General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		5
No of valves		20
Displacement, total	litres in³	2,40 146,5
Firing order		1-2-4-5-3
Rotational direction, viewed from the front		Clockwise
Bore	mm in	81 3,19
Stroke	mm in	93,2 3,67
Compression ratio		16,5
Max. static forward inclination:	°	0
Max. static backward inclination:	°	5
Max. intermittent forward inclination while running:	°	10
Max. intermittent backward inclination while running:	°	20
Max. intermittent side inclination while running:	°	20
Idling speed	rpm	700 + 50
Rated speed R5	rpm	3000
Rated speed R5	rpm	3000
	rpm	
Propeller selection range R5	rpm	2900-3130
Propeller selection range R5	rpm	2900-3130
	rpm	
Dry weight engine BT	kg lb	260 573

1) ISO 3046, fuel temp 40°C.
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4) Acc. to ISO 3744
5) At installed back pressure

Performance	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Crankshaft power 1), 5)	5	kW	11	25	42	86	95	103	110	110	110	110
		hp	15	34	57	117	129	140	150	150	150	150
	5	kW	11	25	42	86	95	103	110	110	110	110
		hp	15	34	57	117	129	140	150	150	150	150
Propeller shaft power 1) (At full load) With drive	5	kW	10	24	40	82	90	98	105	105	105	105
		hp	14	32	54	111	123	133	142	142	142	142
With reverse gear	5	kW	11	24	40	83	91	99	106	106	106	106
		hp	14	33	55	112	124	134	144	144	144	144
Propellershaft power at prop. load $x^{2,5}$	5	kW	3	11	22	38	48	60	73	88	105	
		hp	4	14	30	52	65	81	99	120	142	
	5	kW	3	11	22	38	49	60	74	89	106	
		hp	4	15	30	52	66	82	100	121	144	
Torque at crankshaft 2)	5	Nm	150,1	198,9	250,7	410,6	412,4	409,8	404	375,2	350,1	335,6
		lbf ft	111	147	185	303	304	302	298	277	258	248
	5	Nm	150,1	198,9	250,7	410,6	412,4	409,8	404	375,2	350,1	335,6
		lbf ft	111	147	185	303	304	302	298	277	258	248
Mean piston speed		m/s	2,2	3,7	5,0	6,2	6,8	7,5	8,1	8,7	9,3	9,7
		ft/s	7,1	12,2	16,3	20,4	22,4	24,5	26,5	28,5	30,6	31,9
Effective mean pressure 2)	5	MPa	0,79	1,04	1,31	2,15	2,16	2,14	2,11	1,96	1,83	1,76
		psi	113,9	151,0	190,3	311,7	313,0	311,1	306,6	284,7	265,8	254,7
	5	MPa	0,79	1,04	1,31	2,15	2,16	2,14	2,11	1,96	1,83	1,76
		psi	113,9	151,0	190,3	311,7	313,0	311,1	306,6	284,7	265,8	254,7
Max combustion pressure 2)	5	MPa	10,2	11,1	12,9	15,4	14,9	14,6	14,2	13,6	12,8	13,1
		psi	1479	1610	1871	2234	2161	2118	2060	1973	1856	1900
	5	MPa	10,2	11,1	12,9	15,4	14,9	14,6	14,2	13,6	12,8	13,1
		psi	1479	1610	1871	2234	2161	2118	2060	1973	1856	1900

Lubricating system

Specific lubricating oil consumption.	g/kWh	0,29
Max. oil volume including filters for all allowed installation inclinations:	litres	6,3
	US gal	1,66
Max. oil volume excluding filters for all allowed installation inclinations:	litres	5,8
	US gal	1,53
Min. oil volume excluding filters for all allowed installation inclinations:	litres	4,3
	US gal	1,14

