

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	16,12 984
Firing order			1-5-3-6-2-4
Bore		mm in	144 5,67
Stroke		mm in	165 6,50
Compression ratio			17,5:1
Dry weight	Engine only, excluding cooling system	kg lb	1440 3175
	Power pac	kg lb	1840 4057
Wet weight	Engine only, excluding cooling system	kg lb	1510 3329
	Power pac	kg lb	2000 4409

Performance			r/min	1200	1500	1800	1850
IFN Power	565 kW	without fan	kW hp	410 557	513 697	565 768	565 768
		with fan 890 mm	kW hp	See diagram for fan power consumption			
Torque at:		IFN Power 565 kW	Nm lbf ft	3257 2395	3263 2399	2997 2211	2916 2151
Max torque at engine speed		rpm 1300	Nm lbf ft	3261 2398			
Mean piston speed			m/s ft/sec	6,6 21,7	8,3 27,1	9,9 32,5	10,2 33,4

Performance			r/min	1200	1500	1800	1850
Effective mean pressure at:		IFN Power 565 kW	Mpa psi	2,54 369	2,55 369	2,34 339	2,27 330
Max combustion pressure at:		IFN Power 565 kW	Mpa psi	18 2610	17,5 2538	17,1 2480	16,7 2422
Total mass moment of inertia, J (mR ²) With our standar flywheel			kgm ² lbf ²	4,1 97,3			
Degree of irregularity at:		IFN Power 565 kW		1:23	1:38	1:48	1:80
Friction Power			kW hp	27 37	41 56	58 79	65 88

Derating

The engine may be operated up to 1680 m altitude without derating.
For operation at higher altitudes the power will be derated according to the graph below.
There is no derating for ambient temperature or humidity.

Cold start performance

		r/min	1500	1800	
Time from start to stay within 0.5% of no load speed at ambient temperature:	°C	20	s	6,5	8,4
		5	s	6,7	8,7
		-15*	s	7,3	9,8
Time from start to stay within 0.8% of no load speed at ambient temperature:	°C	20	s	5,6	7,5
		5	s	6,2	8,2
		-15*	s	6,7	9,2

* With manifold heater kW engaged, lubrication oil 10W/30, block heater and MK1 fuel.

Usage of manifold heater:	Time preheating, minutes	Time postheating, minutes		
	0,5	1,7		
Ambient temp. °C	Block heater type and Make	Power kW	Engaged hours	Cooling water temp engine block, °C
-15	External Volvo	2	12	17

Lubrication system

		r/min	1200	1500	1800	1850
Lubricating oil consumption at max rpm at:	IFN Power 565 kW	liter/h	0,10			
		US gal/h	0,026			
Oil system capacity including filters		liter	48			
		US gal	12,68			
Oil sump capacity:	Max	liter	42			
		US gal	11,10			
	Min	liter	32			
		US gal	8,45			
Oil change intervals/specifications	VDS-2	h	600			
	VDS, ACEA, E3	h	400			
	ACEA E2, API CF, CF-4, CG-4	h	200			

Lubrication system

Engine angularity limits:	front up	°	30		
	front down	°	30		
	side tilt	°	30		
Oil pressure at rated speed		kPa	300 -- 650		
		psi	44 -- 94		
Lubrication oil temperature in sump:	max	°C	130		
		°F	266		
Oil filter micron size		mm	0,040		

Fuel system		r/min	1200	1500	1800	1850
IFN Power 565 kW Specific fuel consumption at:	25%	g/kWh lb/hph	218 0,353	219 0,355	230 0,373	238 0,386
	50%	g/kWh lb/hph	200 0,324	200 0,324	207 0,336	213 0,345
	75%	g/kWh lb/hph	197 0,320	192 0,311	203 0,329	208 0,337
	100%	g/kWh lb/hph	190 0,308	194 0,314	198 0,321	200 0,324
Fuel to conform to			ASTM-D975-No2, DIN 51601, EN 590			
System return flow at max. speed		liter/h US gal/h	25 6,6			
System supply flow at max. speed		liter/h US gal/h	185 48,9			
Fuel supply line max. restriction		kPa psi	10 1,5			
Fuel supply line max. pressure, engine stopped		kPa psi	0,0 0,0			
Fuel return line max. restriction		kPa psi	20 2,9			
Max. allowable inlet fuel temp		°C °F	60 140			
Prefilter / Waterseparator micron size		mm	0,010			
Governor type/make, standard			VOLVO / EMS2			
Injection pump type/make			Delphi E1			

