

Document Title: Engine, description	Function Group: 200	Information Type: Service Information	Date: 2015/1/6 0
Profile: GRD, G960 [GB]			

Engine, description

D7E - tier 3 compliant

The D7E configuration is a four stroke, straight six cylinder, turbocharged, direct injected diesel engine with charge air cooling and wet, replaceable cylinder liners.

The D7E engine uses a Common Rail Fuel System controlled by the engine electronic control (E-ECU) software.

The D7E uses V-ACT (Volvo Advanced Combustion Technology). The V-ACT D7E engine features split injection, optimized air handling and wastegate turbocharger. Electronically controlled IEGR (Internal Exhaust Gas Recirculation) reduces NO_x formation and lowers emissions without the need for exhaust after treatment. Volvo's latest engine management system, EMS2 is used to control all engine electronic functions.

The cylinders are numbered consecutively beginning at the flywheel end. Engine rotational direction is counterclockwise as seen from the flywheel end.

The engine model, serial number and performance data are stamped on an identification plate which is attached to the right side of the crankcase. The engine model designation and serial number must be indicated when ordering spare parts.

Fig. model		Series No.		Engine No.		kW (CV)		EP	K
D7E LAE 3		00582464		00582464					
kW (CV)	162	min. rev./min.	2100	stroke	0.0M				
ISO 14398	3840/03	00000000	+25						
ISO 14398				100					
MADE IN GERMANY									

