


VOLVO PENTA TAD1364VE	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			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	375 kW	without fan	kW	326	375	375	375
			hp	443	510	510	510
		with fan	kW	322	369	365	363
		890 mm	hp	438	502	496	494
IFN Power	375 kW	without fan	kW	326	375	375	375
			hp	443	510	510	510
		with fan	kW	322	369	365	363
		890 mm	hp	438	502	496	494
Torque at:		IFN Power 375 kW	Nm	2594	2387	1989	1885
			lbf ft	1913	1761	1467	1390
		IFN Power 375 kW	Nm	2594	2387	1989	1885
			lbf ft	1913	1761	1467	1390
Max torque at engine speed	IFN Power	1200 rpm	Nm	2595			
			lbf ft	1914			
			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 375 kW		MPa	2,55	2,35	1,96	1,85
			psi	370	340	284	269
Max combustion pressure at:	IFN Power 375 kW		MPa	18	19,2	18,5	18,9
			psi	2610	2784	2683	2741
Total mass moment of inertia, J (mR ²) (not including flywheel)			kgm ²	3,43			
			lbf 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	-15
		°F	5
	with manifold heater 4 kW	°C	-25
		°F	-13
	with manifold heater 4 kW and block heater	°C	-30
		°F	-22
*Specify oil and fuel quality	Oil: VDS3 10W30, Fuel: MK1		
Block heater type	Make	Power kW	Engaged hours
Self circulating	Volvo 3828643	2	12
			Cooling water temp engine block
			-1°C 30°F

* See also general section in the sales guide

Lubrication system

Lubricating oil consumption at max rpm at:	IFN Power 375 kW	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	VDS3	h	600
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	300-650
		psi	44-94
Oil pressure shut down switch setting		kPa	N/A
		psi	

Lubrication system

Lubrication oil temperature in sump:	max	°C	125
		°F	257
Oil filter micron size		μ	40




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 (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
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	

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Intake and exhaust system		Inlet air temp	rpm	1200	1500	1800	1900
Air consumption at: (+25°C and 100kPa)	IFN Power 375 kW	25°C 77°F	m³/min cfm	21,4 756	25,3 893	27,1 957	27,8 982
 See front page for important information Max allowable air intake restriction including piping			kPa psi	5 0,7			
Heat rejection to exhaust at:	IFN Power 375 kW		kW BTU/min	222 12625	269 15298	288 16378	290 16492
Exhaust gas temperature after turbine at:	IFN Power 375 kW		°C °F	473 883	483 901	477 891	470 878
 See front page for important information Max allowable back pressure in exhaust line (after turbine) Pipe dimension Ø: 125 mm			kPa psi	20 2,9	27 3,9	29 4,2	32 4,6
 See front page for important information Max allowable temperature drop between turbine and SCR muffler inlet. SCR muffler pressure drop			°C °F	10 18			
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	IFN Power 375 kW		m³/min psi cfm	16 2,3 1702	21 3,0 1960	22 3,2 2045	24 3,5 2009
Exhaust gas smoke	IFN Power 375 kW		*Bosch Units	0,06	0,063	0,109	0,11

Cooling system		rpm	1200	1500	1800	1900
Heat rejection radiation from engine at:	IFN Power 375 kW	kW BTU/min	8,5 483	8,6 489	8,8 500	8,9 506
Heat rejection to coolant at:	IFN Power 375 kW	kW BTU/min	113 6426	119 6767	148 8417	162 9213
Radiator cooling system type		Closed circuit				
Standard radiator core area		m² foot²	0,8 8,61			
Fan diameter	890 mm	mm in	890 35,04			
Fan power consumption	890 mm	kW hp	4,0 5	6,0 8	10,0 14	12,0 16
Fan drive ratio	fan Ø890		0,84			
Coolant capacity:	engine	liter US gal	20 5,3			
	std. 0,8m² radiator with hoses	liter US gal	24 6,3			
Coolant pump		drive/ratio	belt/1.43:1			
Coolant flow with standard system		l/s US gal/s	3,7 1,0	4,7 1,2	5,7 1,5	6 1,6
Minimum coolant flow		l/s US gal/s	3,2 0,8	4,2 1,1	5,2 1,4	5,5 1,5
Maximum outer circuit restriction incl. piping		kPa psi	65,0 9,4			
Thermostat:	start to open	°C °F	82 180			
	fully open	°C °F	92 198			
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa psi	100 14,5			
Minimum static pressure head (expansion tank height + pressure cap setting)		kPa psi	70 10,2			
Standard pressure cap setting		kPa psi	75 10,9			
Maximum top tank temperature		°C °F	107 225			
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 US gal	2 0,5			

