

# Technical data TAD722GE

## 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		7,15
	in <sup>3</sup>		436,3
Firing order			1-5-3-6-2-4
Bore	mm		108
	in		4,25
Stroke	mm		130
	in		5,12
Compression ratio			18,1
Dry weight	Engine only, excluding cooling system	kg	785
		lb	1731
Wet weight	Engine only excluding cooling system	kg	826
		lb	1821

Performance		r/min	1500	1800
Standby Power	without fan	kW	201	224,9
		hp	273	306
	with fan	kW	197	218
		hp	268	296
Prime Power	without fan	kW	183	204
		hp	249	277
	with fan	kW	179	197
		hp	243	268
Continuous Power	without fan	kW	166	186
		hp	226	253
	with fan	kW	162	179
		hp	220	243
Torque at rated speed:	Standby Power	Nm	1280	1193
		lbft	944	880
	Prime Power	Nm	1165	1082
		lbft	859	798
	Continuous Power	Nm	1057	987
		lbft	779	728
Mean piston speed		m/s	6,5	7,8
		ft/sec	21,4	25,7
Effective mean pressure at:	Standby Power	MPa	2,3	2,1
		psi	328	309
Effective mean pressure at:	Prime Power	MPa	2,0	1,9
		psi	290	276
Effective mean pressure at:	Continuous Power	MPa	1,9	1,7
		psi	269	252
Max combustion pressure at:	Standby Power	MPa	14,9	19,1
		psi	2161	2770
Max combustion pressure at:	Prime Power	MPa	14	15,1
		psi	2031	2190
Max combustion pressure at:	Continuous Power	MPa	13,3	14,1
		psi	1929	2045
Total mass moment of inertia, J (mR2) (with flywheel 2,612 kgm <sup>2</sup> )		kgm <sup>2</sup>	3,09	
		lbft <sup>2</sup>	73,2	
Degree of irregularity at:	Standby Power		1:37	1:48
	Prime Power		1:41	1:52
	Continuous Power		1:45	1:57
Residual speed droop at load increase from 0 to 100%		%	adjustable	
Friction Power		kW	9	12
		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  $\pm 0.75$  dB(A)

		r/min	1500	1800
Measured sound power Lw	No load	dB(A)	103	104
	Standby Power	dB(A)	106	109
	Prime Power	dB(A)	106	108
	Continuous Power	dB(A)	105	108
Calculated sound pressure Lp at 1 m	No load	dB(A)	90	91
	Standby Power	dB(A)	93	95
	Prime Power	dB(A)	92	95
	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)	117	118
Prime Power		dB(A)	116	117
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	6,0	6,3	1,8	2,0	40-100	11,2	13,1	4,5	9,9
0-50	7,2	8,2	2,1	2,9	50-100	8,5	9,6	3,8	7,8
0-60	8,7	10,2	3,0	4,3	60-100	6,8	7,8	3,5	5,0
0-75	13,7	17,5	3,8	4,5	75-100	4,0	4,6	3,2	3,6
0-51	7,0		2,8		0-46		7,0		2,8
0-100									
100-0									

#### 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	3,8	4,1	1,2	1,4	40-100	5,4	6,7	2,1	7,0
0-50	4,5	5,1	1,6	1,7	50-100	4,8	5,8	1,9	6,8
0-60	5,6	6,2	1,8	2,2	60-100	3,6	4,4	1,8	4,1
0-75	7,3	7,5	2,1	2,5	75-100	2,4	3,5	1,7	3,6
0-73	7,0		1,9		0-66		7,0		1,9
0-100	14,3	18,3	3,5	9,1					
100-0	5,8	5,8	2,0	2,0					

