

Document Title: Engine Tier 3 introduction	Function Group: 200	Information Type: Service Information	Date: 2014/3/20
Profile: SSL, MC60B [GB]			

Engine Tier 3 introduction

Model	Engine	Part number	Variant
MC60B	D2.2 DCBE3	11852928	Standard hydraulics Pilot Standard hydraulics
MC70B	D2 DCAE3	11852929	Standard hydraulics Self level hydraulics Pilot Standard hydraulics Pilot Self level hydraulics Pilot High Flow self level
MC80B	D3.4 DCBE3	11852930	Standard hydraulics Self level hydraulics Pilot Standard hydraulics Pilot Self level hydraulics
MC90B/MC110B	D3.4 DCCE3	11852931	Standard hydraulics Self level hydraulics Pilot Standard hydraulics Pilot Self level hydraulics Pilot High Flow self level
MC90B/MC110B HF	D3.4 DCGE3	11852932	Standard hydraulics Self level hydraulics Pilot Standard hydraulics Pilot Self level hydraulics Pilot High Flow self level

Document Title: Engine for MC60B and MC70B, description	Function Group: 200	Information Type: Service Information	Date: 2014/3/20
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Engine for MC60B and MC70B, description

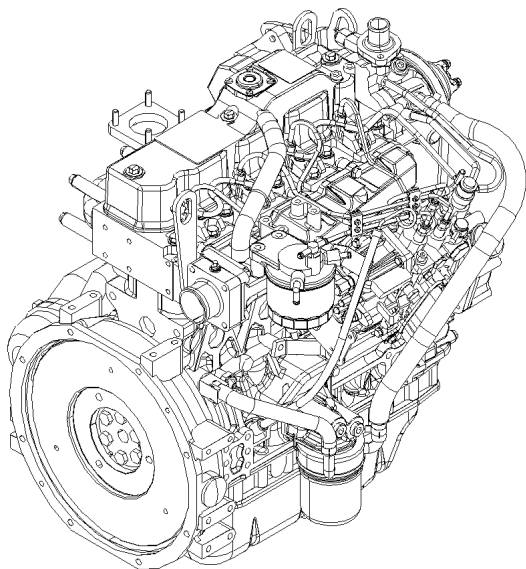
The engine is a vertical in-line, four cylinder, four stroke, water-cooled diesel engine with a direct injection system. The engine for MC70B is also equipped with a turbocharger of radial flow type. The valve mechanism receives its movement from the camshaft via rods and rocker arms. Turning direction is counter-clockwise seen from the flywheel. Firing order is 1-3-4-2 and the first cylinder is on the flywheel side.

The fuel system is direct injection via a rotary high pressure pump, a so called MP pump. It has only one plunger cylinder to pressurize the fuel and a distribution shaft which regulates the fuel flow to each cylinder.

The lubrication system consists of forced lubrication with a trochoid pump.

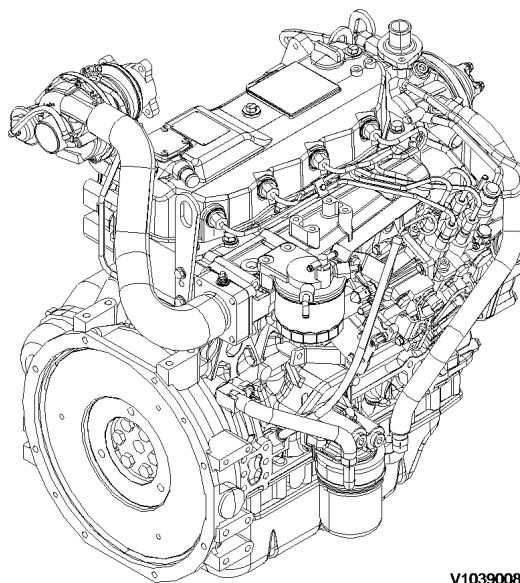
The air system consists of a dual element, self cleaning air cleaner.

The cooling of the engine is performed by a high capacity radiator and a hydraulic oil cooler. The type of fluid used in the cooling system consists of 50% ethylene glycol and 50% water, which gives an anti-freeze protection.



