

Document Title: Engine, description	Function Group: 200	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Engine, description

he engine is a four-cylinder, four-stroke, in-line diesel engine with direct injection, oil/air cooling and externally controlled exhaust gas recirculation (EGR).

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.

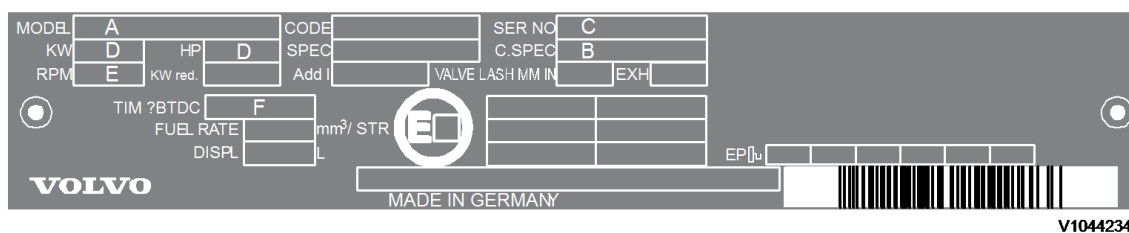


Figure 1
Engine data plate

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

Components, servicing view

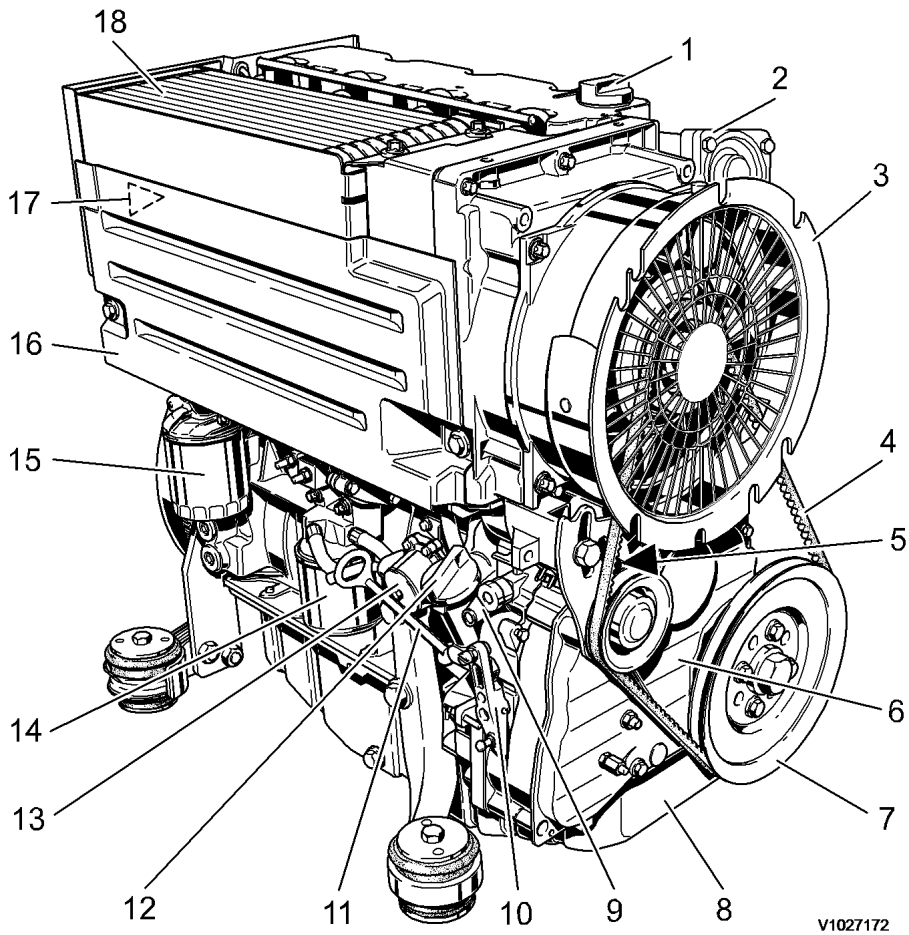
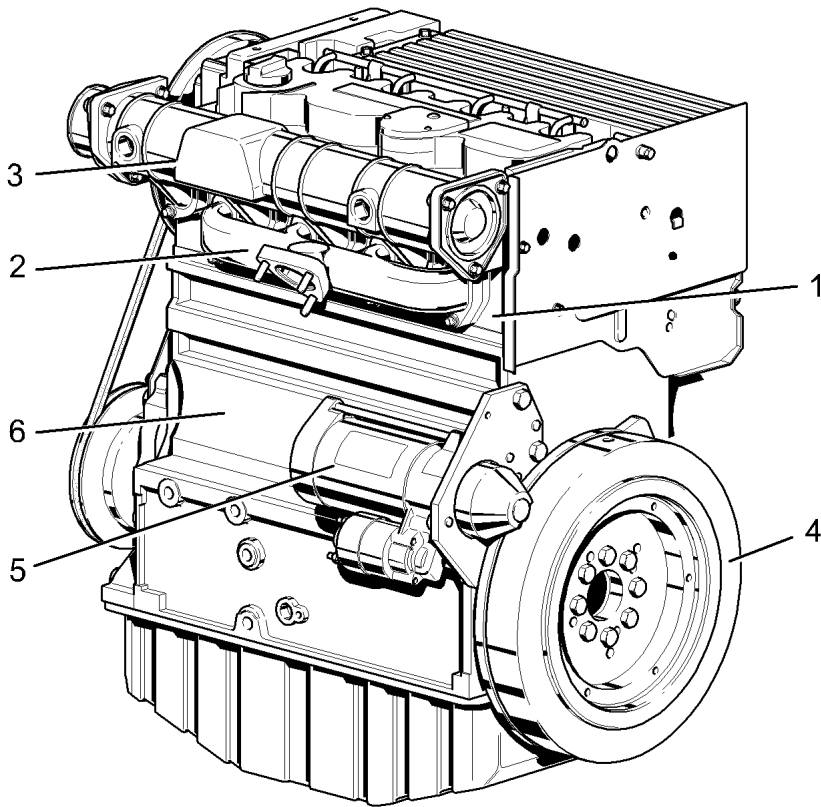


Figure 2
Components, servicing view

1. Oil filler port (valve cover)
2. Air inlet pipe
3. Fan with integrated alternator
4. V-rib belt
5. Engine stop solenoid
6. Gear housing cover, timing belt cover
7. V-belt roller, crankshaft
8. Oil sump
9. Start/stop lever
10. Engine speed adjustment
11. Oil dipstick
12. Oil filler pipe
13. Fuel pump
14. Fuel filter
15. Oil filter
16. Cooling air baffle
17. Injection pumps
18. Oil cooler

Components, exhaust view



V1027173

Figure 3
Components, exhaust view

1. Cylinder head
2. Exhaust manifold
3. Air inlet pipe
4. Flywheel
5. Starter
6. Crankcase

Exhaust gas recirculation (EGR)

In order to comply with emission limits, the engine is equipped with an externally controlled exhaust gas recirculation system, which directs some of the exhaust gas back into the combustion air. The oxygen content of this exhaust gas is low, which serves to lower the peak combustion temperature, thereby reducing generation of nitrogen oxides (NO_x).

The exhaust gas required for recirculation is directed from the cylinders via a line system and travels through the EGR valve via the exhaust induction port directly into the inlet ports of the cylinder head, where it is re-aspirated by the engine.

The EGR valve is active when the load is between 0 and 75%. If the load is greater than 75%, the EGR valve remains closed to prevent oxygen deficiency through high smoke formation.

The EGR valve is controlled via a control rod displacement sensor. An LED on the control rod displacement sensor indicates the status of the exhaust gas recirculation system. The LED is lit when the system is active.

The control rod displacement sensor and EGR valve are supplied power via connector x40 (stop solenoid Y6).

Oil from rocker arm lubrication is used to cool the EGR valve. This oil travels back to the oil sump via the oil return system.

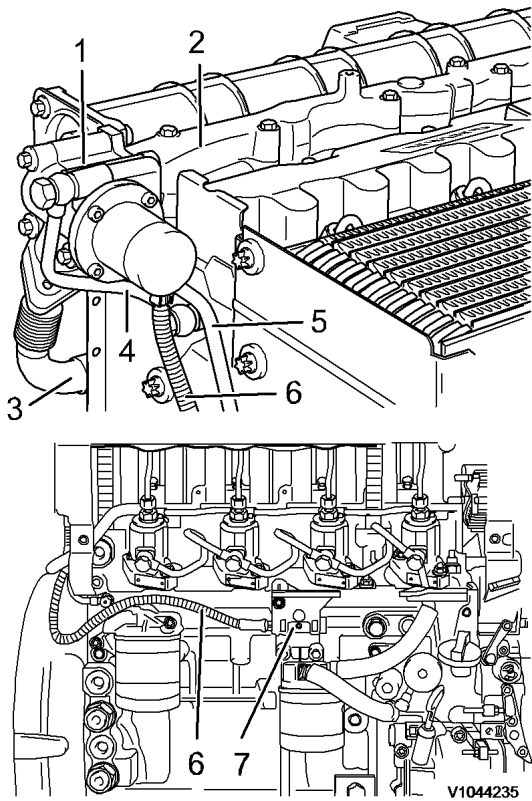


Figure 4
Externally controlled exhaust gas recirculation

1. EGR valve
2. Exhaust induction port
3. Exhaust supply
4. Lubrication oil from cooling taken from rocker arm lubrication
5. Lubrication oil return to oil sump
6. Electrical cable for control rod displacement sensor
7. Control rod displacement sensor

Document Title: Engine, removing	Function Group: 210	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Engine, removing

Op nbr 210-070

1. Place the machine in service position.
2. Switch off the battery disconnect switch and disconnect the positive battery terminal.

WARNING

The work involves handling heavy components - failure to stay alert may result in severe crushing injuries.

3. Open the engine hood and unscrew the fixing bolts.
4. Lift off the engine hood and place it on a suitable surface.
5. Remove the air flow guide plate (1).

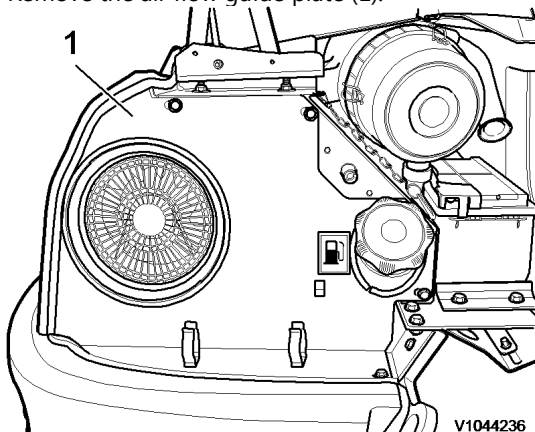


Figure 1

6. Disconnect the pin plug connection of the tail lights.
7. Detach the engine hood catch (1) at the counterweight.

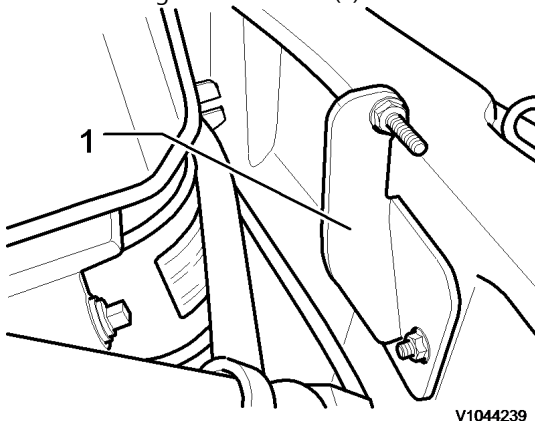
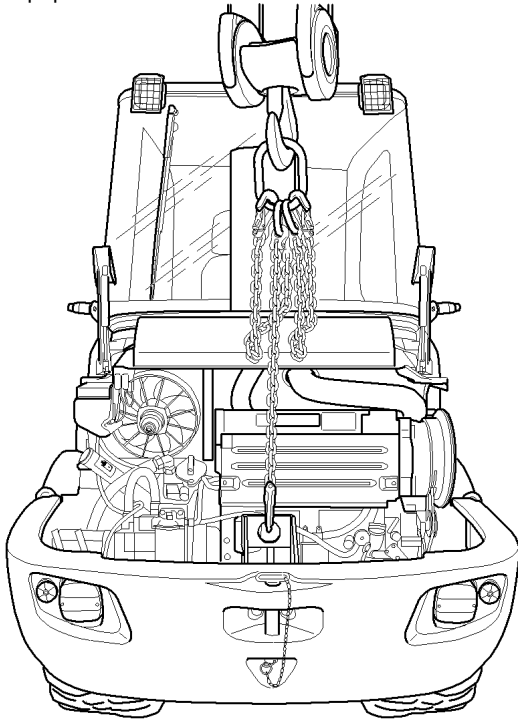


Figure 2

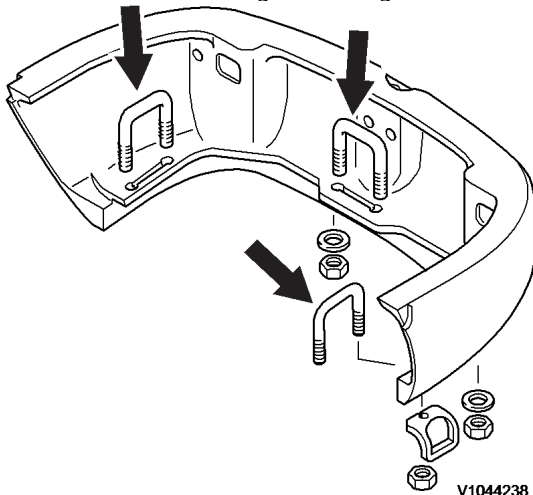
8. Attach a lifting device (E-tool) to the counterweight and suspend it from the crane using suitable hoisting equipment.



V1044240

Figure 3

9. Remove the counterweight retaining bracket (arrows).



V1044238

Figure 4

10. Slowly raise the counterweight and remove towards the rear.

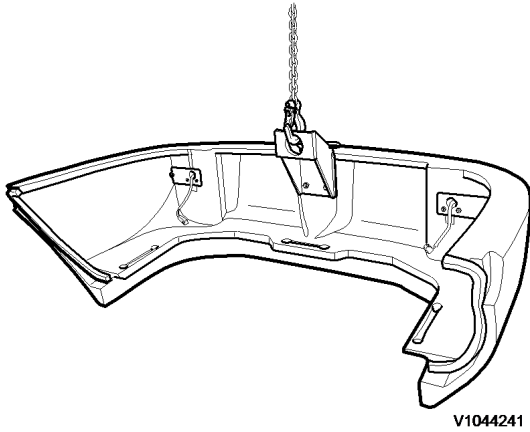


Figure 5

NOTE!

Lower the counterweight onto a suitable surface.

11. Detach the throttle cable from the engine. Unscrew the bracket (1) and slacken the jam nuts (2).

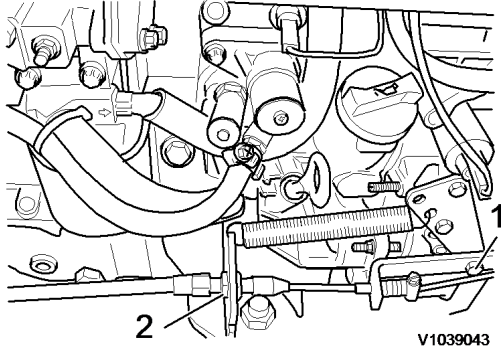


Figure 6

12. Remove heater connections (1) and (2) and seal with plugs.

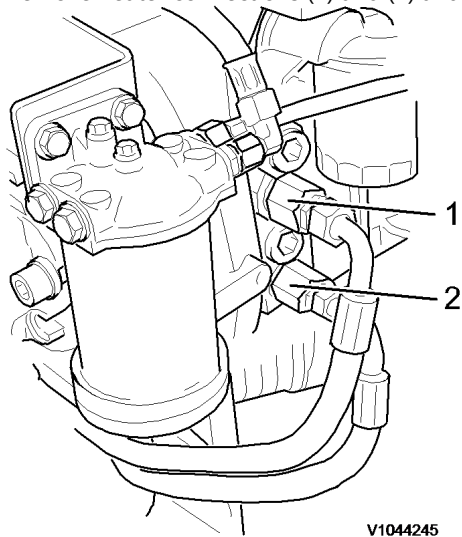


Figure 7

NOTE!

Mark supply and return.

13. Remove air duct cover

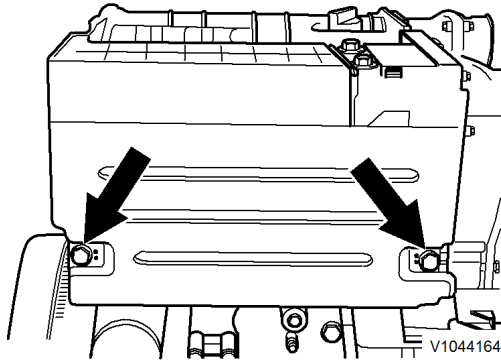


Figure 8

14. Undo the hose clamp with clamping tongs and detach the fuel return hose (1).

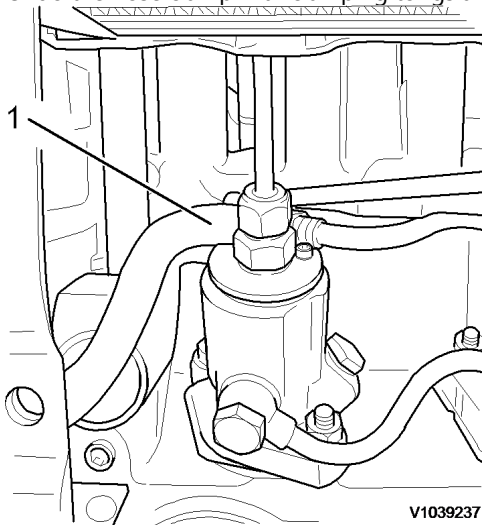


Figure 9

NOTICE

When a hose has been disconnected, plug both the hose and the connection immediately. The hoses should be marked for correct connection.

15. Undo the hose clamp (1) and detach the fuel hose (2) from the fuel pump.

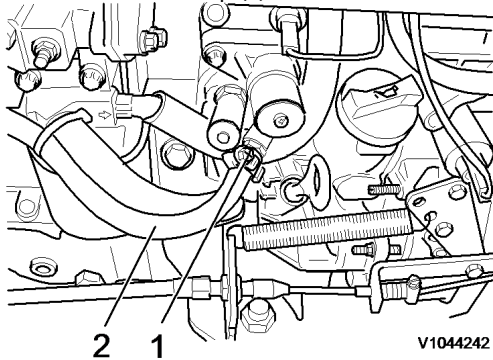
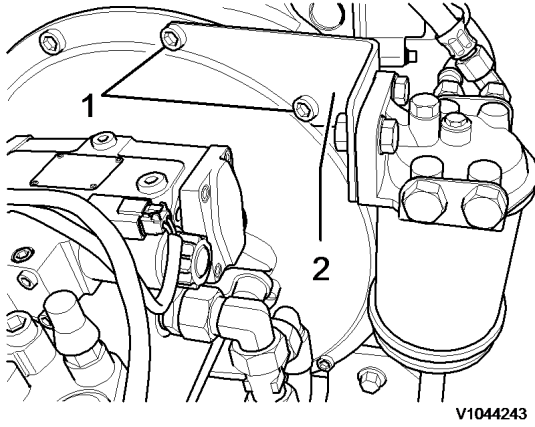


Figure 10

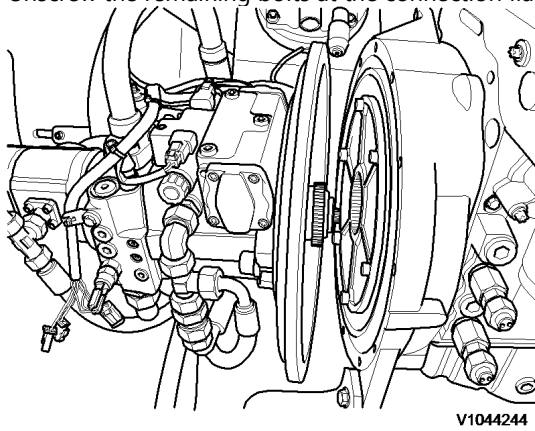
16. Unscrew the bolt (1) at the connection flange and remove the bracket (2) with the fuel filter/water separator assembly.



V1044243

Figure 11

17. Unscrew the remaining bolts at the connection flange.



V1044244

Figure 12

18. Suspend the hydraulic variable displacement pump from a crane using suitable hoisting equipment and pull it out of the connection housing. Support the hydraulic variable displacement pump and put it aside.
19. Remove the flexi exhaust pipe from the silencer.



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Figure 13

20. Disconnect the connection cable (1) from the air filter control switch.

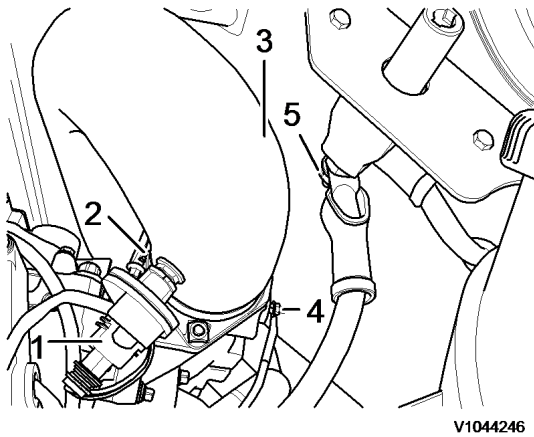


Figure 14

21. Release clamp (2) on air filter intake hose and pull hose (3) off air inlet pipe.
22. Unscrew the glow plug connection cable (4).
23. Unscrew the ground connection (5) from the battery disconnect switch.
24. Disconnect electrical pin plug connection X24 (fuel tank sensor) and X26 (engine connection).