Intake and exhaust system		Inlet air temp	r/min	1200	1500	1800	1850
Air consumption at 100kPa ambient pres:	IFN Power 565 kW	25°C 77°F	m³/min cfm	27 936	40 1413	43 1519	43 1529
Air intake restriction, clean filter(s)			kPa In wc	2,1 8,4			
Max allowable air intake restriction			kPa In wc	5 20,1			
Air filter type				Single stage paper cartridge			
Air filter cleaning efficiency			%	99,85			
Heat rejection to exhaust at:	IFN Power 565 kW		kW BTU/min	294 16719	384 21838	486 27638	495 28150
		Exhaust gas temperature after turbine at:	°C °F	486 907	438 820	501 934	508 946
Max allowable back pressure in exhaust line			kPa In wc	8,5 34,1	13,0 52,2	13,5 54,2	15,0 60,2
Exhaust gas flow at:	IFN Power 565 kW		m³/min cfm	69 2437	90 3178	104 3684	106 3731
		Exhaust gas smoke	*Bosch	0,2	0,16	0,4	0,45

*N.B! Bosch units are calculated values. Measured values are acc. to ISO 10054 in FSN units

VOLVO PENTA

TAD1643VE

Document No

21388470

Issue Index

04

Cooling system		r/min	1800	1850
Heat rejection radiation from engine at:	IFN Power 565 kW	kW BTU/min	8 455	8,3 472
Heat rejection to coolant at:	IFN Power 565 kW	kW BTU/min	230 13080	236 13421
Radiator cooling system type			Closed circuit	

Cooling system		r/min	1200	1500	1800	1850
Standard radiator core area		m ²	1,42			
		foot ²	15,28			
HD radiator core area		m ²	0,87			
		foot ²	9,36			
Fan diameter	890 mm	mm in	890 35,04			
Fan power consumption	890 mm	kW hp	See diagram for actual fan drive ratio power.			
Fan drive ratio	fan Ø890		See diagram for cooling performance			
Coolant capacity:	Engine	liter US gal	24 6,3			
	STD. 1,42m ² radiator with hoses Pusher syst. Core thickness 63mm	liter US gal	37 9,8			
	STD. 1,42m ² radiator with hoses Puller syst. Core thickness 41mm	liter US gal	30 7,9			
	HD 0,87m ² radiator with hoses	liter US gal	32 8,5			
	Coolant pump	drive/ratio	belt/1,85:1			
Coolant flow with standard system		l/s US gal/s	5,4 1,4	6,8 1,8	8,1 2,1	8,5 2,2
	Minimum coolant flow	l/s US gal/s	5,4 1,4	6,8 1,8	8,1 2,1	8,5 2,2
Maximum external coolant system restriction incl. piping		kPa In wc	55,0 220,8			
	Thermostat:	start to open	°C	86		
°F			187			
fully open		°C	96			
		°F	205			
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa in wc	100 402			
	Minimum static pressure head (expansion tank height + pressure cap setting)		kPa in wc	70 281		
Standard pressure cap setting			kPa In wc	75 301		
	Maximum top tank temperature		°C °F	107 225		
Draw down capacity			4% of total cooling system capacity			

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Charge air cooler system		r/min	1800	1850
Cooling power	IFN Power 565 kW	kW BTU/min	155 8815	156 8872
Combustion air inlet temp. (Charge air temp after turbo compressor)	IFN Power 565 kW	°C	239	240
		°F	462	464
Max allowable Comb. Air temp after CAC at 25 degree ambient. (Charge air temp after intercooler)	IFN Power 565 kW	°C	45	45
		°F	113	113
Maximum pressure droop over intercooler, incl. piping		kPa psi	16 2,32	
Boost pressure at rated power 1800rpm.		kPa psi	230 33,36	
Standard intercooler core area		m ² foot ²	1,3 13,99	
Standard intercooler core thickness		mm in	68 2,68	

Cooling performance: STD cooling package 1,42m² radiator and suction 890mm fan

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and 40% antifreeze

Engine speed rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	kg/s	lb/s	Pa	psi
1800	565 768	57,5	136	13,2	29,1	0	0,000
		54	129	11,2	24,8	409	0,059
		49	120	9,6	21,1	770	0,112
		44	111	8,0	17,7	1048	0,152

Cooling performance: STD cooling package 1,42 m² radiator and pusher 890mm 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.

Fix fan drive ratio 1:1,13

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	565 768	58	137	9,7	342,9	450	0,065
		59	139	10,2	360,9	300	0,044
		61	141	10,8	381,4	150	0,022
		62	143	11,4	401,5	0	

Fix fan drive ratio 1:1,04

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	565	55	131	8,9	312,5	450	0,065
	768	56	134	9,3	328,1	300	0,044
		58	136	9,9	348,2	150	0,022
		59	139	10,4	365,5	0	

Fix fan drive ratio 1:0,97

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	565	53	127	8,2	289,6	450	0,065
	768	54	129	8,6	303,4	300	0,044
		56	132	9,1	321,7	150	0,022
		57	134	9,5	336,5	0	

Fix fan drive ratio 1:0,88

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	565	49	120	7,4	261,7	450	0,065
	768	50	122	7,8	273,7	300	0,044
		52	126	8,2	290,3	150	0,022
		53	127	8,5	300,9	0	

Cooling performance: HD cooling package 0,87m² radiator and pusher 890mm 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.

