Document Title:	Function Group:	Information Type:	Date:
Component locations	200	Service Information	2014/9/28
Profile: EXC, ECR235D L [GB]			

Component locations

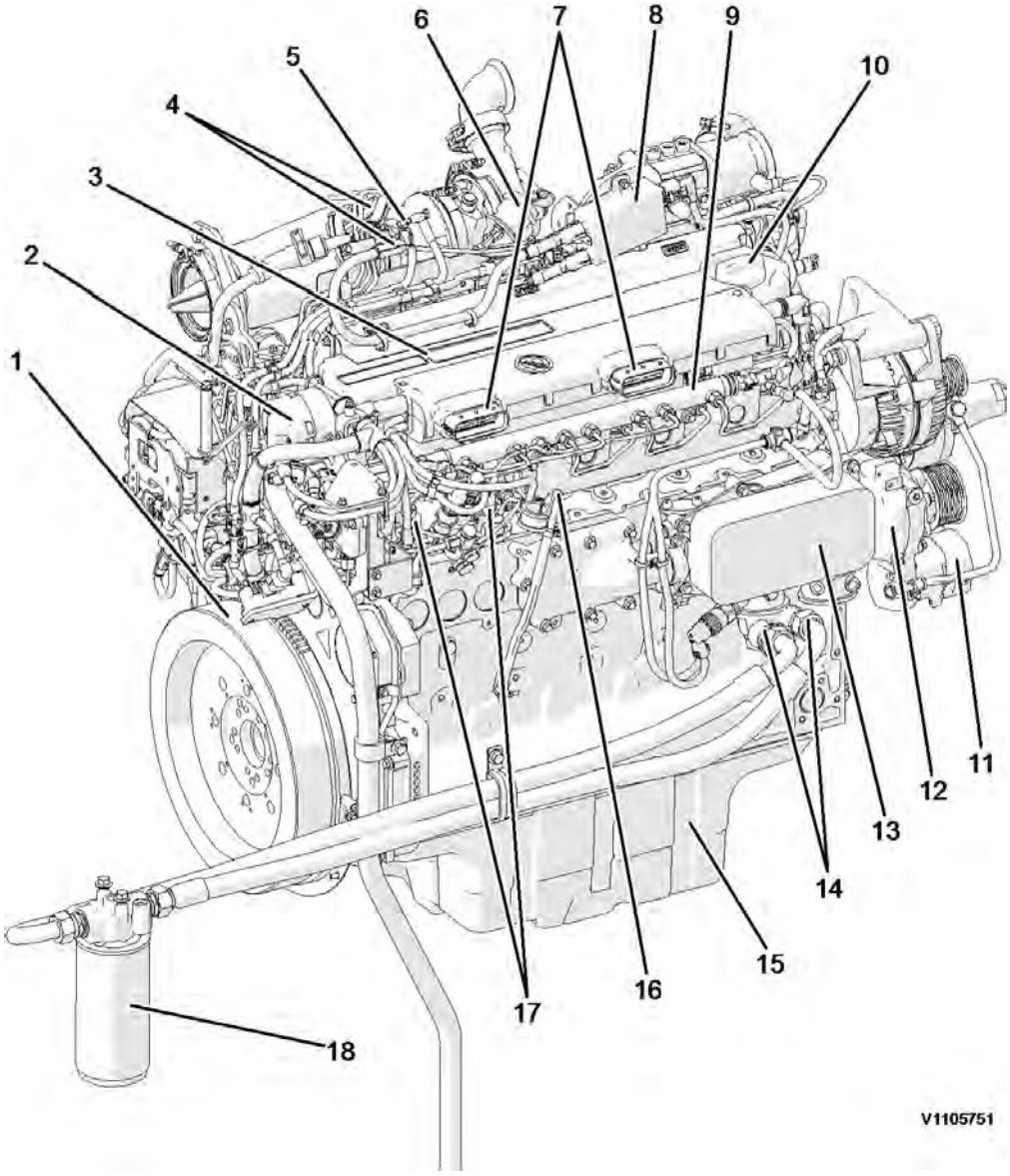


Figure 1
Engine, front side

1	Flywheel	10	Engine oil filling port
2	Crankcase ventilation duct	11	Belt tensioner
3	Valve cover	12	Coolant pump
4	Spark plug	13	Engine oil cooler
5	Glow plug	14	Engine oil filter remote port
6	Turbocharger waste-gate	15	Oil pan
7	ECU connecting port	16	Engine oil dipstick gauge

8	**Spark plug control unit**	**17**	**High pressure fuel pump**
9	**Common rail**	**18**	**Engine oil filter**

