Technical data TAD1630GE Prime & Standby Power

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	16,12
	in^3	983,9
Firing order		1-5-3-6-2-4
Bore	mm	144
	in	5,67
Stroke	mm	165
	in	6,50
Compression ratio		15,0:1

Performance		**r/min**	**1500**	**1800**
Prime Power:	without fan	kW	407	450
		hp	554	612
	with fan	kW	400	438
		hp	544	596
Standby Power:	without fan	kW	447	494
		hp	608	672
	with fan	kW	440	482
		hp	598	656
Torque at:	Prime Power	Nm	2591	2387
		lbft	1911	1761
	Standby Power	Nm	2846	2621
		lbft	2099	1933
Mean piston speed		m/s	8,3	9,9
		ft/sec	27,1	32,6
Effective mean pressure at Prime Power		MPa	2,02	1,86
		psi	293	270
Max combustion pressure at Prime Power		MPa	15,0	15,5
		psi	2176	2248
Total mass moment of inertia, J (mR2)		kgm^2	4,22	
		$lbft^2$	100,1	
Degree of irregularity at Prime Power			1:60	1:135
Residual speed droop at load increase from 0 to 100%		%	5	
Friction Power		kW	40	54
		hp	54,4	73,44

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)	-	-
	Prime Power	dB(A)	113,9	116,1
	Standby Power	dB(A)	114,5	116,5
Calculated sound pressure Lp at 1 m	No load	dB(A)	-	-
	Prime Power	dB(A)	101,9	104,1
	Standby Power	dB(A)	102,5	104,5

Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m	**r/min**	**1500**	**1800**
Prime Power	dB(A)	115	119
Standby Power	dB(A)	115	119

Technical data TAD1630GE Prime & Standby Power

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
0-20	2,4	2,4	0,9	0,9	20-100	>16	>16	5,0	14,0
0-40	4,4	4,4	1,1	1,1	40-100	12,6	>16	3,2	10,0
0-60	6,8	8,4	1,6	2,0	60-100	5,6	10,8	2,4	8,6
0-63		10,0		2,2	63-100		10,8		13,2
0-69	10,0		2,2		69-100	4,4		1,8	
0-80	>16	>16	4,2	5,0	80-100	2,8	4,4	1,2	5,4
0-100	>16	>16	5,6	8,0					
100-0	9,6	10,4	1,0	1,1					

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
0-20	2,0	2,0	1,2	1,2	20-100	12,3	>16	2,8	13,3
0-40	3,7	4,0	1,3	1,3	40-100	6,3	10,7	2,2	8,7
0-60	5,5	6,2	1,4	1,4	60-100	4,2	6,0	1,0	5,2
0-75		10,0			75-100		3,3		4,0
0-80	10,0	12,3	2,3	2,6	80-100	2,3	2,7	1,2	2,4
0-100	>16		4,8						
100-0	7,7	8,5	1,2	1,2					

Cold start performance			**r/min**	**1500**	**1800**
Time from start to no load speed at ambient temperature:	°C	20	s	4,0	6,0
		0	s	7,0	7,0
			s		
Time from start to stay within 0.8% of no load speed at ambient temperature:	°C	20	s	4,0	6,0
		0	s	7,0	7,0
			s		

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

Technical data TAD1630GE Prime & Standby Power

Derating

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:

	r/min	1500	1800
Altitude derating factor < 3000 m	% / m	4 / 500	
Altitude derating factor > 3000 m	% / m	6 / 500	
Ambient temperature derating factor	% / °C	1,5 / 5°C	
Humidity	%	No derating	

Lubrication system			r/min	1500	1800
Lubricating oil consumption	Prime Power		liter/h	0,11	0,17
			US gal/h	0,029	0,045
	Standby Power		liter/h	0,18	0,21
			US gal/h	0,048	0,055
Oil system capacity including filters			liter	64	
			US gal	16,9	
Oil sump capacity:		max	liter	57	
			US gal	15,1	
		min	liter	40	
			US gal	10,6	
Oil change intervals/specifications:					
	VDS-2*		h	600	
	VDS, ACEA, E3*		h	400	
	ACEA E2, API CD, CF, CF-4, CG-4*		h	200	
Engine angularity limits:		front up	degrees	15	
		front down	°	15	
		side tilt	°	10	
Oil pressure at rated speed			kPa	300-500	
Oil pressure shut down switch setting			kPa	70	
Lubrication oil temperature:		normal	°C	105	
			°F	221	
		max	°C	120	
			°F	248	
Oil filter micron size			mm	0,040	

