


VOLVO PENTA TAD1342VE	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			18.1:1
Wet weight (Not including after treatment system)	Engine only	kg	1325
		lb	2921
	Power pac	kg	1790
		lb	3946

Performance

			rpm	1500	1800	2000	2100
310 kW	without fan	kW		310	310	310	310
		hp		422	422	422	422
	with fan 890 mm	kW		304	300	296	294
		hp		413	408	403	400
Torque at:	ICFN Power 310 kW	Nm		1974	1645	1480	1410
		lbf ft		1455	1213	1092	1040
Max torque at engine speed	1260 rpm	Nm		2000			
		lbf ft		1475			
Power tolerance		%		±2%			
Mean piston speed		m/s		7,9	9,5	10,5	11,1
		ft/sec		25,9	31,1	34,6	36,3
Effective mean pressure at:	ICFN Power 310 kW	MPa		1,94	1,62	1,46	1,39
		psi		281	235	211	201
Max combustion pressure at:	ICFN Power 310 kW	MPa		13,7	16	14,7	14
		psi		1987	2320	2132	2030
Total mass moment of inertia, J (mR ²) (not including flywheel)		kgm ²		3,43			
		lbft ²		81,4			
Friction Power		kW		30	43	54	60
		hp		41	58	73	82

Derating see Technical Diagrams

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Cold start performance

*Cold start limit temperature	without starting aid	°C / sec	20	3
		°F / sec	68	
	#REF!	°C / sec	-5	4
	°F / sec	23		
#REF!	°C / sec	-15	4.5	
	°F / sec	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 310 kW	liter/h	0,02
		US gal/h	0,005
		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	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	300 - 650	
	psi	44 - 94	
Oil pressure shut down switch setting	kPa	130	
	psi	19	



Lubrication system

Lubrication oil temperature in sump:	max	°C	130
		°F	266
Oil filter micron size		μ	40

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Fuel system		rpm	1500	1800	2000	2100
ICFN Power 310 kW Specific fuel consumption at:	25%	g/kWh	221	246	270,7	286,3
		lb/hph	0,358	0,399	0,439	0,464
	50%	g/kWh	198	212	226,9	234,8
		lb/hph	0,321	0,344	0,368	0,381
	75%	g/kWh	188	198	211,2	219,2
		lb/hph	0,305	0,320	0,342	0,355
	100%	g/kWh	188	197	208,3	216,9
		lb/hph	0,305	0,319	0,338	0,352
Fuel to conform to			ASTM-D975-No1 and 2D JIS KK 2204, EN 590			



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	10
		psi	1,5
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
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: (+25°C and 100kPa)	ICFN Power 310 kW	25°C	m ³ /min	24	27	28	28
		77°F	cfm	836	939	974	979
 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 310 kW		kW	203	218	236	246
			BTU/min	11544	12397	13421	13990
Exhaust gas temperature after turbine at:	ICFN Power 310 kW		°C	409	388	417	450
			°F	768	730	783	842
 See front page for important information							
Max allowable back pressure in exhaust line (after turbine)			kPa	11	14	15	15
Pipe dimension Ø:		mm	psi	1,6	2,0	2,2	2,2
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	ICFN Power 310 kW		m ³ /min	52	55	59	62
			cfm	1848	1959	2098	2205
Exhaust gas smoke	ICFN Power 310 kW		*Bosch	0,08	0,09	0,25	0,49
			Units				

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Cooling system		rpm	1500	1800	2000	2100
Heat rejection radiation from engine at:	ICFN Power 310 kW	kW	16	16	15,5	15,5
		BTU/min	910	910	881	881
Heat rejection to coolant at:	ICFN Power 310 kW	kW	114	127	139	143
		BTU/min	6483	7222	7905	8132
Radiator cooling system type			Closed circuit			
Standard radiator core area		m ²	0,8			
		foot ²	8,61			
Fan diameter	890 mm	mm	890			
		in	35,04			
Fan power consumption	890 mm	kW	6,0	10,0	14,0	16,0
		hp	8	14	19	22
Fan drive ratio	fan Ø890		0,84 : 1			
Coolant capacity:	engine	liter	20			
		US gal	5,3			
	std. 0,8m ² radiator with hoses	liter	24			
		US gal	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	4,7	5,7	6,0	6,2
		US gal/s	1,2	1,5	1,6	1,6
Maximum outer circuit restriction incl. piping		kPa	65,0			
		psi	9,4			
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	70			
		psi	10,2			
Maximum top tank temperature		°C	107			
		°F	225			

