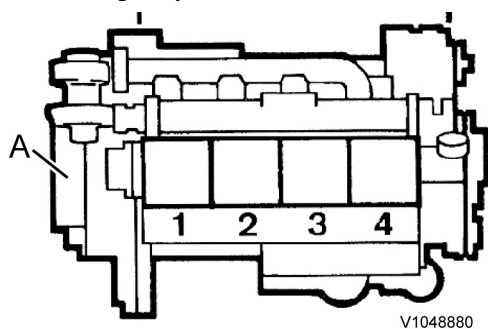


Document Title: <b>Engine, description</b>	Function Group: <b>200</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/17</b>
Profile: <b>BHL, BL71 [GB]</b>			

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## Engine, description

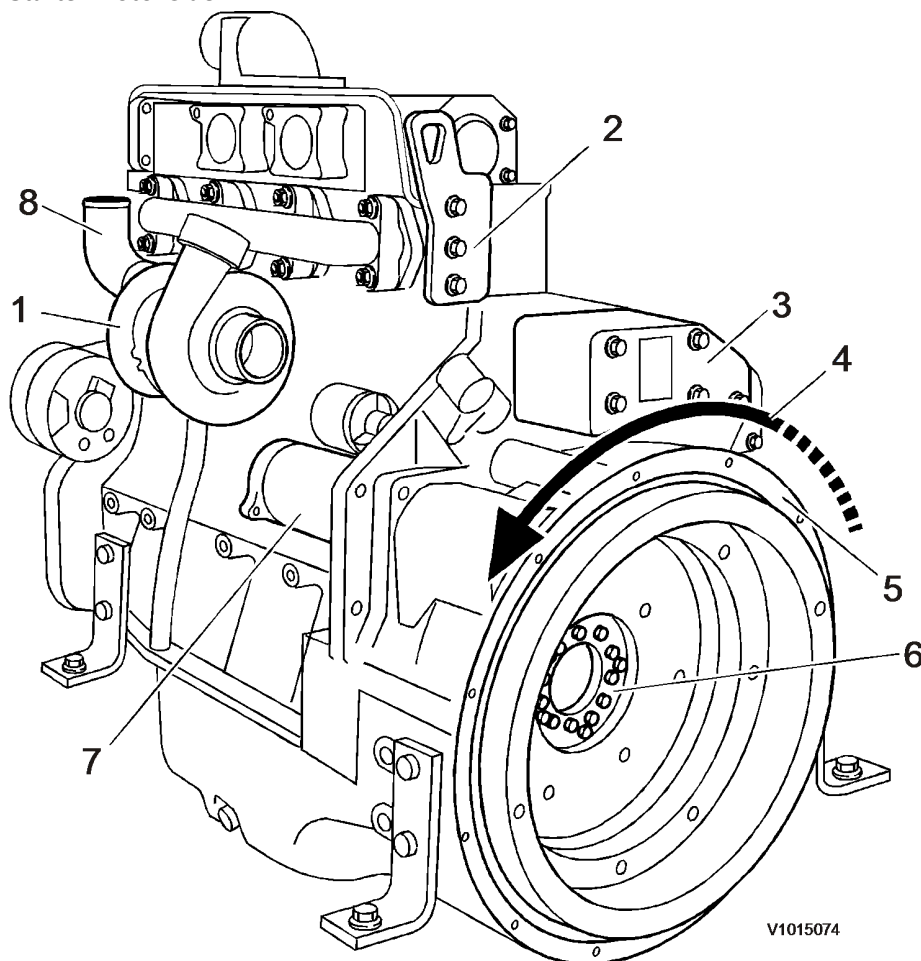
Numbering of cylinders



**Figure 1**

**A = flywheel**

**Starter motor side**



**Figure 2**

1. Turbocharger
2. Lifting eye
3. Engine revolution governor
4. Direction of rotation
5. Flywheel housing
6. Flywheel
7. Starter motor
8. Outlet pipe, coolant