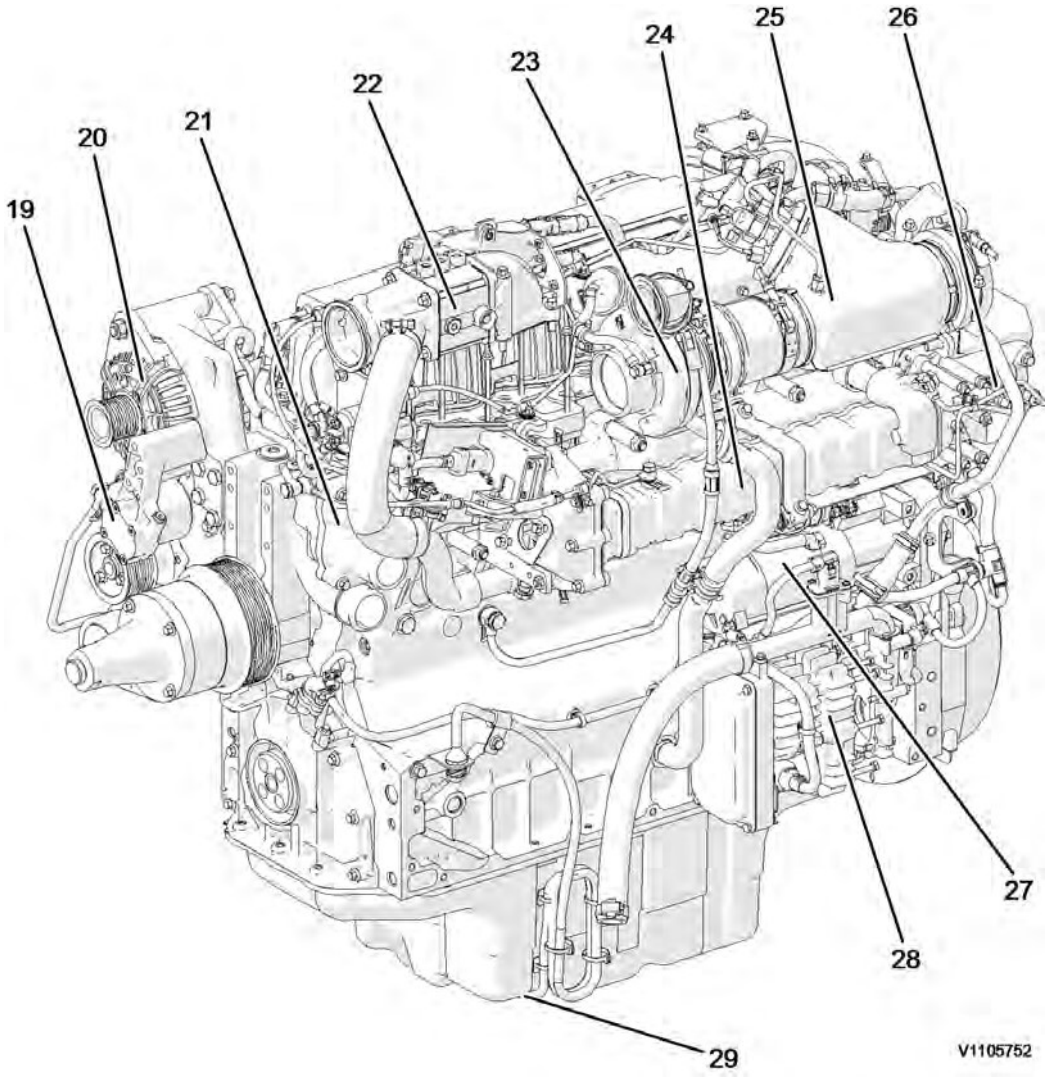


Figure 2
Engine, back side

19	**Fuel feed pump**	**25**	**Partial flow-burner**
20	**Alternator**	**26**	**EGR actuator**
21	**Thermostat housing**	**27**	**Starter motor**
22	**Pre-heating coil housing**	**28**	**Electric air pump**
23	**Turbocharger**	**29**	**Engine oil level sensor**
24	**EGR cooler**		

VOLVO
Construction Equipment

Service Information

Document Title: E-ECU, MID 128, changing non-programmed ECU	Function Group: 200	Information Type: Service Information	Date: 2014/9/28
Profile: EXC, ECR235D L [GB]			

E-E CU, MID 128, changing non-programmed ECU

Op nbr 200-068

VCADS Pro VCADS Pro Service Tool
88890180 Interface
88890027 Cable

1. **Park the machine in the service position A, see 091 Service positions.**
2. **Open the side door on the left side of the machine.**
3. **Turn OFF the battery disconnect switch.**


V1109236

Figure 1

4. **Download software to VCADS Pro computer for target machine.**
5. **Connect the VCADS Pro computer to the machine, and perform the operation '28423-7 MID 128 control unit, programming'.**
6. **When VCADS Pro 'MID 128 ECU, programming' window appears, follow the instructions for replacing E-ECU.**
7. **Open the cover.**


V1109982

Figure 2

8. **Disconnect the wiring harness connectors from E-ECU and remove 2 screws fixing the clamps.**

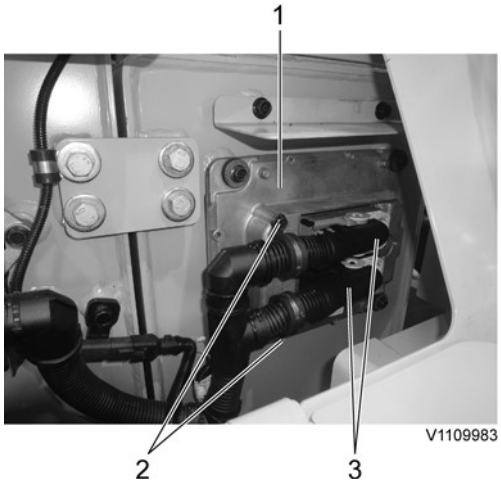


Figure 3

1. **E-ECU**
2. **Connector**
3. **Screw**

NOTE!
Pull up the locking device to disconnect the connector.

9. **Remove 4 screws fixing the E-ECU.**

10. **Install new E-ECU, and tighten 4 screws.**

11. **Connect the wiring harness connectors to the E-ECU and tighten 2 screws fixing the clamps.**

12. **After replacing E-ECU, press OK button of VCADS Pro operation '28423-7 MID 128 control unit, programming'. Now VCADS Pro starts the programming of software and parameters to the new E-ECU.**
    NOTE!
    If not able to read out the parameters with the program operation, the VCADS Pro operation 25438–8 “Nox sensor, age compensation, reset” has to be performed.

13. **Close the cover.**

VOLVO
Construction Equipment

Service Information

Document Title: E-ECU, MID 128, changing pre-programmed ECU	Function Group: 200	Information Type: Service Information	Date: 2014/9/28
Profile: EXC, ECR235D L [GB]			

E-E CU, MID 128, changing pre-programmed ECU

Op nbr 200-070

VCADS Pro VCADS Pro Service Tool
88890180 Interface
88890027 Cable

1. **Park the machine in the service position A, see 091 Service positions.**
2. **Open the side doors on the left side of the machine.**
3. **Turn OFF the battery disconnect switch.**


V1109236

Figure 1

4. **Connect VCADS Pro computer to the machine, and perform the operation '17030-3 Parameter, programming'.**
5. **Use the function 'save all parameters to job card'.**
6. **Open the cover.**

