


**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 turbocharged diesel engine with direct injection.  
Rotation direction, anti-clockwise viewed towards flywheel.

Number of cylinders			6
Displacement, total	litre		7.70
	in <sup>3</sup>		469.9
Firing order			1-4-2-6-3-5
Bore	mm		110
	in		4.33
Stroke	mm		135
	in		5.31
Compression ratio			17.5:1
Wet weight w/o EATS	Engine only	kg	707
		lb	1559
	Engine incl. cooling system and air filtration system	kg	917
		lb	2022
	Engine incl. cooling system, air filtration system, and frame	kg	N/A
		lb	

**Performance**

			<b>rpm</b>	<b>1500</b>	<b>1800</b>
Standby Power	without fan	kW		320	321
		hp		435	437
	with fan	kW		308	301
		hp		419	409
Prime Power	without fan	kW		292	294
		hp		397	400
	with fan	kW		280	274
		hp		381	373
COP Power	without fan	kW		219	221
		hp		298	300
	with fan	kW		207	201
		hp		282	273
Torque at:	Standby Power	Nm		2037	1703
		lbft		1502	1256
	Maximum within fine speed range	Nm		2167	1793
		lbft		1598	1322
Total mass moment of inertia, J (mR <sup>2</sup> )	kgm <sup>2</sup>		0.420		
	lbft <sup>2</sup>		10.0		
<b>Derating due to altitude - see Technical Diagrams</b>					

**Engine noise emission**

Test Standards: ISO 3744-1981 (E) sound power with fan

Tolerance  $\pm 0.75$  dB(A)

		rpm	1500	1800
Measured sound power Lw	Standby Power	dB(A)	111.8	115.3
	Prime Power	dB(A)	111.2	115.3
	No load	dB(A)	111.5	100.3
Calculated sound pressure Lp at 1 m	Standby Power	dB(A)	99.8	103.3
	Prime Power	dB(A)	99.2	103.3
	No load	dB(A)	99.5	88.3

**Test conditions for load acceptance data**

Engine at working temperature, fuel that is used..... Nominal operating conditions

Generator	Brand	Model	Type of AVR	
	Stamford	HCI444FI	SX440	
AVR Settings	UFRO (Hz):	3	DIP: std	DWELL: std
	Stability (%)*:	std	Voltage (V): 400	Power factor: 1

Load acceptance performance can vary due to actual alternator inertia, voltage regulator, type of load and local ambient conditions.

**Nomenclature**

Abbreviation:	Full name:	Descriptions
AVR	Automatic Voltage Regulator	Generator performance and safty control unit
UFRO	Under Frequency Roll Off	Overheating protection at under frequency
-	Dip	Controls the slope of voltage drop when the UFRO is active
-	Dwell	Controls the slope of voltage recovery when the UFRO is active.

**Load Acceptance at 1500 rpm**

Genset Classification

This engine fulfills G1, G2 and G3 classes, according to ISO8528-5. For other class, please, see the table below.

Load (%)	Speed diff (%)	Speed Recovery time (s)	
0-39	7 (G3)	1.2	G3 boundary conditions
0-48	10 (G2)	3.0	G2 boundary conditions

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	3.0	1.2	0.6	0.1	20-100	60.7	8.9	64.5	8.0
0-40	6.2	1.7	3.2	2.0	40-100	19.9	4.1	23.2	3.0
0-60	20.6	1.9	12.8	3.0	60-100	6.6	1.4	3.4	1.0
0-80	42.8	4.8	56.1	4.0	80-100	3.1	1.3	0.4	0.1
0-100	71.3	11.3	71.9	11.0					
0-110	73.7	14.5	75.8	15.6					
100-0	15.2	2.1	12.1	1.0					

**Load Acceptance at 1800 rpm**

## Genset Classification

This engine fulfills G1, G2 and G3 classes, according to ISO8528-5. For other class, please, see the table below.

Load (%)	Speed diff (%)	Speed Recovery time (s)	
0-55	7 (G3)	1.5	G3 boundary conditions
0-59	10 (G2)	1.8	G2 boundary conditions

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	1.6	0.7	0.0	0.1	20-100	19.4	2.7	22.1	3.1
0-40	3.5	0.8	0.6	0.1	40-100	9.8	2.2	8.8	2.0
0-60	9.0	1.9	3.9	1.0	60-100	7.3	2.8	3.9	2.0
0-80	22.7	2.8	28.5	3.6	80-100	1.9	0.7	0.5	0.1
0-100	30.6	3.4	31.3	3.8					
0-110	34.2	3.8	42.5	4.0					
100-0	7.3	1.2	9.3	1.1					

Cold start performance	Ambient Temp. [°C]	Manifold Heater	Block heater	RPM	
				1500	1800
Time to Set Speed from start	20	-	-	4.8	5.5
	5	-	-	4.3	5.5
	-15*	Yes	-	6.4	7.1
	-25*	Yes	-	8.6	-
	-30 **	Yes	Yes	5.3	7.9

Min start temp w/o Block Heater*	-25	°C
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\* With manifold heater kW engaged, lubrication oil SAE 10W/30.

\*\* With manifold heater kW engaged, lubrication oil SAE 10W/30 and block heater, Fuel MK-1.

