VOLVO PENTA **TAD550GE**	Document No **21813912**	Issue Index **05**

General

In-line four stroke diesel engine with direct injection. Rotation direction, anti-clockwise viewed towards flywheel.
Turbocharged

Number of cylinders			4
Displacement, total		litre in^3	4,76 290,7
Firing order			1342
Bore		mm in	108 4,25
Stroke		mm in	130 5,12
Compression ratio			18
Wet weight	Engine only	kg lb	560 1235
	Engine incl. cooling system and air filtration system	kg lb	660 1455
	Engine incl. cooling system, air filtration system, and frame	kg lb	

Performance			**rpm**	**1500**	**1800**
Prime Power		without fan	kW hp	79 108	89 121
		with fan	kW hp	76 104	85 115
Standby Power		without fan	kW hp	87 118	98 133
		with fan	kW hp	84 115	94 127
Torque at:	Prime Power		Nm lbft	504 371	473 349
	Standby Power		Nm lbft	554 408	520 383
Mean piston speed			m/s ft/sec	6,5 21,4	7,8 25,7
Effective mean pressure at:	Prime Power		MPa psi	1,3 193	1,2 181
Effective mean pressure at:	Standby Power		MPa psi	1,5 212	1,4 199
Max combustion pressure at:	Prime Power		MPa psi	12,7 1842	12,5 1813
Max combustion pressure at:	Standby Power		MPa psi	18,5 2683	21 3046
Total mass moment of inertia, J (mR^2)			kgm^2 $lbft^2$	1,43 33,9	
Friction Power			kW hp	13 17,68	17 23,664
Derating see Technical Diagrams					

Engine noise emission

Test Standards: ISO 3744-1981 (E) sound power (without fan, cooler, intake and exhaust noise)

Tolerance ± 0.75 dB(A)		**rpm**	**1500**	**1800**
Measured sound power Lw	No load	dB(A)	97,8	100
	Prime Power	dB(A)	99,8	101,8
	Standby Power	dB(A)		
Calculated sound pressure Lp at 1 m	No load	dB(A)	84,3	86,5
	Prime Power	dB(A)	86,3	88,3
	Standby Power	dB(A)		

Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m	**rpm**	**1500**	**1800**
Prime Power	dB(A)		
Standby Power	dB(A)		

Test conditions for load acceptance data

Warm engine.	**Generator**	**Model**	**Type of AVR**
	mecc alte	ECP 34-1S/4	

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

Single step load performance at 1500 rpm

Load (%)	Speed diff (%)		Recovery time (s)		Remaining load	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby	(%)	Prime	Standby	Prime	Standby
0-20	1,7	1,7	1,2	1,4	20-100	12,1	14,3	4,4	5,7
0-40	3,2	3,9	2,3	2,5	40-100	6,2	6,0	3,5	4,4
0-60	5,1	5,6	3,2	3,7	60-100	4,2	4,2	2,5	1,7
0-80	11,6	14,0	3,5	4,1	80-100	2,1	2,1	1,2	1,2
0-100	18,1	22,2	4,6	5,4					
100-0	7,7	8,7	2,3	2,5					

Single step load performance at 1800 rpm

Load (%)	Speed diff %		Recovery time (s)		Remaining load	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby	(%)	Prime	Standby	Prime	Standby
0-20	1,1	1,6	0,9	0,9	20-100	10,2	9,7	3,4	4,5
0-40	2,7	3,1	2,0	2,4	40-100	4,9	4,1	2,7	3,2
0-60	6,4	5,3	2,4	2,8	60-100	2,2	2,1	1,2	2,7
0-80	9,7	10,3	2,7	2,8	80-100	1,3	1,4	1,0	1,4
0-100	13,8	15,0	3,7	3,6					
100-0	6,1	6,6	2,5	2,6					

Cold start performance			rpm	1500	1800
Time from start to no load speed at ambient temperature:	°C	20	s		
		5	s		
		-15*	s		
		Min start temp*	s	-30,0	-30,0
Time from start to stay within 0.5% of no load speed at ambient temperature:	°C	20	s		
		5	s		
		-15*	s		

* With manifold heater kW engaged, lubrication oil 15W/40 and block heater.

Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block

Lubrication system			rpm	1500	1800
Lubricating oil consumption	Prime Power		litre/h	0,03	0,03
			US gal/h	0,008	0,008
	Standby Power		litre/h	0,03	0,03
			US gal/h	0,008	0,008
Oil system capacity including filters			litre	13	
			US gal	3,4	
Oil sump capacity:		max	litre	11	
			US gal	2,9	
		min	litre	7	
			US gal	1,8	
Oil change intervals/specifications:			h	250	
			h		
			h		
Engine angularity limits:		front up	°	30	
		front down	°	30	
		side tilt	°	30	
Oil pressure at rated speed			kPa	300 - 500	
			psi	44 - 73	
Lubrication oil temperature in oil sump:		max	°C	125	
			°F	257	
Oil filter micron size			µ	17	

* See also general section in the sales guide

Fuel system		rpm	1500	1800
Prime Power	25%	g/kWh	340	340
Specific fuel consumption at:		lb/hph	0,551	0,551
	50%	g/kWh	275	291
		lb/hph	0,446	0,472
	75%	g/kWh	253	260
		lb/hph	0,410	0,421
	100%	g/kWh	231	230
		lb/hph	0,374	0,373
Standby Power	25%	g/kWh	276	302
Specific fuel consumption at:		lb/hph	0,447	0,490
	50%	g/kWh	251	259
		lb/hph	0,407	0,420
	75%	g/kWh	234	230
		lb/hph	0,379	0,373
	100%	g/kWh	212	213
		lb/hph	0,344	0,345

Fuel system	rpm	1500	1800
Fuel to conform to		DIN EN590	
System supply flow at:	litre/h	240	240
	US gal/h	63,4	63,4
Fuel supply line max restriction (Measured at fuel inlet connection)	kPa	35	35
	psi	5,1	5,1
Fuel supply line max pressure, engine stopped	kPa	10	10
	psi	1,5	1,5
System return flow	litre/h	240	240
	US gal/h	63,4	63,4
Fuel return line max restriction (Measured at fuel return connection)	kPa	50	50
	psi	7,3	7,3
Maximum allowable inlet fuel temp (Measured at fuel inlet connection)	°C	70	70
	°F	158	158
Prefilter / Water separator micron size	µ	10	
Fuel filter micron size	µ	5	
Governor type/make, standard	EMS 2.2		
Injection pump type/make	Bosch PF45		

Intake and exhaust system			rpm	1500	1800
Air consumption at: (+25°C and 100kPa)	Prime Power		m^3/min	6,7	7,6
			cfm	237	268
	Standby Power		m^3/min	7	7,9
			cfm	247	279
Max allowable air intake restriction including piping			kPa	5	5
			psi	0,7	0,7
Air filter restriction clean Volvo Penta filter			kPa	3	3
			psi	0,4	0,4
Heat rejection to exhaust at:		Prime Power	kW	72	85
			BTU/min	4095	4834
		Standby Power	kW	80	93
			BTU/min	4550	5289
Exhaust gas temperature after turbine at:		Prime Power	°C	458	442
			°F	856	828
		Standby Power	°C	565	569
			°F	1049	1056
Max allowable back pressure in exhaust line		Prime Power	kPa	7	7
			psi	1,0	1,0
		Standby Power	kPa	7	7
			psi	1,0	1,0
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)		Prime Power	m^3/min	17,8	20,6
			cfm	629	727
		Standby Power	m^3/min	18,8	21,8
			cfm	664	770

Cooling system			rpm	1500	1800
Heat rejection radiation from engine at:		Prime Power	kW BTU/min	8 455	9 512
		Standby Power	kW BTU/min	10 569	11 626
Heat rejection to coolant at:		Prime Power	kW BTU/min	44 2479	51 2900
		Standby Power	kW BTU/min	47 2673	54 3071
Coolant		Volvo Penta coolant "ready mix" or Volvo Penta coolant mixed with clean fresh water 40 / 60			
Radiator cooling system type			Closed circuit		
Standard radiator core area			m² foot²	0,45 4,84	
Fan diameter			mm in	596 23,46	
Fan power consumption			kW hp	2,6 4	4,4 6
Fan drive ratio				1,4:1	
Coolant capacity,	engine		litre US gal	7,5 1,98	
	engine with std radiator and hoses		litre US gal	22 5,81	
Coolant pump			drive/ratio	1,4:1	
Coolant flow with standard system			l/s US gal/s	2,07 0,55	2,48 0,66
Minimum coolant flow			l/s US gal/s	1,7 0,44	2,0 0,52
Maximum outer circuit restriction, including piping			kPa psi	25 3,6	35 5,1
Thermostat		start to open	°C °F	86 187	
		fully open	°C °F	98 208	
Maximum static pressure head (expansion tank height + pressure cap setting)			kPa psi	70 10,2	
Minimum static pressure head (expansion tank height + pressure cap setting)			kPa psi	50 7,3	
Standard pressure cap setting			kPa psi	60 8,7	
Maximum top tank temperature			°C °F	105 221	
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			litre US gal		

