


Important

This Technical Data Sheet and the corresponding Installation Instructions provide important information to ensure the installed engine will operate according to the design specification in the Volvo Penta application for certification.

Requirements marked with  are considered as critical for exhaust emissions compliance according to the design specification in the Volvo Penta application for certification.

Failing to follow and meet these instructions and requirements when installing a certified engine in a piece of nonroad equipment for use in the United States violates U.S. federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.

General

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

Number of cylinders			6
Displacement, total	litre		17.26
	in ³		1053.3
Firing order			1-5-3-6-2-4
Bore	mm		149
	in		5.87
Stroke	mm		165
	in		6.50
Compression ratio			16,5
Wet weight w/o EATS	Engine only	kg	1927
	Engine incl. cooling system and air filtration system	lb	4248
		kg	2218
Engine incl. cooling system, air filtration system, and frame	lb	4890	
	kg	N/A	

Performance

			rpm	1500	1800
Standby Power	without fan	kW		731	784
		hp		994	1066
	with fan	kW		710	750
		hp		966	1020
Prime Power	without fan	kW		666	716
		hp		906	974
	with fan	kW		645	682
		hp		877	928
COP Power 83% of prime power	without fan	kW		553	597
		hp		752	812
	with fan	kW		532	563
		hp		724	766
Torque at:	Standby Power	Nm		4654	4159
		lbft		3432	3067
Total mass moment of inertia, J (mR ²)		kgm ²		5.980	
		lbft ²		141.9	

Derating due to altitude - see Technical Diagrams

V O L V O P E N T A	Document No	Issue Index
	24510903	02

TWD1744GE

Engine noise emission

Test Standards: ISO 3744-1981 (E) sound power with fan

Tolerance ± 0.75 dB(A)

		rpm	1500	1800
Measured sound power Lw	Standby Power	dB(A)	114.2	118.2
	Prime Power	dB(A)	114.1	117.8
	No load	dB(A)	114.3	118.1
Calculated sound pressure Lp at 1 m	Standby Power	dB(A)	103.2	107.2
	Prime Power	dB(A)	103.1	106.8
	No load	dB(A)	103.3	107.1

Tailpipe noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m?

	rpm	1500	1800
Standby Power	dB(A)	112.2	113.7
Prime Power	dB(A)	110.5	112.3
COP	dB(A)	109.2	111.4

Test conditions for load acceptance data

Engine at working temperature, fuel that is used..... Nominal operating conditions

Generator	Brand	Model	Type of AVR
	Mecc Alte	ECO40-VL4C	Mecc Alte, DER2
AVR Settings	UFRO (Hz):	47 / 57	DIP: std
	Stability (%)*:	std	DWELL: std
		Voltage (V):	400 / 440
		Power factor:	1

Load acceptance performance can vary due to actual alternator inertia, voltage regulator, type of load and local ambient conditions.

Nomenclature

Abbreviation:	Full name:	Descriptions
AVR	Automatic Voltage Regulator	Generator performance and safty control unit
UFRO	Under Frequency Roll Off	Overheating protection at under frequency
-	Dip	Controls the slope of voltage drop when the UFRO is active
-	Dwell	Controls the slope of voltage recovery when the UFRO is active.

Load Acceptance at 1500 rpm

Genset Classification
This engine fulfills G1, G2 and G3 classes, according to ISO8528-5. For other class, please, see the table below.

Load (%)	Speed diff (%)	Speed Recovery time (s)	
44%	7 (G3)	1.0	G3 boundary conditions
49%	10 (G2)	1.9	G2 boundary conditions

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	2.7	0.7	0.7	0.0	20-100	19.1	2.0	16.0	1.4
0-40	5.5	1.0	1.3	0.0	40-100	9.8	1.2	4.7	0.8
0-60	15.2	1.7	10.8	1.2	60-100	5.0	1.0	0.3	0.0
0-80	25.2	2.5	23.2	1.9	80-100	2.7	0.8	0.2	0.0
0-100	35.5	3.4	34.3	2.7					
0-110	38.3	5.3	38.8	3.5					
100-0	9.3	1.6	5.9	0.8					

V O L V O P E N T A	Document No	Issue Index
	24510903	02

TWD1744GE

Load Acceptance at 1800 rpm

Genset Classification
This engine fulfills G1, G2 and G3 classes, according to ISO8528-5. For other class, please, see the table below.

