VOLVO PENTA TAD1360VE	Document No 21593477	Issue Index 05

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 ⚠ e 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 penalities 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			17.8:1
Wet weight	Engine only	kg	1325
		lb	2921
	Power pac	kg	1790
		lb	3946

Performance				**rpm**	**1200**	**1500**	**1800**	**1900**
IFN Power	256 kW	without fan		kW	219	256	256	256
				hp	298	348	348	348
		with fan		kW	215	250	246	244
		890 mm		hp	292	340	335	332
IFN Power	256 kW	without fan		kW	219	256	256	256
				hp	298	348	348	348
		with fan		kW	215	250	246	244
		890 mm		hp	292	340	335	332
Torque at:		IFN Power 256 kW		Nm	1743	1630	1358	1287
				lbf ft	1285	1202	1002	949
		IFN Power 256 kW		Nm	1743	1630	1358	1287
				lbf ft	1285	1202	1002	949
Max torque at engine speed	IFN Power		1200 rpm	Nm	1745			
				lbf ft	1287			
				Nm				
				lbf ft				
Power tolerance				%	±2%			
Mean piston speed				m/s	6,3	7,9	9,5	10,0
				ft/sec	20,7	25,9	31,1	32,8
Effective mean pressure at:		IFN Power 256 kW		MPa	1,71	1,60	1,34	1,27
				psi	249	232	194	183
Max combustion pressure at:		IFN Power 256 kW		MPa	12,7	13,8	14,2	13,7
				psi	1842	2001	2059	1987
Total mass moment of inertia, J (mR^2)				kgm^2	3,43			
(not including flywheel)				$lbft^2$	81,4			
Friction Power				kW	21	31	45	51
				hp	29	42	61	69
Derating see Technical Diagrams								

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Cold start performance

*Cold start limit temperature	without starting aid	°C °F	-15 5	
	with manifold heater 4 kW	°C °F	-25 -13	
	with manifold heater 4 kW and block heater	°C °F	-30 -22	
*Specify oil and fuel quality	Oil: VDS3 10W/30, Fuel: MK1			
Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block
Self circulating	Volvo 3828643	2	12	-1°C 30°F

* See also general section in the sales guide

Lubrication system

Lubricating oil consumption at max rpm at:	IFN Power 256 kW		liter/h US gal/h	0,02 0,005
Oil system capacity including filters			liter US gal	36 9,51
Oil sump capacity:		Max	liter US gal	30 7,93
		Min	liter US gal	19 5,02
Oil change intervals/specifications	VDS3		h	600
Engine angularity limits:	front up		°	11
	front down		°	11
	side tilt		°	11
Oil pressure at rated speed			kPa psi	300-650 44-94
Oil pressure shut down switch setting			kPa psi	N/A

Lubrication system

Lubrication oil temperature in sump:	max	°C °F	130 266
Oil filter micron size		µ	40

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Fuel system	**rpm**	**1200**	**1500**	**1800**	**1900**
Fuel to conform to		EN590 ASTM D 975 No 1D and 2D (Max 20 ppm sulphur and 7% FAME)			

Fuel system

System supply flow at max. speed	liter/h	100
	US gal/h	26,4
Fuel supply line max. restriction (Measured at fuel inlet connection)	kPa	30
	psi	4,4
Fuel supply line max. pressure, during engine stand still (meassured at fuel inlet connection)	kPa	0
	psi	
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
Prefilter / Water separator micron size	µ	10
Fuel filter micron size	µ	5
Governor type/make, standard		Volvo/EMS2.2
Injection pump type/make		Delphi E3

Intake and exhaust system		**Inlet air temp**	**rpm**	**1200**	**1500**	**1800**	**1900**
Air consumption at: (+25°C and 100kPa)	IFN Power 256 kW		m³/min	17,0	22,0	26	27
			cfm	600	777	918	954
⚠ **See front page for important information** Max allowable air intake restriction including piping			kPa			5	
			psi			0,7	
Heat rejection to exhaust at:	IFN Power 256 kW		kW	145	175	187	202
			BTU/min	8246	9952	10635	11488
Exhaust gas temperature after turbine at:	IFN Power 256 kW		°C	420	385	360	355
			°F	788	725	680	671
⚠ **See front page for important information** Max allowable back pressure in exhaust line (after turbine)			kPa	15	22	26	28
Pipe dimension Ø:	125 mm		psi	2,2	3,2	3,8	4,1
⚠ **See front page for important information** Max allowable temperature drop between turbine and SCR muffler inlet.			°C			10	
			°F			18	
SCR muffler pressure drop			kPa	11	16	19	20
			psi	1,6	2,3	2,8	2,9
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	IFN Power 256 kW		m³/min	36,0	44,0	48	49
			cfm	1271	1554	1695	1730
Exhaust gas smoke	IFN Power 256 kW		*Bosch	0,013	0,014	0,016	0,02
			Units				

