OPERATOR'S MANUAL

Volvo Penta IPS

Service and spare parts

Volvo Penta marine engines are designed for high reliability and long life. They are built to withstand a marine environment, but also to have the smallest possible environmental impact. Through regular service and use of by Volvo Penta approved spare parts, these qualities are retained.
Volvo Penta's world-wide network of authorised dealers is at your service. They are Volvo Penta product specialists, and have the accessories, original spares, test equipment and special tools needed for high quality service and repair work.
Always observe the maintenance intervals in the Operator's manual, and remember to note the engine/transmission identification number when you order service and spare parts.

Recording engine data

One or more computers in your Volvo Penta engine can record detailed information. It can include data such as usage and information of other systems and modules on the engine. This data can include information such as boat position and usage. Only a limited amount of data can be stored.
AB Volvo Penta will not distribute this stored information without permission. AB Volvo Penta may, however, be forced to provide this information if required by national legislation. In general, AB Volvo Penta and authorised workshops may read and use the information.

Volvo Penta Electronic Vessel Control system (EVC) Integrity and Modification

The EVC system is a complete vessel control system for engine, gear and vessel steering control. The complete EVC system is developed, tested and verified to comply with Volvo Penta's stringent requirements for safety and reliability based on approved standard configurations. In order to maintain the EVC system integrity, all interaction with external systems (e.g., autopilot) is performed via Volvo Penta designed interfaces. After-market interfaces breach system integrity and may negatively affect vessel performance, safety and warranty coverage. Volvo Penta does not endorse any direct or indirect connection with other systems or components not being fully tested, verified and approved in writing by Volvo Penta. Volvo Penta accepts no responsibility for modification of the Volvo Penta EVC system and/or use of components or interfaces not sold or approved by Volvo Penta.

Certified engines

If you own or operate an emission certified engine it is important to be aware of the following:

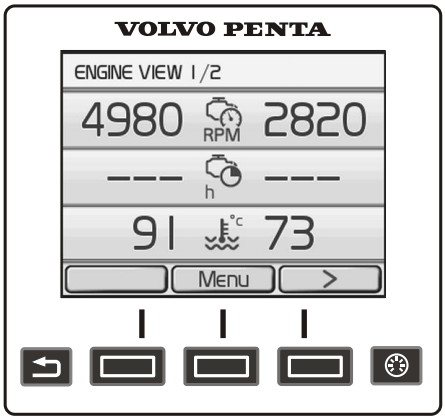
Certification means that an engine type has been checked and approved by the relevant authority. The engine manufacturer guarantees that all engines made of the same type are equivalent to the certified engine.

This makes special demands on the care and maintenance you give your engine, as follows:

- Maintenance and service intervals recommended by Volvo Penta must be complied with.
- Only by Volvo Penta approved spares may be used.
- Service on injection pumps, pump settings and injectors must always be done by an authorised Volvo Penta workshop.
- The engine must not be converted or modified, except for the accessories and service kits which Volvo Penta has approved for the engine.
- Installation changes to the exhaust pipe and engine air inlet ducts must not be done.
- No seals may be broken by unauthorised personnel.

The general advice in the Operator's manual about operation, care and maintenance apply.

Late or inadequate maintenance/service or the use of spare parts not approved by Volvo Penta will invalidate AB Volvo Penta's responsibility for the engine specification being in accordance with the certificated variant.
Volvo Penta accepts no responsibility or liability for any damage or costs arising due to the above.



P0014718

Engine View

Engine View

Information concerning the engine and its transmission is shown in Engine View. The information is shown in two windows; switch between the windows by pressing the arrow buttons.
Up to six different pieces of operations data can be shown on the display. The information shown can be set under *Change gauge*.
Depending on the functions installed in the boat, the following can be displayed:

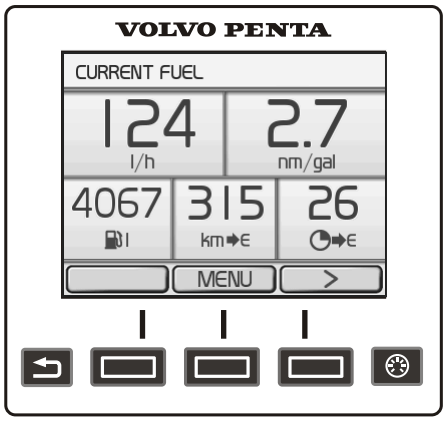
- Engine speed
- Engine Hours
- Engine Coolant Temperature
- Battery voltage
- Engine Oil Pressure
- Turbo Pressure
- Exhaust Temperature
- Transmission Oil Pressure
- Transmission Oil Temperature
- Propeller Rotation
- Ahead speed
- Power Trim angle

Fuel

This is the boat's trip computer and information is shown in two windows, Current Fuel and Average Fuel. Switch between screens by pressing the arrow buttons.