Fix fan drive ratio 1:0,88

Engine speed rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
1850	565 768	62	144	11,1	392,0	0	0,000
		60	140	10,3	363,7	100	0,015
		57	135	9,7	342,6	200	0,029
		55	131	9,0	317,8	300	0,044
		52	126	8,5	300,2	400	0,058
1800	565 768	62	144	10,7	377,9	0	0,000
		60	140	10,1	356,7	100	0,015
		57	135	9,3	328,4	200	0,029
		54	129	8,7	307,2	300	0,044
		51	124	8,0	282,5	400	0,058

Cooling performance: HD cooling package 0,87m² radiator and suction 890mm 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.

Fix fan drive ratio 1:0,88

Engine speed rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
1850	565 768	58	136	10,1	356,7	0	0,000
		56	133	9,5	335,5	100	0,015
		54	129	9	317,8	200	0,029
		51	124	8,5	300,2	300	0,044
		49	120	8,0	282,5	400	0,058
1800	565 768	57	135	9,9	349,6	0	0,000
		54	129	9,2	324,9	100	0,015
		51	124	8,7	307,2	200	0,029
		48	118	8,1	286,0	300	0,044
		45	113	7,6	268,4	400	0,058

Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronous/droop Switchable during operation	Isochronous
Governor droop	0 - 5%	0
Governor response	Adjustable PID-constants	
Idle speed	550 - 800 rpm	600 rpm
Stop function	Energized to run / stop	Energized to stop
Preheating function	ON/OFF	OFF
Lamp test	ON/OFF	ON

Engine protection		Alarm level		Engine protection	
Parameter	Unit	Setting range	Default setting	Protection at	Protective action
Oil temperature	°C	120 - 130	125	Setting +5	Shut down / off *
Oil pressure	Low idle	kPa	-	Default -30	Shut down / off *
	Rated speed	kPa	-	Default -30	Shut down / off *
Oil level		-	Min level	-	-
Piston cooling pressure >1000 rpm	kPa	-	150	150	Shut down / off *
Coolant temp	°C	95 - 101	102	Setting +5	Shut down / off *
Coolant level		-	On	Low level	Shut down / off *
Fuel feed pressure	Low idle	kPa	-	100	-
	Rated speed		-	300	-
Water in fuel		-	High level	-	-
Crank case pressure	kPa	-	-	-	Shut down
Air filter pressure drop	kPa	-	5,0	-	-
Altitude, above sea	m			-	Automatic derating, see section derating
Charge air temp	°C	-	80	+5	Shut down
Charge air pressurer	kPa	-	290	340	Shut down
Engine speed	rpm	100 - 120% of rated	120% / off *	Alarm level	Shut down / on
Low voltage	V	-	25,5	-	-