Block heater type	Power kW	Engaged hours	Cooling water temp engine block
M9T701	1.5	16	28°C

**VOLVO PENTA**

TAD843GE

Document No

**24132160**

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Lubrication system		rpm		
		1500	1800	
Lubricating oil consumption	Standby Power	litre/h US gal/h	0.02 0.005	0.02 0.005
	Prime Power	litre/h US gal/h	0.02 0.005	0.02 0.005
Oil system capacity including filters		litre US gal	27 7.1	
Oil sump capacity:	max	litre US gal	25 6.6	
	min	litre US gal	16 4.2	
Oil change intervals/specifications:		h	1000	
Engine angularity limits:	front up	°	10	
	front down	°	10	
	side tilt	°	10	
Oil pressure at nominal set speed		kPa psi	330 - 430 48 - 62	
Lubrication oil temperature in oil sump:	max	°C	125	
		°F	257	
Oil filter micron size		μ	5.000	

\* See also general section in the sales guide

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Fuel system		rpm	1500	1800
<b>Standby Power</b> Specific fuel consumption at:	25%	g/kWh lb/hph	219 0.355	229 0.371
	50%	g/kWh lb/hph	206 0.334	211 0.342
	75%	g/kWh lb/hph	198 0.321	203 0.329
	100%	g/kWh lb/hph	197 0.319	198 0.321

<b>Prime Power</b> Specific fuel consumption at:	25%	g/kWh lb/hph	219 0.355	230 0.373
	50%	g/kWh lb/hph	208 0.337	214 0.347
	75%	g/kWh lb/hph	200 0.324	204 0.331
	100%	g/kWh lb/hph	198 0.321	204 0.331

CO2 emission declaration	rpm	1500	1800
Carbon dioxide (CO <sub>2</sub> ) emissions determined during the EU type approval process, NRSC-D2.	g/kWh	682	692

Fuel system	
Fuel to conform to	ASTM-D975-No1-D and 2-D EN 590 / JIS KK2204 / HVO100% B30(Sulphur levels up to 3000ppm)

	rpm	1500	1800
System supply flow at:	litre/h	139.0	142.0
	US gal/h	36.7	37.5
Fuel supply line max restriction (Measured at fuel inlet connection)	kPa	-55.0	-55.0
	psi	-8.0	-8.0
Fuel supply line max pressure, engine stopped & running	kPa	20.0	20.0
	psi	2.9	2.9
System return flow at:	litre/h	64.0	65.0
	US gal/h	16.9	17.2
Fuel return line max restriction (Measured at fuel return connection)	kPa	15.0	15.0
	psi	2.2	2.2
Maximum allowable inlet fuel temp (Measured at fuel inlet connection)	°C	80	80
	°F	176	176
Prefilter / Water separator micron size	μ	30	
Fuel filter micron size	μ	5	
Governor type/make, standard	Volvo / EMS 2.4		
Injection pump type/make	Denso HP4		

**Intake and exhaust system**

		rpm	1500	1800
Air consumption at: (+25°C and 100kPa)	Standby Power	m <sup>3</sup> /min cfm	19 671	21.8 770
	Prime Power	m <sup>3</sup> /min cfm	18.7 660	21.9 773



**See front page for important information**

Max air intake restriction including piping with maintained performance		kPa psi	3 0.4	3.8 0.6
Max <u>allowable</u> air intake restriction including piping		kPa psi	5 0.7	5 0.7
Air filter restriction clean Volvo Penta filter		kPa psi	5.0 0.7	5.0 0.7
Heat rejection to exhaust at:	Standby Power	kW BTU/min	213 12113	217 12341
	Prime Power	kW BTU/min	199 11317	211 11999
Exhaust gas temperature after turbine at:	Standby Power	°C	455	500
		°F	851	932
	Prime Power	°C	500	460
		°F	932	860

**See front page for important information**

Max allowable back pressure in exhaust after turbine		kPa psi	10 1.5	10 1.5
Heat rejection to exhaust:		kW BTU/min	213 12113	217 12341
	Exhaust gas temperature after turbine at maximum power:	°C °F	505 941	459 858
Exhaust gas flow at max power: (temp and pressure after turbine)		m <sup>3</sup> /min	50	53
		cfm	1766	1872

**Charge air cooler system**

	<b>rpm</b>	<b>1500</b>	<b>1800</b>
Heat rejection to charge air cooler at standby power	kW BTU/min	75 4265	84 4777
Charge air mass flow at standby power	kg/s	0.395	0.465
Charge air inlet temp at standby power (Charge air temp after turbo compressor)	°C °F	230 446	223 433
 <b>See front page for important information</b>			
Max allowable Charge air outlet temp at standby power (Charge air temp after intercooler)	°C °F	45 113	45 113
 Maximum pressure drop over charge air cooler incl. Piping	kPa psi	9.3 1.35	12.8 1.86
Maximum charge air pressure (After charge air cooler)	kPa psi	300 43.51	288 41.77
Standard charge air cooler core area	m <sup>2</sup> foot <sup>2</sup>	0.217 2.34	