Charge air cooler system		rpm	1500	1800
Heat rejection to charge air cooler	Prime Power	kW	15	19
		BTU/min	876	1086
	Standby Power	kW	19	24
		BTU/min	1086	1359
Charge air mass flow	Prime Power	kg/s	0,13	0,15
	Standby Power	kg/s	0,15	0,17
Charge air inlet temp. (Charge air temp after turbo compressor)	Prime Power	°C	156	165
		°F	313	329
	Standby Power	°C	157	167
		°F	315	333
Charge air outlet temp. (Charge air temp after intercooler)	Prime Power	°C	40	40
		°F	104	104
	Standby Power	°C	40	40
		°F	104	104
Maximum pressure drop over charge air cooler incl. piping		kPa	15	
		psi	2,18	
Charge air pressure (After charge air cooler)		kPa	159	
		psi	23,06	
Standard charge air cooler core area		m²	0,38	
		foot²	4,09	

Cooling performance

Cooling air flow and external restriction at different radiator air temperatures based on 105°C TTT and 40% coolant. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp °C	PRIME POWER		STANDBY POWER	
		Air flow m^3/s	External restriction Pa	Air flow m^3/s	External restriction Pa
1500	40	1,1	350	1,3	310
	50	1,4	280	1,5	240
	55	1,5	230	1,7	180
	60	1,8	170	2,0	100
	64			2,3	0
	67	2,3	0		
1800	40	1,4	480	1,5	460
	50	1,8	360	1,9	350
	55	2,1	270	2,1	260
	60	2,4	180	2,5	150
	66			2,8	0
	67	2,8	0		

Note! External restrictions are calculated for values >0 Pa

Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronous/droop switchable	Isochronous
Governor droop	1rpm/10Nm - 1rpm/127Nm	1rpm/25Nm
Governor response	N/A	N/A
Dual speed		
Idle speed	550-800 rpm	600 rpm
Fine speed adjustment		
Stop function	Energized to run / stop	Energized to stop
Preheating function	ON/OFF	Option
Lamp test	ON/OFF	ON

Engine sensor and switch settings

			Warning level	Alarm level	Engine protection	
			Default setting			Action.
Parameter		Unit	Yellow lamp	Red lamp	Level	Default/Alternative
Oil temp		°C	125	130	130	Shut down.
Oil pressure	Low idle	kPa	120	100	100	Shut down
	1500 rpm	kPa	200	170	170	Shut down
	1800 rpm	kPa	230	200	200	Shut down
Oil level						
Piston cooling pressure >1000 rpm		kPa				
Coolant temp		°C	105	110	110	Shut down.
Coolant level			On		Low level	Shut down.
Fuel feed pressure	Low idle	kPa				
	>1400 rpm					
Water in fuel						
Crank case pressure		kPa				
Air filter pressure droop		kPa				
Altitude, above sea		m	Automatic derating, see section derating			
Charge air temp		°C	75	80	80	shut down
Charge air pressure		kPa	295	305	305	shut down
Engine speed		rpm	115% of rated speed			

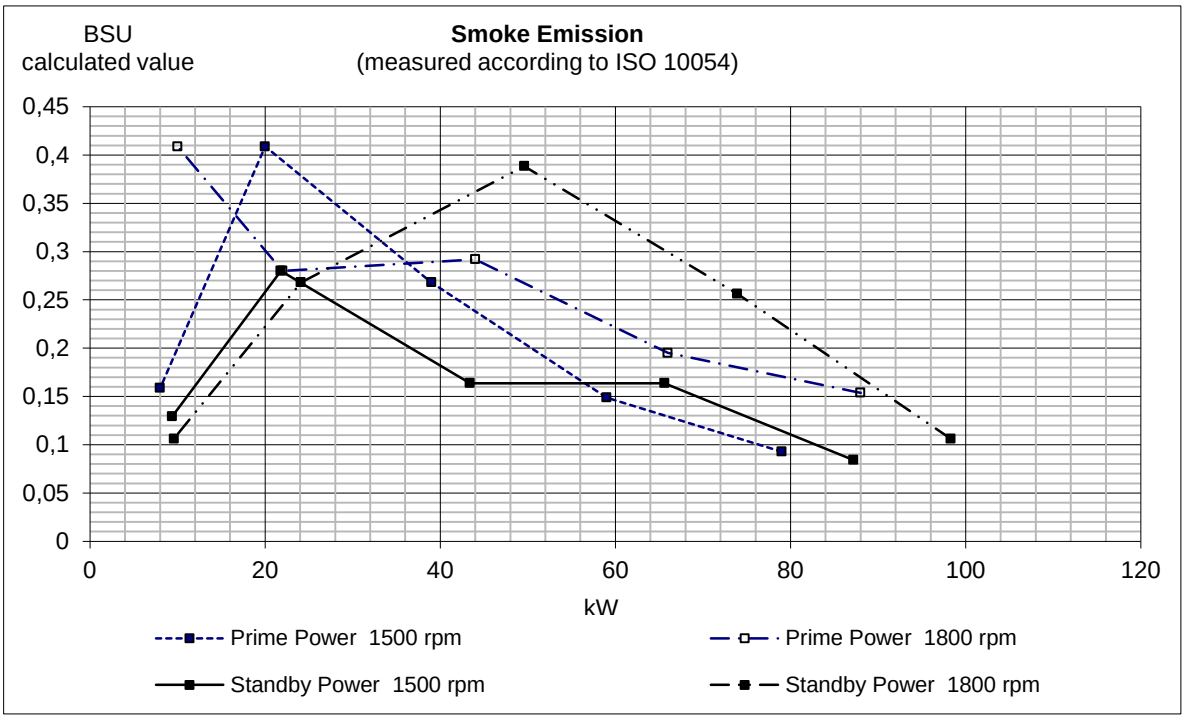
Engine protection can be disabled. For consequences please see VP International Limited Warranty Policy