Load (%)	Speed diff (%)	Speed Recovery time (s)	
53%	7 (G3)	0.9	G3 boundary conditions
63%	10 (G2)	1.3	G2 boundary conditions

Load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)	Remaining load (%)	Speed diff (%)	Speed Recovery time (s)	Voltage diff (%)	Voltage Recovery time (s)
0-20	1.0	0.5	0.1	0.0	20-100	12.9	1.7	9.0	1.7
0-40	2.2	0.9	1.6	0.0	40-100	10.4	1.4	4.6	1.4
0-60	4.3	1.2	2.3	1.3	60-100	5.5	0.9	0.5	0.9
0-80	8.2	1.9	12.7	1.3	80-100	2.4	0.6	0.2	0.6
0-100	12.1	2.5	21.6	1.8					
0-110	13.3	4.2	25.3	2.4					
100-0	6.9	0.3	4.8	0.8					

Cold start performance	Ambient Temp. [°C]	Manifold Heater	Block heater	RPM	
				1500	1800
Time to Set Speed from start	-10	-	-	8.6	9.0
	-15	-	-	11.7	12.4
	-20*	Yes	-	10.0	10.7
	-25*	Yes	-	11.9	12.6
	-30 **	Yes	Yes	N/A	N/A

Min start temp w/o Block Heater*	-25	°C
----------------------------------	-----	----

* With manifold heater 4,4 kW engaged, lubrication oil VDS-4.5 5W-30."

** With manifold heater 4,4 kW engaged, lubrication oil VDS-4.5 5W-30 and block heater, Fuel MK-1.

Block heater type	Power kW	Engaged hours	Cooling water temp engine block
CALIX PH	1,5 (110V)	10 h 1,5 kW at -30 C	-2 C
CALIX PH	2 (230V)	10 h 2 kW at -30 C	N/A

Lubrication system

		rpm		1500	1800
Lubricating oil consumption	Standby Power	litre/h		0.08	0.09
		US gal/h		0.021	0.024
	Prime Power	litre/h		0.08	0.08
		US gal/h		0.021	0.021
COP	litre/h		0.06	0.07	
	US gal/h		0.016	0.018	
Oil system capacity including filters		litre		52	
		US gal		13.7	
Oil sump capacity:	max	litre		47	
		US gal		12.4	
	min	litre		32	
		US gal		8.5	
Oil change intervals/specifications:	VDS-4.5 SAE 10w-30	h	Operators manual		
Engine angularity limits:	front up	°	0		
	front down	°	0		
	side tilt	°	0		
Oil pressure at nominal set speed		kPa		270 - 600 270 - 600	
		psi			
Lubrication oil temperature in oil sump:	max	°C		130	
		°F		266	

VOLVO PENTA	Document No	Issue Index
TWD1744GE	24510903	02

Fuel system

		rpm	1500	1800
Standby Power Specific fuel consumption at:	25%	g/kWh lb/hph	208 0.338	222 0.360
	50%	g/kWh lb/hph	195 0.317	200 0.325
	75%	g/kWh lb/hph	195 0.315	196 0.318
	100%	g/kWh lb/hph	194 0.315	197 0.319
% DEF consumption at: (Compare to Fuel consumption by Volyme)	25%	%	N/A	N/A
	50%	%	N/A	N/A
	75%	%	N/A	N/A
	100%	%	N/A	N/A