**Cooling system**

Coolant type and mixture		VCS 40/60		
Coolant capacity,	engine only	litre	17	
		US gal	4.49	
	coolant radiators incl piping	litre	19	
		US gal	5.02	
	expansion tank	litre	5	
		US gal	1.32	
		<b>rpm</b>	<b>1500</b>	<b>1800</b>
Heat rejection radiation from engine at Standby power:		kW	9	10
		BTU/min	512	569
Heat rejection to coolant at standby power		kW	127	129
		BTU/min	7222	7336
Standard radiator core area		m <sup>2</sup>	0.485	
		foot <sup>2</sup>	5.22	
Min coolant flow <b>engine coolant circuit</b> (at fully open thermostat)		litre/s	3.8	4.6
		US gal/s	0.99	1.20
Maximum coolant temperature entering engine (25°C amb. Temp.)		°C	96	
		F	205	
Maximum external <b>engine coolant circuit</b> restriction, including piping (25°C amb. Temp.)		kPa	45	
		psi	6.5	
Nominal coolant pressure		kPa	100	100
		psi	14.5	14.5
Nominal coolant flow <b>with standard system</b>		litre/s	3.8	4.6
		US gal/s	1.00	1.22
Fan diameter		mm	650	
		in	25.59	
Fan power consumption		kW	12	20
Standard Fan		hp	16	27
Fan drive ratio			1.4:1	
Coolant pump		drive/ratio	1.4:1	
Thermostat		start to open	°C	85
			°F	185
		fully open	°C	100
			°F	212
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa	110	
		psi	16.0	
Minimum static pressure head (expansion tank height + pressure cap setting)		kPa	60	
		psi	8.7	
Standard pressure cap setting		kPa	100	
		psi	14.5	
Maximum top tank temperature		°C	107	
		°F	225	
Charge air pressure (after charge air coolers)		kPa	300	288
		psi	43.5	41.8



## Cooling performance

Standard fan:	650mm	Fan ratio:	1:1.4	Fan type:	Fixed
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Cooling air flow and external restriction at different radiator air temperatures based on 107°C TTT and 40% glycol. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	External restriction Pa	Air flow m <sup>3</sup> /s	STANDBY POWER	PRIME POWER
			Air on temp °C	Air on temp °C
1500	0	5.3	59.8	62.5
	150	5.1	58.7	61.5
	300	4.9	57.6	60.4
	450	4.7	56.4	59.2
1800	0	6.4	64.3	66.7
	150	6.2	63.7	66.1
	300	6.0	62.9	65.4
	450	5.9	62.2	64.7

Note! External restrictions are calculated for values >0 Pa

Optional fan:	650mm	Fan ratio:	1:1.4	Fan type:	Visco
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Cooling air flow and external restriction at different radiator air temperatures based on 107°C TTT and 40% glycol. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	External restriction Pa	Air flow m <sup>3</sup> /s	STANDBY POWER	PRIME POWER
			Air on temp °C	Air on temp °C
1500	0	4.9	57.2	60
	150	4.7	56.1	59
	300	4.6	55.2	58.1
	450	4.5	54.2	57.2
1800	0	5.8	61.8	64.4
	150	5.6	61	63.7
	300	5.5	60.4	63.1
	450	5.4	59.8	62.5

Note! External restrictions are calculated for values >0 Pa

**Engine management system**

Functionality	Alternatives	Default setting
Governor mode	Isochronus / Droop	Isochronus
Governor droop	0-8%	0.0
Governor response	Adjustable PID-constant (VODIA)	Standard
Dual speed	YES	1500 / 1800
Idle speed	600-1200	900,0
Fine speed adjustment	± 90	0
Stop function	Energized to Run / Stop	Energized to Run / Stop
Preheating function	On / Off	On

**Engine protection map**

Parameter	Unit	Warning Level (Yellow)	Engine protection				
			Alarm level (Red)	Default		Optional	
Oil temp	°C	125	130	Shut Down			
Oil pressure	Low idle	kPa	151	101	Shut Down		
	1500 rpm	kPa	233	183	Shut Down		
	1800 rpm	kPa	263	213	Shut Down		
Oil level		N/A	N/A	N/A			
DEF Dosing injector failure		N/A	N/A	N/A			
		N/A	N/A	N/A			
Piston cooling pressure >1000 rpm	kPa	N/A	N/A	N/A			
Coolant temp	°C	105	107.0	Shut Down			
Coolant level		N/A	Low	Shut Down (10 s delay)			
Fuel feed pressure	Low idle	kPa	N/A	N/A	N/A	N/A	
	>1400 rpm		N/A	N/A	N/A	N/A	
Water in fuel		On	N/A	N/A			
Crank case pressure	kPa	N/A	N/A	N/A			
Air filter pressure droop	kPa	5.0	N/A	Warning			
Altitude, above sea	m						
Charge air temp	°C	80	85.0	Shut Down			
Charge air pressure	kPa	95-330	200-435	Shut Down			
Engine speed	rpm						
Exhaust Temperature (Before SCR volume)	°C	N/A	N/A	N/A			
		N/A	N/A	N/A			

**Electrical system**

Voltage and type		24V Dc	
Alternator:	Output	A	110 A
	tacho output	Hz/alt. Rev	
	drive ratio		1:4
Starter motor	type		
	kW		5.6
	Number of teeth on:	flywheel	137
	starter motor		10
Max wiring resistance main circuit		mΩ	5
Cranking current at +20°C		A	507
Crank engine speed at 20°C		rpm	230
Starter motor battery capacity:	min	Ah	100 / 680
	CCA at -18°C	Ah/A	140 / 800
Inlet manifold heater (at 24 V)		kW	
Power relay for the manifold heater		A	200