Current Fuel

- **Instant Fuel Rate**, current fuel consumption per hour.
- **Instant Fuel Economy**, based on current fuel consumption.
- **Remaining In Tank**, amount of fuel remaining in the tank.
- **Distance Remaining**, trip distance with fuel remaining in the tank based on current fuel consumption.
- **Time To Empty**, operating time with fuel remaining in the tank based on current fuel consumption..



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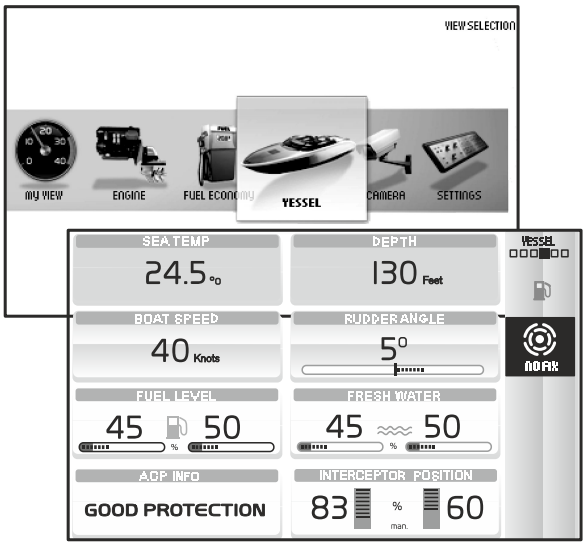
Current Fuel



P0018177

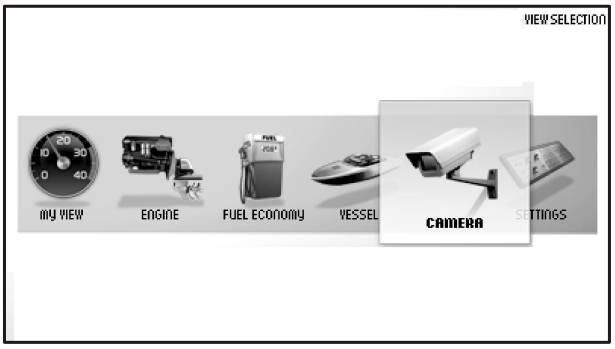
Vessel

Information concerning boat installations is displayed in this view.

Depending on the functions installed in the boat, the following can be displayed:

- **Sea Water Temperature**
- **Depth**, to set the echo sounder refer to*Depth Alarm* in chapter *Settings Menu page 118* .
- **Boat Speed**
- **Rudder Angle**
- **Fuel Level**
- **Freshwater Level**
- **ACP Info**, for further ACP information, refer to the *Optional page 52* chapter.
- **Interceptor Position**, for further information refer to the *Optional page 55* chapter.