* See also general section in the sales guide

Technical data TAD1630GE Prime & Standby Power

Fuel system		**r/min**	**1500**	**1800**
Prime Power. Specific fuel consumption at:	25%	g/kWh	238	251
		lb/hph	0,386	0,407
	50%	g/kWh	210	215
		lb/hph	0,340	0,349
	75%	g/kWh	202	208
		lb/hph	0,327	0,337
	100%	g/kWh	209	213
		lb/hph	0,339	0,345
Standby Power. Specific fuel consumption at:	25%	g/kWh	235	244
		lb/hph	0,381	0,396
	50%	g/kWh	202	213
		lb/hph	0,327	0,345
	75%	g/kWh	204	210
		lb/hph	0,331	0,340
	100%	g/kWh	216	220
		lb/hph	0,350	0,357
Recommended fuel to conform to		ASTM-D975-No1 and 2-D JIS KK 2204, EN 590		
Total fuel flow		liter/h	145	165
		US gal/h	38	44
Feed pump pressure		kPa	100-150	
Feed pump max suction head		m	2	
Fuel filter micron size		mm	0,008	
Prefilter / Water separator		mm		
Governor type/make, standard		Electronic/GAC		
Injection pump type/make		P 7000/Bosch		
Injection timing std.		°B.T.D.C	19	21
Injection timing		°B.T.D.C		

Intake and exhaust system			**r/min**	**1500**	**1800**
Air consumption:	Prime Power at:	27°C	m^3/min	32	39,1
		81°F	cfm	1130	1381
	Standby Power at:	27°C	m^3/min	34,8	41,7
		81°F	cfm	1229	1473
Air intake restriction, clean filter(s)			kPa	1,3	1,8
			in wc	5,2	7,2
Max allowable air intake restriction			kPa	5	5
			in wc	20,1	20,1
Air filter type			Single stage paper cartridge		
Air filter cleaning efficiency			%	99,85	
Heat rejection to exhaust at:		Prime Power	kW	354	399
			BTU/min	20132	22691
		Standby Power	kW	405	454
			BTU/min	23032	25819
Exhaust gas temperature after turbine at:		Prime Power	°C	490	455
			°F	914	851
		Standby Power	°C	510	490
			°F	950	914
Max allowable back pressure in exhaust line			kPa	5	7
			In wc	20,1	28,1
Exhaust gas flow at:		Prime Power	m^3/min	81,7	91,5
			cfm	2885	3231
		Standby Power	m^3/min	90,3	101,3
			cfm	3189	3577

Technical data TAD1630GE Prime & Standby Power

Cooling system		**r/min**	**1500**	**1800**
Heat rejection radiation from engine at:	Prime Power	kW	24	27
		BTU/min	1365	1535
	Standby Power	kW	27	30
		BTU/min	1535	1706
Heat rejection to coolant at:	Prime Power	kW	179	204
		BTU/min	10180	11601
	Standby Power	kW	188	224
		BTU/min	10691	12739
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	1,1	
		foot²	11,84	
Radiator core thickness (std. size)		mm	73	
		in	2,87	
Intercooler core area (std. Size)		m²	0,9	
		foot²	9,69	
Intercooler core thickness (std. Size)		mm	68	
		in	2,68	
Fan diameter		mm	890	
		in	35,04	
Fan power consumption		kW	7	12
		hp	10	16
Fan drive ratio			0,86:1	
Coolant capacity,	engine	liter	35	
		US gal	9,25	
	std radiator with hoses	liter	25	
		US gal	6,60	
Coolant pump		drive/ratio	gear/1,48:1	
Coolant flow with standard system		l/s	8,7	10,5
		US gal/s	2,30	2,77
Minimum coolant flow		l/s	8,3	10,0
		US gal/s	2,19	2,64
Maximum external coolant system restrictions		kPa	30	50
		in wc	121	201
Thermostat,	start to open	°C	86	
		°F	187	
	fully open	°C	96	
		°F	205	
Maximum static pressure head		kPa	50	
		in wc	201	
Pressure cap setting on standard radiator		kPa	70	
		in wc	281	
Maximum top tank temperature		°C	103	
		°F	217	
Minimum temperature entering engine		°C	68	