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Charge air cooler system		rpm	1500	1800	2000	2100
Heat rejection to charge air cooler	ICFN Power 310 kW	kW	63	72	74	73
		BTU/min	3583	4095	4208	4151
Charge air mass flow	ICFN Power 310 kW	kg/s	0,47	0,53	0,54	0,55
Charge air inlet temp. (Charge air temp after turbo compressor)	ICFN Power 310 kW	°C	175	179	179	176
		°F	347	354	354	349
 See front page for important information Max allowable Charge air outlet temp. (Charge air temp after charge air cooler)		°C	41	43	45	44
		°F	106	109	113	111
 See front page for important information Maximum pressure drop over charge air cooler incl. piping		kPa		8		
		psi		1,16		
Charge air pressure (After charge air cooler)		kPa		181		
		psi		26,25		
Standard charge air cooler core area		m ²		0,8		
		foot ²		8,61		

Cooling performance: 0,8 m² radiator and 890 mm 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.

Engine speed	Engine power	Air on temp		Air flow		External restriction	
				m ³ /s	ft ³ /s	Pa	psi
2100 (0,84)	310	58	136,00				
	422	60	140	6,5	229,5	518	0,075
		63	145	7,4	261,3	225	0,033
		65	149	7,9	279,0	0	
1800 (0,84)	310	58	136	5,6	197,8	322	0,047
	422	60	140	6	211,9	210	0,030
		63	145	6,7	236,6	0	
		65	149				

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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 rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
2100 (0,84)	310	75	167	7,6	268,4	0	
	422	73	163	7,0	247,2	100	0,015
		71	160	6,4	226,0	200	0,029
		69	156	6,0	211,9	300	0,044
		67	153	5,6	197,8	400	0,058
1800 (0,84)	310	76	169	6,3	222,5	0	
	422	74	165	5,9	208,4	100	0,015
		70	158	5,2	183,6	200	0,029
		67	153	4,7	166,0	300	0,044
		63	145	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 rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
2100 (0,84)	310	72	162	6,9	243,7	0	
	422	70	158	6,4	226,0	100	0,015
		68	154	6,1	215,4	200	0,029
		66	151	5,7	201,3	300	0,044
		64	147	5,3	187,2	400	0,058
1800 (0,84)	310	70	158	6,0	211,9	0	
	422	67	153	5,4	190,7	100	0,015
		65	149	4,9	173,0	200	0,029
		61	142	4,5	158,9	300	0,044
		57	135	4,0	141,3	400	0,058

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Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronous / 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 hp	7 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: *	Nm lbf ft	300 221
PTO SAE B		
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 on PTO output is used simultaneously, calculations needs to be performed to determine maximum available torque, depending on application inertia.

