

Technical data TAD1241GE

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

Performance

		r/min	1500	1800
Prime Power:	without fan	kW hp	332 452	367 499
	with fan	kW hp	323 439	352 479
Standby Power:	without fan	kW hp	363 494	402 547
	with fan	kW hp	354 481	387 526
Torque at:	Prime Power	Nm lbft	2114 1559	1947 1436
	Standby Power	Nm lbft	2311 1704	2133 1573
Mean piston speed		m/s ft/sec	7,5 24,7	9,0 29,6
Effective mean pressure at Prime Power		MPa psi	2,19 318	1,97 286
Max combustion pressure at Prime Power		MPa psi	15,9 2306	16,7 2422
Total mass moment of inertia, J (mR2)		kgm ² lbft ²	3,75 89,0	
Degree of irregularity at Prime Power			1:55	1:1,05
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 ± 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	112,4
	Standby Power	dB(A)	111,5	112,4
Calculated sound pressure Lp at 1 m	No load	dB(A)	91,4	93,4
	Prime Power	dB(A)	97,6	99,3
	Standby Power	dB(A)	98	99,1

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)	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	Standby	Prime	Standby		Prime	Standby	Prime	Standby
0-20	1,4	1,5	1	1,1	20-100	21,5	30,0	3,7	6,2
0-40	3,1	3,7	1,3	1,5	40-100	7,6	14,3	2,2	4,5
0-58	-	10,0	-	2,5	58-100	-	8,0	-	2,5
0-60	9,1	11,3	2,4	2,8	60-100	5,6	6,5	2,1	2,3
0-63	10,0	-	2,5	-	63-100	4,8	-	2,1	-
0-80	20,2	25,6	2,8	3,0	80-100	2,4	2,5	1,0	1,3
0-100	33,6	45,0	3,4	3,5					
100-0	9,8	9,9	2,2	2,3					

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	1,0	1,2	0,7	0,8	20-100	9,5	10,2	1,8	2,0
0-40	2,6	3,0	1,2	1,2	40-100	4,6	5,1	1,6	1,8
0-60	4,8	5,8	1,8	2,1	60-100	2,8	3,2	1,4	1,7
0-72	-	10,0	-	2,2	72-100	-	2,4	-	1,6
0-80	9,4	11,8	2,2	2,5	80-100	1,6	1,8	1,1	1,3
0-100	16,4	20,3	2,4	4,0					
100-0	7,5	7,6	2,3	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 and temperatures 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	%	16	23
Ambient temperature derating factor	% / °C	No derating	
Humidity	%	No derating	

Lubrication system

		r/min	1500	1800
Lubricating oil consumption	Prime Power	liter/h	0,11	0,12
		US gal/h	0,029	0,032
	Standby Power	liter/h	0,12	0,13
		US gal/h	0,032	0,034
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	400-550	
Oil pressure shut down switch setting		kPa	250	
Lubrication oil temperature:	normal	°C	120	
	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
Prime Power. Specific fuel consumption at:	25%	g/kWh lb/hph	221 0,358	236 0,383
	50%	g/kWh lb/hph	202 0,327	206 0,334
	75%	g/kWh lb/hph	198 0,321	200 0,324
	100%	g/kWh lb/hph	198 0,321	202 0,327
Standby Power. Specific fuel consumption at:	25%	g/kWh lb/hph	217 0,352	227 0,368
	50%	g/kWh lb/hph	201 0,326	203 0,329
	75%	g/kWh lb/hph	198 0,321	200 0,324
	100%	g/kWh lb/hph	199 0,323	206 0,334
Recommended fuel to conform to		ASTM-D975-No1 and 2-D JIS KK 2204, EN 590		
Total fuel flow		liter/h	120	130
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		

Intake and exhaust system			r/min	1500	1800
Air consumption at:	Prime Power	at 27°C	m ³ /min cfm	23 812	28 989
	Standby Power	at 27°C	m ³ /min cfm	24 848	30 1059
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	250 14217	272 15468
	Standby Power		kW BTU/min	276 15696	324 18426
Exhaust gas temperature after turbine at:	Prime Power		°C °F	490 914	460 860
	Standby Power		°C °F	505 941	495 923
Max allowable back pressure in exhaust line			kPa In wc	10 40,2	10 40,2
Exhaust gas flow at:	Prime Power		m ³ /min cfm	58,0 2048	68,0 2401
	Standby Power		m ³ /min cfm	63,0 2225	74,0 2613

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Cooling system		r/min	1500	1800
Heat rejection radiation from engine at:	Prime Power	kW	17	18
		BTU/min	967	1024
	Standby Power	kW	18	21
		BTU/min	1024	1194
Heat rejection to coolant at:	Prime Power	kW	123	139
		BTU/min	6995	7905
	Standby Power	kW	131	153
		BTU/min	7450	8701
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	0,8		
	foot ²	8,61		
Radiator core thickness (std. size)	mm	50		
	in	1,97		
Intercooler core area (std. Size)	m ²	0,89		
	foot ²	9,58		
Intercooler core thickness (std. Size)	mm	68		
	in	2,68		
Fan diameter	mm	890		
	in	35,04		
Fan power consumption	kW	9	15	
	hp	12	20	
Fan drive ratio	1,0:1			
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	
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			

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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	3,10	1410	3,10	1410
	40	3,80	1125	3,80	1125
	50	4,85	725	4,85	725
	55	5,60	495	5,60	495
	60	6,60	260	6,60	260
	64	7,70	0	7,70	0
1800	30	3,60	2080	3,60	2080
	40	4,45	1680	4,45	1680
	50	5,75	1120	5,75	1120
	55	6,65	775	6,65	775
	60	7,85	455	7,85	455
	65	9,35	0	9,35	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		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		156	
	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	

Power take off

		r/min	1500	1800
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	