## 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.

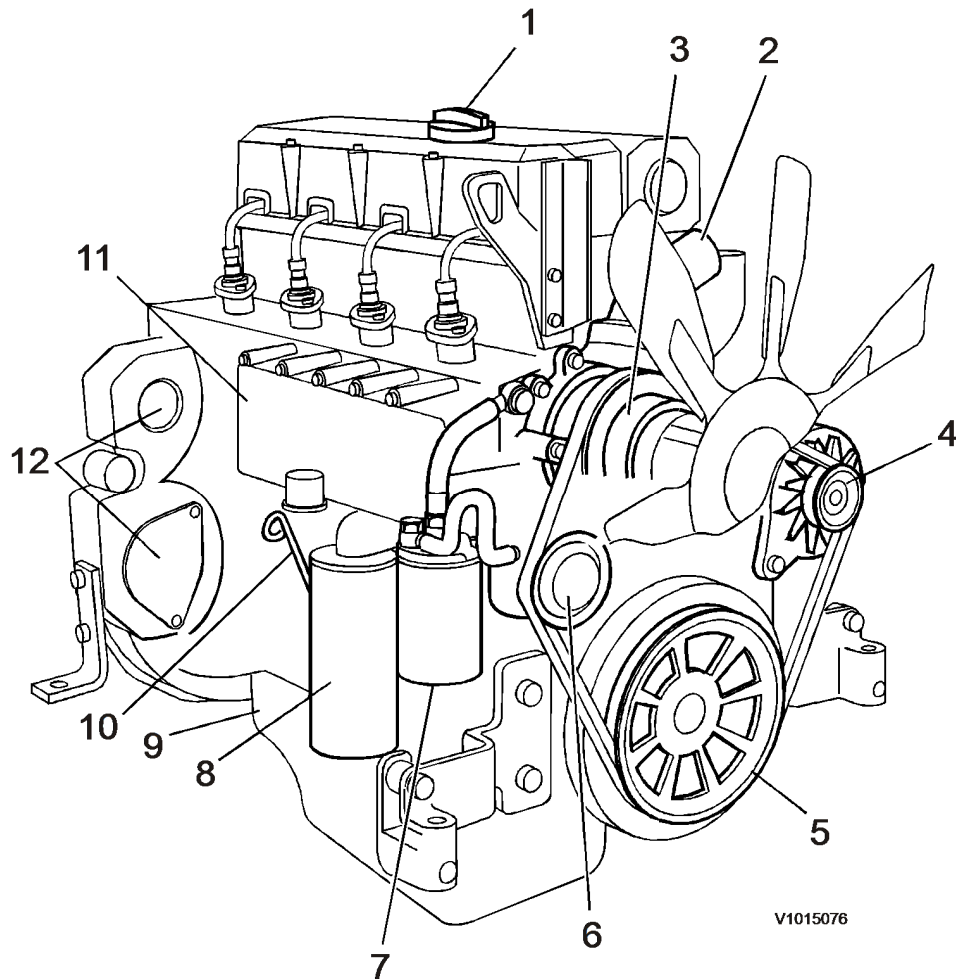
Engine type, serial number and rated speed (rpm) must always be stated when ordering a governor as spare part.

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.

### Service side



**Figure 3**

1. Oil filling point
2. Inlet pipe, coolant
3. Coolant pump
4. Alternator
5. Crankshaft belt pulley
6. Fuel pump
7. Fuel filter
8. Lubricating oil filter
9. Oil pan
10. Oil dipstick
11. Lubricating oil cooler
12. Power take-off for, for example, hydraulic pump, air compressor etc.
13. Cylinder head

Document Title: <b>Engine, description</b>	Function Group: <b>200</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/17</b>
Profile: <b>BHL, BL71 [GB]</b>			

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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<sub>x</sub>).

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).

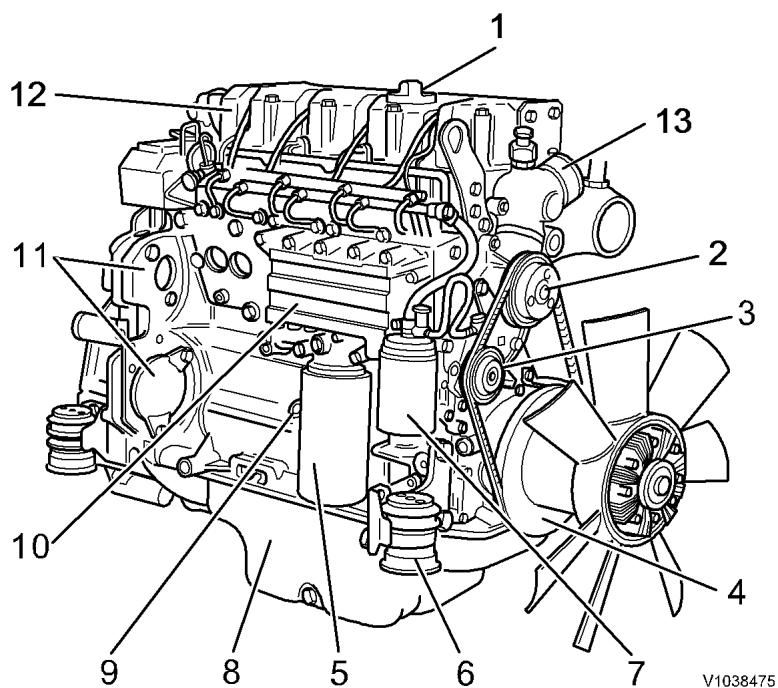
**IMPORTANT! Adjustments to the regulator may only be performed by trained staff in an authorized central repair workshop.**

MODEL	A	CODE		SER NO	C
KW	D	SPEC		C.SPEC	B
RPM	E	Add I		VALVE LASH I/M IN	EXH
	HP				
	KW red.				
TIM ?BTDC	F				
FUEL RATE		mm <sup>3</sup> /STR			
DISPL		L			
VOLVO		MADE IN GERMANY		EP [L]	
				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

