


<b>VOLVO PENTA</b> TAD1363VE	Document No	Issue Index
	<b>21593480</b>	<b>09</b>

### 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 in <sup>3</sup>	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		17.8:1	
Wet weight	Engine only	kg lb	1325 2921
	Power pac	kg lb	1790 3946

### Performance

				rpm	1200	1500	1800	1900
IFN Power	345 kW	without fan	kW	299	345	345	345	345
			hp	407	469	469	469	469
		with fan	kW	295	339	335	333	333
		890 mm	hp	401	461	456	453	453
IFN Power	345kW	without fan	kW	299	345	345	345	345
			hp	407	469	469	469	469
		with fan	kW	295	339	335	333	333
		890 mm	hp	401	461	456	453	453
Torque at:		IFN Power 345 kW	Nm	2379	2196	1830	1734	1734
			lbf ft	1755	1620	1350	1279	1279
		IFN Power 345kW	Nm	2379	2196	1830	1734	1734
			lbf ft	1755	1620	1350	1279	1279
Max torque at engine speed	IFN Power		1200 rpm	Nm	2380			
				lbf ft	1755			
				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 345 kW		MPa	2,34	2,16	1,80	1,71
				psi	339	313	261	247
Max combustion pressure at:		IFN Power 345 kW		MPa	16,6	18	17,4	17,8
				psi	2407	2610	2523	2581
Total mass moment of inertia, J (mR <sup>2</sup> ) (not including flywheel)				kgm <sup>2</sup>	3,43			
				lbft <sup>2</sup>	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:	IFN Power 345 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
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	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	125 257
Oil filter micron size		μ	40




**Fuel system**

	<b>rpm</b>	<b>1200</b>	<b>1500</b>	<b>1800</b>	<b>1900</b>
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 (measured at fuel inlet connection)	kPa psi	16,5 2,4
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	

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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 345 kW	25°C 77°F	m³/min cfm	20,7 731	25,0 883	26,4 932	27,1 957
 <b>See front page for important information</b> Max allowable air intake restriction including piping			kPa psi	5 0,7			
Heat rejection to exhaust at:	IFN Power 345 kW		kW BTU/min	185 10521	224 12739	259 14729	263 14957
Exhaust gas temperature after turbine at:	IFN Power 345 kW		°C °F	454 849	455 851	448 838	419 786
 <b>See front page for important information</b> Max allowable back pressure in exhaust line (after turbine) Pipe dimension Ø: 125 mm			kPa psi	19 2,8	25 3,6	28 4,1	31 4,5
 <b>See front page for important information</b> Max allowable temperature drop between turbine and SCR muffler inlet. SCR muffler pressure drop			°C °F	10 18			
			m³/min psi	15 2,2	19 2,8	21 3,0	23 3,3
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	IFN Power 345 kW		m³/min	45,8	53,2	54,9	53,9
			cfm	1617	1879	1939	1903
Exhaust gas smoke	IFN Power 345 kW		*Bosch Units	0,022	0,021	0,047	0,053

Cooling system		rpm	1200	1500	1800	1900
Heat rejection radiation from engine at:	IFN Power 345 kW	kW BTU/min	7 409	7,6 432	7,6 432	7,7 438
Heat rejection to coolant at:	IFN Power 345 kW	kW BTU/min	128 7279	135 7677	140 7962	148 8417
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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<b>Charge air cooler system</b>		<b>rpm</b>	<b>1200</b>	<b>1500</b>	<b>1800</b>	<b>1900</b>
Heat rejection to charge air cooler	IFN Power 345 kW	kW	49	59	64	65
		BTU/min	2787	3355	3640	3696
Charge air mass flow	IFN Power 345 kW	kg/s	0,37	0,46	0,53	0,54
Charge air inlet temp.	IFN Power 345 kW	°C	166	173	174	174
(Charge air temp after turbo compressor)		°F	331	343	345	345
						
<b>See front page for important information</b>						
Max allowable Charge air outlet temp.		°C	42	45	46	50
(Charge air temp after charge air cooler)		°F	108	113	115	122
						
<b>See front page for important information</b>						
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 <sup>2</sup>	0,8			
		foot <sup>2</sup>	8,61			

**Cooling performance: 0,8 m<sup>2</sup> 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	
				m <sup>3</sup> /s	ft <sup>3</sup> /s	Pa	psi
rpm	kW hp	°C	°F				
1900	345	58	136	6,4	226,0	247	0,036
0,84	469	60	140	6,9	243,7	125	0,018
		62	144	7,3	257,8	0	

