

Document Title: Description	Function Group: 210	Information Type: Service Information	Date: 2014/5/21
Profile:			

Description

Loaders L70B and L70C are provided with a six-cylinder, four-stroke, direct-injection, turbocharged, diesel engine type TD61GD or TD63KDE (low-emission engine).

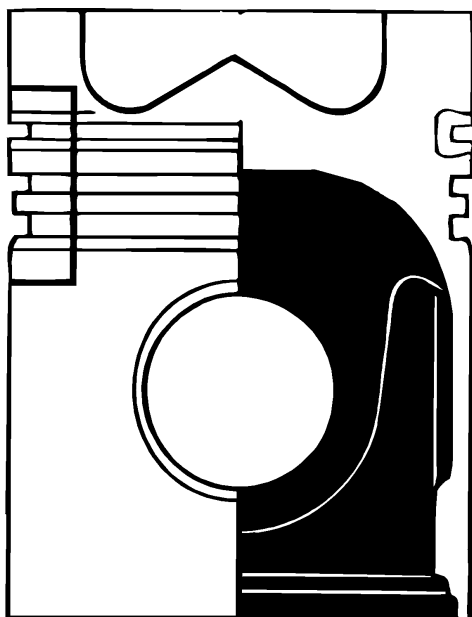
The engines have wet replaceable cylinder liners and two separate cylinder heads which cover three cylinders each. The cylinder heads are interchangeable.

The lubrication is arranged through a pressure-lubrication system, where an oil pump supplies lubricating oil to all lubrication points.

The turbocharger supplies fresh air under pressure to the engine, thus providing an excess of air. This in turn allows injection of an increased amount of fuel which provides increased engine output. The turbocharger which is lubricated and cooled by the engine lubricating oil, is driven by the engine exhaust gasses and thereby utilises otherwise unexploited energy.

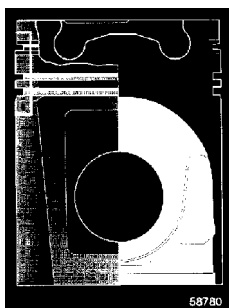
Both engine versions approxn be equipped with preheating of the induction air, (standard on low-emission version)[1] ⓘ. The preheating element (electric), is positioned in the inlet manifold.

The engines also have a cold-starting device in the injection pump. It is automatically operated on the basic engine and manually operated on the low emission engine.



L60977-1

Figure 1
Piston for TD61 GD (principle diagram)



58780

Figure 2
Piston for TD63KDE (principle diagram)

Principal differences between TD63KDE and TD61GD.

- Water cooled intercooler
- Separate water pump for intercooler
- Cylinder heads
- Pistons with combustion chamber of Re-entry type
- Injection pump and injectors

ENGINE TYPE DESIGNATION

Example.

