VOLVO
Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Engine, description	**200**	**Service Information**	**2015/3/3 0**
Profile: **EXC, EC140B LC [GB]**			

Engine, description

The engine is a 4-cylinder, 4-stroke, direct injected, turbocharged, aftercooled with a cast iron block and cylinder head.
Gears in the engine gear case are hardened helical type for strength and reduced noise, arranged to provide quiet, smooth transmission of power.
The cylinder block and head are designed with internal passages forming galleries for both lubricating oil and coolant.
The fan belt is a poly type V-belt for improved performance and an auto tension adjuster maintains belt tension.

Starter side view (step 1)

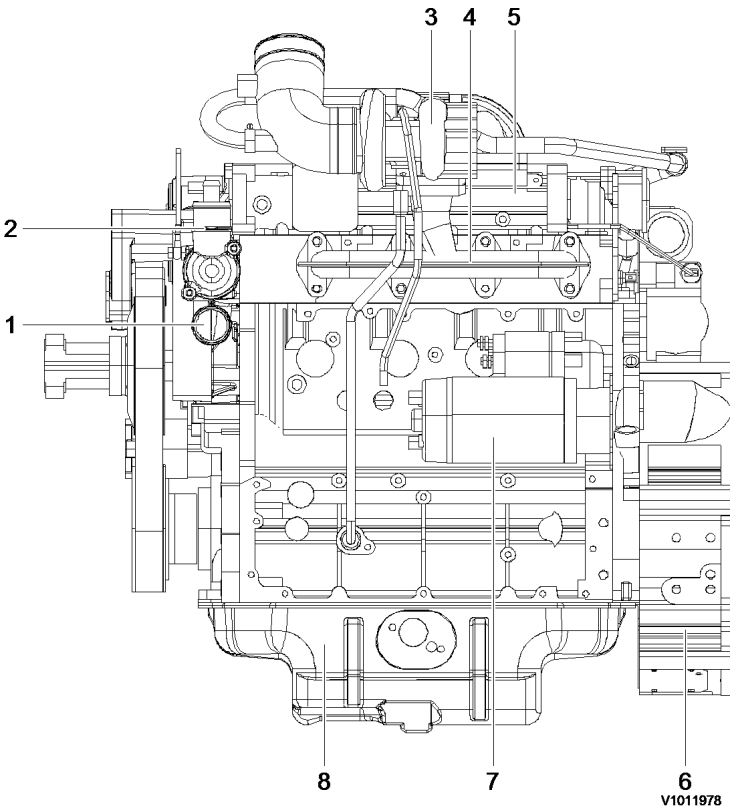

Figure 1
Engine, starter side view (step 1)

1. Coolant inlet
2. Coolant outlet
3. Exhaust turbocharger
4. Exhaust manifold
5. Air intake manifold
6. Flywheel housing
7. Starter
8. Oil pan

Starter side view (step 2)

