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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 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.
Turbocharged

Number of cylinders			6
Displacement, total		litre in^3	16,12 983,9
Firing order			1-5-3-6-2-4
Bore		mm in	144 5,67
Stroke		mm in	165 6,50
Compression ratio			17.0:1
Wet weight (Not including after treatment system)	Engine only	kg lb	1550 3417
	Engine incl. cooling system and air filtration system	kg lb	1750 3858
	Engine incl. cooling system, air filtration system, and frame	kg lb	2020 4453

Performance			**rpm**	**1500**	**1800**
Prime Power		without fan	kW hp	514 699	551 749
		with fan	kW hp	505 687	536 729
Standby Power		without fan	kW hp	565 768	604 821
		with fan	kW hp	556 756	589 801
Torque at:	Prime Power		Nm lbft	3272 2413	2923 2156
	Standby Power		Nm lbft	3597 2653	3204 2363
Power tolerance			%	+4 / -0	
Mean piston speed			m/s ft/sec	8,3 27,1	9,9 32,6
Effective mean pressure at:	Prime Power		MPa psi	2,6 370	2,3 330
Effective mean pressure at:	Standby Power		MPa psi	2,8 407	2,5 362
Max combustion pressure at:	Prime Power		MPa psi	18,8 2727	18,9 2741
Max combustion pressure at:	Standby Power		MPa psi	17,7 2567	18 2611
Total mass moment of inertia, J (mR^2)			kgm^2 $lbft^2$	4,20 99,7	
Friction Power			kW hp	36 48,96	53 72,08
Derating due to altitude - see Technical Diagrams					

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Engine noise emission

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

Tolerance ± 0.75 dB(A)

			rpm	1500	1800
Measured sound power Lw	No load	dB(A)		116,6	118,4
	Prime Power	dB(A)		117,5	119
	Standby Power	dB(A)		118,6	119,1
Calculated sound pressure Lp at 1 m	No load	dB(A)		104,6	106,4
	Prime Power	dB(A)		105,5	107
	Standby Power	dB(A)		106,6	107,1

Test conditions for load acceptance data

Warm engine.	**Generator**		**Model**		**Type of AVR**	
	ABB		AMG 0355CC04 DBPM		Blaster Electric, DECS-150 1NS1V	
AVR Settings	UFRO (Hz):	47/57	DIP (%)*:	0%	DWELL (%)*:	std
	Stability (%)*:	std	Voltage (V):	400	Load factor:	1.0

Applies to Stamford nomenclature,

(%)* : % of max potentiometer setting range

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

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.

Single step load performance at 1500 rpm - PRIME (Resistiv load)

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	2,4	1,3	0,4	0,0	20-100	20,5	3,1	21,7	2,3
0-40	5,2	1,5	0,9	0,0	40-100	10,0	1,8	6,9	1,2
0-50					50-100				
0-60	12,4	2,3	9,6	1,6	60-100	5,6	1,4	2,0	1,0
0-48	7 (G3)	1,4	2,1	0,9	48-100	7,7	1,6	3,7	1,1
0-56	10 (G2)	1,8	6,4	1,4	80-100	2,7	1,2	1,4	0,9
0-80	22,0	3,5	23,4	2,7	80-100	2,7	1,2	1,4	0,9
0-100	30,1	4,7	35,3	3,9					
100-0	7,0	1,3	2,1	1,0					

Single step load performance at 1500 rpm - STAND BY (Resistiv load)

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	2,4	1,4	0,4	0,0	20-100	24,9	7,2	27,9	3,3
0-40	6,2	0,4	1,1	0,6	40-100	11,1	4,2	8,7	1,7
0-50					50-100				
0-60	15,4	2,7	13,8	1,9	60-100	6,5	3,1	2,3	1,5
0-44	7 (G3)	1,4	2,1	0,9	x-100				
0-50	10 (G2)	1,8	6,4	1,4	x-100				
0-80	25,7	4,0	28,6	3,1	80-100	3,0	1,4	1,6	1,1
0-100	33,4	7,8	39,9	5,3					
100-0	6,1	1,3	2,4	1,0					

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Single step load performance at 1800 rpm - PRIME (Resistiv load)

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	1,7	1,0	0,2	0,0	20-100	10,7	2,1	10,8	1,5
0-40	3,9	1,5	1,5	0,3	40-100	6,6	1,5	3,7	1,2
0-50					50-100				
0-60	6,8	1,4	3,4	1,0	60-100	3,9	1,4	1,6	1,0
0-62	7 (G3)	1,4	4,0	1,1	62-92	2,9	1,3	1,3	0,8
0-71	10 (G2)	1,9	8,9	1,3	71-100	2,0	1,0	1,1	0,7
0-80	12,3	2,3	13,3	1,6	80-100				
0-100	1,9	1,0	1,2	0,7					
100-0	4,4	1,2	4,4	1,2					

Single step load performance at 1800 rpm - STAND BY (Resistiv load)

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	2,0	1,2	1,0	0,0	20-100	12,1	3,2	13,2	1,9
0-40	4,1	1,4	1,3	0,3	40-100	7,5	2,2	5,3	1,5
0-50					50-100				
0-60	8,1	1,4	5,8	1,1	60-100	3,9	1,5	1,8	1,2
0-56	7 (G3)	1,4	4,0	1,1	x-100				
0-65	10 (G2)	1,9	9,9	1,3	x-100				
0-80	14,3	2,7	16,6	1,8	80-100	1,8	1,0	1,3	0,9
0-100	19,9	3,6	26,4	2,5					
100-0	4,4	1,2	6,6	1,1					

Cold start performance

				rpm	**1500**	**1800**
Time from start to stay within 0.5% of no load speed at ambient temperature:	℃	20		s	6,5	8,4
		5		s	6,7	8,7
		-15 *		s	7,3	9,8
		-25**		s	11,2	13,2
		Min start temp**		℃	-35,0	

* With manifold heater 4 kW engaged, lubrication oil 10W/30 .