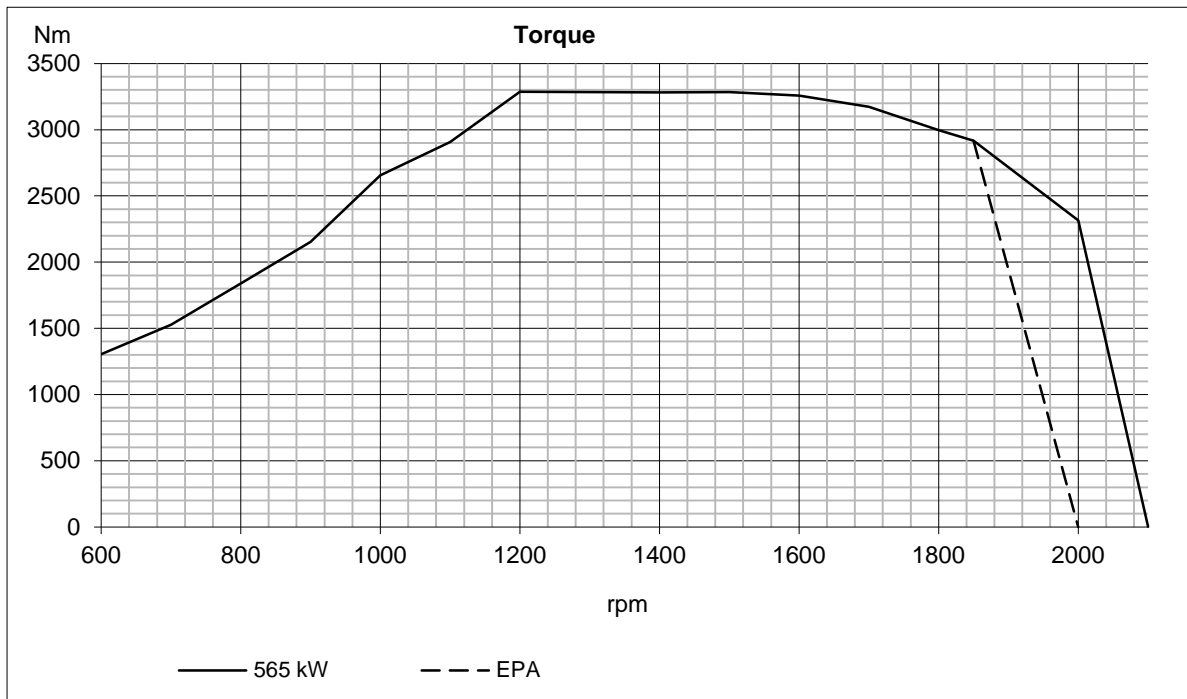
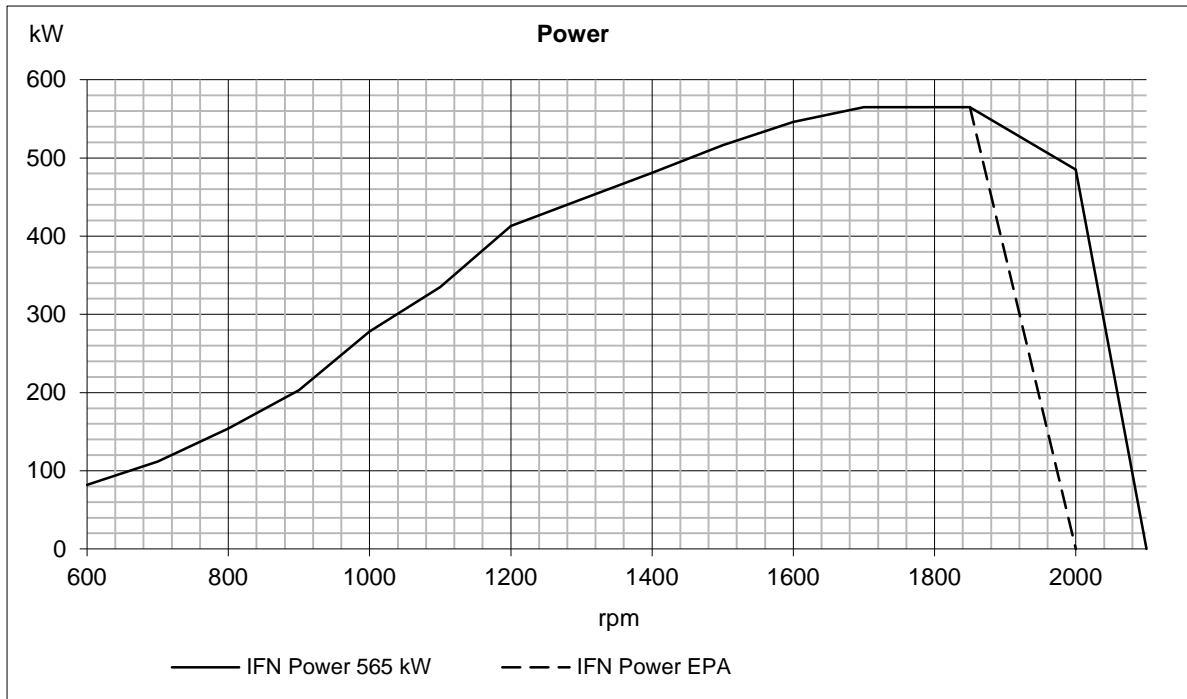
*Off means no shutdown , alarm only.

