VOLVO PENTA **TAD1343VE**	Document No **22186975**	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 ⚠ 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 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 in^3	12,78 780
Firing order			1-5-3-6-2-4
Bore		mm in	131 5,16
Stroke		mm in	158 6,22
Compression ratio			18.1:1
Wet weight (Not including after treatment system)	Engine only	kg lb	1325 2921
	Power pac	kg lb	1790 3946

Performance		**rpm**	**1500**	**1800**	**2000**	**2100**
332 kW	without fan	kW hp	332 452	332 452	332 452	332 452
	with fan 890 mm	kW hp	326 443	322 438	318 432	316 430
Torque at:	ICFN Power 332 kW	Nm lbf ft	2114 1559	1761 1299	1585 1169	1510 1113
Max torque at engine speed	1260 rpm	Nm lbf ft	2119 1563			
Power tolerance		%	±2%			
Mean piston speed		m/s ft/sec	7,9 25,9	9,5 31,1	10,5 34,6	11,1 36,3
Effective mean pressure at:	ICFN Power 332 kW	MPa psi	2,08 301	1,73 251	1,56 226	1,48 215
Max combustion pressure at:	ICFN Power 332 kW	MPa psi	17 2465	16,7 2422	15,1 2190	14,5 2103
Total mass moment of inertia, J (mR^2) (not including flywheel)		kgm^2 $lbft^2$	3,43 81,4			
Friction Power		kW hp	30 41	43 58	54 73	60 82
Derating see Technical Diagrams						

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Cold start performance

*Cold start limit temperature	without starting aid	°C / sec °F / sec	20 68	3
	with manifold heater 4 kW	°C / sec °F / sec	-5 23	4
	with manifold heater 4 kW and block heater	°C / sec °F / sec	-15 5	4.5
*Specify oil and fuel quality	Mk1 fuel, VDS2 oil, 15w40 above -15°C, 10w30 below -15°C			

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 332 kW		liter/h US gal/h	0,02 0,005
			liter/h US gal/h	0,02 0,005
Oil system capacity including filters			liter US gal	Std sump 36 / Aluminium sump 52 Std sump 9,51 / Aluminium sump 13,74
Plastic Oil sump capacity (Std):		Max	liter US gal	30 7,93
		Min	liter US gal	19 5,02
Aluminium Oil sump capacity:		Max	liter US gal	46 12,15
		Min	liter US gal	36 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 psi	300 - 650 44 - 94
Oil pressure shut down switch setting			kPa psi	130 19

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	1500	1800	2000	2100
ICFN Power 332 kW	25%	g/kWh	217	239	263,3	278,8
Specific fuel consumption at:		lb/hph	0,352	0,387	0,427	0,452
	50%	g/kWh	194	204	221,6	234,2
		lb/hph	0,314	0,331	0,359	0,380
	75%	g/kWh	188	196	210	220,5
		lb/hph	0,305	0,318	0,340	0,357
	100%	g/kWh	191	197	208	215,1
		lb/hph	0,310	0,319	0,337	0,349
Fuel to conform to			ASTM-D975-No1 and 2D JIS KK 2204, EN 590			

Fuel system

System supply flow at max. speed	liter/h	104
	US gal/h	27,5
Fuel supply line max. restriction	kPa	10
(Measured at fuel inlet connection)	psi	1,5
Fuel supply line max. pressure, during engine stand still	kPa	16,5
(meassured at fuel inlet connection)	psi	2,4
System return flow at max. speed	liter/h	18,0
	US gal/h	4,8
Fuel return line max. restriction	kPa	20
(Measured at fuel return connection)	psi	2,9
Max. allowable inlet fuel temp	°C	60
(Measured at fuel inlet connection)	°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:	ICFN Power 332 kW		m³/min	25	27	27	27
(+25°C and 100kPa)			cfm	885	938	968	969
⚠ **See front page for important information**							
Max allowable air intake restriction including piping			kPa	3			
			psi	0,4			
Heat rejection to exhaust at:	ICFN Power 332 kW		kW	222	235	264	282
			BTU/min	12625	13364	15013	16037
Exhaust gas temperature after turbine at:	ICFN Power 332 kW		°C	421	419	452	475
			°F	790	786	846	887
⚠ **See front page for important information**							
Max allowable back pressure in exhaust line (after turbine)			kPa	11	13	14	15
Pipe dimension Ø:	mm		psi	1,6	1,9	2,1	2,2
Exhaust gas flow at:	ICFN Power 332 kW		m³/min	56	58	62	64
(temp and pressure after turbine at the			cfm	1974	2060	2204	2274
Exhaust gas smoke	ICFN Power 332 kW		*Bosch	0,08	0,1	0,3	0,6
			Units				

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Cooling system			rpm	1500	1800	2000	2100
Heat rejection radiation from engine at:	ICFN Power 332 kW		kW BTU/min	17 944	17 950	16,7 950	16,6 944
Heat rejection to coolant at:	ICFN Power 332 kW		kW BTU/min	124 7052	132 7507	146 8303	154 8758
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	6,0 8	10,0 14	14,0 19	16,0 22
Fan drive ratio	fan Ø890			0,84 : 1			
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/1,50:1			
Coolant flow with standard system			l/s US gal/s				
Minimum coolant flow			l/s US gal/s	4,7 1,2	5,7 1,5	6,0 1,6	6,2 1,6
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	70 10,2			
Maximum top tank temperature			°C °F	107 225			