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Charge air cooler system		rpm	1200	1500	1800	1900
Heat rejection to charge air cooler	IFN Power 375 kW	kW	58	65	67	69
		BTU/min	3298	3696	3810	3924
Charge air mass flow	IFN Power 375 kW	kg/s	0,42	0,5	0,54	0,55
Charge air inlet temp. (Charge air temp after turbo compressor)	IFN Power 375 kW	°C	175	177	171	171
		°F	347	351	340	340
 See front page for important information Max allowable Charge air outlet temp. (Charge air temp after charge air cooler)	IFN Power 375 kW	°C	42	46	47	50
		°F	108	115	117	122
 See front page for important information Maximum pressure drop over charge air cooler incl. Piping (throttle not included)		kPa	12			
		psi	1,74			
Charge air pressure at rated power (After charge air cooler)		kPa	167			
		psi	24,22			
Standard charge air cooler core area		m ²	0,8			
		foot ²	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 rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
1900	345	52	126	5,9	208,4	300	0,044
0,84	469	54	129	6,3	222,5	190	0,028
		57	135	6,9	243,7	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 rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
1900	375	60	140	7,6	268,4		
0,99	510	61	142	7,9	279,0		
		62	144	8,3	293,1		

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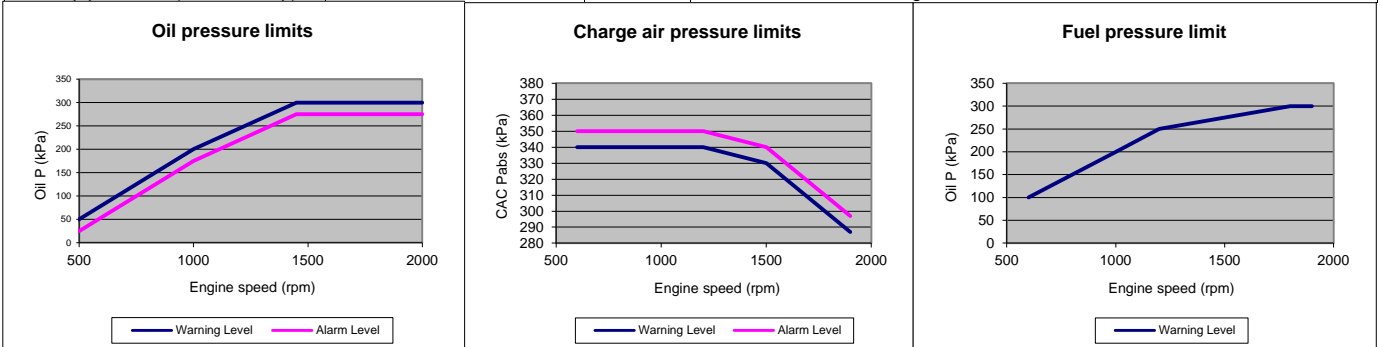
Engine management system

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
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 temp protection (exhaust temp)	-	-	Derates the engine in order to not exceed exhaust T>550°C			



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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		
Number of teeth on:		hp		9,5		
	flywheel			153		
	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

		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
Continuou torque. Timing gear at compressor PTO max: * PTO SAE B	Nm		300			
	lbf ft		221			
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		15000			
	lbf ft		11063			
Max. rear main bearing load	N		4000			
	lbf		899,2			

* 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.

