ASKELADDEN

BRUKSANVISNING	N
INSTRUKTIONBOK	S
INSTRUKTIONSBOG	DK
GEBRUIKSHANDLEIDING	NL
BETRIEBSANLEITUNG	D
OWNER'S MANUAL	GB
OMISTAJAN KÄSIKIRJA	FIN

ASKELADDEN



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Innledning

Selv om alt har blitt planlagt og utformet for sikkerhet ombord på båten og for båtens brukere, er bruk av båter svært avhengig av værforhold, sjøtilstand, erfaringen og den fysiske tilstanden til mannskapet osv. og det er umulig å garantere full sikkerhet.

Selv om båten er kategorisert for dem, strekker sjø- og vindforholdene som korresponderer til design kategoriene A, B og C seg fra sterk storm til alvorlige tilstander og utsetter båten for farer for uventede bølger eller vindkast. Dette er farlige tilstander hvor kun et dyktig og veltrent mannskap i fysisk god form kan seile et godt vedlikeholdt fartøy på en tilfredsstillende måte.

Sjøen eller vannet er ikke naturlige omgivelser for mennesker, og det er bare å respektere naturens lover og styrke. Lytt alltid til eller les værvarslene eller vær forutsigelsene før en båttur og forsikre at vinden og sjøtilstandene korresponderer til din båts design kategori og at mannskapet ditt er istand til å håndtere båten under disse forholdene.

Denne brukerhåndboken inneholder minimal informasjon som er nødvendig for å bruke båten skikkelig, i tillegg til noen sikkerhetsemner, drifts- og vedlikeholdshint. Les håndboken nøye og gjør deg kjent med fartøyet før du tar det i bruk. Denne brukerhåndboken er, derimot, ikke et båtsikkerhetskurs eller kurs i hvordan å navigere, ankre eller dokke båten din. Din forhandler, nasjonale seilerforbund eller din lystbåtklubb vil gi deg råd om lokale skoler eller instruktører.

Denne brukerhåndboken er verken en drifts- eller en vedlikeholds- eller problemløsnings håndbok.

Vennligst bruk en opplært profesjonell person for vedlikehold, reparasjon eller mindre modifikasjoner til enhver tid. For større modifikasjoner, påse at vedkommende ikke utfører store modifikasjoner på sikkerhets-karakteristikkene til fartøyet, og hvor det er relevant, påse at vedkommende har skriftlig autorisasjon fra båtbyggeren eller båtbyggerens juridiske representant.

Enhver forandring i den loddrette posisjonen til massene ombord (for eksempel tilføyelsen av et fisketårn, en radar, en stuingsmast osv.) kan ha stor påvirkning på stabiliteten til båten din. Ikke utfør disse endringene uten først å ha fått skriftlig autorisasjon fra båtbyggeren eller båtbyggerens juridiske representant.

I mange land er et førekort, autorisasjon eller opplæring påkrevd. Vennligst påse at du har disse påbudte autorisasjonene før du kjøper eller seiler en båt.

Hold alltid båten din godt vedlikeholdt, men utover dette, juster bruken for å passe til tilstanden til båten din som slites etter tid og bruk.

Den internasjonale IMO Colreg bestemmelsen definerer regler om seilingsrett, navigasjonslys osv. over hele verden. Vær sikker på at du kjenner disse reglene og at du har en bok som forklarer dem ombord.

Dersom dette er ditt første fartøy eller du forander til en type fartøy som du ikke kjenner, vennligst sørg for håndterings- og driftserfaring før du “tar kommando” over fartøyet. Dette er for din egen komfort og sikkerhet.

Envher båt - uansett hvor solid den er - kan bli alvorlig skadet dersom den håndteres eller behandles på feil måte av uerfarne personer. Dette er ikke kompatibelt med trygg båtbruk. Juster alltid farten til hurtiggående båter etter sjøtilstanden for å unngå overdreven stamping.

VENNLIGST OPPBEVAR DENNE HÅNDBOKEN OG DENS VEDLEGG PÅ ET TRYGT STED OG SØRG FOR AT DEN NYE EIEREN FÅR DEN NÅR FARTØYET SELGES.

Ettersom vi stadig utvikler og forbedrer våre produkter, kan det hende at illustrasjonene i denne håndboken ikke er det samme som for ditt fartøy, men de vil likevel være representative referansetegninger. Noen kontroller og indikatorer kan være tilleggsutstyr som ikke finnes på ditt fartøy, og deler av informasjonen i håndboken kan omhandle dette.

Sertifisering

Fartøyet er sertifisert i henhold til de relevante bestemmelsene i EUs direktiv om fritidsfartøyer (Det europeiske parlaments direktiv nr. 94/25/EU, 2003/44/EU). CE-merket betyr at fartøyet tilfredsstiller eller overgår alle ISO-standarder og -direktiver som var gjeldende på produksjonstidspunktet.

CE

Grader av fare

⚠ADVARSEL!

Påminnelse om påkrevd sikkerhetspraksis for å unngå skader på båten.

⚠FARE!⚠

Påminnelse om nødvendige forholdsregler for å unngå alvorlig personskade eller død.

Konstruksjonskategori

Alle små fartøyer er klassifisert i henhold til en standard konstruksjonskategori. (Se produsentens merkeplate på fartøyets skrog for informasjon om konstruksjonskategori.) Din Askeladden Z7 er klassifisert i kat. C.

Kategori C - LANGS KYSTEN

Fartøyer som er beregnet på bruk i kystfarvann, bukter, elvedeltaer, innsjøer og elver, der forhold med vindstyrke på høyst 6 (Beaufort-skalaen) og signifikant bølgehøyde på høyst 2 m kan forekomme.

Utstyr og funksjoner

Tillegg A inneholder alle skisser/ illustrasjoner som det henvises til i den følgende teksten.

Tillegg B inneholder håndbøker for motoren som er montert i fartøyet.

Tillegg C inneholder informasjon om de brannslokkingssystemene som er installert i fartøyet.

Tillegg D inneholder informasjon om kjøleskapet som er installert i fartøyet.

Tillegg E inneholder informasjon om komfyren som er installert i fartøyet.

Tillegg F inneholder informasjon om stereoanlegget som er installert i fartøyet.

Tillegg G inneholder informasjon om Z-Top som er installert i fartøyet.

Tillegg H inneholder informasjon om lensepumpen som er installert i fartøyet.

Tillegg I inneholder informasjon om trimplanet som er installert i fartøyet.

Tillegg J inneholder informasjon om ankervinsjen som er installert i fartøyet.

Tillegg K inneholder informasjon om batteriladeren som er installert i fartøyet.

Tillegg L inneholder informasjon om toalettet som er installert i fartøyet.

Tillegg M inneholder informasjon om SecureVolt.

Tillegg N inneholder informasjon om SmartCraft.

Tillegg O inneholder samsværserklæringen og tillegget til denne.

Tekniske data

Lengde:	7,06 m
Bredde:	2,54 m
Dypgående:	0,39 m
Vekt med 5,0 L-260 MPI FWC Alpha, bensin:	Ca. 1805 kg
Vekt med QSD 2,8L-230 Bravo 2, diesel:	Ca. 1866 kg
Personer:	Maks. 6
Drivstofftype:	Blyfri bensin/diesel
Tillatt last:	Maks. 1096 kg
Motor:	Maks. 191 kW / 260 HK
Kabellengde, fjernkontroll, diesel:	14/16 ft.
Kabellengde, fjernkontroll, bensin:	14/16 ft.
Kabellengde, rattstyring, diesel/bensin:	4,75 m
Drivstofftank:	200 liter
Vanntank:	54 liter
Septiktank:	54 liter

Skisse av båten

Det finnes en skisse av båten i Tillegg A. Vær oppmerksom på at det finnes egne tegninger for hvert hekkaggregat.

Sikringer og overbelastningsbrytere

Det er brukt sikringer og overbelastningsbrytere på de elektriske kretsene i båten for å beskytte mot overbelastning. Sikringen vil ryke eller overbelastningsbryteren vil slå seg ut hvis den elektriske kretsen overbelastes. Hvis dette skjer ofte, kontakt din forhandler umiddelbart for å få råd.

Det finnes skisser av båtens elektriske systemer i Tillegg A.

Utstyr og funksjoner

Girspak/turtallsregulator

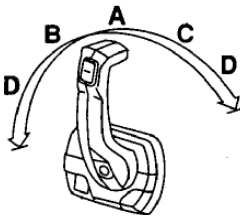
Girspaken/turtallsregulatoren varierer noe avhengig av modell og motorsystem. Alle girspaker/turtallsregulatorer krever periodisk vedlikehold for å fungere sikkert og problemfritt.

⚠ADVARSEL!

Feilaktig eller manglende vedlikehold av kontroller kan føre til at de svikter, noe som kan føre til alvorlige skader. Sjekk kontrollenes kabler og deler regelmessig. NB! Alle girspaker/turtallskontroller har en sikkerhetsbryter som bare tillater start av motoren når spaken er i fri posisjon.

• Enkel spake - Skjult montering

Énhånds, enkel spake - fungerer både som girspak og turtallsregulator.



A Fri (Nøytral) - Sikkerhetsbryteren gjør at motoren bare kan startes i denne posisjonen.

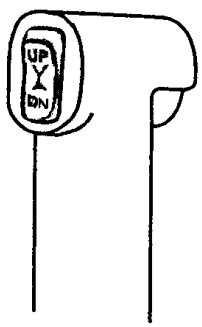
B Forover - Trykk inn knappen under for å skifte til girposisjon for forover.

C Akterover - Trykk inn knappen under for å skifte til girposisjon for akterover.

D Gasspådrag - Motorturtallet økes når du skyver spaken fra deg (i forover-posisjonen) eller trekker den til deg (i akterover-posisjonen).

For alle spaker/kontroller - Prøv aldri å skifte gir uten at motoren går. Det er en egen knapp nederst på spaken for alle kontroller som du trykker på for å varme motoren når den er i fri.

• Motortrim



Bryter på håndtaket til girspaken/ turtallsregulatoren som justerer trim/vipping for motoren. Brukes til å forbedre ytelsen i kombinasjon med justering av trimplan (se under Brytere og indikatorer). Når du skal gjøre båten klar til transport, bruker du opp-bryteren til å heve motoren.

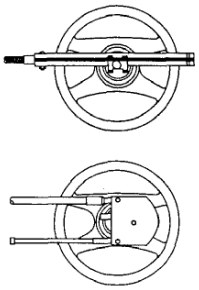
Styring

Alle styresystemer krever periodisk vedlikehold for å fungere sikkert. Jevnlige inspeksjoner er nødvendig. Se avsnittet om vedlikehold for mer informasjon.

Husk at styresystemer på båter ikke er selvsentrerende - du må alltid holde et fast grep om roret slik at du har full kontroll over båten til enhver tid.

• Mekanisk styring

Når rattet dreies på modeller med mekanisk styresystem, overfører rattenheten rattets rotasjonsbevegelse til lineær bevegelse i kabelen som beveger styrearmen i ønsket retning.



⚠ADVARSEL!

Feilaktig eller manglende vedlikehold av styresystemet kan føre til alvorlige skader.

Drivstoff- og vanntanker

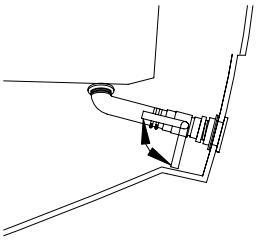
Drivstoff- og vanntankenes påfyllingspunkter er vist på tegning i Tillegg A. Innenbordsmotoren på din Askeladden Z7 er en bensin- eller dieselmotor.

Skjematiske illustrasjoner av drivstoffsystemet finner du i Tillegg A. Det finnes også en skjematisk illustrasjon av vannsystemet om bord i båten i Tillegg A.

Ventiler

• Bunnkran

Båten din er utstyrt med en bunnkran som befinner seg under eller ved vannlinjen, slik at den kan dreneres for regnvann. Det kan være nødvendig å stenge bunnkranen når båten er lastet for å unngå oversvømmelse.



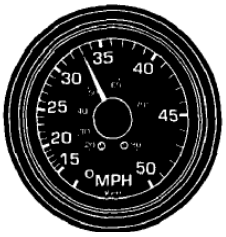
Hold alltid bunnkranen fri for smuss og avfall, ettersom det kan føre til blokkeringer.

Instrumenter

Båten din kan være utstyrt med ett eller flere av følgende instrumenter:

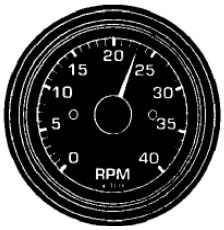
• Speedometer

Måler båtens hastighet i knop, km/t eller miles/t.



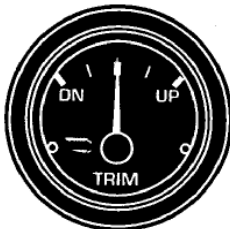
• Turteller

Måler motorens hastighet i omdreininger per minutt.



• Trimindikator

Bruk denne måleren til å kontrollere båtens trim, dvs. posisjonen til drevet og baugens relative posisjon i forhold til horisontalplanet.



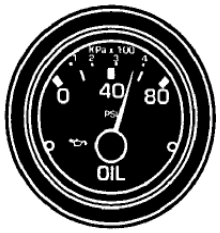
• Drivstoffmåler

Viser det omtrentlige nivået i drivstofftanken. Ettersom nøyaktigheten kan variere med båtens planingsvinkel, anbefales det å beregne en tredjedel av det viste nivået som en reserve.



• Oljetrykksmåler

Måler oljetrykket i motoren. Se motorhåndboken for mer informasjon.

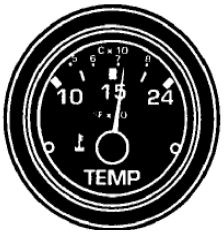


• Temperaturmåler for motorolje

Måler temperaturen på motoroljen. Se motorhåndboken for mer informasjon.

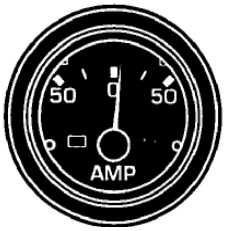
• Temperaturmåler for kjølevann

Måler temperaturen på kjølevannet i motoren. Se motorhåndboken for mer informasjon.



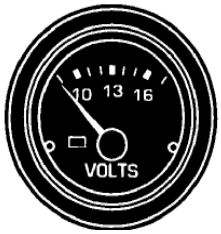
• Amperemeter

Måler det elektriske systemets ladestrøm. Se motorhåndboken for mer informasjon.



• Voltmeter

Måler tilstanden til batteriet i volt (likestrømsspenning). Hvis voltmeteret viser en verdi som er under 11,5, sjekk og lad batteriet.



• Timeteller

Viser antall driftstimer for motoren. Se motor-håndboken for mer informasjon om vedlikeholdsplaner.

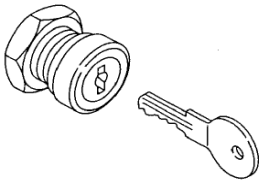


Se Tillegg N - SmartCraft.

Brytere og indikatorer

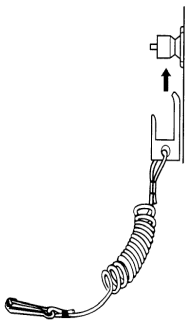
• Tenningsnøkkel

Sett inn nøkkelen i tenningen og drei den med urviserne for å starte motoren. Så snart motoren starter, slipper du nøkkelen tilbake til posisjonen ON (PÅ).



• Stoppbryter for motor

Nødstoppbryteren for motoren må bare brukes i nødsituasjoner. Den må IKKE brukes til normal avstengning av motoren. Stoppbryteren skal være festet til den personen som fører båten, ved hjelp av klipset. Dermed vil stoppbryteren bli trukket ut og motoren stanse hvis denne personen mister balansen eller faller over bord.



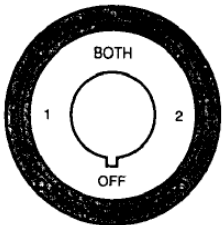
⚠ADVARSEL!

Kontroller alltid at stoppbryteren er ordentlig festet til både kontrollene og båtføreren, før turen starter.

Én gang per måned skal det kontrolleres at stoppbryteren fungerer slik den skal, ved at den trekkes ut mens motoren går. Hvis

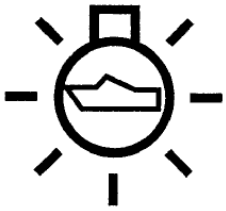
motoren ikke stanser, kontakt din forhandler omgående for å få skiftet ut stoppbryteren.

• Batteribryter



Brukes til å koble batteriet til det elektriske systemet. Når batteriet er frakoblet, er det beskyttet mot hærverk, brann og utlading. Kontroller at batteriet er frakoblet (still bryteren i posisjonen OFF (AV)) når båten ikke er i bruk.

• Bryter for navigasjonslys



Av/på-bryter for navigasjonslys og ankerlanterner.

Kjør aldri båten i mørke uten at navigasjons-lysene er tent. De er nødvendige for at andre båter skal kunne bestemme kursen til din båt og avgjøre hvem som har rett til å holde sin kurs.

• Strømforsyning fra land

Kontroller at båtens bryter for strømforsyning fra land er i posisjonen OFF (AV) før du kobler til eller fra strømforsyningen fra land. Koble til de nødvendige kablene før du aktiverer slik strømforsyning. Hvis det vises et varselsignal på polaritetindikatoren, må du umiddelbart frakoble strømforsyningen fra land. Når du frakobler, slår du først av strømmen på land. Kontroller dessuten at strøminntakets deksel er ordentlig lukket etter at du har koblet fra.

• Landgangs- og cockpitlys

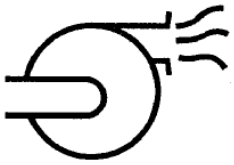
Brytere for betjening av landgangs- og cockpitlys. Hovedstrømsbryteren må være i posisjonen ON (PÅ) før lysene kan tennes.

• Vindusviskerbryter



Kontrollerer bruken av vindusviskerne.

• Viftebryter

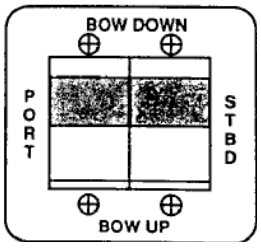


Kontrollerer ventilasjonen i motorrommet, slik at eventuelle gasser kan luftes ut.

⚠FARE!⚠

Hver gang du skal starte motoren, må du først la viften gå i minst 5 minutter før du starter motoren. Du bør også bruke viften når motoren går på tomgang eller ved lave hastigheter. Hvis viften ikke brukes som foreskrevet, kan det føre til eksplosjon og alvorlige skader.

• Brytere for trim-plan



Tilleggsutstyr. Brytere som kontroller trimplanene som er plassert på babord og styrbord side av hekken. Brukes til å korrigere krenging under vanskelige forhold, og til generell forbedring av båtens bevegelse i sjøen.

• Bryter for lensepumpe

Manuell av/på-bryter for lensepumpe.

Det er montert en håndrevet lensepumpe i båten med en kapasitet på 40 liter/min. Plasseringen til lensepumpen er vist på tegning i Tillegg A.

• Alarm

Hvis det høres en alarm, må du sjekke alle målere og stoppe motoren umiddelbart. Alarmen kan være et varsel om overoppheting av motoren og/eller for lavt oljenivå.

Sikkerhet og sikkerhetsutstyr

Påbudt sikkerhetsutstyr

- Redningsvester for alle passasjerer
- Navigasjonslys
- Brannslokkingsapparat
- Manuelt lenseutstyr

Anbefalt sikkerhetsutstyr

- Ankerline og anker
- Fortøyningliner og fendere
- Førstehjelpssett
- Ekstra nøkkelsett
- Ekstra startbatteri
- Ekstra sikringer og pærer

Redningsvester

Kontroller at alle redningsvestene passer og er lett tilgjengelige.

⚠ADVARSEL!

Det er svært viktig at barn, handikappede og personer som ikke kan svømme, har på seg redningsvester til enhver tid. Dessuten bør det finnes en lett tilgjengelig livbøye om bord, slik at den kan kastes ut på kort varsel.

Brannslokkingsapparat

Oppbevar brannslokkingsapparatet på et sted der det er lett å nå. Sørg for at du vet hvordan du bruker apparatet når du tar det om bord. Les bruksanvisningen for apparatet i Tillegg C. Stå aldri vendt mot vinden når du bruker brannslokkings-apparatet, og rett apparatet mot brannkilden.

Når et brannslokkingsapparat er brukt, uansett hvor lenge, må det leveres inn til en godkjent forhandler for etterfylling.

⚠FARE!⚠

Lanterneføring

Fartøy uten lanterneføring skal ikke benyttes i mørke og dårlig sikt.

⚠ADVARSEL!

Alkohol/rusmidler og båtliv

Ikke nyt alkohol eller rusmidler når du er på sjøen. Det vil i sterk grad påvirke din konsentrasjon og balanse. Alkohol i blodet vil dessuten redusere din motstands-dyktighet overfor temperaturendringer, f.eks. kald vind eller kaldt vann hvis du skulle falle over bord.

Lenseutstyr

Når det ikke er montert en lensepumpe, er det eierens ansvar å ha minst én øse/bøtte om bord, og den må være godt festet til båten.

⚠FARE!⚠

Bruk av badeleider/plattform

Slå alltid av motoren før bruk av bade-leideren/plattformen for å unngå kontakt med bevegelige deler, f.eks. propellen.

Maks. anbefalt last

Legg merke til den tillatte lasten i tabellen på side 3 i denne håndboken. Den tillatte lasten må aldri overskrides, ettersom det kan gå utover båtens sikkerhet. Den tillatte lasten omfatter all proviant, tankinnhold, diverse utstyr og personer om bord.

Sørg dessuten for at all last er fornuftig fordelt og godt festet, spesielt i dårlig vær.

⚠ADVARSEL!

Båtførerens synsfelt fra roret

Båtførerens synsfelt fra roret kan bli blokkert av høye trimvinkler på fartøyet og andre faktorer som forårsakes av ett eller flere av følgende variable forhold:

- motorenes trimvinkler
- trimplanvinkler for skroget
- lasting og lastfordeling
- fart, rask akselerasjon
- overgang fra sakte fart til planing
- sjøforhold, regn og sjøsprøyt
- mørke og tåke
- innvendige lys og plassering av gardiner
- personer og flyttbart utstyr i synsfeltet

Internasjonale regler krever at det til enhver tid holdes god utkikk, slik at man unngår kollisjoner og overholder gjeldende regler for retten til å holde kursen.

⚠FARE!⚠

Fare for CO-forgiftning

Alle båtmotorer produserer karbonmonoksid (CO) som eksos. Dette er en svært giftig og farlig gass. Den er dessuten så å si umulig å oppdage, ettersom den er luktfri og fargeløs.

Tidlige symptomer på CO-forgiftning er tretthet, svimmelhet og kvalme. Langvarig kontakt med CO kan føre til hjerneskade eller død.

For å forhindre kontakt med CO-gass er det svært viktig at du følger disse retnings-linjene:

- Sørg for at det ikke er noe som blokkerer utslippet av eksos fra motoren - dette kan være fortøyninger, andre båter osv.
- Når du kjører med lave hastigheter, muligens med baugen høyt, må du kontrollere at eksosen ikke blåser inn i båten, men bort fra den.
- Når du bruker en seildukstopp eller kalesje på båten din, må du sørge for at det er god ventilasjon for eksosdampen.

Vinduer og luker

Hold alle vinduer osv. lukket ved høye hastigheter og i dårlig vær, slik at du unngår fare for skader.

Generell bruk av fartøyet

Vennligst vær oppmerksom på følgende med hensyn til motor- og manøvrerings-begrensninger for fartøyet:

- Ikke bruk denne båten med en motor med større oppgitt effekt enn det som er angitt på båtens kapasitetsmerke.
- Ikke bruk denne båten med negative trim-innstillinger for fremdriftsenheten (bau-gen ned) ved høye hastigheter, ettersom båten da kan krenge til siden og bli ustabil. Bruk negativ trim til å akselerere til planings-hastighet fra sakte fart og ved lavere planingshastigheter i grov sjø.
- Ikke bruk båten med maksimal hastighet på tett trafikkerte vannveier, i dårlig vær eller grov sjø eller under forhold med redusert sikt.
- Overhold seilingsregler på sjøen som definert i internasjonale vedtekter.
- Beregn alltid tilstrekkelig stopp- eller manøvreringsdistanse, slik at du er i stand til å unngå kollisjoner.

Miljømessige hensyn

Som eier av en fritidsbåt er du ansvarlig for å beskytte naturen og miljøet, både i sjøen og på land. Vennligst forlat steder på både sjø og land slik du selv håper å finne dem.

Utslipp av drivstoff og olje

Slipp aldri ut drivstoff eller olje i sjøen. Dette er giftige stoffer som skader miljøet. Utslipp av drivstoff eller olje i sjø eller vann er forbudt, og du kan bli bøtelagt.

⚠FARE!⚠

Hvis det forekommer utslipp ved et uhell, f.eks. når du fyller drivstoff eller olje, må du huske at disse væskene er svært eksplosive og giftige. Ikke utsett dem for åpen flamme. Tøy eller tekstiler som er brukt til å tørke opp drivstoff eller olje, bør ikke oppbevares i båten.

Utslipp og fjerning av avfall

Ikke kast noen typer avfall i sjøen eller vannet. De fleste marinaer har store søppelcontainere som båteiere kan bruke. Ta med deg alt avfall tilbake til land og kasser det der.

Hvis det er installert et toalett i båten din, kan du kun tømme det på et godkjent avfallsanlegg i din marina eller utaskjærs i henhold til forskrifter.

Unødig støy

Vis hensyn til andre sjøfarende og folk på land. Lyd kan høres på lang avstand på sjøen, spesielt om natten, og derfor må du unngå lyder som musikk, høye stemmer og motorstøy. Hold lydnivået så lavt som mulig.

Kjølvann og bølger

Du må alltid overholde alle fartsrestriksjoner. De fleste marinaer vil ha fartsrestriksjoner i farvannet ved marinaen for å forhindre at kjølvannet fra andre båter skader de fortøyde båtene.

⚠ADVARSEL!

Ikke alle områder er merket med fartsrestriksjoner, så vennligst reduser farten din slik at båten ikke planer når du passerer områder med fortøyde båter eller badende mennesker.

Eksosutslipp

Hydrokarbonene i eksos forurenser luften og vannet. Får å holde eksosutslippet så lavt som mulig, må du sørge for at motoren er riktig innstilt og rengjøre båtens skrog jevnlig. Din forhandler kan gi deg mer informasjon om dette.

Bunnstoff og rensemidler

Du kan unngå algevekst eller marin groe på båtens skrog ved å bruke et veksthindrende bunnstoff. Vær imidlertid oppmerksom på miljøvernforskrifter om hvilke typer bunnstoff du kan bruke - din forhandler eller lokale båtmyndigheter vil kunne gi deg råd om dette.

Vi anbefaler at du bruker miljøvennlige rensemidler, som ikke bare reduserer trusselen mot miljøet til et minimum, men også er mer effektive og sikrere for deg. Bruk rensemidler med forsiktighet, og ikke kast brukte rensemidler eller tomme beholdere i sjøen.

Vedlikehold

Generelt stell

• Rengjøring av båten
Over tid vil båter generelt slites når de er utsatt for saltvann, sollys og forurensning. Jevnlig rengjøring av båten vil redusere denne slitasjen. Du kan kjøpe spesielle båtrengjøringsmidler hos din forhandler, men du må aldri bruke produkter med slipemidler, ettersom disse vil skade båtens gelcoatoverflate.

⚠ADVARSEL!
Vær forsiktig når du rengjør båtens dekk, ettersom vaskemidler kan gjøre underlaget svært glatt.

• Algevekst og marin groe
Hvis det er helt nødvendig, kan det brukes spesialprodukter til fjerne algevekst og marin groe fra skroget, men disse produktene bør ikke slippes ut i sjøen. Ikke bruk stålbørster eller skuresvamper på båtens skrog, ettersom disse vil lage riper i overflaten.

• Antigromaling
Det er nødvendig å bruke god antigromaling for å beskytte båtens skrog mot blemmer og osmose. Kontakt din forhandler for mer informasjon.

• Saltvannskorrosjon
Hvis du bruker båten i saltvann, bør du rense den med ferskvann så ofte som mulig for å unngå korrosjon.

• Styring
For å sikre riktig og sikker drift av styresystemet, bør styrearmen smøres minst to gang per år - før og etter vinterlagring.

• Seteputer
Putene i båten din er laget av materialer av høy kvalitet, og de skal tåle væskesøl og mindre mengder av vann og sjøsprøyt. Du bør rengjøre putene jevnlig med en svamp og såpevann. Bruk ALDRI sterke, syntetiske vaskemidler, løsemidler eller kjemiske rensemidler. Du kan også kjøpe spesialprodukter for rengjøring av møbeltrekk.

Du må også huske å vedlikeholde glidelåsen og andre metalldeler på putene. Smør disse én gang per år med silikon eller vaselin for å unngå rust.

Vær forsiktig når du tar ut putene - ikke dra i selve puten, bare i trykkfestet.

Når båten ikke er i bruk, bør du legge putene i et av oppbevaringsrommene om bord, eller på et tørt sted.

• Kalesje
Kalesjen på båten din er smuss- og vannavstøtende. Den kan rengjøres med et mildt vaskemiddel. Skrubb utsiden av kalesjen med en myk børste og rengjør innsiden med en myk klut eller svamp, slik at du unngår å lage riper. Temperaturen på vannet som du bruker til rengjøring av kalesjen, bør ikke være over 30°C.

Ikke rengjør kalesjen med kjemiske rensemidler eller høytrykksspyler, og unngå å tørke kalesjen ved høye temperaturer eller i en tørketrommel.

Under vinteropplag bør kalesjen tas av, tørkes og oppbevares på et tørt sted. Vi anbefaler også hyppig lufting av kalesjen, minst én gang per uke, når båten er i bruk, slik at du unngår muggdannelser på den.

• Lensepumpe
Lensepumper bør inspiseres jevnlig med hensyn til oppsamling av smuss og avfall, særlig i perioder med kraftig regn og dårlig vær. Smuss i lensepumpen kan føre til at den ikke fungerer. Du bør dessuten regelmessig sjekke at klemmer og slanger på lensepumpen er godt tilstrammet.

⚠ADVARSEL!
Bruk aldri lettantennelige eller kjemiske løsemidler til rengjøring av lensepumpen.

• Toalett
En illustrasjon av septiktanksystemet om bord i båten finnes i Tillegg A.

Bruk milde vaskemidler og varmt vann til rengjøring av toalettet. Kast aldri tøy, sanitærbind eller andre faste gjenstander i toalettet. Tillegg M inneholder informasjon om toalettet som er installert i båten.

• Montasjer i rustfritt stål
Rustfritt stål kan også utsettes for slitasje. Bruk et mildt vaskemiddel og vann til å holde det rent. Bruk aldri stålull, børster eller lignende, ettersom disse vil lage riper i

overflaten. Bruk et poleringsmiddel til å fjerne rustflekker så snart de oppstår, og påfør voks regelmessig slik at det ikke oppstår korrosjon.

• Vinduer i pleksiglass

Bruk milde vaskemidler og varmt vann til rengjøring. Sørg for å bruke en myk klut, ettersom pleksiglass lett får riper.

Materialer og komponenter

Båten din er konstruert og produsert, testet og sertifisert i henhold til strenge vedtekter og sikkerhetsstandarder. Vi fraråder på det sterkeste at eieren selv utfører noen installasjon av tilleggsutstyr eller komponenter, ettersom disse kan ha betydning for sikker bruk av båten, og dermed også garantiens dekning.

Hvis du skulle ha behov for tilleggsutstyr, kontakt din forhandler, som er kvalifisert til å foreta slike modifikasjoner.

Vinteropplag

Se motorhåndboken, Tillegg B, for råd om vinteropplag av motoren.

Batteriet bør tas ut, lades og lagres på et tørt sted.

Sørg for at båten er helt tørr, og fjern alt vann fra rør og andre komponenter for å unngå frostskader.

Din båtforhandler vil kunne gi deg profesjonell vinteropplagsservice.

Maling

Vi anbefaler jevnlig påføring av bunnstoff for å hindre marin groe. Spør din forhandler om hvilket bunnstoff eller hvilken maling du bør bruke, avhengig av hvor du har tenkt å bruke båten.

⚠ADVARSEL!

Maling er både giftig og lettantennelig. Kontroller at det området der du maler båten, er godt ventilert, og husk å bruke nødvendig sikkerhetsutstyr - hansker, briller, maske osv.)

Inspeksjon

Før du tar båten ut av vinteropplag, er det viktig å inspisere alle komponenter på den nøye. Kontroller at alle beslag og rørdeler er tette, at det ikke er lekkasjer, samt at det ikke finnes skadde eller nedslitte deler. Du bør også inspisere viktige komponenter på båten i løpet av sesongen.

Løfting av båten

Kontroller at repene er nøyaktig plassert slik at båten er horisontal når den løftes. Bruk beskyttelse mellom rep/kabler og båten for å forhindre skader under løfting.

⚠FARE!⚠

Stå aldri under båten når den løftes!

Fortøyning

Det er eierens ansvar å sikre at fortøyninger, slepetrosse, ankerkjettinger og anker er av en passende størrelse for båtens tenkte bruk.

⚠ADVARSEL!

Eieren må selv gjøre seg kjent med festing av slepetrossen om bord til de aktuelle festepunktene.

Transport

Kontroller at båtens kjøl er riktig plassert mellom senterrullene og juster sidelageret for å hindre at båten beveger seg.

⚠ADVARSEL!

Ikke last båten og gå aldri om bord i den under transport.

Ytterligere informasjon

Garanti

Se baksiden av samsværserklæringen (Tillegg O) for komplett garantiinformasjon.

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Bilaga

Bilaga A - Ritningar/illustrationer
Bilaga B - Motor
Bilaga C - Brandsläckarsystem
Bilaga D - Kylskåp
Bilaga E - Spis
Bilaga F - Stereo
Bilaga G - Z-Top
Bilaga H - Länspumpe
Bilaga I - Trimplan
Bilaga J - Ankarvinsch
Bilaga K - Marina batteriladdar
Bilaga L - Toalett
Bilaga M - SecureVolt
Bilaga N - SmartCraft
Bilaga O - Överensstämmelse och bilagan

ASKELADDEN 77

Introduktion

Även om allting har planerats och ritats för båtens och användarnas säkerhet är båtlivet helt beroende av väder, sjö, besättningens erfarenhet och fysiska tillstånd osv, och man kan aldrig garantera fullständig säkerhet.

Även om båten har rätt kategori kan väder- och sjöförhållandena som motsvarar designkategori A, B och C variera från stark storm till svåra förhållanden, med risk för en onormal våg eller vindstöt, och de är därför farliga förhållanden där endast en skicklig, vältränad och kunnig besättning på en väl underhållen båt klarar sig.

Sjön eller vädret är inte människans naturliga miljö, och man kan bara respektera naturlagarna och deras styrka. Lyssna eller titta alltid på väderleksutsikterna före all segling, och kontrollera att vind- och sjöförhållendena motsvarar båtens designkategori och att du och din besättning klarar av båten under dessa förhållanden.

Denna instruktionsbok innehåller den väsentliga information som krävs för att sköta båten ordentligt, en del säkerhetsanvisningar, råd för användning och underhåll. Läs den noga och bekanta dig med båten innan du använder den. Denna instruktionsbok är dock ingen kurs i seglingssäkerhet eller konsten att navigera, ankra eller docka båten. Återförsäljaren, segelsällskap eller båtklubben kan ge råd om lokala segelskolor eller instruktörer.

Denna instruktionsbok handlar inte om vare sig användning, underhåll eller felsökning.

Anlita alltid en utbildad fackman till underhåll, reparationer eller smärre modifieringar. Se till vid större modifieringar att han inte modifierar båtens säkerhestanordningar i större utsträckning, och kontrollera vid behov att han har skriftligt tillstånd från båttillverkaren eller deras juridiska ombud.

All förändring av den vertikala placeringen av tyngder ombord (t.ex. tillägg av fisketorn, radar, stuvningsmast osv.) kan påverka båtens stabilitet avsevärt. Utför inte dessa eventuella ändringar utan skriftligt tillstånd från båttillverkaren eller deras juridiska ombud.

I många länder krävs körkort, tillstånd eller utbildning. Se till att du har sådana dokument före köp eller segling.

Underhåll alltid båten ordentligt, men anpassa trots detta användningen till båtens kondition, som slits med tiden.

Den internationella IMO Colreg förordningen definierar trafikregler, navigationslyktor osv över hela världen. Se till att du kan dessa regler och har ett häfte ombord som förklarar dem.

Om detta är din första båt eller om du byter till en båttyp som du inte känner till, bör du för din egen komfort och säkerhet se till at du får erfarenhet i dess hantering och använding innan du “övertar befälet” på båten.

Alla båtar - oavsett hur starka de är - kan få allvarliga skador om de hanteras eller behandlas felaktigt av oerfarna personer. Detta hör inte ihop med säkert båtliv. Anpassa alltid motorbåtens hastighet efter sjöförhållandene så att båten inte slår för mycket.

FÖRVARA INSTRUKTIONSBOKEN MED BILAGORNA PÅ SÄKER PLATS, OCH ÖVERLÄMNA DEN TILL DEN NYA ÄGAREN NÄR DU SÄLJER BÅTEN.

Beroende på vår policy beträffande ständig produktförbättring kan illustrationerna i denne instruktionsbok inte vara desamma som på Din båt utan de kan vara avsedda som referenser. Vissa instrument eller viss information må vara för extra utrustning som inte finns på Din båt.

Certifiering

Din båt är certifierad enligt relevanta delar av Europaparlamentets Recreational Craft Directive (direktiv för fritidsbåtar) 94/25/EU, 2003/44/EU). CE-märket anger att din båt uppfyller eller överträffar alla gällande standarder och direktiv uppställda av International Organisation for Standardisation (ISO).

CE

ASKELADDEN 27

Grader av fara

⚠Varning
Påpekande av säkerhetsåtgärder för att undvika skada på person eller båt.

⚠Fara⚠
Påpekande av korrekta åtgärder för att undvika allvarlig skada på person/båt eller dödsfall.

Båtens konstruktionskategori

Alla små båtar klassificeras enligt en standardiserad konstruktionskategori. (Se tillverkarens platta på båtens skrov beträffande konstruktionskategori). Din Askeladden Z7 är klassificerad under kategori C.

Kategori C - INSHORE/inomskärs
Båt konstruerad för turer i kustnära vatten, stora vikar, flodmynningar, sjöar och floder där väderförhållanden innebär en vindstyrka upp till och med 6 (Beaufort Skala) och betydande våghöjder upp till och med 4 m.

Viktig utrustning och egenskaper

Bilaga A innehåller alla ritningar/illustrationer som det hänvisas till i följande text.

Bilaga B innehåller handböcker rörande motorn som monterats i din båt.

Bilaga C innehåller information om brandsläckarsystemet som är installerat i din båt.

Bilaga D innehåller information om kylskåpet som är installerat i din båt.

Bilaga E innehåller information om spisen som är installerad i din båt.

Bilaga F innehåller information om stereon som är installerad i din båt.

Bilaga G innehåller information om Z-Top som är installerad i din båt.

Bilaga H innehåller information om den länspumpen som är installerad i din båt.

Bilaga I innehåller information om trimplanen som är installerat i din båt.

Bilaga J innehåller information om ankarvinschen som är installerad i din båt.

Bilaga K innehåller information om den marina batteriladdaren som är installerad i din båt.

Bilaga L innehåller information om toalettet som är installerad i din båt.

Bilaga M innehåller information om SecureVolt.

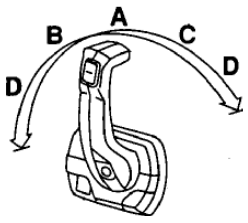
Bilaga N innehåller information om SmartCraft.

Bilaga O innehåller försäkran om överensstämmelse och bilagan till försäkran om överensstämmelse.

Växel-/gasreglage
Växel-/gasreglaget varierar beroende på modell och motorsystem. Alla växel-/gasreglage måste underhållas och kontrolleras regelbundet för att säkerställa korrekt funktion och säkerhet.

⚠Varning
Felaktigt underhåll av reglage kan leda till att de inte fungerar korrekt, vilket kan leda till allvarlig skada på person eller båt. Kontrollera reglagekablarna och -delarna regelbundet. OBS! Alla växel-/gasreglage har en säkerhetsbrytare som gör att motorn bara kan startas i neutralläge.

• Enkel spak - dold montering
Enhands enkelspaksreglage - fungerar både som växelspak och gasreglage.



A Neutralläge - motorn startar bara i detta läge p.g.a. säkerhetsbrytaren.

B Framåt - tryck på knappen under handtaget för att lägga i framåtväxeln.

C Back - tryck på knappen under handtaget för att lägga i backväxeln.

D Gas - tryck i framåtläge eller drag i backläge för att öka motorvarvtalet.

För alla reglage: försök aldrig att växla när motorn inte är igång. Det finns en separat knapp vid spaken på alla reglage som du kan använda för att värma upp motorn när den går i neutralläge.

Tekniska data

Längd:	7,06 m
Största bredd:	2,54 m
Djupgående:	0,39 m
Vikt med 5,0 L-260 MPI FWC Alpha, bensin:	Ca. 1805 kg
Vikt med QSD 2,8L-230 Bravo 2, diesel:	Ca. 1866 kg
Personer:	Max. 6
Typ av bränsle:	Blyfri bensin/diesel
Tillåten last:	Max. 1096 kg
Motor:	Max. 191 kW / 260 HK
Kabellängd, fjärrstyrning, diesel:	14/16 ft.
Kabellängd, fjärrstyrning, bensin:	14/16 ft.
Kabellängd, manuell styrning, diesel/bensin:	4,75 m
Bränsletank:	200 liter
Vattentank:	54 liter
Septiktank:	54 liter

Ritning över båten

En ritning över båten finns i bilaga A. Observera att det finns separata ritningar för varje typ av drivsystem.

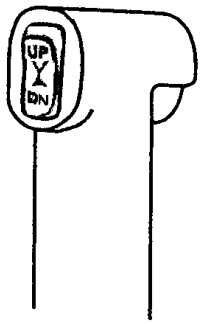
Säkringar och brytkontakter

Säkringar och brytkontakter används i de elektriska kretsarna i båten för att skydda mot överbelastning. Säkringen går sönder eller brytkontakten utlöses om den elektriska kretsen överbelastas. Om detta inträffar regelbunden bör du kontakta din återförsäljare omedelbart för råd.

Ritningar över de elektriska systemen ombord finns i bilaga A.

Viktig utrustning och egenskaper

• Trimning av motor



Reglage på handtaget på din växel/gas som trimmar/lutar motorn. Används för att förbättra prestanda i kombination med trimplanen (se Omkopplare och indikatorer). När du förbereder båten för trailertransport kan du använda uppåt-omkopplaren för att höja upp motorn.

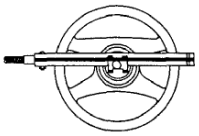
Styrning

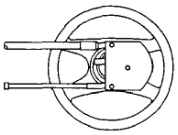
Det är viktigt att styrsystemet underhålls väl så att det fungerar tillfredsställande och säkert. Se avsnittet om underhåll för mer information.

Kom ihåg att båtars styrsystem inte är självcentrerande - du måste alltid hålla ett stadigt tag i ratten för att behålla kontroll över båten.

• Mekanisk styrning

Med ett mekaniskt styrsystem överför styrenheten rattens roterande rörelse till linjär rörelse i kabeln som för styrarmen i önskad riktning.





⚠Varning

Felaktigt underhåll av styrsystemet kan leda till allvarlig skada på person eller båt.

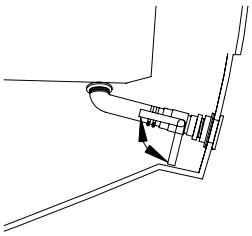
Bränsle- och vattentankar

Bränsle- och vattentankarnas påfyllningspositioner för din båt indikeras i ritning i bilaga A. Inombordsmotorn i din Askeladden Z7 drivs med bensin eller diesel.

Schematiska illustrationer av bränsle-systemet finns i bilaga A. En schematisk illustration av vattensystemet ombord på din båt finns också i bilaga A.

Ventiler

• Bottenkran

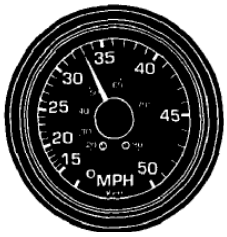


Båten är utrustad med en bottenkran under eller vid vattenlinjen. Det gör att man kan avleda regnvatten från båten. Det kan vara nödvändigt att stänga bottenkranen när båten är lastad för att undvika att vatten kommer in. Håll bottenkranen ren från allt skräp som kan orsaka blockering.

Instrument

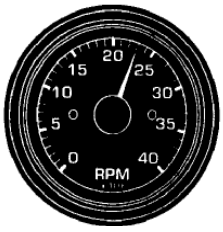
Din båt kan vara utrustad med ett eller flera av följande instrument:

• Hastighetsmätare



Mäter båtens hastighet i knop, kilometer eller miles i timmen.

• Varvräknare



Mäter motorns varvtal i varv per minut.

• Trimningsmätare



Använd denna mätare för att kontrollera båtens trimning, dvs. drivenhetens position och bogens relativa position.

• Bränslemätare



Indikerar ungefärlig bränslenivå i bränsletanken. Graden av noggrannhet kan variera - det är därför bäst att räkna med en tredjedel av den indikerade nivån som reserv.

• Oljetrycksmätare

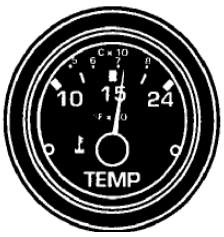


Mäter motorns oljetryck - se motorhandboken för mer information.

• Oljetemperatur-mätare

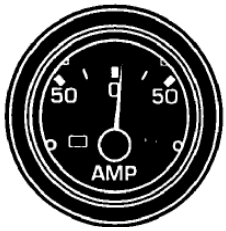
Mäter motoroljans temperatur. Se motorhandboken för mer information.

• Mätare för kylvatten-temperatur



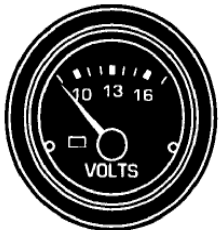
Mäter temperaturen på motorns kylvatten. Se motorhandboken för mer information.

• Amperemätare



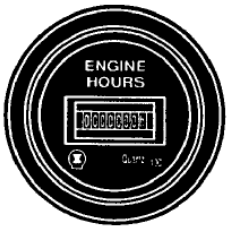
Mäter laddnings-strömmen i elsystemet. Se motorhandboken för mer information.

• Voltmätare



Mäter batteriets kondition i likspänning. Om voltmätaren indikerar spänning under 11,5 volt ska batteriet kontrolleras och laddas.

• Tidmätare

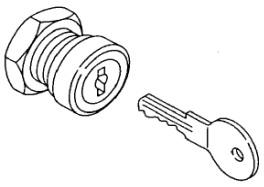


Indikerar antalet timmar som motorn har varit i drift. Se motor-handboken för underhållsscheman.

Se Bilaga N - SmartCraft.

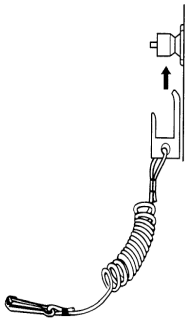
Omkopplare och indikatorer

• Tändning



Sätt i nyckeln i tändningslåset och vrid medsols för att aktivera startmotorn. Så snart motorn börjar gå vrider du nyckeln tillbaka till körläge.

• Stoppbrytare för motor



Motorns stoppbrytare ska bara användas i nödsituationer. Den får INTE användas till normal avstängning av motorn.

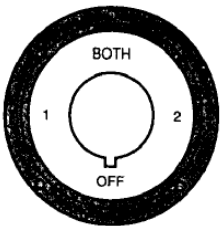
Motorns stoppbrytare bör vara fäst med klämman vid personen som kör båten. Om denna person tappar balansen eller faller överbord dras stoppbrytaren av och motorn stoppas.

⚠Varning

Se alltid till att stoppbrytaren är korrekt fäst både vid reglagen och vid personen som kör båten innan du kör iväg.

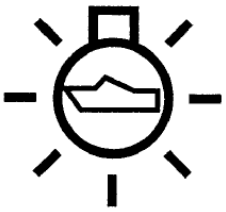
En gång i månaden ska stoppbrytarens funktion kontrolleras genom att den dras av medan motorn är igång. Om motorn inte stannar kontaktar du omedelbart din återförsäljare för att skaffa en ny stoppbrytare.

• Huvudströmbrytare för batteri



Används för att ansluta batteriet till elsystemet. När den är avstängd är batteriet skyddat mot oavsedd användning, brand och urladdning. Se till att batteriet är frånkopplat (omkopplaren i från-läge) när båten inte används.

• Omkopplare för lanternor



Av/på-omkopplare för lanternor och ankarljus.

Kör aldrig båten på natten utan lanternorna. De behövs för att andra båtar ska kunna avgöra din riktning och väjningsplikt.

• Landström

Se till att omkopplaren för landström ombord är i från-läge innan landström ansluts eller kopplas bort. Anslut nödvändiga kablar innan du aktiverar landström. Om du får en varningssignal från polaritetsindikatorn ska landströmmen omedelbart kopplas bort. Stänga av strömmen på land först när du

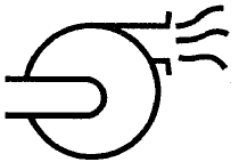
kopplar bort. Se också alltid till att skyddet för landström stängs ordentligt efter bortkoppling.

• Belysning ombord
Omkopplare för påstigningslampor och cockpitbelysning. Huvudströmsbrytaren för likström måste vara i till-läge innan du kan tända dessa lampor.

• Vindrutetorkare
Styr vindrutetorkarnas funktion.

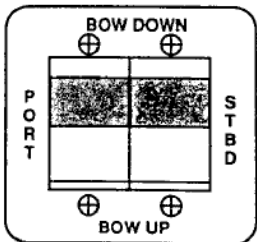


• Fläktomkopplare
Styr ventilationen i motorrummet, för att avlägsna ångor.



⚠Fara⚠
Kör alltid fläkten i minst 5 minuter innan du startar motorn. Du bör också använda fläkten när motorn går på tomgång eller vid låga hastigheter. Om fläkten inte används kan explosion inträffa, som kan leda till allvarlig skada på person eller båt.

• Trimplan
Extrautrustning. Omkopplare för att reglera trimplanen på babords och styrbords sida av akterspegeln. Används för att korrigera slagsida i svåra förhållanden och för att allmänt förbättra båtens gång.



• Länspump
Manuell till/från-omkopplare för länspump.

En handmanövrerad länspump med en kapacitet på 40 liter/min. är monterad på båten. Länspumpens placering framgår av ritningarna i bilaga A (bilge pump).

• Varningsalarm
Om ett varningsalarm ljuder ska du kontrollera alla mätare och omedelbart stoppa motorn. Du kan ha problem med överhettning i motorn och/eller för lite olja.

Säkerhetsutrustning och säkerhet

Nödvändig säkerhetsutrustning

- Flytvästar för alla passagerare
- Lanternor
- Brandsläckare
- Manuell länsanordning

Rekommenderad säkerhetsutrustning

- Ankarlina och ankar
- Förtöjningslina och fendrar
- Första hjälpen-sats
- Reservnycklar
- Extra startbatteri
- Reservsäkringar och glödlampor

Flytvästar

Se till att alla flytvästar sitter korrekt och är lätt åtkomliga.

⚠Varning
Ej simkunniga, som t.ex. barn och handikappade, bör alltid bära flytväst. En kastbar flytanordning, som t.ex. en frälsarkrans, bör också finnas lätt åtkomlig ombord.

Brandsläckare

Förvara brandsläckaren på en plats där den är lätt åtkomlig. Se till att du kan använda brandsläckaren så snart du tar den ombord genom att läsa användarhandboken i bilaga C.

Stå aldrig vänd mot vinden när du använder brandsläckaren och rikta strålen mot brandkällan.

När en brandsläckare har använts, oavsett hur länge, måste den lämnas in till en auktoriserad återförsäljare för påfyllning.

⚠Fara⚠

Lanternor

Båtar utan lanternor får inte framföras när det är mörkt eller vid dålig sikt.

⚠Varning

Alkohol/droger och båtfärd

Använd inte alkohol eller droger när du åker båt. De försämrar allvarligt din koncentration och balans. Alkohol i blodomloppet minskar också din tolerans mot temperatur-förändringar, t.ex. vid kalla vindar och kallt vatten om du faller överbord.

Länsanordning

Om en länspump inte är monterad är det ägarens ansvar att ha minst ett öskar/en hink ombord, säkrade mot oavsiktlig förlust.

⚠Fara⚠

Användning av badstege/plattform

Stäng alltid av motorn innan du använder badstege/plattform för att undvika kontakt med rörliga delar som t.ex. propellern.

Maximal rekommenderad last

Tillåten last framgår av tabellen på sidan 3 i denna handbok. Den tillåtna lasten får aldrig överskridas, detta för att säkerställa att båten kan framföras säkert. Den tillåtna lasten innefattar alla livsmedelsförråd, tankinnehåll, annan utrustning och personer ombord.

Se också till att all last är jämnt fördelad och säkert fastsatt, särskilt vid hårt väder.

⚠Varning

Förarens sikt från förarplatsen

Förarens sikt från förarplatsen kan hindras av höga trimningsvinklar på båten och andra faktorer orsakade av ett eller flera av följande olika förhållanden:

- framdrivande motors trimningsvinklar
- trimplansvinklar på skrovet
- lastningsgrad och fördelning av last
- hastighet, snabb acceleration
- övergång från låg hastighet till planingsläge
- sjöförhållanden, regn och stänk
- mörker och dimma
- innerbelysning och placering av gardiner
- personer eller flyttbara föremål i siktfältet

Internationella regler kräver att korrekt uppsikt alltid hålls för att undvika kollision och för att iaktta väjningsplikt.

⚠Fara⚠

Koloxidexponering

Alla båtmotorer producerar koloxid som avgaser. Det är en extremt giftig och farlig gas. Den är nästan omöjlig att upptäcka eftersom den är luktfri och färglös.

Tidiga tecken på koloxidexponering är trötthet, yrsel och illamående. Utdragen koloxidexponering kan leda till hjärnskada eller dödsfall.

För att förhindra koloxidexponering är det viktigt att följa dessa riktlinjer:

- Se till att det inte finns några hinder för motorns avgasutsläpp - det kan vara förtöjningar, andra båtar etc.
- När du kör i låg hastighet, eventuellt med bogen högt, se till att avgaserna inte blåser in i båten utan bort från båten.
- När du använder kapell eller sufflett på båten, se till att du har god ventilation för avgasångor.

Fönster och luckor

Håll alla fönster/luckor etc. stängda vid höga hastigheter och i hårt väder för att undvika risk för skada på person och båt.

Allmän hantering av båt

Iaktta följande vad gäller kraft- och manövreringsgränser för din båt:

- Kör inte båten med en motor med större effekt än vad som anges på kapacitetsetiketten på båten.
- Kör inte båten med negativa inställningar (bogen nere) i höga hastigheter eftersom båten kan luta över på sidan vilket leder till instabilitet. Använd negativ trimning för att accelerera till planingshastighet från låg hastighet och vid lägre planingshastigheter i hårt väder.
- Kör inte båten i maximal hastighet i vatten med mycket trafik eller i hårt väder/svåra sjöförhållanden eller situationer med reducerad sikt.
- Iaktta väjningsplikten till sjöss enligt de internationella definitionerna.
- Håll alltid tillräckligt stoppavstånd och manöveravstånd för att undvika kollision.

Miljömässiga hänsyn

Som ägare till en fritidsbåt ansvarar du för skydd av miljön, både till sjöss och i land. Lämna både sjön och land så som du själv vill finna dem.

Bränsle- och oljespill

Släng aldrig bort bränsle eller olja ute på sjön. De är giftiga ämnen som skadar miljön. Det är brottsligt att kasta bränsle eller olja i vattnet och du kan straffas för det.

⚠Fara⚠

Om spill sker oavsiktligt, t.ex. vid påfyllning av bränsle eller olja, kom ihåg att dessa ämnen är mycket explosiva och giftiga. Utsätt dem inte för öppen eld och spara inte heller trasor som använts för att torka upp spill i båten.

Bortskaffande av avfall

Kasta inte något slags avfall i vattnet. De flesta marinor har stora avfallsbehållare vid vattnet avsedda för båtägare, så ta med dig alla avfallsprodukter i land.

Om du har en toalett installerad ombord ska du bara använda godkänd utpumpnings-anordning på din marina.

Överdrivet oljud

Visa hänsyn mot dina medtrafikanter och folk i land. Buller hörs mycket långt över vattnet, särskilt på natten, så håll musik, ropande och motorbuller på så låg nivå som möjligt.

Svallvågor

Du måste alltid följa alla hastighets-begränsningar. De flesta marinor har hastighetsbegränsningar i de omgivande vattnen för att förhindra att svallvågor skadar de förtöjda båtarna.

⚠Varning

Alla områden är inte utmärkta med hastighetsbegränsningar. Minska därför farten så att du kommer ur planingsläge när du passerar områden där båtar ligger förtöjda eller där folk simmar.

Avgasutsläpp

Kolväte i avgaserna förorenar luften och vattnet. För att hålla avgasutsläppen på minimal nivå ska motorn hållas väl justerad och båtens skrov ska rengöras regelbundet. Din återförsäljare ger dig ytterligare information.

Färger/rengöringsmedel

Vattenväxter på båtens skrov kan undvikas genom användning av bottenfärg. Ta dock hänsyn till de miljömässiga begränsningar som gäller för den färgtyp du använder - din återförsäljare eller lokala båtmyndighet kan ge råd.

Vi rekommenderar användning av miljövänliga rengöringsmedel, som inte bara minimerar inverkan på miljön, utan som också är effektiva och säkrare för dig. Använd alla rengöringsmedel sparsamt och släng inte dem eller deras förpackningar i sjön.

Underhåll

Allmän skötsel

• Rengöra båten

Båtar slits i allmänhet med tiden genom påverkan från saltvatten, solljus och föroreningar. Regelbunden rengöring av båten minimerar denna förslitning.

Det finns speciella rengöringsprodukter för båtar hos din återförsäljare, men du får aldrig använda slipande produkter eftersom dessa skadar gelcoat-ytan.

⚠Varning

Var försiktig vid rengöring av båtens däck eftersom rengöringsmedel kan göra ytan mycket hal.

• Vattenväxter

Om det är absolut nödvändigt kan specialprodukter användas för att ta bort vattenväxter från skrovet. Dessa produkter får dock inte kastas i vattnet. Använd inte stålborste eller skursvamp på båtens skrov eftersom dessa repar ytan.

• Bottenfärg

Korrekt bottenfärgssystem är nödvändigt för att skydda båtens skrov mot blåsbildning och vatteninträngning. Kontakta din återförsäljare för ytterligare information.

• Saltvattenskorrosion

Om du använder båten i saltvatten bör du skölja den med sötvatten så ofta som möjligt för att undvika korrosion.

• Styrning

För att säkerställa korrekt och säker funktion hos styrsystemet bör styrarmen smörjas med fett minst två gånger om året, före och efter vinterförvaring.

• Dynor

Dynorna i båten är tillverkade av högkvalitativa material och konstruerade för att motstå spill och mindre mängder av vatten och sjöskum. Du bör rengöra dynorna

regelbundet med en svamp och tvålvatten. Använd ALDRIG starka, syntetiska rengöringsmedel, lösningsmedel eller kemiska rengöringsmedel. Du kan också köpa specialprodukter för rengöring av klädseln.

Du måste komma ihåg att underhålla dynornas dragkedjor och andra monteringar. Smörj dessa en gång om året med silikon eller vaselin för att förhindra rost.

Var försiktig när du tar bort dynorna - dra inte i själva dynan utan bara i snäppfästet.

Om båten inte används ska dynorna förvaras i ett av utrymmena i båten eller på en torr plats.

• Sufflett
Suffletten på båten är smuts- och vattenbeständig. Den kan rengöras med ett milt rengöringsmedel. Borsta sufflettens utsida med en mjuk borste och rengör insidan med en mjuk trasa eller svamp för att undvika repor. Maximal vattentemperatur för rengöring av suffletten är 30° C.

Rengör inte suffletten med kemiska ämnen eller högtrycksutrustning och försök aldrig torka suffletten i höga temperaturer eller torktumling.

Under vinterförvaring bör suffletten tas av, torkas och förvaras på en torr plats. Vi rekommenderar också regelbunden luftning av suffletten, minst en gång i veckan medan båten används, för att undvika mögelbildning på suffletten.

• Länspump
Länspumpar bör inspekteras regelbundet med avseende på smuts, särskilt under perioder med kraftigt regn eller oväder. Smuts i länspumpen kan göra att den inte fungerar. Du bör också regelbundet kontrollera att klämmor och slangar på länspumpen sluter tätt.

⚠Varning
Använda aldrig antändliga eller kemiska lösningsmedel för att rengöra länspumpen.

• Toalett
En illustration av det septiska systemet ombord på båten finns i bilaga A.

Använd milda rengöringsmedel och varmt vatten för att rengöra toaletten. Kasta aldrig trasor, pappershanddukar eller andra fasta föremål i toaletten. Bilaga M innehåller information om toalettet som är installerad i din båt.

• Monteringar av rostfritt stål
Rostfritt stål kan också drabbas av förslitning. Använd ett milt rengöringsmedel och vatten för att hålla det rent. Använd aldrig slipduk eller borstar eftersom dessa repar ytan. Använd ett polermedel för att ta bort rostfläckar så fort de dyker upp och vaxa regelbundet för att förhindra korrosion.

• Vindrutor av plexiglas
Återigen, använd bara milt rengöringsmedel och varmt vatten och en mjuk trasa för att rengöra eftersom plexiglas lätt repas.

Material och komponenter
Din båt har konstruerats och tillverkats, testats och certifierats enligt stränga regler och säkerhetsstandarder. Vi avråder bestämt från all installation av ägaren av ytterligare material eller komponenter eftersom dessa kan påverka säkert framförande av båten, och dess garanti.

Om ytterligare utrustning måste installeras ska du kontakta din återförsäljare som är kvalificerad för sådana modifieringar.

Vinterförvaring
Se motorhandboken, bilaga B, för råd om vinterförvaring av motorn.

Batteriet bör tas bort, laddas och förvaras på en torr plats.

Se till att båten är helt torr och avlägsna allt vatten från rör och andra komponenter för att förhindra frysskador.

Din återförsäljare kan eventuellt erbjuda professionell vinterförvaring.

Målning
Vi rekommenderar regelbunden målning med bottenfärg för att förhindra vattenväxter på båten. Rådfråga din återförsäljare om vilken bottenfärg som ska användas beroende på var du tänker använda båten.

⚠Varning
Färgerna är både giftiga och antändliga. Se till att området där du målar båten är väl

ventilerat och att du använder korrekt säkerhetsutrustning - handskar, glasögon, mask etc.).

Inspektion

Innan båten tas fram ur vinterförvaringen är det viktigt att inspektera båtens alla komponenter noga. Se till att alla monteringar är åtdragna, att inga läckor finns, skada eller nötning på delar. Du bör också inspektera viktiga komponenter på båten noga under båtsäsongen.

Lyfta båten

Se till att repen är korrekt placerade så att båten är vågrät när den lyfts. Lägg skydd mellan rep/kablar och båten för att förhindra skada vid lyft.

⚠Fara⚠

Vistas aldrig under båten när den lyfts!

Förtöjning

Det är ägarens ansvar att se till att förtöjningslinor, bogserlinor, ankarkättingar och ankare är av lämplig storlek för båtens avsedda användning.

⚠Varning

Ägaren måste se till att behärska fastsättning av bogserlina ombord på avsedda fästpunkter.

Trailertransport

Se till att båtens köl är korrekt placerad mellan centrumrullarna och justera sidobäringen för att förhindra att båten rör sig.

⚠Varning

Placera ingen last i båten och gå inte ombord när båten transporteras på trailer.

Ytterligare information

Garanti

Se baksidan av försäkran om överensstämmelse (bilaga O) för kompletta garantivillkor.

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Bilag

Bilag A - Illustrationer
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Bilag D - Køleskab
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Bilag G - Z-Top
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Bilag I - Trimplan
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Bilag K - Marinebatterioplader
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Bilag O - Overensstemmelseserklæring og bilaget

ASKELADDEN 77

Indledning

Selv om alt er blevet planlagt og konstrueret med bådens og den brugeres sikkerhed for øje, er sejlads særdeles afhængig af vejrforholdene, havets tilstand, besætningens erfaring og kondition o.s.v., og man vil aldrig kunne have fuldkommen sikkerhed.

Selv om Deres båd er kategoriseret dertil, varierer de hav- og vindforhold, der svarer til designkategorierne A, B og C fra stærk storm til alvorlige forhold, og er udsat for de farer, en forkert sø eller vinsdstød, og er derfor farlige forhold, hvori kun en dygtig og trænet besætning i god fysisk kondition, på en godt vedligeholdt båd, kan sejle.

Havet eller vejret er ikke menneskets naturlige miljø, og man må respektere deres love og styrke. Lyt altid til, eller læs, vejrmeldinger før en sejlads eller rejse, og vær sikker på, at vind- og havforhold vil svare til din bås designkategori, og at du og din besætning kan håndtere båden under de givne forhold.

Denne ejerhåndbog indholder de mest nødvendige oplysninger, man har behov for for at bruge båden rigtig, med råd om sikkerhed, drift og vedligeholdelse. Imidlertid er den ikke et kursus i sikker sejlads, navigation, forankring eller dokning. Din forhandler, nationale sejlforbund eller din sejlklub vil kunne give dig råd om stedlige skoler eller instruktører.

Denne ejerhåndbog er heller ikke en håndbog i drift, vedligeholdelse eller problemløsning.

Brug altid en professionel, når det gælder vedligeholdelse, reparation eller mindre ændringer. Foretager han større ændringer, skal man sikre sig, at han ikke ændrer bådens sikkerhedsegenskaber, og er det relevant, skal man sikre sig, at han har skriftlig tilladelse fra bådebyggeren eller dennes juridiske repræsentation.

Enhver forandring i den lodrette position af masserne ombord (for eksempel tilføjelsen af et fisketårn, en radar, en stuvningsmast osv.) kan have stor påvirkning på stabiliteten af din båd. Udfør ikke disse ændringer, uden først at have fået skriftlig tilladelse fra bådebyggeren eller bådebyggerens juridiske representant.

I mange lande er en licens, bemyndigelse eller træning nødvendig. Sørg venligst for at have, hvad der er påkrævet, før du køber eller sejler.

Hold alltid båden i god stand, men også for at tilpasse bådens brug til dens tilstand, eftersom den med tiden udsættes for slid.

De internationale IMO Colreg-regulativer foreskriver kursret, navigationslys o.l. verden over. Sørg for at være fortrolig med dem, og for at have en håndbog derom ombord.

Hvis dette er din første båd, eller hvis du har skiftet bådtype og ikke er fortrolig med denne, bør du for din egen sikkerheds og behageligheds sykld, sikre at du indhenter erfaring i håndtering og brug, før du “overtager kommandoen”.

Enhver båd - uanset hvor kraftig den måtte være - kan lide alvorlig skade, hvis uerfarne personer bruger den forkert. Noget sådant er ikke forenelig med sikker sejlads. Sørg altid for at indrette hurtige motorbådes fart til søen for at undgå for stærk stampen.

OPBEVAR VENLIGST DENNE HÅNDBOG OG DENS BILAG PÅ SIKKERT STED, OG GIV DEN TIL DEN NYE EJER, HVIS DU SÆLGER BÅDEN.

På grund af vor politik om konstant produktudvikling kan det ske, at illustrationerne i denne bog ikke helt stemmer overens med båden. De er ment som en repræsentative vejledning. Visse instrumenter, indikatorer eller informationer er/gælder ekstra-udstyr og er ikke i din båd.

Certificering

Båden er godkendt som værende i overensstemmelse med de relevante afsnit i Europa-Parlamentets direktiv 94/25/EU, 2003/44/EU om fritidsfartøjer. CE-mærket betyder, at din båd opfylder eller overstiger alle gældende standarder og direktiver, som er fastsat af Den Internationale Standardiserings-organisation (ISO).

CE

Graden af fare

⚠Advarsel
Påmindelse om sikkerhedspraksis for at undgå ulykker eller skader på båden.

⚠Fare⚠
Påmindelse om nødvendige forholdsregler for at undgå alvorlige ulykker/skader eller død.

Fartøjskonstruktionskategori

Alle mindre fartøjer er klassificeret i henhold til en standard konstruktionskategori. (Se konstruktionskategorien på fabrikantpladen på fartøjets skrog). Askeladden Z7 er klassificeret under kategori C.

Kategori C - KYSTSEJLADS
Fartøjet er konstrueret med henblik på sejlads i kystfarvande, større bugter, flodmundinger, søer og floder, hvor vindstyrken kan komme op på 6 (Beaufort skalaen), og den signifikante bølgehøjde kan komme op på 2 m.

Væsentligt udstyr og funktioner

Bilag A indeholder alle de stregtegninger/ illustrationer, som henvises til nedenfor.

Bilag B indeholder manualer til bådens motor.

Bilag C indeholder oplysninger om bådens brandslukningssystem.

Bilag D indeholder oplysninger om bådens køleskab.

Bilag E indeholder oplysning om bådens ovn.

Bilag F indeholder oplysninger om bådens stereoanlæg.

Bilag G indeholder oplysninger om bådens Z-Top.

Bilag H indeholder oplysninger om bådens lænsepumpe.

Bilag I indeholder oplysninger om bådens trimplan.

Bilag J indeholder oplysninger om bådens ankerspil.

Bilag K indeholder oplysninger om bådens marinebatterioplader.

Bilag L indeholder oplysninger om bådens toilet.

Bilag M indeholder oplysninger om SecureVolt system.

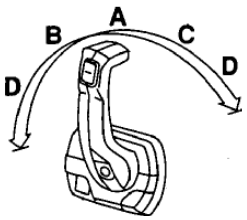
Bilag N indeholder oplysninger om SmartCraft.

Bilag O indeholder oplysninger om bådens overensstemmelseserklæring og bilaget.

Gearskift-/gaskontrol
Gearskift-/gaskontrol kan variere afhængig af de forskellige modeller og fremdrivnings-systemter. Alle betjeningssystemer kræver periodisk vedligeholdelse for at fungere korrekt og sikkert.

⚠Advarsel
Misligholdte betjeningssystemer kan for-årsage fejl med alvorlige ulykker eller skader til følge. Kontroller kablerne og delene regel-mæssigt. NB! Alle betjeningsgreb er udstyret med en sikkerhedskontakt, der skal sikre, at motoren kun kan startes i neutral position.

• Enkeltgreb - indbygget
Enkeltgrebet fungerer både som gearskift- og gaskontrol.



A Neutral - motoren starter kun i denne position på grund af sikkerhedskontakten.

B Fremad - Knappen under grebet trykkes op, så grebet kan føres frem til fremad-positionen.

C Bak - Knappen under grebet trykkes op, så grebet kan føres frem til bak-positionen.

D Gaskontrol - Skub fremad eller træk tilbage for at give mere gas.

Tekniske data

Længde:	7,06 m
Dæksbredde:	2,54 m
Dybgang:	0,39 m
Vægt med 5,0 L-260 MPI FWC Alpha, benzin:	Ca. 1805 kg
Vægt med QSD 2,8L-230 Bravo 2, diesel:	Ca. 1866 kg
Brændstof:	Blyfri benzin/diesel
Personer:	Maks. 6
Tilladt last:	Maks. 1096 kg
Motor:	Maks. 191 kW / 260 HK
Kabellængde, fjernstyring, diesel:	14/16 fod
Kabellængde, fjernstyring, benzin:	14/16 fod
Kabellængde, manuel styring, diesel/benzin:	4,75 m
Brændstoftank:	200 liter
Vandtank:	54 liter
Septiktank:	54 liter

Bådens stregtegning

Bilag A indeholder en stregtegning af båden. Bemærk, at der er forskellige tegninger for hver type bådmotorsystem.

Sikringer og strømsluttere

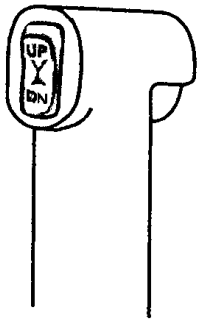
Sikringer og strømsluttere bruges i bådens elektriske kredsløb for at forhindre overbelastning. Sikringen går eller strømslutteren udløser, hvis det elektriske kredsløb overbelastes. Kontakt omgående forhandleren ved hyppig overbelastning.

Bilag A indeholder stregtegninger af elektriske systemer om bord.

Væsentligt udstyr og funktioner

For alle betjeningssystemer: Forsøg aldrig at skifte gear, når motoren er slukket. Der findes en særskilt knap for enden af grebet på alle betjeningssystemer, som du kan trykke på for at varme motoren op i frigear.

• Motortrim



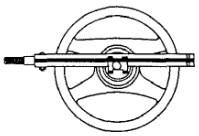
Kontakt på gearskift-/gashåndtaget, som trimmer/tilter motoren. Bruges sammen med trimklapperne (se under Kontakter og indikatorer) til at forbedre ydeevnen. Tryk kontakten op for at løfte motoren ved transport.

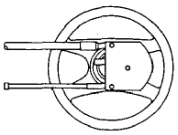
Styring

Det er vigtigt at vedligeholde styringssystemet for at sikre fejlfri og sikker betjening. Der er flere oplysninger i afsnittet om vedligeholdelse. Bådens styring er ikke selvoprettende. Sørg altid for at have et solidt greb om rattet for at sikre fuld kontrol over båden.

• Mekanisk styring

Når rattet drejes ved hjælp af mekanisk styring, omsætter styrehuset den roterende bevægelse til linear bevægelse i kablet, som skubber styrearmen i den ønskede retning.





⚠Advarsel

Utilstrækkelig vedligeholdelse af styresystemet kan medføre alvorlige ulykker eller skader.

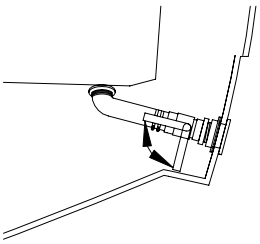
Brændstof- og vandtanke

Fyldningsindikatoren i brændstof- og vandtanke er vist på tegning i bilag A. Indenbordsmotoren på Askeladden Z7 er benzin- eller dieseldrevet.

Brændselssystemet er skematisk illustreret i bilag A. Vandsystemet på båden er også skematisk illustreret i bilag A.

Ventiler

• Ventil for å tømme regnvand



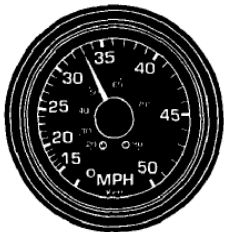
Din båd er udstyret med en søventil under eller i vandlinjen, så båden kan tømmes for regnvand. Når båden er lastet, kan det være nødvendigt at lukke for søventilen for at undgå oversvømmelse. Søventilen bør renses for snavs for at forhindre tilstopning.

Instrumenter

Båden kan være udstyret med et eller flere af følgende instrumenter:

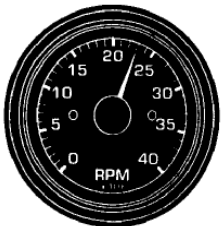
• Fartmåler

Viser bådens fart i knob, kilometer eller miles i timen.



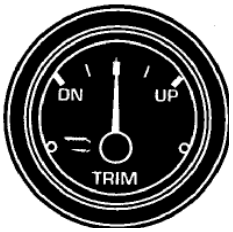
• Omdrejningstæller

Viser motorens hastighed i omdrejninger i minuttet.



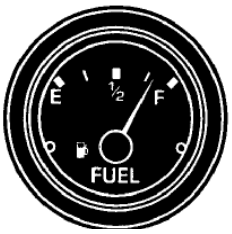
• Trimur

Brug denne måler til at checke bådens trim, dvs. drevets position og stævnens relative position.



• Brændstofmåler

Viser den omtrentlige brændstofstand i tanken. Da nøjagtigheden varierer, anbefales det, at 1/3 af den indikerede stand forbeholdes som reserve.



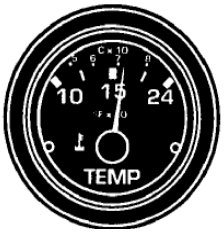
• Måler til motorolietryk

Viser motorens olietryk. Der er yderligere oplysninger i motormanualen.



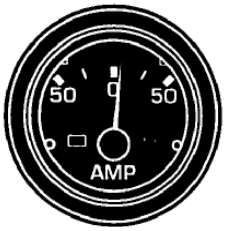
• Termometer til motorolie
Viser motoroliens temperatur. Der er yderligere oplysninger i motormanualen.

• Termometer til vand i motoren



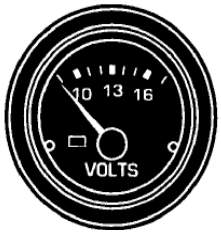
Viser temperaturen på vandet i motoren. Der er yderligere oplysninger i motormanualen.

• Amperemeter



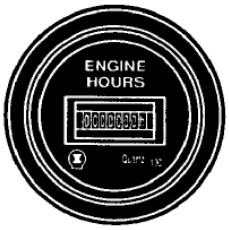
Viser det elektriske systems ladestrøm. Der er yderligere oplysninger i motormanualen.

• Voltmeter



Viser batteriets jævnstrøm i volt. Kontroller og oplad batteriet, hvis voltmetret viser under 11,5.

• Timetæller

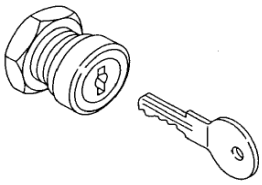


Viser motorens akkumulerede driftstimer. Der er yderligere oplysninger i motormanualen.

Se Bilag N - SmartCraft.

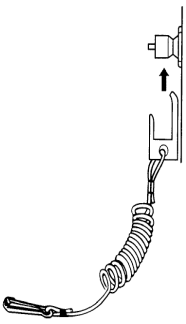
Kontakter og indikatorer

• Tænding



Sæt nøglen i tændingen, og drej den i urets retning for at starte motoren. Så snart motoren starter, drejes nøglen til ON.

• Motorens stopkontakt



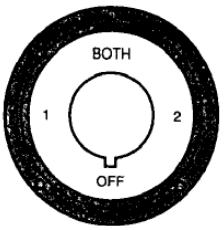
Motorens stopkontakt må kun benyttes i nødstilfælde. Den må IKKE bruges som almindelig stopkontakt for motoren.

Motorens stopkontakt bør fastgøres til føreren af båden. Hvis føreren f.eks. mister balancen eller falder overbord, trækkes stopkontakten af og stopper motoren.

⚠Advarsel
Sørg altid for, at stopkontakten er ordentligt fastgjort på både betjeningspanelet og føreren før start.

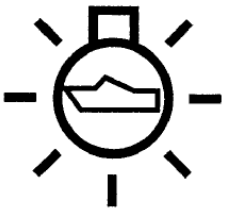
Kontroller en gang om måneden, at stopkontakten fungerer korrekt, ved at trække den af, mens motoren er i gang. Kontakt omgående forhandleren, hvis motoren ikke stopper, så kontakten kan blive udskiftet.

• Hovedafbryder til batteriet



Bruges til at forbinde batteriet med det elektriske system. Ved afbrydelse er batteriet børne-, brand- og afladningssikret. Sørg for, at batteriet er slået fra (drej til OFF), når båden ikke er i brug.

• Kontakt til navigationslys



Kontakt til navigations-lys og ankerlys.

Sejl aldrig om natten uden tændt navigations-lys. Dette er nødvendigt for at vise andre både din retning og færdselsret.

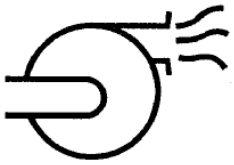
• Strømopladning fra land
Sørg for, at kontakten om bord til strøm fra land står på OFF før tilkobling/frakobling af strømmen. Tilslut de nødvendige kabler, før opladningen igangsættes. Hvis polviseren afgiver et advarselssignal, frakobles strømmen straks. Sluk først for strømmen på land ved frakobling. Sørg altid for, at klappen til stikkontakten er lukket ordentligt efter frakobling.

• Boardinglys
Kontakter til boardinglys og cockpitlys. Hovedafbryderen til jævnstrøm skal stå på ON, før du kan tænde lysene.

• Vinduesvisker-kontakt
Styrer vinduesviskerne.

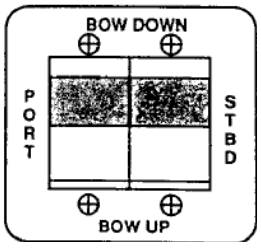


• Blæserkontakt
Styrer ventilationen i motorrummet for at fjerne dampe.



⚠Fare⚠
Blæseren skal køre mindst fem minutter, før motoren startes. Dette skal gøres før hver start. Desuden skal blæseren køre, mens motoren kører i tomgang eller ved langsom sejlads. Hvis blæserkontakten ikke benyttes, kan det resultere i eksplosion eller alvorlige ulykker eller skader.

• Trimklap
Ekstraudstyr. Kontakter til at kontrollere trimklapper ved bagbord og styrbord. Bruges til at rette op på slagside under vanskelige forhold og generelt til at forbedre bådens ydeevne.



• Lænsepumpe
Manuel knap til at tænde og slukke den lænsepumpe.

En manuel lænsepumpe med en kapacitet på 40 liter/min. er monteret på båden. Pumpens placering kan ses på tegning i bilag A (bilge pump).

• Advarselsalarm
Kontroller alle instrumenter, og stop straks motoren, hvis en advarselsalarm går i gang. Alarmen advarer mod overophedet motor og/eller mangel på olie.

Sikkerhedsudstyr og sikkerhed

Obligatorisk sikkerhedsudstyr
- Redningsveste til alle passagerer
- Navigationslys
- Ildslukker
- Manuelt lænseudstyr

Anbefalet sikkerhedsudstyr
- Ankerline og anker
- Fortøjninger og fendere
- Førstehjælpskasse
- Reservenøgler
- Ekstra startbatteri
- Ekstra sikringer og pærer

Redningsveste
Sørg for, at alle redningsveste passer ordentligt og er let tilgængelige.

⚠Advarsel
Børn og handicappede personer, som ikke kan svømme, bør altid bære redningsvest om bord. Desuden bør kastbart flyde-materiel, f.eks. en redningskrans, altid være let tilgængelig om bord.

Ildslukker
Ildslukkeren opbevares let tilgængeligt. Straks når ildslukkeren er kommet om bord, bør du sætte dig ind i, hvordan den betjenes, se brugervejledningen i bilag C.

Stå aldrig i vindens retning, når du benytter ildslukkeren, og ret ildslukkeren mod ildens senter.

Uanset hvor længe ildslukkeren har været i brug, skal den genopfyldes af en autoriseret forhandler.

⚠Fare⚠

Lanterner
Både uden lanterner må ikke sejle i mørke eller ved nedsat sigtbarhed.

⚠Advarsel

Rusmidler og sejlads
Indtag ikke alkohol eller andre rusmidler i forbindelse med sejlads. Rusmidler har en kraftig indvirkning på din koncentration og balance. Alkohol nedsætter også din tolerance over for temperaturskift, f.eks. kolde vinde og koldt vand, hvis du falder overbord.

Lænseanordning
Hvis ikke båden er udstyret med en lænsepumpe, er det ejerens ansvar at have mindst en øse/spand om bord, som er sikret mod tab ved uheld.

⚠Fare⚠

Brug af badestige/-platform

Motoren skal altid slukkes, før badestigen/-platformen benyttes for at undgå kontakt med bevægelige dele som propellen.

Anbefalet maksimal last

Bemærk den tilladte last i tabellen på side 3 i instruktionsbogen. Den tilladte last skal altid overholdes for at sikre, at båden kan betjenes sikkert. Den tilladte last omfatter al proviant, tankindhold, diverse udstyr og antal personer om bord.

Sørg for, at al proviant er jævnt fordelt og spændt godt fast, især i barsk vejr.

⚠Advarsel

Udsyn fra styrepladsen

Førerens udsyn fra styrepladsen kan spærres af bådens høje trimvinkler og andre faktorer, som skyldes en eller flere af følgende variable forhold:

- fremdrivningsmotorens trimvinkler
- trimplanets vinkler på skroget
- læsning og vægtfordeling
- hastighed, hurtig acceleration
- overgang fra lav hastighed til planing
- søforhold, regn og søstænk
- mørke og tåge
- indvendigt lys og gardiners position
- personer eller bevægeligt udstyr i synsfeltet

Ifølge internationale bestemmelser skal der til enhver tid være fuldt udsyn for at undgå kollision og for at overholde færdselsretten.

⚠Fare⚠

Eksponering for kulilte

Alle bådmotorer producerer kulilte som udstødning. Dette er en yderst skadelig og farlig gas. Den er næsten umulig at opdage, da den ikke har nogen lugt eller farve.

De første tegn på kulilteforgiftning er træthed, svimmelhed og kvalme. Kraftig kulilteforgiftning kan medføre hjerneskade eller død.

For at forhindre kulilteforgiftning, er det vigtigt at følge nedenstående retningslinjer:

- Sørg for, at udstødningen fra motoren kan passere frit, ved at fjerne eventuelle hindringer som fortøjninger, andet udstyr m.v.
- Sørg for, at udstødningen ikke blæser ind i båden, men væk fra båden, ved langsom sejlads, f.eks. hvor stævnen er høj.
- Sørg for, at der er god ventilation for udstødningsgasser, når der benyttes kaleche eller overtræk til båden.

Vinduer og luger

Luk alle vinduer/luger m.v. ved høje hastigheder og i barsk vejr for at undgå ulykker eller skader.

Generel betjening af båden

Ved styring og manøvrering skal du være opmærksom på bådens begrænsninger:

- Brug ikke en motor med højere drivkraft end den, som er anvist på bådens kapacitetsmærkat.
- Sejl ikke båden med negative trim-indstillinger på drivaggregatet (med stævnen nedad) ved høje hastigheder, da båden kan tippe over på siden og skabe ustabilitet. Brug negativt trim til at accelerere fra lav hastighed til planings-hastighed, og sejl ved lavere planings-hastigheder under barske forhold.
- Sejl ikke båden ved maksimal hastighed i overfyldte farvande, i barsk vejr eller ved nedsat sigtbarhed.
- Overhold færdselsretten på vandet i overensstemmelse med internationale bestemmelser.
- Hold altid tilstrækkelig standselængde eller afstand til at manøvrere, hvis det er nødvendigt for at undgå kollision.

Miljøhensyn

Du er som ejer af et fritidsfartøj ansvarlig for at beskytte miljøet både til lands og til vands. Efterlad naturen, som du ønsker at finde den.

Brændstof- og oliespild

Udled aldrig brændstof eller olie i vandet, da disse stoffer er giftige og miljøskadelige. Det er forbudt at udlede brændstof eller olie i vandet, og du kan få en bøde.

⚠Fare⚠

Husk i tilfælde af spild ved uheld, f.eks. ved påfyldning af brændstof eller olie, at disse stoffer er meget sprængfarlige og giftige. De må ikke udsættes for åben ild. Klude, der har været brugt til at optørre spild, må ikke opbevares i båden.

Udledning eller bortskaffelse af affald

Affald må ikke bortskaffes i vandet. De fleste marinaer har store affaldsbeholdere ved havnefronten til brug for bådejere. Medbring derfor al affald til land.

Hvis der er toilet på båden, må der kun benyttes godkendt udpumpningsudstyr på marinaen.

Unødig støj

Vis hensyn over for folk på andre både eller på land. Støj bæres over lange afstande på vand, især om natten, hvorfor musik, råben og motorstøj bør begrænses til et minimum.

Kølvand og hækbølger

Overhold altid fartbegrænsninger. Der er fartbegrænsninger tæt på de fleste marinaer for at undgå, at hækbølger fra andre både skader både, der ligger for kaj.

⚠Advarsel

Da ikke alle områder er markeret med hastighedsbegrænsninger, bør du sænke hastigheden for at sejle roligt forbi områder, hvor både ligger fortøjret, eller hvor folk bader.

Udstødningsemission

Kulbrinte i udstødningsemissioner forurener luften og vandet. For at reducere udstødningsemissioner så vidt muligt, bør du holde motoren i god stand og regelmæssigt rengøre skroget. Kontakt forhandleren for at få yderligere oplysninger.

Maling/rensemidler

Begroning på bådens bund kan undgås ved at bruge bundfarve, der hindrer begroning. Vær opmærksom på miljøkrav til malingen. Kontakt forhandleren eller de lokale myndigheder.

Vi anbefaler miljøvenlige rensemidler, som ikke alene begrænser miljøpåvirkningen, men også er effektive og sikre. Begræns brugen af rensemidler, og smid ikke rensemidlerne eller beholderne i vandet.

Vedligeholdelse

Almindelig pleje

• Rengøring af båden

Bådes stand bliver normalt dårligere med tiden, da de udsættes for saltvand, sollys og forurening. Regelmæssig rengøring af båden minimerer denne slitage. Du kan købe specielle rengøringsprodukter til din båd hos forhandleren, men brug aldrig produkter med slibeeffekt, da dette skader gelcoatoverfladen.

⚠Advarsel

Vær forsigtig ved rengøring af bådens dæk, da rensemidler kan gøre overfladen meget glat.

• Begroning

Hvis det er bydende nødvendigt, kan der anvendes specialprodukter til at fjerne begroning på bunden, men disse produkter bør ikke udledes i vandet. Brug ikke stålbørster eller skuresvampe på bådens bund, da disse ridser overfladen.

• Bundfarve, der hindrer begroning

Det er nødvendigt at anvende bundfarve, der hindrer begroning, for at beskytte båden mod blærer på bunden og osmotiske blærer. Kontakt forhandleren for at få yderligere oplysninger.

• Saltvandskorrosion

Hvis båden ofte sejles i saltvand, bør den skylles med ferskvand så ofte som muligt for at forhindre korrosion.

• Styring

For at styresystemet fungerer ordentligt og sikkert, bør styrearmen olieres mindst to gange om året, nemlig før og efter vinteropbevaring.

• Hynder

Hynderne er lavet af materiale af høj kvalitet og kan modstå spild og mindre mængder vand og skumsprøjt. Du bør regelmæssigt vaske hynderne med en svamp og sæbevand. Brug ALDRIG kraftige syntetiske rensemidler, opløsningsmidler eller kemiske rengøringsmidler. Du kan også købe specialprodukter til rengøring af indtræk.

Husk også at vedligeholde lynlåsen og andet tilbehør på hynderne. Tilbehøret bør smøres med silikone eller vaseline en gang

om året for at undgå rustdannelse. Fjern hynderne forsigtigt. Træk ikke i hynden, men kun i tryklåsen.

Når båden ikke er i brug, bør hynderne opbevares i et af bådens rum eller på et tørt sted.

• Kaleche

Bådens kaleche er smuds- og vandafvisende og kan rengøres med et mildt rensemiddel. Skrub kalechens yderside med en blød børste, og rengør indersiden med en blød klud eller svamp for at undgå ridser. Temperaturen på vandet til rengøring af kalechen bør ikke overstige 30° C.

Kalechen bør ikke renses kemisk, højtryks-spules, tørres ved høje temperaturer eller tørretumbles. Kalechen bør fjernes, tørres og opbevares tørt ved vinteropbevaring. Vi anbefaler, at kalechen luftes mindst en gang om ugen, mens båden er i brug for at modvirke mug.

• Lænsepumpe

Lænsepumper bør hyppigt renses for snavs, især i perioder med kraftig regn eller storm. Snavs i lænsepumpen kan medføre svigt. Du bør også regelmæssigt kontrollere, at lænsepumpens pakninger og slanger er tætte.

⚠Advarsel

Brug aldrig brandbare eller kemiske opløsningsmidler til rensning af pumpen.

• Toilet

Tegning i bilag A illustrerer septiksystemet.

Brug milde rensemidler og varmt vand til at rengøre toilettet med. Smid aldrig klude, bind eller lignende i toilettet. Bilag M indeholder oplysninger om bådens toilet.

• Udstyr i rustfrit stål

Rustfrit stål kan også udsættes for slitage. Brug milde rensemidler og vand til rengøring. Brug aldrig klude eller børster med slibemidler, da disse ridser overfladen. Fjern rustpletter hurtigst muligt med et pudsemiddel, og voks regelmæssigt for at udgå korrosion.

• Plexiglasforrude

Rengøres kun med milde rensemidler, varmt vand og en blød klud, da der let kommer ridser i plexiglas.

Materialer og komponenter

Båden er konstrueret, produceret, testet og certificeret i overensstemmelse med strenge bestemmelser og sikkerhedsstandarder. Vi fraråder, at ejeren selv installerer ekstra-udstyr eller komponenter, så sikkerheden og garantien ikke kompromitteres.

Hvis du ønsker ekstraudstyr, bør du kontakte forhandleren, som er kvalificeret til at installere dette.

Vinteropbevaring

Motormanualen, bilag B, indeholder råd om vinteropbevaring af motoren.

Batteriet bør fjernes, oplades og opbevares tørt.

Båden skal være helt tør, og vand i rør og andre komponenter fjernet for at undgå frostskader.

Kontakt forhandleren for at undersøge, om han tilbyder professionel vinteropbevaring.

Maling

Vi anbefaler, at bunden males regelmæssigt for at forhindre begroning.

Spørg forhandleren til råds om valg af bundmaling, som afhænger af, hvor du planlægger at bruge din båd.

⚠Advarsel

Maling er giftigt og brandbart. Når båden skal males, skal du sørge for god ventilation og bære sikkerhedsudstyr (handsker, beskyttelsesbriller, maske, m.m.).

Eftersyn

Før hver sæsonstart bør alle bådens dele kontrolleres grundigt. Kontroller, at al tilbehør er fastgjort, og at delene ikke er utætte, ødelagte eller slidte. Vigtige komponenter bør ligeledes kontrolleres periodisk sæsonen igennem.

Løft af båden

Anbring tovene forsigtigt, så båden er vandret, når den løftes. Beskyt båden mod tovene/kablerne for ikke at skade båden, når den løftes.

⚠Fare⚠

Stå aldrig under båden, når den løftes!

Yderligere oplysninger

Fortøjring

Det er ejerens ansvar at sikre, at fortøjninger, slæbetov, ankerkæder og ankre har den rigtige størrelse til bådens tilsigtede brug.

⚠Advarsel

Ejeren skal vide, hvordan slæbetovet fastgøres på de dertil beregnede forstærkede punkter om bord.

Transport

Sørg for, at bådens køl er placeret korrekt mellem de miderste rullebroer, og tilpas tværlejet, så båden ikke bevæger sig.

⚠Advarsel

Last ikke båden, og gå aldrig om bord på båden under transport.

Yderligere oplysninger

Garanti

Se garantibestemmelserne i deres helhed på bagsiden af overensstemmelses-erklæringen (bilag O).

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Inleiding

Ook al is alles in het werk gesteld om voor de gebruikers ervan een zo veilig mogelijke boot te ontwerpen en construeren, toch is en blifjt varen voor een zeer groot deel afhankelijk van de weersomstandigheden, de toestand van de zee, de ervaring en lichamelijke gesteldheid van de bemanning enz. Bovendien kan men de veiligheid nooit voor 100% garanderen.

Zelfs al is uw boot er wat betreft categorie in principe geschikt voor, bedenk dat de zee- en windomstandigheden die overeenkomen met de ontwerpcateorieën A, B en C uiteenlopen van storm (kracht 9) tot zware omstandigheden, waarbij men blootstaat aan de gevaren van een overslaande golf of rukwind, en zijn daarom gevaarlijke omstandigheden, waarin alleen een bekwame, fitte en goed getrainde bemanning die op een goed onderhouden boot vaart, goed kan varen.

De zee of het weer is niet de natuurlijke omgeving voor mensen en men kan alleen maar de wetten en de kracht ervan eerbiedigen. Luisten altijd naar of lees het weerbericht of de weersvoorspelling alvorens te gaan varen, en vergewis u ervan dat de wind- en zeeomstandigheden overeenstemmen met de ontwerpcategorie van uw boot, en dat u en uw bemanning in deze omstandigheden goed met de boot kunnen omgaan.

In deze gebruikershandleiding staat de informatie die minimaal nodig is om naar behoren met de boot te kunnen varen, enkele veiligheidspunten en wenken m.b.t. de bediening en het onderhoud. Lees de nahdleiding zorgvuldig door en maak uzelf vertrouwd met het vaartuig voordat u het in gebruik neemt. Maar deze gebruikershandleiding is geen cursus in veilig varen of in het navigeren, voor anker laten gaan of afmeren van uw boot. Uw deler, nationale zeilfederatie of uw jachtclub zullen u van advies kunnen dienen aangaande vaarscholen of instructeurs.

Deze gebruikershandleiding is geen bedieningshandleiding en ook geen handleiding voor onderhoud of het opsporen en verhelpen van storingen.

Laat onderhoud, reparaties of kleine modificaties altijd uitvoeren door een daarvoor opgeleide vakman. Zorg dat hij bij grotere modificaties geen ingrijpende wijzigingen aanbrengt in de veiligheidskenmerken van heet vaartuig en controleer of hij, waar dat van belang is, over een schriftelijke machtiging van de bouwer van de boot of diens wettelijke vertegenwoordiger beschikt.

Elke verandering in de verticale positie van de massa's aan boord (bijvoorbeeld een uitbreiding met een vistoren, een radar, een mast die gestreken kan worden enz.) kan van grote invloed zijn op de stabiliteit van uw boot. Voer dit soort wijzigingen alleen uit met de schriftelijke machtiging van de bouwer van de boot of diens wettelijke vertegenwoordiger.

In veel landen is een vaarbewijs, vergunning of opleiding een vereisete. Zorg ervoor dat u over deze wettelijke vergunningen beschikt alvorens u een boot gaat kopen of ermee gaat varen.

Onderhoud uw oot altijd goed, maar pas de wijze waarop u uw boot begruikt, niettemin aan aan de toestand waarin uw boot verkeert; want deze slijt met de jaren en naar gelang het gebruik.

In het internationale IMO Colreg-reglement staan regels met betrekking tot voorrang, navigatielichten enz., die wereldwijd worden toegepast. Zorg dat u deze regels kent. Er is een handboek met een toelichting op de regels aan boord.

Als dit uw eerste vaartuig is of u stapt over op een type vaartuig waarmee u niet vertrouwd bent, zorg er dan - voor uw eigen gemoedsrust en veiligheid - voor dat u voldoende ervaring opdoet in het omgaan met en de bediening van het vaartuig voordat u "het bevel gaat voeren" over het vaartuig.

Elke boot - om het even hoe sterk die ook moge zijn - kan ernstig beschadigd raken als die onoordeelkundig bediend en behandeld wordt door onervaren personen. Dit verdraagt zich niet met veilig varen. Pas de snelheid van motorboten altijd aan aan de omstandigheden op zee om te vermijden dat de boot al te hard op de golven klapt.

BERG DEZE HANDLEIDING EN BIJBEHORENDE BIJLAGEN OP EEN VEILIGE PLEK OP EN DRAAG ZE OVER AAN DE NIEUWE EIGENAAR WANNEER U HET VAARTUIG VERKOOPT.

Doordat wij onze producten voortdurend verbeteren, kunnen de illustraties in deze handleiding afwijken van de onderdelen van uw boot. De afbeeldingen zijn alleen bedoeld als referentie. Sommige bedieningsknoppen, hendels en instrumenten zijn optioneel en komen mogelijk niet op uw boot voor. Bovendien is niet alle infomatie op uw boot van toepassing.

Certificering

Uw vaartuig is gecertificeerd in overeenstemming met de relevante gedeelten van Richtlijn 94/25/EU, 2003/44/EU van het Europees Parlement met betrekking tot pleziervaartuigen. De CE-aanduiding geeft aan dat uw vaartuig voldoet aan alle huidige standaarden en richtlijnen die zijn opgesteld door de International Organisation for Standardisation (ISO) of deze overtreft.

CE

Gradaties van gevaar

⚠Waarschuwing

Herinnering aan veiligheidshandelingen om schade aan de boot of letsel te voorkomen.

⚠Gevaar⚠

Herinnering aan de juiste voorzorgsmaatregelen om ernstige schade, ernstig letsel of zelfs de dood te voorkomen.

Vaartuigconstructiecategorie

Alle kleine vaartuigen worden geclassificeerd volgens een standaardconstructiecategorie. (Zie het bouwplaatje op de romp van het vaartuig voor de constructiecategorie). De Askeladden Z7 is geclassificeerd onder categorie C.

Categorie C - KUST

Vaartuig ontworpen voor tochten langs de kust, in grote baaien, riviermondingen, meren en rivieren, situaties waar de wind windkracht 6 (schaal van Beaufort) en de belangrijke golven 2 m hoogte kunnen bereiken.

Essentiële uitrusting en voorzieningen

Bijlage A bevat alle lijntekeningen/afbeeldingen waarnaar in de volgende tekst wordt verwezen.

Bijlage B bevat handleidingen die horen bij de geïnstalleerde motor in uw vaartuig.

Bijlage C bevat informatie over het geïnstalleerde brandblussysteem in uw vaartuig.

Bijlage D bevat informatie over de geïnstalleerde ijskast in uw vaartuig.

Bijlage E bevat informatie over het geïnstalleerde kooktoestel in uw vaartuig.

Bijlage F bevat informatie over het geïnstalleerde stereosysteem in uw vaartuig.

Bijlage G bevat informatie over de geïnstalleerde Z-Top in uw vaartuig.

Bijlage H bevat informatie over de geïnstalleerde lenspomp in uw vaartuig.

Bijlage I bevat informatie over het geïnstalleerde trimvlaktype in uw vaartuig.

Bijlage J bevat informatie over de geïnstalleerde ankerspil in uw vaartuig.

Bijlage K bevat informatie over de geïnstalleerde scheepsacculader in uw vaartuig.

Bijlage L bevat informatie over de geïnstalleerde toilet in uw vaartuig.

Bijlage M bevat informatie over de SecureVolt systeem.

Bijlage N bevat informatie over de SmartCraft.

Bijlage O bevat de gelijkvormigheidsverklaring en de bijlage op de gelijkvormigheidsverklaring.

Technische gegevens

Lengte:	7,06 m
Breedte:	2,54 m
Diepgang:	0,39 m
Gewicht met 5,0 L-260 MPI FWC Alpha, benzine:	ca. 1805 kg
Gewicht met QSD 2,8L-230 Bravo 2, diesel:	ca. 1866 kg
Personen:	Max. 6
Type brandstof:	Loodvrije benzine/diesel
Toelaatbare belading:	Max. 1096 kg
Motor:	Max. 191 kW / 260 PK
Kabellengte, afstandsbediening, benzine:	14/16 ft.
Kabellengte, afstandsbediening, diesel:	14/16 ft.
Kabellengte, handmatige besturing, benzine/diesel:	4,75 m
Brandstoftank:	200 liter
Watertank:	54 liter
Septische tank:	54 liter

Lijntekening van uw vaartuig

Een lijntekening van uw vaartuig is opgenomen in Bijlage A. Wees u ervan bewust dat er afzonderlijke tekeningen zijn voor elk type achteraandrijfsysteem.

Zekeringen en onderbrekers

Zekeringen en onderbrekers worden in de elektrische circuits van uw boot gebruikt als beveiliging tegen overbelasting. Als het elektrische circuit wordt overbelast, brandt de zekering door of slaat de onderbreker uit. Indien dit regelmatig voorkomt, neem dan onmiddellijk contact op met uw leverancier voor advies.

Lijntekeningen of de elektrische systemen aan boord van uw vaartuig zijn als volgt in Bijlage A

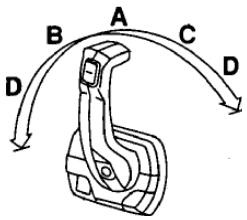
Schakel/gasbediening

De schakel/gasbediening kan afhankelijk van het model en het motorsysteem verschillend zijn. Elke schakel/gasbediening moet regelmatig worden onderhouden en gecontroleerd om veiligheid en een goede werking te garanderen.

⚠Waarschuwing

Onjuist onderhoud van bedieningselementen kan storing tot gevolg hebben, wat ernstig letsel of schade kan veroorzaken. Controleer regelmatig de bedieningskabels en onderdelen. NB! Elke schakel/gasbediening is uitgerust met een veiligheidsschakelaar die ervoor zorgt dat de motor alleen in vrijloop kan worden gestart.

• Enkele hendel - inbouwtype



Enkele hendel met éénhandsbediening - met deze hendel bedient u zowel de versnelling als het gas.

A Vrijloop - u kunt de motor alleen starten in deze stand, door de aanwezigheid van de veiligheidsschakelaar.

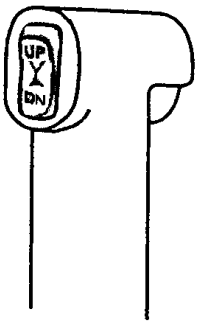
B Vooruit - druk op de knop onder de hendel om de motor in zijn vooruit te schakelen.

C Achteruit - druk op de knop onder de hendel om de motor in zijn achteruit te schakelen.

D Versnelling - duw in vooruit of trek in achteruit om de snelheid te verhogen.

Voor alle bedieningstypen geldt het volgende: Probeer nooit de versnelling in te schakelen als de motor niet draait. Er bevindt zich een aparte knop onderaan alle bedieningshendels die u indrukt om de motor op te warmen als deze nog in vrijloop staat.

• Motortrim



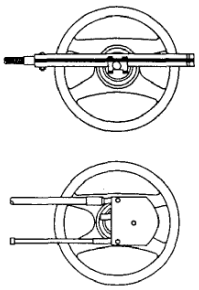
Schakelaar op de hendel van de schakel/gasbediening voor het trimmen/kantelen van de motor. Wordt gebruikt voor verbetering van de prestaties in combinatie met de trimvlakken (zie onder Schakelaars en indicators). Gebruik de schakelaar UP om de motor omhoog te brengen als u de boot op een aanhangwagen gaat vervoeren.

Besturing

Het is essentieel om het besturingssysteem goed te onderhouden, zodat het veilig en naar volle tevredenheid blijft functioneren. Zie voor meer informatie het hoofdstuk over onderhoud.

Denk eraan dat besturingssystemen op boten niet zelf-centrerend zijn - u dient altijd het stuurwiel stevig vast te houden om uw boot volledig onder controle te hebben.

• Mechanische besturing



Bij een mechanisch besturingssysteem zet het roer de draaibeweging van het stuurwiel om in een lineaire beweging in de kabel die de stuurarm in de gewenste richting verplaatst.

⚠Waarschuwing

Onjuist onderhoud van het besturingssysteem kan ernstig letsel of schade veroorzaken.

Brandstof- en watertanks

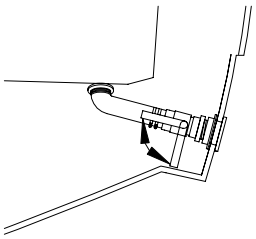
De vulposities van de brandstof- en watertanks staan in Bijlage A. De binnenboordmotor in uw Askeladden Z7 draait op benzine of diesel.

Schema's van het brandstofsysteem (benzine/diesel) staan in Bijlage A.

Een schema van het watersysteem aan boord van uw vaartuig is ook opgenomen in Bijlage A.

Kleppen

• Buitenboordkraan



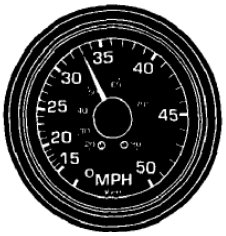
Uw boot is uitgerust met een buitenboord-kraan die zich onder water of net boven de waterlijn bevindt. Met deze kraan kunt u regenwater uit de boot verwijderen. U wordt aangeraden de kraan dicht te draaien wanneer de boot zwaar is beladen om te voorkomen dat deze volstroomt met water.

Houd de buitenboordkraan vrij van vuil, anders kan de kraan verstopt raken.

Instrumenten

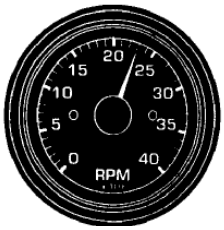
Uw boot kan zijn uitgerust met een of meer van de onderstaande instrumenten:

• Snelheidsmeter



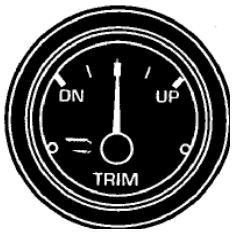
Deze meet de bootsnelheid in knopen, kilometer of mijl per uur.

• Toerenteller



Deze meet het motortoerental in omwentelingen per minuut.

• Trim



Gebruik dit meetinstrument om de boottrim te controleren, d.w.z. de stand van de buitenste aandrijfe-enheid en de relatieve stand van de boeg.

• Brandstofmeter



Deze geeft het brandstofniveau in de brandstoftank bij benadering aan. De nauwkeurigheid kan variëren, zodat het beter is om eenderde van het aangegeven niveau als reserve te houden.

• Motoroliedruk

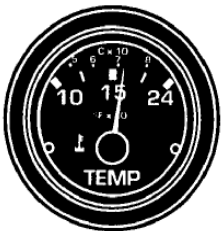


Deze meter meet de motoroliedruk - zie voor meer informatie de motorhandleiding.

• Motorolie-temperatuur

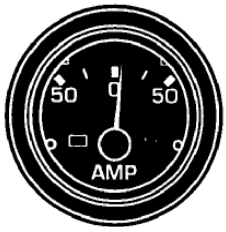
Deze meter meet de temperatuur van de motorolie. Zie voor meer informatie de motorhandleiding.

• Motorwater-temperatuur



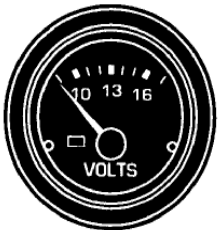
Deze meter meet de watertemperatuur van de motor. Zie de motorhandleiding voor meer informatie.

• Ampèremeter



Deze meter meet de laadstroom in het elektrische systeem. Zie voor meer informatie de motorhandleiding.

• Voltmeter



Deze meter meet de conditie van de accu in DC-volt. Als de voltmeter een waarde beneden 11,5V aangeeft, controleer dan de accu en laad deze op.

• Urenteller

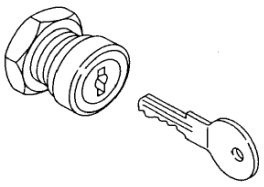


Deze teller geeft het aantal bedrijfsuren van de motor aan. Zie de motorhandleiding voor de onderhoudsschema's.

Ref Bijlage N - SmartCraft.

Schakelaars en indicators

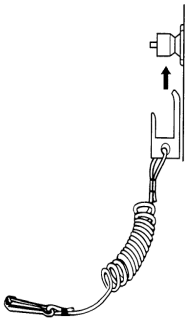
• Contactslot



Steek de sleutel in het contactslot en draai deze rechtsom om de startmotor in te schakelen. Zodra de motor begint te lopen, draait u de sleutel terug in de stand ON.

Essentiële uitrusting en voorzieningen

• Motorstopschakelaar



De motorstopschakelaar mag alleen in noodgevallen worden gebruikt. Gebruik deze schakelaar NIET in normale situaties.

De motorstopschakelaar moet via de klem worden verbonden met de persoon die de boot bestuurt.

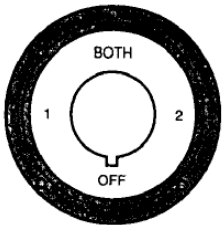
Mocht die persoon dan uit balans raken of overboord vallen, dan zal de stopschakelaar worden losgetrokken, zodat de motor wordt uitgeschakeld.

⚠Waarschuwing

Zorg voor vertrek dat de stopschakelaar altijd goed is verbonden met zowel de bedieningselementen als met de persoon die de boot bestuurt.

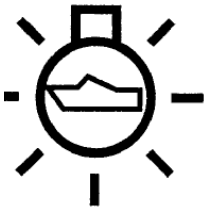
Controleer eenmaal per maand of de stopschakelaar correct werkt door deze los te trekken terwijl de motor draait. Indien de motor niet stopt, neem dan onmiddellijk contact op met uw leverancier voor een vervangingsstopschakelaar.

• Accuhoofdschakelaar



Deze wordt gebruikt om de accu op het elektrische systeem aan te sluiten. Wanneer de accu is uitgeschakeld, is deze beveiligd tegen sabotage, brand en leeglopen. Zorg dat de accu is uitgeschakeld (schakelaar in de stand OFF) als de boot niet wordt gebruikt.

• Navigatielicht-schakelaar



Aan/uit-schakelaar voor navigatie- en ankerlichten.

Vaar nooit 's nachts met uw boot zonder brandende navigatielichten. U dient deze lichten in het donker altijd te branden zodat de bestuurders van andere boten uw vaarrichting en eventuele voorrang kunnen bepalen.

• Walvoeding

Let erop dat de walvoedingsschakelaar aan boord in de stand OFF staat voordat de walvoeding wordt aangesloten/ losgekoppeld. Sluit de benodigde kabels aan voordat de walvoeding wordt ingeschakeld. Als u een waarschuwingssignaal van de polariteitsindicator krijgt, koppel dan de walvoeding onmiddellijk los. Schakel vóór het loskoppelen eerst de walvoeding uit. Zorg er altijd voor dat het afdekplaatje voor de ingangsopening van de walvoeding goed wordt gesloten na het loskoppelen.

• Boordverlichting

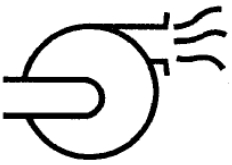
Schakelaars om de boord- en cockpitverlichting in en uit te schakelen. De DC-hoofdstroomonderbreker moet in de stand ON staan voordat u deze verlichting kunt inschakelen.

• Ruitenwissers



Regelt de werking van de ruitenwissers.

• Ventilatorschakelaar

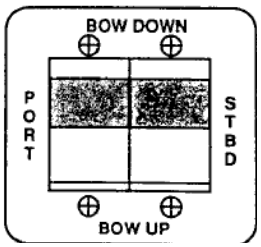


Activeert de ventilatie in de motorruimte voor het verwijderen van gassen.

⚠Gevaar⚠

Activeer telkens voordat u de motor start de ventilator gedurende minstens 5 minuten. U dient de ventilator ook te gebruiken bij stationair draaien van de motor en bij lage vaarsnelheden. Het niet gebruiken van de ventilatorschakelaar kan een explosie, ernstig letsel en schade veroorzaken.

• Trimvlakken



Optionele uitrusting. Schakelaars om de trimvlakken te regelen die zich aan bakboord- en stuurboordzijde van de achterspiegel bevinden. Worden gebruikt om de slagzij te corrigeren onder moeilijke omstandigheden en om de werking van uw boot in algemene zin te verbeteren.

• Lenspomp
Handbediende aan/uit-schakelaar voor lenspomp.

In uw boot is een handbediende lenspomp met een capaciteit van 40 liter/min. aangebracht. De plaats van de lenspomp is aangegeven in Bijlage A (bilge pump).

• Waarschuwings-alarm
Als er een waarschuwingsalarm klinkt, controleer dan alle meters en zet de motor onmiddellijk stil. De motor kan oververhit zijn geraakt en/of onvoldoende olie bevatten.

Veiligheidsuitrusting en veiligheid

Vereiste veiligheidsuitrusting

- Reddingsvesten voor alle passagiers
- Navigatielichten
- Brandblusapparaat
- Handbediend hoosvat

Aanbevolen veiligheidsuitrusting

- Ankerkabel en anker
- Meerkabels en stootranden
- EHBO-doos
- Set reservesleutels
- Hulpstartaccu
- Reservezekeringen en -gloeilampen

Reddingsvesten

Zorg dat alle reddingsvesten goed passen en gebruiksklaar zijn.

⚠Waarschuwing

Personen die niet goed kunnen zwemmen, moeten altijd hun reddingsvest dragen. Een uitwerpbaar drijvend voorwerp, zoals een reddingsband, moet ook aan boord binnen handbereik liggen.

Brandblusapparaat

Houd uw brandblusapparaat binnen handbereik. Stel u op de hoogte van het gebruik van het brandblusapparaat zodra u dit aan boord neemt door de gebruiksaanwijzing in Bijlage C te lezen.

Gebruik het brandblusapparaat nooit tegen de windrichting in en richt het apparaat op de vuurhaard.

Als het brandblusapparaat is gebruikt, al was het maar eventjes, moet dit worden ingeleverd bij een erkende leverancier om opnieuw te worden gevuld.

⚠Gevaar⚠

Lantaarns

Boten die niet zijn voorzien van lantaarns mogen niet in het donker of bij slecht zicht worden bevaren.

⚠Waarschuwing

Alcohol/drugs en varen

Drink geen alcohol en gebruik geen drugs tijdens het varen. Alcohol en drugs oefenen een zeer nadelige invloed uit op uw concentratie en evenwicht. Alcohol in uw bloed maakt u ook gevoeliger voor temperatuursveranderingen - koude wind en koud water, mocht u overboord vallen.

Hoosvat

Indien er geen lenspomp is geïnstalleerd, is het de verantwoordelijkheid van de eigenaar om minstens één hoosvat/emmer aan boord te hebben, beveiligd tegen verlies.

⚠Gevaar⚠

Gebruik van zwemtrap/platform

Zet altijd de motor af voordat een zwemtrap/ platform wordt gebruikt, zodat niemand in aanraking kan komen met draaiende delen, zoals de propeller.

Maximale aanbevolen belading

Let op de toelaatbare belading in de tabel op pagina 3 van deze handleiding. Om een veilige werking van uw boot te kunnen garanderen, mag de toelaatbare belading nooit worden overschreden.

De toelaatbare belading omvat alle voorraden, tankinhoud, uitrustingen en personen aan boord.

Zorg er tevens voor dat alle belading op verstandige wijze wordt verdeeld en stevig wordt vastgemaakt, vooral bij ruwe weersomstandigheden.

Milieuoverwegingen

⚠Waarschuwing

Zicht van de stuurman vanaf het roer

Het zicht van de stuurman vanaf het roer kan worden belemmerd door een grote trimhoek van het vaartuig en door andere factoren die door een of meer van de volgende variabele omstandigheden worden veroorzaakt:

- trimhoeken van de stuwmotor
- trimvlakhoeken aan de romp
- lading en de verdeling ervan
- snelheid en snelle acceleratie
- overgang van verplaatsings- naar planeersnelheid
- zeeomstandigheden, regen en nevel
- duisternis en mist
- binnenverlichting en plaats van gordijnen
- personen of verplaatsbare werktuigen in het gezichtsveld

Internationale regelgeving vereist dat een goede uitkijkpost te allen tijde behouden blijft om aanvaringen te voorkomen en om de voorrangsregels te kunnen eerbiedigen.

⚠Gevaar⚠

CO-blootstelling

Alle bootmotoren stoten koolmonoxide (CO) uit. Dit is een uiterst giftig en gevaarlijk gas. Het is vrijwel onmogelijk om het waar te nemen, omdat het zowel reukloos als kleurloos is.

De eerste tekenen van blootstelling aan koolmonoxide zijn vermoeidheid, duizeligheid en misselijkheid. Langdurige blootstelling aan koolmonoxide kan hersenletsel of de dood tot gevolg hebben.

Om blootstelling aan koolmonoxide te voorkomen, is het essentieel dat u onderstaande richtlijnen opvolgt:

- Let erop dat er geen obstructies aanwezig zijn in de buurt van de motoruitlaat - zoals meerkabels, een ander vaartuig, enz.
- Let er bij het varen met lage snelheid, mogelijk met hoge boeg, op dat de uitlaat niet in de boot, maar juist ervan af blaast.
- Zorg er bij gebruik van canvas dekzeilen of -kappen op uw vaartuig voor dat u voldoende ventilatie voor de uitlaatgassen hebt voorzien.

Ruiten en luiken

Houd alle ruiten/luiken enz. bij hoge snelheden en ruwe weersomstandigheden gesloten, om het risico op letsel/schade te voorkomen.

Algemene bediening van het vaartuig

Houdt u aan het volgende met betrekking tot de vermogens- en manoeuvreerbeperkingen van uw vaartuig:

- Gebruik dit vaartuig niet met een motor waarvan het nominaal vermogen groter is dan het vermogen dat staat aangegeven op het capaciteitsplaatje in uw vaartuig.
- Gebruik dit vaartuig niet bij negatieve triminstellingen van de stuweenheid (boeg omlaag) en hoge snelheden, omdat het vaartuig naar de zijkant kan gaan overhellen, wat instabiliteit tot gevolg heeft. Maak gebruik van negatieve trim om vanuit verplaatsingssnelheid naar planeersnelheid te accelereren en bij lagere planeersnelheden in ruw water.
- Vaar niet op volle snelheid op drukke waterwegen of bij ruwe weers- en zeeomstandigheden of omstandigheden met verminderd zicht.
- Eerbiedig de voorrangsregels op zee, zoals die zijn bepaald door internationale regelgeving.
- Houd altijd voldoende afstand aan om te stoppen of om zo nodig te manoeuvreren en een aanvaring te voorkomen.

Milieuoverwegingen

Als eigenaar van een pleziervaartuig bent u verantwoordelijk voor de bescherming van de natuurlijke omgeving, zowel op zee als aan land. Laat zowel de zee als het land achter zoals u beide hoopt aan te treffen.

Lozen/morsen van brandstof of olie

Loos nooit brandstof of olie terwijl u op zee bent. Dit zijn giftige stoffen die het milieu schade toebrengen. Het lozen van brandstof of olie op water is een overtreding waarvoor u beboet kunt worden.

⚠Gevaar⚠

Mocht u per ongeluk morsen, bijv. bij het vullen met brandstof of olie, denk er dan aan

dat deze stoffen uiterst explosief en giftig zijn. Stel deze stoffen niet bloot aan open vuur en bewaar geen poetsdoeken in de boot waarmee het gemorste is afgeveegd.

Storten en verwijderen van afval

Gooi geen afval in het water. De meeste jachthavens hebben grote afvalbakken langs de waterkant die booteigenaren kunnen gebruiken; breng dus al uw afvalproducten mee terug aan land.

Als u een toilet in uw boot hebt geïnstalleerd, maak dan alleen gebruik van een goedgekeurde leegpompvoorziening in de jachthaven.

Overmatig geluid

Houd rekening met medewatersporters en mensen aan wal. Geluiden dragen behoorlijk ver over water, vooral 's nachts. Houd dus muziek, geroep en motorgeluiden zo zacht mogelijk.

Kielwater en golfslag

Houdt u altijd aan alle snelheids-beperkingen. Voor de meeste jachthavens gelden snelheidsbeperkingen in de omliggende wateren om te voorkomen dat de golfslag van andere boten de aangemeerde boten beschadigt.

⚠Waarschuwing

Niet in alle gebieden worden snelheidsbeperkingen aangegeven, dus verminder uw snelheid tot onder de planeersnelheid wanneer u plaatsen passeert waar boten zijn aangemeerd of mensen aan het zwemmen zijn.

Uitstoot

Koolwaterstof in de uitstoot verontreinigt de lucht en het water. Zorg dat de motor goed is afgeregeld en reinig regelmatig de romp van uw vaartuig, zodat de uitstoot tot een minimum wordt beperkt. Van uw leverancier kunt u meer informatie hierover krijgen.

Lakken/reinigingsmiddelen

Aangroei op de romp van uw boot kan worden voorkomen door gebruik te maken van een vuilwerende lak, maar houdt u aan de milieubepalingen wat betreft de laksoorten die u mag gebruiken - uw leverancier of de lokale maritieme overheid kan u adviseren.

Wij bevelen het gebruik aan van milieuvriendelijke reinigingsmiddelen, die niet alleen de invloed op het milieu minimaliseren, maar ook effectief en veiliger voor uzelf zijn. Gebruik alle reinigings-middelen spaarzaam, loos ze niet en gooi ook geen verpakkingen in het water.

Onderhoud

Algemene verzorging

• Uw boot reinigen

In het algemeen gaat de conditie van de boot naar verloop van tijd achteruit door blootstelling aan zout water, zonlicht en milieuverontreiniging. Regelmatig reinigen van uw boot zal deze slijtage minimaliseren. Speciale bootreinigingsproducten zijn verkrijgbaar bij uw leverancier, maar gebruik nooit schuurproducten, omdat deze de gelcoat aantasten.

⚠Waarschuwing

Denk eraan dat tijdens het reinigen van het dek van de boot de reinigingsmiddelen het oppervlak erg glad kunnen maken.

• Aangroei

Indien absoluut noodzakelijk mogen speciale producten worden gebruikt om aangroei van de romp te verwijderen, maar deze producten mogen niet in het water worden geloosd. Gebruik geen staalborstel of schuurspons op de romp van uw boot, omdat deze het oppervlak bekrast.

• Vuilwerende lak

Goede vuilwerende laksystemen zijn nodig om uw boot te beschermen tegen blaasjes op de romp en osmose. Neem voor meer informatie contact op met uw leverancier.

• Zoutwatercorrosie

Als u de boot in zout water gebruikt, dient u deze zo vaak mogelijk met zoet water schoon te spoelen om corrosie te voorkomen.

• Besturing

Om een juiste en veilige werking van het besturingssysteem te garanderen, moet de stuurarm minstens tweemaal per jaar worden ingevet, zowel vóór als na de winterstalling.

• Kussens
De kussens in uw boot zijn gemaakt van hoogwaardige materialen en zijn bestand tegen morsen en kleine hoeveelheden water en zeenevel. U dient de kussens regelmatig met een spons en zeepwater te reinigen. Gebruik NOOIT sterke, synthetische of chemische reinigingsmiddelen of oplossingen. U kunt ook speciale producten kopen voor het reinigen van de bekleding.

U zult eveneens de ritsen en andere delen van de kussens moeten onderhouden. Vet deze eenmaal per jaar in met siliconenvet of vaseline om corrosie te voorkomen.

Wees voorzichtig bij het verwijderen van de kussens - trek niet aan het kussen zelf, maar alleen aan de drukknoop.

Als de boot niet wordt gebruikt, berg de kussens dan op in een van de compartimenten in de boot of op een droge plaats.

• Cabriolet kap
De cabriolet kap aan uw boot is vuilwerend en waterafstotend. Deze kan worden gereinigd met een mild reinigingsmiddel. Schrob de buitenkant van de cabriolet kap met een zachte borstel en reinig de binnenzijde met een zachte doek of spons om krassen te voorkomen. Het water dat u gebruikt voor het reinigen van de cabriolet kap mag maximaal 30 graden Celsius zijn.

Reinig de cabriolet kap niet met chemische middelen of een hogedrukreiniger en probeer de cabriolet kap nooit te drogen met behulp van hoge temperatuur of een droogtrommel.

Bij winterstalling dient de cabriolet kap te worden verwijderd, gedroogd en opgeborgen op een droge plaats. Tevens adviseren wij om de cabriolet kap minstens eenmaal per week te luchten als de boot in gebruik is, zodat de vorming van schimmel op de cabriolet kap wordt voorkomen.

• Lenspomp
De lenspomp moet vaak worden gecontroleerd op verontreiniging, vooral in perioden met zware regenval of stormachtige condities. Door vuil in de lenspomp kan de pomp slecht gaan werken. U dient ook regelmatig te controleren of de slangklemmen en slangen aan de lenspomp nog vastzitten.

⚠Waarschuwing
Reinig de lenspomp nooit met brandbare of chemische oplosmiddelen.

• Toilet
Een schema van het septische systeem aan boord van uw vaartuig is opgenomen in Bijlage A.

Gebruik milde reinigingsmiddelen en warm water voor het reinigen van het toilet. Spoel nooit doekjes, maandverband of andere vaste voorwerpen door het toilet. Bijlage M bevat informatie over de geïnstalleerde toilet in uw vaartuig.

• Roestvrijstalen hulpstukken
Roestvrij staal is ook onderhevig aan slijtage. Gebruik een mild reinigingsmiddel en water voor het schoonhouden ervan. Gebruik nooit schuurdoekjes of -borstels, omdat deze het oppervlak bekrassen. Gebruik een poetsmiddel om roestvlekken te verwijderen, zodra ze verschijnen, en behandel het oppervlak regelmatig met was om corrosie te voorkomen.

• Plexiglas voorruiten
Reinig ook deze alleen met milde reinigingsmiddelen en warm water en een zachte doek, omdat plexiglas gevoelig is voor krassen.

Materialen en componenten
Uw boot is ontworpen en gefabriceerd, getest en gecertificeerd in overeenstemming met strenge regelgeving en veiligheidsstandaarden. Het door de eigenaar installeren van extra materialen of componenten wordt door ons ten zeerste ontraden, omdat dit van invloed kan zijn op een veilige werking van de boot en op de geldigheid van de garantie.

Mocht u behoefte hebben aan extra uitrusting, neem dan contact op met uw leverancier die bevoegd is om dit soort wijzigingen aan te brengen.

Winterstalling
Raadpleeg de motorhandleiding, Bijlage B, voor advies over de winteropslag van de motor.

De accu moet worden verwijderd en opgeladen en op een droge plaats worden opgeslagen.

Zorg dat de boot volledig droog is en verwijder al het water uit de leidingen en andere componenten om schade door bevriezing te voorkomen.

De leverancier van uw boot biedt wellicht een professionele winterstallingsservice.

Verven

Wij adviseren regelmatig bodemlak aan te brengen om aangroei te voorkomen. Neem contact op met de leverancier van uw boot over de bodemlak die u kunt gebruiken. Dit is afhankelijk van waar u met uw boot gaat varen.

⚠Waarschuwing

Lakproducten zijn zowel giftig als brandbaar. Zorg dat de ruimte waarin u uw boot gaat verven goed geventileerd is en dat u de juiste veiligheidsuitrusting - handschoenen, veiligheidsbril, stofmaskers, enz. - gebruikt.

Inspectie

Voordat u uw boot uit de winterstalling haalt, is het noodzakelijk dat u alle componenten op uw boot nauwkeurig inspecteert. Let erop dat alle bevestigingen stevig vastzitten en dat er geen lekkages, beschadigingen of gerafelde onderdelen zijn.

Tevens dient u gedurende het hele vaarseizoen alle essentiële componenten op uw boot te inspecteren.

Uw boot ophijsen

Zorg dat de touwen zich op de juiste plaats bevinden, zodat de boot bij het ophijsen horizontaal blijft. Breng bescherming aan tussen de touwen/kabels en de boot om schade tijdens het hijsen te voorkomen.

⚠Gevaar⚠

Ga nooit onder de boot staan wanneer deze wordt opgehesen!

Aanmeren

Het valt onder de verantwoordelijkheid van de eigenaar om te zorgen dat meerkabels, sleepkabels, ankerkettingen en ankers afmetingen hebben die passen bij het bedoelde gebruik van de boot.

⚠Waarschuwing

De eigenaar dient bekend te zijn met het aan boord bevestigen van de sleepkabel aan het (de) hiervoor bestemde sterktepunt(en).

Vervoer per aanhangwagen

Zorg dat de kiel van uw boot correct is geplaatst tussen de middelste rollen en stel het laterale lager zo af dat de boot niet kan bewegen.

⚠Waarschuwing

Plaats geen lading in de boot en ga niet aan boord van het vaartuig als dit op een aanhangwagen wordt vervoerd.

Extra informatie

Garantie

Zie de achterzijde van de gelijkvormigheidsverklaring (Bijlage O) voor de complete garantievoorwaarden.

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Einleitung

Auch wenn alles zur Sicherheit des Bootes und dessen Nutzer bedacht und konstruiert wurde, ist das Bootfahren stark von den Witterungsbedingungen, dem Zustand der See und den Erfahrungen und den physischen Kräften der Crew etc. abhängig, was die Gewährleistung 100-prozentiger Sicherheit unmöglich macht.

Selbst wenn Ihr Boot dafür kategorisiert ist, so reichen die auf die See- und Windbedingungen bezogenen Konstruktionskategorien A, B und C von starkem Stum bis zu extremen Bedingungen mit möglichen Flutwellen und Sturmböen. Das sind gefährliche Bedingungen, welche nur eine erfahrene, geschulte Crew in Topform auf einem gut gewarteten Boot beherrschen kann.

Die See oder extreme Wetterbedingungen sind nicht der natürliche Lebensraum des Menschen. Ihre Gesetze und Kräfte sind zu respektieren. Hören oder lesen Sie immer vor Antritt einer Seefahrt den Wetterbericht oder die Wettervorhersage und stellen Sie sicher, daß die Wind- und Seebedingungen der Konstruktionskategorie Ihres Bootes entsprechen und daß Sie und Ihre Crew in der Lage sind, mit diesen Bedingungen fertig zu werden.

Dieses Besitzerhandbuch enthält den minimalen Informationsumfang, der zum korrekten Betreiben des Bootes nötig ist, einige Sicherheitsaskpekte sowie Betriebs- und Wartungshinweise. Lesen Sie das Handbuch aufmerksam durch und machen Sie sich vor der Benutzung mit dem Boot vertaut. Dieses Handbuch ist jedoch kein Schulungskurs für Bootfahrtsicherheit oder wie Ihr Boot zu navigierenm zu ankern oder anzulegen ist. Ihr Händler, der nationale Segler-Verband oder Ihr Yachtclub kann Ihnen regionale Schulen oder Lehrer empfehlen.

Dieses Besitzerhandbuch ist kein Betriebshandbuch und kein Handbuch zur Wartung oder Störungsbeseitigung.

Bitte beauftragen Sie immer geschulte Fachkräfte für Wartungsarbeiten, Reparaturen oder geringe Modifikationen. Bei Modifikationen größeren Umfangs ist sicherzustellen, daß diei Sicherheitscharakteristika des Bootes night beeinträchtigt werden und falls erforderlich, daß eine schriftliche Genehmigung des Bootherstellers oder seiner autorisierten Vertretung eingeholt wird.

Jegliche vertikale Massenschwerpunktänderungen (z.B. der Anbau eines Angelturmaufbaus, Radars oder Lademastes etc.) kann die Stabilität des Bootes stark beeinflussen. Nehmen Sie keine dieser eventuellen Änderungen ohne schriftliche Genehmigung des Bootherstellers oder seiner autorisierten Vertretung vor.

In vielen Ländern ist ein Bootsführerschein, eine Zulassung oder eine Schulung erforderlich. Stellen Sie bitte vor dem Kauf oder dem Segeln sicher, daß Sie im Besitz der entsprechenden gesetzlich vorgeschriebenen Dokumente sind.

Warten Sie Ihr Boot stets ordnungsgemäß und passen Sie Ihr Nutzungsverhalten dem Zustand des Bootes an, das mit der Zeit und je nach Gebrauchsintensität verschleißt.

In den internationalen IMO-Bestimmungen und im COLREG -Übereinkommen sind die Schiffahrtsvorschriften, Navigationslichter etc. mit weltweiter Gültigkeit definiert. Stellen Sie sicher, daß Sie diese kennen und eine Broschüre mit deren Erklärungen an Bord haben.

Wenn dies Ihr erstes Boot ist oder Sie zu einem anderen, nicht vertrauten Bootstyp wechseln, dann gewährleisten Sie bitte zu Ihrer eigenen Sicherheit, daß Sie ausreichend Erfahrung im Umgang und Führen des Bootes erwerben, bevor Sie “das Bootskommando” übernehmen.

Jedes Boot, ganz gleich wie robust es ist, kann durch unsachgemäßen Umgang unerfahrener Personen schwer beschädigt werden. Das entspricht nicht dem sicheren Bootsfahren. Stets die Geschwindigkeit von Motorbooten den Seebedingungen anspassen, um starke Seeschläge zu vermeiden.

BITTE BEWAHREN SIE DIESES HANDBUCH AN EINEM SICHEREN ORT AUF UND GEBEN SIE ES IM FALLE EINES VERKAUFS AN DEN NEUEN EIGENTÜMER WEITER.

Zertifizierung

Da wir uns um die ständige Verbesserung unserer Produkte bemühen, gleichen die Abbildungen in der vorliegenden Anleitung ggf. nicht Ihrem Boot und sind nur als typische Darstellungen zu betrachten. Gewisse Bedienungselemente, Anzeiger und Angaben können zur Sonderausstattung gehören und bei Ihren Boot nicht vorhanden sein.

Zertifizierung

Ihr Boot ist gemäß den entsprechenden Teilen der Richtlinie 94/25/EU, 2003/44/EU des Europäischen Parlaments über Sportboote zertifiziert. Aus der CE-Kennzeichnung geht hervor, dass Ihr Boot alle gültigen Vorschriften und Richtlinien der Intern-ationalen Organisation für Standardisierung (ISO) erfüllt oder darüber hinausgeht.

CE

Gefahreneinstufung

⚠Gefahr

Hinweis auf Sicherheitsvorkehrungen zur Vermeidung von Verletzungen oder Schäden am Boot.

⚠Warnung⚠

Hinweis auf angemessene Vorsichtsmaßnahmen zur Vermeidung von schweren Verletzungen/Schäden oder Tod.

Auslegungskategorie

Alle kleinen Boote werden gemäß einer Standardmodell-Kategorisierung eingestuft. (Die Kategorie können Sie der Herstellerplakette am Rumpf des Bootes entnehmen.) Ihr Askeladden Z7 fällt in die Kategorie C.

Kategorie C - KÜSTENNAHE GEWÄSSER

Boot, das für Fahrten in küstennahen Gewässern, großen Buchten, Flussmündungen, Seen und Flüssen ausgelegt ist, bei denen Wetterverhältnisse mit einer Windstärke bis einschließlich 6 (Beaufort-Skala) und signifikante Wellenhöhen bis einschließlich 2 m auftreten können.

Wesentliche Ausstattungs- und Leistungsmerkmale

Anhang A enthält alle Zeichnungen/ Abbildungen, auf die im folgenden Text Bezug genommen wird.

Anhang B enthält die Handbücher zu dem Motor, der sich auf Ihrem Boot befindet.

Anhang C enthält Informationen über das Feuerlöschsystem auf Ihrem Boot.

Anhang D enthält Informationen über den Kühlschrank auf Ihrem Boot.

Anhang E enthält Informationen über das Kochgerät auf Ihrem Boot.

Anhang F enthält Informationen über die Stereoanlage auf Ihrem Boot.

Anhang G enthält Informationen über das Z-Top an Ihrem Boot.

Anhang H enthält Informationen über die Bilgepumpe auf Ihrem Boot.

Anhang I enthält Informationen über die Trimmvorrichtung auf Ihrem Boot.

Anhang J enthält Informationen über die Ankerwinde an Ihrem Boot.

Anhang K enthält Informationen über das Ladegerät für Schiffsbatterien auf Ihrem Boot.

Anhang L enthält Informationen über den Toilette auf Ihrem Boot.

Anhang M enthält Informationen über SecureVolt.

Anhang N enthält Informationen über SmartCraft.

Anhang O enthält die Konformitäts-erklärung und die Anlage zur Konformitätserklärung.

Technische Daten

Länge:	7,06 m
Breite:	2,54 m
Tiefgang:	0,39 m
Gewicht mit 5,0 L-260 MPI FWC Alpha, Benzin:	ca. 1805 kg
Gewicht mit QSD 2,8L-230 Bravo 2, Diesel:	ca. 1866 kg
Personen:	Max. 6
Treibstoff:	Bleifreies Benzin/Diesel
Zulässige Ladung:	Max. 1096 kg
Motor:	Max. 191 kW / 260 PS
Kabellänge, Fernbedienung, Benzin:	14/16 Fuß
Kabellänge, Fernbedienung, Diesel:	14/16 Fuß
Kabellänge, manuelle Steuerung, Benzin/Diesel:	4,75 m
Treibstofftank:	200 Liter
Wassertank:	54 Liter
Fäkalientank:	54 Liter

Strichzeichnung Ihres Bootes

Eine Strichzeichnung Ihres Bootes finden Sie in Anhang A.

Bitte achten Sie darauf, dass es für jeden Außenbordantrieb eine separate Zeichnung gibt.

Sicherungen und Stromunterbrecher

Sicherungen und Stromunterbrecher werden in den Stromkreisen in Ihrem Boot zum Schutz gegen Überlastung verwendet. Wenn der Stromkreis überlastet ist, springt die Sicherung heraus oder der Stromunterbrecher wird ausgelöst. Wenn dies regelmäßig passiert, sollten Sie sich unverzüglich mit Ihrem Händler in Verbindung setzen.

Strichzeichnungen der elektrischen Systeme an Bord Ihres Bootes finden Sie in Anhang A.

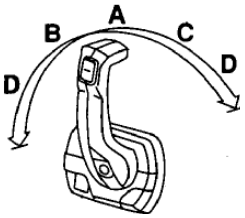
Schalt-/Gashebel

Schalt-/Gashebel hängen von dem jeweiligen Modell und dem jeweiligen Motor ab. Alle Schalt-/Gashebel müssen regelmäßig gewartet und geprüft werden, um die ordnungsgemäße Funktion und Betriebssicherheit zu gewährleisten.

⚠Gefahr

Die fehlerhafte Wartung der Steuerung kann zu deren Fehlfunktion führen, was wiederum ernste Verletzungen oder Schäden verursachen kann. Überprüfen Sie die Steuerungskabel und Teile regelmäßig. Notabene! Alle Schalt-/Gashebel haben einen Sicherheitsschalter, der bewirkt, dass der Motor nur in der neutralen Position gestartet werden kann.

• Einhebelsteuerung - Verdeckte Montage



Einhand-Einhebelschaltung - damit werden gleichzeitig Getriebe und Gas bedient.

A Neutral - Der Motor startet wegen des Sicherheitsschalters nur in dieser Position.

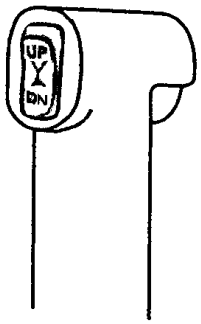
B Vorwärts - Drücken Sie den Knopf unter dem Griff, um in den Vorwärtsgang zu schalten.

C Rückwärts - Drücken Sie den Knopf unter dem Griff, um in den Rückwärtsgang zu schalten.

D Gasdrosselung - Schalten Sie auf Vorwärts (drücken) oder auf Rückwärts (ziehen), um die Motorgeschwindigkeit zu erhöhen.

Für alle Steuerungen gilt: Versuchen Sie niemals, ohne laufendem Motor zu schalten. Es gibt an allen Steuerungen einen separaten Knopf am Ende des Hebels, den Sie drücken, um den Motor in der neutralen Position warm laufen zu lassen.

• Trimmen des Motors



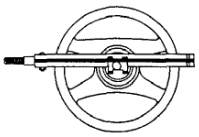
Mit dem Griff an Ihrem Schalt-/Gashebel trimmen/kippen Sie den Motor. Dient der verbesserten Leistung in Kombination mit den Trimmklappen (siehe auch unter Schalter und Anzeigen). Bei den Vorbereitungen zum Straßentransport des Bootes auf einem Trailer benutzen Sie den Auf-Schalter, um den Motor hochzuheben.

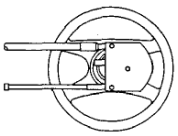
Steuerung

Es ist von wesentlicher Bedeutung, Ihr Steuerungssystem immer gut zu warten, damit es sicher und problemlos funktioniert. Weitere Informationen finden Sie im Abschnitt Wartung.

Bitte beachten Sie, dass die Steuerungssysteme auf den Booten nicht selbstzentrierend sind - Sie müssen das Steuerrad immer festhalten, um die vollständige Kontrolle über Ihr Boot zu haben.

• Mechanische Steuerung





Bei einem mechanischen Steuerungssystem überträgt die Rudereinheit die Drehbewegung des Steuerrads in eine lineare Bewegung jenes Seils, das den Lenkarm in die gewünschte Richtung bewegt.

⚠Gefahr

Die unsachgemäße Wartung Ihres Steuerungssystems kann zu schweren Verletzungen oder Schäden führen.

Treibstoff- und Wassertanks

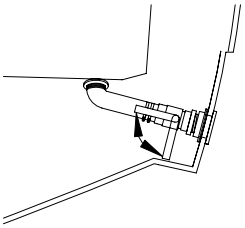
Die Einfüllöffnungen der Treibstoff- und Wassertanks sind auf in Anhang A angezeigt. Der Innenbordmotor auf Ihrem Askeladden Z7 verbraucht bleifreies Benzin oder Diesel.

Schematische Darstellungen des Treibstoffsystems finden Sie in Anhang A.

Eine schematische Darstellung des Wassersystems an Bord Ihres Bootes finden Sie ebenfalls in Anhang A.

Ventile

• Seeventil

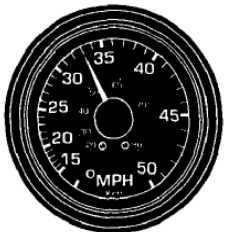


Ihr Boot ist mit einem Seeventil unterhalb oder auf der Wasserlinie ausgestattet. So kann das Boot Regenwasser ableiten. Bei beladenem Boot kann es notwendig sein, das Seeventil zu schließen, um ein Fluten zu vermeiden. Halten Sie das Seeventil von allen Verunreinigungen frei, die möglicherweise eine Verstopfung verursachen könnten.

Instrumente

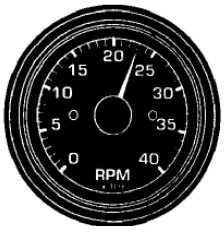
Ihr Boot kann mit einem oder mehreren der folgenden Instrumente ausgestattet sein:

• Geschwindigkeitsmesser



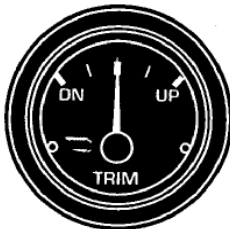
Misst die Geschwindigkeit des Bootes in Knoten, Kilometern oder Meilen pro Stunde.

• Drehzahlmesser



Misst die Motorgeschwindigkeit in Umdrehungen pro Minute.

• Trimmanzeige



Mit diesem Messgerät überprüfen Sie den Trimm Ihres Bootes, d.h. die Position der Antriebseinheit und die relative Position des Bugs.

• Tankanzeige



Zeigt den ungefähren Stand der Treibstoffmenge im Tank an. Wegen der Ungenauigkeit der Anzeige ist es empfehlenswert, ein Drittel des angezeigten Stands als Reserve zu behalten.

• Öldruckmesser

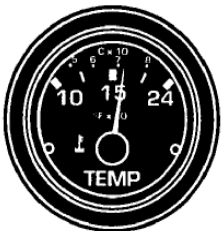


Misst den Druck des Motoröls - weitere Informationen dazu können Sie Ihrem Handbuch zum Motor entnehmen.

• Öltemperaturanzeige

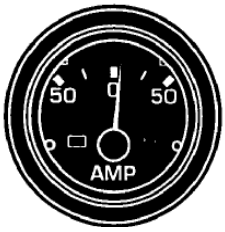
Misst die Temperatur des Motoröls. Weitere Informationen dazu entnehmen Sie bitte Ihrem Handbuch zum Motor.

• Kühlwassertemperaturanzeige



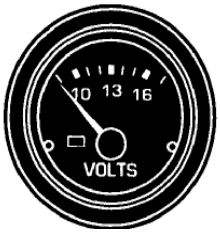
Misst die Temperatur des Kühlwassers. Weitere Informationen dazu entnehmen Sie bitte Ihrem Handbuch zum Motor.

• Amperemeter



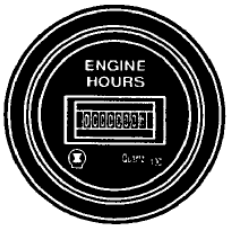
Misst den Ladestrom im elektrischen System. Weitere Informationen dazu entnehmen Sie bitte Ihrem Handbuch zum Motor.

• Voltmeter



Misst den Zustand der Batterie in Gleichstrom-Volt. Wenn das Voltmeter einen Wert von unter 11,5 anzeigt, überprüfen Sie die Batterie und laden Sie sie auf.

• Betriebsstundenzähler



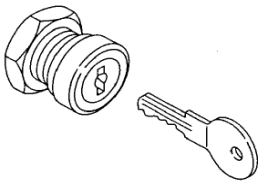
Zeigt die Anzahl der Stunden an, die der Motor in Betrieb ist. Die Wartungsintervalle

entnehmen Sie bitte dem Handbuch zum Motor.

Referenz Anhang N - SmartCraft.

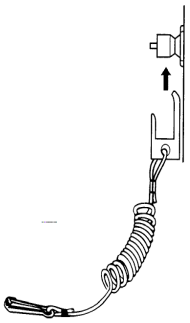
Schalter und Anzeigen

• Zündung



Stecken Sie den Schlüssel ins Zündschloss und drehen Sie ihn im Uhrzeigersinn, um den Motor zu starten. Sobald der Motor zu laufen beginnt, drehen Sie den Schlüssel in die Stellung "Ein".

• Notstoppschalter



Der Schalter für den Motorstopp ist ausschließlich für Notfälle vorgesehen. Er darf AUF KEINEN FALL zum normalen Abschalten des Motors verwendet werden.

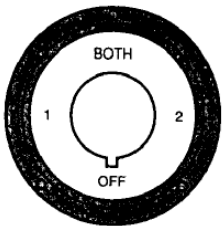
Der Motorstoppschalter ist über den Clip mit dem Fahrer des Bootes zu verbinden. Wenn dann diese Person entweder das Gleichgewicht verliert oder über Bord geht, wird der Stoppschalter ausgelöst und der Motor gestoppt.

⚠Gefahr

Achten Sie immer darauf, dass der Notstopp-schalter vor dem Ablegen ordnungsgemäß sowohl an der Steuerung als auch an der Person befestigt ist, die das Boot steuert.

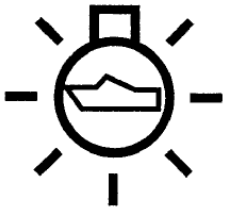
Einmal im Monat sollten Sie überprüfen, ob der Stoppschalter ordnungsgemäß funktioniert, indem Sie ihn bei laufendem Motor abziehen. Falls der Motor nicht stoppen sollte, setzen Sie sich umgehend mit Ihrem Händler in Verbindung, um einen neuen Stoppschalter zu erhalten.

• Batteriehauptschalter



Verbindet die Batterie mit dem elektrischen System. Wenn diese Verbindung nicht besteht, ist die Batterie von unsachgemäßen Eingriffen, Feuer und Entladung geschützt. Achten Sie darauf, dass die Batterie abgeschaltet ist ("Aus"-Position), wenn das Boot nicht benutzt wird.

• Schalter für Navigationslichter



Ein/Aus-Schalter für die Navigations- und Ankerlichter. Fahren Sie nachts niemals ohne Ihre Navigationslichter. Sie sind notwendig, damit andere Schiffe Ihre Richtung und die Vorfahrt bestimmen können.

• Landanschluss

Achten Sie darauf, dass sich der Schalter für den Landanschlussstutzen an Bord in der "Aus"-Position befindet, bevor Sie die Verbindung zum Landanschluss herstellen oder unterbrechen. Verbinden Sie die notwendigen Kabel, bevor Sie den Landanschlussstutzen aktivieren. Wenn Sie ein Warnsignal von der Polaritätsanzeige erhalten, unterbrechen Sie die Verbindung zum Landanschluss sofort. Dabei sollten Sie zuerst den Strom an Land abschalten. Und überprüfen Sie immer, dass die Abdeckung für den Landanschluss nach dem Abschalten richtig geschlossen ist.

• Einstiegsbeleuchtung

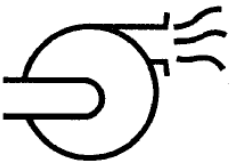
Schalter für die Bedienung der Einstiegsbeleuchtung und Cockpit-Lichter. Der Haupt-Gleichstromschalter muss sich in der "Ein"-Position befinden, bevor Sie diese Lichter anschalten können.

• Scheibenwischer



Steuert die Funktion der Scheibenwischer.

• Gebläse

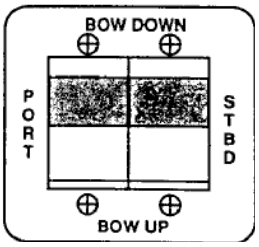


Betreibt die Belüftung im Motorraum, um Abgase abzuleiten.

⚠Warnung⚠

Vor jedem Starten des Motors sollten Sie das Gebläse mindestens 5 Minuten laufen lassen. Sie sollten das Gebläse auch bei niedrigen Geschwindigkeiten anstellen oder wenn der Motor im Leerlauf ist. Das Nichteinschalten des Gebläses kann zu einer Explosion, schweren Verletzungen und Schäden führen.

• Trimmklappen



Optionale Ausstattung. Schalter zur Steuerung der Trimmklappen am Backbord- und Steuerbordheckspiegel. Dient der Korrektur der Schlagseite in schwierigen Bedingungen sowie der allgemeinen Verbesserung der Bedienung Ihres Bootes.

• Bilgenpumpe

Manueller Ein/Aus-Schalter für die Bilgenpumpe.

Eine manuell zu bedienende Bilgenpumpe mit einer Kapazität von 40 Litern pro Minute gehört zu Ihrer Bootsausstattung. Die Position der Bilgenpumpe ist auf den Zeichnungen in Anhang A, markiert (bilge pump).

• Alarm

Wenn der Alarm ertönt, müssen Sie sofort alle Geräte überprüfen und den Motor stoppen. Es könnte ein Problem mit Überhitzung des Motors vorliegen und/oder zu wenig Öl vorhanden sein.

Sicherheitsausstattung und Sicherheit

Vorgeschriebene Sicherheitsausstattung

- Rettungswesten für alle Passagiere
- Navigationslichter
- Feuerlöscher
- Geräte zum manuellen Ausschöpfen

Empfohlene Sicherheitsausrüstung

- Ankerleine und Anker
- Muringtaue und Fender
- Erste-Hilfe-Kasten
- Ersatzschlüssel
- Hilfsbatterie zum Starten
- Ersatzsicherungen und -glühbirnen

Rettungswesten

Stellen Sie sicher, dass alle Rettungswesten richtig passen und leicht zugänglich sind.

⚠Gefahr

Nichtschwimmer wie Kinder und Behinderte sollten ihre Rettungswesten immer tragen. Ein abwerfbarer Rettungsschwimmkörper, beispielsweise ein Rettungsring, sollte an Bord ebenfalls leicht zugänglich sein.

Feuerlöscher

Bewahren Sie den Feuerlöscher an einem leicht zugänglichen Ort auf. Machen Sie sich mit der Bedienung des Feuerlöschers vertraut, sobald Sie ihn an Bord nehmen und lesen Sie die Gebrauchsanleitung in Anhang C des Handbuchs.

Halten Sie den Feuerlöscher nie gegen den Wind, wenn Sie ihn benutzen, und richten Sie ihn auf die Feuerquelle.

Nach jedem Einsatz, unabhängig von der Dauer der Benutzung, muss der Feuerlöscher von einem zugelassenen Händler wieder aufgefüllt werden.

⚠Warnung⚠

Navigationslichter

Boote ohne Navigationslichter sollten nachts oder bei schlechter Sicht nicht benutzt werden.

⚠Gefahr

Alkohol/Medikamente und Bootfahren

Nehmen Sie keinen Alkohol und keine Medikamente zu sich, wenn Sie Boot fahren, denn beides wirkt sich erheblich auf Ihre Konzentration und Ihren Gleichgewichtssinn aus.

Alkohol in Ihrem Blut vermindert auch die Wahrnehmung von kritischen Temperaturänderungen - d.h. etwa kalte Winde, kaltes Wasser, sollten Sie über Bord gehen.

Schöpfgefäß

Wenn keine Bilgenpumpe vorhanden ist, liegt es in der Verantwortung des Eigentümers, mindestens ein Schöpfgefäß/ einen Eimer an Bord zu haben und gegen versehentliches Verlieren zu sichern.

⚠Warnung⚠

Betreten der Badeleiter/-plattform

Schalten Sie den Motor immer aus, bevor Sie die Badeleiter/-plattform betreten, damit eine Berührung mit beweglichen Teilen wie dem Propeller verhindert wird.

Zulässiges Gesamtgewicht

Beachten Sie die erlaubte Zuladung in der Tabelle auf Seite 3 dieses Handbuchs. Das zulässige Gesamtgewicht darf nicht überschritten werden, damit die sichere Handhabung Ihres Bootes gewährleistet ist. Das zulässige Gesamtgewicht schließt sämtliche Lebensmittel, Tankinhalt, die verschiedenen Ausrüstungsgegenstände und alle Personen an Bord ein.

Bitte stellen Sie auch sicher, dass die gesamte Ladung sinnvoll verteilt und sicher befestigt ist, insbesondere bei widrigen Wetterverhältnissen.

⚠Gefahr

Sicht des Bootsführers vom Steuerruder aus

Die Sicht des Bootsführers vom Steuerruder aus kann durch große Trimmwinkel des Bootes und andere Faktoren behindert sein, die wiederum durch einen oder mehrere der folgenden wechselnden Bedingungen verursacht werden:

- Trimmwinkel der Antriebsmaschine
- Winkel der Trimmflächen am Rumpf
- Ladung und Verteilung der Ladung
- Geschwindigkeit, schnelle Beschleunigung
- Übergang vom Wasserverdrängen zum Gleiten
- Bedingungen auf See, Regen und Gischt
- Dunkelheit und Nebel
- Innenbeleuchtung und Position der Gardinen
- Personen oder bewegliches Gerät im Sichtfeld

Internationale Vorschriften verlangen, dass jederzeit für eine gute Sicht zu sorgen ist, damit Zusammenstöße vermieden und die Vorfahrtsrechte beachtet werden können.

⚠Warnung⚠

Kohlenmonoxid-Austritt

Alle Bootsmotoren erzeugen Kohlenmonoxid (CO) als Abgas. Dabei handelt es sich um ein extrem schädliches und gefährliches Gas, dessen Vorhandensein zudem nur sehr schwer festzustellen ist, denn es ist geruchlos und farblos.

Frühe Anzeichen einer CO-Vergiftung sind Müdigkeit, Schwindel und Brechreiz. Anhaltender Kontakt mit CO kann zu Hirnschäden oder zum Tod führen.

Um eine CO-Vergiftung zu vermeiden, ist es wichtig, dass Sie folgende Anweisungen befolgen:

- Sorgen Sie dafür, dass der Auspuff nicht durch irgendwelche Gegenstände verstopft wird - das könnten Verankerungen sein, andere Boote usw.
- Bei niedrigen Geschwindigkeiten, möglicherweise mit hohem Bug, sollten Sie darauf achten, dass die Abgase nicht in das Boot getrieben werden, sondern davon weg.
- Wenn Sie Segeltuchverdecke oder Kappen auf Ihrem Boot einsetzen, stellen Sie sicher, dass die Ventilation ausreicht, um die Abgase abzuleiten.

Fenster und Luken

Halten Sie alle Fenster/Luken usw. bei hohen Geschwindigkeiten und rauer See geschlossen, um das Risiko von Verletzungen/Schäden zu vermeiden.

Allgemeine Handhabung des Boots

Bitte beachten Sie die folgenden Hinweise bezüglich der Einschränkungen bei der Motorisierung und beim Manövrieren Ihres Bootes:

- Betreiben Sie dieses Boot nicht mit einem Motor, dessen Nennleistung höher ist als auf dem Leistungsschild in Ihrem Boot angegeben.
- Fahren Sie dieses Boot bei hohen Geschwindigkeiten nicht mit negativem Trimmwinkel (Bug nach unten), denn das Boot könnte sich nach einer Seite lehnen und dann instabil werden. Verwenden Sie eine negative Trimmung zur Beschleunigung von Verdrängungs- auf Gleitgeschwindigkeit sowie bei niedrigerer Gleitgeschwindigkeit auf rauer See.
- Fahren Sie Ihr Boot auf überfüllten Wasserwegen, bei widrigen Wetter- oder Wasserbedingungen oder schlechten Sichtverhältnissen nicht mit Höchstgeschwindigkeit.
- Beachten Sie die Vorfahrtsregeln, die in den internationalen Vorschriften festgelegt sind.

- Halten Sie immer einen ausreichenden Sicherheitsabstand ein, damit Sie zur Vermeidung einer Kollision gegebenenfalls noch rechtzeitig anhalten oder ausweichen können.

Umweltbelange

Als Eigentümer eines Freizeitbootes sind Sie verantwortlich für den Schutz der Umwelt, sowohl zu Wasser wie auch zu Lande. Bitte hinterlassen Sie beide in einem Zustand, den Sie auch selbst antreffen möchten.

Treibstoff- und Ölverlust

Lassen Sie niemals Treibstoff oder Öl ab, während Sie auf dem Wasser sind. Beides sind giftige Substanzen, die die Umwelt schädigen. Das Ablassen von Treibstoff oder Öl ins Wasser ist überdies ein Vergehen, für das Sie bestraft werden können.

⚠Warnung⚠

Sollte es versehentlich zu einem Verschütten kommen, etwa beim Auffüllen von Treibstoff oder Öl, denken Sie daran, dass diese Substanzen hochexplosiv und giftig sind. Setzen Sie sie nicht einer offenen Flamme aus, und bewahren Sie Lappen, mit denen Sie verschütteten Treibstoff oder Öl aufgewischt haben, nicht an Bord auf.

Ausladen und Beseitigen von Abfall

Bitte werfen Sie keinerlei Abfall ins Wasser. Die meisten Häfen verfügen für Bootsbesitzer über große Mülleimer an der Wasserseite; nehmen Sie daher Ihren gesamten Abfall mit in den Hafen.

Wenn an Bord eine Toilette installiert ist, benutzen Sie bitte nur eine geeignete Auspumpeinrichtung in Ihrem Hafen.

Lärmbelästigung

Nehmen Sie Rücksicht auf andere Bootsfahrer und auf die Menschen an Land. Geräusche werden auf dem Wasser über große Entfernungen weiter getragen, insbesondere bei Nacht. Achten Sie also bitte darauf, dass Musik, Gespräche und Motorengeräusche so leise wie möglich sind.

Nachstrom und Wellenschlag

Sie müssen sich immer an alle Geschwindigkeitsbeschränkungen halten. In den meisten Häfen gibt es Geschwindigkeitsbeschränkungen für die unmittelbare Umgebung, damit der Wellenschlag die Boote in den Muren nicht beschädigt.

⚠Gefahr

Nicht überall herrschen Geschwindigkeitsbeschränkungen; bitte reduzieren Sie Ihre Geschwindigkeit, wenn Sie an Bereichen vorbeikommen, in denen Boote festgemacht sind oder Menschen schwimmen.

Abgasemissionen

Kohlenwasserstoffe in den Abgasen verschmutzen Luft und Wasser. Um den Ausstoß möglichst gering zu halten, sollten Sie darauf achten, dass der Bootsmotor immer gut eingestellt ist, und regelmäßig den Rumpf Ihres Bootes reinigen. Ihr Händler gibt Ihnen gerne weitere Auskünfte zu diesem Thema.

Anstrich/Reinigungsmittel

Der Bewuchs durch Algen und Muscheln am Rumpf Ihres Bootes kann durch die Verwendung eines Antifouling-Anstrichs vermieden werden, achten Sie aber auf umweltbedingte Einschränkungen im Hinblick darauf, welche Arten von Anstrich Sie einsetzen dürfen - Ihr Händler oder das örtliche Wasser- und Schifffahrtsamt kann Ihnen behilflich sein.

Wir empfehlen die Benutzung von umweltfreundlichen Reinigungsmitteln, die nicht genauso wirksam sind, sich aber weniger auf die Umwelt auswirken und für Sie sicherer sind. Verwenden Sie alle Reinigungsmittel sparsam und werfen Sie sie nicht ins Wasser. Das gilt auch für die Behälter.

Wartung

Allgemeine Pflege

• Reinigung Ihres Bootes

Der Zustand eines Bootes verschlechtert sich im Laufe der Zeit, wenn es Salzwasser, Sonnenlicht und Verschmutzung ausgesetzt ist.

Regelmäßiges Reinigen Ihres Bootes vermindert diese Art von Abnutzung und Verschleiß. Bei Ihrem Händler sind spezielle Bootreinigungsprodukte erhältlich. Sie

dürfen niemals Scheuermittel verwenden, denn diese beschädigen die Gelcoat-Oberfläche.

⚠Gefahr

Seien Sie vorsichtig beim Säubern des Decks, denn Reinigungsmittel können die Oberfläche sehr rutschig machen.

• Bewuchs durch Algen und Muscheln

Nur wenn es unbedingt notwendig ist, können zur Entfernung von Bewuchs durch Algen und Muscheln am Rumpf Spezialprodukte verwendet werden; aber auch diese sollten nicht ins Wasser gelangen. Verwenden Sie keine Drahtbürsten oder Scheuerpads am Rumpf Ihres Bootes, denn diese verkratzen die Oberfläche.

• Antifouling-Anstrichfarben

Die geeigneten Antifouling-Anstriche sind eine Notwendigkeit zum Schutz Ihres Bootes vor Blasenbildung und Wasseraufnahme am Rumpf. Weitere Informationen erhalten Sie bei Ihrem Händler.

• Korrosion durch Salzwasser

Wenn Sie Ihr Boot im Salzwasser fahren, sollten Sie es so oft wie möglich mit Frischwasser abspülen, um Korrosionsschäden vorzubeugen.

• Steuerung

Um die richtige und sichere Funktion des Steuerungssystems zu gewährleisten, sollte der Lenkarm mindestens zweimal jährlich geschmiert werden, d.h. vor und nach der Winterlagerung.

• Kissen

Die Kissen in Ihrem Boot bestehen aus qualitativ hochwertigem Materialien und sind so gefertigt, dass ihnen Regengüsse, kleinere Mengen Wasser und vom Wind getriebene Gischt nichts ausmachen. Sie sollten Ihre Kissen regelmäßig mit einem Schwamm und etwas Seifenlauge reinigen. Verwenden Sie NIEMALS scharfe, synthetische Waschmittel, Lösungen oder chemische Reinigungsmittel.

Sie können sich auch spezielle Produkte zum Reinigen von Polsterungen besorgen.

Denken Sie auch daran, die Reißverschlüsse und andere Beschläge an den Kissen zu pflegen. Schmieren Sie diese einmal jährlich mit Silikon oder Vaseline ein, um sie vor Rost zu schützen.

Seien Sie vorsichtig, wenn Sie die Kissen entfernen - ziehen Sie nicht am Kissen selbst, sondern nur am Druckknopf.

Wenn das Boot nicht eingesetzt wird, bewahren Sie die Kissen in einem der Fächer an Bord auf oder an einem trockenen Ort.

• Verdeck

Das Verdeck auf Ihrem Boot ist schmutz- und wasserabweisend. Es kann mit einem milden Reinigungsmittel gesäubert werden. Reinigen Sie die Außenseite des Verdecks mit einer weichen Bürste und die Innenseite mit einem weichen Tuch oder Schwamm, um Kratzer zu vermeiden. Die Temperatur des Reinigungswassers sollte 30°C nicht übersteigen.

Benutzen Sie zur Reinigung des Verdecks keine chemischen Substanzen oder Hochdruckreiniger und versuchen Sie auch nicht, das Verdeck bei hohen Temperaturen oder in einem Trockner zu trocknen.

Während der Winterlagerung sollte das Verdeck entfernt, getrocknet und an einem trockenen Ort gelagert werden. Zur Verhinderung von Schimmelbildung empfehlen wir, das Verdeck häufig zu lüften, in Zeiten der Benutzung des Boots mindestens einmal wöchentlich.

• Bilgenpumpe

Die Bilgenpumpen sollten häufig auf Verunreinigungen hin überprüft werden, besonders während Zeiten starken Regens oder Sturms. Verunreinigungen in der Bilgenpumpe können zu einer Fehlfunktion der Pumpe führen. Sie sollten auch prüfen, ob die Schellen und Schläuche der Bilgenpumpe fest sitzen.

⚠Gefahr

Verwenden Sie niemals entflammbare oder chemische Lösungsmittel zur Reinigung der Bilgenpumpe.

• Toilette
Eine Darstellung des Sanitärsystems an Bord Ihres Bootes finden Sie in Anhang A.

Verwenden Sie milde Reinigungsmittel und warmes Wasser zur Reinigung der Toilette. Werfen Sie niemals Lappen, Binden oder andere feste Teile in die Toilette. Anhang M enthält Informationen über den Toilette auf Ihrem Boot.

• Edelstahlbeschläge
Auch Edelstahl kann Abnutzung und Verschleiß unterliegen. Halten Sie diese Teile mit einem milden Reinigungsmittel sauber. Nehmen Sie niemals Scheuerlappen oder Bürsten, denn diese verkratzen die Oberfläche. Mit einer Politur können Sie Rostflecken entfernen, sobald sie sichtbar sind, und durch regelmäßiges Wachsen beugen Sie der Korrosion vor.

• Plexiglas-Windschutzscheiben
Auch hierfür sollten Sie nur milde Reinigungsmittel, warmes Wasser und ein weiches Tuch nehmen, denn Plexiglas verkratzt sehr leicht.

Materialien und Komponenten

Ihr Boot wurde gemäß strengen Vorschriften und Sicherheitsstandards ausgelegt und hergestellt, geprüft und zertifiziert. Wir raten dringend davon ab, dass seitens des Eigners zusätzliche Materialien oder Bauteile installiert werden, denn diese könnten die sichere Bedienung Ihres Bootes und auch die Haftungsübernahme beeinträchtigen.

Sollten Sie irgendeine zusätzliche Ausstattung wünschen, setzen Sie sich mit Ihrem Händler in Verbindung, der qualifiziert ist, solche Veränderungen vorzunehmen.

Winterlagerung

Hinweise zur Winterlagerung Ihres Motors entnehmen Sie bitte Ihrem Handbuch zum Motor in Anhang B.

Die Batterie sollte ausgebaut, geladen und an einem trockenen Ort gelagert werden.

Stellen Sie sicher, dass das Boot vollständig trocken ist, und lassen Sie das Wasser aus allen Leitungen und anderen Bauteilen auslaufen, damit keine Frostschäden auftreten.

Ihr Händler kann Ihnen eine professionelle Winterlagerung anbieten.

Anstrichfarbe

Wir empfehlen die regelmäßige Anwendung einer Unterwasserfarbe, um Bewuchs durch Algen und Muscheln vorzubeugen. Fragen Sie Ihren Händler, welche Bodenanstrich-farbe Sie verwenden sollten, abhängig davon, wo Sie Ihr Boot einsetzen möchten.

⚠Gefahr
Anstrichfarben sind giftig und entflammbar. Sorgen Sie dafür, dass der Bereich, in dem Sie Ihr Boot streichen, gut belüftet ist und Sie über die nötige Sicherheitsausrüstung verfügen (Handschuhe, Schutzbrille, Atemschutzmaske etc.).

Inspektion

Bevor Sie Ihr Boot aus der Winterlagerung holen, ist es wichtig, alle Bauteile sorgfältig zu kontrollieren. Überprüfen Sie, ob alle Beschläge fest sitzen und ob es Lecks, Schäden oder Scheuerstellen gibt.

Sie sollten die wichtigsten Teile an Bord Ihres Bootes auch während der Saison überprüfen.

Ihr Boot hochheben

Sorgen Sie dafür, dass die Leinen sorgfältig angebracht sind, damit das Boot sich beim Hochheben in einer waagerechten Position befindet. Achten Sie auf Schutz zwischen den Leinen/Kabeln und dem Boot, um Schäden während des Liftens zu vermeiden.

⚠Warnung⚠
Halten Sie sich nie unter dem Boot auf, wenn es gehoben wird.

Muren

Es liegt in der Verantwortung des Eigentümers, dafür zu sorgen, dass Muringtaue, Schleppleinen, Ankerketten und Anker in der dem Boot und seiner Nutzung entsprechenden Größe vorhanden sind.

⚠Gefahr
Der Eigner muss sich mit der Sicherung der Schleppleine an Bord an den vorgesehenen Stützpunkten vertraut machen.

Zusätzliche Informationen

Transport mit Trailer

Stellen Sie sicher, dass der Kiel Ihres Bootes korrekt zwischen den Mittelrollen platziert ist und passen Sie die seitlichen Lagerungen an, um jegliche Bewegung des Bootes zu verhindern.

⚠ Gefahr

Beladen Sie das Boot nicht und besteigen Sie das Boot niemals, während Sie trailern.

Zusätzliche Informationen

Gewährleistung

Die kompletten Gewährleistungs-bestimmungen finden Sie am Ende der Konformitätserklärung (Anhang O).

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ASKELADDEN 27

Introduction

Even if everything has been planned and designed for the safety of the boat and its users, boating is highly dependent on the weather conditions, the sea state, the experience and physical shape of the crew etc. and one can never ensure full safety.

Even if your boat is categorised for them, the sea and wind conditions corresponding to the design categories A, B and C range from strong gale to severe conditions, open to the hazards of a freak wave or gust, and are therefore dangerous conditions, where only a skilled, fit and trained crew sailing on a well-maintained boat can satisfactorily sail.

The sea or the weather is not the natural environment for mankind and one can only respect its laws and its strength. Always listen to or read a weather forecast or prevision prior to any sailing excursion or voyage, and ensure that the wind and sea conditions will correspond to the design category of your boat, and that you and your crew are able to handle the boat in these conditions.

This Owner's manual contains the minimum information that is necessary to run the boat properly, some safety topics, operation and maintenance hints. Read it carefully, and familiarise yourself with the craft before using it. However, this Owner's manual is not a course on boating safety or how to navigate, anchor or dock your boat. Your dealer, national sailing federation or your yacht club will be able to advise you on local schools, or instructors.

This Owner's manual is neither an operation, nor a maintenance or troubleshooting booklet.

Please always use a trained professional for maintenance, repairs or minor modifications. For major modifications, ensure that he does not significantly modify the safety characteristics of the craft, and where relevant, ensure he has the written authorisation of the boat builder or its legal representative.

Any change in the vertical position of the masses onboard (for example, the addition of a fishing tower, a radar, a stowing mast etc.) may significantly affect the stability of your boat. Do not make these eventual changes without the written authorisation of the boat builder or its legal representative.

In many countries, a boat driving licence, authorisation or training is required. Please make sure you have these legal authorisations before purchasing and using your boat.

Always maintain the boat properly and irrespective of this, always adjust your use of the boat to the condition it is in. Boats suffer wear and tear with time and usage.

The International IMO Colreg regulation defines rights of way, navigation lights etc. throughout the world. Make sure you are familiar with these rules and you have a booklet explaining them onboard.

If this is your first craft or you are changing to a type of craft you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before taking command of the craft.

Any boat, no matter how strong it may be, can be severely damaged if handled and treated improperly by unskilled persons. This is not compatible with safe boating. Always adjust the speed of powerboats to sea conditions to avoid excessive slamming.

PLEASE KEEP THIS MANUAL AND ITS ENCLOSURES IN A SECURE PLACE, AND HAND IT OVER TO THE NEW OWNER WHEN YOU SELL THE CRAFT.

Due to our policy of continual product improvement, the illustrations used in this manual may not be the same as on your craft and are intended as representative reference illustrations. Some controls, indicators or information may be optional and not apply to your craft.

Certification

Your craft is certified in compliance with the relevant parts of the Recreational Craft Directive 94/25/EU, 2003/44/EU of the European Parliament. The CE mark denotes that your craft meets or exceeds all current standards and directives set by the International Organisation for Standardisation (ISO).

CE

Degrees of danger

⚠Caution

Reminder of safety practices to avoid injury or damage to boat.

⚠Warning⚠

Reminder of proper precautions to avoid severe injury/damage or death.

Craft Design Category

All small craft are classified according to a standard design category. (See builder's plate on hull of craft for design category). Your Askeladden Z7 is classified under category C.

Category C - INSHORE

Craft designed for voyages in coastal waters, large bays, estuaries, lakes and rivers, where conditions up to and including wind force 6 (Beaufort scale) and significant wave heights up to and including 2 m may be experienced.

Essential equipment and features

Appendix A contains all line drawings/ illustrations referred to in the following text.

Appendix B contains manuals pertaining to the engine mounted on your craft.

Appendix C contains information on the fire extinguishing system installed in your craft.

Appendix D contains information on the fridge installed in your craft.

Appendix E contains information on the cooker installed in your craft.

Appendix F contains information on the stereo installed in your craft.

Appendix G contains information on the Z-Top installed in your craft.

Appendix H contains information on the bilge pump installed in your craft.

Appendix I contains information on the trim plane installed in your craft.

Appendix J contains information on the anchor winch installed in your craft.

Appendix K contains information on the marine battery charger installed in your craft.

Appendix L contains information on the toilet installed in your craft.

Appendix M contains information on the SecureVolt system.

Appendix N contains information on the SmartCraft.

Appendix O contains the declaration of conformity and its annex.

Shift/Throttle Control

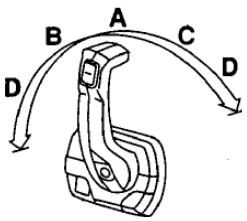
The shift/throttle control will differ depending on model and engine systems. All shift/ throttle controls need to be maintained and checked regularly to ensure proper operation and safety.

⚠Caution

Improper maintenance of controls may result in their failure which could cause serious injury or damage. Check the control cables and parts regularly. NB! All shift/ throttle controls have a safety switch which only allows the engine to be started in the neutral position.

• Single lever - Concealed mount

One-hand single lever control - acts as both gear shift and throttle.



A Neutral - engine will only start in this position due to safety switch.
B Forward - Press button under handle to move into forward gear.
C Reverse - Press button under handle to move into reverse gear.
D Throttle - Push in forward or pull in reverse to increase engine speed.

Technical data

Length:	7.06 m
Beam:	2.54 m
Draft:	0.39 m
Weight with 5.0 L-260 MPI FWC Alpha, petrol:	Approx. 1805 kg
Weight with QSD 2,8L-230 Bravo 2, diesel:	Approx. 1866 kg
Persons:	Max. 6
Type of fuel:	Unleaded petrol/diesel
Permissible load:	Max. 1096 kg
Engine:	Max. 191 kW / 260 HP
Cable length, remote control, petrol:	14/16 ft.
Cable length, remote control, diesel:	14/16 ft.
Cable length, manual steering, petrol/diesel:	4.75 m
Fuel tank:	200 litres
Water tank:	54 litres
Septic tank:	54 litres

Line drawing of your craft

A line drawing of your craft is provided in Appendix A. Please note that there are separate drawings for each stern drive system.

Fuses and circuit breakers

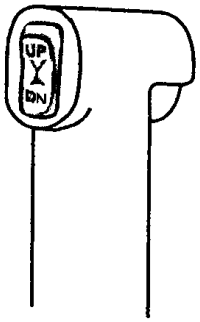
Fuses and circuit breakers are used on the electrical circuits in your boat to protect against overload. The fuse will blow or the circuit breaker will trip if the electrical circuit is overloaded. If this occurs regularly, contact your dealer immediately for advice.

Line drawings of the electrical systems onboard your craft are provided in Appendix A.

Essential equipment and features

For all controls - Never try to shift gear without the engine running. There is a separate button at the base of the lever on all controls which you press to warm the engine while still in neutral.

• Engine trim



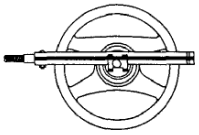
Switch on the handle of your shift/throttle which trims/tilts the engine. Used to improve performance in combination with the trim tabs (see under Switches and Indicators). When preparing your boat for trailering, use the up switch to raise your engine.

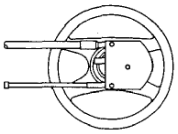
Steering

It is essential to keep your steering system well-maintained so that it operates satisfactorily and safely. See the section on maintenance for more information.

Remember that steering systems on boats are not self-centring - you must keep a tight hold of the steering wheel at all times to maintain full control of your boat.

• Mechanical steering





With a mechanical steering system, the helm unit transfers the rotary motion of the steering wheel to linear motion in the cable which moves the steering arm in the direction required.

⚠Caution

Improper maintenance of your steering system may lead to serious injury or damage.

Fuel and water tanks

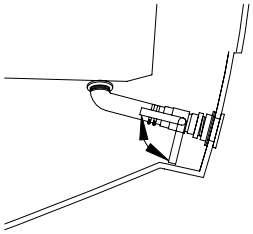
The filling positions of fuel and water tanks are indicated on the line drawing of your boat in Appendix A. The inboard engine on your Askeladden Z7 takes unleaded petrol or diesel.

Schematic illustrations of the fuel system are provided in Appendix A.

A schematic illustration of the water system onboard your craft is also provided in Appendix A.

Valves

• Rain water draining



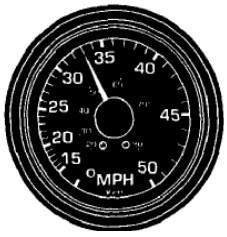
Your boat is equipped with a seacock below or on the waterline. This allows the boat to drain rain water. It may be necessary to close the seacock when your boat is loaded to avoid flooding.

Keep the seacock clean from all debris, which may cause blockage.

Instruments

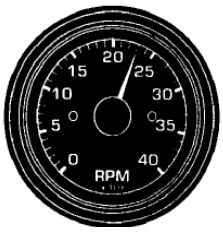
Your boat may be equipped with one or more of the following instruments:

• Speedometer



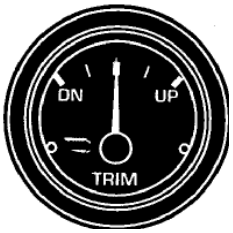
Measures boat speed in knots, kilometres or miles per hour.

• Tachometer



Measures engine speed in revolutions per minute.

• Trim



Use this gauge to check your boat trim, i.e. the position of the outdrive unit and relative position of bow.

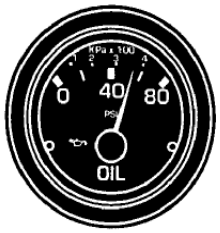
• Fuel gauge



Indicates the approximate level of fuel in the fuel tank. Can be varying levels of accuracy, so it is best to

keep a third of the indicated level as a reserve.

• Engine oil pressure

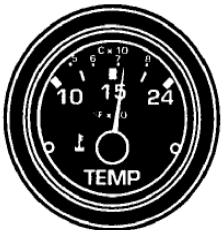


Measures the engine oil pressure - see your engine manual for more information.

• Engine oil temperature

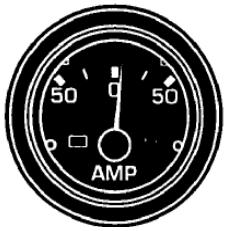
Measures the temperature of the engine oil. See your engine manual for more information.

• Engine water temperature



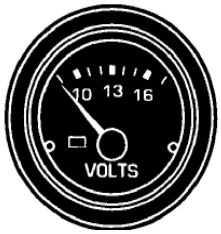
Measures the engine water temperature. See the engine manual for more information.

