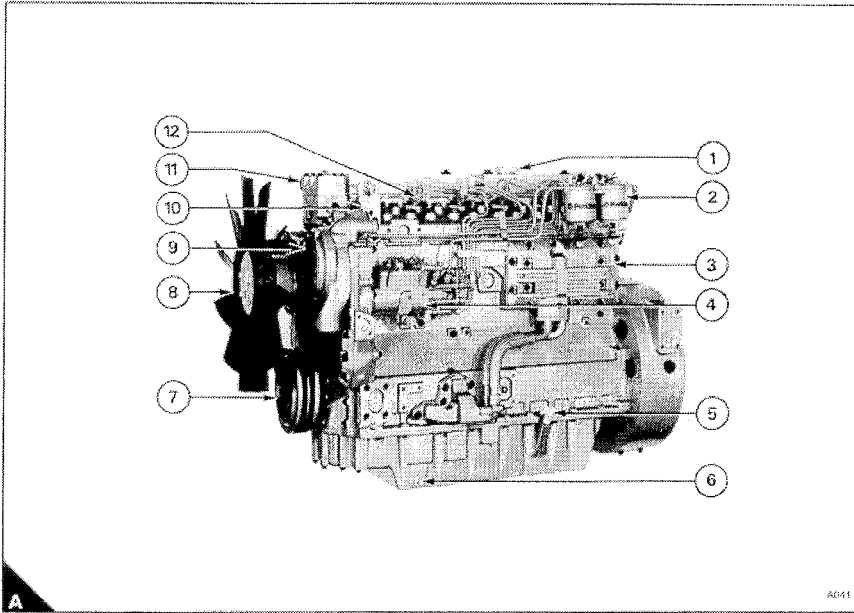


HML 41 SERVICE-MANUAL

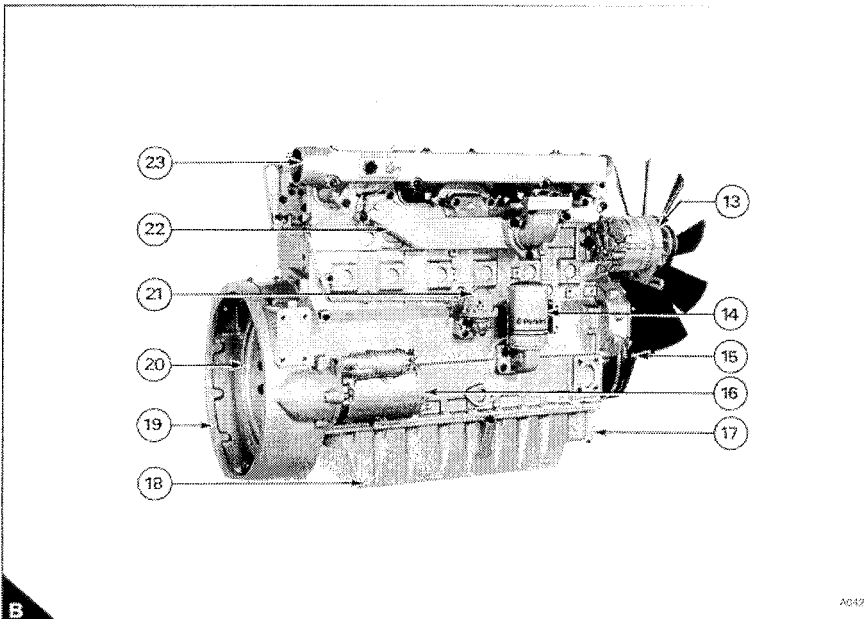
List of Contents

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Front and left side view of YA engine (2.05/A)