# VOLVO PENTA

TAD843GE

Document No

**24132160**

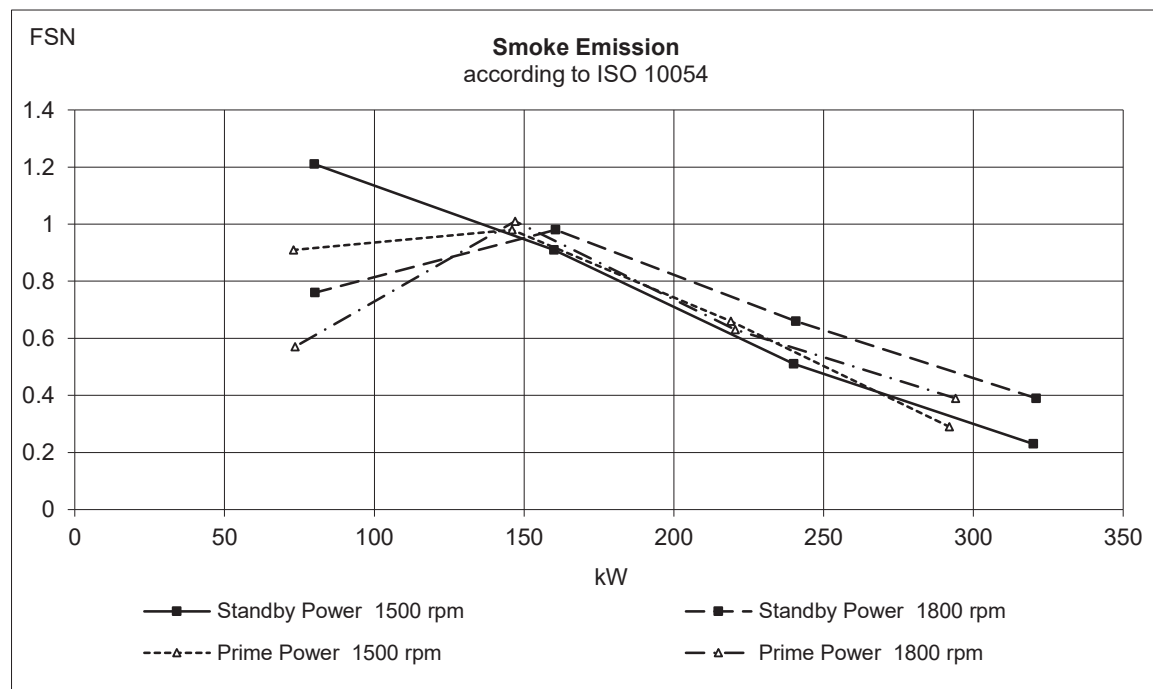
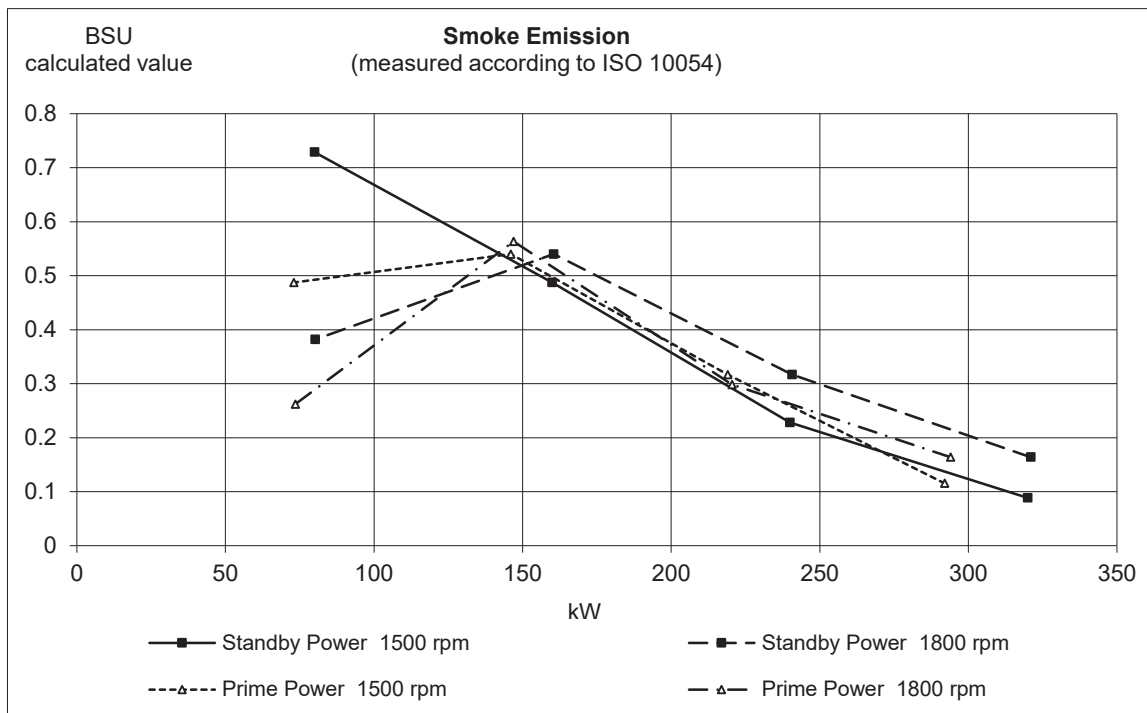
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Performance	Power (kW)	Rpm
Standby Power	320	1500
Standby Power	321	1800
Prime Power	292	1500
Prime Power	294	1800

