

# Technical data TAD740GE

## 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	7.28 liter / 445 in <sup>3</sup>	
Firing order	1-5-3-6-2-4	
Bore	107 mm / 4.21 in	
Stroke	135 mm / 5.31 in	
Compression ratio	17.2:1	
Dry weight	Engine only*) 901 kg / 1987 lb	GenPac 1128 kg / 2487 lb
Wet weight	Engine only*) 964 kg / 2126 lb	GenPac 1196 kg / 2637 lb

\*) Including radiator and intercooler

TAD740GE	Speed, rpm	1500	1800
<b>Performance</b>	Test no.	24001183	24001190
Prime Power			
without fan	kW / hp	225 / 306	236 / 321
with fan	kW / hp	220 / 299	228 / 310
Continuous Standby Power			
without fan	kW / hp	225 / 306	236 / 321
with fan	kW / hp	220 / 229	228 / 310
Standby Power			
without fan	kW / hp	247 / 336	259 / 352
with fan	kW / hp	242 / 329	251 / 341
Torque at			
Prime Power	Nm / lbft	1432 / 1056	1245 / 918
Standby Power	Nm / lbft	1572 / 1159	1374 / 1013
Mean piston speed	m/s / ft/sec	6.5 / 21.3	7.8 / 25.6
Effective mean pressure at			
Prime Power	MPa / psi	2.5 / 362	2.2 / 318
Max combustion pressure at Prime Power	MPa / psi	16.3 / 2360	15.8 / 2287
Total mass moment of inertia, J (mR <sup>2</sup> )	kgm <sup>2</sup> / lbft <sup>2</sup>		1.7 / 40.35
Residual speed droop at load increase from 0 to 100%	%	≤ 5	≤ 5
Friction Power	kW	17	24

## 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)	98.7	101.0
Prime Power	dB(A)	109.5	110.0
Standby Power	dB(A)	109.2	110.1

### Calculated sound pressure Lp at 1 m

No load	dB(A)	91.8	94.0
Prime Power	dB(A)	101.7	102.5
Standby Power	dB(A)	101.6	102.5

## Unsilenced exhaust noise

Data calculated as sound pressure Lp  
 Assumed microphone distance 1m

Prime power	dB(A)	112	116
Standby power	dB(A)	113	116

## 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	3.1	3.3	0.5	0.5	20-100	> 15	> 15	4.5	4.6
0-40	5.6	6.2	0.8	1.1	40-100	14.5	15.0	0.9	1.0
0-50		10.0		1.2					
0-55	10.0		1.9						
0-60	11.0	> 15	1.9	2.0	60-100	8.1	9.2	0.8	0.9
0-80	> 15	> 15	5.2	5.4	80-100	3.8	3.9	1.1	1.2
100-0	13.3	15.3	0.7	0.7					

### 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	1.6	2.0	0.4	0.4	20-100	14.6	> 15	0.9	1.0
0-40	3.1	3.4	0.6	0.6	40-100	8.0	8.9	0.8	0.8
0-60	7.9	8.3	0.8	1.0	60-100	4.0	4.2	0.7	0.8
0-64		10.0		1.0					
0-72	10.0		1.0						
0-80	14.7	> 15	1.2	1.4	80-100	1.5	1.7	0.4	0.5
100-0	7.6	8.9	0.7	0.8					

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

TAD740G	Speed, rpm	1500	1800
<b>Cold start performance</b>			
Time from start to no load speed			
+20°C ambient temperature	s	5.2	5.3
+5°C ambient temperature	s	7.2	5.8
-15°C ambient temperature*	s	9.0	9.9
Time from start to stay within 0.8% of no load speed			
+20°C ambient temperature	s	5.2	5.3
+5°C ambient temperature	s	7.2	5.8
-15°C ambient temperature*	s	9.0	9.9

