


<b>VOLVO PENTA</b>	Document No	Issue Index
<b>TAD1343GE-B</b>	<b>23572230</b>	<b>01</b>
<b>Important</b>		
This Technical Data Sheet and the corresponding Installation Instructions provide important information to ensure the installed engine will operate according to the design specification in the Volvo Penta application for certification.		
Requirements marked with  are considered as critical for exhaust emissions compliance according to the design specification in the Volvo Penta application for certification.		
Failing to follow and meet these instructions and requirements when installing a certified engine in a piece of nonroad equipment for use in the United States violates U.S. federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.		

## 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	12,78	
	in <sup>3</sup>	779,7	
Firing order		1-5-3-6-2-4	
Bore	mm	131	
	in	5,16	
Stroke	mm	158	
	in	6,22	
Compression ratio		18, 1:1	
Wet weight (Not including after treatment system)	Engine only	kg	1325
		lb	2921
	Engine incl. cooling system and air filtration system	kg	
		lb	
Engine incl. cooling system, air filtration system, and frame	kg	1790	
	lb	3946	

## Performance

		rpm	1500	1800
Prime Power	without fan	kW	335	371
		hp	456	505
	with fan	kW	325	353
		hp	442	480
Standby Power	without fan	kW	366	406
		hp	498	552
	with fan	kW	356	388
		hp	484	528
Torque at:	Prime Power	Nm	2133	1968
		lbft	1573	1452
	Standby Power	Nm	2330	2154
		lbft	1718	1588
Power tolerance		%	+4 / -0	
Mean piston speed		m/s	7,9	9,5
		ft/sec	26,0	31,2
Effective mean pressure at:	Prime Power	MPa	2,1	1,9
		psi	304	281
Effective mean pressure at:	Standby Power	MPa	2,3	2,1
		psi	332	307
Max combustion pressure at:	Prime Power	MPa	17,5	17,3
		psi	2538	2509
Max combustion pressure at:	Standby Power	MPa	18,3	18
		psi	2654	2611
Total mass moment of inertia, J (mR <sup>2</sup> )		kgm <sup>2</sup>	3,43	
		lbft <sup>2</sup>	81,4	
Friction Power		kW	30	44
		hp	40,8	59,84

**Derating due to altitude - see Technical Diagrams**

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**TAD1343GE-B****Engine noise emission**

Test Standards: ISO 3744-1981 (E) sound power

Tolerance  $\pm 0.75$  dB(A)

		rpm	1500	1800
Measured sound power Lw	No load	dB(A)	110	111,4
	Prime Power	dB(A)	114,4	116,4
	Standby Power	dB(A)	114,3	116,4
Calculated sound pressure Lp at 1 m	No load	dB(A)	98	99,3
	Prime Power	dB(A)	102,4	104,4
	Standby Power	dB(A)	102,3	104,4

**Test conditions for load acceptance data**

Warm engine.	Generator	Model	Type of AVR
	Stamford	HCI 444 F1	SX 440
AVR Settings	UFRO (Hz):	47/57	DIP (%)*: 0% DWELL (%)*: std
	Stability (%)*:	std	Voltage (V): 400 Load factor: 1.0

Applies to Stamford nomenclature,

(%)\* : % of max potentiometer setting range

Load acceptance performance can vary due to actual alternator inertia, voltage regulator, type of load and local ambient conditions.

Abbreviation:	Full name:	Descriptions
AVR	Automatic Voltage Regulator	Generator performance and safety control unit
UFRO	Under Frequency Roll Off	Overheating protection at under frequency
DIP		Controls the slope of voltage drop when the UFRO is active
DWELL		Controls the slope of voltage recovery when the UFRO is active.

**Single step load performance at 1500 rpm - PRIME (Resistiv load)**

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	2,1	0,7	1,0	0,0	20-100	15,1	2,0	12,1	2,2
0-40	3,7	0,9	1,8	1,2	40-100	6,7	1,8	3,8	1,1
0-50					50-100				
0-60	6,7	1,6	2,6	1,9	60-100	3,3	0,8	2,6	1,4
0-62	7 (G3)	1,7	3,9	1,5	x-100				
0-73	10 (G2)	1,4	8,0	2,1	x-100				
0-80	13,5	1,8	11,0	2,4	80-100	1,7	0,6	1,8	0,8
0-100	24,3	2,9	17,7	3,0					
100-0	7,4	1,4	3,3	1,3					