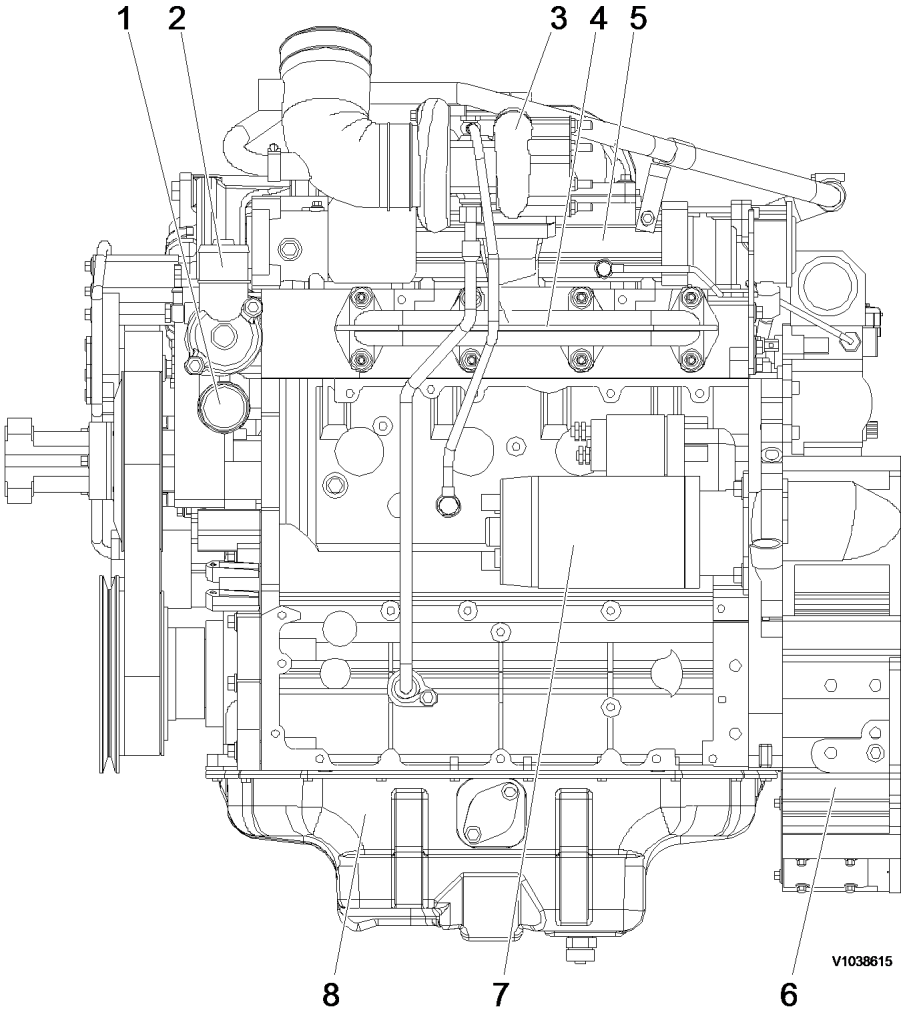

Figure 2
Engine, starter side view (step 2)

1. Coolant inlet
2. Coolant outlet
3. Exhaust turbocharger
4. Exhaust manifold
5. Air intake manifold
6. Flywheel housing
7. Starter
8. Oil pan

Alternator side view (step 1)

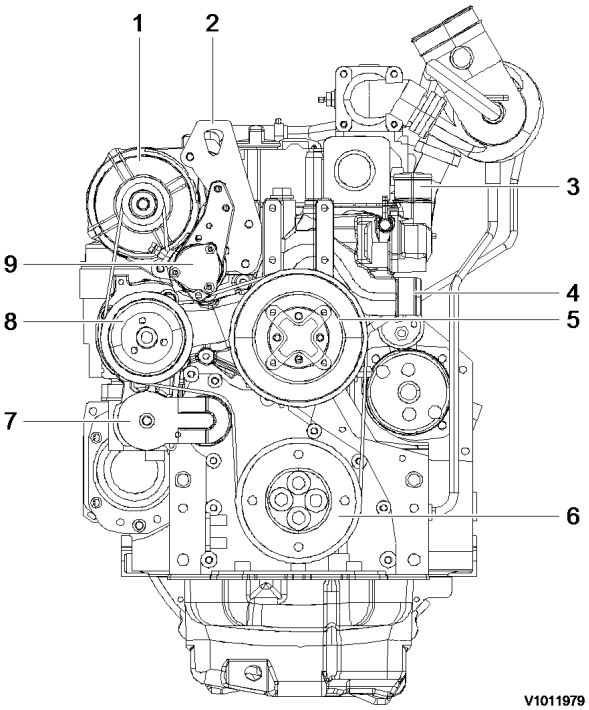

Figure 3
Engine, Alternator side view (step 1)

1. Alternator
2. Engine lifting bracket
3. Coolant outlet
4. Coolant inlet
5. Fan pulley
6. Poly - V-pulley with vibration damper
7. Poly - V-belt tension pulley
8. Coolant pump
9. Fuel pump

Alternator side view (step 2)

