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| Document Title: Engine, description | Function Group: 200 | Information Type: Service Information | Date: 2014/3/19 |
| Profile: BHL, BL61 PLUS [GB] | | | |

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Engine, description

Numbering of cylinders

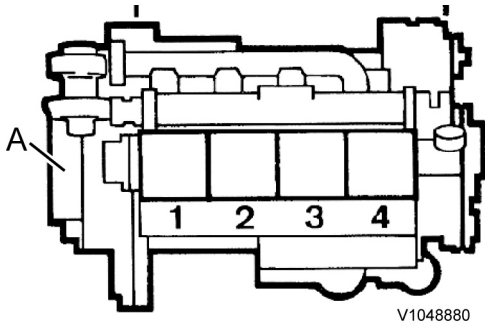


Figure 1
V1022577

NOTICE

The governor's settings may only be adjusted by trained personnel at a central overhaul workshop.

Engine revolution governor (Heinzmann).

The engine revolution governor on the D4D engine is of the centrifugal type.

Engine type, serial number and rated speed (rpm) must always be stated when ordering a governor as spare part.

Each regulator for the above mentioned engines has been especially made for a particular engine. This means that a governor cannot be moved from one engine to another.

NOTE!

An incorrectly adjusted governor may cause the engine not to meet the applicable regulations for emissions and performance.

Component location front

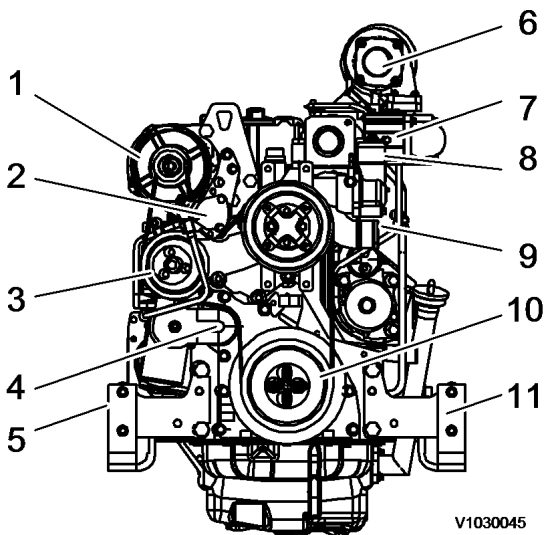
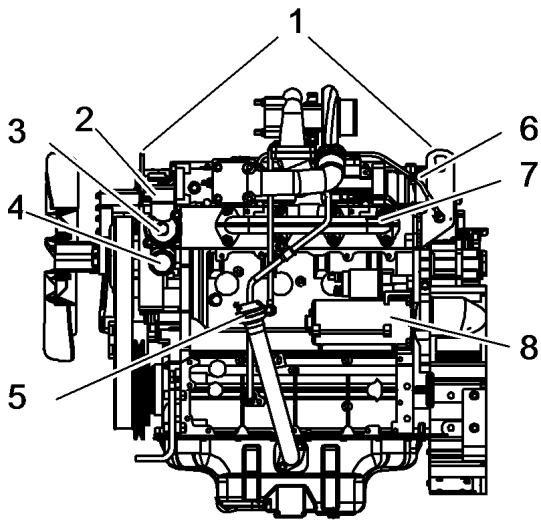


Figure 2

1. Alternator
2. Fuel pump
3. Water pump
4. V-belt and tension pulley
5. Right engine mount bracket
6. Turbo charger exhaust
7. Pre heater
8. Coolant out
9. Coolant in
10. Crankshaft pulley
11. Left engine mount bracket