** With manifold heater 4 kW engaged and block heater 2kW, lubrication oil 10W/30.

Ambient temp. ℃	Block heater type and Make	Power kW	Engaged hours	Cooling water temp engine block
-15	GENETECH	2	12	17℃ 63℉

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Lubrication system			**rpm**	**1500**	**1800**
Lubricating oil consumption	Prime Power		litre/h US gal/h	0,10 0,026	0,11 0,029
	Standby Power		litre/h US gal/h	0,11 0,029	0,12 0,032
Oil system capacity including filters			litre US gal	48 12,7	
Oil sump capacity:		max	litre US gal	42 11,1	
		min	litre US gal	32 8,5	
Oil change intervals/specifications:	VDS-3, VDS-4, VDS-4.5*		h	600	
	VDS, ACEA, E3*		h	400	
	ACEA E2, API CD, CF, CF-4, CG-4*		h	200	
Engine angularity limits:		front up	°	30	
		front down	°	30	
		side tilt	°	30	
Oil pressure at rated speed			kPa psi	300 - 650 44 - 94	
Lubrication oil temperature in oil sump:		max	℃ ℉	130 266	
Oil filter			µ	40,000	

* See also general section in the sales guide

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Fuel system		**rpm**	**1500**	**1800**
Prime Power Specific **fuel** consumption at:	25%	g/kWh	219	234
		lb/hph	0,356	0,380
	50%	g/kWh	198	203
		lb/hph	0,321	0,329
	75%	g/kWh	196	202
		lb/hph	0,318	0,327
	100%	g/kWh	193	204
		lb/hph	0,313	0,330

Standby Power Specific **fuel** consumption at:	25%	g/kWh	215	296
		lb/hph	0,348	0,480
	50%	g/kWh	197	202
		lb/hph	0,320	0,327
	75%	g/kWh	198	205
		lb/hph	0,322	0,332
	100%	g/kWh	196	206
		lb/hph	0,317	0,334

Fuel system	**rpm**	**1500**	**1800**
Fuel to conform to	ASTM-D975-No1 and 2D JIS KK 2204, EN 590		
System supply flow at:	litre/h	180,0	200,0
	US gal/h	47,6	52,8
Fuel supply line max restriction (Measured at fuel inlet connection)	kPa	30,0	30,0
	psi	4,4	4,4
Fuel supply line max pressure, engine stopped	kPa	20,0	20,0
	psi	2,9	2,9
Max system return flow	litre/h	60,0	60,0
	US gal/h	15,9	15,9
Fuel return line max restriction (Measured at fuel return connection)	kPa	20,0	20,0
	psi	2,9	2,9
Maximum allowable inlet fuel temp (Measured at fuel inlet connection)	℃	60	60
	℉	140	140
Prefilter / Water separator	µ	10,000	
Fuel filter	µ	5,000	
Governor type/make, standard	Volvo / EMS 2.4		
Injection pump type/make	Delphi E3.18		

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Intake and exhaust system			**rpm**	**1500**	**1800**
Air consumption at: (+25℃ and 100kPa)	Prime Power		m^3/min cfm	41,2 1455	46,6 1646
	Standby Power		m^3/min cfm	39 1377	45,4 1603
⚠ **See front page for important information** Max allowable air intake restriction including piping			kPa psi	5 0,7	5 0,7
Air filter restriction clean Volvo Penta filter			kPa psi	1,5 0,2	2,0 0,3
Heat rejection to exhaust at:		Prime Power	kW BTU/min	427 24283	500 28435
		Standby Power	kW BTU/min	407 23146	439 24965
Exhaust gas temperature after turbine at:		Prime Power	°C °F	456 853	468 874
		Standby Power	°C °F	482 900	512 954
⚠ **See front page for important information** Max allowable back pressure in exhaust line (after turbine) Pipe dimension Ø: 125 mm		Prime Power	kPa psi	8 1,2	8 1,2
		Standby Power	kPa psi	10 1,5	10 1,5
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)		Prime Power	m^3/min cfm	102,5 3620	117,6 4153
		Standby Power	m^3/min cfm	94,4 3334	108,9 3846