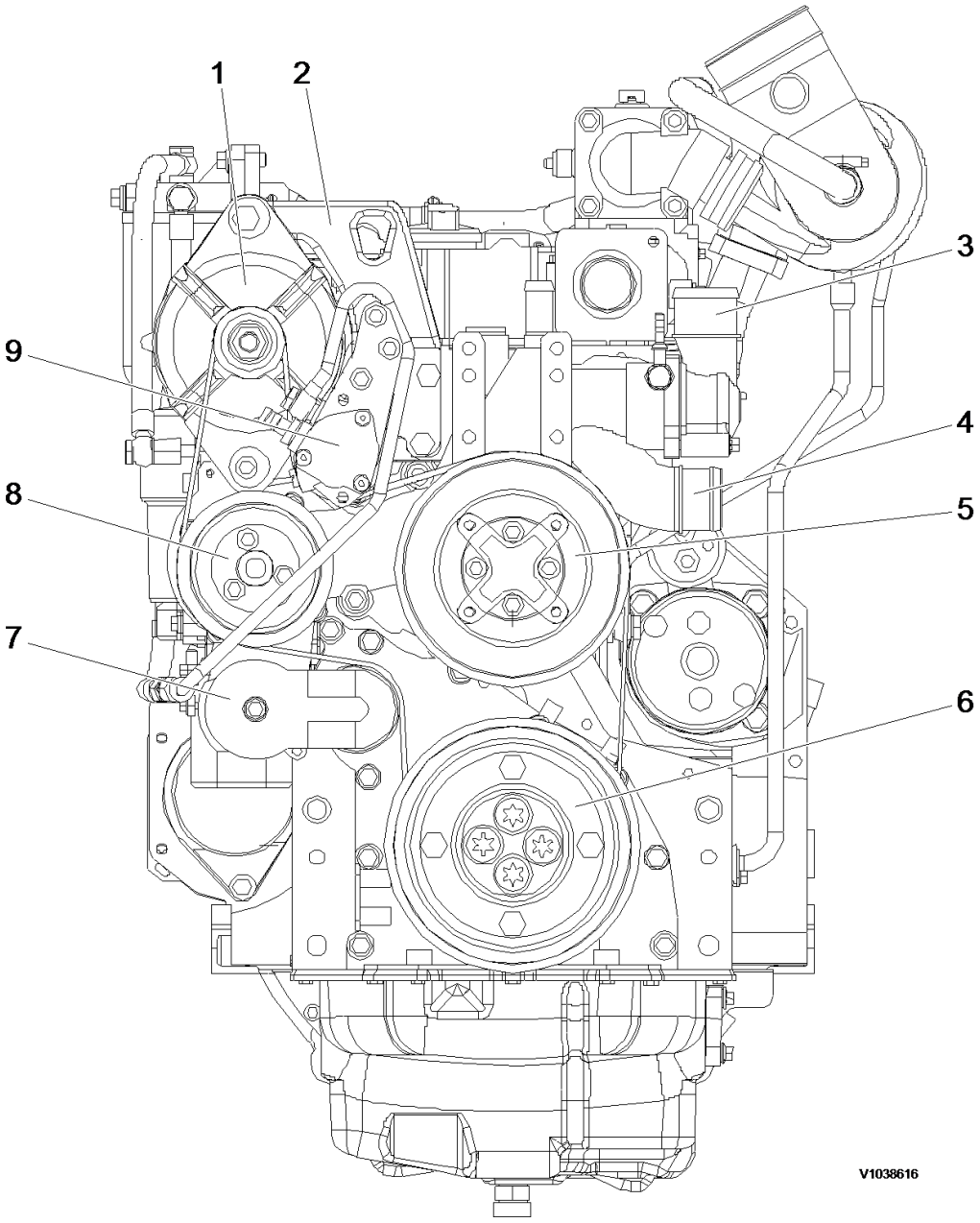

Figure 4
Engine, Alternator side view (step 2)

1. Alternator
2. Engine lifting bracket
3. Coolant outlet
4. Coolant inlet
5. Fan pulley
6. Poly - V-pulley with vibration damper
7. Poly - V-belt tension pulley
8. Coolant pump
9. Fuel pump

Top view (step 1)

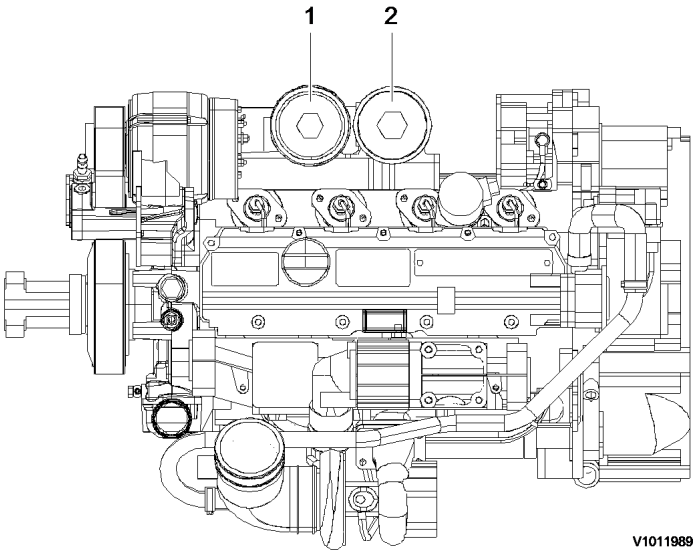

Figure 5
Engine, top view (step 1)

