

Document Title: Description	Function Group: 000	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Description

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

L220E is a four-wheel drive loader with articulated frame steering.

The engine is a six-cylinder, four-stroke, direct-injection, turbocharged diesel engine with the type designation D12C.

The transmission, with the designation HTE305, is hydro-mechanical, where all gears are in constant mesh.

Between engine and transmission there is a single stage hydraulic torque converter.

Front and rear axles have fully floating drive shafts with planetary type gears in the hubs. The front axle is provided with a differential lock.

The parking and service brakes on the machine are wet type multi-disc brakes. The service brakes are built into each wheel hub and the parking brake is positioned on the output shaft inside the transmission.

The steering system is hydrostatic with a variable load-sensing axial piston pump and two hydraulic cylinders (steering cylinders).

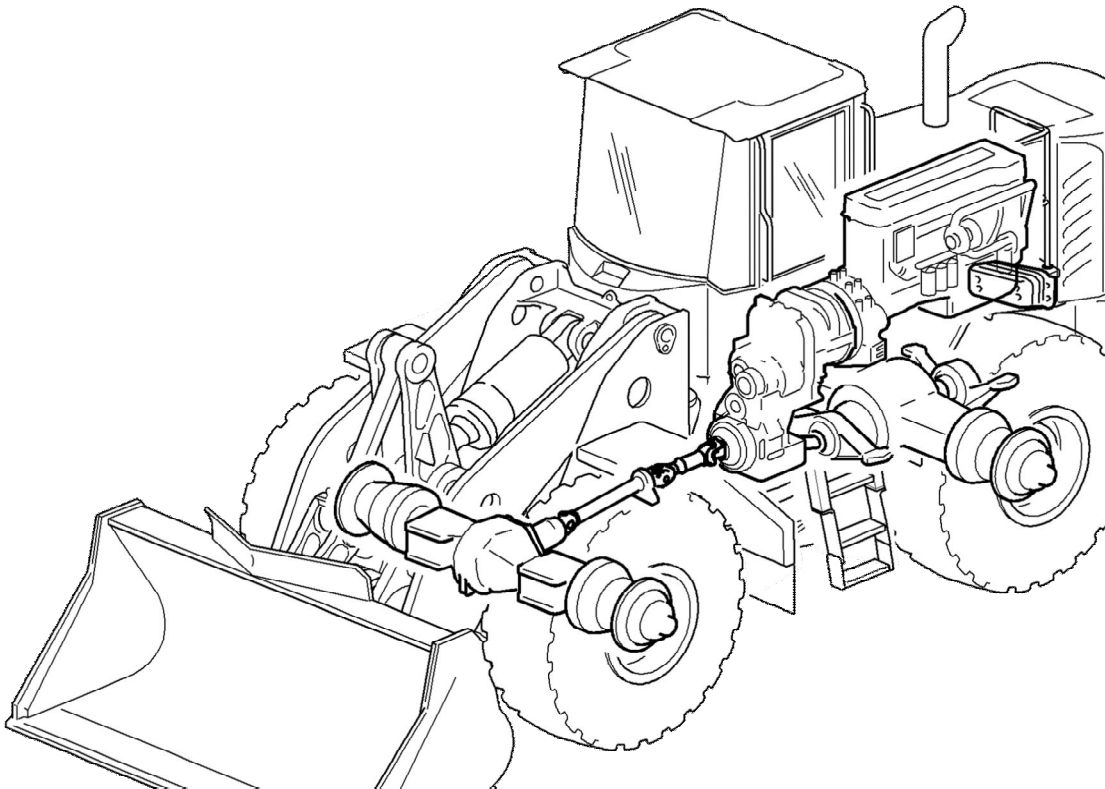


Figure 1

Document Title: Measurement conversion tables	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Measurement conversion tables

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Length

Unit	cm	m	km	in	ft	yd	mile
cm	1	0.01	0.00001	0.3937	0.03281	0.01094	0.000006
m	100	1	0.001	39.37	3.2808	1.0936	0.00062
km	100000	1000	1	39370.7	3280.8	1093.6	0.62137
in	2.54	0.0254	0.000025	1	0.08333	0.02777	0.000015
ft	30.48	0.3048	0.000304	12	1	0.3333	0.000189
yd	91.44	0.9144	0.000914	36	3	1	0.000568
mile	160930	1609.3	1.6093	63360	5280	1760	1
1 mm = 0.1 cm - 1 mm = 0.001 m							