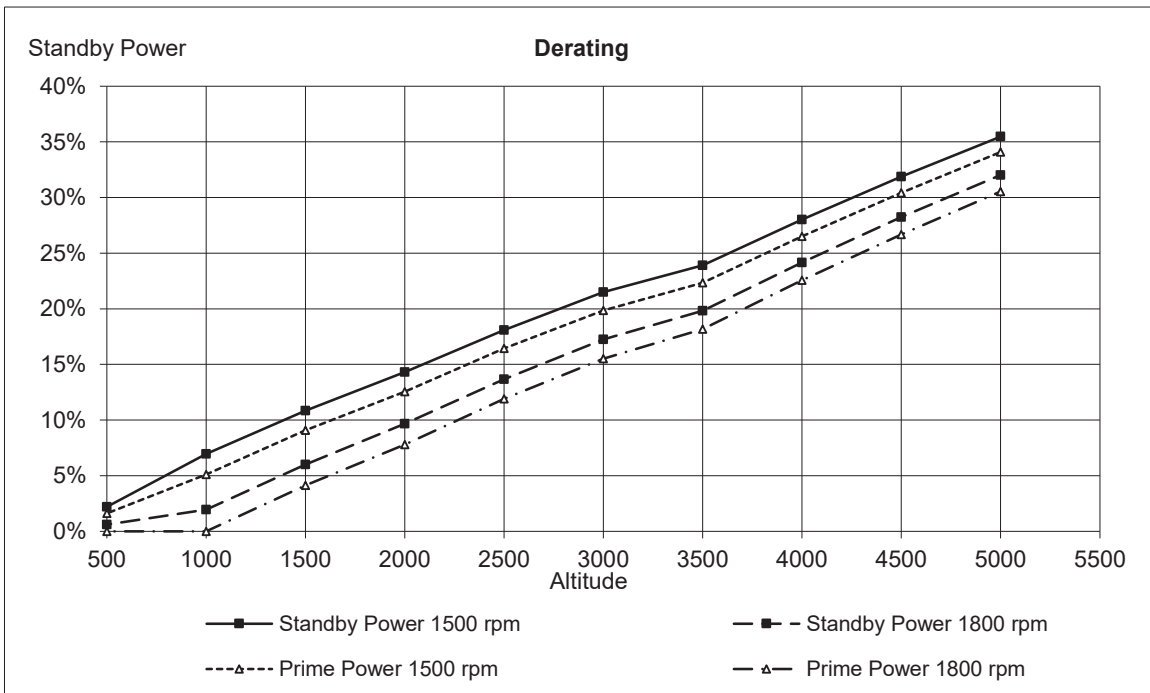
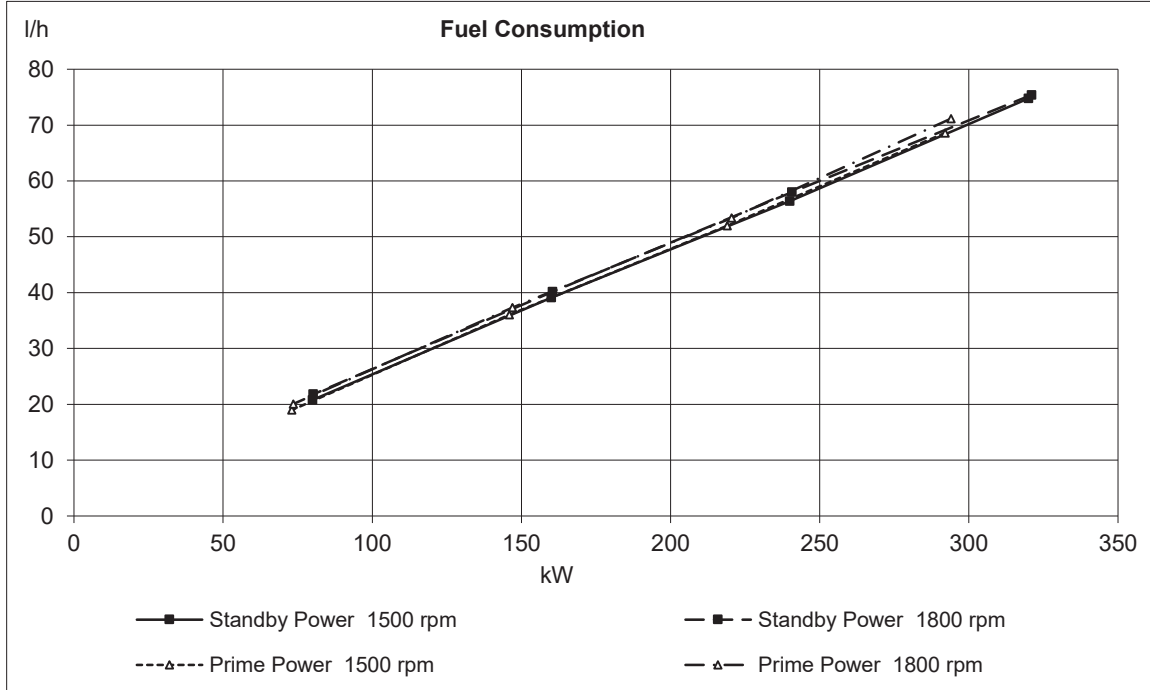
Sensors Alarm	Signal	Range	Alarm switch	Alarm Level	Shut down level	Condition/Delay	Derating
Boost pressure	0.5-4.5 V	50-400 kPa	N/A	320 kPa	330 kPa	N/A	N/A
Boost temperature	50-0 kΩ	-40° - 130°C		80°C	85°C	N/A	N/A
Coolant level switch	Digital	-	Alarm when closed	N/A	Low	10s	N/A
Coolant temperature	45-0 kΩ	-40°-140°C	N/A	105	107	N/A	N/A
Crankcase pressure	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Engine Speed Cam	Frequency	-	N/A	Lost sign	N/A	N/A	N/A
Engine Speed Crank	Frequency	-	N/A	Lost sign	N/A	N/A	N/A
Exhaust gas temp	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil level sensor	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil temperature	45-0 kΩ	-40°- 140°C		125°C			
Piston cooling switch	N/A	N/A		N/A	130°C	N/A	N/A
Water In fuel switch	Digital		Alarm when closed	Water in Fuel	N/A	N/A	N/A

