

Technical data TAD720GE (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			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	760
		lb	1676
Wet weight	Engine and cooling package	kg	804
		lb	1773
	SAE3	kg	-36
		lb	-79

Performance		r/min	1500	1800
Standby Power	without fan	kW	153	163
		hp	208	222
	with fan std cool.	kW	149	156
		hp	203	213
Prime Power	without fan	kW	140	149
		hp	190	203
	with fan std cool.	kW	136	142
		hp	185	194
Standby Power	without fan	kW	153	163
		hp	208	222
	with fan trop cool & dual sp	kW	149	156
		hp	203	213
Prime Power	without fan	kW	140	149
		hp	190	203
	with fan trop cool & dual sp	kW	132	140
		hp	179	190
Torque at:	Standby Power	Nm	974	865
		lbft	718	638
	Prime Power	Nm	891	790
		lbft	657	583
Mean piston speed		m/s	6,5	7,8
		ft/sec	21,4	25,7
Effective mean pressure at:	Standby Power	MPa	1,7	1,5
		psi	248	221
Effective mean pressure at:	Prime Power	MPa	1,6	1,4
		psi	227	202
Max combustion pressure at:	Prime Power	MPa	13,5	13
		psi	1958	1885
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

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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)	100,5	102,5
	Standby Power	dB(A)	103,5	106
	Prime Power	dB(A)	102,5	105,5
Calculated sound pressure Lp at 1 m	No load	dB(A)	87,5	89,5
	Standby Power	dB(A)	90,5	92,5
	Prime Power	dB(A)	89,5	93

Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m

	r/min	1500	1800
Standby Power	dB(A)	112	113
Prime Power	dB(A)	111	112

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	4,7	5,3	2,2	2,1	40-100	7,1	8,4		8,3
0-50	6,0	6,7	2,1	2,0	50-100	5,8	7,3	3,0	>15
0-60	7,0	7,8	2,3	2,3	60-100	4,5	5,1	3,7	5,5
100-0	9,0	6,4	2,0	1,7					

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	3,1	3,5	1,2	1,2	40-100	3,9	4,0	1,2	3,3
0-60	4,4	4,8	1,1	0,9	60-100	2,5	2,5	1,1	2,5
100-0	5,0	4,3	0,9	1,3					

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	6,2		0,5						
100-0	6,9		1,3						

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	5,0								
0-100	7,3		1,1						
100-0	5,2								

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 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

Lubrication system		r/min	1500	1800
Lubricating oil consumption	Standby Power	liter/h US gal/h	0,10 0,026	0,10 0,026
Oil system capacity including filters		liter US gal	20 5,3	
Oil sump capacity:	max	liter US gal	17 4,5	
	min	liter US gal	14 3,7	
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 psi	420 - 450 61 - 65	
Oil pressure shut down switch setting		kPa psi	200 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 lb/hph		
	50%	g/kWh lb/hph	204 0,331	215 0,349
	75%	g/kWh lb/hph	198 0,321	205 0,332
	100%	g/kWh lb/hph	197 0,319	203 0,329

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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	360	450
	US gal/h	95	119
Feed pump pressure	kPa	500 - 500	
	psi	73 - 73	
Feed pump max suction head	m	1,5	
	foot	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	608	830
			cfm	21472	29311
Air intake restriction, clean filter(s)			kPa	1	1
			in wc	4,0	4,0
Max allowable air intake restriction			kPa	3	3
			in wc	12,0	12,0
Air filter type	Single stage paper cartridge				
Air filter cleaning efficiency	%				
Heat rejection to exhaust at:	Standby Power		kW	109	121
			BTU/min	6199	6881
Exhaust gas temperature after turbine at:	Standby Power		°C	476	433
			°F	889	811
Max allowable back pressure in exhaust line			kPa	5	7
			In wc	20,1	28,1
Exhaust gas flow at:	Standby Power		m ³ /min	26,7	31,3
			cfm	943	1105

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Cooling system

		r/min	1500	1800
Heat rejection radiation from engine at:	Standby Power	kW	18	20
		BTU/min	1046	1115
Heat rejection to coolant at:	Standby Power	kW	78	85
		BTU/min	4424	4828
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	0,52	
		foot ²	5,60	
Radiator core thickness (std. size)		mm	60	
		in	2,36	
Fan diameter - standard cooling system		mm	546	
		in	21,50	
Fan diameter - tropical cooling system & dual speed rating		mm	596	
		in	23,46	
Fan power consumption - standard cooling system		kW	3,8	6,6
		hp	5	9
Fan power consumption - tropical cooling system & dual speed rating		kW	8,2	9,2
		hp	11	13
Fan drive ratio			1,73:1	
Coolant capacity,	engine	liter	9,8	
		US gal	2,59	
	std radiator with hoses	liter	14	
		US gal	3,70	
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	105	
		°F	221	
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			9360	150
	60			14100	150
1800 standard tropical	45			11160	150
	60			14040	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	