Area

Unit	cm ²	m ²	km ²	a	ft ²	yd ²	in ²
cm ²	1	0.0001	-	0.000001	0.001076	0.000012	0.155000
m ²	10000	1	0.000001	0.01	10.764	1.1958	1550.000
km ²	-	1000000	1	10000	1076400	1195800	-
a	0.01	100	0.0001	1	1076.4	119.58	-
ft ²	-	0.092903	-	0.000929	1	0.1111	144.000
yd ²	-	0.83613	-	0.008361	9	1	1296.00
in ²	6.4516	0.000645	-	-	0.006943	0.000771	1
1 ha = 100 a - 1 mile ² = 259 ha = 2.59 km ²							

Volume

Unit	cm ³ = cc	m ³	l	in ³	ft ³	yd ³
cm ³ = ml	1	0.000001	0.001	0.061024	0.000035	0.000001
m ³	1000000	1	1000	61024	35.315	1.30796
dm ³ (l)	1000	0.001	1	61.024	0.035315	0.001308
in ³	16.387	0.000016	0.01638	1	0.000578	0.000021
ft ³	28316.8	0.028317	28.317	1728	1	0.03704
yd ³	764529.8	0.76453	764.53	46656	27	1
1 gal (US) = 3785.41 cm ³ = 231 in ³ = 0.83267 gal (UK)						

Sample manual. Download All 1973 pages at:

<https://www.arepairmanual.com/downloads/l220e-volvo-wheel-loaders-service-manual/>

Weight

Unit	g	kg	t	oz	lb
g	1	0.001	0.000001	0.03527	0.0022
kg	1000	1	0.001	35.273	2.20459
t	1000000	1000	1	35273	2204.59
oz	28.3495	0.02835	0.000028	1	0.0625
lb	453.592	0.45359	0.000454	16	1

1 ton (metric) = 1.1023 ton (US) = 0.9842 ton (UK)

Pressure

Unit	kp/cm ²	bar	Pa=N/m ²	kPa	lbf/in ²	lbf/ft ²
kp/cm ²	1	0.98067	98066.5	98.0665	14.2233	2048.16
bar	1.01972	1	100000	100	14.5037	2088.6
Pa=N/m ²	0.00001	0.001	1	0.001	0.00015	0.02086
kPa	0.01020	0.01	1000	1	0.14504	20.886
lbf/in ²	0.07032	0.0689	6894.76	6.89476	1	144
lbf/ft ²	0.00047	0.00047	47.88028	0.04788	0.00694	1

kg/cm² = 735.56 Dry (mmHg) = 0.96784 atm

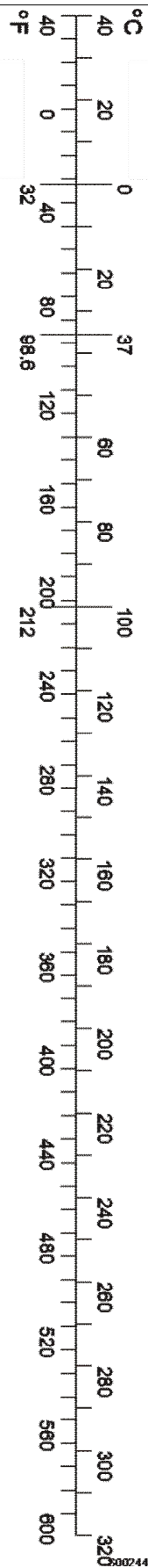
Unit explanations

Unit	abbreviation
Newton meter	Nm
Kilopoundmeter	kpm
Kilopascal	kPa
Megapascal	MPa
Kilowatt	kW
kilojoule	kJ
British thermal unit	Btu
Calorie	ca

Approx. conversion

SI unit	Conversion factor	Non SI	Conversion factor	SI
Torque				
Nm	x10.2	=kg/cm	x0.8664	=lb in
Nm	x0.74	=lbf-ft	x1.36	=Nm
Nm	x0.102	=kg/m	x7.22	=lbft
Pressure (Pa = N/m²)				
kPa	x4.0	=in.H ₂ O	x0.249	=kPa
kPa	x0.30	=in.Hg	x3.38	=kPa
kPa	x0.145	=psi	x6.89	=kPa
bar	x14.5	=psi	x0.069	=bar
kp/cm ²	x14.22	=psi	x0.070	=kp/cm ²
N/mm ²	x145.04	=psi	x0.069	=bar
MPa	x145	=psi	x0.00689	=MPa
Power (W = J/s)				