• Ammeter



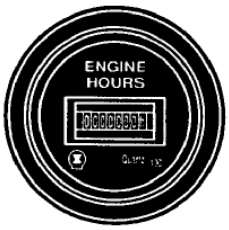
Measures the charging current in the electrical system. See your engine manual for more information.

• Voltmeter



Measures the condition of the battery in DC volts. If the voltmeter indicates a reading of below 11.5, check and charge the battery.

• Hourmeter

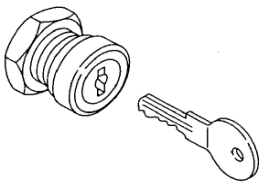


Indicates the number of hours the engine has been in operation. See engine manual for maintenance schedules.

See Appendix N - SmartCraft.

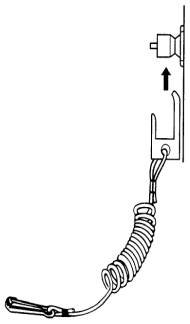
Switches and indicators

• Ignition



Insert the key in the ignition and turn clockwise to engage the starting motor. As soon as the engine starts running, return the key to the on position.

• Engine stop switch



The engine stop switch is only to be used in emergencies. It must **NOT** be used for normal shutoff of engine.

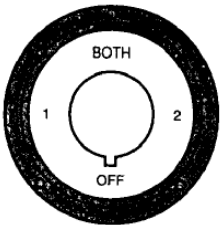
The engine stop switch should be attached to the person driving the boat, by the clip. Then, if that person either loses balance or falls overboard, the stop switch will be pulled off and will stop the engine.

⚠Caution

Always make sure the stop switch is properly attached to both the controls and the person driving the boat before setting out.

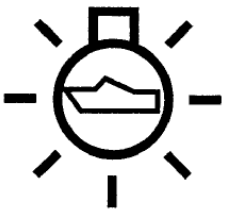
Once a month, check that the stop switch functions properly by pulling it off while the engine is running. If the engine does not stop, contact your dealer immediately to get a replacement stop switch.

• Battery main switch



Used to connect the battery to the electrical system. When disconnected, the battery is protected from tampering, fire and rundown. Make sure the battery is disconnected (switch to off position) when the boat is not in use.

• Navigation lights switch



On/off switch for navigation lights and anchor lights.

Never drive your boat at night without your navigation lights. They are necessary for other boats to determine your direction and right-of-way.

• Shore supply

Make sure that the shore supply switch onboard is in the OFF position before connecting/disconnecting to shore supply. Connect the necessary cables before activating the shore supply. If you get a warning signal from the polarity indicator, disconnect the shore supply immediately.

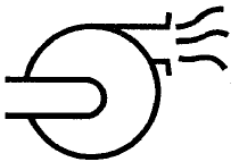
When disconnecting, turn off the power on shore first. And always make sure that the cover for the shore supply inlet is properly closed after disconnection.

• Boarding lights
Switches for operation of boarding lights and cockpit lights. The main DC breaker must be in the ON position before you can switch these lights on.

• Windscreen wipers
Controls the operation of the windscreen wipers.

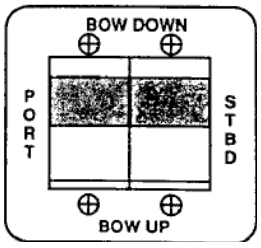


• Blower switch
Operates the ventilation in the engine compartment, to remove fumes.



⚠Warning⚠
Every time you start the engine, operate the blower for at least 5 minutes **before** starting the engine. You should also use the blower when the engine is at idle or on low speeds. Failure to use the blower switch could result in an explosion, severe injury and damage.

• Trim tabs
Optional equipment. Switches to control the trim tabs on the port and starboard transoms. Use to correct listing in difficult conditions, and to generally improve the operation of your boat.



• Bilge pump
Manual on/off switch for bilge pump.

A hand-operated bilge pump with a capacity of 40 litres/min. is fitted on your boat. The location of the bilge pump is indicated in Appendix A.

• Warning alarm
If a warning alarm sounds, check all your gauges and stop the engine immediately.

You may have a problem with overheating of the engine and/or not enough oil.

Safety equipment and safety

Required safety equipment
- Life jackets for all passengers
- Navigation lights
- Fire extinguisher
- Manual bailing device

Recommended safety equipment
- Anchor line and anchor
- Mooring lines and fenders
- First-aid kit
- Spare set of keys
- Auxiliary starting battery
- Spare fuses and bulbs

Life jackets
Make sure that all life jackets fit properly and are readily available.

⚠Caution
Non-swimmers such as children and handicapped people should wear their life jacket at all times. A throwable flotation device, such as a ring, should also be easily reached onboard.

Fire extinguisher
Keep your fire extinguisher where it is easy to reach. Make sure you know how to use the fire extinguisher as soon as you take it onboard by reading the user manual in appendix C.

Never face the wind direction when using the fire extinguisher, and point the extinguisher at the source of the fire.

When an extinguisher has been used, for no matter what length of time, it must be delivered to an authorised dealer to be refilled.

⚠Warning⚠
Lanterns
Boats without lanterns must not be driven in the dark or when visibility is poor.

⚠Caution
Alcohol/drugs and boating
Do not consume alcohol or drugs when boating. They severely effect your concentration and balance. Alcohol in your bloodstream will also lessen your tolerance

of temperature changes - cold winds, cold water should you fall overboard.

Bailing device

Where a bilge pump is not fitted, it is the owner's responsibility to have at least one bailer/bucket on board, secured against accidental loss.

⚠Warning⚠

Use of bathing ladder/platform

Always turn off the engine before using the bathing ladder/platform to avoid contact with moving parts such as the propeller.

Maximum recommended load

Note the permissible load in the table on page 3 of this manual. The permissible load must never be exceeded in order to ensure safe operation of your boat. The permissible load covers all provisions, tank contents, miscellaneous equipment and persons onboard.

Please also make sure that all load is sensibly distributed and safely secured, especially during rough weather.

⚠Caution

Operator vision from the helm

Operator vision from the helm can be obstructed by high trim angles of the craft and other factors caused by one or more of the following variable conditions:

- propulsion engine trim angles
- trim plane angles on the hull
- loading and load distribution
- speed, rapid acceleration
- transition from displacement to planing
- sea conditions, rain and spray
- darkness and fog
- interior lights and position of curtains
- persons or movable gear in field of vision

International regulations require that a proper lookout be maintained at all times to avoid collision and observe right of way.

⚠Warning⚠

CO Exposure

All boat engines produce CO as exhaust. This is an extremely noxious and dangerous gas. It is almost impossible to detect as it is odourless and colourless.

Early signs of exposure to CO are tiredness, dizziness and nausea. Extended exposure to CO could result in brain damage or death.

In order to prevent exposure to CO, it is essential you follow these guidelines:

- Make sure there are no obstructions to the engine exhaust - these could be moorings, other craft etc.
- While operating at slow speeds, possibly with the bow high, make sure the exhaust is not blowing into the boat, but away from the boat.
- When using canvas tops or hoods on your craft, make sure that you have plenty of ventilation for exhaust fumes.

Windows and hatches

Keep all windows/hatches etc. closed at high speeds and in rough weather, to avoid risk of injury/damage.

General operation of craft

Please observe the following with regard to the powering and manoeuvring limitations of your craft:

- Do not operate this craft with an engine of rated power larger than that displayed on the capacity label in your craft.
- Do not operate this craft at negative propulsion unit trim settings (bow down) at high speeds as the craft may lean over on the side resulting in instability. Use negative trim to accelerate to planing speed from displacement speed and at lower planing speeds in rough waters.
- Do not operate your craft at maximum speed while in congested waterways or in rough weather and sea conditions or conditions of reduced visibility.
- Observe right of way at sea as defined by international regulations.
- Always maintain sufficient stopping distance or distance to manoeuvre if required to avoid collision.

Environmental considerations

As the owner of a leisure craft, you are responsible for protecting the natural environment, both at sea and ashore. Please leave both sea and land as you would hope to find them.

Fuel and oil spillage

Never dispose of fuel or oil while out at sea. These are toxic substances which harm the environment. Disposal of fuel or oil into the water is an offence and you may be fined.

⚠Warning⚠

If spillage occurs accidentally, e.g. while filling fuel or oil, please remember that these substances are highly explosive and toxic. Do not expose them to open flame, or store cloths used to wipe up the spillage in the boat.

Discharge and disposal of waste

Please do not dispose of any form of waste into the water. Most marinas have large waste bins at the waterside for boat owners' use, so take all your waste products back to shore with you.

If you have a toilet installed in your boat, please only use an approved pump-out facility at your marina.

Excessive noise

Show consideration for fellow boaters or those ashore. Noise carries considerable distances on water, particularly at night, so keep music, shouting and engine noise as low as possible.

Wake and wash

You must always obey all speed restrictions. Most marinas will have speed restrictions in the waters nearby to prevent wash from other boats damaging the boats in moorings.

⚠Caution

Not all areas are marked with speed restrictions, so please reduce your speed to come off plane when passing by areas where boats are moored or people are swimming.

Exhaust emissions

Hydrocarbon in exhaust emissions pollutes the air and water. To keep exhaust emissions to a minimum, keep your engine well-tuned and regularly clean the hull of your craft. Your dealer will provide you with further information.

Paints/cleaning agents

Marine growth on the hull of your boat can be avoided by the use of anti-fouling paint, but be aware of environmental restrictions on what types of paint you can use - your dealer or local boating authority will be able to provide advice.

We recommend the use of environmentally-friendly cleaners, which not only minimise the impact on the environment, but are also effective and safer for you. Use all cleaners sparingly, and do not dispose of them or their containers into the water.

Maintenance

General care

• Cleaning your boat

Boats generally deteriorate over lengths of time with exposure to salt water, sunlight, pollution. Regular cleaning of your boat will minimise this wear and tear. Special boat cleaning products are available from your boat dealer, but you must never use abrasive products as these will damage the gelcoat surface.

⚠Caution

Take care when cleaning the deck of your boat as detergents can make the surface very slippery.

• Marine growth

If absolutely necessary, special products may be used to remove marine growth from the hull, but these products should not be discharged into the water. Do not use wire brushes or scouring pads on the hull of your boat as these will scratch the surface.

• Anti-fouling paint

Proper anti-fouling paint systems are a necessity to protect your boat from hull blisters and osmosis. Contact your dealer for further information.

• Saltwater corrosion
If you use your boat in saltwater, you should rinse it with freshwater as often as possible to avoid corrosion.

• Steering
To ensure proper and safe operation of the steering system, the steering arm should be greased at least twice a year, before and after winter storage.

• Cushions
The cushions in your boat are made from high-quality materials and designed to withstand spills and lesser quantities of water and seaspray. You should clean your cushions regularly with a sponge and soapy water. NEVER use strong, synthetic detergents, solutions or chemical cleaning agents. You can also purchase special products for cleaning upholstery.

You must also remember to maintain the zip and other fittings on the cushions. Grease these once a year with silicon or Vaseline to avoid rusting.

Take care when removing the cushions - do not pull the actual cushion, only the snap fastener.

When the boat is not in use, store your cushions in one of the compartments on the boat, or in a dry place.

• Hood
The hood on your boat is dirt and water repellent. It can be cleaned with a mild detergent. Scrub the outside of the hood with a soft brush and clean the inside with a soft cloth or sponge to avoid any scratches. The maximum temperature of the water you use to clean your hood should be 30 degrees Celsius.

Do **not** clean your hood with chemical substances, high-pressure equipment, and **never** try to dry your hood using high temperatures or tumble drying.

During winter storage, the hood should be removed, dried and kept in a dry place. We also recommend frequent airing of the hood, at least once weekly, while the boat is in use, to avoid mildew forming on the hood.

• Bilge pump
Bilge pumps should be frequently inspected for debris, especially during periods of heavy rainfall or stormy conditions. Debris in the bilge pump can cause the pump to malfunction. You should also regularly check the tightness of clamps and hoses on the bilge pump.

⚠Caution
Never use flammable or any chemical solvents to clean your bilge pump.

• Toilet
An illustration of the septic system onboard your craft is provided in Appendix A.

Use mild detergents and warm water to clean your toilet. Never dispose of cloths, sanitary towels or other solid objects in the toilet. Appendix M contains information on the toilet in your boat.

• Stainless steel fittings
Stainless steel can also suffer from wear and tear. Use a mild detergent and water to keep it clean. Never use abrasive cloths or brushes as these will scratch the surface. Use a polish to remove rust spots as soon as they appear, and wax regularly to prevent corrosion.

• Plexiglas windscreens
Again, use only mild detergents and warm water and a soft cloth to clean, as plexiglas scratches easily.

Materials and components
Your boat has been designed and manufactured, tested and certified according to strict regulations and safety standards. We strongly advise against any installation by the owner of additional materials or components as these may affect the safe operation of your boat, and its warranty coverage.

Should you require any additional equipment, contact your dealer who is qualified to make such modifications.

Winter storage
Refer to your engine manual, appendix B, for advice on winter storage of your engine.

Your battery should be removed, charged and stored in a dry place.

Make sure your boat is completely dry, and remove all water from pipes and other components to prevent freeze damage.

Additional information

Your boat dealer may provide a professional winter storage service.

Painting

We recommend regular application of a bottom pain to prevent marine growth. Consult your boat dealer on which bottom paint to use, depending on where you plan to use your boat.

⚠Caution

Paints are both toxic and flammable. Make sure the area where you are painting your boat is well-ventilated and that you use the proper safety equipment - gloves, glasses, mask etc.)

Inspection

Before removing your boat from winter storage, it is essential to inspect all components on your boat closely. Make sure all fittings are tight, there are no leakages, damage or fraying of parts. You should also inspect essential components on your boat throughout the boating season.

Lifting your boat

Make sure the ropes are positioned carefully so that the boat is horizontal when lifted. Provide protection between ropes/cables and the boat to prevent damage while lifting.

⚠Warning⚠

Never stand under the boat while it is being lifted!

Mooring

It is the owner's responsibility to ensure that mooring lines, towing lines, anchor chains and anchors are of suitable size for the boat's intended use.

⚠Caution

The owner must make himself acquainted with the securing of the tow line onboard on the designated strong point(s).

Trailering

Make sure that the keel of your boat is correctly placed between the centre rollers and adjust the lateral bearing to prevent any movement of the boat.

⚠Caution

Do not load the boat and never go onboard the craft when trailering.

Additional information

Warranty

See the rear of the declaration of conformity (appendix O) for full warranty conditions.

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ASKELADDEN Z7

FIN

Johdanto

Vaikka kaikki onkin suunniteltu ja muotoiltu veneen ja sen käyttäjien turvallisuutta ajatellen, riippuu veneen käyttö paljon sääolosuhteista, aallokosta, kuljettajan kokemuksesta sekä miehistön fyysisestä kunnosta jne., jolloin täydellistä turvallisuutta on mahdotonta taata.

Vaikka vene on luokiteltu suunnitteluluokkia A, B ja C varten, ulottuvat niitä vastaavat meri- ja tuuliolosuhteet voimakkaasta myrskystä vakaviin tilanteisiin, jotka altistavat veneen odottamattomien aaltojen ja tuulenpuuskien aiheuttamille vaaroille. Nämä ovat tilanteita, joissa vain taitava ja hyväkuntoinen miehistö voi veneillä hyvin huolletulla aluksella tyydyttävällä tavalla.

Meri tai järvi ei ole luonnollinen ympäristö ihmisille, jolloin ihmisen tulee kunnioittaa luonnon lakeja ja voimaa. Kuuntele tai lue säätiedotukset aina ennen venematkaa ja varmista, että tuuli- ja meriolosuhteet vastaavat veneesi suunnitteluluokkaa ja että miehistö kykenee hallitsemaan venettä näissä olosuhteissa.

Tämä käsikirja sisältää kaikkein oleellisimmat tarvittavat tiedot, jotta venettä voitaisiin käyttää kunnolla sekä joitakin turvallisuusaiheita ja käyttö- ja kunnossapitovinkkejä. Lue ohjekirja huolellisesti ja tutustu veneeseen ennen sen käyttöönottamista. Tämä ohjekirja ei sisällä veneturvallisuuskurssia tai navigointi-, ankkurointi- tai telakointikurssia. Tietoja paikallisista kouluista ja ohjaajista saat jälleenmyyjältäsi, kansalliselta purjehdusliitolta tai veneilyseurastasi. Tämä ohjekirja ei ole käyttö-, kunnossapito- tai ongelmanratkaisukäsikirja.

Veneen kunnossapito, korjaukset ja säädöt tulee aina suorittaa ammattilaisen toimesta. Suurien muutosten yhteydessä tulee huolehtia siitä, että kyseinen henkilö suorita veneen turvallisuustekijöihin vaikuttavia suuria muutoksia ja tarvittaessa varmistaa, että henkilöllä on veneenrakentajan tai sen laillisen edustajan myöntämä kirjallinen valtuutus tehtävään.

Kaikilla veneen pystysuoran massan sijainnin muutoksilla (kuten kalastustornilla, tutkalla tai mastolla), voi olla suuri merkitys veneen vakauteen. Älä suorita tällaisia muutoksia ennen kuin olet hankkinut kirjallisen luvan veneen rakentajalta tai sen laillisilta edustajalta.

Monissa maissa veneen ohjaajalta vaaditaan ajokorttia, valtuutusta tai kurssia. Ole hyvä ja tarka ista, että sinulla on vaadittavat valtuudet ennen veneen ostamista tai käyttämistä.

Pidä vene aina hyvässä kunnossa ja sovita sen käyttö sen kuntoa vastaavaksi. Kansainvälinen IMO Colreg-säädös määrittelee purjehdusoikeudet, navigointivalot jne. koko maailmassa. Varmista, että tunnet nämä säännöt ja että veneessäsi on kirja, jossa ne on selitetty.

Jos tämä on ensimmäinen veneesi tai jos olet vaihtanut venetyyppiin, jota et tunne, hanki käsittely- ja käyttökokemusta ennen kuin otat "komennon" veneellä. Suosittelemme sitä oman mukavuutesi ja turvallisuutesi vuoksi.

Jokainen vene - sen vankkuudesta huolimatta - voi vahingoittua vakavasti, jos sitä käsitellään väärin kokemattomien henkilöiden toimesta. Tämä ei vastaa turvallista veneenkäyttöä. Sovita aina nopeiden veneiden nopeus meriolosuhteiden mukaiseksi liiallisen aaltoihin hakkaamisen välttämiseksi.

SÄILYTÄ TÄMÄ OHJEKIRJA JA SEN LIITTEET VARMASSA PAIKASSA JA HUOLEHDI, ETTÄ KIRJA SEURAA ALUSTA, KUN ALUS VAIHTAA OMISTAJAA:

Kehitämme ja parannamme tuotteittamme jatkuvasti, jolloin tämän ohjekirjan kuvat eivät välttämättä vastaa omaa venettäsi, mutta ne toimivat silti suuntaa-antavina. Jotkin säätölaitteet ja ilmaisimet saattavat olla lisävarusteita, joita ei ole sinun veneessäsi ja osa ohjekirjan tiedoista voi käsitellä niitä.

Sertifiointi

Vene on sertifioitu asianmukaisten huviveneitä koskevien EU-direktiivien mukaisesti (Euroopan parlamentin direktiivit nro 94/25/EU, 2003/44/EU). CE-merkintä tarkoittaa, että alus täyttää tai ylittää kaikki ISO-standardit ja direktiivit, jotka olivat voimassa tuotantohetkellä.

CE

Vaaran vakavuusaste

⚠Varoitus

Muistutus vaaditusta turvallisuuskäytännöstä vahinkojen välttämiseksi veneessä..

⚠Vaaraa⚠

Muistutus välttämättömistä säädöksistä vakavien henkilövahinkojen tai kuoleman välttämiseksi.

Rakenneluokka

Kaikki pienet alukset on luokiteltu suhteessa vakiorakenneluokkaan. (Katso rakenneluokkatiedot aluksen rungossa olevasta valmistajan tietolaatasta. Sinun Askeladden Z7-veneesi kuuluu luokkaan C.

Luokka C - RANNIKOLLA

Alukset, jotka on tarkoitettu käyttöön rannikkovesillä, lahdelmissa, jokisuistoissa, järvillä ja joilla, joilla tuulen voimakkuus on enintään 6 (Beaufort-asteikko) ja aallonkorkeus enintään 2 m.

Varusteet ja toiminnot

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Tekniset tiedot

Pituus:	7,06 m
Leveys:	2,54 m
Syvälläkulkeva:	0,39 m
Paino mukaan lukien 5,0 L-260 MPI FWC Alpha, bensiini:	N. 1805 kg
Paino mukaan lukien QSD 2,8L-230 Bravo 2, diesel:	N. 1866 kg
Henkilöitä:	enint. 6
Polttoainetyyppi:	Lyijytön bensiini/diesel
Sallittu kuorma:	enint. 1096 kg
Moottori:	Enint. 191 kW / 260 HV
Kaapelin pituus, kauko-ohjaus, diesel:	14/16 jalkaa
Kaapelin pituus, kauko-ohjaus, bensiini:	14/16 jalkaa
Kaapelin pituus, rattiohjaus, diesel/bensiini:	4,75 m
Polttoainetankki:	200 litraa
Vesisäiliö:	54 litraa
Jätevesisäiliö:	54 litraa

Veneen piirustus

Liitteessä A on piirustus veneestä.

Sulakkeet ja ylikuormituskatkaisijat

Veneen sähköpiireissä on käytetty sulakkeita ja ylikuormituskatkaisijoita. Jos virtapiiri ylikuormittuu, sulake palaa ja ylikuormituskatkaisija kääntyy päälle. Jos näin tapahtuu usein, ota yhteyttä jälleenmyyjääsi saadaksesi neuvoja tilanteen ratkaisemiseksi.

Liitteessä A on piirustus veneen sähköjärjestelmistä.

Varusteet ja toiminnot

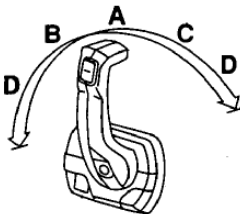
Vaihdekeppi/kierroslukusäädin

Vaihdekepin/kierroslukusäätimen tyyppi vaihtelee mallin ja moottorijärjestelmän mukaan. Kaikki vaihdekepit/ kierroslukusäätimet vaativat säännöllistä kunnossapitoa toimiakseen varmasti ja ongelmattomasti.

⚠Varoitus

Virheellinen tai puutteellinen hallintalaitteiden kunnossapito voi johtaa häiriöihin, jotka puolestaan voivat johtaa vakaviin vahinkoihin. Tarkasta hallintalaitteiden johdot ja osat säännöllisesti. Huom.! Kaikissa vaihdekepeissä/kierroslukusäätimissä on turvakatkaisija, joka sallii moottorin käynnistämisen vain vaihdekepin ollessa vapaa-asennossa.

• Yksi vipu - Piiloasennus



Yhden käden sauva - toimii sekä vaihdekeppinä että kierroslukusäätimenä.

A Vapaa (Neutraali) - Turvakytkimen vuoksi moottori voidaan käynnistää vain tässä asennossa.

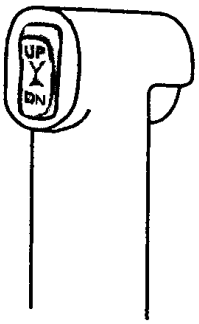
B Eteenpäin - Paina alla olevaa nappia vaihtaaksesi vaihteen eteenpäin.

C Taaksepäin - Paina alla olevaa nappia vaihtaaksesi vaihteen taaksepäin.

D Kaasu - Moottorin kierroslukumäärä kasvaa, kun työnnät sauvaa itsestäsi poispäin (eteenpäin-asentoon) tai vedät sitä itseesi päin (taaksepäin-asentoon).

Kaikki sauvat/hallintalaitteet - Älä koskaan vaihda vaihdetta moottorin ollessa käynnissä. Kaikkien hallintalaitteiden sauvoissa on alimpana painike, jota painamalla voit lämmittää moottorin sen ollessa vapaalla.

• Moottorin trimmi



Vaihdekepin/ kierroslukusäätimen kädensijassa on säädin, jonka avulla voidaan säätää moottorin kulmaa. Sitä käytetään veneen suorituskyvyn parantamiseen yhdessä trimmitason säätöjen kanssa (ks. kohta Säätimet ja ilmaisimet) Valmistellessasi venettä kuljetusta varten, käytä säädintä moottorin nostamiseen.

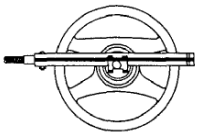
Ohjaus

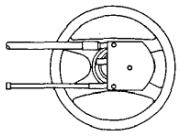
Kaikki ohjausjärjestelmät vaativat säännöllistä kunnossapitoa toimiakseen luotettavasti. Säännölliset tarkastukset ovat välttämättömiä. Katso kunnossapito-osiota.

Muista, että veneiden ohjausjärjestelmät eivät ole itsekeskittyviä - sinulla tulee aina olla vakaa ote ruorista siten, että vene on aina täydessä hallinnassasi.

Ohjauskaapelin läpivienti moottorikaivossa tulee sinetöidä vedenpitävällä kumipohjaisella tiivisteaineella moottorin asentamisen jälkeen.

• Mekaaninen ohjaus





Kun rattia käännettään, malleissa joissa on mekaaninen ohjausjärjestelmä, rattiyksikkö siirtää ratin kiertoliikkeen kaapelin lineaariseksi liikkeeksi, joka siirtää ohjausvartta haluttuun suuntaan.

⚠Varoitus

Ohjausjärjestelmän virheellinen tai puutteellinen kunnossapito saattaa johtaa vakaviin vahinkoihin.

Polttoaine- ja vesisäiliöt

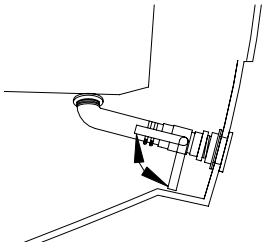
Polttoaine- ja vesisäiliöiden täyttöpisteet on näytetty piirustuksessa Liitteessä A. Askeladden Z7 sisämoottori on dieselmoottori tai bensiinillä.

Kaaviomaiset kuvat polttoainejärjestelmästä Liitteessä A.

Myös vesijärjestelmästä on kaaviomainen piirustus Liitteessä A.

Venttiilit

• Pohjatulppa

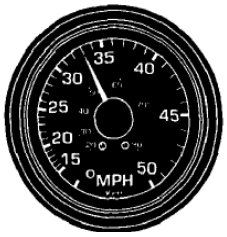


Vene on varustettu pohjatulpalla, joka on vesilinjan tasolla tai sen alapuolella, jotta sadevesi saadaan valutettua pois. Pohjatulpan tulee olla suljettuna, kun vene on lastattu, jottei vettä pääse veneeseen. Pidä pohjatulpan aukko aina puhtaana, jottei se tukkeudu.

Instrumentit

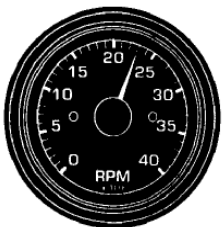
Veneesi on voitu varustaa yhdellä tai useammalla seuraavista instrumenteista:

• Nopeusmittari



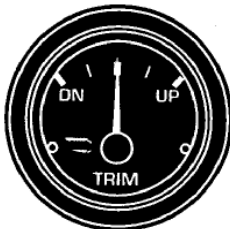
Mittaa veneen nopeuden solmuina, km/t tai mailia/t.

• Kierroslukumittari



Mittaa moottorin nopeuden kierroksia minuuttia kohti.

• Trimmimittari



Käytä tätä mittaria hallitaksesi veneen trimmiä eli ajoyksikön asentoa ja keulan suhteellista asentoa horisontaalitasoon verrattuna.

• Polttoainemittari



Näyttää suuntaa-antavasti polttoainesäiliön tason. Koska mittarin antaman lukeman tarkkuus voi vaihdella veneen kulman mukaan, tulee sinun huomioida, että tankissa saattaa olla annettua arvoa vähemmän polttoainetta. Suosittelemme, että lasket virhemarginaaliksi noin kolmasosan annetusta arvosta.

• Öljynpainemittari

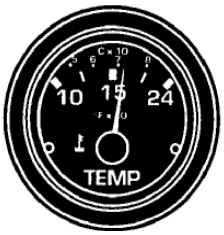


Mittaa moottorin öljynpaineen. Lisätietoja moottorikäsikirjassa.

• Moottoriöljyn lämpötilamittari

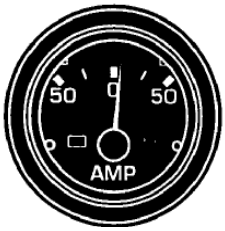
Mittaa moottoriöljyn lämpötilan. Lisätietoja moottorikäsikirjassa.

• Jäähdytysveden lämpötilamittari



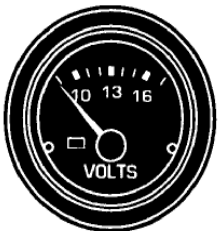
Mittaa moottorin jäähdytysveden lämpötilan. Lisätietoja moottorikäsikirjassa.

• Ampeerimittari



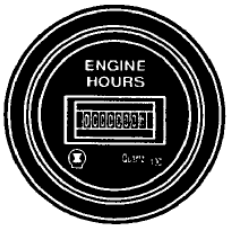
Mittaa sähköjärjestelmän latausvirran. Lisätietoja moottorikäsikirjassa.

• Volttimittari



Mittaa moottorin tilan voltteina (tasavirtajännite). Jos volttimittarin lukema on alle 11,5, tarkasta ja lataa akku.

• Ajanlaskin



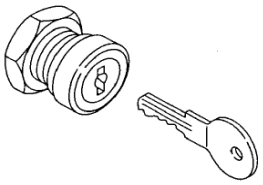
Näyttää moottorin käyttötunnit. Lisätietoja kunnossapitosuunnitelmasta löydät moottorikäsikirjasta.

Katso myös Liite N - SmartCraft.

Varusteet ja toiminnot

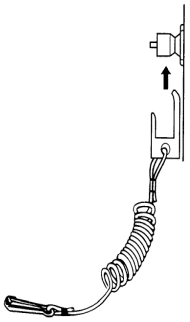
Katkaisijat ja ilmaisimet

• Virta-avain



Aseta avain virtalukkoon ja käännä sitä myötäpäivään käynnistääksesi moottorin. Heti kun moottori käynnistyy päästä avain takaisin asentoon ON (päällä).

• Moottorin hätäkatkaisin



Moottorin hätäkatkaisinta tulee käyttää vain hätätilanteissa. Sitä **EI** tule käyttää normaaliin moottorin sammuttamiseen.

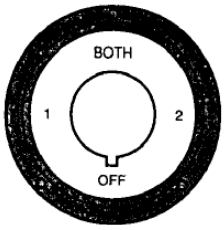
Hätäkatkaisin tulee kiinnittää venettä ohjaavaan henkilöön klipsin avulla. Näin ollen hätäkatkaisin irtoaa ja moottori pysähtyy, jos ohjaava henkilö menettää tasapainonsa tai putoaa veneestä.

⚠Varoitus

Tarkasta aina, että hätäkatkaisin on kiinnitetty sekä hallintalaitteeseen että veneen ohjaajaan ennen venematkan aloittamista.

Hätäkatkaisimen toiminta tulee tarkastaa kerran kuukaudessa vetämällä siitä moottorin ollessa käynnissä. Jos moottori ei sammu, ota välittömästi yhteyttä jälleenmyyjääsi ja vaihda hätäkatkaisin.

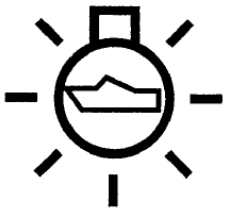
• Akkukytkimet



Akkukytkimiä käytetään akun liittämiseen sähköjärjestelmään. Kun akku on pois päältä, se on suojattu ilkitöiltä, palamiselta ja tyhjentymiseltä. Tarkasta, että akku on pois päältä (aseta katkaisija asentoon OFF (pois päältä), kun vene ei ole käytössä.

Katkaisijaa käytetään myös kummankin akun kytkemiseen, kun tarvitaan enemmän käynnistysvirtaa.

• Navigointivalojen katkaisija



Navigointivalojen ja ankkurivalon katkaisija.

Älä koskaan aja veneellä ilman että navigointivalot ovat päällä. Ne ovat välttämättömiä, jotta muut veneet voisivat nähdä kurssisi ja määritellä kenellä on oikeus säilyttää kurssinsa.

• Virransaanti maalta

Tarkasta, että veneen maavirtakatkaisija on asennossa OFF (pois päältä), ennen kuin kytket virranoton maalta päälle tai poispäältä. Kiinnitä kaikki tarvittavat johdot ennen kuin käynnistät virranoton maalta. Jos napaisuuden ilmaisin näyttää varoitusmerkkiä, tulee virransaanti maalta kytkeä pois päältä välittömästi. Kun kytket virran pois päältä, kytke ensin virta pois päältä maalla. Tarkasta myös, että virranoton suojus on kunnolla kiinni, kun olet kytkenyt virran pois päältä.

• Maihinnousu- ja ohjaamovalo

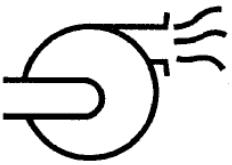
Maihinnousu- ja ohjaamovalojen katkaisijat. Päävirtakatkaisijan tulee olla asennossa ON (päällä), ennen kuin valot voidaan sytyttää.

• Tuulilasinpyyhkijöiden katkaisija



Ohjaa tuulilasinpyyhkijöiden käyttöä.

• Tuulettimen säädin

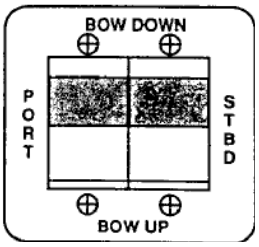


Säätelee moottoritilan ilmanvaihtoa, jotta mahdolliset kaasut pääsevät ulos.

⚠Vaara⚠

Säätelee moottoritilan ilmanvaihtoa, jotta mahdolliset kaasut pääsevät ulos. Tuulettimen tulee antaa käydä 5 minuutin ajan ennen moottorin käynnistämistä. Tuuletinta tulee myös käyttää tyhjäkäynnin aikana tai ajettaessa alhaisilla nopeuksilla. Jos tuuletinta ei käytetä kuvatulla tavalla, voi aiheutua räjähdys tai vakavia vahinkoja.

• Trimmitason katkaisijat



Lisävaruste. Veneen peräpeilin paapuurin ja tyyrpuurin puolille sijoitettujen trimmitasojen katkaisijat. Käytetään kallistuman korjaamisen vaikeissa olosuhteissa ja veneen liikkumisen yleiseen parantamiseen vedessä.

• Pilssipumpun katkaisija

Pilssipumpun manuaalinen katkaisija.

Veneeseen on asennettu käsikäyttöinen pilssipumppu, jonka kapasiteetti on 40 litraa/min. Pumpun sijainti on osoitettu piirustuksessa Liitteessä A.

• Hälytin

Jos kuulet hälyttimen äänen, tarkasta kaikki mittarit ja sammuta moottori välittömästi. Hälytys voi olla varoitus moottorin ylikuumentumisesta ja/tai alhaisesta öljytasosta.

Turvallisuus ja turvavarusteet

Pakolliset turvavarusteet

- Pelastusliivit kaikille matkustajille
- Navigointivalot
- Palosammutin
- Käsikäyttöinen pilssipumppu

Suositeltavat turvavarusteet

- Ankkuriköysi ja ankkuri
- Kiinnitysköydet ja lepuuttimet
- Ensiapulaukku
- Vara-avainsetti
- Ylimääräinen käynnistysakku
- Varasulakkeita ja polttimoita

Pelastusliivit

Tarkasta, että pelastusliivit ovat sopivan kokoisia ja helposti saatavilla.

⚠Varoitus

On erittäin tärkeää, että lapsilla sekä liikuntarajoitteisilla ja uimataidottomilla on yllään pelastusliivit koko venematkan ajan. Tämän lisäksi veneessä tulee olla pelastusrengas nopeasti saatavilla, jotta se voidaan tarvittaessa heittää nopeasti veteen.

Palosammutin

Säilytä palosammutin paikassa, josta se on helposti saatavilla. Huolehdi, että osaat käyttää laitetta, kun otat sen mukaan veneeseen. Lue laitteen käyttöohje Liitteestä C.

Älä koskaan seiso vastatuuleen päin käyttäessäsi palosammutinta. Suuntaa laite palonlähdettä kohti.

Kun palosammutinta on käytetty, käyttöajan pituudesta huolimatta se tulee toimittaa täytettäväksi valtuutetulle jälleenmyyjälle.

⚠Vaara⚠

Merkkilyhdyt

Alusta, jossa ei ole merkkilyhtyjä, ei tule käyttää pimeässä tai kun näkyvyys on heikko.

⚠Varoitus

Alkoholi/päihteet ja veneily

Älä nauti alkoholia tai päihteitä ollessasi vesillä. Ne vaikuttavat voimakkaasti keskittymiskykyysi ja tasapainoosi.
Veressä oleva alkoholi vähentää myös vastustuskykyä lämmönvaihteluita vastaan (esim. kylmä tuuli tai kylmä vesi), jos putoat veteen.

Lenssilaite

Jos veneeseen ei ole asennettu lenssipumppua, tulee veneen omistajan itse huolehtia, että veneessä on äyskäri/ämpäri, joka on kiinnitetty hyvin veneeseen.

⚠Vaara⚠

Uimatikkaiden/uimatason käyttö

Sammuta moottori aina ennen uimatikkaiden/uimatason käyttöä kosketuksen välttämiseksi liikkuvien osien kuten esim. potkurin kanssa.

Suurin suositeltu kuorma

Katso sallittua kuormaa koskevaa taulukkoa tämän ohjekirjan sivulla 3. Sallittua kuormaa ei tule koskaan ylittää, sillä se vaikuttaa veneen turvallisuuteen. Sallittu kuorma sisältää kaiken, muonat, tankin sisällön, erilaiset varusteet sekä matkustajat.

Ympäristönäkökohdat

Huolehdi myös, että kuorma on jaettu järkevästi ja kiinnitetty hyvin, varsinkin huonolla säällä.

⚠Varoitus

Veneenkuljettajan näkökenttä ruorista

Veneenkuljettajan näkökenttään ruorista voivat vaikuttaa aluksen korkeat trimmikulmat sekä muut tekijät, jotka johtuvat yhdestä tai useammasta seuraavasta tekijästä:

- moottorin trimmikulmat
- rungon trimmitason kulmat
- kuorma ja kuorman jakautuminen
- nopeus, nopea kiihdytys
- siirtyminen hitaasta vauhdista plaaniin
- aallokko, sade ja tyrskyt
- pimeys ja sumu
- sisävalot ja verhojen sijainti
- henkilöt ja liikkuvat varusteet näkökentässä

Kansainväliset määräykset vaativat jatkuvaa tarkkailua törmäyksien välttämiseksi ja noudattavat voimassa olevia sääntöjä kurssinsäilyttämisoikeudesta.

⚠Vaara⚠

Häkämyrkytyksen vaara

Kaikki venemoottorit tuottavat pakokaasuna häkää (CO). Tämä on erittäin myrkyllinen ja vaarallinen kaasu. Kaasu on lähestulkoon mahdotonta huomata, sillä se on hajutonta ja väritöntä.

Ensimmäisiä häkämyrkytyksen oireita ovat väsymys, huimaus ja pahoinvointi. Pitkäaikainen häkäkaasulle altistuminen voi johtaa aivovaurioihin tai kuolemaan.
Häkäkaasulle altistumisen välttämiseksi on erittäin tärkeää noudattaa seuraavia ohjeita:

- Huolehdi, ettei mikään tuki moottorin pakokaasun ulostulokohtaa esim. kiinnitysköydet, muut veneet jne.
- Ajaessa alhaisilla nopeuksilla ja keulan ollessa korkealla, huolehdi, ettei pakokaasu kulkeudu veneeseen vaan siitä poispäin.
- Käyttäessäsi yläpressua tai kuomua, huolehdi hyvästä tuuletuksesta.

Ikkunat ja luukut

Pidä kaikki ikkunat, luukut yms. suljettuina ajaessasi suurella nopeudella sekä huonolla säällä vahinkojen välttämiseksi.

Aluksen yleinen käyttö

Ole hyvä ja kiinnitä huomiota seuraaviin aluksen moottori- ja manöverirajoituksiin:

- Älä käytä veneessä moottoria, jonka teho on suurempi kuin veneen kapasiteettikilvessä annettu arvo.
- Älä käytä tässä veneessä sellaisia vetoyksikön trimmiasetuksia, jotka aiheuttavat keulan laskun ajettaessa suurilla nopeuksilla. Vene voi tällöin kallistua ja tulla epävakaaksi. Käytä negatiivista trimmiä kiihdyttääksesi liukunopeuteen hitaasta vauhdista ja alhaisempaan liukunopeuteen aallokossa.
- Älä aja venettä huippunopeudella liikennöidyillä vesiväylillä, huonolla säällä, aallokossa tai näkyvyyden ollessa heikko.
- Noudata kansainvälisissä määräyksissä määriteltyjä purjehdussääntöjä.
- Arvioi aina riittävästi pysähdys- tai ohjausetäisyyttä törmäysten välttämiseksi.

Ympäristönäkökohdat

Huviveneen omistajana olet vastuussa luonnon ja ympäristön suojelemisesta sekä vesillä että maalla. Jätä alueet vesillä ja maalla sellaisiksi, jollaisina itse toivoisit löytäväsi ne.

Polttoaine- ja öljypäästöt

Älä koskaan päästä polttoainetta tai öljyä veteen. Ne ovat myrkyllisiä aineita, jotka vahingoittavat ympäristöä. Polttoaineiden tai öljyn päästäminen veteen on kiellettyä ja rangaistavaa.

⚠Vaara⚠

Vahingon aiheuttamien päästöjen yhteydessä esim. tankatessasi tai lisätessä öljyä, tulee muistaa, että nämä nesteet ovat hyvin räjähdysherkkiä ja myrkyllisiä. Älä altista niitä avotulelle. Polttoaineen tai öljyn pyyhkimiseen tarkoitettuja kankaita tai tekstiilejä ei tule säilyttää veneessä.

Päästöt ja jätteiden poistaminen
Älä heitä mitään jätettä veteen. Useimmissa satamissa on suuret roskasäiliöt, joita veneilijät voivat käyttää. Vie jätteet mukanasi maalle ja hävitä ne siellä.

Jos veneeseen on asennettu WC, tulee se tyhjentää vain hyväksyttyyn jätteidenkeräilypisteeseen tai sääntöjen mukaisesti avovesillä.

Tarpeeton melu
Ota huomioon muut vesilläliikkujat sekä mantereella olijat. Ääni kantautuu vesillä pitkiä matkoja erityisesti yöllä, joten vältä musiikin soittamista, kovaäänistä puhetta tai moottorimelua. Pidä äänen taso mahdollisimman alhaisena.

Vanavesi ja aallokko
Noudata aina kaikkia nopeusrajoituksia. Useimpien satamien läheisyydessä on nopeusrajoituksia, jotta muiden veneiden aiheuttamat aallot eivät vahingoita kiinnitettyjä veneitä.

⚠Varoitus
Kaikkia alueita ei ole merkitty nopeusrajoituksin, joten hidasta vauhtia siten, ettei vene plaanaa ohittaessasi kiinnitettyjä veneitä tai uivia ihmisiä.

Pakokaasupäästöt
Pakokaasun hiilivedyt saastuttavat ilmaa ja vettä. Pakokaasupäästöjen pitämiseksi mahdollisimman alhaisina, tulee huolehtia siitä, että moottori on säädetty oikein ja puhdistaa veneen runko säännöllisesti. Lisätietoja tästä saat jälleenmyyjältäsi.

Antifouling- maali ja puhdistusaineet
Veneen pohjan kasvustoa voidaan välttää käyttämällä kasvua estäviä antifouling-maaleja. Tällöin tulee kuitenkin kiinnittää huomiota ympäristömääräyksin sallituista käsittelyaineista. Lisätietoja saat jälleenmyyjältäsi tai paikallisilta viranomaisilta.

Suosittelemme ympäristöystävällisten puhdistusaineiden käyttämistä,sillä ne ovat tehokkaita ja turvallisia käyttää. Käytä puhdistusaineita varovasti, äläkä heitä käytettyjä puhdistusaineita tai tyhjiä astioita veteen.

Kunnossapito

Yleinen huolto

• Veneen puhdistus
Ajan kuluessa vene kuluu sen altistuessa suolavedelle, auringonvalolle ja saasteille. Veneen säännöllinen puhdistaminen vähentää sen kulumista. Jälleenmyyjältäsi voit ostaa erityisiä veneenpuhdistusaineita, mutta älä koskaan käytä hankausaineita sisältäviä puhdistusaineita, sillä ne vahingoittavat veneen gelcoat-pintaa.

⚠Varoitus
Ole varovainen puhdistaessasi veneen kantta, sillä puhdistusaineet voivat tehdä siitä hyvin liukkaan.

• Vesikasvit
Tarvittaessa kasvuston poistamiseen voidaan käyttää erikoistuotteita, mutta näitä tuotteita ei saa päästää veteen. Älä käytä terästharjoja tai hankaussieniä veneen pohjan puhdistamiseen, sillä ne voivat naarmuttaa sen pintaa.

• Kiinnittymisenestoaine
Hyvän kasvunestomaalin käyttö on välttämätöntä veneen rungon suojelemiseksi veden tunkeutumiselta ja lasikuiturutolta. Lisätietoja saat jälleenmyyjältäsi.

• Suolavesikorroosio
Jos käytät venettä suolavedessä, tulee se puhdistaa mahdollisimman usein makealla vedellä korroosion välttämiseksi.

• Hallinta
Hallintajärjestelmän oikean ja varman toiminnan varmistamiseksi tulee ohjainvarsi voidella vähintään kaksi kertaa vuodessa ennen talvitelakointia ja sen jälkeen.

• Istuintyynyt
Veneen tyynyt on valmistettu korkealaatuisista materiaaleista ja ne kestävät roiskeita ja pieniä määriä vettä ja tyrskyjä. Tyynyt tulee puhdistaa säännöllisesti sienellä ja saippuavedellä. Älä KOSKAAN käytä voimakkaita, synteettisiä puhdistusaineita, liuottimia tai kemiallisia puhdistusaineita. Voit myös ostaa huonekaluille tarkoitettuja erikoispuhdistusaineita.

Kunnossapito

Muista myös puhdistaa tyynyjen vetoketjut ja muut metalliosat. Voitele ne kerran vuodessa silikonilla tai vaseliinilla ruosteen välttämiseksi.

Irrota tyynyt varovasti, älä vedä tyynystä vaan vain kiinnikkeestä.

Kun vene ei ole käytössä, tulee tyynyt säilyttää jossakin veneen säilytystiloista tai kuivassa tilassa.

• Kuomu

Veneen kuomu on likaa- ja vettähylkivä. Se voidaan puhdistaa miedolla puhdistusaineella. Harjaa kuomun ulkopuoli pehmeällä harjalla ja puhdista sisäpuoli pehmeällä liinalla tai sienellä, siten ettet naarmuta sen pintaa. Puhdistamisessa käytettävän veden ei tule olla lämpimämpää kuin 30 C.

Älä puhdista kuomua kemiallisilla puhdistusaineilla tai painepesurilla, äläkä kuivata kuomua korkeissa lämpötiloissa tai kuivausrummussa.

Kuomu tulee ottaa irti talven ajaksi ja kuivata ja sen jälkeen säilyttää kuivassa paikassa. Suosittelemme, että kuomu tuuletetaan usein, vähintään kerran viikossa veneen ollessa käytössä. Näin kuomuun ei pääse muodostumaan hometta.

• Pilssipumppu

Pilssipumput tulee tarkastaa säännöllisin väliajoin, jottei niihin kerry likaa, erityisesti sateisina ajanjaksoina. Lika voi aiheuttaa pumpun menemisen epäkuntoon. Tarkasta myös, että pumpun kiinnittimet ja letkut on kiristetty.

⚠Varoitus

Älä koskaan käytä helposti syttyviä puhdistusaineita tai kemiallisia liuottimia pumpun puhdistamiseen.

• WC

Veneen likavesisäiliöjärjestelmästä on kuva Liitteessä A.

Käytä WC:n puhdistamiseen mietoja puhdistusaineita ja lämmintä vettä. Älä koskaan heitä WC-pönttöön kankaita, terveyssiteitä tai muita kiinteitä esineitä. Liite L sisältää tietoja veneeseen asennetusta WC-stä.

• Asennukset ruostumattomasta teräksestä

Myös ruostumaton teräs voi altistua kulumiselle. Puhdista se miedolla puhdistusaineella ja vedellä. Älä käytä teräsvillaa, harjoja yms. sillä ne voivat naarmuttaa pintaa. Käytä ruostetahrojen poistamiseen kiillotusainetta heti, kun niitä esiintyy ja vahaa säännöllisesti korroosion estämiseksi.

• Pleksilasi-ikkunat

Käytä puhdistamiseen mietoja puhdistusaineita ja lämmintä vettä. Käytä pehmeää liinaa, sillä pleksilasiin tulee helposti naarmuja.

Materiaalit ja komponentit

Veneesi on rakennettu ja tuotettu, testattu ja sertifioitu tiukkojen määräysten ja turvallisuusstandardien mukaisesti. Suosittelemme, ettei omistaja asenna itse lisävarusteita tai muita komponentteja, sillä niillä voi olla suuri merkitys veneen käyttöturvallisuuden kannalta ja siten vaikuttaa myös veneen takuuseen.

Jos tarvitset lisävarusteita, ota yhteys jälleenmyyjään, joka on valtuutettu tekemään tällaisia muutoksia.

Talvitelakointi

Katso Liitteestä B moottorin talvitelakointiohjetta.

Akku tulee ottaa ulos, ladata ja säilyttää kuivassa paikassa.

Huolehdi myös, että vene on täysin kuiva ja poista kaikki vesi putkista ja puista komponenteista jäätymisen välttämiseksi.

Jälleenmyyjäsi tarjoaa sinulle talvitelakointipalvelun.

Maalaus

Suosittelemme antifouling-maalin säännöllistä levittämistä pohjakasvuston välttämiseksi. Kysy jälleenmyyjältäsi mitä antifouling-ainetta tai maalia sinun tulee käyttää, riippuen siitä, missä olet aikonut käyttää venettä.

⚠Varoitus

Maali on sekä myrkyllistä että helposti syttyvää. Tarkasta, että alue, jolla maalaat

venettä on hyvin ilmastoitu ja muista käyttää tarvittavia suojavarusteita kuten käsineitä, suojalaseja, hengityssuojaa jne.

Tarkastus

Ennen veneen vesillelaskua, on tärkeää tarkastaa kaikki komponentit huolellisesti. Tarkasta, että kaikki liitokset ja putken osat ovat tiiviitä, eikä niissä esiinny vuotoja ja ettei veneessä ole kuluneita tai vahingoittuneita osia. Tärkeät komponentit tulee tarkastaa myös veneilykauden aikan.

Veneen nostaminen

Huolehdi, että köydet on asetettu tarkasti niin, että vene on nostettaessa vaakatasossa. Käytä köyden/kaapelin ja veneen välissä suojaa veneen vahingoittumisen estämiseksi nostamisen aikana.

⚠Vaara⚠

Älä koskaan seiso veneen alla noston aikana!

Kiinnittäminen

Omistaja on vastuussa siitä, että veneen kiinnitysköydet, hinausköysi, ankkuriketjut ja ankkurit ovat sopivan kokoisia käyttötarkoitustaan varten.

⚠Varoitus

Omistajan on opeteltava hinausköyden kiinnittäminen oikeisiin kiinnityspisteisiin.

Kuljetus

Tarkasta, että veneen köli on sijoitettu oikein rullatelojen väliin ja säädä sivut veneen liikkumisen estämiseksi.

⚠Varoitus

Venettä ei saa kuormittaa, eikä siinä saa oleskella kuljetuksen aikana.

Lisätietoja

Takuu

Kattavat tiedot takuusta yhdenmukaisuusjulistuksen kääntöpuolella (Liite O).

TILLEGG / APPENDIX A

N **Skisser/illustrasjoner:**

S **Ritningar/illustrationer:**

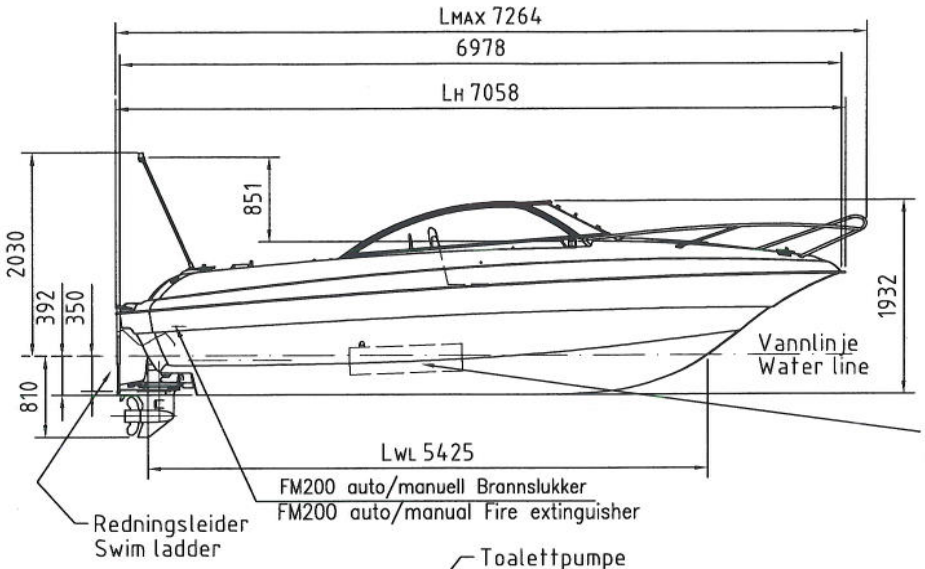
DK **Stregtegninger/illustrationer:**

NL **Lijntekeningen/afbeeldingen:**

D **Zeichnungen/Abbildungen:**

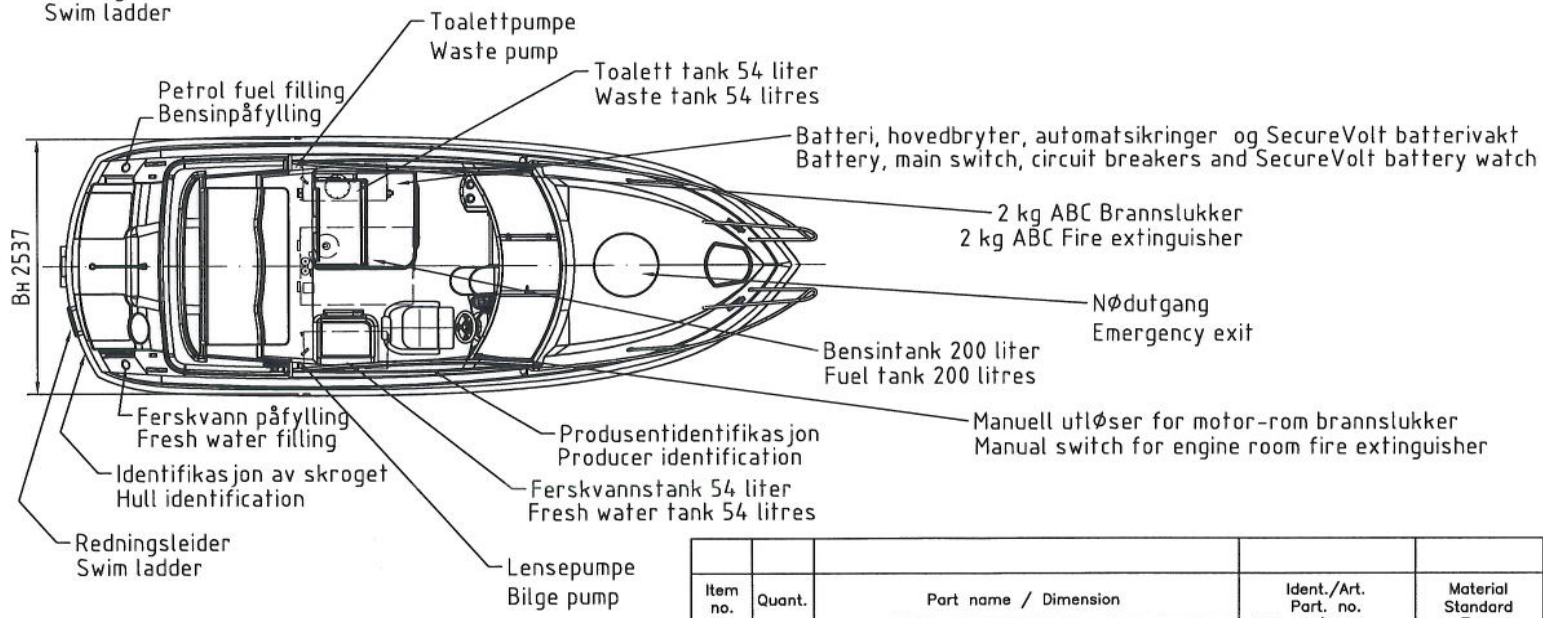
GB **Line drawings/illustrations:**

FIN **Piirustukset/kuvat**



MIN. BREAKING STRENGTH, STRONG POINTS
MIN.BRUDDSTYRKE, FORSTERKEDE PUNKTER

Anchor/Towing Ankring/Sleping	Mooring, forward Fortøyning, forut	Mooring, aft Fortøyning, akter	Max. line/chain breaking strength Maks. tau/kjetting bruddstyrke
19300 N (1970 kg)	15800 N (1610 kg)	15800 N (1610kg)	80 %

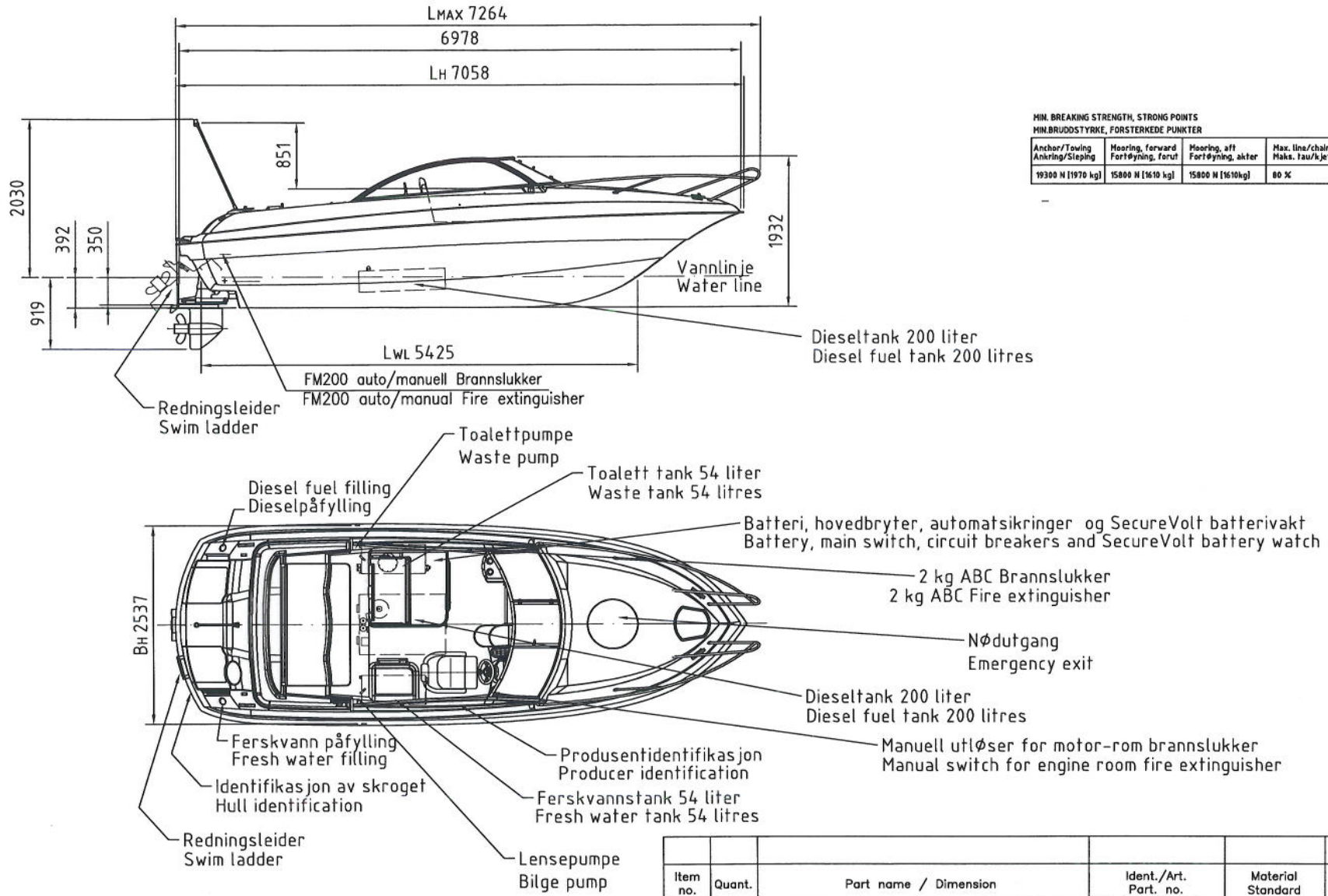


Item no.	Quant.	Part name / Dimension	Ident./Art. Part. no. Patteren/Blank no.	Material Standard Type	Alt. material Alt. standard Maker	Weight Remarks
General tolerances: ISO 2768-1-m.		Welding tolerances: NS1432, Class A.				

K	H	G	F	E	D	C	B	A	Revisions	Type/Group	Sign.: TK	Part list:
									Sign.:		Date: 05.01.05	Replaced by:
									Date:	Scale	Checked:	Replaces:
									Checked:	1:50	Approved:	Ref.:

ASKELADDEN Z7
5,0 MPI FWC Alpha

Drawing no. Z7-031



MIN. BREAKING STRENGTH, STRONG POINTS
MIN.BRUDDSTYRKE, FORSTERKEDE PUNKTER

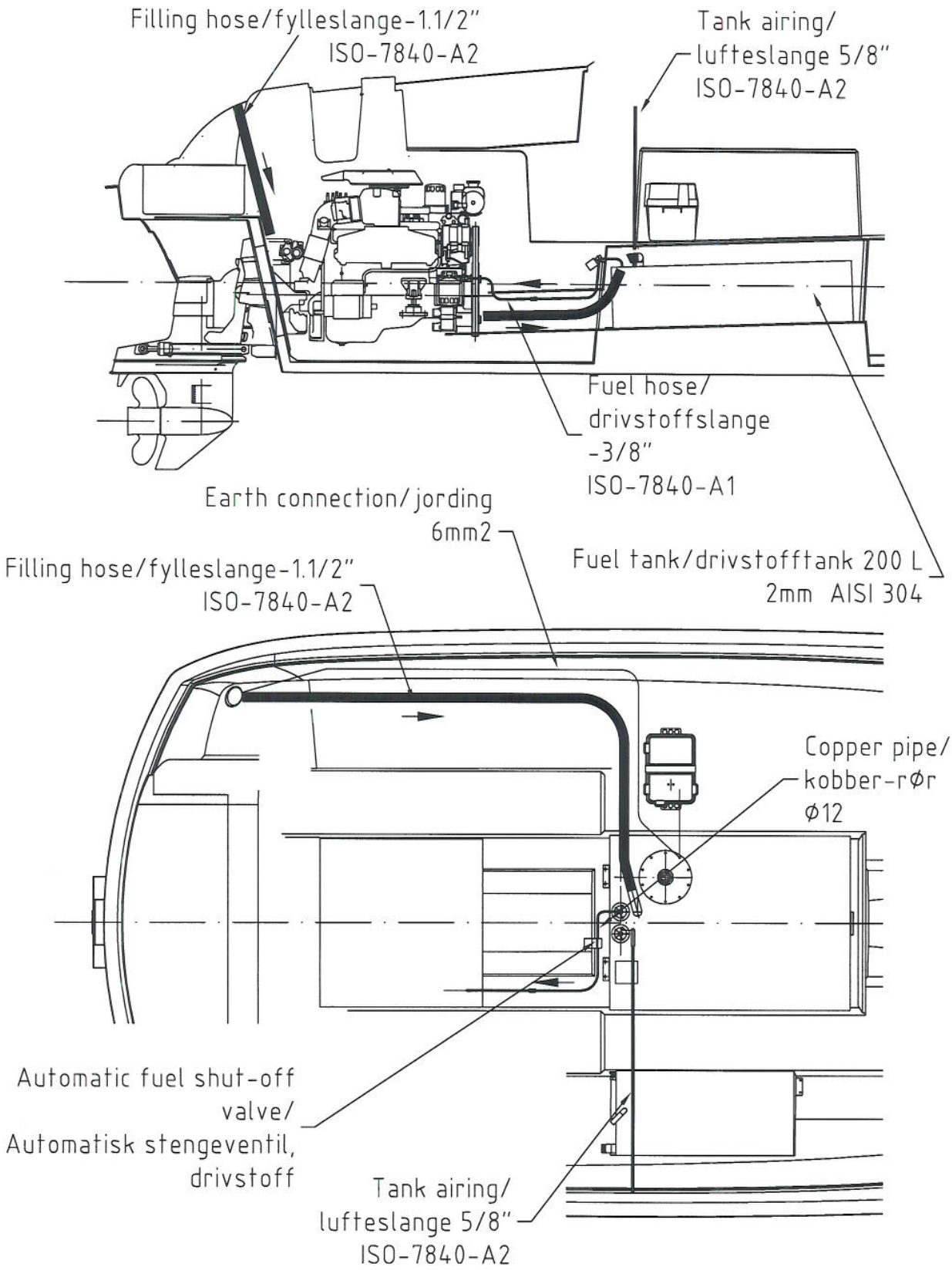
Anchor/Towing Ankring/Sleping	Mooring, forward Fortøyning, forut	Mooring, aft Fortøyning, akter	Max. line/chain breaking strength Maks. tau/kjetting bruddstyrke
19300 N [1970 kg]	15800 N [1610 kg]	15800 N [1610kg]	80 %

Item no.	Quant.	Part name / Dimension	Ident./Art. Part. no. Patteren/Blank no.	Material Standard Type	Alt. material Alt. standard Maker	Weight Remarks
General tolerances: ISO 2768-1-m.		Welding tolerances: NS1432, Class A.				

K	H	G	F	E	D	C	B	A	Revisions	Type/Group	Sign.: TK	Part list:
									Sign.:		Date: 05.01.05	Replaced by:
									Date:	Scale	Checked:	Replaces:
									Checked:	1:50	Approved:	Ref.:

ASKELADDEN Z7
2,8L ES Bravo II

Drawing no. Z7-032



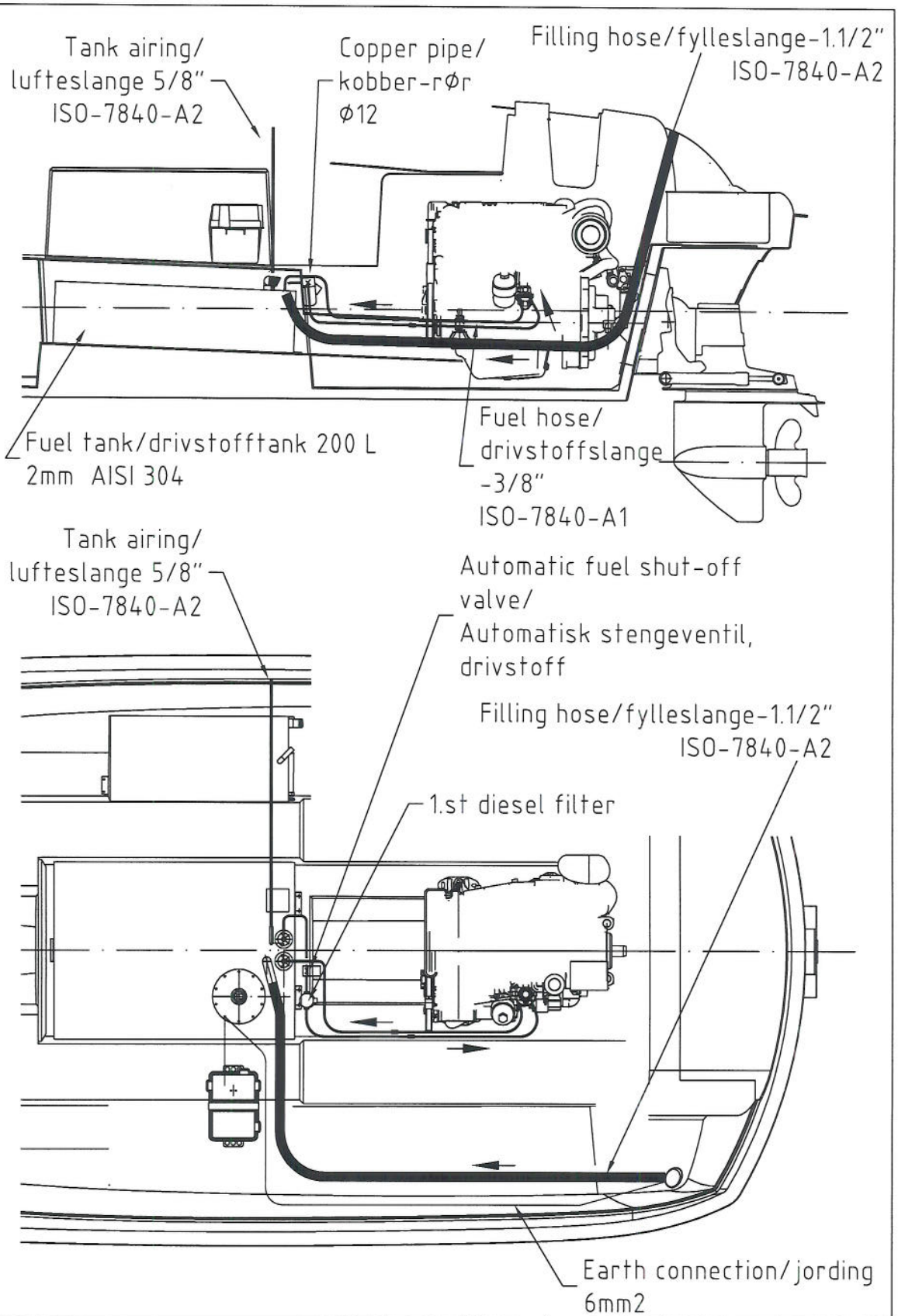
Item no.	Quant.	Part name / Dimension	Ident./Art. Part. no. Patteren/Blank no.	Material Standard Type	Alt. material Alt. standard Maker	Weight Remarks
General tolerances: ISO 2768-1-m.		Welding tolerances: NS1432, Class A.				

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									Sign.:		Date: 02.06.05	Replaced by:
									Date:	Scale	Checked:	Replaces:
									Checked:	1:25	Approved:	Ref.:

ASKELADDEN Z7

Petrol fuel system

Drawing no. Z7-071



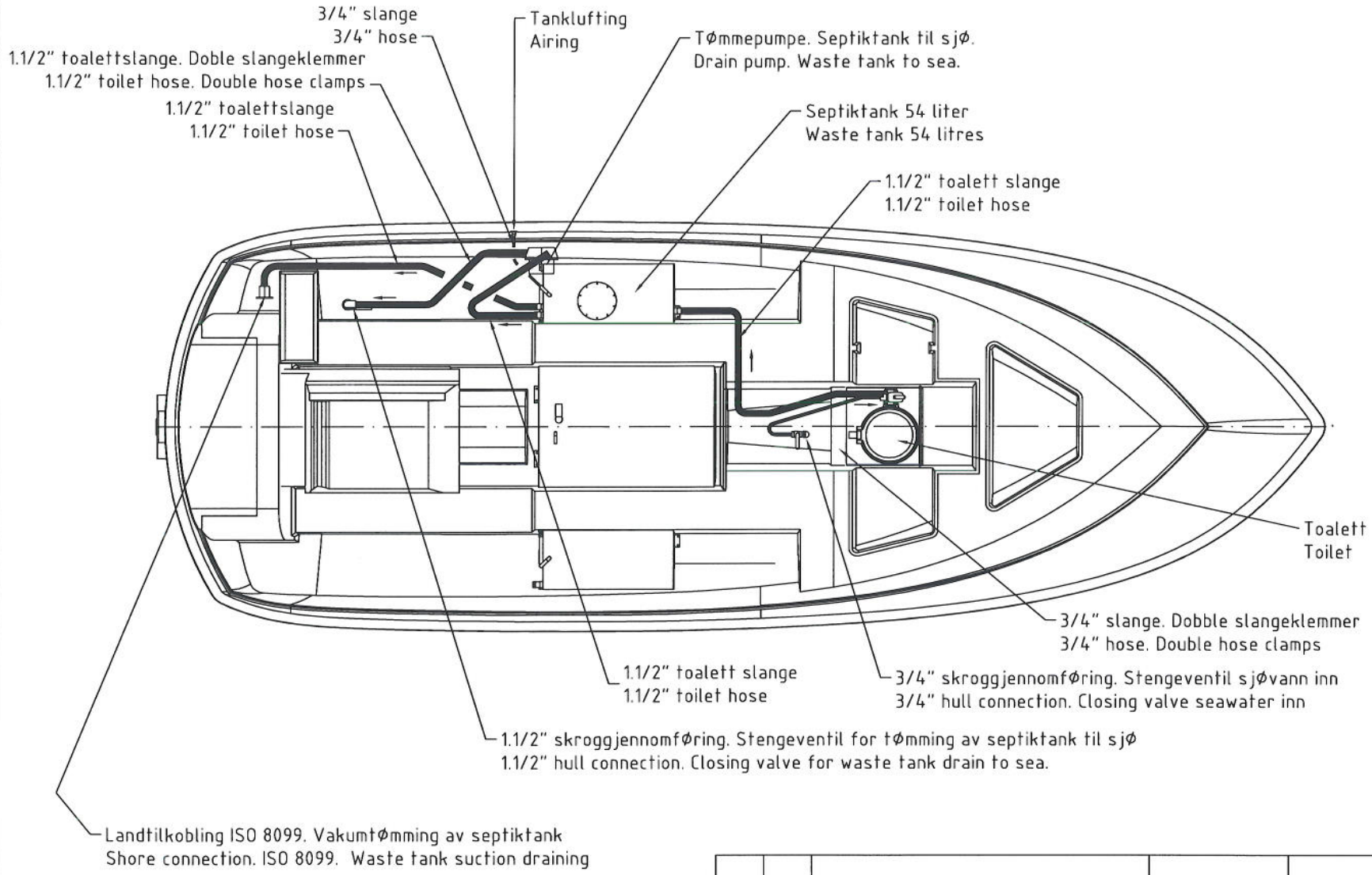
Item no.	Quant.	Part name / Dimension	Ident./Art. Part. no. Patteren/Blank no.	Material Standard Type	Alt. material Alt. standard Maker	Weight Remarks
General tolerances: ISO 2768-1-m.		Welding tolerances: NS1432, Class A.				

K	H	G	F	E	D	C	B	A	Revisions	Type/Group	Sign.: TK	Part list:
									Sign.:		Date: 02.06.05	Replaced by:
									Date:	Scale	Checked:	Replaces:
									Checked:	1:25	Approved:	Ref.:

ASKELADDEN Z7

Diesel fuel system

Drawing no. Z7-072

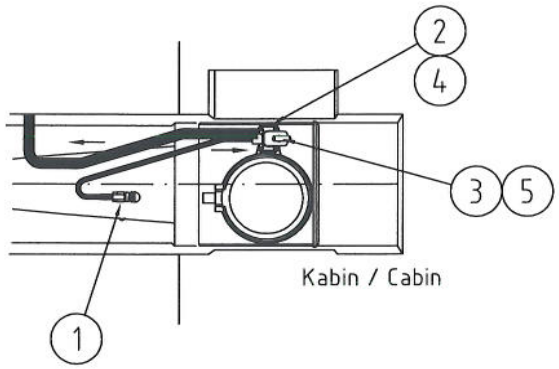


Item no.	Quant.	Part name / Dimension	Ident./Art. Part. no. Patteren/Blank no.	Material Standard Type	Alt. material Alt. standard Maker	Weight Remarks
		General tolerances: ISO 2768-1-m. Welding tolerances: NS1432, Class A.				

K	H	G	F	E	D	C	B	A	Revisions	Type/Group	Sign.: TK	Part list:
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ASKELADDEN Z7
Toalettsystem / Septic system

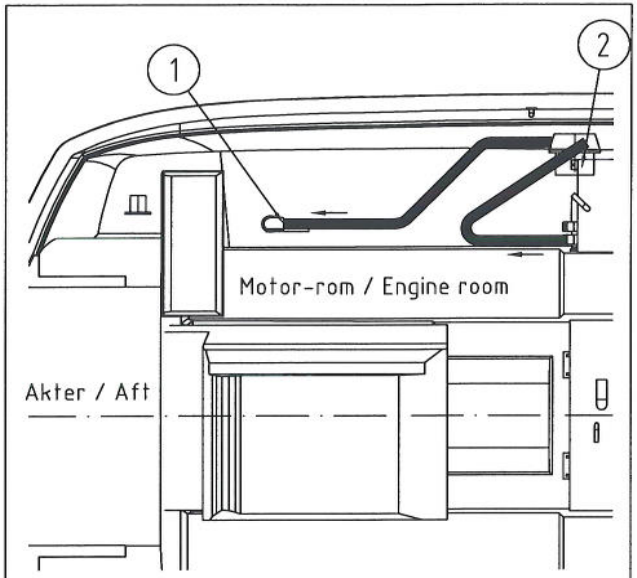
Drawing no. Z7-171



Spyling av toalett/Toilet flushing

1. Ventil for vanntilførsel må være åpen. Ventilen er plassert i kabin under toalett.
2. Ventil på toalettpumpe må stå i spyleposisjon (åpen).
3. Fyll vann i toalett med toalettpumpen.
4. Steng ventil på toalettpumpe.
5. Tøm toalett til tank med toalettpumpe.

1. Sea-water valve must be open. Valve is placed in cabin beneath toilet.
2. Valve on toilet pump to be set in flushing position (open).
3. Fill water in toilet with toilet pump.
4. Close valve on toilet pump.
5. Emty toilet to tank with toilet pump.



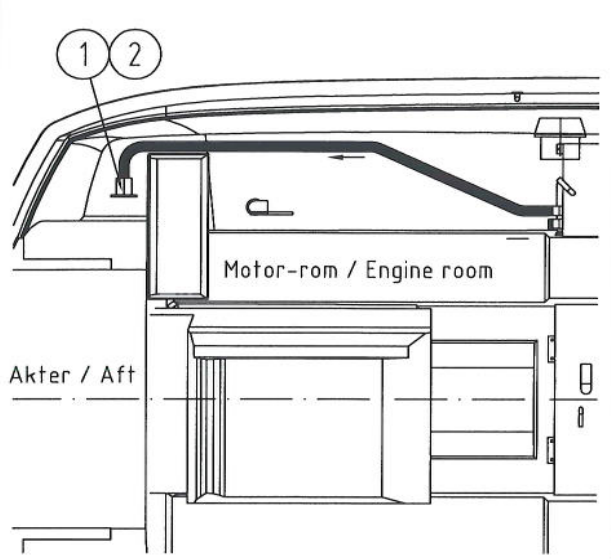
Tømming av tank til sjø
Tank flushing to sea

1. Ventil for tømming må være åpen. Ventilen er plassert bak i motor-rom.
2. Veggpumpe i cockpit betjenes.

NB! Respekter offentlige forskrifter.

1. Bottom waste valve must be open. Valve is placed aft in engine room
2. Operate cockpit wall pump.

NB! Respect authority regulations.



Vakum-tømming av tank
Vacuum evacuation of waste tank

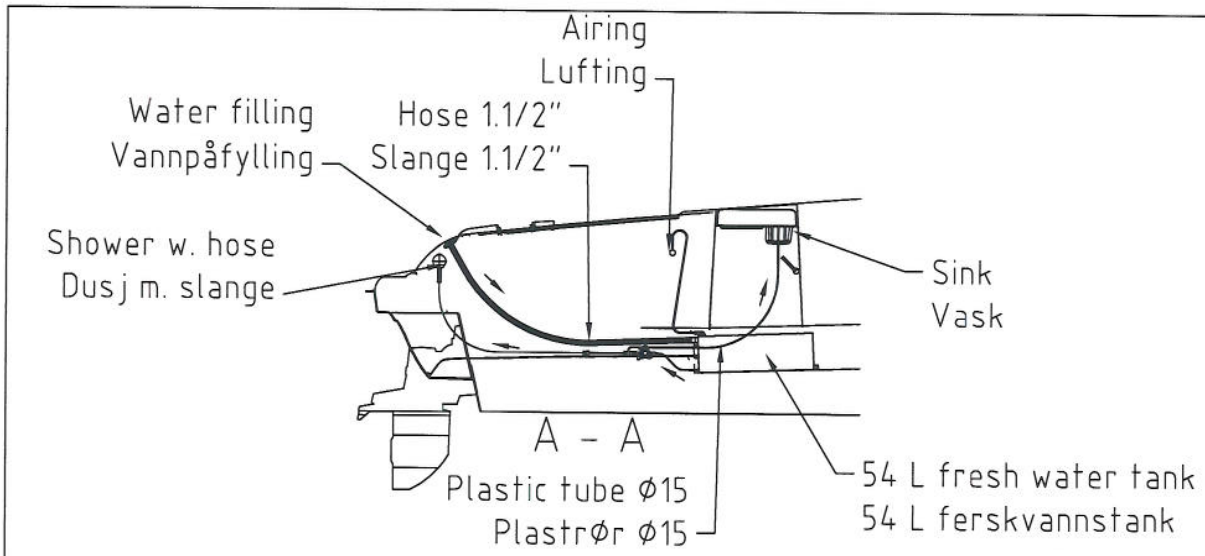
1. Kobling på akter plattform må være tilkoblet landanlegg
2. Landanlegg betjenes.

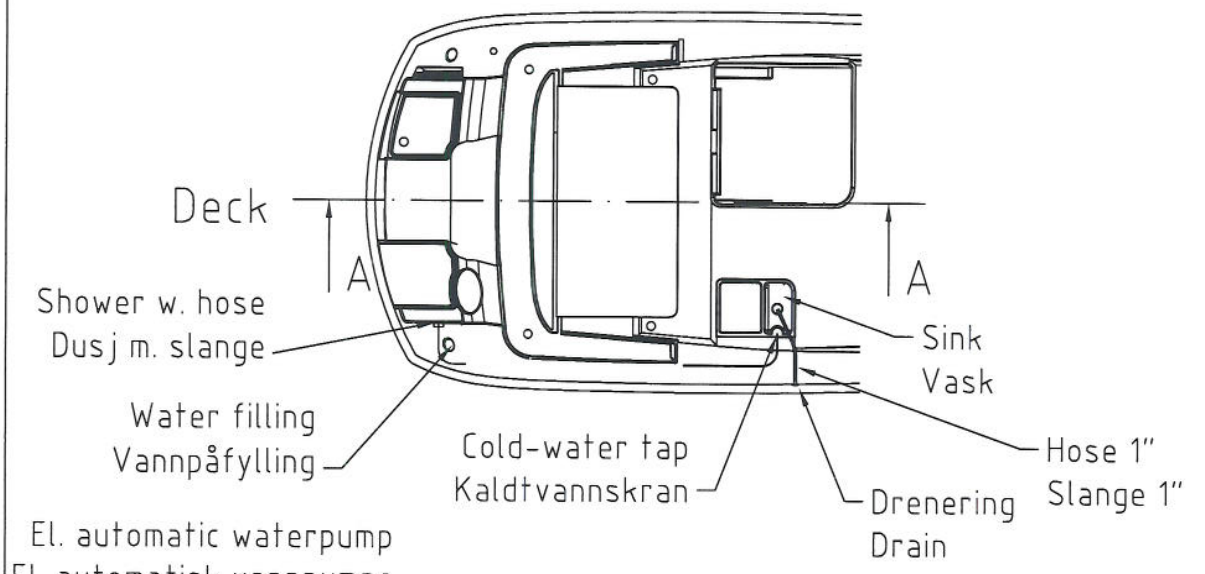
1. Waste coupling on aft platform to be connected to shore system.
2. Operate shore system.

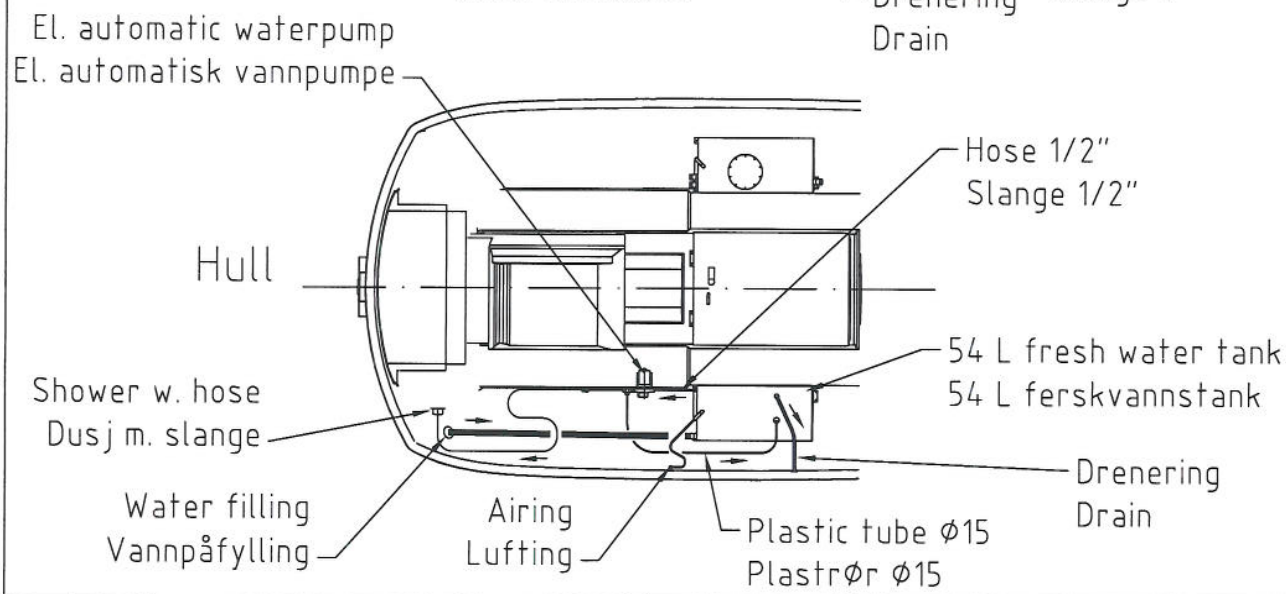
ADVARSEL !
Bruk aldri veggpumpe med stengt bunnventil.
Slanger kan ødelegges.

WARNING !
Never operate wall pump with closed bottom waste valve. Hoses may rupture.

Rev. -
Z7-172







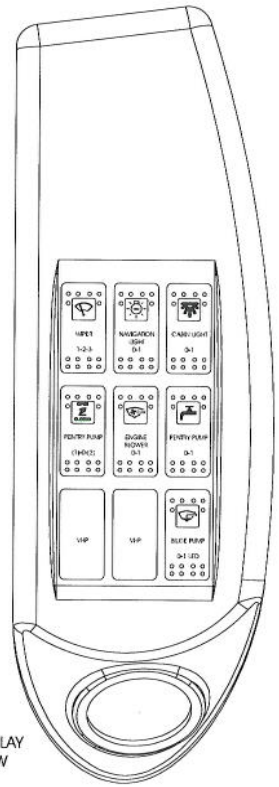
Item no.	Quant.	Part name / Dimension	Ident./Art. Part. no. Patteren/Blank no.	Material Standard Type	Alt. material Alt. standard Maker	Weight Remarks
General tolerances: ISO 2768-1-m.		Welding tolerances: NS1432, Class A.				

K	H	G	F	E	D	C	B	A	Revisions	Type/Group	Sign.: TK	Part list:
									Sign.:		Date: 07.06.05	Replaced by:
									Date:	Scale	Checked:	Replaces:
									Checked:	1:50	Approved:	Ref.:

ASKELADDEN Z7

Fresh water system

Drawing no. Z7-11



WIPER SWITCH



1 PINK
2 CONNECTED TO 4
3 WHITE/GREEN
5 WHITE/BLUE
6 GREY/BLACK

Z-TOP SWITCH



1 CONNECTED TO 6
2 BLACK
3 OUT BROWN
4 CONNECTED TO 3
5 WHITE/BLACK
6 OUT BLUE

CHARGE RELAY
BLUE/YELLOW

50

50

50

10

WIPER C WHITE/BLUE	NAV. LIGHT IN RED	CABIN LIGHT IN YELLOW	PENTRY P IN RED/BLACK
Z-TOP + (Input switchpanel) WHITE/BLACK	ENG. BLOWER IN WHITE/GREY	ENG. BLOWER OUT WHITE	INPUT - 2 x BLACK

X1

FEMALE

CHARGE RELAY BLUE/YELLOW	BILGE P. IN RED 2,5

X9

DECK

CABIN L. OUT YELLOW	WIPER I PINK	WIPER II WHITE/GREEN	WIPER III GREY/BLACK
NAV. LIGHT SB/BB RED			

HULL

X5

NAV. L. REAR RED	PENTRY P. OUT RED/BLACK		BILGE P. OUT (MAN) GREY 2,5
Z-TOP A BROWN	Z-TOP B BLUE		

X6

SUB-PRODUCTS:
5392 ASKELADDEN Z-7 SWITCH PANEL LEFT-08(WITHOUT COMP.)

MODIFICATION DESCRIPTION:			
	Revision	A1	Date
	Drawn by	RN	15.5.-07
	Modified by	XX	xx.xx.-xx
	PAGE: 1/1		

Askeladden Z-7 SWITCHPANEL LEFT -08

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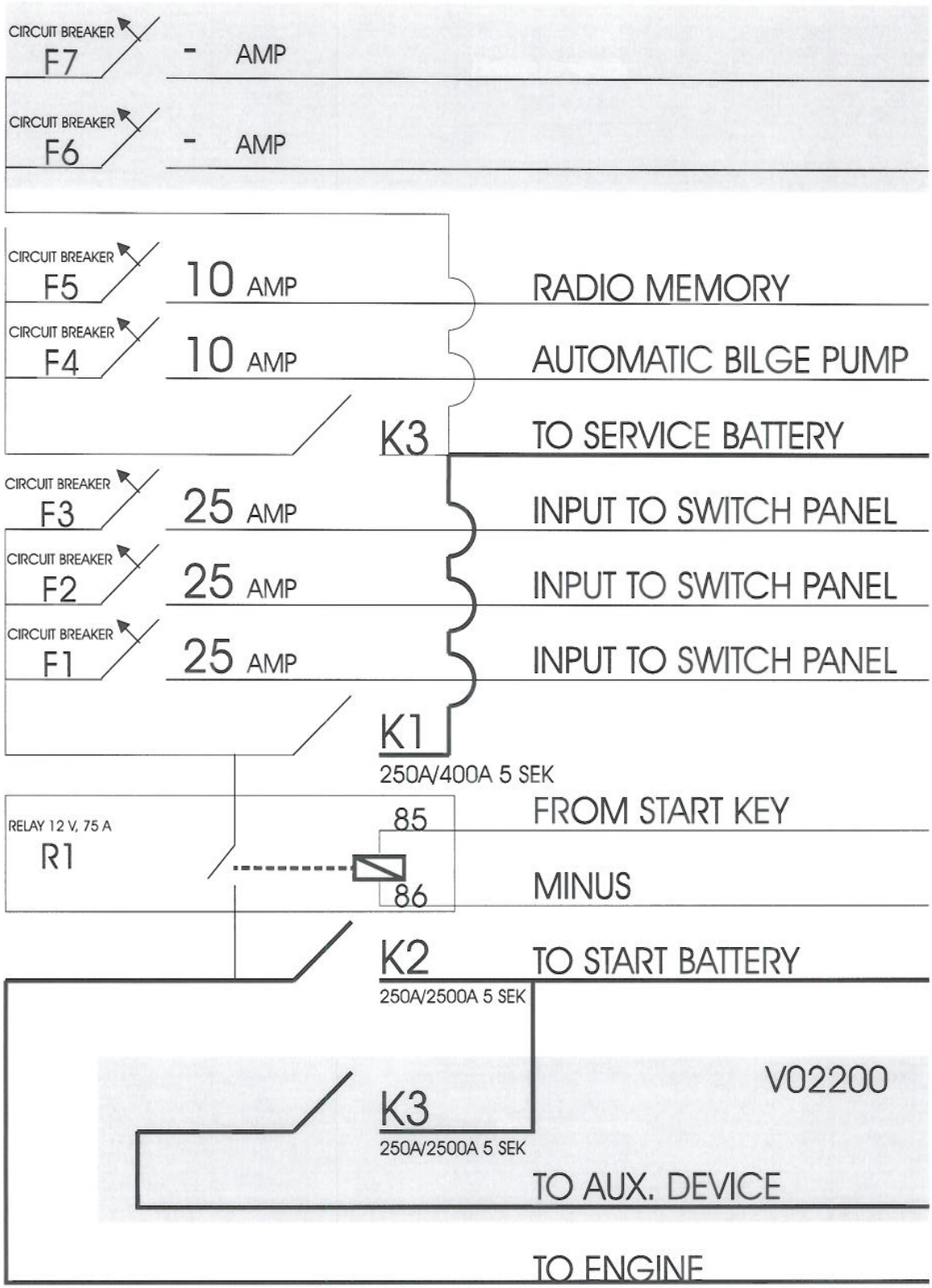
N:O 5397

CIRCUIT BREAKER N:O	AMP	SWITCH CONN.	CABLE N:O/COLOR	SIZE mm2	FUNCTION
F1	10		RED	1,5	NAV. LIGHTS
F2	10		YELLOW	1,5	CABIN LIGHT
F3	10		PINK	1,5	WIPER I
			WHITE/GREEN	1,5	WIPER II
			GREY/BLACK	1,5	WIPER III
F4	10		RED/BLACK	1,5	PENTRY PUMP
F5	10		WHITE/GREY	1,5	ENG.BLOWER
F6	10		GREEN/BLACK	1,5	OUTLET
F7	10		RED	6	PLOTTER
F8	10		WHITE/YELLOW	1,5	RADIO
F9	10		BROWN	1,5	Z-TOP A
			BLUE	1,5	Z-TOP B
F10	15		BLUE	6	REFRIDGERATOR
F11	25		RED	6	TRIM
F12	10		XXX	1,5	SPARE
			RED	3 x 6	+ INPUT

MODIFICATION DESCRIPTION:	Revision	A1	Date	ASKELADDEN Z-7	
	Drawn by	PE	26.11.-04		
	Modified by	RN	6.6.-07	NAVIX MARINE PRODUCTS	N:O 5397DRA
	PAGE: 1/2				

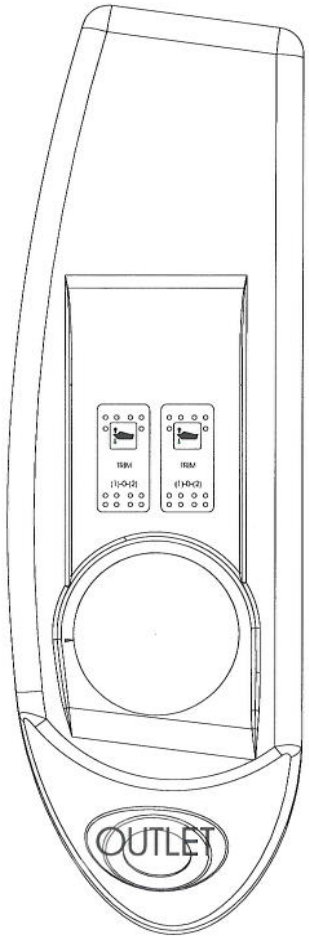
COPYRIGHT BY

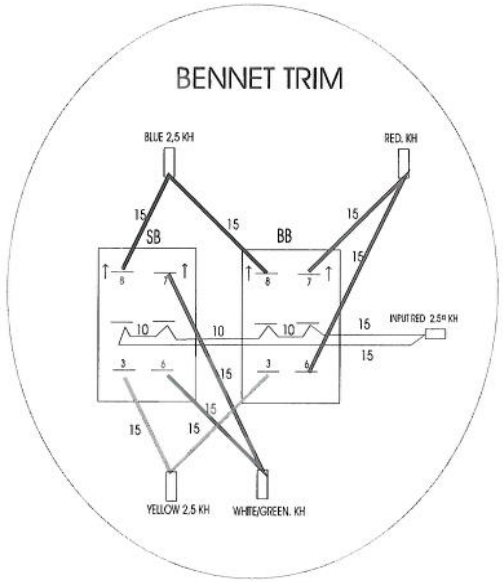
CIRCUIT BREAKER N:O	AMP	SWITCH CONN.	CABLE N:O/COLOR	SIZE mm2	FUNCTION



MODIFICATION DESCRIPTION:	Revision	A1	Date	ASKELADDEN Z-7	
	Drawn by	PE	26.11.-04		
	Modified by	RN	6.6.-07	NAVIX MARINE PRODUCTS	N:O 5397DRA
	PAGE: 2/2				

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C
FIRE EXTINGUSER
WHITE/BROWN

D
EI YHDISTETÄ
TRIMMIN KYTKIMIIN!
TRIM
RED 6¤

E
PLOTTER +
RED 6¤
PLOTTER -
BLACK 6¤

50 | 20 | 50

10

70

TRIM RED 6¤	OUTLET GREEN/BLACK	FIRE EXTINGUISER WHITE/BROWN	INPUT - BLACK 6¤
PLOTTER + RED 6¤			INPUT - BLACK

X2

SUB-PRODUCTS:
5399 ASKELADDEN Z-7 SWITCH PANEL RIGHT-08(WITHOUT COMP.)

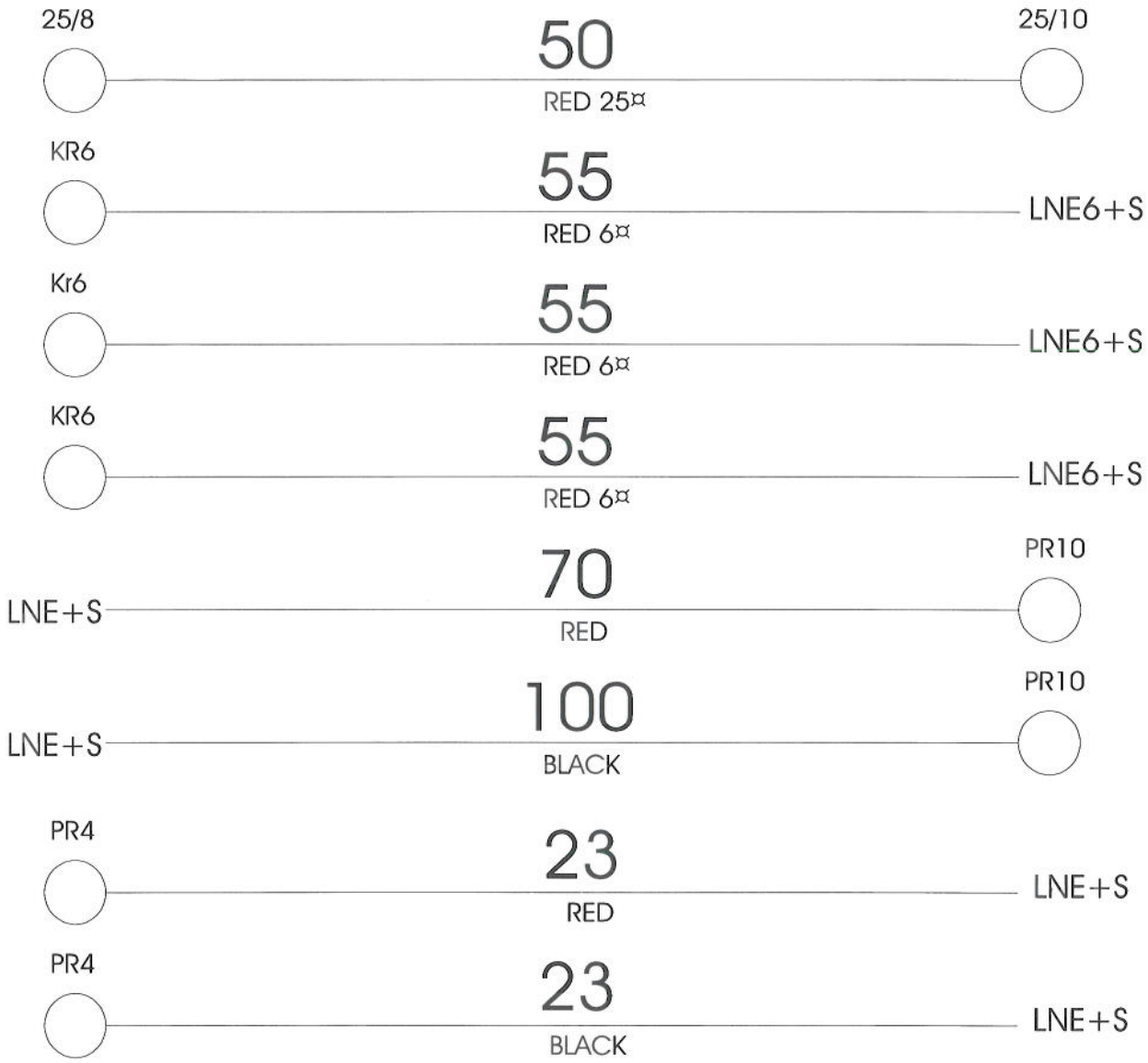
MODIFICATION DESCRIPTION:	Revision	A1	Date
	Drawn by	XX	XX.XX.-XX
	Modified by	XX	XX.XX.-XX
	PAGE: 1/1		

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Askeladden Z-7 SWITCHPANEL RIGHT -08

N:O 5398



SUB-PRODUCTS:	MODIFICATION DESCRIPTION:	Revision	A1	Date	Askeladden Z-7 SECURE VOLT EXTENSION CABLES	
		Drawn by	PE	30.3.-05		
		Modified by	RN	3.8.-06		
		PAGE: 1/1			COPY RIGHT BY: NAVIX MARINE PRODUCTS	N:O 3165

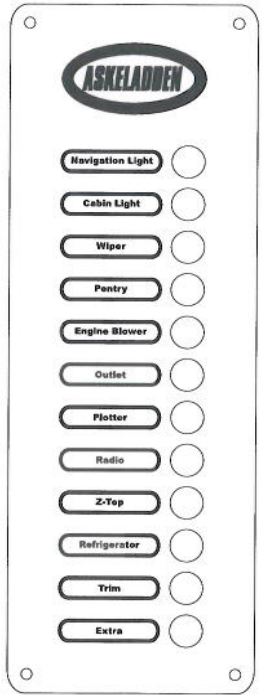
WIPER C WHITE/BLUE	NAV LIGHT RED	CABIN LIGHT YELLOW	PENTRY PUMP RED/BLACK
RADIO WHITE/YELLOW	REFRIDGERATOR BLUE 6¤	OUTLET GREEN/BLACK	ENG.BLOWER WHITE/GREY

X7

TRIM RED 6¤	INPUT+ RED 6¤	INPUT+ RED 6¤	INPUT+ RED 6¤
Z-TOP + (Input switchpanel) WHITE/BLACK	PLOTTER RED 6¤		

X8

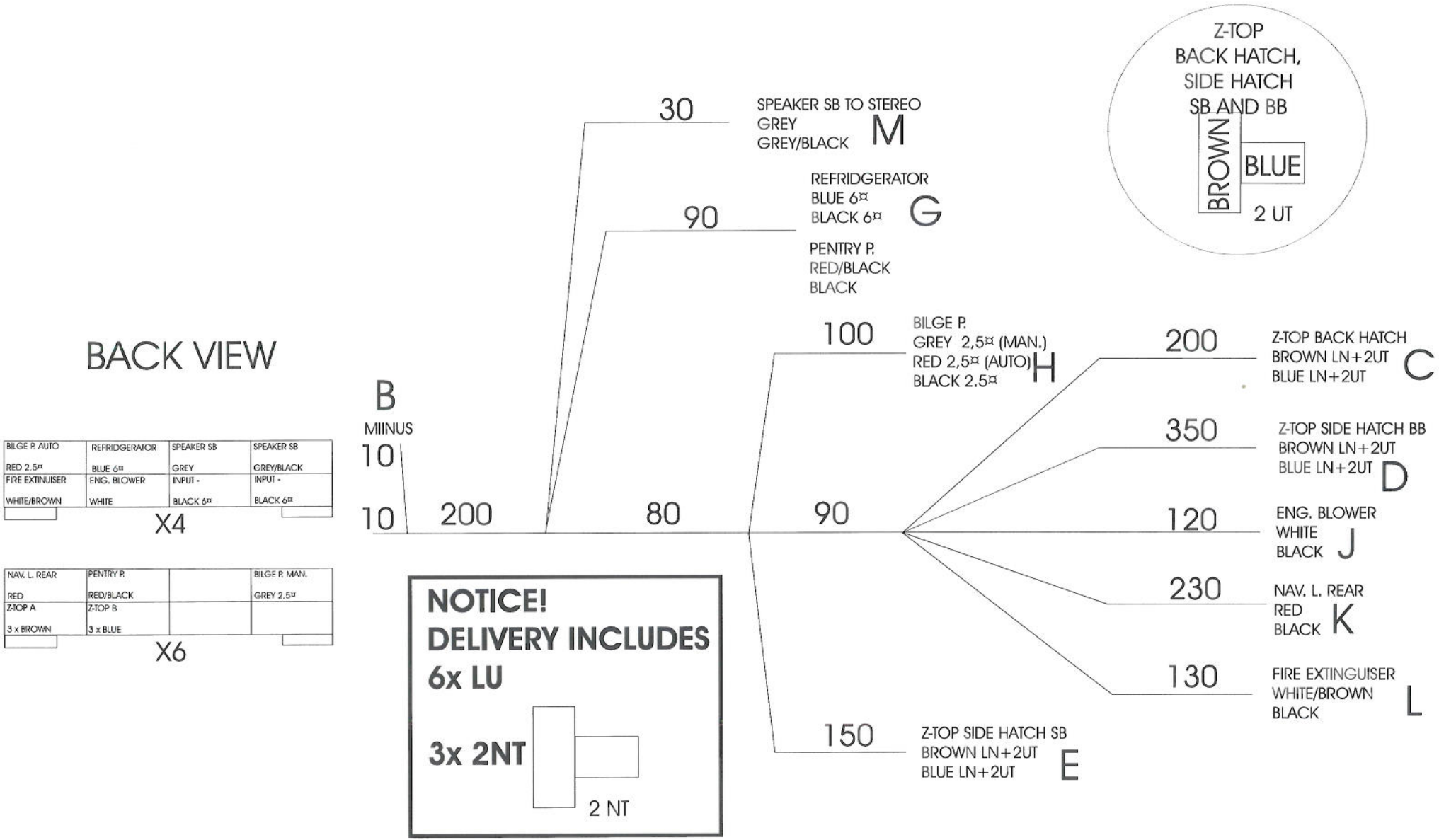
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SUB-PRODUCTS:	MODIFICATION DESCRIPTION:				
		Revision	A1	Date	Askeladden Z-7 FUSEPANELHARNESS
		Drawn by	SB	24.5.-04	
		Modified by	RN	8.6.-07	N:0
		PAGE: 1/1			2974

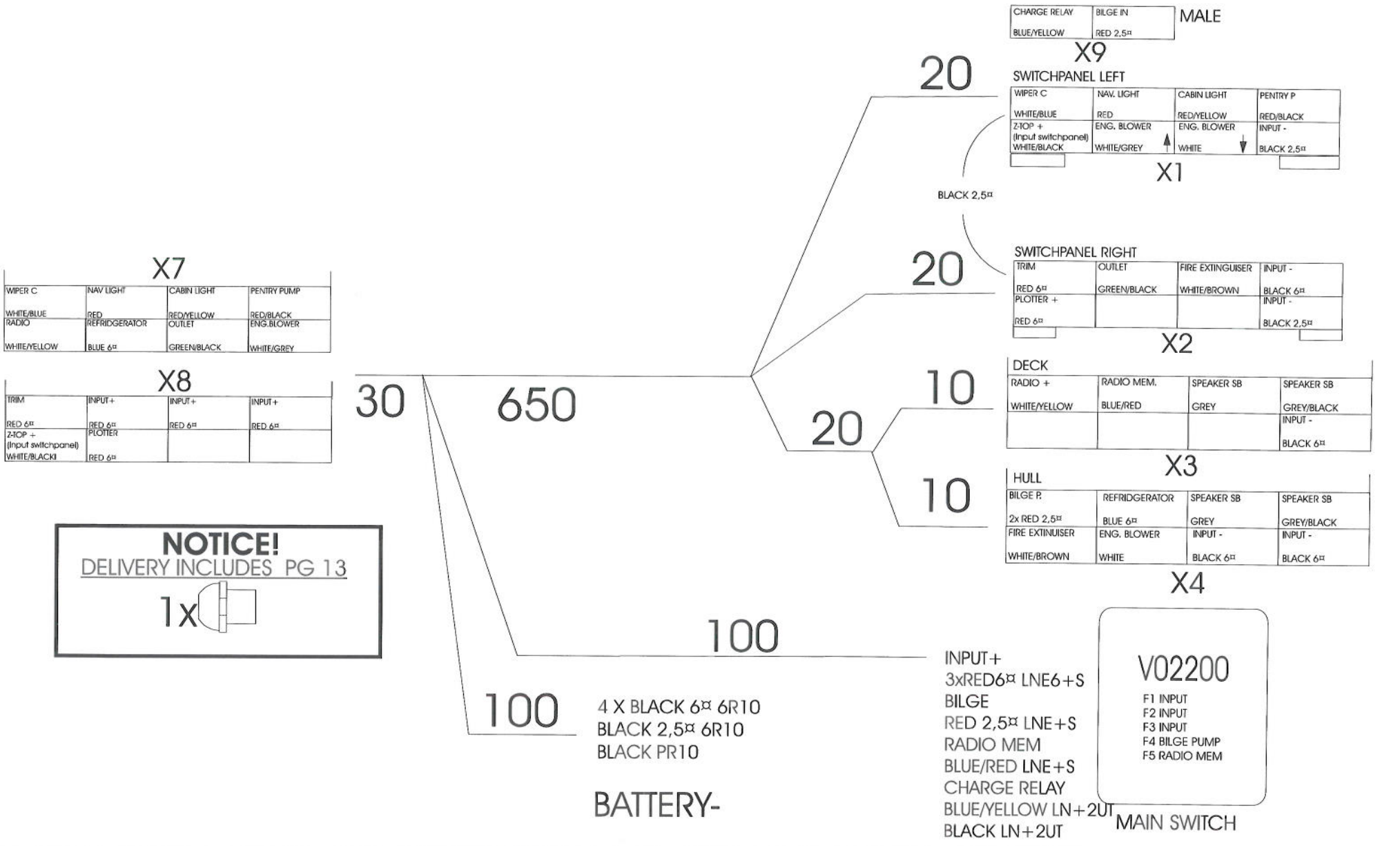
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NAVIX MARINE PRODUCTS



SUB-PRODUCTS:	MODIFICATION DESCRIPTION:				
		Revision	A1	Date	Askeladden Z-7 HULL HARNESS
		Drawn by	PE	26.11.-04	
		Modified by	RN	15.5.-07	N:O 2976
		PAGE: 1/1			NAVIX MARINE PRODUCTS

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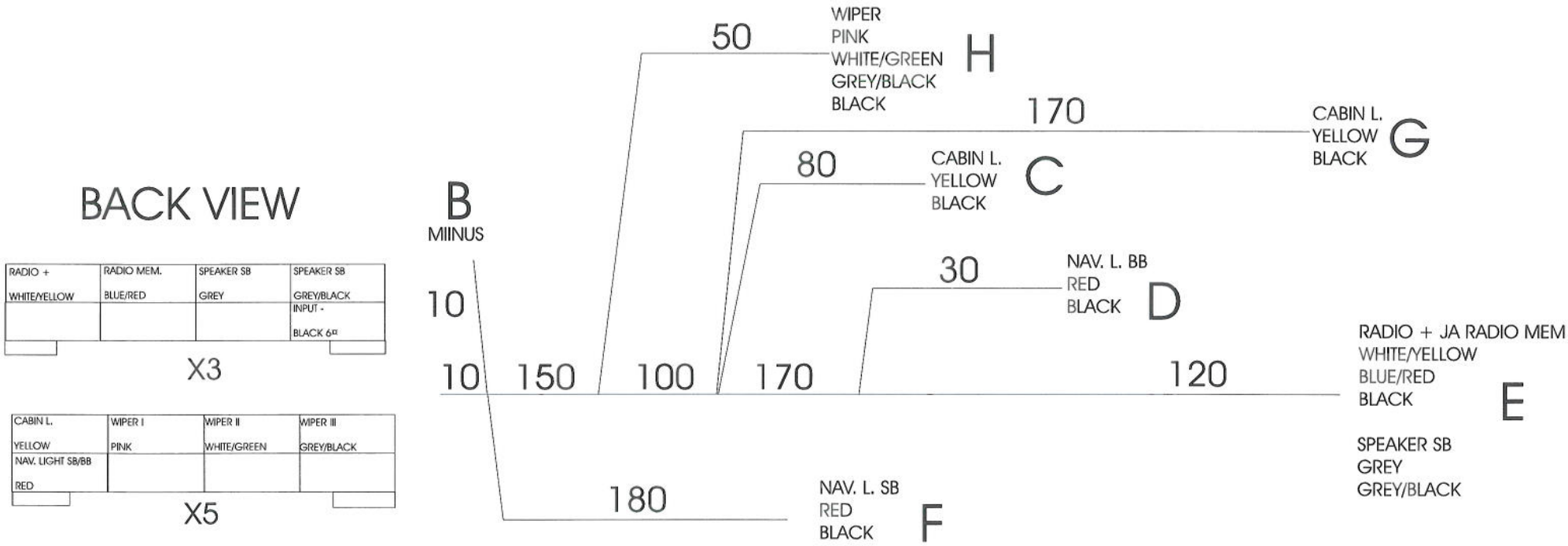
SUB-PRODUCTS:	MODIFICATION DESCRIPTION:	Revision	A1	Date
		Drawn by	PE	26.11.-04
		Modified by	RN	8.6.-07
		PAGE: 1/1		

Askeladden Z-7 MAINSWITCH HARNESS

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N:O 2975



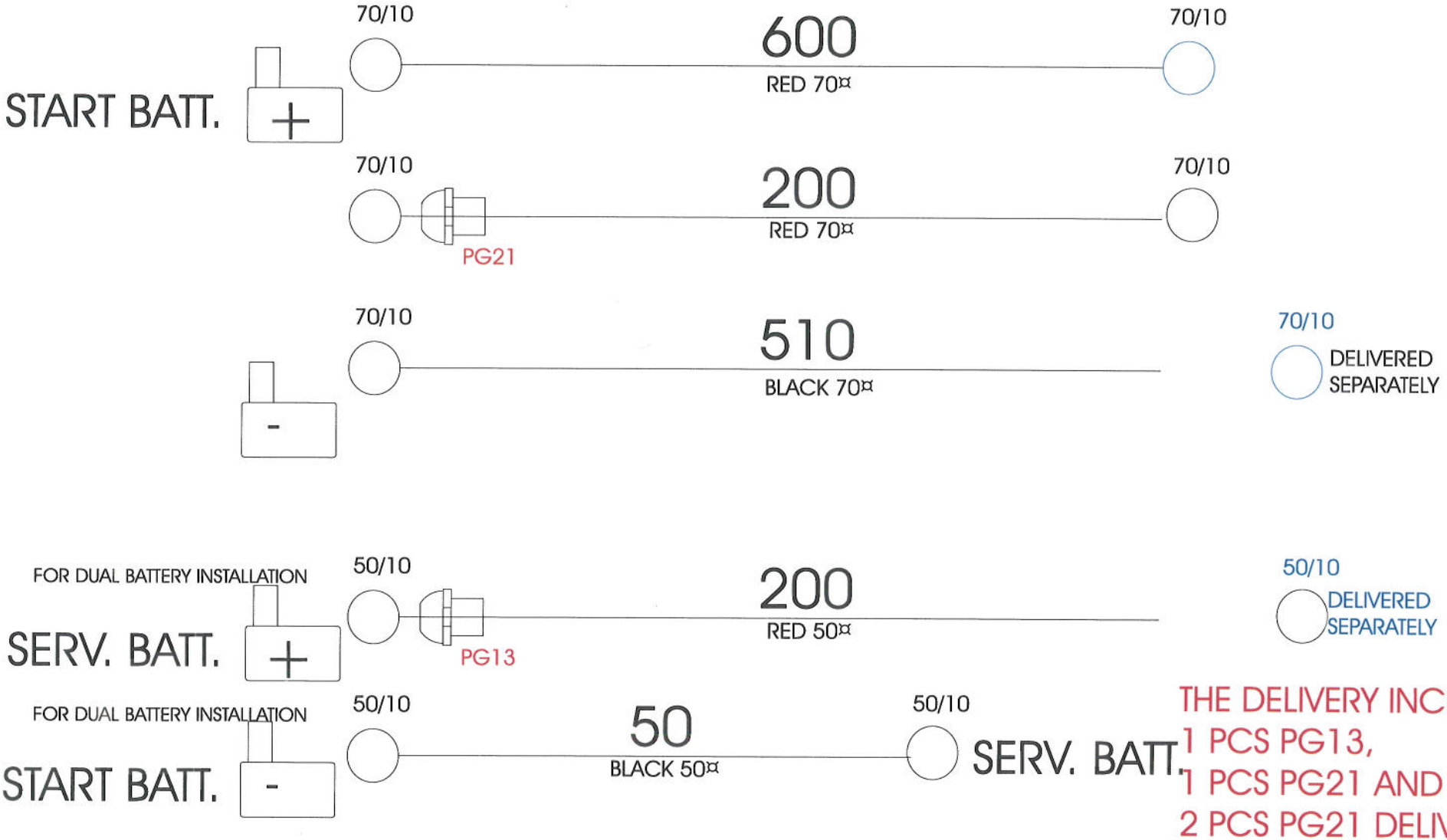
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		Drawn by	PE	26.11.-04
		Modified by	PE	11.03.-05
		PAGE: 1/1		

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NAVIX MARINE PRODUCTS

Askeladden Z-7 DECK HARNESS

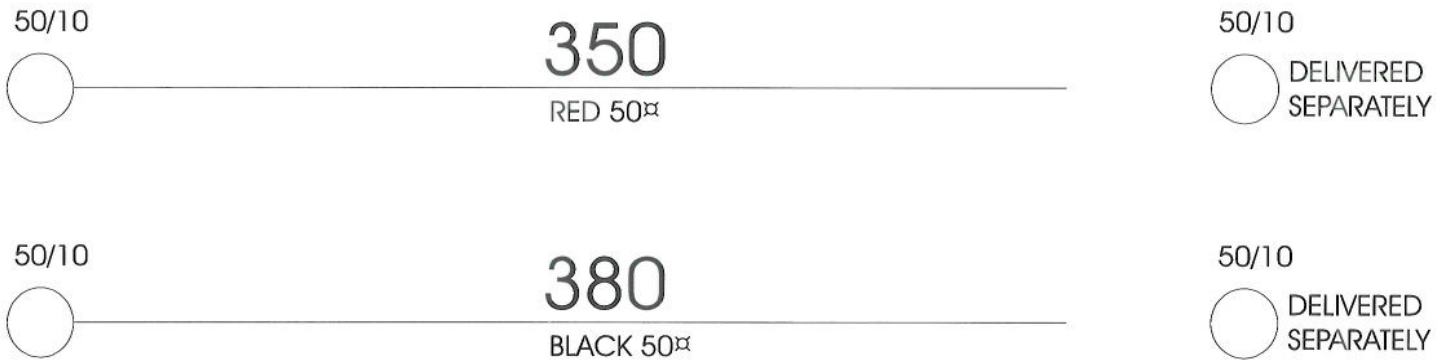
N:O 2977



THE DELIVERY INCLUDES
1 PCS PG13,
1 PCS PG21 AND
2 PCS PG21 DELIVERED
SEPARATELY

SUB-PRODUCTS:	MODIFICATION DESCRIPTION:	Revision	A2	Date	Askeladden Z-7 BATTERY HARNESS
		Drawn by	PE	26.11.-04	
		Modified by	RN	19.12.-07	N:O 2978
		PAGE: 1/1			NAVIX MARINE PRODUCTS

COPY RIGHT BY:



THE DELIVERY INCLUDES
2 PCS PG16

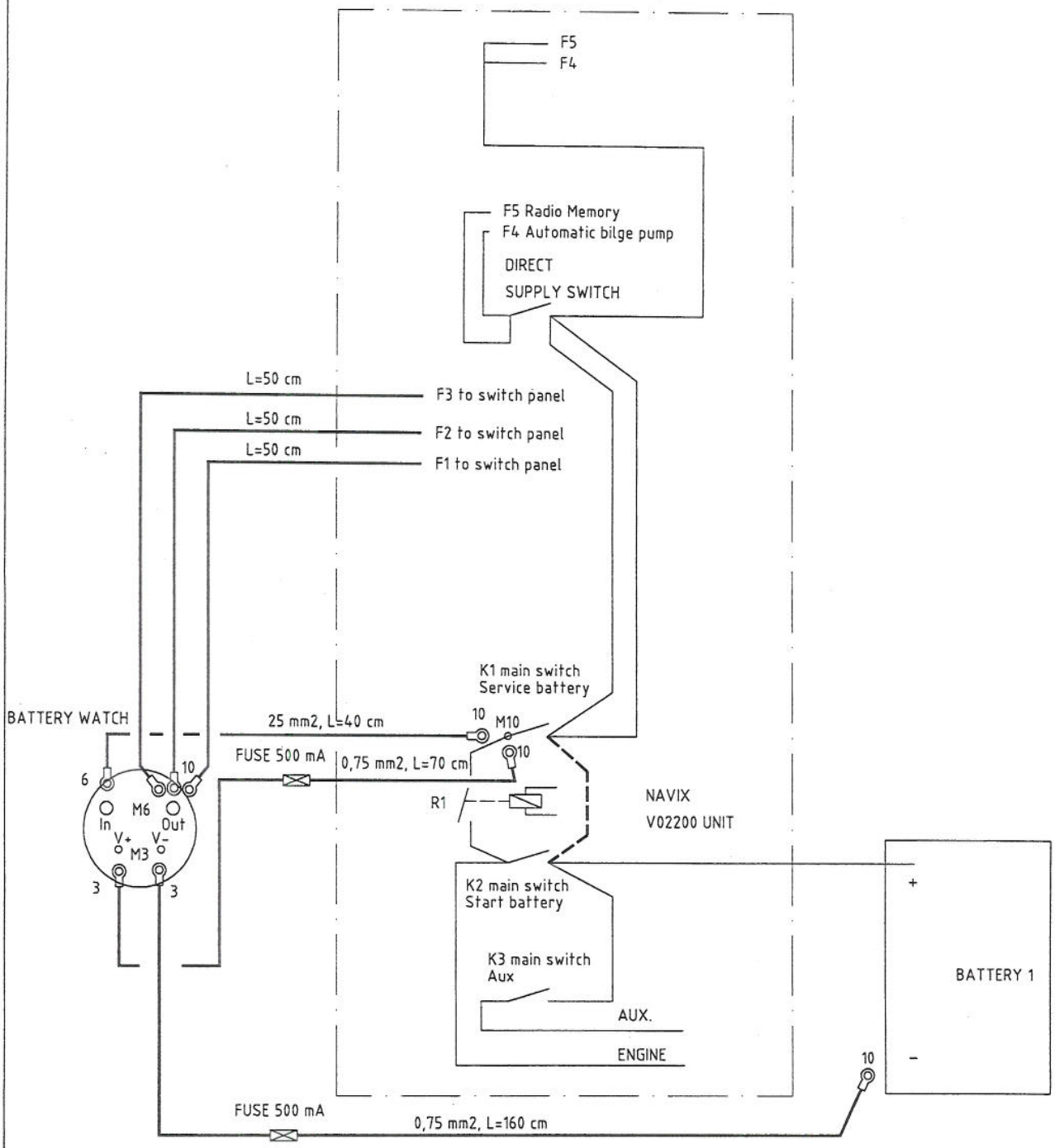
SUB-PRODUCTS:	MODIFICATION DESCRIPTION:	Revision	A1	Date
		Drawn by	PE	26.11.-04
		Modified by	PE	11.3.-05
		PAGE: 1/1		

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NAVIX MARINE PRODUCTS

Askeladden Z-7 ANCHOR WINCH CABLES

N:O 2979



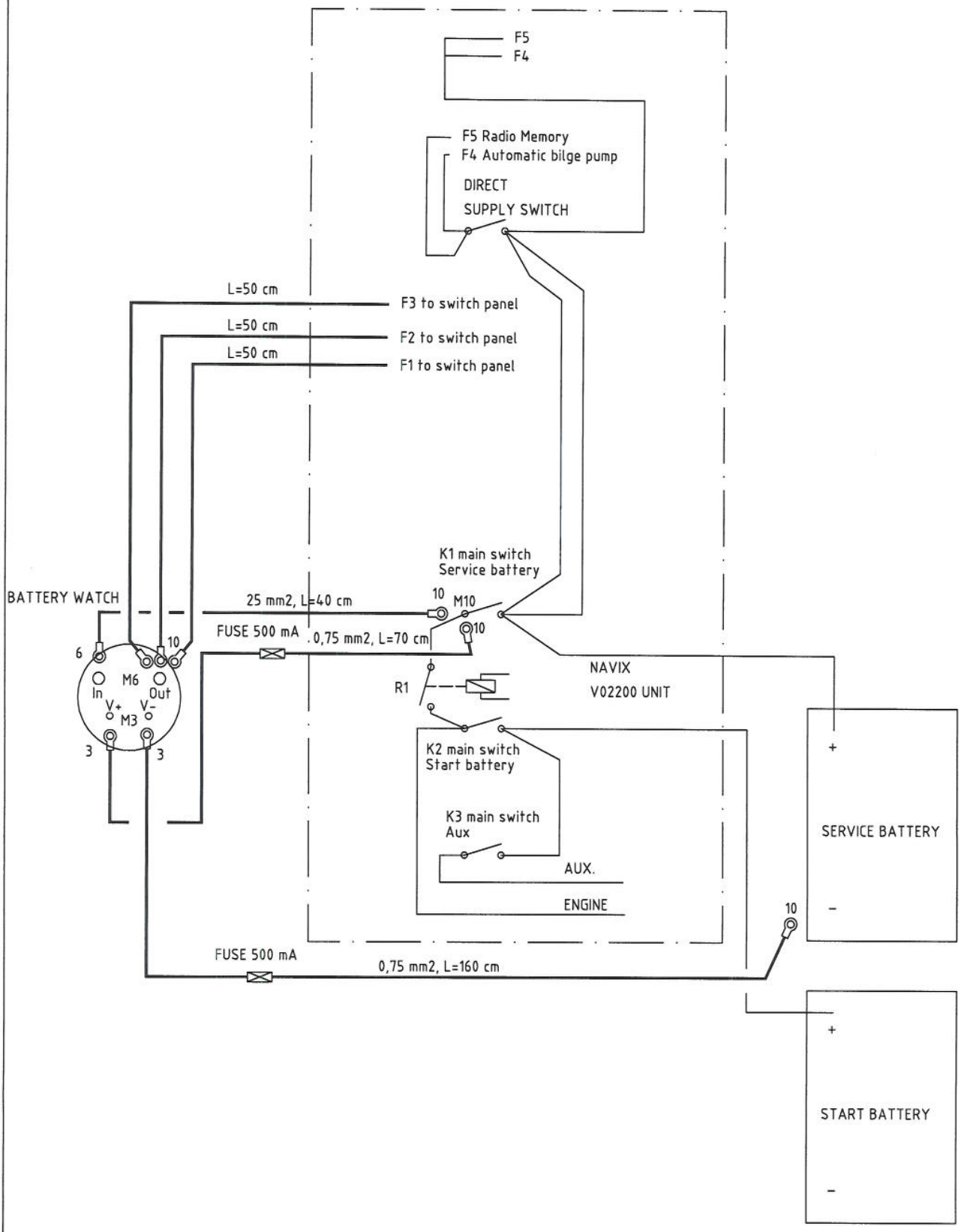
Item no.	Quant.	Part name / Dimension	Ident./Art. Part. no. Patteren/Blank no.	Material Standard Type	Alt. material Alt. standard Maker	Weight Remarks
General tolerances: ISO 2768-1-m.		Welding tolerances: NS1432, Class A.				

K	H	G	F	E	D	C	B	A	Revisions	Type/Group	Sign.: TK	Part list:
							TK	TK	Sign.:		Date: 210105	Replaced by:
							100605	260105	Date:	Scale	Checked:	Replaces:
									Checked:	1:1	Approved:	Ref.:

ASKELADDEN Z7

NAVIX V02200 UNIT w. battery guard. 1 Battery

Drawing no. Z7-040



Item no.	Quant.	Part name / Dimension	Ident./Art. Part. no. Patteren/Blank no.	Material Standard Type	Alt. material Alt. standard Maker	Weight Remarks
General tolerances: ISO 2768-1-m.		Welding tolerances: NS1432, Class A.				

K	H	G	F	E	D	C	B	A	Revisions	Type/Group	Sign.: TK	Part list:
								-	Sign.:		Date: 210105	Replaced by:
									Date:	Scale	Checked:	Replaces:
									Checked:	1:1	Approved:	Ref.:

ASKELADDEN Z7

NAVIX V02200 UNIT w. battery guard. 2 Batteries

Drawing no. Z7-041

CARE AND MAINTENANCE OF GUARD, GRABRAILS AND FITTINGS

In the care and maintenance for guard, grabrails and fittings manufactured from acid-restistant steel, the following matters must be considered:

- When hoisting the boat, steel cables and lifting shackles must not come into direct contact with acid-resistant components.

- Care must also be taken that neither the boat nor its parts are knocked or scratched in the process of mowing. If damage is sustained, the damaged railings or fittings must be carefully polished and waxed.

- To Ensure that the boat's acid-resistant components remain bright and new, the boat owner must keep them clean and waxed. If no damage occurs otherwise, railings must be cleaned and waxed at least twice during the season. At the end of season, when the boat is transferred for winter storage, railings must also be treated appropriately. Maintenance must include cleaning and waxing.

By carrying out these simple maintenance procedures, guard and grabrails will remain neat and functional for as long as possible.

NØDVENDIG VEDLIKEHOLD AV REKKER, PULLERTER OG ANDRE DETALJER AV RUSTFRITT STÅL

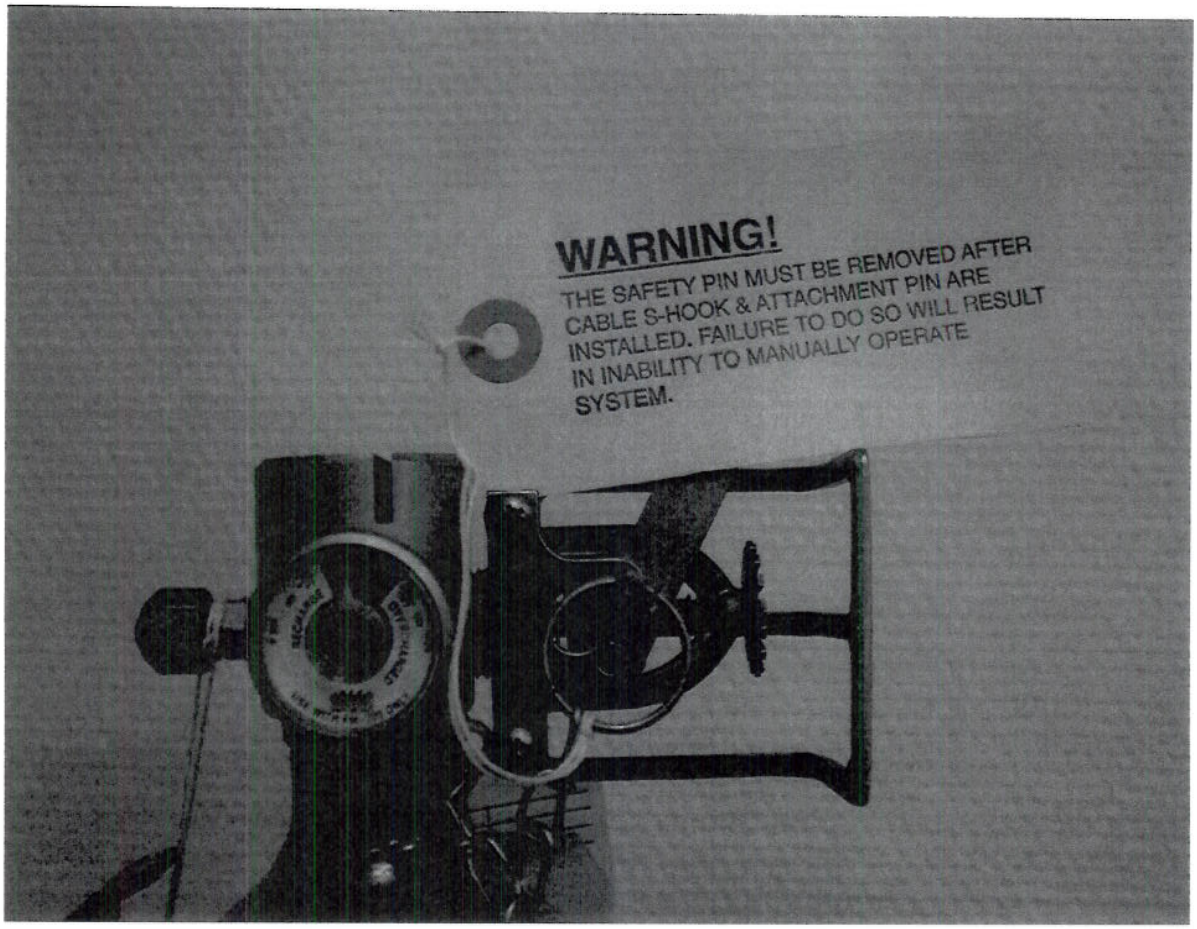
Ved håndtering og bruk av rekker, pullerter og andre detaljer av rustfritt stål må følgende forhåndsregler observeres:

- Under håndtering av båten (heising, flytting etc.) må det ikke benyttes stålwire eller løftesjakler som kommer i direkte kontakt med rustfrie komponenter.

- Sørg også for å unngå støt og riper på noen del av båten under forflytning. Skulle en skade oppstå må denne vokses og poleres straks.

- For å beholde den blanke overflaten må båteier holde de rustfrie komponentene rene og vokset til enhver tid. Selv uten at skader oppstår bør delene rengjøres og vokses minst to ganger i løpet av sesongen. Etter sesongslutt, før båten settes i opplag, må rekker og andre rustfrie detaljer rengjøres nøye, og vokses på nytt.

Dersom disse enkle forholdsreglene følges vil rekker og andre rustfrie detaljer holde seg fine, og vare i mange år fremover.



BRANNSLUKKER I MOTOR_ROM
LÅSEPINN MÅ FJERNES !

FIRE EXTINGUISHER IN ENGINE ROOM
REMOVE SAFETY PIN !

TILLEGG / APPENDIX B

N Motor

S Motor

DK Motor

NL Motor

D Motor

GB Engine

FIN Moottoria koskevat ohjekirjat

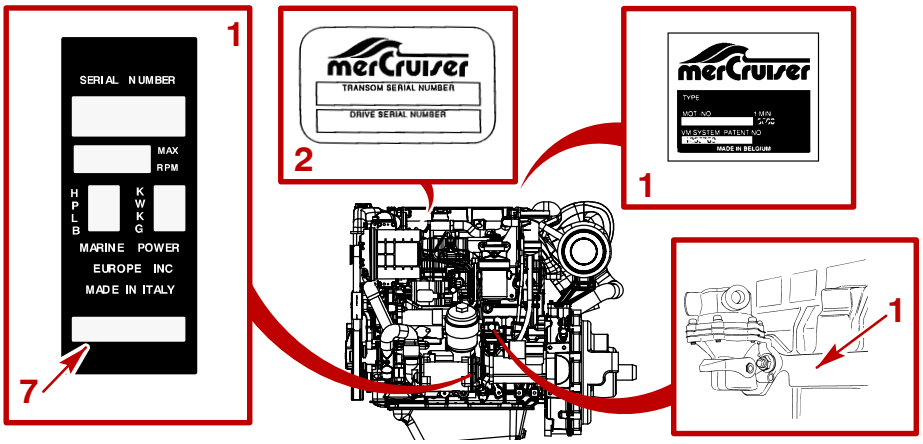
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2.8 ES Diesel Sterndrive Models

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Identification Record

The serial numbers are the manufacturer's keys to numerous engineering details which apply to your Cummins MerCruiser Diesel® power package. When contacting Cummins MerCruiser Diesel (CMD®) about service, **always specify model and serial numbers**.



79994

Please record the following information:

1.

Engine Model and Horsepower		Engine Serial Number

2.

Transom Assembly Serial Number (Sterndrive)	Gear Ratio	Sterndrive Unit Serial Number

3.

Transmission Model (Inboard)	Gear Ratio	Transmission Serial Number

4.

Propeller Number	Pitch	Diameter

5.

Hull Identification Number (HIN)		Purchase Date

6.

Boat Manufacturer	Boat Model	Length

7.

Exhaust Gas Emissions Certificate Number (Europe Only)

The description and specifications contained herein were in effect at the time this guide was approved for printing. Cummins MerCruiser Diesel, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change specifications or designs, without notice and without incurring obligation.

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Mercury Marine, Fond du Lac, Wisconsin, U.S.A. Printed in U.S.A.

WELCOME!

You have selected one of the finest marine power packages available. It incorporates numerous design features to assure operating ease and durability.

With proper care and maintenance, you will thoroughly enjoy using this product for many boating seasons. To ensure maximum performance and carefree use, we ask that you thoroughly read this manual.

The Operation, Maintenance, and Warranty Manual contains specific instructions for using and maintaining your product. We suggest that this manual remain with the product for ready reference whenever you are on the water.

Thank you for purchasing one of our Cummins MerCruiser Diesel products. We sincerely hope your boating will be pleasant!

Cummins MerCruiser Diesel

Warranty Message

The product you have purchased comes with a **limited warranty** from Cummins MerCruiser Diesel; the terms of the warranty are set forth in the Warranty Sections of this manual. The warranty statement contains a description of what is covered, what is not covered, the duration of coverage, how to best obtain warranty coverage, **important disclaimers and limitations of damages** and other related information. Please review this important information.

Read This Manual Thoroughly

IF YOU DON'T UNDERSTAND ANY PORTION, CONTACT YOUR DEALER FOR A DEMONSTRATION OF ACTUAL STARTING AND OPERATING PROCEDURES.

NOTICE

Throughout this publication, and on your power package, **WARNINGS** and **CAUTIONS**, accompanied by the International Hazard Symbol ⚠, may be used to alert the installer/user to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. **Observe them carefully.**

These Safety Alerts alone cannot eliminate the hazards that they signal. Strict compliance with these special instructions while performing the service, plus common sense operation, are major accident prevention measures.

⚠ WARNING

WARNING - Hazards or unsafe practices which could result in severe personal injury or death.

⚠ CAUTION

CAUTION - Hazards or unsafe practices which could result in minor personal injury or product or property damage.

IMPORTANT: - Indicates information or instructions that are necessary for proper operation and/or maintenance.

⚠ WARNING

The operator (driver) is responsible for the correct and safe operation of the boat, the equipment aboard and the safety of all occupants aboard. We strongly recommend that the operator read this Operation, Maintenance and Warranty Manual and thoroughly understand the operational instructions for the power package and all related accessories before the boat is used.

We strongly recommend that other occupants be instructed on proper starting and operation procedures so they will be prepared should they be required to operate the power package and boat in an emergency.

⚠ WARNING

California Proposition 65 Warning

The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

⚠ WARNING

Electrical system components on this engine are not external ignition protected. DO NOT STORE OR UTILIZE GASOLINE ON BOATS EQUIPPED WITH THESE ENGINES, UNLESS PROVISIONS HAVE BEEN MADE TO EXCLUDE GASOLINE VAPORS FROM ENGINE COMPARTMENT (REF: 33 CFR). Failure to comply could result in fire, explosion and/or severe personal injury.

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SECTION 1 - WARRANTY

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Warranty Information

Owner Warranty Registration

UNITED STATES AND CANADA ONLY

- It is important that your selling dealer fills out the Warranty Registration Card completely and mails it to the factory immediately upon sale of the new product.
- It identifies name and address of the original purchaser, product model and serial number(s), date of sale, type of use and selling dealer's code, name and address. The dealer also certifies that you are the original purchaser and user of the product.
- Upon receipt of the Warranty Registration Card at the factory, you will be issued a plastic Owner Warranty Registration Card which is your only valid registration identification. It must be presented to the servicing dealer should warranty service be required. Warranty claims will not be accepted without presentation of this card.
- A temporary Owner Warranty Registration Card will be presented to you when you purchase the product. It is valid only for 30 days from date of sale while your plastic Owner Warranty Registration Card is being processed. Should your product need service during this period, present the temporary registration card to the dealer. He will attach it to your warranty claim form.
- Because of your selling dealer's continuing personal interest in your satisfaction, the product should be returned to him for warranty service.
- If your plastic card is not received within 30 days from date of new product sale, please contact your selling dealer.
- The product warranty is not effective until the product is registered at the factory.
- NOTICE: Registration lists must be maintained by factory and dealer on marine products sold in the United States, should notification under the Federal Boat Safety Act be required.
- You may change your address at any time, including at time of warranty claim, by calling Mercury MerCruiser or sending a letter or fax with you name, old address, new address, and engine serial number to Mercury MerCruiser's warranty registration department. Your dealer can also process this change of information.

Mercury Marine
Attn: Warranty Registration Department
W6250 Pioneer Road
P.O. Box 1939
Fond du Lac, WI 54935-1939
Phone: 920-929-5054
Fax: 920-929-5893

International Owner Registration

OUTSIDE THE UNITED STATES AND CANADA

- It is important that your selling dealer fills out the Warranty Registration Card completely and mails it to the distributor or Marine Power Service Center responsible for administering the warranty registration/claim program for your area.
- The Warranty Registration Card identifies your name and address, product model and serial number(s), date of sale, type of use and the selling distributor's/dealer's code number, name and address. The distributor/dealer also certifies that you are the original purchaser and user of the product.
- A copy of the Warranty Registration Card, designated as the "Purchaser's Copy", MUST be given to you immediately after the card has been completely filled out by the selling distributor/dealer. This card represents your factory registration identification, and should be retained by you for future use when required. Should you ever require warranty service on this product, your dealer may ask you for the Warranty Registration Card to verify date of purchase and to use the information on the card to prepare the warranty claim form(s).
- In some countries, the Marine Power Service Center will issue you a permanent (plastic) Warranty Registration Card within 30 days after receiving the "Factory Copy" of the Warranty Registration Card from your distributor / dealer. If you receive a plastic Warranty Registration Card, you may discard the "Purchaser's Copy" that you received from the distributor / dealer when you purchased the product. Ask your distributor / dealer if this plastic card program applies to you.
- For further information concerning the Warranty Registration Card and its relationship to Warranty Claim processing, refer to the "International Warranty." Refer to "Table of Contents."

IMPORTANT: Registration lists must be maintained by the factory and dealer in some countries by law. It is our desire to have ALL products registered at the factory should it ever be necessary to contact you. Make sure your dealer / distributor fills out the warranty registration card immediately and sends the factory copy to the Marine Power International Service Center for your area.

Warranty Policies

Recreational Use Diesel Limited Warranty

WHAT IS COVERED

Cummins MerCruiser Diesel warrants its new products to be free of defects in material and workmanship during the period described below.

DURATION OF COVERAGE

This Limited Warranty provides coverage for one (1) year from the date the product is first sold to a recreational use retail purchaser, or the date on which the product is first put into service, whichever occurs first. Commercial use of the product voids the warranty. Commercial use is defined as any work or employment related use of the product, or any use of the product which generates income, for any part of the warranty period, even if the product is only occasionally used for such purposes. The repair or replacement of parts, or the performance of service under this warranty, does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred from one recreational use customer to a subsequent recreational use customer upon proper re-registration of the product. Unexpired warranty coverage cannot be transferred either to or from a commercial use customer.

CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE

Warranty coverage is available only to retail customers that purchase from a Dealer authorized by Cummins MerCruiser Diesel to distribute the product in the country in which the sale occurred, and then only after the Cummins MerCruiser Diesel specified pre-delivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Inaccurate warranty registration information regarding recreational use, or subsequent change of use from recreational to commercial (unless properly re-registered) may void the warranty at the sole discretion of Cummins MerCruiser Diesel. Routine maintenance outlined in the Operation, Maintenance, and Warranty Manual must be timely performed in order to obtain warranty coverage. Cummins MerCruiser Diesel reserves the right to make any warranty coverage contingent upon proof of proper maintenance.

WHAT CUMMINS MERCRUISER DIESEL WILL DO

Cummins MerCruiser Diesel's sole and exclusive obligation under this warranty is limited to, at our option, repairing a defective part, replacing such part or parts with new or Cummins MerCruiser Diesel certified re-manufactured parts, or refunding the purchase price of the Cummins MerCruiser Diesel product. Cummins MerCruiser Diesel reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

HOW TO OBTAIN WARRANTY COVERAGE

The customer must provide Cummins MerCruiser Diesel with a reasonable opportunity to repair, and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Cummins MerCruiser Diesel dealer / distributor authorized to service the product. If purchaser cannot deliver the product to such a dealer, written notice must be given to Cummins MerCruiser Diesel. We will then arrange for the inspection and any covered repair. Purchaser in that case shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related labor and material, and any other expenses associated with that service. Purchaser shall not, unless requested by Cummins MerCruiser Diesel, ship the product or parts of the product directly to Cummins MerCruiser Diesel. The warranty registration card is the only valid registration identification and must be presented to the dealer at the time warranty service is requested in order to obtain coverage.

WHAT IS NOT COVERED

This limited warranty does not cover routine maintenance items, tune ups, adjustments, normal wear and tear, damage caused by abuse, abnormal use, use of a propeller or gear ratio that does not allow the engine to operate at the recommended Engine Rated rpm, operation of the product in a manner inconsistent with the recommended operation / duty cycle section of the Operation, Maintenance, And Warranty Manual, neglect, accident, submersion, improper installation (proper installation specifications and techniques are set forth in the installation instructions for the product), improper service, use of an accessory or part which damages the Cummins MerCruiser Diesel product and was not manufactured or sold by us, jet pump impellers and liners, operation with fuels, oils or lubricants which are not suitable for use with the product (see the Operation, Maintenance, And Warranty Manual), alteration or removal of parts, water entering the engine through the fuel intake, air intake or exhaust system or damage to the product from insufficient cooling water caused by blockage of the cooling system by a foreign body, running the engine out of water, mounting the engine too high on the transom, or running the boat with the engine trimmed out too far. Use of the product for racing or other competitive activity, or operating with a racing type lower unit, at any point, even by a prior owner of the product, voids the warranty.

Expenses related to haul-out, launch, towing, storage, telephone, rental, inconvenience, slip fees, insurance coverage, loan payments, loss of time, loss of income, or any other type of incidental or consequential damages are not covered by this warranty. Also, expenses associated with the removal and/or replacement of boat partitions or material caused by boat design for access to the product are not covered by this warranty.

No individual or entity, including Cummins MerCruiser Diesel authorized dealers, has been given authority by Cummins MerCruiser Diesel to make any affirmation, representation or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against Cummins MerCruiser Diesel.

DISCLAIMERS AND LIMITATIONS

THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/COUNTRIES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE. AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.

Warranty Coverage and Exclusion

Keep in mind that warranty covers repairs that are needed within the warranty period because of defects in material and workmanship. Installation errors, accidents, normal wear, and a variety of other causes that affect the product are not covered.

Warranty is limited to defects in material or workmanship, but only when the consumer sale is made in the country to which distribution is authorized by us.

Should you have any questions concerning warranty coverage contact your authorized dealer. They will be pleased to answer any questions that you may have.

WARRANTY DOES NOT APPLY TO THE FOLLOWING:

- Minor adjustments or checks, including checking fuel injection pump timing, cleaning fuel injectors, filters, or adjusting belts, controls, and checking lubrication made in connection with normal services.
- Damage caused by neglect, lack of maintenance, accident, abnormal operation, improper installation or service, or freezing temperatures.
- Haul-out, launch, towing charges; removal and/or replacement of boat partitions or material because of boat design for necessary access to the product; all related transportation charges and/or travel time, etc. Reasonable access must be provided to the product for warranty service. Customer must deliver product to an Authorized Dealer.
- Additional service work requested by customer other than that necessary to satisfy the warranty obligation.
- Labor performed by other than an Authorized Dealer may be covered only under following circumstances: When performed on emergency basis (providing there are no Authorized Dealers in area who can perform the work required or have no facilities to haul out, etc., and prior factory approval has been given to have the work performed at this facility).
- All incidental and/or consequential damages (storage charges, telephone or rental charges of any type, inconvenience or loss of time or income) are the owner's responsibility.

- Use of other than Quicksilver replacement parts when making warranty repairs.
- Oils, lubricants or fluids changed as a matter of normal maintenance is customer's responsibility unless loss or contamination of same is caused by product failure that would be eligible for warranty consideration.
- Participating in or preparing for racing or other competitive activity.
- Engine noise does not necessarily indicate a serious engine problem. If diagnosis indicates a serious internal engine condition which could result in a failure, condition responsible for noise should be corrected under the warranty.
- Lower unit and/or propeller damage caused by striking a submerged object is considered a marine hazard.
- Water entering the engine via the air filter or exhaust system or submersion. Also, water in the starter motor.
- Starter motors and/or armatures or field coil assembly, which are burned, or where lead is thrown out of commutator because of excess cranking.
- Valve or valve seat grinding required because wear.
- Failure of any parts caused by lack of cooling water, which results from starting power package out of water, foreign material blocking inlets or power package being mounted too high.
- Use of fuels and lubricants that are not suitable for use with or on the product. Refer to your Operation, Maintenance, And Warranty Manual.
- Our limited warranty does not apply to any damage to our products caused by the installation or use of parts and accessories that are not manufactured or sold by us. Failures that are not related to the use of those parts or accessories, are covered under warranty, if they otherwise meet the terms of the limited warranty for that product.

Transferable Warranty

The product warranty is transferable to a subsequent purchaser, but only for the remainder of the unused portion of the limited warranty. This will not apply to products used for commercial applications.

Direct Sale By Owner

- The second owner can be registered as the new owner and retain the unused portion of the limited warranty by sending the former owner's plastic Owner Warranty Registration Card and a copy of the bill of sale to show proof of ownership. In the United States and Canada, mail to:

  Mercury Marine
  Attn: Warranty Registration Department
  W6250 Pioneer Road
  P.O. Box 1939
  Fond du Lac, WI 54935-1939

- A new Owner Warranty Registration Card will be issued with the new owner's name and address. Registration records will be changed on the factory computer registration file.
- There is no charge for this service.

Outside the United States and Canada, please contact the distributor in your country, or the Marine Power International Service Center closest to you, for the transferable warranty procedure that would apply to you.

SECTION 2 - GETTING TO KNOW YOUR POWER PACKAGE

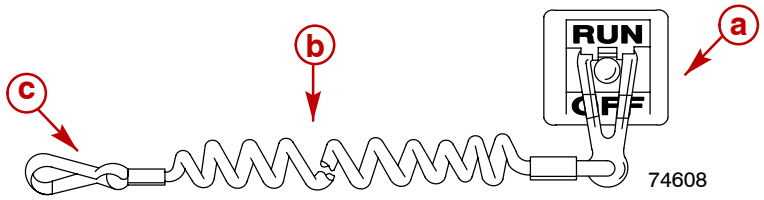
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Features And Controls

Lanyard Stop Switch

The purpose of a lanyard stop switch is to turn off the engine when the operator moves outside the operator's position (as in accidental ejection from the operator's position).



a - Stop switch
b - Lanyard
c - Clips to the operator

Accidental ejections, such as falling overboard, are more likely to occur in:

- low sided sport boats
- bass boats
- high performance boats

Accidental ejections can also occur from:

- poor operating practices
- sitting on the seat or gunwale at planing speeds
- standing at planing speeds
- operating at planing speeds in shallow or obstacle infested waters
- releasing your grip on the steering wheel that is pulling in 1 direction
- consuming alcohol or drugs
- high speed boating maneuvers

Some remote control units are equipped with a lanyard stop switch, if your remote control is not equipped with a lanyard stop switch one can be installed on the dashboard or side adjacent to the operator's position. The lanyard is a cord usually 1.2 - 1.5 m (4 - 5 ft) long when stretched out with an element on 1 end made to be inserted into the switch and a snap on the other end for attaching to the operator. The lanyard is coiled to make it as short as possible to minimize the likelihood of entanglement with nearby objects. It stretches to minimize the likelihood of accidental activation should the operator choose to move around in an area close to the normal operator's position. To shorten the lanyard, wrap it around the operator's wrist or leg, or tie a knot in the lanyard.

Activation of the lanyard stop switch will stop the engine immediately, but the boat will continue to coast for some distance depending upon the velocity and degree of any turn at shut down. However, the boat will not complete a full circle. While the boat is coasting, it can cause injury to anyone in the boat's path as seriously as the boat would when under power.

We strongly recommend that other occupants be instructed on proper starting and operating procedures should they be required to operate the engine in an emergency (e.g. if the operator is accidentally ejected).

⚠ WARNING

Avoid contact with the boat hull and propeller from accidental ejection. Personal injury or death could occur. Always properly connect both ends of the lanyard stop switch.

Accidental or unintended activation of the switch during normal operation is also a possibility. This could cause any, or all, of the following potentially hazardous situations:

- Occupants could be thrown forward due to unexpected loss of forward motion, a particular concern for passengers in the front of the boat who could be ejected over the bow and possibly struck by the gear case or propeller.
- Loss of power and directional control in heavy seas, strong current or high winds.
- Loss of control when docking.

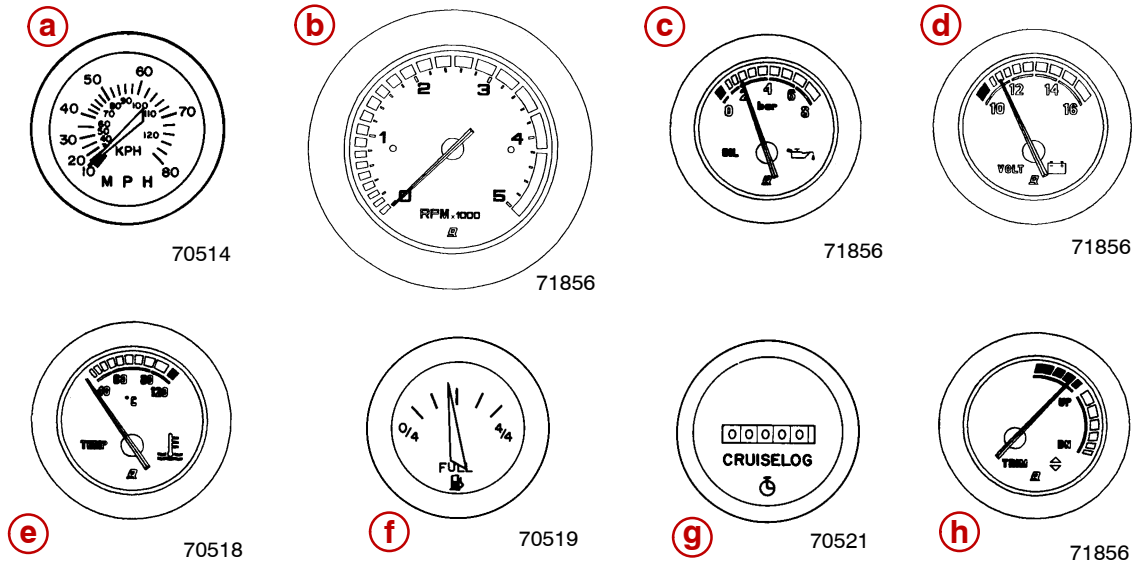
⚠ WARNING

Avoid abrupt deceleration of the boat from lanyard stop switch activation. Boat damage and personal injury or death could occur. NEVER leave the operator's station with the engine operating and in gear.

Instrumentation

INSTRUMENTS

The following is a brief explanation of instrumentation typically found on some boats. The owner/operator should be familiar with all instruments and their functions on the boat. Because of the large variety of instrumentation and manufacturers, you should have your boat dealer explain the particular gauges and normal readings that will appear on your style gauges.



Typical

- **a -** Speedometer
- **b -** Tachometer
- **c -** Oil pressure gauge
- **d -** Battery meter
- **e -** Coolant temperature gauge
- **f -** Fuel gauge
- **g -** Hour meter
- **h -** Power trim gauge

Speedometer: Indicates boat speed.

Tachometer: Indicates engine rpm.

Oil Pressure Gauge: Indicates engine oil pressure.

Battery Meter: Indicates battery voltage.

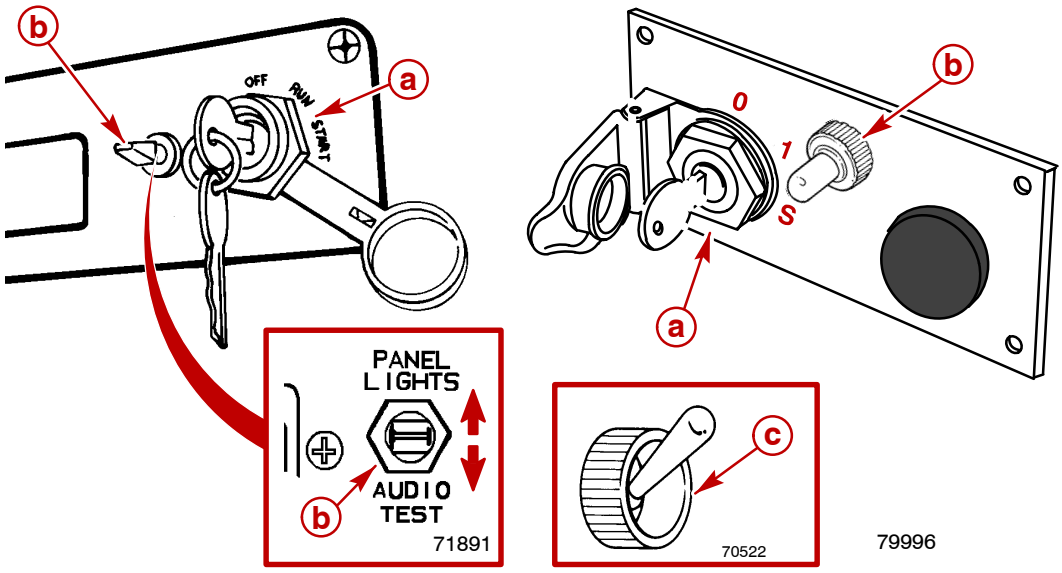
Coolant Temperature Gauge: Indicates engine operating temperature.

Fuel Gauge: Indicates quantity of fuel in tank.

Hour Meter: Records engine operating time.

Power Trim Gauge: Indicates sterndrive unit angle (trim up/out and down/in). Sterndrive Models only.

SWITCHES



Typical switches

a - Key switch
b - Panel lights / audio test switch
c - Bilge blower switch, if equipped

Key Switch - has three positions.

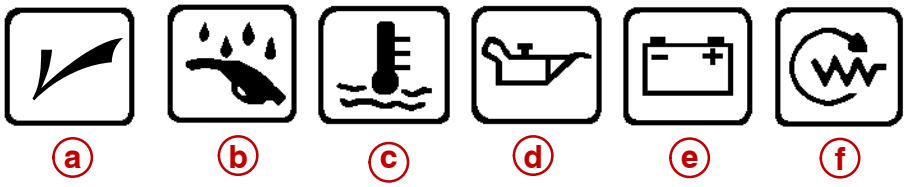
1. OFF - In the OFF position, all electrical circuits are off and engine cannot be started. The engine is stopped when the key switch is turned to the OFF position.
2. RUN - In the RUN position, all electrical circuits, indicator lamps, automatic preheating (if equipped) and all instruments are operational.
3. START - In the START position the engine can be started.

NOTE: *Key can only be removed in the OFF position.*

Panel Lights / Audio Test Switch - has three positions; in the NORMAL position all electrical circuits operate in a standard fashion (as described above). With switch toggled UP the instrumentation lights are all illuminated. When the switch is toggled DOWN the audio warning horn will sound allowing the operator to perform a test of the audio warning horn.

Bilge Blower Switch: Operates bilge blower, if equipped.

ENGINE MONITORING FEATURES



77359

Typical

- **a** - Malfunction indicator lamp
- **b** - Water-in-fuel warning lamp, if equipped
- **c** - Coolant temperature warning lamp
- **d** - Oil pressure warning lamp
- **e** - Charge indicator lamp
- **f** - Preheat indicator lamp, if equipped

The appropriate lamp functions as follows:

Malfunction Indicator Lamp (MIL) - additional lamp indicates when a problem exists, or a malfunction has occurred, that requires service.

Water-In-Fuel Warning Lamp, if equipped - indicates water is present in fuel filter and that fuel filter requires service.

Coolant Temperature Warning Lamp - indicates excessive engine coolant temperature if lamp illuminates while engine is running.

Oil Pressure Warning Lamp - indicates low engine oil pressure if lamp illuminates while engine is running, or low oil level in the gear lube monitor bottle. (See the following note).

NOTE: *The oil pressure warning lamp is wired in a parallel circuit with the gear lube monitor bottle switch. If lamp illuminates while engine is running and oil pressure and oil level are normal, this may be an indication of low oil level in the gear lube monitor bottle. The cause should be determined and corrected.*

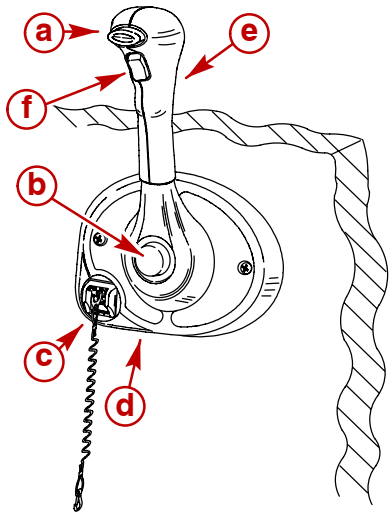
Charge Indicator Lamp - indicates a problem with charging system if lamp illuminates while engine is operating. Lamp will be on when key switch is in RUN and engine is not operating. When engine starts, light should go off.

Preheat Indicator Lamp - indicates when the glow plugs, if equipped, are preheating the combustion chambers. When the engine is cold the timed preheat period begins when the key switch is turned to RUN. The light stays on until the preheat period is complete. The engine can be started only after the light goes out.

Remote Controls

Your boat may be equipped with a Mercury Precision Parts or Quicksilver remote controls. All controls may not have all features shown. Consult your dealer for a description and/or demonstration of your remote control.

PANEL MOUNTED



77019

a - Neutral lock button
b - Throttle only button
c - Lanyard stop switch
d - Control handle throttle friction screw
e - Control handle
f - Trim / tilt button

Neutral Lock Button - Prevents accidental shift and throttle engagement. Neutral lock button must be pushed IN to move the control handle out of NEUTRAL.

Throttle Only Button - Allows engine throttle advancement without shifting the engine. This is done by disengaging the shift mechanism from the control handle. The throttle only button can be depressed only when the remote control handle is in the NEUTRAL position, and should only be used to assist in starting the engine.

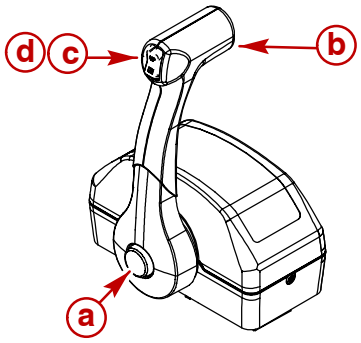
Lanyard Stop Switch - Turns the ignition OFF whenever the operator (when attached to the lanyard) moves far enough away from the operator's position to activate the switch. Refer to Lanyard Stop Switch for information on the use of this switch.

Control Handle Throttle Friction Screw - This screw (located behind the bezel cover) can be adjusted to increase or decrease the tension on the control handle. This will help prevent slipping of the remote control handle. Turn screw clockwise to increase tension and counterclockwise to decrease tension. Adjust to tension desired.

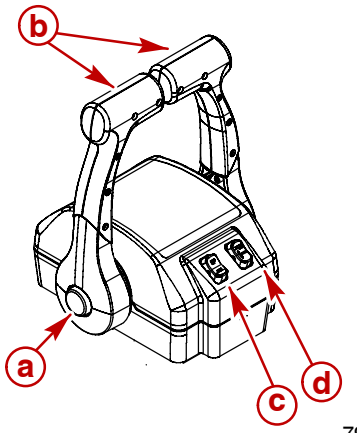
Control Handle - Operation of the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from NEUTRAL with a quick firm motion to the first detent for FORWARD gear. Continue pushing forward to increase speed. Pull the control handle back from NEUTRAL with a quick firm motion to the first detent for REVERSE gear and continue pushing back to increase speed.

Trim/Tilt Button - Refer to Power Trim.

CONSOLE MOUNTED



mc79503



79690

a - Throttle only button
b - Control handles
c - Power Trim switch
d - Trailer switch

Throttle Only Button - Allows engine throttle advancement without shifting the engine. This is done by disengaging the shift mechanism from the control handle. The throttle only button can be depressed only when the remote control handle is in the NEUTRAL position, and should only be used to assist in starting the engine.

Control Handle Tension Adjustment Screw - This screw can be adjusted to increase or decrease the tension on the control handle (cover must be removed to adjust). This will help prevent slipping of the remote control handle. Turn screw clockwise to increase tension and counterclockwise to decrease tension. Adjust to tension desired.

Control Handles - Operation of the the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from NEUTRAL with a quick firm motion to the first detent for FORWARD gear and continue pushing forward to increase speed. Pull the control handle back from NEUTRAL with a quick firm motion to the first detent for REVERSE gear and continue pushing back to increase speed.

Power Trim Switch - See Power Trim section for detailed power trim operating procedures.

Trailer Switch - Used to raise drive unit for trailering, launching, beaching or shallow water operation. On the single remote control handle units, the trailering mode begins with the second click or when the Power Trim/ Trailer Switch is pressed all the way UP. See Power Trim for detailed trailer switch operation.

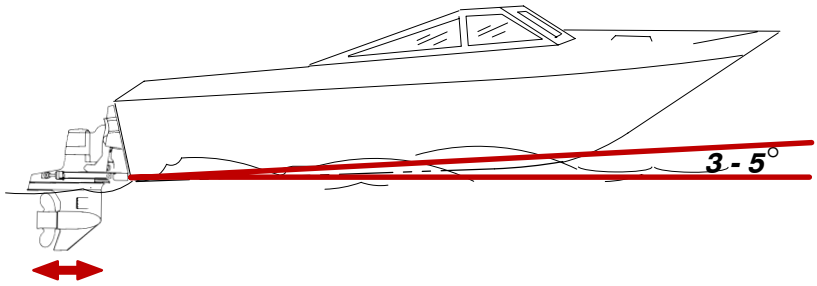
Power Trim

Power Trim allows the operator to adjust the sterndrive angle while underway, to provide the ideal boat angle for varying load and water conditions. Also, the Power Trim system Trailering feature allows the operator to raise and lower the sterndrive unit for trailering, beaching, launching and low speed (below 1200 rpm engine speed), shallow water operation.

⚠ CAUTION

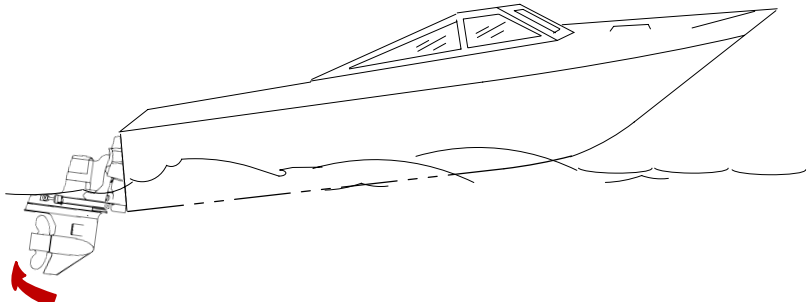
Never trim the sterndrive unit UP/OUT using TRAILER switch while boat is underway at engine speeds above 1200 rpm. Use extreme caution when operating with sterndrive unit raised. Severe damage to the sterndrive unit may result if unit is raised beyond the gimbal ring support flanges at engine speeds above 1200 rpm.

For best performance trim the sterndrive unit so that the boat bottom is at a 3-5 degree angle to the water.



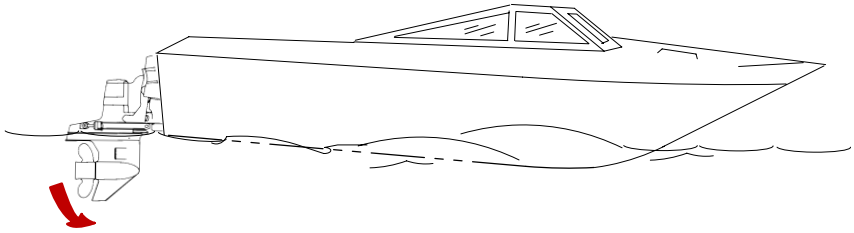
Trimming sterndrive unit UP/OUT can:

- Generally increase top speed
- Increase clearance over submerged objects or a shallow bottom
- Cause boat to accelerate and plane off slower
- In excess, cause boat porpoising (bouncing) or propeller ventilation
- Cause engine overheating if trimmed UP/OUT to a point where any cooling water intake holes are above the water line



Trimming sterndrive unit DOWN/IN can:

- Help the boat accelerate and plane off quicker
- Generally improve the ride in choppy water
- In most cases, reduce boat speed
- If in excess, lower the bow of some boats to a point at which they begin to plow with their bow in the water while on plane. This can result in an unexpected turn in either direction called bow steering or over steering if any turn is attempted or if a significant wave is encountered.



SINGLE ENGINE TRIM/TRAILER

Single engine applications will have a button that can be pressed to trim the sterndrive unit up or down.

To raise the sterndrive unit for trailering, beaching, launching and low speed (below 1200 rpm), shallow water operation push the trim button to raise the sterndrive unit to the full UP/OUT position.

Some controls also have a trailer button that trims the sterndrive to a position suitable for trailer purposes only.

DUAL ENGINE TRIM/TRAILER

⚠ CAUTION

Avoid twisting or binding dual engine tie bars. Damage to the tie bar and sterndrives could occur. ALWAYS raise or lower the sterndrive units evenly.

Dual engine applications may have a single integral button to operate both sterndrive units simultaneously or may have separate buttons for each sterndrive unit.

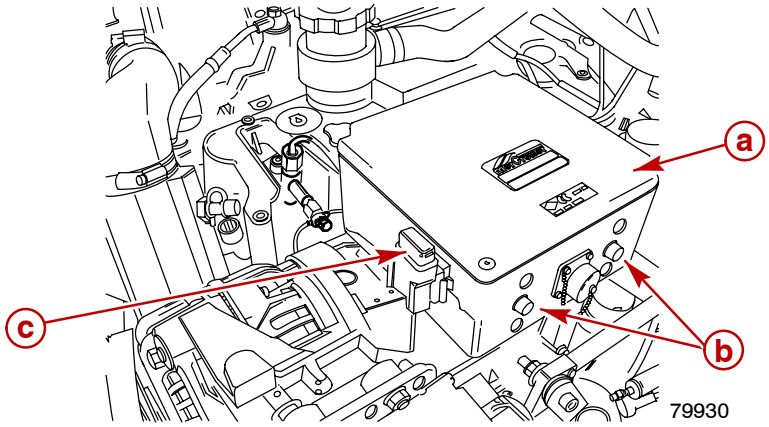
Some controls also have a trailer button that trims the drives to a position suitable for trailer purposes only.

Electrical System Overload Protection

If an electrical overload occurs, a fuse will blow or the circuit breaker will trip open. The cause must be found and corrected before replacing the fuse or resetting the circuit breaker.

NOTE: *In an emergency, when the engine must be operated and the cause for the high current draw cannot be located and corrected, turn OFF or disconnect all accessories connected to the engine and instrumentation wiring. Reset the circuit breaker. If the breaker remains open, the electrical overload has not been eliminated. Further checks must be made on the electrical system. Contact your authorized Cummins MerCruiser Diesel dealer / distributor.*

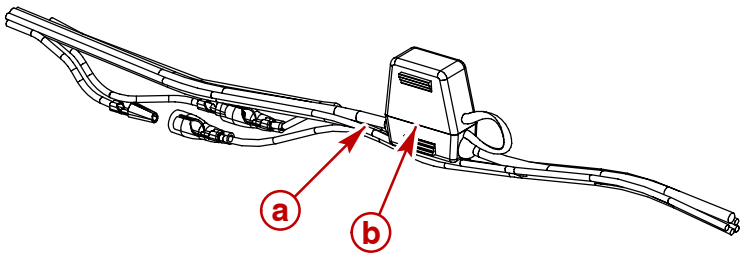
1. Two 60 amp circuit breakers provide protection for engine wiring harness and instrumentation power lead. Reset by pushing RESET button IN (on outside of electrical box).
2. The Engine Control Module (ECM) is protected from overload by a 5 amp in-line fuse inside the electrical box. Additional fuses are located inside the electrical box.



Typical

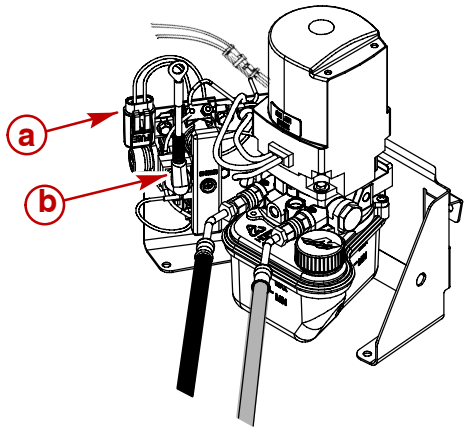
a - Electrical box
b - Circuit breaker
c - ECM fuse

3. A 20 amp. fuse located in-line on key switch power supply wire and protects the instrumentation and wiring should an electrical overload occur. If an overload occurs, the fuse will burn out. Check blown (burned) fuse if key is turned to RUN or START and instruments do not work and/or if switches do not function (and a circuit breaker is not tripped).



a - Key switch power supply wire
b - 20 amp. fuse holder

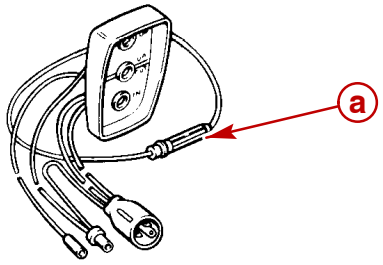
4. The Power Trim System is protected from overload by a 110 amp fuse and a 20 amp in-line fuse on the power trim pump.



79779

a - 20 amp. fuse holder
b - 110 amp. fuse

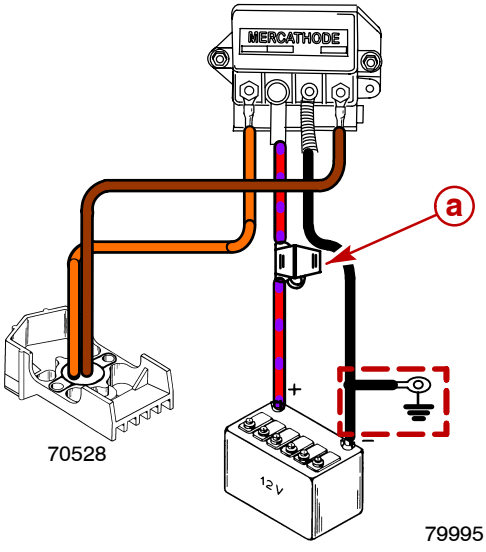
5. The Quicksilver Three-Button Power Trim Control Panel is further protected by a 20 amp in-line fuse.



70527

a - 20 amp. fuse holder

6. The Quicksilver MerCathode System has a 20 amp in-line fuse in the wire which connects to the positive (+) terminal on the controller. If the fuse is blown (burned), the system will not operate resulting in a loss of corrosion protection.



70528
79995

Typical

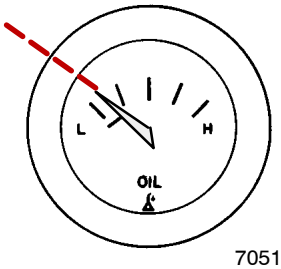
a - 20 amp. fuse holder

Audio Warning System

Your Cummins MerCruiser Diesel power package may be equipped with an Audio Warning System. The Audio Warning System will not protect the engine from damage. It is designed to warn the operator that a problem has occurred.

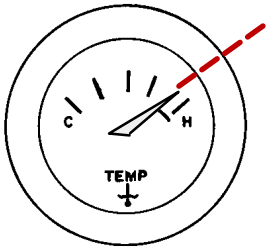
The audio warning system will sound with a continuous alarm if one of the following occurs:

- Engine oil pressure too low
- Coolant temperature too hot
- Sterndrive oil level too low



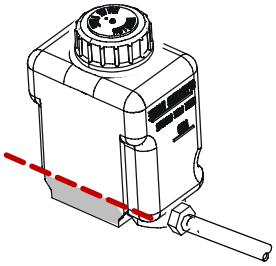
70516

Typical oil pressure gauge



70518

Typical engine temperature gauge



79148

Typical sterndrive oil reservoir

⚠ CAUTION

Operation of the engine after the audio warning system alarm has sounded could result in damage to the power package. Do not operate engine once the alarm has sounded EXCEPT TO AVOID A HAZARDOUS SITUATION.

If the alarm sounds, stop the engine immediately. Investigate the cause and correct it, if possible. If the cause cannot be determined, consult your authorized Cummins MerCruiser Diesel dealer / distributor.

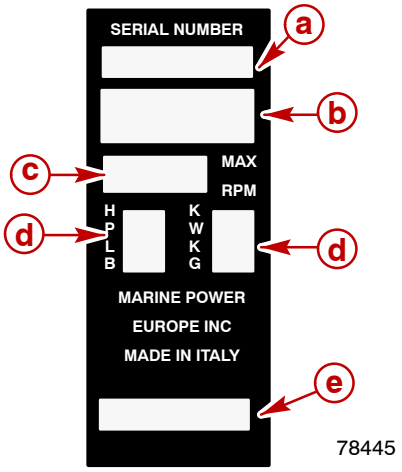
TESTING THE AUDIO WARNING SYSTEM

1. Turn the ignition switch to the ON position without cranking the engine.
2. Engage the audio test switch and hold.
3. Listen for the alarm to sound indicating that the system is functioning correctly.

Emissions Information

Exhaust Gas Emissions Certificate (Europe Only)

A tamper-resistant label is affixed to the engine at time of manufacture by Cummins MerCruiser Diesel. In addition to the required exhaust gas emissions certificate number, the label lists the engine serial number, engine family, maximum rpm, engine power, and weight. Please note that the exhaust gas emissions certification will not affect the fit, function, or performance of the engines. Boatbuilders and Dealers may not remove the label or the part it is affixed to before sale. If modifications are necessary, contact Cummins MerCruiser Diesel about the availability of replacement decals before proceeding.



a - Engine serial number
b - Engine family
c - Maximum rpm
d - Power and weight
e - “IMO” - Exhaust Gas Emissions Certificate Number

Owner Responsibility

The owner/operator is not to modify the engine in any matter that would alter the horsepower or allow exhaust gas emission levels to exceed their predetermined factory specifications.

SECTION 3 - ON THE WATER

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3

Safe Boating Suggestions

In order to safely enjoy the waterways, familiarize yourself with local and all other governmental boating regulations and restrictions and also consider the following suggestions.

- **Know and obey all nautical rules and laws of the waterways.**

Cummins MerCruiser Diesel strongly recommends that all powerboat operators complete a boating safety course. Courses are offered in the U.S.A. by: The U.S. Coast Guard Auxiliary, The Power Squadron, The Red Cross and your state or provincial boating law enforcement agency. Inquiries may be made to the Boating Hotline at 1-800-368-5647 or the Boat U.S. Foundation at 1-800-336-BOAT.

You should also review the NMMA Sources of Waterway Information booklet. It lists regional sources of safety, cruising and local navigation and is available at no charge by writing to:

Sources of Waterway Information
National Marine Manufacturers Association
410 N. Michigan Avenue
Chicago, IL 60611 U.S.A.

- **Perform safety checks and required maintenance.** Follow a regular schedule and ensure that all repairs are properly made.
- **Check safety equipment on board.** Here are some suggestions of the types of safety equipment to carry when boating:

Approved fire extinguishers	Paddle or oar
Signal devices: flashlight, rockets or flares, flag and whistle or horn	Spare propeller, thrust hubs, and an appropriate wrench
Tools necessary for minor repairs	First aid kit and instructions
Anchor and extra anchor line	Water-proof storage containers
Manual bilge pump and extra drain plugs	Spare operating equipment, batteries, bulbs and fuses
Drinking water	Compass and map or chart of the area
Transistor radio	

- **Watch for signs of weather change and avoid foul weather and rough-sea boating.**
- **Tell someone where you are going and when you expect to return.**
- **Passenger boarding.** Stop the engine whenever passengers are boarding, unloading or are near the back (stern) of the boat. Shifting the drive unit into neutral is not sufficient.
- **Use personal flotation devices.** Federal Law requires that there be a U. S. Coast Guard approved, wearable-type life jacket (personal flotation device), correctly sized and readily accessible for every person on board, plus a throwable cushion or ring. We strongly advise that everyone wear a life jacket at all times while in the boat.
- **Prepare other boat operators.** Instruct at least 1 person on board in the basics of starting and operating the engine and boat handling in case the driver becomes disabled or falls overboard.
- **Do not overload your boat.** Most boats are rated and certified for maximum load (weight) capacities (refer to your boat capacity plate). Know your boat's operating and loading limitations. Know if your boat will float if full of water. When in doubt, contact your authorized Cummins MerCruiser Diesel dealer / distributor or the boat manufacturer.
- **Ensure that everyone in the boat is properly seated.** Do not allow anyone to sit or ride on any part of the boat that was not intended for such use. This includes the backs of seats, gunwales, transom, bow, decks, raised fishing seats and any rotating fishing seat; anywhere that sudden unexpected acceleration, sudden stopping, unexpected loss of boat control or sudden boat movement could cause a person to be thrown overboard or into the boat. Ensure that all passengers have a proper seat and are in it before any boat movement.
- **Never be under the influence of alcohol or drugs while boating (it is the law).** They impair your judgment and greatly reduce your ability to react quickly.

