

General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		5
No of valves		20
Displacement, total	litres in ³	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:	°	10
Max. intermittent forward inclination while running:	°	20
Max. intermittent backward inclination while running:	°	10
Max. intermittent side inclination while running:	°	20
Idling speed	rpm	700 + 50
Rated speed R5	rpm	4000
Rated speed R5	rpm	4000
Propeller selection range R5	rpm	3900-4130
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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	24	44	74	90	104	121	125	125	125
		hp	15	33	60	101	122	141	165	170	170	170
Propeller shaft power 1) (At full load) With drive	5	kW	10	23	42	70	86	99	115	119	119	119
		hp	14	31	57	96	116	134	156	162	162	162
Propellershaft power at prop. load x ^{2,5} With drive	5	kW	1	2	6	12	21	33	49	68	91	119
		hp	1	2	8	16	29	45	66	92	124	162
Torque at crankshaft 2)	5	Nm	150,1	191	262,6	353,3	358,1	354,7	361,1	331,6	298,4	289
		lbf ft	111	141	194	261	264	262	266	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	1,00	1,37	1,85	1,87	1,86	1,89	1,74	1,56	1,51
		psi	113,9	145,0	199,3	268,2	271,8	269,2	274,1	251,7	226,5	219,4
Max combustion pressure 2)	5	MPa	9,5	11,9	14,5	15,7	12,9	14	14,8	14,8	13,2	12,8
		psi	1378	1726	2103	2277	1871	2031	2147	2147	1914	1856

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	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

Fuel system

	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Specific fuel consumption 2)	5	g/kWh	284	265	239	209	212	212	217	223	241	247
		lb/hph	0,46	0,429	0,387	0,339	0,343	0,343	0,352	0,361	0,39	0,4
Fuel consumption, Test cycle E5	5	g/kWh	241									
		lb/hph	0,39									
Fuel consumption at prop. load x ^{2.5}	5	l/h		0,8	2,1	3,8	6,5	9,9	14,7	19,6	26,1	36,0
		US gal/h		0,2	0,5	1,0	1,7	2,6	3,9	5,2	6,9	9,5
Fuel consumption at full load	5	l/h	3,7	7,6	12,6	18,5	22,8	26,4	31,4	33,4	36,0	36,9
		US gal/h	1,0	2,0	3,3	4,9	6,0	7,0	8,3	8,8	9,5	9,8

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	%	54	65	65	58	67	68	73	78	93	97	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C	357	457	482	420	466	453	474	480	544	555	
		°F	675	855	900	788	871	847	885	896	1011	1031	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa								Max	25		
			psi									3,6	
		kPa								Min	5		
			psi									0,7	

Intake and exhaust system

	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPa and relative humidity 30%.	5	m³/min	0,7	1,6	2,7	4,8	6	7,3	8,8	9,7	9,9	10,1
		cu.ft./min	24,72	56,5	95,35	169,5	211,9	257,8	310,8	342,6	349,6	356,7
Charge air pressure Inlet manifold	5	kPa	105	126	162	230	234	249	257	255	239	239
		psi	15,2	18,3	23,5	33,4	33,9	36,1	37,3	37,0	34,7	34,7
Exhaust gas flow	5	m³/min	1,7	4,3	7,5	11,5	14,7	16,9	19,8	21,1	22,8	23,4
		cu.ft./min	60,03	151,9	264,9	406,1	519,1	596,8	699,2	745,1	805,2	826,4

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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	6	5	4	3	1	1
Heat rejection to charge air cooler in percent of crankshaft power.	5	%	2	5	9	15	15	17	18	19	18	18
Coolant heat rejection to HE in percent of crankshaft power.	5	%	0	109	87	69	65	63	63	66	76	78
Coolant flow with fully open thermostat and std cooling system		l/min	45	80	109	138	165,9	195	221	250	275	283
		cu.ft./min	1,6	2,8	3,8	4,9	5,9	6,9	7,8	8,8	9,7	10,0
Max. permissible temperature on coolant in engine outlet		°C	98									
		°F	208									
Coolant volume engine, including heat exchanger		litres	8,7									
		US gal.	2,30									
Max. additional coolant for cabin heater etc. with std. Expansion tank		litres	8									
		US gal.	2,11									
Maximum coolant flow to cabin heater etc.		l/min	20									
		cu.ft./min	0,71									
Thermostat, start open at		°C	80									
		°F	176									
Thermostat, fully open at		°C	94									
		°F	201									

Raw water circuit	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Nominal raw water design flow	l/min	27	46	61	76	89	103	114	125	135	138
	cu.ft./min	1,0	1,6	2,2	2,7	3,1	3,6	4,0	4,4	4,8	4,9
Nominal raw water pump pressure head at design flow. (measured before and after pump)	kPa	19	26	36	48	62	77	93	109	125	130
	psi	2,8	3,8	5,2	7,0	9,0	11,2	13,5	15,8	18,1	18,9
Maximum raw water pump suction head	kPa	30									
	psi	4,4									
Maximum additional pressure drop excl. reverse gear oil cooler and riser	kPa	0	1	3	5	8	12	17	22	28	30
	psi		0,1	0,4	0,7	1,2	1,7	2,5	3,2	4,1	4,4
Pressure drop over reverse gear oil cooler (optional equipment)	kPa	2	3	4	5	6	7	7	8	9	9
	psi	0,2	0,4	0,6	0,7	0,9	1,0	1,0	1,2	1,3	1,3
Maximum raw water temperature entering charge air cooler	°C	30									
	°F	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	0,1	0,4	0,4	0,6	0,2	0,3	0,7	
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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