IVECO NEF ENGINES
F4GE0484E - F4GE0684F - F4HE0684J

Service Manual

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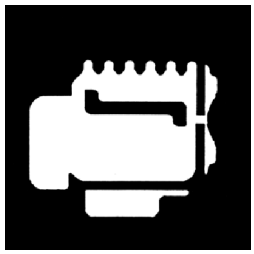
FIAT KOBELCO

EVOLVING TECHNOLOGY

ENGINE F4GE0484E OVERHAUL



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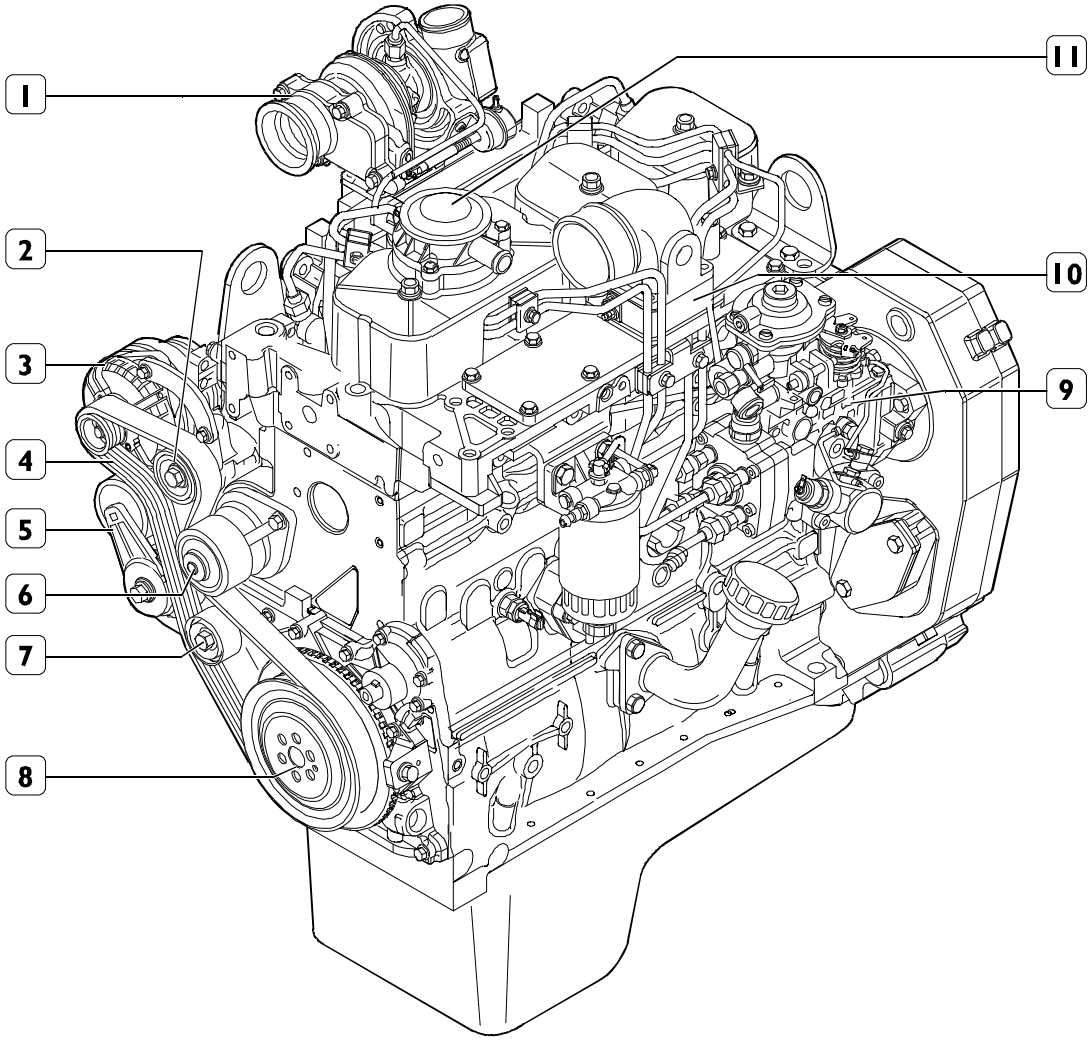
GENERAL REMARKS

Figure 2



1. Turbocompressor – 2. Fixed guide pulley – 3. Alternator – 4. Water pump and alternator drive belt – 5. Automatic belt stretcher – 6. Water pump - 7. Fixed guide pulley – 8. Crankshaft pulley - 9. In-line injection pump – 10. Cold start air heater – 11. Blow-by

