


VOLVO PENTA TAD1340VE	Document No	Issue Index
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Important

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

Number of cylinders			6
Displacement, total		liters	12,78
		in ³	780
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
	Power pac	kg	1790
		lb	3946

Performance			rpm	1500	1800	2000	2100
256 kW	without fan	kW		256	256	256	256
		hp		348	348	348	348
	with fan	kW		252	250	242	240
	890 mm	hp		343	340	329	326
Torque at:	ICFN Power 256 kW	Nm		1630	1358	1222	1164
		lbf ft		1202	1002	901	859
Max torque at engine speed	1260 rpm	Nm		1790			
		lbf ft		1320			
Power tolerance		%		±2%			
Mean piston speed		m/s		7,9	9,5	10,5	11,1
		ft/sec		25,9	31,1	34,6	36,3
Effective mean pressure at:	ICFN Power 256 kW	MPa		1,60	1,34	1,20	1,14
		psi		232	194	174	166
Max combustion pressure at:	ICFN Power 256 kW	MPa		14,7	15	13,8	13,4.
		psi		2132	2175	2001	
Total mass moment of inertia, J (mR ²) (not including flywheel)		kgm ²		3,43			
		lbf ²		81,4			
Friction Power		kW		30	43	54	60
		hp		41	58	73	82
Derating see Technical Diagrams							

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Cold start performance

*Cold start limit temperature	without starting aid	°C / sec	20	3
		°F / sec	68	
	with manifold heater 4 kW	°C / sec	-5	4
	°F / sec	23		
*Specify oil and fuel quality	Mk1 fuel, VDS2 oil, 15w40 above -15°C, 10w30 below -15°C	°C / sec	-15	4.5
		°F / sec	5	
Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block
	Volvo	2	12	10°C

* See also general section in the sales guide

Lubrication system

Lubricating oil consumption at max rpm at:	ICFN Power 256 kW	liter/h	0,02
		US gal/h	0,005
		liter/h	0,02
		US gal/h	0,005
Oil system capacity including filters		liter	Std sump 36 / Aluminium sump 52
		US gal	Std sump 9,51 / Aluminium sump 13,74
Plastic Oil sump capacity (Std):	Max	liter	30
		US gal	7,93
	Min	liter	19
		US gal	5,02
Aluminium Oil sump capacity:	Max	liter	46
		US gal	12,15
	Min	liter	36
		US gal	9,51
Oil change intervals/specifications	VDS 3	h	600
	VDS 2	h	400
Engine angularity limits:	front up	°	Std sump: 11 / Aluminium sump: 35
	front down	°	Std sump: 11 / Aluminium sump: 35
	side tilt	°	Std sump: 11 / Aluminium sump: 35
Oil pressure at rated speed		kPa	300 - 600
		psi	44 - 87
Oil pressure shut down switch setting		kPa	N/A
		psi	



Lubrication system

Lubrication oil temperature in sump:	max	°C	130
		°F	266
Oil filter micron size		μ	

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Fuel system		rpm	1500	1800	2000	2100
ICFN Power 256 kW Specific fuel consumption at:	25%	g/kWh lb/hph	232 0,376	262 0,425	2889,2 4,683	305,28 0,495
	50%	g/kWh lb/hph	201 0,325	215 0,349	232,7 0,377	244,1 0,396
	75%	g/kWh lb/hph	192 0,311	202 0,327	216,4 0,351	225,7 0,366
	100%	g/kWh lb/hph	188 0,305	197 0,319	210 0,340	218,6 0,354
Fuel to conform to			ASTM-D975-No1 and 2D JIS KK 2204, EN 590			



Fuel system			
System supply flow at max. speed		liter/h	87
		US gal/h	23,0
Fuel supply line max. restriction (Measured at fuel inlet connection)		kPa	10
		psi	1,5
Fuel supply line max. pressure, during engine stand still (measured at fuel inlet connection)		kPa	16,5
		psi	2,4
System return flow at max. speed		liter/h	18,0
		US gal/h	4,8
Fuel return line max. restriction (Measured at fuel return connection)		kPa	20
		psi	2,9
Max. allowable inlet fuel temp (Measured at fuel inlet connection)		°C	60
		°F	140
Fuel filter micron size		µ	5
Governor type/make, standard			Volvo / EMS 2,2
Injection pump type/make			Delphi E3