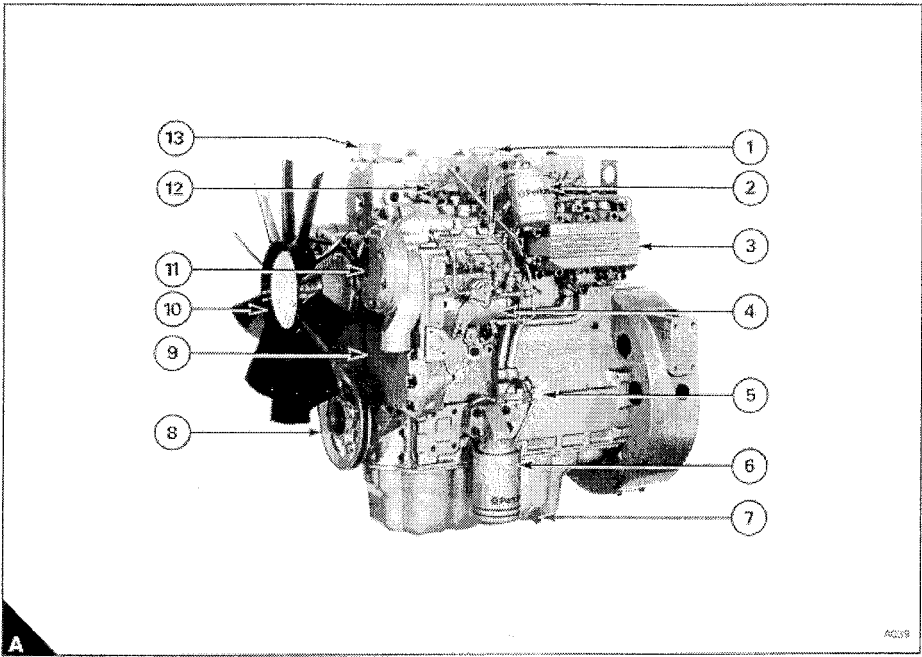
- 1 Filler cap for lubricating oil
- 2 Fuel filter
- 3 Lubricating oil cooler
- 4 Fuel injection pump
- 5 Lubricating oil dipstick
- 6 Drain plug for lubricating oil
- 7 Crankshaft pulley
- 8 Fan
- 9 Water pump
- 10 Front lifting bracket
- 11 Water outlet
- 12 Atomiser



Rear and right side view of YA engine (2.05/B)

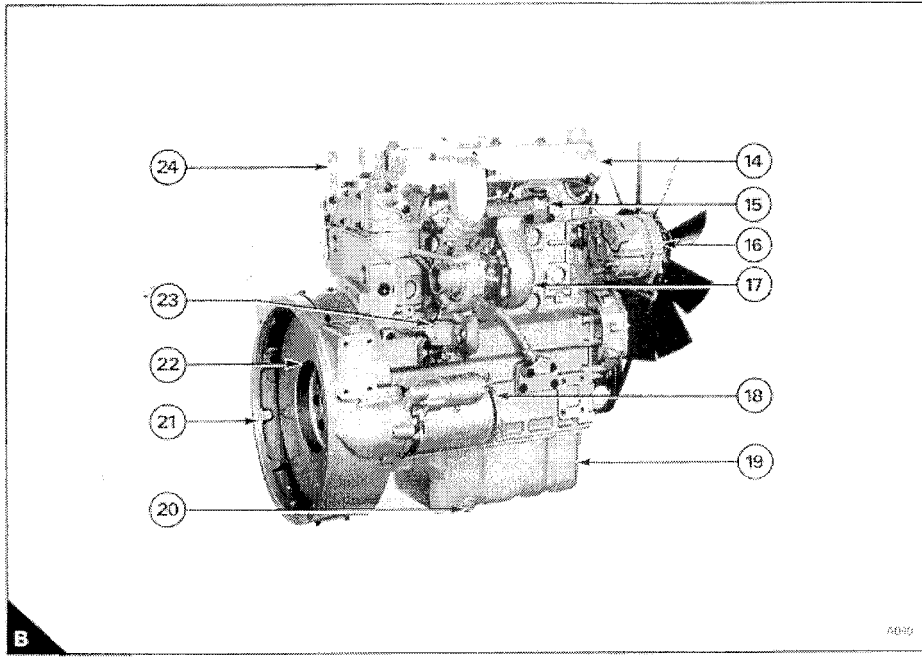
- 13 Alternator
- 14 Lubricating oil filter
- 15 Drive belts
- 16 Starter motor
- 17 Lubricating oil sump
- 18 Drain plug for lubricating oil
- 19 Flywheel housing
- 20 Flywheel
- 21 Fuel lift pump
- 22 Exhaust manifold
- 23 Induction manifold