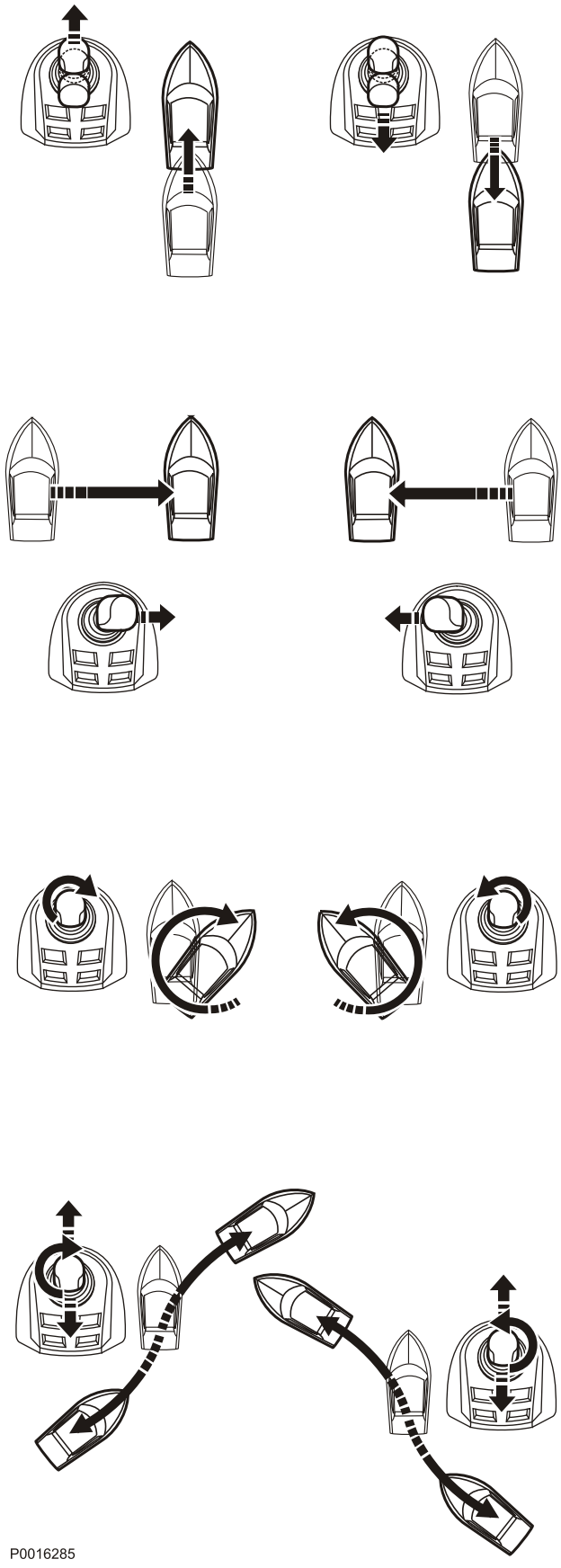
The information in this view cannot be changed.



P0001175

Camera

It is possible to connect a camera to the screen (e.g. for monitoring the engine compartment or swimming platform).
If a camera is installed, images will be displayed in this view.



P0016285

Joystick

Joystick for docking

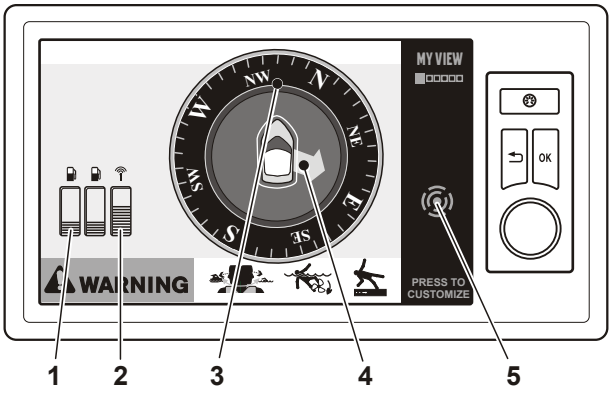
Volvo Penta Joystick is a control used for docking and maneuvering. Practise using the joystick and its functions in a safe and proper manner. Practise how to operate the boat with both joystick docking and steering functions.

⚠ CAUTION!
The joystick maneuvering works differently depending on if the docking function or steering function is active.

Practise using all means of steering and throttle under all conditions.

The docking function is designed to be used when docking or maneuvering in close quarters. Use the steering wheel and throttle control levers in all other situations.

The boat is maneuvered by moving the joystick forward, aft, abeam, twisting the top of the joystick and combinations of the movements.



P0010264

Overview

The DPS view shows when the DPS function is activated. If you browse to another view, the DPS view will be re-displayed after a brief period of inactivity.

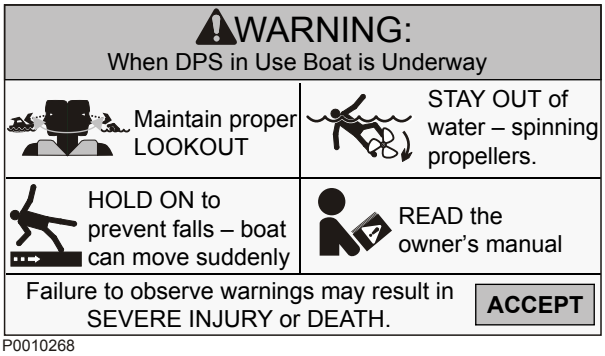
1 Fuel level

2 GPS signal strength

3 Bearing

4 Direction of movement

5 DPS symbol

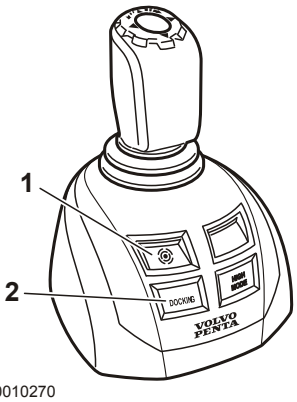


P0010268

Warning message at start

Activating the DPS

The DPS can only be activated when boat speed is below 3 knots.
The function remains active for a maximum of 12 hours.
In order to engage the DPS, the warning message shown when the engine is started must be acknowledged. The message is acknowledged by pressing the OK button or the knob on the control panel.



