

Document Title: <b>Engine, description</b>	Function Group: <b>200</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/27</b>
Profile: <b>WLO, L50E [GB]</b>			

## Engine, description

### General

Loader L50E is equipped with a four-cylinder, four-stroke, diesel engine with the type designation D4D. D4D is a low-emission engine. It is provided with mechanically controlled fuel injection and is turbocharged. The engine has four separate fuel injection pumps, one for each cylinder.

### Cooling system

The engine cooling system is based on a concept, which entails an integrated cooling of the engine, transmission and the hydraulics.

The degree of cooling of these systems is dependent on the cooling fan speed.

The engine cooling fan is driven by an axial piston motor and is positioned in front of the radiator. The fan is driven hydrostatically by a variable axial piston pump. See also [263 Hydraulic cooling fan, description](#) and [263 Cooling fan speed control, description](#).

### Engine revolution governor

The engine revolution governor on the D4D engine is of the centrifugal type.

Each engine has an individually adapted revolution governor and the governor can thus not be moved from one engine to another.

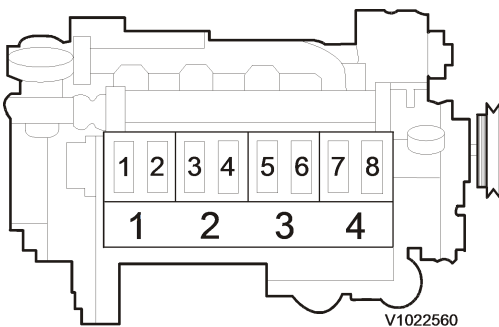
This might result in a poorer combustion, which may lead to high emissions, high fuel consumption and poorer performance.

## NOTICE

**The governor's settings may only be adjusted by trained personnel at a central overhaul workshop.**

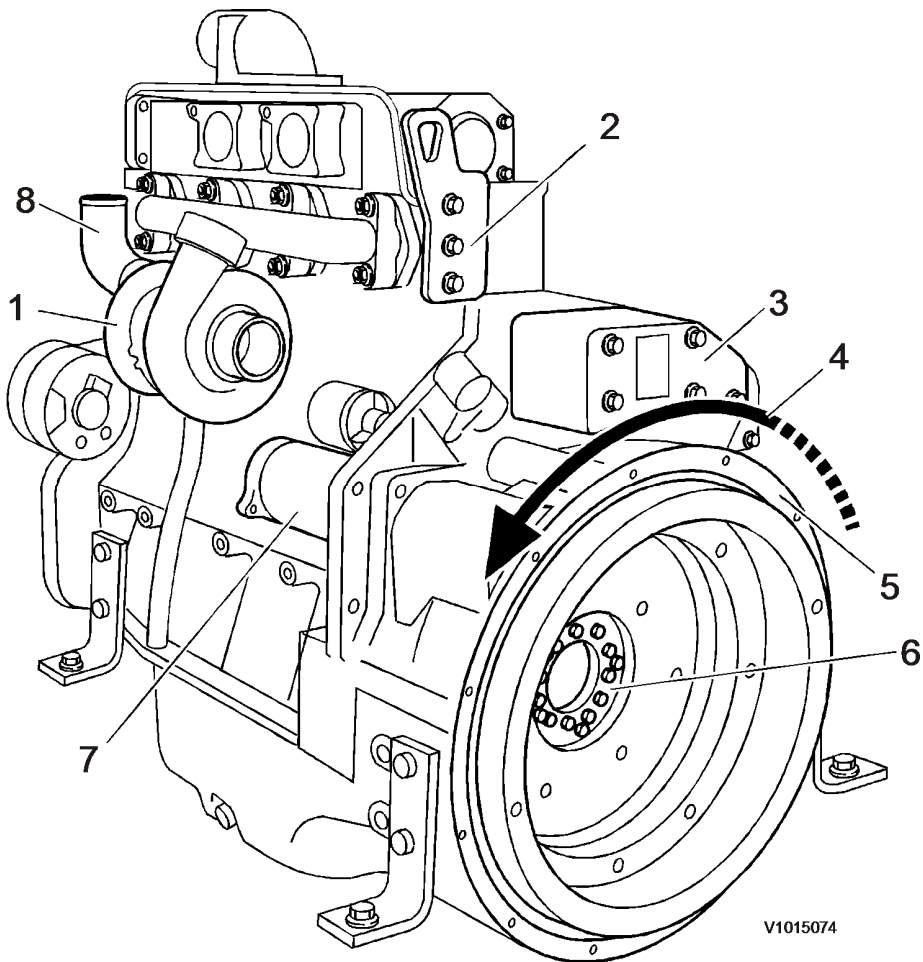
The engine type designation, the engine serial number and speed range must always be stated when ordering a new revolution governor as spare part.