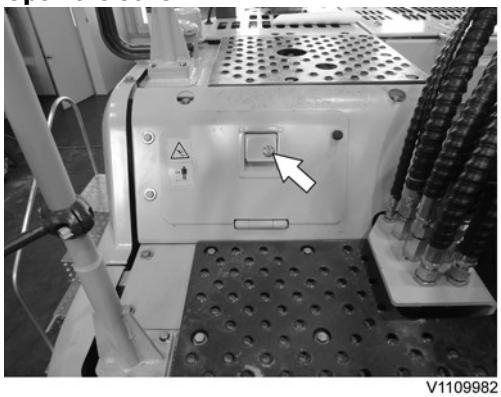

V1109982

Figure 2

7. **Disconnect the wiring harness connectors from E-ECU and remove 2 screws fixing the clamps.**

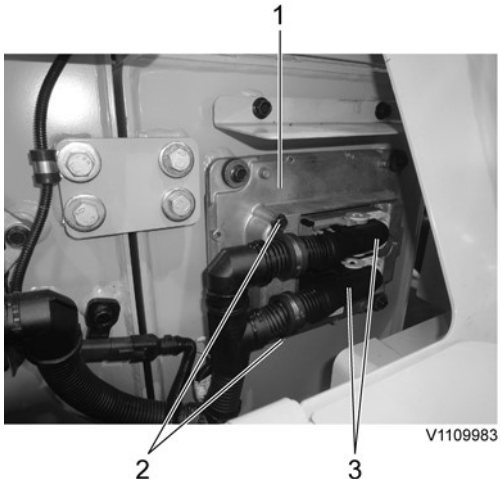


Figure 3

1. E-E CU
2. Connector
3. Screw

NOTE!
Pull up the locking device to disconnect the connector.

8. **Remove 4 screws fixing the E-ECU.**

9. **Install new E-ECU, and tighten 4 screws fixing the E-ECU.**

10. **Connect the wiring harness connectors to the E-ECU and tighten 2 screws fixing the clamps.**

11. **Connect VCADS Pro computer to the machine, and perform the operation 17030-3 Parameter, programming'. Now the customer parameters are changed according to the job card saved at step 2.**

12. **Perform VCADS Pro operation 25438–8 “Nox sensor, age compensation, reset”.**

13. **Close the cover.**

Document Title:	Function Group:	Information Type:	Date:
Engine, removing	210	Service Information	2014/9/28
Profile: EXC, ECR235D L [GB]			

Engine, removing

Op nbr 210-070

WARNING

Risk of burns - stop the diesel engine and allow it to cool down before starting any work.

WARNING

Removal of residual pressure from the circuit must be done prior to any maintenance.

NOTE!

Cable ties and clamps that secure hoses and electrical wiring must be removed and then replaced when installing components.

NOTE!

Disconnected hoses, lines and connections must be plugged. Oil that drains from hoses, lines and connections should be collected in a container.

1. **Place the machine in the service position B. See 091 Service positions**
2. **Turn off the battery disconnect switch.**
3. **Drain the coolant in a collection container. See 261 Coolant, changing.**
4. **Remove the cabin, see 810 Cab, removing.**
5. **Remove the DPF hood and the radiator hood.**

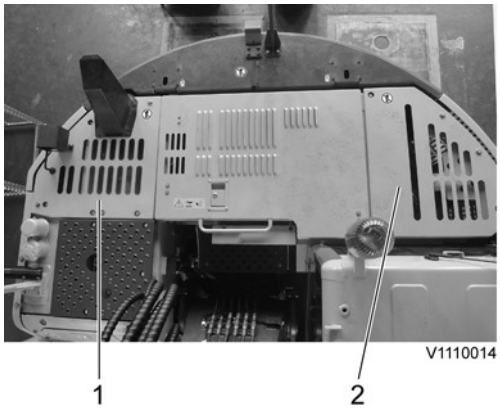


Figure 1

1. **DPF hood**
2. **Radiator hood**

6. **Open the engine hood, disconnect the boost sensor and the air inlet hoses. Remove the screws on the bracket and the air inlet pipe.**

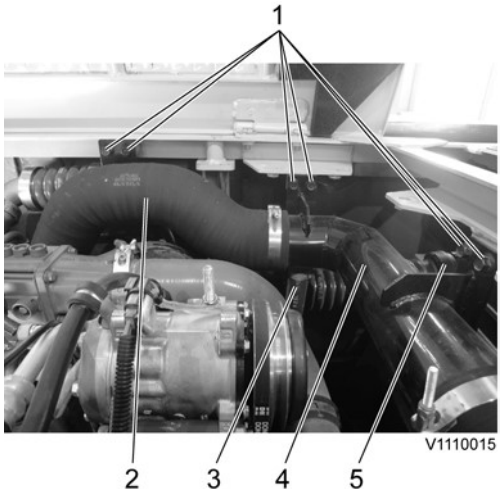


Figure 2

1. **Screw**
2. **Air inlet hose**
3. **Air pump inlet hose**
4. **Air inlet pipe**
5. **Boost sensor**