Prime Power Specific fuel consumption at:	25%	g/kWh lb/hph	211 0.343	225 0.365
	50%	g/kWh lb/hph	197 0.319	202 0.328
	75%	g/kWh lb/hph	194 0.314	197 0.319
	100%	g/kWh lb/hph	194 0.314	196 0.318
% DEF consumption at: (Compare to Fuel consumption by Volume)	25%	%	N/A	N/A
	50%	%	N/A	N/A
	75%	%	N/A	N/A
	100%	%	N/A	N/A

CO2 emission declaration

	rpm	1500	1800
Carbon dioxide (CO ₂) emissions determined during the EU type approval process, NRSC-D2.	g/kWh	TBD	TBD

Fuel system

Fuel to conform to	Technical Data with US1065 Fuel bulletin https://pubs.volvopenta.com/publications/18-8-8_US ASTM-D975-1D and 2D, JIS KK 2204, EN 590
--------------------	---

	rpm	1500	1800
System supply flow at:	litre/h	193.0	208.0
	US gal/h	51.0	55.0
Fuel supply line max restriction (Measured at fuel inlet connection)	kPa	-20.0	-20.0
	psi	-2.9	-2.9
Fuel supply line max pressure, engine stopped & running	kPa	17.0	17.0
	psi	2.5	2.5
System return flow at:	litre/h	25.0	25.0
	US gal/h	6.6	6.6
Fuel return line max restriction (Measured at fuel return connection)	kPa	17.0	17.0
	psi	2.5	2.5
Maximum allowable inlet fuel temp (Measured at fuel inlet connection)	°C	60	60
	°F	140	140
Prefilter / Water separator micron size	μ	Volvo Penta original fi	
Fuel filter micron size	μ	Volvo Penta original fi	
Governor type/make, standard	Volvo engine control unit		
Injection pump type/make	Common rail fuel injection system		

V O L V O P E N T A	Document No	Issue Index
TWD1744GE	24510903	02

Intake and exhaust system

		rpm	1500	1800
Air consumption at: (+25°C and 100kPa)	Standby Power	m ³ /min cfm	50.5 1783	56.3 1988
	Prime Power	m ³ /min cfm	48.7 1720	52.5 1854



See front page for important information

Max air intake restriction including piping with maintained performance		kPa psi	-3 -0.4	-3 -0.4
Max <u>allowable</u> air intake restriction including piping		kPa psi	-5 -0.7	-5 -0.7
Air filter restriction clean Volvo Penta filter		kPa psi	2.3 0.3	3.0 0.4
Heat rejection to exhaust at:	Standby Power	kW BTU/min	532 30254	597 33951
	Prime Power	kW BTU/min	480 27297	540 30709
Exhaust gas temperature after turbine at:	Standby Power	°C	486	491
		°F	907	916
	Prime Power	°C	461	476
		°F	862	889



See front page for important information

Max allowable back pressure in exhaust after turbine		kPa psi	10 1.5	10 1.5
 See front page for important information Max allowable temperature drop between turbine and SCR muffler inlet.		Δ°C Δ°F	N/A	N/A
	Heat rejection to exhaust:	kW BTU/min	N/A	N/A
Exhaust gas temperature after turbine at maximum power:		°C °F	N/A	N/A



See front page for important information

Max allowable temperature drop between turbine and muffler 1 inlet at exhaust temperature 480° C and exhaust gas flow 69.8 m ³ /min.		Δ°C Δ°F	N/A	N/A
---	--	------------	-----	-----



See front page for important information

Max allowable temperature drop between muffler 1 and muffler 2 at exhaust temperature ° C and exhaust gas flow m ³ /min.		Δ°F	N/A	N/A
DPF muffler pressure drop (at exhaust gas flow and exhaust temp specified in this table)		kPa psi	N/A	N/A
SCR muffler pressure drop (at exhaust gas flow and exhaust temp specified in this table)		kPa psi	N/A	N/A
Exhaust gas flow at max power: (temp and pressure after turbine)		m ³ /min cfm	N/A	N/A



