


VOLVO PENTA TAD1361VE	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
ICFN Power	285 kW	without fan	kW	247	285	285	285
			hp	336	388	388	388
	with fan	890 mm	kW	243	279	275	273
			hp	330	379	374	371
ICFN Power	256 kW	without fan	kW	247	256	256	256
			hp	336	348	348	348
	with fan	890 mm	kW	243	250	246	244
			hp	330	340	335	332
Torque at:	ICFN Power 285 kW		Nm	1966	1814	1512	1432
			lbf ft	1450	1338	1115	1056
	ICFN Power 256 kW		Nm	1966	1630	1358	1287
			lbf ft	1450	1202	1002	949
Max torque at engine speed	ICFN Power	1200 rpm	Nm	1966			
			lbf ft	1450			
			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:	ICFN Power 285 kW		MPa	1,93	1,78	1,49	1,41
			psi	280	259	216	204
Max combustion pressure at:	ICFN Power 285 kW		MPa	13,6	14,6	15	14,6
			psi	1972	2117	2175	2117
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	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:	ICFN Power 285 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	130
		°F	266
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)	ICFN Power 285 kW		m ³ /min cfm	18,0 636	23,0 812	27 954	28 989
 See front page for important information Max allowable air intake restriction including piping			kPa psi	5 0,7			
Heat rejection to exhaust at:	ICFN Power 285 kW		kW BTU/min	161 9156	196 11146	208 11829	225 12796
Exhaust gas temperature after turbine at:	ICFN Power 285 kW		°C °F	427 801	403 757	377 711	363 685
 See front page for important information Max allowable back pressure in exhaust line (after turbine) Pipe dimension Ø: 125 mm			kPa psi	16 2,3	23 3,3	27 3,9	29 4,2
 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)	ICFN Power 285 kW		m ³ /min psi m ³ /min cfm	12 1,7 39,0 1377	17 2,5 48,0 1695	20 2,9 52 1836	21 3,0 53 1872
Exhaust gas smoke	ICFN Power 285 kW		*Bosch Units	0,01	0,01	0,01	0,02

Cooling system		rpm	1200	1500	1800	1900
Heat rejection radiation from engine at:	ICFN Power 285 kW	kW BTU/min	5 301	6 336	6 341	6,4 364
Heat rejection to coolant at:	ICFN Power 285 kW	kW BTU/min	104 5914	120 6824	134 7620	144 8189
Radiator cooling system type			Closed circuit			
Standard radiator core area		m ² foot ²	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. 0,8m ² 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	55,0 8,0			
Thermostat:	start to open	°C °F	82 180			
		°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	ICFN Power 285 kW	kW BTU/min	36 2047	53 3014	66 3753	72 4095
Charge air mass flow	ICFN Power 285 kW	kg/s	0,33	0,45	0,52	0,54
Charge air inlet temp. (Charge air temp after turbo compressor)	ICFN Power 285 kW	°C °F	146 295	162 324	174 345	181 358
 See front page for important information Max allowable Charge air outlet temp. (Charge air temp after charge air cooler)	ICFN Power 256 kW	°C °F	37 99	42 108	47 117	50 122
 See front page for important information Maximum pressure drop over charge air cooler incl. Piping (throttle not included)		kPa psi		12 1,74		
Charge air pressure at rated power (After charge air cooler)		kPa psi		185 26,83		
Standard charge air cooler core area		m ² foot ²		0,8 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	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
1900	285	64	147	6,2	219,0	310	0,045
0,84	388	66	151	6,7	236,6	175	0,025
		68	154	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	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
1900	285	64	147	6	211,9	380	0,055
0,84	388	66	151	6,6	233,1	200	0,029
		68	154	7,2	254,3	0	

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Cooling performance: **0,73 m² radiator and Radiator module 136232624 and kit 22113648 pusher** **750 fan** **fan drive ratio 0.84:1**

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 (0,84)	285 388	71	160	6,7	237,5	0	
		69	156	6,1	214,8	100	0,015
		64	147	5,6	198,8	200	0,029
		63	145	5,2	182,3	300	0,044
		60	140	4,7	165,0	400	0,058
1800 (0,84)	285 388	73	163	6,3	224,2	0	
		68	155	5,9	207,5	100	0,015
		66	151	5,2	184,0	200	0,029
		63	146	4,7	166,5	300	0,044
		57	134	4,2	148,8	400	0,058

Cooling performance: **0,73 m² radiator and Radiator module 136232625 and kit 22113649 suction** **750 fan** **fan drive ratio 0.84:1**

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 (0,84)	285 388	67	153	6,1	216,4	0	
		63	145	5,7	202,3	100	0,015
		60	140	5,3	187,7	200	0,029
		60	140	4,9	172,5	300	0,044
		54	129	4,4	156,6	400	0,058
1800 (0,84)	285 388	67	152	6,0	210,9	0	
		64	146	5,4	190,4	100	0,015
		63	146	4,9	173,8	200	0,029
		57	135	4,5	158,1	300	0,044
		53	127	4,0	141,8	400	0,058

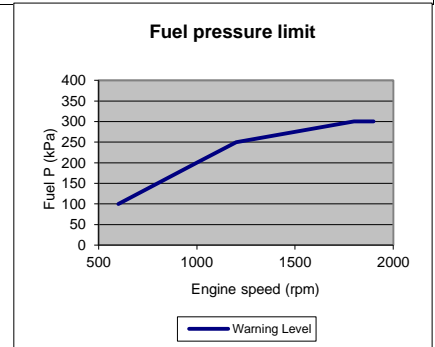
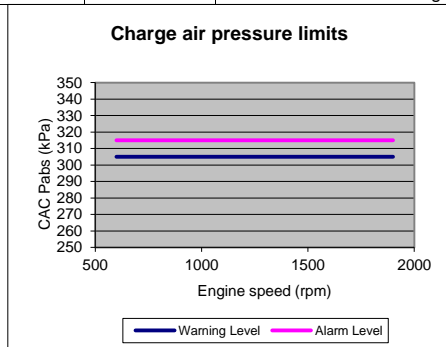
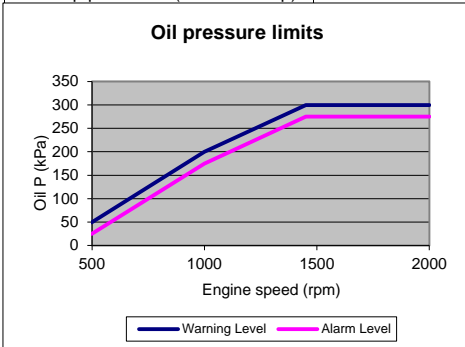
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Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronous	
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	Alarm map	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				90				
Alternator:	make			90				
	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			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						
	Battery	Ah / CCA						
				25				
				0				
				-15				
Crank speed	rpm		140/800			140/800	145 / 1050	
Crank current	A		171			118	98	
Starter input power during crank	kW		290			400	480	
Battery power during crank	kW		6,2			7,5	7,7	
Min battery	Ah / CCA		6,5			8,1	8,5	
				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
Continuous torque at: Timing gear at compressor PTO max: *		Nm	300			
PTO SAE B		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 available maximum torque depending on application inertia.

