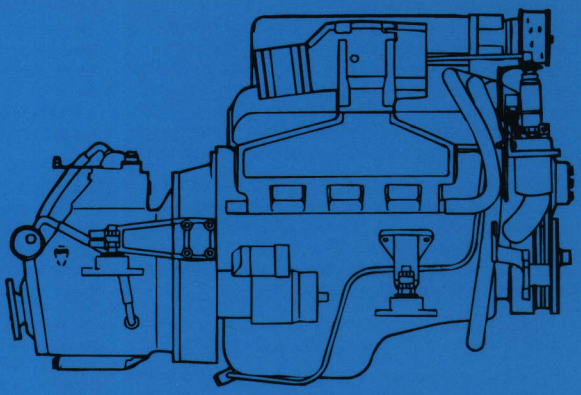
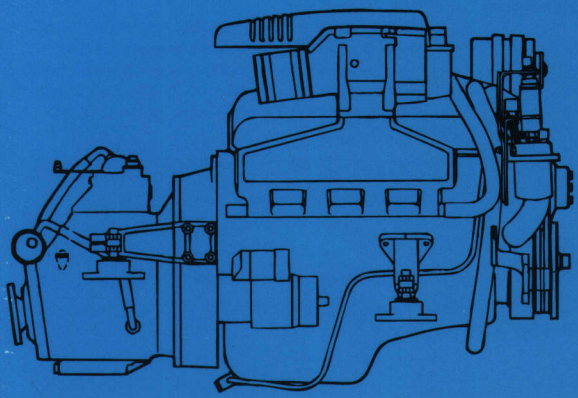
Owner's Manual





VOLVO
PENTA

WELCOME ABOARD

Please study this manual to completely understand how your Volvo Penta marine engine operates and to enable you to take full advantage of its many built-in features.

Boating Responsibilities

Most countries have regulations controlling boating. Always make sure you follow these regulations! As a boat owner, you have certain responsibilities to others. Be sure that all operators read this manual.

You are legally responsible for all occupants of your boat. Instruct at least one of your passengers in the basic fundamentals of handling your boat in case of an emergency. Show all hands the location of emergency equipment and how to use it. In the U.S. you are required by law to have one U.S. Cost Guard approved life jacket for each person aboard, plus one approved throwable device for man overboard protection. Other countries may have regulations that differ, contact Boat foundations in your country for detailed information.

Learn the waterway rules of the locality in which you are going to operate your boat. Navigable waterways are controlled by Federal (national) regulations while inland lakes are controlled by local jurisdictions. Obey these regulations to protect yourself, your passengers and fellow boating enthusiasts.

Thoroughly familiarize yourself with weather bureau warning system signals and waterway traffic signs.

In the U.S. contact your local U.S. Coast Guard station and take advantage of their seasonal boat inspections and training courses. For other countries, contact Boat foundations for information.

Our Joint Responsibility

Volvo Penta continually invests considerable development resources to minimize the effects on the environment caused by our products. Examples of this continuous work are the improvements in exhaust emissions, sound levels and fuel consumption.

Whether your Volvo Penta engine is used to power a pleasure boat or is used in a commercial application it can, if used incorrectly or maintained insufficiently, disturb or damage the environment.

This Owner's Manual covers several service checks that, if not performed correctly, can cause a deterioration of the engine affecting the environment, its service life and operating economy. Always follow the recommended service intervals and make it a habit to check for anything abnormal each time you use the engine. An example of this is excessive exhaust smoke. Contact an Authorized Volvo Penta Service Dealer if you cannot remedy the cause yourself.

Remember that most chemical products used to maintain your boat and engine are harmful to the environment, if used incorrectly. Volvo Penta recommends the use of biodegradable degreasing agents during all cleaning. Always dispose correctly of used engine and transmission oil, paint, degreasing agents and washing fluids etc., so that they cannot harm the environment.

When using your boat, always adjust the speed and distance to prevent the wake or sound level from disturbing wildlife, moored boats, pontoons, etc. Leave the waters and natural harbors in the condition you yourself would like to find them.

We thank you for your choice of Volvo Penta marine engine and we wish to continue to supply you with maintenance and advice to help you get the best possible performance from your engine. Contact your nearest Authorized Volvo Penta Service Dealer for assistance.

We wish you pleasant trips with your boat.

AB VOLVO PENTA

Identification Numbers

Record your engine and reverse gear model and serial numbers immediately after purchase. This will enable you to have them available for quick reference when ordering parts or literature.

Engine Model No. ... Serial No. ...

Reverse Gear Model ... Serial No ...

Ignition Key No. ... Recommended Propeller Size ...

Boat Model No. ... Hull Identification No. (HIN) ...

Toll Free Dealer Locator Service for U.S.A.

To locate the an authorized Volvo Penta servicing dealer, consult the Yellow Pages under "Boat Dealers" or call **1-800-522-1959**

Owner's Manual

Marine engines

7.4 GL, 7.4 Gi,
8.2 GL

ENGLISH

Contents

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⚠ Important information

Stop the engine before opening the hatch to the engine compartment There are rotating parts on an engine which are dangerous to approach when the engine is running

Bear in mind the risk of fire All engine fuel is inflammable Alcohol, either methanol or ethanol is sometimes added to fuel, especially to unleaded gasoline These additives shorten the life of rubber and plastic components in the fuel system Inspect regulary for leaks and cracks

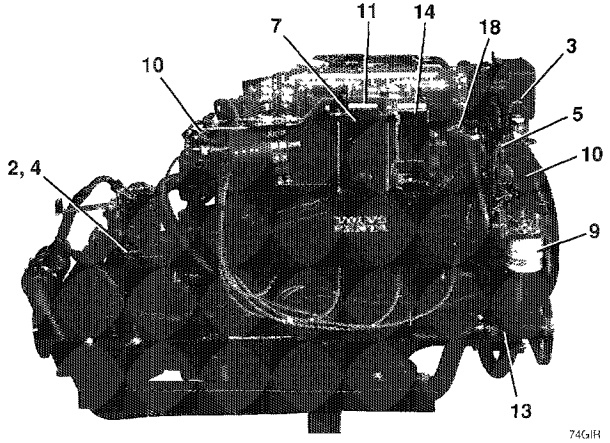
The engine is fluid-cooled Drain the cooling system when the engine has been stopped if there is a risk of freezing Note that siphoning action can occur with certain work on the cooling system Close all drainage points when the boat is not under constant supervision Incorrectly performed drainage may cause the boat to become filled with water and sink, in addition to damaged engine parts

Read this Owner's Manual carefully before putting your engine into operation The engines covered in this manual have as standard equipment the Volvo Penta HS 1 hydraulic reverse gearbox As an option the engines can be equipped with reverse gears from other manufacturers Please consult the manufacturer of the reverse gear for owner and service information

7.4 GL, Gi, 8.2 GL HS1A

Features, Model 7.4 Gi

1 Oil filler, engine
2 Oil filler, reverse gear
3 Dipstick, engine
4 Dipstick, reverse gear
5 Oil withdrawal tube
6 Oil filter, reverse gear
7 Water cooled exhaust elbow
8 Oil filter engine
9 Fuel filter
10 Fuel pumps
11 ECM
12 Backfire flame arrestor
13 Seawater pump
14 Circuit breakers
15 Alternator
16 Oil cooler, reverse gear
17 Serial number, reverse gear
18 Thermostat housing



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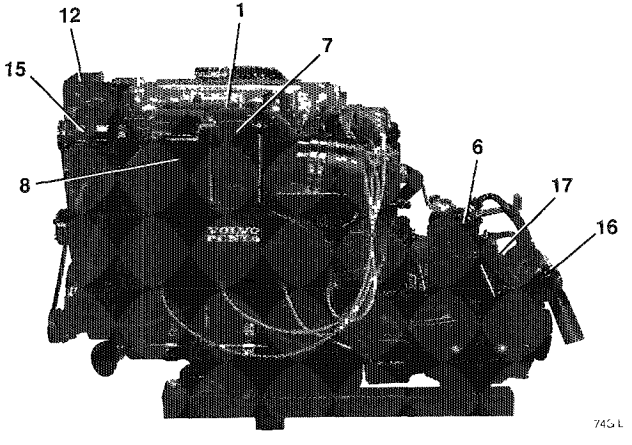

