Technical data TAD1232GE

General

In-line four stroke diesel engine with direct injection		
Turbo charged and air to air intercooled		
Rotation direction, anti-clockwise viewed towards flywheel		
Number of cylinders	6	
Displacement, total	11.98 liter / 731 in^3	
Firing order	1-5-3-6-2-4	
Bore	130.17 mm / 5.12 in	
Stroke	150 mm / 5.91 in	
Compression ratio	14.0:1	
Dry weight	Engine only*) 1250 kg / 2756 lb	Gen Pac 1434 kg / 3162 lb
Wet weight	Engine only*) 1330 kg / 2933 lb	Gen Pac 1514 kg / 3338 lb

*) Including radiator and intercooler

TAD1232GE	**Speed, rpm**	**1500**	**1800**
Performance	Test no.	21000675/676	21000677/678
Prime Power			
without fan	kW / hp	330 / 449	352 /479
with fan	kW / hp	324 / 441	341 /464
Continuous Standby Power			
without fan	kW / hp	330 / 449	360 / 490
with fan	kW / hp	324 / 441	349 / 475
Standby Power			
without fan	kW / hp	363 / 494	392 / 533
with fan	kW / hp	356 / 481	381 / 518
Torque at			
Prime Power	Nm / lbft	2102 / 1550	1870 / 1380
Standby Power	Nm / lbft	2308 / 1700	2080 / 1530
Mean piston speed	m/s / ft/sec	7.5 / 24.6	9.0 / 29.5
Effective mean pressure at			
Prime Power	MPa / psi	2.20 / 319	1.96 /284
Max combustion pressure at			
Prime Power	MPa / psi	12.8 / 1860	13.8 / 2000
Total mass moment of inertia, J (mR^2)	kgm^2 / $lbft^2$	2.80 / 66.4	
Degree of irregularity at			
Prime Power		1:48	1:99
Residual speed droop at load increase from 0 to 100%	%	≤ 5	
Friction Power	kW	32	40
Engine noise emission			
Test standards: ISO 3744-1981 (E)			
sound power (without fan, intake and exhaust noise)			
Tolerance ± 0.75 dB(A)			
Measured sound power Lw			
No load	dB(A)	105.1	107.2
Prime Power	dB(A)	111.8	114.0
Standby Power	dB(A)	112.8	114.2
Calculated sound pressure Lp at 1 m			
No load	dB(A)	93.1	95.2
Prime Power	dB(A)	99.8	102.0
Standby Power	dB(A)	100.8	102.2
Unsilenced exhaust noise			
Data calculated as sound pressure Lp			
Assumed microphone distance 1 m			
Prime power	dB(A)	114	118
Standby power	dB(A)	114	118

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	St-by	Prime	St-by		Prime	St-by	Prime	St-by
0–20	2.1	2.1	0.7	0.8	20–100				
0–40	4.2	4.8	1.5	1.5	40–100	35	36	8.4	10.6
0–51		10.0		3.0	51–100				
0–56	10.0		3.1		56–100	16.6		4.6	
0–60	14.0	22	3.3	4.6	60–100	13.3	16	4.2	7.6
0–62	>15		3.6		62–100				
0–67			5.2		67–100				
0–78		43.4		8.0	78–100				
100–0	10.1	9.5	2.4	2.6					

Single step load performance at 1800 rpm

Load (%)	Speed diff (%)		Recovery time (s)		Remaining load (%)	Speed diff (%)		Recovery time (s)	
	Prime	St-by	Prime	St-by		Prime	St-by	Prime	St-by
0–20	1.1	1.7	0.9	0.8	20–100	25.0	30.8	6	7.6
0–40	2.3	3.3	1.4	0.8	40–100	13.2	16.8	5.1	6.5
0–60	5.9	10.0	2.4	2.8	60–100	4.8	7.4	3.4	4.9
0–64	8.0		2.9		64–100				
0–68	10.0		2.9		68–100				
100–0	7.6	7.6	1.4	1.4					

Prime= based on Prime Power rating St-by= based on Standby Power rating

TAD1232GE	Speed, rpm	1500	1800
Cold start performance			
Time from start to no load speed			
+20°C ambient temperature	s	5.0	5.0
+5°C ambient temperature	s	4.0	3.3
–15°C ambient temperature*	s	9.3	9.0
Time from start to stay within 0.8% of no load speed			
+20°C ambient temperature	s	6.1	5.6
+5°C ambient temperature	s	5.0	5.5
–15°C ambient temperature *	s	10.0	11.0

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

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:

Altitude derating factor <3000 m	4%/500 m
Altitude derating factor >3000 m	6%/500 m
Ambient temperature derating factor	1.5%/5°C
Humidity	No derating

