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1. FOR SAFE OPERATION

Following the precautions described in this manual will enable you to use this engine with complete satisfaction. Failure to observe any of the rules and precautions, however, may result in injury, burns, fires, and engine damage. Read this manual carefully and be sure you fully understand it before beginning operation.

1.1 Warning Symbols

These are the warning signs which are used in this manual and on the products. Pay special attention to them.

⚠ DANGER

DANGER- Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠ WARNING

WARNING- Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

⚠ CAUTION

CAUTION- Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

- The descriptions captioned by **[NOTICE]** are for the particularly important cautions for handling. If you ignore them, the performance of your machine may deteriorate leading to trouble.

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2.2 Engine Specifications

• 6LPA-DTP/-DTZP

Engine model		6LPA-DTP	6LPA-DTZP
Type		Vertical water cooled 4-cycle diesel engine	
No. of clinders		6	
Bore × Stroke	mm	94×100	
Displacement	ℓ	4.164	
Fuel stop power at crankshaft	kw(hp)/rpm	*191 (260) / 3800 **182 (248) / 3800	
Cont. power at crankshaft.	kw(hp)/rpm	154 (210) / 3600	
High idling	rpm	4200 ± 25	
Low idling	rpm	750 ± 25	
Combustion system		Direct injection	
Starting system		Electric starting (12V-2.5kW)	
Charging system		Regulator built in Alternator DC12V-80A	
Cooling system		Constant high temperature fresh water cooling (2 systems : sea & fresh water)	
Lubrication system		Forced lubrication system with trochoidal gear pump	
Direction of rotation (crankshaft)		Counter-clockwise (viewed from flywheel side)	
Lube oil capacity	All ℓ	10.0	
	Oil pan ℓ	8.4	
Cooling water capacity	ℓ	13.5 (Engine), 1.6 (Sub-tank)	
Turbochager	Model	RHE62W (IHI made)	
	Type	Water cooled turbine housing	
Dimension (L×W×H) (gear less)	mm	1065×671×729	1145×752×799
Dry mass (gear less)	kg	380	400
Recommended battery capacity		12V×120Ah	
Recommended type of remote control handle		Single lever type only	
Engine installation style		On the flexible engine mount	

(Note) 1. Rating condition : ISO 3046-1, 8665 2. 1hp = 0.7355 kW
3. Fuel condition : Density at 15℃ = 0.860, Fuel oil temperature *: 25℃ at the fuel injection pump inlet
**: ISO 8665 (Fuel oil temp. 40℃ at the fuel injection pump inlet)

• Marine gear (Option)

Model	HURTH	MERCRUISER		
	HSW630A1	Bravo X-1	Bravo X-2	Bravo X-3
Type	8° down Hydraulic	Stern drive		
Available engine	6LPA-DTP	6LPA-DTZP		
Reduction ratio Hsw630A: Ahead/Astern Bravo X-1, 2, 3: Both ahead and astern	1.22/1.21	1.36	1.50	1.36
	1.56/1.58	1.50	1.65	1.50
	2.04/2.10	1.65	1.81	1.65
	2.52/2.53		2.00	1.81
			2.20	2.00
For further detail, refer to the maker's manual				

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2.5 Control Equipment

The control equipment consists of the control panel and remote control handle, which are connected by the wires and cables to the control levers for remote control operation.

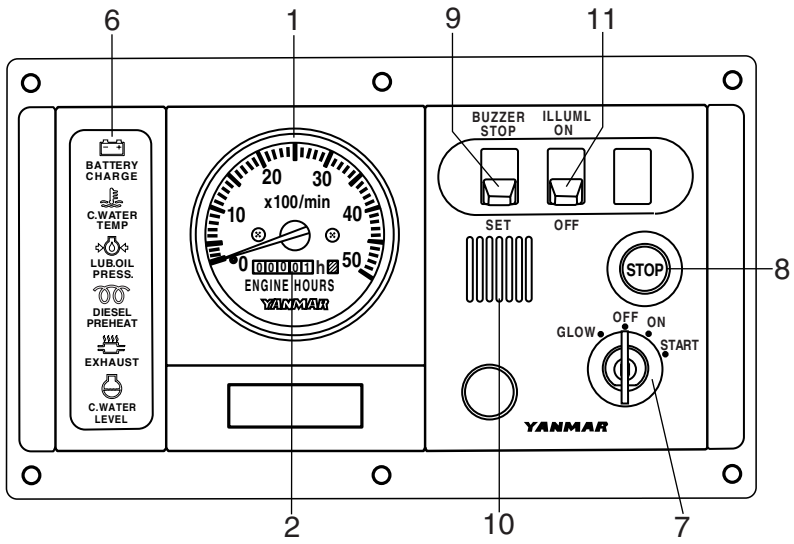
2.5.1 Control Panel (Optional)

The control panel has the following gauges and alarm devices (optional accessories):

● Available , — Not available

No.	Model		New B-type	New C-type	New D-type
7	Switch unit	Key switch (Starter switch)	●	●	●
8		Engine stop switch	●	●	●
10		Alarm buzzer	●	●	●
9		Alarm buzzer stop switch	●	●	●
11		IIlumination switch for meters	●	●	●
6	Alarm lamp unit	Battery not charging	●	●	●
		C.W. high temperature	●	●	●
		L.O. low pressure (engine)	●	●	●
		C.W level	—	●	●
		Exhaust (C.S.W.flow)	●	●	●
		Boost	—	●	●
		Fuel filter	●	●	●
		Gear oil (stern drive)	—	●	●
1	Tachometer uni	Tachometer with hour meter	●	●	●
4	Sub meter unit	LO. pressure meter	—	●	●
3		C.W. temperature meter	—	●	●
5		Boost meter (Turbo)	—	—	●
12	Clock unit	Quartz clock	● (option)	● (option)	●

● **New B-type**



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3.2 Supplying Fuel

⚠ DANGER



Fires from Oil Ignition

- **Be sure to use the correct type of fuel when refueling. Mistakenly filling with gasoline or the like will result in ignition.**
- **Be sure to stop the engine before refueling. If you spill fuel, wipe such spillage carefully.**
- **Never place oils or other flammable material close to the engine as this could result in ignition.**

3.2.1 Filling the Fuel Tank

Before supplying fuel, flush the fuel tank and the fuel system parts with diesel fuel or kerosene.

Fill the tank with clean fuel which has not been contaminated with water or dust.

Fill the tank to approximately 90% of its capacity, and take care not to let the fuel spill over during operation.

3.2.2 Bleeding the Fuel System

Bleed the fuel system according to the following procedure. When there is air in the fuel system, the fuel injection pump will not be able to function.

①Check the amount of fuel in the fuel tank, if insufficient replenish.

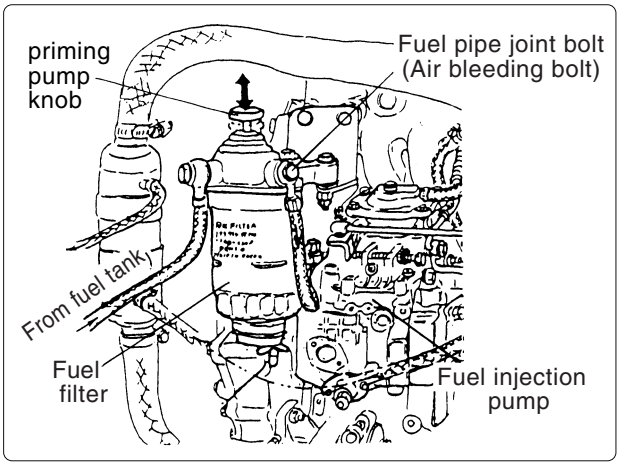
②Open the fuel cock of the fuel tank.

③Loosen the fuel pipe joint bolt on the fuel filter outlet by turning it 2～3 times with a spanner.

④Feed the fuel with the priming pump.
The priming pump is on the top of the fuel filter.
Move the priming pump knob up and down until fuel mixed with air bubbles flows out of the pipe joint bolt.

⑤When the fuel coming out is clear and not mixed with any bubbles, tighten the pipe joint bolt.

⑥Check no leakage of fuel oil from the seals of the pipe joint bolt during moving the priming pump knob up and down.



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5. MAINTENANCE & INSPECTION

Conduct Periodic Inspection for Your Safety.

The functions of engine components will degenerate and engine performance will fall according to the use of the engine. If countermeasures are not taken, you may encounter unexpected troubles while cruising at sea. Consumption of fuel or lube oil may become excessive and exhaust gas and engine noise may increase. These all shorten the life of the engine.
Daily and periodic inspection and servicing increase your safety operation.

Inspect Before Starting.