DESCRIPTION OF MAIN MECHANIC ENGINE COMPONENTS

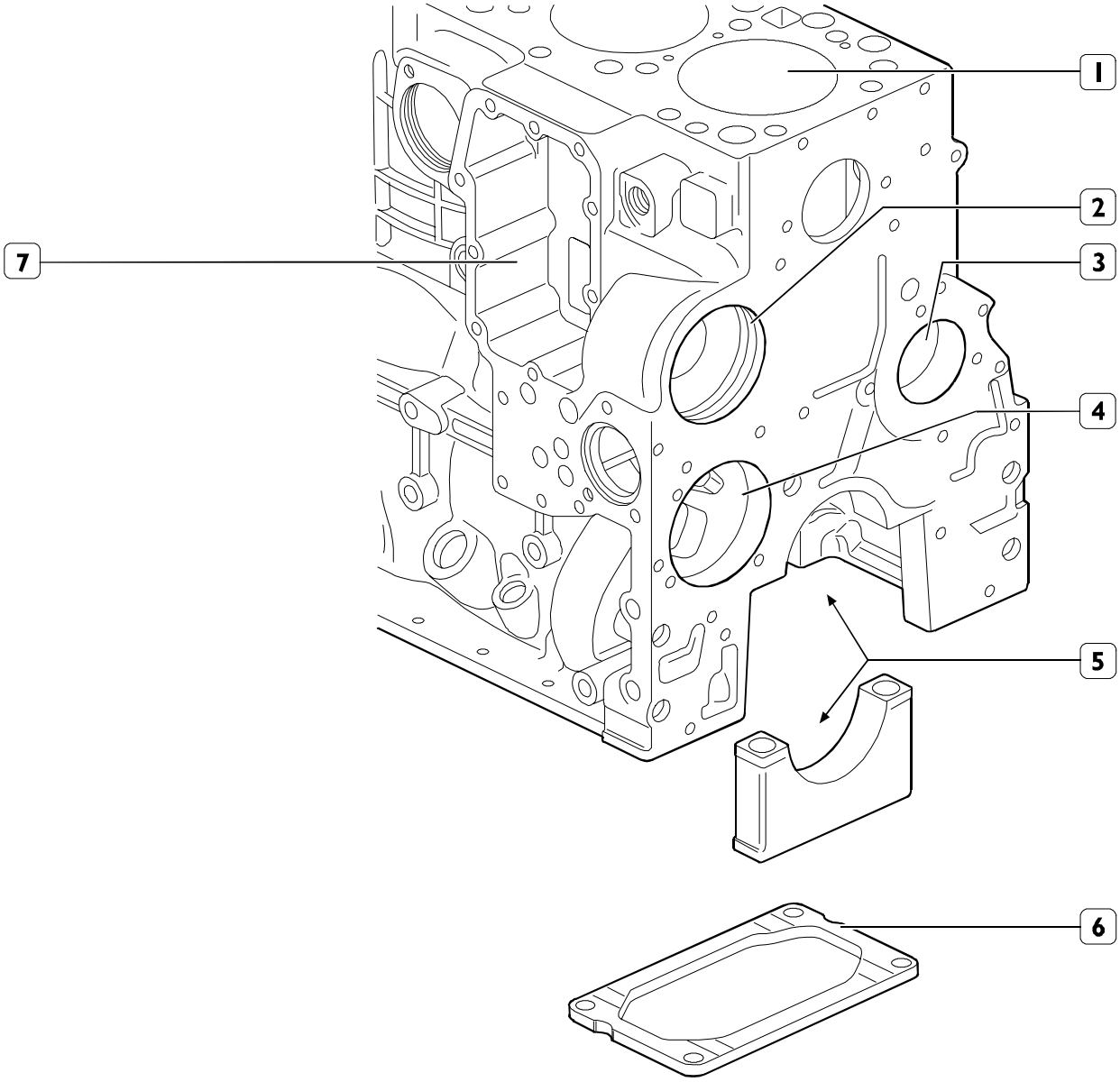
Crankcase

It consists of a cast-iron structure in which the following items are realized: cylinder liners (1); bed supports (5) and seats for: distributing shaft bushings (3), tappets, water/oil heat exchanger (7), water pump (2) and oil pump (4).

It also incorporates the coolant circulation chambers and the engine member lubricating circuit ducts.

Plate (6) is fitted to the lower part of the crankcase and ensures greater resistance to forces and stress.

Figure 3



Drive shaft

It is made of steel and rests on five induction-hardened supports.

Inside the drive shaft are the lubricating oil ducts.

The following items are force-fitted on the front shank: oil pump drive gear, phonic wheel, damper flywheel and auxiliary component drive pulley.

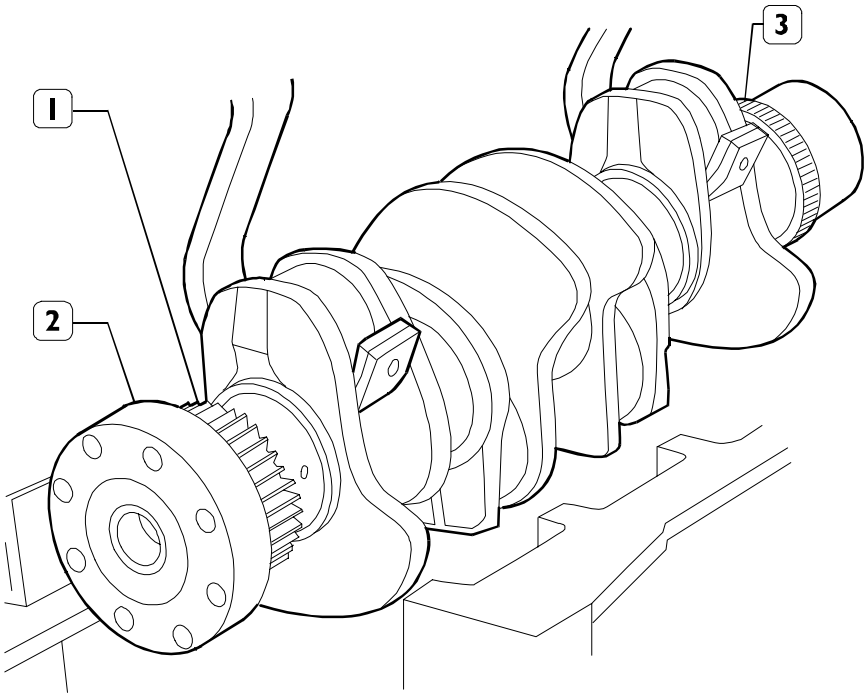
The following items are force-fitted on the rear shank: distributing shaft drive gear and engine flywheel mounting hub.

The main half bearings are made of steel with anti-friction alloy coating.

The second main half bearing is equipped with a shoulder to restrain the drive shaft end play.

Parts (1) and (3) are mounted in an interfering manner on the rear shank and cannot be replaced.

Figure 4



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1. Valve gear drive gear - 2. Flywheel attachment hub - 3. Oil pump drive gear

Drive shaft seal rings

The front and rear seal rings are of the “box” type, with radial seal. They can be removed by means of tools 380000980 and 380000981, and mounted by means of tools 380000983 and 380000984.

Connecting rods

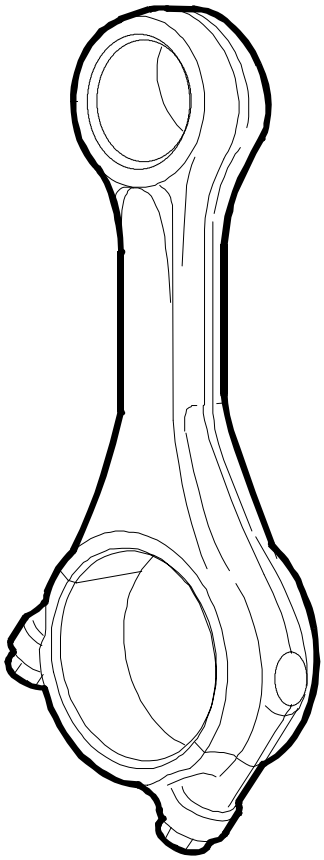
They are steel-stamped, of the oblique cut type, with separation of the cap obtained by an advanced technology (fracture split) instead of mechanic machining.

The connecting rod half bearings are made of steel, with anti-friction alloy coating.

