General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		6
No of valves		24
Displacement, total	litres in³	12,78 779,7
Firing order		1-5-3-6-2-4
Rotational direction, viewed from the front		Clockwise
Bore	mm in	131 5,16
Stroke	mm in	158 6,22
Compression ratio		18,5
Compression pressure at 240 rpm	MPa psi	3,5 508
Max. static forward inclination:	°	0
Max. static backward inclination:	°	10
Max. intermittent forward inclination while running:	°	35
Max. intermittent backward inclination while running:	°	35
Max. intermittent side inclination while running:	°	35
Idling speed	rpm	550-800
Rated speed R1	rpm	1800
Propeller selection range R1	rpm	1770-1870
Dry weight engine BT	kg lb	HE=1520, KC=1480 HE=3351, KC=3263

Performance	**Rating**	**rpm**	**600**	**800**	**1000**	**1200**	**1400**	**1500**	**1600**	**1700**	**1800**
Crankshaft power 1), 5)	1	kW	82	146	194	232	267	286	293	294	294
		hp	112	199	264	316	363	389	398	400	400
Propeller shaft power 1) (At full load)	1	kW	78	140	186	222	256	274	281	283	283
With drive Twin Disc 5114		hp	106	190	253	302	349	373	382	384	384
Propellershaft power at prop. load $x^{2,5}$	1	kW	18	37	65	103	151	180	211	245	283
With drive Twin Disc 5114		hp	25	51	89	140	205	244	287	333	385
Propellershaft power at prop. load x^{3}	1	kW	11	25	49	84	134	164	199	239	283
With drive Twin Disc 5114		hp	15	34	67	115	182	223	271	325	385
Torque at crankshaft 2)	1	Nm	1305	1743	1853	1846	1821	1821	1749	1651	1560
		lbf ft	963	1285	1366	1362	1343	1343	1290	1218	1150
Mean piston speed	1	m/s	3,2	4,2	5,3	6,3	7,4	7,9	8,4	9,0	9,5
		ft/s	10,4	13,8	17,3	20,7	24,2	25,9	27,6	29,4	31,1
Effective mean pressure 2)	1	MPa	1,28	1,71	1,82	1,82	1,79	1,79	1,72	1,62	1,53
		psi	186,2	248,6	264,3	263,3	259,8	259,7	249,4	235,6	222,5
Max combustion pressure 2)	1	MPa	14,8	15,8	15,1	15,2	15,6	16,3	16,4	15,1	14,7
		psi	2147	2292	2190	2205	2263	2364	2379	2190	2132

Lubricating system

Specific lubricating oil consumption.	g/kWh	0,06
Max. oil volume including filters for all allowed installation inclinations:	litres US gal	49 12,94
Max. oil volume excluding filters for all allowed installation inclinations:	litres US gal	44 11,62
Min. oil volume excluding filters for all allowed installation inclinations:	litres US gal	35 9,25

1) ISO 3046, fuel temp 40°C.
ISO 8665 (=SAE J 1228=ICOMIA 28-83)
2) At power according to 1).
3) If reverse gear is used, 4% in heat rejection will be added for its oil cooler.
4) Acc. to ISO 3744
5) At installed back pressure

Fuel system	Rating	rpm	600	800	1000	1200	1400	1500	1600	1700	1800
Specific fuel consumption att full load	1	g/kWh	250,3	217,3	196,1	190,0	189,7	190,4	191,6	196,6	198,9
		lb/hph	0,405	0,352	0,318	0,308	0,307	0,308	0,31	0,318	0,322
Fuel consumption at prop. load x [2,5]	1	l/h	5,0	10,0	17,0	26,0	37,0	44,0	51,0	60,0	69,0
		US gal/h	1,3	2,6	4,5	6,9	9,8	11,6	13,5	15,9	18,2
Fuel consumption at prop. load x [3]	1	l/h	4,0	7,0	13,0	22,0	33,0	41,0	49,0	59,0	69,0
		US gal/h	1,1	1,8	3,4	5,8	8,7	10,8	12,9	15,6	18,2
Fuel consumption at full load	1	l/h	24,6	38,0	45,5	52,7	60,6	65,2	67,2	69,2	70,0
		US gal/h	6,5	10,0	12,0	13,9	16,0	17,2	17,7	18,3	18,5

Intake and exhaust system	Rating	rpm	600	800	1000	1200	1400	1500	1600	1700	1800
Specific exhaust heating effect in percent of crankshaft power	1	%	54	50	55	63	69	71	75	72	74
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	1	°C	490	534	461	398	367	356	345	388	388
		°F	914	993	862	748	693	673	653	730	730
Exhaust back pressure after turbocharger at rated speed during test.		kPa									12
		psi									1,7
Permitted exhaust back pressure after turbocharger. (Installed back pressure)		kPa							Max		17
		psi									2,5
		kPa							Min		0
		psi									0,0
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA	1	m³/min	4,6	7,7	11,5	16,0	20,2	22,5	24,3	23,2	23,8
		cu.ft./min	162,4	270,2	404,4	565	713,4	794,6	858,1	819,3	840,5
Charge air pressure Inlet manifold	1	kPa	37	71	106	139	168	181	185	161	155
		psi	5,4	10,3	15,4	20,2	24,4	26,3	26,8	23,4	22,5
Exhaust gas flow	1	m³/min	13,6	23,3	30,4	36,7	42,6	45,3	47,2	48,4	49,2
		cu.ft./min	480,3	822,8	1074	1296	1504	1600	1667	1709	1737

Cooling system	Rating	rpm	600	800	1000	1200	1400	1500	1600	1700	1800
Radiated heat (per engine)	1	kW	4	4	5	5	6	6	6	6	7
Heat rejection to charge air coolers	1	kW	3	9	19	32	46	54	60	52	52
Coolant heat rejection to HE, incl. engine oil cooler and excl. charge air coolers.	1	kW	113	148	133	115	107	104	96	131	133
Coolant flow with fully open thermostat and std cooling system		l/min	120	192	246	306	360	384	408	420	450
		cu.ft./min	4,2	6,8	8,7	10,8	12,7	13,6	14,4	14,8	15,9
Max. permissible temperature on coolant in engine outlet		°C	98								
		°F	208								
Coolant volume engine, including heat exchanger and charge air cooler		litres	51								
		US gal.	13,47								
Max. additional coolant for cabin heater etc. with std. Expansion tank		litres	15								
		US gal.	3,96								
Maximum coolant flow to cabin heater etc.		l/min	42								
		cu.ft./min	1,48								
Thermostat, start open at		°C	82								
		°F	180								
Thermostat, fully open at		°C	92								
		°F	198								

1) ISO 3046, fuel temp 40°C.
ISO 8665 (=SAE J 1228=ICOMIA 28-83)
2) At power according to 1).
3) If reverse gear is used, 4% in heat rejection will be added for its oil cooler.
4) Acc. to ISO 3744
5) At installed back pressure

Raw water circuit	rpm	600	800	1000	1200	1400	1500	1600	1700	1800
Nominal raw water design flow	l/min	161	216	273	320	368	392	414	436	456
	cu.ft/min	5,7	7,6	9,6	11,3	13,0	13,8	14,6	15,4	16,1
Nominal raw water pump pressure head at design flow. (measured before and after pump)	kPa	19	30	49	66	84	95	107	119	131
	psi	2,8	4,4	7,1	9,6	12,2	13,8	15,5	17,3	19,0
Maximum raw water pump suction head	kPa	-30								
	psi	-4,4								
Maximum raw water temperature entering heat exchanger	°C	32								
	°F	90								

2 circuit keel cooling system, LT	Rating	rpm	600	800	1000	1200	1400	1500	1600	1700	1800
Maximum temperature to charge air cooler from external LT-cooling system	1	°C									44
		°F									111
Coolant flow through keel cooler, LT-cooling system circuit	1	l/min	33	45	58	70	81	85	90	93	96
		cu.ft./min	1,2	1,6	2,0	2,5	2,9	3,0	3,2	3,3	3,4
Pressure drop in external LT-cooling system circuit, including piping		kPa	85								
		psi	12,3								
Coolant volume charge air cooler		litres	5								
		US gal.	1,32								

2 circuit keel cooling system, HT	Rating	rpm	600	800	1000	1200	1400	1500	1600	1700	1800
Design point for keel cooler, engine outlet temperature	1	°C									89
		°F									192
Maximum temperature to engine from external HT-cooling system circuit	1	°C									70
		°F									158
Coolant flow through keel cooler, HT-cooling system circuit at design point	1	l/min									121
		cu.ft./min									4,3
Maximun coolant flow through keel cooler, HT-cooling system circuit	1	l/min									216
		cu.ft./min									7,6
Pressure drop in external HT-cooling system circuit, including piping		kPa	85								
		psi	12,3								
Coolant volume engine, excl. heat exchangers		litres	28								
		US gal.	7,40								

Emissions	Rating	rpm	600	800	1000	1200	1400	1500	1600	1700	1800
Smoke at prop. load $x^{2,5}$	1	*BSU	0,06	0,06	0,26	0,21	0,14	0,17	0,13	0,14	0,14
Smoke at prop. load x^3	1	*BSU	0,11	0,10	0,16	0,21	0,16	0,18	0,14	0,14	0,15
Noise at prop. load x^3. 4)	1	dBA	100,0	101,5	104,1	107,6	109,2	110,1	111,1	111,9	112,7

***NB.!** BSU are calculated values. Measured values are acc. to ISO 10054 in FSN units

1) ISO 3046, fuel temp 40°C.
ISO 8665 (=SAE J 1228=ICOMIA 28-83)
2) At power according to 1).
3) If reverse gear is used, 4% in heat rejection will be added for its oil cooler.
4) Acc. to ISO 3744
5) At installed back pressure