Make it a daily rule to inspect before starting. →See [4.1 Inspection Before Starting]

Monitor the hour meter and conduct periodic inspections.

Keep a daily record of operation and maintenance. When the time for an inspection approaches, study the relevant pages in the Operation Manual. Inspections should be made after every 50, 125 (6 mos.), 250(1 yr.), 500 (2 yrs.), 1000(4 yrs.), and 1250 (5 yrs.) hours of use.

Use Genuine YANMAR Parts.

Be sure to use genuine YANMAR parts for consumable and replacement parts. Use of other parts will reduce engine performance and shorten the life of the engine.
Specialty technicians are ready to assist you with periodic inspections and maintenance.
Consult your YANMAR dealer or distributor in accordance with the service agreement.

Always Have Servicing Tools On Hand.

Keep servicing tools close to the machinery and ready for use in inspections.

Tightening Torque of Bolts & Nuts.

It is important to tighten bolts and nuts properly to the correct tightening torque. Over-tightening damages the threads of the bolts and nuts and ruins them. Insufficient tightening causes oil leakage from the installation face or damage to parts. Important parts must be tightened with a torque wrench to the correct tightening torque and in the right order.
Consult with your dealer or distributor if servicing requires the removal of parts.

The tightening torque for standard nuts & bolts is listed below:

[NOTICE]



- ● Apply the following tightening torque to bolts having "7" on the head. (JIS strength classification : 7T)
- ○ Tighten bolts with no "7" mark to 60% tightening torque.
- ○ If the parts to be tightened are made from aluminum alloy, tighten the bolts to 80% tightening torque.

Bolt dia. × pitch	mm	M6×1.0	M8×1.25	M10×1.5	M12×1.75	M14×1.5	M16×1.5
Tightening torque	N·m (Kgf-m)	10.8±1.0 (1.1±0.1)	25.5±2.9 (2.6±0.3)	49.0±4.9 (5.0±0.5)	88.3±9.8 (9.0±1.0)	137±9.8 (14.0±1.0)	226±9.8 (23.0±1.0)

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6. TROUBLE AND TROUBLESHOOTING

6.1 Simple problems and the appropriate countermeasures

If you should encounter some difficulty during operation, refer to the following table for countermeasures.

Trouble	Probable Cause	Measure	Reference
Problem occurs during operation. ■Alarm buzzer sounds and alarm lamps come on.	**[NOTICE]** **When the alarm equipment indicates a problem, immediately put the clutch in neutral and run the engine at low speed. Check to see which alarm indicator is lit, then stop the engine and inspect. When you cannot determine the source of the problem, return to port at low speed and ask your Yanmar dealer for repairs.**		
●Charge Lamp (Alarm buzzer does not sound.)	Faulty battery V-belt is loose or damaged Alternator is not generating electricity	Check battery fluid. Adjust V-belt tension or replace belt. Ask for repairs.	5.2.2(3) 5.2.5(1)
●C.W. Temp. Lamp goes on.	Insufficient cooling water in fresh water tank Leakage in fresh water cooling system Fresh water cooling pump is damaged Inside of C.W. system is dirty.	Check and replenish cooling water. Ask for repairs for water leakage. Ask for repairs. Ask for repairs.	3.5
●L.O. Press. Alarm Lamp goes on.	Insufficient engine oil	Replenish engine oil.	3.3
●C.W. Level Alarm Lamp goes on.	Insufficient cooling water in fresh water tank	Check and replenish fresh cooling water.	4.1(5)
●Gear Oil Alarm Lamp goes on.	Insufficient drive oil	Replenish drive oil.	3.4
●Boost Press. Alarm Lamp goes on.	Boost Press. adjustment device is damaged.	Ask for repairs.	
●Fuel Filter Alarm Lamp goes on.	Increased fuel filter drain	Drain water separator.	5.2.2(2)
●Exhaust Alarm Lamp goes on.	Insufficient discharge of cooling seawater Damaged cooling seawater pump	Kingston cock is closed. Kingston cock is clogged. Suction hose is damaged or joints loose Check seawater pump impeller.	 5.2.6(1)
Faulty Alarm Devices	**[NOTICE]** **Do not operate the engine if alarm devices are not working properly. Serious accidents may result if difficulties are not spotted due to faulty alarm lamps.**		
■Before starting when switch is turned from **OFF→ON**, alarm devices do not work.			2.5.1(2)
●Alarm buzzer does not sound.	Circuit broken or buzzer damaged	Ask for repairs.	
●Some alarm lamps do not light up.	Circuit broken or lamp burnt out.	Ask for repairs.	
■After starting when switch returns from **START →ON**, alarm devices do not work.			2.5.1(2)
●Alarm buzzer does not stop.	Short circuit	Ask for repairs.	
●Some alarm lamps do not go out.	Damaged sensor or switch	Ask for repairs.	

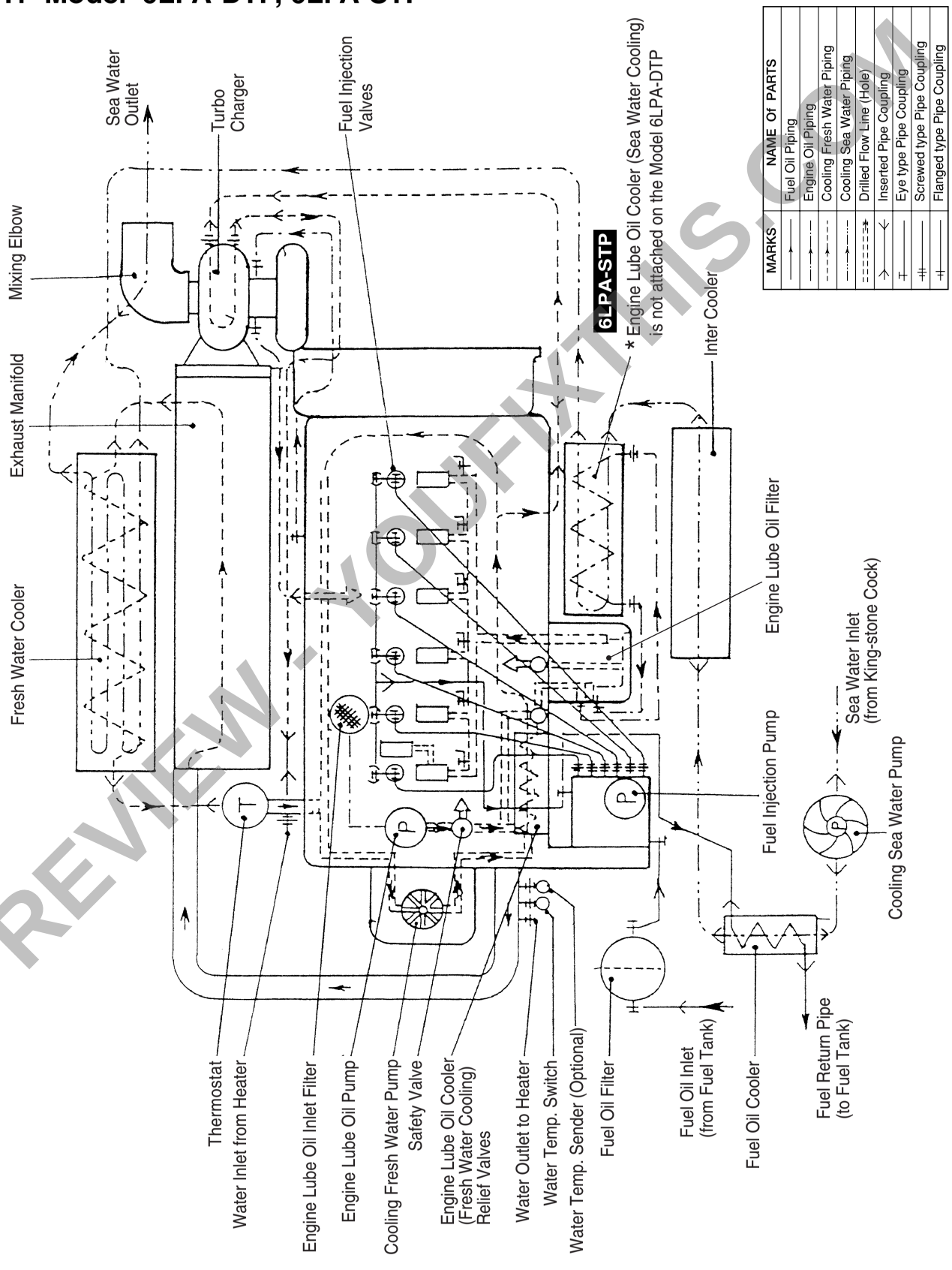
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7. SYSTEM DIACGRAMS