- **Know your boating area and avoid hazardous locations.**
- **Be alert.** The operator of the boat is responsible by law to “maintain a proper lookout by sight and hearing.” The operator must have an unobstructed view particularly to the front. No passengers, load or fishing seats should block the operators view when operating the boat above idle or planing transition speed. Watch out for others, the water and your wake.
- **Never drive your boat directly behind a water skier in case the skier falls.** As an example, your boat traveling at 40 km/h (25 mph) will overtake a fallen skier who was 61 m (200 ft) in front of you in 5 seconds.
- **Watch fallen skiers.** When using your boat for water skiing or similar activities, always keep a fallen or down skier on the operator’s side of the boat while returning to attend to the skier. The operator should always have the down skier in sight and never back up to the skier or anyone in the water.
- **Report accidents.** Boat operators are required by law to file a Boating Accident Report with their state boating law enforcement agency when their boat is involved in certain boating accidents. A boating accident must be reported if (1) there is loss of life or probable loss of life, (2) there is personal injury requiring medical treatment beyond first aid, (3) there is damage to boats or other property where the damage value exceeds $500.00 or (4) there is complete loss of the boat. Seek further assistance from local law enforcement.

Be Alert To Carbon Monoxide Poisoning

Carbon monoxide is present in the exhaust fumes of all internal combustion engines including the outboards, sterndrives and inboard engines that propel boats, as well as the generators that power various boat accessories. Carbon monoxide is a deadly gas that is odorless, colorless and tasteless.

Early symptoms of carbon monoxide poisoning, which should not be confused with seasickness or intoxication, include headache, dizziness, drowsiness and nausea.

⚠ WARNING

Avoid prolonged exposure to carbon monoxide. Carbon monoxide poisoning can lead to unconsciousness, brain damage or death. Ensure that the boat, while at rest or underway, is well ventilated.

GOOD VENTILATION

Ventilate the passenger area by opening the side curtains or forward hatches to remove fumes.



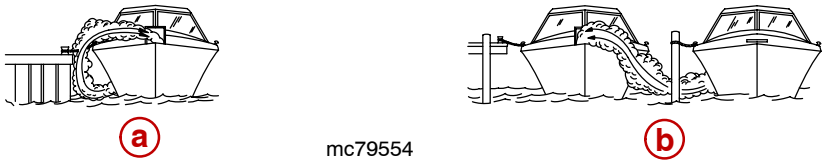
mc79553 Courtesy of ABYC

Example of desired air flow through the boat

POOR VENTILATION

Under certain conditions, permanently enclosed or canvas enclosed cabins or cockpits with insufficient ventilation may draw in carbon monoxide. Install one or more carbon monoxide detectors in your boat.

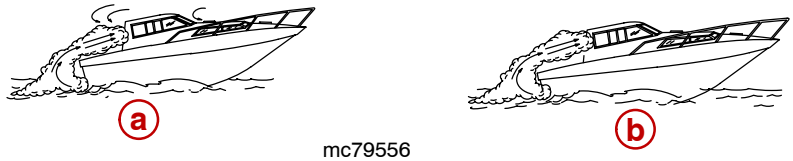
Although the occurrence is rare, on a very calm day, swimmers and passengers in an open area of a stationary boat that contains or is near an operating engine may be exposed to a hazardous level of carbon monoxide.



mc79554 Courtesy of ABYC

Example of poor ventilation while a boat is stationary:

a - Operating the engine when the boat is moored in a confined space.
b - Mooring close to another boat with its engine operating.



mc79556 Courtesy of ABYC

Example of poor ventilation while a boat is moving:

a - Operating the boat with the trim angle of the bow too high.
b - Operating the boat with no forward hatches open (station wagon effect).

Basic Boat Operation

Launching And Boat Operation Care

⚠ CAUTION

To avoid possible ingestion of water that can damage engine components:

- **Do not turn the ignition key off when the engine is above idle speed.**
- **When launching your boat from a steep ramp, enter the water slowly.**
- **Do not use the lanyard stop switch to shut off the engine above idle speed.**
- **When coming off plane, if a large following wave may roll over the boat's transom, apply a short, light burst of throttle to minimize the wave action against the stern of the boat.**
- **Do not come off plane quickly, shift into reverse and shut off engine.**

IMPORTANT: Install bilge drain plug prior to launching boat.

Duty Cycle Rating

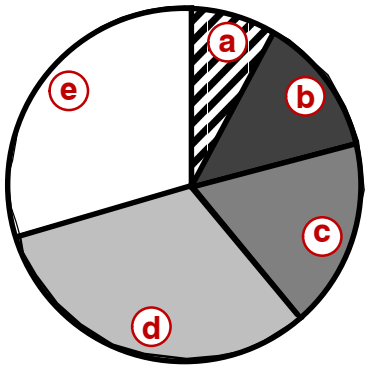
IMPORTANT: Damage caused by improper application or failure to operate the power package within the specified operating parameters, will not be covered by the Cummins MerCruiser Diesel Limited Warranty.

It is the responsibility of the boat manufacturer and/or the installing dealer to ensure that the power package is properly applied. In all cases, the power package must be equipped with a propeller that will allow the engine to operate at wide open throttle (WOT) at the Rated Engine rpm.

PLEASURE DUTY RATING

The Pleasure Duty Rating applies to recreational planing craft used exclusively for pleasure and recreation. Typical applications include pleasure craft such as sailboats, ski boats, runabouts, speedboats, and other planing hulls. Application must conform to the Pleasure Craft / Recreational duty cycle shown (EPA Mode Number Cycle 5 / ICOMIA 83-28 Duty Cycle).

EPA Mode Number Cycle 5 / ICOMIA 83-28 Duty Cycle	Modes				
	1	2	3	4	5
Engine Speed (Percent of WOT)	100	91	80	63	Idle
Engine Power (Percent of Total)	100	75	50	25	0
Time At Given Mode (Percent Of Total Operating Time)	8	13	17	32	30



79175

Chart showing full power operation is limited to a maximum of 1 of 12 hours

- **a** - Mode 1: 1.0 hour (8 percent)
- **b** - Mode 2: 1.5 hours (13 percent)
- **c** - Mode 3: 2.0 hours (17 percent)
- **d** - Mode 4: 4.0 hours (32 percent)
- **e** - Mode 5: 3.5 hours (30 percent)

Operation Chart - 2.8 ES

STARTING PROCEDURE	AFTER STARTING	WHILE UNDERWAY	STOPPING & SHUT DOWN
Open engine hatch. Air out bilge completely.	Observe all gauges and warning lights to check condition of engine. If not normal, stop engine.	Frequently observe all gauges and indicator lights to monitor engine condition.	Shift remote control lever to neutral position.
Turn battery switch ON, if so equipped.	Check for fuel, oil, water, fluid, and exhaust leaks, etc.		Operate engine at idle speed several minutes to allow the turbocharger and engine to cool.
Turn on and run engine compartment bilge blower, if so equipped, for five minutes.	Check shift and throttle control operation.		Turn key switch to OFF position.
Check for leaks - fuel, oil, water, fluid, etc.	Check steering operation.		Turn battery switch, if so equipped, to OFF.
Open fuel shutoff valve, if so equipped.			Close fuel shutoff valve, if so equipped.
Open seacock, if so equipped.			Close seacock, if so equipped.
Prime fuel injection system, if necessary.			Flush seawater cooling circuit, if operating in saltwater area.
Turn key switch to RUN and check that lights and indicator lamps come on.			
Turn key switch to START, *after* the indicator lamp for glow plugs (if so equipped) ceases. Release key when engine starts.			
Check that charge indicator and oil pressure indicator lamps cease AFTER engine starts.			
Warm-up engine at idle rpm for several minutes.			

Starting, Shifting and Stopping - 2.8 ES

⚠ WARNING

Do not use volatile starting aids, such as Ether, Propane, or Gasoline in the engine air intake system. Explosion hazard resulting from ignition of vapors by glow plugs could cause severe personal injury and engine damage.

⚠ CAUTION

It is good practice to ventilate the engine compartment prior to servicing any engine components to remove any fuel vapors which may cause difficulty breathing or be an irritant.

BEFORE STARTING THE ENGINE

⚠ CAUTION

Do not operate engine without water flowing thru seawater pickup pump, as pump impeller may be damaged and subsequent overheating damage to engine or drive unit may result.

IMPORTANT: Observe the following before starting:

- **Provide water to the seawater pickup pump.**
- **Never operate the starter motor longer than 15 seconds at a time, to avoid overheating the starter motor. If engine does not start, wait 1 minute to allow the starter motor to cool; then, repeat starting procedure.**
- **Ensure engine crankcase is filled to correct level with the proper grade of oil for the prevailing temperature. Refer to Specifications - Engine Oil.**
- **Ensure all electrical connections are secure.**
- **Check the air cleaner for proper installation of filter element.**

1. Check all items listed in the Maintenance Schedules and Operation Chart. Refer to Table Of Contents.
2. Perform any other necessary checks, as indicated by your dealer, or specified in your boat owner's manual.

STARTING A COLD ENGINE

IMPORTANT: Always check fluid levels before starting the engine. Refer to the Section 5 - Maintenance Schedule.

1. Turn on and run engine compartment bilge blower, if equipped, for five minutes. Or, open the engine hatch to air out bilge before attempting to start engine.
2. Place drive unit in full DOWN/IN position.
3. Place control handle in NEUTRAL.
4. If the engine has not been run for a period of time and will not readily start with the standard starting procedure, there is a hand pump/primer knob located on the engine to improve initial fuel supply. Refer to **Section 5 - Fuel System, Priming** and follow the instructions given.
5. Turn the key switch to the RUN position to activate the glow plugs. Observe indicator lamp for glow plugs, if equipped. When cylinder temperature is great enough to sustain combustion, the indicator lamp will go off. The engine should be started only after the preheat indicator lamp goes off.

⚠ CAUTION

Do not attempt to engage the starter while the engine is running as this will lead to starter pinion and ring gear damage.

6. Turn key switch to START position. Release the key and allow the switch to return to RUN position when the engine starts.
7. After starting, ensure that the charge indicator and the oil pressure warning lamps are off.

⚠ CAUTION

Do not increase the engine speed until the oil pressure gauge indicates normal. Shut the engine down if oil pressure does not register on the gauge within 20 to 30 seconds after start.

IMPORTANT: Within seconds after starting the engine, the oil pressure should exceed 10 psi (69 kPa) minimum. If the oil pressure does not meet these minimum limits, stop the engine, locate and correct the problem, or see your authorized Cummins MerCruiser Diesel dealer or distributor if you are unable to determine the problem.

8. Observe the oil pressure gauge immediately after the engine starts.
9. Ensure that all instrumentation is functioning properly and indicating normal readings.

ENGINE WARM UP

⚠ CAUTION

Improper engine warm-up or no engine warm-up can seriously impair the life of your diesel engine. Ensure the the engine coolant temperature has warmed to within the normal operating range before applying full load.

1. After starting, ensure all instrumentation is functioning properly.
2. Operate engine for 1 or 2 minutes at fast IDLE (1000-1500 rpm). It is very important that any engine be warmed up before applying full load. The warm-up period provides time for the lubricating oil to establish a film between moving parts.

NOTE: *Engine warm-up time during cold weather can be reduced by operating vessel at reduced engine speed. Commence normal vessel operation when systems reach operating temperatures.*

3. After the engine has reached operating temperature:
   a. Oil pressure should be within range listed in the engine specifications chart. Stop the engine if oil pressure is not within this range.
   b. Check the fuel system for leakage from the injection pump, fuel pipes, fuel filter and fuel lines.
   c. Check for oil leakage. Check the engine and sterndrive unit for oil leakage. Especially check the oil filter, oil lines, oil line connectors, and oil pan.
   d. Check for coolant leaks. Check coolant hoses and connection pipes of heat exchanger, fluid coolers, intercooler, water pump and drain fittings.

4. Locate and correct any problems, or see your Cummins MerCruiser Diesel dealer / distributor if you are unable to determine the problem.

STARTING A WARM ENGINE

1. Turn on and run the engine compartment bilge blower, if equipped, for five minutes. Or, open the engine hatch to air out bilge before attempting to start engine.
2. Place the remote control handle in NEUTRAL.
3. Turn the key switch to the RUN position.
4. Turn key switch to START position. Release the key and allow the switch to return to RUN position when the engine starts.
5. After starting, ensure that the charge indicator and the oil pressure warning lamps are off.
6. Ensure that all instrumentation is functioning properly and indicating normal readings.

SHIFTING

⚠ CAUTION

Avoid damage to the sterndrive unit. Shifting the sterndrive unit at rpms greater than idle rpm may cause internal damage to the sterndrive unit. Shift the sterndrive unit only when the engine is at idle rpm.

1. Ensure the remote control / shift lever is in NEUTRAL.
2. To shift the sterndrive unit, move the remote control / shift lever with a firm, quick motion forward to shift to FORWARD gear, or backward to shift to REVERSE.
3. After shifting drive unit, advance throttle to desired setting.

IMPORTANT: Avoid stopping the engine if the sterndrive unit is in gear. If the engine does stop with the sterndrive unit in gear, refer to the following procedure:

4. Push and pull repeatedly on the remote control handle until handle returns to the neutral detent position. This may take several tries if the power package was operating above idle rpm when the engine stopped.
5. After handle returns to the neutral detent position, resume normal starting procedures.

ENGINE SHUT-DOWN (STOPPING)

1. Place remote control lever in NEUTRAL.

⚠ CAUTION

Avoid damaging the turbocharger and engine. Immediate engine shutdown (stopping) after high load operation may result in permanent turbocharger bearing damage. Operate the engine at IDLE for several minutes before shut-down.

2. Operate the engine at idle speed for several minutes to allow the turbocharger and engine to cool.
3. Turn key switch to the OFF position.

Starting The Engine After Stopped While In Gear

IMPORTANT: Avoid stopping the engine if the sterndrive unit is in gear. If the engine does stop, refer to the following procedure:

1. Push and pull repeatedly on the remote control handle until handle returns to the NEUTRAL/IDLE position. This may take several tries if the power package was operating above idle rpm when the engine stopped.
2. After the handle returns to the NEUTRAL/IDLE position, resume normal starting procedures.

Trailering The Boat

Your boat can be trailered with the sterndrive unit in the UP or DOWN position. Adequate clearance is required between the road and sterndrive when transporting.

If adequate road clearance is a problem, place the sterndrive unit in full trailer position and support it with an optional trailer kit which is available from your authorized Cummins MerCruiser Diesel dealer / distributor.

Freezing Temperature And Cold Weather Operation

IMPORTANT: If boat is operated during periods of freezing temperature, precautions must be taken to prevent freezing damage to power package. Damage caused by freezing IS NOT covered by Cummins MerCruiser Diesel Limited Warranty.

⚠ CAUTION

Seawater (raw water) section of cooling system MUST BE COMPLETELY drained for winter storage or immediately after cold weather use, if the possibility of freezing temperatures exist. Failure to comply may result in trapped water causing freeze and/or corrosion damage to engine.

In order to operate the engine in temperatures of 0 degrees C (32 degrees F) or lower, observe the following instructions:

- At the end of each daily operation, COMPLETELY drain seawater section of cooling system to protect against damage by freezing.
- At the end of each daily operation, drain water from water separator, if equipped. Fill fuel tank at end of daily operation to prevent condensation.
- Use required permanent-type antifreeze solution to protect components against damage by freezing.
- Be sure to use proper cold weather lubrication oil, and be sure the crankcase contains a sufficient amount.
- Make certain that the battery is of sufficient size and is fully charged. Check that all other electrical equipment is in optimum condition.
- At temperatures of – 20 degrees C (–4 degrees F) and below, it is recommended that you use a coolant heater to improve cold starting.
- If operating in arctic temperatures of – 29 degrees C (–20 degrees F) or lower, consult your Cummins MerCruiser Diesel dealer / distributor for information about special cold weather equipment and precautions.

Refer to **Section 6** for Cold Weather (Freezing Temperatures), Seasonal Storage, or Extended Storage related information. Refer to **Section 5 - Maintenance** for draining instructions.

Drain Plug and Bilge Pump

The engine compartment in your boat is a natural place for water to collect. For this reason, boats are normally equipped with a drain plug and/or a bilge pump. It is very important to check these items on a regular basis to ensure that the water level does not come into contact with your power package. Components on your engine will be damaged if submerged. Damage caused by submersion is not covered by the Cummins MerCruiser Diesel Limited Warranty.

Protecting People In The Water

While You Are Cruising

It is very difficult for a person standing or floating in the water to take quick action to avoid a boat heading in his/her direction even at slow speed.

Always slow down and exercise extreme caution any time you are boating in an area where there might be people in the water.

Whenever a boat is moving (coasting) in NEUTRAL/IDLE, there is sufficient force by the water on the propeller to cause the propeller to rotate. This neutral propeller rotation can cause serious injury.

While Boat Is Stationary

⚠ WARNING

Stop your engine immediately whenever anyone in the water is near your boat. Serious injury to the person in the water is likely if contacted by a rotating propeller, a moving boat, a gear case or any solid device rigidly attached to a moving boat or gear case.

Shift into the NEUTRAL/IDLE position and shut off the engine before allowing people to swim or be in the water near your boat.

High-Speed And High-Performance Boat Operation

If your boat is considered a high-speed or high-performance boat with which you are unfamiliar, we recommend that you never operate it at its high speed capability without first requesting an initial orientation and demonstration ride with your dealer or an operator experienced with your boat. For additional information, refer to ***Hi-Performance Boat Operation*** booklet (90-849250-R2) from your authorized Cummins MerCruiser Diesel dealer or distributor.

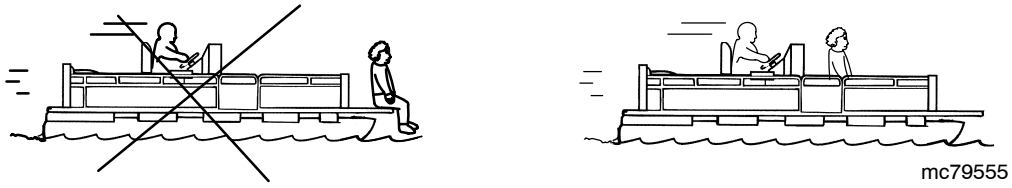
Passenger Safety Message - Pontoon And Deck Boats

⚠ WARNING

Avoid serious injury or death from falling over the front end of a pontoon or deck boat and coming in contact with the boat hull or propeller. Stay back from the front end of the deck and remain seated while the boat is in motion.

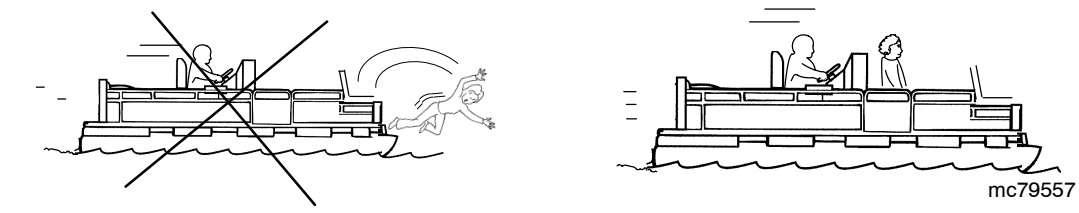
Whenever the boat is in motion, observe the location of all the passengers. Do not allow any passengers to stand or use seats other than those designated for traveling faster than idle speed. A sudden reduction in boat speed, such as the result of plunging into a large wave or wake, a sudden throttle reduction or a sharp change of boat direction, could throw them over the front of boat. Falling over the front of the boat between the two pontoons will position them to come into contact with the drive unit.

1. **Boats having an open front deck:**
   a. No one should ever be on the deck in front of the fence while the boat is in motion. Keep all passengers behind the front fence or enclosure.
   b. Persons on the front deck could easily be thrown overboard or persons dangling their feet over the front edge could get their legs caught by a wave and pulled into the water.



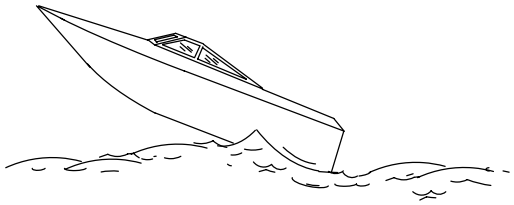
Incorrect **Correct**

2. **Boats with front-mounted, raised pedestal fishing seats:**
   a. These elevated fishing seats are not intended for use when the boat is traveling faster than idle or trolling speed. Sit only in seats designated for traveling at faster speeds.
   b. Any unexpected sudden reduction in boat speed could result in the elevated passenger falling over the front of the boat.



Incorrect **Correct**

Wave And Wake Jumping



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⚠ WARNING

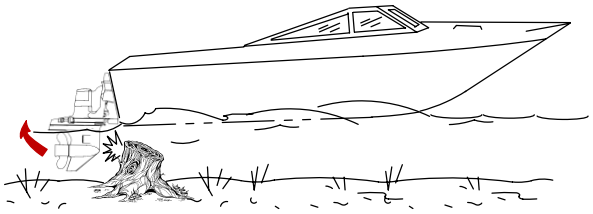
Avoid serious injury or death from being thrown within or out of a boat when it lands after jumping a wave or wake. Avoid wave or wake jumping whenever possible. Instruct all occupants that if a wake or wave jump occurs, get low and hang on to a boat hand hold.

Operating recreational boats over waves and wakes is a natural part of boating. However, when this activity is done with enough speed to force the boat hull partially or completely out of the water, certain hazards arise, particularly when the boat re-enters the water.

The primary concern is the boat changing direction while in the midst of the jump. In such cases the landing may cause the boat to violently veer in a new direction. Such a sharp change in direction or turn can cause occupants to be thrown out of their seats or out of the boat.

There is another less common hazardous result from allowing your boat to launch off of a wave or wake. If the bow of your boat pitches down far enough while airborne, upon water contact it may penetrate under the water surface and submarine for an instant. This will bring the boat nearly to a stop in an instant and can send the occupants flying forward. The boat may also veer sharply to one side.

Impact With Underwater Hazards



Reduce speed and proceed with caution whenever you're driving a boat in shallow water or in areas where the waters are suspected of having underwater obstacles that could be struck by the underwater drive components, rudder or the boat bottom.

IMPORTANT: The most important thing you can do to help reduce injury or impact damage from striking a floating or underwater object is control the boat speed. Under these conditions, boat speed should be kept to a maximum speed of 24 to 40 km/h (15 to 25 MPH).

Striking a floating/underwater object may result in an infinite number of situations. Some of these situations could result in the following:

- The boat could move suddenly in a new direction. Such a sharp change in direction or turn can cause occupants to be thrown out of their seats or out of the boat.
- A rapid reduction in speed. This will cause occupants to be thrown forward, even out of the boat.
- Impact damage to the underwater drive components, rudder and/or boat.

Keep in mind, one of the most important things you can do to help reduce injury or impact damage in these situations is control the boat speed. Boat speed should be kept to a minimum planing speed when driving in waters known to have underwater obstacles.

After striking a submerged object, stop the engine as soon as possible and inspect the drive system for any broken or loose parts. If damage is present or suspected, the power package should be taken to an authorized Cummins MerCruiser Diesel dealer / distributor for a thorough inspection and necessary repair.

The boat should be checked for hull fractures, transom fractures and water leaks.

Operating with damaged underwater drive components, rudder or boat bottom could cause additional damage to other parts of the power package, or could affect control of the boat. If continued operation is necessary, do so at greatly reduced speeds.

⚠ WARNING

Avoid serious injury or death from loss of boat control. Continued boating with major impact damage can result in sudden component failure with or without subsequent impacts. Have the power package thoroughly inspected and any necessary repairs made.

Drive Unit Impact Protection

The power trim hydraulic system is designed to provide impact protection for the sterndrive unit. If a submerged object is struck while the boat is moving forward, the hydraulic system will cushion the kickup of the sterndrive unit as it clears the object, reducing damage to the unit. After the sterndrive unit has cleared the object, the hydraulic system allows the sterndrive unit to return to its original operating position, preventing loss of steering control and engine overspeed.

Use extreme caution when operating in shallow water or where underwater objects are known to be present. No impact protection is provided in REVERSE, use extreme care to prevent striking submerged objects while operating in REVERSE.

IMPORTANT: Impact protection system cannot be designed to ensure total protection from impact damage under all conditions.

Conditions Affecting Operation

Weight Distribution (Passengers And Gear) Inside The Boat

Shifting weight to rear (stern):

- Generally increases speed and engine rpm
- Causes bow to bounce in choppy water
- Increases danger of following wave splashing into the boat when coming off plane
- At extremes, can cause the boat to porpoise

Shifting weight to front (bow):

- Improves ease of planing
- Improves rough water ride
- At extremes, can cause the boat to veer back and forth (bow steer)

Bottom Of Boat

To maintain maximum speed, the boat bottom should be:

- Clean, free of barnacles and marine growth
- Free of distortion; nearly flat where it contacts the water
- Straight and smooth, fore and aft

Marine vegetation may accumulate when the boat is docked. This growth must be removed before operation; it may clog the water inlets and cause the engine to overheat.

Cavitation

Cavitation occurs when water flow cannot follow the contour of a fast-moving underwater object, such as a gear housing or a propeller. Cavitation permits the propeller to speed up, but the boat speed to reduce. Cavitation can seriously erode the surface of the gear housing or the propeller. Common causes of cavitation are:

- Weeds or other debris snagged on the propeller
- Bent propeller blade
- Raised burrs or sharp edges on the propeller

Ventilation

Ventilation is caused by surface air or exhaust gases that are introduced around the propeller resulting in propeller speedup and a reduction in boat speed. Excessive ventilation is annoying and usually caused by:

- Drive unit trimmed out too far
- A missing propeller diffuser ring
- A damaged propeller or gear housing, which allows exhaust gases to escape between propeller and gear housing
- Drive unit installed too high on transom

Elevation And Climate

NOTE: *Engines equipped with an Engine Control Module (ECM) reduce the effects of changes in elevation and climate by automatically adjusting fuel flow for weather conditions and elevation. ECM controlled engines however, do not compensate for increased loading or hull conditions.*

NOTE:

Elevation and climate changes will affect the performance of your power package. Loss of performance can be caused by:

- Higher elevations
- Higher temperatures
- Low barometric pressures
- High humidity

For you to have optimum engine performance under changing weather conditions, it is essential that the engine be propped to allow the engine to operate at or near the top end of the Rated Engine rpm with a normal boat load during your normal boating weather conditions.

In most cases, performance can be regained by changing to a lower pitch propeller.

Propeller Selection

⚠ CAUTION

The installed propeller must allow the engine to run at the Rated Engine rpm at WOT to avoid engine damage. Using a propeller that causes the engine to operate below the Rated Engine rpm can cause piston and/or valve damage (even if the engine is not operated at WOT). Conversely, using a propeller that allows engine to operate above the specified Rated Engine rpm can increase fuel consumption and wear and will not allow engine to produce its rated horsepower.

It is the responsibility of the boat manufacturer and/or the selling dealer to equip the power package with the correct propellers.

IMPORTANT: The engines covered in this manual are equipped with an ECM that limits engine rpm. Be sure that propeller being used does not allow engine to run against the limiter, as a significant loss in performance will result.

NOTE: *Use an accurate service tachometer to verify rpm.*

Select a propeller that will allow the engine power package to operate at the Rated Engine rpm with a full load.

If full throttle operation is below the Engine Rated rpm, the propeller must be changed to prevent loss of performance and possible engine damage. On the other hand, operating an engine above the Rated Engine rpm will cause higher than normal wear and/or damage.

After initial propeller selection, the following common problems may require that the propeller be changed to a lower pitch:

- Warmer weather and greater humidity cause an rpm loss (not as significant on these models).
- Operating in a higher elevation causes an rpm loss (not as significant on these models).
- Operating with a damaged propeller or dirty boat bottom causes an rpm loss.
- Operating with increased load (additional passengers, pulling skiers).

For better acceleration, such as is needed for water skiing, use the next lower pitch propeller. Do not operate at full throttle when using the lower pitch propeller but not pulling skiers.

Getting Started

Initial Break-In Procedure

It is especially important that the following procedure be used on new diesel engines. This break-in procedure allows the proper seating of the pistons and rings, which greatly reduces the likelihood of problems.

IMPORTANT: It is recommended that the boat not be accelerated hard until this procedure has been completed.

IMPORTANT: Never operate the starter motor longer than 15 seconds at a time, to avoid overheating the starter motor. If engine does not start, wait 1 minute to allow the starter motor to cool; then, repeat starting procedure.

1. Refer to appropriate Starting, Shifting and Stopping section and start the engine. Operate the engine at a fast idle until it has reached normal operating temperature.
2. Operate the engine in gear for 3 minutes at each of the following rpms: 1200 rpm, 2400 rpm and 3000 rpm.
3. Operate the engine in gear for 3 minutes at each of the following rpms: 1500 rpm, 2800 rpm and 3400 rpm.
4. Operate the engine in gear for 3 minutes at each of the following rpms: 1800 rpm, 3000 rpm and Maximum Rated Full Throttle rpm.

Sterndrive Unit 10-Hour Break-In Period

It is especially important that the following procedure be used on new sterndrive units. This break-in procedure allows the proper seating of drive unit gears and related components, which greatly reduces the likelihood of problems.

1. Avoid full throttle starts.
2. Do not operate at any one constant speed for extended periods of time.
3. Do not exceed 75 percent of full throttle during the first 5 hours. During the next 5 hours, operate at intermittent full throttle.
4. Drive unit should be shifted into forward gear a minimum of 10 times during break-in, with run-in time at moderate rpm after each shift.

20-Hour Break-In Period

IMPORTANT: The first 20 hours of operation is the engine break-in period. Correct break-in is essential to obtain minimum oil consumption and maximum engine performance. During this break-in period, the following rules must be observed:

- Do not operate below 1500 rpm for extended periods of time for the first 10 hours. Shift into gear as soon as possible after starting and advance the throttle above 1500 rpm **if conditions permit safe operation.**
- Do not operate at one speed consistently for extended periods.
- Do not exceed 3/4 throttle during the first 10 hours. During the next 10 hours, occasional operation at full throttle is permissible (5 minutes at a time maximum).
- Avoid full throttle acceleration from IDLE speed.
- Do not operate at full throttle until the engine reaches normal operating temperature.
- Frequently check engine oil level. Add oil as needed. It is normal for oil consumption to be high during the break-in period.
- AT END OF 20-HOUR break-in period, remove break-in oil and replace oil filter. Fill the engine with the correct grade and viscosity oil.

After Break-In Period

To help extend the life of your Cummins MerCruiser Diesel power package, the following recommendations should be considered:

- Use a propeller that allows the engine to operate at the Rated Engine rpm at WOT when at full throttle with a full boat load. Refer to Specifications and Maintenance.
- Operation at 3/4 throttle setting or lower is recommended. Refrain from prolonged operation at WOT rpm.

End of First Season Checkup

At the end of the first season of operation, contact an authorized Cumins MerCruiser Diesel dealer / distributor to discuss and/or perform scheduled maintenance items. If you are in an area where the product is operated continuously, year-round, you should contact your dealer at the end of the first 100 hours of operation or once yearly, whichever occurs first.

NOTES:

SECTION 4 - SPECIFICATIONS

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4

Fuel Requirements

⚠ WARNING

Electrical system components on this engine are not external ignition protected. DO NOT STORE OR UTILIZE GASOLINE ON BOATS EQUIPPED WITH THESE ENGINES, UNLESS PROVISIONS HAVE BEEN MADE TO EXCLUDE GASOLINE VAPORS FROM ENGINE COMPARTMENT (REF: 33 CFR). Failure to comply could result in fire, explosion and/or severe personal injury.

⚠ WARNING

FIRE HAZARD: Fuel leakage from any part of the fuel system can be a fire hazard which can cause serious bodily injury or death. Careful periodic inspection of entire fuel system is mandatory, particularly after storage. All fuel components including fuel tanks, whether plastic, metal or fiberglass, fuel lines, primers, fittings, and fuel filters should be inspected for leakage, soften, hardening, swelling or corrosion. Any sign of leakage or deterioration requires replacement before further engine operation.

⚠ WARNING

Under *no circumstances* should gasoline, gasohol and/or alcohol be mixed with diesel fuel for any reason. This mixture of gasoline, gasohol and/or alcohol with diesel fuel is highly flammable and produces a significant risk to the user.

IMPORTANT: Use of improper or water contaminated diesel fuel can damage your engine seriously. Use of improper fuel is considered misuse of engine, and damage caused thereby will not be covered by warranty.

Grade 2-D diesel fuel is required, meeting ASTM Standards D975 (or fuel rated Diesel DIN 51601), and having a minimum cetane rating of 45.

The Cetane number is a measure of the ignition quality of diesel fuel. Increasing the cetane number will not improve overall engine performance, but it may be necessary to raise the cetane rating for low temperature, or high altitude use. A lower cetane number could cause hard starting and slower warm-up, and could increase engine noise and exhaust emissions.

NOTE: *If your engine suddenly becomes noisy after a fuel fill, you possibly received substandard fuel with a low cetane rating.*

Sulphur content of the above fuel is rated at 0.50% by weight, maximum (ASTM). Limits may vary in countries outside of the United States.

On intermittent use engines, high sulphur content diesel fuel will greatly increase:

- Corrosion on metal parts.
- Deterioration of elastomer and plastic parts.
- Corrosion and extensive damage, and excessive wear of internal engine parts, particularly bearings.
- Starting and operating difficulties.

Diesel Fuel In Cold Weather

Unaltered diesel fuels thicken and gel in cold temperatures, unless treated. Virtually all diesel fuels are climatized to allow their use in the particular region for that time of the year. If it becomes necessary to further treat diesel fuel, it is the owner/operator's responsibility to add a commercial standard brand anti-gel diesel fuel additive, following that product's directions.

AntiFreeze/Coolant

⚠ CAUTION

Alcohol or Methanol base antifreeze or plain water are not recommended for use in closed cooling section of cooling system at any time.

Because diesel engines are high compression engines and related higher engine operating temperatures are created, the closed cooling system and engine, including related cooling passages must remain as clean as possible to provide adequate engine cooling. This can only be assured by using the proper antifreeze, water, additives and inhibitors. It is recommended that the closed cooled section of the cooling system be filled with a low silicate formula of ethylene glycol antifreeze in solution with deionized water. A low silicate formula prevents antifreeze separation which causes a silicate gelatin to form. This gelatin will block engine and heat exchanger passages causing engine overheating.

The coolant, if not premixed, should be mixed before being added to the closed cooling system using a proper antifreeze together with deionized water. Common tap water or softened water contains unwanted minerals which can leave large deposits in the system that restrict the cooling system efficiency. In addition, additives and inhibitors introduced into acceptable coolant solutions will form a protective film on internal passages and provide protection against internal cooling system erosion.

The closed cooling section should be kept filled year-round with an acceptable antifreeze/coolant solution. Do not drain closed cooled section for storage, as this will promote rusting of internal surfaces. If engine will be exposed to freezing temperatures, ensure that the closed cooled section is filled with a properly mixed antifreeze/coolant solution, to protect engine and closed cooling system to lowest temperature to which they will be exposed.

NOTE: *A 50/50 antifreeze/coolant solution should be used except when operating where seawater temperatures are greater than 32 degrees C (90 degrees F), then a 25 / 75 (antifreeze / water) solution can be used for improved cooling performance.*

IMPORTANT: The antifreeze/coolant used in these marine engines must be a low silicate ethylene glycol, containing special additives, and deionized, purified water. Using other types of engine coolant may cause fouling of the heat exchangers, and overheating of the engine. Do not combine different types of coolants without knowing that they are compatible. Refer to the coolant manufacturer's instructions.

Some acceptable types of antifreeze/coolants are listed in the following table. Refer to **Section 5 - Maintenance Schedules** for respective change intervals.

Description	Part Number
Marine Engine Coolant	92-813054A2
Fleetguard Compleat with DCA4 Fleetguard Part Number: CC2825 Quantity: 3-3/4 liters, 1 U.S. Gallon	Obtain Locally

Engine Oil

⚠ CAUTION

ENVIRONMENTAL HAZARD! **Discharge of oil or oil waste into the environment is restricted by law. Do NOT spill oil or oil waste into the environment when using or servicing your boat. Contain and dispose of oil or oil waste as defined by local authorities.**

To help obtain optimum engine performance and to provide maximum protection, the engine requires engine oil with a rating of HD-SAE-API CG-4 and CH-4.

We strongly recommend the use of:

Description	Where Used	Part Number
Mercury Diesel Engine Oil	Engine crankcase	92-877695K1

This oil is a specially blended 15W-40 oil with Marine Additives, for all temperature operation. It exceeds requirements for API CF-2, CF-4, CG-4 and CH-4 oils.

Other recommended oils:

Description	Where Used	Part Number
Shell Myrina	Engine crankcase	Obtain Locally
Mopar		
Texaco Ursa Super TD		
Wintershall Multi-Rekord		
Veedol Turbostar		
Wintershall VIiva 1		

These oils are approved by Mercury Marine and Marine Power Europe. For all temperature operation use 15W-40 oil.

Engine Specifications

2.8 ES

Description		Specification - Sterndrive
Engine Type		In-Line 4 Cylinder Diesel
Displacement		2.8 liters (169 cu. in.)
Firing Order		1 - 3 - 4 - 2
Bore		94.1 mm (3.705 in.)
Stroke		100.1 mm (3.941 in.)
Rated Engine rpm [2]		Refer to CMD's *Marine Performance Curves And Data Sheet (www.Cummins.com).*
Idle rpm in Neutral [3]		
Thermostats:	Water: (2 total)1 at:	70 (160) [1]
	1 at:	82 (180) [1]
	Oil:	95 (203) [1]
Coolant Temperature		80 - 85 (176 - 185) [1]
Electrical System		12-volt Negative (–) Ground
Recommended Battery Rating		750 cca, 950 mca, or 180 Ah

[1] *Unit of measure shown in degrees C (degrees F).*

[2] *Refer to "Conditions Affecting Operation - Propeller Selection" for additional information.*

[3] *Engine at normal operating temperature.*

Fluid Specifications

IMPORTANT: All capacities are approximate fluid measures.

ENGINE

IMPORTANT: It may be necessary to adjust oil levels depending on installation angle and cooling systems (heat exchanger and fluid lines).

All models	Capacity - liters (U.S. qts.)	Fluid type	Part Number
Engine Oil (With Filter) [1]	8.9 (9.4)	Mercury Diesel Engine Oil	92-877695K1
Closed Cooling System	11 (11.6)	Marine Engine Coolant	92-813054A2
		Fleetguard Compleat with DCA4 Fleetguard Part Number: CC2825	Obtain Locally

[1] *Always use the dipstick to determine the exact quantity of oil or fluid required.*

Sterndrives

NOTE: *Oil capacity includes drive lube monitor.*

Model	Capacity ml (oz)	Fluid Type	Part Number
Bravo One	2736 (92.5)	High Performance Gear Lube	92-802854A1
Bravo Two	3209 (108.5)		
Bravo Three	2972 (100.5)		

SECTION 5 - MAINTENANCE

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5

Owner/Operator Responsibilities

It is the operator's responsibility to perform all safety checks, to ensure that all lubrication and maintenance instructions are complied with for safe operation and to return the unit to an authorized Cummins MerCruiser Diesel for a periodic checkup.

Normal maintenance service and replacement parts are the responsibility of the owner/operator and as such, are not considered defects in workmanship or material within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

Proper maintenance and care of your power package will ensure optimum performance and dependability and will keep your overall operating expenses at a minimum. See your authorized Cummins MerCruiser Diesel dealer / distributor for service aids.

Dealer Responsibilities

In general, a dealer's responsibilities to the customer include predelivery inspection and preparation such as:

- Ensure that the boat is properly equipped.
- Prior to delivery, make certain that the Cummins MerCruiser Diesel dealer / distributor power package and other equipment are in proper operating condition.
- Make all necessary adjustments for maximum efficiency.
- Familiarize the customer with the on-board equipment.
- Explain and demonstrate the operation of the power package and boat.
- Provide you with a copy of a Predelivery Inspection Checklist.
- Your selling dealer should fill out the Warranty Registration Card completely and mail it to the factory immediately upon sale of the new product.

Maintenance

⚠ WARNING

Avoid injury or death and power package damage from an electrical shock, fire or explosion. Always disconnect both battery cables from the battery before servicing the power package.

⚠ CAUTION

It is good practice to ventilate the engine compartment prior to servicing any engine components to remove any fuel vapors which may cause difficulty breathing or be an irritant.

IMPORTANT: Refer to Maintenance Chart for complete listing of all scheduled maintenance to be performed. Some listings can be done by owner/operator, while others should be performed by an authorized Cummins MerCruiser Diesel dealer / distributor. Before attempting maintenance or repair procedures not covered in this manual, it is recommended that the appropriate Cummins MerCruiser Diesel or Mercury MerCruiser Service Manual be purchased and read thoroughly.

NOTE: *Maintenance points are color coded for ease of identification. See the decal on engine for identification.*

- Blue-Coolant
- Yellow-Engine Oil
- Orange-Fuel
- Black-Gear Lube Oil

Do-It-Yourself Maintenance Suggestions

Present-day marine equipment, such as your Cummins MerCruiser Diesel power package, are highly technical pieces of machinery. Special fuel delivery systems provide greater fuel economies, but also are more complex for the untrained mechanic.

If you are one of those persons who likes to do-it-yourself, here are some suggestions for you.

- Do not attempt any repairs unless you are aware of the Cautions, Warnings and procedures required. Your safety is our concern.
- If you attempt to service the product yourself, we suggest you order the service manual for that model. The service manual outlines the correct procedures to follow. It is written for the trained mechanic, so there may be procedures you don't understand. Do not attempt repairs if you do not understand the procedures.
- There are special tools and equipment that are required to perform some repairs. Do not attempt these repairs unless you have these special tools and/or equipment. You can cause damage to the product in excess of the cost a dealer would charge you.

- Also, if you partially disassemble an engine or drive assembly and are unable to repair it, the dealer's mechanic must reassemble the components and test to determine the problem. This will cost you more than taking it to the dealer immediately upon having a problem. It may be a very simple adjustment to correct the problem.
- Do not telephone the dealer, service office or the factory to attempt for them to diagnose a problem or to request the repair procedure. It is difficult for them to diagnose a problem over the telephone.

Your local dealer / distributor of Cummins MerCruiser Diesel products is there to service your power package. They have qualified factory-trained mechanics.

It is recommended you have the dealer do periodic maintenance checks on your power package. Have them winterize it in the fall and service it before the boating season. This will reduce the possibility of any problems occurring during your boating season when you want trouble-free boating pleasure.

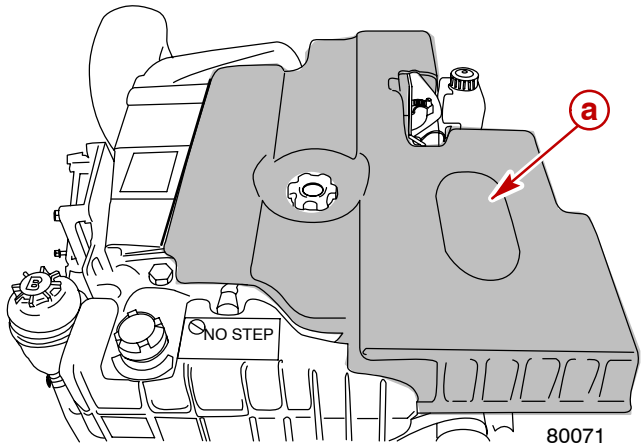
Inspection

Inspect your power package often, and at regular intervals, to help maintain its top operating performance and correct potential problems before they occur. The entire power package should be checked carefully, including all accessible engine parts.

1. Check for loose, damaged or missing parts, hoses and clamps; tighten or replace as necessary.
2. Check electrical connections and leads for damage.
3. Remove and inspect the propeller. If badly nicked, bent or cracked, contact your authorized Cummins MerCruiser Diesel dealer / distributor.
4. Repair nicks and corrosion damage on power package exterior finish. Contact your authorized Cummins MerCruiser Diesel dealer / distributor.

It may be necessary to remove the engine cover during some maintenance inspections and procedures. To remove the engine cover:

1. Lift and detach the engine cover from the mounts.



Typical

a - Engine cover

2. Set the engine cover over the mounts and press the cover down in the mount areas to reattach the engine cover.

Maintenance Schedules

Routine Maintenance *	Each Day Start	Each Day End	Weekly	Every Two Months
Check the engine oil level (interval can be extended based on experience).	•			
Check the coolant level.	•			
Check the power steering fluid level.	•			
Check the drive unit oil level in the gear lube monitor.	•			
If operating in salt, brackish or polluted waters, flush the cooling system after each use.		•		
Drain any water from the fuel filter after each use (If operating in freezing temperatures).		•		
Check the trim pump oil level.	•			
Check the water inlets for debris or marine growth. Check the seawater strainer and clean.			•	
Inspect the drive unit anodes and replace if 50 percent eroded.			•	
Check the battery connections and fluid level.				•
Lubricate the propeller shaft and retorque the nut. [3]				•
Operating in saltwater, brackish or polluted waters: treat the engine surface with corrosion guard.				•
Clean the air filter. [1]				•
Ensure that the gauges and the wiring connections are secure. Clean the gauges. [2]				•

***** Only perform maintenance which applies to your particular power package.

1 *Or every 50 hours whichever occurs first.*

2 *Or every 50 hours, whichever occurs first. If operating in saltwater, interval is reduced to every 25 hours or 30 days whichever occurs first.*

3 *If operating in only freshwater, this maintenance may be extended to every four months.*

Maintenance Schedules (Continued)

Scheduled Maintenance *	After First 20 hours	Annually	Every 100 hours or Annually ◆
Change the engine oil and filter.	●		●
Touch-up paint the power package and spray with corrosion guard.		●	
Change the drive unit oil. Retorque the gimbal ring to steering shaft connection.			●
Replace the fuel filter(s).			●
Check the steering system and the remote control for loose, missing or damaged parts. Lubricate the cables and linkages.			●
Inspect and lubricate the sterndrive U-joint cross bearings [2] and splines. Inspect the bellows and clamps. Check the engine alignment.			●
Lubricate the gimbal bearing and engine coupler [1]			●
Check continuity circuit for loose or damaged connections. Test MerCathode® unit output on Bravo Models.			●
Retorque the engine mounts.			●
Check the electrical system for loose, damaged or corroded fasteners.			●
On driveshaft extension models, lubricate the drive shaft U-joints and tailstock input and output bearings.			●
Inspect the condition and tension of the belts.			●
Check the cooling system and the exhaust system hose clamps for tightness. Inspect both systems for damage or leaks.			●
Disassemble and inspect the seawater pump and replace worn components.			●
Clean the seawater section of the closed cooling system. Clean, inspect and test the pressure cap. Check the anodes and replace if 50 percent eroded.			●
Replace the air filter.			●

***** Only perform maintenance which applies to your particular power package.

◆ Whichever occurs first

[1] *Lubricate engine coupler every 50 hours if operated at idle for prolonged periods of time.*

[2] *Gray sterndrive U-joint cross bearings have grease fittings and require lubrication at specified intervals. Black sterndrive U-joint cross bearings do not have grease fittings and do not require additional lubrication.*

Maintenance Schedules (Continued)

Scheduled Maintenance * (Continued)	Every 2 years	Every 500 hours or 5 years ◆	Every 1000 hours or 5 years ◆
Replace the coolant.	●		
Clean the aftercooler core.		●	
Clean the fuel tank.			●

***** Only perform maintenance which applies to your particular power package.

◆ Whichever occurs first

Maintenance Record

Date	Hour Meter Reading	Serviced By	Maintenance Performed

Maintenance Record (continued)

Date	Hour Meter Reading	Serviced By	Maintenance Performed

Engine Oil

⚠ CAUTION

ENVIRONMENTAL HAZARD! Discharge of oil or oil waste into the environment is restricted by law. Do NOT spill oil or oil waste into the environment when using or servicing your boat. Contain and dispose of oil or oil waste as defined by local authorities.

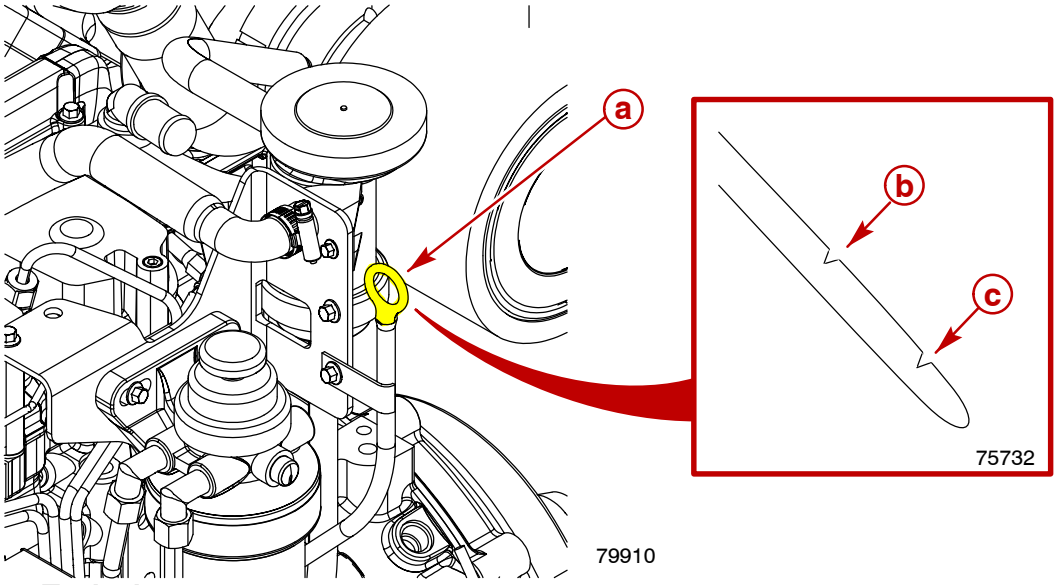
Checking

⚠ CAUTION

Avoid possible injury or damage to oil dipstick and internal engine components. Do not remove crankcase oil dipstick when engine is running. Stop the engine completely before removing or inserting dipstick.

If it becomes necessary to check the engine oil level during operation, **stop the engine** and allow 5 minutes for oil to drain into pan.

1. Remove dipstick. Wipe clean and reinstall into dipstick tube.
2. Remove dipstick and observe oil level. Oil must be between marks on dipstick. If necessary, add oil as follows.



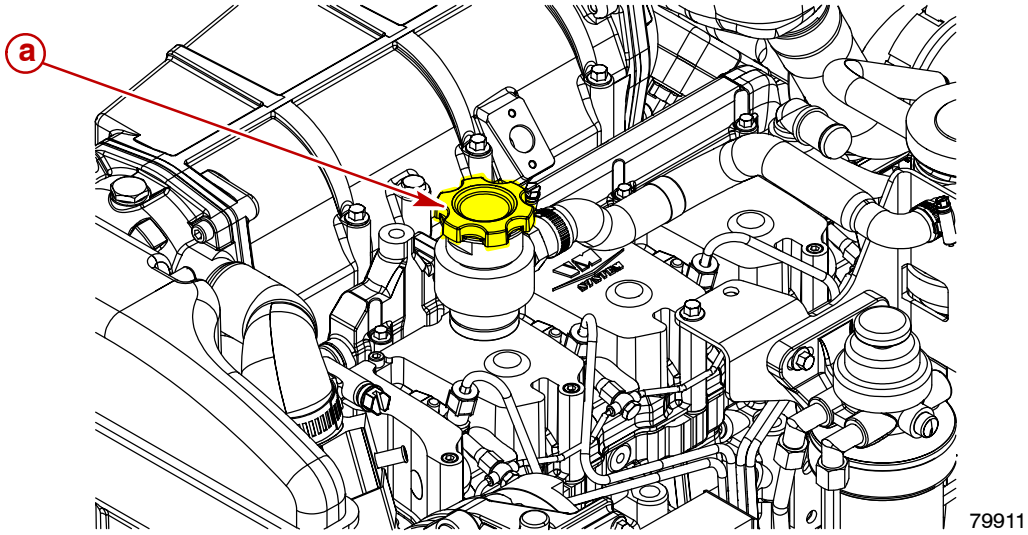
Typical

a - Dipstick
b - Maximum mark
c - Minimum mark

Filling

IMPORTANT: Do not overfill the engine with oil.

1. Remove the oil filler cap.



Shown without engine cover

a - Oil filler cap

2. Add specified oil to bring level up to, but not over, MAX mark on dipstick.

2.8 ES	Capacity Liters (U.S. qts.)	Fluid Type
Engine Oil (With Filter)	8.9 (9.4) [1]	4-Cycle 15W-40 Marine Engine Oil

[1] Always use the dipstick to determine the exact quantity of oil or fluid required.

3. Install the oil filler cap.

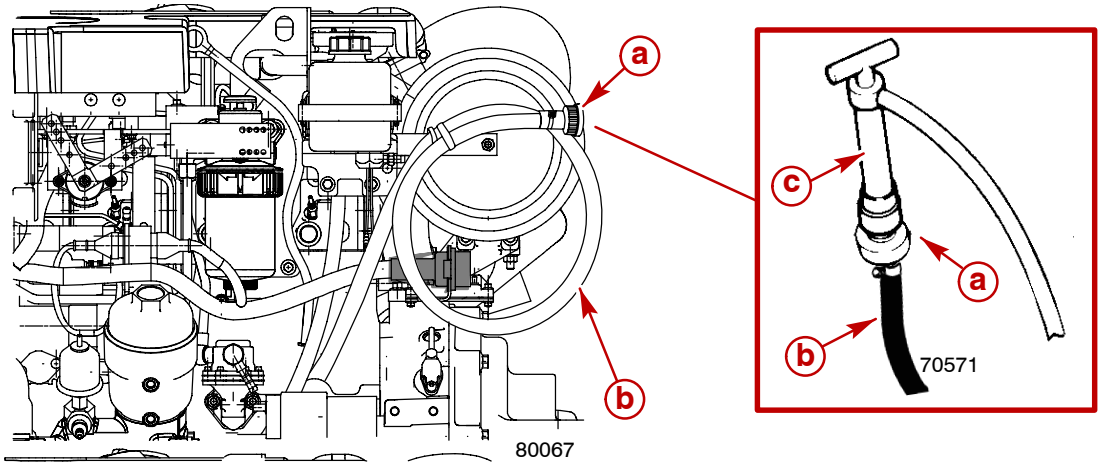
Changing Oil and Filter

Refer to the Maintenance schedule for the change interval. Engine oil should be changed before placing the boat in storage.

IMPORTANT: Change engine oil when the engine is warm from operation. Warm oil flows more freely, carrying away more impurities. Use only recommended engine oil (refer to Specifications).

2.8 ES

1. Start engine and allow it to warm up to normal operating temperature.
2. Stop engine and allow some time for oil to drain into oil pan (approximately 5 minutes).
3. Remove fitting from end of crankcase oil drain hose laying on top of engine.
4. Install crankcase oil pump (order separately) onto threaded fitting of oil drain hose.

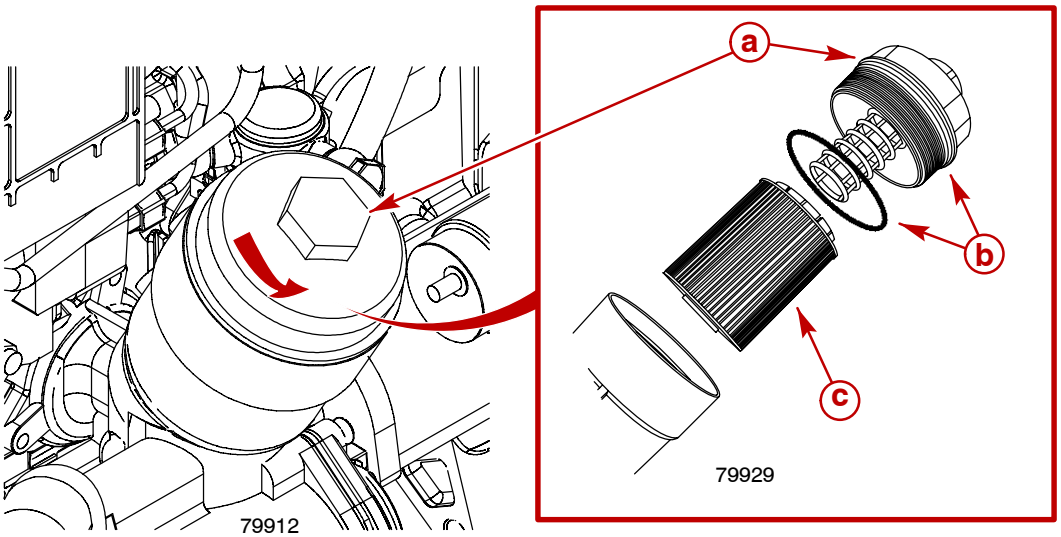


Typical engine and oil drain hose, all similar

a - Threaded fitting
b - Oil drain hose
c - Crankcase oil pump (802889Q1, or equivalent)

5. Pump oil out of crankcase into drain pan.
6. When crankcase is empty, remove pump and install crankcase oil drain hose fitting. Tighten securely.
7. Install the oil dipstick.

8. Use an appropriate socket to loosen the oil filter top piece.
9. Remove the top piece and cartridge type oil filter.
10. Disconnect and discard the old filter element. Discard the old O-ring from the top piece.



a - Top piece
b - O-ring
c - Filter element

11. Install the O-ring. Apply lubricant to the O-ring.

Description	Where Used	Part Number
Engine oil	Oil filter O-rings	Obtain Locally

12. Push the filter element onto the top piece until it is locked. Listen for a click sound.
13. Install the top piece with the new filter element into the oil filter housing.

IMPORTANT: Over tightening the top piece will cause deformation resulting in oil leakage.

14. Turn the oil filter top piece until the sealing surface contacts the housing. Torque the top piece using an appropriate socket.

Description	Nm	lb-in.	lb-ft
Oil filter top piece	25		18

15. Remove the oil fill cap and refill the engine with new oil. Refer to Filling.

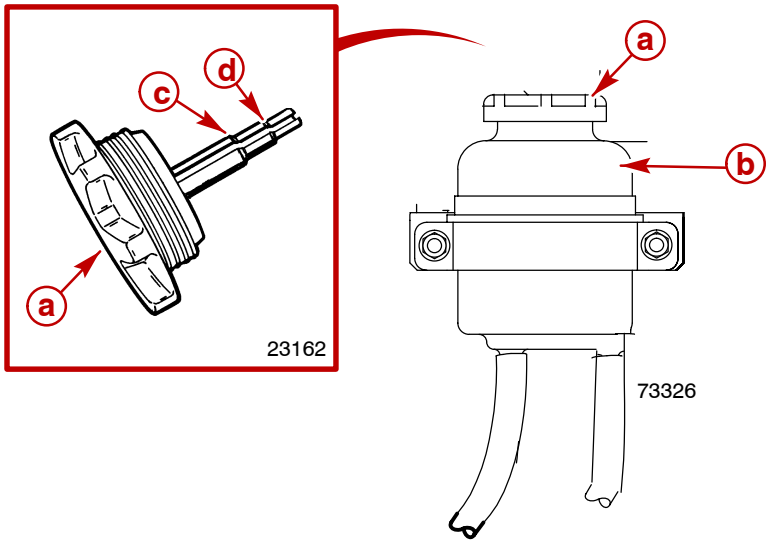
IMPORTANT: When refilling engine with oil always use dipstick to determine how much oil is required.

16. Start the engine and check for leaks.

Power Steering Pump Fluid

Checking

1. Stop the engine and center the sterndrive unit.
2. Remove the fillcap/dipstick and observe the level.
   a. Proper fluid level with engine at normal operating temperature should be between the full hot and full cold marks.
   b. Proper fluid level with engine cold should be between the full cold mark and the end of the dipstick.



Typical

a - Fillcap/dipstick
b - Fluid reservoir
c - Full hot mark
d - Full cold mark

IMPORTANT: If fluid is not visible in the pump, contact your authorized Cummins MerCruiser Diesel dealer/distributor.

Filling

1. Remove the fill cap/dipstick and observe the level.
2. Add Quicksilver Power Trim and Steering Fluid or Dexron III Automatic Transmission Fluid (ATF) to bring the fluid level up to the proper level.
3. Reinstall the fill cap/dipstick.

Changing

Power Steering fluid does not require changing.

Engine Coolant - Closed Cooled Models Only

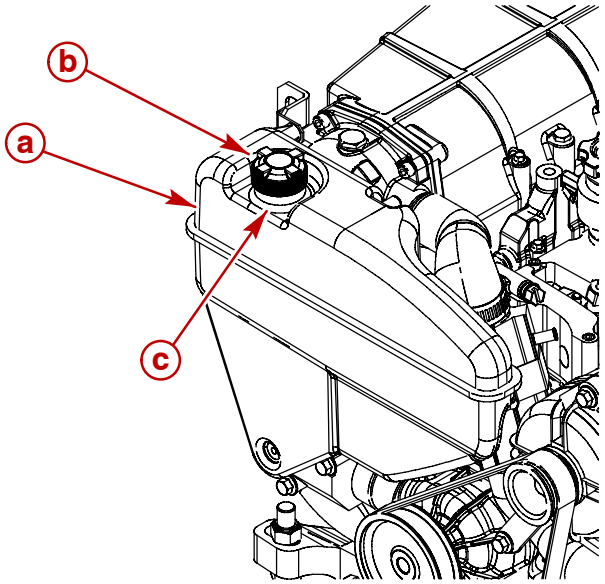
Checking

⚠ CAUTION

Avoid serious injury from burns. Do not remove coolant cap when engine is hot. Coolant may discharge violently.

IMPORTANT: Check engine coolant BEFORE starting the engine.

1. Allow the engine to cool.
2. Remove the pressure cap from the coolant expansion tank.
3. The coolant level in the coolant expansion tank should be within 25 mm (1 in.) of the bottom of the filler neck or between the upper and lower marks, if marked. If coolant is low refer to Filling.



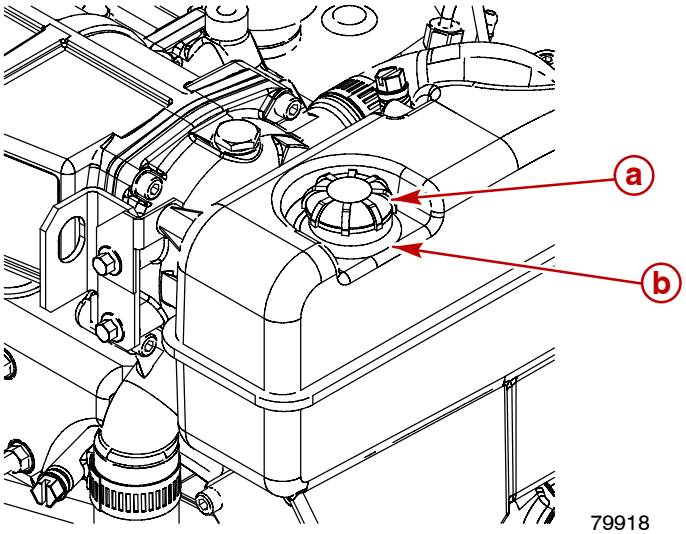
79913

a - Coolant expansion tank
b - Pressure cap
c - Bottom of filler neck

IMPORTANT: When installing the pressure cap, be sure to tighten it securely to prevent coolant loss.

4. Install the pressure cap. Tighten securely.

5. With the engine at normal operating temperature, check the coolant level in the coolant expansion tank. Turn the pressure cap 1/4 turn to allow any pressure to escape slowly, then remove the cap.
6. The coolant level should be within 25 mm (1 in.) of the bottom of the filler neck or between the upper and lower marks, if marked.



a - Pressure cap
b - Bottom of filler neck

7. Add the specified coolant as required.

Description	Where Used	Part Number
Marine Engine Coolant	Closed cooling system	92-813054A2
Fleetguard Compleat with DCA4 Fleetguard Part Number: CC2825 Quantity: 3-3/4 liters, 1 U.S. Gallon		Obtain Locally

8. Install the pressure cap. Tighten securely.
9. If the coolant level is low:
   a. Inspect coolant recovery system for leaks.
   b. If coolant is low, inspect gasket in pressure cap for damage and replace if necessary.
   c. The pressure cap maintains pressure on the cooling system and may not be holding pressure properly. To have the cap tested, contact your authorized Cummins MerCruiser Diesel dealer/distributor.

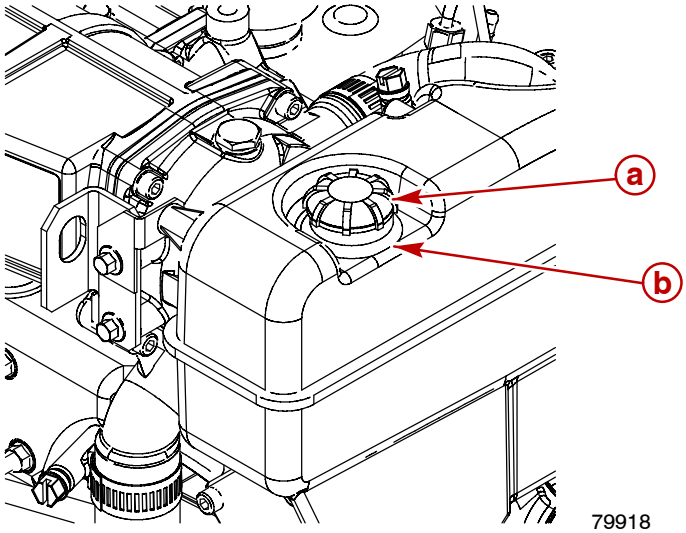
Filling

1. If coolant is low in the coolant expansion tank, add specified coolant as necessary to bring the level to within 25 mm (1 in.) of the bottom of the filler neck or between the upper and lower marks, if marked.

Description	Where Used	Part Number
Marine Engine Coolant	Closed cooling system	92-813054A2
Fleetguard Compleat with DCA4 Fleetguard Part Number: CC2825 Quantity: 3-3/4 liters, 1 U.S. Gallon		Obtain Locally

IMPORTANT: When installing the pressure cap, be sure to tighten it securely to prevent coolant loss.

2. Install the pressure cap. Tighten securely.
3. With the engine at normal operating temperature, maintain the coolant level in the coolant expansion tank within 25 mm (1 in.) of the bottom of the filler neck or between the upper and lower marks, if marked.



a - Pressure cap
b - Bottom of filler neck

Changing

Contact your authorized Cummins MerCruiser Diesel dealer/distributor.

Drive Unit Oil

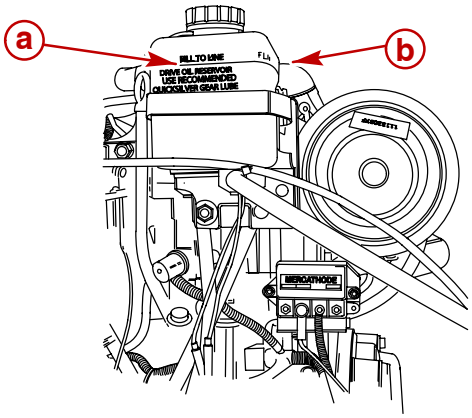
⚠ CAUTION

ENVIRONMENTAL HAZARD! Discharge of oil or oil waste into the environment is restricted by law. Do NOT spill oil or oil waste into the environment when using or servicing your boat. Contain and dispose of oil or oil waste as defined by local authorities.

Checking

NOTE: *Oil level will fluctuate during operation. Oil level should be checked with the engine cold, before starting.*

1. Check the gear lube oil level. Keep the oil level at or near FULL line in the drive lube monitor. If any water is visible at the bottom of the monitor or appears at the oil fill/drain plug and/or if oil appears discolored, contact your authorized Cummins MerCruiser Diesel dealer / distributor immediately. Both conditions may indicate a water leak in the sterndrive unit.



79932

a - Gear lube monitor
b - FULL line

Description	Where Used	Part Number
High Performance Gear Lube	Gear lube monitor	92-802854A1

Filling

IMPORTANT: If more than 59 ml (2 fl. oz.) of Quicksilver High Performance Gear Lube is required to fill the monitor, a seal may be leaking. Damage to the sterndrive unit may occur due to lack of lubrication. Contact your authorized Cummins MerCruiser Diesel dealer/distributor.

1. Remove the gear lube monitor cap.
2. Fill to full line with specified fluid.

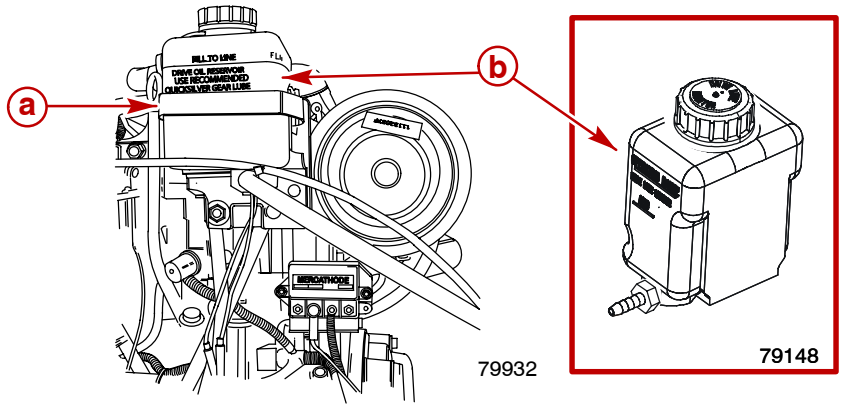
Description	Where Used	Part Number
High Performance Gear Lube	Gear lube monitor	92-802854A1

3. Replace the cap.

NOTE: *When filling the entire sterndrive unit refer to Changing Sterndrive Unit Oil instructions.*

Changing

1. Loosen the rubber strap and remove the gear lube monitor from the bracket.

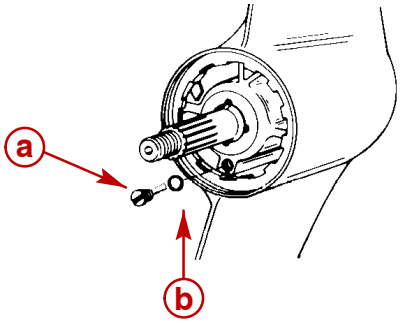


Typical gear lube monitor location

a - Rubber strap
b - Gear lube monitor

2. Empty the contents into a suitable container.
3. Install the monitor in the bracket.

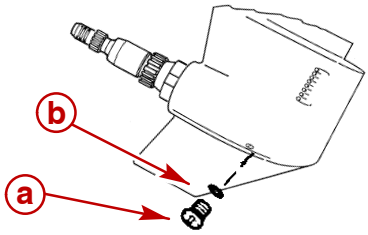
4. **Bravo One Models:** Remove the propeller, place the sterndrive unit in full trim limit IN position, remove the oil fill/drain screw and sealing washer and drain the oil.



70568

a - Oil fill/drain
b - Sealing washer

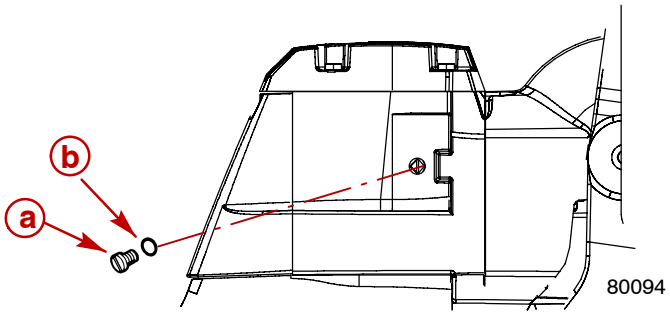
5. **All Other Models:** Place the sterndrive unit in full trim limit OUT position, remove the oil fill/drain screw and sealing washer and drain the oil.



72522

a - Oil fill/drain
b - Sealing washer

6. Remove the oil vent screw and sealing washer. Allow the oil to drain completely.



80094

Typical

a - Oil vent screw
b - Sealing washer

IMPORTANT: If any water drained from the oil fill/drain hole, or if the oil appears milky, the sterndrive unit is leaking and should be checked immediately by your authorized Cummins MerCruiser Diesel dealer/ distributor.

7. Lower the sterndrive unit so that the propeller shaft is level. Fill the sterndrive unit, through the oil fill/drain hole, with specified gear lube until an air-free stream of lubricant flows from oil vent hole.

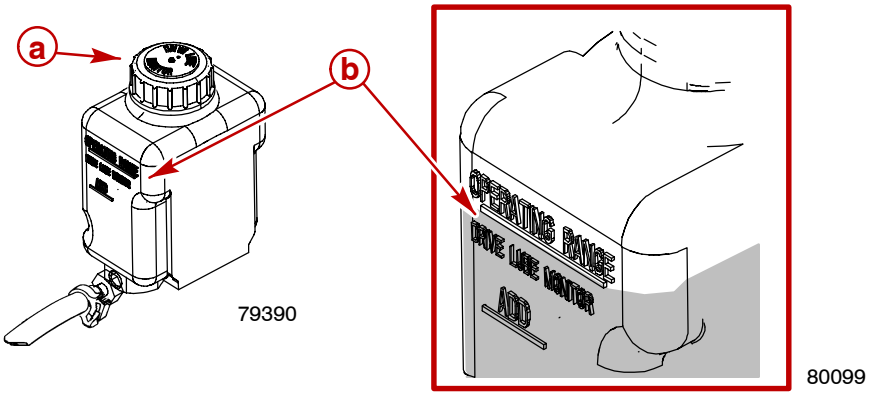
Description	Where Used	Part Number
High Performance Gear Lube	Gear lube monitor	92-802854A1

IMPORTANT: Use only Quicksilver High Performance Gear Lube in sterndrive unit.

8. Install the oil vent screw and sealing washer. Torque the oil vent screw.

Description	Nm	lb-in.	lb-ft
Oil vent screw	6.8	60	

9. Continue to pump gear lube into the gear lube monitor circuit until the gear lube appears in the gear lube monitor.
10. Fill the gear lube monitor so that the oil level is in the operating range. Do not overfill.



a - Gear lube monitor cap
b - “OPERATING RANGE” line

Description	Where Used	Part Number
High Performance Gear Lube	Gear lube monitor	92-802854A1

11. Ensure that the rubber gasket is inside the cap and install the cap. Do not overtighten.
12. Remove the pump from the oil fill/drain hole. Quickly install the sealing washer and oil fill/drain screw. Torque the oil fill/drain screw.

Description	Nm	lb-in.	lb-ft
Oil fill/drain screw	6.8	60	

13. Reinstall the propeller. Refer to **Propellers**.
14. Recheck the oil level after the first use.

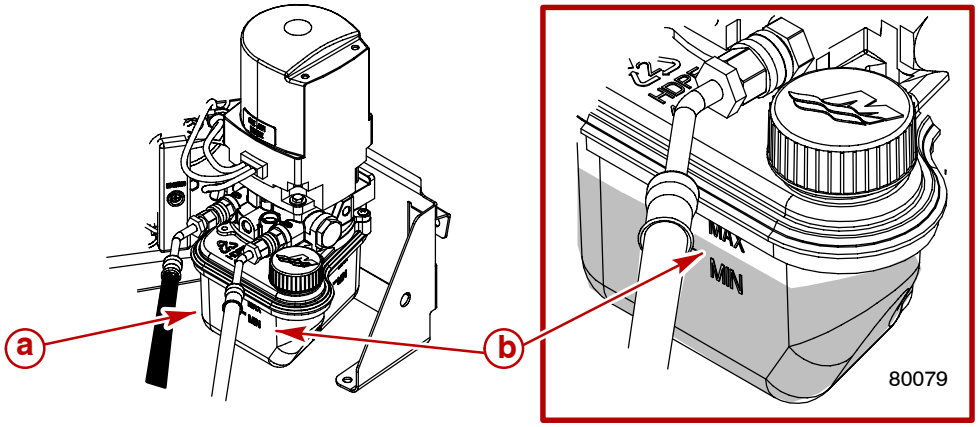
IMPORTANT: Oil level in the gear lube monitor will rise and fall during sterndrive operation; always check the oil level when the sterndrive is cool and the engine is shut down.

Power Trim Pump Fluid

Checking

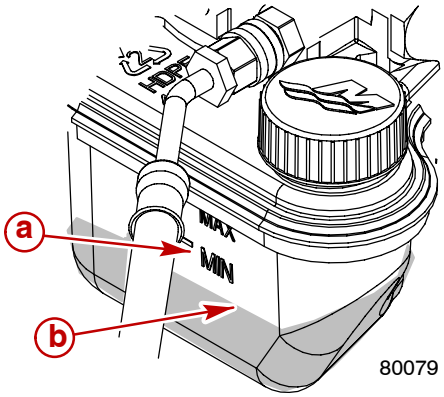
IMPORTANT: Check the oil level with sterndrive unit in the full DOWN/IN position only.

1. Place the sterndrive unit in full DOWN/IN position.
2. Observe the oil level in the reservoir. The oil level should be maintained within the “MIN” and “MAX” lines on the reservoir.



a - Reservoir
b - “MIN” and “MAX” lines

3. The oil level is low if it is below the “MIN” line on the reservoir. Fill as necessary with the specified fluid. Refer to **Filling**.

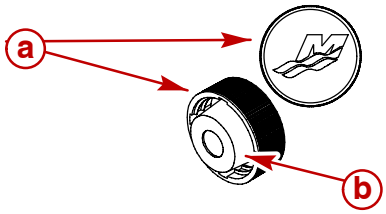


a - “MIN” line
b - Low oil level

Filling

1. Place the sterndrive unit in full DOWN/IN position.
2. Unscrew and remove the fill cap assembly from the reservoir.

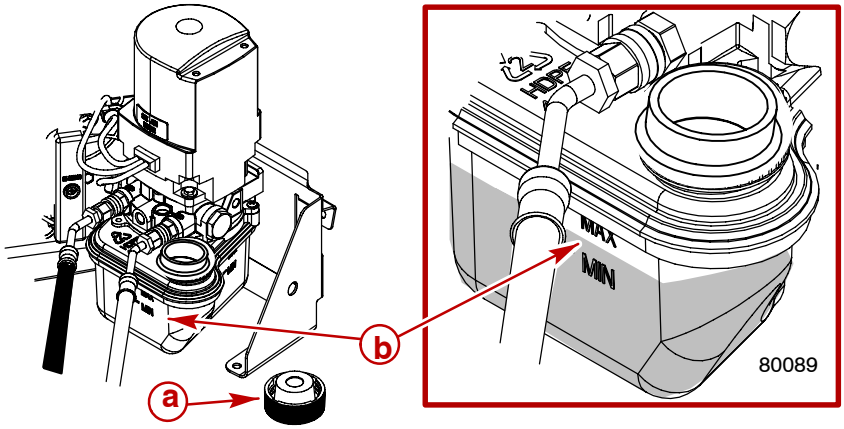
NOTE: *The fill cap and cap vent are an assembled as a unit and should not be separated. Do not remove or discard the cap vent.*



a - Fill cap assembly
b - Cap vent

IMPORTANT: Use only the specified lubricant.

3. Add lubricant to bring the oil level to within the “MIN” and “MAX” lines on the reservoir.



Typical

a - Fill cap assembly
b - “MIN” and “MAX” lines

Description	Where Used	Part Number
Power Trim And Steering Fluid	Power trim pump	92-802880A1

4. Install the fill cap assembly.

Changing

Power Trim fluid does not require changing unless it becomes contaminated with water or debris. Contact your authorized Cummins MerCruiser Diesel dealer/distributor.

Battery

Refer to specific instructions and warnings accompanying your battery. If this information is not available, observe the following precautions when handling a battery.

⚠ WARNING

Avoid serious injury from fire or explosion. Do NOT use jumper cables and a booster battery to start engine. Do NOT recharge a weak battery in the boat. Remove battery and recharge in a ventilated area away from fuel vapors, sparks or flames.

⚠ WARNING

Batteries contain acid which can cause severe burns. Avoid contact with skin, eyes and clothing. If electrolyte is spilled or splashed on any part of the body, immediately flush the exposed area with liberal amounts of water and obtain medical aid as soon as possible.

Safety glasses and rubber gloves are recommended when handling batteries or filling with electrolyte.

Multiple Electronic Control Engine Battery Precautions

SITUATION

Alternators: Alternators are designed to charge the battery that supplies electrical power to the engine that the alternator is mounted on. When batteries for two different engines are connected, one alternator will supply all of the charging current for both batteries. Normally, the other engine's alternator will not be required to supply any charging current.

Engine Control Module (ECM): The ECM requires a stable voltage source. During multiple engine operation, an onboard electrical device may cause a sudden drain of voltage at the engine's battery. The voltage may go below the ECM's minimum required voltage. Also, the alternator on the other engine may now start charging. This could cause a voltage spike in the engine's electrical system.

In either case, the ECM could shut off. When the voltage returns to the range that the ECM requires, the ECM will reset itself. The engine will now run normally. This ECM shut down usually happens so fast that the engine just appears to have an ignition miss.

RECOMMENDATIONS

Batteries: Boats with multi-engine Electronic Control power packages require each engine be connected to its own battery. This ensures that the engine's Electronic Control Module (ECM) has a stable voltage source.

Battery Switches: Battery switches should always be positioned so each engine is running off its own battery. Do not operate engines with switches in BOTH or ALL position. In an emergency, another engine's battery can be used to start an engine with a dead battery.

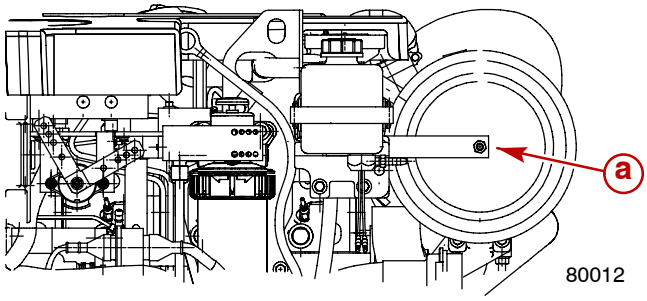
Battery Isolators: Isolators can be used to charge an auxiliary battery used for powering accessories in the boat. Isolators should not be used to charge the battery of another engine in the boat unless the type of isolator is specifically designed for this purpose.

Generators: The generator's battery should be considered in the same manner as another engine's battery.

Air Filter

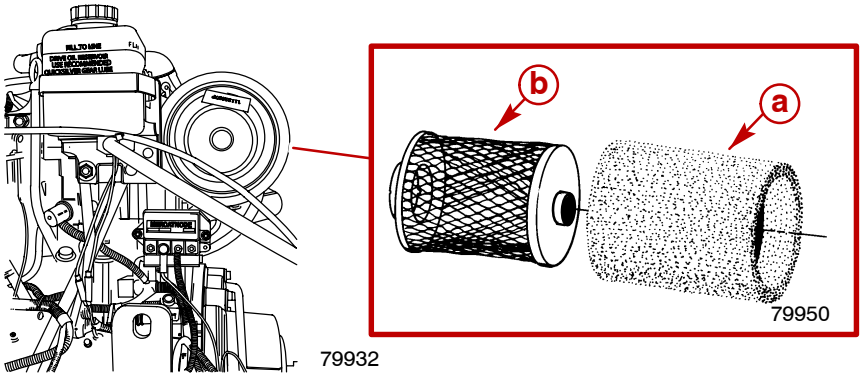
Cleaning

1. If equipped, remove the nut, hardware, bracket and cover attached to the air cleaner.



a - Nut, hardware, bracket and cover, if equipped

2. Carefully remove the air cleaner foam element from around the air intake screen housing mounted on the turbocharger inlet.



a - Foam element
b - Intake screen housing

⚠ CAUTION

Avoid potential fire hazards and injury, or damage to polyester foam element. Do not clean foam element in petroleum based solvents or cleaners.

3. Wash the foam element in warm water and detergent until clean.
4. Allow the foam element to completely dry before use.

IMPORTANT: No treatment (such as partial oil saturation) is required or recommended on air cleaner foam element prior to use. Use element clean and dry for proper filtration.

5. Install the foam element around air intake screen

IMPORTANT: To prevent unfiltered air from entering the engine be certain that all of the air intake screen is covered by the foam element when installed.

6. Install the nut, hardware and bracket to the air cleaner. Tighten the nut securely

Replacement

Replace the foam element if it is deteriorated or torn. Refer to Maintenance Schedules for replacement interval under normal conditions.

Water Separating Fuel Filter

⚠ WARNING

Be careful when draining water separating fuel filter. Diesel fuel is flammable. Be sure ignition key is OFF. Do not allow fuel to contact any hot surfaces which may cause it to ignite. Do not allow sources of open flame in the area. Wipe up any spilled fuel immediately. Dispose of fuel soaked rags, paper, etc. in an appropriate air tight, fire retardant container. Fuel soaked items may spontaneously ignite and result in a fire hazard which could cause serious bodily injury or death.

⚠ CAUTION

Any water entering the fuel injection system will disable the system. Check for water in water separating fuel filter before starting, daily.

⚠ CAUTION

If water should enter the fuel injection system, take unit to an authorized Cummins MerCruiser Diesel dealer / distributor IMMEDIATELY, so that corrosion and rusting of the injectors and other components can be avoided.

The engine mounted water separating fuel filter is equipped with a water in fuel (WIF) sensor that should alert the operator when water is present in the filter. This fuel filter needs to be replaced at specified intervals or whenever water is detected in the fuel, whichever comes first.

The operator may be alerted that the WIF sensor has detected water in the fuel. Depending upon the boat instrumentation package and if equipped:

- A message may be displayed on an instrument
- An indicator lamp may be illuminated

Refer to **Section 2 – Getting To Know Your Power Package**.

When the engine is equipped with a remote mounted primary filter (such as a Racor filter) it should be drained or replaced at specified intervals, or whenever water is detected in the engine mounted fuel filter.

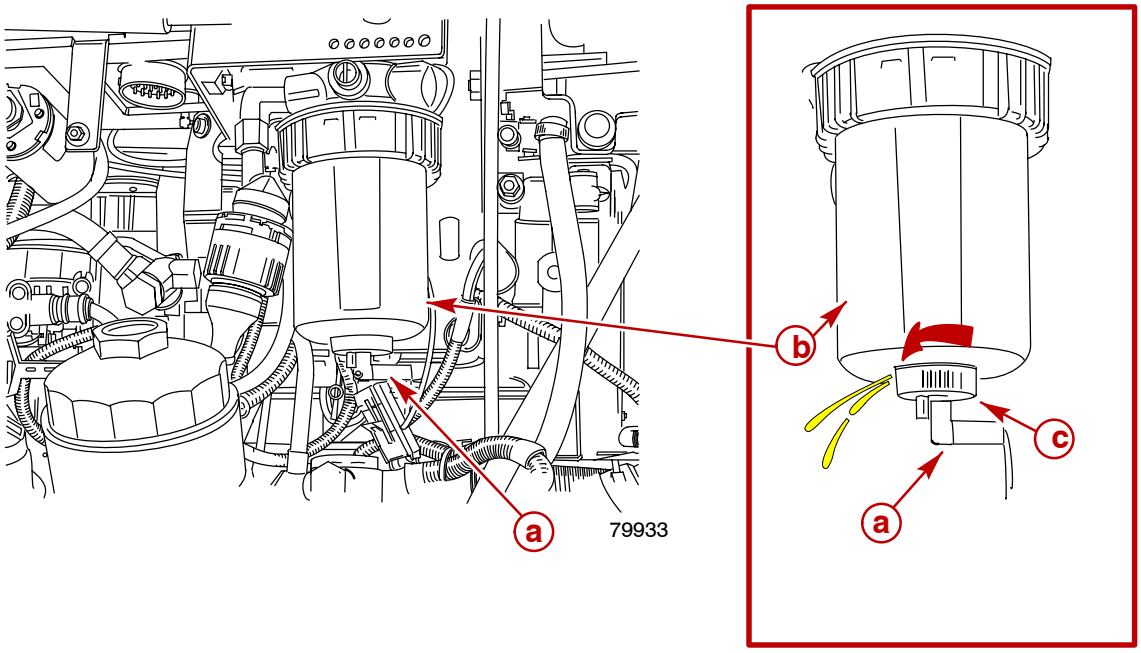
Draining

The filter can be drained of water and small dirt particles by opening drain cap on bottom of filter.

NOTE: *To ensure complete draining, in warm weather drain the filter before starting daily operations. In cold weather, where there is a possibility that the condensed water will freeze, drain the filter shortly after the end of daily operations.*

NOTE: *Place a suitable container under fuel filter to catch contaminated fuel and/or water. Dispose of properly.*

1. Place a container under the drain cap on the filter.
2. Open the drain by turning the drain cap counterclockwise *(as viewed from the bottom of the filter)* until fuel starts draining. Do not remove the drain cap.



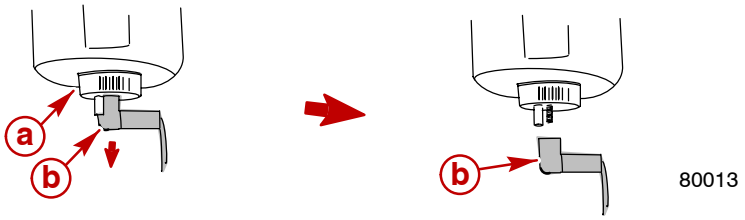
Typical

a - WIF sensor wire
b - Filter
c - Drain cap

3. Drain until fuel is clear in appearance.
4. Close the drain cap by turning clockwise. Tighten securely.
5. Refer to **Filling** and fill the fuel filter.

Replacing

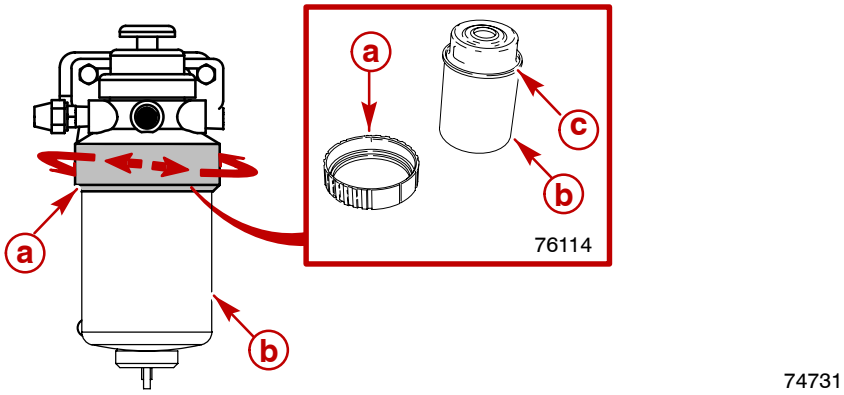
1. Unplug the WIF sensor wire from the drain cap.



Typical

a - Drain cap
b - WIF sensor wire

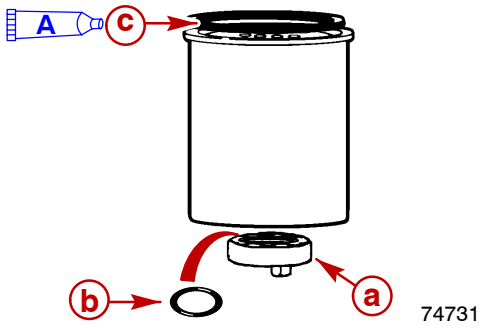
2. Twist locking ring by hand. Remove water separating fuel filter and sealing ring from mounting bracket. Do not use a filter wrench.



Typical

a - Locking ring
b - Water separating fuel filter
c - Sealing ring

3. Remove the drain cap and O-ring from the bottom of the existing filter.
4. Install the drain cap and O-ring on the new filter.
5. Lubricate the sealing ring on the new filter.

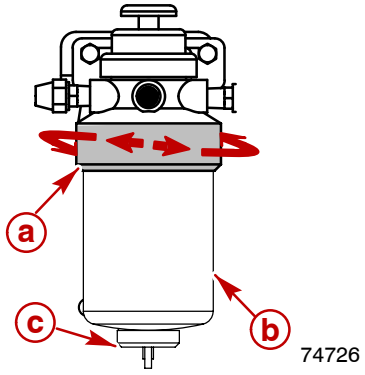


Typical

a - Drain cap
b - O-ring
c - Sealing ring

Description		Where Used	Part Number
A	SAE 30W Engine Oil	Water separating fuel filter sealing ring	Obtain locally

6. Align filter to bracket. Twist locking ring by hand to secure filter to bracket. Do not use a filter wrench.
7. Ensure drain cap is securely tightened.



Typical

a - Locking ring
b - Filter
c - Drain cap

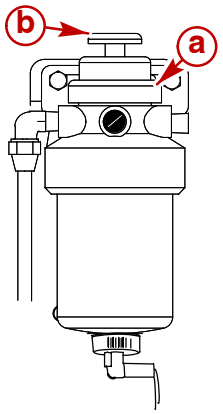
8. Plug the WIF sensor wire onto the drain cap.

9. Refer to Filling and fill the fuel filter.
10. Check filter and drain cap for fuel leaks.
11. Supply cooling water to water inlets.
12. Start and operate the engine.
13. Check filter connection for fuel leaks. If leaks exist, recheck filter installation.
14. If leaks continue, stop engine immediately and contact your authorized Cummins MerCruiser Diesel dealer/distributor.

Filling

A plunger-type of hand pump/primer is located on the fuel filter bracket and is used to:

- Refill fuel filter when changing filter
- Refill fuel system if system was run dry
- To prime the fuel system if engine has not been run for a while.

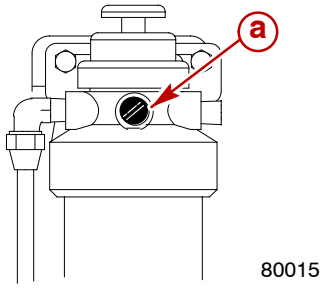


Typical

a - Fuel filter bracket
b - Hand pump / primer

NOTE: *Follow this procedure after installing new filter or if fuel has been drained from filter checking for water.*

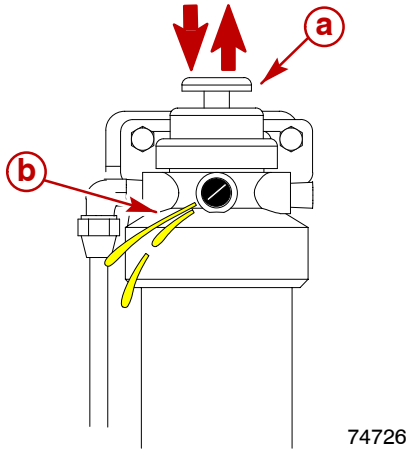
1. Loosen the bleed screw on fuel filter bracket.



Typical

a - Bleed screw
b - Bleed screw

2. Move the plunger on the hand pump/primer up and down repeatedly, until an air free stream of fuel flows from the bleed screw. Filter is full when this occurs.



Typical

a - Plunger
b - Fuel from bleed screw

3. Tighten the bleed screw.

Fuel System

Priming

Prime engine if it has not been run for a while or if engine will not start. Move the hand pump/primer plunger up and down several times as previously outlined. Attempt to start engine.

Filling (Bleeding)

NOTE: *Follow this procedure if fuel system was run dry or if part of fuel system was drained for a service function.*

1. Refer to **Water Separating Fuel Filter - Filling** and fill the fuel filter.
2. Check filter and drain cap for fuel leaks. Ensure that bleed screw on fuel filter bracket is closed.

Fuel Tank Cleaning And Flushing

IMPORTANT: Diesel fuel should not be left in tank during winter storage, as an accumulation of rust, sludge and wax residue will form.

Refer to boat manufacturer's instructions and clean fuel tank at specified intervals. Unless specified otherwise, flush and clean diesel fuel tank every 1000 hours or 5 years, whichever occurs first.

Lubrication

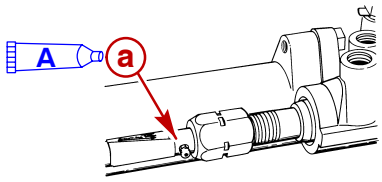
Steering System

⚠ WARNING

Do NOT grease steering cable while extended. Hydraulic lock could occur and cause loss of steering control.

1. **If Steering Cable Has Grease Fittings:** Turn steering wheel until steering cable is fully retracted into cable housing. Apply approximately 3 pumps of grease from a typical hand-operated grease gun.

NOTE: *If steering cable does not have grease fitting, inner wire of cable cannot be greased.*

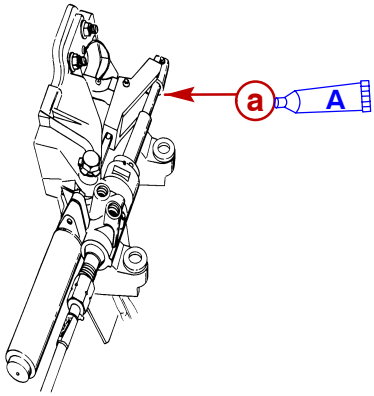


71903

a - Steering cable grease fitting

Description		Where Used	Part Number
A	2-4-C with Teflon	Steering cable	92-802859A1

2. Turn steering wheel until steering cable fully extended. Lightly lubricate the exposed part of cable.

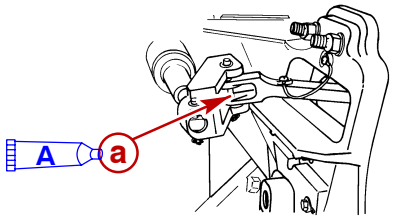


71901

a - Extended steering cable

Description		Where Used	Part Number
A	Special Lubricant 101	Steering cable	92-802865A1

3. Lubricate the steering system pivot points.



71904

a - Steering system pivot points

Description		Where Used	Part Number
A	SAE 30W Engine Oil	Pivot points	Obtain Locally

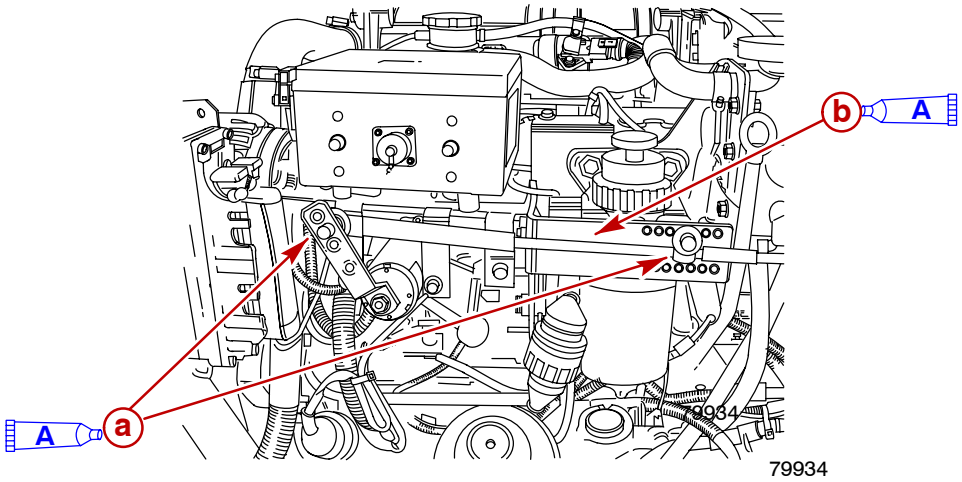
4. **On dual engine boats:** Lubricate the tie bar pivot points.

Description	Where Used	Part Number
SAE 30W Engine Oil	Pivot points	Obtain Locally

5. Upon first starting engine, turn steering wheel several times to starboard and then port to ensure that the steering system operates properly before getting underway.

Throttle Cable

1. Lubricate the pivot points and the guide contact surfaces.



79934

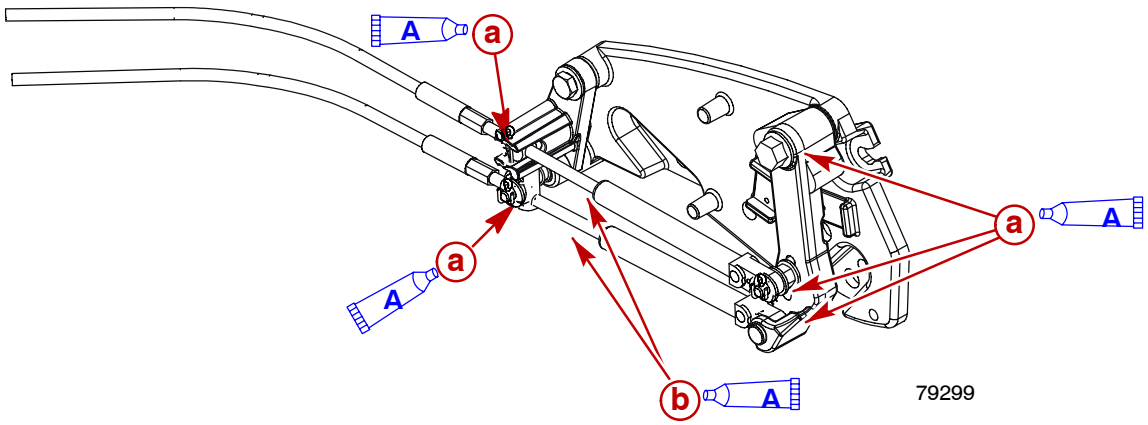
Typical

a - Pivot points
b - Guide contact surfaces

Description		Where Used	Part Number
A	SAE 30W Engine Oil	Pivot points, guide contact surfaces	Obtain Locally

Shift Cable

1. Lubricate the pivot points and the guide contact surfaces.



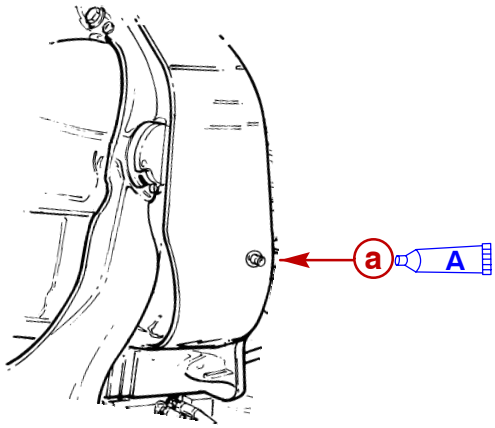
Typical

a - Pivot points
b - Guide contact surfaces

Description		Where Used	Part Number
A	Engine Oil	Pivot points, guide contact surfaces	Obtain Locally

Sterndrive Unit and Transom Assembly

1. Lubricate the gimbal bearing through the grease fittings by applying approximately 8-10 pumps of grease from a typical hand-operated grease gun.



77068

a - Gimbal bearing grease fitting

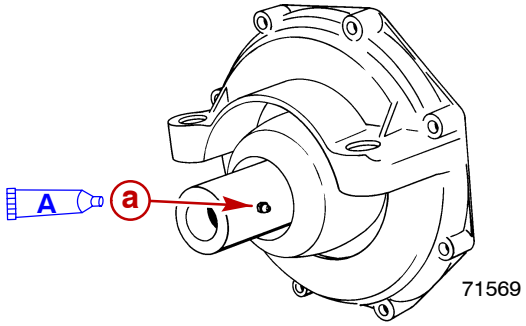
Description		Where Used	Part Number
A	U-joint And Gimbal Bearing Grease	Gimbal bearing	92-802870A1

2. For propeller shaft lubrication, refer to Propeller.

Engine Coupler

1. Lubricate the engine coupler splines through the grease fitting on the coupler by applying approximately 8-10 pumps of grease from a typical hand-operated grease gun.

NOTE: *If the boat is operated at idle for prolonged periods of time, coupler should be lubricated every 50 hours.*



71569

Typical

a - Engine coupler grease fitting

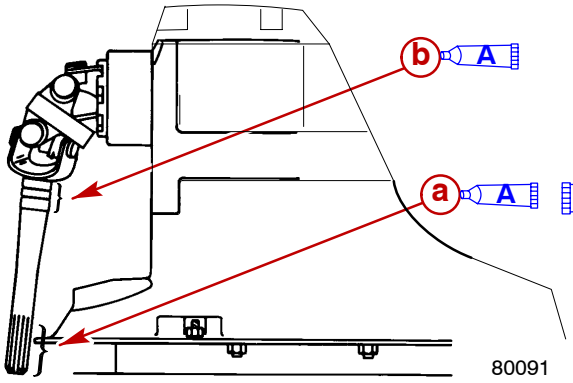
Description		Where Used	Part Number
A	Engine Coupler Spline Grease	Coupler	92-802869A1

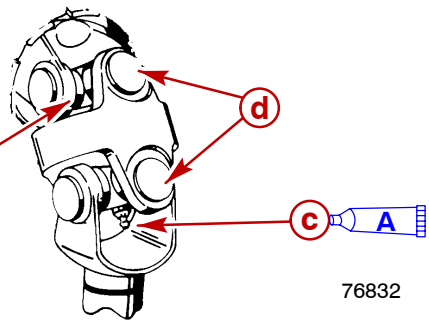
Sterndrive U-joint Cross Bearings And Shaft Splines (Sterndrive Unit Removed)

NOTE: *Gray sterndrive U-joint cross bearings have grease fittings and require lubrication at specified intervals. Black sterndrive U-joint cross bearings do not have grease fittings and do not require additional lubrication.*

1. Lubricate the sterndrive U-joint cross bearings through the grease fittings, if equipped, by applying approximately 3-6 pumps of grease from a typical hand-operated grease gun.

2. Lubricate the U-joint shaft splines and the O-rings.



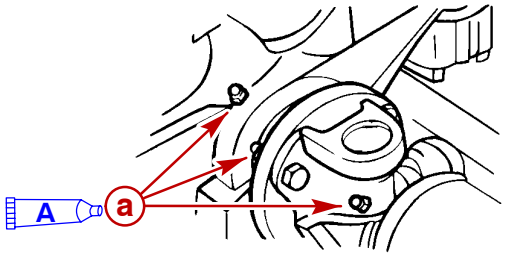


a - U-joint shaft splines
b - U-joint shaft O-rings
c - Grease fittings, if equipped
d - Cross bearing assemblies

Description		Where Used	Part Number
A	Engine Coupler Spline Grease	U-joint shaft splines and O-rings	92-802869A1
		Cross bearings grease fitting, if equipped	

Drive Shaft Extension Models

1. Lubricate the drive shaft at the transom end, by applying approximately 10 - 12 pumps of grease from a typical hand-operated grease gun through the transom grease fittings and approximately 3 - 4 pumps of grease through the drive shaft grease fitting.

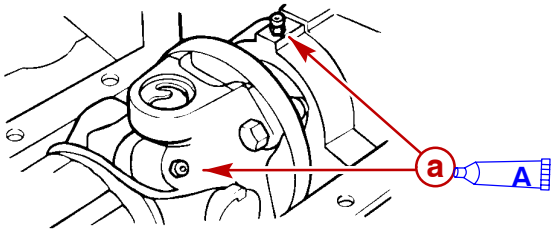


71346

a - Transom grease fittings
b - Drive shaft grease fitting

Description		Where Used	Part Number
A	U-joint and Gimbal Bearing Grease	Drive shaft U-joints	92-802870A1

2. Lubricate the drive shaft at engine end, by applying approximately 3 - 4 pumps of grease from a typical hand-operated grease gun through each grease fitting.



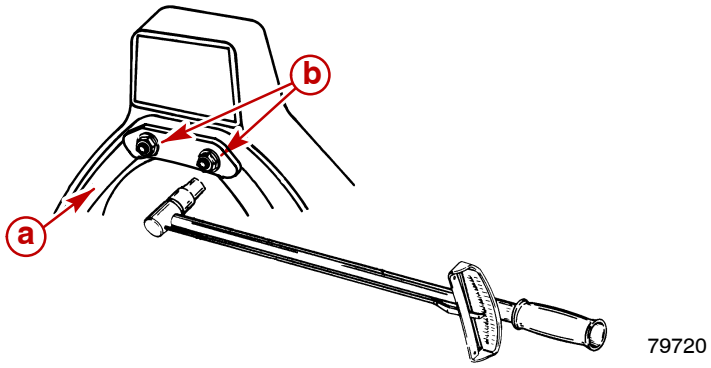
71347

a - Grease fitting

Description		Where Used	Part Number
A	U-joint and Gimbal Bearing Grease	Drive shaft U-joints	92-802870A1

Gimbal Ring To Steering Shaft Connection

1. Loosen the gimbal ring locknuts 1 to 1-1/2 turns. Retorque the gimbal ring locknuts for the steering shaft connection.



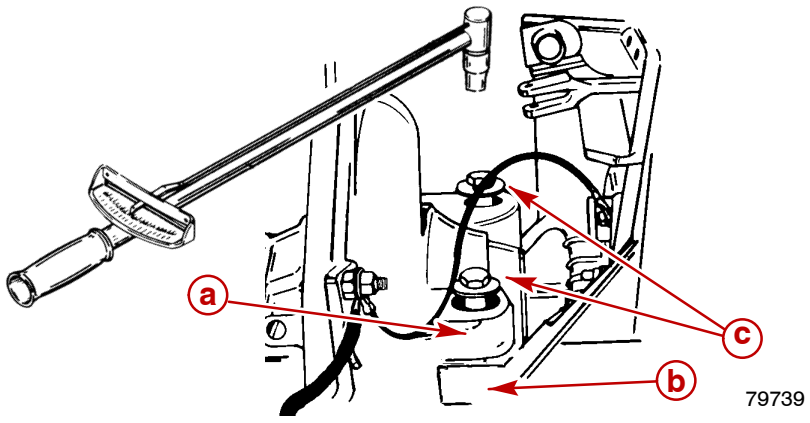
a - Gimbal ring
b - Gimbal ring locknut

Description	Nm	lb-in.	lb-ft
Gimbal ring locknut	72		53

Rear Engine Mount

NOTE: *Refer to the boat manufacturer for front engine mount torque information.*

1. Loosen the rear engine mount bolts 1 to 1-1/2 turns. Retorque the rear engine mount bolts.



Typical

a - Rear engine mount
b - Transom plate mount
c - Rear engine mount bolt

Description	Nm	lb-in.	lb-ft
Rear engine mount bolt	47		35

Propellers

⚠ WARNING

A rotating propeller, especially when driven by an operating engine, can cause injury. Prior to installing or removing the propeller, ensure that the lanyard switch, if equipped, is in the off position, the remote control is in the NEUTRAL position, and the ignition switch is in the off position with the key removed from the switch

⚠ WARNING

A rotating propeller can cause injury. Place a block of wood between the anti-ventilation plate and the propeller to protect hands from the propeller blades and to prevent the propeller from turning when tightening the propeller nut.

IMPORTANT: Installation is correct when at least 2 threads of propeller the shaft are exposed through the propeller locknut after torquing the locknut.

IMPORTANT: Correct rotation propeller MUST match direction of drive rotation.

Bravo One and Two

REMOVAL

1. Set the remote control in the NEUTRAL position. Set the lanyard stop switch, if equipped, in the OFF position. Ensure the ignition switch is in the OFF position and remove the key from the switch.
2. Place wood block between propeller blade and anti-ventilation plate to prevent rotation.

NOTE: *Refer to Installation for exploded view of propellers and hardware.*

3. Straighten bent tabs on tab washer.
4. Turn propeller shaft nut counterclockwise to remove nut.
5. Slide tab washer, spline washer, propeller and thrust hub off propeller shaft.

REPAIR

Some damaged propellers can be repaired. Contact your authorized Cummins MerCruiser Diesel dealer / distributor.

INSTALLATION

1. Set the remote control in the NEUTRAL position. Set the lanyard stop switch, if equipped, in the OFF position. Ensure the ignition switch is in the OFF position and remove the key from the switch.
2. Place wood block between propeller blade and anti-ventilation plate to prevent rotation.
3. Apply a liberal coat of one of the following lubricants to the propeller shaft.

Description	Where Used	Part Number
Anti-Corrosion Grease	Propeller shaft	92-802867A1
Special Lubricant 101		92-802865A1
2-4-C with Teflon		92-802859A1

4. Slide thrust hub into propeller hub with stepped side toward propeller hub.
5. **Bravo One:** Install Flo-Torque II Drive Hub into propeller.

NOTE: *The drive sleeve is tapered and will slide fully into the propeller as the nut is tightened and properly torqued.*

6. Align splines and place propeller on propeller shaft.
7. Install final attaching hardware.
   a. **Bravo One:** Install drive sleeve adapter and locking tab washer.
   b. **Bravo Two:** Install spline washer and tab washer.

⚠ CAUTION

Avoid Injury: Periodically check propeller nut for tightness during boating season. A minimum of 55 lb-ft (75 Nm) torque is required.

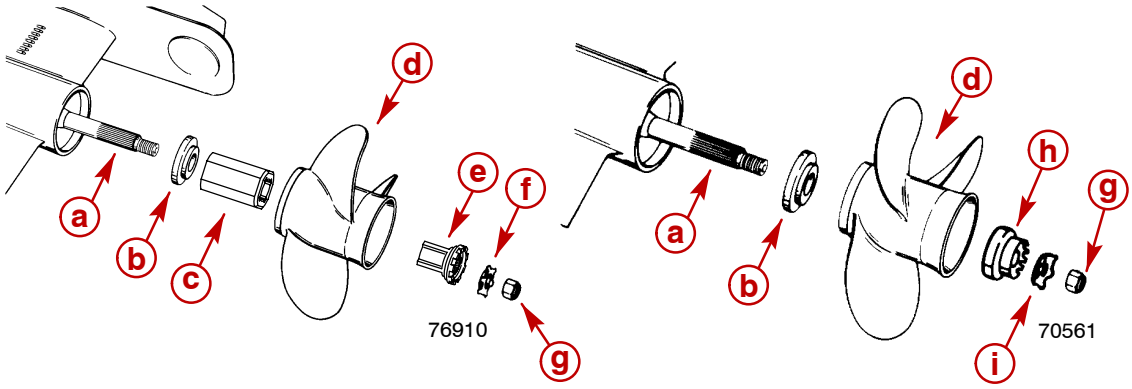
8. Install and torque the propeller nut.

Description	Nm	lb-in.	lb-ft
Propeller Nut[1]	75		55

[1] The propeller torque stated is the minimum torque value.

IMPORTANT: If reusing the tab washer, carefully inspect the tabs for cracks or other damage. Replace the tab washer if condition is questionable.

9. Bend 3 tabs on the tab washer down into the grooves in spline washer. After the first use, bend the 3 tabs straight and retorque the propeller nut. Bend tabs into spline washer. Check propeller at least after 20 hours of operation. Do not operate with loose propeller.



Bravo One

a - Propeller shaft
b - Thrust hub
c - Flo-Torque II drive hub
d - Propeller
e - Drive sleeve

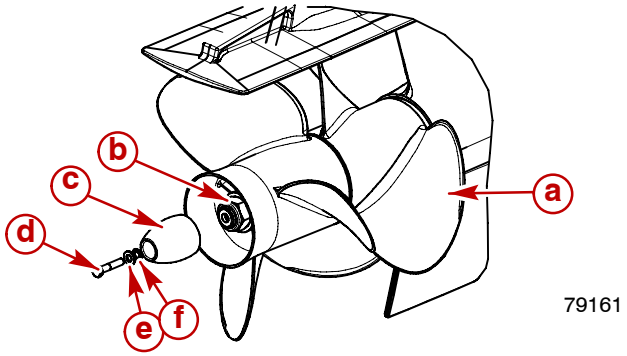
Bravo Two

f - Locking tab washer
g - Propeller nut
h - Spline washer
i - Tab washer

Bravo Three

REMOVAL

1. Set the remote control in the NEUTRAL position. Set the lanyard stop switch, if equipped, in the OFF position. Ensure the ignition switch is in the OFF position and remove the key from the switch.
2. Place wood block between propeller blade and anti-ventilation plate to prevent rotation. Straighten bent tabs on tab washer.
3. Remove the bolt and washers securing the propeller nut anode.
4. Remove the propeller shaft anode.



a - Propeller
b - Propeller shaft nut
c - Propeller shaft anode
d - Propeller shaft anode screw
e - Flat washer
f - Star washer

NOTE: *Refer to Installation for exploded view of propellers and hardware.*

5. Turn aft propeller shaft nut (1-7/16 in. or 37 mm) counterclockwise to remove nut.
6. Slide propeller and thrust hub off propeller shaft.
7. Turn front propeller shaft nut (2-3/4 in. or 70 mm) counterclockwise to remove nut.
8. Slide propeller and thrust hub off propeller shaft.

REPAIR

Some damaged propellers can be repaired. Contact your authorized Cummins MerCruiser Diesel dealer / distributor.

INSTALLATION

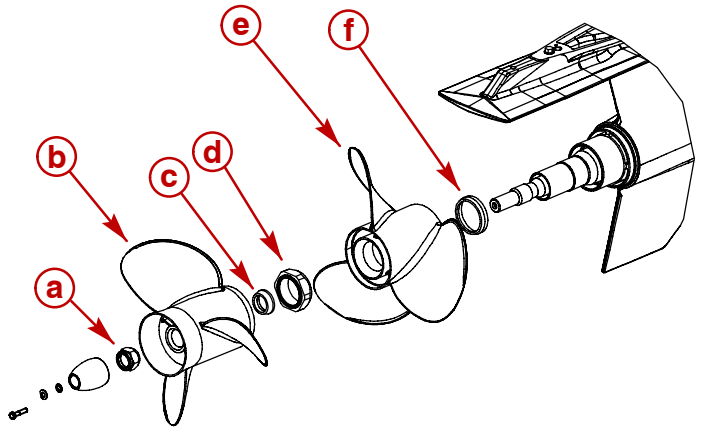
1. Set the remote control in the NEUTRAL position. Set the lanyard stop switch, if equipped, in the OFF position. Ensure the ignition switch is in the OFF position and remove the key from the switch.
2. Place wood block between propeller blade and anti-ventilation plate to prevent rotation. Straighten bent tabs on tab washer.
3. Apply a liberal coat of one of the following lubricants to the propeller shaft.

Description	Where Used	Part Number
Anti-Corrosion Grease	Propeller shaft	92-802867A1
Special Lubricant 101		92-802865A1
2-4-C with Teflon		92-802859A1

4. Slide forward thrust hub onto propeller shaft with tapered side toward propeller hub (toward end of shaft).
5. Align splines and place propeller on propeller shaft.
6. Install and torque the propeller nut. Check propeller at least every 20 hours of operation and retorque as needed.

Description	Nm	lb-in.	lb-ft
Forward Propeller Nut	136		100

7. Slide aft thrust hub onto propeller shaft, with tapered side toward propeller hub (toward end of shaft).
8. Align splines and place propeller on propeller shaft.



77107

a - Rear propeller nut
b - Rear propeller
c - Rear propeller thrust hub
d - Front propeller nut
e - Front propeller
f - Front propeller thrust hub

⚠ CAUTION

Avoid Injury: Periodically check propeller nut for tightness during boating season. A minimum of 60 lb-ft (81 Nm) torque is required.

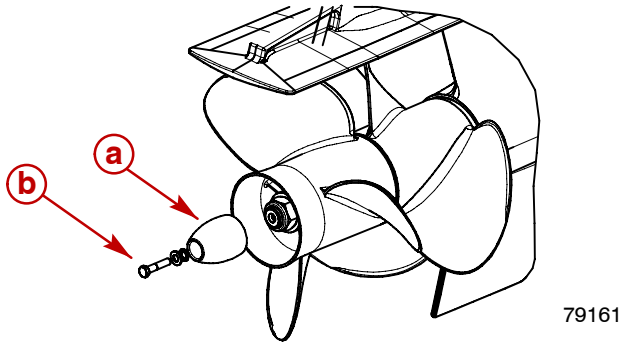
9. Install and torque the propeller nut. Check propeller at least every 20 hours of operation and retorque as needed.

Description	Nm	lb-in.	lb-ft
Aft Propeller Nut	81		60

10. Install the propeller shaft anode over the propeller shaft nut.
11. Place the flat washer onto the propeller shaft anode screw.
12. Place the star washer onto the propeller shaft anode screw.

NOTE: *If the propeller shaft anode is removed after initial installation and is to be reinstalled, it will be necessary to apply Loctite Thread Locker 271 to the threads of the propeller shaft anode screw.*

13. Secure the propeller shaft anode to the propeller shaft using the propeller shaft anode screw and washers. Torque the screw.



a - Propshaft anode
b - Propeller shaft anode screw and washers

Description	Nm	lb-in.	lb-ft
Propeller shaft anode screw 5/16 in.-18 x 1.5 in. (38 mm) long	27		20

Drive Belts

All drive belts must be periodically inspected for tension and condition (excessive wear, cracks, fraying, or glazed surfaces).

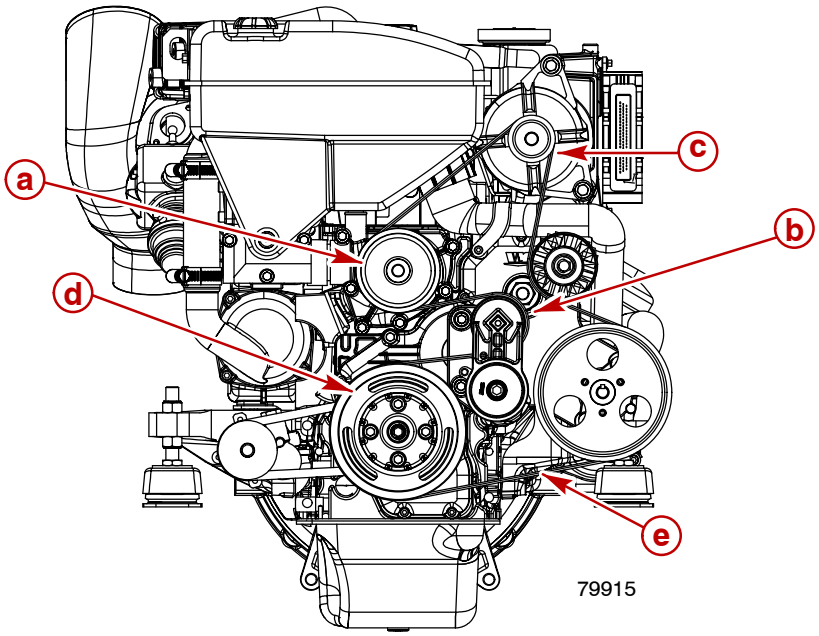
If any drive belts need replacement or tension needs adjustment, see your authorized Cummins MerCruiser Diesel dealer / distributor.

⚠ WARNING

Avoid possible serious injury. Make sure engine is shut off and ignition key is removed before inspecting belts.

Checking Serpentine Belt

1. The various components are:



Typical

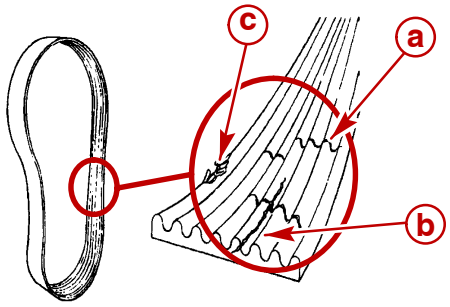
- **a** - Water circulating pump pulley
- **b** - Automatic tensioner pulley
- **c** - Alternator pulley
- **d** - Crankshaft pulley
- **e** - Serpentine belt

2. Inspect serpentine belt for proper tension and for the following:

- Excessive wear
- Cracks

NOTE: *Minor, transverse cracks (across the belt width) may be acceptable. Longitudinal cracks (in direction of belt length) that join transverse cracks are NOT acceptable.*

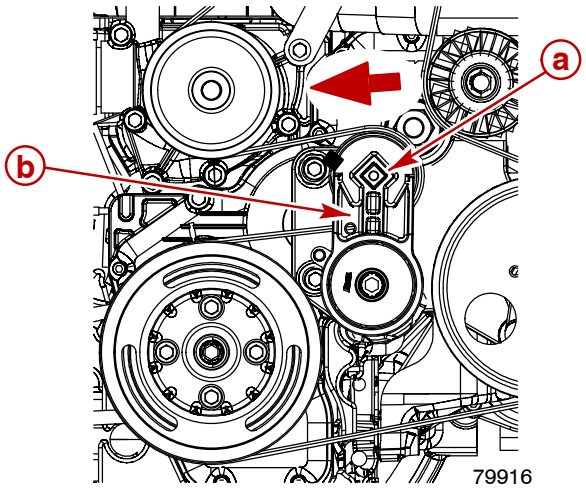
- Fraying
- Glazed surfaces
- Proper tension



75130

a - Transverse crack
b - Longitudinal crack
c - Fraying

3. Check operation of the automatic tensioner and associated components.
   a. Position a suitable tool in the square tool opening and move (rotate) tensioner pulley in direction of arrow.
   b. Release and allow to glide back slowly.
   c. Tensioner must return to it's initial position.



79916

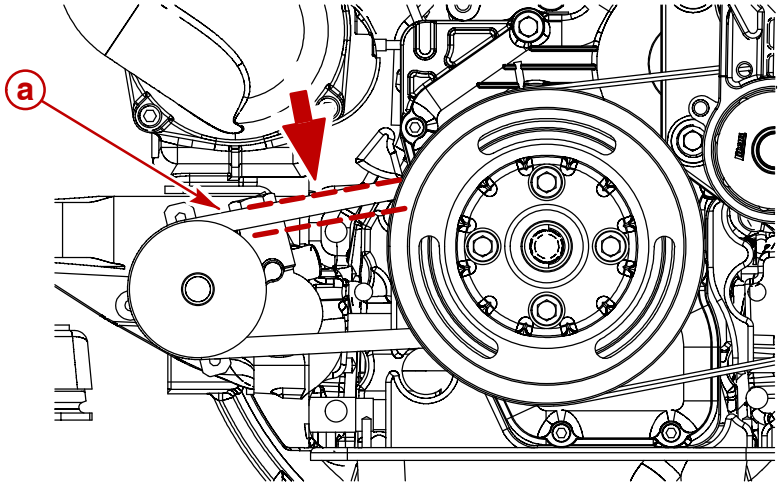
a - Automatic tensioner
b - Square tool opening

Checking Power Steering Pump Belt

1. Inspect power steering belt for proper tension and for the following:

- Excessive wear
- Cracks
- Fraying
- Glazed surfaces
- Proper tension

2. Check tension by depressing upper strand of power steering belt, with light thumb pressure (approximately 5 kgf [11 lbf]), at point shown. Belt should move no more than 5 mm (3/16 in.) either way.

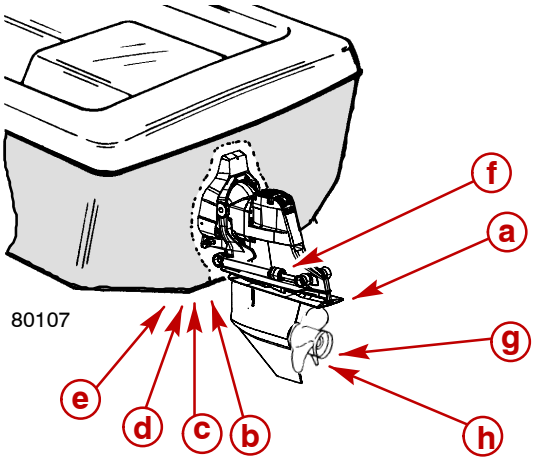


a - Power steering pump belt

Corrosion Protection

Whenever 2 or more dissimilar metals (like those found on the sterndrive) are submerged in a conductive solution, such as saltwater, polluted water or water with a high mineral content, a chemical reaction takes place causing electrical current to flow between metals. The electrical current flow causes the metal that is most chemically active, or anodic, to erode. This is known as galvanic corrosion and, if not controlled, it will in time cause the need for replacement of power package components exposed to water.

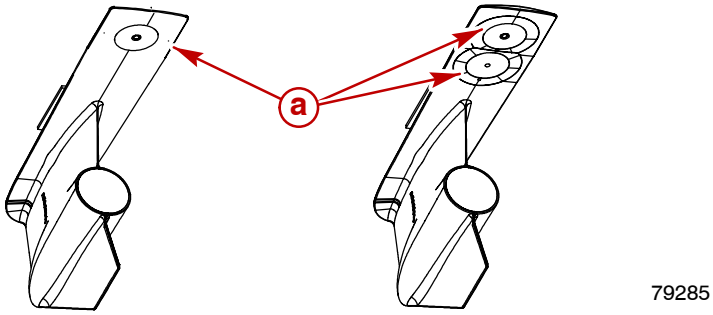
To help control the effects of galvanic corrosion, Cummins MerCruiser Diesel sterndrive units come with several sacrificial anodes and other corrosion protection devices. For a more comprehensive explanation of corrosion and corrosion protection refer to the ***Marine Corrosion Protection Guide*** (90-88181301).



a - Gearcase anodic plate
b - Ventilation Plate Anode
c - Drive mounted anodic block
d - MerCathode system
e - Anode kit
f - Trim cylinder anodes
g - Bearing carrier anode
h - Propshaft anode

IMPORTANT: Replace sacrificial anodes if eroded 50 percent or more. Do not use anodes from another manufacturer. Refer to your Cummins MerCruiser Diesel dealer / distributor for additional information.

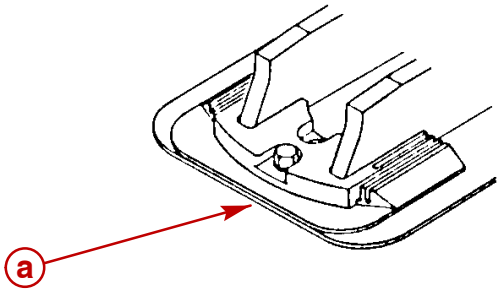
Gearcase Anodic Plate - Is mounted on the underside of the lower gearcase and serves as a sacrificial anode.



Bravo One and Bravo Two Models **Bravo Three Models**

a - Gearcase anodic plate

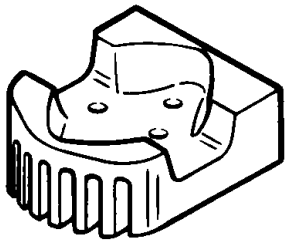
Ventilation Plate Anode - Is mounted on the front of the gearcase and serves as a sacrificial anode.



All Bravo Models

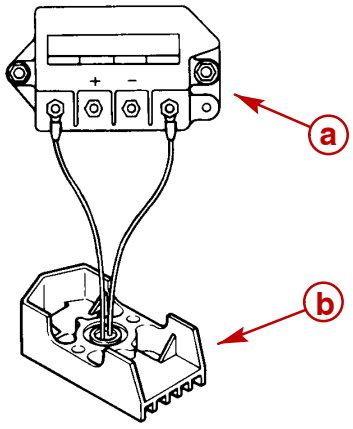
a - Anode

Drive Mounted Anodic Block (if equipped) - Is mounted to underside of gimbal housing and serves as a sacrificial anode.



70576

MerCathode System (if equipped) - Electrode assembly replaces Anodic Block. System should be tested to ensure adequate output. The test should be performed where boat is moored, using Quicksilver Reference Electrode and Test Meter. Contact your authorized Cummins MerCruiser Diesel dealer / distributor.



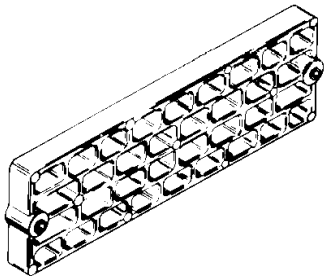
70578

Typical

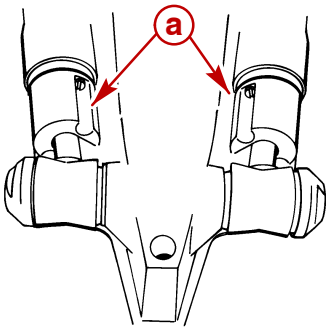
a - MerCathode controller

b - Anodic block

Anode Kit (if equipped) - Mounted to boat transom. Acts as a sacrificial anode.



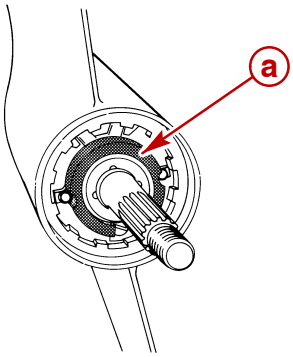
Trim Cylinder Anodes - are mounted on each trim cylinder.



71966

a - Trim cylinder anodes

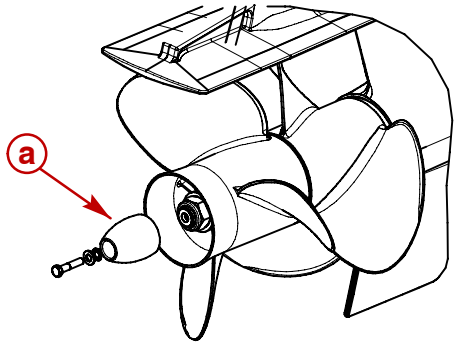
Bearing Carrier Anode (Bravo One Models) - is located in front of the propeller, between the front side of the propeller and the gear housing.



72032

a - Bearing carrier anode

Propshaft Anode (Bravo Three Only) - is located behind the aft propeller.



79161

a - Propshaft anode

In addition to the corrosion protection devices, the following steps should be taken to inhibit corrosion:

1. Paint your power package, refer to Painting Your Power Package.
2. Spray power package components on inside of boat annually with Corrosion Guard to protect finish from dulling and corrosion. External power package components may also be sprayed.
3. All lubrication points, especially steering system, shift and throttle linkages, should be kept well lubricated.
4. Flush cooling system periodically, preferably after each use.

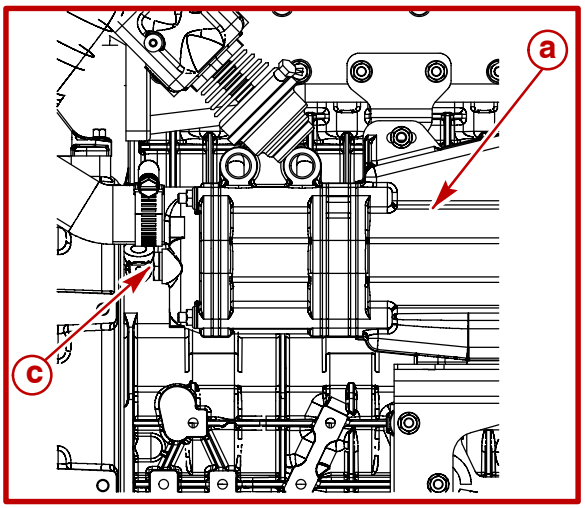
Internal Components

Sacrificial anode locations:

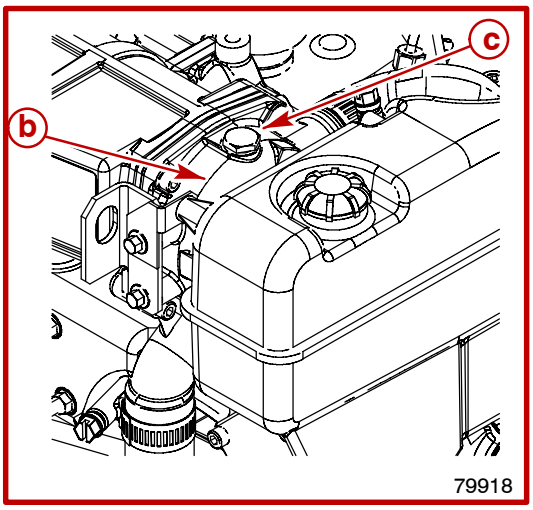
- Starboard, aft-end of the heat exchanger / fluid cooler.
- Top of the aftercooler end cover.

REMOVAL

1. Allow the engine to cool.
2. Remove anode plugs and sacrificial anodes.



79919



79918

a - Heat exchanger / fluid cooler
b - Intercooler end cover
c - Anode plug and sacrificial anode

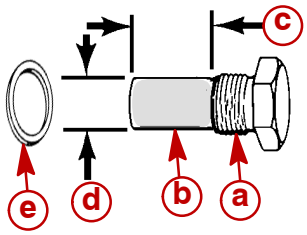
INSPECTION

NOTE: *Remove deposits from surface of anode before trying to determine amount of erosion.*

1. Replace anode assembly when deteriorated 50%.

- Length When New - 19 mm (3/4 in.)
- Diameter When New - 16 mm (5/8 in.)

2. Discard sealing washer.



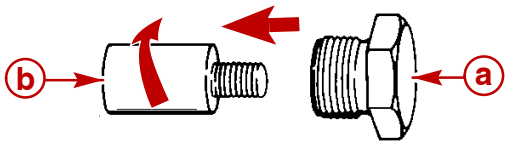
71368

a - Anode Plug
b - Sacrificial Anode
c - Length
d - Diameter
e - Sealing Washer

REPAIR

NOTE: *Sacrificial anodes are available as an assembly. Replace both the plug and anode, if so desired.*

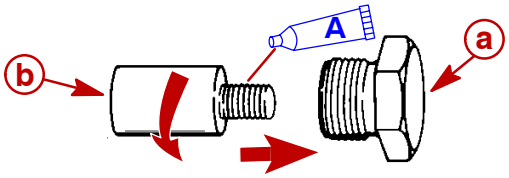
1. Unscrew sacrificial anode from anode plug by holding plug hex head and turning anode.



71367

a - Plug
b - Anode

2. Clean interior threads of anode plug.
3. Apply sealant to threads of new sacrificial anode and install into anode plug. Tighten securely.



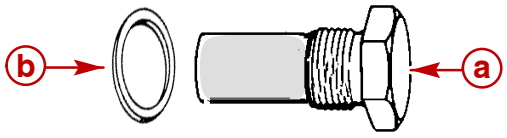
71367

a - Plug
b - Anode

Description		Where Used	Part Number
A	Loctite 567 PST Pipe Sealant	Threads of anode plug	92-809822

INSTALLATION

1. Install new sealing washer.
2. Install anode plug, with sacrificial anode and washer into heat exchanger or aftercooler end cover. Tighten securely.



71368

a - Plug And Anode
b - Sealing Washer

⚠ CAUTION

Avoid seawater pump impeller damage. Do not operate the engine without cooling water being supplied to the seawater pickup pump.

3. Ensure that the seawater pickup pump is supplied cooling water.
4. Start the engine and check for leaks.

Painting Your Power Package

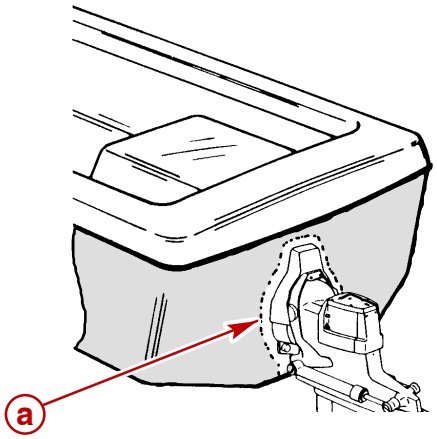
IMPORTANT: Corrosion damage that results from the improper application of anti-fouling paint will not be covered by the limited warranty.

1. **Painting Boat Hull or Boat Transom:** Anti-fouling paint may be applied to boat hull and boat transom but you must observe the following:

IMPORTANT: Do not paint anodes or MerCathode System reference electrode and anode, as this will render them ineffective as galvanic corrosion inhibitors.

IMPORTANT: If anti-fouling protection is required for boat hull or boat transom, copper or tin base paints, if not prohibited by law, can be used. If using copper or tin based anti-fouling paints, observe the following:

- **Avoid any electrical interconnection between the Cummins MerCruiser Diesel Product, Anodic Blocks, or MerCathode System and the paint by allowing a minimum of 40 mm (1-1/2 in.) UNPAINTED area on transom of the boat around these items.**



71176

a - Unpainted Area On Transom

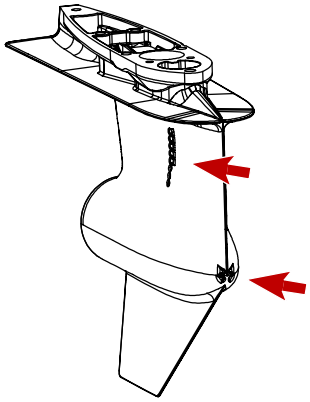
2. **Painting Sterndrive Unit or Transom Assembly:** Sterndrive unit and transom assembly should be painted with a good quality marine paint or an anti-fouling paint that does not contain copper, or any other material that could conduct electrical current. Do not paint drain holes, anodes, MerCathode system, and items specified by boat manufacturer.

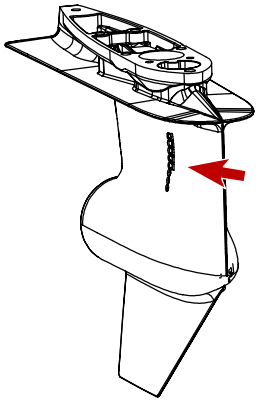
Seawater System

Checking The Water Pickups

STERNDRIVE

1. Ensure that the gear housing water inlet holes are clean and not obstructed.



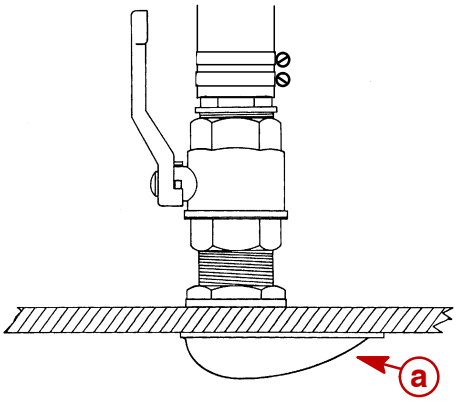


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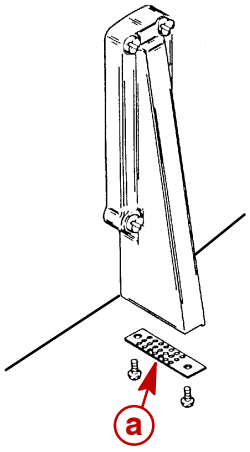
Dual Water Pickup **Side Pickup**

THOUGH THE HULL OR THROUGH THE TRANSOM PICKUPS, IF EQUIPPED

1. Ensure that the seawater pickup water inlet holes are clean and not obstructed.



70355



72640

Typical Through The Hull Pickup **Typical Through The Transom Pickup**

a - Water inlet holes

Draining Instructions

⚠ CAUTION

Ensure that the boat is out of the water, or the seacock is closed, or the seawater inlet hose is disconnected and plugged, and the bilge pump is operating before beginning procedure. Excess water in the bilge can damage the engine or cause the boat to sink.

⚠ CAUTION

Do not operate the engine with the drain system open. Excess water in the bilge can damage the engine or cause the boat to sink.

IMPORTANT: Engine must be as level as possible to ensure complete draining of the cooling system.

The power package should be drained before flushing or prior to extended or cold weather storage.

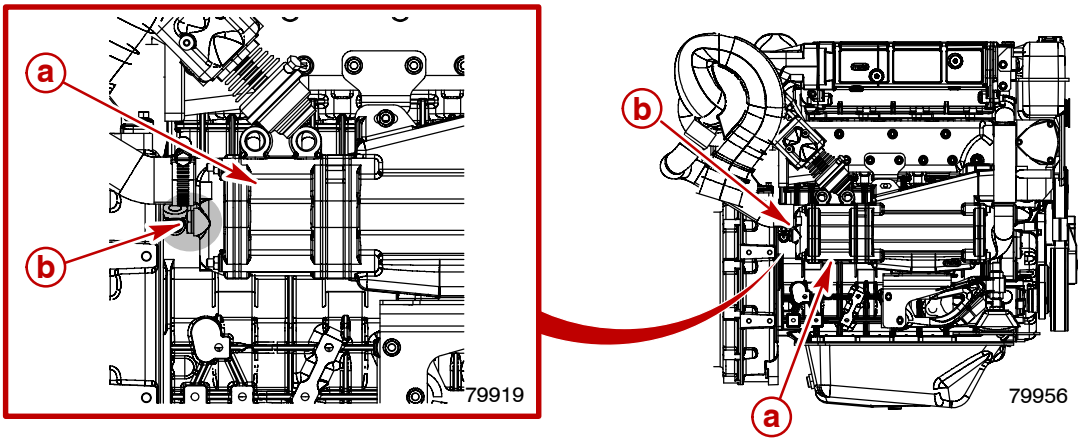
IMPORTANT: The boat must not be operating at any point during this procedure.

1. Remove the boat from the water, if possible, or turn on the bilge pump, if the boat is in the water
2. Close the seacock, if equipped, or disconnect and plug the seawater inlet hose, if the boat is to remain in the water.
3. Make the engine as level as possible to ensure complete draining of seawater cooling system.

⚠ CAUTION

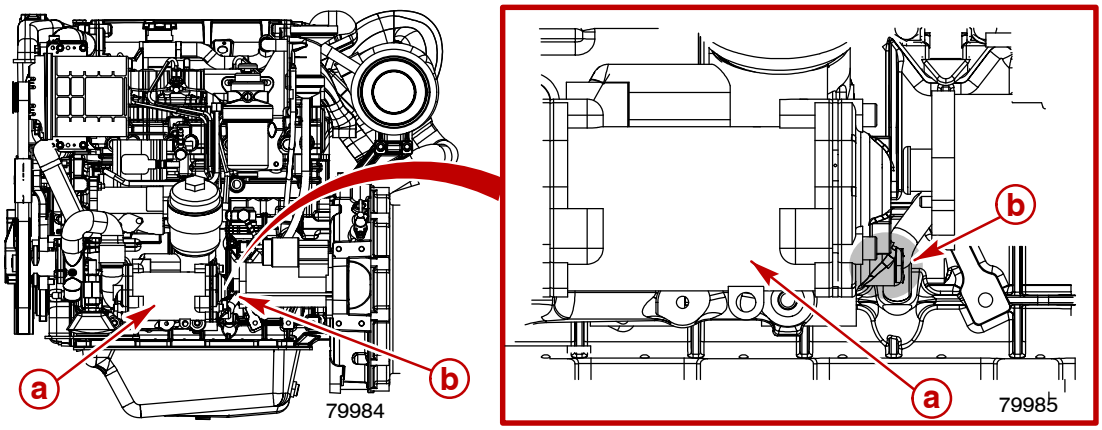
Avoid damage to heat exchanger and subsequent possible engine damage. Remove all water from heat exchanger sections. Failure to do so could cause corrosion or freeze damage to heat exchanger water passage tubes.

4. Remove the drain plug from the aft end cover of the fluid cooler.



a - Fluid cooler
b - Drain plug

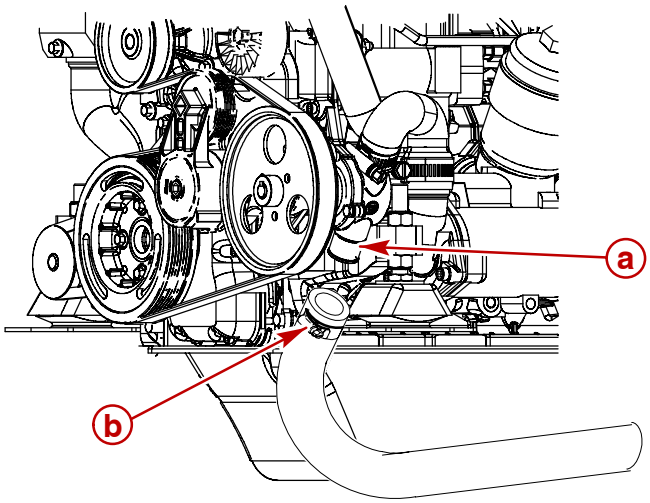
5. Remove the drain plug from the aft end cover of the engine oil cooler.



a - Engine oil cooler
b - Drain plug

NOTE: *In the following steps, it may be necessary to lower or bend the hoses to allow water to drain completely.*

6. Disconnect seawater inlet hose from the seawater pump and drain.



a - Seawater pump
b - Seawater inlet hose

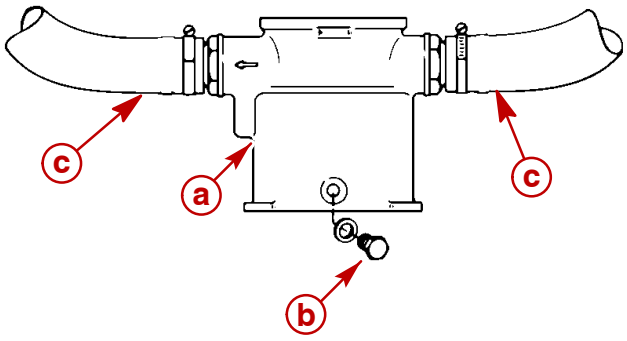
79920

7. Repeatedly clean out drain holes using a stiff piece of wire. Do this until entire system is drained.

⚠ CAUTION

Avoid water entering the boat. Do not disconnect or unplug the seawater inlet hose unless a seacock is present and it is closed.

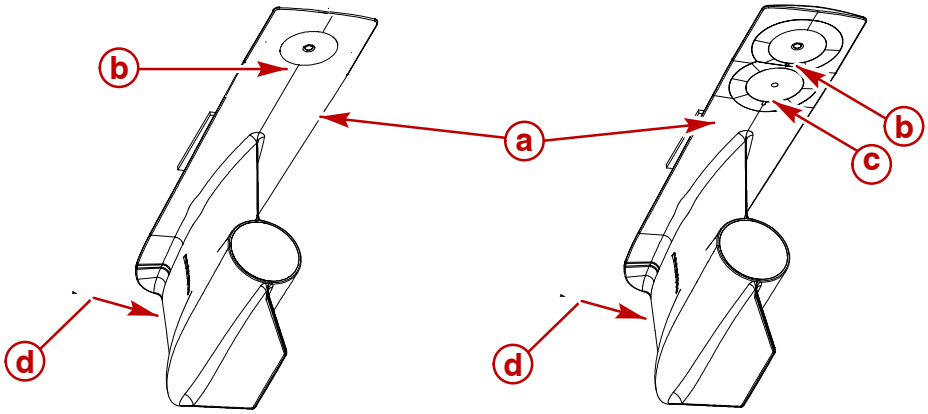
8. **On models equipped with a seawater strainer:** remove the hose at the seawater strainer and drain the hose completely. Drain and empty the seawater strainer. Reconnect the hose and tighten the hose clamps securely. Install the washer and drain plug.



71362

a - Seawater strainer
b - Washer and drain plug
c - Hose

9. Using a piece of wire, check the water drain passages in the sterndrive unit to ensure that they are open.



Bravo One and Brave Two Models **Bravo Three Models**

a - Under side of prop shaft housing
b - First anode cavity drain passage
c - Second anode cavity drain passage
d - Speedometer pitot tube

10. After the seawater section of the cooling system has been drained completely, coat the threads of the drain plugs with sealant and install. Tighten plugs securely.

Description	Where Used	Part Number
Perfect Seal	Fluid and oil cooler drain plug threads	92-34227-1

11. Reconnect the hoses. Tighten the hose clamps securely.

Cleaning The Seawater Strainer, If Equipped

1. Visually inspect seawater strainer through glass top.

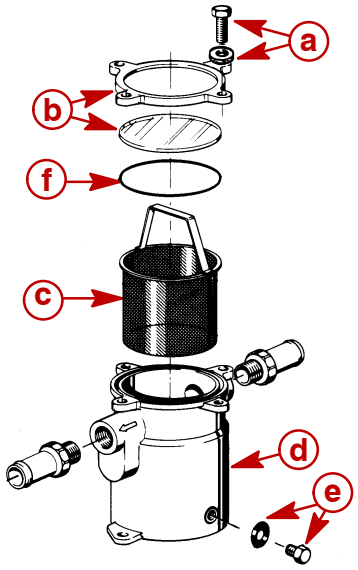
⚠ CAUTION

While cleaning the seawater strainer, seawater can flow into the engine or engine compartment causing damage to the engine or boat. Water inlet must be closed before cleaning the seawater strainer.

⚠ CAUTION

Do not overtighten the cover screws or the cover will warp and leak.

2. With the engine off, close the seacock (if equipped) or remove and plug the seawater inlet hose if no seacock exists.
3. Remove the screws, washers, and cover.
4. Remove the strainer, drain plug and washer.
5. Clean all debris from the strainer housing; flush both the strainer and housing with clean water.
6. Check the gasket and replace it when necessary (if it leaks).
7. Reinstall the strainer, drain plug and washer.
8. Reattach the cover with the screws and washers.
9. Open the seacock (if equipped) or remove the plug and reconnect the seawater inlet hose.
10. After starting engine, check for leaks and/or air in system, which would indicate an external leak.



78157

Typical

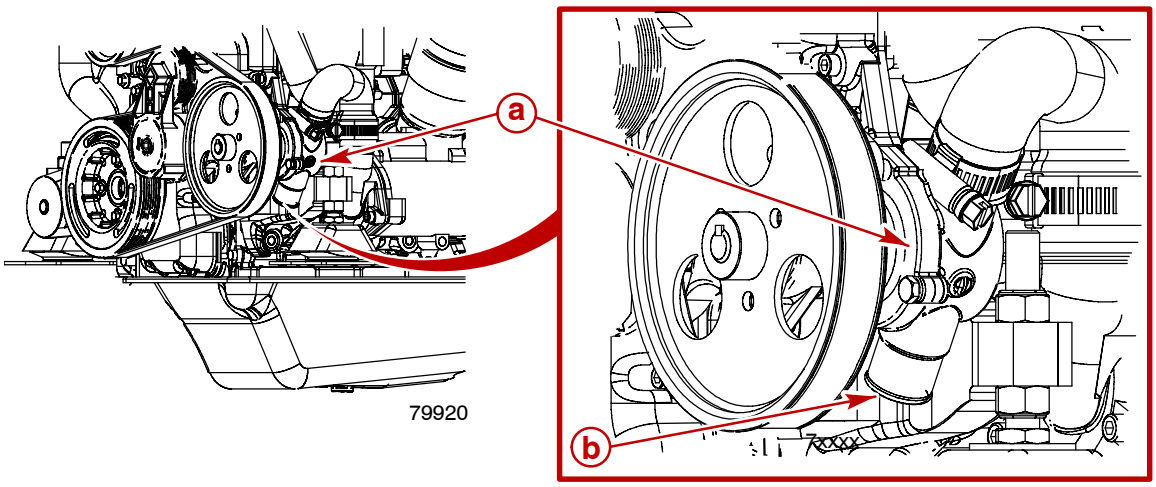
- **a** - Screws and washers
- **b** - Cover, with glass
- **c** - Strainer
- **d** - Housing
- **e** - Drain plug and sealing washer gasket

Flushing The Seawater System

To prevent silt or salt buildup in the seawater cooling system, flush with fresh water after each use and prior to storage. Seawater cooling system must be flushed after each operation in saltwater.

IMPORTANT: Engines with the sterndrive water inlet blocked off at the gimbal housing and using a through the hull water inlet, need a supply of cooling water available to both the sterndrive unit and to the engine during operation.

1. **On engines with through the hull water inlet:** Supply sufficient cooling water to the seawater pump. Attach a hose between the seawater pump inlet and a water source.



a - Seawater pump
b - Inlet

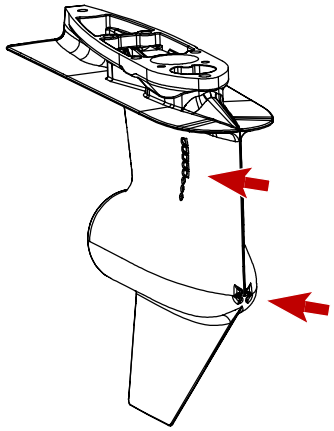
⚠ WARNING

When flushing, ensure the area around the propeller is clear and no one is standing nearby. To avoid possible injury, remove the propeller.

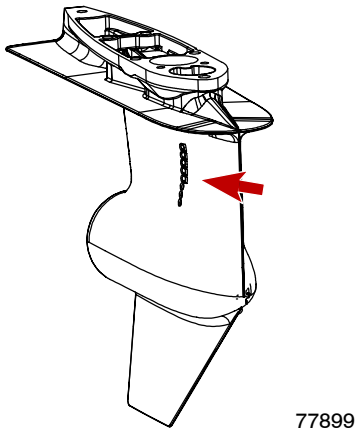
2. Ensure the area around the propeller is clear and no one is standing nearby. To avoid possible injury, remove the propeller. Refer to Propellers.
3. Install Flushing Attachment (or equivalent) over water pickup openings in gear housing.

⚠ CAUTION

If using flush test device (attachment), install over water intake holes and connect a water hose. Do not use full water tap pressure. Also, do not operate engine above 1500 rpm, as suction created could cause water hose to collapse causing water supply to be cut off.

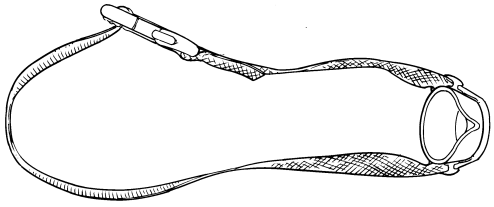


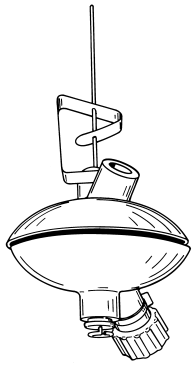
Dual water pickup



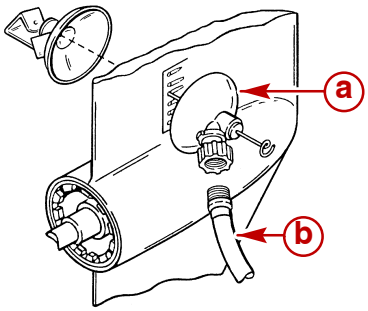
77899

Side pickup

Dual Water Pick-Up Flush Gear Case Seal Kit	**91-881150Q1**
Description: Use to block-off the front water inlet holes on the dual water inlet gear cases.	 77977

Flushing Device	**91-44357Q2**
Description: Attaches to the drive unit water intakes, provides a fresh water connection when flushing the cooling system or operating the engine.	 73440

4. Attach a hose between the flushing attachment and a water source.



72012

Typical

a - Flushing attachment
b - Hose

5. Lower the sterndrive unit to full DOWN/IN position.
6. Partially open the water tap (approximately 1/2 maximum capacity). Do not use full water pressure.
7. Place the remote control in NEUTRAL, IDLE speed position and start the engine.

⚠ CAUTION

Do not run engine above 1500 rpm when flushing. Suction created by seawater pickup pump may collapse flushing hose, causing engine to overheat.

8. Operate the engine at IDLE speed in NEUTRAL for 10 minutes, then stop the engine.
9. Shut off the water tap.
10. If boat is in the water, raise the sterndrive unit to the TRAILER position.
11. Remove the hose and flushing attachment.

NOTES:

SECTION 6 - STORAGE AND RECOMMISSIONING

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6

Cold Weather (Freezing Temperature), Seasonal Storage, And Extended Storage

IMPORTANT: Cummins MerCruiser Diesel strongly recommends that this service should be performed by an authorized Cummins MerCruiser Diesel dealer / distributor. Damage caused by freezing IS NOT covered by the Cummins MerCruiser Diesel Limited Warranty.

⚠ CAUTION

Avoid cooling system and engine damage. Water trapped in the seawater section of the cooling system can cause corrosion damage, can freeze causing freeze damage, or may result in both types of damage. Ensure that the seawater section of the cooling system is drained immediately after operation or before any length of storage in cold weather if the possibility of freezing temperatures exists.

Consider a boat is in storage whenever it is not in operation. The amount of time that the power package is not operated may be for a brief period, such as during a day, overnight, for a season, or for an extended period of time. Certain precautions and procedures must be observed to protect the power package from freeze damage, corrosion damage, or both types of damage during storage.

Freeze damage can be caused when water trapped in the seawater cooling system is frozen. For example, after operating the boat, exposure to freezing temperatures for even a brief period of time could result in freeze damage.

Corrosion damage is the result of saltwater, polluted water, or water with a high mineral content trapped in the seawater cooling system. Saltwater should not stay in an engine's cooling system for even a brief storage time; drain and flush the seawater cooling system after each outing.

Cold weather operation refers to operating the boat whenever the possibility of freezing temperatures exists. Likewise, cold weather (freezing temperature) storage refers to whenever the boat is not being operated and the possibility of freezing temperatures exists. In such cases, the seawater section of the cooling system must be completely drained immediately after operation.

Seasonal storage refers to when the boat is not being operated for 1 month or more. The length of time varies depending on the geographic location of the boat in storage. Seasonal storage precautions and procedures include all of the steps for cold weather (freezing temperature) storage and some additional steps that must be taken when storage will last longer than the short time of cold weather (freezing temperature) storage.

Extended storage means storage for a period of time that may last for several seasons or longer. Extended storage precautions and procedures include all of the steps for cold weather (freezing temperature) storage and seasonal storage plus some additional steps.

Refer to the specific procedures in this **Section 6** related to the conditions and the length of storage for your application.

Cold Weather (Freezing Temperature) Storage

1. Read all precautions and perform all procedures found in **Section 5 - Draining The Seawater System** and drain the seawater section of the cooling system.

⚠ CAUTION

If boat is in the water, the seacock must remain closed until the engine is to be re-started to prevent water from flowing back into the cooling system, boat, or both. If the boat is not fitted with a seacock, the water inlet hose must remain disconnected and plugged to prevent water from flowing back into the cooling system, boat, or both.

2. Place a caution tag at the helm advising the operator to unplug and connect the water inlet hose or open the seacock, if equipped, before operating the boat.
3. For additional assurance against freezing and corrosion fill the seawater cooling system with a mixture of propylene glycol antifreeze and tap water. Refer to **Seasonal Storage Instructions** in this section.

Preparing Your Power Package

IMPORTANT: If boat has already been removed from the water, before starting the engine a source of water must be supplied to the water inlet holes. Follow all warnings and flushing attachment procedures stated in Section 5 - Flushing The Seawater System.

⚠ CAUTION

Overheating from insufficient cooling water will cause engine and drive damage. Ensure that there is sufficient water always available at the water inlet holes during operation.

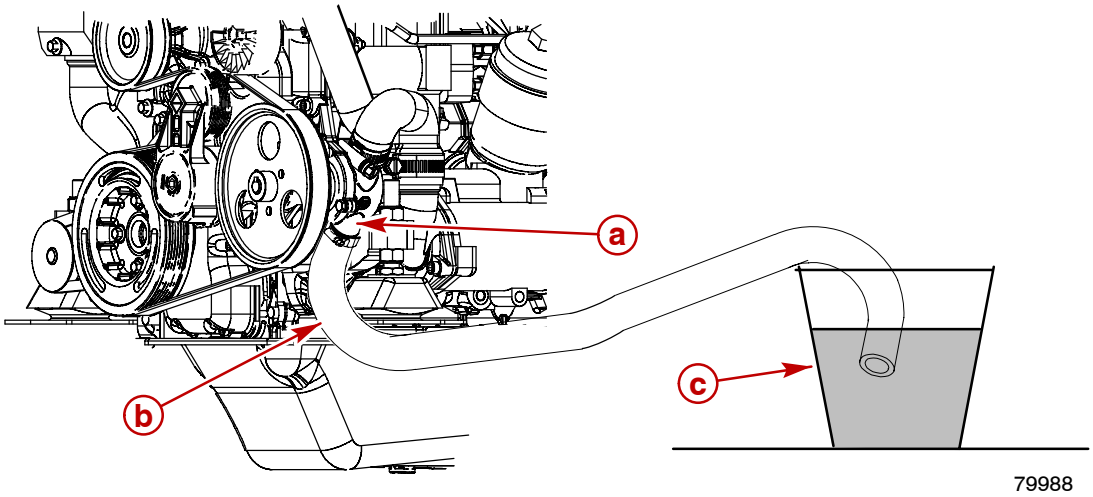
1. Supply cooling water to the water inlet holes or seawater pump inlet.
2. Start the engine and operate until it reaches normal operating temperature.
3. Stop the engine.
4. Change the engine oil and filter.
5. Start the engine and run for about 15 minutes. Check for oil leaks.
6. Flush the seawater cooling system. Refer to **Section 5 - Flushing The Seawater System**.

Seasonal Storage Instructions

1. Read all precautions and perform all procedures found in Preparing Your Power Package For Seasonal or Extended Storage.
2. Read all precautions and perform all procedures found in **Section 5 - Draining The Seawater System** and drain the seawater section of the cooling system.

IMPORTANT: Cummins MerCruiser Diesel recommends that propylene glycol antifreeze be used in seawater section of the cooling system for cold weather (freezing temperature), seasonal storage, or extended storage. Make sure that the propylene glycol antifreeze contains a rust inhibitor and is recommended for use in marine engines. Be certain to follow the propylene glycol manufacturer's recommendations.

3. Fill a container with approximately 5.6 liter (6 U.S. quarts) of propylene glycol antifreeze and tap water mixed to manufacturer's recommendation to protect engine to the lowest temperature to which it will be exposed during cold weather or extended storage.
4. Disconnect the seawater inlet hose from the seawater pump. Using an adapter, if required, temporarily connect an appropriate length piece of hose to seawater pump and place the other end of the hose into the container of propylene glycol antifreeze and tap water.



Typical

a - Seawater pump
b - Temporary hose
c - Container of propylene glycol antifreeze and tap water

NOTE: *Discharge of propylene glycol into the environment may be restricted by law. Dispose of propylene glycol in accordance with Federal, State, and local laws and guidelines.*

5. Start the engine and operate at IDLE speed until antifreeze mixture has been pumped into engine seawater cooling system.
6. Stop the engine.

7. Remove the temporary hose from the seawater pump.

⚠ CAUTION

If boat is in the water, seacock must remain closed until engine is to be re-started to prevent water from flowing back into cooling system and/or boat. If boat is not fitted with a seacock, water inlet hose must remain disconnected and plugged to prevent water from flowing back into cooling system and/or boat.

8. Clean the outside of the engine and repaint any areas required with Primer and Spray Paint. After the paint has dried, coat the engine with specified corrosion inhibiting oil or equivalent.

Description	Where Used	Part Number
Corrosion Guard	Outside of engine	92-802878-55
Light gray primer		92-802878-52
Phantom Black paint		92-802878-1

9. Your Cummins MerCruiser Diesel dealer / distributor should now perform all checks, inspections, lubrication and fluid changes outlined in **Section 5 - Maintenance Schedules.**

⚠ CAUTION

Sterndrive unit should be stored in full DOWN / IN position. Universal Joint bellows may develop a set if unit is stored in raised position and may fail when unit is returned to service.

10. Place sterndrive unit in the full DOWN / IN position.
11. Follow the battery manufacturer's instructions for storage and store the battery.

Extended Storage Instructions

IMPORTANT: Cummins MerCruiser Diesel strongly recommends that this service should be performed by an authorized Cummins MerCruiser Diesel dealer / distributor.

1. Read all precautions and perform all procedures found in Preparing Your Power Package.
2. Read all precautions and perform all procedures found in Draining Instructions.
3. Read all precautions and perform all procedures found in Seasonal Storage Instructions.

IMPORTANT: The seawater pump impeller material can be damaged by prolonged exposure to direct sunlight.

4. Remove the seawater pump impeller and store away from direct sunlight. Refer to an authorized Cummins MerCruiser Diesel dealer / distributor for additional information and service.
5. Place a CAUTION TAG at instrument panel and in engine compartment stating that the seawater pump is out and to not operate the engine.

Recommissioning

NOTICE
Refer to Cold Weather (Freezing Temperature), Seasonal Storage, And Extended Storage - Precautions, BEFORE proceeding.

NOTE: *Discharge of propylene glycol into the environment may be restricted by law. Contain and dispose of propylene glycol in accordance with Federal, State, and local laws and guidelines.*

1. **On engines that were prepared for Cold Weather (Freezing Temperature), Seasonal Storage or Extended Storage:** Refer to **Section 5 - Draining The Seawater System** and drain the propylene glycol into a suitable container. Dispose of the propylene glycol in accordance with Federal, State, and local laws and guidelines.
2. **On engines that were prepared for Extended Storage:** Refer to your Cummins MerCruiser Diesel dealer / distributor and have the seawater pump impeller installed if it was removed for storage.
3. Ensure that all cooling system hoses are in good condition, connected properly, and hose clamps are tight. Verify that all drain valves and drain plugs are installed and tight.
4. Inspect all drive belts.
5. Perform all lubrication and maintenance specified for completion Annually in **Section 5 - Maintenance Schedule**, except items that were performed at time of engine layup.
6. Fill fuel tanks with fresh diesel fuel. Old fuel should not be used. Check fuel lines and connections for leaks and general condition.
7. Replace fuel filter
8. For the sterndrive unit, refer to appropriate Mercury MerCruiser Sterndrive Service Manual.

⚠ CAUTION
When installing battery, connect POSITIVE (+) battery cable to POSITIVE (+) battery terminal FIRST, and NEGATIVE (–) battery cable to NEGATIVE (–) battery terminal LAST. If battery cables are reversed, or connection order is reversed, electrical system damage will result.

9. Install a fully charged battery. Clean the battery cable clamps and terminals. Reconnect the cables (see **CAUTION** listed above). Secure each cable clamp when connecting. Coat terminals with a battery terminal anti-corrosion spray to help retard corrosion.
10. Perform all checks on Operation Chart in the Starting Procedure column found in **Section 3** of the ***Operation, Maintenance and Warranty Manual*** provided with the product.

⚠ CAUTION

Overheating from insufficient cooling water will cause engine and drive system damage. Ensure that there is sufficient water always available at water inlet holes during operation.

11. Supply cooling water to the water inlet openings.
12. Start the engine and closely observe instrumentation. Ensure that all systems are functioning correctly.
13. Carefully inspect the engine for fuel, oil, fluid, water and exhaust leaks.
14. Check the steering system, shift and throttle control for proper operation.

NOTES:

SECTION 7 - TROUBLESHOOTING

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7

Diagnosing Electronically Controlled Fuel System Problems

Your authorized Cummins MerCruiser Diesel dealer / distributor has the proper service tools for diagnosing problems on electronically controlled fuel systems. The Engine Control Module (ECM) on these engines has the ability to detect some problems with the system when they occur, and store a Trouble Code in the ECM's memory. This code can then be read later by a service technician using a special diagnostic tool.

Troubleshooting Charts

Starter Motor Will Not Crank Engine, Or Cranks Slow

Possible Cause	Remedy
Battery switch turned off.	Turn switch on.
Remote control not in neutral position.	Position control lever in neutral.
Open circuit breaker or blown fuse.	Check and reset circuit breaker or replace fuse.
Loose or dirty electrical connections or damaged wiring.	Check all electrical connections and wires (especially battery cables). Clean and tighten faulty connection.
Bad battery.	Test and replace if bad.

Engine Will Not Start, Or Is Hard To Start

Possible Cause	Remedy
Lanyard stop switch activated.	Check lanyard stop switch.
Improper starting procedure.	Read starting procedure.
Empty fuel tank or fuel shut off valve closed.	Fill tank or open valve.
Faulty mechanical fuel delivery pump.	Have pump replaced by an authorized Cummins MerCruiser Diesel dealer / distributor, if fuel is present.
Throttle not operating properly.	Check throttle for freedom of movement.
Faulty electrical stop-circuit	Have an authorized Cummins MerCruiser Diesel dealer / distributor service the electrical stop circuit.
Clogged fuel filters.	Replace filters.
Stale or contaminated fuel.	Drain tank. Fill with fresh fuel.
Fuel line or tank vent line kinked or clogged.	Replace kinked lines or blow out lines with compressed air to remove obstruction.
Air in fuel injection system	Purge fuel injection system
Faulty wire connections.	Check wire connections.
Glow plugs or glow plug system inoperative, if so equipped	Have an authorized Cummins MerCruiser Diesel dealer / distributor service the glow plug system.
Electronic fuel system fault.	Have the electronic fuel system checked by an authorized Cummins MerCruiser Diesel dealer / distributor.

Engine Runs Rough, Misses And/Or Backfires

Possible Cause	Remedy
Throttle not operating properly.	Check throttle linkages for binding or an obstruction.
Idle speed too low.	Check idle speed and adjust, if necessary.
Clogged fuel or air filters.	Replace filters.
Stale or contaminated fuel.	If contaminated, drain tank. Fill with fresh fuel.
Kinked or clogged fuel line or fuel tank vent line.	Replace kinked lines or blow out lines with compressed air to remove obstruction.
Air in fuel system.	Purge fuel injection system.
Electronic fuel system fault.	Have electronic fuel system checked by an authorized Cummins MerCruiser Diesel dealer / distributor.

Poor Performance

Possible Cause	Remedy
Throttle not fully open.	Inspect throttle cable and linkages for proper operation.
Damaged or improper propeller.	Replace propeller. See an authorized Cummins MerCruiser Diesel dealer / distributor.
Excessive bilge water.	Drain and check for cause of entry.
Boat overloaded or load improperly distributed.	Reduce load or redistribute load more evenly.
Boat bottom fouled or damaged.	Clean or repair as necessary.
Electronic fuel system fault.	Have electronic fuel system checked by an authorized Cummins MerCruiser Diesel dealer / distributor.

Excessive Engine Temperature

Possible Cause	Remedy
Water inlet or seacock closed.	Open.
Drive belt loose or in poor condition.	Replace or adjust belt.
Seawater pickups or sea strainer obstructed.	Remove obstruction.
Faulty thermostat.	Replace. See an authorized Cummins MerCruiser Diesel dealer / distributor.
Coolant level low in closed cooling section.	Check for cause of low coolant level and repair. Fill system with proper coolant solution.
Heat exchanger cores plugged with foreign material	Clean heat exchanger. See an authorized Cummins MerCruiser Diesel dealer / distributor.
Loss of pressure in closed cooling section.	Check for leaks. Clean, inspect and test pressure cap. See an authorized Cummins MerCruiser Diesel dealer / distributor.
Faulty seawater pickup pump.	Repair. See an authorized Cummins MerCruiser Diesel dealer / distributor.
Seawater discharge restricted or plugged.	Clean exhaust elbows. See an authorized Cummins MerCruiser Diesel dealer / distributor.
Seawater inlet hose kinked (restricted)	Position hose to prevent kinking (restriction).
Use of improperly designed hose on inlet side of seawater pump allowing it to collapse.	Replace hose with wire reinforced design.

Insufficient Engine Temperature

Possible Cause	Remedy
Faulty thermostats.	Replace. See an authorized Cummins MerCruiser Diesel dealer / distributor.

Low Engine Oil Pressure

Possible Cause	Remedy
Faulty senders.	Have system checked by an authorized Cummins MerCruiser Diesel dealer / distributor.
Insufficient oil in crankcase.	Check and add oil.
Excessive oil in crankcase (causing it to become aerated).	Check and remove required amount of oil. Check for cause of excessive oil (improper filling).
Diluted or improper viscosity oil.	Change oil and oil filter, using correct grade and viscosity oil. Determine cause for dilution (excessive idling).

Battery Will Not Charge

Possible Cause	Remedy
Excessive current draw from battery.	Turn off non-essential accessories.
Loose or dirty electrical connections or damaged wiring.	Check all associated electrical connections and wires (especially battery cables). Clean and tighten faulty connections. Repair or replace damaged wiring.
Alternator drive belt loose or in poor condition.	Replace and/or adjust.
Unacceptable battery condition.	Test battery.

Remote Control Operates Hard, Binds, Has Excessive Free-play Or Makes Unusual Sounds

Possible Cause	Remedy
Insufficient lubrication on shift and throttle linkage fasteners.	Lubricate.
Obstruction in shift or throttle linkages.	Remove obstruction.
Loose or missing shift and throttle linkages.	Check all throttle linkages. If any are loose or missing, see authorized Cummins MerCruiser Diesel dealer / distributor immediately.
Shift or throttle cable kinked.	Straighten cable or have authorized Cummins MerCruiser Diesel dealer / distributor replace cable if damaged beyond repair.
Improper shift cable adjustment.	Have adjustment checked by an authorized Cummins MerCruiser Diesel dealer / distributor.
Vacuum leak at shift cylinder, hose or fittings of Power Shift Assembly, if so equipped	Repair cut, pinched, or kinked hose or faulty shift cylinder.

Steering Wheel Turns Hard Or Jerky

Possible Cause	Remedy
Low power steering pump fluid level.	Check for leak. Refill system with fluid.
Drive belt loose or in poor condition.	Replace and/or adjust.
Insufficient lubrication on steering components.	Lubricate.
Loose or missing steering fasteners or parts.	Check all parts and fasteners if any are loose or missing, see an authorized Cummins MerCruiser Diesel dealer / distributor.
Contaminated power steering fluid.	See an authorized Cummins MerCruiser Diesel dealer / distributor.

Power Trim Does Not Operate (Motor Doesn’t Operate)

Possible Cause	Remedy
Blown fuse.	Replace fuse.
Loose or dirty electrical connections or damaged wiring.	Check all associated electrical connections and wires (especially battery cables). Clean and tighten faulty connection. Repair or replace wiring.

Power Trim Does Not Operate (Motor Operates But Sterndrive Unit Does Not Move)

Possible Cause	Remedy
Trim pump oil level low.	Fill pump with oil. See an authorized Cummins MerCruiser Diesel dealer / distributor.
Drive unit binding in gimbal ring.	Check for obstruction. See an authorized Cummins MerCruiser Diesel dealer / distributor.

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Owner Service Assistance

Local Repair Service

Always return your Cummins MerCruiser Diesel (CMD®) powered boat to your authorized dealer should the need for service arise. Only he has the factory trained mechanics, knowledge, special tools and equipment and the genuine Quicksilver parts and accessories* to properly service your engine should the need occur. He knows your engine best.

Contact 1-800-DIESELS to locate your closest distributor.

* Quicksilver parts and accessories are engineered and built especially for Cummins MerCruiser Diesel sterndrives and inboards.

Service Away From Home

If you are away from your local dealer and the need arises for service, contact the nearest authorized dealer. Refer to the Yellow Pages of the telephone directory or by using the service locator on the Cummins website (www.Cummins.com). If, for any reason, you cannot obtain service, contact the nearest Regional Service Center. Outside the United States and Canada, contact the nearest Marine Power International Service Center.

Stolen Power Package

If your power package is stolen, immediately advise the local authorities and Cummins MerCruiser Diesel of the model and serial number(s) and to whom the recovery is to be reported. This information about the stolen motor is placed into a file at Cummins MerCruiser Diesel to aid authorities and dealers / distributors in recovery of stolen motors.

Attention Required After Submersion

1. Before recovery, contact an authorized Cummins MerCruiser Diesel dealer / distributor.
2. After recovery, immediate service by an authorized Cummins MerCruiser Diesel dealer / distributor is required to prevent serious damage to power package.

Replacement Service Parts

⚠ WARNING

Electrical, ignition and fuel system components on Cummins MerCruiser Diesel engines and drive systems are designed and manufactured to comply with U.S. Coast Guard Rules and Regulations to minimize risks of fire or explosion.

Use of replacement electrical, ignition or fuel system components, which do not comply to these rules and regulations, could result in a fire or explosion hazard and should be avoided.

When servicing the electrical, ignition and fuel systems, it is extremely important that all components are properly installed and tightened. If not, any electrical or ignition component opening would permit sparks to ignite fuel vapors from fuel system leaks, if they existed.

Marine engines are expected to operate at or near full throttle for most of their life. They are also expected to operate in both fresh and saltwater environments. These conditions require numerous special parts. Care should be exercised when replacing marine engine parts as specifications are quite different from those of the standard automotive engine.

Since marine engines must be capable of running at or near maximum rpm much of the time, special pistons, camshafts, and other heavy-duty moving parts are required for long life and peak performance.

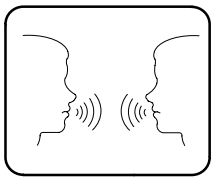
These are but a few of the many special modifications that are required in Cummins MerCruiser Diesel marine engines to provide long life and dependable performance.

Parts And Accessories Inquiries

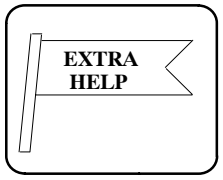
All inquiries concerning Quicksilver replacement parts and accessories should be directed to your local authorized dealer. The dealer has the necessary information to order parts and accessories for you should he not have them in stock. Only authorized dealers can purchase genuine Quicksilver parts and accessories from the factory. Cummins MerCruiser Diesel does not sell to unauthorized dealers or retail customers. When inquiring on parts and accessories, the dealer requires the **engine model** and **serial numbers** to order the correct parts.

Resolving A Problem

Satisfaction with your Cummins MerCruiser Diesel product is very important to your dealer and to us. If you ever have a problem, question or concern about your power package, contact your authorized Cummins MerCruiser Diesel dealer / distributor. If additional assistance is required, take these steps:



1. Talk with the dealership's sales manager or service manager. If this has already been done, then contact the owner of the dealership.



2. Should you have a question, concern or problem that cannot be resolved by your dealership, please contact your local distributor of Cummins MerCruiser Diesel products for assistance. The distributor will work with you and your dealership to resolve all problems.

The following information will be needed by the service office:

- Your name and address
- Daytime telephone number
- Model and serial numbers for your power package
- The name and address of your dealership
- Nature of problem

The distributor for your area can be found by using the service locator on the Cummins website (www.Cummins.com) or by contacting your local CMD distributor listed in the Yellow Pages of the telephone directory. To locate the closest distributor, call 1-800-DIESELS.

Customer Service Literature

English Language

English language publications are available from:

Mercury Marine
Attn: Publications Department
W6250 West Pioneer Road
P.O. Box 1939
Fond du Lac, WI 54935-1939

Outside the United States and Canada, contact the nearest Mercury Marine or Marine Power International Service Center for further information.

When ordering be sure to:

- List your product, model, year and serial numbers.
- Check the literature and quantities you want.
- Enclose full remittance in check or money order (NO COD).

Other Languages

To obtain an Operation, Maintenance and Warranty Manual in another language, contact the nearest Mercury Marine or Marine Power International Service Center for information. A list of part numbers for other languages is provided with your power package.

Andre sprog

Kontakt det nærmeste Mercury Marine eller Marine Power International servicecenter for oplysninger om hvordan du kan anskaffe en Betjenings– og vedligeholdelsesmanual på et andet sprog. En liste med reservedelsnumre for andre sprog leveres sammen med din power–pakke.

Andere talen

Voor het verkrijgen van een Handleiding voor gebruik en onderhoud in andere talen dient u contact op te nemen met het dichtstbijzijnde internationale servicecentrum van Mercury Marine of Marine Power voor informatie hierover. Een lijst met onderdeelnummers voor andere talen wordt bij uw motorinstallatie geleverd.

Muut kielet

Saadaksesi Käyttö– ja huolto–ohjekirjoja muilla kielillä, ota yhteys lähimpään Mercury Marine tai Marine Power International huoltokeskukseen, josta saat lähempiä tietoja. Moottorisi mukana seuraa monikielinen varaosanumeroluettelo.

