INSTRUCTION BOOK

740/DP, 740/MS-5

Introduction

This Owner's Manual contains valuable information to assist you in the correct operation and maintenance of your Volvo Penta engine, drive/reverse gear and their auxiliary equipement.

Make sure that you have the correct Owner's Manual for the products installed in your boat.

Warnings

The following special warning signs are used in the instruction book and on the product.

WARNING! There is a risk of personal injury, damage to property, or a functional fault may occur if the instruction is not followed.

Read the Owner's Manual.

All the information, illustrations and specifications in this book are based on the latest product information available at the time of printing. Volvo Penta reserves the right to introduce product changes without prior notice and without assuming any obligation to perform similar modifications to products previously manufactured or sold. Volvo Penta also reserves the right to discontinue production of any particular model. Not all engine/drive/reverse gear models, optional equipment and accessories are marketed in all countries. All rights are reserved. Volvo and Volvo Penta are registered trade marks of AB Volvo.

Read this Owner's Manual carefully before putting your engine into operation — do not wait until a problem arise. If you do not understand or are uncertain about anything in this Owner's Manual, get in touch with your Dealer, who can explain or demonstrate the procedures to you.

Your new boat

Every new boat offers the driver and passengers new experiences based on the boat's characteristics. The type of hull, engine power, propeller configuration, all influence the performance and handling of the boat. The engine power may be more that you are used to. It is strongly recommended that all owners of new boats, even experience boat owners, learn the boat's characteristics at all speeds and in a safe manner. For example: how fast does the boat accelerate, how does it turn to port and starboard, how does the boat react when throttling down rapdily, etc.

WARNING! Operating a new boat without knowing how the boat reacts to different maneuvres can be dangerous. Never let anyone take the helm unless they have received instructions regarding the boats performance.

For all high speed operation we strongly recommend that the driver has a safety breaker switch attached, irrespective of the boat type. If your boat is not equipped with a safety breaker switch, contact a Volvo Penta dealer who can supply one on part No. 839442-3.

Boats with Duoprop installations

The Duoprop drive system is designed to be more effective than single propeller model drives and has the following advantages:

— faster acceleration
— higher top speed
— planes more quickly
— better course holding
— improved backing characteristics

The Duoprop propellers are designed to better grip the water than single propeller drives, with faster reactions both when steering and accelerating.

When there are passengers in the boat, especially children, ensure that they are informed of the boat's characteristic and prepared for sudden manoeuvres, swerves, rapid acceleration and even rapid deceleration.

Warranty

A warranty and service book, with the current warranty conditions, and warranty card are supplied with each engine.

Warranty Registration Card — Warranty Card

The Warranty Registration Card (US Market) Warranty Card (other markets) should be filled out and sent by the selling dealer. Warranty service may be denied if no proof or delivery date can be provided.

Volvo Penta Service

Volvo Penta has built up a comprehensive service organization to provide your drive system with the service in requires. Volvo Penta dealers and service stations have specially trained personel, they have the special tools, test equipment and a stock of spare parts — everything to provide high standards of service. When you request service or spare parts, always state the engine's complete model designation and its serial number. This information is on the engine's serial plate and on the adhesive label stuck on the carburator cover.

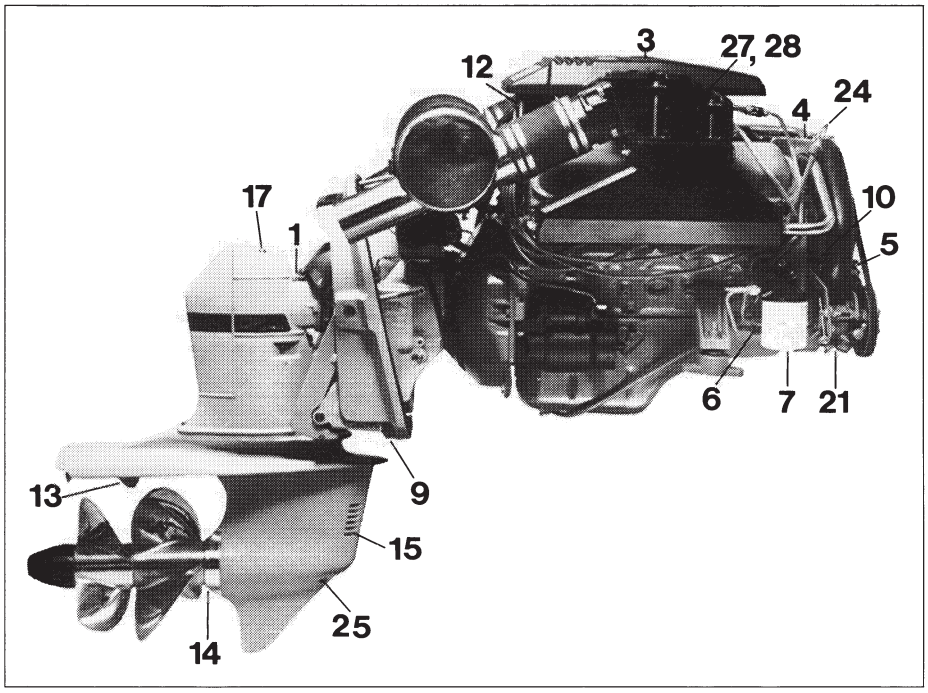
AB VOLVO PENTA
Technical Information

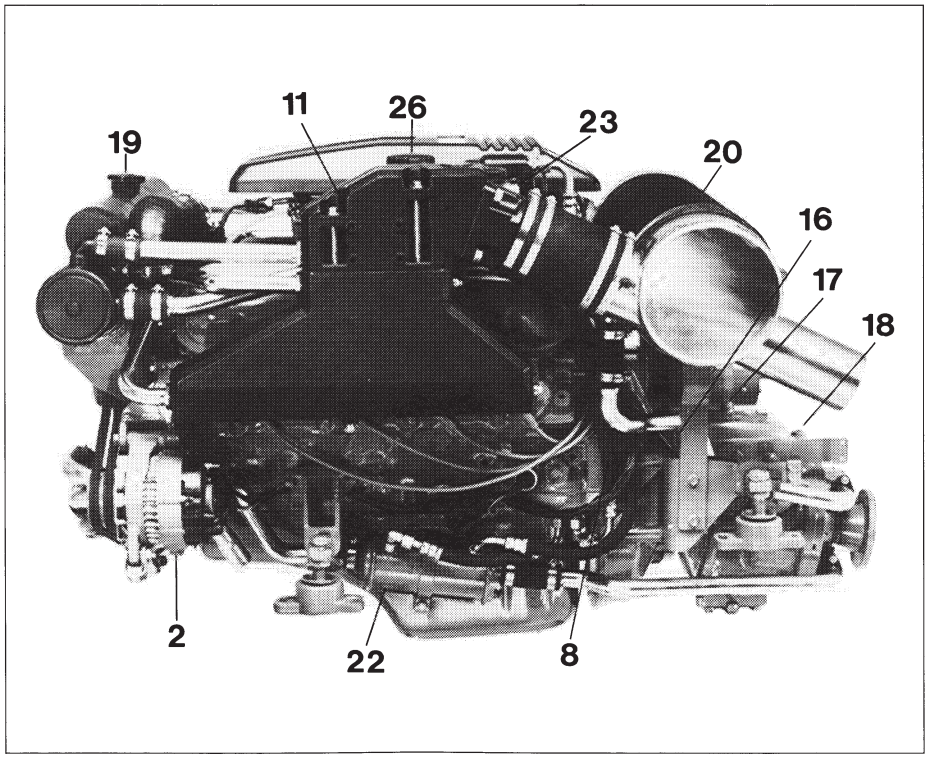
WARNINGS

1. Stop the engine before opening the hatch to the engine compartment. An engine which is running has rotating and moving parts which are dangerous to touch.
2. Bear in mind the risk of a fire. All engine fuel is inflammable. Alcohol, either methanol or ethanol is sometimes added to fuel, especially to unleaded gasoline (petrol). These additives shorten the life of rubber and plastic components in the fuel system. Inspect regularly for leaks and craks.
3. The cooling system should be drained when there is risk of freezing. Close all drainage points when the boat is not under constant supervision. Incorrectly performed drainage may cause the boat to become filled with water and sink.
4. When working on the drive in the upper position, lock the drive in position with the special tool available or in some other secure way so that there is no possibility of the drive falling down.
5. Read this Owner's Manual carefully before putting your engine into operation.

Contents

Features 740 DP, 740 MS5





1. Serial number, drive
2. Alternator
3. Carburetor, with flame arrestor.
4. Thermostat and water distribution housing
5. Seawater pump
6. Fuel pump
7. Fuel filter
8. Serial number, engine
9. Zinc anode
10. Circulation pump
11. Exhaust riser
12. Ignition distributor
13. Trim tab
14. Zinc anode
15. Cooling water intake
16. Reverse gear serial number
17. Oil dipstick
18. Oil filling
19. Pressure cap, expansion tank
20. Muffler
21. Power steering pump
22. Oil cooler
23. Oil filter
24. Oil dipstick, engine
25. Drain plug
26. Oil filling, engine
27. Automatic fuses (behind riser)
28. Oil reservoir, power steering (behind riser)

The engine

The Volvo Penta 740 marine engine, a 7.4 litre V8, equipped with Duoprop or MS5 reversing gearbox is a propulsion unit which combines high top speed, first class driving comfort and excellent acceleration.

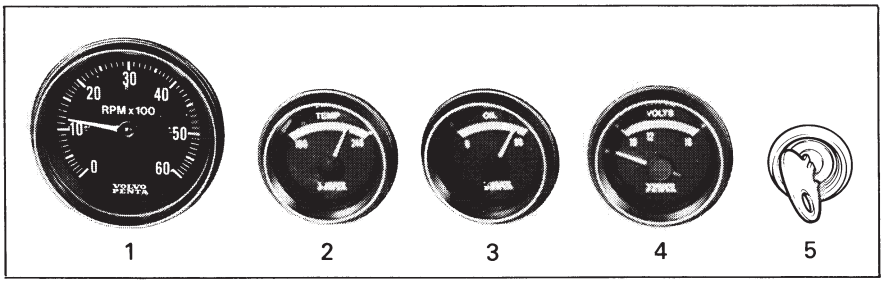
Located at the front, the waterpump is driven directly by the fivebearing crankshaft while the elevated position of the oil filter simplifies its replacement. The oil filler cap is located on top of the unit, enabling the unit to be topped up without the risk of spillage. The main electrical unit is located in a convenintly high position on the engine while the carburettor and ignition system are protected by a practical plastic housing.

The drive

The Volvo Penta Duoprop is a unique drive featuring twin contra-rotating propellers — a configuration which produces a combination of low steering force, low noise level, low planing thresh-hold, excellent acceleration and low fuel consumption. Computer display instrument monotoring the trim and beach angle and with a digital display indicating the exact position of the drive under all running conditions.

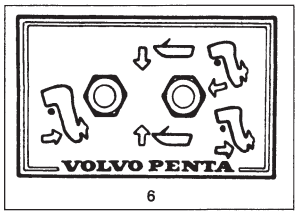
The reverse gear box

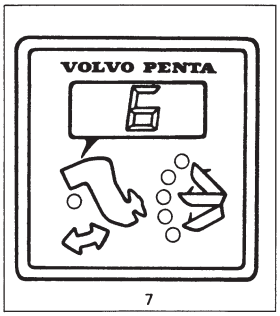
This unit has been designed especially for the 740 engine. The unit is installed with a downward shaft angle of 8° to minimize the installation height.



Instrument panel

1. **Tachometer** graduated 0—6000 rev/min.
2. **Temperature gauge for cooling water.** Green field — normal cooling water temperature
3. **Oil pressure gauge**
4. **Voltmeter**
5. **Key-switch (Starting)**
6. Operating switch for sterndrive "Up", "Down"
7. Instrument indicating the trim angle

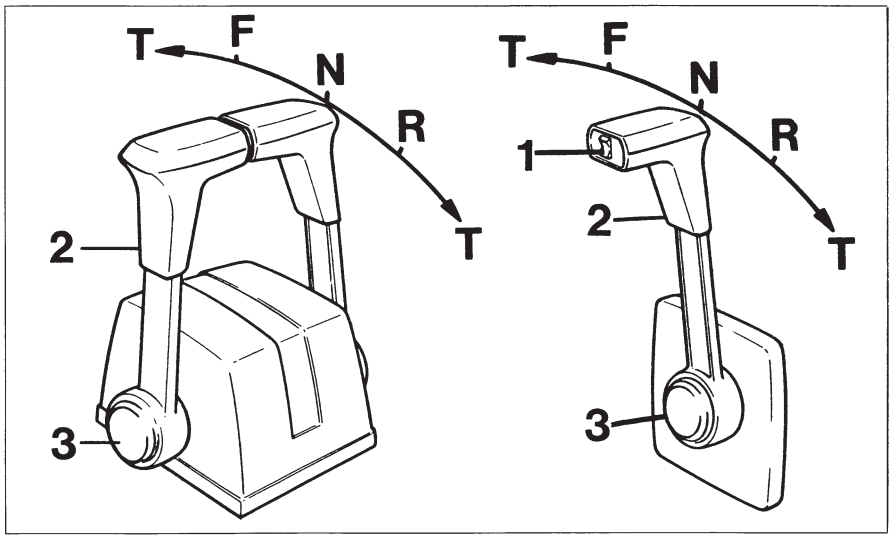




Operating controls

1. Operating switch for Power Trim
2. Control lever
3. Disengaging device
   Push in the button when the control lever is in neutral and move the lever forwards slightly. Release the button. The lever now operates the throttle only. Pull back the lever when you wish to operate the throttle and the shift mechanism simultaneously.

N = Neutral
F = Control lever in position for running "Forward"
R = Control lever in position for "reversing'
T = Engine speed



General information

The following is important information for your engine:

Fuel

Use gasoline with the correct octane rating (at least 91 RON, USA R + M/2 = 87). The engine can be operated on lead-free gasoline.

Use of lower rated octane fuel **will** result in severe engine damage that is **not** covered by the factory limited warranty.

Alcohol, and primarily methanol, can accelerate the ageing of rubber and plastic materials. This can cause fuel leakage. For safety reasons, all parts made of rubber or plastic, which are components in the fuel system, should be checked often and at regular intervals. Examples of such components are: the fuel pump diaphragm, fuel lines, seals and fuel tanks. Replace any part which you suspect may be affected.

Gasoline mixed with alcohol can collect more water than pure gasoline. This can result in increased corrosion on metal parts in the fuel system. Check often and regularly.

The ethanol content of the fuel being used must not exceed 10% and the prescribed octane rating **must** always be maintained.

Fuel which contains methanol (methyl alcohol) must not be used since there is a considerable risk of damage to important parts of the system.