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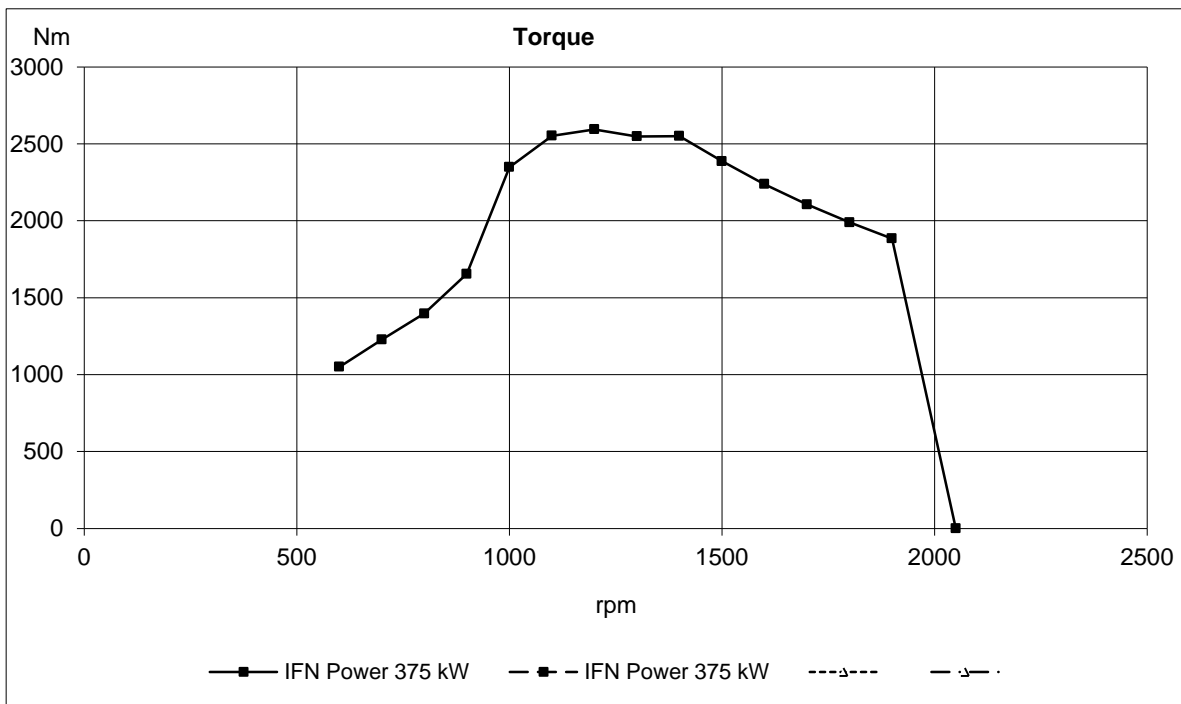
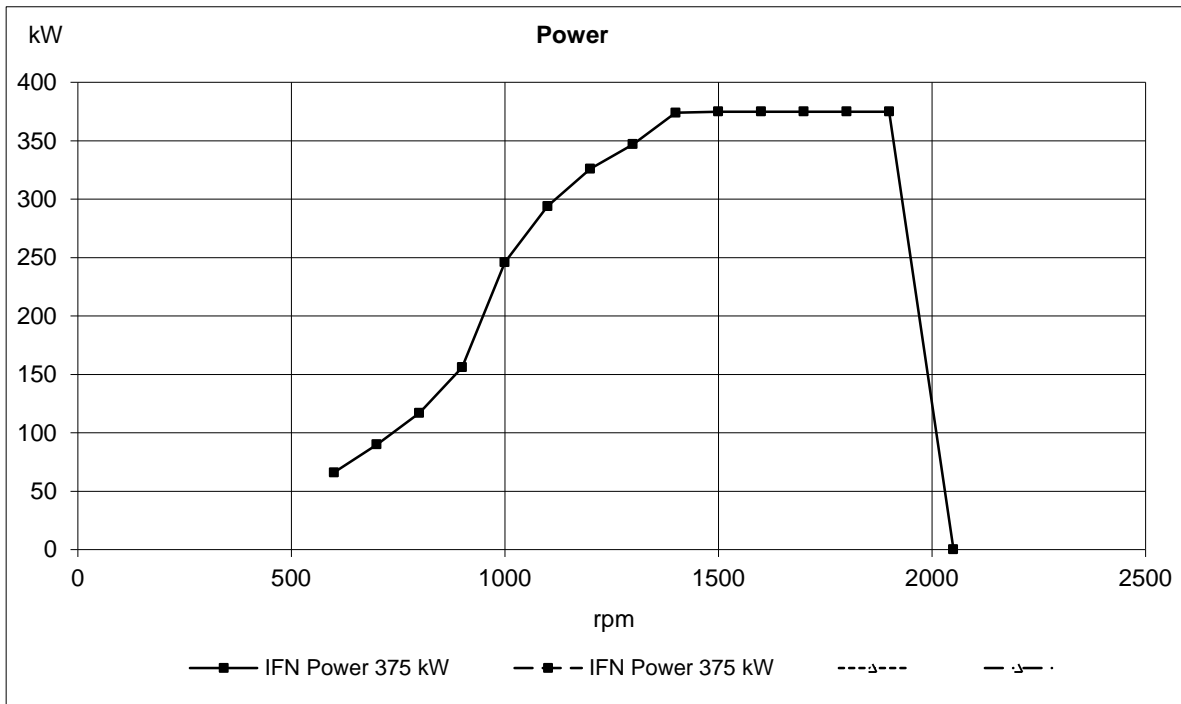