74G L

Features, Model 7.4 GL / 8.2 GL

1 Oil filler, engine
2 Oil filler, reverse gear
3 Dipstick, engine
4 Dipstick, reverse gear
5 Oil withdrawal tube
6 Oil filter, reverse gear
7 Water cooled exhaust elbow
8 Oil filter engine
9 Fuel filter
10 Fuel pump
11 Carburetor
12 Backfire flame arrestor
13 Seawater pump
14 Circuit breakers
15 Alternator
16 Oil cooler, reverse gear
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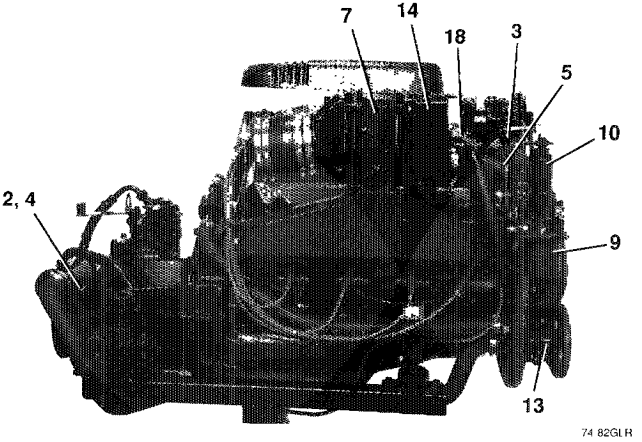
18 Thermostat housing



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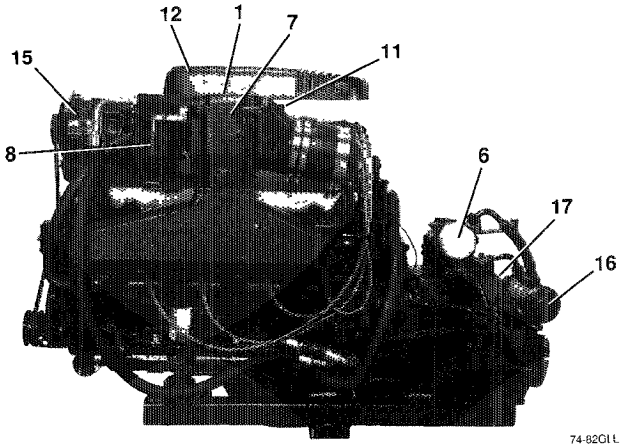

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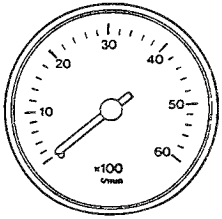
Instruments, Main panel



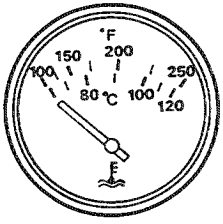
Rev counter

This shows the engine speed in revolutions per minute x 100

Speed

It is important that the engine reaches the maximum speed with a normal load The full throttle RPM range is 4000-4400 rpm for the 7 4 GL For models 7 4 Gi and 8 2 GL the full throttle range is 4200-4600 RPM A recommended maximum cruising speed is around 300-500 rpm below the maximum speed achieved

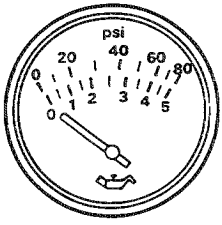
NOTE! Growth on the hull reduces the speed



Temperature gauge

During normal use, the temperature gauge should display 158-195°F (70-90°C) Your boat may be equipped with an audible alarm to alert the operator to an engine cooling overheat

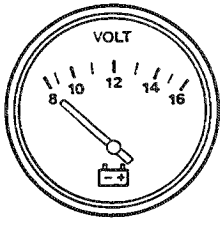
If the engine overheats, reduce the speed and shift into neutral. Find out what is blocking the water supply to the engine if the temperature does not drop. Stop the engine if necessary and rectify the fault.



Oil pressure gauge

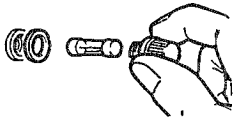
The oil pressure gauge should normally show about 40-45 psi (275-300kPa) when the engine is running It is normal for the gauge to show a lower reading at low speeds Your boat may be equipped with an audible alarm to alert the operator to low engine oil pressure

If the oil pressure is too low , stop the engine immediately and determine the cause.



Voltmeter

The voltmeter shows the system voltage When the engine is running it should be 14 0-14 4 V The voltage is 12 V when the engine is switched off



Main panel fuses

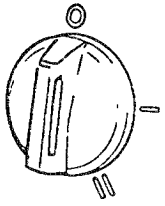
The instrument panel has two replaceable 8 Amp fuses The fuse protected circuits are System voltage and Starting circuit

WARNING! Always keep spare fuses on board

Push button, instrument lighting

Control units.

Ignition switch



The ignition switch has three positions.

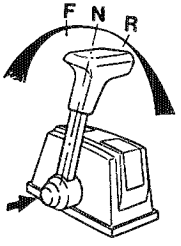
0 = **Stop position.** Everything connected across the key is switched off. The key can be withdrawn from the lock

I = **Drive position.** Sytem voltage connected

II = **Start position.** Starter motor activated

WARNING! The ignition key must only be in the drive position when the engine is to be started and when the engine is running Carry out the starting procedure in one operation

Single lever control



The Volvo Penta control is designed to operate the speed, forward and reverse gears by moving the lever in the desired direction. The engine speed can be controled without selecting forward or reverse by pressing the button in the center of the control hub and moving the lever slightly forward Release the button and only the engine speed can be controlled When the lever is returned to the neutral position, it comes out of neutral automatically and the speed, forward and reverse can now be regulated

F = **FORWARD.** Simultaneous control of speed and movement

R = **REVERSE** Simultaneous control of speed and movement

High performance boat driving

High performance is not only defined by engine size, but by a combination of the engine power, hull design, and the size and weight of the boat Your new engine(s) produce a high power output Depending on the boat type. the top speed may be much higher that what you are used to

High speed operation requires an experienced driver who has mastered handling of high performance boats It is advisable that you learn the boat's behavior before taking passengers on board Inform your passengers about the boat's characteristics and the maneuvres you intend to do Use the boat's performance with due consideration and care!

When operating at high speeds remember that other boaters may not realize the speed you are travelling at, especially when you close in on another boat from astern or from ahead. Always keep a good distance to allow for the unexpected! Always be prepared for what other boaters may do unexpectedly High speed driving requires the driver to give a high degree of attention to boat operation

A boat traveling at a speed of 70 mph (60 knots) covers 101 feet (30 meters) during 1 second The faster you go, the quicker things will happen **High speed driving requires a lot of water and good distance to possible hazards.** Always allow a 3 - 4 second reaction time

When driving, make sure that all passengers are safely seated. Emphasize this especially if you have a larger cabin cruiser where one normally moves about during operation Reduce the speed considerably, or stop completely if someone needs to move about in the boat

The driver should always use the safety kill switch! The switch, which is connected to the driver, immediately shuts off the engine(s) should the driver be thrown from the driving position Even if the risk of falling overboard is practically nonexistent in your type of boat, the risk of the driver falling and being dazed in rough seas can be even greater

Remember, **even when the engine(s) is stopped in a high performance boat that is planing, it will travel about 325 ft (100 meters) before dropping through the planing threshold and stopping.**

Safety equipment and personal gear.

Equip your boat with all safety items required by law, U S. Coast Guard regulations or other national regulations Added to this, following safety equipment is vital in a high performance boat

Life Jackets of an approved make for all those on board **Note: The life jacket should be designed for the speed the boat can reach.**

Helmet. A helmet should be worn for all advanced boat driving at high speeds. Use an approved type for use in boats

Wet Suit. When operating in cold waters

Eye Protection. If the boat is not equipped with an adequate windshield, the driver needs eye protection of approved shatterproof type

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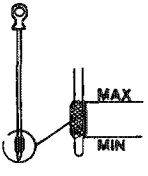
On inboard engine installations.