Component location left hand side



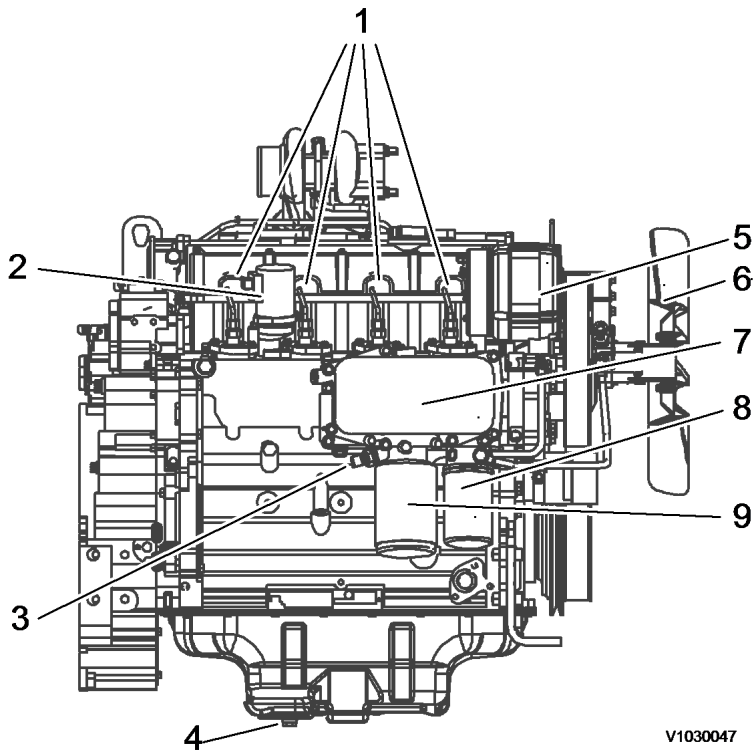
V1030046

Figure 3

V1030046

1. Engine lifting eyes
2. Coolant out
3. Thermostat
4. Coolant in
5. Oil filler and dipstick
6. Inlet manifold
7. Exhaust manifold
8. Starter motor

Component location right hand side

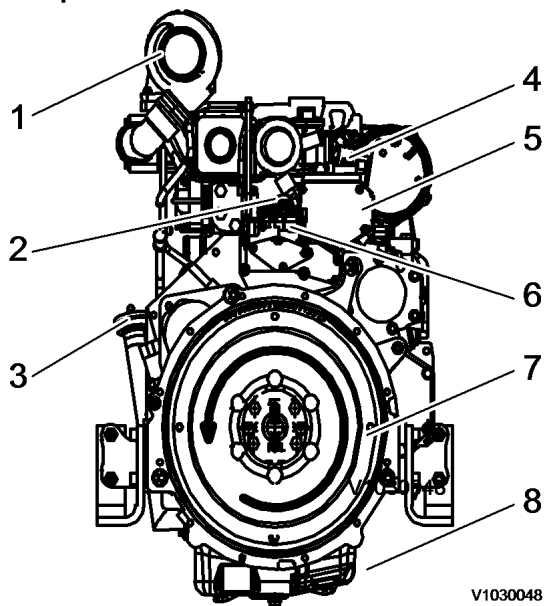


V1030047

Figure 4
V1030047

1. Injection pumps + Injectors
2. Shutoff solenoid
3. Oil pressure switch
4. Oil drain plug
5. Alternator
6. Cooling fan
7. Oil cooler
8. Fuel filter
9. Engine oil filter