Each connecting rod is marked:

- ❑ By a number (on the connecting rod body and cap) indicating its respective match and the cylinder in which it is mounted.
- ❑ By a letter (on the connecting rod body) indicating the weight class of the factory-assembled connecting rod.

Figure 5



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Pistons

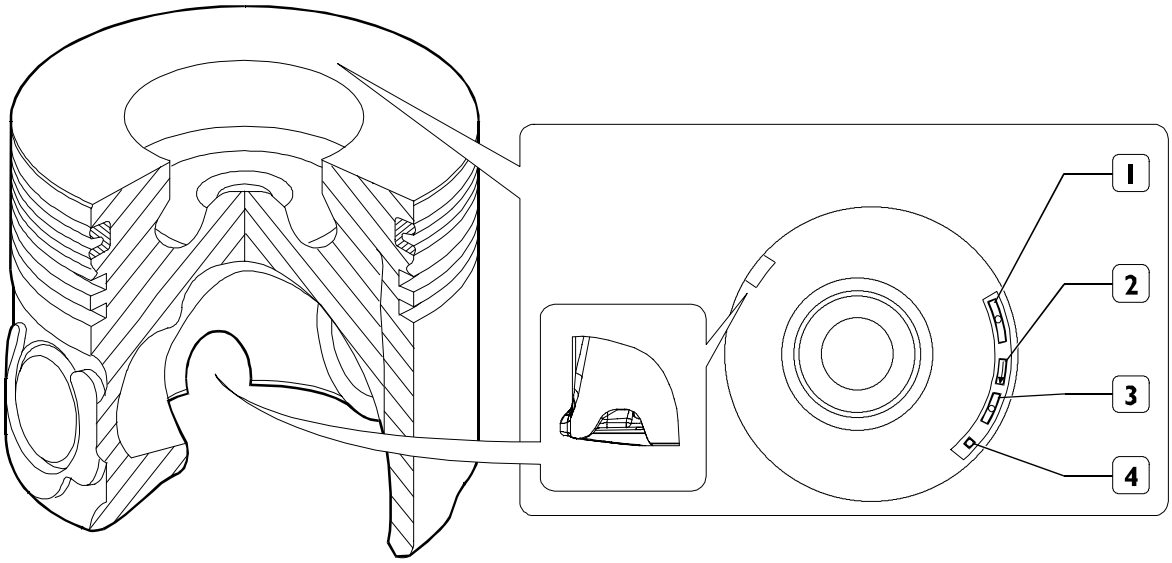
The combustion chamber is machined in the piston crown. The crown of the piston is cooled by the engine oil supplied by the sprayer.

There are three grooves that house the compression rings; the 1st of which is V shaped and is obtained using a cast iron insert.

The following references are engraved on the crown of the piston:

1. Spare part number and design change number.
2. Arrow indicating the assembly sign of the piston in the cylindrical liner; this must be facing towards the front side of the engine block.
3. Date of manufacture.
4. Stamp indicating testing of the 1st groove insert

Figure 6



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Distributing shaft
The distributing shaft rests on five supports in the crankcase.

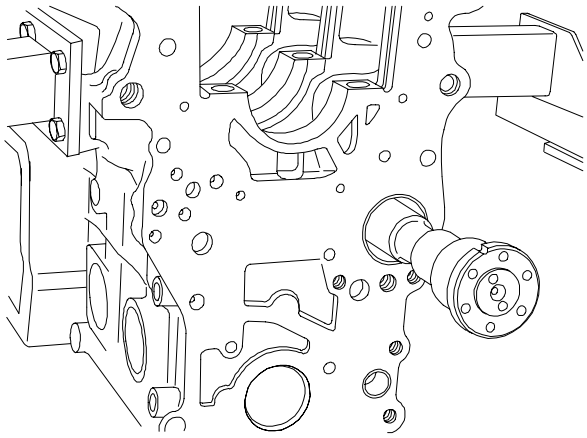
The supports (front and rear) are equipped with steel bushings mounted in an interfering manner and coated with anti-friction material; two control eccentrics are provided for each cylinder.

A. Intake valve control

B. Exhaust valve control

The distributing shaft is controlled directly by the drive shaft by means of straight-tooth gears.

Figure 7



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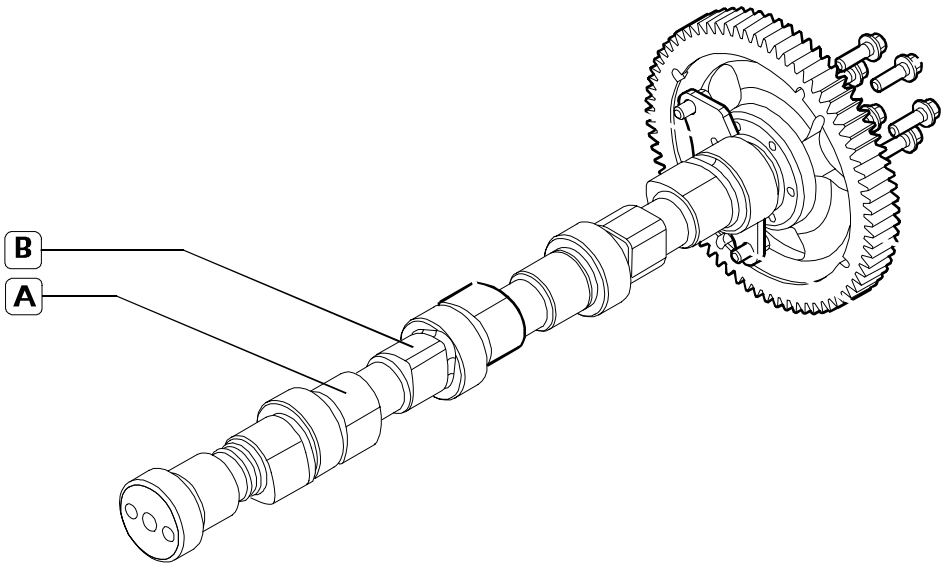