	Typ/Model/Type	Datum/Edition/Date
	Perkins 1004/1006	01.2000
	Benennung/Description/Dénomination	Blatt/Page/Feuille
	Diesel engine	3.300.01



Front and left side view of AB engine (2.03/A)

- 1 Filler cap for lubricating oil
- 2 Fuel filter
- 3 Lubricating oil cooler
- 4 Fuel injection pump
- 5 Lubricating oil dipstick
- 6 Lubricating oil filter
- 7 Drain plug for lubricating oil
- 8 Crankshaft pulley
- 9 Drive belt
- 10 Fan
- 11 Water pump
- 12 Atomiser
- 13 Water outlet



Rear and right side view of AB engine (2.03/B)

- 14 Induction manifold
- 15 Exhaust manifold
- 16 Alternator
- 17 Turbocharger
- 18 Starter motor
- 19 Lubricating oil sump
- 20 Drain plug for lubricating oil
- 21 Flywheel housing
- 22 Flywheel
- 23 Fuel lift pump
- 24 Rear lift bracket

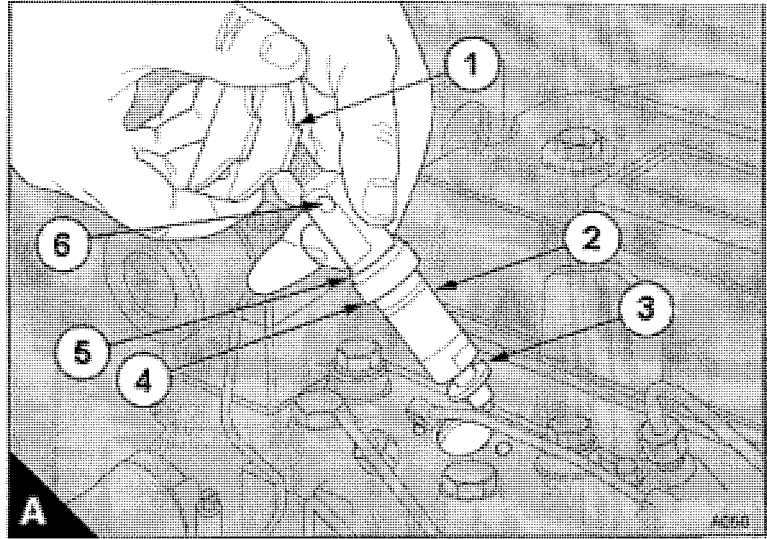
How to renew an atomiser

Attention: Do not allow dirt to enter the fuel system. Before a connection is disconnected, clean thoroughly the area around the connection. After a component has been disconnected, fit a suitable cover to all open connections.

- 1 Remove the fuel leak-off pipe.
- 2 Remove the union nuts of the high-pressure pipe from the atomiser and from the fuel injection pump. Do not bend the pipe. If necessary, remove the pipe clamps.
- 3 Remove the atomiser flange setscrews and remove the flange (A1), the atomiser (A2) and its seat washer (A3). Remove the dust seal (A4) and the spacer (A5) and fit the spacer and a new dust seal onto the new atomiser.
- 4 Put the new atomiser in position with its spacer, new dust seal and a new seat washer. Ensure that the fuel leak-off connection is not toward the engine. Fit the flange and engage the flange setscrews. Ensure that the atomiser is not tilted and tighten the flange setscrews evenly and gradually to 12 Nm (9 lbf ft) 1,2 kgf m.

Attention: Do not tighten the nuts of the high pressure pipes more than the recommended torque tension. If there is a leakage from the union nut, ensure that the pipe is correctly aligned with the atomiser inlet. Do not tighten the atomiser union nut more, as this can cause a restriction at the end of the pipe. This can affect the fuel delivery.