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Charge air cooler system		**rpm**	**1500**	**1800**	**2000**	**2100**
Heat rejection to charge air cooler	ICFN Power 332 kW	kW BTU/min	72 4095	72 4095	73 4151	72 4095
Charge air mass flow	ICFN Power 332 kW	kg/s	0,5	0,52	0,54	0,54
Charge air inlet temp. (Charge air temp after turbo compressor)	ICFN Power 332 kW	°C °F	187 369	180 356	178 352	175 347
⚠ **See front page for important information** Max allowable Charge air outlet temp. (Charge air temp after charge air cooler)		°C °F	44 111	45 113	45 113	45 113
⚠ **See front page for important information** Maximum pressure drop over charge air cooler incl. piping		kPa psi	8 1,16			
Charge air pressure (After charge air cooler)		kPa psi	226 32,78			
Standard charge air cooler core area		m² foot²	0,8 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.

				IFN Power 332 kW			
Engine speed	Engine power	Air on temp		Air flow		External restriction	
rpm	kW hp	°C	°F	m^3/s	ft^3/s	Pa	psi
2100	332	58	136	6,5	229,5	518	0,075
(0,84)	452	61	142	7,3	257,8	270	0,039
		64	147	7,9	279,0	0	
1800	332	55	131	5,6	197,8	322	0,047
(0,84)	452	58	136	6,1	215,4	216	0,031
		61	142	6,7	236,6	0	

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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	Engine power	Air on temp		Air flow		External restriction	
	kW						
rpm	hp	°C	°F	m^3/s	ft^3/s	Pa	psi
2100	332	72	162	7,6	268,4	0	
(0,84)	452	70	158	7,0	247,2	100	0,015
		68	154	6,4	226,0	200	0,029
		66	151	6,0	211,9	300	0,044
		63	145	5,6	197,8	400	0,058
1800	332	73	163	6,3	222,5	0	
(0,84)	452	71	160	5,9	208,4	100	0,015
		67	153	5,2	183,6	200	0,029
		64	147	4,7	166,0	300	0,044
		59	138	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	Engine power	Air on temp		Air flow		External restriction	
	kW						
rpm	hp	°C	°F	m^3/s	ft^3/s	Pa	psi
2100	332	69	156	6,9	243,7	0	
(0,84)	452	67	153	6,4	226,0	100	0,015
		65	149	6,1	215,4	200	0,029
		63	145	5,7	201,3	300	0,044
		60	140	5,3	187,2	400	0,058
1800	332	67	153	6,0	211,9	0	
(0,84)	452	64	147	5,4	190,7	100	0,015
		61	142	4,9	173,0	200	0,029
		58	136	4,5	158,9	300	0,044
		53	127	4,0	141,3	400	0,058

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Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronus / 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	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			See cooling system	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.

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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			7		
		hp			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

Timing gear at compressor PTO max: * PTO SAE B	Nm lbf ft	300 221
Speed ratio direction of rotation viewed from flywheel side		1.31:1/ccw
Timing gear at servo pump PTO max: *	Nm lbf ft	100 74
Speed ratio direction of rotation viewed from flywheel side		1.75:1/ccw
Max allowed bending moment in flywheel housing	Nm lbf ft	15000 11063
Max. rear main bearing load	N lbf	4000 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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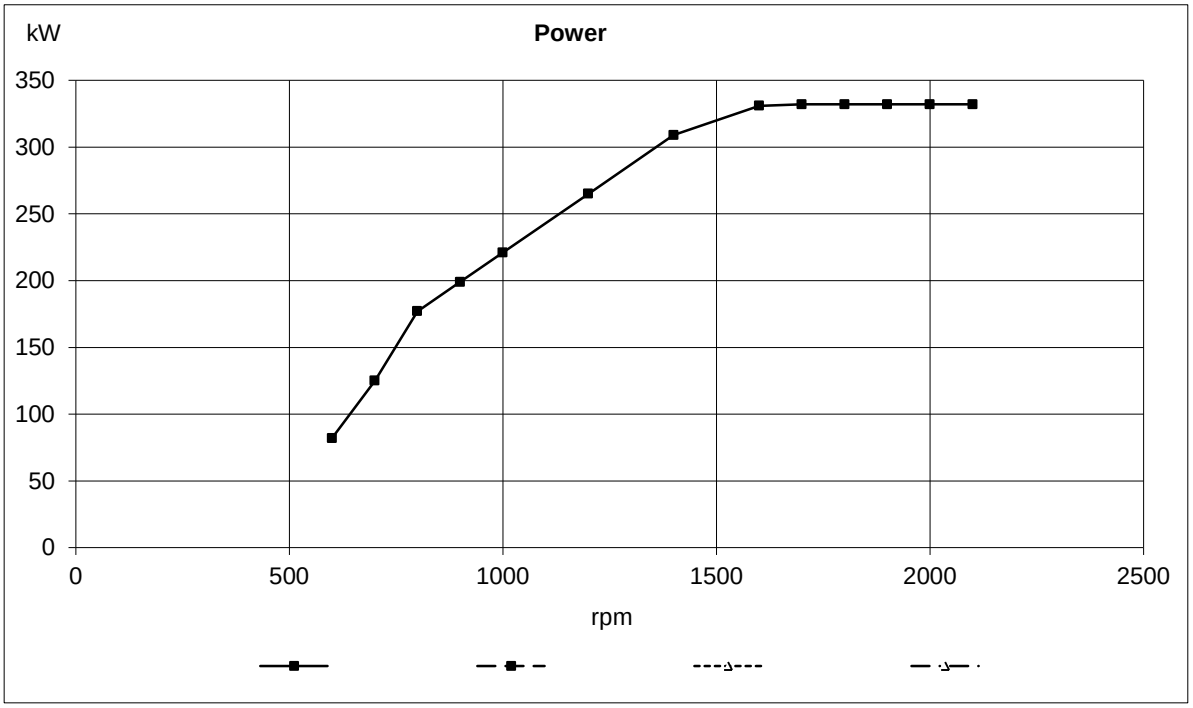