Sensors : Control and Monitoring System							
Sensors	**Signal**	**Range**	**Unit**	**Warning Initial Delay / Warning Delay**	**Warning Level**	**Derating Level**	**Engine protection action**
AUS/DEF concentration			%	N/A	28	N/A	Warning only
AUS/DEF Tank Empty			%	30 sec	0	N/A	Warning only
AUS/DEF Tank Low level			%	30 sec	15	N/A	Warning only
AUS/DEF tank temp High alarm			°C	1 sec	70	N/A	Warning only
Coolant level switch	Digital	ON/OFF		30 sec from start / 11 sec	Low (ON / Closed)	N/A	Warning only
Coolant temperature	50-0 kΩ	-40 - 140 ±1.5°C	°C	30 sec from start / 2 sec	98	101	See derating map
Engine speed cam	Frequency		rpm	Instant	Lost signal	N/A	Warning only
Engine speed crank	Frequency		rpm	Instant	Lost signal	N/A	Warning only
Exhaust gas temperature	PT200	-40 - 750 ± 2.5%	°C	30 sec from start / 2 sec	542	550	See derating map
Oil level sensor	Digital	± 1.9 mm		30 sec from start / 5 sec	Low level	N/A	Warning only
Oil temperature	50-0 kΩ	-40 - 140 ± 1.5°C	°C	30 sec from start/1.5 sec	125	130	See derating map
SCR temp	PT200	-40 - 750 ± 2.5%	°C	30 sec from start / 2 sec	532	540	Engine derate
Water In fuel switch	Digital	ON/OFF		Instant	Water in fuel	N/A	Warning only
Wet Exhaust temp	PT200	0 - 850	°C	30 sec from start / 5 sec	192	200	See derating map

Sensors (rpm dependent)	Signal	Range	Unit	Initial Delay / Delay	Warning Level / Derating Level / Shutdown Level rpm Map					Comment
Charge air pressure	0,5-4,5 V	50-600 ±4.2 kPa	kPa		**600 rpm**	**1000 rpm**	**1200 rpm**	**1500 rpm**	**1800 rpm**	*From prop curve 2.5 with IPS drive*
Warning Level			kPa	30 sec from start / 2.2sec	280	280	280	245	300	
Derating Level			kPa	10% trq. decr. per sec	290	290	290	255	310	
Charge air temperature	50-0 kΩ	-40 - 130 ±4%	°C		**600 rpm**	**1000 rpm**	**1200 rpm**	**1500 rpm**	**1800 rpm**	
Warning Level			°C	60 sec from start / 15 sec	80	80	80	80	76	
Derating Level			°C		85	85	85	85	81	**See derating map**
Coolant pressure	0,5-4,5 V	0-300 ± 3%	kPa		**600 rpm**	**1000 rpm**	**1200 rpm**	**1500 rpm**	**1800 rpm**	
Warning Level			kPa	30 sec from start /1.5sec	0	25	35	50	76	
Derating Level			kPa	10% trq. decr. per sec	-5	20	30	45	71	
Fuel pressure	0,5-4,5 V	0-700 ±2.5%	kPa		**600 rpm**	**1000 rpm**	**1200 rpm**	**1500 rpm**	**1800 rpm**	
Warning Level			kPa	60 sec from start / 5 sec	80	80	80	205	280	
Derating Level			kPa	NA	NA	NA	NA	NA	NA	
Oil pressure	0,5-4,5 V	0-700 ±2.5%	kPa		**600 rpm**	**1000 rpm**	**1200 rpm**	**1500 rpm**	**1800 rpm**	
Warning Level			kPa	30 sec from start / 3 sec	120	200	224	260	260	
Derating Level			kPa	10% trq. decr. per sec	95	175	199	235	235	
Seawater pressure	0,5-4,5 V	0-300 ± 3%	kPa		**600 rpm**	**1000 rpm**	**1200 rpm**	**1500 rpm**	**1800 rpm**	
Warning Level			kPa	30 sec from start /5 sec	-5	10	18	30	45	
Derating Level			kPa	10% trq. decr. per sec	-15	0	8	20	35	

Warning = Yellow Lamp active

Derating = Red Lamp active

Remarks

Charge Air Temp [°C]	rpm	90°C	95°C	105°C
Remaining torque in %	600	100%	100%	100%
	1200	100%	82%	74%
	1800	100%	66%	52%

Coolant temp [°C]	rpm	96°C	103°C	106°C
Remaining torque in %	600	100%	100%	100%
	1200	100%	97%	93%
	1800	100%	50%	0%

Exhaust Temp [°C]	rpm	545°C	560°C	575°C	580°C
Remaining torque in %	600	100%	100%	100%	100%
Max 1000 rpm in engine prot map	1200	100%	97%	95%	93%
> 570°C	1800	100%	50%	25%	0%

Oil temp [°C]	rpm	125°C	132°C	134°C
Remaining torque in %	600	100%	100%	100%
	1200	100%	97%	93%
	1800	100%	50%	0%

Wet exhaust temp [°C]	rpm	190°C	200°C	205°C	210°C
Remaining torque in %	600	100%	100%	100%	100%
	1200	100%	96%	93%	89%
	1800	100%	93%	86%	80%

Tranmission: Control and Monitoring System						Engine protection action
Sensors	**Signal**	**Range**	**Unit**	**Warning Initial Delay / Warning Delay**	**Warning Level**	
Gear oil temperature (EVC)	50-0 kΩ	-30 - 130 ± 4%	°C	N/A	95	Warning only
Gear oil pressure (EVC)	Frequency	0-3000 ±3%	kPa	60 sec from start/7sec	700	Warning only

For SDM only

Sensors Control and Monitoring System						
Sensors	**Signal**	**Range**	**Unit**	**Warning Initial Delay / Warning Delay**	**Shutdown level**	**Engine protection action**
Coolant temperature	Digital	ON/OFF	°C	12sec from start/1 sec	105	Shutdown
Eng. overspeed SDM 1800+15%	Frequency	153 puls./rev	rpm / Hz	Instant	2070 rpm/5278 Hz	Shutdown

Sensors (rpm dependent)	**Signal**	**Range**	**Unit**	**Initial Delay / Delay**	**Warning Level / Derating Level / Shutdown Level rpm Map**					**Engine protection action**
					0 rpm	**600 rpm**	**1000 rpm**	**1500 rpm**	**1800 rpm**	
Oil pressure	Digital	ON/OFF	kPa	12 sec from start / 1 sec	NA	120 ±20	120 ±20	120 ±20	120 ±20	Shutdown
Gear oil pressure (IPS)	Digital	ON/OFF	kPa	12 sec from start / 1 sec	NA	400 ±20	400 ±20	400 ±20	400 ±20	Shutdown
Gear oil pressure (Reverse gear ZF)	Digital	500-3000	kPa	12 sec from start / 1 sec	NA	2100±20	2100±20	2100±20	2100±20	Shutdown
Gear oil pressure (Reverse gear Other)	Digital	500-3000	kPa	12 sec from start / 1 sec	NA	X±20	X±20	X±20	X±20	Shutdown Level depending on type of gearbox

Technical data - Drive unit

Drive line		IPSxxx
Transmission type		IPSx-y
Gear ratio (total)		1,xx:1 and 1,xx:1
Steering angle, max.		+/- xx
Total weight of drive unit (1)	kg	xxx
Oil capacity, approx.	litres	xx
Oil volume difference MIN-MAX	litres	0,x
Oil type		Volvo Penta API GL5 75W/90
Propeller range		

(1) Including oil, exhaust pipe and elbow, clamping ring and various installation components. Propellers are not included in total weight

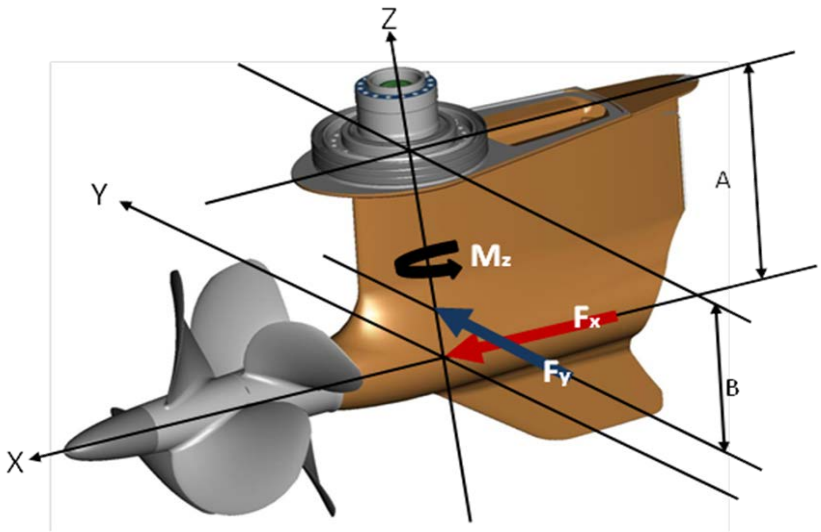
"Generalized maximum load document"for IPS3

Valid products	Drive Unit	Gear Ratio
IPSxxxx	IPSx	1,xx:1
IPSxxxx	IPSx	1,xx:1
IPSxxxx	IPSx	1,xx:1

Loads provided in chart are single maximum loads i.e. not to be used for fatigue calculations

Speed range (top speed)	Load vektor	Maximum load
20-28 kn	Fx	xx kN
	Fy (+/-)	xx kN
	Mz (+/-)	xx kNm
28-42 kn	Fx	xx kN
	Fy (+/-)	xx kN
	Mz (+/-)	xx kNm

A	xxx mm
B	xxx mm



Important Note!
The above forces and torque are to be used as the base for maximum load in normal operations.
Volvo Penta requires however that the detailed guidelines for the structure around
the IPS unit are followed in order to ensure structural strength in case of grounding.