\* 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

<b>TAD740GE</b>	<b>Speed, rpm</b>	<b>1500</b>	<b>1800</b>
<b>Lubrication system</b>			
Lubricating oil consumption at			
Prime Power	liter/h / US gal/	0.04 / 0.011	0.05 / 0.013
Standby Power	liter/h / US gal/h	0.05 / 0.013	0.06 / 0.016
Recommended lubricating oil, see general section in this sales guide			
Oil system capacity including filters	liter / US gal	29 / 7.7	
Oil sump capacity			
max	liter / US gal	24 / 6.3	
min	liter / US gal	16 / 4.2	
Oil change intervals			
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	16	
front down	degrees	40	
side tilt	degrees	40	
Oil pressure			
at rated speed	kPa	300–500	
shut down switch setting	kPa	70	
Lubrication oil temperature			
normal	°C	110	
max	°C	120	
Oil filter micron size	mm	0.040	

\* See also general section in this sales guide

<b>Fuel system</b>			
Specific fuel consumption at			
25% of Prime Power	g/kWh / lb/hph	227 / 0.368	230 / 0.373
50% of Prime Power	g/kWh / lb/hph	200 / 0.324	205 / 0.332
75% of Prime Power	g/kWh / lb/hph	198 / 0.321	199 / 0.323
100% of Prime Power	g/kWh / lb/hph	200 / 0.324	200 / 0.324
Specific fuel consumption at			
25% of Standby Power	g/kWh / lb/hph	219 / 0.355	230 / 0.373
50% of Standby Power	g/kWh / lb/hph	200 / 0.324	203 / 0.329
75% of Standby Power	g/kWh / lb/hph	198 / 0.321	199 / 0.323
100% of Standby Power	g/kWh / lb/hph	201 / 0.326	202 / 0.328
Recommended fuel to conform to		ASTM-D975-No1-D and 2-D JIS KK 2204, EN 590	
Total fuel flow	liter/h / US gal/h	110 / 29.0	125 / 33.0
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		P 3000 / Bosch	
Injection timing	° B.T.D.C.	10	12
<b>Intake and exhaust system</b>			
Air consumption at			
Prime Power, (at 27°C)	m <sup>3</sup> /min / cfm	14.7 / 519	17.6 / 622
Standby Power, (at 27°C)	m <sup>3</sup> /min / cfm	15.6 / 551	18.6 / 657
Air intake restriction, clean filter(s)	kPa / In wc	1.0 / 4.02	1.40 / 5.63
Max allowable air intake restriction	kPa / In wc	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	160 / 9099	164 / 9327
Standby Power	kW / BTU/min	180 / 10237	184 / 10464
Exhaust gas temperature after turbine at			
Prime Power	°C / °F	525 / 977	470 / 878
Standby Power	°C / °F	540 / 1004	485 / 905
Max allowable back-pressure in exhaust line	kPa / In wc	10 / 40	
Exhaust gas flow at			
Prime Power	m <sup>3</sup> /min / cfm	39.2 / 1384	43.0 / 1519
Standby Power	m <sup>3</sup> /min / cfm	41.8 / 1476	46.3 / 1635

<b>TAD740GE</b>	<b>Speed, rpm</b>	<b>1500</b>	<b>1800</b>
<b>Cooling system</b>			
Heat rejection radiation from engine at			
Prime Power	kW / BTU/min	13 / 737	13 / 737
Standby Power	kW / BTU/min	15 / 850	15 / 850
Heat rejection to coolant at			
Prime Power	kW / BTU/min	99 / 5630	99 / 5630
Standby Power	kW / BTU/min	106 / 6028	110 / 6256
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 <sup>2</sup>	0.80	
Radiator core thickness (std size)	mm	73	
Intercooler core area (std size)	m <sup>2</sup>	0.75	
Intercooler core thickness (std size)	mm	68	
Fan diameter	mm	750	
Fan power consumption	kW / hp	5 / 7	8 / 11
Fan drive ratio		1.01:1	
Coolant capacity			
engine	liter	15.9	
std radiator with hoses	liter	21	
Coolant pump	drive/ratio	gear / 1.30:1	
Coolant flow with standard system	l/s	3.4	4.1
Minimum coolant flow	l/s	3.2	3.9
Maximum external coolant system restriction	kPa	30	50
Thermostat			
starts to open	°C	75	
fully open	°C	88	
Maximum static pressure head	kPa	50	
Pressure cap setting on standard 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	