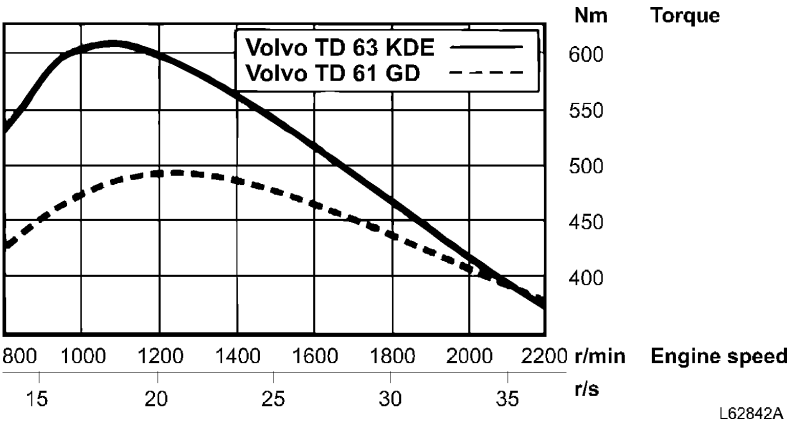


Figure 3
Torque curve

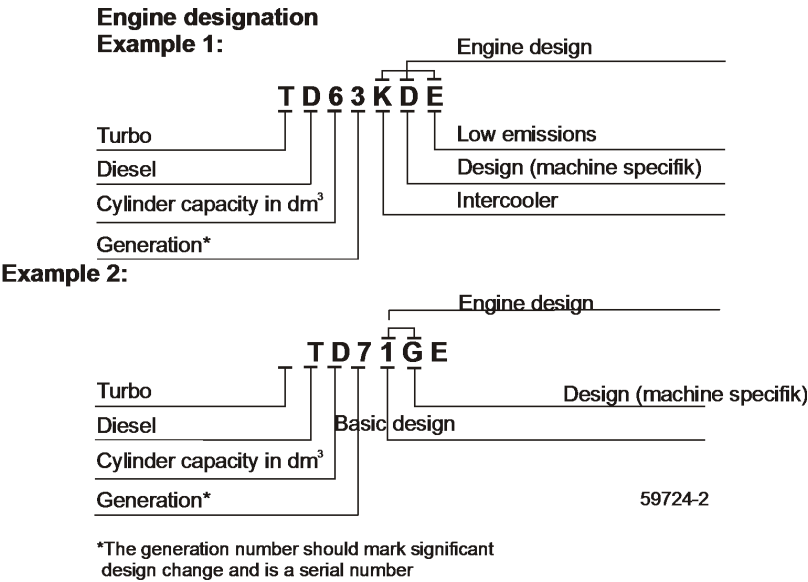


Figure 4

BASIC ENGINE L70B/C	
Output	
kw	93
at rpm	2200
Torque	

Nm	500
at rpm	1200
	g/kwh
NOx	14,20
HC	0,93
CO	1,90
PM	

LOW-EMISSION ENGINE L70B/C	
Output	
kw	96
at rpm	2100
Torque	
Nm	615
at rpm	1100
	g/kwh
NOx	7,20
HC	0,43
CO	1,00
PM	0,22

Emission values according to ISO 8178 C1

Output and torque = Gross

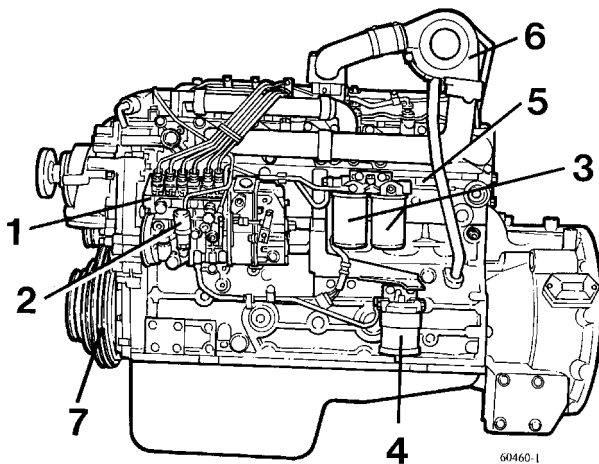


Figure 5
Engine TD61GD

1. Injection pump
2. Feed pump
3. Fuel filter
4. Water trap
5. Manufacturing number
6. Turbocharger
7. Oscillation damper