Component location rear side

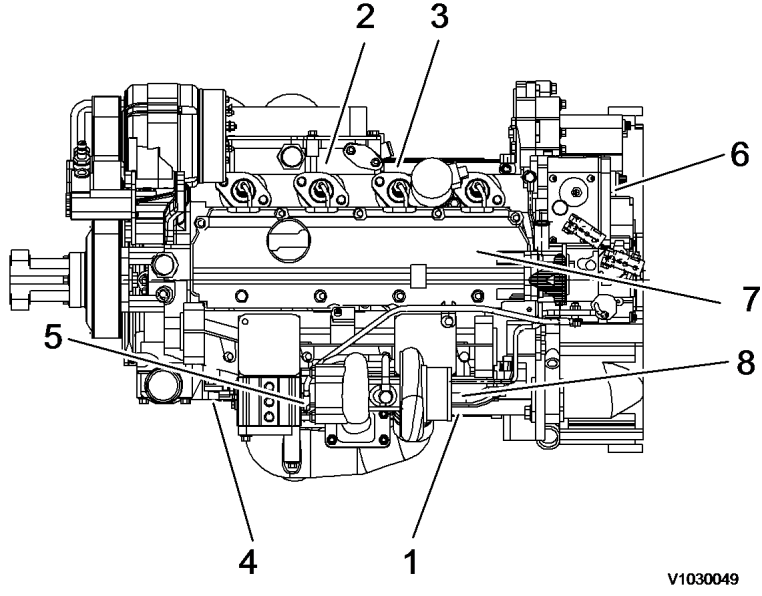


V1030048

Figure 5
V1030048

1. Turbocharger
2. Coolant temperature sensor
3. Oil filler and dipstick
4. Cold start solenoid
5. Governor
6. Accelerator
7. Flywheel
8. Sump

Component location top view



V1030049

Figure 6
V1030049

1. 1st Cylinder
2. 3rd Cylinder
3. 2nd Cylinder
4. 4th Cylinder
5. Exhaust
6. Governor
7. Rocker cover
8. Air inlet

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Engine, description

The engine is a four-cylinder, four-stroke, in-line diesel engine with direct injection, exhaust turbocharger, liquid cooling and internal, unregulated exhaust gas recirculation (EGR).

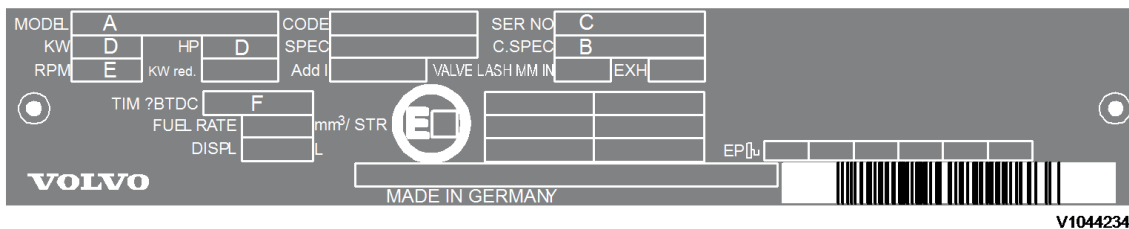
To comply with exhaust gas limit values, the turbocharger is equipped with **unregulated, internal exhaust gas recirculation (IEGR)**, which returns the exhaust gas within the cylinder head to the combustion air. The oxygen content of this exhaust is low. A lower oxygen content reduces the temperature spike during combustion and thereby reduces nitrogen oxide (NO_x).

The camshaft has an extra cam - the trailing cam. This causes the inlet valve to briefly open during the exhaust stroke so that exhaust gas also enters the engine intake system. In the subsequent induction stroke, this exhaust is sucked back in. There is no regulation of exhaust gas quantity.

Engine data plate

The engine data plate specifies model, engine number and power data. The engine number is also stamped into the crankcase. Model and engine number must be specified when ordering spare parts. The direction of rotation is found on the flywheel, anticlockwise. Firing order: 1-3-4-2 (cylinder no. 1 on the flywheel side).

IMPORTANT! Adjustments to the regulator may only be performed by trained staff in an authorized central repair workshop.



