

## Quality Campaign: 4877-1785, Heat Exchanger and Software

V8-380-C-A, V8-380-C-B, V8-380-CE-A

Binder: C

Date: 09-2013

Page: 1(6)

**Description:** There are two parts to the campaign;

### Heat Exchanger

During manufacture, some tubes within the heat exchanger may have been accidentally plugged with solder. Plugged tubes will not drain during the winterization (off-season storage) procedure and the heat exchanger will be damaged if exposed to temperatures below freezing (32°F / 0°C). This freeze damage could lead to coolant loss, overheating, and activation of power reduction mode during use.

### Software

New engine software will exercise the camshaft position actuator through a wider range of travel to prevent sticking, increase reliability and improve actuator performance.

**Products  
Concerned:**

40869320 ... V8-380-C-A  
40869321 ... V8-380-CE-A  
40869452 ... V8-380-C-B

Within the serial number ranges listed below:

Heat exchanger inspection and/or replacement; all engines up to serial number **A245042**.

Updated software: All engines up to **A250500**.

Some engines may have been corrected prior to shipment.

Before starting any work, check the engine's serial number on Volvo Penta Partner Network Serial Number Search to determine if the engine is affected by this or any other campaign.

**Campaign  
Instructions:**

- A. Heat Exchanger Inspection and/or Replacement
- B. Update engine ECM software

Full testing, repair, and other information follows for both issues.

**Action:**

### A. Heat Exchanger Inspection and/or Replacement

**NOTICE!** To prevent serious engine damage, this campaign must be performed before any affected engine is subjected to temperatures below freezing (32°F / 0°C).

Follow the test procedure below based on the history of the engine:

For stock boats or engines that have less than 30 minutes total running time, the first step will be to determine the condition of the heat exchanger as the engine may have been exposed to freezing temperatures following shipment from the factory or OEM. Start at step 1 below.

For engines that have been placed in service and have been used, confirm there are no reports of coolant loss. If no loss of coolant has been reported, start at step 5.

**⚠ WARNING!**

Ethylene Glycol coolant is poisonous to humans and animals if ingested.

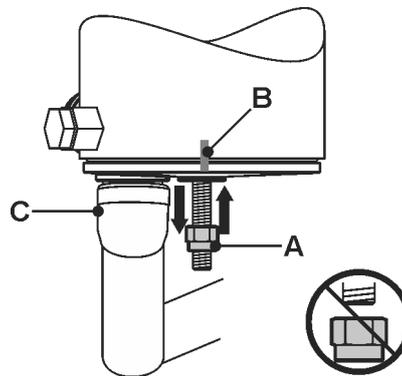
**⚠ CAUTION!**

Ethylene glycol coolant is an eye irritant. Wear eye protection when working with coolant.

Before starting the testing and inspection of the heat exchanger, ensure that there is an indexing mark on the heat exchanger and a corresponding mark on the end cover at **B**. If there are no marks, use a white paint marker to create the indexing marks.

**NOTICE!** Engine over-heating and damage are possible if the bottom cover and cooling inlet are not reinstalled correctly on the heat exchanger.

This indexing mark is required to ensure that the raw water inlet **C** is in the correct position when the bottom cover is reinstalled.



P0018592

1. Use a 9/16" deep socket to loosen the nut **A** securing the bottom cover. Do not completely remove the nut or cover. Carefully unstick the gasket and lower the gasket and cover ½ inch (12 mm) to drain the water.
2. Remove the 9/16" bolt from the top cover and remove the cover and gasket.
3. Pressurize the cooling reservoir with a cooling system pressure tester. The system must hold 10 psi for five minutes. If you lose pressure, look for coolant leaking at the lower cover indicating a cracked cooling tube bundle. If a cracked tube is found, replace the heat exchanger. See *Materials* below. If no damage is found, continue with the next steps.
4. The heat exchanger must hold water for the next test.  
Reinstall the end covers.  
Make sure the bottom cover is positioned with the marks **B** aligned.
5. There are two procedures to fill the heat exchanger with water for the next test.  
if the engine can not be started and run, start at **a**.  
  
If the engine can be started and run, start at **b** (preferred procedure).

- a. Remove the outlet hose on the seawater pump.  
Attach a water supply to this hose (a standard male hose end will fit into this hose). Turn on the water and allow water to flow through the system for five minutes. Water will flow through the system and exit through the exhaust y-pipe. Remove the hose end, reconnect the hose to the seawater pump, and secure with the hose clamp.