### Numbering of cylinders and valves.



**Figure 1**

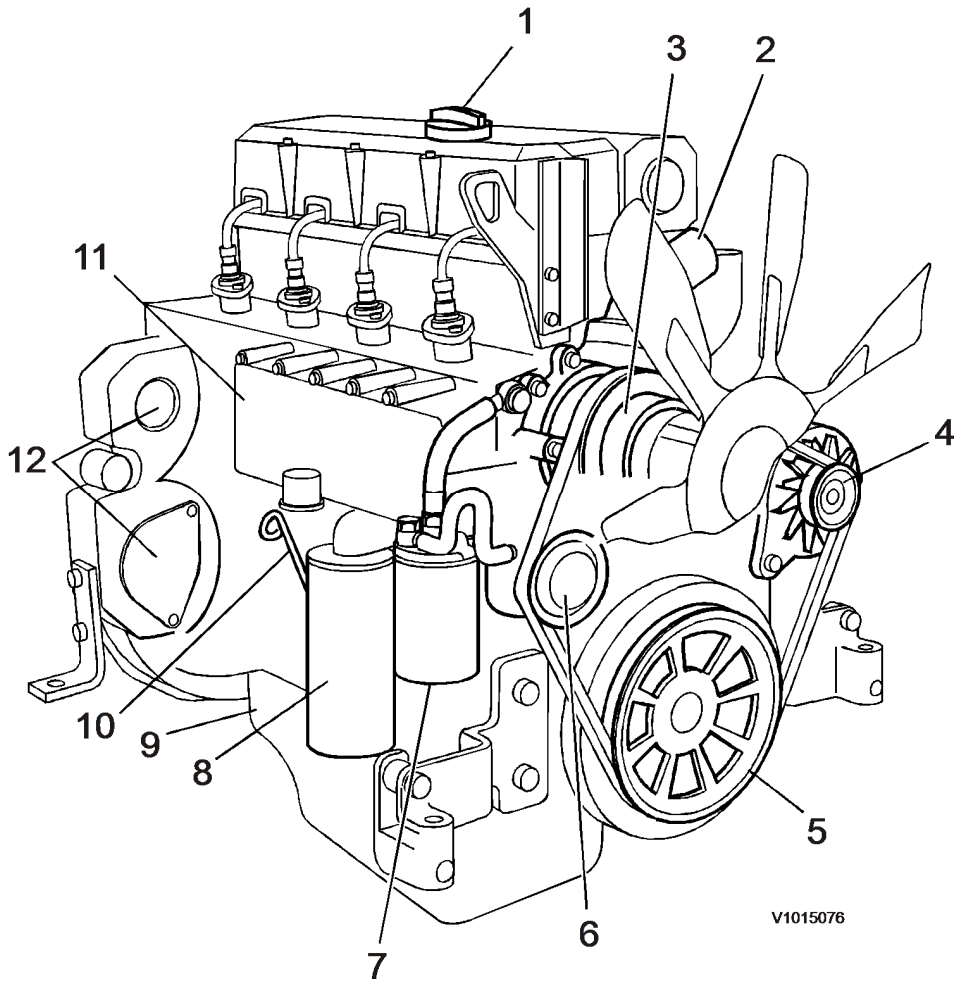
### Starter motor side



**Figure 2**

1. Turbocharger
2. Lifting point
3. Engine revolution governor
4. Direction of rotation
5. Flywheel housing
6. Flywheel
7. Starter motor
8. Outlet, cooling system (thermostat housing)

