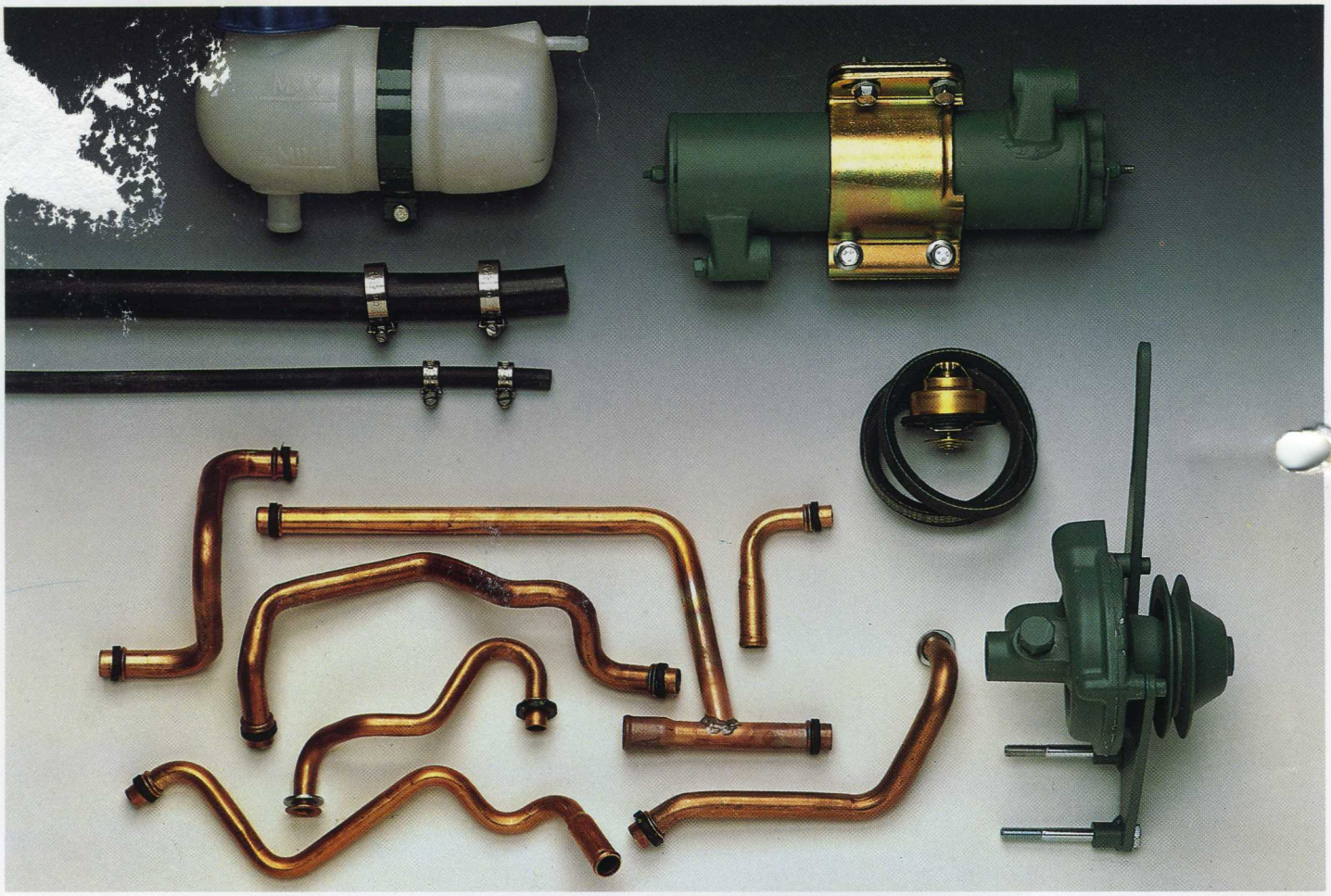
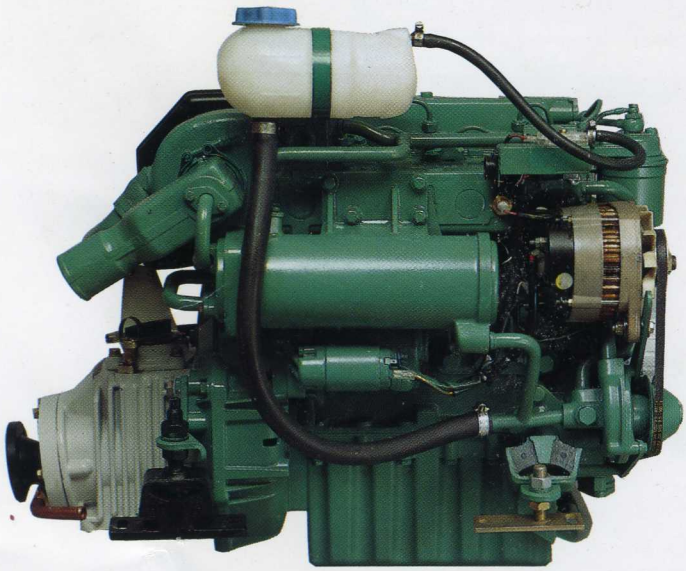
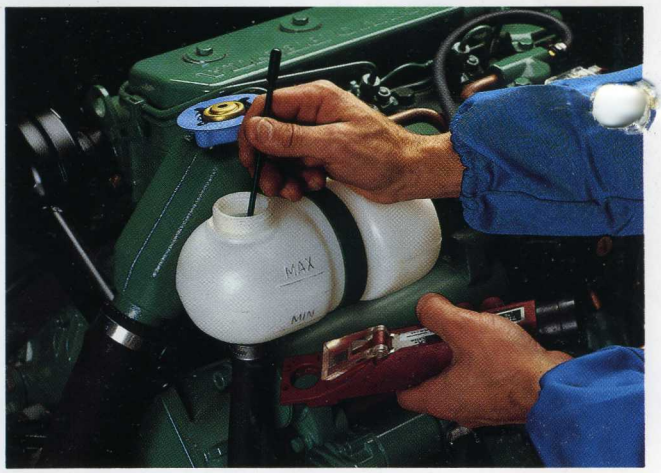
Freshwater cooling diesel engines