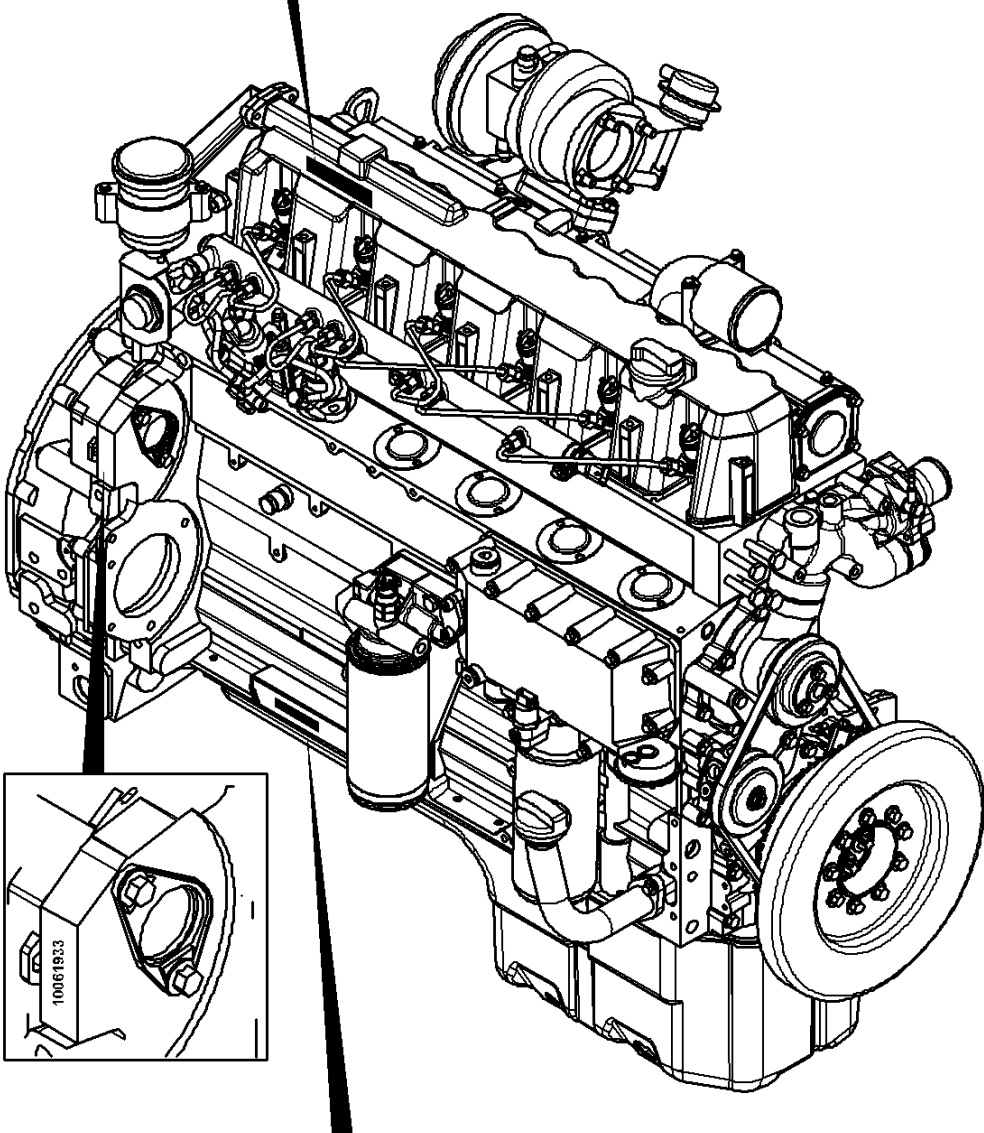


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ISO 14398				100					
MADE IN GERMANY									

V104*234

Figure 1

Document Title: VCADS Pro, MID 128, programming E-ECU	Function Group: 200	Information Type: Service Information	Date: 2015/1/6 0
Profile: GRD, G960 [GB]			

VCADS Pro, MID 128, programming E-ECU

Op nbr 200-009

MID 128, E-ECU for D7

1.
 - Turn on battery disconnect switch.
 - Start up the computer.
 - Connect VCADS Pro computer to the data link port in the machine.
 - Create a new job card.
 - Perform the operations no 28423-2 MID 128 ECU, programming.
 - Save performed work.
 - Shut down the computer and disconnect the adapter cable from data link port.
 - Turn off battery disconnect switch.

Document Title: Engine, removing	Function Group: 210	Information Type: Service Information	Date: 2015/1/6 0
Profile: GRD, G960 [GB]			

Engine, removing

Op nbr 210-070

[9998547 Lifting tool](#)

Strap 2m, 2 pieces

Puller

Engine, removal - D7 models G930, G940, G946 and G960

1. Place the machine in service position. Refer to [191 Service position](#).
2. Remove the engine hoods. Refer to [821 Engine hood, removing](#).
3. Remove the engine lower side panel on both sides of the machine.



Figure 1

1. Engine lower side panel



Hot oil and hot engine coolant can cause severe burns!

4. Drain the oil from the engine placing it in a suitable container. Refer to [030 Engine D7, volume](#).



Before removing the radiator cap, stop the engine and let it cool down sufficiently. When removing it, turn it slowly to release the pressure.

5. Remove the expansion tank pressure cap. Add a 3/8" nipple to the draining valve.

NOTE!

Be sure that the valve does not turn.

NOTICE

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

6. Connect a drain hose to the nipple. Drain the engine coolant into a suitable container. Refer to [030 Cooling system, volume \(Models G930 - G940\)](#).

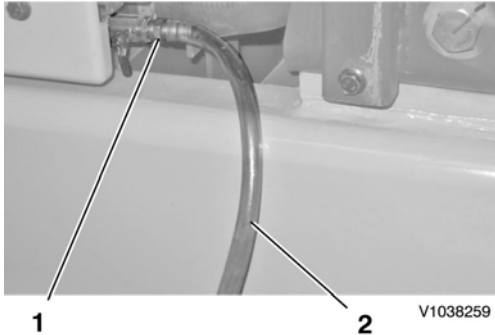


Figure 2

1. Nipple
2. Drain hose

Be sure to seal all charge air tubes as soon as they are removed from the machine.



Figure 3
Right side view of engine

Right side

7.
 - Remove all clamps and remove the turbocharger to charge air cooler tube
 - Disconnect intake air temperature/pressure sensor. Remove the air intake tube
 - Remove the charge air cooler to engine intake tube

NOTE!

The engine lifting bracket is secured with the same bolts as the charge air outlet bracket. Reinstall the engine lifting bracket and retorque the bolts. **Torque 60 ±10 Nm (44 ±7.5 lbf ft)**

- Disconnect the upper and lower radiator hoses at the engine
- Disconnect the wiring harness at the alternator and the grounding point on the frame

- Remove the safety cover from the starter and remove the electrical wiring harnesses and clamps
- Remove the clamp from the hydraulic return line hose
- Remove the connections from the engine ECU
- Disconnect hoses from the expansion tank to the engine

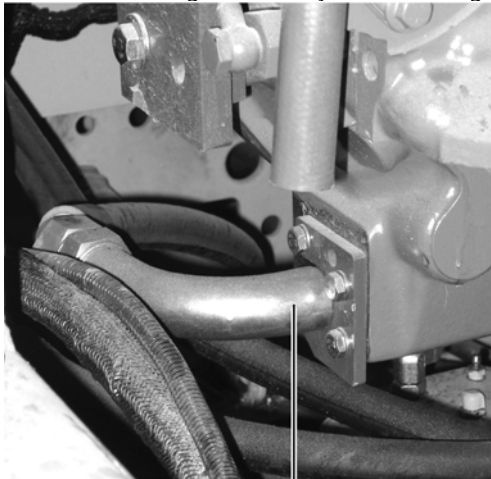


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Figure 4
Left side view of engine