**Service side**



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**Figure 3**

1. Oil filling point
2. Inlet, cooling system
3. Coolant pump
4. Alternator
5. Belt pulley
6. Fuel pump
7. Fuel filter
8. Lubricating oil filter
9. Oil sump
10. Oil dipstick
11. Oil cooler
12. Power take-off

Document Title: <b>Engine, removing</b>	Function Group: <b>210</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/27</b>
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## Engine, removing

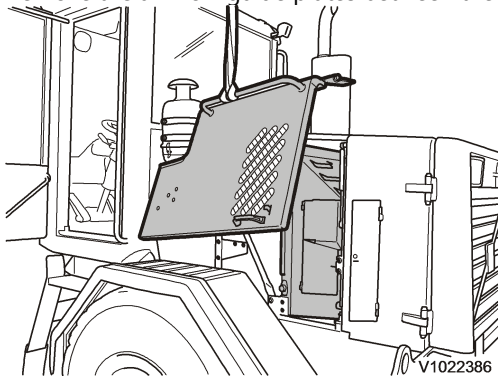
### Op nbr 210-070

ratchet block

shackle

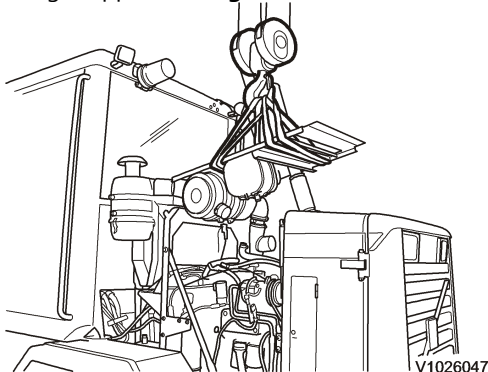
slings

1. Place the machine in service position, see [191 Safety rules when servicing](#).
2. Break the connection from the battery by turning off the battery disconnect switch.  
Take apart the canon connector halves (RR) which are positioned on the inside of the battery disconnect switch.
3. Drain the engine oil and the coolant from the engine.
4. Remove the side covers.  
Remove the air-flow guide plates between the engine and the fan.



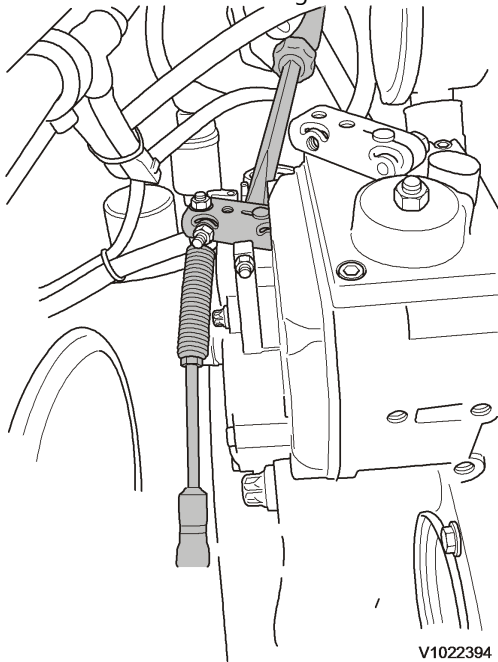
**Figure 1**

5. Disconnect the flexible hose and the inlet hose from the turbocharger. Plug all open connections.
6. Disconnect the coolant hoses from the expansion tank. Detach the engine hood and lift it away together with expansion tank, air cleaner and silencer.  
Weight approx.: **45 kg (99 lb)**



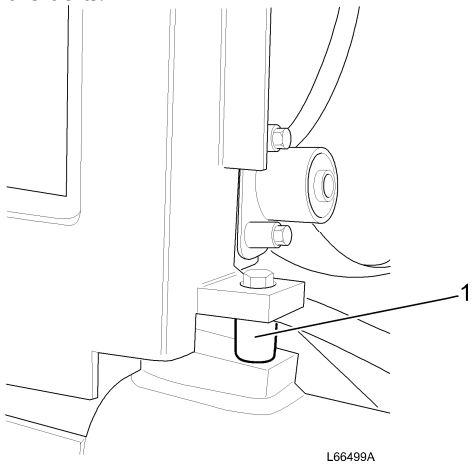
**Figure 2**

7. Disconnect hoses, sensors, fuel lines and electrical leads from the engine.
8. Remove the lever from the governor shaft.