kW	x1.36	= hp(cv)	x0.736	= kW
kW	x1.34	= bhp	x0.746	= kW
kW	x0.948	= Btu/s	x1.055	= kW
W	x0.74	= ft.lb/s	x1.36	= W
Energy (J = Nm)				
kJ	x0.948	= Btu	x1.055	= kJ
J	x0.239	= calorie	x4.19	= J
Speed and acceleration				
m/s ²	x3.28	= ft/s ²	x0.305	= m/s ²
m/s	x3.28	= ft/s	x0.305	= m/s
km/h	x0.62	= mph	x1.61	= km/h
Horsepower/torque				
Bhp x5252 rpm = TQ (lb-ft)			TQ x rpm 5252 = bhp	
Temperature				
°C = (°F-32)/1.8			°F = (°C x1.8) +32	
Flow factor				
l/min (dm ³ /min)	x0.264	= US gal/min	x3.785	= liter/min



Document Title: Volvo standard tightening torques	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Volvo standard tightening torques

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

The tightening torques in the following tables apply to bolts and nuts with tensile strength. The tables should be used as a general instruction for tightening bolts and nuts without specified values. The charts contains values for course thread bolts and nuts.

Torque values should be increased with $\approx 10\%$, for flange bolts.

All standard torques for bolts are without surface treatment.

The standard torque for bolts lubricated with oil should be reduced with 20% of the given value.

Standard tightening torque charts

Bolt size Metric Coarse Threads	Tensile strength 8.8		Tensile strength 10.9	
	(Nm)	(lbf ft)	(Nm)	(lbf ft)
M5	6	4	8	6
M6	10	7	14	11
M8	25	18	35	26
M10	50	37	70	52
M12	87	64	122	90
M14	139	103	195	144
M16	213	157	299	220
M18	293	216	413	305
M20	416	307	585	432
M24	719	530	1010	745
M27	1060	782	1490	1100
M30	1140	840	2025	1493
M36	2500	1844	3600	2653

Bolt size Inch SAE Coarse Threads	Tensile strength 5		Tensile strength 8	
	(lbf ft)	(Nm)	(lbf ft)	(Nm)
1/4	10	13,6	14	19
5/16	21	28,5	29	39,3
3/8	37	50,2	52	70
7/16	59	80	84	114
1/2	90	122	128	174
9/16	130	176	184	250
5/8	180	244	254	345

3/4	320	434	451	612
7/8	515	700	728	988
1	775	1052	1091	1480
1 1/8	953	1290	1545	2100
1 1/4	1344	1823	2180	2960
1 3/8	1600	2170	2650	3600
1 1/2	2000	2714	3200	4340

Document Title: Engine, specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Engine, specifications

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo	Arvika	4001	5999

Engine	
Designation	D12DLDE3
Product number	8188761
Flywheel output at 26.7 r/s (1600 rpm)	261 kW (350 hp) SAE J1995 Gross
Flywheel output at 26.7 r/s (1600 rpm)	259 kW (347 hp), ISO 9249, SAE J1349
Flywheel output at 26.7 r/s (1600 rpm)	238 kW (319 hp), DIN 70020, net
Torque at 23.3 r/s (1400 rpm)	1765 Nm (1302 lbf ft) SAE J1995 Gross
Torque at 16.7 r/s (1000 rpm)	1665 Nm (1228 lbf ft) DIN 70020, Net
Torque at 23.3 r/s (1400 rpm)	1756 Nm (1295 lbf ft) ISO 9249, SAE J1349
Number of cylinders	6
Cylinder bore	131 mm (5.16 in)
Stroke	150 mm (5.91 in)
Cylinder capacity	12.13 dm ³ (litres) (740 in ³)
Compression ratio	18.5:1
Injection sequence	1-5-3-6-2-4
Economy rpm	1200-1600 rpm
Idling speed, low	725-775 rpm
Idle speed, high	2080-2130 rpm
Stall speed with torque converter	1850 +0/-35 rpm
Stall speed with torque converter + working hydraulics	1790 ±50 rpm

Document Title: Engine, weight	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Engine, weight

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo	Arvika	2001	3566

Engine	
Engine	1350 kg (2980 lbs)
Engine hood	240 kg (530 lbs)
Partition, engine hood	45 kg (100 lbs)

Document Title: Engine, weight	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Engine, weight

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo	Arvika	2001	3566

Engine	
Engine	1350 kg (2980 lbs)
Engine hood	240 kg (530 lbs)
Partition, engine hood	45 kg (100 lbs)

Document Title: Engine, volume	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Engine, volume

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

NOTICE

Stated capacity applies when changing, unless otherwise stated.