P0010270

Activating the DPS at the main helm station

1 Make sure that swimmers and boats or other objects are more than two boat lengths away.

2 Move the control levers to neutral.

3 Press the DPS button (**1**). An audible signal confirms that the DPS is active and the button light is lit. The screen shows a brief warning message before switching to the DPS image.

Activating the DPS at the docking station

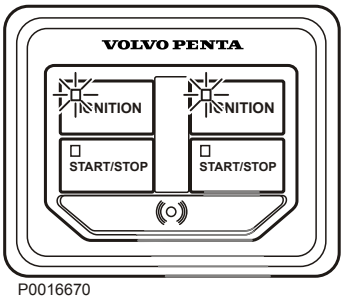
1 Make sure that swimmers and boats or other objects are more than two boat lengths away.

2 Press the DPS button (**1**). An audible signal confirms that the DPS is active and the button light is lit.

Starting the Engine

Shifting and adjusting speed is only possible at an active station. The main station is automatically activated when the EVC-system is unlocked with the e-Key panel and the ignition is switched on.

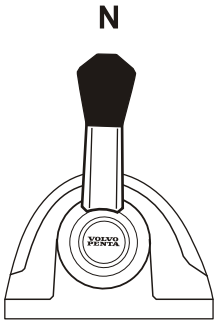
On a boat with two or more stations the engine(s) can be started from another station with a start/stop panel – if the engine(s) are turned off. The station automatically becomes active when the engine(s) is/are started.



P0016670

Make sure the ignition is on

A green light in the IGNITION button indicates to ignition is on.
The ignition is switched on via the e-Key panel. Press the IGNITION button to switch the ignition on.



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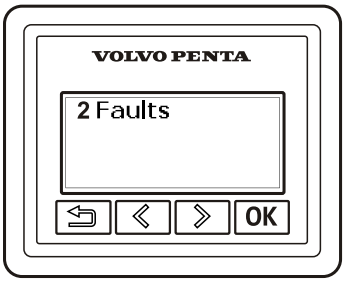
Put the gear in neutral

Put the drive/reverse gear in neutral by moving the control lever(s) to neutral at all stations.

Acknowledge message



P0012800

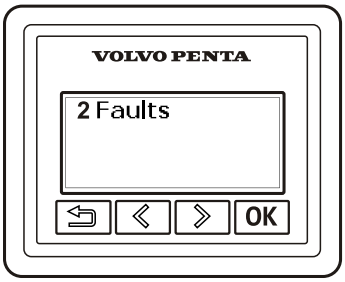
1 Push OK to ackowledge the alarm. The buzzer becomes silent.

2 Read the message.

3 Push OK again and the message disappears.

The alarm has to be acknowledged before the engine can be started.

Faults list



P0012800

If a fault is registered Faults (Faults) is displayed in the information panel together with the number of faults.