V1039007

Figure 1
Engine, MC60B (Volvo D2.2A CAE2SW1U)



V1039008

Figure 2
Engine, MC70B (Volvo D2.0A CAE2SW1U)

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Engine, description

MC60B (D2.2DCBE3)

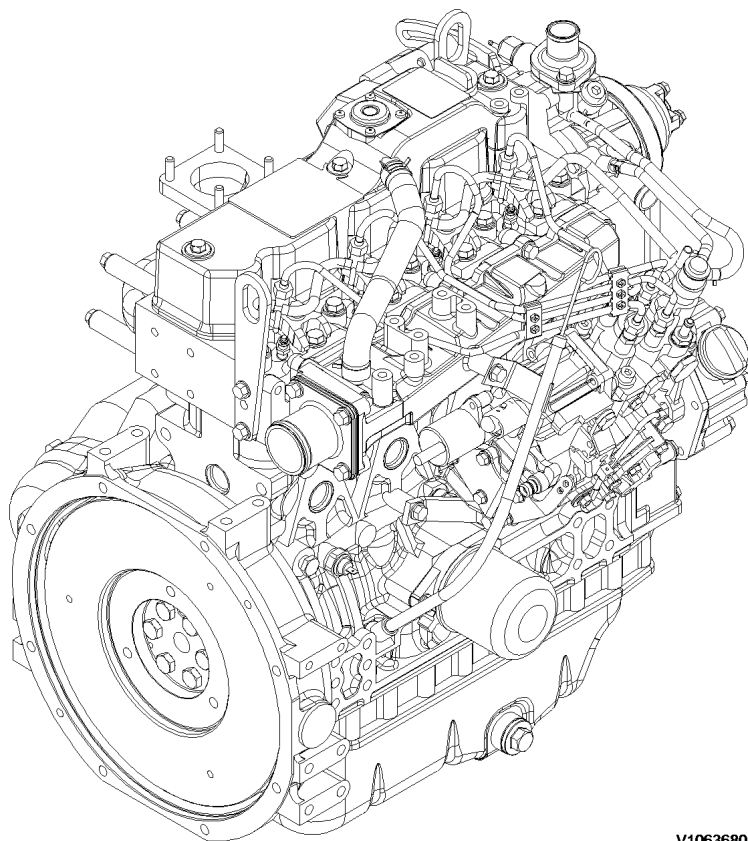
The engine is a vertical in-line, four cylinder, four stroke, water-cooled diesel engine with a direct injection system. The valve mechanism receives its movement from the camshaft via rods and rocker arms. Turning direction is counter-clockwise seen from the flywheel. Firing order is 1-3-4-2 and the first cylinder is on the flywheel side.

The fuel system is fed by an electric fuel pump that supplies the fuel to the (mechanical) fuel injection pump.

The lubrication system consists of forced lubrication with a trochoid pump.

The air system consists of a dual element, self cleaning air cleaner.

The cooling of the engine is performed by a high capacity radiator and a hydraulic oil cooler. For type of fluid used in the cooling system, see section [260 Engine cooling system, specification](#)



V1063680

Figure 1

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Engine, removing

Op nbr 210-070

[11668023 Lifting tool](#)

[9993902 Disassembly tool](#)

9993903 Disassembly tool



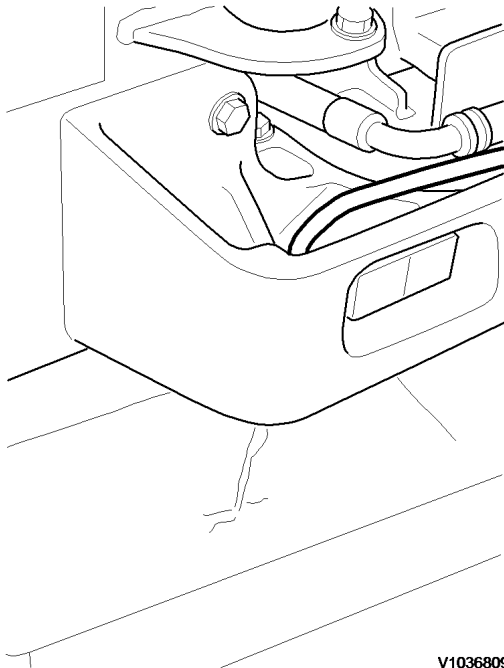
WARNING

Hot oil and hot engine coolant can cause severe burns!