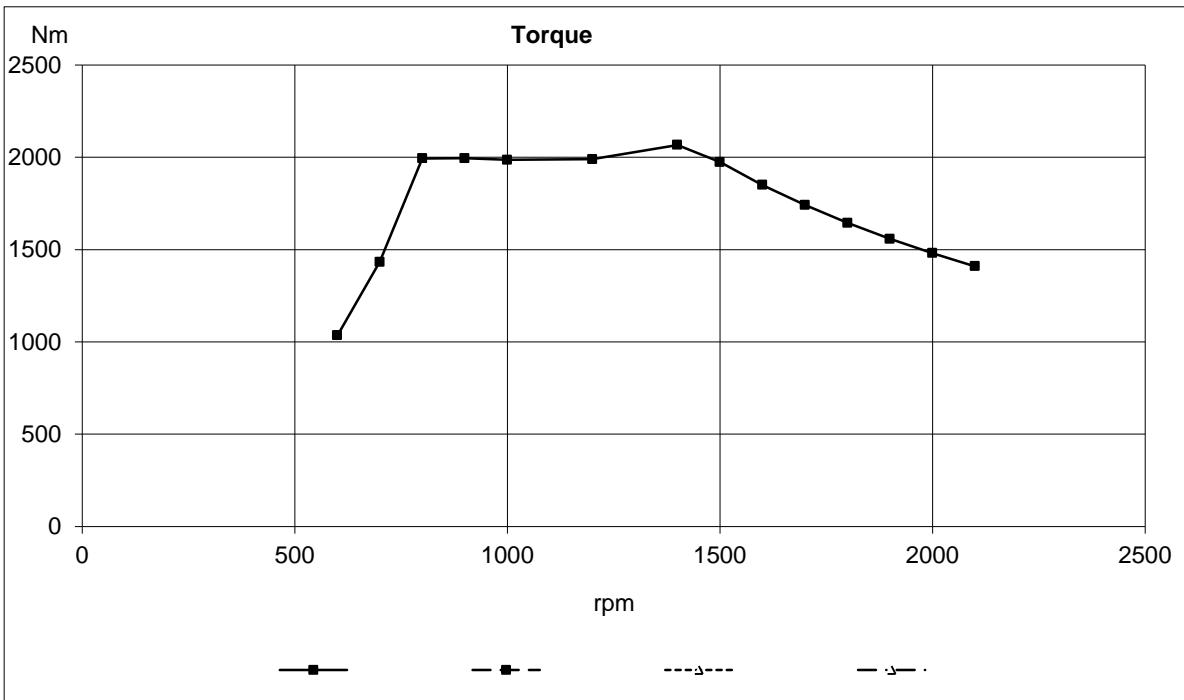
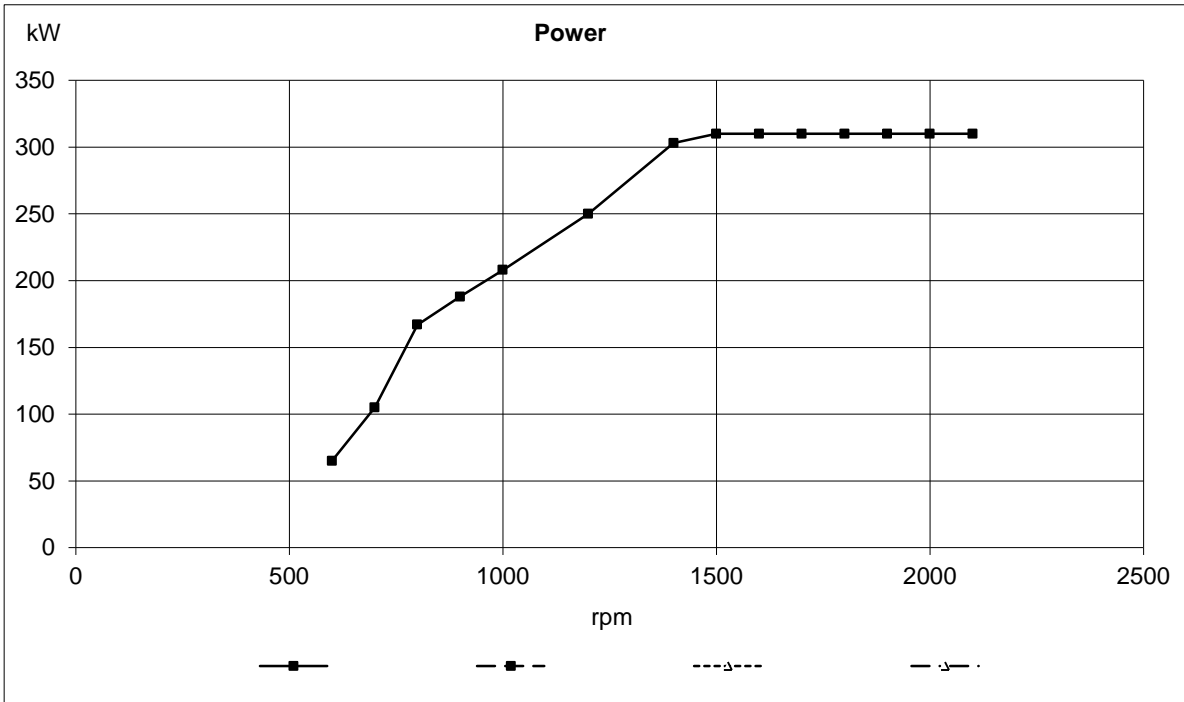
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