**Figure 3**

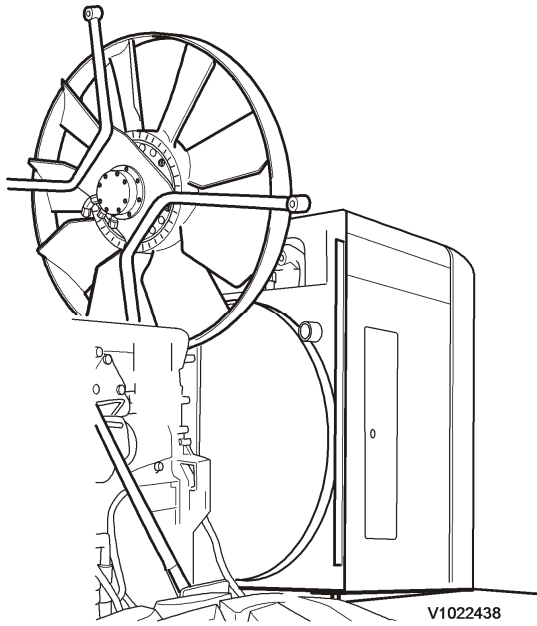
9. Loosen the two rear attaching bolts for the radiator grill and remove the two front bolts and their spacer sleeves. Incline the radiator grill slightly rearwards and position a spacer sleeve under each attaching lug and secure with the bolts.



**Figure 4**

1. Spacer sleeve

10. Remove the hydraulic engine cooling fan. See [263 Fan motor, removing](#).

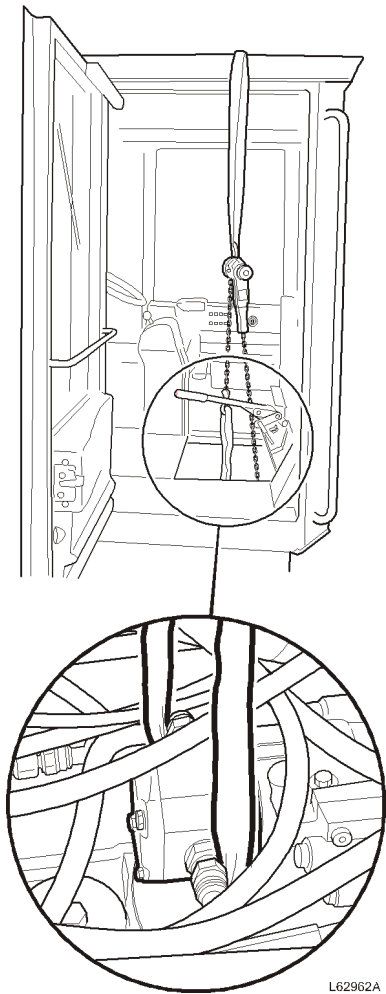


**Figure 5**

**NOTICE**

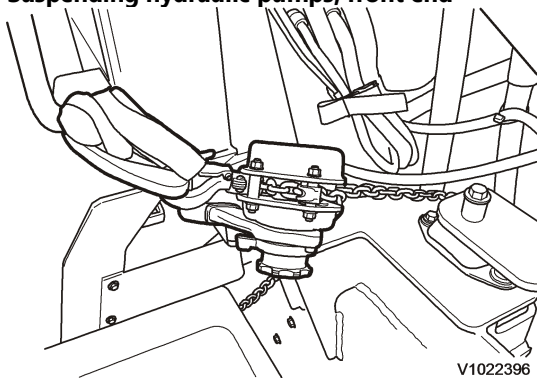
**Refrigerant under pressure. Do not disconnect any hoses or connections on the air conditioning, thereby involuntarily releasing refrigerant.**

11. Remove the AC compressor from the engine together with its bracket and other equipment.
12. Remove the operator seat.  
Weight of seat: **approx. 45 kg (99 lb)**
13. Fold back the floor mat and remove the rear cover plate from the cab floor.
14. With the aid of ratchet blocks and slings suspend the front and rear ends of the hydraulic pumps.



