

<b>VOLVO PENTA</b> D13B-B MP R5 800hp	Document No	Issue Index
	<b>21345287</b>	<b>02</b>

## General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		6
No of valves		24
Displacement, total	litres in <sup>3</sup>	12,78 779,7
Firing order		1-5-3-6-2-4
Rotational direction, viewed from the front		Clockwise
Bore	mm in	131 5,16
Stroke	mm in	158 6,22
Compression ratio		16.7:1
Max. static forward inclination:	°	0
Max. static backward inclination:	°	10
Max. intermittent forward inclination while running:	°	5
Max. intermittent backward inclination while running:	°	17
Max. intermittent side inclination while running:	°	30
Idling speed	rpm	600 + 200 / -50
Rated speed R5	rpm	2300
	rpm	2300
Propeller selection range R5	rpm	2250-2370
Dry weight engine BT	kg lb	1450 3197

Performance	Rating	rpm	600	800	1000	1200	1400	1600	1800	2000	2100	2300
Crankshaft power 1), 5)	5	kW	66	113	209	368	430	492	553	588	588	588
		hp	90	154	284	500	585	669	752	800	800	800
Propeller shaft power 1) (At full load) With drive	5	kW	63	108	201	353	413	472	531	564	564	564
		hp	86	148	273	480	561	642	722	768	768	768
Propellershaft power at prop. load x <sup>2,5</sup>	5	kW	20	40	70	111	163	228	306	398	450	564
		hp	27	55	96	151	222	310	416	541	612	768
Propellershaft power at prop. load x <sup>3</sup>	5	kW	10	24	46	80	127	190	271	371	430	564
		hp	14	32	63	109	173	258	368	505	584	768
Torque at crankshaft 2)	5	Nm	1050	1349	1996	2928	2933	2936	2934	2807	2674	2441
		lbf ft	775	995	1472	2160	2163	2166	2164	2071	1972	1801
Mean piston speed		m/s	3,2	4,2	5,3	6,3	7,4	8,4	9,5	10,5	11,1	12,1
		ft/s	10,4	13,8	17,3	20,7	24,2	27,6	31,1	34,6	36,3	39,7
Effective mean pressure 2)	5	MPa	1,03	1,33	1,96	2,88	2,88	2,89	2,89	2,76	2,63	2,40
		psi	149,8	192,4	284,7	417,7	418,4	418,9	418,5	400,5	381,4	348,2
Max combustion pressure 2)	5	MPa	10	11,9	16,8	20,2	20,3	20,2	20,3	20,1	20,2	20,1
		psi	1450	1726	2437	2930	2944	2930	2944	2915	2930	2915

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

Specific lubricating oil consumption.	g/kWh	0,05
Max. oil volume including filters for all allowed installation inclinations:	litres	45
	US gal	11,89
Max. oil volume excluding filters for all allowed installation inclinations:	litres	40
	US gal	10,57
Min. oil volume excluding filters for all allowed installation inclinations:	litres	32
	US gal	8,45

### Fuel system

	Rating	rpm	600	800	1000	1200	1400	1600	1800	2000	2100	2300
Specific fuel consumption 2)	5	g/kWh	227,4	221,1	214,5	199,3	188,7	191,9	197,6	203,4	206,2	211,7
		lb/hph	0,368	0,358	0,347	0,323	0,306	0,311	0,32	0,33	0,334	0,343
Fuel consumption, Test cycle E5	5	g/kWh	209									
		lb/hph	0,34									
Fuel consumption, Test cycle E3		g/kWh	207,8									
		lb/hph	0,34									
Fuel consumption at prop. load x <sup>2,5</sup>	5	l/h	5,8	11,0	18,5	28,4	40,7	55,9	75,0	99,4	115,3	149,1
		US gal/h	1,5	2,9	4,9	7,5	10,7	14,8	19,8	26,3	30,4	39,4