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Cooling system			rpm	1500	1800
Heat rejection radiation from engine at:		Prime Power	kW BTU/min	18 1024	20 1137
		Standby Power	kW BTU/min	20 1137	24 1365
Heat rejection to coolant at:		Prime Power	kW BTU/min	187 10635	218 12397
		Standby Power	kW BTU/min	218 12397	248 14104
Radiator cooling system type			Closed circuit		
Standard radiator core area			m² foot²	1,3 13,99	
Fan diameter			mm in	890 35,04	
Fan power consumption			kW hp	9 12	15 20
Fan drive ratio				0,97 : 1	
Coolant capacity,	engine		litre US gal	33 8,72	
	engine with std radiator and hoses		litre US gal	60 15,85	
Coolant pump			drive/ratio	Belt / 1,85:1	
Coolant flow with standard system			l/s US gal/s	6,4 1,69	7,7 2,03
Minimum coolant flow			l/s US gal/s	6,4 1,69	7,7 2,03
Maximum outer circuit restriction, including piping			kPa psi	50 7,3	70 10,2
Thermostat		start to open	℃ ℉	86 187	
		fully open	℃ ℉	96 205	
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	100 14,5	
Maximum top tank temperature			℃ ℉	107 225	
Draw down capacity. The difference between min coolant level in the expansion tank and the lowest level where the engine's coolant system still is functioning			litre US gal	58 15,32	

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Charge air cooler system		**rpm**	**1500**	**1800**
Heat rejection to charge air cooler	Prime Power	kW BTU/min	112 6369	145 8246
	Standby Power	kW BTU/min	131 7450	159 9042
Charge air mass flow	Prime Power	kg/s	0,78	0,9
	Standby Power	kg/s	0,83	0,92
Charge air inlet temp. (Charge air temp after turbo compressor)	Prime Power	℃ ℉	214 417	228 442
	Standby Power	℃ ℉	229 444	243 469
⚠ **See front page for important information**				
Max allowable Charge air outlet temp. (Charge air temp after intercooler)	Prime Power	℃ ℉	43 109	43 109
	Standby Power	℃ ℉	45 113	45 113
⚠ **See front page for important information**				
Maximum pressure drop over charge air cooler incl. piping		kPa psi	12 1,74	17 2,47
Charge air pressure (After charge air cooler)		kPa psi	274 39,70	262 38,03
Standard charge air cooler core area		m² foot²	0,765 8,23	

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Cooling performance

Standard fan: STD cooling Fan ratio: 1 : 1.13 Fan type: FIX

Cooling air flow and external restriction at different radiator air temperatures based on 107℃ TTT and 40% antifreeze. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed	Air on	PRIME POWER		STANDBY POWER	
rpm	temp	Air flow	External restriction	Air flow	External restriction
	℃	m^3/s	Pa	m^3/s	Pa
1500	55			7,6	450,0
	56			8,2	300,0
	58			8,7	150,0
	59			9,1	0,0
	60	7,6	450,0		
	61	8,2	300,0		
	63	8,7	150,0		
	64	9,1	0,0		
1800	56			9,9	450,0
	58			10,0	300,0
	59			10,5	150,0
	60	9,9	450,0	10,9	0,0
	62	10,0	300,0		
	63	10,5	150,0		
	64	10,9	0,0		

Note! External restrictions are calculated for values >0 Pa

Optonal fan: STD cooling Fan ratio: 1 : 1.04 Fan type: FIX

Cooling air flow and external restriction at different radiator air temperatures based on 107℃ TTT and 40% antifreeze. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed	Air on	PRIME POWER		STANDBY POWER	
rpm	temp	Air flow	External restriction	Air flow	External restriction
	℃	m^3/s	Pa	m^3/s	Pa
1500	52			6,8	450,0
	53			7,4	300,0
	55			7,9	150,0
	56			8,6	0,0
	58	6,8	450,0		
	59	7,4	300,0		
	60	7,9	150,0		
	61	8,6	0,0		
1800	53			9,0	450,0
	55			9,3	300,0
	56			9,9	150,0
	57			10,3	0,0
	58	9,0	450,0		
	59	9,3	300,0		
	60	9,9	150,0		
	61	10,3	0,0		

Note! External restrictions are calculated for values >0 Pa

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Optonal fan: STD cooling Fan ratio: 1 : 0.97 Fan type: FIX

Cooling air flow and external restriction at different radiator air temperatures based on 107℃ TTT and 40% antifreeze. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp ℃	PRIME POWER		STANDBY POWER	
		Air flow m^3/s	External restriction Pa	Air flow m^3/s	External restriction Pa
1500	49			6,4	450,0
	50			6,8	300,0
	52			7,3	150,0
	53			7,5	0,0
	55	6,4	450,0		
	56	6,8	300,0		
	58	7,3	150,0		
	58	7,5	0,0		
1800	51			8,0	450,0
	52			8,4	300,0
	54			8,9	150,0
	55	8,0	450,0	9,3	0,0
	56	8,4	300,0		
	58	8,9	150,0		
	59	9,3	0,0		

Note! External restrictions are calculated for values >0 Pa

Optonal fan: VISCO Fan ratio: 1 : 1.04 Fan type: VISCO

Cooling air flow and external restriction at different radiator air temperatures based on 107℃ TTT and 40% antifreeze. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp ℃	PRIME POWER		STANDBY POWER	
		Air flow m^3/s	External restriction Pa	Air flow m^3/s	External restriction Pa
1500	51			6,8	450
	52			7,4	300
	54			7,9	150
	55			8,6	0
	57	6,8	450		
	58	7,4	300		
	60	7,9	150		
	60	8,6	0		
1800	52			8,7	450
	53			9,1	300
	55			9,5	150
	56			10,1	0
	57	8,7	450		
	58	9,1	300		
	59	9,5	150		
	60	10,1	0		