Left side

8.
 - Remove the hose from the expansion tank
 - Remove both heater hoses
 - Remove the fuel inlet hose from the engine
 - Remove the fuel filter bracket leaving the filter attached to the bracket
 - Remove the bolt and disconnect the engine harness
 - Disconnect the fuel lines support bracket
 - Disconnect the fuel line from the fuel pump
 - Remove the fitting from the flywheel housing drain



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Figure 5

1. Flywheel housing drain

9. Remove the hydraulic tank side cover support member bracket and the drive shaft cover.
10. Disconnect and remove the drive shaft. **Weight 15 kg (33 lbs)**

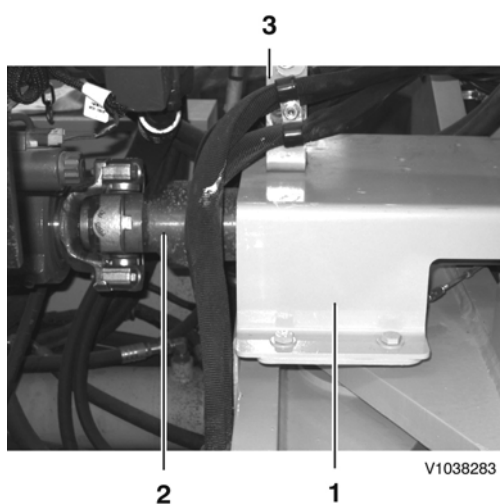


Figure 6

1. Driveshaft cover
2. Driveshaft
3. Side cover support member bracket

11. Secure the pump drive use a securing device.

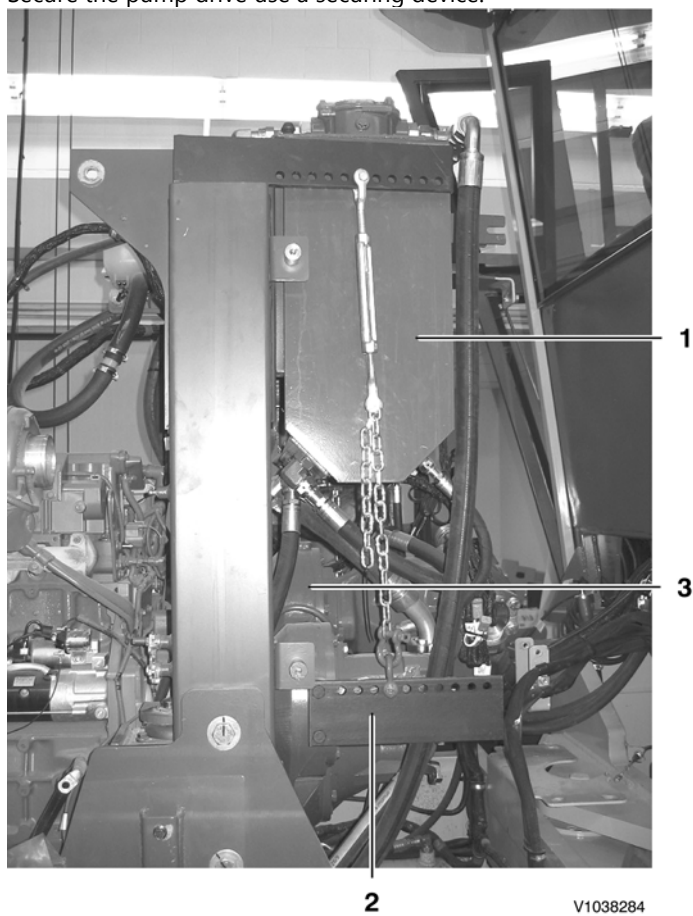


Figure 7

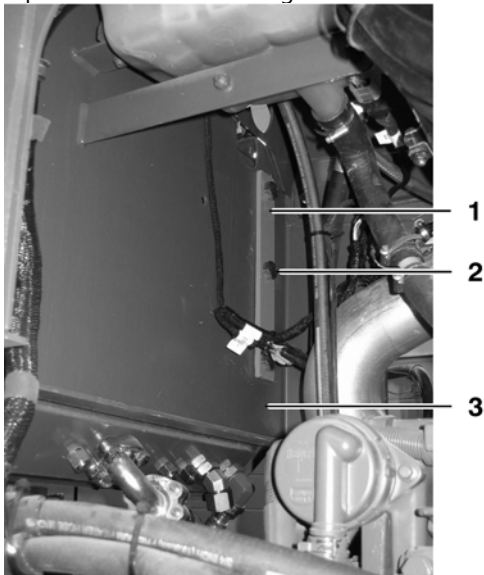
1. Hydraulic tank
2. Securing device
3. Pump drive