7.1 Piping Diagram
Fuel Oil, Engine Lube Oil, Cooling Water System

7.1.1 Model 6LPA-DTP, 6LPA-STP

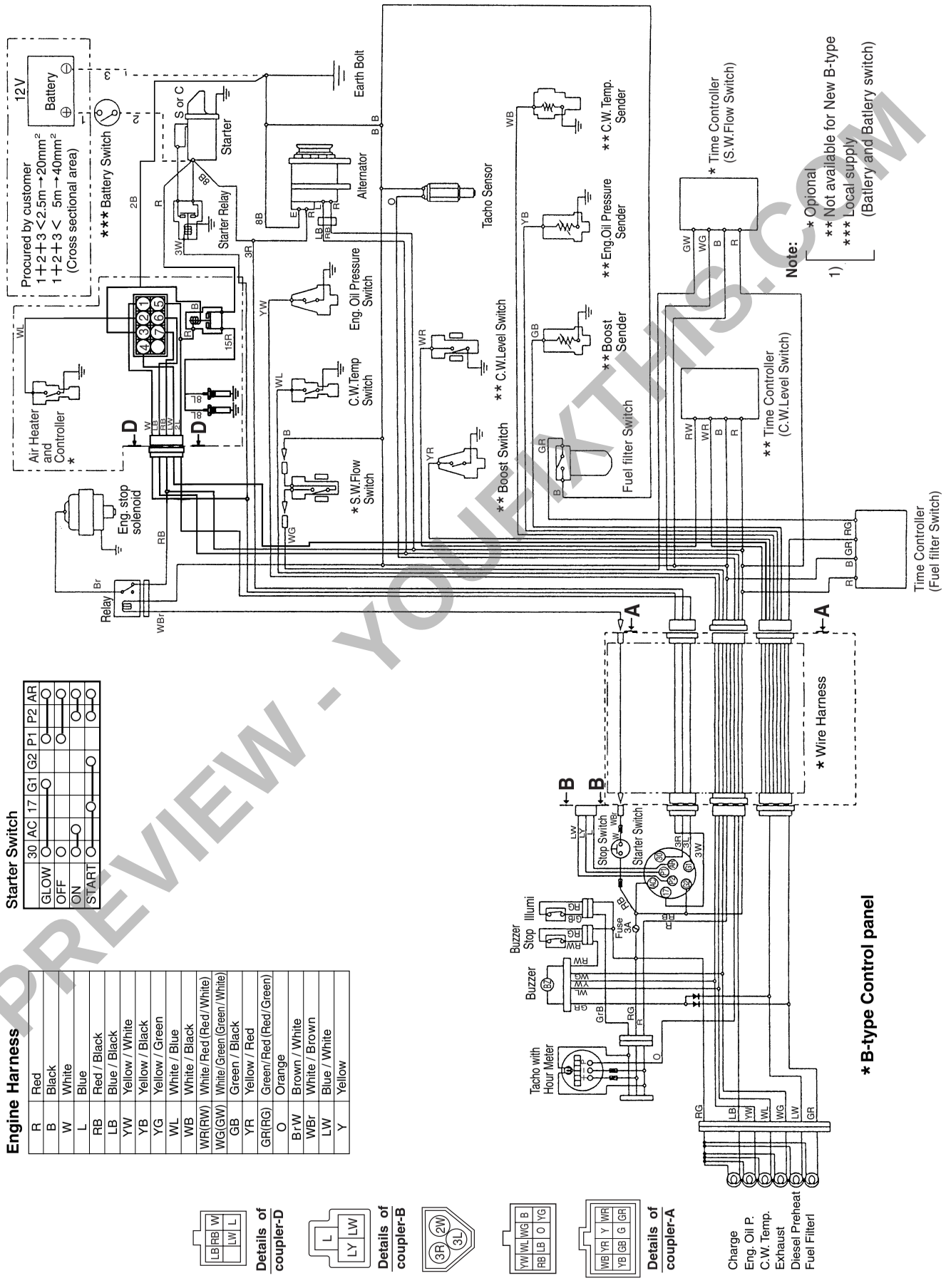


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7.2 Electric Wiring Diagram

7.2.1 For B-type Control Panel



Starter Switch

	30	AC	17	G1	G2	P1	P2	AR
GLOW	○			○			○	
OFF	○					○		
ON	○	○				○	○	
START			○		○			○

Engine Harness

R	Red
B	Black
W	White
L	Blue
RB	Red / Black
LB	Blue / Black
YW	Yellow / White
YB	Yellow / Black
YG	Yellow / Green
WL	White / Blue
WB	White / Black
WR(RW)	White/Red(Red/White)
WG(GW)	White/Green(Green/White)
GB	Green / Black
YR	Yellow / Red
GR(RG)	Green/Red(Red/Green)
O	Orange
BrW	Brown / White
WBr	White / Brown
LW	Blue / White
Y	Yellow

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YANMAR
MARINE DIESEL ENGINE
MODELS : 6LPA-DTP/-DTZP/-STP/-STZP
OPERATION MANUAL

Thank you for purchasing the YANMAR Marine Diesel Engine.

[INTRODUCTION]

●This Operation Manual describes the operation, maintenance and inspection of the **6LPA-DTP/-DTZP/-STP/-STZP** Yanmar marine diesel engines.

●Read this Operation Manual carefully before operate the engine to ensure that the engine is used correctly and that it stays in the best possible condition.

●Keep this Operation Manual in a convenient place for easy access.

●If this Operation Manual is lost or damaged, order a new one from your dealer or distributor.

●Make sure this manual is transfered to subsequent owners. This manual should be considered a permanent part of the engin and remain it.

●Constant efforts are made to improve the quality and performance of Yanmar products, so some details included in this Operation Manual may differ slightly from your engine. If you have any questions about such difference, please contact your Yanmar Dealer or Distributor.

●For detailed information marine gears, refer to the Marine Gear Operation Manual.

Operation Manual (Marine Engine)	Models	**6LPA-DTP/-DTZP/-STP/-STZP**
	Code No.	49961-205771

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(3) Inspecting and Replacing Anti-Corrosive Zinc

Inspect and replace the anti-corrosive zinc periodically.

①Close the kingston cock.

②Drain the cooling seawater.

→ See 4.9.1(2)

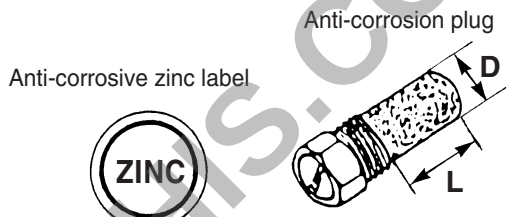
③Remove the plug labeled ZINC and indicated in the figure.
Anti-corrosive zinc is on the following parts.

Part	Parts No.	Quantity	Dimensions D×L
Intercooler	119574-18790	1	1/2"×1"
Engine oil cooler*	119574-44150	2*	1/2"×1"
Fresh water cooler	119574-44150	2	1/2"×2"

*Applied to 6LPA-STP, STZP

【NOTICE】

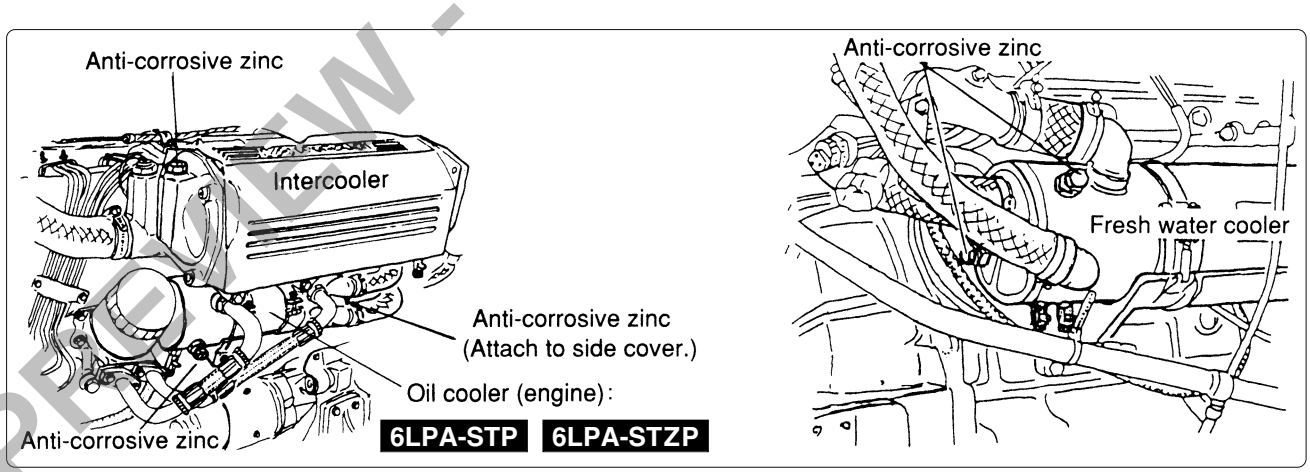
If replacement of zinc is neglected and operation is continued with a small volume of anti-corrosive zinc, corrosion of the seawater cooling system will occur and water leakage, parts breakage, or accidents will result.