V1044234

Figure 1
Engine data plate

- A. Engine type
- B. Spare part number
- C. Engine number
- D. Capacity
- E. Rated speed
- F. Timing setting

Components, servicing view

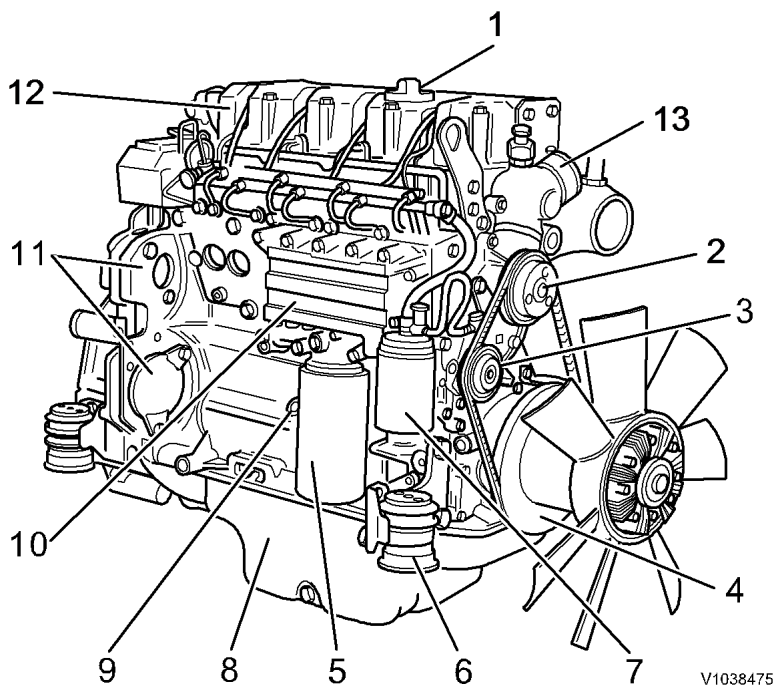
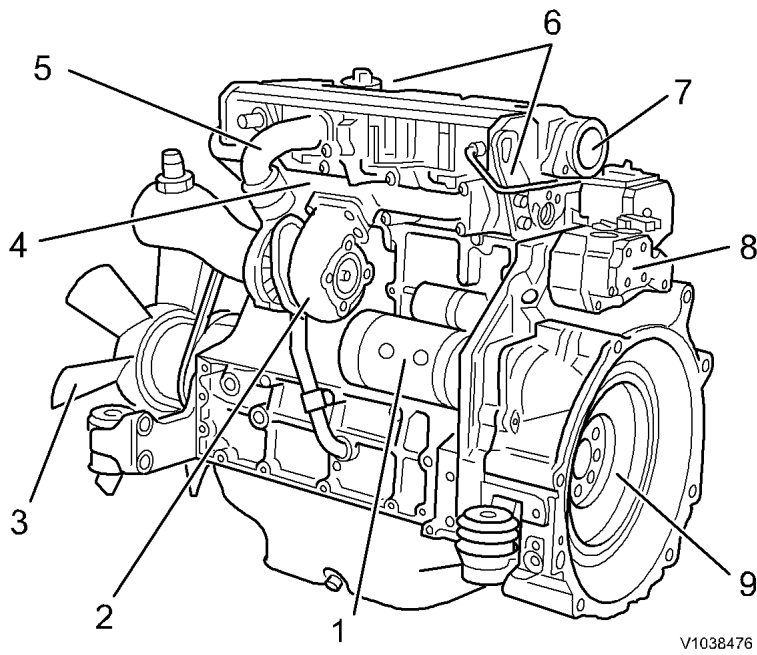


Figure 2
Components, servicing view

1. Oil filler pipe
2. Coolant pump
3. Fuel pump
4. Vibration damper
5. Oil filter
6. Engine mounting
7. Fuel filter
8. Oil sump
9. Oil dipstick
10. Oil cooler
11. Attachment for power take-off
12. Cylinder head
13. Coolant supply

Components, exhaust view



V1038476

Figure 3
Components, exhaust view

1. Starter motor
2. Turbocharger
3. Engine fan
4. Exhaust manifold
5. Inlet manifold
6. Transport device
7. Crankcase ventilation
8. Speed (rpm) sensor.
9. Flywheel

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Engine, removal

Op nbr 21070-1

[14360000 Vacuum pump](#)

[Lifting chains, min. 1000 kg \(2200 lb\)](#)

WARNING

To avoid severe burns, **DO NOT** attempt the next procedure when the engine is **HOT**. Wait for the engine, silencer and tailpipe to cool before proceeding.