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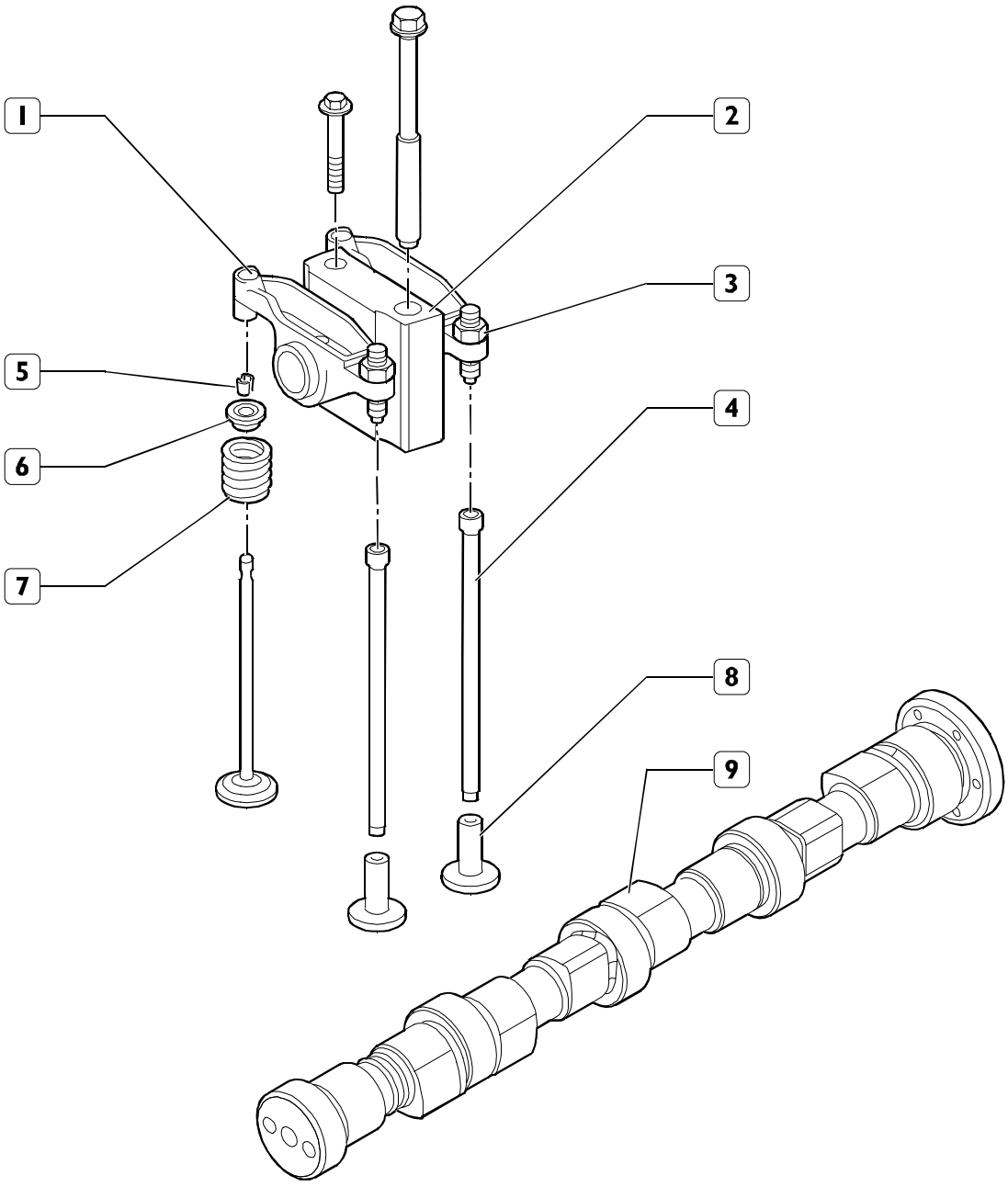
Valve control

Figure 8



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1. Rocker arm – 2. Arbour support – 3. Adjusting screw – 4. Rod – 5. Lock cones – 6. Cup – 7. Spring – 8. Tappet – 9. Distributing shaft

Cylinder head

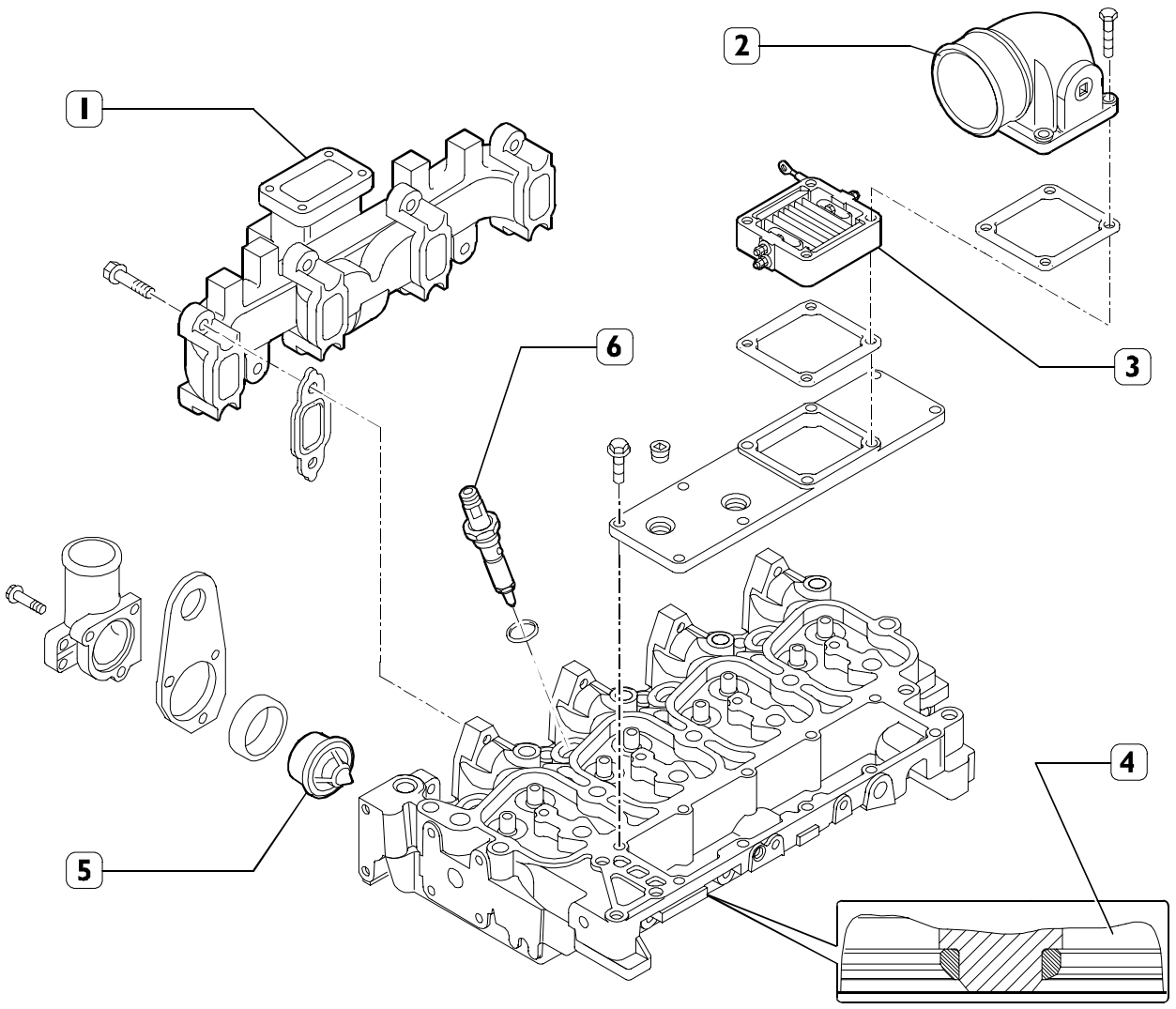
The seats of the following parts are obtained from the cast-iron cylinder head:

- ❑ inserted valve seats (4);
- ❑ injector (6);
- ❑ thermostat (5);

Moreover, the following components are inserted on the heads:

- ❑ single-block exhaust manifold (1);
- ❑ intake manifold (2) with seat for cold start air heater (3).

Figure 9



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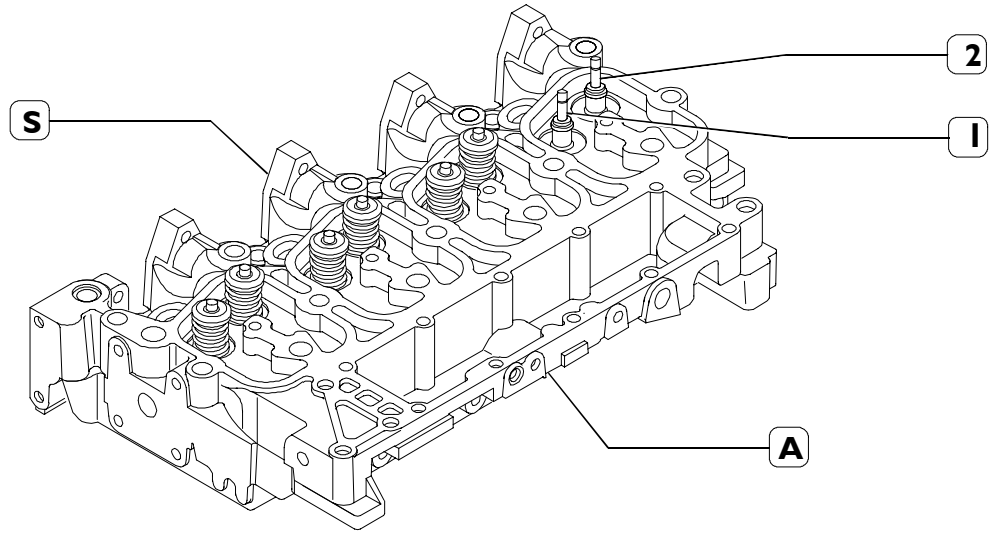
DETAIL OF CYLINDER HEAD WITH INSERTED VALVE SEATS

Valves and valve seats

Figure 10



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1. Intake valve – 2. Exhaust valve – A. Intake side – S. Exhaust side.

The valve seats inserted on the cylinder head have the following inclination:

- ❑ 45° (exhaust valves)
- ❑ 60° (intake valves).

The exhaust valves (2) differ from intake valves in that they have only one notch at the stem end.

