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	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	315 kW	without fan		kW	273	315	315	315
				hp	371	428	428	428
		with fan 890 mm		kW	269	309	305	303
				hp	366	420	415	412
IFN Power	315 kW	without fan		kW	273	315	315	315
				hp	371	428	428	428
		with fan 890 mm		kW	269	309	305	303
				hp	366	420	415	412
Torque at:		IFN Power 315 kW		Nm	2172	2005	1671	1583
				lbf ft	1602	1479	1232	1168
		IFN Power 315 kW		Nm	2172	2005	1671	1583
				lbf ft	1602	1479	1232	1168
Max torque at engine speed	IFN Power		1200 rpm	Nm	2175			
				lbf ft	1604			
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 315 kW		MPa	2,14	1,97	1,64	1,56
				psi	310	286	238	226
Max combustion pressure at:		IFN Power 315 kW		MPa	14,8	15,9	15,1	14,2
				psi	2146	2306	2190	2059
Total mass moment of inertia, J (mR^2) (not including flywheel)				kgm^2	3,43			
				$lbft^2$	81,4			
Friction Power				kW	21	31	45	51
				hp	29	42	61	69
Derating see Technical Diagrams								

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 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:	IFN Power 315 kW		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
Plastc 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	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 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

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 US gal/h	100 26,4
Fuel supply line max. restriction (Measured at fuel inlet connection)	kPa psi	30 4,4
Fuel supply line max. pressure, during engine stand still (meassured at fuel inlet connection)	kPa psi	0
System return flow at max. speed	liter/h US gal/h	18,0 4,8
Fuel return line max. restriction (Measured at fuel return connection)	kPa psi	20 2,9
Max. allowable inlet fuel temp (Measured at fuel inlet connection)	°C °F	60 140
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 315 kW	25°C	m³/min	19,5	25,0	27,3	27,6
		77°F	cfm	689	883	964	975
⚠ **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 315 kW		kW	179	219	239	259
			BTU/min	10180	12454	13592	14729
Exhaust gas temperature after turbine at:	IFN Power 315 kW		°C	440	426	433	450
			°F	824	799	811	842
⚠ **See front page for important information** Max allowable back pressure in exhaust line (after turbine)			kPa	18	25	28	30
Pipe dimension Ø: 125 mm			psi	2,6	3,6	4,1	4,4
⚠ **See front page for important information** Max allowable temperature drop between turbine and SCR muffler inlet.			°C	10			
			°F	18			
SCR muffler pressure drop			m³/min	14	19	21	22
			psi	2,0	2,8	3,0	3,2
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	IFN Power 315 kW		m³/min	42,9	51,5	55,1	56,6
			cfm	1515	1819	1946	1999
			cfm				
Exhaust gas smoke	IFN Power 315 kW		*Bosch Units	0,025	0,017	0,017	0,035

Cooling system			rpm	1200	1500	1800	1900
Heat rejection radiation from engine at:	IFN Power 315 kW		kW	7,0	7,1	7,2	7,9
			BTU/min	398	404	409	449
Heat rejection to coolant at:	IFN Power 315 kW		kW	114	132	147	155
			BTU/min	6483	7507	8360	8815
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			

Charge air cooler system		rpm	1200	1500	1800	1900
Heat rejection to charge air cooler	IFN Power 315 kW	kW	44	59	63	64
		BTU/min	2502	3355	3583	3640
Charge air mass flow	IFN Power 315 kW	kg/s	0,36	0,47	0,51	0,52
Charge air inlet temp.	IFN Power 315 kW	°C	161	172	172	171
(Charge air temp after turbo compressor)		°F	322	342	342	340
⚠ **See front page for important information** Max allowable Charge air outlet temp.		°C	38	48	49	50
(Charge air temp after charge air cooler)		°F	100	118	120	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	170			
(After charge air cooler)		psi	24,66			
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	315	62	144	6,2	219,0	310	0,045
0,84	428	64	147	6,7	236,6	175	0,025
		66	151	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	315	63	145	6,3	222,5	270	0,039
0,84	428	64	147	6,6	233,1	185	0,027
		66	151	7,2	254,3	0	

Cooling performance: 0,73 m² radiator and 750 fan fan drive ratio 0.84:1
Radiator module 136232624 and kit 22113648 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
1900	315	67	152	6,7	237,5	0	
(0,84)	428	65	149	6,1	214,8	100	0,015
		63	146	5,6	198,8	200	0,029
		58	136	5,2	182,3	300	0,044
		56	132	4,7	165,0	400	0,058
1800	315	69	155	6,3	224,2	0	
(0,84)	428	67	152	5,9	207,5	100	0,015
		60	141	5,2	184,0	200	0,029
		58	137	4,7	166,5	300	0,044
		54	130	4,2	148,8	400	0,058

Cooling performance: 0,73 m² radiator and 750 fan fan drive ratio 0.84:1
Radiator module 136232625 and kit 22113649 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
1900	315	62	143	6,1	216,4	0	
(0,84)	428	62	144	5,7	202,3	100	0,015
		57	135	5,3	187,7	200	0,029
		54	129	4,9	172,5	300	0,044
		52	126	4,4	156,6	400	0,058
1800	315	66	150	6,0	210,9	0	
(0,84)	428	60	140	5,4	190,4	100	0,015
		56	134	4,9	173,8	200	0,029
		55	131	4,5	158,1	300	0,044
		48	119	4,0	141,8	400	0,058

Engine management system

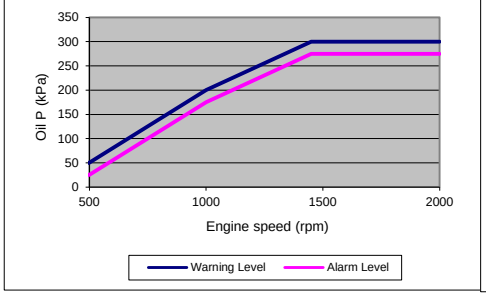
Functionality	Alternatives	Default setting
Governor mode	Isochronus	
Governor droop	0%	
Governor response	Adjustable PI-constants	1
Idle speed	600-900	700
Stop function	Energized to run/Stop	
Preheating function	On/Off	
Lamp test	On/Off	

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		

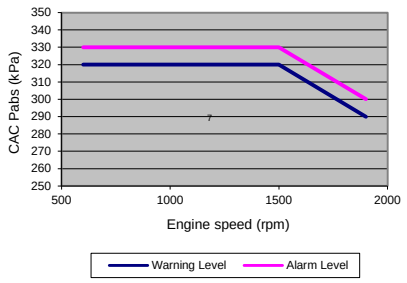
*** Off: disables the function, i e no shut down.**

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	Alarm map value	N/A	N/A
Engine speed	120%	N/A	N/A	N/A	N/A	N/A
ECU temp	85°C	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			

