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	4000
Propeller selection range R5	rpm	3900-4130
Dry weight engine BT	kg lb	260 573

Performance	**Rating**	**rpm**	**700**	**1200**	**1600**	**2000**	**2400**	**2800**	**3200**	**3600**	**4000**	**4130**
Crankshaft power 1), 5)	5	kW	11	25	43	75	89	104	120	125	125	125
		hp	15	34	58	102	121	141	163	170	170	170
Propeller shaft power 1) (At full load) With drive	5	kW	10	24	41	71	85	99	114	119	119	119
		hp	14	32	56	97	115	134	155	162	162	162
With reverse gear	5	kW	11	24	41	72	85	100	115	120	120	120
		hp	14	33	56	98	116	136	157	163	163	163
Propellershaft power at prop. load $x^{2,5}$	5	kW	2	6	12	21	33	49	68	91	119	
		hp	2	8	16	29	45	66	92	124	162	
	5	kW	2	6	12	21	33	49	69	92	120	
		hp	2	8	17	29	46	67	93	125	163	
Torque at crankshaft 2)	5	Nm	150	199	257	358	354	355	358	332	298	289
		lbf ft	111	147	189	264	261	262	264	245	220	213
Mean piston speed		m/s	2,2	3,7	5,0	6,2	7,5	8,7	9,9	11,2	12,4	12,8
		ft/s	7,1	12,2	16,3	20,4	24,5	28,5	32,6	36,7	40,8	42,1
Effective mean pressure 2)	5	MPa	0,79	1,04	1,34	1,87	1,85	1,86	1,87	1,74	1,56	1,51
		psi	113,9	151,0	194,8	271,8	268,8	269,2	271,8	251,7	226,5	219,4
Max combustion pressure 2)	5	MPa	10	11,7	13,8	14,9	12,7	13,5	14,1	13,6	14,3	14,3
		psi	1450	1697	2002	2161	1842	1958	2045	1973	2074	2074

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

Lubricating system

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

Fuel system	**Rating**	**rpm**	**700**	**1200**	**1600**	**2000**	**2400**	**2800**	**3200**	**3600**	**4000**	**4130**
Specific fuel consumption 2)	5	g/kWh lb/hph	363 0,59	266 0,43	245 0,4	208 0,34	211 0,34	211 0,34	216 0,35	224 0,36	235 0,38	239 0,387
Fuel consumption, Test cycle E5	5	g/kWh lb/hph	238 0,39									
Fuel consumption at prop. load x [2,5]	5	l/h US gal/h	0,7 0,2	2,0 0,5	3,6 1,0	6,3 1,7	9,6 2,5	14,4 3,8	18,9 5,0	25,6 6,8	34,9 9,2	
Fuel consumption at full load	5	l/h US gal/h	4,8 1,3	8,0 2,1	12,6 3,3	18,7 4,9	22,5 5,9	26,3 6,9	31,0 8,2	33,5 8,9	35,2 9,3	35,8 9,4

Intake and exhaust system	**Rating**	**rpm**	**700**	**1200**	**1600**	**2000**	**2400**	**2800**	**3200**	**3600**	**4000**	**4130**
Specific exhaust heating effect in percent of crankshaft power	5	%									81	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C °F									439 822	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi							Max	25 3,6		
		kPa psi							Min	5 0,7		
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	5	m³/min cu.ft./min									10,9 385	
Charge air pressure Inlet manifold	5	kPa psi									264 38,3	
Exhaust gas flow	5	m³/min cu.ft./min									22,4 791	

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Cooling system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Radiated heat in percent of crankshaft power.	5	%									6	
Heat rejection to charge air cooler in percent of crankshaft power.	5	%									24	
Coolant heat rejection to HE in percent of crankshaft power.	5	%									51	
Coolant flow with fully open thermostat and std cooling system		l/min cu.ft./min									270 9,5	
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	2400	2800	3200	3600	4000	4130
Nominal raw water design flow	l/min cu.ft/min									131 4,6	
Nominal raw water pump pressure head at design flow. (measured before and after pump)	kPa psi									125 18,1	
Maximum raw water pump suction head	kPa psi	30 4,4									
Maximum additional pressure drop excl. reverse gear oil cooler and riser	kPa psi									28 4,1	
Pressure drop over reverse gear oil cooler (optional equipment)	kPa psi									9 1,3	
Maximum raw water temperature entering charge air cooler	°C °F	30 86									

Emissions	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Smoke at prop. load $x^{2,5}$	5	*BSU	0,0	0,0	0,0	0,2	0,1	0,3	0,1	0,2	0,5	
Noise at prop. load $x^{2,5}$. 4)	5	dBA	92	92	96	100	109	108	108	109	111	

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

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