Autres langues

Pour obtenir un Manuel d’utilisation et d’entretien dans une autre langue, contactez le centre de service après–vente international Mercury Marine ou Marine Power le plus proche pour toute information. Une liste des numéros de pièces en d’autres langues accompagne votre bloc–moteur.

Andere Sprachen

Um eine Betriebs– und Wartungsanleitung in einer anderen Sprache zu erhalten, wenden Sie sich an das nächste Mercury Marine oder Marine Power International Service Center. Eine Liste mit Teilenummern für Fremdsprachen ist im Lieferumfang Ihres Motors enthalten.

Altre lingue

Per ottenere il manuale di funzionamento e manutenzione in altra lingua, contattate il centro assistenza internazionale Mercury Marine o Marine Power più vicino. In dotazione con il gruppo motore, viene fornito l'elenco dei codici prodotto dei componenti venduti all'estero.

Andre språk

Ytterligere informasjon om bruks– og vedlikeholdshåndbok på andre språk kan fås ved henvendelse til nærmeste internasjonale servicecenter for Mercury Marine eller Marine Power. En liste over delenumre for andre språk følger med aggregatet.

Outros Idiomas

Para obter um Manual de Operação e Manutenção em outro idioma, contate o Centro de Serviço Internacional de "Marine Power" (Potência Marinha) ou a Mercury Marine mais próxima para obter informações. Uma lista de números de referência para outros idiomas é fornecida com o seu pacote de propulsão.

Otros idiomas

Para obtener un Manual de operación y mantenimiento en otro idioma, póngase en contacto con el centro de servicio más cercano de Mercury Marine o Marine Power International para recibir información. Con su conjunto motriz se entrega una lista de los números de pieza para los otros idiomas.

Andra språk

För att få Instruktions– och underhållsböcker på andra språk, kontakta närmaste Mercury Marine eller Marine Power International servicecenter, som kan ge ytterligare information. En förteckning över artikelnummer på andra språk medföljer ditt kraftpaket.

Αλλες γλώσσες

Για να αποκτήσετε ένα Εγχειρίδιο Λειτουργίας και Συντήρησης σε άλλη γλώσσα, επικοινωνήστε με το πλησιέστερο Διεθνές Κέντρο Σέρβις της Mercury Marine ή της Marine Power για πληροφορίες. Το πακέτο ισχύος σας συνοδεύεται από έναν κατάλογο αριθμών παραγγελίας για άλλες γλώσσες.

Ordering Literature

Before ordering literature, please have the following information about your power package available:

Model _____ Horsepower_____
Serial Number_____ Year_____

United States and Canada

For information on additional literature that is available for your particular Cummins MerCruiser Diesel power package and how to order that literature contact your nearest Cummins MerCruiser Diesel dealer / distributor or contact:

Mercury Marine

Telephone 	Fax 	Mail 
(920) 929–5110	(920) 929-4894	Mercury Marine Attn: Publications Department P.O. Box 1939 Fond du Lac, WI 54935-1939

Outside The United States and Canada

Contact your nearest authorized Cummins MerCruiser Diesel dealer / distributor or Marine Power Service Center for information on additional literature that is available for your particular Cummins MerCruiser Diesel power package and how to order that literature.

NOTES:

NOTE: The following applies to CE marked products only.

Declaration of Conformance – Mercury MerCruiser

This sterndrive or inboard engine when installed in accordance to Mercury MerCruisers' instructions complies with the requirements of the following directives by meeting the associated standards, as amended:

Recreational Craft Directive 94/25/EC; 2003/44/EC

Applicable Requirement	Standards Applied
Owner's manual (A.2.5)	ISO 10240
Openings in Hull, Deck and superstructure (A.3.4)	ISO 9093-1; ISO 9093-2
Handling characteristics (A.4)	ISO 8665
Inboard Engine (A.5.1.1)	ISO 15584; ISO 10088; ISO 7840; ISO 10133
Fuel System (A.5.2)	ISO 10088; ISO 7840; ISO 8469
Electrical System (A.5.3)	ISO 10133; ISO 8846
Steering system (A.5.4)	Applicable portions of: ISO 10592, ISO 8848 and ABYC P-17
Exhaust emission requirements (B.2)	ISO 8178
Owner's manual (B.4)	ISO 8665
Noise emission levels (C.1)	ISO 14509
Ignition-protected equipment (Annex II)	ISO 8846; SAE J1171; SAE J1191; SAE J 2031

Mercury MerCruiser declares that our sterndrive or inboard engines without integral exhaust, when installed in a recreational craft, in accordance with the manufacturers supplied instructions, will meet the exhaust emissions requirements of the directive mentioned above. This engine must not be put into service until the recreational craft in which it is to be installed has been declared in conformity, if so required, with the relevant provision of the directive.

Electromagnetic Compatibility Directive 89/336/EC, 92/31/EEC and 93/68/EEC

Generic emission standard	EN 50081-1
Generic immunity standard	EN 50082-1
Vehicles, boats and internal combustion engine driven devices - Radio disturbance characteristics	SAE J551 (CISPR 12)
Electrostatic discharge testing	EN 61000-6-2; EN 61000-4-2; EN61000-4-3

The notified body responsible for surveillance of the quality system under Full Quality Assurance Module H of Directive 2003/44/EC is:

Det Norske Veritas
Norway
Notified Body Number: 0575

This declaration is issued under the sole responsibility of Mercury Marine and Mercury MerCruiser.



Patrick C. Mackey

President - Mercury Marine, Fond du Lac, WI USA

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Regulatory contact:
Engineering - Regulatory
MerCruiser
3003 N. Perkins Rd
Stillwater, Oklahoma 74075
USA
(405) 377-1200

Identification Record

Please record the following information:

Engine Model and Horsepower		**Engine Serial Number**
Transom Assembly Serial Number (Sterndrive)	**Gear Ratio**	**Sterndrive Unit Serial Number**
Transmission Model (Inboard)	**Gear Ratio**	**Transmission Serial Number**
Propeller Number	**Pitch**	**Diameter**
Hull Identification Number (HIN)		**Purchase Date**
Boat Manufacturer	**Boat Model**	**Length**
Exhaust Gas Emissions Certification Number		

The serial numbers are the manufacturer's keys to numerous engineering details that apply to your Mercury MerCruiser® power package. When contacting your Authorized Mercury MerCruiser Dealer about service, **always specify model and serial numbers.**

The description and specifications contained herein were in effect at the time this guide was approved for printing. Mercury Marine, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change specifications or designs, without notice and without incurring obligation.

Mercury Marine, Fond du Lac, Wisconsin, U.S.A. Printed in U.S.A.

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Mercury, Mercury Marine, MerCruiser, Mercury MerCruiser, Mercury Racing, Mercury Precision Parts, Mercury Propellers, Mariner, Quicksilver, #1 On The Water, Alpha, Bravo, Pro Max, OptiMax, Sport-Jet, K-Planes, MerCathode, RideGuide, SmartCraft, Zero Effort, M with Waves logo, Mercury with Waves logo, and SmartCraft logo are all registered trademarks of Brunswick Corporation. Mercury Product Protection logo is a registered service mark of Brunswick Corporation.

Welcome

You have selected one of the finest marine power packages available. It incorporates numerous design features to assure operating ease and durability.

With proper care and maintenance, you will thoroughly enjoy using this product for many boating seasons. To ensure maximum performance and carefree use, we ask that you thoroughly read this manual.

The Operation, Maintenance and Warranty Manual contains specific instructions for using and maintaining your product. We suggest that this manual remain with the product for ready reference whenever you are on the water.

Thank you for purchasing one of our Mercury MerCruiser products. We sincerely hope your boating will be pleasant!

Mercury MerCruiser

Warranty Message

The product you have purchased comes with a **limited warranty** from Mercury Marine; the terms of the warranty are set forth in the Warranty Sections of this manual. The warranty statement contains a description of what is covered, what is not covered, the duration of coverage, how to best obtain warranty coverage, **important disclaimers and limitations of damages** and other related information. Please review this important information.

Mercury Marine products are designed and manufactured to comply with our own high quality standards, applicable industry standards and regulations, as well as certain emissions regulations. At Mercury Marine every engine is operated and tested before it is boxed for shipment to make sure that the product is ready for use. In addition, certain Mercury Marine products are tested in a controlled and monitored environment, for up to 10 hours of engine run time, in order to verify and make a record of compliance with applicable standards and regulations. All Mercury Marine product, sold as new, receives the applicable limited warranty coverage, whether the engine participated in one of the test programs described above or not.

Read This Manual Thoroughly

IMPORTANT: If you don't understand any portion of this manual, contact your dealer for a demonstration of actual starting and operating procedures.

Notice

Throughout this publication, and on your power package, dangers, warnings, cautions, and notices., accompanied by the International Hazard Symbol ⚠, may be used to alert the installer/user to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly. **Observe them carefully.**

These Safety Alerts alone cannot eliminate the hazards that they signal. Strict compliance with these special instructions while performing the service, plus common sense operation, are major accident prevention measures.

⚠ DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

. These safety alerts follow ANSI standard Z535.6-2006 for product safety information in product manuals, instructions, and other collateral materials.

NOTICE
Indicates a situation which, if not avoided, could result in engine or major component failure.

IMPORTANT: Identifies information essential to the successful completion of the task.

NOTE: *Indicates information that helps in the understanding of a particular step or action.*

⚠ WARNING
The operator (driver) is responsible for the correct and safe operation of the boat, the equipment aboard and the safety of all occupants aboard. We strongly recommend that the operator read this Operation, Maintenance and Warranty Manual and thoroughly understand the operational instructions for the power package and all related accessories before the boat is used.

⚠ WARNING
The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

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Section 1 - Warranty

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Transfer Of Warranty

The limited warranty is transferable to a subsequent purchaser, but only for the remainder of the unused portion of the limited warranty. This will not apply to products used for commercial applications.

To transfer the warranty to the subsequent owner, send or fax a copy of the bill of sale or purchase agreement, new owner's name, address and engine serial number to Mercury Marine's warranty registration department. In the United States and Canada, mail to:

Mercury Marine
Attn: Warranty Registration Department
W6250 W. Pioneer Road
P.O. Box 1939
Fond du Lac, WI 54936-1939
920-929-5054
Fax 920-929-5893

Upon processing the transfer of warranty, Mercury Marine will send registration verification to the new owner of the product by mail.

There is no charge for this service.

For products purchased outside the United States and Canada, contact the distributor in your country, or the Marine Power Service Center closest to you.

Warranty Registration United States And Canada

1. You may change your address at any time, including at time of warranty claim, by calling Mercury Marine or sending a letter or fax with your name, old address, new address, and engine serial number to Mercury Marine's warranty registration department. Your dealer can also process this change of information.
   Mercury Marine
   Attn: Warranty Registration Department
   W6250 Pioneer Road
   P.O. Box 1939
   Fond du Lac, WI 54936-1939
   920-929-5054
   Fax 920-929-5893

NOTE: *Registration lists must be maintained by Mercury Marine and any dealer on marine products sold in the United States, should a safety recall notification under the Federal Safety Act be required.*

2. To be eligible for warranty coverage, the product must be registered with Mercury Marine. At the time of sale, the dealer should complete the warranty registration and immediately submit it to Mercury Marine via MercNET, E-mail, or mail. Upon receipt of this warranty registration, Mercury Marine will record the registration.
3. Upon processing the warranty registration, Mercury Marine will send registration verification by mail to the purchaser of the product. If this registration verification is not received within 30 days, please contact your selling dealer immediately. Warranty coverage is not effective until your product is registered with Mercury Marine.

Warranty Registration Outside The United States And Canada

1. It is important that your selling dealer fills out the Warranty Registration Card completely and mails it to the distributor or Marine Power Service Center responsible for administering the warranty registration/claim program for your area.

2. The Warranty Registration Card identifies your name and address, product model and serial numbers, date of sale, type of use and the selling distributor's/dealer's code number, name and address. The distributor/dealer also certifies that you are the original purchaser and user of the product.
3. A copy of the Warranty Registration Card, designated as the Purchaser's Copy, MUST be given to you immediately after the card has been completely filled out by the selling distributor/dealer. This card represents your factory registration identification, and should be retained by you for future use when required. Should you ever require warranty service on this product, your dealer may ask you for the Warranty Registration Card to verify date of purchase and to use the information on the card to prepare the warranty claim forms.
4. In some countries, the Marine Power Service Center will issue you a permanent (plastic) Warranty Registration Card within 30 days after receiving the Factory Copy of the Warranty Registration Card from your distributor/dealer. If you receive a plastic Warranty Registration Card, you may discard the Purchaser's Copy that you received from the distributor/dealer when you purchased the product. Ask your distributor/dealer if this plastic card program applies to you.

IMPORTANT: Registration lists must be maintained by the factory and dealer in some countries by law. It is our desire to have ALL products registered at the factory should it ever be necessary to contact you. Make sure your dealer/distributor fills out the warranty registration card immediately and sends the factory copy to the Marine Power International Service Center for your area.

5. For further information concerning the Warranty Registration Card and its relationship to Warranty Claim processing, refer to the International Warranty.

Mercury, MerCruiser Limited Warranty United States, Canada and Europe (Gasoline Fueled Products Only)

WHAT IS COVERED: Mercury Marine warrants its new products to be free of defects in material and workmanship during the period described below.

DURATION OF COVERAGE: This Limited Warranty provides coverage for either two (2) years from the date the product is first sold to a recreational use retail purchaser, or the date on which the product is first put into service, whichever occurs first. Commercial users of these products receive warranty coverage of either one (1) year from the date of first retail sale, or the accumulation of 500 hours of operation, whichever occurs first. Commercial use is defined as any work or employment related use of the product, or any use of the product which generates income, for any part of the warranty period, even if the product is only occasionally used for such purposes. The repair or replacement of parts, or the performance of service under this warranty, does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred from one recreational use customer to a subsequent recreational use customer upon proper re–registration of the product. Unexpired warrant coverage cannot be transferred either to or from a commercial use customer.

CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE: Warranty coverage is available only to retail customers that purchase from a Dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified pre–delivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Routine maintenance outlined in the Operation and Maintenance Manual must be timely performed in order to maintain warranty coverage. Mercury Marine reserves the right to make future warranty coverage contingent on proof of proper maintenance.

WHAT MERCURY WILL DO: Mercury's sole and exclusive obligation under this warranty is limited to, at our option, repairing a defective part, replacing such part or parts with new or Mercury Marine certified remanufactured parts, or refunding the purchase price of the Mercury product. Mercury reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

HOW TO OBTAIN WARRANTY COVERAGE: The customer must provide Mercury with a reasonable opportunity to repair, and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Mercury dealer authorized to service the product. If purchaser cannot deliver the product to such a dealer, written notice must be given to Mercury. We will then arrange for the inspection and any covered repair. Purchaser in that case shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related labor and material, and any other expenses associated with that service. Purchaser shall not, unless requested by Mercury, ship the product or parts of the product directly to Mercury. Proof of registered ownership must be presented to the dealer at the time warranty service is requested in order to obtain coverage.

WHAT IS NOT COVERED: This limited warranty does not cover routine maintenance items, tune ups, adjustments, normal wear and tear, damage caused by abuse, abnormal use, use of a propeller or gear ratio that does not allow the engine to run in its recommended RPM range (see the Operation and Maintenance Manual), operation of the product in a manner inconsistent with the recommended operation/duty cycle section of the Operation and Maintenance Manual, neglect, accident, submersion, improper installation (proper installation specifications and techniques are set forth in the installation instructions for the product), improper service, use of an accessory or part which damages the Mercury Product and was not manufactured or sold by us, jet pump impellers and liners, operation with fuels, oils or lubricants which are not suitable for use with the product (see the Operation and Maintenance Manual), alteration or removal of parts, or water entering the engine through the fuel intake, air intake or exhaust system, or damage to the product from insufficient cooling water caused by blockage of the cooling system by a foreign body, running the engine out of water, mounting the engine too high on the transom, or running the boat with the engine trimmed out too far.. Use of the product for racing or other competitive activity, or operating with a racing type lower unit, at any point, even by a prior owner of the product, voids the warranty.

Expenses related to haul out, launch, towing, storage, telephone, rental, inconvenience, slip fees, insurance coverage, loan payments, loss of time, loss of income, or any other type of incidental or consequential damages are not covered by this warranty. Also, expenses associated with the removal and/or replacement of boat partitions or material caused by boat design for access to the product are not covered by this warranty.

No individual or entity, including Mercury Marine authorized dealers, has been given authority by Mercury Marine to make any affirmation, representation or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against Mercury Marine.

DISCLAIMERS AND LIMITATIONS:
THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/COUNTRIES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.

Mercury MerCruiser Limited Warranty (Confederation of Independent States, Middle-East, and Africa

WHAT IS COVERED: Mercury Marine warrants its products to be free of defects in material and workmanship during the period described below.

DURATION OF COVERAGE: This Limited Warranty provides coverage for either one (1) year from the date the product is first sold to a recreational use retail purchaser, or the date on which the product is first put into service, whichever occurs first. Commercial users of these products receive warranty coverage for either one (1) year from the date of first retail sale, or the accumulation of 500 hours of operation, whichever occurs first. Commercial use is defined as any work or employment related use of the product, or any use of the product which generates income, for any part of the warranty period, even if the product is only occasionally used for such purposes. The repair or replacement of parts, or the performance of service under this warranty, does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred from one recreational use customer to a subsequent recreational use customer upon proper re-registration of the product. Unexpired warranty coverage cannot be transferred either to or from a commercial use customer.

CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE: Warranty coverage is available only to retail customers that purchase from a Dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified pre–delivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Routine maintenance outlined in the Operation and Maintenance Manual must be timely performed in order to maintain warranty coverage. Mercury Marine reserves the right to make warranty coverage contingent on proof of proper maintenance.

WHAT MERCURY WILL DO: Mercury's sole and exclusive obligation under this warranty is limited to, at our option, repairing a defective part, replacing such part or parts with new or Mercury Marine certified remanufactured parts, or refunding the purchase price of the Mercury product. Mercury reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

HOW TO OBTAIN WARRANTY COVERAGE: The customer must provide Mercury with a reasonable opportunity to repair, and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Mercury dealer authorized to service the product. If purchaser cannot deliver the product to such a dealer, written notice must be given to Mercury. We will then arrange for the inspection and any covered repair. Purchaser in that case shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related laborand material, and any other expenses associated with that service. Purchaser shall not, unless requested by Mercury, ship the product or parts of the product directly to Mercury. Proof of registered ownership must be presented to the dealer at the time warranty service is requested in order to obtain coverage.

WHAT IS NOT COVERED: This limited warranty does not cover routine maintenance items, tune ups, adjustments, normal wear and tear, damage caused by abuse, abnormal use, use of a propeller or gear ratio that does not allow the engine to run in its recommended RPM range (see the Operation and Maintenance Manual), operation of the product in a manner inconsistent with the recommended operation/duty cycle section of the Operation and Maintenance Manual, neglect, accident, submersion, improper installation (proper installation specifications and techniques are set forth in the installation instructions for the product), improper service, use of an accessory or part not manufactured or sold by us, jet pump impellers and liners, operation with fuels, oils or lubricants which are not suitable for use with the product (see the Operation and Maintenance Manual), alteration or removal of parts, or water entering the engine through the fuel intake, air intake or exhaust system, or damage to the product from insufficient cooling water caused by blockage of the cooling system by foreign body, running the engine out of water, mounting the engine too high on the transom, or running the boat with the engine trimmed out too far.

Use of the product for racing or other competitive activity, or operating with a racing type lower unit, at any point, even by a prior owner of the product, voids the warranty.

Expenses related to haul out, launch, towing, storage, telephone, rental, inconvenience, slip fees, insurance coverage, loan payments, loss of time, loss of income, or any other type of incidental or consequential damages are not covered by this warranty. Also, expenses associated with the removal and/or replacement of boat partitions or material caused by boat design for access to the product are not covered by this warranty.

No individual or entity, including Mercury Marine authorized dealers, has been given authority by Mercury Marine to make any affirmation, representation or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against Mercury Marine.

DISCLAIMERS AND LIMITATIONS:
THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/COUNTRIES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE AND COUNTRY TO COUNTRY.

3 Year Limited Warranty Against Corrosion (Worldwide)

WHAT IS COVERED: Mercury Marine warrants that each new Mercury, Mariner, Mercury Racing, Sport Jet, M^2 Jet Drive, Tracker by Mercury Marine Outboard, MerCruiser Inboard or sterndrive engine (Product) will not be rendered inoperative as a direct result of corrosion for the period of time described below.

DURATION OF COVERAGE: This limited corrosion warranty provides coverage for three (3) years from either the date the product is first sold, or the date on which the product is first put into service, whichever occurs first. The repair or replacement of parts, or the performance of service under this warranty does not extend the life of this warranty beyond its original expiration date. Unexpired warranty coverage can be transferred to subsequent (non-commercial use) purchaser upon proper re-registration of the product.

CONDITIONS THAT MUST BE MET IN ORDER TO OBTAIN WARRANTY COVERAGE: Warranty coverage is available only to retail customers that purchase from a Dealer authorized by Mercury Marine to distribute the product in the country in which the sale occurred, and then only after the Mercury Marine specified pre-delivery inspection process is completed and documented. Warranty coverage becomes available upon proper registration of the product by the authorized dealer. Corrosion prevention devices specified in the Operation and Maintenance Manual must be in use on the boat, and routine maintenance outlined in the Operation and Maintenance Manual must be timely performed (including without limitation the replacement of sacrificial anodes, use of specified lubricants, and touch-up of nicks and scratches) in order to maintain warranty coverage. Mercury Marine reserves the right to make warranty coverage contingent upon proof of proper maintenance.

WHAT MERCURY WILL DO: Mercury's sole and exclusive obligation under this warranty is limited to, at our option, repairing a corroded part, replacing such part or parts with new or Mercury Marine certified re-manufactured parts, or refunding the purchase price of the Mercury product. Mercury reserves the right to improve or modify products from time to time without assuming an obligation to modify products previously manufactured.

HOW TO OBTAIN WARRANTY COVERAGE: The customer must provide Mercury with a reasonable opportunity to repair, and reasonable access to the product for warranty service. Warranty claims shall be made by delivering the product for inspection to a Mercury dealer authorized to service the product. If purchaser cannot deliver the product to such a dealer, written notice must be given to Mercury. We will then arrange for the inspection and any covered repair. Purchaser in that case shall pay for all related transportation charges and/or travel time. If the service provided is not covered by this warranty, purchaser shall pay for all related labor and material, and any other expenses associated with that service. Purchaser shall not, unless requested by Mercury, ship the product or parts of the product directly to Mercury. Proof of registered ownership must be presented to the dealer at the time warranty service is requested in order to obtain coverage.

WHAT IS NOT COVERED: This limited warranty does not cover electrical system corrosion; corrosion resulting from damage, corrosion which causes purely cosmetic damage, abuse or improper service; corrosion to accessories, instruments, steering systems; corrosion to factory installed jet drive unit; damage due to marine growth; product sold with less than a one year limited Product warranty; replacement parts (parts purchased by customer); products used in a commercial application. Commercial use is defined as any work or employment related use of the product, or any use of the product which generates income, for any part of the warranty period, even if the product is only occasionally used for such purposes.

Warranty Coverage And Exclusions

The purpose of this section is to help eliminate some of the more common misunderstandings regarding warranty coverage. The following information explains some of the types of services that are not covered by warranty. The provisions set forth following have been incorporated by reference into the Three Year Limited Warranty Against Corrosion Failure, the International Limited Outboard Warranty, and the United States and Canada Limited Outboard Warranty.

Keep in mind that warranty covers repairs that are needed within the warranty period because of defects in material and workmanship. Installation errors, accidents, normal wear, and a variety of other causes that affect the product are not covered.

Warranty is limited to defects in material or workmanship, but only when the consumer sale is made in the country to which distribution is authorized by us.

Should you have any questions concerning warranty coverage, contact your authorized dealer. They will be pleased to answer any questions that you may have.

General Exclusions From Warranty

1. Minor adjustments and tune-ups, including checking, cleaning or adjusting spark plugs, ignition components, carburetor settings, filters, belts, controls, and checking lubrication made in connection with normal services.
2. Factory installed jet drive units - Specific parts excluded from the warranty are: The jet drive impeller and jet drive liner damaged by impact or wear, and water damaged drive shaft bearings as a result of improper maintenance.
3. Damage caused by neglect, lack of maintenance, accident, abnormal operation or improper installation or service.
4. Haul out, launch, towing charges, removal and/or replacement of boat partitions or material because of boat design for necessary access to the product, all related transportation charges and/or travel time, etc. Reasonable access must be provided to the product for warranty service. Customer must deliver product to an authorized dealer.
5. Additional service work requested by customer other than that necessary to satisfy the warranty obligation.
6. Labor performed by other than an authorized dealer may be covered only under following circumstances: When performed on emergency basis (providing there are no authorized dealers in the area who can perform the work required or have no facilities to haul out, etc., and prior factory approval has been given to have the work performed at this facility).
7. All incidental and/or consequential damages (storage charges, telephone or rental charges of any type, inconvenience or loss of time or income) are the owner's responsibility.
8. Use of other than Mercury Precision or Quicksilver parts when making warranty repairs.
9. Oils, lubricants or fluids changed as a matter of normal maintenance is customer's responsibility unless loss or contamination of same is caused by product failure that would be eligible for warranty consideration.
10. Participating in or preparing for racing or other competitive activity or operating with a racing type lower unit.
11. Engine noise does not necessarily indicate a serious engine problem. If diagnosis indicates a serious internal engine condition which could result in a failure, condition responsible for noise should be corrected under the warranty.
12. Lower unit and/or propeller damage caused by striking a submerged object is considered a marine hazard.
13. Water entering engine through the fuel intake, air intake or exhaust system or submersion.
14. Failure of any parts caused by lack of cooling water, which results from starting motor out of water, foreign material blocking inlet holes, motor being mounted too high or trimmed too far out.

15. Use of fuels and lubricants which are not suitable for use with or on the product. Refer to the **Maintenance** section.
16. Our limited warranty does not apply to any damage to our products caused by the installation or use of parts and accessories which are not manufactured or sold by us. Failures which are not related to the use of those parts or accessories are covered under warranty if they otherwise meet the terms of the limited warranty for that product.

Notes:

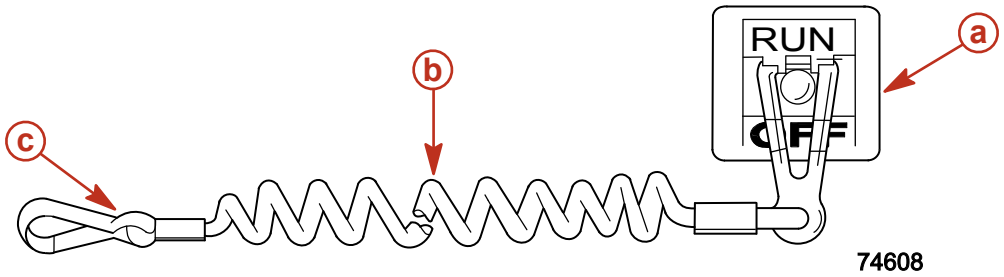
Section 2 - Getting to Know Your Power Package

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Lanyard Stop Switch

The purpose of a lanyard stop switch is to turn off the engine when the operator moves outside the operator's position (as in accidental ejection from the operator's position).



a - Stop switch
b - Lanyard
c - Clips to the operator

Accidental ejections, such as falling overboard, are more likely to occur in:

- low sided sport boats
- bass boats
- high performance boats

Accidental ejections can also occur from:

- poor operating practices
- sitting on the seat or gunwale at planing speeds
- standing at planing speeds
- operating at planing speeds in shallow or obstacle infested waters
- releasing your grip on the steering wheel that is pulling in one direction
- consuming alcohol or drugs
- high speed boating maneuvers

The lanyard is a cord usually between 122 and 152 cm (4 and 5 feet) in length when stretched out, with an element on one end made to be inserted into the switch and a snap on the other end for attaching to the operator. The lanyard is coiled to make its at-rest condition as short as possible to minimize the likelihood of lanyard entanglement with nearby objects. Its stretched-out length is made to minimize the likelihood of accidental activation should the operator choose to move around in an area close to the normal operator's position. If it is desired to have a shorter lanyard, wrap the lanyard around the operator's wrist or leg, or tie a knot in the lanyard.

Activation of the lanyard stop switch will stop the engine immediately, but the boat will continue to coast for some distance depending upon the velocity and degree of any turn at shut down. However, the boat will not complete a full circle. While the boat is coasting, it can cause injury to anyone in the boat's path as seriously as the boat would when under power.

We strongly recommend that other occupants be instructed on proper starting and operating procedures should they be required to operate the engine in an emergency (e.g. if the operator is accidentally ejected).

⚠ WARNING

Should the operator fall out of the boat, the possibility of serious injury or death from being run over by the boat can be greatly reduced by stopping the engine immediately. Always properly connect both ends of the stop switch lanyard to the stop switch and the operator.

Accidental or unintended activation of the switch during normal operation is also a possibility. This could cause any, or all, of the following potentially hazardous situations:

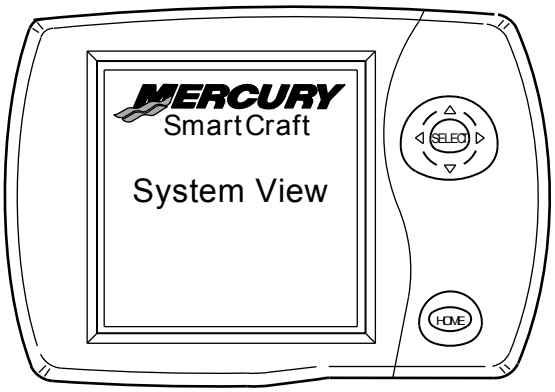
- Occupants could be thrown forward due to unexpected loss of forward motion, a particular concern for passengers in the front of the boat who could be ejected over the bow and possibly struck by the propulsion or steering components.
- Loss of power and directional control in heavy seas, strong current or high winds.
- Loss of control when docking.

⚠ WARNING

Avoid serious injury or death from deceleration forces resulting from accidental or unintended stop switch activation. The boat operator should never leave the operator's station without first disconnecting the stop switch lanyard from the operator.

Instrumentation

System View



Your power package may be connected to the Mercury SC5000 SmartCraft System View display. The display monitors and reports information ranging from basic operating data to engine alarm data.

The SC5000 System View Display is a comprehensive boat information center. System View allows the boat operator to receive a wealth of critical operational information, displayed clearly and instantly at the helm on the LCD display. The System View continuously monitors and reports information ranging from basic operating data to detailed vessel environment information. System View displays water temperature and depth, engine trim status, boat speed, steering angle, system preventive maintenance reminders and systems diagnostics. System View also can be fully integrated with the boat's GPS, if equipped, to provide up to the minute location, course, speed, and fuel-to-destination information.

When a problem is detected with the engine or system, the System View will alert the operator to the potential problem by displaying the alarm message in the information window, located at the bottom of the view screen.

If the problem can cause immediate engine damage, the Engine Guardian System will respond to the problem by limiting engine power. Immediately reduce throttle speed to idle. Refer to the System View Operation Manual for further explanation of the problem and the correct action to take.

Digital Gauges

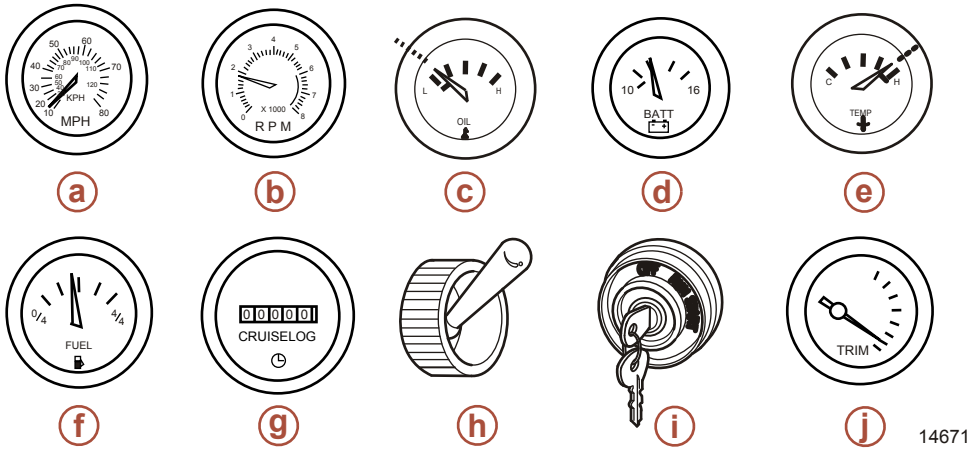
A Mercury SmartCraft System instrument package can be purchased for this product. A few of the functions the instrument package will display are engine RPM, coolant temperature, oil pressure, battery voltage, fuel consumption and engine operating hours.

The SmartCraft Instrument package will also aid in Engine Guardian diagnostics. The SmartCraft Instrument package will display critical engine alarm data and potential problems.

Refer to the manual with your gauge package for the warning functions monitored and basic operation of the SmartCraft Instrument package.

Analog Gauges

The following is a brief explanation of the instrumentation typically found on some boats. The owner/operator should be familiar with all instruments and their functions. Because of the large variety of instrumentation and manufacturers, you should have your boat dealer explain the particular gauges and normal readings for your boat.



a - Speedometer
b - Tachometer
c - Oil pressure gauge
d - Voltmeter
e - Water temperature gauge
f - Fuel gauge
g - Hour meter
h - Bilge blower switch
i - Ignition switch
j - Power trim gauge

Speedometer: Indicates boat speed.

Tachometer: Indicates engine RPM.

Oil Pressure Gauge: Indicates engine oil pressure.

Voltmeter: Indicates battery voltage.

Water Temperature Gauge: Indicates engine operating temperature.

Fuel Gauge: Indicates quantity of fuel in tank.

Hour meter: Records engine operating time.

Bilge Blower Switch: Operates bilge blower.

Ignition Switch: Allows operator to start and stop engine.

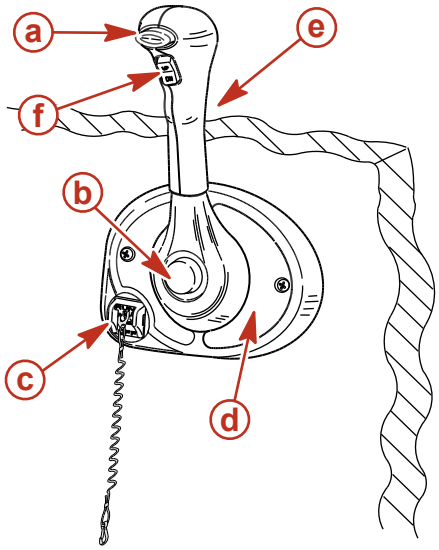
Power Trim Gauge: Indicates sterndrive unit angle (trim up/out and down/in).

Remote Controls (Non-DTS Models)

Remote Controls

Your boat may be equipped with a Mercury Precision Parts or Quicksilver remote controls. All controls may not have all features shown. Consult your dealer for a description and/or demonstration of your remote control.

PANEL MOUNT FEATURES



mc77019-1

a - Neutral lock button
b - Throttle only button
c - Lanyard stop switch
d - Control handle tension adjustment screw
e - Control handle
f - Trim/tilt button

Neutral Lock Button - Prevents accidental shift and throttle engagement. Neutral lock button must be pushed into move the control handle out of neutral.

Throttle Only Button - Allows engine throttle advancement without shifting the engine. This is done by disengaging the shift mechanism from the control handle. The throttle only button can be depressed only when the remote control handle is in the neutral position, and should only be used to assist in starting the engine.

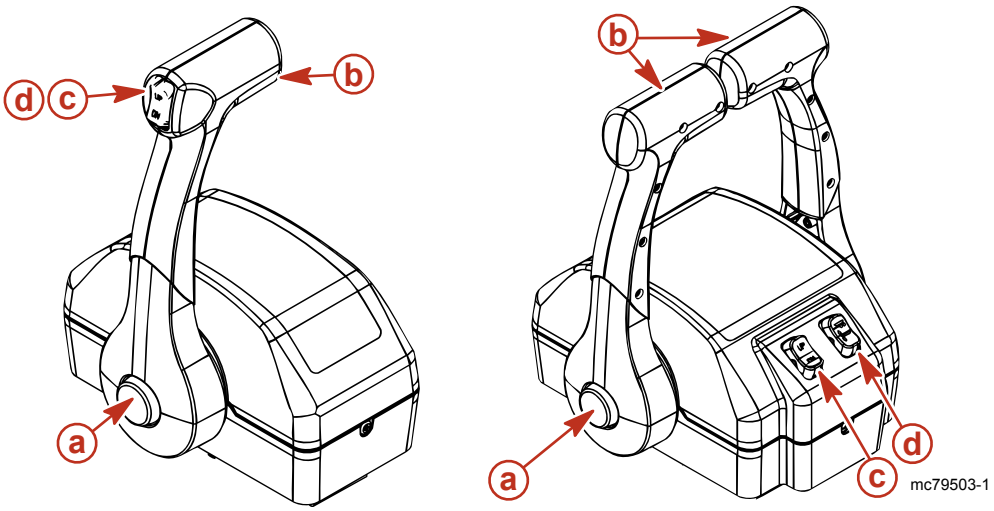
Lanyard Stop Switch - Turns the ignition off whenever the operator (when attached to the lanyard) moves far enough away from the operator's position to activate the switch. Refer to **Lanyard Stop Switch** for information on the use of this switch.

Control Handle - Operation of the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from neutral with a quick firm motion to the first detent for forward gear. Continue pushing forward to increase speed. Pull the control handle back from neutral with a quick firm motion to the first detent for reverse gear and continue pushing back to increase speed.

Control Handle Tension Adjustment Screw - (not visible) This screw is used to adjust the effort required to move the remote control handle. Refer to instructions provided with remote control for complete adjustment instructions.

Trim/Tilt Button - Refer to **Power Trim**.

CONSOLE MOUNT FEATURES



a - Throttle Only Button
b - Control Handle
c - Power Trim Switch
d - Trailer Switch

Throttle Only Button - Allows engine throttle advancement without shifting the engine. This is done by disengaging the shift mechanism from the control handle. The throttle only button can be depressed only when the remote control handle is in the neutral position.

Control Handles - Operation of the the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from neutral with a quick firm motion to the first detent for forward gear and continue pushing forward to increase speed. Pull the control handle back from neutral with a quick firm motion to the first detent for reverse gear and continue pushing back to increase speed.

Control Handle Tension Adjustment Screw - (not visible) This screw is used to adjust the effort required to move the remote control handle. Refer to instructions provided with remote control for complete adjustment instructions.

Power Trim Switch - See **Power Trim** section for detailed power trim operating procedures.

Trailer Switch - Used to raise drive unit for trailering, launching, beaching or shallow water operation. See **Power Trim** for detailed trailer switch operation.

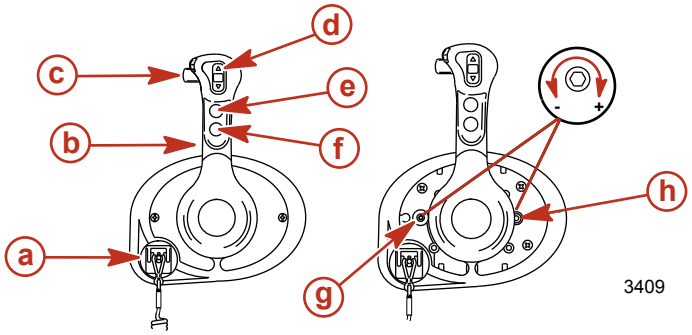
Remote Controls (DTS Models)

Remote Controls

IMPORTANT: Your boat must be equipped with a Mercury Marine electronic remote control. Start in gear protection is provided by this control system and prevents the engine from starting when the control is actuated in forward or reverse. Refer to the Mercury Precision Parts/Quicksilver Accessories Guide.

The Digital Throttle and Shift System (DTS) required to operate this engine package provides start and stop functions, throttle control, shift control, start in gear protection, and emergency lanyard stop functions. The DTS system works with specialized helm components such as a command module kit and electronic remote control. Consult your dealer for a description and/or demonstration of your remote control.

Panel Mount Features



a - Lanyard stop switch
b - Control handle
c - Shift lock
d - Trim/tilt switch
e - Throttle only button
f - Start/stop button
g - Detent tension adjustment screw
h - Control handle friction adjustment screw

Lanyard Stop Switch - Turns the ignition off whenever the operator (when attached to the lanyard) moves far enough away from the operator's position to activate the switch. Refer to **Lanyard Stop Switch** for information on the use of this switch.

Control Handle - Operation of the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from neutral with a quick, firm motion to the first detent for forward gear. Continue pushing forward to increase speed. Pull the control handle back from neutral with a quick, firm motion to the first detent for reverse gear and continue pushing back to increase speed.

Shift Lock - Pressing the shift lock allows the engine to shift. The shift lock must always be pressed when moving the control handle out of the neutral position.

Trim/Tilt Switch (if equipped) - Refer to **Power Trim**.

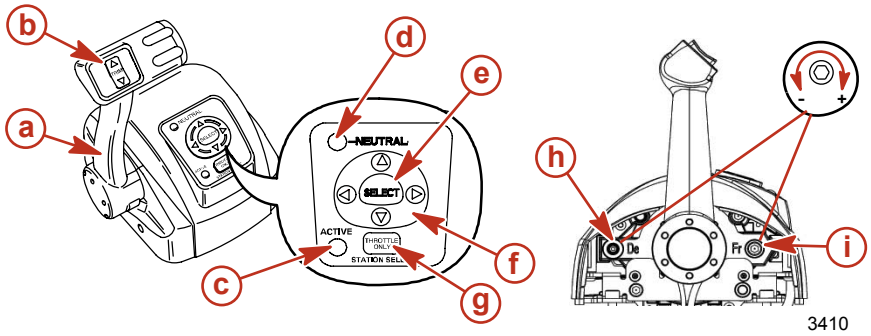
Throttle Only Button - Allows engine throttle advancement without shifting the engine. The throttle only button can be depressed only when the remote control is in the neutral position, and should only be used to assist in starting or warming up the engine.

Start/Stop Button - Allows the boat operator to start or stop the engine without using the ignition key.

Detent Tension Adjustment Screw - This screw can be adjusted to increase or decrease the effort required to move the control handle out of the detent positions (cover must be removed). Turning the screw clockwise will increase tension.

Control Handle Friction Adjustment Screw - This screw can be adjusted to increase or decrease the tension on the control handle (cover must be removed). This will help prevent unwanted motion of the handle in rough water. Turn the screw clockwise to increase tension and counterclockwise to decrease tension.

Console Mount Features - Single Engine



a - Control handle
b - Trim/tilt switch
c - Active light
d - Neutral light
e - Select key
f - Arrow trackpad
g - Throttle only/station select key
h - Detent tension adjustment
i - Control handle friction adjustment screw

Control Handle - Operation of the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from neutral with a quick, firm motion to the first detent for forward gear. Continue pushing forward to increase speed. Pull the control handle back from neutral with a quick, firm motion to the first detent for reverse gear and continue pushing back to increase speed.

Trim/Tilt Switch (if equipped) - Refer to **Power Trim**.

Active Light - The active light is illuminated to show the remote control is active and ready for use.

Neutral Light - The neutral light is illuminated when the engine is in neutral gear position.

NOTE: *Gear position is determined by sensing the position of the shift actuator on the engine, not the position of the gear switch.*

Select Key - Selects System View on-screen options and confirms data entries.

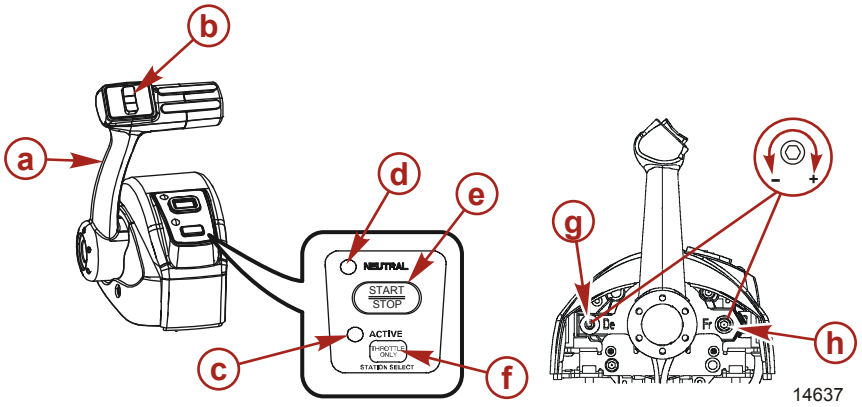
Arrow Trackpad - Navigates through System View on-screen function messages.

Throttle Only/Station Select Key - Allows engine throttle advancement without shifting the engine. The throttle only/station select button also allows the boat operator to select which remote control is in control of the engine operation when operating with multiple helms. Refer to **Dual Helm Station Transfer**.

Detent Tension Adjustment Screw - This screw can be adjusted to increase or decrease the effort required to move the control handle out of the detent positions (cover must be removed). Turning the screw clockwise will increase tension.

Control Handle Friction Adjustment Screw - This screw can be adjusted to increase or decrease the tension on the control handle (cover must be removed). This will help prevent unwanted motion of the handle in rough water. Turn the screw clockwise to increase tension and counterclockwise to decrease tension.

Slim Binnacle Console Mount Features - Single Engine



a - Control handle
b - Trim/tilt switch
c - Active light
d - Neutral light
e - Start/stop button
f - Throttle only/station select key
g - Detent tension adjustment
h - Control handle friction adjustment screw

Control Handle - Operation of the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from neutral with a quick, firm motion to the first detent for forward gear. Continue pushing forward to increase speed. Pull the control handle back from neutral with a quick, firm motion to the first detent for reverse gear and continue pushing back to increase speed.

Trim/Tilt Switch (if equipped) - Refer to **Power Trim**.

Active Light - The active light is illuminated to show the remote control is active and ready for use.

Neutral Light - The neutral light is illuminated when the engine is in neutral gear position.

NOTE: *Gear position is determined by sensing the position of the shift actuator on the engine, not the position of the gear switch.*

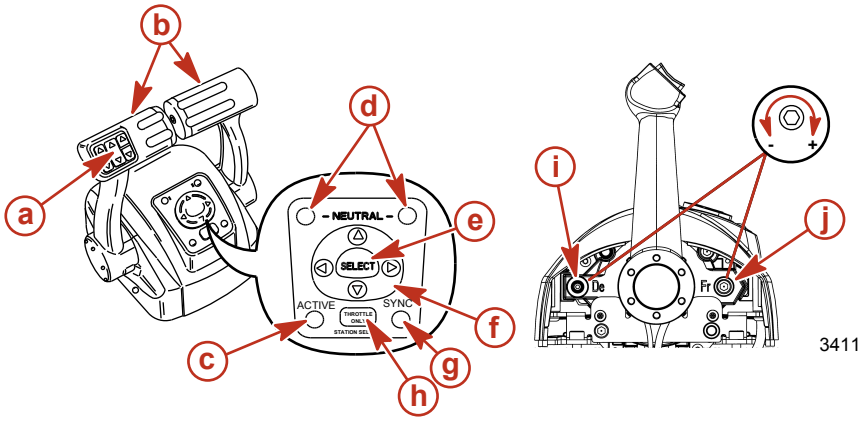
Stop/Start Button - Allows the boat operator to start or stop the engine without using the ignition key.

Throttle Only/Station Select Key - Allows engine throttle advancement without shifting the engine. The throttle only/station select button also allows the boat operator to select which remote control is in control of the engine operation when operating with multiple helms. Refer to **Dual Helm Station Transfer**.

Detent Tension Adjustment Screw - This screw can be adjusted to increase or decrease the effort required to move the control handle out of the detent positions (cover must be removed). Turning the screw clockwise will increase tension.

Control Handle Friction Adjustment Screw - This screw can be adjusted to increase or decrease the tension on the control handle (cover must be removed). This will help prevent unwanted motion of the handle in rough water. Turn the screw clockwise to increase tension and counterclockwise to decrease tension.

Console Mount Features- Dual Engine



a - Trim/tilt switch
b - Control handles
c - Active light
d - Neutral light
e - Select key
f - Arrow trackpad
g - Sync light
h - Throttle only/station select key
i - Detent tension adjustment
j - Control handle friction adjustment screw

Trim/Tilt Switch (if equipped) - Refer to **Power Trim**.

Control Handle - Operation of the shift and throttle are controlled by the movement of the control handle. Push the control handle forward from neutral with a quick, firm motion to the first detent for forward gear. Continue pushing forward to increase speed. Pull the control handle back from neutral with a quick, firm motion to the first detent for reverse gear and continue pushing back to increase speed.

Active Light - The active light is illuminated to show the remote control is active and ready for use.

Neutral Light - The neutral light is illuminated when the engine is in neutral gear position.

NOTE: *Gear position is determined by sensing the position of the shift actuator on the engine, not the position of the gear switch.*

Select Key - Selects System View on-screen options and confirms data entries.

Arrow Trackpad - Navigates through System View on-screen function messages.

Sync Light - The sync light is illuminated when the RPM of the two engines are being synchronized by the DTS system.

Throttle Only/Station Select Key - Allows engine throttle advancement without shifting the engine. The throttle only/station select button also allows the boat operator to select which remote control is in control of the engine operation when operating with multiple helms. Refer to **Dual Helm Station Transfer**.

Detent Tension Adjustment Screw - This screw can be adjusted to increase or decrease the effort required to move the control handle out of the detent positions (cover must be removed). Turning the screw clockwise will increase tension.

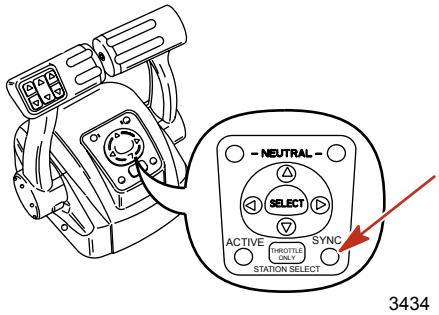
Control Handle Friction Adjustment Screw - This screw can be adjusted to increase or decrease the tension on the control handle (cover must be removed). This will help prevent unwanted motion of the handle in rough water. Turn the screw clockwise to increase tension and counterclockwise to decrease tension.

Synchronizing Dual Engines

The auto synchronizing feature, when engaged, will automatically adjust the port engine speed to match the speed of the starboard engine.

Synchronizing of engines will automatically engage when the speed of both engines are over 900 RPM for two seconds and remote control handles are positioned within 5° of each other.

Auto Synchronizing will stay engaged up to 95% throttle opening. The Sync light will turn on when the engines are synchronized.



3434

To disengage, move one or both control handles until they are more than 5° apart, reduce engine speed below 900 RPM, or increase engine speed beyond 95%.

Dual Helm Station Transfer

The throttle only/station select button allows the boat operator to select which remote control is in control of the engine operation.

The active light is illuminated at the remote control station that is in control of the engine.

⚠ WARNING

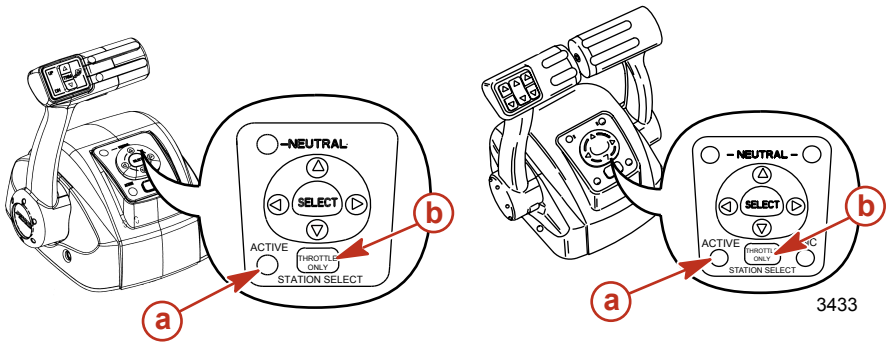
Avoid serious injury or death from loss of boat control. The boat operator should never leave the active station while engine is in gear. Helm transfer should only be attempted while both stations are manned. One person helm transfer should only be performed while engine is in neutral.

NOTE: *Idle position is preferred when doing a station transfer. If conditions do not allow the remote control to be placed at idle position, a station transfer can be done while in gear.*

NOTE: *Pressing and releasing station select button at new station allows the engine control to be transferred to the new station. The control will automatically start adjusting engine RPM and gear position to match the control handle setting at the new station. Adjust control handles to the desired throttle and gear position.*

1. Place active remote control lever to idle position.
2. Proceed to the inactive helm station and position remote control lever to the idle position.

3. Press throttle only/station select button once. The "ACTIVE" light will illuminate to indicate the remote control station is in control of the engine.



a - Active light

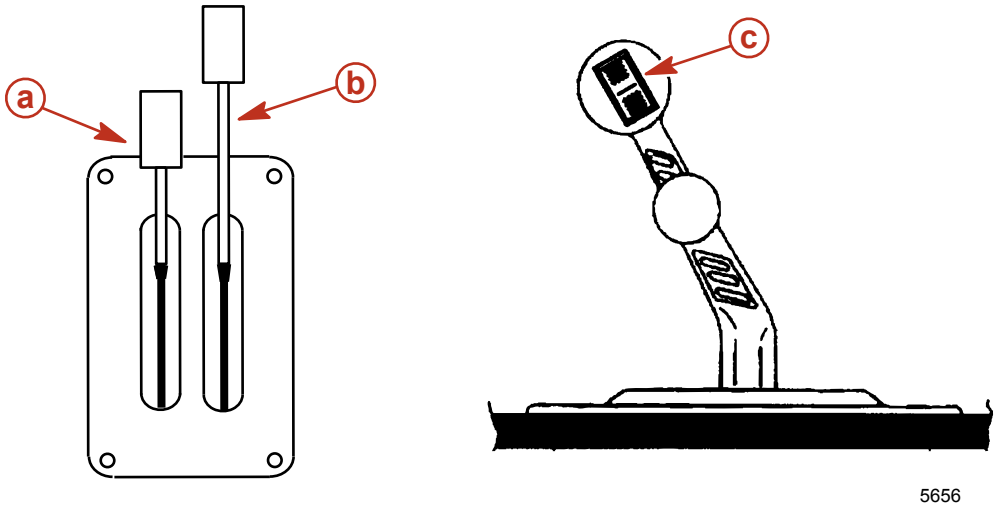
b - Throttle only/station select button

4. The active light will switch off at the original remote control station.

SYNCHRONIZING DUAL HELMS PRIOR TO STATION TRANSFER

Pressing the station select button and holding it in allows the boat operator 10 seconds to match up the control handle settings at the new station with the handle settings that are at the old (to be inactive) station. If the handles are not matched, the neutral light will flash. The light blinks faster as the handles are nearing match position. Once the light stays on continuously, the handles are matched and the button can be released. Transfer process is complete and the new station is now in control. If the button is held for over 10 seconds, the station transfer is cancelled.

Zero Effort Features



a - Shift ever

b - Throttle lever

c - Trim/tilt switch

Shift Lever - Shift functions are controlled by the movement of the shift lever. Shift into reverse by moving the shift lever to its aft position. Shift into neutral by moving the shift lever to its center position. Shift into forward by moving the shift lever to its forward position.

Throttle Lever - Throttle functions are controlled by the movement of the throttle lever. Increase the RPM by moving the throttle lever forward. Achieve Wide Open Throttle (WOT) by placing the throttle lever in its full forward position. Decrease RPM by moving the throttle lever back. Achieve minimum RPM (idle) by placing the throttle lever in its full aft position.

Trim/Tilt Switch - Refer to **Power Trim**.

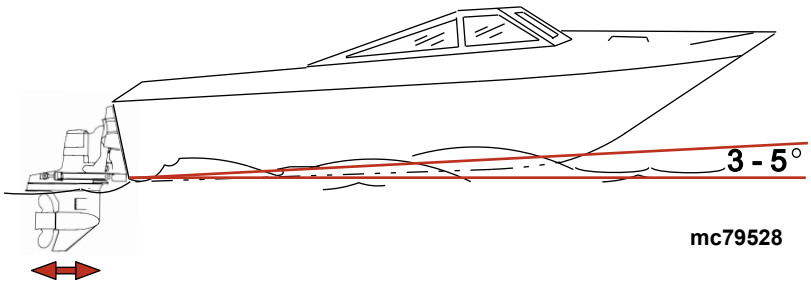
Power Trim

Power trim allows the operator to adjust the sterndrive angle while underway, to provide the ideal boat angle for varying load and water conditions. Also, the trailering feature allows the operator to raise and lower the sterndrive unit for trailering, beaching, launching, low speed (below 1200 RPM engine speed) and shallow water operation.

⚠ CAUTION

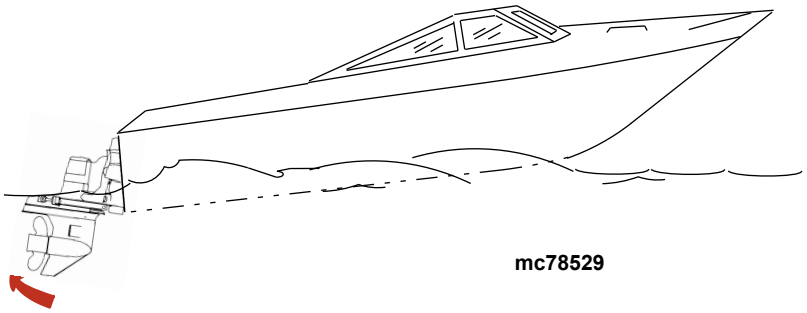
Never trim the sterndrive unit up\out using the trailer switch while boat is underway at engine speeds above 1200 rpm. Use extreme caution when operating with sterndrive unit raised. Severe damage to the sterndrive unit may result if unit is raised beyond the gimbal ring support flanges at engine speeds above 1200 rpm.

For best performance trim the sterndrive unit so that the boat bottom is at a 3-5° angle to the water.



Trimming sterndrive unit up/out can:

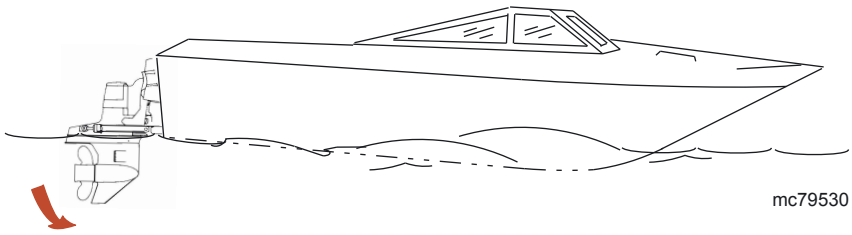
- Generally increase top speed
- Increase clearance over submerged objects or a shallow bottom
- Cause boat to accelerate and plane off slower
- In excess, cause boat porpoising (bouncing) or propeller ventilation
- Cause engine overheating if trimmed up/out to a point where any cooling water intake holes are above the water line



Trimming sterndrive unit down/in can:

- Help the boat accelerate and plane off quicker
- Generally improve the ride in choppy water
- In most cases, reduce boat speed

- If in excess, lower the bow of some boats to a point at which they begin to plow with their bow in the water while on plane. This can result in an unexpected turn in either direction called bow steering or over steering if any turn is attempted or if a significant wave is encountered.



Single Engine Trim/Trailer

Single engine applications will have a button that can be pressed to trim the sterndrive unit up or down.

To raise the sterndrive unit for trailering, beaching, launching, low speed (below 1200 rpm), and shallow water operation push the trim button to raise the sterndrive unit to the full up/out position.

Some controls also have a trailer button that trims the sterndrive to a position suitable for trailer purposes only.

NOTE: *The DTS control system limits the extent to which the sterndrive unit can be trimmed up/out when engine speed is above 3500 RPM.*

Dual Engine Trim/Trailer

⚠ CAUTION

Avoid twisting or binding dual engine tie bars. Damage to the tie bar and sterndrives could occur. Always raise or lower the sterndrive units evenly.

Dual engine applications may have a single integral button to operate both sterndrive units simultaneously or may have separate buttons for each sterndrive unit.

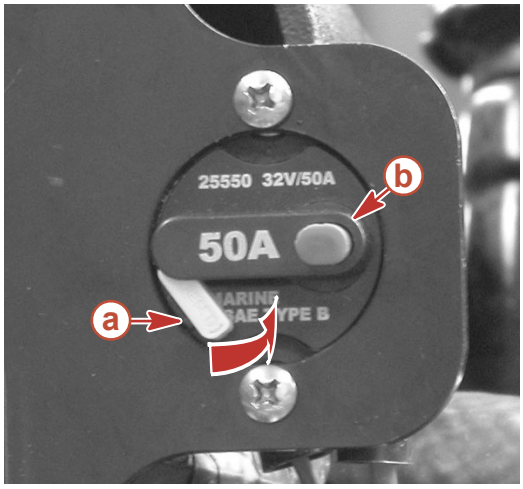
Some controls also have a trailer button that trims the sterndrives to a position suitable for trailer purposes only.

Electrical System Overload Protection

If an electrical overload occurs, a fuse will blow or the circuit breaker will trip open. The cause must be found and corrected before replacing the fuse or resetting the circuit breaker.

NOTE: *In an emergency, when the engine must be operated and the cause for the high current draw cannot be located and corrected, turn off or disconnect all accessories connected to the engine and instrumentation wiring. Reset the circuit breaker. If the breaker remains open, the electrical overload has not been eliminated. Further checks must be made on the electrical system. Contact your authorized dealer.*

1. A circuit breaker provides protection for the engine wiring harness and the instrumentation power lead. The circuit breaker can be tested by pushing the red button. If the circuit breaker is functioning properly, the yellow lever will appear. Reset the yellow lever after testing, or if tripped, by pushing the yellow lever back into the housing.

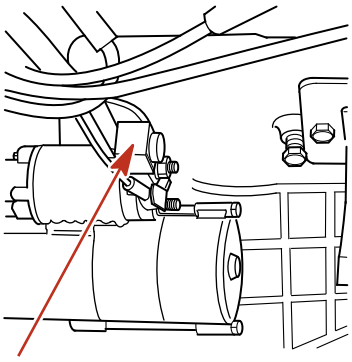


22529

Yellow lever style circuit breaker-typical

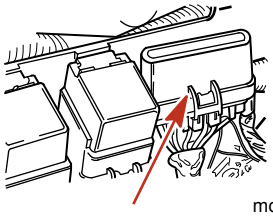
a - Yellow lever-shown tripped **b -** Red test button

2. A 90 amp fuse is located on the large post of the starter solenoid. This fuse is designed to protect the engine wiring harness if an electrical overload occurs.



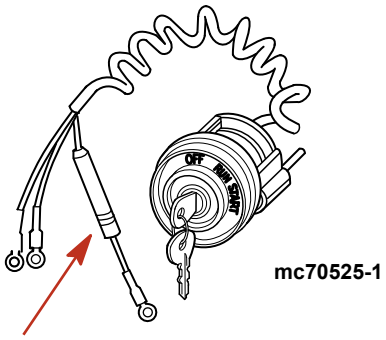
mc74907-1

3. Four fuses are located on the port side of the engine. These fuses protect the main power, fuel pump, ignition, and accessory circuits.



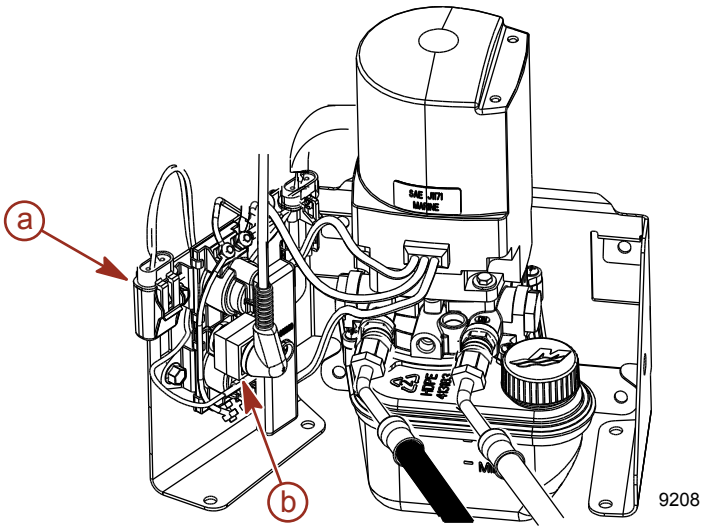
mc77602-1

4. A 20 amp fuse may be located in the ignition switch "I" terminal lead to protect the electrical system. Check for blown fuse if the ignition key is turned to the "START" position and nothing happens (and circuit breaker is not tripped).



mc70525-1

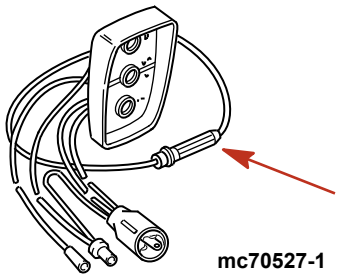
5. The power trim system is protected from overload by a 110 amp fuse and a 20 amp spade fuse on the power trim pump. The trim pump may also have an in-line circuit protection device in the power trim positive lead near the battery switch or battery connection.



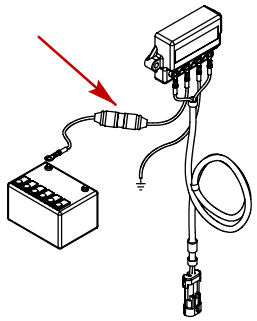
9208

a - 20 amp spade fuse **b -** 110 amp fuse

6. The Quicksilver Three-Button Power Trim Control Panel is further protected by a 20 amp in-line fuse.


mc70527-1

7. The Quicksilver MerCathode System has a 20 amp in-line fuse in the wire which connects to the positive (+) terminal on controller. If the fuse is blown, the system will not operate resulting in a loss of corrosion protection.



mc79977

Audio Warning System

Your Mercury MerCruiser power package may be equipped with an Audio Warning System. The Audio Warning System will not protect the engine from damage. It is designed to warn the operator that a problem has occurred.

The audio warning system will sound with a continuous horn if one of the following occurs:

- Engine oil pressure too low
- Engine temperature too hot
- Seawater pressure too low

The audio warning system will sound with an intermittent beeping if the following occurs:

- Sterndrive oil level too low

NOTICE
A continuous horn indicates a critical fault. Operating the engine during a critical fault can damage components. If the warning horn emits a continuous beep, do not operate the engine unless avoiding a hazardous situation.

If the alarm sounds, stop the engine immediately. Investigate cause and correct it, if possible. If the cause cannot be determined, contact your authorized Mercury MerCruiser dealer.

Testing The Audio Warning System

1. Turn the ignition switch to the "ON" position without cranking the engine.
2. Listen for the audio alarm. The alarm will sound if the system is functioning correctly.

Engine Guardian Strategy

IMPORTANT: Boat speed could be reduced to idle and may not respond to the throttle.

Engine Guardian Strategy is designed to help reduce the potential for engine damage by reducing engine power when a potential problem is sensed by the ECM. Engine Guardian monitors:

- Oil pressure
- Coolant temperature
- Seawater pressure
- Engine overspeed
- Exhaust Manifold Temperature [8.1 liter (496 cid) engines only]

Also the Engine Guardian Strategy will reduce engine power to 90 percent of maximum if any sensor on the power package fails.

For example, if the water inlet becomes partially blocked, Engine Guardian Strategy will reduce the available power level of the engine to help prevent damage from decreased water flow to the engine. If the debris passes through and full water flow is restored, engine power levels are restored to normal.

To avoid a possible recurrence of the problem you should contact an authorized dealer. The ECM stores the fault and with this information the technician will be able to more rapidly diagnose problems.

Warning Horn Signals

Most faults will cause the warning horn circuit to activate. How the warning horn activates depends on how serious the problem is. There are four warning horn states:

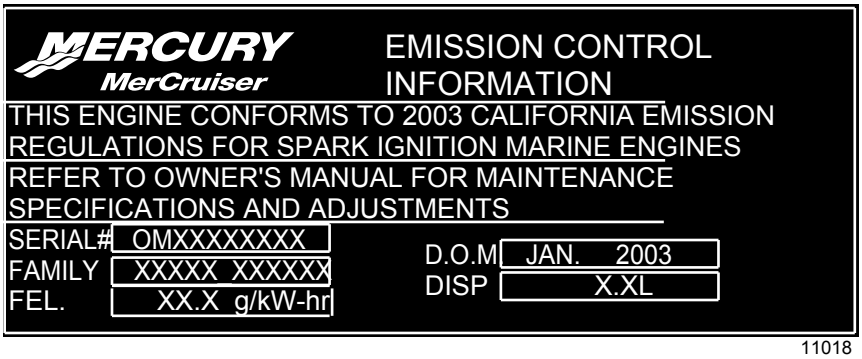
- Caution - horn signal varies with product line and calibration. Minimal guardian.
- Warning - horn signal varies with product line and calibration.
- Severe - horn is beeping constantly.
- Critical - horn is beeping constantly and guardian will be at forced idle.

In addition, depending on the gauge package, there will be warning icons and fault messages on the dash mounted gauges.

Emissions Information

Emission Control Information Label

A tamper-resistant Emission Control Information label is affixed in a visible location to the engine at time of manufacture by Mercury MerCruiser. In addition to the required emissions statement, the label lists the engine serial number, family, FEL (emission level), date of manufacture (month, year), and the engine displacement. Please note that the low emissions certification will not affect the fit, function, or performance of the engines. Boatbuilders and dealers may not remove the label or the part it is affixed to before sale. If modifications are necessary, contact Mercury MerCruiser about the availability of replacement decals before proceeding.



Emission Control Label - Non CE Marked

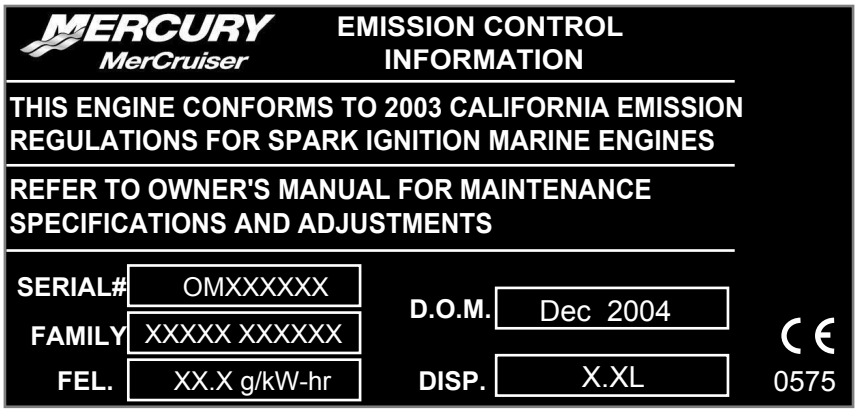
"SERIAL#" - Engine Serial Number

"FAMILY" - Engine Family

"FEL." - Family Emission Limit

"D.O.M." - Date of Manufacture

"DISP" - Piston Displacement



10652

Emission Control Label - CE Marked

"SERIAL#" - Engine Serial Number

"FAMILY" - Engine Family

"FEL." - Family Emission Limit

"D.O.M." - Date of Manufacture

"DISP" - Piston Displacement

CE - When this mark is present in the lower right corner of the Emission Control Information Label, on the engine, the Declaration of Conformance applies. Refer to the front page of this Manual for further information.

OWNER RESPONSIBILITY

The owner/operator is required to have routine engine maintenance performed to maintain emission levels within prescribed certification standards.

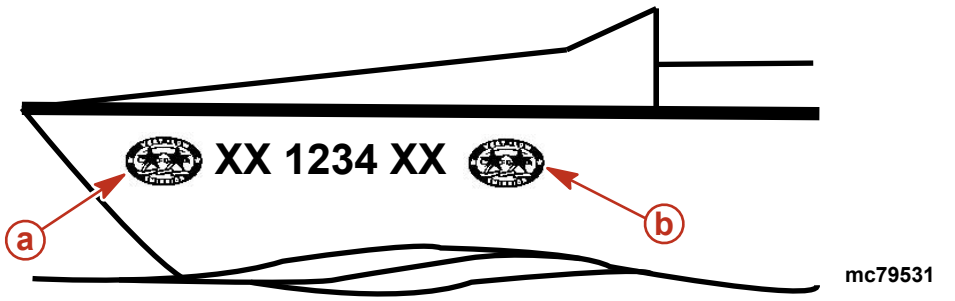
The owner/operator is not to modify the engine in any manner that would alter the horsepower or allow emissions levels to exceed their predetermined factory specifications.

Star Label

Beginning January 1, 2003, one Three-Star label will be included with each factory-certified Mercury MerCruiser engine.

All Mercury MerCruiser engines (500 hp and below) will have a Three-Star Ultra Low Emission rating. The Three-Star label identifies that these engines meet the California Air Resources Board's Sterndrive and Inboard marine engine 2003 exhaust emission standards. Engines meeting these standards have 65% lower emissions than One-Star - Low Emissions engines.

The Three-Star label will be affixed on the left side of the hull as shown.



a - Recommended location **b -** Secondary location

One Star - Low emission	
 mc79569-1	The one-star label identifies personal watercraft, outboard, sterndrive and inboard engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2001 exhaust emission standards. Engines meeting these standards have 75% lower emissions than conventional carbureted two-stroke engines. These engines are equivalent to the U.S. EPA's 2006 standards for marine engines.
Two Stars - Very Low emission	
 mc79570-1	The two-star label identifies personal watercraft, outboard, sterndrive and inboard engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2004 exhaust emission standards. Engines meeting these standards have 20% lower emissions than One Star - Low-Emission engines.
Three Stars - Ultra Low emission	
 mc79571-1	The three-star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2008 exhaust emission standards or the Sterndrive and Inboard marine engine 2003 exhaust emission standards. Engines meeting these standards have 65% lower emissions than One Star - Low Emission engines.
Four Stars - Super Ultra Low emission	
 mc79572-1	The Four Star label identifies engines that meet the Air Resources Board's Sterndrive and Inboard marine engine 2009 exhaust emission standards. Personal Watercraft and Outboard marine engines may also comply with these standards. Engines meeting these standards have 90% lower emissions than One Star - Low Emission engines.

Section 3 - On The Water

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Safe Boating Suggestions

In order to safely enjoy the waterways, familiarize yourself with local and all other governmental boating regulations and restrictions, and consider the following suggestions.

Know and obey all nautical rules and laws of the waterways.

- Mercury MerCruiser strongly recommends that all powerboat operators complete a boating safety course. Courses are offered in the U.S.A. by: The U.S. Coast Guard Auxiliary, The Power Squadron, The Red Cross and your state or provincial boating law enforcement agency. Inquiries may be made to the Boating Hotline at 1-800-368-5647 or the Boat U.S. Foundation at 1-800-336-BOAT.

Perform safety checks and required maintenance.

- Follow a regular schedule and ensure that all repairs are properly made.

Check safety equipment on board.

- Here are some suggestions of the types of safety equipment to carry when boating:
  - Approved fire extinguishers
  - Signal devices: flashlight, rockets or flares, flag and whistle or horn
  - Tools necessary for minor repairs
  - Anchor and extra anchor line
  - Manual bilge pump and extra drain plugs
  - Drinking water
  - Transistor radio
  - Paddle or oar
  - Spare propeller, thrust hubs, and an appropriate wrench
  - First aid kit and instructions
  - Water-proof storage containers
  - Spare operating equipment, batteries, bulbs and fuses
  - Compass and map or chart of the area
  - Personal flotation device (1 per person on board)

Watch for signs of weather change and avoid foul weather and rough-sea boating.

Tell someone where you are going and when you expect to return.

Passenger boarding.

- Stop the engine whenever passengers are boarding, unloading or are near the back (stern) of the boat. Shifting the drive unit into neutral is not sufficient.

Use personal flotation devices.

- Federal Law requires that there be a U. S. Coast Guard approved life jacket (personal flotation device), correctly sized and readily accessible for every person on board, plus a throwable cushion or ring. We strongly advise that everyone wear a life jacket at all times while in the boat.

Prepare other boat operators.

- Instruct at least 1 person on board in the basics of starting and operating the engine and boat handling in case the driver becomes disabled or falls overboard.

Do not overload your boat.

- Most boats are rated and certified for maximum load (weight) capacities (refer to your boat capacity plate). Know your boat's operating and loading limitations. Know if your boat will float if full of water. When in doubt, contact your authorized Mercury MerCruiser dealer or the boat manufacturer.

Ensure that everyone in the boat is properly seated.

- Do not allow anyone to sit or ride on any part of the boat that was not intended for such use. This includes the backs of seats, gunwales, transom, bow, decks, raised fishing seats and any rotating fishing seat; anywhere that sudden unexpected acceleration, sudden stopping, unexpected loss of boat control or sudden boat movement could cause a person to be thrown overboard or into the boat. Ensure that all passengers have a proper seat and are in it before any boat movement.

Never be under the influence of alcohol or drugs while boating (it is the law).

- They impair your judgment and greatly reduce your ability to react quickly.

Know your boating area and avoid hazardous locations.

Be alert.

- The operator of the boat is responsible by law to maintain a proper lookout by sight and hearing. The operator must have an unobstructed view particularly to the front. No passengers, load or fishing seats should block the operators view when the boat is above idle or planing transition speed. Watch out for others, the water and your wake.

Never drive your boat directly behind a water skier in case the skier falls.

- As an example, your boat traveling at 40 km/h (25 MPH) will overtake a fallen skier who was 61 m (200 ft.) in front of you in 5 seconds.

Watch fallen skiers.

- When using your boat for water skiing or similar activities, always keep a fallen or down skier on the operator's side of the boat while returning to attend to the skier. The operator should always have the down skier in sight and never back up to the skier or anyone in the water.

Report accidents.

- Boat operators are required by law to file a Boating Accident Report with their state boating law enforcement agency when their boat is involved in certain boating accidents. A boating accident must be reported if 1) there is loss of life or probable loss of life, 2) there is personal injury requiring medical treatment beyond first aid, 3) there is damage to boats or other property where the damage value exceeds $500.00 or 4) there is complete loss of the boat. Seek further assistance from local law enforcement.

Be Alert To Carbon Monoxide Poisoning

Carbon monoxide is present in the exhaust fumes of all internal combustion engines including the outboards, sterndrives and inboard engines that propel boats, as well as the generators that power various boat accessories. Carbon monoxide is a deadly gas that is odorless, colorless and tasteless.

Early symptoms of carbon monoxide poisoning, which should not be confused with seasickness or intoxication, include headache, dizziness, drowsiness and nausea.

⚠ WARNING

Avoid prolonged exposure to carbon monoxide. Carbon monoxide poisoning can lead to unconsciousness, brain damage or death. Ensure that the boat, while at rest or underway, is well ventilated.

Good Ventilation

Ventilate the passenger area, open the side curtains or forward hatches to remove fumes.

1. Example of desired air flow through the boat.



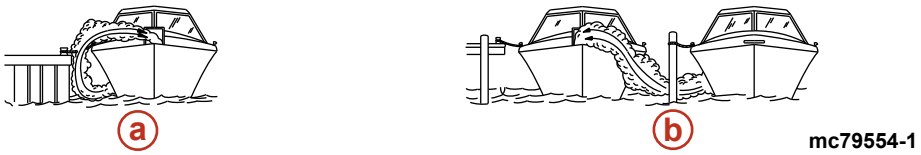
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Poor Ventilation

Under certain conditions, permanently enclosed or canvas enclosed cabins or cockpits with insufficient ventilation may draw in carbon monoxide. Install one or more carbon monoxide detectors in your boat.

Although the occurrence is rare, on a very calm day, swimmers and passengers in an open area of a stationary boat that contains or is near an operating engine may be exposed to a hazardous level of carbon monoxide.

1. Examples of poor ventilation while a boat is stationary:



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a - Operating the engine when the boat is moored in a confined space

b - Mooring close to another boat with its engine operating

2. Examples of poor ventilation while a boat is moving:



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a - Operating the boat with the trim angle of the bow too high

b - Operating the boat with no forward hatches open (station wagon effect)

Basic Boat Operation (Non-DTS Models)

Launching and Boat Operation

IMPORTANT: Install bilge drain plug prior to launching boat.

OPERATION CHART

Operation Chart			
BEFORE STARTING	**AFTER STARTING**	**WHILE UNDERWAY**	**AFTER STOPPING**
Install bilge drain plug.	Observe all gauges to check condition of engine. If not normal, stop engine.	Observe all gauges to check condition of engine. If not normal, stop engine.	Turn ignition key to the "OFF" position.
Open engine hatch.	Check for fuel, oil, water, fluid and exhaust leaks.	Listen for the audio alarm.	Turn battery switch to the "OFF" position.
Turn battery switch on.	Check shift and throttle control operation.		Close fuel shut off valve.

Operation Chart			
BEFORE STARTING	AFTER STARTING	WHILE UNDERWAY	AFTER STOPPING
Operate bilge blowers.	Check steering operation.		Close seacock, if equipped.
Open fuel shut off valve.			Flush cooling system if in saltwater.
Open seacock, if equipped.			Drain bilge.
Close the drain system.			
Place sterndrive unit in full down/in position.			
Check the engine oil.			
Perform all other checks specified by your dealer and/or boat builder.			
Listen for Audio Warning Alarm to sound when the ignition switch is in the "ON" position.			

Starting and Stopping the Engine

NOTE: *Only perform those functions applicable to your power package.*

STARTING THE ENGINE

1. Check all items listed in the Operation Chart.
2. Place the remote control handle in neutral.

⚠ CAUTION

Overheating from insufficient cooling water will cause engine and drive system damage. Ensure that there is sufficient water always available at water inlet holes during operation.

⚠ WARNING

Avoid fire or explosion. Before starting the engine, operate the bilge blower for at least five minutes to remove any explosive fumes from the engine compartment. If the boat is not equipped with a bilge blower, open the engine hatch and leave it open while starting the engine.

3. Turn ignition key to "START". Release key when engine starts and allow switch to return to "ON" position. Allow engine to warm up (6-10 minutes on first start of the day).
4. If engine does not start after 3 attempts:
   a. Push the **throttle only** button and position the remote control handle/throttle lever to the 1/4 throttle position.
   b. Turn ignition key to "START". Release key when engine starts and allow switch to return to "ON" position.
5. If engine does not start after step 4:
   a. Move the remote control handle/throttle lever to full throttle position, then return to 1/4 throttle.
   b. Turn ignition key to "START". Release key when engine starts and allow switch to return to "ON" position.
6. Inspect the power package for fuel, oil, water and exhaust leaks.

7. Move control handle with a firm, quick motion forward to shift to forward gear, or backward to shift to reverse. After shifting, advance throttle to desired setting.

⚠ CAUTION

Shifting the drive system at RPMs greater than engine idle speed may cause internal damage to the drive system. Shift the drive system only when the engine is at idle RPM.

STOPPING THE ENGINE

1. Move the remote control handle to neutral/idle and allow the engine to slow to idle speed. If engine has been operated at high speed for a long period of time, allow the engine to cool at idle speed for 3 to 5 minutes.
2. Turn ignition key to the "OFF" position.

Starting Engine After Stopped While In Gear

IMPORTANT: Avoid stopping the engine if the sterndrive unit is in gear. If the engine does stop, refer to the following procedure:

1. Push and pull repeatedly on the remote control handle until handle returns to the neutral/idle position. This may take several tries if the power package was operating above idle RPM when the engine stopped.
2. After the handle returns to the neutral/idle position, resume normal starting procedures.

Throttle Only Operation

1. Refer to **Remote Controls** section for remote control features.
2. Move the control lever to the idle/neutral position.
3. Depress and hold the throttle only button, and move the control lever to the idle/forward or idle/reverse position.
4. Advancing the control lever beyond the idle/forward or idle/reverse position will cause engine speed to increase.

IMPORTANT: Moving the control lever back to the idle/neutral position will disengage the throttle only button and allow the engine to shift into gear.

5. Throttle only mode is deactivated by moving the control lever to the idle/neutral position. Moving the control lever from the idle/neutral position to the idle/forward or idle/reverse position without pressing the throttle only button will shift the unit into the chosen gear.

Trailering the Boat

Your boat can be trailered with the sterndrive unit in the up or down position. Adequate clearance is required between the road and sterndrive when transporting.

If adequate road clearance is a problem, place the sterndrive unit in full trailer position and support it with an optional trailer kit which is available from your authorized Mercury MerCruiser dealer.

Freezing Temperature Operation

IMPORTANT: If the boat is operated during periods of freezing temperature, precautions must be taken to prevent freeze damage to the power package. Damage caused by freezing is not covered by Mercury MerCruiser Limited Warranty.

Drain Plug and Bilge Pump

The engine compartment in your boat is a natural place for water to collect. For this reason, boats are normally equipped with a drain plug and/or a bilge pump. It is very important to check these items on a regular basis to ensure that the water level does not come into contact with your power package. Components on your engine will be damaged if submerged. Damage caused by submersion is not covered by the Mercury MerCruiser Limited Warranty.

Basic Boat Operation (DTS Models)

Launching and Boat Operation

IMPORTANT: Install bilge drain plug prior to launching boat.

OPERATION CHART

Operation Chart			
BEFORE STARTING	**AFTER STARTING**	**WHILE UNDERWAY**	**AFTER STOPPING**
Install bilge drain plug.	Observe all gauges to check condition of engine. If not normal, stop engine.	Observe all gauges to check condition of engine. If not normal, stop engine.	Turn ignition key to the "OFF" position.
Open engine hatch.	Check for fuel, oil, water, fluid and exhaust leaks.	Listen for the audio alarm.	Turn battery switch to the "OFF" position.
Turn battery switch on.	Check shift and throttle control operation.		Close fuel shut off valve.
Operate bilge blowers.	Check steering operation.		Close seacock, if equipped.
Open fuel shut off valve.			Flush cooling system if in saltwater.
Open seacock, if equipped.			Drain bilge.
Close the drain system.			
Place sterndrive unit in full down/in position.			
Check the engine oil.			
Perform all other checks specified by your dealer and/or boat builder.			
Listen for Audio Warning Alarm to sound when the ignition switch is in the "ON" position.			

Starting and Stopping the Engine

NOTE: *Perform only those functions applicable to your power package.*

STARTING THE ENGINE

1. Check all items listed in the Operation Chart.

2. Place the remote control handle in neutral.

⚠ CAUTION

Overheating from insufficient cooling water will cause engine and drive system damage. Ensure that there is sufficient water always available at water inlet holes during operation.

⚠ WARNING

Avoid fire or explosion. Before starting the engine, operate the bilge blower for at least five minutes to remove any explosive fumes from the engine compartment. If the boat is not equipped with a bilge blower, open the engine hatch and leave it open while starting the engine.

NOTE: *MerCruiser DTS models are equipped with SmartStart. The SmartStart feature incorporates push button starting. Rather than holding the start button or key switch to start the engine and then releasing it when the engine starts, SmartStart completely controls the starting process. When the start button is pushed, the DTS system signals the engine PCM to start the engine. If the engine does not start, the starting process times out after a few seconds or when the engine reaches 400 RPM. Attempting to start the engine with the engine already running will turn the engine off.*

3. Turn ignition key to "RUN" position.
4. Turn the ignition key switch to the "START" position then release, or depress the start/stop button and release. If the engine is cold, allow the engine to operate at idle for 6-10 minutes or until the engine temperature reaches 60 °C (140 °F).
5. If the engine does not start after three attempts:
   a. Push the throttle-only button and position the remote control handle or throttle lever to the 1/4 throttle position.
   b. Turn the ignition key to "start." Release key when the engine starts and allow the switch to return to the "on" position.
6. If the engine does not start after step 5:
   a. Move the remote control handle.throttle lever to the full throttle position, then return to 1/4 throttle.
   b. Turn the ignition key to "start." Release key when the engine starts and allow the switch to return to the "on" position.
7. Inspect the power package for fuel, oil, water, and exhaust leaks.
8. Move the control handle with a firm, quick motion forward to shift to forward gear, or backward to shift to reverse. After shifting, advance throttle to desired setting.

⚠ CAUTION

Shifting the drive system at RPMs greater than engine idle speed may cause internal damage to the drive system. Shift the drive system only when the engine is at idle RPM.

STOPPING THE ENGINE

1. Move the remote control handle to neutral/idle and allow the engine to slow to idle speed. If engine has been operated at high speed for a long period of time, allow the engine to cool at idle speed for 3 to 5 minutes.

2. The engine can be stopped by any one of the following 4 methods:
   a. Move the ignition key switch to the "ACCESSORY" or "OFF" position. The engine will stop and the control system will be deactivated.
   b. Depress the start/stop button, if equipped. The engine will stop and the control system will remain active.
   c. Momentarily move the ignition key switch to the "START" position, then release immediately. The control system will recognize that the engine is running and will stop the engine. The control system will remain active. Moving the ignition key switch to the "START" position again will issue a start request to the control system and the control system will start the engine, if appropriate.
   d. Activate the lanyard stop switch, if equipped. The engine will stop, but the control system will remain active. The control system will not allow the engine to start if the lanyard stop switch is activated.

Throttle Only Operation

NOTE: *When operating in throttle only (neutral) mode, the DTS Control System will not allow the engine speed to increase above 3500 RPM.*

Zero effort remote controls: Zero effort remote controls have seperate throttle control and shift control levers. Advancing the throttle control lever beyond the idle position while the shift control lever is in the neutral position will cause engine speed to increase, but only up to the maximum neutral engine speed of 3500 RPM.

⚠ WARNING

The Digital Throttle and Shift (DTS) Zero Effort control can shift the engine or transmission at speeds greater than idle, causing unexpected boat movement, which may result in injury, death, or property damage due to loss of boat control. Always place the throttle control lever in the idle position before moving the shift control lever into forward or reverse gear position.

Panel Mount and Console Mount Remote Controls: Panel mount and console mount remote controls are equipped with a throttle only button. To activate throttle only mode:

1. Refer to **Remote Controls** section for remote control features.
2. Move the control lever to the idle/neutral position.
3. Depress the throttle only button, and move the control lever to the idle/forward or idle/reverse position. The DTS control system will sound two beeps on the audio warning horn to indicate throttle only mode is active. On console mount remote controls, the neutral light will begin to blink.
4. Advancing the control lever beyond the idle/forward or idle/reverse position will cause engine speed to increase.

IMPORTANT: Moving the control lever back to the idle/neutral position will deactivate the throttle only mode and allow the engine to shift into gear.

5. Throttle only mode is deactivated by moving the control lever to the idle/neutral position. Moving the control lever from the idle/neutral position to the idle/forward or idle/reverse position without pressing the throttle only button will shift the unit into the chosen gear.

Trailering the Boat

Your boat can be trailered with the sterndrive unit in the up or down position. Adequate clearance is required between the road and sterndrive when transporting.

If adequate road clearance is a problem, place the sterndrive unit in full trailer position and support it with an optional trailer kit which is available from your authorized Mercury MerCruiser dealer.

Freezing Temperature Operation

IMPORTANT: If the boat is operated during periods of freezing temperature, precautions must be taken to prevent freeze damage to the power package. Damage caused by freezing is not covered by Mercury MerCruiser Limited Warranty.

Drain Plug and Bilge Pump

The engine compartment in your boat is a natural place for water to collect. For this reason, boats are normally equipped with a drain plug and/or a bilge pump. It is very important to check these items on a regular basis to ensure that the water level does not come into contact with your power package. Components on your engine will be damaged if submerged. Damage caused by submersion is not covered by the Mercury MerCruiser Limited Warranty.

Protecting People In The Water

While You Are Cruising

It is very difficult for a person in the water to take quick action to avoid a boat heading in their direction, even at slow speeds.



Always slow down and exercise extreme caution any time you are boating in an area where there might be people in the water.

Whenever a boat is moving (even coasting) and the gear shift is in neutral, there is sufficient force by the water on the propeller to cause the propeller to rotate. This neutral propeller rotation can cause serious injury.

While Boat Is Stationary

⚠ WARNING

Stop your engine immediately whenever anyone in the water is near your boat. Serious injury to the person in the water is likely if contacted by a rotating propeller, a moving boat, a moving gearcase, or any solid device rigidly attached to a moving boat or gearcase.

Shift into neutral and shut off the engine before allowing people to swim or be in the water near your boat.

High-Speed And High-Performance Boat Operation

If your boat is considered a high-speed or high-performance boat with which you are unfamiliar, we recommend that you never operate it at its high speed capability without first requesting an initial orientation and demonstration ride with your dealer or an operator experienced with your boat. For additional information, refer to **Hi-Performance Boat Operation** booklet (90-849250-R2) from your dealer, distributor or Mercury Marine.

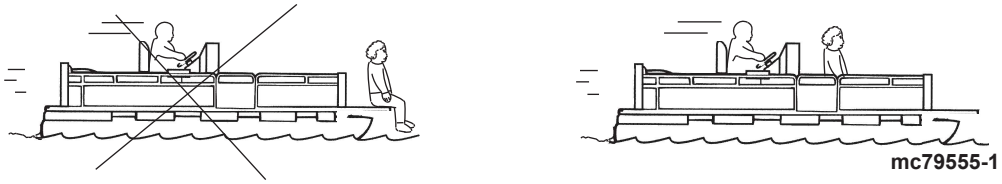
Passenger Safety In Pontoon Boats And Deck Boats

Whenever the boat is in motion, observe the location of all passengers. Do not allow any passengers to stand or use seats other than those designated for traveling faster than idle speed. A sudden reduction in boat speed, such as plunging into a large wave or wake, a sudden throttle reduction, or a sharp change of boat direction, could throw them over the front of boat. Falling over the front of the boat between the two pontoons will position them to be run over.

Boats Having An Open Front Deck

No one should ever be on the deck in front of the fence while the boat is in motion. Keep all passengers behind the front fence or enclosure.

Persons on the front deck could easily be thrown overboard or persons dangling their feet over the front edge could get their legs caught by a wave and pulled into the water.



⚠ WARNING

Avoid serious injury or death from falling over the front end of a pontoon or deck boat and being run over. Stay back from the front end of the deck and remain seated while the boat is in motion.

Boats With Front-Mounted, Raised Pedestal Fishing Seats

Elevated fishing seats are not intended for use when the boat is traveling faster than idle or trolling speed. Sit only in seats designated for traveling at faster speeds.

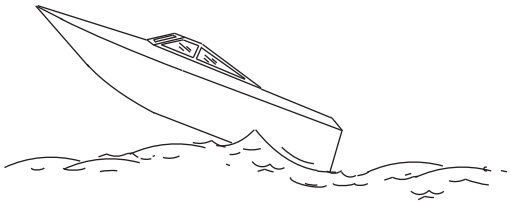
Any unexpected, sudden reduction in boat speed could result in the elevated passenger falling over the front of the boat.



Wave And Wake Jumping

⚠ WARNING

Avoid serious injury or death from being thrown within or out of a boat when it lands after jumping a wave or wake. Avoid wave or wake jumping whenever possible. Instruct all occupants that if a wake or wave jump occurs, get low and hang on to any boat hand hold.



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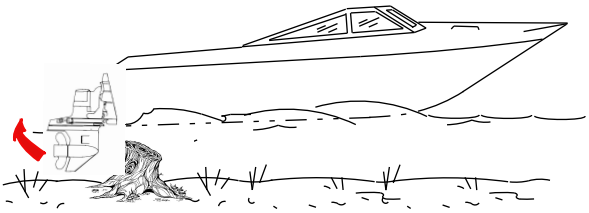
Operating recreational boats over waves and wakes is a natural part of boating. However, when this activity is done with enough speed to force the boat hull partially or completely out of the water, certain hazards arise, particularly when the boat re-enters the water.

The primary concern is the boat changing direction while in the midst of the jump. In such cases the landing may cause the boat to violently veer in a new direction. Such a sharp change in direction or turn can cause occupants to be thrown out of their seats or out of the boat.

There is another less common hazardous result from allowing your boat to launch off of a wave or wake. If the bow of your boat pitches down far enough while airborne, upon water contact it may penetrate under the water surface and submarine for an instant. This will bring the boat nearly to a stop in an instant and can send the occupants flying forward. The boat may also veer sharply to one side.

Impact With Underwater Hazards

Reduce speed and proceed with caution whenever you're driving a boat in shallow water or in areas where the waters are suspected of having underwater obstacles that could be struck by the underwater drive components, rudder or the boat bottom.



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IMPORTANT: The most important thing you can do to help reduce injury or impact damage from striking a floating or underwater object is control the boat speed. Under these conditions, boat speed should be kept to a maximum speed of 24 to 40 km/h (15 to 25 MPH).

Striking a floating/underwater object may result in an infinite number of situations. Some of these situations could result in the following:

- The boat could move suddenly in a new direction. Such a sharp change in direction or turn can cause occupants to be thrown out of their seats or out of the boat.

- A rapid reduction in speed. This will cause occupants to be thrown forward, even out of the boat.
- Impact damage to the underwater drive components, rudder and/or boat.

Keep in mind, one of the most important things you can do to help reduce injury or impact damage in these situations is control the boat speed. Boat speed should be kept to a minimum planing speed when driving in waters known to have underwater obstacles.

After striking a submerged object, stop the engine as soon as possible and inspect the drive system for any broken or loose parts. If damage is present or suspected, the power package should be taken to an authorized Mercury MerCruiser dealer for a thorough inspection and necessary repair.

The boat should be checked for hull fractures, transom fractures and water leaks.

Operating with damaged underwater drive components, rudder or boat bottom could cause additional damage to other parts of the power package, or could affect control of the boat. If continued operation is necessary, do so at greatly reduced speeds.

⚠ WARNING

Avoid serious injury or death from loss of boat control. Continued boating with major impact damage can result in sudden component failure with or without subsequent impacts. Have the power package thoroughly inspected and any necessary repairs made.

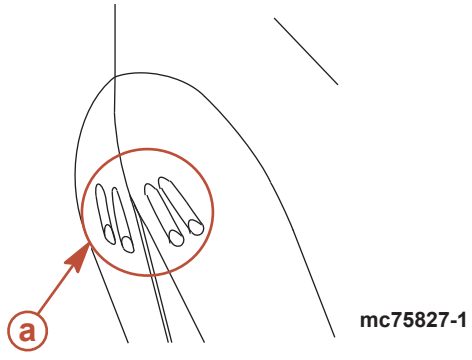
Drive Unit Impact Protection

The power trim hydraulic system is designed to provide impact protection for the sterndrive unit. If a submerged object is struck while the boat is moving forward, the hydraulic system will cushion the kickup of the sterndrive unit as it clears the object, reducing damage to the unit. After the sterndrive unit has cleared the object, the hydraulic system allows the sterndrive unit to return to its original operating position, preventing loss of steering control and engine overspeed.

Use extreme caution when operating in shallow water or where underwater objects are known to be present. No impact protection is provided in reverse; use extreme care to prevent striking submerged objects while operating in reverse.

IMPORTANT: Impact protection system cannot be designed to ensure total protection from impact damage under all conditions.

Operating With Low Water Inlets In Shallow Water



a - Low Water Inlets

NOTICE

Operating in shallow water can cause severe engine damage due to clogged water inlets. Ensure that the water inlets on the gearcase do not ingest sand, silt, or other debris, which can restrict cooling water supply to the engine.

Extreme care should be exercised when operating a boat equipped with low water inlets while maneuvering in shallow water. Also, avoid beaching a boat with the engine operating.

Conditions Affecting Operation

Weight Distribution (Passengers and Gear) Inside the Boat

Shifting weight to rear (stern):

- Generally increases speed and engine RPM
- Causes bow to bounce in choppy water
- Increases danger of following wave splashing into the boat when coming off plane
- At extremes, can cause the boat to porpoise

Shifting weight to front (bow):

- Improves ease of planing
- Improves rough water ride
- At extremes, can cause the boat to veer back and forth (bow steer)

Bottom Of Boat

To maintain maximum speed, the boat bottom should be:

- Clean, free of barnacles and marine growth
- Free of distortion; nearly flat where it contacts the water
- Straight and smooth, fore and aft

Marine vegetation may accumulate when the boat is docked. This growth must be removed before operation; it may clog the water inlets and cause the engine to overheat.

Cavitation

Cavitation occurs when water flow cannot follow the contour of a fast-moving underwater object, such as a gear housing or a propeller. Cavitation permits the propeller to speed up, but the boat speed to reduce. Cavitation can seriously erode the surface of the gear housing or the propeller. Common causes of cavitation are:

- Weeds or other debris snagged on the propeller
- Bent propeller blade
- Raised burrs or sharp edges on the propeller

Ventilation

Ventilation is caused by surface air or exhaust gases that are introduced around the propeller resulting in propeller speed-up and a reduction in boat speed. Air bubbles strike the propeller blade and cause erosion of the blade surface. If allowed to continue, eventual blade failure (breakage) will occur. Excessive ventilation is usually caused by:

- Drive unit trimmed out too far.
- A missing propeller diffuser ring.
- A damaged propeller or gear housing, which allows exhaust gases to escape between propeller and gear housing.
- Drive unit installed too high on transom.

Elevation And Climate

Elevation and climate changes will affect the performance of your power package. Loss of performance can be caused by:

- Higher elevations
- Higher temperatures
- Low barometric pressures
- High humidity

For you to have optimum engine performance under changing weather conditions, it is essential that the engine be propped to allow the engine to operate at or near the top end of the specified maximum RPM range with a normal boat load during your normal boating weather conditions.

In most cases, recommended RPM can be achieved by changing to a lower pitch propeller.

Propeller Selection

IMPORTANT: The engines covered in this manual are equipped with an RPM rev-limiter that is set to an upper (or limited) RPM amount. This limit is slightly above the normal operating range of the engine and is designed to help prevent damage from excessive engine RPM. Once the RPM returns to the recommended operating RPM range, normal engine operation resumes.

It is the responsibility of the boat manufacturer and/or the selling dealer to equip the power package with the correct propeller. Refer to Mercury Marine's web page **http://www.mercurymarine.com/everything_you_need_to_know_about_propellers6**.

Select a propeller that will allow the engine power package to operate at or near the top end of the recommended WOT operating RPM range with a normal load.

If full throttle operation is below the recommended range, the propeller must be changed to prevent loss of performance and possible engine damage. On the other hand, operating an engine above the recommended operating RPM range will cause higher than normal wear and/or damage.

After initial propeller selection, the following common problems may require that the propeller be changed to a lower pitch.

- Warmer weather and greater humidity cause a loss of RPM.
- Operating in a higher elevation causes a loss of RPM.
- Operating with a dirty boat bottom causes a loss of RPM.
- Operating with increased load (additional passengers, pulling skiers) causes a loss of RPM.

For better acceleration, such as is needed for water skiing, use the next lower pitch propeller. When not pulling skiers, do not operate at full throttle when using the lower pitch propeller.

Getting Started

20-Hour Break-In Period

IMPORTANT: The first 20 hours of operation is the engine break-in period. Correct break-in is essential to obtain minimum oil consumption and maximum engine performance. During this break-in period, the following rules must be observed:

- Do not operate below 1500 RPM for extended periods of time for the first 10 hours. Shift into gear as soon as possible after starting and advance the throttle above 1500 rpm **if conditions permit safe operation**.

- Do not operate at one speed consistently for extended periods.
- Do not exceed 3/4 throttle during the first 10 hours. During the next 10 hours, occasional operation at full throttle is permissible (5 minutes at a time maximum).
- Avoid full throttle acceleration from idle speed.
- Do not operate at full throttle until the engine reaches normal operating temperature.
- Frequently check engine oil level. Add oil as needed. It is normal for oil consumption to be high during the break-in period.

After Break-In Period

To help extend the life of your Mercury MerCruiser power package, the following recommendations should be considered;

- Ensure that propeller allows the engine to operate at or near the top of the specified WOT RPM range (Refer to **Specifications** and **Maintenance**) when at full throttle with a normal boat load.
- Operation at 3/4 throttle setting or lower is recommended. Refrain from prolonged operation at WOT RPM.
- Change the engine oil and oil filter. Refer to **Maintenance**.
- Change the transmission oil and filter. Refer to **Maintenance** (ZF Transmission models).[1.]

End of First Season Checkup

At the end of the first season of operation, contact an authorized Mercury MerCruiser dealer to discuss and/or perform scheduled maintenance items. If you are in an area where the product is operated continuously, year-round, you should contact your dealer at the end of the first 100 hours of operation or once yearly, whichever occurs first.

1. Require fluid and filter change after the first 25 hours and then every 100 hours.

Section 4 - Specifications

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Fuel Requirements

IMPORTANT: Use of improper gasoline can damage your engine. Engine damage resulting from the use of improper gasoline is considered misuse of the engine, and damage caused thereby will not be covered under the limited warranty.

Fuel Ratings

Mercury MerCruiser engines will operate satisfactorily when using a major brand of unleaded gasoline meeting the following specifications:

USA and Canada - having a posted pump Octane Rating of 87 (R+M)/2 minimum. Premium gasoline [92 (R+M)/2 Octane] is also acceptable. Do not use leaded gasoline.

Outside USA and Canada - having a posted pump Octane Rating of 90 RON minimum. Premium gasoline (98 RON) is also acceptable. If unleaded gasoline is not available, use a major brand of leaded gasoline.

Using Reformulated (Oxygenated) Gasolines (USA Only)

This type of gasoline is required in certain areas of the USA. The 2 types of oxygenates used in these fuels is Alcohol (Ethanol) or Ether (MTBE or ETBE). If Ethanol is the oxygenate that is used in the gasoline in your area, refer to Gasolines Containing Alcohol.

These Reformulated Gasolines are acceptable for use in your Mercury MerCruiser engine.

Gasolines Containing Alcohol

If the gasoline in your area contains either methanol (methyl alcohol) or ethanol (ethyl alcohol), you should be aware of certain adverse effects that can occur. These adverse effects are more severe with methanol. Increasing the percentage of alcohol in the fuel can also worsen these adverse effects.

Some of these adverse effects are caused because the alcohol in the gasoline can absorb moisture from the air, resulting in a separation of the water/alcohol from the gasoline in the fuel tank.

The fuel system components on your Mercury MerCruiser engine will withstand up to 10% alcohol content in the gasoline. We do not know what percentage your boat's fuel system will withstand. Contact your boat manufacturer for specific recommendations on the boat's fuel system components (fuel tanks, fuel lines, and fittings). Be aware that gasolines containing alcohol may cause increased:

- Corrosion of metal parts
- Deterioration of rubber or plastic parts
- Fuel permeation through rubber fuel lines
- Starting and operating difficulties

⚠ WARNING

FIRE AND EXPLOSION HAZARD: Fuel leakage from any part of the fuel system can be a fire and explosion hazard which can cause serious bodily injury or death. Careful periodic inspection of entire fuel system is mandatory, particularly after storage. All fuel components should be inspected for leakage, softening, hardening, swelling or corrosion. Any sign of leakage or deterioration requires replacement before further engine operation.

Because of possible adverse effects of alcohol in gasoline, it is recommended that only alcohol-free gasoline be used where possible. If only fuel containing alcohol is available, or if the presence of alcohol is unknown, increased inspection frequency for leaks and abnormalities is required.

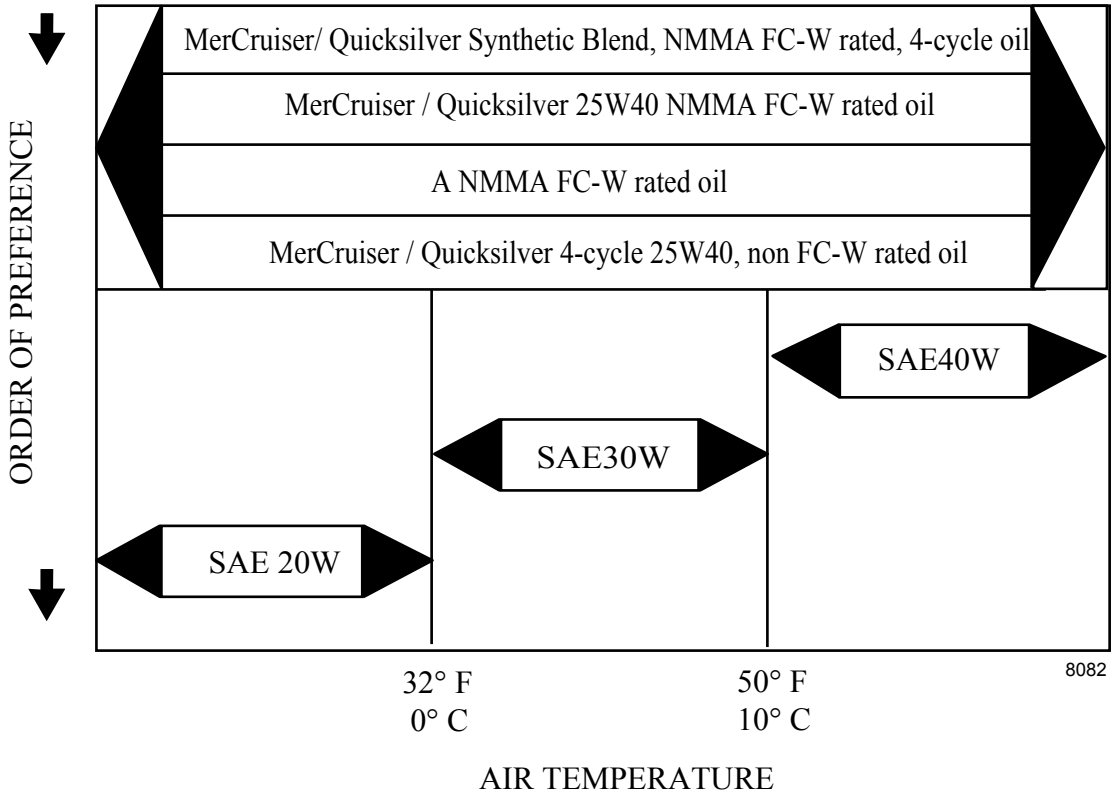
IMPORTANT: When operating a Mercury MerCruiser engine on gasoline containing alcohol, storage of gasoline in the fuel tank for long periods should be avoided. Long periods of storage, common to boats, create unique problems. In cars alcohol-blend fuels normally are consumed before they can absorb enough moisture to cause trouble, but boats often sit idle long enough for phase separation to take place. In addition, internal corrosion may take place during storage if alcohol has washed protective oil films from internal components.

Engine Oil

To help obtain optimum engine performance and to provide maximum protection, we strongly recommend the use of the following oils listed in the order of recommendation:

1. MerCruiser / Quicksilver Synthetic Blend, NMMA FC-W rated, 4 cycle oil.
2. MerCruiser / Quicksilver 25W40 NMMA FC-W rated oil.
3. A NMMA FC-W rated oil.
4. MerCruiser / Quicksilver 4-cycle 25W40, non FC-W rated oil.
5. A good grade straight weight detergent automotive oil per the operating chart below.

NOTE: *The use of non-detergent oils, multi-viscosity oils (other than as specified), non FC-W rated synthetic oils, low quality oils or oils that contain solid additives are specifically not recommended.*



Engine Specifications

Models	4.3L MPI	5.0L MPI	350 MAG MPI Horizon	350 MAG MPI	MX 6.2 MPI	MX 6.2 MPI Horizon
Horsepower[1.]	220	260	300	300	320	320
Kilowatts[1.]	164	194	224	224	238	238
Displacement	4.3 L (262 cid)	5.0 L (305 cid)	5.7 L (350 cid)		6.2 L (377 cid)	
Specified WOT RPM Range[2.]	4400-4800	4600-5000	4800-5200		4800-5200	
Idle RPM in Neutral[2.]	600[3.]					
Minimum Oil Pressure @ Idle[4.]	41 kPa (6 psi)					
Minimum Oil Pressure @ 2000 RPM[4.]	124 kPa (18 psi)					
Thermostat, Seawater Cooled Models	71° C (160° F)					
Thermostat, Closed Cooled Models	77° C (170° F)					
Timing @ Idle[3.]	Not Adjustable					
Firing Order	1-6-5-4-3-2	1-8-4-3-6-5-7-2				
Electrical System	12-Volt Negative (-) Ground					
Alternator Rating - Hot Operating Amps	65 amp					
Alternator Rating - Cold Operating Amps	72 amp					
Recommended Battery Rating (Non-DTS Models) (Minimum)	750 CCA, 950 MCA, or 180 Ah					
Recommended Battery Rating (DTS Models) (Minimum)	800 CCA, 1000 MCA, or 190 Ah					
Spark Plug Type	AC Platinum (AC 41-993)					
Spark Plug Gap	1.5 mm (0.060 in.)					

Fluid Specifications

Sterndrives

NOTE: *Oil capacity includes gear lube monitor.*

Model	Capacity	Fluid Type
Alpha One	1892 ml (64 oz.)	High Performance Gear Lubricant
Bravo One	2736 ml (92-1/2 oz.)	
Bravo Two	3209 ml (108-1/2 oz.)	
Bravo Three	2972 ml (100-1/2 oz.)	

1. Performance obtained and corrected in accordance with SAE J1228/ISO 8665 Crankshaft Power.
2. Measured using an accurate service tachometer with the engine at normal operating temperatures
3. Idle speed and timing on EFI models are not adjustable
4. Oil pressure must be checked with the engine at normal operating temperature.

Engine

IMPORTANT: All capacities are approximate fluid measures.

IMPORTANT: It may be necessary to adjust oil levels depending on installation angle and cooling systems (heat exchanger and fluid lines).

4.3L MPI Models	Capacity	Fluid Type
Engine Oil (With Filter)[1.]	3.8 liters (4 U.S. qt.)	Mercury/Quicksilver Synthetic Blend MerCruiser Engine Oil 25W-40
Seawater Cooling System [2.]	20 liters (21 U.S. qt.)	Propylene Glycol and Purified Water
Closed Cooling System	19 liters (20 U.S. qt.)	Mercury Extended Life Coolant/Antifreeze or Extended Life Ethylene Glycol 5/100 Coolant/Antifreeze mixed 50/50 with Purified Water

5.0 MPI, 350 MAG MPI, MX 6.2 MPI (includes Horizon) Models	Capacity	Fluid Type
Engine Oil (With Filter)[1.]	4.25 liters (4.5 U.S. qt.)	Mercury/Quicksilver Synthetic Blend MerCruiser Engine Oil 25W-40
Seawater Cooling System [2.]	20 liters (21 U.S. qt.)	Propylene Glycol and Purified Water
Closed Cooling System	19 liters (20 U.S. qt.)	Mercury Extended Life Coolant/Antifreeze or Extended Life Ethylene Glycol 5/100 Coolant/Antifreeze mixed 50/50 with Purified Water

1. Always use the dipstick to determine the exact quantity of oil or fluid required.
2. Seawater cooling system capacity information is for winterization use only.

Notes:

Section 5 - Maintenance

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Owner/Operator Responsibilities

It is the operator's responsibility to perform all safety checks, to ensure that all lubrication and maintenance instructions are complied with for safe operation and to return the unit to an authorized Mercury MerCruiser dealer for a periodic checkup.

Normal maintenance service and replacement parts are the responsibility of the owner/operator and as such, are not considered defects in workmanship or material within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

Proper maintenance and care of your power package will ensure optimum performance and dependability and will keep your overall operating expenses at a minimum. See your authorized Mercury MerCruiser dealer for service aids.

Dealer Responsibilities

In general, a dealer's responsibilities to the customer include predelivery inspection and preparation such as:

- Ensure that the boat is properly equipped.
- Prior to delivery, make certain that the Mercury MerCruiser power package and other equipment are in proper operating condition.
- Make all necessary adjustments for maximum efficiency.
- Familiarize the customer with the on-board equipment.
- Explain and demonstrate the operation of the power package and boat.
- Provide you with a copy of a Predelivery Inspection Checklist.
- Your selling dealer should fill out the Warranty Registration Card completely and mail it to the factory immediately upon sale of the new product.

Maintenance

⚠ WARNING

Avoid product damage, injury, or death from electrical shock, fire or explosion. Always disconnect both battery cables from the battery before servicing the power package.

⚠ WARNING

Fuel vapors can be present in the engine compartment. Avoid injury or power package damage caused by fuel vapors or explosion. Always ventilate the engine compartment prior to servicing the power package.

IMPORTANT: Refer to the maintenance schedule for complete listing of all scheduled maintenance to be performed. Some listings can be done by owner/operator, while others should be performed by an authorized Mercury MerCruiser dealer. Before attempting maintenance or repair procedures not covered in this manual, it is recommended that a Mercury MerCruiser Service Manual be purchased and read thoroughly.

NOTE: *Maintenance points are color coded for ease of identification. See the decal on engine for identification.*

Maintenance Point Color Codes	
Blue	Coolant
Yellow	Engine Oil

Maintenance Point Color Codes	
Orange	Fuel
Black	Gear Lube Oil (Sterndrive models only)
Brown	Transmission (Inboard models only)

Do It Yourself Maintenance Suggestions

Present day marine equipment, such as your Mercury MerCruiser power package, are highly technical pieces of machinery. Electronic ignition and special fuel delivery systems provide greater fuel economies, but also are more complex for the untrained mechanic.

If you are one of those persons who likes to do it yourself, here are some suggestions for you.

- Do not attempt any repairs unless you are aware of the Cautions, Warnings and procedures required. Your safety is our concern.
- If you attempt to service the product yourself, we suggest you order the service manual for that model. The service manual outlines the correct procedures to follow. It is written for the trained mechanic, so there may be procedures you don't understand. Do not attempt repairs if you do not understand the procedures.
- There are special tools and equipment that are required to perform some repairs. Do not attempt these repairs unless you have these special tools and/or equipment. You can cause damage to the product in excess of the cost a dealer would charge you.
- Also, if you partially disassemble an engine or drive assembly and are unable to repair it, the dealer's mechanic must reassemble the components and test to determine the problem. This will cost you more than taking it to the dealer immediately upon having a problem. It may be a very simple adjustment to correct the problem.
- Do not telephone the dealer, service office or the factory to attempt for them to diagnose a problem or to request the repair procedure. It is difficult for them to diagnose a problem over the telephone.

Your authorized dealer is there to service your power package. They have qualified factory trained mechanics.

It is recommended you have the dealer do periodic maintenance checks on your power package. Have them winterize it in the fall and service it before the boating season. This will reduce the possibility of any problems occurring during your boating season when you want trouble free boating pleasure.

Inspection

Inspect your power package often, and at regular intervals, to help maintain its top operating performance and correct potential problems before they occur. The entire power package should be checked carefully, including all accessible engine parts.

- Check for loose, damaged or missing parts, hoses and clamps; tighten or replace as necessary.
- Check plug leads and electrical leads for damage.
- Remove and inspect the propeller. If badly nicked, bent or cracked, contact your authorized Mercury MerCruiser dealer.
- Repair nicks and corrosion damage on power package exterior finish. Contact your authorized Mercury MerCruiser dealer.

Maintenance Schedule - Sterndrive Models

Routine Maintenance

NOTE: *Only perform maintenance which applies to your particular power package.*

EACH DAY START

- Check the crankcase oil (interval can be extended based on experience).
- Check the drive unit oil level, the trim pump oil level, and the power steering pump or compact hydraulic steering fluid level.

EACH DAY END

- If operating in salt, brackish or polluted waters, flush the cooling system after each use.

WEEKLY

- Check the water inlets for debris or marine growth. Check the seawater strainer and clean. Check the coolant level.
- Inspect the drive unit anodes and replace if 50 percent eroded.

EVERY TWO MONTHS OR 50 HOURS

- Lubricate the propeller shaft and retorque the nut (if operating in only freshwater, this maintenance may be extended to every four months).
- Operating in saltwater or brackish or polluted water only: treat the power package with Corrosion Guard.
- Check the battery connections and the fluid level.
- Ensure that the gauges and the wiring connections are secure. Clean the gauges.[1.]

Scheduled Maintenance

NOTE: *Only perform maintenance which applies to your particular power package.*

AFTER THE INITIAL 20 HOUR BREAK-IN PERIOD

To help extend the life of your Mercury MerCruiser power package, we reccommend the following:

- Change the engine oil and filter
- Change the sterndrive lube.

EVERY 100 HOURS OR ANNUALLY (WHICHEVER OCCURS FIRST)

- Touch-up the paint on the power package.
- Change the crankcase oil and filter.
- Change the drive unit oil
- Retorque the connection of the gimbal ring to the steering shaft.
- Replace the water separating fuel filter element.
- Check the steering system and the remote control for loose, missing or damaged parts. Lubricate the cables and the linkages.
- Check the continuity circuit for loose or damaged connections. Test the MerCathode unit output on Bravo Models.

NOTE: *On V6 models the PCV valve is non serviceable and is an internal component of the valve cover assembly.*

- Clean the flame arrestor, IAC muffler (MPI engines), and the crankcase ventilation hoses. Inspect the PCV valve, if equipped.
- Inspect the condition and the tension of the belts.

1. If operating in saltwater, interval is reduced to every 25 hours or 30 days whichever occurs first.

- Driveshaft extension models: Lubricate the driveshaft U-joints, and tailstock input and output bearings.

EVERY 200 HOURS OR 3 YEARS

- Inspect the U-joints, the splines and the bellows. Check the clamps. Check the engine alignment. Lubricate the U-joint splines and cross bearing, if equipped with a grease fitting.
- Lubricate the gimbal bearing and the engine coupler.[2.]

EVERY 300 HOURS OR 3 YEARS

- Check the engine mount for tightness and retorque if necessary.
- Check the distributor cap, if equipped.
- Check the electrical system for loose, damaged, or corroded fasteners.
- Check the cooling system and the exhaust system hose clamps for tightness. Inspect both systems for damage or leaks.
- Disassemble and inspect the seawater pump and replace worn components.
- Clean the seawater section of the closed cooling system. Clean, inspect, and test the pressure cap.
- Inspect the exhaust system components and verify that the flapper valves are not missing or worn, if equipped.

EVERY 5 YEARS

- Replace the coolant (every two years if extended life antifreeze coolant is not being used).

Maintenance Log

Record all maintenance performed on your power package here. Be sure to save all work orders and receipts.

Date	Maintenance Performed	Engine Hours

2. Lubricate the engine coupler every 50 hours if operated at idle for prolonged periods of time.

Date	Maintenance Performed	Engine Hours

Engine Oil

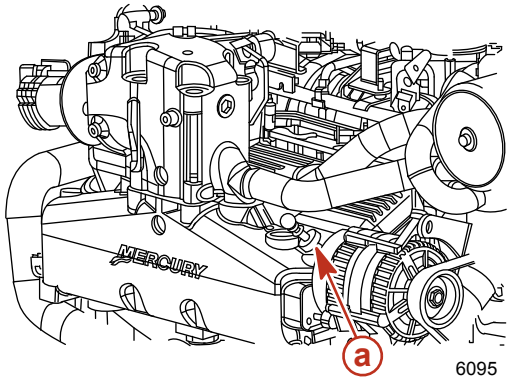
⚠ CAUTION

ENVIRONMENTAL HAZARD! Discharge of oil or oil waste into the environment is restricted by law. Do not spill oil or oil waste into the environment when using or servicing your boat. Contain and dispose of oil or oil waste as directed by local authorities.

Checking

1. Stop the engine. Allow approximately 5 minutes for the oil to drain into the oil pan. The boat must be at rest in the water.
2. Remove the dipstick. Wipe clean and reinstall fully into the dipstick tube. Wait 60 seconds to allow trapped air to vent.

NOTE: *Ensure that dipstick is installed with oil level indication marks facing the rear of the engine (flywheel end).*



a - Dipstick tube

IMPORTANT: Add the specified engine oil to bring the level up to, but not over, the full or OK range mark on the dipstick.

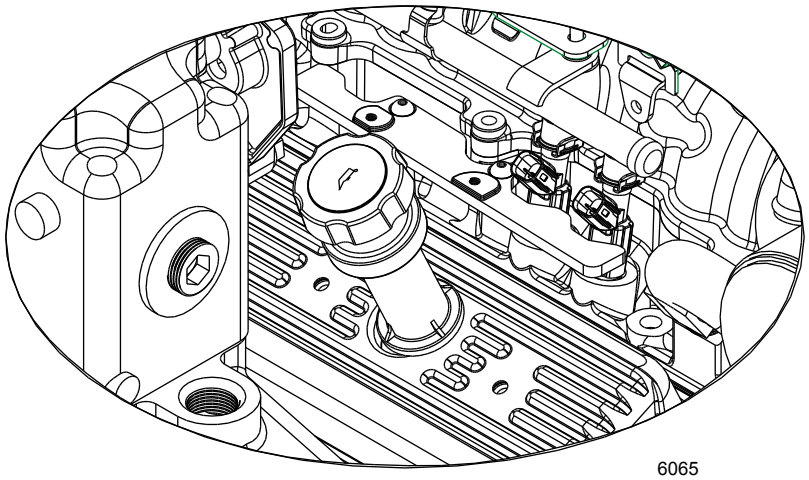
3. Remove the dipstick and observe the oil level. Oil level must be between full or OK range and add. Reinstall dipstick into dipstick tube.

Filling

IMPORTANT: Do not overfill the engine with oil.

IMPORTANT: Always use the dipstick to determine the exact quantity of oil or fluid required.

1. Remove oil fill cap.



IMPORTANT: Add the specified engine oil to bring the level up to, but not over, the full or OK range mark on the dipstick.

2. Add the specified engine oil to bring the level up to, but not over, the full or OK range mark on the dipstick. Recheck oil level.
3. Replace the fill cap.

Engine Model	Engine Oil Capacity	Fluid type
4.3L (262 cid)	3.8 liters (4 U.S. qt.)	Mercury/Quicksilver Synthetic Blend MerCruiser Engine Oil 25W-40
5.0L (305 cid)	4.25 liters (4.5 U.S. qt.)	
5.7L (350 cid)		

Changing Oil and Filter

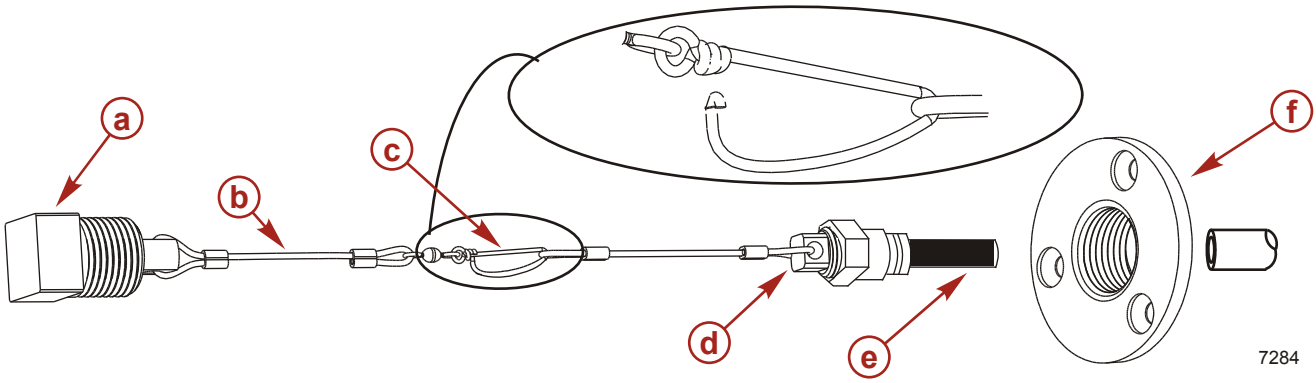
Refer to the Maintenance schedule for the change interval. Engine oil should be changed before placing the boat in storage.

IMPORTANT: Change engine oil when the engine is warm from operation. Warm oil flows more freely, carrying away more impurities. Use only recommended engine oil (refer to Specifications).

EASY ENGINE OIL DRAIN SYSTEM

NOTE: Boat must be out of water to perform this procedure.

1. Loosen the oil filter to vent the system.

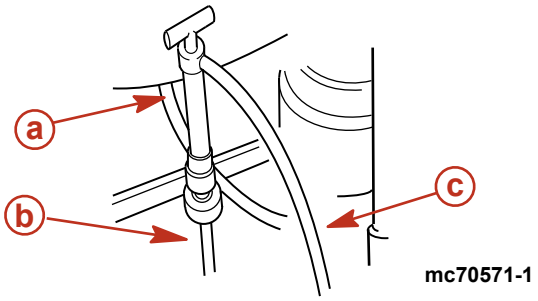


a - Bilge drain plug
b - Tether
c - Clip
d - Oil drain hose plug
e - Oil drain hose
f - Bilge drain flange

2. Remove the bilge drain plug.
3. Pull tether through the bilge drain.
4. Place the oil drain hose in a suitable container.
5. Remove the drain plug from the oil drain hose.
6. After oil has drained completely, install the drain plug in the oil drain hose.
7. Push the hose through bilge drain and install the plug.

ENGINE OIL DRAIN PUMP

1. Loosen the oil filter to vent the system.
2. Remove the dipstick.
3. Install the oil pump onto the dipstick tube.

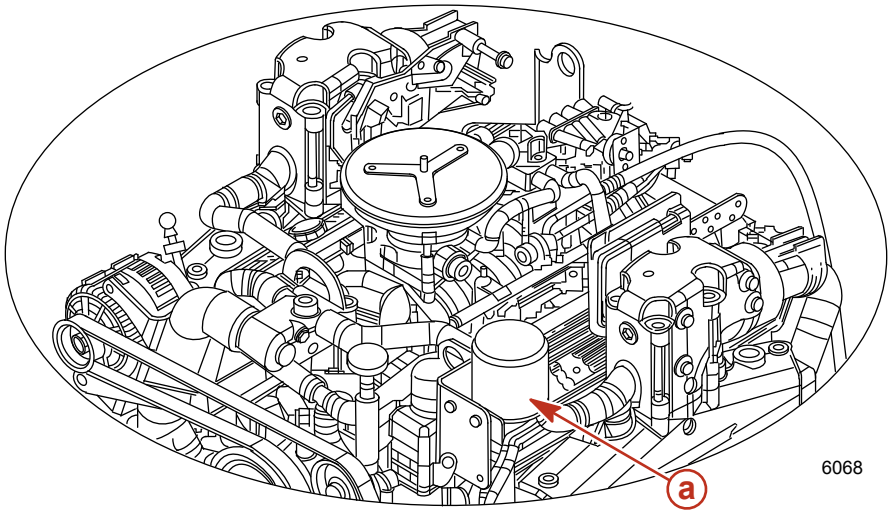


a - Typical oil pump
b - Dipstick tube
c - Oil drain hose

4. Insert the hose end of the crankcase oil pump onto an appropriate container and, using the handle, pump until the crankcase is empty.
5. Remove the pump.
6. Install the dipstick.

CHANGING FILTER

1. Remove and discard oil filter.



a - Oil filter

2. Coat sealing ring on new filter with engine oil and install.
3. Tighten oil filter securely (following filter manufacturer's instructions). Do not overtighten.
4. Remove oil fill cap.

IMPORTANT: Always use dipstick to determine exactly how much oil is required.

5. Add recommended engine oil to bring level up to the bottom of the OK range on the dipstick.
6. With the boat at rest in the water, check the oil level and add specified fluid to bring the oil level up to, but not over, the full or OK range.

NOTE: *Adding 0.95 liters (1 quart) of engine oil will raise the level from the add mark to the top of the OK range.*

Engine Model	Engine Oil Capacity	Fluid type
4.3L MPI	3.8 liters (4 U.S. qt.)	Mercury/Quicksilver Synthetic Blend MerCruiser Engine Oil 25W-40
5.0 MPI, 350 MAG MPI, MX 6.2 MPI 5.7L (350 cid)	4.25 liters (4.5 U.S. qt.)	

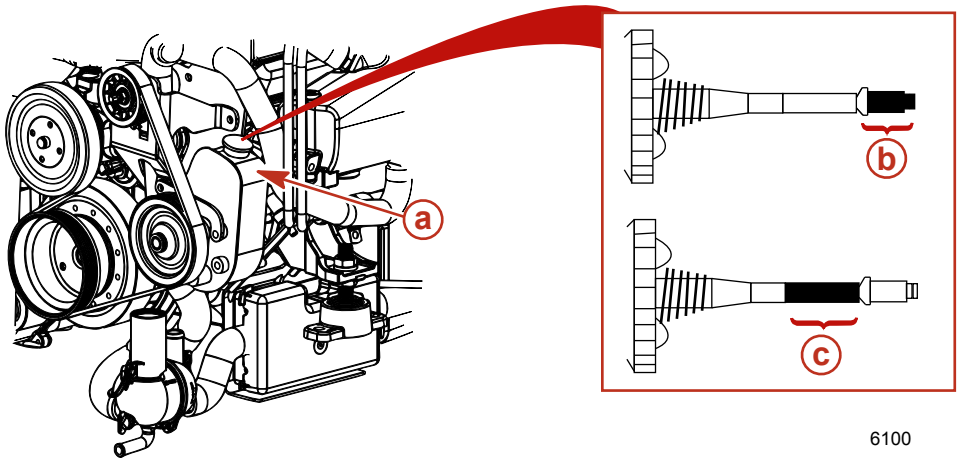
7. Start the engine, run the engine for three minutes, and check for leaks. Stop the engine. Allow approximately 5 minutes for the oil to drain into the oil pan. The boat must be at rest in the water.

Power Steering Fluid

Checking

1. Stop the engine and center the sterndrive unit.

2. Remove the fill cap/dipstick and observe the level.
   a. Proper fluid level with engine at normal operating temperature should be within the warm range.
   b. Proper fluid level with engine cold should be within the cold range.



a - Power steering pump
b - Cold range
c - Warm range

3. Fill to full line with specified fluid.

IMPORTANT: If fluid is not visible in pump, contact your authorized Mercury MerCruiser dealer.

Filling

1. Remove the fill cap/dipstick and observe the level.
2. Add Quicksilver Power Trim and Steering Fluid or Dexron III Automatic Transmission Fluid (ATF) to bring the fluid level up to the proper level.

Tube Ref No.	Description	Where Used	Part No.
114	Power Trim and Steering Fluid	Power steering system	92-858074K01

3. Reinstall the fill cap/dipstick.

Changing

Power steering fluid does not require changing unless it becomes contaminated with water or debris. Contact your authorized Mercury MerCruiser dealer.

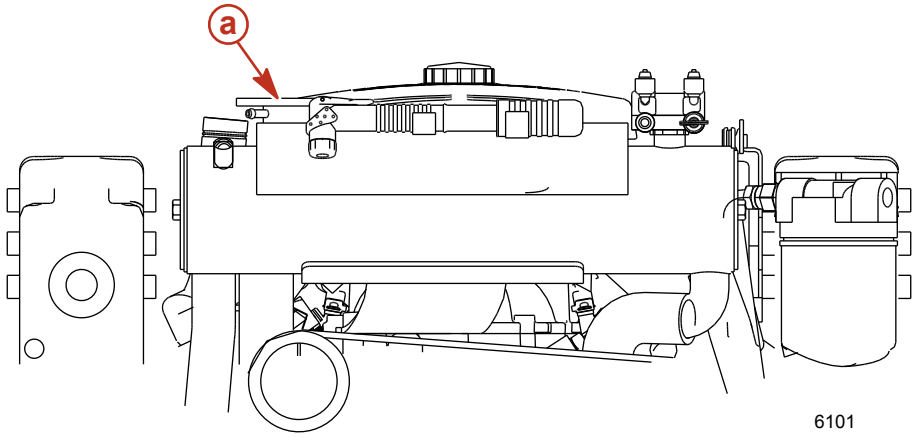
Engine Coolant

Checking

⚠ WARNING

Allow the engine to cool down before removing the coolant pressure cap. A sudden loss of pressure could cause hot coolant to boil and discharge violently. After the engine has cooled, turn the cap 1/4 turn to allow any pressure to escape slowly, then push down and turn the cap all the way off.

1. Remove the cap from the heat exchanger and observe the fluid level.

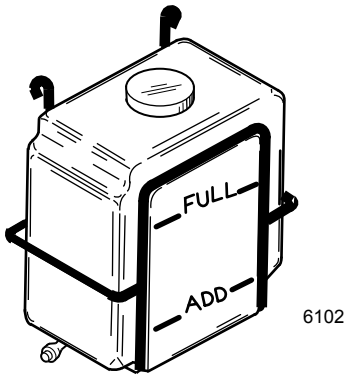


a - Heat exchanger cap

2. The coolant level in the heat exchanger should be at the bottom of the filler neck. If the coolant level is low, contact your authorized Mercury MerCruiser dealer.
3. Install the cap onto the heat exchanger.

IMPORTANT: When reinstalling the pressure cap, be sure to tighten it until it seats on the filler neck.

4. With the engine at normal operating temperature, check the coolant level in the coolant recovery bottle.
5. The coolant level should be between the "ADD" and "FULL" marks.



6. Add the specified fluid as necessary.

Tube Ref No.	Description	Where Used	Part No.
122	Extended Life Antifreeze/ Coolant	Closed Cooling System	92-877770K1

Filling

⚠ CAUTION

Alcohol or Methanol based antifreeze or plain water, are not recommended for use in the coolant section of the Closed Cooling System at any time.

⚠ CAUTION

Overheating from insufficient cooling water will cause engine and drive system damage. Ensure that there is sufficient water always available at water inlet holes during operation.

⚠ CAUTION

Air trapped in the closed cooling section of an engine cooling system can cause the engine to overheat resulting in engine damage. To minimize the possibility of trapping air when initially filling the closed cooling system, position the boat so that the front of the engine is higher than the rear of the engine.

NOTE: *Add coolant only when engine is at normal operating temperature.*

1. Remove the fill cap from the coolant recovery bottle.
2. Fill to the "FULL" line with the specified coolant.

Tube Ref No.	Description	Where Used	Part No.
	Extended Life Antifreeze/ Coolant	Closed Cooling System	92-877770K1

3. Install the fill cap onto the coolant recovery bottle.

Changing

Contact your authorized Mercury MerCruiser dealer.

Drive Unit Oil

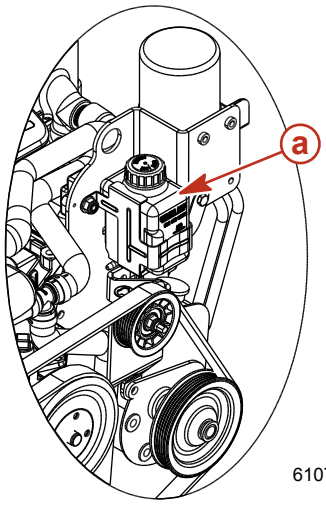
⚠ CAUTION

ENVIRONMENTAL HAZARD! Discharge of oil or oil waste into the environment is restricted by law. Do not spill oil or oil waste into the environment when using or servicing your boat. Contain and dispose of oil or oil waste as directed by local authorities.

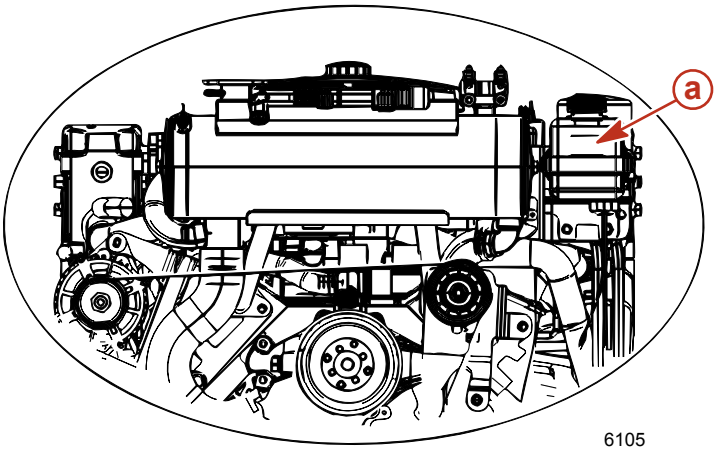
Checking

NOTE: *Oil level will fluctuate during operation. Oil level should be checked with the engine cold, before starting.*

1. Check the gear lube oil level. Keep the oil level within the recommended operating range. If any water is visible at the bottom of the monitor or appears at the oil fill/drain plug and/or if oil appears discolored, contact your authorized Mercury MerCruiser dealer immediately. Both conditions may indicate a water leak somewhere in the sterndrive unit.



Seawater cooled models



Closed cooled models

a - Gear lube monitor

Filling

IMPORTANT: If more than 59 ml (2 fl. oz.) of High Performance Gear Lubricant is required to fill the monitor, a seal may be leaking. Damage to the sterndrive unit may occur due to lack of lubrication. Contact your authorized Mercury MerCruiser dealer.

1. Remove the gear lube monitor cap.
2. Fill the monitor with the specified fluid so that the oil level is in the operating range. Do not overfill.

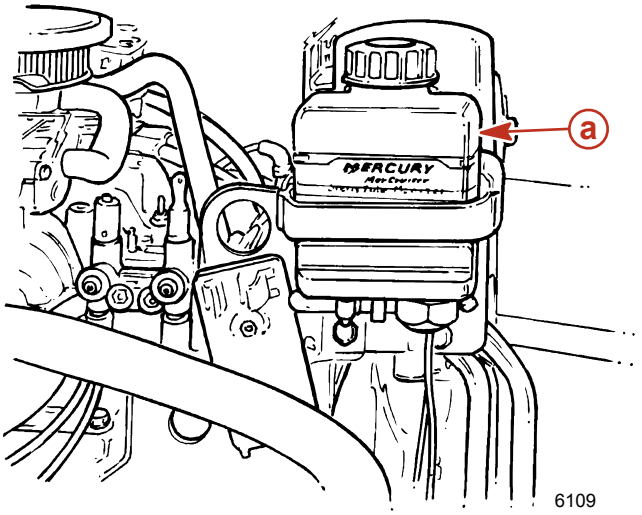
Tube Ref No.	Description	Where Used	Part No.
87	High Performance Gear Lubricant	Gear lube monitor	92-802854A1

3. Replace the cap.

NOTE: *When filling the entire sterndrive unit refer to Changing instructions, following.*

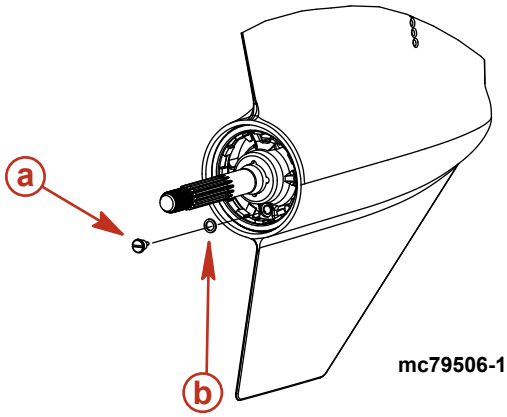
Changing

1. Remove the gear lube monitor from the bracket.



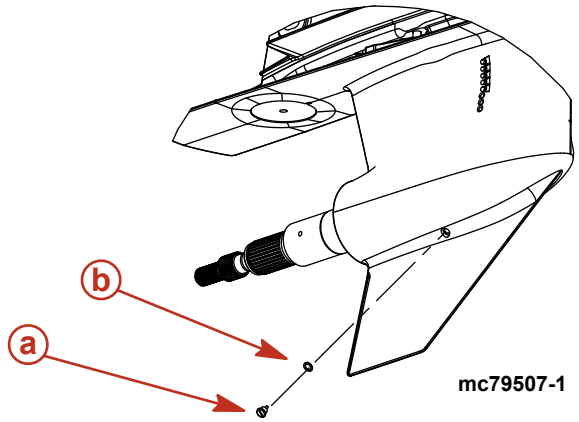
a - Gear lube monitor

2. Empty the contents into a suitable container.
3. Install the gear lube monitor in the bracket.
4. **Bravo One Models:** Remove the propeller, lower the sterndrive unit to the full down/in position, remove the oil fill/drain screw and sealing washer and drain the oil.



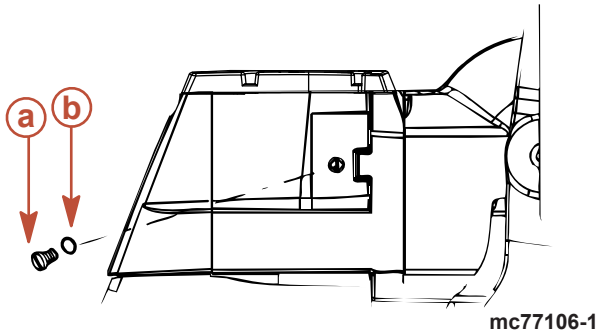
a - Oil fill/drain screw **b -** Sealing washer

5. **All Other Models:** Place the sterndrive unit in full trim limit out position, remove the oil fill/drain screw and sealing washer and drain the oil.



a - Oil fill/drain screw b - Sealing washer

6. Remove the oil vent screw and sealing washer. Allow the oil to drain completely.



a - Oil vent screw b - Sealing washer

IMPORTANT: If any water drained from the oil fill/drain hole, or if the oil appears milky, the sterndrive unit is leaking and should be checked immediately by your authorized Mercury MerCruiser dealer.

7. Lower the sterndrive unit so that the propeller shaft is level. Fill the sterndrive unit, through the oil fill/drain hole, with specified gear lubricant until an air-free stream of lubricant flows from oil vent hole.

Tube Ref No.	Description	Where Used	Part No.
87	High Performance Gear Lubricant	Sterndrive unit	92-802854A1

IMPORTANT: Use only Mercury/Quicksilver High Performance Gear Lubricant in sterndrive unit.

8. Install the oil vent screw and sealing washer.
9. Continue to pump gear lubricant into the gear lube monitor circuit until the gear lubricant appears in the gear lube monitor.

10. Fill the monitor so that the oil level is in the operating range. Do not overfill. Ensure that the rubber gasket is inside the cap and install. Do not overtighten.

NOTE: *Oil capacity includes gear lube monitor.*

Model	Capacity	Fluid Type
Alpha One	1892 ml (64 oz.)	High Performance Gear Lubricant
Bravo One	2736 ml (92-1/2 oz.)	
Bravo Two	3209 ml (108-1/2 oz.)	
Bravo Three	2972 ml (100-1/2 oz.)	

11. Remove the pump from the oil fill/drain hole. Quickly install the sealing washer and oil fill/drain screw. Tighten securely.
12. Reinstall the propeller. Refer to **Propellers**.
13. Recheck the oil level after the first use.

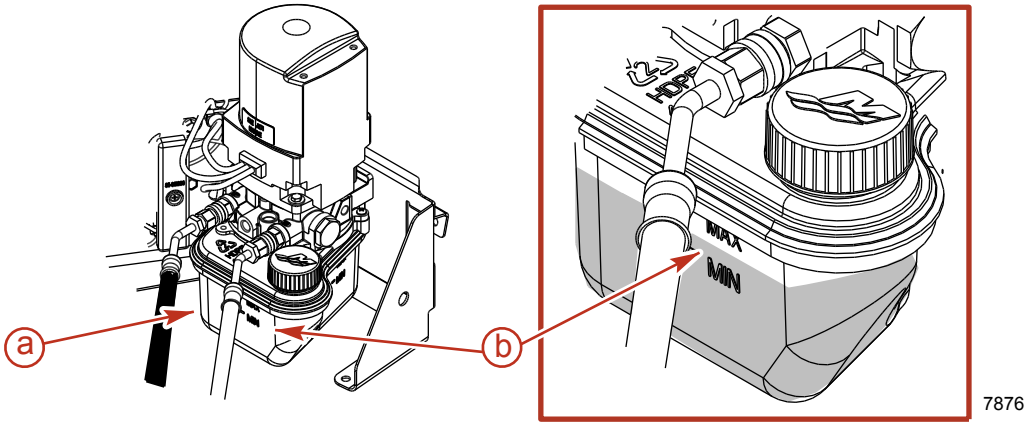
IMPORTANT: Oil level in the gear lube monitor will rise and fall during sterndrive operation; always check the oil level when the sterndrive is cool and the engine is shut down.

Power Trim Fluid

Checking

IMPORTANT: Check the oil level with the sterndrive unit in the full down/in position only.

1. Place the sterndrive unit in full down/in position.
2. Observe the oil level. Level must be between the "MIN" and "MAX" lines on the reservoir.



a - Reservoir **b -** "MIN" and "MAX" lines

3. Fill as necessary with the specified fluid.

Tube Ref No.	Description	Where Used	Part No.
114	Power Trim and Steering Fluid	Power trim pump	92-858074K01

Filling

1. Remove the fill cap from the reservoir.

NOTE: *Fill cap is vented.*

2. Add lubricant to bring level to the within the "MIN" and "MAX" lines on the reservoir.

Tube Ref No.	Description	Where Used	Part No.
114	Power Trim and Steering Fluid	Power trim pump	92-858074K01

3. Install the cap.

Changing

Power trim fluid does not require changing unless it becomes contaminated with water or debris. Contact your authorized Mercury MerCruiser dealer.

Cleaning The Flame Arrestor

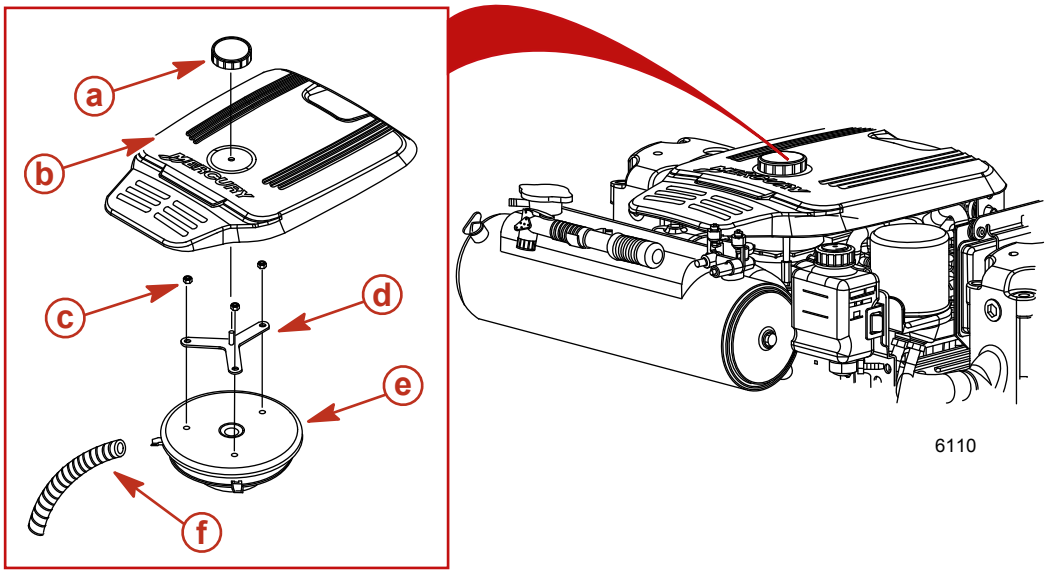
⚠ WARNING

Avoid gasoline fire or explosion. Gasoline is extremely flammable and highly explosive under certain conditions. Be careful when cleaning flame arrestor; ensure that ignition is off. Do not smoke or allow sources of spark or open flame in area when cleaning flame arrestor.

1. Remove the engine cover.
2. Disconnect and remove the crankcase ventilation hose from the fitting on the flame arrestor and valve cover.
3. Remove the flame arrestor.

⚠ WARNING

Avoid gasoline fire or explosion. Gasoline is extremely flammable and highly explosive under certain conditions. Never use gasoline as a cleaning solvent.



a - Engine cover knob
b - Engine cover
c - Nuts, flame arrestor
d - Cover mount bracket
e - Flame arrestor
f - Crankcase ventilation hose

4. Clean the flame arrestor with warm water and a mild detergent.
5. Inspect the flame arrestor for holes, cracks or deterioration. Replace if necessary.
6. Allow the flame arrestor to air dry completely before use.

7. Clean the crankcase ventilation hose with warm water and a mild detergent. Dry with compressed air or allow to air dry completely.
8. Inspect the crankcase ventilation hose for cracks or deterioration. Replace if necessary.
9. Install the flame arrestor and flame arrestor bracket. Torque the flame arrestor bracket nuts.

Description	Nm	lb. in.	lb. ft.
Flame arrestor bracket nut	12	106	

10. Connect the crankcase ventilation hose to the fitting on the flame arrestor and valve cover.
11. Install the engine cover.

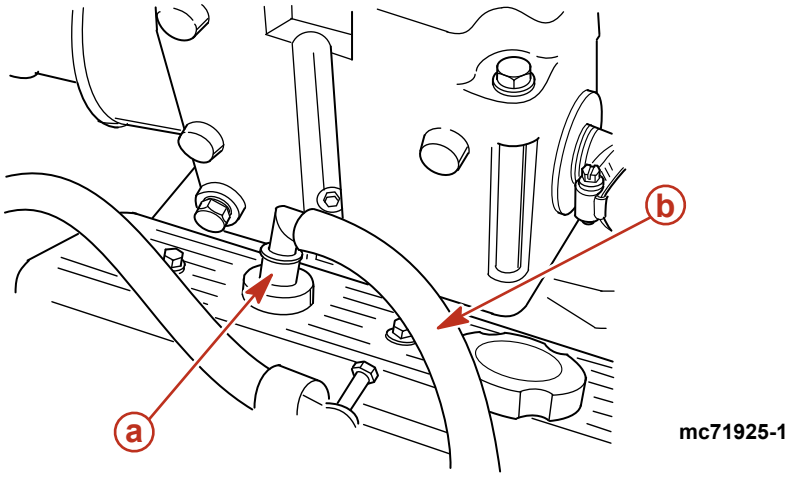
Positive Crankcase Ventilation Valve (PCV)

CHANGING

IMPORTANT: Use only Mercury MerCruiser replacement parts to ensure compliance with emission regulations.

NOTE: *On V6 models the PCV valve is non-serviceable and is an internal component of the valve cover.*

1. Remove the PCV valve from the port valve cover.



a - PCV valve **b -** Hose

2. Disconnect the PCV valve from the hose and discard the valve.
3. Install a new PCV valve in the valve cover and reconnect the hose.
4. Ensure the PCV valve is tightly seated in the valve cover.

Changing Water Separating Fuel Filter

⚠ WARNING

Avoid serious injury or death from a gasoline fire or explosion; gasoline is extremely flammable and highly explosive under certain conditions. When servicing the fuel system components ensure that the engine is cool, the ignition switch is in the off position, and that the lanyard stop switch, if equipped, is in the off position. Do not smoke or allow spark or open flame in the area. Wipe up any spilled fuel immediately. Ensure that no fuel leaks exist before closing the engine hatch.

GEN II Models

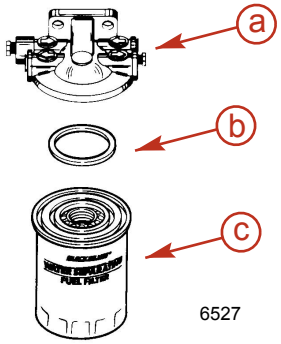
1. Allow the engine to cool down.

NOTE: *Mercury MerCruiser recommends that the engine be shut off for 12 hours prior to filter removal.*

2. Close fuel supply valve, if equipped.
3. Wrap the water separating fuel filter with a cloth to help catch any fuel spills or spray.
4. Remove and discard the water separating fuel filter and sealing ring from the mounting bracket.
5. Coat the sealing ring on the new filter with engine oil.

Tube Ref. No.	Description	Where Used	Part No.
	Synthetic Blend MerCruiser Engine Oil SAE25W-40	Filter sealing ring	92-883725K01

6. Thread filter onto the mounting bracket and tighten securely by hand. Do not use a filter wrench.



a - Fuel filter mounting bracket
b - Sealing ring
c - Fuel filter

7. Open fuel supply valve, if equipped.
8. Ensure that engine compartment is properly ventilated.
9. Supply cooling water to the engine.
10. Start the engine. Check for gasoline leaks around the fuel filter assembly. If leaks exist, stop the engine immediately. Recheck the filter installation, wipe up any spilled fuel, and properly ventilate the engine compartment. If leaks continue, stop engine immediately and contact your authorized Mercury MerCruiser dealer.

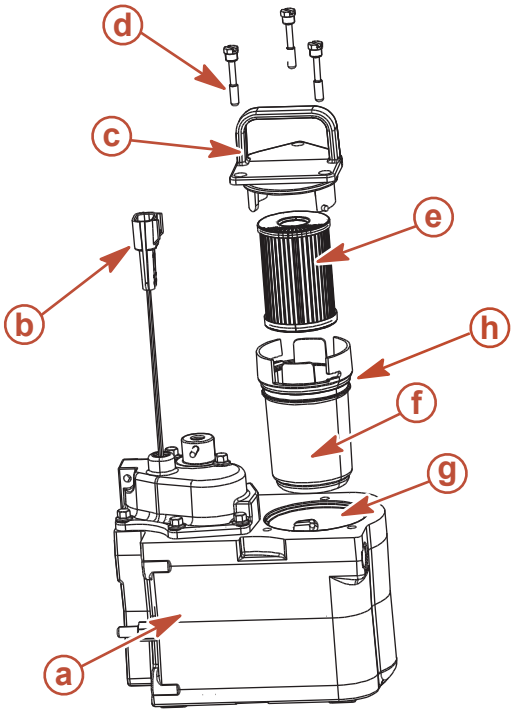
GEN III Models

1. Allow the engine to cool down.

NOTE: *Mercury MerCruiser recommends that the engine be shut off for 12 hours prior to filter removal.*

2. Close fuel supply valve, if equipped.
3. Disconnect the Cool Fuel Module harness from the engine wiring harness.
4. Turn the key switch to the start position and allow the starter to operate for 5 seconds.
5. Turn key switch to off position.

6. Loosen each filter assembly retaining screw until the screw is disengaged from the Cool Fuel Module. Do not remove the filter assembly retaining screws from the filter cap.



8837

a - Cool Fuel Module
b - Cool Fuel Module harness
c - Filter cap
d - Filter assembly retaining screw
e - Fuel filter element
f - Filter cup
g - Cool Fuel Module filter reservoir
h - O-ring

7. Unseat the filter assembly by grasping the filter assembly handle and pulling upward. Do not remove the filter assembly from the Cool Fuel Module at this time.
8. Allow any fuel that may be in the filter assembly to drain out through the bottom of the filter assembly and into the Cool Fuel Module filter reservoir.
9. Remove the filter cup from the filter cap by grasping the filter cap and rotating it in a clockwise direction while holding the filter cup stationary.
10. Remove the used water separating fuel filter element from the filter cup, place it in a clean, approved container.
11. Dispose of any water or debris that may be in the filter cup.
12. Install a new water separating fuel filter element into the filter cup. Push the element into the cup until completely seated.
13. Install new O-ring on the filter cup.
14. Attach the filter cap to the filter cup by grasping the filter cap and rotating it in a counter clockwise direction while holding the filter cup stationary, until the filter cap locks securely into place.
15. Install the fuel filter assembly slowly into the Cool Fuel Module to prevent spilling fuel, and align the screws retained in the filter cap with the screw holes in the Cool Fuel Module. Tighten the filter assembly retaining screws until hand tight.

16. Ensure that the filter cap is firmly seated against the Cool Fuel Module and torque each filter assembly retaining screw.

Description	Nm	lb. in.	lb. ft.
Filter assembly retaining screw	6	53	

17. Open fuel supply valve, if equipped.
18. Reconnect the Cool Fuel Module harness to the engine wiring harness.
19. Supply cooling water to the engine.
20. Properly ventilate the engine compartment.
21. Start the engine. Check for gasoline leaks around the fuel filter assembly. If leaks exist, stop the engine immediately. Recheck the filter installation, clean spilled fuel and properly ventilate the engine compartment. If leaks continue, stop engine immediately and contact your authorized Mercury MerCruiser dealer.

Lubrication

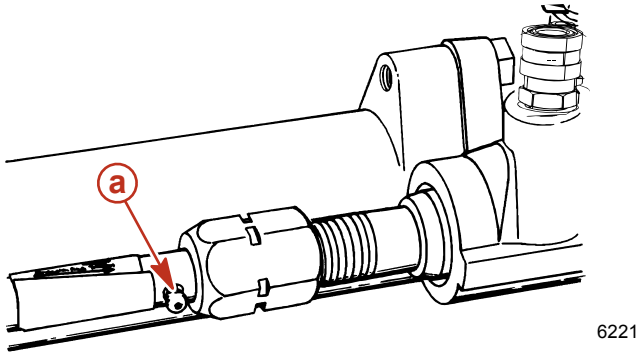
Steering System

⚠ WARNING

Do not grease the steering cable while it is extended. Hydraulic lock could occur and cause loss of steering control.

NOTE: *If steering cable does not have grease fitting, inner wire of cable cannot be greased.*

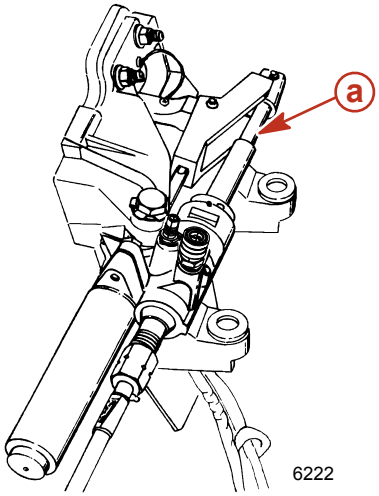
1. **If Steering Cable Has Grease Fittings:** Turn steering wheel until steering cable is fully retracted into cable housing. Apply approximately 3 pumps of grease from a typical hand-operated grease gun.



a - Steering cable grease fitting

Tube Ref No.	Description	Where Used	Part No.
34	Special Lubricant 101	Steering cable grease fitting	92-802865A1

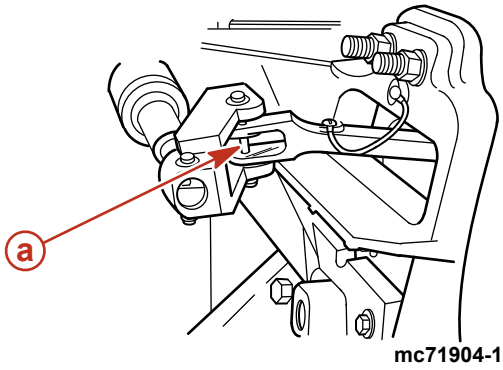
2. Turn steering wheel until steering cable fully extended. Lightly lubricate the exposed part of cable.



a - Extended steering cable

Tube Ref No.	Description	Where Used	Part No.
34	Special Lubricant 101	Steering cable	92-802865A1

3. Lubricate the steering pin.



a - Steering pin

Tube Ref. No.	Description	Where Used	Part No.
	Synthetic Blend MerCruiser Engine Oil SAE25W-40	Steering pin	92-883725K01

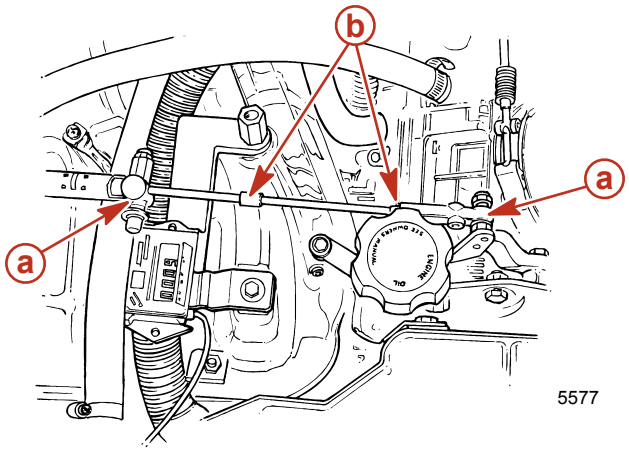
4. On dual engine boats: Lubricate the tie bar pivot points.

Tube Ref. No.	Description	Where Used	Part No.
	Synthetic Blend MerCruiser Engine Oil SAE25W-40	Tie bar pivot points	92-883725K01

5. Upon first starting engine, turn steering wheel several times to starboard and then port to ensure that the steering system operates properly before getting underway.

Throttle Cable

1. Lubricate the pivot points and the guide contact surfaces.

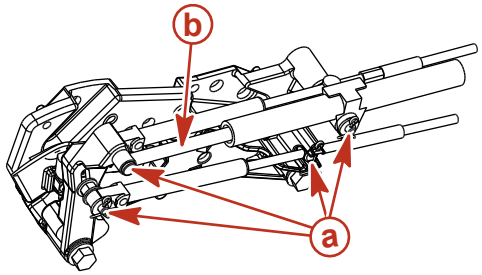


a - Pivot points **b -** Guide contact surfaces

Tube Ref. No.	Description	Where Used	Part No.
	Synthetic Blend MerCruiser Engine Oil SAE25W-40	Throttle cable pivot points & guide contact surfaces	92-883725K01

Shift Cable - Typical

1. Lubricate the pivot points and the guide contact surfaces.



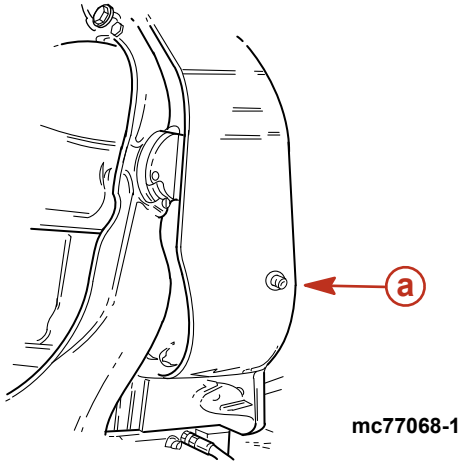
mc79736

a - Pivot points **b -** Guide contact surfaces

Tube Ref. No.	Description	Where Used	Part No.
	Synthetic Blend MerCruiser Engine Oil SAE25W-40	Shift cable pivot points & guide contact surfaces	92-883725K01

Sterndrive Unit and Transom Assembly

1. Lubricate gimbal bearing by applying approximately 8-10 pumps of grease from a typical hand-operated grease gun.



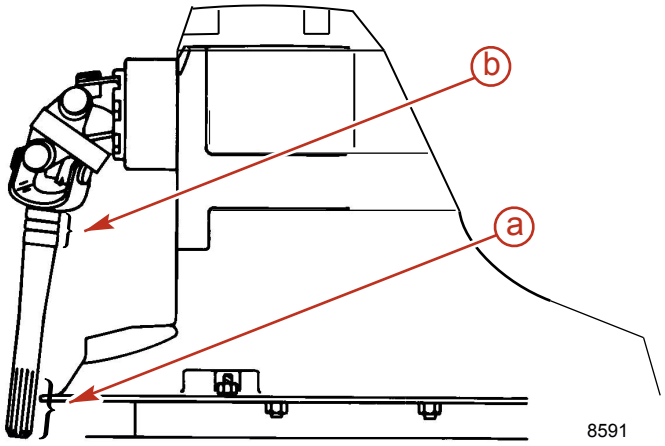
a - Gimbal bearing grease fitting

Tube Ref No.	Description	Where Used	Part No.
42	U-joint and Gimbal Bearing Grease	Gimbal bearing	92-802870A1

2. For propeller shaft lubrication, refer to **Propellers**.

Sterndrive U-joint Shaft Splines And O-rings (Sterndrive Unit Removed)

1. Coat sterndrive U-joint O-rings and driveshaft splines with grease.



a - Driveshaft splines **b -** U-joint O-rings (3)

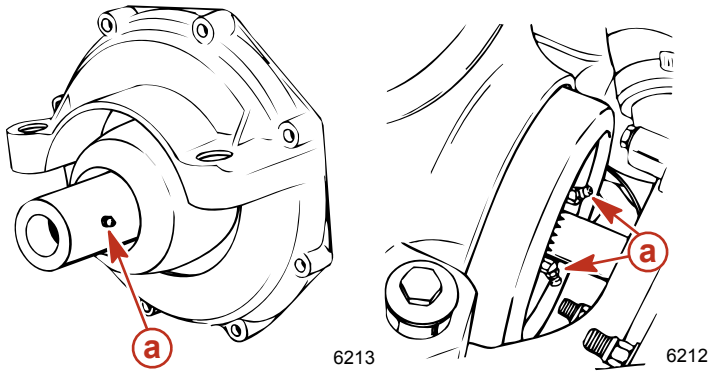
Tube Ref No.	Description	Where Used	Part No.
91	Engine Coupler Spline Grease	Driveshaft splines and U-joint O-rings	92-802869A1

2. For propeller shaft lubrication, refer to Propellers.

Engine Coupler

1. Lubricate engine coupler splines through grease fittings on coupler by applying approximately 8-10 pumps of grease from a typical hand-operated grease gun.

NOTE: *If the boat is operated at idle for prolonged periods of time, coupler should be lubricated* ***Bravo Models*** *- every 50 hours;* ***Alpha Models*** *- every 150 hours.*



Alpha drive coupler **Bravo drive coupler**

a - Grease fitting

Tube Ref No.	Description	Where Used	Part No.
91	Engine Coupler Spline Grease	Coupler	92-802869A1

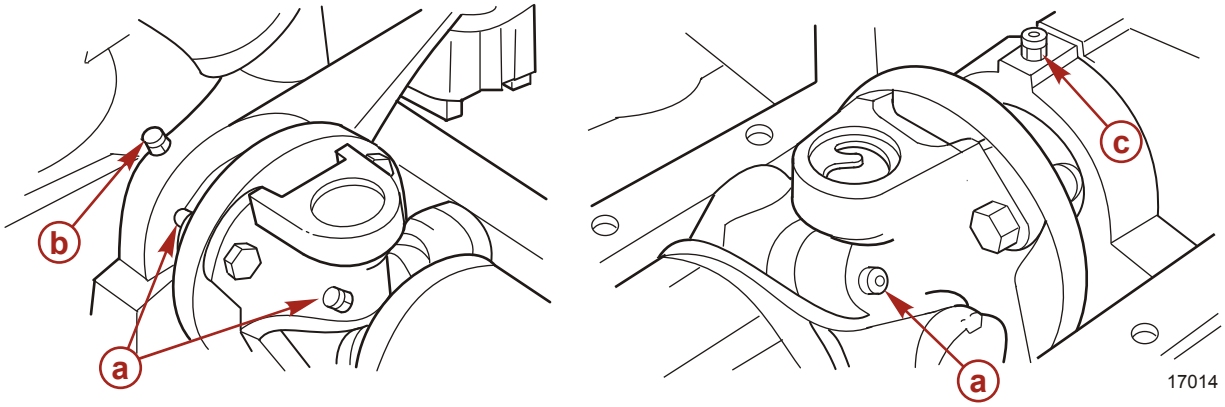
NOTE: ***Alpha Models*** *- Your power package is equipped with a sealed engine coupler and Perm-a-Lube U-joints. The sealed coupler and shaft splines can be lubricated without removing the sterndrive unit. The Perm-a-Lube U-joints do not require lubrication.*

NOTE: ***Bravo Models*** *- The coupler and shaft splines can be lubricated without removing the sterndrive unit. Apply lubricant from a typical hand-operated grease gun until a small amount of grease begins to push out. The Perm-a-Lube U-joints do not require lubrication.*

Driveshaft Extension Models

1. Lubricate the transom end grease fitting and engine end grease fitting by applying approximately 10 - 12 pumps of grease from a typical hand-operated grease gun.

2. Lubricate the driveshaft grease fittings by applying approximately 3 - 4 pumps of grease from a typical hand-operated grease gun.



a - Driveshaft grease fittings
b - Transom end grease fitting
c - Engine end grease fitting

Tube Ref No.	Description	Where Used	Part No.
42	U-joint and Gimbal Bearing Grease	Transom end grease fitting, engine end grease fitting, driveshaft grease fittings	92-802870A1

Propellers

Propeller Repair

Some damaged propellers can be repaired. Contact your authorized Mercury MerCruiser dealer.

Alpha Propeller Removal

⚠ WARNING

Avoid Injury: Remote Control must be in neutral and ignition key removed from switch before removing and/or installing propeller.

⚠ WARNING

A rotating propeller can cause injury. Place a block of wood between the anti-ventilation plate and the propeller to protect hands from the propeller blades, and to prevent the propeller from rotating when removing or installing the propeller nut.

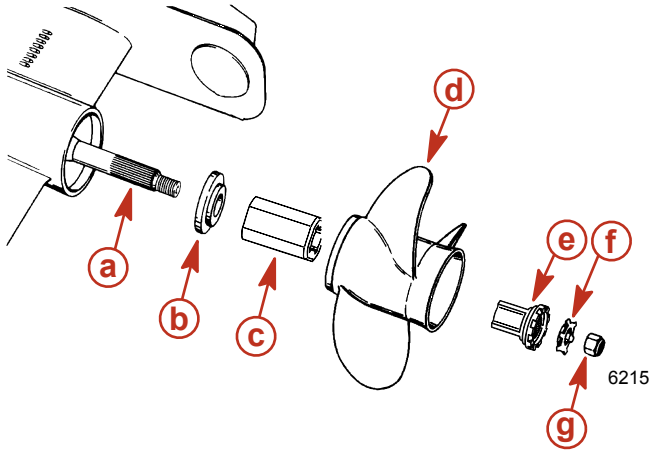
1. Place wood block between propeller blade and anti-ventilation plate to prevent rotation. Straighten bent tabs on tab washer.
2. Turn propeller shaft nut counterclockwise to remove nut.
3. Slide tab washer, drive sleeve, propeller and thrust hub off propeller shaft.

Alpha Propeller Installation

⚠ CAUTION

Avoid injury and propeller damage or sterndrive damage, or both, caused by a loose propeller or propellers. The propeller may become loose during normal operation. Periodically throughout the boating season and at the maintenance intervals specified, the propeller nut or nuts must be checked for tightness. Torque the propeller nut or nuts to specification.

IMPORTANT: If reusing tab washer, carefully inspect tabs for cracks or other damage. Replace tab washer if condition is questionable.



a - Propeller shaft
b - Thrust hub
c - Flo-Torq II drive hub
d - Propeller
e - Drive sleeve
f - Locking tab washer
g - Propeller nut

1. Apply a liberal coat of one of the following lubricants to the propeller shaft.

Tube Ref No.	Description	Where Used	Part No.
34	Special Lubricant 101	Propeller shaft	92-802865A1
94	Anti-Corrosion Grease	Propeller shaft	92-802867A1
95	2-4-C Marine Lubricant with Teflon	Propeller shaft	92-802859A1

2. Slide thrust hub onto propeller shaft, with stepped side toward propeller hub.
3. Install Flo-Torq II Drive Hub into propeller.

NOTE: *The drive sleeve is tapered and will slide fully into the propeller as the nut is tightened and properly torqued.*

4. Align splines and place propeller on propeller shaft.
5. Install drive sleeve and locking tab washer.
6. Install and torque the propeller nut.

Description	Nm	lb. in.	lb. ft.
Propeller nut[1.]	75		55

1. The propeller torque stated is a minimum torque value.

7. Bend three tabs on the tab washer down into the grooves in spline washer. After the first use, bend the three tabs straight and retorque the propeller nut. Bend tabs back down into spline washer. Check propeller at least after 20 hours of operation. Do not operate with loose propeller.

Bravo One Propeller Removal

⚠ WARNING

Avoid Injury: Remote Control must be in neutral and ignition key removed from switch before removing and/or installing propeller.

⚠ WARNING

A rotating propeller can cause injury. Place a block of wood between the anti-ventilation plate and the propeller to protect hands from the propeller blades, and to prevent the propeller from rotating when removing or installing the propeller nut.

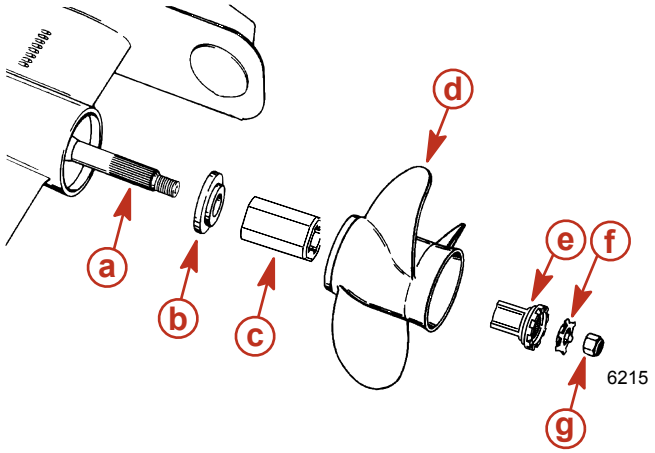
1. Place wood block between propeller blade and anti-ventilation plate to prevent rotation. Straighten bent tabs on tab washer.
2. Turn propeller shaft nut counterclockwise to remove nut.
3. Slide tab washer, drive sleeve, propeller and thrust hub off propeller shaft.

Bravo One Propeller Installation

⚠ CAUTION

Avoid injury and propeller damage or sterndrive damage, or both, caused by a loose propeller or propellers. The propeller may become loose during normal operation. Periodically throughout the boating season and at the maintenance intervals specified, the propeller nut or nuts must be checked for tightness. Torque the propeller nut or nuts to specification.

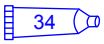
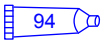
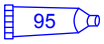
IMPORTANT: If reusing tab washer, carefully inspect tabs for cracks or other damage. Replace tab washer if condition is questionable.



a - Propeller shaft
b - Thrust hub
c - Flo-Torq II drive hub
d - Propeller
e - Drive sleeve
f - Locking tab washer
g - Propeller nut

1. Slide thrust hub onto propeller shaft, with stepped side toward propeller hub.

2. Apply a liberal coat of one of the following lubricants to the propeller shaft.

Tube Ref No.	Description	Where Used	Part No.
	Special Lubricant 101	Propeller shaft	92-802865A1
	Anti-Corrosion Grease	Propeller shaft	92-802867A1
	2-4-C Marine Lubricant with Teflon	Propeller shaft	92-802859A1

3. Install Flo-Torq II Drive Hub into propeller.

NOTE: *The drive sleeve is tapered and will slide fully into the propeller as the nut is tightened and properly torqued.*

4. Align splines and place propeller on propeller shaft.
5. Install drive sleeve and locking tab washer.
6. Install and torque the propeller nut.

Description	Nm	lb. in.	lb. ft.
Propeller nut[1]	75		55

7. Bend three tabs on the tab washer down into the grooves in spline washer. After the first use, bend the three tabs straight and retorque the propeller nut. Bend tabs back down into spline washer. Check propeller at least after 20 hours of operation. Do not operate with loose propeller.

Bravo Two Propeller Removal

⚠ WARNING

Avoid Injury: Remote Control must be in neutral and ignition key removed from switch before removing and/or installing propeller.

⚠ WARNING

A rotating propeller can cause injury. Place a block of wood between the anti-ventilation plate and the propeller to protect hands from the propeller blades, and to prevent the propeller from rotating when removing or installing the propeller nut.

1. Place wood block between propeller blade and anti-ventilation plate to prevent rotation. Straighten bent tabs on tab washer.
2. Turn propeller shaft nut counterclockwise to remove nut.
3. Slide tab washer, spline washer, propeller and thrust hub off propeller shaft.

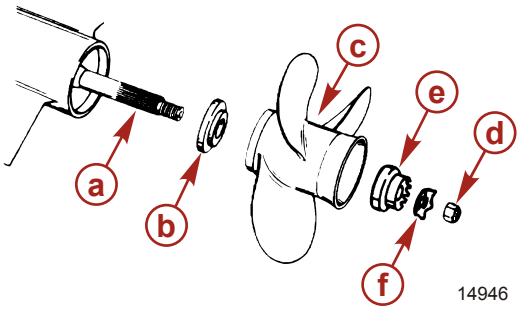
Bravo Two Propeller Installation

⚠ CAUTION

Avoid injury and propeller damage or sterndrive damage, or both, caused by a loose propeller or propellers. The propeller may become loose during normal operation. Periodically throughout the boating season and at the maintenance intervals specified, the propeller nut or nuts must be checked for tightness. Torque the propeller nut or nuts to specification.

1. The propeller torque stated is a minimum torque value. Some special use propellers may have a different torque value. Use the installation information provided with the propeller to determine if another torque value is appropriate to your propeller.

IMPORTANT: If reusing tab washer, carefully inspect tabs for cracks or other damage. Replace tab washer if condition is questionable.



a - Propeller shaft
b - Thrust hub
c - Propeller
d - Propeller nut
e - Spline washer
f - Tab washer

1. Slide thrust hub into propeller hub with stepped side toward propeller hub.
2. Apply a liberal coat of one of the following lubricants to the propeller shaft.

Tube Ref No.	Description	Where Used	Part No.
34	Special Lubricant 101	Propeller shaft	92-802865A1
94	Anti-Corrosion Grease	Propeller shaft	92-802867A1
95	2-4-C Marine Lubricant with Teflon	Propeller shaft	92-802859A1

3. Align splines and place propeller on propeller shaft.
4. Install spline washer and tab washer.
5. Install and torque the propeller nut.

Description	Nm	lb. in.	lb. ft.
Propeller nut[1]	81		60

6. Bend 3 tabs on the tab washer down into the grooves in spline washer. After the first use, bend the 3 tabs straight and retorque the propeller nut. Bend tabs back down into spline washer. Check propeller at least after 20 hours of operation. Do not operate with loose propeller.

Bravo Three Propeller Removal

⚠ WARNING

Avoid Injury: Remote Control must be in neutral and ignition key removed from switch before removing and/or installing propeller.

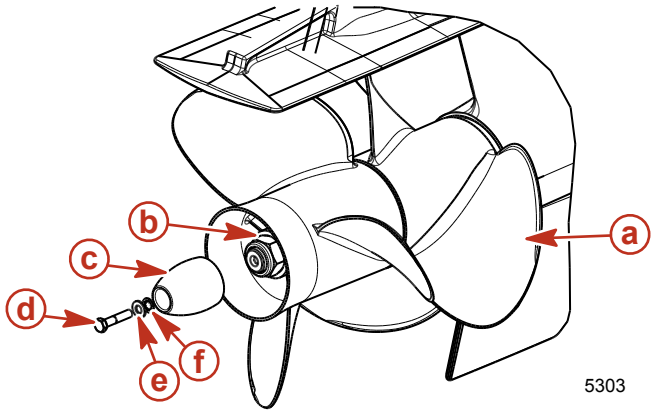
⚠ WARNING

A rotating propeller can cause injury. Place a block of wood between the anti-ventilation plate and the propeller to protect hands from the propeller blades, and to prevent the propeller from rotating when removing or installing the propeller nut.

1. Place wood block between propeller blades and anti-ventilation plate to prevent rotation.
2. Remove the bolt and washers securing the propeller shaft anode.