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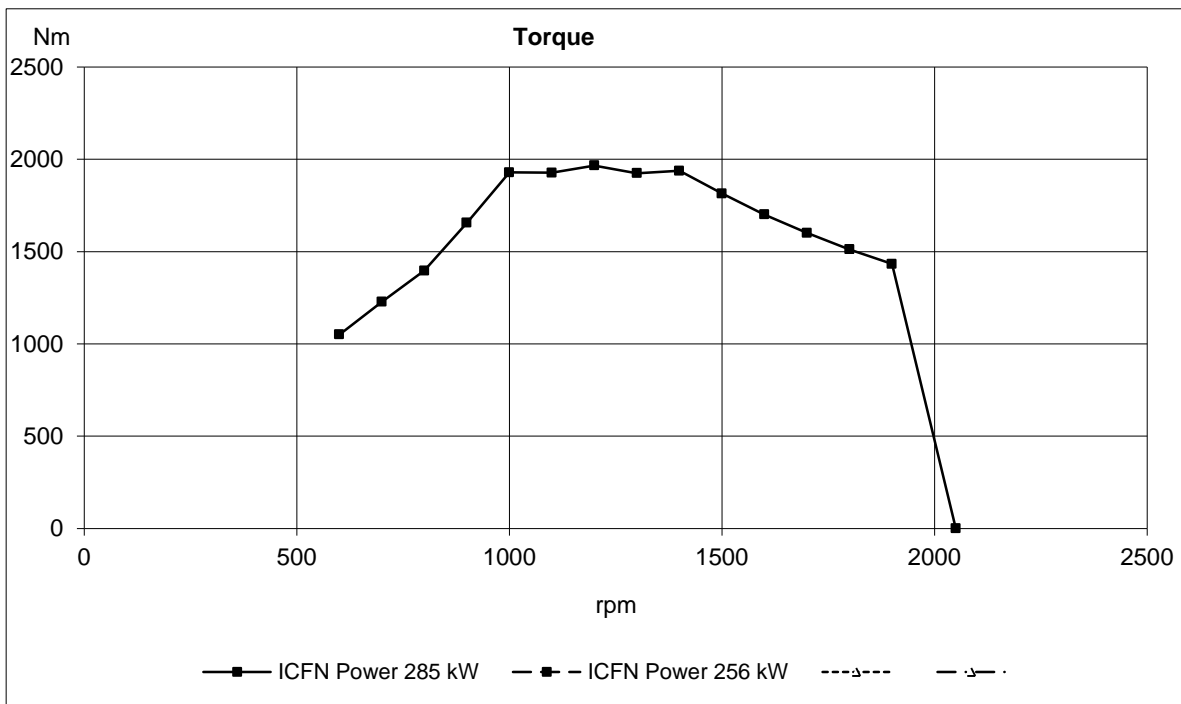
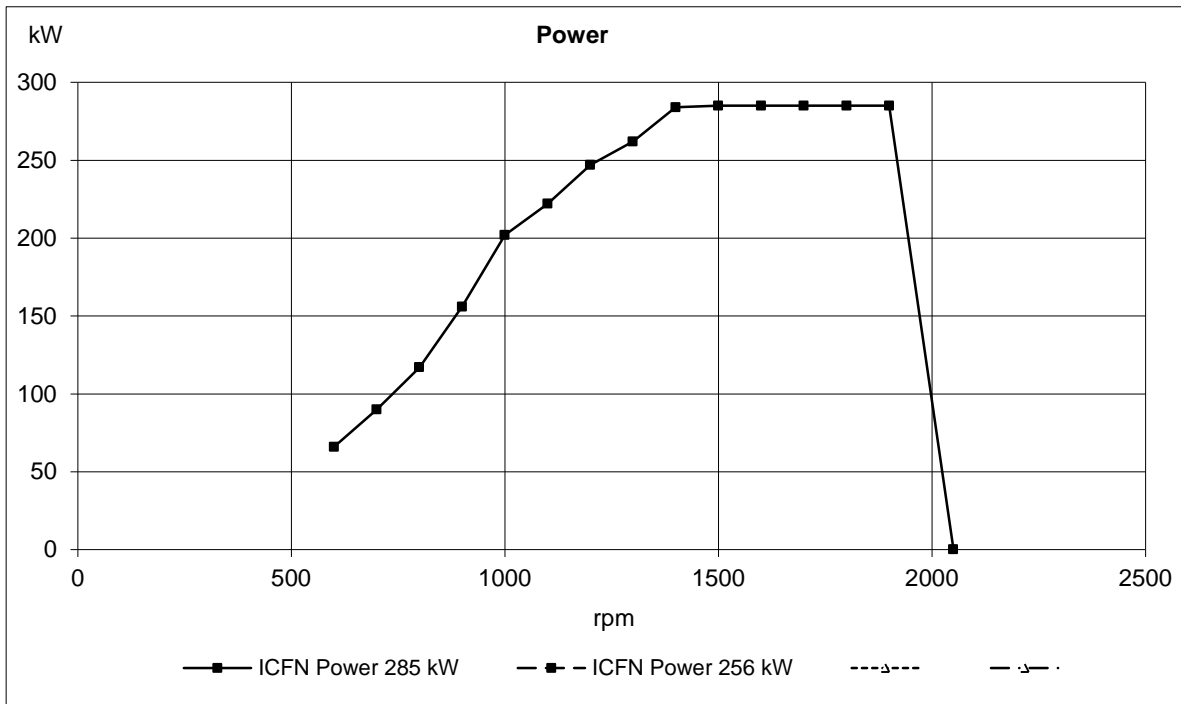
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