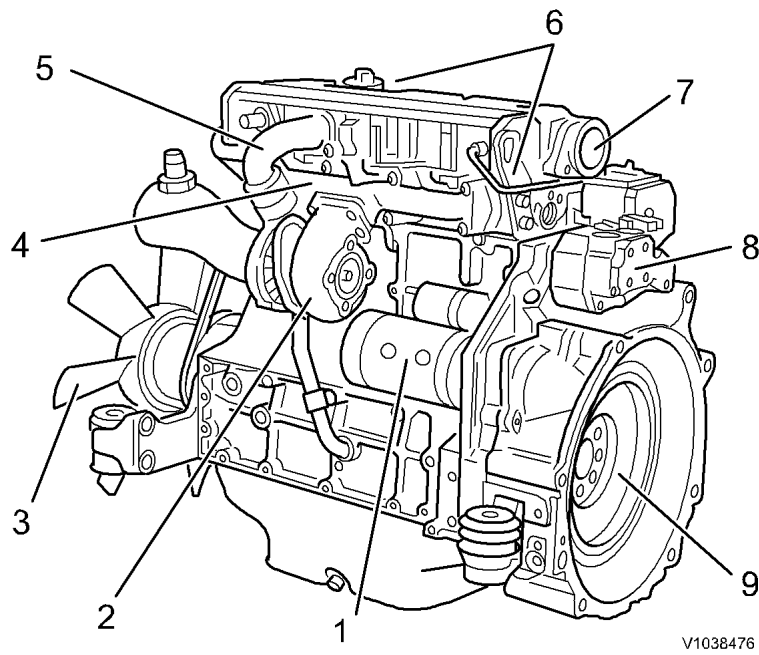


V1038475

**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

Document Title: <b>Engine, removal</b>	Function Group: <b>210</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/17</b>
Profile: <b>BHL, BL71 [GB]</b>			

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## Engine, removal

Op nbr 21070-1

[14360000 Vacuum pump](#)

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



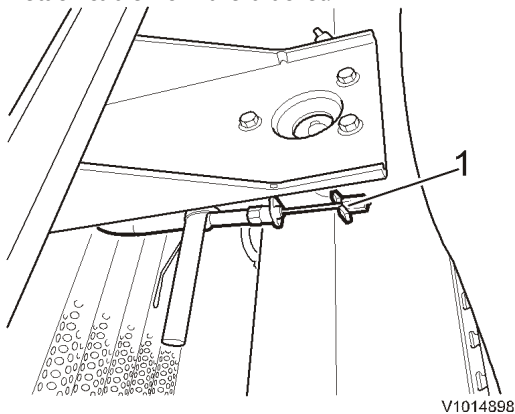
### WARNING

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!

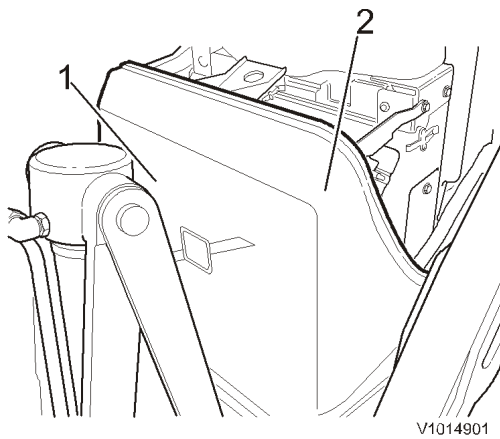
In general, all strip clamps that secure hoses and electrical cables must be removed. All disconnected hoses and open connections must be plugged.

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



**Figure 1**

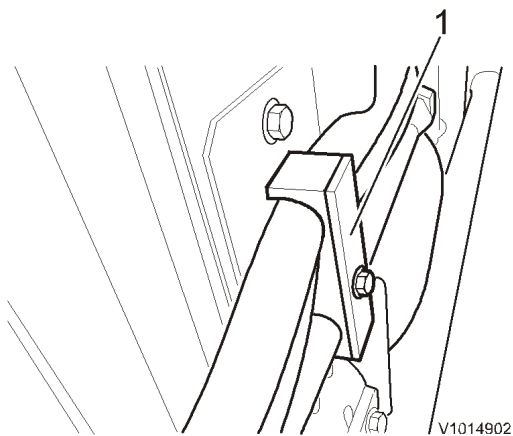
1. Cable
3. Remove the grille and the front plate.



**Figure 2**

- 1. Grille
- 2. Front plate

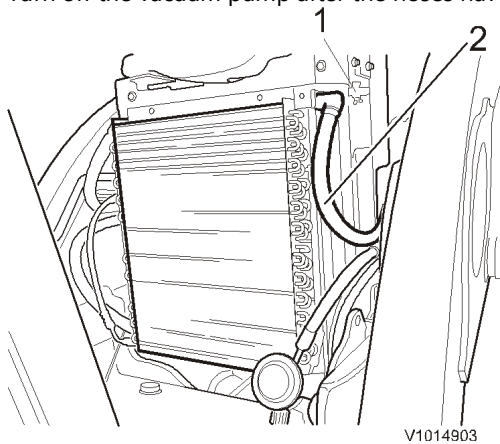
- 4. Remove the clamps from both sides of the cooler.