This type of damage is not covered by the factory warranty.

Warranty inspection (not USA)

The warranty inspection is carried out after a running time of between 20 and 50 hours of within 180 days after delivery. The inspection is carried out by an authorized Volvo Penta workshop.

First inspection (USA)

A first inspection should be carried out by an authorized Volvo Penta dealer within 20 to 50 hours or 180 days after delivery. This inspection is at the owner's expense.

Oil changes

The oil and oil filter are changed during the 20 hour inspection. Refer also to Checks and Servicing.

> **NOTE!** Neglecting to follow the oil change recommendations for the engine, reverse gear or drive will cause increased wear and shorten the service life of your propulsion package. If you chose to do your servicing yourself, we recommend that you note all oil change intervals in a log book to easily keep check of the change times.

Lubrication oil

Use only SG quality oil according to the API system. Volvo Penta's lubricating oil for gasoline engines complies with these requirements and can therefore be recommended for use. Refer to viscosity in the Technical Data if any other type of lubricating oil is used.

Breaking in period

A new marine engine requires careful breaking in during the first 20 hours of use. You should therefore avoid running the engine at maximum load during this period. A higher consumption of oil during the breaking in period is normal. Check the oil level more regularly during the break-in period for this reason.

Electrolytic corrosion

Your boat and its engine/transmission package is equipped with sacrificial zinc anodes in order to proctect drive(s) and propeller(s) against galvanic corrosion. This protection can malfunction if so-called leakage currents from the electrical system occur. This can happen if the wrong type of equipment is used or the connection of electrical equipment to the negative pole is incorrect. The following should always be observed:

The main switch for the engine should be connected to the positive (+) pole of the battery. The main switch should disconnect all circuits. Electrical cables should be routed and clamped so that they are not exposed to dampness or the risk of exposure to water in the bilge.

If several batteries are used, there should be separate switches for extra equipment. There should also be a main switch between the positive (+) pole of the extra battery and fuse box for the boat's electrical equipment. The main switch for the extra battery should disconnect all circuits connected to it and should be switched off when there no longer is a need for electricity. The main switch for the engine should be disconnected as soon as the engine is not used.

The engine or drive must not be electrically connected with other equipment such as trim tabs, ladders etc. The engine and drive must not be used as ground for radio or navigation equipment or other electrical equipment where separate ground cables are used. All such separate ground connections should be gathered to a common ground point separated from the engine/drive.

If shore power is connected, no protective AC ground must be connected to the engine or any other DC ground points in the boat unless an isolation device is installed.

The transformer for shore power should have the protective AC ground on the input side (120/220V) and the negative (—) connection on the output side (12/24V) without any connection to each other.

Warning! Electrolytic corrosion due to stray currents can in a short time cause severe and expensive damage to the boat's equipment. All work involving the boat's low voltage circuit should only be done by trained or knowledgeable personnel. Installation or work with shore power equipment **must only** be done by a qualified marine electrician, authorized for high voltage installations.

Spare parts

WARNING! Components in the electrical system, the ignition system and the fuel system on Volvo Penta products are designed and built to minimize the risk of explosion and fire.

The use of non-approved parts, which do not comply with the above requirements, may result in an explosion or fire on board.

Speed range, maximum speed

When selecting a propeller, it may be difficult to find the right size to provide the recommended maximum speed during all load and weather conditions.

It may be an advantage on some boats to use a lower maximum speed than is recommended. The advantage of this could be lower fuel consumption, lower noise and vibration levels or better propeller efficiency etc. For these reasons we have recommended a ''speed range maximum speed''. The cruising speed should always be at least 300—500 rpm below the maximum rpm **achieved.**

Speed range, full speed 4000—4400 rpm.

Safety equipment

Irrespective of whether the boat is to be used for long trips or short day trips, it should be equipped with the following safety equipment. This can of course be added to depending on your own wishes. Make regular checks to ensure that the safety equipment is on board and that it is serviceable.

LIFE JACKETS of an approved make and of a sufficient quantity for all those on board.
FIRE EXTINGUISHERS of an approved make. There should be at least one on board and it should be easily accessible.
DISTRESS ROCKETS and matches in watertight packing.
FIRST AID BOX
TOOLS suitable for the equipment on board.
SET OF SPARES containing an impeller, spares for the engine etc.
ANCHOR with anchor line.
RADAR REFLECTOR with attachment device.
FOGHORN AND WHISTLE
FLASHLIGHT
EXTRA PROPELLERS AND TOOLS FOR REMOVING AND REFITTING.

NOTICE: USCG regulations, state and federal laws specify equipment and safety requirements that must be complied with to operate boat safely and legally. Consult USCG, state and federal publications for details.

Preparations before starting

Check the following before starting the engine:

make sure that there are no **FUEL LEAKS**
make sure that there is no **WATER LEAKAGE** from the engine
there must be no **OIL LEAKS**
you should not be able to detect the smell of Gasoline or **LP GAS** in the engine compartment or bilge
make sure the **OIL LEVEL** in the engine is correct
up-to-date **CHARTS** must be kept on board
there must be sufficient **FUEL** on board for the journey you have planned.

⚠ **WARNING!** Before filling with fuel, check that there are no open flames in nearby. Ventilate the boat and operate the engine room fan before starting the engine.
Do not overfill the tank.

If any of the passengers are on board for the first time, the person concerned shall be instructed on the operation of the boat, where the life jackets are located, and where to find the fire extinguisher. Also run through everything you consider is important in terms of safety with them. If anything unforeseen arises during the course of the trip, it is then often too late to instruct anybody on how safety equipment operates.

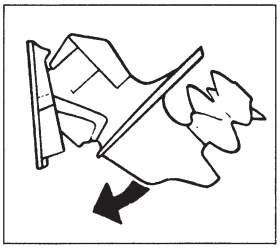
Starting the engine

Switch on the main power switch.

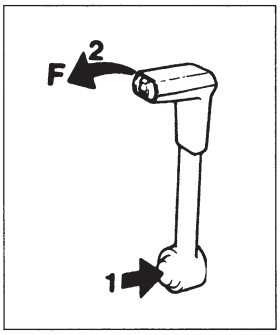
⚠ **WARNING!** Start the engine room fan and let it run for at least 2 minutes before starting the engine.

Insert the ignition key and turn it one step to the right (running position).

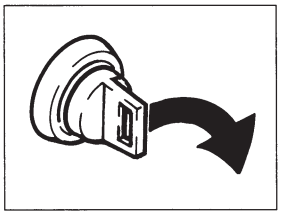
⚠ **Warning!** The ignition key must only be in the running position when the engine is to be started and when the engine is running. Carry out the starting procedure in one operation.



Lower the drive if it has been tilted. Check that there are no obstacles in the way of the propeller.

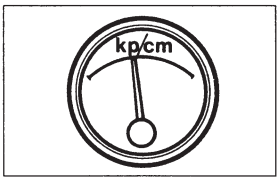


Release the speed control from the gear function as follows: Press the release button (1) while the lever (2) is in neutral and then press the lever slightly forward. Let go of the release button. The lever will now only affect the speed control.

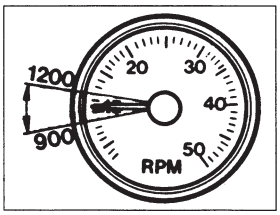


Push in the ignition key and turn it another step to the right (starting position) to start the engine. Release the key as soon as the engine starts.

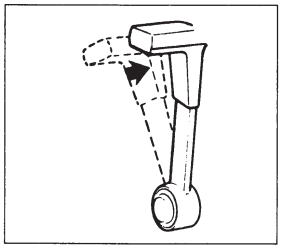
⚠ **Warning!** Never turn the key to the starting position when the engine is running!



Check immediately after starting that the oil pressure gauge displays normal readings. The acoustic alarm (optional) will sound for low oil pressure. In the event of the alarm sounding or abnormal readings — stop the engine and investigate the cause.

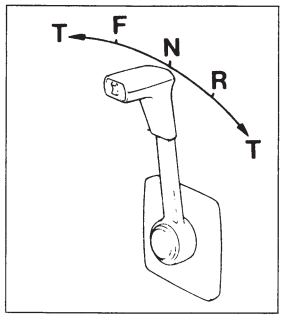


Run the engine until it is warm at a fast idling speed, i.e. at a speed between 900—1200 rpm. The boat is ready for use when the needle of the temperature gauge reaches the green area.



Reduce the engine speed to idling and check that the engine runs smoothly. Pull back the control level to the neutral position. The control level is now linked to the gear function (this applies to Volvo Penta controls).

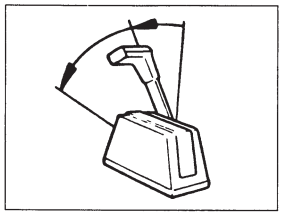
Running instructions



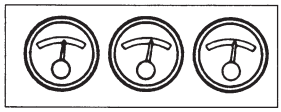
The single control lever operates both the throttle and the gear shifting.

F = Forwards
R = Reverse
N = Neutral
T = Throttle

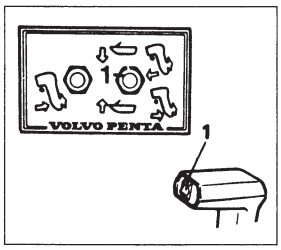
WARNING! If there is an emergency stop switch installed, use it for your own safety.



To obtain good operating economy, the engine should not be run at maximum speed for long periods.



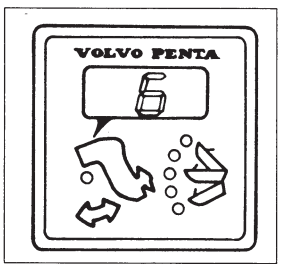
Check during running that the engine temperature is normal (within the green sector) and that the instruments for charging and oil pressure show normal readings. The oil pressure and cooling water gauges may have acoustic alarms (optional) which sounds for low oil pressure or high cooling water temperature. If the reading are abnormal or if the alarm sounds, the engine must be stopped immediately and the cause investigated.



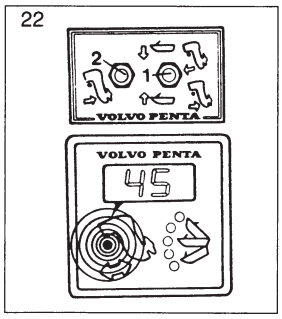
The outboard drive can be trimmed in and out hydraulically while in operation. To lower the bow of the boat, one of the switches (1), (in the control or on the instrument panel) shall be held in the up position until the required attitude is reached. To raise the bow, switch (1) shall be held in the down position.

Caution! The two switches (1) must never be used simultaneously.

WARNING! Exercise extreme care when running with the drive in the fully raised position.



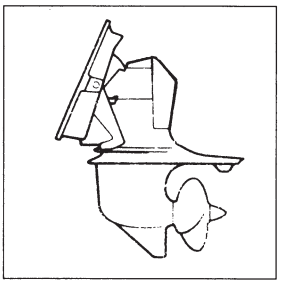
The drive can be trimmed within the trim limit range to give the boat the best attitude. The maximum trim angle corresponds to 6 on the trim gauge for the DP.



Running in the shallow waters

If you are uncertain about the depth of water, we recommend that you reduce the speed to idle and tilt up the drive. For the drive to pass the maximum trim angle, switch (2) must be pressed in at the same time and the overdrive (1) is held in the lower position. The drive can now be raised to a maximum of 44. At 45 or more, the red warning lamp flashes on the instrument. **The range above 45 is only for use when the boat is moored in shallow water or when being towed on a trailer.**

NOTE! In case of grounding or hitting an obstacle in the water. Check that the drive or propellers are not damaged and that there are no vibrations. Should that be the case, run to harbour at reduced speed and lift up the boat onto land. Check the oil to see if water has entered into the drive (oil is gray colored). Contact an authorised Volvo Penta Dealer, should this or other damage have occured to the drive. After replacing the propeller, check the hull and launch the boat. Ensure that the vibrations have ceased. The oil should then be checked again, after a short run. Should the faults remain, turn to an authorised Volvo Penta Dealer.

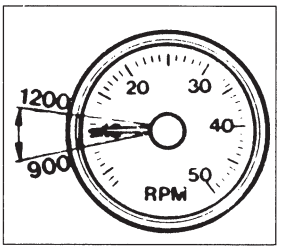


Reversing

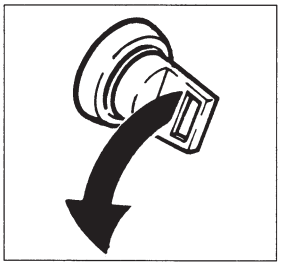
The maximum position for reversing is when the drive is raised to 44.

WARNING! Never select reverse while the boat is planing.

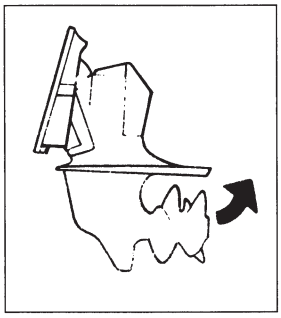
Shutdown procedure



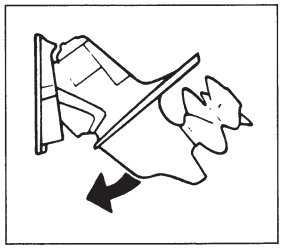
After mooring, the engine should be allowed to idle for a few minutes with the control lever in the neutral position before the engine is switched off. This is to prevent subsequent overheating of the engine and consequent thermal loading. This is particularly important if the engine has be run at high speed.



Stop the engine by turning the key switch to the off position.



If the water is shallow at the mooring and there is a risk of the drive striking the bottom, the drive should be fully tilted. If there is sufficient depth of water, there is no need to tilt the drive.



To prevent growth on the trim cylinders' piston rod, the drive should be trimmed down to its maximum if the boat is to be unused for a long period. The quickness of growth depends on water conditions and time of year.

⚠ **WARNING!** Be observant of the water depth. Under no conditions, such as low water etc shall there be any risk that the drive hits the bottom.

Switch off the battery switch

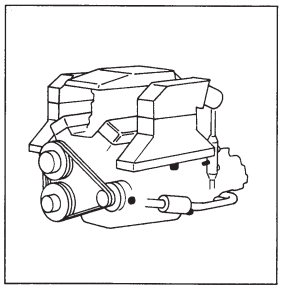
⚠ **WARNING!** The battery switch must not be switched off before the engine has stopped. Damage to the electrical system can result.

When trailering the boat

⚠ **WARNING!** Before transporting the boat by trailer the drive shall be trimmed up to the maximum (above 45 on the trim instrument) to the transportation position.

NOTE! Acquaint yourself with the laws regarding trailering boats. Remember the rules can differ between countries and states (USA).