A specially-tailored system with the right dimensions and performance for each individual engine type. Easy fitting and reliable function; operated by a mechanical pump unlike the so-called "universal kits" which are driven by an electrical pump.



Easier to maintain during the winter

Freshwater cooling kits

2002, 2003	**Order No. 859388-1*** **
MD11C	**Order No. 829959-6***
MD11C	**Order No. 840602-7**
MD17C	**Order No. 840603-5****
MD17D	**Order No. 840603-5**

* Additional fitting is required for the MD11C with an engine number lower than 51594. Order number 829962-0. A V-belt groove must be cut in the flywheel on engines with an engine number lower than 51376.
** A drive belt, order number 958325-3, is required.
*** 2003, not in combination with the PRM reverse gear.

A closed system opens up new avenues

The advantages of a freshwater system are obvious. Instead of cooling the engine with sea water, the cooling is done by a closed coolant system. This prevents the often salty sea water, which is also rich in oxygen, from corroding cooling ducts, cylinder heads, water jackets and branch pipes. As the coolant, which passes through a closed copper coil, is cooled in a heat exchanger, the sea water never comes in contact with the engine cooling ducts.

The salt content in sea water poses serious problems when it comes to engine service life. Salt deposits begin to form when the cooling water in the engine reaches a temperature of just 60°C. The salt deposits increase as the temperature rises. (The working temperature of a freshwater-cooled engine should be 80–90°C and it should be about 70°C for a seawater-cooled engine.) Salt deposits, corrosion and silt gradually block the cooling ducts if you do not have a freshwater-cooled engine.