1. Engine oil filter
2. Fuel filter

Top view (step 2)

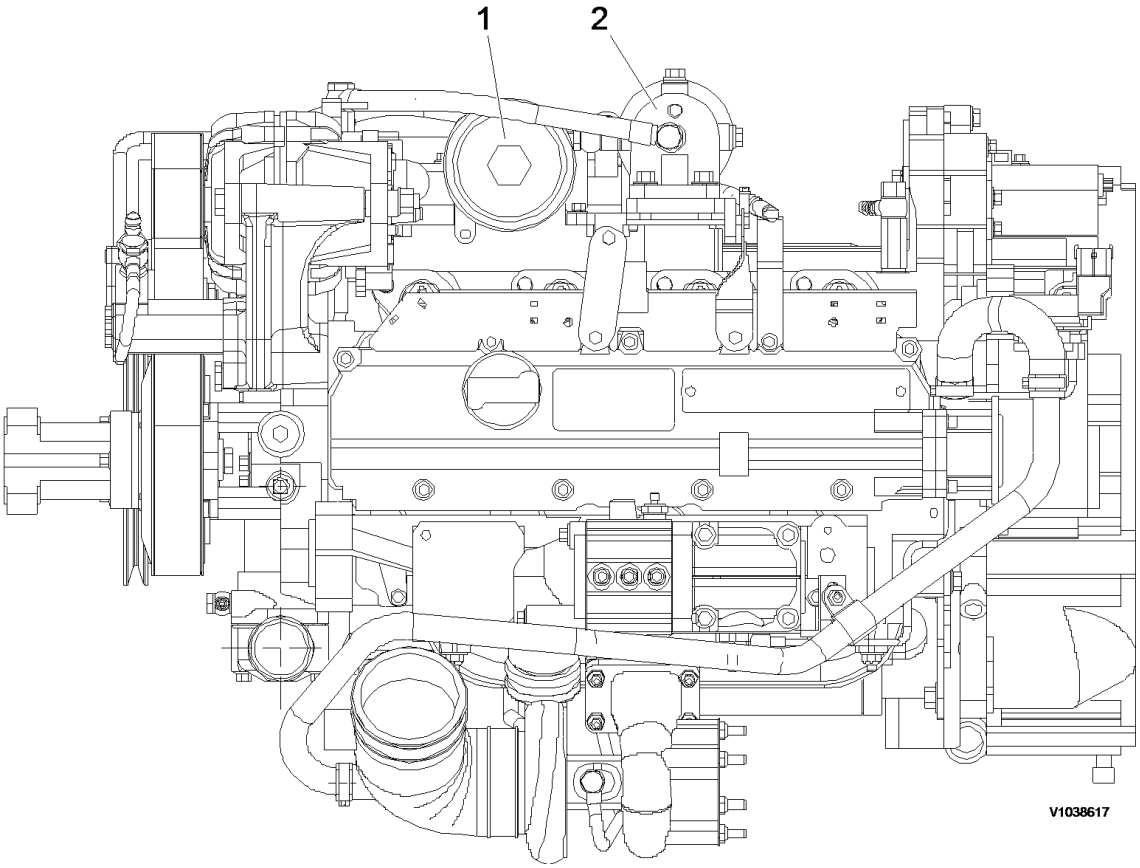

Figure 6
Engine, top view (step 2)

1. Engine oil filter
2. Fuel filter

Fuel filter side view (step 1)

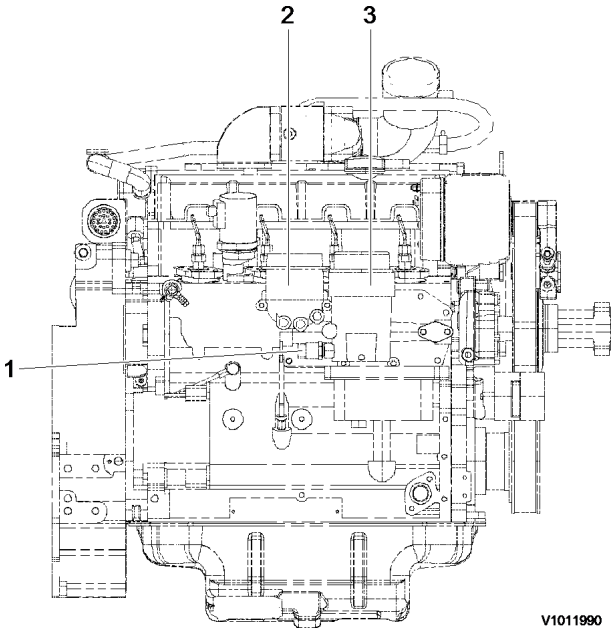

Figure 7
Engine, fuel filter side view (step 1)