Technical data - Exhaust AfterTreatment System data (EATS)

Weight data:

SCR system weight: (incl SCR unit, AUS injector pipe, AUS sensor and bracket)			kg lb	115,7 255,1
Total SCR system weight for IPS: (incl SCR unit, AUS injector pipe, AUS sensor and bracket, exhaust piping)			kg lb	115,7 255,1
AUS pump			kg lb	3,1 6,8
AUS cabinet 20l weight: (incl tank, pump,UQS, ACM)			kg lb	36,4 80,2
AUS tank 160l weight:			kg lb	45,0 99,2
UQS - Lenght/Weight	mm in	439,0 17,3	kg lb	1,2 2,6
UQS - Lenght/Weight	mm in	597,0 23,5	kg lb	1,2 2,6
UQS - Lenght/Weight	mm in	715,0 28,1	kg lb	1,3 2,9

Dimension data:

SCR Surface area		m2/ft2	2.2 / 23.7
SCR Flange:	Standard type		
	Diameter:	in/mm	6 / 152
	Number of Inlet / Outlet:	1 inlet / 2 outlet	

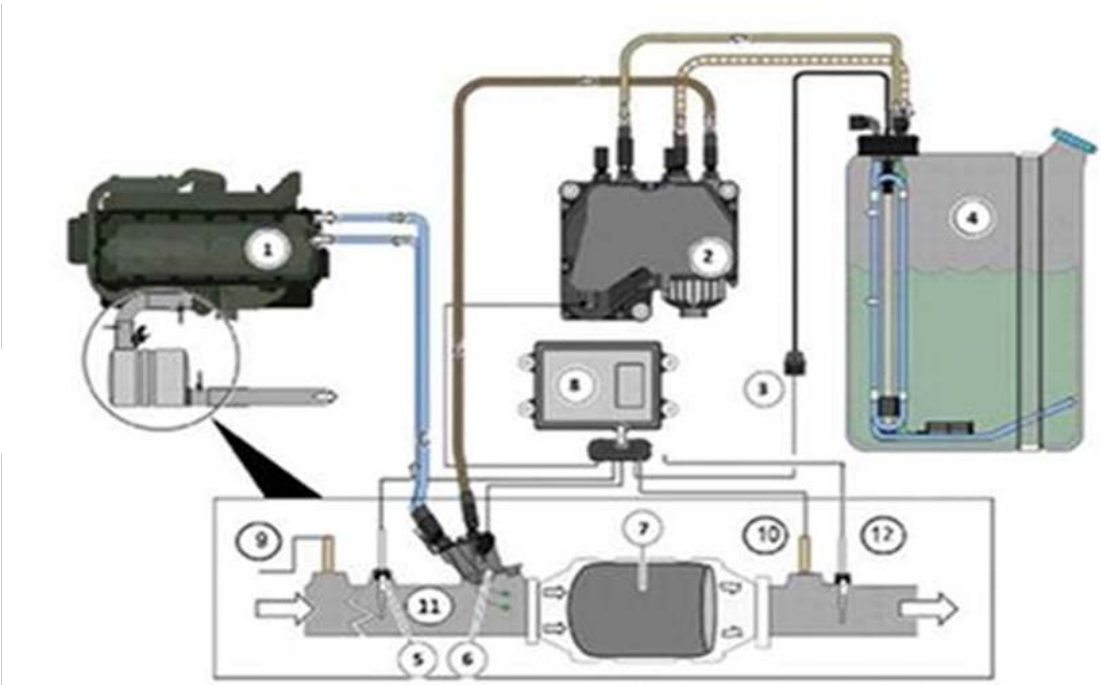
Flow data:

Max AUS flow to injector	l/h US gal/h	7,9 2,1
Max collant flow to AUS injector	l/h US gal/h	6,7 1,8

Exhaust system	**Rating**	**rpm**	**600**	**800**	**1000**	**1200**	**1300**	**1400**	**1500**	**1600**	**1700**	**1800**
Max allowable temperature drop between turbine and SCR muffler inlet.		°C °F	10 50	10 50	10 50	10 50	10 50	10 50	10 50	10 50	10 50	10 50
SCR muffler pressure drop at prop. load x^3		kPa psi	0	1 0,1	1 0,1	1 0,1	2 0,3	2 0,3	2 0,3	2 0,3	3 0,4	5 0,7
SCR muffler pressure drop at Full load		kPa psi	1 0,1	2 0,3	2 0,3	2 0,3	2 0,3	3 0,4	3 0,4	3 0,4	4 0,6	5 0,7

AUS system	Rating	rpm	600	800	1000	1200	1300	1400	1500	1600	1700	1800
Specific AUS consumption		g/kWh	7,51	9,57	13,49	13,47	13,46	12,32	12,32	12,45	12,06	12,05
		lb/hph	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,02
AUS consumption at prop. load $x^{2,5}$		l/h	0,00	0,35	0,58	0,97	1,38	1,82	2,34	3,03	3,34	3,83
		US gal/h		0,09	0,15	0,26	0,36	0,48	0,62	0,80	0,88	1,01
AUS consumption at prop. load x^{3}		l/h	0,00	0,00	0,38	0,71	1,05	1,57	2,11	2,91	3,35	3,90
		US gal/h			0,10	0,19	0,28	0,41	0,56	0,77	0,88	1,03
AUS consumption at Full load		l/h	0,67	1,52	2,85	3,41	3,64	3,59	3,84	3,98	3,87	3,86
		US gal/h	0,18	0,40	0,75	0,90	0,96	0,95	1,01	1,05	1,02	1,02