⚠ **WARNING!** Volvo Penta recommends use of a properly installed sea strainer or raw filter to provide engine and reverse gear with an unrestricted flow of filtered cooling water Regular inspection and cleaning of this strainer is required Operation in areas where seaweed, sea grass, sand etc or other foreign matter might block intake of filter require more frequent maintenance.

Driving

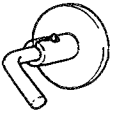
Starting

1 Check the oil level in the engine

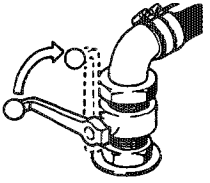


NOTE! High performance engines normally have a higher oil consumption when compared with a standard marine engine of the similar displacement Apart from lubrication the most important task of the oil is to cool lubricated engine parts High performance engines develop more heat compared with standard marine engines. Therefore, it is very important never to fall below the minimum required oil level in order to have an optimal engine life **Check the oil level daily!**

2 If equiped with an optional closed cooling system, check the fresh water level in the cooling system The level should be up to the lower edge of the filler pipe Fill with antifreeze mixture to the correct level 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 Refer to "Engine Maintence" for coolant mixture



3 Turn on the main switch



4 Start the engine room fan (blower) Let it run for four minutes Open all sea water cocks for the engine cooling water intake

5 Release the control lever. Idling position

6 Start the engine (See "Ignition switch") If the engine is cold, run at high idle (900-1200 rpm) for 1-2 minutes until engine is at operating temp

NOTE! 7 4 Gi The fuel injection system is controlling the engine speed during warm-up phase and thus the engine speed control should remain set on idle

7 Reduce the engine speed to idle and read the instruments. If the readings are abnormal, stop the engine and determine the cause

8 Check for obstructions in front of and behind the boat before selecting "Forward" or "Reverse"

The maximum cruising speed is 300-500 rpm below maximum speed Good operating economy is achieved if full throttle is avoided

7.4 Gi, 8.2 GL models

WARNING! Your engine(s) develops a considerable output even at idling Depending on the hull design your engine(s) can push your boat at idle and with the gear engaged at a speed of 6-9 mph (5-8 knots) Therefore, you might need to adjust your speed by shifting into neutral and reverse more frequently that what you are used to when operating the boat in harbors, shallow waters, and when mooring, etc If you are not operating the gear shift frequently when running the boat at engine idle speed you might exceed the maximum allowed speed in harbors and in narrow passages

Running in shallow waters

9 If you are uncertain of the water depth or when operating in shallow waters we recommend that you decrease speed to idle

WARNING! Inboard propulsion systems normally have no collision protection for the propeller(s) and propeller shaft In case of grounding or hitting an obstacle in the water, check carefully that nothing is damaged and there is no water leakage into the boat Check that the propellers are not damaged and that there are no vibrations If operation is abnormal, return to port at reduced speed and have the vessel hauled onto land for a closer inspection

After use

10 After use and when the boat is tied up, it is important for the engine to idle for at least 1 minute before shut down to avoid boiling of the coolant

11 Stop the engine using the ignition switch Switch off the main battery switch Close all sea water cocks

WARNING! Never switch off the main battery switch before stopping the engine This could damage the alternator On the 7 4 Gi model electronic components in the fuel injection system may be damaged

Before leaving the boat

12 Check for leaks around the engine and that everything else in the engine compartment appears normal If leakage occurs, find the cause and correct it immediately

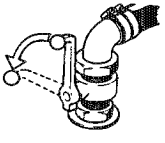
NOTE! When using the bilge pump be observant that the bilge water does not contain oil or other chemicals that can be harmful to the environment

WARNING! Be observant of the water depth Under no conditions, such as low water etc shall there be any risk that the hull hits the bottom when the boat is tied up

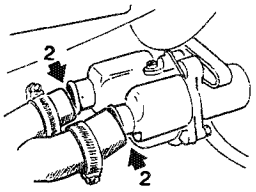
Cold weather precautions

13 Before leaving the boat, the cooling water (raw water) must be drained from the engine to prevent freeze damage

WARNING! Be observant for any water leakage into the boat Close all sea water cocks before draining the cooling system Incorrectly performed drainage may cause the boat to become filled with water and sink

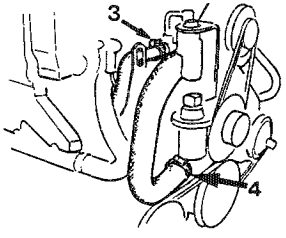


Drain the cooling system in the following sequence **Reverse gear HS 1:** Close the bottom cock and remove the hose on oil coolers port side



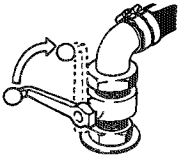
All models: Loosen and slide clamps back (2) Remove hoses from the rear of water pump and drain

Fresh water cooled models: Remove the expansion tank fill cap and check the freezing point of the coolant mixture If it is not sufficient, then drain the freshwater system and replace with 50/50 coolant mixture Close all drain points and fit the cooling water hoses **Use the bilge pump to pump out any water before leaving the boat.**

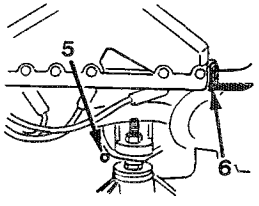


Sea water cooled models: Disconnect long hose at thermostat housing (3) Lower alongside block and drain completely Disconnect and drain large hose at water pump housing (4).

WARNING! If there is a risk of freezing while the boat is moored, it must not be left in the water without first taking some special precautions e g water circulation around the hull using air bubbles Be observant for any floating ice due to currents and winds Contact with floating ice can cause extensive damage to the hull and propellers



Do not forget to open all sea water cocks before starting the engine again Retighten all hose clamps and drain plugs



Sea water cooled models: Remove the plugs on the port and starboard sides of the cylinder block (5) and remove manifold hoses (6) **Closed cooled models:** drain manifold hoses (6) and make sure the sea water has been drained from the expansion tank

Close all drain points and fit the cooling water hoses . **Use the bilge pump to pump out any water before leaving the boat.**

Idle engine

14 In order to prevent engine corrosion damage, the engine should be run warm at least once every month as long as the boat is in the water Allow engine to reach operating temperature when running

Corrosion Protection

15 Your boat is protected against galvanic corrosion by sacrificial zinc anodes The following is general information about corrosion protection Consult your boat manual or boat dealer for detailed information concerning your boat model

The zinc anodes must be replaced when 50% eroded When replacing anodes, scrape the surface clean so that good metallic contact is made between the anode and the surface

To remove any oxide coating from the anodes surface clean with coarse emery or sandpaper; just before launching Also new anodes should be cleaned Cleaning should be done frequently on boats that are stored on land when not used **Note!** Steel brushes or other steel tools must not be used for cleaning of the zinc anodes as they can deteriorate the galvanic protection

The galvanic corrosion protection can malfunction if stray 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 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 the fuse panel 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 is no longer a need for electricity The main switch for the engine should be disconnected when the engine is not in use

The engine and drive train must not be electrically connected with other equipment such as trim tabs, ladders etc The engine and reverse gear 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 (120/220 V) and the negative (–) connection on the output side (12/24 V) 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 s equipment All work involving the boat's 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 installation

Regular maintenance

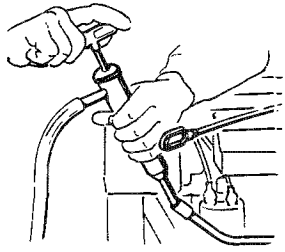
The following text is describing the regular maintenance procedures The Reference Numbers refer to the Maintenance Schedule on pages 21 & 22

WARNING! To avoid injury, always make sure that the engine is switched off before starting work on it. An engine which is running has rotating and moving parts which are dangerous to touch

Engine maintenance

1. Engine oil level check. The level should be between the "Add" and "Full" marks on the dipstick Refer to "Technical data" for the correct type of oil