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Fuel system	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Specific fuel consumption 2)	5	g/kWh	352	253	247	216	211	212	215	215	217	217
		lb/hph	0,57	0,41	0,4	0,35	0,342	0,343	0,348	0,348	0,352	0,352
	5	g/kWh	352	253	247	216	211	212	215	215	217	217
		lb/hph	0,57	0,41	0,4	0,35	0,342	0,343	0,348	0,348	0,352	0,352
Fuel consumption, Test cycle E5	5	g/kWh	225									
		lb/hph	0,36									
	5	g/kWh	225									
		lb/hph	0,36									
Fuel consumption at prop. load x [2,5]	5	l/h	1,0	3,1	6,2	10,5	13,0	16,4	19,7	23,8	28,7	
		US gal/h	0,3	0,8	1,6	2,8	3,4	4,3	5,2	6,3	7,6	
	5	l/h	1,0	3,1	6,2	10,5	13,0	16,4	19,7	23,8	28,7	
		US gal/h	0,3	0,8	1,6	2,8	3,4	4,3	5,2	6,3	7,6	

Fuel system	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Fuel consumption at full load	5	l/h	4,6	7,6	12,4	22,2	24,0	26,1	28,3	28,3	28,6	28,6
		US gal/h	1,2	2,0	3,3	5,9	6,3	6,9	7,5	7,5	7,5	7,5
	5	l/h	4,6	7,6	12,4	22,2	24,0	26,1	28,3	28,3	28,6	28,6
		US gal/h	1,2	2,0	3,3	5,9	6,3	6,9	7,5	7,5	7,5	7,5

Intake and exhaust system	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Specific exhaust heating effect in percent of crankshaft power	5	%									73	
	5										73	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C									506	
		°F									943	
	5	°C									506	
		°F									943	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa							Max		15	
		psi									2,2	
		kPa							Min		5	
		psi									0,7	

Intake and exhaust system	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	5	m³/min									7,4	
		cu.ft./min									261,3	
	5	m³/min									7,4	
		cu.ft./min									261,3	
Charge air pressure Inlet manifold	5	kPa									230	
		psi									33,4	
	5	kPa									230	
		psi									33,4	
Exhaust gas flow	5	m³/min									18,3	
		cu.ft./min									646,3	
	5	m³/min									18,3	
		cu.ft./min									646,3	

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Cooling system	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Radiated heat in percent of crankshaft power.	5	%									8	
	5										8	
Heat rejection to charge air cooler in percent of crankshaft power.	5	%	2								15	
	5		2								15	
Coolant heat rejection to HE in percent of crankshaft power.	5	%	0								55	
	5		0								55	
Coolant flow with fully open thermostat and std cooling system		l/min cu.ft./min	45 1,6								208 7,3	
Max. permissible temperature on coolant in engine outlet		°C °F	98 208									
Coolant volume engine, including heat exchanger		litres US gal.	8,7 2,30									
Max. additional coolant for cabin heater etc. with std. Expansion tank		litres US gal.	8 2,11									
Maximum coolant flow to cabin heater etc.		l/min cu.ft./min	20 0,71									
Thermostat, start open at		°C °F	80 176									
Thermostat, fully open at		°C °F	94 201									

Raw water circuit	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Nominal raw water design flow	l/min cu.ft/min									105 3,7	
Nominal raw water pump pressure head at design flow. (measured before and after pump)	kPa psi									85 12,3	
Maximum raw water pump suction head	kPa psi	30 4,4									
Maximum additional pressure drop excl. reverse gear oil cooler and riser	kPa psi									14 2,0	
Pressure drop over reverse gear oil cooler (optional equipment)	kPa psi									7 1,0	
Maximum raw water temperature entering charge air cooler	°C °F	30 86									

Emissions	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Smoke at prop. load $x^{2,5}$	5	*BSU	0,0	0,1	0,3	0,3	0,2	0,3	0,1	0,3	0,4	
	5	*BSU	0,0	0,1	0,3	0,3	0,2	0,3	0,1	0,3	0,4	
Noise at prop. load $x^{2,5}$. 4)	5	dBA	90	97	103	108	112	112	112	112	111	
	5	dBA	90	97	103	108	112	112	112	112	111	

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

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