**Single step load performance at 1500 rpm - STAND BY (Resistiv load)**

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	2,1	0,7	1,1	0,6	20-100	18,4	3,9	14,5	2,6
0-40	4,1	0,9	1,8	1,3	40-100	7,7	2,7	4,5	1,2
0-50					50-100				
0-60	8,6	1,7	5,4	2,0	60-100	3,5	1,8	2,8	0,8
0-56	7 (G3)	1,7	3,9	1,5	x-100				
0-67	10 (G2)	1,4	8,0	2,1	x-100				
0-80	17,1	2,2	13,7	2,4	80-100	1,7	0,6	1,6	0,8
0-100	30,3	5,1	21,3	3,8					
100-0	8,4	1,7	3,7	1,2					

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**TAD1343GE-B****Single step load performance at 1800 rpm - PRIME (Resistiv load)**

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	1,5	0,7	0,4	0,0	20-100	5,6	0,9	8,4	1,6
0-40	3,0	0,9	2,3	0,9	40-100	3,7	1,0	5,6	1,2
0-50					50-100				
0-60	4,3	1,0	5,3	1,0	60-100	2,6	0,9	2,8	0,8
0-85	7 (G3)	1,5	11,1	1,7	x-100				
0-100	10 (G2)	1,8	15,5	2,2	x-100				
0-80	6,2	0,9	8,9	1,5	80-100	1,3	0,5	1,0	0,0
0-100	10,4	1,8	14,0	2,2					
100-0	6,0	1,5	4,5	1,3					

**Single step load performance at 1800 rpm - STAND BY (Resistiv load)**

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	1,7	0,6	0,4	0,0	20-100	6,9	2,0	11,0	2,1
0-40	3,2	0,9	3,5	0,9	40-100	4,1	1,2	6,7	1,6
0-50					50-100				
0-60	4,7	1,0	6,3	1,0	60-100	2,7	0,9	3,5	0,9
0-77	7 (G3)	1,5	11,1	1,7	x-100				
0-94	10 (G2)	1,8	15,5	2,2	x-100				
0-80	7,2	1,0	10,6	2,2	80-100	1,5	0,6	1,1	0,6
0-100	10,6	2,2	16,5	2,7					
100-0	6,6	1,4	5,0	1,3					

**Cold start performance**

		rpm	1500	1800
Time from start to stay within 0.5% of no load speed at ambient temperature:	°C			
	-15 *	s	6,6	6,0
	-25 *	s	10,8	
	-25 **	s	5,2	
	Min start temp*	°C		

\* With manifold heater 4 kW engaged, lubrication oil 10W/30.

\*\*With manifold heater 4 kW engaged, lubrication oil 10W/30 and block heater.

Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block
	Volvo	2	12	20°C 68°F

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Lubrication system			rpm	1500	1800
Lubricating oil consumption	Prime Power		litre/h	0,04	0,05
			US gal/h	0,011	0,013
	Standby Power		litre/h	0,04	0,05
			US gal/h	0,011	0,013
Oil system capacity including filters			litre	36	
			US gal	9,5	
Oil sump capacity:	max		litre	30	
			US gal	7,9	
	min		litre	19	
			US gal	5,0	
Oil change intervals/specifications:	VSD3		h	600	
	VSD2		h	400	
			h	200	
Engine angularity limits:	front up		°	11	
		front down	°	11	
		side tilt	°	11	
Oil pressure at rated speed			kPa	370 - 520	
			psi	54 - 75	
Lubrication oil temperature in oil sump:	max		°C	130	
			°F	266	
Oil filter			μ	40,000	

\* See also general section in the sales guide



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Fuel system		rpm	1500	1800
<b>Prime Power</b> Specific fuel consumption at:	25%	g/kWh	224	239
		lb/hph	0,363	0,387
	50%	g/kWh	198	205
		lb/hph	0,320	0,333
	75%	g/kWh	193	200
		lb/hph	0,312	0,325
	100%	g/kWh	192	205
		lb/hph	0,312	0,332

<b>Standby Power</b> Specific fuel consumption at:	25%	g/kWh	219	232
		lb/hph	0,355	0,376
	50%	g/kWh	196	202
		lb/hph	0,317	0,328
	75%	g/kWh	193	202
		lb/hph	0,313	0,327
	100%	g/kWh	195	207
		lb/hph	0,316	0,336

Fuel system		rpm	1500	1800
Fuel to conform to	ASTM-D975-No1 and 2D JIS KK 2204, EN 590			
System supply flow at:	litre/h		120,0	130,0
	US gal/h		31,7	34,3
Fuel supply line max restriction (Measured at fuel inlet connection)	kPa		30,0	30,0
	psi		4,4	4,4
Fuel supply line max pressure, engine stopped	kPa		20,0	20,0
	psi		2,9	2,9
System return flow	litre/h		18,0	18,0
	US gal/h		4,8	4,8
Fuel return line max restriction (Measured at fuel return connection)	kPa		20,0	20,0
	psi		2,9	2,9
Maximum allowable inlet fuel temp (Measured at fuel inlet connection)	°C		50	50
	°F		122	122
Prefilter / Water separator			10,000	
Fuel filter			5,000	
Governor type/make, standard			Volvo / EMS 2.4	
Injection pump type/make			Delphi E3	