④Check the zinc on the inside of the plug to determine the amount of wear to the anti-corrosive zinc.
- Replace the anti-corrosive zinc when it has been reduced to less than 1/2 of its original size.
- If there is only a little bit of wear, clean the surface by sanding off any corroded areas.

⑤Replace plug with new one.

⑥Open the kingston cock and check water leakage.



[NOTICE]

Check the zinc for marine drive (marin CTP gear) in accordance with their accompanying operation manuals.

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3.7 Verificación del lubricante y del agua de refrigeración

Cuando se pone la primera vez el lubricante del motor, el lubricante de la transmisión, el gasóleo, el lubricante de la dirección asistida y el agua de refrigeración, o después de cambiarlos o añadir, hay que verificar los niveles, tras una prueba en marcha. El funcionamiento del motor envía el lubricante y el agua a distintas piezas y se reducen los niveles de ambos. Añadir la cantidad necesaria.

- **Suministro de lubricante del motor --> Ver 3.3**
- **Suministro de lubricante a la caja de cambios --> Ver 3.4**
- **Suministro de agua de refrigeración --> Ver 3.5**

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• 6LPA-STP/-STZP

Modèle du moteur		6LPA-STP	6LPA-STZP
Type		Moteur diesel 4 temps vertical à refroidissement par eau	
Nombre de cylindres		6	
Alésage x course	mm	94x100	
Cylindrée	(ℓ)	4,164	
Puissance à l'arrêt au niveau du vilebrequin	kw(hp)/t/min	*232 (315) / 3800 **222 (301) / 3800	
Puissance continue au niveau du vilebrequin	kw(hp)/t/min	188 (255) / 3600	
Point mort haut	t/min	4200 ± 25	
Point mort bas	t/min	750 ± 25	
Système de combustion		Injection directe	
Système d'allumage		Allumage électrique	
Système de mise en charge		Régulateur intégré dans l'alternateur 12VCC - 80A	
Système de refroidissement		Refroidissement permanent à eau douce à haute température(2 systèmes : eau de mer et eau douce)	
Système de lubrification		système de lubrification forcée avec pompe à engrenage trochoïde	
Sens de rotation (vilebrequin)		Anti-horaire (vu de la barre)	
Contenance d'huile de lubrification	Total (ℓ)	10,5	
	Carter d'huile (ℓ)	8,4	
Contenance d'eau de refroidissement (ℓ)		13,5 (moteur), 1,6 (réservoir annexe)	
Turbocompresseur	Modèle	RHE62W (IHI)	
	Type	Enveloppe à refroidissement par eau	
Dimensions (LXlXH) (sans engrenage)	mm	1065x671x729	1145x752x799
Masse sèche (sans engrenage)	kg.	408	428
Capacité recommandée de la batterie		12Vx120Ah	
Type recommandé de commande à distance		Type à levier simple uniquement	
Style d'installation du moteur		Sur la monture souple du moteur	

Note : 1. Réglage : ISO 3046-1. 2. 1hp = 0,7355 kW
3. Carburant : densité à 15°C = 0,860, température du carburant * : 25°C à l'entrée de la pompe d'injection.
** : ISO 8665(température du carburant : 40°C à l'entrée de la pompe d'injection.)

• Engrenage marin (option)

Modèle	HURTH HSW630A1	Mercruiser		
		Bravo X-1	Bravo X-2	Bravo X-3
Type	Hydraulique incliné à 8°	Transmission arrière		
Moteur proposé	6LPA-STP	6LPA-STZP		
Rapport de démultiplication Hsw630A: Avant/Arrière Bravo X-1,2,3: Avant et Arrière	1,22/1,21	1,36	1,50	1,36
	1,56/1,58	1,50	1,65	1,50
	2,04/2,10		1,81	1,65
	2,52/2,53		2,00	1,81
Pour de plus amples détails, reportez-vous au manuel du fabricant				

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7.2 Schéma de câblage électrique

(Voir annexe B au dos de ce manuel)

Faisceau de moteur

R	Rouge
B	Noir
W	Blanc
L	Bleu
RB	Rouge/Noir
LB	Bleu/Noir
YW	Jaune/Blanc
YB	Jaune/Noir
YG	Jaune/Vert
WL	Blanc/Bleu
WB	Blanc/Noir
WR(RW)	Blanc/Rouge (Rouge/Blanc)
WG(GW)	Blanc/Vert (Vert/Blanc)
GB	Vert/Noir
YR	Jaune/Rouge
GR(RG)	Vert/Rouge (Rouge/Vert)
O	Orange
BrW	Marron/Blanc
WBr	Blanc/Marron
LW	Bleu/Blanc
Y	Jaune

0-1 (1) Panneau de commande type B
0-2 (2) Panneau de commande type B x type C/D
0-3 (3) Panneau de commande type C x type C/D
1 *Dispositif de mesure d'équilibrage
2 Dispositif de mesure d'admission du turbocompresseur
3 Dispositif de mesure de pression d'huile du moteur
4 Dispositif de mesure de température d'eau de refroidissement
5 Tachymètre avec horamètre
6 Sonnerie
7 Arrêt de la sonnerie
8 Eclairage
9 Fusible
10 Commutateur d'arrêt
11 Démarreur
12 Charge
13 Pression d'huile du moteur
14 Température d'eau de refroidissement
15 Echappement
16 Niveau d'eau de refroidissement
17 Admission du compresseur
18 Filtre à carburant
19 Capteur de niveau de carburant
20 Huile à engrenage
21 Préchauffage du diesel
22 *Panneau de commande type B
23 *Panneau de commande type C/D
24 *Faisceau de câbles
25 *Faisceau de câbles pour 2 tableaux
26 Relais
27 Solénoïde d'arrêt du moteur
28 *Réchauffeur d'air et contrôleur
29 Fourni par le client
30 (section)
31 ***Batterie
32 ***Commutateur de la batterie
33 Relais du démarreur
34 Démarreur
35 S ou C
36 *Commutateur de débit d'eau de mer
37 Commutateur de température d'eau de refroidissement
38 Commutateur de pression d'huile du moteur
39 Alternateur
40 Prise de terre
41 **Commutateur d'admission du turbocompresseur
42 *Commutateur d'admission du turbocompresseur
43 *Commutateur de niveau d'eau de refroidissement(**)
44 Capteur du tachymètre
45 *Commutateur de niveau d'huile à engrenage (fourniture locale)
46 Commutateur du filtre à carburant
47 *Emetteur de dispositif d'équilibrage (fourniture locale)
48 *Emetteur d'admission du turbocompresseur(**)
49 *Emetteur de pression d'huile du moteur(**)
50 *Emetteur de température d'eau de refroidissement(**)
51 Contrôleur de temps
(Commutateur du filtre à carburant)
52 *Contrôleur de temps(**)
(Commutateur de niveau d'eau de refroidissement)
53 *Contrôleur de temps
(Commutateur de débit d'eau de mer)
54 *Panneau de commande type B (station N°2)
55 *Panneau de commande type C (station N°2)
56 *Type D
57 Détails du coupleur A-A
58 Détails du coupleur B-B
59 Détails du coupleur C-C
60 Détails du coupleur D-D
61

Note:

1) * Option
** Non disponible sur le nouveau type B
*** Fourniture locale
(Batterie avec commutateur)

2) Le faisceau de câbles du système de mesure d'équilibrage est en option
- Dispositif de mesure d'équilibrage
- Emetteur de mesure d'équilibrage

62 Démarreur
63 GLOW
64 OFF
65 ON
66 START

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5.2 Parti da sottoporre a controllo periodico

5.2.1 Controllo dopo le prime 50 ore di funzionamento

(1) Sostituzione dell'olio lubrificante del motore e dei filtri dell'olio (1a volta)

⚠ ATTENZIONE



Precauzioni per l'eliminazione di olio caldo ed evitare il rischio di ustioni
Se si estrae l'olio a motore ancora caldo, prestare la massima attenzione ad eventuali schizzi.

Durante la fase iniziale di funzionamento del motore, l'olio si contamina rapidamente a causa dell'usura iniziale delle parti interne, rendendo quindi necessaria la sostituzione prematura dell'olio lubrificante. Sostituire contemporaneamente anche il filtro dell'olio lubrificante.