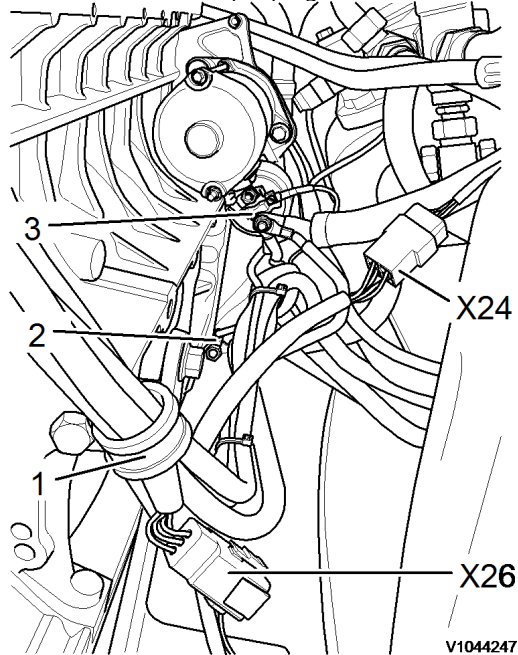


Figure 15

25. Undo clamp (1) and remove cable tie.
26. Remove ground connection (2) at engine block.
27. Disconnect charging current line (B+) to starter (3).
28. Remove engine bracket fixing bolts at frame.

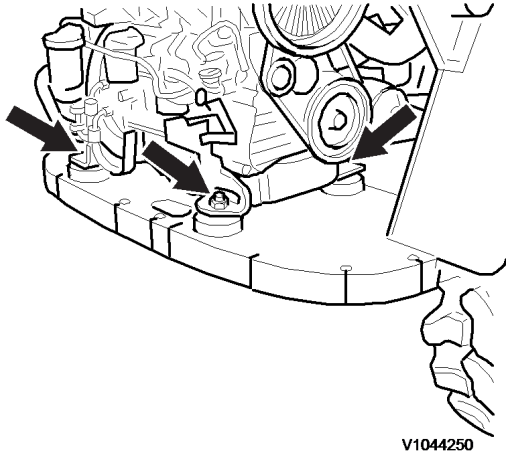


Figure 16

29. Fasten a lifting device (E-tool) to the engine and suspend from the crane.

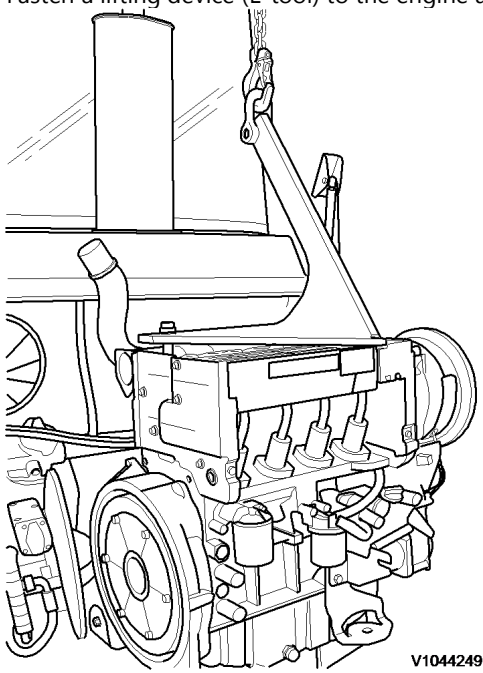


Figure 17

30. Slowly out the engine and place it on a suitable surface.

Document Title: Engine, installing	Function Group: 210	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Engine, installing

Op nbr 210-072

! WARNING

The work involves handling heavy components - failure to stay alert may result in severe crushing injuries.

1. Fasten a lifting device (E-tool) to the engine and suspend from the crane.

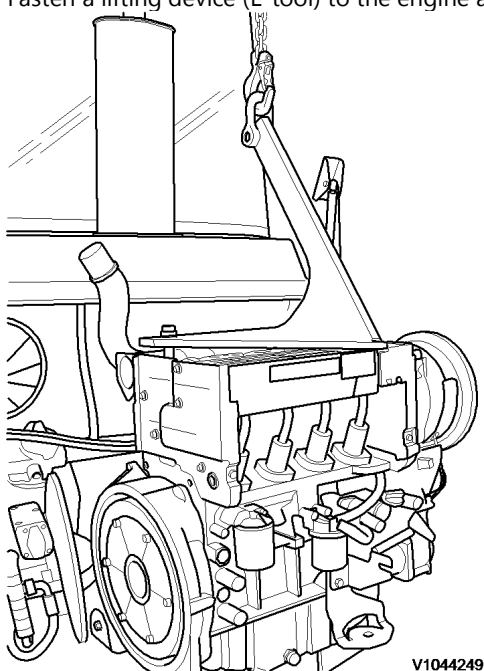


Figure 1

2. Slowly lower the engine into the engine bay and position on the engine mounts.

NOTICE

Make sure that no hoses or cables are trapped.

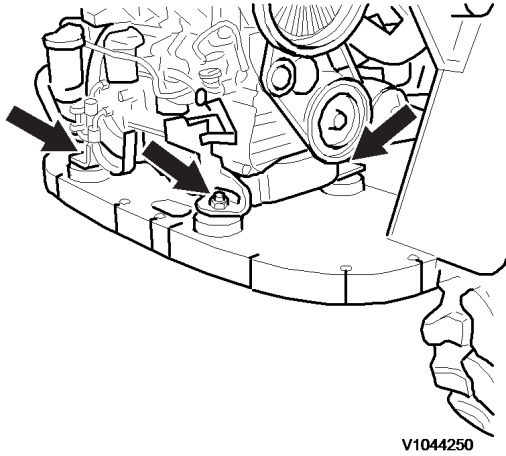


Figure 2

3. Tighten the engine bracket fixing bolts to the frame. Tightening torque **200 Nm (148 lbf ft)**.
4. Unhook the lifting device and unscrew from the engine.
5. Connect electrical pin plug connection X24 (fuel tank sensor) and X26 (engine connection).

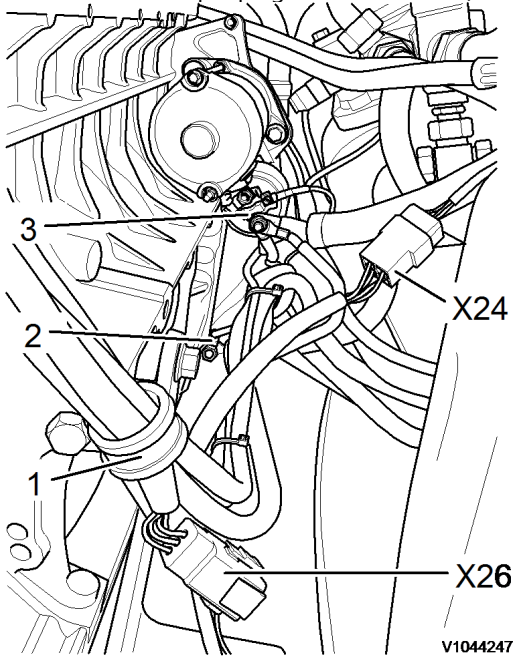
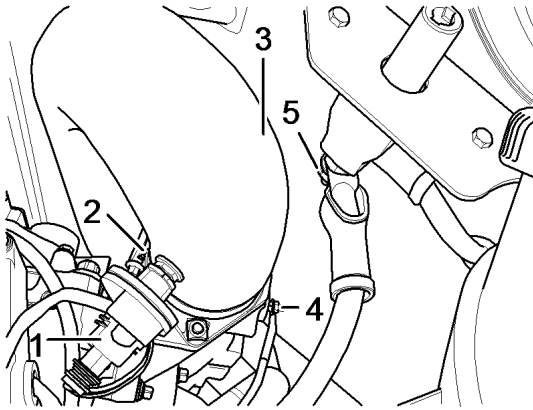


Figure 3

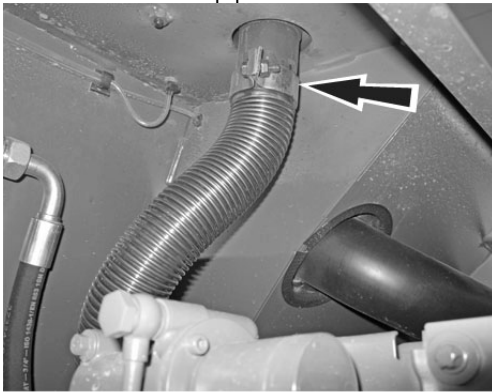
6. Install ground connection (2) at engine block.
7. Attach charging current line (B+) to the starter (3).
8. Screw in clamp (1) and fit cable tie.
9. Attach intake hose (3) to the air inlet pipe and fasten with the clamp (2).



V1044246

Figure 4

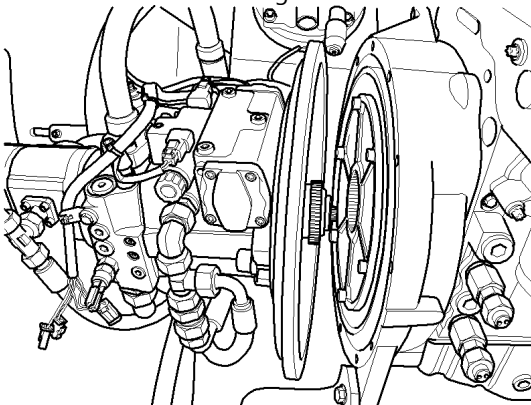
10. Connect the connection cable (1) to the air filter control switch.
11. Screw on the glow plug connection cable (4).
12. Screw the ground connection (5) onto the battery disconnect switch.
13. Fit the flexi exhaust pipe to the silencer.



V1038860

Figure 5

14. Suspend the hydraulic variable displacement pump from a crane using suitable hoisting equipment and position it on the connection housing.



V1044244

Figure 6

15. Screw in the connection flange bolt (1) and fit the bracket (2) with the fuel filter/water separator assembly. Tighten

the bolt to **49 Nm (36 lbf ft)**.

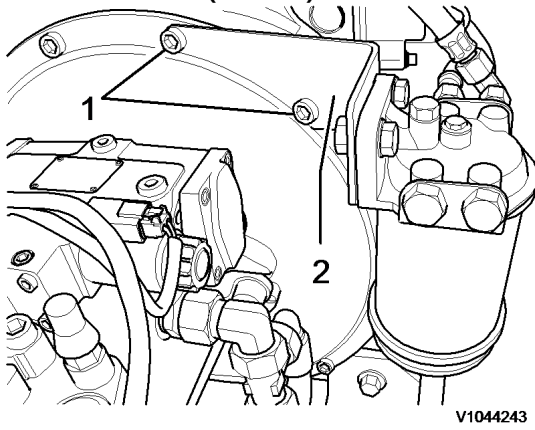


Figure 7

16. Attach the fuel hose (2) to the fuel pump and fasten it with the clamp (1).

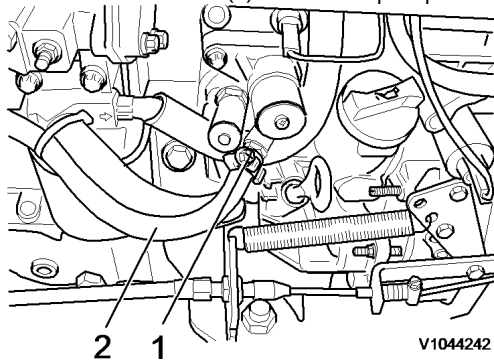


Figure 8

17. Attach the fuel return hose (1) and fasten the hose clamp using clamping tongs.

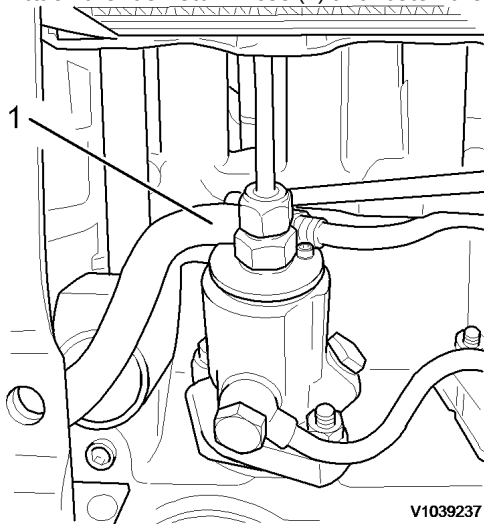


Figure 9

18. Install air duct cover.

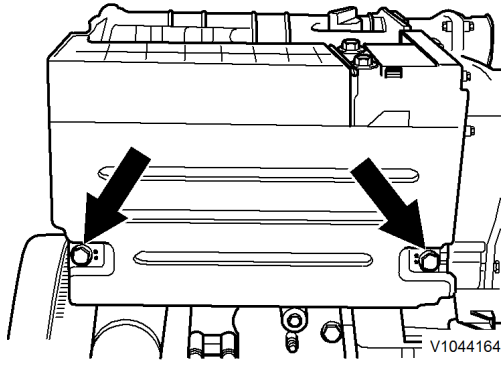


Figure 10

19. Fit heater connections (1) and (2).

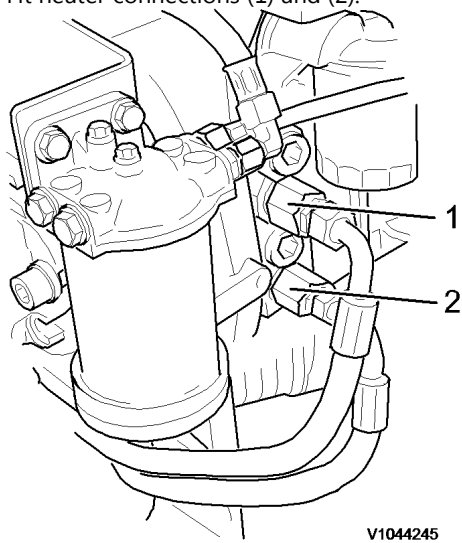


Figure 11

NOTE!

Observe supply and return markings.

20. Attach throttle cable to the engine. Fasten the bracket (1) and slacken approximately one turn. Tighten the jam nuts (2).

NOTE!

Depress the accelerator pedal all the way and check whether the engine speed adjustment level rests against the adjuster screw.

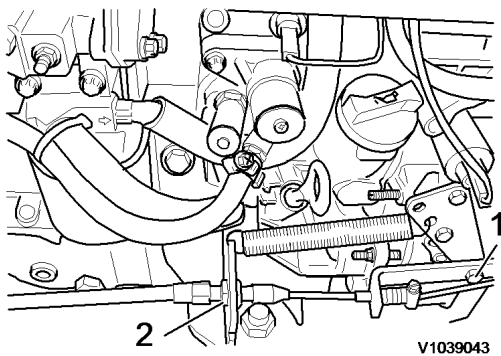
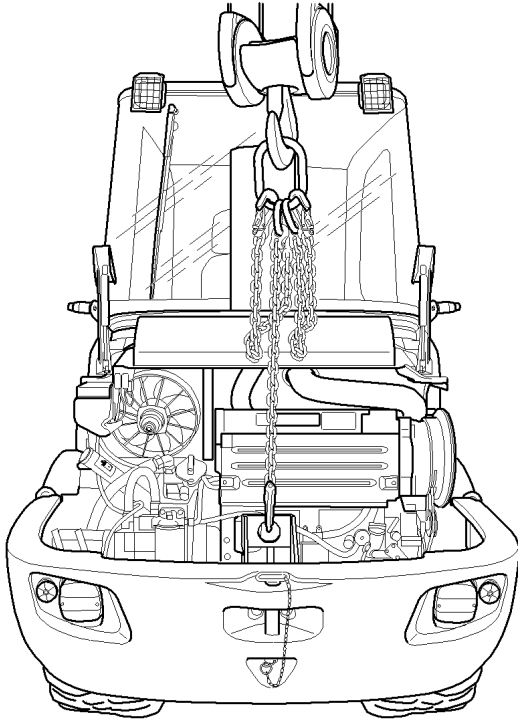


Figure 12

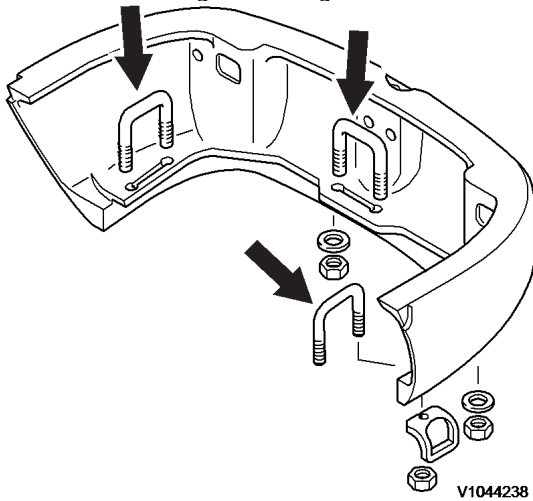
21. Suspend the counterweight from a crane using suitable hoisting equipment and position it on the rear frame plate.



V1044240

Figure 13

22. Fit the counterweight retaining bracket (arrows) and tighten the fixing nuts to **210 Nm (155 lbf ft)**.



V1044238

Figure 14

23. Connect the pin plug connection of the tail lights.
24. Detach the lifting device (E-tool) from the counterweight and refit the engine hood catch (1).

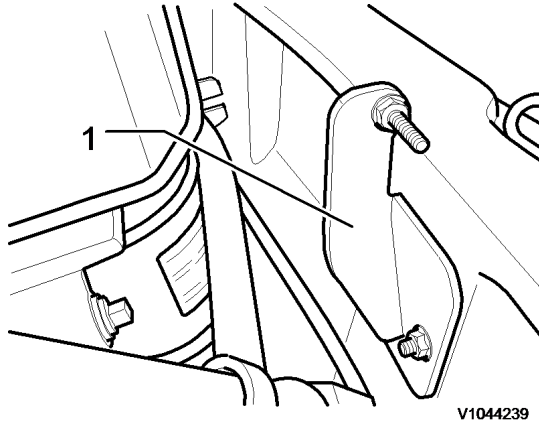


Figure 15

25. Fit the air flow guide plate (1).

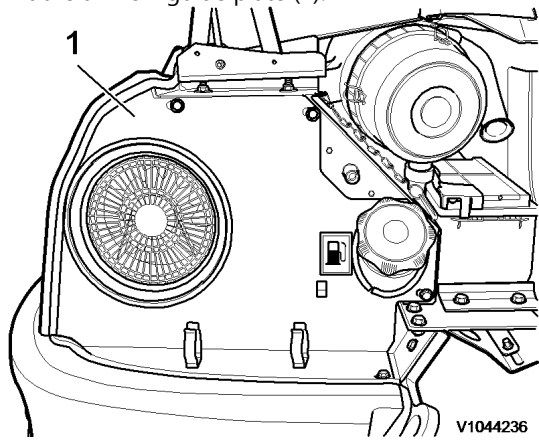


Figure 16

26. Install the engine hood.
27. Check engine oil level
28. Switch on the battery disconnect switch.
29. Start the engine. After test running for a brief period (approx. 2 minutes at low idling speed), check the oil level and top up as necessary.

Document Title: Cylinder head, description	Function Group: 211	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Cylinder head, description

Single-piece grey cast iron cylinder head with integrated valve guide and shrunk valve seat ring.

The valves are suspended in the cylinder head and are actuated via camshaft, tappets, push rods and rocker arms.

Document Title: Valve mechanism, description	Function Group: 214	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Valve mechanism, description

The engine has one inlet and one exhaust valve per cylinder.

The valves are suspended in the cylinder head and are actuated via camshaft, tappets, push rods and rocker arms. Timing is handled via toothed belt and camshaft.

The upper end of the valve guide has a valve stem seal that prevents a high level of oil consumption.

Rocker arm lubrication is part of the engine force-feed lubrication system. The oil is supplied via the tappets and push rods.

Document Title: Valves, adjusting	Function Group: 214	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Valves, adjusting

Op nbr 214-012

NOTE!

Only adjust the valve clearance with cold engine.

1. Place the machine in service position.
2. Remove the air flow guide plate (1).

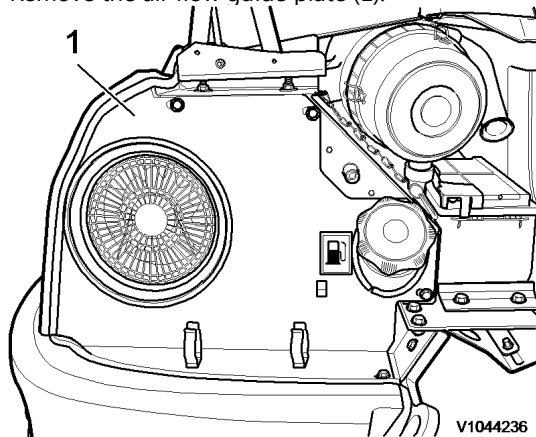


Figure 1

3. Remove cylinder head cover.

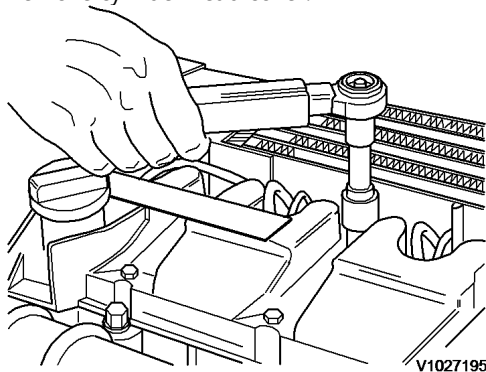


Figure 2

4. Turn the crankshaft until you reach the valve intersection at cylinder no. 1.

NOTE!