- 5 Fit the high-pressure fuel pipe and tighten the union nuts to 22 Nm (16 lbf ft) 2,2 kgf m. If necessary, fit the pipe clamps.
- 6 Renew the aluminium washers and fit the leak-off pipe.
- 7 Operate the engine and check for leakage of fuel and air.



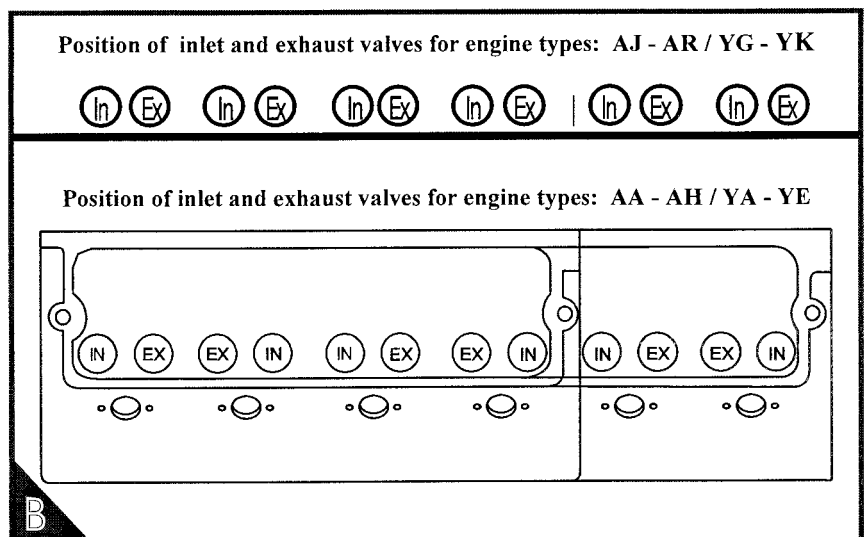
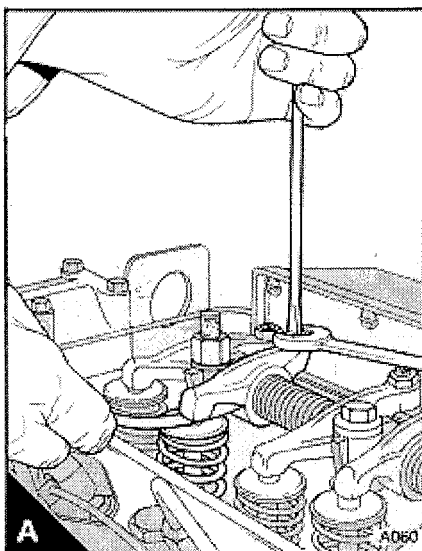
Four cylinder engines

How to check the valve tip clearances

These are checked between the top of the valve stem and the rocker lever (A), with the engine hot or cold. The correct clearances are 0,20 mm (0.008 in) for inlet valves and 0.45 mm (0.018 in) for exhaust valves. The valve positions are shown at (B)

Attention: Number 1 cylinder is at the front of the engine.

- 1 Turn the crankshaft in the normal direction of rotation until the inlet valve of number 4 cylinder has just opened and the exhaust valve of the same cylinder has not closed completely. Check the clearances of the valves of number 1 cylinder and adjust them, if it is necessary.
- 2 Set the valves of number 2 cylinder as indicated above for number 4 cylinder. Then check/adjust the clearances of the valves of number 3 cylinder.
- 3 Set the valves of number 1 cylinder. Then check/adjust the clearances of the valves of number 4 cylinder.
- 4 Set the valves of number 3 cylinder. Then check/adjust the clearances of the valves of number 2 cylinder.