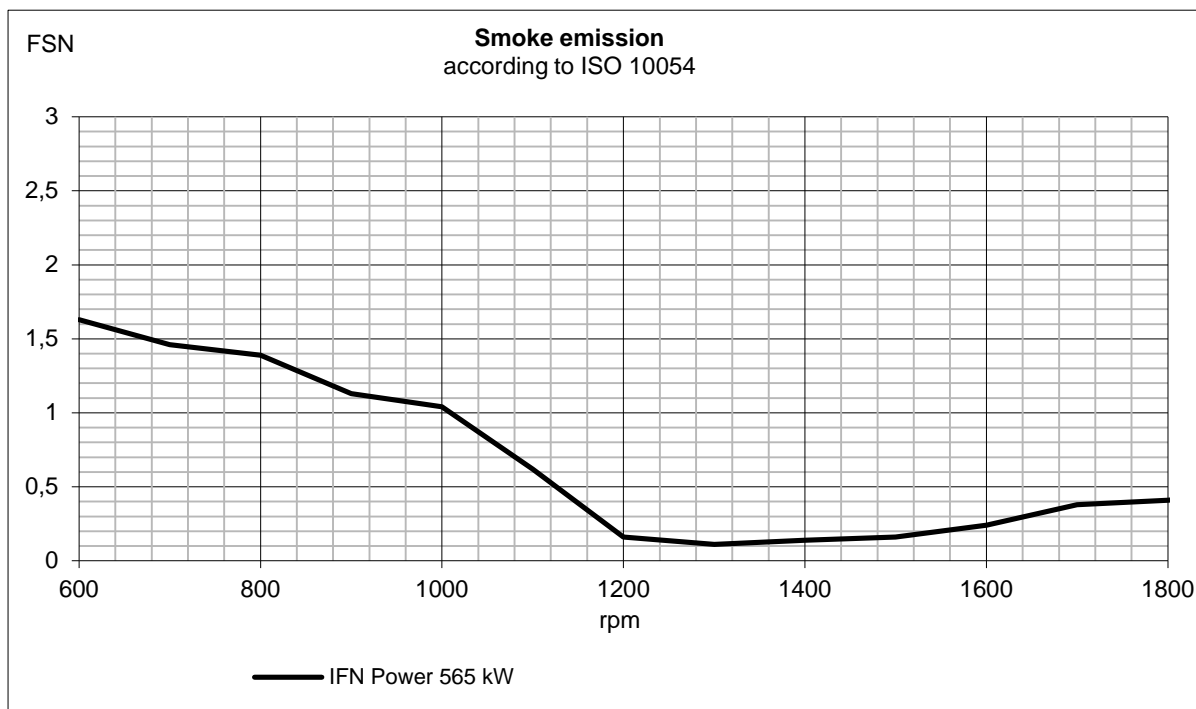
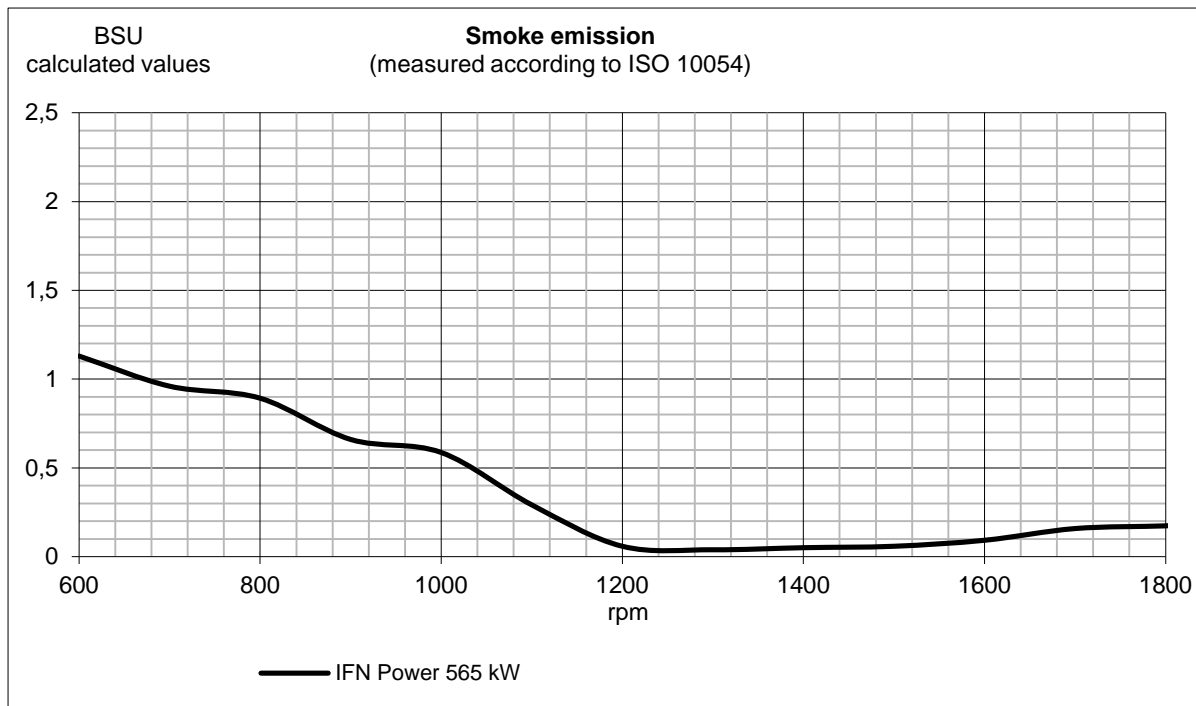
Electrical system