12. Remove the bolts connecting the pump drive to the engine. Leave the two top bolts attached. Disconnect the level sensor harness from the expansion tank.

NOTE!

It is important to replace the top bolts connecting the hydraulic tank to the engine support frame with longer bolts before removing the lower bolts. Failure to do so could result in personal injury.

13. Remove the top bolt from each side that support the hydraulic tank to the engine support frame and immediately replace them with two longer bolts 20 mm *60 mm. Remove the four bottom bolts.

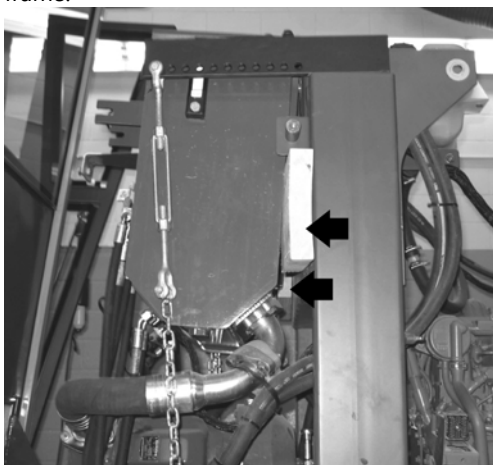


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Figure 8

1. Backing plate
2. Bolt
3. Hydraulic tank

14. Using two 40 mm (1.5 in.) blocks of wood, position them in between the hydraulic tank and the engine support frame.



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Figure 9

Blocks of wood positioned between hydraulic tank and engine support frame

15. Remove the remaining pump drive bolts and pull the pump drive away with the use of two, 2 m straps and a puller.

Place one strap around the output driveshaft under the cab and the other strap through one of the holes in the lockbar.

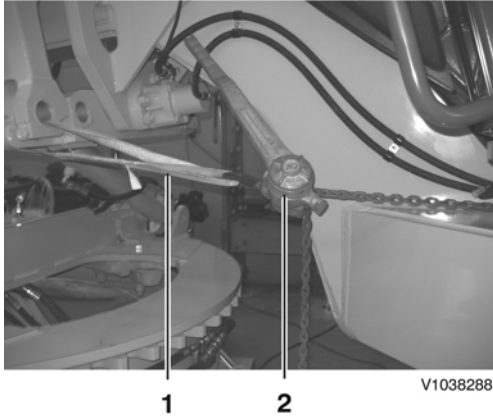


Figure 10

1. Strap - 2m, 2 pieces
2. Puller



Only use lifting devices with adequate capacity.

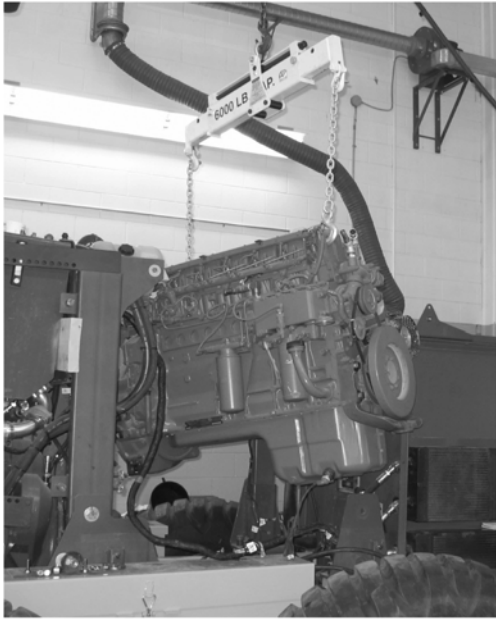
16. Remove the two bolts from the left rear engine hood support member, disconnect the wiring harness and remove it. Install a lifting device to hold the engine in place (tool number 9998547).