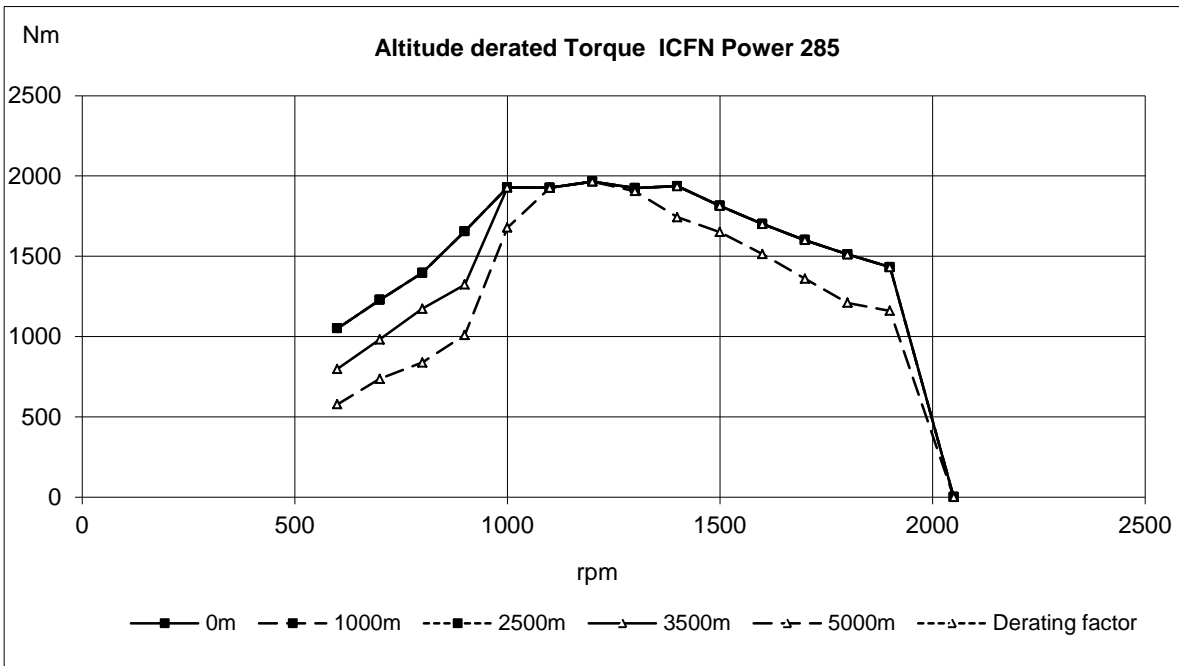
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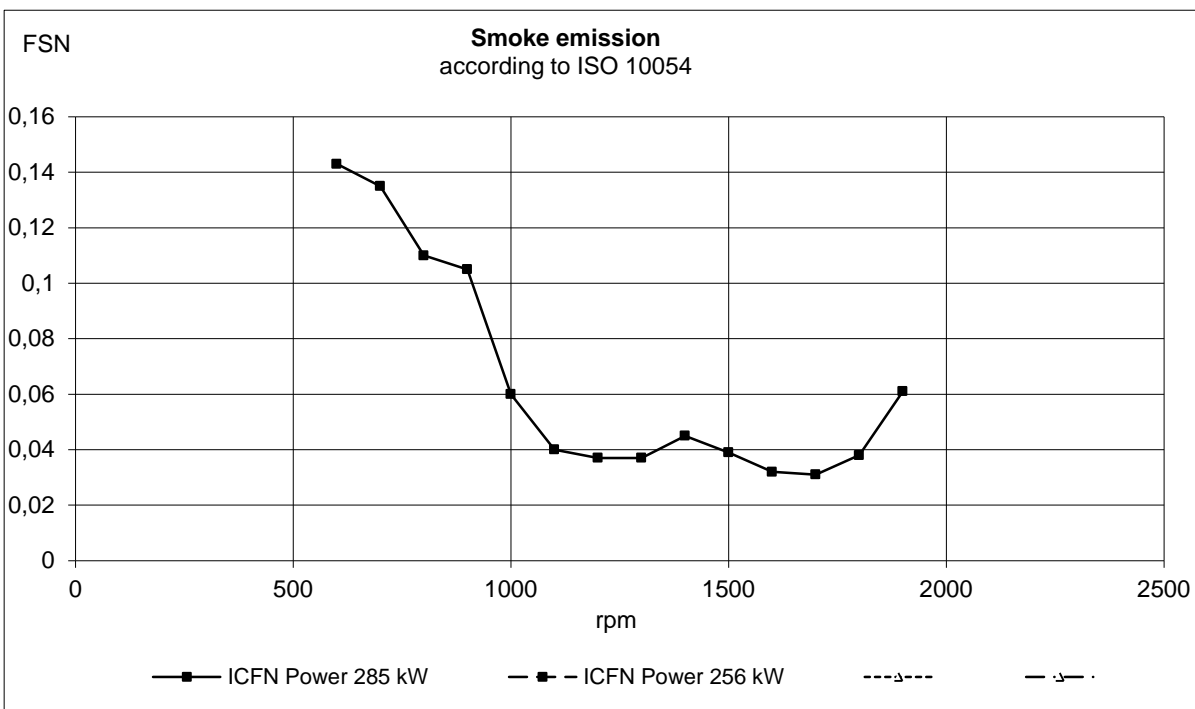