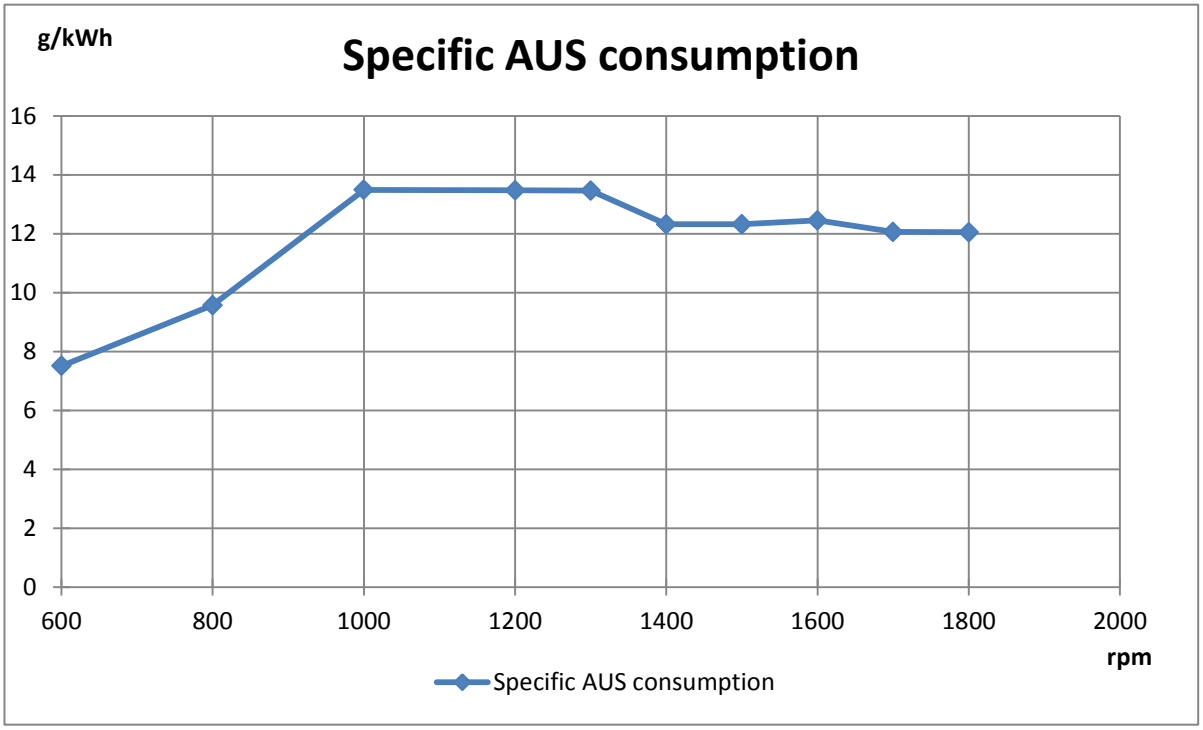
AUS concentration 32.5%

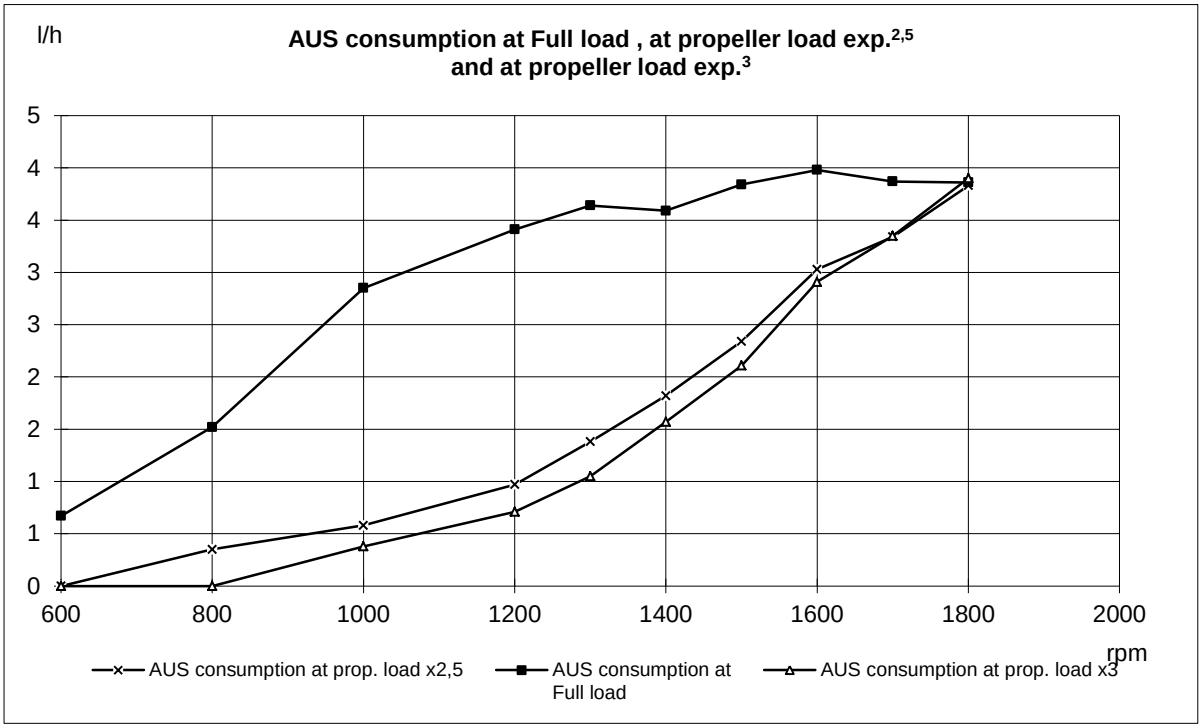


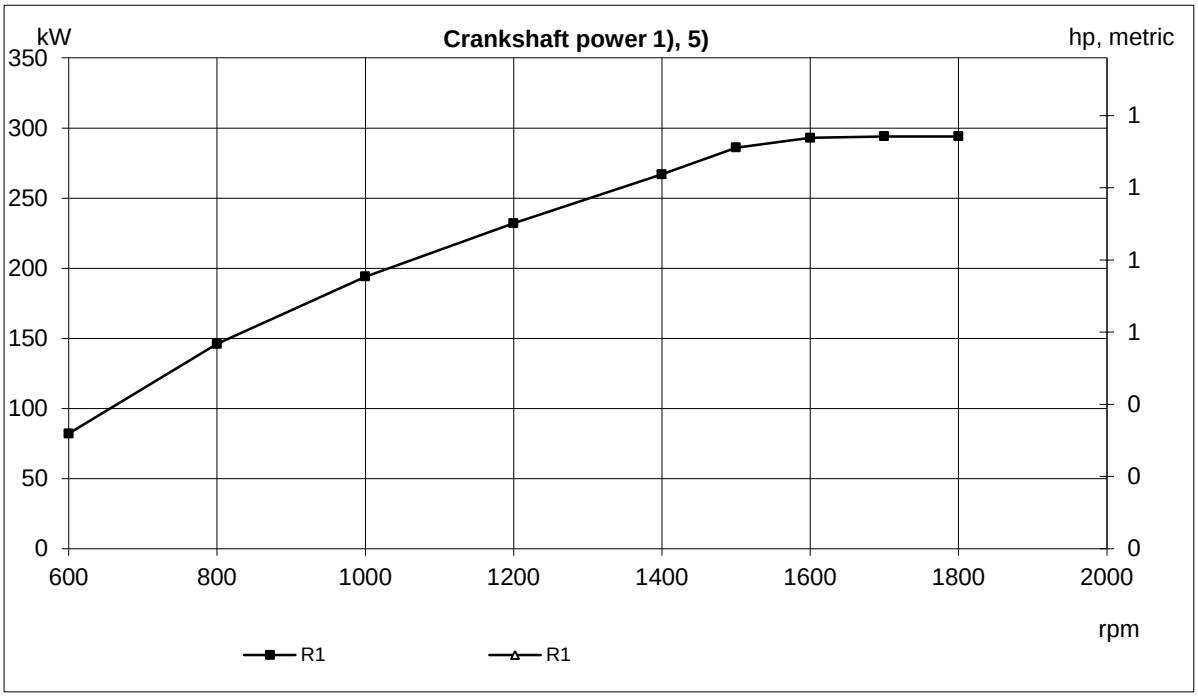
1. Engine
2. AUS pump
3. Sensor connector QLT
4. AUS tank with QLT
5. Front exhaust temperature sensor
6. AUS injector
7. Catalytic converter (SCR)
8. ACM (After Treatment Module)
9. Front NOx sensor
10. Rear NOx sensor
11. Injector pipe
12. Rear exhaust temperature sensor

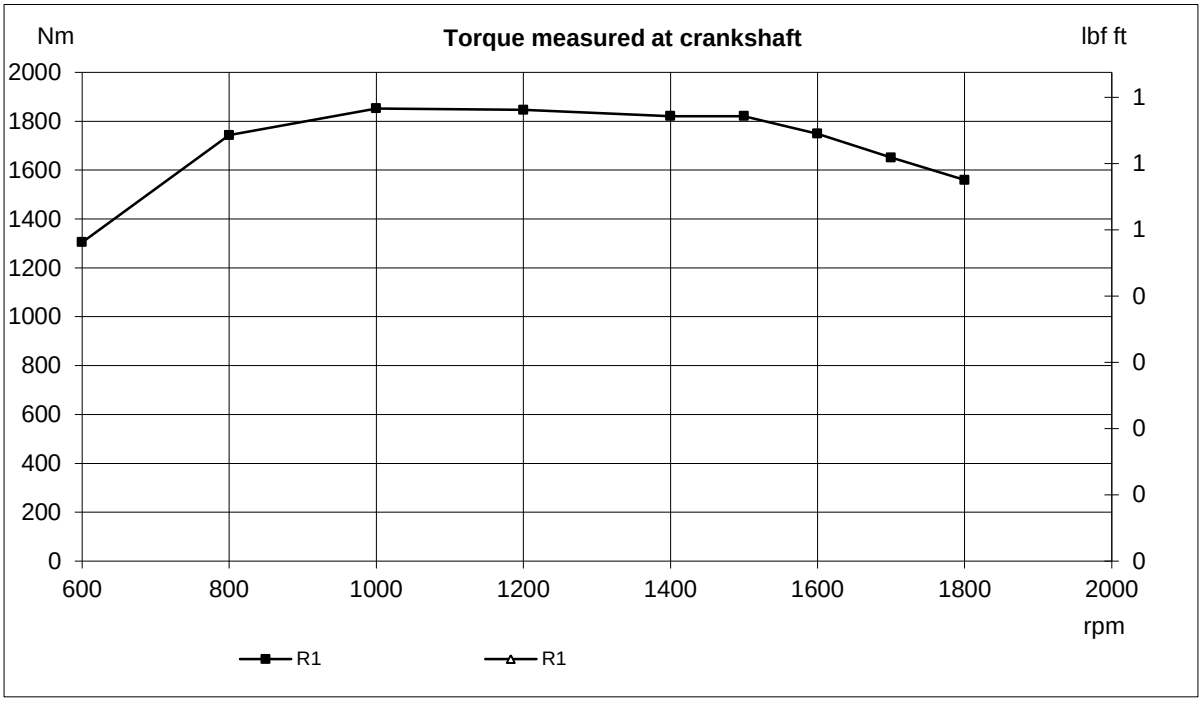
Abbreviations:

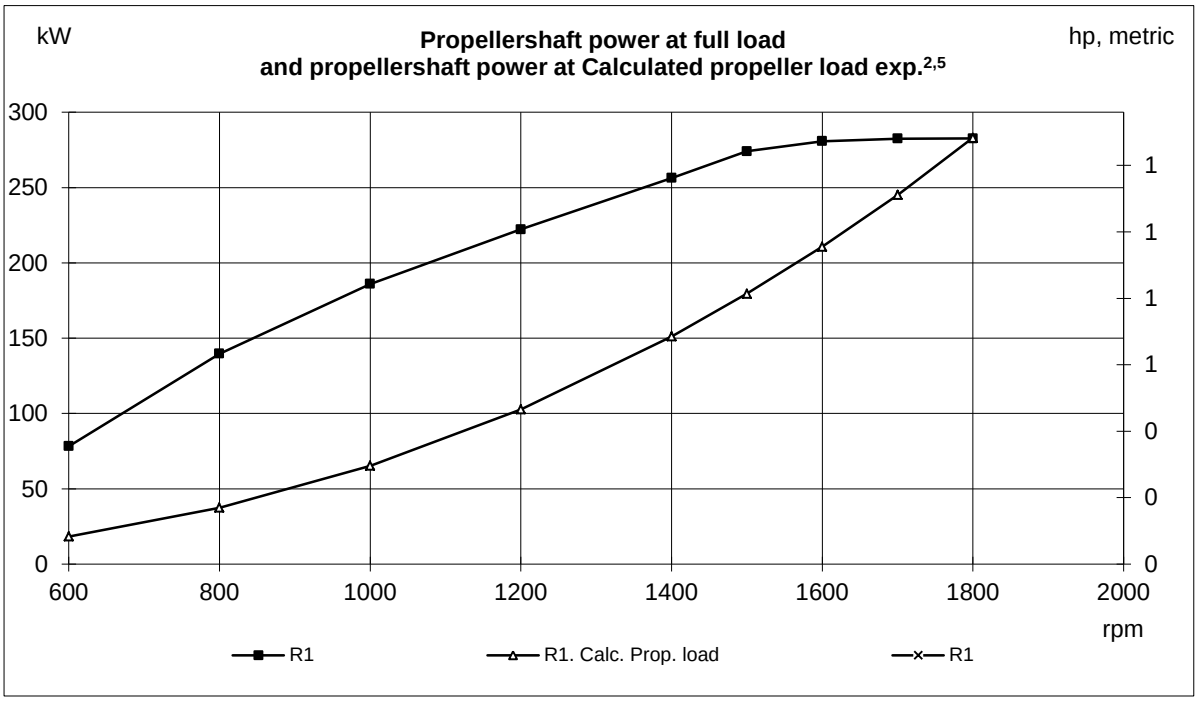
ACM	Aftertreament Control Module
AUS	Aqueous Urea Solution
EATS	Exhaust Aftertreatment System
SCR	Selective Catalytic Reduction
UDS	Urea Dosing System
UQS	Urea Quality Sensor

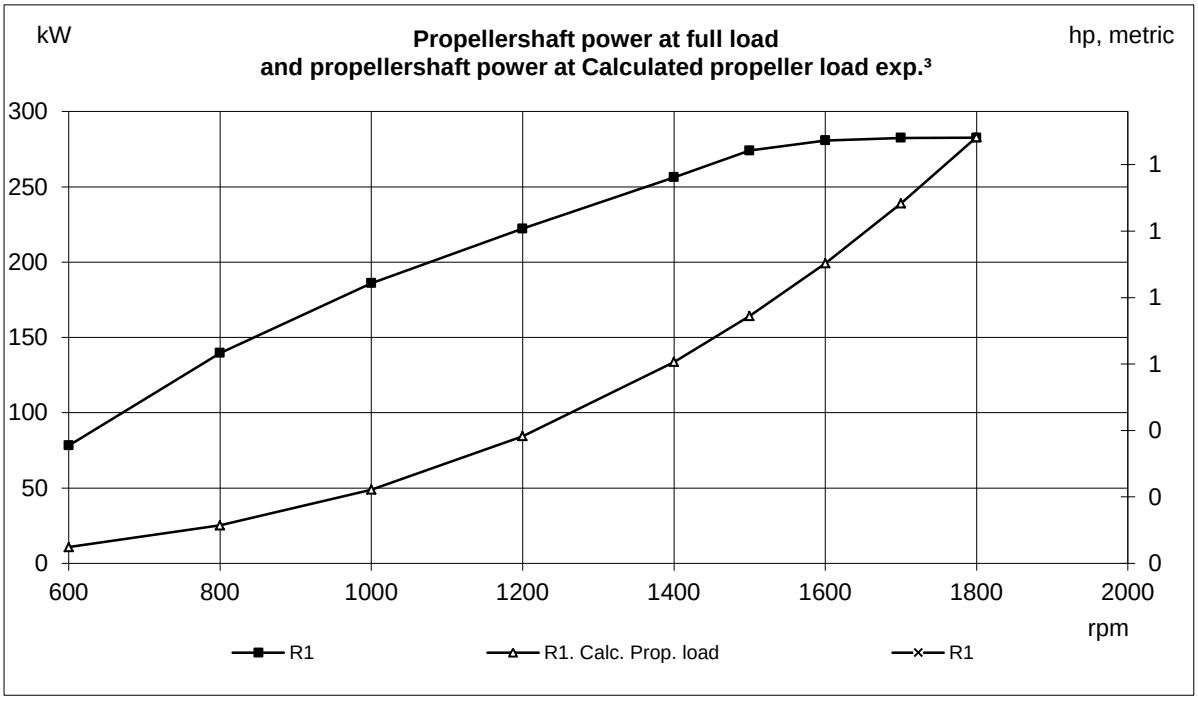

g/kWh
Specific AUS consumption
16
14
12
10
8
6
4
2
0
600
800
1000
1200
1400
1600
1800
2000
rpm
Specific AUS consumption