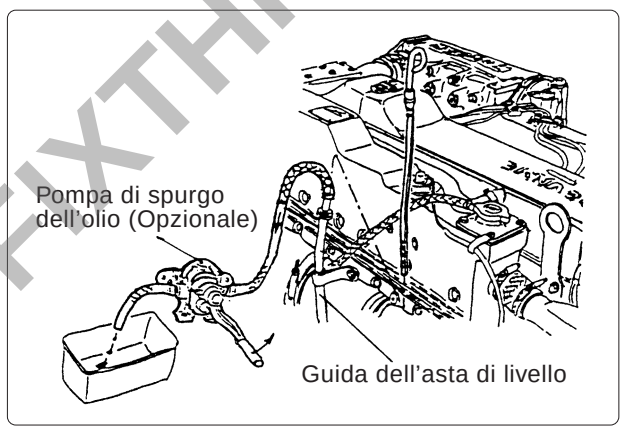
1) Spurgo dell'olio motore

E' opportuno spurgare l'olio motore prima che il motore si raffreddi.

① Togliere l'asta di livello dell'olio, collegare il tubo flessibile alla pompa di scarico dell'olio (opzionale) alla guida dell'asta di livello.

② Predisporre un recipiente in cui scaricare l'olio di spurgo e l'olio con la pompa di scarico.

③ Pompare, togliere il tappo di scarico posto sul fondo del radiatore dell'olio ed eliminare l'olio contenuto. (6LPA-STP/-STZP)



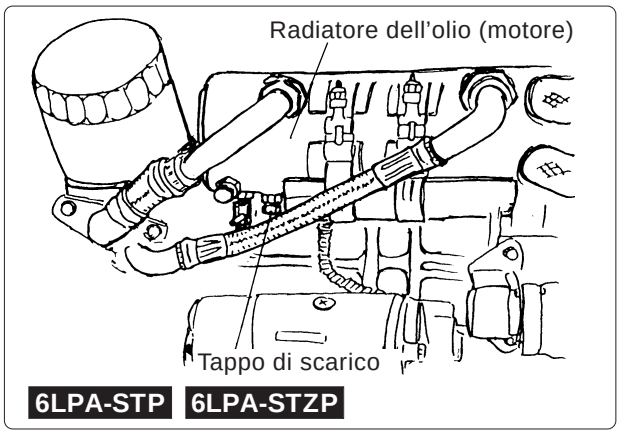
2) Sostituire il filtro olio motore

① Togliere il filtro olio motore mediante l'apposita chiave (girare in senso antiorario)

② Pulire la superficie di montaggio del filtro mettendovi un po' di olio motore.

③ Montare il nuovo filtro, girandolo manualmente in senso orario e serrare ulteriormente per 3/4 di giro mediante l'apposita chiave.

Numeri di particolare:
Filtro olio motore 119770-90620

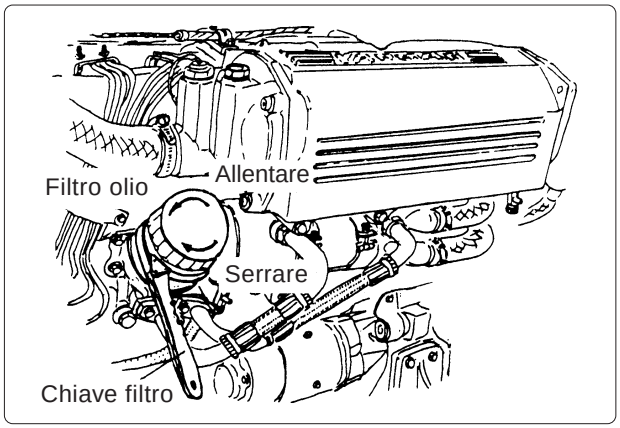


3) Riempire con olio motore nuovo

① Riempire con nuovo olio motore fino al livello specificato. **-->Vedere 3.3**

② Eseguire una prova di funzionamento motore per circa 5 minuti e verificare che non vi siano fuoriuscite di olio.

③ Attendere circa 10 minuti prima di spegnere il motore. Controllare nuovamente il livello dell'olio con l'apposita asta e rabboccare al livello specificato.



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3.2 Betankung mit Kraftstoff

⚠ GEFAHR



Feuergefahr durch sich entzündendes Öl

- **Achten Sie beim Nachtanken auf den richtigen Kraftstoff. Versehentliches Befüllen mit Benzin o.ä. führt zur Entzündung.**
- **Motor vor dem Nachtanken ausschalten. Verschütteter Kraftstoff muss sorgfältig aufgewischt werden.**
- **Niemals Öl oder andere entflammbare Materialien in der Nähe des Motors unterbringen, da dieses zur Entzündung führen kann.**

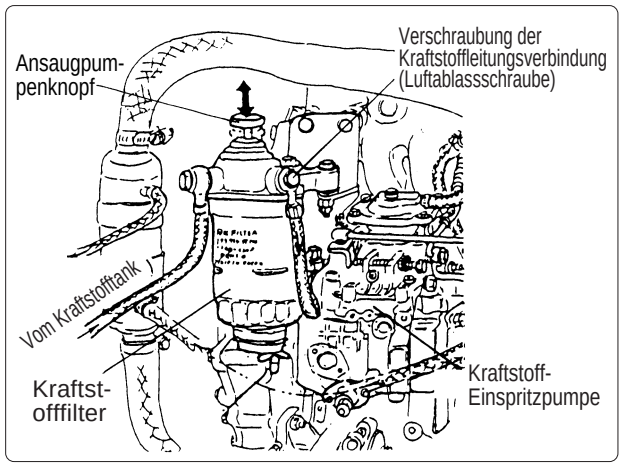
3.2.1 Befüllung des Kraftstofftanks

Bevor Kraftstoff nachgefüllt wird, müssender Kraftstofftank und die einzelnen Teile des Kraftstoffsystems mit Dieselöl oder Kerosin gespült werden. Den Tank mit sauberem, nicht durch Wasser oder Staub verunreinigten, Kraftstoff nachfüllen. Den Tank bis ca. 90 % der Füllkapazität befüllen und darauf achten, dass während des Füllens kein Kraftstoff verschüttet wird.

3.2.2 Entlüftung des Kraftstoffsystems

Kraftstoffsystem wie folgt entlüften. Wenn sich Luft im Kraftstoff befindet, kann die Kraftstoff-Einspritzpumpe nicht mehr ordnungsgemäß arbeiten.

①Kraftstoffmenge im Kraftstofftank überprüfen; bei unzureichender Menge nachfüllen.
②Kraftstoffhahn am Kraftstofftank öffnen.
③Verschraubung an der Kraftstoffleitungsverbindung am Kraftstofffilterauslass durch 2-3-maliges Drehen mit Schraubenschlüssel lösen.
④Kraftstoff mittels Ansaugpumpe zuführen. Die Ansaugpumpe befindet sich oben am Kraftstofffilter. Den Knopf an der Ansaugpumpe nach oben und unten bewegen, bis Kraftstoff mit Luftblasen aus der Verbindungsver-schraubung heraustritt..
⑤Wenn der austretende Kraftstoff klar und sauber und ohne Luftblasen ist, muss die Verbindungsverschraubung wieder angezogen werden.
⑥Ansaugknopf auf- und abwärts bewegen und Dichtungen an der Verbindungsverschraubung auf Dieselöl-Leckage überprüfen.



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2.2 Motorspecificaties

• 6LPA-DTP/-DTZP

Motortype			6LPA-DTP	6LPA-DTZP
Model			Verticale watergekoelde 4-takt-dieselmotor	
Aantal cilinders			6	
Boring x slag		mm	94x100	
Verplaatsing		(ℓ)	4,164	
Vermogen aan de krukas bij brandstofblokkering		kW(pk)/tpm	*191 (260) / 3800 **182 (248) / 3800	
Cont. vermogen aan de krukas		kW(pk)/tpm	154 (210) / 3600	
Snelste vrijloop		tpm	4200 ± 25	
Langzaamste vrijloop		tpm	750 ± 25	
Verbrandingssysteem			Directe inspuiting	
Startsysteem			Elektrische startmotor	
Laadsysteem			Ingebouwde regulateur in de dynamo (DC) 12V-80A	
Koelsysteem			Zoetwaterkoeling met constante maximumtemperatuur (2 systemen: zeewater & zoetwater)	
Smeersysteem			Geforceerd smeersysteem met excentrische tandwielpomp	
Draairichting (krukas)			Tegen de klok (gezien vanaf de vliegwielzijde)	
Smeerolie-capaciteit	Totaal	(ℓ)	10,0	
	Oliepan	(ℓ)	8,4	
Koelwatercapaciteit		(ℓ)	13,5 (motor), 1,6 (subtank)	
Turbocompressor	Model		RHE62W (merk IHI)	
	Type		Watergekoelde turbinebehuizing	
Afmetingen (LxBxH) (zonder app.)		mm	1065x671x729	1145x752x799
Droog gewicht (zonder app.)		kg	380	400
Aanbevolen accucapaciteit			12Vx120Ah	
Aanbevolen type of afstandsbedieningshendel			Alleen typen met een hendel	
Motorinbouwmethode			Op een flexibel montageframe	

Noot : 1. Meetomstandigheden: ISO 3046-1. 2. 1 pk = 0,7355 kW
3. Brandstofeigenschappen: dichtheid (bij 15°C) = 0,860, * : dieselolietemperatuur = 25°C bij de inlaat van de brandstofinspuitpomp.
** : ISO8665 (dieselolietemperatuur 40°C bij de inlaat van de brandstofinspuitpomp.)