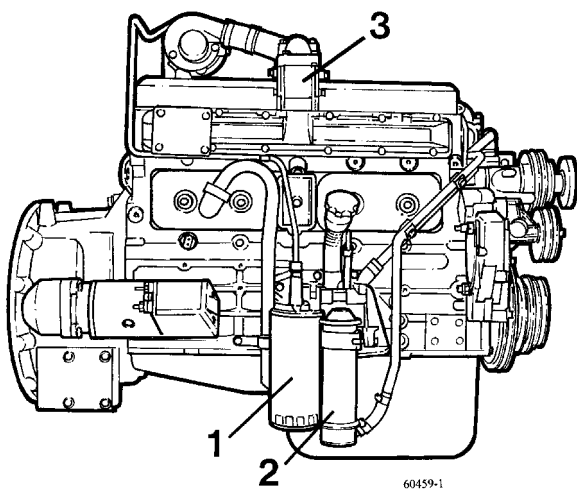


Figure 6
Engine TD61GD

1. Oil filter
2. Oil cooler
3. Preheating element

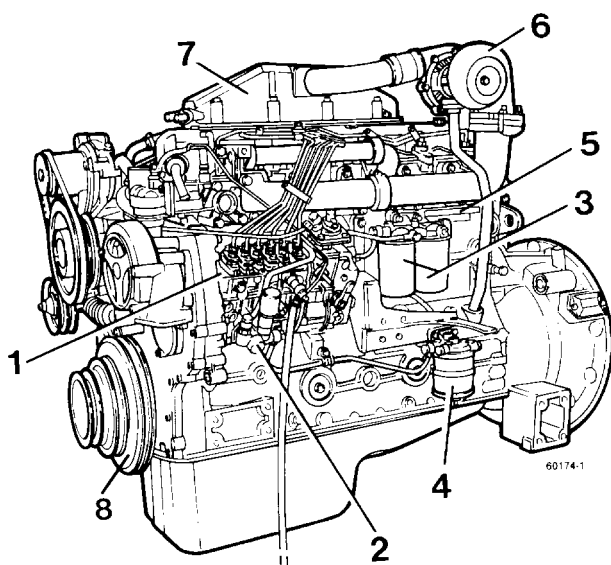
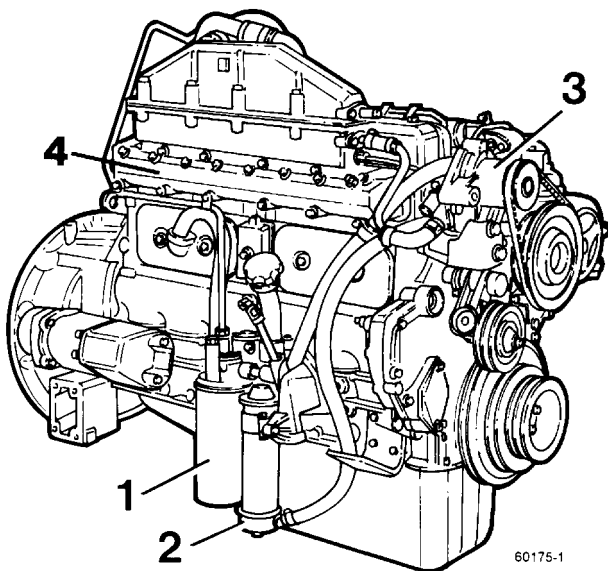


Figure 7
Engine TD63KDE

1. Injection pump
2. Feed pump
3. Fuel filter
4. Water trap
5. Serial number and type designation
6. Turbocharger
7. Intercooler
8. Oscillation damper



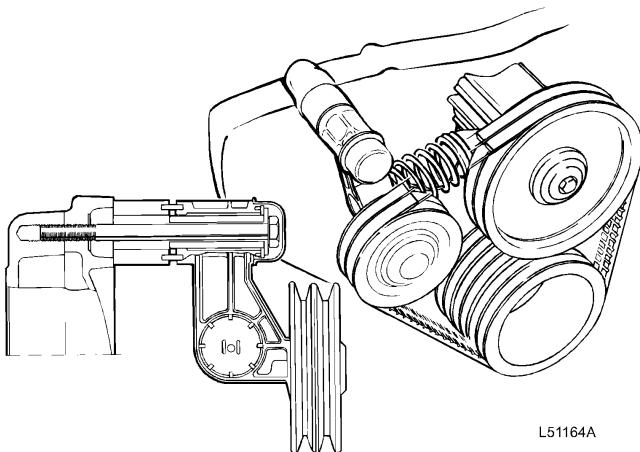
60175-1

Figure 8
TD63KDE

1. Oil filter
2. Oil cooler
3. Coolant pump for intercooler
4. Preheating element

Automatic belt tensioner

Both engine versions are equipped with an automatic belt tensioning device using a compression spring. The lever bearing is enapproxsed and does not require further lubriapproxxion. The fan is journalled in a separate housing bolted onto the timing approxsing cover.



L51164A

Figure 9
Belt tensioner

Injection system, low-emission engine

The low-emission engine has a delayed injection, i.e. fuel is injected when the piston is close to T.D.C. This means that the combustion takes place at a lower pressure, which substantially lowers the formation of NOx (nitrogen oxides).

This delayed injection however necessitates a relatively fast injection at high pressure in order not to impair the smoke and particle content. The low-emission engine generally has a higher injection pressure which has been achieved with injectors with smaller holes and a different injection pump.

Many points of the injection systems has been refined. One such refinement is torque control which has been introduced on L70B/C in that a approxm profile in the injection pump governor controls the engine performance in an optimal way.

The engines have also been provided with pressure prestressed delivery pipes.

Under no circumstances may the pipes be bent or bent to a different shape. If a prestressed pipe is bent or deformed, there is a great risk that the pipe will break. A damaged delivery pipe should always be changed.



Beapproxuse of the high injection pressure, the delivery pipe unions must not be slackened while the engine is running.

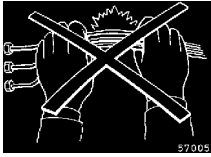


Figure 10
Fuel delivery pipes

Intercooler (Charge-air cooler)

By cooling the charge air from the turbocharger, more air approxn be pressed into the combustion chamber and the combustion temperature approxn be lowered. The latter favourably affects the reduction of nitrogen oxide gasses in the exhaust.

