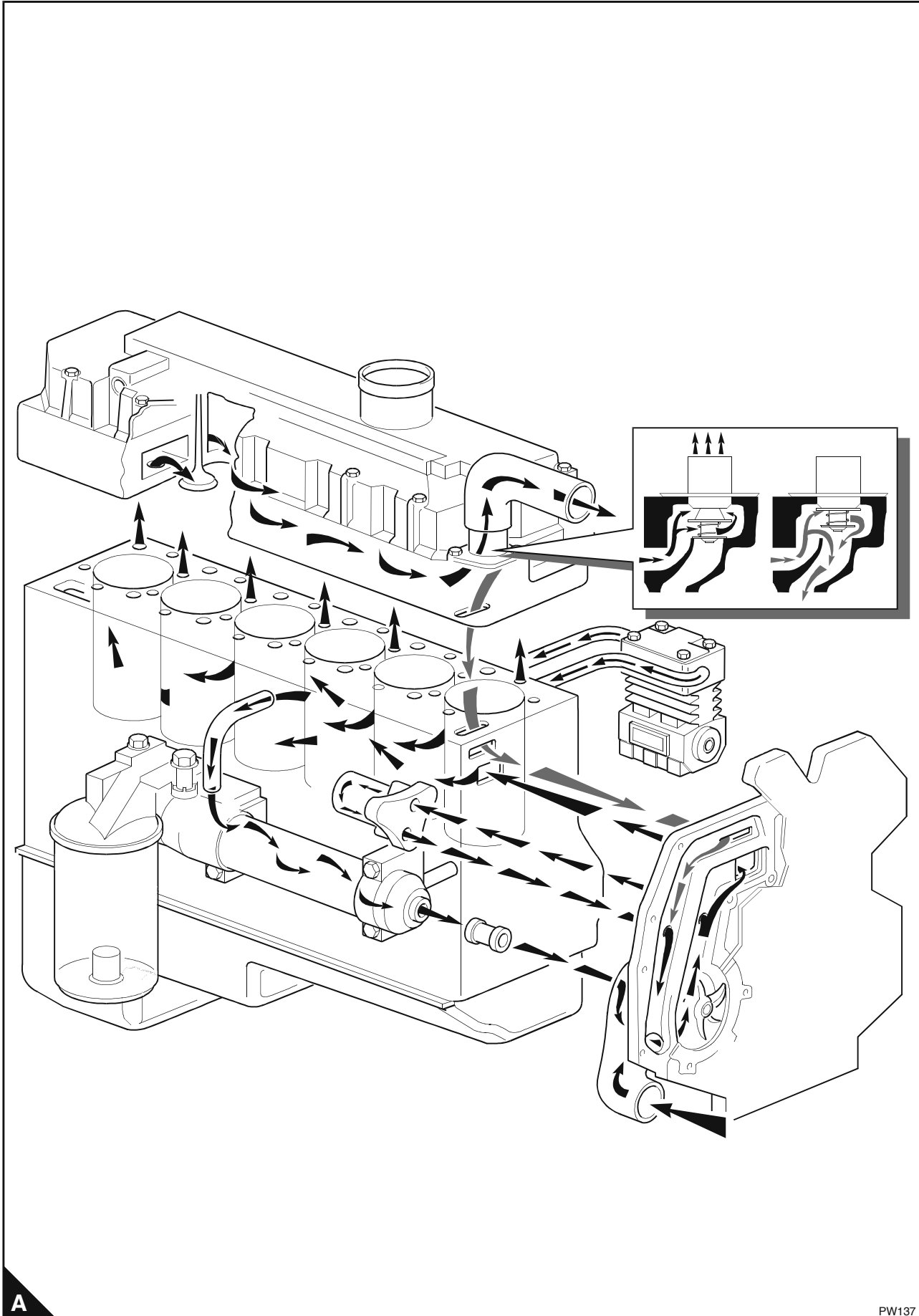


## Cooling system flow diagram



**Coolant filter**

To renew the canister of the coolant filter / inhibitor

**Operation 12-1**

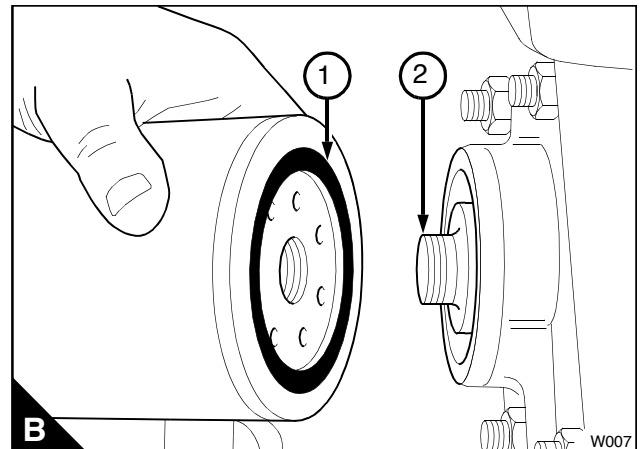
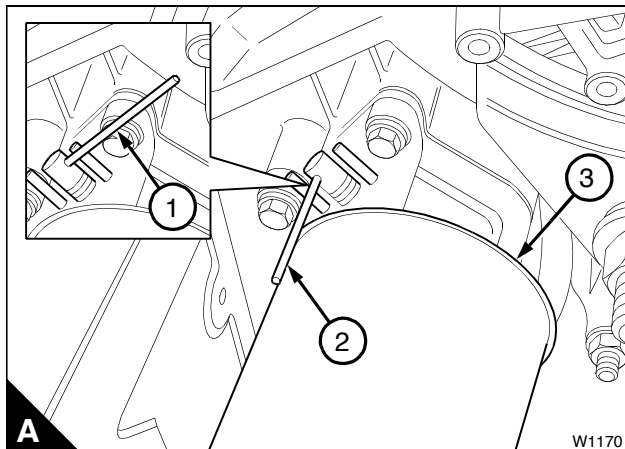
**Warning!** Do not remove the canister while the engine is still hot and under pressure because dangerous hot fluid can be discharged.

**Caution:** The canister contains a corrosion inhibitor that is circulated around the cooling system as the coolant passes through the canister. It is important that only the genuine correct Perkins canister is used.

1 When the engine has cooled, remove the radiator filler cap to release the system pressure.

**Notes:**

- Up to engine number N117199, when the system pressure is released, automatic check valves in the filter head will close to prevent the loss of coolant when the filter canister is removed.
  - From engine number N117199, a manual valve is fitted and is shown open (A2). When the system pressure is released, the valve lever must be turned counter-clockwise to the closed position (A1) to prevent the loss of coolant when the filter canister is removed.