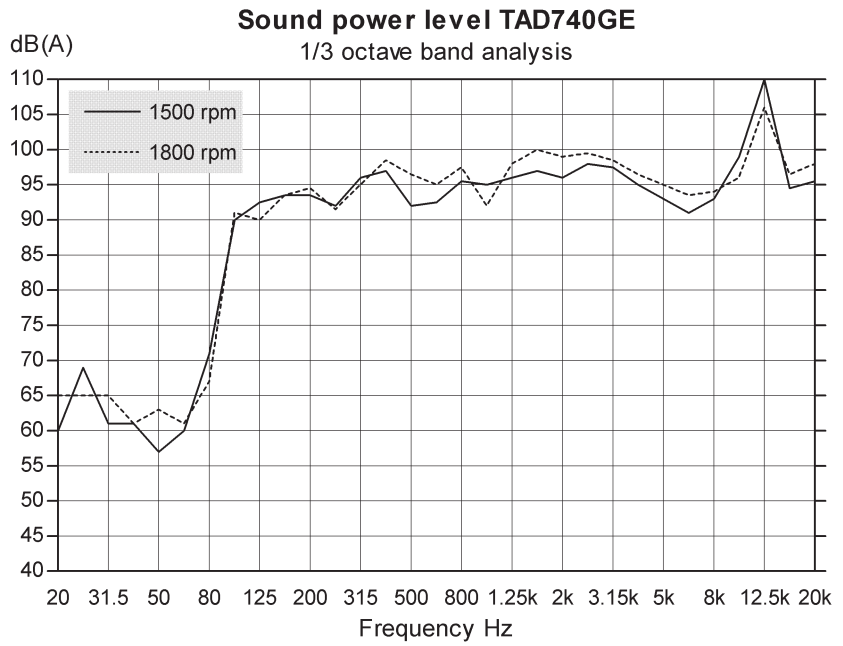
### Cooling performance

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 103°C TTT and 50% antifreeze.

Engine speed rpm	Air on temp °C	110% of PRIME POWER		STANDBY POWER	
		Air flow kg/s	Max additional external restriction Pa	Air flow kg/s	Max additional external restriction Pa
1500	40	2.7	480		
	45	3.0	360		
	50	3.4	240		
	55	3.9	65		
	57	4.1	0		
1800	40	3.1	740		
	45	3.5	580		
	50	3.9	390		
	55	4.5	160		
	58	4.9	0		

<b>TAD740GE</b>	<b>Speed, rpm</b>	<b>1500</b>	<b>1800</b>
<b>Electrical system</b>			
Voltage and type		24 V/insulated from earth	
Alternator make / output	Amp	Valeo / 60	
tacho output	Hz / alternator rev	6	
drive ratio		3.37:1	
Starter motor	make / type / kW	Bosch / KB / 5.4	
Starter motor solenoid			
pull current	Amp	12	
hold current	Amp	6	
Number of teeth on flywheel (SAE2 / SAE1)		140 / 156	
Number of teeth on starter motor (SAE2 / SAE1)		9 / 11	
Inrush current at +20°C	Amp	800	
Cranking current at +20°C	Amp	330	
Crank engine speed at +20°C	rpm	200	
Starter motor battery capacity			
maximum	Ah	2x143	
minimum at > +5°C	Ah	2x70	
Stop solenoid			
pull current	Amp	-	
hold current	Amp	-	
Inlet manifold heater (at 20 V)	kW	3.0	
Power relay for the manifold heater	Amp	1	
<b>Power take off</b>			
Front end in line with crank shaft	Nm	max 420	
Front end belt pulley load:			
Direction of load viewed from flywheel side:			
left	kW	max 16	max 22
down	kW	max 23	max 24
right	kW	max 12	max 21
Timing gear at compressor PTO	Nm	max 110	
speed ratio direction of rotation viewed from flywheel side		0.91:1 / clockwise	
Timing gear at servo pump PTO	Nm	max 38	
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  $\pm 0.75$  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.)