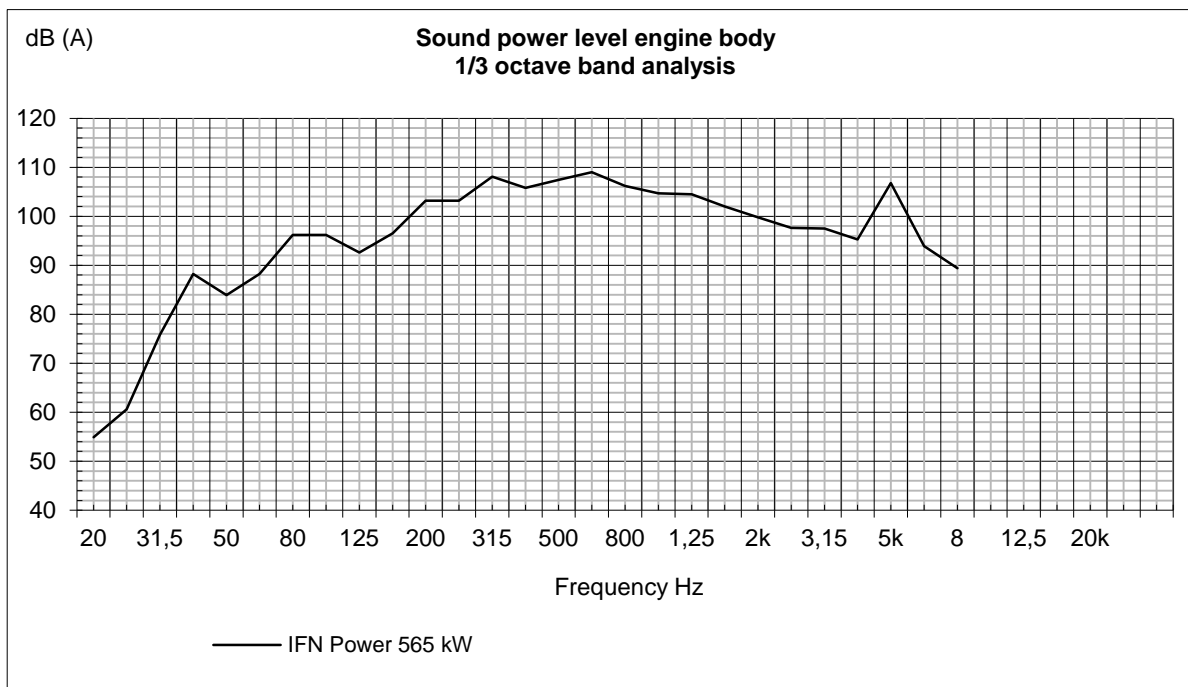
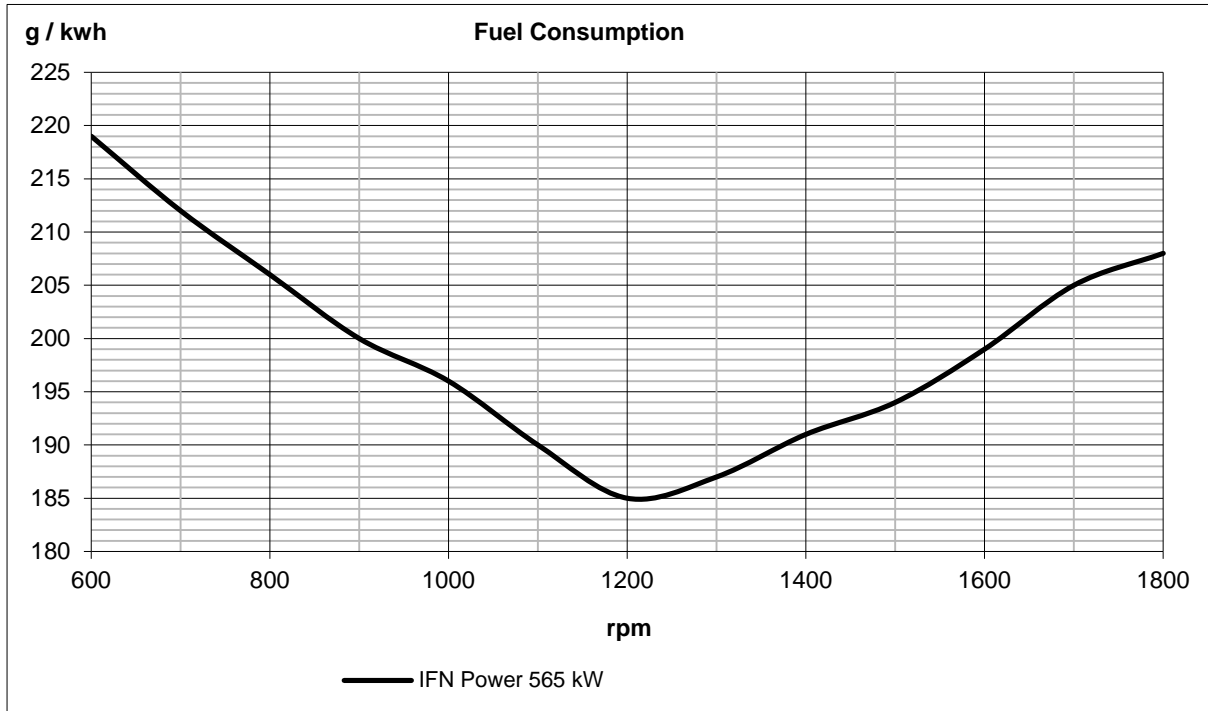
Voltage and type			24V / Insulated from earth	
Alternator:	make		Bosch	
	output	Amp	80	
	tacho output	Hz/alternator rev.	6	
	drive ratio		3,9 : 1	
Starter motor:	make		Melco	
	type		105P70	
	output	kW	7	
		hp	9,5	
Starter motor solenoid:	pull current	Amp	-	
	hold current	Amp	2,3	
Number of teeth on:	flywheel		153	
	starter motor		12	
Inrush current at +20°C		Amp	700	
Cranking current at +20°C		Amp	280	
Crank engine speed at +20°C		rpm	150	
Starter motor battery capacity	max	Ah	2x 225	
	min at +5°C	Ah		
Inlet manifold heater (at 20 V)		kW	4	
Power relay for the manifold heater		Amp	1	