- 2 Thoroughly clean the outside surfaces of the coolant filter canister.
  - 3 Use a strap wrench or similar tool to loosen the filter canister and remove the canister.
  - 4 Ensure that the threaded adaptor (B2) is secure in the filter head and that the inside of the head is clean.
  - 5 Lubricate lightly the seal (B1) on top of the new filter canister with clean engine coolant. Fit the new canister to the filter head and tighten by hand. Do not overtighten the canister.
  - 6 Turn the lever (A2) 90° clockwise to open the valve. This will allow the flow of coolant through the canister.



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**Thermostat**

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To remove and to fit

**Operation 12-2**

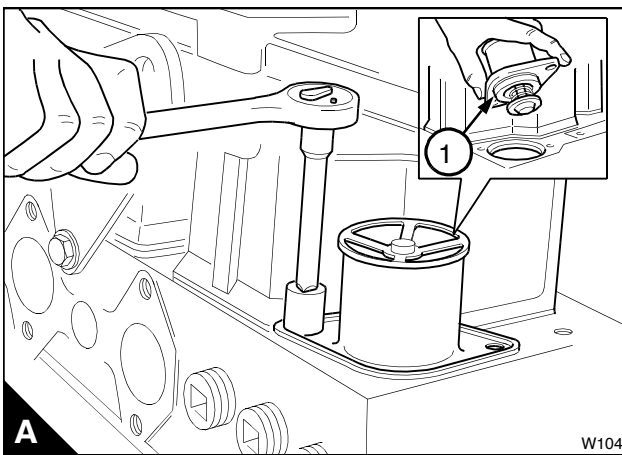
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**To remove**

- 1 Drain the cooling system so that the coolant level is below the thermostat position and disconnect the top hose from the water outlet connection.
- 2 Release the setscrews and remove the thermostat assembly (A). Discard the 'O' ring (A1).