7. **Remove the engine hood with the upper cowl frame.**

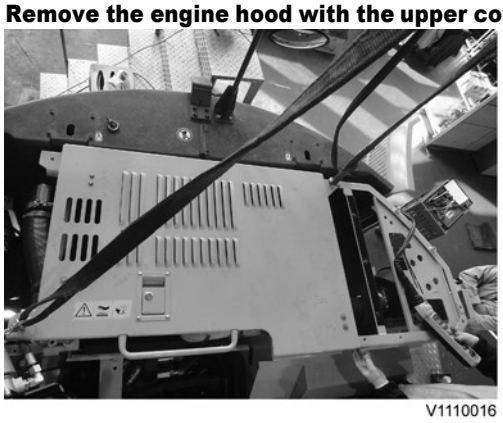


Figure 3

8. **Remove the cowl frame behind the cabin.**

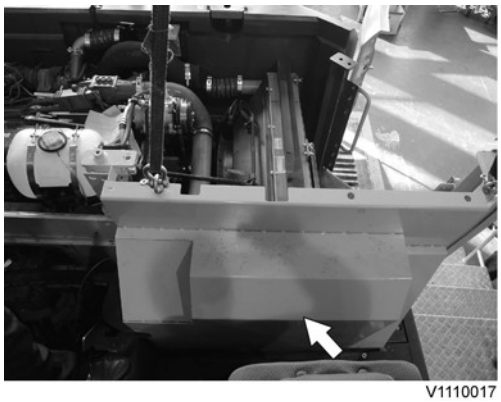


Figure 4

9. **Remove the clamps, screw and the charge air cooler hoses.**

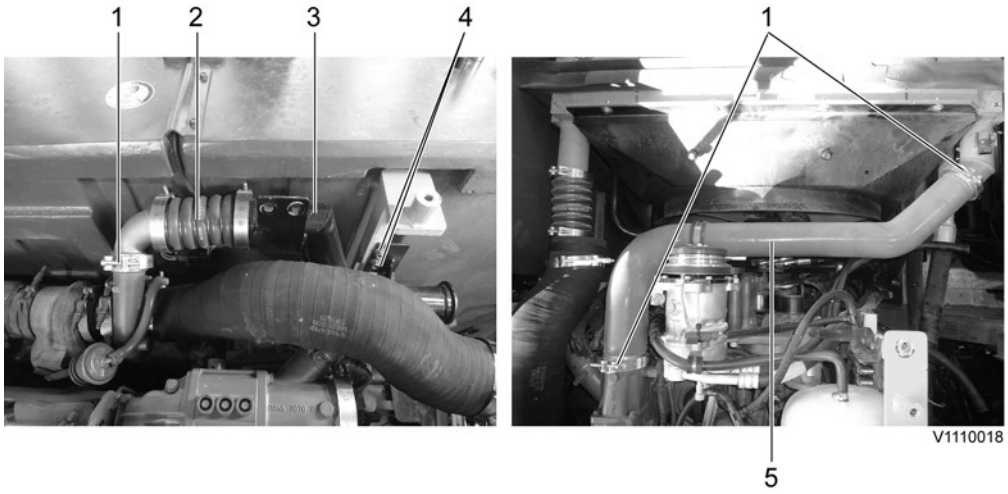


Figure 5

1. Clamp
2. Charge air cooler hose (Outlet)
3. Bracket
4. Screw
5. Charge air cooler hose (Inlet)

10. **Remove the air inlet hose.**

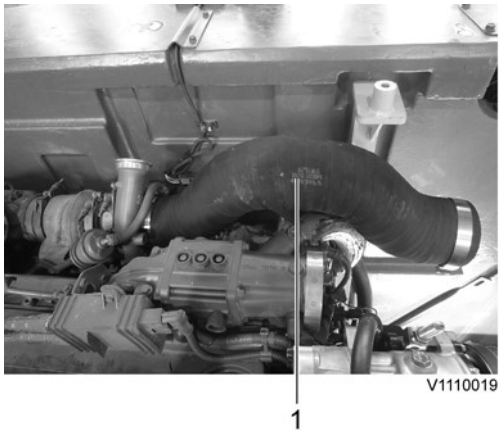


Figure 6

1. Air inlet hose

11. **Remove the clamps and disconnect the radiator hoses.**

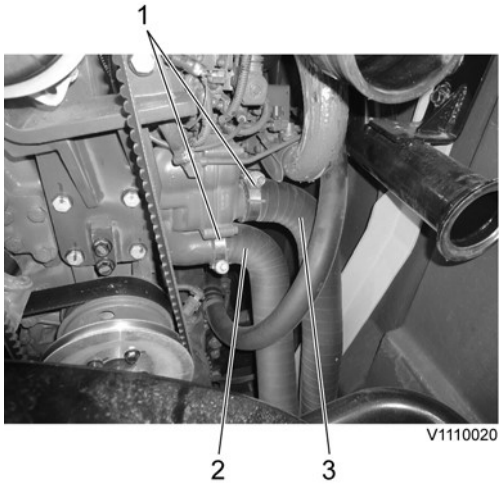


Figure 7

1. Clamp
2. Radiator hose (Outlet)
3. Radiator hose (Inlet)

12. Remove the main pump. See 913 Hydraulic pump, replacing

13. Remove the screws and cowl plate.

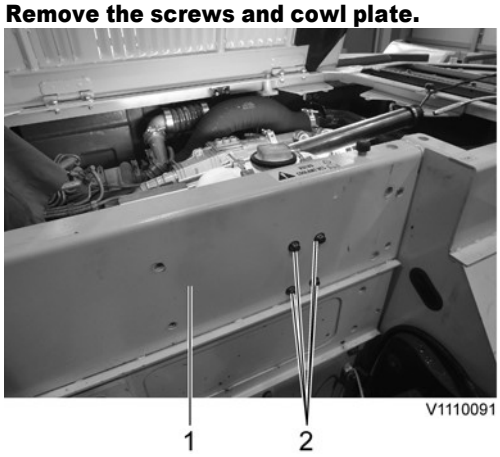


Figure 8

1. Cowl plate
2. Screw

14. Disconnect the hose on the top side of the expansion tank.

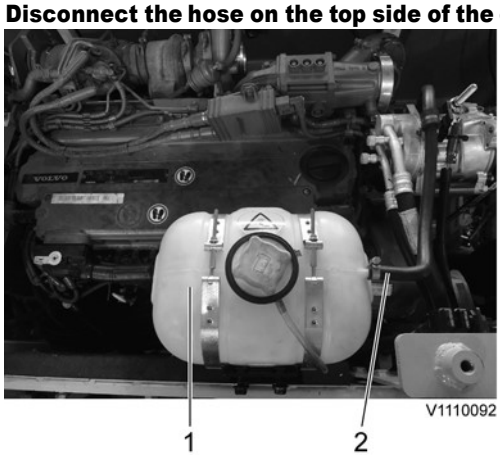


Figure 9

1. Expansion tank
2. Hose

15. Disconnect wire harness connector and the hoses.
Remove the expansion tank.