• Keerkoppeling (optioneel)

Model	HURTH HSW630A1	Mercruiser		
		Bravo X-1	Bravo X-2	Bravo X-3
Type	8° omlaag hydraulisch	Hekaandrijving		
Beschikbare motor	6LPA-DTP	6LPA-DTZP		
Reductieverhouding Hsw630A: vooruit/achteruit Bravo X-1,2,3: zowel vooruit als achteruit	1,22/1,21	1,36	1,50	1,36
	1,56/1,58	1,50	1,65	1,50
	2,04/2,10	1,65	1,81	1,65
	2,52/2,53		2,00	1,81
			2,20	2,00
Voor meer details, zie de handleiding van de fabrikant				

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7. BLOKSCHEMA'S

7.1 Leidingschema's (dieselolie, smeerolie, koelwatersysteem)

(Zie appendix A achterin dit boek)

• 6LPA-DTP/STP/DTZP/STZP

CODERING PIJPTYPEN	NAAM
	BRANDSTOFLEIDING
	Motorolieleidingen
	ZOETWATERKOELINGLEIDING
	ZEEWATERKOELINGLEIDING
	Stuurbekrachtigingsolieleiding
	Geboorde stromingspad (holte)
	Insteekpijpkoppeling
	Oog-pijpkoppeling
	Schroef-pijpkoppeling
	Flens-pijpkoppeling

1 Oliepomp stuuraandrijving
2 Olietank
3 Zoetwaterkoeler
4 Uitlaatspruitstuk
5 Mengknie
6 Thermostaat
7 Waterinlaat van verhitter
8 Motorsmeerolie-inlaatfilter
9 Motorsmeeroliepomp
10 Zoetwaterkoelingpomp
11 Veiligheidsklep
12 Overdrukkleppen motoroliekoeler (zoetwaterkoeling)
13 Wateruitlaat naar verhitter
14 Watertemp. schakelaar
15 Watertemp. zender (optioneel)
16 Dieseloliefilter
17 Brandstofinlaat (van brandstoftank)
18 Dieseloliekoeler
19 Brandstofretourleiding (naar brandstoftank)
20 Zeewaterkoelinguitlaat
21 Turbocompressor
22 Brandstofinspuitkleppen
23 Stuuraandrijvingscilinder (lokale leverancier)
24 6LPA-STP
Motoroliekoeler (zeewaterkoeling)
is niet aanwezig op het type 6LPA-DTP
25 6LPA-STZP
Motoroliekoeler (zeewaterkoeling)
is niet aanwezig op het type 6LPA-DTZP
26 Interkoeler
27 Zeewaterpomp
28 Brandstofinspuitpomp
29 Zeewaterinlaat (vanaf de huidafsluiter)
30 Oliekoeler stuuraandrijving
31 Motoroliefilter

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5.1 Luettelo määräaikaistarkastuksista

Päivittäiset ja määräaikaiset tarkastukset ovat oleellisia moottorin kunnossapidon kannalta. Seuraavassa on yhteenveto tarkastuksista ja huoltokohteista väleittäin. Määräaikaistarkastuksien välit vaihtelevat riippuen käytöstä, kuormituksesta, käytetystä polttonesteestä ja voiteluöljystä sekä olosuhteista, eikä niitä voi antaa ehdottomina. Alla ilmoitettuja välejä tulee sen vuoksi pitää vain ohjeellisina.

[HUOM]

Laadi oma määräaikaistarkastuskaavio moottorisi käyttöolosuhteiden mukaisesti, ja tarkasta kaikki kohteet. Määräaikaistarkastuksien laiminlyönti johtaa moottorin käyntihäiriöihin ja kestoiän lyhenemiseen. Katso merikytkimen ja kaukohallintalaitteen huolto-ohjeet valmistajan ohjeista.

○: Tarkista ◎: Vaihda ●: Ota yhteyttä jälleenmyyjään

Kohde	Toimenpide	Päivittäin	Väli					
			50 tunnin välein	125 tunnin tai 6 kuukauden välein	250 tunnin tai 1 vuoden välein	500 tunnin tai 2 vuoden välein	1000 tunnin tai 4 vuoden välein	1250 tunnin tai 5 vuoden välein
Polttoneste	Tarkasta polttonesteen määrä	○						
	Tyhjennä polttonestesäiliö		○					
	Tyhjennä vedenerotin		○					
	Vaihda suodatinelementti				◎			
Voiteluöljy	Tarkista öljyn määrä	○						
	Vaihda moottoriöljy		1. kerran ◎	2. kerran ja sen jälkeen ◎				
	Vaihda öljynsuodattimen elementti		1. kerran ◎	2. kerran ja sen jälkeen ◎				
	Huuhtele öljynjäähdytin							●
Vetolaitteen öljy	Tarkista öljyn määrä	○	Katso merikytkimen käyttöohjeesta					
	Tarkasta ohjaustehostimen öljy	○						
	Tarkasta trimminsäätölaitteen öljy	○						
	Vaihda öljy							
Makeavesijäähdytysjärjestelmä	Tarkasta makeaveden taso ja täytä	○						
	Vaihda jäähdytysneste				◎			
	Puhdista ja tarkasta jäähdytysnestekanavat							●
Merivesijäähdytysjärjestelmä	Tarkista meriveden purkaus	○						
	Tarkasta ja vaihda merivesipumpun juoksupyörä						●	
	Tarkista ja vaihda sinkkianodi				◎			
	Puhdista ja tarkasta merivesikanavat							●
Putket	Tarkista ja vaihda poltto- ja jäähdytysvesiletkut	○				●		
	Tarkasta ja vaihda pakoputken mutka	○				●		
Sähkölaitteet	Tarkasta varoitusvalot ja -laitteet	○						
	Tarkista akkuhapon määrä ja lisää tarvittaessa		○					
Hihna	Generaattori, kiilahihna					○		
	Vaihda nokka-akselin hihna							●
Kaukohallintalaite	Tarkasta kaukohallintalaitteen toiminta ja voitele	○						
	Kaukohallintalaitteen vaijerin säätäminen				○			
Imuilma- ja pakojärjestelmä	Pese turboahtimen turbiinipyörä				○			
	Säädä imu- ja pakoventtiilien välykset				1. kerran ●		sen jälkeen ●	
	Imu- ja pakoventtiilien hionta						●	
Polttonesteen ruiskutus	Tarkasta ja säädä polttonesteen ruiskutuspaine ja sumutus				1. kerran ●		sen jälkeen ●	
	Tarkista ja säädä ruiskutuksen ajoitus						●	

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3.5 Fylle kjølevann

⚠ FARE



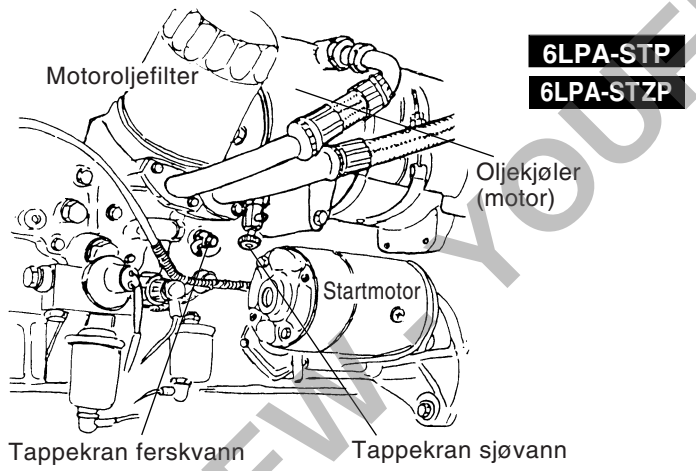
Skålding

- **Du må ikke ta av påfyllingslokket på ferskvannskjøleren mens motoren fortsatt er varm.**
  Damp og varmt vann vil sprute ut og gi alvorlige brannskader. Vent til temperaturen på vannet har gått ned, legg et stykke tøy rundt lokket og løsne det langsomt.
- **Etter kontrollen må lokket skrus godt fast igjen. Hvis ikke lokket er skrudd godt til, kan det komme ut damp eller skåldende varmt vann mens motoren er i gang. Dette kan gi brannsår.**

Fyll ferskvannstanken og ekspansjonstanken med ferskvann.