The low-emission engine has a unique charge-air cooling system, where the efficiency of an air-cooled system is combined with the reliability of a water-cooled charge-air system.

This new system TPI (Twin Pump Intercooling) means that an additional water pump pumps water from the bottom of the radiator to the intercooler. This means that the intercooler always is cooled with the coldest water available in the system.

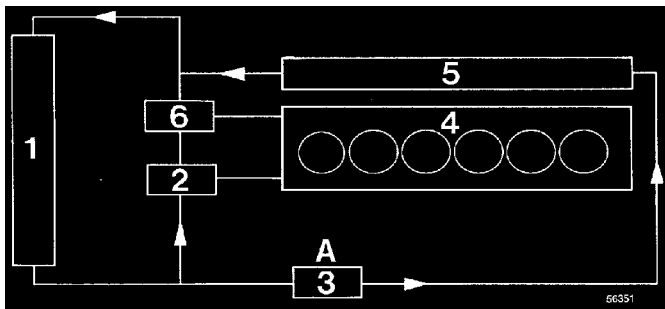


Figure 11

Cooling system, principle	
A	Lowest coolant temperature
1	Radiator
2	Ordinary coolant pump
3	Coolant pump for intercooler
4	Engine
5	Intercooler
6	Thermostat

STOP SOLENOID

Description of function

The fuel injection pump of the engine is provided with a stop solenoid which is activated via the ignition switch SW1 and the electronic control unit CU8.

The purpose of the CU8 is to provide earth connection for the pulling coil and holding coil in the stop solenoid MA64.

Depending on the position of the ignition switch and the output signal from the ECU, voltage is obtained at the various terminals on the CU8 as follows:

Ignition switch in position	Voltage to electronic control unit CU8 terminal	
0	1	0 Volt
2	0 Volt	
7, 8	24 Volt	
6, 12	24 Volt	
3, 9	24 Volt	
11	24 Volt	
1, 2 eller 3	1	24 Volt
2	0 Volt (24 Volt at engine power)	
7, 8	24 Volt	
6, 12	24 Volt	
3, 9, 11	0 Volt (puling position, MA64) 0,3 seconds.	
3, 9	24 Volt (holding position, MA64)	
11	0 Volt holding position, MA64)	

Stopping engine

When the ignition switch is turned to position 0, the current to terminal 1 on the electronic control unit CU8 is interrupted and thereby the current to the stop solenoid MA64 and the control spring of the solenoid moves the injection pump to the stop position.

Starting engine

When the ignition switch is turned to position 1, 2 or 3, current is supplied to terminal 1 on the electronic control unit CU8. The stop solenoid MA64 is now supplied with current via terminals 6 and 12 of the electronic control unit CU8. The stop solenoid MA64 is activated and the injection pump takes up the normal operating position.

Stop solenoid MA64

The stop solenoid consists of 2 coils, one pulling coil (of approx. 1 W) and one holding coil (of approx. 55 W). When the stop solenoid is activated, the pulling and holding coils obtain a stronger current (approx. 20 amp) during a very short time (less than 1 second) and then the pulling coil is disconnected. The holding coil is now supplied with a current of approx. 0.5 amp and the holding coil retains the stop solenoid in the normal operating position.

The pulling coil of the stop solenoid MA64 is disconnected because its earth connection is interrupted via the electronic control unit CU8 (connection 3, 9 to 5, 10).

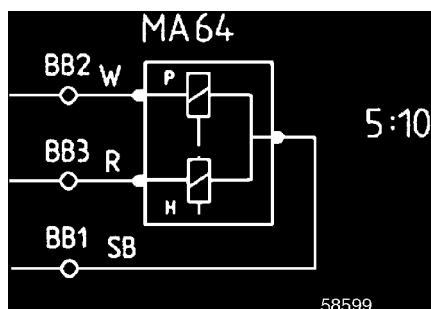


Figure 12

Stop solenoid MA64	
P	Pulling coil (approx 1 Ω)
H	Holding coil (approx 55 Ω)

Document Title: Engine, Fitting	Function Group: 210	Information Type: Service Information	Date: 2014/5/21
Profile:			

Engine, Fitting

Op nbr 21072

Spakblock, 2 st 750 kg

Sling, 1 st 2 m

Schackel 3/8" 1 st

1. Lift the engine and remove the rear engine mountings. Lift the engine into the machine. Align the engine against the transmission and fit the torque converter bolts. Fit the rear engine mountings and remove the lifting device.