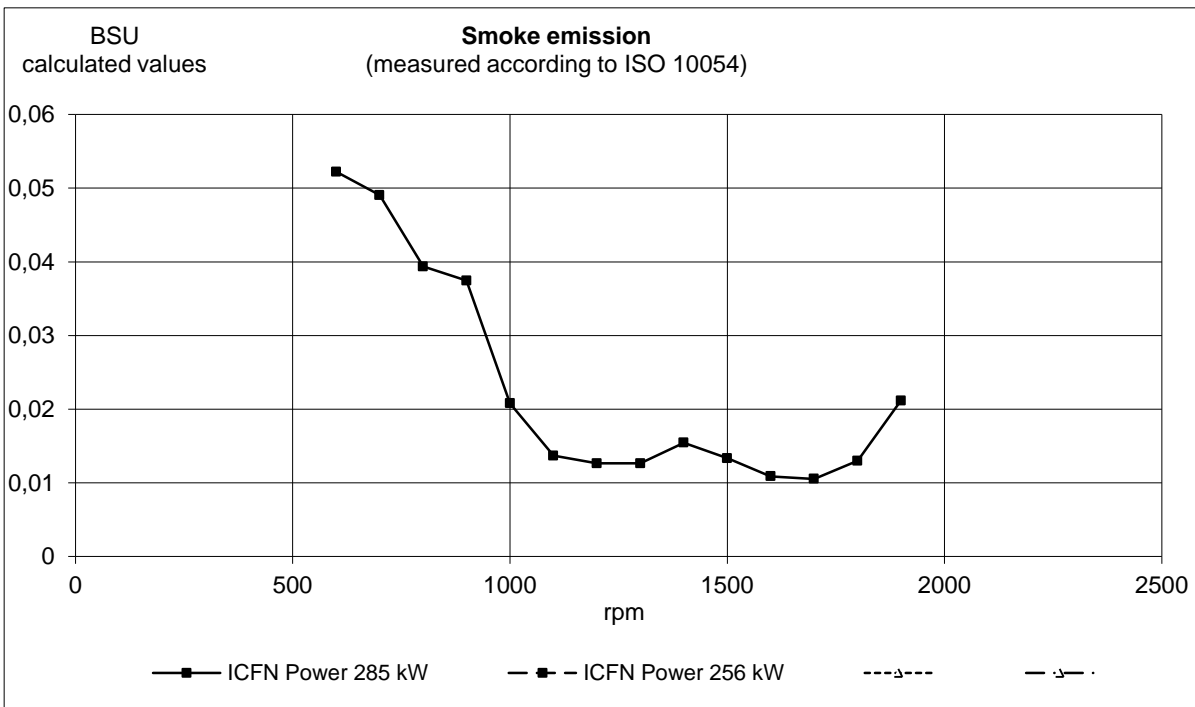
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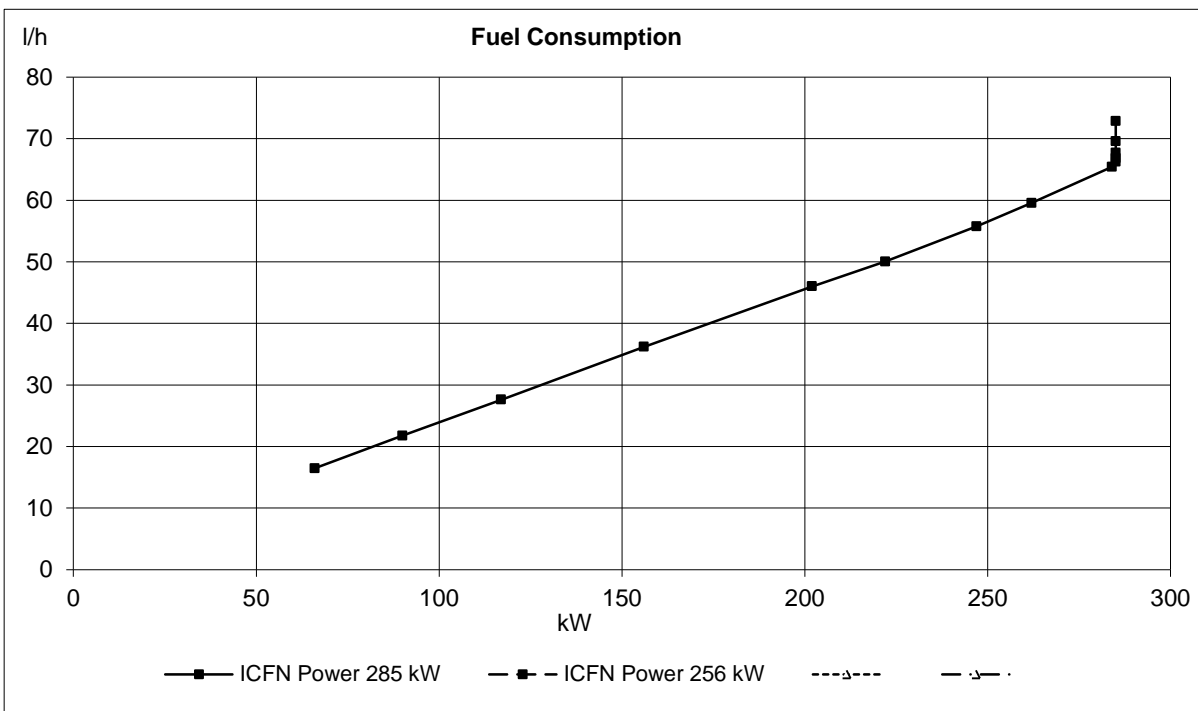
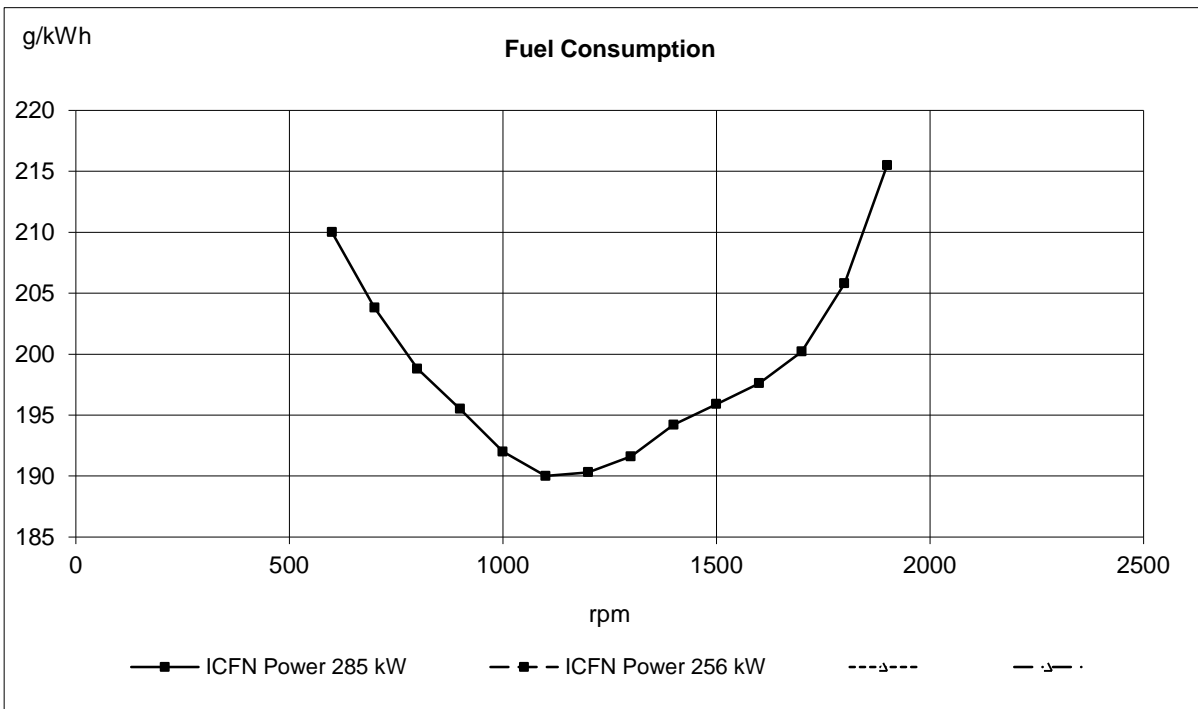