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<b>Intake and exhaust system</b>			<b>rpm</b>	<b>1500</b>	<b>1800</b>
Air consumption at: (+25°C and 100kPa)	Prime Power		m <sup>3</sup> /min cfm	26 918	28 989
	Standby Power		m <sup>3</sup> /min cfm	27 954	28 989
 <b>See front page for important information</b> Max allowable air intake restriction including piping			kPa psi	5 0,7	5 0,7
Air filter restriction clean Volvo Penta filter			kPa psi	0,9 0,1	1,0 0,1
Heat rejection to exhaust at:	Prime Power		kW BTU/min	209 11886	263 14957
	Standby Power		kW BTU/min	236 13421	299 17004
Exhaust gas temperature after turbine at:	Prime Power		°C °F	400 752	446 835
		Standby Power	°C °F	420 788	498 928
 <b>See front page for important information</b> Max allowable back pressure in exhaust line (after turbine) Pipe dimension Ø:                      mm			Prime Power	kPa psi	9 1,3
			Standby Power	kPa psi	10 1,5
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	Prime Power		m <sup>3</sup> /min cfm	56,0 1978	66,0 2331
	Standby Power		m <sup>3</sup> /min cfm	60,0 2119	71,0 2507

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<b>Cooling system</b>		<b>rpm</b>		<b>1500</b>	<b>1800</b>
Heat rejection radiation from engine at:	Prime Power	kW	12	22	
		BTU/min	682	1251	
	Standby Power	kW	13	23	
		BTU/min	739	1308	
Heat rejection to coolant at:	Prime Power	kW	141	163	
		BTU/min	8019	9270	
	Standby Power	kW	152	177	
		BTU/min	8644	10066	
Radiator cooling system type	Closed circuit				
Standard radiator core area		m <sup>2</sup>	0,8		
		foot <sup>2</sup>	8,61		
Fan diameter		mm	890		
		in	35,04		
Fan power consumption		kW	10	18	
		hp	14	24	
Fan drive ratio	0.99 : 1				
Coolant capacity,	engine	litre	20		
		US gal	5,28		
	engine with std radiator and hoses	litre	24		
		US gal	6,34		
Coolant pump	drive/ratio	Belt / 1,43:1			
Coolant flow with standard system		l/s	5	5,5	
		US gal/s	1,32	1,45	
Minimum coolant flow		l/s	4,5	5,2	
		US gal/s	1,19	1,37	
Maximum outer circuit restriction, including piping		kPa	30	50	
		psi	4,4	7,3	
Thermostat	start to open	°C	82		
		°F	180		
	fully open	°C	92		
		°F	198		
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa	100		
		psi	14,5		
Minimum static pressure head (expansion tank height + pressure cap setting)		kPa	100		
		psi	14,5		
Standard pressure cap setting		kPa	100		
		psi	14,5		
Maximum top tank temperature		°C	107		
		°F	225		
Draw down capacity. The difference between min coolant level in the expansion tank and the lowest level where the engine's coolant system still is functioning		litre	1,8		
		US gal	0,48		

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<b>Charge air cooler system</b>		<b>rpm</b>	<b>1500</b>	<b>1800</b>
Heat rejection to charge air cooler	Prime Power	kW	72	80
		BTU/min	4095	4550
	Standby Power	kW	83	80
		BTU/min	4720	4550
Charge air mass flow	Prime Power	kg/s	0,49	0,54
	Standby Power	kg/s	0,52	0,55
Charge air inlet temp. (Charge air temp after turbo compressor)	Prime Power	°C	192	196
		°F	378	385
	Standby Power	°C	207	196
		°F	405	385
 <b>See front page for important information</b> Max allowable Charge air outlet temp. (Charge air temp after intercooler)	Prime Power	°C	44	44
		°F	111	111
	Standby Power	°C	45	45
		°F	113	113
 <b>See front page for important information</b> Maximum pressure drop over charge air cooler incl. piping		kPa	8	
		psi	1,16	
Charge air pressure (After charge air cooler)		kPa	252	221
		psi	36,55	32,05
Standard charge air cooler core area		m <sup>2</sup>	0,89	
		foot <sup>2</sup>	9,58	



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**TAD1343GE-B****Cooling performance**