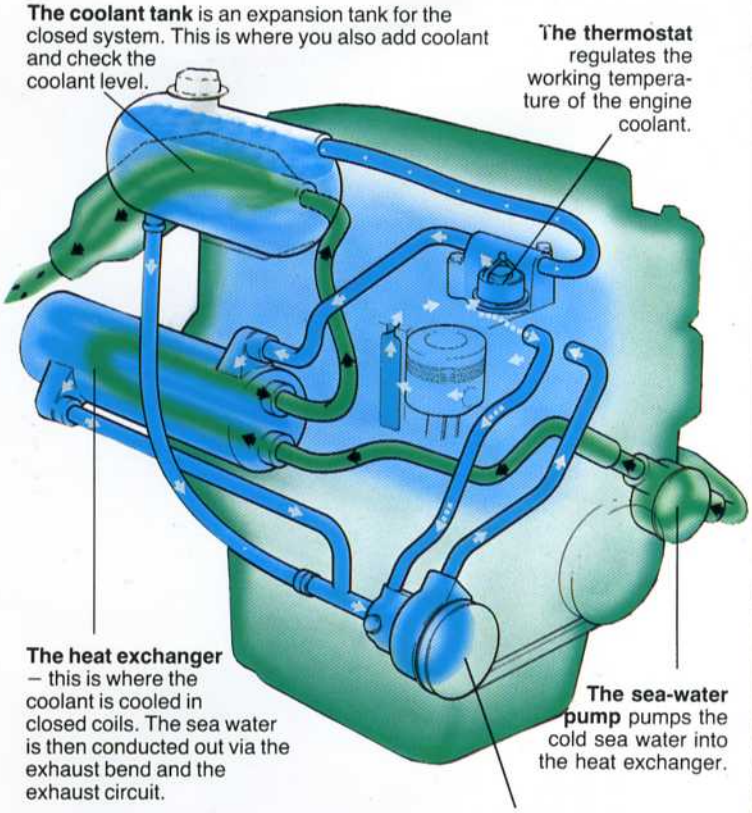
A freshwater system also makes it much easier for the engine to maintain the right working temperature. The engine runs more evenly and develops less exhaust smoke. The right working temperature also reduces fuel consumption, something you will appreciate after your first season.

There is something else you will also notice immediately. The winter maintenance of the engine will be much easier if you have a freshwater system. You check the freezing point of the coolant in just the same way as you do with the car – if necessary, you just add some anti-freeze.

Do it yourself...

Detailed fitting instructions and specially-tailored kits mean that you can easily do the installation work yourself in just a few hours.
If you have a somewhat older engine, it might be a good idea to clean the cooling ducts prior to fitting.
Ask your Volvo Penta dealer for advice.

The comfort of hot water into the bargain.