TAD1232GE	Speed, rpm	1500	1800
Lubrication system			
Lubricating oil consumption at			
Prime Power	liter/h / US gal/h	0.18 / 0.048	0.21 / 0.055
Standby Power	liter/h / US gal/h	0.19 / 0.050	0.25 / 0.066
Recommended lubricating oil, see general section in this sales guide			
Oil system capacity including filters	liter / US gal	38 / 10.0	
Oil sump capacity			
max	liter / US gal	34 / 9.0	
min	liter / US gal	25 / 6.6	
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	20	
front down	degrees	28	
side tilt	degrees	40	
Oil pressure			
at rated speed	kPa	300–500	
shut down switch setting	kPa	70	
Lubrication oil temperature			
normal	°C	105	
max	°C	120	
Oil filter micron size	mm	0.040	

* See also general section in this sales guide

Fuel system			
Specific fuel consumption at			
25% of Prime Power	g/kWh / lb/hph	222 / 0.360	234 / 0.379
50% of Prime Power	g/kWh / lb/hph	206 / 0.334	210 / 0.341
75% of Prime Power	g/kWh / lb/hph	204 / 0.339	204 / 0.331
100% of Prime Power	g/kWh / lb/hph	208 / 0.337	206 / 0.334
Specific fuel consumption at			
25% of Standby Power	g/kWh / lb/hph	220 / 0.357	231 / 0.375
50% of Standby Power	g/kWh / lb/hph	205 / 0.332	207 / 0.336
75% of Standby Power	g/kWh / lb/hph	209 / 0.339	204 / 0.331
100% of Standby Power	g/kWh / lb/hph	210 / 0.341	210 / 0.341
Recommended fuel to conform to		ASTM-D975-No1-D and 2-D JIS KK 2204, EN 590	
Total fuel flow	liter/h	145	165
Feed pump pressure	kPa	100–150	
Feed pump max suction head	m	2	
Fuel filter micron size	mm	0.008	
Governor type/make, standard		Electronic/GAC	
Injection pump type/make		P7000/Bosch	
Injection timing	°B.T.D.C.	12	15
Intake and exhaust system			
Air consumption at			
Prime Power, (at 27°C)	m^3/min / cfm	22.3 / 790	26.8 / 950
Standby Power, (at 27°C)	m^3/min / cfm	24.9 / 880	29.1 / 1030
Air intake restriction, clean filter(s)	kPa / In wc	0.6 / 2.4	0.9 / 3.6
Max allowable air intake restriction	kPa / In wc	5 / 20.1	5 / 20.1
Air filter type		single stage paper cartridge	
Air filter cleaning efficiency	%	99.85	
Heat rejection to exhaust at			
Prime Power	kW / BTU/min	292 / 16600	312 / 17700
Standby Power	kW / BTU/min	328 / 18600	359 / 20400
Exhaust gas temperature after turbine at			
Prime Power	°C / °F	575 / 1071	525 / 977
Standby Power	°C / °F	580 / 1072	540 / 1004
Max allowable back pressure in exhaust line	kPa / In wc	5 / 20.1	7 / 28.1
Exhaust gas flow at			
Prime Power	m^3/min / cfm	65.2 / 2302	71.5 / 2525
Standby Power	m^3/min / cfm	73.4 / 2592	79.7 / 2822

TAD1232GE	Speed, rpm	1500	1800
Cooling system			
Heat rejection radiation from engine at			
Prime Power	kW / BTU/min	20 / 1140	22 / 1250
Standby Power	kW / BTU/min	22 / 1250	23 / 1300
Heat rejection to coolant at			
Prime Power	kW / BTU/min	113 / 6420	113 / 6420
Standby Power	kW / BTU/min	120 / 6830	122 / 6940
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	1.10	
Radiator core thickness (std size)	mm	73	
Intercooler core area (std size)	m^2	0.90	
Intercooler core thickness (std size)	mm	68	
Fan diameter	mm	890	
Fan power consumption	kW / hp	6 / 8	11 / 15
Fan drive ratio		0.82:1	
Coolant capacity			
engine	liter	23	
std radiator with hoses	liter	25	
Coolant pump	drive/ratio	gear / 1.58:1	
Coolant flow with standard system	l/s	6.1	7.3
Minimum coolant flow	l/s	Not available	
Maximum external coolant system restriction	kPa	Not available	
Thermostat			
start to open	°C	86	
fully open	°C	96	
Maximum static pressure head	kPa	50	
Pressure cap setting on standard radiator (Gen Pac radiator)	kPa	70	
Maximum top tank temperature	°C	103	
Minimum temperature entering engine	°C	68	
Shutdown switch setting	°C	103	
Recommended drawdown capacity		10% of total cooling system capacity	

