

VOLVO PENTA INDUSTRIAL DIESEL

TAD732GE

179 kW (243 hp) at 1500 rpm, 197 kW (268 hp) at 1800 rpm

The TAD732GE is a powerful, reliable and economical Generating Set Diesel Engine built on the dependable in-line six design.

Durability & low noise

Designed for easiest, fastest and most economical installation. Well-balanced to produce smooth and vibration-free operation with low noise level.

To maintain a controlled working temperature in cylinders and combustion chambers, the engine is equipped with piston cooling. The engine is also fitted with replaceable cylinder liners and valve seats/guides to ensure maximum durability and service life of the engine.

Low exhaust emission

The state of the art, high-tech injection and charging system with low internal losses contributes to excellent combustion and low fuel consumption.

The TAD732GE complies with EU Stage 2 and TA-Luft exhaust emission regulations.

Easy service & maintenance

Easily accessible service and maintenance points contribute to the ease of service of the engine.

Technical description

Engine and block

- Optimized cast iron cylinder block with optimum distribution of forces
- Piston cooling for low piston temperature and reduced ring temperature
- Drop forged steel connecting rods
- Crankshaft hardened bearing surfaces and fillets for moderate load on main and big-end bearings
- Keystone top compression rings for long service life
- Replaceable valve guides and valve seats
- Three PTO positions at flywheel end
- Lift eyelets
- Flywheel housing with connection acc. to SAE 2
- Flywheel for flexible coupling and friction clutch
- Transport brackets

Lubrication system

- Full flow disposable spin-on oil filter, for extra high filtration
- Rotary displacement oil pump driven by the crankshaft
- Deep centre oil sump, 30° inclination
- Oil filler on top



Features

- Electronic governing, EDC 4
- CAN bus communication
- Compact design
- High power to weight ratio
- Emission compliant
- Noise optimized engine design
- A wide selection of optional equipment and power settings

- Oil dipstick, short in front
- Integrated full flow oil cooler, side-mounted

Fuel system

- Six hole fuel injection nozzles
- Direct injection unit pumps
- Electronic governor with smoke limiter function
- Washable fuel prefilter with water separator
- Rotary low-pressure fuel pump
- Fine fuel filter of disposable type

Intake and exhaust system

- Connection flange for exhaust line
- Turbo charger, centre low with exhaust flange
- Closed crankcase ventilation
- Heater flange in charge air inlet (without power relay)

Cooling system

- Belt driven, maintenance-free coolant pump with high degree of efficiency
- Efficient cooling with accurate coolant con-

trol through a water distribution duct in the cylinder block

- Reliable thermostat with minimum pressure drop
- Cooling water pipe, inlet and outlet
- Belt driven coolant pump, ratio 1.0:1
- Fan hub
- Fan on separate bracket 292mm above crankshaft
- Pusher fan Ø 600 mm

Electrical system

- 24V electrical system
- Alternator 1x35A / 24V, low left
- Starter motor, Melco, 5.5kW / 24V, single pole
- ECU (without high altitude sensor) control and monitoring of oil pressure, coolant temperature, coolant level, charge air pressure, engine rpm and fuel temperature compensation
- Engine wiring

**VOLVO
PENTA**

TAD732GE

Technical Data

General

Engine designation	TAD732GE	
No. of cylinders and configuration	in-line 6	
Method of operation	4-stroke	
Bore, mm (in.)	108 (4.25)	
Stroke, mm (in.)	130 (5.12)	
Displacement, l (in ³)	7.15 (436.3)	
Compression ratio	18:1	
Dry weight, with cooling package, kg (lb)	785 (1731)	
Wet weight, with cooling package, kg (lb)	826 (1821)	

Performance	1500 rpm	1800 rpm
with fan, kW (hp) at:		
Prime Power	160 (218)	176 (240)
Max Standby Power	179 (243)	197 (268)

Lubrication system	1500 rpm	1800 rpm
Oil consumption, liter/h (US gal/h) at:		
Prime Power	0.08 (0.021)	0.09 (0.024)
Max Standby Power	0.09 (0.024)	0.11 (0.029)
Oil system capacity incl filters, liter	34	