1 Press OK to get to the submenu.

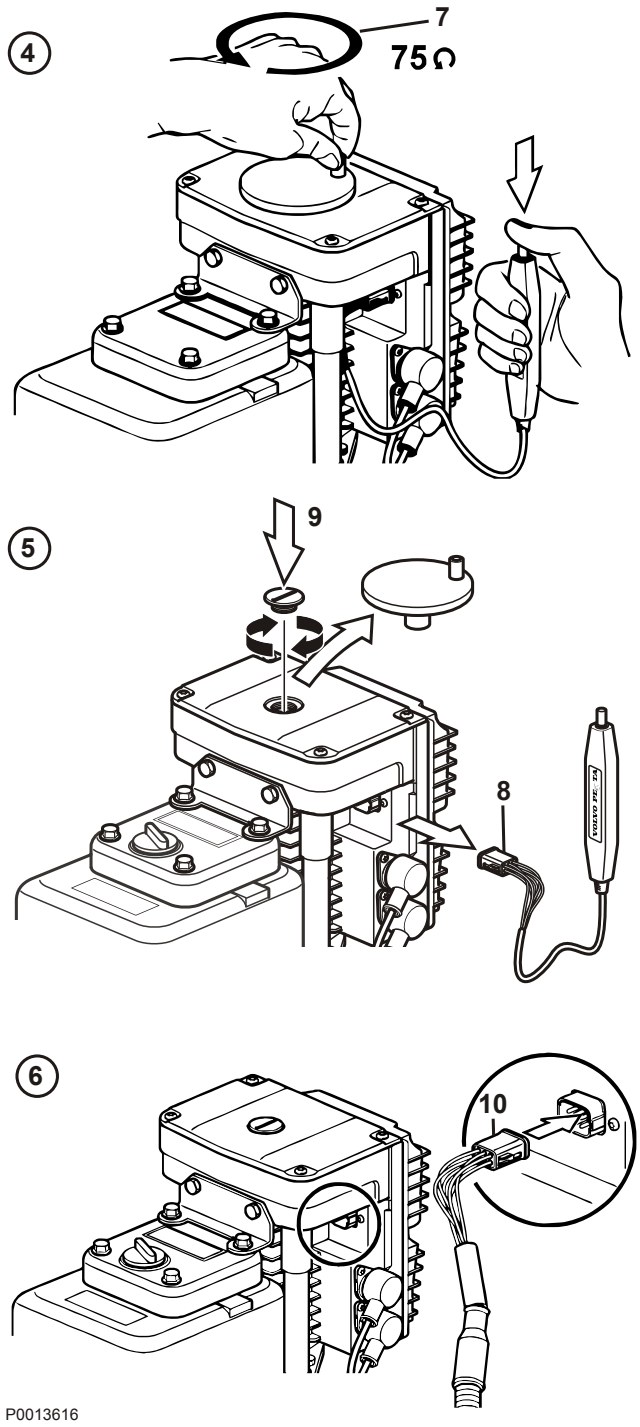
2 Browse through the fault list using the arrows if more than one fault is registered.

3 Press OK twice to see information about the cause of the fault and the remedy.

4 Return to the previous menu by pressing [⏎].

Deleting faults from the list

Acknowledged faults that have been stored are deleted automatically when the ignition key is turned to the stop position. Stop the engine and check that the ignition key is in position 0 at all helm stations.
When system power is reconnected, the diagnostic function checks if there are any faults in the EVC system. If there are the fault message is shown on the display.
Faults that have been remedied or have disappeared are automatically deleted. Faults that have not been remedied must be acknowledged every time system power is switched on.



4 Turn the crank tool back 75 turns (**7**). The propulsion unit is now aligned for straight forward motion.

5 Remove the crank tool. Disconnect the switch (**8**) by pressing down the lock and at the same time unplugg the switch by slowly wiggling it.
Screw back the plug (**9**).

6 Reconnect the cable (**10**) you disconnected in step 1.

Lubrication System

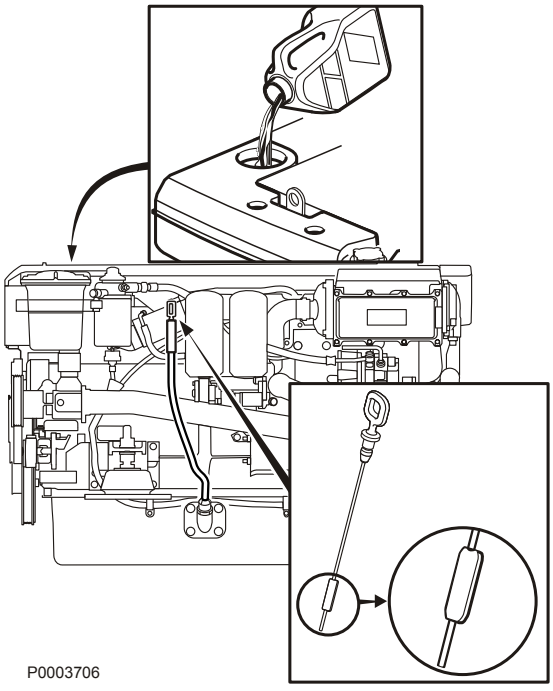
P0002089

Oil change intervals can vary depending on oil grade and sulphur content of the fuel, please refer to*Technical Data page 129*.

Oil change intervals must never exceed a period of 12 months.

If you want longer oil change intervals than given in the table *Technical Data page 129*, the condition of the oil must be checked by the oil manufacturers through regular oil testing.

Oil level, checking and topping up



P0003706

The oil level must be within the marked area on the oil dipstick and must be checked daily before the first start.