Cold weather precautions

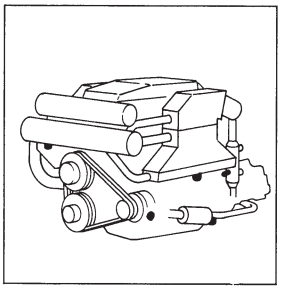


Before leaving the boat, close all sea water cocks and ensure that no water leakage has occurred.

⚠ **WARNING!** All sea water cocks must be closed before draining the cooling system.

For sea water cooled engines, the cooling water is drained through plugged holes on the port and starboard sides of the engine block and exhaust manifold. Also remove the cover from the sea water pump and drain the oil cooler (port side) through the plug hole.

If an oil cooler for servo steering is installed, drain it by opening the drain nipple. The reverse gear on the 740 MS5 model is drained by removing the lower hose connection on the port side (the "U" shaped hose).



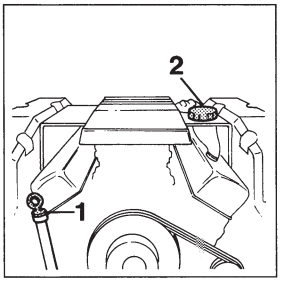
For freshwater cooled engines, the sea water in the heat exchanger, sea water pump, risers and oil cooler must be drained. This is done by removing one of the end covers from the heat exchanger, the cover from the sea water pump, and the drain plug from the oil cooler. The risers are drained by removing the cooling water pipe connection at the heat exchanger. If an oil cooler for servo steering is installed, then open its drain nipple.

The reverse gear on the 740 MS5 model is drained by removing the lower hose connection on the port side (the "U" shaped hose). Check the frost protection in the freshwater system. If not sufficient, then the freshwater system must be drained through the drain holes on the starboard and port sides of the engine block, and the drain holes under the heat exchanger and exhaust manifold. Unscrew the drain plugs and remove the filler cap to allow the water to drain more quickly.

⚠ **WARNING!** Do not forget to fit all plugs and covers for the sea water pump and heat exchanger. Fit and tighten all hose connections. Make sure that all sea water cocks are closed.

Check daily before starting

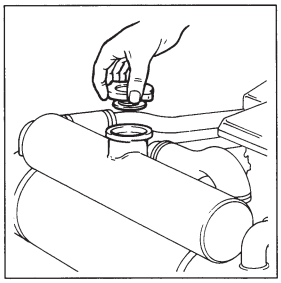
Oil in the engine



Check the level daily to ensure that it is between the maximum and minimum marks on the dipstick (1) and that the level is sufficient for the intended trip.

Replenish with oil as required (2). Refer to "Technical Data" for the recommended oil specifications.

Coolant level in expansion tank (closed coolant models)



Check the level of the cooling system (fresh water) each day prior to start. The level should be up to the lower edge of the filler pipe. Fill with antifreeze mixture to the correct level. The venting nipple on the thermostat housing must be opened, when filling, to avoid air prevnting the filling of the system. Close the nipple after all the fluid has been filled. Use the antifreeze recommended by Volvo Penta type 85. Type 85 has a blue green color.

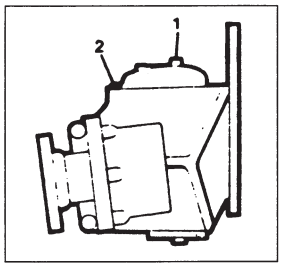
Note! Do not mix antifreeze type 85 with other types. Always use antifreeze even if there is no risk of low temperatures. The antifreeze ensures the cooling system corrosion protection and running with fresh water only can result in severe corrosion damage to the component parts of the cooling system.

⚠ **WARNING:** Top up using only 50/50 mix of water and anti-freeze. Do not exceed this %.

⚠ **WARNING:** Closed fresh water system is under pressure. If pressure cap is removed when engine is at operating temperature, turn cap to first stop and allow pressure to escape before completely removing cap.

Check every 14 days

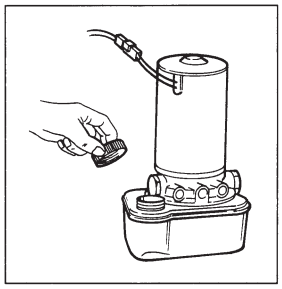
Oil level in the MS5 reverse gear



Check the oil using the dipstick (1). The oil level shall be within the marks on the dipstick.

CAUTION! The dipstick must **not** be screwed in when checking the level. Replenish with oil as required through the filler hole (2). Use the same type of oil that is already in the reverse gear. Refer to "Technical Data" for the correct oil specification.

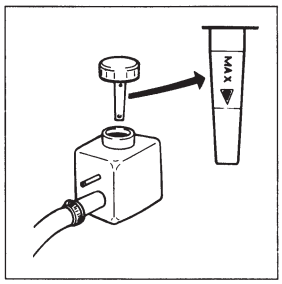
Oil level, hydraulic pump — power trim



Trim in the drive as far as possible. Check that the oil level is between the max and min marks on the reservoir. Top up if necessary with engine oil. The use of ATF oil is recommended in cold operation conditions and during long operational runs. Observe strict cleanliness so that dirt is not drawn in by the oil.

Important! ATF oil and engine oil must never be mixed. If ATF oil is to be used, the engine oil must first be drained from the system. If the system has been drained, fill up with new oil and trim the drive 6 to 10 times in and out to purge air from the system. Check the oil level and top up if necessary.

Oil level, hydraulic pump — servo steering



Turn the filler cap anti-clockwise and remove it. Check oil level on dipstick. The level should be between the max and min marks on both sides of the dipstick. Top up if necessary with engine oil. The use of ATF oil is recommended in cold operational conditions and during long operational runs.

Important! ATF oil and engine oil must never be mixed. If ATF oil is to be used, the engine oil must first be drained from the system.

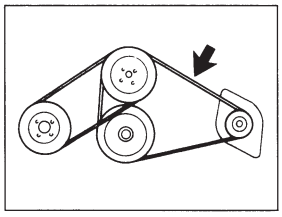
Electrolyte level in the battery

The electrolyte level shall be 5—10 mm (0.2—0.4") above the cell plates. Top up with distilled water as required.

CAUTION: Some maintenance-free batteries are supplied with special instructions. These instructions must be complied with.

Belt tension, alternator

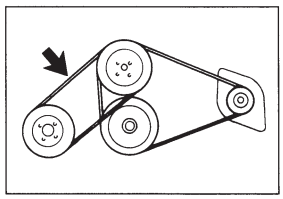
⚠ **WARNING!** Ensure that the ignition is switched off and the ignition key removed before checking the belts.



Correct belt tension is a necessity if the alternator is to provide full power. The belt tension is properly tensioned when it is possible to depress it 10 mm (0.4") with thumb pressure applied between the pulleys.

A badly worn or split belt must be replaced. See "Checking the V-belts".

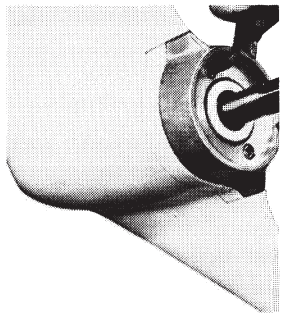
Belt tension, power steering pump



The belt is correctly tensioned when it can be depressed approx. 10 mm (0.4") midway between the pulleys. A worn or cracked belt must be replaced. When adjusting or replacing, see: Checking the V-belts.

⚠ **WARNING!** A worn or cracked belt must be replaced. Should the belt break, the steering will get considerably heavier and the steering will take longer to function. Especially at high speeds, this could lead to the boat being subjected to dangerous situations, if e.g. a manouver must be carried out quickly. The unexpected stiffness of the steering can also make the driver react in panic, and further worsen the situation.

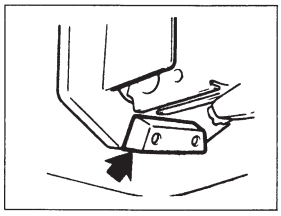
Checking the corrosion protection



Replace the zinc ring when about half has been consumed.

⚠ **WARNING:** To achieve good galvanic contact, it is important for the contact surface on the drive to be cleaned before a new zinc ring is fitted.

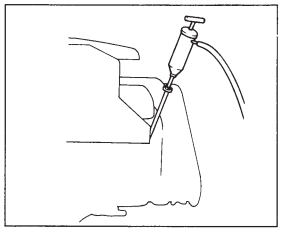
For boats used mainly in freshwater lakes it is recommended to change the zinc ring to a magnesium ring part No. 876138-9.



Replace the zinc plates under the transom cover when about half has been consumed.

WARNING! To achieve good galvanic contact, it is essential for the contact surface on the transom cover to be cleaned before the new zinc plates is fitted.

Service every 50 hours of operation



Engine oil change

Change the oil in a new or reconditioned engine after the first 20 hours of operation and then after every 50 hours of operation.

Run the engine until it is hot. Remove the oil through the tube for the dipstick.

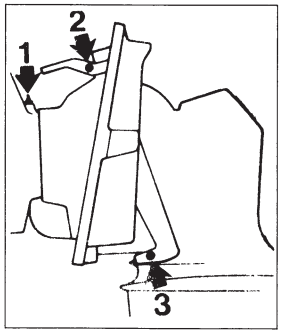
Replenish with oil to the correct level. Refer to Technical Data for the correct choice of oil. Do **not** overfill.

NOTE! The oil filter must be changed before new oil is filled.

Valve clearance

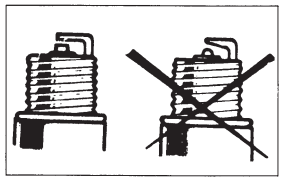
The engine has hydraulic valve lifters and valve adjustment is not necesary.

Lubricating the primary shaft and the steering shaft journals



Lubricate the primary shaft (1) with about 1 cm^3 (0.06 cu.in) of water resistant grease. Lubricate the upper steering shaft journal (2), the lower steering shaft journal (3) and the retaining pawl with a grease gun. Use water-resistant grease. Continue applying grease until grease is forced out of the journal.

Spark plugs

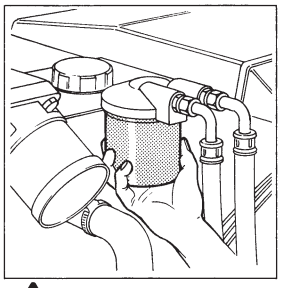


Check the spark plug gap and adjust as required. If the spark plugs are damaged or worn, or if the electrodes are rounded, they must be replaced with equivalent ones. See under Technical Data.

WARNING! Incorrect type of spark plugs can cause operational difficulties and damage to the engine.

Service every 100 hours of operation or at least once per season

Oil filter



The oil filter is changed for the first time after 20 hours of operation and then after every 50 hours of operation (every oil change). Unscrew the old filter. If the old filter is difficult to undo, there is a special tool which can be used.

CAUTION: Be careful not to spill oil.

Coat the rubber seat on the new filter with oil. **Check the contact surface on the engine** to see that the old seal is not stuck to the oil filter adapter and screw on the filter **by hand** until it makes contract with the face of the adapter. Then tighten the filter a further **half turn — no more.**

CAUTION! Use only genuine Volvo Penta oil filters or filters with the same capacity, flow rate and fittings.

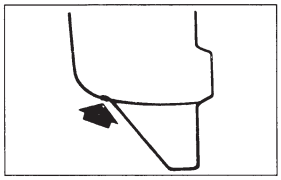
WARNING! Filters which do not comply with the requirements can cause the engine to break down.

Start the engine, let it run at idling speed and check that the oil pressure gauge shows the correct reading. In the event of abnormal readings or alarm soundings — stop the engine and investigate the cause.

Check the oil level and also check that there is no oil leakage around the filter or oil hoses.

Oil change in the drive

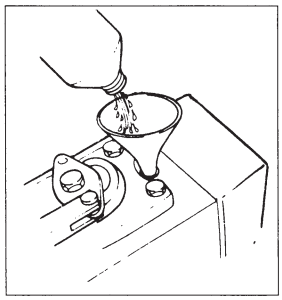
(every 200 hours)



Draining the oil (to be carried out on land)

Remove the dipstick. Tilt the drive up a little. Remove the plug on the underiside of the propeller gear housing and let the oil run out. Refit the plug with its O-ring.

Filling

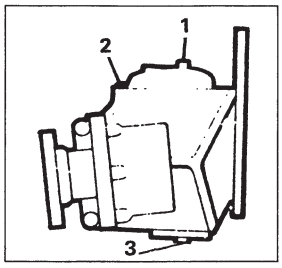


Remove the drive cover and the oil filler plug with its O-ring. Pull the drive cover straight upwards after removing the fastening screw. Tilt up the drive. Fill up with oil. Concerning quality and capacity see Technical Data. Refit the plug together with its O-ring. Lower the drive.

WARNING! Check that the drain-plug is not leaking.

Check the oil with the dipstick, which must **not** be screwed down when measuring the oil level. Fill up to the correct level through the dipstick hole. If the oil level is too high, the oil must be drained to the correct level. Reinstall the dipstick together with its O-ring. Reinstall the drive cover moving it straight downwards so that the guide pin enters into the fastening plate's hole. Thereafter, tighten the screw.

Changing the oil in the MS5 reverse gear



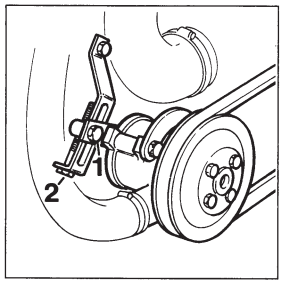
Use the oil drain pump to remove the oil through the hole for the dipstick (1). Remove the magnetic plug (3) and clean it. Refit the plug.

The reverse gear is refilled to the upper mark on the dipstick through the oil filter hole (2). Then start the engine and run it at idling speed a few minutes. Stop the engine and check the oil level. Add more oil as required.

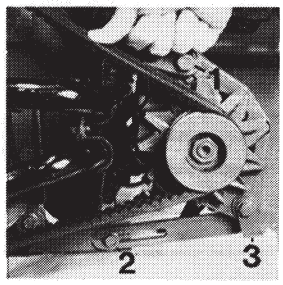
⚠ **WARNING!** Check that the drain-plug is not leaking.

Checking the V-belts

⚠ **WARNING!** Ensure that the ignition is switched off and the ignition key removed before checking the belts.



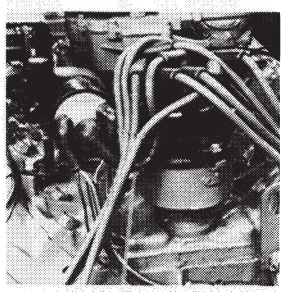
The drive belts must be replaced, if there are signs of wear or cracks. The power steering pump's drive belt is replaced by loosening the lock nut (1). The drive belt is then slackened with the adjuster bolt (2) until it can be pulled off. Clean the belt pulleys and fit a new drive belt. Tension the belt, using the adjuster bolt (2), so that it can be depressed with the thumb approx 10 mm (0.4'') midway between the pulleys. Tighten the lock nut (1). **NOTE!** If the alternator belts are also to be replaced, this must be done before fitting the servo pump's drive belt.