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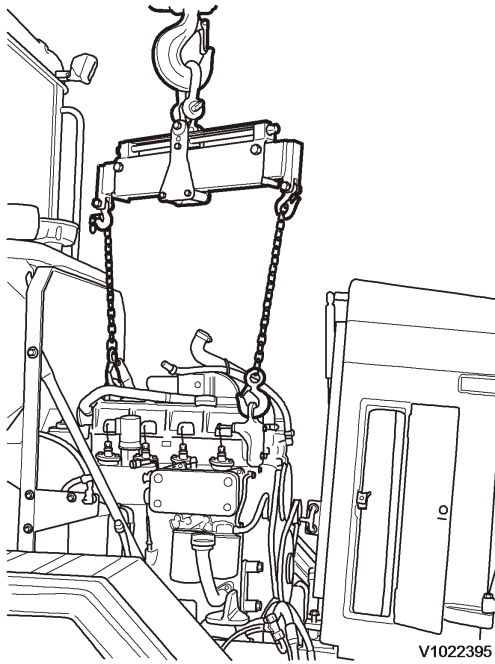
**Figure 6**  
**Suspending hydraulic pumps, front end**



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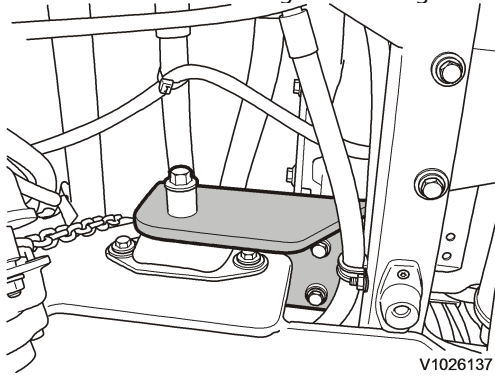
**Figure 7**  
**Suspending hydraulic pumps, rear end**

1. The ratchet block should be attached in the same way on the right side.  
The chain of the ratchet block should be laid under the rear end of the hydraulic pumps.
15. Connect the lifting yoke to the engine. Make use of the existing attaching devices on the engine. Weight of engine: **approx. 450 kg (992 lb)**.



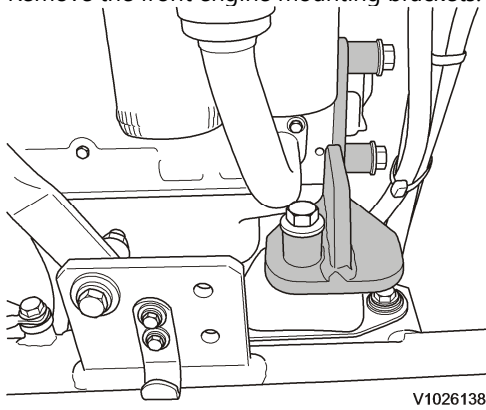
**Figure 8**

16. Remove the bolts retaining the rear engine mounting brackets against the rubber elements.



**Figure 9**

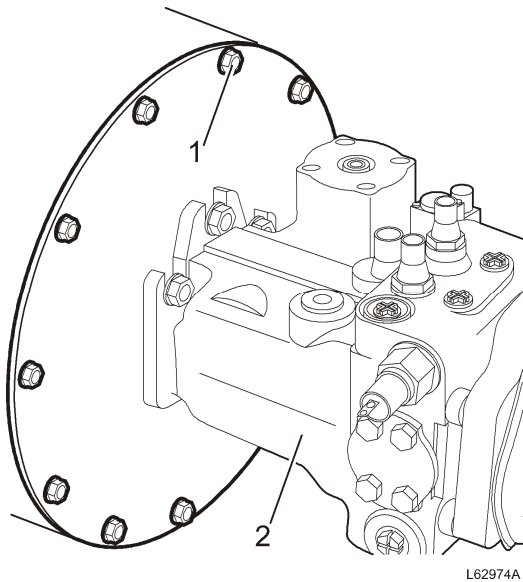
17. Remove the front engine mounting brackets.