Figure 11

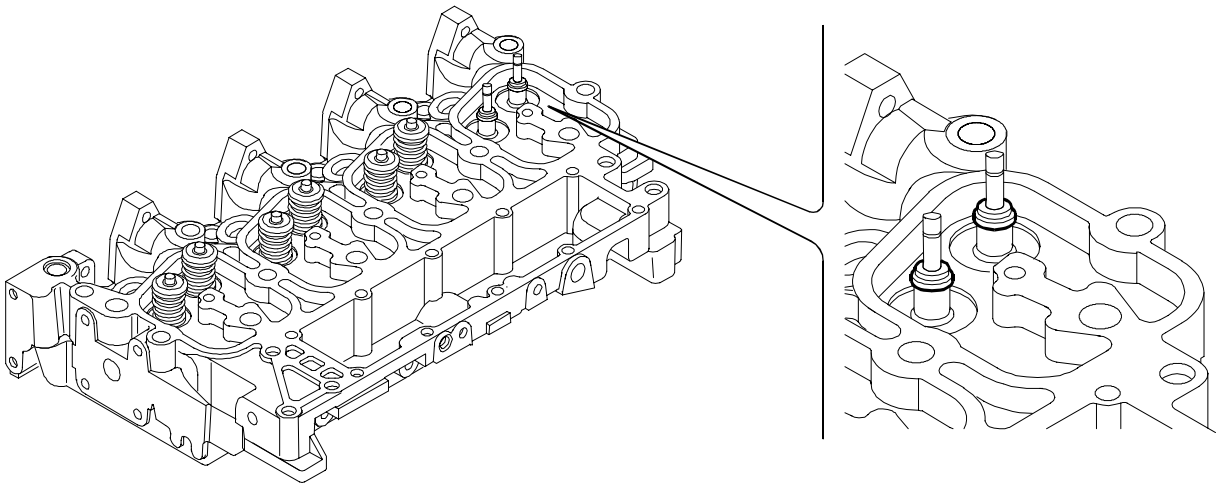

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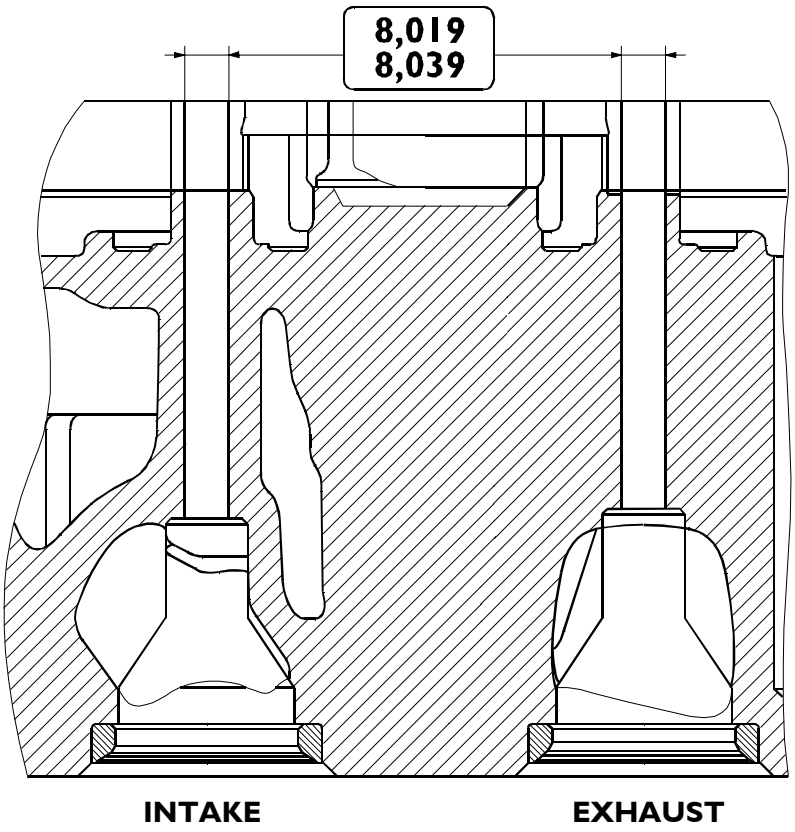
Figure 11 shows the oil seals mounted on valve stems.

Valve guides

Figure 12

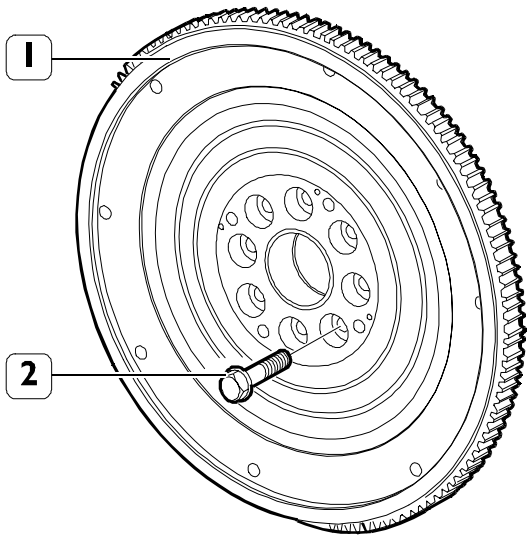


DETAIL OF VALVE GUIDES AND SEATS

Engine flywheel

The flywheel (1) does not need being positioned in a fixed manner on the drive shaft, since it does not bear any stamping, notch or reference hole for sensors or timing. The equidistance of fastening screw holes (2) allows it to be mounted in any position.

Figure 13



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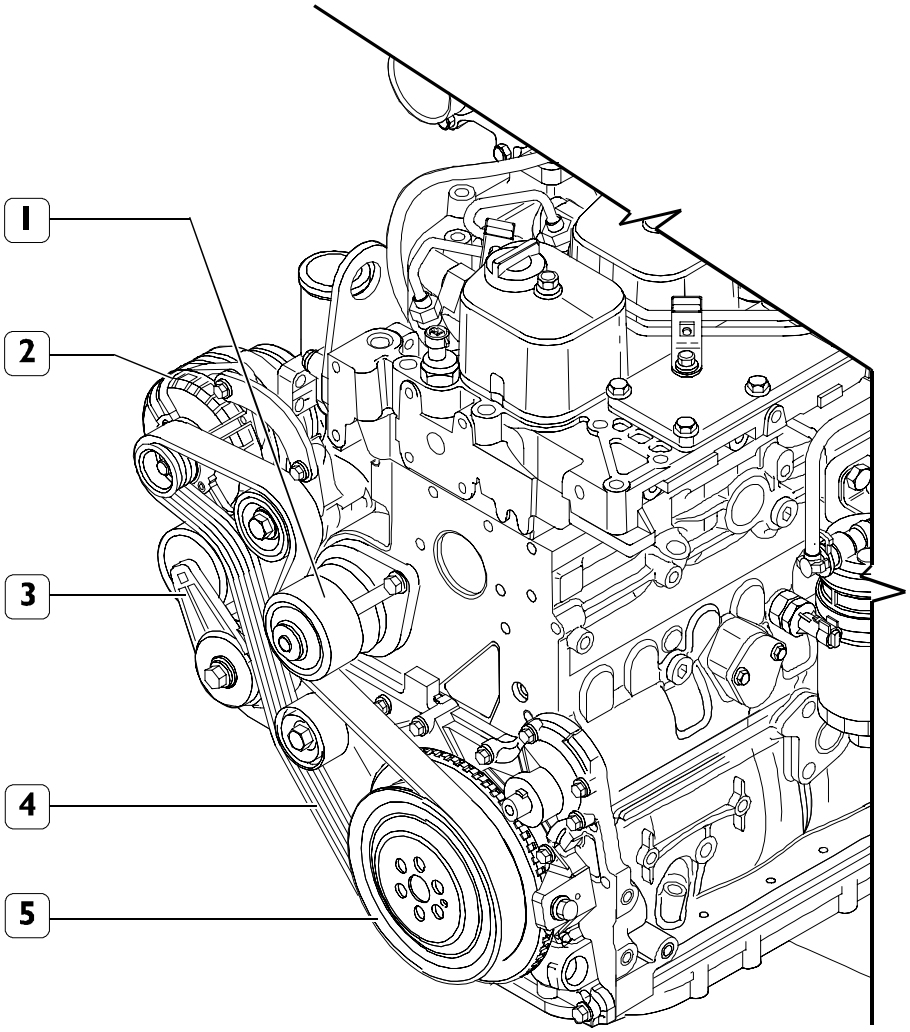
Auxiliary component drive

A Poly-V belt (4) transmits the movement of the crankshaft (5) to the water pump (1) and to the alternator (2).

The belt is stretched by means of automatic belt stretcher (3).

