

General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		5
No of valves		20
Displacement, total	litres	2,40
	in ³	146,5
Firing order		1-2-4-5-3
Rotational direction, viewed from the front		Clockwise
Bore	mm	81
	in	3,19
Stroke	mm	93,2
	in	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
Rated speed R5	rpm	4000
	rpm	
Propeller selection range R5	rpm	3900-4130
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	rpm	
Dry weight engine BT	kg	260
	lb	573

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

Performance	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Crankshaft power 1), 5)	5	kW	11	26	50	91	115	135	154	160	162	162
		hp	15	36	68	124	156	183	209	217	220	220
	5	kW	11	26	50	91	115	135	154	160	162	162
		hp	15	36	68	124	156	183	209	217	220	220
Propeller shaft power 1) (At full load) With drive	5	kW	11	25	47	86	109	128	146	152	154	154
		hp	14	34	64	117	148	174	198	207	209	209
With reverse gear	5	kW	11	25	48	87	110	129	147	154	156	156
		hp	15	34	65	119	150	176	200	209	212	212
Propellershaft power at prop. load x ^{2,5}	5	kW	2	8	16	27	43	63	88	118	154	
		hp	3	10	21	37	58	86	120	161	209	
	5	kW	2	8	16	27	43	64	89	120	156	
		hp	3	10	21	37	59	87	121	163	212	
Torque at crankshaft 2)	5	Nm	152,8	209,3	296,6	434	456,4	459,7	458,1	424,1	386,7	374,6
		lbf ft	113	154	219	320	337	339	338	313	285	276
	5	Nm	152,8	209,3	296,6	434	456,4	459,7	458,1	424,1	386,7	374,6
		lbf ft	113	154	219	320	337	339	338	313	285	276
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	0,80	1,10	1,55	2,27	2,39	2,41	2,40	2,22	2,02	1,96
		psi	116,0	158,9	225,1	329,4	346,4	348,9	347,7	321,9	293,5	284,3
	5	MPa	0,80	1,10	1,55	2,27	2,39	2,41	2,40	2,22	2,02	1,96
		psi	116,0	158,9	225,1	329,4	346,4	348,9	347,7	321,9	293,5	284,3
Max combustion pressure 2)	5	MPa	10,1	12	16,1	16	16,7	16,6	17,4	17,4	17,8	17,7
		psi	1465	1740	2335	2321	2422	2408	2524	2524	2582	2567
	5	MPa	10,1	12	16,1	16	16,7	16,6	17,4	17,4	17,8	17,7
		psi	1465	1740	2335	2321	2422	2408	2524	2524	2582	2567

Lubricating system

Specific lubricating oil consumption.	g/kWh	0,3
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	2400	2800	3200	3600	4000	4130
Specific fuel consumption 2)	5	g/kWh lb/hph	331,5 0,537	250,7 0,406	226,1 0,366	215 0,348	207,6 0,336	210,7 0,341	217,5 0,352	227 0,368	235 0,381	238 0,385
	5	g/kWh lb/hph	331,5 0,537	250,7 0,406	226,1 0,366	215 0,348	207,6 0,336	210,7 0,341	217,5 0,352	227 0,368	235 0,381	237,5 0,385
Fuel consumption, Test cycle E5	5	g/kWh lb/hph	224,1 0,36									
	5	g/kWh lb/hph	224,1 0,36									
Fuel consumption at prop. load x ^{2,5}	5	l/h US gal/h	0,9 0,2	2,4 0,6	4,6 1,2	7,8 2,1	11,6 3,1	17,0 4,5	23,8 6,3	32,7 8,7	45,5 12,0	
	5	l/h US gal/h	0,9 0,2	2,4 0,6	4,6 1,2	7,8 2,1	11,6 3,1	17,0 4,5	23,8 6,3	32,7 8,7	45,5 12,0	

Fuel system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Fuel consumption at full load	5	l/h US gal/h	4,5 1,2	7,9 2,1	13,5 3,6	23,4 6,2	28,6 7,5	34,1 9,0	40,1 10,6	43,5 11,5	45,7 12,1	46,2 12,2
	5	l/h US gal/h	4,5 1,2	7,9 2,1	13,5 3,6	23,4 6,2	28,6 7,5	34,1 9,0	40,1 10,6	43,5 11,5	45,7 12,1	46,2 12,2

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	%									90		
	5										90		
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C °F									544 1011		
	5	°C °F									544 1011		
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi								Max	30 4,4		
		kPa psi								Min	5 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 cu.ft./min									11,52 406,7	
	5	m³/min cu.ft./min									11,52 406,7	
Charge air pressure Inlet manifold	5	kPa psi									278 40,4	
	5	kPa psi									278 40,4	
Exhaust gas flow	5	m³/min cu.ft./min									26,27 927,6	
	5	m³/min cu.ft./min									26,27 927,6	

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5) At installed back pressure

Cooling system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Radiated heat in percent of crankshaft power.	5	%									7	
	5										7	
Heat rejection to charge air cooler in percent of crankshaft power.	5	%									21	
	5										21	
Coolant heat rejection to HE in percent of crankshaft power.	5	%									53	
	5										53	
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	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 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	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	0,0	0,1	0,1	0,1	0,2	0,5	
	5	*BSU	0,0	0,0	0,0	0,0	0,1	0,1	0,1	0,2	0,5	
Smoke at prop. load x ³	5	*BSU	0,0	0,0	0,1	0,0	0,0	0,1	0,1	0,2	0,5	
	5	*BSU	0,0	0,0	0,1	0,0	0,0	0,1	0,1	0,2	0,5	
Noise at prop. load x ^{2.5} . 4)	5	dBA	92	95	100	106	111	110	111	111	112	
	5	dBA	92	95	100	106	111	110	111	111	112	

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

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