**To fit**

- 1 Ensure that the joint faces of the thermostat assembly and the outlet are clean.
- 2 Fit a new 'O' ring to the thermostat assembly and insert the thermostat assembly in position on the cylinder head. Fit and tighten the setscrews.
- 3 Connect the top hose and fill the cooling system.



To test

**Operation 12-3**

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- 1 Hang the thermostat in a suitable container filled with water.
- 2 Heat the water gradually. Use a thermometer to check the temperature at which the valve starts to open and at which it is fully open. The correct temperatures are given in the relevant Data and dimensions for the "Thermostat" on page 18.

## Coolant pump

To remove and to fit

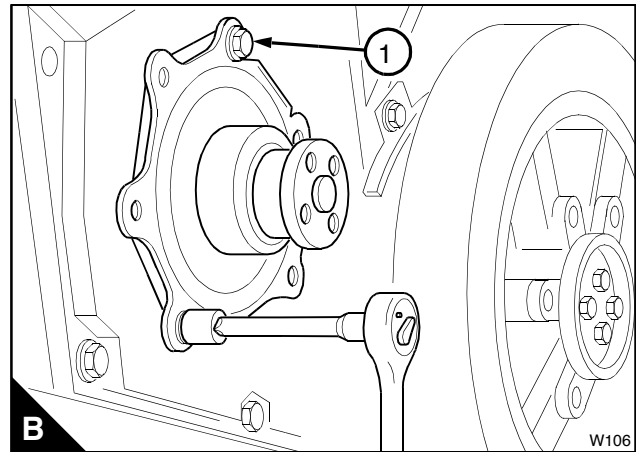
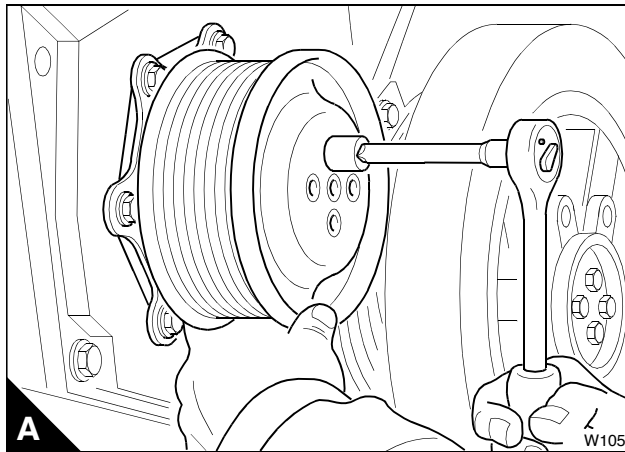
Operation 12-4

**Note:** If the water pump becomes unservicable, a new coolant pump must be obtained.

### To remove

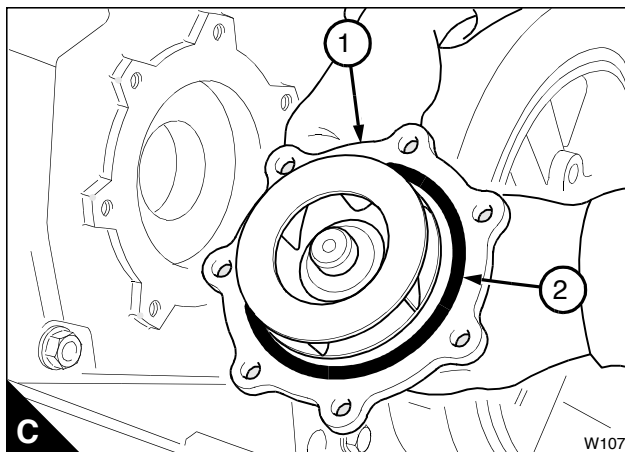
- 1 Drain the cooling system.
- 2 Remove the drive belt, see Operation 12-7.
- 3 Remove the setscrews from the drive pulley and remove the drive pulley (A).
- 4 Remove the coolant pump fasteners (B1) and remove the coolant pump. Discard the 'O' ring (C2).