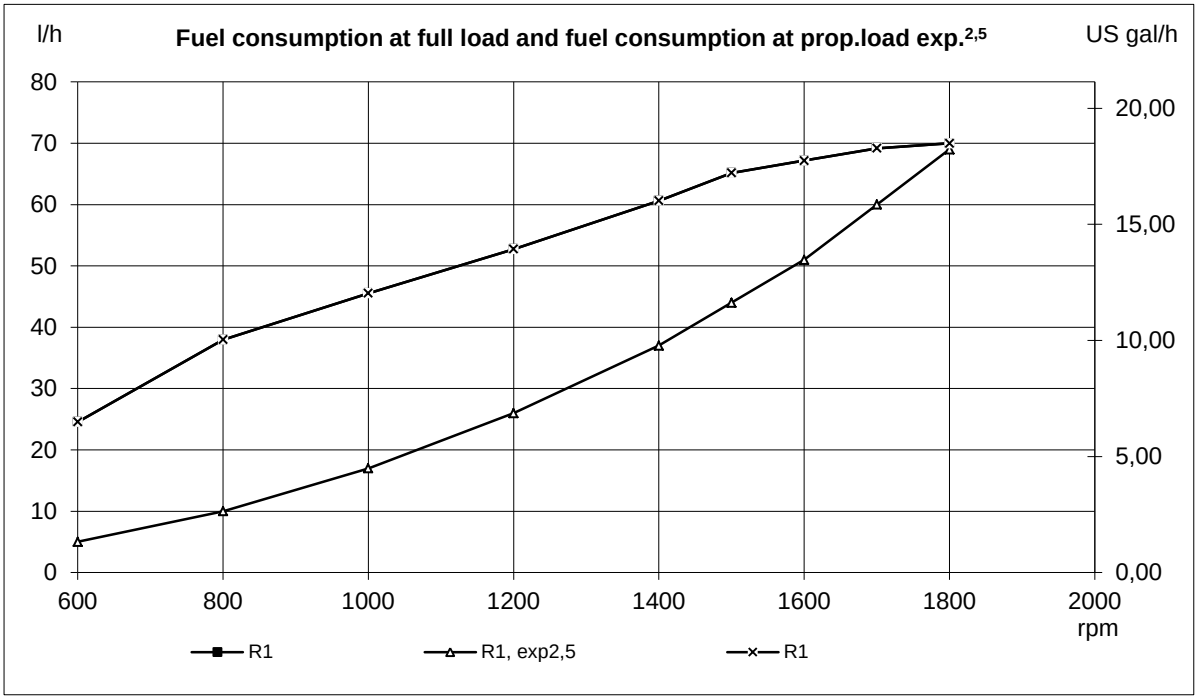

l/h
AUS consumption at Full load , at propeller load exp.2,5
and at propeller load exp.3
5
4
4
3
3
2
2
1
1
0
600
800
1000
1200
1400
1600
1800
2000
rpm
AUS consumption at prop. load x2,5
AUS consumption at Full load
AUS consumption at prop. load x3

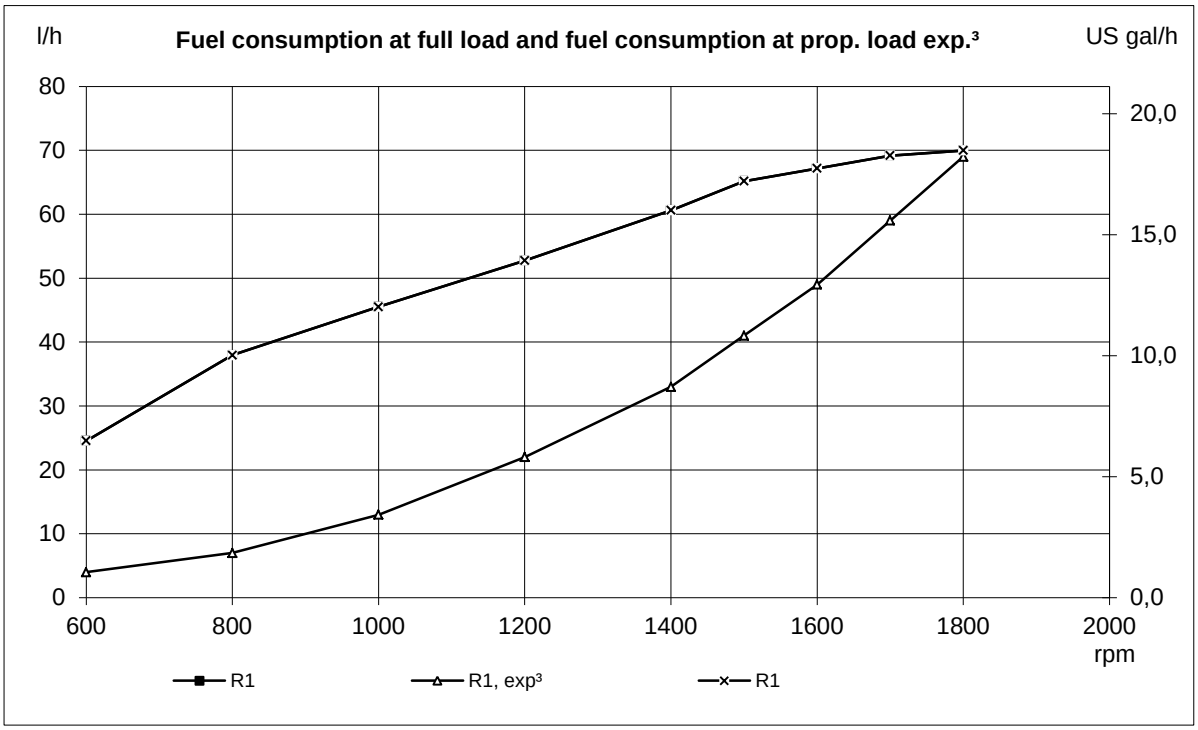

kW
Crankshaft power 1), 5)
hp, metric
350
300
250
200
150
100
50
0
1
1
1
1
0
0
0
600
800
1000
1200
1400
1600
1800
2000
rpm
R1
R1

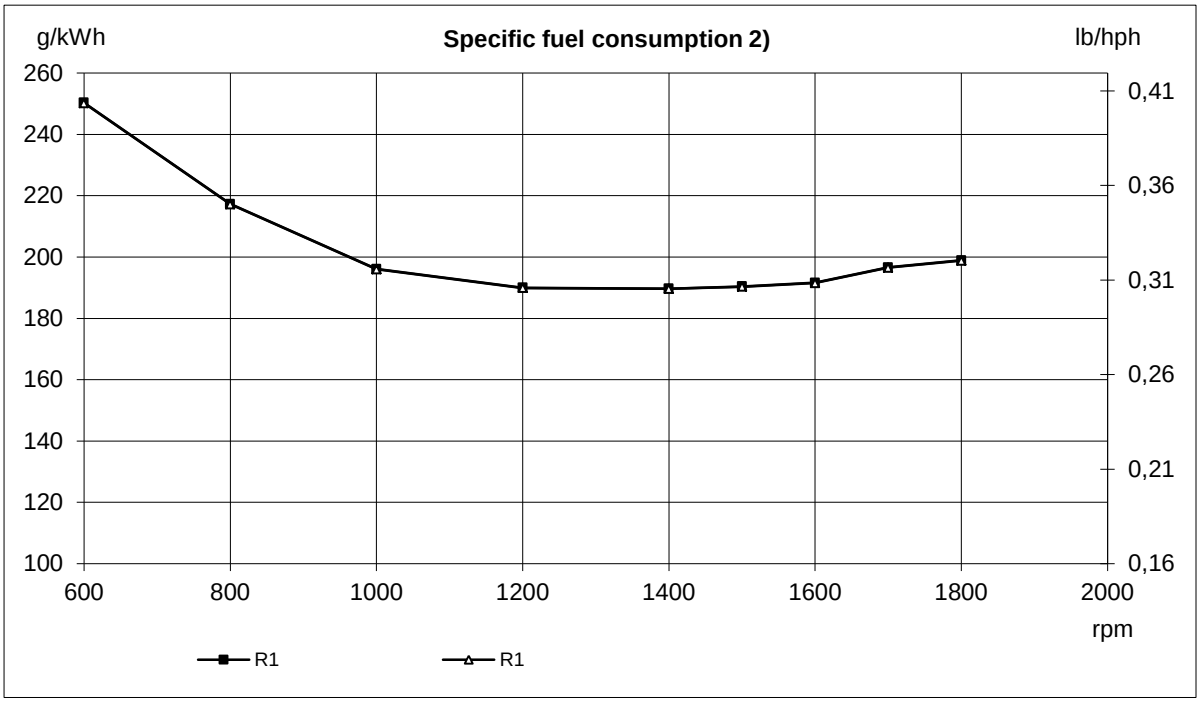

Nm
Torque measured at crankshaft
lbf ft
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1
1
1
0
0
0
0
0
600
800
1000
1200
1400
1600
1800
2000
rpm
R1
R1

