

Section 2 Diesel engine

Group 20 General, diesel engine D 5252 T

Performance, compression ratio, applies to diesel engine D 5252 T:

Engine:	Geometric compression ratio	Power		Maximum torque	
		kW / r/s	hp / rpm (hp / rpm)	Nm / r/s	kpm / rpm (ft.lbf / rpm)
D 5252 T	19.5:1	103/67	140 (4000)	290/32	29.6 (1900) 22 (1900)

Other general data, applies to diesel engine D 5252 T:

No. of cylinders	5
Bore	mm 81
Stroke	mm 95.5
Cylinder displacement	litres 2.46
Injection order / ignition sequence	1-2-4-5-3
Compression:	
New	Mpa 3.0
Minimum	Mpa 2.4
Maximum deviation between cylinders	MPa 0.5
Weight:	
Basic engine automatic gearbox	kg 185
Basic engine manual gearbox	kg 199
Basic engine automatic gearbox, with auxiliaries	kg 208
Basic engine manual gearbox, with auxiliaries	kg 222

Group 21 Engine body, diesel engine D 5252 T:

Cylinder head	
Maximum distortion, front-rear	mm 0.2
Maximum distortion, lateral	mm 0.2

Note! The cylinder head must not be ground flat. It should always be replaced when distortion is outside permitted limits.

Cylinder head gasket Dependent on the piston height over the cylinder block surface three different gaskets are used:	
Piston height over cylinder block surface (mm)	Number of index holes(thickness in mm)
0.76 - 1.01	1 (1.53)
1.02 - 1.05	2 (1.57)
1.06 - 1.13	3 (1.61)

Cylinder block, dimensions:	Piston diameter mm	Cylinder diameter mm
Standard	80.96	81.01

Tightening torques for lubricated screws and nuts:	Nm / ft.lb.
Cylinder head	
Tighten screws in sequence from centre and outwards:	
Step 1	35/26
Step 2	60/44
Stage 3 angle-tighten	90°
Step 4 angle-tighten	90°
Main bearing cap	65 ± 6.5/48 ± 5
Connecting rod cap:	
Step 1	30 ± 3/22 ± 2
Stage 2 angle-tighten	90° ± 10°
Camshaft cover	20/15
Camshaft pulley:	
Front door	100 ± 10/74 ± 7
Rear	160/118
Toothed belt tensioner	20/15
Belt cover, rear, plastic	M8: 22/16 M6: 8/6
Belt cover, rear, metal	M8: 22/16 M6: 8/6
Cover metal, for rear belt cover	8/6
Idler pulley, auxiliary equipment	25/18
Tensioner, auxiliaries belt	40/30
Water pump	22/16
Fuel lines	8/6
Pulley, crankshaft, (vibration damper)	

Tightening torques for lubricated screws and nuts:	Nm / ft.lb.
Centre screw.	
Tightened using special tool:	
Step 1	160/118
Stage 2 angle-tighten	180°
Allen screws:	
Step 1	20/15
Stage 2 angle-tighten	90°
Flywheel / carrier plate.	
Use new screws:	
Step 1	60/44
Step 2 angle-tighten, alternately	90°
Glow plug	15/11
Heater plug, for coolant heating	18/13
Coolant pipe, rear	M10 = 40/30 M8 = 22/16
Intake manifold, cylinder head side	22/16
Exhaust manifold, studs, nuts	25/18
Exhaust Gas Recirculation Valve (EGR Valve)	Nut 25/18 Screw 22/16
Exhaust manifold, turbocharger (TC), studs	30/22
Turbocharger (TC), exhaust manifold	Bi-hex screw 60/44 Nuts 60/44
Engine mounting, engine side, rear	M10 8.8 = 15/11 + 40/30 M10 10.9 = 15 + 65/58
Drive shaft mounting	M8 = 25/18
Oil cooler, nut	30/20
Collision protection system	25/18
Starter motor	80/60
Gutter, oil	10/7
Oil return line, turbocharger (TC), cylinder block	25/18
Oil return line, turbocharger (TC), oil filter, cap nut	30/22
Crankcase ventilation pipe	12/9
Heat deflector plate, turbocharger (TC)	8/6
Coolant pipe	M8 = 22/16 M6 = 8/6
Auxiliary equipment, bracket	M10 = 40/30 M8 = 20/15
Air conditioning (A/C) compressor	45/33