1. Propeller torque stated is a minimum torque value.

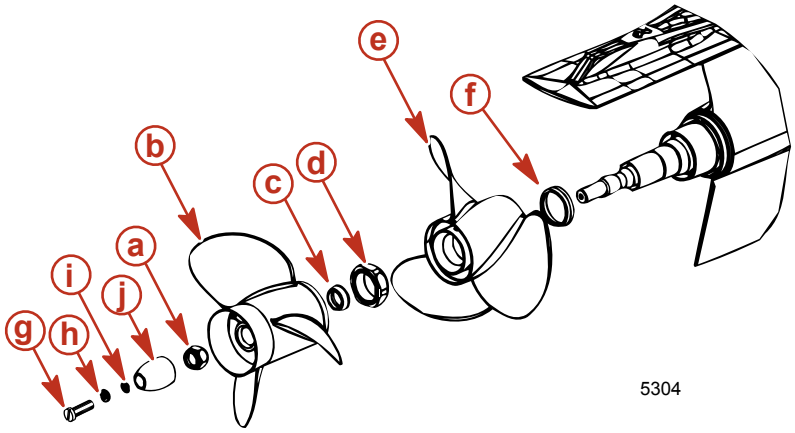
3. Remove the propeller shaft anode.



a - Propeller
b - Propeller shaft nut
c - Propeller shaft anode
d - Propeller shaft anode screw
e - Flat washer
f - Star washer

4. Turn aft propeller shaft nut 37 mm (1-7/16 in.) counterclockwise to remove nut.
5. Slide propeller and thrust hub off propeller shaft.
6. Turn front propeller shaft nut 70 mm (2-3/4 in.) counterclockwise to remove nut.
7. Slide propeller and thrust hub off propeller shaft.

NOTE: *Some damaged propellers can be repaired. Contact your authorized Mercury MerCruiser dealer.*

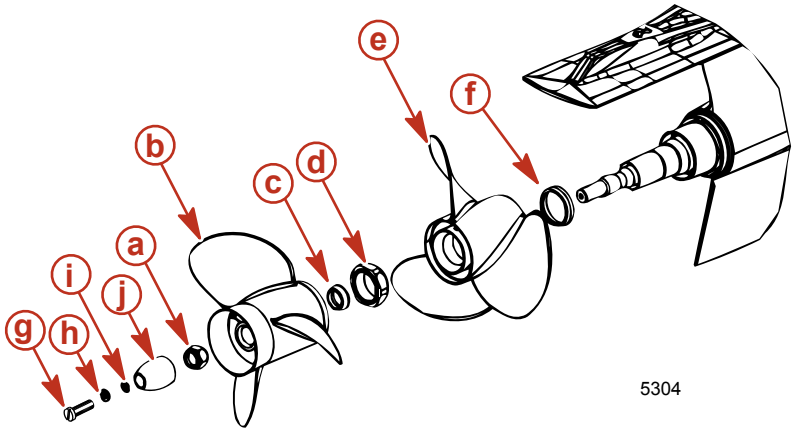


a - Rear propeller nut
b - Rear propeller
c - Rear propeller thrust hub
d - Front propeller nut
e - Front propeller
f - Front propeller thrust hub
g - Propeller shaft anode screw
h - Flat washer
i - Star washer
j - Propeller shaft anode

Bravo Three Propeller Installation

⚠ CAUTION

Avoid injury and propeller damage or sterndrive damage, or both, caused by a loose propeller or propellers. The propeller may become loose during normal operation. Periodically throughout the boating season and at the maintenance intervals specified, the propeller nut or nuts must be checked for tightness. Torque the propeller nut or nuts to specification.



a - Rear propeller nut
b - Rear propeller
c - Rear propeller thrust hub
d - Front propeller nut
e - Front propeller
f - Front propeller thrust hub
g - Propeller shaft anode screw
h - Flat washer
i - Star washer
j - Propeller shaft anode

1. Slide forward thrust hub onto propeller shaft with tapered side toward propeller hub (toward end of shaft).
2. Apply a liberal coat of one of the following lubricants to the propeller shaft.

Tube Ref No.	Description	Where Used	Part No.
34	Special Lubricant 101	Propeller shaft	92-802865A1
94	Anti-Corrosion Grease	Propeller shaft	92-802867A1
95	2-4-C Marine Lubricant with Teflon	Propeller shaft	92-802859A1

3. Align splines and place propeller on propeller shaft.
4. Install and torque the propeller nut. Check propeller at least every 20 hours of operation and retorque as needed.

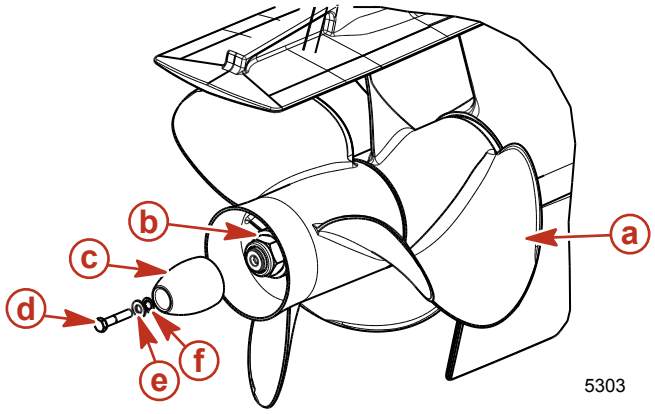
Description	Nm	lb. in.	lb. ft.
Forward propeller nut	136		100

5. Slide aft thrust hub onto propeller shaft, with tapered side toward propeller hub (toward end of shaft).
6. Align splines and place propeller on propeller shaft.

7. Install and torque the propeller nut. Check propeller at least every 20 hours of operation and retorque as needed.

Description	Nm	lb. in.	lb. ft.
Aft propeller nut	81		60

8. Install the propeller shaft anode over the propeller shaft nut.
9. Place the flat washer onto the propeller shaft anode screw.
10. Place the star washer onto the propeller shaft anode screw.
11. If a propeller shaft anode is reinstalled, apply Loctite Threadlocker 271 to the threads of the propeller shaft anode screw.



a - Propeller
b - Propeller shaft nut
c - Propeller shaft anode
d - Propeller shaft anode screw
e - Flat washer
f - Star washer

Tube Ref No.	Description	Where Used	Part No.
7	Loctite 271 Threadlocker	Propeller shaft threads	92-809819

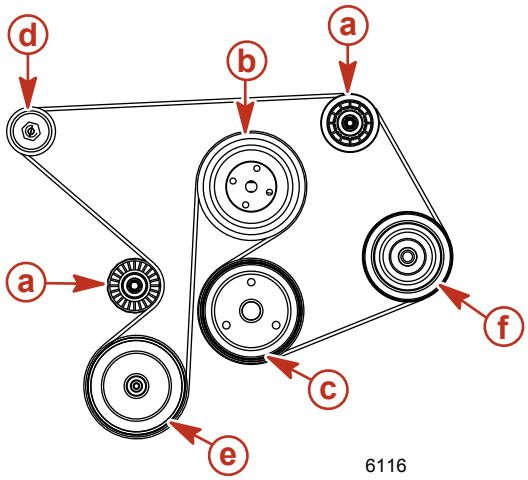
12. Secure the propeller shaft anode to the propeller shaft using the propeller shaft anode screw and washers. Torque the screw.

Description	Nm	lb. in.	lb. ft.
Propeller shaft anode screw 38 mm (0.3125-18 x 1.5 in.) long	27		20

Serpentine Drive Belt

⚠ WARNING

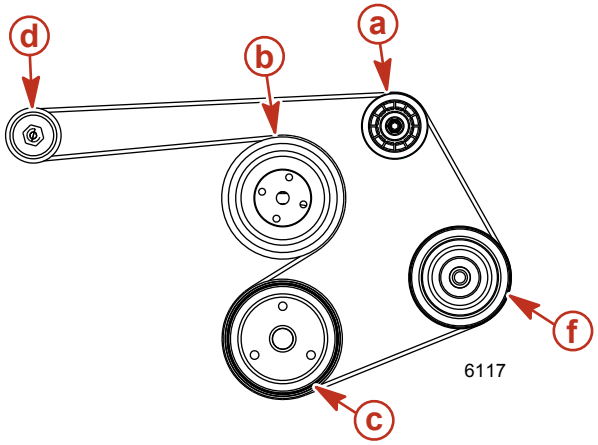
Avoid possible serious injury. Make sure that the engine is turned off and the ignition key is removed before inspecting belts.



6116

With a seawater pump

- **a -** Idler pulley
- **b -** Water circulating pump pulley
- **c -** Crankshaft pulley



6117

Without a seawater pump

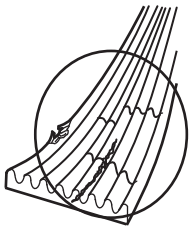
- **d -** Alternator pulley
- **e -** Seawater pump pulley
- **f -** Power steering pump pulley

Checking

1. Inspect the drive belt for proper tension and for the following:
   - Excessive wear
   - Cracks

NOTE: *Minor, transverse cracks (across the belt width) may be acceptable. Longitudinal cracks (in the direction of belt length) that join transverse cracks are NOT acceptable.*

   - Fraying
   - Glazed surfaces
   - Proper tension - 13 mm (1/2 in.) deflection, with moderate thumb pressure, on the belt at the location that has the longest distance between two pulleys.



mc75130-1

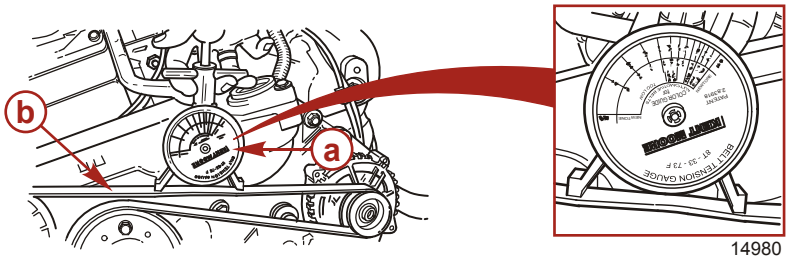
Replacing Belt and/or Adjusting Tension

IMPORTANT: If a belt is to be reused, it should be installed in the same direction of rotation as before.

NOTE: *Belt deflection is to be measured on the belt at the location that has the longest distance between two pulleys.*

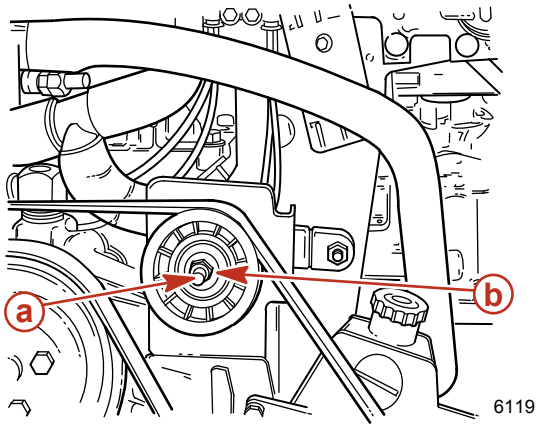
1. Loosen the 16 mm (5/8 in.) locking nut on the adjustment stud.

2. Turn the adjustment stud and loosen the belt.
3. If a new serpentine drive belt is required, remove the old belt and install a new belt onto the pulleys.
4. Put a wrench on the adjustment stud 16 mm (5/8 in.) locking nut.
5. Use a 8 mm (5/16 in.) socket and tighten adjusting the stud to adjust the belt deflection.
6. Using one of the 2 methods following, check for correct deflection.
   a. Push down with moderate thumb pressure on the longest stretch of belt. Proper deflection is 13 mm (1/2 in.).
   b. Attach the Kent Moore Belt Tension Gauge to the belt. The gauge has different ranges for new and used belts.



a - Kent Moore Tension Gauge **b -** Serpentine belt

7. While holding the adjustment stud at the correct belt tension, tighten the 16 mm (5/8 in.) locking nut.



a - 16 mm (5/8 in.) locking nut **b -** 8 mm (5/8 in.) adjusting stud

8. Operate the engine for a short period of time and recheck the belt adjustment.

Battery

Refer to specific instructions and warnings accompanying your battery. If this information is not available, observe the following precautions when handling a battery.

⚠ WARNING

Avoid serious injury from fire or explosion. Do not use jumper cables and a booster battery to start engine. Do not recharge a weak battery in the boat. Remove battery and recharge in a ventilated area away from fuel vapors, sparks or flames.

⚠ WARNING

Batteries contain acid which can cause severe burns. Avoid contact with skin, eyes and clothing. If electrolyte is spilled or splashed on any part of the body, immediately flush the exposed area with liberal amounts of water and obtain medical aid as soon as possible. Safety glasses and rubber gloves are recommended when handling batteries or filling with electrolyte.

Multiple EFI Engine Battery Precautions

Alternators: Alternators are designed to charge the battery that supplies electrical power to the engine that the alternator is mounted on. When batteries for 2 different engines are connected, one alternator will supply all of the charging current for both batteries. Normally, the other engine's alternator will not be required to supply any charging current.

EFI Electronic Control Module (ECM): The ECM requires a stable voltage source. During multiple engine operation, an onboard electrical device may cause a sudden drain of voltage at the engine's battery. The voltage may go below the ECM's minimum required voltage. Also, the alternator on the other engine may now start charging. This could cause a voltage spike in the engine's electrical system.

In either case, the ECM could shut off. When the voltage returns to the range that the ECM requires, the ECM will reset itself, and the engine will operate normally. The ECM shuts off and resets itself so quickly that the engine may only seem to have an ignition miss.

Batteries: Boats with multi-engine EFI power packages require each engine be connected to its own battery. This ensures that the engine's ECM has a stable voltage source.

Battery Switches: Battery switches should always be positioned so each engine is operating off of its own battery. Do not operate engines with switches in both or all position. In an emergency, another engine's battery can be used to start an engine with a dead battery.

Battery Isolators: Isolators can be used to charge an auxiliary battery used for powering accessories in the boat. They should not be used to charge the battery of another engine in the boat unless the type of isolator is specifically designed for this purpose.

Generators: The generators battery should be considered another engine's battery.

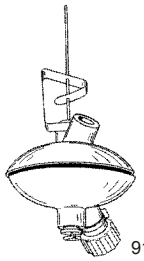
Flushing the Power Package

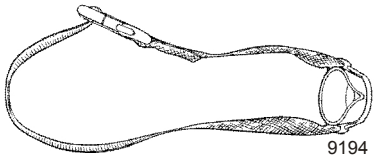
Your boat could come equipped with a combination of any of three different types of water pickups: through the hull, through the transom, and through the sterndrive. The flushing procedures for these systems are separated into two categories: sterndrive water pickups and alternative water pickups. Consult your authorized Mercury MerCruiser dealer for further explanation.

IMPORTANT: Bravo models equipped with closed cooling require dual water pickups and must be equipped with a through the hull or through the transom pickup in addition to the sterndrive water inlets.

IMPORTANT: Alpha engines with the sterndrive water inlet blocked off at the gimbal housing, and using a through the hull water inlet, need a supply of cooling water available to both the sterndrive unit and to the engine during operation

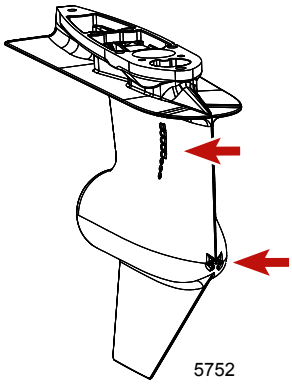
Flushing Attachments

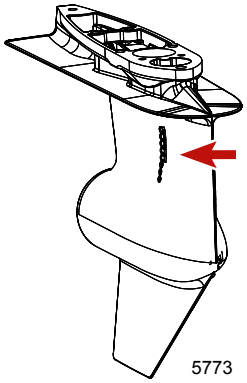
Flushing Device	91-44357Q 2
 9192	Attaches to the water intakes; provides a fresh water connection when flushing the cooling system or operating the engine.

Dual Water Pick-up Flush Gearcase Seal Kit	91-881150K 1
 9194	Blocks off the front water inlet holes on the dual water inlet gearcases.

Sterndrive Water Pickups

There are two types of water pickups available on Mercury MerCruiser sterndrives: dual water, and side pickups. Dual water pickups require the flushing attachment (44357Q 2) and the flush seal kit (881150K 1), and side pickups require the flushing attachment (44357Q 2).


5752


5773

Dual Water Pickup **Side Pickup**

NOTE: *Flushing is needed only for salty, brackish, mineral laden or polluted water applications. Flushing is recommended after each outing for best results.*

⚠ CAUTION

If flushing the engine with the boat in the water, seawater can flow into the engine causing damage. The water inlet must be closed when flushing the engine.

1. On seawater cooled models: Proceed to Step 5. or Step 6.

NOTE: *Closed cooled models are equipped with a heat exchanger on the front of the engine.*

2. **On Alpha closed cooled models with the sterndrive seawater inlet blocked:** Flushing water will need to be supplied to the sterndrive unit and to the engine. Refer to **Alternative Water Pickups**.
3. **On Bravo closed cooled models using the sterndrive seawater inlet and a through the hull or through the transom alternative water pickup:** Flushing water will need to be supplied to only the sterndrive unit by taking the following steps to block, or disconnect and block, the hose from the alternative seawater pickup pump inlet Y-fitting.
   a. If equipped with a seacock, close the seacock in the hose from the alternative water pickup.
   b. If not equipped with a seacock, disconnect the hose from the alternative water pickup and plug both ends.
   c. If there is not a hose running to the transom, refer to **Alternative Water Pickups**.
4. If flushing the cooling system with the boat in the water:
   a. Raise sterndrive unit to trailer position.
   b. Install the appropriate flushing attachment over the water inlet holes in the gear housing.
   c. Lower sterndrive unit to full down/in position.
5. If flushing the cooling system with the boat out of the water:
   a. Lower sterndrive unit to full down/in position.

⚠ WARNING

Contact with moving drive components and the propeller can cause personal injury or death. To avoid possible injury, remove the propeller and ensure that no people or animals are in the area of the drive unit while flushing.

   b. Remove propeller.
   c. Install the appropriate flushing attachment over the water inlet holes in the gear housing.
6. Connect hose between flushing attachment and water source.
7. With sterndrive unit in normal operating position, open the water source fully.
8. Place the remote control in the neutral idle speed position and start engine.

⚠ CAUTION

Avoid engine damage from overheating. If the engine is operated above 1500 RPM during flushing, suction created by the seawater pickup pump may collapse the flushing water hose causing the engine to overheat.

9. Depress the throttle only button and slowly advance the throttle until the engine reaches 1300 RPM (± 100 RPM).

⚠ CAUTION

Engine overheating can cause engine damage. To avoid, observe the water temperature gauge and ensure that the engine is operating in the normal range.

10. Observe the water temperature gauge to ensure that the engine is operating in the normal range.

11. Operate engine with sterndrive in neutral for about 10 minutes or until discharge water is clear.
12. Slowly return throttle to idle speed position.
13. Stop engine.
14. Shut off water and remove flushing attachment.
15. Remove the seawater inlet hose from the seawater pump and plug the hose to prevent water from siphoning into the engine.
16. Tag the ignition switch with an appropriate tag requiring the seawater inlet hose to be reconnected prior to operating engine.

Alternative Water Pickups

IMPORTANT: Two water sources are needed for this procedure.

NOTE: *Flushing is needed only for salty, brackish, mineral laden or polluted water applications. Flushing is recommended after each outing for best results.*

IMPORTANT: Engines with the sterndrive water inlet blocked off at the gimbal housing and using a through the hull water inlet need a supply of cooling water available to both the sterndrive unit and to the engine during operation.

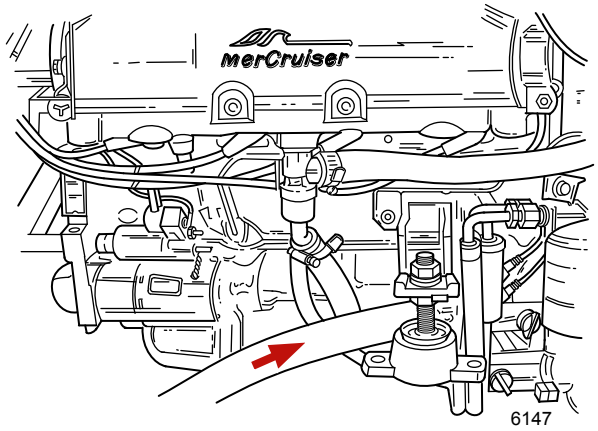
1. If flushing the cooling system with the boat in the water:
   a. Raise sterndrive unit to trailer position.
   b. Install the appropriate flushing attachment over the water inlet holes in the gear housing.
   c. Lower sterndrive unit to full down/in position.
2. If flushing the cooling system with the boat out of the water:
   a. Lower sterndrive unit to full down/in position.

⚠ WARNING

Contact with moving drive components and the propeller can cause personal injury or death. To avoid possible injury, remove the propeller and ensure that no people or animals are in the area of the drive unit while flushing.

   b. Remove propeller.
   c. Install the appropriate flushing attachment over the water inlet holes in the gear housing.
3. Connect hose between flushing attachment and water source.
4. Close the seacock, if equipped, to prevent water from siphoning into the engine or boat.

5. Remove the seawater inlet hose from the seawater pump and plug the hose to prevent water from siphoning into the engine or boat.



6. Using a suitable adapter, connect the flushing hose from the water source to the water inlet of the seawater pump.

⚠ CAUTION

Overheating from insufficient cooling water will cause engine and drive system damage. Ensure that there is sufficient water always available at water inlet holes during operation.

7. With sterndrive unit in normal operating position, open the water source fully.
8. Place the remote control in neutral idle speed position and start engine.

⚠ CAUTION

Avoid engine damage from overheating. If the engine is operated above 1500 RPM during flushing, suction created by the seawater pickup pump may collapse the flushing water hose causing the engine to overheat.

9. Slowly advance throttle until engine reaches 1300 RPM (+/-100 RPM).

⚠ CAUTION

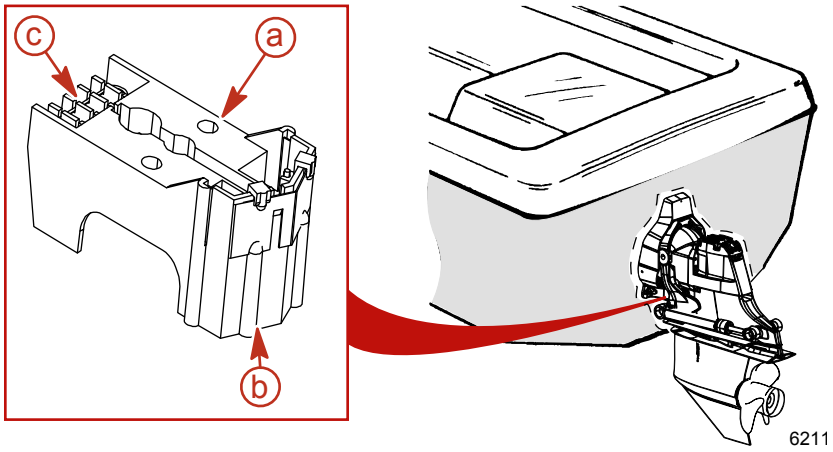
Engine overheating can cause engine damage. To avoid, observe the water temperature gauge and ensure that the engine is operating in the normal range.

10. Observe the water temperature gauge to ensure that the engine is operating in the normal range.
11. Operate engine with sterndrive in neutral for about 10 minutes or until discharge water is clear.
12. Slowly return throttle to idle speed position.
13. Stop engine.
14. Shut off the water and remove flushing attachments.
15. **If the boat is out of the water:** Install the water inlet hose to the aft side of the seawater pump. Tighten the hose clamp securely.
16. **If the boat is in the water:** Tag the ignition switch with an appropriate tag requiring the seawater inlet hose to be reconnected prior to operating engine.

Corrosion Protection

⚠ CAUTION

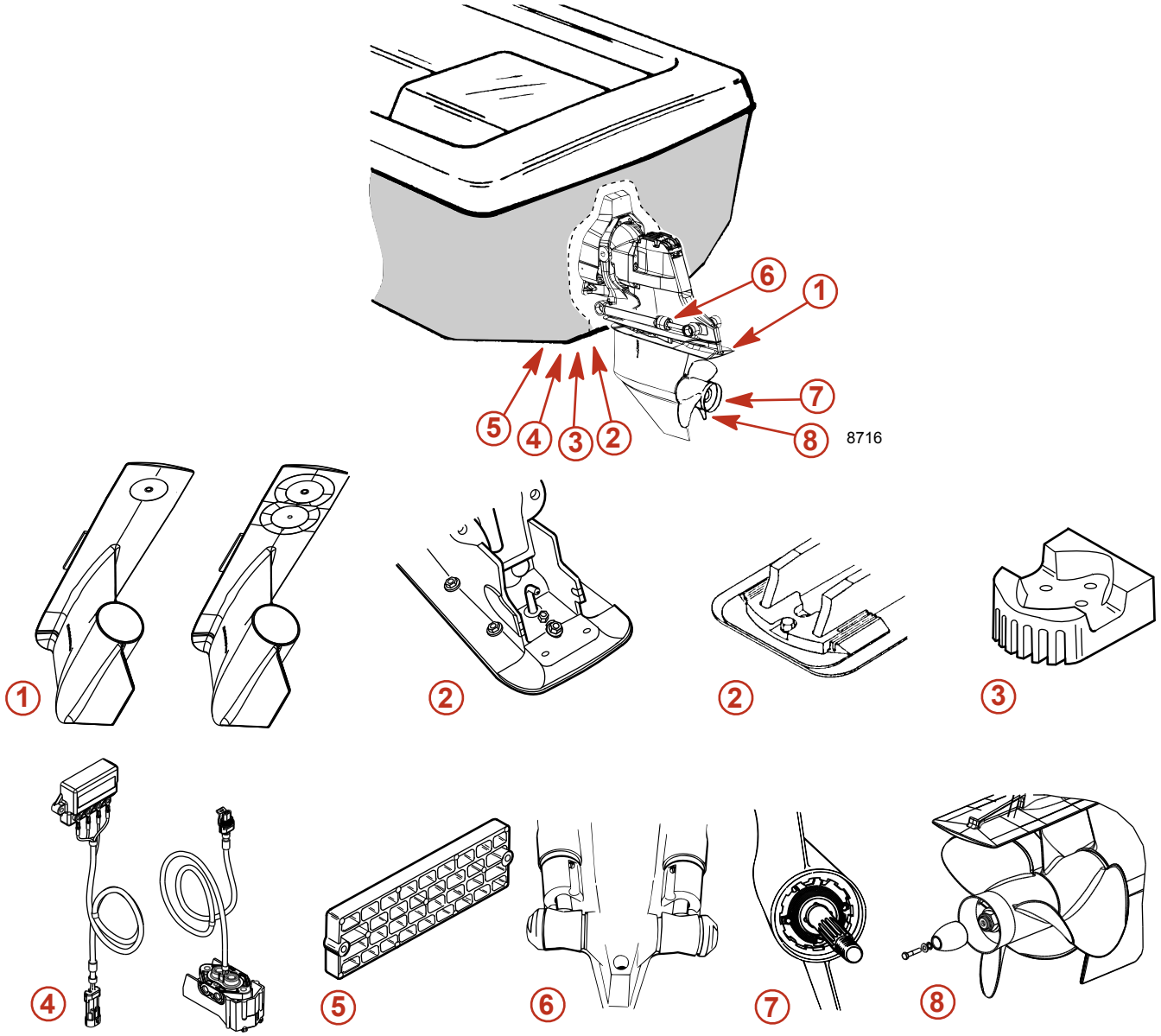
Improper boat-cleaning procedures can cause product damage. Washing the MerCathode assembly, especially with a brush or high-pressure washer, will damage the MerCathode assembly making it unable to inhibit galvanic corrosion. When cleaning the boat, do not use a brush or a high-pressure washer to wash the MerCathode assembly found on the bottom of the transom assembly.



a - MerCathode reference electrode
b - Do not paint
c - Do not pressure wash

Whenever two or more dissimilar metals (like those found on the sterndrive) are submerged in a conductive solution, such as saltwater, polluted water or water with a high mineral content, a chemical reaction takes place causing electrical current to flow between metals. The electrical current flow causes the metal that is most chemically active, or anodic, to erode. This is known as galvanic corrosion and, if not controlled, it will in time cause the need for replacement of power package components exposed to water. Refer to the **Marine Corrosion Protection Guide** (90-88181301).

Mercury MerCruiser power packages are equipped with anodes to help protect them from galvanic corrosion under moderate conditions. However, for severe conditions (i.e. when using a stainless steel propeller, docking/mooring in areas with rapid water flow, etc.), it is recommended that a Quicksilver Anti-Corrosion Anode Kit and/or a MerCathode System be installed (some models have a MerCathode System as standard equipment).

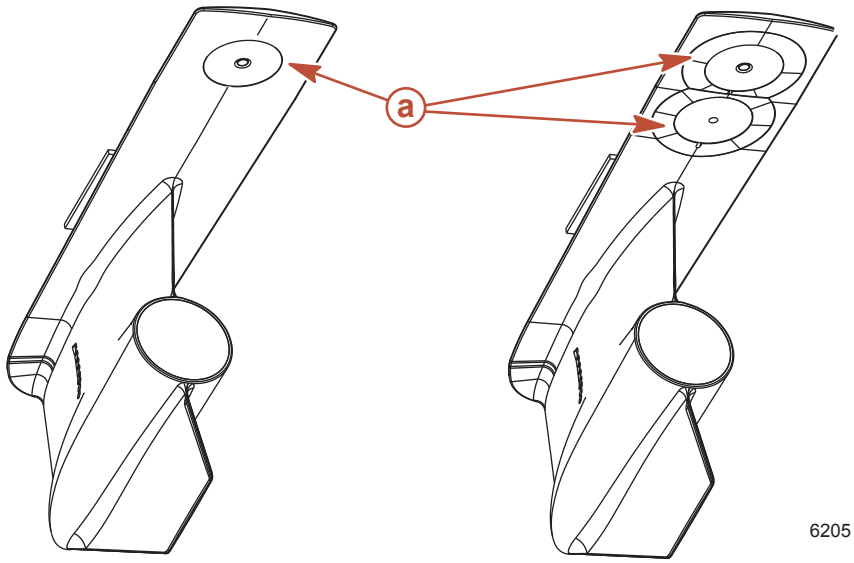


1 - Gearcase anodic plate
2 - Ventilation plate anode
3 - Gimbal mounted anodic block
4 - MerCathode System
5 - Anode kit
6 - Trim cylinder anodes
7 - Bearing carrier anodes (Alpha only)
8 - Propshaft Anode (Bravo III standard)

IMPORTANT: Replace sacrificial anodes if eroded 50 percent or more.

The following sacrificial anodes are installed at different locations on your power package. These anodes help protect against galvanic corrosion by sacrificing its metal to be slowly eroded instead of the metal components on the power package.

Gearcase Anodic Plate - Mounted on the underside of the lower gearcase.

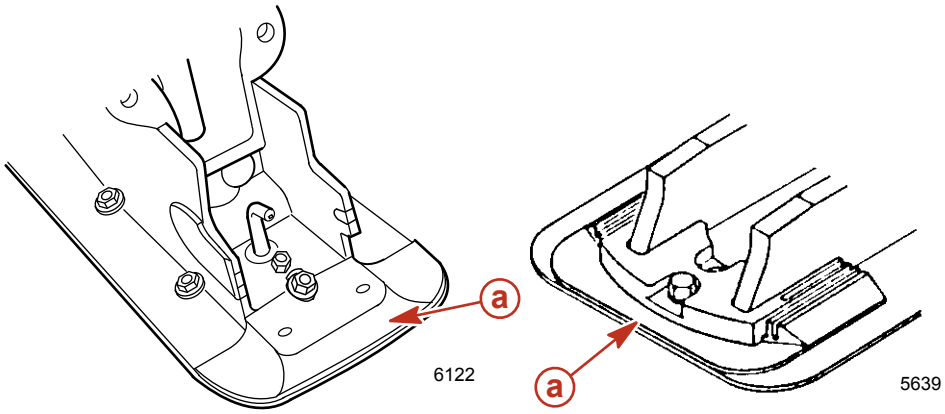


Alpha, Bravo One, Bravo Two Models

All Bravo Three Models

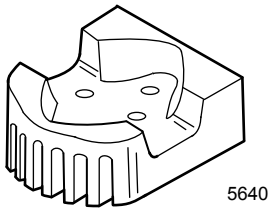
a - Anode

Ventilation Plate Anode - Mounted on the front of the gearcase.



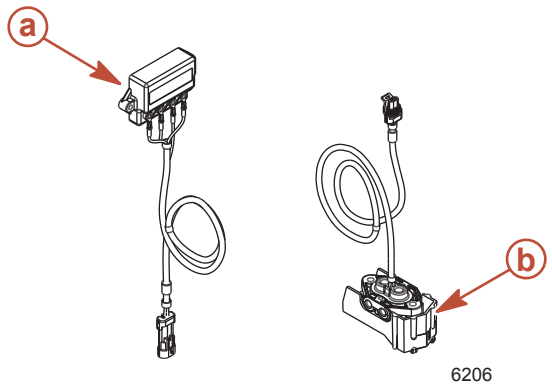
a - Anode

Drive Mounted Anodic Block (if equipped) - Mounted to underside of gimbal housing.



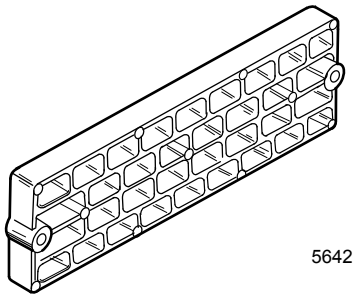
MerCathode System - Electrode assembly replaces Anodic block. System should be tested to ensure adequate output. The test should be performed where boat is moored, using Quicksilver Reference Electrode and Test Meter. Contact your authorized Mercury MerCruiser dealer.

IMPORTANT: To ensure that the MerCathode reference electrode is not damaged, do not paint or pressure wash.

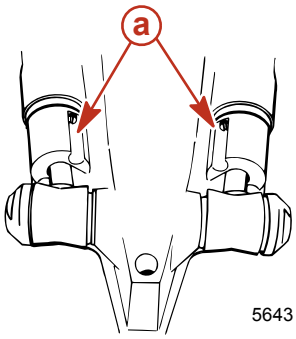


a - MerCathode controller **b -** MerCathode assembly

Anode Kit (if equipped) - Mounted to the boat transom.

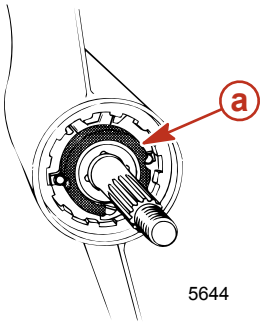


Trim Cylinder Anodes - Mounted on each trim cylinder.



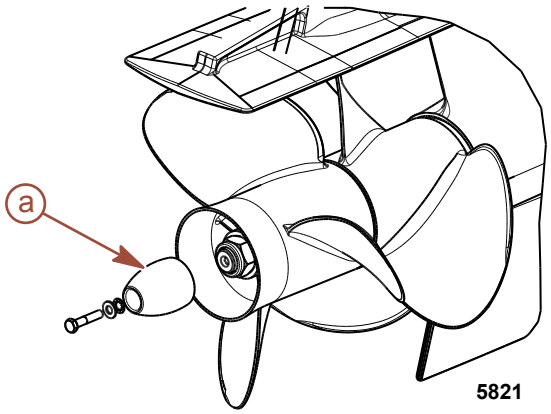
a - Trim cylinder anodes

Bearing Carrier Anode (Alpha and Bravo One) - Located in front of the propeller, between the front side of the propeller and the gear housing.



a - Bearing carrier anode

Propshaft Anode (Bravo Three) - Located behind the aft propeller.



a - Propshaft anode

In addition to the corrosion protection devices, the following steps should be taken to inhibit corrosion:

1. Paint your power package, refer to **Painting Your Power Package**.
2. Spray power package components on inside of boat annually with Corrosion Guard to protect finish from dulling and corrosion. External power package components may also be sprayed.
3. All lubrication points, especially steering system, shift and throttle linkages, should be kept well lubricated.
4. Flush cooling system periodically, preferably after each use.

Painting Your Power Package

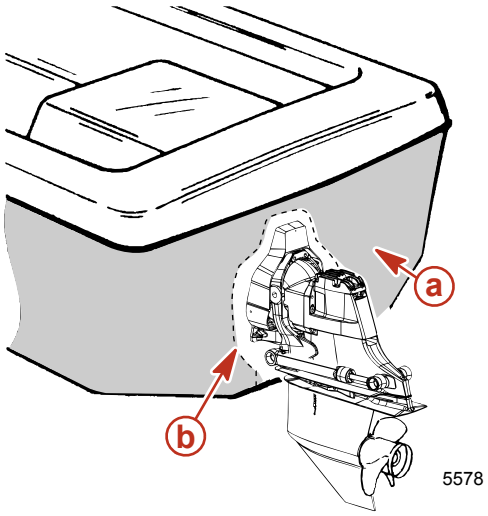
IMPORTANT: Corrosion damage that results from the improper application of anti-fouling paint will not be covered by the limited warranty.

1. **Painting Boat Hull or Boat Transom:** Anti-fouling paint may be applied to boat hull and boat transom but you must observe the following:

IMPORTANT: Do NOT paint anodes or MerCathode System reference electrode and anode, as this will render them ineffective as galvanic corrosion inhibitors.

IMPORTANT: If anti-fouling protection is required for boat hull or boat transom, copper or tin base paints, if not prohibited by law, can be used. If using copper or tin based anti-fouling paints, observe the following:

- Avoid any electrical interconnection between the Mercury MerCruiser Product, Anodic Blocks, or MerCathode System and the paint by allowing a minimum of 40 mm (1-1/2 in.) unpainted area on transom of the boat around these items.



a - Painted boat transom **b -** Unpainted Area on Transom

2. **Painting Sterndrive Unit or Transom Assembly:** Sterndrive unit and transom assembly should be painted with a good quality marine paint or an anti-fouling paint that does not contain copper, tin, or any other material that could conduct electrical current. Do not paint drain holes, anodes, MerCathode system, and items specified by boat manufacturer.

Section 6 - Storage

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6

Cold Weather or Extended Storage

IMPORTANT: Mercury MerCruiser strongly recommends that this service should be performed by an authorized Mercury MerCruiser dealer. Damage caused by freezing temperatures IS NOT covered by the Mercury MerCruiser Limited Warranty.

NOTICE
Avoid cooling system and engine damage. Water trapped in the seawater section of the cooling system can cause corrosion damage, freeze damage, or both. Ensure the seawater section of the cooling system is drained immediately after operation, or before any length of storage in cold weather, if the possibility of freezing temperatures exists. If the boat is in the water, keep the seacock closed until restarting the engine to prevent water from flowing back into the cooling system. If the boat is not fitted with a seacock, leave the water inlet hose disconnected and plugged.

NOTE: *As a precautionary measure, attach a tag to the key switch or steering wheel of the boat reminding the operator to open the seacock or unplug and reconnect the water inlet hose before starting the engine.*

IMPORTANT: Mercury MerCruiser requires that propylene glycol antifreeze, mixed to the manufacturers instructions, be used in the seawater section of the cooling system for freezing temperatures or extended storage. Make sure that the propylene glycol antifreeze contains a rust inhibitor and is recommended for use in marine engines. Be certain to follow the propylene glycol manufacturer's recommendations.

Preparing Power Package for Storage

1. Fill the fuel tanks with fresh gasoline (that does not contain alcohol) and a sufficient amount of Quicksilver Gasoline Stabilizer for Marine Engines to treat the gasoline. Follow instructions on the container.
2. If the boat is to be placed in storage with fuel containing alcohol in fuel tanks (if fuel without alcohol is not available): Fuel tanks should be drained as low as possible and Mercury/Quicksilver Gasoline Stabilizer for Marine Engines added to any fuel remaining in the tank. Refer to **Fuel Requirements** for additional information.
3. Flush the cooling system. Refer to the **Maintenance** section.
4. For additional assurance against freezing and rust, after draining, fill the seawater cooling system with propylene glycol mixed to the manufacturer's recommendation to protect engine to the lowest temperature to which it will be exposed during freezing temperatures or extended storage.
5. Operate the engine sufficiently to bring it up to normal operating temperature and allow fuel with Mercury/Quicksilver Gasoline Stabilizer to circulate through the fuel system. Shut off the engine.
6. Change the oil and oil filter.
7. Prepare the engine and fuel system for storage. Refer to **Engine and Fuel System Preparation**. Perform this operation.

8. Drain the engine seawater cooling system. Refer to **Draining the Seawater System**.

NOTICE

Avoid cooling system and engine damage. Water trapped in the seawater section of the cooling system can cause corrosion damage, freeze damage, or both. Ensure the seawater section of the cooling system is drained immediately after operation, or before any length of storage in cold weather, if the possibility of freezing temperatures exists. If the boat is in the water, keep the seacock closed until restarting the engine to prevent water from flowing back into the cooling system. If the boat is not fitted with a seacock, leave the water inlet hose disconnected and plugged.

9. Store the battery according to the manufacturer's instructions.

ENGINE AND FUEL SYSTEM PREPARATION

⚠ WARNING

Avoid serious injury or death from a gasoline fire or explosion; gasoline is extremely flammable and highly explosive under certain conditions. When servicing the fuel system components ensure that the engine is cool, the ignition switch is in the off position, and that the lanyard stop switch, if equipped, is in the off position. Do not smoke or allow spark or open flame in the area. Wipe up any spilled fuel immediately. Ensure that no fuel leaks exist before closing the engine hatch.

⚠ WARNING

Fuel vapors can be present in the engine compartment. Avoid injury or power package damage caused by fuel vapors or explosion. Always ventilate the engine compartment prior to servicing the power package.

1. In a 23 liter (6 U.S.gal.) remote fuel tank mix:
   a. 19 liter (5 U.S. gal) regular unleaded 87 octain (90 RON) gasoline
   b. 1.89 liter (2 U.S. qts.) Premium Plus 2-Cycle TC-W3 Outboard Oil
   c. 150 ml (5 ounces) Fuel System Treatment and Stabilizer or 30 ml (1 ounce) Fuel System Treatment and Stabilizer Concentrate

Tube Ref No.	Description	Where Used	Part No.
115	Premium Plus 2-cycle TC-W3 Outboard Oil	Fuel system	92-802824A1
124	Fuel System Treatment & Stabilizer	Fuel system	802875A1

2. Allow the engine to cool down.

IMPORTANT: Immediately wipe up any fuel spills or sprays.

3. Close the fuel shut off valve, if equipped. Disconnect and plug the fuel inlet fitting if not equipped with a fuel shut off valve.
4. Connect the remote fuel tank (with the fogging mixture) to the fuel inlet fitting.

IMPORTANT: Supply cooling water to the engine.

5. Start and operate the engine at 1300 rpm for 5 minutes.
6. After specified operating time is complete, slowly return throttle to idle rpm and shut engine off.

IMPORTANT: Ensure that some fogging mixture remains in the engine. Do not allow the engines fuel system to become completely dry.

7. Replace the water separating fuel filter element. Refer to Section 5 for proper procedure.

Draining the Seawater System

⚠ CAUTION

Excess water in the bilge can damage the engine or cause the boat to sink. Ensure that the boat is out of the water, the seacock is closed (if equipped) or the seawater inlet hose is disconnected and plugged on both ends, and the bilge pump is operating before beginning the draining procedure.

⚠ CAUTION

Excess water in the bilge can damage the engine or cause the boat to sink. When the drain system is open, excess water can enter the bilge. Do not operate the engine with the drain system open.

IMPORTANT: Only drain the seawater section of the closed cooling system.

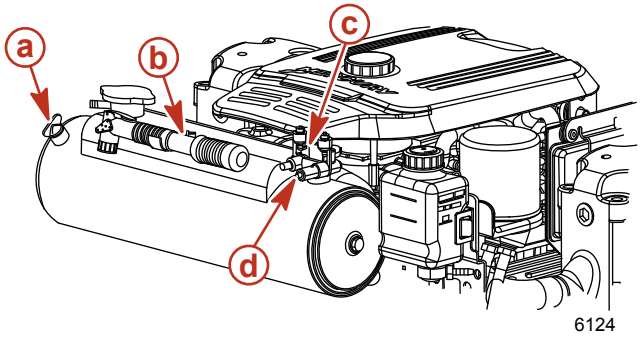
IMPORTANT: The boat must be as level as possible to ensure complete draining of the cooling system.

Your power package is equipped with a drain system. Refer to **Drain System Identification** to determine which instructions apply to your power package.

IMPORTANT: The engine must not be operating at any point during the draining procedure.

Drain System Identification

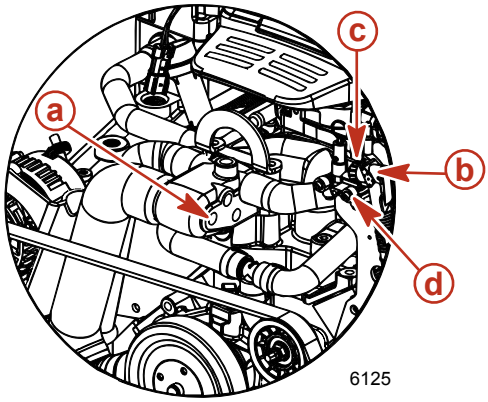
AIR ACTUATED SINGLE POINT DRAIN SYSTEM



Closed Cooled Models

a - Blue drain plug location

b - Blue air pump

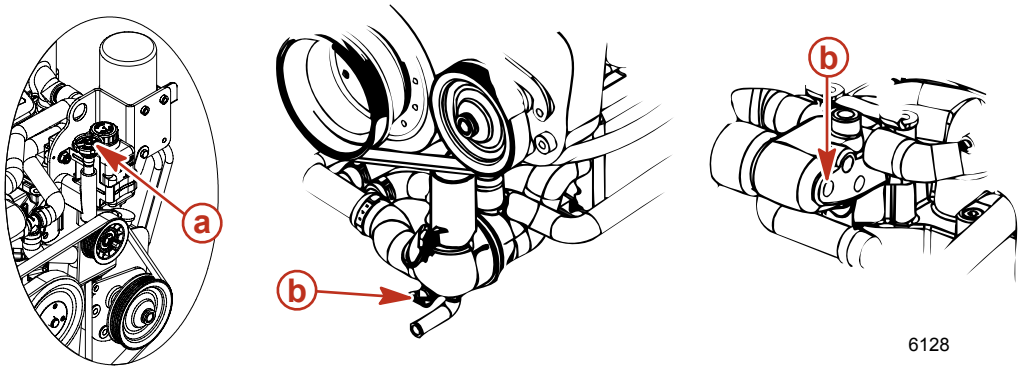


Seawater Cooled Models

c - Air manifold

d - Green indicators

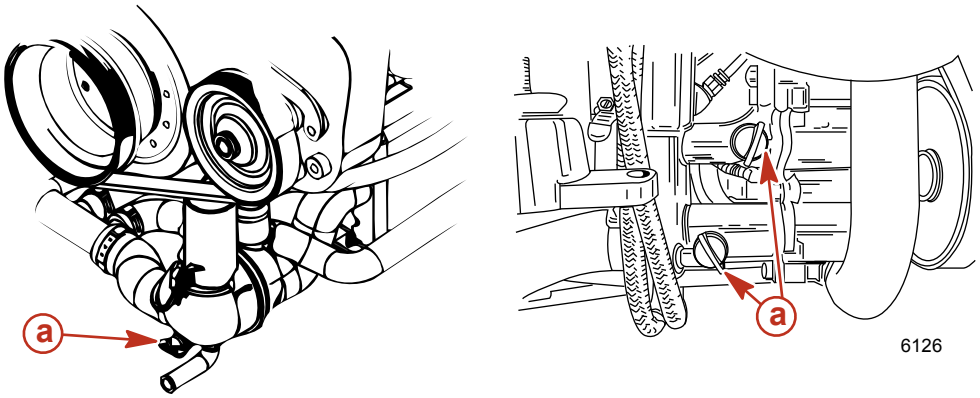
MANUAL SINGLE POINT DRAIN SYSTEM



a - Blue handle

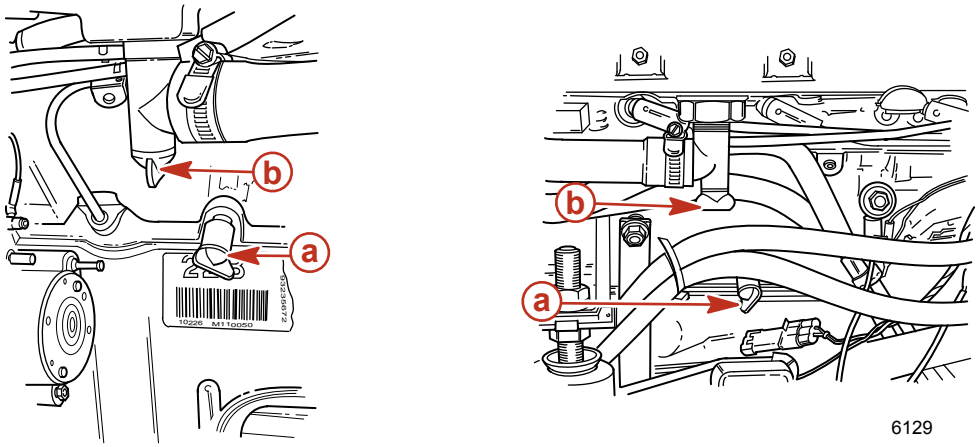
b - Blue drain plug location

THREE POINT MANUAL DRAIN SYSTEM



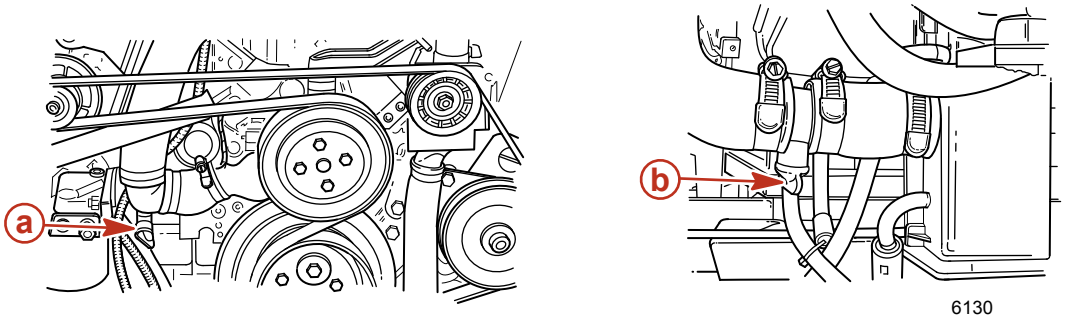
a - Blue drain plug

MULTI-POINT DRAIN (MPD) SYSTEM



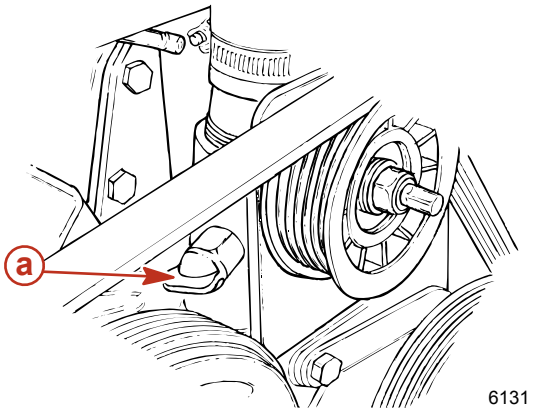
a - Side of cylinder block

b - Bottom of exhaust manifolds



a - Water circulating pump hose

b - Fuel cooler to thermostat housing



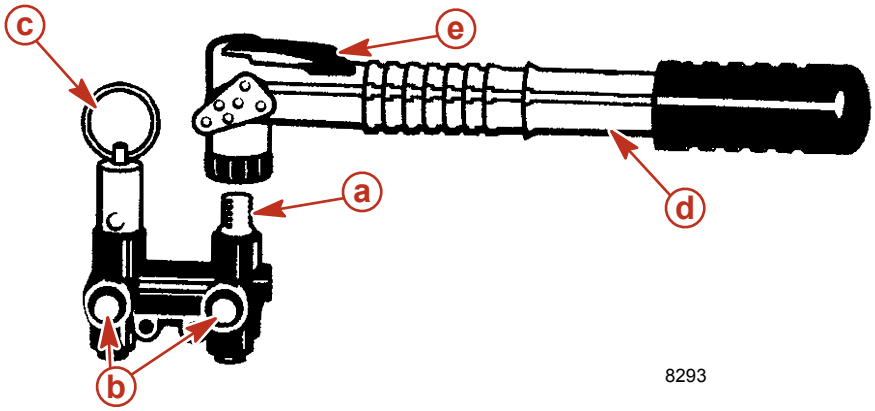
a - Check valve (if equipped)

Air Actuated Single Point Drain System

BOAT IN THE WATER

NOTE: *This procedure is written for the air pump that is attached to the engine. However, any air source can be used.*

1. Close the seacock (if equipped) or remove and plug the water inlet hose.
2. Remove the air pump from the engine.
3. Ensure that the lever on top of the pump is flush with the handle (horizontal).
4. Install the air pump on the actuator fitting.
5. Pull lever on air pump (vertical) to lock pump on the fitting.



a - Actuator fitting

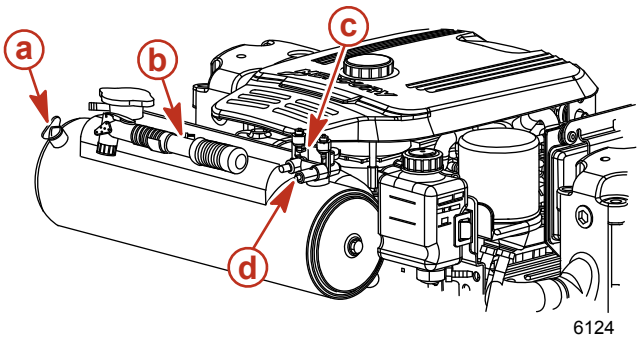
b - Green indicators

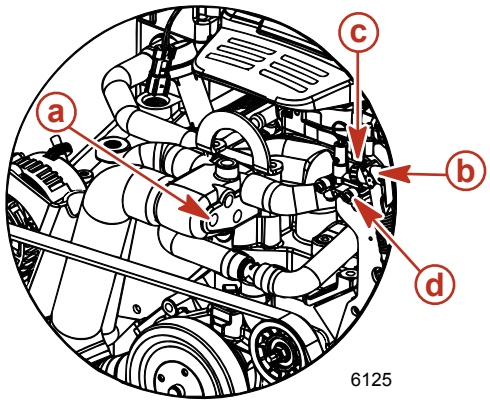
c - Manual release valve

d - Air pump

e - Lever (locking)

6. Pump air into the system until both green indicators extend and water drains from both sides of the engine. The port side will begin draining before the starboard side.
7. Immediately remove the blue drain plug from the side of the thermostat housing or the heat exchanger. This must be removed within 30 seconds to properly vent the cooling system.





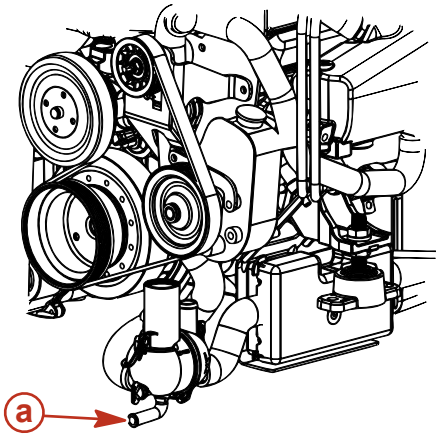
Closed Cooled Models

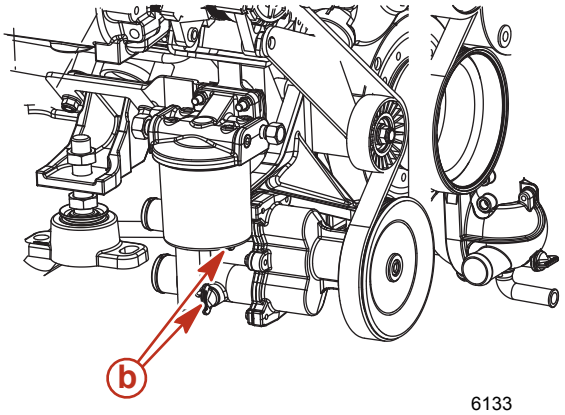
a - Blue drain plug location
b - Blue air pump

Seawater Cooled Models

c - Air manifold
d - Green indicators

8. Verify that water is draining from each opening. If not, use the **Three Point Manual Drain System** instructions.



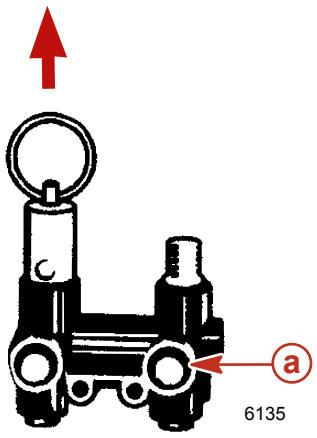


a - Port side drain location

b - Starboard side drain location

9. Allow the system to drain for a minimum of five minutes. Pump air as necessary to keep the green indicators extended.
10. Crank the engine over slightly with the starter motor to purge any water trapped in the seawater pump. Do not allow engine to start.
11. Reinstall the blue drain plug in the thermostat housing or heat exchanger.
12. Remove the air pump from the air manifold and return it to the mounting bracket.
13. Mercury MerCruiser recommends leaving the drain system open while transporting the boat or while performing other maintenance. This helps ensure that all water is drained.

14. Before launching the boat, pull up on the manual release valve. Verify that the green indicators are no longer extended.



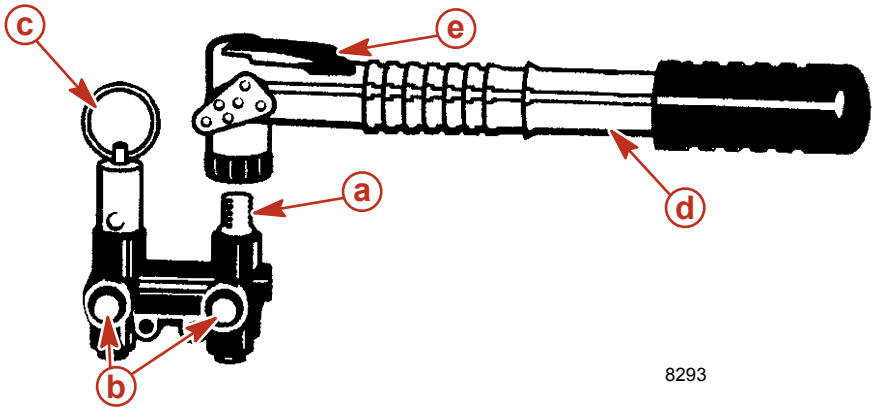
a - Green indicators

15. Open the seacock, if equipped, or unplug and reconnect the water inlet hose prior to operating the engine.

BOAT OUT OF THE WATER

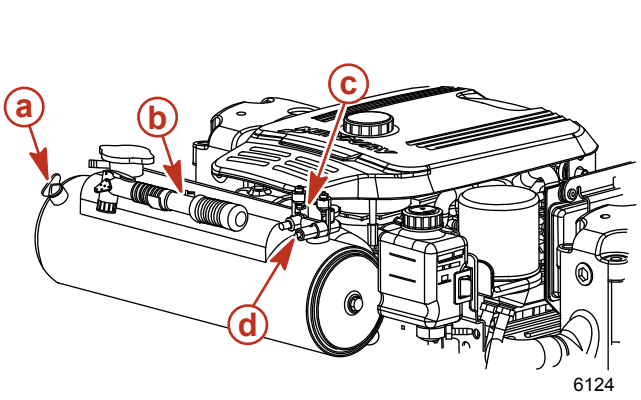
NOTE: *This procedure is written for the air pump that is attached to the engine. However, any air source can be used.*

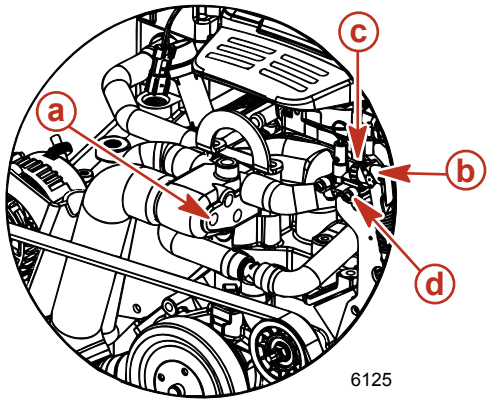
1. Place the boat on a lever surface to ensure complete draining of system.
2. Remove the air pump from the engine.
3. Ensure that the lever on top of the pump is flush with the handle (horizontal).
4. Install the air pump on the actuator fitting.
5. Pull lever on air pump (vertical) to lock pump on the fitting.



a - Actuator fitting
b - Green indicators
c - Manual release valve
d - Air pump
e - Lever (locking)

6. Pump air into the system until both green indicators extend and water drains from both sides of the engine. The port side will begin draining before the starboard side.





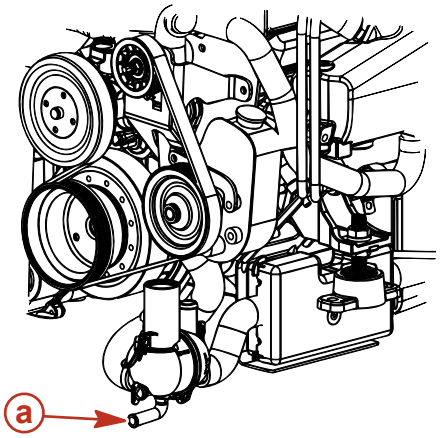
Closed Cooled Models

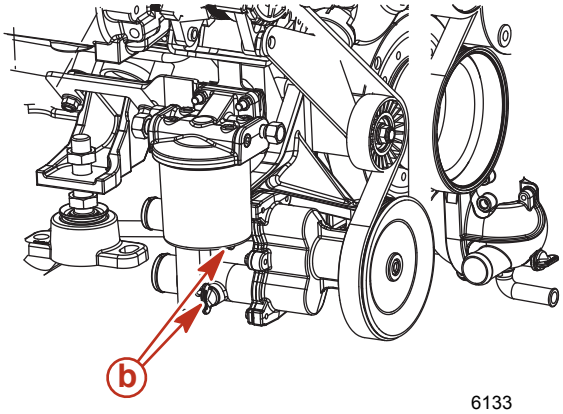
a - Blue drain plug location
b - Blue air pump

Seawater Cooled Models

c - Air manifold
d - Green indicators

7. Verify that water is draining from each opening. If not, use the **Three Point Manual Drain System** instructions.



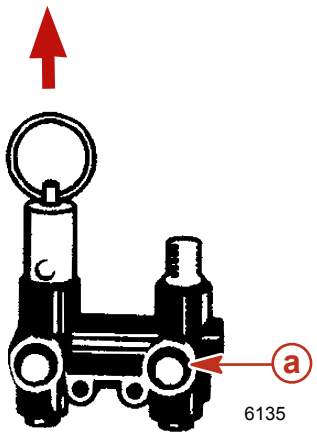


a - Port side drain location

b - Starboard side drain location

8. Allow the system to drain for a minimum of five minutes. Pump air as necessary to keep the green indicators extended.
9. Crank the engine over slightly with starter motor to purge any water trapped in the seawater pump. Do not allow engine to start.
10. Remove the air pump from the air manifold and return it to the mounting bracket.
11. Mercury MerCruiser recommends leaving the drain system open while transporting the boat or while performing other maintenance. This helps ensure that all water is drained.

12. Before launching the boat, pull up on the manual release valve. Verify that the green indicators are no longer extended.

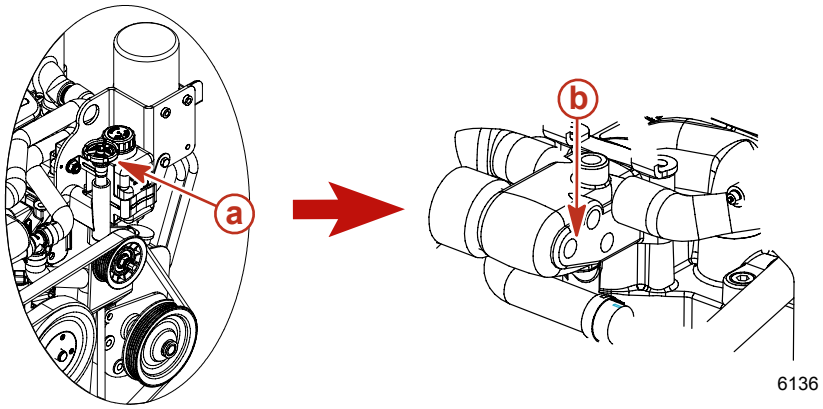


a - Green indicators

Manual Single Point Drain System

BOAT IN THE WATER

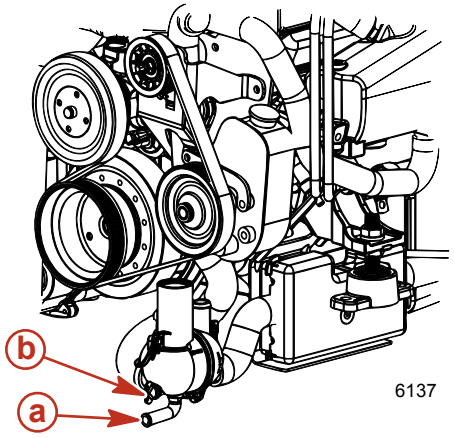
1. Close the seacock (if equipped) or remove and plug the water inlet hose.
2. Rotate the blue handle counterclockwise until it stops (approximately two turns). The red on the handle shaft indicates that the drain system is open. Do not force the handle as this will create new threads.
3. Immediately remove the blue drain plug from the side of the thermostat housing. This must be removed within 30 seconds to properly vent the cooling system.



a - Blue handle

b - Blue drain plug location

4. Visually verify that water is draining. If water does not drain, remove the blue drain plug from the distribution housing and drain manually.

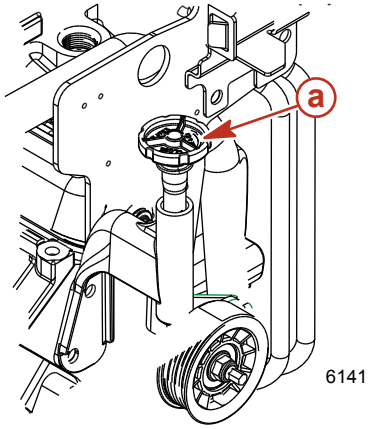


a - Drain location - orange or red **b -** Blue drain plug

5. Allow the system to drain for a minimum of five minutes. Mercury MerCruiser recommends leaving the drain system open while transporting the boat or while performing other maintenance.
6. Reinstall the blue drain plug in the thermostat housing.
7. Close the drain system by rotating the blue handle clockwise until it stops and install the blue drain plug, if removed. The handle is fully seated when no red is visible. Do not overtighten the handle as this will create new threads.
8. Open the seacock (if equipped) or unplug and reconnect the water inlet hose prior to operating the engine.

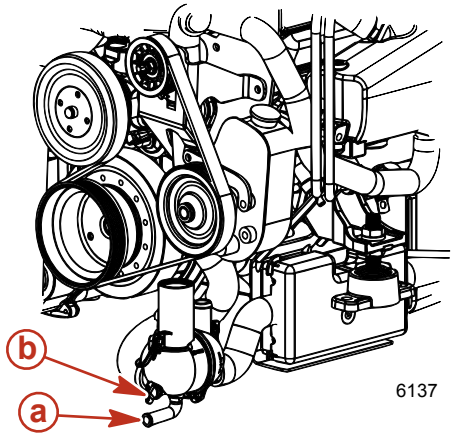
BOAT OUT OF THE WATER

1. Place the boat on a level surface to ensure complete draining of system.
2. Rotate the blue handle counterclockwise until it stops (approximately two turns). The red on the handle shaft indicates that the drain system is open. Do not overtighten the handle as this will create new threads.



a - Blue handle

3. Visually verify that water is draining. If water does not drain, remove the blue drain plug from the distribution housing and drain manually.



a - Drain location - orange or red **b -** Blue drain plug

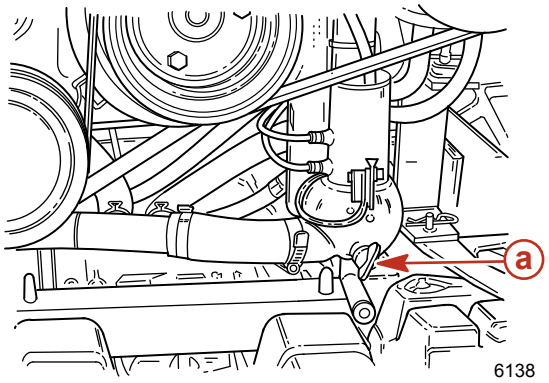
4. Allow the system to drain for a minimum of five minutes. Mercury MerCruiser recommends leaving the plugs out while transporting the boat or while performing other maintenance to ensure that all water is drained.
5. Close the drain system by rotating the blue handle clockwise until it stops or installing the blue drain plug. The handle is fully seated when no red is visible. Do not overtighten handle as this will create new threads.

Three Point Manual Drain System

BOAT IN THE WATER

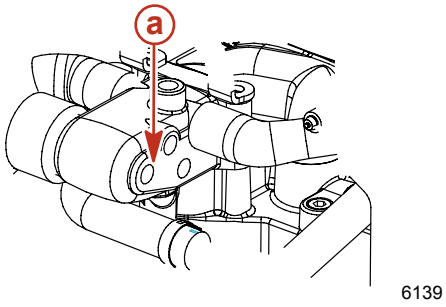
NOTE: *Use this procedure if your engine is not equipped with an air actuated single point drain system or if the air actuated single point drain system fails.*

1. Close the seacock (if equipped) or remove and plug the water inlet hose.
2. Remove the blue drain plug from the distribution housing (lower front, port side).



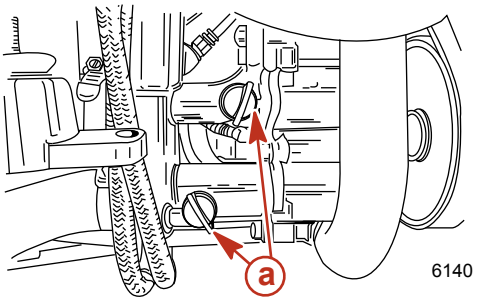
a - Blue drain plug

3. To properly vent the cooling system, remove the blue drain plug from the side of the thermostat housing within 30 seconds.



a - Blue drain plug location

4. Remove the two blue drain plugs from the seawater pickup pump (front, starboard side).



a - Blue drain plugs

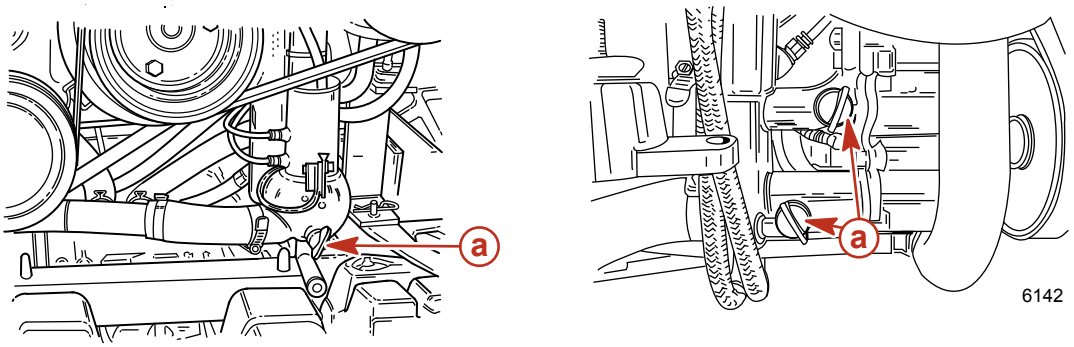
5. Verify that water is draining from each opening.
6. Allow the system to drain for a minimum of five minutes. Mercury MerCruiser recommends leaving the drain system open while transporting the boat or while performing other maintenance to ensure that all water is drained.
7. Crank the engine over slightly with starter motor to purge any water trapped in the seawater pickup pump. Do not allow the engine to start.
8. Prior to launching the boat or starting the engine, close the drain system by installing the four blue drain plugs.
9. Open the seacock, if equipped, or unplug and reconnect the water inlet hose prior to operating the engine.

BOAT OUT OF THE WATER

NOTE: *Use this procedure if your engine is not equipped with an air actuated single point drain system or if the single point drain system fails.*

1. Place the boat on a level surface to ensure complete draining of the system.

2. Remove three blue drain plugs: one from the distribution housing (lower front, port side) and two from the seawater pickup pump (front, starboard side).



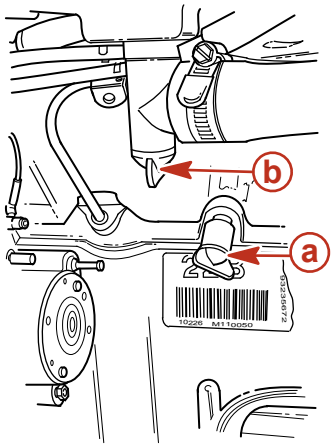
a - Blue drain plug

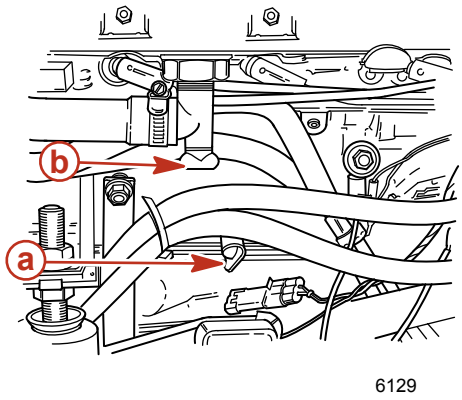
3. Verify that water is draining from each opening.
4. Allow the system to drain for a minimum of five minutes. Mercury MerCruiser recommends leaving the drain system open while transporting the boat or while performing other maintenance to ensure that all water is drained.
5. Crank the engine over slightly with starter motor to purge any water trapped in the seawater pickup pump. Do not allow the engine to start.
6. Prior to launching the boat or starting the engine, close the drain system by installing the three blue drain plugs.

Multi-Point Drain (MPD) System

1. Place the boat on a level surface to ensure complete draining of the system.

2. Remove the blue drain plugs from the following locations. It may be necessary to clean out the drain holes using a stiff piece of wire. Do no until the entire system is drained.
   a. Port and starboard side of cylinder block
   b. Bottom of exhaust manifolds

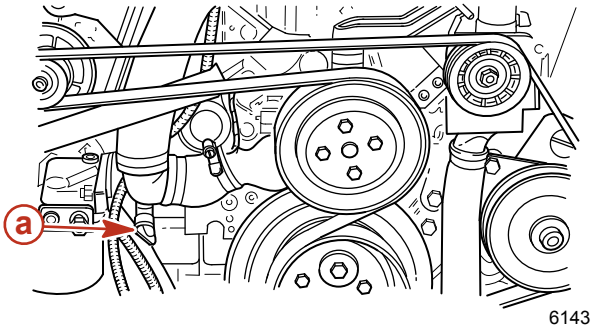




a - Cylinder block drain plug

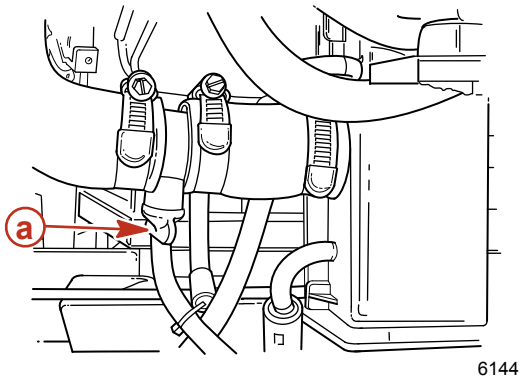
b - Exhaust manifold drain plug

   c. Water circulating pump hose



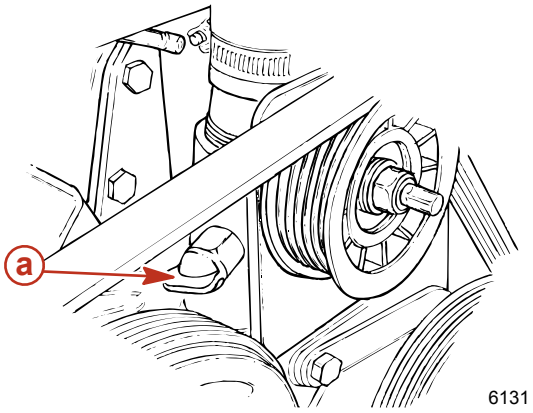
a - Drain plug

   d. Fuel cooler to thermostat housing hose



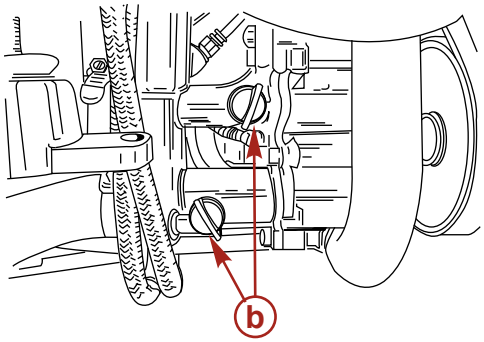
a - Drain plug

e. Check valve

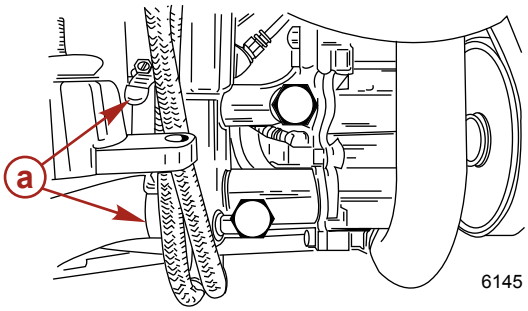


a - Drain plug (if equipped)

3. On models with a seawater pickup pump, remove the two blue drain plugs. If the seawater pickup pump does not have blue drain plugs, or you are unable to access them, loosen the clamps and remove both hoses.



a - Hose clamps



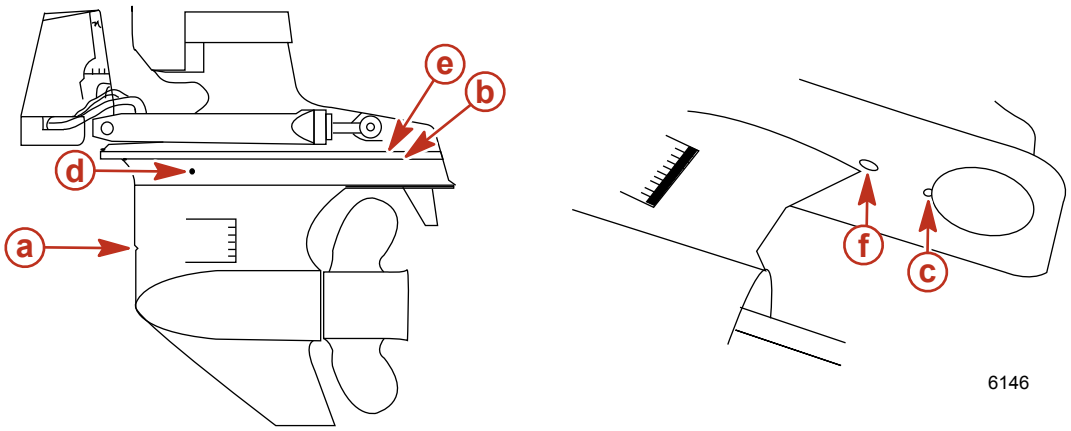
b - Blue drain plugs

4. Crank the engine over slightly with starter motor to purge any water trapped in the seawater pickup pump. Do not allow the engine to start.
5. After the cooling system has been drained completely, install the drain plugs, reconnect hoses, and tighten all hose clamps securely.

Draining the Sterndrive

NOTE: This procedure is needed only for salty, brackish, mineral laden, or polluted water applications; and for freezing temperatures or extended storage.

1. Insert a small wire repeatedly to make sure that vent holes, water drain holes, and passages are unobstructed and open.



Sterndrive Water Drain Holes

a - Speedometer pitot tube
b - Trim tab cavity vent hole
c - Trim tab cavity drain passage
d - Gear housing water drain hole (1 each - port and starboard)
e - Gear housing cavity vent hole
f - Gear housing cavity drain hole

NOTICE

The universal joint bellows may develop a set when stored in a raised or up position, causing the bellows to fail when returned to service and allowing water to enter the boat. Store the sterndrive in the full down position.

2. Lower the sterndrive unit to the full down/in position.
3. For additional assurance against freezing and rust, after draining, fill the cooling system with propylene glycol mixed to the manufacturer's recommendation to protect engine to the lowest temperature to which it will be exposed during freezing temperatures or extended storage

IMPORTANT: Mercury MerCruiser requires that propylene glycol antifreeze, mixed to the manufacturers instructions, be used in the seawater section of the cooling system for freezing temperatures or extended storage. Make sure that the propylene glycol antifreeze contains a rust inhibitor and is recommended for use in marine engines. Be certain to follow the propylene glycol manufacturer's recommendations.

Battery Storage

Whenever the battery will be stored for an extended period of time, be sure the cells are full of water and the battery is fully charged and in good operating condition. It should be clean and free of leaks. Follow the battery manufacturer's instructions for storage.

Power Package Recommissioning

1. Ensure that all cooling system hoses are connected properly and hose clamps are tight.

⚠ CAUTION

Reversing the battery cables or connection order will damage the electrical system. When installing the battery, be sure to connect the positive (+) battery cable to the positive (+) battery terminal first, and the negative (–) battery cable to the negative (–) battery terminal second.

2. Install a fully charged battery. Clean the battery cable clamps and terminals and reconnect cables. Tighten each cable clamp securely when connecting.
3. Coat the terminal connections with a battery terminal anti-corrosion agent.
4. Perform all the checks in the before starting column of the **Operation Chart**.

⚠ CAUTION

Overheating from insufficient cooling water will cause engine and drive system damage. Ensure that there is sufficient water always available at water inlet holes during operation.

5. Start the engine and closely observe instrumentation to ensure that all systems are functioning correctly.
6. Carefully inspect the engine for fuel, oil, fluid, water and exhaust leaks.
7. Inspect the steering system, shift and throttle control for proper operation.

Section 7 - Troubleshooting

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Diagnosing EFI Problems

Your authorized Mercury MerCruiser dealer has the proper service tools for diagnosing problems on Electronic Fuel Injection (EFI) Systems. The Electronic Control Module (ECM) on these engines has the ability to detect some problems with the system when they occur, and store a Trouble Code in the ECM's memory. This code can then be read later by a service technician using a special diagnostic tool.

Diagnosing DTS Problems

Your authorized Mercury MerCruiser dealer has the proper service tools for diagnosing problems on Digital Throttle and Shift (DTS) Systems. The Electronic Control Module (ECM)/Propulsion Control Module (PCM) on these engines has the ability to detect some problems with the system when they occur, and store a Trouble Code in the ECM/PCM's memory. This code can then be read later by a service technician using a special diagnostic tool.

Engine Guardian System

The Engine Guardian System monitors the critical sensors on the engine for any early indications of problems. The system will respond to a problem by emitting a continuous beep and/or reducing engine power in order to provide engine protection.

If Guardian System has been activated, reduce throttle speed. The horn will turn off when throttle speed is within the allowable limit. Consult an authorized Mercury MerCruiser dealer for assistance.

Starter Motor Will Not Crank Engine, Or Cranks Slow

Possible Cause	Remedy
Battery switch turned off.	Turn the switch on.
Remote control not in neutral position.	Position the control lever in neutral.
Open circuit breaker or blown fuse.	Check and reset the circuit breaker or replace fuse.
Loose or dirty electrical connections or damaged wiring.	Check all electrical connections and wires (especially battery cables). Clean and tighten all faulty connections.
Bad battery or low battery voltage.	Test the battery and charge if necessary; replace if bad.
Lanyard stop switch activated.	Check the lanyard stop switch.

Engine Will Not Start Or Is Hard To Start

Possible Cause	Remedy
Lanyard stop switch activated.	Check the lanyard stop switch.
Improper starting procedure.	Read the starting procedure.
Insufficient fuel supply.	Fill fuel tank or open valve.
Faulty ignition system component.	Service the ignition system.
Clogged fuel filter.	Replace fuel filter.
Stale or contaminated fuel.	Drain fuel tank. Fill with fresh fuel.
Fuel line or tank vent line kinked or clogged.	Replace kinked lines or blow out lines with compressed air to remove obstruction.
Faulty wire connections.	Check wire connections.

Possible Cause	Remedy
EFI system fault.	Have EFI System checked by an authorized Mercury MerCruiser dealer.

Engine Runs Rough, Misses And/Or Backfires

Possible Cause	Remedy
Clogged fuel filter.	Replace filter.
Stale or contaminated fuel.	If contaminated, drain tank. Fill with fresh fuel.
Kinked or clogged fuel line or fuel tank vent line.	Replace kinked lines or blow out lines with compressed air to remove obstruction.
Flame Arrestor dirty.	Clean Flame Arrestor.
Faulty ignition system component.	Service ignition system.
Idle speed too low.	Have EFI system checked by an authorized Mercury MerCruiser dealer.
EFI System fault.	Have EFI System checked by an authorized Mercury MerCruiser dealer.

Poor Performance

Possible Cause	Remedy
Throttle not fully open.	Inspect the throttle cable and linkages for proper operation.
Damaged or improper propeller.	Replace the propeller.
Excessive bilge water.	Drain and check for cause of entry.
Boat overloaded or load improperly distributed.	Reduce load or redistribute load more evenly.
Flame arrestor dirty.	Clean the flame arrestor.
Boat bottom fouled or damaged.	Clean or repair as necessary.
Ignition problem.	See **Engine Runs Rough, Misses or Backfires**.
Engine overheating.	See **Excessive Engine Temperature**.
EFI System fault	Have EFI System checked by an authorized Mercury MerCruiser dealer.

Excessive Engine Temperature

Possible Cause	Remedy
Water inlet or seacock closed.	Open.
Drive belt loose or in poor condition.	Replace or adjust belt.
Seawater pickups or sea strainer obstructed.	Remove obstruction.
Faulty thermostat.	Replace.
Coolant level (if equipped) low in closed cooling section.	Check for cause of low coolant level and repair. Fill system with proper coolant solution.
Heat Exchanger or Fluid Cooler plugged with foreign material	Clean Heat Exchanger, Engine Oil Cooler, and Transmission Oil Cooler (if equipped).
Loss of pressure in closed cooling section.	Check for leaks. Clean, inspect and test pressure cap.
Faulty seawater pickup pump.	Repair.
Seawater discharge restricted or plugged.	Clean exhaust elbows.

Insufficient Engine Temperature

Possible Cause	Remedy
Faulty thermostat.	Replace.

Low Engine Oil Pressure

Possible Cause	Remedy
Insufficient oil in crankcase.	Check and add oil.
Excessive oil in crankcase (causing it to become aerated).	Check and remove required amount of oil. Check for cause of excessive oil (improper filling).
Diluted or improper viscosity oil.	Change oil and oil filter, using correct grade and viscosity oil. Determine cause for dilution (excessive idling).

Battery Will Not Come Up On Charge

Possible Cause	Remedy
Excessive current draw from battery.	Turn off non-essential accessories.
Alternator drive belt loose or in poor condition.	Replace and/or adjust.
Unacceptable battery condition.	Test battery, replace if necessary.
Loose or dirty electrical connections or damaged wiring.	Check all associated electrical connections and wires (especially battery cables). Clean and tighten faulty connections. Repair or replace damaged wiring.
Faulty alternator	Test alternator output, replace if necessary.

Remote Control Operates Hard, Binds, Has Excessive Free-play Or Makes Unusual Sounds

Possible Cause	Remedy
Insufficient lubrication on shift and throttle linkage fasteners.	Lubricate.
Obstruction in shift or throttle linkages.	Remove obstruction.
Loose or missing shift and throttle linkages.	Check all throttle linkages. If any are loose or missing, see authorized Mercury MerCruiser dealer immediately.
Shift or throttle cable kinked.	Straighten cable or have authorized Mercury MerCruiser dealer replace cable if damaged beyond repair.

Steering Wheel Turns Hard Or Jerky

Possible Cause	Remedy
Low power steering pump fluid level.	Check for leak. Refill system with fluid.
Drive belt loose or in poor condition.	Replace and/or adjust.
Insufficient lubrication on steering components.	Lubricate.
Loose or missing steering fasteners or parts.	Check all parts and fasteners if any are loose or missing, see authorized Mercury MerCruiser dealer immediately.
Contaminated power steering fluid.	See authorized Mercury MerCruiser dealer.

Power Trim Does Not Operate (Motor Does Not Operate)

Possible Cause	Remedy
Blown fuse.	Replace fuse. Fuses may be located near the dash trim switch, at the trim pump, in the positive (red) power trim battery lead near the battery switch, or a combination of these.
Loose or dirty electrical connections or damaged wiring.	Check all associated electrical connections and wires (especially battery cables). Clean and tighten faulty connection. Repair or replace wiring.

Power Trim Does Not Operate (Motor Operates But Sterndrive Unit Does Not Move)

Possible Cause	Remedy
Trim pump oil level low.	Fill pump with oil.
Drive unit binding in gimbal ring.	Check for obstruction.

Notes:

Section 8 - Customer Assistance Information

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Owner Service Assistance

Local Repair Service

Always return your Mercury MerCruiser powered boat to your authorized dealer should the need for service arise. Only he has the factory trained mechanics, knowledge, special tools and equipment and the genuine Quicksilver parts and accessories[1] to properly service your engine should the need occur. He knows your engine best.

Service Away From Home

If you are away from your local dealer and the need arises for service, contact the nearest authorized dealer. Refer to the Yellow Pages of the telephone directory. If, for any reason, you cannot obtain service, contact the nearest Regional Service Center. Outside the United States and Canada, contact the nearest Marine Power International Service Center.

Stolen Power Package

If your power package is stolen, immediately advise the local authorities and Mercury Marine of the model and serial numbers and to whom the recovery is to be reported. This information is maintained in a database at Mercury Marine to aid authorities and dealers in recovery of stolen power packages.

Attention Required After Submersion

1. Before recovery, contact an authorized Mercury MerCruiser dealer.
2. After recovery, immediate service by an authorized Mercury MerCruiser dealer is required to reduce the possibility of serious engine damage.

Replacement Service Parts

⚠ WARNING

Avoid fire or explosion hazard. Electrical, ignition, and fuel system components on Mercury Marine products comply with U.S. Coast Guard rules to minimize risk of fire or explosion. Do not use replacement electrical or fuel system components that do not comply with these rules. When servicing the electrical and fuel systems, properly install and tighten all components.

Marine engines are expected to operate at or near full throttle for most of their life. They are also expected to operate in both fresh and saltwater environments. These conditions require numerous special parts. Care should be exercised when replacing marine engine parts as specifications are quite different from those of the standard automotive engine.

For example, one of the most important, and probably the least suspected special replacement part, is the cylinder head gasket. Since saltwater is highly corrosive, the steel-type automotive head gasket cannot be used. A marine engine head gasket uses special materials to resist corrosive action.

Since marine engines must be capable of running at or near maximum RPM much of the time, special valve springs, valve lifters, pistons, bearings, camshafts and other heavy duty moving parts are required for long life and peak performance.

These are but a few of the many special modifications that are required in Mercury MerCruiser marine engines to provide long life and dependable performance.

1. Quicksilver parts and accessories are engineered and built by Mercury Marine, specifically for Mercury MerCruiser sterndrives and inboards.

PARTS AND ACCESSORIES INQUIRIES

All inquiries concerning Quicksilver replacement parts and accessories should be directed to your local authorized dealer. The dealer has the necessary information to order parts and accessories for you should he not have them in stock. Only authorized dealers can purchase genuine Quicksilver parts and accessories from the factory. Mercury Marine does not sell to unauthorized dealers or retail customers. When inquiring on parts and accessories, the dealer requires the **engine model** and **serial numbers** to order the correct parts.

Resolving A Problem

Satisfaction with your Mercury MerCruiser product is very important to your dealer and to us. If you ever have a problem, question or concern about your power package, contact your dealer or any authorized Mercury MerCruiser dealership. If additional assistance is required, take these steps:

1. Talk with the dealership's sales manager or service manager. If this has already been done, then contact the owner of the dealership.
2. Should you have a question, concern or problem that cannot be resolved by your dealership, please contact Mercury Marine Service Office for assistance. Mercury Marine will work with you and your dealership to resolve all problems.

The following information will be needed by the service office:

- Your name and address
- Daytime telephone number
- Model and serial numbers for your power package
- The name and address of your dealership
- Nature of problem

Mercury Marine Service Offices are listed on the next page.

Mercury Marine Service Offices

For assistance, call, fax or write. Please include your daytime telephone number with mail and fax correspondence.

Telephone	Fax	Mail
(405) 743 6566	(405) 743 6570	Mercury MerCruiser 3003 N. Perkins Rd. Stillwater, OK 74075
(905) 567 MERC (6372)	(905) 567 8515	Mercury Marine Ltd. 2395 Meadowpine Blvd. Mississauga, Ontario L5N 7W6 Canada
(61) (3) 9791 5822	(61) (3) 9793 5880	Mercury Marine Australia 132-140 Frankston Road Dandenong, Victoria 3164 Australia
(32) (87) 32 32 11	(32) (87) 31 19 65	Marine Power - Europe, Inc. Parc Industriel de Petit-Rechain B-4800 Verviers, Belgium

Telephone	Fax	Mail
(954) 744 3500	(954) 744 3535	Mercury Marine - Latin America & Caribbean 11650 Interchange Circle North, Miramar, FL 33025 U.S.A.
(81) 53 423 2500	(81) 53 423 2510	Mercury Marine - Japan 283-1 Anshin-cho Hamamatsu, Shizuoka 435-0005 Japan
(65) 6546 6160	(65) 6546 7789	Mercury Marine Singapore 72 Loyang Way , 508762 Singapore

Ordering Literature

Before ordering literature, please have the following information about your power package available:

- Model
- Serial Number
- Horsepower
- Year built

United States and Canada

For information on additional literature that is available for your particular Mercury MerCruiser power package and how to order that literature contact your nearest dealer or contact
Mercury Marine Publications
P.O. Box 1939
Fond du Lac, WI 54936-1939
(920) 929-5110
Fax (920) 929-4894

Outside The United States and Canada

Contact your nearest dealer or Marine Power Service Center for information on additional literature that is available for your particular Mercury MerCruiser power package and how to order that literature.

Please return with payment to:
Mercury Marine
Attn: Publications Department
W6250 West Pioneer Road
P.O. Box 1939
Fond du Lac, WI 54936-1939

Ship To: (Please Print Or Type - This Is Your Shipping Label)

Name

Address

City State ZIP

TILLEGG / APPENDIX C

N Brannslokkingssystem

S Brandsläckarsystem

DK Brandslukningssystem

NL Brandblussysteem

D Feuerlöschsystem

GB Fire extinguisher

FIN Palonsammutuslaitteista

ASKELADDEN

(FIN) Käyttöohjeet

923 896– 05 2059

Turvaohjeet

Lue nämä käyttöohjeet huolellisesti. Neuvo ohjeiden perusteella myös muita käsisammuttimen käyttäjiä. Käyttöohjeet on luettava ennen kuin sammutin sijoitetaan / asennetaan paikalleen tai ennen sen käyttöönottoa.

- Käsisammuttimia koskevia kansallisia asetuksia ja määräyksiä tulee ensisijaisesti noudattaa!
- Käyttäjät on mahdollisuuksien mukaan opetettava käyttämään sammutinta. Sen väärinkäytöstä aiheutuviin vaaroihin on kiinnitettävä huomiota. Sammutin ei saa joutua lasten käsiin!
- Tarkoituksenmukainen käyttö on sallittu sammuttimessa olevan kuvakkeilla varustetun käyttöohje-etiketin mukaan.
- Sammutesuihkua ei saa suunnata henkilöitä kohti. Jos sammutetaan henkilöpaloa, esim. palavia vaatteita, tulee henkilöön pitää yhden metrin vähimmäisetäisyys.
- **Käsisammuttimen avaaminen ja kunnossapitotyöt on sallittu ainoastaan Turvatekniikan keskuksen (TUKES) hyväksymälle sammutinhuoltoliikkeelle. Kunnossapitotöissä tulee aina noudattaa voimassa olevia mallikohtaisia tarkastus- ja huolto-ohjeita.**
- Toiminnan harjoittajan tehtävänä on määritellä laitteen elinikä. Määrittelyn tulee perustua vaara-analyysiin, jossa on otettava huomioon käyttöolosuhteet. Mahdollisesta materiaalin väsymyksestä johtuen suosittelemme, että eliniän määrittelyssä ei ylitetä 20:tä vuotta.
- Painemittarilla varustetut sammuttimet: Jos mittarin osoitin on punaisessa kentässä pitää sammutin toimittaa huoltoon.
- Säiliö on paineen alainen. Käsisammutinta ei saa käsitellä väkivaltaisesti eikä sitä saa avata väkisin.
- Jos säiliö tai sen hallintalaitteet ovat vioittuneet tai ruostuneet, tulee laite antaa ammattihenkilön korjattavaksi.
- Käsisammutinta ei saa muuttaa esim. hitsaamalla tai juottamalla säiliötä.
- Käsisammutin on pidettävä puhtaana. Puhdistukseen on käytettävä kosteaa pyyhettä, ei aggressiivisia puhdistusaineita.
- Säiliötä saa käyttää ainoastaan käsisammuttimen säiliönä.
- Käsisammutinta ei saa jättää auringonpaisteeseen eikä muutenkaan auringon vaikutuksen alaiseksi.
- Sammutin tulee toimittaa jätehuoltoon täydellisesti tyhjennettynä ja paineettomana, jätehuollon saa suorittaa ainoastaan tähän tehtävään hyväksytty yritys.
- Ajoneuvossa sammutin on aina kiinnitettävä pidikkeisiin. Ainoastaan valmistajan suosittelemien pidikkeiden käyttö on sallittu. Sammutin tulee kiinnittää siten, ettei tärinä tai liike aiheuta sille vahinkoja ja kiinnityksen tulee estää laitteen tahaton irtoaminen.
- Käsisammuttimen saa luovuttaa toiselle henkilölle ainoastaan käyttöohjeen kanssa!
- Sammutinsäiliöt Ø 150 mm alkaen: Suurin paineen muutos 0 bar - 23 bar, maks. kuormituksen muutos 500
- Sammuttimien säiliöt Ø 110 mm asti: Suurin paineen muutos 0 bar - 18,5 bar, maks. kuormituksen muutos 500

Sammutteella varustetun käsisammuttimen toiminnallis-tekniset tiedot (käyttäjän tiedot)

Säilytyslämpötila (sammutekohtainen): katso laitteeseen kiinnitettyä käyttöohje-etikettiä

Nimelliskäyttöpaine (paineellinen käsisammutin) +20°C tai ponnekaasu (ponnepullollinen käsisammutin): katso laitteeseen kiinnitettyä käyttöohje-etikettiä

Sammuttimeen kiinnitetyn käyttöohje-etiketin tiedot kuten nimelliskäyttöpaine, sammutemäärä tai ponnekaasumassa koskevat käyttövalmista, sammutteella varustettua käsisammutinta. Näitä arvoja on ehdottomasti noudatettava.

Valmistusvuosi ja –numero, ks.säiliössä oleva stanssaus.

(N) Bruksanvisning

Sikkerhetsforskrifter

Les grundig gjennom denne bruksanvisning og gi informasjonene videre til eventuelle andre brukere av brannsluknings-apparatet. Les gjennom bruksanvisningen før oppsetting/montering på bruksstedet, resp. før første gangs bruk.

- Siste utgave av Nasjonale forskrifter for vedlikehold av brannslokkere må behandles som en prioritert oppgave.
- I den grad det er mulig må brukeren være fortrolig i omgang med brannslukningsapparater og være gjort oppmerksom på farene ved misbruk. Mindre barn skal holdes borte fra slukningsapparatene!
- Hensiktsmessig bruk ifølge påtrykt tekstbilde med bildesymbol.
- Strålen med slukningsmiddel må ikke rettes direkte på personer. Det må holdes en minsteavstand på 1 m ved slukking av antente personer.
- **Bare personer med godkjent sertifikat (personer med godkjenningskurs fra produsent og/eller autorisert firma og bestått eksamen) kan åpne eller foreta reparasjoner/service på brannslokkere i flg. vedlikeholdsinstruks.**
- Operatøren skal fastslå apparatens levetid ved hjelp av en fareanalyse. Dette skal skje under reale driftsbetingelser. På grunn av en mulig materialtretthet anbefaler vi på det sterkeste at levetiden ikke overskrider 20 år.
- Brannslokker med manometer: Dersom viseren befinner seg på rødt felt, må denne slokkeren kontrolleres før bruk.
- Beholderen kan stå under trykk, ikke utsett brannslukningsapparatet for kraftpåvirkning utenfra, ikke bruk makt ved åpning av apparatet.
- Skadet eller korroderte beholdere og armaturer skal erstattes av en sakkyndig person.
- Det må ikke foretas noen endringer, f. eks. ved sveising eller lodding på beholderen.
- Hold brannslukningsapparatet rent, ikke bruk aggressive rengjøringsmidler, rengjør bare med en fuktig klut.
- Beholderen må bare brukes som brannslukningsapparat.
- Ikke utsett apparatet for direkte sollys og -påvirkning.
- Brannslukningsmiddel og fullstendig tomt trykkløst brannslukningsapparat avhendes kun av sertifiserte avhendingsbedrifter.
- I kjøretøy skal brannslukningsapparatet alltid være festet. Det skal kun brukes holdere som er anbefalt av produsenten. Brannslukningsapparatet festes slik at det ikke blir skadet eller revet ut av holderen. Dette gjøres pga. vibrasjoner hhv. bevegelser som kan oppstå.
- Bruksanvisning må følge med når brannslukningsapparater gis videre til tredjemann!
- Brannslokker fra beholder Ø 150 mm: Full trykkveksling 0 bar til 23 bar, maks. 500 lastveksling
- Brannslokker til beholder Ø 110 mm: Full trykkveksling 0 bar til 18,5 bar, maks. 500 lastveksling

Funksjonstekniske data for brannslukningsapparatet med slukningsmiddel (bruksdata)

Funksjonstemperatur-området (vedr. slukningsmiddel): se tekstbilde/bildesymbol

Nominelt driftstrykk (konstant trykk/slukningsapparat) ved + 20°C eller drivgassmengde (opplading/brannslukningsapparat): se tekstbilde/bildesymbol

De data som er angitt på tekstbildet, og som refererer seg til apparatet, som funksjonsområde, nominelt driftstrykk, slukningsmiddelmengde, drivgassmengde, resp. -trykk, gjelder for driftsklart brannslukningsapparat med slukningsmiddel. De oppgitte verdier må absolutt overholdes og må under ingen omstendighet over- resp. underskrides! Produksjons år og produksjons nummer se preging på beholder.

(S) Bruksanvisning

Säkerhetsanvisningar

Läs igenom den här bruksanvisningen noggrant och lämna informationerna vidare till andra tänkbara användare av brandsläck

Det ska ske innan den ställs upp/monteras på sin plats, alternativt innan de används för första gången.

- Beakta gällande nationella föreskrifter vid underhåll av brandsläckaren.
- Om möjligt, informera användarna om hur brandsläckare används och kl riskerna vid missbruk. Håll småbarn borta från brandsläckare.
- Den riktiga användningen beskrivs med instruktionstext och illustration p brandsläckaren.
- Rikta inte släckmedelsstrålen direkt på en person. Håll minst 1 meters säkerhetsavstånd vid släckning av brinnande kläder på en person.
- **Underhåll, omladdning samt öppning av brandsläckaren får endast utföras av utbildad serviceman samt i enlighet med senaste version tillverkarens instruktioner.**
- Apparatens livslängd måste fastställas av användaren baserat på en riskutvärdering under iakttagande av driftsvillkoren. Grundat på möjlig materialutmattning rekommenderar vi starkt att inte överskrida en livsläng 20 år.
- Brandsläckare med manometer. Om manometer står på rött skall släckar omgående åtgärdas.
- Behållaren kan stå under tryck. Utsätt den inte för våld utifrån och öppna inte heller med våld.
- Låt en sakkunnig servicetekniker byta ut skadade eller rostiga behållare respektive armaturer.
- Det är inte tillåtet att göra några förändringar, t ex att svetsa eller löda, på behållaren.
- Håll brandsläckaren ren. Använd inga aggresiva rengöringsmedel, utan r den bara med en fuktig trasa.
- Behållaren får endast användas som brandsläckarbehållare.
- Utsätt den inte för direkt solljus eller solpåverkan.
- Låt endast erkända avfallshanteringsföretag ta hand om släckmedel och tömda trycklösa brandsläckare.
- Sätt alltid fast brandsläckaren ordentligt i fordon. Använd bara fästen som rekommenderats av tillverkaren. Fäst brandsläckaren så att den inte skad förväntade vibrationer och rörelser eller t.o.m. faller ur fästet.
- Överlämna aldrig brandsläckaren till tredje person utan den här bruksanvisningen
- Brandsläckare med ytterdiameter från 150 mm: Full tryckväxling från 0 ba 23 bar, max 500 lastväxlingar
- Brandsläckare med ytterdiameter till 110 mm: Full tryckväxling från 0 bar 18,5 bar, max 500 lastväxlingar

Funktionsteknisk data om brandsläckaren inklusive släckmedel (användardata)

Funktionstemperaturområde (släckmedelsrelaterad):se anvisning på släckar

Nominellt drifttryck vid +20°C eller drivgasvolym (omladdningssläckare): (gä tryckladdad släckare): se anvisning på släckaren

De på brandsläckarens etikett angivna uppgifter om funktionsområde, nomi drifttryck, släckmedelsmängd, drivgasvikt resp -tryck gäller för en driftklar brandsläckare inklusive släckmedel. De uppförda värdena måste absolut följ och får aldrig över- eller underskridas! Tillverkningsår och tillverkningsnumm framgår av behållarens prägling.

(DK) Betjeningsvejledning

Sikkerhed

⚠ Denne driftsvejledning skal gennemlæses omhyggeligt, og oplysningerne skal gives videre til eventuelle andre brugere af brandslukkeren. Driftsvejledningen skal læses før opstilling / montage på bestemmelsesstedet resp. før første anvendelse.

- Vedrørende anvendelse af håndildslukkere har nationale bestemmelser i de til enhver tid gyldige udgaver altid forrang.
- Hvis det er muligt, skal brugerne instrueres i håndtering af brandslukkere og oplyses om risikomomenter ved misbrug. Småbørn skal holdes væk fra brandslukkere!
- Bestemmelsesmæssig anvendelse ifølge påtrykt tekst med piktogrammer.
- Slukningsmiddelstrålen må ikke rettes direkte mod personer. Ved bekæmpelse af ild på brændende personer skal der holdes en minimumsafstand på 1 meter.
- **Kun personer, som har gennemgået special kurser hos fabrikanten eller importøren, må foretage årligt serviceeftersyn, fyldning og periodisk undersøgelse. Det er endvidere en betingelse, at det firma, som personen er ansat hos, er i besiddelse af de til enhver tid gyldige genopladningsmanualer for de forskellige modeller.**
- Apparatets levetid skal fastlægges af den driftsansvarlige på baggrund af en risikovurdering, som skal tage højde for driftsbetingelserne. Vi anbefaler indtrængende, at en levetid på 20 år ikke overskrides, da der kan opstå materialetræthed.
- Ildslukkere med manometer: Såfremt viseren på manometeret befinder sig i det røde område, skal ildslukkeren omgående bringes i funktionsduelig stand igen (repareres).
- Beholderen kan være under tryk, og brandslukkeren må derfor ikke udsættes for vold eller åbnes ved anvendelse af vold.
- Beskadigede eller korroderede beholdere eller armaturer skal udskiftes af en sagkyndig person.
- Der må ikke udføres ændringer på beholderen, f.eks. ved svejsning eller lodning.
- Hold beholderen ren, og undgå brug af aggressive rengøringsmidler. Al rengøring skal ske med en fugtig klud.
- Beholderen må kun anvendes som beholder for brandslukker.
- Må ikke udsættes for direkte sollys og -påvirkning.
- Lad kun anerkendte destruktionsvirksomheder bortskaffe slukningsmidlet og de helt tømte, trykløse brandslukkere.
- Brandslukkerne skal altid anbringes fast i køretøjet. Brug kun holdere, som er anbefalet af producenten. Fastgør brandslukkerne, så de ikke beskadiges på grund af vibrationer eller bevægelser, som kan forventes, eller endog kan falde ud af holderen.
- Brandslukkere må kun videregives med tilhørende betjeningsvejledning.
- Ildslukkere med en diameter på Ø 150 mm: Fuldt trykskift 0 bar til 23 bar, maks. 500 belastningsskift
- Håndildslukkere med beholder maks. Ø 110 mm: Fuldt trykskift 0 bar til 18,5 bar, maks. 500 belastningsskift

Funktionstekniske data for brandslukker med slukningsmiddel (brugerdata)

Funktionstemperaturområde (afhængigt af slukningsmiddel): Se påtrykt tekst / piktogram
Nominelt driftstryk (brandslukker med permanent tryk) ved +20°C: Se påtrykt tekst / piktogram eller drivgasmasse (opladelig brandslukker): Se påtrykt tekst / pictogram . De i den påtrykte tekst anførte udstyrsspecifikke data som funktionsområde, nominelt driftstryk, slukningsmiddelmængde, drivgasmasse resp. -tryk gælder for driftsklar brandslukker med slukningsmiddel. De anførte værdier skal altid overholdes og må under ingen omstændigheder over- eller underskrides! Fremstillingsår og beholdernummer er præget i beholderen.

(LT) Naudojimo instrukcija

Saugos nuorodos

⚠ Atidžiai perskaitykite visą šią naudojimo instrukciją ir informaciją taip pat perduokite kitiems potencialiems gesintuvo naudotojams. Prieš gesintuvo įrengimą ar sumontavimą paskirties vietoje bei prieš jį naudojant pirmą kartą, būtina perskaityti šią naudojimo instrukciją.

- Dirbant su gesintuvais pirmiausia vadovaujamasi tai reglamentuojančiais nuostatais.
- Asmenims, kurie susiduria su gesintuvu ar jį naudoja, kylanti rizika turi būti sumažinta iki minimalios, kiek tai įmanoma. Saugokite gesintuvą, kad jo nepasiektų vaikai!
- Naudokite gesintuvą vadovaudamiesi informaciniais paveikslėliais su piktogramomis.
- Nenukreipkite purškiamų miltelių srovės tiesiai į asmenį. Gesinant degantį asmenį, tarp jo ir gesintuvo turi būti ne mažesnis negu 1 metro atstumas.
- **Atidaryti bei atlikti gesintuvo aptarnavimo darbus gali tik atitinkamą kvalifikaciją turintys asmenys (gesintuvų gamintojų specialiai apmokytas personalas, pvz., įgalioti klientų aptarnavimo darbuotojai), laikantis naujausių priežiūros nurodymų.**
- Prietaiso eksploatavimo trukmę naudotojas turi nustatyti pagal pavojingumo įvertinimą, atsižvelgdamas į eksploatavimo sąlygas. Dėl galimo medžiagų nuovargio primygtinai rekomenduojame nustatyti ne ilgesnę, kaip 20 metų eksploatavimo trukmę.
- Ugunsdzėšamais aparāts ar manometru: Kad spiediena rādījums atrodas sarkanajā zonā, ugunsdzēšamais aparāts ir nekavējoties jāsalabo
- Gesintuvo korpusas atlaiko slėgį; nepažeiskite jo išoriniais veiksmais, atidarydami nenaudokite jėgos.
- Sugedusius arba korozijos pažeistus balionus bei armatūrą turi pakeisti kvalifikuotas specialistas.
- Gesintuvo negalima modifikuoti, pavyzdžiui, lituojant jo korpusą.
- Pasirūpinkite, kad gesintuvas visada būtų švarus, valydami naudokite tiktai neagresyvias valymo priemones, valykite tiktai drėgnu skudurėliu.
- Korpusą galima naudoti tiktai kaip gesintuvo korpusą.
- Nelaikykite gesintuvo vietose, veikiamų tiesioginių saulės spindulių.
- Gesinamąsias priemones ir sukomplektuotus tuščius gesintuvus, kuriuose nėra padidinto slėgio, leidžiama utilizuoti tik įgaliotoms atliekų tvarkymo įmonėms.
- Gesintuvus automobilyje visada tinkamai pritvirtinkite. Naudokite tik gamintojo rekomenduojamus laikiklius. Gesintuvus pritvirtinkite taip, kad jų nesugadintų tikėtina vibracija ir judėjimas, ir kad jie neiškristų iš laikiklių.
- Tretiesiems asmenims gesintuvą visada perduokite kartu su jo naudojimo instrukcija!
- Ugunsdzēšamie aparāti no konteinera Ø 150 mm: Slėgio pasikeitimas nuo 0 barų iki 23 barų, maks. 500 kartų
- Ugunsdzēšamie aparāti līdz konteinera Ø 110 mm: Slėgio pasikeitimas nuo 0 barų iki 18,5 barų, maks. 500 kartų

Miltelinių gesintuvų funkciniai techniniai duomenys (naudojimo duomenys)

Veikimo temperatūros diapazonas (milteliams): žr. iliustraciją / piktogramą
Darbinis slėgis (nenutrūkstamo veikimo slėgio veikiamiems gesintuvams) esant +20°C temperatūrai: žr. iliustraciją / piktogramą
arba išstūmimo priemonės masė (pripildomiems gesintuvams): žr. iliustraciją / piktogramą
Iliustracijoje pateikiami nuo įrenginio priklausantys techniniai duomenys, pavyzdžiui, veikimo temperatūros diapazonas, darbinis slėgis, miltelių masė, išstūmimo priemonės masė ar slėgis, galioja paruoštiems naudoti milteliniams gesintuvams. Nurodytų reikšmių laikytis privaloma ir jokiu būdu negalima viršyti ar nesiekti! Pagaminimo metai ir numeris įspausti ant baliono.

(EW) Kasutusjuhend

Ohutusjuhend

⚠ Lugege see kasutusjuhend hoolikalt läbi ja edastage see informatsi teistele võimalikele tulekustuti kasutajatele. Enne ettenähtud kohale paigaldamist / monteerimist või esmakordset kasutuselevõttu lugeda see kasutusjuhend läbi.

- Pagaminimo metai ir numeris įspausti ant baliono
- Kui võimalik, tuleb tulekustuti kasutajaid instrueerida ja nende tähelepanu juhtida väärkasutuse ohutudele. Väikesed lapsed tuleb tulekustutitest eem hoida!
- Sihipärane kasutamine vastavalt pealetrükitud kirjadele ja piktogrammide
- Kustutusjuga mitte suunata otse inimestele. Põlevate inimeste kustutamis peaks kinni pidama 1 meetrisest minimaaldistantsist.
- **Avada ja hooldustöid tohib teha ainult tulekustutite tootja poolt erikoolituse saanud personal (näiteks volitatud klienditeenindus) uu hooldusjuhendi alusel.**
- Seadme tööea peab kasutaja määrama kindlaks ohu hindamise teel, arvestades töötingimusi. Materjali võimaliku väsimise tõttu soovitame tun mitte ületada 20 aasta pikkust tööiga.
- Manomeetriga tulekustutid: Kui rõhunäit asub punasel alal, siis tuleb kust viivitamatult remonti saata.
- Mahuti võib olla rõhu all, mitte rakendada väljastpoolt jõudu tulekustuti ka ega jõuga avada.
- Laske kahjustatud või roostes anumad või armatuurid asjatundja poolt asendada.
- Mahuti juures ei tohi teha muudatusi näit. keevitada või joota.
- Tulekustuti hoida puhtana, mitte kasutada kangeid puhastusvahendeid, puhastada ainult niiske lapiga.
- Mahutit võib kasutada ainult tulekustuti mahutina.
- Hoida otsese päikesekiirguse ja –mõju eest.
- Kustutusvahendeid ja täielikult tühjendatud rõhuvabasid tulekustuteid tohi lasta käidelda ainult tunnustatud käitlemisettevõtete poolt.
- Kinnitage tulekustutid sõidukites alati kindlalt. Kasutage ainult tootja poolt soovitatud hoidikuid. Kinnitage tulekustutid nii, et oodatavad vibratsioonid liikumine ei kahjustaks neid ega päästaks neid hoidikust välja.
- Tulekustutit võib kolmandatele isikutele edasi anda ainult koos kasutusjuhendiga!Tretiesiems asmenims gesintuvą visada perduokite kart jo naudojimo instrukcija!
- Tulekustutid alates mahuti Ø 150 mm: Täielik rõhumuutus 0 kuni 23 baari, maksimaalne koormuse muutus 500
- Tulekustutid, mahuti kuni Ø 110 mm: Täielik rõhumuutus 0 kuni 18,5 baari maksimaalne koormuse muutus 500

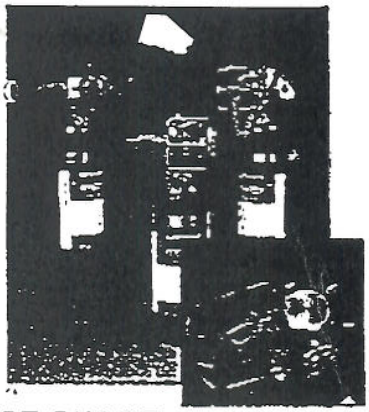
Töötehnilised andmed tulekustutile kustutusvahendiga (kasutajaandmed)

Töötemperatuuriala (kustutusvahendist sõltuv): vaata pealiskirja / piktogramm
Nominaaltöörõhk (pidevsurvekustuti) +20°C juures: vaata pealiskirja / piktogr
või gaasi mass (laaditav tulekustuti): vaata pealiskirja / piktogrammi
Pealiskirjas toodud seadmele vastavad andmed näit. tööpiirkond, nominaaltöörõhk, kustutusvahendi kogus, gaasi mass või rõhk kehtivad tööva tulekustutitele kustutusvahendiga. Nimetatud väärtusi tuleb kindlasti arvestad neist tuleb igal juhul kinni pidada! Tootmisaastat ja seerianumbrit vaadake jäljendilt balloonil.

"FG" MODELL BRANNSLUKKERE

INSTALLASJON INSTRUKSJON OG EIERS BRUKSANVISNING

DENNE BRUKSANVISNINGEN ER EN INTEGRERT DEL AV BRANNSLUKNINGSSYSTEMET OG DERFOR MÅ BRANNSLUKKEREN BLI INSTALLERT OG VEDLIKEHOLDT I OVERENSSTEMMELSE MED DENNE INSTRUKSJON.



GODKJENDT AV U.S. COAST GUARD **GODKJENDT AV FM**

LES HELE DENNE INSTRUKSJONEN MED ADVARSLER OG BEGRENSNINGER FØR MONTASJESTART. ANLEGGET PASSER TIL BRUK MELLOM -18 GRADER C TIL + 54 GRADER C

ADVARSEL

KONSENTRERT BRANNSLUKKNINGSGASS OG BIPRODUKTER SOM OPPSTÅR AV BRANN OG BRANNSLUKKNING ER GIFTIGE.
UNNGÅ INNÅNDING AV OS SOM OPPSTÅR UNDER BRANN.
UHELL SOM RESULTERER I AT APPARATET UTLØSES UNDER HÅNDTERING ELLER MONTASJEN KAN RESULTERE I ALVORLIGE SKADER.
FØR DET I DET HELE TATT GJØRES FORSØK PÅ INSTALLASJON AV BRANNSLUKKINGS UTSTYRET, LES ALT ANGÅENDE INSTRUKSJON, ADVARSLER OG BEGRENSNINGER SOM DENNE BRUKSANVISNINGEN INNEHOLDER.
ENHETEN MÅ ALDRI LØFTES, BÆRES ELLER HÅNDTERES I BRANNFØLEREN (DETEKTOREN). DETEKTOREN ER VISUELT BESKREVET I FIG. 4 I DENNE BRUKSANVISNINGEN. APPARATET MÅ IKKE KASTES. MÅ HOLDES VEKK FRA VARME. SKAL HOLDES VEKK FRA BARN.

HA ALLTID BRUKSANVISNING TILGJENGELIG SOM BRUKER REFERANSE FOR OPERATØREN.

SEA-FIRE FG AUTOMATISK BRANNSLUKKER INSTALLASJON OG VEDLIKEHOLDS VEILEDNING

ANVENDELSE

FM -200*. brannslukkings gass, brukt i alle SEA -FIRE "FG" serien slukkere, er en EPA godkjent , ren, omgivelsesvennlig, ikke korrosiv gass som ikke krever rengjøring etter bruk. Når den blir brukt med riktig beregnet mengde, er den ufarlig og anbefalt for vanlig bebodde områder.
Disse egenskaper og konstruksjonens allsidige muligheter gjør at "FG" serien med slukkere er ideelle i et stort bruksområde som inkluderer maritim, kommersiell. industriell og privat bruk, hvor brennbare flytende væsker kan være en mulig brannårsak.
SEA-FIRE "FG" serien med slukkere har passert et strengt testprogram av Factory Mutual Research Corp. (FM) og United States Coast Guard (USCG) og er blitt godkjent til bruk innenfor de områder de er konstruerte for.

SEA-FIRE Modellen "FG" Automatic FM 200 brannslukkere er spesielt konstruert til å slukke branner i maritime fritidsbåter og båter med uinspiserte motorrom med bensinmotorer.
SEA -FIRE "FG" brannslukkere er konstruert for å tilføre et minimum av brannslukkende gass på 7,8% i det avlukkede rommet.*
Spesifikasjonstabellen i denne bruksanvisningen lister opp maksimum anbefalt romvolum tillatt for hver modell. Volumet kan bestemmes ved å gange rommets lengde x bredde x høyde som vil gi volumet i kubikkfot eller kubikkmeter (L x B x H = V).
Kontroller at det utstyret som skal installeres er i overensstemmelse med spesifikasjonstabellen.

INSTALLER ALDRI EN ENHET SOM ER BEREGNET FOR ET MINDRE ROM ENN VOLUMET AV DET ROMMET SOM SKAL BESKYTTES. TREKK IKKE FRA FOR MOTORER, TANKER ELLER ANNEN UTRUSTNING.

*Referanse: NFPA - 2001 National Fire Protection Assoc. Boston, MA

FUNKSJON

SEA - FIRE enhetene som er beskrevet i denne bruksanvisningen blir automatisk aktivert av et temperatur aktivert stempel. Aktivering vil skje når det temperaturaktiverte stempel når systemets aktiverings temperatur/ punkt som er vist i spesifikasjons tabellen og på merkelappen festet til hvert apparat. Ved aktivering, som medfølges av et høyt smell og en vislende lyd når brannslukknings apparatet (FM) - 200) blåser ut den ikke elektrisk førende, ikke korrosive gassen, i rommet, og stopper brannprosessen ved å kjøle ned gassen på molekylnivå.
FM-200 som er en effektivt virkende varmetransporterende gass, fjerner bokstavelig varme energien vekk fra flammene slik at forbrenningen ikke kan underholde seg selv.
LUKK IKKE OPP til rommet. La brannslukkningsgassen kvele ilden i flere minutter. Ha en transportabel slukker tilgjengelig og vær forsiktig når rommet åpnes.

UNNGÅ Å PUSTE INN DEN BRENTE GASSEN ETC.

NB. DET ER VIKTIG Å BEHOLDE GASSKONSENTRASJONEN I ROMMET FOR Å VÆRE SIKKER PÅ AT ALT ER SLUKKET. UNDER SLUKKINGEN SKAL MOTOREN OG ALLE ELEKTRISKE VIFTER VÆRE AVSTENGT.

ELEKTRISK TRYKK BRYTER/ FØLER

SEA-FIRE "FG" brannslukker serien er utstyrt med fabrikkmonterte trykkbrytere som skal overvåke trykket og kan også bli brukt til å kontrollere andre elektriske funksjoner, som stopp av motorer og styring av luft ventilasjons utstyr, o.s.v..

Når man bruker strømsignalet gjennom trykkbryteren, eller mangel på det, til å styre motorstopp, ventilasjons -vifte og -spjeld regulering, alarm etc., må det være koplet slik at det enkelt kan overstyres for tilbakekopling til operativ status.

Trykkbryteren er en enpolet enveis type som normalt er lukket (strøm gjennomgang), når systemet er operativt. Når systemet er i bruk , eller mangler trykk, vil utløserkontakten være åpen, d.v.s ingen strøm gjennomgang.

BRUK ALDRI TRYKKBRYTEREN MED ELEKTRISK BELASTNING OVER DENS SPESIFISERTE KAPASITET.

BRYTER SPESIFIKASJONER

4,0 AMP VED 12 VDC	5,8 AMP VED 120 VAC
2,0 AMP VED 28 VDC	2,9 AMP VED 240 VAC

For anvendelse med krav til større strøm kapasitet se under tilleggsutstyr i denne bruksanvisning eller kontakt fabrikken.

MOTORER OG VENTILASJONS VIFTER

Fortsatt kjøring av motorer og vifter vil uttynne effekten av gassen og det kan resultere i en oppblomstring av brannen/ flammene. Motor(er) og elektriske vifter **MÅ STANSES UMIDDELBART.**

BENSINMOTORER kan stoppes ved å kuttet den elektriske forbindelsen mellom tennings bryterene/ nøkkelene og motorens coiler

Sea- Fire motorintegrert system vil automatisk stoppe motorer og elektriske vifter og hindre at systemet ikke fungerer. Det er tilgjengelig i 12 og 24 volts modeller med 3,4 og 8 kontroll kurser. Se på avdeling for tilleggsutstyr i denne bruksanvisning.

PÅMINNELSE: BRANNSLUKKINGSUTSTYR ER IKKE MENT SOM ET EKSPLOSJONSVERN ELLER SOM EN GARANTI MOT ØDELEGGENDE BRANNER OM BORD. SEA-FIRE SYSTEMET ER MENT Å VÆRE ET SUPPLEMENT TIL DET ANTALL AV PÅKREVDE FLYTTBARE BRANNSLUKNINGS APPARATER OMBORD. UTSTYRET ER KONSTRUERT OG MENT FOR LUKKEDE INSTALLASJONSROM SOM IKKE ER I DIREKTE KONTAKT MED VANN OG VÆR.

INSTALLASJON

LES HELE INSTRUKSJONSVEILEDNINGEN OG NAVNEPLATEN FØR INSTALLASJONEN

Denne installasjonsinstruksjonen er ment å dekke de fleste vanlige installasjoner. Ytterligere teknisk og anvendelses opplysninger kan fåes ved henvendelse: Metalcraft. Inc.,9331 - 1 Philadelphia Road, Baltimore MD 21237, USA, (410) 687 - 5500

ADVARSEL

- **UFORVARENDE UTLØSNING KAN GI ALVORLIGE SKADER**
- **HÅNDTER SYLINDEREN MED EKSTREM FORSIKTIGHET.**
- **BRUK BESKYTTELSESBRILLER**
- **LØFT IKKE SYLINDEREN ETTER MANIFOLDEN ELLER UTLØSER KOMPONENTENE.**
- **INSTALLER IKKE SEA - FIRE SYSTEMET PÅ UNDERSIDEN AV DEKSLER ELLER LUKER SOM KAN BLI SLENGT AVSTED VED EN MULIG EKSPLOSJON.**
- **MONTER IKKE SLUKKEREN HVOR VANN MULIGVIS KAN SAMLES OG DERVED BLOKKERE SENSOREN ELLER FORÅRSAKE KORROSJON**

Trinn 1 Fjern forsiktig brannslukkeren fra kartongen og sjekk visuelt etter transportskade.

Trinn 2 For å forsikre at brannslukkeren er operasjonsklar, må både vekt og trykk på indikatoren kontrolleres mot brannslukkerens spesifikasjoner som er stemplet på navneplaten. Kontroller, og vei brannslukkeren (uten brakett) på en kalibrert vekt før installasjonen. Noter data, vekt og trykk og noter dette hvor det er satt av plass til formålet.

Trinn 3 Velg en plassering for montasje som er så høyt oppe som mulig på skottet i rommet. Vanligvis velges det å plassere detektorens hode nærmest det område der man tror en eventuell brann vil oppstå. Dette vil kunne være ved motorens brennstoffslanger langs motoren ved forgasseren eller bensinpumpen. Når rommet er lite, hold detektorens hode vekk fra eksosmanifolden for å hindre falsk utløsning.

SLANGEKLEMME
LÅSESTROPP

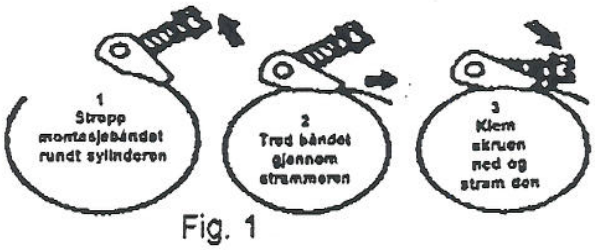


Fig. 1

Trinn 4 Løs monterings braketten fra sylinderen ved å løse stroppene (fig 1) og fjern slukkeren. Selv om detektoren er beskyttet, må det utvises forsiktighet for å unngå skade på detektoren.

Trinn 5 Plasser braketten i ønsket posisjon (Vertikalt - detektorhode opp eller horisontalt se fig 2). Bruk braketten som en merkemal og merk av på skottet og bor hullene. Monter braketten og kontroller at den sitter godt fast med skruene.

ADVARSEL:

NÅR SYSTEMET ER INSTALLERT I HORISONTAL POSISJON, MÅ ALDRI AKTUATOREN (TOPPEN AV SYLINDEREN) VÆRE LAVERE ENN BUNNEN AV SYLINDEREN FORDI DA VIL IKKE ALL GASSEN KUNNE KOMME UT VED TØMMING. (Fig 2).

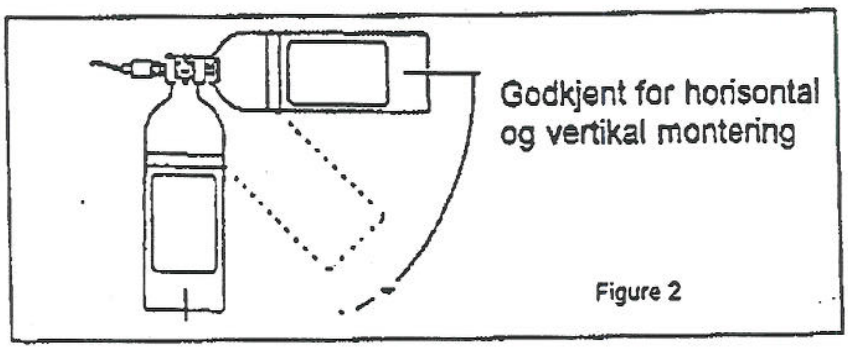


Figure 2

Trinn 6 Fest forsiktig brannslukkeren til braketten. Detektorhodet skal plasseres mot motorsenteret eller mot senteret av rommet. Navneplate skal være synlig. Stram stroppene slik at sylinderkroppen sitter stramt og sikkert montert til braketten.

BRUK AV INDIKATOR LYS

Alle SEA - FIRE brannslukkere godkjent for fritidsbåter og uinspiserte fartøy leveres med indikatorlampe og panelplate. Indikatorlampen (forutsatt at den ikke erstattes av en annen SEA - FIRE løsning) skal installeres for å kunne kontrollere systemet og advare brukere. Når det er riktig montert, vil under vanlige forhold indikatorlampen lyse nå tenningen settes på.
Ved utløsning av systemet vil indikatorlyset umiddelbart slukke. I tilfelle indikatorlampen ikke tenner når tenningen settes på , kontroller følgende.

1. Kontroller at trykkindikatoren viser riktig trykk
2. Kontroller sikring og indikatorlampe og bytt hvis ødelagt. (lampe er tilgjengelig fra fabrikk).
3. Kontroller for løse elektriske forbindelser,.
4. Ta ned brannslukkeren og vei sylinderen som beskrevet i vedlikeholds-delen av veiledningen.

INSTALLASJON AV INDIKATOR LYS

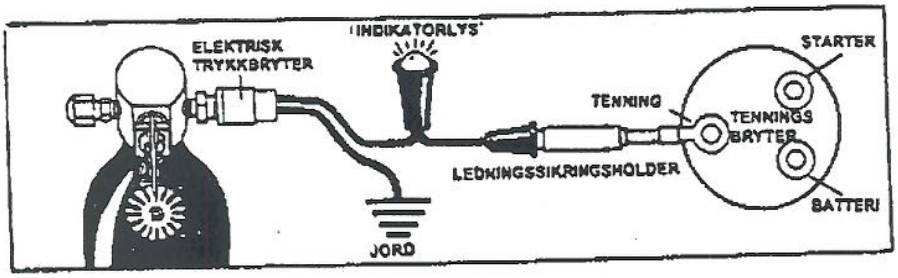
Velg en oversiktlig plass for indikatorlampen på instrumentbordet eller nær dette ved styreposisjonen. Den valgte plasseringen må ha tilgang og plass til elektriske ledninger. Fjern beskyttelsen på kontaktlimstrimmlene på baksiden av indikatordekselet og lim dekselet fast på den utvalgte plass. For skikkelig limkontakt, må overflaten være ren, tørr og temperaturen må være over 10 C . Bruk det ferdige dekselet som boremal og bor forsiktig et 8 mm hull. Monter indikatorlampen ved å trekke ledningene på lampen ned gjennom hullet og press lampen på plass. Indikatorlampen er nå klar til elektrisk montering. (Se Fig. 3).

ADVARSEL: FØR INDIKATORLAMPENS ELEKTRISKE LEDNINGER KOBLES, SKAL STRØMMEN TIL TENNINGEN FRAKOBLES ENTEN VED Å SKRU AV HOVEDBRYTEREN, DEMONTERE SIKRINGEN ELLER KOBLE FRA PLUSS POLEN PÅ BATTERIET. HVIS IKKE ELEKTRISK UTSTYR UNDER OPPKOPLING ER FRAKOPLET DET STRØMFØRENDE ANLEGGET KAN DET RESULTERE I BRANNSKADER ELLER ELEKTRISKE BRANNSÅR.

Indikatorlampen er beregnet for 12 VDC (kontakt fabrikken for andre spenninger). Kabling skal være i overensstemmelse med Amerikansk Båt og Yacht Råds standard E - 9 " Direkte strøm Elektriske Systemer på Båter", kopier kan rekvireres fra ABYC, 3069 Solomon,s Island Road, Edgewater, MD 21037, USA (410) 956 - 1050.

Følgende utstyr som ikke er med levert i ditt SEA - FIRE system bør være for hånden før installasjonen av indikatorlampen starter.

1. Kabel sikringsholder og sikring.
2. Tilstrekkelig lengde med isolert 1,5 kvadrat kabel.
3. Klem forbindelser, kabelsko etc.
4. Klem tang og hånd verktøy.



INSTALLASJON AV SEA - FIRE INDIKATOR LYSE
Fig 3

Fest en av kablene fra ledningssikkringsholderen til en av indikatorlampeledningene. Fest en ny kabel fra den andre enden av ledningssikkringaholderen til tenningsnøkkelterminalen. Forbind den ledige ledningen på indikatorlampen til en av SEA - FIRE apparatets trykkbryterledninger. Den siste trykkbryterledningen festes skikkelig til en felles minus/ jord terminal, til motorblokken eller det kan også være direkte på minus polen på batteriet. (Se Fig.3)

ADVARSEL: HVIS DU PÅ NOEN MÅTE ER I TVIL OM HVORDAN INSTALLASJONEN SKAL UTFØRES, IKKE PRØV. FÅ DET INSTALLERT AV EN GODKJENT SKIPSELEKTRIKER. ELEKTRISKE SYSTEMER VARIERER FRA FARTØY TIL FARTØY OG DENNE INSTRUKSJONEN BEHØVER IKKE Å VÆRE ANVENDELIG FOR DIN INSTALLASJON.

VEDLIKEHOLD

ADVARSEL: PRØV IKKE Å DEMONTER NOEN DEL AV BRANNSLUKKNINGSAPPARATET. BRANNSLUKNINGSAPPARATET ER IKKE BEREGNET VEDLIKEHOLDT AV FORBRUKEREN. Å FJERNE ELLER LØSNE DELER PÅ APPARATET KAN RESULTERE I FARLIGE SKADER.

Kontroller først visuelt for sikkerhetsskyld at indikatorlampen virker, og at sylinder trykkindikatoren viser normalt trykk. Alle brannslukknings systemer som inneholder flytende komprimert gass krever periodisk veiing for å forsikre at apparatet er fulladet.Trykkmåleren viser gassens evne til å tømme apparatet for brannslukningsgass, men ikke mengden av brannslukningsgassen. Brannslukkeren (sylinderen) uten brakett skal veies minst to ganger om året og umiddelbart bytte hvis brutto vekten har minket i forhold til tallet notert på navneplaten.

VÆR OPPMERKSOM: MAL ALDRI PÅ ELLER BLOKKER SYLINDERMANIFOLDEN ELLER SENSORSTEMPELET DA DETTE VIL KUNNE SKADE DEN FORUTSATTE OPERASJONSKARAKTERISTIKKEN.

HUSK:

* **KONTROLLER OFTE AT TRYKKET ER KORREKT**
* **VEI SYLINDEREN FOR Å FORSIKRE AT BRANNSLUKKEREN ER FULLADET**

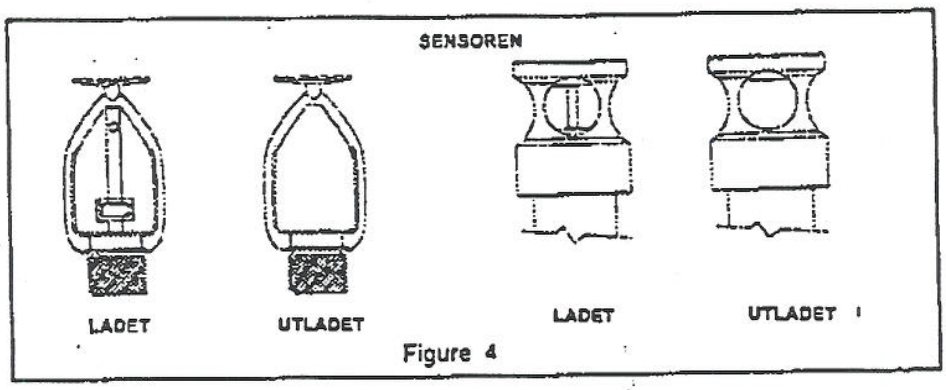


Figure 4

BEGRENSNINGER

SEA - FIRE FG serien FM - 200 automatisk brannslukkingssystem er konstruert og testet til brannslukkings klasse B (Brennbare væsker) for lukkede rom. Enhver åpen dør eller luke vil tillate brannslukkingsgassen å rømme og vil alvorlig påvirke gassens mulighet til å slukke brannen.
Bruk aldri to apparater som hver for seg er for små til å beskytte ett rom. Hvis mer enn ett apparat blir brukt for dekke den nødvendige mengde brannslukningsgass , er det ingen garanti for at apparatene vil aktivere seg samtidig da hver brannslukker arbeider selvstendig. Når mere enn en brannslukker blir brukt for å beskytte ett rom, må hver enkelt brannslukker være stor nok til å dekke hele rommets behov alene.

TILLEGS UTSTYR SDDA MARK I	Panel med audovisuell alarm ved utløsning av brannslukker
ESRS - II	Panel med status indikator og styrings bryter for restart av motor(er). Brukes også sammen med ESRS motor stopp system ved en ekstra nr. 2 stasjon.
ESRS MARK III, V, VIII	Automatisk stopp for motor og motor el. dreven vifte. Inkluderer en kontrollenhet og ett panel ESRS II med visuell alarm, lyd alarm, status indikator og med overstyrings bryter for re start av motoren. Leveres med 3, 5 og 8 kontrollkurser i 12 eller 24 VDC utførelse.
SFAB 12 (24)	Brannutløser alarm klokke (Ø 6" dia. 12 eller 24 VDC).
ESEH -10	10' forlenger kabel til bruk med ESRS stopp system.
ESEH -30	30' forlenger kabel til bruk med ESRS stopp system.

To (2) år "FG " seriens begrenset GARANTI

Vi garanterer til den opprinnnelige førstegangskjøper alle SEA-FIRE modellene FG brannslukkere for en 2 års periode etter kjøpet mot materialdefekter og fabrikasjonsfeil. Forutsatt at kunden har returnert garanti kortet innen (10) dager etter kjøp, vil etthvert system som ikke er i orden innenfor garantiperioden bli erstattet uten kostnader mot forskuds betalt returfrakt av den defekte enheten. Denne garantien gir deg konkrete juridiske rettigheter. Du kan også ha andre rettigheter som vil kunne variere fra land til land.

Den førnevnte garanti er gitt i stedet for alle andre garantier vedrørende systemet innkludert enhver indirekte/ skjult garanti av handelsmessig eller sikkerhet for ett bestemt formål.
Garantien gjelder kun erstatning av brannslukknings systemet og utelukker etthvert tap eller skade på eiendom.

UTEN GARANTI ERSTATTNINGER

SEA-FIRE "FG" sylinderne etterkommer DOT 39 spesifikasjonen og er ikke refyllbare. Den utløste brannslukkeren vil kunne bli erstattet med en tilsvarende SEA-FIRE brannslukker til en nærmere avtalt pris ved motagelsen, mot at returfrakt er betalt for den returnerte brannslukkeren:

SEA-FIRE Marine Prodcts Division of
Metalcraft Inc.
9331 - Philadelhia Road
Baltimore, Maryland 21237 USA

SPESIFIKASJONS TABELLER
SEA-FIRE "FG" SERIEN MED AUTOMATISKE BRANNSLUKKERE

GODKJENT FOR VERTIKAL OG HORISONTAL MONTASJE

MODELL		GODKJENNINGS NUMMER	MAKSIMUM ROM VOLUM	MENGDE FM-200	MONTERINGS MÅL DIA x HGT
AUTOMATISK	MANUELL & AUTOMATISK	*COAST GUARD CERTIFICATE*	KUBIKK FOT/ METER	*LBS KGS*	*IN CM*
FG50A	FG50M	162.029/130/0	50 1.4	1.9 0.9	3.1x12 8x30
FG75A	FG75M	162.029/131/0	75 2.1	2.9 1.3	3.1x15 8x38
FG100A	FG100M	162.029/132/0	100 2.8	3.8 1.7	3.5x15 9x38
FG125A	FG125M	162.029/133/0	125 3.5	4.8 2.2	4.1x15 10x38
FG150A	FG150M	162.029/134/0	150 4.2	5.7 2.6	4.1x15 10x38
FG175A	FG175M	162.029/135/0	175 5.0	6.7 3.1	5.1x16 13x41
FG200A	FG200M	162.029/136/0	200 5.7	7.6 3.5	5.1 X 16 13x41
FG225A	FG225M	162.029/137/0	225 6.4	8.5 3.9	5.1x16 13x41

Temparatur arbeidsområde: 0 grader til 130 grader F, (-18 grader C til +54 grader C)
Utløser temperaturer FG 50 & FG 75 212 grader F (100 grader C)
FG 100 til FG 225 165 grader F (74 grader C)

TILLEGGSUTSTYR - MONTASJESETT MED MANUELL UTLØSERKABEL

MODELL	LENGDE	MODELL	LENGDE
SMAC-6	6 FT. / 1.83 M	SMAC-20	20 FT. / 6.10 M
SMAC-8	8 FT / 2.44 M	SMAC-22	22 FT / 6.71 M
SMAC-10	10 FT. / 3.05 M	SMAC-26	26 FT / 7.93 M
SMAC-12	12 FT / 3.66 M	SMAC-30	30 FT / 9.15 M
SMAC-14	14 FT. / 4.27 M	SMAC-36	36 FT / 10.98 M
SMAC-16	16 FT / 4.88 M	SMAC-40	40 FT / 12.20 M
SMAC-18	18 FT. / 5.49 M	SMAC-03	DOBBELT UTLØSER KABEL FESTE

BRANNSLUKKERE MED MANUELL UTLØSER MULIGHET MÅ HA MONTASJESETT MED MANUELL UTLØSERKABEL

MONTERINGSBESKRIVELSE FOR UTLØSERKABEL

BRUKES TIL SEA-FIRE "F" SERIEN'S MANUELLE/ AUTOMATISKE BRANNSLUKNINGSAPPARATER

ADVARSEL
LES ADVARSLENE OG BEGRENSNINGENE FØR INSTALLASJONEN OG FØLG DEM UNDER INSTALLASJONEN.

A. Kontroller at brannslukningssylinderenheten er installert i overensstemmelse med instruksjons veiledningen som følger med brannslukkersystemet.

B. **FOR Å FORHINDRE SKADER VED UØNSKET UTLØSNING MED MANUELL UTLØSERKABEL UNDER INSTALLASJON AV APPARATET, SKAL DET KONTROLLERES AT SIKKERHETSSPLINTEN TIL DEN MANUELLE UTLØSER ARMEN ER SKIKKELIG PÅ PLASS. (Fig 3)**

C. Valg av riktig plassering.
   1. Det manuelle utløserhåndtaket skal aldri plasseres i det brannbeskyttede rommet.

   2.. Plasser utløserhåndtaket ved styreposisjonen, med full oversikt fra og med lett tilgang til av rormannen.

   3. Den valgte plasseringen må være beskyttet mot tilfeldige bevegelser og det kreves minst tolv(12) tommers (305 mm) klaring på baksiden av panelet til utstyr og kabel etc.

   4. Monter ikke utløserkabelen i områder hvor det er lett å komme bort i den. Følg hvor det er praktisk den samme kabeltraseen som båtbyggeren har brukt.

   5. Det samlede antall bøyninger på kabelen må ikke tilsammen overstige 360 grader. Det er det samme som 4 bøy av 90 grader. Utvis meget stor forsiktighet når kabelen bøyes, så den ikke får knekk. Lag aldri en sving/ bue med mindre enn 12 tommer 305 mm radius. Valg av riktig SEA -FIRE kabellengde vil hindre problemer.

D. **MONTERING AV MANUELL UTLØSER KABEL, FRONTPLATE OG UTLØSERHÅNDTAK.**
   1. Bruk det manuelle utløserkabelsettets frontplate som merkemal (Fig 1), merk og bor et 13/32 tommes (10,4 mm) hull. Trekk den manuelle utløserkabelen gjennom den valgte kabeltraseen i overensstemmelse med valget i punkt C over.

   2. **MONTER IKKE UTLØSERKABELEN TIL SYLINDEREN ENNÅ**

   3. Fjern klebe beskyttelsen på baksiden av frontpanelet. Plasser frontpanelplaten for endelig montasje og når den er i posisjon i forhold til hullene, presses den på plass. For å få et godt feste, bør temperaturen være over 50 grader F (10 grader C).

   4. Følg diagrammet i Fig 1. Monter mutteren og låseskive på kabelen og stikk kabelenden gjennom panel og frontpanelhullet. Trekk kabelen maksimalt ut og monter distanserøret ved å skru det på enden av kabelen. Skru det ikke så fast at gjengen dras over. Fire, fem omdreininger er tilstrekkelig.

5. Tre gummi O - ringen inn på kabelen og monter utløserhåndtaket ved å skru det på kabelenden. Skru det ikke fastere enn at hullet for låsepinnen er helt åpent.

6. Trykk håndtaket mot distanserøret. Dette vil plassere O-ring pakningen. Sett sikkerhets splinthullet i håndtaket og i distanserørhullet overett og sett in låsepinnen. (Fig 1).

7. Vend håndtaket til ordet FIRE er loddrett. Håndtaket kan nu låses i denne posisjonen ved å stramme låsemutteren på baksiden av panelplaten.

8. Ta midlertidig vekk låsepinnen og prøv kabelens bevegelse. Kabelen må kunne bevege seg lett og uhindret. Gjeninnsett låsepinnen og sjekk at utløserhåndtaket er i låst posisjon.

9. Låsepinnens låsetråd av rund sterk plast knyttes fast til utløserpinnens øye og rundt utløserhåndttakskaftet. Den løse enden av låsetråden stikkes inn i kabelenden etter først å ha blitt strammet opp. Låsetråden er ment som en sikkerhet mot uønsket utløsning.

10. Nylon sikkerhetstråd brukes for å feste kabelen. Kabelen skal bare klamres der den går rett. Må ikke festes der kabelen går i bøy.

ADVARSEL: BRUK IKKE NYLON FESTESTRIPS SOM LÅSETRÅD TIL LÅSEPINNEN.

ADVARSEL

TILFELDIG UTLØSNING UNDER HÅNDTERING ELLER INSTALLASJON KAN RESULTERE I ALVORLIGE SKADER. FJERN IKKE DEN FABRIKKMONTERTE LÅSEPINNEN FRA SYLINDERAKTUATOREN FØR INSTALLASJONEN ER FERDIG OG KONTROLLERT. BÆR IKKE, HÅNDTER IKKE ELLER LØFT IKKE SYLINDEREN I AKTUATOREN, TRYKKBRYTEREN ELLER LEDNINGENE. BRUK BESKYTTELSESBRILLER UNDER INSTALLASJONEN OG UNDER VEDLIKEHOLD AV SYSTEMET.

E. TILKOPLING AV KABELEN TIL SYLINDEREN (Fig 2 & 3)

1. Før kabelen festes til sylinderen, skal det kontrolleres at sylinderbraketten er riktig plassert og skikkelig montert.

2. Når sylinderen er festet til braketten, skal distanserøret tres helt gjennom hullet i sylindermanifolden. Herved oppnås nødvendig slakk til montering av den bevegelige metalltrådenden i aktuatorens manuelle utløserarm. Etter å ha montert metalltråden i aktuatorens utløserarm, trekkes kabelen tilbake slik at sporet i distanserøret plasseres overett med manifoldsporet. Låseklipset som følger med i kabelsettet monteres for innbyrdes låsing av kabel og manifold. Kabelsystemet må være låst til manifolden, ellers kan det oppstå tilfeldig utløsning.

3. Med forsiktighet skal den fabrikkmonterte låsepinnen frigjøres fra sylinderen. Ta vare på låsepinnen i nylonholderen på flaskehalsen (Fig 3).

4. Det manuelle og automatiske SEA-FIRE brannslokkningsapparatet er nå operativt.

HUSK PÅ:

MONTER ALLTID LÅSEPINNEN I SYLINDERAKTIVATORUTLØSEREN (Fig 3) NÅR DET GJENNOMFØRES SERVICE ELLER REPARASJON AV SYSTEMET. KONTROLLER AT LÅSEPINNEN ER FJERNET ETTER ENDT SERVICE.

MONTASJESETT MED MANUELL UTLØSERKABLER

MODELL	LENGDE	MODELL	LENGDE
SMAC-6	6FT./1,83M	SMAC-20	20FT./ 6,10M
SMAC-8	8FT./2,84M	SMAC-22	22FT./ 6,71M
SMAC-10	10FT./3,05M	SMAC-26	26FT./ 7,93M
SMAC-12	12FT./3,66M	SMAC-30	30FT./ 9,15M
SMAC-14	14FT./4,27M	SMAC-36	36FT./ 10,98M
SMAC-16	16FT./4,88M	SMAC-40	40FT./ 12,20M
SMAC-18	18FT./5,49M	SMAC-D3	DOBBELT UTLØSER-KABEL FESTE

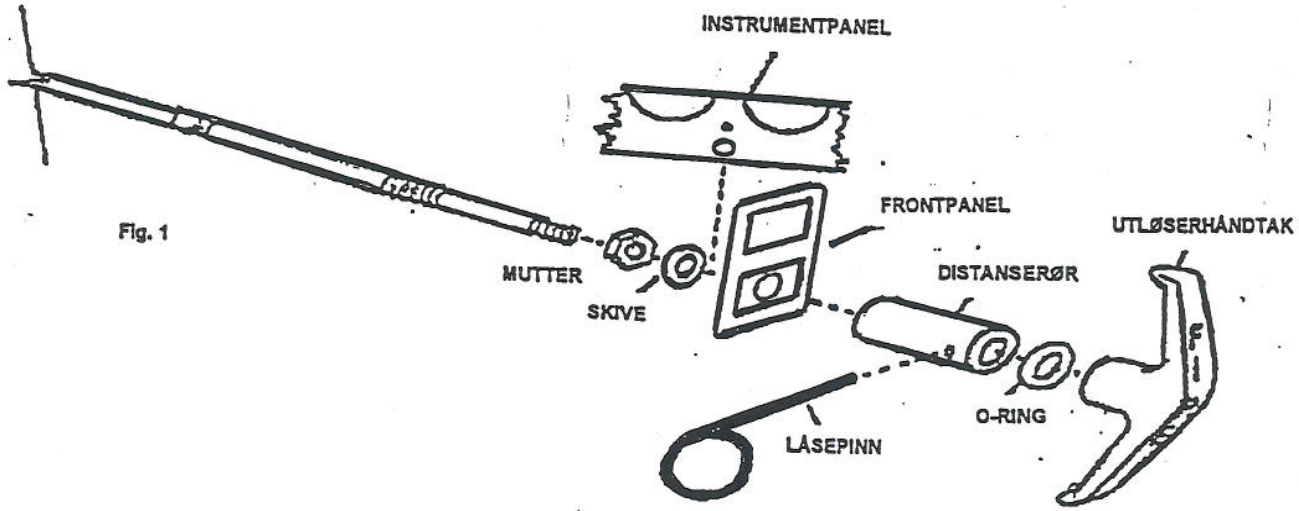


Fig. 1

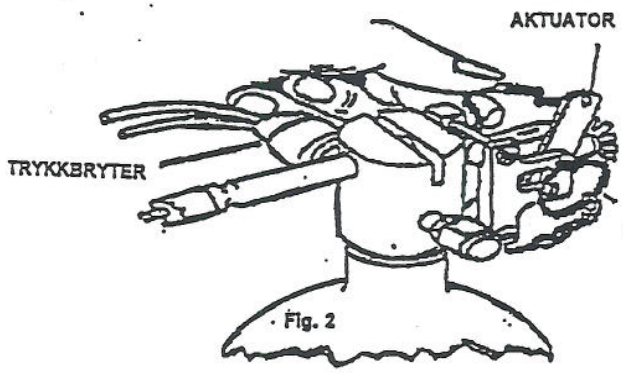


Fig. 2

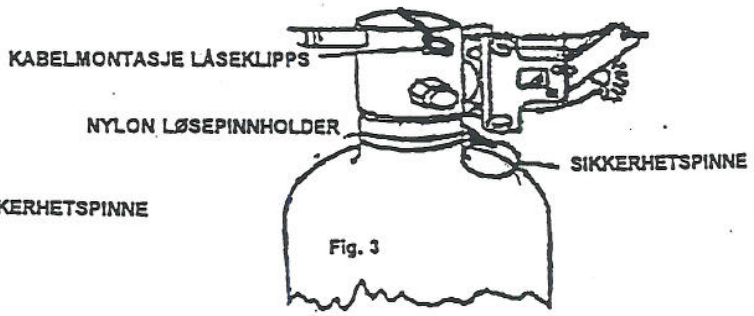
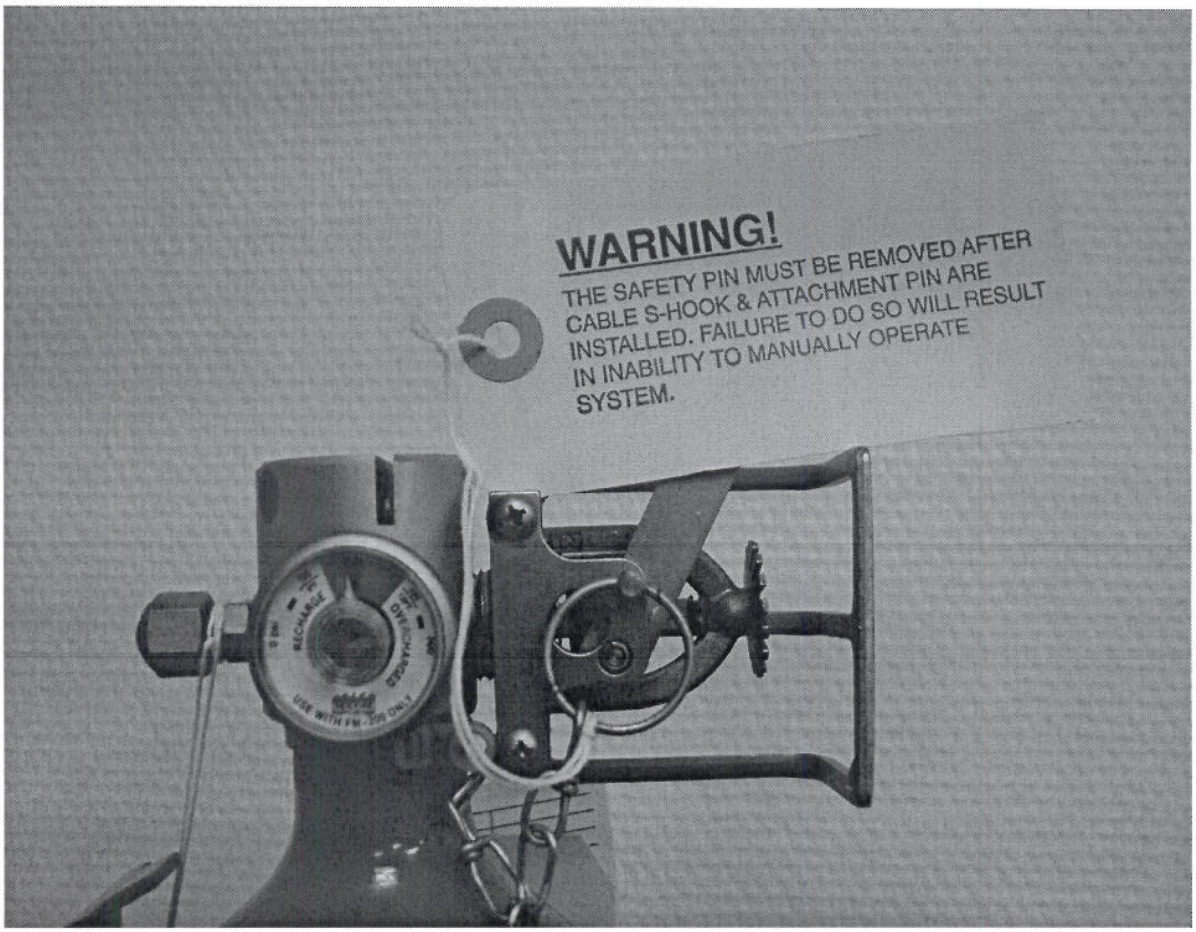


Fig. 3

SEA-FIRE



BRANNSLUKKER I MOTOR_ROM
LÅSEPINN MÅ FJERNES !

FIRE EXTINGUISHER IN ENGINE ROOM
REMOVE SAFETY PIN !

TILLEGG / APPENDIX D

N Kjøleskap

S Kylskäp

DK Køleskap

NL Ijskast

D Kühlschrank

GB Fridge

FIN Jääkaappi

ISTRUZIONI PER L'USO	**Pagina**	**2**
INSTRUCTIONS FOR USE	**Page**	**18**
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MANUAL DE USO	**Página**	**82**
GEBRUIKSAANWIJZING	**Bladzijde**	**97**



INTRODUZIONE

Gentile cliente:

Nel ringraziarLa di aver scelto un nostro prodotto la VITRIFRIGO si augura che Lei possa rimanere completamente soddisfatto dell'acquisto effettuato.

Il presente manuale è considerato parte integrante del frigorifero e deve seguire il percorso di vendita fino all'utilizzatore e che la Vitrifrigo ne vieta la riproduzione di qualsiasi parte.

Ogni frigorifero, prima di lasciare il nostro stabilimento, è sottoposto a severi collaudi e controlli che ne garantiscono il corretto funzionamento.

Per ulteriori informazioni e chiarimenti potrà interpellare i nostri centri assistenza o direttamente i nostri uffici.

Vitri Alceste



AVVERTENZE GENERALI

- Leggere attentamente questo manuale prima di utilizzare il frigorifero.
- Qualora questo apparecchio dovesse sostituirne uno di vecchio tipo si raccomanda di rendere inservibile l'eventuale serratura prima di rottamarlo.
- Verificare che l'imballo sia integro, in caso contrario segnalarlo al trasportatore.
- Procedere allo sballaggio ed alla installazione del prodotto operando con massima cautela; si consiglia, per evitare ferite accidentali, l'uso di guanti protettivi, in particolare per i modelli con unità refrigerante remota (fig. 3).
- Dopo aver sballato l'apparecchio assicurarsi che non sia danneggiato. Eventuali danni devono essere segnalati al rivenditore entro e non oltre le 24 ore dalla data di acquisto.
- Il prodotto deve essere usato esclusivamente per la conservazione di cibi e bevande.
- L'apparecchio deve essere posizionato lontano da fonti di calore assicurando al medesimo sufficiente aerazione (vedi indicazioni successive).
- Si consiglia di attendere almeno un'ora prima di mettere in funzione il frigo per dar modo al circuito refrigerante di essere completamente efficiente.
- Prima di collegare il prodotto verificare che la tensione di rete corrisponda a quanto riportato sulla targhetta di identificazione dell'apparecchio o a quella indicata sulla targhetta posta sul compressore.
- Ad installazione eseguita verificare che l'apparecchio non appoggi sul cavo di alimentazione.
- Per eventuali problemi di funzionamento rivolgersi presso il nostro centro assistenza più vicino; in ogni caso avvalersi di personale qualificato.
- Prima di eseguire qualsiasi operazione di manutenzione o pulizia, disinserire la presa di corrente.
- Evitare di introdurre nel comparto a bassa temperatura liquidi in contenitori di vetro.
- Non gettate l'imballo del vostro apparecchio ma selezionate i materiali secondo le prescrizioni locali relative allo smaltimento dei rifiuti.
- Il presente prodotto non deve essere gettato nei rifiuti urbani ma deve essere smaltito come raccolta separata. Contattare i centri di raccolta Rifiuti Apparecchiature Elettriche ed Elettroniche (RAEE) presenti sul vostro territorio oppure renderlo al venditore all'atto dell'acquisto di un'apparecchiatura nuova equivalente.
- Il prodotto, se non smaltito correttamente, può avere potenziali effetti dannosi sull'ambiente e sulla salute umana dovuti a determinate sostanze presenti al suo interno.
- Il simbolo riportato a fianco  indica che il prodotto non può essere smaltito come rifiuto urbano.
- Lo smaltimento abusivo o non corretto del prodotto comporta sanzioni giuridiche di tipo amministrativo e/o penale severe come previsto dalle leggi vigenti.
- È fatto assoluto divieto di utilizzare il frigorifero per usi diversi da quelli previsti.
- Curare sempre la perfetta pulizia e tenere sempre in efficienza i dispositivi di sicurezza.
- Mantenere libere da ostruzioni le aperture di ventilazione nell'involucro dell'apparecchio e/o struttura da incasso.
- Non rimuovere mai le protezioni (carter) del frigorifero.
- Eseguire sempre le verifiche, i controlli e le manutenzioni programmate descritte in questo manuale.
- L'apparecchio non deve essere esposto alla pioggia.
- Adatto per l'uso nei campeggi.

Informazioni generali

Scopo del manuale

Questo manuale, relativo ai Frigoriferi della serie "INTERIOR (230Vca) / OCEAN-RUNNER (12/24Vcc)", intende fornire una guida per il corretto e sicuro impiego degli stessi e per la loro razionale manutenzione.
Al fine di imparare in breve come far funzionare ed utilizzare il frigorifero in vostro possesso è necessario leggere attentamente questo manuale di uso e manutenzione sin dal primo utilizzo.
Il buon funzionamento del frigorifero dipende anche da una manutenzione efficiente ed efficace. La conoscenza dei lavori di manutenzione è, perciò, necessaria. Le indicazioni per l'uso indicano tutte le operazioni di avvio, di arresto e di funzionamento.
Il frigorifero è stato costruito conformemente a tutti i requisiti di sicurezza previsti dalle direttive in materia, pur tuttavia, la sicurezza massima dell'utente dipende da una attenta lettura di questo manuale e da una pulizia e manutenzione costante ed attenta.
Alcune informazioni o figure di questo manuale potrebbero mostrare dettagli e particolari che possono differenziarsi leggermente da quelle del frigorifero in vostro possesso, senza però che le informazioni essenziali vengano modificate. In base al costante miglioramento, il frigorifero potrà mostrare variazioni che non sono contenute in questo manuale. Eventuali modifiche appariranno, secondo le necessità nelle successive versioni del manuale.

Identificazione del costruttore

Il frigorifero è progettato e prodotto esclusivamente presso la :

Vitrifrigo s.r.l.
Via Della Produzione, 9
61020 Montecchio (PU)
Tel. +39 0721 491080
Fax. +39 0721 497739
E-Mail. vitrifrigo@vitrifrigo.com
www.vitrifrigo.com

DESCRIZIONE DELL'APPARECCHIO (fig.2 e fig.7)

12/24Vcc – 220Vca

A) evaporatore orizzontale
A1) evaporatore verticale
B) gocciolatoio
C) scatola termostato
D) griglie estraibili
E) ripiano in vetro (solo su alcuni modelli)
F) cassetto portafrutta (solo su alcuni modelli)
G) balconcini (estraibili)

12/24Vcc Portatili

A) cestello
B) chiusura cricchetto
C) evaporatore
D) vite fissaggio staffa
E) staffa di fissaggio
F) mascherina con termostato Digitale
G) mascherina con termostato LED
H) termostato manuale (solo C26)
I) interruttore (solo C26)
J) maniglia
K) presa 12/24Vcc – 220Vca

L'etichetta riportante matricola e dati tecnici è posizionata all'interno del frigo nella parte superiore del lato destro. Le prime tre cifre della matricola identificano l'anno e la settimana di costruzione. Tutti i materiali che vengono a contatto con gli alimenti sono conformi alla direttiva 2004/1935/CEE. La rumorosità emessa dalla macchina è minore di 70 dB(A).

INSTALLAZIONE

Assicurarsi che l'apparecchio non sia danneggiato. Eventuali danni di trasporto devono essere segnalati tempestivamente al rivenditore e comunque non oltre le 24 ore successive alla consegna.

Manipolare il prodotto con la massima attenzione. Nel posizionare il gruppo refrigerante (nei modelli di frigoriferi con impianto refrigerante remoto) agire con precauzione onde evitare ostruzioni o rotture sui tubi di collegamento. Posizionare sempre il frigorifero ed il gruppo refrigerante remoto, (nelle versioni con tale soluzione) su piano orizzontale.

Assicurare al gruppo frigorifero sufficiente aerazione predisponendo nel mobile contenitore due aperture, una sul fondo in corrispondenza del gruppo refrigerante, la seconda sulla parte superiore o sulla parte alta del fianco. Tali aperture dovranno avere una superficie non inferiore ai 300 cmq. Qualora non fosse possibile, lasciare un canale di almeno 50 mm fra la parte superiore del frigorifero ed il piano soprastante (vedi fig.5). Installare il frigo lontano da fonti di calore in luogo asciutto e ben aerato.

Lasciare fermo l'apparecchio per almeno un'ora prima di metterlo in funzione. In tale intervallo procedere alla prima pulizia.

PULIZIA DEL FRIGORIFERO

Prima di procedere alla pulizia assicurarsi che il frigorifero non sia collegato all'impianto elettrico. In caso contrario disinserire la spina dalla presa di corrente.

ESTERNO.

Lavare l'esterno del frigorifero con acqua tiepida, ripassare con acqua fredda ed asciugare con un panno morbido. Evitare l'uso di prodotti abrasivi.

INTERNO.

Togliere le griglie (o il cestello), i contenitori e le vaschette per il ghiaccio e procedere alla pulizia utilizzando acqua tiepida con l'aggiunta di bicarbonato di sodio o aceto. Sciacquare ed asciugare accuratamente con un panno morbido. Evitare tassativamente l'uso di prodotti abrasivi, detergenti o saponi.

CONDENSATORE.

E' consigliabile effettuare, almeno una volta l'anno, la pulizia del condensatore (vedi fig.4) per mezzo di una aspirapolvere o di un pennello asciutto.
In caso di prolungato inutilizzo dell'apparecchio, onde evitare la formazione di muffe o cattivi odori, togliere la spina, vuotarlo completamente, procedere alla pulizia dell'interno e lasciare la porta semiaperta.

COLLEGAMENTO ELETTRICO

Questo apparecchio è conforme alle normative 89/336/CEE sulla soppressione dei radiodisturbi. Prima di collegare il prodotto assicurarsi che la tensione di rete corrisponda a quella riportata sulla targhetta di identificazione o a quella indicata sulla targhetta posta sul compressore.

REGOLAZIONE DELLA TEMPERATURA

Ogni frigorifero è equipaggiato di un termostato per il mantenimento automatico della temperatura.

- **TERMOSTATO MECCANICO**
  Per scegliere la temperatura desiderata agire sulla manopola di regolazione.
  Quando la manopola è in posizione '0' o 'STOP' il frigorifero non funziona.
  Spostando la manopola in posizione '1' il frigorifero entra in funzione.
  Ruotando la manopola dalla posizione '1' alla posizione '5' si ottengono temperature sempre più fredde.

  Per schema elettrico vedi fig. 8e/h (12/24V) o fig. 9 (115V/230V)

Alcune versioni di frigoriferi sono equipaggiati con termostati la cui simbologia della regolazione della temperatura si differenzia dalla descrizione sopra, in questi casi fare riferimento alla fig.1. Il raffreddamento del frigorifero aumenta ruotando la manopola in senso orario.

Per una razionale sistemazione e conservazione dei cibi attenersi alla tabella sottostante:

Cibo	Tempo di conservazione	Disposizione nel frigo
Carne e pesce pulito (avvolgere in sacchetti o fogli di plastica).	2 o 3 giorni	Sulla griglia sotto la zona freezer.
Uova.	1 mese	Utilizzare gli scomparti della controporta.
Burro, margarine.	1 settimana	Utilizzare gli scomparti della controporta.
Cibi cotti, torte e minestre (chiudere in recipienti ermetici ed introdurre dopo il raffreddamento).	3 o 4 giorni	Sulla griglia nella parte più bassa del frigorifero.
Salumi crudi, pasta fresca, creme, budini, cioccolati, pasticcini alla crema, lardo, pasticceria secca, pomodori rossi.	3 o 4 giorni	Su qualsiasi griglia.
Bottiglie.		Negli appositi vani della controporta.
Frutta e verdura.		Nella verduriera; nella parte inferiore del frigo.

SOSTITUZIONE DELLA LAMPADINA

Per effettuare la sostituzione della lampadina procedere come segue:

- Estrarre perpendicolarmente alla base il coperchio di protezione facendo attenzione a non danneggiare i perni di fissaggio.
- Allontanare una delle due molle per poter sfilare la lampadina.
- Ripiegare un poco le due molle l'una verso l'altra e inserire la nuova lampadina.
- **Controllare che la lampadina sia ben serrata sulle molle.**
- Riposizionare il coperchio.

REVERSIBILITA' DELLA PORTA

Per variare il verso di apertura della porta con chiusura a PIN:

- Smontare la cerniera superiore e la chiusura a PIN.
- Estrarre la porta fino a liberarla dalla cerniera inferiore.
- Smontare la cerniera inferiore e rimontarla sulla parte opposta del frigorifero.
- Riposizionare la porta sulla cerniera inferiore.
- Rimontare la cerniera superiore e la chiusura a PIN nella parte opposta.

CAMBIO PANNELLO

Per poter smontare e/o cambiare il pannello porta occorre agire nel seguente modo:

- Togliere la porta seguendo le indicazioni del paragrafo precedente.
- Svitare le viti presenti sulla base inferiore ed estrarla.
- Sfilare il pannello facendolo scorrere verso il basso.
- Montare il nuovo pannello inserendolo al posto di quello eliminato facendolo scorrere verso l'alto fino al blocco.
- Rimontare la base inferiore .

SBRINAMENTO DELL'APPARECCHIO

Sarà opportuno procedere allo sbrinamento del frigorifero ogni qualvolta si riscontri uno spessore di brina superiore a tre millimetri. Tale operazione è necessaria per garantire un buon rendimento del frigorifero ed evitare maggior consumo di energia elettrica.

Per ottenere il completo sbrinamento del frigorifero ruotare la manopola del termostato in posizione stop. Mantenere la porta aperta onde accellerare i tempi di sbrinamento.

Non rimuovere lo strato di brina utilizzando utensili metallici appuntiti o taglienti che possono provocare forature nella piastra refrigerante con conseguenze irreparabili per l'apparecchio.

Nei frigoriferi ad accumulo di freddo, lo sbrinamento avviene automaticamente. Si consiglia di svuotare il gocciolatoio giornalmente.

A fine sbrinamento provvedere alla messa in funzione del frigorifero riportando la manopola del termostato nella posizione desiderata.

AVVERTENZE PARTICOLARI PER FRIGORIFERI 220 Vca

COLLEGAMENTO ELETTRICO

E' obbligatoria a termini di legge la messa a terra dell'apparecchio. *Assicurarsi che il sistema di messa a terra dell'impianto elettrico sia perfettamente efficiente.*

Si declina ogni responsabilità per eventuali danni subiti da persone o cose derivanti dalla mancata osservanza di tale norma.

E' sconsigliabile l'uso di adattatori, prese multiple e prolunghe. Se il loro uso si rendesse indispensabile utilizzare esclusivamente materiale conforme alle vigenti norme di sicurezza facendo attenzione a non superare il limite di portata in valore di corrente riportato sui materiali stessi. In caso di incompatibilità fra la presa e la spina dell'apparecchio è preferibile sostituire la presa con altra di tipo adatto. Tale operazione è consigliabile sia eseguita da personale qualificato il quale dovrà accertare che la sezione dei cavi della presa sia idonea alla potenza assorbita dall'apparecchio.

COSA FARE SE IL FRIGO NON FUNZIONA

1- L'APPARECCHIO NON FUNZIONA

Controllare che:

- il termostato non sia nella posizione "STOP".
- non manchi corrente.
- l'interruttore automatico dell'impianto elettrico non sia disinserito.
- la spina sia efficiente e correttamente inserita nella presa di corrente.
- la presa di corrente sia efficiente. Per tale verifica collegare alla presa un apparecchio la cui funzionalità sia certa.
- il cavo di alimentazione non sia interrotto.

2- FRIGORIFERO RUMOROSO

Controllare che:

- il frigorifero o il gruppo refrigerante sia ben livellato.
- il frigorifero non sia a contatto con mobili che possono causare vibrazioni.
- i tubi del circuito refrigerante posti sul retro non abbiano punto di contatto e non vibrino contro l'apparecchio.

3- FRIGORIFERO CON RESA INSUFFICIENTE

Controllare che:

- la porta chiuda ermeticamente.
- il frigorifero non sia vicino a fonti di calore.
- che il frigorifero o il gruppo refrigerante remoto sia sufficientemente aerato.
- non vi sia sull'evaporatore un eccessivo riporto di brina.
- che il condensatore non sia intasato di polvere.
- che la ventola giri liberamente (nelle versioni con raffreddamento forzato).
- che l'interno non sia troppo stipato.

Se al termine di tali verifiche non si riuscisse ad ottenere un funzionamento regolare, rivolgersi al servizio assistenza.

AVVERTENZE PARTICOLARI PER FRIGORIFERI 12-24 Vcc

INSTALLAZIONE

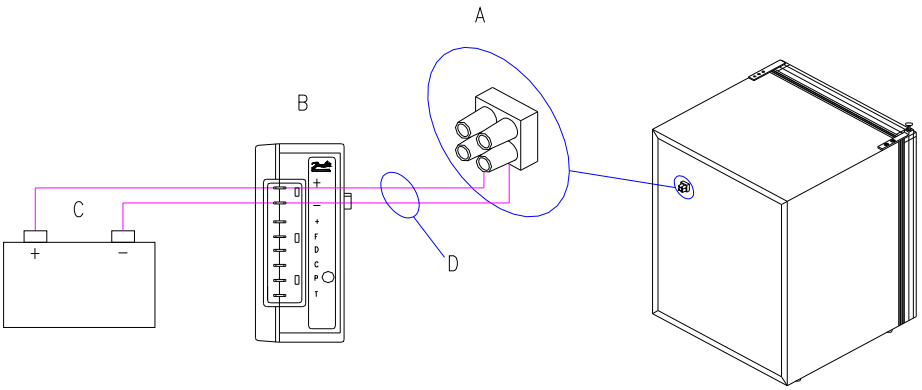
Per l'installazione di frigo o impianti frigo a bordo di caravan, camper, motor home etc. si consiglia di predisporre il mezzo con prese di aerazione direttamente sull'esterno (vedi fig.6).
Per l'installazione dei frigoriferi portatili è disponibile su alcuni modelli una staffa per il fissaggio del frigorifero (vedi fig.7).

COLLEGAMENTO ELETTRICO

Per i frigoriferi alimentati a 12Vcc o 24Vcc si consiglia di collegare gli impianti direttamente alla batteria attenendosi alle corrispondenti istruzioni del compressore Danfoss in dotazione (vedi pag.16 e pag.17).

Collegamento alimentazione luce interna su frigoriferi 12/24Vcc con motore remoto:

- Collegare il cavo in opzionale "D" (Cod.**R10777**) alla morsettiera presente sullo schienale del frigo e alla centralina del compressore. (La morsettiera "A" non è polarizzata, pertanto la connessione può essere effettuata indistintamente.)
- Collegare la batteria alla centralina del compressore, **facendo attenzione alla polarità!**



- Morsettiera collegamento luce interna.
- Centralina compressore.
- Batteria.
- Cavo in dotazione alimentazione luce interna.

AVVERTENZE PARTICOLARI PER FRIGORIFERI 12-24 Vcc 100-240 Vca

COLLEGAMENTO ELETTRICO

Si consiglia di collegare la linea di alimentazione a 12Vcc o 24Vcc direttamente alla batteria attenendosi alle corrispondenti istruzioni del compressore Danfoss in dotazione (vedi pag.16 e pag.17).

Predisporre la linea di alimentazione in Vca utilizzando cavo tripolare di sezione minima per conduttore di 1 mmq ed isolamento adeguati alle modalità ed all'ambiente di utilizzo e conforme alle normative vigenti.
Realizzare la connessione alla linea di alimentazione in Vca mediante una connessione spina presa di portata adeguata conforme alle normative vigenti o predisporre un interruttore magnetotermico differenziale omnipolare con portata di 6 ampere e con apertura dei contatti di almeno 3mm o comunque conforme alle normative vigenti.
Al termine dell'installazione verificare la continuità del circuito di terra ed eseguire tutte le prove di sicurezza elettrica previste dalle normative vigenti.
Proteggere e bloccare adeguatamente i cavi al fine di evitare che trazioni accidentali del cavo possano disconnetterlo dalle connessioni o che possano venire a contatto con parti calde con temperatura superiore a 50°C o con parti taglienti.
L'installazione delle linee di alimentazione è consigliabile sia eseguita da personale qualificato il quale provvederà alla verifica della rispondenza dell'impianto alle normative vigenti ed a rilasciare le relative certificazioni di conformità.
E' obbligatoria a termini di legge la messa a terra dell'apparecchio. *Assicurarsi che il sistema di messa a terra dell'impianto elettrico sia perfettamente efficiente.*
Si declina ogni responsabilità per eventuali danni subiti da persone o cose derivanti dalla mancata osservanza di tale norma.

Collegamento alimentazione luce interna su frigoriferi 12/24Vcc 100-240 Vca con motore remoto:

- Collegare il cavo opzionale (Cod. **R10777**) per il collegamento della luce interna dalla morsettiera presente sullo schienale del frigo e alla centralina del compressore seguendo lo schema presente alla figura 15. (La morsettiera non è polarizzata, pertanto la connessione può essere effettuata indistintamente.)

REGOLAZIONE DELLA TEMPERATURA

- **TERMOSTATO MECCANICO**

  Nei frigoriferi ad accumulo di freddo 12Vcc o 24Vcc onde ottenere il massimo risparmio energetico si consiglia di posizionare la manopola del termostato in posizione 'A' per i frigo con capacità massima di 75 lt; in posizione 'A1' per capacità superiori (fig.1).

- **TERMOSTATO "LED"**

  Il termostato elettronico "LED" è provvisto di due comandi a pulsante:
  - Il comando di accensione e spegnimento "ON/OFF"
  - Il comando di regolazione della temperatura "✱"

  Premendo il comando contrassegnato con "ON/OFF" si ottiene alternativamente **l'accensione o lo spegnimento del frigorifero.**
  Per impostare la temperatura desiderata premere il comando contrassegnato con il simbolo ✱.
  Ad ogni pressione l'indicatore luminoso a LED scorre da sinistra verso destra, per le posizioni intermedie si avrà l'accensione dei due LED vicini.
  Quando l'indicatore si trova a sinistra, il frigorifero è al minimo (più caldo) mentre ogni posizione verso destra indica un aumento della temperatura (più fredda) di circa 3°C.
  Per selezionare una temperatura più fredda premere ripetutamente il comando fino all'accensione dell'indicatore luminoso più a destra (massimo freddo), la successiva pressione realizza l'accensione dell'indicatore luminoso più a sinistra.
  Per schema elettrico vedi fig. 8°a/b/f°

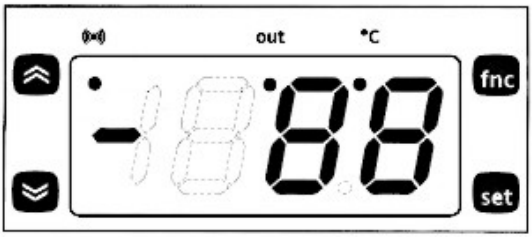


- **TERMOSTATO DIGITALE**

  Il termostato DIGITALE consente di monitorare costantemente la temperatura interna del frigo l'accensione/spegnimento del compressore.
  L'utente dispone di un display e di quattro tasti per il controllo dello stato e la programmazione dello strumento.
  Al momento del collegamento dell'alimentazione il display comincia a lampeggiare e si arresta visualizzando la temperatura attuale all'interno del frigo.
  Per default il termostato è impostato a 0°C.

COME MODIFICARE I PARAMETRI:

- Premere il tasto **SET** velocemente (entro 5 sec.) 2 volte. La prima volta comparirà la scritta "SET" e la seconda il valore "0" o precedentemente impostato.
- Agendo sui pulsanti  o  modificare la temperatura che il frigo dovrà raggiungere.
- Premere il tasto **FNC** velocemente 2 volte per confermare la temperatura impostata. La prima volta comparirà la scritta "SET" e la seconda la temperatura interna.
- Il puntino posto sotto la scritta "OUT" indica che il compressore e la ventola sono in funzione.