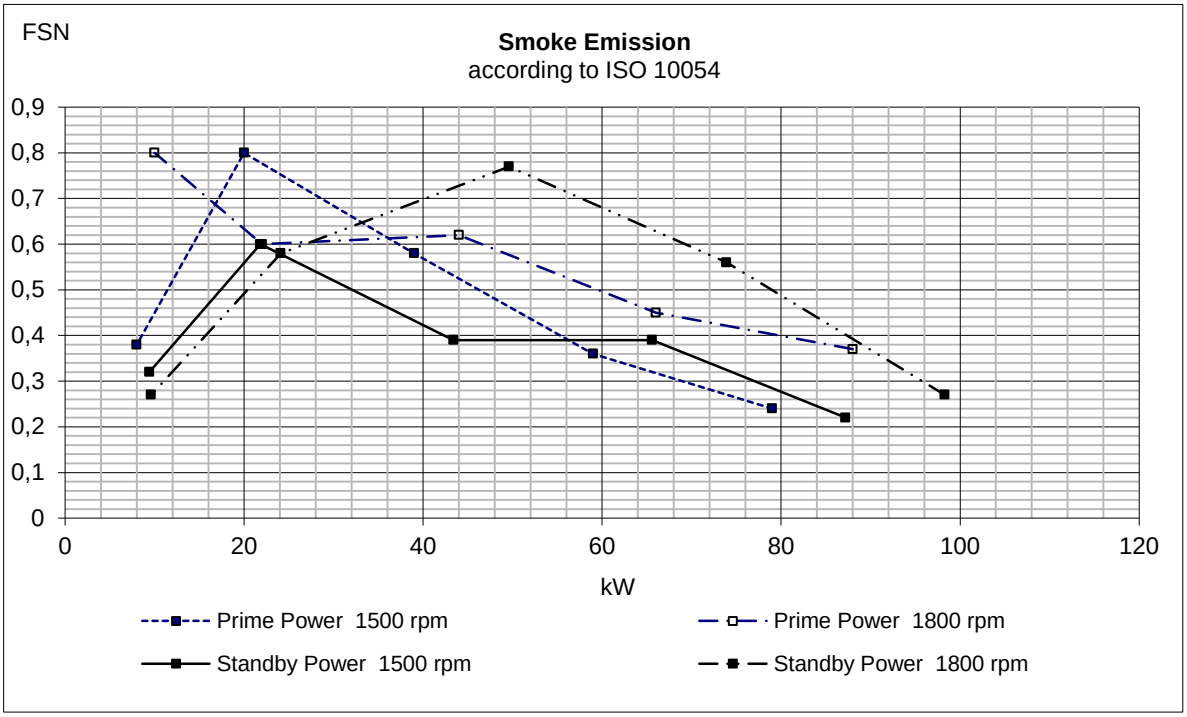
Electrical system

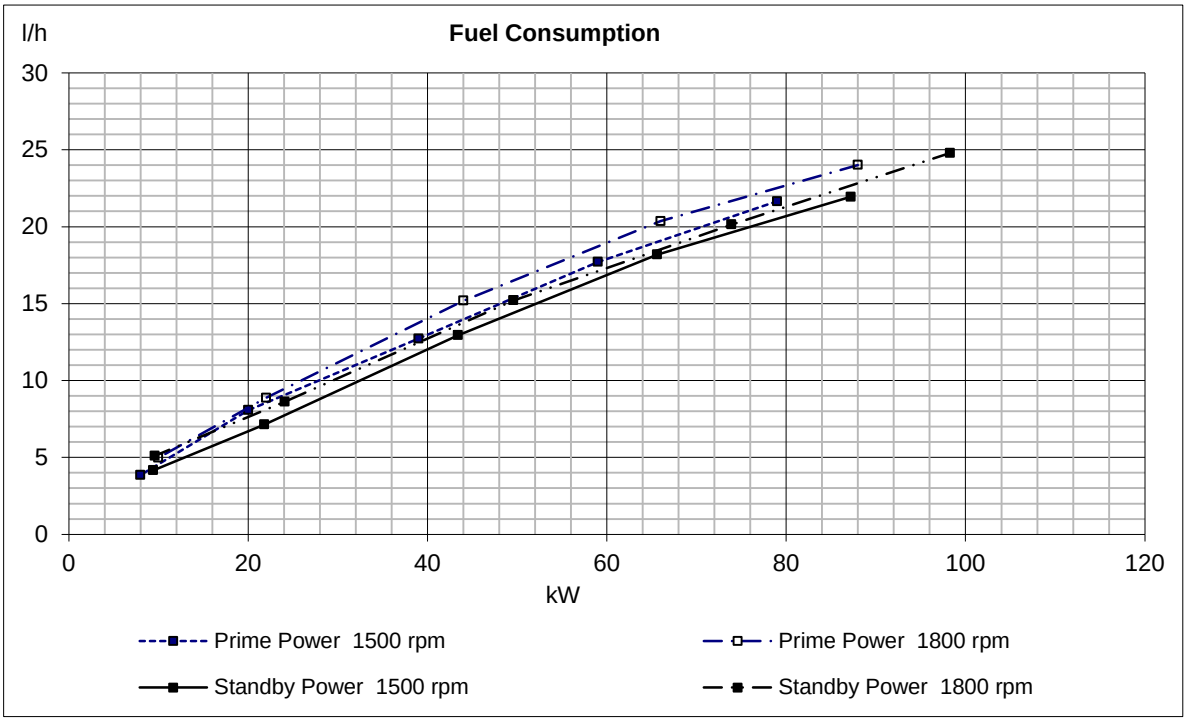
Voltage and type	24V

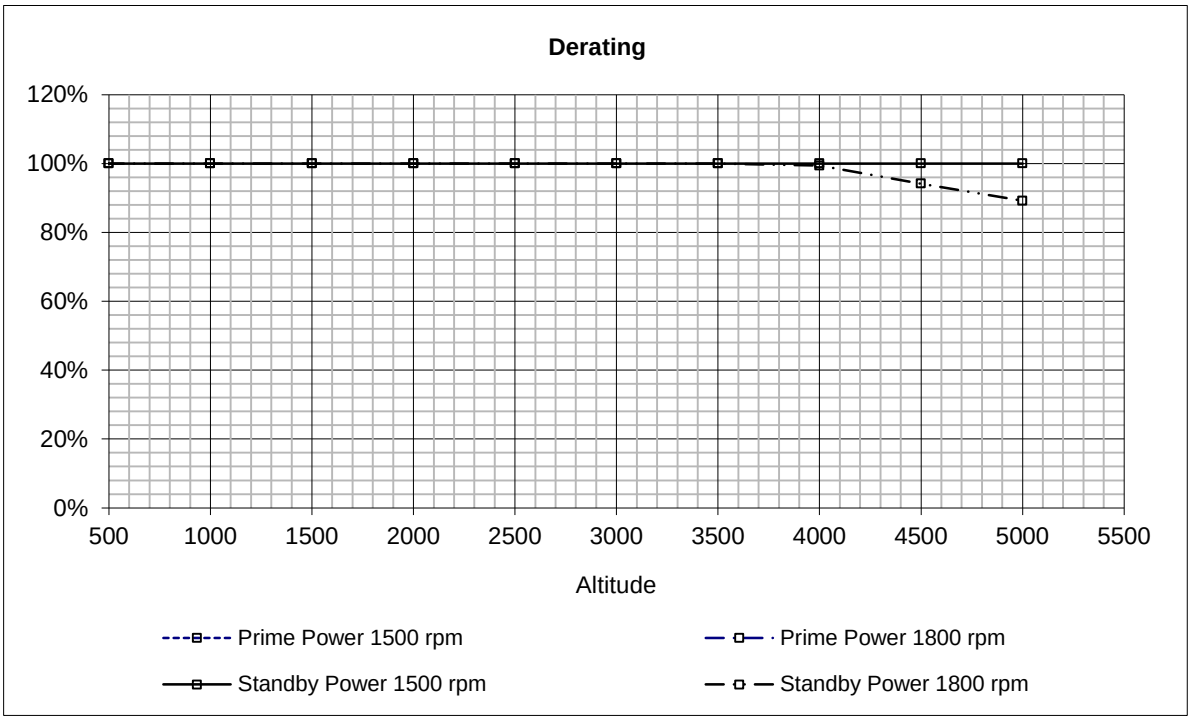
Alternator:	make/output	A	Iskra/55
	tacho output	Hz/alt. Rev	
	drive ratio		
Starter motor		make	Mitsubishi
		type	M008T62471
		kW	5.0
Number of teeth on:	flywheel		129
	starter motor		10
Max wiring resistance main circuit		mΩ	2
Cranking current at +20°C		A	400
Crank engine speed at 20°C		rpm	160
Starter motor battery capacity:	max	Ah/A	176
	min at +5°C	Ah/A	110
Inlet manifold heater (at 20 V)		kW	3,6
Power relay for the manifold heater		A	120