Direction of engine rotation at the flywheel seen from the left.

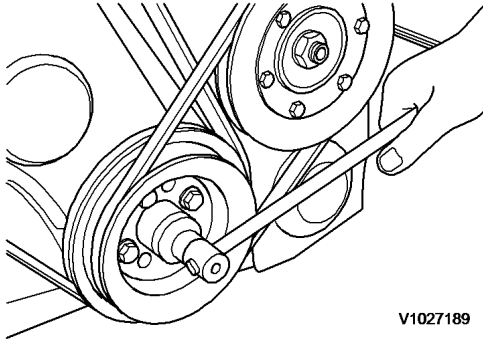


Figure 3

NOTE!

Valve overlap means:

Outlet valve is not yet closed. Inlet valve begins to open.

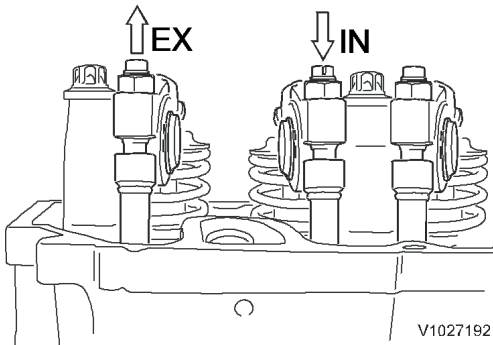


Figure 4

IN = inlet valve

EX = outlet valve

Check valve clearance.

5. Use a feeler gauge to check the valve clearance of the cylinder.

Inlet valve: **0.3 mm (0.0118 in)**

Exhaust valve: **0.5 mm (0.0197 in)**

NOTE!

It must be possible to insert the feeler gauge between the rocker arm sliding surface and the valve with slight resistance.

Slacken the jam nut and correct valve clearance by turning the adjuster screw.

Tighten the jam nut to **20±2 Nm (14.8±1.5 lbf ft)**. Make sure that the adjuster screw is not turned when tightening the jam nut.

Re-check the setting with the feeler gauge.

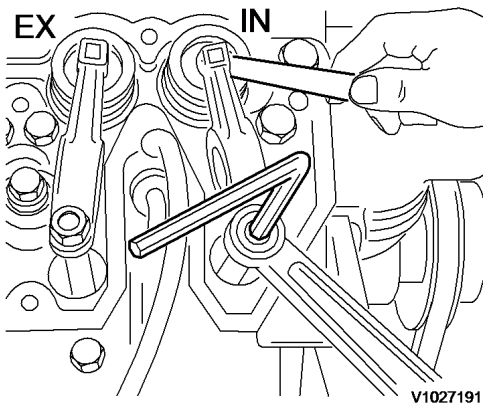


Figure 5

Adjust the valve clearance

6. Crankshaft position 1:
Check and adjust the valves marked black in figure.

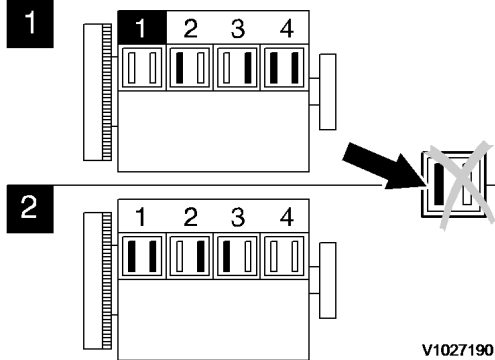


Figure 6
Valve clearance adjustment diagram

7. Crankshaft position 2:
Turn the crankshaft one rotation (360°). Check and adjust valve clearance of the valves marked black in the figure.
NOTE!
If the cylinder head gasket has been replaced, increase valve clearance by 0.1 mm (0.0040 in).

8. Clean the sealing surface of the cylinder head cover and cylinder head.

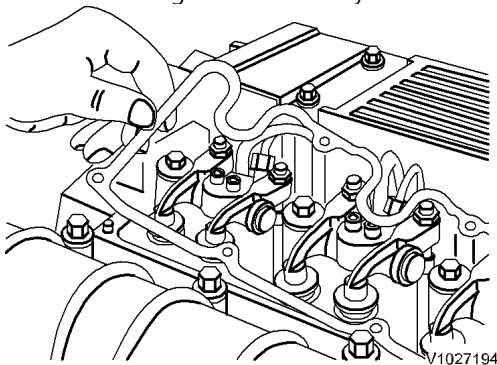


Figure 7

9. Position the gasket.
NOTE!
Note installation position.
10. Position the cylinder head cover and tighten the bolts in a crisscross pattern. Tightening torque **8.5 Nm (6.3 lbf ft)**.

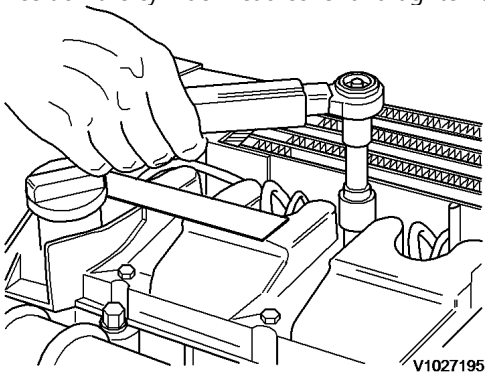


Figure 8

11. Fit the air flow guide plate (1).

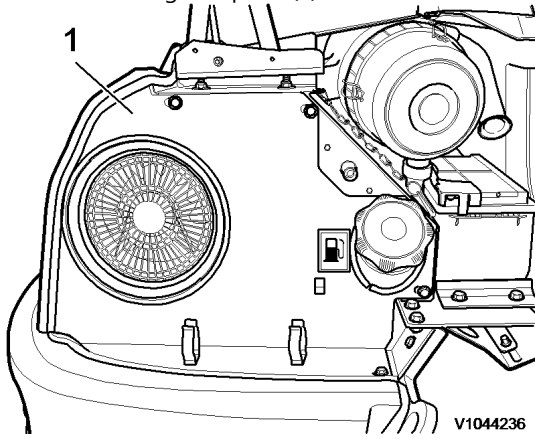


Figure 9

Document Title: Compression test	Function Group: 214	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Compression test

Op nbr 210-002

[2904628 Adapter](#)

[9988539 Pressure gauge](#)

[9998007 Adapter](#)

Injection valves are removed, valve clearance checked.

1. Detach the engine stop solenoid connector (Y6).

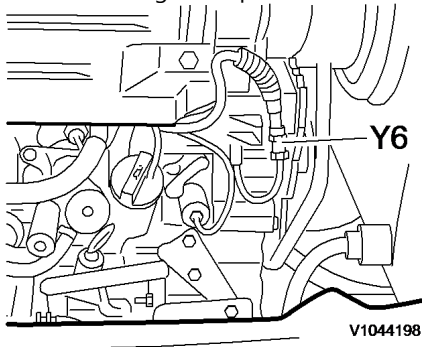


Figure 1

2. Insert connector with seal ring in the injector bore.

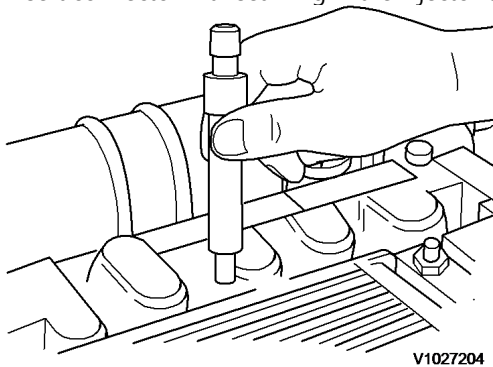
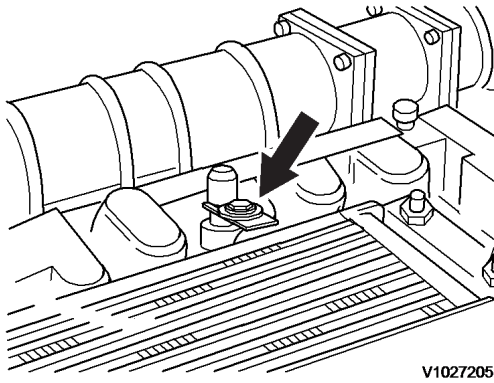


Figure 2

NOTE!

Use the seal ring from the injector.

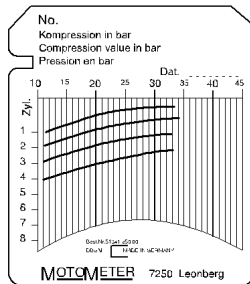
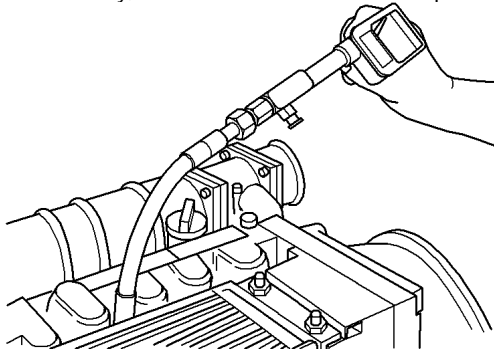
3. Fit the clamping jaw to the connector and tighten.



V1027205

Figure 3

- If necessary, screw on the connector adapter.



V1027206

Figure 4

- Connect compression tester. Crank engine with the starter.

Compression pressure: 22 - 27 bar (319 - 391 psi)

- Carry out compression test on each cylinder.

NOTE!

The compression measured depends on the starter rpm during the measurement and the engine's altitude. Therefore, exact limit values cannot be set. Compression measurement is recommended only for comparison of all engine cylinders. If a deviation of more than 15% is found, the cylinder in question should be dismantled to determine the cause.

- Remove compression tester and connector.
- Attach the engine stop solenoid connector (Y6).
- Install injection valves.

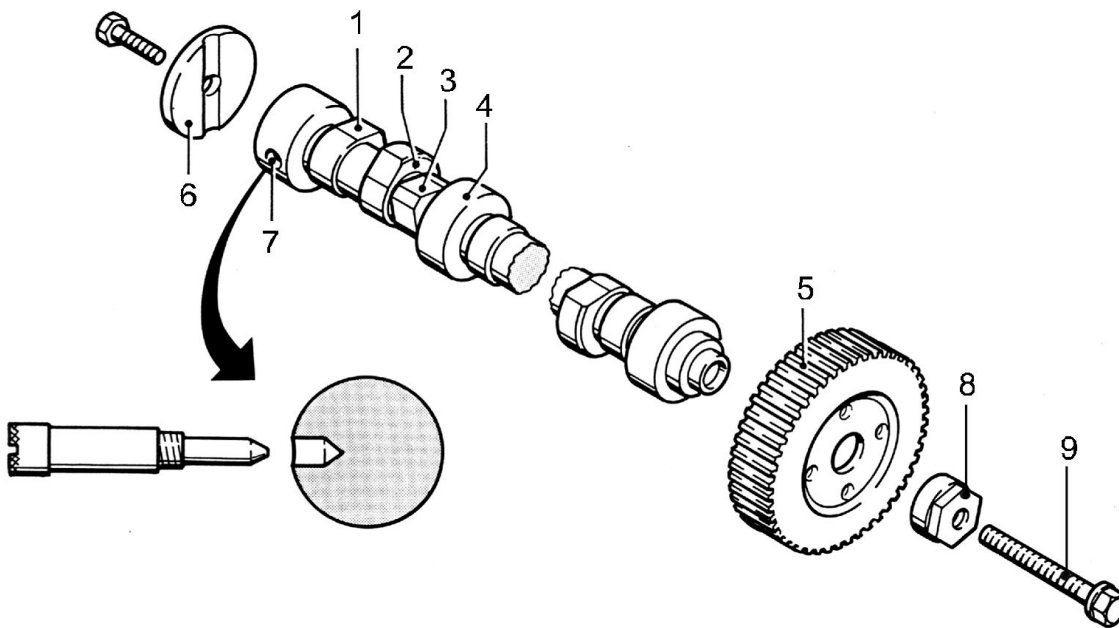
Document Title: Camshaft, description	Function Group: 215	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Camshaft, description

The camshaft is made of forged semi-manufactured parts. Bearings and cams are inductively hardened. The number of bearings = number of cylinders + 1. Each cylinder has an inlet, an exhaust and an injector cam.

The first camshaft bearing has a bore for the adjuster screw that locks the camshaft in place when adjusting engine timing during belt fitting.

The camshafts of induction and turbocharged engines differ in that the shape of the inlet and exhaust cams is different. The camshaft of a turbocharged engine can be recognised by the flat exhaust cam at the tip.



V1044224

Figure 1

1. Exhaust cam
2. Injection pump cam
3. Inlet cam
4. Camshaft bearing
5. Camshaft gear
6. Thrust washer
7. Bore for adjuster screw
8. Washer
9. Centre screw

Document Title: Belt, changing	Function Group: 215	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Belt, changing

Op nbr 215-010

[2906246 Tool](#)

[2289391 Adjustment screws](#)

[2289395 Counterhold](#)

[2902691 V-belt tension gauge](#)

Removing

NOTE!

Each time they are removed, the toothed belt and tension roller must be replaced if they have passed a run time limit.

1. Place the machine in service position.
2. Switch off the battery disconnect switch.

Remove the engine hood.

3. Open the engine hood and unscrew the fixing bolts.
4. Lift off the engine hood and place it on a suitable surface.
5. Remove the air flow guide plate (1).

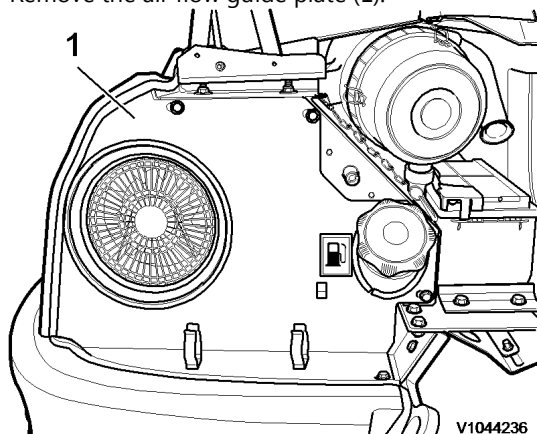
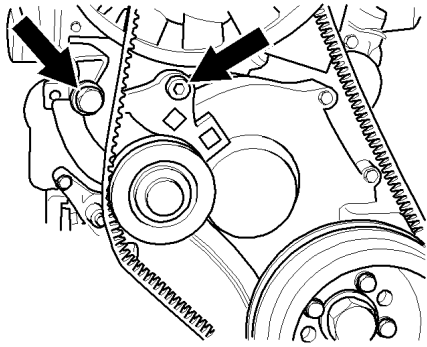


Figure 1

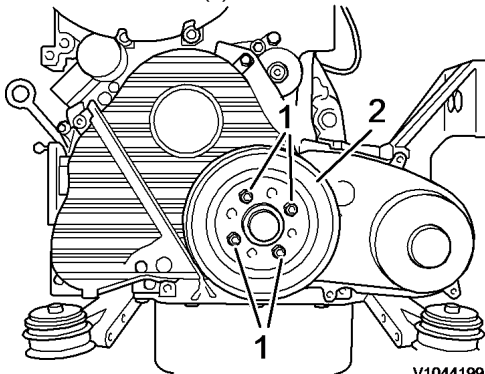
6. Slacken the retaining bolts of the V-belt tension roller. Relieve the load on the tension roller and remove the V-belt.



V1044163

Figure 2

7. Remove the V-belt tension roller.
8. Unscrew the bolts (1) and remove the V-belt roller (2).



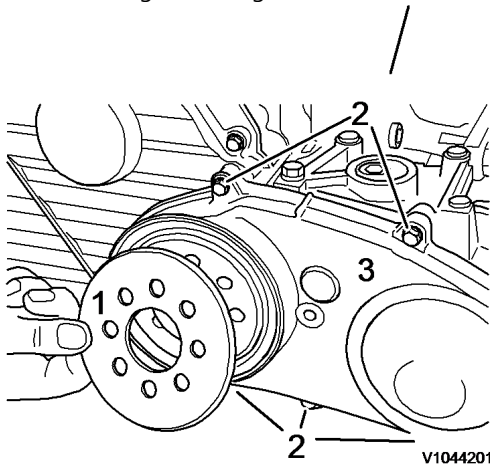
V1044199

Figure 3

NOTE!

Counterhold at the centre screw.

9. Remove the grease slinger (1), unscrew the bolts (2) and remove the guard (3).



V1044201

Figure 4

10. Remove the intermediate piece (arrow).

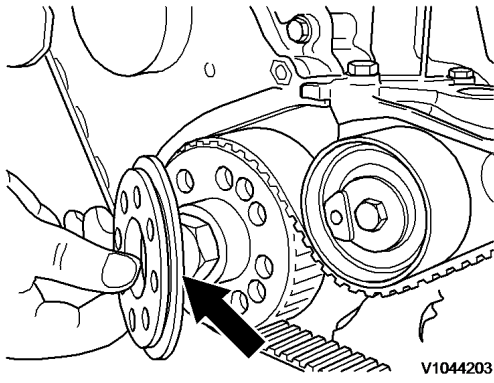


Figure 5

11. Unscrew the bolt (1) and remove the tension roller (2) with toothed belt (3).

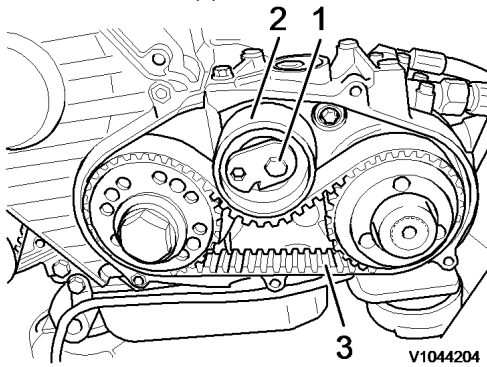


Figure 6

12. Unscrew lock bolt (1) 2906246 Tool and bolts (2). Remove the protective cover (3).

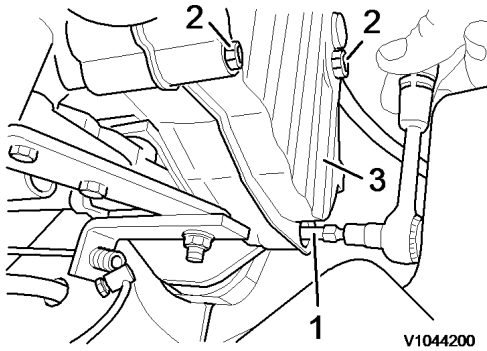


Figure 7

13. Unscrew the bolts (1) and remove the guard (2).

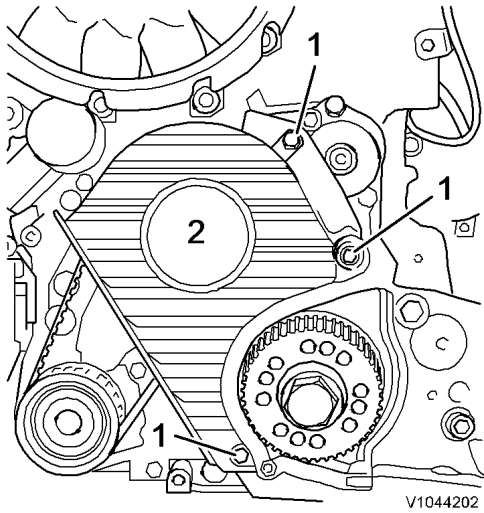


Figure 8

Lock the camshaft in place.

14. Unscrew the lock screw (arrow). Insert adjuster screw (2229391) in the bore to lock the camshaft in position. Hold the adjuster bolt with light pressure and turn the crankshaft in the direction of engine rotation (clockwise) until the adjuster bolt engages in the camshaft. Turn the adjuster bolt until it makes contact with the crankcase.

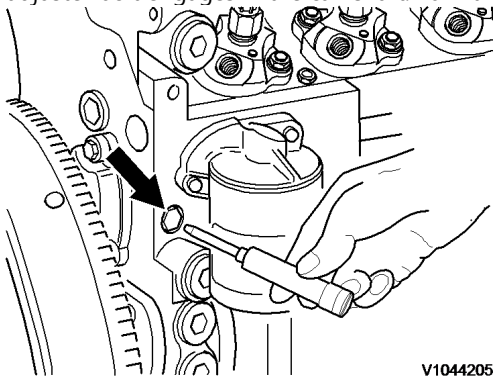


Figure 9

Lock the crankshaft in place.

15. Unscrew the lock screw (arrow) Insert adjuster screw (2229391) in the bore to lock the crankshaft in place. Turn the adjuster bolt until it makes contact with the crankcase.

NOTE!

Cylinder 1 is in TDC.