Note! External restrictions are calculated for values >0 Pa

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Optonal fan: Heavy Dust Fan ratio: 1 : 0.97 Fan type: FIX

Cooling air flow and external restriction at different radiator air temperatures based on 107℃ TTT and 40% antifreeze. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp ℃	PRIME POWER		STANDBY POWER	
		Air flow m^3/s	External restriction Pa	Air flow m^3/s	External restriction Pa
1500	51				400
	55				300
	58				200
	60		400		
	61				100
	62		300		
	64				0
	66		200		
	68		100		
	71		0		
1800	58				400
	60				300
	61				200
	63				100
	65		400		0
	67		300		
	68		200		
	69		100		
	71		0		

Note! External restrictions are calculated for values >0 Pa

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Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronus / Droop	Isochronus
Governor droop	0-8 %	4,0
Governor response	Adjustable PID-constants (VODIA)	Standard
Dual speed	1500 / 1800 RPM	According to customer
Idle speed	600-1200 rpm	900rpm
Fine speed adjustment	± 90 rpm	0,0
Stop function	Energized to Run / Stop	Energized to Stop
Preheating function	On / Off	Off
Lamp test	On / Off	On

Engine sensor and switch settings

			Alarm level		Engine protection	
Parameter		**Unit**	**Setting range**	**Default setting**	**Level**	**Action. Default/Alternative**
Oil temp		℃	120 - 130	125	Setting +5	Shut down
Oil pressure	Low idle	kPa	-	190,0	160,0	Shut down
	1500 rpm	kPa	-	250,0	220,0	Shut down
	1800 rpm	kPa	-	300,0	270,0	Shut down
Oil level			-	Min Level	-	-
Piston cooling pressure >1000 rpm		kPa	-	150	150,0	Shut down
Coolant temp		℃	95 - 103	102	Setting +5	Shut down
Coolant level			-	On	Low level	Shut down
Fuel feed pressure	Low idle	kPa	-	150	-	-
	>1400 rpm		-	300	-	-
Water in fuel			-	High level	-	-
Crank case pressure		kPa	-	-	-	Shut down
Air filter pressure droop		kPa	-	5	-	-
		0,0	Alarm level		Engine protection	
Altitude, above sea		m	-	-	>1500	Automatic derating, see section derating
Charge air temp		℃	-	80	85,0	-
Charge air pressure		kPa	-	290	300,0	-
Engine speed		rpm	100 - 120% of rated speed	120% of rated speed	Alarm level	Shut down.
Low voltage		V	-	25,5	-	-

Engine protection can be disabled. For consequences please see VP International Limited Warranty Policy

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Electrical system

Voltage and type		24 V / insulated from earth	
Alternator:	make/output	A	Bosch / 80
	tacho output	Hz/alt. Rev	6
	drive ratio		3.9:1
Starter motor		make	Melco
		type	105 P70
		kW	7,0
Number of teeth on:	flywheel		153
	starter motor		12
Max wiring resistance main circuit		mΩ	2
Cranking current at +20℃		A	280
Crank engine speed at 20℃		rpm	150
Starter motor battery capacity:	max	Ah/A	2x225
	min at +5℃	Ah/A	-
Inlet manifold heater (at 20 V)		kW	4,0
Power relay for the manifold heater		A	1

Power take off	**rpm**	**1500**	**1800**
Max allowed bending moment in flywheel housing	Nm lbft	15000 11063	
Max. rear main bearing load	N lbf	5000 1124,0	

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Performance	Power (kW)	Rpm
Prime Power	514	1500
Prime Power	551	1800
Standby Power	565	1500
Standby Power	604	1800

Sensors Alarm	Signal	Range	Alarm switch	Alarm Level	Derating level	Condition/Delay	Derating
Boost pressure	0,5-4,5 V	50-500 kPa	N/A	415 kPa	425 kPa		Force Shutdown
Boost temperaure	50-0 kΩ	-40° - 130 ℃	N/A	80℃	85℃		Force Shutdown
Coolant level switch	Digital		Alarm when closed	Low			Force Shutdown
Coolant temperature	50-0 kΩ	-40° - 140 ℃	N/A	102℃	107℃		Force Shutdown
Crankcase pressure	0,5-4,5 V	0-15 kPa	N/A	Rapid pres inc	5 kPa		Force Shutdown
Engine Speed Cam	Frequency		N/A	Lost sign			
Engine Speed Crank	Frequency		N/A	Lost sign			
Exhaust gas temp			N/A	N/A	N/A		N/A
Oil level sensor			N/A	Min level	N/A		
Oil temperature	50-0 kΩ	-40° - 140 ℃	N/A	125℃	130℃		Force Shutdown
Piston cooling switch	Digital		Alarm when closed	150kPa±19	150kPa±19	Above 1000 rpm instant	Force Shutdown
Water In fuel switch	Digital		Alarm when closed	Water in Fuel			