**Note:** The bolt at the 1 o'clock position (B1) passes through the timing case to a nut on the rear of the timing case.



### To fit

- 1 Ensure that the joint faces are clean.
- 2 Fit a new 'O' ring (C2) to the coolant pump (C1) and put the coolant pump into position. Fit the nut and bolt (B1) at the 1 o'clock position and tighten finger tight only. Fit the remaining setscrews and tighten finger tight only. Tighten all the fasteners evenly and gradually to 7 Nm (5.5 lbf ft) 0,8 kgf m.
- 3 Fit the drive pulley and tighten the setscrews to 7 Nm (5.5 lbf ft) 0,8 kgf m (A).
- 4 Fit the drive belt, see Operation 12-7.
- 5 Fill the cooling system to the correct level.



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**Fan**

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**To remove and to fit**

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**Operation 12-5**

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**To remove**

- 1 Remove the fan drive belt, see Operation 12-7.
- 2 Release the setscrews and remove the fan.

**To fit**

- 1 Clean thoroughly the rear of the fan where it fits onto the fan spacer. Also ensure that all paint is removed from this area. Clean the front face of the fan spacer. Fit the fan and tighten the setscrews.
- 2 Fit the fan drive belt, see Operation 12-7.

**Note:** There is no need to check the tension of the belt as the tension is set automatically.

**Fan drive**

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**To remove and to fit**

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**Operation 12-6**

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**To remove**

- 1 Remove the fan, see Operation 12-5.
- 2 Release the setscrews and remove the fan spacer. Remove the drive pulley, if one is fitted, remove the fan pulley.
- 3 Release the setscrews and remove the fan drive.
- 4 Visually inspect the fan drive assembly for damage and wear. If the fan drive is damaged or worn it must be renewed as a unit.

**To fit**

- 1 Put the fan drive in position, fit and tighten the setscrews to 22 Nm (16 lbf ft) 2,2 kgf m.
- 2 Put the fan pulley, the drive pulley and the fan spacer in position, fit and tighten the setscrews.
- 3 Fit the fan, see Operation 12-5.

**Fan drive belt**

To remove and to fit

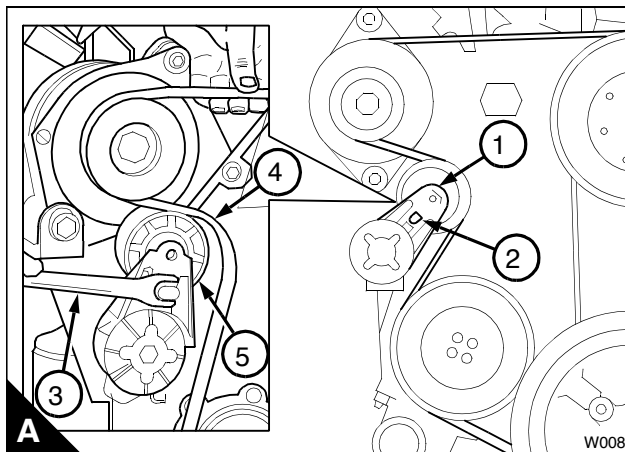
**Operation 12-7****To remove**

**Note:** There is no need to check the tension of the belt as the tension is set automatically.

- 1 Fit a square headed lever (A3) into the 12,7 mm (0.5 in) hole (A2) in the fan tensioner assembly (A1).
- 2 Operate the lever to release the tension from the belt (A4) and remove the belt. The tensioner will return to its original position by spring pressure. Remove the lever.

**To fit**

- 1 With the lever in the fan tensioner, pull the tensioner outwards.
- 2 Put the fan belt in position around all of the pulleys. Ensure that the tensioner pulley (A5) is on the outside of the belt. Allow the tensioner to return and tension the belt. Remove the lever.



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# 13

## **Flywheel and housing**

### **General description**

The steel flywheel is fitted with a hardened starter ring.

The flywheel housing is made of cast iron.