NOTICE

Always handle oils and other environmentally hazardous fluids in an environmentally safe manner.

1. Put the machine in **service position 1**, see [191 Service position 1](#).
2. Switch the battery master switch off.
3. Open the drain valve and drain the coolant to a suitable container.

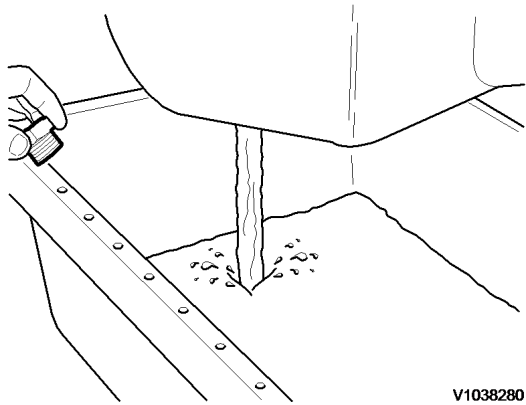


V1036809

Figure 1

4. Carefully open the fill cap on the radiator to speed up the draining.

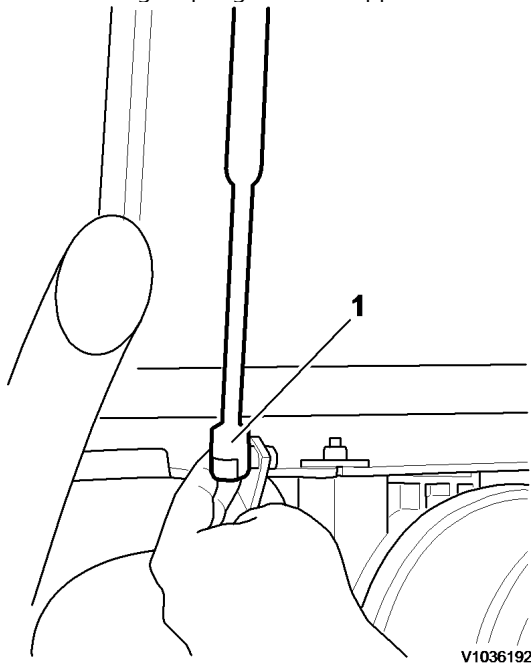
5. When the radiator is drained, close the drain valve
6. **Applies to engine equipped with high flow:**
Open the drain valve and drain the hydraulic oil in a suitable container.



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Figure 2

7. Remove the gas spring from the upper radiator support.



V1036192

Figure 3

1. Gas spring
8. Remove the screw, moulding, stop, clamps and cover that holds the engine cover onto the chassis.
9. Remove the engine cover from the crossmember.

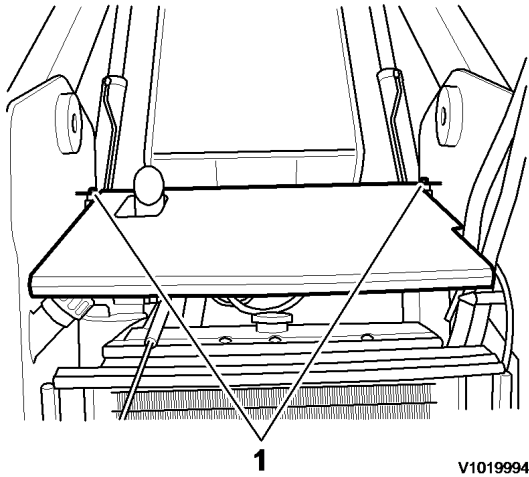


Figure 4

1. Engine cover mounting
10. Disconnect the radiator overflow hose from the radiator and drain the overflow bottle into the container.