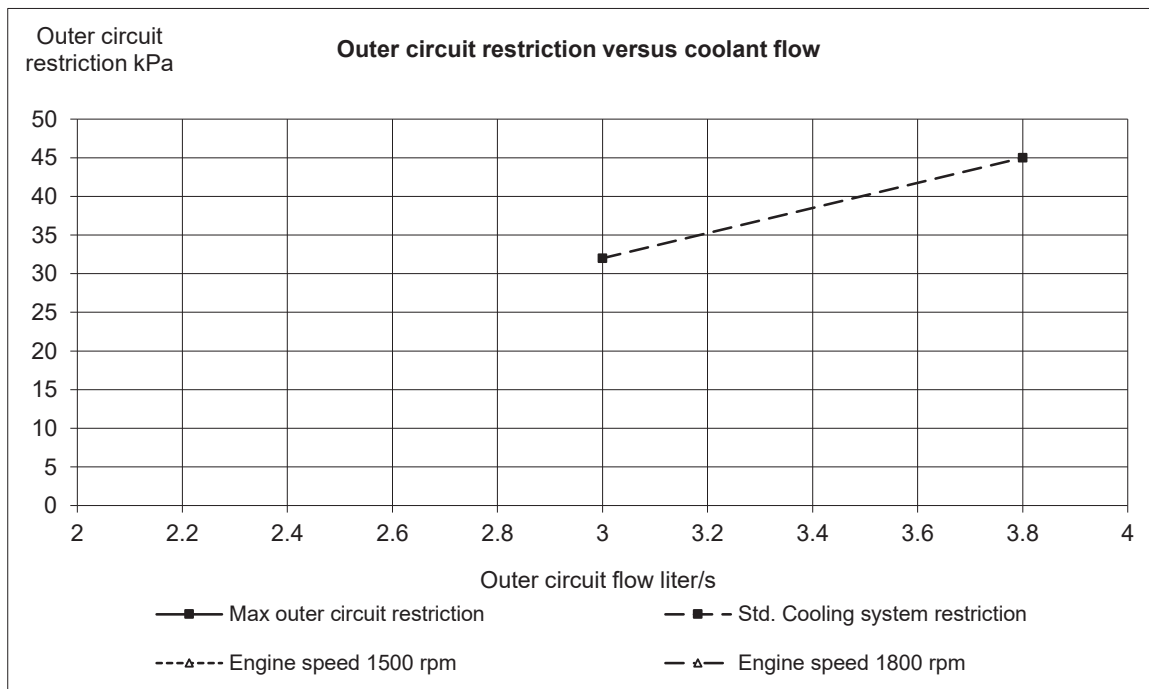
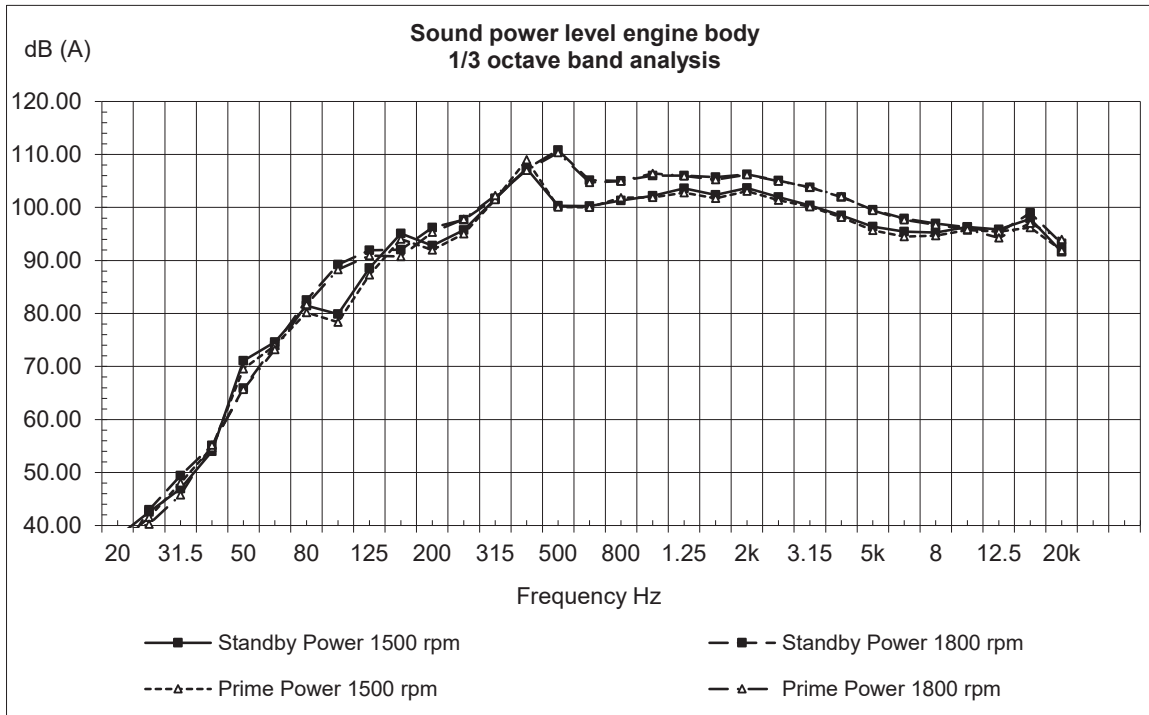
Sensors Alarm	Signal	Range	rpm Map			Condition	Derating
<b>Oil pressure</b>			900	1500	1800		
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Alarm Level			151	233	263		
			101	183	183		