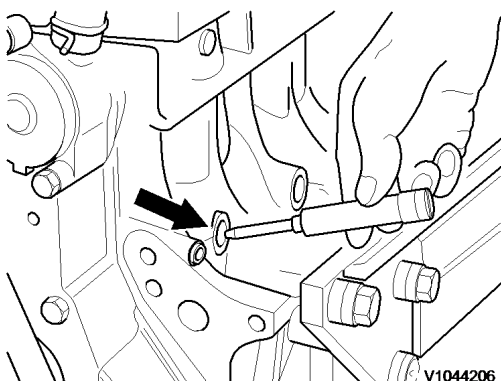


Figure 10

16. Remove tension roller and toothed belt of camshaft. Unscrew bolt (1) and remove tension roller (2) with toothed belt (3).

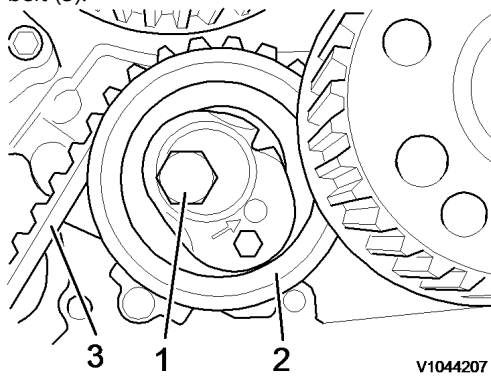


Figure 11

17. Detach camshaft belt pulley. Fit counterhold (2289395) and slacken centre screw.

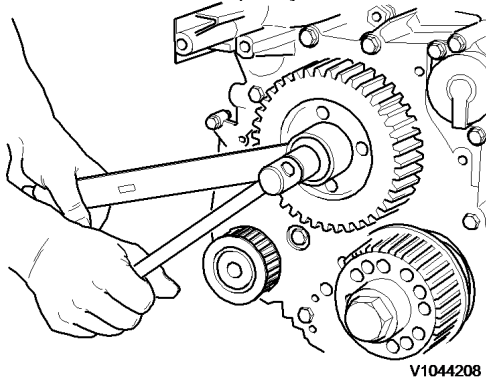


Figure 12

Installing

18. Tighten centre screw of camshaft belt pulley finger-tight.

NOTE!

Use a new centre screw.

To preserve the length compensation of the toothed belt, it must be possible to rotate the camshaft belt pulley.

19. Position a new toothed belt.

NOTE!

Note the toothed belt's direction of rotation. The arrows must follow the direction of engine rotation.

20. Fit new tension roller (1) and eccentric adjuster (arrow) in the 6 o'clock position. Turn the bolt (2). Press the tension roller against the toothed belt and pretension the bolt to **$8 \pm 2 \text{ Nm}$ ($5.9 \pm 1.4 \text{ lbf ft}$)**

NOTE!

Note differing tension rollers.

The tension roller for the camshaft drive is 30 mm (1.18 in) wide.

The tension roller for the hydraulic pump drive is 35 mm (1.38 in) wide.

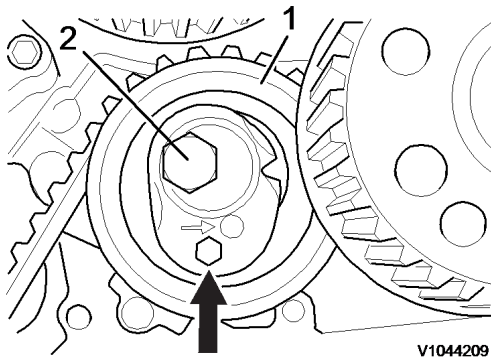


Figure 13

21. Align the toothed belt so that there is a uniform distance from the cover to the toothed belt of **8 - 9 mm (0.31 - 0.35 in)**.

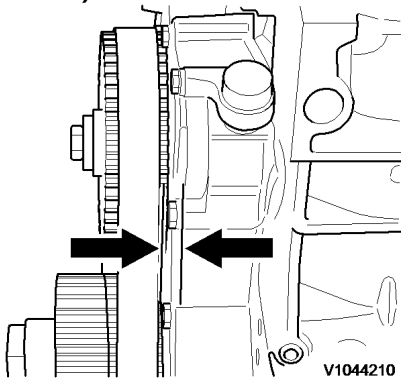


Figure 14

22. Tauten the tension side (1) of the toothed belt by turning the camshaft belt pulley in the direction of the arrow (anticlockwise).

NOTE!

Turn the camshaft belt pulley by hand - do not use the centre screw. The crankshaft must be held against the stop lug during adjustment.

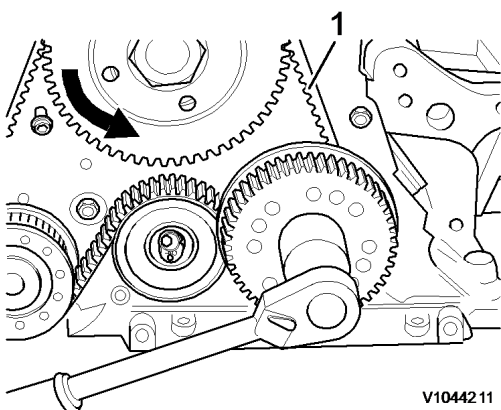


Figure 15

23. Turn the eccentric adjuster in the direction of the arrow (anticlockwise) until the bore (1) aligns with the eccentric adjuster. Tighten the bolt (2) to **21 Nm (15.5 lbf ft)**.

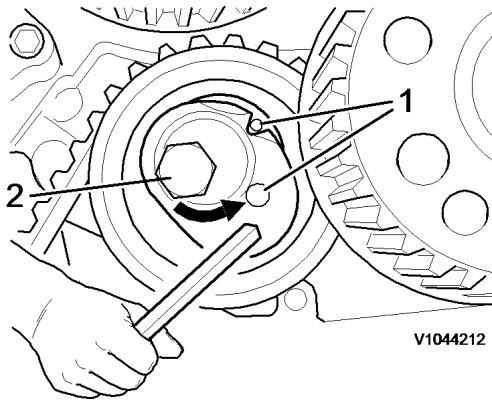


Figure 16

NOTE!

Turn the eccentric adjuster at the Allen screw.

24. Fasten the camshaft belt pulley. Fit the counterhold (2289395) and pretension the centre screw to **30 Nm (22 lbf ft)** and then angle tighten to **+ 210°**.

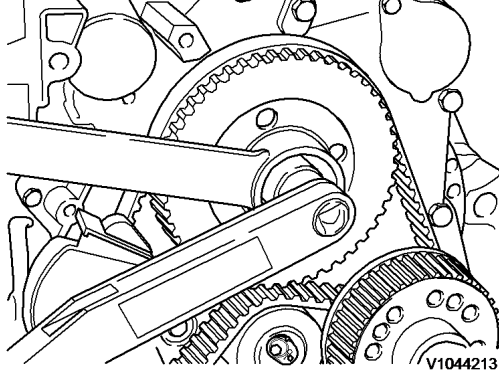


Figure 17

Check toothed belt tension

25. Remove the adjuster bolts used to lock the camshaft and crankshaft in place. Fasten the lock screws with a new seal ring.
26. Place a mark (arrow) on the camshaft belt pulley and the opposite bolt (1).

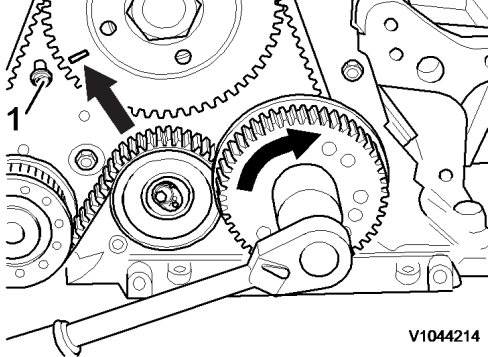


Figure 18

27. Turn the crankshaft 2 turns in the direction of engine rotation (clockwise) until the markings align.
28. The bores (1) in the eccentric adjuster must also align. If not, toothed belt tension must be corrected.

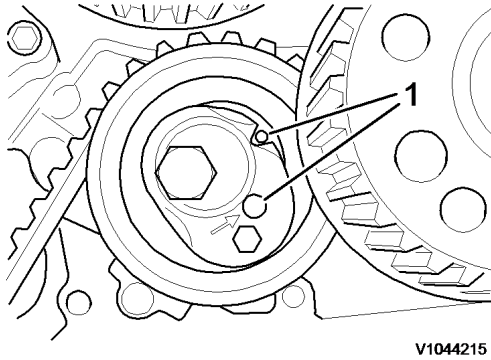


Figure 19

Fit the toothed belt for the power take-off (PTO).

29. Hook the tension roller fork into the guide pin (arrow).

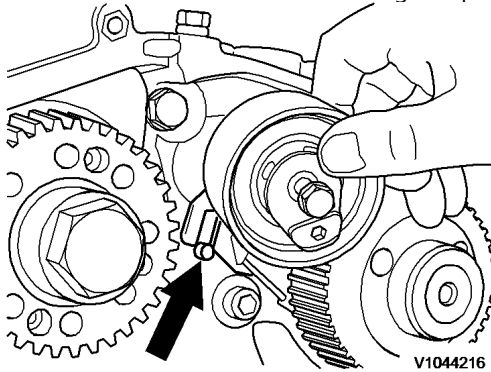


Figure 20

30. Set the eccentric adjuster (arrow) to the 12 o'clock position. Pretension the bolt to **8 + 2 Nm (5.9 + 1.4 lbf ft)**.

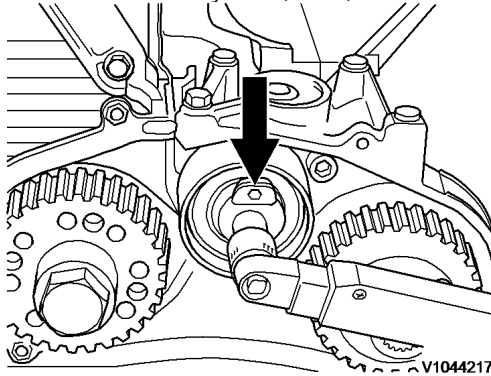


Figure 21

31. Position the new toothed belt and adjust so that on the crankshaft gear at the guide collar and on the hydraulic pump gear there is approximately **4 mm (0.16 in)** to the front edge. Remove the arresting pin.

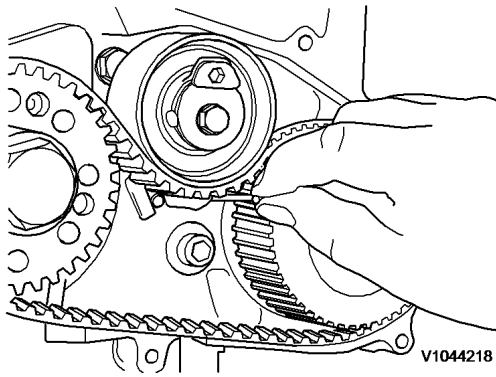


Figure 22

NOTE!

Note the belt's direction of rotation. The text on the belt must be legible from the front.

32. Turn the eccentric adjuster in the direction of the arrow (anticlockwise) until the tension roller pointer aligns with the groove (1). Tighten the bolt to **21 ± 2 Nm (15.5 ± 1.5 lbf ft)**.

NOTE!

Turn the eccentric adjuster at the Allen screw.

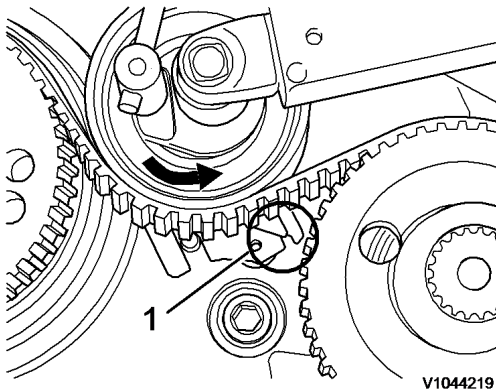


Figure 23

33. Check toothed belt tension. Turn the crankshaft 2 turns in the direction of engine rotation. The tension roller point must align with the groove (1). If the marks do not align, toothed belt tension must be corrected.

34. Fit the intermediate piece.

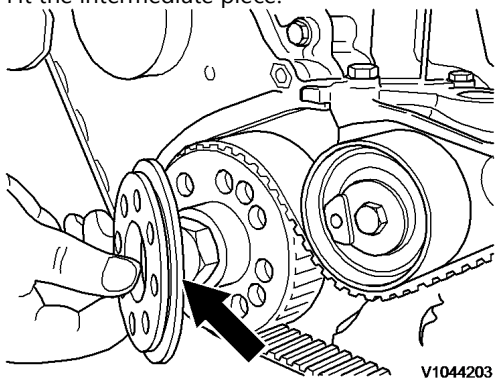
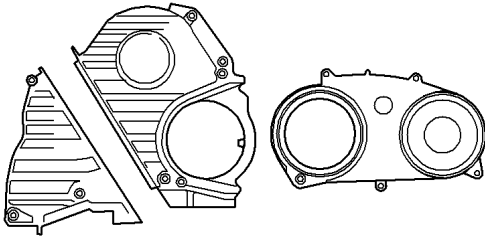


Figure 24

NOTE!

The flat side (arrow) must face the toothed belt.

35. Visually inspect the guard. Replace seals if necessary. Fit the guard. Tighten the fixing bolts to **7 Nm (5.2 lbf ft)**.



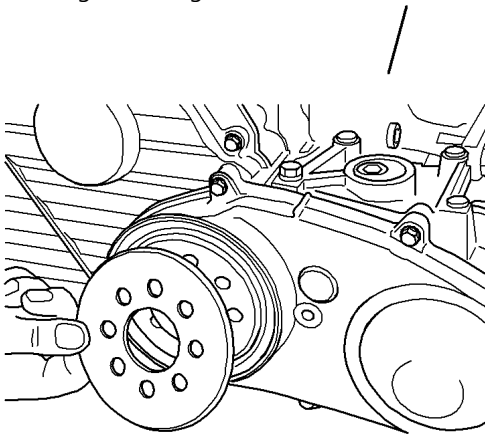
V1044220

Figure 25

NOTE!

Check that the guard is properly seated.

36. Fit the grease slinger.



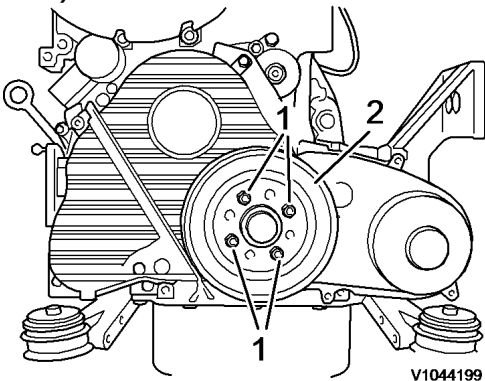
V1044221

Figure 26

NOTE!

The groove must face the intermediate piece.

37. Position the V-belt roller (2) and tighten the bolts (1) in a crosswise pattern. Tightening torque **42 ±4 Nm (31 ±1.5 lbf ft)**.



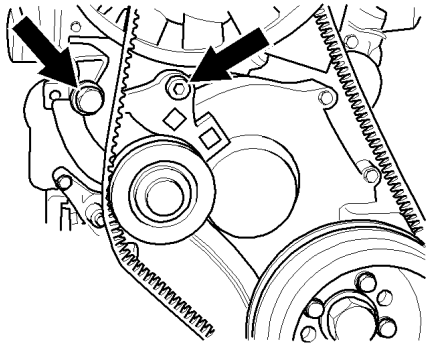
V1044199

Figure 27

NOTE!

Counterhold at the centre screw.

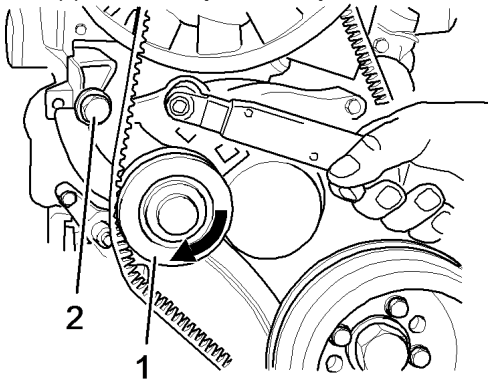
38. Fit the V-belt tension roller and position the belt.



V1044163

Figure 28

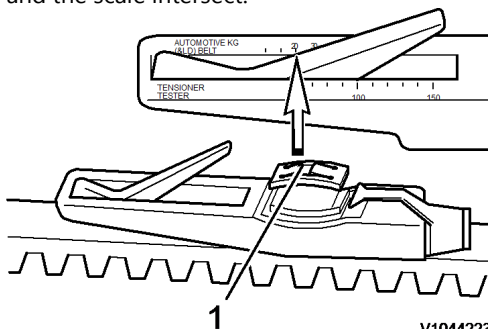
39. Tension the V-belt. Use a suitable tool to press the tension roller (1) in the direction of the arrow and tighten the bolt (2) to **45 Nm (33.2 lbf ft)**.



V1044222

Figure 29

40. Check V-belt tension. Fit measuring device (2902691) to the V-belt. Press the measuring device over the pressure button (1) against the V-belt until there is a clicking sound. Read the measurement value where the pointer arm and the scale intersect.



V1044223

Figure 30

NOTE!

Note the different units on the scale.

V-belt tension	
Pretension after first installation	450 ± 50 N (100 ±10 lbf)
Run for 15 minutes under load and re-tension.	300 ± 20 N (67.4 ±4.5 lbf)

NOTE!

If the set value is not achieved, the tensioning procedure must be repeated.

41. Fit the air flow guide plate.

42. Install the engine hood.

Document Title: Crankshaft, description	Function Group: 216	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Crankshaft, description

The crankshaft is made of ductile cast iron. It is mounted in bearing shells. All bearing trunnions are surface-hardened and ground.

The bores in the crankshaft allow oil to be supplied from the main bearings to the crankshaft bearings.

The connecting rod consists of steel and is drop-forged.

The crankshaft and connecting rod bearings are plain bearings ready for installation.

Document Title: Lubrication description	system, 220	Function Group: 220	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]				

Lubrication system, description

The engine has a centralized lubricating system. The lubrication oil pump (rotor pump) with pressure limiter valve conveys the oil from the oil sump via the main flow filter to the crank mechanism and the camshaft. The lubrication oil pump is outside of the oil sump and is driven by the toothed belt. The lubrication oil cools the cylinders and lubricates the valve train.

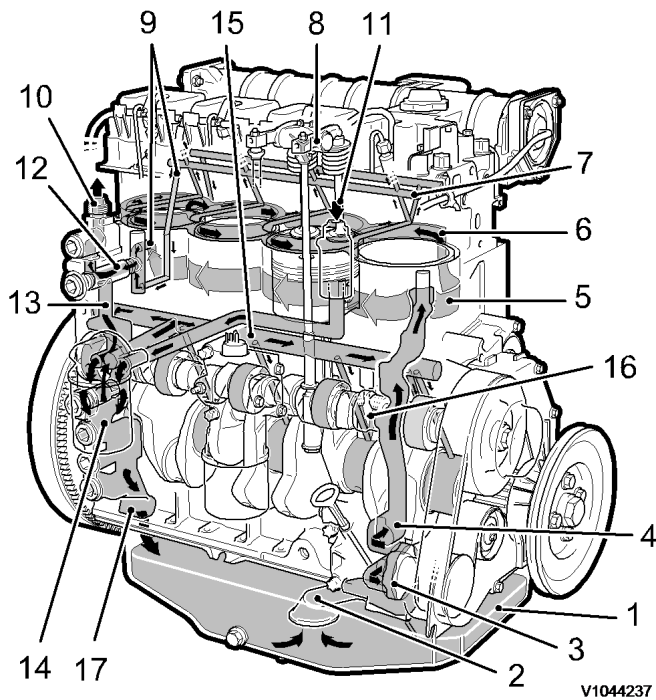


Figure 1

1. Oil sump
2. Oil suction pipe with strainer
3. Oil pump with pressure relief valve (6 bar)
4. Main oil passage
5. Oil-cooled cylinder
6. Cylinder head cooling channel
7. Oil channel for rocker arm lubrication
8. Rocker arm
9. Oil collector line for thermostat
10. Engine radiator inlet
11. Return flow to engine radiator
12. Thermostat housing
13. Oil channel to oil filter
14. Oil filter
15. Oil channel to camshaft, con-rod and crankshaft bearings
16. Piston cooling nozzle
17. Oil return via the crankcase to the oil sump

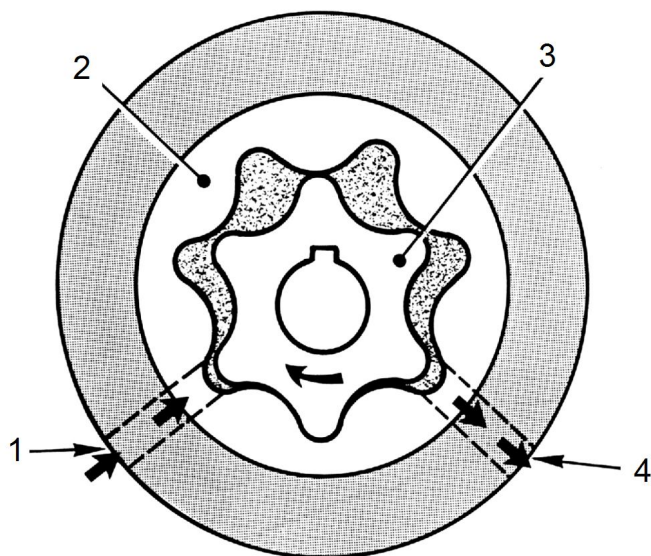
Document Title: Oil pump, description	Function Group: 221	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Oil pump, description

The lubrication oil pump is a rotor pump. Within the outer rotor, an inner rotor moves. This has one fewer cam than the outer rotor, thus there is always one inner rotor cam in complete mesh with the outer rotor. The other inner rotor cams slide across the outer rotor cams, forming a seal that prevents oil from flowing back.