The alternator belts are replaced by first loosening the alternator's fastening bolts (1) and (2), and then pulling off the drive belts. On engines with a power steering pump, the pump's drive belt must be removed first. Clean the belt pulleys and fit the new belts. Insert a large screwdriver or similar into the bracket (3) and pull out the alternator so that the belts are tensioned. Tighten the bolt (2) and check the belt tension: when the belt is properly tensioned, it should be able to be depressed with the thumb approx 10 mm (0.4'') midway between the pulleys.

Important! After a few hours' running, the belt tension should be checked, and if necessary, the belts tensioned again. The best belt tensioning is obtained, if the adjustment is done immediately after running the engine while the belt is still warm and flexible. Use genuine Volvo Penta V-belts.

Ignition system



Any adjustment to the engine's ignition system should be carried out by an authorized workshop that has the correct equipment for the job. The ignition system is sensitive and incorrect action may have serious consequences.

The distributor must be checked on a test bench.

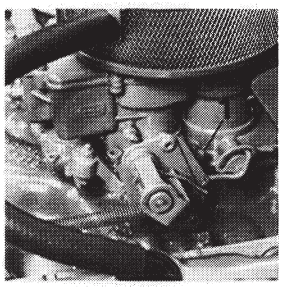
Lubricate the distributor with a few drops of oil on the drive spindle's felt pad under the rotor.

The ignition is electronically controlled and requires no contact points maintenance. Use a timing light for checking ignition timing. Refer to Technical Data for timing setting.

⚠ **WARNING!** Failure to adhere to recommeded setting will result in engine damage.

Important! If the ignition cables are removed, ensure that they are fitted in the correct order. Refer to ''Wiring Diagram'' section for cable routing.

Checks and service

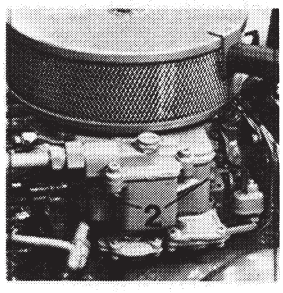


Carburator

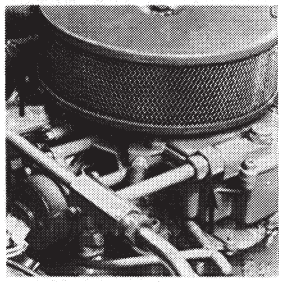
Correct carburator adjustment is a ''must'' if the engine is to operate correctly and at optimum fuel economy. For this reason you should allow an authorized workshop to check the adjustment some time during the season.

Adjust the idling setting as follows.

1. Run the engine until it has reached its working temperature and the choke has opened fully.
2. Adjust the idling speed (see under ''Technical Data'') with the idle speed screw (1).
3. Check that there is no air leakage between the carburretor and the intake manifold (a leakage increases the engine speed).

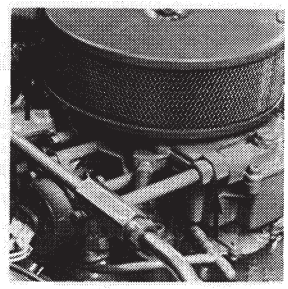


Adjust the fuel/air mixture with the bleed screw (2) so that the best and most regular idling is achieved. Begin by screwing in the bleed screw until the engine starts to run rough, then screw out the screw until the best idling conditions are reached. Finely adjust the engine speed with the idle speed screw if necessary.



The carburetor's fuel filter

The carburetor is fitted with fuel filters in the fuel lines connections next to the carburator.



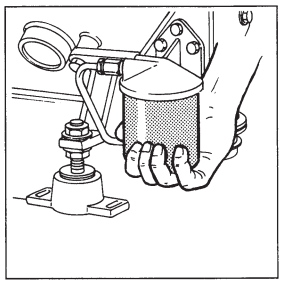
Check the filters at least once a season or as required

WARNING: Exercise extreme care when replacing the fuel filter or cleaning the carburetor's filter. Gasoline is highly inflammable and can be extremely explosive under certain conditions.

Before commencing work: switch off the ignition and let the engine cool completely after running. Smoking, open flames or sparks are not allowed in the immediate vicinity. Place a suitable rag underneath, when the fuel connections or filters are loosened. Remove the rag immediately with any fuel spillage and dispose of it safely.

After the work is completed: run the engine room fan for 2—3 min, start the engine and inspect thoroughly for any leakage.

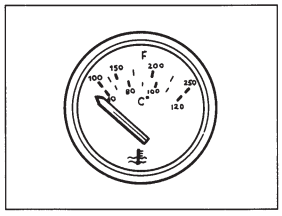
Check: Undo the fuel line and remove the nipple in the filter housing (be careful not to spill fuel). The filter can now be removed for checking. (Wash in solvent.) Refit in the reverse order. The filter's closed end must face into the carburator. Check the seal between the nipple and the filter housing. Start the engine and check that all connections are tight.



Spin on fuel filter

The fuel filter must be replaced once per season or after every 100 hours of operation. Remove the filter, discard it and install a new one. Watch out not to spill fuel.

Checking the cooling system



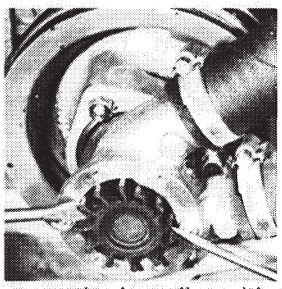
The temperature gauge has a green sector which corresponds to normal cooling water temperature. The gauge has an integrated acoustic alarm (optional) which sounds for excessive cooling water temperature.

If the cooling water temperature is abnormal, the cooling system must be examined immediately. Excessive temperature may be due to a clogged water intake, defective impeller in the sea water pump, blockage in the engine's cooling water channels, clogged oil cooler, faulty thermostat or inaccurate gauge. For engines with a fresh water system the cause can also be: low water level or a clogged heat exchanger. Low water temperature is usually caused by a faulty thermostat or the gauge reading is incorrect.

WARNING: Closed fresh water system is under pressure. If pressure cap is removed when engine is at operating temperature, turn cap to first stop and allow pressure to escape before completely removing cap.

WARNING! Be careful of water penetration when working on the cooling system.

Checking and replacing the impeller in the sea water pump

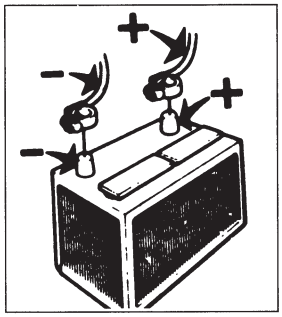


The pump can be damaged by running it dry. Check the pump impeller.

WARNING! Be careful of water entering the boat.

Remove the cover from the water pump. Inspect the pump impeller. The impeller must be replaced if it is damaged. Remove the impeller with the help of two screwdrivers. Be careful not to damage the housing.

Electrical system



WARNING! The engine is equipped with an alternator. If the alternator and the regulator are to operate satisfactorily, it is important that the following instructions be observed.

1. **The main battery switch must not be switched off before the engine has stopped.**

   Never disconnect the battery cables or other cables in the charging circuit when the engine is running since this can destroy the regulator and seriously damage the alternator.

2. **The battery terminals' polarities must never be mixed since this can seriously damage the electrical equipment.**

   The battery terminals are marked with a positive and a negative symbol. The cable from the negative terminal is connected to the engine block. The cable terminals must be properly tightened and greased.

3. **The charging circuits must not be switched while the engine is running.**

   Fit a Volvo Penta charge distributor (accessory) to the alternator if more than one battery is fitted.

4. Starting using an auxiliary battery shall be done as follows:

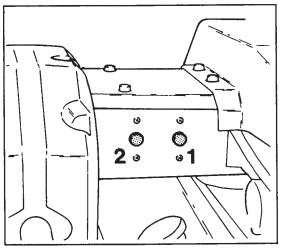
   The normal battery shall remain connected. Connect the auxiliary battery's (+) pole to the normal battery's (+) pole. Then, connect the auxiliary battery's (—) to the normal battery's (—) connection **on the engine block.** When the engine has started, **first disconnect** the auxiliary battery's (—) lead **from the engine block.** Never under any circumstances break the normal battery's circuit.

   WARNING: Start the engine room fan run it for at least 2 minutes before connecting the auxiliary battery.

5. Do not use a booster charger when the alternator is connected to the battery. Never use a booster charger to assist during actual starting.

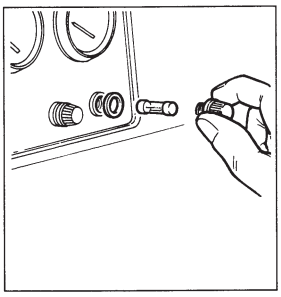
6. Disconnect both battery cables before any type of work is to be carried out on the electrical system or the alternator.

7. If any welding is to be carried out on the engine or its equipment, the charging regulator's cables must be disconnected at the alternator and insulated.
8. Check the belt tension and the cable connections regularly.



Fuses in the electrical system

The electrical systems for the engine and Power Trim are equipped with automatic fuses, that break their electrical circuits on overload. Always investigate the cause for the overload before resetting the fuse. When resetting the engine's electrical circuit, press the button (1), for Power Trim (2).



The engine is also fitted with two replaceable 8A fuses in the instrument panel.

⚠ **WARNING!** Always keep spare fuses on board.

Checking the starter motor and alternator

All work on the starter motor and alternator should be carried out by an authorized Volvo Penta service workshop. An inspection and checks should be carried out in conjunction with a general overhaul of the engine.

Battery

⚠ **WARNING!** The battery must not be exposed to a open flame or an electric spark. Do not smoke in the vicinity of the battery. The battery produces hydrogen which is easily ignited and explosive. The battery contains sulphuric acid.

Do not allow the battery acid to come in contact with your eyes, skin or painted surfaces. If this should happen however, wash the area affected with water immediately. Contact a doctor if the eyes are affected.

Checking the battery

Check the charge state of the battery and the electrolyte regularly. The correct level is 5—10 mm (0.4'') above the cell plates. The battery connections shall be clean, greased and tight.

Service in connection with laying-up and launching the boat

Inhibiting

If the boat is stored in the water unused, the engine should be run until it is warm at least once every month. If the boat is not going to be used for a period exceeding 3 month, long-term inhibiting should be carried out.

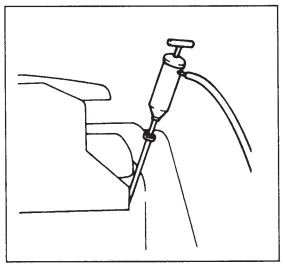
Inhibiting when laying up

Before the motor is long-term inhibited, an authorized Volvo Penta workshop should test the engine and its equipment. If anything needs to be repaired, let the workshop carry out the repair before launching the boat again.

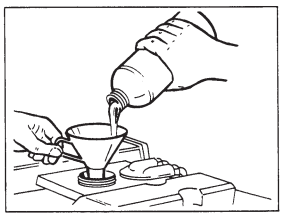
Inhibiting procedure

Carried out while the boat is in the water

Let the engine run at fast idle until warm. Then stop the engine.



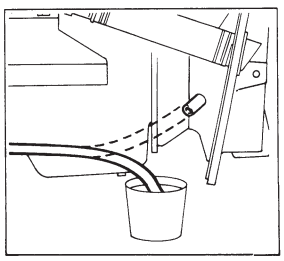
Pump all the oil out of the engine. Use the oil drain pump.



Replace the oil and oil filter. Replenish with Volvo Penta engine oil if available since this also has corrosion protection properties. The engine is now ready to be run on this oil next season.

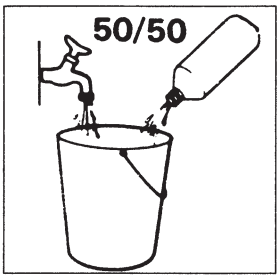
Use special inhibiting oil if the laying up period is longer than a normal winter laying up period. In this case the oil and oil filter shall be replaced when launching. The oil filter needs not to be replaced before the laying up period.

Inhibiting to be carried out on land

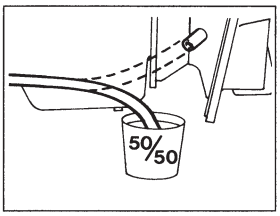


Remove the cooling water hose at the transom shield and insert the free end into a bucket containing fresh water. Make sure there is a water supply to the bucket. Sea water cooled engines: Remove the thermostat and reinstall the thermostat housing.

Run the engine at fast idle for a few minutes. CAUTION: The pump can not withstand being run dry. Drain the system.



Prepare a mixture of 50% fresh water and 50% corrosion protective anti-freeze.

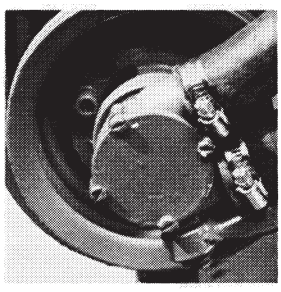


Insert the hose in the mixture. Arrange so that the mixture which is pumped through is collected. Start the engine and let it idle until the mixture is finished. Check that nothing is positioned behind the exhaust outlet.

⚠ WARNING: The water pump must not be allowed to run dry.

The combined corrosion and anti-freeze protection mixture need not be drained. The engine is not protected against freezing if it is inhibited with emulsifying oil. This must be drained. Check that the water runs out since contamination can block the cocks. Then close all cocks.

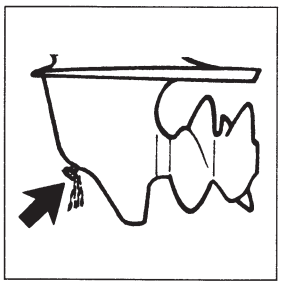
Emulsifying oil should **not** be used on closed cooled engines.



Remove the cover from the coolant water pump. Remove the impeller. Check that the impeller is serviceable. Rinse the impeller in fresh water and store it in a sealed plastic bag until it is time to fit it again. A worn or damaged impeller must be replaced. Refit the cover. Reconnect any hoses that were undone.

Closed cooled models only

Check the antifreeze protection on the fresh water system. To maintain the corrosion protection the anti freeze should be completely replaced every other year. Fill with a 50/50 mixture of fresh water and Volvo Penta antifreeze type 85. NOTE! Type 85 must not be mixed with other antifreeze or corrosion additives.

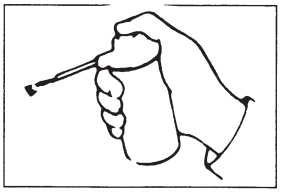


Carefully remove the oil drain plug at the bottom of the drive and let a few drops of oil run out. Check that the oil is clean and not discolored.