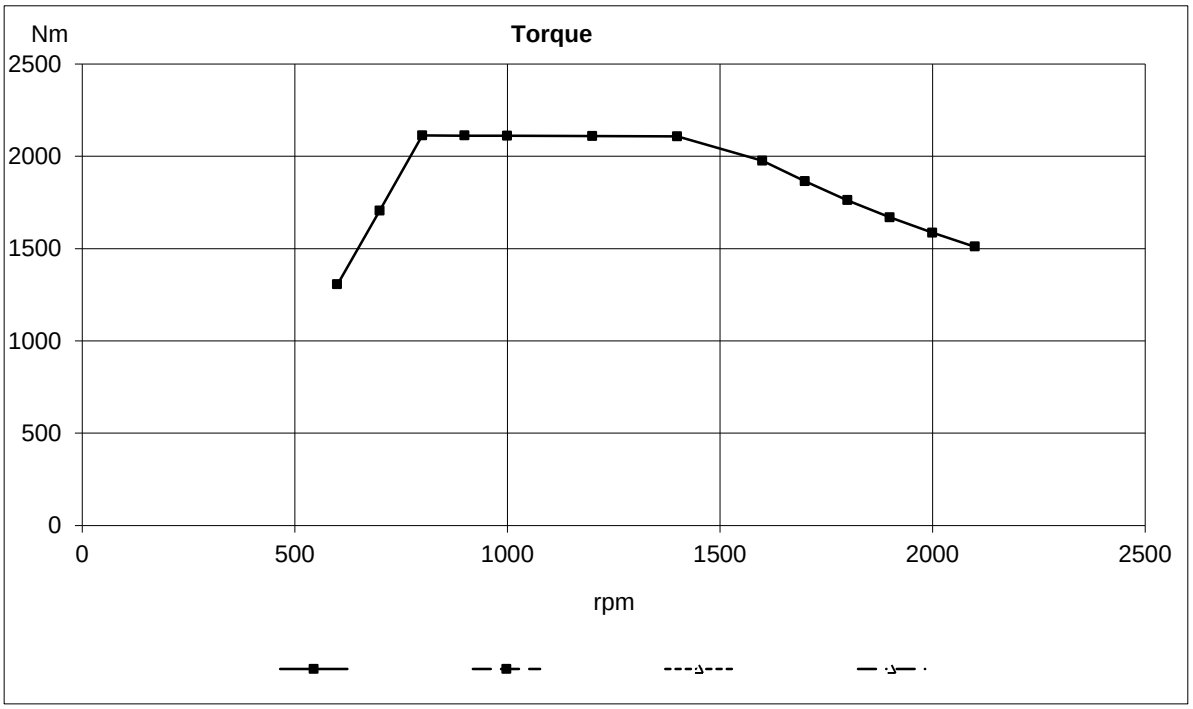

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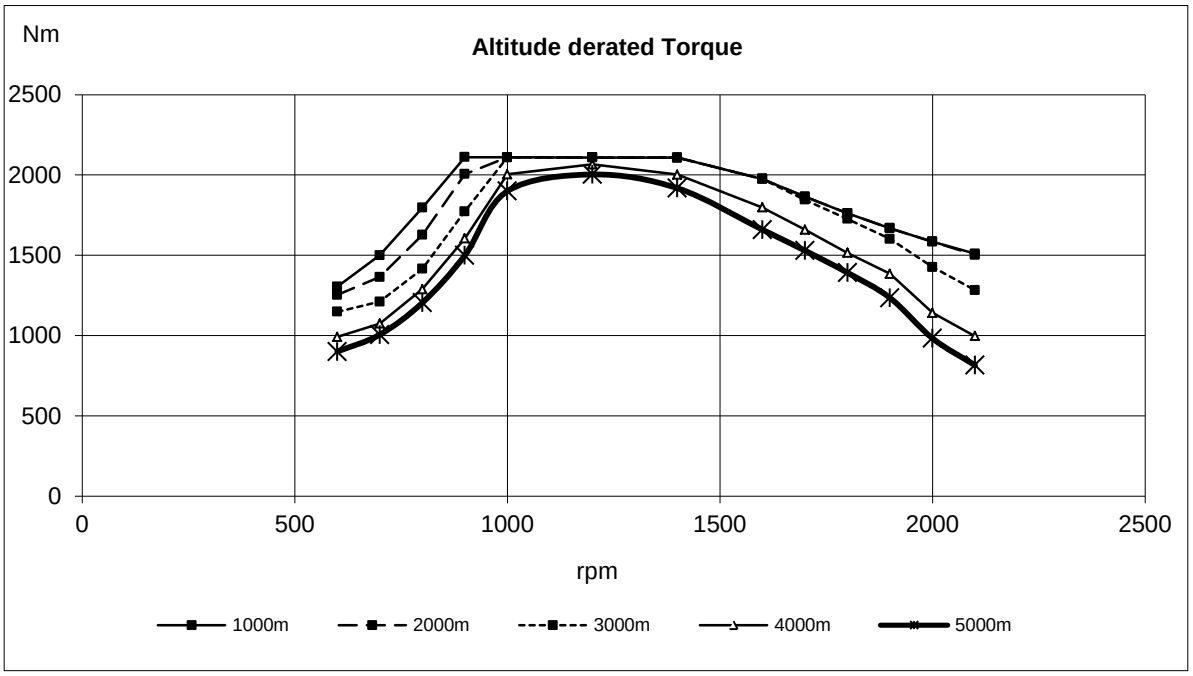