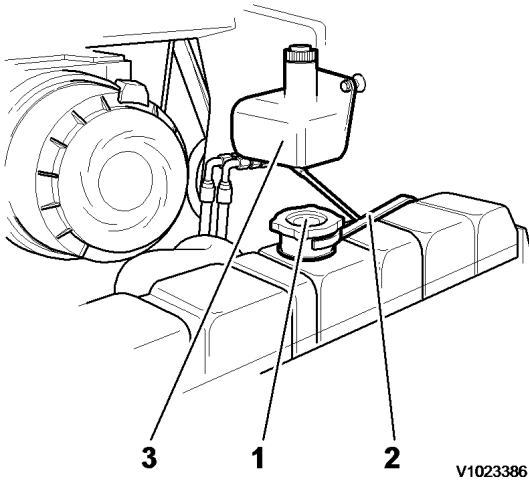
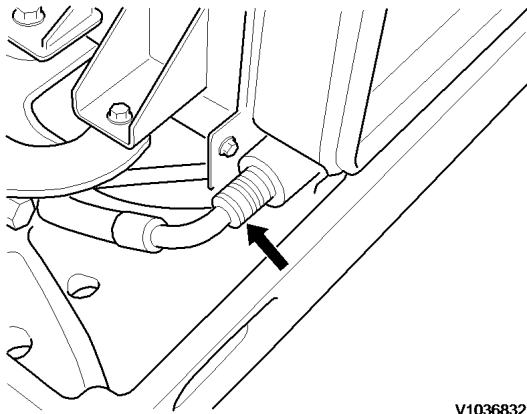


Figure 5

1. Radiator fill cap
2. Over flow hose
3. Over flow bottle
11. Transfer the coolant to a container with a cover and label the container as "Used Antifreeze". Dispose of the coolant at an approved recycling facility.
12. Disconnect and plug up the return hose from the hydraulic cooler. Use 9993902 Disassembly tool and 9993903 Disassembly tool.

NOTE!

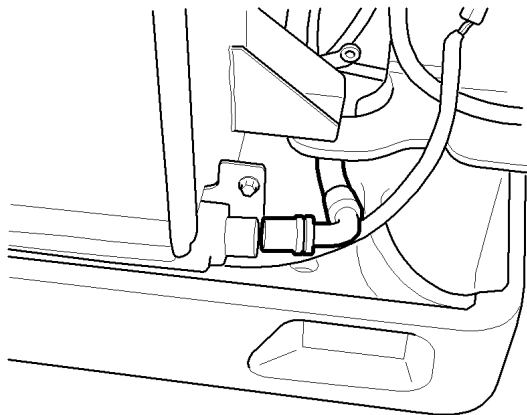
Some hydraulic oil may still be in the system.



V1036832

Figure 6

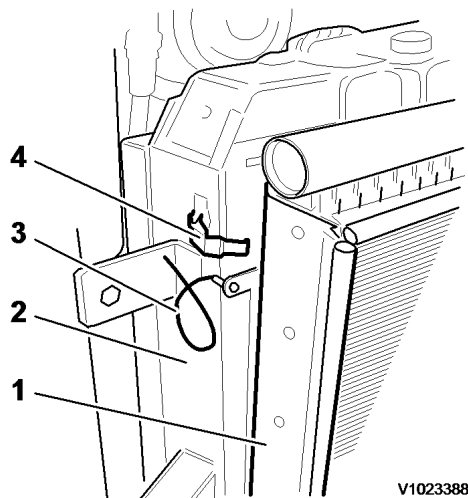
13. Disconnect and plug up the swivel connection on the right side of the radiator.



V1036833

Figure 7

14. Unbolt the cable from oil cooler.
15. Open the latches holding the cooling assembly together. Lift the oil cooler from the radiator. Carefully place the oil cooler on a flat surface.