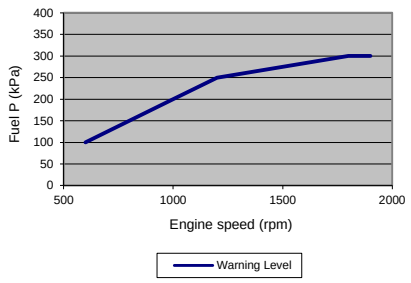
Oil pressure limilts



Charge air pressure limilts



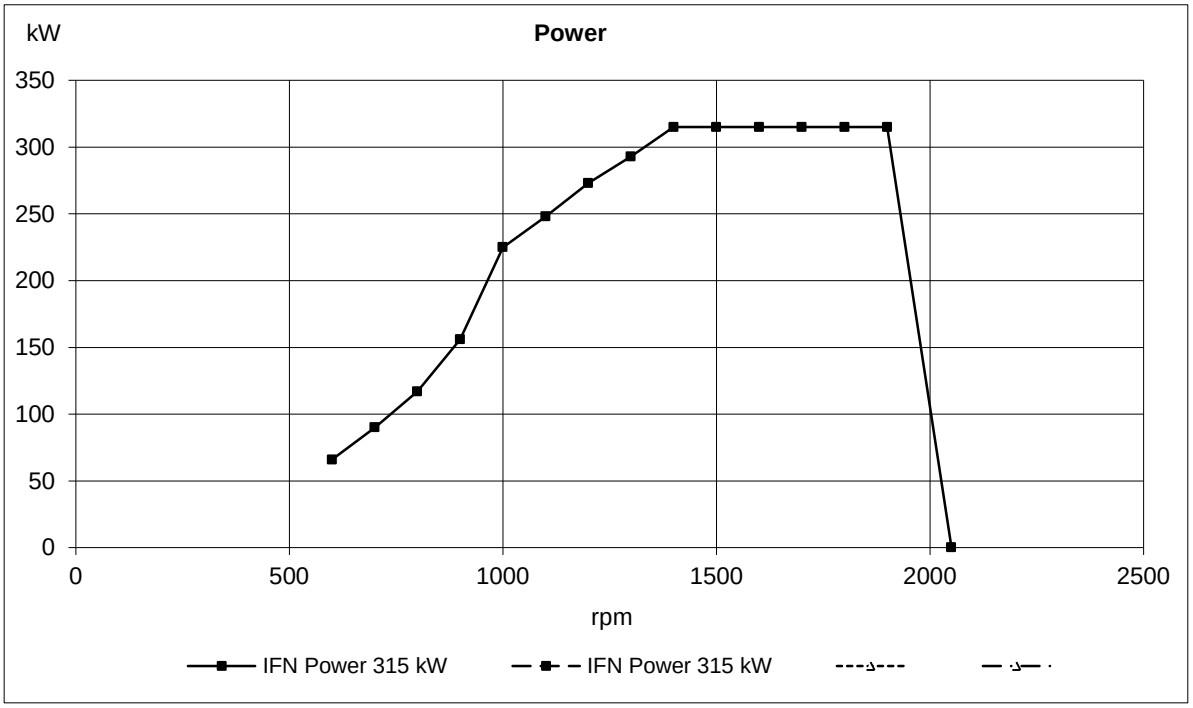
Fuel Pressure limilts

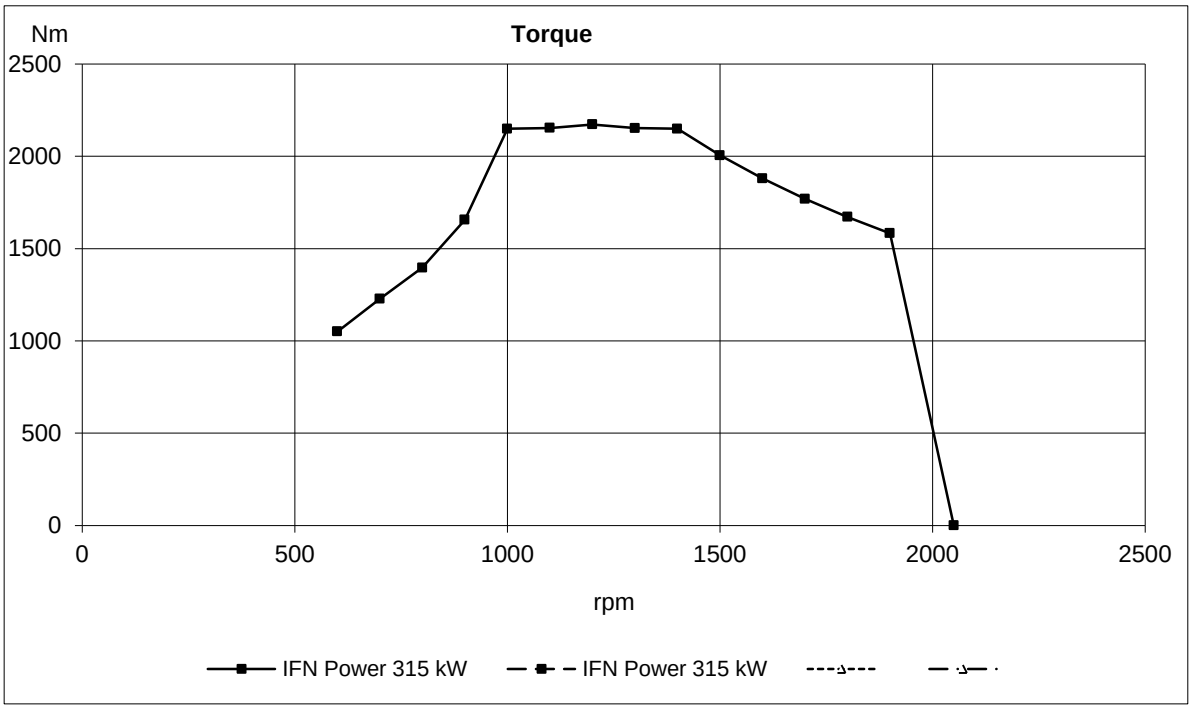


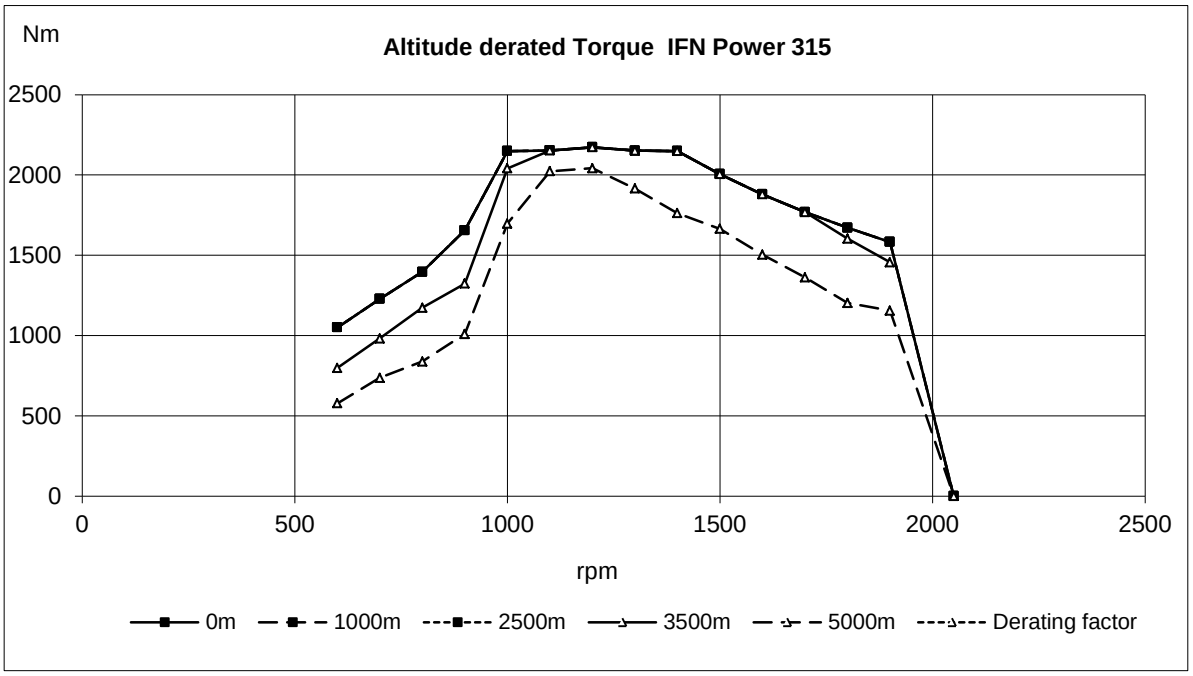
Electrical system

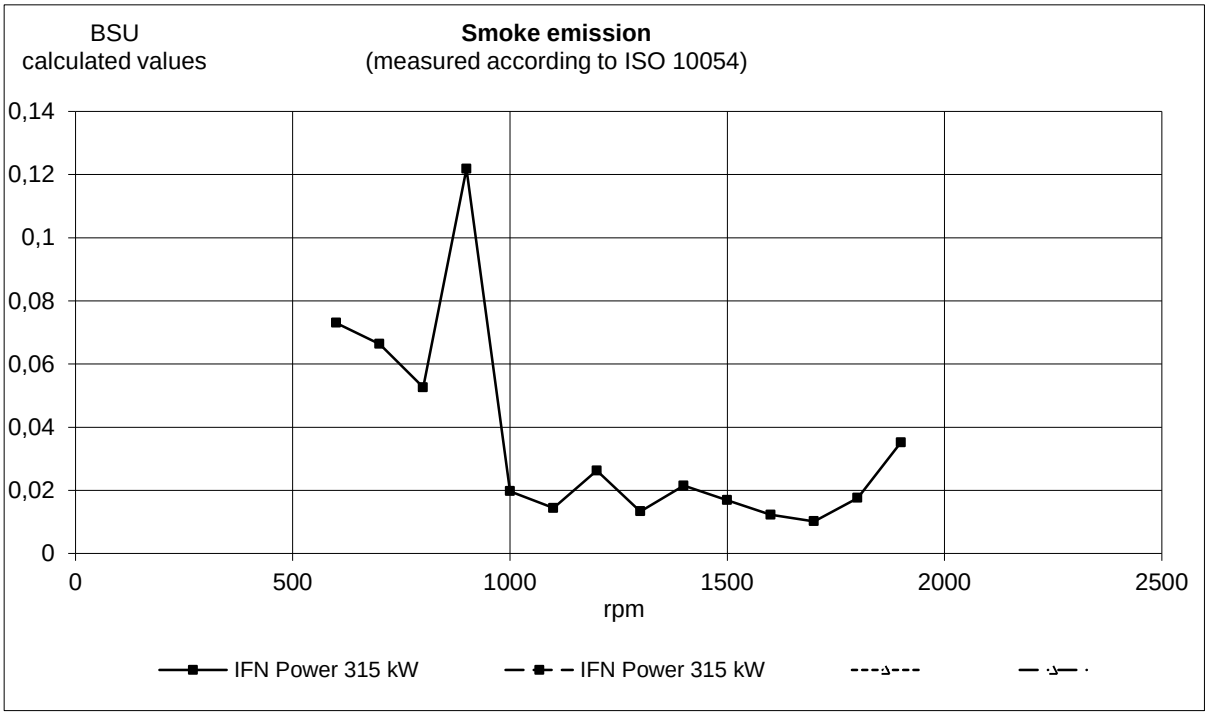
Voltage and type				24 V
Alternator:	make			Bosch
	output	A		80
	tacho output	Hz/alternator rev.		6
	drive ratio			5,3:1
Starter motor:		make		Melco
		type		105P70
		output	kW	7
			hp	9,5
Number of teeth on:		flywheel		153
		starter motor		12
