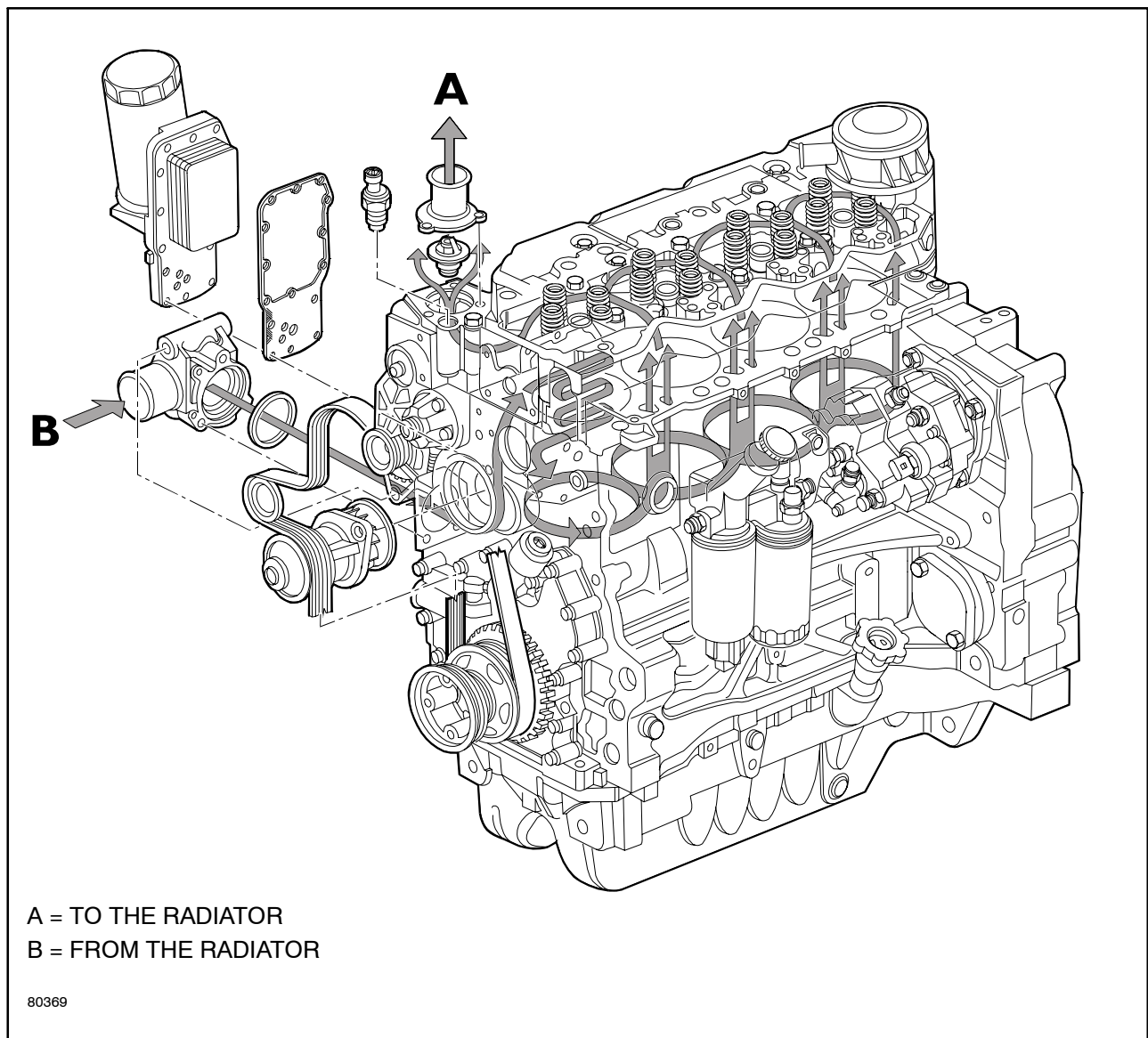

TS100A, TS110A, TS115A, TS125A, TS130A AND TS135A REPAIR AND T6010, T6020, T6030, T6050, T6070 REPAIR

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DESCRIPTION OF OPERATION**COOLING**

The forced circulation, closed-circuit engine cooling system is composed of the following components:

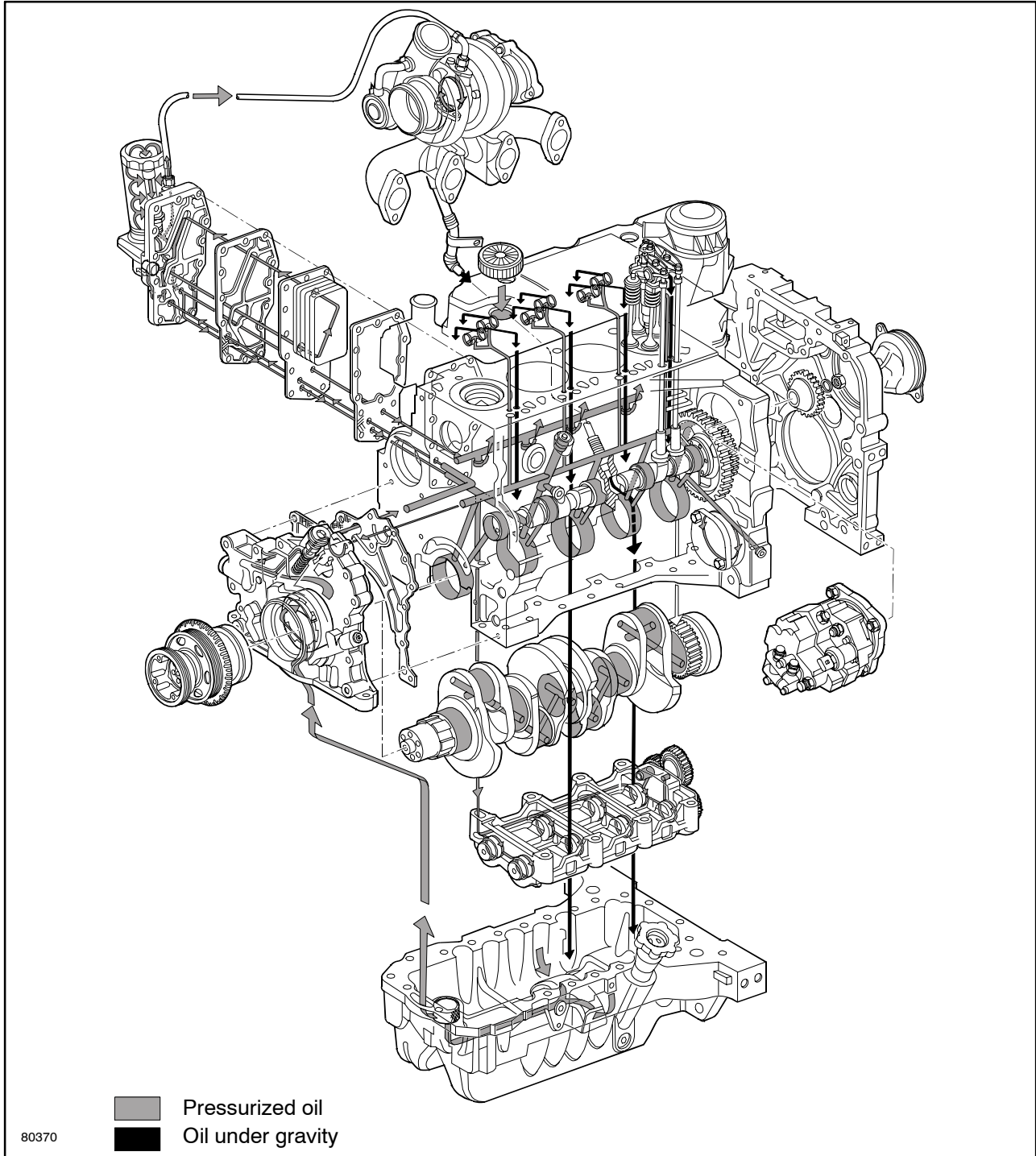
- Expansion tank: its location, shape and size may change depending on the engine version.
- Radiator, whose job is to dissipate the heat taken by the coolant from the engine. This component, too, is a feature of the version as regards both positioning and engine.
- Viscostatic fan, with the task of increasing the radiator's dissipating capacity: this, too, belongs to the specific engine version.
- A lubricating oil cooler: this, too, belongs to the specific engine version.
- A centrifugal coolant pump housed at the front of the crankcase.
- A thermostat governing coolant circulation.
- The circuit may also extend to the compressor if the version includes it.