CAUTION! Do not fill above the "Full" mark Never allow the level to go below the "Add" mark

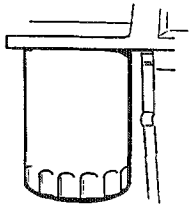


Draining and filling the Engine Crankcase. Change the oil in a new or reconditioned engine after the first 20 hours of operation and then after every 100 hours of operation Run the engine until it is hot Remove dipstick and withdraw oil from crankcase trough the dipstick tube (A)

WARNING! Hot oil can cause burns Be careful not to spill oil

Withdraw oil with a suction pump or use a special oil withdrawal pump. A special fitting is provided for the oil withdrawal pump Replenish with oil to the correct level Refer to "Technical Data" for the correct choice of oil

NOTE: The oil filter must be changed before new oil is added



2. Oil Filter. The oil filter is changed for the first time after 20 hours of operation and then after every 100 hours of operation (every oil change) Unscrew the old filter. If the old filter is difficult to remove, use an oil filter wrench

WARNING! Hot oil can cause burns Be careful not to spill oil

Coat the rubber seal 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 contact 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 severe engine damage and void Volvo Penta's Warranty

Start the engine, let it run at idling speed and check to ensure there is no oil leakage around the filter or oil hoses

Note! The old filter contains oil Dispose of used filter in accorance with any applicable environmental regulations

3. Check the belt tension. Excessive belt tension will damage the bearings in the water pump and alternator Insufficient tension will cause slipping Replace worn belts

Belt Tension is determined by belt deflection With engine stopped, the belt should be tight enough so that it will deflect 1/4 to 1/2 in (6-13 mm) when pressed with the finger at the points G and I shown If the belt is too tight, excessive belt and bearing wear can occur. If the belt is too loose, slippage can occur, resulting in belt wear and poor operation of the water circulating pump and alternator

Alternator Belt. With engine off, check alternator belt deflection midway **G** between the circulating pump pulley and the alternator pulley

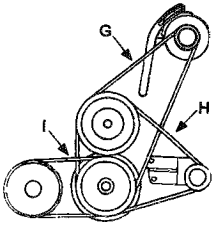
Loosen alternator mounting screws and nuts, and pivot alternator away from engine to increase belt tension While maintaining pressure on alternator, retighten top screw and bottom screw and nut Recheck belt tension

Water Pump Belt. With engine off, check water pump belt deflection midway I between the water pump pulley and the circulating pump pulley

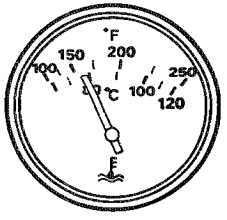
Loosen mounting bracket to water pump screws, and pry water pump away from engine to increase belt tension While maintaining pressure on water pump, retighten top and bottom screws. Recheck belt tension.

Drive Belt. With the engine off, check the drive belt deflection midway **H** between the water pump pulley and the tensioner pulley.

Loosen the tensioner bracket screws and pry tensioner away from the engine to increase belt tension While maintaining pressure on the tensioner, retighten the bracket screws. Recheck belt tension



Checking the cooling system. The temperature gauge for the coolant should show between 148—160°F / 64—71°C (sea water cooled), 160—185°F / 71—85°C (closed cooled) This is the normal coolant temperature when the engine is warm If the cooling water temperature is abnormal, the cooling system must be examined immediately



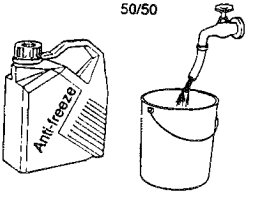
Excessive temperature may be due to a clogged water intake, defective impeller in the sea water pump, blockage in the engine's cooling water channels, clogged reverse gear oil cooler, engine oil cooler on 7 4/8 2 models, faulty thermostat or inaccurate gauge. Low water temperature is usually caused by a faulty thermostat or the gauge reading is incorrect Operation in areas where seaweed, sea grass, sand etc or other foreign matter might cause restricted cooling water flow or damage to the water pump impeller requires the use of properly installed sea water filter or strainer In these areas a frequent maintenance of the filter is needed

4. Check the coolant level (closed cooled models)

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

Remove pressure cap and fill the engine coolant system until the coolant level reaches the lower edge of the filler pipe Fill with anti-freeze mixture to the correct level Top up using only 50/50 mix of water and anti-freeze. Do not exceed this mixture ratio

NOTE! Always use anti-freeze even if there is no risk of low temperatures. The anti-freeze 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 Drain, flush and replace the coolant every other season



Draining and Filling Engine Coolant (closed cooled models).

Remove the bottom cover plate of the heat exchanger to drain sea water from heat exchanger core. Loosen hose clamps and remove hoses from rear of sea water pump. Be sure to allow hoses to drain completely Drain exhaust manifolds by removing the cooling hose on the forward end of the manifold or by removing the hose clamp and cap on the rear of manifold

NOTE! Marine inboard engines can be installed at various installation angles Be sure to drain exhaust manifolds from the lowest point (front or rear)

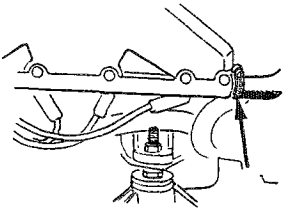
Remove the hose from the heat exchanger to the expansion tank This will drain the coolant mixture from the expansion tank and heat exchanger Disconnect and drain the large hose from the circulation pump The engine block is drained by opening the petcocks on both sides of the engine block

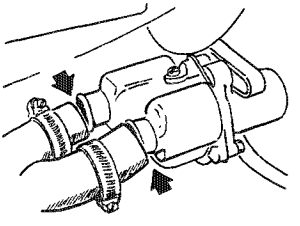
Note! If engine block does not drain, probe petcock with a piece of wire to remove any sediment.

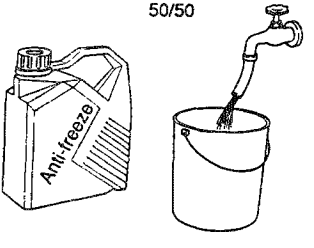
Before filling the system, close all petcocks and check the tightness of all hose clamps. Prepare a 50/50 mixture of fresh water and anti-freeze Refer to "Technical Data" for cooling water capacity Fill the cooling system until the coolant level is equal to the "Minimum" mark on the expansion tank Start the engine to pure the cooling system of trapped air

Note! Do not run engine without water supply to sea water pump!

Check cooling system for leaks. When engine reaches operating temperature shut off the engine and check the coolant level Coolant level should be between the "Maximum" and "Minimum" marks. Add coolant as required



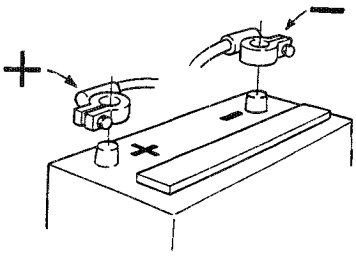


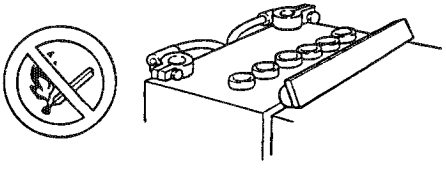


WARNING! Closed fresh water system is under pressure Turn fill cap to first stop to relieve pressure Then fully remove cap for servicing

6. Electrical System. The engine's electrical system is equipped with an alternator with an integrated transistorized voltage regulator The alternator output at idle speed is approximately 20 amperes and rapidly increases to the maximum output at 2000 RPM (alternator speed)

Never disconnect the battery cables or other cables in the charging circuit when the engine is running since this can destroy the alternator or sensitive electronic components in the fuel injection system of the 7 4 GI model **The battery terminals' polarities must never be reversed since this can immediately damage sensitive electronic components.** The negative battery cable must be attached to the negative terminal (-) on the battery and the positve cable must be attached to the positve terminal (+) on the battery
The cable terminals must be properly tightened and greased