NOTE!

In general, all strip clamps that secure hoses and electrical cables must be removed. All disconnected hoses and open connections must be plugged.

1. Remove the engine hood, see [821 Engine hood, removal](#).
2. Detach cable from the bracket.

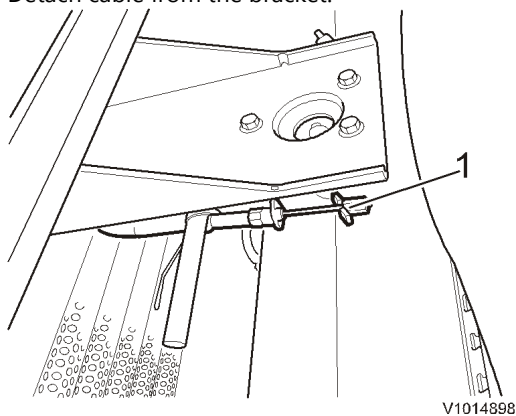


Figure 1

1. Cable
3. Remove the grille and the front plate.

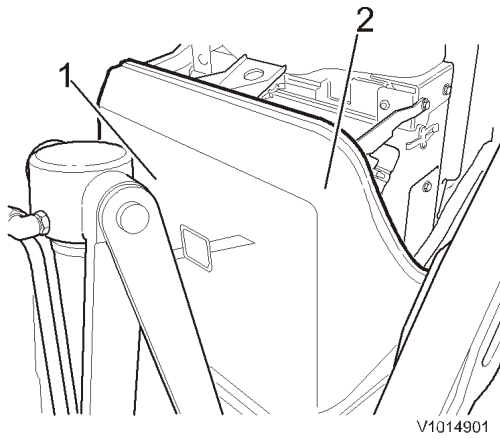


Figure 2

1. Grille
2. Front plate

4. Remove the clamps from both sides of the cooler.

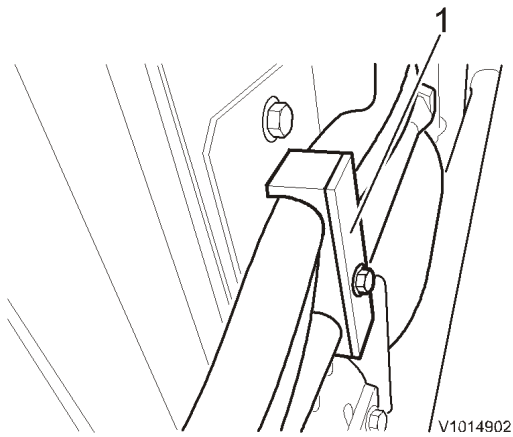


Figure 3

1. Clamp

5. Connect the vacuum pump, see [900 Vacuum pump connection](#).

6. Open the locking device and let down the hydraulic oil cooler.
Disconnect the hoses (4 hoses) from the hydraulic oil cooler.
Turn off the vacuum pump after the hoses have been plugged.

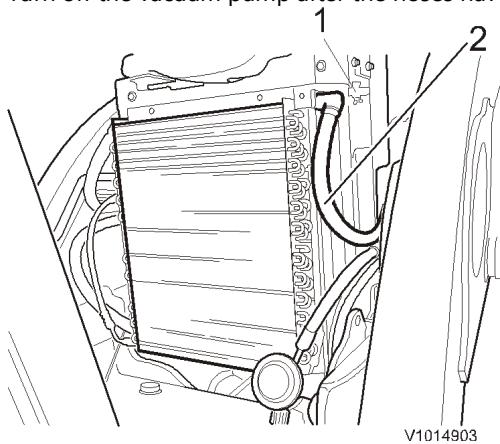


Figure 4

1. Locking device
2. Hoses

7. Connect a drain hose to the valve and place the drain hose down into a container. Open the valve and drain the coolant into the container.

