VOLVO
Construction Equipment

Service Information

Document Title: **Checking function, engine**	Function Group: **210**	Information Type: **Service Information**	Date: **2014/5/29**
Profile:			

Checking function, engine

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Testing for possible causes

1. **First check:**
   - Fluid levels
   - Control/warning lamps
   - Instruments
   - Battery voltage
   - Fuses (correct rating)

2. **Separate systems:**
   - If two or more systems, and/or circuits work together.
     Check the systems/circuits individually.

3. **If the pulling power of the machine is poor, the fault may be in the engine or the transmission:**
   - Then check the stalling speed, see specifications.
   - If the engine stalling speed is within the prescribed values, the fault can be found in the transmission.
   - If the engine stalling speed is low, check according to point below.

4. **Checking engine:**
   - Check oil and coolant, discoloration, smell etc.
   - Check exhaust pipe (sticky inside
   - Check air filter and turbo.
   - If the engine runs unevenly (imbalance-noise).
   - Check for overpressure in header tank.
   - Crankcase breather (overpressure-clogged).
   - Oil dipstick, remove (overpressure).
   - Exhaust smoke (colour-impurities, smell).
   - Bleed the fuel system.
   - Slightly loosen the delivery pipes[1] ⓘ from the injectors (one at a time with the engine running).
   - Check speed.
   - Check feed pressure (before and after filter).
   - Make a compression test (repeat with oil if incorrect).
   - Check injectors.
   - Check injection timing.

[1]This check must not be carried out on low-emission engines, as the fuel injection pressure in these engines is very high.

Document Title: **Description**	Function Group: **210**	Information Type: **Service Information**	Date: **2014/5/29**
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Description

Loader l150 is provided with a td102 type engine and loader l180 with a td122 type engine.

In both cases the engines are straight, six-cylinder, turbocharged, four-stroke direct-injection diesel engines.

Both engine types are available in a low-emission version.

The output and torque curves for the respective engines are shown in Figure 1 and Figure 2.

Figure 3 and Figure 4 show the torque curve for the low-emission engine in relation to a standard engine.

The engine type designation, part and serial numbers are stamped on the left side of the cylinder block. For repair work on the engine, please refer to the separate service manual, see the foreword.

