


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
275 kW	without fan	kW		275	275	275	275
		hp		374	374	374	374
	with fan 890 mm	kW		271	269	261	259
		hp		369	366	355	352
Torque at:	ICFN Power 275 kW	Nm		1751	1459	1313	1251
		lbf ft		1291	1076	968	922
Max torque at engine speed	1260 rpm	Nm		1883			
		lbf ft		1389			
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 275 kW	MPa		1,72	1,43	1,29	1,23
		psi		250	208	187	178
Max combustion pressure at:	ICFN Power 275 kW	MPa		190	166	160	158
		psi		27550	24070	23200	22910
Total mass moment of inertia, J (mR ²) (not including flywheel)		kgm ²		3,43			
		lbft ²		81,4			
Friction Power		kW		30	43	54	60
		hp		41	58	73	82

Derating see Technical Diagrams

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 275 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	

Fuel system		rpm	1500	1800	2000	2100
ICFN Power 275 kW Specific fuel consumption at:	25%	g/kWh lb/hph	227 0,369	254 0,412	279 0,451	294 0,476
	50%	g/kWh lb/hph	198 0,321	212 0,343	228 0,369	239 0,387
	75%	g/kWh lb/hph	190 0,308	199 0,323	214 0,347	224 0,363
	100%	g/kWh lb/hph	187 0,303	195 0,317	209 0,338	217 0,352
Fuel to conform to			ASTM-D975-No1 and 2D JIS KK 2204, EN 590			

Fuel system			
System supply flow at max. speed		liter/h	91
		US gal/h	24,0
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	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
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 275 kW		m³/min	21	25	27	27
			cfm	759	866	956	966
 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 275 kW		kW	181	186	207	225
			BTU/min	10293	10578	11772	12796
Exhaust gas temperature after turbine at:	ICFN Power 275 kW		°C	400	366	370	392
			°F	752	691	698	738
 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 275 kW		m³/min	47	50	54	57
			cfm	1672	1769	1909	2015
Exhaust gas smoke	ICFN Power 275 kW		*Bosch Units	0,09	0,08	0,2	0,4

Cooling system		rpm	1500	1800	2000	2100
Heat rejection radiation from engine at:	ICFN Power 275 kW	kW	13	13	12,8	12,8
		BTU/min	739	739	728	728
Heat rejection to coolant at:	ICFN Power 275 kW	kW	108	117	130,7	130,9
		BTU/min	6136	6671	7433	7444
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			

Charge air cooler system		rpm	1500	1800	2000	2100
Heat rejection to charge air cooler	ICFN Power 275 kW	kW	52	60	71	72
		BTU/min	2957	3412	4038	4095
Charge air mass flow	ICFN Power 275 kW	kg/s	0,43	0,49	0,54	0,55
Charge air inlet temp. (Charge air temp after turbo compressor)	ICFN Power 275 kW	°C	159	163	174	175
		°F	318	325	345	347
 See front page for important information Max allowable Charge air outlet temp. (Charge air temp after charge air cooler)		°C	39	41	44	44
		°F	102	106	111	111
 See front page for important information Maximum pressure drop over charge air cooler incl. piping		kPa	12			
		psi	1,74			
Charge air pressure (After charge air cooler)		kPa	190			
		psi	27,56			
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)	275	62	144	6,3	222,5	570	0,08
	374	65	149	7	247,2	359	0,052
		68	154	7,9	279,0	0	
1800 (0,84)	275	62	144	5,5	194,2	358	0,052
	374	65	149	6,1	215,4	206	0,030
		68	154	6,7	236,6	0	

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)	275	78	172	7,6	268,4	0	
	374	76	169	7,0	247,2	100	0,015
		74	165	6,4	226,0	200	0,029
		72	162	6,0	211,9	300	0,044
		70	158	5,6	197,8	400	0,058
1800 (0,84)	275	78	172	6,3	222,5	0	
	374	77	171	5,9	208,4	100	0,015
		73	163	5,2	183,6	200	0,029
		71	160	4,7	166,0	300	0,044
		67	153	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)	275	75	167	6,9	243,7	0	
	374	73	163	6,4	226,0	100	0,015
		71	160	6,1	215,4	200	0,029
		70	158	5,7	201,3	300	0,044
		68	154	5,3	187,2	400	0,058
1800 (0,84)	275	73	163	6,0	211,9	0	
	374	70	158	5,4	190,7	100	0,015
		68	154	4,9	173,0	200	0,029
		65	149	4,5	158,9	300	0,044
		61	142	4,0	141,3	400	0,058

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	Default setting	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	kPa	140,0	165	Derate. ON/OFF*
	Rated speed	kPa	300	325	Derate. ON/OFF*
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			On	Low level	Alarm.
Fuel feed pressure	Low idle	kPa	0		Alarm.
	Rated speed		200		Alarm.
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.

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
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
Power relay for the manifold heater		A	1

Power take off

Timing gear at compressor PTO max:	Nm	160
	lbf ft	118
Speed ratio direction of rotation viewed from flywheel side		1.31:1/ccw
Timing gear at servo pump PTO max:	Nm	100
	lbf ft	74
Speed ratio direction of rotation viewed from flywheel side		1.75:1/ccw
Max allowed bending moment in flywheel housing	Nm	40000
	lbf ft	29500
Max. rear main bearing load	N	4000
	lbf	899,2

