

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
	rpm	
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	25	47	85	105	124	142	147	147	147
		hp	15	34	64	116	143	169	193	200	200	200
Propeller shaft power 1) (At full load) With reverse gear	5	kW	11	24	45	82	101	119	136	141	141	141
		hp	14	33	61	111	137	162	185	192	192	192
Propellershaft power at prop. load x ^{2,5} With reverse gear	5	kW	1	2	7	14	25	39	58	81	108	141
		hp	2	2	9	19	34	54	79	110	147	192
Torque at crankshaft 2)	5	Nm	150,1	198,9	280,5	405,8	417,8	422,9	423,8	389,9	350,9	339,9
		lbf ft	111	147	207	299	308	312	313	288	259	251
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	1,47	2,12	2,19	2,21	2,22	2,04	1,84	1,78
		psi	113,9	151,0	212,9	308,0	317,1	321,0	321,6	296,0	266,4	258,0
Max combustion pressure 2)	5	MPa	9,5	11,7	14,9	15,7	16,1	16,2	16,1	17,3	17,1	17
		psi	1378	1697	2161	2277	2335	2350	2335	2509	2480	2466

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	263	243	219	216	218	226	226	235	239
		lb/hph	0,46	0,426	0,394	0,355	0,35	0,353	0,366	0,366	0,381	0,387
Fuel consumption, Test cycle E5	5	g/kWh	230									
		lb/hph	0,37									
Fuel consumption at prop. load x ^{2,5}	5	g/kWh	230									
		lb/hph	0,37									
Fuel consumption at prop. load x ^{2,5}	5	l/h		0,9	2,3	4,3	7,2	11,0	16,1	22,0	29,7	41,5
		US gal/h		0,2	0,6	1,1	1,9	2,9	4,2	5,8	7,9	11,0
Fuel consumption at full load	5	l/h	3,7	7,9	13,7	22,3	27,1	32,3	38,4	39,8	41,3	42,0
		US gal/h	1,0	2,1	3,6	5,9	7,2	8,5	10,1	10,5	10,9	11,1

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	68	66	70	73	81	83	90	93	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C	355	460	503	531	548	572	619	583	592	595	
		°F	671	860	937	988	1018	1062	1146	1081	1098	1103	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa										Max	27
		psi											3,9
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa										Min	5
		psi											0,7
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	5	m³/min	0,8	1,6	2,8	4,8	6	7	8,3	9,5	10,2	10,5	
		cu.ft./min	28,25	56,5	98,88	169,5	211,9	247,2	293,1	335,5	360,2	370,8	
Charge air pressure Inlet manifold	5	kPa	105	126	167	229	238	243	245	253	250	250	
		psi	15,2	18,3	24,2	33,2	34,5	35,2	35,5	36,7	36,3	36,3	
Exhaust gas flow	5	m³/min	1,7	4,3	7,9	13,5	16,7	20	23,1	24,5	25,7	26,2	
		cu.ft./min	60,03	151,9	279	476,7	589,8	706,3	815,8	865,2	907,6	925,2	

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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	%				8	6	6	6	3	2	1
Heat rejection to charge air cooler in percent of crankshaft power.	5	%	2	5	9	13	13	13	14	16	17	18
Coolant heat rejection to HE in percent of crankshaft power.	5	%	0	91	81	70	66	66	67	67	71	73
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	102	114	125	135	137
	cu.ft./min	1,0	1,6	2,2	2,7	3,1	3,6	4,0	4,4	4,8	4,8
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	0,0	0,2	0,2	0,2	0,1	0,1	0,8	
Noise at prop. load x ^{2,5} . 4)	5	dBA	92	94	99	105	110	110	110	110	112	

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

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