**Cooling performance: 0,8 m<sup>2</sup> 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	
				m <sup>3</sup> /s	ft <sup>3</sup> /s	Pa	psi
rpm	kW hp	°C	°F				
1900	345	58	136	6,3	222,5	265	0,038
0,84	469	59	138	6,5	229,5	195	0,028
		61	142	7	247,2	0	



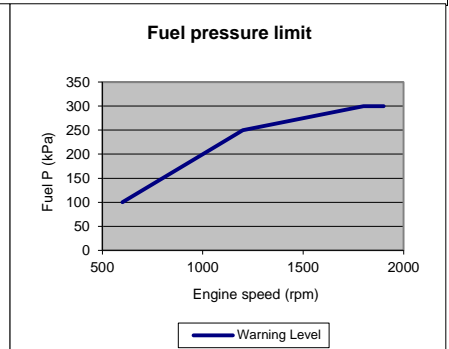
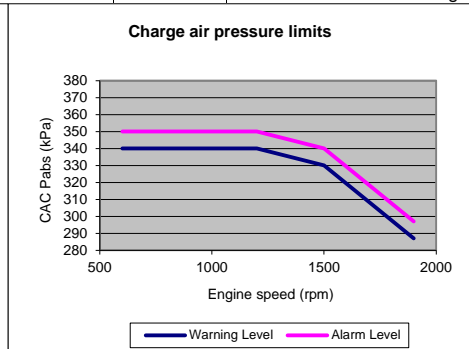
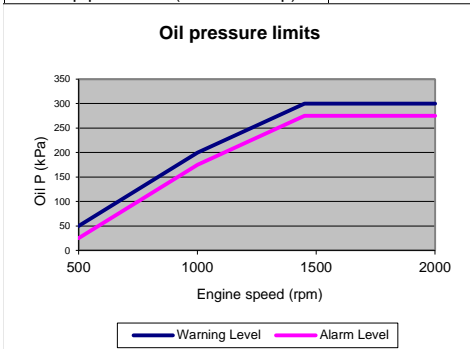
**Engine management system**

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	50 kPa	25 kPa	Shut down.	ON/OFF*
Low idle	300 kPa	275 kPa	Shut down.	ON/OFF*
Rated speed	Min level	-	-	-
Oil level	105°C	107°C	Shut down.	ON/OFF*
Coolant temp	Low level	-	-	-
Coolant level	-	100 kPa	-	-
Fuel feed	1200	250 kPa	-	-
Low idle pressure	-	-	-	-
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 not to 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 not to 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		
<b>Conditions:</b> (4 mΩ main circuit resistance@ 20°C)	<b>Temperature</b>	°C		25	0	-15
	<b>Battery</b>	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
Continuous torque. 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 is used simultaneously, calculations needs to be performed to determine maximum available torque depending on application inertia.

