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General

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

Number of cylinders			6
Displacement, total		litre in^3	9,36 571,4
Firing order			1-5-3-6-2-4
Bore		mm in	120 4,72
Stroke		mm in	138 5,43
Compression ratio			20,2
Dry weight	Engine only, excluding cooling system	kg lb	1015 2238
	GenPac	kg lb	1354 2985
Wet weight	Engine only, excluding cooling system	kg lb	1065 2348
	GenPac	kg lb	1404 3095

Performance		**r/min**	**1500**	**1800**
Standby Power	without fan	kW hp	277 377	294 400
	with fan	kW hp	265 360	273 371
Prime Power	without fan	kW hp	253 344	269 366
	with fan	kW hp	241 328	248 338
	without fan	kW hp		
	with fan	kW hp		
Torque at:	Standby Power	Nm lbft	1763 1301	1560 1150
	Prime Power	Nm lbft	1610 1187	1428 1053
Mean piston speed		m/s ft/sec	6,9 22,7	8,3 27,2
Effective mean pressure at:	Standby Power	MPa psi	2,4 343	2,1 304
Effective mean pressure at:	Prime Power	MPa psi	2,2 313	1,9 278
Max combustion pressure at:	Standby Power	MPa psi	18 2611	19,8 2872
Max combustion pressure at:	Prime Power	MPa psi		
Total mass moment of inertia, J (mR2)		kgm^2 $lbft^2$	2,60 61,7	
Degree of irregularity at:	Standby Power		1:40	1:69
Friction Power		kW hp	28 38,08	38 51,68

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Engine noise emission

Test Standards: ISO 3744-1981 (E) sound power (without fan, intake and exhaust noise)

Tolerans ± 0.75 dB(A)		r/min	1500	1800
Measured sound power Lw	No load	dB(A)	108,2	109,6
	Standby Power	dB(A)	110,3	112,1
		dB(A)	110,1	111,9
Calculated sound pressure Lp at 1 m	No load	dB(A)		
	Standby Power	dB(A)		
		dB(A)		

Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m	r/min	1500	1800
Standby Power	dB(A)	113	117
Prime Power	dB(A)	113	116

Test conditions for load acceptance data

Warm engine.	Generator	Modell	Type of AVR
	Stamford	HCI444F	SX440 AVR

Load acceptance performance can vary due to actual alternator inertia, voltage regulator, type of load and local ambient conditions. UFRO: STD-setting 47 / 57 Hz

Single step load performance at 1500 rpm

Load (%)	Speed diff (%)		Recovery time (s)		Remaining load	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby	(%)	Prime	Standby	Prime	Standby
0-20	NA	1,5	NA	0,8	20-100	NA	15,7	NA	7,4
0-40	NA	3,1	NA	1,5	40-100	NA	8,1	NA	5,9
0-55	NA	6,8	NA	1,9	55-100	NA	5,5	NA	5,1
0-60	NA	9,1	NA	3,1	60-100	NA	4,3	NA	4,9
0-x	10,0		NA		x-100	NA		NA	
0-x		10,0	NA		x-100	NA		NA	
100-0		3,4	NA	1,3		NA		NA	

Single step load performance at 1800 rpm

Load (%)	Speed diff %		Recovery time (s)		Remaining load	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby	(%)	Prime	Standby	Prime	Standby
0-20	NA	1,8	NA	1,7	20-100	NA	5,6	NA	5,0
0-40	NA	2,7	NA	1,5	40-100	NA	3,9	NA	4,2
0-60	NA	4,2	NA	1,8	60-100	NA	2,4	NA	3,2
0-75	NA	6,7	NA	6,8	75-100	NA	1,9	NA	2,1
0-83	NA	10,0	NA	9,4	83-100	NA	1,2	NA	1,7
0-x	10,0		NA		x-100	NA		NA	
0-x		10,0	NA		x-100	NA		NA	
100-0			NA			NA		NA	

Cold start performance			r/min	1500	1800
Time from start to no load speed at ambient temperature:	°C	15	s	4,5	5,1
		0	s	6,0	6,8
		-20*	s	12,5	14,3
Time from start to stay within 0.5% of no load speed at ambient temperature:	°C	15	s	4,5	5,1
		0	s	6,0	6,8
		-20*	s	12,5	14,3

* With manifold heater 4 kW engaged, lubrication oil 15W/40 and block heater.