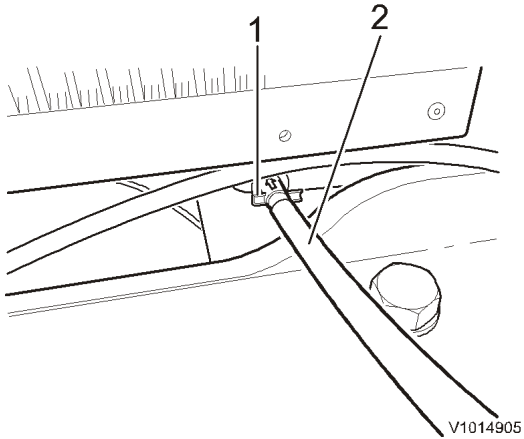


Figure 5

1. Valve
2. Drain hose

8. Disconnect the radiator hoses and the lower hose (hidden). Remove the screws radiator-radiator casting.

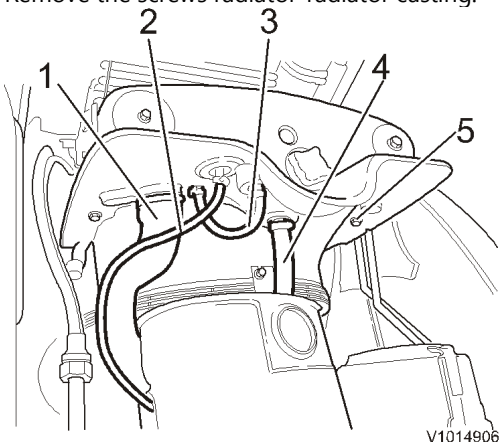


Figure 6

1. Hose
2. Hose
3. Hose
4. Hose
5. Screws

9. Remove the screws from both sides and lift out the hydraulic oil cooler and the radiator.

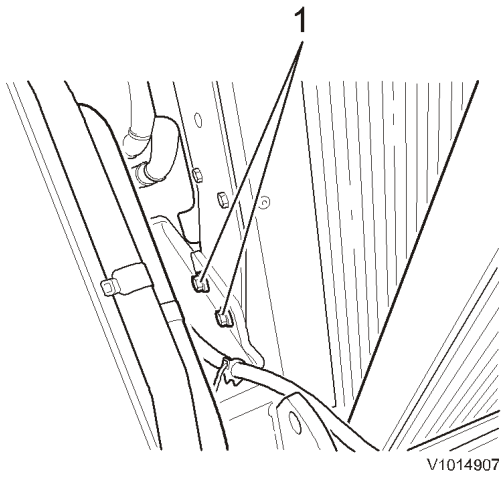


Figure 7

1. Screw

10. Remove the fan guard and the radiator casting.

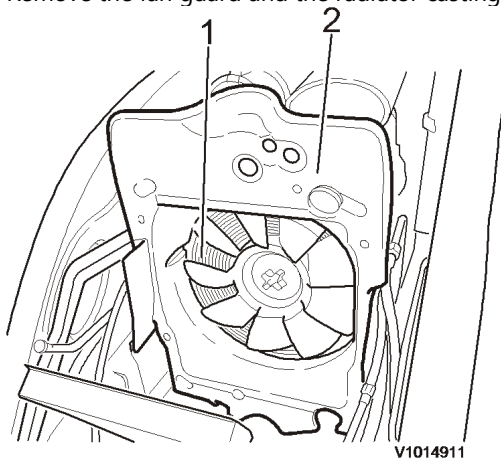


Figure 8

1. Fan guard

2. Radiator casting

11. Remove the fan.

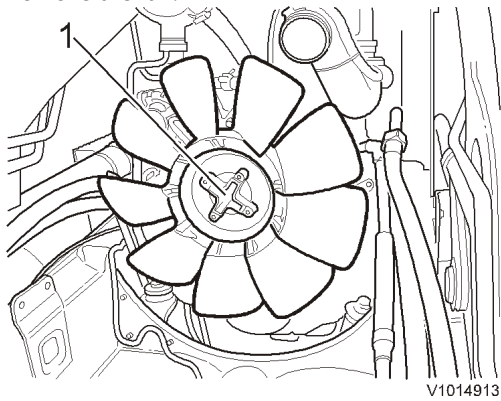


Figure 9

1. Fan

12. Remove the attaching screws (4 attaching screws, 2 underneath).
Remove the nuts and remove the silencer.

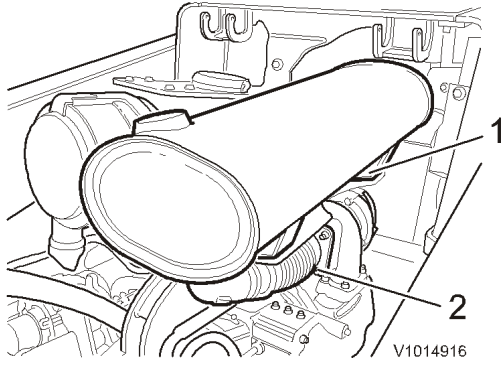


Figure 10

1. Attaching screws
2. Nuts

13. Loosen the hose clamp. Remove the screws and remove the air cleaner. Remove the screws (3 pcs) and remove the bracket.