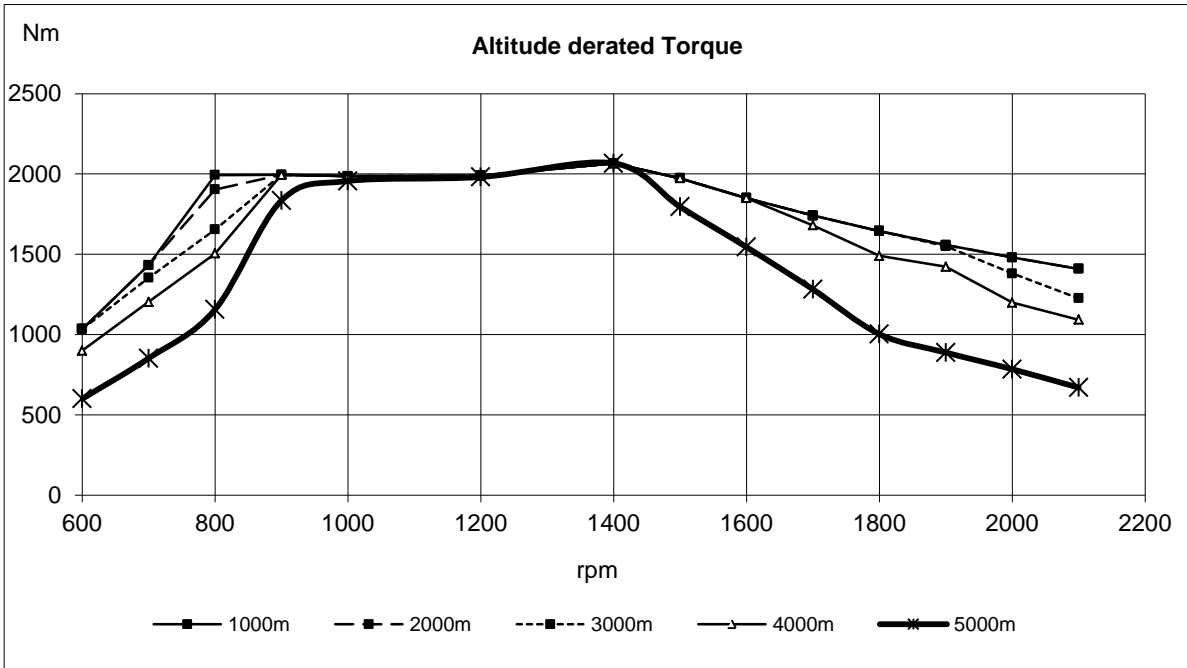
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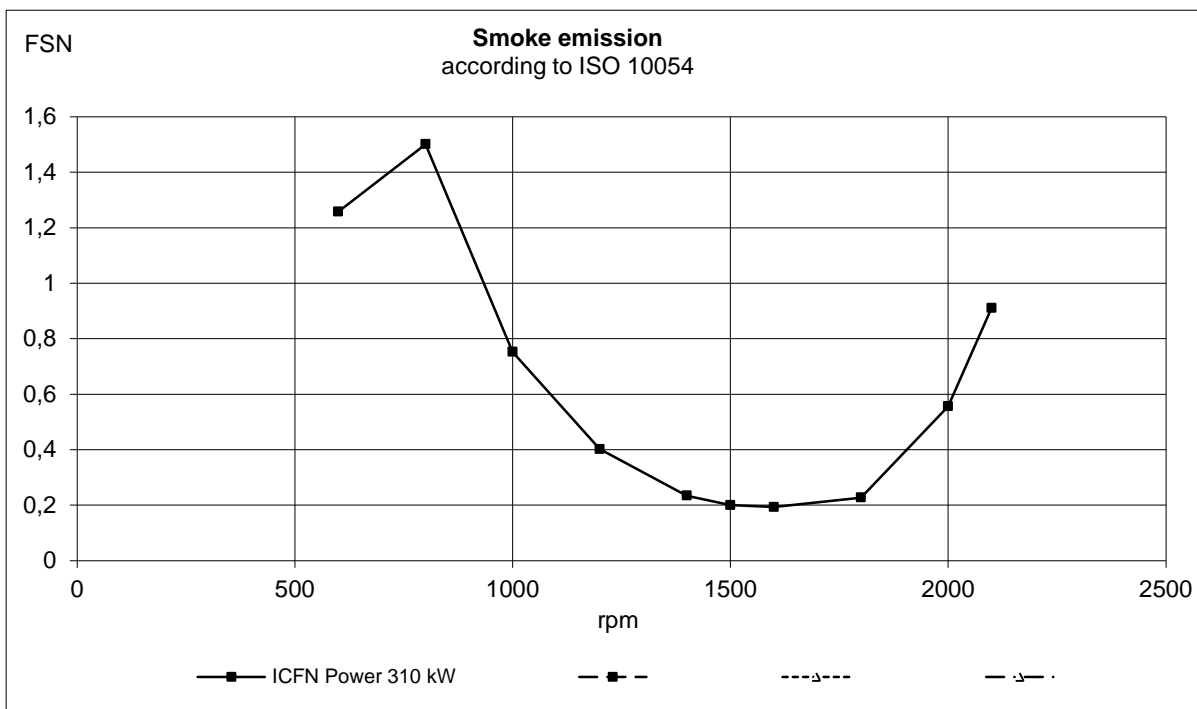