Usage of manifold heater:	Time preheating	Time postheating
	25 sec	100 sec

Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block
Block mounted	Calix	1,5 kW		

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Lubrication system			**r/min**	**1500**	**1800**
Lubricating oil consumption	Standby Power		liter/h	0,03	0,04
			US gal/h	0,009	0,009
	Prime Power		liter/h	0,03	0,03
			US gal/h	0,008	0,008
Oil system capacity including filters			liter	35	
			US gal	9,2	
Oil sump capacity:		max	liter	30	
			US gal	7,9	
		min	liter	22	
			US gal	5,8	
Oil change intervals/specifications:	VDS-2*		h	600	
	VDS, ACEA, E3*		h	400	
	ACEA E2, API CD, CF, CF-4, CG-4*		h	250	
Engine angularity limits:		front up	°	30	
		front down	°	30	
		side tilt	°	30	
Oil pressure at rated speed			kPa	350 - 600	
			psi	51 - 87	
Lubrication oil temperature in oil sump:		max	°C	125	
			°F	257	
Oil filter micron size			mm	0,040	

* See also general section in the sales guide

Fuel system		**r/min**	**1500**	**1800**
Standby Power	25%	g/kWh	227	239
Specific fuel consumption at:		lb/hph	0,368	0,388
	50%	g/kWh	203	210
		lb/hph	0,329	0,341
	75%	g/kWh	197	202
		lb/hph	0,319	0,328
	100%	g/kWh	204	204
		lb/hph	0,330	0,330
Prime Power	25%	g/kWh	230	242
Specific fuel consumption at:		lb/hph	0,373	0,392
	50%	g/kWh	206	214
		lb/hph	0,334	0,347
	75%	g/kWh	197	203
		lb/hph	0,319	0,329
	100%	g/kWh	201	205
		lb/hph	0,326	0,332

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Fuel system	**r/min**	**1500**	**1800**
Fuel to conform to	ASTM-D975-No1 and 2-D JIS KK 2204, EN 590		
System return flow	liter/h US gal/h	36 9,5	
System supply flow at rated speed	liter/h US gal/h	108,0 28,5	
Fuel supply line max restriction	kPa psi	10,0 1,5	
Fuel supply line max pressure, engine stopped	kPa psi	0,0	
Fuel return line max restriction	kPa psi	20,0 2,9	
Maximum allowable inlet fuel temp	°C °F	50 122	
Prefilter / Water separator	mm	0,005	
Governor type/make, standard	EMS2		
Injection pump type/make	Unit injector / Delphi		

Intake and exhaust system			**r/min**	**1500**	**1800**
Air consumption at:	Standby Power		m^3/min cfm	20,0 705	23,2 820
	Prime Power		m^3/min cfm	18,1 638	21,7 765
Air intake restriction, clean filter(s)			kPa in wc	2 8,0	2 8,0
Max allowable air intake restriction			kPa in wc	5 20,1	5 20,1
Air filter type			Single stage paper cartridge		
Air filter cleaning efficiency			%	99,85	
Heat rejection to exhaust at:		Standby Power	kW BTU/min	216 12284	223 12682
		Prime Power	kW BTU/min	NA	NA
Exhaust gas temperature after turbine at:		Standby Power	°C °F	488 910	429 804
		Prime Power	°C °F	NA	NA
Max allowable back pressure in exhaust line			kPa In wc	10 40,2	10 40,2
Exhaust gas flow at:		Standby Power	m^3/min cfm	49,6 1750	52,7 1862
		Prime Power	m^3/min cfm	NA	NA