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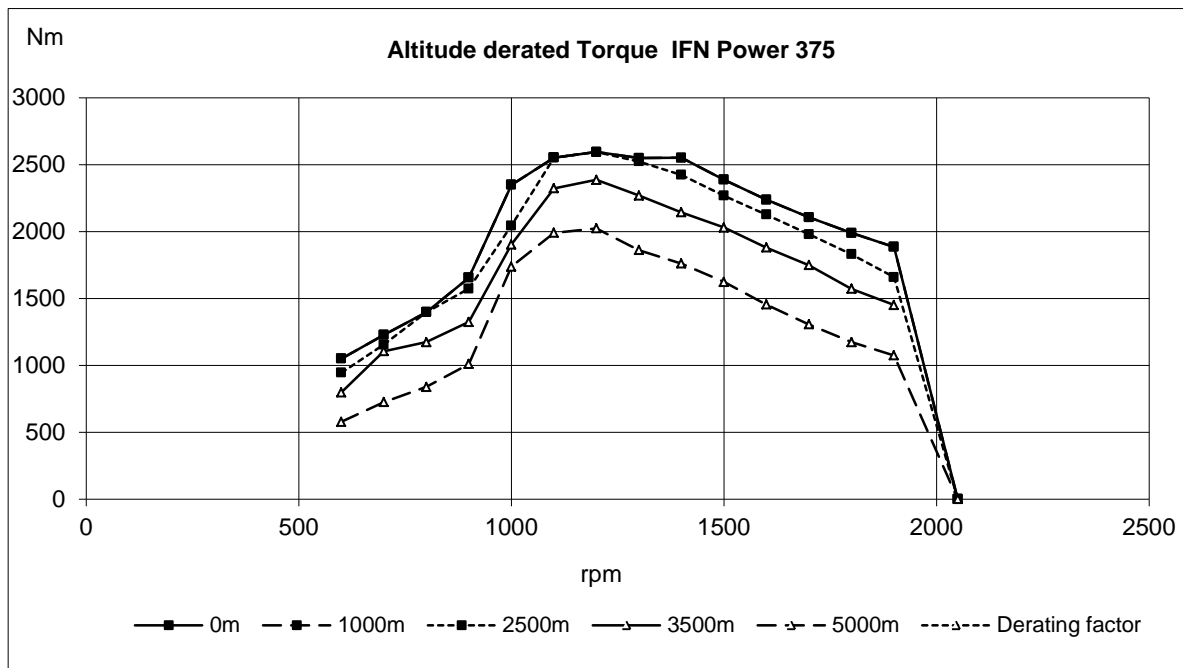
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