Technical data TAD731GE

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	153 208	163 222
	with fan high temp	kW hp	148 201	154 210
Prime Power	without fan	kW hp	138 187	147 200
	with fan high temp	kW hp	133 180	138 188
Torque at:	Standby Power	Nm lbft	974 718	865 638
	Prime Power	Nm lbft	877 647	778 574
Mean piston speed		m/s ft/sec	6,5 21,4	7,8 25,7
Effective mean pressure at:	Standby Power	MPa psi	1,7 249	1,5 222
	Prime Power	MPa psi	1,5 223	1,4 199
Max combustion pressure at:	Prime Power	MPa psi	13,5 1958	13 1885
Total mass moment of inertia, J (mR2)		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

Technical data TAD731GE

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								

Technical data TAD731GE

Cold start performance)²		1500/1800
Cold start limit temperature	°C	-15
		-30*

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

Derating, mechanical governer
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 governer
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	0,10
		US gal/h	0,026	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	480 - 520	
		psi	70 - 75	
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 section in the sales guide

Technical data TAD731GE

Fuel system		r/min	1500	1800
Standby Power	25%	g/kWh	244	259
Specific fuel consumption at:		lb/hph	0,40	0,42
	50%	g/kWh	219	224
		lb/hph	0,36	0,36
	75%	g/kWh	215	218
		lb/hph	0,35	0,35
	100%	g/kWh	215	217
		lb/hph	0,35	0,35
Prime Power	25%	g/kWh	259	279
Specific fuel consumption at:		lb/hph	0,42	0,45
	50%	g/kWh	224	231
		lb/hph	0,36	0,37
	75%	g/kWh	216	220
		lb/hph	0,35	0,36
	100%	g/kWh	215	217
		lb/hph	0,35	0,35

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	480 - 550	
	psi	70 - 80	
Feed pump max suction head	m	1,5	
	foot	4,9	
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

Technical data TAD731GE

Intake and exhaust system			**r/min**	**1500**	**1800**
Air consumption at:	Standby Power	27°C	m^3/min	10,65	13,33
		81°F	cfm	376	471
	Prime Power	27°C	m^3/min	9,86	12,26
		81°F	cfm	348	433
Air intake restriction, clean filter(s)			kPa	1	1
			in wc	4,0	4,0
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			%	99,85	
Heat rejection to exhaust at:		Standby Power	kW	131	135
			BTU/min	7450	7677
		Prime Power	kW	117	121
			BTU/min	6654	6881
Exhaust gas temperature after turbine at:		Standby Power	°C	540	480
			°F	1004	896
		Prime Power	°C	520	471
			°F	968	879
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	30,2	34,2
			cfm	1065	1208
		Prime Power	m^3/min	27,5	31,3
			cfm	971	1105
Heat rejection to CAC		Standby Power	kW	24	33,7
			BTU/min	1365	1916
		Prime Power	kW	21,6	30,3
			BTU/min	1228	1723

Technical data TAD731GE

Cooling system			**r/min**	**1500**	**1800**
Heat rejection radiation from engine at:	Standby Power		kW	15	16
			BTU/min	853	910
	Prime Power		kW	14	15
			BTU/min	796	853
Heat rejection to coolant at:	Standby Power		kW	68	74
			BTU/min	3890	4180
	Prime Power		kW	62	66
			BTU/min	3509	3770
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) - low temp cooling package			mm	60	
			in	2,36	
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	
	std radiator with hoses		liter	14	
			US gal	3,70	
Coolant pump			drive/ratio	1,73:1	
Coolant flow with low temp system			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 on low temp 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				

Technical data TAD731GE

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	55	2,5	0		
low temp	49	2,1	150		
	47	2,0	200		
	41	1,7	300		
	33	1,5	400		
high temp	59	2,9	0		
	55	2,5	150		
	54	2,4	200		
	49	2,1	300		
	43	1,8	400		
low temp	52			2,5	0
	45			2,1	150
	43			2,0	200
	37			1,7	300
	28			1,5	400
high temp	56			2,9	0
	52			2,5	150
	50			2,4	200
	45			2,1	300
	39			1,8	400
1800	57	3,1	0		
low temp	54	2,8	150		
	52	2,6	200		
	49	2,4	300		
	46	2,2	400		
high temp	61	3,6	0		
	59	3,3	150		
	58	3,2	200		
	56	2,9	300		
	53	2,7	400		
low temp	54			3,1	0
	50			2,8	150
	49			2,6	200
	45			2,4	300
	42			2,2	400
high temp	58			3,6	0
	55			3,3	150
	54			3,2	200
	52			2,9	300
	49			2,7	400

Technical data TAD731GE

Electrical system		**r/min**	**1500**	**1800**
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	3,1	
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	