### Fuel system

	Rating	rpm	600	800	1000	1200	1400	1600	1800	2000	2100	2300
Fuel consumption at prop. load x <sup>3</sup>	5	l/h	3,6	7,2	12,9	21,3	32,7	47,3	67,0	92,8	109,8	149,1
		US gal/h	0,9	1,9	3,4	5,6	8,7	12,5	17,7	24,5	29,0	39,4
Fuel consumption at full load	5	l/h	18,0	29,9	53,7	87,8	97,1	113,0	130,8	143,1	145,1	149,0
		US gal/h	4,7	7,9	14,2	23,2	25,7	29,9	34,6	37,8	38,3	39,4

### Intake and exhaust system

	Rating	rpm	600	800	1000	1200	1400	1600	1800	2000	2100	2300
Specific exhaust heating effect in percent of crankshaft power	5	%	64	70	73	71	63	63	68	73	76	80
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C	491	572	644	595	484	445	456	480	503	517
		°F	916	1062	1191	1103	903	833	853	896	937	963
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa									Max	15
		psi										2,2
		kPa									Min	
		psi										
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPa and relative humidity 30%.	5	m³/min	4,0	6,1	10,8	18,5	25,9	33,1	38,4	41,1	41,5	42,1
		cu.ft./min	139,5	216	381,4	651,6	914,6	1169	1356	1452	1465	1485
Charge air pressure Inlet manifold	5	kPa	15	33	87	168	222	266	281	272	259	237
		psi	2,2	4,8	12,6	24,4	32,2	38,6	40,8	39,5	37,6	34,4
Exhaust gas flow	5	m³/min	11	19	35	55	65	77	88	96	99	102
		cu.ft./min	388,5	671	1236	1942	2295	2719	3108	3390	3496	3602

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Cooling system	Rating	rpm	600	800	1000	1200	1400	1600	1800	2000	2100	2300
Radiated heat in percent of crankshaft power.	5	%	13	7,6	3,8	2,3	2	1,9	1,8	1,8	1,9	2,5
Heat rejection to charge air cooler in percent of crankshaft power.	5	%	2,1	3,9	7,5	12,8	16,7	19,7	22	22,4	23,3	22,8
Coolant heat rejection to HE, incl. engine oil cooler and charge air cooler, in percent of crankshaft power.	5	%	121	96	83	69	67	68	69	73	74	74
Coolant flow with fully open thermostat and std cooling system		l/min cu.ft./min	90 3,2	150 5,3	252 8,9	312 11,0	357 12,6	402 14,2	480 17,0	516 18,2	528 18,6	600 21,2
Max. permissible temperature on coolant in engine outlet		°C °F	98 208									
Coolant volume engine, including heat exchanger and charge air cooler		litres US gal.	51 13,47									
Max. additional coolant for cabin heater etc. with std. Expansion tank		litres US gal.	15 3,96									
Maximum coolant flow to cabin heater etc.		l/min cu.ft./min	42 1,48									
Thermostat, start open at		°C °F	82 180									
Thermostat, fully open at		°C °F	92 198									

Raw water circuit	rpm	600	800	1000	1200	1400	1600	1800	2000	2100	2300
Nominal raw water design flow	l/min cu.ft./min	157 5,5	208 7,3	261 9,2	317 11,2	365 12,9	408 14,4	442 15,6	443 15,6	437 15,4	424 15,0
Nominal raw water pump pressure head at design flow. (measured before and after pump)	kPa psi	18 2,6	30 4,4	45 6,5	65 9,4	84 12,2	104 15,1	123 17,8	123 17,8	120 17,4	113 16,4
Maximum raw water pump suction head	kPa psi	30 4,4									
Maximum raw water temperature entering heat exchanger	°C °F	30 86									

Emissions	Rating	rpm	600	800	1000	1200	1400	1600	1800	2000	2100	2300
Smoke at prop. load x <sup>2,5</sup>	5	*BSU	0,1	0,2	0,3	0,3	0,2	0,2	0,1	0,1	0,1	0,3
Smoke at prop. load x <sup>3</sup>	5	*BSU	0,0	0,1	0,2	0,3	0,4	0,3	0,1	0,1	0,1	0,3
Noise at prop. load x <sup>2,5</sup> . 4)	5	dBA	101,6	104,4	107,2	109,6	111	111,9	113,2	115,3	115,7	117

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

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