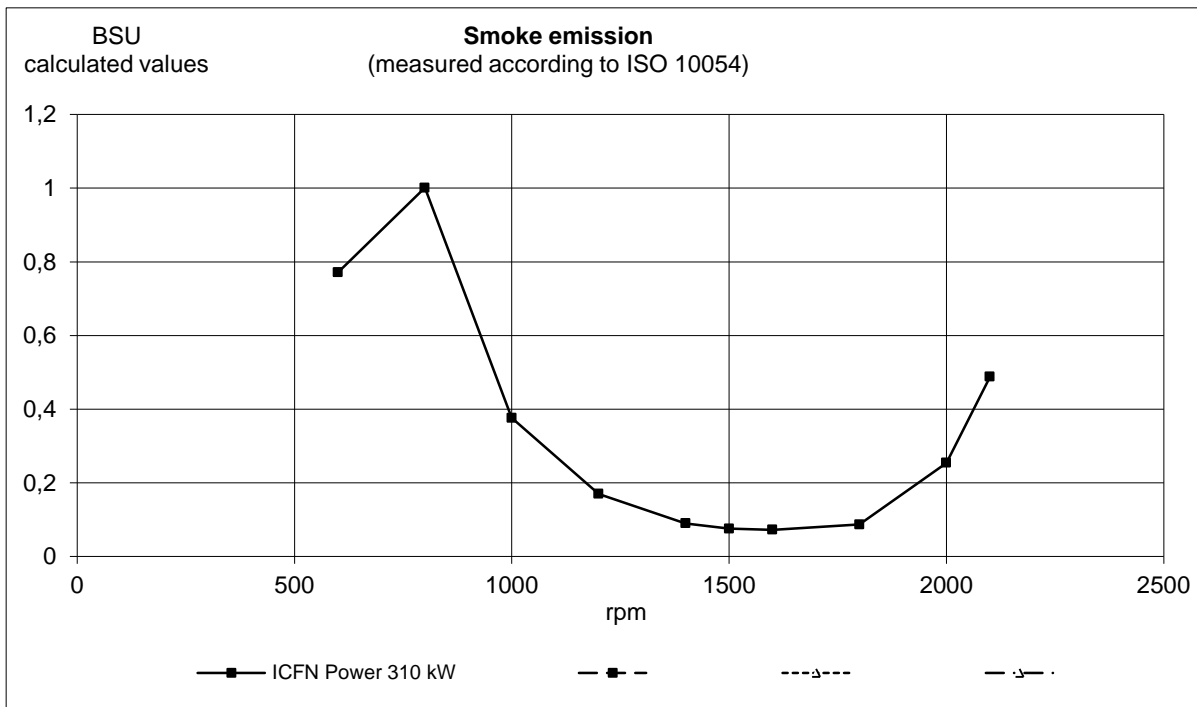
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