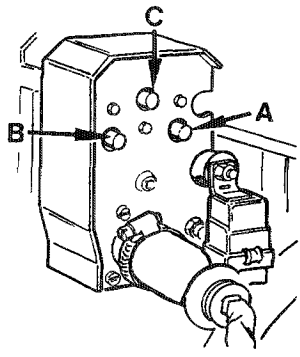
7. Battery. Use a 12 volt battery with a minimum 650 amperes cold cranking rating at 0° F (- 18° C) and 115 minutes reserve capacity rating at 80° F (27° C)(70 ampere - hour reference)

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 Do not use jumper cables and a booster battery to start engine. Remove battery from boat and recharge

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, wash the area affected with water immediately Obtain medical aid as soon as possible

Checking the battery. Check the charge state of the battery and the electrolyte regularly The correct level is 1/4"—1/2" (6-13 mm) above the cell plates The battery connections shall be clean, greased and tight

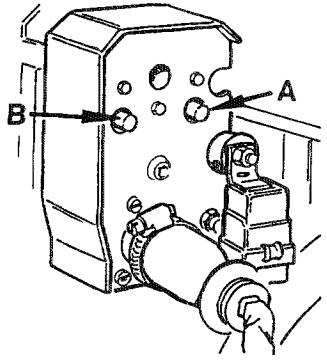
Circuit Breakers and Fuses 7.4 GI. The engine is protected from overload by circuit breakers. If a circuit breaker is tripped, it may be reset If it continues to trip, see your Volvo Penta dealer The main wiring harness is protected by a 60 amp circuit breaker **B** A second 50 amp circuit breaker **A** is installed but is not used on the models covered in this manual The fuel injection system has a 12 5 amp circuit breaker **C** to protect the ECM unit from overload These circuit breakers are located on the starboard side of the engine The fuel pumps are protected by 20 amp circuit breaker (see page 17) The instruments are protected by two replaceable 8 amp fuses (see page 4)



NOTE! The installation of any additional electrical accessories requires the use of individual protected circuits Power take off should be made at the battery. Boats with Volvo Penta instrument panels have two splices for power take off One allowing maximum 5 amp (fuse protected) take off, one allowing maximum 20 amp (not fuse protected) See your Volvo Penta dealer for assistence

Circuit Breakers and Fuses 7.4 GL / 8.2 GL

The engine is protected from overload by circuit breakers If a circuit breaker is tripped, it may be reset. If it continues to trip, see your Volvo Penta dealer The main wiring harness is protected by a 50 amp circuit breaker **B** A second 50 amp circuit breaker **A** is installed but is not used on the models covered in this manual The fuel pump is protected by a 12 5 amp circuit breaker (see page 17) These circuit breakers are located on the starboard side of the engine



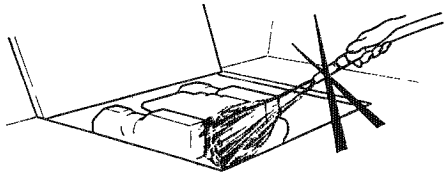
The instruments are protected by two replaceable 8 amp fuses (see page 4)

NOTE! The installation of any additional electrical accessories requires the use of individual protected circuts Power take off should be made at the battery Boats with Volvo Penta instrument panels have two splices for power take off One allowing maximum 5 amp (fuse protected) take off. one allowing maximum 20 amp (not fuse protected) See your Volvo Penta dealer for assistence

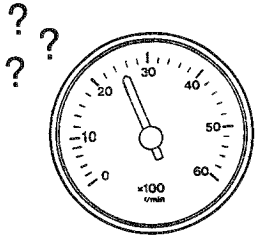
Fuel Injection System (7.4 Gi)

The fuel injection system itself does not have any serviceable points Therefore, any repairs, should be performed by an authorized Volvo Penta Service Workshop, which has at its disposal the necessary testing equipment and trained service personnel

Check once a year that the system wiring harness is clean and without damage. Use a piece of cloth and a mild solvent to clean **Never flush with water or with any kind of degreasing agent.** The contact terminals of the system are moisture-proof and filled with a special type of grease to prevent corrosion The contact terminals and the system as a whole should be checked every second year by an authorized Volvo Penta Service Workshop



WARNING! Never remove the contact terminals of the wire harness from the sensors or from the Engine Control Module (ECM unit). Part of the electronic system is operating on very low voltage of 4-5 volts The electric components can be destroyed by a static discharge as low as 100 volts! As a comparison, the human body can only feel static discharges above 4000 volts



Emergency program / RPM reduction (7.4 Gi)

This engine's electronic fuel injection system is developed specifically for marine use The ECM module of the system is controlling the ignition, idling speed and fuel consumption The operator should be aware of the following: The system is designed with a built-in "emergency program" This program is automatically engaged when the ECM module recognizes wrong or abnormal values from any of the sensors or in case of a fault in the ECM unit itself In order to avoid engine damages, the engine speed is limited to 2500 rpm

IMPORTANT! Should the engine speed only reach 2500 rpm as a maximum, you must contact the nearest Volvo Penta Service Workshop in order to check the fuel injection system.

General Information about the ECM 7.4 Gi models

The function of the fuel metering system is to deliver the correct amount of fuel to the engine under all operating conditions Fuel is delivered by eight fuel injectors controlled by the Engine Control Module (ECM)

The ECM looks at voltage from several sensors to determine how much fuel to give the engine.

One of the sensors is the Manifold Absolute Pressure Sensor (MAP) that measures the pressure in the intake manifold. The MAP sensor allows the ECM to **automatically adjust for different altitudes**. No high altitude adjustment is necessary.

The Knock Sensor detects abnormal engine vibrations (spark knock) The ECM uses the knock sensor voltage to calculate the ignition timing

WARNING! It is extremely important that the correct Knock Sensor is used The Knock sensor is unique for this marine engine Never substitute with automotive or other sensors as this can result in engine damage If the Knock Sensor has been removed it must be installed correctly. Be sure the threads are clean and tighten to 11-16 lb ft. (15-22 Nm) If the Knock Sensor is over or under torqued it will give false signals Consult your Volvo Penta dealer for assistence.

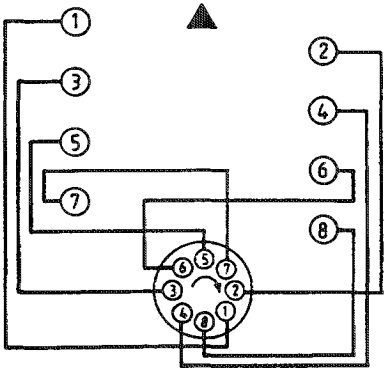
The electronics in the ECM are protected in several ways for false signals and interference The following should be observed; Never mount radiotransmitter antennas near the ECM unit, or ground any wiring to the engine Do not wire sender antenna cables near the ECM as electromagnetic fields can disturb the ECM electronics

If the engine floods it can be cleared by opening the throttle to 75% of its travel The ECM then shuts down the fuel injectors so no fuel is delivered as long the throttle stays at 75% and the engine speed speed is below 400 rpm (cranking speed) If throttle position becomes greater or less than 75% the ECM returns to the starting mode

8. High Tension Lead Routing.

WARNING! Damaged high tension leads or spark plug boots can emit external sparks, witch could ignite any fuel vapors in the engine compartment. Do not operate engine with damaged leads

When spark plug leads are removed, be sure they are replaced in correct order



Firing order 1-8-4-3-6-5-7-2

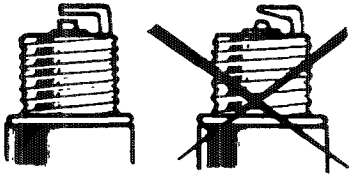
Distributor Cap and Rotor. Remove and inspect distributor cap and rotor Check that cap is clean and that it has no cracks Replace the components if worn or damaged with genuine Volvo Penta Parts No other distributor parts require service or replacement

WARNING! To prevent fire and explosion, Volvo Penta ignition components meet U.S C.G and other national safety requirements for external ignition proof parts. Do not substitute with automotive or other non-approved parts

9. Spark Plugs Always clean area around spark plug before removing spark plug Remove spark plug for inspection Clean and check gap with feeler gauge; replace if electrodes are rounded or the spark plug has cracked ceramic body

WARNING! Incorrect type of spark plugs can cause operational difficulties and damage to the engine. Do not operate engine if spark plug has a cracked ceramic body Damaged spark plugs can emit external sparks which could ignite any fuel vapors in engine compartment.