Fuel system	1500 rpm	1800 rpm
Specific fuel consumption at:		
Prime Power, g/kWh (lb/hph)		
25 %	270 (0.438)	260 (0.422)
50 %	219 (0.354)	225 (0.364)
75 %	213 (0.345)	217 (0.352)
100 %	213 (0.345)	218 (0.354)
Max Standby Power, g/kWh (lb/hph)		
25 %	234 (0.379)	244 (0.395)
50 %	215 (0.348)	220 (0.356)
75 %	212 (0.344)	216 (0.350)
100 %	214 (0.347)	220 (0.356)

Intake and exhaust system	1500 rpm	1800 rpm
Air consumption at 27°C, m ³ /min (cfm):		
Prime Power	11.4 (403)	14.42 (509)
Max Standby Power	12.4 (438)	14.42 (509)
Max allowable air intake restriction, kPa (In wc)	3.5 (14.1)	3.5 (14.1)
Heat rejection to exhaust, kW (BTU/min) at:		
Prime Power	140 (7945)	161 (9173)
Max Standby Power	156 (8872)	181 (10310)
Exhaust gas temperature after turbine, °C (°F) at:		
Prime Power	529 (984)	495 (923)
Max Standby Power	542 (1008)	515 (959)
Max allowable back-pressure in exhaust line, kPa (In wc)	5 (20.1)	7 (28.1)
Exhaust gas flow, m ³ /min (cfm) at:		
Prime power	31.9 (1125)	38.3 (1353)
Max Standby Power	35.1 (1240)	41.8 (1476)

Cooling system	1500 rpm	1800 rpm
Heat rejection radiation from engine, kW (BTU/min)		
Prime Power	17 (972)	20 (1109)
Max Standby Power	19 (1086)	22 (1245)
Heat rejection to coolant kW (BTU/min)		
Prime Power	70 (3981)	76 (4316)
Max Standby Power	76 (4328)	84 (4749)
Fan power consumption, kW (hp)	4.4 (6)	7.4 (10)

Standard equipment

Engine

- Automatic belt tensioner •
- Lift eyelets •

Flywheel

- Flywheel housing with conn. acc. to SAE 2 •
- Flywheel 10" and 11.5" disc •
- Vibration dampers •

Engine suspension

- Fixed front suspension •

Lubrication system

- Oil dipstick •
- Full-flow oil filter of spin-on type •
- By-pass oil filter of spin-on type •
- Oil cooler, side mounted •
- Low noise oil sump •

Fuel system

- Fuel filters of disposable type •
- Electronic unit injectors •
- Pre-filter with water separator •

Intake and exhaust system

- Air filter with replaceable paper insert •
- Air restriction indicator •
- Air cooled exhaust manifold •
- Connecting flange for exhaust pipe •
- Exhaust flange with v-clamp •
- Turbo charger, low right side •
- Crankcase ventilation, open •
- Cooling system**
- Tropical radiator incl intercooler -1)
- Gear driven coolant pump •
- Fan hub •
- Thrust fan -1)
- Fan guard -1)
- Belt guard -1)

Control system

- Engine Management System (EMS) with CAN-bus interface SAE J1939 and stand alone interface •

Alternator

- Alternator 35A / 24 V •

Starting system

- Starter motor, 5.5kW, 24 V •

Instruments and senders

- Temp.- and oil pressure for automatic stop/alarm 103°C •

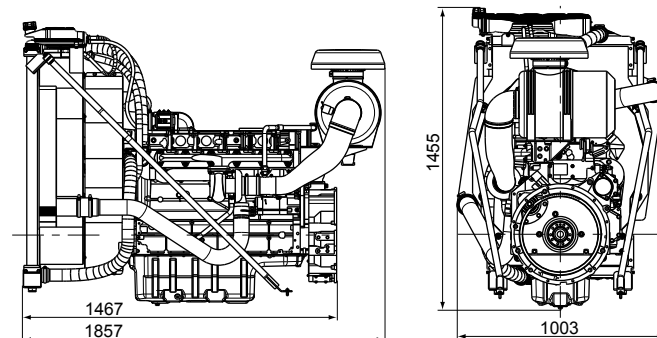
Engine Packing

- Plastic wrapping •

1) must be ordered, see order specification
 - optional equipment or not applicable
 • included in standard specification

Dimensions TAD732GE

Not for installation



Note! Not all models, standard equipment and accessories are available in all countries. All specifications are subject to change without notice. The engine illustrated may not be entirely identical to production standard engines.