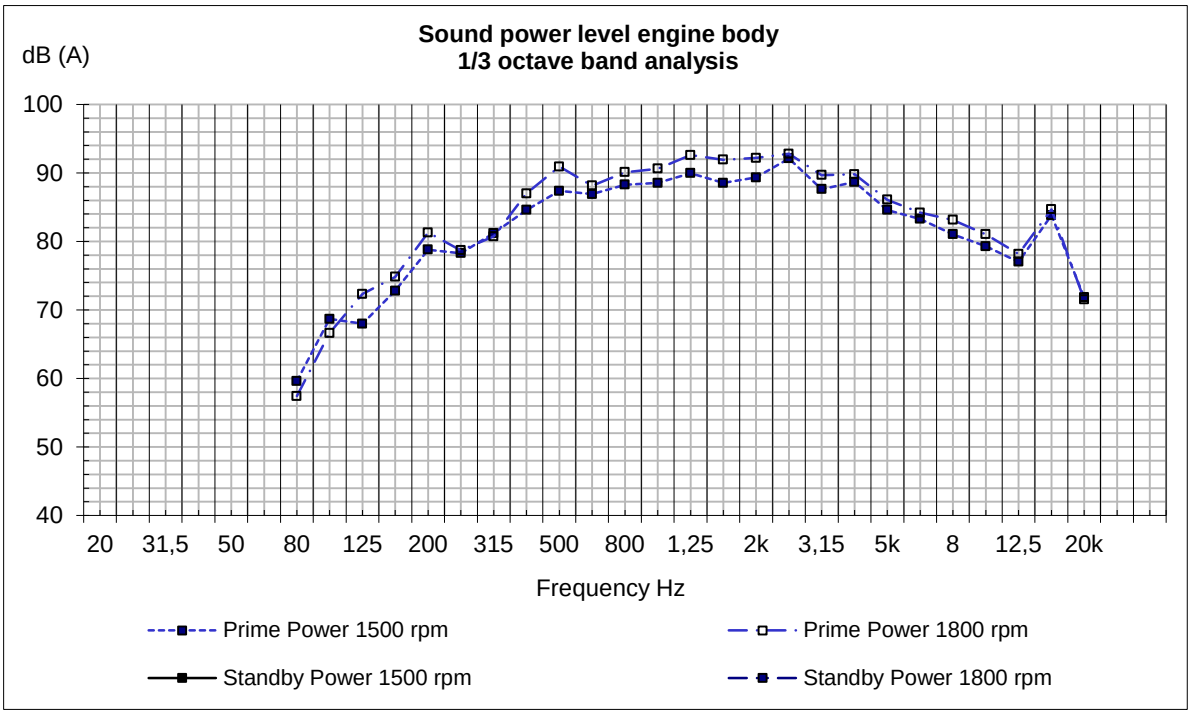
Power take off		**hp**	**108**	**121**
Front end in line with crank shaft max:		Nm lbft		
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW hp		
	max down	kW hp		
	max right	kW hp		
Timing gear at compressor PTO max:		Nm lbft		
Speed ratio direction of rotation viewed from flywheel side		0,91:1/clockwise		
Timing gear at servo pump PTO max:		Nm lbft		
Speed ratio direction of rotation viewed from flywheel side		1,58:1/clockwise		
Timing gear at hydraulic pump PTO max:		Nm lbft		
Speed ratio direction of rotation viewed from flywheel side				
Max allowed bending moment in flywheel housing		Nm lbft	≤ ± 5000	
Max. rear main bearing load		N lbf		