Check the oil level a while after the engine has been switched off. The oil in the engine needs some time to return to the sump before a correct oil level check can be performed.
Wait 15 minutes if the engine has been run at normal operating temperature. Wait an hour if the engine has been idling.

The oil level shall be between the MAX and MIN marks on the dipstick. Levels that are higher or lower than these marks can damage the engine.

IMPORTANT!

Do not fill over the limit for max. oil level. Use only oil of the recommended grade, refer to *Technical Data, Lubrication System*.

1 Fill the oil slowly via the filling hole on the top of the engine.

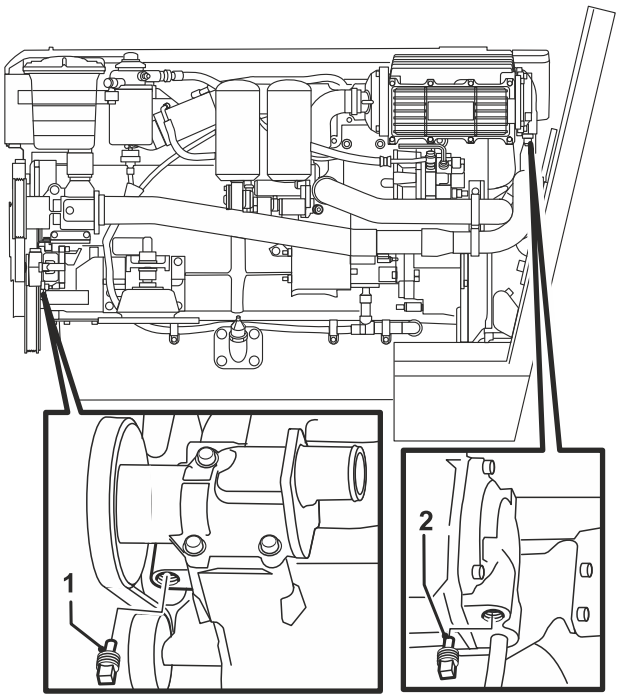
2 Wait 5 minutes to allow the oil time to reach the sump before checking the level again.

3 Then check the level again.

NOTICE! The volume between MAX and MIN is about 3.5 litre (0.9 US gal).

Zinc Anodes, Check and Change

⚠ WARNING!
Risk of water entry. Close the seawater cocks before doing any work on the seawater system.



P0017521

1 Close the sea cock(s).

2 Drain the raw water as described in *Seawater System, Draining page 98*.

3 Remove the zinc anodes from the heat exchanger (**1**) and intercooler (**2**).

4 Check the zinc anodes and replace if consumed to more than 1/3rd of original size. If not, clean the zinc anodes with Emery cloth to remove the oxide layer before re-installing them.
IMPORTANT!
Use emery paper. Do not use a wire brush or other steel tools when cleaning, as these may damage the galvanic protection.

5 Install the zinc anodes. Make sure there is good metallic contact between the anode and the metal contact point.

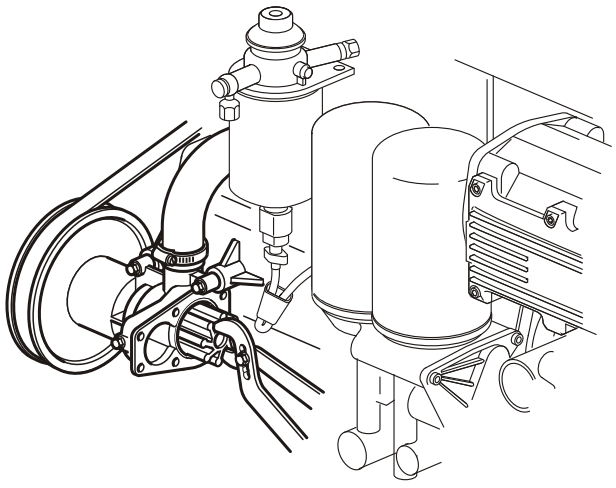
6 Close the drain cocks.

7 Open the sea cock(s), before starting the engine.

8 Check that there are no leaks.

Impeller, Check and Change

⚠ WARNING!
Risk of water entry. Close the seawater cocks before doing any work on the seawater system.