For recommended spark plugs, plug gap and installation torque, refer to Technical Data



10. Exhaust System. Periodically inspect engine exhaust system Check for deteriorated or burned hoses, loose clamps, and evidence of water leaks

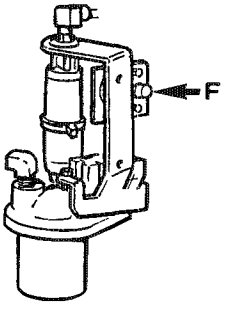
WARNING! Replace damaged /defective components, and securely tighten all clamps Exhaust leaks release fumes that can create hazardous conditions for operator and passengers

11. Fuel system.

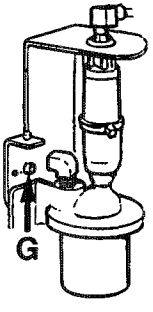
WARNING! To prevent fire and explosion, service procedures are always performed with the engine stopped After completing service procedures, check entire fuel system for possible leaks both before and after starting engine Failure to inspect your work could allow fuel leakage to go undetected This could become a fire or explosion hazard

To prevent fire and explosion, Volvo Penta fuel system components meet U S C G and other national safety requirements Do not substitute with automotive or other non-approved parts

Fuel Pumps 7.4 Gi. The engine is equipped with two electric fuel pumps, one low pressure pump to bring fuel from the boat tank to the engine and a high pressure pump to supply the fuel injectors Both pumps are protected by a single 20 amp circuit breaker **F.** The electrical fuel pumps are activated only when engine is running



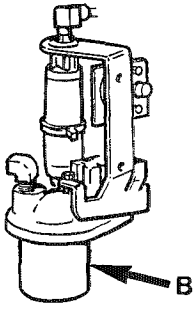
Fuel Pumps 7.4/8.2 GL. The engines are equipped with a electric fuel pump protected by a single 20 amp circuit breaker **G.** The electrical fuel pump is activated only when engine is running



NOTE! A loud whining noise at idle may be due to a restricted fuel filter causing a noisy fuel pump Operating engine with a restricted filter may damage pressure regulator or fuel pumps See your Volvo Penta dealer if pumps make abnormal noise
Do not run engine out of fuel. The electric fuel pumps will be damaged

NOTE! Do not run fuel pumps out of fuel The electric fuel pumps will be damaged

If the engine has stopped, or will not start and you suspect that the fuel pumps are not activated, check the circuit breaker Refer to Circuit Breakers and Fuses See your Volvo Penta dealer if further service is required



12. Engine Fuel Filter. The fuel filter **B** is located in the fuel line before the fuel pump

NOTE! The fuel injected engine requires a special marine filter with a 5-10 micron filtering capability. Do not substitute any other type of filter

WARNING! Accumulation of water and other fuel contaminants may form corrosive compounds which can damage the fuel filter and other fuel system components, resulting in fuel leakage. For this reason, annual replacement of the fuel filter is required to avoid risk of explosion or fire

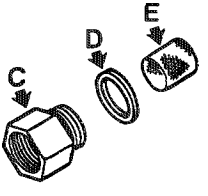
Unscrew fuel filter by turning counterclockwise, remove and discard Note! The old filter contains flammable fuel Please dispose of old filter properly Lightly lubricate the gasket on new fuel filter Screw on fuel filter by turning clockwise and hand tighten, following instructions on filter Clean up any spilled fuel

Run the engine compartment fan (blower) for 4 min, start the engine and check for leakage

Carburetor Fuel Filter (7.4GL, 8.2GL).
The carburetor is equipped with a fuel filter in the fuel line connection next to the carburetor.

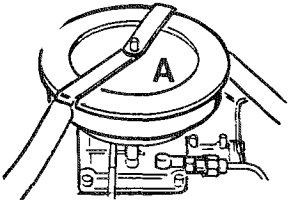
WARNING! Exercise extreme care when replacing the fuel filter or cleaning the carburetor's filter Gasoline is highly flammable and can be extremely explosive under certain conditions

To clean or replace carburetor fuel filter Disconnect fuel line at carburetor Remove fuel inlet nut **C**, gaskets **D**, filter **E** Remove also the spring on models 7 4GL, 8 2GL Replace filter, or clean with solvent and blow dry Install filter, gaskets and fuel inlet nut Tighten nut securely Connect fuel line and tighten securely Clean up any spilled fuel Run the engine compartment fan (blower) for 4 min, start the engine and inspect thoroughly for any leakage.



13. Backfire Flame Arrestor. Remove the backfire arrrestor **A** each year for cleaning. Clean in solvent, air dry, and inspect for damage Replace if damaged Reinstall flame arrestor making sure unit is securely fastened.

WARNING! To prevent fire or explosion in the engine compartment, the backfire flame arrestor must always be in place, properly secured, and undamaged



Carburetor Adjustment

WARNING! Adjustments are carried out with the engine running and engine cover removed Keep hands, hair, clothing away from belts, pulleys and moving parts Never lean over an engine while it is running if you are wearing a neck chain or necklace, scarf, tie or other loose clothing

Changes in fuel, altitude and climate may make it necessary to adjust the idle speed and idle mixture to obtain smooth engine operation. Before attempting to adjust carburetor, ensure that the backfire flame arrestor is free of debris, dirt and grease See **Backfire Flame Arrestor** in this section

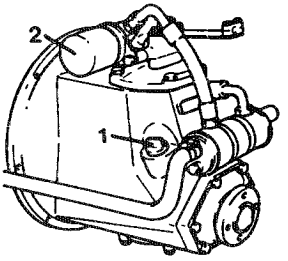
NOTE! Carburetor idle speed and mixture adjustment should not be attempted until engine is warm and it is known that ignition system components (including spark plugs) are to specifications Any attempt to alter the carburetor to compensate for faulty conditions elsewhere will result in reduced fuel economy and overall performance See your Volvo Penta authorized dealer for adjustment

Reverse Gear Maintenance

14. Oil Change in Reverse Gear HS 1

Use a scavenging pump and remove oil through the oil dipstick hole (1) Replace the oil filter (2)

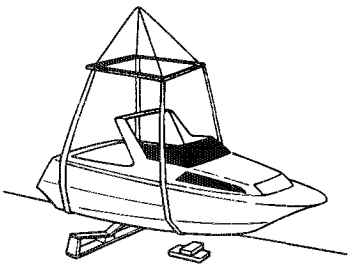
Fill up with oil to the upper mark on the oil dipstick Then start the engine and run it for a few minutes at a speed of minimum 1500 rpm to fill the reverse gear oil cooler with oil Stop the engine and check the oil level. Top up when necessary



Boat Maintenance

17. Anti-Fouling Painting. Check the painting of the hull carefully when launching.

Paint the bottom of the boat with a suitable anti-fouling paint or with a pure Teflon® agent All anti-fouling paints are poisonous and by definition more or less a danger to our marine environment Therefore, avoid these agents Most countries have a legislation detailing the use of anti-fouling boat bottom paints. **Always make sure you follow these regulations!** In some countries it is forbidden to use anti-fouling paints on leisure boats for instance in fresh waters Particularly on small boats, being easy to haul on land, we recommend Teflon® treatment only, combined with some sort of mechanical cleaning a few times during the season If you are the owner of a somewhat larger boat this can be less practical If the boat is operating in waters favoring marine growth, anti-fouling paints, preventing marine growth, must be used. We then suggest you use a pure copper-based anti-fouling paint, containing copper thiocyanate **not copper oxide.** Tin based (TBT paints) must not be used! **Make sure that you are familiar with the legislation in the region where you are using your boat.** Launch the boat when the paint is dry



The zinc anodes are to be cleaned with emery cloth to remove the oxide surface deposits; this shall be done just before launching **NOTE!** Steel brushes or other steel tools may not be used for cleaning of the zinc anodes as they can deteriorate the galvanic protection

WARNING! The zinc anodes **must not** be coated with either paint nor Teflon®-treated Make sure there is a good metallic contact between the zinc anodes and the components where the anodes are fitted

Teflon is a Du Pont registered trade mark

Troubleshooting Chart

The troubleshooting chart given below lists only the more common types of faults which could occur

With the help of the instructions given in the Owner's Manual, 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

The engine variants and boats differ in their equipment and therefore the components named under Cause may not necessarily apply to your engine or boat.