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Sensors Alarm	Signal	Range	rpm Map					Condition	Derating
Coolant pressure	0,5-4,5 V	0-300 kPa	**0 rpm**	**600 rpm**	**1000 rpm**	**1500 rpm**	**1900 rpm**		
Warning Level			0	5	55	100	130		
Alarm Level			-50	-45	5	50	80		Force Shutdown
Fuel pressure	0,5-4,5 V	0-700 kPa	**0 rpm**	**600 rpm**	**1000 rpm**	**1800 rpm**	**1900 rpm**		
Warning Level			-50	50	75	200	200		
Alarm Level			N/A	N/A	N/A	N/A	N/A		
Differential oil pressure	0,5-4,5 V	0-700 kPa	**0 rpm**	**500 rpm**	**1000 rpm**	**1500 rpm**	**1800 rpm**		
Alarm Level			N/A	N/A	N/A	N/A	N/A	N/A	
Derating Limit			N/A	N/A	N/A	N/A	N/A		
Oil pressure	0,5-4,5 V	0-700 kPa	**450 rpm**	**500 rpm**	**1000 rpm**	**1450 rpm**	**2000 rpm**		
Warning Level			-50	60	210	310	310		
Alarm Level			-85	25	175	275	275		Force Shutdown

Remarks

Max Torque High Map R2	600	800	900	1100	1200	1300	1390	1400	1410	1500	1590	1600
	1421	1540	1920	2950	4170	4300	4200	3980	3901	3667	3459	3460

Max Torque Engine	600	700	800	900	1000	1200	1300	1350	1400	1410	1500
Protection Map R2	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500

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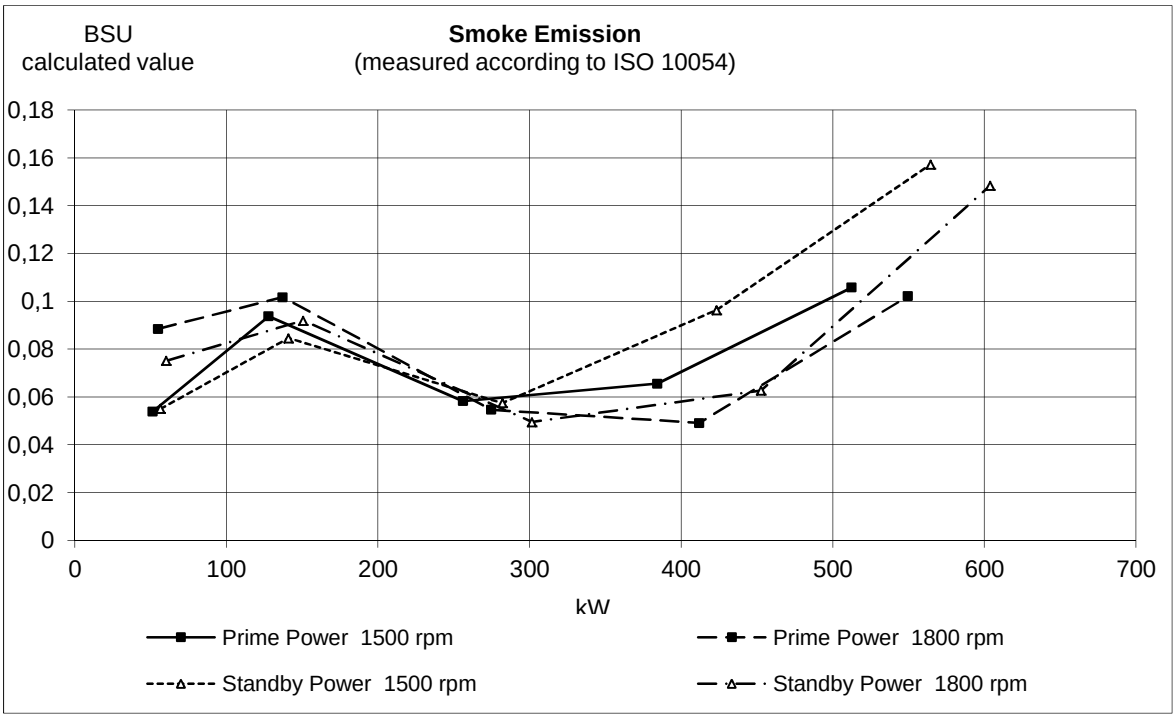