See front page for important information

Engine speed during service regeneration		rpm	N/A	N/A
--	--	-----	-----	-----





See front page for important information

Max allowed load during service regeneration		Nm lb ft	N/A	N/A
--	--	-------------	-----	-----

V O L V O P E N T A	Document No	Issue Index
TWD1744GE	24510903	02

Charge air cooler system

	rpm	1500	1800
Heat rejection to charge air cooler at standby power	kW	181	202
	BTU/min	10293	11488
Charge air mass flow at standby power	kg/s	0.985	1.102
Charge air inlet temp at standby power (Charge air temp after turbo compressor)	°C	162	175
	°F	324	347
 See front page for important information Max allowable Charge air outlet temp at standby power (Charge air temp after intercooler)	°C	50	46
	°F	122	115
 Maximum pressure drop over charge air cooler incl. Piping	kPa	8	10
	psi	1.16	1.45
Maximum charge air pressure (After charge air cooler)	kPa	362	334
	psi	52.50	48.44
Standard charge air cooler core area	m ²	1.68	1.68
	foot ²	18.08	

Cooling system

Coolant type and mixture		60 % glycol 40 % water with qualit according to Volvo requirements	
Coolant capacity,	engine only	litre	25
		US gal	6.60
	charge air coolers	litre	4
		US gal	1.06
coolant radiators incl piping		litre	56
		US gal	14.79
expansion tank		litre	18,3 HT / 4,3 LT
		US gal	
		rpm	1500 1800
Heat rejection radiation from engine at Standby power:		kW	23 24
		BTU/min	1308 1365
Heat rejection to coolant at standby power		kW	229 231
		BTU/min	13023 13137
Standard radiator core area		m ²	1.68
		foot ²	18.08
Min coolant flow engine coolant circuit (at fully open thermostat)		litre/s	6.5 7.7
		US gal/s	1.72 2.03
Maximum coolant temperature entering engine (25°C amb. Temp.)		°C	82
		F	180
Maximum external engine coolant circuit restriction, including piping (25°C amb. Temp.)		kPa	70 100
		psi	10.2 14.5
Nominal coolant pressure		kPa	50 50
		psi	7.3 7.3
Nominal coolant flow with standard system		litre/s	6.1 6.8
		US gal/s	1.61 1.80
Fan diameter		mm	965
		in	37.99
Fan power consumption		kW	21 34
		hp	29 46
Fan drive ratio			Belt / 1,05
Coolant pump		drive/ratio	Belt / 2.07
Thermostat	start to open	°C	82
		°F	180
	fully open	°C	94
		°F	201
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa	100
		psi	14.5
Minimum static pressure head (expansion tank height + pressure cap setting)		kPa	70
		psi	10.2
Standard pressure cap setting		kPa	100
		psi	14.5
Maximum top tank temperature		°C	107
		°F	225
Charge air pressure (after charge air coolers)		kPa	362 / 334
		psi	

V O L V O P E N T A	Document No	Issue Index
TWD1744GE	24510903	02

Cooling performance

Standard fan:	965	Fan ratio:	1	Fan type:	fix
---------------	-----	------------	---	-----------	-----

Cooling air flow and external restriction at different radiator air temperatures based on 107°C TTT and 60% antifreeze. Valid at 1 atm. (radiator and cooling fan, see optional equipment)

Engine speed rpm	External restriction Pa	Air flow m ³ /s	STANDBY POWER	PRIME POWER
			Air on temp °C	Air on temp °C
1500	0	11.1	61.1	61.4
	300	9.6	58.3	59.6
	600	7.8	52.5	56.4
1800	0	13.6	63.1	64.4
	300	12.3	62.5	63.3
	600	11.0	60	62.1
	900	9.4	56	59.2