How to eliminate air from the fuel system

There are two methods to eliminate air from the fuel system according to the type of pump fitted:

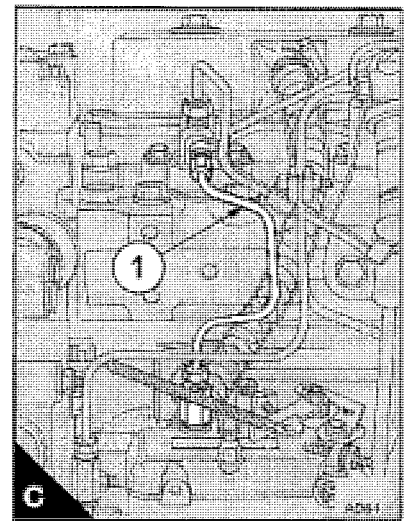
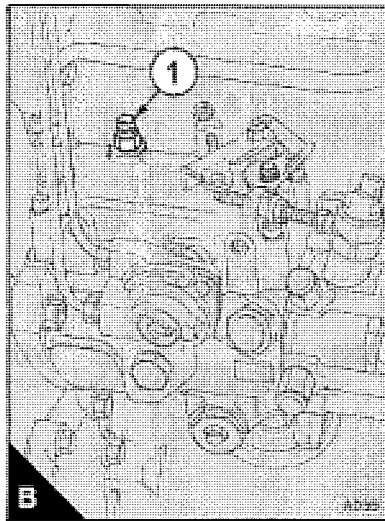
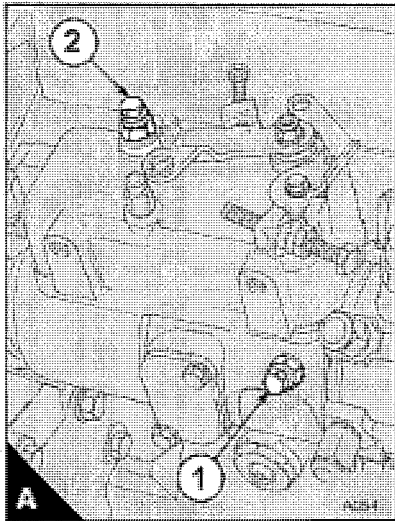
The standard method is used where the fuel injection pump has vent screws (A and B).

The self-vent method is used where the fuel injection pump has a self-vent feature. These pumps have a vent pipe (C1) fitted between a connection in the top of the pump and the atomiser leak-off pipe. Vent screws are not fitted to these pumps.

If air enters the fuel system, it must be eliminated before the engine can be started.

Air can enter the system if:

- The fuel tank is drained during normal operation.
- The low-pressure fuel pipes are disconnected.
- A part of the low-pressure fuel system leaks during engine operation.



Standard method

1 Loosen the vent plug on the top of the twin element fuel filter. If a single element filter is used, loosen the banjo connection bolt which is fitted on the top of the filter.

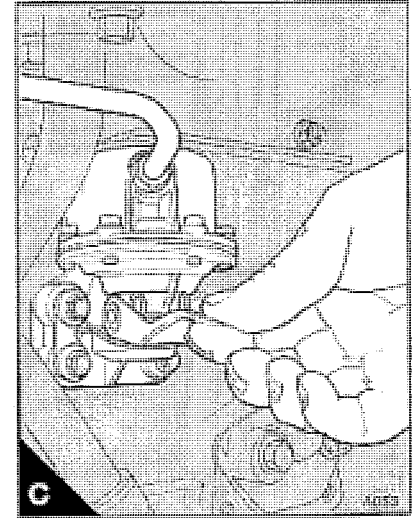
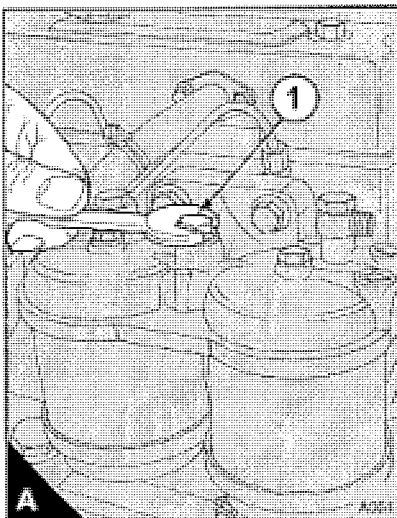
2 Operate the priming lever on the fuel lift pump until fuel, free from air, comes from the filter vent point. Tighten the vent plug or the banjo connection bolt. If the drive cam of the fuel lift pump is at the point of maximum cam lift, it will not be possible to operate the priming lever. In this situation, the crankshaft must be turned one revolution.