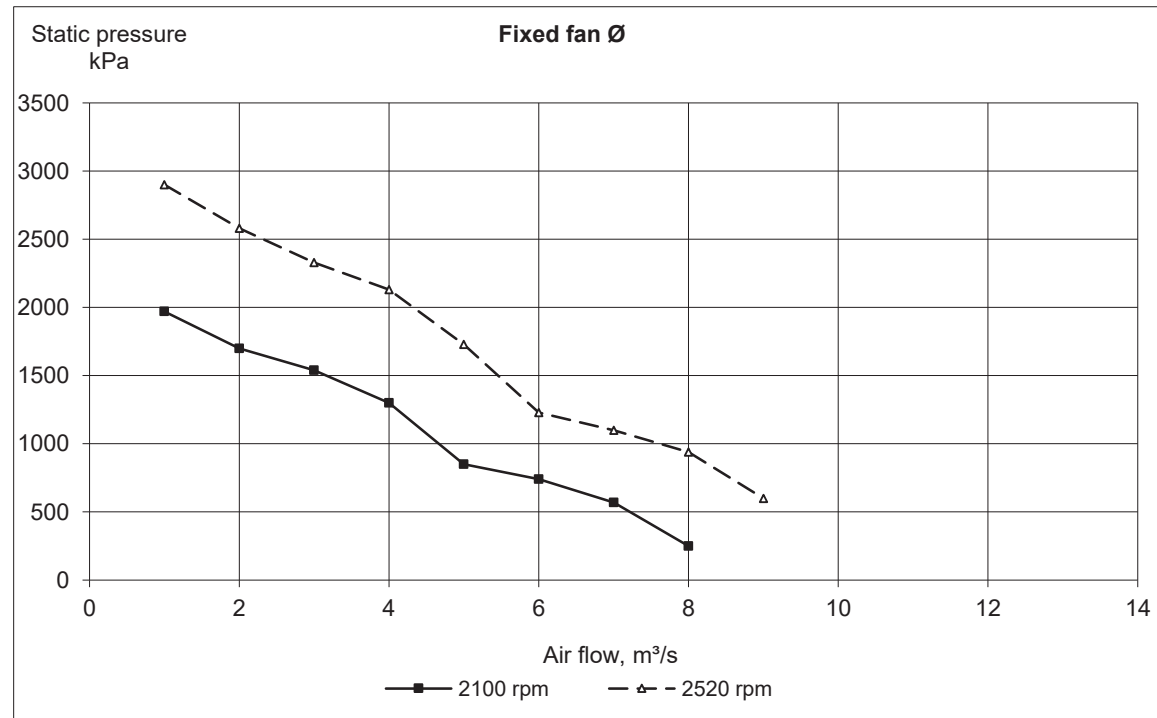
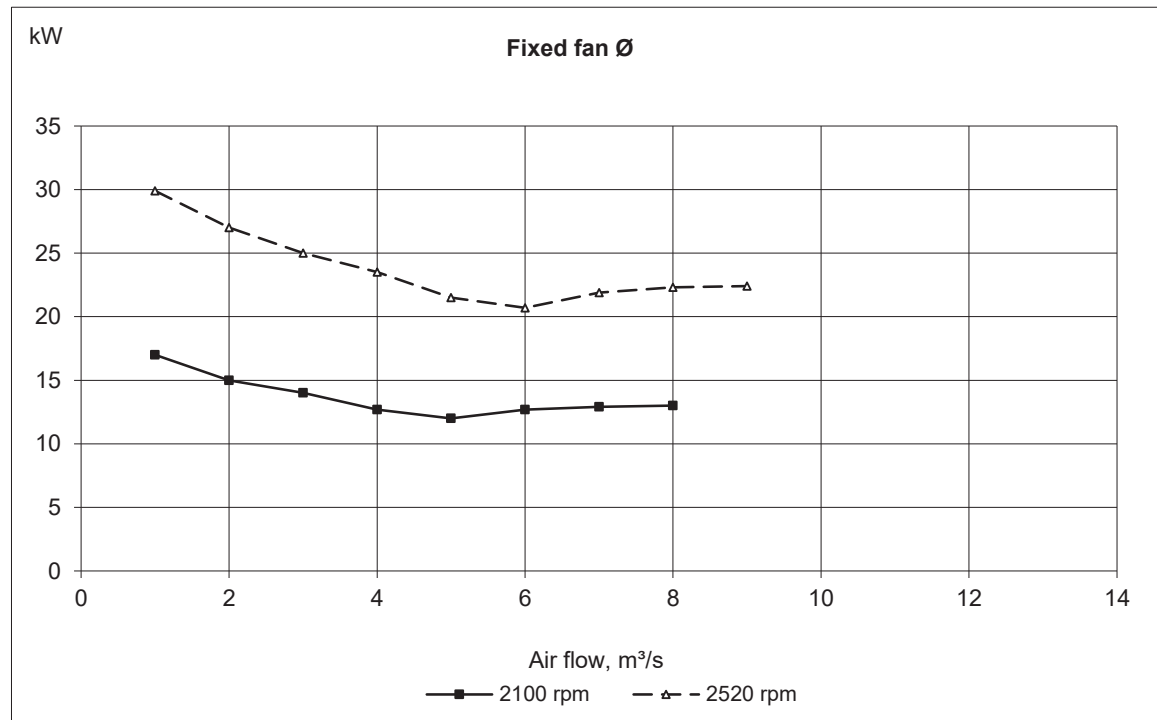