Note! External restrictions are calculated for values >0 Pa

TWD1744GE

Engine management system

Functionality	Alternatives	Default setting
Governor mode	Isochronous/droop	Isochronous
Governor droop	0.1-6%	0.1
Governor response	Adjustable PID-constants (VODIA)	-
Dual speed	1500rpm 50Hz/1800rpm 60Hz	1500rpm 50Hz/1800rpm 60Hz
Idle speed	900-1200	900.0
Fine speed adjustment	±90rpm	-
Stop function	Ignition off stop engine true/false	Ignition off stop engine false
Preheating function	On / Off	Off

Engine protection map

Parameter	Unit	Warning Level (Yellow)	Engine protection			
			Alarm level (Red)	Default	Optional	
Oil temp	°C	125	130.0	Shut down	N/A	
Oil pressure	Low idle	kPa	160	135.0	Shut down	N/A
	1500 rpm	kPa	243.0	218.0	Shut down	N/A
	1800 rpm	kPa	259.0	234.0	Shut down	N/A
Oil level		Low level	N/A	Fault code only	N/A	
DEF Dosing injector failure		N/A	N/A	N/A	N/A	
Piston cooling pressure >1000 rpm	kPa	N/A	N/A	N/A	N/A	
Coolant temp	°C	103	107.0	Shut down	N/A	
Coolant level		Low level	Low level	Shut down	N/A	
Fuel feed pressure	Low idle	kPa	100.0		Fault code only	N/A
	>1400 rpm		225.0		Fault code only	N/A
Water in fuel		High Level	N/A	Fault code only	N/A	
Crank case pressure	kPa	N/A	N/A	N/A	N/A	
Air filter pressure droop	kPa	5.0	N/A	Fault code only	N/A	
Altitude, above sea	m	N/A	N/A	Automatic derating, see section derating	N/A	
Charge air temp	°C	80	82.5	Shut down	N/A	
Charge air pressure	kPa	30kPa above demand	40kPa above demand	Shut down	N/A	
Engine speed	rpm	N/A	N/A	Fault code only	N/A	
Exhaust Temperature (Before SCR volume)	°C	N/A	N/A		N/A	

V O L V O P E N T A	Document No	Issue Index
TWD1744GE	24510903	02

Electrical system

Voltage and type		24V / insulated from ground	
Alternator:	make/output	A	SEG / 80
	tacho output	Hz/alt. Rev	6
	drive ratio		4.02
Starter motor	make	Mitsubishi Electric	
	type	105P70	
	kW	7.0	
Number of teeth on:	flywheel		153
	starter motor		12
Max wiring resistance main circuit		mΩ	5
Cranking current at +20°C		A	300
Crank engine speed at 20°C		rpm	155
Starter motor battery capacity:	min	Ah	120
	CCA at -18°C	Ah/A	700
Inlet manifold heater (at 24 V)		kW	4.4
Power relay for the manifold heater		A	1

VOLVO PENTA

TWD1744GE

Document No

24510903

Issue Index

02

Sensors Alarm	Signal	Range	rpm Map			Condition	Derating
Coolant pressure	N/A						
Warning Level							
Alarm Level							
Fuel pressure	0.5-4.5V?	0-700kPa ?	900	1500	1800		
Warning Level			100	225	250		
Alarm Level							
Differential oil pressure	N/A						
Alarm Level							
Derating Limit							
Oil pressure	0.5-4.5V?	0-700kPa ?	900	1500	1800		
Warning Level			160	245	270		
Alarm Level			135	220	245		Shutdown

Remarks

1) Soft derate Coolant temp	Speed / °C				
Remaining torque in %	No derate	No derate	No derate	No derate	No derate

2) Soft derate Oil temp	Speed / °C				
Remaining torque in %	No derate	No derate	No derate	No derate	No derate

Derate map R2			
°C			
%			

Derate map R2			
°C			
%			