3 Ensure that the manual stop control is in the "run" position. If an electrical stop control is used, turn the start key to the "R" position.

4 For engine codes AA, AC, YA and YC: Loosen the vent screw in the lock screw of the hydraulic head and the vent screw on the governor cover of the fuel injection pump.

For engine codes AB, AD, YB and YD: Loosen the vent screw on the governor cover of the fuel injection pump.

5 Operate the priming lever of the fuel lift pump until fuel, free from air, comes from the vent screw(s). Tighten the vent screw(s).

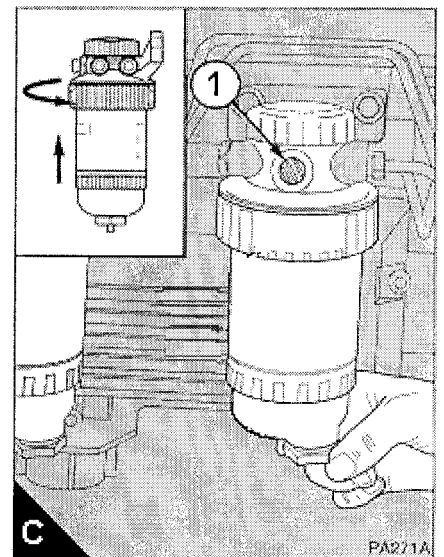
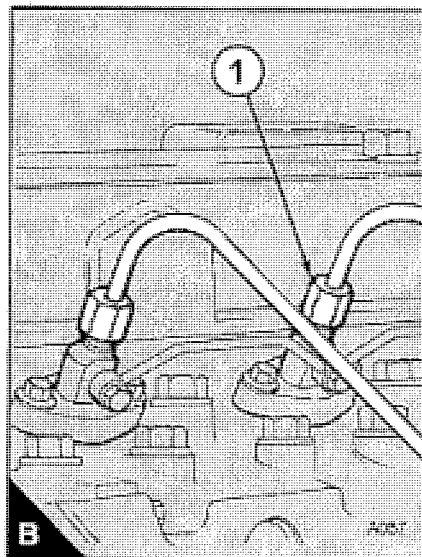
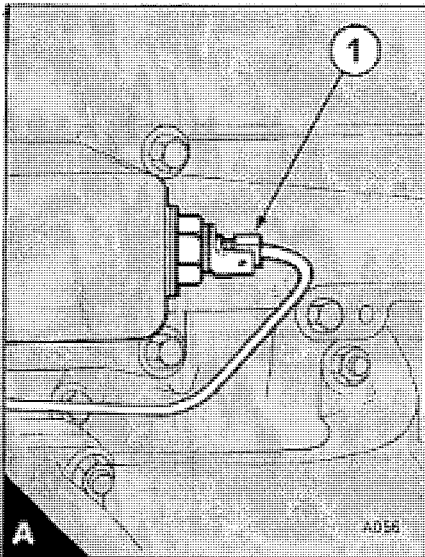


6 Loosen the union nut at the fuelled starting aid (if one is fitted) and operate the lift pump until fuel, free from air, comes from the connection. Tighten the union nut at the starting aid.

7 Loosen the union nut of the high-pressure pipes at two of the atomisers. Operate the starter motor until fuel, free from air, comes from the pipe connections. Tighten the high-pressure pipe connections.

Attention: Do not tighten the nuts of the high pressure pipes more than the recommended torque tension. If there is a leakage from the union nut, ensure that the pipe is correctly aligned with the atomiser inlet. Do not tighten the atomiser union nut more, as this can cause a restriction at the end of the pipe. This can affect the fuel delivery.