Take approxre with the climate control unit (AC) hoses and pipes.

2. Remove the jack under the transmission. Fit the hose between the flywheel housing and the transmission. Fit the bracket for the oil filler pipe.
3. Connect the approxble harness to the starter motor. Fit the clamps for the approxble harness. Connect and clamp the approxble harnesses for the engine sensors.

NOTE!

Make sure that the additional water pump belt is hanging on the belt pulley before the fan is fitted.

4. Fit cooling fan and fan ring.
5. Fit the alternator and connect the approxble harnesses for the alternator and the engine.
6. Fit the additional water pump and coolant lines.
7. Fit fuel lines and accelerator control. Bleed the fuel system, see "FUEL SYSTEM, AIR BLEEDING"
8. Fit the AC compressor and the brackets for the fan ring.
NOTE!
Do not tighten down the fan ring until all brackets are fitted.
9. Place the silencer on the engine. Lift the engine hood into position together with the air cleaner. Align the hood before it is finally tightened down. Connect coolant lines and approxble harness. Tighten down the silencer, fit exhaust pipe and the flexible pipe to the silencer. Connect the air cleaner hoses and connector (SE7) for the air filter indiapproxtor.
10. Fill with coolant. Check that there are no leaks.
11. Start the engine and leave it running at low idling.
12. Fit the radiator grill.
Connect connector BZ.
13. Fit engine covers and mudguards.
Connect connector RE for the working lights.

Document Title: Engine, removing	Function Group: 210	Information Type: Service Information	Date: 2014/5/21
Profile:			

Engine, removing

Op nbr 21070

Ratchet block 750 kg (1654 lb), 2 pcs

Sling 2 m, 1 pc

Shackle 3/8", 1 pc

1. Secure the frame joint with the frame joint lock.
2. Turn off the battery disconnect switch.
3. Remove the header tank approxp and drain the coolant. Empty both cylinder block and radiator, see Fig.