The oil is suctioned into the pipe when the inner rotor cams slide along and then away from the outer rotor cams.

The oil is pressed out when the inner rotor cams engage in the cavities in the outer rotor.



V1044226

Figure 1

1. Oil sump inlet
2. Outer rotor
3. Inner rotor
4. Pressure side

Document Title: Fuel system, description	Function Group: 230	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Fuel system, description

General

Fuel flows from the tank, across the primary filter (fuel pre-filter/water separator) to the fuel feed pump, through the secondary filter (fuel filter) to the inlet of the injection pumps. From the injection pumps, the fuel travels via the delivery pipes to the injectors. Excess fuel is collected with the return line and returned to the tank via the overcurrent line.

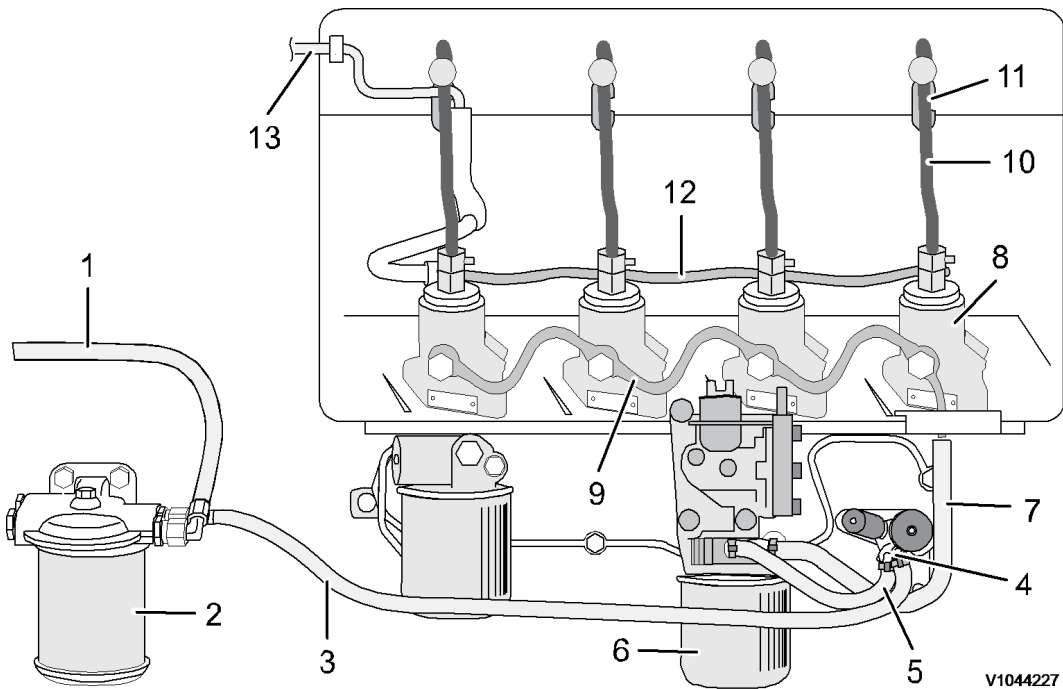


Figure 1

1. Fuel line from tank
2. Primary filter (fuel pre-filter/water separator)
3. Fuel line to fuel feed pump
4. Fuel pump
5. Fuel line from feed pump to secondary filter
6. Secondary filter (fuel filter)
7. Fuel line from secondary filter to injection pump
8. Injection pump
9. Fuel delivery line
10. Delivery pipe
11. Injection valve
12. Fuel return pipe
13. Overcurrent line to tank

Document Title: Fuel feed pump, description	Function Group: 233	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Fuel feed pump, description

The fuel feed pump is a piston pump with integrated coarse filter. If the fuel or fuel tank is heavily polluted, the coarse filter can be cleaned as necessary (loss of power).

The integrated hand pump makes it possible to feed fuel by hand, making it possible to restart the engine more quickly after the fuel tank has been run dry.

Document Title: Fuel pump, removal	Function Group: 233	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Fuel pump, removal

Op nbr 233-011

1. Place the machine in service position.
2. Switch off the battery disconnect switch.

NOTICE

Maintain greatest possible cleanliness when working on the fuel system.

NOTE!

Collect draining fuel in a suitable container and dispose of in an environmentally responsible manner.

3. Pull out oil dipstick (1).

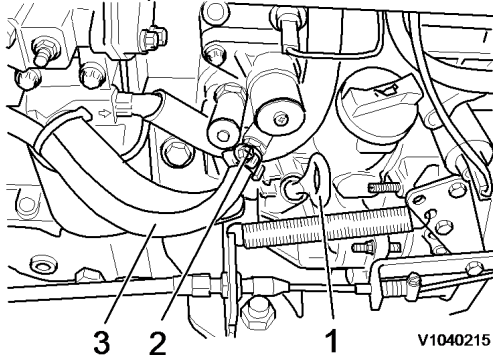


Figure 1

4. Undo the hose clamp (2) and detach the fuel hose (3) from the fuel pump.
5. Detach the fuel hose from the fuel pump of the fuel filter. Undo the hose clamp (1) at the fuel pump connection with the clamping tongs and detach the fuel hose (2).

NOTE!

Mark fuel hoses.

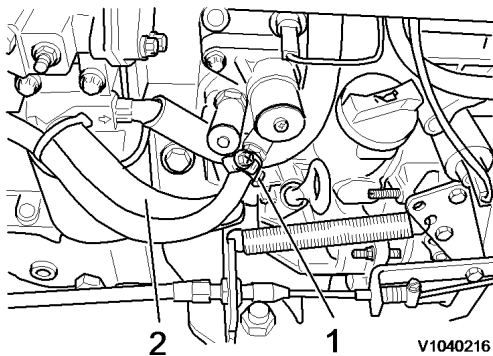
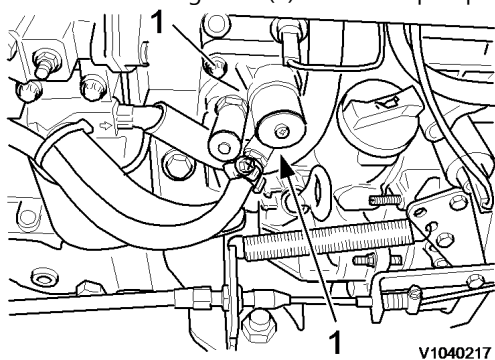


Figure 2

6. Unscrew the fixing bolts (1) of the fuel pump. Remove the fuel pump and gasket.



V1040217

Figure 3

Document Title: Fuel pump, installation	Function Group: 233	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Fuel pump, installation

Op nbr 233-012

1. Clean crankcase sealing surface.
2. Insert fuel pump with new gasket and press until it makes contact. Tighten fixing bolts (1) to **21 Nm (15.5 lbf ft)**.

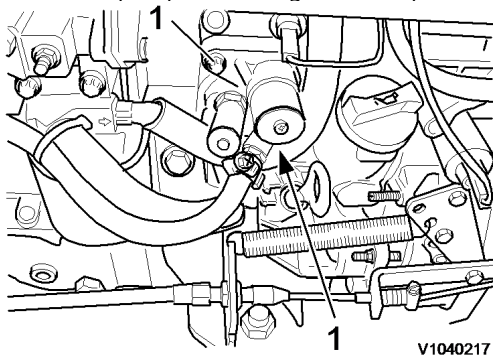


Figure 1

NOTE!

Check fuel hoses and replace if necessary.

3. Attach the fuel hose to the fuel pump of the fuel filter. Fit the fuel hose (2) to the fuel pump connection and fasten the hose clamp (1) with the clamping tongs.

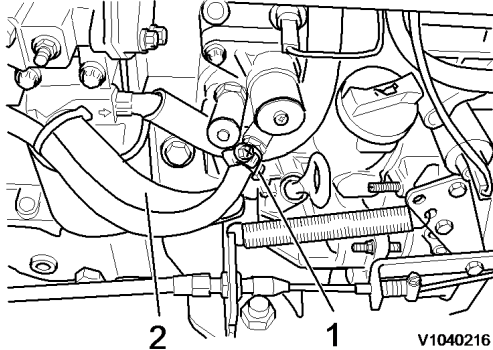


Figure 2

4. Fit the fuel hose (3) to the fuel pump connection and fasten with the hose clamp (2).

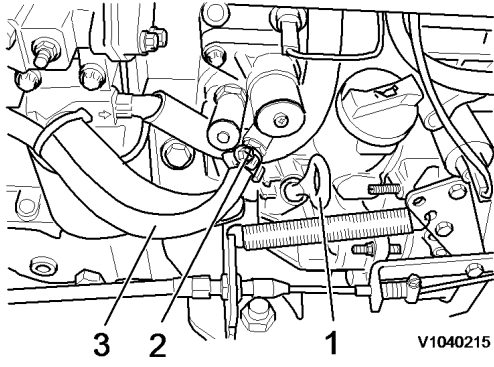


Figure 3

5. Insert the oil level stick.

NOTE!

After test running, check the fuel hoses for leaks.

Document Title: Fuel tank, removing	Function Group: 234	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Fuel tank, removing

Op nbr 234-011

1. Place the machine in service position.
2. Turn OFF the battery disconnect switch.
3. Remove the bonnet; see [821 Engine hood, removing](#).
4. Remove the right-hand and left-hand side panel of the cab.
5. Unscrew the cab roof lock screws and screw in the lifting eyes (1). Hoist the cab with a crane hoist.

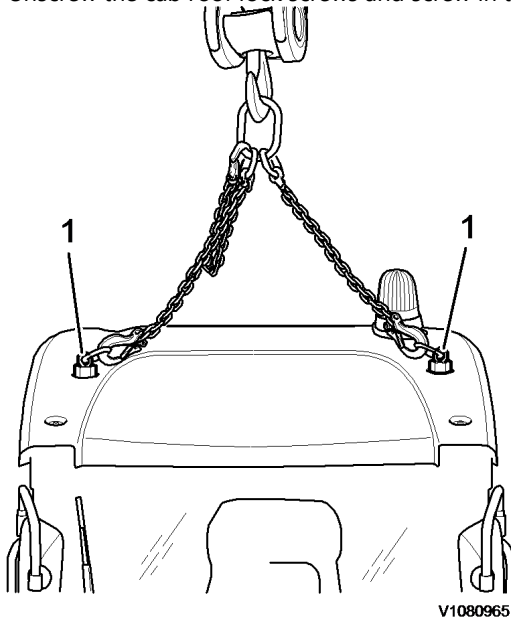


Figure 1

NOTICE

Use a safe lifting device with the proper rated capacity for the job.

6. Unscrew the front and rear cab attaching bolts.

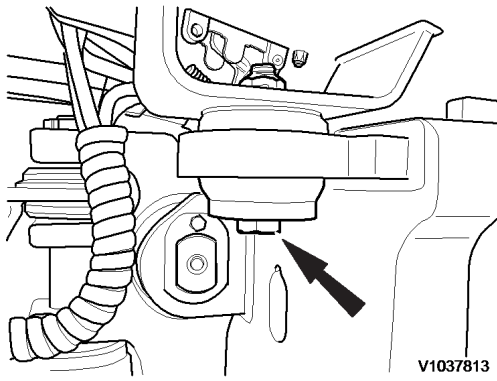


Figure 2

7. Slowly raise the cab and remove the rubber bushing.

NOTE!

When raising the cab, make sure that no hoses or cables are ripped off. Detach if necessary.

8. Rest the cab on the cab supports (1). [080 E-tool Cab support](#).

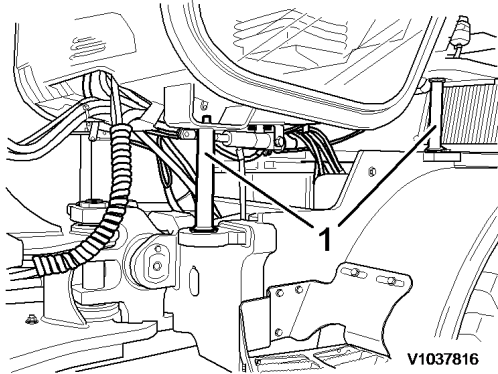


Figure 3

9. Remove the air flow guide plate (1).

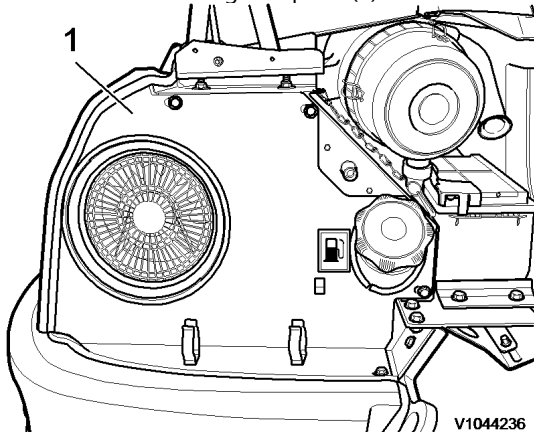


Figure 4

10. Disconnect the battery connection cable (1) and remove the battery.

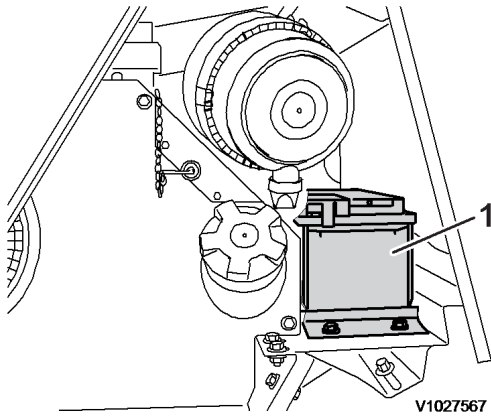


Figure 5

11. Remove the battery disconnect switch (1).

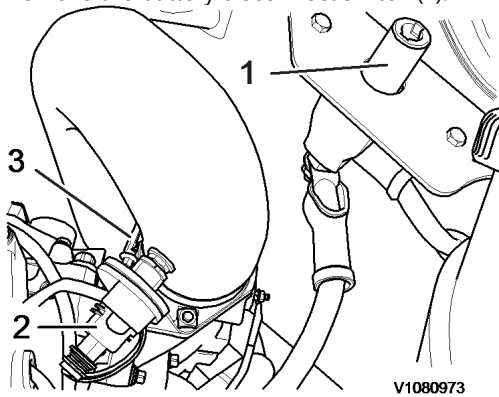


Figure 6

12. Detach the connection cable (2) from the air filter control switch. Release the clamp (3) and detach the induction hose at the air inlet pipe.
13. Remove the flexi exhaust pipe from the silencer.

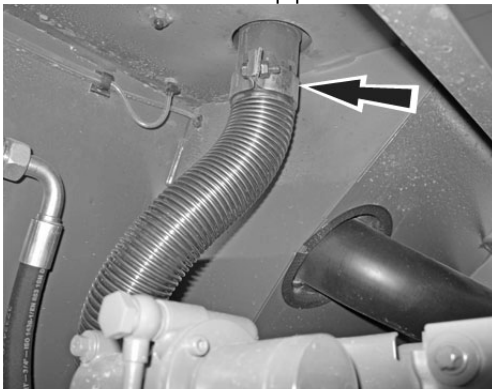
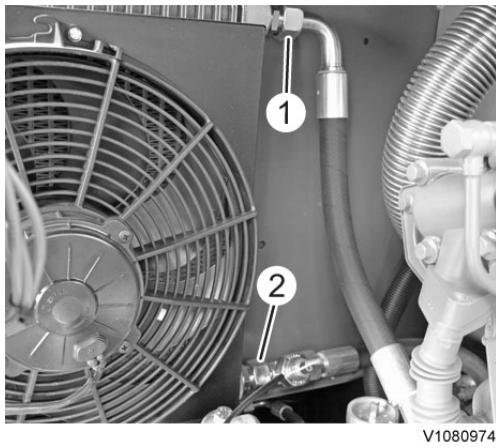


Figure 7

14. Remove the hydraulic connection (1) and (2) on the radiator.

NOTICE

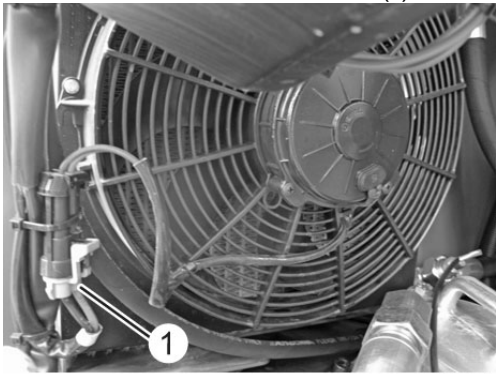
When a hose has been disconnected, plug both the hose and the connection immediately. The hoses should be marked for correct connection.



V1080974

Figure 8

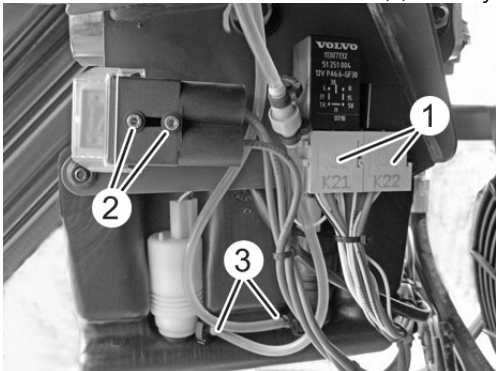
15. Disconnect the electrical connector (1) from the cooling fan.



V1080975

Figure 9

16. Disconnect the electrical connector (1) of relays K21 and K22.



V1080976

Figure 10

17. Unscrew the bolts (2) and remove the fuse socket.
18. Undo the clamps and detach the washer fluid hoses (3).
19. Remove the hose (1) at the air bleeder valve.

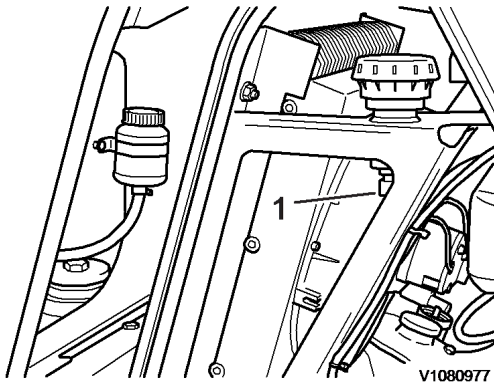


Figure 11

20. Suspend the bonnet support from a crane using suitable hoisting equipment.

NOTICE

Use a safe lifting device with the proper rated capacity for the job.

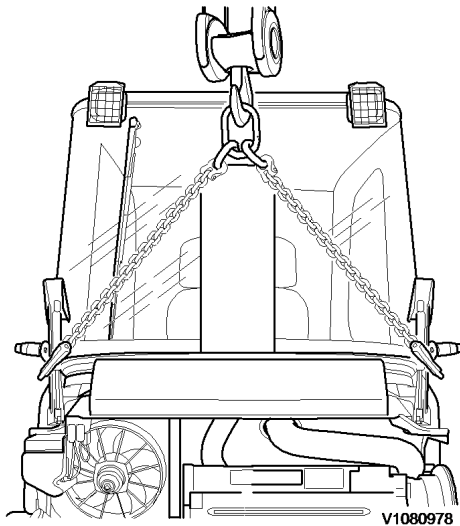


Figure 12

21. Remove the right-hand and left-hand wing attachment (1) and bonnet support attachment (2). Raise the bonnet support and place it on a suitable surface.

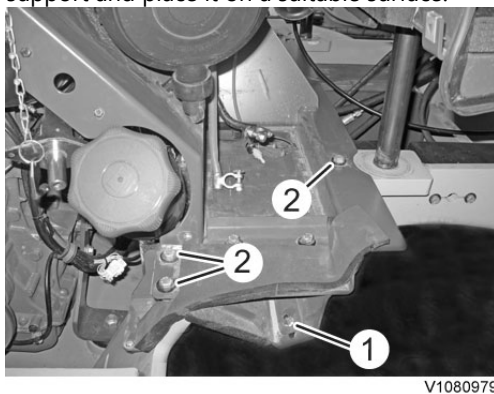
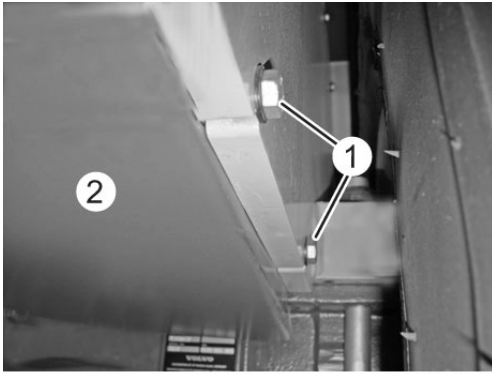


Figure 13

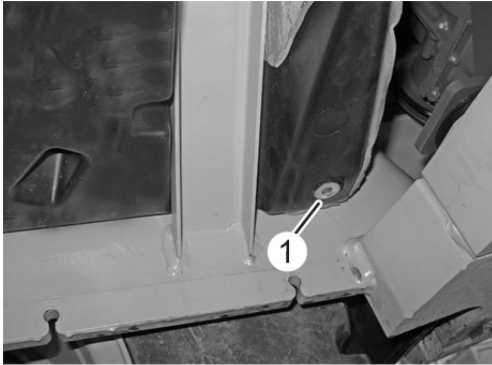
22. Unscrew the bolt (1) and remove the floor plate (2).