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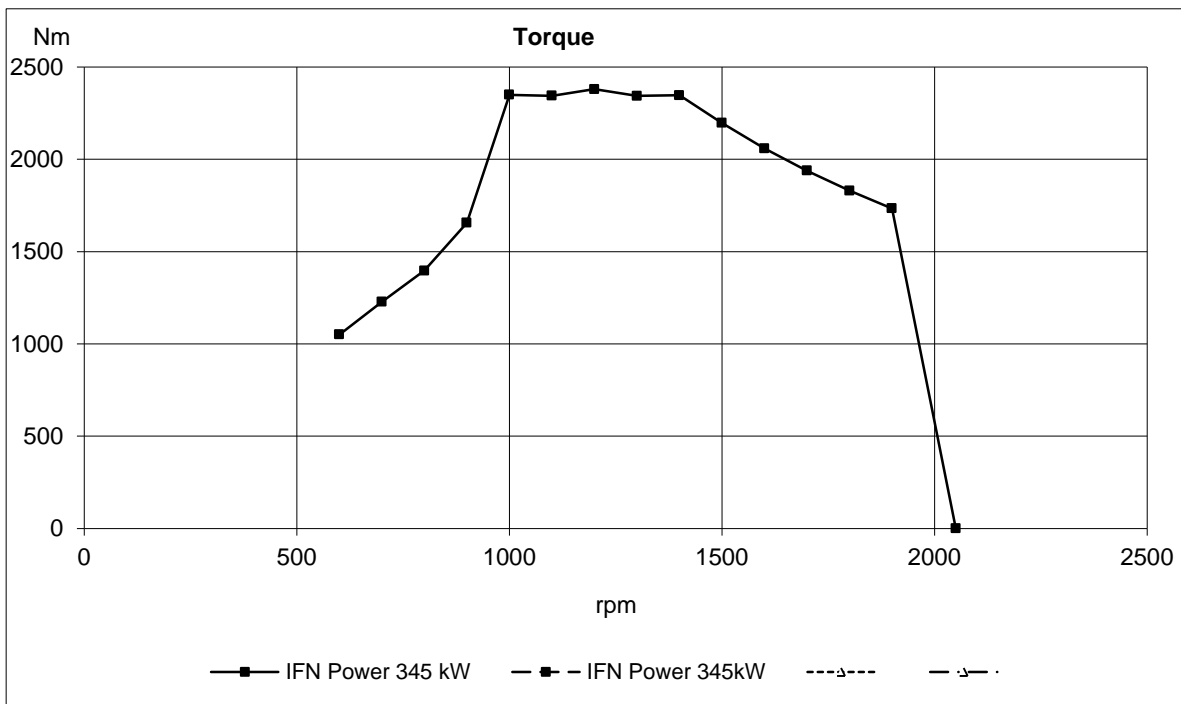
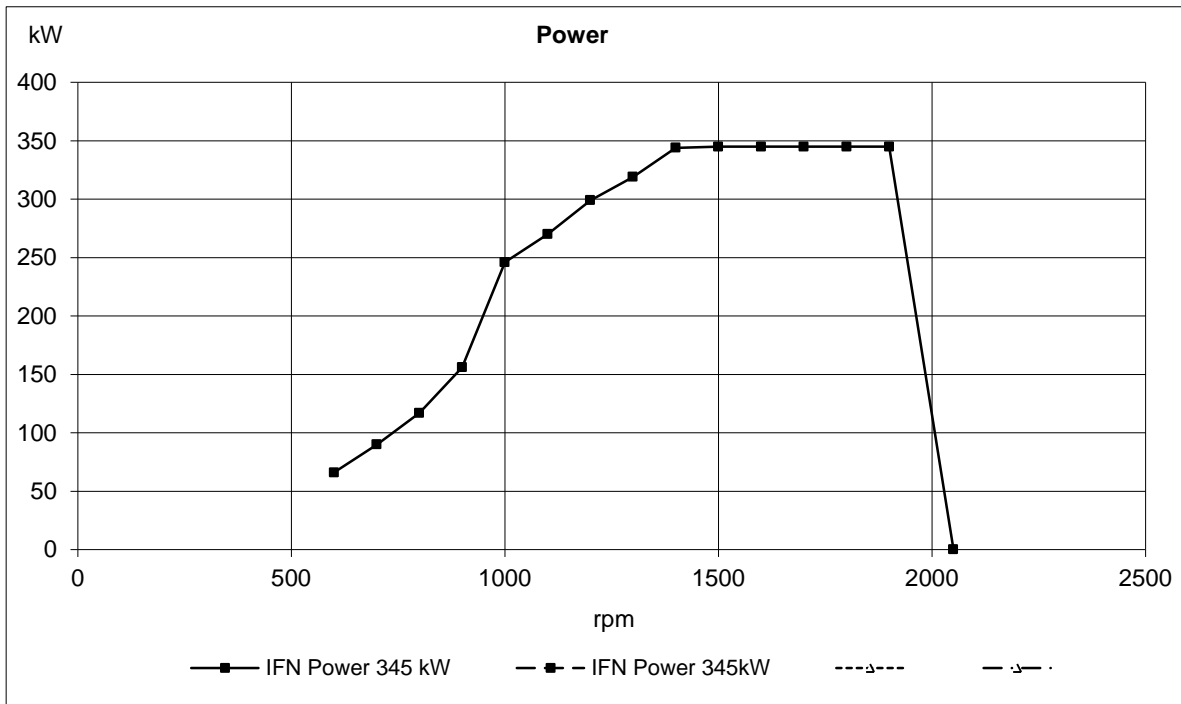