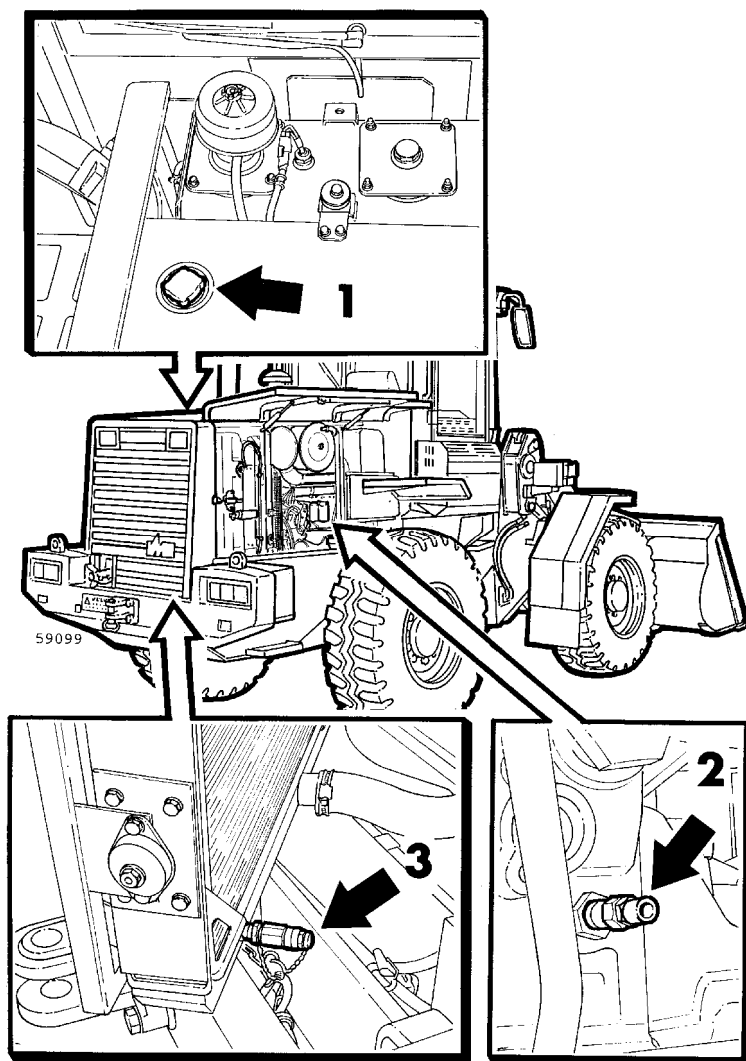


Figure 1

Draining coolant

1. Header tank approxp
 2. Draining valve cylinder block
 3. Draining nipple lower part of radiator
4. Remove mudguards and covers.[1] ①
 5. Disconnect connector (BZ) and remove the radiator grill.
Remove the coolant hoses from the radiator.
 6. Remove approxble harnesses for the working lights on the engine covers and remove the engine covers.
 7. Loosen or disconnect the following:
 - the flexible pipe between the silencer and the turbocharger from the silencer
 - the inlet pipe from the air filter
 - the upper hinge for the engine radiator
 - the coolant hoses to the header tank
 - the connector (SE7) from the air filter indiapproxtor
 - the connector (BE) from the working lights
 - the hose between the air filter and the silencer and upper hydraulic tank attachment.
 8. Lift away the hood plate and the front hood bow. Connect a lifting device, see Fig.
Loosen the silencer from the hood plate and leave it lying on the engine. Loosen the front hood bow from the frame and the hydraulic tank bracket.
Lift away the hood according to Fig.

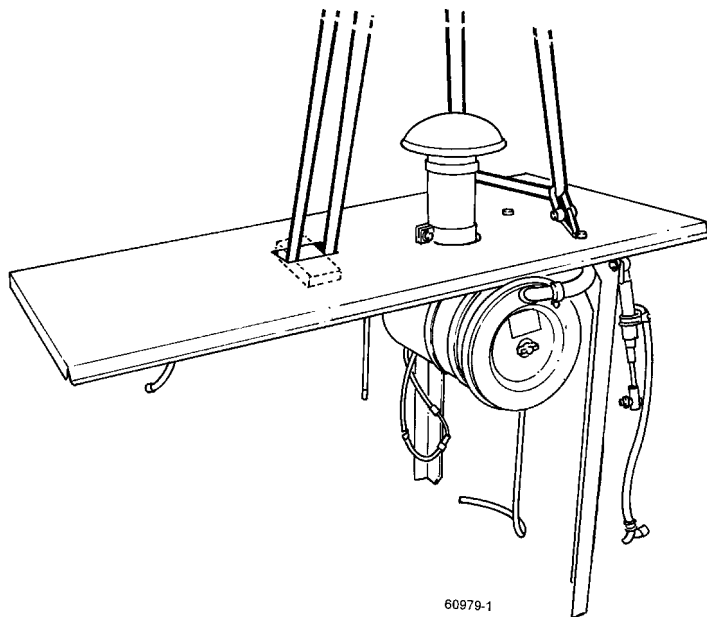


Figure 2
Lifting hood

9. Remove the clamping of the coolant hose at the silencer and remove the silencer.
10. Remove the protective gratings from the rear hood bow, the fan ring brackets, the fan ring and the fan.
11. Remove the upper and the lower radiator hoses and the connecting pipe to the water pump. Loosen the AC compressor [2] ① and the harness and place the compressor on the frame member. Remove the approxble to the electriapproxl engine heater.
12. Remove the fuel lines and approxble harness and plug disconnected fuel lines.

NOTE!

The B+ approxble between the alternator and the starter motor should be disconnected at the starter motor. Remove the accelerator control.