V1080980

Figure 14

23. Unscrew the fuel drain screw (1) and drain the entire tank contents into a suitable container.



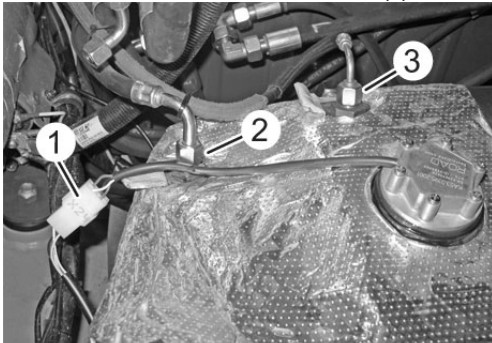
V1080985

Figure 15
Fuel drain plug



All forms of open fire and smoking should be avoided when draining the fuel tank.

24. Disconnect the electrical connector (1) from the fuel level sensor.



V1080986

Figure 16

25. Remove the fuel inlet line (2) and return line (3)

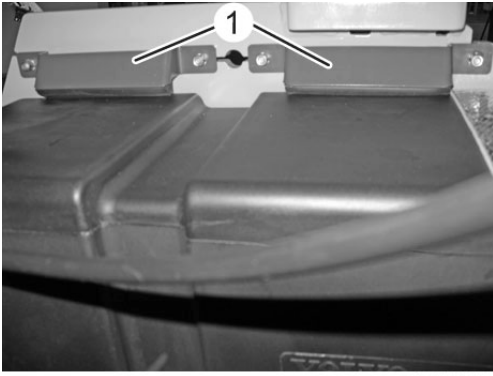
NOTICE

Maintain greatest possible cleanliness when working on the fuel system.

26. Remove the bracket (1) and carefully lift the fuel tank out of the machine.

NOTE!

Fuel tank, weight approx. 9 kg (20 lb).



V1080987

Figure 17

Document Title: Fuel tank, installing	Function Group: 234	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

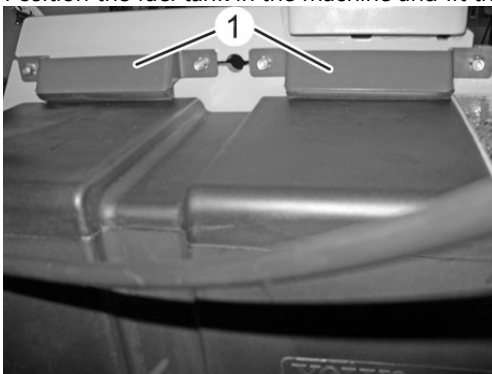
Fuel tank, installing

Op nbr 234-012



The work involves handling heavy components - failure to stay alert may result in severe crushing injuries.

1. Position the fuel tank in the machine and fit the bracket (1).



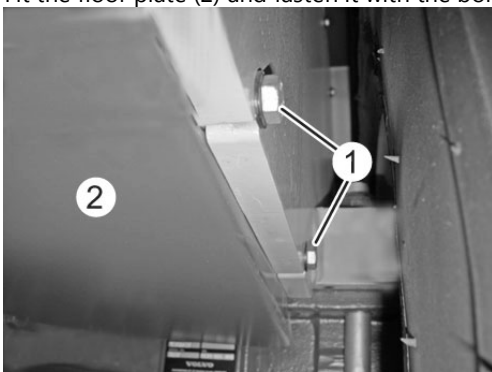
V1080987

Figure 1

NOTE!

Fuel tank, weight approx. 9 kg (20 lb).

2. Fit the floor plate (2) and fasten it with the bolts (1).



V1080980

Figure 2

3. Connect the electrical connector (1) of the fuel level sensor.

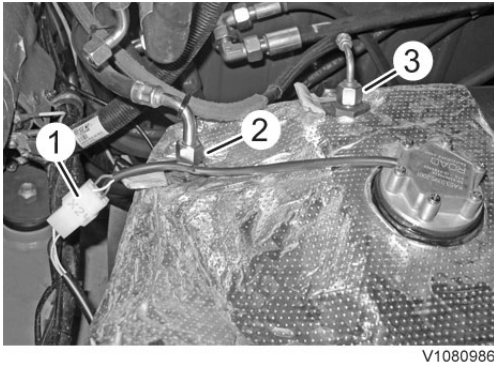


Figure 3

4. Fit the fuel inlet line (2) and return line (3)

NOTICE

Maintain greatest possible cleanliness when working on the fuel system.

5. Position the bonnet support using hoisting equipment.

NOTICE

Use a safe lifting device with the proper rated capacity for the job.

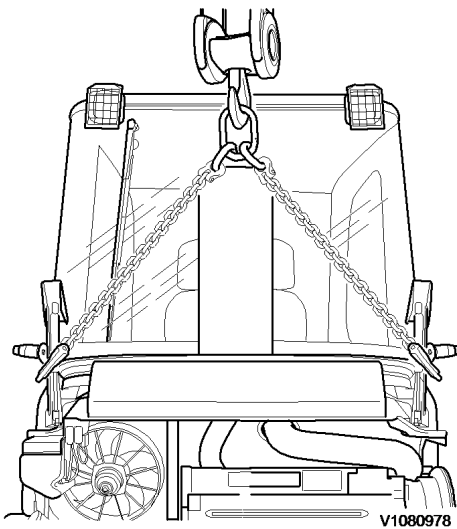


Figure 4

6. Fit the right-hand and left-hand wing attachment (1) and bonnet support attachment (2).

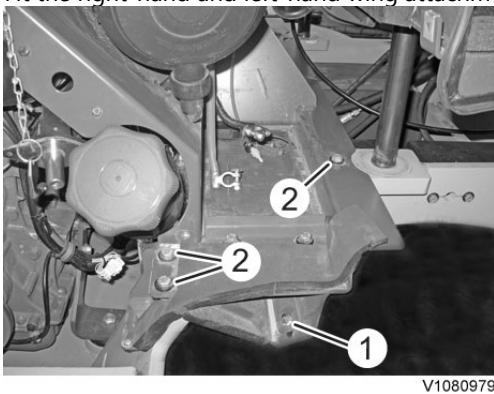


Figure 5

7. Remove the lifting equipment.
8. Fit the hose (1) at the air bleeder valve.

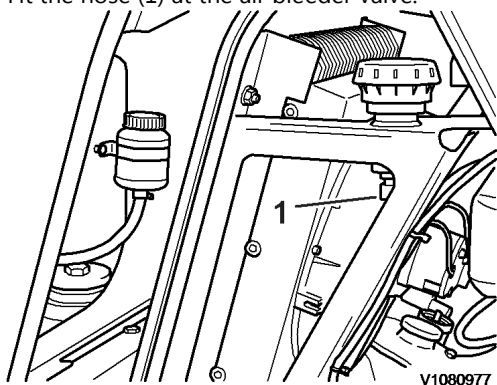


Figure 6

9. Connect the electrical connector (1) of relays K21 and K22.

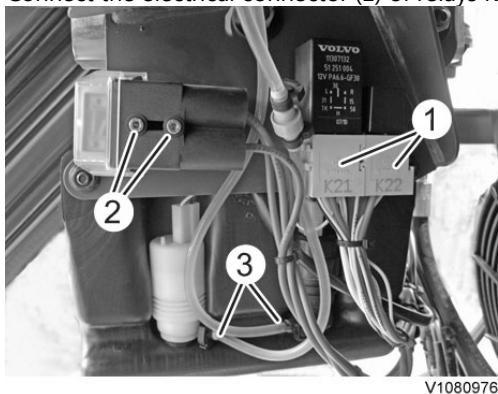


Figure 7

10. Secure the fuse socket with the bolt (2).
11. Fit the washer fluid hoses (3).
12. Connect the electrical connector (1) of the cooling fan.

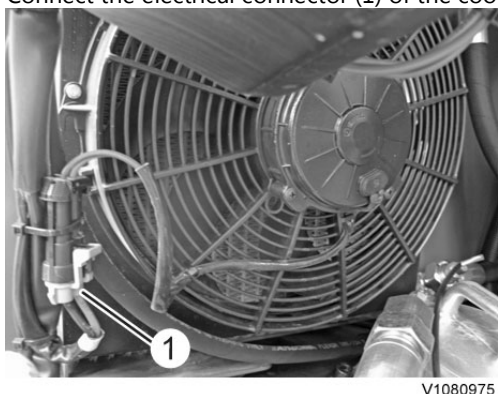
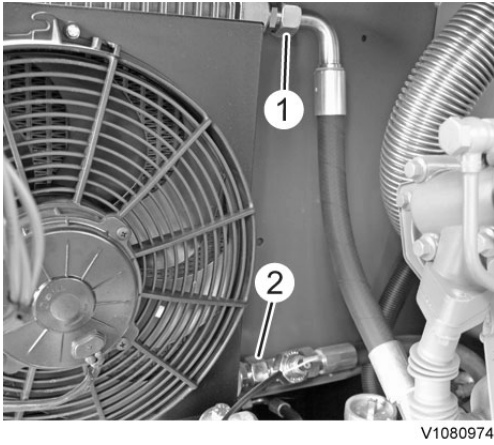


Figure 8

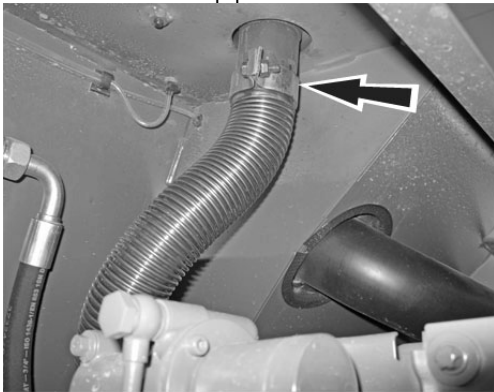
13. Fit the hydraulic connection (1) and (2) on the radiator.



V1080974

Figure 9

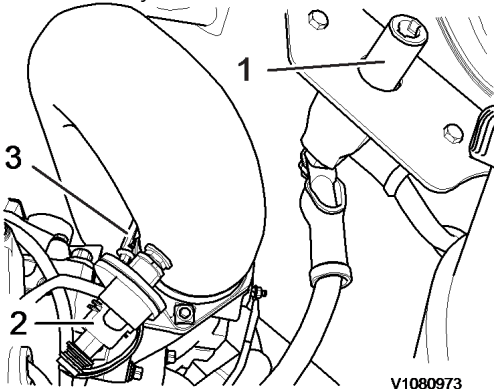
14. Fit the flexi exhaust pipe to the silencer.



V1038860

Figure 10

15. Fit the battery disconnect switch (1).



V1080973

Figure 11

16. Fit the induction hose to the air inlet pipe and fasten with a clamp (3). Connect the connection cable (2) to the air filter control switch.
17. Position and connect the battery (1).

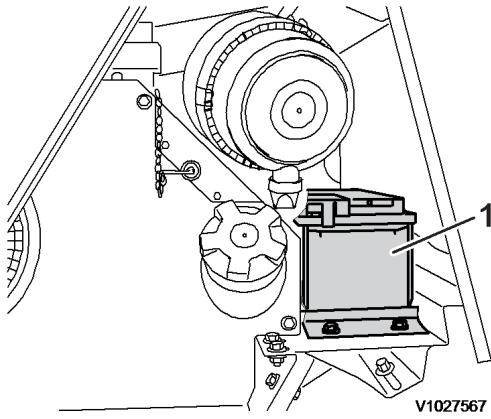


Figure 12

18. Fit the air flow guide plate (1).

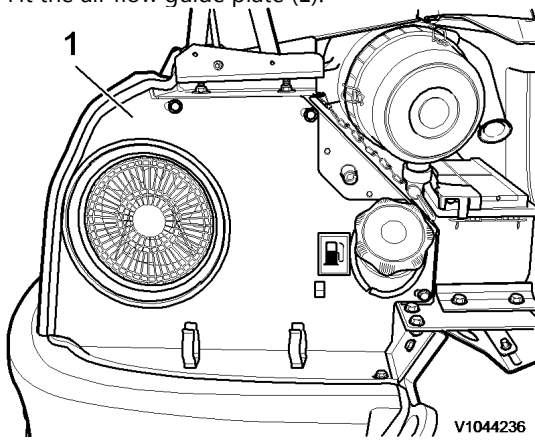


Figure 13

19. Slowly raise the cab and remove the cab supports (1).

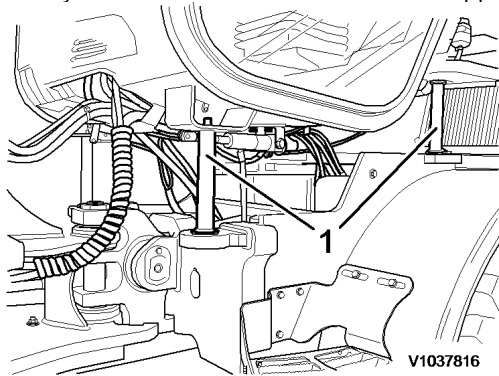


Figure 14

20. Insert the rubber bushing and put the cab into position.
21. Screw in and fasten the front and rear cab attaching bolts. Tightening torque **200 Nm (148 lbf ft)**.

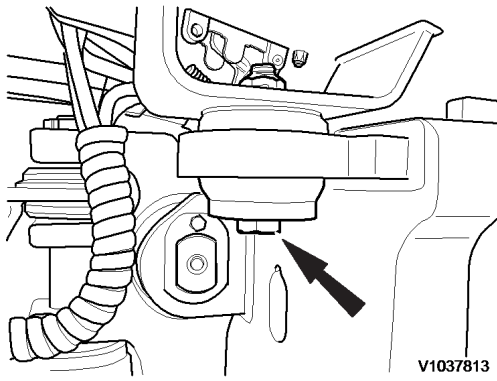


Figure 15

22. Remove the lifting equipment (1) and fit the lock screws to the cab roof.

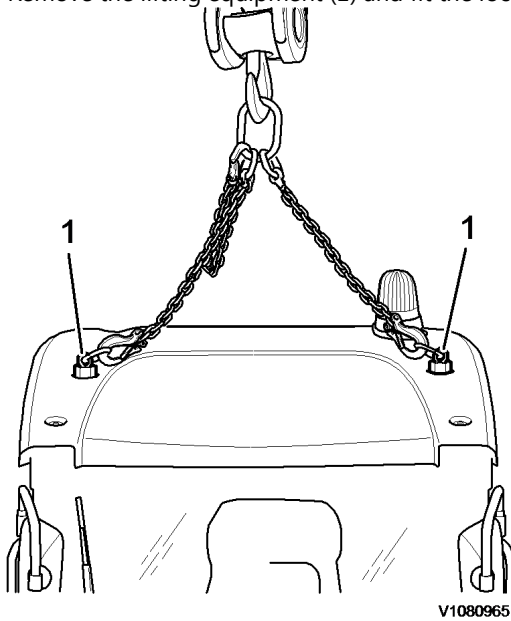


Figure 16

23. Fit the right-hand and left-hand side panel of the cab.
24. Install the bonnet, see [821 Engine hood installing](#).
25. Fill the fuel tank; for capacity see [030 Fuel tank capacities](#).

⚠ WARNING

All forms of open fire and smoking should be avoided when filling the fuel tank.

26. Carry out trial run, check for leaks.

Document Title: Fuel tank level sensor, replacing	Function Group: 234	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Fuel tank level sensor, replacing

Op nbr 234-016

1. Place the machine in service position.
2. Turn OFF the battery disconnect switch.

Removing

3. Disconnect the battery connection cable (1) and remove the battery.

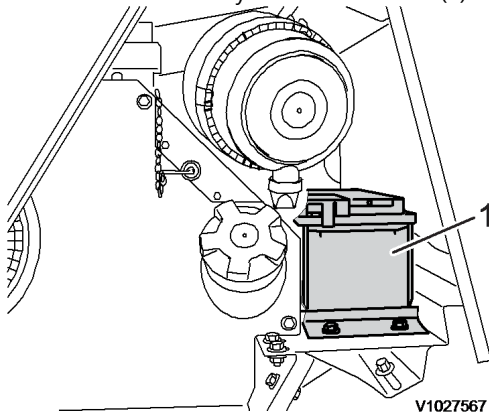


Figure 1

4. Disconnect electrical connector X24 (arrow) from the fuel level sensor.

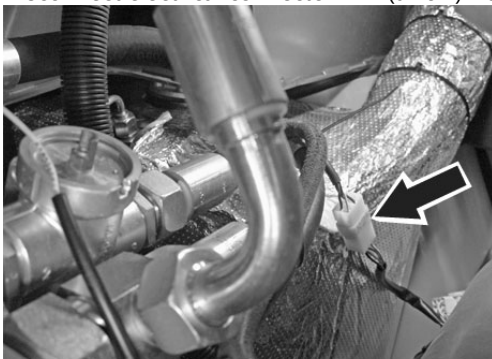
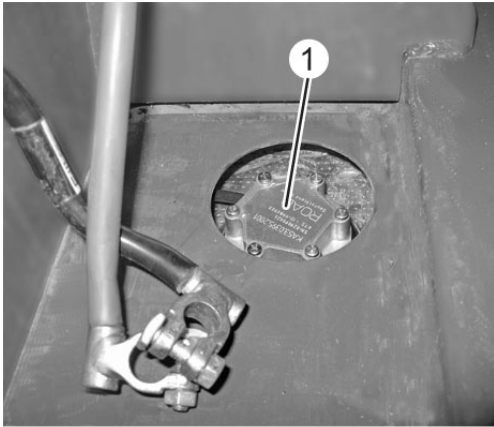


Figure 2

5. Remove the fuel level sensor (1) attaching bolts.



V1080957

Figure 3

6. Carefully pull out the fuel level sensor upwards.



V1080956

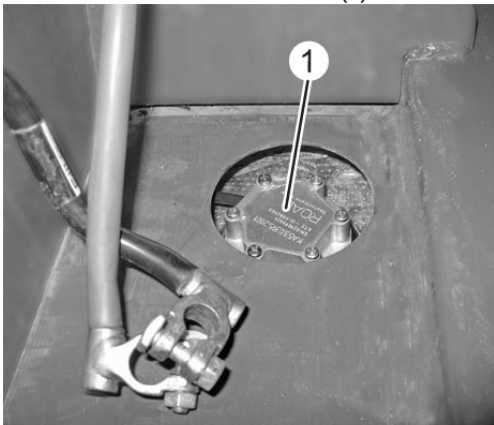
Figure 4

NOTICE

Maintain greatest possible cleanliness when working on the fuel system.

Installation

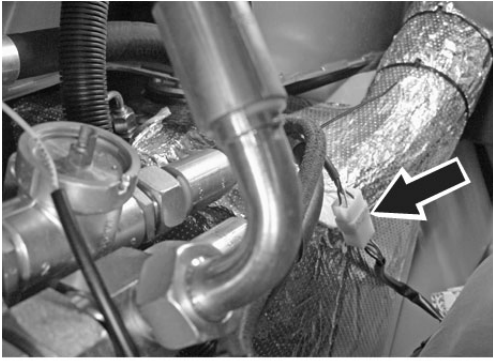
7. Install the new fuel level sensor (1) with a new seal and secure.



V1080957

Figure 5

8. Connect electrical connector X24 (arrow).



V1027568

Figure 6

9. Install the battery and attach the connection cable.
10. Fuel the fuel tank if necessary and check functionality.

Document Title: Idling speed, checking and adjusting	Function Group: 236	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Idling speed, checking and adjusting

Op nbr 236-001

[80872138 Tachometer](#)

1. Warm up the machine to operating temperature.

NOTE!

The largest power consumer/air conditioning must be switched off.

2. Switch off the engine and check that the speed control lever is at the "upper idling speed" stop when the throttle pedal is fully pressed.

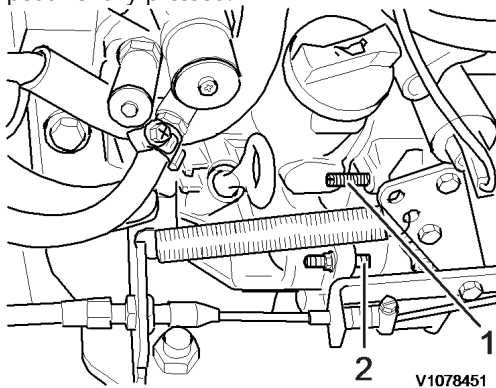


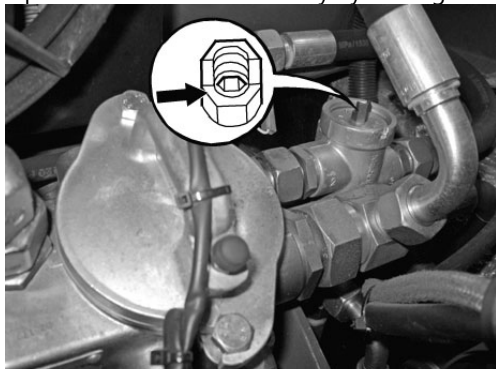
Figure 1

1. Setscrew, "low idling speed"
2. Setscrew, "high idling speed"

NOTE!

The throttle pedal stop bolt must be set so that there is approx. 2 mm (0.08 in) of clearance between the pedal and the stop bolt.