Proceed to step 7.

- b. **NOTICE!** Make sure engine has sufficient cooling water if running on a hose. Monitor engine temperature and alarms while engine is running.

Run the engine at idle speed for five minutes to ensure water will completely fill any plugged tubes so they can be identified during inspection.

 **WARNING!**

Burn hazard. Steam and hot fluid may spray out. Stop the engine and allow it to cool before opening the filler cap.

6. After five minutes, stop the engine and allow it to cool enough to safely remove the upper and lower caps from the heat exchanger.
7. Use a 9/16" deep socket to loosen the nut **A** securing the bottom cover. Do not completely remove the nut or cover. Carefully unstick the gasket and lower the gasket and cover 1/2 inch (12 mm) to drain the water.
8. Remove the 9/16" bolt from the top cover and remove the cover and gasket to inspect the heat exchanger tubes.
9. You may see tubes that are soldered closed at the top and bottom. A tube that is sealed at both ends is acceptable, this is what the manufacturer does to seal off blocked tubes when they are found during the manufacturing process. The manufacturer is allowed to seal up to four tubes without compromising cooling capacity.
10. Inspect the top of the heat exchanger tube bundle for any tubes that are filled with water. Use a heat gun (AC power required) to dry the area, which will make any full tubes more visible. Pay extra attention to areas around the perimeter, at the center, and along the dividers. Probe any suspect tubes with brazing rod or wire. Any blocked tubes that are not soldered closed at both ends are cause for rejection. Inspect each section carefully as the plugged tubes can be difficult to detect.
11. One or more plugged tubes is cause for rejection of the heat exchanger. If you detect a tube that is open at one end, but blocked internally, the heat exchanger must be replaced. See *Materials* below.
12. If no plugged or cracked tubes are found, reassemble top and bottom covers. The cover gaskets should be reused. Use care to properly align the lower cover, inlet fitting, and gasket (see above).
13. Make sure the top of the heat exchanger is marked with a yellow paint dot at least 1/2" (12 mm) in diameter to indicate it has passed inspected.

**Materials:**

If the heat exchanger is determined to have one or more plugged tubes, the heat exchanger must be replaced.

You will need the engine serial number to order the new heat exchanger.

The emissions decals for the engine are mounted on the heat exchanger. The decals contain specific information about the engine family, month and year of manufacture, and other emissions requirements.

The decals are tamper proof and cannot be transferred to a new heat exchanger.

The replacement heat exchanger will be sent with the correct decals. The serial number must be provided to ensure we send the correct decals.

Incorrect or missing emissions markings are subject to US EPA fines. Take care to ensure that a heat exchanger that is ordered for a specific engine serial number is installed on the correct engine.

**Coolant**

VCS coolant will be needed to refill the system. If not in stock, be sure to order coolant when ordering the heat exchanger.

Ready-mix VCS coolant is sold as part number **21485014** (five liter jug, case of four).

Full strength VCS coolant is sold as part number **21485012** (five liter jug, case of four).

**NOTICE!** Do not add other coolant types to these engines. Other coolants are not compatible with the VCS, and will cause the coolant in the engine to gel. Extensive cleaning is required to correct this situation.

**NOTICE!** Check engine coolant for proper freeze protection level.

Removal and installation of the new heat exchanger is covered in publication 47704851 (attached).

Elearning is also available for the removal procedure at;  
[http://www.volvopentatraining.com/video\\_library/v8350\\_380\\_430/heat\\_exchanger/](http://www.volvopentatraining.com/video_library/v8350_380_430/heat_exchanger/)  
The videos are a supplement to the instructions, which are the primary guide for the procedure.

**Ordering procedure: USA**

Call the order desk at 1-800-445-2628, select option 1.

Do not place the order on Partner Network.

Order the following parts to replace the heat exchanger:

Qty	Part Number	Description
1	22247497	Heat exchanger
1	3863438	Clamp, hose, circulation pump
1	3863445	Clamp, hose, thermostat
1	3863445	Clamp, hose, expansion tank
2	3860413	Clamp, hose, fuel cell and by-pass
1	3863445	Clamp, hose, to tee

### **Ordering procedure: all other markets**

All markets outside the US will order the parts for the campaign from Volvo Penta Region Americas. Follow the process below.

Contact us via e-mail at **V8-380.heatexchanger@volvo.com**.