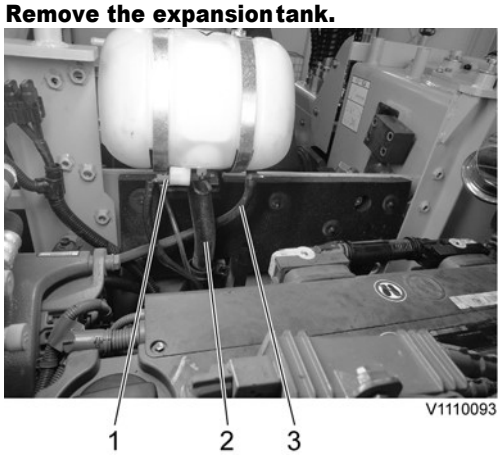


Figure 10

1. Wire harness connector
2. Hose
3. Hose

16. Remove the cowl plate.

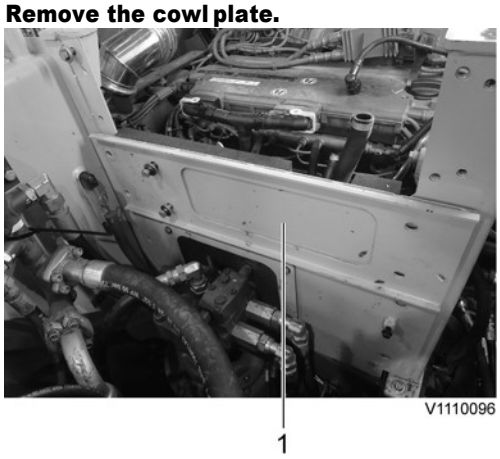


Figure 11

1. Cowl plate

17. Disconnect the engine block heater wire-harness and the cab heater hose.

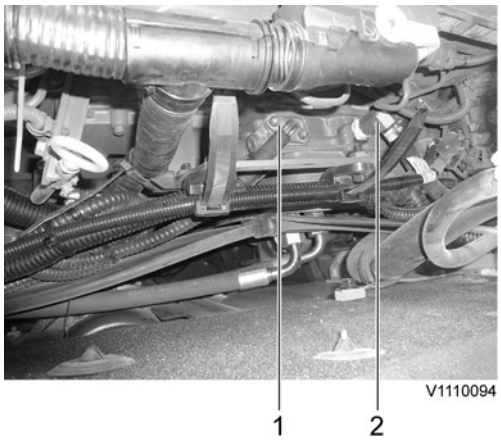


Figure 12

1. **Engine block heater wire-harness (optional)**
2. **Cab heater hose (supply)**

18. **Disconnect the fuel line hoses (4 pcs) and remove the bracket**

NOTE!

Ports must be plugged after disassembling hoses.

Figure 13

1. **Fuel hose**
2. **Bracket**

19. **Disconnect the engine oil remote hoses.**

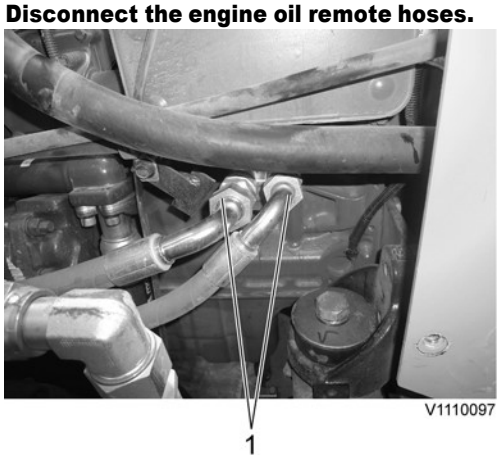


Figure 14

1. **Engine oil remote hose**

20. **Disconnect the wire harness connector, remove the compressor and lay it down on the frame.**

WARNING

Do not disconnect or loosen connections for the air conditioning unit (AC). Risk of gas leakage.

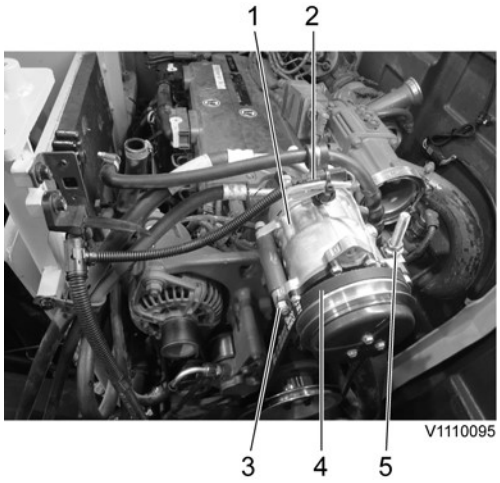


Figure 15

1. **Air conditioner compressor**
2. **Wire harness connector**
3. **Mounting screw**
4. **Air conditioner compressor belt**
5. **Nut**