Intake and exhaust system		Inlet air temp	rpm	1500	1800	2000	2100
Air consumption at: (+25°C and 100kPa)	ICFN Power 256 kW		m³/min	20,0	24,0	26	27
			cfm	706	848	918	954
 See front page for important information							
Max allowable air intake restriction including piping			kPa psi	3 0,4			
Heat rejection to exhaust at:	ICFN Power 256 kW		kW	172	177	193	206
			BTU/min	9781	10066	10976	11715
Exhaust gas temperature after turbine at:	ICFN Power 256 kW		°C	395	361	360	367
			°F	743	682	680	693
 See front page for important information							
Max allowable back pressure in exhaust line (after turbine)			kPa	10	12	14	15
Pipe dimension Ø:		mm	psi	1,5	1,7	2,0	2,2
Exhaust gas flow at: (temp and pressure after turbine at the	ICFN Power 256 kW		m³/min	45,0	48,0	51	54
			cfm	1589	1695	1801	1907
Exhaust gas smoke	ICFN Power 256 kW		*Bosch Units	0,13	0,29	0,54	0,71

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Cooling system		rpm	1500	1800	2000	2100
Heat rejection radiation from engine at:	ICFN Power 256 kW	kW	13	13	12,8	12,8
		BTU/min	739	739	728	728
Heat rejection to coolant at:	ICFN Power 256 kW	kW	101	109	123	130
		BTU/min	5744	6199	6995	7393
Radiator cooling system type			Closed circuit			
Standard radiator core area		m ²	0,8			
		foot ²	8,61			
Fan diameter	890 mm	mm	890			
		in	35,04			
Fan power consumption	890 mm	kW	4,0	6,0	14,0	16,0
		hp	5	8	19	22
Fan drive ratio	fan Ø890		0,84			
Coolant capacity:	engine	liter	20			
		US gal	5,3			
	std. 0,8m ² radiator with hoses	liter	24			
		US gal	6,3			
Coolant pump		drive/ratio	belt/1,50:1			
Coolant flow with standard system		l/s				
		US gal/s				
Minimum coolant flow		l/s	4,7	5,7	6,0	6,2
		US gal/s	1,2	1,5	1,6	1,6
Maximum outer circuit restriction incl. piping		kPa	65,0			
		psi	9,4			
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	70			
		psi	10,2			
Standard pressure cap setting		kPa	70			
		psi	10,2			
Maximum top tank temperature		°C	107			
		°F	225			

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Charge air cooler system		rpm	1500	1800	2000	2100
Heat rejection to charge air cooler	ICFN Power 256 kW	kW	47	55	64	70
		BTU/min	2673	3128	3640	3981
Charge air mass flow	ICFN Power 256 kW	kg/s	0,41	0,47	0,52	0,54
Charge air inlet temp. (Charge air temp after turbo compressor)	ICFN Power 256 kW	°C	151	155	165	172
		°F	304	311	329	342
 See front page for important information Max allowable Charge air outlet temp. (Charge air temp after charge air cooler)		°C	38	40	43	44
		°F	100	104	109	111
 See front page for important information Maximum pressure drop over charge air cooler incl. piping		kPa	8			
		psi	1,16			
Charge air pressure (After charge air cooler)		kPa	178			
		psi	25,82			
Standard charge air cooler core area		m ²	0,8			
		foot ²	8,61			

Cooling performance: m² radiator and fan

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 103°C TTT and 40% coolant. Valid at 1 atm.

Engine speed	Engine power	Air on temp		Air flow		External restriction	
				m ³ /s	ft ³ /s	Pa	psi
2100 (0,84)	256	65	149,00	6,4	226	532	0,08
	348	68	154	7,2	254,3	289	0,042
		71	160	7,9	279,0	0	
1800 (0,84)	256	65	149	5,4	190,7	385	0,056
	348	68	154	6,1	215,4	180	0,026
		71	160	6,7	236,6	0	

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05**Cooling performance: 0,73 m² radiator and 750 fan fan drive ratio 0.84:1****Radiator module 136232626 and kit 22113650 pusher**

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and 40% coolant. Valid at 1 atm.