**Figure 10**

18. Remove the bolts from the joint between the engine and the hydrostatic pump.





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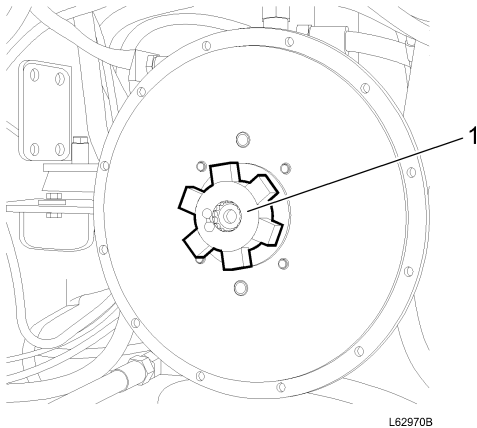
**Figure 11**  
**Bolted joint between diesel engine and hydrostatic pump.**

1. Bolt
2. Hydrostatic pump

19. Pull the engine slightly outwards and lift it out of the machine. Weight of engine: **approx. 450 kg (992 lb)**
20. Move any optional equipment to the engine which is to be installed.
21. With regard to wear, check the connecting parts, i.e. hub and flexible disc between the diesel engine and the hydrostatic motor. Replace parts as necessary

**NOTE!**

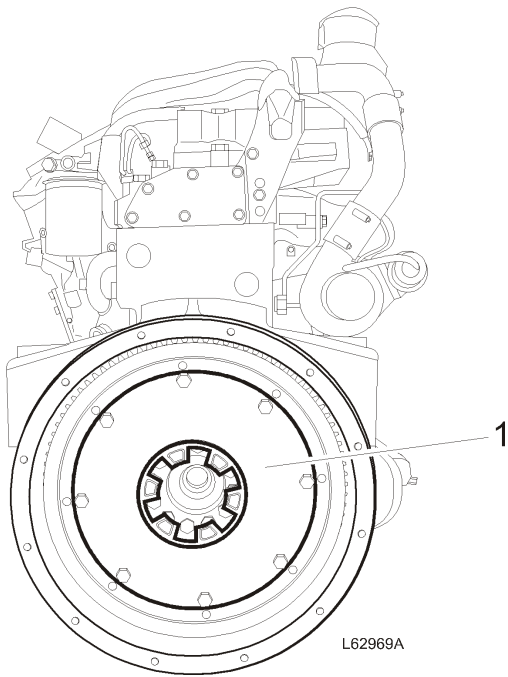
Both flexible disc and hub must be re-installed in a particular way, otherwise their service life will be severely shortened. See [440 Hydrostatic pump, installingdamping element and hub](#).



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**Figure 12**  
**Connecting parts, hydrostatic unit side**

1. Hub



**Figure 13**  
**Connecting parts, diesel engine side**

1. Flexible disc
22. Clean the engine compartment.

Document Title: <b>Engine, installing</b>	Function Group: <b>210</b>	Information Type: <b>Service Information</b>	Date: <b>2014/3/27</b>
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## Engine, installing

