

Technical data TD720GE

Mech & EDC4

General

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

Number of cylinders			6
Displacement, total	litre		7,15
	in ³		436,0
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	750
		lb	1653
Wet weight	Engine and cooling package	kg	790
		lb	1742
	SAE3	kg	-36
		lb	-79

		r/min	1500	1800	2000
Standby Power	without fan	kW	128	134	135
		hp	174	182	184
	with fan high temp cooling	kW	124	127	132
		hp	168	172	179
Prime Power	without fan	kW	117	123	122
		hp	159	167	166
	with fan high temp cooling	kW	113	116	119
		hp	153	157	162
Torque at:	Standby Power	Nm	815	711	645
		lbft	601	524	475
	Prime Power	Nm	745	653	583
		lbft	549	481	430
Mean piston speed		m/s	6,5	7,8	8,7
		ft/sec	21,4	25,7	28,5
Effective mean pressure at:	Standby Power	MPa	1,4	1,3	1,1
		psi	208	181	164
	Prime Power	MPa	1,3	1,1	1,0
		psi	190	166	149
Max combustion pressure at:	Standby Power	MPa			10,5
		psi			1523
	Prime Power	MPa	11,1	10,5	11
		psi	1610	1523	1595
Total mass moment of inertia, J (mR2)		kgm ²	3,09		
		lbft ²	73,3		
Residual speed droop at load increase from 0 to 100%		%	≤ 5		
Friction Power		kW	8,5	12,3	
		hp	11,56	16,728	

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	2000
Measured sound power Lw	No load	dB(A)	99,5	101,5	
	Standby Power	dB(A)	102,5	104,5	
	Prime Power	dB(A)	102,5	104,5	
Calculated sound pressure Lp at 1 m	No load	dB(A)	86,5	88,5	
	Standby Power	dB(A)	89,5	91,5	
	Prime Power	dB(A)	89,5	91,5	

Technical data TD720GE

Mech & EDC4

Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m

	r/min	1500	1800	2000
Standby Power	dB(A)	108	108,5	
Prime Power	dB(A)	109	109,5	

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	4,5	5,0	1,0	1,5	40-100	6,5	-	3,0	-
0-50	5,5	6,0	2,0	2,0	50-100	6,0	6,5	3,0	12,0
0-60	6,5	7,0	2,0	2,0	60-100	4,5	5,0	2,0	5,0
0-75	8,0	8,5	2,5	2,5	75-100	2,5	3,0	2,0	3,0
0-100	12,0	-	4,5	-					
100-0	10,0	7,0	2,0	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	2,5	3,0	1,0	1,5	40-100	3,5	4,0	1,5	3,5
0-50	3,5	3,5	1,0	1,5	50-100	3,0	3,5	1,5	2,5
0-60	4,0	4,5	1,0	1,5	60-100	2,5	2,5	1,0	2,0
0-75	5,0	5,0	1,0	1,5	75-100	1,5	2,0	1,0	2,0
0-100	-	-	-	-					
100-0	6,0	5,0	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	5,5		0,3						
0-100	9,6		1,4						
100-0	6,5		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	4,5								
0-100	5,8		0,7						
100-0	4,9								

Cold start performance

1500/1800/2000

Cold start limit temperature	°C	-15
		-30*

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

Technical data TD720GE

Mech & EDC4

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	2 / 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	2000
Lubricating oil consumption	Standby Power	liter/h	0,10		
		US gal/h	0,026		
Oil system capacity including filters		liter	20		
		US gal	5,3		
Oil sump capacity:	max	liter	17		
		US gal	4,5		
	min	liter	14		
		US gal	3,7		
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	420	450	550
		psi	61	65	80
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	2000
Standby Power Specific fuel consumption at:	25%	g/kWh lb/hph			270 0,438
	50%	g/kWh lb/hph			223 0,361
	75%	g/kWh lb/hph			215 0,349
	100%	g/kWh lb/hph			215 0,349
Prime Power Specific fuel consumption at:	25%	g/kWh lb/hph	236 0,383	270 0,438	285 0,462
	50%	g/kWh lb/hph	212 0,344	220 0,357	226 0,366
	75%	g/kWh lb/hph	208 0,337	212 0,344	215 0,349
	100%	g/kWh lb/hph	211 0,342	212 0,344	215 0,349