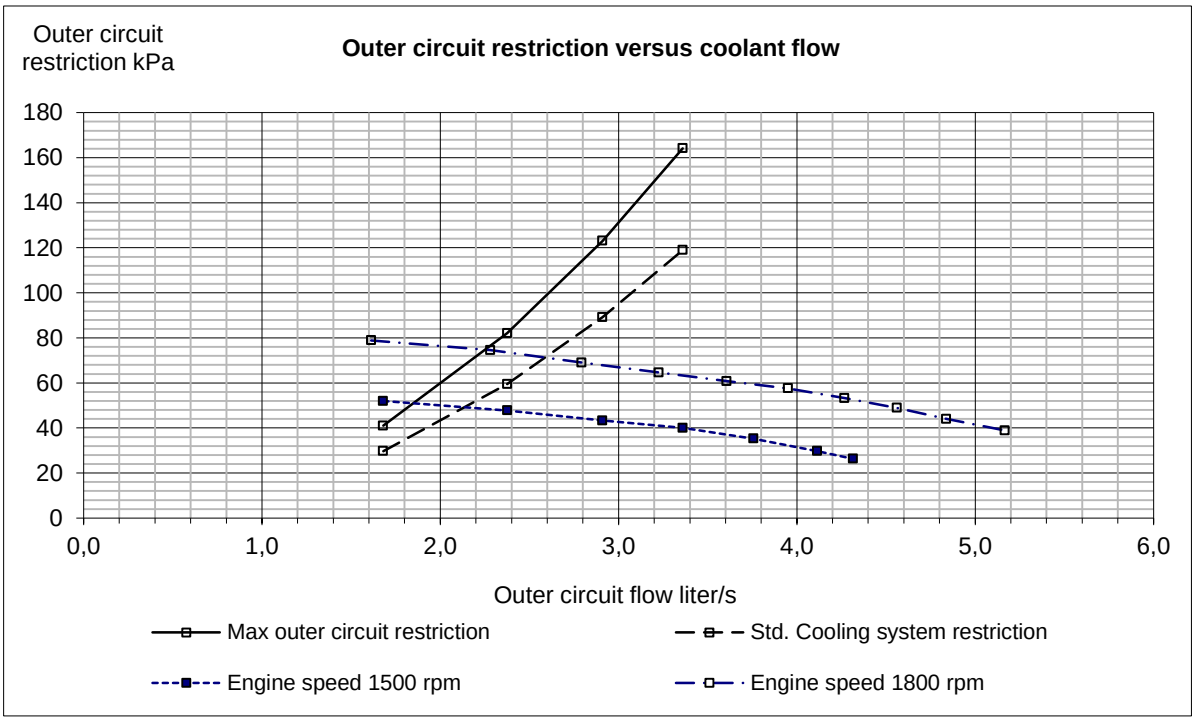

BSU
calculated value
Smoke Emission
(measured according to ISO 10054)
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
0
20
40
60
80
100
120
kW
Prime Power 1500 rpm
Prime Power 1800 rpm
Standby Power 1500 rpm
Standby Power 1800 rpm

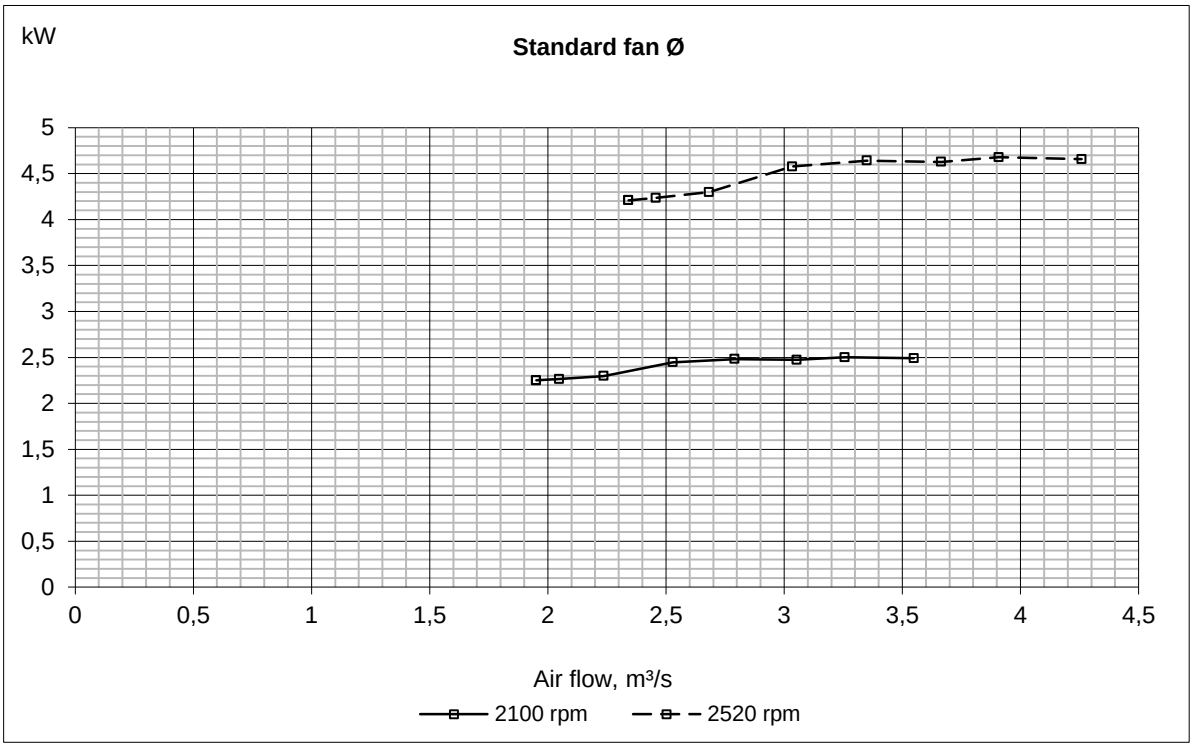

FSN
Smoke Emission
according to ISO 10054
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
0
20
40
60
80
100
120
kW
Prime Power 1500 rpm
Prime Power 1800 rpm
Standby Power 1500 rpm
Standby Power 1800 rpm