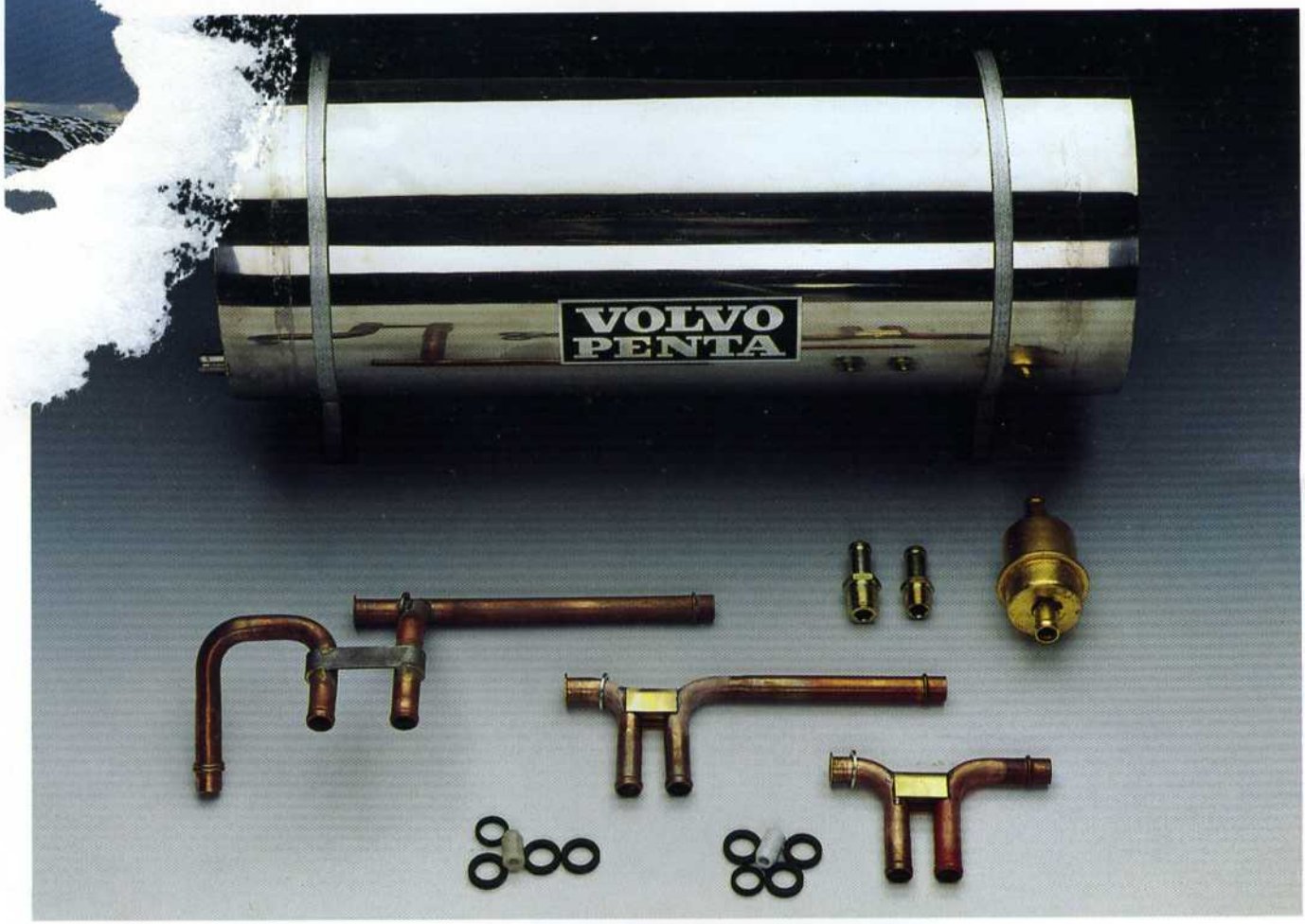
Comfort into the bargain

The higher working temperature of the engine enables you to use the heated liquid in the freshwater system to heat water or give you heat on board your boat "free of charge". Volvo Penta's original kits for freshwater cooling are prepared for connection to the hot water outlet on a water heater, for example.

Last but by no means least...

Even if Volvo Penta's engines are designed for a long service life with sea-water cooling, an engine with freshwater cooling has an even longer service life and gives the boat a higher trade-in value. When one considers the cost of a new engine, freshwater cooling is a cheap investment, regardless of whether the engine runs on salt water or freshwater.

Hot water system



Hot water without heating costs.

Having access to hot water for showers, washing and washing up on your boat is no longer an unattainable luxury. Using the cooling water which has been heated by the engine – heat which just disappears in most cases – you can easily raise the level of comfort on board your boat. This heated cooling water circulates in the water heater, heating coils which heat the water intended for everyday use. The water heater volume, 20 litres, combined with the short heating time ensures that you always have access to hot water.

Hot water heater, 20 litres.
Height 270 mm and width 590 mm. The heater attachments can be adjusted in the sideways direction. Hose to the engine; diameter 16 mm. Hose to utility water; diameter 12.7 mm.
Order No. 1144069-0.

Hose to hot water outlet Ø 16 mm.
Order No. 952969-4.

Stainless steel hose clip.
Order No. 961666-5.

Hose to utility water Ø 12.7 mm.
Order No. 952968-6.

Stainless steel hose clip.
Order No. 961665-7.

Extra thermostat for more even engine temperature. Should be connected between the hot water outlet and the heater.
Order No. 855877-7.

Hot water outlet	**Order No.**	Freshw.-cooled	Saltw.-cooled
2002		**858523-4**	**840775-1**
2003		**858523-4**	**840776-9**
2003T		**858576-2**	–
MD11, MD17		**829963-8**	–
MD11C		–	**829793-9**
MD17C		–	**829794-7**
D31, D41		**858575-4**	–
230, 250, 251 DOHC		**855887-9**	–
431, 500, 501, 570, 571, 740		**855876-9**	**855876-9**

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VOLVO PENTA

Installation Instructions
Einbauanleitung
Instructions de montage
Instrucciones para el montaje
Instruzioni di montaggio
Monteringsanvisning

INSTALLATION INSTRUCTIONS FOR FRESHWATER COOLING AND HOT WATER OUTLET ON 2002 and 2003.