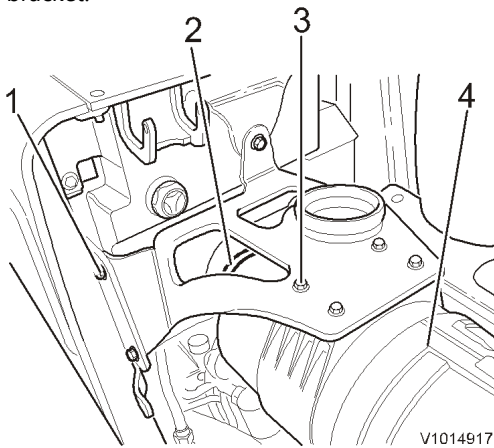


Figure 11

1. Screws
2. Hose clamp
3. Screws
4. Air cleaner

14. Disconnect hose from the engine.

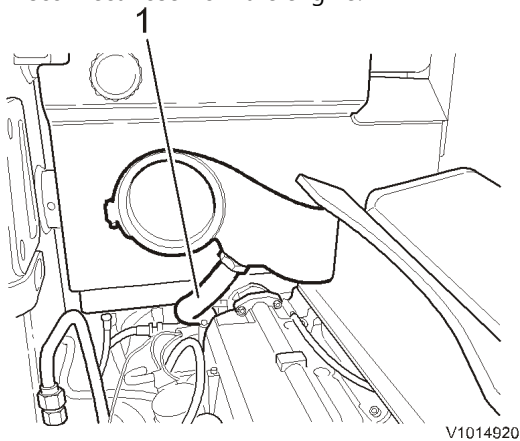


Figure 12

1. Hose

15. Disconnect the hoses (2 hoses, one hidden) from the engine and release the fuel filter/pump from the hydraulic tank.

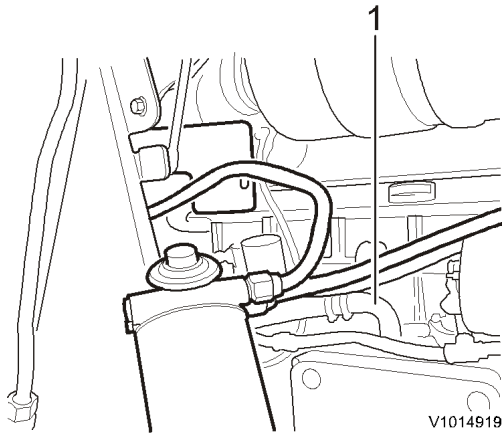


Figure 13

1. Hoses

16. Detach the seat, move the seat back, and lift up the rubber mat from the floor against the seat.

