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TAD1341VE	21340725	02

General

In-line four stroke diesel engine with direct injection. Rotation direction, anti-clockwise viewed towards flywheel

Number of cylinders			6
Displacement, total		liters in ³	12.78 780
Firing order			1-5-3-6-2-4
Bore		mm in	131 5.16
Stroke		mm in	158 6.22
Compression ratio			18.1:1
Wet weight	Engine only	kg lb	1325 2921
	Power pac	kg lb	1790 3946

Performance				rpm	1500	1800	2000	2100
ICFN Power	275 kW	without fan		kW	275	275	275	275
				hp	374	374	374	374
		with fan 890 mm		kW	269	265	261	259
				hp	366	360	355	352
Torque at:		ICFN Power 275 kW		Nm	1751	1459	1313	1251
				lbf ft	1291	1076	968	922
Max torque at engine speed			1260 rpm	Nm lbf ft	1905 1405			
Mean piston speed				m/s ft/sec	7.9 25.9	9.5 31.1	10.5 34.6	11.1 36.3

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Performance		rpm	1500	1800	2000	2100
Effective mean pressure at:	ICFN Power 275 kW	MPa psi	1.72 250	1.43 208	1.29 187	1.23 178
Max combustion pressure at:	ICFN Power 275 kW	MPa psi	15.1 2190	14.9 2161	14.4 2088	13.9 2016
Total mass moment of inertia, J (mR ²)		kgm ² lbft ²	3.43 81.4			
Friction Power		kW hp	30 41	43 58	54 73	60 82
Derating see Technical Diagrams						

Cold start performance

*Cold start ambient temperature limit and time from start to no load speed	without starting aid	°C / sec. °F / sec.	20 68	3s
	with manifold heater 4 kW	°C / sec. °F / sec.	-5 23	4s
	with manifold heater 4 kW and block heater	°C / sec. °F / sec.	-15 5	4.5s
*Specify oil and fuel quality	Mk1 fuel, VDS2 oil. 15w40 above -15°C, 10w30 below -15°C			
Usage of manifold heater:	Time preheating, minutes	Time post heating, minutes		
Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block
	Volvo	2	12	10°C 50°F

* See also general section in the Sales Support Tool

Lubrication system

Lubricating oil consumption at max rpm at:	ICFN Power 275 kW	liter/h US gal/h	0.02 0.005
Oil system capacity including filters		liter US gal	36 9.51
Oil sump capacity:	Max	liter US gal	30 7.93
		liter US gal	19 5.02
	Min	liter US gal	19 5.02
		liter US gal	19 5.02
Oil change intervals/specifications	VDS 3	h	600
	VDS 2	h	400
		h	
Engine angularity limits:	front up	°	11
	front down	°	11
	side tilt	°	11
Oil pressure at rated speed		kPa psi	300 - 650 44 - 94
Oil pressure shut down switch setting		kPa psi	130 19

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Lubrication system

Lubrication oil temperature in sump:	max	°C	130
		°F	266
Oil filter micron size		μ	40

Fuel system

		rpm	1500	1800	2000	2100
ICFN Power 275 kW Specific fuel consumption at:	25%	g/kWh lb/hph	230 0.373	262 0.425	286 0.464	299 0.485
	50%	g/kWh lb/hph	204 0.331	217 0.352	230 0.373	238 0.386
	75%	g/kWh lb/hph	194 0.314	205 0.332	214 0.347	221 0.358
	100%	g/kWh lb/hph	191 0.310	200 0.324	209 0.339	215 0.349
Fuel to conform to			ASTM-D975-No1 and 2D JIS KK 2204, EN 590			

Fuel system

System supply flow at max. speed	liter/h US gal/h	100 26.4
Fuel supply line max. restriction (Measured at fuel inlet connection)	kPa psi	10 1.5
Fuel supply line max. pressure, engine stopped	kPa psi	0
System return flow at max. speed	liter/h US gal/h	18.0 4.8
Fuel return line max. restriction (Measured at fuel return connection)	kPa psi	20 2.9
Max. allowable inlet fuel temp (Measured at fuel inlet connection)	°C °F	60 140
Prefilter / Water separator micron size	μ	10
Fuel filter micron size	μ	5
Governor type/make, standard	Volvo / EMS 2.2	
Injection pump type/make	Delphi E3	

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Intake and exhaust system		Inlet air temp	rpm	1500	1800	2000	2100
Air consumption at: (+25°C and 100kPa)	ICFN Power 275 kW	25°C 77°F	m³/min cfm	23 802	26 911	27 954	28 992
Max allowable air intake restriction including piping			kPa psi	3 0.4			
Heat rejection to exhaust at:	ICFN Power 275 kW		kW BTU/min	179 10180	192 10919	203 11544	211 11999
Exhaust gas temperature after turbine at:	ICFN Power 275 kW		°C °F	387 729	370 698	369 696	374 705
Max allowable back pressure in exhaust line			kPa psi	11 1.6	13 1.9	15 2.2	15 2.2
Exhaust gas flow at: (temp and pressure after turbine at the	ICFN Power 275 kW		m³/min cfm	49 1730	52 1836	55 1946	56 1992
Exhaust gas smoke	ICFN Power 275 kW		*Bosch	0.1	0.2	0.2	0.3
Heat rejection radiation from engine at:	ICFN Power 275 kW		kW BTU/min	14 790	14 790	13.8 785	13.8 785
Heat rejection to coolant at:	ICFN Power 275 kW		kW BTU/min	102 5801	112 6369	122 6938	128 7279
Coolant			Volvo Penta coolant "ready mix" or Volvo Penta coolant mixed with clean fresh water 40 / 60				
Radiator cooling system type				Closed circuit			
Standard radiator core area			m² foot²	0.8 8.61			
Fan diameter	890 mm		mm in	890 35.04			