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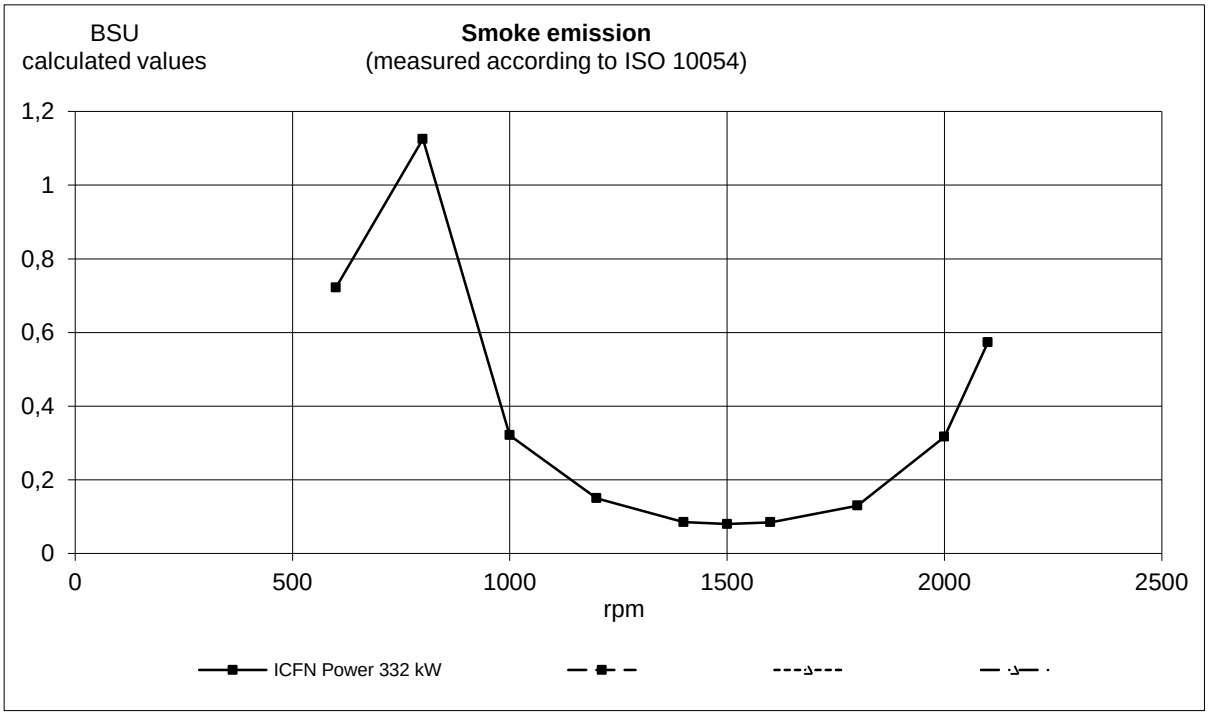

