

Technical data TD520GE (mech & EDC4)

Standby & prime ratings

General

In-line four stroke diesel engine with direct injection. Rotation direction, anti-clockwise viewed towards flywheel.
Turbocharged

Number of cylinders			4
Displacement, total	litre		4,76
	in ³		290,7
Firing order			1-5-3-6-2-4
Bore	mm		108
	in		4,25
Stroke	mm		130
	in		5,12
Compression ratio			17.5:1
Dry weight	Engine and cooling package	kg	550
		lb	1213
Wet weight	Engine and cooling package	kg	580
		lb	1279
	SAE2	kg	36
		lb	79

Performance		r/min	1500	1800
Standby Power	without fan	kW	85	89
		hp	116	121
	with fan	kW	83	85
	std & tropical cool.	hp	112	115
Prime Power	without fan	kW	78	82
		hp	105	111
	with fan	kW	75	77
	std & tropical cool.	hp	102	105
Torque at:	Standby Power	Nm	541	472
		lbft	399	348
	Prime Power	Nm	493	432
		lbft	364	319
Mean piston speed		m/s	6,5	7,8
		ft/sec	21,4	25,7
Effective mean pressure at:	Standby Power	MPa	1,4	1,2
		psi	207	181
Effective mean pressure at:	Prime Power	MPa	1,3	1,1
		psi	189	165
Max combustion pressure at:	Prime Power	MPa	11,2	11,3
		psi	1624	1639
Total mass moment of inertia, J (mR2)		kgm ²	1,43	
		lbft ²	33,9	
Residual speed droop at load increase from 0 to 100%		%	≤ 5	
Friction Power		kW	6,0	8,6
		hp	8,16	11,696

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Engine noise emission

Test Standards: ISO 3744-1981 (E)

sound power (without fan, intake and exhaust noise)

Tolerans ± 0.75 dB(A)

		r/min	1500	1800
Measured sound power Lw	No load	dB(A)	99	100,5
	Standby Power	dB(A)	102	103,5
	Prime Power	dB(A)	102	103,5
Calculated sound pressure Lp at 1 m	No load	dB(A)	86	87,5
	Standby Power	dB(A)	89	90,5
	Prime Power	dB(A)	89	90,5

Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m

		r/min	1500	1800
Standby Power		dB(A)	107	107,5
Prime Power		dB(A)	106,5	107

Load acceptance

Test condition: Warm engine. Load acceptance performance can vary due to actual alternator inertia, voltage regulator, type of load and local ambient conditions.

Single step load performance at 1500 rpm - EDC4

Load (%)	Speed diff (%)		Recovery time (s)		Remaining load (%)	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby		Prime	Standby	Prime	Standby

Available later

Single step load performance at 1800 rpm - EDC4

Load (%)	Speed diff %		Recovery time (s)		Remaining load (%)	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby		Prime	Standby	Prime	Standby

Available later

Single step load performance at 1500 rpm - mech

Load (%)	Speed diff (%)		Recovery time (s)		Remaining load (%)	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby		Prime	Standby	Prime	Standby
0-75	6,3		0,4						
0-100	15,8		2,4						
100-0	6,7		1,1						

Single step load performance at 1800 rpm - mech

Load (%)	Speed diff %		Recovery time (s)		Remaining load (%)	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby		Prime	Standby	Prime	Standby
0-75	5,4		0,4						
0-100	9,0		2,7						
100-0	5,7		0,3						

Cold start performance

1500/1800

Cold start limit temperature	°C	-15
		-30*

* With manifold heater engaged, lubrication oil 15W/40

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Derating

The engine may be operated at sea level up to 25°C ambient air temperature at Standby Power and 40°C at Prime Power without derating. For operation at higher altitudes and temperatures the power should be derated according to the following factors:

Altitude derating factor < 3000 m	% / m	4 / 500
Altitude derating factor > 3000 m	% / m	4 / 500
Ambient temperature derating factor	% / °C	3 / 5°C
Humidity	%	No derating

Lubrication system		r/min	1500	1800
Lubricating oil consumption	Standby Power	liter/h	0,07	0,07
		US gal/h	0,017	0,018
Oil system capacity including filters		liter	13	
		US gal	3,4	
Oil sump capacity:	max	liter	11	
		US gal	2,9	
	min	liter	9	
		US gal	2,4	
Oil change intervals/specifications:				
VDS-2*		h	500	
VDS, ACEA, E3*		h	500	
ACEA E2, API CD, CF, CF-4, CG-4*		h	500	
Engine angularity limits:	front up	°	30	
	front down	°	30	
	side tilt	°	30	
Oil pressure at rated speed		kPa	400 - 440	
		psi	58 - 64	
Oil pressure shut down switch setting		kPa	200	
		psi	29	
Lubrication oil temperature:	normal	°C	80	
		°F	176	
	max	°C	125	
		°F	257	
Oil filter micron size		mm	0,040	