3. Open thermostat mechanically by turning in the adjustment screw until it is flush with the groove on the lock nut.



V1078452

Figure 2
Thermostat, open mechanically

4. Check inching brake function, see [520 Inching and brake adjusting](#).
5. Remove the air flow guide plate (1).

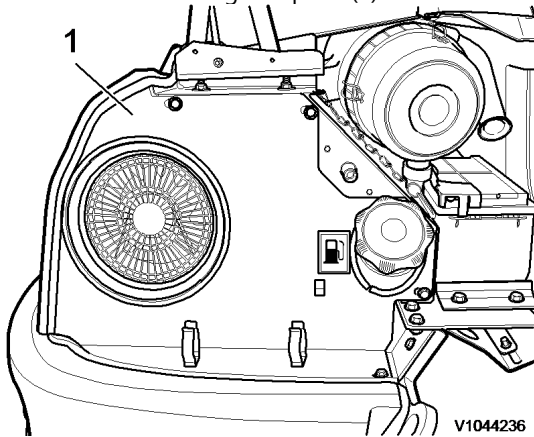


Figure 3

6. Apply reflective sticker (1) to V-belt pulley. Position speed sensor (2) and connect tachometer 12976108.

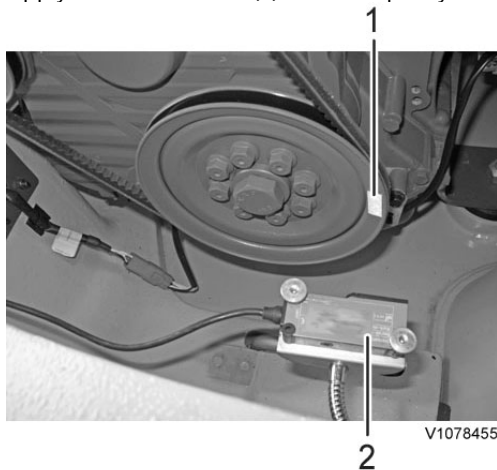


Figure 4

7. Start the engine and read the low idling speed from the tachometer. Press the throttle pedal down all the way and read the high idling speed from the tachometer. Set value: see [030 Engine specification](#)
8. If the specified set value is not reached, adjust the rpm using setscrew (1) or (2).

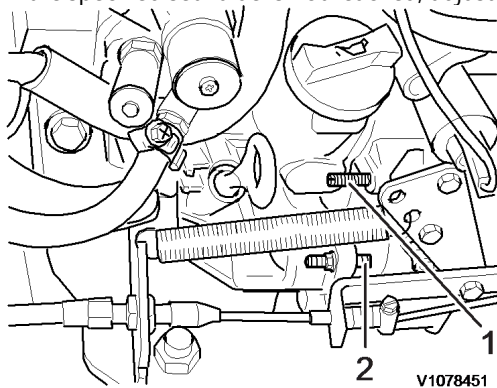


Figure 5

1. Setscrew, "low idling speed"
2. Setscrew, "high idling speed"

NOTE!

Seal the setscrew after adjustment.

9. Fit the air flow guide plate (1).

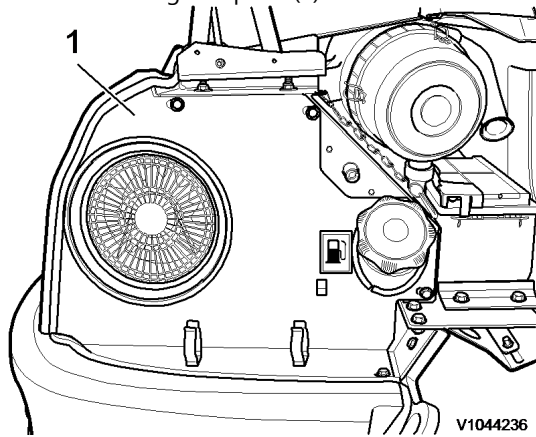


Figure 6

10. Reset thermostat to basic setting by unscrewing the adjusting screw until it is flush with the lock nuts on the outside.

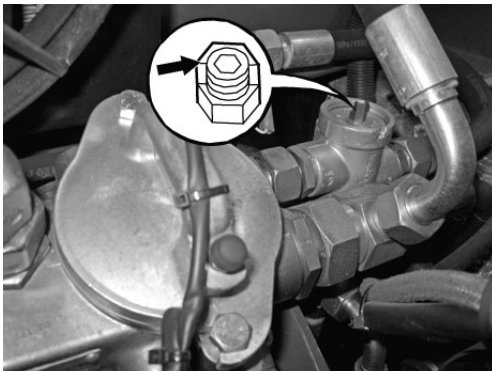


Figure 7
Thermostat, basic setting

Document Title: Injection pump, test and adjust	Function Group: 236	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Injection pump, test and adjust

Op nbr

[2904636 Spanner](#)

2901760 Injection pump tester

NOTE!

The injection pump on the engine is tested for leaks of the pressure valves and pump elements. One condition for testing is perfect fuel supply and no air in the fuel system.

Injector lines are removed.

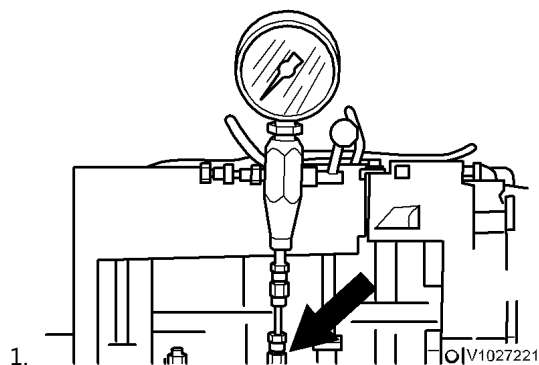


Figure 1

Connect the injection pump tester (2901760) to the pressure valve support.

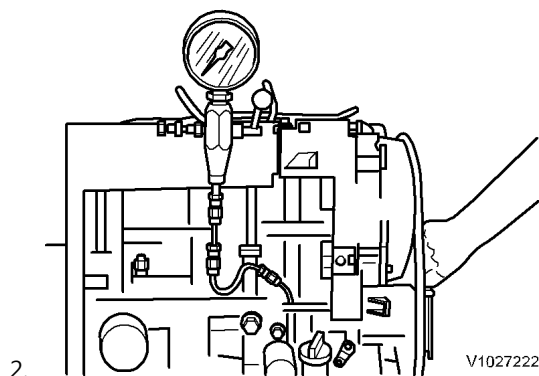


Figure 2

Rotate crankshaft via V-belt pulley, venting the tester on the sealing plug.

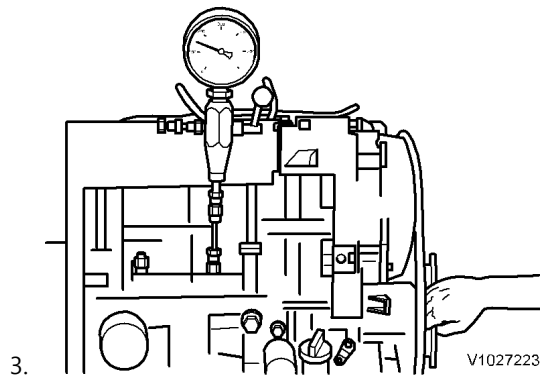


Figure 3

Rotate the crankshaft until the pressure valve reaches **150 bar (2176 psi)**. The pressure must not drop by 10 bar (145 psi) for one minute.

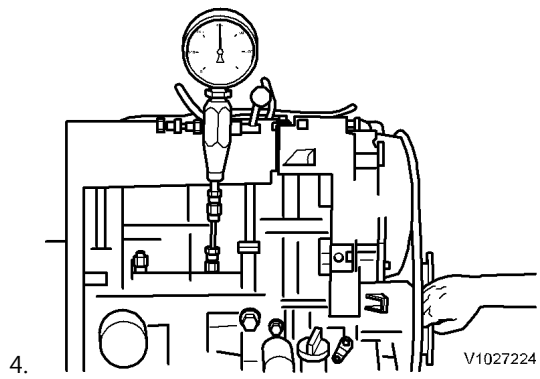


Figure 4

Continue rotating the crankshaft (approx. 5 revolutions) until **300 bar (4351 psi)** is reached.

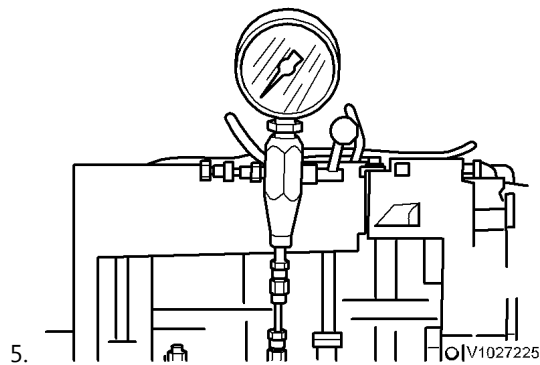


Figure 5

Remove the injection pump tester.

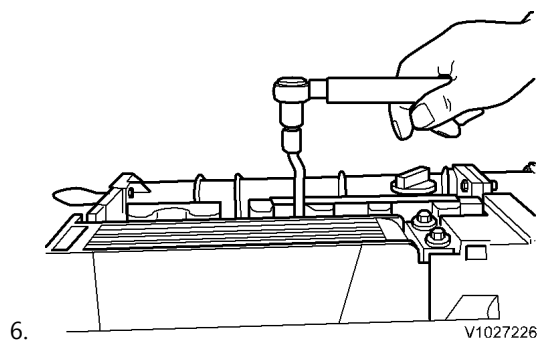


Figure 6

Attach the delivery pipes with the special wrench (2904636) and tighten to **22 ±2 Nm (16 ±1.5 lbf ft)**.

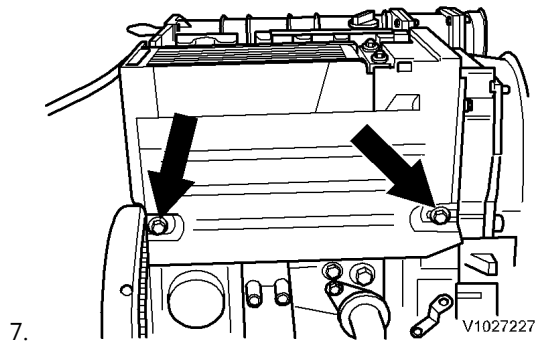


Figure 7

Attach the air duct cover. Tighten the bolts.

NOTE!

Injection pump replacement - see component service manual, D3D engine.

Document Title: Injection valve, test	Function Group: 237	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Injection valve, test

Op nbr

2904633 Nozzle tester

2903014 Long socket SW 15

2903016 Injector support

NOTE!

When working on the injection equipment, ensure maximum cleanliness. To test the injection valves only use clean test oil to ISO 4113 or clean diesel fuel.



WARNING

Fuel jets out from the injector at very high pressure. If the jet hits body parts, fuel may penetrate and cause blood poisoning.

Injectors removed.

1. Insert injector in the holder. Slacken nozzle clamping nut approx. 180° (pressure relief) and re-tighten.

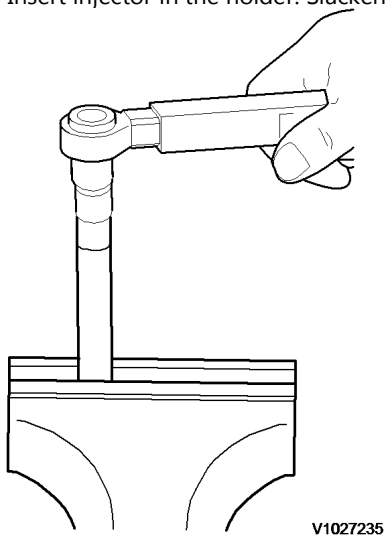


Figure 1

2. Attach injection valve to nozzle tester.

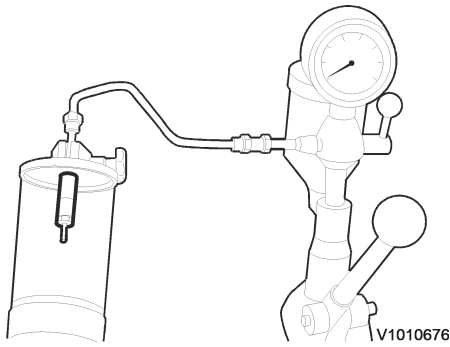


Figure 2

Test opening pressure

3. Slowly press the nozzle tester's lever down and read the pressure gauge. If the pressure gauge indicator stays still or suddenly drops, opening pressure is reached.

Opening pressure: 210 + 8 bar (3045 + 116 psi)

NOTE!

After the hand lever is actuated three or four times, the spring compartment above the nozzle needle in the injector fills with fuel/test oil. Further actuation of the lever is not possible. Before each test, the nozzle clamping nut must be carefully slackened to relieve pressure in the spring compartment.

The test must be repeated. If the measurement values of three tests are the same, they can be considered valid.

4. Detach the injector from the nozzle tester. Tighten the nozzle clamping nut to **35 ± 5 Nm (28.8 ± 3.6 lbf ft)**.

Leak tightness check

5. Dry nozzle and nozzle holder, blow dry with air.
6. Slowly press the tester lever down until approx. 20 bar (290 psi) below the previous opening pressure.

NOTE!

The injector nozzle is free of leaks if there are no drips within 10 seconds.

If there are drips from the injector nozzle, the injector must be removed and cleaned or the nozzle replaced.

The vibration test allows an audible test of ease of movement of the nozzle needle in the nozzle body. New injection valves have different vibration behaviour from used ones.

The nozzle deteriorates due to wear in the needle tip area. If an injector does not vibrate despite cleaning, it must be replaced by a new one.

A used injection valve must rattle audibly at fast lever action so it injects with good atomisation. The jet pattern may differ considerably from that of a new injection valve.

Vibration and jet test

Document Title: Exhaust manifold, replacing gasket	Function Group: 251	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Exhaust manifold, replacing gasket

Op nbr 251-004

1. Place the machine in service position.
2. Switch off the battery disconnect switch.
3. Unscrew the fixing bolts (arrows) and remove the exhaust manifold (1) with seals.

NOTE!

Check components for damage.

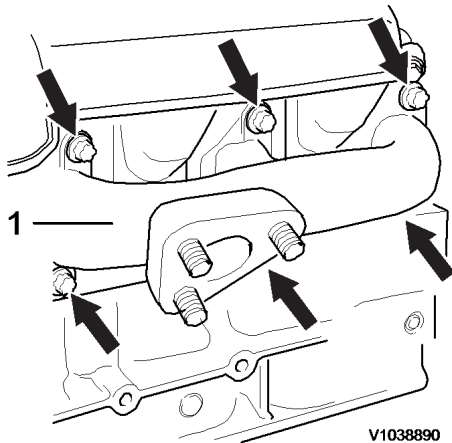


Figure 1

4. Clean the sealing surfaces of the exhaust manifold and cylinder head.

NOTE!

Note the installation position of the seals.

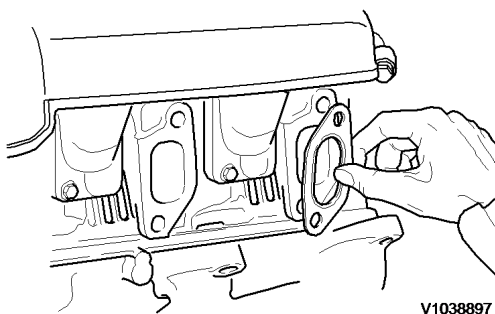
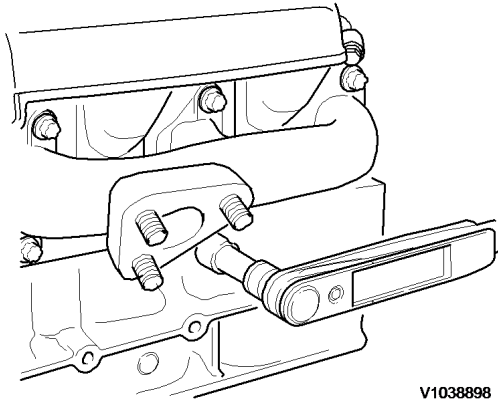


Figure 2

5. Position and fasten the exhaust manifold with new seals. Tightening torque **55 Nm (40,6 lbf ft)**.

NOTE!

Apply mounting paste to the bolts and tighten starting from the middle outwards alternating sides.



V1038898

Figure 3

Document Title: EGR (exhaust gas recirculation) sensor, replacing	Function Group: 251	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

EGR (exhaust gas recirculation) sensor, replacing

Op nbr 251-006

[2906246 Tool](#)

1. Place the machine in service position.

Removing

2. Open the bonnet and remove the air duct cover.

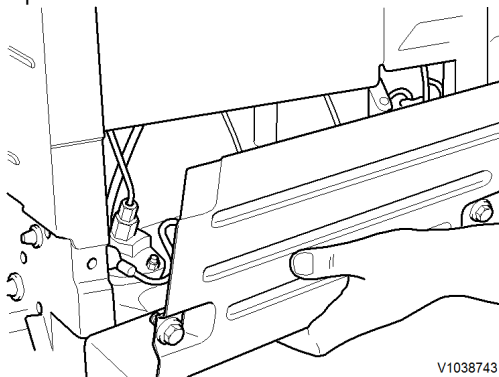


Figure 1

3. Switch on the ignition.

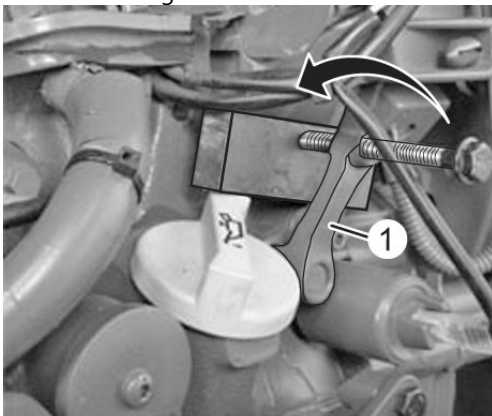
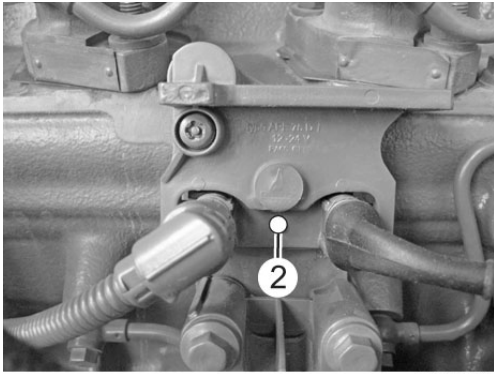


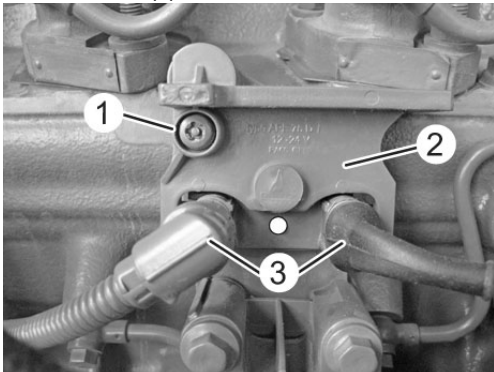
Figure 2
Secure the start/stop lever



V1080964

Figure 3
LED Indicator

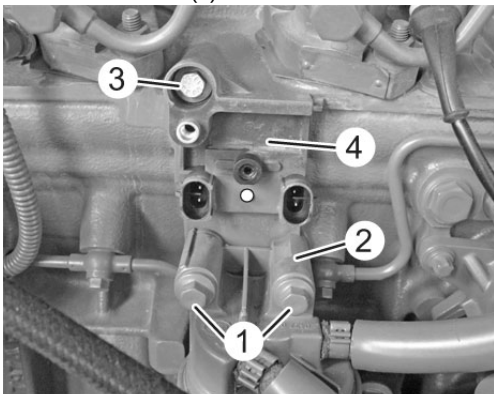
4. Slowly move the start/stop lever (1) in the "stop" direction until the LED indicator (2) for exhaust gas recirculation comes on and the EGR valve is audibly actuated. Secure the start/stop lever in this position.
5. Switch off the ignition and battery disconnect switch.
6. Unscrew bolt (1) with tool 2906246. Remove the cover (2) and disconnect the connector (3).



V1080959

Figure 4

7. Unscrew the bolt (1) and move the fuel filter bracket (2) aside.



V1080960

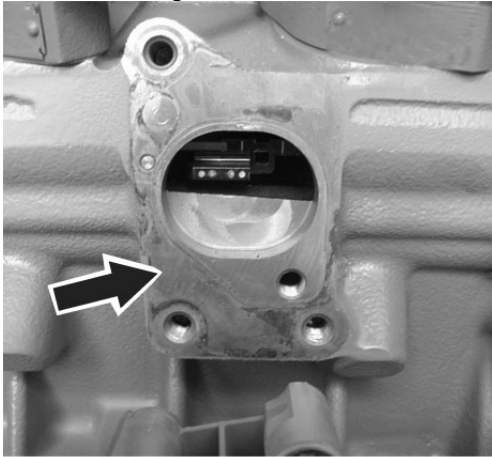
Figure 5

8. Unscrew the bolt (3) and remove the sensor (4).

NOTE!

The start/stop lever must not be moved or released when the sensor is being removed. Otherwise, it is not possible to correctly adjust exhaust gas recirculation!