Power Standards

The engine performance corresponds to ISO 3046, BS 5514 and DIN 6271. The technical data applies to an engine without cooling fan and operating on a fuel with calorific value of 42.7 MJ/kg (18360 BTU/lb) and a density of 0.84 kg/liter (7.01 lb/US gal), also where this involves a deviation from the standards. Power output guaranteed within 0 to +2% at rated ambient conditions at delivery. Ratings are based on ISO 8528.

Engine speed governing in accordance with ISO 3046/IV, class A1 and ISO 8528-5 class G3

Exhaust emissions

The engine complies with EU stage 2 and TA-luft exhaust emission regulations.

Rating Guidelines

PRIME POWER rating corresponds to ISO Standard Power for continuous operation. It is applicable for supplying electrical power at variable load for an unlimited number of hours instead of commercially purchased power. A10 % overload capability for governing purpose is available for this rating.

MAXIMUM STANDBY POWER rating corresponds to ISO Standard Fuel Stop Power. It is applicable for supplying standby electrical power at variable load in areas with well established electrical networks in the event of normal utility power failure. No overload capability is available for this rating. 1 hp = 1 kW x 1.36

Information

For more technical data and information, please look in the Generating Set Engines Sales Guide.



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Technical data TAD732GE

With mounted radiator

General

In-line four stroke diesel engine with direct injection. Rotation direction, anti-clockwise viewed towards flywheel. Turbocharged, charge air cooled (CAC)

Number of cylinders			6
Displacement, total		litre in ³	7,15 436,3
Firing order			1-5-3-6-2-4
Bore		mm in	108 4,25
Stroke		mm in	130 5,12
Compression ratio			18:1
Dry weight	Engine only	kg lb	710 1565
	Engine and cooling package	kg lb	900 1984
Wet weight	Engine only	kg lb	751 1656
	Engine and cooling package	kg lb	968 2134

Performance

		r/min	1500	1800
Standby Power	without fan	kW	183	204,0
		hp	249	277
	with fan	kW	176	192
		hp	239	261
Prime Power	without fan	kW	165	184
		hp	224	250
	with fan	kW	158	171
		hp	214	233
Torque at rated speed:	Standby Power	Nm	1165	1082
		lbft	859	798
	Prime Power	Nm	1049	974
		lbft	773	718
Mean piston speed		m/s ft/sec	6,5 21,4	7,8 25,7
Effective mean pressure at:	Standby Power	MPa	2,1	1,9
		psi	299	278
	Prime Power	MPa	1,8	1,7
		psi	264	249
Max combustion pressure at:	Standby Power	MPa	14,9	19,1
		psi	2161	2770
	Prime Power	MPa	14	15,1
		psi	2031	2190
Total mass moment of inertia, J (mR2) (with flywheel 2,612 kgm ²)		kgm ² lbft ²	3,09 73,2	
Degree of irregularity at:	Standby Power		1:37	1:48
		Prime Power	1:41	1:52
Residual speed droop at load increase from 0 to 100%		%	adjustable	
Friction Power		kW	8,5	12,3
		hp	11,6	16,7

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With mounted radiator

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)	103	104
	Standby Power	dB(A)	106	109
	Prime Power	dB(A)	106	108
Calculated sound pressure Lp at 1 m	No load	dB(A)	90	91
	Standby Power	dB(A)	93	95
	Prime Power	dB(A)	92	95

Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m

	r/min	1500	1800
Standby Power	dB(A)	117	118
Prime Power	dB(A)	116	117

Load acceptance

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

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
0-40	6,0	6,3	1,8	2,0	40-100	11,2	13,1	4,5	9,9
0-50	7,2	8,2	2,1	2,9	50-100	8,5	9,6	3,8	7,8
0-60	8,7	10,2	3,0	4,3	60-100	6,8	7,8	3,5	5,0
0-75	13,7	17,5	3,8	4,5	75-100	4,0	4,6	3,2	3,6
0-51	7,0		2,8		0-46		7,0		2,8
0-100									
100-0									