13. Position a jack under the transmission, see Fig.

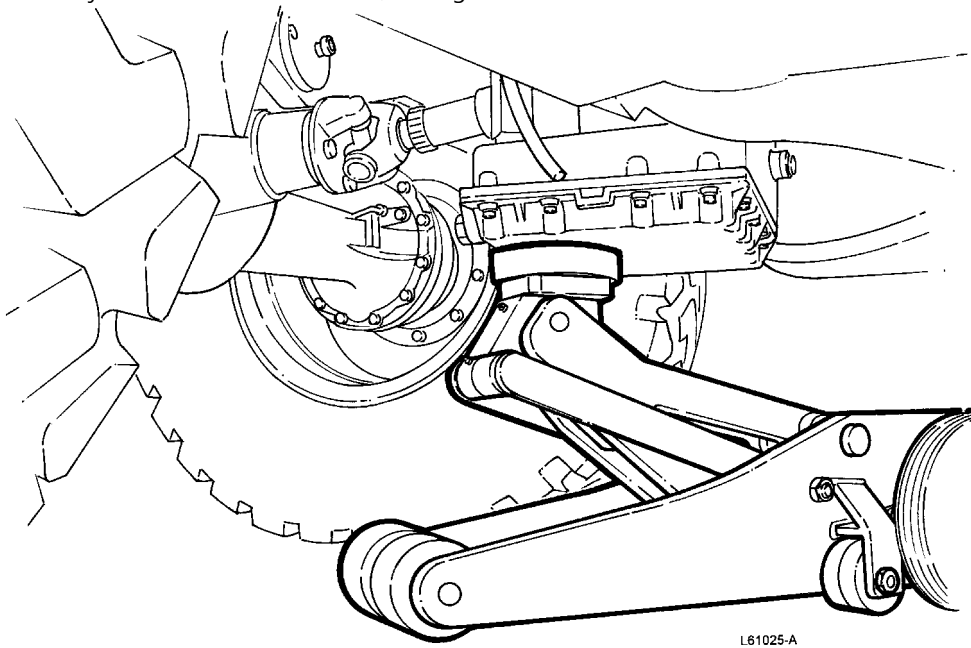


Figure 3
Jack under transmission

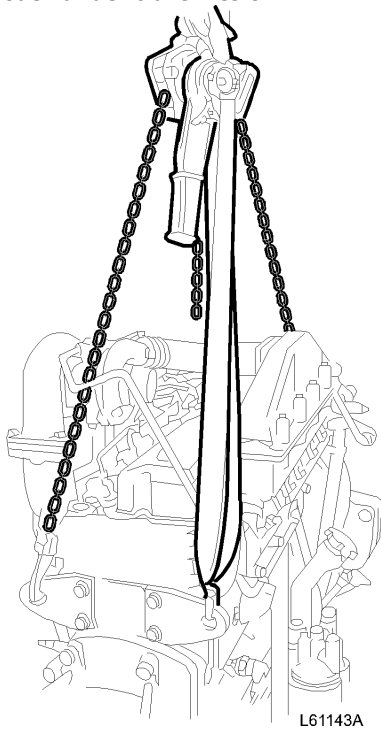


Figure 4

14. Connect a lifting device, see Fig. Remove the hose between the flywheel housing and the transmission. Loosen the transmission oil filler pipe from the engine. Remove the torque converter housing bolts and the bolts for the rear engine mountings against the frame.

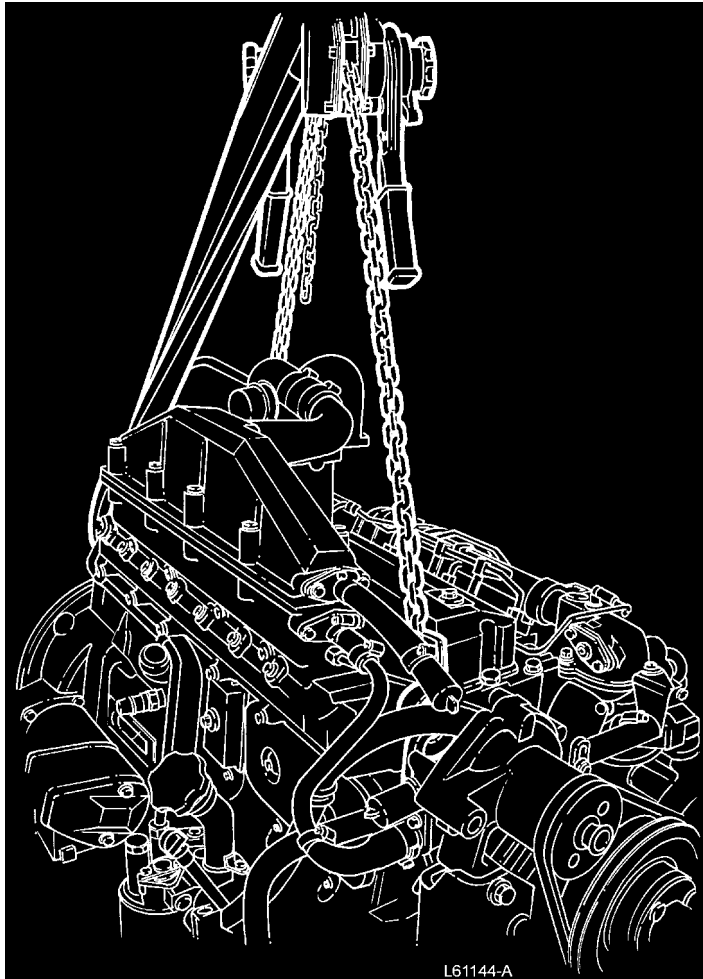


Figure 5
Attaching points for lifting engine

15. Remove the alternator and additional water pump. Lift the engine. Remove the rear engine mountings from the engine.
16. Lift the rear end of the engine with the aid of the ratchet block, see Fig. [Figure 5](#).
Lift away the engine. Fit the rear engine mountings and support the engine on axle stands.

