

# Technical Data D1-20

## Rating

### General

4-stroke in-direct injected, diesel engine

Number of cylinders		3
No of valves		6
Displacement, total	litres in <sup>3</sup>	0,76 46,5
Firing order		1-2-3
Rotational direction, viewed from the front		Clockwise
Bore	mm in	67 2,64
Stroke	mm in	72 2,83
Compression ratio		23,5:1
Compression pressure at 240 rpm	MPa psi	
Maximum forward inclination:	°	0
Max. intermittent backward tilt while running:	°	25
Max. intermittent side tilt while running:	°	35
Idling speed	rpm	850 ± 25
Rated speed	rpm	3200
Propeller selection range	rpm	2800-3200
Dry weight engine BT	kg lb	118 260

Performance		Rating	r/min	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
Crankshaft power 1), 5)		kW	5	6,1	7,4	8,5	9,6	10,6	11,8	12,5	13,1	13,3	13,8	
		hp	6,8	8,296	10,06	11,56	13,06	14,42	16,05	17	17,82	18,09	18,77	
Propeller shaft power 1) (At full load) With reverse gear MS 10		kW	4,8	5,856	7,104	8,16	9,216	10,18	11,33	12	12,58	12,77	13,25	
		hp	6,528	7,964	9,661	11,1	12,53	13,84	15,41	16,32	17,1	17,36	18,02	
Propellershaft power at prop.load x <sup>3</sup> With reverse gear MS 10		kW	0,7	1,1	1,7	2,3	3,2	4,3	5,6	7,1	8,8	10,9	13,2	
		hp	0,9	1,5	2,2	3,2	4,4	5,8	7,6	9,6	12,0	14,8	18,0	
Torque at crankshaft 2)		Nm	39,79	41,61	44,17	45,09	45,84	46,01	46,95	45,91	44,68	42,34	41,18	
		lbf ft	29	31	33	33	34	34	35	34	33	31	30	
Mean piston speed		m/s	2,9	3,4	3,8	4,3	4,8	5,3	5,8	6,2	6,7	7,2	7,7	
		ft/s	9,4	11,0	12,6	14,2	15,7	17,3	18,9	20,5	22,0	23,6	25,2	
Effective mean pressure 2)		MPa	0,66	0,69	0,73	0,74	0,76	0,76	0,77	0,76	0,74	0,70	0,68	
		psi	95,2	99,6	105,7	107,9	109,7	110,1	112,4	109,9	106,9	101,3	98,6	

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

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### Lubricating system

Max oil volume excl. filters at following inclination:		litres	2,8										
		US gal	0,74										

### Fuel system

	Rating	r/min	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
Specific fuel consumption 2)		g/kWh	289	279	276	271	268	266	262	266	269	274	281
		lb/hph	0,468	0,452	0,447	0,439	0,434	0,431	0,424	0,431	0,436	0,444	0,455
Fuel consumption at prop. load x <sup>3</sup>		l/h	0,5	0,7	0,9	1,0	1,3	1,6	2,0	2,4	3,0	3,7	4,6
		US gal/h	0,1	0,2	0,2	0,3	0,3	0,4	0,5	0,6	0,8	1,0	1,2
Fuel consumption at full load		l/h	1,7	2,0	2,4	2,8	3,1	3,4	3,7	4,0	4,2	4,4	4,6
		US gal/h	0,5	0,5	0,6	0,7	0,8	0,9	1,0	1,1	1,1	1,2	1,2

### Intake and exhaust system

	Rating	r/min	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.		°C	429	448	474	496	508	521	511	538	540	531	527	
		°F	804	838	885	925	946	970	952	1000	1004	988	981	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi							Max	20 2,9				
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPa and relative humidity 30%.		m³/min	0,383	0,45	0,5	0,567	0,617	0,683	0,767	0,8	0,85	0,9	0,967	
		cu.ft./min	13,54	15,89	17,66	20,01	21,78	24,13	27,07	28,25	30,02	31,78	34,14	
Exhaust gas flow		m³/min	0,967	1,133	1,333	1,5	1,667	1,817	2	2,1	2,217	2,3	2,383	
		cu.ft./min	34,14	40,02	47,09	52,97	58,86	64,15	70,63	74,16	78,28	81,22	84,17	

### Cooling system

	Rating	r/min	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
Radiated heat in percent of crankshaft power.		%	20	20	21	15	14	12	10	8	12	12	12
Coolant heat rejection to HE, excl. oil- and aftercooler, in percent of crankshaft power.		%	151	139	135	132	129	126	124	127	124	131	133
Sea water pump flow.		m³/h foot³/h	1,2 42	1,4 49	1,3 47	1,5 53	1,7 59	1,8 64	2,0 70	2,1 74	2,2 78	2,4 85	2,5 89
Fresh water circulation pump flow		m³/h foot³/h	1,1 40	1,3 47	1,6 55	1,7 61	2,0 70	2,2 78	2,4 85	2,6 93	2,8 100	3,0 106	3,2 114
Max permissible temperature on fresh water circulation outlet from the engine		°C °F	105										
			221										
Coolant content engine, incl. heat exchangers and air cooler		litres U.S. gal.	3										
			0,79										

### Emissions

	Rating	r/min	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
Smoke at prop. load x <sup>3</sup>		*BSU	0,1	0,0	0,0	0,1	0,2	0,2	0,2	0,3	0,6	0,6	1,0

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

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5) At installed back pressure