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Cooling system			**r/min**	**1500**	**1800**
Heat rejection radiation from engine at:	Standby Power		kW BTU/min	NA	NA
	Prime Power		kW BTU/min	NA	NA
Heat rejection to coolant at:	Standby Power		kW BTU/min	120 6824	124 7052
	Prime Power		kW BTU/min	113 6426	116 6597
Coolant	Volvo coolant or Volvo anticorrosion additive together with clean fresh water				
Radiator cooling system type			Closed circuit		
Standard radiator core area			m² foot²	0,8 8,61	
Standard radiator core thickness			mm in	52 2,05	
Fan diameter			mm in	890 35,04	
Fan power consumption			kW hp	12 16	21 29
Fan drive ratio				1:1,01	
Coolant capacity,	engine		liter US gal	17 4,49	
	std radiator with hoses		liter US gal	24 6,34	
Coolant pump			drive/ratio	belt/1,50:1	
Coolant flow with standard system			l/s US gal/s	5,5 1,45	6,5 1,72
Minimum coolant flow			l/s US gal/s	5,3 1,40	6,2 1,64
Maximum external coolant system restriction, including piping			kPa in wc	50 201	55 221
Thermostat		start to open	°C °F	82 180	
		fully open	°C °F	92 198	
Maximum static pressure head (expansion tank height + pressure cap setting)			kPa in wc	100 402	
Minimum static pressure head (expansion tank height + pressure cap setting)			kPa in wc	70 281	
Standard pressure cap setting			kPa in wc	70 281	
Maximum top tank temperature			°C °F	103 217	
Minimum temperature entering engine			°C °F	68 154	
Draw down capacity	10% of total cooling system capacity				

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Intercooler system		**r/min**	**1500**	**1800**
Cooling power	Standby Power	kW	52	66
		BTU/min	2957	3753
	Prime Power	kW	44	58
		BTU/min	2502	3298
		kW		
		BTU/min		
Combustion air mass flow	Standby Power	kg/s	0,39	0,47
	Prime Power	kg/s	0,36	0,44
		kg/s		
Combustion air inlet temp.	Standby Power	°C	204	193
		°F	399	379
	Prime Power	°C	180	190
		°F	356	374
		°C		
		°F		
Combustion air outlet temp.	Standby Power	°C	55	58
		°F	132	136
	Prime Power	°C	54	56
		°F	128	132
		°C		
		°F		
Maximum pressure droop over intercooler, incl. piping		kPa	5	
		psi	0,73	
Boost pressure		kPa	230	
		psi	33,36	
Standard intercooler core area		m²	0,89	
		foot²	9,58	
Standard intercooler core thickness		mm	68	
		in	2,68	

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Cooling performance Fan ratio 1:1,01

Cooling air flow and external restriction at different radiator air temperatures based on 103°C TTT and 50% antifreeze (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp °C	PRIME POWER		STANDBY POWER	
		Air flow kg/s	External restriction Pa	Air flow kg/s	External restriction Pa
1500	30	3,4	1280	3,6	1240
	40	3,9	1150	4,1	1090
	50	4,6	930	4,9	850
	55	5,0	760	5,4	650
	60	5,7	530	6,1	380
	65	-	-	7,0	0
	67	7,0	0		
1800	30	3,9	1930	4,3	1860
	40	4,4	1760	4,8	1680
	50	5,2	1490	5,6	1370
	55	5,7	1280	6,2	1120
	60	6,4	1010	7,0	780
	67	-	-	8,6	0
	70	8,6	0		

Cooling performance Fan ratio 1:0,9

Cooling air flow and external restriction at different radiator air temperatures based on 103°C TTT and 50% antifreeze (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp °C	PRIME POWER		STANDBY POWER	
		Air flow kg/s	External restriction Pa	Air flow kg/s	External restriction Pa
1500	30	3,4	950	3,5	910
	40	3,8	830	4,0	770
	50	4,5	620	4,8	540
	55	5,0	460	5,3	350
	60	5,6	230	6,0	90
	61	-	-	6,2	0
	64	6,2	0		
1800	30	3,9	1450	4,2	1380
	40	4,4	1290	4,7	1210
	50	5,1	1030	5,5	910
	55	5,6	830	6,1	680
	60	6,3	560	6,9	350
	64	-	-	7,7	0
	67	7,7	0		