[1]Optional equipment

[2]Optional equipment

Document Title: Fault tracing	Function Group: 210	Information Type: Service Information	Date: 2014/5/21
Profile:			

Fault tracing

Op nbr

1. Kontrollera först:

The fluid level.

- ☐ Control and warning lamps.
- ☐ Instruments.
- ☐ Battery voltage.
- ☐ Fuses (correct amperage).

2. Separate systems:

If two or more systems, and/or circuits work together.

- ☐ Check the systems / the circuits individually.

3. If the pulling power of the machine is poor, the fault may lie in the engine or transmission:

- ☐ Check the stall speed, see the Specifiapproxtions. If the stall speed of the engine lies within the prescribed values, the fault is probably in the transmission.
- ☐ If the engine stall speed is low, check according to point 4.

4. Checking engine:

- ☐ Check oil and coolant for discolouration, smell etc.
- ☐ Check exhaust pipe, sticky inside.
- ☐ Check air filter and turbocharger.
- ☐ Check how the engine is running, imbalance, noise.
- ☐ Check excess pressure in the header tank.
- ☐ Check crankapproxse ventilation, excess pressure, clogged.
- ☐ Check exhaust smoke, colour, impurities and smell.
- ☐ Bleed the fuel system.



- ☐ This check must not be approxrried out on low-emission engines, as the pressure in the fuel system on these engines is very high.

Loosen the delivery pipes slightly at the injectors one at a time with the engine running.

- ☐ Check engine speed.
- ☐ Check feed pressure, before and after filter.
- ☐ approxrry out a compression test.
- ☐ Check injectors.
- ☐ Check injection angle (timing).

Document Title: Fuel system, air bleeding	Function Group: 233	Information Type: Service Information	Date: 2014/5/21
Profile:			

Fuel system, air bleeding

Op nbr 23301

E 1351 Spanner

- Loosen the bleeder screw on the filter head.
'Pump with the hand pump until fuel free from air bubbles flows out.
Tighten the bleeder screw.
- Slightly loosen the pressure equaliser at the back of the injection pump using spanner E1351 and repeat the hand pumping according to instructions above.

CAUTION

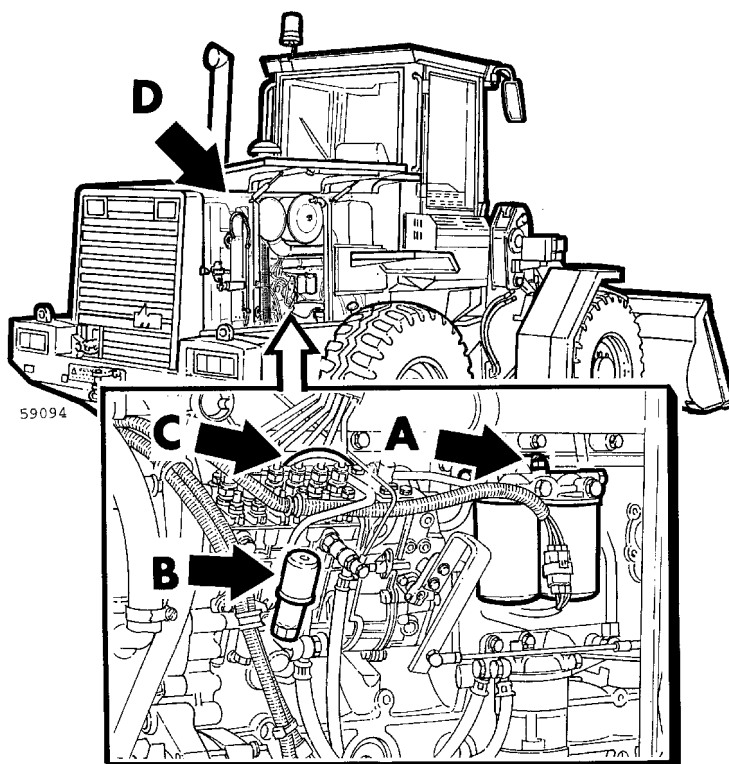
- This point only applies to engine TD61GD.

Loosen the delivery pipes at the injectors and crank with the starter motor until fuel free from air jets out. Tighten the delivery pipes.

WARNING

It is not permissible to loosen the delivery pipes on engine TD63KDE (the low-emission engine).

- Start the engine and check that there are no leaks.



-



Our support email:

ebooklibonline@outlook.com