1. Lube oil pressure port (M14 × 1.5)
2. Fuel filter
3. Engine oil filter

Fuel filter side view (step 2)

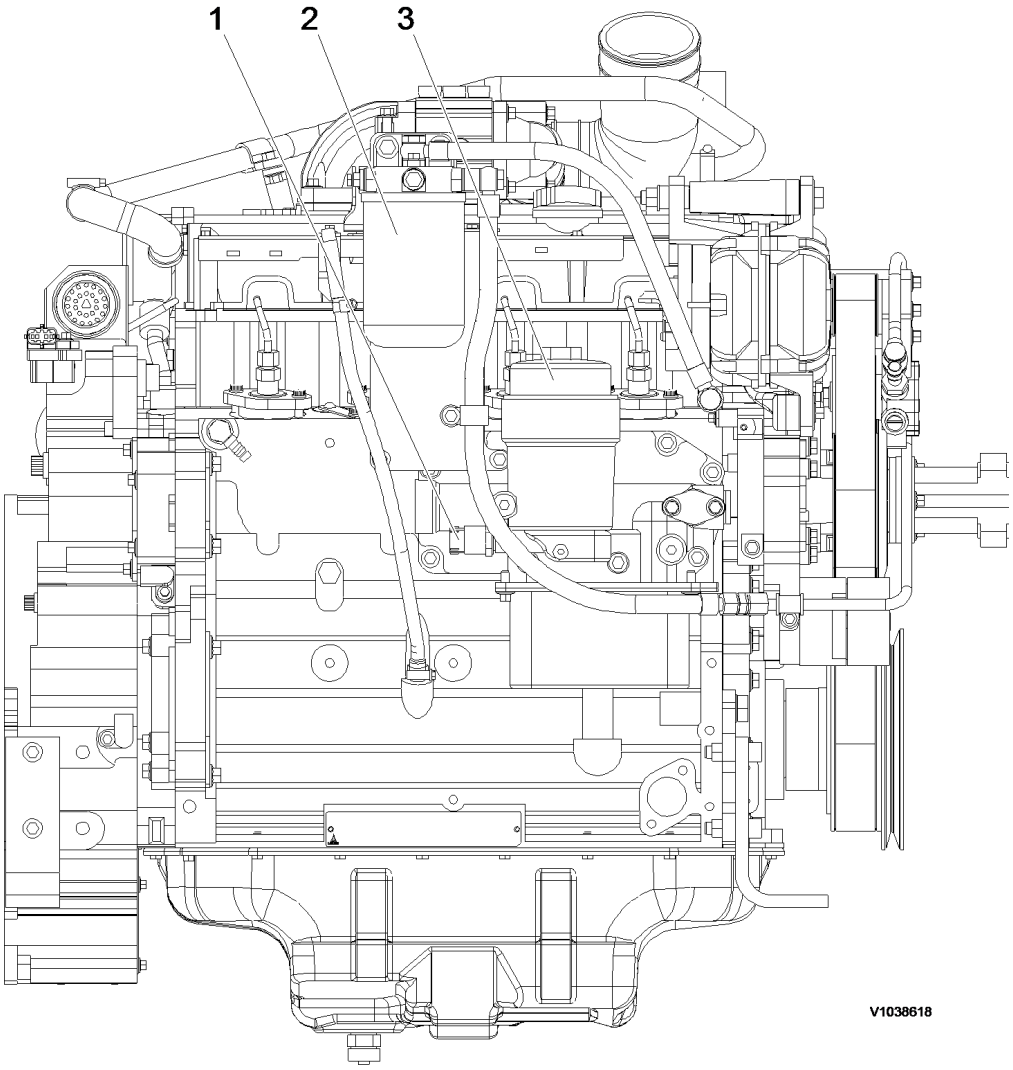

Figure 8
Engine, fuel filter side view (step 2)

1. Lube oil pressure port (M14 × 1.5)
2. Fuel filter
3. Engine oil filter

Flywheel end view (step 1)