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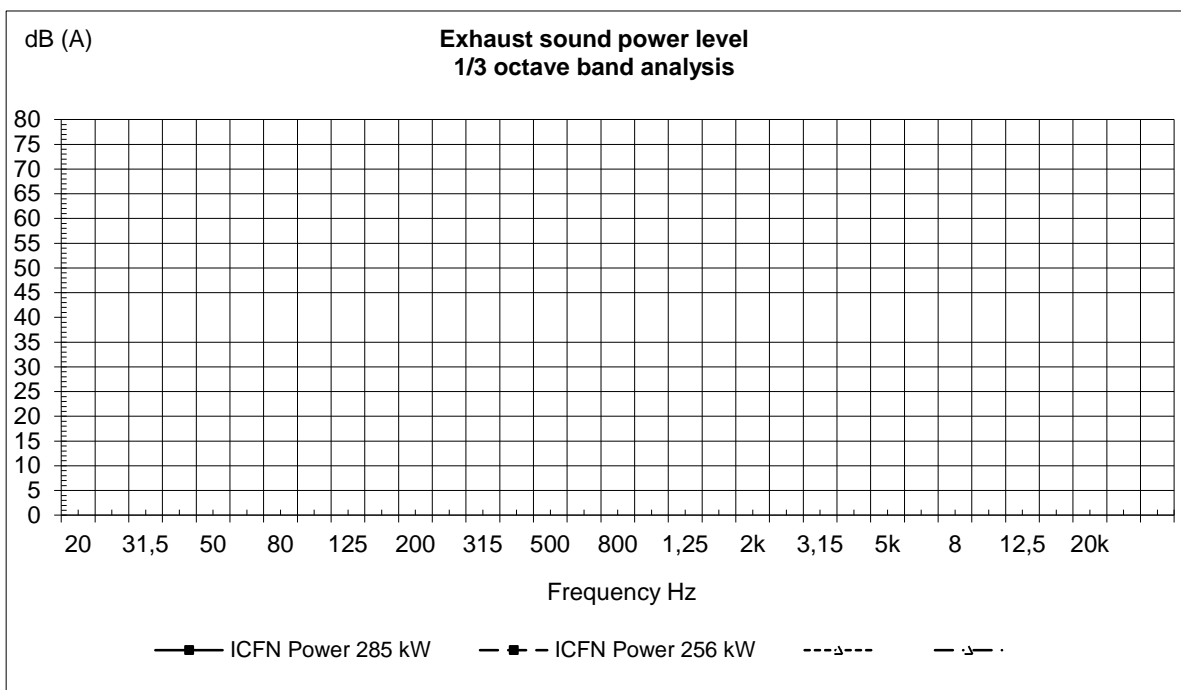
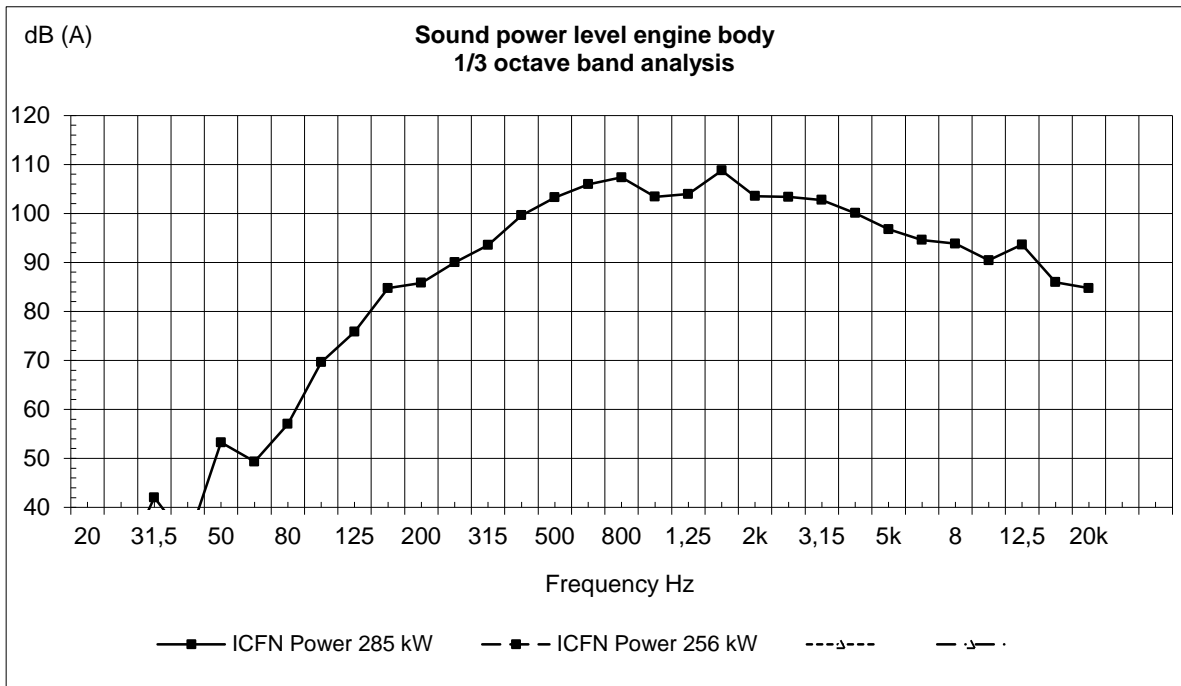
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