Technical data TAD721GE

General

In-line four stroke diesel engine with direct injection. Rotation direction, anti-clockwise viewed towards flywheel. Turbocharged, charge air cooled (CAC)

Number of cylinders			6
Displacement, total		litre in^3	7,15 436,3
Firing order			1-5-3-6-2-4
Bore		mm in	108 4,25
Stroke		mm in	130 5,12
Compression ratio			18,1
Dry weight * excluding cooling system	Engine only*	kg lb	785 1731
Wet weight * excluding cooling system	Engine only*	kg lb	826 1821

Performance		**r/min**	**1500**	**1800**
Standby Power	without fan	kW hp	183 249	204,0 277
	with fan	kW hp	179 243	197 268
Prime Power	without fan	kW hp	166 226	186 253
	with fan	kW hp	162 220	179 243
Continuous Power	without fan	kW hp	151 205	169 230
	with fan	kW hp	147 200	162 220
Torque at rated speed:	Standby Power	Nm lbft	1165 859	1082 798
	Prime Power	Nm lbft	1057 779	987 728
	Continuous Power	Nm lbft	961 709	897 661
Mean piston speed		m/s ft/sec	6,5 21,4	7,8 25,7
Effective mean pressure at:	Standby Power	MPa psi	2,0 290	1,9 276
Effective mean pressure at:	Prime Power	MPa psi	1,9 276	1,7 247
Effective mean pressure at:	Continuous Power	MPa psi	1,7 245	1,6 229
Max combustion pressure at:	Standby Power	MPa psi	14 2031	15,1 2190
Max combustion pressure at:	Prime Power	MPa psi	13,3 1929	14,1 2045
Max combustion pressure at:	Continuous Power	MPa psi	12,4 1798	13,1 1900
Total mass moment of inertia, J (mR2) (with flywheel 2,612 kgm²)		kgm^2 $lbft^2$	3,09 73,2	
Degree of irregularity at:	Standby Power		1:41	1:52
	Prime Power		1:45	1:57
	Continuous Power		1:49	1:63
Residual speed droop at load increase from 0 to 100%		%	adjustable	
Friction Power		kW hp	9 11,56	12 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)	103	104
	Standby Power	dB(A)	106	108
	Prime Power	dB(A)	105	108
	Continuous Power	dB(A)	105	108
Calculated sound pressure Lp at 1 m	No load	dB(A)	90	91
	Standby Power	dB(A)	92	95
	Prime Power	dB(A)	92	94
	Continuous Power	dB(A)	92	94

Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m	r/min	1500	1800
Standby Power	dB(A)	116	117
Prime Power	dB(A)	114	115
Continuous Power	dB(A)	114	115

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

Load (%)	Speed diff (%)		Recovery time (s)		Remaining load	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby	(%)	Prime	Standby	Prime	Standby
0-40	5,4	6,0	1,9	1,9	40-100	11,0		4,8	
0-50	6,7	7,4	2,0	2,1	50-100	8,6		4,1	
0-60	8,5	9,6	3,0	3,3	60-100	6,4		3,6	
0-75	13,0	16,4	4,2	4,4	75-100	3,6		2,3	
0-52	7,0		2,0		0-47		7,0		2,0
0-100									
100-0	9,4	9,4	1,9	1,9					

Single step load performance at 1800 rpm

Load (%)	Speed diff %		Recovery time (s)		Remaining load	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby	(%)	Prime	Standby	Prime	Standby
0-40	3,4	3,7	1,6	1,6	40-100	5,3		2,5	
0-50	4,0	4,6	1,6	1,8	50-100	4,4		2,4	
0-60	5,0	5,5	1,6	1,8	60-100	3,2		1,8	
0-75	6,2	7,9	2,0	2,2	75-100	2,0	2,3	1,2	2,6
0-80	7,0		2,0		0-73		7,0		2,0
0-100	12,0		3,6						
100-0	5,3	6,5	2,0	2,2					

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Cold start performance	r/min	1500	1800
Without cold start aid (heater flange)	°C	-15	-15
With cold start aid (heater flange)	°C	-30	-30

Derating

For applications 1000 m above the ocean an ECU with automatic derating sensor must be used. For applications with air ambient temperature up to 40°C no derating is necessary.

Altitude derating factor < 3000 m	% / m	4% / 500m
Altitude derating factor > 3000 m		6% / 500m
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	0,08 0,021	0,09 0,024
	Prime Power		liter/h US gal/h	0,08 0,021	0,09 0,024
	Continuous Power		liter/h US gal/h	0,08 0,021	0,09 0,024
Oil system capacity including filters			liter US gal	34 8,9	
Oil sump capacity:		max	liter US gal	31 8,1	
		min	liter US gal	24 6,2	
Oil change intervals/specifications	VDS-3*, 10W-40		h	500	
Engine angularity limits:		front up	°	10	
		front down	°	10	
		side tilt	°	10	
Oil pressure at rated speed			kPa psi	400 58	440 64
Oil pressure shut down switch setting			kPa psi	200 29	
Lubrication oil temperature:		max	°C °F	125 257	
Oil filter micron size			mm	0,012	