Engine	
Engine oil, incl. filter when changing	48 l (12.7 US gal)

Document Title: Engine, specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

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Engine, specifications

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo	Arvika	2001	3566

Engine	
Designation	D12CLBE2
Product number	8188169
Flywheel output at 26.7 r/s (1600 rpm)	258 kW (346 hp) ISO 9249
Flywheel output at 26.7 r/s (1600 rpm)	259 kW (347 hp) SAE J1349 Gross
Flywheel output at 26.7 r/s (1600 rpm)	258 kW (346 hp) SAE J 1349 Net
Flywheel output at 26.7 r/s (1600 rpm)	241 kW (323 hp) DIN 70020 Net
Flywheel output at 26.7 r/s (1600 rpm)	258 kW (346 hp) DIN 6271 Net
Torque at 20 r/s (1200 rpm)	1760 Nm (1298 lbf ft) ISO 9249
Torque at 20 r/s (1200 rpm)	1765 Nm (1302 lbf ft) SAE J1349 Gross
Torque at 20 r/s (1200 rpm)	1760 Nm (1298 lbf ft) SAE J1349 Net
Torque at 20 r/s (1200 rpm)	1660 Nm (1224 lbf ft) DIN 70020 Net
Torque at 20 r/s (1200 rpm)	1760 Nm (1298 lbf ft) DIN 6271 Net
Number of cylinders	6
Cylinder bore	131 mm (5.16 in)
Stroke	150 mm (5.91 in)
Cylinder capacity	12.13 dm ³ (litres) (740 in ³)
Compression ratio	18,5:1
Injection sequence	1-5-3-6-2-4
Idling speed, low	675–725 rpm
Idling speed, high	2060–2110 rpm
Stall speed with torque converter	30.5 r/s (1830 rpm)
Stall speed with torque converter + working hydraulics	29.7 r/s (1780 rpm)

Document Title: Engine, specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
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Engine, specifications

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo	Arvika	4001	5999

Engine	
Designation	D12DLDE3
Product number	8188761
Flywheel output at 26.7 r/s (1600 rpm)	261 kW (350 hp) SAE J1995 Gross
Flywheel output at 26.7 r/s (1600 rpm)	259 kW (347 hp), ISO 9249, SAE J1349
Flywheel output at 26.7 r/s (1600 rpm)	238 kW (319 hp), DIN 70020, net
Torque at 23.3 r/s (1400 rpm)	1765 Nm (1302 lbf ft) SAE J1995 Gross
Torque at 16.7 r/s (1000 rpm)	1665 Nm (1228 lbf ft) DIN 70020, Net
Torque at 23.3 r/s (1400 rpm)	1756 Nm (1295 lbf ft) ISO 9249, SAE J1349
Number of cylinders	6
Cylinder bore	131 mm (5.16 in)
Stroke	150 mm (5.91 in)
Cylinder capacity	12.13 dm ³ (litres) (740 in ³)
Compression ratio	18.5:1
Injection sequence	1-5-3-6-2-4
Economy rpm	1200-1600 rpm
Idling speed, low	725-775 rpm
Idle speed, high	2080-2130 rpm
Stall speed with torque converter	1850 +0/-35 rpm
Stall speed with torque converter + working hydraulics	1790 ±50 rpm

Document Title: Fuel tank, volume	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Fuel tank, volume

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo	Arvika	4001	5999

Fuel tank total/potential	370/335 dm ³ (98/88 US gal)
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Document Title: Lighting, specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Lighting, specifications

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Bulbs	Watt	Socket
Headlights, asymmetric	75/70	P 43t - 38 (H4)
Parking light, front	4	BA 9 s
Parking light, rear	10	BA 15 s
Tail lights	10	BA 15 s
Brake lights	21	BA 15 s
Direction indicators, rear	21	BA 15 s
Direction indicators, side	21	BA 15 s
Side running lights	5	SV 8.5
Cab lighting	10	BA 15 s
Instrument lighting	2	BA 9 s
Control light panel	1.2	W 2x 4.6 d
Switches' guide lights	1.2	W 2x 4.6 d
Work lights, front halogen, cab ^(a)	70	PK 22 s (H3)
Work lights, rear halogen, cab ^(a)	70	PK 22 s (H3)
Work lights, front halogen[T1] ⓘ	70	PK 22 s (H3)
Work lights, rear halogen ^(a)	70	PK 22 s (H3)

[T1]Optional equipment.