Technical data TD720GE

Mech & EDC4

Fuel system		r/min	1500	1800	2000
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	480 127
Max allowed inlet fuel temperature	continuous	°C	70		
		°F	158		
	temporarily	°C	90		
		°F	194		
Feed pump pressure		kPa psi	480 70	550 80	500 73
Fuel supply line max. restriction (before fuel feed pump)		kPa psi	35 5,1		
Fuel supply line max. restriction (before fuel prefilter and manuel feed pump)		kPa psi	15 2,2		
Fuel supply line max. pressure, (before fuel feed pump)		kPa psi	20 2,9		
Fuel filter micron size		mm	0,005		
Prefilter / Water separator		mm	0,063		
Governor type/make, standard		Heinzman / EDC4			
Injection pump type/make		PFM1P00S2002 / Bosch			

Intake and exhaust system			r/min	1500	1800	2000
Air consumption at:	Standby Power	27°C	m ³ /min	8,1	10,1	10,8
		81°F	cfm	286	357	381
Air intake restriction, clean filter(s)			kPa in wc	1,5 6,0		
Max allowable air intake restriction			kPa in wc	3,5 14,1		
Air filter type			Two stage paper cartridge			
Air filter cleaning efficiency			%	99,9		
Heat rejection to exhaust at:	Standby Power		kW	108	116	
			BTU/min	6142	6597	
Exhaust gas temperature after turbine at:	Standby Power	°C	560	505	520	
		°F	1040	941	968	
Max allowable back pressure in exhaust line			kPa In wc	5 20,1	7 28,1	7 28,1
Exhaust gas flow at:	Standby Power		m ³ /min	22,3	26,0	30,0
			cfm	788	918	1059

Technical data TD720GE

Mech & EDC4

Cooling system

		r/min	1500	1800	2000
Heat rejection radiation from engine at:	Standby Power	kW BTU/min	19 1081	20 1137	20 1137
Heat rejection to coolant at:	Standby Power	kW BTU/min	80 4544	84 4766	85 4805
Recommended coolant	Volvo coolant or Volvo anticorrosion additive together with clean fresh water				
Radiator cooling system type	Closed circuit				
Radiator core area		m ² foot ²	0,40 4,31		
Radiator core thickness		mm in	54 2,13		
Fan diameter - low and high temp cooling system		mm in	516 20,31		
Fan power consumption - low temp cooling system		kW hp	2,5 3	4,3 6	
Fan power consumption - high temp cooling system & dual speed raiting		kW hp	4,2 6	7,3 10	3,2 4
Fan drive ratio			1,73:1		1,22:1
Coolant capacity,	engine	liter US gal	9,8 2,59		
	radiator with hoses	liter US gal	12,2 3,22		
Coolant pump		drive/ratio	1,73:1		1,22:1
Coolant flow		l/s US gal/s	2,9 0,77	3,6 0,95	2,8 0,74
	Maximum external coolant system restriction	kPa in wc	25 100	35 141	25 100
Thermostat,	start to open	°C	83		
		°F	181		
	fully open	°C	95		
		°F	203		
Maximum static pressure head		kPa in wc	100 402		
	Pressure cap setting	kPa in wc	60 241		
Maximum top tank temperature		°C °F	110 230		
	Shutdown switch setting	°C °F	113 235		
Recommended draw down capacity	10% of total cooling system capacity				

Technical data TD720GE

Mech & EDC4

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			1,4	200	
	41			1,7	150	
	50			2,0	100	
	tropical	40			1,7	250
		48			2,0	200
		56			2,6	100
	60			3,1	0	
1800 standard	42			1,9	300	
	49			2,1	250	
	53			2,4	200	
	tropical	48			2,1	400
		58			2,7	300
		60			3,4	150
	66			3,8	0	
2000 tropical	-			0,9	400	
	5			1,7	300	
	42			2,4	150	
	55			2,8	0	

Electrical system

		r/min	1500	1800	2000
Voltage and type		12V / 1 pole system			
Alternator:	make/output	Amp	Iskra/55		
	tacho output	Hz/alt. Rev	6		
	drive ratio		3,01:1		
Starter motor	make	Bosch			
	type	EV			
	kW	3,0			
Starter motor solenoid,	pull current	Amp	60		
	hold current	Amp	12		
Number of teeth on:	flywheel	129			
	cam wheel	96			
	starter motor	9			
Inrush current at +20°C		Amp	1200		
Cranking current at +20°C		Amp	400		
Crank engine speed at 20°C		rpm	150		
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	2 / 3,6		
Power relay for the manifold heater (at 12V/24V)		Amp	150 / 120		