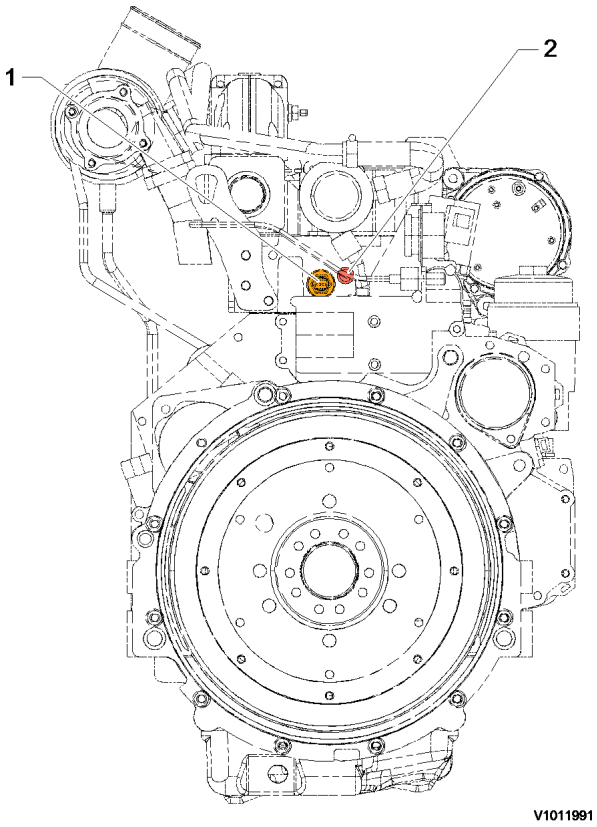

Figure 9
Engine, flywheel end view (step 1)

1. Coolant temperature check port
2. Coolant temperature sensor port

Flywheel end view (step 2)

