

Technical data TWD1240VE

General

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

Number of cylinders			6
Displacement, total		liters	12,13
		in ³	740
Firing order			1-5-3-6-2-4
Bore		mm	131
		in	5,16
Stroke		mm	150
		in	5,91
Compression ratio			18,5:1
Dry weight	Engine	kg	1270
		lb	2800
	Power Pac	kg	1660
		lb	3660

Performance		r/min	1500	1800	2000	2100
IFN Power. 310 kW	without fan	kW	310	310	310	310
		hp	422	422	422	422
	with fan	kW	306	303	300	298
	750 mm	hp	416	412	408	405
IFN Power. 294 kW	without fan	kW	294	294	294	294
		hp	400	400	400	400
	with fan	kW	290	287	284	282
	750 mm	hp	394	390	386	384
ICFN Power. 275 kW	without fan	kW	275	275	275	275
		hp	374	374	374	374
	with fan	kW	271	268	265	263
	750 mm	hp	369	364	360	358
ICFN Power. 256 kW	without fan	kW	256	256	256	256
		hp	348	348	348	348
	with fan	kW	252	249	246	244
	750 mm	hp	343	339	335	332
Torque at:	IFN Power. 310 kW	Nm	1974	1645	1480	1410
		lbf ft	1455	1213	1092	1040
	IFN Power. 294 kW	Nm	1872	1560	1404	1337
		lbf ft	1380	1150	1035	986
	ICFN Power. 275 kW	Nm	1751	1459	1313	1251
		lbf ft	1291	1076	968	922
	ICFN Power. 256 kW	Nm	1630	1358	1222	1164
		lbf ft	1202	1002	901	859
Mean piston speed		m/s	7,5	9,0	10,0	10,5
		ft/sec	24,6	29,5	32,8	34,4
Effective mean pressure at ICFN Power		Mpa	1,81	1,51	1,36	1,30
		psi	262	219	197	189
Max combustion pressure at ICFN Power		MPa	15,3	15,7	15,5	14,8
		psi	2219	2277	2248	2146
Total mass moment of inertia, J (mR ²)		kgm ²	3,64			
		lbft ²	86,4			
Degree of irregularity at:	IFN Power. 310 kW		1:54	1:114	1:186	1:226
	ICFN Power. 275 kW		1:65	1:138	1:231	1:270
Residual speed droop at load increase from 0 to 100% at:	IFN Power. 310 kW	%	0-8			
	ICFN Power. 275 kW	%	0-8			
Friction Power		kW	27	38	47	52

Technical data TWD1240VE

Derating

The engine will operate up to 1100m altitude without derating. For operation at higher altitudes the power will be derated according to the following factors: Linear interpolation is active between 1100m and 5000 m

	r/min	1500	1800	2000	2100
Altitude derating factor at 1100 m	%			0	
Altitude derating factor at 5000 m	%			10	
Ambient temperature derating factor	% / °C			No derating	
Humidity				No derating	

Lubrication system		r/min	1500	1800	2000	2100
Lubricating oil consumption at max rpm at:	IFN Power. 310 kW	liter/h			0,11	
		US gal/h			0,029	
	ICFN Power. 294kW	liter/h			0,10	
		US gal/h			0,026	
Oil system capacity incl. Filters		liter			35	
		US gal			9,25	
Oil sump capacity:	Max	liter			31	
		US gal			8,19	
	Min	liter			19	
		US gal			5,02	
Engine angularity limits:	front up	°			11	
	front down	°			11	
	side tilt	°			11	
Oil pressure:	at rated speed	kPa			400-500	
	shut down switch setting	kPa			250	
Lubrication oil temperature:	normal	°C			120	
		°F			248	
	max	°C			130	
		°F			266	
Oil filter micron size		mm			0,040	