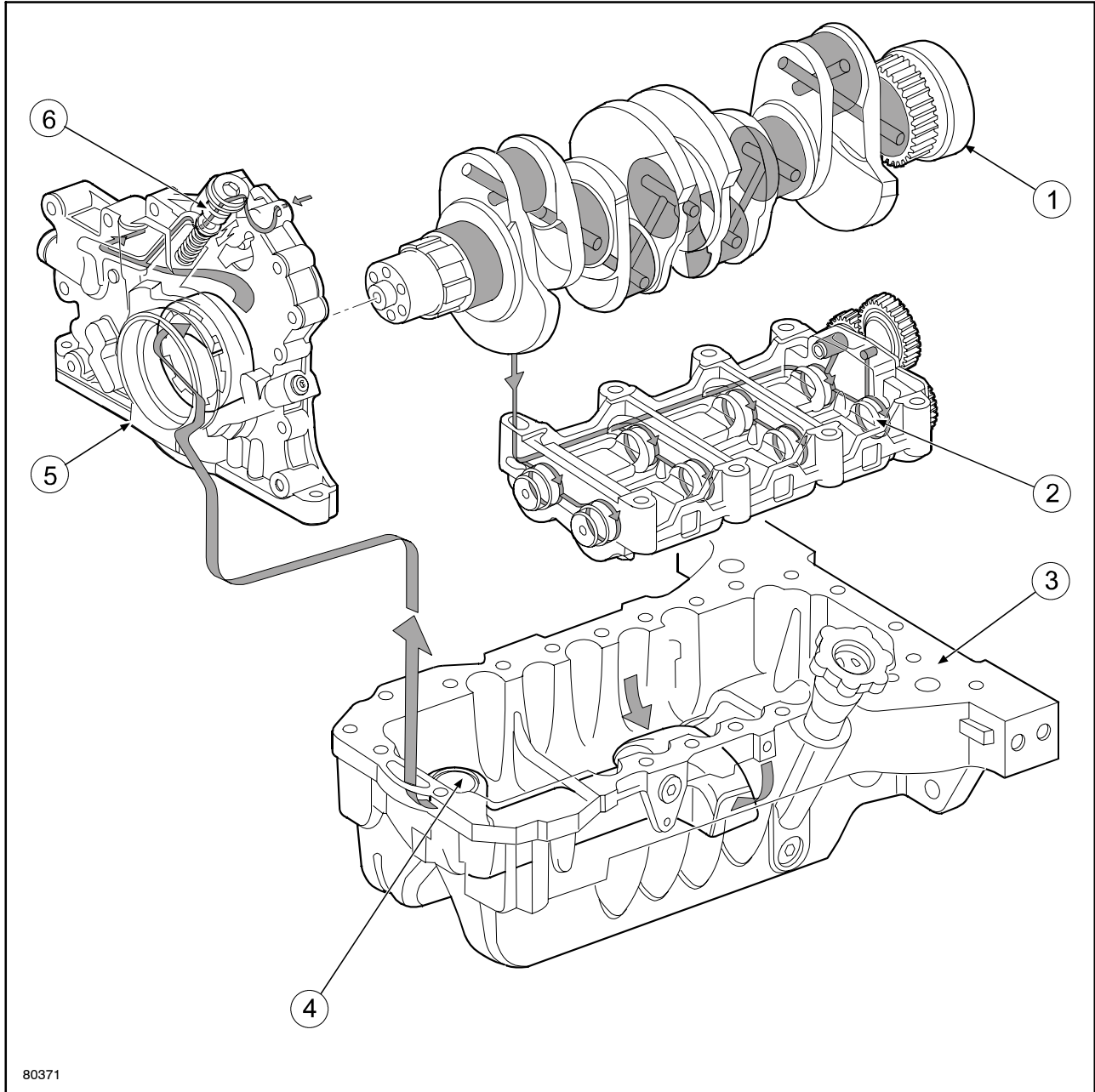
LUBRICATION

Forced-circulation lubrication is accomplished by the oil pump, housed at the front of the crankcase. The lubricating oil is sent from the oil sump to the crankshaft, camshaft and valve control.

Lubrication also includes the cooler, turbo-blower and compressor for the compressed air system if there is one. All these components often change according to use and will therefore be covered under the specific heading.



LUBRICATION SYSTEM COMPONENTS



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1. Crankshaft – 2. Balancing weight – 3. Oil sump with suction rose – 4. Suction rose in oil sump –
5. Oil pump – 6. Relief valve.

ENGINE OVERHAUL

INTRODUCTION

Removal

To remove engine from tractor see Section 01 "Separating the Tractor."

DISASSEMBLY

Some of the operations described in this section can be carried out directly with the engine fitted on the vehicle, depending on access to the engine bay and on the version.

⚠ CAUTION ⚠

The operations for removing the engine, as those for overhaul, must be performed by skilled personnel using specific tools.