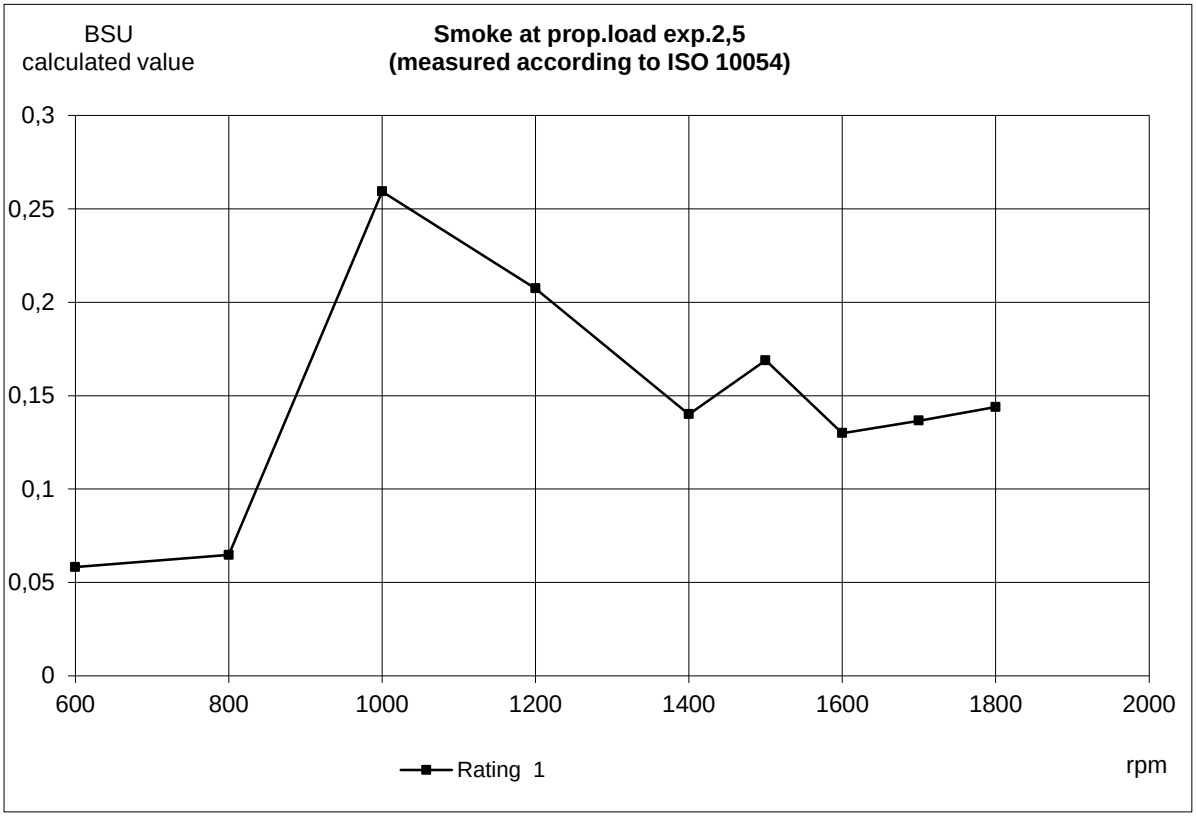

kW
Propellershaft power at full load
and propellershaft power at Calculated propeller load exp.2,5
hp, metric
300
250
200
150
100
50
0
1
1
1
1
0
0
0
600
800
1000
1200
1400
1600
1800
2000
rpm
R1
R1. Calc. Prop. load
R1

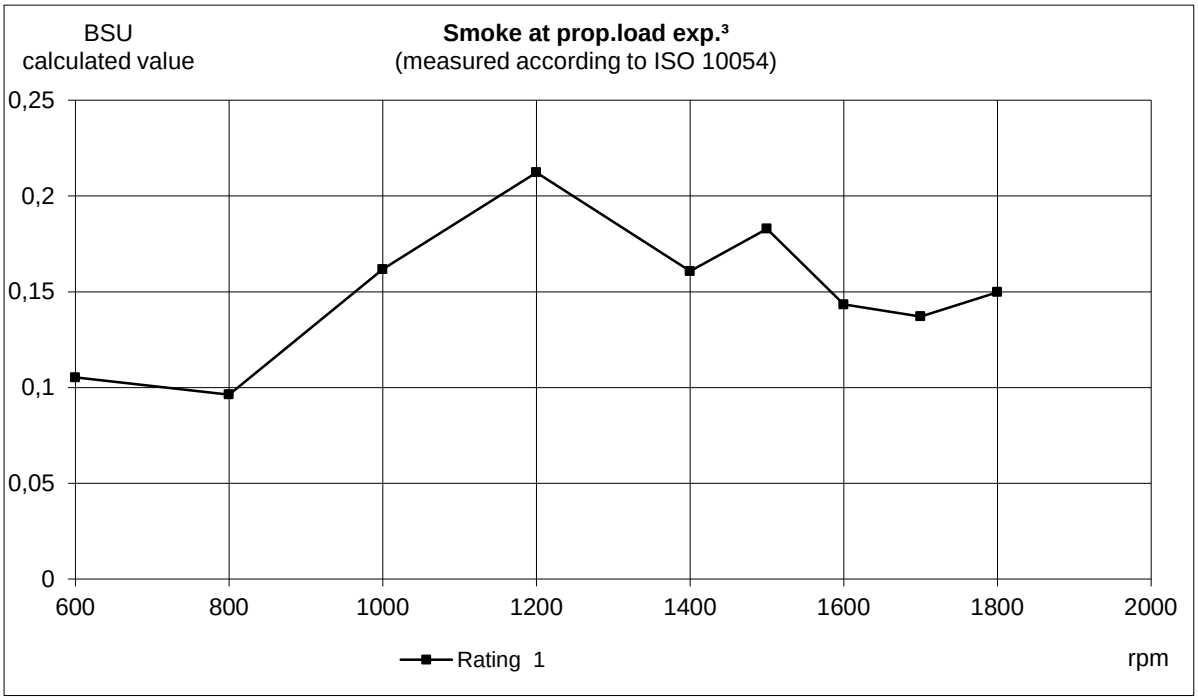

kW
Propellershaft power at full load
and propellershaft power at Calculated propeller load exp.3
hp, metric
300
250
200
150
100
50
0
1
1
1
1
0
0
0
600
800
1000
1200
1400
1600
1800
2000
rpm
R1
R1. Calc. Prop. load
R1

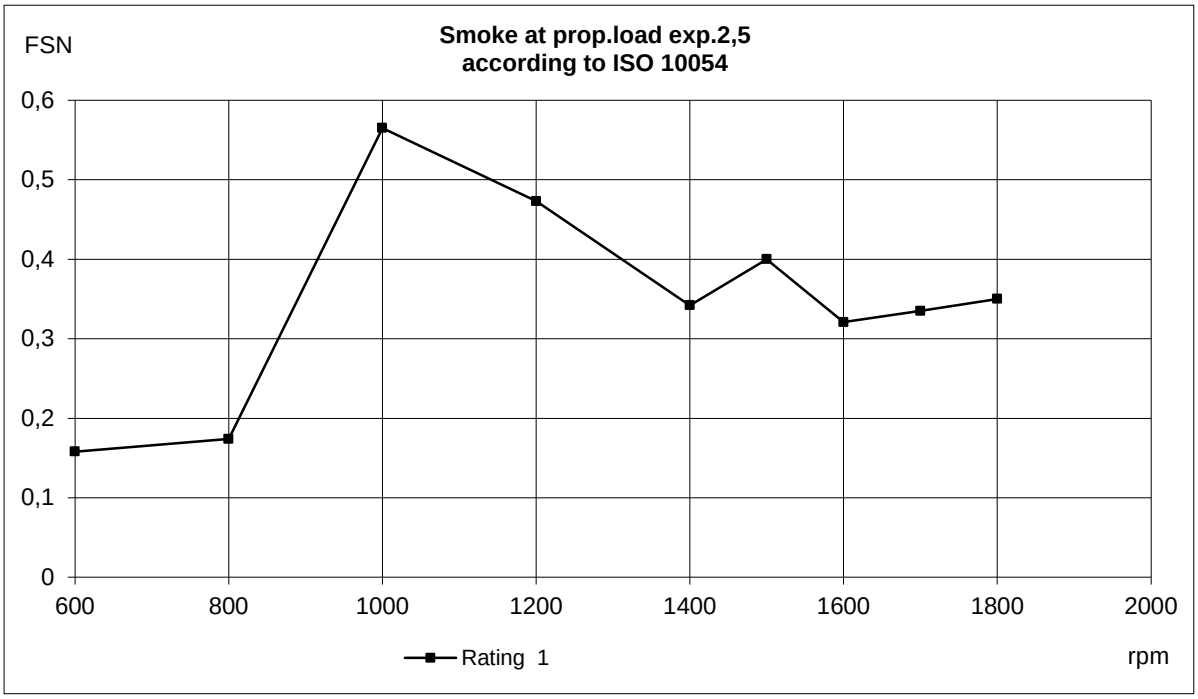

l/h
Fuel consumption at full load and fuel consumption at prop.load exp.2,5
US gal/h
80
70
60
50
40
30
20
10
0
20,00
15,00
10,00
5,00
0,00
600
800
1000
1200
1400
1600
1800
2000
rpm
R1
R1, exp2,5
R1

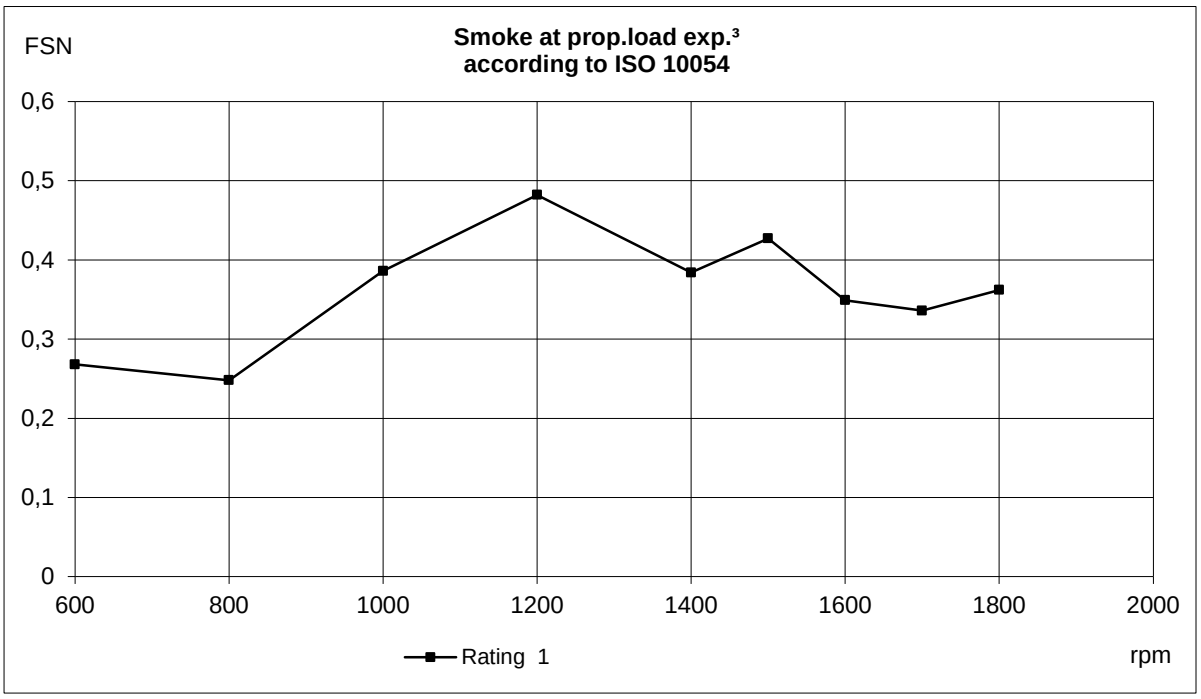

l/h
Fuel consumption at full load and fuel consumption at prop. load exp.3
US gal/h
80
70
60
50
40
30
20
10
0
20,0
15,0
10,0
5,0
0,0
600
800
1000
1200
1400
1600
1800
2000
rpm
R1
R1, exp3
R1