**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.

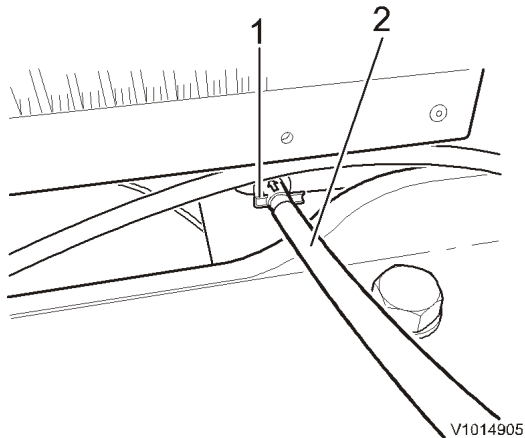




**Figure 4**

1. Locking device
2. Hoses

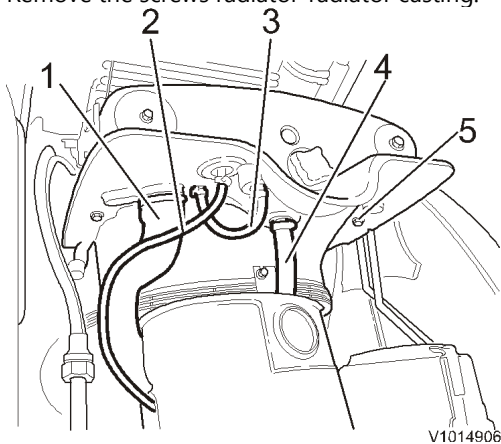
7. Connect a drain hose to the valve and place the drain hose down into a container. Open the valve and drain the coolant into the container.



**Figure 5**

1. Valve
2. Drain hose

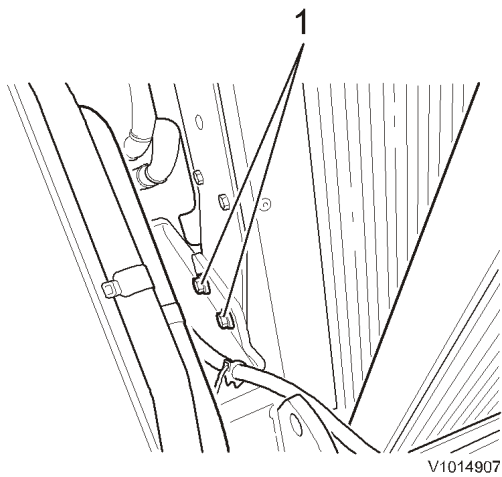
8. Disconnect the radiator hoses and the lower hose (hidden). Remove the screws radiator-radiator casting.



**Figure 6**

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

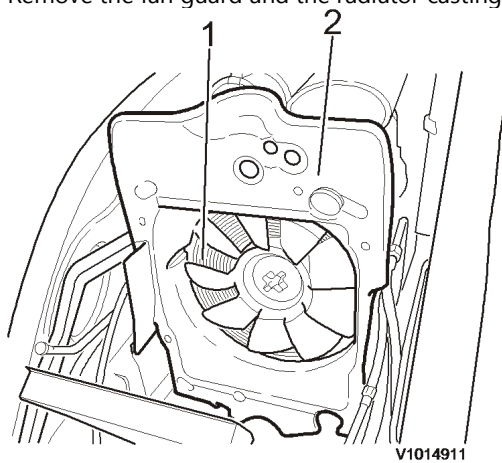
9. Remove the screws from both sides and lift out the hydraulic oil cooler and the radiator.



**Figure 7**

1. Screw

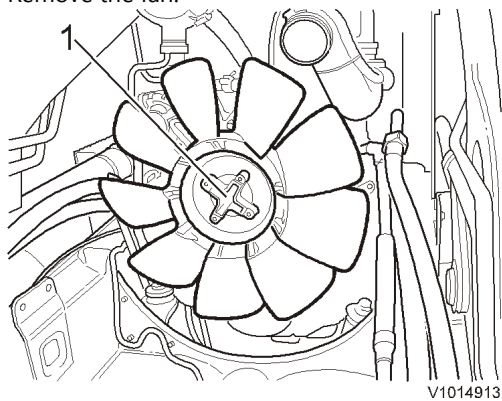
10. Remove the fan guard and the radiator casting.



**Figure 8**

1. Fan guard
2. Radiator casting

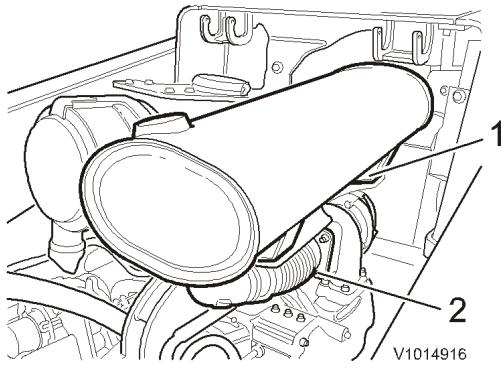
11. Remove the fan.