8 The motor is now ready to start. If the engine runs correctly for a short time and then stops or runs roughly, check for air in the fuel system. If there is air in the fuel system, there is probably a leakage in the low pressure system.



Self-vent method:

This method is used on the CAV and Stanadyne fuel injection pumps. Vent screws are not fitted to these pumps.

If the engine has been stopped by air in the fuel system:

Ensure that fuel has been added to the tank or that the leakage has been corrected.

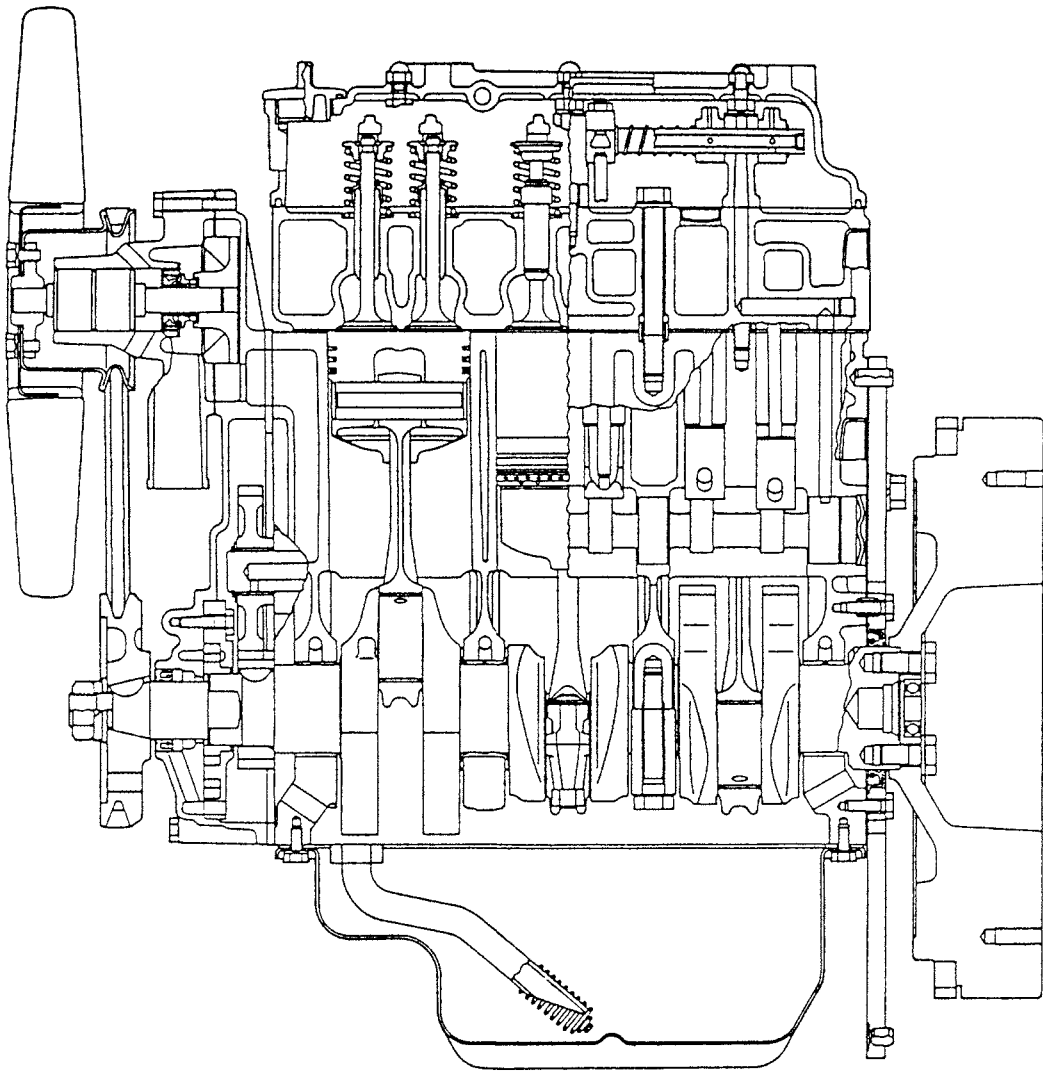
Attention: Although some fuel injection pumps will eliminate air automatically, use the procedure that follows to remove air from the fuel system to ensure that the battery will not discharge excessively:

1 Release the vent plug (A1) on the fuel filter head. Operate the priming lever of the fuel lift pump (C) until fuel, free of air, comes from the vent plug. Tighten the vent plug. If the drive cam of the fuel lift pump is at the point of maximum lift, it will not be possible to operate the priming lever. In this situation, the crankshaft must be turned one revolution.

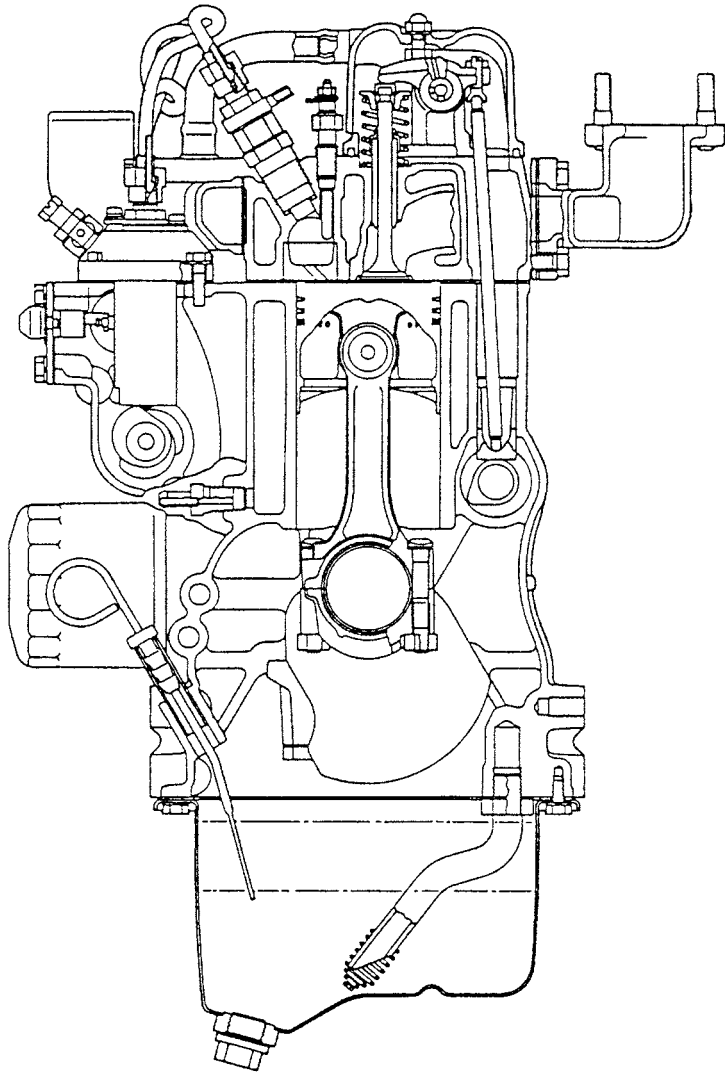
2 Loosen the high-pressure connections (1B) at the atomisers. Ensure that the manual stop control, if one is fitted, is in the „run“ position. Operate the starter motor until fuel, free of air, comes from the pipe connections. Tighten the connections to 22 Nm (2,2 kgf m).

Attention: Do not tighten the nuts of the high pressure pipes more than the recommended torque tension. If there is a leakage from the union nut, ensure that the pipe is correctly aligned with the atomiser inlet. Do not tighten the atomiser union nut more, as this can cause a restriction at the end of the pipe. This can affect the fuel delivery.

3 The engine is now ready to start. If the engine runs correctly for a short time and then stops or runs roughly, check for air in the fuel system. If there is air in the fuel system, there is probably a leakage in the low pressure system.



longitudinal section



cross section

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