Include ALL of the following information in the e-mail;

Date

Dealer Number

Order reference

Engine Serial Number

Contact at Dealer

Dealer name

Complete SHIPPING address for dealer

Business phone number

E-mail

After receipt of this information we will ship all parts needed for the repair to the address you provide. Parts will be shipped from the US, via international priority air.

**Note:** incomplete information in your e-mail will delay receipt of the parts.

There will be no charge for the parts or shipping. Do not enter any of these parts on the reimbursement part of the claim form.

**Reimbursement: Labor:**

**If heat exchanger was inspected, but not replaced.**

Description	Flat rate code	Hours
Extra time, radiator and connections	26100	1.0

**If heat exchanger was replaced.**

Description	Flat rate code	Hours
Extra time, radiator and connections	26100	1.0
Heat exchanger R&R	26112	1.5
Heat Exchanger - Pressure Test	26105	1.0
Cooling system-Replace coolant	26010	1.0

**Action: B. Update software in the engine ECM**

**NOTICE!** A Vodia tool is required to complete the software update.

Update your Vodia tool before starting work on the campaign. The needed software is provided in the latest update.

Update the engine ECM with the new software.

**Materials:** Campaign software. No invoice charges apply for campaign software.

**Reimbursement: Labor:**

Description	Flat rate code	Hours
Diagnostic test and/or programming – ECU	17151	0.7

**Claim**

**Procedure:**

Warranty Type	54
Function Group	2611
Failed Part	21722581
Reason Code	09

**Campaign**

**Number:**

4877-1785  
This number must be used when making claims.

**Deadline:**

This campaign should be performed as soon as possible. Dealer stock boats should be identified and the campaign should be performed prior to delivery. Avoid freezing temperatures until the campaign has been performed.

The campaign will remain open until further notice.  
Hold all parts per warranty policy guidelines.

# INSTALLATION INSTRUCTIONS

## Remove Heat Exchanger, V8-350/380/430

**(ENG)** **Installation Instructions**  
Remove Heat Exchanger

**(SWE)** **Monteringsanvisning**  
Demontera värmväxlaren,

**(GER)** **Einbauanleitung**  
Wärmetauscher ausbauen,

**(BRA)** **Instruções de instalação**  
Remover o Trocador de Calor

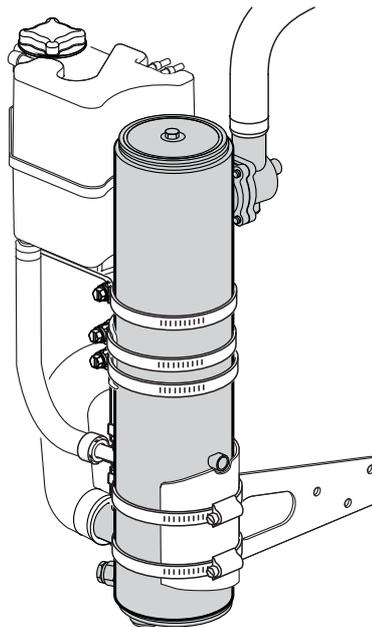
**(FRE)** **Instructions de montage**  
Dépose de l'échangeur de chaleur

**(RUS)** **Инструкция по установке**  
Снятие теплообменника

**(SPA)** **Instrucciones de montaje**  
Desmontaje del intercambiador de calor

**(CHI)** **安装须知**  
拆除热交换器

**(ITA)** **Istruzioni di montaggio**  
Rimozione dello scambiatore di calore



**VOLVO  
PENTA**

### **IMPORTANT!**

This kit with its accompanying instructions is produced for Volvo Penta's service workshops, boat-builders, machine manufacturers and other authorized workshops which have personnel with qualified professional training. The installation instructions are only produced for professional use and are not intended for non-professional use. Volvo Penta will not assume any liability whatsoever for damage incurred, either damage to materials or personal injury, which may result if the installation instructions are not followed or if the work is carried out by non-professional personnel.

### **WICHTIG!**

Dieser Satz mit vorliegender Einbauanleitung ist für Volvo Penta Kundendienst-werkstätten, Werften, Maschinenbauer und für andere ermächtigte Werkstätten mit beruflich geschultem Personal vorgesehen.

Die Einbauanleitung ist nur für den berufsmäßigen Gebrauch vorgesehen und nicht für unprofessionelle Anwendung gedacht. Volvo Penta übernimmt nicht die geringste Haftung für irgendwelchen Schäden an Personen oder Sachen, die als Folge einer Nichtbefolgung der Einbauanleitung oder wegen Ausführung der darin beschriebenen Arbeiten durch nicht beruflich geschulte Personen entstehen.