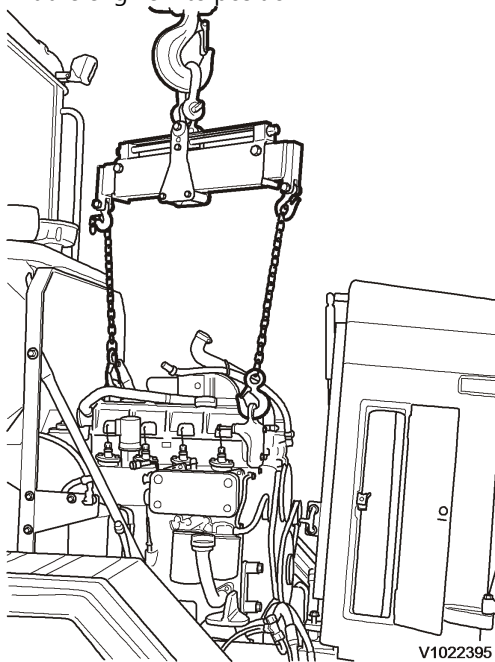
### Op nbr 210-072

ratchet block

shackle

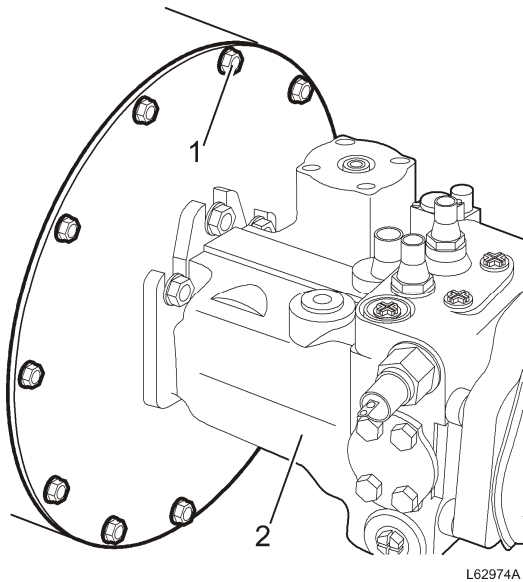
slings

1. Align the flexible disc lugs and hub lugs, so that engine and pump can dock.
2. Lift the engine into position



**Figure 1**

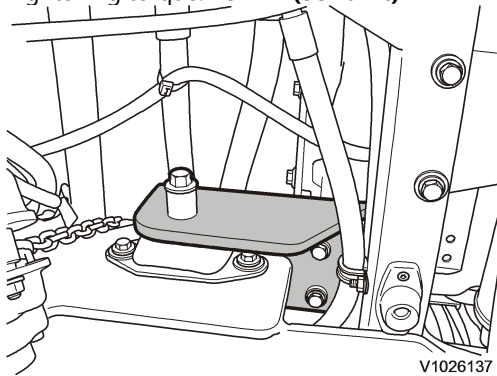
3. Install and tighten down the bolts between the engine and the hydrostatic pump.



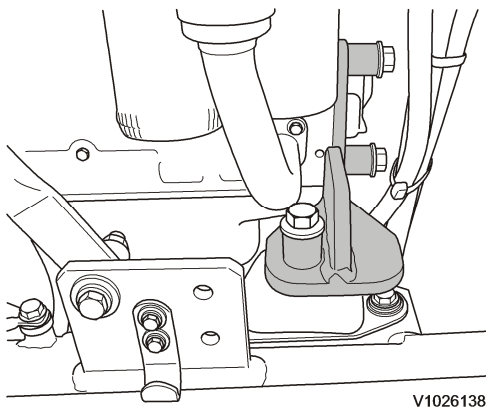
**Figure 2**  
**Bolted joint between diesel engine and hydrostatic pump.**

1. Bolt
2. Hydrostatic pump

4. Remove the suspension of the hydraulic pumps.
5. Install all engine mounting brackets.  
Tightening torque: **78 Nm (58 lbf ft)**



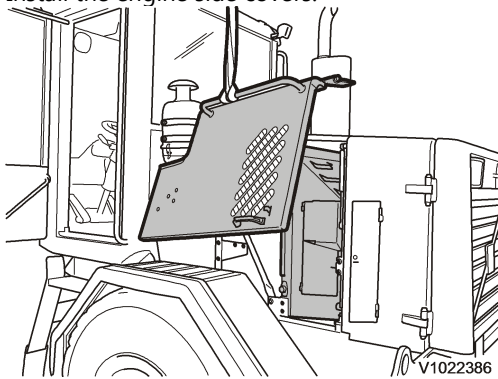
**Figure 3**



**Figure 4**

6. Remove the lifting yoke from the engine.

7. Install the rear cover plate for the cab floor and lay down the floor mat.  
Install the operator seat. Weight of seat: **45 kg (99 lb)**.
8. Install the cooling fan, see [263 Fan motor, installing](#).
9. Re-install the radiator grill and tighten down its attachments.
10. Connect hoses, cables and other items to the engine.
11. Install the oil draining hose.
12. Install the engine hood.
13. Connect the hose to the turbocharger and the silencer.
14. Fill with coolant.
15. Fill with engine oil.
16. Bleed the fuel system.
17. Install the air guide plates between the engine and the fan.  
Install the engine side covers.



**Figure 5**

1. Left side cover
2. Left air guide plate

18. Joint up the connector halves, RR.
19. Reconnect the battery current with the battery disconnect switch.
20. Start the engine and check its functions.
21. Recheck oil and coolant levels.

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