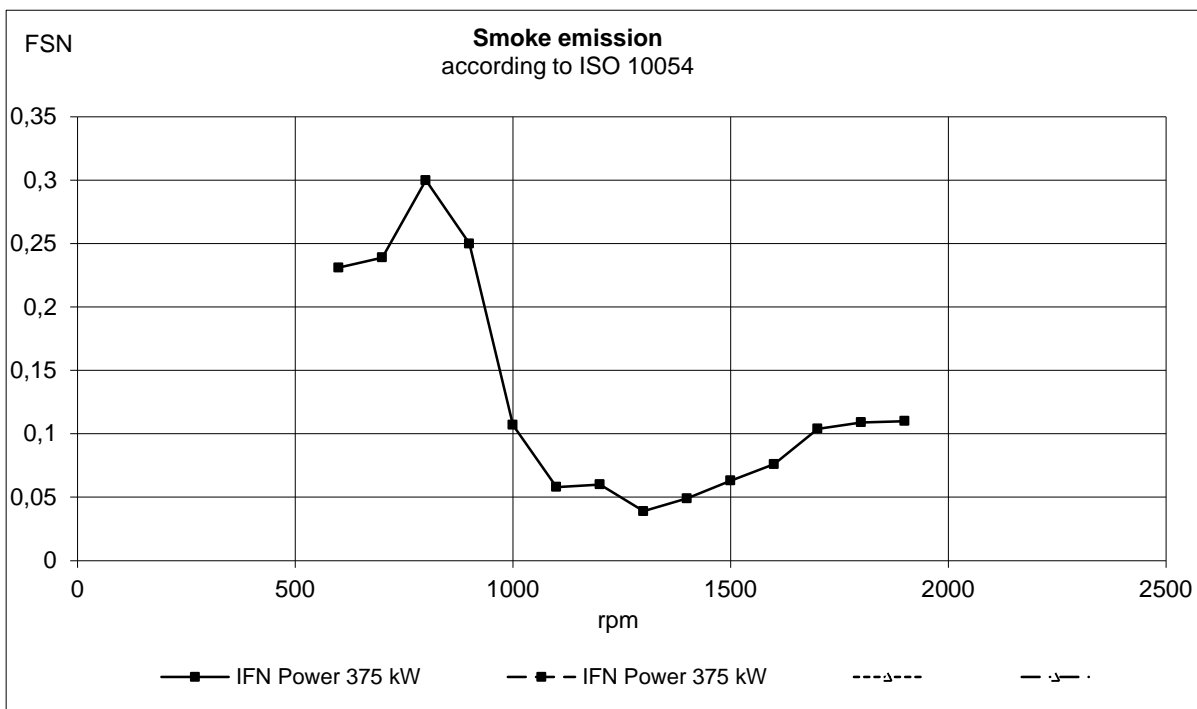
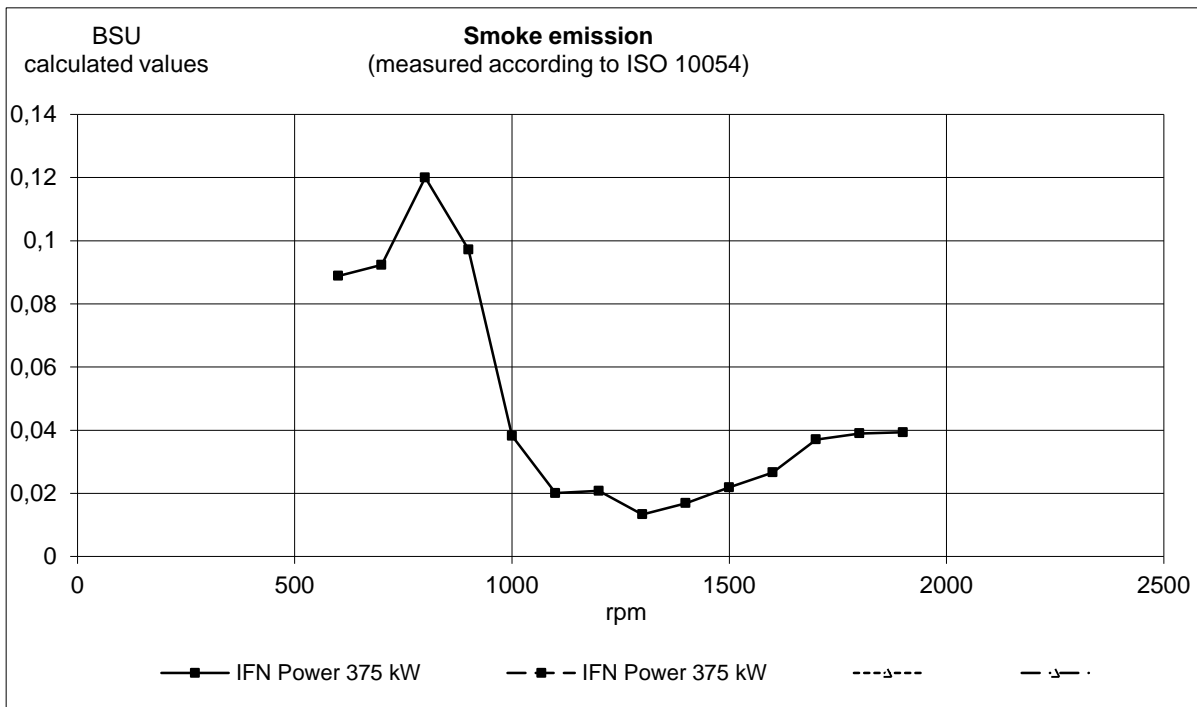
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