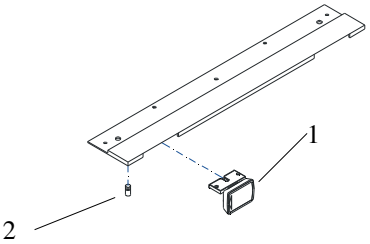
I rispettivi schemi elettrici sono riportati nelle fig. 8c/d/g (12/24V)

UN MANUALE ISTRUZIONI RELATIVO AL TERMOSTATO DIGITALE È COMUNQUE PRESENTE IN DOTAZIONE IN OGNI FRIGO.

REVERSIBILITA' DELLA PORTA

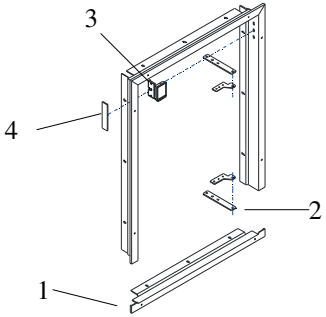
Per variare il verso di apertura della porta con chiusura NAUTIC-EUROPA:

- Smontare la cerniera inferiore ed estrarre la porta verso il basso.
- Smontare la maniglia Nautic (1) e riposizionarla sulla porta nella parte opposta facendo attenzione agli interassi dei fori.
- Svitare il perno d'incernieramento (2) dalla staffa e avvitarlo nella parte opposta.
- Riposizionare la porta facendo attenzione che la chiusura lavori in modo efficiente.
- Rimontare la cerniera inferiore nella parte opposta del frigorifero.



Per variare il verso di apertura della porta con chiusura NAUTIC-USA:

- Smontare la base del profilo di fissaggio (1) se presente.
- Smontare la cerniera e il piastrino inferiore (2) ed estrarre la porta verso il basso.
- Smontare la maniglia Nautic (3), invertire i fermi e la molla interna per modificarne il movimento di apertura; ruotare l'impugnatura per il verso della freccia.
- Riposizionare la maniglia Nautic sul lato opposto della porta facendo attenzione agli interassi dei fori.
- Spostare il piastrino di aggancio chiusura (4) sul lato opposto del profilo.
- Riposizionare la porta facendo attenzione che la chiusura lavori in modo efficiente.
- Riposizionare la cerniera, il piastrino inferiore e la base del profilo di fissaggio.



COSA FARE SE IL FRIGO NON FUNZIONA

1- L'APPARECCHIO NON FUNZIONA

Controllare che:

- il termostato non sia nella posizione "STOP".
- l'interruttore automatico dell'impianto elettrico non sia disinserito.
- il fusibile posto sul dispositivo elettronico del frigorifero sia integro.
- il cavo di alimentazione non sia interrotto.
- la batteria sia efficiente.
- **la tensione sulla morsettiera del dispositivo elettronico del frigorifero sia uguale a quella della batteria**. Nel caso verificaste una caduta di tensione superiore a 0,2-0,4V controllare che:
- la sezione del cavo che collega la batteria al dispositivo elettronico del frigorifero sia di dimensione adeguata (vedi tabella su istruzioni Danfoss allegate).
- lungo la linea di alimentazione eventuali punti di giunzione non siano deteriorati o non correttamente serrati.
- non vi siano ossidazioni sui poli della batteria e nei punti di contatto.
-

2- FRIGORIFERO RUMOROSO

Controllare che:

- il frigorifero o il gruppo refrigerante sia ben livellato.
- il frigorifero non sia a contatto con mobili che possono causare vibrazioni.
- i tubi del circuito refrigerante posti sul retro non abbiano punto di contatto e non vibrino contro l'apparecchio.

3- FRIGORIFERO CON RESA INSUFFICIENTE

Controllare che:

- la porta chiuda ermeticamente.
- il frigorifero non sia vicino a fonti di calore.
- che il frigorifero o il gruppo refrigerante remoto sia sufficientemente aerato.
- non vi sia sull'evaporatore un eccessivo riporto di brina.
- che il condensatore non sia intasato di polvere.
- che la ventola giri liberamente (nelle versioni con raffreddamento forzato).
- che l'interno non sia troppo stipato.

Se al termine di tali verifiche non si riuscisse ad ottenere un funzionamento regolare, rivolgersi al servizio assistenza.

ISTRUZIONI DANFOSS BD35/BD50F 12-24 Vcc

L'unità elettronica di controllo è un'apparecchia-tura con possibilità di due diverse tensioni di alimentazione. Ciò significa che la stessa unità è utilizzabile sia in sistemi con alimentazione a 12V, sia a 24V. La tensione massima per sistemi a 12V è di 17V, mentre quella per i sistemi a 24V è di 31,5V. La massima temperatura ambiente consentita è di 55°C. L'unità elettronica di controllo è dotata di una protezione termica incorporata che entra in funzione in caso di surriscaldamento arrestando il compressore.

Installazione (fig. 10)

Collegare il connettore terminale dell'unità elettronica di controllo al terminale del compressore. Montare l'unità sul compressore incastrando il coperchio sulla testa della vite (1).

Alimentazione (fig. 10)

L'unità elettronica di controllo deve essere sempre collegata direttamente ai poli della batteria (2). Connettere il polo positivo al + ed il negativo al -; diversamente l'unità non potrà funzionare. L'unità è protetta contro l'inversione di polarità. Per proteggere l'installazione deve essere sempre montato un fusibile (3) sul cavo + il più vicino possibile alla batteria. Si raccomanda l'uso di un fusibile da 15A per il circuito a 12V e di un fusibile da 7,5A per il circuito a 24V. Se si fa uso di interruttore generale (4), esso va dimensionato per un minimo di 20A. Le dimensioni dei cavi raccomandate in fig. 11 devono essere rispettate. Evitare ulteriori connessioni al sistema di alimentazione per evitare che eventuali cadute di tensione influiscano sulle impostazioni per la protezione della batteria.

Protezione batteria (fig. 10)

L'arresto ed il riavvio del compressore dipendono dall'impostazione dei prescelti limiti di tensione misurati sui morsetti + e - dell'unità elettronica di controllo. Le impostazioni standard per i sistemi con alimentazione rispettivamente a 12V e 24V sono indicati in fig. 12. Possono comunque essere impostati altri limiti (fig. 13) nel caso in cui si effettui una connessione per mezzo di una resistenza (9) tra i morsetti C e P. Nelle applicazioni per pannelli solari senza batteria si raccomanda un resistore da 220 kW. Nella modalità AEO (ottimizzazione energetica mediante controllo adattativo) il compressore BD adatterà sempre la propria velocità alla reale richiesta di resa frigorifera entro una tensione d'esercizio casuale compresa tra 9,6 e 31,5 V.

Termostato (fig. 10)

Il termostato (7) va collegato tra i morsetti C e T. Senza resistenza nel circuito di controllo il compressore con unità elettronica 101N0210 o 101N0220 ruoterà alla velocità di 2.000 giri/min quando il termostato è inserito. Con il termostato collegato direttamente al terminale C, l'unità elettronica 101N0300 adatterà la propria velocità alla reale richiesta di resa frigorifera. È possibile ottenere altre velocità del compressore, comprese nella gamma 2000-3500 giri/min, inserendo una resistenza (8) per la regolazione della corrente (mA) nel circuito di controllo. I valori della resistenza per diverse velocità del motore sono riportati in fig. 14.

Ventilatore (opzionale, Fig. 10)

È possibile collegare un ventilatore (5) tra i terminali + ed F. Collegare il positivo al + e il negativo ad F. Poiché la tensione di uscita tra i morsetti + ed F viene sempre regolata a 12V, va utilizzato un ventilatore a 12V sia nel caso di alimentazione a 12V che nel caso di alimentazione a 24V! L'uscita per il ventilatore è in grado di fornire una corrente continua di 0,5 Aavg. In fase di accensione è comunque permesso un assorbimento di corrente maggiore per un tempo di 2 secondi.

LED (opzionale, fig. 10)

È anche possibile collegare un diodo LED da 10 mA (6) tra i morsetti + e D. Nel caso in cui l'unità elettronica di controllo registri un errore di funzionamento, il diodo lampeggerà un certo numero di volte. Il numero dei lampeggi dipende dal tipo di errore registrato, con una durata per ciascun lampeggio di 1/4 di secondo. Alla sequenza di lampeggi fa seguito una pausa senza lampeggiare, dopo di che la sequenza relativa all'errore in questione verrà ripetuta ogni 4 secondi.

Numero-lampeggi	Tipo di errore
5	**Arresto termico dell'unità elettronica** (Se il sistema di refrigerazione è stato sottoposto a carico eccessivo o se la temperatura ambiente è troppo elevata, l'unità di controllo si surriscalderà).
4	**Velocità del motore troppo bassa** (Se il sistema di refrigerazione viene sottoposto ad un carico eccessivo, il motore non è in grado di mantenere la velocità minima di 1.850 rotazioni/min).
3	**Errore nell'avviamento del motore** (Il rotore è bloccato o la pressione differenziale nel sistema di refrigerazione è troppo alta (>5 bar)).
2	**Arresto del ventilatore per sovracorrente** (Il ventilatore assorbe dall'unità elettronica di controllo una corrente superiore a 1 A_{pp}).
1	**Arresto per protezione batteria** (La tensione di alimentazione si trova al di fuori del valore di stacco impostato).

ISTRUZIONI DANFOSS BD35/BD50F 12-24 Vcc / 110-240 Vca

L'unità elettronica è un dispositivo multitensione. Può essere utilizzato sia con sistemi di alimentazione da 12V/24V DC che da 100-240V AC 50/ 60Hz. In caso di sistema di alimentazione a 12V DC la tensione massima è 17V DC; per sistemi di alimentazione a 24V DC la tensione massima è 31.5V DC. In caso di sistema di alimentazione AC, la tensione massima è 265V AC, la tensione minima è 85V AC. La temperatura ambiente massima è di 55°C. L'unità elettronica è dotata di un isolamento termico incorporato che attiva ed arresta il funzionamento del compressore in caso la temperature dell'unità elettronica diventi troppo elevata (100°C / 212°F sul circuito stampato). **La potenza assorbita è limitata a 100W. Vedi la scheda tecnica BD50F per i dettagli.**

Installazione (fig. 10)

Collegare il connettore terminale dell'unità elettronica di controllo al terminale del compressore. Montare l'unità sul compressore incastrando il coperchio sulla testa della vite (1).

Alimentazione (fig. 10)

DC: L'unità elettronica di controllo deve essere sempre collegata direttamente ai poli della batteria (2). Connettere il polo positivo al + ed il negativo al -; diversamente l'unità non potrà funzionare. L'unità è protetta contro l'inversione di polarità. Per proteggere l'installazione deve essere sempre montato un fusibile (3) sul cavo + il più vicino possibile alla batteria. Si raccomanda l'uso di un fusibile da 15A per il circuito a 12V e di un fusibile da 7,5A per il circuito a 24V. Se si fa uso di interruttore generale (4), esso va dimensionato per un minimo di 20A. Le dimensioni dei cavi raccomandate in fig. 11 devono essere rispettate. Evitare ulteriori connessioni al sistema di alimentazione per evitare che eventuali cadute di tensione influiscano sulle impostazioni per la protezione della batteria.

AC: I cavi elettrici devono essere collegati ai morsetti contrassegnati L ed N sulla unità elettronica. Tensione nominale da 100 a 240 V AC 50/60Hz. Interruttore di sicurezza: limite superiore = 270V AC, limite inferiore = 80V AC. Un fusibile 4A (11) deve essere montato nel cavo di tensione (L) per proteggere l'impianto. Qualora si utilizzi un interruttore principale (12), deve essere regolato ad una corrente di almeno 6A. Il cavo deve avere dimensione minima di 0.75 mm2 o 18 AWG. NB: se necessario è possibile utilizzare la connessione di terra.

Generale: è possibile collegare contemporaneamente all'unità elettronica sia alimentazione AC che alimentazione DC. In questo caso, AC sarà la fonte di alimentazione preferenziale. In caso di disconnessione dell'alimentazione AC o di caduta al di sotto di 85V AC si attiverà il sistema di alimentazione a 12V DC con un ritardo di 1 minuto. Qualora venga ristabilita l'alimentazione AC, non vi sarà alcun ritardo nel funzionamento del compressore.

Protezione batteria (fig. 10)

L'arresto ed il riavvio del compressore dipendono dall'impostazione dei prescelti limiti di tensione misurati sui morsetti + e - dell'unità elettronica di controllo. Le impostazioni standard per i sistemi con alimentazione rispettivamente a 12V e 24V sono indicati in fig. 12. Possono comunque essere impostati altri limiti (fig. 13) nel caso in cui si effettui una connessione per mezzo di una resistenza (9) tra i morsetti C e P.

Termostato (fig. 10)

Il termostato (7) va collegato tra i morsetti C e T. Senza resistenza nel circuito di controllo il compressore con unità elettronica 101N0210 o 101N0220 ruoterà alla velocità di 2.000 giri/min quando il termostato è inserito. È possibile ottenere altre velocità del compressore, comprese nella gamma 2000-3500 giri/min, inserendo una resistenza (8) per la regolazione della corrente (mA) nel circuito di controllo. I valori della resistenza per diverse velocità del motore sono riportati in fig. 14.

Ventilatore (opzionale, Fig. 10)

È possibile collegare un ventilatore (5) tra i terminali + ed F. Collegare il positivo al + e il negativo ad F. Poiché la tensione di uscita tra i morsetti + ed F viene sempre regolata a 12V, va utilizzato un ventilatore a 12V sia nel caso di alimentazione a 12V che nel caso di alimentazione a 24V! L'uscita per il ventilatore è in grado di fornire una corrente continua di 0,5 Aavg. In fase di accensione è comunque permesso un assorbimento di corrente maggiore per un tempo di 2 secondi.

Lampada (opzionale, Fig. 1)

Una lampada da 5 Watt 12V DC (10) può essere collegata fra i morsetti A e C. La tensione d'uscita fra i morsetti A e C è sempre regolata su 12V DC. Sia con il sistema di alimentazione a 12V che con quello a 24V deve essere utilizzata una lampada 12V DC. L'uscita della lampada può erogare una tensione continua di 0,5A di media.

LED (opzionale, Fig. 1)

Un LED da 10mA (6) può essere collegato fra i morsetti + e D. In caso l'unità elettronica rilevi un errore di funzionamento, il diodo lampeggia per un determinato numero di volte. Questo numero dipende dal tipo di errore di funzionamento rilevato. Ogni lampeggiamento ha la durata di ¼ di secondo. Alla sequenza di lampeggiamento segue un intervallo privo di emissioni luminose, e quindi la sequenza relativa ad ogni errore rilevato è ripetuta ogni 4 secondi.

INTRODUCTION

Dear Customer,

Thank you for choosing a VITRIFRIGO product. We hope that you will be completely satisfied with your purchase.

This manual is considered an integral part of the refrigerator and must accompany it from the time of sale to the end user. Vitrifrigo prohibits the reproduction of this manual in any part or form.

Before leaving our works, every refrigerator is subjected to stringent tests and inspections to guarantee correct operation.

For more information or clarifications, please contact one of our assistance centres or our offices directly.

Vitri Alceste



WARNINGS

- Read this manual carefully before using the refrigerator.
- If this appliance is replacing an older model, any locking device must be rendered completely non-functional prior to disposal.
- Verify that the pachaging should be not demaged, otherwise tell it to the forwarder agent.
- Unpacking and installation of the unit must be carried out with the utmost care. To avoid accidental injury use protective gloves, in particular for the models with remote refrigerating unit (Fig. 3).
- After unpacking the appliance, ensure that it is not damaged in any way. Notification of damage must be given to the dealer no later than 24 hours from the purchase date.
- The appliance must be used exclusively for the conservation of food and drinks.
- Install the appliance far from any heat sources and allow for sufficient ventilation (see indications below).
- After installation, wait at least one hour before switching on the refrigerator. This precaution ensures optimum refrigeration efficiency.
- Before connecting the appliance to the power supply, check that the line voltage corresponds to the specifications stated on the appliance rating plate and that of the compressor.
- After installation check, that the appliance is not standing on the power cable.
- For any operational problems, please contact your nearest Vitrifrigo assistance centre. In any case, always refer to qualified personnel for assistance.
- Before carrying out any maintenance or cleaning operations, disconnect the appliance from the power supply.
- Do not put glass containers holding liquids into the freezer compartment.
- Dispose of packaging material in accordance with local by-laws for sorted waste recycling.
- This machine cannot be thrown away with urban waste; it must be disposed of as separate refuse. Contact the special refuse collection centres for electrical and electronic appliances in your area or return it to your dealer when you purchase a newer model.
- If not disposed of correctly, the machine may cause damage to the environment and to people's health on account of the specific substances it contains.
- The symbol shown here opposite indicates that this machine cannot be disposed of with urban waste.



- Should you fly tip or dispose of the machine incorrectly, you risk fines and/or legal action being taken against you, as specified by the laws in force.
- The use of the refrigerator for anything other than its intended purpose is strictly prohibited.
- Always keep the appliance perfectly clean and maintain the safety devices in good working order.
- Keep the air vents in the appliance casing and/or cabinet for built-in installation free from obstruction.
- Never remove safeguards (casings) from the refrigerator.
- Always perform the checks, inspections, and scheduled maintenance, as specified on page x of this manual.
- The appliance must never be exposed to rain.
- Suitable for campsite use.

General Information

Purpose of the manual

This manual, which applies to refrigerators from the "INTERIOR (230 V AC) OCEAN-RUNNER (12/24 V DC)" ranges, is intended as a guide for the correct and safe use of same as well as for their routine maintenance.
To learn all about how to operate and use your refrigerator within a short space of time, you must read this use and maintenance manual carefully as from the first time of use.
The correct operation of your refrigerator also depends on efficient and effective maintenance. However, it is necessary to know how to perform maintenance operations. The instructions for use indicate all of the operations required to start, stop and operate your refrigerator.
Your refrigerator has been made in compliance with all of the safety requirements foreseen by the relevant directives. However, maximum user safety depends on reading this manual carefully as well as on constant, careful cleaning and maintenance.
Some of the information or figures in this manual may show details or features that differ slightly from those on your refrigerator; this does not alter essential information.
Due to our policy of constant product improvement, your refrigerator may have variations not mentioned in this manual. Any variations will be included in subsequent versions as necessary.

Manufacturer's identity

This refrigerator is designed and made exclusively by:

Vitrifrigo s.r.l.
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Italy
Tel. +39 0721 491080
Fax. +39 0721 497739
E-Mail. vitrifrigo@vitrifrigo.com
www.vitrifrigo.com

DESCRIPTION OF THE APPLIANCE (Fig. 2 and Fig. 7)

12/24Vcc – 220Vca

A) Horizontal evaporator
A1) Vertical evaporator
B) Drip tray
C) Thermostat housing
D) Removable wire racks
E) Glass shelf (on some models only)
F) Salad drawer (on some models only)
G) Door compartments (removable)

12/24Vcc Portatili

A) Basket
B) Pawl closure
C) Evaporator
D) Bracket fastening screw
E) Fixing bracket
F) Mount with digital thermostat
G) Mount with LED thermostat
H) Manual thermostat (C26 only)
I) Switch (C26 only)
J) Handle
K) 12/24 V DC – 220 V AC socket

The data plate bearing the serial number and technical data is located on the upper right-hand section, inside the refrigerator. The first three figures of the serial number indicate the year and week of manufacture.
All materials exposed to contact with food comply with EC directive 2004/1935.
Noise emission levels are maintained below 70 dB (A).

INSTALLATION

Ensure that the appliance is in no way damaged. Any damage resulting from transport must be reported to the dealer no later than 24 hours after delivery.
Handle the appliance with care. Take care when positioning the refrigerating unit (in the case of refrigerators with remote refrigerating units) to avoid breaking the connection pipelines or obstructing them in any way. Always ensure that the refrigerator and remote refrigerating unit (where supplied) are installed on a flat surface.
For built-in installation, cut two holes in the cupboard that will accommodate the refrigerator: one at the bottom next to the refrigerating unit and the second in the top or on the upper half of the side. The holes must have an area of at least 300 cm^2. If this is not possible, leave a gap of at least 50 mm between refrigerator top and the interior surface of the top of the cupboard (see Fig. 5).
Install the refrigerator away from heat sources in dry and well-ventilated surroundings. Leave the appliance for at least one hour before switching on. In the meantime the appliance should be cleaned for the first time.

CLEANING THE REFRIGERATOR

Before cleaning, ensure that the refrigerator is not connected to the power supply. If necessary, extract the plug from the power socket.

EXTERIOR

Clean exterior first with warm and then with cold water. Dry with a soft cloth. Avoid all use of abrasive products.

INTERIOR

Remove the racks (or basket), containers, and ice trays, and clean the interior using warm water mixed with a little bicarbonate of soda or vinegar. Rinse and dry carefully with a soft cloth. Never use abrasive products, detergents or soap.

CONDENSER

The condenser (Fig. 4) should be cleaned at least once a year using a vacuum cleaner or a dry brush.

In the case of prolonged disuse, to avoid the formation of mould or unpleasant odours, extract the plug from the socket, empty the unit completely, clean the interior, and leave the door ajar.

ELECTRICAL CONNECTION

This appliance complies with EC directive 89/336 governing radio suppression.
Before connecting the appliance to the power supply, check that the line voltage corresponds to the indications on the appliance rating plate and those of the compressor plate.

TEMPERATURE CONTROL

Each refrigerator is fitted with a thermostat, which automatically maintains set temperatures.

- **MECHANICAL THERMOSTAT**
  Select the desired temperature by means of the adjustment knob.
  When the knob is on "0" or "STOP" the refrigerator is not in operation.
  The refrigerator is started by turning the knob to "1". Temperature settings range from 1 to 5; 5 being the lowest temperature.

  For the wiring diagram, see Fig. 8e/h (12/24 V) or Fig. 9 (115 V/230 V)

Some models are fitted with thermostats with different temperature scale markings to those described above. In this case refer to Fig. 1. Decrease temperature by turning the knob clockwise.

For rational food storage and conservation refer to the table below:

Food	**Storage Time**	**Position in Refrigerator**
Cleaned meat or fish (place in plastic bags or wrapping)	2 to 3 days	On the rack under the freezer compartment
Eggs	1 month	Use door compartment
Butter, margarine	1 week	Use door compartment
Cooked food, cakes and soups (cool and place in airtight, sealed containers)	3 to 4 days	On the lowest rack in the refrigerator
Cold cuts of meat, fresh pasta, confectioners creams and custards, puddings, chocolate, cream cakes, lard, pastries, tomatoes	3 to 4 days	On any rack
Bottles		In the bottle compartment inside door
Fruit and vegetables		In the salad drawer at the bottom of the refrigerator

REPLACING THE LAMP

To replace the lamp (see fig. 2), proceed as follows:

- Remove the protective cover perpendicularly from the base. Take care not to damage the fastening pins.
- Move one of the two springs in order to be able to slide out the lamp.
- Bend the two springs lightly towards one another and insert the new lamp.
- **Make sure that the light is correctly tightened on the springs.**

Refit the cover.

REVERSING THE DOOR

To change the door opening direction on doors with PIN closure:

- Remove the top hinge and PIN closure.
- Pull the door away until it comes free of the bottom hinge.
- Remove the bottom hinge and refit it on the opposite side of the refrigerator.
- Refit the door on the bottom hinge.
- Fit the top hinge and PIN closure on the opposite side.

PANEL CHANGING

To remove and/or change the panel, proceed as follows:

- Remove the door, as indicated in the previous section.
- Loosen the screws on the lower base section and remove it.
- Remove the panel by sliding it out downwards.
- Insert a new panel in place of the old one, sliding it upwards as far as the stop. Refit the lower base section.

DEFROSTING

Defrosting should be carried out whenever the frost layer exceeds a thickness of three millimetres. This is necessary to guarantee efficient refrigeration and to avoid excessive power consumption.

To completely defrost the refrigerator turn the thermostat knob to "stop". Keep the door open to speed up defrosting time.

Do not attempt to remove the frost layer using any sharp metal instruments. This could pierce the refrigerator plate and cause irreparable damage to the appliance.

In portable absorption refrigerators, defrosting is carried out automatically. We recommend emptying the drip tray every day.

After defrosting, switch the refrigerator on by turning the thermostat knob to the desired setting.

SPECIAL WARNINGS FOR 220 V AC REFRIGERATORS

ELECTRICAL CONNECTION

The appliance must be earthed in accordance with the law.

Ensure that the earthing plant of the electrical system is in perfect working condition.

The manufacturer declines any responsibility for injury to people or damage to property caused by non-compliance with the above regulations.

Avoid the use of adaptors, multiple sockets and extension leads. If absolutely necessary, only use products that conform to current safety standards and take care not to exceed the maximum power stated in the product specifications.

If the socket and the appliance plug are incompatible, replace the socket with one of the correct type. This operation should be carried out by a qualified electrician who must ensure that the wire size of the socket is suitable for the electrical input of the appliance.

TROUBLESHOOTING

1- IF YOUR REFRIGERATOR DOES NOT WORK

Check that:

- the thermostat is not set to "Stop"
- the power supply is present
- the electrical system circuit breaker on the appliance has not tripped
- the plug is in perfect condition and is inserted properly in the socket
- the power socket functions properly. To check, connect up a similar appliance that you know functions correctly
- the power cable is not faulty.

2-EXCESS REFRIGERATOR NOISE

Check that:

- the refrigerator is standing on a completely level surface
- the refrigerator is not touching other objects which may cause vibrations
- the refrigerating circuit tubes at the back of the unit are not touching or vibrating against the appliance

3-INSUFFICIENT REFRIGERATING POWER

Check that:

- the door is sealed properly
- the refrigerator is not positioned close to heat sources
- the refrigerator and remote refrigerating unit are sufficiently ventilated
- frost has not accumulated on the evaporator
- dust has not blocked the condenser
- the fan rotates freely (in forced cooling models)
- the refrigerator is not over-full

If, after checking the above, the refrigerator still does not function, consult your nearest assistance centre.

SPECIAL WARNINGS FOR 12-24 V DC REFRIGERATORS

INSTALLATION

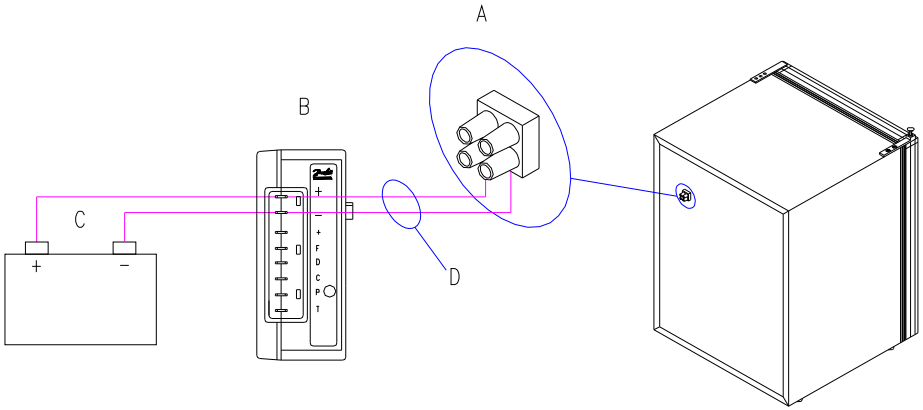
When installing the refrigerator in caravans, campers, motor homes etc., fit air vents communicating directly with the outside (see Fig. 6).
For installation purposes, some portable refrigerator models have a bracket to fix the refrigerator in place (see Fig. 7).

ELECTRICAL CONNECTION

For refrigerators powered at 12 or 24 V DC, we recommend connecting the systems directly to the battery, following the corresponding instructions for the Danfoss compressor supplied (see p.32 and p. 33).

<u>Connecting power to the internal light on 12/24V DC refrigerators with remote motor:</u>

- Connect the optional cable "D" (Code **<u>R10777</u>**) to the terminal board on the back of the refrigerator and to the compressor control unit. (The terminal board "A" is not polarised and therefore, the connection can be made without distinction).
- Connect the battery to the compressor control unit, **taking care to respect polarity!**
    - Terminal board for internal light connection.
    - Compressor control unit.
    - Battery.
    - Internal light power cable (supplied).



SPECIAL WARNINGS FOR 12-24Vcc 100-240Vca REFRIGERATORS

ELECTRICAL CONNECTION

We recommend connecting 12 or 24 V DC power lines directly to the battery, following the corresponding instructions for the Danfoss compressor supplied (see p. 32 and p.33).

Prepare the V AC power supply line using a three-pole cable with a minimum section per conductor of 1 sq mm, suitable insulation for the intended use and environment and compliant with the standards in force.
Connect the V AC power line using a plug/socket connection with suitable capacity compliant with the standards in force. Alternatively, it is possible to fit an omnipolar differential thermomagnetic circuit breaker with a capacity of 6 amperes and contact opening of at least 3 mm or in any case, compliant with the standards in force.
When installation is complete, check the continuity of the earth circuit and perform all of the electrical safety tests foreseen by the standards in force.
Protect the cables and lock them into place sufficiently to prevent them from disconnecting if accidentally pulled or from coming into contact with hot parts at temperatures above 50°C or with sharp parts.
Power line installation should be performed by qualified technical personnel who can check the compliance of the system with standards in force and issue the relevant conformity certification.

Connecting power to the internal light on 12/24V DC refrigerators with remote motor:

- Connect the optional cable (Code **R10777**) for inside light connection from the terminal board on the back of the refrigerator and to the control unit of the compressor, following the diagram on figure 15. (The terminal board is not polarised and therefore, the connection can be made without distinction.)

TEMPERATURE CONTROL

- **MECHANICAL THERMOSTAT**

In the case of 12V DC or 24V DC portable absorption refrigerators, for maximum energy saving, set the thermostat to position "A" for refrigerators of maximum 75 l capacity, and to "A1" for models exceeding this capacity (Fig. 1).

- **"LED" THERMOSTAT**

The electronic "LED" thermostat has two button controls:
- An "ON/OFF" control
- A temperature adjustment control "✱"

Pressing the control marked "ON/OFF" will **switch the refrigerator on or off,** alternatively.
To set the required temperature, press the control marked ✱. Each time this control is pressed, the LED indicator will light up from left to right; for intermediate settings, two adjacent LEDs will light up. When the LED indicator is on the left, the refrigerator is set to minimum (warmest), while a right-hand LED position indicates a reduction in temperature (cooler) of approximately 3°C. To select a cooler temperature, press the button repeatedly until the LED furthest to the right switches on (maximum cooling); if the control is pressed again, the LED furthest to the left will switch on.
For the wiring diagram, see Fig. 8a/b/f

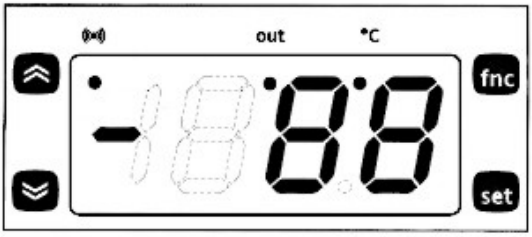


- **DIGITAL THERMOSTAT**

The DIGITAL thermostat can be used to monitor the internal temperature of the refrigerator constantly as well as to switch the compressor on and off.
The thermostat has a display and four keys, to check its status and programming.
When first connected to the power supply, the display will begin to flash and then stop, showing the current temperature inside the refrigerator.
The default setting for the thermostat is 0°C.

EDITING THE PARAMETERS:

- Press the **SET** key twice quickly (within 5 sec.).
  The first time, the display will read "SET" and the second time, it will show "0" or the parameter set previously.
- Use the  or  keys to change the temperature setting for the refrigerator.
- Press the **FNC** key twice quickly to confirm the new temperature setting.
  The first time, the display will read "SET" and the second time, it will show the internal temperature.
- A small dot below the word "OUT" indicates that the compressor and fan are operating.



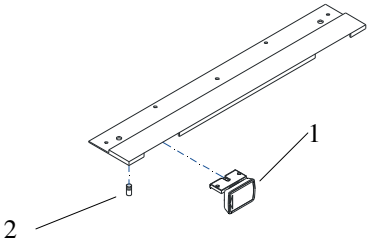
For the wiring diagram, see Fig. 8c/d/g (12/24V)

AN INSTRUCTION MANUAL FOR THE DIGITAL THERMOSTAT IS SUPPLIED WITH EACH REFRIGERATOR IN ANY CASE.

REVERSING THE DOOR

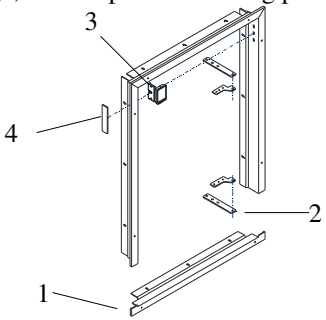
To change the door opening direction on doors with NAUTIC-EUROPA closure:

- Remove the bottom hinge and pull the door downwards.
- Take off the Nautic handle (1) and fit it back onto the door, on the opposite side, taking care to respect the distance between centres of the relevant holes.
- Unscrew the hinge pin (2) from the bracket and screw it to the other side.
- Refit the door, making sure that the closure operates effectively.
- Refit the bottom hinge on the opposite side of the refrigerator.



To change the door operating direction on doors with NAUTIC-USA closure:

- Remove the base of the fixing profile (1), if fitted.
- Remove the hinge and bottom plate (2) and pull the door downwards.
- Remove the Nautic handle (3), invert the stops and internal spring to change the opening movement; turn the handle grip in the direction of the arrows.
- Fit the Nautic handle back onto the door, on the opposite side, taking care to respect the distance between centres of the relevant holes.
- Move the catch plate (4) to the other side of the profile.
- Refit the door, making sure that the closure operates effectively.
- Refit the hinge, bottom plate and fixing profile base.



TROUBLESHOOTING

1-IF YOUR REFRIGERATOR DOES NOT WORK

Check that:

- the thermostat is not set to "STOP"
- the electrical system circuit breaker on the appliance has not tripped.
- the fuse in the electronic control unit has not blown
- the power supply cable is not faulty
- the battery is delivering sufficient power
- **the voltage on the electronic control unit terminal board corresponds to that of the battery.** If there is a voltage drop of over 0.2-0.4 V check that:
- the size of the cable connecting the battery to the electronic control unit corresponds to specifications (see table in the Danfoss instructions enclosed)
- any junction points in the power line are efficient and terminals are properly tightened.
- there are no signs of oxidisation on the battery poles and contact points

2-EXCESS REFRIGERATOR NOISE

Check that:

- the refrigerator and refrigerating unit are positioned on flat surfaces
- the refrigerator is not touching other objects that may cause vibrations
- the refrigerating circuit tubes at the back of the unit are not touching or vibrating against the appliance

3-INSUFFICIENT REFRIGERATING POWER

Check that:

- the door is sealed properly
- the refrigerator is not positioned close to heat sources
- the refrigerator and remote refrigerating unit are sufficiently ventilated
- frost has not accumulated on the evaporator
- dust has not blocked the condenser
- the fan rotates freely (in forced cooling models)
- the refrigerator is not over-full

If, after checking the above, the refrigerator still does not function, consult your nearest assistance centre.

INSTRUCTIONS FOR DANFOSS BD35/BD50F 12-24 V DC

The electronic unit is a dual voltage device. This means that the same unit can be used in both 12V and 24V power supply systems. Maximum voltage is 17V for a 12V system and 31.5V for a 24V power supply system. Max. ambient temperature is 55°C. The electronic unit has a builtin thermal protection which is actuated and stops compressor operation if the electronic unit temperature gets too high.

Installation (Fig. 10)

Connect the terminal plug from the electronic unit to the compressor terminal. Mount the electronic unit on the compressor by snapping the cover over the screw head (1).

Power supply (Fig. 10)

The electronic unit must always be connected directly to the battery poles (2). Connect the plus to + and the minus to -, otherwise the electronic unit will not work. The electronic unit is protected against reverse battery connection. For protection of the installation, a fuse (3) must be mounted in the + cable as close to the battery as possible. 15A fuse for 12V and 7.5A fuse for 24V circuits are recommended. If a main switch (4) is used, it should be rated to a current of min. 20A. The wire dimensions in Fig. 11 must be observed. Avoid extra junctions in the power supply system to prevent voltage drop from affecting the battery protection setting.

Battery protection (Fig. 10)

The compressor is stopped and re-started again according to the decided voltage limits measured on the + and - terminals of the electronic unit. The standard settings for 12V and 24V power supply systems appear from Fig. 12. Other settings (Fig. 13) are optional if a connection which includes a resistor (9) is established between terminals C and P. In solar applications without a battery a 220 kW resistor is recommended. In AEO (Adaptive Energy Optimizing) speed mode the BD compressor will always adapt its speed to the actual cooling demand within a random operation voltage of 9.6 to 31.5V.

Thermostat (Fig. 10)

The thermostat (7) is connected between the terminals C and T. Without any resistor in the control circuit, the compressor with electronic unit 101N0210 or 101N0220 will run with a fixed speed of 2,000 rpm when the thermostat is switched on. With the thermostat directly connected to terminal C the electronic unit 101N0300 will adjust its speed to the actual cooling demand. Other fixed compressor speeds in the range between 2,000 and 3,500 rpm can be obtained when a resistor (8) is installed to adjust the current (mA) of the control circuit. Resistor values for various motor speeds appear from Fig. 14.

Fan (optional, Fig. 10)

A fan (5) can be connected between the terminals + and F. Connect the plus to + and the minus to F. Since the output voltage between the terminals + and F is always regulated to 12V, a 12V fan must be used for both 12V and 24V power supply systems. The fan output can supply a continous current of 0.5Aavg. A higher current draw is allowed for 2 seconds during start.

LED (optional, Fig. 10)

A 10mA light emitting diode (LED) (6) can be connected between the terminals + and D. In case the electronic unit records an operational error, the diode will flash a number of times. The number of flashes depends on what kind of operational error was recorded. Each flash will last ¼ second. After the actual number of flashes there will be a delay with no flashes, so that the sequence for each error recording is repeated every 4 seconds.

Number of flashes	Error type
5	**Thermal cut-out of electronic unit** (If the refrigeration system has been too heavily loaded, or if the ambient temperature is high, the electronic unit will run too hot).
4	**Minimum motor speed error** (If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed 1,850 rpm).
3	**Motor start error** (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)).
2	**Fan over-current cut-out** (The fan loads the electronic unit with more than $1A_{peak}$).
1	**Battery protection cut-out** (The voltage is outside the cut-out setting).

INSTRUCTIONS FOR DANFOSS BD35/BD50F 12-24 Vcc / 110-240 Vca

The electronic unit is a multi voltage device. It can be used in both 12V/24V DC and 100-240V AC 50/60Hz power supply systems. Max. voltage is 17V DC for a 12V DC system and 31.5V DC for a 24V DC power supply system. Max. voltage is 265V AC and min. 85V AC for an AC power supply system. Max. ambient temperature is 55°C. The electronic unit has a builtin thermal protection which is actuated and stops the compressor operation if the electronic unit temperature becomes too high (100°C / 212°F on the PCB). **Power consumption is limited to 100W. See datasheet BD50F for details.**

Installation (Fig. 1)

Connect the terminal plug from the electronic unit to the compressor terminal. Mount the electronic unit on the compressor by snapping the cover over the screw head (1).

Power supply (Fig. 1)

DC: The electronic unit must always be connected directly to the battery poles (2). Connect the plus to + and the minus to -, otherwise the electronic unit will not work. The electronic unit is protected against reverse battery connection. For protection of the installation, a fuse (3) must be mounted in the + cable as close to the battery as possible. It is recommended to use 15A fuses for 12V and 7.5A fuses for 24V circuits. If a main switch (4) is used, it should be rated to a current of min. 20A. The wire dimensions in Fig. 2 must be observed. Avoid extra junctions in the power supply system to prevent voltage drop from affecting the battery protection setting.

AC: The wires must be connected to the terminals marked L and N on the electronic unit. Nominal voltages from 100 to 240 VAC 50/60Hz. Upper safety cut-out limit = 270V AC and lower limit 80V AC. A 4A fuse (11) must be mounted in the live (L) cable to protect the installation. If a main switch (12) is used, it should be rated to a current of min. 6A. The wire dimensions must be min. 0.75 mm2 or AWG 18. NB: Earth connection can be used if required.

General: Both the AC and the DC power supply can be connected to the electronic unit at the same time. In this case, AC will be preferred power supply source. If the AC power supply is disconnected or drop below 85V AC on a 12V DC supply system, a time delay of 1 min. will be activated before the compressor continues on DC power supply. If AC power supply is re-established there will be no delay in compressor operation.

Battery protection (Fig. 1)

The compressor is stopped and re-started again according to the decided voltage limits measured on the + and - terminals of the electronic unit. The standard settings for 12V and 24V power supply systems appear from Fig. 3. Other settings are optional if a connection which includes a resistor (9) is established between terminals C and P. See manual.

Thermostat (Fig. 1)

The thermostat (7) is connected between the terminals C and T. Without any resistor in the control circuit, the compressor will run with a fixed speed of 2,000 rpm when the thermostat is switched on. Other fixed compressor speeds in the range between 2,000 and 3,500 rpm can be obtained when a resistor (8) is installed to adjust the current (mA) of the control circuit. Resistor values for various motor speeds appear from Fig. 5.

Fan (optional, Fig. 1)

A fan (5) can be connected between the terminals + and F. Connect the plus to + and the minus to F. Since the output voltage between the terminals + and F is always regulated to 12V, **a 12V fan must be used for both 12V and 24V power supply systems.** The fan output can supply a continuous current of 0.5Aavg. A higher current draw is allowed for 2 seconds during start.

Lamp (optional, Fig. 1)

A 12V DC 5 Watt lamp (10) can be connected between the terminals A and C. The output voltage between the terminals A and C is always regulated to 12V DC. **A 12V DC lamp must be used for both 12V and 24V power supply systems**.The lamp output can supply a continuous current of 0.5Aavg.

LED (optional, Fig. 1)

A 10mA light emitting diode (LED) (6) can be connected between the terminals + and D. If the electronic unit records an operational error, the diode will flash a number of times. The number of flashes depends on what kind of operational error was recorded. Each flash will last ¼ second. After the actual number of flashes there will be a delay with no flashes, so that the sequence for each error recording is repeated every 4 seconds.

INTRODUCTION

Cher client:

En vous remerciant d'avoir choisi un de nos produits VITRIFRIGO espère que vous serez tout à fait satisfait de votre achat.

Ce manuel est partie intégrante du réfrigérateur et il doit suivre le parcours de vente jusqu'à l'utilisateur ; Vitrifrigo interdit toute reproduction même partielle.

Chaque réfrigérateur, avant de quitter notre établissement, est soumis à de sévères essais et contrôles qui garantissent leur fonctionnement correct.

Pour toutes informations supplémentaires ou éclaircissements, veuillez vous adresser à nos centres agréés ou directement à nos bureaux.

Vitri Alceste



AVERTISSEMENTS

- Lire attentivement ce manuel avant d'utiliser le réfrigérateur.
- Si cet appareil doit en remplacer un autre d'un type ancien, il est recommandé de rendre inutilisable l'éventuelle serrure de ce dernier avant de le mettre au rebut.
- Vérifier que l'emballage est intact, en cas contraire le signaler au transporteur.
- Déballer et installer l'appareil en faisant très attention; pour éviter toute blessure accidentelle, il est conseillé d'utiliser des gants de protection, en particulier pour les modèles avec unité réfrigérante à distance (fig. 3).
- Après avoir déballé l'appareil, s'assurer qu'il n'est pas endommagé. Tout dommage éventuel doit être signalé au revendeur dans les 24 heures à compter de la date d'achat.
- Cet appareil doit être exclusivement utilisé pour la conservation d'aliments et de boissons.
- Installer l'appareil loin de toute source de chaleur et dans une position suffisamment aérée (voir indications ci-après).
- Il est conseillé d'attendre au moins une heure avant de mettre le frigo en marche pour que le circuit réfrigérant puisse être totalement efficace.
- Avant de brancher l'appareil, vérifier que la tension du secteur correspond à ce qui est indiqué sur sa plaquette signalétique ou sur celle se trouvant sur le compresseur.
- Au terme de l'installation, vérifier que l'appareil n'est pas posé sur le cordon d'alimentation.
- Pour tout problème de fonctionnement, s'adresser à notre centre de service après-vente le plus proche; dans tous les cas, n'avoir recours qu'à des personnes qualifiées.
- Avant d'effectuer une quelconque opération d'entretien ou de nettoyage, débrancher la prise de courant.
- Eviter d'introduire des liquides dans des conteneurs en verre dans le compartiment basse température.
- Ne pas jeter l'emballage de votre appareil mais sélectionner les matériaux conformément aux prescriptions locales relatives à l'élimination des déchets.
- Ne jetez pas ce produit dans les déchets ménagers mais éliminez-le en le triant dans les déchets spécifiques. Contactez les centres de collecte des Déchets d'appareils électriques et électroniques (RAEE) présents dans votre territoire ou bien restituez-le à votre revendeur au moment de l'achat d'un appareil équivalent.
- S'il n'est pas éliminé correctement, cet appareil peut avoir des effets nocifs sur l'environnement et sur la santé humaine, causés par des substances spécifiques qu'il contient à l'intérieur.
- Le symbole représenté ci-contre indique que le produit ne peut pas être éliminé comme déchet urbain.



- L'élimination abusive ou non correcte du produit entraîne de sévères sanctions juridiques de type administratif et/ou pénal prévues par les lois en vigueur.
- Il est formellement interdit d'utiliser le réfrigérateur pour des usages autres que ceux prévus.
- Maintenir toujours bien propre l'appareil et faire en sorte que les dispositifs de sécurité fonctionnent toujours parfaitement.
- Ne jamais boucher les ouvertures de ventilation dans le châssis de l'appareil et/ou la structure à encastrement.
- Ne jamais enlever les protections (carters) du réfrigérateur.
- Exécuter toujours les vérifications, les contrôles et les entretiens programmés décrit à la page x de ce manuel.
- L'appareil ne doit pas être mis sous la pluie.
- Peut être utilisé dans les campings.

Informations générales

Finalité du manuel

Ce manuel, relatif aux Réfrigérateurs de la série "INTERIOR (230Vca) / OCEAN-RUNNER (12/24Vcc)", entend fournir une aide pour leur utilisation correcte et sûre et leur entretien rationnel.
Afin d'apprendre brièvement comment faire fonctionner et utiliser le réfrigérateur que vous possédez, il faut lire attentivement cette notice d'emploi dès sa première utilisation.
Le bon fonctionnement du réfrigérateur dépend aussi d'un entretien efficace et efficient. Il est donc opportun de connaître les interventions d'entretien à réaliser. Les indications pour l'usage décrivent toutes les opérations de mise en marche, d'arrêt et de fonctionnement.
Le réfrigérateur a été fabriqué dans le respect des conditions de sécurité prévues par les directives en la matière ; cependant le maximum de sécurité de l'utilisateur dépend d'une lecture attentive de ce manuel et d'un nettoyage et d'un entretien constant et attentif.
Certaines informations ou figures de ce manuel pourraient montrer des détails qui pourraient être légèrement différents par rapport au réfrigérateur que vous possédez, sans toutefois que les informations essentielles ne soient modifiées. Dans une optique d'amélioration constante, le réfrigérateur pourra montrer des variations qui ne sont pas contenues dans cette notice. Les éventuelles modifications apparaîtront, selon les exigences, dans les versions successives du manuel.

Identification du constructeur

Le réfrigérateur est conçu et produit exclusivement chez :

Vitrifrigo s.r.l.
Via Della Produzione, 9
61020 Montecchio (PU)
Tel. +39 0721 491080
Fax. +39 0721 497739
E-Mail. vitrifrigo@vitrifrigo.com
www.vitrifrigo.com

DESCRIPTION DE L'APPAREIL (fig.2 et fig.7)

12/24Vcc – 220Vca

A) évaporateur horizontal
A1) évaporateur vertical
B) bac horizontal de récupération de l'eau
C) boîtier thermostat
D) clayettes amovibles
E) tablette en verre (sur certains modèles seulement)
F) bac à fruits (sur certains modèles seulement)
G) balconnets (extractibles)

12/24Vcc Portatifs

A) bac
B) fermeture cliquet
C) évaporateur
D) vis de fixation bride
E) bride de fixation
F) panneau avec thermostat numérique
G) panneau avec thermostat LED
H) thermostat manuel (seulement C26)
I) interrupteur (seulement C26)
J) poignée
K) fiche 12/24Vcc – 220Vca

L'étiquette reportant le numéro de série ainsi que les caractéristiques techniques est placée á l'intérieur du réfrigérateur, dans la partie supérieure droite. Les trois premiers chiffres du numéro de série correspondent à l'année et à la semaine de fabrication.
Tous les matériaux pouvant entrer en contact avec les aliments sont conformes à la directive 2004/1935/CEE.Le bruit émis par l'appareil est inférieur à 70 dB(A).

INSTALLATION

S'assurer que l'appareil n'est pas endommagé. Tout dommage éventuel de transport doit être signalé rapidement au revendeur et dans tous les cas dans les 24 heures après la livraison.
Manier l'appareil en faisant très attention. Lorsqu'on positionne le groupe réfrigérant (dans les modèles de réfrigérateurs avec installation réfrigérante à distance), agir avec précaution afin d'éviter toute obstruction ou rupture des tuyaux de raccordement. Placer toujours le réfrigérateur et le groupe réfrigérant à distance (dans les versions qui en sont dotées) sur des surfaces horizontales.
Garantir une aération suffisante du groupe frigorifique en prévoyant deux ouvertures dans le meuble-conteneur, une sur le fond en regard du groupe réfrigérant, l'autre sur la partie supérieure ou sur la partie haute du côté. La surface de ces ouvertures ne devra pas être inférieure à 300 cm^2. Si cela n'est pas possible, laisser un espace d'au moins 50 mm entre la partie supérieure du réfrigérateur et le plateau situé au dessus (voir fig. 5).
Installer le réfrigérateur loin de toute source de chaleur dans un endroit sec et bien aéré.Laisser l'appareil à l'arrêt pendant une heure au moins avant de le mettre en marche. Dans ce laps de temps, effectuer le premier nettoyage.

NETTOYAGE DU REFRIGERATEUR

Avant de procéder au nettoyage, s'assurer que le réfrigérateur n'est pas branché sur l'installation électrique. S'il l'est, débrancher la fiche de la prise de courant.

EXTERIEUR

Laver l'extérieur du réfrigérateur à l'eau tiède, repasser à l'eau froide et sécher avec un chiffon doux. Eviter d'utiliser des produits abrasifs.

INTERIEUR

Enlever les clayettes (ou le bac à légumes), les bacs et les cuvettes pour la glace et procéder au nettoyage avec de l'eau tiède additionnée de bicarbonate de soude ou de vinaigre. Rincer et sécher soigneusement avec un chiffon doux. Eviter impérativement d'utiliser des produits abrasifs, des détergents ou des savons.

CONDENSEUR

Il est conseillé de nettoyer le condenseur (voir fig. 4) au moins une fois par an à l'aide d'un aspirateur ou d'un pinceau sec.

En cas d'inutilisation prolongée de l'appareil, afin d'éviter la formation de moisissures ou de mauvaises odeurs, débrancher la fiche, le vider complètement, en nettoyer l'intérieur et laisser la porte entrouverte.

RACCORDEMENT ELECTRIQUE

Cet appareil est conforme à la directive communautaire 89/336/CEE sur l'antiparasitage. Avant de brancher l'appareil, s'assurer que la tension du secteur correspond bien à celle qui est indiquée sur la plaquette signalétique ou à celle indiquée sur la plaquette se trouvant sur le compresseur.

REGLAGE DE LA TEMPERATURE

Chaque réfrigérateur est équipé d'un thermostat pour le maintien automatique de la température.

- **THERMOSTAT MECANIQUE**

  Pour choisir la température désirée, utiliser le bouton de réglage.

  Quand le bouton est en position «0» ou «STOP», le réfrigérateur ne fonctionne pas.

  En déplaçant le bouton sur la position «1», le réfrigérateur se met en marche.

  En tournant le bouton de la position «1» vers la position «5», on obtient des températures de plus en plus froides.

  Pour schéma électrique voir fig. 8 e/h (12/24V) ou fig. 9 (115V/230V)

Certaines versions de réfrigérateurs sont équipées de thermostats dont les symboles de réglage de la température se différencient de la description ci-dessus; dans ce cas, se rapporter à la fig. 1. Le refroidissement du réfrigérateur augmente en tournant le bouton en sens horaire.

Pour ranger et conserver de façon rationnelle les aliments, suivre les indications du tableau ci-dessous.

Aliments	**Temps de conservation**	**Place dans le réfrigérateur**
Viande et poisson propre (envelopper dans des sachets ou des feuilles en plastique)	2 ou 3 jours	Sur la clayette sous la zone freezer.
Œufs	1 mois	Utiliser les compartiments de la contre-porte.
Beurre, margarine	1 semaine	Utiliser les compartiments de la contre-porte.
Aliments cuits, tartes et soupes (contenus dans des récipients hermétiques et introduits dans le frigo après refroidissement)	3 ou 4 jours	Sur la clayette dans la partie la plus basse du réfrigérateur.
Charcuterie crue, pâtes fraîches, crèmes, flans, chocolats, pâtisseries à la crème, lard, pâtisseries sèches, tomates rouges.	3 ou 4 jours	Sur n'importe quelle clayette.
Bouteilles		Dans les supports de la contre-porte.
Fruits et légumes		Dans le bac dans la partie inférieure du réfrigérateur.

REMPLACEMENT DE L'AMPOULE

Pour remplacer l'ampoule (voir fig.2) procéder comme suit:

- Extraire perpendiculairement à la base le couvercle de protection en prenant garde de ne pas abîmer les chevilles de fixation.
- Éloigner un des deux ressorts pour pouvoir ôter l'ampoule.
- Replier légèrement les deux ressorts l'un vers l'autre et introduire la nouvelle ampoule.
- **Contrôler que l'ampoule est bien serrée sur les ressorts.**
- Replacer le couvercle.

REVERSIBILITE DE LA PORTE

Pour changer le sens d'ouverture de la porte avec fermeture à PIN:

- Démonter la charnière supérieure et la fermeture à PIN.
- Extraire la porte jusqu'à la libérer de la charnière inférieure.
- Démonter la charnière inférieure et la remonter sur la partie opposée du réfrigérateur.
- Replacer la porte sur la charnière inférieure.
- Remonter la charnière supérieure et la fermeture à PIN sur la partie opposée.

CHANGEMENT DU PANNEAU

Pour démonter et/ou changer le panneau de la porte procéder de la façon suivante:

- Oter la porte en suivant les indications du paragraphe précédent.
- Dévisser les vis présentes sur la base inférieure et ôter celle-ci.
- Enlever le panneau en le faisant glisser vers le bas.
- Monter le nouveau panneau en l'introduisant à la place de celui qui a été enlevé le faisant glisser vers le haut jusqu'à ce qu'il se bloque.
- Replacer la base inférieure.

DEGIVRAGE DE L'APPAREIL

Il convient de dégivrer le réfrigérateur dès que l'on constate que l'épaisseur de glace dépasse 3 mm. Cette opération est nécessaire si on veut garantir un bon rendement du réfrigérateur et éviter de consommer trop d'énergie électrique.

Pour un dégivrage complet du réfrigérateur, tourner le bouton du thermostat sur la position «Stop». Laisser la porte ouverte afin d'accélérer le dégivrage.

Ne pas enlever la couche de glace en utilisant des outils métalliques pointus ou coupants car on pourrait percer la plaque réfrigérante, ce qui aurait des conséquences irréparables pour l'appareil.

Dans les réfrigérateurs à accumulation de froid, le dégivrage a lieu automatiquement. Il est conseillé de vider le bac de l'eau tous les jours.

En fin de dégivrage, mettre le réfrigérateur en marche en remettant le bouton du thermostat à la position désirée.

INSTRUCTIONS PARTICULIÈRES POUR LES RÉFRIGÉRATEURS 220 Vca

RACCORDEMENT ELECTRIQUE

Aux termes la loi, il est obligatoire de mettre l'appareil à la terre. *S'assurer que le système de mise à la terre de l'installation électrique est parfaitement efficace.*

Le constructeur décline toutes responsabilités en cas de dommages subis par des personnes ou des choses dus au non respect de cette norme.

Il est déconseillé d'utiliser des adaptateurs, des prises multiples et des rallonges. Si leur utilisation s'avère toutefois indispensable, n'employer que des accessoires conformes aux normes de sécurité en vigueur en faisant attention de ne pas dépasser la limite de capacité en valeur de courant indiquée sur ces accessoires. En cas d'incompatibilité entre la prise et la fiche de l'appareil, il est préférable de remplacer la prise par une autre d'un type approprié. Il est conseillé de faire faire cette opération par des personnes qualifiées qui devront s'assurer que la section des câbles de la prise est appropriée à la puissance absorbée par l'appareil.

QUE FAIRE SI LE REFRIGERATEUR NE FONCTIONNE PAS

- L'APPAREIL NE FONCTIONNE PAS

Contrôler que:

- le thermostat n'est pas sur la position «STOP»;
- qu'il y a bien du courant;
- l'interrupteur automatique de l'installation électrique n'est pas débranché;
- la fiche fonctionne bien et qu'elle est correctement branchée dans la prise de courant;
- la prise de courant fonctionne bien. Pour cette vérification, raccorder à cette même prise un appareil dont on est sûr qu'il marche;
- le cordon d'alimentation n'est pas interrompu.

2- LE REFRIGERATEUR EST BRUYANT

Contrôler que:

- le réfrigérateur ou le groupe réfrigérant sont bien de niveau;
- le réfrigérateur n'est pas en contact avec des meubles pouvant causer des vibrations;
- les tuyaux du circuit réfrigérant situés à l'arrière ne touchent pas l'appareil et ne vibrent pas contre lui;

3- LE RENDEMENT DU REFRIGERATEUR EST INSUFFISANT

Contrôler que:

- la porte se ferme hermétiquement;
- le réfrigérateur ne se trouve pas à proximité d'une source de chaleur;
- le réfrigérateur ou le groupe réfrigérant à distance sont suffisamment aérés;
- qu'il n'y a pas trop de givre sur l'évaporateur;
- le condenseur n'est pas encrassé de poussière;
- le ventilateur tourne librement (dans les versions à refroidissement forcé);
- l'intérieur n'est pas trop rempli.

Si, après avoir fait ces vérifications, on n'arrive toujours pas à obtenir un fonctionnement normal, s'adresser au service après-vente.

INSTRUCTIONS PARTICULIÈRES POUR LES RÉFRIGÉRATEURS 12/24 Vcc

INSTALLATION

Pour l'installation de réfrigérateurs ou d'installations frigorifiques dans des caravanes, des autocaravanes, etc., il est conseillé de prévoir sur ces derniers des prises d'aération directement sur l'extérieur (voir fig. 6).
Pour l'installation des réfrigérateurs portatifs une bride de fixation est disponible sur certains modèles (voir fig.7).

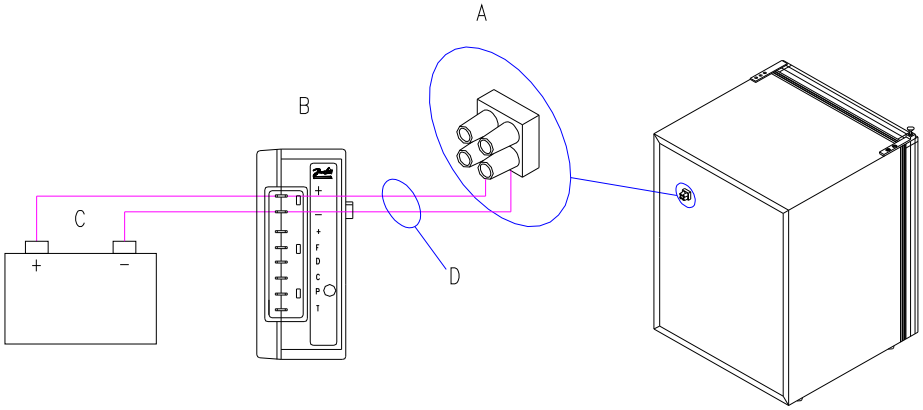
RACCORDEMENT ELECTRIQUE

Pour les réfrigérateurs alimentés à 12Vcc ou à 24Vcc il est préférable de connecter les installations directement à la batterie en respectant rigoureusement les instructions correspondantes fournies relatives au compresseur Danfoss (voir page 48 et page 49)..

Connexion alimentation lumière intérieure sur les réfrigérateurs 12/24Vcc avec moteur à distance:

- Relier le câble en option "D" (Cod.**R10777**) à la boîte à bornes présente au dos du réfrigérateur et à la centrale du compresseur. (La boîte à bornes "A" n'est pas polarisée, donc la connexion peut être effectuée indifféremment.)
- Connecter la batterie à la centrale du compresseur, **en faisant attention à la polarité!**

  - boîte à bornes de connexion lumière intérieure.
  - Centrale compresseur.
  - Batterie.
  - Câble fourni alimentation lumière intérieure.



INSTRUCTIONS PARTICULIÈRES POUR LES RÉFRIGÉRATEURS 12-24 Vcc 100-240 Vca

RACCORDEMENT ELECTRIQUE

Il est conseillé de connecter la ligne d'alimentation à 12Vcc ou à 24Vcc directement à la batterie en respectant les instructions correspondantes du compresseur Danfoss fournies (voir page 48 et page 49).

Préparer la ligne d'alimentation en Vca en utilisant un câble tripolaire d'une section minimale pour un conducteur de 1 mm^2 et une isolation adéquate aux modalités et au milieu d'utilisation et conforme aux lois en vigueur.
Réaliser la connexion à la ligne d'alimentation en Vca par une connexion fiche prise d'une portée adéquate, conforme aux lois en vigueur ou prévoir un interrupteur magnétothermique différentiel omnipolaire d'une portée de 6 ampères et avec ouverture des contacts de 3 mm au moins ou en tout cas conforme aux lois en vigueur.
À la fin de l'installation vérifier la continuité du circuit de terre et exécuter tous les essais de sécurité électrique prévus par les lois en vigueur.
Protéger et bloquer convenablement les câbles afin d'éviter que des tractions accidentelles du câbles ne puissent le déconnecter ou qu'elles ne puissent entrer en contact avec des parties chaudes à une température supérieure à 50°C ou avec des parties tranchantes.
Il est conseillé de faire exécuter l'installation des lignes d'alimentation par un personnel qualifié qui vérifiera la conformité de l'installation aux dispositions en vigueur et délivrera les certifications de conformité correspondantes.

Connexion alimentation lumière intérieure sur les réfrigérateurs 12/24Vcc 100-240Vca avec moteur à distance:

- Relier le câble en option (Cod. **R10777**) pour le branchement de l'ampoule interne, de la boîte à bornes présente au dos du réfrigérateur au central du compresseur en suivant le schéma illustré à la figure 15. (La boîte à bornes n'est pas polarisée, par conséquent la connexion peut être effectuée indifféremment).

REGLAGE DE LA TEMPERATURE

- **THERMOSTAT MECANIQUE**

  Dans les réfrigérateurs à accumulation de froid 12 Vcc ou 24Vcc, afin d'obtenir une économie d'énergie maximum, il est conseillé de mettre le bouton du thermostat sur la position «A» pour les réfrigérateurs d'une capacité maximum de 75 l et sur la position «A1» pour ceux d'une capacité supérieure (fig.1)

- **THERMOSTAT "LED"**

  Il thermostat électronique "LED" est muni de deux commandes à bouton:
  - La commande de mise en marche et arrêt "ON/OFF"
  - La commande de réglage de la température "✱"

  En appuyant le bouton "ON/OFF" on obtient alternativement **la mise en marche ou l'arrêt du réfrigérateur.**

  Pour programmer la température voulue, appuyer sur la touche avec le symbole ✱. A chaque pression l'indicateur lumineux à LED défile de la gauche vers la droite, pour les positions intermédiaires deux LEDS voisines s'allumeront. Quand l'indicateur se trouve à gauche, le réfrigérateur est au minimum (plus chaud) alors que quand il est à droite il indique une réduction de la température (plus froid) de 3°C environ. Pour sélectionner une température plus froide appuyer plusieurs fois la commande jusqu'à ce que l'indicateur lumineux plus à droite (maximum de froid) s'allume, la pression successive provoque l'allumage de l'indicateur lumineux plus à gauche.

  Pour le schéma électrique, se rapporter à la fig. 8a/b/f



- **THERMOSTAT NUMERIQUE**

  Le thermostat NUMERIQUE permet de contrôler constamment la température intérieure du réfrigérateur, la mise en marche/ l'arrêt du compresseur.

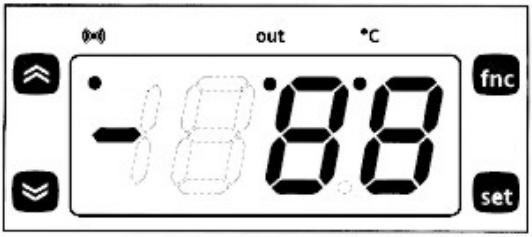
  L'utilisateur dispose d'un display et de quatre touches pour le contrôle de l'état et la programmation de l'appareil.

  Lors de la connexion de l'alimentation le display commence à clignoter et s'arrête en affichant la température actuelle à l'intérieur du réfrigérateur.

  Par défaut le thermostat est programmé à 0°C.

COMMENT MODIFIER LES PARAMETRES:

- Appuyer sur la touche **SET** rapidement (en 5 sec.) 2 fois.
  La première fois le mot "SET"s'affiche et la seconde le paramètre "0" ou celui programmé auparavant.
- En agissant sur les touches ou modifier la température que le réfrigérateur devra atteindre.
- Appuyer sur la touche **FNC** rapidement 2 fois pour confirmer la température programmée.
  La première fois le mot "SET"s'affiche et la seconde la température à l'intérieur.
- Le petit point sous le mot "OUT" indique que le compresseur et le ventilateur sont en fonction.



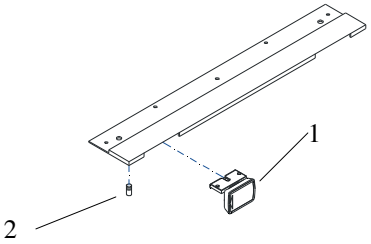
Pour le schéma électrique, se rapporter à la Fig. 8c/d/g

UN MANUEL D'INSTRUCTIONS RELATIF AU THERMOSTAT NUMERIQUE EST TOUJOURS FOURNI AVEC LE REFRIGERATEUR

REVERSIBILITE DE LA PORTE

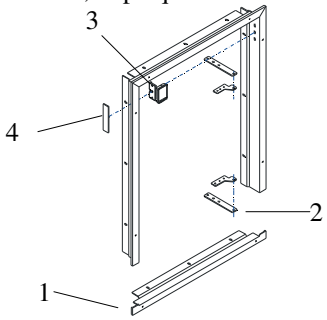
Pour changer le sens d'ouverture de la porte avec fermeture NAUTIC-EUROPA:

- Démonter la charnière inférieure et ôter la porte vers le bas.
- Démonter la poignée Nautic (1) et la replacer sur la porte de la partie opposée en prenant garde aux empattements des trous.
- Dévisser le pivot charnière (2) de la bride et le visser dans la partie opposée.
- Replacer la porte en prenant garde que la fermeture fonctionne correctement.
- Remonter la charnière inférieure dans la partie opposée du réfrigérateur.



Pour changer le sens d'ouverture de la porte avec fermeture NAUTIC-USA:

- Démonter la base du profil de fixation (1) si présent.
- Démonter la charnière et la petite plaque inférieure (2) et extraire la porte vers le bas.
- Démonter la poignée Nautic (3), inverser les arrêts et le ressort intérieur pour modifier le mouvement d'ouverture, tourner la poignée dans le sens indiqué par la flèche.
- Replacer la poignée Nautic sur le côté opposé de la porte en prenant garde aux empattements des trous.
- Déplacer la plaque d'enclenchement de la fermeture (4) sur le côté opposé du profil.
- Replacer la porte en prenant garde que la fermeture fonctionne parfaitement.
- Replacer la charnière, la plaque inférieure et la base du profil de fixation.



QUE FAIRE SI LE REFRIGERATEUR NE FONCTIONNE PAS

1- L'APPAREIL NE FONCTIONNE PAS

Contrôler que:

- le thermostat n'est pas sur la position «STOP»;
- l'interrupteur automatique de l'installation électrique n'est pas débranché;
- le fusible situé sur le dispositif électronique du réfrigérateur est intact;
- le cordon d'alimentation n'est pas interrompu;
- la batterie fonctionne bien;
- **la tension sur le bornier du dispositif électronique du réfrigérateur est égale à celle de la batterie.** En cas de chute de tension supérieure à 0,2-0,4 V, contrôler que:
- la section du câble raccordant la batterie au dispositif électronique du réfrigérateur est correcte (voir tableau sur instructions Danfoss ci-jointes);
- qu'il n'y a pas de points de jonction détériorés ou incorrectement serrés le long de la ligne d'alimentation;
- qu'il n'y a pas d'oxydations sur les pôles de la batterie et aux points de contact.

2- LE REFRIGERATEUR EST BRUYANT

Contrôler que:

- le réfrigérateur ou le groupe réfrigérant sont bien de niveau;
- le réfrigérateur n'est pas en contact avec des meubles pouvant causer des vibrations;
- les tuyaux du circuit réfrigérant situés à l'arrière ne touchent pas l'appareil et ne vibrent pas contre lui;

3- LE RENDEMENT DU REFRIGERATEUR EST INSUFFISANT

Contrôler que:

- la porte se ferme hermétiquement;
- le réfrigérateur ne se trouve pas à proximité d'une source de chaleur;
- le réfrigérateur ou le groupe réfrigérant à distance sont suffisamment aérés;
- qu'il n'y a pas trop de givre sur l'évaporateur;
- le condenseur n'est pas encrassé de poussière;
- le ventilateur tourne librement (dans les versions à refroidissement forcé);
- l'intérieur n'est pas trop rempli.

Si, après avoir fait ces vérifications, on n'arrive toujours pas à obtenir un fonctionnement normal, s'adresser au service après-vente.

INSTRUCTIONS DANFOSS BD35/BD50F 12-24 Vcc

La commande électronique peut fonctionner sous deux tensions. Cela signifie que le meme module peut toujours être utilisé, que la tension d'alimentation soit de 12V ou de 24V. La tension d'alimentation maximale des montages en 12V est de 17V, alors qu'elle est de 31,5V pour les montages en 24V. La température ambiante maximale admissible est de 55°C. La commande électronique est équipée d'une protection thermique intégrée qui est activée et arrête le compresseur en cas de surchauffe.

Installation (fig. 10)

Brancher la fiche de raccordement de la commande électronique aux bornes du compresseur. Monter la commande électronique sur le compresseur en bloquant/pressant le couvercle sous la tête de vis (1).

Alimentation électrique (fig. 10)

La commande électronique doit toujours être raccordée directement aux bornes de la batterie (2). Raccorder le positif à + et le négatif à - ; la commande électronique ne peut fonctionner que raccordée de cette façon et elle est protégée contre toute connexion de batterie inversée. Un fusible (3) doit être monté sur le câble +, le plus près possible de la batterie, afin de protéger l'installation. Il est recommandé d'utiliser un fusible de 15A pour le circuit en 12V et un fusible de 7,5A pour le circuit en 24V. Si un interrupteur (4) est installé, il doit être dimensionné pour une intensité d'au moins 20A. Les caractéristiques dimensionnelles des câbles électriques recommandées en fig. 11 doivent être respectées. Éviter tout raccordement supplémentaire au système d'alimentation électrique afin d´éviter qu'une éventuelle chute de tension n'affecte le réglage de protection de la batterie.

Protection de batterie (fig. 10)

L'arrêt et le redémarrage du compresseur dependent des limites de tension choisies, mesurées sur les bornes + et – de la commande électronique. Les réglages standards des montages d'alimentation électrique en 12V et en 24V sont indiqués en fig. 12. On peut choisir d'autres limites de tension (fig. 13) en établissant une connexion comportant une résistance (9) entre les bornes C et P. Pour les applications solaires sans batterie, une résistance de 220 kW est recommandée. En mode de vitesse AEO (Adaptation Energie Optimisée), le compresseur BD modulera toujours sa vitesse de rotation en fonction de la demande de froid, sur une plage de tension de 9,6 à 31,5 V.

Thermostat (fig. 10)

Le thermostat (7) est monté entre les bornes C et T. En l'absence de résistance dans le circuit de commande, et lorsque le thermostat est enclenché, le compresseur avec une unité électronique standard 101N0210 ou 101N0220 tournera à une vitesse constante de 2.000 tr/min. Quand le thermostat est raccordé directement à la borne C, l'unité électronique 101N0300 ajustera la vitesse de rotation en fonction de la demande de froid souhaitée. Il est possible de faire tourner le compresseur à d'autres vitesses constantes, comprises entre 2.000 et 3.500 tr/min, en montant une résistance (8) sur le circuit de commande, cette résistance permettant d'ajuster l'intensité (mA). Les valeurs des résistances correspondent aux différentes vitesses de rotation du moteur sont indiquées en fig. 14.

Ventilateur (option, fig. 10)

Un ventilateur (5) peut être monté entre les bornes + et F. Raccorder le positif à + et le negative à F. La tension de sortie entre les bornes + et F étant toujours régulée à 12 V, toujours employer un ventilateur 12V, que l'alimentation électrique soit en 12V ou en 24V. Le courant d'alimentation du ventilateur peut atteindre 0,5A moy. Une intensité plus importante est cependant acceptée pendant 2 secondes au démarrage.

LED (option, fig. 10)

Une diode électroluminescente (LED) (6) de 10 mA peut être montée entre les bornes + et D. Si la commande électronique enregistre une panne d'exploitation, la diode clignote un certain nombre de fois. Le nombre de clignotements dépend du type de panne enregistrée. Chaque clignotement dure 1/4 seconde. Le type de panne est défini par le nombre de clignotements (voir tableau ci-dessous).

Nombre de clignotements	Type de panne
5	**Coupure thermique de la commande électronique** (En cas de charge thermique trop importante du système ou de température ambiante trop élevée, il y a surchauffe de la commande électronique).
4	**Vitesse du moteur trop faible** (En cas de charge thermique trop importante du système, le moteur ne peut maintenir une vitesse minimale de 1.850 tr/min).
3	**Panne, démarrage de moteur** (Le rotor est bloqué ou la pression différentielle dans le système de refroidissement est trop élevée) (> 5 bars).
2	**Surintensité moteur de ventilateur** (Le ventilateur absorbe plus de 1 A en pointe).
1	**Coupure, protection de batterie** (La tension se situe en dehors des limites de coupure).

INSTRUCTIONS DANFOSS BD35/BD50F
12-24 Vcc / 110-240 Vca

L'unité électronique est un dispositif multitension. On peut l'utiliser aussi bien avec des systèmes d'alimentation à 12V/24V DC qu'avec 100-240V AC 50/ 60Hz En cas de système d'alimentation à 12V DC la tension maximale est 17V DC; pour des systèmes d'alimentation à 24V DC la tension maximale est 31.5V DC. En cas de système d'alimentation AC, la tension maximale est 265V AC, la tension minimale est 85V AC. La température ambiante maximale est de 55°C. L'unité électronique est équipée d'une isolation thermique incorporée qui actionne et arrête le fonctionnement du compresseur si la température de l'unité électronique devient trop élevée (100°C / 212°F sur le circuit imprimé). **La puissance absorbée peut atteindre 100W maximum. Consulter la fiche technique BD50F pour les détails.**

Installation (fig. 10)

Brancher la fiche de raccordement de la commande électronique aux bornes du compresseur. Monter la commande électronique sur le compresseur en bloquant/pressant le couvercle sous la tête de vis (1).

Alimentation électrique (fig. 10)

La commande électronique doit toujours être raccordée directement aux bornes de la batterie (2). Raccorder le positif à + et le négatif à - ; la commande électronique ne peut fonctionner que raccordée de cette façon et elle est protégée contre toute connexion de batterie inversée. Un fusible (3) doit être monté sur le câble +, le plus près possible de la batterie, afin de protéger l'installation. Il est recommandé d'utiliser un fusible de 15A pour le circuit en 12V et un fusible de 7,5A pour le circuit en 24V. Si un interrupteur (4) est installé, il doit être dimensionné pour une intensité d'au moins 20A. Les caractéristiques dimensionnelles des câbles électriques recommandées en fig. 11 doivent être respectées. Éviter tout raccordement supplémentaire au système d'alimentation électrique afin d´éviter qu'une éventuelle chute de tension n'affecte le réglage de protection de la batterie.

AC: Les câbles électriques doivent être connectés aux bornes marquées L et N sur l'unité électronique. Tension nominale de 100 à 240 V AC 50/60Hz. Interrupteur de sécurité: Limite supérieure = 270V AC, limite inférieure = 80V AC. Un fusible 4A (11) doit être monté dans le câble de tension (L) pour protéger l'installation. Au cas où on utiliserait un interrupteur principal (12), celui-ci doit être réglé à un courant de 6A au moins. Le câble doit avoir une dimension minimale de 0,75 mm2 ou 18 AWG. NB: si nécessaire on pourra utiliser la connexion de terre.

Général: on peut connecter à l'unité électronique simultanément et l'alimentation AC et l'alimentation DC. Dans ce cas, AC sera la source d'alimentation préférentielle. En cas de déconnexion de l'alimentation AC ou de chute sous 85V AC le système d'alimentation à 12V DC entrera en fonction avec un retard de 1 minute. Si l'alimentation AC est réarmée, il n'y aura aucun retard dans le fonctionnement du compresseur.

Protection de batterie (fig. 10)

L'arrêt et le redémarrage du compresseur dependent des limites de tension choisies, mesurées sur les bornes + et – de la commande électronique. Les réglages standards des montages d'alimentation électrique en 12V et en 24V sont indiqués en fig. 12. On peut choisir d'autres limites de tension (fig. 13) en établissant une connexion comportant une résistance (9) entre les bornes C et P.

Thermostat (fig. 10)

Le thermostat (7) est monté entre les bornes C et T. En l'absence de résistance dans le circuit de commande, et lorsque le thermostat est enclenché, le compresseur avec une unité électronique standard 101N0210 ou 101N0220 tournera à une vitesse constante de 2.000 tr/min. Quand le thermostat est raccordé directement à la borne C, l'unité électronique 101N0300 ajustera la vitesse de rotation en fonction de la demande de froid souhaitée. Il est possible de faire tourner le compresseur à d'autres vitesses constantes, comprises entre 2.000 et 3.500 tr/min, en montant une résistance (8) sur le circuit de commande, cette résistance permettant d'ajuster l'intensité (mA). Les valeurs des résistances correspondent aux différentes vitesses de rotation du moteur sont indiquées en fig. 14.

Ventilateur (option, fig. 10)

Un ventilateur (5) peut être monté entre les bornes + et F. Raccorder le positif à + et le negative à F. La tension de sortie entre les bornes + et F étant toujours régulée à 12 V, toujours employer un ventilateur 12V, que l'alimentation électrique soit en 12V ou en 24V. Le courant d'alimentation du ventilateur peut atteindre 0,5A moy. Une intensité plus importante est cependant acceptée pendant 2 secondes au démarrage.

Ampoule (option, Fig.1)

Une ampoule de 5 Watts 12V DC (10) peut être connectée entre les bornes A et C. La tension de sortie entre les bornes A et C est toujours réglée sur 12 V DC. **Utiliser une ampoule de 12VDC aussi bien avec le système d'alimentation à 12V qu'avec celui à 24V.** La sortie de l'ampoule peut débiter une tension continue de 0,5A en moyenne.

LED (option, Fig.1)

Une LED de 10mA (6) peut être reliée entre les bornes + et D. Au cas où l'unité électronique relèverait une erreur de fonctionnement, la diode clignote pour un nombre déterminé de fois. Ce nombre dépend du type d'erreur de fonctionnement relevé. Chaque clignotement dure ¼ de seconde. la séquence de clignotement est suivie d'un intervalle sans émissions lumineuses, ensuite la séquence relative à chaque erreur relevée est répétée toutes les 4 secondes.

EINLEITUNG

Geehrter Kunde:

Wir danken Ihnen für Ihre Wahl unseres Produkts. von VITRIFRIGO und hoffen, dass Sie der Kauf umfassend zufrieden stellt.

Diese Anleitung ist Bestandteil des Kühlschranks und ist dem Benutzer bei Kauf des Gerätes auszuhändigen. Die Vervielfältigung, auch auszugsweise, ist untersagt.

Vor Verlassen unseres Werks wird jeder Kühlschrank strengen Prüfungen und Kontrollen unterzogen, die einen korrekten Betrieb gewährleisten.

Wenden Sie sich für weitere Informationen oder Fragen an unseren Kundendienst oder direkt an uns.

Vitri Alceste



WICHTIGE HINWEISE

- Vor Inbetriebnahme des Kühlschranks diese Anleitung aufmerksam durchlesen.
- Falls dieses Gerät ein altes Modell ersetzt, vor dessen Verschrottung den eventuellen Verschluss unbrauchbar machen.
- Sicherstellen, dass die Verpackung unbeschädigt ist, andernfalls den Spediteur darauf hinweisen.
- Das Produkt mit äußerster Vorsicht auspacken und installieren. Es empfiehlt sich, zur Vorbeugung von Verletzungen Schutzhandschuhe zu tragen, insbesondere bei Modellen mit separater Kühleinheit (siehe Abb. 3).
- Nach dem Auspacken das Gerät auf etwaige Schäden überprüfen. Diese müssen dem Händler innerhalb von 24 Stunden nach Erwerbsdatum mitgeteilt werden.
- Das Gerät darf ausschließlich für die Aufbewahrung von Lebensmitteln und Getränken verwendet werden.
- Der Kühlschrank sollte von Wärmequellen entfernt und in gut belüftetem Raum aufgestellt werden (siehe nachfolgende Anleitungen).
- Der Kühlschrank sollte mindestens eine Stunde vor Gebrauch eingeschaltet werden, damit der Kühlkreis voll betriebsfähig ist.
- Vor dem Anschließen des Geräts überprüfen, ob die Netzspannung mit der auf dem Typenschild des Kühlschranks bzw. Aufkleber des Kompressors angegebenen Spannung übereinstimmt.
- Bei der Installation darauf achten, dass das Gerät nicht auf dem Versorgungskabel aufliegt.
- Für eventuelle Störungen wenden Sie sich bitte an unsere nächste Service-Stelle. In jedem Fall Fachpersonal zu Rate ziehen.
- Vor jeglichen Wartungs- bzw. Reinigungsarbeiten den Stecker abziehen.
- Keine Flüssigkeiten in Glasbehältern im Tiefkühlfach aufbewahren.
- Bei der Entsorgung des Verpackungsmaterials die örtlichen Entsorgungsvorschriften beachten.
- Das vorliegende Produkt darf nicht in den Hausratsabfall gelangen, sondern es muss ordnungsgemäß entsorgt werden. Wenden Sie sich an die Sammelsstellen für Elektro- und Elektronikgeräte (RAEE) in Ihrem Gebiet oder geben Sie das Gerät beim Kauf eines gleichwertigen Geräts an den Händler zurück.
- Falls das Produkt nicht ordnungsgemäß entsorgt wird, kann es aufgrund des Vorhandensein bestimmter Substanzen gefahren für die Umwelt und die Gesundheit darstellen.
- Das nebenstehend abgebildete Symbol weist darauf hin, dass das Produkt nicht in den Hausratsabfall gelangen darf.



- Die gesetzwidrige oder unsachgemäße Entsorgung des Produkts führt zu strengen verwaltungs- und/oder strafrechtlichen Sanktionen, die die geltende Rechtsprechung vorsieht.
- Der Kühlschrank darf nur für vorgesehene Zwecke verwendet werden.
- Das Gerät sauber halten und die Sicherheitsvorrichtungen funktionstüchtig halten.
- Die Lüftungsöffnungen am Gehäuse und/oder Einbaugestell freihalten.
- Niemals die Abschirmungen (Gehäuse) des Kühlschranks entfernen.
- Die auf Seite x dieser Unterlagen beschriebenen Tests, Kontrollen und regelmäßigen Wartungsschritte immer durchführen.
- Das Gerät niemals Regen aussetzen.
- Für den Campingeinsatz geeignet.

Allgemeine Hinweise

Zweck der Anleitung

Dieses Benutzerhandbuch der Kühlschrankserie „INTERIOR (230Vac) / OCEAN-RUNNER (12/24Vdc)“ stellt eine Anleitung zur korrekten und sicheren Nutzung und vernünftigen Pflege der Geräte dar.
Um den Betrieb und die Anwendung Ihres Kühlschranks schnell zu lernen, sollte diese Betriebs- und Wartungsanleitung zu Beginn durchgelesen werden.
Der korrekte Betrieb des Kühlschranks ist auch von einer effizienten Wartung abhängig. Daher ist die Kenntnis der notwendigen Wartungsarbeiten erforderlich. Die Bedienungsanleitung enthält alle Angaben zu Inbetriebnahme, Abschalten und Betrieb.
Der Kühlschrank wurde gemäß den gesetzlichen Sicherheitsanforderungen hergestellt, dennoch ist die maximale Sicherheit des Anwenders von einer gründlichen Lektüre dieser Anleitung und einer sorgfältigen und regelmäßigen Wartung des Gerätes abhängig.
Einige Angaben oder Abbildungen in dieser Anleitung können Details enthalten, die leicht von Ihrem Kühlschrank abweichen können, ohne jedoch die wesentlichen Informationen zu beeinflussen. Durch eine ständige Verbesserung können die Kühlschränke Variationen aufweisen, die nicht in dieser Anleitung enthalten sind. Eventuelle Modifikationen werden je nach Notwendigkeit den folgenden Ausgaben des Handbuchs hinzugefügt.

Kennzeichnung des Herstellers

Der Kühlschrank wurde ausschließlich entworfen und hergestellt durch:

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BESCHREIBUNG DES GERÄTS (Abb.2 und Abb.7)

12/24Vdc – 220Vac

A) waagerechter Verdampfer
A1) senkrechter Verdampfer
B) Tropfenfänger
C) Thermostatgehäuse
D) abnehmbare Gitter
E) Glasfläche (nur bestimmte Modelle)
F) Gemüseablage (nur bestimmte Modelle)
G) Ablagen (herausnehmbar)

12/24Vdc Tragbar

A) Korb
B) Ratschenverschluss
C) Verdampfer
D) Schraube Befestigungsstrebe
E) Befestigungsstrebe
F) Maske mit Digitalthermostat
G) Maske mit LED-Thermostat
H) manuelles Thermostat (nur C26)
I) Schalter (nur C26)
J) Griff
K) Stecker 12/24Vdc – 220Vac

Das Etikett, auf dem die Kennummer und die technischen Daten angegeben sind, befindet sich rechts oben im Kühlschrank selbst. Die ersten drei Ziffern der Kennummer bezeichnen Baujahr und -woche.
Alle Materialien, die mit den Lebensmitteln in Berührung kommen können, entsprechen der Richtlinie 2004/1935/EWG.
Die Geräuschemission der Maschine liegt unter 70dB(A).

INSTALLATION

Sicherstellen, dass das Gerät unbeschädigt ist. Eventuelle Transportschäden müssen innerhalb von 24 Stunden dem Händler mitgeteilt werden.
Das Gerät mit äußerster Vorsicht behandeln. Bei der Installation der Kühlanlage (bei Geräten mit separater Kühlanlage) besonders vorsichtig vorgehen, um Verbindungsleitungen nicht zu verbiegen bzw. brechen. Der Kühlschrank (und ggf. separate Kühlanlage) muss in jedem Fall auf ebener Fläche aufgestellt werden.
Die Kühlanlage muss ausreichend belüftet werden. Hierfür das Kühlschrankmöbel mit einer Öffnung unten in Höhe des Kühlaggregats und einer zweiten auf der Oberseite bzw. oben in der Seitenwand versehen. Diese Öffnungen müssen mindestens 300 cmq groß sein. Sollte dies nicht möglich sein, mindestens 50 mm Raum zwischen der Oberseite des Kühlschranks und der darüber liegenden Fläche belassen (siehe Abb. 5).
Für die Installation von Kühlschränken in Wohnwagen, Campern, Wohnmobilen usw. empfiehlt sich ein direkter Luftanschluss nach außen (siehe Abb. 6).

REINIGUNG DES KÜHLSCHRANKS

Vor der Reinigung auf jeden Fall die Stromzufuhr unterbrechen. Hierzu den Stecker herausziehen.

AUSSENREINIGUNG

Den Kühlschrank von außen mit lauwarmem Wasser waschen, mit Kaltwasser nachspülen und mit einem weichen Tuch trocknen. Keine Scheuermittel verwenden.

INNENREINIGUNG

Die Gitter (oder Korb), Behälter und Eiswürfelschalen herausnehmen, Kühlschrank mit lauwarmem Natron- bzw. Essigwasser reinigen. Nachspülen und mit einem weichen Tuch gut trocknen. Auf keinen Fall Scheuer- bzw. Reinigungsmittel oder Seife verwenden.

KONDENSATOR

Der Kondensator (siehe Abb. 4) sollte mindestens einmal im Jahr mit einem Staubsauger bzw. trockenem Pinsel gereinigt werden.
Bei längerem Stillstand des Kühlschranks folgende Maßnahmen treffen, um Schimmelbildung und unangenehme Gerüche zu vermeiden: das Versorgungskabel herausziehen, den Kühlschrank vollständig leeren, innen reinigen und die Tür etwas offen lassen.

ELEKTRISCHER ANSCHLUSS

Dieses Gerät entspricht der EG-Norm 89/336 in punkto Funkentstörung.
Vor dem Anschließen sicherstellen, dass Netzspannung und die auf dem Typenschild bzw. dem Aufkleber des Kompressors angegebene Spannung übereinstimmen.

TEMPERATURREGELUNG

Jeder Kühlschrank verfügt über ein Thermostat für den automatischen Temperaturerhalt.

- **MECHANISCHER THERMOSTAT**
  Die gewünschte Temperatur über den Regelgriff einstellen.
  Griff auf "0" bzw. "STOP": Gerät außer Betrieb.
  Griff auf "1": Gerät in Betrieb.
  Griffpositionen von "1" bis "5": fortschreitend tiefere Temperaturen.

  Elektroschema, siehe Abb. 8e/h (12/24V) oder Abb. 9 (115V/230V)

Einige Kühlschrankversionen sind mit Thermostaten ausgerüstet, deren Symbole zur Temperaturreglung von der obigen Beschreibung abweichen. In diesen Fällen ist sich auf Abb. 1 zu beziehen. Die Kühlschranktemperatur wird durch Drehen des Schalters im Uhrzeigersinn herabgesetzt.

Für die rationelle Aufwahrung von Lebensmitteln die folgende Tabelle beachten:

Lebensmittel	**Haltbarkeit**	**Anordnung im Kühlschrank**
Fleisch, ausgenommener Fisch (in Kühlbeutel)	2 bis 3 Tage	Rost unter Tiefkühlfach
Eier	1 Monat	Ablage in der Tür
Butter, Margarine	1 Woche	Ablage in der Tür
Gekochte Speisen, Torten und Suppen (in dicht verschlossenen Behältern, nach Abkühlung)	3 bis 4 Tage	Rost im unteren Teil des Kühlschranks
Wurstwaren, frische Nudeln, Soßen, Pudding, Schokolade, gefülltes Gebäck, Speck, trockenes Gebäck, frische Tomaten	3 bis 4 Tage	Überall
Flaschen		Aufnahme in der Tür
Obst und Gemüse		Gemüsefach; unterer Teil des Kühlschranks

AUSTAUSCH DER GLÜHBIRNE

Für den Austausch der Glühbirne folgendermaßen vorgehen:

- Die Schutzabdeckung senkrecht vom Sockel ziehen, darauf achten, dass die Befestigungsstifte nicht beschädigt werden.
- Eine der beiden Federn entfernen, um die Glühbirne herauszuziehen.
- Die beiden Federn ein wenig zueinander biegen und die neue Glühbirne einsetzen.
- **Sicherstellen, dass die Glühbirne fest in den Federn sitzt.**
- Die Schutzabdeckung wieder aufsetzen.

WECHSEL DES TÜRSCHLAGS

Wechsel des Türschlags bei PIN-Verschluss:

- Das obere Scharnier und den PIN-Verschluss ausbauen.
- Die Tür von dem unteren Scharnier ziehen.
- Das untere Scharnier ausbauen und an der gegenüberliegenden Kühlschrankseite montieren.
- Die Tür auf das untere Scharnier setzen.
- Das obere Scharnier und den PIN-Verschluss an der gegenüberliegenden Seite montieren.

AUSTAUSCH DES PANEELS

Zum Ausbau und/oder Austausch des Türpaneels folgendermaßen vorgehen:

- Die Tür entsprechend den Angaben im vorherigen Kapitel ausbauen.
- Die Schrauben an der unteren Seite herausschrauben.
- Das Paneel nach unten herausziehen.
- Das neue Paneel nach oben bis zum Anschlag hineinschieben.
- Die untere Seite montieren.

ABTAUEN DES GERÄTS

Sobald die Eisschicht 3 mm überschreitet sollte der Kühlschrank abgetaut werden. Wichtige Voraussetzung für einen einwandfreien und energiesparenden Betrieb des Geräts.

Für vollständiges Abtauen den Regelgriff auf "STOP" drehen. Zur Beschleunigung des Abtauvorgangs die Kühlschranktür offen lassen.

Eisschicht nie mit spitzen oder scharfen bzw. Metallgegenständen entfernen. Hierdurch könnte die Kühlplatte unweigerlich beschädigt werden.

Kühlschränke mit Kältespeicherung tauen automatisch ab. Der Tropfenfänger sollte daher täglich geleert werden.

Nach dem Abtauen den Kühlschrank wieder in Betrieb nehmen und den Thermostat auf die gewünschte Temperatur stellen.

BESONDERE HINWEISE FÜR KÜHLSCHRÄNKE 220 V AC

ELEKTRISCHER ANSCHLUSS

Der Kühlschrank muss nach gesetzlichen Bestimmungen geerdet werden. Vorschriftsmäßige Erdung der Elektroanlage sicherstellen.
Im Fall von Personen- bzw. Sachschäden aufgrund Nichteinhaltung dieser Vorschrift weist die Herstellerfirma jegliche Haftung zurück.

Für den Anschluss sollten keine Adapter, Vielfachstecker bzw. Verlängerungskabel verwendet werden. Sollte dies nicht vermeidbar sein, auf jeden Fall nur den einschlägigen Sicherheitsvorschriften entsprechendes Material verwenden und dabei auf keinen Fall die vorgegebenen elektrischen Stromfestigkeitsgrenzen überschreiten.
Falls Stecker und Steckdose nicht übereinstimmen, die Steckdose durch eine passende ersetzen. Dies sollte nur durch Fachpersonal ausgeführt werden, wobei zu beachten ist, dass der Kabelquerschnitt der Steckdose auf die Leistungsaufnahme des Geräts abgestimmt ist.

STÖRUNGEN UND ABHILFE

1- DAS GERÄT FUNKTIONIERT NICHT

Überprüfen, ob
- der Thermostat auf "STOP" steht;
- die Stromzufuhr unterbrochen ist;
- der Schutzschalter der elektrischen Anlage ausgeschaltet ist;
- der Stecker beschädigt ist oder falsch in der Steckdose sitzt;
- die Steckdose defekt ist. Hierfür ein anderes, sicher funktionierendes Gerät verwenden;
- das Versorgungskabel unterbrochen ist.

2- LAUTES BETRIEBSGERÄUSCH

Überprüfen, ob
- der Kühlschrank bzw. das Kühlaggregat eben stehen;
- der Kühlschrank Möbel berührt, die Vibrationen verursachen können;
- die Kühlleitungen an der Rückwand am Gerät anliegen und somit schwingen.

3- UNZUREICHENDE KÜHLUNG

Überprüfen, ob
- die Tür dicht schließt;
- der Kühlschrank in der Nähe von Wärmequellen aufgestellt ist;
- der Kühlschrank bzw. die separate Kühleinheit ausreichend belüftet sind;
- der Verdampfer vereist ist;
- der Kondensator durch Staub behindert ist;
- der Ventilator frei dreht (bei Modellen mit Lüfterkühlung);
- der Kühlschrank überfüllt ist.

Sollte nach diesen Kontrollen der Kühlschrank weiterhin nicht ordnungsgemäß funktionieren, sich mit dem Kundendienst in Verbindung setzen.

BESONDERE HINWEISE FÜR KÜHLSCHRÄNKE 12-24 V DC

Für die Installation von Kühlschränken in Wohnwagen, Campern, Wohnmobilen usw. empfiehlt sich ein direkter Luftanschluss nach außen (siehe Abb. 6).
Für die Installation tragbarer Kühlschränke steht bei einigen Modellen eine Befestigungsstrebe zur Verfügung (siehe Abb.7).

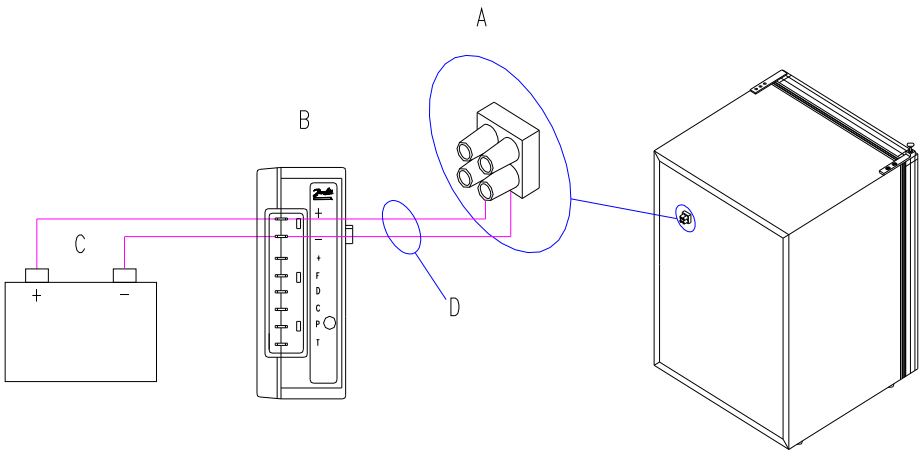
ELEKTRISCHER ANSCHLUSS

Für 12 oder 24V Gleichstromkühlschränke wird empfohlen, die Anlagen gemäß den beiliegenden Anleitungen der Danfoss-Verdichter direkt an die Batterie zu schließen (siehe Seite 64 und 65).

Anschluss der Innenbeleuchtung bei 12/24Vdc-Kühlschränken mit externem Motor:

- Das optionale Kabel „D“ (Cod.**R10777**) an die Klemme an der Kühlschrankrückseite und die Kompressorsteuerung schließen. (Die Klemme „A“ ist ungepolt, daher kann der Anschluss beliebig erfolgen).
- Die Batterie an die Kompressorsteuerung anschließen, **auf die Polarität achten!**

  - Anschlussklemme Innenbeleuchtung.
  - Kompressorsteuerung.
  - Batterie.
  - Beiliegendes Kabel zur Speisung der Innenbeleuchtung.



BESONDERE HINWEISE FÜR KÜHLSCHRÄNKE 12-24Vcc 100-240Vca

ELEKTRISCHER ANSCHLUSS

Es wird empfohlen, die 12V oder 24V Gleichstromleitung entsprechend der beiliegenden Anleitung des Danfoss-Verdichters direkt an die Batterie zu schließen (siehe Seite 64 und Seite 65).

Für die Wechselstromleitung muss ein dreipoliges Kabel mit mindestens 1 mm2 Querschnitt pro Leiter verwendet werden, das dem Einsatzbereich und der Umgebung sowie den geltenden Bestimmungen entspricht.

Der Anschluss an die Wechselstromversorgung muss durch einen gemäß den geltenden Bestimmungen dafür ausgelegten Stecker und Steckdose oder einen thermomagnetischen mehrpoligen 6A-Differentialschalter mit Kontaktabstand von mindestens 3 mm, bzw. den geltenden Bestimmungen entsprechend, erfolgen.
Nach der Installation sind die Funktion des Masseanschlusses zu prüfen, sowie sämtliche gesetzlich vorgesehenen elektrischen Sicherheitstests durchzuführen.
Die Kabel müssen angemessen geschützt und befestigt werden, um ein versehentliches Ziehen an den Kabeln und eine daraus folgende Abtrennung, sowie die Berührung mit über 50°C heißen oder scharfkantigen Komponenten zu verhindern.
Es wird empfohlen, die Montage der Stromleitungen durch einen Fachmann ausführen zu lassen, der die Anlage auf Entsprechung der geltenden Bestimmungen überprüft und die erforderlichen Konformitätsbescheinigungen ausstellt.

Anschluss der Innenbeleuchtung bei 12/24Vdc-Kühlschränken mit externem Motor:

- Das optionale Kabel (Cod.**R10777**) zum Anschluss der Innenbeleuchtung gemäß dem Schema auf Abbildung 15 an der Klemmleiste auf der Kühlschrankrückseite und der Verdichtersteuerung anschließen. (Die Klemmleiste ist nicht gepolt, weshalb der Anschluss beliebig erfolgen kann).

TEMPERATURREGELUNG

In 12Vdc bzw. 24Vdc-Kühlschränken mit Kältespeicherung und 75l-Inhalt sollte der Regelgriff zur optimalen Energieeinsparung auf "A", in größeren Modellen auf "A1" gestellt werden (Abb.1)

- **„LED"-THERMOSTAT**

  Der elektronische „LED"-Thermostat ist mit zwei Steuertasten ausgestattet:

  - Die Ein-/Ausschalttaste „ON/OFF"
  - Die Temperaturregelung „✱"

  Durch Drücken der „ON/OFF"-Taste wird der **Kühlschrank ein- bzw. ausgeschaltet**.
  Zur Einstellung der gewünschten Temperatur, die mit dem Symbol „✱" gekennzeichnete Taste drücken. Bei jedem Tastendruck leuchtet eine LED von links nach rechts auf, bei Zwischentemperaturen leuchten zwei nebeneinander liegende LEDs auf. Bei Anzeige auf der linken Seite ist der Kühlschrank auf Mindestkälte eingestellt (wärmste Stufe), während die Positionen in die rechte Richtung eine stufenweise Reduzierung (kälter) um zirka 3°C anzeigen. Zur Einstellung einer niedrigeren Temperatur wiederholt die Taste drücken, bis die rechte Leuchtanzeige leuchtet (höchste Kältestufe), die nächste Betätigung der Taste setzt die Anzeige wieder auf die ganz linke Position zurück.
  Elektroschema, siehe Abb. 8a/b/f

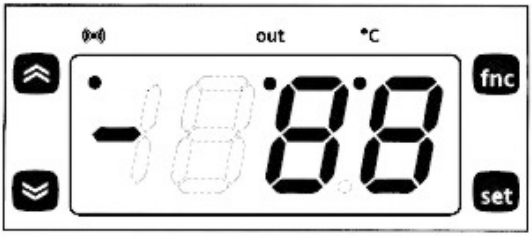


DIGITALES THERMOSTAT

Das DIGITALE Thermostat ermöglicht eine ständige Kontrolle der Kühlschranktemperatur durch Ein-/Ausschalten des Kompressors.
Dem Anwender stehen ein Display und vier Tasten zur Steuerung und Programmierung zur Verfügung.
Bei Inbetriebnahme beginnt das Display zu blinken und zeigt anschließend die momentane Innentemperatur des Kühlschranks an.
Die Standardeinstellung des Thermostats ist 0°C.

ÄNDERN DER PARAMETER:

- Schnell (innerhalb von 5 sek.) zweimal hintereinander die Taste **SET** drücken. Zuerst erscheint „SET“ und anschließend „0“, bzw. Der eingestellte Wert.
- Durch Drücken der Tasten oder die gewünschte Temperatur einstellen.
- Schnell zweimal hintereinander die Taste **FNC** drücken, um die eingestellte Temperatur zu bestätigen.
  Zuerst erscheint „SET“ und anschließend die Innentemperatur.
- Der Punkt unter „OUT“ weist auf den Betrieb des Kompressors und des Ventilators hin.

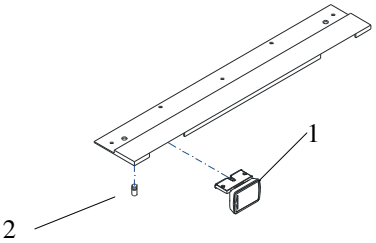


Elektroschema, sieghe Abb. 8c/d/g

JEDEM KÜHLSCHRANK LIEGT EINE DETAILLIERTE BEDIENUNGSANLEITUNG DES DIGITALEN THERMOSTATS BEI.

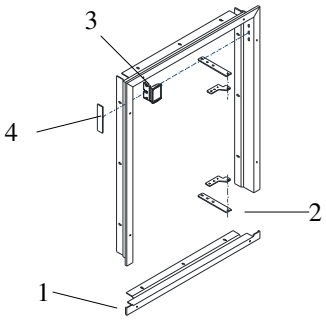
Wechseln des Türschlags bei NAUTIC-EUROPA-Verschluss:

- Das untere Scharnier ausbauen und die Tür nach unten herausziehen.
- Den Nautic-Griff (1) ausbauen und an der gegenüberliegenden Türseite montieren, dabei auf die Lochachsen achten.
- Den Scharnierstift (2) von der Strebe abschrauben und an der gegenüberliegenden Seite festschrauben.
- Die Tür einsetzen, dabei auf die gute Funktion des Verschlusses achten.
- Das untere Scharnier an der gegenüberliegenden Kühlschrankseite montieren.



Wechseln des Türschlags bei NAUTIC-USA-Verschluss:

- Den Sockel des Befestigungsprofils (1) ausbauen, wenn vorhanden.
- Das untere Scharnier und Platte (2) ausbauen und die Tür nach unten herausziehen.
- Den Nautic-Griff (3) ausbauen, die Sperren und die innen liegende Feder umdrehen, um die Richtung der Öffnungsbewegung zu verändern; den Griff in die Pfeilrichtung drehen.
- Den Nautic-Griff an der gegenüberliegenden Türseite befestigen, dabei auf die Lochachsen achten.
- Die Verschlussplatte (4) auf der gegenüberliegenden Profilseite befestigen.
- Die Tür einsetzen, dabei auf die gute Funktion des Verschlusses achten.
- Das Scharnier, die untere Platte und den Sockel des Befestigungsprofils montieren.



STÖRUNGEN UND ABHILFE

1- DAS GERÄT FUNKTIONIERT NICHT

Überprüfen, ob

- der Regelgriff auf "STOP" steht;
- der Schutzschalter der elektrischen Anlage ausgeschaltet ist;
- die Sicherung der elektronischen Vorrichtung beschädigt ist;
- das Versorgungskabel unterbrochen ist.
- die Batterie betriebstüchtig ist;
- **die Spannung auf dem Klemmenbrett der elektronischen Vorrichtung mit dem Spannungswert der Batterie übereinstimmt.** Bei Spannungsabfällen über 0,2-0,4 V sicherstellen, dass
- der Kabelquerschnitt zwischen Batterie und elektronischer Vorrichtung ausreichend groß ist;
- entlang der Versorgungslinie eventuelle Verbindungspunkte nicht abgenutzt bzw. richtig befestigt sind;
- Batteriepole und Kontaktstellen keine Oxidationen aufweisen.

2- LAUTES BETRIEBSGERÄUSCH

Überprüfen, ob

- der Kühlschrank bzw. das Kühlaggregat eben stehen;
- der Kühlschrank Möbel berührt, die Vibrationen verursachen können;
- die Kühlleitungen an der Rückwand am Gerät anliegen und somit schwingen.

3- UNZUREICHENDE KÜHLUNG

Überprüfen, ob

- die Tür dicht schließt;
- der Kühlschrank in der Nähe von Wärmequellen aufgestellt ist;
- der Kühlschrank bzw. die separate Kühleinheit ausreichend belüftet sind;
- der Verdampfer vereist ist;
- der Kondensator durch Staub behindert ist;
- der Ventilator frei dreht (bei Modellen mit Lüfterkühlung);
- der Kühlschrank überfüllt ist.

Sollte nach diesen Kontrollen der Kühlschrank weiterhin nicht ordnungsgemäß funktionieren, sich mit dem Kundendienst in Verbindung setzen.

Die elektronische Steuerungseinheit arbeitet mit zwei Spannungen. Sie kann sowohl in Systeme mit 12V als auch in Systeme mit 24V Spannungsversorgung eingesetzt werden. Die maximale Spannung für 12V Systeme beträgt 17V, die für 24V Systeme 31,5V. Die maximal zulässige Umgebungstemperatur ist 55°C. Die elektronische Steuerungseinheit hat einen eingebauten Überhitzungsschutz. Dieser schaltet den Verdichter bei Überhitzung ab.

Installation (Abb. 10)

Der Stecker der elektronischen Steuerungseinheit muß zunächst auf die Anschlüsse des Verdichters gesteckt werden. Die gesamte Steuerungseinheit wird dann durch Aufschnappen des Gehäuses über den Schraubenkopf (1) montiert.

Stromversorgung (Abb. 10)

Die elektronische Steuerungseinheit muß direct mit den Klemmen der Stromversorgung (Batterie) (2) verbunden werden. Plus mit + und Minus mit - verbinden, andernfalls arbeitet die Steuerung nicht. Die Steuerung ist gegen Verpolung geschützt. Zum Schutz der Installation muß eine Sicherung (3) in der + Leitung, möglichst nahe an der Stromversorgung, montiert sein. 15A Sicherungen für 12V und 7,5A Sicherungen für 24V Stromkreise werden empfohlen. Wenn ein Hauptschalter (4) montiert wird, sollte dieser mit 20A belastbar sein. Die Leitungsdimensionierung in Abb. 11 muß beachtet werden. Zusätzliche Verbindungen in der Stromversorgung sollten vermieden werden um zu verhindern, daß ein Spannungsabfall den Batterieschutz beeinflusst.

Batterieschutz (Abb. 10)

Die Abschaltung des Verdichters und der Wiederanlauf ist abhängig von der ausgewählten Spannungsbegrenzung, die an den + und – Klemmen der Elektronik gemessen wird. Die Werkseinstellung für 12V und 24V Spannungsversorgungen werden in der Tabelle Abb. 12 dargestellt. Zusätzliche Spannungsbegrenzungen (Abb. 13) zum Schutz der Batterie können durch einen Widerstand (9) zwischen den Klemmen C und P eingestellt werden. Bei direkt solar betriebener Anwendung, ohne Batterie, wird ein 220kW Widerstand empfohlen. Im AEO-Betrieb (Adaptive Energie-Optimierung) stellt der BD-Verdichter die Drehzahl dem Kühlbedarf entsprechend ein, im Versorgungsspannungsbereich von 9,6 bis 31,5V.

Thermostat (Abb. 10)

Der Thermostat (7) wird an die Anschlußklemmen C und T angeschlossen. Ohne einen Widerstand im Steuerkreis läuft der Verdichter mit elektronischer Steuerungseinheit 101N0210 oder 101N0220 mit einer Festdrehzahl von 2.000 min-1, wenn der Thermostat eingeschaltet wird. Wird bei der elektronischer Steuerungseinheit 101N0300 der Thermostat ohne Wiederstand an C verbunden, so stellt sich die Verdichterdrehzahl selbsttätig ein. Andere Festdrehzahlen im Bereich zwischen 2.000 und 3.500 min-1 können mit einem Widerstand (8) eingestellt werden der dazu dient, den Strom (mA) im Steuerkreis zu regeln. Die Widerstandswerte für die verschiedenen Motordrehzahlen werden in der Tabelle Abb. 14 dargestellt.

Ventilator (Option, Abb. 10)

Ein Ventilator (5) kann an die Klemmen + und F angeschlossen werden. Plus an + und Minus an F. Da die Ausgangsspannung zwischen den Klemmen + und F immer auf 12V geregelt ist, muß ein 12V Ventilator für 12V und 24V versorgte Systeme benutzt werden. Der Ventilatorausgang kann einen Dauerstrom von 0,5ADurchschnitt liefern. Eine höhere Stromaufnahme ist nur während des Anlaufens für 2 Sekunden zulässig.

LED (Option, Abb. 10)

Eine 10mA Leuchtdiode (LED) (6) kann an die Klemmen + and D angeschlossen werden. Falls die elektronische Steuerung einen Bedienungsfehler registriert, wird dieser durch Aufleuchten der LED angezeigt. Die Anzahl der Leuchtimpulse ist je nach Bedienfehler unterschiedlich. Jeder Impuls dauert ¼ Sekunde. Die Fehleranzeige wird alle 4 Sekunden wiederholt.

Anzahl Leucht-impulse	Fehlertyp
5	**Übertemperatur der Elektronikeinheit** (Bei zu starker Belastung des Kühlsystems oder zu hoher Umgebungstemperatur wird die Elektronik zu heiß).
4	**Zu niedrige Drehzahl** (Bei zu stark belastetem Kühlsystem läßt sich die Mindestdrehzahl des Motors von 1.850 min^{-1} nicht aufrecht erhalten).
3	**Motor läuft nicht an** (Der Rotor sitzt fest oder der Differenzdruck im Kühlsystem ist zu hoch (>5 bar)).
2	**Lüfter-Überstrom** (Der Lüfter belastet die Elektronikeinheit mit mehr als $1A_{Spitze}$).
1	**Versorgungsspannung** (Die Versorgungsspannung lag außerhalb des eingestellten Bereichs).

ANLEITUNG DANFOSS BD35/BD50F 12-24 V DC / 110-240 V AC

Die elektronische Einheit besitzt einen Spannungssensor und kann sowohl mit Versorgungssystemen mit 12V/24V Gleichstrom als auch 100-240V Wechselstrom bei 50/60Hz verwendet werden. Bei einer Gleichstromversorgung mit 12V liegt die Höchstspannung bei 17V und bei einer Gleichstromversorgung mit 24V liegt die Höchstspannung bei 31,5V. Bei Wechselstromsystemen liegen die Höchstspannung bei 265V und die Mindestspannung bei 85V. Die höchste zulässige Raumtemperatur beträgt 55°C. Die elektronische Einheit ist mit einem integrierten thermischen Schalter ausgestattet, der den Verdichterbetrieb ein- und ausschaltet, wenn die Temperatur der elektronischen Einheit zu stark ansteigt (100°C/121°F auf der Platine). Die Stromaufnahme ist auf 100W begrenzt. Siehe Datenblatt BD50F für Details.

Installation (Abb. 10)

Der Stecker der elektronischen Steuerungseinheit muß zunächst auf die Anschlüsse des Verdichters gesteckt werden. Die gesamte Steuerungseinheit wird dann durch Aufschnappen des Gehäuses über den Schraubenkopf (1) montiert.

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Die elektronische Steuerungseinheit muß direct mit den Klemmen der Stromversorgung (Batterie) (2) verbunden werden. Plus mit + und Minus mit - verbinden, andernfalls arbeitet die Steuerung nicht. Die Steuerung ist gegen Verpolung geschützt. Zum Schutz der Installation muß eine Sicherung (3) in der + Leitung, möglichst nahe an der Stromversorgung, montiert sein. 15A Sicherungen für 12V und 7,5A Sicherungen für 24V Stromkreise werden empfohlen. Wenn ein Hauptschalter (4) montiert wird, sollte dieser mit 20A belastbar sein. Die Leitungsdimensionierung in Abb. 11 muß beachtet werden. Zusätzliche Verbindungen in der Stromversorgung sollten vermieden werden um zu verhindern, daß ein Spannungsabfall den Batterieschutz beeinflusst.

Wechselstrom: Die Stromkabel müssen an die mit L und N gekennzeichneten Klemmen auf der elektronischen Einheit geschlossen werden. Nennspannung von 100 bis 240V AC 50/60Hz. Sicherheitsschalter: Obergrenze = 270V AC, Untergrenze = 80V AC. Eine Sicherung 4A (11) muss zum Schutz der Anlage in das Stromkabel (L) integriert werden. Wird ein Hauptschalter (12) verwendet, muss er für eine Spannung von mindestens 6A ausgelegt sein. Das Kabel muss mindestens 0,75 mm2 oder 18 AWG besitzen. ANM: wenn erforderlich, kann die Masseleitung verwendet werden.

Allgemein: Die elektronische Einheit kann gleichzeitig an eine Wechsel- und eine Gleichstromversorgung angeschlossen werden. In diesem Fall ist die Wechselstromversorgung aktiv. Bei Unterbrechung der Wechselstromversorgung oder einen Spannungsabfall unter 85V, wird nach 1 Minute die 12V Gleichstromversorgung aktiviert. Ist die Wechselstromversorgung wieder hergestellt, erfolgt keine Verzögerung des Verdichterbetriebs.

Batterieschutz (Abb. 10)

Die Abschaltung des Verdichters und der Wiederanlauf ist abhängig von der ausgewählten Spannungsbegrenzung, die an den + und – Klemmen der Elektronik gemessen wird. Die Werkseinstellung für 12V und 24V Spannungsversorgungen werden in der Tabelle Abb. 12 dargestellt. Zusätzliche Spannungsbegrenzungen (Abb. 13) zum Schutz der Batterie können durch einen Widerstand (9) zwischen den Klemmen C und P eingestellt werden. **Thermostat (Abb. 10)**

Der Thermostat (7) wird an die Anschlußklemmen C und T angeschlossen. Ohne einen Widerstand im Steuerkreis läuft der Verdichter mit elektronischer Steuerungseinheit 101N0210 oder 101N0220 mit einer Festdrehzahl von 2.000 min-1, wenn der Thermostat eingeschaltet wird. Wird bei der elektronischer Steuerungseinheit 101N0300 der Thermostat ohne Wiederstand an C verbunden, so stellt sich die Verdichterdrehzahl selbsttätig ein. Andere Festdrehzahlen im Bereich zwischen 2.000 und 3.500 min-1 können mit einem Widerstand (8) eingestellt werden der dazu dient, den Strom (mA) im Steuerkreis zu regeln. Die Widerstandswerte für die verschiedenen Motordrehzahlen werden in der Tabelle Abb. 14 dargestellt.

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Ein Ventilator (5) kann an die Klemmen + und F angeschlossen werden. Plus an + und Minus an F. Da die Ausgangsspannung zwischen den Klemmen + und F immer auf 12V geregelt ist, muß ein 12V Ventilator für 12V und 24V versorgte Systeme benutzt werden. Der Ventilatorausgang kann einen Dauerstrom von 0,5ADurchschnitt liefern. Eine höhere Stromaufnahme ist nur während des Anlaufens für 2 Sekunden zulässig.

Lampe (optional, Abb. 1)

Zwischen den Klemmen A und C kann eine 12V DC 5W-Lampe (10) angeschlossen werden. Sowohl bei einer Stromversorgung mit 12V, als auch mit 24V muss eine Lampe mit 12V Gleichstrom verwendet werden. Der Lampenausgang besitzt eine durchschnittliche kontinuierliche Spannung von 0,5A.

LED (optional, Abb. 1)

Zwischen den Klemmen + und D kann eine 10mA-LED (6) angeschlossen werden. Erfasst die elektronische Einheit eine Betriebsstörung, blinkt die Diode eine bestimmte Anzahl, die von der Art der Betriebsstörung abhängig ist. Jeder Blinkimpuls dauert ¼ Sekunde. Nach der Blinksequenz folgt eine Pause und die dem erfassten Fehler entsprechende Sequenz wird alle 4 Sekunden wiederholt.

INTRODUCCIÓN

Gentil cliente:

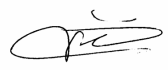
Agradeciéndole por haber elegido un producto nuestro, la empresa VITRIFRIGO desea que usted se encuentre completamente satisfecho de la compra que ha efectuado.

Le recordamos que el presente manual debe ser considerado parte integrante del frigorífico y debe seguir el recorrido de venta hasta el usuario y que la Vitrifrigo prohíbe la reproducción de cualquiera de sus partes.

Cada frigorífico, antes de abandonar nuestro establecimiento, soporta toda una serie de pruebas y de controles que garantizan el correcto funcionamiento.

Para cualquier información podrá dirigirse a nuestros centros de asistencia o directamente a nuestras oficinas.

Vitri Alceste



ADVERTENCIAS

- **El manual se refiere a todos los frigoríficos con compresor fabricados por VITRIFRIGO s.n.c.**

- Leer detenidamente este manual antes de utilizar el frigorífico.
- Si este aparato tuviera que sustituir otro de tipo viejo se aconseja inutilizar la cerradura antes de desguazarlo.
- Verificar que el embalaje esté entero, en caso contrario comunicarlo al transportador.
- Desembalar e instalar el producto actuando con la máxima precaución; para evitar heridas accidentales, se aconseja usar guantes de protección, en especial para los modelos con unidad refrigerante remota (fig. 3).
- Tras haber desembalado el aparato comprobar que no está dañado. Los daños han de indicarse al agente de ventas a las 24 horas a partir de la fecha de compra a más tardar.
- El producto se utilizará exclusivamente para guardar alimentos y bebidas.
- El aparato ha de ubicarse lejos de fuentes de calor asegurándole la suficiente ventilación (véanse indicaciones siguientes).
- Se aconseja esperar una hora por lo menos antes de encender el frigorífico para que el circuito refrigerante pueda ser completamente eficiente.
- Antes de conectar el producto comprobar que la tensión de red corresponde a lo que se indica en la placa de identificación del aparato o la indicada en la placa situada en el compresor.
- Una vez efectuada la instalación comprobar que el aparato no se apoya sobre el cable de alimentación.
- Para cualquier problema de funcionamiento dirigirse a nuestro centro de asistencia más cercano; en cualquier caso, utilizar personal cualificado.
- Antes de efectuar cualquier operación de mantenimiento o limpieza, desenchufar el aparato.
- No introducir en la sección de baja temperatura líquidos en recipientes de cristal.
- No desechar el embalaje del aparato, seleccionar los materiales según las prescripciones locales relativas a la evacuación de desechos.
- El presente producto no se debe tirar entre los residuos urbanos sino que se debe eliminar con recogida selectiva de residuos. Dirigirse a los centros de recogida de Residuos de Aparatos Eléctricos y Electrónicos (RAEE) presentes en su territorio o bien devolverlo al vendedor en el momento de la compra de un aparato nuevo equivalente.
- El producto, si no se elimina correctamente, puede tener potenciales efectos dañinos en el ambiente y en la salud humana debidos a determinadas sustancias presentes en su interior.
- El símbolo presente aquí a lado indica que el producto no se puede eliminar como residuo urbano.



- La eliminación abusiva o no correcta del producto comporta sanciones jurídicas de tipo administrativo y/o penal severas como previsto por las leyes vigentes.
- Está absolutamente prohibido utilizar el frigorífico para usos diferentes de aquellos previstos.
- Cuidar siempre la perfecta limpieza y tener siempre eficientes los dispositivos de seguridad.
- Mantener siempre libre de obstrucciones los orificios de ventilación en la envoltura del aparato y/o estructura de empotrado.
- No sacar nunca las protecciones (cárter) del frigorífico
- Efectuar siempre las verificaciones, los controles y el mantenimiento programados descriptos en el capítulo 13 de este manual leyendo atentamente las advertencias.
- El aparato no debe ser expuesto a la lluvia.
- Su uso es apropiado en las acampadas.

Informaciones generales

Objetivo del Manual

Este manual, relativo a los Frigoríficos de la serie "INTERIOR (230Vca) / OCEAN-RUNNER (12/24Vcc)", se propone suministrar una guía para la utilización correcta y segura de los mismos y para su racional mantenimiento.
Para aprender en poco tiempo cómo hacer funcionar y utilizar el frigorífico que usted posee es necesario leer atentamente este manual de uso y mantenimiento ya desde el primer uso. El correcto funcionamiento del frigorífico depende en gran parte de un mantenimiento eficiente y eficaz. Por este motivo, es preciso el conocimiento de los trabajos de mantenimiento. Las indicaciones para el uso indican todas las operaciones de puesta en marcha, de detención y de funcionamiento.
El frigorífico ha sido construido en conformidad con todos los requisitos de seguridad (considerados pertinentes) previstos por las directivas en materia; no obstante esto, la seguridad máxima del operador así también como la de otras personas depende de una atenta lectura de este manual y de una limpieza y mantenimiento constantes y esmerados.
Algunas informaciones o figuras de este manual pueden mostrar detalles o partes que pueden diferenciarse ligeramente de aquellas del frigorífico que usted posee, pero las informaciones esenciales no han sido modificadas. En base al constante mejoramiento, el frigorífico podrá mostrar variaciones que no están contenidas en este manual. Eventuales modificaciones aparecerán, según las necesidades, en las versiones sucesivas del manual.

Identificación del constructor

El frigorífico ha sido proyectado y producido exclusivamente en la:

Vitrifrigo s.r.l.
via della Produzione, 9
61020 Montecchio di PESARO
Tel. +39 0721 491080
Fax. +39 0721 497739
E-Mail. Vitrifrigo@vitrifrigo.com
Www.vitrifrigo.com

DESCRIPCION DEL APARATO (fig. 2 y fig. 7)

12/24Vcc – 220Vca

A) evaporador horizontal
A1) evaporador vertical
B) goteador
C) caja del termostato
D) rejillas extraíbles
E) estante de cristal (sólo en algunos modelos)
F) cajón portafruta (sólo en algunos modelos)
G) balconcillos (extraíbles)

12/24Vcc Portatátiles

A) cestita
B) cierre en cric
C) evaporador
D) tornillos de fijación bornes
E) borne de fijación
F) pantalla con termóstato Digital
G) pantalla con termóstato LED
H) termóstato manual (solo C26)
I) interruptor (solo C26)
J) manopla
K) enchufe 12/24Vcc – 220Vca

La etiqueta, en la que se indican la matrícula y los datos técnicos, está situada en el interior del frigorífico, en la parte superior del lado derecho. Las primeras tres cifras de la matrícula se refieren al año y la semana de fabricación. Todos los materiales que pueden entrar en contacto con alimentos son conformes a la directiva 2004/1935/CEE.El nivel del ruido emitido por la máquina es menor de 70dB(A).

INSTALACION

Comprobar que el aparato no está dañado. Los posibles daños de transporte han de indicarse inmediatamente al agente de venta y de todas formas no superando nunca las 24 horas a partir de la entrega.
Manipular el producto con el máximo cuidado. Al colocar el grupo refrigerante (en los modelos de frigoríficos con sistema refrigerante remoto) actuar con precaución para evitar obstrucciones o roturas en los puntos de unión. Colocar siempre el frigorífico y el grupo refrigerante remoto, (en las versiones con esta solución) sobre una superficie horizontal.
Garantizar al grupo frigorífico su ventilación suficiente efectuando en el mueble-contenedor dos aperturas, una en el fondo a la altura del grupo refrigerante y la segunda en la parte superior o en la parte alta del costado. Estas aperturas deberán tener una superficie que no sea inferior a 300 cm². De no ser posible, dejar un canal de 50 mm por lo menos entre la parte superior del frigorífico y la superficie que está encima (véase fig. 5).Instalar el frigorífico lejos de fuentes de calor en un lugar seco y bien ventilado. Dejar parado el aparato durante una hora por lo menos antes de encenderlo. En este intervalo, hacer la primera limpieza.

LIMPIEZA DEL FRIGORIFICO

Antes de limpiarlo comprobar que el frigorífico no está conectado a la instalación eléctrica. En caso contrario, desenchufarlo.

EXTERIOR.

Lavar el exterior del frigorífico con agua templada, repasar con agua fría y secar con un trapo suave. No utilizar productos abrasivos.

INTERIOR

Quitar las rejillas (o la cestita), los contenedores y las cubetas de hielo y limpiarlo utilizando agua templada con bicarbonato de sodio o vinagre. Enjuagar y secar con cuidado con un trapo suave. No utilizar nunca productos abrasivos, detergentes o jabones.

CONDENSADOR

Se aconseja efectuar, al menos una vez al año, la limpieza del condensador (véase fig. 4) con un aspirador o un pincel seco.

En caso de no utilizar el aparato durante mucho tiempo, para evitar que se forme moho o malos olores, desenchufarlo, vaciarlo completamente y limpiar el interior dejando la puerta entreabierta.

CONEXION ELECTRICA

Este aparato cumple con la normativa 89/336/CEE sobre la supresión de las interferencias de radio.
Antes de conectar el aparato comprobar que la tensión de la red corresponde a la que se indica en la placa de identificación o a la que se indica en la placa situada en el compresor.

REGULACION DE LA TEMPERATURA

Cada frigorífico va equipado con un termostato para mantener automáticamente la temperatura.

- **TERMÓSTATO MECÁNICO**

Para elegir la temperatura deseada mover el mando de regulación. Cuando el mando está en posición "0" o "STOP" el frigorífico no funciona.
Colocando el mando en posición "1" el frigorífico se activa.
Llevando el mando de la posición "1" a la posición "5" se obtienen temperaturas cada vez más frías.

Para esquemas eléctricos ver fig. 8e/h (12/24) o fig. 9 (115V/230V)

Algunas versiones de frigoríficos van equipadas con termostatos cuya simbología de la regulación de la temperatura es diferente de la descripción anterior, en estos casos remitirse a la fig. 1. La refrigeración del frigorífico aumenta girando el mando hacia la derecha.

Para una colocación y conservación racional de los alimentos, tomar como referencia la tabla de abajo.

Alimento	**Tiempo de conservacion**	**Colocacion en el frigorifico**
Carne o pescado limpio (envolver en bolsas u hojas de plástico).	2 ó 3 días	En la rejilla bajo la zona del congelador.
Huevos	1 mes	Utilizar los compartimientos contrapuerta.
Mantequilla, margarina.	1 semana	Utilizar los compartimientos contrapuerta.
Alimentos cocidos, pasteles y sopas (meter en recipientes herméticos e introducir después de que se enfríen).	3 ó 4 días	En la rejilla de la parte más baja del frigorífico.
Embutidos crudos, pasta fresca, cremas , flanes, chocolates, pastelitos de crema, manteca, pastas secas y tomates rojos.	3 ó 4 días	En cualquier rejilla.
Botellas		En los alojamientos de la contrapuerta.
Fruta y verdura		En el cajón de la verdura; en la parte inferior del frigorífico.

SUSTITUCIÓN DEL BOMBILLO

Para efectuar la sustitución del bombillo (ver fig.2) proceder como sigue:

- Extraer perpendicularmente a la base la tapa de protección procurando no dañar los pernos de ajuste.
- Alejar uno de los dos resortes para poder quitar el bombillo.
- Doblar ligeramente los dos resortes el uno hacia el otro y colocar el bombillo nuevo.
- **Controlar que el bombillo quede bein ajustado sobre los resortes.**
- Volver a posicionar la tapa.

REVERSIBILIDAD DE LA PUERTA

Para cambiar el sentido de apertura de la puerta con cierre en PIN:

- Desmontar la cremallera superior y el cierre en PIN.
- Extraer la puerta superiormente hasta sacarla de la cremallera inferior.
- Desmontar la cremallera inferior y volver a colocarla en la parte opuesta del frigorífico.
- Volver a colocar la puerta en la cremallera inferior.
- Volver a colocar la cremallera superior y el cierre en PIN en la parte opuesta.

REVERSIBILIDAD DE LA PUERTA

Para cambiar el sentido de apertura de la puerta intervenir de la siguiente manera:

- Desmontar la cremallera superior.
- Extraer la puerta superiormente hasta sacarla de la cremallera inferior.
- Desmontar la cremallera inferior y volver a colocarla en la parte opuesta del frigorífico.
- Volver a colocar la puerta en la cremallera inferior.
- Volver a colocar la cremallera superior.

DESCONGELACION DEL APARATO.

Será oportuno descongelar el frigorífico cada vez que se note un espesor de hielo superior a tres milímetros. Es necesario efectuar esta operación para garantizar un buen rendimiento del frigorífico y evitar un mayor consumo de energía eléctrica. Para descongelar completamente el frigorífico girar el mando del termostato colocándolo en posición de stop. Mantener la puerta abierta para acelerar el tiempo de descongelación.

No quitar la capa de hielo utilizando utensilios metálicos puntiagudos o cortantes que puedan perforar la chapa refrigerante con consecuencias irreparables para el aparato.

En los frigoríficos de acumulación de frío, la descongelación se realiza automáticamente. Se aconseja vaciar la bandeja recolectora de gotas cada día.

Al terminar de descongelar, activar el frigorífico colocando el mando del termostato en la posición deseada.

ADVERTENCIAS PARTICULARES PARA REFRIGERADORES 220 Vca

CONEXION ELECTRICA

Es legislativamente obligatorio poner a tierra el aparato. *Comprobar que el sistema de puesta a tierra de la instalación eléctrica es perfectamente eficiente.*

Se declina toda responsabilidad por posibles daños sufridos por personas o cosas que deriven del incumplimiento de dicha norma.

De desaconseja utilizar adaptadores, tomas de corriente múltiples o alargos. De tener que utilizarlos, usar exclusivamente material que cumpla con las normas de seguridad vigentes tratando de no superar el límite de capacidad en valor de corriente indicado en los materiales. En caso de incompatibilidad entre la toma de corriente y la clavija del aparato es preferible sustituir la toma con otra del tipo adecuado. Se aconseja que se efectúe esta operación por parte de personal cualificado, el cual tendrá que comprobar que la sección de los cables de la toma es adecuada a la potencia absorbida por el aparato.

QUE HACER SI NO FUNCIONA EL FRIGORIFICO

1- EL APARATO NO FUNCIONA

Controlar que:

- el termostato no está en la posición "STOP".
- no falta corriente.
- el interruptor automático de la instalación eléctrica no está desactivado.
- la clavija es eficiente y está introducida correctamente en la toma de corriente.
- la toma de corriente funciona perfectamente. Para efectuar este control enchufar un aparato del que se haya constatado su funcionamiento.
- el cable de alimentación no está interrumpido.

2- EL FRIGORIFICO HACE RUIDO

Controlar que:

- el frigorífico o el grupo refrigerante está bien nivelado.
- el frigorífico no está en contacto con muebles que puedan causar vibraciones.
- los tubos de circuito refrigerante situados en la parte posterior no tienen punto de contacto y no crean hielo contra el aparato.

3- FRIGORIFICO CON RENDIMIENTO INSUFICIENTE

Controlar que:

- que la puerta cierra herméticamente.
- el frigorífico no está cerca de fuentes de calor.
- el frigorífico o el grupo refrigerante remoto está suficientemente ventilado.
- que no hay en el evaporador una excesiva cantidad de hielo.
- que el condensador no está obstruido de polvo.
- que el ventilador gira libremente (en las versiones con refrigeración forzada).
- que el interior no está demasiado lleno.

Si al terminar estos controles no se obtiene un funcionamiento bueno, llamar al servicio de asistencia.

ADVERTENCIAS PARTICULARES PARA REFRIGERADORES 12-24 Vcc

INSTALACION

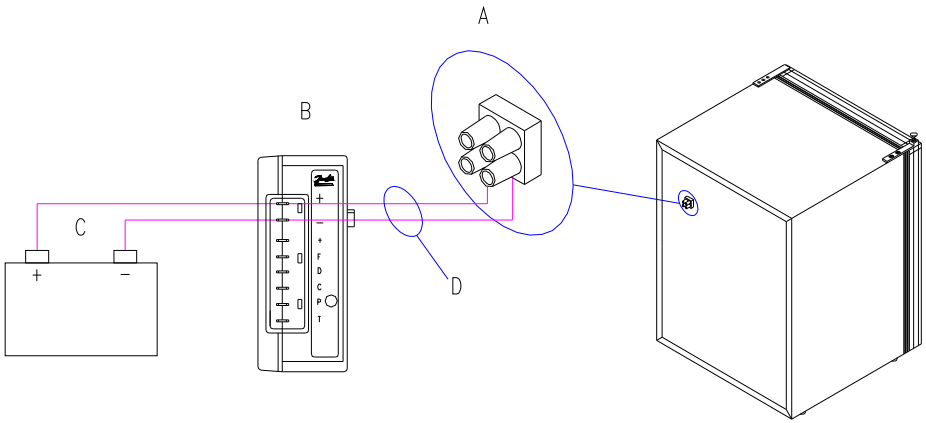
Para instalar el frigorífico o sistemas frigoríficos de caravanas, camping-cars, motor-homes, etc. se aconseja preparar el vehículo con tomas de ventilación situadas directamente en la parte exterior (véase fig. 6).
Para la instalación de los frigoríficos portátiles está disponible, para algunas modelos, un borne de sujeción (ver Fig.7).

CONEXION ELECTRICA

Para los refrigeradores alimentados a 12Vcc o 24Vcc se aconseja conectar las instalaciones directamente a la batería ateniéndose a las correspondientes instrucciones del compresor Danfoss en dotación (véase pág.80 y pág.81).

<u>Conexión alimentación luz interna en frigoríficos 12/24Vcc con motor remoto:</u>

- Conecte el cable opcional "D" (Cod. R10777) con la tabla de bornes presente en el dorsal de la nevera y con la centralita del compresor. (La tabla de bornes "A" no está polarizada, por lo tanto la conexión pede ser realizada indistintamente)
- Conectar la batería con la centralita del compresor, prestando atención con las polaridades:
    - Tabla de bornes conexión luz interna
    - Centralita compresor
    - Batería
    - Cable de alimentación luz interna



ADVERTENCIAS PARTICULARES PARA REFRIGERADORES 12-24Vcc 100-240Vca

CONEXION ELECTRICA

Se aconseja conectar la línea de alimentación a 12Vcc o 24Vcc directamente a la batería ateniéndose a las correspondientes instrucciones del compresor Danfoss en dotación (véase pág.80 y pág.81).

Predisponga la línea de alimentación en Vca utilizando un cable tripolar de sección mínima para conductores de 1 mm^2 y aislamiento adecuados a los modos y al ambiente de uso y conforme a las normativas vigentes.
Efectúe la conexión a la línea de alimentación en Vca mediante una conexión enchufe-toma de capacidad adecuada conforme a las normativas vigentes o predisponga un interruptor magnetotérmico diferencial omnipolar con capacidad de 6 amperios y con abertura de los contactos de al menos 3mm o, de todos modos, conforme a las normativas vigentes.
Una vez terminada la instalación verifique la continuidad del circuito de tierra y lleve a cabo todas las pruebas de seguridad eléctrica previstas por las normativas vigentes.
Proteja y bloquee adecuadamente los cables a fin de evitar que tracciones accidentales del cable puedan desconectarlo de las conexiones o que puedan entrar en contacto con partes calientes con temperatura superior a 50°C o con partes cortantes.
Se aconseja llevar a cabo la instalación de las líneas de alimentación recurriendo a personal calificado, el cual proveerá a comprobar la correspondencia de la instalación con las normativas vigentes y a expedir las relativas certificaciones de conformidad.

Conexión alimentación luz interna en frigoríficos 12/24Vcc con motor remoto:

- Conecte el cable opcional (Cód. **R10777**) para la conexión de la luz interior desde la caja de conexiones presente en la parte trasera del frigorífico y a la centralita del compresor siguiendo el esquema presente en la figura 15. (La caja de conexiones no está polarizada, por tanto la conexión se puede efectuar indistintamente.)

REGULACION DE LA TEMPERATURA

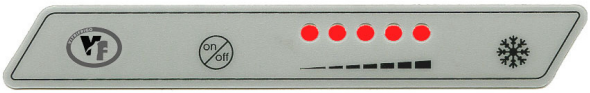
- **TERMÓSTATO MECÁNICO**

  En los frigoríficos de acumulación de frío 12 Vcc ó 24 Vcc, para obtener el máximo ahorro de energía se aconseja colocar el mando del termostato en posición "A" para el frigorífico con capacidad máxima de 75 l.; en posición "A1" para capacidades superiores (fig.1)

- **TERMÓSTATO LED**

  El termóstato electrónico "LED" está dotado de dos mandos con teclas:
  - El mando de encendido y apagado "ON/OFF"
  - El mando de regularización de la temperatura "*"

Pulsando el mando señalizado con "ON/OFF" se obtiene alternativamente el encendido o el apagado del frigorífico.
Para establecer la temperatura deseada pulsar el mando con el símbolo "*". Tras cada presión el señalizador luminoso en LED se desplaza de izquierda a derecha, para las posiciones intermedias se obtendrá el encendido de los dos LED cercanos. Cuando el señalizador se encuentra a la izquierda, el frigorífico está al mínimo (más caliente), mientras que si se encuentra a la derecha hay una reducción de la temperatura (más fría) de unos 3´ C. Para seleccionar una temperatura más fría pulsar repetidamente el mando hasta el encendido del señalizador luminoso más a la izquierda.
Para esquema eléctrico ver fig. 8°/b/f

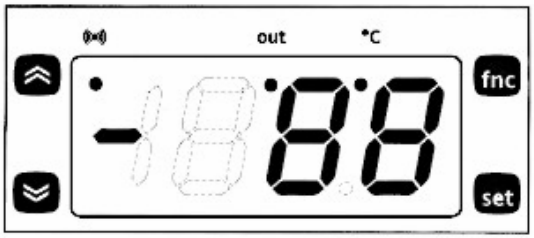


- **TERMÓSTATO DIGITAL**

  El termóstato DIGITAL permite controlar constantemente la temperatura interna de la nevera tras el encendido y apagado del compresor.
  El usuario está dotado de una pantalla y de cuatro teclas para el control del estado y la programación del aparato.
  Tras la conexión de la alimentación, la pantalla empieza a parpadear y se detiene visualizando la temperatura actual en el interior de la nevera. Para el default el termóstato está colocado en 0¨C.

CÓMO MODIFICAR LOS PARÁMETROS:

- Pulsar la tecla SET rápidamente (dentro de 5 seg.) 2 veces.
  la primera vez aparecerá escrito "SET" y la segunda vez el valor "0" precedentemente colocado.
- Actuando en las teclas  o  modificar la temperatura que deberá alcanzar la nevera.
- Pulsar la tecla FNC rápidamente 2 veces para confirmar la temperatura elegida.
  La primera vez aparecerá escrito "SET" y la segunda la temperatura interna.
- El puntito que se encuentra debajo de la escrita "OUT" indica que el compresor y el ventilador están en marcha.

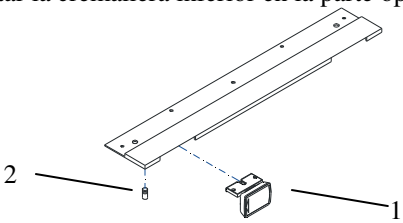


Para el esquema elèctrico ver fig. 8c/d/g

UN MANUAL DE INSTRUCCIONES RELATIVO AL TERMÓSTATO DIGITAL APARECE EN DOTACIÓN CON TODOS LOS FRIGORÍFICOS

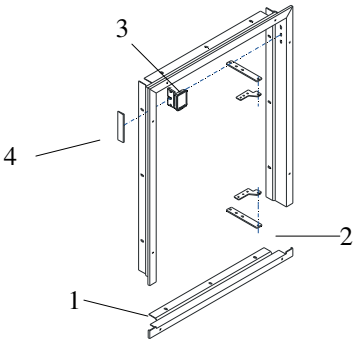
Para cambiar el sentido de la apertura de la puerta con cierre NAUTIC-EUROPA:

- Desmontar la cremallera inferior y extraer la puerta hacia abajo.
- Desmontar la manopla Nautic (1) y volver a posicionarla en la puerta en la parte opuesta, prestando atención a los orificios.
- Destornillar el perno de la cremallera (2) del borne y atornillarlo en la parte opuesta.
- Volver a posicionar la puerta prestando atención en que el cierre trabaje de manera eficiente.
- Volver a montar la cremallera inferior en la parte opuesta del frigorífico.



Para cambiar el sentido de la puerta con cierre NAUTIC-USA:

- Desmontar la base del perfil de fijación (1) si presente.
- Desmontar la cremallera y la plaqueta inferior (2) y extraer la puerta hacia abajo.
- Desmontar la manopla Nautic (3), invertir las fijaciones y el resorte interno para modificar el movimiento de apertura, girar la empuñadura hacia el sentido de la flecha.
- Volver a posicionar la manopla Nautic en al lado opuesto de la puerta prestando atención a los orificios.
- Mover la plaqueta de enganche cierre (4) en el lado opuesto del perfil.
- Volver a posicionar la puerta prestando atención que el cierre trabaje de manera eficiente.
- Volver a posicionar la cremallera, la plaqueta inferior y la base del perfil de fijación.



QUE HACER SI NO FUNCIONA EL FRIGORIFICO

1- EL APARATO NO FUNCIONA

Controlar que:

- el termostato no está en la posición "STOP".
- el interruptor automático de la instalación eléctrica no está desactivado.
- el fusible situado en el dispositivo electrónico del frigorífico está íntegro.
- el cable de alimentación no está interrumpido.
- la batería es eficiente.
- **la tensión en el tablero de bornes del dispositivo electrónico del frigorífico es igual a la de la batería.** En caso de observar una caída de tensión superior a 0,2-0,4 V controlar que :
- la sección del cable que conecta la batería al dispositivo electrónico del frigorífico tanto de dimensión adecuada (véase tabla en instrucciones Danfoss adjuntas).
- a lo largo de la línea de alimentación los posibles puntos de unión no están deteriorados o apretados correctamente.
- no hay oxidación en los polos de la batería y en los puntos de contacto.

2- EL FRIGORIFICO HACE RUIDO

Controlar que:

- el frigorífico o el grupo refrigerante está bien nivelado.
- el frigorífico no está en contacto con muebles que puedan causar vibraciones.
- los tubos del circuito refrigerante situados en la parte posterior no tienen puntos de contacto y no vibran contra el aparato.

3- FRIGORIFICO CON RENDIMIENTO INSUFICIENTE

Controlar que:

- la puerta se cierra herméticamente.
- el frigorífico no está cerca de fuentes de calor.
- el frigorífico o el grupo refrigerante remoto está suficientemente ventilado.
- no hay en el evaporador una excesiva cantidad de hielo.
- el condensador no está obstruido de polvo.
- el ventilador gira libremente (en las versiones con refrigeración forzada.
- el interior no está demasiado lleno.

Si al terminar estos controles no se obtiene un funcionamiento bueno, llamar al servicio de asistencia.

INSTRUCCIONES DANFOSS BD35/BD50F 12-24 Vcc

La unidad electrónica de control trabaja con dos tensiones. Esto significa que la misma unidad puede ser utilizada para sistemas de alimentación de 12V así como de 24V. La tensión máxima es de 17V para el sistema de 12V y de 31,5V para el sistema de 24V. La temperatura ambiente máxima es de 55°C. La unidad electrónica de control tiene incorporada una protección
térmica que desconecta el compresor en caso de temperatura excesiva.

Instalación (fig. 10)

Conéctese el conector de la unidad electrónica al terminal del compresor. Móntese la unidad electrónica en el compresor presionando la tapa por encima de la cabeza del tornillo (1).

Alimentación eléctrica (fig. 10)

La unidad electrónica de control debe sempre conectarse directamente a los polos de la batería (2). Conéctese el polo positivo a + y el negativo a -, de lo contrario la unidad electrónica de control no funcionará. La unidad está protegida contra una conexión invertida de la batería. Para la protección de la instalación, deberá montarse un fusible (3) en el conductor de signo +, lo más cerca posible de la batería. Se recomienda un fusible de 15A para el circuito de 12V y uno de 7,5A para el circuito de 24V.

Si se utiliza un interruptor general (4), éste deberá tener una intensidad nominal mínima 20 A. Las dimensiones de los conductores de la fig. 11 deberán ser respetadas. Evite uniones extras en el sistema de suministro de energía para impedir que una caída de tensión afecte el aduste de protección de la batería.

Protección de batería (fig. 10)

El compresor se para y arranca de nuevo según los límites de voltaje establecidos y medidos en los terminales + y - de la unidad electrónica de control. Los valores estándar para sistemas de alimentación de 12V y 24V están ilustrados en la fig. 12. Se pueden establecer ajustes opcionales (fig. 13) incluyendo una resistencia (9) en el circuito entre los terminales C y P. En aplicaciones de energía solar sin batería, se recomienda una resistencia de 220 kW. Con el sistema de control AEO (optimización de energía adaptativa) el compresor BD, ajustará sempre su velocidad a la demanda de refrigeración actual dentro de un rango de tensión de funcionamiento de 9.6 a 31.5 V.

Termostato (fig. 10)

El termostato (7) está conectado entre los terminales C y T. Sin resistencia en el circuito de control el compressor con unidad electrónica 101N0210 ó 101N0220, rodará a una velocidad fija de 2.000 r.p.m. cuando el termostato está conectado. Con el termostato conectado directamente al terminal C, la unidad electrónica 101N0300, ajustará su velocidad a la demanda actual de refrigeración. Otras velocidades del compresor establecidas dentro del rango de 2.000 y 3.500 r.p.m. se pueden obtener mediante una resistencia (8) que se instala para ajustar la corriente (mA) de control del circuito. Los valores de resistencia para distintas velocidades de motor pueden verse en la fig. 14.

Ventilador (opcional, fig. 10)

Se puede conectar un ventilador (5) entre los terminales + y F. Conéctese el positivo a + y el negativo a F. Ya que el voltaje de salida entre los terminales + y F está siempre regulado a 12 V, deberá utilizarse un ventilador de 12 V, tanto para los sistemas de alimentación de 12 V como para los de 24 V. La salida del ventilador puede suministrar una corriente continua de 0,5 A avg. Se permite un valor más alto de corriente de 2 segundos de duración durante el arranque.

LED (opcional, fig. 10)

Un LED diodo emisor de luz (6) de 10 mA se puede conectar entre los terminales + y D. En caso que la unidad de control detecte una avería de funcionamiento, el diodo emitirá destellos luminosos un cierto número de veces. La velocidad de los destellos dependerá del tipo de avería detectada. Cada destello tendrá una duración de ¼ de segundo. A cada periodo de destellos le sigue otro sin destellos, de manera que la secuencia de cada detección de avería se repetirá cada 4 segundos.

Número de destellos	Tipo de avería
5	**Disparo térmico de la unidad electrónica de control** (Si el sistema de refrigeración ha sido excesivamente recargado, o si la temperatura ambiente es demasiado alta, la unidad electrónica se sobrecalentará).
4	**Velocidad de giro del motor demasiado baja** (Si el sistema de refrigeración está excesivamente recargado, el motor no puede mantener la velocidad mínima de 1.850 r.p.m.).
3	**Fallo de arranque de motor** (El rotor está bloqueado o la presión diferencial en el sistema de refrigeración es demasiado alta (>5 bar)).
2	**Disparo por sobreintensidad del ventilador** (El ventilador carga la unidad electrónica con más de $1A_{peak}$).
1	**Disparo de protección de batería** (El valor de la tensión de alimentación está fuera del rango de ajuste de disparo).

INSTRUCCIONES DANFOSS BD35/BD50F 12-24 V DC / 110-240 V AC

La unidad electrónica es un dispositivo multitensión. Se puede utilizar tanto con sistemas de alimentación de 12V/24V CC como con los de 100-240V AC 50/ 60Hz. En el caso del sistema de alimentación de 12V CC la tensión máxima es 17V CC; para sistemas de alimentación de 24V CC, la tensión máxima es 31.5V CC. En caso de sistema de alimentación AC, la tensión máxima es 265V AC, la tensión mínima es 85V AC. La temperatura ambiente máxima es de 55°C. La unidad electrónica está equipada con un aislamiento térmico incorporado que activa y detiene el funcionamiento del compresor en caso de que la temperatura de la unidad electrónica se vuelva demasiado elevada (100°C / 212°F en el circuito impreso). La potencia absorbida está limitada a 100W. Véase la ficha técnica BD50F para los detalles.

Instalación (fig. 10)

Conéctese el conector de la unidad electrónica al terminal del compresor. Móntese la unidad electrónica en el compresor presionando la tapa por encima de la cabeza del tornillo (1).

Alimentación eléctrica (fig. 10)

La unidad electrónica de control debe sempre conectarse directamente a los polos de la batería (2). Conéctese el polo positivo a + y el negativo a -, de lo contrario la unidad electrónica de control no funcionará. La unidad está protegida contra una conexión invertida de la batería. Para la protección de la instalación, deberá montarse un fusible (3) en el conductor de signo +, lo más cerca posible de la batería. Se recomienda un fusible de 15A para el circuito de 12V y uno de 7,5A para el circuito de 24V.

Si se utiliza un interruptor general (4), éste deberá tener una intensidad nominal mínima 20 A. Las dimensiones de los conductores de la fig. 11 deberán ser respetadas. Evite uniones extras en el sistema de suministro de energía para impedir que una caída de tensión afecte el aduste de protección de la batería.

AC: Los cables eléctricos tienen que estar conectados a los bornes marcados L y N en la unidad electrónica. Tensión nominal de 100 a 240 V AC 50/60Hz. Interruptor de seguridad: límite superior = 270V AC, límite inferior = 80V AC. Un fusible 4A (11) tiene que estar montado en el cable de tensión (L) para proteger la instalación. En caso se utilice un interruptor principal (12), tiene que estar ajustado a una corriente de al menos 6A. El cable ha de tener una dimensión mínima de 0,75 mm2 o 18 AWG. NOTA: si necesario es posible utilizar la conexión de tierra.

General: es posible conectar contemporáneamente a la unidad electrónica tanto la alimentación AC como la alimentación CC. En este caso, AC será la fuente de alimentación preferente. En caso de desconexión de la alimentación AC o de caída por debajo de 85V AC, se activará el sistema de alimentación de 12V CC con un retraso de 1 minuto. En caso se vuelva a establecer la alimentación AC, no habrá ningún retraso en el funcionamiento del compresor.

Protección de batería (fig. 10)

El compresor se para y arranca de nuevo según los límites de voltaje establecidos y medidos en los terminales + y - de la unidad electrónica de control. Los valores estándar para sistemas de alimentación de 12V y 24V están ilustrados en la fig. 12. Se pueden establecer ajustes opcionales (fig. 13) incluyendo una resistencia (9) en el circuito entre los terminales C y P.

Termostato (fig. 10)

El termostato (7) está conectado entre los terminales C y T. Sin resistencia en el circuito de control el compressor con unidad electrónica 101N0210 ó 101N0220, rodará a una velocidad fija de 2.000 r.p.m. cuando el termostato está conectado. Con el termostato conectado directamente al terminal C, la unidad electrónica 101N0300, ajustará su velocidad a la demanda actual de refrigeración. Otras velocidades del compresor establecidas dentro del rango de 2.000 y 3.500 r.p.m. se pueden obtener mediante una resistencia (8) que se instala para ajustar la corriente (mA) de control del circuito. Los valores de resistencia para distintas velocidades de motor pueden verse en la fig. 14.

Ventilador (opcional, fig. 10)

Se puede conectar un ventilador (5) entre los terminales + y F. Conéctese el positivo a + y el negativo a F. Ya que el voltaje de salida entre los terminales + y F está siempre regulado a 12 V, deberá utilizarse un ventilador de 12 V, tanto para los sistemas de alimentación de 12 V como para los de 24 V. La salida del ventilador puede suministrar una corriente continua de 0,5 A avg. Se permite un valor más alto de corriente de 2 segundos de duración durante el arranque.

Lámpara (opcional, Fig. 1)

Entre los bornes A y C se puede conectar una lámpara de 5 Vatios 12V CC (10). La tensión de salida entre los bornes A y C está siempre ajustada en 12V CC. Tanto con el sistema de alimentación de 12V como con el de 24V hay que utilizar una lámpara 12V CC. La salida de la lámpara puede suministrar una media de tensión continua de 0,5A.

LED (opcional, Fig. 1)

Entre los bornes + y D se puede conectar un LED de 10mA (6). En caso de que la unidad electrónica detecte un error de funcionamiento, el diodo parpadea un determinado número de veces. Este número depende del tipo de error de funcionamiento detectado. Cada parpadeo dura ¼ de segundo. A la secuencia de parpadeo sigue un intervalo sin emisiones luminosas, y así la secuencia relativa a cada error detectado se repite cada 4 segundos.

INTRODUÇÃO

Prezado cliente:

Agradecemos por ter escolhido um dos nossos produtos. A VITRIFRIGO espera que V.Sa. possa ficar completamente satisfeito com a compra efectuada.

O presente manual é considerado parte integrante do frigorífico e deve seguir o percurso de venda até o utilizador e a Vitrifrigo proíbe a reprodução de qualquer parte do mesmo.

Cada frigorífico, antes de deixar o nosso estabelecimento, é submetido a vistorias e controlos rigorosos que garantem o seu funcionamento correcto.

Para outras informações e esclarecimentos V.Sa. poderá contactar os nossos centros de assistência ou directamente os nossos escritórios.

Vitri Alceste



ADVERTÊNCIAS:

- Leia atentamente este manual antes de usar o frigorífico.
- Se este aparelho substituir um modelo velho, antes de desmantelá-lo, inutileze a eventual fechadura do mesmo.
- Verifique que a embalagem esteja íntegra, caso contrário comunique ao transportador.
- Proceda à desembalagem e instalação do produto usando a máxima cautela; aconselhamos a fim de evitar ferimentos acidentais, o uso de luvas de protecção, principalmente para os modelos com unidade refrigerante separada (fig. 3).
- Depois de ter desembalado o aparelho, verifique que não esteja danificado. Eventuais danos devem ser avisados ao revendedor impreterivelmente até 24 horas da data de compra.
- O produto deve ser usado exclusivamente para a conservação de alimentos e bebidas.
- O aparelho deve ser colocado longe de fontes de calor; assegure ao mesmo uma ventilação suficiente (vide sucessivas indicações).
- Aconselhamos esperar pelo menos uma hora antes de pôr em função o frigorífico a fim de permitir ao circuito refrigerante de ser completamente eficiente.
- Antes de ligar o produto, verifique que a corrente de rede corresponda à referida na placa de identificação do aparelho ou àquela indicada na placa colocada no compressor.
- Uma vez terminada a instalação, verifique que o aparelho não esteja apoiado sobre o cabo de alimentação.
- Para eventuais problemas de funcionamento, dirija-se ao nosso centro de assistência mais próximo; de qualquer forma, consulte sempre pessoal qualificado.
- Antes de quaisquer operações de manutenção ou limpeza, desligue a tomada da corrente.
- Evite introduzir na parte de baixa temperatura líquidos em recipientes de vidro.
- Não jogue fora a embalagem do vosso aparelho, mas separe os materiais segundo as prescrições locais relativas à eliminação dos mesmos.
- O presente produto não deve ser jogado nos lixos urbanos mas deve ser eliminado como recolha separada. Contactar os centros de recolha de Lixos de Aparelhagens Eléctricas e Electrónicas (RAEE) presentes no próprio território ou entregá-lo ao vendedor no acto da compra de uma aparelhagem nova equivalente.
- O produto, se não for eliminado correctamente, pode ter efeitos nocivos danosos sobre o ambiente e sobre a saúde humana devido a determinadas substâncias presentes na sua parte interna.
- O símbolo contido ao lado indica que o produto não pode ser eliminado como lixo urbano.



- A eliminação abusiva ou incorrecta do produto implica em sanções jurídicas de tipo administrativo e/ou penal severas como previsto pelas leis vigentes.
- É absolutamente proibido usar o frigorífico para empregos diferentes daqueles previstos.
- Cuide sempre da limpeza perfeita e mantenha sempre eficientes os dispositivos de segurança.
- Mantenha livre de impedimentos as aberturas de ventilação no invólucro do aparelho e/ou estrutura de encastre.
- Não remova nunca as protecções (cárter) do frigorífico.
- Execute sempre as verificações, os controlos e as manutenções programadas descritas na pág. x deste manual.
- O aparelho não deve ser exposto à chuva.
- Apropriado para uso nos acampamentos.

Informações gerais

Finalidade do manual

Este manual, relativo aos Frigoríficos da série "INTERIOR (230Vca) / OCEANRUNNER (12/24Vcc) tem a intenção de fornecer instruções para o uso correcto e seguro dos mesmos e para a relativa manutenção racional.
A fim de aprender rapidamente como fazer funcionar e usar o frigorífico em seu poder é necessário que leia com atenção este manual de uso e manutenção desde o primeiro uso.
O bom funcionamento do frigorífico depende também de uma manutenção eficiente e eficaz. O conhecimento dos trabalhos de manutenção portanto é necessário. As indicações para o uso indicam todas as operações de accionamento, de paragem e de funcionamento.
O frigorífico foi construído em conformidade com todos os requisitos de segurança previstos pelas directrizes em matéria, mesmo se todavia a segurança máxima do utente depende de uma leitura atenta deste manual e de uma limpeza e manutenção constante e profunda.
Algumas informações ou figuras deste manual poderão mostrar detalhes e partes que poderão diferenciar-se ligeiramente daquelas do frigorífico em seu poder, sem porém alterar as informações essenciais. De acordo com a melhoria constante, o frigorífico poderá apresentar variações que não estão contidas neste manual. Aparecerão eventuais modificações, segundo as necessidades nas versões posteriores do manual.

Identificação do fabricante

O frigorífico é projectado e produzido exclusivamente junto à:

Vitrifrigo s.r.l.
Via Della Produzione, 9
61020 Montecchio (PU)
Tel. +39 0721 491080
Fax. +39 0721 497739
E-Mail. vitrifrigo@vitrifrigo.com
www.vitrifrigo.com

DESCRIÇÃO DO APARELHO (fig. 2 e fig. 7)

12/24Vcc – 220Vca

A) evaporador horizontal
A1) evaporador vertical
B) bandeja de recolha gotas
C) caixa termóstato
D) grelhas extraíveis
E) prateleira de vidro (somente em alguns modelos)
F) gaveta porta-fruta (somente em alguns modelos)
G) pequeno balcão (extraíveis)

12/24Vcc Portáteis

A) cesto
B) fecho de lingueta
C) evaporador
D) parafuso fixação suporte
E) suporte de fixação
F) quadro com termóstato Digital
G) quadro com termóstato LED
H) termóstato manual (somente C26)
I) interruptor (somente C26)
J) maçaneta
K) tomada 12/24Vcc – 220Vca

A etiqueta que contém os dados concernentes à matrícula e aos dados técnicos, está colocada dentro do frigorífico, na parte superior do lado direito. Os primeiros três algarismos da matrícula identificam o ano e a semana de fabrico.
Todos os materiais que podem entrar em contacto com os alimentos são conformes à Directiva 2004/1935/CE.
O ruído emitido pelo aparelho é inferior a 70 dB(A).

INSTALAÇÃO

Assegure-se que o aparelho não esteja danificado. Eventuais danos de transporte, deverão ser avisados tempestivamente ao revendedor e de qualquer maneira, no máximo até 24 horas sucessivas à entrega.
Manipule o produto com a máxima atenção. Posicionando o grupo refrigerante (nos modelos de frigoríficos com instalação refrigerante separada), aja com precaução a fim de evitar obstruções ou rupturas dos tubos de conexão. Posicione sempre o frigorífico e o grupo refrigerante separado (nos modelos com esta solução), num plano horizontal.
Verifique que o grupo frigorífico seja bem ventilado, predispondo no móvel que o contém, duas aberturas: uma no fundo em correspondência do grupo refrigerante e a outra na parte superior ou naquela alta do lado. Estas aberturas deverão ter uma superfície não inferior a 300 cmq. Quando isto não for possível, deixe um canal de pelo menos 50 mm. entre a parte superior do frigorífico e o plano que está encima (vide fig. 5).
Instale o frigorífico longe de fontes de calor e num lugar seco e bem ventilado.
Deixe parado o aparelho pelo menos uma hora antes de ligá-lo. Durante este intervalo, faça a primeira limpeza.

LIMPEZA DO FRIGORÍFICO

Antes de iniciar a limpeza, verifique que o frigorífico não esteja ligado na instalação eléctrica. Caso contrário, desligue a tomada da corrente.

PARA EXTERNA

Lave a parte de fora com água morna, depois com água fria e enxugue com um pano macio. Evite o uso de produtos abrasivos.

PARTE INTERNA

Tire as grelhas (ou o cesto), os recipientes e as formas para o gelo e proceda à limpeza usando água morna misturada com bicarbonato de sódio ou vinagre. Enxágue e enxugue com cuidado usando um pano macio. Evite taxativamente o uso de produtos abrasivos, detergentes ou sabões.

CONDENSADOR

Aconselhamos efectuar pelo menos uma vez por ano, a limpeza do condensador (vide fig. 4), usando um aspirador ou um pincel seco.

Em caso de desuso prolongado do aparelho, a fim de evitar a formação de bolor ou mau cheiro, desligue a tomada, esvazie-o completamente, limpe-o por dentro e deixe a porta encostada.

LIGAÇÃO ELÉCTRICA

Este aparelho é conforme às normativas CEE nº 89/336 concernentes à supressão das interferências.
Antes de ligar o produto, verifique que a corrente de rede corresponda àquela referida na placa de identificação ou àquela indicada na placa colocada no compressor.

REGULAÇÃO DA TEMPERATURA

Cada frigorífico está equipado com um termóstato para a manutenção automática da temperatura.

- **TERMÓSTATO MECÂNICO**
  Para escolher a temperatura desejada, aja no manípulo de regulação.
  Quando o mesmo está na posição '0' ou 'STOP', o frigorífico não funciona.
  Pondo o manípulo na posição '1', o frigorífico começa a funcionar.
  Pondo o manípulo da posição '1' à posição '5', obtém-se temperaturas sempre mais frias.

  Para o esquema eléctrico ver fig. 8e/h (12/24V) ou fig. 9 (115V/230V)

Alguns modelos de frigoríficos estão equipados com termostatos cuja simbologia de regulação da temperatura, diferencia-se daquela acima; nestes casos é preciso ter como referência a fig. 1. O esfriamento do frigorífico aumenta girando o manípulo no sentido horário.

Para a colocação e conservação racional dos alimentos, siga a tabela abaixo.

Alimento	**Tempo de conservação**	**Colocação no frigorífico**
Carne e peixe limpo (embrulhe em saquinhos ou folhas de plástico).	2 ou 3 dias	Na grelha embaixo do freezer.
Ovos.	1 mês	Use os espaços da contraporta.
Manteiga, margarinas.	1 semana.	Use os espaços da contraporta.
Alimentos cozidos, bolos e sopas (feche em recipientes herméticos e guarde-os quando estiverem frios).	3 ou 4 dias	Na grelha na parte mais baixa do frigorífico.
Frios crus, massa fresca, cremes, pudins, chocolates, doces com base de creme, banha, doces secos, tomates maduros.	3 ou 4 dias	Em qualquer grelha.
Garrafas.		Nos vãos apropriados da contraporta.
Fruta e verdura.		Na gaveta para verduras; na parte inferior do frigorífico.

SUBSTITUIÇÃO DA LÂMPADA

Para efectuar a substituição da lâmpada (veja fig.2) proceda conforme a seguir:

- Extraia perpendicularmente à base a tampa de protecção prestando atenção para não danificar os pinos de fixação.
- Afaste uma das duas molas para poder extrair a lâmpada.
- Dobre um pouco as duas molas uma na direcção da outra e introduza a nova lâmpada.
- **Controle que a lâmpada esteja bem apertada nas molas.**
- Recoloque a tampa.

REVERSIBILIDADE DA PORTA

Para variar o sentido de abertura da porta com fecho com PIN:

- Desmonte a dobradiça superior e o fecho com PIN.
- Extraia a porta até soltá-la da dobradiça inferior.
- Desmonte a dobradiça inferior e remonte-a na parte oposta do frigorífico.
- Recoloque a porta na dobradiça inferior.
- Remonte a dobradiça superior e o fecho com PIN na parte oposta.

TROCA DE PAINEL

Para poder desmontar e/ou trocar o painel da porta é preciso agir conforme a seguir:

- Remova a porta seguindo as indicações do parágrafo anterior.
- Desaparafuse os parafusos presentes na base inferior e extraia a mesma.
- Remova o painel fazendo-o correr para baixo.
- Monte o novo painel encaixando-o no lugar daquele eliminado fazendo-o correr para cima até travar.
- Remonte a base inferior .

DESCONGELAMENTO DO APARELHO.

É oportuno descongelar o frigorífico toda vez que se forme uma camada de gelo superior a três milímetros. Esta operação é necessária para garantir o bom rendimento do frigorífico e evitar maior consumo de energia eléctrica.

Para obter o descongelamento completo do frigorífico, gire o manípulo do termostato na posição stop. Mantenha a porta aberta a fim de acelerar o tempo.

Não remova a camada de gelo utilizando utensílios metálicos pontudos ou cortantes que podem provocar furos na chapa refrigerante com consequências irreparáveis para o aparelho.

Nos frigoríficos com acúmulo de frio, o descongelamento acontece automaticamente. Aconselhamos esvaziar diariamente o dispositivo para recolher as gotas.

Quando o descongelamento estiver terminado, providencie para pôr em função o frigorífico pondo o manípulo do termóstato na posição desejada.

AVISOS ESPECÍFICOS PARA FRIGORÍFICOS 220 Vca

LIGAÇÃO ELÉCTRICA

É obrigatório nos termos da lei a ligação à terra do aparelho. *Verifique que o sistema de ligação à terra da instalação eléctrica esteja perfeitamente eficiente.*

Declinamos quaisquer responsabilidades por eventuais danos causados a pessoas ou coisas, derivantes da não observação de tal norma.

É desaconselhável o uso de adaptadores, benjamins e extensões. Se o uso dos mesmos for indispensável, utilize exclusivamente material conforme às vigentes normas de segurança, prestando atenção a não superar o limite de potência descrito nos mesmos.

Em caso de incompatibilidade entre as tomadas, é melhor substituir aquela da parede com outra apropriada. Esta operação, aconselhamos seja feita por pessoal qualificado, que deverá verificar que a secção dos cabos da tomada da parede seja idónea a potência consumida pelo aparelho.

O QUÊ FAZER SE O FRIGORÍFICO NÃO FUNCIONA

1- O APARELHO NÃO FUNCIONA

Controle que:

- o termóstato não esteja na posição "STOP";
- não falte corrente;
- o interruptor automático da instalação eléctrica não esteja desligado;
- a tomada esteja eficiente e correctamente inserida naquela da parede;
- a tomada da parede esteja eficiente. Verifique ligando um outro aparelho na mesma cujo funcionamento você tem certeza;
- o cabo de alimentação não esteja interrompido.

2- FRIGORÍFICO RUIDOSO

Controle que:

- o frigorífico ou o grupo refrigerante esteja bem nivelado;
- o frigorífico não esteja em contacto com móveis que possam causar vibrações;
- os tubos do circuito refrigerante colocados na parte de trás não tenham pontos de contacto e não vibrem contra o aparelho.

3- RENDIMENTO FRIGORÍFICO INSUFICIENTE

Controle que:

- a porta feche hermeticamente;
- o frigorífico não esteja perto de fontes de calor;
- o frigorífico ou o grupo refrigerante separado estejam suficientemente ventilados;
- não haja acúmulo excessivo de gelo no evaporador;
- o condensador não esteja entupido de pó;
- a ventoinha gire livremente (nos modelos com esfriamento forçado)
- dentro não esteja demasiado cheio.

Se no final destas verificações, não for possível obter o funcionamento regular, dirija-se ao serviço de assistência.

AVISOS ESPEC[IFICOS PARA FRIGORÍFICOS 12-24 Vcc

INSTALAÇÃO

Para a instalação de frigoríficos ou equipamentos frigoríficos a bordo de caravan, camper, motorhome, etc, aconselhamos predispô-los com tomadas de ventilação directamente do externo (vide fig. 6).
Para a instalação dos frigoríficos portáteis em alguns modelos é disponível um suporte para a fixação do frigorífico (ver fig. 7).

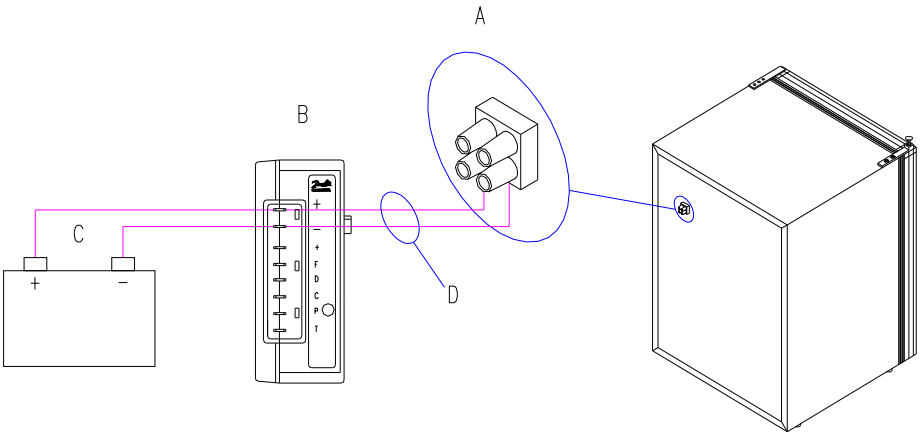
LIGAÇÃO ELÉCTRICA

Para os frigoríficos alimentados a 12Vcc ou 24Vcc, recomenda-se de interligar as instalações directamente à bateria seguindo as instruções correspondentes do compressor Danfoss fornecido (ver pág.95 e pág.96).

Ligação da alimentação da luz interna nos frigoríficos 12/24Vcc com motor remoto:

- Ligar o fio opcional "D" (Cod.**R10777**) à régua de bornes presente na parte traseira do frigorífico e à central do compressor. (A régua de bornes "A" não é polarizada, portanto a conexão pode ser efectuada indiferentemente.)
- Ligar a bateria à central do compressor, **prestando atenção à polaridade!**

  - Régua de bornes da ligação luz interna.
  - Central do compressor.
  - Bateria.
  - Cabo fornecido de alimentação luz interna.



AVISOS ESPEC[IFICOS PARA FRIGORÍFICOS 12-24Vcc 100-240Vca

LIGAÇÃO ELÉCTRICA

Recomenda-se de ligar a linha de alimentação a 12Vcc ou 24Vcc directamente à bateria, observando as instruções correspondentes do compressor Danfoss fornecido (ver pág.95 e pág.96).

Predispor a linha de alimentação em Vca com a utilização de fio tripolar de secção mínima para condutor de 1 mmq e isolamento adequado às modalidades e ao ambiente de utilização e conforme às normas em vigor.
Realizar a conexão à linha de alimentação em Vca por meio de uma conexão de ficha tomada com capacidade adequada, em conformidade com as normas em vigor ou predispor um interruptor magnetotérmico diferencial unipolar com capacidade de 6 ampères e com abertura dos contactos de pelo menos 3 mm, de qualquer maneira em conformidade com as normas em vigor.
No fim da instalação verificar a continuidade do circuito de terra e efectuar todos os ensaios de segurança eléctrica previstos pelas normas em vigor.
Proteger e bloquear adequadamente os fios a fim de evitar que tracções acidentais do fio possam desprender o mesmo das conexões ou que possam entrar em contacto com partes quentes com temperatura superior a 50°C ou com partes afiadas.
Recomenda-se que a instalação das linhas de alimentação seja executada por pessoal qualificado o qual providenciará à verificação da correspondência da instalação com as normas em vigor e a emitir as certificações relativas de conformidade.

Ligação da alimentação da luz interna nos frigoríficos 12/24Vcc com motor remoto:

- Ligar o fio opcional (Cód. **R10777**) para a ligação da luz interna da régua de bornes presente no encosto do frigorífico e à central de comando do compressor, seguindo o esquema presente na figura 15. (A régua de bornes não é polarizada, portanto a conexão pode ser efectuada indistintamente.)

REGULAÇÃO DA TEMPERATURA

- **TERMÓSTATO MECÂNICO**

Nos frigoríficos por acumulo de frio 12Vcc ou 24Vcc a fim de obter a máxima economia de energia recomenda-se para posicionar o botão do termóstato na posição "A" para o frigorífico com capacidade máxima de 75 l; na posição "A1" para capacidades superiores (fig. 1).

- **TERMOSTATO "LED"**

O termóstato electrónico "LED" é equipado com dois comandos de botão:
- O comando de liga e desliga "ON/OFF"
- O comando de regulação da temperatura "✱"

Carregando o comando marcado com "ON/OFF" obtém-se alternadamente a **ligação** e o **desligamento do frigorífico.**
Para configurar a temperatura desejada carregue o comando marcado com o símbolo ✱. A cada carregamento o indicador luminoso com LED corre da esquerda para a direita, para as posições intermediárias haverá o acendimento dos dois LEDs próximos. Quando o indicador estiver à esquerda, o frigorífico está no mínimo (mais quente) enquanto a posição para a direita indica uma redução da temperatura (mais fria) de cerca 3°C. Para seleccionar uma temperatura mais fria carregue repetidamente o comando até acender o indicador luminoso mais à direita (máximo frio), a pressão sucessiva realiza o acendimento do indicador luminoso mais à esquerda.
Para esquema eléctrico ver a fig. 8ª/b/f

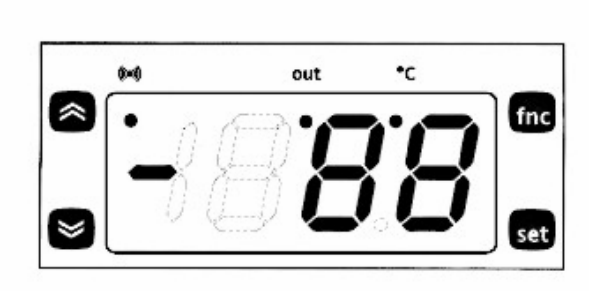


- **TERMÓSTATO DIGITAL**

O termóstato DIGITAL permite monitorar constantemente a temperatura interna do frigorífico para a ligação/desligamento do compressor.
O utente dispõe de um display e de quatro teclas para o controlo do estado e a programação do instrumento.
No momento da ligação da alimentação o display inicia a lampejar e pára exibindo a temperatura actual dentro do frigorífico.
Por default o termóstato é configurado em 0°C.

COMO MODIFICAR OS PARÂMETROS:

- Carregar a tecla **SET** rapidamente (em 5 seg.) 2 vezes.
  A primeira vez aparecerá a escrita "SET" e a segunda o valor "0" ou configurado anteriormente.
- Agindo nos botões ou modificar a temperatura que o frigorífico deverá alcançar.
- Carregar a tecla **FNC** rapidamente 2 vezes para confirmar a temperatura configurada.
  A primeira vez aparecerá a escrita "SET" e a segunda a temperatura interna.
- O pontinho situado sob a escrita "OUT" indica que o compressor e a ventoinha estão a funcionar.

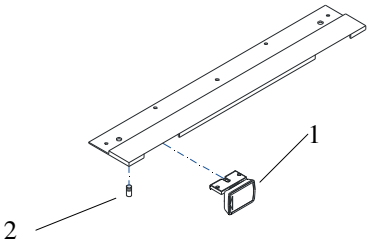


Para o esquema eléctrico ver fig. 8c/d/g

UM MANUAL DE INSTRUÇÕES RELATIVO AO TERMÓSTATO DIGITAL É TAMBÉM FORNECIDO EM CADA FRIGORÍFICO.

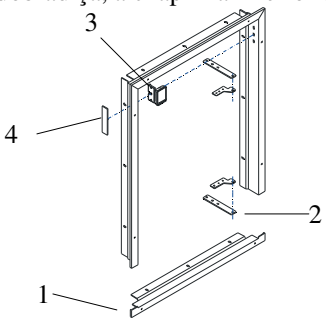
Para variar o sentido de abertura da porta com fecho NAUTIC-EUROPA:

- Desmonte a dobradiça inferior e extraia a porta para baixo.
- Desmonte a maçaneta Nautic (1) e recoloque-a na porta no lado oposto prestando atenção aos intereixos dos furos.
- Desaparafuse o pino da dobradiça (2) do suporte e aparafusá-lo no lado oposto.
- Recoloque a porta prestando atenção que o fecho funcione com eficiência.
- Remonte a dobradiça inferior no lado oposto do frigorífico.



Para variar o sentido de abertura da porta com fecho NAUTIC-USA:

- Desmonte a base do perfil de fixação (1) se presente.
- Desmonte a dobradiça e a chapinha inferior (2) e extraia a porta para baixo.
- Desmonte a maçaneta Nautic (3), inverta os fixadores e a mola interna para modificar o seu movimento de abertura; vire o manípulo para o lado da secta.
- Recoloque a maçaneta Nautic no lado oposto da porta prestando atenção aos intereixos dos furos.
- Desloque a chapinha de enganche do fecho (4) no lado oposto do perfil.
- Recoloque a porta prestando atenção que o fecho funcione de modo eficiente.
- Recoloque a dobradiça, a chapinha inferior e a base do perfil de fixação.



INSTRUÇÕES DANFOSS BD35/BD50F 12-24Vcc

A unidade electrónica de controlo é um aparelho com a possibilidade de duas tensões diferentes de alimentação. Isto significa que a mesma unidade pode ser utilizada tanto em sistemas com alimentação a 12V, como a 24V. A tensão máxima para sistemas a 12V é de 17V, enquanto aquela para os sistemas a 24V é de 31,5V. A temperatura ambiente máxima permitida é de 55°C. A unidade electrónica de controlo é dotada de uma protecção térmica incorporada que entra em funcionamento se o sobreaquecimento parar o compressor.

Instalação (fig. 10)

Interligar o conector terminal da unidade electrónica de controlo ao terminal do compressor. Montar a unidade no compressor por meio do encaixe da tampa na cabeça do parafuso (1).

Alimentação (fig. 10)

A unidade electrónica de controlo deve sempre ser ligada directamente aos pólos da bateria (2). Conectar o pólo positivo ao + e o negativo ao -; ao contrário, a unidade não poderá funcionar. A unidade é protegida contra a inversão de polaridade. Para proteger a instalação deve sempre ser montado um fusível (3) no fio + o mais próximo possível da bateria. Recomenda-se o uso de um fusível de 15A para o circuito a 12V e de um fusível de 7,5A para o circuito a 24V. Se for utilizado um interruptor geral (4), o mesmo deve ser dimensionado para o mínimo de 20 A. As medidas recomendadas para os fios na fig. 11 devem ser respeitadas. Evitar outras conexões ao sistema de alimentação para evitar que eventuais quedas de tensão influam nas configurações para a protecção da bateria.

Protecção da bateria (fig. 10)

A paragem e a reactivação do compressor dependem da configuração dos limites escolhidos de tensão medidos nos bornes + e - da unidade electrónica de controlo. As configurações standard para os sistemas com alimentação respectivamente a 12V e 24V estão indicadas na fig. 12. Por outro lado, podem ser configurados outros limites (fig. 13) se for efectuada uma conexão por meio de uma resistência (9) entre os bornes C e P. Nas aplicações para painéis solares sem bateria recomenda-se um resistor de 220 kW. Na modalidade AEO (optimização energética por meio do controlo adaptativo) o compressor BD adaptará sempre a própria velocidade à necessidade real de rendimento frigorífico no limite de uma tensão de exercício casual compreendida entre 9,6 e 31,5 V.