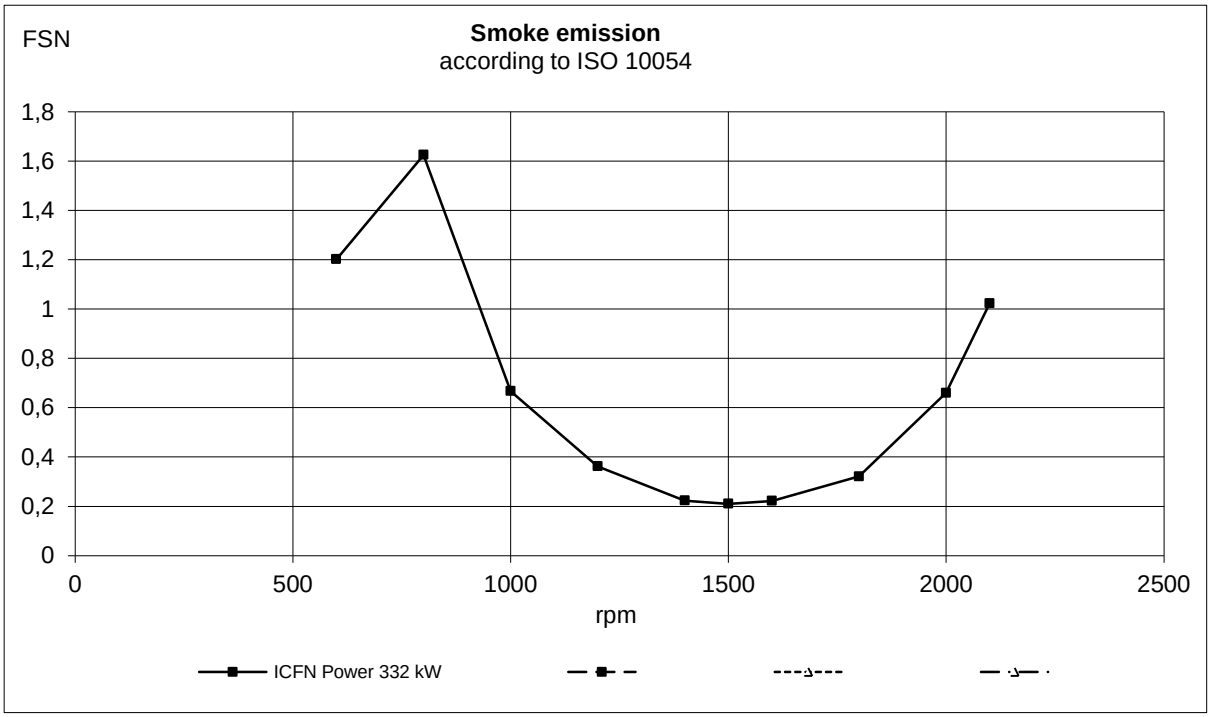

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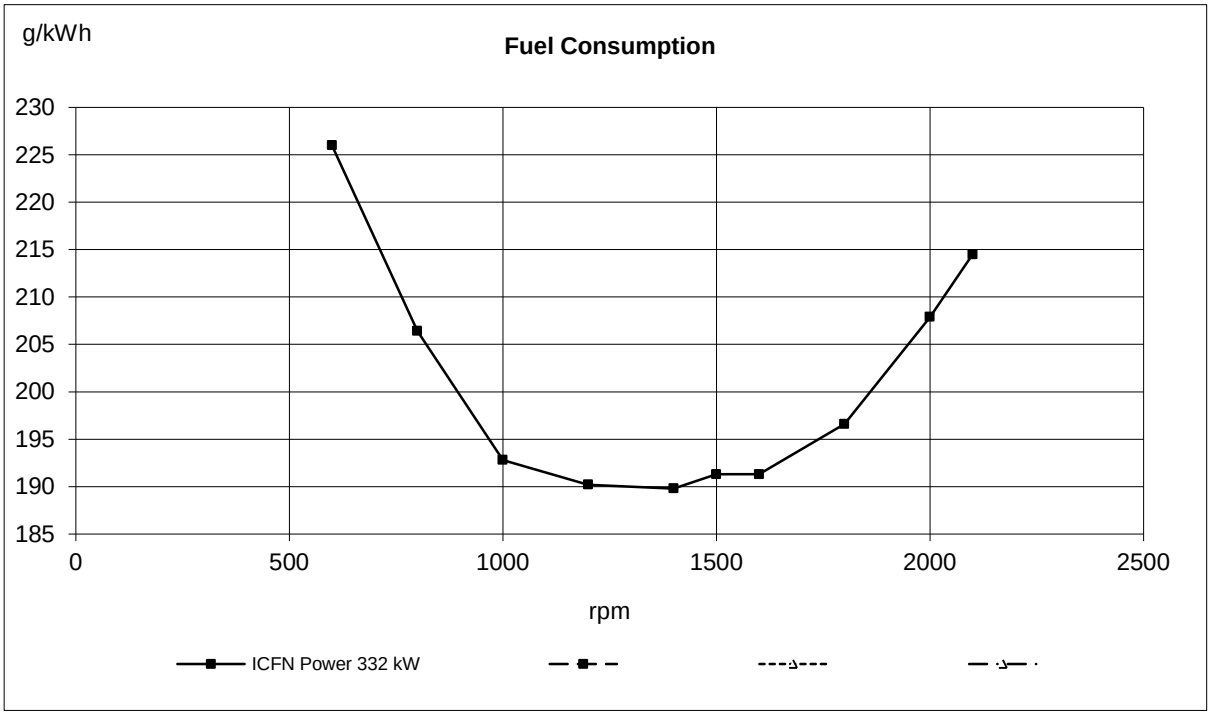