Technical data TWD1240VE

Fuel system		r/min	1500	1800	2000	2100
IFN Power. 310 kW Specific fuel consumption at:	25%	g/kWh lb/hph	220 0,357	239 0,387	255 0,413	280 0,454
	50%	g/kWh lb/hph	197 0,319	207 0,336	217 0,352	235 0,381
	75%	g/kWh lb/hph	196 0,318	200 0,324	212 0,344	234 0,379
	100%	g/kWh lb/hph	195 0,316	199 0,323	209 0,339	227 0,368
ICFN Power. 275 kW Specific fuel consumption at:	25%	g/kWh lb/hph	237 0,384	256 0,415	307 0,498	297 0,481
	50%	g/kWh lb/hph	201 0,326	213 0,345	236 0,383	243 0,394
	75%	g/kWh lb/hph	197 0,319	203 0,329	222 0,360	229 0,371
	100%	g/kWh lb/hph	196 0,318	200 0,324	217 0,352	223 0,361
Recommended fuel to conform to			ASTM-D975-No1 and 2-D JIS KK 2204, EN 590			
Total fuel flow	liter/h	105	110	115	120	
Feed pump pressure	kPa	350				
Feed pump max suction head	m	2				
Fuel filter micron size	mm	0,005				
Prefilter / Waterseparator micron size	mm	0,030				
Governor type/make		Electronic / EDCIII				

Intake and exhaust system

		r/min	1500	1800	2000	2100
Air consumption at:	IFN Power. 310 kW	m³/min cfm	22,8 805	26,7 943	29,2 1031	31,3 1105
	ICFN Power. 275 kW	m³/min cfm	20,3 717	24,4 862	27 954	29,4 1038
Air intake restriction, clean filter(s)		kPa In wc	2 8,0			
Max allowable air intake restriction		kPa In wc	5 20,1			
Heat rejection to exhaust at:	IFN Power. 310 kW	kW BTU/min	202 11488	231 13137	244 13876	258 14672
	IFN Power. 310 kW	°C °F	470 878	425 797	425 797	455 851
Exhaust gas temperature after turbine at:	ICFN Power. 275 kW	°C °F	460 860	410 770	400 752	420 788
		kPa In wc	9,0 36,1	11,0 44,2	14,0 56,2	15,0 60,2
Exhaust gas flow at:	IFN Power. 310 kW	m³/min cfm	56,4 1992	60,2 2126	64,2 2267	70,6 2493
	ICFN Power. 275 kW	m³/min cfm	49,6 1752	53,7 1896	57,1 2016	62,9 2221
Exhaust gas smoke	IFN Power. 310 kW	Bosch Units	0,15	0,10	0,11	0,32
	ICFN Power. 275 kW		0,10	0,10	0,11	0,27

Technical data TWD1240VE

Cooling system

		r/min	1500	1800	2000	2100
Heat rejection radiation from engine at:	IFN Power. 310 kW	kW	14	14	18	22
		BTU/min	796	796	1024	1251
	ICFN Power. 275 kW	kW	0	0	0	0
		BTU/min	0	0	0	0
Heat rejection to coolant at:	IFN Power. 310 kW	kW	160	182	192	199
		BTU/min	9099	10350	10919	11317
	ICFN Power. 275 kW	kW		156		179
		BTU/min	0	8872	0	10180
Recommended coolant		Volvo coolant together with clean fresh water				
Radiator cooling system type		Closed circuit				
Radiator core area	(std. size)	m ²	0,8			
		foot ²	8,61			
Radiator core thickness	(std. size)	mm	50			
		in	1,97			
Fan diameter	890 mm (std. size) Power Pac	mm	890			
		in	35,04			
	750 mm	mm	750			
		in	29,53			
Fan power consumption	890 mm	kW	7,0	12,0	16,0	19,0
		hp	10	16	22	26
	750 mm	kW	4,0	7,0	10,0	12,0
		hp	5	10	14	16
Fan drive ratio	890 mm (std. size) Power Pac	0,93:1				
	750 mm	0,93:1				
Coolant capacity:	engine	liter	20			
		US gal	5			
	std. radiator with hoses	liter	24			
		US gal	6			
Coolant pump		drive/ratio	gear/1,41:1			
Coolant flow including radiator restriction		l/s	4,8	6,0	6,7	7,1
		US gal/s	1,3	1,6	1,8	1,9
Maximum permissible external coolant system restriction		kPa	70,0			
		in wc	281,1			
Thermostat:	start to open	°C	75			
		°F	167			
	fully open	°C	88			
		°F	190			
Maximum static pressure head		kPa	70			
		in wc	281,1			
Maximum pressure cap setting		kPa	70			
		in wc	281,1			
Maximum top tank temperature		°C	103			
		°F	217			
Minimum temperature entering engine		°C	68			
		°F	154			
Shutdown switch setting		°C	103			
		°F	217			
Recommended drawdown capacity		10% of total cooling system capacity				