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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	0,09	0,11
		US gal/h	0,024	0,029
	Prime Power	liter/h	0,08	0,09
		US gal/h	0,021	0,024
	Continuous Power	liter/h	0,08	0,09
		US gal/h	0,021	0,024
Oil system capacity including filters		liter	34	
Oil sump capacity:		US gal	8,9	
		max	liter	31
			US gal	8,1
		min	liter	24
		US gal	6,2	
Oil change intervals/specifications	VDS-3*, 10W-40	h	500	
Engine angularity limits:		front up	°	
		front down	°	
		side tilt	°	
Oil pressure at rated speed		kPa	400	440
		psi	58	64
Oil pressure shut down switch setting		kPa	200	
		psi	29	
Lubrication oil temperature:		max	°C	125
			°F	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	219 0,355	232 0,376
	50%	g/kWh lb/hph	205 0,332	207 0,336
	75%	g/kWh lb/hph	203 0,329	205 0,332
	100%	g/kWh lb/hph	208 0,337	213 0,345
Prime 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
Continuous 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
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	m <sup>3</sup> /min	12,7	15,9
		81°F	cfm	449	562
	Prime Power	27°C	m <sup>3</sup> /min	11,8	15
81°F		cfm	417	530	
Continuous Power	27°C	m <sup>3</sup> /min	10,9	14,1	
	81°F	cfm	385	498	
Air intake restriction, clean filter(s)		kPa	1,5	1,5	
		in wc	6,0	6,0	
Max allowable air intake restriction		kPa	3,5	3,5	
		in wc	14,1	14,1	
Air filter type		Single stage paper cartridge			
Air filter cleaning efficiency		%	≥ 99,9		
Heat rejection to exhaust at:	Standby Power	kW	160	178	
		BTU/min	9099	10123	
	Prime Power	kW	143	166	
BTU/min		8132	9440		
Continuous Power	kW	128	149		
	BTU/min	7279	8473		
Exhaust gas temperature after turbine at:	Standby Power	°C	557	520	
		°F	1035	968	
	Prime Power	°C	540	494	
°F		1004	921		
Continuous Power	°C	527	473		
	°F	981	883		
Max allowable back pressure in exhaust line		kPa	5	7	
		In wc	20,1	28,1	
Exhaust gas flow at:	Standby Power	m <sup>3</sup> /min	37,2	45,5	
		cfm	1314	1607	
	Prime Power	m <sup>3</sup> /min	33,9	41,1	
cfm		1197	1451		
Continuous Power	m <sup>3</sup> /min	31,1	37,4		
	cfm	1098	1321		
Max allowable comb. air temp after CAC		°C	40	40	
		°F	104	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	13	15
		BTU/min	739	853
	Prime Power	kW	12	13
BTU/min		682	739	
Continuous Power	kW	11	12	
	BTU/min	626	682	
Heat rejection to coolant at:	Standby Power	kW	91	103
		BTU/min	5147	5835
	Prime Power	kW	82	93
BTU/min		4686	5295	
Continuous Power	kW	75	85	
	BTU/min	4248	4811	
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 <sup>2</sup>	0,716	
		foot <sup>2</sup>	7,71	
Radiator core thickness (std. size)		mm	55	
		in	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 (LTP)		PRIME POWER (PRP)		Continuous Power (COP)	
		Air flow kg/s	External restriction Pa	Air flow kg/s	External restriction Pa	Air flow kg/s	External restriction Pa
1500	—	2,1	400				
	38			2,1	400		
	42	2,5	300				
	45					2,1	400
	48	3,0	200	2,5	300		
	51	3,1	150				
	54			3,0	200	2,5	300
	56			3,1	150		
	57	3,7	0				
	59					3,0	200
	61			3,7	0	3,1	150
66					3,7	0	
1800	44	3,2	400				
	48	3,5	300				
	50			3,2	400		
	52	3,8	200				
	53	4,0	150				
	54			3,5	300		
	55					3,2	400
	57			3,8	200		
	58	4,5	0	4,0	150	3,5	300
	61					3,8	200
	62			4,5	0	4,0	150
66					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	