

# Technical data TAD1242GE

## 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	12,13
	in <sup>3</sup>	740,2
Firing order		1-5-3-6-2-4
Bore	mm	131
	in	5,16
Stroke	mm	150
	in	5,91
Compression ratio		17,5:1

## Performance

		r/min	1500	1800
Prime Power:	without fan	kW	363	410
		hp	494	558
	with fan	kW	352	391
		hp	479	532
Standby Power:	without fan	kW	398	449
		hp	541	611
	with fan	kW	387	430
		hp	526	585
Torque at:	Prime Power	Nm	2311	2175
		lbft	1704	1604
	Standby Power	Nm	2534	2382
		lbft	1869	1757
Mean piston speed	m/s	7,5	9,0	
	ft/sec	24,7	29,6	
Effective mean pressure at Prime Power	MPa	2,39	2,25	
	psi	347	326	
Max combustion pressure at Prime Power	MPa	17,0	18,1	
	psi	2465	2625	
Total mass moment of inertia, J (mR <sup>2</sup> )	kgm <sup>2</sup>	3,75		
	lbft <sup>2</sup>	89,0		
Degree of irregularity at Prime Power		1:49	1:88	
Residual speed droop at load increase from 0 to 100%	%	0-8		
Friction Power	kW	24,5	36	

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## Engine noise emission

Test Standards: ISO 3744-1981 (E)

sound power (without fan, intake and exhaust noise)

Tolerans  $\pm 0.75$  dB(A)

		r/min	1500	1800
Measured sound power Lw	No load	dB(A)	105,3	106,6
	Prime Power	dB(A)	111,2	112,3
	Standby Power	dB(A)	110,8	111,5
Calculated sound pressure Lp at 1 m	No load	dB(A)	91,4	93,4
	Prime Power	dB(A)	98	98,7
	Standby Power	dB(A)	97,6	98,5

## Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m

		r/min	1500	1800
Prime Power		dB(A)	114	118
Standby Power		dB(A)	115	119

## 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	1,5	1,7	1,1	1,0	20-100	30,0	37,0	3,9	7,8
0-40	3,7	4,8	1,4	1,5	40-100	14,3	13,9	2,3	5,0
0-54	-	10,0	-	2,9	54-100	-	8,8	-	3,0
0-58	10,0	-	2,9	-	58-100	8,0	-	2,2	-
0-60	11,3	15,0	3,0	2,9	60-100	6,5	8,5	2,2	2,5
0-80	25,6	31,0	3,0	3,1	80-100	2,5	2,6	1,0	1,8
0-100	45,0	51,0	3,8	9,0					
100-0	9,8	10,0	2,4	2,4					

### 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	1,2	1,4	0,7	0,7	20-100	15,4	15,0	1,9	2,1
0-40	3,1	3,5	1,3	1,3	40-100	6,6	9,5	1,7	1,9
0-60	6,3	8,2	2,1	2,4	60-100	3,2	3,4	1,5	1,8
0-66	-	9,3	-	2,5	66-100	-	2,9	-	1,8
0-71	9,3	-	2,2	-	71-100	2,7	-	1,3	-
0-85	15,3	19,5	2,2	2,6	85-100	1,4	2,0	0,8	1,2
0-100	23,3	27,8	2,4	4,3					
100-0	7,7	7,7	2,4	2,4					

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## Cold start performance

		r/min	1500	1800	
Time from start to no load speed at ambient temperature:	°C	15	s	3,0	4,0
		0	s	3,2	4,1
		-15	s	10,9	12,0
Time from start to stay within 0.8% of no load speed at ambient temperature:	°C	15	s	4,2	4,9
		0	s	4,4	5,0
		-15	s	12,9	14,0

Without preheating or engine heater. Lubrication oil 15W/40

## Derating

The engine will operate up to 1100 m altitude without derating. For operation at higher altitudes the power will be derated according to the following factors:

	r/min	1500	1800
Altitude derating factor at 1100 m	%	0	0
Altitude derating factor at 5000 m	%	25	34
Ambient temperature derating factor	% / °C	No derating	
Humidity	%	No derating	

## Lubrication system

		r/min	1500	1800
Lubricating oil consumption	Prime Power	liter/h	0,12	0,14
		US gal/h	0,032	0,037
	Standby Power	liter/h	0,14	0,15
		US gal/h	0,037	0,040
Oil system capacity including filters		liter	35	
		US gal	9,2	
Oil sump capacity:	max	liter	31	
		US gal	8,2	
	min	liter	19	
		US gal	5,0	
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	°	11	
	front down	°	11	
	side tilt	°	11	
Oil pressure at rated speed		kPa	370-520	
Oil pressure shut down switch setting		kPa	250	
Lubrication oil temperature:	normal	°C	115	
	max	°C	130	
Oil filter micron size		mm	0,040	