①Før du fyller på, må du passe på at tappekranene (vist på tegningene) er lukket.

Modell	Sjøvanns kjøling	Ferskvanns kjøling
6LPA-DTP/-DTZP	1	2
6LPA-STP/-STZP	2	2

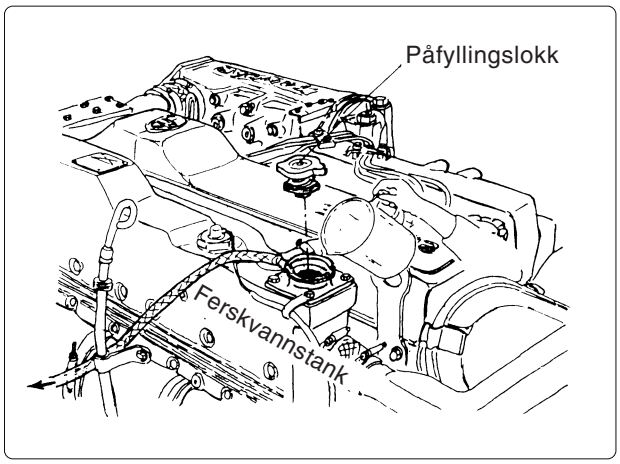


②Ta av påfyllingslokket på ferskvannstanken. (Drei påfyllingslokket 1/3 omdreininger mot urviseren for å ta det av.)

③Fyll ferskvannstanken sakte med kjølevann slik at det ikke oppstår luftbobler. Fyll på vann til det flommer over fra påfyllingsåpningen.

Kapasitet ferskvannstank: 13,5 ℓ

④Når du har fylt på kjølevann, setter du påfyllingslokket på og skrur det godt til. Når du skal sette på lokket, må hakkene i bunnen av lokket passe til sporene i påfyllingsåpningen. Deretter dreier du lokket 1/3 omdreining.

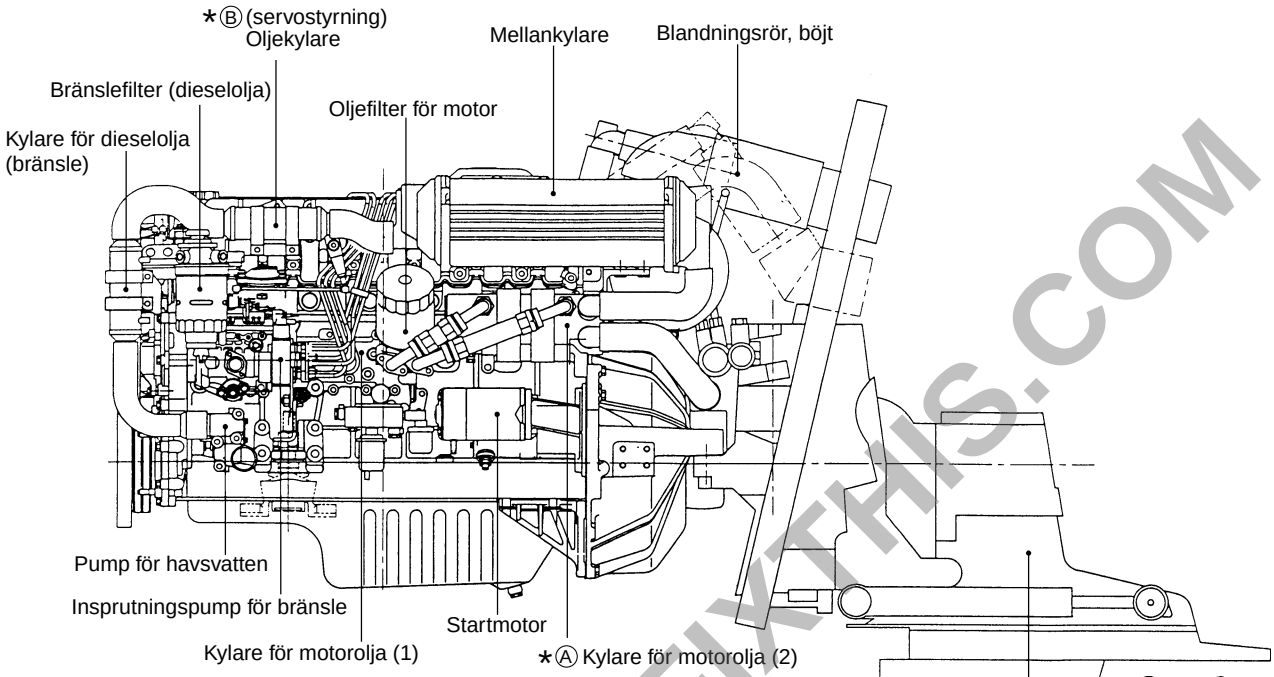


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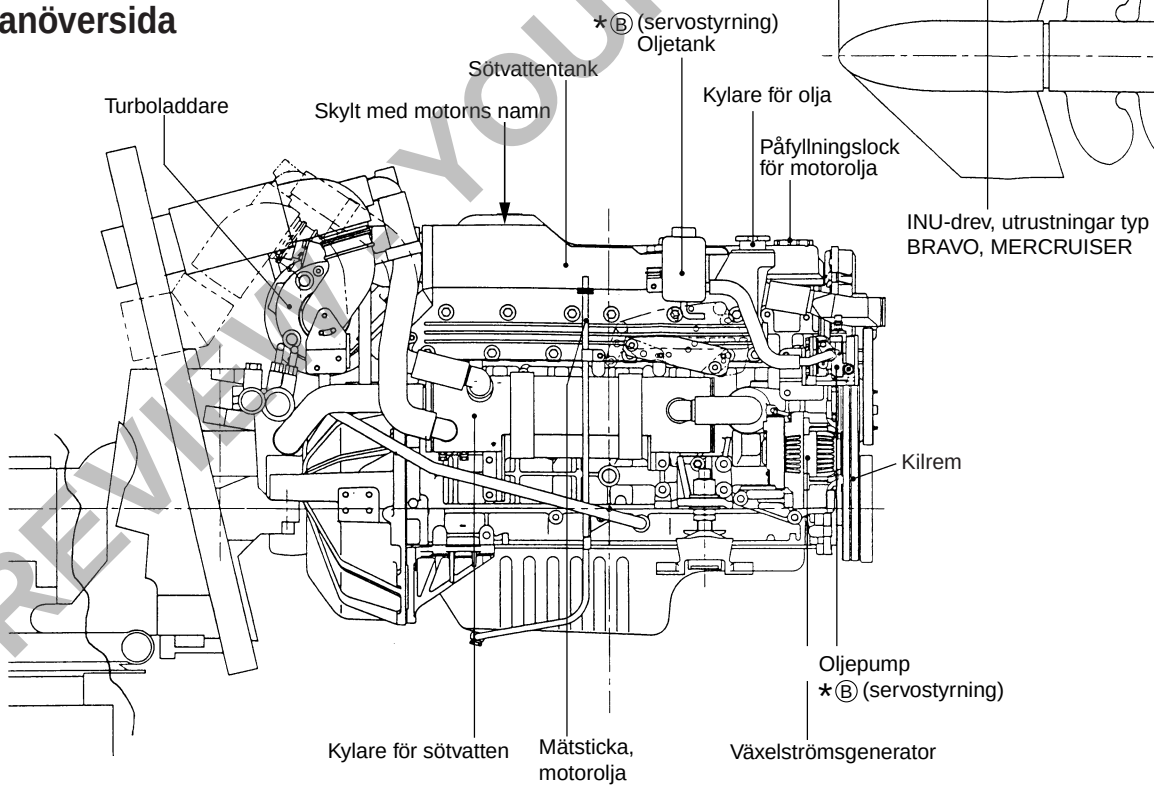
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2.3 Delarnas benämning

Manöversida (Vänster sida om motorn sedd från propellern.).



