

Technical data TAD730GE

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 in ³	7.15 436.0
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 and cooling package	kg lb	760 1676
Wet weight	Engine and cooling package	kg lb	804 1773
	SAE3	kg lb	-36 -79

Performance

		r/min	1500	1800
Standby Power	without fan	kW hp	129 175	136 185
	with fan high temp cooling	kW hp	124 169	127 173
Prime Power	without fan	kW hp	116 158	122 166
	with fan high temp cooling	kW hp	111 151	113 154
Torque at:	Standby Power	Nm lbft	821 606	722 532
	Prime Power	Nm lbft	739 545	649 479
Mean piston speed		m/s ft/sec	6.5 21.4	7.8 25.7
Effective mean pressure at:	Standby Power	MPa psi	1.4 203	1.3 189
	Prime Power	MPa psi	1.3 189	1.1 160
Max combustion pressure at:	Prime Power	MPa psi	15.2 2205	15.5 2248
Total mass moment of inertia, J (mR ²)		kgm ² lbft ²	3.09 73.3	
Residual speed droop at load increase from 0 to 100%		%	≤ 5	
Friction Power		kW hp	8.5 11.56	12.3 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	4.5	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
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
0-60	4.0	4.5	1.0	1.5	60-100	2.5	2.5	1.0	2.0
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								

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Cold start performance)²

1500/1800

Cold start limit temperature	°C	-15
		-30*

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

Derating, mechanical governor

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 governor

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 governor.

Lubrication system

		r/min	1500	1800
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	
Engine angularity limits:	front up	°	30	
	front down	°	30	
	side tilt	°	30	
Oil pressure at rated speed		kPa	420	450
		psi	61	65
Oil pressure shut down switch setting		kPa	200	
		psi	29	
Lubrication oil temperature:	normal	°C	110	
		°F	230	
	max	°C	125	
		°F	257	
Oil filter micron size		mm	0.040	

* See also general information in Sales Support Tool

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Fuel system		r/min	1500	1800
Standby Power Specific fuel consumption at:	25%	g/kWh lb/hph	268 0.434	293 0.474
	50%	g/kWh lb/hph	227 0.368	236 0.383
	75%	g/kWh lb/hph	217 0.352	221 0.358
	100%	g/kWh lb/hph	215 0.348	217 0.352
Prime Power Specific fuel consumption at:	25%	g/kWh lb/hph	280 0.454	310 0.502
	50%	g/kWh lb/hph	231 0.374	242 0.392
	75%	g/kWh lb/hph	218 0.354	223 0.361
	100%	g/kWh lb/hph	215 0.348	218 0.353

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 US gal/h	360 95	450 119
Max allowed inlet fuel temperature	continuous	°C °F	70 158	
	temporarily	°C °F	125 257	
Feed pump pressure		kPa psi	480 70	550 80
Fuel supply line max. restriction (before fuel feed pump)		kPa psi	35 5	
Fuel supply line max. restriction (before fuel prefilter and manuel feed pump)		kPa psi	15 2	
Fuel supply line max. pressure, (before fuel feed pump)		kPa psi	20 3	
Fuel filter micron size		mm	0.005	
Prefilter / Water separator		mm	0.063	
Governor type/make, standard		Heinzman / EDC4		
Injection pump type/make		PFM 1 P100 S 2005/Bosch		
Injection timing std.		°B.T.D.C	2	2

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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	9.4 332	11.64 411
	Prime Power	27°C 81°F	m ³ /min cfm	8.7 307	10.85 383
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			%	99.99	
Heat rejection to exhaust at:	Standby Power		kW BTU/min	111 6312	112 6369
	Prime Power		kW BTU/min	99 5630	100 5687
Exhaust gas temperature after turbine at:	Standby Power		°C °F	510 950	461 861
	Prime Power		°C °F	497 927	448 839
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	25.6 905	29.3 1034
	Prime Power		m ³ /min cfm	23.5 830	26.9 949
Heat rejection to CAC	Standby Power		kW BTU/min	18 1024	26 1479
	Prime Power		kW BTU/min	17 967	24 1365
Intercooler system		r/min	1500	1800	
Boost pressure			kPa in wc	110 442	125 502
Charge air temp after turbo compressor			°C °F	140 284	150 302
Max allowable comb. air temp after CAC			°C °F	50 122	
Max pressure droop over intercooler, incl. Piping			kPa In wc	15 60	

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Cooling system		r/min	1500	1800
Heat rejection radiation from engine at:	Standby Power	kW BTU/min	13 739	14 796
	Prime Power	kW BTU/min	13 739	14 796
Heat rejection to coolant at:	Standby Power	kW BTU/min	59 3355	64 3640
	Prime Power	kW BTU/min	53 3014	58 3298
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	0.44		
	foot ²	4.74		
Radiator core thickness (std. size) - low temp cooling package	mm	55		
	in	2.17		
Fan diameter - low temp cooling system	mm	546		
	in	21.50		
Fan diameter - high temp cooling system & dual speed rating	mm	596		
	in	23.46		
Fan power consumption - low temp cooling system	kW	3.8	6.6	
	hp	5	9	
Fan power consumption - high temp cooling system & dual speed rating	kW	5	8.7	
	hp	7	12	
Fan drive ratio	1,73:1			
Coolant capacity	engine	liter	9.8	
		US gal	2.59	
	radiator with hoses	liter	14	
		US gal	3.70	
Coolant pump	drive/ratio	1,73:1		
Coolant flow	l/s	2.9	3.6	
	US gal/s	0.77	0.95	
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	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	PRIME POWER		STANDBY POWER		
		Air flow m ³ /s	External restriction Pa	Air flow m ³ /s	External restriction Pa	
1500	low temp	63	2.5	0		
		58	2.1	150		
		56	2.0	200		
		51	1.7	300		
		44	1.5	400		
	high temp	66	2.9	0		
		63	2.5	150		
		61	2.4	200		
		58	2.1	300		
		52	1.8	400		
	low temp	60			2.5	0
		54			2.1	150
		52			2.0	200
		47			1.7	300
		40			1.5	400
high temp	63			2.9	0	
	60			2.5	150	
	58			2.4	200	
	54			2.1	300	
	49			1.8	400	
1800	low temp	64	3.1	0		
		61	2.8	150		
		60	2.6	200		
		57	2.4	300		
		54	2.2	400		
	high temp	67	3.6	0		
		65	3.3	150		
		64	3.2	200		
		62	2.9	300		
		60	2.7	400		
	low temp	61			3.1	0
		58			2.8	150
		57			2.6	200
		54			2.4	300
		51			2.2	400
high temp	65			3.6	0	
	62			3.3	150	
	61			3.2	200	
	60			2.9	300	
	57			2.7	400	

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Electrical system

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