

VOLVO PENTA	Document No	Issue Index
TAD551GE	21813915	05

General

In-line four stroke diesel engine with direct injection. Rotation direction, anti-clockwise viewed towards flywheel.
Turbocharged

Number of cylinders			4
Displacement, total		litre in ³	4,76 290,7
Firing order			1342
Bore		mm in	108 4,25
Stroke		mm in	130 5,12
Compression ratio			18
Wet weight	Engine only	kg lb	560 1235
	Engine incl. cooling system and air filtration system	kg lb	660 1455
	Engine incl. cooling system, air filtration system, and frame	kg lb	

Performance

Performance		rpm	1500	1800				
Prime Power		without fan	kW hp	91 124	104 141			
		with fan	kW hp	89 120	100 135			
		Standby Power		without fan	kW hp	100 136	114 155	
				with fan	kW hp	98 133	110 149	
Torque at:				Prime Power		Nm lbft	581 428	551 407
				Standby Power		Nm lbft	639 471	606 447
		Mean piston speed		m/s ft/sec	6,5 21,4	7,8 25,7		
		Effective mean pressure at:		Prime Power		MPa psi	1,5 222	1,5 211
Standby Power				MPa psi	1,7 244	1,6 232		
Max combustion pressure at:		Prime Power		MPa psi	13,5 1958	13,1 1900		
Max combustion pressure at:		Standby Power		MPa psi	17,2 2495	16,2 2350		
Total mass moment of inertia, J (mR ²)		kgm ² lbft ²	1,43 33,9					
Friction Power		kW hp	13 17,68	17 23,664				
Derating see Technical Diagrams								

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Engine noise emission

Test Standards: ISO 3744-1981 (E) sound power (without fan, cooler, intake and exhaust noise)

Tolerance ± 0.75 dB(A)

		rpm	1500	1800
Measured sound power Lw	No load	dB(A)	97,8	100
	Prime Power	dB(A)	100,2	102,1
	Standby Power	dB(A)		
Calculated sound pressure Lp at 1 m	No load	dB(A)	84,3	86,5
	Prime Power	dB(A)	86,7	88,6
	Standby Power	dB(A)		

Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m

	rpm	1500	1800
Prime Power	dB(A)		
Standby Power	dB(A)		

Test conditions for load acceptance data

Warm engine.	Generator	Model	Type of AVR
	mecc alte	ECP 34-2S/4	

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	2,0	2,2	1,4	1,4	20-100	17,3	16,7	4,1	3,1
0-40	4,0	4,3	2,1	2,1	40-100	6,6	6,7	2,1	2,7
0-60	7,9	8,1	2,8	2,8	60-100	4,9	5,3	1,7	1,7
0-80	18,2	21,3	3,5	3,8	80-100	2,6	1,6	1,3	1,1
0-100	27,8	27,3	4,2	4,6					
100-0	10,1	10,8	1,7	1,9					

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	1,3	1,2	1,0	1,2	20-100	11,6	9,7	3,0	2,9
0-40	2,9	3,9	2,0	2,2	40-100	5,2	4,4	2,4	2,2
0-60	10,1	10,0	3,0	3,3	60-100	2,7	3,3	1,7	1,9
0-80	17,5	19,5	3,7	3,6	80-100	1,5	0,8	1,0	0,7
0-100	25,4	23,9	3,7	3,8					
100-0	8,3	9,2	1,5	1,7					

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Cold start performance

			rpm	1500	1800
Time from start to no load speed at ambient temperature:	°C	20	s		
		5	s		
		-15*	s		
		Min start temp*	s	-30,0	-30,0
Time from start to stay within 0.5% of no load speed at ambient temperature:	°C	20	s		
		5	s		
		-15*	s		

* With manifold heater 3,6 kW engaged, lubrication oil 15W/40 and block heater.

Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block

Lubrication system

Lubrication system			rpm	1500	1800
Lubricating oil consumption	Prime Power		litre/h	0,03	0,03
			US gal/h	0,008	0,008
	Standby Power		litre/h	0,03	0,03
			US gal/h	0,008	0,008
Oil system capacity including filters			litre	13	
			US gal	3,4	
Oil sump capacity:		max	litre	11	
			US gal	2,9	
		min	litre	7	
			US gal	1,8	
Oil change intervals/specifications:			h	250	
			h		
			h		
Engine angularity limits:		front up	°	30	
		front down	°	30	
		side tilt	°	30	
Oil pressure at rated speed			kPa	300 - 500	
			psi	44 - 73	
Lubrication oil temperature in oil sump:		max	°C	125	
			°F	257	
Oil filter micron size			μ	17	

* See also general section in the sales guide

Fuel system

			rpm	1500	1800
Prime Power Specific fuel consumption at:	25%		g/kWh	318	318
			lb/hph	0,515	0,515
	50%		g/kWh	284	282
			lb/hph	0,460	0,457
	75%		g/kWh	270	263
			lb/hph	0,438	0,426
	100%		g/kWh	244	233
			lb/hph	0,396	0,378
Standby Power Specific fuel consumption at:	25%		g/kWh	287	300
			lb/hph	0,465	0,486
	50%		g/kWh	247	281
			lb/hph	0,400	0,456
	75%		g/kWh	238	230
			lb/hph	0,386	0,373
	100%		g/kWh	211	206
			lb/hph	0,342	0,334

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Fuel system	rpm	1500	1800
Fuel to conform to	DIN EN590		
System supply flow at:	litre/h US gal/h	240 63,4	240 63,4
Fuel supply line max restriction (Measured at fuel inlet connection)	kPa psi	35 5,1	35 5,1
Fuel supply line max pressure, engine stopped	kPa psi	10 1,5	10 1,5
System return flow	litre/h US gal/h	240 63,4	240 63,4
Fuel return line max restriction (Measured at fuel return connection)	kPa psi	50 7,3	50 7,3
Maximum allowable inlet fuel temp (Measured at fuel inlet connection)	°C °F	70 158	70 158
Prefilter / Water separator micron size	μ	10	
Fuel filter micron size	μ	5	
Governor type/make, standard	EMS 2.2		
Injection pump type/make	Bosch PF45		

Intake and exhaust system			rpm	1500	1800
Air consumption at: (+25°C and 100kPa)	Prime Power		m ³ /min cfm	7,5 265	8,2 290
	Standby Power		m ³ /min cfm	8,5 300	9,4 332
Max allowable air intake restriction including piping			kPa psi	5 0,7	5 0,7
Air filter restriction clean Volvo Penta filter			kPa psi	3 0,4	3 0,4
Heat rejection to exhaust at:	Prime Power		kW BTU/min	88 5004	100 5687
	Standby Power		kW BTU/min	98 5573	111 6312
Exhaust gas temperature after turbine at:	Prime Power		°C °F	530 986	540 1004
	Standby Power		°C °F	619 1146	620 1148
Max allowable back pressure in exhaust line	Prime Power		kPa psi	7 1,0	7 1,0
	Standby Power		kPa psi	7 1,0	7 1,0
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	Prime Power		m ³ /min cfm	20,8 735	23,3 823
	Standby Power		m ³ /min cfm	21,4 756	24,1 851

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Cooling system		rpm	1500	1800
Heat rejection radiation from engine at:	Prime Power	kW	9	10
		BTU/min	512	569
	Standby Power	kW	12	14
		BTU/min	682	796
Heat rejection to coolant at:	Prime Power	kW	50	57
		BTU/min	2843	3253
	Standby Power	kW	56	67
		BTU/min	3185	3810
Coolant	Volvo Penta coolant "ready mix" or Volvo Penta coolant mixed with clean fresh water 40 / 60			
Radiator cooling system type	Closed circuit			
Standard radiator core area		m ²	0,45	
		foot ²	4,84	
Fan diameter		mm	596	
		in	23,46	
Fan power consumption		kW	2,6	4,4
		hp	4	6
Fan drive ratio			1,4:1	
Coolant capacity,	engine	litre	7,5	
		US gal	1,98	
	engine with std radiator and hoses	litre	22	
		US gal	5,81	
Coolant pump		drive/ratio	1,4:1	
Coolant flow with standard system		l/s	2,07	2,48
		US gal/s	0,55	0,66
Minimum coolant flow		l/s	1,7	2,0
		US gal/s	0,45	0,53
Maximum outer circuit restriction, including piping		kPa	25	35
		psi	3,6	5,1
Thermostat	start to open	°C	86	
		°F	187	
	fully open	°C	98	
		°F	208	
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa	70	
		psi	10,2	
Minimum static pressure head (expansion tank height + pressure cap setting)		kPa	50	
		psi	7,3	
Standard pressure cap setting		kPa	60	
		psi	8,7	
Maximum top tank temperature		°C	105	
		°F	221	
Draw down capacity. The difference between min coolant level in the expansion tank and the lowest level where the engine's coolant system still are functioning		litre		
		US gal		