NOTE! Always read the Owner's Manual instructions before commencing work Failure to do so could result in safety hazards.

Engine will not start	Engine stops	Engine does not attain top speed at full throttle	Engine runs unevenly or vibrates abnormally	Engine overheats	CAUSE
●					Main switch not switched on, dead battery, break in electric circuit or main fuse. Lanyard stop switch
●	●				Empty fuel tank, fuel cock closed, blocked fuel filter.
●	●		●		Water or contamination in the fuel
●	●	●	●		Worn or fouled spark-plug
●					Moisture in the distributor and ignition cables
●	●				Idling speed not properly adjusted
	●				Fuel pumps not working, caused by tripped circuit breaker
		●			Incorrect tachometer setting.
		●			Boat abnormally loaded
		●			Growth on the bottom of the boat and on the propeller(-s)
		●	●		Damaged or incorrect propeller.
				●	Blocked coolant inlet, cooling galleries, heat exchanger, damaged impeller or thermostat
●		●	●	●	Ignition timing incorrect (7 4/8.2 GL)
		●			7 4 GI The engine speed is reaching maximum 2500 rpm The electronic unit has engaged an emergency program Contact your authorized Volvo Penta Service Workshop immediately to remedy the fault

Maintenance Schedule

Items marked ⚠ **Warning**, are safety related service points to prevent mechanical failfures, that could lead to an injury Make sure the safety related service is performed at these points and at the intervals specified.

	Service points (No's refer to descriptions in Regular Maintenance)	20-Hour Check	Weekly By Operator	Monthly	Every 50 Operating Hours	Annually
17	Anti-Corrosion Anodes **	C				R
	Audible Horn			C		C
6, 7	Battery and Connections – Water Level			C	C, T	C, T
3	Belts – Alternator, Water Pump	C, T			C. T	C, T
	Bilge Area – Clean			P		
	⚠ **Boat Safety Equipment**	C		C		C
	⚠ **Emergency Stop Switch, Clip, and Lanyard**	C		C		C
	Engine Alignment and Mounting Screws	C *				C *
1	Engine Crankcase Oil	R	C, F			R***
2	Engine Oil Filter	R				R***
10	⚠ **Exhaust System Hoses/ Clamps – Leakage**	C, T		C, T		C, T
	Fasteners – Screws, Nuts, Etc.				C. T	C, T
13	⚠ **Flame Arrestor – Mounting**	C, T			C T	
12	Fuel Filter					R
11	⚠ **Fuel System – Leakage**	C, T	C, T		C, T	C, T

A = Adjust **C** = Check **L** = Lubricate **F** = Fill

P = Perform **R** = Replace **T** = Tighten or Torque

* By Dealer ** Refer to Owner's manual for the boat *** Once a season or every 100 operating hours

Continued

⚠ **Warning: When replacement parts are required, use only genuine VOLVO PENTA service parts. Use of substandard parts could result in product failure and personal injury.**

Maintenance Schedule – (continued)

Items marked ⚠ **Warning**, are safety related service points to prevent mechanical failfures, that could lead to an injury Make sure the safety related service is performed at these points and at the intervals specified

	Service points (No's refer to descriptions in Regular Maintance)	20-Hour Check	Weekly By Operator	Monthly	Every 50 Operating Hours	Annually
	Rutter shaft Journals **					C, L
17	Hull – Clean-anti fouling painting					C, P
16	Propellers and Shaft					C, L
	⚠ **Remote Control Shift Cable – Damage**				C	C
	⚠ **Shift System – Operation**	C, A *	C			C, A *
9	Spark Plugs				C	R
8	⚠ **Spark Plug Wires/Boots – Deterioration**					C
	⚠ **Steering System/Cable – Operation**	L	C		L	L
15	Hydraulic steering	C				C
14	Reverse gear oil and oil filter	C	C (2 weeks)			R***
4	Coolant level	C	C			R (2 yrs)
	Water Pump Impeller				C	R (2 yrs)

A = Adjust **C** = Check **L** = Lubricate **F** = Fill

P = Perform **R** = Replace **T** = Tighten or Torque

* By Dealer ** Refer to Owner's Manual for the boat

*** Once a season or every 200 hours of operation

⚠ **Warning: When replacement parts are required, use only genuine VOLVO PENTA service parts. Use of substandard parts could result in product failure and personal injury.**

Laying - up

If the boat is stored in water, the engine should be run until it is warm at least once every month If the boat is unlikely to be used for more than 90 days it must be put into Lay up storage

Lay up Storage

Let an authorized workshop test the engine and equipment before the boat is taken out of the water

WARNING! The procedures for Lay up storage **do not** prevent freeze damage They are intended only to reduce the possiblity of corrosion damage to the internal engine parts during prelonged periods of non-use

Off Season Storage (Winterization)

1 Add fuel conditioner to the fuel tanks This will stabilize the fuel and prevent the formation of varnish and gum in the tanks

2 Change engine oil and filter Run engine to warm up the oil Shut off engine and siphon oil out from withdrawl tube (dip stick tube) Install new oil filter and fill crankcase with recommended oil. See Technical Data

Important! Do not run engine without a supply of cooling water. Do not run sea water pump impeller dry

3 Change oil in HS-1 transmission gear box Siphon oil out of oil withdrawl tube (dip stick tube). Install new oil filter and fill HS-1 transmission with recommended oil See Technical Data

4 **GI Models:** Prepare an engine storage mixture in a six gallon fuel tank It should consist of five gallons fuel, 64oz fogging oil, and 2 5 oz fuel conditioner Mix thouroughly Disconnect the boats fuel tank supply line at the fuel filter intake nipple Connect the six gallon fuel tank to the fuel intake nipple Run engine on the storage mixture for approximately five minutes at 1500 RPM Shut off engine before storage mixture is used up **Note!** Do not run engine out of fuel, the fuel pumps will be damaged

GL Models: Remove the flame arrestor from the carburetor Start engine and bring it up to a fast idle Follow the instructions on the fogging oil container Pour or spray 2/3 of the fogging oil into the carburetor throat Keep engine running while pouring fogging oil into the carburetor.

Rapidly add the remaining 1/3 of the fogging oil to the carburetor and reduce throttle to idle; the engine will die Turn off ignition and replace flame arrestor

Do the following while the boat is in the water:

- ❑ Drain the engine oil once the engine is hot
- ❑ Change the oil filter
- ❑ Fill with new engine oil to the correct level See Technical Data

Do the following with the boat laid up

- ❑ Change the fuel filter.
- ❑ Clean the backfire flame arrestor.
- ❑ Clean the exterior of the engine and the hull
- ❑ Change the reverse gear oil filter
- ❑ Change the oil in the reverse gear

WARNING! Exercise extreme care when changing fuel lines. Make sure all lines are secure and no fuel leaks are possible Gasoline is extremely flamable and can be highly explosive if ignited

Important! Do not run engine without a supply of cooling water Do not run sea water pump impeller dry

5 Drain the cooling system See section titled "Cold weather precautions" Follow the necessary steps for Sea water cooled models **Note!** For Closed cooled models (Fresh water cooled) , it may only be necessary to check the freezing point of the coolant mixture See section titled "Cold weather precautions" and follow the steps for Fresh water cooled models

6. Fill sea water passages with a 50/50 mixture of anti-freeze and fresh water. This will help avoid corrosion in the cooling system of sea water cooled models and the sea water portion of the cooling system in Closed cooled models It is very important that the engine block exhaust manifolds, oil coolers and HS1 transmission be drained completely of sea water and filled with 50/50 mixture of anti-freeze and fresh water. Freeze damage is not covered under the Volvo Penta Warranty

7 Disconnect the Battery and place in storage Periodically recharge battery following the manufacturers recommendations All batteries discharge when they are not in use This self-discharge increases with storage temp Charge the battery every month or two, depending on the storage 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

8 Spray the entire engine and HS1 transmission with an anti-corrosion spray such as Dura Plus™ Corrosion Shield

Pre-launch

Check the oil levels in the engine and reverse gear

Check that all water drainage plugs and all hoses have been reinstalled Drain anti-freeze from sea water system DO NOT DRAIN ANTI - FREEZE INTO THE ENVIRONMENT Dispose of anti-freeze properly

Check the tightness of the hose clamps at the same time as the condition of the rubber hoses and bellows is checked

Clean the backfire - flame arrestor.