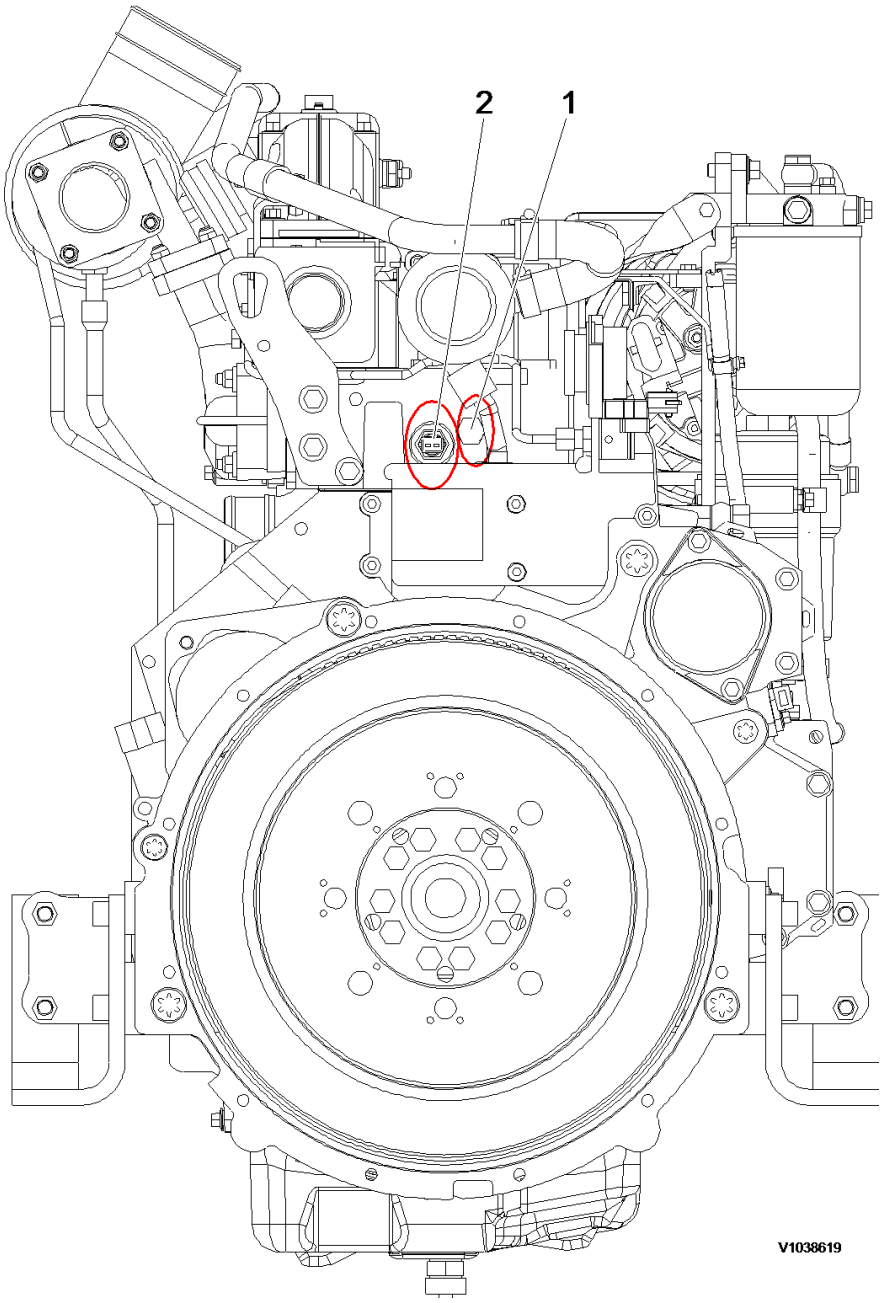

Figure 10
Engine, flywheel end view (step 2)

1. Coolant temperature check port
2. Coolant temperature sensor port

Document Title:	Function Group:	Information Type:	Date:
Engine characteristic curve	**210**	**Service Information**	**2015/3/3 0**
Profile: **EXC, EC140B LC [GB]**			

Engine characteristic curve

Engine characteristics

Item	Specification
Maximum power (Net)	94 PS (69 kW) / 2100 rpm
Maximum torque (Net)	38 kgf·m (274 lbf·ft, 372 N·m) / 1500 rpm
Minimum fuel consumption	157 g / PS·h
Rated fuel consumption	163 g / PS·h

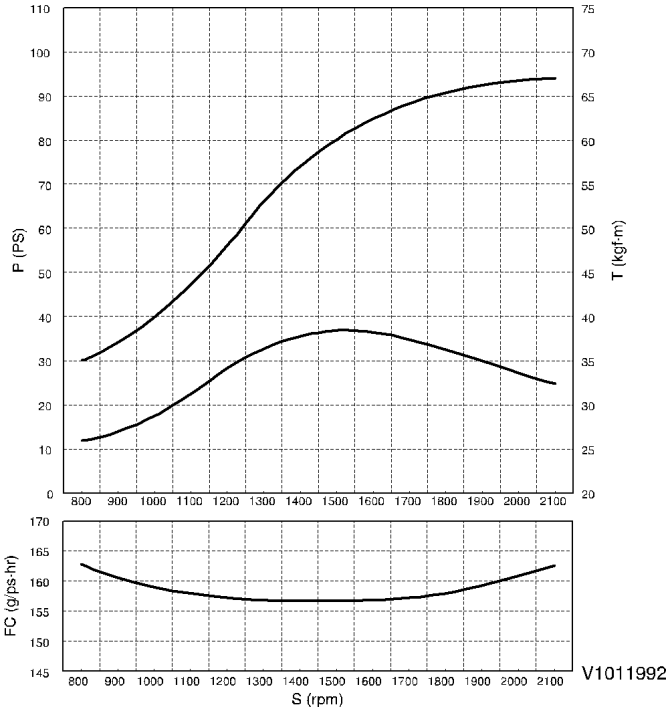

Figure 1
Engine, characteristic curve

P	Power
T	Torque
FC	Fuel consumption
S	Speed

Document Title:	Function Group:	Information Type:	Date:
Cylinder head, description	**211**	**Service Information**	**2015/3/3 0**
Profile: **EXC, EC140B LC [GB]**			

Cylinder head, description

The cylinder head of the D4D engine is made of grey cast iron and designed as block type head. The combustion air enters vertically and the exhaust air is discharged laterally. Inlet and outlet are located on one side of the cylinder head.

Document Title: **Determining cylinder head gasket**	Function Group: **211**	Information Type: **Service Information**	Date: **2015/3/3 0**
Profile: **EXC, EC140B LC [GB]**			

Determining cylinder head gasket

- The thickness of the cylinder head gasket is responsible for the correct piston crown clearance of the engine. The piston crown clearance (0.65 mm) essentially influences the combustion and thus:
  - Power
  - Fuel consumption
  - Exhaust emission
- The piston crown clearance is adjusted by determining the piston projection and the thickness of the cylinder head gasket.

Measuring piston projection

- A dial gauge with a fixture is needed to measure the piston projection.
- The piston is in its TDC position above the cylinder block face.