* See also general section in the sales guide

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Fuel system

		r/min	1500	1800
Prime Power Specific fuel consumption at:	25%	g/kWh lb/hph		
	50%	g/kWh lb/hph	213 0,345	223 0,361
	75%	g/kWh lb/hph	208 0,337	217 0,352
	100%	g/kWh lb/hph	213 0,345	215 0,349

Fuel system

		r/min	1500	1800
Recommended fuel to conform to		ASTM-D975-No1 and 2-D JIS KK 2204, EN 590		
Total fuel flow		liter/h US gal/h	360 95	450 119
Feed pump pressure		kPa psi	500 - 500 73 - 73	
Feed pump max suction head		m foot	1,5 4,9	
Fuel filter micron size		mm	0,008	
Prefilter / Water separator		mm		
Governor type/make, standard		Heinzman / EDC4		
Injection pump type/make		PFM1P00S2002 / Bosch		

Intake and exhaust system

			r/min	1500	1800
Air consumption at:	Standby Power	27°C 81°F	m ³ /min cfm	285 10065	346 12219
Air intake restriction, clean filter(s)			kPa in wc	1 4,0	1 4,0
Max allowable air intake restriction			kPa in wc	3 12,0	3 12,0
Air filter type			Single stage paper cartridge		
Air filter cleaning efficiency			%	99,85	
Heat rejection to exhaust at:	Standby Power		kW BTU/min	72 4078	77 4379
Exhaust gas temperature after turbine at:	Standby Power		°C °F	610 1130	530 986
Max allowable back pressure in exhaust line			kPa In wc	3 12,0	5 20,1
Exhaust gas flow at:	Standby Power		m ³ /min cfm	15,4 544	17,5 618

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Cooling system

		r/min	1500	1800
Heat rejection radiation from engine at:	Standby Power	kW	13	14
		BTU/min	722	779
Heat rejection to coolant at:	Standby Power	kW	54	56
		BTU/min	3054	3168
Recommended coolant		Volvo coolant or Volvo anticorrosion additive together with clean fresh water		
Radiator cooling system type		Closed circuit		
Radiator core area (std. size)		m ²	0,24	
		foot ²	2,58	
Radiator core thickness (std. size) - standard cooling package		mm	40	
		in	1,57	
Radiator core thickness (std. size) - tropical cooling package		mm	60	
		in	2,36	
Fan diameter - standard cooling system		mm	516	
		in	20,31	
Fan power consumption - standard & tropical cooling system		kW	2,5	4,3
		hp	3	6
Fan drive ratio		1,73:1		
Coolant capacity,	engine	liter	9,8	
		US gal	2,59	
	std radiator with hoses	liter	12,2	
		US gal	3,22	
Coolant pump		drive/ratio	1,73:1	
Coolant flow with standard system		l/s	173	218
		US gal/s	45,70	57,59
Maximum external coolant system restriction		kPa	25	35
		in wc	100	141
Thermostat,	start to open	°C	83	
		°F	181	
	fully open	°C	95	
		°F	203	
Maximum static pressure head		kPa	100	
		in wc	402	
Pressure cap setting on standard radiator		kPa	60	
		in wc	241	
Maximum top tank temperature		°C	110	
		°F	230	
Shutdown switch setting		°C	113	
		°F	235	
Recommended draw down capacity	10% of total cooling system capacity			

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Cooling performance

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 105°C TTT and 50% antifreeze (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp °C	110% OF PRIME POWER		STANDBY POWER	
		Air flow m ³ /s	Max additional external restriction Pa	Air flow m ³ /s	Max additional ext. restriction Pa
1500 standard tropical	45			5400	150
	60			7920	150
1800 standard tropical	45			6480	150
	60			9360	150

Electrical system

		r/min	1500	1800
Voltage and type		12V / 1 pole system		
Alternator:	make/output	Amp	Bosch/55	
	tacho output	Hz/alt. Rev	6	
	drive ratio		3,01:1	
Starter motor	make		Bosch	
	type		EV	
	kW		3,1	
Starter motor solenoid,	pull current	Amp	60	
	hold current	Amp	12	
Number of teeth on:	flywheel		129	
	cam wheel		96	
	starter motor		9	
Starter motor battery capacity:	max	Ah	176	
	min at +5°C	Ah	110	
Stop solenoid,	max	Amp	3	
Inlet manifold heater (at 20 V)			kW	
Power relay for the manifold heater			Amp	