21. **Remove the clamp and disconnect the exhaust pipe.**

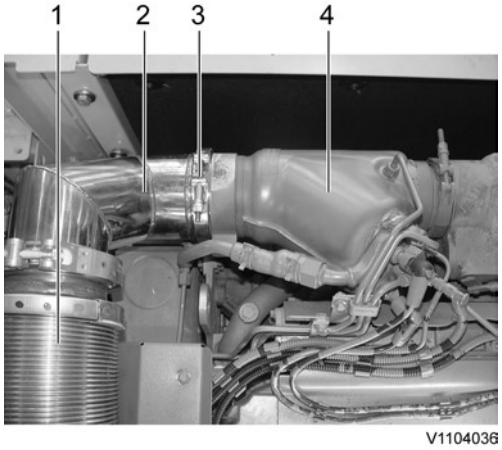


Figure 16

1. **Exhaust flexible tube**
2. **Exhaust pipe**
3. **Clamp**
4. **Burner**

22. **Disconnect the starter motor wire harness.**

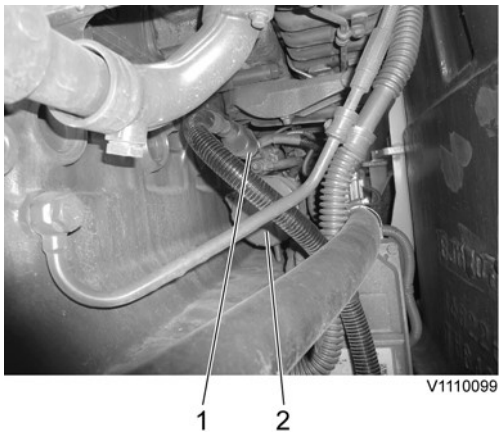


Figure 17

1. **Starter motor wire harness**

23. **Disconnect the junction box connector.**

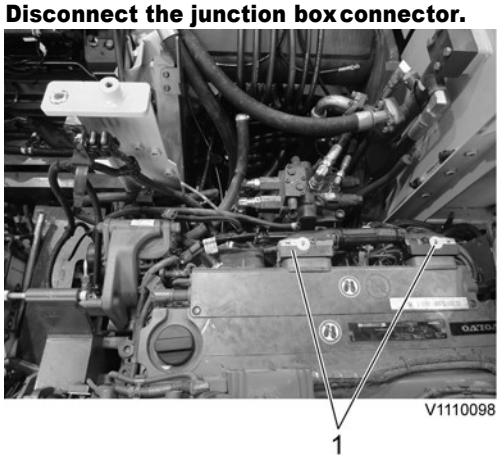


Figure 18

1. **Junction box connector**

24. **Remove the screw and the clamp.**

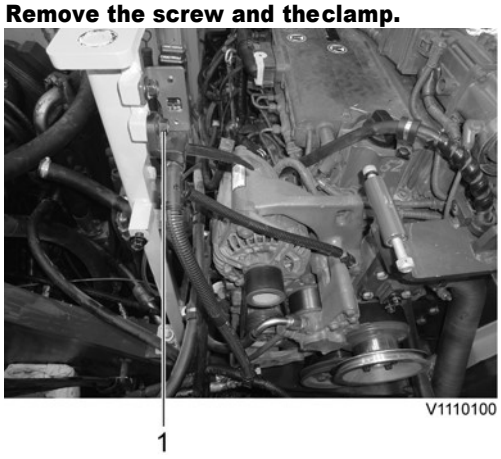


Figure 19

1. **Screw**

25. **Remove the four mounting screws.**

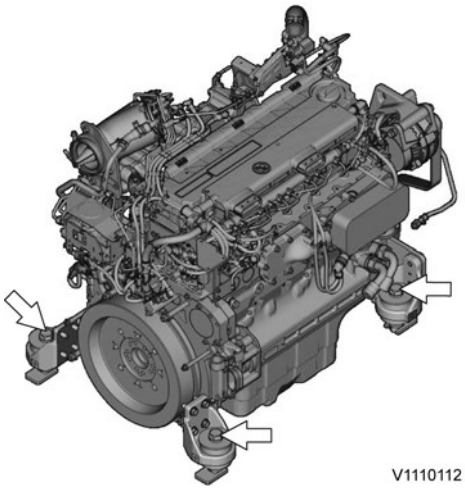


Figure 20

26. **Lift the engine just a little using a lifting device, and after confirming safety around, lift it up and out slowly to the work stand.**

Figure 21

Document Title:	Function Group:	Information Type:	Date:
Crankcase ventilation, description	212	Service Information	2014/9/28
Profile: EXC, ECR235D L [GB]			

Crankcase ventilation, description

Since some of the combustion pressure enters the crankcase after passing by the pistons and piston rings (blow-by), the crankcase must be ventilated.

The purpose of the crankcase ventilation is to balance the pressure in the crankcase in order to avoid damage to engine components and to prevent oil mist formation and oil leakage into the ambient air.

The crankcase ventilation consists of a housing containing a filter, with connections to the oil sump and ventilation piping.

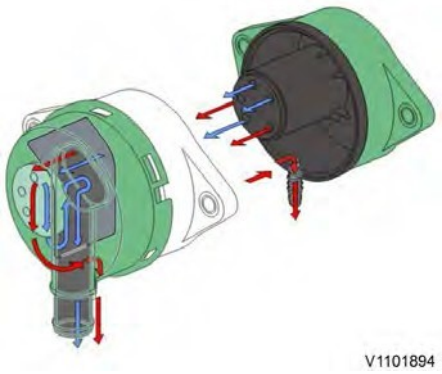


Figure 1
Crankcase ventilation housing

Air containing oil particles comes from the crankcase via the cylinder head into the crankcase ventilator. The air (blue arrows) passes through the filter, while oil particles (red arrows) are caught and led back to the oil sump via a return pipe.

Supplementary information

- 200 Engine, description
- 200 Component locations

Document Title:	Function Group:	Information Type:	Date:
Valves, adjusting	214	Service Information	2014/9/28
Profile: EXC, ECR235D L [GB]			

Valves, adjusting

Op nbr 214-012

9998681 Rotation tool
885812 Timing tool

WARNING

Risk of burns - stop the diesel engine and allow it to cool down before starting any work.

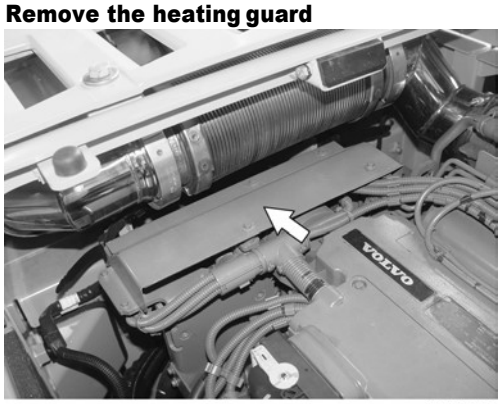
NOTICE

Never adjust the valves with the engine running as the valves may strike the piston and cause serious damage.

NOTICE

Always cover open air connections with a plastic bag and rubber bands. Gravel, dust and other particles in these connections may result in engine failure!

