

Technical data TAD733GE

With mounted radiator

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	Engine only	kg lb	710 1565
	Engine and cooling package	kg lb	900 1984
Wet weight	Engine only	kg lb	751 1656
	Engine and cooling package	kg lb	968 2134

Performance

		r/min	1500	1800
Standby Power	without fan	kW	201	224,9
		hp	273	306
	with fan	kW	194	213
		hp	264	289
Prime Power	without fan	kW	181	202
		hp	246	275
	with fan	kW	174	190
		hp	236	258
Torque at rated speed:	Standby Power	Nm lbft	1280 944	1193 880
	Prime Power	Nm lbft	1152 849	1074 792
Mean piston speed		m/s ft/sec	6,5 21,4	7,8 25,7
Effective mean pressure at:	Standby Power	MPa psi	2,2 326	2,1 304
		Prime Power	MPa psi	2,0 294
Max combustion pressure at:	Standby Power		MPa psi	14,9 2161
		Prime Power	MPa psi	14 2031
Total mass moment of inertia, J (mR2) (with flywheel 2,612 kgm ²)			kgm ² lbft ²	3,09 73,2
Degree of irregularity at:	Standby Power		1:37	1:48
	Prime Power		1:41	1:52
Residual speed droop at load increase from 0 to 100%		%	adjustable	
Friction Power		kW hp	8,5 11,6	12,3 16,7

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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	109
	Prime Power	dB(A)	106	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

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

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

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

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
Oil system capacity including filters		liter	34	
		US gal	8,9	
Oil sump capacity:	max	liter	31	
		US gal	8,1	
	min	liter	24	
		US gal	6,2	
Oil change intervals/specifications:				
Closed crankcase ventilation	ACEA: E4. API: CH-4, CI-4* full synthetic	h	500	
Open crankcase ventilation	VDS-2. ACEA: E3, E5. API: CG-4, CH-4*	h	500	
Open crankcase ventilation	VDS. ACEA: E2. API: CF, CF-4*	h	250	
Engine angularity limits:	front up	°	10	
	front down	°	10	
	side tilt	°	10	
Oil pressure at rated speed	kPa	480	520	
	psi	70	75	
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	228 0,370	238 0,386
	50%	g/kWh lb/hph	216 0,350	221 0,359
	75%	g/kWh lb/hph	215 0,348	220 0,357
	100%	g/kWh lb/hph	219 0,355	228 0,369
Prime Power Specific fuel consumption at:	25%	g/kWh lb/hph	228 0,369	245 0,397
	50%	g/kWh lb/hph	217 0,352	222 0,361
	75%	g/kWh lb/hph	214 0,347	220 0,357
	100%	g/kWh lb/hph	216 0,351	222 0,361
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	
Max allowable inlet fuel temp under operation conditions		°C °F	75 167	
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	2,5	

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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	12,43 439	15,76 557
	Prime Power	27°C 81°F	m ³ /min cfm	11,5 406	14,2 501
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	165 9383	202 11488
	Prime Power		kW BTU/min	142 8075	168 9554
Exhaust gas temperature after turbine at:	Standby Power		°C °F	530 986	530 986
	Prime Power		°C °F	510 950	509 948
Max allowable back pressure in exhaust line	Standby Power		kPa In wc	3 12,0	5 20,1
	Prime Power		kPa In wc	5 20,1	7 28,1
Exhaust gas flow at:	Standby Power		m ³ /min cfm	37,2 1314	44,4 1569
	Prime Power		m ³ /min cfm	31,8 1123	40,4 1428
Max allowable comb. air temp after CAC			°C °F	50 122	50 122
Max allowable pressure drop over CAC			kPa	15	15
Heat rejection to CAC	Standby Power		kW BTU/min	42 2388	50,9 2895
	Prime Power		kW BTU/min	37,8 2150	45,8 2605

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Cooling system		r/min	1500	1800
Heat rejection radiation from engine at:	Standby Power	kW	20	23
		BTU/min	1137	1308
	Prime Power	kW	19	22
		BTU/min	1081	1223
Heat rejection to coolant at:	Standby Power	kW	96,1	109,8
		BTU/min	5465	6244
	Prime Power	kW	86,5	98,6
		BTU/min	4919	5607
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		0,65	
	foot ²		7,00	
Radiator core thickness (std. size)	mm		55	
	in		2,17	
Intercooler core area (std. size)	m ²		0,414	
	foot ²		4,46	
Intercooler core thickness (std. size)	mm		50	
	in		1,97	
Fan diameter	mm		870	
	in		34,25	
Fan power consumption	kW		7,2	12,4
	hp		10	17
Fan drive ratio	1 : 0,8			
Coolant capacity,	engine	liter		9,8
		US gal		2,59
	std radiator with hoses	liter		28,6
		US gal		7,56
Coolant pump	drive/ratio		1 : 1,73	
Coolant flow with standard system	l/s		3,0	3,6
	US gal/s		0,79	0,95
Maximum external coolant system restriction, including piping	kPa		25	35
	in wc		100	141
Thermostat,	start to open	°C		87
		°F		189
	fully open	°C		102
		°F		216
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		105	
	°F		221	
Max. permissible cooling down of engine coolant by radiator	°C		8	
	°F		46	
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	STANDBY POWER (LTP)		PRIME POWER (PRP)	
		Air flow m³/s	External restriction Pa	Air flow m³/s	External restriction Pa
1500	61	3,9	0		
	55	3,3	150		
	53	3,1	200		
	48	2,7	300		
	41	2,4	400		
	64			3,9	0
	59			3,3	150
	57			3,1	200
	52			2,7	300
	46			2,4	400
1800	63	4,9	0		
	59	4,3	150		
	58	4,1	200		
	54	3,7	300		
	51	3,4	400		
	66			4,9	0
	62			4,3	150
	61			4,1	200
	58			3,7	300
	55			3,4	400

Electrical system

		r/min	1500	1800
Voltage and type		24V / 1 polesystem		
Alternator:	make/output	Amp	Iskra / 55	
	tacho output	Hz/alt. Rev	6	
	drive ratio		1:4,07	
Starter motor	make	Melco		
	type	M008T62471		
	kW	5,0		
Starter motor solenoid,	pull current	Amp	2	
	hold current	Amp	2	
Number of teeth on:	flywheel		129	
	cam gear		96	
	starter motor		10	
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	135	
	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	