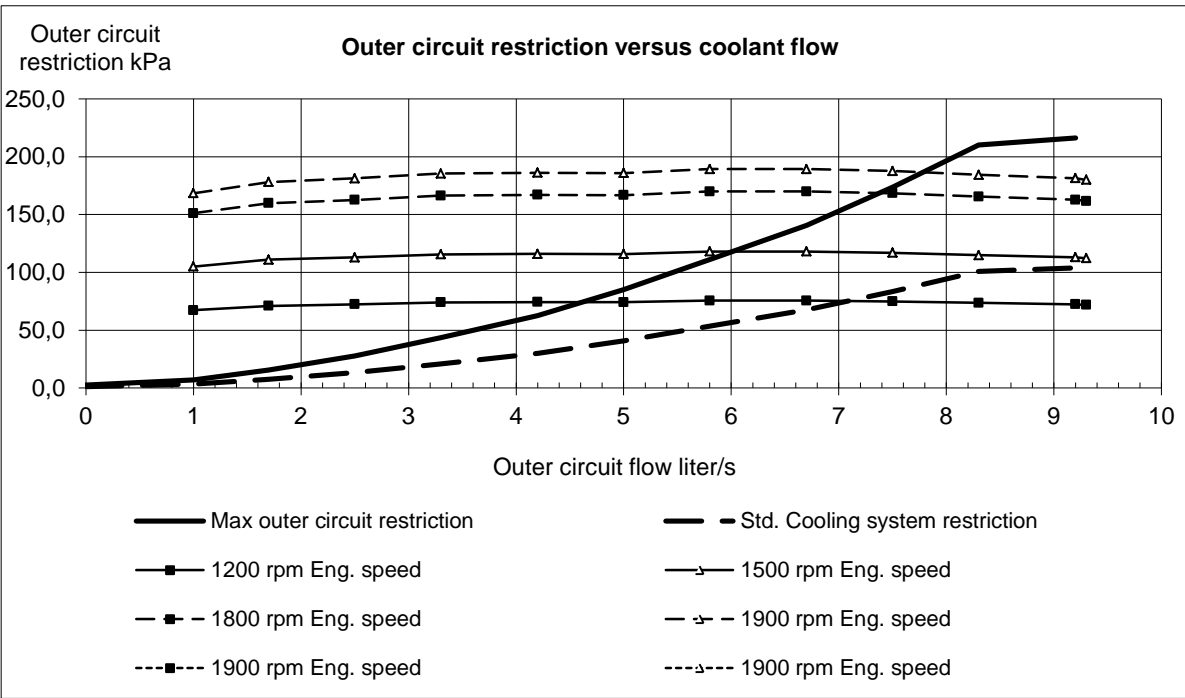
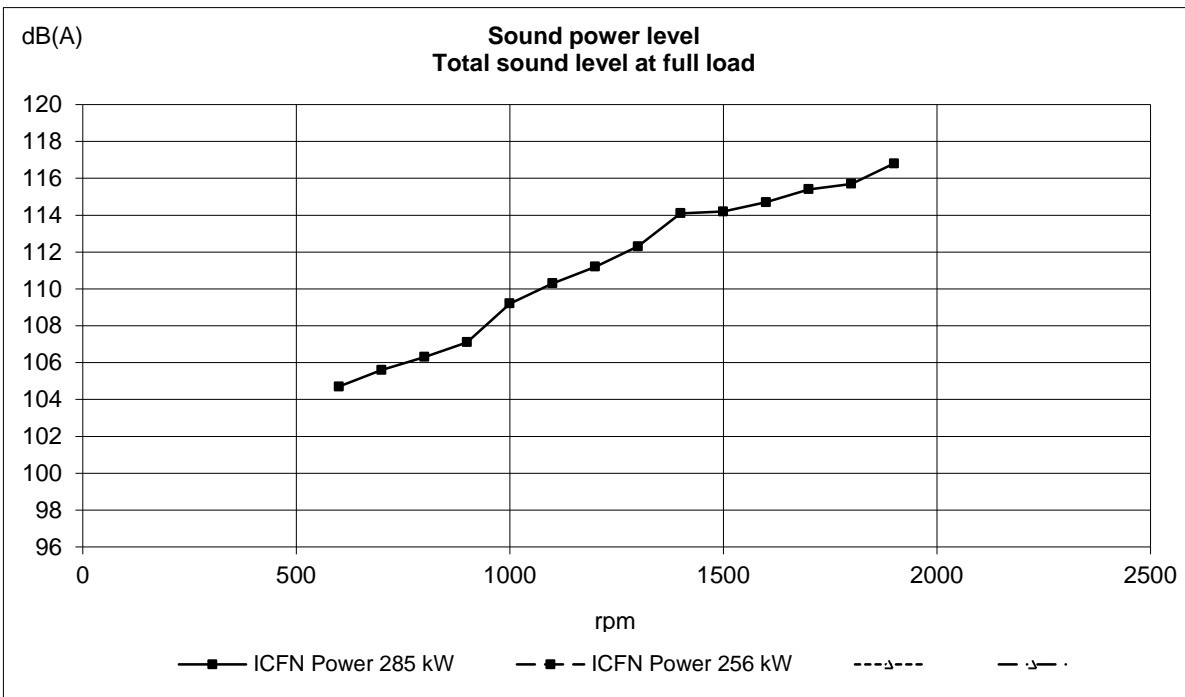
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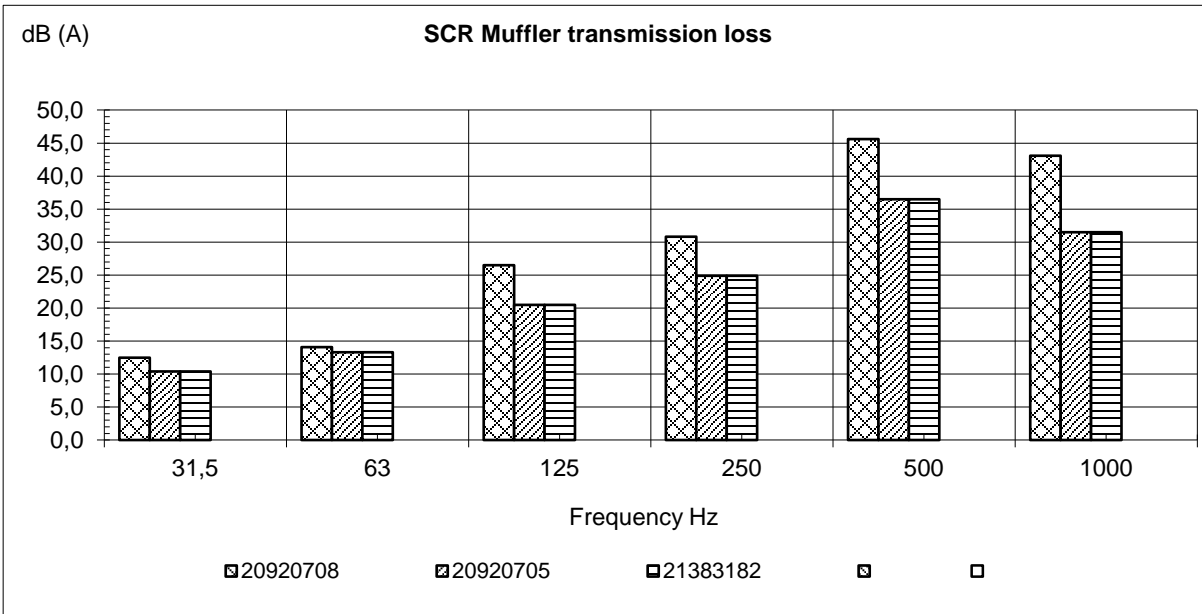