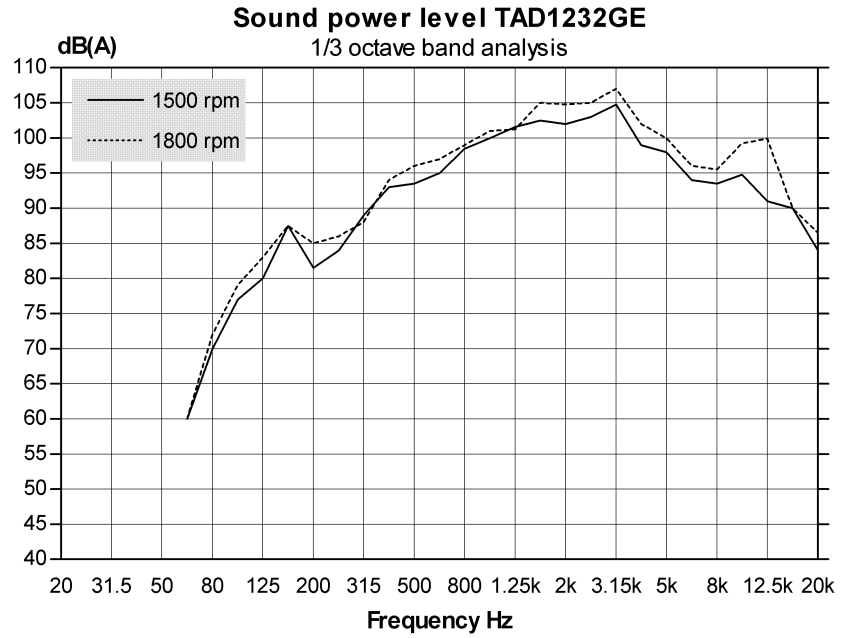
Cooling performance

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).

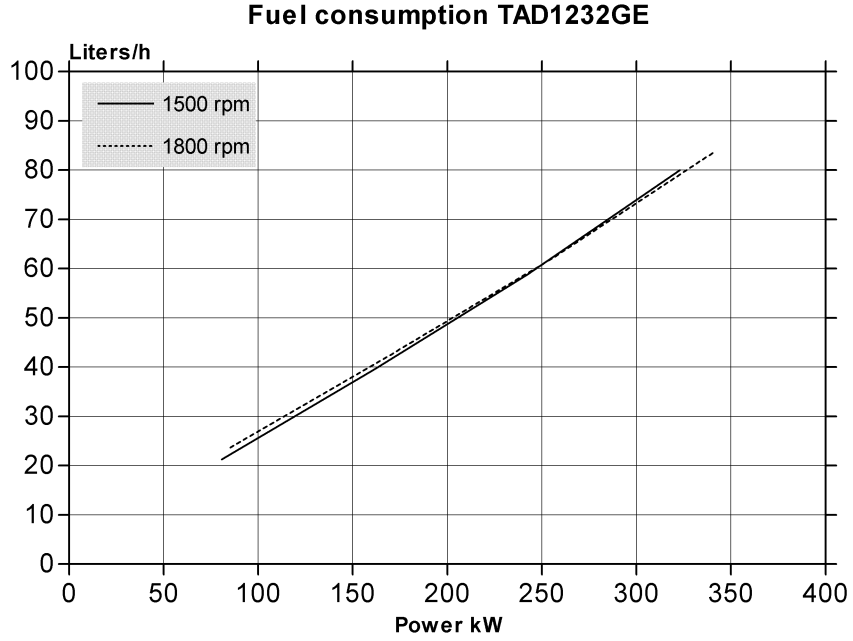
Engine speed	Air on temp	110% OF PRIME POWER Air flow	Max additional external restriction	STANDBY POWER Air flow	Max additional external restriction
rpm	°C	m^3/s	Pa	m^3/s	Pa
1500	30	2.8	1025		
	40	3.6	800		
	50	4.8	550		
	60	6.9	125		
	62	7.5	0		
1800	30	2.8	1550		
	40	3.7	1250		
	50	4.9	900		
	60	6.9	575		
	65	8.7	0		