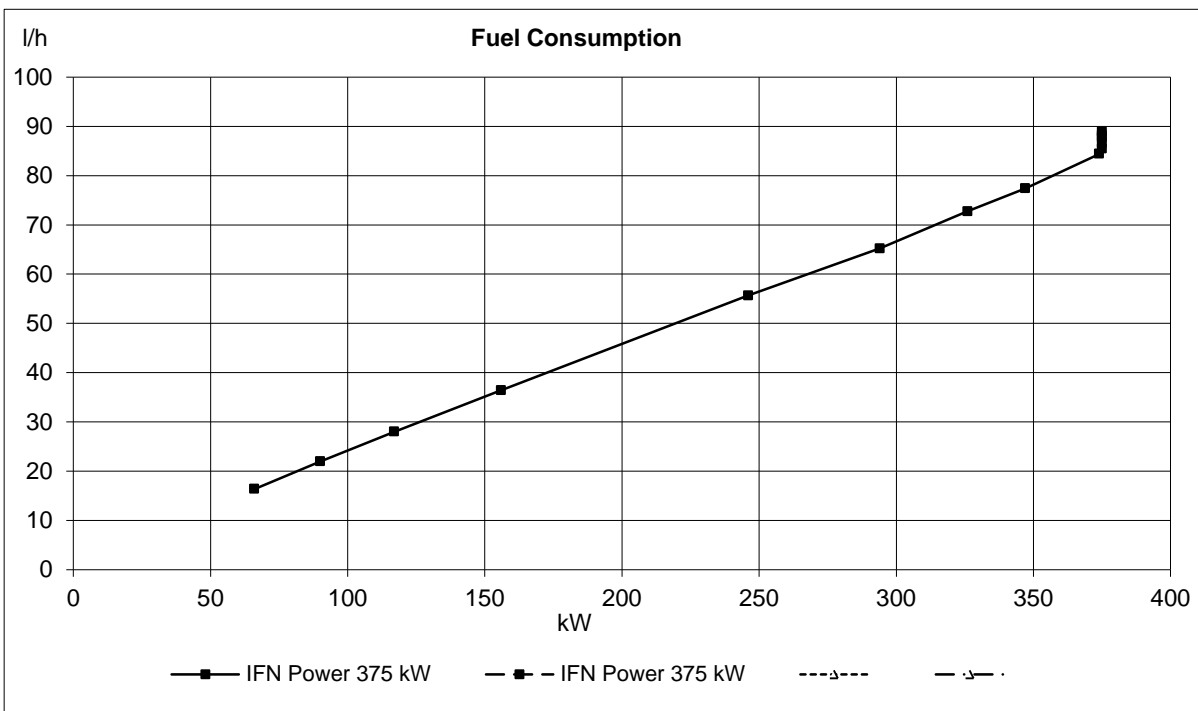
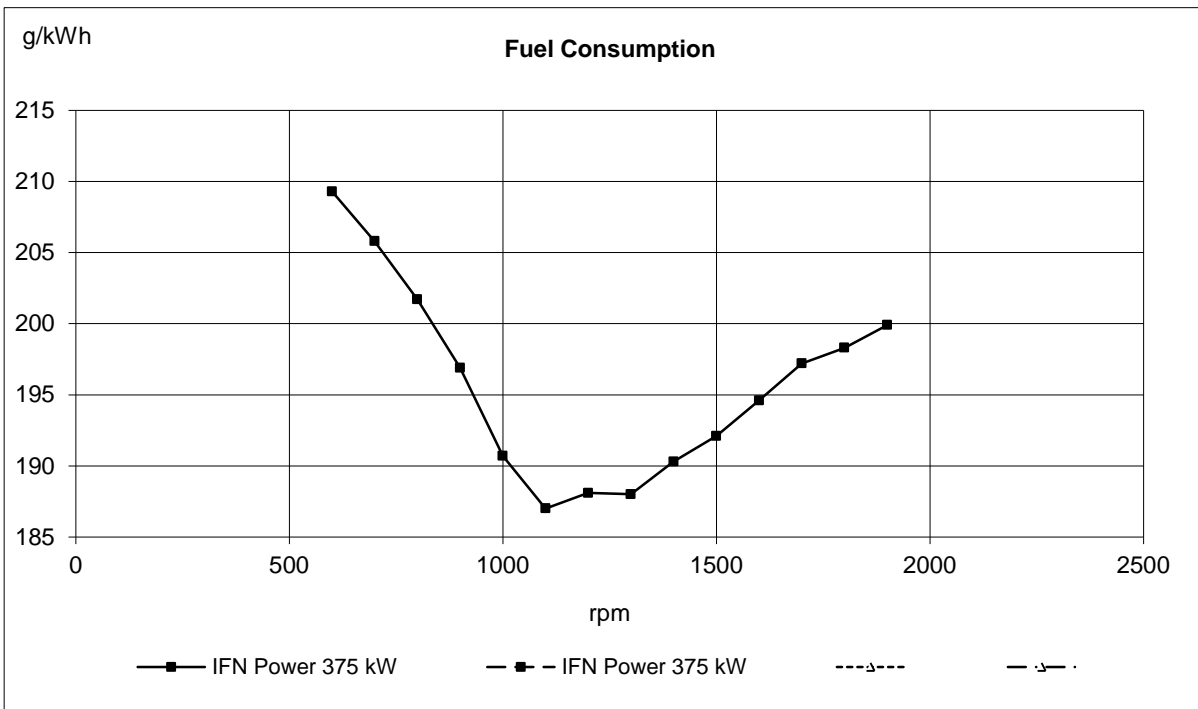
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