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Cooling system			**rpm**	**1200**	**1500**	**1800**	**1900**
Heat rejection radiation from engine at:		IFN Power 256 kW	kW	4	5	5	5,9
			BTU/min	227	279	284	336
Heat rejection to coolant at:		IFN Power 256 kW	kW	98	110	123	132
			BTU/min	5573	6256	6995	7507
Radiator cooling system type				Closed circuit			
Standard radiator core area			m²	0,8			
			foot²	8,61			
Fan diameter	890 mm		mm	890			
			in	35,04			
Fan power consumption	890 mm		kW	4,0	6,0	10,0	12,0
			hp	5	8	14	16
Fan drive ratio	fan Ø890			0,84			
Coolant capacity:	engine		liter	20			
			US gal	5,3			
	std. 0,8m² radiator with hoses		liter	24			
			US gal	6,3			
Coolant pump			drive/ratio	belt/1.43:1			
Coolant flow with standard system			l/s	3,7	4,7	5,7	6
			US gal/s	1,0	1,2	1,5	1,6
Minimum coolant flow			l/s	3,2	4,2	5,2	5,5
			US gal/s	0,8	1,1	1,4	1,5
Maximum outer circuit restriction incl. piping			kPa	55,0			
			psi	8,0			
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	75			
			psi	10,9			
Maximum top tank temperature			°C	107			
			°F	225			
Recommended 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			liter	2			
			US gal	0,5			

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Charge air cooler system		**rpm**	**1200**	**1500**	**1800**	**1900**
Heat rejection to charge air cooler	IFN Power 256 kW	kW	29	44	54	59
		BTU/min	1649	2502	3071	3355
Charge air mass flow	IFN Power 256 kW	kg/s	0,31	0,42	0,49	0,51
Charge air inlet temp.	IFN Power 256 kW	°C	134	150	158	164
(Charge air temp after turbo compressor)		°F	273	302	316	327
⚠	IFN Power 256 kW					
See front page for important information						
Max allowable Charge air outlet temp.		°C	36	41	46	50
(Charge air temp after charge air cooler)		°F	97	106	115	122
⚠						
See front page for important information						
Maximum pressure drop over charge air cooler incl.		kPa	12			
Piping (throttle not included)		psi	1,74			
Charge air pressure at rated power		kPa	165			
(After charge air cooler)		psi	23,93			
Standard charge air cooler core area		m²	0,8			
		foot²	8,61			

Cooling performance: 0,8 m² radiator and Pull 890 fan

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	Engine power		Air on temp		Air flow		External restriction	
	kW							
rpm	hp	°C	°F		m^3/s	ft^3/s	Pa	psi
1900	256	68	154		6,4	226,0	260	0,038
0,84	348	70	158		7	247,2	100	0,015
		71	160		7,3	257,8	0	

Cooling performance: 0,8 m² radiator and Push 890 fan

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	Engine power		Air on temp		Air flow		External restriction	
	kW							
rpm	hp	°C	°F		m^3/s	ft^3/s	Pa	psi
1900	256	68	154		6,4	226,0	255	0,037
0,84	348	69	156		6,7	236,6	160	0,023
		71	160		7,2	254,3	0	

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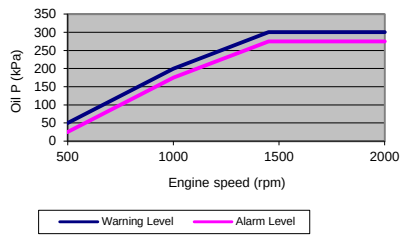
Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronus	
Governor droop	0%	
Governor response	Adjustable PI-constants	1
Idle speed	600-900	700
Stop function	Energized to run/Stop	
Preheating function	On/Off	
Lamp test	On/Off	