Max wiring resistance main circuit			mΩ	2
Cranking current 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

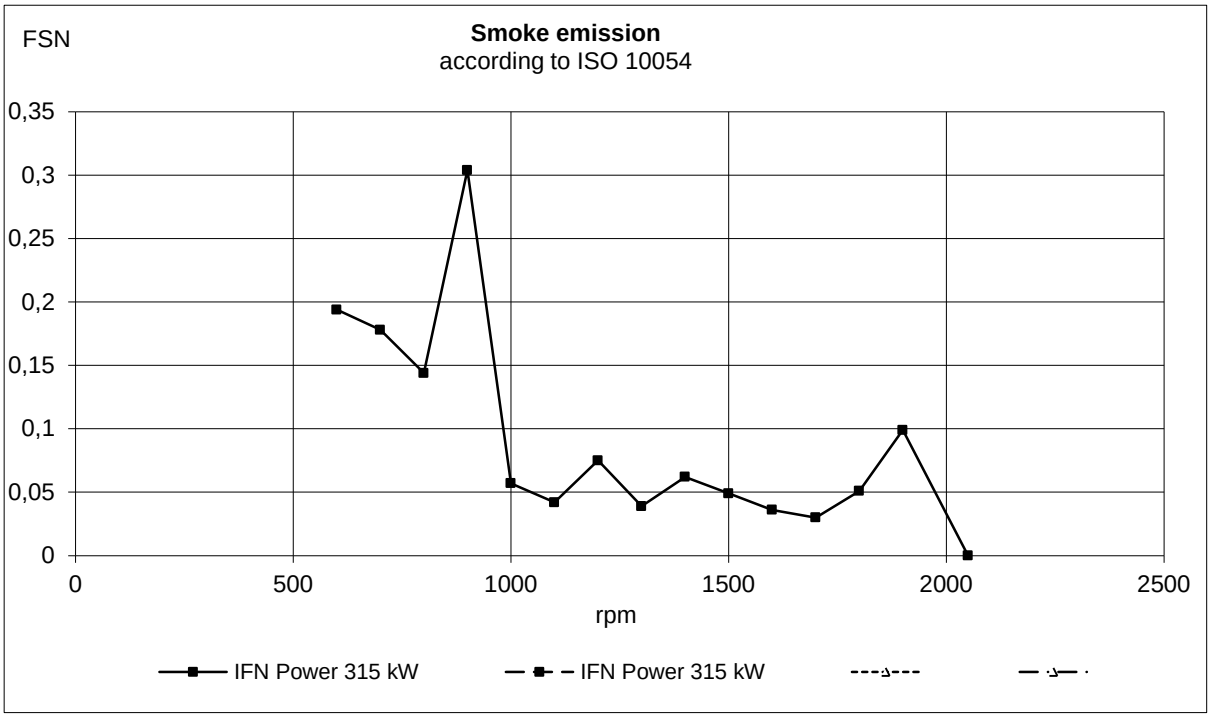
Power take off		**rpm**	**1200**	**1500**	**1800**	**1900**
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW	42	53	62	68
		hp	57	72	84	92
	max down	kW	36	44	52	60
		hp	49	60	71	82
	max right	kW	42	53	62	68
		hp	57	72	84	92
Timing gear at compressor PTO max:		Nm	600			
		lbf ft	443			
Speed ratio direction of rotation viewed from flywheel side			1.31:1 / 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			