If the oil shows signs of water entry (gray colored oil), get in touch with an authorised Volvo Penta Dealer to check the sealing rings.

No further inhibiting of the drive lubricating system is necessary. Remove the propellers and coat the shaft with rust inhibiting oil.

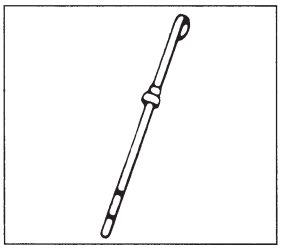
Volvo Penta strongly recommends to remove the outdrive and carefully inspect the u-joint bellows and hoses. Lubricate the splines and pivot pins. Inspect and lubricate the reverse latch mechanism.



Clean the exterior of the drive and the engine. Touch up any blemeishes with original paint. Spray the electrical system's components and all control parts with water-repellant spray.

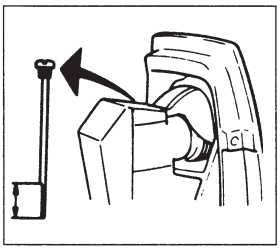
Remove the battery. Clean the battery, check the state of the electrolyte and charge it. Store it in a dry, cool place. All batteries discharge when they are not in use. This self-discharge increases the hotter the room the battery is stored in. Charge the battery every or every other month, depending on the storge temperature. **Important!** A battery gets severely damaged by being discharged for a longer period. A discharged or low-charged battery can be destroyed by freezing.

Procedure when launching



Only the oil level needs be checked if Volvo Penta oil has been used to inhibit the engine.

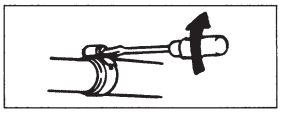
Both the oil and the filter must be changed if other inhibiting oil has been used. Refer to "Service every 50 hours".



Check the oil in the drive. If the level is too high, it must be lowered by draining some of it off. If the level is too low, replenish via the dipstick hole.

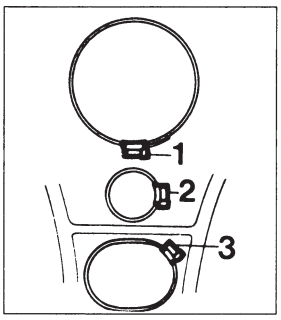
CAUTION: The dipstick must **not** be screwed in when checking the level. Also check the oil in the hydraulic pump for Power Trim and Power Steering. Replenish as required.

Install the sea water pump impeller and thermostat, if this has been removed.



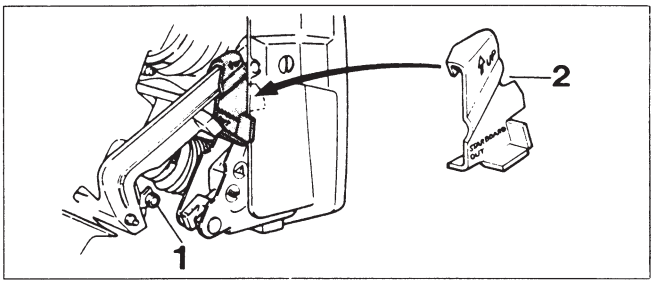
Check the tightness of all hose clamps. Check that all drain cocks and drain plugs are closed. Clean the engine and the drive externally. Check the exhaust hose.

Closed cooled models:
Check the coolant level in the expansion tank. Top up with a 50/50 mixture of fresh water and Volvo Penta coolant Type 85. Do not exceed this %.



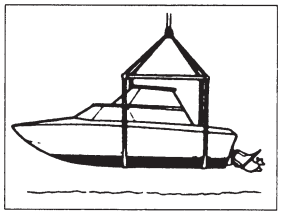
Carefully check the bellows for any damage and check the tightness and position of the clamps. CAUTION: The u joint bellows and clamps should be changed **every second year.** Let an authorized workshop check and replace the bellows.

WARNING! Never work on the drive's bellows or hydraulics before locking the drive in the raised position in such a way that it cannot possibly fall. A falling drive can cause serious bodily injury.



Tool 885061-2 when carefully fitted can help prevent the drive from falling. The tool shall be used for locking the drive in the raised position. Fit the tool as follows:

Carefully put your hand in from behind the cover's zinc plate and take hold of the retaining pawl (1). Press the retaining pawl down at the same time as the drive is lifted up by hand to the fully raised position. Hold the drive steady in this position and fit the tool (2) on the starboard side as shown in the figure. CAUTION: Do not overload the tool by standing on the raised drive.

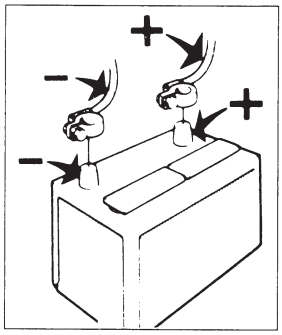


Check the condition of the paintwork on the outboard drive. Damaged paint should be repainted with Volvo Penta original paint. Then paint the drive with anti-fouling paint specially formulated for use with aluminium outdrives.

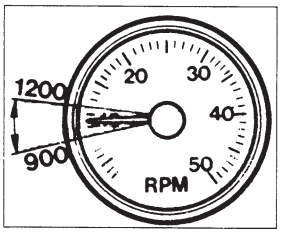
These anti-fouling paints often contain tin "TBT" as an active component. In markets where tin based paints are not allowed, the drive should instead be treated with teflon. Use a teflon compound free from copper and tin. NOTE! These clean teflon compounds are not anti-fouling paints, but the treated surface becomes so shiny that any growth has difficulty in getting a hold. Consequently the surface is also easy to keep clean.

WARNING! The drive's zinc anodes must not be painted or teflon treated. Ensure there is good metallic contact between the anodes and the drive.

Paint the bottom of the boat with growth inhibiting paint. Use a clean tin based bottom anti-fouling paint that does not contain copper. In markets where tin based "TBT" paints are not allowed, teflon based copper paint should be used instead. NOTE! The teflon based paint must contain metallic copper, **not copper oxide**. The finished surface must have max 20 g (0.71 oz) pure copper per m^2 (11 sq ft). Do not paint closer to the shield/drive than 10 mm (0.4"). Launch the boat when the paint has dried.



Check that the batteries are fully charged. Smear the cable terminals with terminal grease. Connect the battery cables. **CAUTION! Do not mix the polarities.** Tighten the battery connection properly.



Start the engine. Run the engine with the drive engaged if possible. Check that there are no fuel, water or exhaust leaks in the boat. Also check that the controls operate correctly.

Contact an authorized Volvo Penta workshop as required.

Let the workshop carry out a service on the motor and the drive according to the instructions in the servicing schedule.

Propellers, DP

WARNING! There are 3 different propeller series for Aquamatic model DP. The series designations are A, B and C. Series A is intended for diesel engines and series B for gasoline engines in the lower output range. For 740 DP, **only** series C propellers may be used.

The series type can be seen by A and B series propellers being painted, and series C propellers not painted (stainless steel). Series A or B propellers must under no circumstances be used, as they can cause the boat to behave unstable with unexpected turning at high speeds or cause propeller failures.

The propellers are classified together and are marked with the type designation, e.g. C6. Propellers with different markings must not be fitted to the same drive. If the boat has a twin installation, ensure that both drives get the same propeller type. A damaged propeller must be changed without delay. Operate with extreme caution if a propeller is damaged. Do not drive with a single propeller since this can damage the propeller shafts.

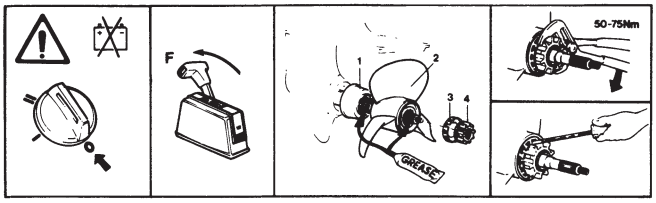
Installing DP propellers

CAUTION! Before installing the propellers:
Switch off the ignition key.

Install the propellers as follows:

Put the gear in forward. If possible, use tool 854668-1 when removing and installing the propellers.

Installing the forward propeller



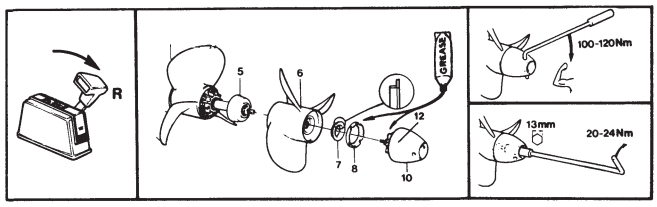
Apply grease to both propeller shafts. Use Volvo Penta grease (part number 828250-1).

Install: Line cutter (1)
Propeller (2)
Tab washer (3)
Nut (4)

WARNING! Handle the fish line cutter with care since the edge is sharp and can cause injury and damage.

Tighten the nut (4) using a polygrip to a torque of 50—75 Nm (5—7.5 kpm/37—55 lbf.ft.). Bend in one of the tab washer's abs into a recess in the nut.

Installing the rear propeller



Put the gear in reverse.

Install: Line cutter (5)
Propeller (6)
Pressure washer (7)
Plastic washer (8)
Propeller cone (10)

WARNING! Handle the fish line cutter with care since the edge is sharp and can cause injury and damage.

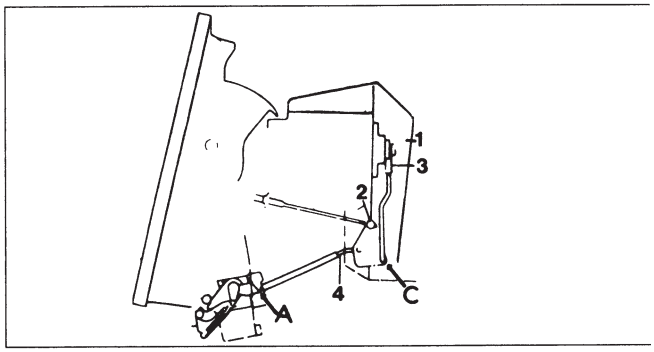
Tighten the propeller cone as hard as possible (100—120 Nm/10—12 kpm/74—88 lbf.ft.). Tighten the screw (12) in the propeller shaft to a torque of 20—24 Nm (2—2.4 kpm/15—18 lbf.ft).

Put the gear in neutral before starting the engine.

Adjusting the retaining pawl

Check once a season and if necessary adjust the location of the retaining pawl rod in relation to the retaining pawl (A). Adjust as follows:

1. Remove the protective cover (1). Move the control lever to neutral.
2. Disengage the shift cable swivel (2) and the fork (3).
3. Relase the locknut for the fork (3). Adjust the fork so that when it is connected to the lever it causes the retaining pawl rod (4) to take up such a position that it reaches the retaining pawl bracket at "A" without pressing against it. Lock the fork (3) with the locknut.



4. Adjust the swivel (2) so that it easily enters the hole in the shift yoke. Move the control lever to the "Forward" position and check that the corner "C" does not foul the housing. Refit the cover (1).

Troubleshooting chart

Troubleshooting

The troubleshooting chart given below lists only the more common types of faults which could occur. With the help of the instructions, the owner can usually rectify most of the faults listed below. When in doubt, always contact the nearest Volvo Penta workshop.

Follow the instructions in the troubleshooting chart — it helps to provide trouble-free running.

Engine will not start	Engine stops	Engine does not attain top speed at full throttle	Engine runs unevenly or vibrates abnormally	Engine over-heats	CAUSE
●					Battery switch not switched on, flat battery, break in electric circuit main fuse or 8A fuse on instrument panel.
●	●				Empty fuel tank, fuel cock closed, blocked fuel filter.
●	●		●		Water or contaimination in the fuel.
●	●	●	●		Worn or oily sparkplug.
●					Moisture in the distributor and ignition cables.
	●		●		Idling speed not properly adjusted.
		●			Incorrect rev counter.
		●			Boat abnormally loaded.
		●			Growth on the bottom of the boat and on the outboard drive.
		●	●		Damaged or incorrect propeller.
				●	Blocked coolant inlet, oil cooler, cooling galleries, heat exchanger, damaged impeller or thermostat, too low coolant level in expansion tank.

Technical Data

General

Engine designation	740/DP, 740/MS5
Type	4-stroke
Number of cylinders (90°V)	8
Output (see 'Sales Literature')	
Bore mm (in)	108 (4.25)
Stroke mm (in)	101.6 (4.0)
Swept volume dm^3 (cu.in)	7.4 (454)
Compression ratio	8.0:1
Compression pressure (starter motor)	10.0—11.0 kp/cm^2 (142—156 p.s.i.)
Max. speed range	4000—4400 rpm
Recommended 'cruising speed'	300—500 rpm lower than the obtained max. speed
Idling speed	750 rpm
Direction of rotation (seen from front of engine)	Clockwise
Maximum propeller diameter, DP	16''
Gross weight	
(engine, risers and sterndrive model DP) kg (lbs)	522 (1150)
(engine, risers and reverse gearbox MS5) kg (lbs)	456 (1005)
Ratio, sterndrive model DP	1.78:1
reverse gear MS5	1.5:1, 1.9:1 or 2.4:1

Valves

Valve system	Overhead valves Hydraulic lifters

Cooling system

Thermostat, limit values °C (°F)	
Sea water cooled	62—72 (143—161)
Closed cooled	70—83 (158—181)
Fresh-water quantity in litres (US qts.) approx. (closed cooled models)	26 lit (27.4)

Fuel system

Carburettor model	4 barrel spread bore with electric choke

Fuel quality

Gasoline with an octane value of min. 91 (RON) (USA 87 R + M/2). The engines can be run on unleaded fuel.

Lubricating system

Engine:	
Oil quality	Service SG
Viscosity	SAE 20W/50
Capacity, incl. oil filter litres/US qts. and oil cooler	6.65/7.02
Sterndrive, model DP:	
Oil quality/viscosity	Volvo Penta part No. 1141572-6 or Mobil lube SHC 75W90
Capacity litres/US qts.	2.7/2.8
Capacity, Power Trim hydraulic system litres/US qts.	1/1
Quality, Power Trim hydrualic system	Same as engine or ATF
Power steering	
Oil quality	Same as engine or ATF
Reverse gear MS5	
Oil volume litres/US qts	1.7 (1.8)
Oil quality	Volvo Penta part No. 1141572-6 or Mobil lube SHC 75W90

Ignition system

Firing order	1-8-4-3-6-5-7-2
Stroboscope setting at	
2500 rpm	25° BTDC
Basic setting (idling speed)	8° BTDC
Spark plugs — Volvo Penta p/n 876047-2	
AC MR 43T or similar, gap mm (in)	0.9 (0.35'')
Ignition cables with radio interference suppression.	