P0002636

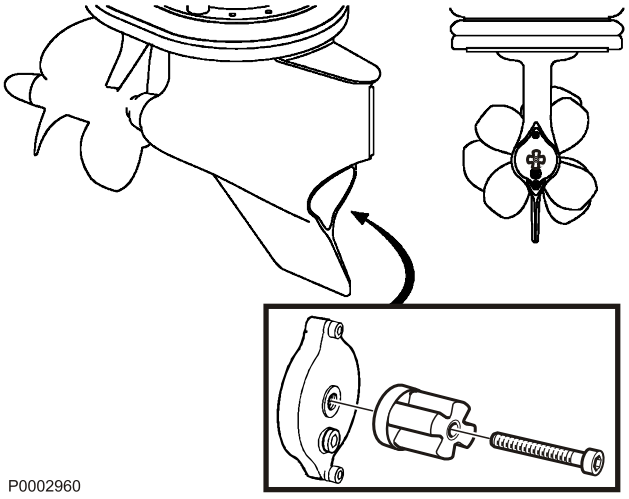
1 Remove the cover from the raw water pump and remove the impeller.
If the impeller is cracked or damaged it must be replaced.

2 If the pump shaft can be turned by hand, the flange must be replaced.

3 Lubricate the pump housing and inside of the cover with a little glycerin.
IMPORTANT!
The impeller will be damaged if other types of lubricant than glycerin are used.

4 Press the impeller in with an anti-clockwise rotating movement.

5 Fit the sealing washer on the center bearing of the shaft. Install the cover with a new O-ring.



P0002960

Check/change corrosion protection – protection anodes

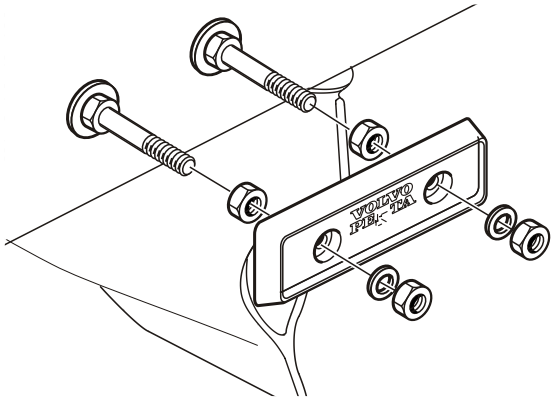
Check the protection anodes regularly. There are two types of anode per drive; one is fastened to the drive and the other to the transom. Refer to the illustrations. Replace with new anodes when approximately 1/3 of an anode has corroded away.

When the boat is stored ashore, corrosion protection deteriorates due to protection anode oxidization. Even new anodes have surface oxidation. Before the boat is launched, the protection anodes must be cleaned.

The anode in the exhaust outlet is of iron and does not need cleaning.

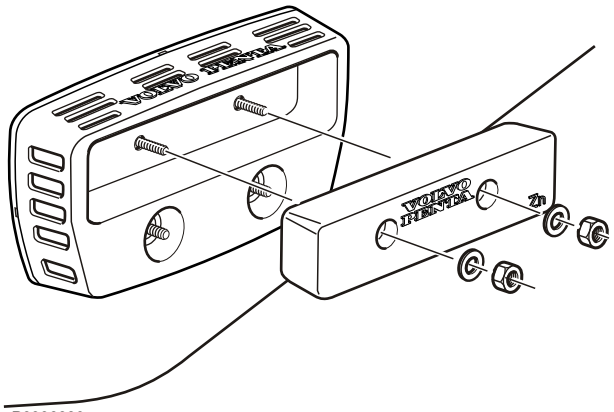
IMPORTANT!

Use emery paper. Do not use a wire brush or other steel tools when cleaning, as these may damage the galvanic protection.



Replacing corrosion protection

All anodes are fastened by bolts or nuts. Undo the anode retaining bolts or nuts. Clean the contact surface and fasten the new anode. Tighten the new anode so that it has good electrical contact.



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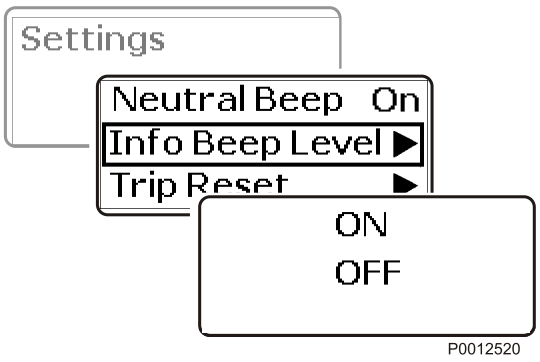
ACP, Active Corrosion Protection

Boats equipped with ACP (option) have a zinc anode integrated into the ACP unit; see illustration. Change the anode when around 1/3 has corroded away.