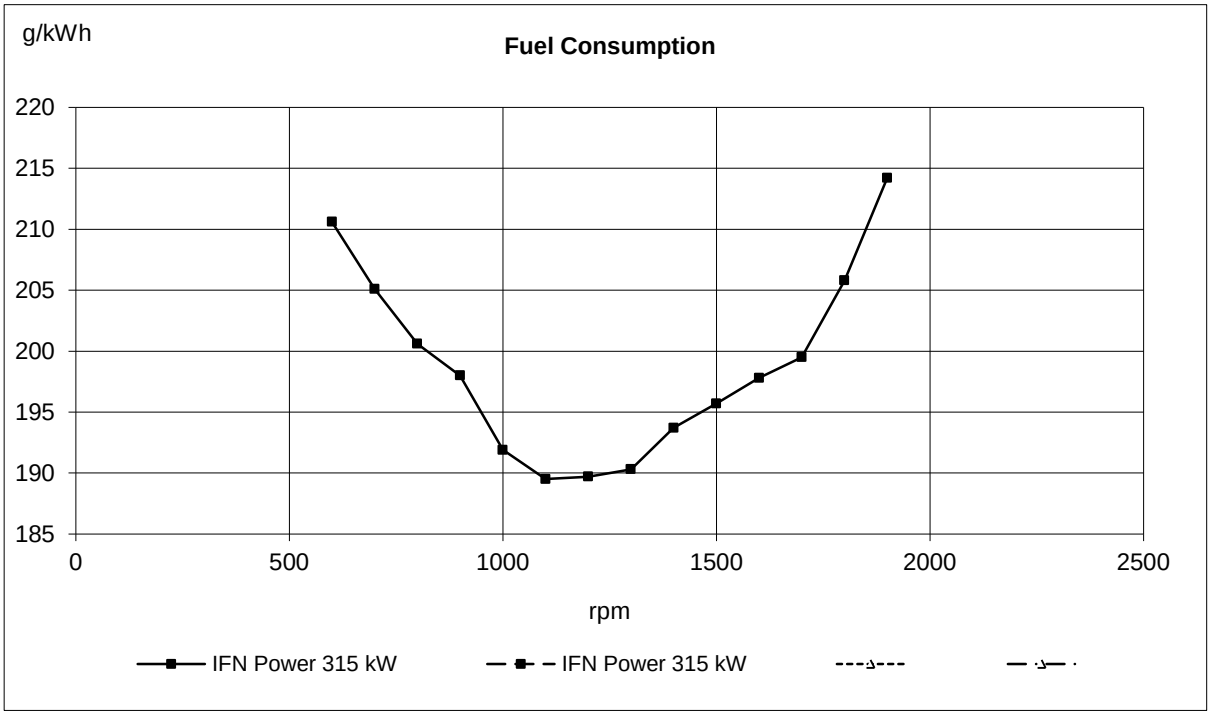

kW
Power
350
300
250
200
150
100
50
0
0
500
1000
1500
2000
2500
rpm
IFN Power 315 kW
IFN Power 315 kW

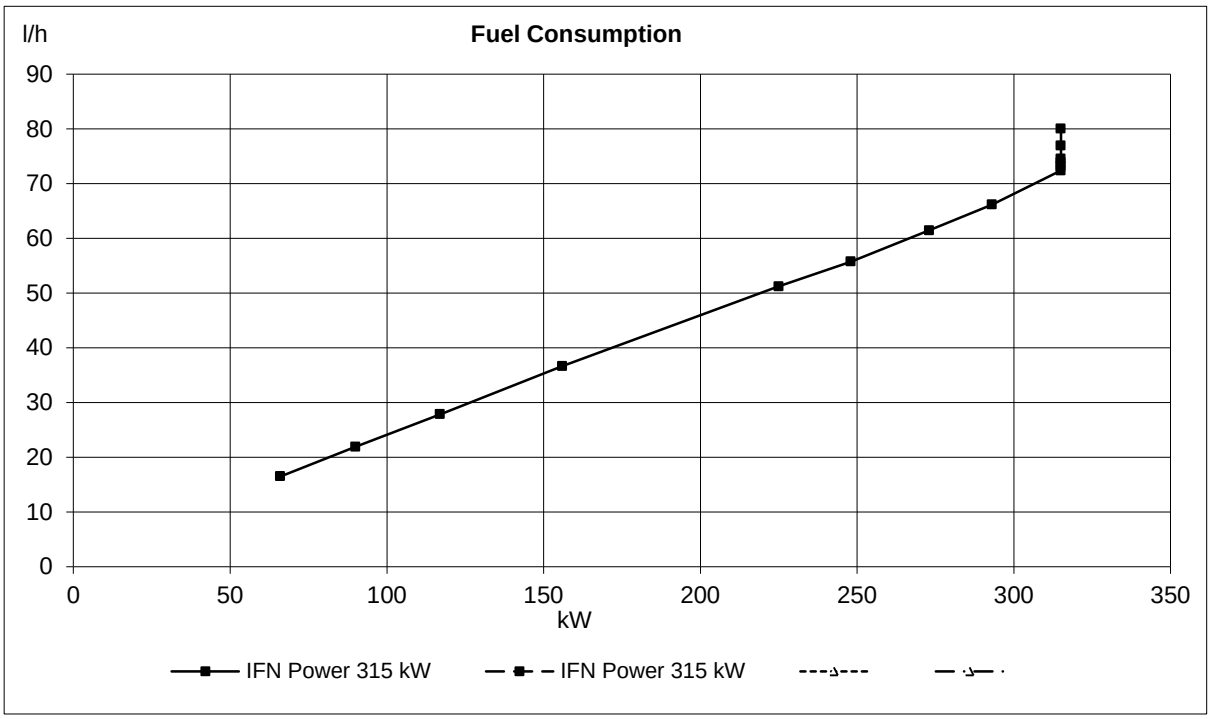

Nm
Torque
2500
2000
1500
1000
500
0
0
500
1000
1500
2000
2500
rpm
IFN Power 315 kW
IFN Power 315 kW