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
0-40	3,8	4,1	1,2	1,4	40-100	5,4	6,7	2,1	7,0
0-50	4,5	5,1	1,6	1,7	50-100	4,8	5,8	1,9	6,8
0-60	5,6	6,2	1,8	2,2	60-100	3,6	4,4	1,8	4,1
0-75	7,3	7,5	2,1	2,5	75-100	2,4	3,5	1,7	3,6
0-73	7,0		1,9		0-66		7,0		1,9
0-100	14,3	18,3	3,5	9,1					
100-0	5,8	5,8	2,0	2,0					

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Cold start performance

	r/min	1500	1800
Without cold start aid (heater flange)	°C	-15	-15
With cold start aid (heater flange)	°C	-30	-30

Derating

The engine may be operated up to 1000 m altitude and 40°C ambient air temperature without derating. For applications above 1000 m an ECU with automatic derating must

Altitude derating factor < 3000 m	% / m	4% / 500m
Altitude derating factor > 3000 m		6% / 500m
Ambient temperature derating factor	% / °C	2% / 5°C
Humidity	%	No derating

Lubrication system

		r/min	1500	1800
Lubricating oil consumption	Standby Power	liter/h	0,09	0,11
		US gal/h	0,024	0,029
	Prime Power	liter/h	0,08	0,09
		US gal/h	0,021	0,024
Oil system capacity including filters		liter	34	
		US gal	8,9	
Oil sump capacity:	max	liter	31	
		US gal	8,1	
	min	liter	24	
		US gal	6,2	
Oil change intervals/specifications:				
Closed crankcase ventilation	ACEA: E4. API: CH-4, CI-4* full synthetic	h	500	
Open crankcase ventilation	VDS-2. ACEA: E3, E5. API: CG-4, CH-4*	h	500	
Open crankcase ventilation	VDS. ACEA: E2. API: CF, CF-4*	h	250	
Engine angularity limits:	front up	°	10	
	front down	°	10	
	side tilt	°	10	
Oil pressure at rated speed		kPa	480	520
		psi	70	75
Oil pressure shut down switch setting		kPa	200	
		psi	29	
Lubrication oil temperature:	max	°C	125	
		°F	257	
Oil filter micron size		mm	0,012	

* See also general section in the sales guide

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With mounted radiator

Fuel system		r/min	1500	1800
Standby Power Specific fuel consumption at:	25%	g/kWh lb/hph	234 0,379	244 0,395
	50%	g/kWh lb/hph	215 0,348	220 0,356
	75%	g/kWh lb/hph	212 0,344	216 0,350
	100%	g/kWh lb/hph	214 0,347	220 0,356
Prime Power Specific fuel consumption at:	25%	g/kWh lb/hph	270 0,438	260 0,422
	50%	g/kWh lb/hph	219 0,354	225 0,364
	75%	g/kWh lb/hph	213 0,345	217 0,352
	100%	g/kWh lb/hph	213 0,345	218 0,354
Recommended fuel to conform to		ASTM-D975-No1 and 2-D JIS KK 2204, EN 590		
Total fuel flow		liter/h US gal/h	360 95	450 119
Feed pump max suction head		m foot	1,5 4,9	
Feed pump pressure		kPa psi	500 72,5	
Max allowable inlet fuel temp under operation conditions		°C °F	75 167	
Fuel filter micron size		mm	0,005	
Prefilter / Water separator micron size		mm	0,063	
Governor type/make, standard		Heinzmann / EDC 4		
Injection pump type/make		PFW 1 P100 52007 / Bosch		
Injection timing std.		°B.T.D.C	2,5	

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With mounted radiator

Intake and exhaust system		r/min	1500	1800	
Air consumption at:	Standby Power	27°C 81°F	m ³ /min cfm	12,4 438	14,42 509
	Prime Power	27°C 81°F	m ³ /min cfm	11,4 403	14,42 509
Air intake restriction, clean filter(s)			kPa in wc	1,5 6,0	1,5 6,0
Max allowable air intake restriction			kPa in wc	3,5 14,1	3,5 14,1
Air filter type		Single stage paper cartridge			
Air filter cleaning efficiency			%	≥ 99,9	
Heat rejection to exhaust at:	Standby Power		kW BTU/min	144 8189	167 9497
	Prime Power		kW BTU/min	127 7222	146 8303
Exhaust gas temperature after turbine at:	Standby Power		°C °F	542 1008	515 959
	Prime Power		°C °F	529 984	495 923
Max allowable back pressure in exhaust line	Standby Power		kPa In wc	3 12,0	5 20,1
	Prime Power		kPa In wc	5 20,1	7 28,1
Exhaust gas flow at:	Standby Power		m ³ /min cfm	35,1 1240	41,8 1476
	Prime Power		m ³ /min cfm	31,9 1125	38,3 1353
Max allowable comb. air temp after CAC			°C °F	50 122	50 122
Max allowable pressure drop over CAC			kPa	15	15
Heat rejection to CAC	Standby Power		kW BTU/min	35,9 2042	46,8 2661
	Prime Power		kW BTU/min	32,3 1837	42,1 2394