FRESHWATER COOLING

1. Close seawater inlet.
2. Drain water from engine.
3. Rinse the engine in fresh water if it has been used in salt water.
4. Dismantle the tensioning bracket and V-belt of the generator.
5. Move the generator up out of the way (lock in the raised position).
6. Remove two screws and washers in the transmission cover (under the generator bracket),pos 1.
7. Remove the plug from the cylinder head (under thermostat housing), pos.2.
8. Remove the hose between the seawater pump and the cylinder head and also the upper pipe (not to be used later). Cut the existing hose to 75 mm length, pos. 3.
9. Fit the circulation pump (complete with tensioning bracket and spacer). Tighten the screws (M8x75) at a torque of 20 Nm (2 kpm), pos. 4.
10. Dismantle the thermostat housing, the pipe between the thermostat housing and the exhaust pipe bend and the cylinder head.
11. Exchange the thermostat (N.B. new sealing ring) and fit the thermostat housing.
12. Fit the two brackets (pos 9) loosely round the heat exchanger (pos 5) with 2 flange screws and 2 flange nuts. Hang up the heat exchanger loosely with two similar screws.
    a) Fit the pipe, pos. 6*) and the hose, pos 3, between the heat exchanger and the seawater pump; use the existing hose clamps (smear soapy water on all of the rubber rings).
    b) Fit the pipe between the heat exchanger and thermostat housing, pos. 7.
    c) Fit the pipe between the heat exchanger and the circulation pump, pos.8.
    Insert the pipe into the heat exchanger and adjust to best position. Screw tight with the four screws on the heat exchanger.
13. Fit the pipe between the heat exchanger and the exhaust pipe bend, pos. 10 2002=short pipe, 2003= the long pipe. Note. The bracket for the pipe, pos. 11, and new clamp, pos. 11a.
14. Fit the pipe between the circulation pump (lower outlet) and the cylinder block, pos. 12.
15. Fit the pipe between the circulation pump (upper outlet) and the cylinder head, pos 13.
16. Fit the generator; fit the screw for the bracket with the head turned outwards. Place a new V-belt in position and tension the belt.

17. Mount the expansion tank on a bulkhead or similar, Alt.I. The tank should not be placed so low that the bracket is under the upper part of the cylinder head, pos. 14. The tank may also be mounted on the exhaust pipe bracket, Alt. II: When mounted on the exhaust pipe, the two outer screws should first be dismantled, pos 15.
18. Fit the hose between the tank and the circulation pump (branch pipe). When the tank is fitted on to the engine, the hose should be cut to: 2002 = 450 mm, 2003 = 550 mm (only single hose clips on the freshwater section) pos. 16.
19. Remove the plug from the thermostat housing and fit the connector, pos. 17.
20. Fit the hose between the tank and the thermostat housing (connector). When the tank is mounted on the engine, cut the hose to: 2002 = 350 mm, 2003 = 450 mm, pos. 18. Clip the hoses in to position using soft clip.
21. Fit plugs in to the exhaust pipe bend and the cylinder head, pos. 19 and 20.
22. Fill the system to the correct level with a mixture of fresh water (50%), and ethylene glycol (50%), or alternatively an anti-corrosion agent (VP accessory). Volume of freshwater system: 2002 = 4.0 dm^3 (litre), 2003 = 5.5 dm^3 (litre). Open the seawater intake.

