

Technical data TD520GE (mech & EDC4)

Standby & Prime Power

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

Performance

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

Technical data TD520GE (mech & EDC4)

Standby & Prime Power

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
0-40	4,0	4,5	1,5	2,0	40-100	7,0	9,5	3,0	10,0
0-50	6,0	6,5	2,0	2,0	50-100	6,0	6,5	3,0	4,0
0-60	7,0	7,5	2,0	2,0	60-100	5,0	5,5	2,5	3,5
0-75	8,0	9,0	2,5	3,0	75-100	3,0	3,5	2,0	5,0
0-100	14,0	18,0	4,0	15,5					
100-0	6,0	6,5	1,5	2,0					

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
0-40	3,0	3,5	1,0	1,5	40-100	4,0	4,5	1,5	2,5
0-50	3,5	4,0	1,5	1,5	50-100	3,0	3,5	1,5	2,5
0-60	4,0	4,5	1,5	1,5	60-100	2,5	2,5	1,5	2,5
0-75	5,0	5,5	1,5	2,0	75-100	2,0	2,0	1,5	2,0
0-100	7,0	7,5	2,0	3,0					
100-0	6,5	6,0	1,5	1,5					

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						

Technical data TD520GE (mech & EDC4)

Standby & Prime Power

Cold start performance

1500/1800

Cold start limit temperature	°C	-15
		-30*

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

Derating, mechanical governer

The engine may be operated up to 1000 m altitude and 40°C ambient air temperature 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	6 / 500
Ambient temperature derating factor	% / °C	3 / 5°C
Humidity	%	No derating

Derating, electronic governer

The engine may be operated up to 1000 m altitude and 40°C ambient air temperature without derating. For applications above 1000 m an ECU with automatic derating must be used. For operations with air ambient temperature over 40°C, see mechanical governer.

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. ACEA: E3, E5. API: CG-4, CH-4*		h	500	
VDS. ACEA: E2. API: CF, CF-4*		h	250	
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

Fuel system

		r/min	1500	1800
Prime Power Specific fuel consumption at:	25%	g/kWh	243	268
		lb/hph	0,394	0,434
		g/kWh	213	223
		lb/hph	0,345	0,361
	75%	g/kWh	208	217
		lb/hph	0,337	0,352
		g/kWh	213	215
		lb/hph	0,345	0,349

Technical data TD520GE (mech & EDC4)

Standby & Prime Power

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	4,8 170	5,8 205
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

Cooling system		r/min	1500	1800
Heat rejection radiation from engine at:	Standby Power	kW BTU/min	13 722	14 779
Heat rejection to coolant at:	Standby Power	kW BTU/min	54 3054	56 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 foot ²	0,24 2,58		
Radiator core thickness (std. size) - standard cooling package	mm in	40 1,57		
Radiator core thickness (std. size) - tropical cooling package	mm in	60 2,36		

Technical data TD520GE (mech & EDC4)

Standby & Prime Power

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	2.88	3.63
		US gal/s	0.76	0.96
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	90	
		in wc	361	
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		

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	PRIME POWER		STANDBY POWER	
		Air flow m ³ /s	External restriction Pa	Air flow m ³ /s	External restriction Pa
1500 standard	30			1,0	250
	42			1,3	200
	49			1,5	150
1500 tropical	35			1,2	250
	46			1,5	200
	54			1,7	150
	59			2,3	0
1800 standard	30			1,1	400
	46			1,6	300
	52			1,8	250
1800 tropical	39			1,3	400
	53			1,8	300
	58			2,0	250
	62			2,2	200

Technical data TD520GE (mech & EDC4)

Standby & Prime Power

Electrical system		r/min	1500	1800
Voltage and type		12V / 1 pole system		
Alternator:	make/output	Amp	Iskra/55	
	tacho output	Hz/alt. Rev	6	
	drive ratio		3.26:1	
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 12V/24V)			kW	
Power relay for the manifold heater (at 12V/24V)			Amp	