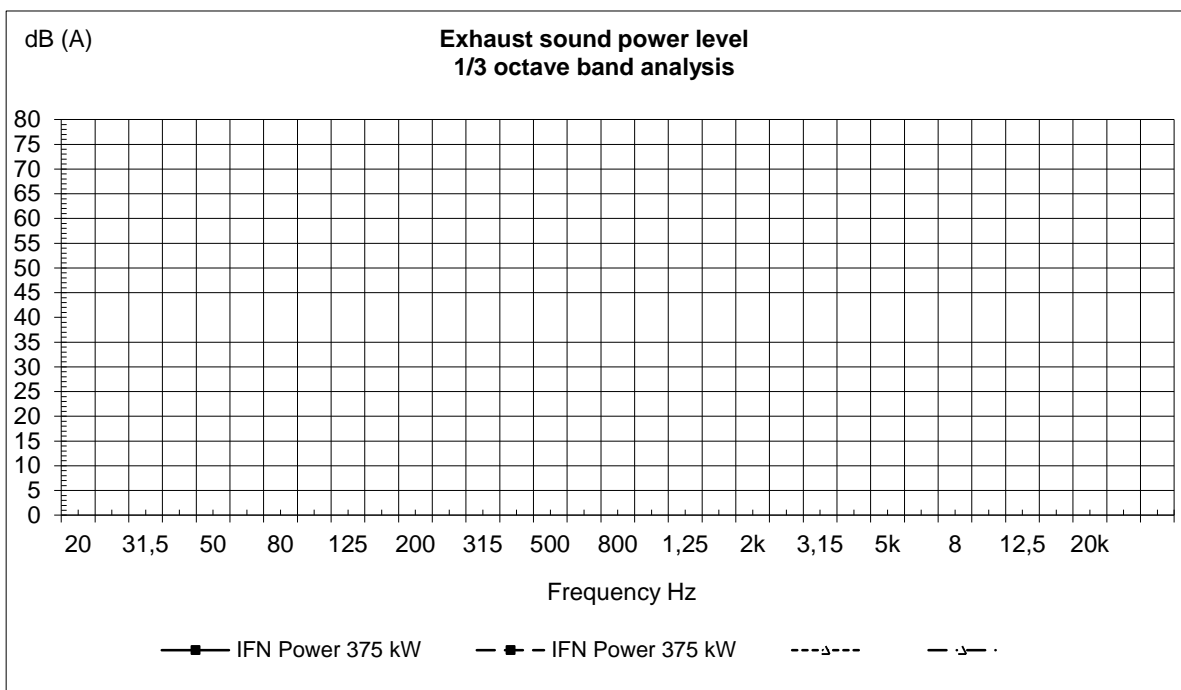
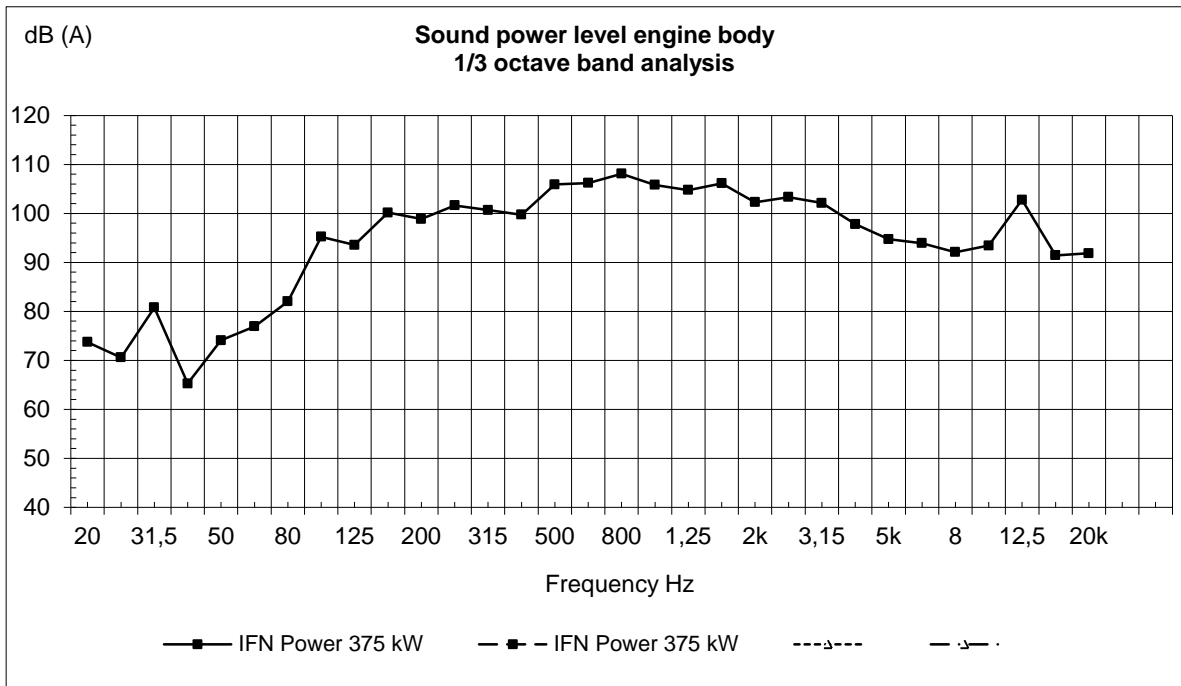
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