Standard fan: STD Fan ratio: 1 : 0,99 Fan type: FIX

Cooling air flow and external restriction at different radiator air temperatures based on 107°C TTT and 40% antifreeze. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp °C	PRIME POWER		STANDBY POWER	
		Air flow m <sup>3</sup> /s	External restriction Pa	Air flow m <sup>3</sup> /s	External restriction Pa
1500	55			5,7	304
	58			6,2	156
	61	5,9	235	6,8	0
	63	5,9	125		
	65	6,8	0		
1800	58			7,0	455
	60			7,4	290
	63	7,5	275	8,2	0
	65	8,0	100		
	66	8,3	0		

Note! External restrictions are calculated for values &gt;0 Pa

Optional fan: LOW Fan ratio: 1 : 0,84 Fan type: FIX

Cooling air flow and external restriction at different radiator air temperatures based on 107°C TTT and 40% antifreeze. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp °C	PRIME POWER		STANDBY POWER	
		Air flow m <sup>3</sup> /s	External restriction Pa	Air flow m <sup>3</sup> /s	External restriction Pa
1500	45			4,6	246
	50	4,4	292	5,2	8
	52	4,7	224	5,5	0
	55	5,2	78		
	58	5,5	0		
1800	51			6,1	240
	53	5,9	285	6,5	115
	55	6,3	172	6,8	0
	58	6,8	0		

Note! External restrictions are calculated for values &gt;0 Pa

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**TAD1343GE-B****Engine management system**

Functionality	Alternatives	Default setting
Governor mode	Isochronus / Droop	Isochronus
Governor droop	0-8%	0,0
Governor response	Adjustable PID-constants (VODIA)	Standard
Dual speed	YES	1500 or 1800
Idle speed	600-1200	900,0
Fine speed adjustment	± 90	0,0
Stop function	Energized to Run / Stop	Energized to Run / Stop
Preheating function	On / Off	On
Lamp test	On / Off	On

**Engine sensor and switch settings**

Parameter	Unit	Alarm level		Engine protection		
		Setting range	Default setting	Level	Action. Default/Alternative	
Oil temp	°C	120 - 130	125	Setting +5	Shut down.	
Oil pressure	Low idle	kPa	-	190,0	-30,0	Shut down
	1500 rpm	kPa	-	250,0	-30,0	
	1800 rpm	kPa	-	300,0	-30,0	
Oil level		-	Mid level	-	Shut down.	
Piston cooling pressure >1000 rpm	kPa	-	150	150,0		
Coolant temp	°C	95 - 103	102	Setting +5	Shut down.	
Coolant level		See cooling system	On	Low level	Shut down.	
Fuel feed pressure	Low idle	kPa	-	100	-	
	>1400 rpm		-	200	-	
Water in fuel		-	High level	-		
Crank case pressure	kPa	-	Increased pressure	Invreased pressure		
Air filter pressure droop	kPa	-	5			
	0,0		Alarm level		Engine protection	
Altitude, above sea	m	-	-	1200	Automatic derating, see section derating	
Charge air temp	°C	-	80	85,0	Shut down.	
Charge air pressure 1500	kPa	-	360 / 350	370 / 360	Shut down.	
Engine speed	rpm	100 - 120% of rated speed	120% of rated speed	Alarm level	Shut down.	

**Engine protection can be disabled. For consequences please see VP International Limited Warranty Policy**

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**Electrical system**

Voltage and type		24V / insulated from earth	
Alternator:	make/output	A	Bosch 80 A
	tacho output	Hz/alt. Rev	6
	drive ratio		5,3:1
Starter motor	make	Melco	
	type	105P70	
	kW	7,0	
Number of teeth on:	flywheel		153
	starter motor		12
Max wiring resistance main circuit		mΩ	2
Cranking current at +20°C		A	180
Crank engine speed at 20°C		rpm	155
Starter motor battery capacity:	max	Ah/A	2x225
	min at +5°C	Ah/A	-
Inlet manifold heater (at 20 V)		kW	4,0
Power relay for the manifold heater		A	1

**Power take off**

	rpm	1500	1800
Max allowed bending moment in flywheel housing	Nm	15000	
	lbft	11063	
Max. rear main bearing load	N	4000	
	lbf	899,2	



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Sensors Alarm	Signal	Range	rpm Map					Condition	Derating
<i>Oil pressure</i>	0,5-4,5 V	0-700 kPa	<b>450 rpm</b>	<b>500 rpm</b>	<b>1000 rpm</b>	<b>1450 rpm</b>	<b>2000 rpm</b>		
Warning Level			-50	60	210	310	310		
Alarm Level			-85	25	175	275	275		

Remarks

<b>1) Soft derate Coolant temp</b>	<b>Speed / °C</b>				
Remaining torque in %	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A

<b>Derate map R2</b>			
°C			
%	N/A	N/A	N/A

<b>2) Soft derate Oil temp</b>	<b>Speed / °C</b>				
Remaining torque in %	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A

<b>Derate map R2</b>			
°C			
%	N/A	N/A	N/A