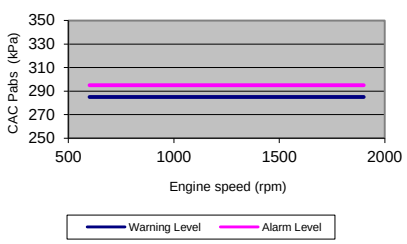
Parameter		Warning level	Alarm level		Engine protection	
Parameter for Power Pack		**Default setting**	**Level**		**Action. Default/Alternative**	
Oil temp		125°C	Setting +5°C		Shut down. ON/OFF*	
Oil pressure	Low idle	50 kPa	25 kPa		Shut down. ON/OFF*	
	Rated speed	300 kPa	275 kPa		Shut down. ON/OFF*	
Oil level		Min level	-		-	
Coolant temp		105°C	107°C		Shut down. ON/OFF*	
Coolant level		Low level	-		-	
Fuel feed pressure	Low idle	-	100 kPa		-	
	1200	-	250 kPa		-	
Water in fuel		High level	-		-	
Crank case pressure		Press inc			Shut down. ON/OFF*	
Air filter pressure drop		5 kPa	-		-	
Altitude, above sea		Automatic derating, see section derating				
Charge air temp		80°C	85°C		Shut down. ON/OFF*	
Charge air pressure		Warning map value + 5kPa	Alarm map value + 5kPa		Shut down. ON/OFF*	
Engine speed		120%	-		Shut down. ON/OFF*	
Cat temp protection (exhaust temp)		-	-		Derates the engine in order to not exceed exhaust T>550°C	
*** Off: disables the function, i e no shut down.**						

Parameter	Warning level	Alarm level	Engine protection			
Parameter for Mobile	**Warning**	**Alarm**	**Derated 0% to engine protection map**	**Derated 100% to engine protection map**	**Forced idle after sec**	**Forced shut down after 2 sec**
Oil temp	125°C	127°C	127°C	130°C	N/A	N/A
Oil pressure	Warning map value	Alarm map value	N/A	N/A	N/A	Alarm map value
Oil level	Min level	N/A	N/A	N/A	N/A	N/A
Coolant temp	105°C	107°C	107°C	108°C	N/A	N/A
Coolant level	Low level	N/A	N/A	N/A	N/A	N/A
Fuel feed pressure	Warning map value	N/A	N/A	N/A	N/A	N/A
Water in fuel	High level	N/A	N/A	N/A	N/A	N/A
Crank case pressure	N/A	Press incr 5kPa	N/A	N/A	N/A	Press incr 5kPa
Air filter pressure drop	5 kPa	N/A	N/A	N/A	N/A	N/A
Altitude, above sea	Automatic derating, see section derating					
Charge air temp	80°C	85°C	85°C	86°C	N/A	N/A
Charge air pressure	Warning map value	Alarm map value	Alarm map value	Alarm map value	N/A	N/A
Engine speed	120%	N/A	N/A	N/A	N/A	N/A
Cat protection (exhaust temp)	-	-	Derates the engine in order to not exceed exhaust T>550°C			

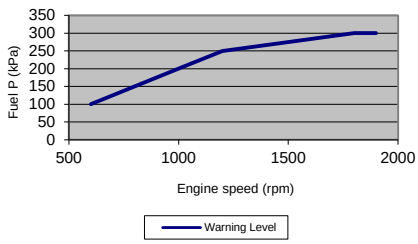
Oil Pressure limits



Charge air pressure limits



Fuel pressure limit



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Electrical system

Voltage and type				24 V
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	7
			hp	9,5
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	2*225
		min at +5°C	Ah/A	-
Inlet manifold heater (at 20 V)			kW	4
Power relay for the manifold heater			A	1

Power take off		**rpm**	**1200**	**1500**	**1800**	**1900**
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW	42	53	62	68
		hp	57	72	84	92
	max down	kW	36	44	52	60
		hp	49	60	71	82
	max right	kW	42	53	62	68
		hp	57	72	84	92
Timing gear at compressor PTO max:		Nm	600			
		lbf ft	443			
Speed ratio direction of rotation viewed from flywheel side			1.31:1 / anti-clockwise			
Timing gear at servo pump PTO max:		Nm	100			
		lbf ft	74			
Speed ratio direction of rotation viewed from flywheel side			1.58:1/clockwise			
Max allowed bending moment in flywheel housing		Nm	15000			
		lbf ft	11063			
Max. rear main bearing load		N	4000			
		lbf	899,2			