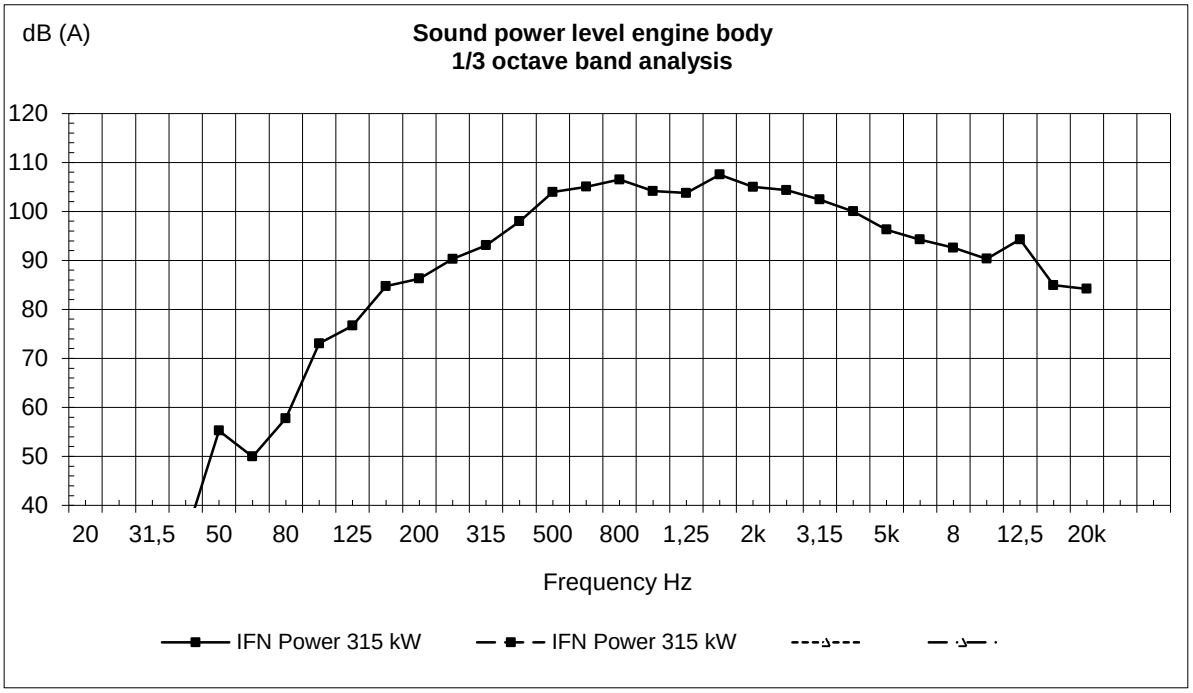

Nm
Altitude derated Torque IFN Power 315
2500
2000
1500
1000
500
0
0
500
1000
1500
2000
2500
rpm
0m
1000m
2500m
3500m
5000m
Derating factor

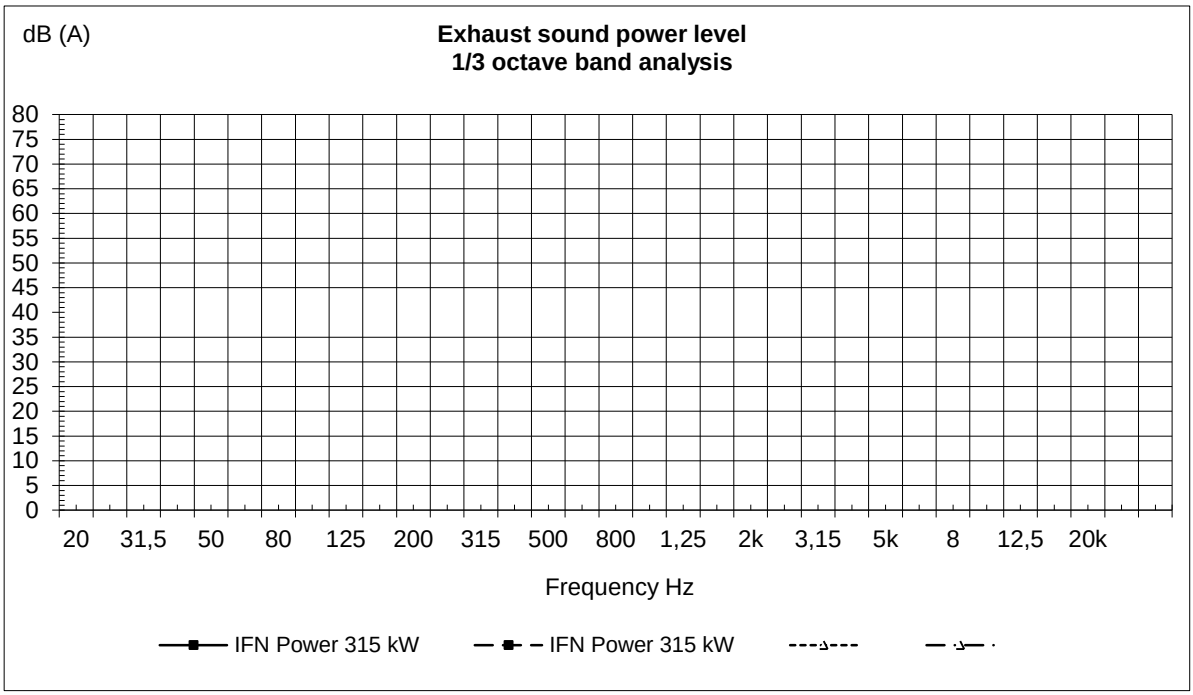

BSU
calculated values
Smoke emission
(measured according to ISO 10054)
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
0
500
1000
1500
2000
2500
rpm
IFN Power 315 kW
IFN Power 315 kW