Fuel System/Preparing Engine to Mount on Rotating Stand

To be able to fit the brackets **380001298** (for fixing the engine to the overhaul stand, **380000301**) to the crankcase, it is necessary to work from the left-hand side of the engine:

1. Remove the fuel filters (6) from the mounting (1);
2. Disconnect the electrical connection (2) from the mounting (1) and the one to the heater (again located on the filter mounting);
3. Disconnect the fuel pipes (3 - 4 - 5) from the mounting (1);
4. Remove the bracket supporting the mounting (1) from the crankcase.

⚠ CAUTION ⚠

To disconnect the fuel pipes (3 - 4 - 5, Figure 11) from the relevant fittings, you need to press the clip (1) as shown in Figure 12, B.

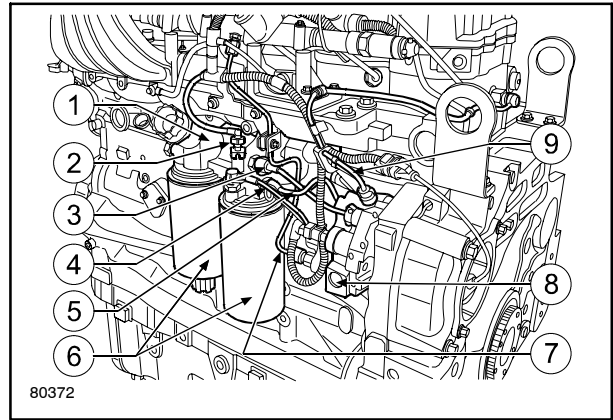
After disconnecting the piping, put the clip (1) back in its locking position (Figure 12, A) to prevent it getting buckled.

5. Disconnect the high-pressure fuel pipe (7, Figure 1) from the rail choke tube and from the high-pressure pump (8) and remove it from the crankcase by taking out the bracket.
6. Disconnect the pipe 9 from the high-pressure pump (8).

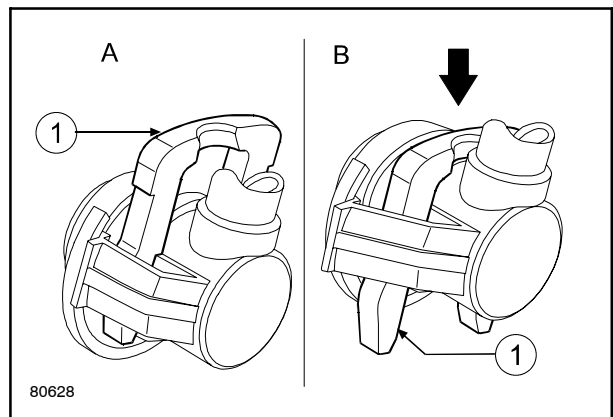
⚠ CAUTION ⚠

Depending on the high pressure in the piping from the high-pressure pump to the rail and from here to the electro-injectors, **never**:

- disconnect the pipes with the engine running,
- reuse disconnected pipes.