**Figure 9**

1. Fan

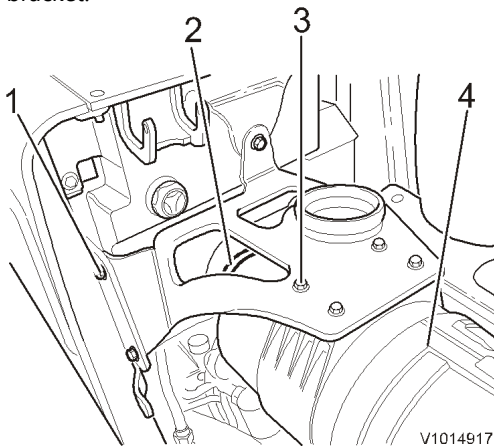
12. Remove the attaching screws (4 attaching screws, 2 underneath).  
Remove the nuts and remove the silencer.



**Figure 10**

- 1. Attaching screws
- 2. Nuts

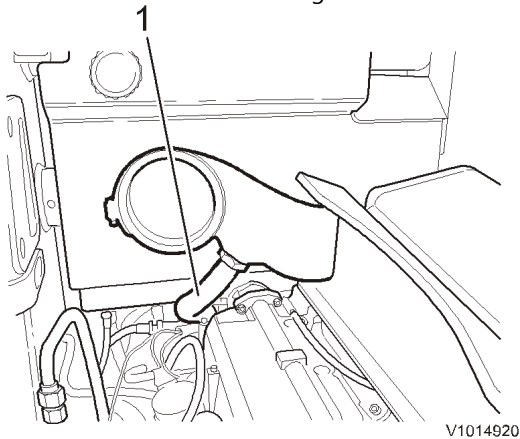
13. Loosen the hose clamp. Remove the screws and remove the air cleaner. Remove the screws (3 pcs) and remove the bracket.



**Figure 11**

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

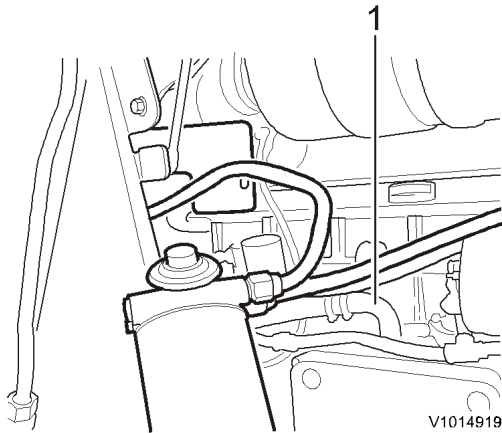
14. Disconnect hose from the engine.



**Figure 12**

1. Hose

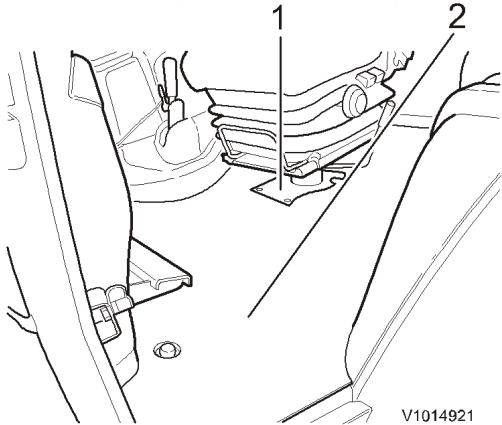
15. Disconnect the hoses (2 hoses, one hidden) from the engine and release the fuel filter/pump from the hydraulic tank.



**Figure 13**

1. Hoses

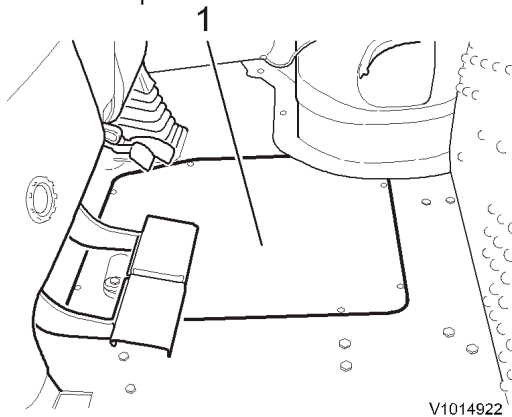
16. Detach the seat, move the seat back, and lift up the rubber mat from the floor against the seat.