Figure 11

Left rear engine hood support member removed

17. Remove the rear motor mount bolts securing the rear engine mount to the engine bracket. Remove the center motor mount bolts from the flywheel end of the engine. Lift slightly to take the weight off the front engine mounts.
18. Lift the engine out of the machine and put the engine in a stand.



V1038312

Figure 12
Engine and lifting device

Document Title: Engine, installing	Function Group: 210	Information Type: Service Information	Date: 2015/1/6 0
Profile: GRD, G960 [GB]			

Engine, installing

Op nbr 210-072

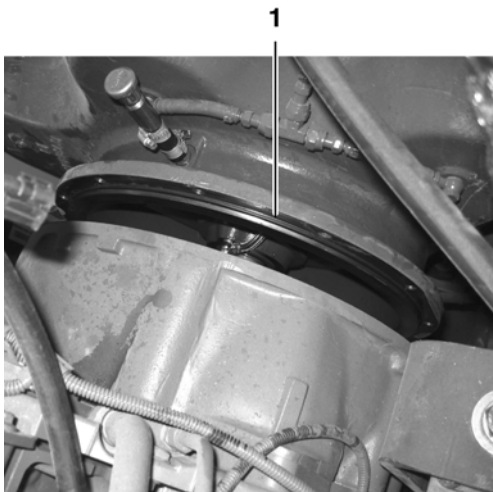
[9998547 Lifting tool](#)

Strap 2m, 2 pieces

Puller

Engine, installing — D7 models G930, G940 and G960

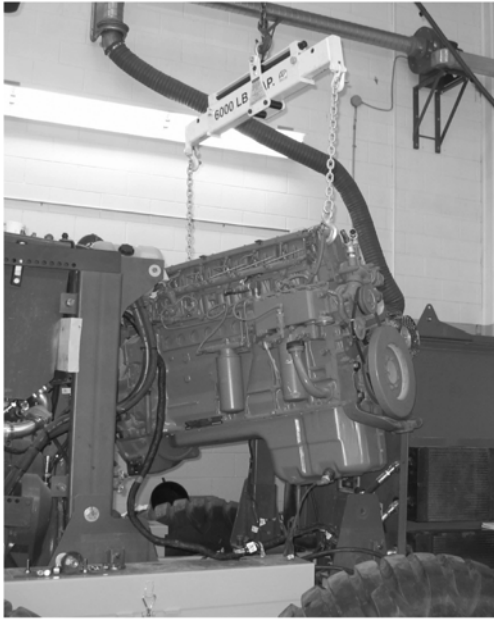
1. Replace and lubricate the pump drive housing o-ring.



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Figure 1
Pump drive

1. O-ring
2. Install the lifting tool to the engine and lift it from the stand.
3. Install the engine from the left side of the machine with the fly wheel end first.



V1038312

Figure 2
Engine lift

4. Lower the engine to the mount and install the front mount bolts but do not tighten.
5. Install and torque the rear mount bolts.
Tighten torque 115-130 Nm (85-96 lbf ft)
6. Remove the wooden blocks from between the hydraulic tank and the engine. Install the four lower bolts that were removed in [210 Engine, removing](#). Remove the longer top bolts and install the original bolts.
7. Release the puller and swing the pump drive back into position to be reattached to flywheel housing. Align the splines between pump drive and flex plate and engage the pump drive to the engine.
8. Install the bolts between the engine and pump drive. **Torque the bolts in sequence.**
9. Remove the pump drive support.
10. Torque the front engine mount bolts.
Tighten torque 490-550 Nm (361-406 lbf ft)
11. Reinstall the drive shaft and cover. Refer to [451 Drive shaft, installing](#)
12. Reinstall the left side engine hood support member.