* See also general section in the sales guide

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Fuel system		**r/min**	**1500**	**1800**
Standby Power Specific fuel consumption at:	25%	g/kWh lb/hph	223 0,361	239 0,387
	50%	g/kWh lb/hph	205 0,332	208 0,337
	75%	g/kWh lb/hph	203 0,329	205 0,332
	100%	g/kWh lb/hph	205 0,332	208 0,337
Prime Power Specific fuel consumption at:	25%	g/kWh lb/hph	230 0,373	245 0,397
	50%	g/kWh lb/hph	207 0,336	210 0,340
	75%	g/kWh lb/hph	204 0,331	205 0,332
	100%	g/kWh lb/hph	204 0,331	205 0,332
Continuous Power Specific fuel consumption at:	25%	g/kWh lb/hph	243 0,394	264 0,428
	50%	g/kWh lb/hph	207 0,336	213 0,345
	75%	g/kWh lb/hph	203 0,329	206 0,334
	100%	g/kWh lb/hph	203 0,329	204 0,331
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 max suction head		m foot	1,5 4,9	
Feed pump pressure		kPa psi	500 72,5	
Fuel filter micron size		mm	0,005	
Prefilter / Water separator micron size		mm	0,010	
Governor type/make, standard		Heinzmann / EDC 4		
Injection pump type/make		PFW 1 P100 52007 / Bosch		
Injection timing std.		°B.T.D.C	4	

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Intake and exhaust system			**r/min**	**1500**	**1800**
Air consumption at:	Standby Power	27°C 81°F	m^3/min cfm	11,1 391	15 530
	Prime Power	27°C 81°F	m^3/min cfm	10,9 385	14,1 498
	Continuous Power	27°C 81°F	m^3/min cfm	10,6 374	13,8 487
Air intake restriction, clean filter(s)			kPa in wc	1,5 6,0	1,5 6,0
Max allowable air intake restriction			kPa in wc	3,5 14,1	3,5 14,1
Air filter type			Single stage paper cartridge		
Air filter cleaning efficiency			%	≥ 99,9	
Heat rejection to exhaust at:	Standby Power		kW BTU/min	143 8132	166 9440
	Prime Power		kW BTU/min	128 7279	149 8473
	Continuous Power		kW BTU/min	116 6597	134 7620
Exhaust gas temperature after turbine at:	Standby Power		°C °F	540 1004	494 921
	Prime Power		°C °F	527 981	473 883
	Continuous Power		°C °F	514 957	456 853
Max allowable back pressure in exhaust line			kPa In wc	5 20,1	7 28,1
Exhaust gas flow at:	Standby Power		m^3/min cfm	33,9 1197	41,1 1451
	Prime Power		m^3/min cfm	31,1 1098	37,4 1321
	Continuous Power		m^3/min cfm	28,6 1010	37,4 1321
Max allowable Comb. Air temp after CAC			°C °F	40 104	40 104
Max allowable pressure drop over CAC			kPa	10	10
Heat rejection to CAC			kW	31	44

Cooling system		**r/min**	**1500**	**1800**
Heat rejection radiation from engine at:	Standby Power	kW BTU/min	12 682	13 739
	Prime Power	kW BTU/min	11 626	12 682
	Continuous Power	kW BTU/min	10 569	11 626
Heat rejection to coolant at:	Standby Power	kW BTU/min	82 4663	93 5289
	Prime Power	kW BTU/min	75 4265	85 4834
	Continuous Power	kW BTU/min	68 3867	77 4379
Recommended coolant	Volvo coolant or Volvo anticorrosion additive together with clean fresh water			
Radiator cooling system type		Closed circuit		
Radiator core area (std. size)		m² foot²	0,716 7,71	
Radiator core thickness (std. size)		mm in	55 2,17	

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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	STANDBY POWER		PRIME POWER		Continuous Power	
		Air flow kg/s	External restriction Pa	Air flow kg/s	External restriction Pa	Air flow kg/s	External restriction Pa
1500	38	2,1	400				
	45			2,1	400		
	48	2,5	300				
	49					2,1	400
	54	3,0	200	2,5	300		
	56	3,1	150				
	57					2,5	300
	59			3,0	200		
	61	3,7	0	3,1	150		
	62					3,0	200
	64			3,7	0	3,1	150
	66						
	68					3,7	0
1800							
	50	3,2	400				
	54	3,5	300				
	55			3,2	400		
	57	3,8	200				
	58	4,0	150	3,5	300	3,2	400
	61			3,8	200	3,5	300
	62	4,5	0	4,0	150	3,2	400
	64					3,8	200
	65					4,0	150
	66			4,5	0		
	68					4,5	0

Electrical system		**r/min**	**1500**	**1800**
Voltage and type			24V / 1 polesystem	
Alternator:	make/output		Amp	Bosch / 55
	tacho output		Hz/alt. Rev	6
	drive ratio			1:4,07
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 gear			96
	starter motor			9
Cranking current at +20°C			Amp	400
Crank engine speed at 20°C			rpm	140
Starter motor battery capacity:	max		Ah	176
	min at +5°C		Ah	110
Inlet manifold heater (at 12 V / 24 V)			kW	2 / 3,6
Power relay for the manifold heater (at 12 V / 24 V)			Amp	150 / 120