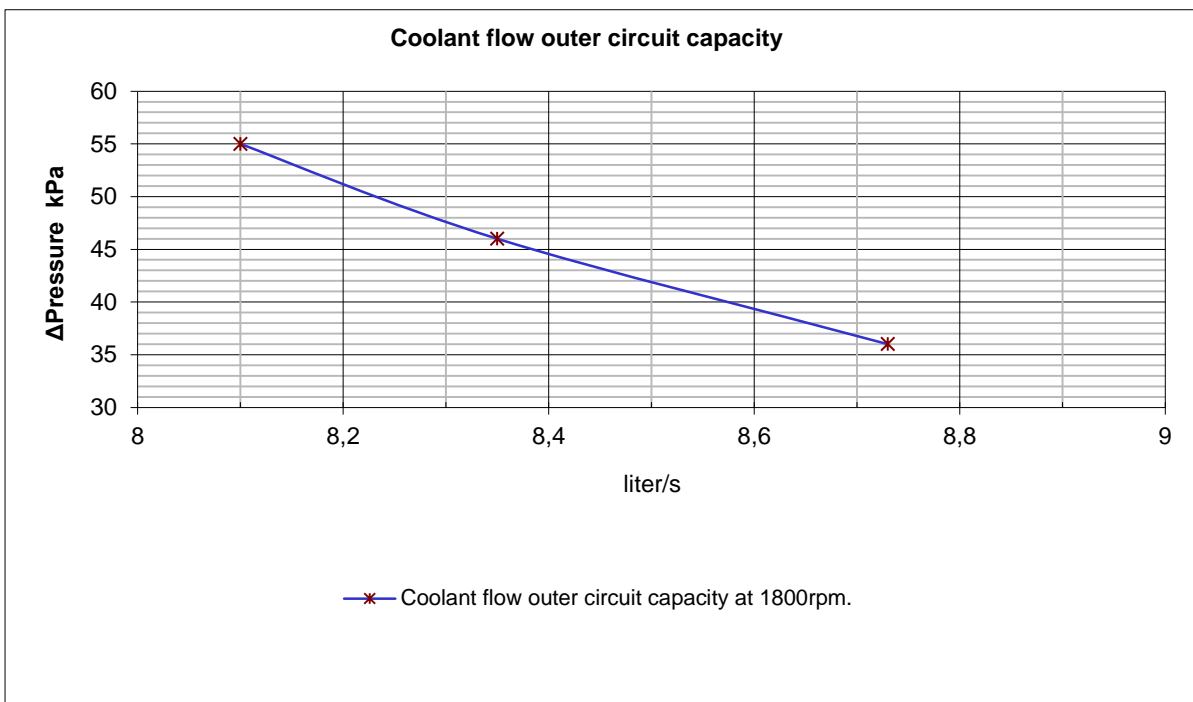
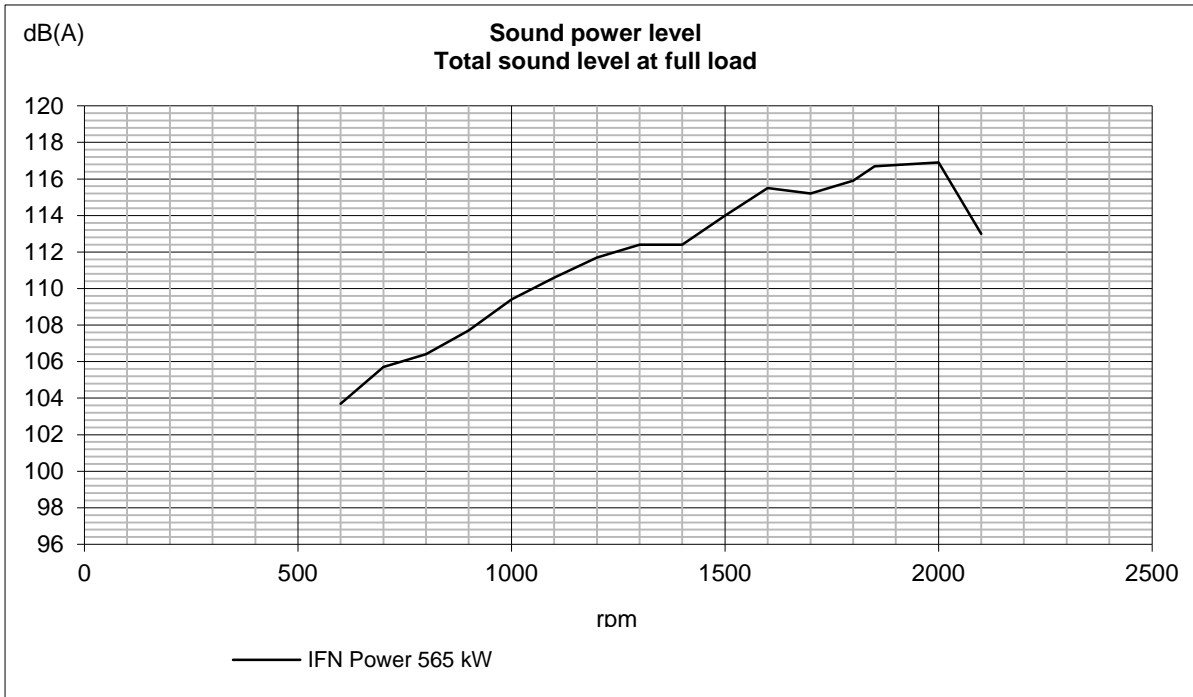
Power take off