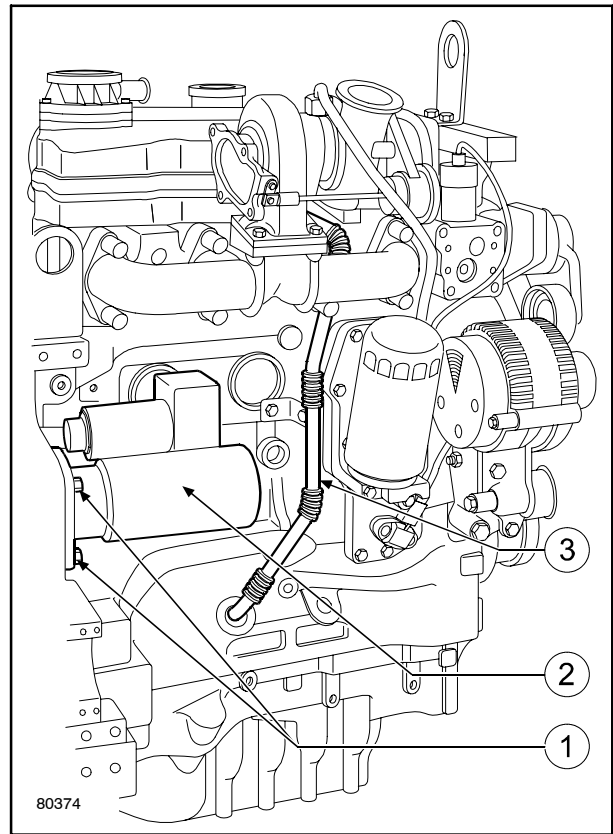


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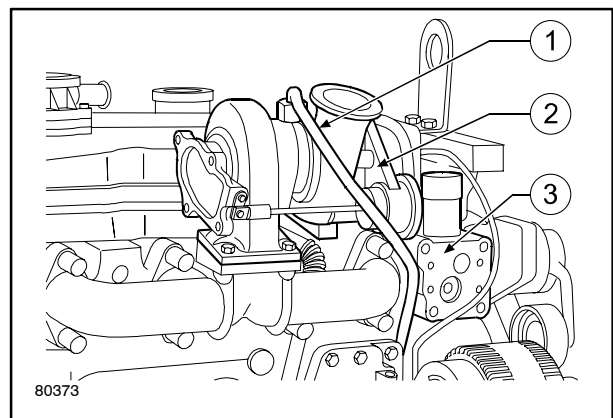
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7. Remove the oil filler pipe (3).
8. Unscrew the fixing screws (1) and remove the starter motor (2) from its seat.



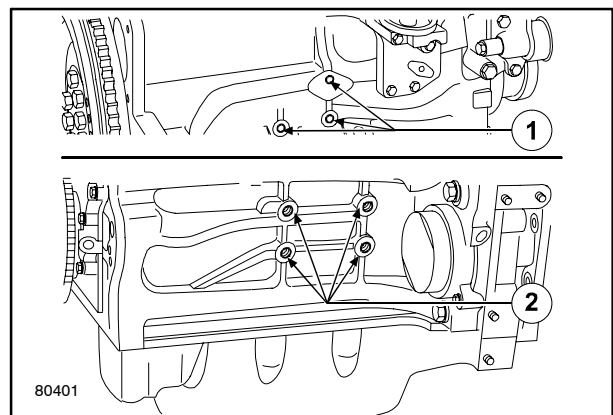
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9. Working from the right-hand side of the engine, disconnect the lubricating pipe (1) from the top of the cooler to the turbo-blower (2).
10. Remove the thermostat body (3) together with the seal.