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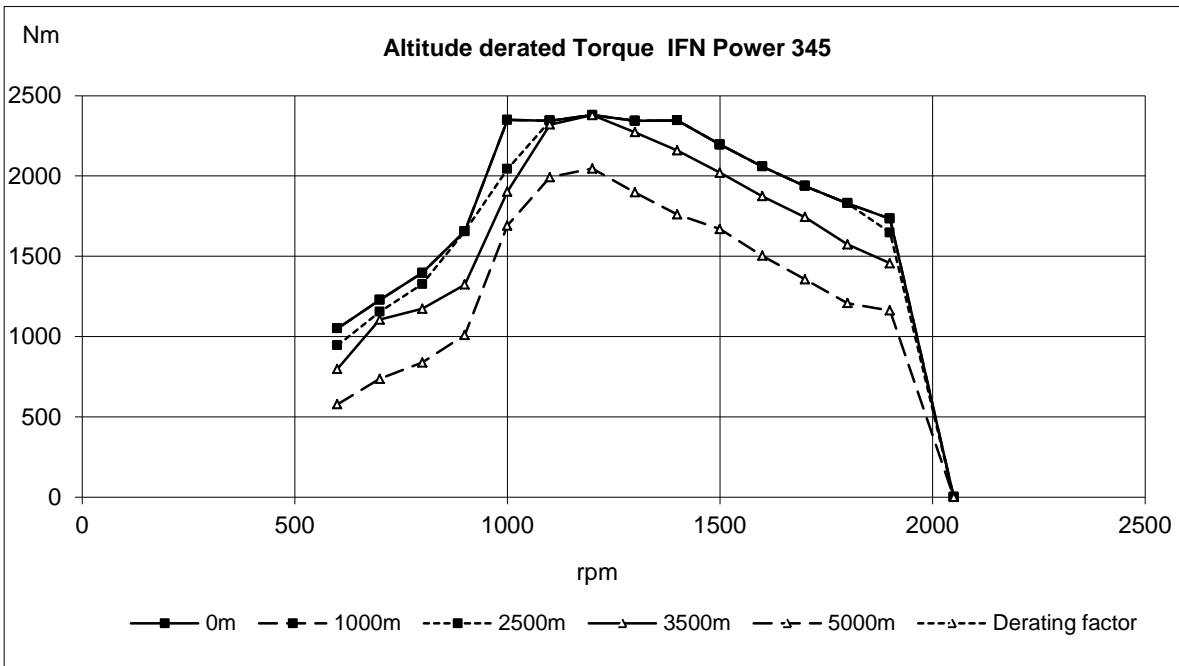
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