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Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronous/droop Switchable during operation	Isochronous
Governor droop	0 - 8%	0 % (4 % when switched)
Governor response	NA	NA
Dual speed	1500 / 1800 rpm	According to customer
Idle speed	600 - 1200 rpm	900 rpm
Fine speed adjustment	NA	±120 rpm
Stop function	Energized to run / stop	Energized to stop
Preheating function	On ignition / Preheat on request	Preheat on request
Lamp test	ON/OFF	ON

Engine protection			Alarm level		Engine protection	
Parameter		**Unit**	**Setting range**	**Default setting**	**Level**	**Action. Default/Alternative**
Oil temp		°C	120 - 130	125	Setting +3	Shut down. ON/OFF
Oil pressure	Low idle	kPa	NA	160	130	Shut down. ON/OFF
	1500 rpm	kPa	NA	250	220	Shut down. ON/OFF
	1800 rpm	kPa	NA	300	270	Shut down. ON/OFF
Oil level			NA	Low level	Low level	Shut down. ON/OFF
Piston cooling pressure >1000 rpm		kPa	NA	NA	NA	NA
Coolant temp		°C	95 - 103	98	Setting +5	Shut down. ON/OFF
Coolant level			NA	Low level	Low level	Shut down. ON/OFF
Fuel feed pressure	Low idle	kPa	NA	150	NA	NA
	>1400 rpm		NA	300	NA	NA
Water in fuel			NA	Water in fuel	NA	NA
Crank case pressure		kPa	NA	Increased pressure	Increased pressure	Shut down. ON/OFF
Air filter pressure droop		kPa	NA	NA	NA	NA
Altitude, above sea		m	NA		>1500	Automatic derating, see section derating
Charge air temp		°C	NA	87	+5	Shut down. ON/OFF
Charge air pressure		kPa	NA	380	380	Shut down. ON/OFF
Engine speed		rpm	100 - 120% of rated speed	120% of rated speed	Alarm level	Shut down. OFF/ON

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Electrical system		**r/min**	**1500**	**1800**
Voltage and type		24V / insulated from earth		
Alternator:	make/output	Amp	Bosch/80	
	tacho output	Hz/alt. Rev	6	
	drive ratio		4,5	
Starter motor		make	Melco	
		type	90P55	
		kW	5,5	
Starter motor solenoid,	pull current	Amp	N/A	
	hold current	Amp	2	
Number of teeth on:	flywheel		153	
	starter motor		11	
Inrush current at +20°C		Amp	1000	
Cranking current at +20°C		Amp		
Crank engine speed at 20°C		rpm	140	
Starter motor battery capacity:	max	Ah	2x225 700A DIN	
	min at +5°C	Ah	2x170 600A DIN	
Inlet manifold heater (at 20 V)		kW	4,0	
Power relay for the manifold heater		Amp	1	

Power take off		**r/min**	**1500**	**1800**
Front end in line with crank shaft max:		Nm lbft	TVC necessary	
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW hp	53 72	54 73
	max down	kW hp	248 337	300 408
	max right	kW hp	43 58	69 94
Timing gear at compressor PTO max:		Nm lbft	150 111	
Speed ratio direction of rotation viewed from flywheel side		1,29:1/clockwise		
Timing gear at servo pump PTO max:		Nm lbft		
Speed ratio direction of rotation viewed from flywheel side		1,58:1/clockwise		
Timing gear at hydraulic pump PTO max:		Nm lbft		
Speed ratio direction of rotation viewed from flywheel side				
Max allowed bending torque in flywheel housing		Nm lbft	7000 5163	
Max. rear main bearing load		N lbf	3000 674,4	