Termóstato (fig. 10)

O termóstato (7) deve ser ligado aos bornes C e T. Sem resistência no circuito de controlo o compressor com unidade electrónica 101N0210 ou 101N0220 rodará na velocidade de 2.000 rpm, quando o termóstato estiver introduzido. Com o termóstato ligado directamente ao terminal C, a unidade electrónica 101N0300 adaptará a própria velocidade à necessidade real de rendimento frigorífico. É possível obter outras velocidades do compressor, incluídas na faixa 2000-3500 rpm, introduzindo uma resistência (8) para a regulação da corrente (mA) no circuito de controlo. Os valores da resistência para velocidades diferentes do motor estão contidas na fig. 14.

Ventilador (opcional, Fig. 10)

É possível interligar um ventilador (5) entre os terminais + e F. Interligar o positivo ao + e o negativo a F. Como a tensão de saída entre os bornes + e F é sempre regulada em 12V, deve ser utilizado um ventilador a 12V, tanto no caso de alimentação a 12V como no caso de alimentação a 24V! A saída para o ventilador é capaz de fornecer uma corrente contínua de 0,5 Aavg. Na fase de ligação é sempre permitida uma absorção maior de corrente durante um tempo de 2 segundos.

LED (opcional, fig. 10)

É também possível ligar um díodo LED de 10 mA (6) entre os bornes + e D. Se a unidade electrónica de controlo regista um erro de funcionamento, o diodo lampejará um certo número de vezes. O número de lampejos depende do tipo de erro registado, com uma duração para cada lampejo de 1/4 de segundo. À sequência de lampejos segue uma pausa sem lampejar, depois a sequência relativa ao erro em questão será repetida cada 4 segundos.

Número de lampejos	Tipo de erro
5	**Paragem térmica da unidade electrónica** (Se o sistema de refrigeração tiver sido submetido a carga excessiva ou se a temperatura Ambiente for muito elevada, a unidade de controlo se aquecerá demasiado).
4	**Velocidade muito baixa do motor** (Se o sistema de refrigeração for submetido a uma carga excessiva, o motor não é capaz de manter a velocidade mínima de 1.850 rpm).
3	**Erro no accionamento do motor** (O rotor está bloqueado ou a pressão diferencial no sistema de refrigeração é muito Alta (>5 bar)).
2	**Paragem do ventilador devido a sobrecarga de corrente** (O ventilador absorve da unidade electrónica de controlo uma corrente superior a 1 A).
1	**Paragem para a protecção da bateria** (A tensão de alimentação está fora do valor configurado de arranque).

INSTRUÇÕES DANFOSS BD35/BD50F 12-24 Vcc / 110-240 Vca

A unidade electrónica é um dispositivo multivoltagem. Pode ser utilizado tanto com sistemas de alimentação de 12V/24V DC como de 100-240V CA 50/ 60Hz. No caso de sistema de alimentação a 12V DC a voltagem máxima é de 17V DC; para sistemas de alimentação a 24V DC a voltagem máxima é 31.5V DC. No caso de sistema de alimentação CA, a voltagem máxima é 265V CA, a voltagem mínima é 85V CA. A temperatura ambiente máxima é de 55°C. A unidade electrónica é dotada de um isolamento térmico incorporado que activa e pára o funcionamento do compressor se a temperatura da unidade electrónica se tornar muito elevada (100°C / 212°F no circuito impresso). A potência absorvida é limitada a 100W. Ver a ficha técnica BD50F para os pormenores.

Instalação (fig. 10)

Interligar o conector terminal da unidade electrónica de controlo ao terminal do compressor. Montar a unidade no compressor por meio do encaixe da tampa na cabeça do parafuso (1).

Alimentação (fig. 10)

A unidade electrónica de controlo deve sempre ser ligada directamente aos pólos da bateria (2). Conectar o pólo positivo ao + e o negativo ao -; ao contrário, a unidade não poderá funcionar. A unidade é protegida contra a inversão de polaridade. Para proteger a instalação deve sempre ser montado um fusível (3) no fio + o mais próximo possível da bateria. Recomenda-se o uso de um fusível de 15A para o circuito a 12V e de um fusível de 7,5A para o circuito a 24V. Se for utilizado um interruptor geral (4), o mesmo deve ser dimensionado para o mínimo de 20 A. As medidas recomendadas para os fios na fig. 11 devem ser respeitadas. Evitar outras conexões ao sistema de alimentação para evitar que eventuais quedas de tensão influam nas configurações para a protecção da bateria.

CA: Os fios eléctricos devem ser interligados aos bornes marcados L e N na unidade electrónica. Tensão nominal de 100 até 240 V CA 50/60Hz. Interruptor de segurança: limite superior = 270 CA, limite inferior = 80V CA. Um fusível 4A (11) deve ser montado no cabo de tensão (L) para proteger a instalação. Se for utilizado um interruptor principal (12), deve ser regulado a uma corrente de pelo menos 6A. O cabo deve ter uma dimensão mínima de 0.75 mm2 ou 18 AWG. Obs.: se necessário é possível utilizar a conexão de terra.

Geral: é possível interligar simultaneamente à unidade electrónica tanto alimentação CA como alimentação DC. Neste caso, CA será a fonte de alimentação preferencial. No caso de desconexão da alimentação CA ou de queda abaixo de 85V CA, será activado o sistema de alimentação a 12V DC com um atraso de 1 minuto. Se for restaurada a alimentação CA, não haverá nenhum atraso no funcionamento do compressor.

Protecção da bateria (fig. 10)

A paragem e a reactivação do compressor dependem da configuração dos limites escolhidos de tensão medidos nos bornes + e - da unidade electrónica de controlo. As configurações standard para os sistemas com alimentação respectivamente a 12V e 24V estão indicadas na fig. 12. Por outro lado, podem ser configurados outros limites (fig. 13) se for efectuada uma conexão por meio de uma resistência (9) entre os bornes C e P.

Termóstato (fig. 10)

O termóstato (7) deve ser ligado aos bornes C e T. Sem resistência no circuito de controlo o compressor com unidade electrónica 101N0210 ou 101N0220 rodará na velocidade de 2.000 rpm, quando o termóstato estiver introduzido. Com o termóstato ligado directamente ao terminal C, a unidade electrónica 101N0300 adaptará a própria velocidade à necessidade real de rendimento frigorífico. É possível obter outras velocidades do compressor, incluídas na faixa 2000-3500 rpm, introduzindo uma resistência (8) para a regulação da corrente (mA) no circuito de controlo. Os valores da resistência para velocidades diferentes do motor estão contidas na fig. 14.

Ventilador (opcional, Fig. 10)

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Lâmpada (opcional, Fig. 1)

Uma lâmpada de 5 Watt 12V DC (10) pode ser interligada entre os bornes A e C. A tensão de saída entre os bornes A e C é sempre regulada em 12V DC. Tanto com o sistema de alimentação a 12V assim como com o de 24V deve ser utilizada uma lâmpada de 12V DC. A saída da lâmpada pode distribuir uma tensão contínua de 0,5A de média.

LED (opcional, Fig. 1)

Um LED de 10mA (6) pode ser interligado entre os bornes + e D. Se a unidade electrónica detectar um erro de funcionamento, o diodo lampejará durante um certo número de vezes. Este número depende do tipo de erro de funcionamento detectado. Cada lampejo tem uma duração de ¼ de segundo. À sequência de lampejo segue um intervalo sem emissões luminosas e, portanto, a sequência relativa a cada erro detectado é repetida cada 4 segundos.

INLEIDING

Beste klant:

Wij zijn van mening dat u met dit product van VITRIFRIGO een uitstekende keuze hebt gemaakt en hopen dat dit product volledig aan uw wensen zal blijven voldoen.

Wij herinneren u eraan dat deze handleiding dient te worden beschouwd als integraal deel uit makend van de koelkast. U dient de handleiding samen met de koelkast van de verkoper te krijgen. Vitrifrigo verbiedt enig deel uit deze handleiding te verveelvoudigen.

Voordat de koelkasten onze bedrijfsplaats verlaten, wordt elke koelkast getest en gekeurd zodat wij kunnen garanderen dat ze perfect functioneren.

Voor meer informatie en ophelderingen kunt u onze servicecentra raadplegen of rechtstreeks onze kantoren.

Vitri Alceste



WAARSCHUWING

- Lees deze handleiding aandachtig voordat u de koelkast in gebruik neemt.
- Als dit toestel een oud vervangt, raden wij aan de vergrendeling die er eventueel op zit, onbruikbaar te maken voordat u het oude toestel sloopt.
- Controleer of de verpakking nergens beschadigd is en signaleer eventuele schade aan de transporteur.
- Haal de koelkast uit de verpakking en start voorzichtig met de installatie; draag voor alle veiligheid en om eventuele ongevallen te voorkomen beveiligingshandschoenen (afb. 3).
- Controleer of het toestel nergens beschadigd is zodra u het uit de verpakking hebt gehaald. Eventuele schade aan het toestel dient niet later dan 24 uur na de datum van aankoop aan de verkoper te worden gesignaleerd.
- Het toestel dient uitsluitend voor het bewaren van voedingsmiddelen en drank.
- Het toestel dient ver van warmtebronnen te worden geïnstalleerd en voldoende te worden geventileerd (zie de hierna volgende aanwijzingen).
- Wij raden aan ten minste een uur te wachten voordat u de koelkast in werking zet om het koelmiddelcircuit te optimaliseren.
- Voordat u het toestel aansluit, dient u de stroomgegevens te controleren op het serieplaatje en op het plaatje op de compressor.
- Na de installatie controleren of het toestel nergens op de elektrische kabel rust.
- Voor eventuele problemen het dichtstbijzijnde servicecentrum raadplegen; in elk geval dient u beroep te doen op vakkundige technici.
- Haal altijd eerst de stekker uit het stopcontact of ontkoppel andere energiebronnen voordat u het toestel reinigt of onderhoudt.
- Zet geen glazen flessen of potten met vloeistof in het koudste deel van de koelkast.
- Het afgedankte toestel mag niet als huisafval worden behandeld en dient te worden gescheiden van ander afval. Neem contact op met een ophaaldienst voor Afgedankte Elektrische en Elektronische Apparatuur in uw eigen gebied of ruil het afgedankte toestel in als u een nieuw en gelijksoortig toestel koopt.
- Als het afgedankte toestel bij het verkeerde afval terechtkomt, kan het gevaarlijk zijn voor de gezondheid en voor het milieu vanwege bepaalde stoffen die het bevat.
- Het symbool hiernaast betekent dat het afgedankte toestel niet als huisafval mag worden behandeld.



- Illegaal storten of verkeerde behandeling van het afgedankte toestel kan bestraft worden met strenge administratieve en/of strafrechterlijke door de wet bepaalde sancties.
- maar wend u tot een plaatselijk afvalverwerkingsbedrijf.
- Het is ten strengste verboden de koelkast voor andere doeleinden te gebruiken dan de voorgeschreven doeleinden.
- Houd de koelkast altijd perfect schoon en controleer of de veiligheidsmechanismen werken.
- Laat de ventilatie-openingen in de carters van het apparaat of in de inbouwkast vrij.
- Haal nooit de carters (behuizing) van de koelkast.
- Voer altijd de controles, inspecties en het onderhoud uit die beschreven zijn op pagina. x van deze handleiding.
- Het apparaat mag niet aan regen worden blootgesteld.
- Geschikt voor gebruik op campings.

Informatie van algemene aard

Doel van deze gebruiksaanwijzingen

De bedoeling van deze handleiding met de gebruiksaanwijzingen voor de koelkasten van de serie "INTERIOR (230Vca) / OCEAN RUNNER (12/24Vcc) is een leidraad te vormen voor een correct en veilig gebruik en een rationeel onderhoud van deze koelkasten.
Om zo snel mogelijk te leren hoe u de koelkast moet aanzetten en gebruiken, dient u deze gebruiks- en onderhoudsaanwijzingen aandachtig te lezen, meteen van bij het begin.
Of de koelkast goed werkt, hangt voor een groot deel af van een efficiënt en doeltreffend onderhoud. U dient de onderhoudswerkzaamheden dus onvoorwaardelijk te kennen. De gebruiksaanwijzingen bevatten alle handelingen om de koelkast aan te zetten, uit te zetten en te laten werken.
Deze koelkast is volgens alle veiligheidsvoorschriften geconstrueerd (de toepasbare voorschriften) die zijn voorzien in de desbetreffende normen. Desondanks hangt de veiligheid ervan ook af van een aandachtige studie van deze handleiding en van constante en zorgvuldige reinigings- en onderhoudswerkzaamheden.
Sommige informatie of afbeeldingen kunnen details en delen bevatten die lichtjes afwijken van de details en onderdelen van uw eigen koelkast. Dit verandert echter niets aan de essentie van de informatie die wordt verstrekt. Omdat wij voortdurend aan verbetering van onze producten werken, kan de koelkast hier en daar afwijken van wat is beschreven in deze handleiding. Eventuele modificaties zullen, naar gelang van de behoeften, in een volgende druk worden opgenomen.

Identificatiegegevens van de constructeur

Deze koelkast is uitsluitend ontworpen en geproduceerd door :

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BESCHRIJVING VAN HET APPARAAT (Afb. 2 en 7)

12/24Vcc - 220Vca

A) horizontale verdamper
A1) verticale verdamper
B) druppelbakje
C) thermostaatbox
D) uitneembare roosters
E) blad in glas (alleen sommige modellen)
F) groentenbak (alleen sommige modellen)
G) draagbakjes (uitneembaar)

12/24Vcc Draagbare apparaten

A) mand
B) kriksluiting
C) verdamper
D) schroef om de beugel te bevestigen
E) bevestigingsbeugel
F) voorplaat met digitale thermostaat
G) voorplaat met LED-thermostaat
H) manuele thermostaat (alleen C26)
I) schakelaar (alleen C26)
J) handvat
K) contact 12/24Vcc - 220Vca

Het serieplaatje met het serienummer en de technische gegevens zit in de koelkast bovenaan op de rechter wand. De eerste drie cijfers van het serienummer staan voor het constructiejaar en -week.
Alle materialen die in aanraking komen met voedingsmiddelen voldoen aan de richtlijn 2004/1935/EEG. Het apparaat maakt minder dan 70 dB(A) lawaai.

INSTALLATIE

Controleer of het toestel nergens beschadigd is. Eventuele schade aan het toestel dient niet later dan 24 uur na de datum van aankoop aan de verkoper te worden gesignaleerd.
Verplaats het apparaat zo voorzichtig mogelijk. Zet de koelgroep zo voorzichtig mogelijk neer om de verbindingsbuizen niet stuk te maken of te verstoppen (geldt voor koelkasten met afzonderlijke koelgroepen) zodat de verbindingsbuizen niet breken of versopt raken. Zet de koelkast en de eventuele afzonderlijke koelgroep altijd op een perfect horizontale ondergrond.
Zorg voor genoeg ventilatie rondom de koelgroep: maak hiervoor in het inbouwmeubel twee openingen, één in de bodem ter hoogte van de koelgroep en één in de bovenkant of bovenaan in de zijkant. Deze openingen moeten kleiner dan 300 vierkante cm zijn. Als dit niet kan, dient u een spleet te laten van ten minste 50 mm tussen de bovenkant van de koelkast en het blad erboven (zie afb.5).Installeer de koelkast ver van warmtebronnen, op een droge en goed geventileerde plaats.
Laat het apparaat ten minste een uur rusten voordat u het in werking zet. Gebruik deze tijd voor een eerste reinigingsbeurt.

DE KOELKAST REINIGEN

Controleer of de stroom is uitgeschakeld voordat u de koelkast begint te reinigen. Is dit niet het geval, dan haalt u de stekker uit het stopcontact.

BUITENKANT

De buitenkant van de koelkast reinigen met lauw water, afspoelen met koud water en drogen met een zachte doek. Geen schurende middelen gebruiken.

BINNENKANT

De roosters (of het mandje), bakjes en ijsbakjes eruit halen en de koelkast schoonmaken met lauw water waarin u een beetje sodiumcarbonaat of azijn doet. Afspoelen en zorgvuldig drogen met een zachte doek. Nooit schurende producten, reinigingsmiddelen of zeep gebruiken.

CONDENSOR

Ten minste één keer per jaar moet de condensor schoongemaakt worden (zie afb. 4) met een stofzuiger of een droge kwast.

Als het apparaat een lange tijd niet wordt gebruikt dient men de stekker uit het stopcontact te halen, de koelkast helemaal leeg te maken, de binnenkant schoon te maken en de deur een beetje open te laten staan zodat er geen schimmel of vieze luchtjes in komen.

AANSLUITEN OP HET LICHTNET

Dit apparaat voldoet aan de voorschriften van de richtlijn 89/336/EEG sulla soppressione dei radiodisturbi.
Voordat u het toestel aansluit, dient u de stroomkgegevens te controleren op het serieplaatje en op het plaatje op de compressor.

TEMPERATUURREGELING

Deze koelkast is uitgerust met een thermostaat voor het automatisch constant houden van de temperatuur.

- **MECHANISCHE THERMOSTAAT**
  Om de gewenste temperatuur te kiezen, dient u aan de regelknop te draaien.
  Als de knop op '0' of 'STOP' staat, werkt de koelkast niet.
  Als de knop op '1' wordt gezet, begint deze te draaien.
  Als u de knop van de stand '1' in de stand '5' draait, wordt de temperatuur steeds lager.

  Zie voor het bedradingschema de afb. 8e/h (12/24V) of 9 (115V/230V)

Sommige koelkasten zijn uitgerust met thermostaten met een andere temperatuuraanduiding dan diegene die hierboven is beschreven. Raadpleeg in dit geval de afbeelding1. Door de knop naar rechts te draaien, maakt men de koelkast kouder.

Om de voedingswaren op ee nrationele manier in de koelkast te zetten en te bewaren, dient u rekening te houden met de volgende tabel:

Type	Bewaartijd	Plaats in de koelkast
Vlees en schoongemaakte vis (in plastic zakjes of folei).	2 of 3 dagen	Op het rooster onder het vriesvak.
Eieren.	1 maand	In de vakjes in de deur.
Boter, margarine.	1 week	In de vakjes in de deur.
Bereide gerechten, taarten, soep (hermetisch afgesloten en helemaal afgekoeld).	3 of 4 dagen	Op het rooster onderaan in de koelkast.
Salami, verse fresca, room, pudding, chocolade, roomsoesjes e.d., spekvet, droge koekjes, rijpe tomaten.	3 of 4 dagen	Op elk rooster.
Flessen.		In de vakjes in de deur.
Fruit en groenten.		In de groentenlade; onderaan in de koelkast.

HET LAMPJE VERVANGEN

Men vervangt het lampje (fig.2) als volgt:

- Haal het beschermglas er loodrecht van de basis uit zonder de bevestigingspennen te beschadigen.
- Duw een van de twee veren weg om het lampje eruit te kunnen halen.
- Duw de twee veren een beetje naar elkaar toe en steek er een nieuw lampje tussen.
- **Controleer of het lampje stevig tussen de veren zit.**
- Steek het beschermglas er weer op.

OMKEERBARE DEUR

Om de deur met pinsluiting aan de andere kant te zetten, gaat u als volgt te werk:

- Demonteer het bovenste scharnier en de pinsluiting.
- Haal de deur er naar boven uit zodat deze uit het onderste scharnier komt.
- Demonteer het onderste scharnier en monteer dit aan de andere kant van de koelkast.
- Steek de deur op het onderste scharnier.
- Monteer het bovenste scharnier en de pinsluiting.

HET PANEEL WIJZIGEN

Om het paneel te demonteren en/of te vervangen, gaat u als volgt te werk:

- De deur eruit halen volgens de aanwijzingen in de vorige paragraaf.
- De schroeven losdraaien op de basis onderaan en de basis eraf halen.
- Het paneel naar onder eruit schuiven.
- Het nieuwe paneel monteren en op de plaats van het oude steken door het naar boven te schuiven tot aan de stop.
- De onderkant weer monteren.

HET APPARAAT LATEN ONTDOOIEN

Telkens als het ijs dikker wordt dan 3 millimeter, dient men de koelkast te laten ontdooien. Een regelmatig ontdooide koelkast rendeert meer en verbruikt minder energie.

Om de koelkast helemaal te laten ontdooien, draait u de knop van de thermostaat op stop. Laat de deur openstaan om het ontdooien sneller te laten verlopen.

Verwijder het ijs niet met puntige of scherpe metalen voorwerpen die het toestel onherroepelijk kunnen beschadigen.

Koelkasten met koude-opslag worden automatisch ontdooid. Wij raden aan het druppelbakje elke dag leeg te maken.

Na het ontdooien, dient de koelkast weer te worden aangezet door de knop van de thermostaat op de gewenste stand te zetten.

SPECIALE WAARSCHUWINGEN VOOR 220 Vca-KOELKASTEN

AANSLUITEN OP HET LICHTNET

Het is wettelijk verplicht dit toestel te aarden. Controleren of het stroomnet waarop het toestel wordt aangesloten perfect geaard is.

De fabrikant is niet verantwoordelijk voor eventuele schade aan personen of voorwerpen die voortvloeit uit het overtreden van dit voorschrift.

Wij raden af adaptors, meervoudige contacten of verlengingen te gebriuken. Als dit toch nodig is, kies dan uitsluitend materiaal dat aan alle geldende veiligheidsvoorschriften voldoet en overschrijdt nooit het vermogen dat op de materialen zelf is vermeld. Als de stekker va nde koelkast niet in het stopcontact past, vervang deze dan door een andere stekker. Wij raden aan deze vervanging over te laten aan een deskundig elektricien die ook zal moeten controleren of de draden in de stekker bij het opgenomen stroomvermogen van het apparaat passen.

WAT MOET U DOEN WANNEER DE KOELKAST NIET WERKT

1- DE KOELKAST WERKT NIET

Controleren:

- de thermostaat moet op "STOP" staan.
- er moet stroom zijn.
- de hoofdstroomschakelaar moet aan staan.
- de stekker moet goed werken en in het stopcontact zitten.
- het stopcontact moet goed werken. Controleer het stopcontact door er een stekker van een goed werkend apparaat in te doen.
- de stroomkabel mag nergens onderbroken zijn.

2- DE KOELKAST MAAKT LAWAAI

Controleren:

- de koelkast of de koelgroep moet recht en vlak staan.
- de koelkast mag geen meubels aanraken die trillingen kunnen veroorzaken.
- de buizen van het koelcircuit op de achterkant mogen nergens raken en tegen het apparaat zelf trillen.

3- KOELKAST MET ONVOLDOENDE RENDEMENT

Controleren:

- de deur moet hermetisch sluiten.
- de koelkast mag neit te dicht bij een warmtebron staan.
- de koelkast of de koelgroep moet voldoende geventileerd zijn.
- er mag niet te veel ijs op de verdamper zitten.
- de condensor mag niet vol stof zitten.
- de ventilator moet vrij kunnen draaien (uitvoeringen met ventilatorkoeling).
- de koelkast mag nit te vol worden geladen.

Als u dit alles gecontroleerd hebt, en er zijn nog steeds problemen, neemt u contact op met een servicecentrum.

SPECIALE WAARSCHUWINGEN VOOR 12/24 Vcc-KOELKASTEN

INSTALLATIE

Voor het installeren van koelkasten of koelgroepen in caravans, campers, motor homes enz. raden wij aan luchtopeningen naar buiten in het vervoermiddel zelf te maken (zie afb 6).
Voor het installeren van draagbare koelkasten zit op sommige modellen een beugel waarmee deze kan worden vastgemaakt (zie afb.7).

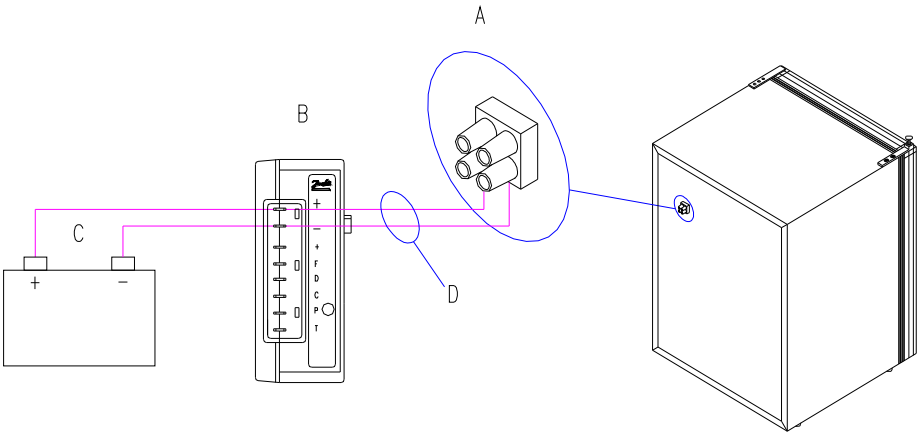
AANSLUITEN OP HET LICHTNET

Voor koelkasten die werken op 12Vcc of 24Vcc raden wij aan de leidingen direct op de accu aan te sluiten en de meegeleverde aanwijzingen die bij de Danfoss-compressor horen hiervoor te volgen (zie pag.111 en pag.112)..

De verlichting in de koelkasten 12/24Vcc met externe motor aansluiten:

- Maak de optionele kabel "D" (bestelnr.**R10777**) aansluiten op de klemmen achteraan op de koelkast en op de compressor. (Er zijn geen negatieve of positieve polen op de klemmen "A", wat betekent dat men geen rekening dient te houde nemt de polen voor het aansluiten.)
- Sluit de accu aan op de compressorbesturing, **maar pas op voor de polen!**

  - Klemmen voor koelkastverlichting.
  - Compressorbesturing.
  - Accu.
  - Verlichtingskabel.



SPECIALE WAARSCHUWINGEN VOOR 12/24 Vcc 100-240Vca-KOELKASTEN

AANSLUITEN OP HET LICHTNET

Wij raden aan de koelkasten die werken op 12Vcc of 24Vcc direct op de accu aan te sluiten en de meegeleverde aanwijzingen die bij de Danfoss-compressor horen hiervoor te volgen (zie pag.111 en pag.112).

Voor de Vca-aansluiting dient een draaistroomkabel te worden gebruikt die aan de geldende voorschriften voldoet met een minimum dikte van 1mm2 en geïsoleerd is volgens de gebruiks- en omgevingsvereisten.
Maak de Vca-aansluiting met een steker en een stopcontact die voldoen aan de geldende voorschriften en sterk genoeg zijn of monteer een omnipolaire differentieelschakelaar van 6 ampère en een opening tussen de contacten van minstens 3 mm of volgens de geldende voorschriften.
Controleer na de installatie of er nergens onderbrekingen zijn in het aardcircuit en voer alle veiligheidstesten uit die voorgeschreven zijn door de wet.
Beveilig en blokkeer de kabels zodat niemand ze per toeval uit het stopcontact kan trekken en ze niet in aanraking kunnen komen met voorwerpen met een temperatuur die hoger is dan 50°C of met scherpe hoeken en kanten.
Het is aanbevolen de installatie over te laten aan een deskundig elektricien die kan controleren of de aansluiting en de leiding voldoen aan de voorschriften en die een goedkeuringscertificaat kan overhandigen.

De verlichting in de koelkasten 12/24Vcc met externe motor aansluiten:

- Maak de optionele kabel (Bestelnr. **R10777**) voor de aansluiting van de binnenverlichting vast op de aansluitklemmen die achteraan op de koelkast zitten en op de compressor volgens het bedradingschema van afbeelding 15. (U hoeft voor de klemmen geen rekening te houden met positieve en negatieve polen.).

TEMPERATUURREGELING

- **MECHANISCHE THERMOSTAAT**

  In koelkasten met koude-opslag op 12Vcc of 24Vcc raden wij met het oog op een zo groot mogelijke energiebesparing aan de thermostaatknop in de 'A'-stand te zetten voor koelkasten met een maximale inhoud van 75 lt; en in de stand 'A1' voor koelkasten met een grotere inhoud (afb.1).

- **THERMOSTAAT MET "LED"**

  Op de elektronische thermostaat met "LED" zitten twee bedieningsknoppen:
  - Een knop om de koelkast aan en uit te zetten: "ON/OFF"
  - Een knop om de temperatuur te regelen "✱"

  Als men de knop "ON/OFF" indrukt, zal men de koelkast **aan en uit zetten.**
  Om de temperatuur te regelen drukt men op de knop met het symbool ✱. Telkens als de knop wordt ingedrukt, zal het lichtje van het LED verschuiven van links naar rechts, terwijl voor de tussenstanden de twee dichtstbijzijnde LED's gaan branden. Als de aanwijzer links staat, is de koelkast het minst koud (minimum)
  de stand naar rechts wijst op een lagere temperatuur (kouder) met een verschil van ongeveer 3°C. Om een koudere temperatuur te kiezen, drukt u herhaaldelijk de knop in totdat het meeste rechtse led brandt (koudste temperatuur). Als u de knop daarna weer indrukt, zal het led uiterst links gaan branden.
  Zie voor het bedradingschema de afb. 8a/b/f



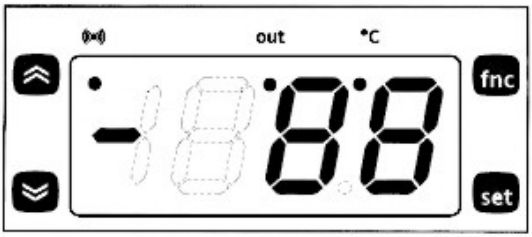
- **DIGITALE THERMOSTAAT**

  Met de DIGITALE thermostaat wordt de temperatuur in de koelkast en het aan en uit gaan van de compressor constant en automatisch gecontroleerd.
  De gebruiker heeft een display ter beschikking en vier toetsen om de staat van de koelkast te cotnroleren en het instrument zelf te programmeren.
  Zodra het display stroomvoeding krijgt, zal het beginnen te kinpperen waarna de huidige temperatuur in de koelkast erop verschijnt.
  De thermostaat is default ingesteld op 0°C.

  Zie voor het bedradingschema de afb. 8c (12/24V) of 8d (12/24V-230V)

DE PARAMETERS WIJZIGEN:

- De toets **SET** 2 keer kort indrukken (niet langer dan 5 sec.) 2 volte.
  De eerste keer verschijnt het woordje "SET", de tweede keer de waarde "0" of de waarde die reeds geprogrammeerd was.
- Stel met de toetsen  o  de temperatuur in die de koelkast moet bereiken.
- Druk de toets **FNC** snel 2 keer in om de ingestelde temperatuur te bevestigen.
  De eerste keer verschijnt het woordje "SET", de tweede keer de echte temperatuur in de koelkast.
- Het puntje onder het woordje "OUT" betekent dat de compressor en de ventilator in werking zijn.

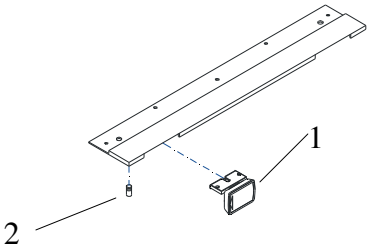


Zie voor het bedradingschema de afb. 8c/d/g

ER ZIT BIJ DE KOELKAST IN ELK GEVAL EEN HANDLEIDING VAN DE DIGITALE THERMOSTAAT.

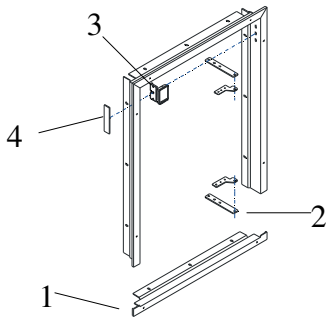
Om de deur met sluiting NAUTIC-EUROPA aan de andere kant te zetten, gaat u als volgt te werk:

- Haal de deur er naar boven uit zodat deze uit het onderste scharnier komt.
- Demonteer de klink van Nautic (1) en plaats deze op de deur aan de overkant. Meet de hartlijn tussen de openingen.
- Schroef de scharnierpin (2) uit de beugel en schroef deze vast aan de andere kant.
- Plaats de deur en controleer de sluiting.
- Monteer het onderste scharnier aan de andere kant van de koelkast.



Om de deur met sluiting NAUTIC-USA aan de andere kant te zetten, gaat u als volgt te werk:

- Demonteer de basis van het bevestigingsprofiel (1) indien aanwezig.
- Demonteer het scharnier en het onderste plaatje (2) en haal de deur er naar onder uit.
- Demonteer het handvat Nautic (3), keer de stoppen en de binnenste veer om om de beweging van de deur om te keren; draai het handvat in de richting van de pijl.
- Monteer de klink van Nautic (1) op de deur aan de overkant. Meet de hartlijn tussen de openingen.
- Verplaats het plaatje waarop de sluiting pakt (4) aan de andere kant van het profiel.
- Plaats de deur en controleer de sluiting.
- Plaats het scharnier, het onderste plaatje en de basis van het bevestigingsprofiel.



WAT MOET U DOEN WANNEER DE KOELKAST NIET WERKT

1- DE KOELKAST WERKT NIET

Controleren:

- de thermostaat moet op "STOP" staan.
- de hoofdstroomschakelaar moet aan staan.
- de zekering op het elektronisch mechanisme van de koelkast mag neit doorgebrand zijn.
- de stroomkabel mag nergens onderbroken zijn.
- de accu moet goed werken.
- **de spanning naar de klem van het elektronisch mechanisme op de koelkast moet gelijk zijn aan de spaning naar de accu**. Bij een spanningverlies groter dan 0,2-0,4V controleert u:
- de kabel tussen de accu en het elektronisch mechanisme (zie de tabel van de instructies van Danfoss).
- over de gehele aansluiting of eventuele verbindingspunten niet stuk zijn of niet goed vast zitten.
- of er geen oxidatie zit op de accupolen of op de contacten.

2- DE KOELKAST MAAKT LAWAAI

Controleren of:

- de koelkast of de koelgroep moet recht en vlak staan.
- de koelkast mag geen meubels aanraken die trillingen kunnen veroorzaken.
- de buizen van het koelcircuit op de achterkant mogen nergens raken en tegen het apparaat zelf trillen.

3- KOELKAST MET ONVOLDOENDE RENDEMENT

Controleren of:

- de deur moet hermetisch sluiten.
- de koelkast mag niet te dicht bij een warmtebron staan.
- de koelkast of de koelgroep moet voldoende geventileerd zijn.
- er mag niet te veel ijs op de verdamper zitten.
- de condensor mag niet vol stof zitten.
- de ventilator moet vrij kunnen draaien (uitvoeringen met ventilatorkoeling).
- de koelkast mag niet te vol worden geladen.

Als u dit alles gecontroleerd hebt, en er zijn nog steeds problemen, neemt u contact op met een servicecentrum.

INSTRUCTIES VOOR DANFOSS BD35/BD50F 12-24 Vcc

De elektronische unit is geschikt voor twee verschillende aansluitspanningen. Dit houdt in dat dezelfde unit voor zowel 12V als 24V voedingsspanning kan worden toegepast. De max. spannino voor een 12V systeem is 17V en 31,5V voor een 24 V voedingssysteem. De max. omgevingstemperatuur is 55°C. De elektronische unit heeft een ingebouwde thermische beveiliging die geactiveerd wordt en de werking van de compressor stopt als de temperatuur van de elektronische unit te hoog wordt.

Installatie (fig. 10)

Steek de stekker van de elektronische unit in de compressoraansluiting. Monteer de elektronische unit op de compressor door de behuizing over de schroefkop (1) te klemmen.

Voeding (fig. 10)

De elektronische unit moet altijd direct op de polen van de batterij (2) worden aangesloten. Sluit de plus op de + en de min op de - aan, anders zal de elektronische unit niet werken. De elektronische unit is tegen een verkeerde batterijaansluiting beschermd. Ter bescherming van de installatie moet er in de + kabel zo dicht mogelijk bij de batterij een zekering (3) worden gemonteerd. Een 15A zekering voor 12V en een 7,5A zekering voor 24V circuits worden aanbevolen. Als er een hoofdschakelaar (4) gebruikt is, moet er uitgegaan worden van een stroom van min. 20A. De aanbevolen kabelafmetingen in fig. 11. moeten worden aangehouden. Vermijd bijkomende verbindingen in het voedingsspannings circuit om te voorkomen dat een spanningsdaling de instelling van de batterijbeveiliging beïnvloed.

Batterijbeveiliging (fig. 10)

De compressor wordt gestopt en weer gestart volgens de vastgestelde spanningslimieten op de + en - klemmen van de elektronische unit. De standaard instellingen voor de 12V als 24V voedingssystemen blijken uit fig. 12. Andere instellingen (fig. 13) zijn optioneel als er een verbinding d.m.v. een weerstand (9) wordt aangebracht tussen de klemmen C en P. Wanneer zonneenergie gebruikt wordt, zonder batterij, is een weerstand van 220 kW aanbevolen. In AEO (Adaptive Energy Optimizing) modus past de compressor zijn snelheid altijd aan in functie van de vraag naar koeling; en dit binnen een willekeurig spanningsbereik 9.6 tot 31.5V.

Thermostaat (fig. 10)

De thermostaat (7) is aangesloten tussen de klemmen C en T. Zonder een weerstand in het stuurstroom circuit zal de compressor met een standaard electronische unit 101N0210 or 101N0220 op een vast toerental van 2000 omw. per minuut draaien als de thermostaat wordt ingeschakeld. Met de thermostaat rechtstreeks aangesloten op de klem C, zal de elektronische eenheid 101N0300 de snelheid aanpassen in functie van de actuele vraag naar koeling. Andere vaste compressortoerentallen binnen het bereik van 2.000 en 3.500 rpm zijn mogelijk als er een weerstand (8) gemonteerd is om de stroom (mA) van het stuurstroom circuit af te stellen. Weerstandswaarden voor verschillende toerentallen zijn terug te vinden in fig. 14.

Ventilator (optie, fig. 10)

Tussen de klemmen + en F kan een ventilator (5) worden aangesloten. Verbind de plus met + en de min met F. Aangezien de uitgangsspanning tussen de klemmen + en F altijd 12V is, moet een 12V ventilator voor zowel de 12V als de 24V voedingsspanning worden gebruikt. De ventilator uitgang kan een continue stroom leveren van 0,5A gemiddeld. Een hogere stoom is toegestaan gedurende 2 seconden tijdens de start.

LED (optie, fig. 10)

Een 10mA lichtdiode (LED) (6) kan tussen de klemmen + en D worden aangesloten. Als de elektronische unit een werkingsfout registreert, zal de diode een aantal malen knipperen. Het aantal knipperingen is afhankelijk van de werkingsfout die geregistreerd wordt. Elke knippering zal ¼ seconde duren. Na het desbetreffende aantal knipperingen zal er een pauze zonder knipperingen zijn, zodat de reeks voor elke foutenregistratie om de 4 seconden herhaald wordt.

Aantal knip-peringen	Type fout
5	**Thermisch uitschakelen van de elektronische unit** (Als het koelsysteem te zwaar belast is geweest, of als de omgevingstemperatuur te hoog is, zal de elektronische unit te heet worden)
4	**Fout minimumsnelheid motor** (Als het koelsysteem te zwaar belast is, kan de motor de minimumsnelheid van 1.850 omw.per minuut niet aanhouden).
3	**Fout motorstart** (De rotor is geblokkeerd of het drukverschil in het koelsysteem is te groot (>5 bar)).
2	**Ventilator overstroombeveiliging** (De ventilator verbruikt meer dan 1 A_{peak}).
1	**Batterijbeveiliging uitschakeling** (De spanning ligt buiten de uitschakelinstelling).

INSTRUCTIES VOOR DANFOSS BD35/BD50F 12-24 Vcc / 110-240 Vca

De elektronische besturing is een multispanningsysteem. De besturing kan gebruikt worden voor 12V/24V DC voedingstroom en voor 100-240V AC 50/ 60Hz. Als de voedingstroom12V DC is, is de maximale spanning 17V DC; voor een voedingstroom van 24V DC is de maximum spanning 31.5V DC. Voor AC-systemen bedraagt de maximum spanning 265V AC en de minimum spanning 85V AC. De maximum omgevingstemperatuur bedraagt 55°C. De elektronische besturing is uitgerust met een ingebouwde temperatuurcontrole die de compressor uit en aan zet als de temperatuur van de elektronische besturing te hoog wordt (100°C / 212°F op het elektronisch circuit). Het opgenomen vermogen is beperkt tot 100W. **Lees het blad met technische kenmerken BD50F voor details.**

Installatie (fig. 10)

Steek de stekker van de elektronische unit in de compressoraansluiting. Monteer de elektronische unit op de compressor door de behuizing over de schroefkop (1) te klemmen.

Voeding (fig. 10)

De elektronische unit moet altijd direct op de polen van de batterij (2) worden aangesloten. Sluit de plus op de + en de min op de - aan, anders zal de elektronische unit niet werken. De elektronische unit is tegen een verkeerde batterijaansluiting beschermd. Ter bescherming van de installatie moet er in de + kabel zo dicht mogelijk bij de batterij een zekering (3) worden gemonteerd. Een 15A zekering voor 12V en een 7,5A zekering voor 24V circuits worden aanbevolen. Als er een hoofdschakelaar (4) gebruikt is, moet er uitgegaan worden van een stroom van min. 20A. De aanbevolen kabelafmetingen in fig. 11. moeten worden aangehouden. Vermijd bijkomende verbindingen in het voedingsspannings circuit om te voorkomen dat een spanningsdaling de instelling van de batterijbeveiliging beïnvloed.

AC: De elektrische kabels moeten aangesloten worden op de klemmen L en N op de elektronische besturing. Nominale spanning van 100 tot 240 V AC 50/60Hz. Veiligheidsschakelaar: bovenste limiet = 270V AC, onderste limiet = 80V AC. Een zekering van 4A (11) moet worden gemonteerd op de spanningskabel (L) ter beveiliging van het systeem. Als u een hoofdschakelaar gebruikt (12), dient op minstens 6° te worden afgesteld. De kabel moet minimaal 0.75 mm2 of 18 AWG zijn. Opm.: indien nodig een aardverbinding aanbrengen.

Algemeen: u kunt tegelijkertijd op de elektronische besturing een AC en een DC voeding aansluiten. In dit geval zal het systeem voorrang geven aan de AC-voeding. Als de AC-voeding uitvalt of onder 85V AC valt, schakelt het systeem over op de 12V DC-voeding met een uitsteltijd van 1 minuut. Als de AC-voeding weer inschakelt, zal er geen enkele schakelvertraging zijn voor de compressor.

Batterijbeveiliging (fig. 10)

De compressor wordt gestopt en weer gestart volgens de vastgestelde spanningslimieten op de + en - klemmen van de elektronische unit. De standaard instellingen voor de 12V als 24V voedingssystemen blijken uit fig. 12. Andere instellingen (fig. 13) zijn optioneel als er een verbinding d.m.v. een weerstand (9) wordt aangebracht tussen de klemmen C en P.

Thermostaat (fig. 10)

De thermostaat (7) is aangesloten tussen de klemmen C en T. Zonder een weerstand in het stuurstroom circuit zal de compressor met een standaard electronische unit 101N0210 or 101N0220 op een vast toerental van 2000 omw. per minuut draaien als de thermostaat wordt ingeschakeld. Met de thermostaat rechtstreeks aangesloten op de klem C, zal de elektronische eenheid 101N0300 de snelheid aanpassen in functie van de actuele vraag naar koeling. Andere vaste compressortoerentallen binnen het bereik van 2.000 en 3.500 rpm zijn mogelijk als er een weerstand (8) gemonteerd is om de stroom (mA) van het stuurstroom circuit af te stellen. Weerstandswaarden voor verschillende toerentallen zijn terug te vinden in fig. 14.

Ventilator (optie, fig. 10)

Tussen de klemmen + en F kan een ventilator (5) worden aangesloten. Verbind de plus met + en de min met F. Aangezien de uitgangsspanning tussen de klemmen + en F altijd 12V is, moet een 12V ventilator voor zowel de 12V als de 24V voedingsspanning worden gebruikt. De ventilator uitgang kan een continue stroom leveren van 0,5A gemiddeld. Een hogere stoom is toegestaan gedurende 2 seconden tijdens de start.

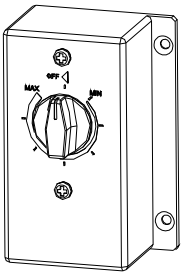
Lamp (optional, Afb. 1)

Een lamp van 5 Watt 12V DC (10) kan aangesloten worden tussen de klemmen A en C. De uitgaande spanning tussen de klemmen A en C is altijd ingesteld op 12V DC. Zowel met een voedingsysteem van 12V als één met 24V dient een lamp van 12V DC te worden gebruikt. Op de uitgang van de lamp kan een gemiddelde continue spanning van 0,5A worden gemeten.

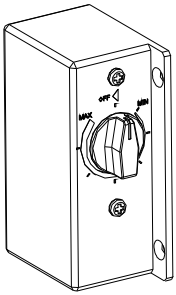
LED (optional, Afb. 1)

Een LED van 10mA (6) kan aangesloten worden tussen de klemmen + en D. Als de elektronische besturing een fout signaleert zal deze LED een bepaald aantal keer knipperen. Het aantal keren hangt af van het type fout. Elk knippersignaal duurt ¼ seconde. Na elke knippersignaalreeks volgt een interval zonder signalen. Elke foutsignaleringsreeks wordt dus om de 4 seconden herhaald.

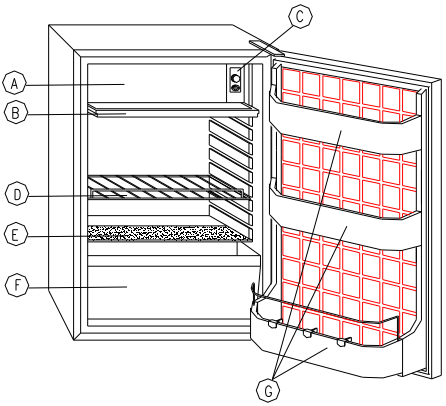
fig.1



Type A



Type B



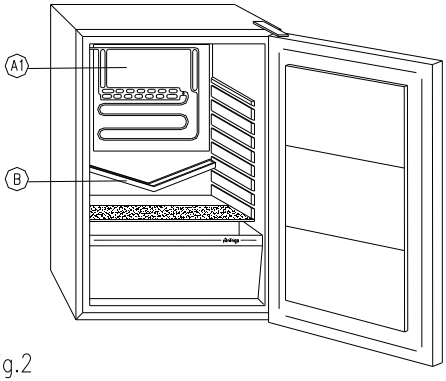


fig.2

fig.3

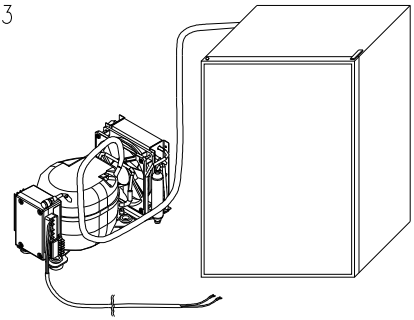
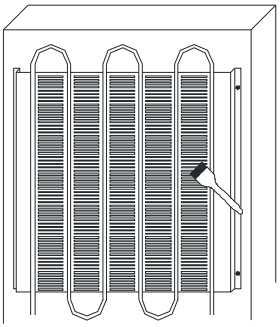
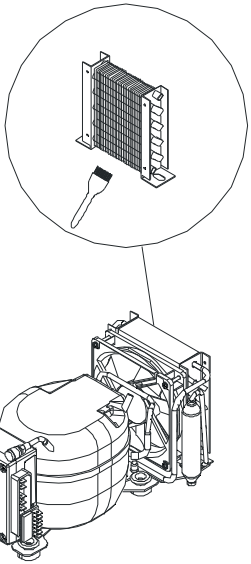


fig.4





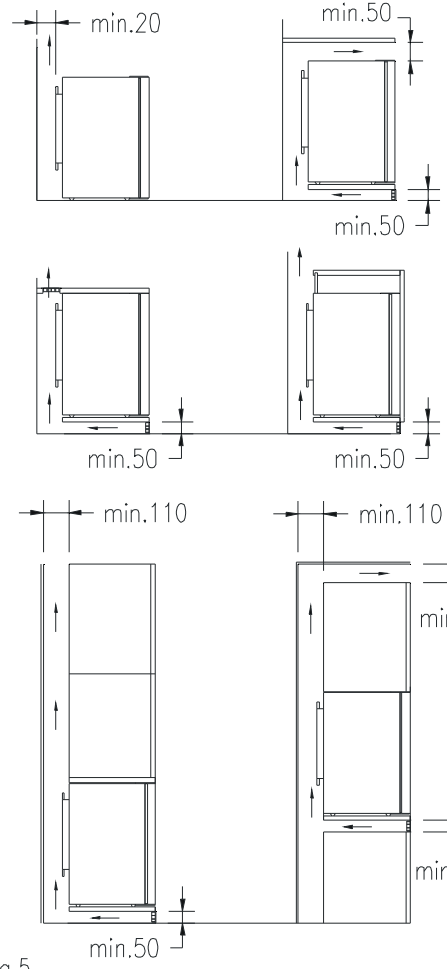


fig.5

fig.6

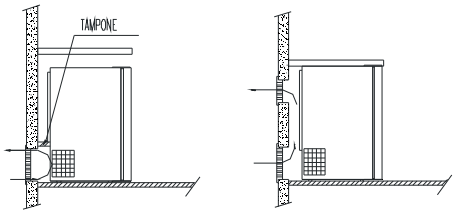
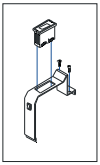


fig.7a



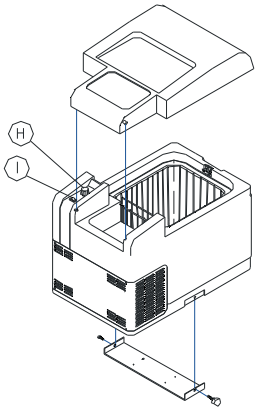
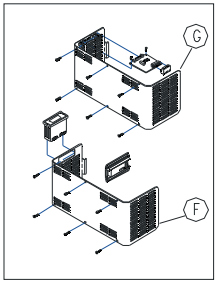


fig.7b



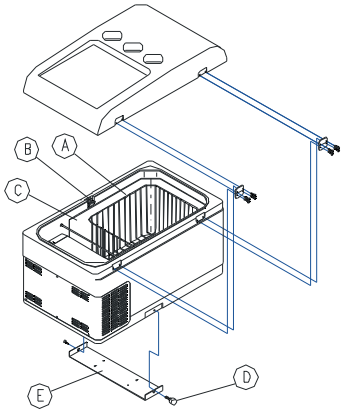
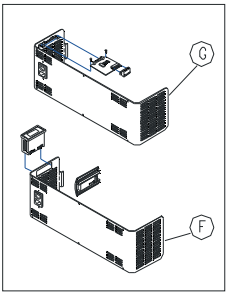


fig.7c



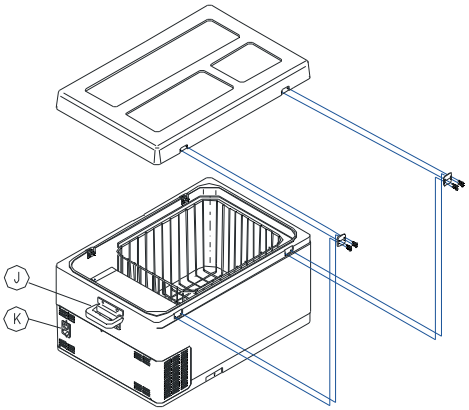


fig.8a

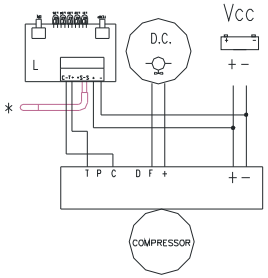


fig.8b

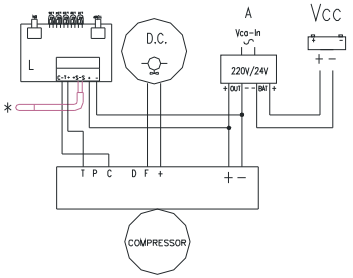


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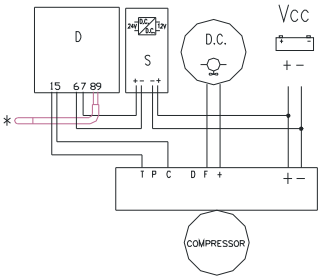


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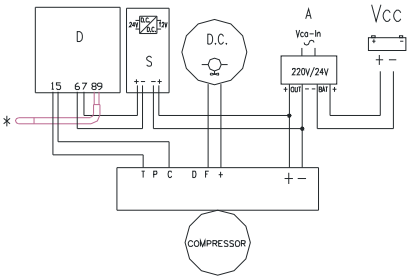


fig.8e

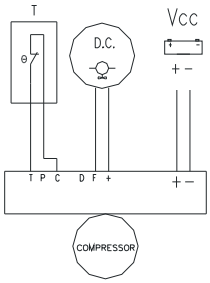


fig.8f

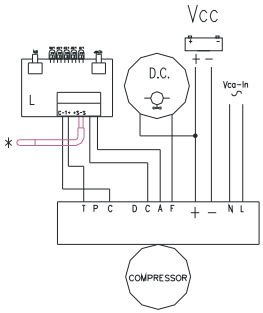


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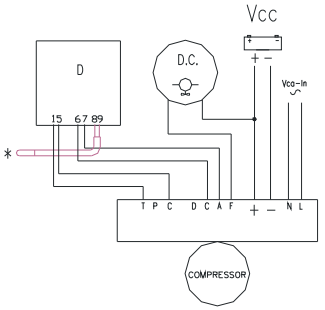


fig.8h

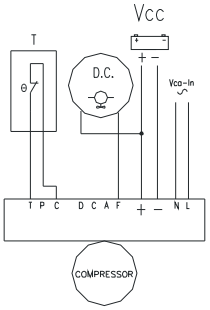


fig.9

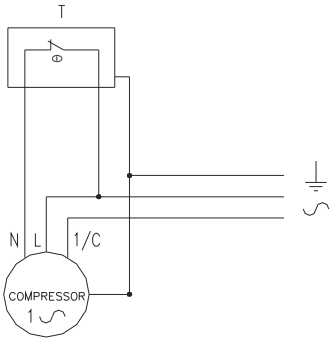
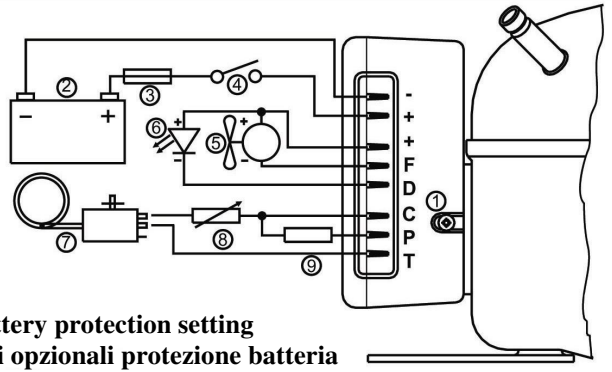


Fig.10



Optional battery protection setting
Impostazioni opzionali protezione batteria

Resistor (9) kΩ	12V cut-out V	12V cut-in V	12V max. Voltage	24V cut-out V	24Vcut-in V	24V max Voltage
Resistore (9) kΩ	12V stacco V	12V attacco V	Max tensione a 12V	24V stacco V	24V attacco V	Max tensione A 24V
0	9.6	10.9	17.0	21.3	22.7	31.5
1.6	9.7	11.0	17.0	21.5	22.7	31.5
2.4	9.9	11.1	17.0	21.8	22.9	31.5
3.6	10.0	11.3	17.0	22.0	23.2	31.5
4.7	10.1	11.4	17.0	22.3	23.4	31.5
6.2	10.2	11.5	17.0	22.5	23.7	31.5
8.2	10.4	11.7	17.0	22.8	23.9	31.5
11	10.5	11.8	17.0	23.0	24.2	31.5
14	10.6	11.9	17.0	23.3	24.5	31.5
18	10.8	12.0	17.0	23.6	24.7	31.5
24	10.9	12.2	17.0	23.8	25.0	31.5
33	11.0	12.3	17.0	241	25.2	31.5
47	11.1	12.4	17.0	24.3	25.5	31.5
82	11.3	12.5	17.0	24.6	25.7	31.5
220	9.6	10.9			26.0	31.5

Fig.13

Wire dimensions
Dimensioni cavi (Fig.11)

Cross section mm²	Max length* m 12V operation	Max length* m 24V operation
Sezione mm²	Max. lunghezza* m funzionamento a 12V	Max. lunghezza* m funzionamento a 12V
2.5 4 6 10	2.5 4 6 10	5 8 12 20

Lenght between battery and electronic unit
Lunghezza tra la batteria e l'unità elettronica

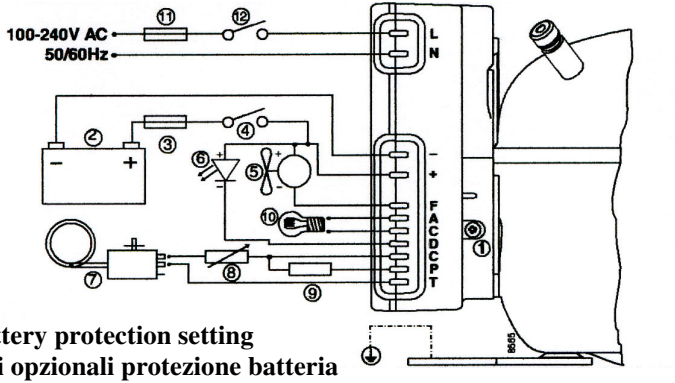
Standard battery protection setting
Impostazioni standard protezione batteria (Fig.12)

12V cut-out V	12V cut-in V	24V cut-out V	24V cut-in V
12V stacco V	12V attacco V	24V stacco V	24V attacco V
10.4	11.7	22.8	24.2

Compressor speed
Velocità compressore (Fig.14)

Resistor (8) Ω	Motor speed rpm	Contr.Circ. Current mA
Resistore (8) Ω	Velocità motore giri/min	Corrente circuito controllo mA
0 277 692 1523	2000 2500 3000 3500	5 4 3 2

Fig.15



Optional battery protection setting
Impostazioni opzionali protezione batteria

Resistor (9) kΩ	12V cut-out V	12V cut-in V	12V max. Voltage	24V cut-out V	24Vcut-in V	24V max Voltage
Resistore (9) kΩ	12V stacco V	12V attacco V	Max tensione a 12V	24V stacco V	24V attacco V	Max tensione A 24V
0	9.6	10.9	17.0	21.3	22.7	31.5
1.6	9.7	11.0	17.0	21.5	22.7	31.5
2.4	9.9	11.1	17.0	21.8	22.9	31.5
3.6	10.0	11.3	17.0	22.0	23.2	31.5
4.7	10.1	11.4	17.0	22.3	23.4	31.5
6.2	10.2	11.5	17.0	22.5	23.7	31.5
8.2	10.4	11.7	17.0	22.8	23.9	31.5
11	10.5	11.8	17.0	23.0	24.2	31.5
14	10.6	11.9	17.0	23.3	24.5	31.5
18	10.8	12.0	17.0	23.6	24.7	31.5
24	10.9	12.2	17.0	23.8	25.0	31.5
33	11.0	12.3	17.0	241	25.2	31.5
47	11.1	12.4	17.0	24.3	25.5	31.5
82	11.3	12.5	17.0	24.6	25.7	31.5
220	9.6	10.9			26.0	31.5

Fig.18

Wire dimensions
Dimensioni cavi (Fig.16)

Cross section mm²	Max length* m 12V operation	Max length* m 24V operation
Sezione mm²	Max. lunghezza* m funzionamento a 12V	Max. lunghezza* m funzionamento a 12V
2.5	2.5	5
4	4	8
6	6	12
10	10	20

Lenght between battery and electronic unit
Lunghezza tra la batteria e l'unità elettronica
Wire dimension AC/Dimensioni cavi AC
Cross section / Sezione : min. 0.75 mm²

Standard battery protection setting
Impostazioni standard protezione batteria (Fig.17)

12V cut-out V	12V cut-in V	24V cut-out V	24V cut-in V
12V stacco V	12V attacco V	24V stacco V	24V attacco V
10.4	11.7	22.8	24.2

Compressor speed
Velocità compressore (Fig.19)

Resistor (8) Ω	Motor speed rpm	Contr.Circ. Current mA
Resistore (8) Ω	Velocità motore giri/min	Corrente circuito controllo mA
0	2000	5
277	2500	4
692	3000	3
1523	3500	2

DICHIARAZIONE DI CONFORMITA'
La VITRIFRIGO srl con sede in via della Produzione 9, 61020 Montecchio (PS), Italia,
DICHIARA
sotto la propria responsabilità che il frigorifero o unità refrigerante per la refrigerazione ed il mantenimento di cibi e bevande i cui dati sono riportati nell'etichetta sottostante ed alla quale questa dichiarazione si riferisce
E' CONFORME
ai requisiti essenziali di sicurezza previsti dalle direttive:
2006/95/CEE 2004/108/CEE.

DECLARATION OF CONFORMITY
VITRIFRIGO srl, with it main office in via della Produzione 9, 61020 Montecchio (PS), Italy,
hereby DECLARES,
under its sole responsibility, that the refrigerator or refrigerating unit designed for the refrigeration and preservation of food and beverages, as per the dataplate indicated below and to which this declaration refers,
COMPLIES WITH THE
basic safety requirements specified in EC directives:
2006/95/EC EC/2004/108.

DÉCLARATION DE CONFORMITÉ
La soussignée société VITRIFRIGO srl, dont le siège est à Montecchio (PS) - 61020 (ITALIE), via della Produzione 9,
ATTESTE
sous sa responsabilité que le réfrigérateur ou unité de réfrigération et de conservation d'aliments et de boissons, dont les caractéristiques sont reportées sur l'étiquette ci-dessous et objet de la présente déclaration est
CONFORME
aux exigences essentielles des directives:
2006/95/CEE 2004/108/CEE.

KONFORMITÄTSERKLÄRUNG
Die Firma VITRIFRIGO srl mit Sitz in Via della Produzione 9, 61020 Montecchio (PS), Italien
ERKLÄRT
in eigener Verantwortung, dass der Kühlschrank bzw. das Kühlgerät für die Kühlung und Aufbewahrung von Speisen und Getränke, dessen Daten auf nachstehendem Etikett angegeben sind, und auf das sich diese Erklärung bezieht,
von folgenden Richtlinien vorgeschriebenen Sicherheitsanforderungen:
2006/95/EWG 2004/108/EWG
KONFORM IST.

DECLARACIÓN DE CONFORMIDAD
La VITRIFRIGO srl, con domicilio en via della Produzione n° 9, 61020 Montecchio (Pésaro), Italia,
DECLARA,
bajo su propia responabilidad, que el frigorífico o unidad refrigerante para la refrigeración y conservación de alimentos y bebidas - cuyos datos técnicos se indican en la etiqueta situada debajo, al que la presente declaración se refiere,
CUMPLE CON
los requisitos esenciales de seguridad establecidos por las directivas:
2006/95/CE 2004/108/CE.

DECLARAÇÃO DE CONFORMIDADE
A VITRIFRIGO srl, com sede na Via della Produzione n° 9 - 61020 - Montecchio (PS), Itália
DECLARA
sob a própria responsabilidade que o frigorifero ou unidade refrigerante á refrigeraçã e conservação de alimentos e bebidas, cujos dados estão contidos na etiqueta abaixo e a qual esta declaração concerne
É CONFORME
aos requisitos essenciais de segurança previstos pelas directivas:
2006/95/CE 2004/108/CE.

CONFORMITEITSVERKLARING
De firma VITRIFRIGO srl, gevestigd in de via della Produzione 9, 61020 Montecchio (PS), Italië,
VERKLAART,
onder eigen verantwoording, dat de koelkast of de koeleenheid voor het koelen en bewaren van voedingswaren en dranken, waarvan de gegevens op onderstaand etiket zijn vermeld en waarop deze verklaring betrekking heeft,
VOLDOET
aan de fundamentele vereisten zoals gedefinieerd in de richtlijnen:
2006/95/EEG 2004/108/EEG.

Vitri Alceste

TILLEGG / APPENDIX E

N **Komfyr**

S **Spisen**

DK **Ovn**

NL **Kooktoestel**

D **Kochgerät**

GB **Cooker**

FIN **Liesi**

ASKELADDEN

TROUBLE SHOOTING

Troubles / Causes	Canister would not installed.	No gas supply in "ON" position	Small gas in "OFF" position	Low flame	Uneven flame	No ignition/ Faulty ignition	Extinction in operation	Trouble shooting
Ignition knob not in "OFF" position	●							Turn igniton knob completely to "OFF" and reset canister.
Pressure sensor in regulator valve activated		●				●	●	Refer to explanation for pressure device.
Ignition knob malfunction		●	●	●		●		Contact local agent to repair
The clogged nozzle		●		●		●		Contact local agent to repair
Canister incorrectly installed	●	●	●			●		Fit canister hole into canister guide.
Clogged burner holes				●	●	●		Use a metal brush to clean it.
Bent or enrusted electrode						●		Remove dirty.
No gas		●		●	●	●	●	Replace fuel canister.

* THE INSTRUCTIONS SHALL BE MARKED WITH DIRECTIONS TO THE CONSUMER TO RETAIN THEM FOR FUTURE REFERENCE.

SPECIFICATIONS

DESCRIPTION	PORTABLE GAS COOKER
MODEL	CI-153
DIMENSION	L 13.7" × W 11" × H 3.5"
WEIGHT	4.4 Lb (1.7 kg)
GAS CONSUMPTION	208 Gms/Hr (9925 Btu/Hr)
IGNITION TYPE	PIEZO ELECTRIC IGNITION
FUEL	BUTANE
FUEL WEIGHT	220g

FEATURES

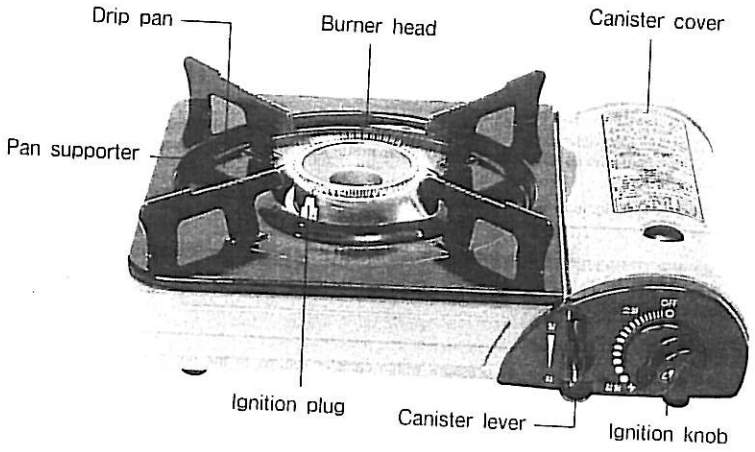
- SAFETY SHUT OFF DEVICE (GAS OVER PRESSURE SENSOR)
- ALUMINUM BURNER HEAD
- PIEZO ELECTRIC IGNITION
- PRE-SET

주방의 꽃

키친 플라워
KITCHEN FLOWER

NAMYANG KING®

Portable Gas Cooker

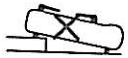
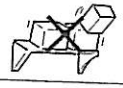


CI-153

NAMYANG

"DO NOT USE THE STOVE WHILE IN THE PLASTIC CAS"

CAUTIONS FOR USE

· Do not use in windy place 	· Place on a flat place 
· Do not use in condition cooker is covered by large pan. 	· Do not use in connection of burners. 
· Always place over 15cm away from walls or inflammables. 	· Do not leave the fuel canister in places where temperature exceed 40℃ and do not leave in trunk of a car. 
· Do not put under shelves or anywhere precarious or has the possibility of impact. 	· Puncture holes in the can before discarding never throw into a fire. 

HOW TO MAINTAIN

Body of cooker

- Make sure to clean the unit after canister is released and being cool.
- Wash the drip pan, outside and canister cover with warm water and then dry out with a cloth.

Burner head & surroundings

- Dirty burner make flame holes stuffed and results in imperfect combustion.
- Clean flame holes of burner head with a metal brush and keep out of water.

Ignition plug

- If it is wet, ignition is not made. Make sure to remove water and dry out with a cloth.

SAFETY DEVICE

· This unit will not operate until gas pressure within canister returns to the nomal range. Some reasons for excessive pressure build-up are long term exposure to direct sunlight, or any excessive heat near the fuel canister. In this occasion, read the followings and remove the reasons and then use the unit.





HOW TO MANAGE

1. Turn the ignition knob to the "OFF" position and raise canister lever up to the "UN LOCK" position.
2. Replace fuel canister or cool cown canister being used.
3. Safety device is returned automatically by pushing the canister lever down to the "LOCK" position and then raise canister lever up to the "UN LOCK" position.
4. Repeat the ignition procedure.

※ If the temperature in the canister is high at the first time, fuel could be come out although canister is installed in range. It is because of operation of safety device but not out of order.

HOW TO USE

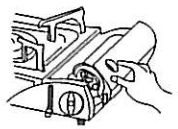
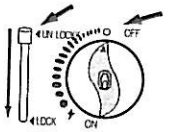
1. HOW TO INSTALL CANISTER

① Open the canister cover.
- Use standard size of the canister since there could be leakage.

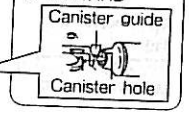
② Make sure ignition knob is in "OFF" position and canister lever is in "UN LOCK" position.
- If the ignition knob is not completely in "OFF" position, the canister can not be engaged into "LOCK" position.

③ Install the canister in order to be fitted the canister hole into the canister guide.

④ Lock by pushing the canister lever down and then close the canister cover.
- After check that the canister is positioned properly, and canister lever is in the "LOCK" position, you are able to turn on the unit.

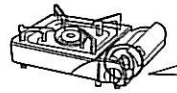



⚠ CAUTIONS
MAKE SURE THE CANISTER HOLE IS UPWARD



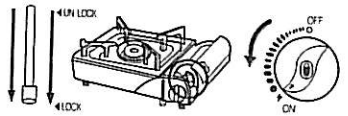
2. HOW TO IGNITE

Turn the ignition knob 90° counter-clockwise unitil you hear a "click" sound
- If the burner does not light, repeat the ignition procedure.



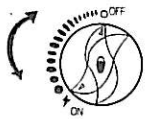
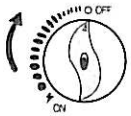
3. HOW TO CONTROL FLAME

The size of the flame can be regulated by turning the ignition knob slowly toward "OFF" position from "ON"position.



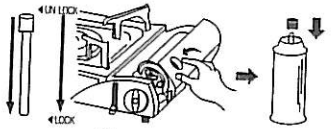
4. HOW TO EXTINGUISH

Turn the ignition knob clockwise to "OFF" position. The flame is automatically put out and there is no gas supplied.
- The flame will be extinguished before the ignition knob is turned completely ot "OFF" position.
- Make sure to check the flame is off.

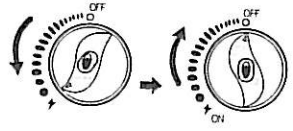
5. HOW TO UN LOCK CANISTER

Be sure to raise the canister lever up to the "RELEASE" position. Open the canister cover and then take the canister out.



6. BURNING REMAINED FUEL OFF

Some fuel may remain in the canister after the unit has been turned off. For your safety, with the canister lever in "UN LOCK" position turn ignition knob "ON" position to burn off any remained fuel.



TILLEGG / APPENDIX F

N **Stereoanlegg**

S **Stereo**

DK **Stereoanlæg**

NL **Stereosysteem**

D **Stereoanlage**

GB **Stereo**

FIN **Stereolaite**

ASKELADDEN

TILLEGG / APPENDIX G

N Z-Top

S Z-Top

DK Z-Top

NL Z-Top

D Z-Top

GB Z-Top

FIN Z-Top

TILLEGG / APPENDIX H

N	**Lensepumpe**
S	**Länspump**
DK	**Lænsepumpe**
NL	**Lenspomp**
D	**Bilgepumpe**
GB	**Bilge pump**
FIN	**Pilssipumppu**

attwood®

Sahara Series Automatic Bilge Pumps

4505 / 4507 / 4511 Installation Instructions

SAVE THESE INSTRUCTIONS

Form Number 69370 Rev A 02-3

This product carries the standard Attwood three-year warranty.

See **www.attwoodmarine.com** or Product Catalog for details.

CAUTION:

Read all instructions carefully before installing and using this product.

This pump is sealed and, therefore, submersible. However, the electrical wire connections must not be submerged. For extra protection, coat the butt joints and adjacent wire ends liberally with liquid electrical tape such as MDR® or Starbrite®.

Specifications

			ABYC Specifications 13.6-volts DC (GPH=Gallons Per Hour)			*ISO Specifications 12.0-volts DC (LPH=Liters Per Hour)*		
Part Num.	*Model*	*Amp Fuse*	*0 ft. Head GPH/ amps*	*3.3 ft. Head GPH/ amps*	*6.7 ft. Head GPH/ amps*	*10kPa Head LPH/ amps*	*20kPa Head LPH/ amps*	*Max Head (ft.@13.6v/ kPa@12v)*
4505	S500	3.0	500/1.5	350/1.4	200/1.4	1136/1.2	598/1.2	9'/24
4507	S750	5.0	750/3.0	625/2.8	450/2.8	1817/2.5	1306/2.5	16'/36
4511	S1100	6.0	1100/4.0	970/3.8	750/3.8	3104/3.3	2328/3.3	11'7"/28

⚠ **WARNING:** To prevent injury, always disconnect the power source when installing or servicing any electrical product.

DO NOT use pump to remove gasoline, oil or other flammable liquids.

Always use the fuse amperage rating specified for your pump model. Failure to do so could result in serious personal injury or fire hazards.

Attwood bilge pumps are designed to exhaust *STANDING WATER ONLY.* They are not intended to prevent rapid accumulation of on-board water due to rough weather, hull damage, and/or other unsafe navigational conditions.

REQUIRED MATERIALS

- Hose and thru-hull fittings, available separately from Attwood:
  Sahara Model 4505 and 4507–
  3/4" I.D. hose: Attwood No. 4199 (includes 2 clamps)
  3/4" I.D. thru-hull: No. 3873 (straight), No. 66541 or 66547 (stainless steel straight), No. 3877 (90°), or No. 3878 (double-end)
  Sahara Model 4511–
  1-1/8" I.D. hose: No. 11551 (clamps not included)
  1-1/8" I.D. thru-hull: No. 3874 (white), No. 3874A (black) or No. 66543, 66549 (stainless steel), or No. 3879 (90°)
- Two (2) hose clamps suitable for (3/4" or 1-1/8") hose.
- AUTO/OFF/MANUAL dash-mounted control switch (Attwood No. 7615A).
- In-line fuse connector (Attwood No. 14341) and appropriate size fuse.
- Four (4) stainless steel #10 x 1/2" self-tapping screws, round or pan head. Use a 1/8"-diameter drill bit for pilot holes.
- Four (4) wire butt-connectors for 16-gauge wire.
- Two (2) insulated spade terminal connectors for 16-gauge wire.
- Suitable means to make electrical connections waterproof.
- Cordless drill.
- Screwdriver.

OPTIONAL MATERIALS

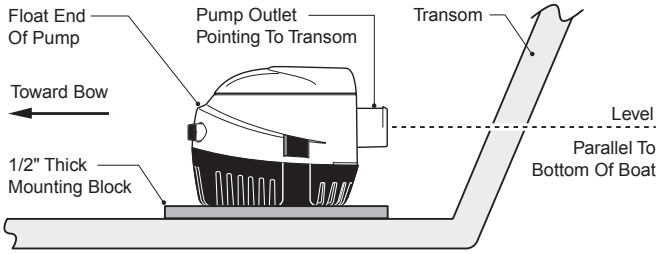
- 1/2"-thick marine plywood block (slightly larger than pump base).
- Waterproof adhesive (epoxy, silicone adhesive, or fiberglass resin) to mount block.
- 16-gauge wire (brown and black).

PUMP MOUNTING INSTRUCTIONS

⚠ **WARNING:** Remove the pump mounting base (See Figure 3). Remove the foam block that supports the float during shipping. Failure to do this prevents the pump from starting when water is present.

1. Make sure the hull thickness is at least 1/2" thick. If not, place a block of 1/2" marine plywood (slightly larger than pump base) in the lowest part of the bilge. Be sure that the pump cover can be removed for cleaning in this position. Glue the plywood to the hull with a waterproof adhesive (epoxy, silicone adhesive, or fiberglass resin). See Figure 1.

Figure 1



2. Position the pump in the lowest part of the bilge on a flat, level surface (on the plywood block if it has been installed) with the outlet pointing toward the transom.
3. Be sure outlet nozzle is level. If pointed upward or downward, an airlock may form in the pump. (See Figure 1.)
4. The float end of the pump must be level with or above the pump end (See Figure 1). This prevents the pump from running out of water while the float is still high enough to activate the pump.
5. Mark location each of the four (4) mounting holes with a pencil or scribe.

⚠ **WARNING:** When drilling holes do not drill through the hull!

6. Carefully drill two 1/8" diameter pilot holes in marked area and drive a screw in each hole.
7. Slide hose clamps (one to clamp hose to the pump, the other for the thru-hull connector) over end of the hose. Force hose over the discharge nozzle of the pump. Install clamp.
8. Route hose on an upward incline to the thru-hull connector. Avoid dips in hose that can trap water and airlock the pump. Avoid putting excess tension on hose, which can damage the pump outlet.
9. Force the hose over the thru-hull barbs and clamp into place.

THRU-HULL CONNECTOR INSTRUCTIONS

If no thru-hull connector exists, choose a location for the fitting.

1. Position thru-hull fittings at least 12" above the water line to prevent water from coming back into the hull. On sailboats, mount the thru-hull high enough on the center of the transom to be above the water line at all times.
2. Place fitting, if possible, on the same side as the steering wheel so the driver can see discharge of water when the pump is working properly.
3. Drill hole to match outside diameter of the thru-hull connector thread.
4. Place a small bead of suitable marine sealant around inside of the thru-hull connector flange.

⚠ **WARNING:** Do not allow sealants containing acetic acid (smells like vinegar) such as silicone rubber sealant to contact the plastic pump housing or thru-hull connector. Such sealants can attack the plastic, causing the pump housing to crack, resulting in pump failure.

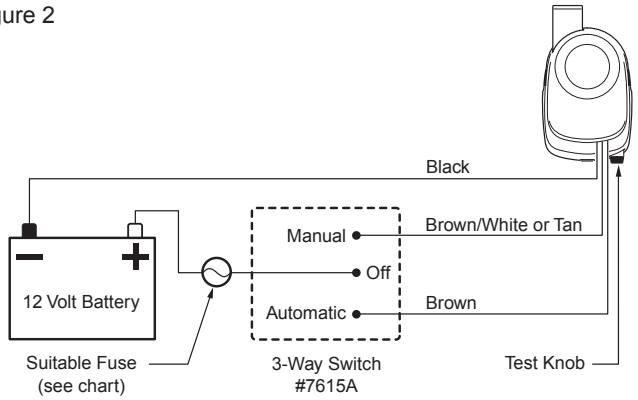
5. Insert thru-hull connector through the hole and tighten to hold the thru-hull connector firmly in place. **CAUTION: Do not overtighten the nut.**

WIRING INSTRUCTIONS

⚠ **WARNING:** Be certain that power source is 12-volt D.C. Higher voltage will damage the pump.

1. Using the full length of wire provided (and additional wire if necessary), connect wires to the pump as shown in the diagram. (See Figure 2.)

Figure 2



2. Route wires out of the way and secure them to the bulkhead to avoid pulling.
3. Using butt connectors sized for 16-gauge wire, splice fuse holder into positive lead (brown) between the battery and switch. Position fuse holder in a location that is easily accessible for changing fuses.

IMPORTANT: Use fuses of the proper amperage (See Specification Chart at top of sheet).

⚠ **WARNING:** FAILURE TO PROPERLY FUSE AND MAKE THE APPROPRIATE WATERPROOF CONNECTIONS WILL VOID THE PRODUCT WARRANTY.

4. Install a Three-Way Switch (Attwood No. 7615A) that allows for automatic or manual switching modes.
5. Turn the pump on and twist the Test Knob clockwise to check operation. Feed water into the pump. If output appears to be too low, check the wire connections. Reversed connections result in opposite impeller rotation that drastically reduces capacity and can cause premature pump failure.

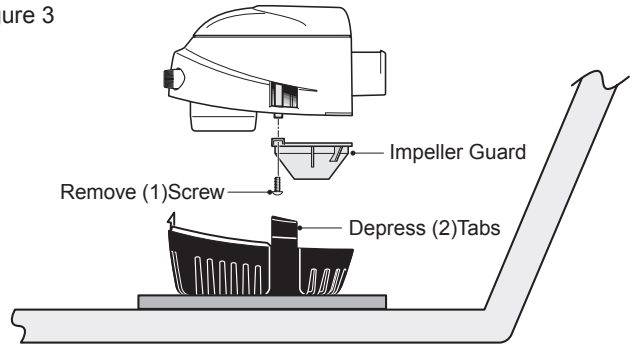
CARE AND MAINTENANCE

Occasionally check your pump to be certain debris is not jamming the impeller and/or float within the housing. Use the test knob by rotating in a clockwise direction. Careful attention will guarantee outstanding pump performance.

To clean the water chamber, remove pump housing from the mounting base by pressing in tabs on sides. Lift the pump housing away. (See Figure 3.)

To clean the impeller, remove the impeller guard screw and lift the impeller guard.

Figure 3



Remove all debris that has accumulated in pump chamber and around the impeller. Ensure that all debris is removed from strainer slots around the pump base.

Inspect the impeller to ensure that it is firmly attached to shaft and is not cracked or broken.

Replace impeller guard, screw, and pump housing on base. Be certain that all tabs are fully engaged.

Periodically check the electrical connections to ensure they are water-resistant and mounted high and dry.

Do not use household cleaners on the pump because many of them may damage the pump materials.

ATTWOOD LIMITED WARRANTY

ATTWOOD CORPORATION, 1016 North Monroe, Lowell, Michigan 49331 (“Attwood”) warrants to the original consumer purchaser that Attwood brand products will be free from defects in materials and workmanship under normal use and service for three years from the date of original consumer purchase. This warranty does not extend to any batteries or fuses used with the product. This limited warranty is not applicable if the product has been damaged by accident, improper installation, unreasonable or improper use, lack of proper maintenance, unauthorized repairs or modifications, normal wear and tear, or other causes not arising out of defects in materials or workmanship. Attwood products are warranted for use on pleasure boats. Any other use — including but not limited to commercial, racing, or non-marine use — are not covered under this warranty. Attwood’s obligation under this warranty is limited to repair of the product at Attwood’s plant or replacement of the products at Attwood’s option without expense to the original consumer purchaser. Any expenses involved in the removal, reinstallation or transportation of the product are not covered by this warranty. The product must be returned to Attwood’s plant at the address above, postage prepaid, and insured with proof of original purchase including date. If Attwood is unable to replace the product and repair is not commercially practical or cannot be timely made, or if the original consumer purchaser is willing to accept a refund in lieu of repair or replacement, Attwood may refund the purchase price, less an amount for depreciation. The acceptance by Attwood of any product returned or any refund provided by Attwood shall not be deemed an admission that the product is defective or in violation of any warranty. Products that are replaced or for which a refund is issued become the property of Attwood.

THIS WARRANTY IS ATTWOOD’S ONLY EXPRESS WARRANTY OF THIS PRODUCT. NO IMPLIED WARRANTY SHALL EXTEND BEYOND THREE (3) YEARS FROM THE DATE OF ORIGINAL CONSUMER PURCHASE. ATTWOOD SHALL NOT BE LIABLE FOR ANY DAMAGES, FOR LOSS OF USE OF THIS PRODUCT, NOR FOR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES, COSTS OR EXPENSES.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

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A Steelcase Company. 1016 N. Monroe Street, Lowell, MI 49331-0260

Amazon

Manual Bilge Pumps & Accessories



Universal
(Through Deck or on Deck mounting)



Bulkhead



Thrudeck



Warrior



Bilge Strainers



In-Line Non-Return Valves

Applications

The Amazon range of pumps is primarily designed to evacuate standing bilge water.

⚠ ***CAUTION: Amazon pumps are not designed to keep pace with water flowing in through a hole in the vessel's structure.***

Actual performance varies according to the individual installation and the pumping rate of the user.

The Amazon Universal and Warrior models are also suitable for discharging toilet waste from holding tanks.

⚠ ***CAUTION: Amazon pumps are designed specifically for use as bilge pumps and toilet waste disposal pumps. Consult ITT Industries-Jabsco for advice about all other possible applications. Do not use Amazon pumps to transfer petrol, petroleum products, acids, chemicals or caustic liquids.***

Models

PUMPS

▼ 29240-0000	25mm (1")	Bulkhead pump, c/w detachable handle
▼ 29250-0000	25mm (1")	Thrudeck pump, c/w detachable handle and through deck kit
▼ 29250-0010	38mm (1½")	Thrudeck pump, c/w detachable handle and through deck kit
▼ 29270-0000	38mm (1½")	Universal pump, c/w detachable handle and one push-fit elbow
▼ 29280-0000	38mm (1½")	Warrior pump, c/w detachable handle

OPTIONS

▼ 29279-0000	Through deck kit (for Universal and Warrior only)
▼ 29289-0000	Under deck bracket (required for Warrior when used with through deck kit)
▼ 29266-1000	Additional push-fit elbow (for Universal only)

ACCESSORIES

▼ 29290-1020	Bilge strainer for 19mm (¾") id hose
▼ 29290-1000	Bilge strainer for 25mm (1") id hose
▼ 29290-1010	Bilge strainer for 38mm (1½") id hose
▼ 29295-1011	In-line non-return valve for 19mm (¾") id hose
▼ 29295-1000	In-line non-return valve for 25mm (1") id hose
▼ 29295-1010	In-line non-return valve for 38mm (1½") id hose

Installation Instructions

An Amazon pump will become an integral part of your bilge pumping system. Correct installation of the whole system is essential if you want the pump to perform properly, operate reliably and safely, and to give satisfactory length of life.

1. Location

Your pump is delivered ready for installation, but all Amazon pumps can be adapted by the installer to suit different types of location.

- Select a location that allows you to pump comfortably for long periods of time, preferably with the handle rocking vertically towards and away from you at waist height.
- Ensure that there is sufficient clearance for you to use the full stroke of the handle without injury to your hands and arms.
- You must be able to get easy access to the pump chamber and both inlet and outlet valves in the event of a blockage occurring.
- For safety, locate the pump - whether above or below decks - where you can operate it with all hatches and lockers fully closed.

2. Mounting

For all models, except the Thrudeck, you will need the appropriate number, type, diameter and length of bolts, complete with nuts and washers, to mount the unit on the deck. All should be in marine grade stainless steel or bronze, and a small tube of silicone sealant will be required to seal the bolts where they pass through the deck.

- The mounting surface must be flat and sufficiently strong so that it does not flex when you are pumping hard.

3. Through Hull Fittings

If you are installing the pump as a bilge pump you will need either a 25mm (1") id or 38mm (1½") id through hull fitting, according to the particular model of pump.

- Follow the through hull fitting manufacturer's own instructions concerning materials and methods of installation.
- Ensure that the through hull fitting will be above the waterline at all times, whether the craft is at rest or underway, or heeling, rolling or pitching.

4. Suction Inlet

The suction inlet must be located in the deepest part of the bilges.

- To minimise the risk of a blockage you should fit an Amazon Strainer.
- You must be able to get easy access to the suction inlet point in the event of a blockage occurring.
- To maximise the efficiency of the pump you should have a non-return valve close to the suction inlet. This prevents the water that you have just lifted up the hose from falling back into the bilge. (Amazon Bilge Strainers incorporate a non-return valve). If, for any reason, you do not want to fit a strainer you should fit an Amazon in-line, non-return valve as close to the suction inlet as possible.

5. Pipework

You will need spiral reinforced smooth bore flexible hose for both the inlet and outlet pipework, and a stainless steel wormdrive hose clip for every hosetail connection (4 or more).

- To maximise the efficiency of the pump ensure that the outlet hose rises at least 30cm (12") after it leaves the pump. This prevents the pump from sucking in air through the outlet hose.
- Avoid sharp bends in the pipework that may cause the hose to become kinked.
- Keep all pipework lengths as short as possible. Unnecessary inlet or outlet hose length makes the pump harder to operate.
- Secure the pipework so that the hoses cannot move and chafe, and so that they do not exert any leverage on the hose tail fittings to which they are connected.
- If it is difficult to fit the hose onto any hosetails, soften the hose by dipping the end of it in hot water.

⚠ ***CAUTION: Do NOT apply flame to the hoses. Do NOT apply flame or heat to any plastic hosetails. Do NOT apply sealing compounds to any hose connections.***

- Secure the ends of all hoses to the hosetails with stainless steel wormdrive hoseclips, ensuring that all inlet connections are airtight and that all outlet connections are watertight.

6. Handle

Store the handle close to the pump in spring clips.

- Using the hole provided in the stainless steel handle, secure it with a lanyard to the mounting surface of the pump.

Operating instructions

Amazon pumps are simple to operate.

- If your pump is installed through the deck, first swing the white lid of the deck cover through 180° and snap it into its open position.
- Then just insert the end of the pump handle into the socket on the rocker arm, and move the handle backwards and forwards.
- For maximum efficiency, use even strokes through the full arc of travel of the handle.
- Expect the pump to prime and begin to discharge after a few strokes.
- After use, remove the handle and return it to its storage position.
- Close the white lid of the deck cover.

JABSCO Safety Instructions

GB **MANUAL PUMPS** SAFETY INSTRUCTIONS

DE **HANDPUMPEN EINBAU** – UND SICHERHEITSHINWEISE

IT **POMPE MANUALI** INFORMAZIONI D'INSTALLAZIONE E SICUREZZA

ES **BOMBAS MANUALES** INSTRUCCIONES DE INSTALACION Y MEDIDAS DE SEGURIDAD

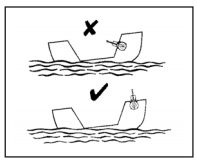
FR **POMPES MANUELLES** INSTALLATION ET SECURITE

SE **MANUELLA PUMPAR** INSTALLATIONS-OCH SÄKERHETSANVISNINGAR

NL **HANDPOMPEN** INSTALLATIE EN VEILIGHEIDSADVIES

1.

- Always install pumps in a position that allows for sustained periods of pumping, where there is full access to the pump for service.
- Die Pumpe stets an einer Stelle einbauen, wo man sie bequem auch für längere Zeit betätigen kann und wo sie zur wartung leicht zugänglich ist.
- Installare sempre le pompe in una posizione che consenta di usarle per lunghi periodi e di sottoporle facilmente a manutenzione.
- Siempre instalar las bombas en una posición que permita prolongados períodos de bombeo y donde exista acceso total para el servicio de las mismas.
- Les pompes doivent toujours être installées dans un emplacement permattant leur utilisation pendant des périodes prolongées, et permettant un ácces integral pour effectuer leur entretien.
- Installera alltid pumparna så att de är lätta pumpa och är helt åtkomliga för service.
- Plaats de pompen altijd zodanig dat u langdurig kunt pompen en er makkelijjk bij kan voor onderhoud.



2.

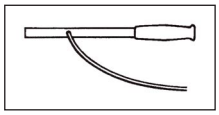
- Fix pumps to a flat surface.
- Die Pumpe auf einer ebenen Unterlage befestigen.
- Fissare le pompe su una superficie piatta.
- Montar las bombas en una surface plane.
- Fäst pumparna pä ett plant underlag.
- Bevestig de pompen open vlak oppervlak.

3.

- Secure detachable handles to the vessel by use of a lanyard.
- Den abnehmbaren Handgriff mit einem Taudende am Boot sichern.
- Attaccare I manici staccabili all'imbarcazione usando uno spezzone di cima.
- Afianzar las manijas desmontables a la nave utilizando un destornillador.
- Fixer les poignées amovibles au bateau au moyen d'un bout.
- Sätt fast det löstagbara handtaget I en klämma I närheten av pumpen.
- Borg de uitneembare hendel aan het vaatuig met gebruik van een koord.

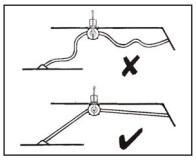
4.

- Always use marine grade spiral reinforced hose (with smooth internal bore) of the correct size for the pump.
- Einen spiral-verstärkten Schmutzwasserschlauch (mit glatter Innenwandung) mit dem zur Pumpe passenden Innendurchmesser verwenden.
- Usare sempre un tubo flessibile di tipo marino, rinforzato e a spirale (con un'anima interna liscia), di dimensioni adatte alla pompa.
- Siempre usar mangueras reforzadas con espiral para uso marino (con diámetro interior liso) del tamaño correcto.
- Toujours utiliser des flexibles renforcés à spirale (à pario intérieure lisse) de diameter approprié.
- Använd alltid spiralarmerad marinslang (med slat insida) I rätt storlek.
- Gebruik altijd 'marine grade' spiral versterkte slang (met gladde binnenzijde) in de juiste maat voor de pomp.



5.

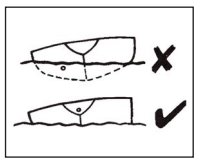
- Pipework runs should be kept as short and straight as possible, avoiding rising and dipping over obstructions.
- Die verlegte Schlauchleitung sollte so kurz und so gerade wie möglich sein. Auf- und absteigende Verlegung über Hindernisse ist zu vermeiden.
- I tratti di tubatura dovrebbero essere corti e diritti al Massimo, evitando che salgano e scendano a causa di ostruzioni.
- Los tramos de tuberia deben tan cortos y rectos como sea posible, evitando subidas o bajadas para sortear obstrucciones.
- Les canalisations doivent suivre un trajet aussi droit et court que possible, et éviter de passer au-dessus ou au-dessous des obstacles éventuels.



- Slangarna skall hållas så raka och korta som möjligt.
- Leidingwerk moet zo kort en recht mogelijk gehouden worden. Voorkom stijgen en dalen van pijp over obstakels.

6.

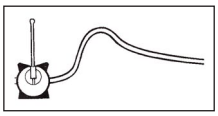
- All bilge pumps discharged overboard must be installed with the overboard discharge well above both static and heeled waterlines. (Sailboats normally discharge through the transom).
- Bei allen nach aussenbords entleerenden Bilgepumpen muß der Borddurchlass auch bei Krängung oberhalb der Wasserlinie liegen. (Bei Segelbooten normalerweise im Spiegal).
- Tutte le pompe di sentina che si scaricano fuori devono essere installate con lo carico in acqua ben al di sopra della linea di galleggiamento sia statica che inclinata. (Nelle barche a vela lo scarico avviene normalmente attraverso l'arcaccia).
- Todas las bombas de carena con descarga al agua deben instalarse con la descarga al amr bien por encima de la línea de flotación estática e inclinada. (Las embarcaciones a vela generalmente descargan a través de yugo).
- L'évacuation de toutes les pompes de cale à rejet en mer doit être située bien audessus de la ligne de flottaison maximale (sur les voiliers, l'évacuation se fait habituellement à travers le tableau arrière).



- Alla länspumpar med utlopp överboord pompen moeten hun huid doorlaat voldoende boven de waterlijn plaatsen. Houd rekening met de maximum overhelling. (Zeilboten pompen normal gesproken over het gangboord het lens water overboord).

7.

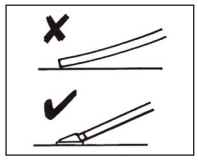
- For maximum efficiency raise discharge hose at least 30cm (12") after it leaves the pump.
- Die beste Förderleistung wird erzielt, wenn der Druckschlauch nicht höher als 30 cm über der Pumpe nach aussen führt.
- Per la massima efficienza alzare il tubo di scario almeno di 30 cm dopo aver lasciato la pompa.
- Para maxima eficacia elevar la descarge de manguera un mínimo de 30cm después de su salida de la bomba.
- Pour maximiser le rendement, le tuyua d'évacuation ne droit commencer à s'élever que 30cm au moins après la sortie de la pompe.



- För bästa effektivitet bör slangen höjas minst 30cm after utloppet från pumpen.
- Voor maximum doelmatigheid dient u de uitlaat slang na de pomp minstens 30cm omhoog to leiden.

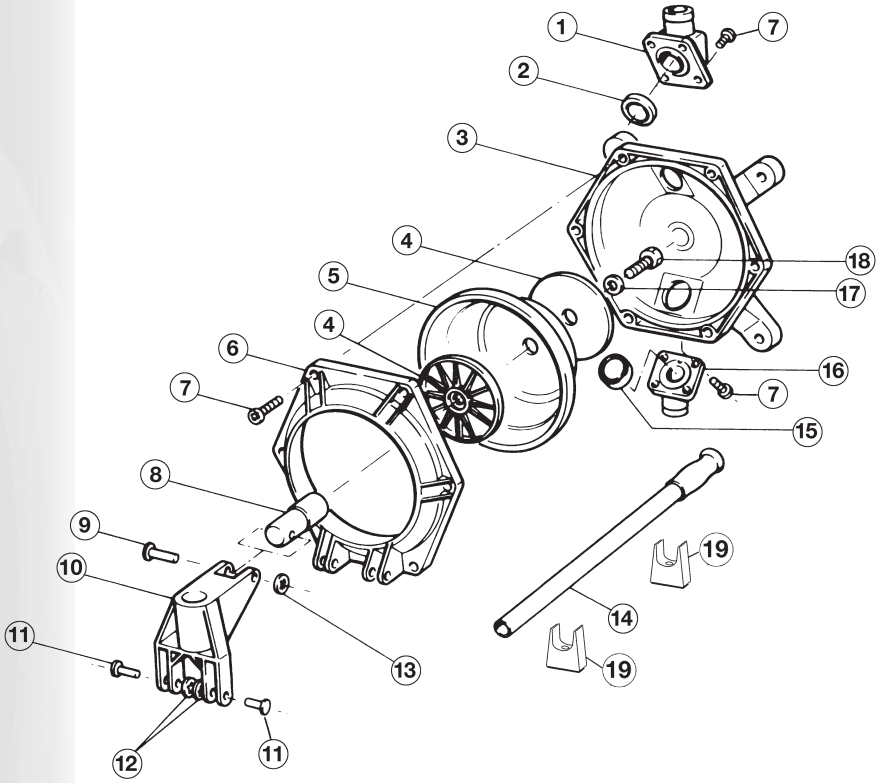
8.

- To minimise risk of blockage fit a strainer on the bilge end of the pipework.
- Um das Risiko enien Verstopfung gering zu halten, wird der Einbau eines Saugkorbes in der Bilge empfohlen.
- Per minimizzare il rischio di blocco, installare un filtro sull'estremità di sentina della tubatura.
- Para reducer a un mínimo el riesgo de obstucciones, colocar un filtro en el extreme de carena de la tubería.



- Pour minimiser les risques d'obturation, monet une crépine sur le côté find de cale de la tuyauterie.
- För blockeringsrisk bör en sil med backventil monteras på slangens sugsida.
- Bevestig een zuigkorf aan het begin van de zuigslang, dit helpt verstopping te voorkomen.

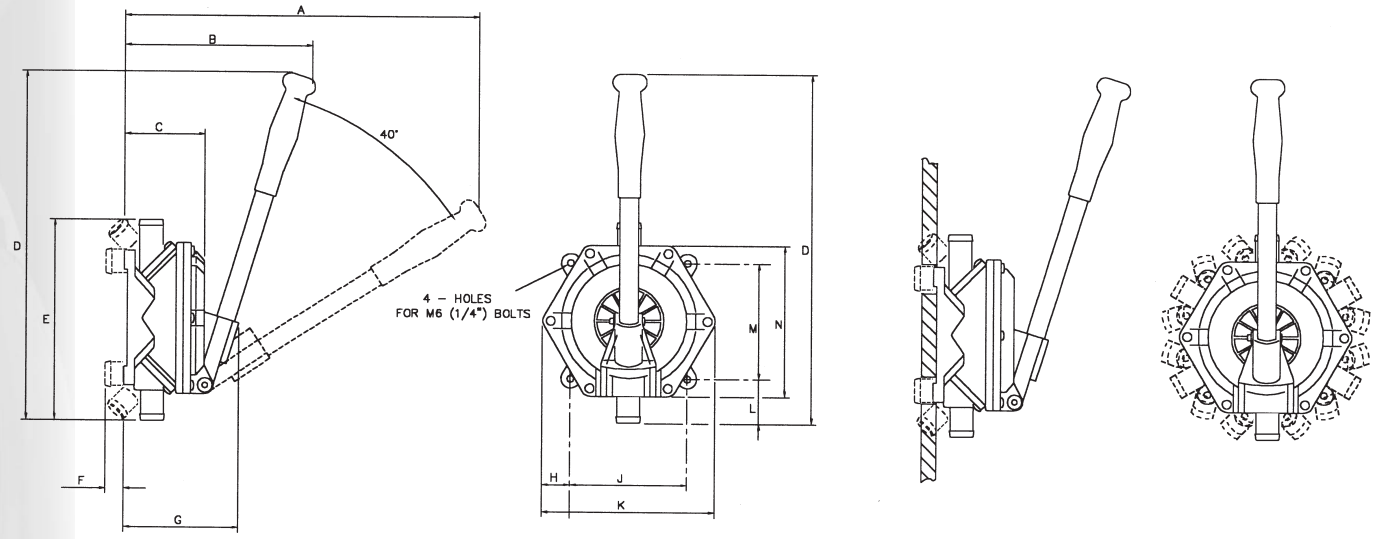
Spare Parts List - 29240-000 Bulkhead



Repair Kits Available		
Kit	**Part No**	**Description**
A	29246-1000	MAJOR SERVICE KIT
B	29241-1000	PORTS KIT
C	29243-1000	CLAMP RING & ROCKER KIT

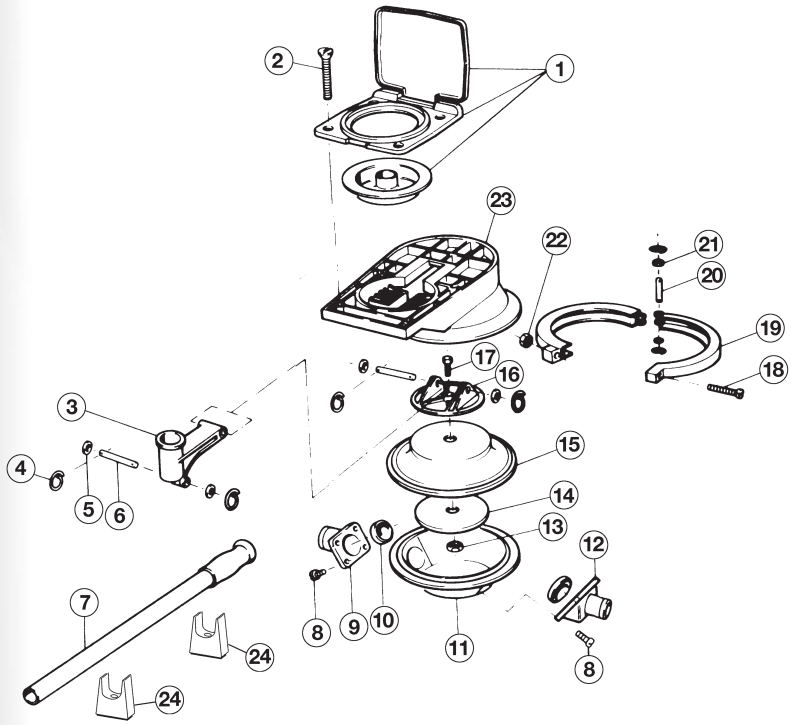
Key	Description	Qty Per Pump	Part No	Qty per Repair Kit		
				A	B	C
1	OUTLET PORT	1			1	
2	OUTLET VALVE	1		1	1	
3	BODY	1	29242-1000			
4	DIAPHRAGM PLATE	2				2
5	DIAPHRAGM	1		1		
6	CLAMP RING	1				1
7	SCREW	14		3	2	3
8	CON ROD	1				1
9	PIVOT PIN (LONG)	1				1
10	ROCKER	1				1
11	PIVOT PIN (SHORT)	2				2
12	STARLOCK WASHER	2				2
13	STARLOCK WASHER	1				1
14	HANDLE	1	29267-1000			
15	INLET VALVE	1		1	1	
16	INLET PORT	1			1	
17	WASHER	1		1		1
18	BOLT	1				1
19	HANDLE CLIPS	2				

Dimensions



A	B	C	D	E	F	G	H	J	K	L	M	N	UNITS	WEIGHT
362	192	82	357	216	19	120	28.5	119	176	46	119	155	mm	0.6 kg
(14.3)	(7.6)	(3.3)	(14)	(8.5)	(0.8)	(4.8)	(1.1)	(4.7)	(7)	(1.8)	(4.7)	(6.1)	(ins)	(1.4) (lbs)

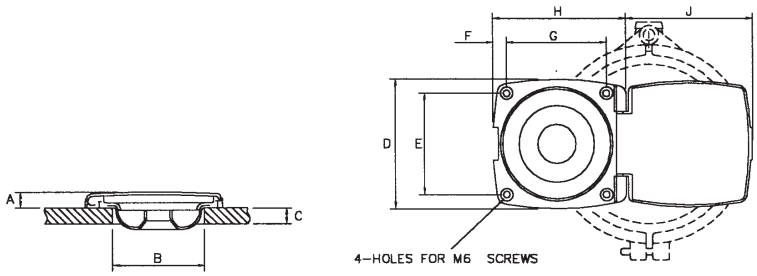
JABSCO Spare Parts List - 29250 Series Thrudeck

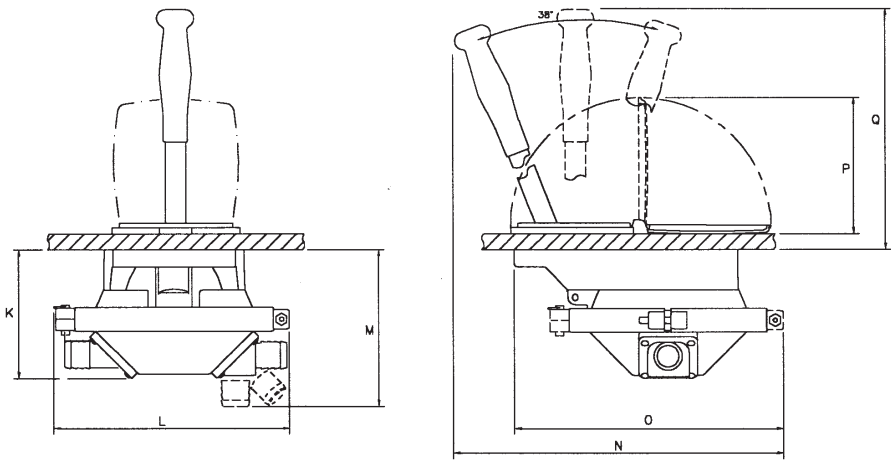


Repair Kits Available		
Kit	**Part No**	**Description**
A	29256-1000	MAJOR SERVICE KIT
B	29241-1000	PORTS KIT 1"
	29241-1010	PORTS KIT 1 1/2"
C	29252-1000	CLAMP RING ASSEMBLY
D	29254-1000	ROCKER ASSEMBLY

Key	Description	Qty Per Pump	Part No	Qty per Repair Kit			
				A	B	C	D
1	THROUGH DECK KIT	1	29279-0000				
2	SCREW	4					
3	ROCKER	1					1
4	RING CLIP	6				2	4
5	WASHER	4					4
6	PIVOT PIN	2					2
7	HANDLE	1	29267-1000				
8	SCREW	8		2	2		
9	OUTLET PORT	1			1		
10	FLAP VALVE	2		2	2		
11	LOWER BODY	1	29258-1000				
12	INLET PORT	1			1		
13	NYLOC NUT	1		1			1
14	DIAPHRAGM PLATE (LOWER)	1				1	
15	DIAPHRAGM	1		1			
16	DIAPHRAGM PLATE (UPPER)	1				1	
17	BOLT	1				1	
18	SCREW	1		1		1	
19	DIAPHRAGM CLAMP RING	2				2	
20	PIVOT PIN (CLAMP)	1				1	
21	WASHER	2				2	
22	NUT	1				1	
23	UPPER BODY	1	29251-1000				
24	HANDLES CLIPS	2					

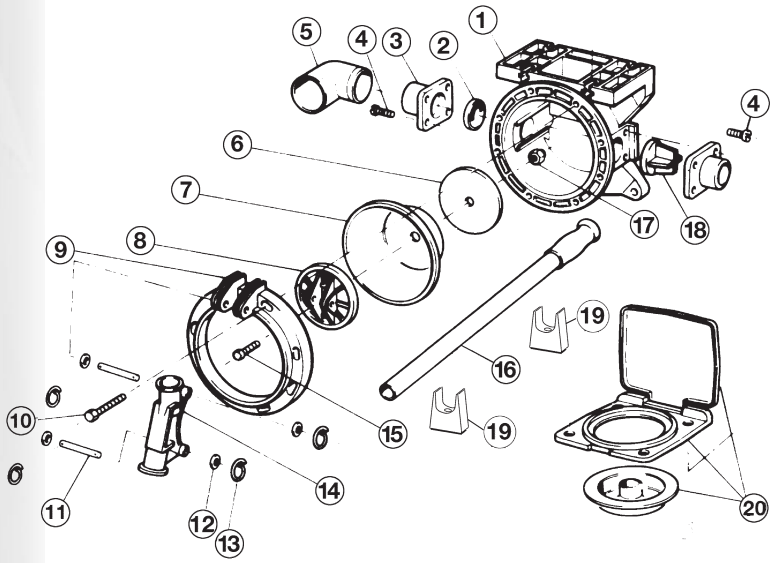
JABSCO Dimensions





A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	UNITS	WEIGHT
14.5 (0.6)	Ø86 (3.4)	5-22 (0.2-0.9)	120 (4.7	94 (3.7)	12.8 (0.5)	94 (3.7)	129 (5.1)	115 (4.5)	121 (4.8)	218 (8.58)	147 (5.8)	310 (12.2)	252 (9.9)	129 (5.1)	277 (10.9)	mm (ins)	1.2 kg (2.5) (lbs)

JABSCO Spare Parts List - 29270-0000 Universal



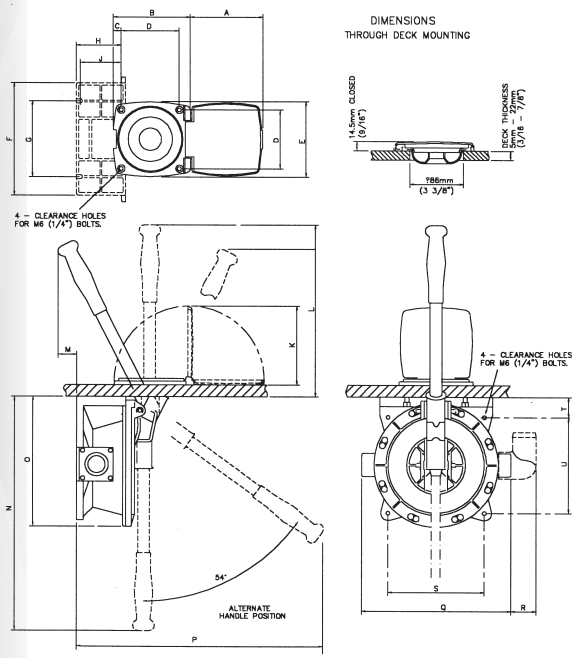
Repair Kits Available		
Kit	**Part No**	**Description**
A	29276-1000	MAJOR SERVICE KIT
B	29275-1000	PORTS KIT
C	29272-1000	CLAMP RING & ROCKER KIT

Key	Description	Qty Per Pump	Part No	Qty per Repair Kit		
				A	B	C
1	BODY	1	29271-1000			
2	INLET VALVE	1		1	1	
3	PORT	2			2	
4	SCREW	8		3	2	
5	PUSH FIT ELBOW	1	29266-1000			
6	DIAPHRAGM PLATE (INNER)	1				1
7	DIAPHRAGM	1		1		
8	DIAPHRAGM PLATE (OUTER)	1				1
9	CLAMP RING	1				1
10	SCREW	8		3		3
11	PIVOT PIN	2				1
12	WASHER	4		1		2
13	RING CLIP	4		1		2
14	ROCKER	1				1
15	BOLT	1				1
16	HANDLE	1	29267-1000			
17	NYLOC NUT	1		1		1
18	OUTLET VALVE	1		1	1	
19	HANDLE CLIPS	2				

Optional Extras Available		
Key	**Part No**	**Description**
20	29279-0000	THROUGH DECK KIT

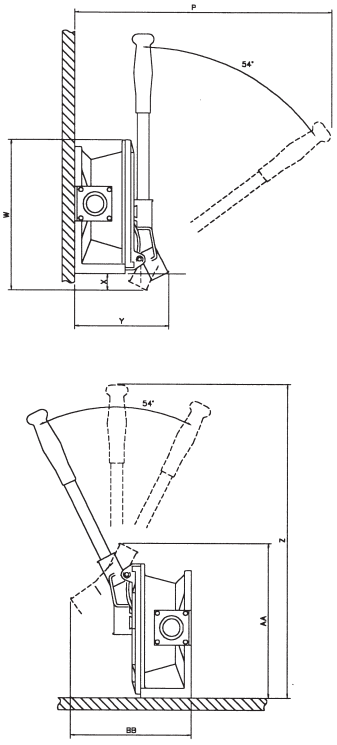
JABSCO Dimensions

Through Deck Mounting



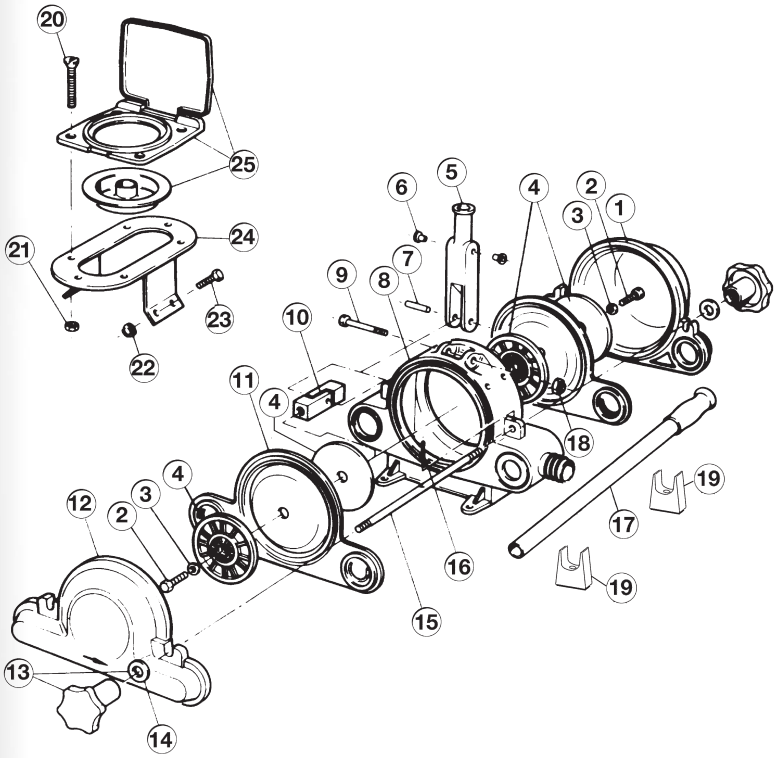
A	B	C	D	E	F	G	H	J	K	L	M	N	O	UNITS
115 (4.5)	129 (5.1)	12.8 (0.5)	94 (3.7)	120 (4.8)	180 (7)	121 (4.8)	73 (2.9)	66 (2.6)	129 (5.1)	277 (11)	29 (1.1)	380 (15)	212 (8.4)	mm (ins)

On Deck Mounting



P	Q	R	S	T	V	W	X	Y	Z	AA	BB	UNITS	WEIGHT
390 (15.4)	242 (9.5)	41 (1.6)	156 (6.1)	33 (1.3)	405 (16)	238 (9.4)	26 (0.5)	149 (6)	498 (19.6)	244 (9.6)	192 (7.5)	mm (ins)	1.2 kg (2.9) (lbs)

JABSCO Spare Parts List - 292480-000 Warrior



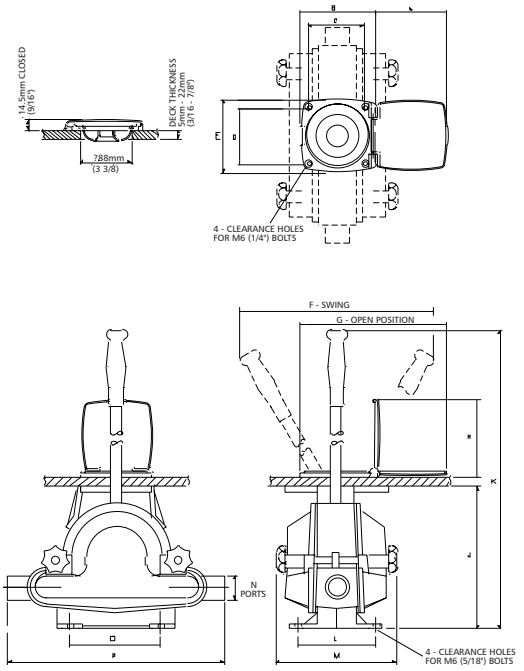
Repair Kits Available		
Kit	**Part No**	**Description**
A	29286-1000	MAJOR SERVICE KIT
B	29283-1000	BODY KIT
C	29284-1000	ROCKER KIT

Key	Description	Qty Per Pump	Part No	Qty per Repair Kit		
				A	B	C
1	LEFT HAND COVER PLATE	1	29281-1000			
2	BOLT (DIAPHRAGM PLATE)	2				2
3	WASHER	2		1		2
4	DIAPHRAGM PLATE	4				4
5	ROCKER ARM	1				1
6	BUSH					2
7	PIVOT PIN	1				1
8	BODY	1			1	
9	BOLT (ROCKER ASSEMBLY)	1				1
10	CONROD	1				1
11	DIAPHRAGM	2		2		
12	RIGHT HAND COVER PLATE	1	29282-1000			
13	KNOB & WASHER ASSY	4	29288-1000			
14	WASHER (STUD)	4		2		
15	LONG STUD	2			2	
16	ROLL PIN	2			2	
17	HANDLE	1	29287-1000			
18	NUT (ROCKER ASSEMBLY)	1				1
19	HANDLE CLIPS	2				

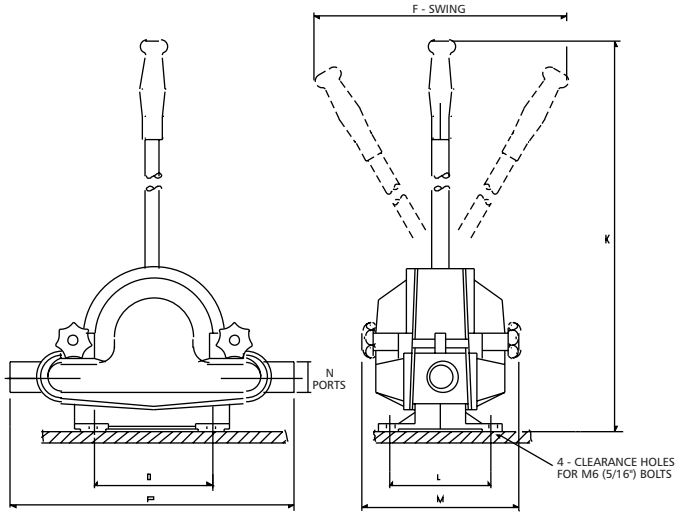
Optional Extras Available			
Key	**Description**	**Qty Per Pump**	**Part no**
20	SCREW	6	
21	NUT	6	
22	NUT	4	
23	BOLT	4	
24	UNDERDECK BRACKET	1	29289-0000
25	THROUGH DECK KIT	1	29279-0000

JABSCO Dimensions

Through Deck Mounting



On Deck Mounting



F	K	L	M	N	O	P	UNITS	WEIGHT
310 (12.2)	680 (27)	130 (5.1)	200 (8)	38.1 (1.5)	150 (6)	355 (14)	mm (ins)	4.40 kg (9.7) (lbs)

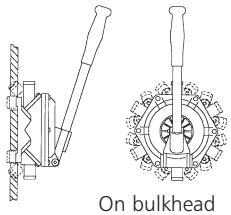
A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	UNITS	WEIGHT
14.5 (0.6)	Ø86 (3.4)	5-22 (02-09)	120 (4.7)	94 (3.7)	12.8 (0.5)	94 (3.7)	129 (5.1)	115 (4.5)	121 (4.8)	218 (8.58)	147 (5.8)	310 (12.2)	252 (9.9)	129 (5.1)	mm (ins)	1.2 kg (2.5) (lbs)

JABSCO Amazon Manual Bilge Pumps

Amazon Bulkhead

For surface mounting on bulkhead or deck

- Repositionable ports and body offer an amazing 96 assembly variations
- Complete with stainless steel handle, mounting clips and provision for safety lanyard
- Sustainable outputs up to 45 lpm (10 gpm)



Connections for 25mm (1") id hose

29240-000	Bulkhead pump c/w detachable handle

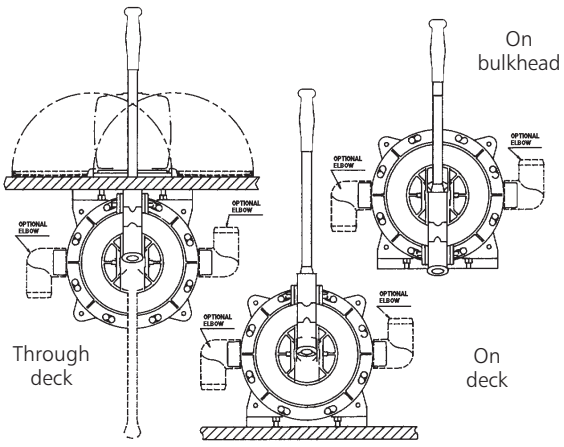
Amazon Universal

For mounting on bulkhead, through bulkhead, on deck, or through deck (with optional through deck kit).

- Flow direction can be changed 180º by interchanging inlet and outlet ports
- Optional push-fit inlet and outlet elbows swivel through 360º to increase flexibility of installation still further
- Unique safety feature allows operation from both inside and outside the cabin (with optional through deck kit)
- Quick release clamp ring gives fast access for blockage clearance
- Complete with stainless steel handle, mounting clips and provision for safety lanyard
- Impressive features are matched by impressive flow rate of up to 100 lpm (22 gpm)
- Excellent solids handling ability for use with holding tanks

Connections for 38mm (1½") id hose

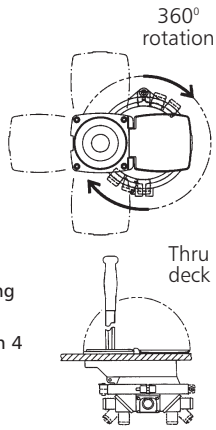
29270-0000	Universal pump, c/w detachable handle and one push-fit elbow
29279-0000	Optional through deck kit
29266-1000	Additional push-fit elbow



Amazon Thrudeck

For mounting through deck or through bulkhead

- The ultimate compact through deck pump with no less than 16 port variations relative to the body
- Loosening just one screw lets you clear blockages or re-position the body anywhere through 360º relative to the handle position
- Complete with stainless steel handle, mounting clips and provision for safety lanyard
- Sleekly styled through deck kit and cover, with 4 mounting positions relative to the pump
- Readily achievable 50 lpm (11 gpm) output



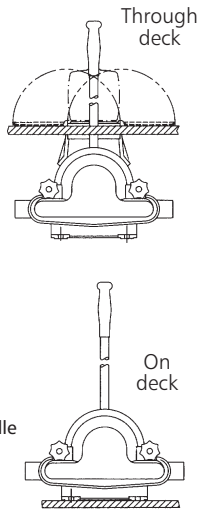
Connections for 25mm (1") or 38mm (1½") id hose

29250-0000 / 0010	Thrudeck pump, c/w detachable handle and through deck kit

Amazon Warrior

For mounting on deck or through deck (with optional through deck kit and bracket)

- Robust, alloy body particularly suited to workboat and safety applications
- Double diaphragm design gives maximum efficiency and added safety, because each side of the pump operates independently
- Solid 18" handle assists sustained high outputs of up to 135 lpm (30 gpm)



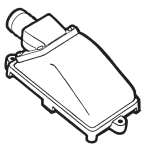
Connections for 38mm (1½") id hose

29280-0000	Warrior pump, c/w detachable handle
29279-0000	Optional throughdeck kit
29289-0000	Under deck bracket (required for use with through deck kit)

Amazon Accessories

29290-1020	Bilge strainer for 19mm (¾") id hose
29290-1000	Bilge strainer for 25mm (1") id hose
29290-1010	Bilge strainer for 38mm (1½") id hose
29295-1011	In-line non-return valve for 19mm (¾") id hose
29295-1000	In-line non-return valve for 25mm (1") id hose
29295-1010	In-line non-return valve for 38mm (1½") id hose


In-line Non-Return Valve


Bilge Strainer

Jabsco

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Warranty: All products of the company are sold and all services of the company are offered subject to the company's warranty and terms and conditions of sale, copies of which will be furnished upon request

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TILLEGG / APPENDIX I

N Trimplan

S Trimplan

DK Trimplan

NL Trimvlaktype

D Trimmvorrichtung

GB Trim plane

FIN Trimmitaso



(EIC5000) ELECTRONIC INDICATOR CONTROL INSTALLATION AND OPERATION INSTRUCTIONS

BEFORE BEGINNING INSTALLATION:
READ INSTRUCTIONS COMPLETELY
MAKE SURE BATTERY POWER IS DISCONNECTED

TEST SYSTEM BEFORE PUTTING THE BOAT BACK IN THE WATER

IMPORTANT - SPECIAL REQUIREMENTS:

- System is voltage specific. Please make sure you have a 12 or 24 volt EIC5000 depending on your requirements.
- **(SEE FIGURE 1)**
  Special sensor coils are required if:
  - Actuator stroke is more than 2 ½" **OR**
  - Less than 1" of piston shaft is exposed when the actuator is fully retracted **OR**
  - Actuator has external hydraulic connection

FIGURE 1



- System will not work when actuator stroke is 1" or less
- If installing in an M80 or M120 Sport Tab kit, your actuator will have three molded rings as shown in Figure 1. Cut the metal rod to 6 11⁄16" as indicated by score mark (see enclosed instruction sheet for cutting the rod).

REQUIRED TOOLS

7/16", 1/2" & 9/16" Wrench	Teflon Tape	Marine Grade Sealant
1/8", 3/16", 5/16" & 3/4" Drill Bit	Wire Stripper	Vise Grips
2" Hole Saw	Electric Drill	Wire Cutter

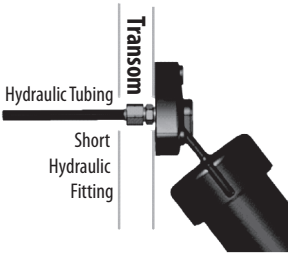
KEEP THIS MANUAL WITH BOAT OWNER'S INFORMATION

Bennett Marine, Inc.
550 Jim Moran Blvd • Deerfield Beach, FL 33442
Phone: 954.427.1400 • Fax: 954.480.2897
Web: **www.BennettTrimTabs.com**

IMPORTANT:
Check Special Requirements noted on the front cover of this manual before beginning installation. If you are installing a preassembled actuator with the sensor wires already included, skip to step 6.

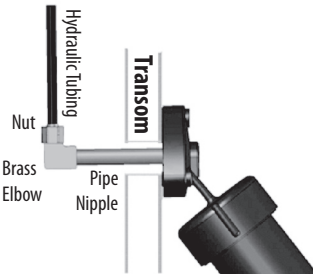
Installing New Upper Hinge with Sensor

FIGURE 2



Step 1 - Inside transom, with tabs in full up position, locate trim tab hydraulic line. If there is no pipe nipple visible inside the transom, you have a short through-transom fitting connection, (see Figure 2). Unscrew and remove actuator away from the transom and use a 7/16" wrench to remove the tubing from the upper hinge. ***Skip to step 3.***

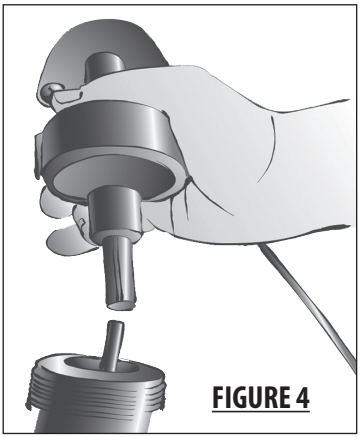
FIGURE 3



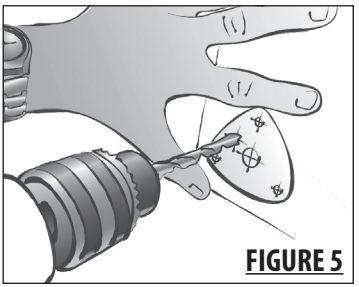
For standard installations, detach tubing from brass elbow (some fluid will drip out). While holding pipe nipples with vise grips, unscrew brass elbow using 9/16" wrench. Do this procedure for port and starboard cylinders (see Figure 3).

Step 2 - Outside transom, unscrew and remove actuator away from the transom. Remove pipe nipple.

Step 3 - Start with the port side cylinder. Snap white plastic clip on shaft protruding from bottom of cylinder. **IMPORTANT:** This clip must be used to keep the spring inside the cylinder compressed. Grasp cylinder upper hinge with both hands and unscrew it counterclockwise from the cylinder body (a small amount of fluid may spill).


FIGURE 4

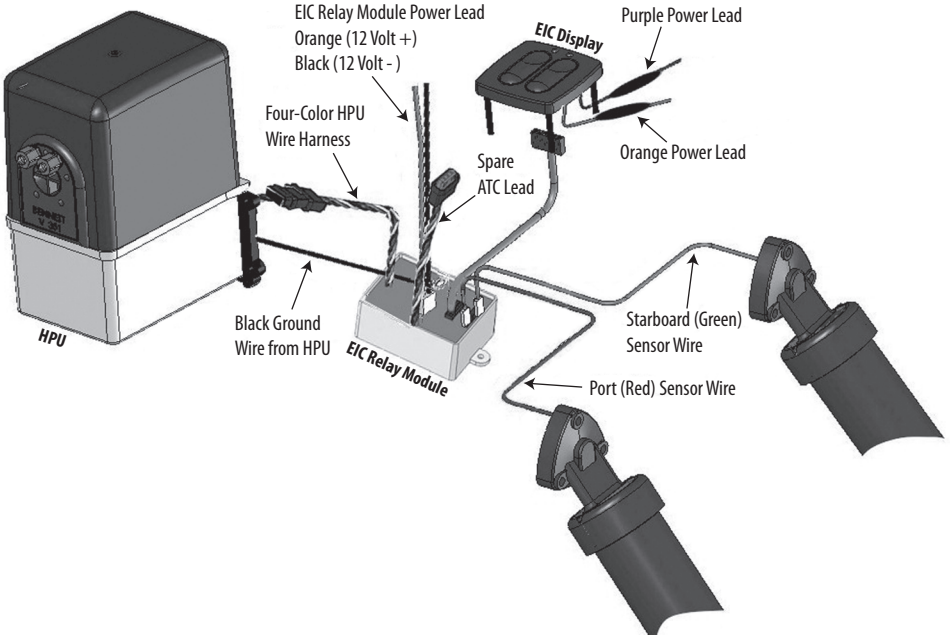
Step 4 - **IMPORTANT:** Use care when handling sensor coils during assembly to avoid damaging wires. Insert metal rod into piston, POINTED END DOWN. Make sure that the O-ring is in place in new upper hinge with sensor coil. Screw new upper hinge with **Red Sensor Wire onto the port side cylinder** while keeping metal rod inserted into center of sensor coil (see Figure 4). Tighten upper hinge hand tight. ***You will finish tightening cylinder in Step 7.***


FIGURE 5

Step 5 - Remove plastic clip from piston and repeat steps 2 - 4 for the starboard cylinder. **Use upper hinge with Green Sensor Wire for the starboard side.**

Step 6 - Using template on the last page, drill 5/16" hole in transom for the Sensor Wire (see Figure 5). Screw pipe

EIC Installation Overview



nipple into actuator upper hinge. Tighten nipple hand tight. Then, with vise grips, tighten two full turns … NO MORE. Cover end of pipe nipple with masking tape. If you have the short through-transom fitting, using a 7/16" wrench, screw it in until the fitting is snug; the shoulder of the fitting will just touch the plastic of the upper hinge.

Step 7 - Carefully feed Sensor Wire through 5/16" hole. Apply sealant to actuator upper hinge surface around pipe nipple, screw holes, and cable. Secure actuator upper hinge to transom with mounting screws. Grasp cylinder body with both hands and tighten (clockwise) securely.

Step 8 - Inside transom, remove masking tape from pipe nipples. Carefully wrap Teflon tape around male threads of pipe nipples. Holding pipe nipples with vise grips (to prevent them from turning) re-secure 90 degree elbows. Re-attach hydraulic tubing, tightening nut finger tight. Snug nut with 1/2" wrench. **Do not over-tighten.** Note: If you have the short through-transom fittings, omit this step. Repeat for other side. Run Red and Green Sensor Wires to where you plan to mount the EIC Module.

Step 9 - Mounting the EIC Display

Using the template on the last page, mark the location for your EIC Display and locate the centers of the holes. Use a 2" hole-saw to cut the center hole and 3/16" drill for the four mounting stud holes. Use a small bead of sealant around the perimeter of the display to seal. Plug the EIC Harness (blue cable) into the back of the EIC Display. Use the 4 nylon thumb nuts to secure the display (use care to avoid over-tightening).

Step 10 - Mounting the EIC Relay Module

The Module is best located in a **dry location** close to the Hydraulic Power Unit. Use the mounting hardware to secure it in place.

Step 11 - Running the EIC Wire Harness from the Display to the Module

Run the EIC Harness to the location you have selected for the EIC Relay Module. Plug the EIC Wire Harness into the EIC Relay Module. The cable must be properly strain relieved and secured with cable ties. For best results, create a drip loop.

Step 12 - Connecting the Wiring for the EIC

Purple wire with inline 1.5 amp fuse: Connect to ignition switch or any 12 volt circuit that turns ON and OFF with ignition. This wire is used to initiate Auto Tab Retraction when the ignition is switched to the OFF position. If Auto Tab Retraction is not desired this connection may be omitted.

Orange wire with inline 1.5 amp fuse: To source that supplies power to boat's electronics and or gauges. This wire switches the display system and must be installed.

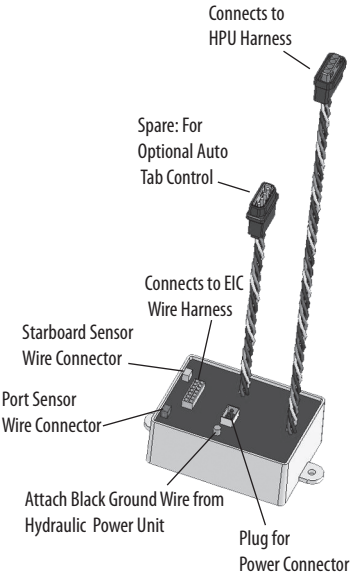
Making Electrical Connections
(See Figure 6)

Ground wire from pump: Run the black ground wire from the back of the hydraulic power unit to the grounding stud on the Relay Module. Crimp the supplied ring terminal on wire and secure with 10-32 hex nut.

HPU Connection: Plug the 4-color wire harness from the Hydraulic Power Unit into the 4-color output cable (longer of the two harnesses) on the EIC Relay Module.

Sensor Wires: Plug Green Sensor wire into the Green Wire Connector (starboard) on the EIC Module. Plug Red Sensor Wire into the Red Wire Connector (port) on the EIC Module.

FIGURE 6



Power Cable: Attach the black wire to 12 volt negative ground and the orange wire with inline 20 amp fuse to 12 volt positive source and plug into EIC Relay Module. Power source must be capable of supporting 20 amps.

Auto Tab Control: (Shorter of two harnesses) This plug is used to interface a Bennett Auto Tab Control into the EIC System. Please refer to Auto Tab Control Installation Instructions. If no Auto Tab Control is installed this lead is not used.

Calibration and Operation

Calibration – NOTE: If you have Upper and Lower Helm EIC Displays installed, calibration must be done at the Lower Helm EIC Display.
Check trim tab system to ensure it is operational, then put both trim tabs in the FULL UP position by holding down the "Bow Up" position.

1. The port and starboard **red** LEDs will flash alternately, indicating that the system is not calibrated.

2. Press and hold the sun and moon buttons on the EIC Display simultaneously for approximately 3 seconds. Both the port and starboard **lower yellow** LEDs will begin to flash. Release the sun and moon buttons.

3. Using the EIC Display, run both trim tabs to the full down position (Bow Down on the control). **Make sure the tabs go all the way DOWN by holding the buttons down for at least 15 seconds** or until the lower yellow LEDs stop flashing. (Holding the buttons after the tabs are down will not harm the system).

4. A few seconds after the tabs are all the way down the port and starboard **upper yellow** LEDs will begin flashing. Again, using the EIC Display, run both tabs to the full up position (Bow Up on the control). **Make sure the tabs come all the way UP by holding the buttons down for at least 15 seconds** or until the upper yellow LEDs stop flashing.

5. The upper and lower yellow LEDs will then light up solidly, indicating that the EIC is calibrated and ready to operate. If you wish to recalibrate the EIC at any time, simply bring the tabs to the full up position, press and hold the sun and moon buttons down and repeat the calibration instructions.

Operation
The brightness of the display may be adjusted by pressing the sun button to brighten and the moon button to dim the display.

Diagnostic Information

Port and starboard red LEDs alternately flash: EIC requires calibration. Follow steps above.

Upper yellow LED flashes on port or starboard side: Indicates the EIC Display is not receiving a sensor signal. If the port upper yellow LED flashes, the fault is in the port (red) sensor or wires. A flashing yellow LED on the starboard side would indicate a fault on the starboard (green) sensor or wires. Switching the sensor connections on the EIC Relay Module will confirm the diagnostic code if the flashing LED switches sides. If the problem switched sides, check the suspected faulty actuator with an Ohm meter at the EIC sensor cable plug. The reading should be in the 220-260 Ohm range. If the sensor readings are good, check for faulty connections (corrosion or broken wires).

Electro-Hydraulic System Information

EIC Relay Module Fuse: 12 volt system uses 20 amp in-line fuse on positive, 24 volt uses 10 amp.
EIC Display Fuses: Both Purple and Orange wire fused at 1.5 amp for both 12 and 24 volts.

Hydraulic Power Unit and EIC Module Wiring
Red = Port Valve
Green = Starboard Valve
Yellow = Motor Reverse (pump retract)
Blue = Motor Forward (pump pressure)
Black on HPU = Connects to Ground Stud on EIC Module
Orange on EIC Module = Positive
Black on EIC Module = Ground (boat's electrical system)

Troubleshooting

(This general information is not intended to be complete. Please feel free to contact Bennett Marine at **954.427.1400** or visit our website at **www.BennettTrimTabs.com** for additional information.)

If Trim Tabs do nothing, no movement, no sound from HPU:
Inspect 20 amp fuse on Orange wire at Relay Module and 1.5 amp fuse on Orange wire at display. Inspect all wiring for disconnected or corroded connections.

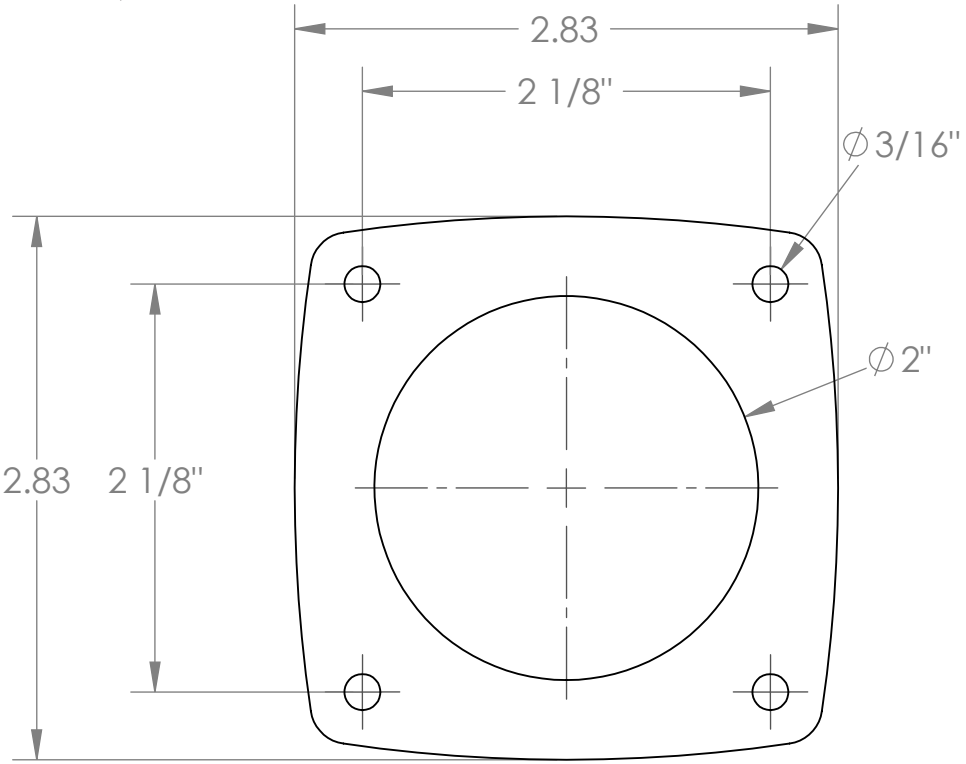
HPU running but Trim Tabs do not move, or will go down but not retract:
Is the unit receiving a solid 12 volts to the EIC Module? Low voltage will sometimes cause the solenoids to not open preventing the tabs from moving even though the pump motor is running. Inspect all wiring for disconnected or corroded connections.

Conduct the following test using the "Spare for Auto Tab Control" connector at the EIC Module:
Operation = Reaction
Apply 12 volts (+)to blue, red = Port trim tab down
Apply 12 volts (+)to blue, green = Starboard trim tab down
Apply 12 volts (+)to blue, red, green = Both trim tabs down
Apply 12 volts (+)to yellow, red = Port trim tab up
Apply 12 volts (+)to yellow, green = Starboard trim tab up
Apply 12 volts (+)to yellow, red, green = Both trim tabs up

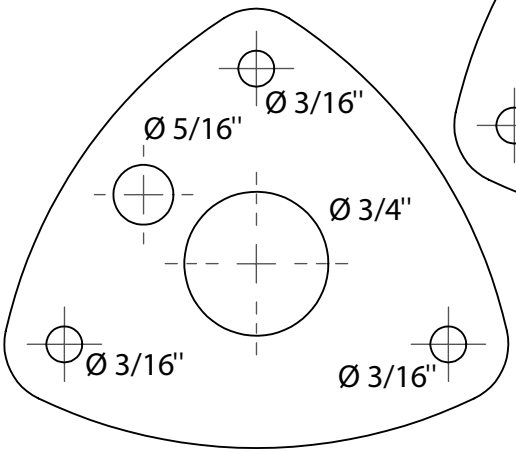
If the trim tabs function correctly for each wire grouping, then the Display or EIC Wire Harness is at fault.

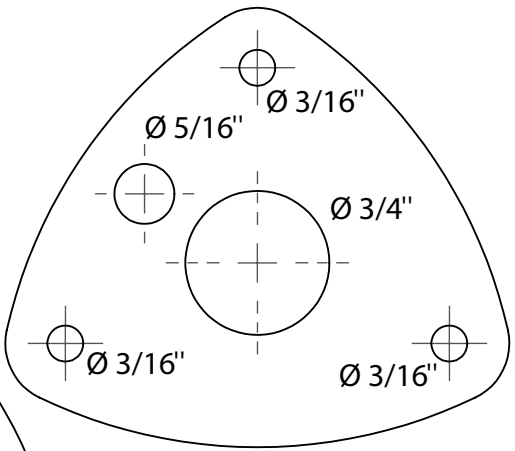
If the system does not function properly, then conduct the same test using the wire harness connected to the HPU. If the trim tabs function correctly then the Module is faulty. If the trim tabs do not function correctly, the HPU is at fault.

EIC Display Template



Upper Hinge Templates





EIC5000 Electronic Indicator Control – Upper Helm
INSTALLATION AND OPERATION INSTRUCTIONS
READ INSTRUCTIONS COMPLETELY BEFORE BEGINNING INSTALLATION

Step 1 Follow EIC5000 Installation Instructions to install system and Lower Helm EIC Display.

Step 2 Mounting the Upper Helm EIC Display
Using the template, mark the location for your Upper Helm EIC Display and locate the centers of the holes. Use a 2-1/8" holesaw to cut the center hole and 3/16" drill for the four mounting stud holes. Use a small bead of sealant around the perimeter of the display to seal. Using the 4 nylon thumb nuts secure the display (use care to avoid overtightening).

Step 3 Mounting the Bridge Box
Mount the Bridge Box within 4 feet of the Lower Helm EIC Display.



Step 4 Running the EIC Wire Harness from Bridge Box to the EIC Relay Module
If you already have a Lower Helm EIC Display installed, simply unplug the blue EIC Wire Harness from the back of that Lower Helm EIC Display and plug it into ANY of the three connectors on the Bridge Box.

If this is a new installation, plug the blue EIC Wire Harness directly, connecting the EIC Relay Module to any of the three connectors on the Bridge Box.

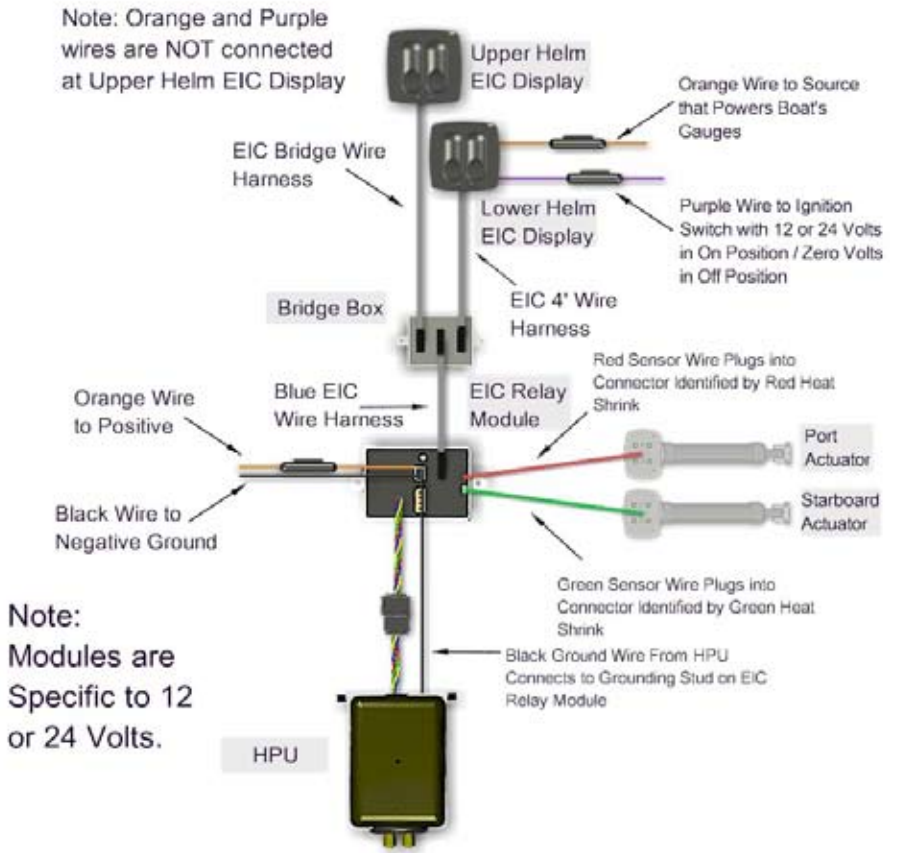
Step 5 Running the EIC Bridge Wire Harness to the Bridge Box
Plug the EIC Bridge Wire Harness into the back of the Upper Helm EIC Display, run it down to the Bridge Box and plug it into ANY of the three connectors.

Step 6 Running the EIC 4-foot Wire Harness from the Lower Helm EIC Display to the Bridge Box
Plug the 4-foot Wire Harness into the back of the Lower Helm EIC Display and plug into the remaining connector on the Bridge Box.

Step 7 Connecting the EIC Display Wiring
The orange and purple wires at the Upper Helm EIC Display are NOT connected to any power source. (They are connected at the Lower Helm EIC Display.)

Calibration
Refer to the EIC5000 Installation Instructions and calibrate system ONLY at the Lower Helm EIC Display.

EIC5000 Electronic Indicator Control – Upper Helm
INSTALLATION DIAGRAM



TILLEGG / APPENDIX J

N **Ankervinsj**

S **Ankarvinsch**

DK **Ankerspil**

NL **Ankerspil**

D **Ankerwinde**

GB **Anchor winch**

FIN **Ankkurivinssi**

ENGBO ANKERVINSJ

Innstallasjons og brukermanual

MINI 101
MIDI 201



CE 0470

Rev:12
2010-04-15

I h.t. NS-EN ISO 9001:2000

FCC ID: R78-RC-01
R78-ECU-01

ENGBO AS – *et selskap i Engbo-gruppen*

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Innledning

Gratulerer med ny vinsj og mange takk for at du valgte en Engbo vinsj. Vi håper du vil få mye nytte og glede av den. Vær oppmerksom på at en forutsetning for dette er at den monteres og brukes i henhold til denne manual og har de nødvendige forutsetninger for å kunne fungere. Bl.a. er det viktig med nødvendig kapasitet mht. spenning til vinsjens motor samt korrekt plassering av vinsj, tau, anker og ankerbrakett.

Kort beskrivelse av MINI 101 og MIDI 201.

Engbo **MINI 101** er beregnet for båter opp til ca. 20 fot og Engbo **MIDI 201** for båter opp til ca. 25 fot. Disse vinsjene er ekte fritt fall vinsjer og er utstyrt med **transistor basert kraftelektronikk** som erstatter det tradisjonelle innslagsreleet. Den nye elektronikken har ingen åpne kontakter og er svært fleksibel m.h.t. spenning. Engbo **MINI 101** og **MIDI 201** leveres også med **styringselektronikk** med **integrert radiomottaker** til den trådløse fjernkontrollen samt innbygget system for beskyttelse av vinsjens motor og elektronikk modul.

Vinsjene leveres med bryter panel som standard, i tillegg kan man benytte trådløs fjernkontroll med en rekkevidde på inntil 30 m under normale forhold.

Mrk. Denne manualen inneholder informasjon som er nyttig å kjenne til før vinsjen installeres. Les den derfor nøye.

Generell prosedyre for bruk av Engbo vinsjer.

Les hele bruksanvisningen nøye før bruk av vinsjen.

Vær oppmerksom på at det er store krefter som håndteres. Bruk derfor vinsjen med fornuft og pass bl.a. på at:

- Fingrene ikke kommer i konflikt med tau/kjetting, anker, ruller eller trekkskiver.
- Tau alltid er under oppsikt når ankeret trekkes inn.
- Alle som er ombord er informert om hvordan vinsjen fungerer.
- Kjør alltid vinsjen fra et sted med full oversikt når ankeret skal opp. Det hindrer at uventede ting følger med opp og skader båten.
- Om vinsjen drar tungt ved oppkjøring, så kan man slippe bryteren litt. Når båten har kommet i bevegelse bakover kan man starte vinsjen på nytt. Da vil vinsjen jobbe lettere og bruke mindre strøm.
- Dersom ankeret sitter fast i bunnen: Slipp ut tau og gjør det fast i kryssholt i båten. Bruk båten til å dra løs ankeret. Når ankeret har løsnet, brukes vinsjen på vanlig måte.
- Vinsjen kan kjøres i maks 3 minutter med normal belastning
- Ankeret skal **alltid sikres** til båten under fart. Medfølgende sikringsline benyttes.
- Strømmen til vinsjen slås av når båten er i fart.
- Barn skal ikke håndtere vinsjen.
- Uforsiktig bruk kan medføre unødvendige skader.
- Sørg alltid for god batterispenning ved bruk av vinsjen. Ha **alltid** motoren i gang når vinsjen brukes.
- Vinsjen har elektronisk overbelastnings beskyttelse. Om nødvendig, la vinsjen kjøle seg ned i ca. 15-20 min. og prøv igjen. Ved nødsfall, kan overbelastningsbeskyttelsen overstyres ved at vinsjens hovedstrømbryter slås av og på igjen.
- Engbo AS er ikke ansvarlig for skade som kan oppstå ved bruk av vinsjen.

MRK!

- ***La alltid båtens motor gå når vinsjen brukes.***
- ***Slå alltid av strømmen til vinsjen når den ikke brukes.***
- ***Benytt alltid originalt Engbo ankertau.***
- ***Trykk aldri på opp bryteren før ankeret har falt til ro på sjøbunnen.***
- ***Vinsj og tilbehør må monteres og brukes på en slik måte at det ikke oppstår skader på mennesker, båt eller omgivelser.***
- ***Installasjon må utføres eller kontrolleres av personer med spesialkunnskap om høy strøm og lav spenning.***

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Forberedelse før ankring

Engbo MINI 101 og MIDI 201 har ekte fritt fall ankerdropp. Ett bryter-trykk og ankeret faller fritt til bunnen. Det anbefales å slippe ankeret i en avstand fra der båten skal ligge, som tilsvarer 3-5 ganger vanndybden.



Mot land.

- La båtens motor gå under oppankring.
- Bestem deg for hvor du vil droppe ankeret.
- Kontroller at sikkerhetslinen på ankeret er løsnet.
- Slå på vinsjens hovedstrømbryter.
- Når ankervinsjens hovedstrømsbryter har vært avslått, **må** alltid ned-bryteren trykkes først. Denne må holdes inne i min. 1 sekund for at ankeret skal droppes.
- Vinsjens motor kjører da ut i 1,5 sekunder for å sikre korrekt frislipp funksjon.



Fastmontert bryterpanel

- Hold ned-bryteren inne i min. 1 sek.
- Ankeret faller ut.
- Vinsjen er nå frikoblet og tauet vil løpe ut i takt med at båten siger mot land.
- Fortøy båten i land.

Mrk. *Med kjettingvinsjer med fritt fall, vil man kunne oppleve at kjettingens høye vekt fører til at hele kjettinglengden faller ut. Sørg i så fall for å trekke opp den lengden som er til overs når båten er gjort fast i land.*



- Stram opp ankertauet (kjettingen) ved å holde opp-bryteren inne slik at ankeret fester seg til bunnen og båten trekkes fra land.

Mrk. *Vinsjen vil alltid trekke opp på lav hastighet i 1,5 sek. før den går over på full fart. Om man slipper bryteren før det har gått 1,5 sek og trykker den inn igjen, og så gjentar dette, vil man holde vinsjen på lav hastighet.*



Fra land.

- Start båtens motor, slik at batteriet lades.
- Sjekk at vinsjens hovedstrømsbryter er slått på.
- Slipp fortøyningene til land.
- Aktiver vinsjen.

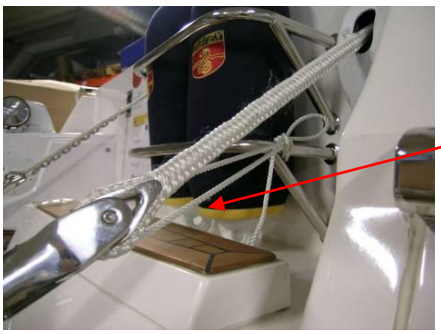
Hold opp-bryteren inne og vinsjen vil trekke båten fra land. Vinsjen trekker ankeret opp med full hastighet til første **autostopp** blir aktivisert.

Mrk*. Gjelder* ***KUN*** *tauvinsjer og forutsetter korrekt monterte messingtråder på ankertauet.*

Viktig! *Hold øye med ankeret når det kommer opp av vannet og parkeres i ankerbraketten. Da vil man kunne stoppe vinsjen og unngå at det oppstår skader dersom ankeret trekker med seg ukjente gjenstander opp.*

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***Mrk**. Dersom vinsjen drar tungt ved oppkjøring, vil det være fornuftig og strømbesparende å la vinsjen trekke i perioder. Når båten har kommet i bevegelse akterover, kan man slippe bryteren litt, for deretter å vinsje inn i perioder.*

- Slipp opp-bryteren, trykk den inn igjen og hold den inne.
- Vinsjen trekker ankeret videre opp i sakte fart til andre autostopp blir aktivisert og vinsjen stopper helt.
- Ankeret er nå parkert korrekt i ankerbraketten.
- Fest sikkerhetslinen til ankeret.
- Slå av vinsjens hovedstrømbryter.
- God Tur!

Trådløs fjernkontroll

Er sprutsikker og flyter om den faller i vannet. Rekkevidden er mer enn 30m under normale forhold. Engbo fjernkontroll er en høykvalitets, smalbåndet enhet med 2-veis kommunikasjons mot elektronikk enheten. Det er unik kode til hver enhet.
Den bruker 3 stk standart AAA, (LR03) batterier som er inkludert.
Den har anti-gli striper på baksiden.
Levetid på batterier er ved normalt bruk mer enn 2 sesonger.
Samme fjernkontroll kan brukes mot opptil 2 vinsjer.



***Mrk!** Fjernkontrollen må kodes før den kan tas i bruk.*
Se prosedyre annet sted i manualen.

- Fjernkontrollen slåes på ved å holde en av bryterne inne i 1,5 sekund. Power indikator vil da lyse grønt og en kort lyd vil høres.
- Alle påfølgende trykk på bryteren vises på tilhørende indikator over bryteren og gir en kort lyd.
- For å sikre lang levetid, slår fjernkontrollen seg automatisk av 5 min etter siste trykk. Dette blir varslet med to korte lyder og blink i Power indikator.

Anker ut

- Når fjernkontrollen er slått **på** kan ankeret slippes ved at ned bryteren, trykkes **inn.** Bryteren må holdes inne i min. 1 sekund for at anker skal droppes.
- Vinsjen kjører da ut i 1,5 sekunder for å sikre korrekt frislipp funksjon.

Anker opp

- Når ankeret er droppet og falt til bunns, kan innkjøring startes ved å trykke inn opp bryteren. Vinsjen vil trekke inn så lenge bryteren holdes inne. Har fjernkontrollen slått seg av, (dersom mer enn 5 minutter er gått siden siste knappe aktivering), vil den først slå seg på, så umiddelbart etterpå starte innkjøring av anker. Vinsjen starter alltid med 3 sekunder sakte fart, for så å øke til full fart.
- Man kan dermed kjøre vinsjen også i sakte fart ved å slippe og trykke innknappen flere ganger etter behov.

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"Power" indikatoren kan gi følgende informasjon:

- **Grønt lys** viser at fjernkontrollen er klar til bruk.
- **Oransje lys** indikerer at spenning inn på vinsjen ikke er optimal eller at vinsjen er overbelastet og trenger kjøletid.
- **Rødt hurtg blinkende lys** indikerer systemfeil eller at batterispenningen er for lav til at vinsjen fungerer.
- **Rødt blinkende lys** i sakte takt sammen med korte lydsignaler varsler at kontakt med elektronikkenheten (mottakeren) ikke oppnås.

Mrk. Slik feilvarsling vises så lenge bryterknappen er trykket inn.

Mrk. Fjernkontrollen vist til venstre kan benyttes til både vinsj for- og akterut samt baug- og akterthruster.

Mrk. Tvangskjøring av vinsjen



Trenger man å trekke ankeret ytterligere litt lenger inn etter andre autostopp, så kan det gjøres ved at opp-knappen, på touch panel eller fjernkontroll, holdes inne i mer enn 10 sekunder. Da vil vinsj igjen kjøre sakte så lenge som knapp holdes nede.

NB. Dette må bare gjøres under svært kontrollerte forhold for å hindre skade.

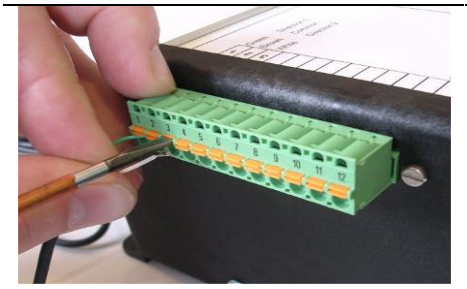
Elektrisk kabling

Etiketten på lokket av elektronikk modulen viser også tilkoblingen.
All kabling og tilkoblinger skal gjøres med hovedstrømsbryter slått av eller batteri frakoblet.

Bryterpanel for fast montasje



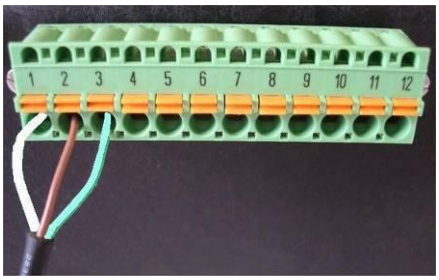
Vanntett, (IP 68) bryterpanel for montasje utsatt for sjøsprøyt og sol. Konstruert for å kunne monteres direkte på også svakt krummede flater. (To-sidig tape). Medfølgende skruer kan også benyttes.
Kan leveres med adapter plate for å passe inn i eksisterende 62 x 62mm hull.
Flere paneler kan om ønskelig kobles i parallell mot samme elektronikk enhet.



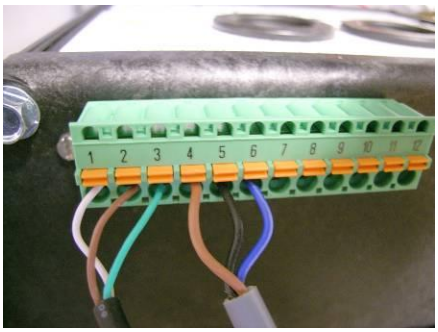
Tilkobling av bryterpanel

Som standard følger 1 stk bryter panel med 10m kabel.
Ledningene kuttes og avisoleres til ønsket lengde og tilkobles ved å presse inn, og holde innpresset, den oransje knappen over ønsket hull, mens ledningen stikkes inn. Slipp knappen når ledningen er på plass. Sjekk at ikke isolasjonen er inne i klemmen, og ingen løse kordeler stikker ut.
Ledningene skal tilkobles som følger:
1: Hvit
2: Brun
3: Grønn
Ønsker man mer enn et panel, så kan ledningene kobles i parallell til 1, 2 og 3. (2 er felles 0 V).

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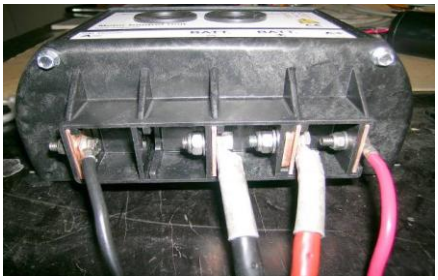


(Det er valgt rekkeklemmer med fjærlåsing fremfor skruklemmer for å unngå problemer med at vibrasjon eller temperaturforandring får klemmene til å løsne).



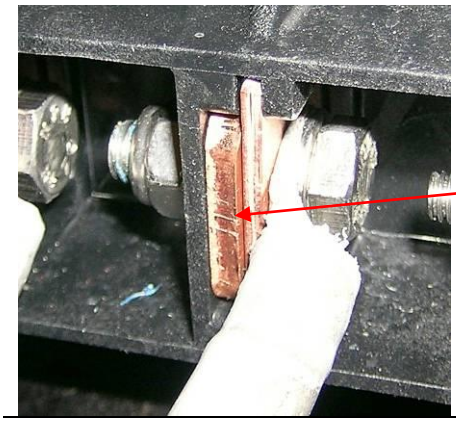
Tilkobling av autostopp giver

(NB. KUN MIDI 201)
Ledninger fra endestoppgiver tilkobles på samme måte som beskrevet over.
Ledningene skal tilkobles som følger:
4: Brun (BN) = +V
5: Svart (BK) = Signal
6: Blå (BU) = Gnd



Tilkobling av motor og batterikabler

Monter gjerne kablene først til enhet, før denne festes stående mot skott, med kraftkablene nedover.
Motorkablene leveres montert på motor.
Start fra venstre mot høyre. Koble til motorens svarte minus kabel til venstre, så batteriets svarte minus, deretter batteriets pluss og til slutt motorens pluss kabel. (Demonter i motsatt rekkefølge om nødvendig).
Bildet viser korrekt tilkobling og retning på bolter og kabler.
(Låsemutterne på venstre side)



(Kabelskoenes underside skal klemmes direkte mot kobberskinnene uten skiver eller annet i mellom. Bruk plan skive mellom bolt hode og kabelsko oppside, og mellom plast siden på endegavel og låsemutter.)
M8x 25mm bolten er for batteriets plusskabel.
Legg merke til kobberskiven som fyller ut mellomrom i endegavel.
Ved normale avstander fra batteri til elektronikk modul, (<4m), brukes 25mmP^{2P} til MINI100 og 35mmP^{2P} til MIDI 201. Ved lengre avstander gå opp til neste standard kabeldimensjon.

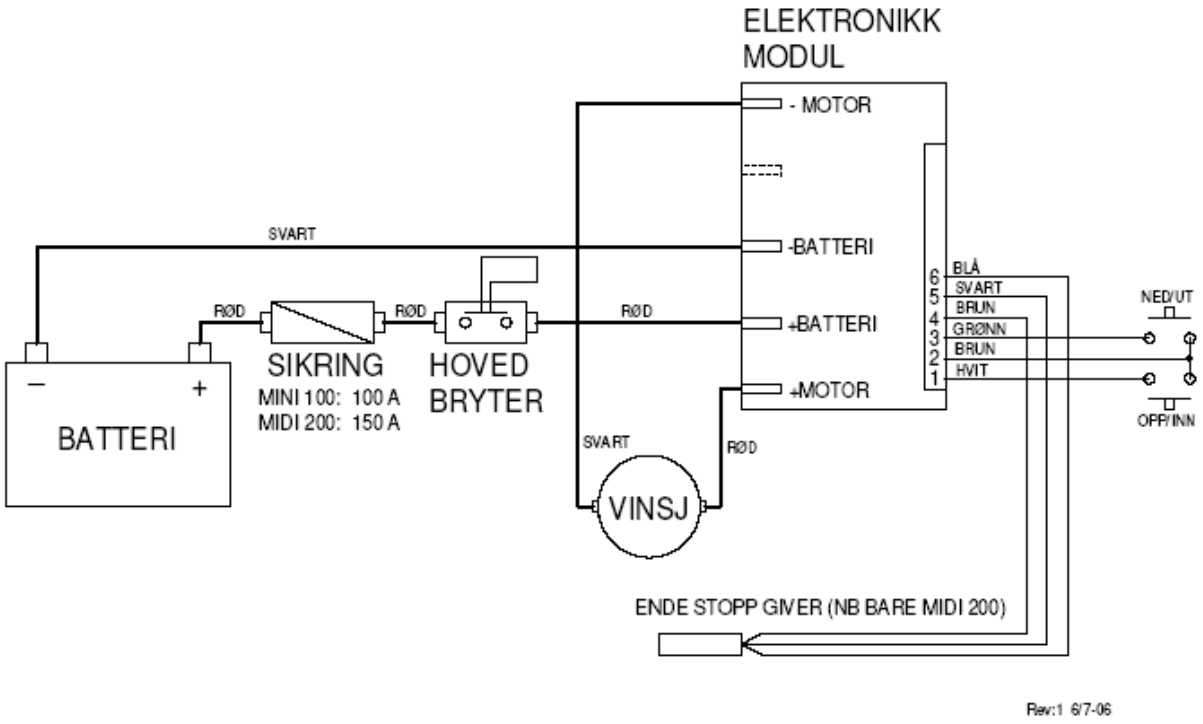
ADVARSEL !

Batteri tilkobling

- *Feil batteripolaritet vil ødelegge kraftelektronikken.*
- *Kotroller at ingen kabler er kortsluttet eller skadet før batteriet kobles til.*
- *Kontroller alle kraftkabler og koblingspunkter, etterstram om nødvendig.*
- *Bruk **aldri** skiver **mellom** kabelsko og tilkoblingspunkter hvor det går store strømmer.*
- *Batteriets pluss kabel skal ha sikring så nærme batteriet som mulig og deretter hovedstrømsbryter, som skal monteres på tilgjengelig sted, før elektronikk enhet.*
- *Vinsjen skal **alltid** tilkobles startbatteriet*.

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Koblingsskjema



MRK! Vinsj skal kobles til båtens startbatteri og tilkobles etter båtens hovedstrømsbryter.

Monteringsanvisning

Generelt

Plasser vinsjen så høyt som mulig slik at det er god plass til tauet under vinsjen. Høyden fra underkant av trekkskiven bør være minst 40 cm over bunnen av tau-korgen eller der tauet skal ligge. Dette for å få plass til 50 meter 12 mm flettet Roblon ankertau. Er høyden mindre enn 40 cm, må man kontrollere at tauet ikke kveiler seg helt oppunder vinsjen. I tilfelle bør kortere tau benyttes.
Vinsjen bør monteres så langt inn mot midten av akterspeilet at ankeret ikke slepes i sidebølgen som bøyer seg inn rett bak båten.

Ved bruk av plattformrulle

Taurullen må monteres med trinsene utenfor plattformen slik at anker/tau går klar av plattformen når det hales opp.

Ved hulltaking av akterspeil

Kontroller at hullet for tauet i skroget blir riktig i forhold til tauets retning. For å unngå unødig slitasje skal ikke tauet berøre hullsidene verken vertikalt eller horisontalt, og hullet må være ovalt vertikalt for å oppta tauets vandring i taurullen under oppvinsjing.

Standard plattformrulle, eller leddet rulle

Dersom vinsjen må monteres lavt i forhold til badeplattformen, slik at den vil dra ankeret framover/innover isteden for oppover/innover, bør vår leddet tau-rulle, (se katalog), brukes.

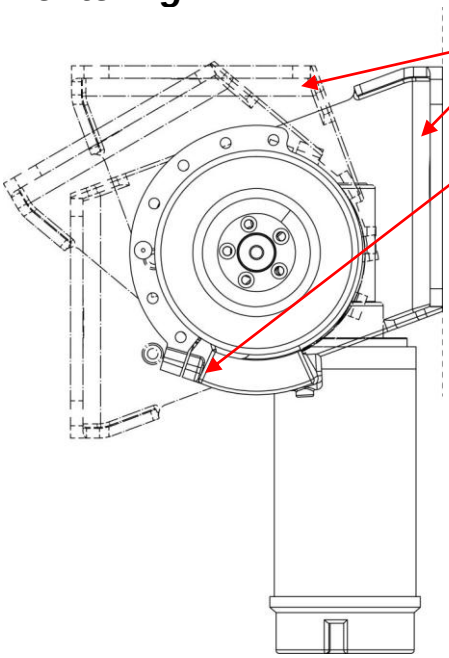
Skrogrulle

Blir det vanskelig å få tauet til å gå direkte vertikalt fra trekkskiven til ankerrullen, kan det med fordel benyttes en skrogrulle (68-00008) for å oppta tauets vinkel.

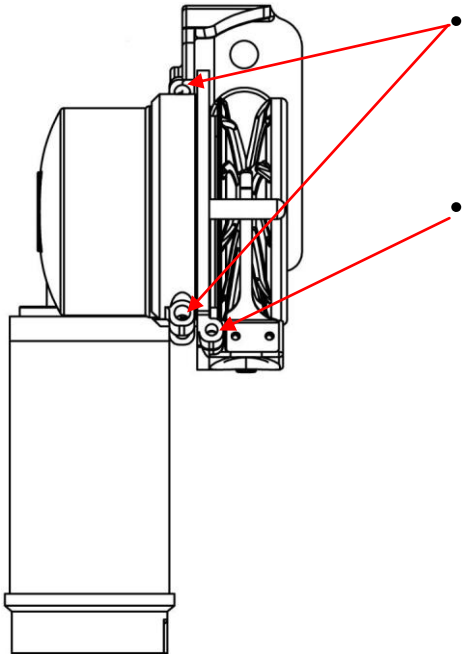
MRK! Husk å feste tauet innvendig i båten.

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Montering

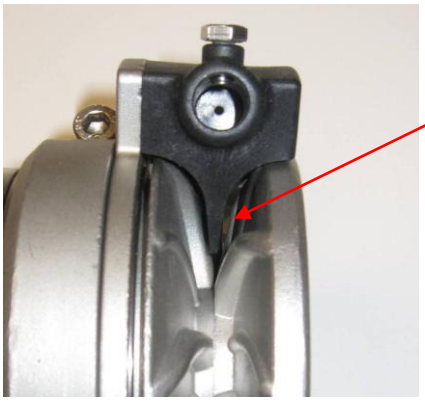


- Festebraketten på MINI 101 og MIDI 201 kan dreies trinnløst i forhold til vinsjens gir/motor.
- Likeledes kan braketten som tau-fører / tau-avviser er montert på dreies uavhengig av gir/motor og festebrakett.
- På den måten vil det være mulig å montere vinsjen på flater som har ulik vinkel i forhold til akterspeilet. Den kan monteres på innsiden av akterspeilet, hengende under dekk eller på aktersiden av tverrskott innvendig i båten.



- Tilpasse vinsjens festebrakett i riktig posisjon ved å løsne på de to skruene som klemmer fast braketten til gearhuset, drei vinsjen i ønsket posisjon og trekk til skruene.
  Mrk. Maks. tiltrekningsmoment 17 Nm.
- Tilpass vinsjens tau-førerbrakett på tilsvarende måte ved å løsne skruen som klemmer denne fast i gearhuset, drei braketten slik at tau-føreren styrer tauet ned og evt. bort fra skott og komponenter som hindrer tauet å legge seg korrekt til rette under vinsjen.
  Mrk. Maks. tiltrekningsmoment 7 Nm.

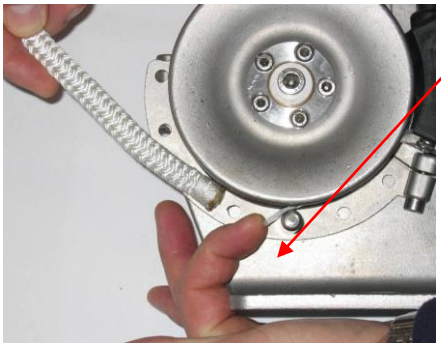
MRK! Det er viktig at tauet har tilstrekkelig omlegg rundt trekkskiven slik at den får godt grep m tauet.
Se eget avsnitt.



MRK! Det er viktig at tauføreren er sentrert i trekkskiven. Kontrollér dette også etter at skruen som fester tauførerbraketten er trukket til

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Innføring av tauet i vinsjens trekkskive



Før tauet inn i trekkskiven mellom denne og tau-føreren. Gjør gjerne plass til tauet ved å bøye tuppen av tau-føreren forsiktig ut.



Før tauet videre ut via trekkskiven og ut gjennom hullet i tau-avviseren.



Når vinsjen er koblet opp, kan man kjøre tauet gjennom ved å trykke på opp knappen på touch panel eller fjernkontroll.

Mrk. Vær forsiktig, unngå klemskader på fingre.

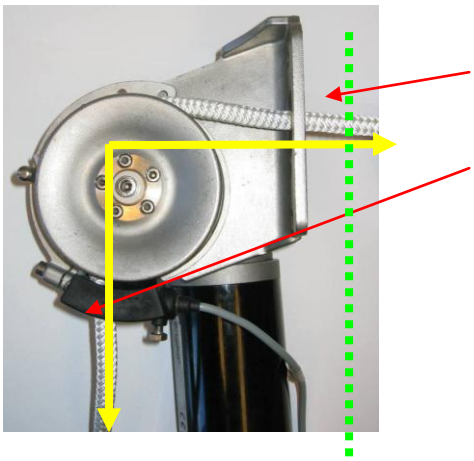


Når tauenden er trukket gjennom tau-avviseren kan resten av tauet trekkes gjennom ved å kjøre vinsjen.

Kontroller at vinsjen trekker som den skal.

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Tauets omlegg rundt trekkskiven



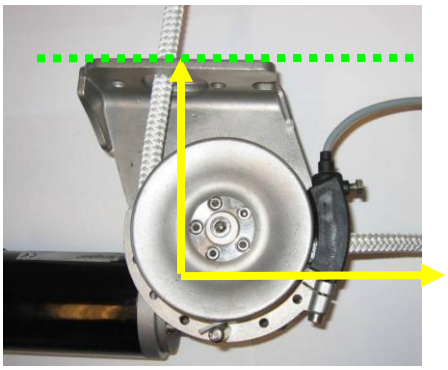
Festebraketten på MINI 101 og MIDI 201 kan dreies trinnløst i forhold til vinsjens gir/motor.

Likeledes kan braketten som taufører / tauavviser er montert på dreies uavhengig av gir/motor og festebrakett. Se egen beskrivelse.

Denne montasjen illustrerer vinsjen montert på framsiden av vertikalt tverrskott, for eksempel på innsiden av akterspeilet. Grønn stiplet linje viser skottet vinsjen er festet til.

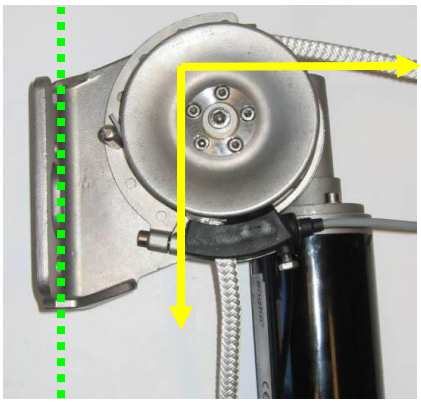
Det er viktig at omlegget, den delen av tauet som er i kontakt med trekkskiven, er tilstrekkelig til at tauet får godt feste. Gule piler.

Mrk! Uavhengig av hvordan vinsjen festes til båten, må tauet danne minimum 900 vinkel mellom retningen det har inn og ut av trekkeskiven.



I dette tilfellet henger vinsjen under dekk el. lign.
Vinsjens festebrakett er dreiet 90^0 mot klokken i forhold til eksempelet over.

Tauet føres ovenfra og ned i trekkskiven. Tauføreren må i slike tilfeller justeres slik at tauet skyves horisontalt ut av vinsjen.



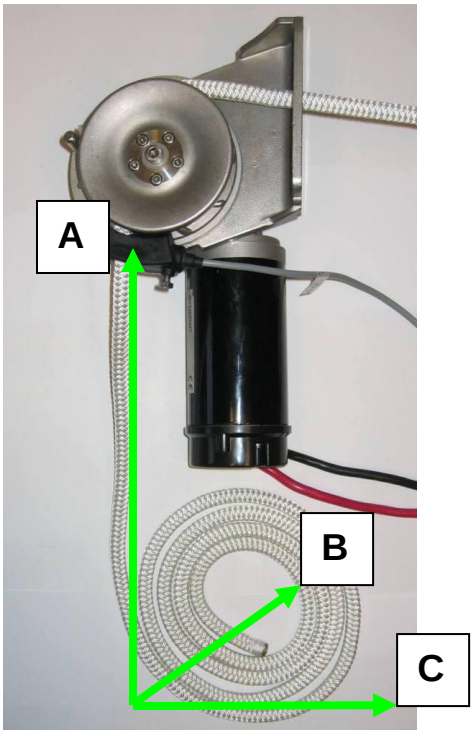
Denne illustrasjonen viser vinsjen montert på aktersiden av innvendig tverrskott.
Vinsjens festebrakett er dreiet 1800 mot klokken i forhold til eksempelet øverst på siden.

Mrk! Legg merke til at tauet i alle tilfeller trekkes inn i vinsjen fra høyre. Dette har å gjøre med retningen vinsjens trekkskive trekker inn tauet.

MRK! Sørg for at det er tilstrekkelig plass til å stuve tauet under vinsjen og ved siden av vinsjen.

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Minimum plass til tauet - høyde under vinsjen



For at vinsjen skal kunne fungere normalt, er det en forutsetning at det er tilstrekkelig volum/høyde under vinsjen til å stuve tauet når ankeret er oppe.

Tabellen under viser anbefalte minimums mål for høyden **(A)** under vinsjen samt bredde **(B)** og lengde **(C)** av arealet der tauet skal stuves.

Tau dimensjon.	A (cm)	B (cm)	C (cm)
10 mm x 30 m	35	30	30
12 mm x 30 m	35	30	30
12 mm x 50 m	40	35	35

MRK! Ved installasjoner der tauet føres horisontalt ut av vinsjen når ankeret trekkes opp, kan forholdet mellom A, B og C variere. Det er viktig at det er tilstrekkelig volum til at tauet ikke pakker seg opp under vinsjen og hindres i føres ut av trekkskiven.

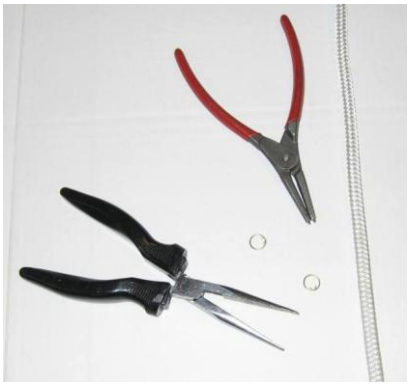
Montasje av stoppring for autostopp

MRK! Gjelder kun MIDI 201

Under tauavviseren er det en induktiv giver som signaliserer autostopp når ankret er oppe. For å aktivere giveren monteres to stoppringer (følger med), på tauet. Se prosedyre under.
Ytre diameter på stoppringen skal være så lik ytre diameter på tauet som mulig. Dette for at den induktive giveren skal kunne detektere korrekt.

For å plassere stoppringen på rett sted på tauet, trekkes ankeret opp til kausen er 25-50 cm under taurullen, (kjør sakte den siste biten), og tauet merkes med en tusjpenn rett ut for den induktive giveren. Ankeret kjøres deretter helt opp med sakte fart til ønsket sluttposisjon. Tauet merkes på nytt ved giveren og stoppringene plasseres ved merkene.

Disse stoppringene vil være utsatt for slitasje av trekk skiven, særlig ved stor belastning, og må derfor inspiseres regelmessig. Erstatt skadet stoppring ved behov.



Anbefalt verktøy:

- Segerring tang
- Nebbtang
- Autostoppringer (stålringer medfølger)

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Medfølgende stålringer (autostoppringer) monteres på de stedene man vil at vinsjen skal stoppe. Merkes på forhånd, se prosedyre ovenfor.

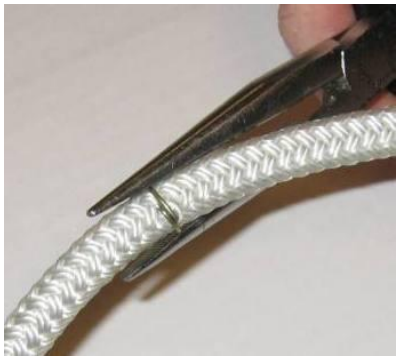
Åpne opp stoppringen med segerring tangen.