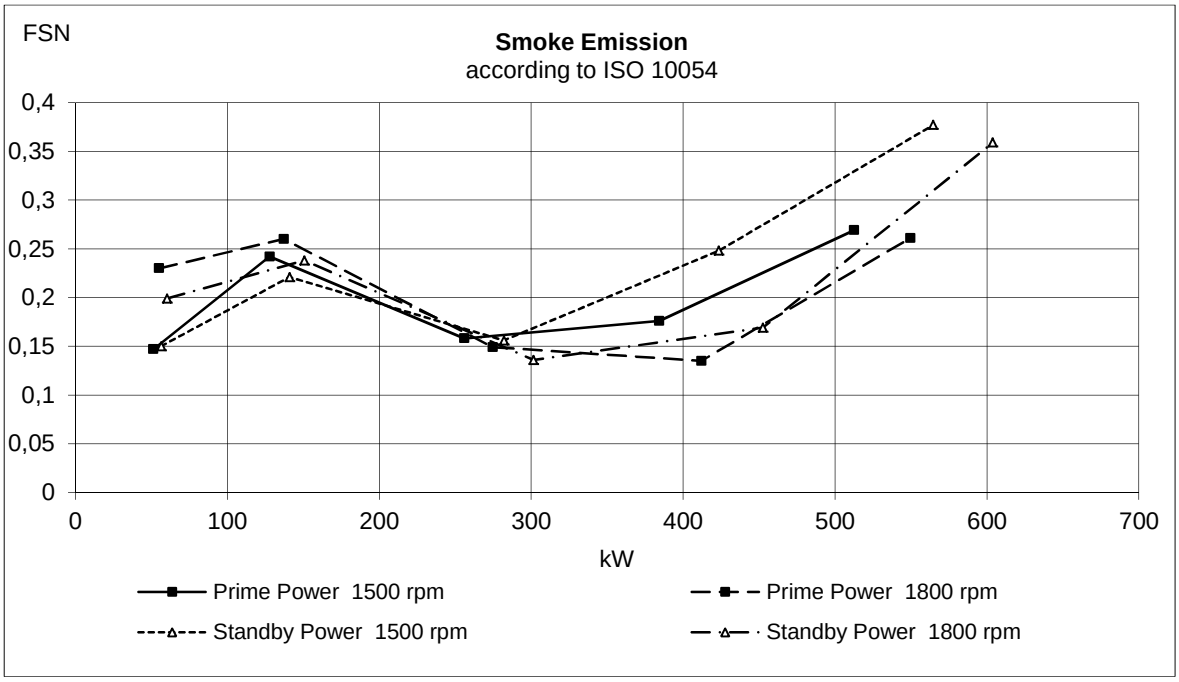

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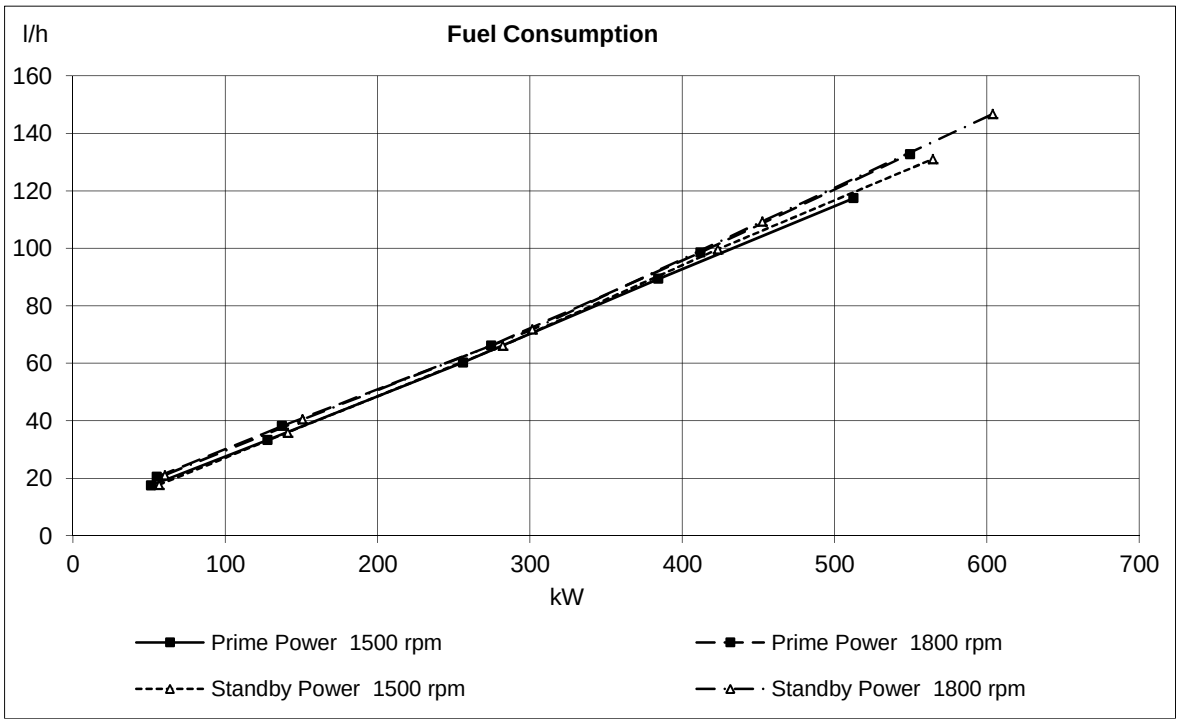