**Figure 14**

1. Seat  
2. Rubber mat

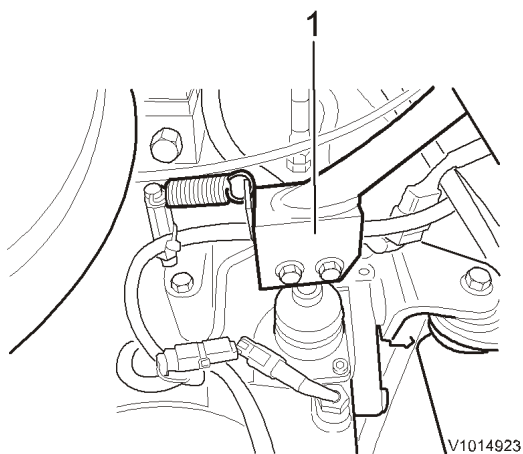
17. Remove the plate.



**Figure 15**

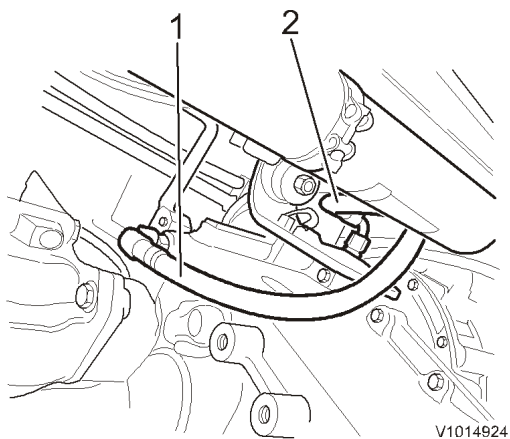
1. Plate

18. Remove the shift lever.



**Figure 16**

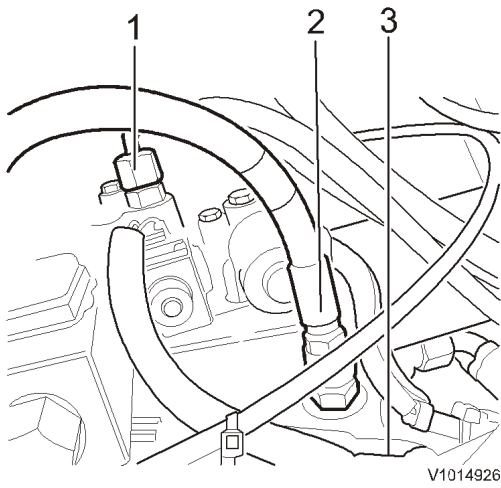
19. Disconnect the hoses from the gearbox.



**Figure 17**

1. Hose
2. Hose

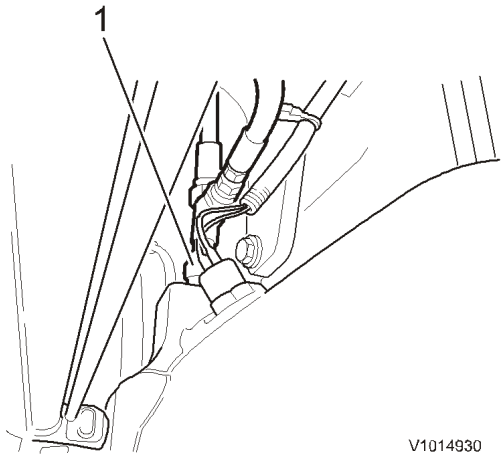
20. Disconnect the hoses from the gearbox.



**Figure 18**

- 1. Hose
- 2. Hose
- 3. Hose

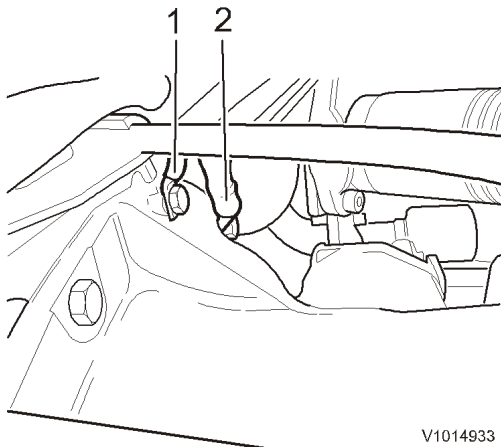
21. Disconnect the hose from the gearbox.



**Figure 19**

- 1. Hose

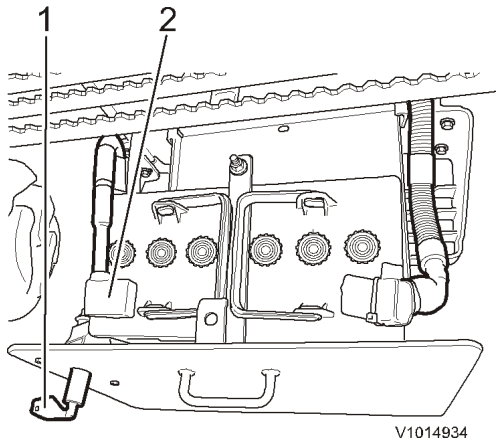
22. Disconnect ground cables from the gearbox.