9. Clean the sealing surface.

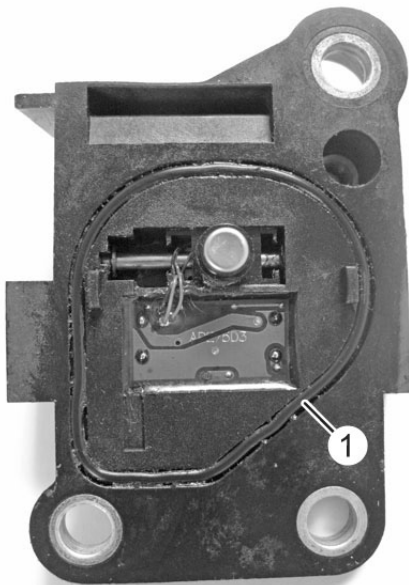


V1080961

Figure 6

Installation

10. Insert the new seal ring (1).

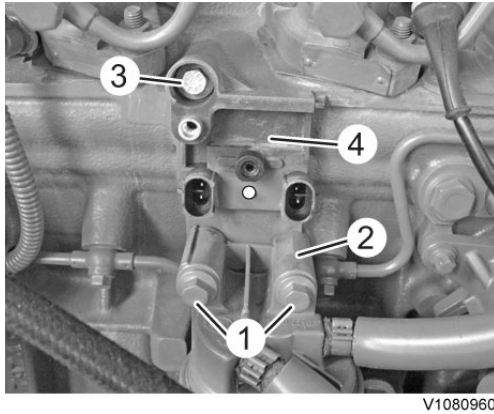


V1080962

Figure 7
EGR sensor
NOTE!

Check that the seal ring is in the proper position.

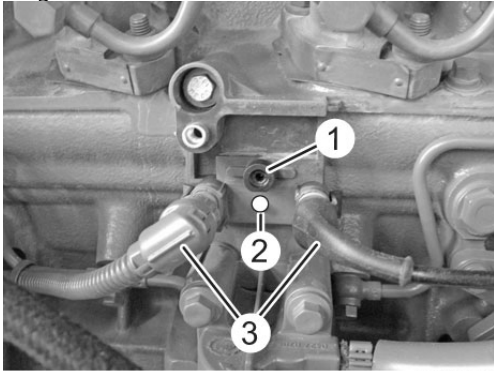
11. Position the sensor (4) and secure with a bolt (3). Tightening torque **21 Nm (15.5 lbf ft)**.



V1080960

Figure 8

12. Position the fuel filter bracket (2) and secure with bolts (1). Tightening torque **21 Nm (15.5 lbf ft)**.
13. Plug in the connector (3).



V1080963

Figure 9

14. Switch on the battery disconnect switch and the ignition.

NOTE!

The sensor's default setting is in the middle. That means that the Allen head screw (1) of the sensor can be turned about 2.5 turns to the left or right. The centre position is not marked.

15. If the LED indicator (2) **is not lit**:
Turn the sensor's Allen head screw (1) until the LED indicator (2) lights up and the EGR valve is audibly actuated.
16. If the LED indicator (2) **is lit**:
Turn the sensor's Allen head screw (1) until the LED indicator (2) goes out. Then turn it back until the LED indicator (2) comes back on and the EGR valve is audibly actuated.
17. Switch on the ignition.
18. Fit the cover and (2) fasten bolt (1) with tool 2906246. Tightening torque **8 Nm (6 lbf ft)**.

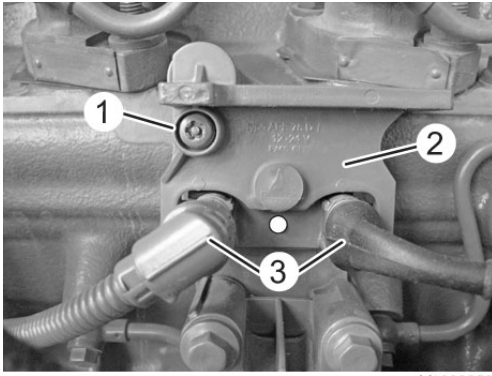


Figure 10

19. Remove the fixing from the start/stop lever (1).

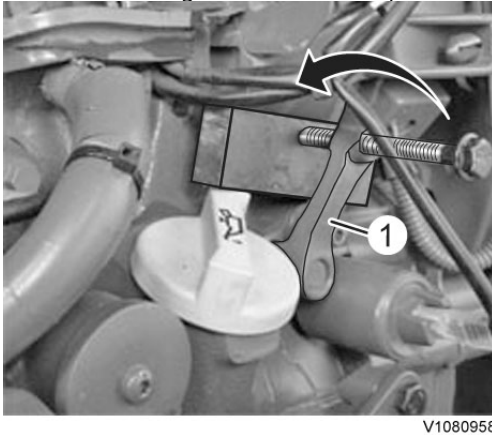


Figure 11
Secure the start/stop lever

20. Install air duct cover.

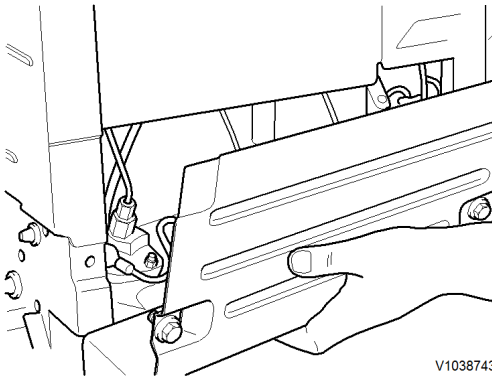


Figure 12

Document Title: Air filter, description	Function Group: 256	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Air filter, description

The air filter system works without prefiltration. The main air filter is a dry filter with a filter cartridge. The filter element with radial seal is replaceable.

As an option, an oil-bath prefilter, cyclone cleaner or Turbo 2 (air filter) are available.

Document Title: Cooling system, description	Function Group: 260	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Cooling system, description

Integrated oil/air cooling.

The flow from the cooling fan directly cools the cylinder head and pressurises the oil cooler. The lubrication oil cools the cylinders and lubricates the valve train.

The thermostat is on the flywheel side of the crankcase. The thermostat begins to open when cooling oil temperature is at 93°C and is fully open at 110°C.

Under the thermostat and in the crankcase is the valve assembly. As standard, a pressure regulating valve is fitted behind the upper lock screw of the valve assembly. Depending on machine equipment level, it is connected to connection 2-4 of cab heating (heat exchanger).

Document Title: Radiator, removing	Function Group: 261	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Radiator, removing

Op nbr 261-011

1. Place the machine in service position.
2. Switch off the battery connection switch.
3. Remove air duct cover.

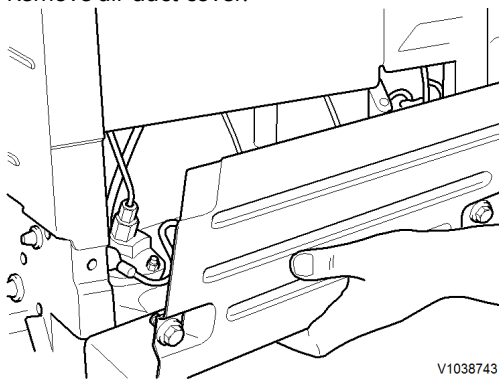


Figure 1

4. Unscrew bolts (1) and remove frame panel (2).

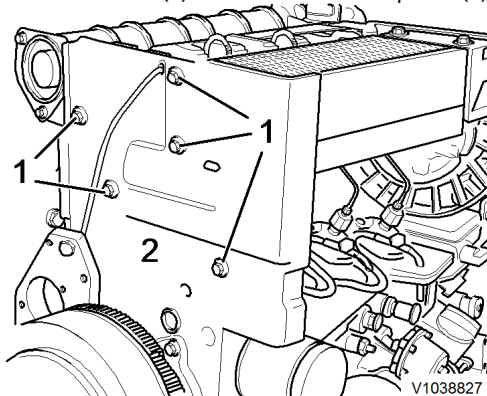


Figure 2

5. Unscrew the bolts (1) and pull off the oil cooler upwards.

NOTE!

Catch draining oil in a suitable container and dispose of it in an environmentally responsible manner.

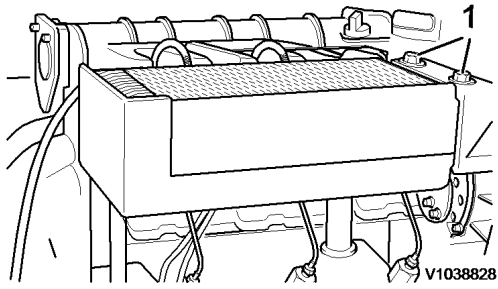


Figure 3

6. Pull the sockets (arrows) out of the crankcase.

NOTE!

Check the sockets for damage.

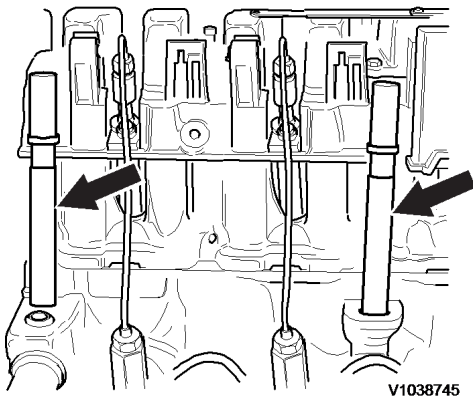


Figure 4

Document Title: Radiator, installing	Function Group: 261	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Radiator, installing

Op nbr 261-013

1. Press in the sockets (arrows) all the way into the crankcase.

NOTE!

The side with the collar must point up.

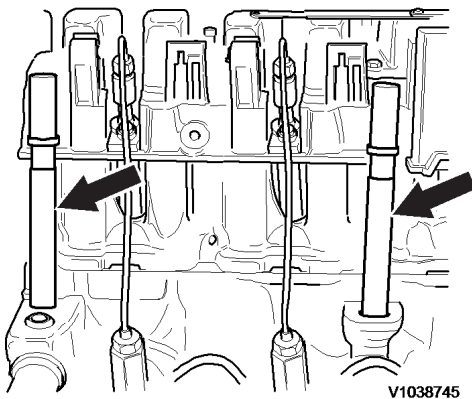


Figure 1

2. Fit the oil cooler all the way onto the sockets (arrows) and loosely tighten the bolts.

NOTE!

Do not tighten the bolts all the way.

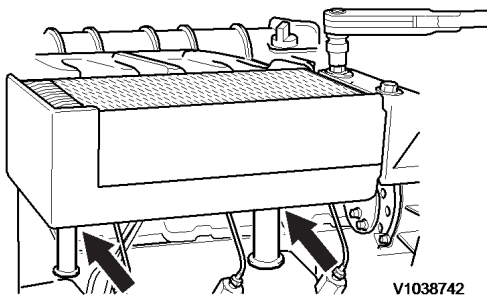


Figure 2

3. Fit the frame panel and turn the bolts (1).

NOTE!

The oil cooler must lie on the lug (arrow).

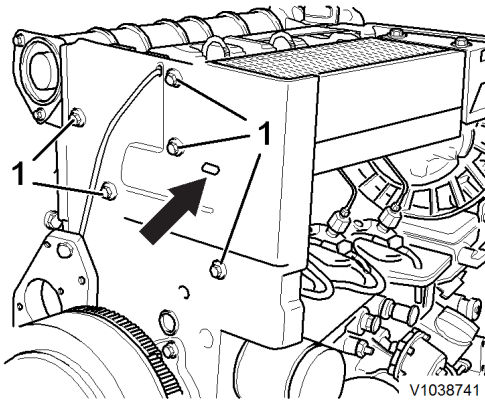


Figure 3

4. Tighten the oil cooler and frame panel fixing bolts to **21 Nm (15.5 lbf ft)**.
5. Fit the air duct cover. Tighten the bolts to **21 Nm (15.5 lbf ft)**.

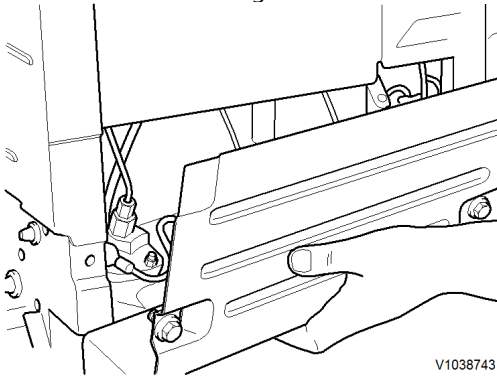


Figure 4

Document Title: Thermostat, replacing	Function Group: 262	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Thermostat, replacing

Op nbr 262-098

1. Place the machine in service position.
2. Switch off the battery connection switch.
3. Remove air duct cover.

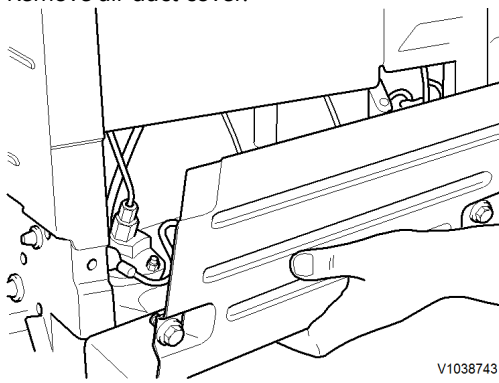


Figure 1

4. Unscrew bolts (1) and remove frame panel (2).

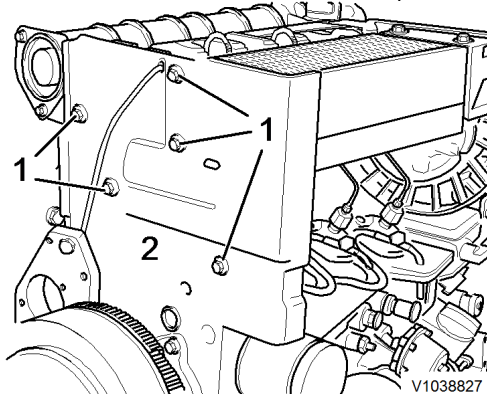


Figure 2

5. Unscrew lock plug (1) and remove thermostat with compression spring.

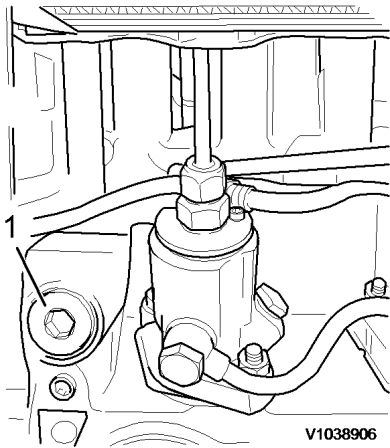


Figure 3

6. Check components for wear. Measure compression spring length (**116.7 mm (4.6 in)**) with a caliper.

NOTE!

If the wear limit has been reached, the compression spring must be replaced.

7. Insert new thermostat with compression spring.

NOTE!

Lightly oil the thermostat.

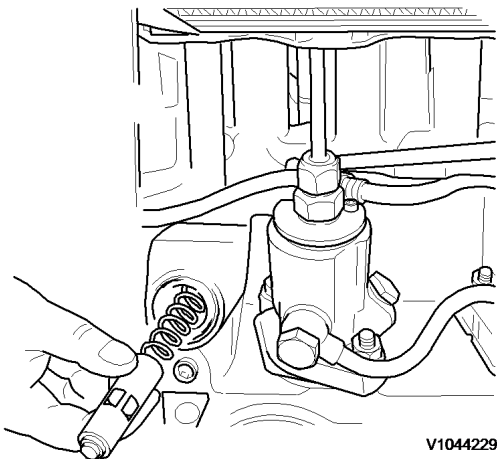


Figure 4

8. Fit a new seal ring on the lock screw.

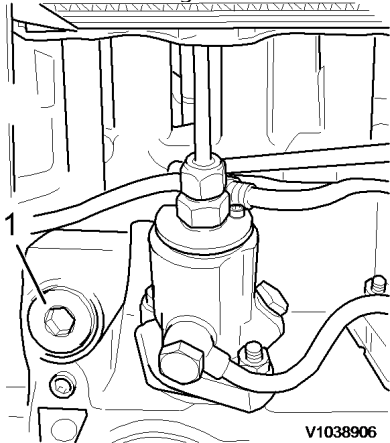


Figure 5

NOTE!

Use a mounting sleeve.

9. Tighten the lock screw (1) to **50 Nm (37 lbf ft)**.
10. Fit the frame panel and tighten the bolts (1) to **21 Nm (15.5 lbf ft)**.

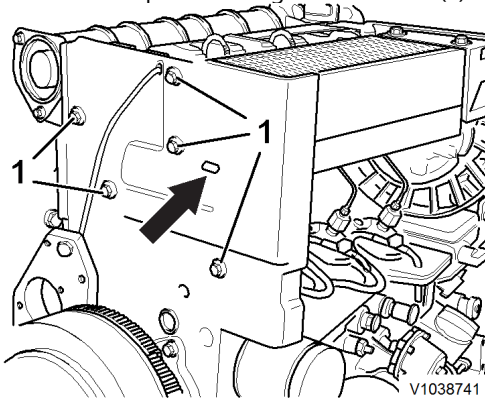


Figure 6

NOTE!

The oil cooler must lie on the lug (arrow).

11. Fit the air duct cover. Tighten the bolts to **21 Nm (15.5 lbf ft)**.

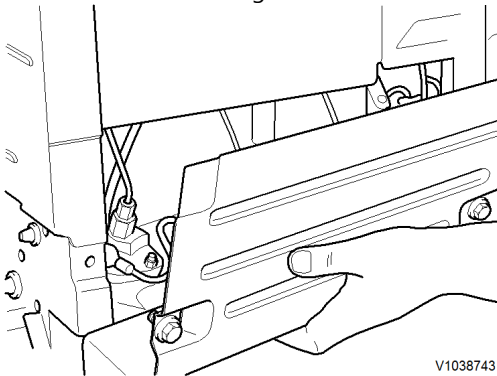


Figure 7

Document Title: Fan belt and/or alternator belt, replacing	Function Group: 263	Information Type: Service Information	Date: 2014/3/8 0
Profile: CWL, L25F [GB]			

Fan belt and/or alternator belt, replacing

Op nbr 263-012

[2902691 V-belt tension gauge](#)

1. Place the machine in service position.
2. Switch off the battery connection switch.
3. Remove the air flow guide plate (1).

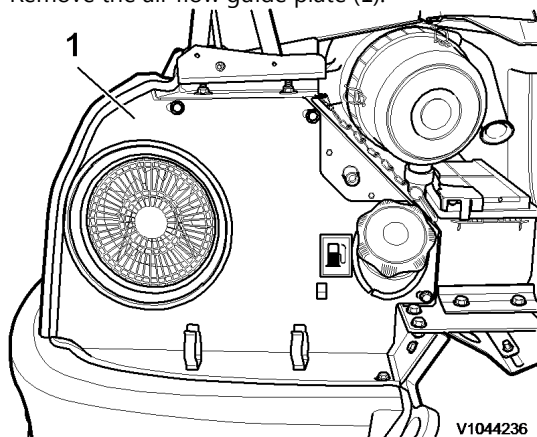


Figure 1

4. Slacken the fixing bolts (1). Relieve the load on the tension roller (2) and remove the V-belt.

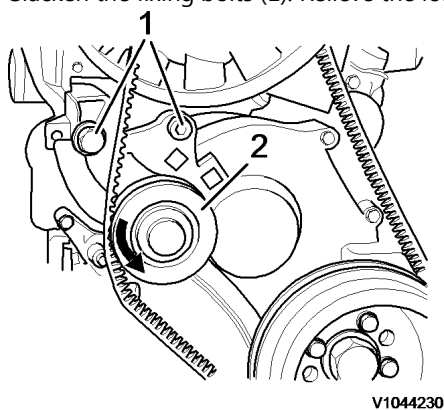


Figure 2

5. Install the new V-belt.

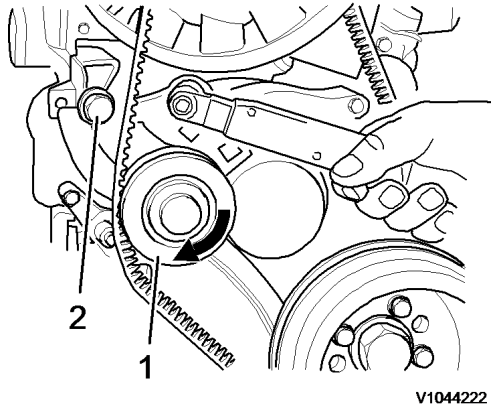


Figure 3

6. Tension the V-belt. Use a suitable tool to press the tension roller (1) in the direction of the arrow and tighten the bolt (2) to **45 Nm (33.2 lbf ft)**.
7. Check V-belt tension. Fit measuring device (2902691) to the V-belt. Press the measuring device over the pressure button (1) against the V-belt until there is a clicking sound. Read the measurement value where the pointer arm and the scale intersect.

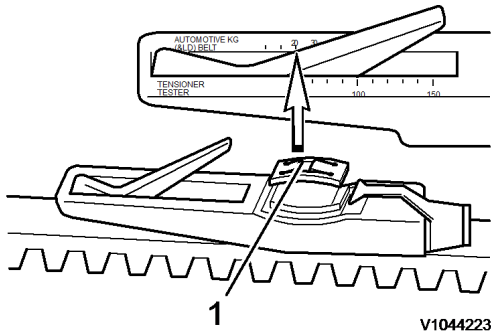


Figure 4

NOTE!

Note the different units on the scale.

V-belt tension	
Pretension after first installation	450 ± 50 N (100 ± 10 lbf)
Run for 15 minutes under load and re-tension.	300 ± 20 N (67.4 ± 4.5 lbf)

NOTE!

If the set value is not achieved, the tensioning procedure must be repeated.

8. Fit the air flow guide plate (1).

Many thanks for your purchase.
Happy every day.