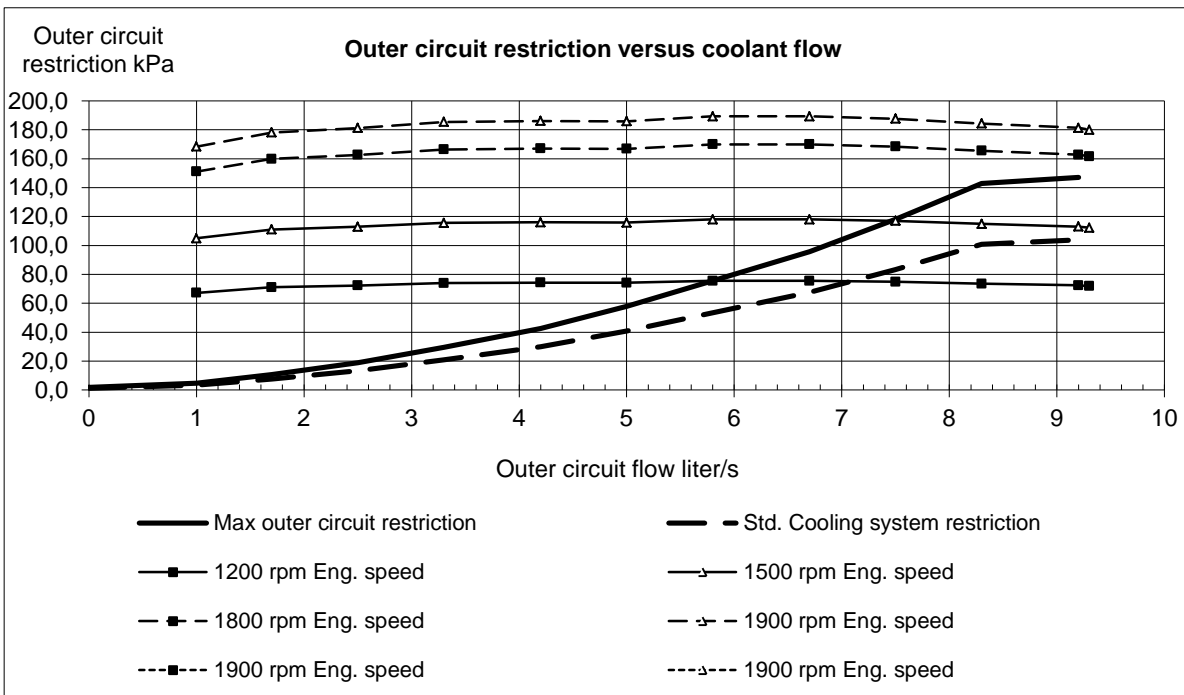
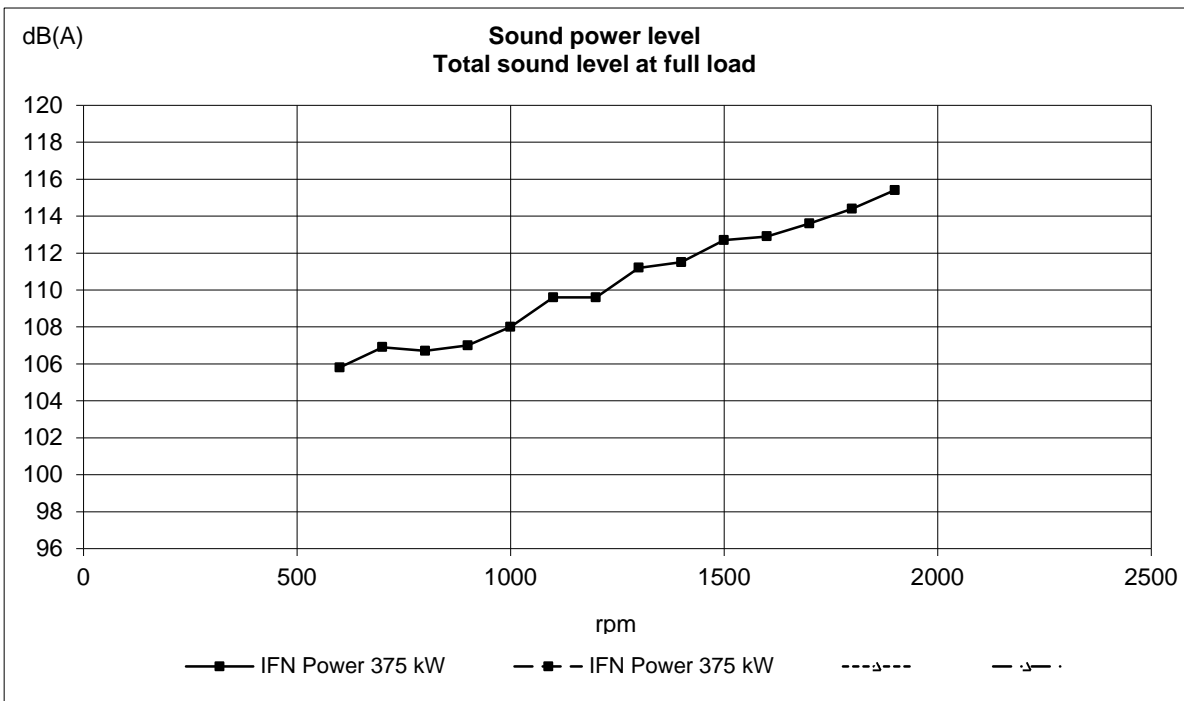
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