**Figure 20**

1. Ground cable
2. Ground cable

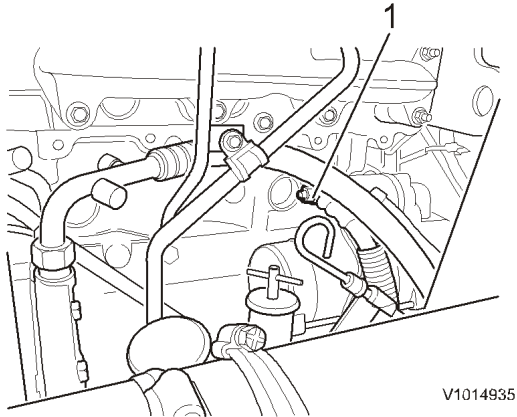
23. Turn off the electric power with the battery disconnect switch and disconnect the ground cable.



**Figure 21**

1. Battery disconnect switch
2. Ground cable

24. Disconnect the electrical cables from the starter motor.

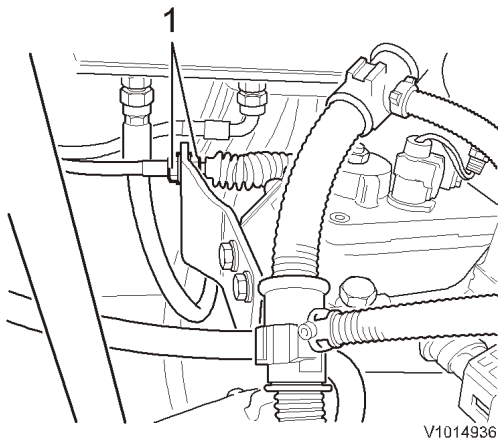


**Figure 22**

1. Electrical cable

25. Disconnect the fuel hoses from the fuel filter. Remove the fuel filter from the hydraulic tank.

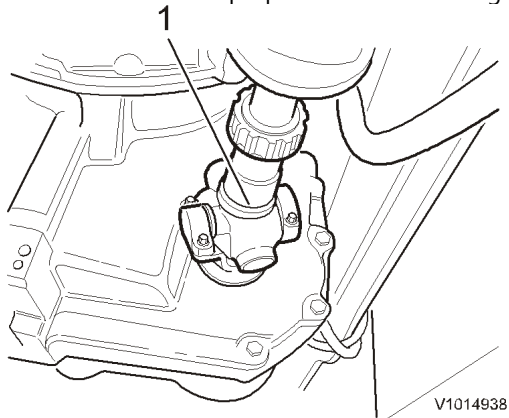
26. Unscrew the nuts and remove the throttle control cable from the engine.



**Figure 23**

1. Nut

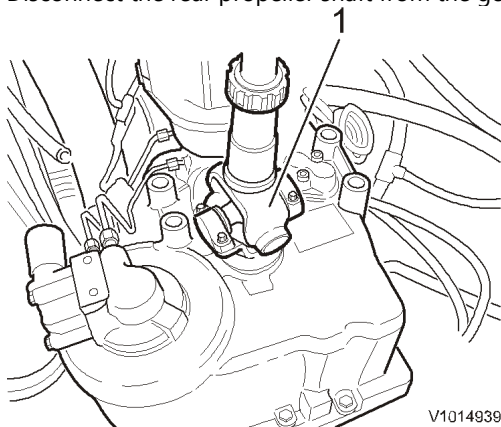
27. Disconnect the front propeller shaft from the gearbox unit.