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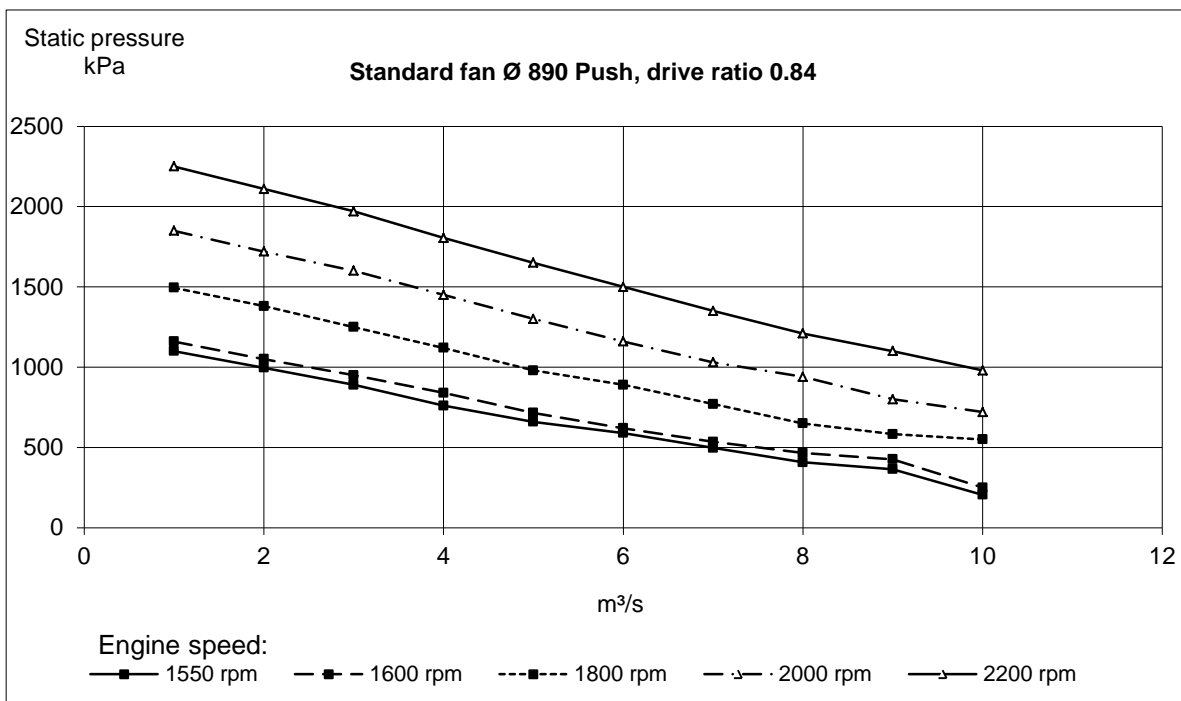
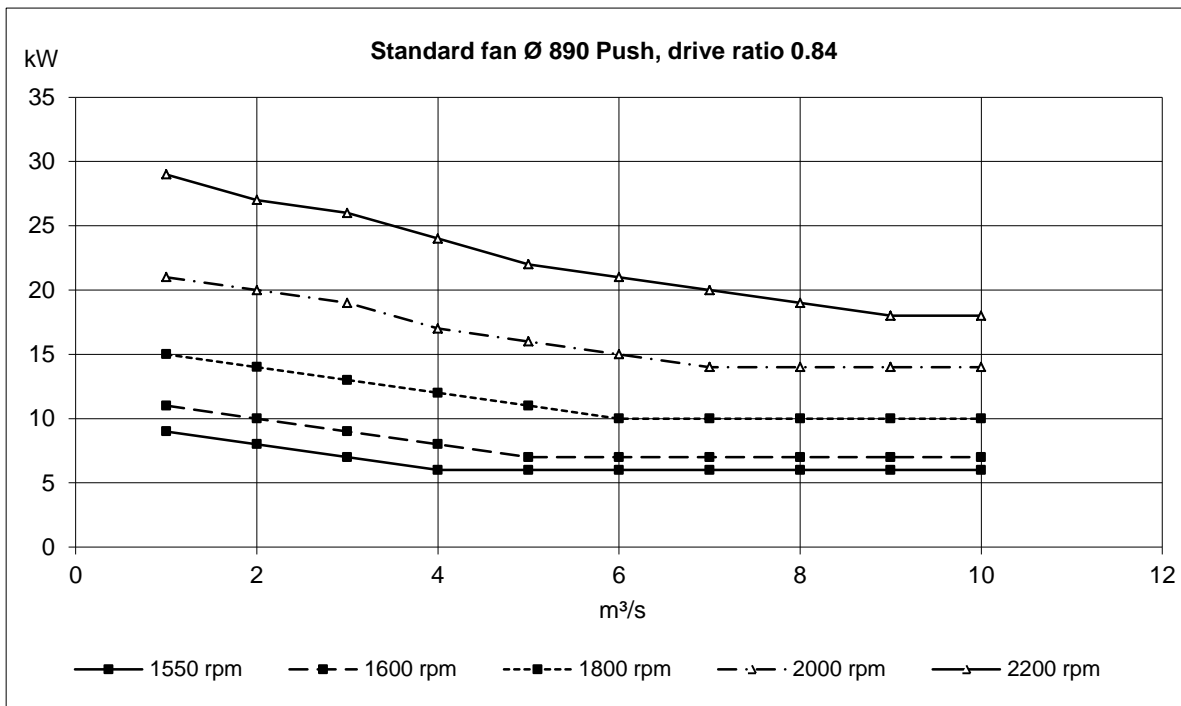