Volvo bm l150

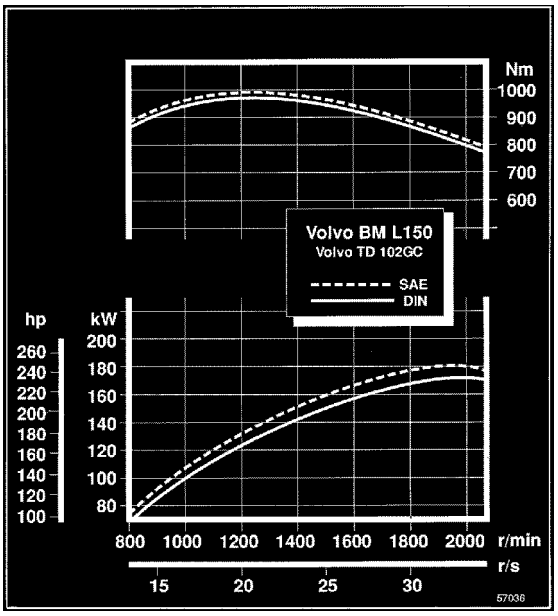

Figure 1
Output and torque curves, td102

Volvo bm l180

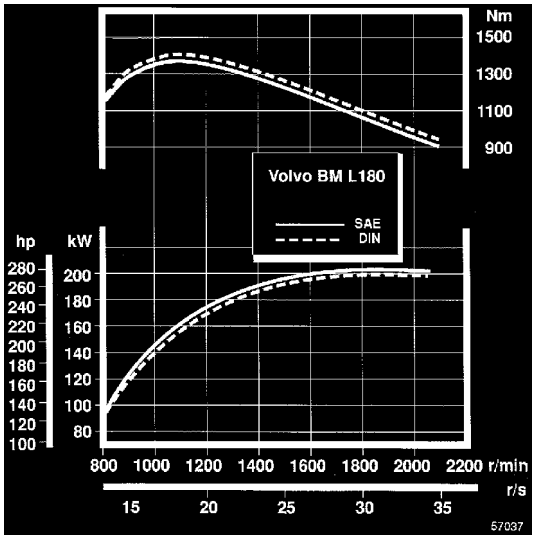

Figure 2
Output and torque curves, td122

Additional or new parts for low-emission engine

	L150	**L180**
Engine designation	TD102KCE	TD122KHE
Pistons	New	New
Camshaft	= Std.	Std.
Cylinder head	Std.	Std.
Turbo	Std.	Std.
Intercooler	T	T
Additional coolant pump	T Built-in	T Built-in
Injection pump	New	New
camshaft	New	NEW
pump element	New	New
cold-starting groove [1] ⓘ	No	No
idling change-over	–	–
delivery valve	New	New
torque control	–	New
Delivery pipes	Std.	New
Injectors	Std.	New
Injection timing	New	New

Explanations:

Std. Component which is included in the standard engine
New New component as compared with the standard engine
T Additional component as compared with the standard engine

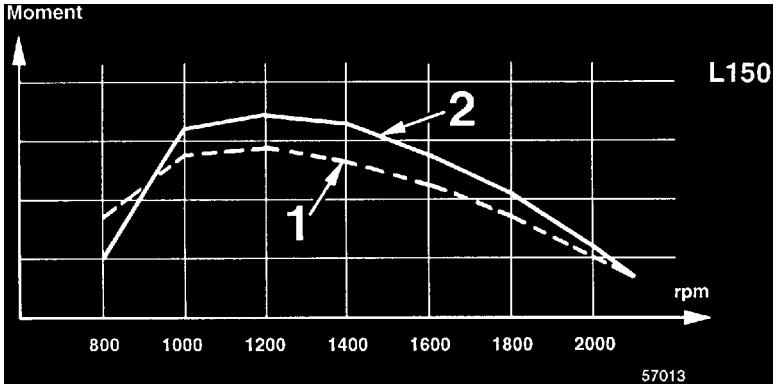

Figure 3

1	Torque curve standard engine L150
2	Torque curve, low-emission engine

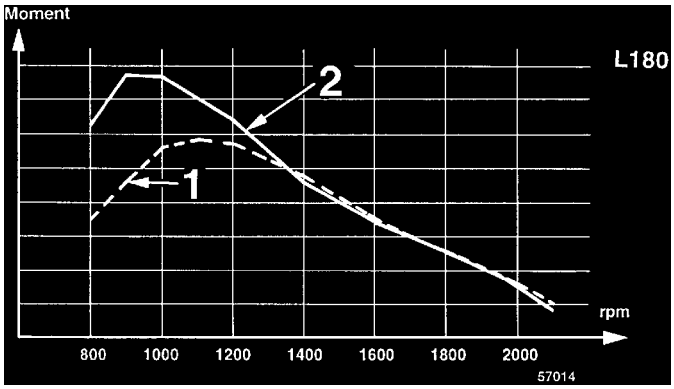

Figure 4

1	Torque curve, standard engine L180
2	Torque curve, low-emission engine

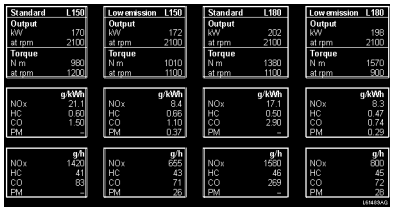

Figure 5
Emission values according to ece r49

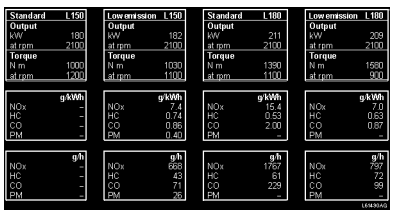

Figure 6
Emission values according to california 8-mode and iso 8178

[1]Omitted as it is not required on the low-emission engine

Document Title: **Specifications L180**	Function Group: **210**	Information Type: **Service Information**	Date: **2014/5/29**
Profile:			

Specifications L180

Unless otherwise stated, the following data apply to all three versions of the engine i.e. The basic, the low-emission and the high-altitude versions.