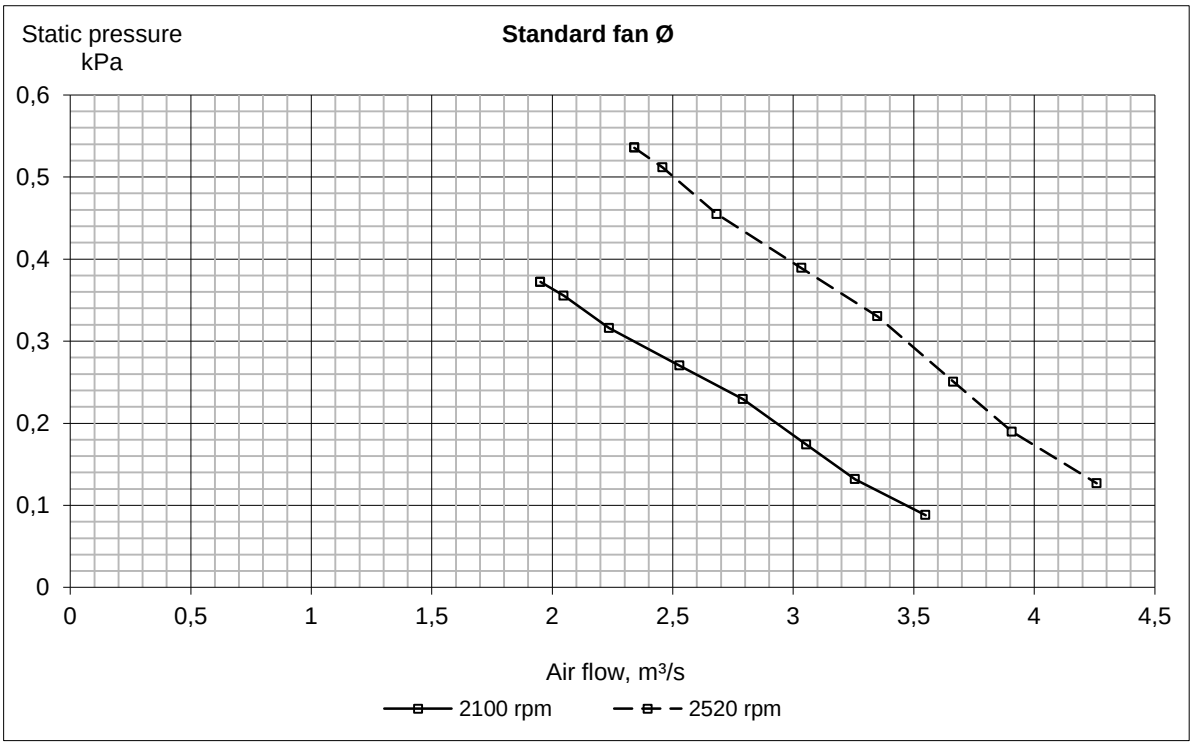

Fuel Consumption
l/h
30
25
20
15
10
5
0
0
20
40
60
80
100
120
kW
Prime Power 1500 rpm
Prime Power 1800 rpm
Standby Power 1500 rpm
Standby Power 1800 rpm


Derating
120%
100%
80%
60%
40%
20%
0%
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
Altitude
Prime Power 1500 rpm
Prime Power 1800 rpm
Standby Power 1500 rpm
Standby Power 1800 rpm


Sound power level engine body
1/3 octave band analysis
dB (A)
100
90
80
70
60
50
40
20
31,5
50
80
125
200
315
500
800
1,25
2k
3,15
5k
8
12,5
20k
Frequency Hz
Prime Power 1500 rpm
Prime Power 1800 rpm
Standby Power 1500 rpm
Standby Power 1800 rpm


Outer circuit restriction kPa
Outer circuit restriction versus coolant flow
180
160
140
120
100
80
60
40
20
0
0,0
1,0
2,0
3,0
4,0
5,0
6,0
Outer circuit flow liter/s
Max outer circuit restriction
Std. Cooling system restriction
Engine speed 1500 rpm
Engine speed 1800 rpm


kW
Standard fan Ø
5
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
0,5
1
1,5
2
2,5
3
3,5
4
4,5
Air flow, m³/s
2100 rpm
2520 rpm


Static pressure
kPa
Standard fan Ø
0,6
0,5
0,4
0,3
0,2
0,1
0
0
0,5
1
1,5
2
2,5
3
3,5
4
4,5
Air flow, m³/s
2100 rpm
2520 rpm