V1023388

Figure 8

1. Oil cooler
2. Radiator

3. Cable
4. Latch

16. Disconnect the upper radiator hose from the engine block.

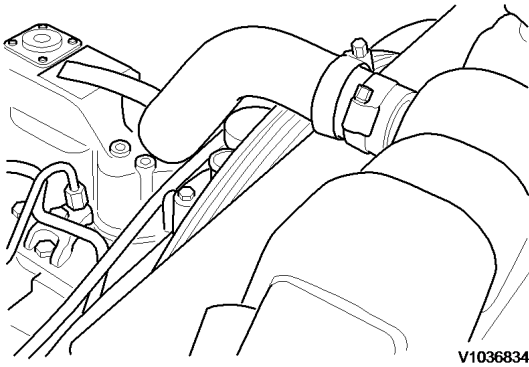


Figure 9

17. Remove the fan guard.

18. Disconnect the lower radiator hose from the engine block.

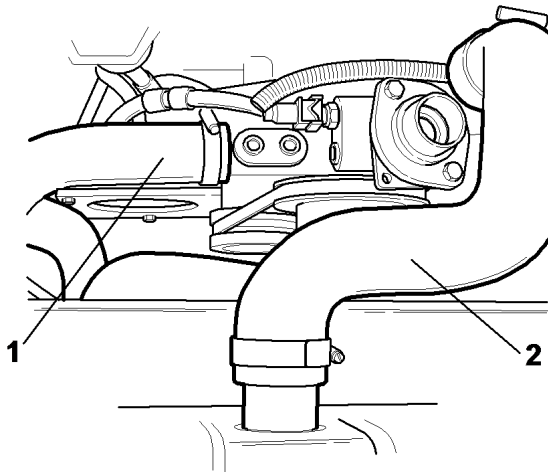
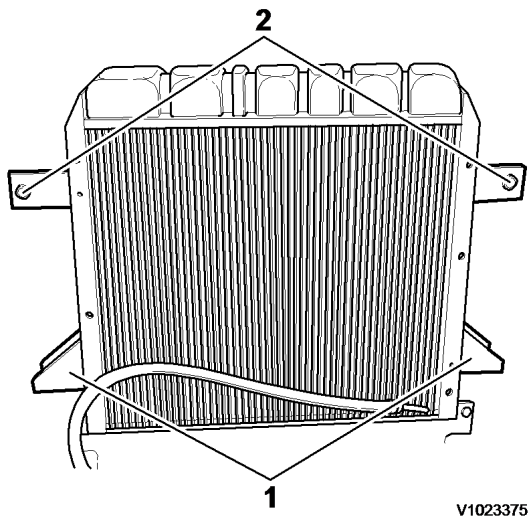


Figure 10

1. Lower radiator hose
2. Upper radiator hose

19. Remove the locknuts and the washers from the bottom of the radiator.

20. Remove the capscrews, washers and locknuts from the top of the radiator.



V1023375

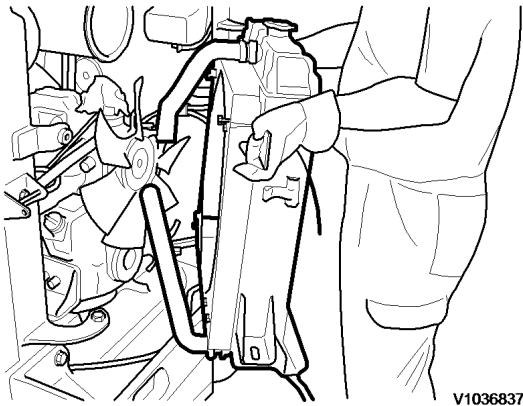
Figure 11

1. Lower radiator mounts
2. Upper radiator mounts

21. Carefully lift the radiator assembly.

NOTE!

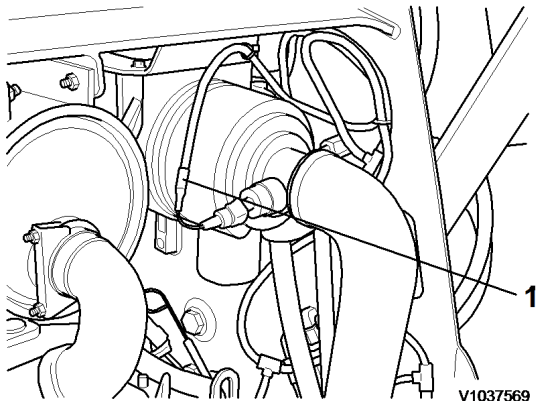
Use care when handling the radiator/oil cooler assembly. To prevent damage to the radiator drain valve, do not place the radiator on its bottom surface without support blocks used on each side.



