General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		4
No of valves		16
Displacement, total	litres in³	3,67 223,7
Firing order		1-3-4-2
Rotational direction, viewed from the front		Clockwise
Bore	mm in	103 4,06
Stroke	mm in	110 4,33
Compression ratio		17.5:1
Max. static forward inclination:	°	0
Max. static backward inclination:	°	10
Max. intermittent forward inclination while running:	°	10
Max. intermittent backward inclination while running:	°	20
Max. intermittent side inclination while running:	°	30 for max 30 sec
Idling speed	rpm	700 - 750
Rated speed R5	rpm	3500
Rated speed R5	rpm	3500
Propeller selection range R5	rpm	3400-3600
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Dry weight engine BT	kg lb	483 1065
Dry weight with reverse gear HS63AE	kg lb	559 1232
Dry weight with reverse gear HS63IVE	kg lb	595 1312
Dry weight with reverse gear HS80AE	kg lb	580 1279
Dry weight with reverse gear HS80IVE	kg lb	624 1376

Performance	**Rating**	**rpm**	**1000**	**1500**	**2000**	**2500**	**3000**	**3500**				
Crankshaft power 1), 5)	5	kW	29	56	113	184	215	221				
		hp	39	76	154	250	292	301				
Propeller shaft power 1) (At full load)	5	kW	28	54	108	177	206	212				
With reverse gear		hp	38	73	148	240	281	289				
Propellershaft power at prop. load $x^{2,5}$	5	kW	9	26	52	91	144	212				
With reverse gear		hp	13	35	71	124	196	289				
Propellershaft power at prop. load x^3	5	kW	5	17	40	77	134	212				
With reverse gear		hp	7	23	54	105	182	289				
Torque at crankshaft 2)	5	Nm	276,9	356,5	539,5	702,8	684,4	603				
		lbf ft	204	263	398	518	505	445				
Mean piston speed		m/s	3,7	5,5	7,3	9,2	11,0	12,8				
		ft/s	12,0	18,0	24,1	30,1	36,1	42,1				
Effective mean pressure 2)	5	MPa	0,95	1,22	1,85	2,41	2,35	2,07				
		psi	137,7	177,2	268,2	349,4	340,2	299,8				
Max combustion pressure 2)	5	MPa	18	19	19	18	18	18				
		psi	2611	2756	2756	2611	2611	2611				

Lubricating system

Specific lubricating oil consumption.	g/kWh	< 0,2
Max. oil volume including filters for all allowed installation inclinations:	litres US gal	12 3,17
Min. oil volume excluding filters for all allowed installation inclinations:	litres US gal	10,5 2,77

Fuel system	**Rating**	**rpm**	**1000**	**1500**	**2000**	**2500**	**3000**	**3500**
Specific fuel consumption 2)	5	g/kWh lb/hph	277 0,449	238 0,386	232 0,376	206 0,334	207 0,335	221 0,358
Fuel consumption, Test cycle E5	5	g/kWh lb/hph	225 0,36					
Fuel consumption at prop. load x [2,5]	5	l/h US gal/h	3,0 0,8	7,1 1,9	14,4 3,8	24,4 6,4	38,7 10,2	58,4 15,4
Fuel consumption at prop. load x [3]	5	l/h US gal/h	2,0 0,5	5,0 1,3	11,2 2,9	21,1 5,6	36,1 9,5	58,4 15,4
Fuel consumption at full load	5	l/h US gal/h	9,6 2,5	15,9 4,2	31,4 8,3	45,4 12,0	53,3 14,1	58,4 15,4

Intake and exhaust system	**Rating**	**rpm**	**1000**	**1500**	**2000**	**2500**	**3000**	**3500**
Specific exhaust heating effect in percent of crankshaft power	5	%						64
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C °F	195 383	300 572	400 752	460 860	485 905	560 1040
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi						Max 30 4,4
		kPa psi						Min 10 1,5
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	5	m³/min cu.ft./min						17,3 610,9
	5	m³/min cu.ft./min						17,3 610,9
Charge air pressure Inlet manifold	5	kPa psi						225 32,6
Exhaust gas flow	5	m³/min cu.ft./min						33,3 1176

Cooling system	Rating	rpm	1000	1500	2000	2500	3000	3500				
Radiated heat in percent of crankshaft power.	5	%						3				
Heat rejection to charge air cooler in percent of crankshaft power.	5	%						26				
Coolant heat rejection to HE, incl. engine oil cooler and excl. charge air cooler, in percent of crankshaft power.	5	%						74				
Coolant flow with fully open thermostat and std cooling system		l/min cu.ft./min						360 12,7				
Extra water pump flow through charge air cooler		l/min cu.ft./min						172 6,1				
Max. permissible temperature on coolant in engine outlet		°C °F	55 131									
Coolant volume engine, including heat exchanger and charge air cooler		litres US gal.	13 3,43									
Max. additional coolant for cabin heater etc. with std. Expansion tank		litres US gal.	5 1,32									
Maximum coolant flow to cabin heater etc.		l/min cu.ft./min	30 1,06									
Thermostat, start open at		°C °F	82 180									
Thermostat, fully open at		°C °F	92 198									

Raw water circuit	rpm	1000	1500	2000	2500	3000	3500				
Nominal raw water design flow	l/min cu.ft/min						172 6,1				
Maximum raw water temperature entering heat exchanger	°C °F	30 86									

Emissions	Rating	rpm	1000	1500	2000	2500	3000	3500				
Smoke at prop. load $x^{2,5}$	5	*BSU	0,3	0,2	0,4	0,3	0,3	0,9				
Smoke at prop. load x^3	5	*BSU	0,5	0,3	0,9	0,4	0,3	0,9				
Noise at prop. load $x^{2,5}$. 4)	5	dBA		101,5	104,2	107	109,4	111				

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