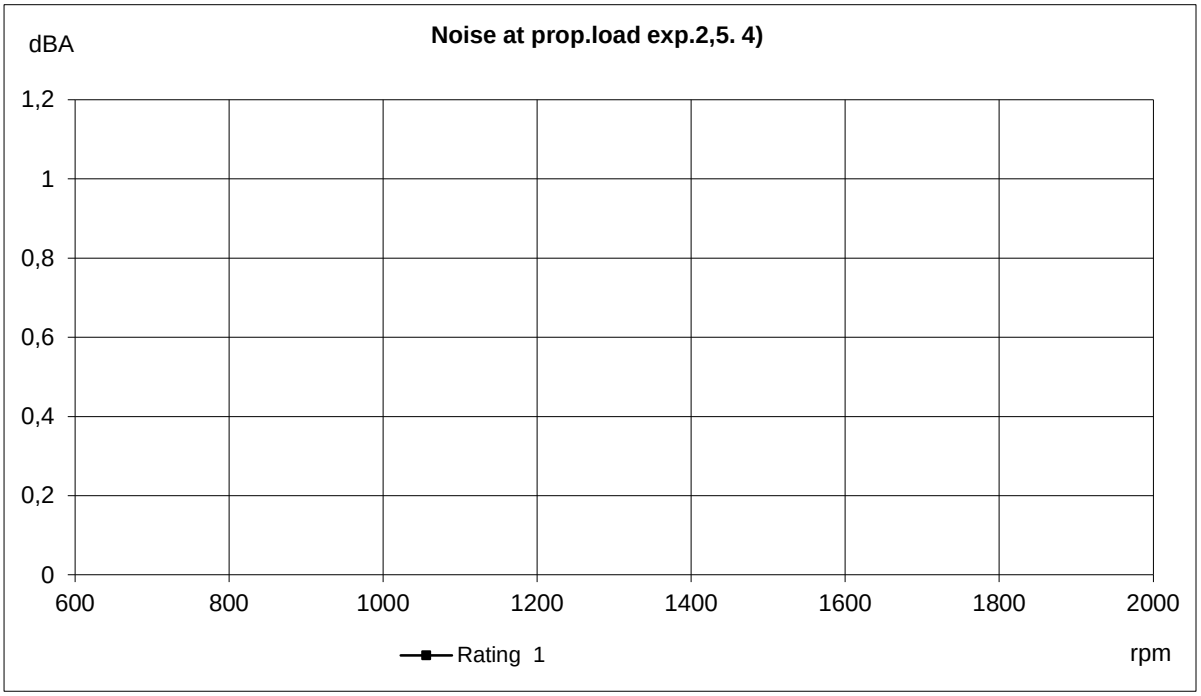

g/kWh
Specific fuel consumption 2)
lb/hph
260
240
220
200
180
160
140
120
100
0,41
0,36
0,31
0,26
0,21
0,16
600
800
1000
1200
1400
1600
1800
2000
rpm
R1
R1

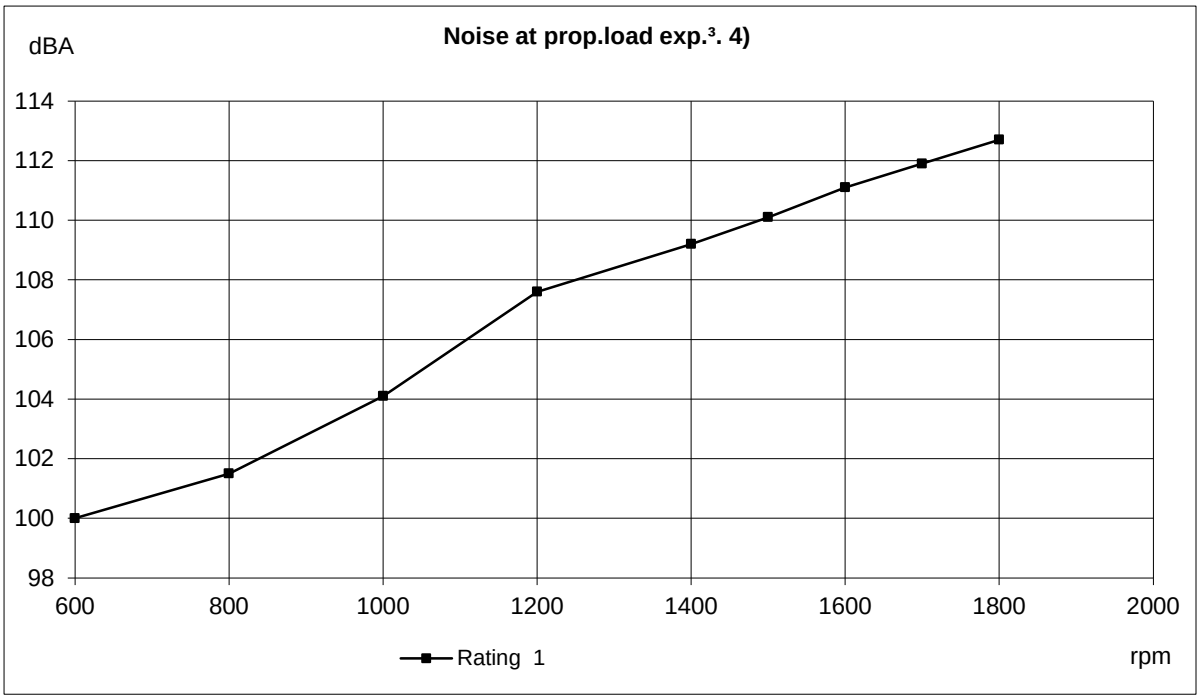

BSU
calculated value
Smoke at prop.load exp.2,5
(measured according to ISO 10054)
0,3
0,25
0,2
0,15
0,1
0,05
0
600
800
1000
1200
1400
1600
1800
2000
Rating 1
rpm


BSU
calculated value
Smoke at prop.load exp.³
(measured according to ISO 10054)
0,25
0,2
0,15
0,1
0,05
0
600
800
1000
1200
1400
1600
1800
2000
Rating 1
rpm


Smoke at prop.load exp.2,5
according to ISO 10054
FSN
0,6
0,5
0,4
0,3
0,2
0,1
0
600
800
1000
1200
1400
1600
1800
2000
Rating 1
rpm


Smoke at prop.load exp.3
according to ISO 10054
FSN
0,6
0,5
0,4
0,3
0,2
0,1
0
600
800
1000
1200
1400
1600
1800
2000
Rating 1
rpm

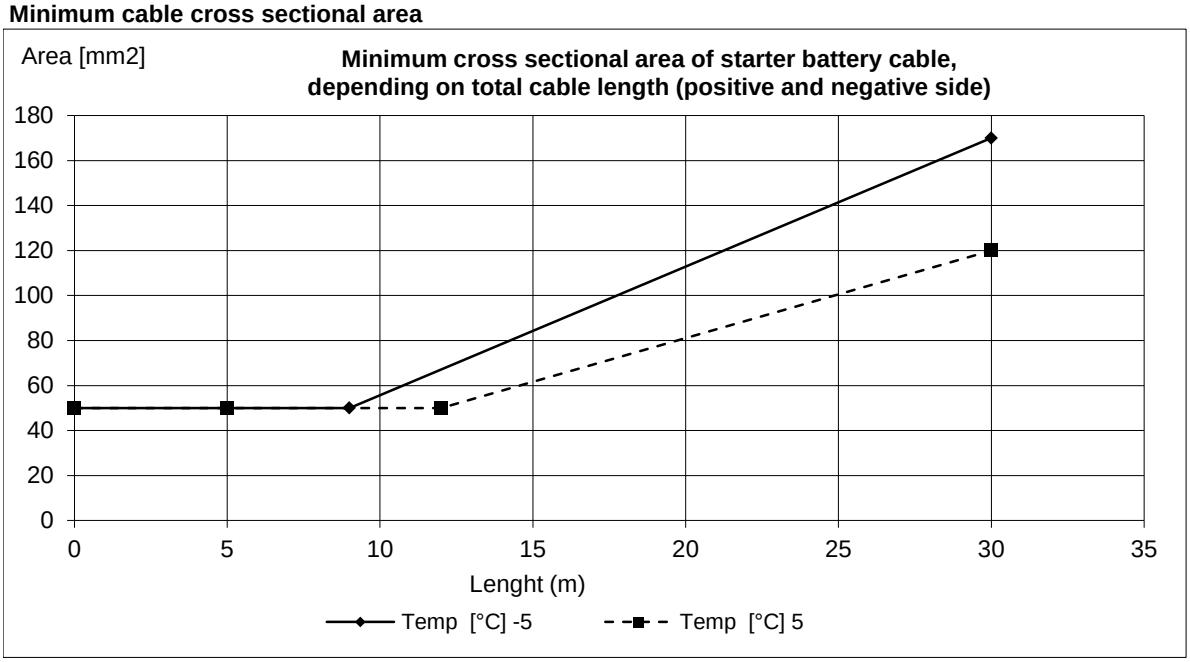

Noise at prop.load exp.2,5. 4)
dBA
1,2
1
0,8
0,6
0,4
0,2
0
600
800
1000
1200
1400
1600
1800
2000
Rating 1
rpm


Noise at prop.load exp.³. 4)
dBA
114
112
110
108
106
104
102
100
98
600
800
1000
1200
1400
1600
1800
2000
Rating 1
rpm

Battery capacity

Temp [°C]	Min battery size [Ah]	CCA EN (Cold cranking Amps) [A]	Max line resistance @ 20°C [mΩ]	Recommended max cable resistance @ 20°C [mΩ]	Min cross sectional area (due to heat increase) [mm²]
5					
-5					

Minimum cable cross sectional area



Fuses size:

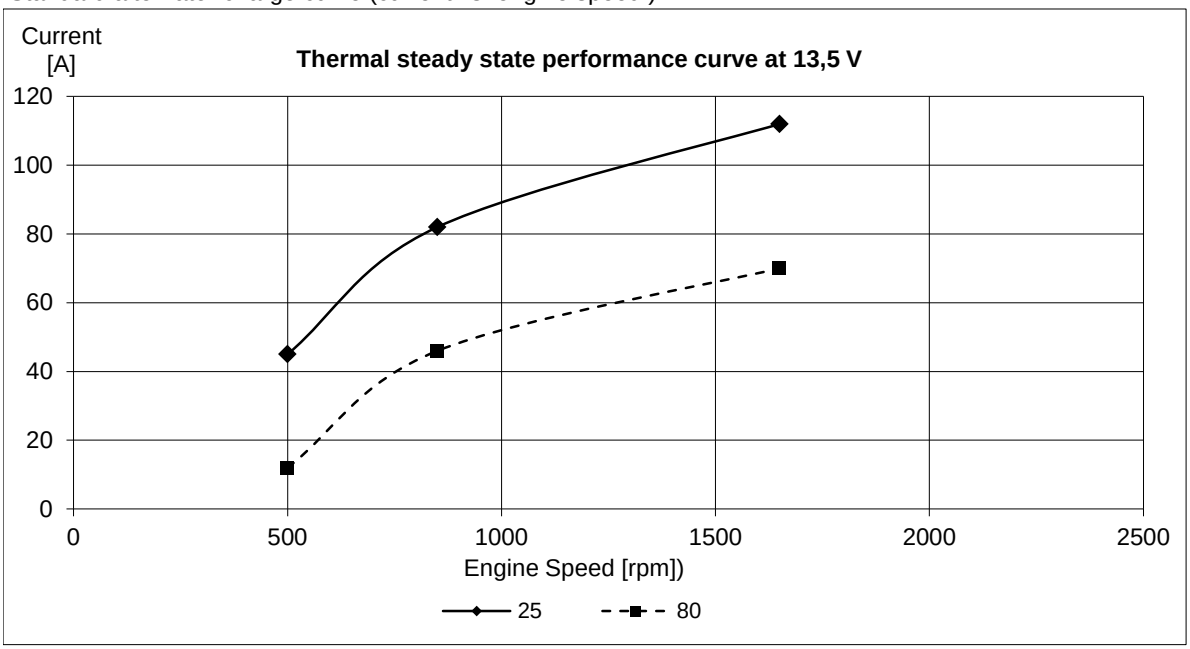
	[A]
Engine:	
Control system:	

Max current consumption during normal operation:

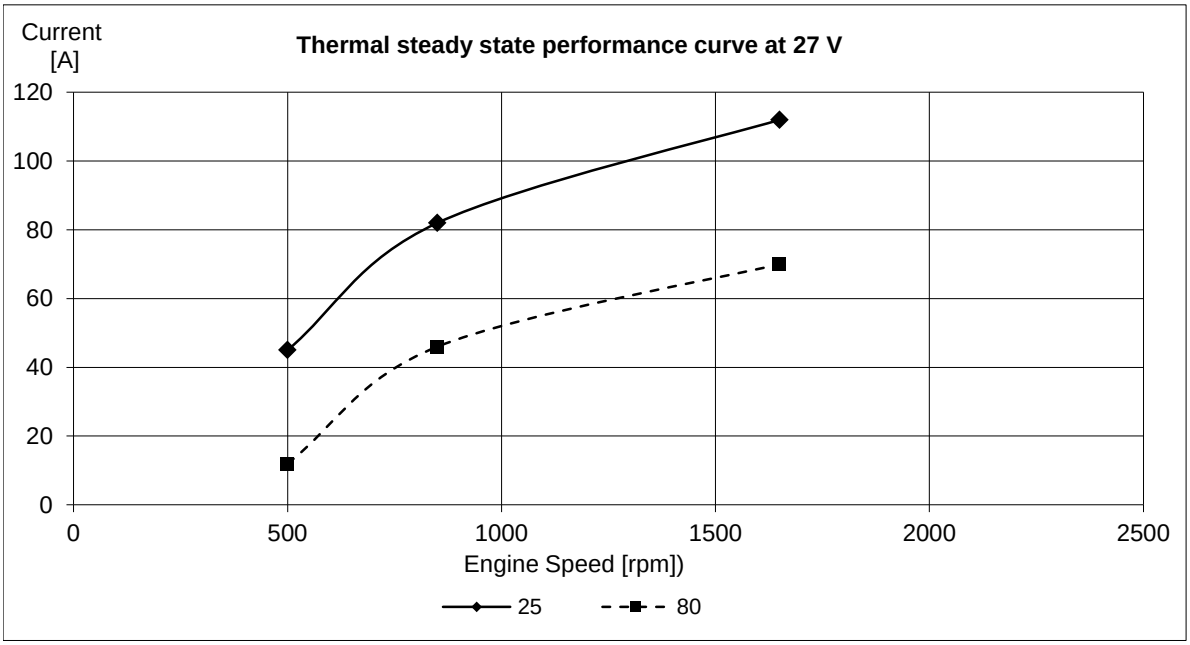
	[A]
Engine :	

Alternator data:

Standard alternator charge curve (current vs. engine speed.)



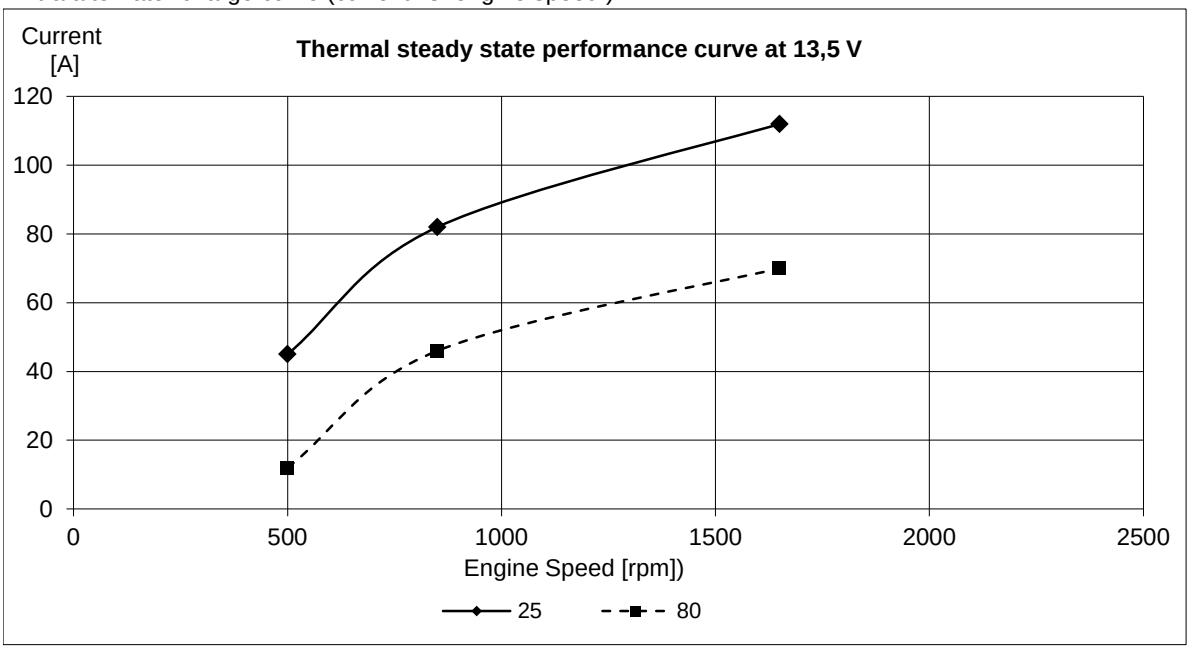
Constant charge voltage: [V]	14,3	+/- 0,3



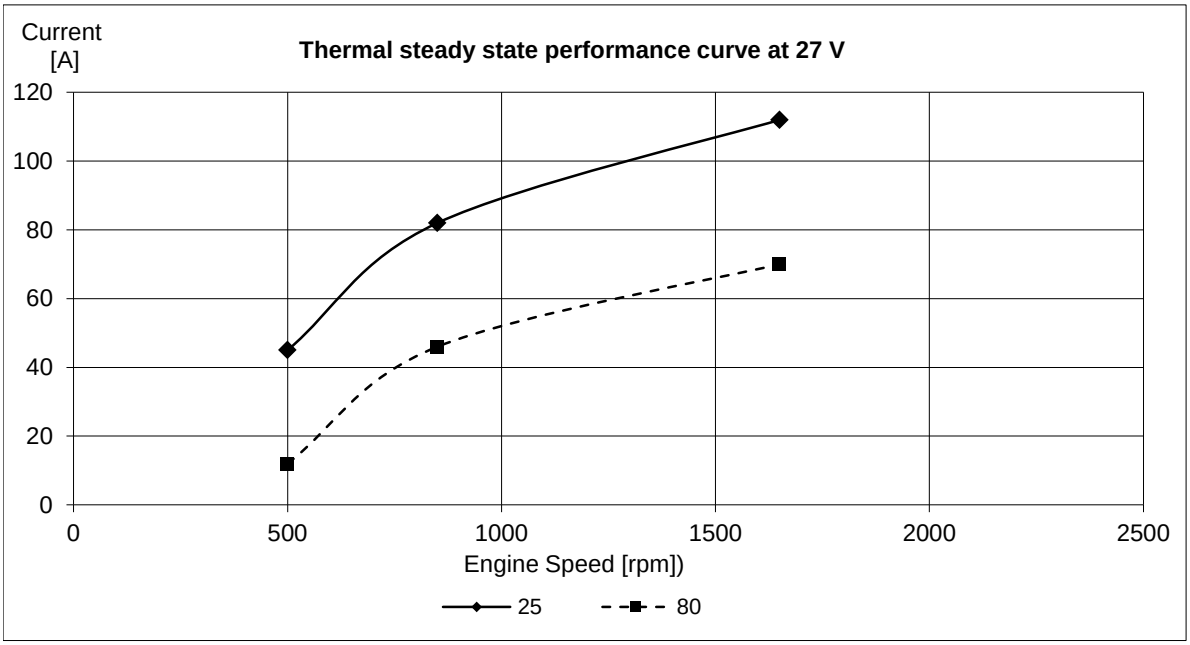
Constant charge voltage: [V]	28,3	+/- 0,3

Alternator data:

Extra alternator charge curve (current vs. engine speed.)



Constant charge voltage: [V]	14,3	+/- 0,3



Constant charge voltage: [V]	28,3	+/- 0,3