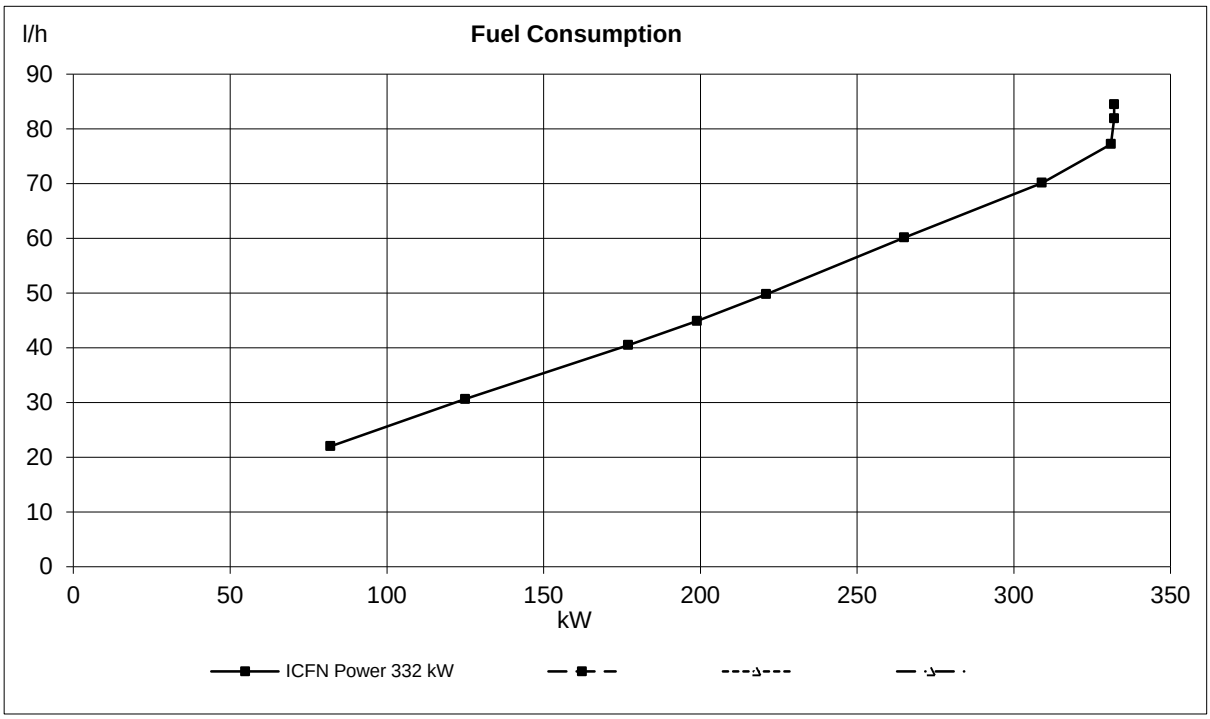

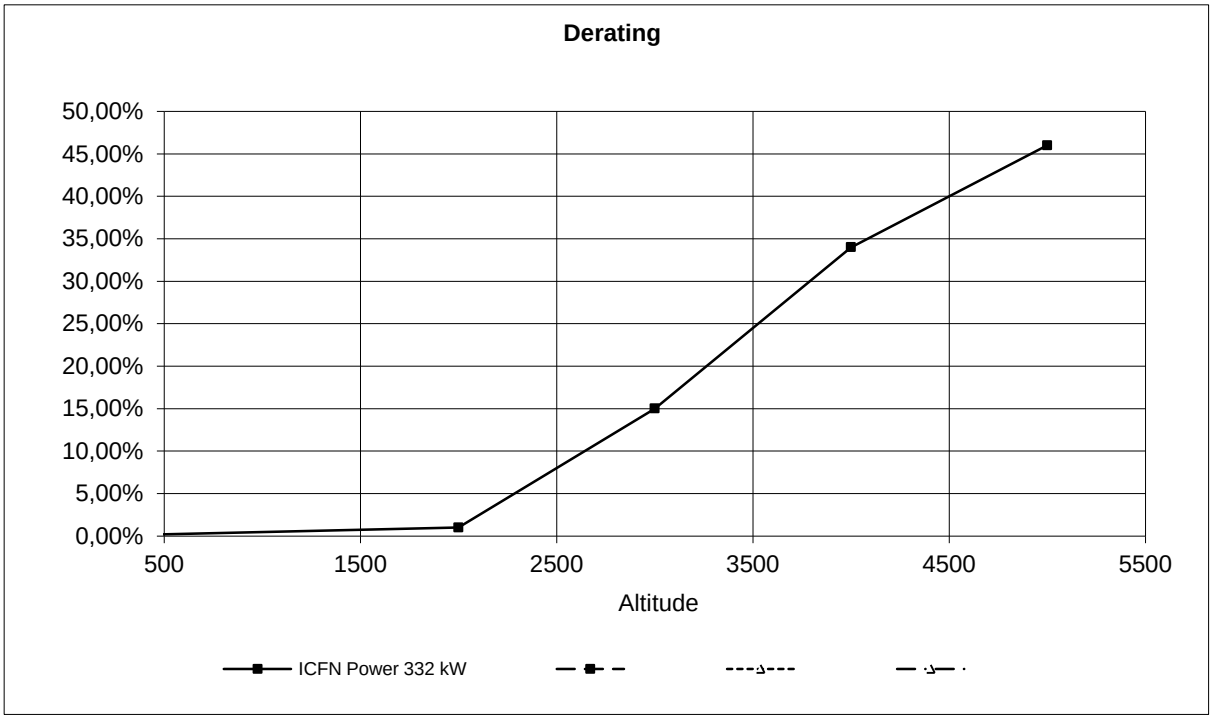
Derating
50,00%
45,00%
40,00%
35,00%
30,00%
25,00%
20,00%
15,00%
10,00%
5,00%
0,00%
500
1500
2500
3500
4500
5500
Altitude
ICFN Power 332 kW