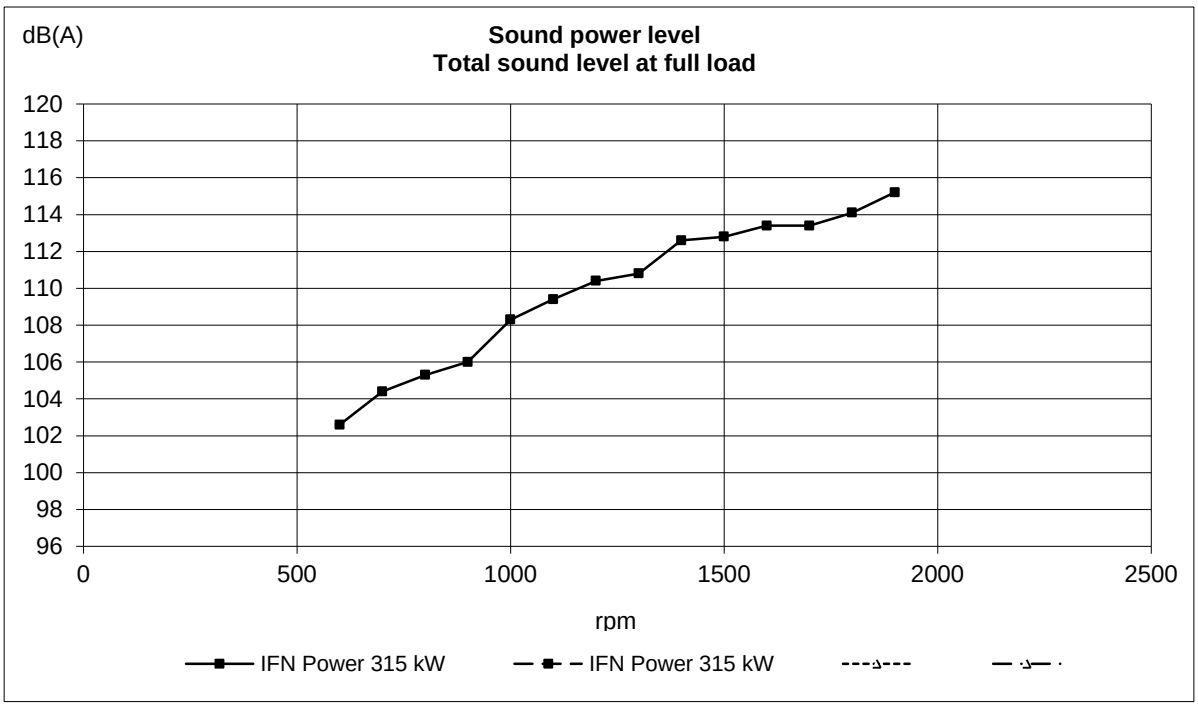

FSN
Smoke emission
according to ISO 10054
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
0
500
1000
1500
2000
2500
rpm
IFN Power 315 kW
IFN Power 315 kW

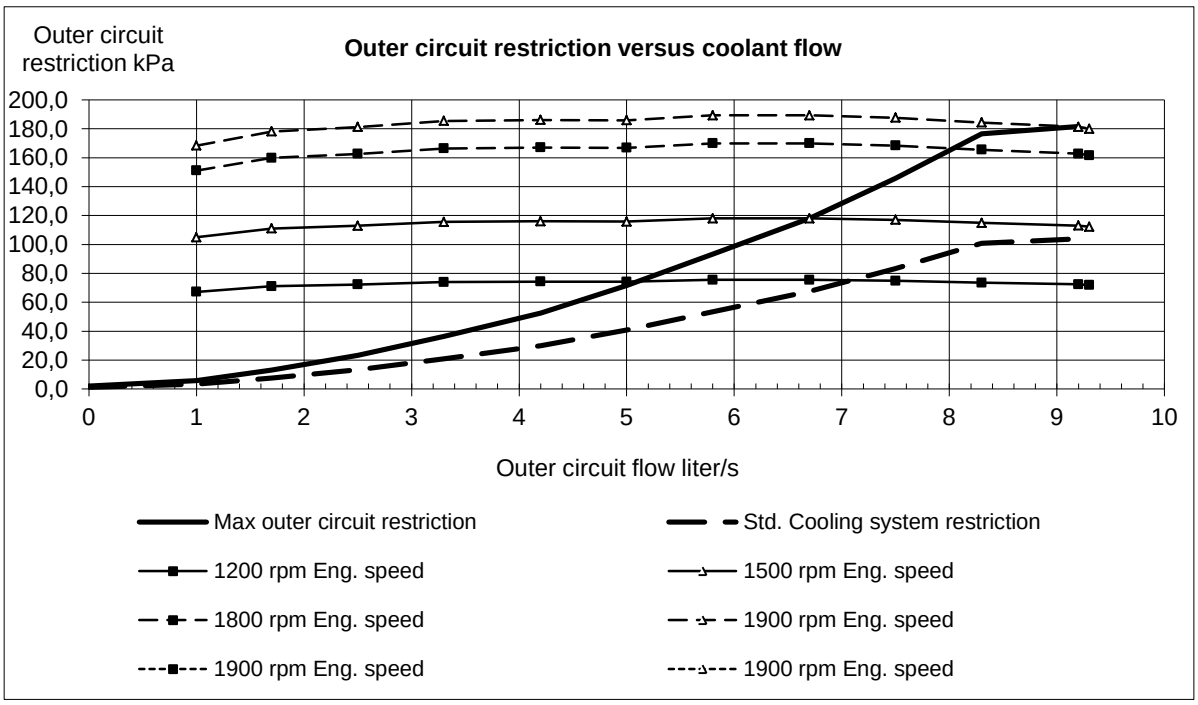

g/kWh
Fuel Consumption
220
215
210
205
200
195
190
185
0
500
1000
1500
2000
2500
rpm
IFN Power 315 kW
IFN Power 315 kW

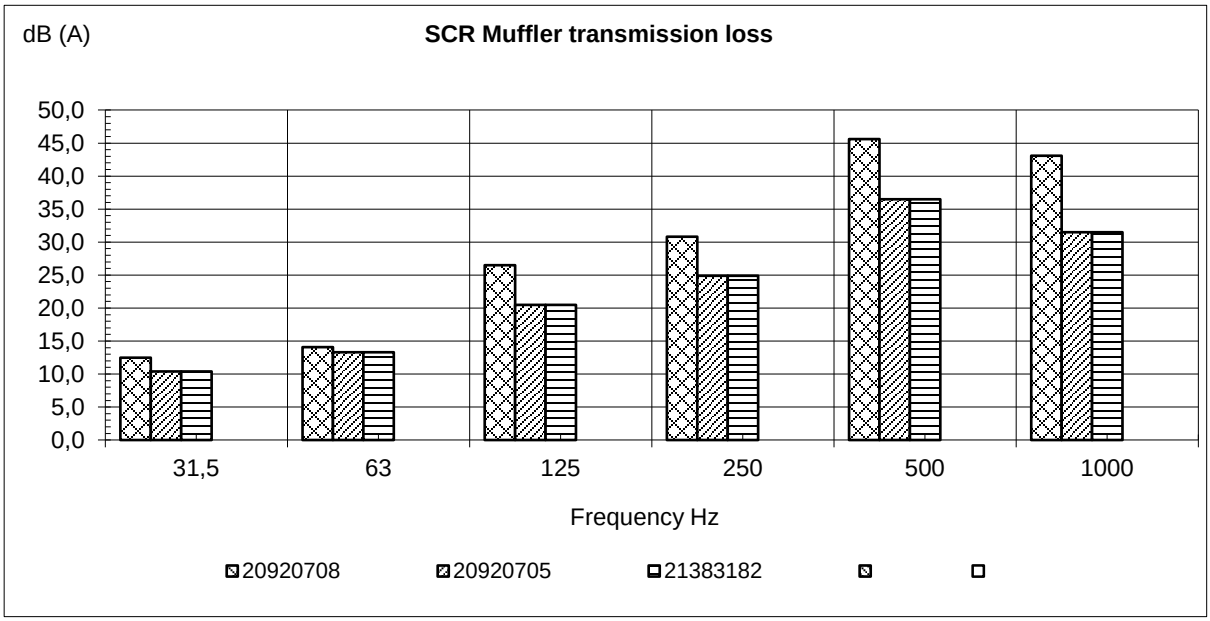

l/h
Fuel Consumption
90
80
70
60
50
40
30
20
10
0
0
50
100
150
200
250
300
350
kW
IFN Power 315 kW
IFN Power 315 kW