Paint the bottom of the hull (see page 19)

Check that the batteries are fully charged Install batteries with the ignition in the "OFF" position Make sure terminals are secure and spray with Dura Plus™ Corrosion Shield

Fill up the fuel tanks. Open fuel valves if they have been closed

Fit the propeller (-s) if it has been removed

Launch the boat. Run engine room blower for four minutes Start engine and check all functions and all fluids for leaks

VOLVO PENTA Dura Plus™ Brand Products

	12 Quarts	4 Gallons
Synthetic Motor Oil, SAE 30 Heavy Duty CE / SG	3851230-7	3851232-3

Corrosion Shield	362002-8
Extended Life Coolant	381081-9
Spray Paint	
Dark Charcoal, Engine	3851221-6

Genuine ***Volvo Penta*** Parts are the result of many hours of strenuous testing and fulfill ***Volvo*** Penta's strict quality and safety requirments Your ***Volvo Penta*** dealer has a complete line of Genuine ***Volvo Penta*** parts, coolants and lubricants When replacement parts are required, use only Genuine ***Volvo Penta*** parts

Technical Data 7.4 Gi

General

Engine designation	**7.4 Gi**
Type	4-stroke
Number of cylinders (90°V)	8
Bore inches (mm)	4 25 (108)
Stroke inches (mm)	3 48 (102)
Swept volume cu. inches (dm^3)	454 (7.4)
Compression ratio	8 4·1
Compression pressure (starter motor) psi	142-156
kp/cm^2	10 0-11 0
Full throttle speed range	4200-4600 rpm
Recommended "cruising speed"	300–500 below obtained max. rpm
Idling speed	600 rpm
Direction of rotation (front of engine)	Clockwise
Gross weight (engine and reverse gear) lbs (kg)	1094 (497)
Ratio reverse gear model HS 1	1 96 1 or 2 63 1

Valves

Valve system	Overhead valves, Hydraulic lifters (non-adjustable)

Cooling system

Thermostat	
Sea water cooled limit values °F (°C)	148–160 (64-72)
Closed cooled system, limit values °F (°C)	160-185 (72-87)

Fuel pump	(2) High & Low pressure electronic
Fuel delivery system	Marine Multiport EFI
Fuel Quality	Gasoline, min octane value 87 (R+M)/2 U S market 91 (RON) other markets **Unleaded fuel should be used.**

Lubricating System

Engine	
Oil Quality	Service SG
Viscosity, 32°F/0°C and above	SAE 30 Volvo Penta Dura Plus™ P/N 3851230-7 (U S and CANADA only)
	SAE 20W/50 SAE 15W/50
0°F/-18°C to 32°F/0°C	SAE 20W-20
Below 0°F/-18°C	SAE 10W
Capacity, excl oil filter US qts /liters.	6.0/5 7
Capacity incl oil filter, US qts /liters	7 0/6 6
Capacity between min and max marks on the dipstick, US qts /liters	1 0/1 0

Reverse Gear model HS 1

Oil quality/viscosity	Synthetic motor oil, SAE 30 SG/CF Volvo Penta DuraPlus™ P/N 3851230-7 (U S and CANADA only)
Capacity U S qts./liters	3.17/3 0

Ignition System

Firing order	1-8-4-3-6-5-7-2
Basic setting (min 87 (R+M)/2 or 91 RON octane	
7 4Gi	10° BTDC (not adjustable)

Spark plug gap, inches (mm)	
7 4Gi	.045" (1 14)
Spark plugs – Volvo Penta p/n	
7 4Gi	3851862-7 (Qty 2)

Electrical system

Voltage	12 V (negative earth)
Battery capacity (min)	650 cold cranking Amps (70 Amp hour)
Battery electrolyte spec gravity	1 275–1 285
Battery to be recharged at	1 230
Alternator, max output A (W)	
7 4Gi	65 A (900 W)

Tightening torques

Cylinder head bolts	80 ft lbs / 108 Nm
Spark plugs	22 ft lbs / 30 Nm

Technical Data 7.4 GL, 8.2 GL

General

Engine designation	7.4 GL	8.2 GL
Type	4-stroke	
Number of cylinders (90°V)	8	
Bore inches (mm)	4 25 (107 95)	4 468 (113 49)
Stroke inches (mm)	4 00 (101 60)	4 00 (101,60)
Swept volume cu inches (dm^3)	454 (7.4)	502 (8.2)
Compression ratio	8 4 1	8 8 1
Compression pressure (starter motor) psi	142-156	
kp/cm^2	10 0-11 0	
Full throttle speed range	4200-4600 rpm	4400-4800 rpm
Recommended "cruising speed"	300–500 below obtained max rpm	
Idling speed	750 rpm	
Direction of rotation (front of engine)	Clockwise	
Gross weight (engine and reverse gear) lbs (kg)	1094 (497)	1114 (506)
Ratio reverse gear model HS 1	1 96 1 or 2 63 1	

Valves

Valve system — Overhead valves, Hydraulic lifters (non-adjustable)

Cooling system

Thermostat.

Sea water cooled, limit values °F (°C)	140–155 (60-68)
Closed cooled system, limit values °F (°C)	160-185 (72-87)

Fuel pump — Electric with circuit breaker

Carburettor — 4-barrel Holley

Fuel Quality — Gasoline, min octane value 87 (R+M)/2 U S market
91 (RON) other markets
Unleaded fuel can be used

Lubricating System

Engine

Oil Quality	Service SG
Viscosity, 32°F/0°C and above	SAE 30 Volvo Penta Dura Plus™ P/N 3851230-7 (U S ,Canada only)
	SAE 20W/50
	SAE 15W/50
0°F/-18°C to 32°F/0°C	SAE 20W-20
Below 0°F/-18°C	SAE 10W
Capacity, excl oil filter, US qts /liters	6 0/5 7
Capacity incl oil filter, US qts /liters	7 0/6 6
Capacity between min and max marks on the dipstick, US qts /liters	1 0/1 0

Reverse Gear model HS 1

Oil quality/viscosity	Synthetic motor oil, SAE 30 SG/CF Volvo Penta DuraPlus™ P/N 3851230-7 (U S and CANADA only)
Capacity U S qts /liters	3.17/3 0

Hydraulic Steering System (Volvo Penta)

Oil quality	Volvo Penta part No 1140595-8 (If VP oil 1140595-8 is not available, the following oils are recommended Texaco HO15, Shell Aero 4, Esso Univis N15, Chevron Aviation Fluid A, Mobil Aero HFA)
Capacity, U S. qts /liters approx	2 1/2.0 Single helm 3 1/3 0 Dual helm

Ignition System

Firing order	1-8-4-3-6-5-7-2
Basic setting (min 87 (R+M)/2 or 91 RON octane	
7 4GL	10° BTDC
8 2GL	8° BTDC
Spark plug gap, inches (mm)	035" (0.9)
Spark plugs – Volvo Penta p/n	3851861-9 (Qty 2)

Electrical system

Voltage	12 V (negative earth)
Battery capacity (min)	650 cold cranking Amps (70 Amp hour)
Battery electrolyte spec gravity	1 275–1 285
Battery to be recharged at	1 230
Alternator, max output A (W)	51 A (700 W)

Tightening torques

Cylinder head bolts	80 ft lbs / 108 Nm
Spark plugs	22 ft lbs / 30 Nm