V1036837

Figure 12

22. Disconnect the wires to the air cleaner restriction sensor.



V1037569

Figure 13

1. Restriction sensor
23. Loosen the hose clamp that secures the air intake hose to the engine induction manifold and remove the intake hose. Plug or cover the induction manifold intake port to prevent entry of dirt or debris into the engine. Remove the air cleaner assembly out of the frame.
Engine equipped with turbo remove the hose between air cleaner and turbo charger.

NOTE!

Remove the hose between the air cleaner and the turbo charger on engines equipped with turbo.

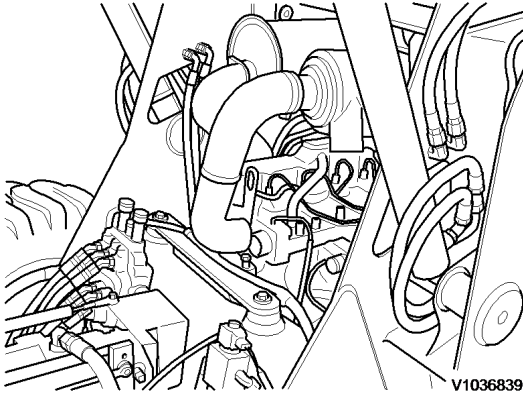


Figure 14

Picture shows MC60B

24. Loosen the capscrews holding the muffler and the capscrews holding the exhaust manifold.
On engine equipped with turbo remove the exhaust manifold between muffler and turbo charger.

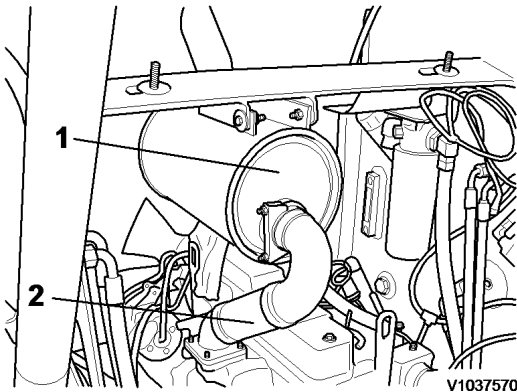
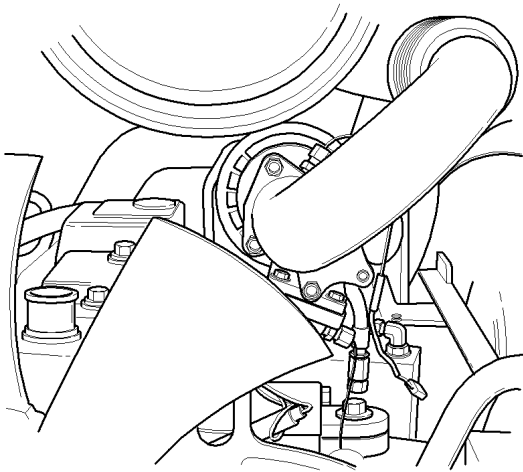


Figure 15

1. Muffler
2. Exhaust manifold

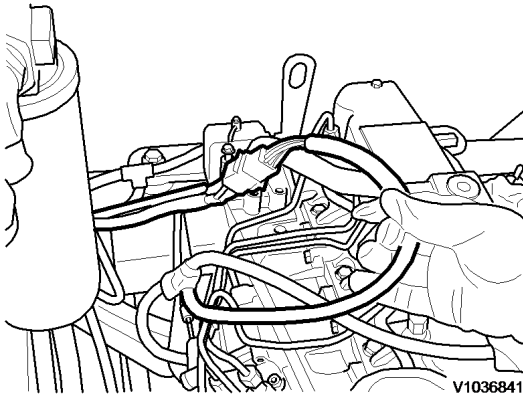
25. Remove the muffler assembly.