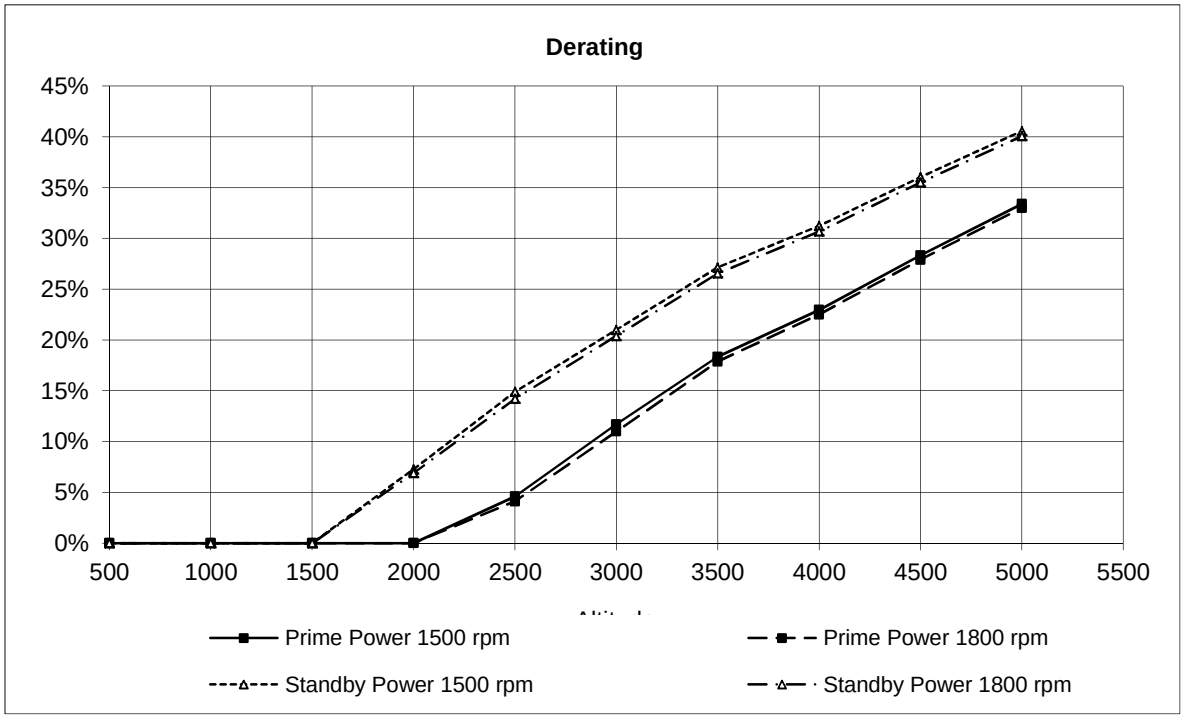

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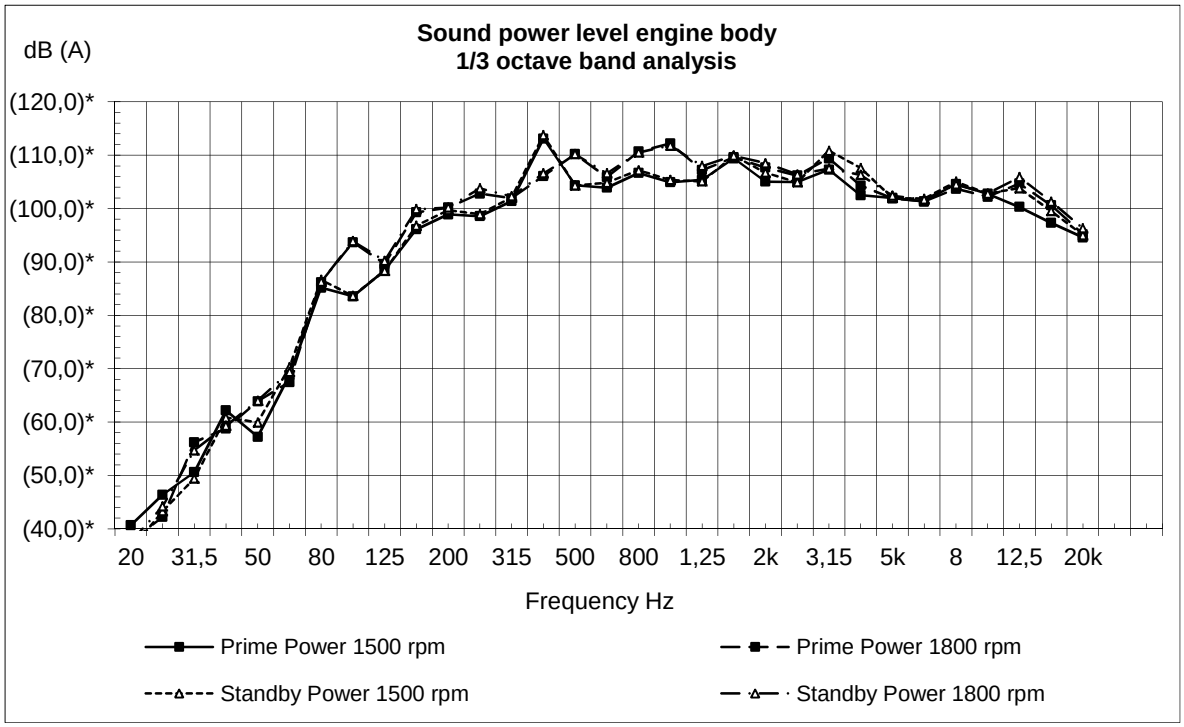