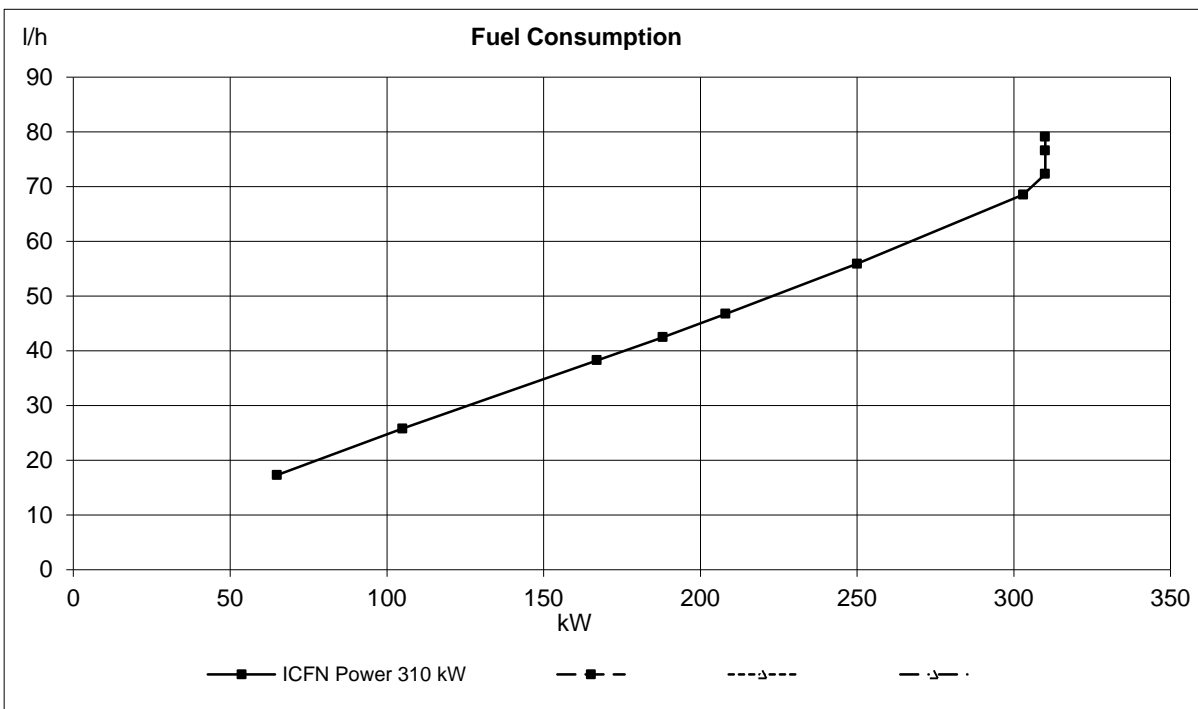
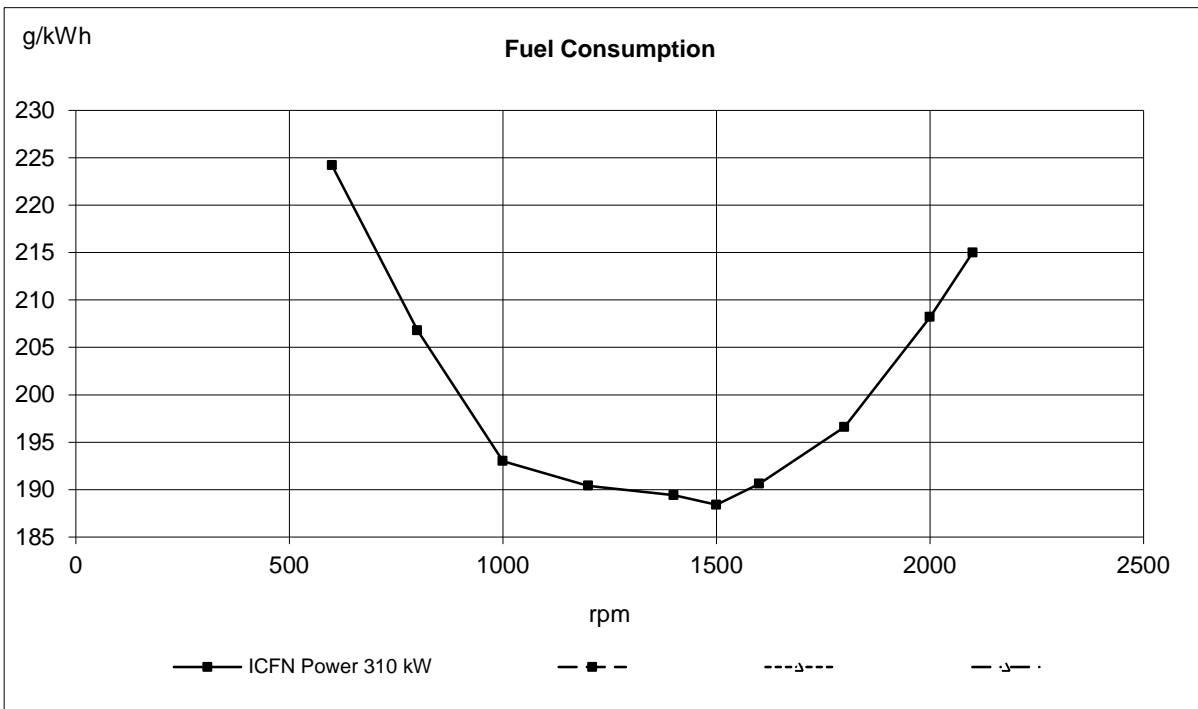


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