Technical data TWD1240VE

Cooling performance: 0,8 m² radiator and 750 mm fan

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 100°C TTT and 50% antifreeze

Engine speed rpm	Engine power kW hp	Air on temp °C °F		IFN POWER			
				Air flow		Max additional external restriction	
				m ³ /s	cu ft/s	Pa	psi
2100	310	40	104	4,2	148,3	600	0,087
	422	50	122	5,7	201,3	300	0,044
		56	133	7,4	261,3	0	
1800	310	40	104	3,9	137,7	350	0,051
	422	50	122	5,3	187,2	150	0,022
		54	129	6,2	219,0	0	

Cooling performance: 0,8 m² radiator and 750 mm fan

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 100°C TTT and 50% antifreeze

Engine speed rpm	Engine power kW hp	Air on temp °C °F		ICFN POWER			
				Air flow		Max additional external restriction	
				m ³	cu ft/s	Pa	psi
2100	275	50	122	4,5	158,9	600	0,087
	374	60	140	6,8	240,1	200	0,029
		62	144	7,5	264,9	0	
1800	275	50	122	3,7	130,7	400	0,058
	374	60	140	5,4	190,7	100	0,015
		63	145	6,3	222,5	0	

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 100°C TTT and 50% antifreeze

Engine speed rpm	Engine power kW hp	Air on temp °C °F		ICFN POWER			
				Air flow		Max additional external restriction	
				m ³	cu ft/s	Pa	psi
1800	294	50	122	4,1	144,8	900	0,131
	400	60	140	6,1	215,4	500	0,073
		65	149	8,1	286,0	0	
1500	294	50	122	4,3	151,9	450	0,065
	400	60	140	6,5	229,5	0	

Technical data TWD1240VE

Electrical system

Voltage and type		24V / Insulated from ground	
Alternator:	make	Valeo	
	output	Amp	
	tacho output	Hz/alternator rev.	
	drive ratio	3,41:1	
Starter motor:	make	Bosch	
	type	GVB	
	output	kW	
Starter motor solenoid:	pull current	Amp	
	hold current	Amp	
Number of teeth on:	flywheel	156	
	starter motor	12	
Inrush current at +20°C		Amp	1500-1650
Cranking current at +20°C		Amp	400
Crank engine speed at 20°C		rpm	200
Starter motor battery capacity	max	Ah	2x143 570A DIN
	min at +5°C	Ah	2x88 400A DIN
Inlet manifold heater (at 20 V) (Optional equipment)		kW	2,8
Power relay for the manifold heater		Amp	1

Power take off

	r/min	1500	1800	2000	2100	
Front end in line with crank shaft max:	Nm	600				
	lbf ft	443				
Front end belt drive pulley	max left	kW	30	30	62	62
		hp	41	41	84	84
	max down	kW	19	31	28	28
		hp	26	42	38	38
	max right	kW	30	30	62	62
		hp	41	41	84	84
Timing gear at compressor PTO max:	Nm	140				
	lbf ft	103				
Speed ratio / direction of rotation viewed from flywheel side		1,31:1 / anti-clockwise				
Timing gear at servo pump PTO max:	Nm	40				
	lbf ft	30				
Speed ratio / direction of rotation viewed from flywheel side		1,65:1 / anti-clockwise				
Timing gear at hydraulic pump PTO max:	Nm	400				
	lbf ft	295				
Speed ratio / direction of rotation viewed from flywheel side		0,97:1 / anti-clockwise				