1. **Place the machine in service position B. See 091 Service positions**
2. **Open the engine hood.**
3. **Remove the heating guard**



V1103092

Figure 1

4. **Remove the screws and put aside the crankcase ventilation duct from the engine.**

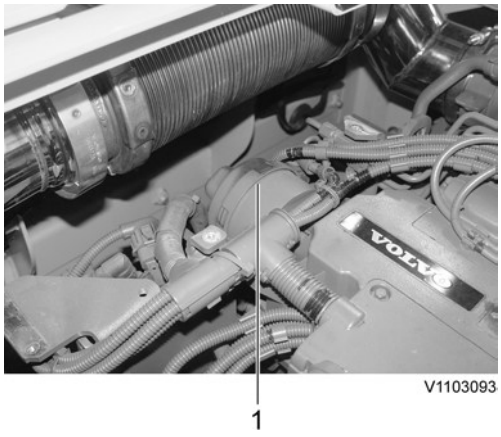


Figure 2

1. **Crankcase ventilation duct**

5. **Disconnect the spark plug cables and connector. Remove the screws and spark plug control unit.**

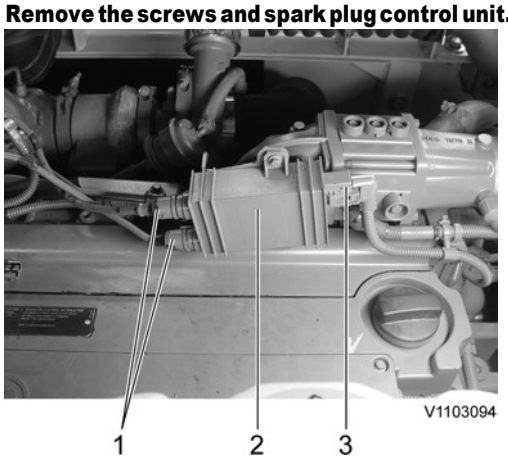


Figure 3

1. **Spark plug cable**
2. **Spark plug control unit**
3. **Wire-harness connector**

6. **Disconnect the junction box connector and pull apart the cover plates**

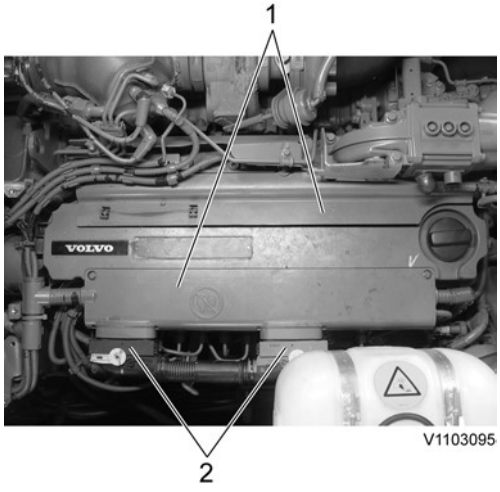


Figure 4

1. **Cover plate**
2. **Junction box connector**

7. **Disconnect the connectors.**

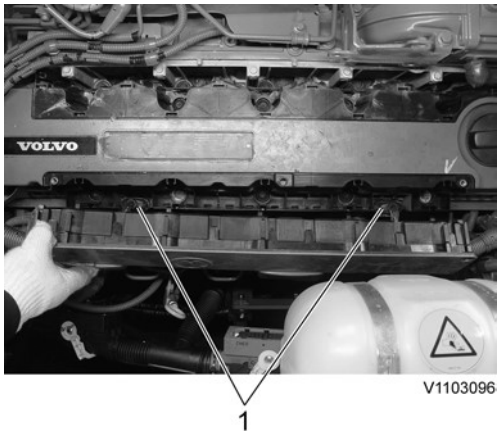


Figure 5

1. **Connector**

NOTICE

Clean round the valve cover, intercooler and turbo to avoid oil residue and the like from getting into the engine while work is in progress.

8. **Remove the valve cover.**

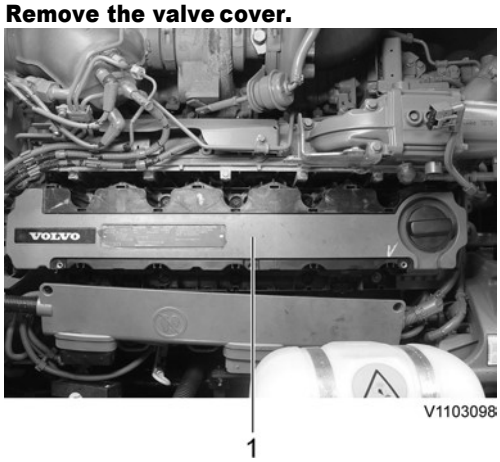


Figure 6

1. **Valve cover**

9. **Open the side door on the right side of the machine.**

10. **Remove the clamp screw.**

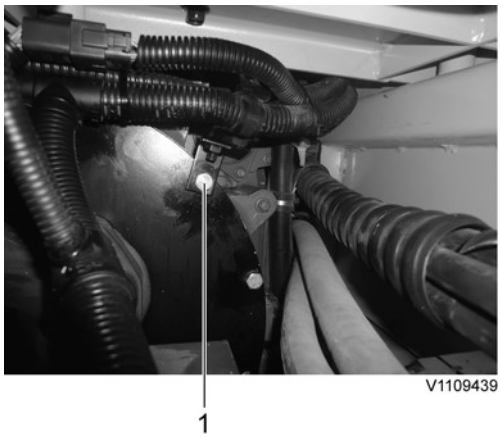


Figure 7

1. **Clamp screw**

11. **Remove the gear cover.**

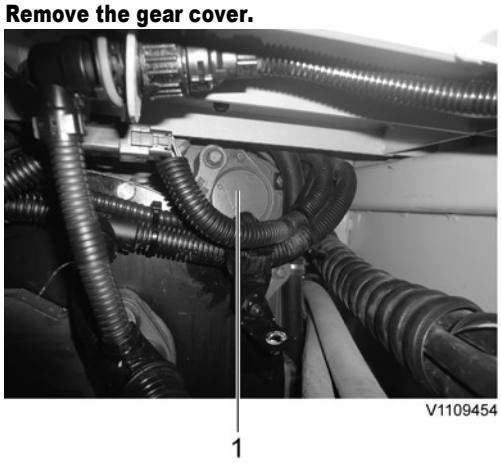


Figure 8

1. **Gear cover**

12. **Install the engine rotating tool.**
NOTE!
The teeth of the rotation tool must mesh fully with the teeth of the flywheel gear.

