

VOLVO PENTA D13 MP, 662KW/2300RPM, DST	Document No	Issue Index
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General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		6
No of valves		24
Displacement, total	litres in ³	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
Compression pressure at 240 rpm	MPa psi	N/A
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 + 50
Rated speed R5	rpm	2300
Propeller selection range R5 (recommended)	rpm	2250-2350
Dry weight engine BT	kg lb	1560 3439

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Performance	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Crankshaft power 1), 5)	5	kW	84	250	345	379	449	519	615	659	662	662
		hp	114	340	469	515	611	706	836	896	900	900
Propeller shaft power 1) (At full load) With drive IPS	5	kW	77	234	324	356	422	488	579	621	624	624
		hp	105	319	441	484	574	664	788	844	848	848
Propellershaft power at prop. load x ^{2.5} With drive IPS	5	kW	22	44	78	99	150	214	338	440	497	624
		hp	29	61	106	134	204	291	460	598	676	848
Propellershaft power at prop. load x ³ With drive IPS	5	kW	11	26	51	68	113	173	299	410	475	624
		hp	15	36	70	93	153	235	407	558	646	848
Torque at crankshaft 2)	5	Nm	1337	2984	3295	3290	3298	3304	3263	3146	3010	2749
		lbf ft	986	2201	2430	2427	2433	2437	2406	2321	2220	2027
Mean piston speed		m/s	3,2	4,2	5,3	5,8	6,8	7,9	9,5	10,5	11,1	12,1
		ft/s	10,4	13,8	17,3	19,0	22,5	25,9	31,1	34,6	36,3	39,7
Effective mean pressure 2)	5	MPa	1,31	2,93	3,24	3,24	3,24	3,25	3,21	3,09	2,96	2,70
		psi	190,7	425,7	469,9	469,3	470,5	471,3	465,4	448,8	429,4	392,1
Max combustion pressure 2)	5	MPa	13,5	19,8	19,5	19,4	19,4	19,2	18,8	18	17,6	16,9
		psi	1958	2872	2828	2814	2814	2785	2727	2611	2553	2451

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

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Fuel system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Specific fuel consumption 2)	5	g/kWh	248	209	198	197	199	200	204	207	207	208
		lb/hph	0,401	0,338	0,32	0,319	0,322	0,324	0,33	0,335	0,335	0,338
Fuel consumption, Test cycle E5	5	g/kWh	208,2									
		lb/hph	0,34									
Fuel consumption at prop. load x ^{2,5}	5	l/h	6,6	12,7	20,8	25,8	37,9	53,9	85,8	112,9	128,5	165,4
		US gal/h	1,8	3,3	5,5	6,8	10,0	14,2	22,7	29,8	33,9	43,7

Fuel system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Fuel consumption at prop. load x ³	5	l/h	4,1	8,1	14,6	18,9	29,6	44,9	77,0	105,9	123,3	165,4
		US gal/h	1,1	2,2	3,9	5,0	7,8	11,9	20,3	28,0	32,6	43,7
Fuel consumption at full load	5	l/h	24,9	62,4	81,7	89,4	106,8	124,1	149,9	163,0	163,6	165,1
		US gal/h	6,6	16,5	21,6	23,6	28,2	32,8	39,6	43,0	43,2	43,6

Intake and exhaust system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Specific exhaust heating effect in percent of crankshaft power	5	%	59	62	60	62	66	68	72	74	73	73
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C	460	487	451	461	488	493	510	513	495	474
		°F	860	909	844	862	910	919	950	955	923	885
		°C										
		°F										
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa							Max	15		
		psi								2,2		
		kPa							Min			
		psi										

Intake and exhaust system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	5	m³/min	4,8	14,3	21,1	23,4	27,8	32,6	39,4	43,2	44,9	47,4
		cu.ft./min	168,9	505	745,1	825,2	980	1152	1390	1525	1585	1674
		m³/min										
Charge air pressure Inlet manifold	5	kPa	42	216	282	287	292	313	329	334	336	333
		psi	6,1	31,3	40,9	41,6	42,4	45,4	47,7	48,4	48,7	48,3
Exhaust gas flow	5	m³/min	13,0	39,2	54,2	60,6	73,5	85,6	102,9	111,1	112,7	115,0
		cu.ft./min	459,7	1384	1913	2139	2594	3022	3633	3922	3981	4062

Cooling system	Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Radiated heat in kW (per engine)	5	kW	5	7	7	7	7	8	9	9	9	9
Heat rejection to charge air cooler in percent of crankshaft power.	5	%	5	16	19	19	19	20	23	23	24	26
Coolant heat rejection to HE, incl. engine oil cooler and excl. charge air cooler, in percent of crankshaft power.	5	%	77	57	47	45	44	43	42	42	42	43
Coolant flow with fully open thermostat and std cooling system		l/min	90	150	252	282	335	380	480	516	528	600
		cu.ft./min	3,2	5,3	8,9	10,0	11,8	13,4	17,0	18,2	18,6	21,2
Extra water pump flow through charge air cooler		l/min cu.ft./min	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max. pump pressure at extra pump pressure side (pressure set system)		kPa psi	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max. permissible temperature on coolant in engine outlet		°C	98									
		°F	208									
Coolant volume engine, including heat exchanger and charge air cooler		litres	57									
		US gal.	15,06									
Max. additional coolant for cabin heater etc. with std. Expansion tank		litres	15									
		US gal.	3,96									
Maximum coolant flow to cabin heater etc.		l/min	40									
		cu.ft./min	1,41									
Thermostat, start open at		°C	82									
		°F	180									
Thermostat, fully open at		°C	92									
		°F	198									

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Raw water circuit		rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Nominal raw water design flow	l/min		190	230	270	290	342	387	430	438	428	415
	cu.ft/min		6,7	8,1	9,5	10,2	12,1	13,7	15,2	15,5	15,1	14,7
Nominal raw water pump pressure head at design flow. (measured before and after pump)	kPa		18	30	45	65	84	104	123	123	120	113
	psi		2,6	4,4	6,5	9,4	12,2	15,1	17,8	17,8	17,4	16,4
Maximum raw water pump suction head	kPa		30									
	psi		4,4									
Maximum additional pressure drop excl. reverse gear oil cooler	kPa		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	psi		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pressure drop over reverse gear oil cooler (optional equipment)	kPa		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	psi		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Maximum raw water temperature entering heat exchanger	°C		30									
	°F		86									

Emissions		Rating	rpm	600	800	1000	1100	1300	1500	1800	2000	2100	2300
Smoke at prop. load $x^{2,5}$	5	*BSU		0,1	0,2	0,4	0,5	0,5	0,3	0,3	0,4	0,3	0,4
Smoke at prop. load x^3	5	*BSU		0,0	0,1	0,3	0,6	0,6	0,3	0,3	0,4	0,3	0,4
Noise at prop. load $x^{2,5}$. 4)	5	dBA		98,6	107,5	108,3	107,9	107,8	109,5	111,8	113,9	115	116,1

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