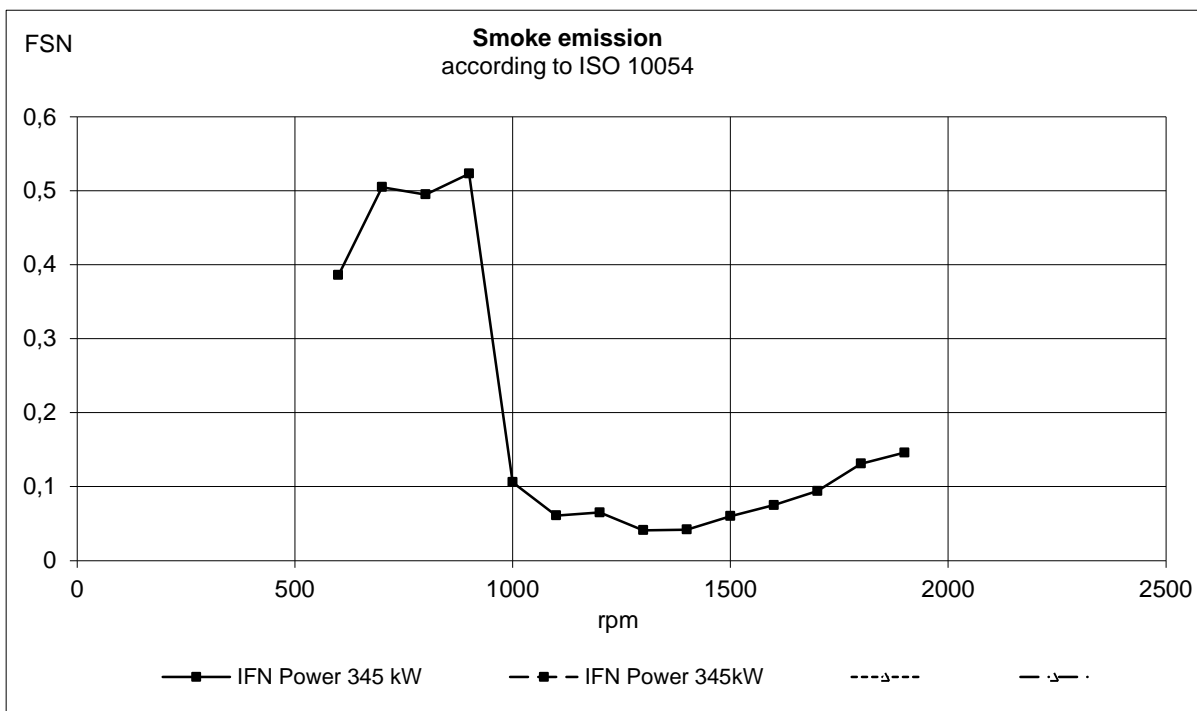
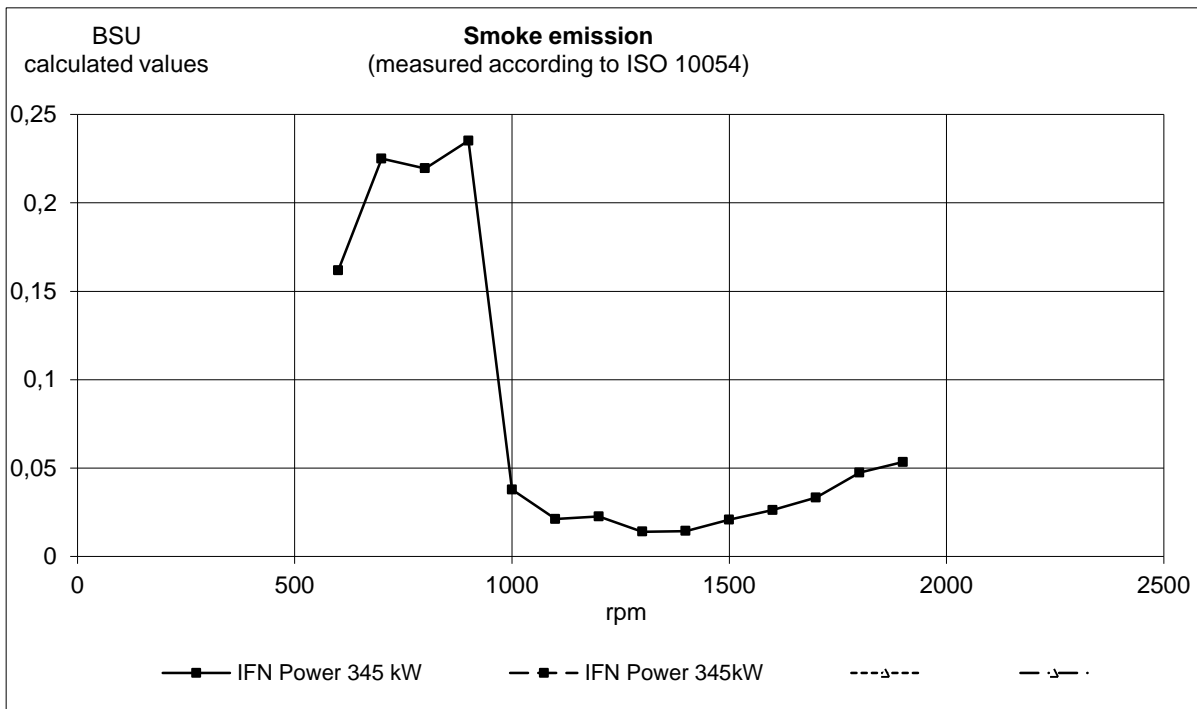
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