Technical data TAD1630GE Prime & Standby Power

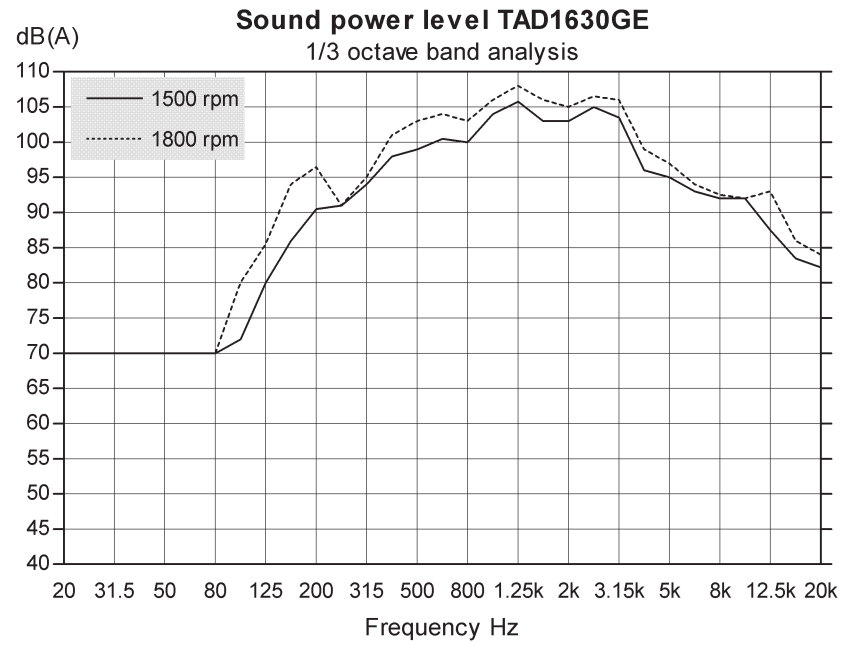
Cooling performance

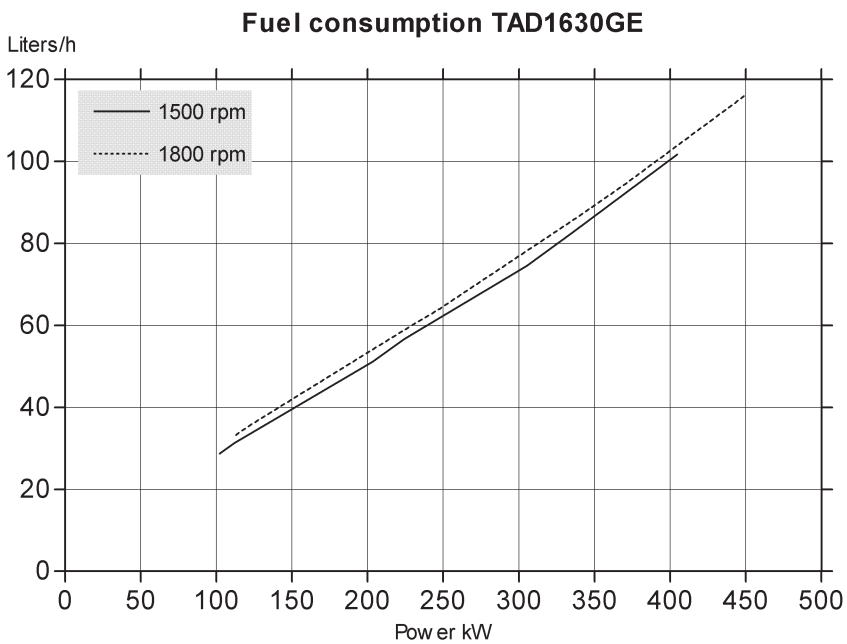
Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 103°C TTT and 50% antifreeze (radiator and cooling fan, see optional equipment)

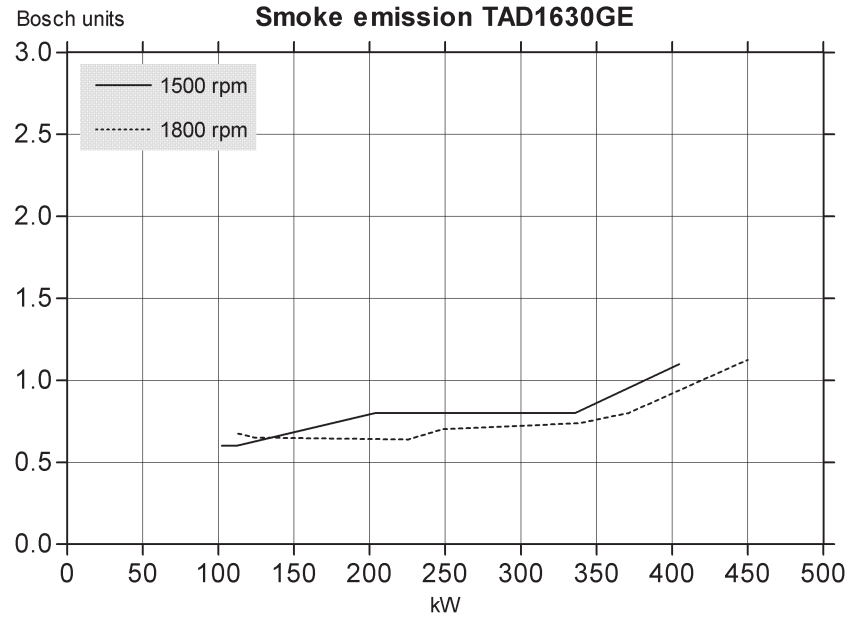
Engine speed rpm	Air on temp °C	110% OF PRIME POWER		STANDBY POWER	
		Air flow m^3/s	Max additional external restriction Pa	Air flow m^3/s	Max additional ext. restriction Pa
1500	30	4,80	675	4,80	675
	40	6,30	450	6,30	450
	57	7,90	0	7,90	0
1800	30	6,40	800	6,40	800
	40	8,20	450	8,20	450
	56	9,40	0	9,40	0