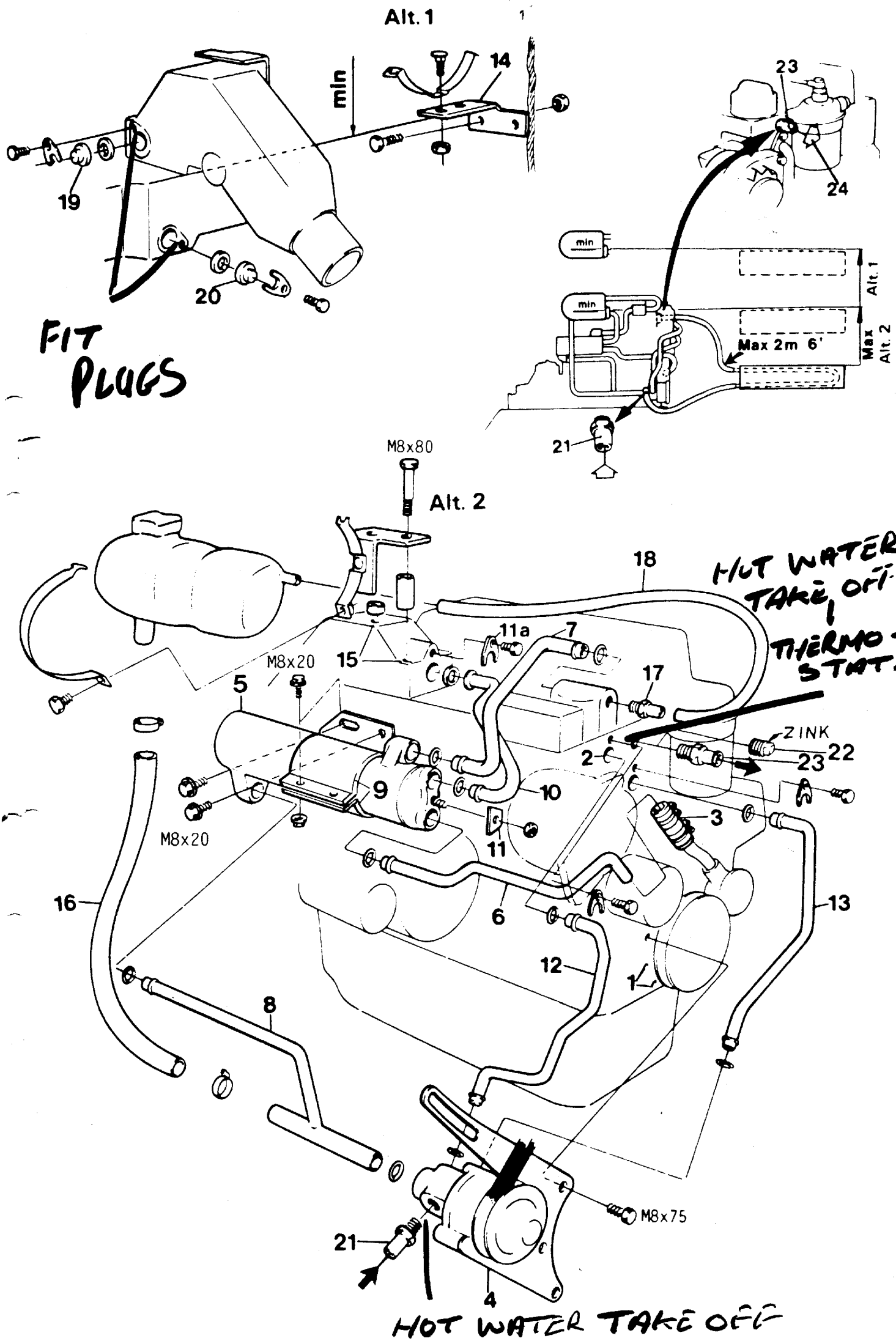
HOT WATER OUTLET

1. Remove the plug on the circulation pump and fit the hose connector, part no 961653 (3/8"-18NPTF), pos 21.
2. Remove the zinc plug from the cylinder head, pos. 22, and fit the hose connector, part no 961654 (1/2"-14 NPTF), pos. 23.

The arrows on the connectors indicate the direction of flow of the water. The recommended volume of water for heating is approx. 20 litre.The recommended hose dimension is 16x4 (5/8" x 5/32") part no 952969. When there is a large consumption of hot water (long heating time) the system should be supplemented by a thermostat, 60^0 (hose thermostat) at the outlet connector, pos. 24.
Note: The upper edge of the hot water heater should not be placed higher than the "min" marking on the expansion tank.

*)

The kit includes a 90^0 hose connector. This should be used for fitting the vacuum valve for freshwater cooling and in this case, replaces the pipe shown in pos. 6.


Alt. 1
min
14
19
20
23
24
min
min
Alt. 1
Max 2m 6'
Max
Alt. 2
21
FIT PLUGS
M8x80
Alt. 2
18
HOT WATER TAKE OFF
THERMO-STAT.
11a
7
M8x20
15
17
5
ZINK
22
23
2
9
10
3
M8x20
11
16
6
13
12
1
8
M8x75
21
4
HOT WATER TAKE OFF