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TAD1342VE	21340726	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
IFN Power	310 kW	without fan		kW	310	310	310	310
				hp	422	422	422	422
		with fan 890 mm		kW	304	300	296	294
				hp	413	408	403	400
ICFN Power	310 kW	without fan		kW	310	310		
				hp	422	422		
		with fan 890 mm		kW	304	300		
				hp	413	408		
Torque at:		IFN Power 310 kW		Nm	1974	1645	1480	1410
				lbf ft	1455	1213	1092	1040
		ICFN Power 310 kW		Nm	1974	1645		
				lbf ft	1455	1213		
Max torque at engine speed			1260 rpm	Nm lbf ft	2005 1479			
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:	IFN Power 310 kW	MPa psi	1.94 281	1.62 235	1.46 211	1.39 201
	ICFN Power 310 kW	MPa psi	1.94 281	1.62 235		
Max combustion pressure at:	IFN Power 310 kW	MPa psi	16.2 2349	15.7 2277	14.7 2132	14.2 2059
	ICFN Power 310 kW	MPa psi	16.2 2349	15.7 2277		
Total mass moment of inertia, J (mR ²)		kgm ² lbft ²	3.43 81.4			
Friction Power		kW	30	43	54	60
		hp	41	58	73	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:	IFN Power 310 kW	liter/h US gal/h	0.02 0.005
	ICFN Power 310 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
	Min	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
IFN Power 310 kW Specific fuel consumption at:	25%	g/kWh lb/hph	222 0.360	252 0.408	274 0.444	287 0.465
	50%	g/kWh lb/hph	200 0.324	213 0.345	224 0.363	232 0.376
	75%	g/kWh lb/hph	193 0.313	202 0.327	212 0.344	218 0.353
	100%	g/kWh lb/hph	191 0.310	200 0.324	207 0.336	213 0.345
ICFN Power 310 kW Specific fuel consumption at:	25%	g/kWh lb/hph	222 0.360	252 0.408		
	50%	g/kWh lb/hph	200 0.324	213 0.345		
	75%	g/kWh lb/hph	193 0.313	202 0.327		
	100%	g/kWh lb/hph	191 0.310	200 0.324		
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)	IFN Power 310 kW	25°C 77°F	m³/min cfm	25 879	28 975	28 989	28 999
	ICFN Power 310 kW	25°C 77°F	m³/min cfm	25 883	28 989		
Max allowable air intake restriction including piping			kPa psi	3 0.4			
Heat rejection to exhaust at:	IFN Power 310 kW		kW BTU/min	203 11544	218 12397	236 13421	246 13990
	ICFN Power 310 kW		kW BTU/min	203 11544	218 12397		
Exhaust gas temperature after turbine at:	IFN Power 310 kW		°C °F	398 748	389 732	411 772	425 797
	ICFN Power 310 kW		°C °F	398 748	389 732		
Max allowable back pressure in exhaust line			kPa psi	11 1.6	14 2.0	15 2.1	15 2.2
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	IFN Power 310 kW		m³/min cfm	54 1893	57 2002	59 2087	61 2137
	ICFN Power 310 kW		m³/min cfm	54 1907	57 2013		
Exhaust gas smoke	IFN Power 310 kW		*Bosch Units	0.1	0.2	0.3	0.3
	ICFN Power 310 kW			0.1	0.2		
Heat rejection radiation from engine at:	IFN Power 310 kW		kW BTU/min	16 887	16 887	15.5 881	15.4 876
	ICFN Power 310 kW		kW BTU/min	16 887	16 887		
Heat rejection to coolant at:	IFN Power 310 kW		kW BTU/min	113 6426	122 6938	132 7507	140 7962
	ICFN Power 310 kW		kW BTU/min	113 6426	122 6938		
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	890			
			in	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	4.5 1.2	5.7 1.5	6.4 1.7	6.7 1.8
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	IFN Power 310 kW	kW	66	74	72	71
		BTU/min	3753	4208	4095	4038
	ICFN Power 310 kW	kW	66	74		
		BTU/min	3753	4208		
Charge air mass flow	IFN Power 310 kW	kg/s	0.48	0.53	0.54	0.55
	ICFN Power 310 kW	kg/s	0.48	0.53		
Charge air inlet temp. (Charge air temp after turbo compressor)	IFN Power 310 kW	°C	178	182	176	174
		°F	352	360	349	345
	ICFN Power 310 kW	°C	178	182		
		°F	352	360		
Charge air outlet temp. (Charge air temp after charge air cooler)	IFN Power 310 kW	°C	43	45	45	45
		°F	109	113	113	113
	ICFN Power 310 kW	°C	43	45		
		°F	109	113		
Maximum pressure drop over charge air cooler incl. piping		kPa	8			
		psi	1.16			
Charge air pressure (After charge air cooler)		kPa	219			
		psi	31.76			
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.

Engine speed	Engine power	IFN Power 310 kW					
		Air on temp		Air flow		External restriction	
rpm	kW hp	°C	°F	m³/s	ft³/s	Pa	psi
2100 (0,84)	310 422	58	136				
		60	140	6.5	229.5	518	0.075
		63	145	7.4	261.3	225	0.033
		65	149	7.9	279.0	0	
1800 (0,84)	310 422	58	136	5.6	197.8	322	0.047
		60	140	6	211.9	210	0.030
		63	145	6.7	236.6	0	
		65	149				

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Cooling performance: 0.8 m² radiator and 890 mm variak 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.

				ICFN Power 310 kW			
Engine speed	Engine power	Air on temp		Air flow		External restriction	
rpm	kW hp	°C	°F	m³/s	ft³/s	Pa	psi
1800	310	58	136	5.6	197.8	322	0.047
	422	60	140	6	211.9	210	0.030
		63	145	6.7	236.6	0	
		65	149				

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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	15000
	lbf ft	11063
Max. rear main bearing load	N	4000
	lbf	899.2