### **IMPORTANT!**

Ce kit, avec instructions de montage, est destiné aux ateliers de service Volvo Penta, aux constructeurs de bateaux et autres ateliers de construction agréés avec un personnel qualifié.

Les instructions de montage sont exclusivement conçues pour une utilisation professionnelle. Volvo Penta se dégage de toute responsabilité pour d'éventuels dommages, corporels ou matériels, résultant du non respect des instructions ou d'un travail effectué par un personnel non compétent.

### **IMPORTANTE!**

El presente juego con las instrucciones de montaje se destina a los talleres de servicio Volvo Penta, constructores de embarcaciones y máquinas y a otros talleres autorizados que cuentan con personal capacitado.

Las instrucciones de montaje están destinadas únicamente para uso profesional, por lo que Volvo Penta no aceptará responsabilidad alguna por cualquier daño, tanto personal como material, resultado de no haber seguido las instrucciones de montaje o de haber sido efectuado el trabajo por personal que no está debidamente capacitado.

### **IMPORTANTE!**

Questo kit e le relative istruzioni di montaggio sono stati realizzati per le officine di servizio Volvo Penta, i cantieri, i fabbricanti di macchine e tutte le altre officine autorizzate il cui personale ha ricevuto un addestramento qualificato e specializzato.

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### **VIKTIGT!**

Denna sats med föreliggande monteringsanvisning är framtagen för Volvo Pentas serviceverkstäder, båtbyggare, maskintillverkare och övriga auktoriserade verkstäder som har personal med kvalificerad fackutbildning.

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### **IMPORTANTE!**

Este lote, juntamente com as instruções que o acompanham, é produzida para as oficinas de serviço da Volvo Penta, construtores de barcos, fabricantes de máquinas e outras oficinas autorizadas que tenham pessoal com treinamento profissional qualificado.

As instruções de instalação são produzidas apenas para uso profissional e não se destinam ao uso não profissional. A Volvo Penta não assumirá nenhuma responsabilidade por eventuais danos, sejam danos materiais ou lesões corporais, que possam ser resultado de falha em seguir as instruções de instalação ou se o trabalho for realizado por pessoal não profissional.

### **ВАЖНОЕ ЗАМЕЧАНИЕ!**

Этот набор с входящими в него инструкциями произведен для использования предприятиями техобслуживания, судостроительными верфями, производителями машинного оборудования и другими авторизованными предприятиями Volvo Penta, использующими квалифицированный, прошедший профессиональную подготовку персонал.

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## Introduction

This installation instruction covers parts or accessories manufactured or marketed by Volvo Penta and used in the specified application and for the intended purpose recommended by Volvo Penta. Any use other than those specified may give unpredictable results and result in equipment failure or personal injury.

Proper preparation is extremely helpful for efficient service work. A clean work area at the start of the job will minimize tools and parts becoming misplaced. Obtain tools, instruments and parts needed for the job before work is started. Interrupting a job to locate special tools or repair kits is a needless delay.

When following these instructions the installer must adhere to all U.S. Coast Guard Safety Regulations and ABYC Recommendations and Standards, or other regional regulation that may be in effect.

## Service Policy

Whether within or following the warranty period, Volvo Penta has a constant interest in our products.

It is Volvo Penta's policy to provide dealers with service knowledge so they can give professional service demanded by today's consumer. Volvo Penta Service Schools, frequent mailing of Service Bulletins, Letters and Promotions, Special Tools and these instructions represent Volvo Penta's efforts in giving consumers the best and most prompt service possible. If a service question does not appear to be answered in these instructions, you are invited to call or write to the Volvo Penta Service Department for additional help. Always be sure to give complete information, including engine model and serial number.

Be sure you are familiar with Volvo Penta's Warranty. If you have any questions, call or write the Volvo Penta Service Department. If other than genuine Volvo Penta parts and components are used, Volvo Penta may refuse subsequent warranty claims involving that engine.

When a brand-name product or specific tool is specified, another item may be used. However, the substitute must have equivalent characteristics, including type, strength, and material. It is your responsibility to determine if incorrect substitution could result in product malfunction and personal injury to anyone. To avoid hazards, equivalent products which are used must meet all U.S. Coast Guard Safety Regulations and ABYC standards.