Figure 14



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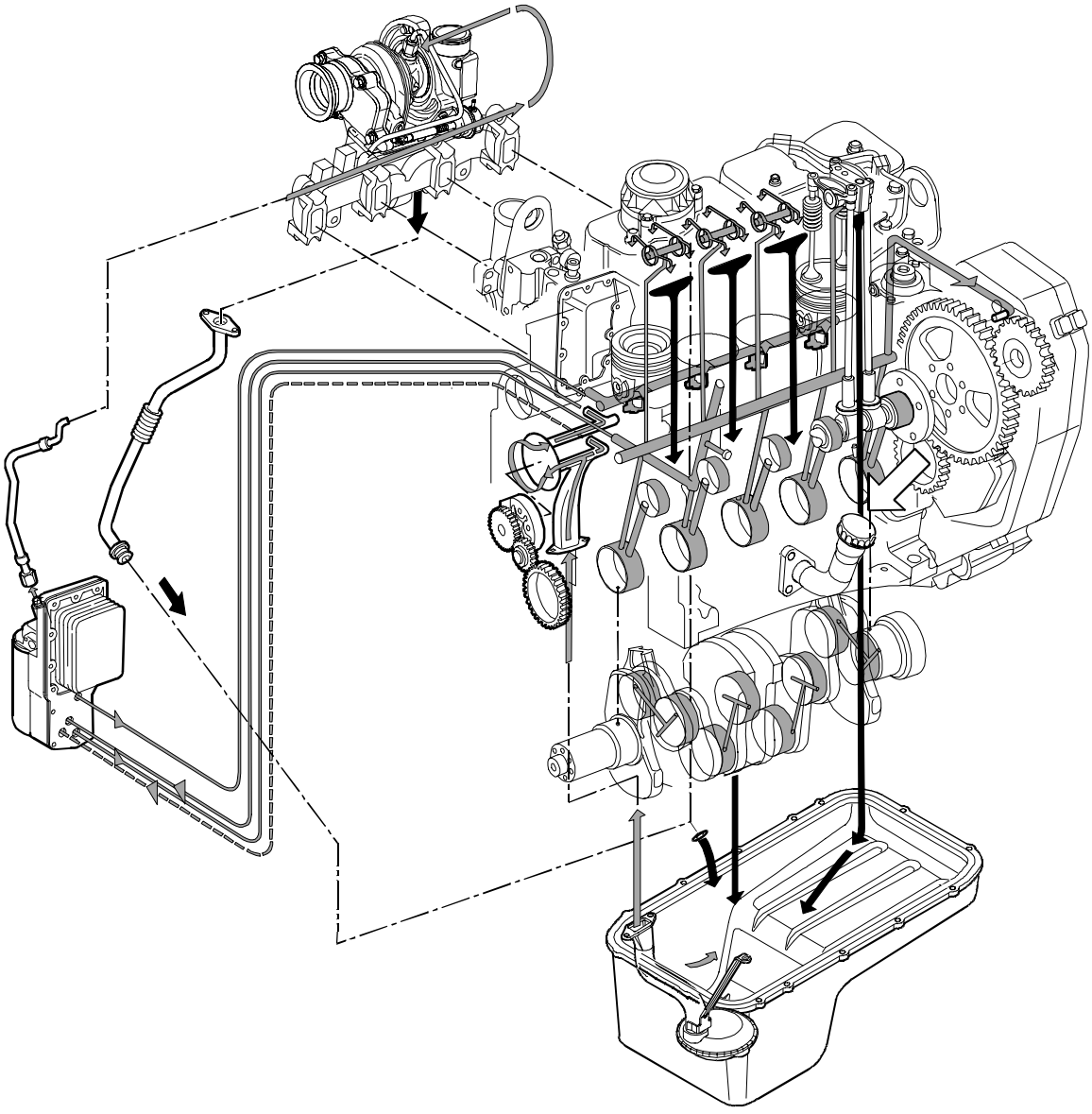
1. Water pump - 2. Alternator - 3. Belt stretcher - 4. Poly-V belt - 5. Drive shaft

LUBRICATION

Forced circulation lubrication is performed by the following components:

- ❑ rotor-equipped oil pump housed in the crankcase front part, controlled by the straight-tooth gear force-fitted on the drive shaft shank;
- ❑ water / oil heat exchanger housed in the crankcase;
- ❑ oil pressure control valve;
- ❑ by-pass valve for clogged oil filter cut-off, built into the oil filter adapter;
- ❑ cartridge-type oil filter.

Figure 15



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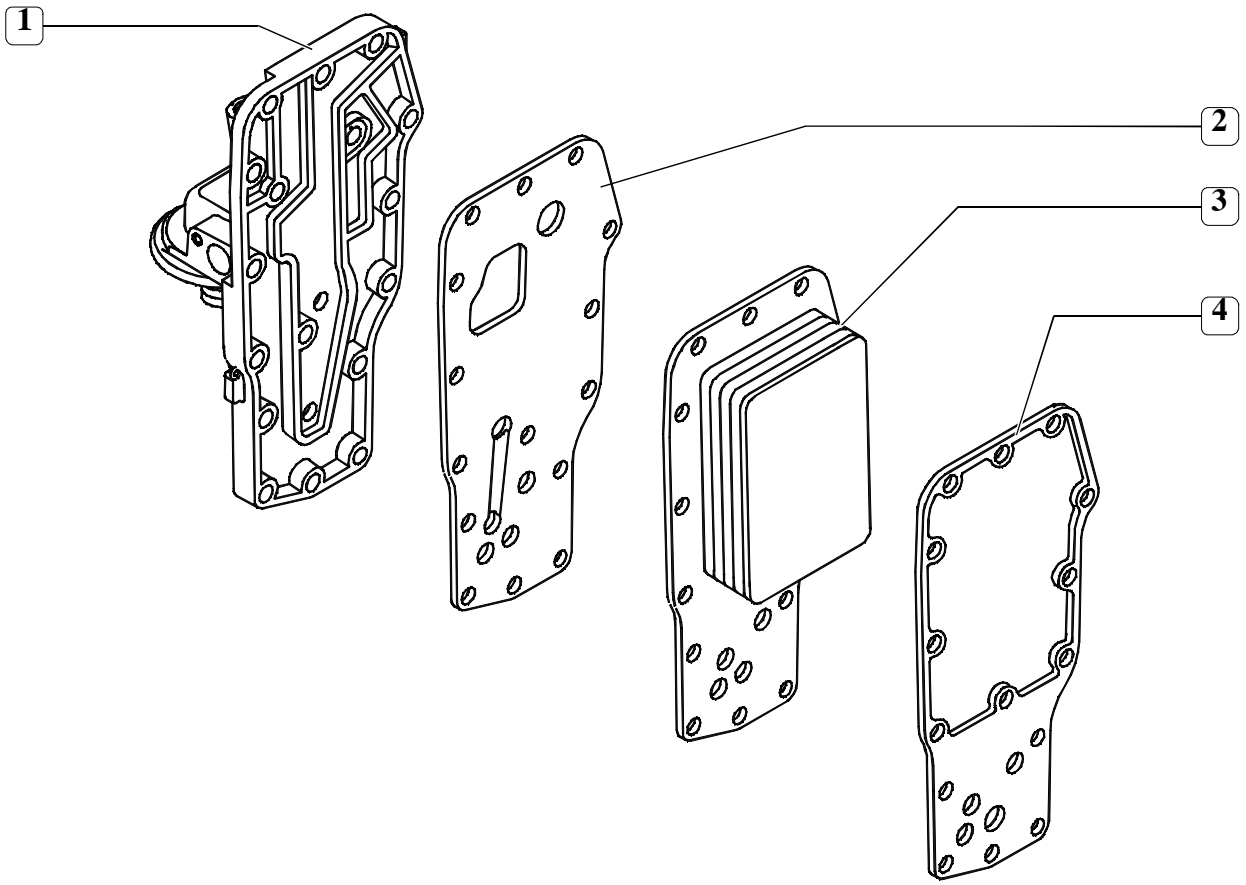
Oil return drop-type path

