

General

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		4
No of valves		16
Displacement, total	litres in ³	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
Propeller selection range R5	rpm	3400-3600
Dry weight engine BT	kg lb	482 1063
Dry weight with drive IPS	kg lb	780 1720

Performance		Rating	rpm	1000	1500	2000	2500	3000	3500				
Crankshaft power 1), 5)	5	kW	48	87	128	161	187	191					
		hp	65	118	174	219	254	260					
Propeller shaft power 1) (At full load) With drive IPS	5	kW	46	84	123	155	180	183					
		hp	63	114	167	210	244	249					
Propellershaft power at prop. load $x^{2.5}$ With drive IPS	5	kW	8	22	45	79	125	183					
		hp	11	30	62	108	170	249					
Propellershaft power at prop. load x^3 With drive IPS	5	kW	4	14	34	67	115	183					
		hp	6	20	47	91	157	249					
Torque at crankshaft 2)	5	Nm	458,4	553,9	611,2	615	595,2	521,1					
		lbf ft	338	409	451	454	439	384					
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	1,57	1,90	2,09	2,11	2,04	1,79					
		psi	227,9	275,3	303,8	305,7	295,9	259,1					
Max combustion pressure 2)	5	MPa	18	21	20	20	19	19					
		psi	2611	3046	2901	2901	2756	2756					

Lubricating system

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

Fuel system	Rating	rpm	1000	1500	2000	2500	3000	3500				
Specific fuel consumption 2)	5	g/kWh lb/hph	232 0,376	223 0,361	216 0,35	206 0,334	213 0,345	230 0,373				
Fuel consumption, Test cycle E5	5	g/kWh lb/hph	233 0,38									
Fuel consumption at prop. load x ^{2,5}	5	l/h US gal/h	2,6 0,7	6,2 1,6	12,4 3,3	21,3 5,6	34,7 9,2	52,6 13,9				
Fuel consumption at prop. load x ³	5	l/h US gal/h	1,8 0,5	4,5 1,2	9,8 2,6	18,3 4,8	32,5 8,6	52,6 13,9				
Fuel consumption at full load	5	l/h US gal/h	13,3 3,5	23,2 6,1	33,1 8,7	39,7 10,5	47,7 12,6	52,6 13,9				

Intake and exhaust system	Rating	rpm	1000	1500	2000	2500	3000	3500				
Specific exhaust heating effect in percent of crankshaft power	5	%						69				
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C °F	185 365	280 536	380 716	430 806	480 896	565 1049				
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi kPa psi							Max Min	30 4,4 10 1,5		

Intake and exhaust system	Rating	rpm	1000	1500	2000	2500	3000	3500				
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	5	m³/min cu.ft./min						15,5 547,4				
Charge air pressure Inlet manifold	5	kPa psi						205 29,7				
Exhaust gas flow	5	m³/min cu.ft./min						30,7 1084				

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	%						23				
Coolant heat rejection to HE, incl. engine oil cooler and excl. charge air cooler, in percent of crankshaft power.	5	%						69				
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				

VOLVO PENTAVolvo Penta IPS350
R5 260 hp (191 kW)

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02**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							30			
	°F							86			

Emissions

	Rating	rpm	1000	1500	2000	2500	3000	3500				
Smoke at prop. load $x^{2.5}$	5	*BSU	0,4	0,3	0,2	0,2	0,3	0,7				
Smoke at prop. load x^3	5	*BSU	0,4	0,2	0,3	0,2	0,3	0,7				

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