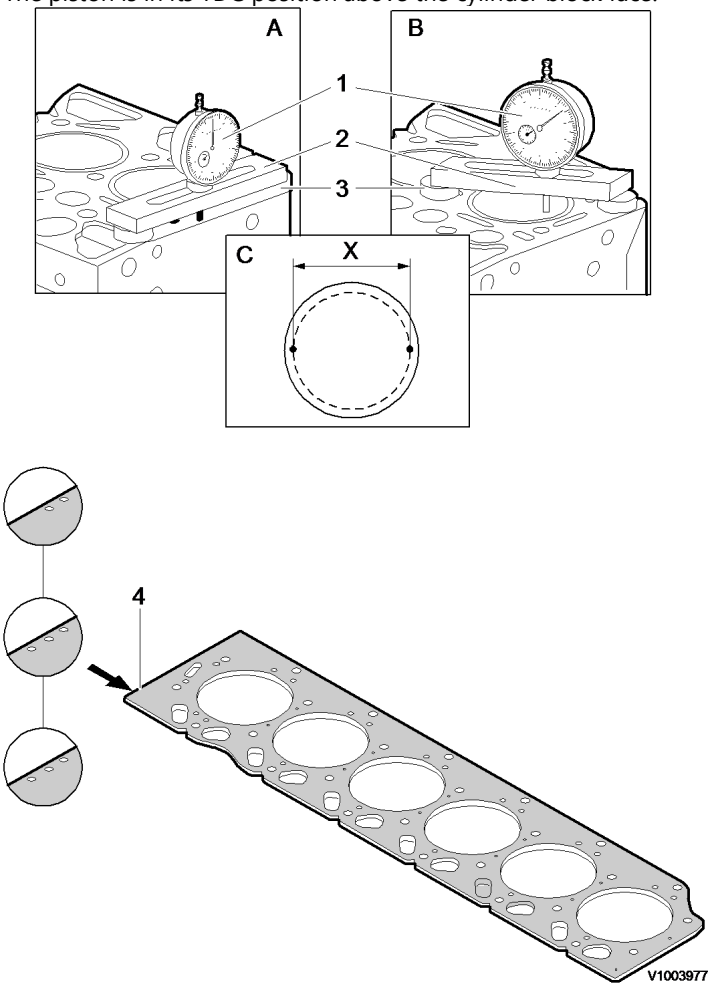

Figure 1
Measurement, piston projection

1. Dial gauge
2. Bridge
3. Two spacer plates

A. Set the dial gauge on the level of the cylinder block face to "zero".
B. Position the dial gauge at measuring points (C), at the piston pin axis, on the piston and determine the maximum projection.
C. Measuring points on the piston.

Distance X = 90 mm

This measurement is performed on each piston. The maximum measured piston projection determines the thickness of the cylinder head gasket (see table). There are 3 different gasket thicknesses identified by bores (4):

- 1 bore = 1.2 mm
- 2 bores = 1.3 mm
- 3 bores = 1.4 mm

Piston projection

Piston projection	**Identification of cylinder head gasket**
0.33 ~ 0.55 mm	1 bore
0.56 ~ 0.65 mm	2 bores
0.66 ~ 0.76 mm	3 bores

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Document Title:	Function Group:	Information Type:	Date:
Fitting cylinder head	**211**	**Service Information**	**2015/3/3 0**
Profile: **EXC, EC140B LC [GB]**			

Fitting cylinder head

Op nbr 21182

1. Prior to fitting the cylinder head onto the crankcase, the sealing surfaces for the cylinder head gasket must be clean and free from oil. Pay attention to dowel sleeves.

2. Lightly oil the cylinder head bolts.

3. It is absolutely necessary to observe the bolt tightening order in the adjacent schematic.

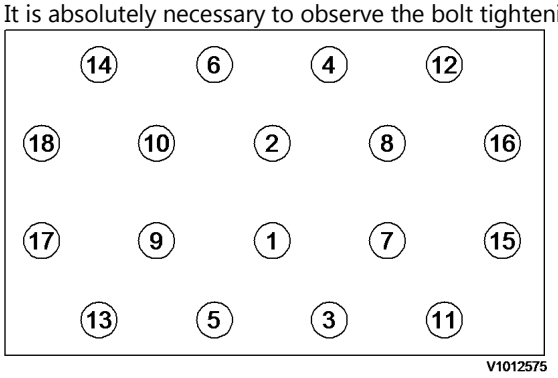

Figure 1
Tightening order (exhaust manifold side)
Tightening torque specification:

- 1st step: 30 N·m (22.2 lbf·ft, 3.1 kgf·m)
- 2nd step: 80 N·m (59 lbf·ft, 8.2 kgf·m)
- 3rd step: 90° turn

Tightening order

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