Pressure oil path

Oil supply

Heat exchanger

Figure 16



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1. Heat exchanger body – 2. Inner gasket – 3. Water / oil heat exchanger – 4. Gasket between exchanger unit and engine block

Oil pump

Figure 17

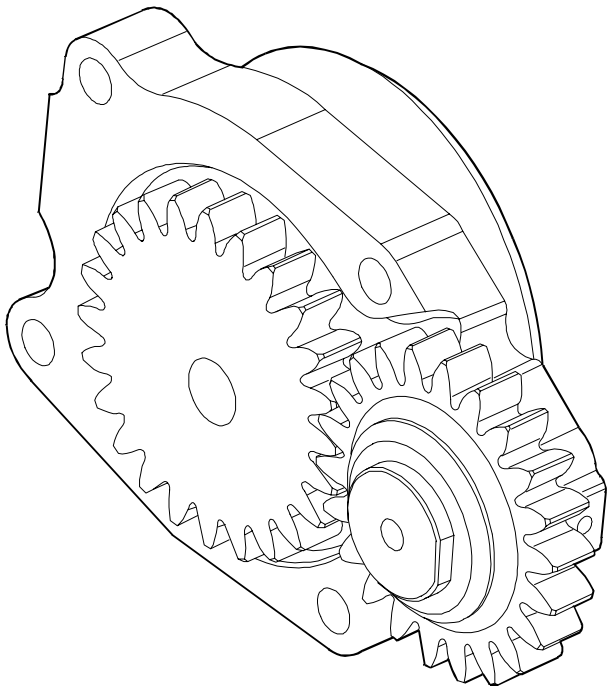

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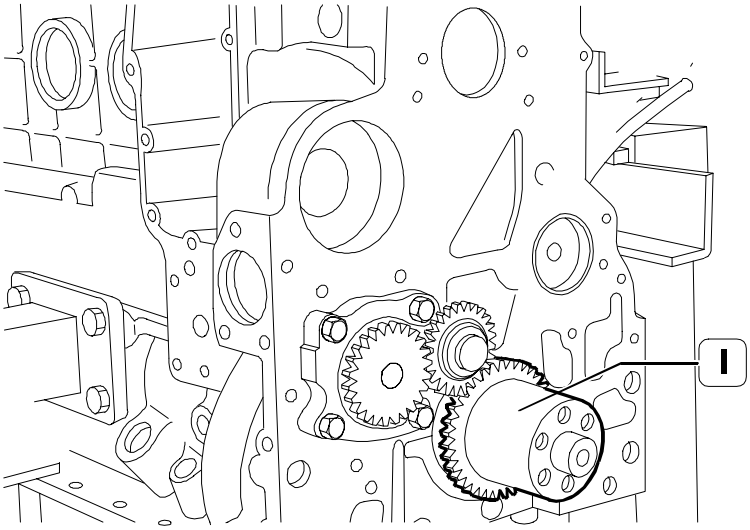
Figure 18



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1. Drive shaft with oil pump drive gear

Oil sump

The oil sump (1) is secured elastically to the crankcase by means of an aluminium plate (3), Figure 19.

The C-section rubber gasket (2) (fitted onto the oil sump leading profile) enhances sealing properties and also deaden noise.

This type of gasket can only be replaced in case of deterioration or break, and not necessarily at every single disassembling operation.

Figure 19

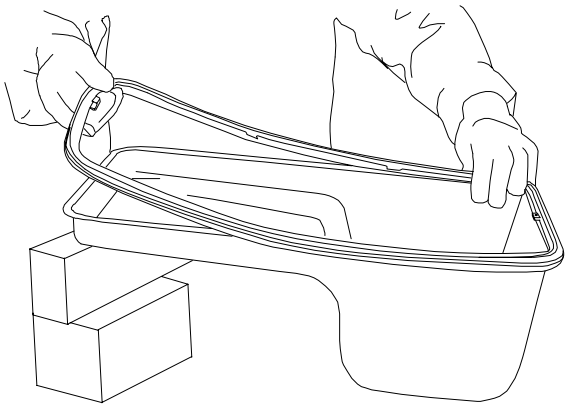

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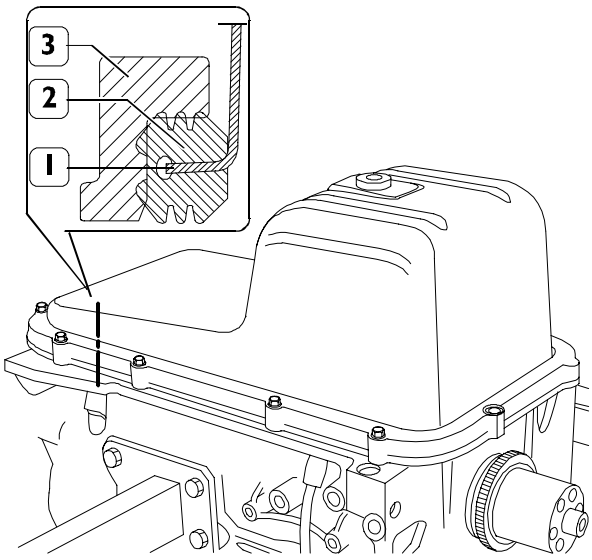
Figure 20



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