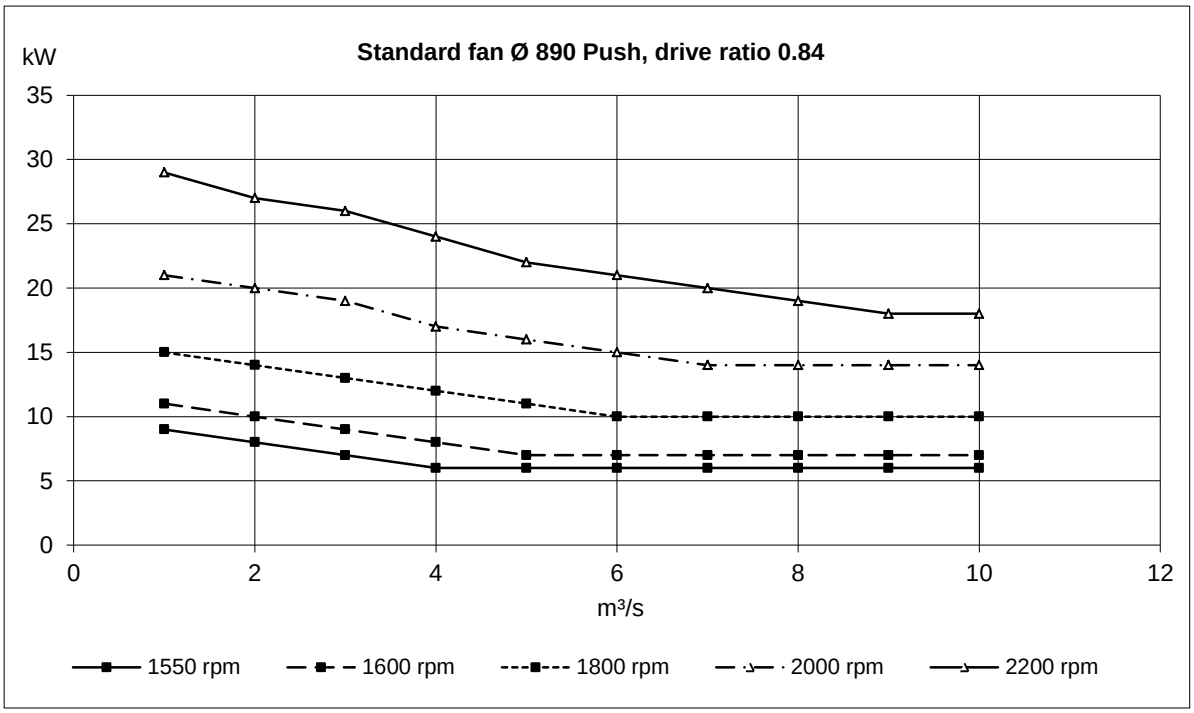

dB (A)
Sound power level engine body
1/3 octave band analysis
120
110
100
90
80
70
60
50
40
20
31,5
50
80
125
200
315
500
800
1,25
2k
3,15
5k
8
12,5
20k
Frequency Hz
IFN Power 315 kW
IFN Power 315 kW

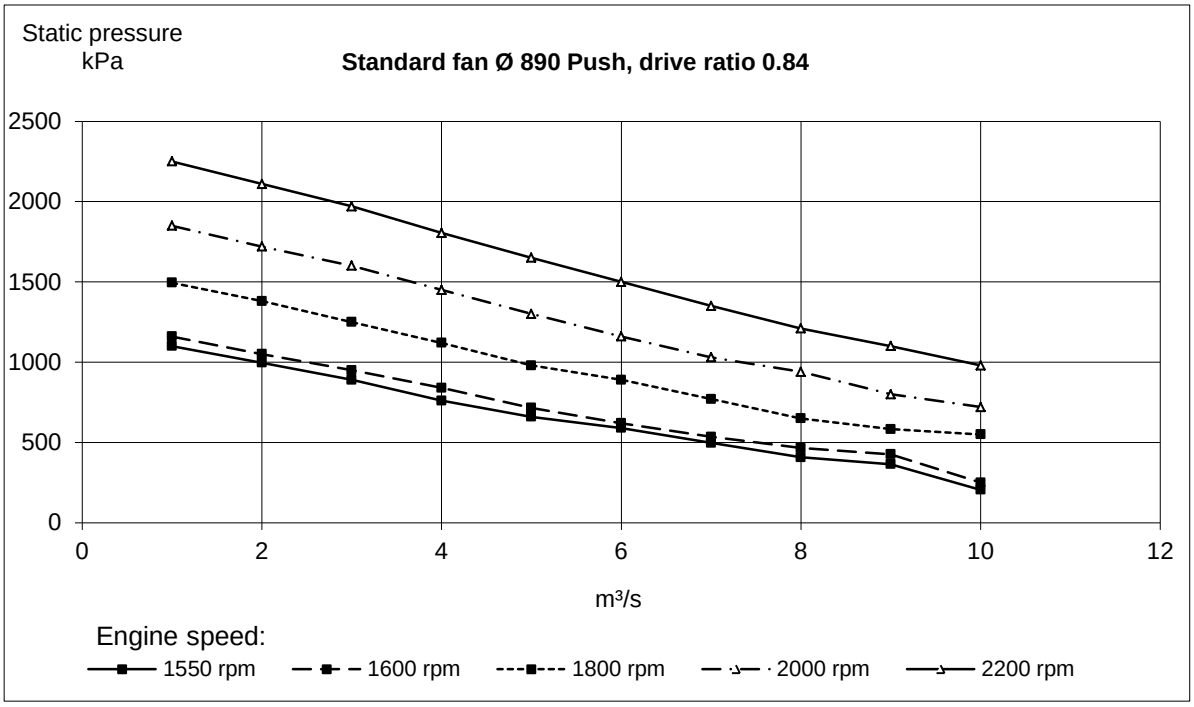

dB (A)
Exhaust sound power level
1/3 octave band analysis
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
20
31,5
50
80
125
200
315
500
800
1,25
2k
3,15
5k
8
12,5
20k
Frequency Hz
IFN Power 315 kW
IFN Power 315 kW