Engine speed rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
2100 (0,84)	256 348	79	174	7,6	268,4	0	
		78	172	7,0	247,2	100	0,015
		76	169	6,4	226,0	200	0,029
		74	165	6,0	211,9	300	0,044
		72	162	5,6	197,8	400	0,058
1800 (0,84)	256 348	80	176	6,3	222,5	0	
		78	172	5,9	208,4	100	0,015
		75	167	5,2	183,6	200	0,029
		73	163	4,7	166,0	300	0,044
		69	156	4,2	148,3	400	0,058

Cooling performance: 0,73 m² radiator and 750 fan fan drive ratio 0.84:1**Radiator module 136232627 and kit 22113651 suction**

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and 40% coolant. Valid at 1 atm.

Engine speed rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
2100 (0,84)	256 348	76	169	6,9	243,7	0	
		75	167	6,4	226,0	100	0,015
		73	163	6,1	215,4	200	0,029
		71	160	5,7	201,3	300	0,044
		69	156	5,3	187,2	400	0,058
1800 (0,84)	256 348	75	167	6,0	211,9	0	
		72	162	5,4	190,7	100	0,015
		70	158	4,9	173,0	200	0,029
		67	153	4,5	158,9	300	0,044
		63	145	4,0	141,3	400	0,058

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Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronous / Droop	
Governor droop	0-8%	
Governor response	Adjustable PID-constants (VODIA)	Standard
Idle speed	550-900	
Stop function	Energized to Run / Stop	
Preheating function	On / Off	
Lamp test	On / Off	

Engine sensors and switch settings		Alarm level		Engine protection	
Parameter	Unit	Setting range	Default setting	Level	Action.
					Default/Alternative
Oil temp	°C	120 - 130	125	Setting +5	Derate. ON/OFF*
Oil pressure	Low idle				Derate. ON/OFF*
	Rated speed				
Oil level				Low level	Alarm.
Piston cooling pressure >1000 rpm	kPa		150	150	Alarm. ON/OFF*
Coolant temp	°C	95 - 103	102	Setting +5	Derate. ON/OFF*
Coolant level		See cooling system	On	Low level	Alarm.
Fuel feed pressure	Low idle				Alarm.
	Rated speed				
Water in fuel			High level		Alarm.
Crank case pressure	kPa			Rapid pres inc	Derate. ON/OFF*
Air filter pressure drop			5		Alarm.
Altitude, above sea	m				Automatic derating, see section derating
Charge air temp	°C		82	87	Derate. ON/OFF*
Charge air pressure	kPa		310**	320**	Derate. ON/OFF*
Engine speed	rpm	100 - 120% of rated speed	120% of rated speed	Alarm level	

* Off means no shut down, alarm only

**Pabs, 2100 rpm at sea level.

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Electrical system

Voltage and type		24V / insulated from earth			
Alternator:	make	Bosch			
	output	A	80		
	tacho output	Hz/alternator rev.	6		
	drive ratio	5.3:1			
Starter motor:	make	Melco			
	type	105P70			
	output	kW hp	7 9,5		
Number of teeth on:	flywheel	10			
	starter motor	12			
Inlet manifold heater (at 20 V)		kW	4		
Power relay for the manifold heater		A	1		
Conditions: (4 mΩ main circuit resistance@ 20°C)	Temperature	°C	25	0	-15
	Battery	Ah / CCA	140/800	140/800	145 / 1050
Crank speed		rpm	171	118	98
Crank current		A	290	400	480
Starter input power during crank		kW	6,2	7,5	7,7
Battery power during crank		kW	6,5	8,1	8,5
Min battery		Ah / CCA	120 / 700	140 / 800	145 / 1050

Power take off

Front end in line with crank shaft max:		Nm lbf ft			
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW hp			
		lbf ft	74		
Speed ratio direction of rotation viewed from flywheel side		1.75:1/ccw			
Timing gear at hydraulic pump PTO max:		Nm lbf ft			
Speed ratio direction of rotation viewed from flywheel side					
Max allowed bending moment in flywheel housing		Nm	15000		

* **Maximum allowed torque at individual PTO,s: If more than one PTO output is used simultaneously, calculations needs to be performed to determine maximum available torque, depending on application inertia.**