\* See also general section in the sales guide

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Fuel system		r/min	1500	1800
<b>Prime Power.</b> Specific fuel consumption at:	25%	g/kWh lb/hph	215 0,349	225 0,365
	50%	g/kWh lb/hph	201 0,326	202 0,327
	75%	g/kWh lb/hph	198 0,321	199 0,323
	100%	g/kWh lb/hph	199 0,323	206 0,334
<b>Standby Power.</b> Specific fuel consumption at:	25%	g/kWh lb/hph	213 0,345	222 0,360
	50%	g/kWh lb/hph	199 0,323	201 0,326
	75%	g/kWh lb/hph	197 0,319	199 0,323
	100%	g/kWh lb/hph	202 0,327	212 0,344
Recommended fuel to conform to		ASTM-D975-No1 and 2-D JIS KK 2204, EN 590		
Total fuel flow		liter/h	130	150
Feed pump pressure		kPa	350	
Feed pump max suction head		m	2	
Fuel filter micron size		mm	0,005	
Governor type/make, standard		Electronic / EDCIII		
Injection pump type/make		-		
Injection timing std.		°B.T.D.C		
Injection timing		°B.T.D.C		

Intake and exhaust system			r/min	1500	1800
Air consumption at:	Prime Power	at 27°C	m³/min cfm	24 848	30 1059
	Standby Power	at 27°C	m³/min cfm	26 918	31 1095
Air intake restriction, clean filter(s)			kPa in wc	2 8,0	2 8,0
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	271 15411	324 18426
	Standby Power		kW BTU/min	306 17402	380 21610

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Exhaust gas temperature after turbine at:	Prime Power	°C	505	500
		°F	941	932
	Standby Power	°C	525	540
		°F	977	1004
Max allowable back pressure in exhaust line		kPa	10	10
		In wc	40,2	40,2
Exhaust gas flow at:	Prime Power	m³/min	64,0	80,0
		cfm	2260	2825
	Standby Power	m³/min	69,0	90,0
		cfm	2437	3178

## Cooling system

		r/min	1500	1800
Heat rejection radiation from engine at:	Prime Power	kW	18	21
		BTU/min	1024	1194
	Standby Power	kW	21	22
		BTU/min	1194	1251
Heat rejection to coolant at:	Prime Power	kW	136	161
		BTU/min	7734	9156
	Standby Power	kW	149	180
		BTU/min	8473	10236
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	0,8		
	foot²	8,61		
Radiator core thickness (std. size)	mm	50		
	in	1,97		
Intercooler core area (std. Size)	m²	0,89		
	foot²	9,58		
Intercooler core thickness (std. Size)	mm	68		
	in	2,68		
Fan diameter	mm	890		
	in	35,04		
Fan power consumption	kW	11	19	
	hp	15	26	
Fan drive ratio	1,08:1			
Coolant capacity,	engine	liter	20	
		US gal	5,28	
	std radiator with hoses	liter	24	
		US gal	6,34	
Coolant pump	drive/ratio	gear / 1.41:1		
Coolant flow with standard system	l/s	4,8	6	
	US gal/s	1,27	1,59	
Minimum coolant flow	l/s	4,6	5,7	
	US gal/s	1,22	1,51	

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Maximum external coolant system restriction		kPa	40	60
		in wc	161	241
Thermostat,	start to open	°C	82	
		°F	180	
	fully open	°C	95	
		°F	203	
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	
		°F	154	
Shutdown switch setting		°C	100	
		°F	212	
Recommended draw down 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 rpm	Air on temp °C	110% OF PRIME POWER		STANDBY POWER	
		Air flow m³/s	Max additional external restriction Pa	Air flow m³/s	Max additional ext. restriction Pa
1500	30	3,60	1565	3,60	1565
	40	4,50	1190	4,50	1190
	50	5,85	685	5,85	685
	55	6,75	435	6,75	435
	60	8,15	130	8,15	130
	61	8,50	0	8,50	0
1800	30	4,75	2130	4,75	2130
	40	5,90	1555	5,90	1555
	50	7,25	830	7,25	830
	55	9,05	475	9,05	475
	59	10,30	0	10,30	0

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<b>Electrical system</b>		<b>r/min</b>	<b>1500</b>	<b>1800</b>
Voltage and type		24V / insulated from earth		
Alternator:	make/output	Amp	Valeo / 60	
	tacho output	Hz/alt. Rev	6	
	drive ratio		3,41:1	
Starter motor	make		Bosch	
	type		GVB	
	kW		6,0	
Starter motor solenoid,	control current	Amp	< 2	
	hold current	Amp	-	
Number of teeth on:	flywheel		153	
	starter motor		12	
Inrush current at +20°C		Amp	1500-1650	
Cranking current at +20°C		Amp	400	
Crank engine speed at 20°C		rpm	200	
Starter motor battery capacity:	max	Ah	2x143 570A DIN	
	min at +5°C	Ah	2x88 400A DIN	
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	

<b>Power take off</b>		<b>r/min</b>	<b>1500</b>	<b>1800</b>
Front end in line with crank shaft max:		Nm	600	
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW	30	50
	max down	kW	19	31
	max right	kW	30	50
Timing gear at compressor PTO max:		Nm	140	
Speed ratio direction of rotation viewed from flywheel side			1,31:1/anti-clockwise	
Timing gear at servo pump PTO max:		Nm	40	
Speed ratio direction of rotation viewed from flywheel side			1.65:1/anti-clockwise	
Timing gear at hydraulic pump PTO max:		Nm	400	
Speed ratio direction of rotation viewed from flywheel side			0,97:1/anti-clockwise	