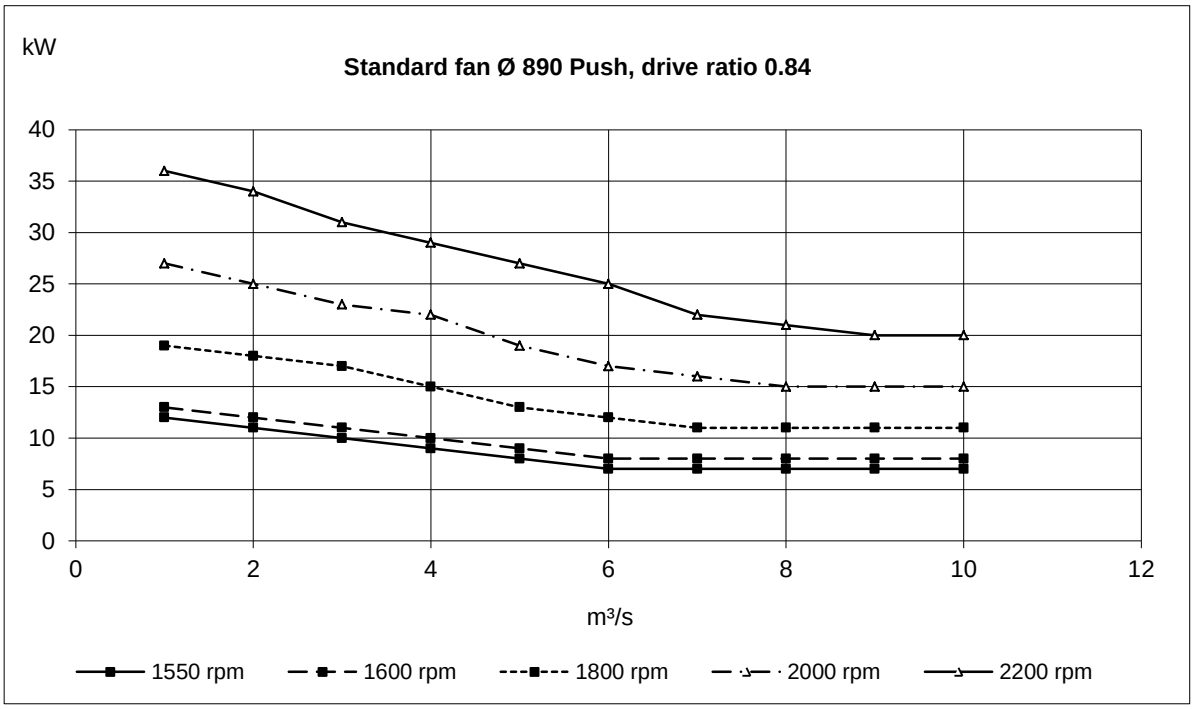

dB(A)
Sound power level
Total sound level at full load
120
118
116
114
112
110
108
106
104
102
100
98
96
0
500
1000
1500
2000
2500
rpm
IFN Power 315 kW
IFN Power 315 kW

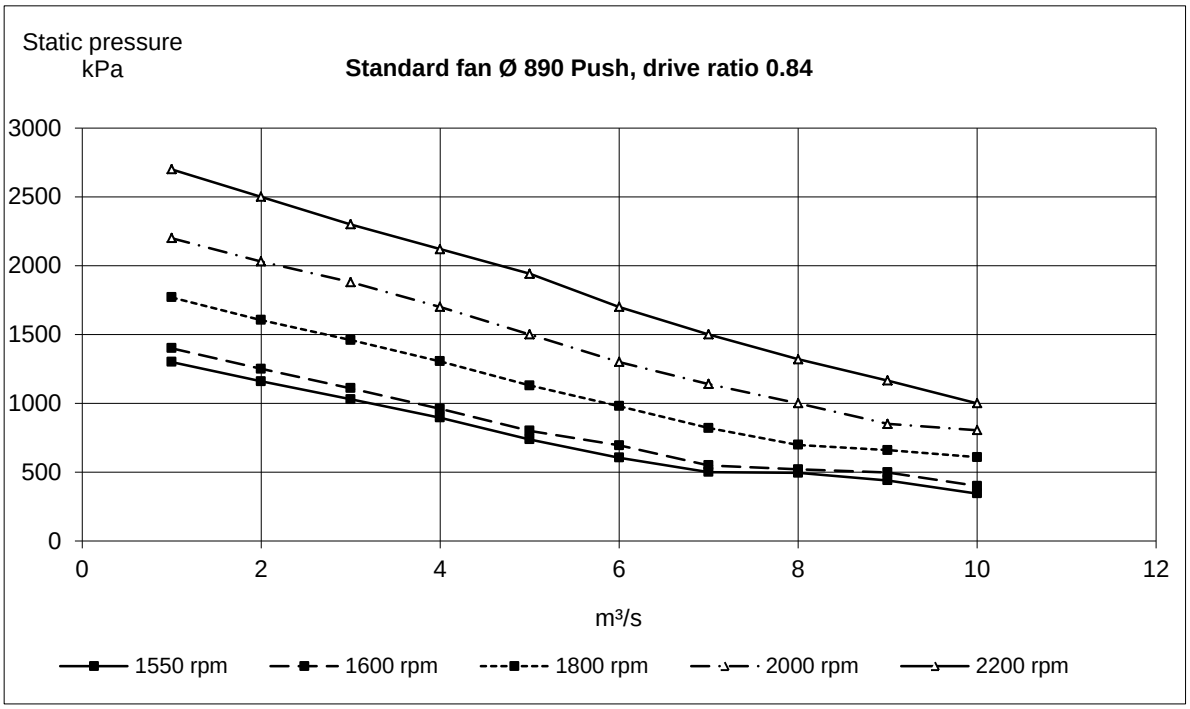

Outer circuit restriction kPa
Outer circuit restriction versus coolant flow
200,0
180,0
160,0
140,0
120,0
100,0
80,0
60,0
40,0
20,0
0,0
0
1
2
3
4
5
6
7
8
9
10
Outer circuit flow liter/s
Max outer circuit restriction
Std. Cooling system restriction
1200 rpm Eng. speed
1500 rpm Eng. speed
1800 rpm Eng. speed
1900 rpm Eng. speed
1900 rpm Eng. speed
1900 rpm Eng. speed


dB (A)
SCR Muffler transmission loss
50,0
45,0
40,0
35,0
30,0
25,0
20,0
15,0
10,0
5,0
0,0
31,5
63
125
250
500
1000
Frequency Hz
20920708
20920705
21383182


Standard fan Ø 890 Push, drive ratio 0.84
kW
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
m³/s
1550 rpm
1600 rpm
1800 rpm
2000 rpm
2200 rpm


Static pressure
kPa
Standard fan Ø 890 Push, drive ratio 0.84
2500
2000
1500
1000
500
0
0
2
4
6
8
10
12
m³/s
Engine speed:
1550 rpm
1600 rpm
1800 rpm
2000 rpm
2200 rpm


kW
Standard fan Ø 890 Push, drive ratio 0.84
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
m³/s
1550 rpm
1600 rpm
1800 rpm
2000 rpm
2200 rpm


Static pressure
kPa
Standard fan Ø 890 Push, drive ratio 0.84
3000
2500
2000
1500
1000
500
0
0
2
4
6
8
10
12
m³/s
1550 rpm
1600 rpm
1800 rpm
2000 rpm
2200 rpm

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