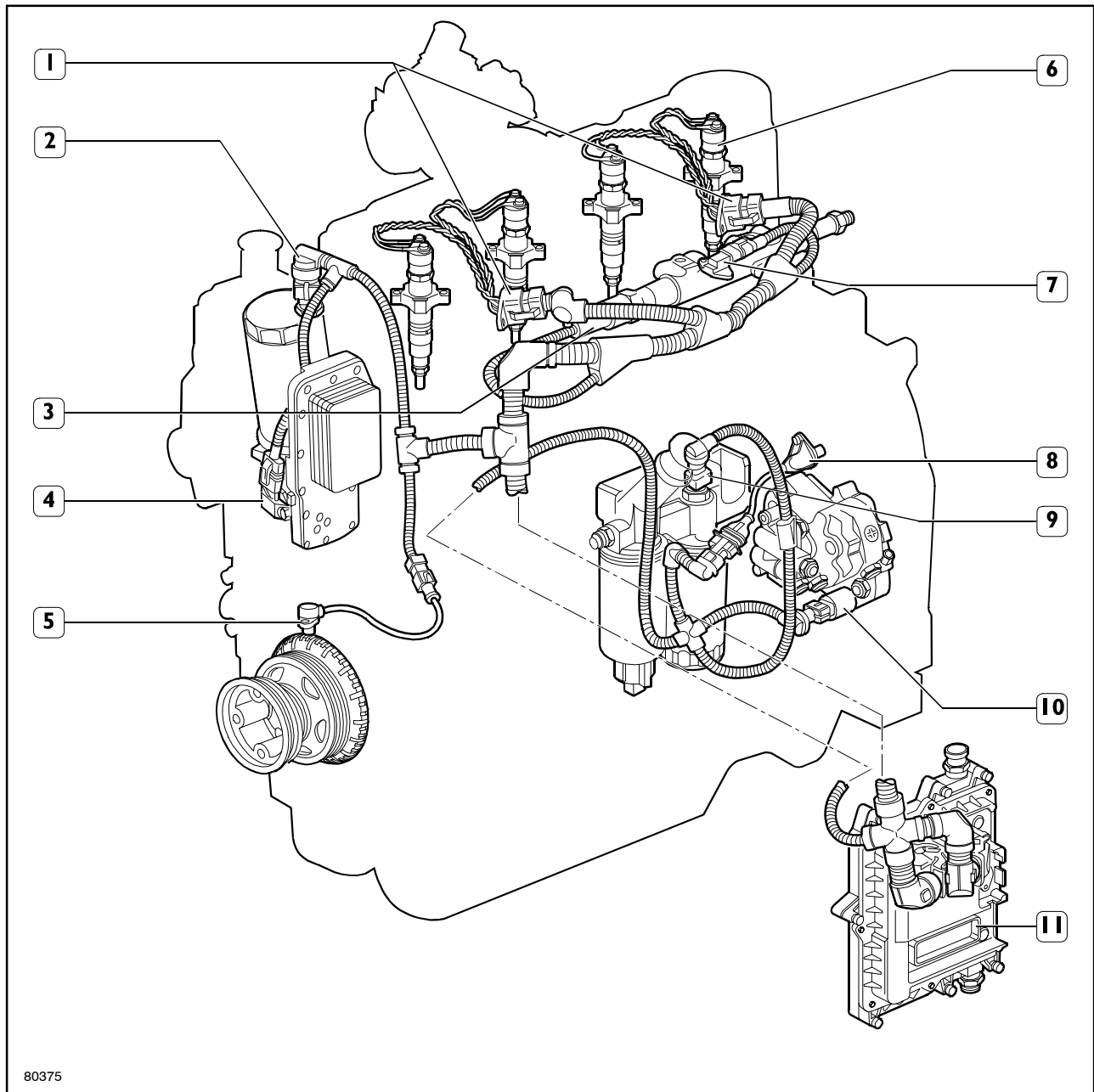


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11. Fit brackets **380001298** into the holes (1) and (2) in the crankcase on both sides and, using these brackets, secure the engine to the rotating stand **380000301**. Drain off the engine oil by removing the plug from the sump.



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REMOVING COMPONENTS OF THE APPLICATION

1. Connection for electro-injectors - 2. Engine coolant temperature sensor -
3. Fuel pressure sensor cable - 4. Engine oil pressure and temperature sensor - 5. Crankshaft sensor -
6. Electro-injector - 7. Air pressure temperature sensor - 8. Timing system phase sensor -
9. Fuel temperature sensor - 10. Pressure regulator wiring - 11. EDC7C control unit

Electrical Connections

12. Disconnect the engine cable from the connectors: (1) electro-injector wiring (6); (7) air pressure/temperature sensor; (3) fuel pressure sensor; (11) EDC control unit; (10) high-pressure pump sensor; (8) timing system phase sensor; (2) engine coolant temperature sensor on thermostat; (5) crankshaft speed sensor.

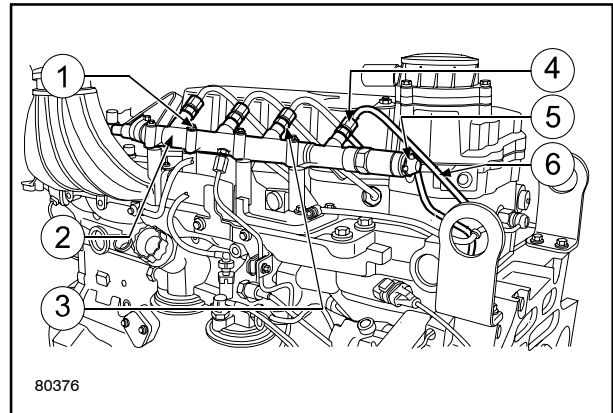
Fuel Rail

13. Take off the clamps fastening it to the crankcase and remove it completely.
14. Disconnect the fuel pipes (5) from the rail (2) and from the manifolds (6) for the electro-injectors.



When locking the fittings (4) securing the pipes (6) to the rail (2), using an appropriate wrench, you must prevent the flow limiters, if fitted, (3) from turning.

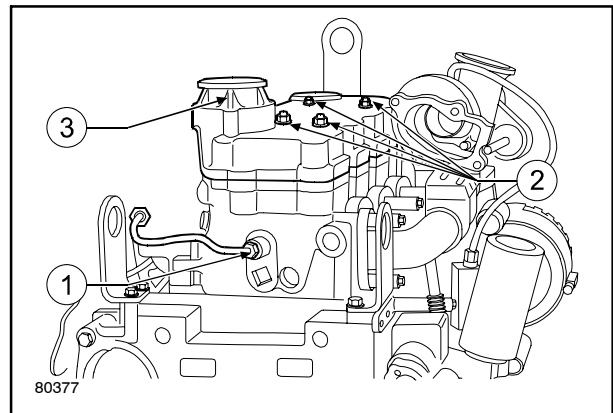
15. Remove the screws (1) and detach the rail (2).