## References, Illustrations and Specifications

Volvo Penta reserves the right to make changes at anytime, without notice, to specifications, models, and procedures. Also, the right to change any specifications or parts at any time without incurring any obligation to equip same models manufactured prior to date of such change. All information, photographs, illustrations, and specifications, contained in these instructions are based on the latest information available at the time of printing.

Photographs and illustrations used in this instruction may not depict actual models or equipment. The continuing accuracy of this installation instruction cannot be guaranteed.

Use the general torque specification for all fasteners unless otherwise specified in the instructions.

## Important Safety Notices

Carefully observe the safety alert symbols below for dangers, warnings, and cautions. They alert installers and operators of possible dangers or important information contained in this manual.

**Warnings alone do not eliminate hazards. They are no substitute for professional workmanship and proper installation.**



**DANGER!** Failure to comply with a danger symbol will result in death or serious injury.

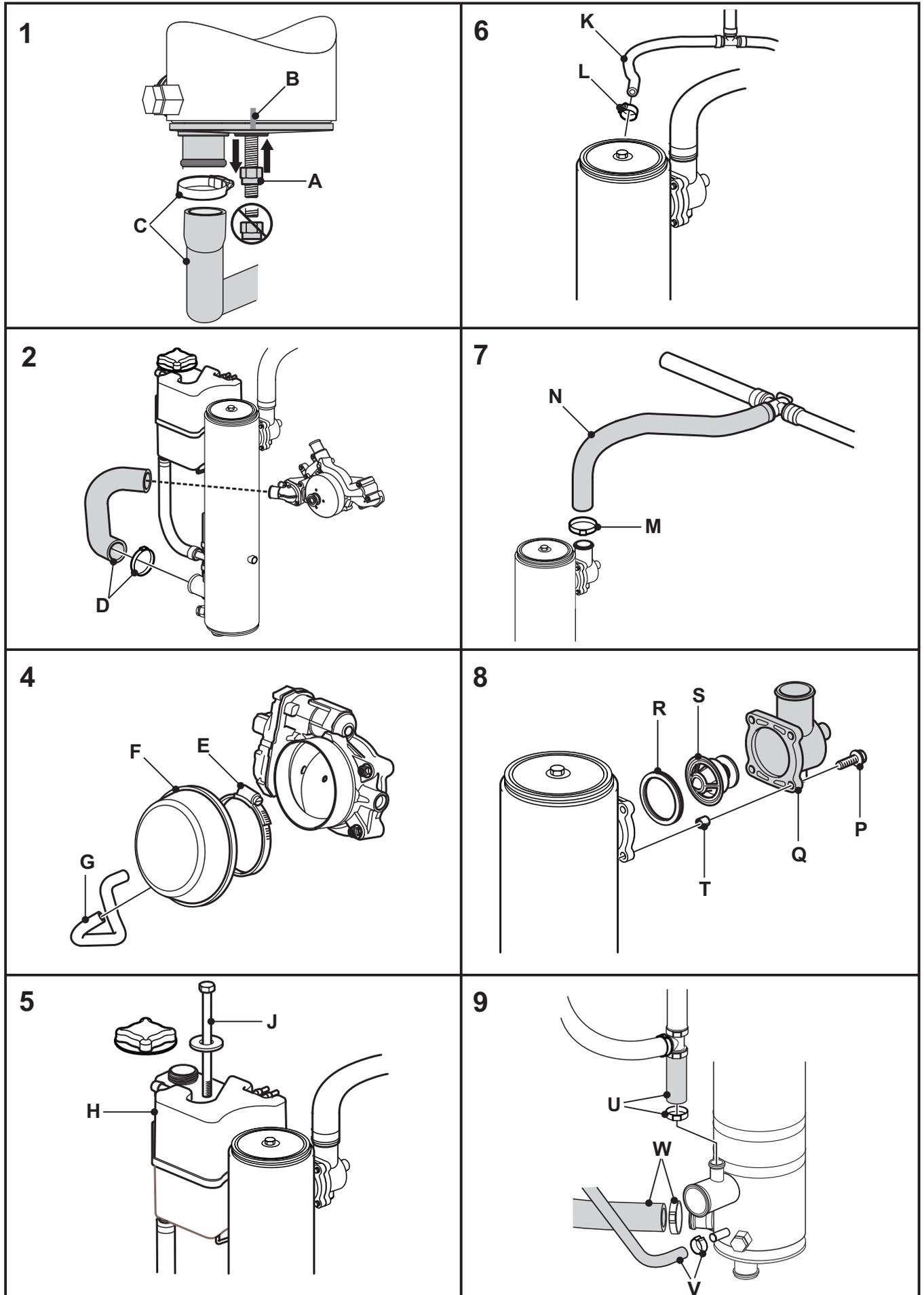


**WARNING!** Failure to comply with a warning may result in death or serious injury.



**CAUTION!** Failure to comply with a caution may result in injury.

**NOTICE!** Special attention should be used to prevent incorrect assembly or disassembly. Failure to comply with a notice may result in equipment failure or damage.