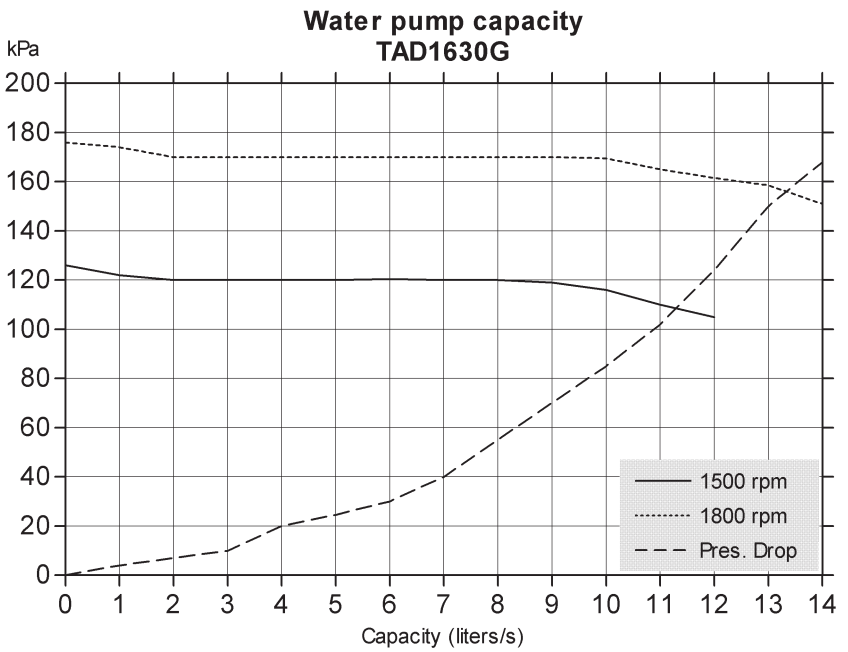
Electrical system		**r/min**	**1500**	**1800**
Voltage and type		24V / insulated from earth		
Alternator:	make/output	Amp	Valeo/60	
	tacho output	Hz/alt. Rev	6	
	drive ratio		4,06:1	
Starter motor		make	Bosch	
		type	KE	
		kW	7,5	
Starter motor solenoid,	pull current	Amp	51	
	hold current	Amp	7	
Number of teeth on:	flywheel		153	
	starter motor		12	
Inrush current at +20°C		Amp	950	
Cranking current at +20°C		Amp	400	
Crank engine speed at 20°C		rpm	200	
Starter motor battery capacity:	max	Ah	2x176	
	min at +5°C	Ah	2x110	
Stop solenoid,	pull current	Amp	-	
	hold current	Amp	-	
Inlet manifold heater (at 20 V)		kW	4,0	
Power relay for the manifold heater		Amp	1	

Power take off		**r/min**	**1500**	**1800**
Front end in line with crank shaft max:		Nm	-	
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW	-	-
	max down	kW	-	-
	max right	kW	-	-
Timing gear at compressor PTO max:		Nm	130	
Speed ratio direction of rotation viewed from flywheel side		1,12:1/anti clockwise		
Timing gear at servo pump PTO max:		Nm	55	
Speed ratio direction of rotation viewed from flywheel side		1,68:1/anti clockwise		
Timing gear at hydraulic pump PTO max:		Nm		
Speed ratio direction of rotation viewed from flywheel side				


Sound power level TAD1630GE
1/3 octave band analysis
dB(A)
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
1500 rpm
1800 rpm
20
31.5
50
80
125
200
315
500
800
1.25k
2k
3.15k
5k
8k
12.5k
20k
Frequency Hz


Fuel consumption TAD1630GE
Liters/h
120
100
80
60
40
20
0
1500 rpm
1800 rpm
0
50
100
150
200
250
300
350
400
450
500
Pow er kW


Smoke emission TAD1630GE
Bosch units
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1500 rpm
1800 rpm
0
50
100
150
200
250
300
350
400
450
500
kW


Water pump capacity
TAD1630G
kPa
200
180
160
140
120
100
80
60
40
20
0
1500 rpm
1800 rpm
Pres. Drop
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Capacity (liters/s)