Tre ringen over tauet.



Bruk nebb tangen til å trekke stoppringen på plass, slik at stoppringens skjøt overlapper åpningen og lukker seg om tauet.



Press endene inn i tauet med tangen slik at stoppringen ikke glir på tauet.

En ferdig montert stoppring bør se slik ut med tette vindinger og endene sikret inn i tauet.



Stoppringen er montert og sitter festet på tauet uten slakk.

Fest den andre stoppringen på tilsvarende måte.

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Batteriskifte

Fjernkontrollen bruker 3 stk vanlige AAA/LR03 alkaliske batterier. Batteri levetid er mer enn 2 sesonger ved normal bruk. Ved batteriskifte så må enhet åpnes ved at alle 5 skruer skrues opp.



Mrk! Skruene har forskjellige lengder og O-ring under skrue hodene.

Erstatt batteriene med nye, legg merke til at alle peker samme vei med + opp, og – ned mot kant, som vist på bildet.

Monter tilbake bak-dekslet, og skru forsiktig sammen delene til pakningen mellom dekslene blir **svakt, presset sammen**.

Tettheten av denne enhet er avhengig av intakte O-ringer og uskadet pakning med rett kompresjon.

Mrk! For å sikre lang levetid så har denne fjernstyringen syrefaste maskinskruer og gjenge bøssinger i topplokket. Uforsiktig, hardhendt sammenskruing kan tvinge skruene gjennom topplokket. *(Dekkes ikke av garanti.)*

Ettermontasje av fjernkontroll

Om fjernkontrollen er anskaffet etter elektronikk enheten, må elektronikk enheten utstyres med antenne. Videre må fjernkontrollen og elektronikk enheten kodes/læres elektronisk opp til å kommunisere med hverandre.



Ta løs det venstre gummi lokket, (den nærmest Engbo logoen). Stikk deretter antennen gjennom lokket (ved den ene siden).



Mens hendelen holdes nede stikker man antennen helt ned i bunnen av klemmen. Slipp hendelen og antennen sitter fast.



Sett på plass igjen gummi lokket. Start med å trykke inn gummi lokket der antennen er, og forsett rundt til lokket er helt på plass. Pass på å ikke vri lokket med antennen.

(Fjernkontrollen vil fungere på kort avstand også uten antennen montert).

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Koding av fjernkontroll

Bilde A



Bilde B



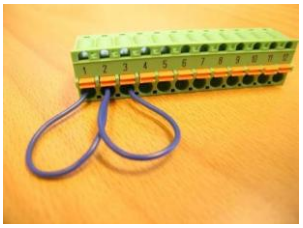
Bilde C



Bilde D



Bilde E



Prosedyre for <u>alle</u> fjernkontroller med serienr. over 8600

Viktig! Dersom du har en fjernkontroll med lavere serienr. enn 8600 skal prosedyren som fulgte med fjernkontrollen benyttes. Dersom en fjernkontroll med serienr. over 8600 kodes mot en mottaker med eldre software vil det ta 10 sekunder fra sender og mottaker har opprettet kontakt til fjernkontrollen er operativ.

1. **Slik setter du <u>fjernkontrollen</u> i kodemodus:**

- Start alltid med å sette fjernkontrollen i kodemodus.
- Velg ut det **<u>bryterparet</u>** på fjernkontrollen som skal kodes.
- Hold begge bryterne inne, samtidig, i 12 sek.
- Når det kan høres et kort lydsignal og den grønne power lampen begynner å blinke er **fjernkontrollen** i kode-modus. Det vil den være i 5 min. eller til den er ferdig kodet. (Bilde A)

2. **Slik setter du <u>mottakeren</u> i kodemodus:**

Alt 1. Dersom du har touch panel.

- Trykk inn og hold inne begge bryterne på touch panelet mens hovedstrømbryteren til vinsjen slås på. (Bilde B og C)
- Mottakeren vil nå forstå at koding er ønsket, og automatisk registrere kontakt til din fjernkontroll. Fjernkontrollen er nå umiddelbart klar til bruk.
- Dette vil bekreftes ved et kort lydsignal og at den grønne power lampen på fjernkontrollen går over fra å blinke til å lyse permanent.
- Kontrollér at fjernkontrollen fungerer.

Alt. 2. Dersom du f. eks har joystick eller panel der ikke begge bryterne kan trykkes inn samtidig.

- Kontroller at hovedstrømbryteren til vinsjen ar avslått.
- Koble ut kablene til joysticken som er koblet til 1, 2 og 3 på den grønne pluggen på kontrollenheten (RCU). Lag to korte kabler (ca. 5 cm) som er avisolert i begge ender og koble disse mellom 1 og 2, samt 2 og 3 på den grønne pluggen. (Bilde E)
- Slå deretter på hovedstrømbryteren til vinsjen.
- Mottakeren vil nå forstå at koding er ønsket, og automatisk registrere kontakt til din fjernkontroll. Fjernkontrollen er nå umiddelbart klar til bruk.
- Dette vil bekreftes ved et kort lydsignal og at den grønne power lampen på fjernkontrollen går over fra å blinke til å lyse permanent.
- Slå av hovedstrømbryteren til vinsjen.
- Fjern de to korte kablene og koble til styrekablene til joystick igjen.
- Slå på hovedstrømbryteren til vinsjen og kontrollér at fjernkontrollen fungerer.

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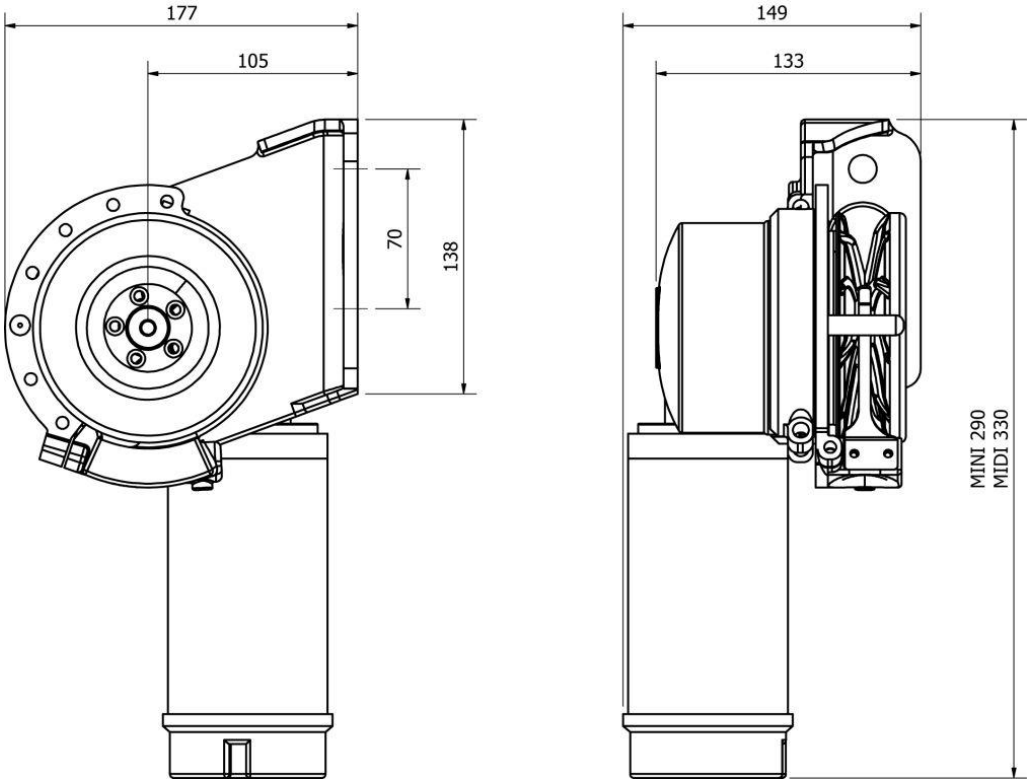
Vedlikehold

Vinterlagring

- Før vinterlagring skal vinsjen og alle elektriske punkter og koblinger sprayes med fuktdrivende spray.
- Sørg for at vinsjen står beskyttet mot snø og fukt under vinterlagring.
- Vinsjen må ikke pakkes inn slik at det blir kondens ved vinterlagring.
- Ta av tauet før hver vinterlagring. Legg det i bløt i mildt såpevann over natten slik at man får skylt ut saltrester og skitt. Dette sikrer at tauet holder seg smidig i mange år, og samtidig kan stoppringene som markerer autostopp funksjonen kontrolleres og eventuelt skiftes ut.

Vask eventuelt tau-kassen ren innvendig og fjern rester av tang, søle og lignende.

Målskisser



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Tekniske data

	ENGBO – MINI 101	**ENGBO – MIDI 201**
Motor effekt nom.	12V DC/350W	12V DC/600W
Tau	Flettet blytau: Ø10mm, 30m Vekt:4,5kg Bruddstyrke:1200 daN	Flettet blytau Ø12mm, 30/50m Vekt: 7,2kg/12kg Bruddstyrke: 1600 daN
Trekkraft	Opptil 100 kg (Elektronisk begrenset)	Opptil 200 kg (Elektronisk begrenset)
Trekkhastighet	15-35m/min ca 20m/min ved 20kg last	15-30m/min ca 20m/min ved 30kg last
Strømforbruk	10-150A ca 50A ved 20kg last	10-200A ca 40A ved 30kg last
Tomgangsstrøm	‹ 0,3A ved 12V	‹ 0,3A ved 12V
Anbefalt sikring	100 A	150 A
Anbefalt min. batterikapasitet	12V/75 Ah	12V/75 Ah
Vekt: Vinsj med motor kabler	8,1kg	9,8kg
Vekt: Styrings-elektronikk	2,3kg	2,3kg
Autostopp funksjon	Nei	Ja
Anbefalt anker	5-8kg Bruce eller Skål	7,5-16kg Bruce, Skål eller Engbo
Anbefalt båtstørrelse	Maks. 6,0m (20 fot)	Maks. 7,6m (25 fot)
Montering	Vertikalt, hengende, front eller side montasje. (Kan kreve tilleggs brakett).	Vertikalt, hengende, front eller side montasje. (Kan kreve tilleggs brakett).
Standard utstyr	Vinsj, elektronikk modul, touchpanel og hovedstrømsbryter. Basis festemateriell.	Vinsj med ende stopp giver, elektronikk modul, touchpanel og hovedstrømsbryter. Basis festemateriell.
Tilleggsutstyr	Blytau Anker,(flere typer tilgjengelig) Anker brakett, (flere typer) Sjakler Trådløs fjernkontroll Sikring og sikringsholder Montasje brakett(er) Batterikabel	Blytau Anker,(flere typer tilgjengelig) Anker brakett, (flere typer) Sjakler Trådløs fjernkontroll Sikring og sikringsholder Montasje brakett(er) Batterikabel

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Feilsøking MINI 101 og MIDI 201

(For kobling, se skjema under Elektrisk Kobling)

	Symptom på feil:	Utfør og vær oppmerksom på følgende:	Handling fører til:	Resultat
		MRK! Bryter til hovedstrøm **MÅ** være avslått når kabler kobles til og fra, og mekanisk arbeid utføres		
1.	**Vinsjen er helt "død". Ingenting virker.**	**Kontroller at:** -hovedstrømsbryter er slått på, -sikringen er inntakt -alle koblingspunkter har kontakt -alle koblinger er i h.t. skjema i manual -det er tilstrekkelig høy spenning fram til vinsjens motor. (Se pkt. 3)		
2.	**Vinsjen vil ikke slippe anker, og kjører bare 3 s inn.**	**Kontroller at:** -tilkoblingene til 1,2 og 3 er ifølge skjema. Ved å bytte om 1 og 3 skal vinsj fungere korrekt.		
3.	**Vinsjen fungerer ikke, eller trekker svært dårlig.**	**VIKTIG!** **Dette er erfaringsmessig den vanligste feilkilden.** 1.Feilsøk på hovedstrøm: Mål spenningen på batterikablene ved inngangen til vinsjen mens vinsjen kjøres. 2. Feilsøk på autostop giver: Koble ut pkt 4,5 og 6 på grønn plugg på MCU enhet. Prøv vinsjen. Dersom den nå trekke opp som normalt, må autostop giveren justeres litt nærmere tauet. Prøv først å flytte den ca. 2 mm. Montér kablene til 4, 5 og 6 og kontrollér at vinsjen stopper automatisk når den skal.	1. Spenningen må være minimum 10,5V når vinsjen kjøres for at motoren skal kunne fungere normalt. 2. Vær oppmerksom på at vinsjen nå ikke vil stoppe automatisk. Autostop giveren må være montert i riktig avstand til tauet for å fungere riktig.	1. **Dersom** spenningen er lavere enn 10,5V må årsaken finnes. Sjekk alle koblingspunkter, f.eks. hovedstrømsbryter, sikring, batterisko, batterispenning, evt. batterienes generelle tilstand. **Dersom** spenningen er over 10,5V, men motor vil fremdels ikke gå så kan det være p.g.a. at langvarig bruk/overbelastning av vinsjen har fått den elektroniske beskyttelsen til å slå av motoren. Vent 20 min for avkjøling og prøv igjen. 2. Når autostopp giveren er riktig justert vil vinsjen kun stoppe når den skal.
4.	**Hvis vinsjen fremdeles ikke fungerer.**	Kabel til punkt nr. 1, 2 og 3 kobles fra. Avisoler endene på en løs kabel (ca. 10 cm) og opprett kontakt mellom følgende punkter: Kabel mellom punkt 2 og 3 Kabel mellom punkt 1 og 2	Funksjoner som normalt styres fra bryterpanelet kobles ut slik at man kan "tvangskjøre" vinsjen direkte fra elektronikk enhet. -------- Vinsj frikobles og ankeret droppes Vinsj trekker inn.	Bryterpanel er frakoblet. -------- Dersom vinsjen fungerer normalt når man gjennomfører denne prosedyren, er feilen lokalisert til kabel feil til bryterpanelet, eller bryterpanel, som må byttes.
5.	**Hvis endestoppen ikke fungerer: (KUN MIDI 201)**	**Kontroller at:** -tilkoblingene til 4, 5 og 6 er ifølge skjema. -spenning til giver, (mellom 4 og 6), er mer enn 10 V DC -endestopp trådene er på plass.	Indikator lampe på giver skal lyse når metall ring på tau er ved føler. (Kan også testes med for eksempel en skrutrekker ved føleren)	Dersom spenning er OK og lampe ikke lyser, så må giver byttes.

Dersom vinsjen fremdeles ikke fungerer normalt etter at man har gjennomført denne prosedyren, er feilen lokalisert i selve vinsjen. Kontakt nærmeste forhandler, eller Engbo AS, Tønsberg. Tlf. 33003150, Fax. 33003160, E.mail: support@engbo.no

BESØKSADRESSE: Wirgenesvei 7, 3157 Barkåker **POSTADR**: Postboks 2288 Postterminalen, 3103 Tønsberg
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Engbo trådløs fjernkontroll
Installasjon og brukermanual







CE 0470

I h.t. NS-EN ISO 9001:2000
Art. nr. 117-00141

FCC ID: R78-RC-01
R78-ECU-01

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1 INNLEDNING

Først og fremst vil vi takke for at du valgte en fjernkontroll fra Engbo. Engbo sine fjernkontroller er utviklet for å kunne håndtere Engbo ankervinsjer og thrustere uten å være avhengig av å oppholde seg ved det fastmonterte panelet.

Kontrollenheten til vinsjene og thrusterne er basert på felles teknologi. Dette gjør det enkelt å manøvrere og ankre opp båten med en felles fjernkontroll. I tillegg kan Engbo fjernkontroller, kodet opp mot Engbo RCU – Remote Control Unit, også benyttes til å håndtere vinsjer, thrustere og annet elektrisk utstyr fra andre leverandører.

Vi ber deg om å studere denne manualen nøye før installasjon og bruk av fjernkontrollen. Dersom du har spørsmål i forbindelse med installasjon eller bruk, ber vi deg om å kontakte oss, slik at du får maksimal nytte av din fjernkontroll.

Vennlig hilsen,

Engbo AS, PB 2288 Postterminalen, 3103 Tønsberg, Norway
E-mail: support@engbo.no
Web: www.engbo.no



VIKTIG:
Når fjernkontrollen installeres i båter som er godkjent eller klassisfisert iht. internasjonale eller spesielle regler, er installatøren ansvarlig for at disse overholdes. Det garanteres ikke at instruksjonene i denne manualen er i henhold til alle ulike reguleringer og klassifikasjoner. Den trådløse fjernkontrollen er godkjent for bruk i EU/EFTA (CE) eller USA/Canada (FCC). For andre land, vennligst kontakt lokale myndigheter.

1.1 Trådløs fjernkontroll - generell info

- Sprut-tett.
- Kan betjene opptil to thrustere, baug og akter, samt to vinsjer.
- Kan betjene baug- og akterthruster samtidig i motsatt retning ved å trykke bryterne i senter.
- Rekkevidde: 30 m under normale forhold.
- Smalbånd radio system med toveis kommunikasjon mellom kontrollenheten og fjernstyringen som garanterer sikker overførng av radiosignalene.
- Alle fjernkontroller kommuniserer med mottakeren med unik kode.
- Anti–skli ”strips” på baksiden.
- Holder for fast montasje er inkudert.
- Snor for feste / sikring rundt håndledd eller hals med sikkerhetslås som åpner ved overbelastning.



- Normal levetid for batterier, > 2 år.
- Varsellampe som indikerer lavt spenningsnivå på vinsj- eller thruster motor.
- Alle Engbo fjernkontroller leveres med antenne.
- Monter antenne i mottaker enheten hvis den ikke allerede er montert.

For å sikre lang levetid for fjernkontrollens batterier, vil den slå seg av automatisk 5 min. etter at den sist ble brukt. Deaktivering vil varsles med to korte lydsignaler samt blink i ”POWER” indikatoren. Ved å holde inne en av bryterne i 1,5 sek. vil fjernkontrollen aktiveres. Når fjernkontrollen er aktivert er den klar til bruk, og vil umiddelbart starte vinsj eller thruster når en av bryterne trykkes inn og vil holdes i gang så lenge bryteren holdes inne.



Art. nr. 12-47023

1.2 Bruksanvisning for 12-47023

Trådløs fjernkontroll for en thruster og en ankervinsj

Ankervinsj:

- Når nederste bryter på et av brytersettene for ankervinsj holdes inne, vil vinsjen droppe anker.
- Når øverste bryter på et av brytersettene for ankervinsj holdes inne, vil vinsjen trekke ankeret opp.

Thruster:

- Når bryter med **rød pil** holdes inne vil thusteren bli aktivisert mot babord
- Når bryter med **grønn pil** holdes inne, vil thrusteren bli aktivisert mot styrbord.



Art. nr. 12-47021

1.3 Bruksanvisning for 12-47021

Trådløs fjernkontroll for inntil to ankervinsjer og to thrustere

- To bryterpar som kan kodes separat til to ulike vinsjer.
- To bryterpar som kan kodes separat til to ulike thrustere.
- To bryterpar som aktiviser både baug og akterthuster når begge deler er montert og kodet.

Ankervinsj:

- Når nederste bryter på et av brytersettene for ankervinsj holdes inne, vil vinsjen droppe anker.
- Når øverste bryter på et av brytersettene for ankervinsj holdes inne, vil vinsjen trekke ankeret opp.

Thruster:

- Når bryter med **rød pil** holdes inne vil thusteren bli aktivisert mot babord
- Når bryter med **grønn pil** holdes inne, vil thrusteren bli aktivisert mot styrbord.
- Når fjernkontrollens to midtre brytere (**to piler**) trykkes inn, vil både baug-og akterthruster samtidig skyve i hver sin retning som vist med pilene. Båten vil rotere rundt sin egen akse. (Det forutsettes at både baug- og akterthruster er montert.)

1.4 Bruksanvisning for 12-47022

Trådløs fjernkontroll for inntil 6 vinsjer

- Seks bryterpar som kan kodes separat til 6 ulike vinsjer.
- Benyttes ofte i forbindelse med Engbo elektriske fortøyningssystem.



Art. nr. 12-47022

- Når nederste bryter på et av brytersettene for ankervinsj holdes inne, vil vinsjen droppe anker.
- Når øverste bryter på et av brytersettene for ankervinsj holdes inne, vil vinsjen trekke ankeret opp.

VIKTIG! Installér alltid minimum 1 stk panel for fast montasje.

1.5 Holder til fjernkontroll



En praktisk holder (Art. nr. 12-47030) til å oppbevare fjernkontrollen leveres vedlagt.



Holderen består av to deler:

- Selve holderen som festes til braketten i egnede ”sleidespor”.



- Brakett som festes til underlaget med dobbelsidig tape.



- Ved å snu fjernkontrollen med baksiden vendt fram og sette den i holderen, vil man beskytte bryterne mot uønsket aktvering når man for eksempel ønsker å oppbevare fjernkontrollen i en lomme eller bag.



2 GENERELL BRUKSANVISNING

MRK! Engbo vinsjer og Engbo XF thrustere har elektroniske overvåking som varsler ved lav spenning og overbelastning. Se manual for de enkelte produkter.



Grønt lys

MRK! Aktivering av fjernkontroll indikeres ved at **grønt lys** i "POWER" lampe lyser, samtidig som kort lydsignal kan høres. All påfølgende bruk av bryterne vil vises ved lys i bryterens tilhørende indikator sammen med lydsignal.



Orange lys

Lavt spenningnivå inn på den elektroniske styringsenheten varsles ved **orange lys** i "POWER" indikatoren.

Hvis thrusteren er overopphetet og trenger tid til nedkjøling, vil dette også varsles ved **orange lys.**



Rødt lys

Indikatorlampen vil varsle med **hurtig blinkende rødt lys** ved systemfeil og **blinke sakte rødt** samtidig med korte lydsignaler dersom fjernkontrollen har mistet kontakt med den elektroniske kontrollenheten (mottakeren).

MRK! Nevnte feilmeldinger vises når bryterne er trykket inn.

2.1 Klargjøring for trådløs fjernkontroll Engbo vinsjer og XF thrustere



2.2 XF20 Thruster og Engbo ankervinsjer

XF20 kan leveres med tre ulike modeller styringsenhet (**MCU - Motor Control Unit):**

1. **Relestyring.**
2. **Relestyring med integrert radiomottaker for fjernkontroll.**
3. **Transistorstyrt kraftelektronikk som erstatter det konvensjonelle innslagsreleer, er standard til alle Engbo vinsjer.**



VIKTIG! Pkt. 3 gjelder også alle Engbo ankervinsjer da de leveres med transistorstyrt kraftelektronikk med integrert radiomottaker.

2.3 Montasje av antenne i MCU – Motor Control Unit



Gjelder alle Engbo ankervinsjer samt XF20 som er forberedt for trådløs fjernkontroll.

Hvis trådløs fjernkontroll skal implementeres i etter først å ha valgt kontrollenhet (MCU) 2 eller 3 i pkt. 2.2.
Hvis antenne ikke allerede er montert, må denne monteres til kontrollenheten (MCU).
Fjern gummi lokket på kontrollenheten (bilde). Trykk antennen gjennom lokket fra utsiden.
Hold nede antenneholderens hendel og trykk på plass antennen i bunnen av holderen. Slipp hendelen og antennen sitter festet og på plass.
Fjernkontroll og kontrollenhet må også kodes slik at de kommuniserer med hverandre.



Fest gummilokket.

- Start med å presse inn lokket ved antennen og fortsett rundt hele hullet i dekselet inntil gummilokket er festet og på plass.
- Vær nøye slik at gummilokket ikke vrir antennen ut av posisjon.

Fjernkontrollen vil kunne fungere over korte distanser også uten antenne montert.

2.4 Trådløs fjernkontroll til øvrige XF thrustere

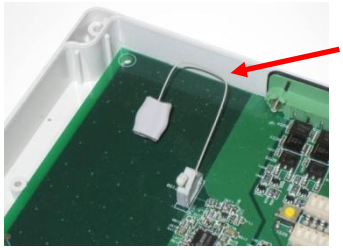
RCU – Remote Control Unit med integrert radio mottaker
Med unntak av XF20 og alle modeller Engbo ankervinsjer, leveres alle Engbo XF thrustere med separat styringsenhet, **Remote Control Unit – RCU.** Denne har integrert radio mottaker med antennen ferdig montert innvendig.



RCU

MRK! RCU enheten kan også benyttes som mottakerenhet til annet elektrisk utstyr og kodes opp mot Engbo trådløs fjernkontroll. (Se særskilt avsnitt vedr. dette.)

Antennen er ferdig montert i RCU enheten.



VIKTIG! Skru av vinsjens og/-eller thrusterens hovedstrømbryter når den ikke er i bruk. Radio mottakeren (integrert i **MCU/RCU**) vil ha et strømforbruk på ca. 3,5W når den lytter etter signaler fra fjernkontrollen.

2.5 Koding av fjernkontroll



Prosedyre for <u>alle</u> fjernkontroller med serienr. over 8600
Viktig! Dersom du har en fjernkontroll med lavere serienr. enn 8600 skal prosedyren som fulgte med fjernkontrollen benyttes.
Dersom en fjernkontroll med serienr. over 8600 kodes mot en mottaker med eldre software vil det ta 10 sekunder fra sender og mottaker har opprettet kontakt til fjernkontrollen er operativ.

1. **Slik setter du <u>fjernkontrollen</u> i kodemodus:**

- Start alltid med å sette fjernkontrollen i kodemodus.
- Velg ut det **<u>bryterparet</u>** på fjernkontrollen som skal kodes.
- Hold begge bryterne inne, samtidig, i 12 sek.
- Når det kan høres et kort lydsignal og den grønne power lampen begynner å blinke er **fjernkontrollen** i kode-modus. Det vil den være i 5 min. eller til den er ferdig kodet. (Bilde A)

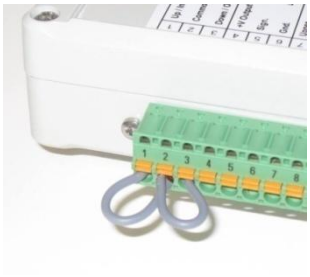
Bilde A



Bilde B



Bilde C



Bilde D

2. Slik setter du <u>mottakeren</u> i kodemodus:

Alt 1. Dersom du har touch panel.

- Trykk inn og hold inne begge bryterne på touch panelet mens hovedstrømbryteren til thrusteren slås på. (Bilde B og C)
- Mottakeren vil nå forstå at koding er ønsket, og automatisk registrere kontakt til din fjernkontroll. Fjernkontrollen er nå umiddelbart klar til bruk.
- Dette vil bekreftes ved et kort lydsignal og at den grønne power lampen på fjernkontrollen går over fra å blinke til å lyse permanent.
- Kontrollér at fjernkontrollen fungerer.

Alt. 2. Dersom du f. eks har joystick.

- Kontroller at hovedstrømbryteren til thrusteren ar avslått.
- Koble ut kablene til joysticken som er koblet til 1, 2 og 3 på den grønne pluggen på kontrollenheten (RCU). Lag to korte kabler (ca. 5 cm) som er avisolert i begge ender og koble disse mellom 1 og 2, samt 2 og 3 på den grønne pluggen. (Bilde D)
- Slå deretter på hovedstrømbryteren til thrusteren.
- Mottakeren vil nå forstå at koding er ønsket, og automatisk registrere kontakt til din fjernkontroll. Fjernkontrollen er nå umiddelbart klar til bruk.
- Dette vil bekreftes ved et kort lydsignal og at den grønne power lampen på fjernkontrollen går over fra å blinke til å lyse permanent.
- Slå av hovedstrømbryteren til thrusteren.
- Fjern de to korte kablene og koble til styrekablene til joystick igjen.
- Slå på hovedstrømbryteren til thrusteren og kontrollér at fjernkontrollen fungerer.



2.6 Bytte batteri i fjernkontroll

Fjernkontrollen benytter tre AAA/LR03 alkaliske batterier. Levetid er mer enn to sesonger ved normal bruk. Ved skifte av batterier må fjernkontrollen åpnes ved å skru ut alle fem skruene.

MRK!

- Skruene har ulik lengde og det er plassert O-ringer under skruehodene.
- Skift batteriene og kontroller at alle sammen er plassert i korrekt posisjon mht. **(+)** og **(–)**.
- Monter dekselet ved å skru forsiktig sammen delene inntil pakningen er <u>lett sammenpresset</u>. Fjernkontrollen vil forbli vanntett avhengig av at O-ringene er intakte og at pakningen er intakt og skrudd sammen med riktig trykk.

MRK!

For å sikre lang levetid, har fjernkontrollen maskinskruer og innvendige gjenger i messing. Skruene kan trenge gjennom dekselet hvis de blir skrudd for langt inn. (Dekkes ikke av garanti.)

3 RCU SOM MOTTAKER TIL ANDRE ELEKTRISKE PRODUKTER

RCU – Radio Control Unit har flere ulike software løsninger og kan også benyttes som mottaker for annet elektrisk utstyr:

Art. nr. 12-47009 Engbo vinsjer fra før 2007 (untatt type 33).

Art. nr. 12-47008 XF thrustere og Volvo Penta QL- BP og CT thrustere.

Art. nr. 12-47007 Engbo vinsj type 33, thrustere og vinsjer fra andre leverandører og annet el. utstyr som skal kjøres ubegrenset og kjører når den ene eller andre bryteren holdes inne.

Art. nr. 12-47006 Elektrisk utstyr som skal slås på med den ene bryteren og av med den andre.



VIKTIG!
Ved bruk av RCU i forbindelse med annet elektrisk utstyr som ikke er levert originalt av Engbo.

- Mottager/styringskort, RCU kan med forskjellig software (SW) versjoner og/eller bryter posisjoner brukes til trådløs fjernstyring av forskjellig typer elektrisk utstyr. Høyere (nyere), software versjonsnummer inneholder også alle foregående programvarianter. (Software kan oppdateres på alle Engbo elektronikk enheter).

- RCU kan brukes til alle systemer med spenning mellom 10 og 30 V DC.

- Det er viktig at RCU får tilførselspenning fra samme kilde som det utstyret det skal styre, og at det dermed er koblet etter en sikring og hovedbryter. (Se koblingskjema.)

- De to utgangene 15 og 16 transistorer og vil gi ut samme positive spenning som forsyningsspenningen under aktivering.

- Maksimal utgangsstrøm per transistorutgang 15 og 16 fra **RCU** er 1A kontinuerlig og 1,5 A kortvarig.

- **RCU** kan med eksterne releer/kontaktorer også brukes til større strømmer.
  NB: De eksterne reléene/kontaktorene må ha samme spolespenning og kontaktene må tåle den strømmen utstyret trekker.

- Mottager/styringskortet må kodes for å kunne brukes sammen med eksisterende eller nye fjernkontroller.

- Engbo AS tar ikke ansvar for skader som kan oppstå på originalt utstyr.



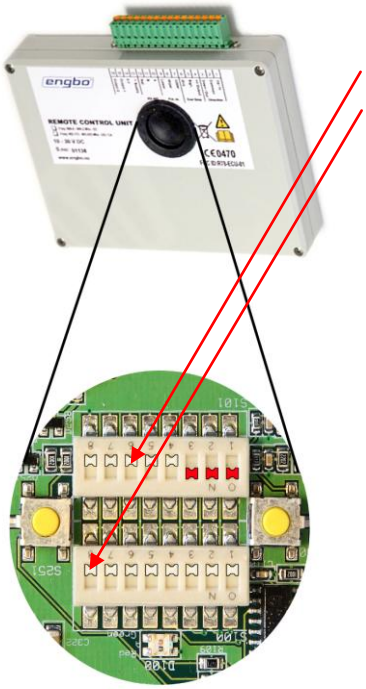
VIKTIG: Er eksisterende utstyr (+) eller (-) styrt?
Utgang 15 og 16 på **RCU** enheten gir (+) spenning ut under aktivering. Husk derfor å verifisere at det utstyret som skal fjernstyres også er positivt (+) styrt, **før** innkobling av **RCU**. Dette gjøres enkelt med et voltmeter eller multimeter stilt på DCV.

- Finn tilkoblingpunktene av original joystick/panel på den originale styring (se skjema).

- Mål spenningen ved å koble til måleinstrumentets svarte ledning (COM/0V) til systemets 0V, og koble den røde måleledningen til inngang 1 og etterpå inngang 2.

- Les av måleinstrumentet **samtidig** som joystick eller panel aktiveres. Det er viktig at instrumentet får noen sekunder til å stabilisere seg før avlesning.
- Er det under aktivering en positiv spenning, så kan mottager/styringskortet kobles direkte i parallell med original panelet.
- **NB:** Er det 0V under aktivering må eksterne releer kobles i mellom, som vist på koblingsskjema s. 10.

4 RCU - VALG AV RIKTIG PROGRAM



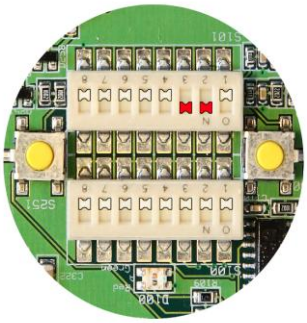
- Valg av frekvensområde: Øverst rekke, bryter 6:”OFF”=868MHz (CE), ”ON”=902MHz (FCC)
- Nederste rekke: Bryter 8=Bytter om utgangene, (reversering).
  NB: Disse to bryterfunksjoner gjelder alle versjoner.

Software kan opdateres uten varsel og får dermed nye SW versjonsnr. Alle nye versjoner vil være bakover kompatible med tildligere versjoner.

4.1 12-47009 - Til Engbo vinsjer t.o.m. 2006

(Gjelder ikke Engbo 33 kjettingvinsj)
Øverste rekke: Bryter 1, 2 og 3 ”ON”, Resten ”OFF”
Nederste rekke: ALLE ”OFF”

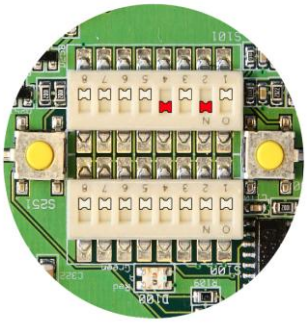
Se kobingsskjema nr. 3



4.2 12-47008 - Til Volvo Penta QL thrustere

Øverste rekke: Bryter 2 og 3 ”ON”, Resten ”OFF”
Nederste rekke: ALLE ”OFF”

QL Thrustere type BP: Se kobingsskjema nr. 2

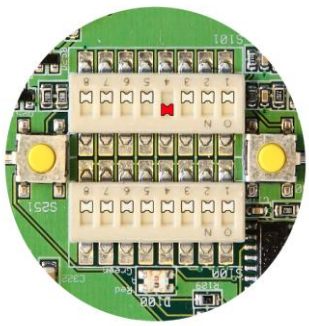


4.3 12-47007 - Til Engbo vinsj type 33 og annet elektrisk utstyr

Mrk: Kan også benyttes til annet elektrisk utstyr som skal kunne kjøres uten begrensninger.

Øverste rekke: Bryter 2 og 4 ”ON”, Resten ”OFF”
Nederste rekke: ALLE ”OFF”

Engbo 33 vinsj: Se kobingsskjema nr. 3
Annet utstyr: Se kobingsskjema nr. 1



4.4 12-47006 - Til annet elektrisk utstyr

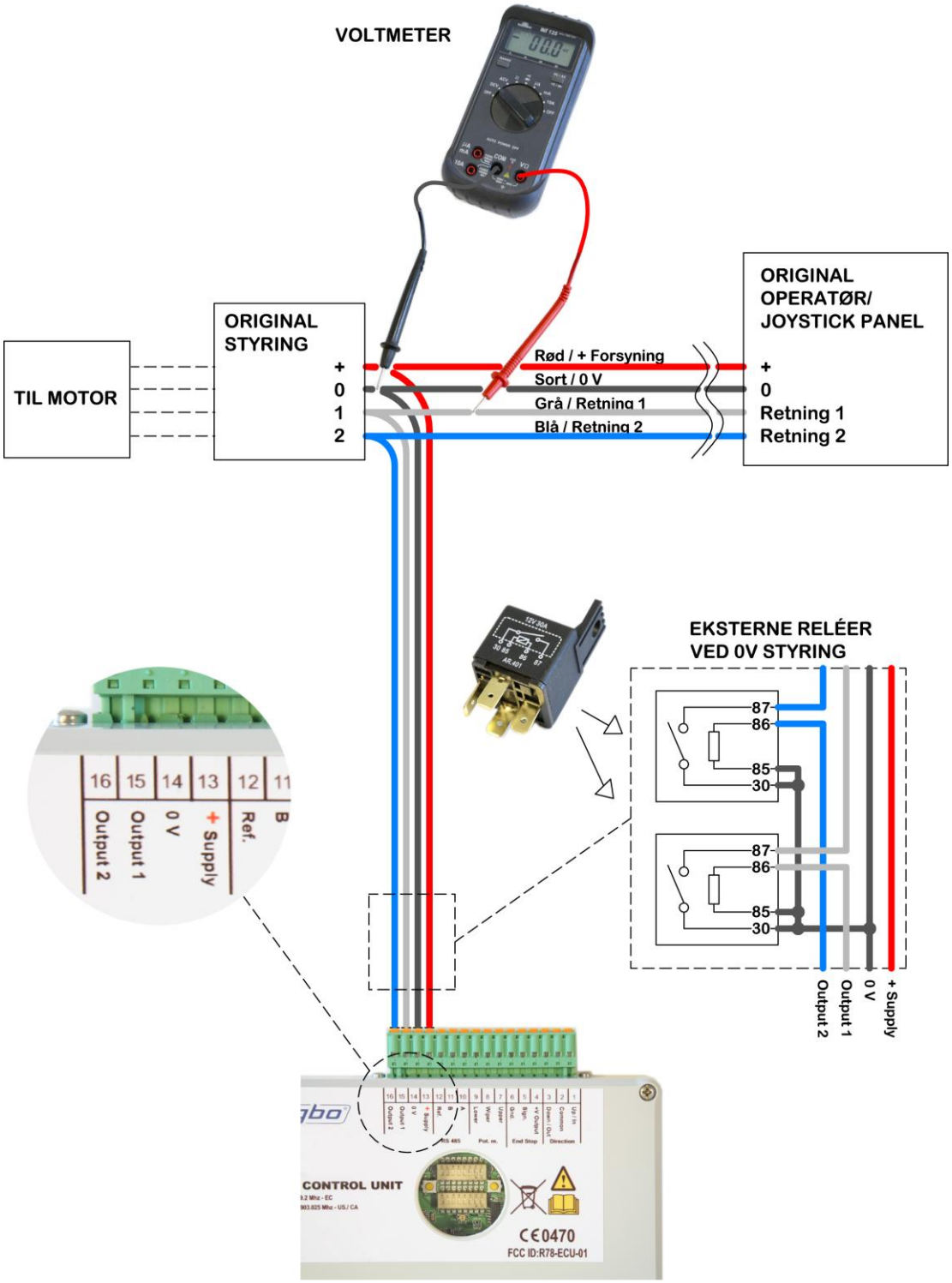
Mrk: Kan også benyttes til annet elektrisk utstyr som slåes på med den ene bryteren og av med den andre i et bryterpar.

Øverste rekke: Bryter 4 ”ON”, Resten ”OFF”
Nederste rekke: ALLE ”OFF”.

Se kobingsskjema nr. 1

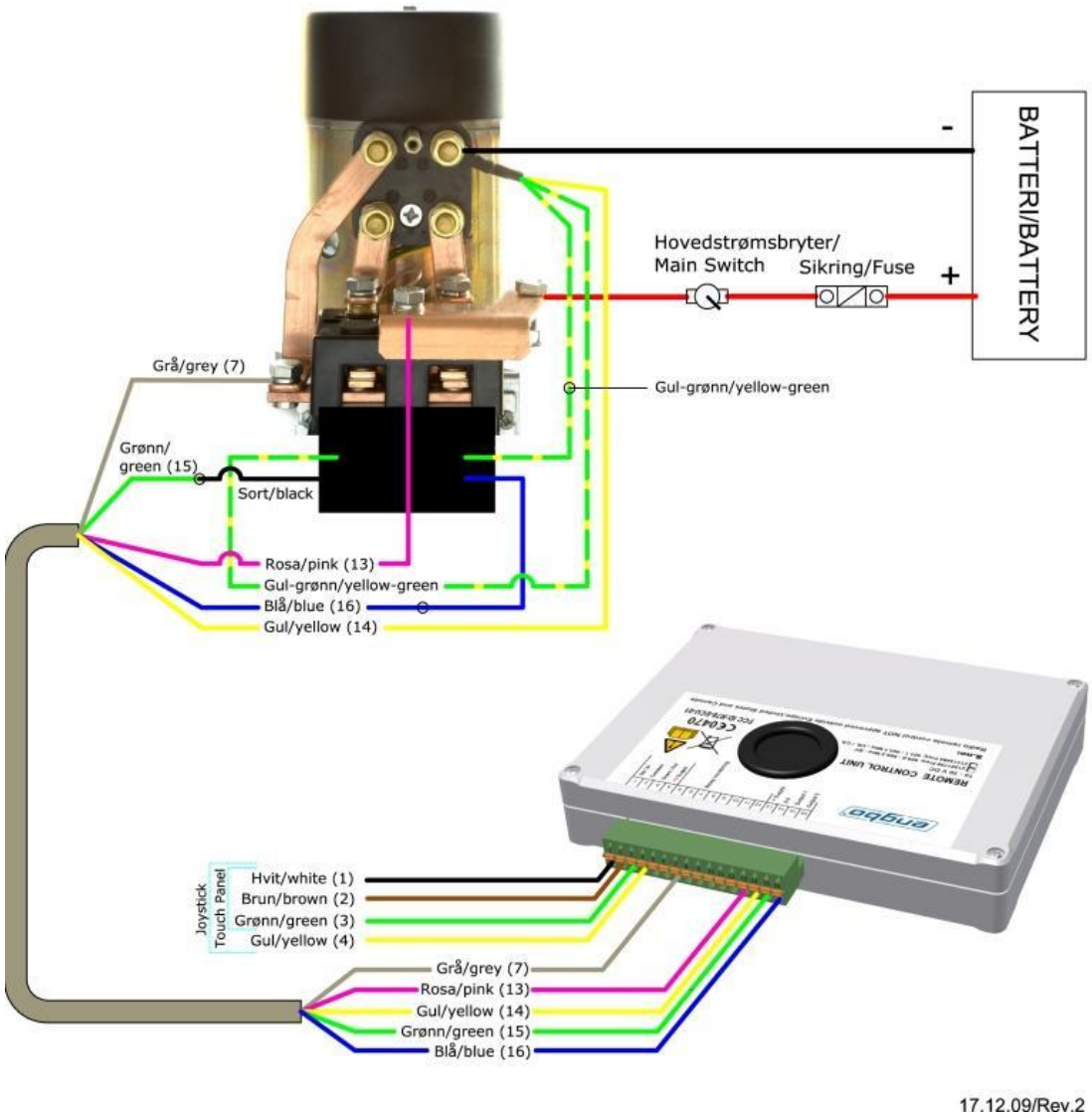
4.5 Koblingskjema nr. 1 - Annet elektrisk utstyr

VIKTIG: Les pkt 3. S. 8. før tilkobling påbegynnes.



4.6 Koblingskjema nr. 2 – XF thrustere og Volvo Penta QL thrustere

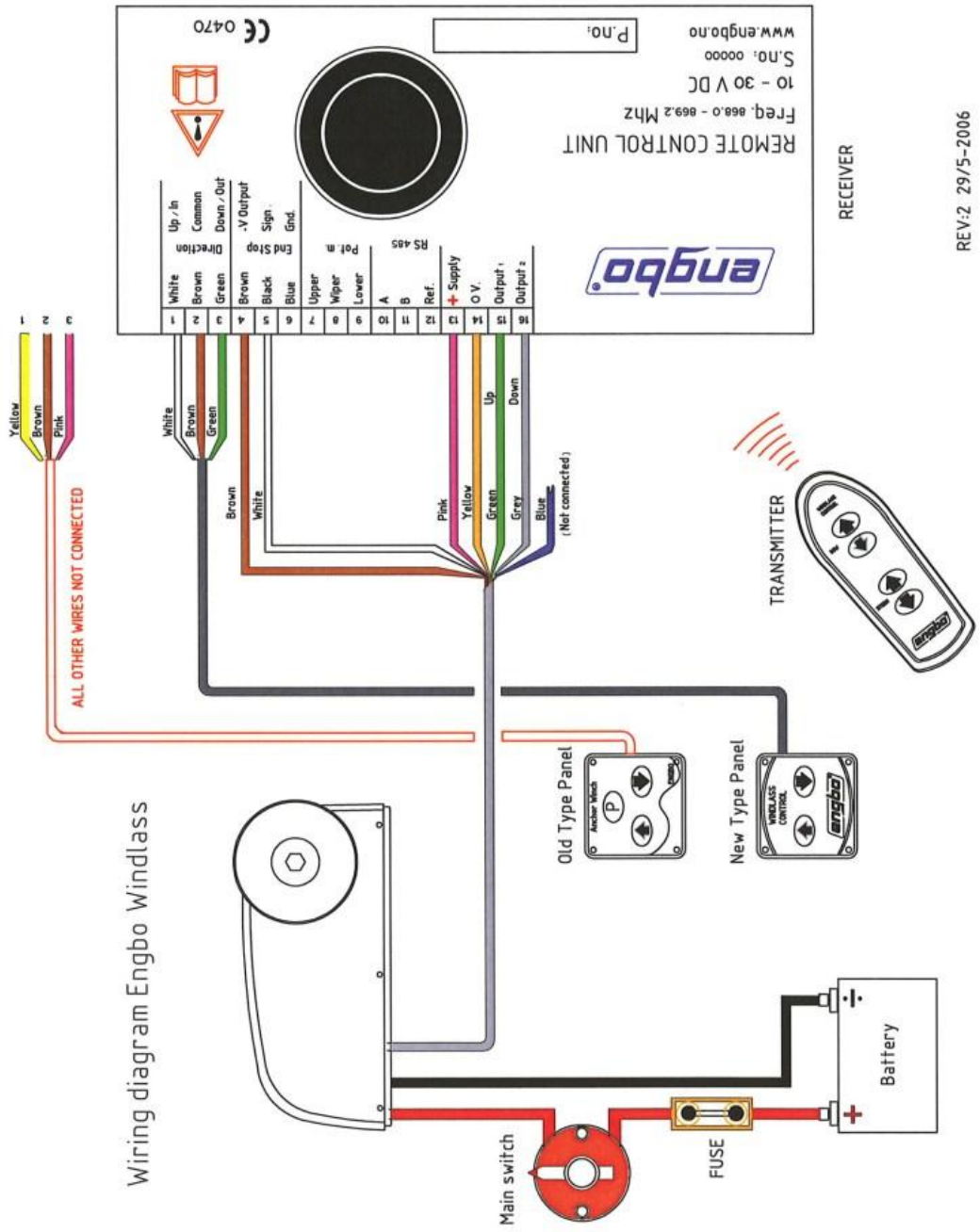
(1) Hvit - Signal til panel/joystick retning 1
(2) Brun - Felles 0V (-)
(3) Grønn - Signal til panel/joystick retning 1
(4) Gul - Positiv (+V) spenningstilførsel ut til joystick
(7) Grå - Spenningsovervåkning
(13) Rosa - Positiv (+V) spenningstilførsel
(14) Gul - 0V (-)
(15) Grønn – Signal til relé, retning 1
(16) Grønn – Signal til relé, retning 2



4.7 Koblingskjema nr. 3 – Engbo vinsjer fram til 2006 (untatt Engbo 33 kjettingvinsj)

VIKTIG!
Ved bruk til Engbo vinsjer produsert t.o.m. 2006 erstatter **RCU** enheten evt. både kretskort og radiomottaker, som reservedel. Den tidligere, blå fjernkontrollen vil ikke kunne benyttes.
Ny modell som beskrevet i denne manual er påkrevet.
Mrk: Fjernkontrollen må kodes opp mot ny **RCU**. Se eget avsnitt.

Vær spesielt oppmerksom på at ved kobling av RCU opp mot gammelt Engbo bryterpanel med 3 brytere vil kun rød bryter (ut) og gul bryter (opp), være aktive. Grønn (P) bryter, temperatur alarm og bakgrunnsbelysning vil ikke være i funksjon.



TILLEGG / APPENDIX K

N Marinbatterilader

S Marina batteriladdar

DK Marinebatterioplader

NL Scheepsacculader

D Ladegerät für Schiffsbatteri

GB Marine battery charger

FIN Akkulaturi

ASKELADDEN



MANUAL

LADIX
230 VAC
LANDSTRØM-
SYSTEM

MAN LADIX 1

LADix™
Det optimale batteriladesystem

LADAC

www.ladix.no
www.ladac.no

VIKTIG!

Ta deg tid til å lese manualen.
Skade på utstyr og personer kan være resultatet dersom utstyret installeres feil.
Er det usikkerhet vedrørende monteringen så ta kontakt med LADAC, en av våre forhandlere eller en autorisert installatør.

INNHOLD Norsk

Gratulerer med valget av LADIX landstrøm 3
Viktig å vite om landstrøm 3
Hva er galvanisk tæring? 3
Før montering av utstyret 4
Greit å vite om blybatterier og lading 4
Montering av inntakskabel 5
Montering av batterilader 6
Montering av el-sentral 6
Montering av 230 V veggkontakt 7
Kobling av LADIX-kontakter 7
"Safety Lock" låseklips 7
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Koblingsskjemaer 11



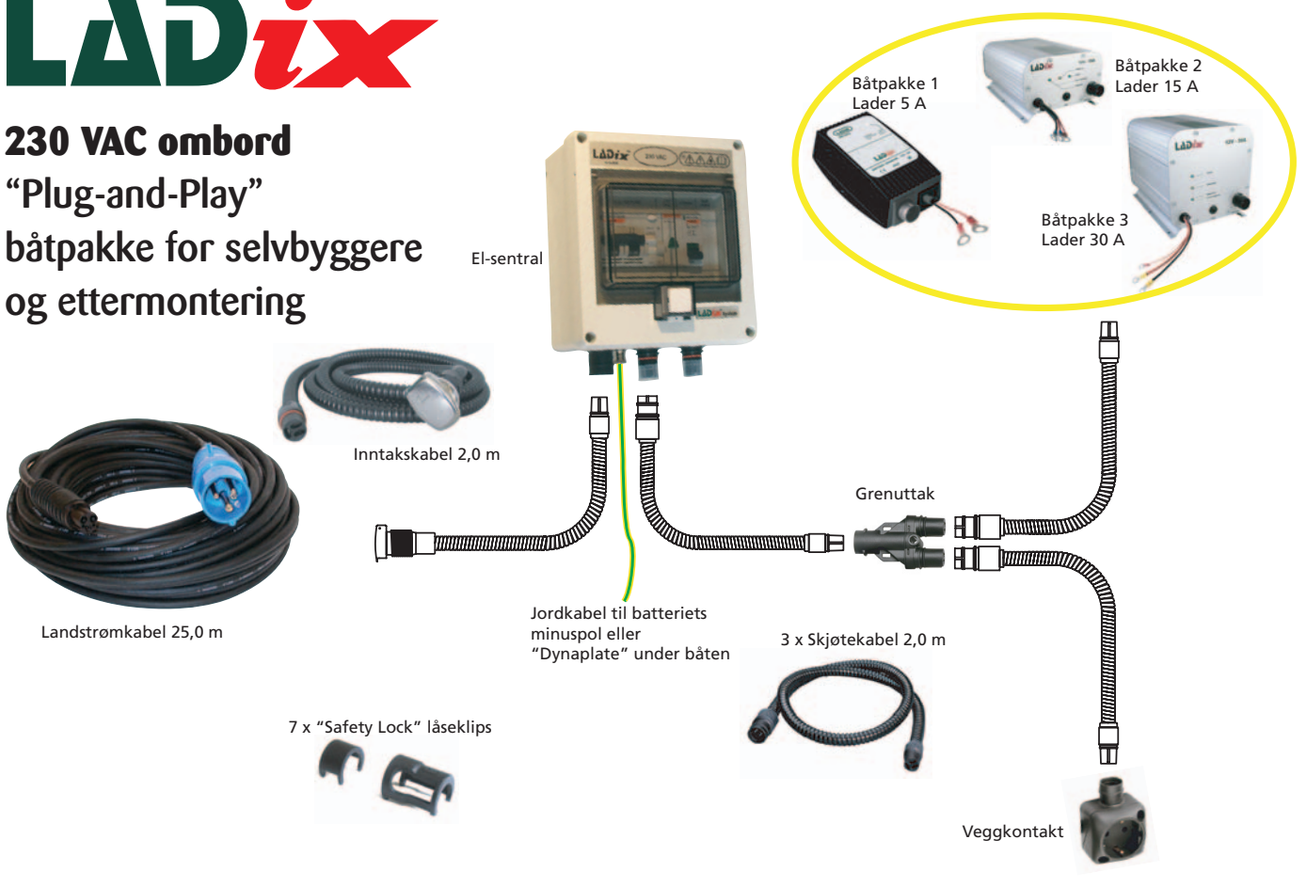
LADIX-systemet er i samsvar med følgende standard:
NS-EN ISO 13297



LADAC har et sertifisert kvalitetssikringssystem iht.
EN29001 (NS-ISO 9001)

LADix

230 VAC ombord
"Plug-and-Play" båtpakke for selvbyggere og ettermontering



Gratulerer med valget av LADIX landstrøm

LADAC har utviklet LADIX-systemet som gjør at man selv kan montere 230 V strømuttak om bord uten å bruke installatør. Takket være faste kabellengder, med godkjente og vanntette plugger, behøver man ikke annet verktøy enn å bore hull for kabelgjennomføring og skru fast utstyret på hensiktsmessige steder om bord. LADIX-systemet oppfyller kravene i standard NS-EN ISO 13297 og er godkjent for montering i båter med skroglengde på inntil 24 meter.

For deg selv og dine båtpassasjerers sikkerhet bør du ta deg tid til å lese denne manualen. Skade på utstyr og personer kan være et resultat dersom utstyret monteres feil. Er det usikkerhet vedrørende montering så ta enten kontakt med LADAC, en av våre forhandlere eller en autorisert installatør.

Båtpakken som du nå har kjøpt gir deg mulighet til å lade båtbatteriet med landstrøm samt at du får ett 230 V uttak ombord. Ved vedlikeholdsbehov er det praktisk å ha nettspenning om bord til bruk av f.eks. verktøy, støvsuger o.l. Har du behov for flere 230 V uttak om bord kan LADIX-systemet utvides etter ønske. Det totale strømforbruket er begrenset til 16 A.

Ved bruk av 230 V spenning om bord, bør du av hensyn til personsikkerheten og galvanisk tæring på båt og utstyr koble en skilletrafo (isolasjonstransformator) til LADIX-systemet.

Viktig å vite om landstrøm

Som vi alle vet representerer strøm i kombinasjon med vann visse farer og utfordringer. Hovedutfordringen heter jording når landstrøm og båtstrøm møter hverandre ved hjelp av en landkabel. Ved feil eller brudd i jordforbindelse kan det oppstå spenninger som i verste fall fører til tap av menneskeliv og/eller alvorlig skade på båt og utstyr.

Med en skilletrafo montert direkte før el-sentral får man et 230 V anlegg om bord som er fullstendig galvanisk skilt fra landstrøm. Det betyr at uansett hvor mye overledning, krypstrøm og andre feil som måtte komme fra landstrøm, så vil skilletrafo levere en helt ren og trygg strøm til båten. Jordledning fra landstrøm skal avsluttes i skilletrafo som etablerer en ny og sikker jordbeskyttelse om bord.

Hva er galvanisk tæring?

Det oppstår spenninger som fører til alvorlige skader på båt og utstyr dersom man ikke isolerer jord fra land med jord i båten ved hjelp av en skilletrafo. Strøm søker mot jord og den ledes som regel best gjennom metaller på vei mot jord. Dette blir det galvaniske spenninger av.

Alle metaller seg i mellom har den egenskap at de produserer noe som heter "galvanisk spenning" når de kommer i kontakt med elektrisk ledende væsker. Saltvann er en slik væske. Metalldeler under båten som er i kontakt med saltvann vil fungere som anoder. Saltvannet vil virke som en elektrolytt, akkurat som væsken inne i et batteri. Metal-

lets galvaniske spenning gjør at det går en strøm mellom saltvannet og metalldelene (anodene) og metallet vil tæres opp til det er borte. Propeller, akslinger, ror og skroggjennomføringer er noen eksempler på viktige deler som garantert vil tæres opp i denne prosessen.

Galvanisk spenning er forskjellig fra metall til metall. Sink har f.eks. lavere galvanisk spenning enn messing og kobber. Metallet med den laveste spenningen tæres mest. Dette er grunnen til at det benyttes offeranoder av sink på skrog og akslinger. Disse forhindrer at vitale deler under båten tæres bort.

ADVARSEL!

Ikke kutt jordlederen mellom land og båt!
Det kan være livsfarlig for mennesker om bord.

Før montering av utstyret

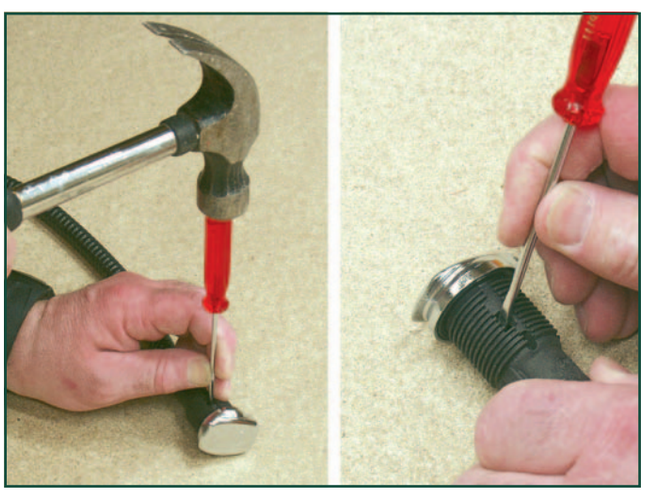
Vær oppmerksom på lengden på kablene før du bestemmer hvor el-sentral, inntakskontakt og batterilader skal plasseres.
Kontroller at innholdet i båtpakken stemmer med følgende liste:

- 1 stk el-sentral
- 1 stk lader
- 1 stk landstrømkabel
- 1 stk kabel med inntakskontakt
- 3 stk skjøtekabler
- 1 stk grenuttak
- 7 stk ”Safety Lock” låseklips
- 1 stk veggkontakt
- 1 stk pose med monteringsutstyr

VIKTIG!

Lengden på inntakskabel og skjøtekabler er 2 meter. Påse at el-sentral, lader og inntakskontakt monteres innenfor denne avstanden.

Inntakskontakten er utstyrt med to dreneringshull som er tettet fra fabrikken. Med en flat skrutrekker ”bankes” de små lokkene ut så det blir hull for drenering av fuktighet inne i kontakten. Se bilde nedenfor.



Legg inntakskontakten på et plant underlag. Bank gjentagende ganger forsiktig med en skrutrekker med 5-6 mm flat klinge. Ikke bank hardt, da man kan skade de elektriske kontaktpinnene inne i kontakten. Pirk ut plastrester i hullet med skrutrekkeren til slutt.

Greit å vite om blybatterier og lading

Batterispenning

Batteriet består av svovelsyre og bly. Svovelsyren er blandet ut med vann i et bestemt forhold som danner en elektrolytt. Elektrolytten gir hver celle en hvilespenning på 2,13 V. Et ”friskt” batteri har derfor en hvilespenning på 12,7 V, mens et ”flatt” batteri har 11,7 V.

Selvutlading

Batterier selvutlader og må vedlikeholdslades. Batteriets helse påvirkes av flere faktorer, bl.a. temperaturen. 100 % batterikapasitet er gitt ved +20 °C. Lavere temperaturer gir mindre ytelse.

Lading

Et batteri skal ha en ladespenning på 14,4 V ved +20 °C for å opprett-holde kapasiteten ved normal drift. Spenningen ved vedlikeholdslading skal være 13,5 V.

Destruktiv dyplading

Dersom man forsøker å lade et batteri som ikke er i stand til å ta imot lading, vil det ”koke” og utvikle eksplosive gasser som ved en gnist kan antenne. Gamle batterier som har under 7,5 V hvilespenning må ikke lades opp pga. gassdannelse. De fleste LADAC-ladere vil ikke starte lading under dette spenningsnivå. LADAC-ladere er selvregulerende og tar hensyn til hva batteriet kan motta av ladespenning.

Sjekkliste

- Kontroller alder på batteriet, det er datostemplet.
- Kontroller batteriets hvilespenning.
- Sjekk batteriets temperatur ved lading.
  - Stiger denne til over +40 °C, stopp ladingen.
  - Batteriet er da ødelagt.

Vedlikehold av lader og batterier

Laderen er vedlikeholdsfri. Alle batterier bør ha ettersyn minimum hver måned for å oppnå best mulig sikkerhet.
Laderens ladeforløp er slik at batteriene holdes fulladet praktisk talt uten mer vannforbruk enn det som er normal fordampning.

ADVARSEL!

Monter ikke laderen i brannfarlig miljø. Lad ikke opp et skadet batteri.

Under lading utvikles knallgass som er meget eksplosjonsfarlig. En liten gnist er nok til å antenne gassen. Bruk derfor aldri åpen ild, sigaretter eller lignende i nærheten av batteriet.

Syren i batteriet er etsende og angriper klær, metall og lakk. Dersom man søler syre, skal det vaskes og skylles med rikelige mengder vann. Syresprut i øynene kan være skadelig. Skyll med vann og oppsøk lege umiddelbart.

Bly og andre kjemikalier som blir brukt i batterier er meget giftige. Vask hud og hender skikkelig etter arbeid med batterier.

Montering av inntakskabel

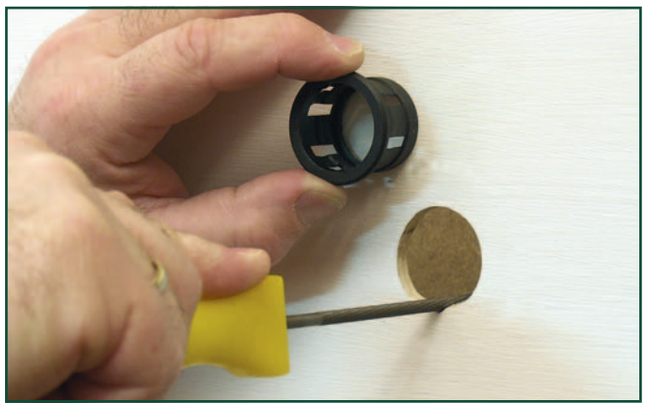
Bestem hvor det skal bores hull for montering av inntakskontakt.

Bor et hull med 29 mm hullsag.



Fil et styrespor for låsetappen på ekspansjonsringen med en 4 mm rundfil.

Låsetappen er ikke stor, så sporet må ikke lages for stort. Prøv ekspansjonsringen i hullet og sjekk at den sitter trangt.



Stikk ekspansjonsringen inn i dekkplaten av metall.

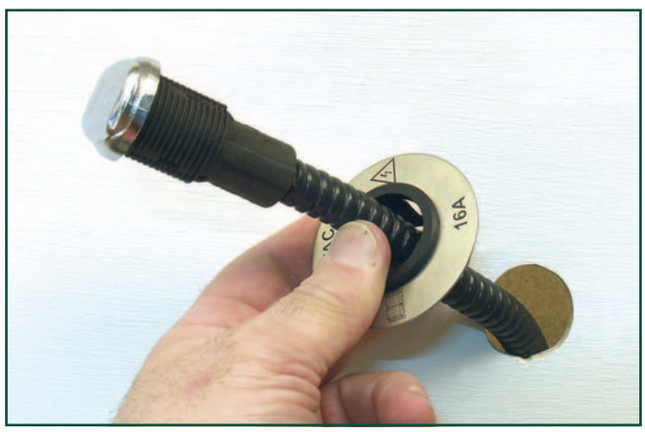
Tre inntakskabelen inn i ekspansjonsringen.

Skru ekspansjonsringen inn på gjengene på inntakskontakten, men ikke dra så hardt til at ekspansjonsringen begynner å utvide seg.

Tre kabelen gjennom hullet i skroget fra utsiden og inn.

Press ekspansjonsringen inn i hullet. Påse at styretapp treffer i styrespor og at dekkplaten ligger plant med skroget.

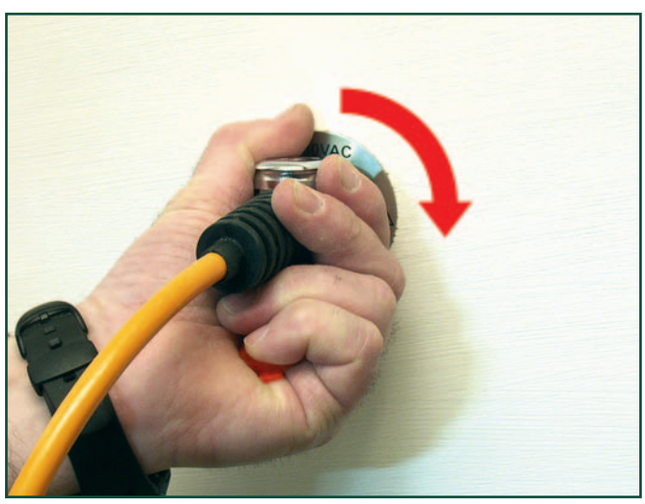
Ekspansjonsringen skal utvide seg og låse fast kontakten fra baksiden.



Stikk pluggen på den oransje landstrømkabelen inn i inntakskontakten.

Hold godt i pluggen og vri den med urviseren til du kjenner at ekspansjonsringen utvider seg og strammer til på baksiden.

Avslutt tilstrammingen slik at lokket på inntakskontakten vender med hengslene opp.



Montering av batterilader

Batteriladeren tåler fuktighet, men bør likevel monteres på et tørt sted ombord. Laderen bør plasseres nærmest mulig batteriet. Laderen må festes godt til skott eller lignende med skruer i alle festehull.

Båtpakkene leveres med tre forskjellige batteriladere avhengig av kapasiteten til batteriet man har i båten. Den minste er en 5 A lader, den mellomste en 15 A og den største er en 30 A lader.

Skru fast kablene til batteripolene, rød til plusspol og sort til minuspol.

Fra 15 A og 30 A laderene kommer det to røde kabler. Den tynne er en sensorkabel som måler batteristatus, mens den tykke er selve ladekabelen. Den tynne rød kabelen bør kobles direkte til forbruksbatteriets plusspol.

Har båten kun ett batteri kobles også den tykke rød kabelen direkte til plusspol.
Dersom båten har to eller flere batterier, startbatteri og forbruksbatteri, kobler man disse enten med skillediode, ladeskillerelé eller batterivender i forbindelse med batteriene. Se koblingsskjemaer på side 11.

VIKTIG!

Det skal være montert en sikring på ladekabelen nær batteriet.



Montering av el-sentral

El-sentralen tåler fuktighet, men bør likevel monteres på et tørt sted ombord.
Skru el-sentralen godt fast til skott eller lignende.
El-sentralen kan også monteres innfelt ved bruk av egnet frontplate (ekstrautstyr).

På undersiden av el-sentralen er alle tilkoblinger samlet. Det er én inntakskontakt og to spenningsuttak. Det ene uttaket gir fast spenning, mens det andre går via bryter i el-sentralen merket "H.Water".
Den blanke jordkabel skruen er innvendig tilkoblet en galvanisk isolator som minsker risikoen for galvanisk tæring.

VIKTIG!

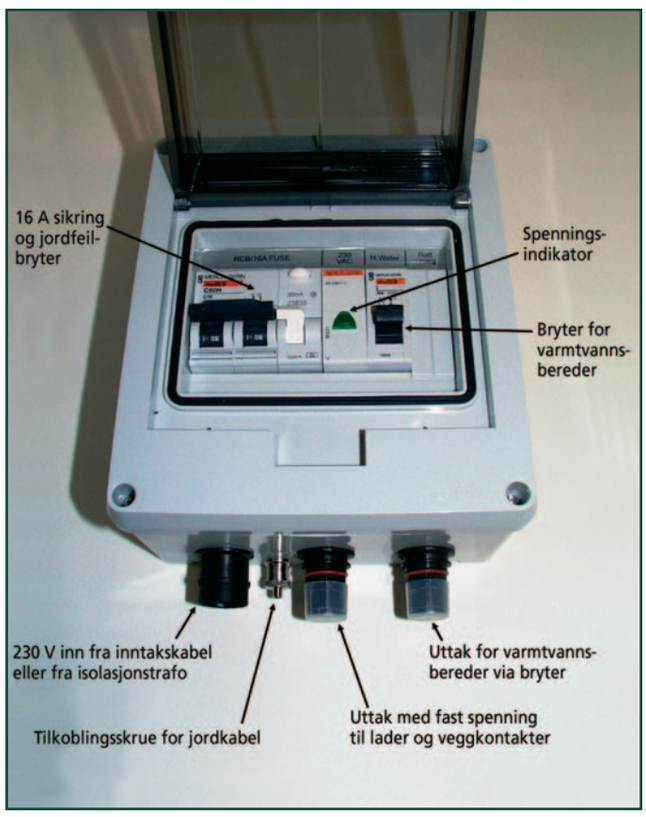
- *For en-polet elektrisk anlegg:* ***jordkabel*** *kobles til minuspol på batteriet.*
- *For to-polet elektrisk anlegg:* ***jordkabel*** *kobles til en "dynaplate" under båten.*
- *For anlegg med isolasjonstrafo:* ***jordkabel*** *brukes ikke.*

Inntakskabelen stikkes inn i den venstre pluggen under el-sentralen.
På grunn av vibrasjon skal alle plugger sikres med en "safety lock".
Klem en "safety lock" over forbindelsen mellom inntakskabel og el-sentral.

VIKTIG!

~~*Dersom det av sikkerhetsmessige grunner ønskes tilkoblet en skilletrafo, skal denne kobles til inntakskabelen direkte foran el-sentralen.*~~

Koble en skjøtekabel mellom el-sentral og batterilader. Husk å bruke "safety lock" over pluggene.
Fest kabler på hensiktsmessige steder i båten med festeklammer.



Montering av 230 V veggkontakt

Den medfølgende veggkontakten skrus fast på et hensiktsmessig sted med 2 skruer. Man trenger ikke å åpne kontakten for å skru den fast.

Avstanden fra el-sentral og grenuttak bestemmes av lengden på skjøtekabelen man har til rådighet.
Flere lengder leveres som ekstrautstyr.



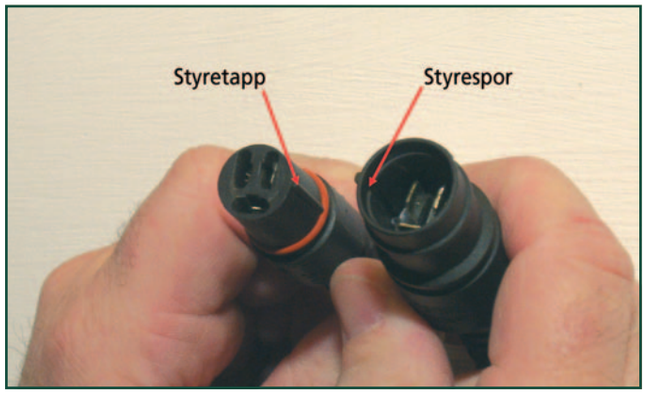
Kobling av LADIX-kontakter

Ikke bruk makt når LADIX-kontaktene skal kobles i hverandre.
Før kontaktene mot hverandre og vri dem forsiktig til styretappen føles på plass i styresporet.

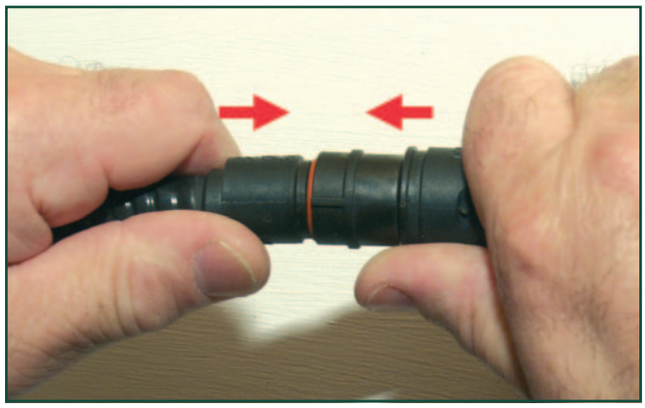
Ta gjerne litt spytt på pakningen for at kontaktene skal gli lettere inn i hverandre uten at pakningen forskyves.

VIKTIG!

Ikke bruk noen form for kjemikalier (f.eks. CRC-spray eller lignende). Dette kan skade pakningen.



Skyv kontaktene lett sammen inn mot den røde pakningen.
Press deretter hardt de siste 3 mm.
Avslutt med å klemme over et låseklips.

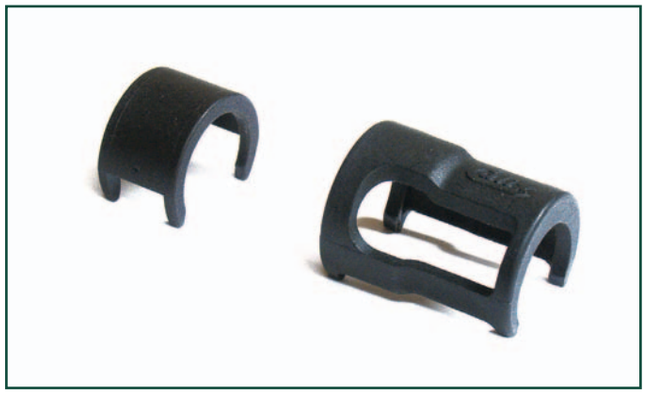


"Safety Lock" låseklips

På grunn av vibrasjon skal alle kabelforbindelser sikres med en "safety lock". Klem en "safety lock" over alle pluggforbindelser.

Det lille klipset er for "utgående" plugger.
(dvs. ut fra el-sentral og ut fra grenuttak).

Det store klipset brukes for "inngående" plugger og over pluggen mellom to skjøtekabler.



Bruk av Ladix om bord

Ved ankomst til havn:

- Koble fra strømbrukere om bord ved å slå ned sikringene i el-sentralen.
- Plugg først inn landstrømkabelen i inntakskontakt om bord.
- Deretter plugges landstrømkabelen til 230 V uttak på land.
- Slå opp sikringene i el-sentralen.
- Anlegget er klart til bruk.

ADVARSEL!

Dersom jordfeilbryter slår ned hovedsikringen automatisk er det jordfeil på det elektriske anlegget. Anlegget må ikke brukes før feilen er funnet og utbedret.

Ved avreise fra havn:

- Koble fra strømbrukere ombord ved å slå ned sikringene i el-sentralen.
- Trekk først ut pluggen fra 230 V uttak på land.
- Deretter trekkes landstrømkabelen ut av inntakskontakten om bord.
- Sørg for at det er beskyttelseslokk over inntakskontakten om bord.
- Sjekk landstrømkabelen for skader, og forsikre deg om at kontaktene inne i pluggene er rene og tørre.
- Oppbevar kabelen på et tørt sted om bord hvor den ikke kan skades.

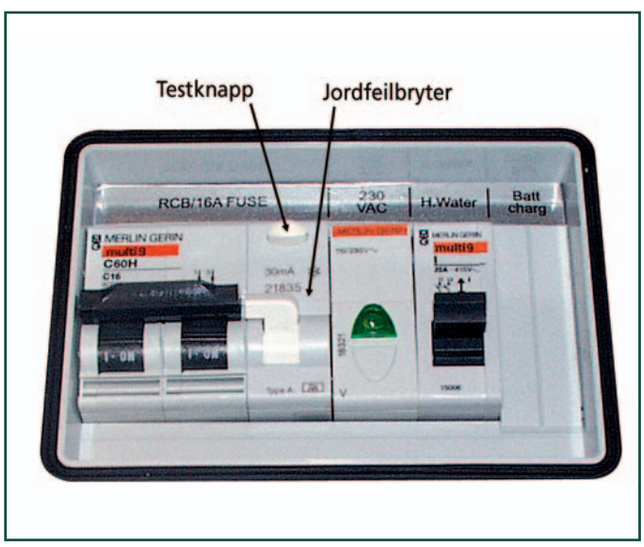
El-sentral

I tillegg til hovedsikring med jordfeilbryter er el-sentralen utstyrt med en indikator som viser at det kommer 230 V inn til el-sentralen.

Det er to spenningsuttak, ett med fast spenning og ett via bryter i el-sentralen. Bryteruttaket er hensiktsmessig å bruke til varmtvannstank.

VIKTIG!

Jordfeilbryteren er utstyrt med en test-knapp som bør sjekkes regelmessig for å forsikre seg om at jordfeilbryteren er i orden.



Batteriladerens indikatorer

5 A lader

Laderen er utstyrt med 1 LED-indikator som viser følgende status:

Rødt/oransje lys:	Hovedlading	Lading av batteri med maksimal strøm til batteriet når en spenning på 14,7 V. (ref. laderens bruksanv.)
Gult lys:	Sluttladefase	Tidsstyrt lading ved 14,7 V i 2 timer etter hovedlading.
Grønt lys:	Batteri fulladet	Spenningen senkes til 13,7 V etter at sluttlading er ferdig. I denne tilstanden kan laderen være tilkoblet i lang tid.



10 A og 15 A lader

Laderene er utstyrt med 3 LED-indikatorer som viser følgende status:

LED 1	Grønt konstant lys	Lading pågår
	Grønt blinkende lys	Batteri fulladet
LED 2	Gult konstant lys	230 VAC tilkoblet
LED 3	Grønt konstant lys	Vedlikeholdslading pågår.

Vedlikeholdslading med lavere ladespenning starter automatisk etter 16 timers lading.



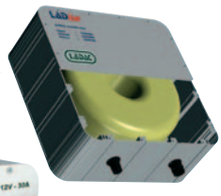
Sikkerhet ved tilkobling av lader til batteriene

Ladeutgangen er beskyttet mot kortslutning av ladekabler og polvending av batteriet.
Laderen starter ikke ladeprosessen dersom batteriets spenning er under 7,5 Volt. (ca 1 V for 5 A laderen).
Laderen trekker ikke strøm fra batteriet når 230 V nettet frakobles.
Under lading kan batterier avgi eksplosive gasser. Det er derfor viktig å unngå gnister i umiddelbar nærhet.

Oversikt over LADIX komponenter

LADIX er et modulbasert system som gjør det mulig å bygge systemet videre etter hvert som det blir behov. LADIX tilbyr følgende komponenter som man kan bruke i tillegg til båtpakken som man startet med. Komponentene får man kjøpt hos den lokale båtutstyrsforhandleren.


0512IX


ISO3500IX


3012IX


1512IX


SOL1315


230-05-01-IX


230-05-02-IX


EL230-05-07


EL230-05-06


EL230-05-04


EL230-05-03


230-05-13-IX


230-02-07-IX


230-02-08-IX


230-11-02-IX


230-11-03-IX


230-11-04-IX


230-02-04-IX


230-02-05-IX


230-02-06-IX


230-02-32-IX


230-02-31-IX


230-02-30-IX


230-02-20-IX


230-02-01-IX (hvit)


230-02-03-IX (stainless)


230-02-02-IX (alu)

	Artikkelnr.	Teknisk info	
	ISO3500IX		Isolasjonstransformator 16A
LADER	0512IX		12V 5A Batterilader-switchmode
	1512IX		12V 15A Batterilader-automat
	3012IX		12V 30A Batterilader-automat
RELÉ	SOL1315		Ladeskillerelé 12V 100A
	SOL1315-200		Ladeskillerelé 12V 200A
EL-SENTRAL	230-05-01-IX	2 utganger	El-Sentral utenpåliggende - grå
	230-05-02-IX	3 utganger	El-Sentral utenpåliggende - grå
	230-05-03-IX	3 utganger	El-Sentral innfelt - sort
	230-05-04-IX	3 utganger	El-Sentral innfelt - mahogany
	230-05-06-IX	3 utganger	El-Sentral innfelt - hvit
	230-05-11-IX	3 utganger	El-sentral innfelt. m/aggr.v. - hvit
	230-05-12-IX	3 utganger	El-sentral innfelt. m/aggr.v. - sort
	230-05-13-IX	3 utganger	El-sent. innf. m/aggr.v. - mahogany
KONTAKTER	230-02-01-IX	Enkel	230V Uttak innfelt - hvit
	230-02-02-IX	Enkel	230V Uttak innfelt - alu
	230-02-03-IX	Enkel	230V Uttak innfelt - stainless
	230-02-04-IX	Enkel	230V Uttak utenpåliggende m/lokk
	230-02-05-IX	Dobbel	230V Uttak utenpåliggende m/lokk
	230-02-06-IX	Dobbel	230V Uttak innfelt m/lokk x2
	230-02-07-IX	Enkel	230V Uttak (230V) innfelt - mini
	230-02-08-IX	Enkel	230V Uttak innfelt- mini VK
	230-02-20-IX	12/230/TV	2-ram uttak innfelt 12V/230V/TV grå
	230-11-01-IX	For 07/08	Ramme med lokk - hvit
	230-11-02-IX	For 07/08	Ramme med lokk - krom blank
	230-11-03-IX	For 07/08	Ramme med lokk - sølv matt
	230-11-04-IX	For 07/08	Ramme med lokk - brun



230-316-IX



230-BAG



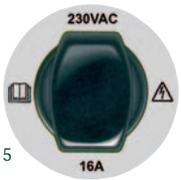
230-01-12



230-15-25



CAL1556664



CAL1762515



CAL1556504



CAL1556724



CAL1762120



CAL1555190



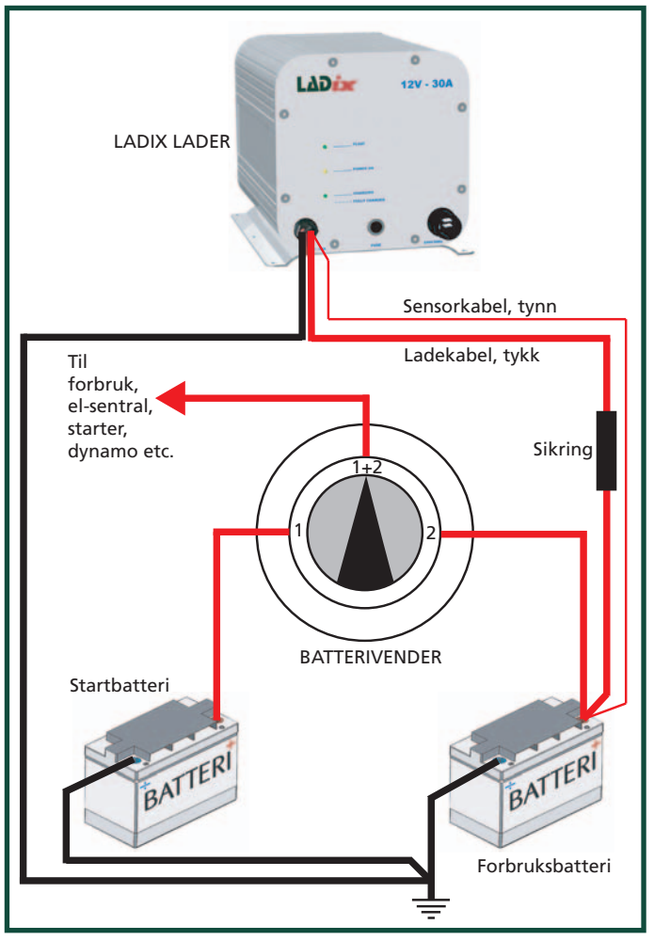
CAL1453714

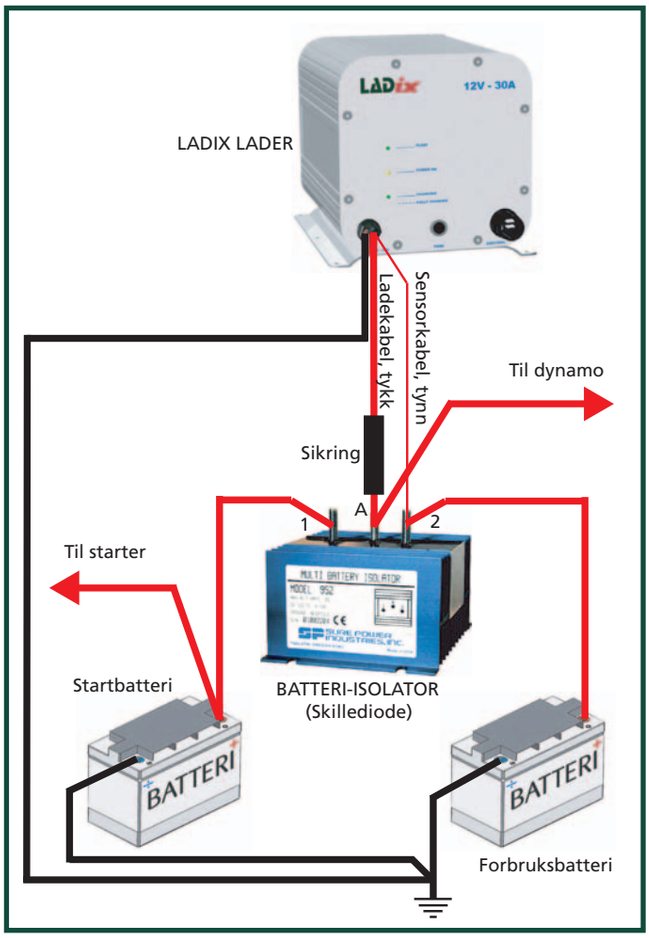


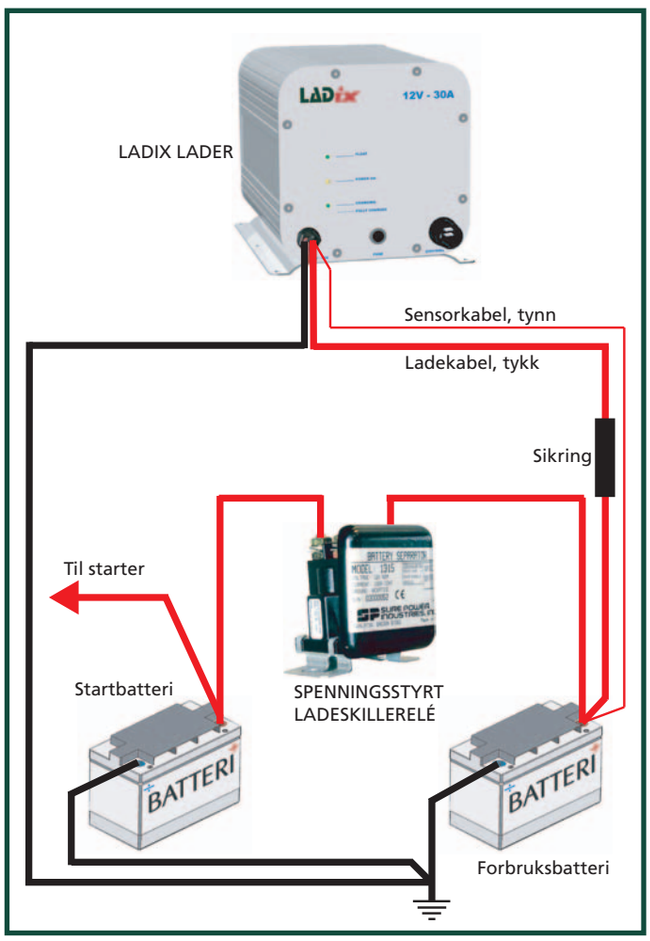
CAL1762413

FRA LAND	230-15-25	Pur 25,0 m	Landsrømskabel 1,5 mm2 - gul
	230-25-25	Pur 25,0 m	Landsrømskabel 2,5 mm2 - gul
	CAL1556504	MS 25,0 m	Landstrømskabel sort med CEE
	CAL1556724	MS 25,0 m	Landstrømskabel orange med CEE
	230-01-12	Pur 30 cm	Adopter Schuko - CEE gul
	230-BAG		Ladix Shore Power Bag
INNTAK	230-316-IX		Inntak krom IP67 med Ladix kopling
	CAL1762505	MK 0,5 m	Inntakskabel mini-kontakt - sort
	CAL1762515	MK 1,5 m	Inntakskabel mini-kontakt - sort
	CAL1556690	MK 1,0 m	Inntakskabel mini-kontakt - krom
	CAL1556664	MK 2,0 m	Inntakskabel mini-kontakt - krom
SKJØTEKABEL	CAL1762105	SK 0,5 m	Skjøteledning
	CAL1762110	SK 1,0 m	Skjøteledning
	CAL1762115	SK 1,5 m	Skjøteledning
	CAL1762120	SK 2,0 m	Skjøteledning
	CAL1762130	SK 3,05 m	Skjøteledning
	CAL1762140	SK 4,0 m	Skjøteledning
	CAL1762150	SK 5,0 m	Skjøteledning
	CAL1762160	SK 8,0 m	Skjøteledning
	CAL1762165	Sk 12,0 m	Skjøteledning
MONTERING	CAL1502040		Monteringssats
	CAL1453714		Safety-lock stor
	CAL1555190		Safety-lock liten
	CAL1762413	GU403	Grenuttak

LADix™
Det optimale batteriladesystem







LADix™
Det optimale batteriladesystem

LADAC



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www.ladac.no

TILLEGG / APPENDIX L

N	**Toalett**
S	**Toalett**
DK	**Toilet**
NL	**Toilet**
D	**Toilette**
GB	**Toilet**
FIN	**WC**

Manual Toilets

Model:
29120-2000
Manual Toilet,
Regular Bowl





Model:
29090-2000
Manual Toilet,
Compact Bowl

Applications

You may install JABSCO Regular and Compact bowl manually operated marine toilets in both power and sailing craft, either above or below the waterline, for use on sea, river, lake or canal.

Your installation may discharge the waste either overboard (provided that your national and local regulations allow this), or into a treatment system or into an on-board holding tank (U.S.C.G. Marine Sanitation Devices Type I, II and III).

⚠ ***JABSCO manual toilets are designed specifically for marine use. Consult ITT Industries Jabsco for advice about possible non-marine applications.***

Optional re-assembly by installer for left hand operation.



Features

Design

- Reversible pump mounting allows re-assembly for left hand operation by installer.
- Powerful self-priming, double-acting piston pump.
- Strong swirl action for efficient flushing.
- Crevice free contours and skirted base for added cleanliness and hygiene.
- Contoured handle and conveniently positioned flush control lever for ease of use.
- Angled pump housing and long stroke for easier pumping.
- Spring assisted top valve closure for easier priming.
- Automatic vacuum breaker operated by flush control lever for easier bowl emptying.
- Constant 38mm (1½") bore waste path minimises blockages.
- Aortic joker valve combines full 38mm (1½") bore with automatic back-flow prevention.
- Multi-angle discharge elbow for ease of installation.
- Accessible mounting points for faster installation.
- All fastenings face front or top for superbly simple servicing without need for special tools.
- Renewable external seal housing for quick, clean replacement of seal and piston rod guide.
- Positively located gaskets ensure correct re-assembly.
- Dual function base plug combines winter drain point with easy cleaning access.

Materials

- Luxury wooden seat and cover with tough baked enamel coating.
- Hygienic white ceramic bowl for ease of cleaning.
- Pump and base moulded in ABS or polypropylene with selected parts in acetal resin, fitted with 316 passivated stainless steel fastenings, brass weights and neoprene seals and gaskets.

Performance

- Flushing pump self-primes from dry up to 1 metre (3ft) below the base.
- Waste pump discharges up to 3 metres (9ft) above the base.

Dimensions

- See the Dimensional Drawing on the back page.

JABSCO Installation Instructions

YOUR TOILET is just one part of a system. Correct installation of the whole system is essential if you want the toilet to perform properly, operate reliably and safely, and give satisfactory length of life. The toilet is delivered assembled for right-handed operation. If you wish, both Regular and Compact Bowl models may be re-assembled with the pump on the left hand side. The seat and lid is delivered boxed and unfitted for its protection.

NB: Key numbers, e.g. ('Key 31'), are references to the exploded view diagram on the back page.

1. Re-assembly for left hand use

If you wish to change the pump mounting from right to left hand, do so before installing the toilet.

- ▼ Pull off the hose (key 4) that runs from the pump to the bowl.
- ▼ Remove the 4 screws (key 31) that secure the pump assembly to the base.
- ▼ Lift off the pump assembly and leave the base valve gasket (key 16) on its 3 locating pegs.
- ▼ Remove the 4 bolts (key 11) that secure the bowl to the base.
- ▼ Rotate the bowl 180° and re-secure it, using the nylon washers (key 14) to protect the ceramic from the stainless steel washers and nuts (key 13,12).
- ▼ Rotate the pump assembly 180° and re-secure it.
- ▼ Rotate the push-fit intake elbow (key 6) 180° and refit the hose between the pump and the bowl.

2. Location

- ▼ Select a location that will give sufficient clearance all round and above the toilet. Ensure that there is room to operate the pump and that there is access to the drain plug at the end of the base.
- ▼ The mounting surface must be flat, rigid and strong enough to support a man's weight and should be at least 50mm (2") wider and 50mm (2") deeper than the base of the toilet.
- ▼ You will need sufficient clearance below the mounting surface to be able to secure the mounting bolts.
- ▼ The seat and lid should be able to swing up and over at least 110°, so that they will not fall forward when the craft heels or pitches. When they are swung up they must be supported so that the hinges are not strained

3. Mounting

YOU WILL need:

- ☐ *4 x 8mm ($^5/_{16}$") diameter stainless steel bolts of length to suit the thickness of the mounting surface.*
- ☐ *4 stainless steel nuts, preferably self-locking. If you do not use self-locking nuts you will need some nut-locking compound.*
- ☐ *8 large stainless steel washers not more than 21mm ($^{13}/_{16}$") diameter.*
- ☐ *A small tube of white silicone sealant.*

- ▼ Offer up the toilet in the selected position and, using the holes in the base as a guide, mark the positions for the 4 bolt holes on the mounting surface. Remove the toilet and drill 4 vertical holes of 9mm diameter through the mounting surface.
- ▼ Apply a bead of white silicone sealant to the outer rim of the bottom base.
- ▼ Bolt down the toilet and tighten the fastenings securely. If you are not using self-locking nuts, use nut-locking compound.

4. Through Hull Fittings

YOU WILL need:

- ☐ *19mm ($^3/_4$") bore seacock for the flushing water inlet, and, if you are discharging the waste overboard, a 38mm ($1^1/_2$") bore seacock for the waste outlet.*
- ▼ Follow the seacock manufacturer's own instructions concerning materials and methods of installation.
- ▼ Ensure the inlet seacock is positioned where it will be below the waterline at all times when the craft is underway, and also ensure that any outlet seacock is both aft of, and higher than, the inlet seacock.

HAZARD RISK:
Through Hull Fittings.

If the installation of the toilet results in it being connected to ANY through-hull fitting that may possibly be below the waterline at ANY time, whether when the craft is at rest, underway and heeling or rolling or pitching, you must install the toilet in accordance with these Installation Instructions. If you do not, water may flood in, causing the craft to sink, which may result in loss of life.

FOLLOW THESE INSTRUCTIONS!

HAZARD RISK:
Accidental Damage.

If the toilet is connected to ANY through-hull fittings and if the toilet or pipework is damaged, water may flood in causing the craft to sink, which may result in loss of life.

Therefore, if you are making connections between the toilet and ANY through-hull fittings that may possibly be below the waterline at ANY time, full bore seacocks MUST be fitted to those hull fittings, to allow them to be shut off.

The seacocks MUST also be positioned where they are easily accessible to all users of the toilet. If, for any reason, it is not possible to do this, then secondary full bore marine quality valves MUST be fitted to the hoses where they are easily accessible.

USE SEACOCKS!

CAUTION: Use lever operated, full bore marine seacocks and valves. The use of screw-down gate valves is not recommended.

5. Pipework - selection of correct method

YOU MUST select the correct method for the inlet pipework from 2 options and for the outlet pipework from 4 options, according to whether the toilet is above or below the waterline, and to whether it discharges the waste overboard or into an on-board holding tank.

HAZARD RISK:
Pipework Becomes Loose

If the toilet is connected to ANY through-hull fittings and if the pipework becomes disconnected, either from a through-hull fitting or seacock, or from the toilet or any secondary valve, water may flood in and may cause the craft to sink, which may result in loss of life.

Therefore the ends of ALL flexible hoses fitted directly or indirectly between the toilet and ANY through-hull fitting that may possibly be below the waterline at ANY time, MUST be secured to the hose tails to which they are connected, using two stainless steel worm-drive hose clips.

USE HOSE CLIPS!

Installation Instructions

5.1 Pipework - General instructions for all options

YOU WILL need:

- ☐ *Spiral reinforced smooth bore flexible hoses for both the 19mm (3/4") id inlet and the 38mm (1 1/2") id outlet pipework*
- ☐ *Two stainless steel worm-drive hose clips for every hose tail connection (4, 6 or 8).*
- ▼ Secure the hose runs so that the hoses cannot move and chafe, and so that they do not exert any leverage on the hose tail fittings to which they are connected, as this may cause adjacent joints to leak.
- ▼ Avoid sharp bends in the hoses that may cause them to become kinked.
- ▼ Keep all pipework lengths as short as possible, whilst complying with these instructions. Unnecessary inlet or outlet hose length just makes the toilet harder to pump.
- ▼ If it is difficult to fit the hose onto the hose tails of the toilet or seacocks, lubricate it with water, or soften the hose by dipping the end of it in hot water.

⚠ ***CAUTION: Do not apply flame to the hose. Do not apply flame or any heat to the plastic hose tails on the toilet. Do not use oils, greases or synthetic lubricants. Do not apply sealing compounds to any hose connections. Do not over tighten hose clips. Any of these actions may result in cracking or breakage of the plastic parts of the toilet.***

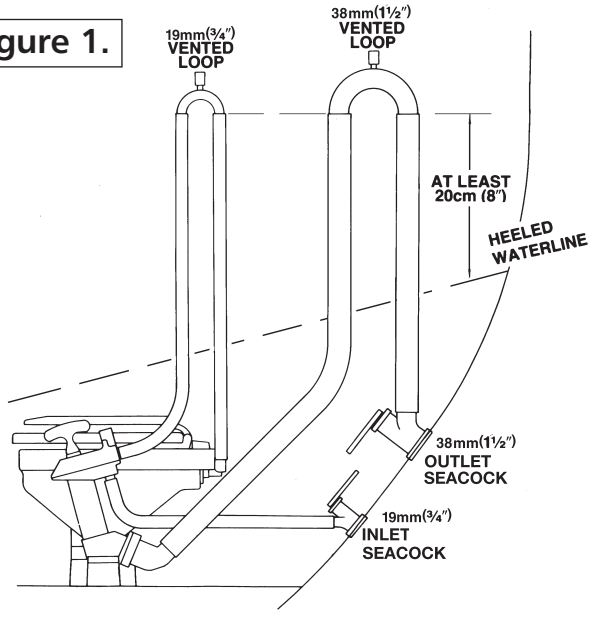
- ▼ Secure the ends of all hoses to the hose tails with two stainless steel worm-drive hose clips, ensuring that all inlet connections are airtight and that all outlet connections are watertight.
- ▼ The Discharge Elbow (key 34) may be rotated 360° to suit your installation. Always slacken the 2 securing screws, adjust the discharge elbow to the required position and re-tighten the 2 securing screws BEFORE you connect the hose to it.

⚠ ***CAUTION: Failure to follow this procedure may result in leaks between the discharge elbow and the pump cylinder.***

5.2 Inlet Pipework - 2 options

Option 1: Toilet below the waterline

Figure 1.



YOU MUST fit a 19mm (3/4") Vented Loop fitting, Jabsco part number 29015-0000.

- ▼ Run the inlet hose by the most direct route from the inlet seacock to the flushing pump inlet tail.
- ▼ Remove the white hose supplied with the toilet, which connects the flushing pump outlet tail to the elbow (key 6).
- ▼ Rotate the intake seal (key 5) so that the elbow points upwards.
- ▼ Replace the white hose with a longer length of 19mm (3/4") id hose and arrange it to form an anti-syphon loop whose highest point is at least 20cm (8") above the highest possible waterline, and fit the Vented Loop at the highest point.
- ▼ Secure the ends of all hoses with two stainless steel worm-drive hose clips.

⚠ ***CAUTION: Do not position the ventilated anti-syphon loop between the inlet seacock and the flushing pump inlet, as it will make the flushing pump difficult to prime, harder to pump and may prevent it from working at all.***

HAZARD RISK:
Bowl Rim Below Waterline

If the toilet is connected to ANY through-hull fittings, and if the rim of the bowl falls below the waterline, water may flood in causing the craft to sink, which may result in loss of life.

Therefore, if the rim of the toilet is less than 20cm (8") above the waterline when the craft is at rest, or if there is ANY possibility that the rim of the bowl may be below the waterline at ANY time, a ventilated anti-syphon loop MUST be fitted in any pipework connected to a through-hull fitting, irrespective of whether inlet or outlet.

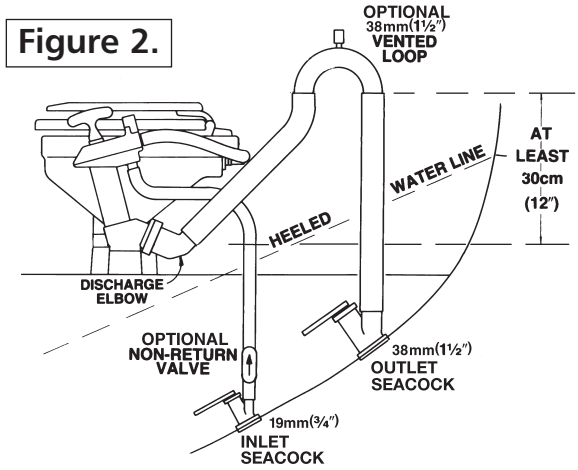
USE VENTED LOOPS!

SPECIAL NOTE 1: The smaller bore inlet pipework is more hazardous than the larger outlet pipework. Unless there is a ventilated anti-syphon loop in the inlet pipework, water will flow into the bowl whenever both the inlet seacock is open and the rim of the bowl is below the actual waterline. Although moving the Flush Control Lever (key 23) to the "Shut" position will restrict the flow, this lever CANNOT be relied upon as a shut-off valve.

SPECIAL NOTE 2: Making a loop in the hose without fitting a vent may be just as hazardous as no loop at all, because water may syphon over a loop. It is the vent that actually prevents the syphon.

Option 2: Toilet always above the heeled waterline

Figure 2.



YOU MAY need A 19mm (3/4") non-return valve, Jabsco part number 29295-0011

- ▼ Run the inlet hose by the most direct route from the inlet seacock to the flushing pump inlet tail.
- ▼ For maximum convenience of use, install a 19mm (3/4") in-line non-return valve next to the inlet seacock, which will ensure that the pump remains primed in between usages.

5.3 Outlet Pipework - 4 options

Option 1: Toilet below the waterline and discharging overboard.

(See Figure 1 on Page 3)

YOU MUST fit a 38mm (1½") Vented Loop fitting, Jabsco part number 29015-0010.

- Arrange the outlet hose to form a loop which is at least 20cm (8") above the highest possible waterline, and fit the vented loop at the highest point.

Option 2: Toilet above the waterline, and discharging overboard.

(See Figure 2 on Page 3)

YOU MAY fit a 38mm (1½") Vented Loop fitting, Jabsco part number 29015-0010.

- Run the outlet hose up from the discharge elbow to form a loop at least 30cm (12") higher than the discharge elbow.
- If you fit a vented loop at the top of the hose loop this will ensure that you can keep some water in the base of the toilet without risk of it being siphoned away.

Option 3: Toilet waste discharging into holding tank, top of holding tank above discharge elbow at anytime.

(See Figure 3 below)

YOU MUST fit a 38mm (1½") Vented loop fitting, Jabsco part number 29015-0010.

- If there is ANY possibility that the discharge elbow may be below the top of the tank at ANY time, a ventilated anti-syphon loop must be fitted in the outlet pipework to ensure that the contents of the tank do not syphon out through the bowl.
- Arrange the outlet hose to form a loop which is at least 20 cm (8") above the highest possible level that the tank may reach, and fit the Vented Loop at that highest point.

Option 4: Toilet waste discharging into holding tank, discharge elbow always above top of holding tank.

(See Figure 3 below)

- Run the outlet hose up from the discharge elbow to form a loop at least 30cm (12") higher than the discharge elbow.
- This will create a water seal at the Joker Valve that will prevent bad odours from escaping through the toilet.

YOU MAY fit a 38mm (1½") Vented Loop fitting, Jabsco part number 29015-0010.

- If you fit a vented loop at the top of the hose loop this will ensure that you can keep some water in the base of the toilet without risk of it being siphoned away.

6. Testing

Refer to the Operating Instructions and follow the procedure "2 Normal use".

- If the flushing pump is hard to prime half fill the bowl with fresh water.

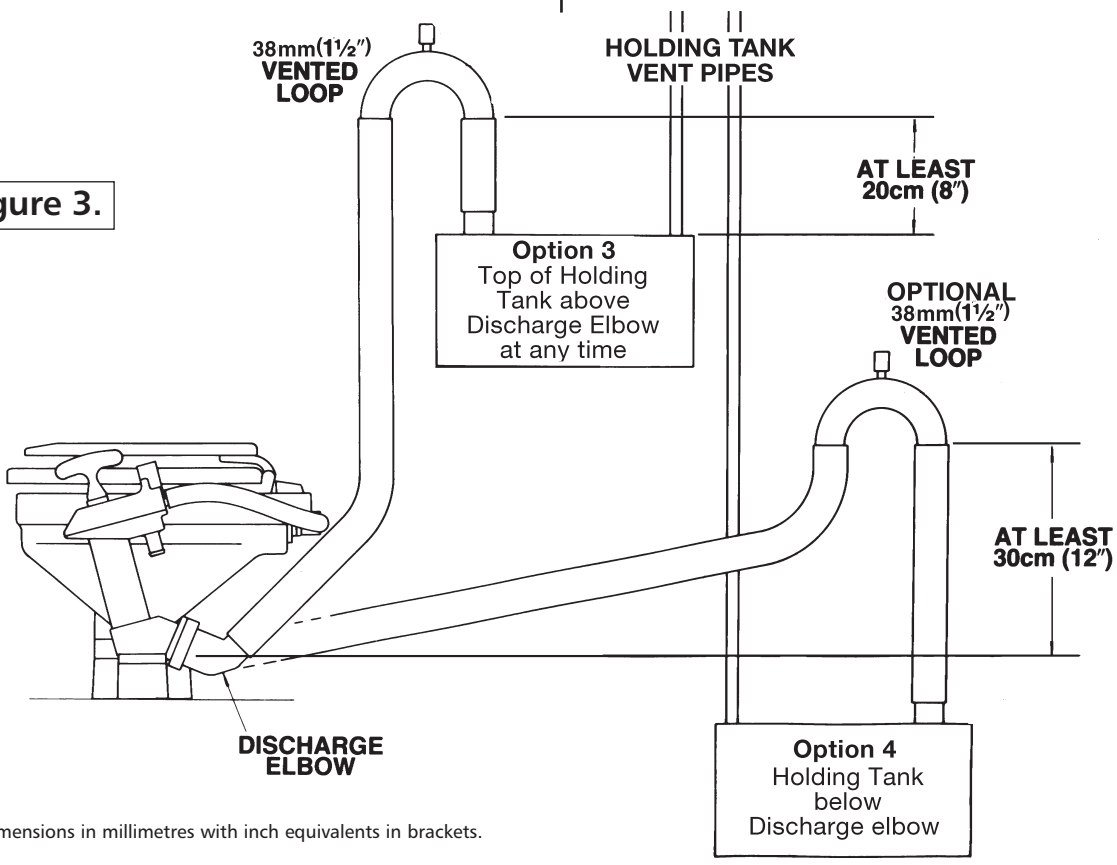
7. Safety

Ensure that this INSTRUCTION MANUAL reaches the owner, skipper or operator of the craft as it contains essential safety information.

ON COMPLETION OF INSTALLATION:

- SHUT THE FLUSH CONTROL (➡)
- CLOSE BOTH SEACOCKS

Figure 3.



All dimensions in millimetres with inch equivalents in brackets.

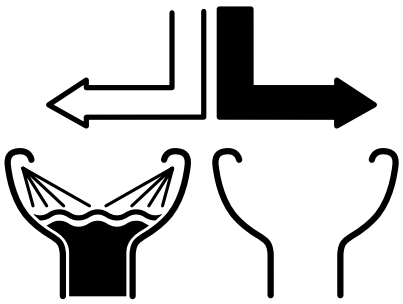
Operating Instructions

The toilet is one of the most used pieces of equipment on your boat. Correct operation of the toilet is essential for the safety and comfort of your crew and craft.

1. First use

After periods without use the toilet may benefit from lubrication.

- ▼ Open inlet and outlet seacocks (and secondary valves if fitted).
- ▼ Half fill the bowl with warm fresh water.
- ▼ Keeping the Flush Control Lever (key 23) in the Shut ( ) position, pump out the warm water.



2. Normal use

Open inlet and outlet seacocks (and secondary valves if fitted).

- ▼ Before use, ensure that there is enough water in the bowl to prevent the toilet paper becoming compacted at the bottom of the bowl.

If the bowl is empty, move the Flush Control Lever (key 23) to the Open ( ) position and pump the handle (key 17) up and down until the flushing pump is primed and water enters the bowl.

Then Shut ( ) the Flush Control.

- ▼ Operate the pump with long, smooth strokes for efficient and easy operation.
- ▼ During use, pump as necessary to keep the contents of the bowl low enough for comfort.
- ▼ Use good quality hard or soft household toilet paper, but do not use more than necessary.
- ▼ After use, keep the Flush Control Shut ( ) and pump until the bowl is empty.
- ▼ When the bowl is empty, Open ( ) the Flush Control again, and continue to pump until all waste has either left the boat, or reached the holding tank (allow 7 complete up/down strokes per metre (yard) length of discharge pipework).

Then Shut ( ) the Flush Control and pump until the bowl is empty. Always leave the bowl empty to minimise odour and spillage.

AFTER USE:

- SHUT ( ) THE FLUSH CONTROL.
- SHUT BOTH SEACOCKS

Hazard Risk:
Accidental Damage.

If the toilet is connected to ANY through-hull fittings that are below the waterline at any time, and if the toilet or pipework is damaged, water may flood in, causing the craft to sink, which may result in loss of life.

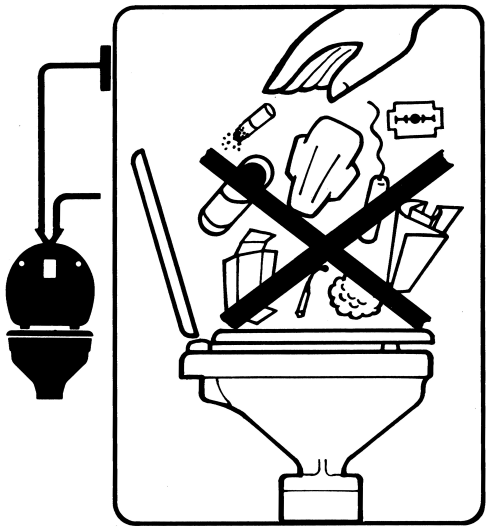
Therefore, after every usage, both seacocks (or secondary valves) MUST be shut.

Whenever your craft is unattended, even if only for a very short period of time, both seacocks (even if secondary valves are fitted) MUST be shut.

- ▼ Ensure that ALL users understand how to operate the toilet system correctly and safely, including seacocks and secondary valves.
- ▼ Take special care to instruct children, the elderly and visitors.

SHUT SEACOCKS!

NOTE: Do not put anything in the toilet unless you have eaten it first, except toilet paper. Do not put in: Sanitary Towels, Wet Strength Tissues, Cotton Wool, Cigarettes, Matches, Chewing Gum or any solid objects, Petrol, Diesel, Oil, Solvents of any kind or water more than hand hot.



3. Cleaning

CAUTION: Do NOT use aggressive chemical agents such as Acetone or Bleach because plastic parts may crack and the enamel coating on the seat and lid may blister.

- ▼ To clean the bowl, use any liquid or cream ceramic cleaner.
- ▼ To clean the rest of the toilet, including the seat and lid, use a non-abrasive liquid cleaner. Polish with a dry cloth only.

CAUTION: Do not use abrasive pads on any part of the toilet and do not use cream cleaners except for the bowl.

▼ To disinfect the toilet, use a liquid disinfectant diluted in accordance with the manufacturer's instructions. You may apply it to all parts of the toilet using a sponge or soft brush as necessary.

CAUTION: Do not use thick liquid toilet cleansers or neat bleach. They may damage the valves, gaskets, seals and the enamel coating of the seat and lid.

JABSCO Servicing Instructions

Jabsco manual toilets do not normally require maintenance during the season, provided that they are winterised in the autumn and overhauled in the spring. However, any toilet will benefit from:

- Thorough flushing - refer to OPERATING INSTRUCTIONS for NORMAL USE.
- Regular use - if not used regularly lubrication is beneficial - refer to OPERATING INSTRUCTIONS for FIRST USE.
- Regularly check all fastenings for tightness and leaks.

HAZARD RISK:
Leaks

If the toilet is connected to ANY through-hull fittings and, if the toilet or the pipework develops a minor leak, it can suddenly become a major leak that allows water to flood in, causing the craft to sink, which may result in loss of life. Therefore, if ANY leak develops you MUST repair it immediately.

REPAIR LEAKS IMMEDIATELY!

1. Servicing & Winterisation - preparation

Jabsco manual toilets are designed to be user serviceable and no special skills or tools are required.

- Flush the toilet in accordance with the OPERATING INSTRUCTIONS for NORMAL USE and, in particular, ensure that all waste has left the discharge pipework and that the bowl is empty.
- CLOSE BOTH SEACOCKS (even if secondary valves are fitted)
- If the vessel is being wintered afloat, WIRE SEACOCKS SHUT
- Be ready to mop up any water that may come out of the system.

2. Servicing - Seal replacement

If water begins to leak around the piston rod (key 29) at the top of the pump, the seal assembly (key 18) is worn and must be replaced.

YOU WILL need:

☐ *A Seal housing Assembly 29044-2000.*

- Unscrew the seal housing assembly (key 18) using a 24mm ($^{15}/_{16}$") spanner and remove the entire piston rod assembly from the toilet.
- Wrap some tape around the piston rod within 16mm ($^{5}/_{8}$") of the handle. Grip the piston rod through the tape, unscrew the handle and remove the bumper washer (key 25). Remove the tape.
- Slide the old seal assembly off the piston rod. Wrap one turn of tape around the thread at the top of the piston rod to protect the new seal and slide the new seal assembly onto the piston rod. Remove the tape from the thread.
- Wrap some tape around the piston rod within 16mm ($^{5}/_{8}$") of the handle. Grip the piston rod through the tape and replace the bumper washer and handle. Remove the tape from the piston rod.
- Slide the whole assembly back into the pump cylinder and tighten in place.

CAUTION: Gripping the piston rod with a tool anywhere except on the 16mm ($^{5}/_{8}$") below the handle damages the surface in a way that causes rapid seal failure.

3. Servicing - Winterisation

Drain the complete system, both as protection against frost damage and to discourage the growth in the pipework of anaerobic bacteria that cause unpleasant smells.

- Open any secondary valves.
- Remove the base drain plug (key 8).
- Disconnect the discharge flange (key 32) from the pump (avoiding the need to remove the hose from the discharge elbow (key 34).
- Loosen hose clips and disconnect the hose ends from both seacock hose tails. Pump the handle (key 17) to drain the toilet pump and ensure that all water is drained from the toilet system.

CAUTION: The use of anti-freeze is NOT RECOMMENDED, as it is impossible to ensure that it penetrates the complete toilet system. If, for any reason, anti-freeze is used it MUST be glycol based.

If you plan to overhaul the toilet in the spring, this is a good time to disassemble it and take the components ashore to make the overhaul easier.

HAZARD RISK:
Seacocks opened by mistake

If you leave the toilet disassembled and, if the seacocks are opened when the craft is afloat, water will flood in and may cause the craft to sink, which may result in loss of life.

Therefore, you MUST attach a warning notice to the seacocks and, if possible, wire the seacocks shut.

ATTACH WARNING NOTICE!

If you are not disassembling the toilet:

- Reconnect all hose ends and secure them with their hose clips.
- Replace the base drain plug securely.
- Replace the joker valve in the discharge elbow.
- Reconnect the discharge elbow and hose to the cylinder using the discharge flange, whilst relieving any leverage from the discharge hose. If you do not, the joint may not seal.
- Fasten down the seat, lid and pump handle to prevent use and attach a warning notice.

4. Servicing - Overhaul

YOU WILL need:

☐ *A Service Kit, part number 29045-2000, which contains all wearing parts - refer to the PARTS LIST for details.*

Remove the pump assembly as follows:

- Loosen hose clips; disconnect the inlet hose and the flushing water hose (key 4) from the top of the pump.
- Remove the 2 screws (key 31) that secure the discharge flange (key 32) that holds the discharge elbow (key 34) and hose to the pump cylinder (key 28).
- Do NOT remove the hose from the discharge elbow.
- Remove the 4 screws (key 31) that secure the pump cylinder to the base.
- Lift off the pump assembly and pick up the base valve gasket (key 16) and the joker valve (key 33).

Dismantle the pump assembly as follows:

- Remove the 6 screws (key 26) that secure the valve cover (key 27).
- Open (⏎) the Flush Control (key 23) before lifting off the valve cover assembly and picking up the top valve gasket (key 21) and the valve seat (key 19).
- Remove the handle and the seal assembly by following the SERVICING INSTRUCTIONS for SEAL REPLACEMENT.
- Withdraw the piston assembly (key 29) and prise off the piston O-ring (key 30).
- Do NOT remove the bowl from the base
- Clean and disinfect all parts - refer to OPERATING INSTRUCTIONS for CLEANING. Remove scale from the cylinder bore.
- Inspect the top and bottom valve gaskets (key 21) and the joker valve, and renew them if they are damaged, stiff or covered with scale. Automatically renew the seal assembly and the piston O-ring. Use the other parts in the kit as necessary.

Reassemble the pump as follows:

- Push on the new O-ring and lubricate with petroleum jelly (vaseline).
- Following the SERVICING INSTRUCTIONS for SEAL REPLACEMENT fit the new seal assembly, the piston assembly and the handle.
- Lubricate pump cylinder bore with petroleum jelly (Vaseline).
- Locate the valve seat on top of the cylinder, locate the top valve gasket on its pegs on top of the cylinder and Open (⏎) the Flush Control before refitting the valve cover.
- Locate the joker valve in the discharge elbow.
- Secure the discharge elbow and hose to the cylinder, using the discharge flange, BEFORE you refit the pump assembly to the base, so that the joint is not under leverage from the discharge hose. If you do not, the joint may not seal.
- Locate the bottom valve gasket on its pegs on the base
- Secure the pump assembly to the base whilst relieving any leverage from the discharge hose. If you do not, the joint may not seal.
- Examine all hoses throughout their length for chafe, kinks and splits under hose clips. Check all hose clips for corrosion and replace worn or damaged parts.
- Reconnect all loose hose ends and secure them with their hose clips.
- Ensure that the base drain plug (key 8) is securely in place.

CAUTION: Do NOT lubricate top or bottom valve gaskets. Do NOT apply sealing compounds to any gaskets or hose connections.

5. Servicing - Testing

REFER to the OPERATING INSTRUCTIONS and follow the procedure for "2. Normal use".

- If the flushing pump is hard to prime, half-fill the bowl with fresh water.

ON COMPLETION OF SERVICING:

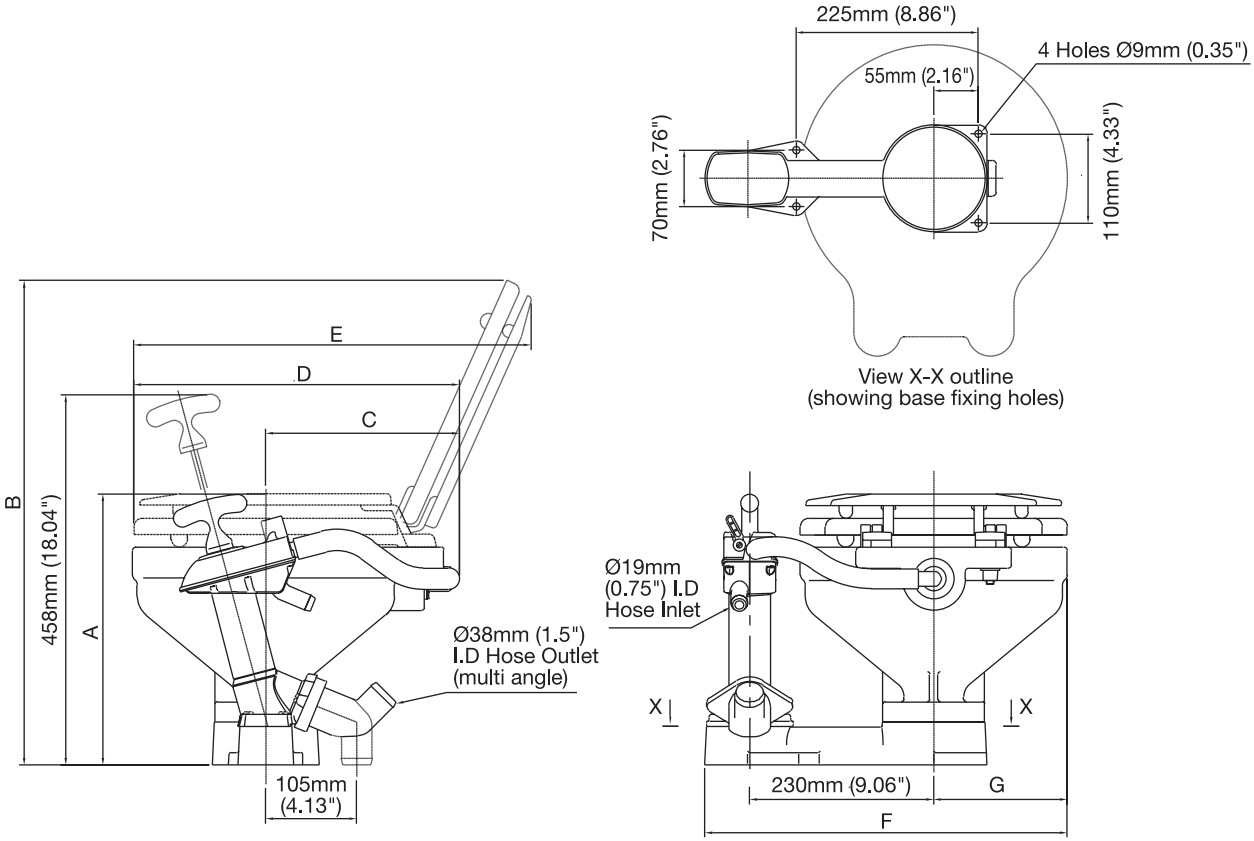
- SHUT (➡) THE FLUSH CONTROL

- CLOSE BOTH SEACOCKS.

Trouble Shooting

▼ **Bowl fills when toilet not in use**	- Shut Seacocks. - Fit Vented Loops.
▼ **Waste water re-appears in bowl**	- Check Bottom Valve Gasket (16) and Joker Valve (33).
▼ **Bowl does not empty & difficult to push handle down**	- Open Outlet Seacock. - Fully shut Flush Control Lever (23). - Check Joker Valve (33), Discharge Hose or Outlet Seacock for blockage.
▼ **Bowl does not empty and difficult to pull handle up**	- Remove pump and check for blockage.
▼ **Bowl does not empty although handle is easy to push & pull**	- Check Piston O-ring (30), Bottom Valve Gasket (16) & Joker Valve (33).
▼ **Water does not come in and handle springs up if pushed down**	- Open Inlet Seacock. - Fully open Flush Control Lever (23).
▼ **Water does not come in although handle is easy to push and pull**	- Open Flush Control Lever (23). - Check Top Valve Gasket (21) and Piston O-ring (30). - Check Inlet Hose connections are airtight.
▼ **Water only comes in after pumping**	- Shorten Inlet Hose from much Seacock. - Vented Loop not allowed between Inlet Seacock & Pump - fit between Pump & Bowl. - Fit Non-Return Valve (29295-0011) next to Inlet Seacock.

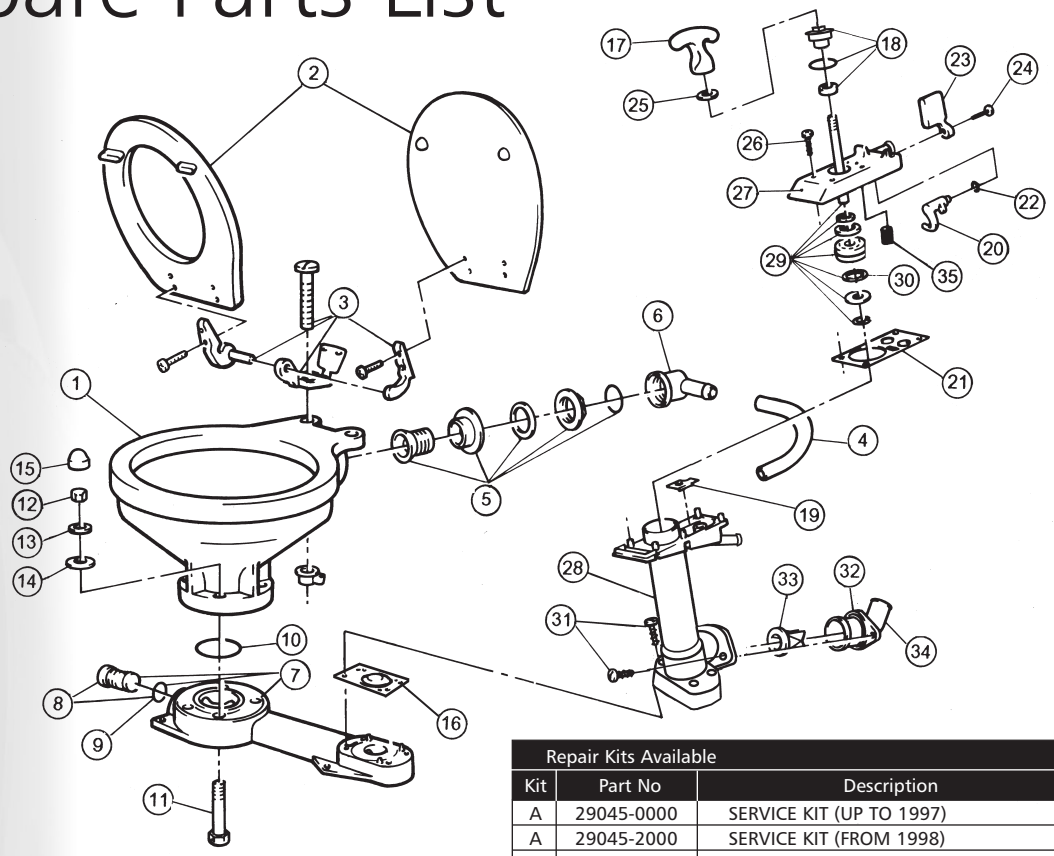
Dimensions and Weights



All dimensions in millimetres with inch equivalents in brackets.

Model No	Description	Net Weight	A	B	C	D	E	F	G	
29090-2000	MANUAL TOILET COMPACT BOWL	9.5kg (21lb)	335 (13.19)	615 (24.21)	247 (9.72)	425 (16.73)	485 (19.09)	450 (17.72)	165 (6.50)	mm (ins)
29120-2000	MANUAL TOILET REGULAR BOWL	10.9kg (24lb)	345 (13.58)	700 (27.56)	280 (11.02)	490 (19.29)	580 (22.83)	465 (18.31)	180 (7.09)	mm (ins)

JABSCO Spare Parts List



Repair Kits Available		
Kit	Part No	Description
A	29045-0000	SERVICE KIT (UP TO 1997)
A	29045-2000	SERVICE KIT (FROM 1998)
B	29040-2000	PUMP ASSEMBLY
C	29094-2000	VALVE COVER ASSEMBLY
D	29051-2000	PUMP CYLINDER ASSEMBLY
E	29047-0000	BASE TO BOWL MOUNTING KIT

Key	Description	Qty Per Toilet	Part No	Qty per Repair Kit				
				A	B	C	D	E
1	BOWL COMPACT TOILET	1	29096-0000					
	BOWL REGULAR TOILET	1	29126-0000					
2	SEAT, LID & HINGE SET	1						
	COMPACT TOILET		29097-1000					
	REGULAR TOILET	1	29127-1000					
3	HINGE SET (1 PAIR)							
	COMPACT TOILET	1	29098-1000					
	REGULAR TOILET	1	29098-2000					
4	HOSE COMPACT TOILET	1	29035-1000					
	HOSE REGULAR TOILET	1	29035-1001					
5	INTAKE SEAL +	1	29048-1000					
6	INTAKE ELBOW	1						
7	BASE, PLUG + O-RING ASSY	1	29041-1000					
8	PLUG + O-RING ASSY							
	(UP TO 2002 – SCREW)	1	29028-0000					
	(FROM 2003 – BAYONET)	1	29028-2000					
9	O-RING (PLUG)	1	–					
10	O-RING (BOWL)	1	–					1
11	BOLT (S/S)	4	–					4
12	NUT (S/S)	4	–					4
13	WASHER (S/S)	4	–					4
14	WASHER (NYLON)	4	–					4
15	CAP	4	–	2				4
16	BASE VALVE GASKET	1	29043-0000	1	1		1	

Key	Description	Qty Per Toilet	Part No	Qty per Repair Kit				
				A	B	C	D	E
17	HANDLE	1	29026-2000		1			
18	SEAL HOUSING ASSY							
	(UP TO 1997)	1	29044-0000	1	1	1		
	(FROM 1998 ONWARDS)	1	29044-2000	1	1	1		
19	TOP VALVE SEAT	1	–	1	1	1	1	
20	CAM	1	–		1	1		
21	TOP VALVE GASKET	1	29042-0000	1	1			
22	O-RING (FLUSH LEVER)	1	–	1	1	1		
23	FLUSH CONTROL LEVER	1	–		1	1		
24	SCREW (FLUSH LEVER)	1	–	1	1	1		
25	BUFFER	1	–	1	1			
26	SCREW (VALVE COVER)	6	–	1	6	6		
27	VALVE COVER	1	–		1	1		
28	PUMP CYLINDER	1	–		1		1	
29	PISTON, ROD & O-RING ASSY	1	29046-0000		1			
30	O-RING (PISTON)	1	–	1	1			
31	SCREW (PUMP CYLINDER)	6	–	1	2		2	
32	DISCHARGE FLANGE	1	29091-1000		1		1	
33	JOKER VALVE	1	29092-1000	1	1		1	
34	DISCHARGE ELBOW	1	29029-1000		1		1	
35	VALVE SPRING	1	–		1	1		
	(ONLY FROM 1998)							

ITT

Engineered for life

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Fluid Products Canada, 55 Royal Road, Guelph, Ontario N1H 1T1 **CANADA**
Tel: +1 519 821 1900 Fax: +1 519 821 2569

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Warranty: All products of the company are sold and all services of the company are offered subject to the company's warranty and terms and conditions of sale, copies of which will be furnished upon request

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43001-0507 Rev 04/06

TILLEGG / APPENDIX M

N SecureVolt

S SecureVolt

DK SecureVolt

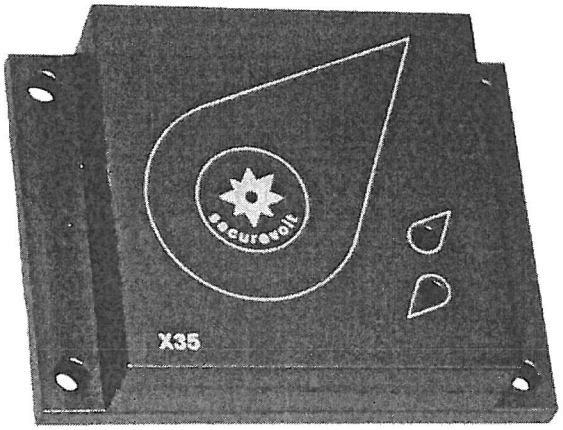
NL SecureVolt

D SecureVolt

GB SecureVolt

FIN SecureVolt

ASKELADDEN



SecureVolt X35

Installasjons- og brukerhåndbok

Funksjon

- Sikrer batterikapasitet til start av motor
- Beskytter mot skadelig utlading og øker batterilevetid
- Tar hensyn til effektforbruk, batterikvalitet og temperatur.
  Unngår å lade ut batteriet selv ved lite strøm over lang tid, i motsetning til vanlige batterivakter.
- Varsler for høy ladespenning
- Intelligent styring hindrer unødig utkobling ved start av motor, bruk av vinsj, baugpropell osv (kretser som ikke er koblet til SecureVolt)
- Egenbeskyttelse: Kutter strømtilførsel ved høye strømtrekk over tid

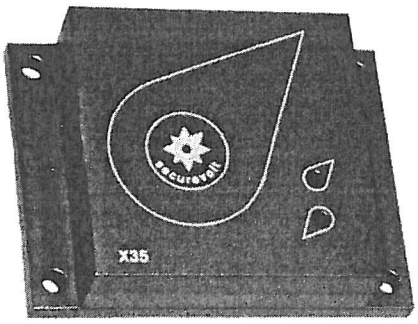
Enheten kan skades hvis den utsettes for kortslutningsstrømmer!

Hva betyr lysblinkene

- Grønn blink annethvert sekund – Alt OK, strøm på
- Grønn blink hvert sekund – For høy ladespenning (> 15.5 Volt), strøm på
- Både rød og grønn blink – I ferd med å slå av strøm
- Rød blink annethvert sekund – Strøm slått av
  Hvis V+ (se figur 2) kobles fra og til får man uansett ca. 5 min. med strømtilførsel (etter tilkobling) fra SecureVolt for bruk av motorromsvifte etc.
- Rød blink hvert sekund – Strøm slått av på grunn av overlast

Konstruksjon

- Kraftig eloksert aluminiumboks
- Ingen bevegelige deler
- Svært lavt egenforbruk
- Innstøpt elektronikk
- Styres av en mikrokontroller



Sikkerhetsanvisninger

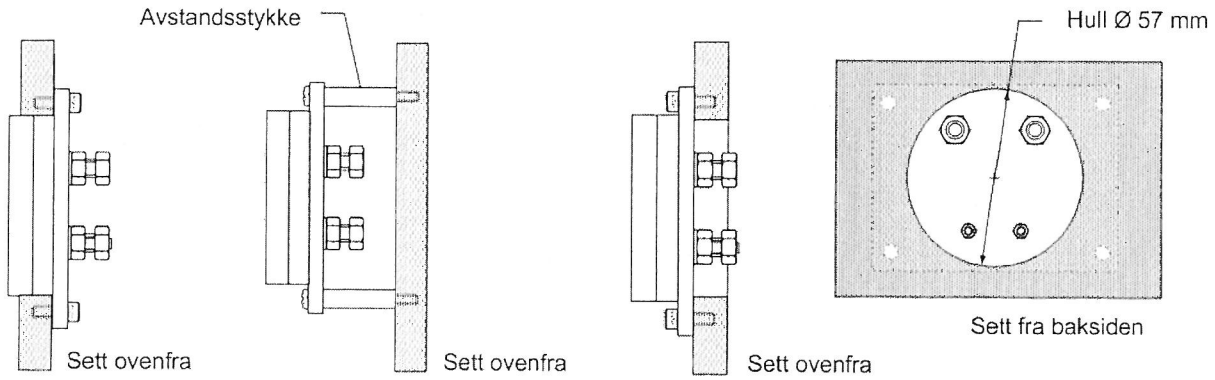
SecureVolt skal ikke monteres slik at det kan oppstå kortslutninger mot eller mellom enhetens elektriske tilkoblingsterminaler!

SecureVolt skal ikke monteres slik at personer kan skade seg på enhetens kanter! Innfelling anbefales hvis den skal monteres der hvor personer beveger seg.

Montering

SecureVolt kan monteres:

- innfelt i kvadratisk hull 61x61mm (se Figur 1a)
- helt utenpåliggende (se Figur 1b)
- utenpåliggende med ledninger fra bakside gjennom hull Ø57mm (se Figur 1c)



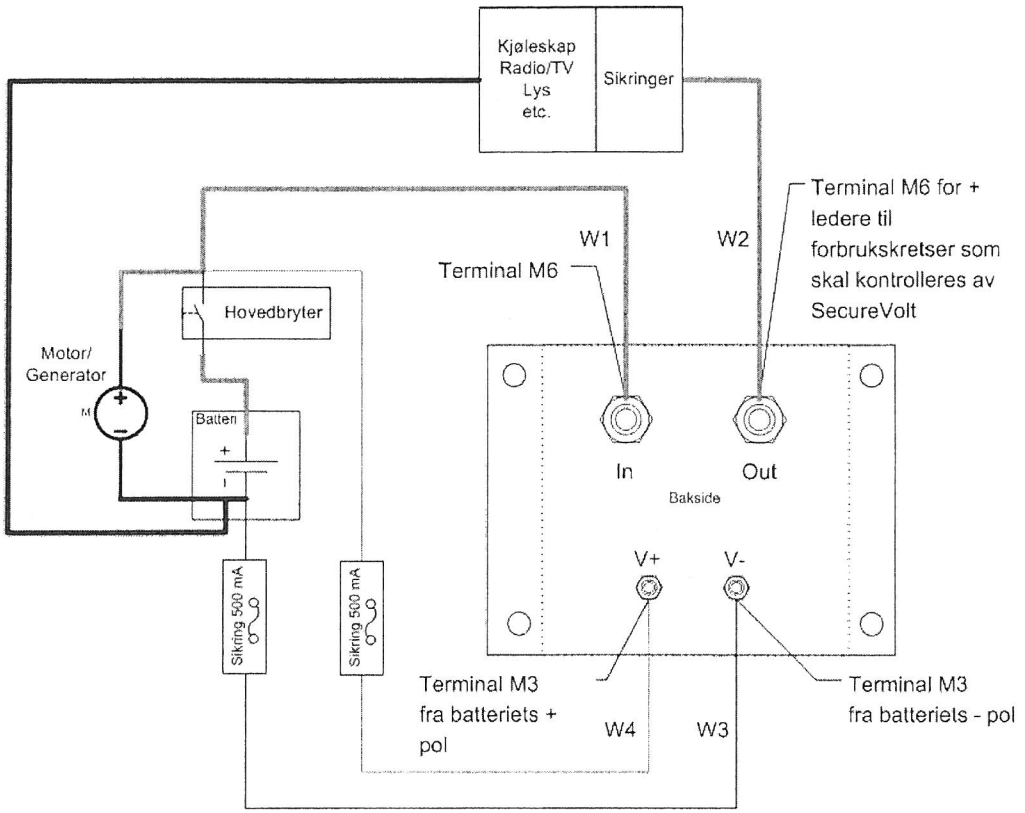
Figur 1 a) **b)** **c)**

Husk:

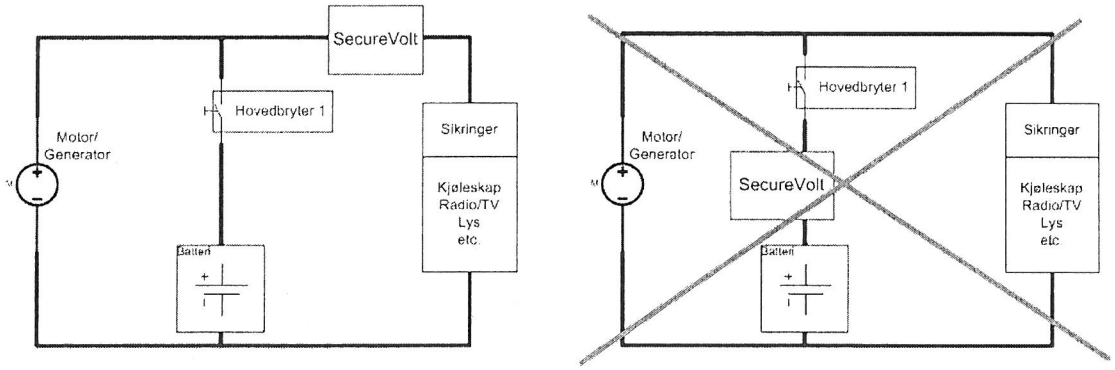
- Festeskruene bør være i syrefast stål (A4), uten forsenking og med skruediameter mindre enn 4,3 mm (gjelder utenpåliggende eller innfelt montering)
- Festeskruene bør være i syrefast stål (A4), uten forsenking og med skruediameter mindre eller lik 4 mm (gjelder helt utenpåliggende montering og bruk av avstandsstykker)
- Unngå å skade enhetens elokserte overflate, da dette kan føre til korrosjon.

Elektrisk tilkobling

- Bruk kabelsko (ringtype) og eventuelt ledninger av rett dimensjon og god kvalitet i koblingene mot terminalene. ***Indre muttere på terminalene må ikke løsnes eller dras rundt - bruk fastnøkkel på disse ved montering av kabelsko***
- Typisk tilkobling for båt med kun startbatteri er vist i figur 2. SecureVolt kan også kobles på tilsvarende måte for å beskytte separate forbruksbatterier
- Hvis ikke hovedbryter er montert, anbefales bruk av hovedsikring (max 60A) på W1 (se figur 2), nær batteriet (innen 1,8 meter)
- Store strømforbrukere som kun brukes i korte perioder (f. eks. vinsj, baugpropell, trimplan etc.) skal ikke kobles til SecureVolt
- Tilkobling skal ikke skje slik at ladestrøm, startmotorstrøm eller strøm mellom start- og forbruksbatterier kan gå igjennom SecureVolt (se figur 3)



Figur 2



Slik **IKKE slik**

Figur 3

Spesifikasjoner

Batterisystem: 12V blybatteri (Normal, AGM eller Gel) 40-200 Ah
Tåler spenning inntil 35V og korte spenningsfall ned til 3,5V

Strømkapasitet: 0 - 35 A kontinuerlig (Inntil 75 A kortvarig)

Merking: CE merket og testet i.h.h.t. EN60945 av NEMKO

Innkapsling: IP67

Temperaturområde: -40 til +70°C

Dimensjoner og vekt: BxHxD 80mm x 60mm x 33mm, vekt 210g

TILLEGG / APPENDIX N

N SmartCraft

S SmartCraft

DK SmartCraft

NL SmartCraft

D SmartCraft

GB SmartCraft

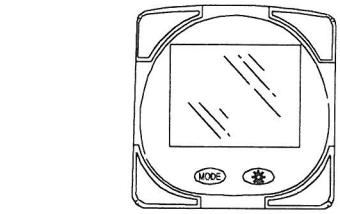
FIN SmartCraft

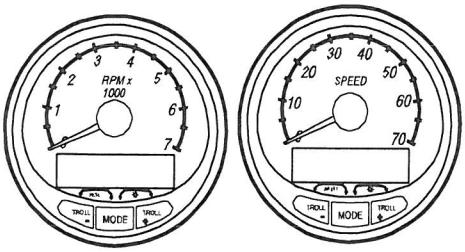
ASKELADDEN

MERCURY

SmartCraft

Brukerhåndbok





DENNE HÅNDBOKEN BESKRIVER

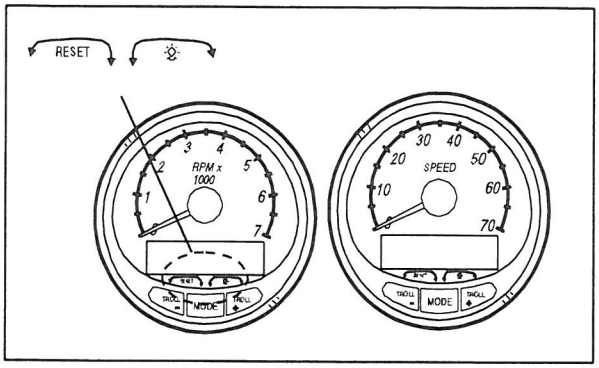
SMARTCRAFT–MÅLERSYSTEMENE SOM ER

TILGJENGELIGE FOR BÅTEN

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Part 2

Systemturteller og –speedometer

Grunnleggende drift og funksjoner 2-1
Automatisk registrering av motorfunksjon 2-3
Nullstilling av alt 2-3
Skjermbilder for speedometer 2-4
Skjermbilder for turteller 2-6
Dorgekontroll 2-8
Varselsystem 2-10
Skjermbilder for advarsler 2-11
Cal 1 turtellerkalibrering 2-15
Cal 2 turtellerkalibrering 2-18
Cal 1 speedometerkalibrering 2-22
Cal 2 speedometerkalibrering 2-24

MERK:Denne håndboken viser alle de tilgjengelige skjermbildene på monitoren. Det er ikke sikkert at alle disse skjermbildene er aktuelle, avhengig av motortypen du har.

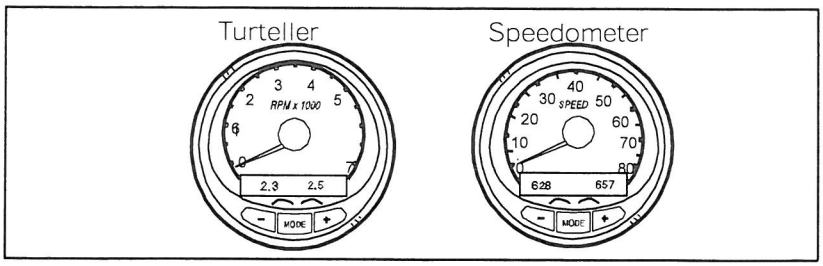
Systemets turteller og speedometer er kompatible med:

Årsmodell 2002 og nyere Mercury Outboard–modeller som er konstruert for å brukes med SmartCraft.

Alle Mercury MerCruiser–modeller er konstruert for bruk med Smartcraft.

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SYSTEMTURTELLER OG – SPEEDOMETER



Grunnleggende drift og funksjoner

Oppstart: Alle instrumentene aktiveres når tenningen slås på. Instrumentene er aktivert så lenge tenningen er på.

Lamper: Lysstyrken og kontrasten kan justeres.

Knapper: MODE –knappen brukes til å velge informasjonsskjermbilder. Knappene "+" og "–" brukes til å innstille motorhastigheten under dorgekontroll og ved innstilling av instrumentkalibreringer.

Dorgekontroll: Med denne kontrollen kan båtføreren innstille og kontrollere tomgangshastigheten til motoren for dorging uten å bruke gassen.

Motorovervåkingssystem Overvåker de kritiske sensorene på motoren, slik at tidlige tegn til problemer kan fanges opp. Systemet gir respons på et problem ved å senke motorhastigheten for å opprettholde trygge driftsforhold.

Varselsystem: Systemet utløser varselhornet og viser advarselmeldingen.

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SYSTEMTURTELLER OG – SPEEDOMETER

Automatisk registrering av motorfunksjon

Ved førstegangs oppstart av målere eller etter en "nullstilling av alt", viser instrumentet "Auto detect" (automatisk registrering). Instrumentet avgjør automatisk motortypen når du trykker på modusknappen. Dette vil forhåndsinnstille skjermbildene for dataovervåking tilsvarende. Hensikten er å gjøre det første oppsettet enklere.

Hvis måleinstrumentet viser en advarsel som "No Starboard Engine" (ingen styrbordmotor) eller "Multiple Starboard Engines" (flere styrbordmotorer), må du velge aktuell motorplassering (babord og styrbord) på motoren med et Mercury motordiagnoseverktøy. Foreta en "Master Reset" (nullstilling av alt) og "Auto detect" (automatisk registrering) på nytt. (Se under "Nullstilling av alt")

Turtalls– og hastighetsmåler vises som standard i "Engine Auto–detection Screen" (skjermbildet for automatisk motorregistrering). Via denne skjermen kan instrumentet automatisk registrere motortypen ved første oppstart, samt konfigurere måleren til å samsvare med den aktuelle fartøytypen.

Nullstilling av alt

Du kan nullstille instrumentet til de forhåndsinnstilte verdiene fra fabrikken med kommandoen Master Reset (nullstilling av alt).

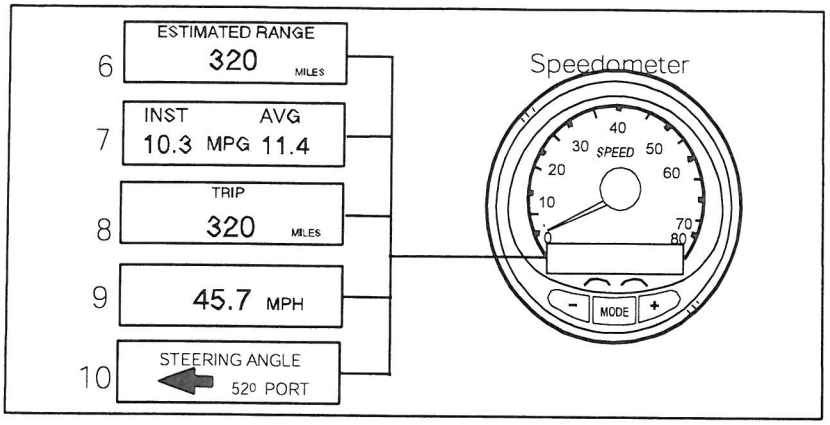
VIKTIG! Ved en nullstilling av alt går måleenheten tilbake til alle fabrikkinnstillinger, og eliminerer dermed eventuelle kalibreringer som ble utført under installeringen av produktet.

Ved å holde TROLL + inne samtidig i ca. 10 sekunder (til de grafiske feltene "kolliderer"). Du kan gjenopprette enheten til fabrikkinnstillingene.



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SYSTEMTURTELLER OG – SPEEDOMETER



Skjermbilder for speedometer

6. Range (kjørelengde) – Den anslåtte kjørelengden er basert på båtens hastighet, drivstofforbruk og gjenværende drivstoffmengde på tanken. De viste tallene angir et overslag for den strekningen du kan kjøre med gjenværende drivstoffmengde på tanken. Inndata for hastighet er nødvendig (skovlhjul, pitottrykk eller GPS).

7. Drivstofforbruk – Skjermen viser "AVG" (gjennomsnittlig) drivstofforbruk foruten "INST" (momentant) drivstofforbruk. De viste tallene angir kilometer per liter "KM/L" eller miles per gallon "MPG". Nullstilling av drivstoff – Nullstill ved å velge skjermen og trykke på MODE (modus) og TROLL

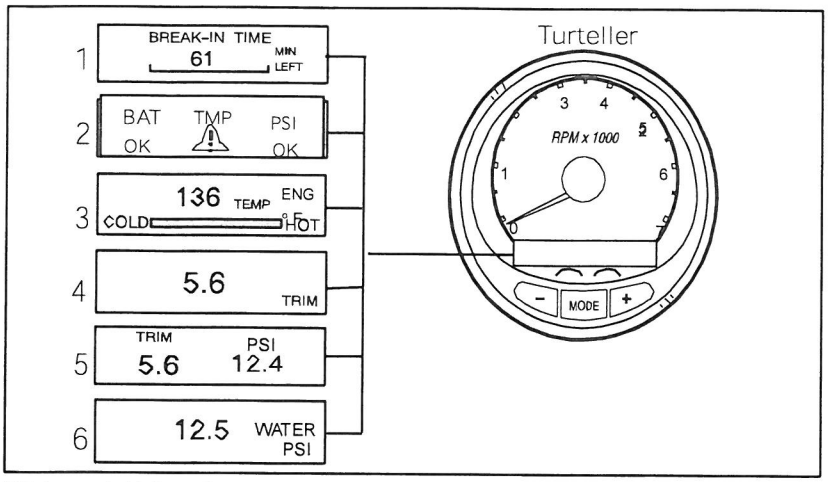
8. Odometer – Viser hvor langt motoren har kjørt siden instrumentet sist ble nullstilt. Nullstilling av turlengde – Nullstiller instrumentet ved å velge skjermen og trykke på MODE (modus) og TROLL

9. Digital fartsmåler – Kan vise båtens hastighet i kilometer, miles eller nautiske mil per time. Speedometeret bruker skovlhjulet til lave hastighetsavlesninger, men bytter til speedometersensor eller GPS (hvis dette er tilkoblet) for høye hastighetsavlesninger. (Innstillingen for overgangspunktet er beskrevet i Cal2.)

10. Steering Angle (styrevinkel) – Viser den relative posisjonen til styresystemet. Bare tilgjengelig på Mercury MerCruiser–modeller. En styrevinkelsensor må installeres på motoren.

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SYSTEMTURTELLER OG – SPEEDOMETER



Skjermbilder for turteller

DET ER IKKE SIKKERT AT ALLE SKJERMBILDER GJELDER DIN MOTORTYPE.

Når tenningen slås på, viser turtelleren den siste skjermen som ble vist før tenningen ble slått av.

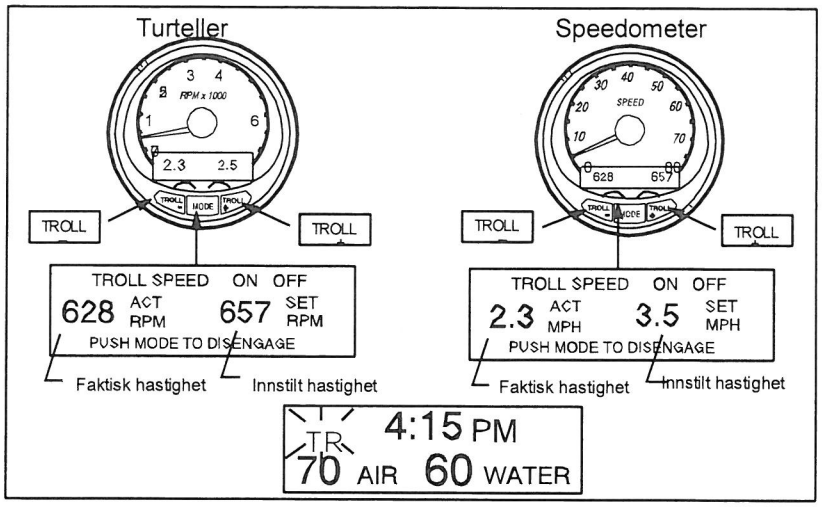
Trykk på MODE for å endre skjermene. Du kan gå tilbake til den forrige skjermen ved å trykke på og holde MODE inne i 2 sekunder. Dette vil reversere skjermroteringen.

MERK:Avlesninger kan vises på engelsk (USA) eller metrisk. Se under Kalibrering.

1. Innkjøring av motor – Viser gjenværende tid av innkjøringsperioden til en ny motor. Skjermen forsvinner automatisk etter at innkjøringsperioden er fullført.
2. Quick Reference Screen (skjermbilde for hurtigoversikt) – Viser at batteriet, motortemperatur og trykk fungerer som det skal.
3. Temperatur – Viser motorens kjølevæsketemperatur.
4. Powertrim–vinkel – Viser trimvinkelen til utenbords– eller hekkmotoren opp til maksimum trimvinkel, og viser deretter vinkelen på tilhengeren. 0 = ned, 10 = maksimal trim, og 25 = full tilhenger.
5. Powertrimvinkel – vanntrykk – Viser trimvinkelen til motoren og vanntrykket i kjølesystemet.
6. Vanntrykk – Viser vanntrykket i motorens kjølesystem.

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SYSTEMTURTELLER OG – SPEEDOMETER



Dorgekontroll

Grunnleggende drift

MERK:Det er ikke sikkert at alle motormodellene er utstyrt med dorgekontroll.

MERK:Min/maks.–område for dorgekontroll kan endres avhengig av motortypen.

Dorgekontrollen kan innstilles ved hjelp av enten turtelleren eller speedometeret. Turtelleren innstiller hastigheten i o/min, og speedometeret innstiller hastigheten i MPH, km/t eller knop.

Dorgekontrollen kan slås av når som helst ved å trykke på MODE når dorgeskjermen vises eller gassen flyttes.

Hvis dorgekontrollen er innstilt på ønsket hastighet og dorgekontrollen deretter slås av, husker systemet den innstilte hastigheten og går tilbake til denne hastigheten når dorgekontrollen innkobles igjen.

Skjermen går tilbake til den forrige skjermen etter 10 sekunder uten + eller TROLL – for å aktivere skjermen på nytt.

Når dorgekontrollen er innkoblet og skjermen for dorgekontroll ikke er aktiv, blinker signalet "TR" (a) øverst i venstre hjørne av skjermen for å angi at dorgekontrollen fremdeles er aktiv.

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SYSTEMTURTELLER OG – SPEEDOMETER

Skjermbilder for advarsler

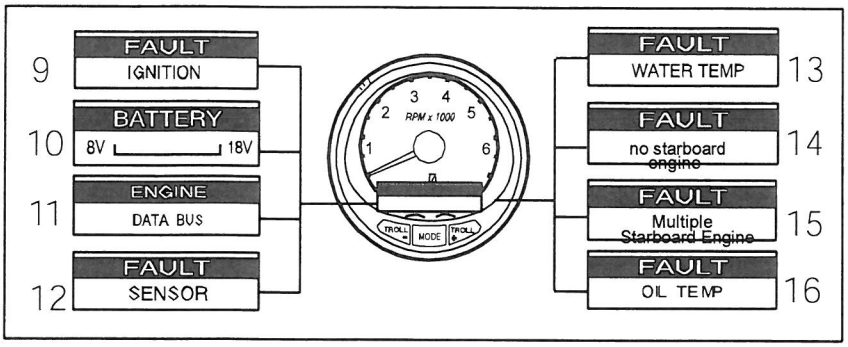
Dersom det registreres et problem med motoren, vises en advarsel på advarselskjermen som varsler båtføreren om et mulig problem. I vedlikeholdshåndboken under Engine Operation (drift av motoren) finner du beskrivelse av problemet, og hva som bør gjøres for å rette på det.

ADVARSELSKJERMBILDER

PROBLEM	TURTEL-LERSKJERM	SPEEDOME-TERSKJERM
BATTERI		
MOTORDATABUSS		
FEIL – HORN		
FEIL – TENNING		
FEIL – INJEKTOR		
FEIL – OLJEPUMPE		
FEIL – SENSOR		
FEIL – VANNTEMP.		
LAVT DRIVSTOFFNIVÅ		
LITE OLJE		
OLJETEMPERATUR		
OLJETRYKK (PSI)		
OVEROPPHETING		
OVERHASTIGHET		
TRYKK		
RESERVEOLJE		
VANN I DRIVSTOFF		
MAP		
MAT		
TPS		

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SYSTEMTURTELLER OG – SPEEDOMETER



Skjermbilder for advarsler

9. FEIL – TENNING – Det har oppstått et problem i tenningssystemet.
10. BATTERI – Det elektriske systemet lader ikke, eller batteriet har lite strøm.
11. MOTORDATABUSS – Datakommunikasjonslenken mellom turtelleren og motoren ikke er koblet.
12. FEIL – SENSOR – Én eller flere sensorer fungerer ikke som de skal.
13. FEIL – VANNTEMPERATUR – Sensoren som skal måle temperaturen i vannet/sjøen fungerer ikke som den skal.
14. INGEN STYRBORD–MOTOR – Opplyser om at instrumentet ikke registrerer datamaskinen for motoren på styrbord side. Dette betyr i praksis at det ikke overføres data fra motorens datamaskin til instrumentet. (Kontroller ledningsnettet og at begge terminatormotstander er installert i bussen). Kontroller at begge ECM–moduler ikke er konfigurert for portsted som bruker et DDT eller Quicksilver diagnoseverktøy.
15. FLERE STYRBORD–MOTORER – SmartCraft–instrumentene registrerer flere motorer som styrbord.

Ved bruk av flere motorer må hver enkelt motor først tilordnes en posisjon (styrbord, babord, styrbord 2 eller babord 2) med et Quicksilver diagnoseverktøy før systemet kan fungere på riktig måte.

Hvis systemet består av to motorer, må du først programmere motoren på babord side med Quicksilver–diagnoseverktøyet.

16. OLJETEMPERATUR – Motoroljen er overopphetet.

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SYSTEMTURTELLER OG – SPEEDOMETER

Kalibrering av hurtigkalibrering

Quick Cal (hurtigkalibrering) – Denne kalibreringen er for å innstille lys og kontrast.

1. Trykk på MODE (modus) og TROLL + i opp til 2 sekunder for å få fram Quick Cal–skjermbildet (hurtigkalibrering).
2. Trykk på MODE for å gå gjennom kalibreringsvalgene.

CAL 1–turtellerkalibrering

Cal 1 – På dette kalibreringsnivået kan du aktivere og deaktivere systemets skjermbilder.

MERK:Skjermbildene kan variere, avhengig av hvilken versjon av måleinstrumentet du har.

1. Trykk på MODE (modus) og TROLL + og hold knappene inne i ca. 7 sekunder til skjermbildet Cal 1 vises.
2. Trykk på MODE for å gå gjennom kalibreringsvalgene.

REMOTE SCREENS? [NO] [SAVE] [YES]	Hvis du velger ja, vil skjermbildeendringene som blir foretatt på denne SC 1000–turtelleren, påvirke eventuelle andre SC1000–turtellere i systemet. MERK: Alle turtellere krever at denne skjermen er innstilt på "Yes" (ja) for at denne funksjonen skal virke.
REMOTE LCD LIGHT? [NO] [SAVE] [YES]	Hvis du velger ja, vil lysnivåene som blir innstilt på denne SC 1000–turtelleren, påvirke eventuelle andre SC1000–turtellere i systemet. MERK: Alle turtellere krever at denne skjermen er innstilt på "Yes" (ja) for at denne funksjonen skal virke.
REMOTE LCD CONTRAST? [NO] [SAVE] [YES]	Hvis du velger ja, vil kontrastnivåene som blir innstilt på denne SC 1000–turtelleren, påvirke eventuelle andre SC1000–turtellere i systemet. MERK: Alle turtellere krever at denne skjermen er innstilt på "Yes" (ja) for at denne funksjonen skal virke.
TRIM POPUP? [NO] [SAVE] [YES]	Vil du at skjermvinduet for Powertrim skal vises hver gang du trimmer utenbordsmotoren?

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SYSTEMTURTELLER OG – SPEEDOMETER

CAL 1–turtellerkalibrering

TRIM CALIBRATION [SKIP] [EDIT] TRIM FULL DOWN THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE] TRIM FULL UP THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE] TRIM TO TRAILER POINT THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	Velger du å redigere, kan du kalibrere instrumentet til standardtrim på 0–10 for enheten, og en skala for tilhengerposisjon på 11–25.
DISPLAY UNITS [DOWN] [SAVE] [UP]	Med dette alternativet kan du skifte mellom engelsk (standard) eller metrisk måleenhet.
SPEED UNITS [DOWN] [SAVE] [UP]	Med dette alternativet kan du velge måleenhet for hastighet. Du kan velge mellom MPH (miles per time), KN (nautiske mil per time) eller KMH (kilometer per time).
QUICK REF SCREEN? [NO] [SAVE] [YES]	Vil du aktivere skjermbildet for hurtigoversikt?
ENGINE TEMP SCREEN? [NO] [SAVE] [YES]	Vil du aktivere skjermbildet for motortemperatur?

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SYSTEMTURTELLER OG – SPEEDOMETER

CAL 1–turtellerkalibrering

VOLT / HOUR SCREEN? [NO] [SAVE] [YES]	Vil du aktivere det delte skjermbildet som viser batterispenning og motorens kjøretid?
SPEED / SEA TEMP SCREEN? [NO] [SAVE] [YES]	Vil du aktivere det delte skjermbildet som viser vanntemperatur og fartøyets hastighet?
SEA TEMP OFFSET = 0°? [DOWN] [SAVE] [UP]	I dette skjermbildet kan du kalibrere skjermbildet og vanntemperatursensoren.
DEPTH SCREEN? [NO] [SAVE] [YES]	Vil du aktivere skjermbildet for dybdemåling? (Husk: Du må ha koblet en Smart Craft–dybdeomformer til systemet for at dette skjermbildet skal fungere)
SIMULATOR MODE? [NO] [SAVE] [YES]	Vil du aktivere en simuleringsmodus? (brukes til demonstrasjonsformål)
CALIBRATION 1 EXIT? [NO] [SAVE] [CAL2]	Vil du avslutte kalibreringen? Eller gå til kalibrering 2?

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SYSTEMTURTELLER OG – SPEEDOMETER

CAL 2–turtellerkalibrering

FUEL TANK CAPACITY [DOWN] [SAVE] [UP]	Med dette alternativet kan du oppgi kapasiteten til båtens drivstofftank. Dette alternativet er det samme for både tank 1 og tank 2.
CALIBRATION FUEL TANK [SKIP] [EDIT]	Med dette alternativet kan du oppgi modusen der du kan kalibrere drivstofftanken. Kalibrering av drivstofftanken er det samme for både tank 1 og tank 2.
EMPTY TANK THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	Du kan velge tom tank og trykke på SAVE (lagre), eller på DFLT hvorpå en standardverdi blir lagt inn på grunnlag av tankkapasiteten.
FILL TO 1/4 THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	Du kan velge 1/4 tank og trykke på SAVE (lagre), eller på DFLT hvorpå en standardverdi blir lagt inn på grunnlag av tankkapasiteten.
FILL TO 1/2 THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	Du kan velge 1/2 tank og trykke på SAVE (lagre), eller på DFLT hvorpå en standardverdi blir lagt inn på grunnlag av tankkapasiteten.
FILL TO 3/4 THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	Du kan velge 3/4 tank og trykke på SAVE (lagre), eller på DFLT hvorpå en standardverdi blir lagt inn på grunnlag av tankkapasiteten.
FILL TO FULL THEN PRESS PLUS BUTTON [DFLT] [SKIP] [SAVE]	Du kan velge full tank og trykke på SAVE (lagre), eller på DFLT hvorpå en standardverdi blir lagt inn på grunnlag av tankkapasiteten.

(forts. på neste side)

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SYSTEMTURTELLER OG – SPEEDOMETER

CAL 2–turtellerkalibrering

TROLL CONTROL? [NO] [SAVE] [YES]	Er dorgekontrollen aktivert eller deaktivert på denne båten?
SPEED OPTION [SKIP] [EDIT]	Med disse valgene kan du konfigurere følgende hastighetssensorer:
PITOT SENSOR? [NO] [SAVE] [YES]	Velg typen pitotomformer. Du kan velge 100 eller 200 PSI. (100 PSI er det vanligste)
PITOT SENSOR MULTIPLIER [DOWN] [SAVE] [UP]	Juster pitottrykksensoren, slik at den korrigerer målinger på skjermen som er for høye/lave.
PADDLE SENSOR PULSE FAC-TOR [DOWN] [SAVE] [UP]	Juster skovlhjulfrekvensen for å vise målinger som er for høye/lave.
PADDLE TO PITOT TRANSITION [DOWN] [SAVE] [UP]	Innstill hastigheten når instrumentet skal slutte å registrere skovlhjulet og begynne å bruke pitot for å måle båtens hastighet.

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SYSTEMTURTELLER OG – SPEEDOMETER

Kalibrering av hurtigkalibrering

Hurtigkalibrering – Denne kalibreringen er for å innstille lys og kontrast.

1. Trykk på MODE (modus) og TROLL + i opp til 2 sekunder for å få fram Quick Cal–skjermbildet (hurtigkalibrering).
2. Trykk på MODE for å gå gjennom kalibreringsvalgene.

CAL 1–speedometerkalibrering

Cal 1 – Denne kalibreringen gjør det mulig å slå systemets skjermbilder av og på.

MERK: Skjermbildene kan variere, avhengig av hvilken versjon av måleinstrumentet du har.

1. Trykk på MODE (modus) og TROLL + og hold knappene inne i ca. 7 sekunder til skjermbildet Cal 1 vises.
2. Trykk på MODE for å gå gjennom kalibreringsvalgene.

REMOTE LCD LIGHT? [NO] [SAVE] [YES]	Med dette alternativet kan du innstille lysnivåene på alle SC1000 samtidig fra dette instrumentet.
REMOTE LCD CONTRAST? [NO] [SAVE] [YES]	Med dette alternativet kan du styre kontrasten fra et annet turteller/hastighetssystem samtidig fra dette instrumentet.
TIME [NO] [SKIP] [EDIT]	Med dette alternativet kan du stille klokka. Velg redigering for å formatere klokkeslettet. Hvis en GPS er koblet til systemet, kan du ikke redigere klokkeslettet med denne funksjonen.
TIME FORMAT [DOWN] [SAVE] [UP]	Velg mellom 12– og 24–timers klokkeformat. 12–timersformatet viser datoen som måned–dag–år. 24–timersformatet viser datoen som dag–måned–år.

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SYSTEMTURTELLER OG – SPEEDOMETER

CAL 1–speedometerkalibrering

CALIBRATION HOUR 12:00 AM [DOWN] [SAVE] [UP]	Still den interne klokken til instrumentene etter lokal tid. Innstill først timen, og trykk deretter på MODE–knappen for å innstille minuttene.
DISPLAY UNITS [DOWN] [SAVE] [UP]	Med dette alternativet kan du endre mellom engelsk (standard) eller metrisk måleenhet.
SPEED UNITS [DOWN] [SAVE] [UP]	Med dette alternativet kan du velge hvilken måleenhet hastigheten skal vises med. Du kan velge mellom MPH (miles per time), KTN (knop) eller KMH (kilometer per time).
STEERING ANG. SCREEN? [NO] [SAVE] [YES]	Vil du aktivere skjermbildet for styrevinkel?
TEMP / CLOCK SCREEN? [NO] [SAVE] [YES]	Vil du aktivere det delte skjermbildet som viser lufttemperatur og klokkeslett?
FUEL USED SCREEN? [NO] [SAVE] [YES]	Vil du aktivere skjermbildet for forbrukt drivstoff? Dette skjermbildet viser hvor mye drivstoff som er brukt på turen.

(forts. på neste side)

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SYSTEMTURTELLER OG – SPEEDOMETER

CAL 2–speedometerkalibrering

CAL 2 – På dette kalibreringsnivået kan du konfigurere inndata for systemsensorene.

MERK:Skjermbildene kan variere, avhengig av hvilken versjon av måleinstrumentet du har.

1. Trykk på [MODE] (modus) og [TROLL] + og hold knappene inne i ca. 10 sekunder for å få fram skjermbildet for kalibrering 2 (Cal2).
2. Trykk på [MODE] for å gå gjennom kalibreringsvalgene.

EXTERNAL SENSORS [SKIP] [EDIT]	Med dette alternativet kan du aktivere eller deaktivere inndata for eksterne sensorer:
AIR TEMP? [NO] [SAVE] [YES]	Bruker du en sensor for lufttemperatur?
GPS? [NO] [SAVE] [YES]	Har du en GPS–sensor installert?
USE GPS SPEED? [NO] [SAVE] [YES]	Vil du bruke GPS–inndata til å styre hastighetsvisningen?

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SYSTEMTURTELLER OG – SPEEDOMETER

CAL 2–speedometerkalibrering

SEA TEMP OFFSET = 0° F [DOWN] [SAVE] [UP]	I dette skjermbildet kan du kalibrere skjermbildet og vanntemperatursensoren.
TROLL CONTROL? [NO] [SAVE] [YES]	Er dorgekontrollen aktivert på denne båten?
WATER TEMPERATURE ADJUST [DOWN] [SAVE] [UP]	Juster omformeren for vanntemperatur slik at den tilsvarer den faktiske sjøvannstemperaturen.
CALIBRATION 2 EXIT? [NO] [SAVE] [CAL1]	Vil du avslutte kalibreringen? Eller gå til kalibrering 1?

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TILLEGG / APPENDIX O

N **Konformitetserklæring og tillegget til denne**

S **Överensstämmelse och bilagan till överensstämmelse**

DK **Overensstemmelseserklæring og bilaget hertil**

NL **De gelijkvormigheidsverklaring en de bijlage op de gelijkvormigheidsverklaring**

D **Die Konformitätserklärung und die Anlage zur Konformitätserklärung**

GB **Declaration of conformity and annex to declaration of conformity**

FIN **Yhdenmukaisuusjulistus ja liite**

ASKELADDEN

ANNEX TO THE DECLARATION OF CONFORMITY

TABELLARISK OVERSIKT OVER BENYTTEDE STANDARDER OG EVENTUELLE, ANDRE ANERKJENTE REGLER
OVERVIEW OF USED STANDARDS AND APPROVED RULES

The table refers directly to the Annex 1 of the Recreational Craft Directive 94/25/EC and 2003/44/EC

ENH; European Standard
ISO; International Standard

Askeladden model; Z7

A. SIKKERHETSKRAV, KONSTRUKSJON OG PRODUKSJON
SAFETY REQUIREMENTS, DESIGN AND CONSTRUCTION

1. **KONSTRUKSJONSKATEGORI** **DESIGN CATEGORY**	RCD annex 1, ENH ISO 12217-1:2002
2. **ALMINNELIGE KRAV** **GENERAL REQUIREMENTS**	EN ISO 8666:2002
2.1. **Identifikasjon av båten/Craft identification**	EN ISO 10087:2006
2.2. **Produsentskilt/Builder´s plate**	EN ISO 14945:2004
2.3. **Vern mot fall over bord og midler som gjør det mulig å komme om bord igjen** **Protection from falling overboard and means of reboarding**	EN ISO 15085:2003
2.4. **Sikt fra styreposisjon** **Visibility from main steering position**	EN ISO 11591:2000
2.5. **Håndbok for brukere/Owner´s manual**	EN ISO 10240:2004
3. **KRAV TIL KONSTRUKSJON** **INTEGRITY AND STRUCTURAL REQUIREMENTS**	
3.1. **Struktur/Structure**	ISO DIS 12215-5:2004
3.2. **Stabilitet og fribord/Stability and freeboard**	EN ISO 12217-1:2002
3.3. **Oppdrift og flyteevne/Buoyancy and flotation**	EN ISO 12217-1:2002
3.4. **Åpninger i skrog, dekk og overbygninger** **Openings in hull, deck and superstructure**	EN ISO 12216:2002/9093-1:1997
3.5. **Vannfylling/Flooding**	EN ISO 15083:2003/12217-1:2002/12216:2002
3.6. **Største last anbefalt av produsent** **Manufacturer´s recommended maximum load**	EN ISO 14946:2001
3.7. **Plassering av redningsflåte/Life raft stowage**	RCD annex 1, clause A.3.7
3.8. **Rømming/Escape**	EN ISO 9094-1:2003
3.9. **Forankring, fortøying, sleping** **Anchoring, mooring and towing**	EN ISO 15084:2003
4. **MANØVRERINGSEGENSKAPER** **HANDLING CHARACTERISTICS**	EN ISO 8665:1995
5. **KRAV TIL UTSTYR OG INSTALLASJON** **INSTALLATION REQUIREMENTS**	
5.1.1. **Innenbordsmotorer** **Engine end engine spaces**	EN ISO 16147:2002/RCD annex1 clauseA.5.1.1
5.1.2. **Ventilasjon/Ventilation**	RCD annex 1, clause A.5.1.2/EN ISO 11105:1997
5.1.3. **Utsatte deler/Exposed parts**	RCD annex 1, clause A.5.1.3
5.1.4. **Start av utenbordsmotor** **Outboard engines starting**	NA
5.1.5. **Vannscootere i fart uten fører** **Personal watercraft running without driver**	NA
5.2.1. **Drivstoffsystemet generelt** **Fuel system, general**	EN ISO 10088:2001/7840:2004
5.2.2. **Drivstofftanker/Fuel tanks**	EN ISO 10088:2001
5.3. **Elektrisk anlegg/Electrical system**	ENISO10133:2001/8849:2003/9097:1994/28846:1993
5.4.1. **Styresystemet generelt** **Steering system, general**	EN ISO 10592:1994
5.4.2. **Nødutstyr/Emergency arrangements**	NA
5.5. **Gassapparater/Gas system**	NA
5.6.1. **Brannvern, nødarrangementer** **Fire protection, emergency arrangements**	EN ISO 9094-1:2003

5.6.2. **Brannslokningsutstyr** **Fire-figthing equipment**	EN ISO 9094-1:2003
5.7. **Navigasjonslys/Navigation lights**	Colregs 1972 w. distinct Scandinavian rules
5.8. **Utslippsforebygging/Discharge prevention**	EN ISO 8099:2000

B. KRAV, EKSOSUTSLIPP FRA MOTORER
REQUIREMENTS, EXHAUST EMISSIONS FROM ENGINES

1. **MOTOR IDENTIFIKASJON** **MOTOR IDENTIFICATION**	Ref. RCD annex 1,clause B.1 and motor manual
2. **KRAV TIL MOTORENS EKSOSUTSLIPP** **EXHAUST EMISSION REQUIREMENTS**	Ref. RCD annex 1,clause B.2 and motor manual
3. **HOLDBARHET** **DURABILITY**	Ref. RCD annex 1,clause B.3 and motor manual
4. **HÅNDBOK FOR BRUKER** **OWNER'S MANUAL**	Ref. RCD annex 1,clause B.4

C. KRAV TIL STØY
REQUIREMENTS FOR NOISE EMISSIONS

1. **STØYNIVÅ** **NOISE EMISSION LEVELS**	Ref. RCD annex 1,clause C.1 and motor manual
2. **HÅNDBOK FOR BRUKER** **OWNER'S MANUAL**	Ref. RCD annex 1,clause C.2

ANNET
OTHER

1. **KLEMFARE** **PINCH DANGER**	Ref. FOR 1994-08-19-820 Forskrift om maskiner Directive 98/37/EC

5-ÅRS SKROGGARANTI OG 2-ÅRS GARANTI PÅ DELER

Askeladden gir følgende garanti til den opprinnelige kjøperen av båter og etterfølgende eiere av båter, såfremt båtene opprinnelig er kjøpt hos en autorisert forhandler i Norge og utsettes for normal, ikke-kommersiell bruk:
A. Reparasjon av strukturelle defekter på skrog som oppstår innen 5 (fem) år fra leveringsdatoen til den opprinnelige kjøperen.
B. Reparasjon eller utskifting av deler som viser seg å ha materialdefekter eller feil som følge av fagmessig utførelse innen 2 (to) år fra leveringsdatoen til den opprinnelige kjøperen.

Hva som ikke omfattes av garantien
Denne garantien gjelder ikke for:
1. Motorer, drivverk, kontroller, propeller, batterier eller annet utstyr eller tilbehør som er dekket av egne garantier.
2. Motorer, deler eller tilbehør som ikke er installert av Askeladden.
3. Blærer på skroget som oppstår under vannlinjen.
4. Normal forringelse, dvs. slitasje, sprekker eller korrosjon på maskindeler, vinyl. kalesjer, pleksiglass, møbeltrekk i vinyl eller stoff, deler av plast, metall eller tre eller dekortape.
5. Alle Askeladden-båter som har blitt utstyrt med for kraftige motorer i forhold til spesifikasjonene for maksimalt antall hestekrefter som er angitt på kapasitets-platen (denne platen er montert på alle Askeladden-båter med utenbordsmotorer).
6. Askeladden-båter som er brukt til kommersielle formål.
7. Eventuelle defekter som har oppstått som følge av at båten og dens utstyr er benyttet på annen måte eller utsatt for andre belastninger enn det slike båter og slikt utstyr normalt er beregnet utsatt for samt eventuelle defekter som følge av manglende vedlikehold.
8. Eventuelle mangler og defekter som skyldes uaktsom bruk.

Andre begrensninger
DET GIS INGEN ANDRE DIREKTE GARANTIER FOR DENNE BÅTEN SÅ FREMT DET IKKE FØLGER AV UFRAVIKELIGE LOVER.

1. Verken Askeladden eller forhandleren som selger båten, skal kunne holdes ansvarlig for tap av båtens bruksevne, tap av tid, kommersielle tap eller skadeserstatninger som følge av driftstap.
2. I tillegg til de rettigheter denne garanti gir deg kan du også ha andre, lovbestemte rettigheter varierende fra land til land.

Dine forpliktelser
Det er en forutsetning at du sender inn registreringskortet for garantien innen 30 dager fra den datoen båten ble levert. Hvis garantien skal gjelde, må dette kortet returneres i utfylt stand. Før det utføres eventuelle garantireparasjoner er du forpliktet til å kontakte din forhandler for å be om garantiassistanse.

Vi krever også at du returnerer, for egen kostnad, båten til din forhandler. Du vil selv være ansvarlig for alle transportkostnader samt for andre kostnader som påløper ved retur av båten i forbindelse med garantiservice.

5-YEAR HULL WARRANTY AND 2-YEAR WARRANTY ON PARTS

Askeladden warrants to the original purchaser of its boats and any following owners, originally purchased from an authorized dealer outside of Norway, operated under normal, noncommercial use that the Selling Dealer will:
A: Repair any structural hull defect which occurs within five (5) years of the date of delivery to the original purchaser.
B: Repair or replace any parts found to be defective in factory material or workmanship within two (2) years of the date of delivery to the original purchaser.

What is Not Covered
This warranty does not apply to:
1. Engines, drive trains, controls, propellers, batteries, or other equipment or accessories carrying their own individual warranties;
2. Engines, parts or accessories not installed by Askeladden;
3. Hull blisters that form below the waterline;
4. Normal deterioration, i.e. wear and tear, cracks in or corrosion of hardware, vinyl, tops, plexiglass, vinyl and fabric upholstery, plastic, metal or wooden parts, or trim tape;
5. Any Askeladden boat which has been overpowered according to the maximum horsepower specifications on the capacity plate provided on each Askeladden outboard boat;
6. Any Askeladden boat used for commercial purposes;
7. Any defect caused by the boat or its equipment being used incorrectly, or being subjected to loads which such boats and such equipment are not designed to withstand, and any failure of the customer to provide reasonable care and maintenance.
8. Any fault or defect caused by improper use.

Other Limitations
THERE ARE NO OTHER EXPRESS WARRANTIES ON THIS BOAT UNLESS DETERMINED BY OBLIGATORY REGULATIONS:

1. Neither Askeladden nor the Selling Dealer shall have any responsibility for loss of use of the boat, loss of time, inconvenience, commercial loss or consequential damages.
2. In addition to the legal rights granted by this warranty, you may also have other rights which vary from country to country.

Your Obligations
It is essential that your warranty registration card be submitted within 30 days of delivery of your boat. Return of this card with all details filled in is a condition precedent to warranty coverage. Before any warranty work is performed, we require that you contact your Selling Dealer to request warranty assistance.

We require that you return your boat, at your expense, to your Selling Dealer. You will be responsible for all transportation and for all other expenses incurred in returning the boat for warranty service.

ASKELADDEN

Simply better