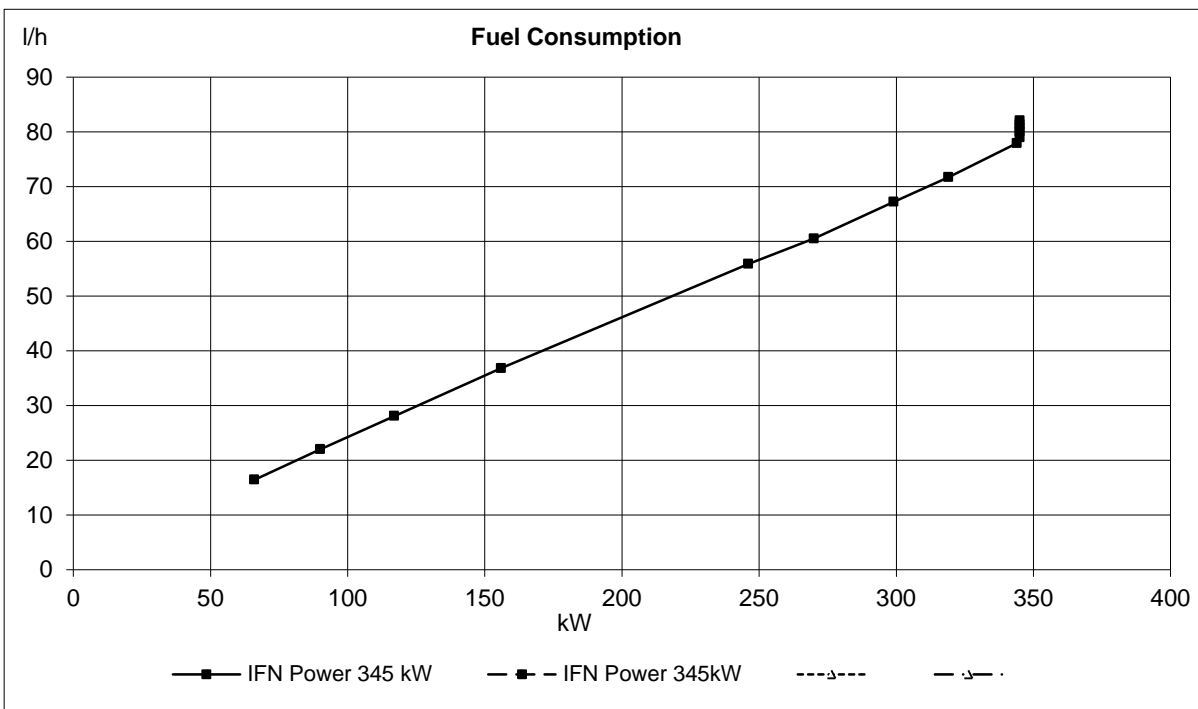
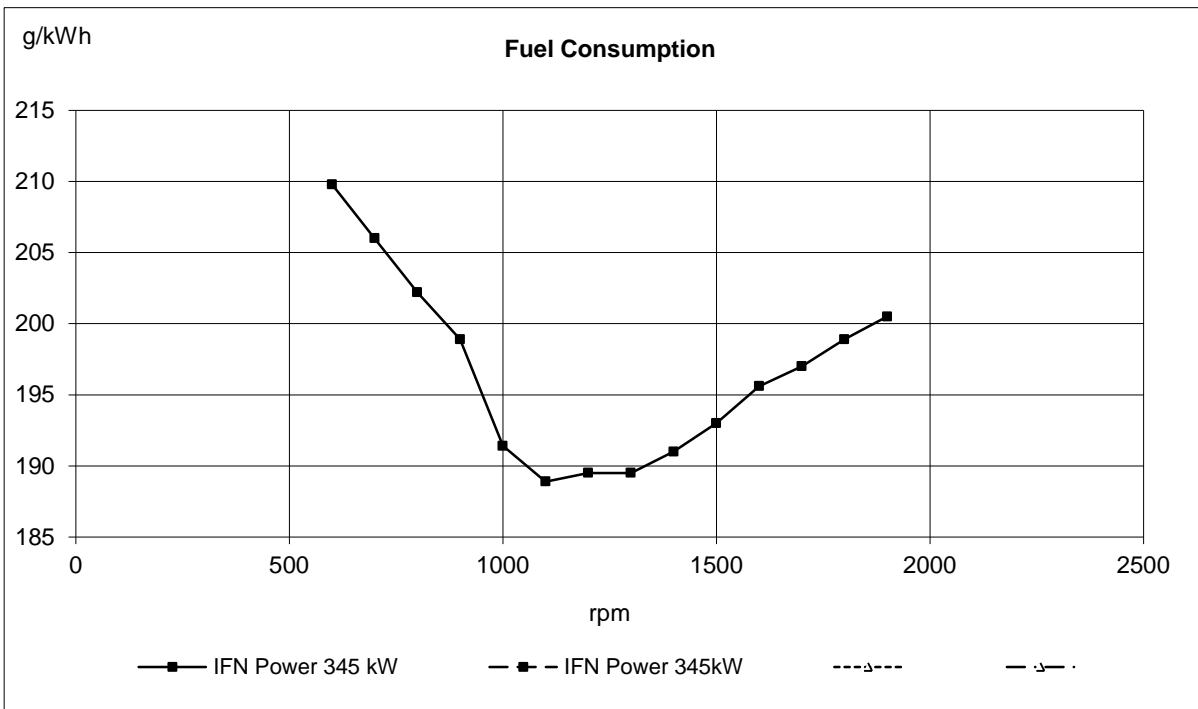
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