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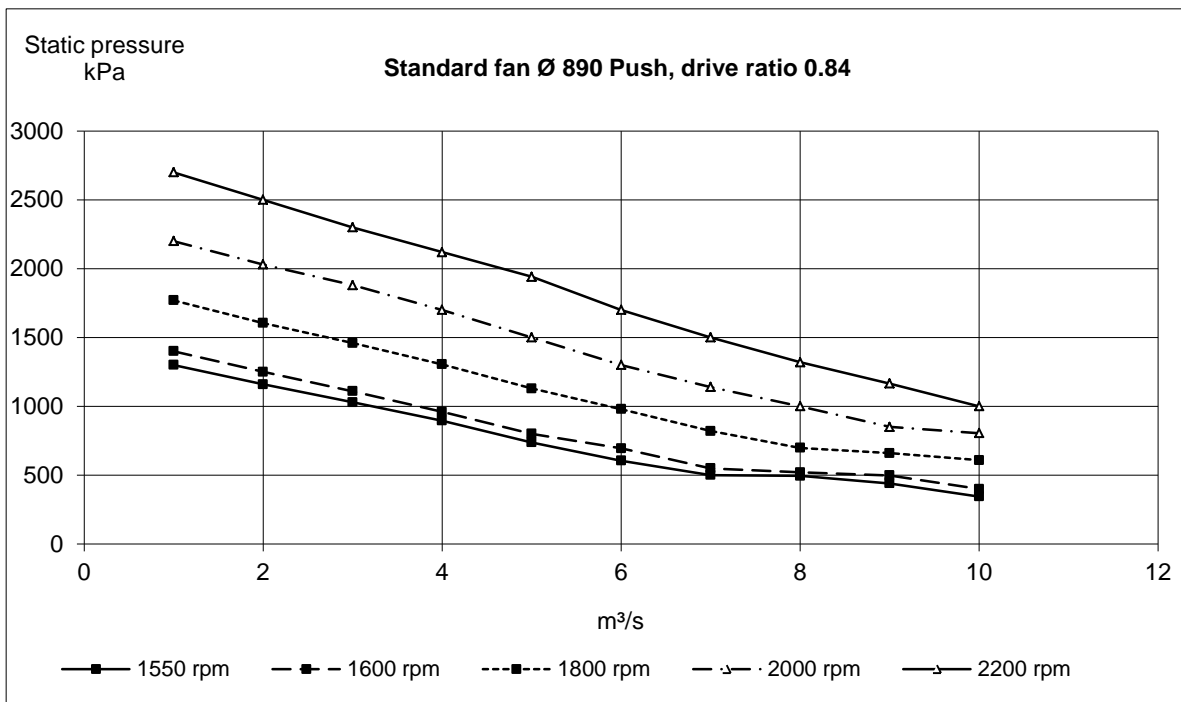
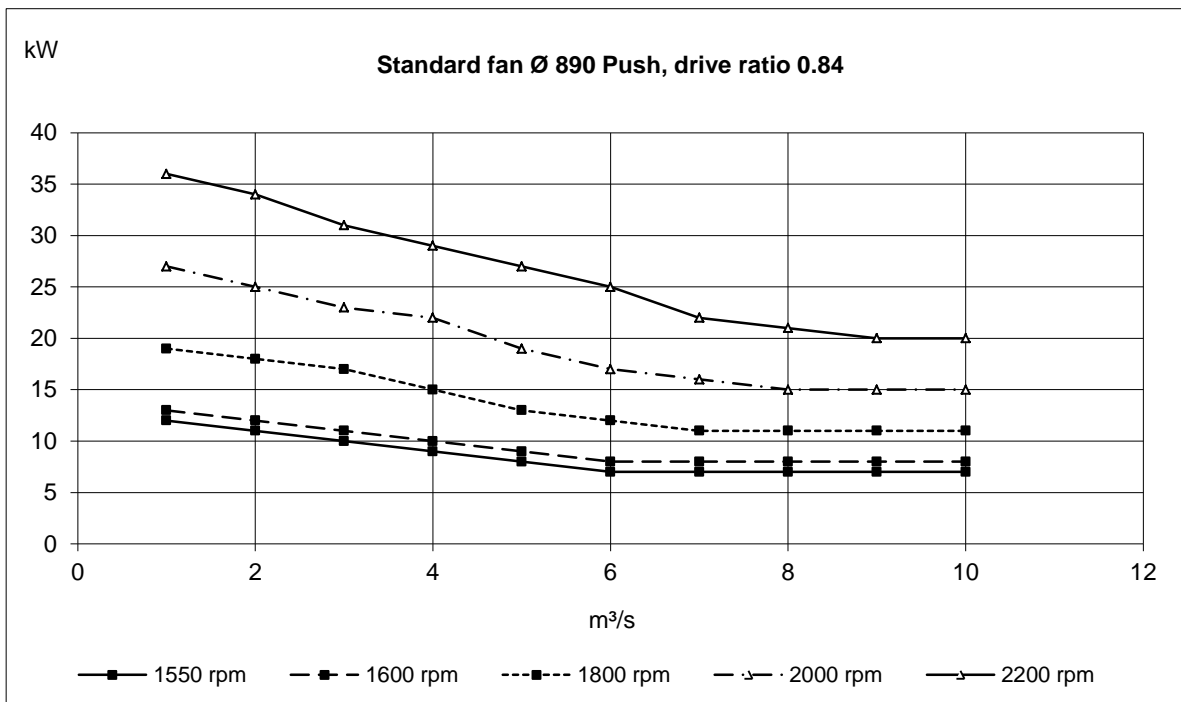
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