		r/min	1200	1500	1800	1850
Front end in line with crank shaft max:		Nm lbf ft	TBD			
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW	26	33	38	40
		hp	35	45	52	54
	max down	kW	60	75	85	90
		hp	82	102	116	122
	max right	kW	26	33	38	40
		hp	35	45	52	54
Timing gear at compressor PTO max:		Nm lbf ft	600 443			
Speed ratio direction of rotation viewed from flywheel side			1,31:1/ anti-clockwise			
Timing gear at servo pump PTO max:		Nm lbf ft	NA			
Max allowed bending moment in flywheel housing		Nm	15000			
		lbf ft	11063			
Max. rear main bearing load		N	5000			
		lbf	1124,0			

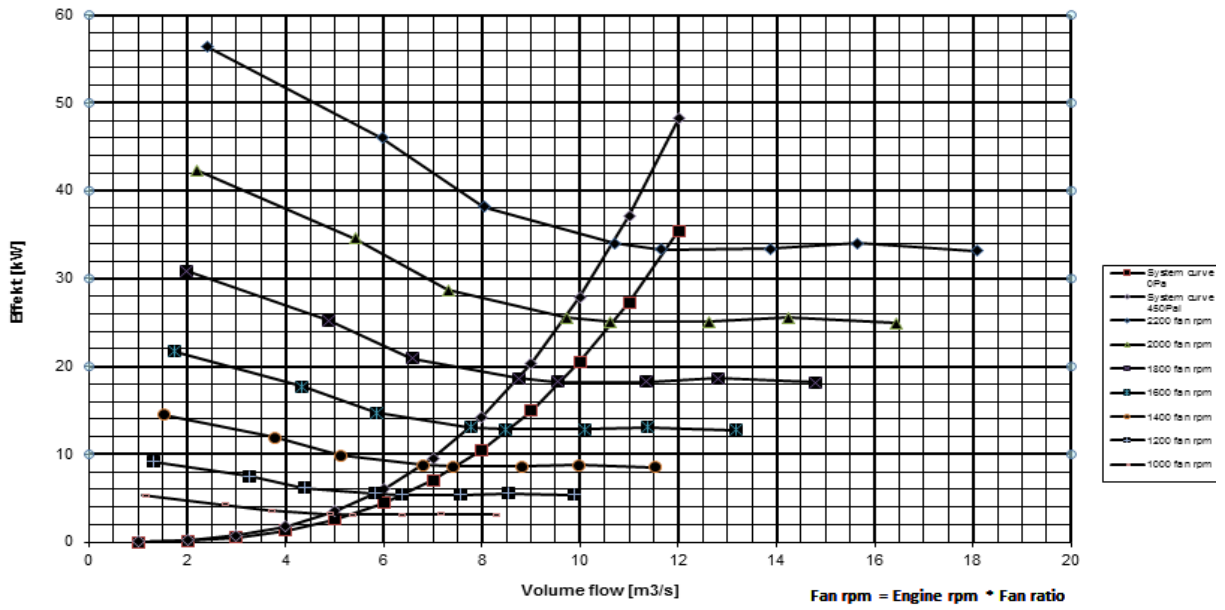








Fan power 890mm Pusher fan



Fan power 890mm Puller fan