Technical data TAD732GE

With mounted radiator

Cooling system		r/min	1500	1800
Heat rejection radiation from engine at:	Standby Power	kW	18	20
		BTU/min	1024	1137
	Prime Power	kW	17	19
		BTU/min	972	1081
Heat rejection to coolant at:	Standby Power	kW	85	96
		BTU/min	4840	5454
	Prime Power	kW	77	87
		BTU/min	4362	4919
Recommended coolant	Volvo coolant or Volvo anticorrosion additive together with clean fresh water			
Radiator cooling system type	Closed circuit			
Radiator core area (std. size)	m ²		0,65	
	foot ²		7,00	
Radiator core thickness (std. size)	mm		55	
	in		2,17	
Intercooler core area (std. size)	m ²		0,414	
	foot ²		4,46	
Intercooler core thickness (std. size)	mm		50	
	in		1,97	
Fan diameter	mm		870	
	in		34,25	
Fan power consumption	kW		7,2	12,4
	hp		10	17
Fan drive ratio	1 : 0,8			
Coolant capacity,	engine	liter	9,8	
		US gal	2,59	
	std radiator with hoses	liter	28,6	
		US gal	7,56	
Coolant pump	drive/ratio	1 : 1,73		
Coolant flow with standard system	l/s		3,0	3,6
	US gal/s		0,79	0,95
Maximum external coolant system restriction, including piping	kPa		25	35
	in wc		100	141
Thermostat,	start to open	°C	87	
		°F	189	
	fully open	°C	102	
		°F	216	
Maximum static pressure head	kPa		100	
	in wc		402	
Pressure cap setting on standard radiator	kPa		90	
	in wc		361	
Maximum top tank temperature	°C		105	
	°F		221	
Max. permissible cooling down of engine coolant by radiator	°C		8	
	°F		46	
Shutdown switch setting	°C		113	
	°F		235	
Recommended draw down capacity	10% of total cooling system capacity			

Technical data TAD732GE

With mounted radiator

Cooling performance

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 105°C TTT and 50% antifreeze (radiator and cooling fan, see optional equipment)

Engine speed rpm	Air on temp °C	STANDBY POWER (LTP)		PRIME POWER (PRP)	
		Air flow kg/s	External restriction Pa	Air flow kg/s	External restriction Pa
1500	64	3,9	0		
	59	3,3	150		
	57	3,1	200		
	52	2,7	300		
	46	2,4	400		
	67			3,9	0
	62			3,3	150
	61			3,1	200
	56			2,7	300
	50			2,4	400
1800	66	4,9	0		
	62	4,3	150		
	61	4,1	200		
	58	3,7	300		
	55	3,4	400		
	69			4,9	0
	66			4,3	150
	64			4,1	200
	62			3,7	300
	59			3,4	400

Electrical system

		r/min	1500	1800
Voltage and type		24V / 1 polesystem		
Alternator:	make/output	Amp	Iskra / 55	
	tacho output	Hz/alt. Rev	6	
	drive ratio		1:4,07	
Starter motor	make	Melco		
	type	M008T62471		
	kW	5,0		
Starter motor solenoid,	pull current	Amp	2	
	hold current	Amp	2	
Number of teeth on:	flywheel		129	
	cam gear		96	
	starter motor		10	
Inrush current at +20°C		Amp	1200	
Cranking current at +20°C		Amp	400	
Crank engine speed at 20°C		rpm	150	
Starter motor battery capacity:	max	Ah	135	
	min at +5°C	Ah	110	
Inlet manifold heater (at 12 V / 24 V)		kW	2 / 3,6	
Power relay for the manifold heater (at 12 V / 24 V)		Amp	150 / 120	