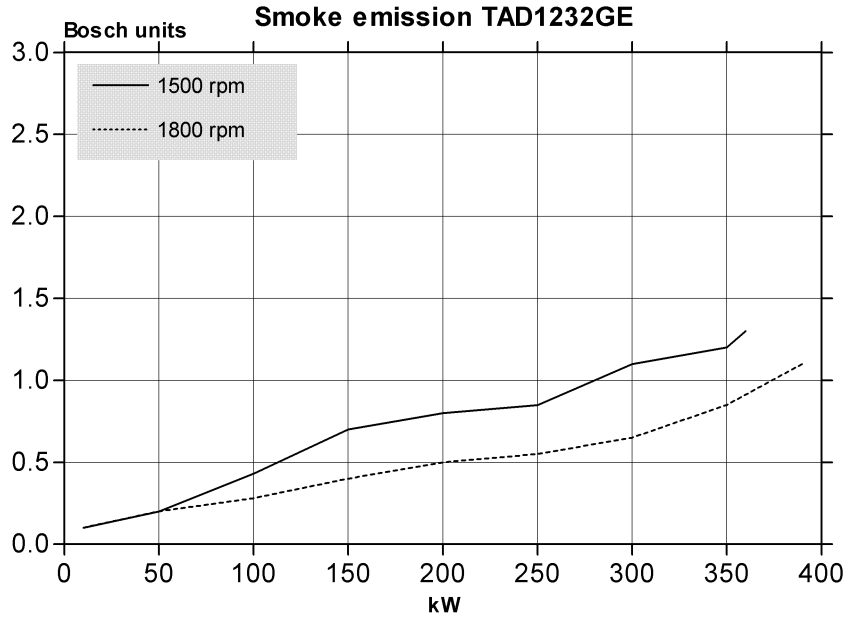
TAD1232GE	Speed, rpm	1500	1800
Electrical system			
Voltage and type		24 V/insulated from earth	
Alternator make/output	Amp	Valeo/60	
tacho output	Hz/alternator rev	6	
drive ratio		4.26:1	
Starter motor	make/type/kW	Bosch/KB/6.6	
Starter motor solenoid			
pull current	Amp	12	
hold current	Amp	6	
Number of teeth on flywheel		156	
Number of teeth on starter motor		11	
Inrush current at +20°C	Amp	900	
Cranking current at +20°C	Amp	380	
Crank engine speed at +20°C	rpm	200	
Starter motor battery capacity			
maximum	Ah	2x150	
minimum at >+5°C	Ah	2x105	
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			
Front end in line with crank shaft	Nm	max 590	
Front end belt pulley load:			
Direction of load viewed from flywheel side:			
left	kW	max 30	max 50
down	kW	max 19	max 31
right	kW	max 30	max 50
Timing gear at compressor PTO	Nm	max 100	
speed ratio direction of rotation viewed from flywheel side		0.91:1/clockwise	
Timing gear at servo pump PTO	Nm	max 35	
speed ratio direction of rotation viewed from flywheel side		1.58:1/clockwise	

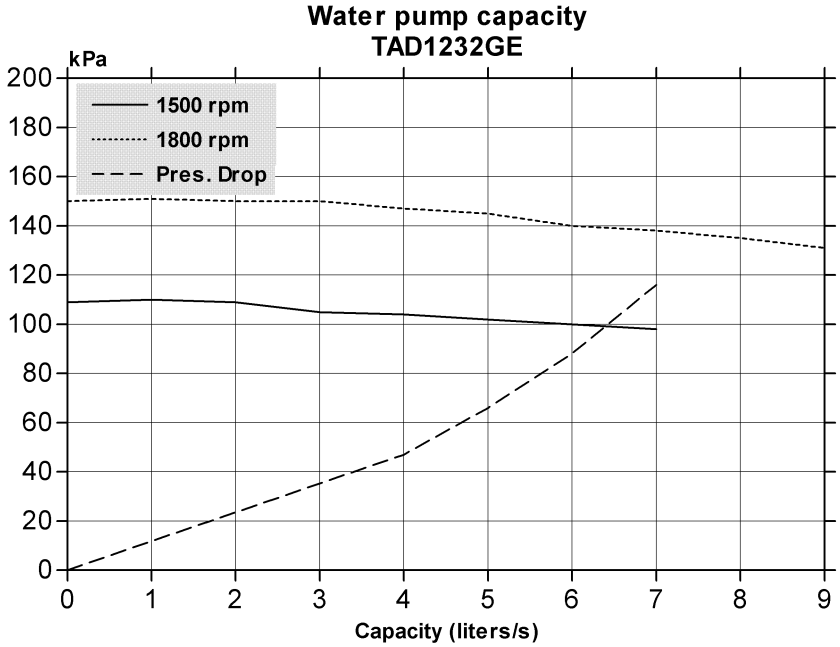
Test standards: ISO 3744-1981 (E) sound power (without fan, intake and exhaust noise)
Tolerance ± 0.75 dB(A)



Fuel consumption data is based on a diesel fuel with a calorific value of 42.7 MJ/kg (18360 BTU/pound) and a density of 0.84 kg/liter (7.01 lb/US gal.)




Smoke emission TAD1232GE
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
kW


Water pump capacity
TAD1232GE
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
Capacity (liters/s)