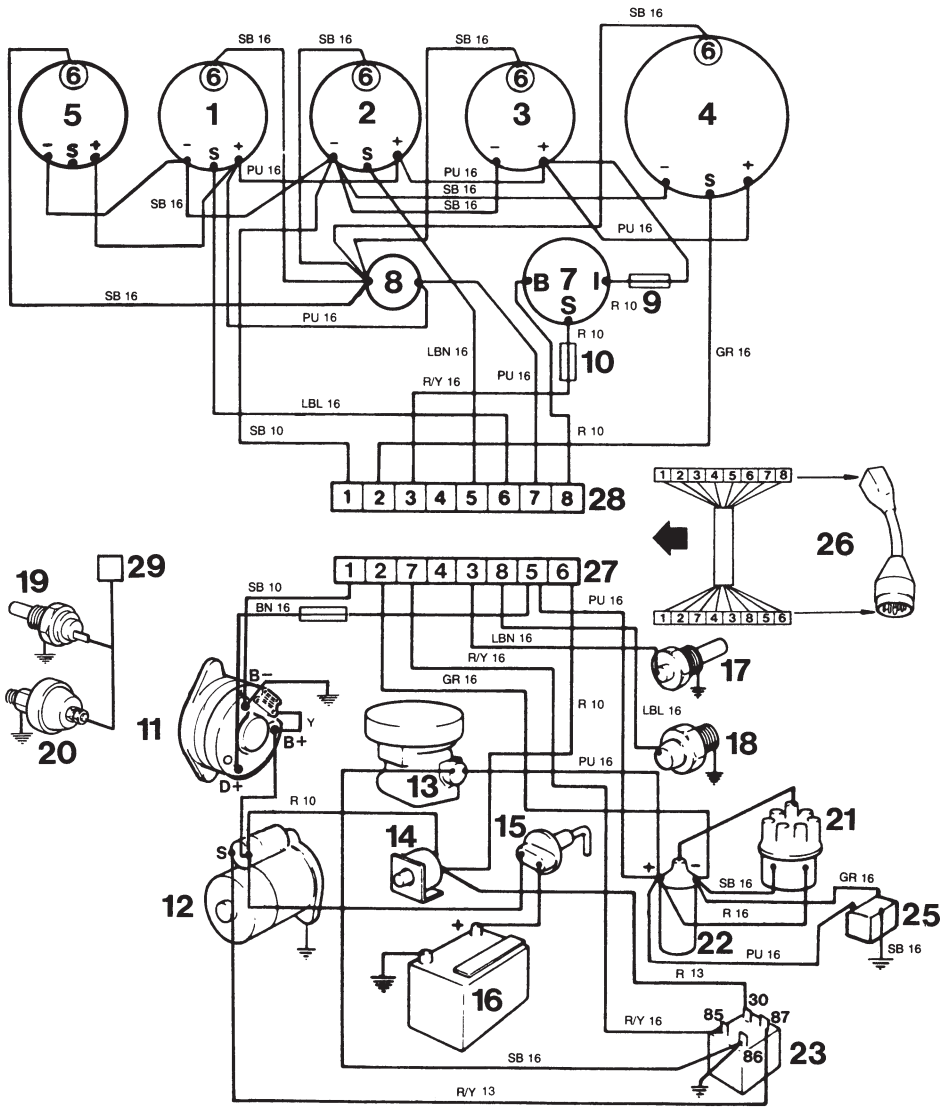
Electrical system

Voltage	12 V (negative ground)
Battery capacity	60 Ah
Battery electrolyte spec. gravity	1.275—1.285
to be recharged at	1.230
Alternator, max output Amp (W)	50 (50 × 14)
Starter motor output kW (hp)	1.2 (1.6)

Tightening torques

Cylinder head bolts	108 Nm 10.8 kpm 80 lb.ft
Spark plugs	21 Nm 2.1 kpm 16 lb.ft
Steering helmet bolts (Aquamatic)	35 Nm 3.5 kpm 26 lb.ft

Wiring Diagram



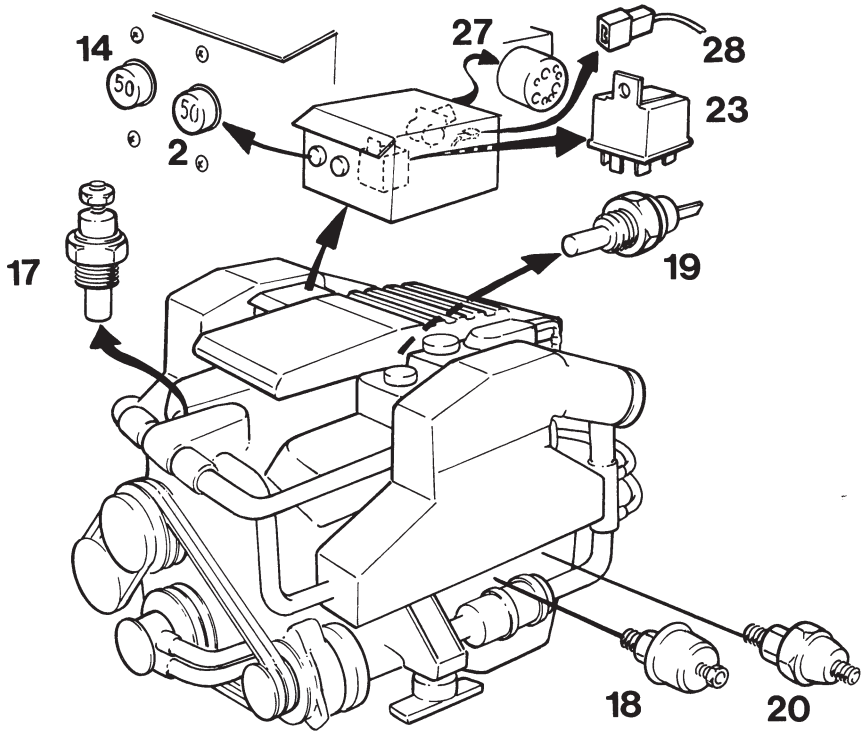
1. Oil pressure gauge
2. Temp gauge
3. Voltmeter
4. Tachometer
5. Fuel gauge
6. Instrument lights
7. Key switch
8. Switch, instrument lights
9. Fuse 8 Amp
10. Fuse 8 Amp
11. Alternator
12. Starter motor
13. Automatic choke
14. Automatic fuse 50 Amp
15. Battery switch (optional)
16. Battery (optional)
17. Temp sender
18. Oil pressure sender
19. Temp monitor
20. Oil pressure monitor
21. Distributor
22. Ignition coil
23. Starter relay
24. Resistor
25. Speed limiter
26. Connector adapter
27. Connector plug
28. Connector plug
29. Cable terminal

Color

				AWG	mm^2
SB	= black	LBL	= light blue	16	1.5
PU	= purpur	R/Y	= red/yellow	13	2.5
LBN	= light brown	BN	= brown	10	6.0
R	= red	W	= white	8	10.0
GR	= grey	Y	= yellow		

NOTE! The connector pins in the engine's round connector (27) and the instrument panel's rectangular connector (28) are numbered differently. The numbers in the Wiring Diagram are the pin numbers in the connectors, not the electrical connection between the connectors. Electrically the connectors are connected according to the cable colors, i.e. with the corresponding pin shown in the diagram.

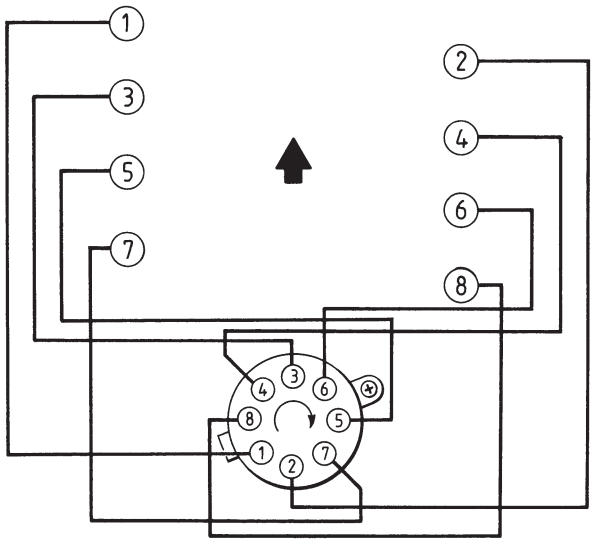
Electrical components location, engine



Component Nos. from wiring diagrams

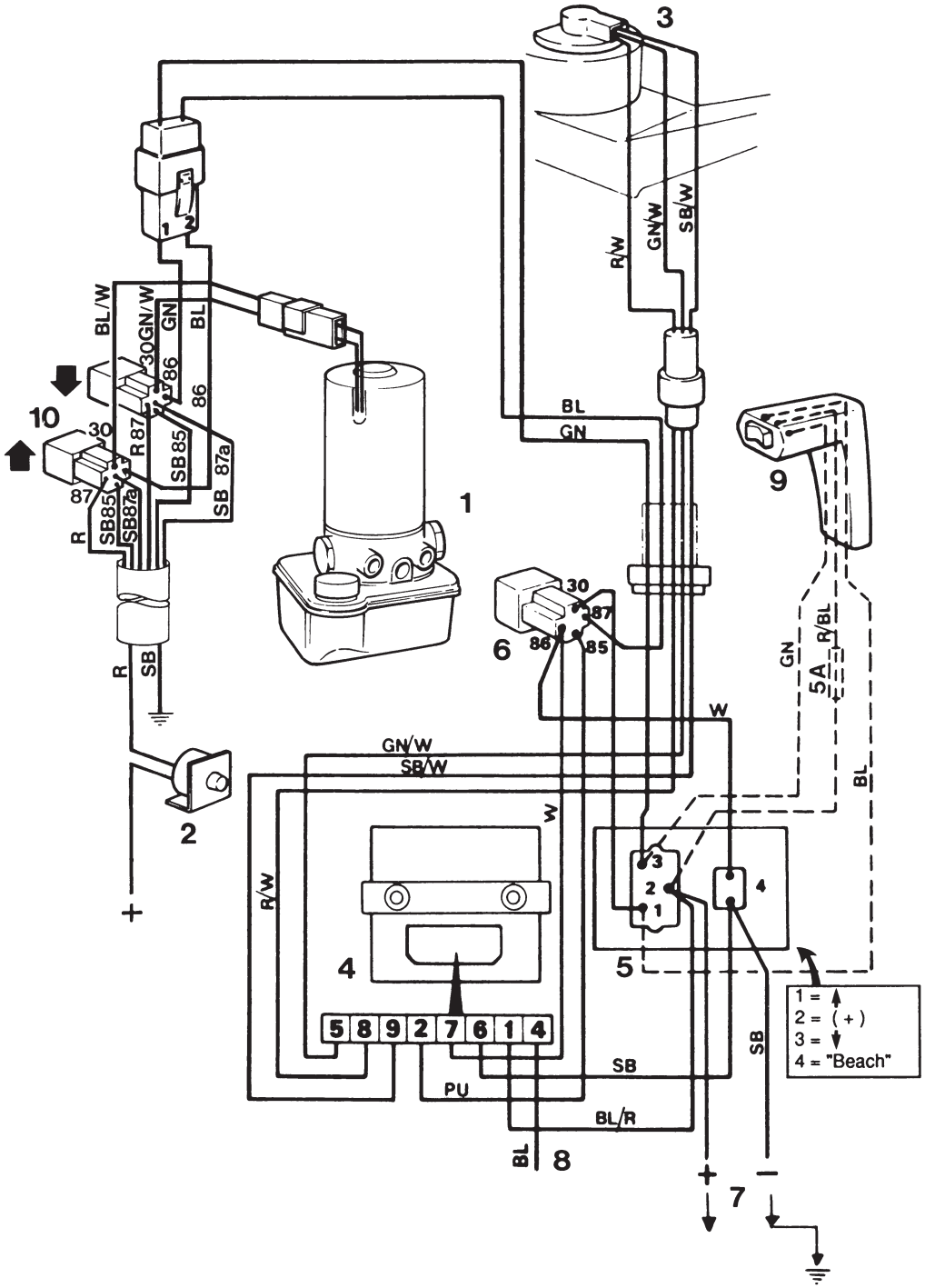
2. Automatic fuse, Power trim (wiring diagram Power Trim)
14. Automatic fuse, engine
17. Temp sender
18. Oil pressure sender
19. Temp monitor (located on R.H. cylinder head, above flywheel)
20. Oil pressure monitor
23. Starter relay
27. Connector plug
28. Cable terminal, temp/oil pressure monitor

High tension lead routing



Arrow indicates engine front

Wiring diagram, Power Trim



Cable color code

R	=	red
SB	=	black
GN	=	green
BL	=	blue
W	=	white
R/W	=	red/white
GN/W	=	green/white
SB/W	=	black/white
BL/R	=	blue/red
PU	=	purple
BL/W	=	blue/white

Cable area 1.5 mm^2

1. Oil pump
2. Automatic fuse 50 Amp
3. Trim sender
4. Trim indicator
5. Switch
6. Switch — relay, position ''beach''
7. Connection instrument panel
8. Instrument lighting
9. Throttle hook-up (optional)
10. Relays — arrows indicates up or down function.

Supplement to Owner's Manual

740/DP, 740/MS-5

STERNDRIVE

The drive is equipped with Power Trim. In connection with this, the retaining pawl has been deleted.

POWER TRIM

The Power Trim function makes it possible to trim the boat's planing angle while running so that it can be optimised for different sea, load and speed conditions.

When trimming, the electro-hydraulic system changes the drive's vertical angle in relation to the boat's hull. In this way the bow of the boat can be raised or lowered until the desired running angle is reached.

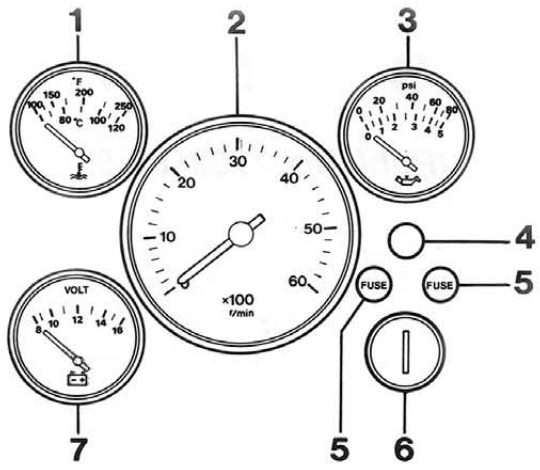
Correct use of the Power Trim give the following advantages:

- Faster acceleration to the planing position.
- Improved manoeuverability and more comfortable ride in choppy seas.
- Improved fuel economy.

The Power Trim is also used to raise or lower the drive when winching the boat out of the water onto a trailer, when launching from a trailer, and when running in shallow waters.