Document Title: Engine mounting, tightening torque	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Engine suspension, tightening torques

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

NOTICE

Regarding bolted joints which are not listed here, see "Volvo standard tightening torques"

Engine	
Engine member – Frame	220 Nm (220 lbf ft)
Flywheel housing – Hydraulic transmission	54 Nm (40 lbf ft)
Rubber damper – Member	85 Nm (63 lbf ft)
Rubber damper – Engine bracket	140 Nm (103 lbf ft)

Document Title: Unit injectors, specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Unit injectors, specifications

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Injectors	
Type	Unit injectors
Order of injection	1-5-3-6-2-4

Document Title: Tightening torques, control valve	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Tightening torques, control valve

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Engine		
	Nm	kgf m
Control valve (VEB)	20	2.0

Document Title: Lubrication specification	Function Group: system, 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Lubrication system, specifications

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Lubrication system	
Oil pressure, operating rpm	300–600 kPa (44–87 psi)
Oil pressure min. low idle, warm engine	70–110 kPa (10–16 psi)

Document Title: Valve system specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Valve system specifications

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo	Arvika	2001	3566

Valve mechanism	
Valve arrangement	Overhead valves
Valve clearance, hot/cold engine	
Inlet valves	0.20 mm (0.008 in)
Exhaust valves	0.50 mm (0.020 in)

Document Title: Valve mechanism, double rocker arm	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Valve mechanism, double rocker arm

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo	Arvika	4003	5999

Valve mechanism	
Inlet valves, valve clearance	0.20 mm
Exhaust valves (IEGR), valve clearance	0.70 mm
Clearance between double rocker arm and base circle on camshaft.	Measure with gauge 88820003

Clearance measured between double rocker arm and base circle on camshaft.

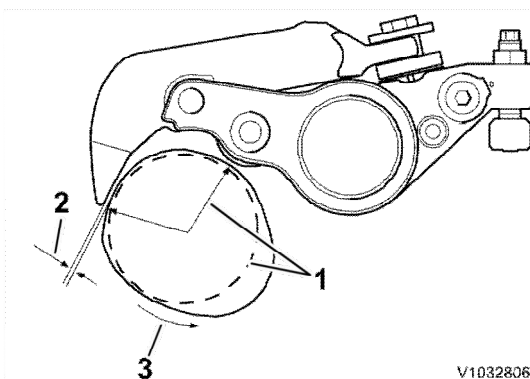


Figure 1

Checking clearance between double rocker arm and base circle

1. Base circle
2. Clearance
3. Camshaft's rotational direction

Checking and adjusting interval double rocker arm

Checking and adjustment, if needed, of the double rocker arm's clearance shall take place after 1000 hours. Thereafter together with [Valves, adjusting](#) every 4000 hours.

Document Title: Fuel feed pump, specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Fuel feed pump, specifications

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Fuel feed pump	
Type	Gear-driven pump
Feed pressure	300–350 kPa (44–51 psi) at low idling speed min. 350 kPa (51 psi) at over 1000 rpm

Document Title: Fuel feed pump, specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Fuel feed pump, specifications

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Fuel feed pump	
Type	Gear-driven pump
Feed pressure	300–350 kPa (44–51 psi) at low idling speed min. 350 kPa (51 psi) at over 1000 rpm

Document Title: Fuel tank, volume	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Fuel tank, volume

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Fuel tank total/potential	370/335 dm ³ (98/88 US gal)
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Document Title: Unit injectors, specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
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Unit injectors, specifications

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
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Injectors	
Type	Unit injectors
Order of injection	1-5-3-6-2-4

Document Title: Injectors, tightening torques	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
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Injectors, tightening torques

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

NOTICE

Regarding bolted joints which are not listed here, see "Volvo standard tightening torques"

Injectors	
Electrical cables, attaching bolts	1.4 ±0.1 Nm (1.03 lbf ft)

Document Title: Turbocharger, specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
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Turbocharger, specifications

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Turbocharger	
Designation	GT45

Document Title: Oil-bath air cleaner, volume	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
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Oil-bath air cleaner, volume

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
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Volume	
Oil-bath air cleaner	9.1 l (2.4 US gal)

Document Title: Intercooler specifications	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo			

Intercooler specifications

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Intercooler	
Type	Air / Air

Document Title: Cooling specifications	system	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
Profile: L220E Volvo				

Cooling system specifications

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Cooling system	
Type	Closed system
Radiator cap valve opens at	50 kPa (7.3 psi)



Document Title: Cooling system volume	Function Group: 030	Information Type: Service Information	Date: 4/12/2026
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Cooling system, volume

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Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
L220E Volvo			

Cooling system, total	67 l (18 US gal)
Cooling system, when changing	44 l (12 US gal)