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Cylinder Head

16. Disconnect the piping from the fuel return pressure limiter (1).
17. Undo the nuts (2) and take off the tappet cover (3).

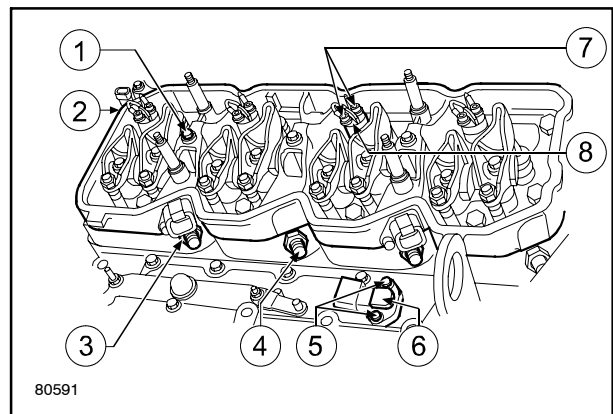


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18. Remove the nuts (7) and disconnect the electric cables from the electro-injectors (8).
19. Take out the screws (1) and remove the electro-injector wiring mounting (2) together with its seal.
20. Take out the screws (5), remove the air temperature/pressure sensor (6).
21. Remove the nuts (3) and extract the fuel manifolds (4).

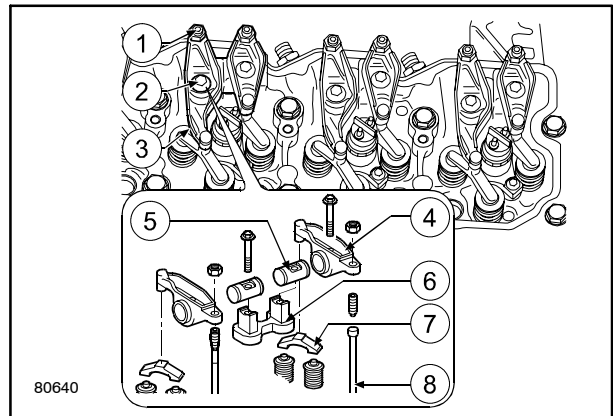


Once removed, the fuel manifolds (4) must not be re-used; they must be replaced with new ones.



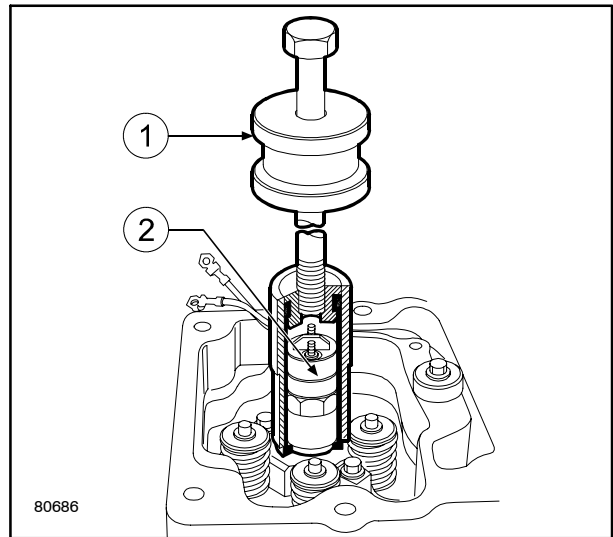
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22. Loosen the tappet adjuster fixing nuts (1) and unscrew the adjusters.
23. Take out the screws (2), remove the rocker-arm assembly (3) comprising the mounting (6), rocker arms (4) and spindles (5) then remove the bridges (7) from the valves.
24. Remove the rods (8).