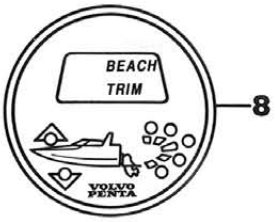
RUNNING AND MAINTENANCE

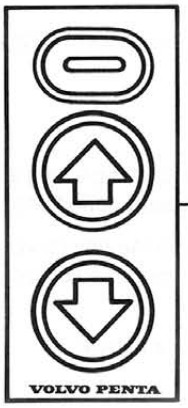
The same instructions as for the earlier versions apply to the new version, but with the exceptions described in this supplement.



Instrument panel

1. **Temperature gauge for cooling water.** Normal cooling water temperature 70–90°C (158–194°F)
2. **Rev counter** – scale 0–6000 r/min
3. **Oil pressure gauge.** Normally abt. 300 kPa (43 p.s.i.) when running
4. **Push button, instrument lighting**
5. **Fuses, 8A.** ("Start function" and "System voltage")
6. **Key switch (start lock)**
7. **Voltmeter.** During operating normally abt. 14V
8. **Instrument for trim angle**
9. **Operating switches for outdrive, "UP" – "DOWN"**

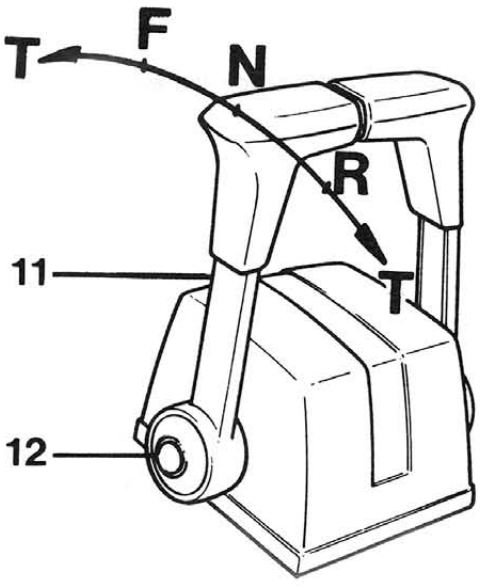


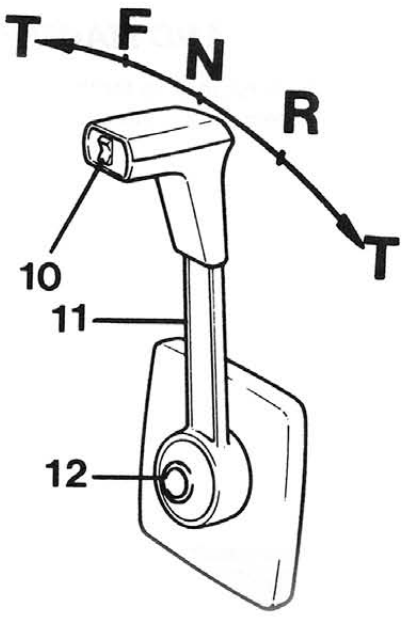


Operating controls

10. **Operating switch for Power Trim**
11. **Control lever**
12. **Disengaging device**
    Push in the button when the control lever is in neutral and move the lever forwards slightly. Release the button. The lever now operates the throttle only. Pull back the lever when you wish to use it for operating the speed and for manoeuvring.

N = Neutral
F = Control lever in position for running "Forward"
R = Control lever in position for reversing
T = Engine speed



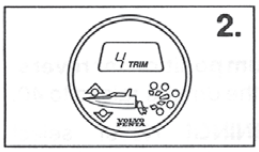


Running instructions

The Power Trim instrument

LCD display

1. Shows the current figure within the measurement range. This figure corresponds to the drive's angle in relation to a vertical line (boat laying still).



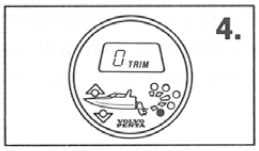
2. TRIM lights when the drive is max trimmed in up to 5.

The drive must be within the TRIM range when running, except for the conditions described in point 3.

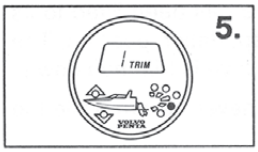
3. BEACH lights when the drive is within the 6 to 40 range.

The BEACH range is used where shallow waters are suspected or when running in shallow waters at reduced speed, when launching or winching from a trailer ramp and when the boat is beached.

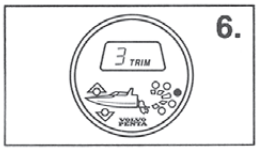
LEDs:



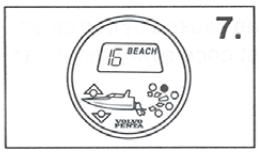
4. Steady green light when the drive is in the maximum trimmed-in position up to 0. Otherwise out.



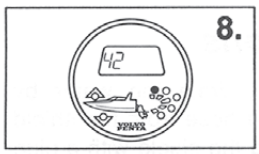
5. Steady green light when the drive is in the range between 0 and 2. Otherwise out.



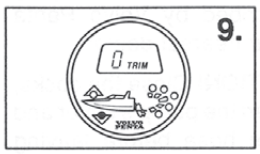
6. Steady green light when the drive is in the range between 2 and 5. Otherwise out.



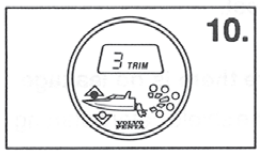
7. Steady red light when the drive is in the range between 5 and 40. Otherwise out.



8. Flashing red light when the drive is trimmed above 40. Otherwise out.



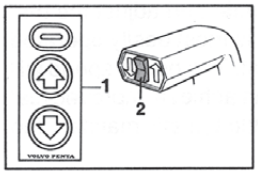
9. Steady yellow light when the drive is in the maximum trimmed-in position up to 0. Flashes when the drive is trimmed down within the trim range (the bow is lowered). Otherwise out.



10. Steady yellow light when the drive is in the range between 2 and 5.

Flashes when the drive is trimmed up within the trim range (the bow is raised). Otherwise out.

Power Trim controls



The Power Trim function can be controlled either from a separate control panel (1) or from a switch built into the controls for the boat (2).

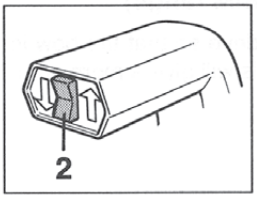
Control panel (Volvo Penta accessory)

When the button is pressed in, the bow of the boat will be raised. This function is locked when the upper limit of the TRIM range is reached.

The bow of the boat is lowered when this button is pressed in.

To be able to trim the drive up in the BEACH range, the red button (bypasses the lock function) and the button for trimming up must be pressed in simultaneously.

Switch in the controls (Volvo Penta accessory)



By pressing the switch's (2) upper or lower half, the boat's bow can be raised or lowered. To be able to trim within the BEACH range, a separate switch in the instrument panel (bypasses the lock function) must be pressed simultaneously.

Hold function BEACH

Boats with separate mounted switches for the bypassing of the BEACH function can also be equipped with a hold function.

Trimming into and within the BEACH range is done as follows:

Press in the button for bypassing the BEACH lock. The warning lamp now comes on confirming that the hold function for bypass is now activated. The drive can now be trimmed "single-handed" within the BEACH range.

The hold function remains in operation as long as the drive is within the BEACH range. When the drive is lowered into the TRIM range, the lock function for BEACH is reactivated and the warning light goes out.

Running with Power Trim

Every boat has its own unique running characteristics. These are also affected by other external factors such as the wind and sea, how the boat is loaded and how the load is distributed, etc.

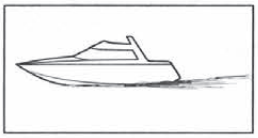
We therefore recommend that you, after you have become familiar with your boat, test to find the most suitable trim angles for different running conditions. Note such things as: how fast does the boat start planing, at which trim angle does the boat feel most comfortable to control, and so on.

When the boat feels well-balanced and easily steered this usually indicates that the trim angle is correct. Check by running with the same amount of throttle and adjust the trim angle up and down slightly. The boat is most easily operated when the engine speed is at its highest. The boat's speed will also be higher here. Therefore, you can achieve improved fuel economy by reducing the throttle a little but still maintain the same speed.

At start (TRIM range)

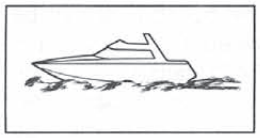
Trim in the drive. The bow will be pressed down which gives a better run and steering characteristics at speeds below the planing treshold. The boat will also reach planing speed quicker.

At planing speed (TRIM range)



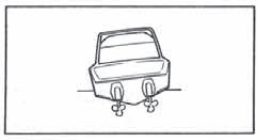
Gradually trim out the drive until the running position, where the boat feels comfortable and stable, is reached.

For choppy and rough seas (TRIM range)



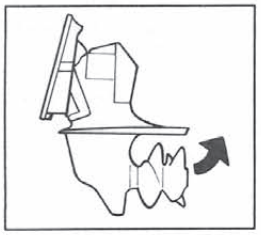
Trim in the drive so that the bow is lowered. This will give a more comfortable ride.

For side winds (TRIM range)



If the boat has a twin installation, the drives can be trimmed in to different trim angles. One can then compensate for side winds or uneven load distribution athwartships, which cause the boat to list when running.

Running in shallow waters (BEACH range)



If you are uncertain of the water depth you should reduce speed and trim the drive up into the BEACH range. The drive can be trimmed up to maximum 40 in BEACH; thereafter BEACH and the LCD display go out.

CAUTION! The maximum engine speed when running in the BEACH range is 1000 r/min. Remember that the boat's manoeuvering characteristics are impaired with the drive trimmed up to BEACH. Always reduce speed before raising the drive to BEACH.

NOTE! If the drive has released after hitting an obstacle, it does not automatically return to the position it had before the incident. The drive must be trimmed back to its original position by using the control button.

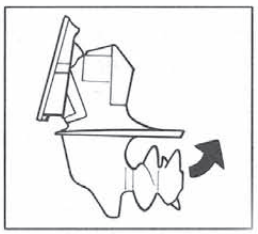
NOTE! In case of grounding or hitting an obstacle in the water. Check that the drive or propellers are not damaged and that there are no vibrations. Should that be the case, run to harbour at reduced speed and tilt up the boat onto land.

Check the oil to see if water has entered into the drive (oil is gray colored). Contact an authorised Volvo Penta Dealer, should this or other damage have occured to the drive.

After replacing the propeller, check the hull and launch the boat. Ensure that the vibrations have ceased. The oil should then be checked again, after a short run.

Should the faults remain, turn to an authorised Volvo Penta Dealer.

Reversing



The maximum position for reversing is when the drive is raised to 40.

WARNING! Never select reverse while the boat is planing.

When trailering the boat

WARNING! Before transporting the boat by trailer, raise the drive to its maximum. When the drive's angle exceeds 40, the LCD display in the trim instrument goes out and the LED (8, page 3) starts to flash with a red light, which indicates that the drive is in the lift range.

Power Trim has an automatic lift stop which breaks the current to the hydraulic pump when the drive has been lifted to its maximum and has reached the transportation position. The stop is reset automatically when the drive is trimmed down.

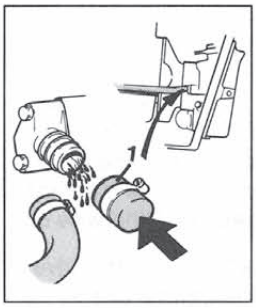
CAUTION! The engine must never be run while the drive is in the lift range.

Shutdown procedure

Idle engine

In order to prevent damage to the engine caused by corrosion, the engine should be run warm at least once every month as long as the boat is in the water.

Cold weather precautions



Furthermore, drain the water by removing the hose from the shield and plugging the shield with a plug (1) as described by Volvo Penta (contact your nearest dealer).

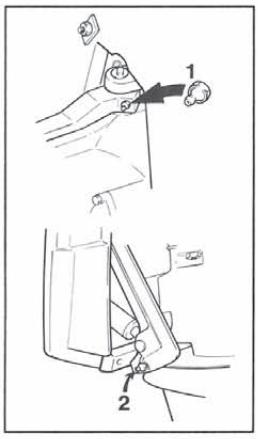
CAUTION! Close the cocks, tighten the pump's cover and fit the hose before leaving the boat.

Bilge pump the boat and make sure there is no leakage.

NOTE! Do not forget to fit the hose to the shield before starting the engine.

Service every 50 hours of operation

Lubricating the steering shaft journals



Lubricate the upper steering fork journal (1) and the lower steering shaft journal (2) with a grease gun. Use water-resistant grease. Continue applying grease until grease is forced out of the journal.

Service every 100 hours of operation or at least once per season

Engine oil and oil filter change

Change the oil and oil filter for the first time after 20 hours of operation and then after every 100 hours of operation.

Spark plugs

Check the spark plug gaps and adjust if necessary.

Service in connection with laying-up and launching the boat

Inhibiting

Remove the protective cover on the carburetor (if there is one) and the flame guard.

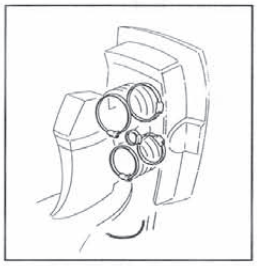
WARNING! Before the engine is turned on, make sure that the engine room is well ventilated so that it contains no flammable gases.

Turn on the engine and slowly pour around 15–20 ml of engine oil (preferably SAE 20W/50) into the neck of the carburetor so that the engine does not stop. The engine will emit a great deal of smoke and will not run smoothly. Make sure that the smoke does not bother other people. When there is only a little corrosion-protective coolant left in the container, another 5–10 ml of engine oil should quickly be poured into the carburettor. The engine should then be turned off a few seconds later if it has not stopped on its own.

WARNING! The coolant mixture must not run out, the water pump must not be allowed to run dry.

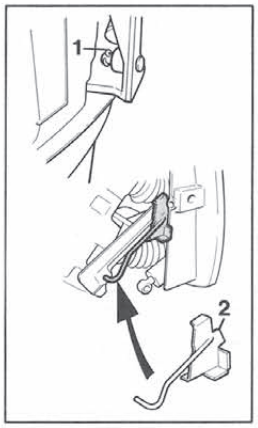
Refit the flame guard and the protective cover (if there is one) on the carburetor.

Procedure when launching



Carefully check the bellows for any damage and chech the tightness and position of the clamps.

NOTE! After tightening, the hose clamp screws must be located as shown in the illustration.



You can use Volvo Penta special tool part No. 885061-2 to ensure that the drive cannot fall down while you are working on it. Proceed as follows:

Trim the drive down to 0. Remove the cotter pins (1) and tap out the cylinder bolts.

CAUTION! Secure the drive so that it does not swing out when the last trim cylinder bolt is tapped out.