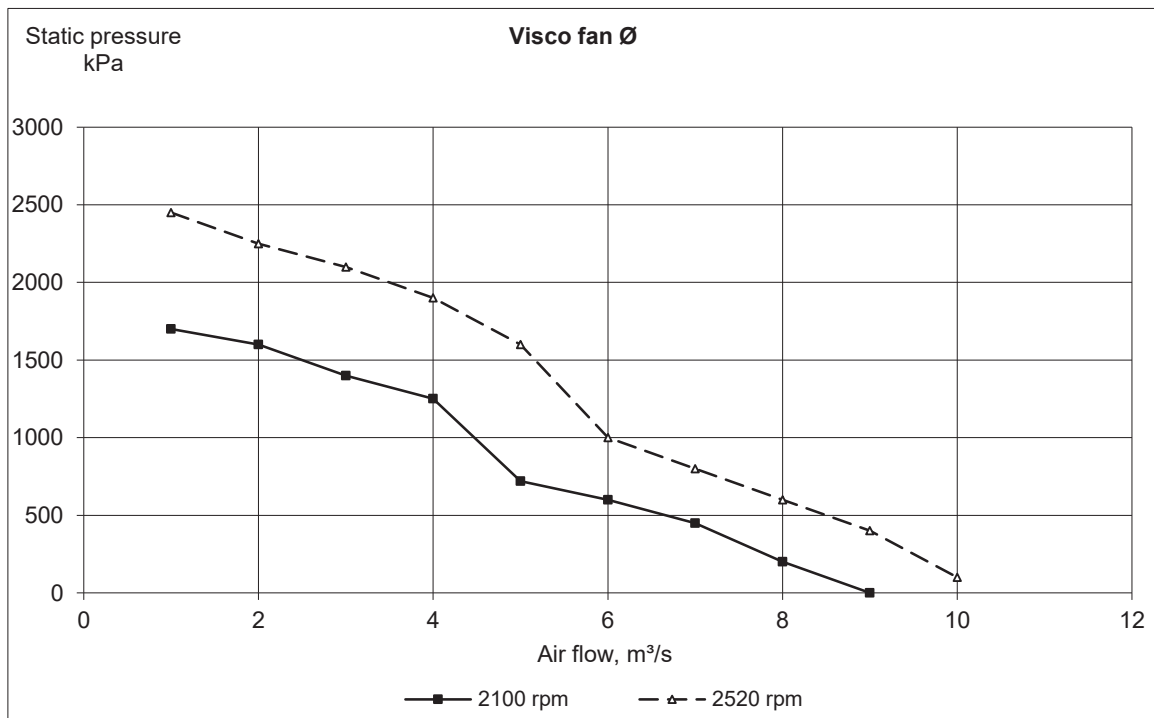
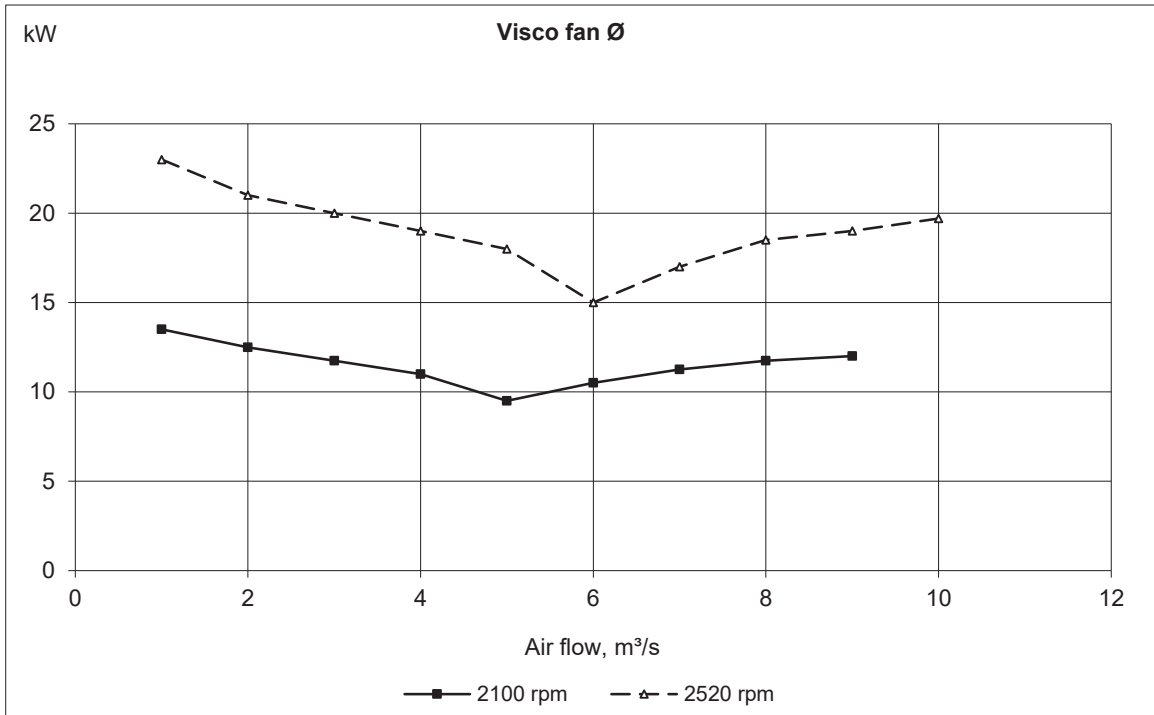
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**Smoke Emission**











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Date	Sign	Information
#####		High Alt derate added
		Sound A-weighted 20220216