Tightening torques for lubricated screws and nuts:	Nm / ft.lb.
Generator (GEN)	25/18
Power steering pump	25/18
Vacuum pump	Nuts 25/18 Studs 15/11
Engine coolant temperature (ECT) sensor	20/15
Dip stick	22/16
Fuel injection pump, mounting	M8 8.8 = 20/15 M8 10.9 = 30/22 Nut M8 20/15
Delivery lines, between fuel injection pump and injector	When first installed: 25/18 When reinstalled. 50/37
Connector pipe, thermostat	8/6
Oil pressure sensor	22/16
Fuel injection pump, bracket, engine cover	22/16
Injector	20/15
Engine speed (RPM) sensor	8/6
Fuel injection pump, pump pulley	45/33
Idler pulley	Stud: 10/7.5 Nut: 25/20
Tensioner pulley	20/15
Toothed belt cover	M8 8.8 = 20/15 M8 10.9 = 30/22
Oil pan plug	38/28
Charge air pipe	10/7.5

Group 22 Lubrication system, diesel engine D 5252 T

General	
Oil volume	6 litre / 6.3 US qt)
Quality	ACEA-B3

Oil pump	
Relief valve:	
Begins to open at	kPa 530 - 630
Oil pressure sensor:	
Switch point, indicator lamp goes out at	kPa 15 - 35

Group 23 Fuel injection system, diesel engine D 5252 T:

Group 23 Fuel Injection system, diesel engine D 5252 T:

Engine type	Injection timing settings (checking) mm	Idling speed	
		Low r/s (rpm)	High r/s (rpm)
D 5252 T	0.275 ± 0.020	14.0 (810)	81.6 (4900)

Fuel injection pump	
Type	Distributor pump
Make and designation	Bosch VP 37
Engine version:	Designation:
D 5252 T	L 649

Injector		
Engine	Injector – assembly	
	Designation	Volvo P/N
D 5252 T	074 130 202 B	12 75 496 (cylinder 4)
MSA 15.7	046 130 201 F	12 70 528 (cylinder 1, 2, 3, 5)
D 5252 T	074 130 203 A	94 70 520 (cylinder 4)
MSA 15.8	074 130 201 Q	94 70 521 (cylinder 1, 2, 3, 5)

Injectors opening pressure:		
Control value	MPa	19 ^{+1.0} _{-1.5}
Default value	MPa	19 ^{+1.0} ₋₀

Group 25 Inlet and exhaust system, diesel engine D 5252 T:

Turbocharger (TC):		
Boost pressure at 3000 rpm (full load)	kPa	90
Tightening torques:		
Mounting screws:		
Use thread sealant	Volvo P/N	11 61 408-8
Front exhaust pipe-turbocharger (TC)	Nm/ft. lb.	40/30

Group 26 Cooling system

General

Never top up with water only.

Use Volvo Genuine parts green coolant (see table below) diluted 50/50 with clean water.

This mixture prevents corrosion and frost damage.

The coolant does not usually need replacing.

In the case of larger repairs when coolant needs to be drained, new coolant must be used because the old has been exposed to oxidation and dirt.

Clean the cooling system when replacing coolant.

Use cleaning agent Volvo P/N 11 61 328.

Green coolant:	Volvo P/N.
1 litres/0.26 gal, cold climate markets	13 81 076
5 litres/1.32 gal, cold climate markets	13 81 077
1 litres/0.26 gal, EU, Rest of the world	13 81 078
5 litres/1.32 gal, EU, rest of the world	13 81 079
210 litres/55.5 gal, whole world	13 81 080
1 gal (3,785 litres), USA	13 81 081
5 litres/1.32 gal, ready-mixed: 50/50, Australia	13 81 082

Engine:	Volume litres	Expansion tank pressure valve opens at		Thermostat °C (°F)		
		Over pressure kPa	Negative pressure kPa	Marking	Starts to open	Fully open
D 5252 T	12.5	150	7	87	87 (188)	102 (216)