The drive can now be tilted by hand to the completely raised position. Hold the drive steady in this position and place the tool (2) on the starboard side as shown in the figure.

NOTE: Do not overload the tool by standing on the drive while it is in the upper position.

Installing DP propellers

WARNING! Before installing the propellers:

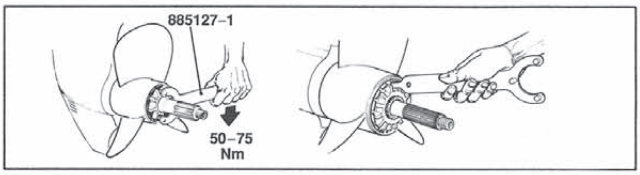
Switch off the ignition key.

Put the gear in "Forward".

Use tools 854669-9 and 885127-1 when removing and installing the propellers.

Installing the forward propeller

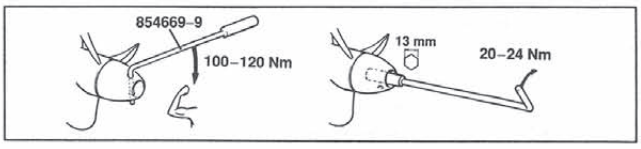
Tighten the nut using tool 885127-1 to a torque of 50–75 Nm (5–7.5 kpm/37–55 lbf.ft). Bend in **one** of the tab washer's tabs into a recess in the nut.



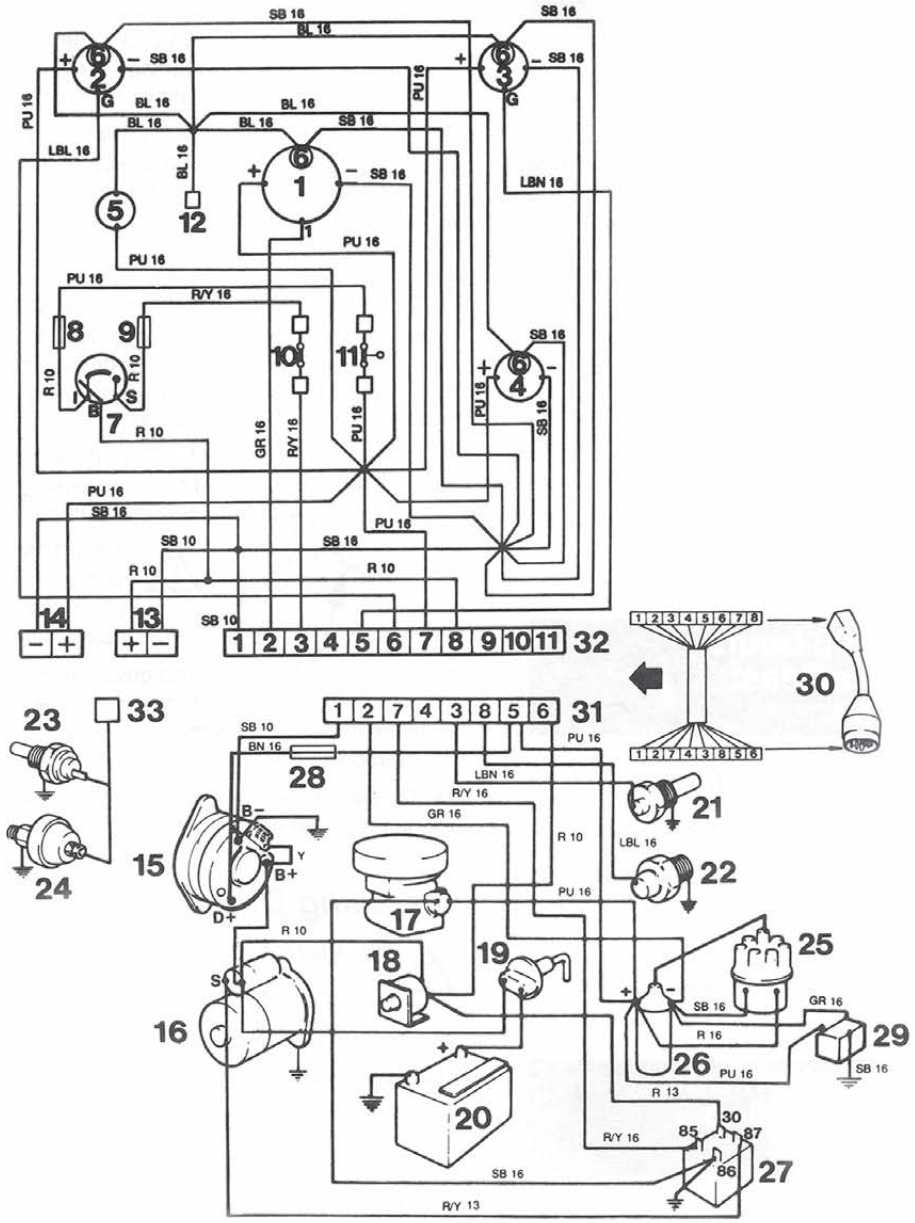
Installing the rear propeller

Tighten the propeller cone as hard as possible (100–120 Nm/ 10–12 kpm/74–88 lbf.ft). Tighten the screw in the propeller shaft to a torque of 20–24 Nm (2–2.4 kpm/15–18 lbf.ft). Use tool 854669-9.

Put the gear in neutral before starting the engine.



Wiring Diagram



1. Tachometer
2. Oil pressure gauge
3. Temp gauge
4. Voltmeter
5. Switch, instrument lighting
6. Instrument lighting
7. Key switch
8. Fuse 8 Amp, system voltage
9. Fuse 8 Amp, start function
10. Connector, neutral position switch (optional/accessory)
11. Connector, safety breaker (accessory)
12. Joining piece, accessory instrument lighting
13. Joining piece, current rating max. 20 Amp
14. Joining piece, current rating max. 5 Amp (main panel + flybridge panel)
15. Alternator
16. Starter motor
17. Automatic choke
18. Automatic fuse 50 Amp
19. Battery switch (optional)
20. Battery (optional)
21. Temp sender
22. Oil pressure sender
23. Temp monitor
24. Oil pressure monitor
25. Distributor
26. Ignition coil
27. Starter relay
28. Resistor
29. Speed limiter
30. Connector adapter
31. Connector plug
32. Connector plug
33. Cable terminal

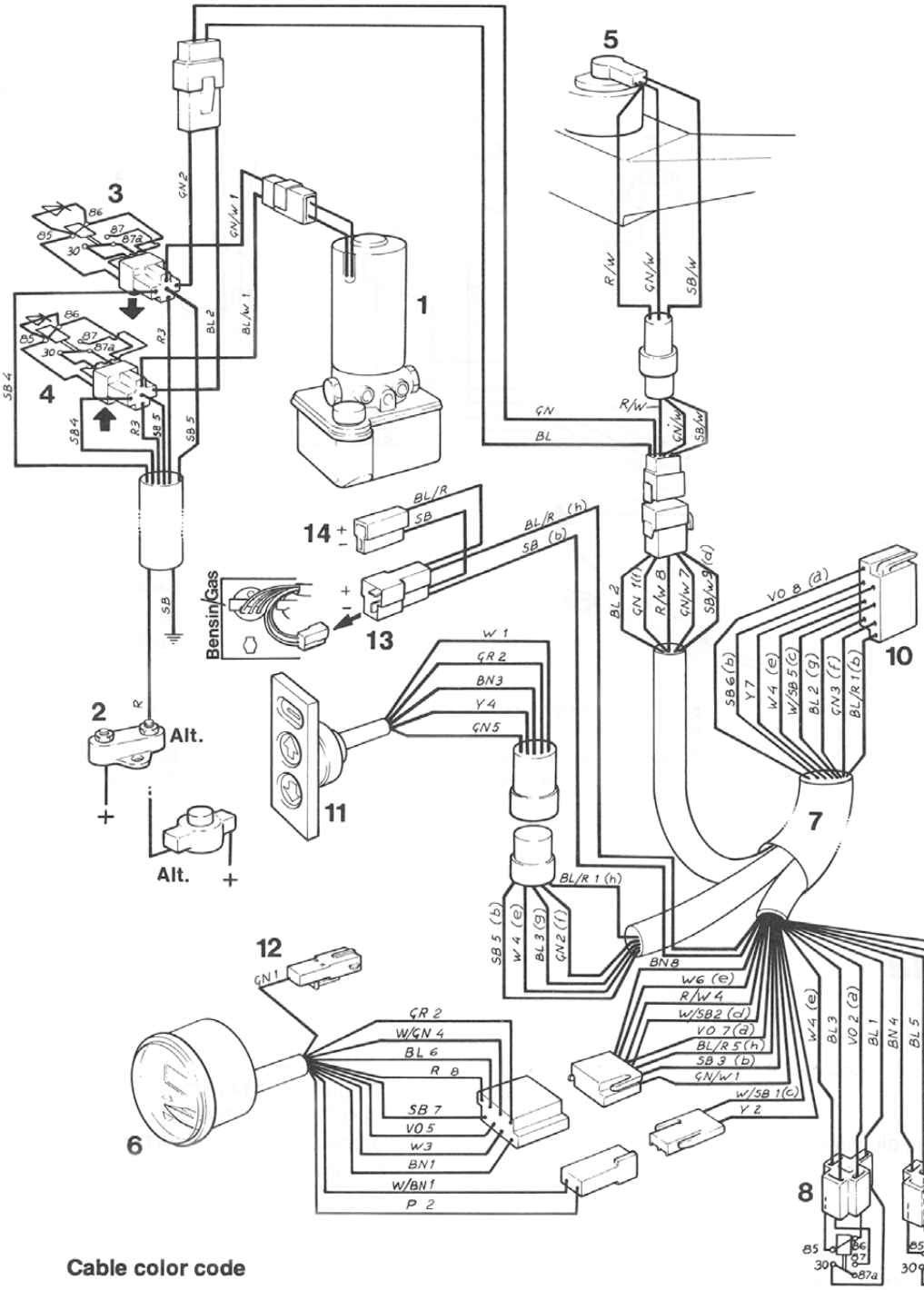
Cable color code

BL	=	Blue
BN	=	Brown
GR	=	Grey
LBL	=	Light blue
LBN	=	Light brown
PU	=	Purple
R	=	Red
SB	=	Black
R/Y	=	Red/Yellow

AWG	mm²
16	1.5
13	2.5
10	6
8	10

NOTE! The connector pins in the engine's round connector (31) and the instrument panel's rectangular connector (32) are numbered differently. The numbers in the Wiring Diagram are the pin numbers in the connectors, not the electrical connection between the connectors. Electrically the connectors are connected according to the cable colors, i.e. with the corresponding pin shown in the diagram.

Wiring Diagram, Power Trim



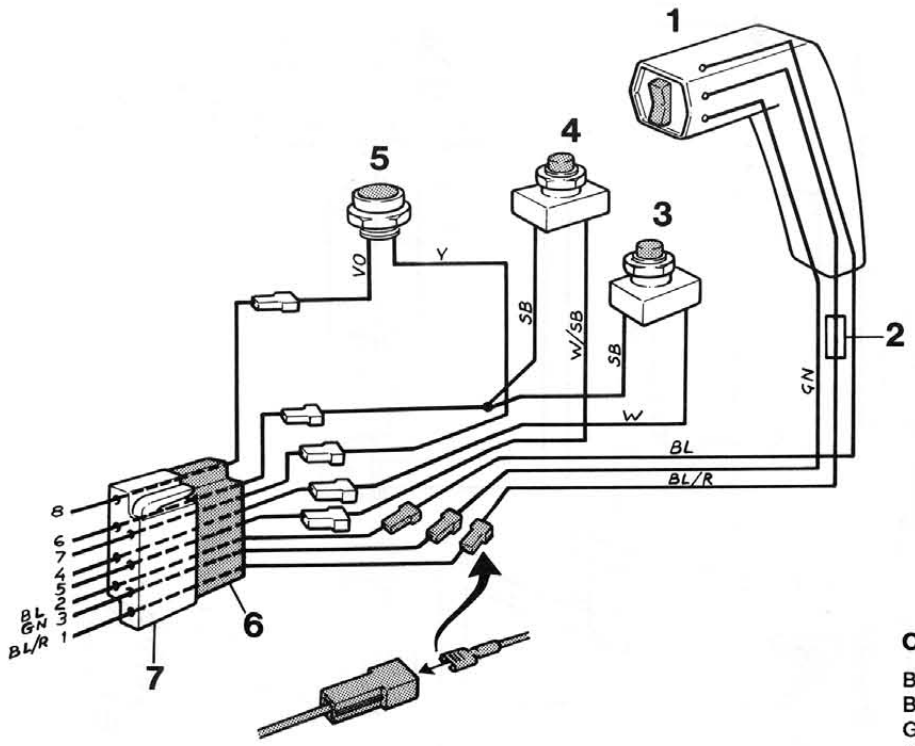
Cable color code

BL	=	Blue
GN	=	Green
PU	=	Purple
R	=	Red
SB	=	Black
W	=	White
BL/R	=	Blue/Red
BL/W	=	Blue/White
GN/W	=	Green/White
R/W	=	Red/White
SB/W	=	Black/White

1. Oil pump
2. Fuse (50 A)
3. Engine relay ("DOWN" function)
4. Engine relay ("UP" function)
5. Trim sender
6. Trim instrument
7. Wiring harness. The wires with the same color coding are electrically connected in the wiring harness
8. Relay, override for the "BEACH" lock
9. Relay, lift stop
10. Sleeve insulator. Connection to the trim control (see separate wiring diagram)
11. Trim control (accessory)
12. Sleeve insulator (for extra equipment)
13. Connector (connected to the instr. panel)
14. Connector (not used)

Note. The wires with the same letter coding are connected electrically.

Wiring Diagram, Trim Control Power Trim



1. Control with integral trim function
2. Fuse 5A
3. Push button–by-pass standard
4. Push button–by-pass (self locking) (lamp 5 is on)
5. Indicator lamp (red)
6. Adapter kit
7. Connector (connected to 10 in the wiring diagram for the Power Trim)

Cable color code

BL	=	Blue
BL/R	=	Blue/Red
GN	=	Green
SB	=	Black
VO	=	Violet
W	=	White
W/SB	=	White/Black
Y	=	Yellow

Technical Data

Lubricating System

Sterndrive, model DP:
Oil quality/viscosity ..... VP part No. 1141572-6, (API GL5 SAE75W/90)
Power Trim hydraulic system, oil quality ..... Same as in engine or ATF*
Power steering, oil quality ..... Same as in engine or ATF*
Reverse gear MS5:
Oil quality ..... VP part No. 1141572-6, (API GL5 SAE75W/90)

*For cold operating conditions or long continuous periods of running, ATF oil is recommended.

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