Information Beep

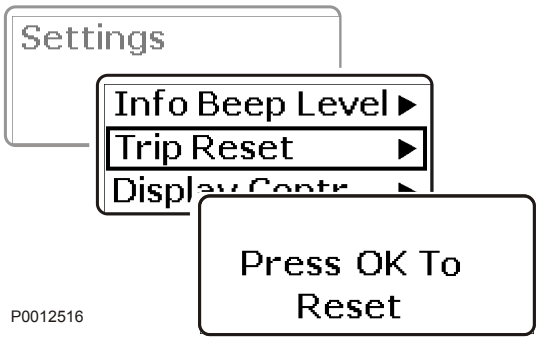
Information Beep

InfoBeep is an audible signal that sounds when there is a message from the system.

1 Navigate to **Information Beep** in the settings menu.

2 Press OK to switch the audible signal on or off. If there is a tachometer (accessory) installed, the volume can be adjusted with the aid of ≪ ≫. Press OK to confirm the selection. The setting is confirmed by an audible signal at the set level.

The screen will return automatically to the settings menu.

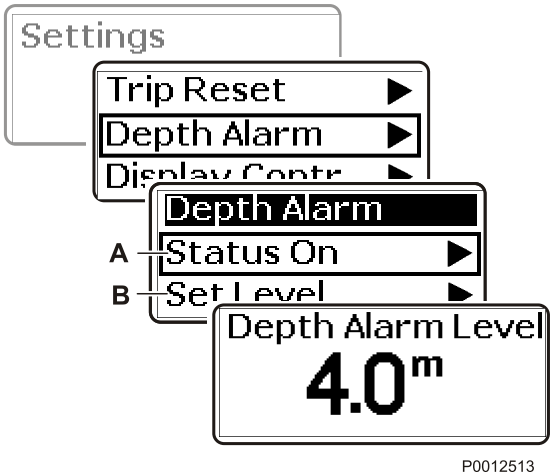


Trip Reset

Trip Reset

1 Navigate to **Trip Reset** in the settings menu.

2 Press OK twice to zero the trip information.



Depth Alarm Level

Depth Alarm

Setting the level for the depth alarm on Volvo Penta echo sounders.
The setting need only be made at one helm station.

1 Navigate to Depth Alarm in the settings menu. Press OK to proceed to the submenu.

2 Depth Alarm Off/On (A). Press OK to switch the alarm on or off.

3 Proceed to Set Level (B) and press OK. Use ≪ ≫ to set the limit where the alarm must begin sounding. Press OK to confirm the setting. The depth alarm is dependent on depth compensation; refer to the next section.

Lubrication System

Engine:	D4	D6
Oil volume, (incl. oil filter)		
for all allowed installation inclinations	12 liters (3.2 US gal)	20 liters (5.3 US gal)
volume difference MIN – MAX	1.2 liters (0.3 US gal)	3.5 liters (0.9 US gal)
Oil pressure, hot engine,		
idling	125 kPa (18.1 PSI)	125 kPa (18.1 PSI)
at full speed	440 kPa (63.8 PSI)	440 kPa (63.8 PSI)
Oil, viscosity:	SAE 15W/40 (See table)	SAE 15W/40 (See table)

Oil Grade and Oil Change Interval

Oil grade [1]	**Sulphur content in fuel, by weight**	
	< 0.5 – 1.0%	**more than 1.0%** [2]
	Oil change interval: Reached first in operation:	
All engines: VDS-3 VDS-2 **and** ACEA E7 [3), 4)] or VDS-2 **and** Global DHD-1 [3)] or VDS-2 **and** API CH-4 [3)] or VDS-2 **and** API CI-4 [3)]	**200** hr. or 12 months	**100** hr. or 12 months

NOTICE! Mineral based oil, either fully or semi-synthetic, can be used on condition that it complies with the quality requirements above.

1) Lowest recommended oil grade. Engine oil with higher oil grade is always possible to use.
2) If sulphur content is > 1.0% by weight, use oil with TBN > 15.
3) When oil quality specifications are joined by ”and” the engine oil must fulfill **both** requirements.
4) ACEA E7 has replaced ACEA E5, but if available ACEA E5 can be used.
5) ACEA E3 can be replaced by ACEA E4, E5 or E7.
6) API CG-4 can be replaced by API CI-4.

VDS = Volvo Drain Specification
ACEA = Association des Constructeurs Européens d'Automobiles
Global DHD = Global Diesel Heavy Duty
API = American Petroleum Institute
TBN = Total Base Number