**Figure 24**

1. Propeller shaft

28. Disconnect the rear propeller shaft from the gearbox unit.

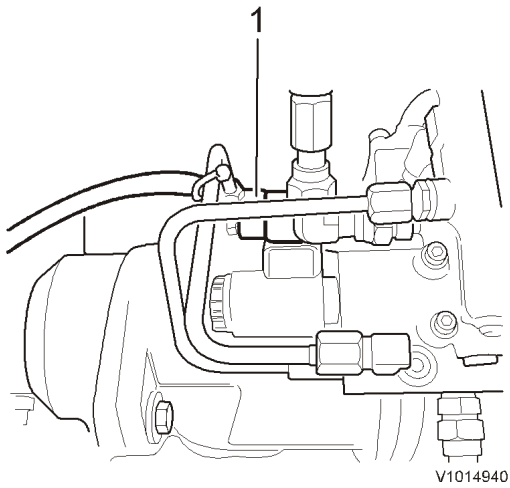


**Figure 25**

1. Propeller shaft

29. Disconnect the connector from the working pump.

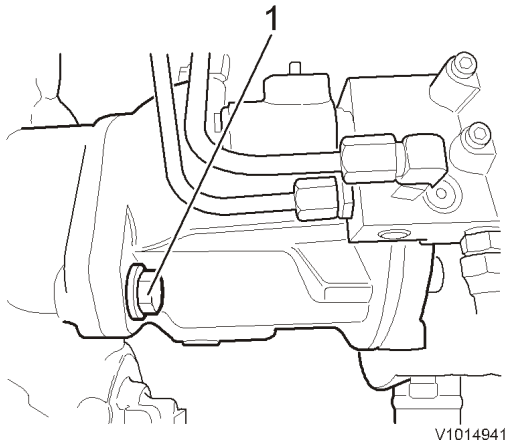




**Figure 26**

1. Connector

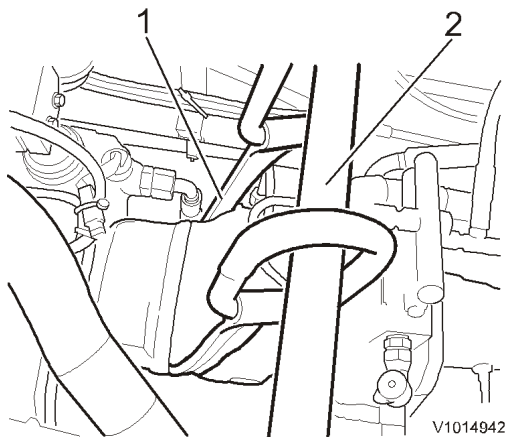
30. Remove the screws (2 screws) gearbox unit - working pump.



**Figure 27**

1. Screw

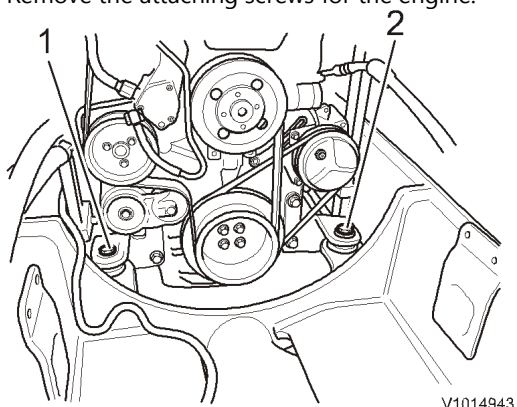
31. Arrange a strap around the working pump and tighten the string using a pinch-bar. Pull the working pump away from the gearbox.



**Figure 28**

1. Strap
2. Iron-bar lever

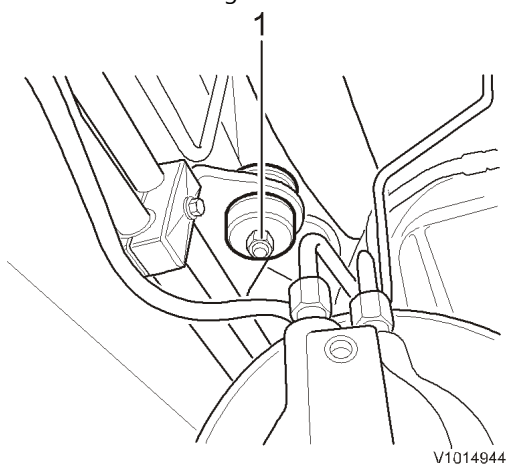
32. Remove the attaching screws for the engine.



**Figure 29**

1. Attaching screw
2. Attaching screw

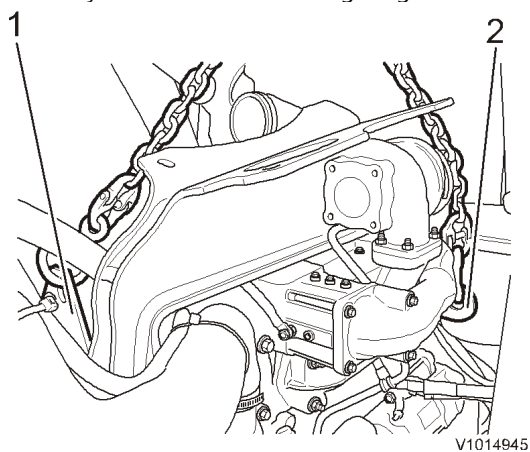
33. Remove the attaching screw from both sides of the gearbox.



**Figure 30**

1. Attaching screw

34. Connect a lifting chain between the lifting eyes and a lifting device.  
Carefully lift and balance the engine/gearbox unit when the unit is lifted out.

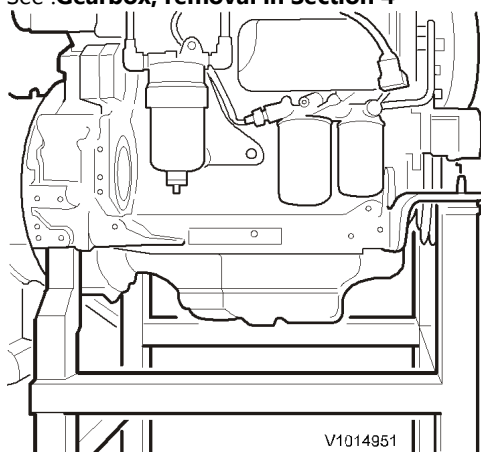


**Figure 31**

1. Lifting eye
2. Lifting eye

35. Place the engine on stable supports.  
Make sure that the gearbox unit is dismountable.

See **.Gearbox, removal in Section 4**



**Figure 32**

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