General

Type designation

basic and high-altitude versions	TD122GH Engine no. 499185
low-emission version	TD122KHE Engine no. 499167

Flywheel output at 35.0 r/s (2100 rpm)

basic and high-altitude versions	202 kW (275 hp) SAE J 1349 Net 202 kW (275 hp) DIN 70020 Net
low-emission version	198 kW (269 hp) SAE J 1349 Net 198 kW (269 hp) DIN 70020 Net

Output gross at 35.0 r/s (2100 rpm)

basic and high-altitude versions	211 kW (287 hp) SAE J 1349 Gross
low-emission version	209 kW (284 hp) SAE J 1349 Gross

Torque

basic and high-altitude versions	1380 N m (959 lbf ft) SAE J 1349 Net
at 18.3 r/s (1100 rpm)	1380 N m (1018 lbf ft) DIN 70020 Net 1390 N m (1025 lbf ft) SAE J 1349 Gross
low-emission version	1570 N m (1158 lbf ft) SAE J 1349 Net
at 15 r/s (900 rpm)	1580 N m (1165 lbf ft) SAE J 1349 Gross 1570 N m (1158 lbf ft) DIN 70020 Net

Number of cylinders	6
Cylinder bore	130.17 mm (5.125 in)
Stroke	150 mm (5.906 in)
Cylinder capacity, total	12.0 litre
Compression ratio, basic and high-altitude versions	15 : 1
low-emission version	16 : 1
Compression pressure at starter motor revolutions	2.6 MPa (26 bar) (377 psi)
Order of injection	1 – 5 – 3 – 6 – 2 – 4

Idling speed, low	10.8 ±0.5 r/s (650 ±50 rpm) (823 ±63 Hz)
high	37.9± 1.0 r/s (2275 ±60 rpm) (2880 ±75 Hz)
Valve clearance, cool engine, inlet valve	0.40 mm (0.016 in)
exhaust valve	0.70 mm (0.028 in)
Stalling speed, basic and high-altitude versions	34.2 ±1.25 r/s (2050 ±75 rpm) (2595 ±95 Hz)

torque converter	
torque conv. + lifting against overflow	25.0 ±1.70 r/s (1500±100 rpm) (1899±127 Hz)
torque conv. + tilting against overflow	26.7±1.70 r/s (1600±100 rpm) (2025±127 Hz)

Stalling speed, low-emission version torque converter	34.2±1.25 r/s (2050±75 rpm) (2595±95 Hz)
torque conv. + lifting against overflow	25.0±1.70 r/s(1500±100 rpm) (1899±127 Hz)
torque conv. + tilting against overflow	26.7±1.70 r/s (1600±100 rpm) (1899±127 Hz)

Document Title:	Function Group:	Information Type:	Date:
Starting engine	**210**	**Service Information**	**2014/5/29**
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Starting engine

Description of function

With the ignition switch sw1 in position 3 the coil in relay re14 receives current via the ignition switch terminal 50.
Relay re14 is activated and starter motor terminal 50 receives current via fuse fu15, relay re14 (30-87) and relay re13 (87a) and the starter motor is activated.

Relay re13, starter lock-out

When the selector control sw2a or any of switches sw43 or sw108 are moved to positions forward or reverse, the coil in relay re11 receives current, see description in section 4.
Relay re11 is activated and the coil in relay re13 receives current.
Relay re13 is activated and the current to the starter motor is interrupted, which prevents the starting of the engine with forward or reverse gear engaged.

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