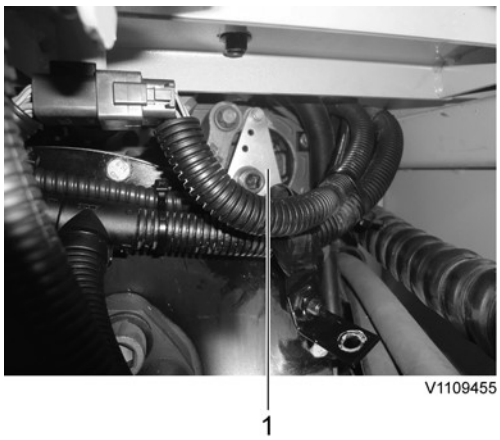


Figure 9

1. **9998681 Rotation tool**

13. Setting engine to valve overlap
Turn the engine using the rotation tool until the valve overlap of cylinder 1 is reached.

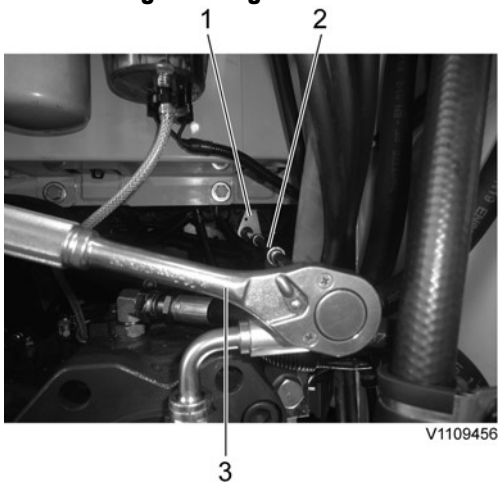


Figure 10

1. **9998681 Rotation tool**
2. **Extension bar**
3. **Handle**

14. **Crank the engine, clockwise, to a position where the valves on the cylinder number 1** (closest to the flywheel side) **overlap. Overlapping means that the exhaust valve is about to open and the inlet valve is about to close. In this position it should not be possible to rotate any of the push rods by hand for the cylinder in question.**

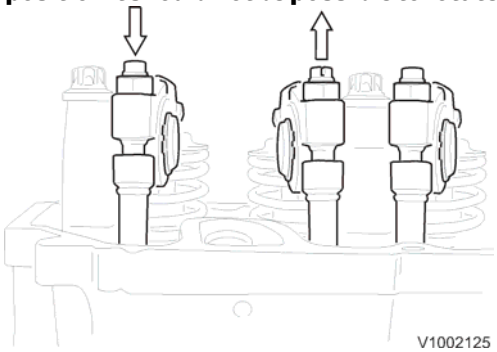


Figure 11
Overlapping

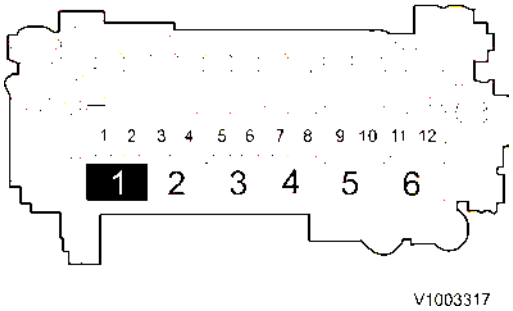


Figure 12

1, 3, 5, 7, 9, 11 are exhaust valves
2, 4, 6, 8, 10, 12 are inlet valves

15. **Adjust the valve clearance for each cylinder according to** the black markings **in the figure. Procedure for adjusting:**

1. Loosen the adjusting screw's lock screw on the rocker arm.
2. Install the timing tool on the adjusting screw.
3. Turn the adjusting screw until zero clearance is obtained between rocker arm and valve. Set the timing tool to zero.
4. Turn the adjusting screw counter-clockwise 75° ±10° for inlet valve and 105° ± 10° for exhaust valve. see 214 Valve system, specification.
5. Hold the adjusting screw in position and at the same time tighten the lock nut. Tightening torque: See 210 Engine, tighten torques.

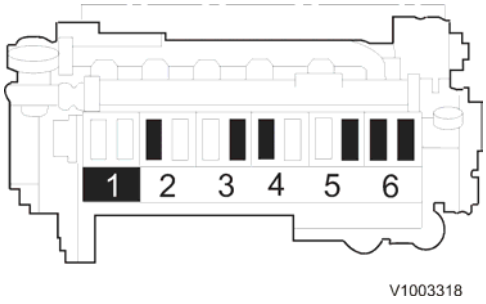


Figure 13

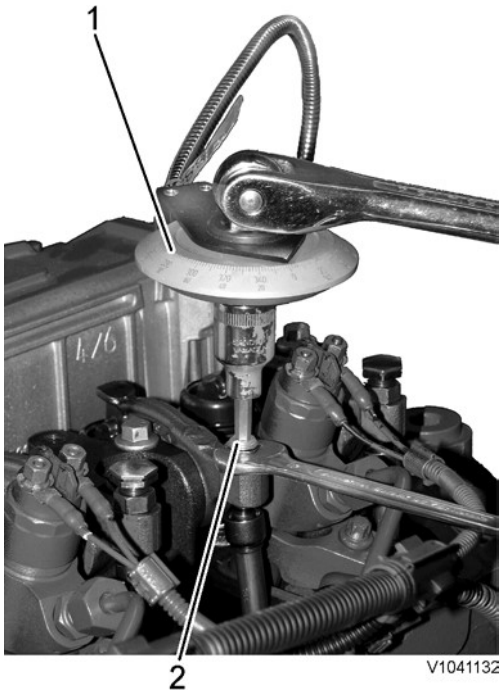


Figure 14
Use of timing tool

1. 885812 Timing tool
2. Adjusting screw

16. Turn the crankshaft one more revolution until the valves for cylinder number 6 overlap. Adjust the valve clearance for each cylinder according to the black markings in the figure.