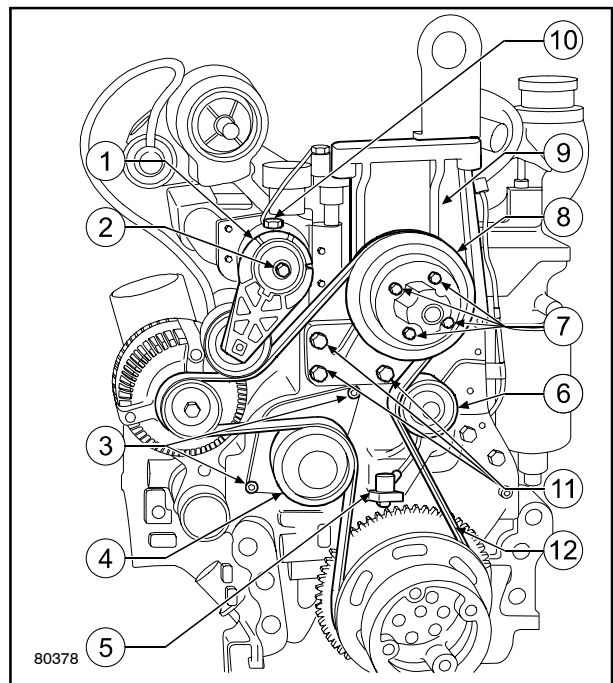
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25. Take out the screws securing the electro-injectors and, using tool **380001099** (1), extract the electro-injectors (2) from the cylinder head.



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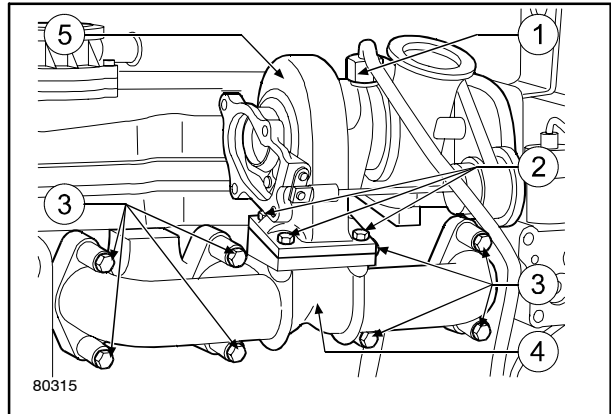
26. Working on the tightener (1), extract the belt (12) from the pulleys of the alternator, coolant pump and snub pulleys.
27. Unscrew the bolt (2) and remove the tightener;
28. Remove the snub pulley (6), unscrew the bolts (7) and remove the pulley (8) from the mounting beneath.
29. Unscrew the bolts (10) and remove the tightener mounting.
30. Unscrew the bolts (11) and remove the mounting (9) from the crankcase.
31. Unscrew the bolts (3) and remove the coolant pump (4).
32. Unscrew the bolt and remove the engine speed sensor (5)



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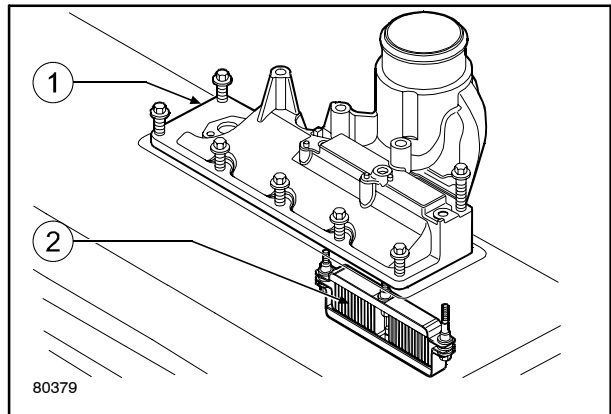
Proceed to remove the turbocharger:

33. Unscrew the ring nut (1) and remove the lubrication piping of the turbo-blower.
34. Unscrew the nuts (2) securing the turbo-blower on the exhaust manifold (4).
35. Support the turbo-blower (5) and, lifting it, remove the seal.
36. Unscrew the retaining nuts (3) and remove the exhaust manifold (4).



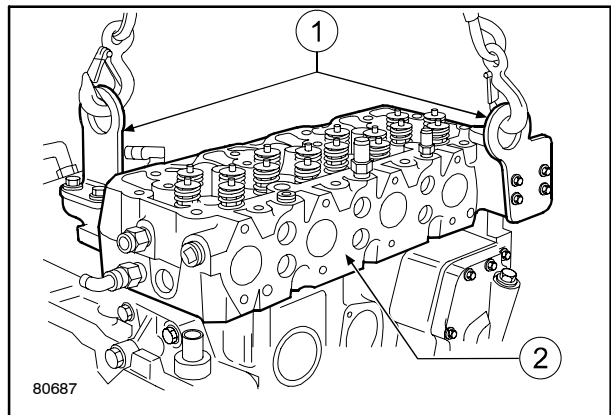
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37. From the opposite side, unscrew the bolts securing the intake manifold (1) and remove it together with the air heater (2) for cold starts.



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38. Hook up the brackets, **380001073** (1) with a suitable sling and, using a hoist, remove the cylinder head (2) from the crankcase.



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