V1038170

Figure 16
Picture shows MC70B

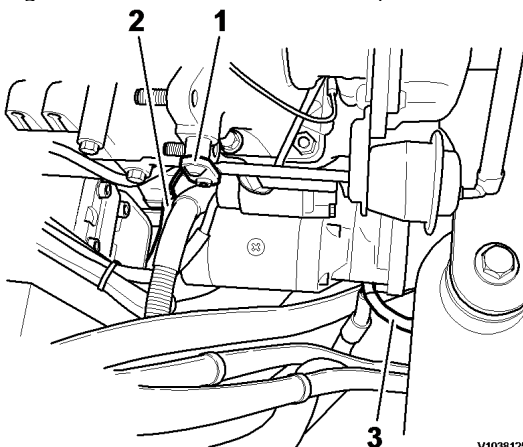
26. Disconnect the engine harness from the main chassis harness.



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Figure 17

27. Tag and remove the wires from the positive (+) terminal on the starter.



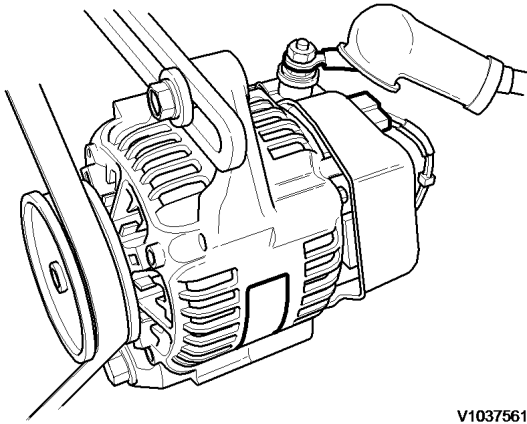
V1038125

Figure 18

1. Positive (+) terminal
2. Starter flange
3. Negative (-) cable

28. Tag and remove the negative (-) cable and ground wire from the starter flange.

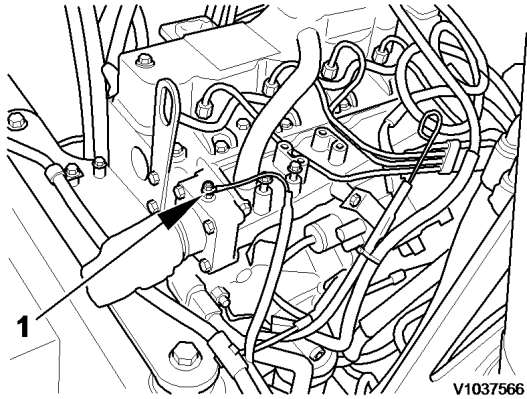
29. Tag and remove the wire to the alternator.



