

Cooling System, Cleaning (Freshwater System)

Industrial Engines

Binder: A B C D E I

Date: 11-2010

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High coolant temperature can be caused by, among other things, deposits on the outside of the pipes in the heat exchanger element and can be remedied by cleaning the cooling system (fresh water system).

Marine engines: Always check that the impeller in the raw water pump is undamaged; see the relevant Operator's Manual.

Cleaning the cooling system is also advisable when replacing the coolant.

- 1 Drain the cooling system (fresh water system) thoroughly.

WARNING!

Stop the engine and let it cool before starting work on the cooling system. Hot fluids and hot surfaces can cause burns.

WARNING!

Glycol is poisonous (dangerous to ingest). Collect the old coolant and hand it to a re-cycling station for disposal.

- 2 Mix the amount of coolant required to fill the engine's fresh water system. Use a separate, clean vessel. Mixing proportions for the cleaning fluid: 30 grams (1.06 oz) of oxalic acid (powder) to 1 liter (1 quart) fresh water.

Example: The fresh water system on a D6 engine holds approx. 16 liters (4.2 US gals) of coolant. To achieve the correct mixture 480 grams (16.9 oz) of oxalic acid are required.

WARNING!

Oxalic acid is dangerous to the eyes and skin. Always use protective goggles and gloves.

- 3 Fill the cooling system with the ready-mixed cleaning fluid.
- 4 Run the engine for around 20 minutes until it is warm (normal operating temperature).
- 5 Empty the fresh water system completely.
- 6 To neutralize any oxalic acid remaining in the system, the system must be run and washed through with a coolant mixture containing sodium hydrogen carbonate.
- 7 Mix the amount of coolant required to fill the engine's cooling system. Use a separate, clean vessel. Mixing proportions for the fluid: 6 grams (0.21 oz) of sodium hydrogen carbonate (powder) to 1 liter (1 quart) fresh water.
- 8 Fill the cooling system with the ready-mixed fluid.
- 9 Run the engine for around 20 minutes until it is warm (normal operating temperature).
- 10 Empty the fresh water system completely.
- 11 Flush the fresh water system with clean water.
- 12 Refill the system with the coolant type recommended and water according to the instructions in the Workshop Manual / Operator's Manual for the engine concerned.

NOTICE! Volvo Penta does not sell oxalic acid or sodium hydrogen carbonate; these should be purchased from a chemical stockist or suchlike.

Chemical formula for “oxalic acid”: $\text{C}_2\text{H}_2\text{O}_4$.

Chemical formula for “sodium hydrogen carbonate”: NaHCO_3 .⁽¹⁾

1. Sodium carbonate (Na_2CO_3) must not be used considering it being corrosive.