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Charge air cooler system		rpm	1500	1800
Heat rejection to charge air cooler	Prime Power	kW	18,8	20,4
		BTU/min	1069	1160
	Standby Power	kW	21	23
		BTU/min	1194	1308
Charge air mass flow	Prime Power	kg/s	0,15	0,16
	Standby Power	kg/s	0,16	0,18
Charge air inlet temp. (Charge air temp after turbo compressor)	Prime Power	°C	163	165
		°F	325	329
	Standby Power	°C	159	164
		°F	318	327
Charge air outlet temp. (Charge air temp after intercooler)	Prime Power	°C	40	40
		°F	104	104
	Standby Power	°C	40	40
		°F	104	104
Maximum pressure drop over charge air cooler incl. piping		kPa	15	
		psi	2,18	
Charge air pressure (After charge air cooler)		kPa	168	
		psi	24,37	
Standard charge air cooler core area		m²	0,38	
		foot²	4,09	

Cooling performance

Cooling air flow and external restriction at different radiator air temperatures based on 105°C TTT and 40% coolant. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp °C	PRIME POWER		STANDBY POWER	
		Air flow m³/s	External restriction Pa	Air flow m³/s	External restriction Pa
1500	40	1,4	280	1,5	250
	50	1,7	180	1,8	150
	55	1,9	115	2,0	90
	58			2,3	0
	60	2,3	0		
1800	40	1,7	400	1,6	440
	50	2,1	260	3,1	310
	55	2,4	160	2,8	0
	59				
	62	2,8	0		

Note! External restrictions are calculated for values >0 Pa

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Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronous/droop switchable	Isochronous
Governor droop	1rpm/10Nm - 1rpm/127Nm	1rpm/25Nm
Governor response	N/A	N/A
Dual speed		
Idle speed	550-800 rpm	600 rpm
Fine speed adjustment		
Stop function	Energized to run / stop	Energized to stop
Preheating function	ON/OFF	Option
Lamp test	ON/OFF	ON

Engine sensor and switch settings

Parameter		Unit	Warning level	Alarm level	Engine protection	
			Default setting		Level	Action.
			Yellow lamp	Red lamp		Default/Alternative
Oil temp		°C	125	130	130	Shut down.
Oil pressure	Low idle	kPa	120	100	100	Shut down
	1500 rpm	kPa	200	170	170	Shut down
	1800 rpm	kPa	230	200	200	Shut down
Oil level						
Piston cooling pressure >1000 rpm		kPa				
Coolant temp		°C	105	110	110	Shut down.
Coolant level			On		Low level	Shut down.
Fuel feed pressure	Low idle	kPa				
	>1400 rpm					
Water in fuel						
Crank case pressure		kPa				
Air filter pressure droop		kPa				
Altitude, above sea		m	Automatic derating, see section derating			
Charge air temp		°C	75	80	80	shut down
Charge air pressure		kPa	295	305	305	shut down
Engine speed		rpm	115% of rated speed			
Engine protection can be disabled. For consequences please see VP International Limited Warranty Policy						

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Electrical system

Voltage and type		24V	
Alternator:	make/output	A	Iskra/55
	tacho output	Hz/alt. Rev	
	drive ratio		
Starter motor	make	Mitsubishi	
	type	M008T62471	
	kW	5.0	
Number of teeth on:	flywheel		129
	starter motor		10
Max wiring resistance main circuit		mΩ	2
Cranking current at +20°C		A	400
Crank engine speed at 20°C		rpm	160
Starter motor battery capacity:	max	Ah/A	176
	min at +5°C	Ah/A	110
Inlet manifold heater (at 20 V)		kW	3,6
Power relay for the manifold heater		A	120

Power take off

Order take on		rpm	1500	1800
Front end in line with crank shaft max:		Nm lbft		
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW hp		
	max down	kW hp		
	max right	kW hp		
Timing gear at compressor PTO max:		Nm lbft		
Speed ratio direction of rotation viewed from flywheel side		0,91:1/clockwise		
Timing gear at servo pump PTO max:		Nm lbft		
Speed ratio direction of rotation viewed from flywheel side		1,58:1/clockwise		
Timing gear at hydraulic pump PTO max:		Nm lbft		
Speed ratio direction of rotation viewed from flywheel side				
Max allowed bending moment in flywheel housing		Nm lbft	≤ ± 5000	
Max. rear main bearing load		N lbf		