V1037561

Figure 19

30. Tag and remove the wire to the pre-heater.

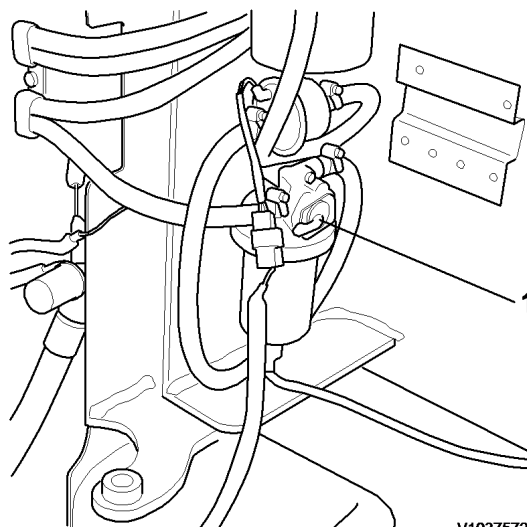


V1037566

Figure 20

1. Pre-heater

31. Close the valve on the fuel supply line at the water separator.



V1037572

Figure 21

1. Crane fuel supply

32. Tag, disconnect and plug the fuel supply- and fuel return line at the engine block.

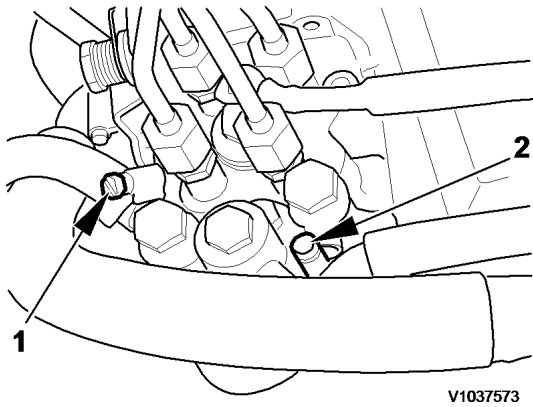


Figure 22

- 1. Fuel return
- 2. Fuel supply

33. Disconnect the throttle cable from the fuel injection pump lever.

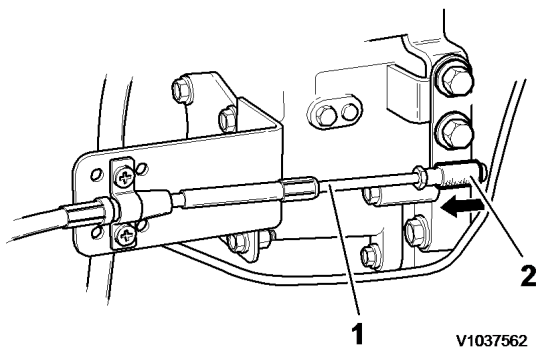


Figure 23

- 1. Throttle cable
- 2. Governor lever

34. **Applies to engine equipped with high flow.**

Remove the high flow hoses.

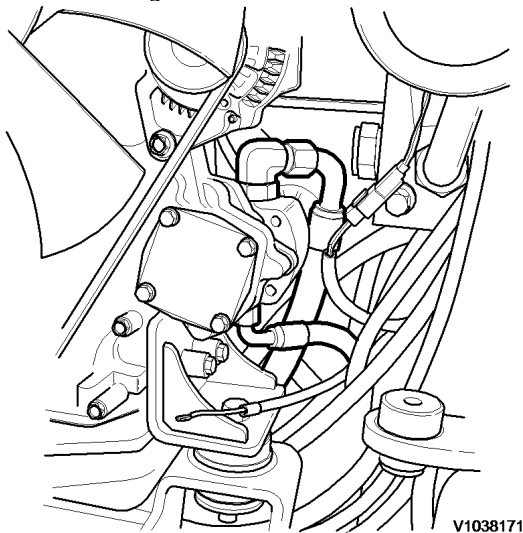


Figure 24

35. Connect the lifting equipment **11668023** to the front (1) and rear (2) lift eyes. Remove all slack in the lift equipment to prevent the engine from unintended movement during removal of the engine mounting hardware.

NOTE!

The engine must be lifted using an overhead or frame type hoist and lift sling or frame, rated at a minimum capacity of **500 kg (1100 lb)**.

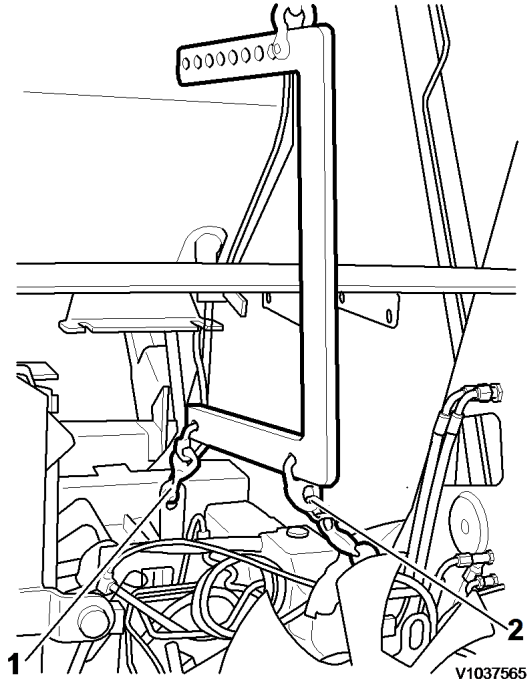


Figure 25

36. Remove capscrews from the rear engine mount.



Figure 26

37. Remove the capscrews from the front engine mount.



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