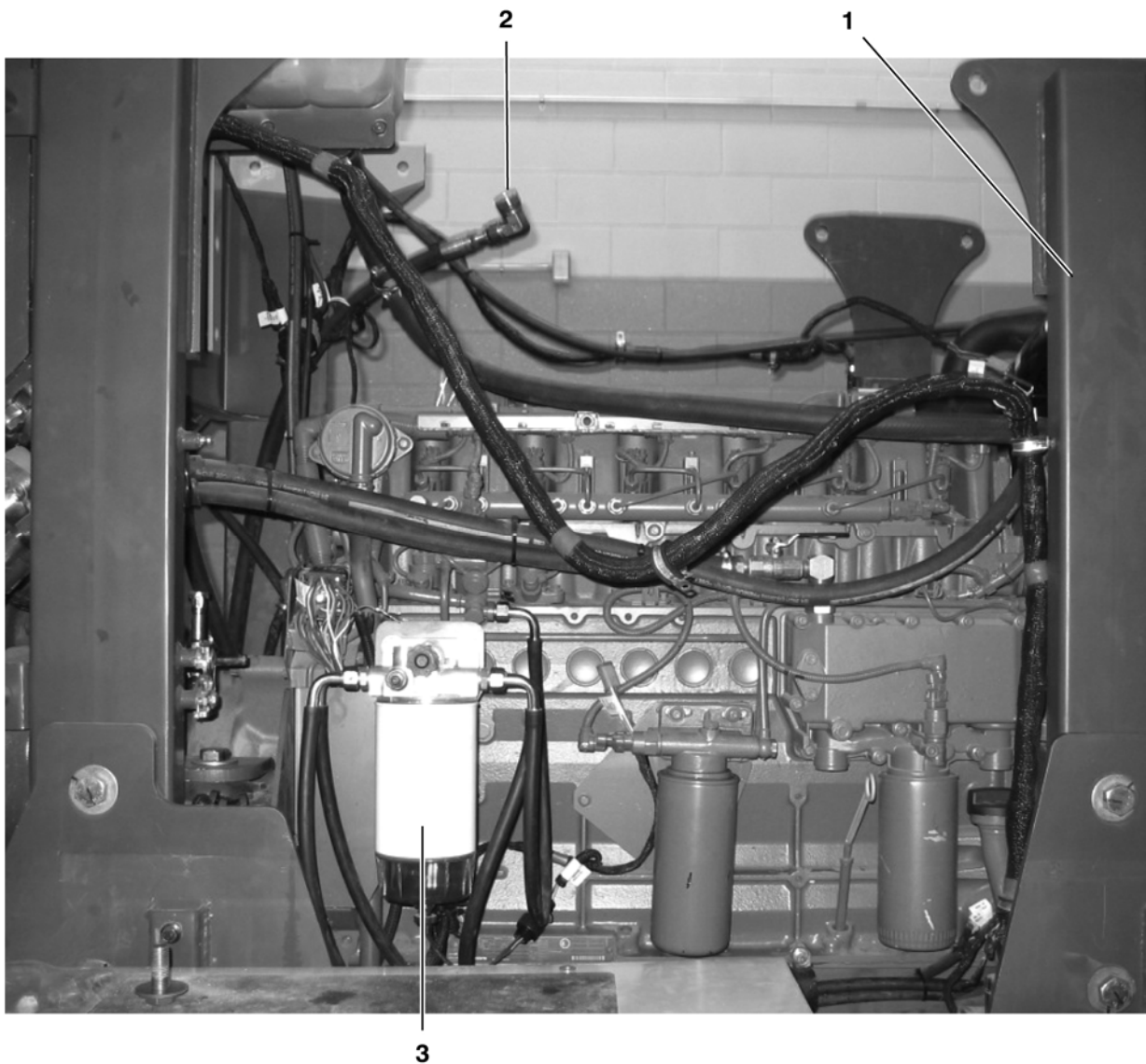
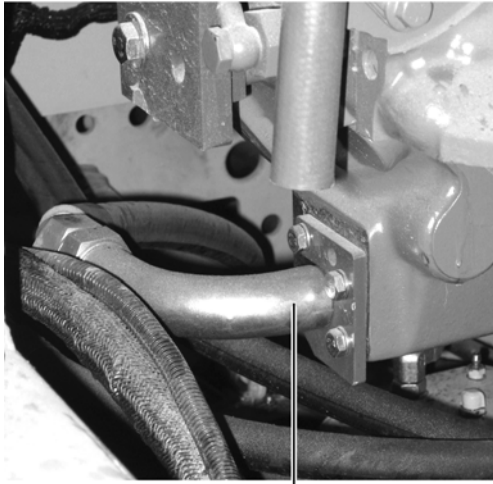


Figure 3
Left side view of engine

1. Hood support member
2. Expansion tank hose
3. Fuel filter

Left side

13.
 - Remove all protecting caps
 - Connect the harness to the engine hood support member
 - Connect the engine harness and reinstall the clip
 - Reinstall the fitting on the flywheel housing drain



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V1038281

Figure 4

1. Flywheel housing drain

- Reinstall the fuel filter with bracket
- Reinstall the fuel inlet hose from the engine
- Reinstall the fuel line from the fuel pump
- Reinstall the fuel lines support bracket
- Reinstall both heater hoses
- Reinstall the hose from the expansion tank

NOTE!

Expansion tank will be changed.

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