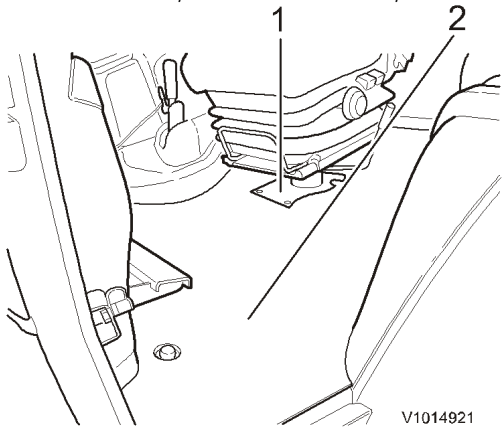


Figure 14

1. Seat
2. Rubber mat

17. Remove the plate.

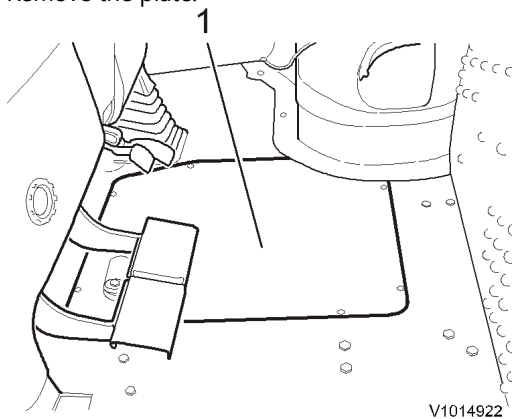


Figure 15

1. Plate

18. Remove the shift lever.

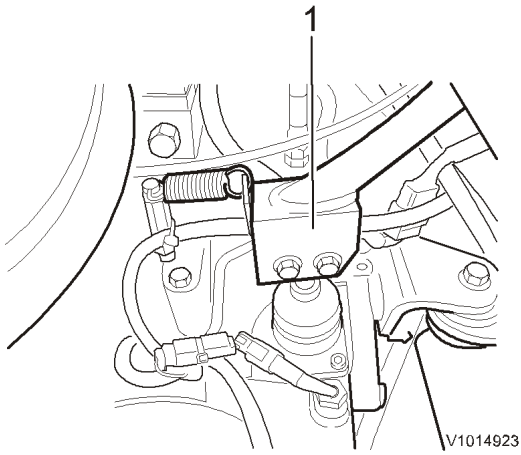


Figure 16

19. Disconnect the hoses from the gearbox.

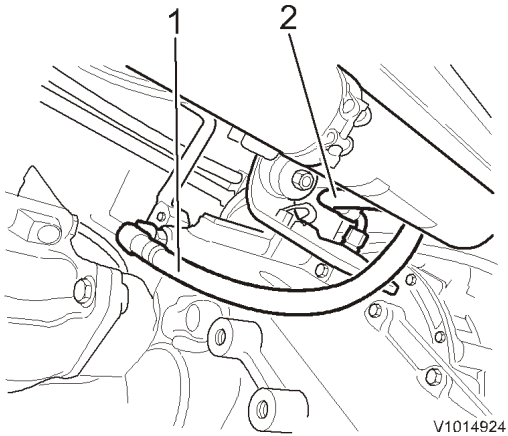


Figure 17

1. Hose
2. Hose

20. Disconnect the hoses from the gearbox.

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