Ej manöversida



För information:

Den här figuren visar motor av typ **6LPA-STZP** (INU-drev: **BRAVO MERCRUISER**)

***Ⓐ** (Se bild) Visar oljekylaren (2) som är en del till motorerna **6LPA-STP/-STZP**. Motorer av typ **6LPA-DTP/-STP** har endast oljekylare (1).

***Ⓑ** (Se bild) Visar oljepump för servostyrning, oljetank, oljekylare som är delar till motorer av typ **6LPA-DTZP/-STZP**. Motorer av typen **6LPA-DTP/-STP** har inte dessa delar.

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YANMAR DIESEL ENGINE CO.,LTD.

OVERSEAS OPERATIONS DIVISION

1-32, CHAYAMACHI, KITA-KU, OSAKA 530-8311, JAPAN
TEL: 81-6-6376-6411
FAX: 81-6-6377-1242

YANMAR DIESEL AMERICA CORP.

951 Corporate Grove Drive, Buffalo Grove, IL 60089-4508, U.S.A.
TEL : (847) 541-1900
FAX : (847) 541-2161

YANMAR EUROPE B.V.

Brugplein 11, 1332 BS Almere-De Vaart, P.O. Box 30112,
1303 AC Almere, The Netherlands
TEL : 036-549 3200
FAX : 036-549 3209

YANMAR ASIA (SINGAPORE) CORPORATION PTE LTD.

4 Tuas Lane, Singapore 638613
TEL : 861-5077
FAX : 861-5189
TELEX: RS 35854 YANMAR

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Användarens exemplar

Inköpsdatum
Plats för inköpet (Återförsäljarens namn)

49961-205771

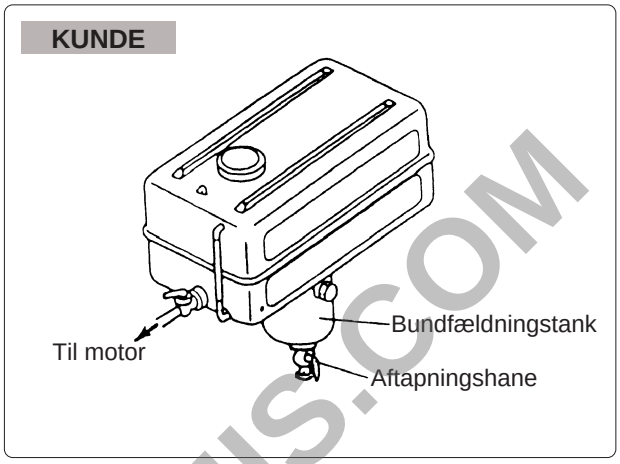
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5.2.2 Eftersyn for hver 50. time

(1) Aftapning af brændstoftank

① Åbn aftapningshanen på brændstoftanken for at tappe (vand, snavs, m.v.) fra bunden af tanken.

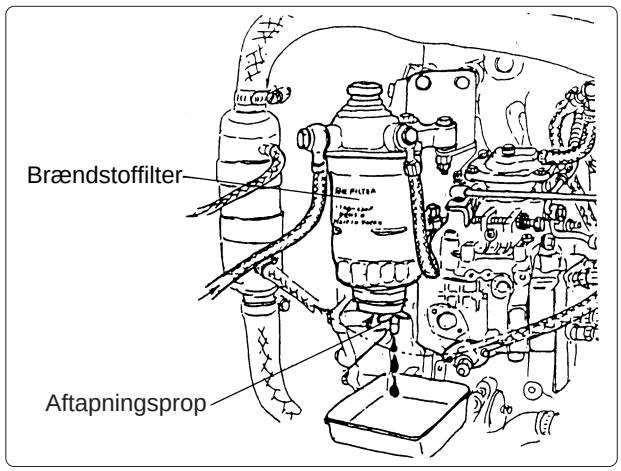
② Opsaml afløbet i en beholder.
Tap af indtil det brændstof, der flyder ud, er fri for vand og snavs. Luk derefter aftapningshanen.



(2) Aftap brændstoffilteret

Hvis vand og snavs blandes med brændstoffet, vil det være umuligt for brændstofpumpen og ventilen at arbejde. Aftap med regelmæssige mellemrum for at hindre tilstopning af filteret. Når der har opsamlet sig en masse afløb i vandseparatoren, der er placeret i bunden af brændstoffilteret, lyser advarselslampen. Tøm samtidig brændstoftanken, hvis der er sket en betydelig aflejring.

① Løsn aftapningsproppen i bunden af brændstoffilteret og tap vand og snavs af, der har opsamlet sig indeni.
② Spænd aftapningsproppen igen.
③ Sørg for at lufte brændstofsystemet godt ud. **--> Se 3.2.2**



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3.7 Έλεγχος στάθμης λιπαντικού και νερού ψύξης

Όταν προσθέσετε λιπαντικό κινητήρα, λιπαντικό συστήματος μετάδοσης, υγρά του υδραυλικού συστήματος διεύθυνσης και νερό ψύξης για πρώτη φορά ή μετά από την αλλαγή τους, η στάθμη τους πρέπει να ελέγχεται μετά από μια δοκιμαστική λειτουργία. Το λιπαντικό και το νερό θα κατανεμηθούν στα διάφορα λειτουργικά μέρη κατά τη λειτουργία και έτσι η στάθμη του λιπαντικού και του νερού θα πέσει. Συμπληρώστε με τις κατάλληλες ποσότητες.

- **Προσθήκη λιπαντικού στον κινητήρα ---> Βλ. 3.3**
- **Προσθήκη λιπαντικού στο σύστημα μετάδοσης θαλάσσης ---> Βλ. 3.4**
- **Προσθήκη νερού ψύξης ---> Βλ. 3.5**

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2.5 Equipamento de controlo

O equipamento de controlo é constituído pelo quadro de instrumentos e pelo punho de comando de mudanças. Estes encontram-se ligados pelos fios e cabos às alavancas de comando para operações de passagem de mudanças.

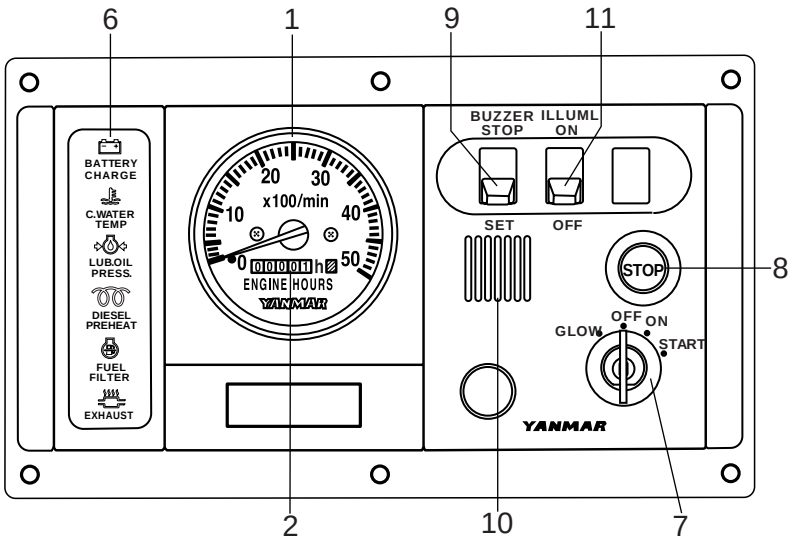
2.5.1 Painel de comando

O quadro de instrumentos dispõe dos seguintes manómetros e dispositivos de alarme (acessórios opcionais):

●Disponível , — Não disponível

N.º	Modelo		Novo tipo B	Novo tipo C	Novo tipo D
7	Unidade de comutação	Comutador de chave (interruptor de arranque)	●	●	●
8		Interruptor de paragem do motor	●	●	●
10		Campainha de alarme	●	●	●
9		Interruptor da campainha de alarme	●	●	●
11		Interruptor de iluminação dos manómetros	●	●	●
6	Unidade das luzes de alarme	A bateria não está a carregar	●	●	●
		Alta temperatura da água de refrigeração	●	●	●
		Baixa pressão do óleo de lubrificação (motor)	●	●	●
		Nível da água de refrigeração	—	●	●
		Escape (fluxo da água salgada de refrigeração)	●	●	●
		Sobrepressão (boost)	—	●	●
		Filtro de combustível	●	●	●
		Óleo de transmissão (coluna de transmissão marítima)	—	●	●
1	Tacómetro	Tacómetro com conta-horas		●	●
4	Manómetros auxiliares	Manómetro do óleo de lubrificação	—	●	●
3		Termómetro da água de refrigeração	—	●	●
5		Manómetro de sobrepressão (Turbo)	—	—	●
12	Relógio	Relógio de quartzo	● (opcional)	● (opcional)	●

• **Novo tipo B**



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