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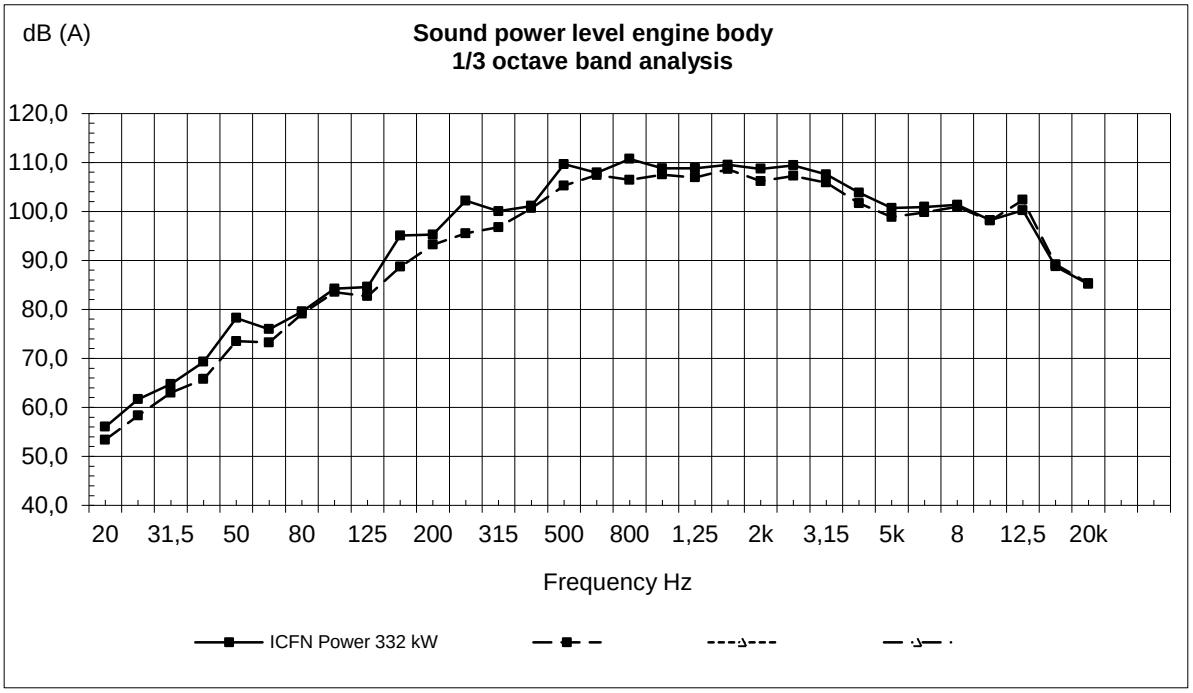