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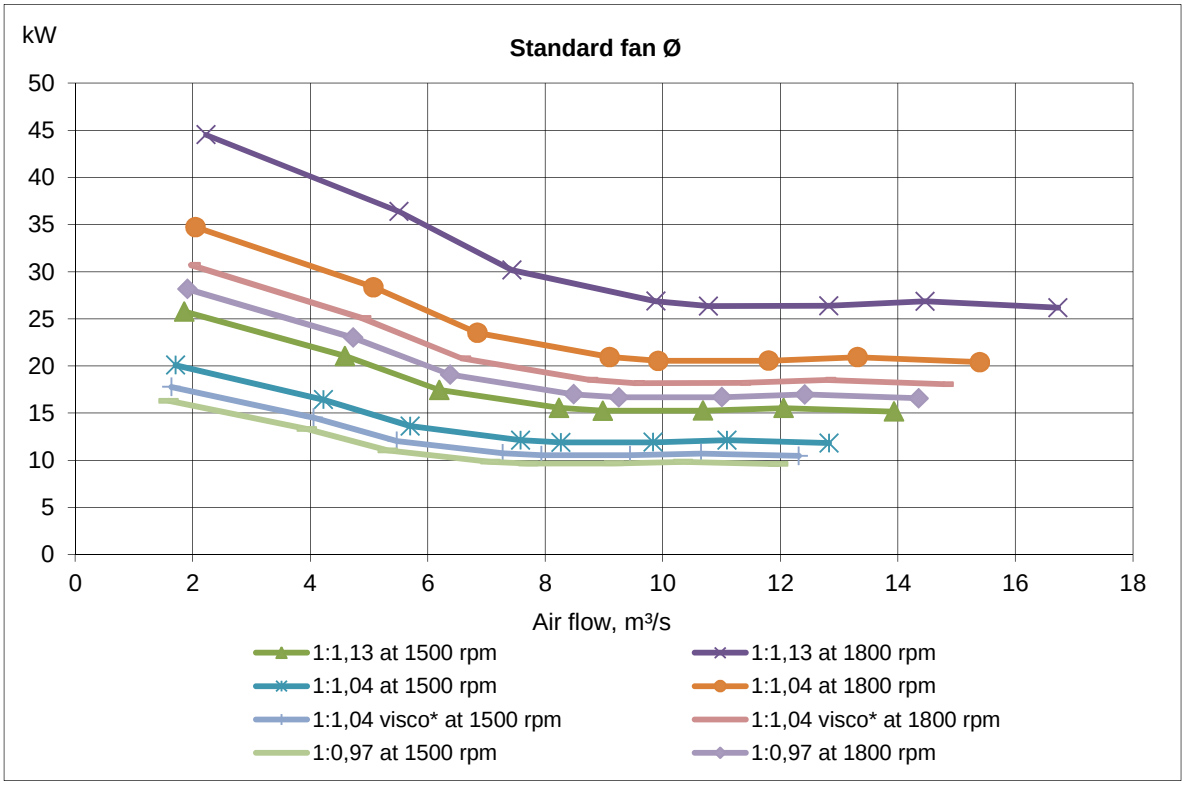

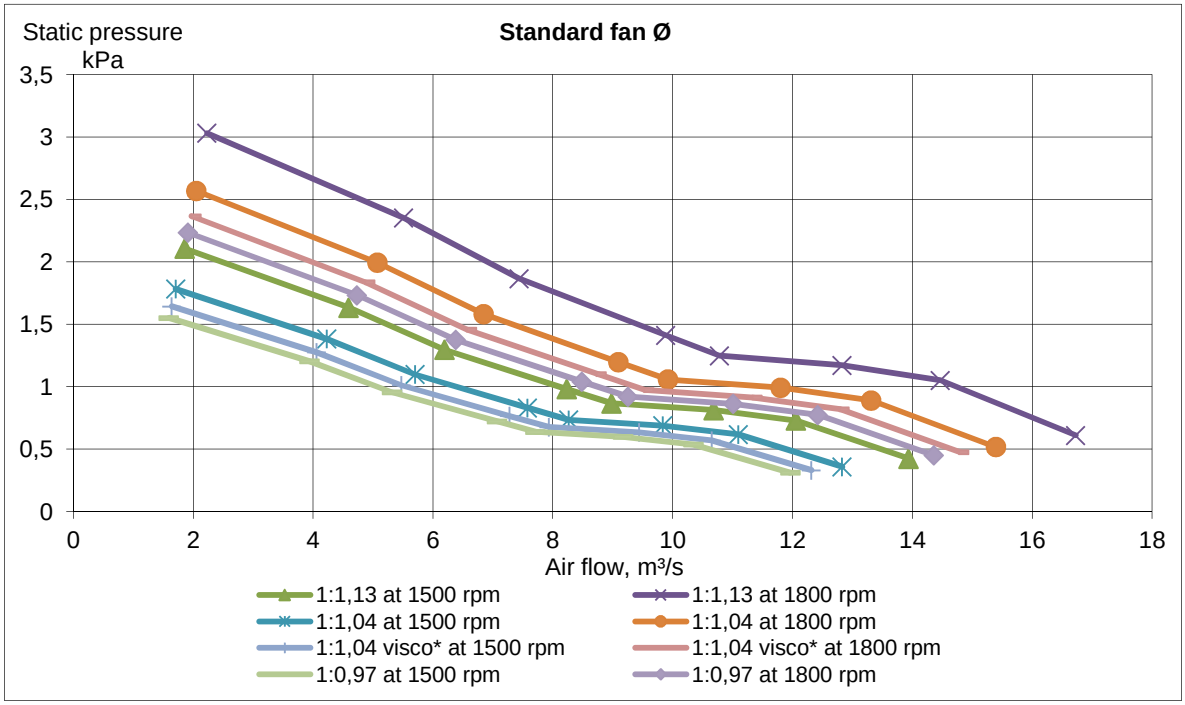

Note:
*when fully engaged.