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Cooling system		rpm	1500	1800	2000	2100
Fan power consumption	890 mm	kW hp	6.0 8	10.0 14	14.0 19	16.0 22
Fan drive ratio	fan Ø890		0,84 : 1			
Coolant capacity:	engine	liter US gal	20 5.3			
	std. 0.8m² radiator with hoses	liter US gal	24 6.3			
Coolant pump		drive/ratio	Belt / 1.43:1			
Coolant flow with standard system		l/s US gal/s				
Minimum coolant flow		l/s US gal/s	4.7 1.2	5.7 1.5	6.0 1.6	6.2 1.6
Maximum outer circuit restriction incl. piping		kPa psi	65.0 9.4			
Thermostat:	start to open	°C	82			
		°F	180			
	fully open	°C	92			
		°F	198			
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa psi	100 14.5			
Minimum static pressure head (expansion tank height + pressure cap setting)		kPa psi	70 10.2			
Standard pressure cap setting		kPa psi	70 10.2			
Maximum top tank temperature		°C °F	107 225			
Draw down capacity. The difference between min coolant level in the expansion tank and the lowest level where the engine's coolant system still are functioning	with std. 0.8 m² radiator	liter US gal	1.8 0.5			
		liter US gal				

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Charge air cooler system		rpm	1500	1800	2000	2100
Heat rejection to charge air cooler	ICFN Power 275 kW	kW	54	63	70	73
		BTU/min	3071	3583	3981	4151
Charge air mass flow	ICFN Power 275 kW	kg/s	0.44	0.5	0.53	0.54
Charge air inlet temp. (Charge air temp after turbo compressor)	ICFN Power 275 kW	°C	162	167	173	176
		°F	324	333	343	349
Charge air outlet temp. (Charge air temp after charge air cooler)	ICFN Power 275 kW	°C	41	44	45	45
		°F	106	111	113	113
Maximum pressure drop over charge air cooler incl. piping		kPa	8			
		psi	1.16			
Charge air pressure (After charge air cooler)		kPa	190			
		psi	27.56			
Standard charge air cooler core area		m²	0.8			
		foot²	8.61			

Cooling performance: 0.8 m² radiator and 890 mm fan

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 103°C TTT and 40% coolant. Valid at 1 atm.

			IFN Power 275 kW				
Engine speed	Engine power	Air on temp		Air flow		External restriction	
		°C	°F	m ³ /s	ft ³ /s	Pa	psi
2100 (0,84)	275 374	62	144	6.3	222.5	570	0.083
		65	149	7.0	247.2	359	0.052
		68	154	7.9	279.0	0	
1800 (0,84)	275 374	62	144	5.5	194.2	358	0.052
		65	149	6.1	215.4	206	0.030
		68	154	6.7	236.6	0	

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Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronous / Droop	
Governor droop	0-8 %	
Governor response	Adjustable PID-constants (VODIA)	Standard
Idle speed	600-1200	
Stop function	Energized to Run / Stop	
Preheating function	On / Off	
Lamp test	On / Off	

Engine sensors and switch settings			Alarm level		Engine protection	
Parameter		Unit	Setting range	Default setting	Level	Action. Default/Alternative
Oil temp		°C	120 - 130	125	Setting +5	Shut down. ON/OFF*
Oil pressure	Low idle	kPa	-	150	-20	Shut down. ON/OFF*
	Rated speed	kPa	-	250	-20	Shut down. ON/OFF*
Oil level			-	Min level	-	-
Piston cooling pressure >1000 rpm		kPa	-	150	150	Shut down. ON/OFF*
Coolant temp		°C	95 - 102	102	Setting +5	Shut down. ON/OFF*
Coolant level			See cooling system	On	Low level	Shut down. ON/OFF*
Fuel feed pressure	Low idle	kPa	-	100	-	-
	>1300 rpm		-	300	-	-
Water in fuel			-	High level	-	-
Crank case pressure		kPa	-	-	Rapid pres inc	Shut down. ON/OFF*
Air filter pressure drop		kPa	-	5	-	-
Altitude, above sea		m	-	-	-	Automatic derating, see section derating
Charge air temp		°C	-	80	85	Shut down. ON/OFF*
Charge air pressure**		kPa	-	310	+10	Shut down. ON/OFF*
Engine speed		rpm	100 - 120% of rated speed	120% of rated speed	Alarm level	

* Off means no shut down, alarm only

** Pabs, 2100 rpm at sea level.

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Electrical system

Voltage and type			24V / insulated from earth
Alternator:	make		Bosch
	output	A	80
	tacho output	Hz/alternator rev.	6
	drive ratio		5,3:1
Starter motor:	make		Melco
	type		105P70
	output	kW	7
		hp	9.5
Number of teeth on:	flywheel		153
	starter motor		12
Max wiring resistance main circuit		mΩ	2
Cranking current at +20°C		A	180
Crank engine speed at 20°C		rpm	155
Starter motor battery capacity	max	Ah/A	2x225
	min at +5°C	Ah/A	-
Inlet manifold heater (at 20 V)		kW	4
Power relay for the manifold heater		A	1

Power take off

Timing gear at compressor PTO max:	Nm	160
	lbf ft	118
Speed ratio direction of rotation viewed from flywheel side		0,91:1/clockwise
Timing gear at servo pump PTO max:	Nm	100
	lbf ft	74
Speed ratio direction of rotation viewed from flywheel side		1,58:1/clockwise
Max allowed bending moment in flywheel housing	Nm	40000
	lbf ft	29500
Max. rear main bearing load	N	4000
	lbf	899.2