## Purpose

This instruction provides procedures for replacing the heat exchanger.

## Parts Included:

qty	Pos	P/N	Description
1		22247497	Heat exchanger
1	D	3863438	Clamp, hose, circ. pump
1	L	3860413	Clamp, hose, by-pass
1	M	3863445	Clamp, hose, thermostat
1	U	3863445	Clamp, hose, expansion tank
1	V	3860413	Clamp, hose, fuel cell
1	W	3863445	Clamp, hose, to tee

1. Drain sea/raw-water from exchanger;  
See decal on exchanger.  
Loosen clamp and remove hose at **C**.  
Loosen nut **A**.  
Lower cap and gasket to drain water.

**⚠ WARNING!** Ethylene Glycol coolant is poisonous to humans and animals if ingested.

**⚠ CAUTION!** Ethylene glycol coolant is an eye irritant. Wear eye protection when working with coolant.

2. Drain coolant from exchanger;  
Remove clamp at **D** at bottom of exchanger.  
Move hose off of nipple on exchanger.  
  
To ease removal of the exchanger, disconnect the thermostat housing from the exchanger and leave the housing attached to the hoses.
3. Remove engine cover.
4. Loosen the clamp **E** securing the flame arrester **F**.  
Remove the hose **G** from the flame arrester.  
Move the flame arrester off of the throttle body and to the right. This improves access to the bolts in the next step.  
Be careful, do not damage the wiring to the sensor.
5. Remove bolt **J**.  
Move the expansion tank **H** to the side to access the by-pass hose/clamp.
6. Cut the clamp **L** on by-pass hose **K**. Remove the hose from the nipple on the heat exchanger.
7. Move top hose on the thermostat housing to access the housing bolts;  
Remove clamp **M**.  
Lift hose **N** up, then move aside.
8. Remove the 4 bolts **P** holding the thermostat housing **Q** to the exchanger.  
Tip: access bolts from rear with a long extension and swivel socket (10mm).  
Discard seal **R** and thermostat **S**.

9. Cut the band clamps **U**, **V**, and **W** securing the fuel cell hose, expansion tank hose and the hose to the tee on the rear of the engine.  
Move the hoses off of the nipples on the exchanger.
10. Remove 5 clamps holding exchanger to brackets.  
Remove the exchanger.  
Thermostat housing should remain connected to the hoses.
11. Remove the thermostat housing **Q** from the new exchanger.  
Move the seal **R** and thermostat **S** to the original thermostat housing (still attached to hoses).
12. Make sure alignment mark **B** is on bottom of new exchanger.
13. Mount new exchanger on the brackets and secure with the 5 clamps.  
Make sure the rubber cushions are between the brackets and the exchanger.
14. Make sure bushings **T** are in mounting holes.  
Attach thermostat with the 4 screws.  
Tighten in a crossing pattern.  
Torque to 10 Nm (8 ft.lbs)
15. Reinstall expansion tank.  
Torque bolt to 34-40 Nm (25-29 ft.lbs)
16. Reconnect all hoses removed above.  
Secure with clamps.  
Replace the Oetiker clamps with the worm clamps listed at *Parts Included*.
17. Reinstall the flame arrester and hose.  
Install engine cover.

**NOTICE!** This engine uses only Volvo **VCS** coolant. Do not add other coolant types to these engines. Other coolants are not compatible with the VCS, and will cause the coolant in the engine to gel. Extensive cleaning is required to correct this situation.

18. Top-off cooling system after hoses are connected.  
Run engine, check for leaks and correct coolant level.

**NOTICE!** Make sure engine has sufficient cooling water if running on a hose. Monitor engine temperature and alarms while engine is running.

**NOTICE!** Check engine coolant for proper freeze protection level.

**Dispose of all coolant and shop materials according to local environmental regulations.**

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PENTA**

**Volvo Penta of the Americas**  
1300 Volvo Penta Drive  
Chesapeake, VA 23320-9810



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