

# Technical Data D12D-E MH 450

Rating 1.

## General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		6
No of valves		24
Displacement, total	litres	12,13
	in <sup>3</sup>	740,2
Firing order		1-5-3-6-2-4
Rotational direction, viewed from the front		Clockwise
Bore	mm	131
	in	5,16
Stroke	mm	150
	in	5,91
Compression ratio		17.5:1
Compression pressure at 240 rpm	MPa	-
Maximum forward inclination:	°	0
Max. intermittent backward tilt while running:	°	20
Max. intermittent side tilt while running:	°	30
Idling speed	rpm	525
Rated speed	rpm	1800
Propeller selection range	rpm	1800 - 1850

## Performance

	Rating	r/min	1000	1200	1400	1600	1800						
Crankshaft power 1), 5)	1	kW	177	252	296	318	331						
		hp	241	343	403	432	450						
Propellershaft power 1) (At full load)	1	kW	172	244	287	308	321						
		hp	233	332	390	420	437						
Propellershaft power at prop.load x <sup>3</sup>	1	kW	55	95	151	225	321						
		hp	75	129	205	306	437						
Torque at crankshaft 2)	1	Nm	1690	2005	2019	1898	1756						
		lbf ft	1247	1479	1489	1400	1295						
Mean piston speed		m/s	5,0	6,0	7,0	8,0	9,0						
		ft/s	16,4	19,7	23,0	26,2	29,5						
Effective mean pressure 2)	1	MPa	1,75	2,08	2,09	1,97	1,82						
		psi	254,0	301,3	303,4	285,2	263,8						
Max combustion pressure 2)	1	MPa	16,5	17,6	18,9	18,7	17,9						
		psi	2396	2554	2741	2718	2589						

## Lubricating system

Specific lubricating oil consumption.		g/kWh	0,2
Max oil volume excl. filters at following inclination:	0 °	litres	50
Min oil volume excl. filters at following inclination:	0 °	litres	40
Max oil volume excl. filters at following inclination:	5 °	litres	43
Min oil volume excl. filters at following inclination:	5 °	litres	32
Max oil volume excl. filters at following inclination:	10 °	litres	37
Min oil volume excl. filters at following inclination:	10 °	litres	26

## Fuel system

	Rating	r/min	1000	1200	1400	1600	1800						
Specific fuel consumption 2)	1	g/kWh	220	201	194	196	207						
		lb/hph	0,356	0,326	0,314	0,318	0,335						
Fuel consumption at prop. load x <sup>3</sup>	1	l/h	14,8	24,6	38,1	56,0	81,6						
		US gal/h	3,9	6,5	10,1	14,8	21,6						
Fuel consumption at full load	1	l/h	46,4	60,3	68,4	74,2	81,6						
		US gal/h	12,2	15,9	18,1	19,6	21,6						

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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Intake and exhaust system	Rating	r/min	1000	1200	1400	1600	1800						
Specific exhaust heating effect in percent of crankshaft power	1	%	60	55	52	52	58						
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	1	°C °F	492 918	426 799	358 676	312 594	302 576						
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi						Max	15 2,2				
		kPa psi						Min	0				
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPa and relative humidity 30%.	1	m³/min cu.ft./min	9,2 324,9	14,1 497,9	19,1 674,5	24,1 851,1	29 1024						
Turbo charge pressure.	1	kPa psi	74 10,7	126 18,3	165 23,9	197 28,6	226 32,8						
Exhaust gas flow	1	m³/min cu.ft./min	25,8 911,1	35,2 1243	41,8 1476	47,2 1667	54 1907						

Cooling system	Rating	r/min	1000	1200	1400	1600	1800						
Radiated heat in percent of crankshaft power.	1	%	6	2	1	1	1						
Heat rejection to after cooler in percent of crankshaft power.	1	%	7	12	16	21	27						
Heat rejection to engine oil cooler in percent of crankshaft power 3).	1	%	15	13	11	12	12						
Cooling water heating effect incl. oil and after cooler in percent of crankshaft	1	%	96	82	79	81	90						
Total pumphead freshwater circulation pump.		kPa	119	140	170	198	230						
		In H <sub>2</sub> O	478	562	683	795	923						
Highest permissible pressure drop in outer circuit at keel cooling.		kPa						50					
		In H <sub>2</sub> O						201					
Sea water pump flow.		m³/h	11,8	14,4	16,9	18,9	20,9						
		foot³/h	417	509	597	667	738						
Cooling water circulation pump flow		m³/h	12,6	14,9	18,0	20,8	23,0						
		foot³/h	445	526	636	735	812						
Max permissible temperature on fresh water circulation outlet from the engine		°C						100					
		°F						212					
Coolant content engine, incl. heat exchangers and air cooler		litres						60					
		U.S. gal.						15,85					
Thermostat, start open at		°C						76					
		°F						169					
Thermostat, fully open at		°C						86					
		°F						187					

Emissions	Rating	r/min	1000	1200	1400	1600	1800						
Smoke at prop. load x <sup>3</sup>	1	BSU	1,6	0,5	0,2	0,1	0,3						
Noise at prop. load x <sup>3</sup> . 4)	1	dBA	107	109	111	113	115						

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