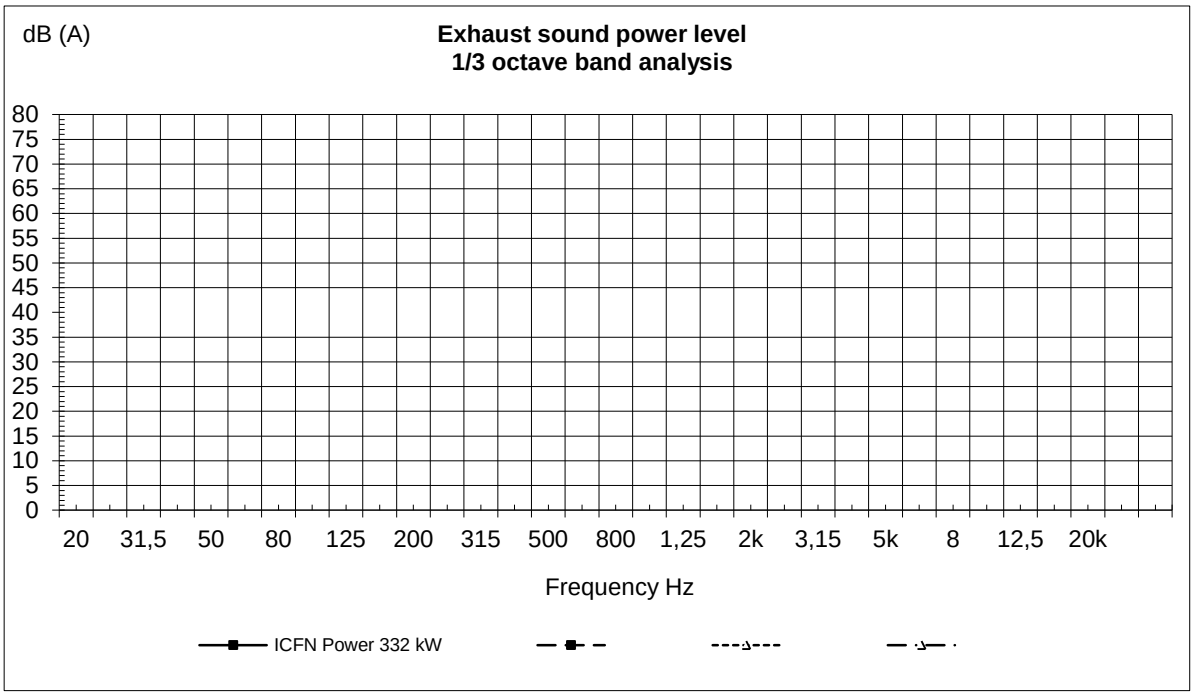

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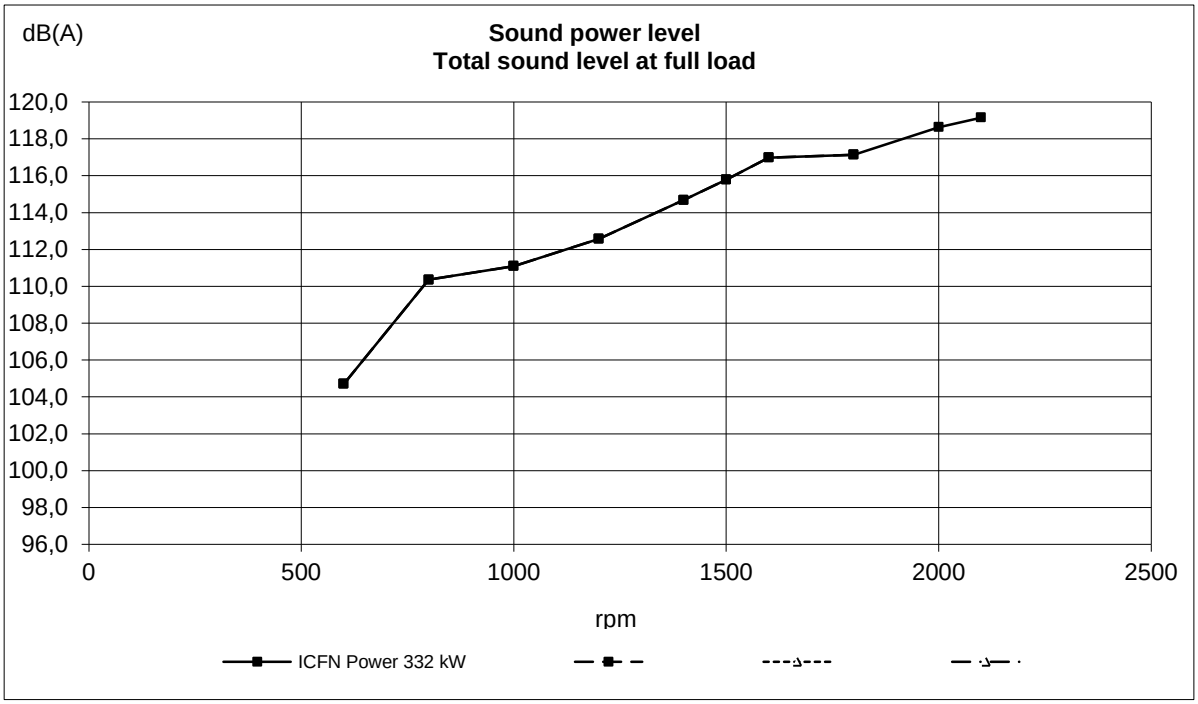

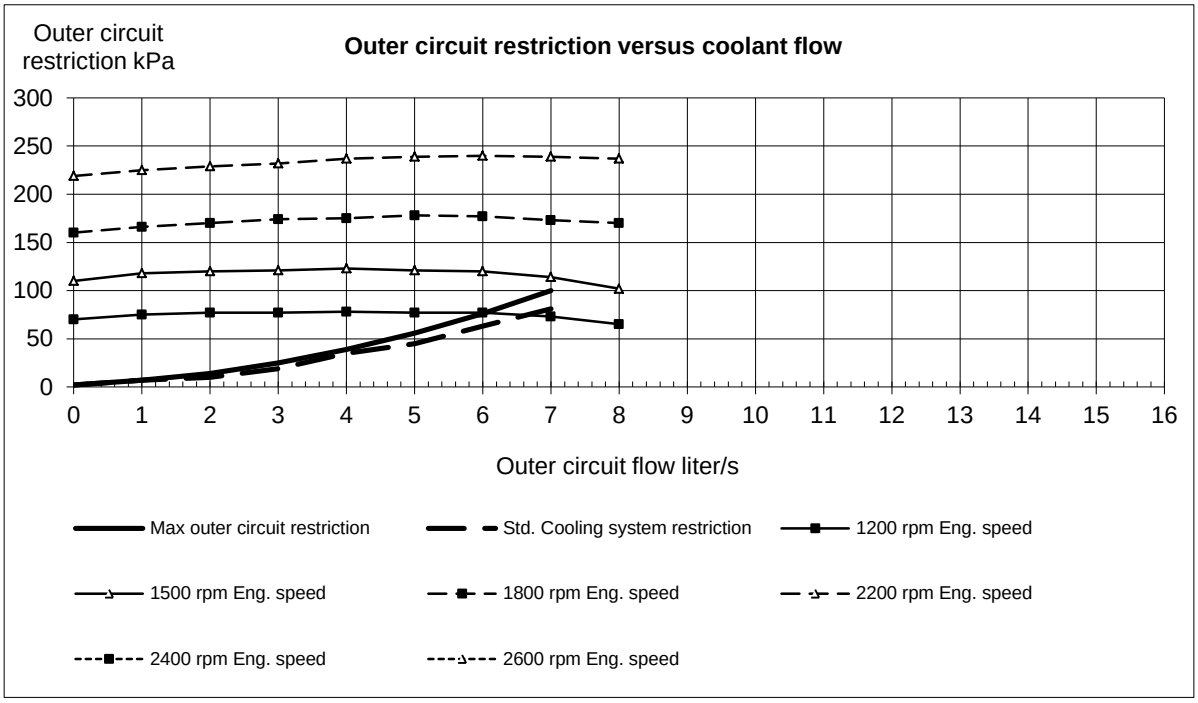

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