# TWD1643GE VOLVO PENTA GENSET ENGINE

613 kW (834 hp) at 1500 rpm, 674 kW (917 hp) at 1800 rpm

The TWD1643GE 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 TWD1643GE is certified for EPA Tier 2. An additional feature is that TWD1643GE fulfils EU Stage 2 exhaust emission levels.

## Easy service & maintenance

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

## Features

- Tropical cooling system (55°C)
- Fully electronic with Volvo Penta EMS 2
- Dual frequency switch (between 1500 rpm and 1800 rpm)
- High power density
- Emission compliant
- Low noise levels
- Low fuel consumption
- Gen Pac configuration
- Compact design for the power class

## Technical description

### Engine and block

- Optimized cast iron cylinder block with optimum distribution of forces without the block being unnessarily heavy.
- Wet, replaceable cylinder liners
- Piston cooling for low piston temperature and reduced ring temperature
- Tapered connecting rods for reduce risk of piston cracking
- Crankshaft induction hardened bearing surfaces and fillets with seven bearings for moderate load on main and high-end bearings
- Case hardened and Nitrocarburized transmission gears for heavy duty operation
- Keystone top compression rings for long service life
- Viscous type crankshaft vibration dampers to withstand single bearing alternator torsional vibrations
- Replaceable valve guides and valve seats
- Over head camshaft and four valves per cylinder

### Lubrication system

- Full flow oil cooler
- Full flow disposable spin-on oil filter, for extra high filtration
- The lubricating oil level can be measured during operation
- Gear type lubricating oil pump, gear driven by the transmission

### Fuel system

- Non-return fuel valve
- Electronic unit injectors
- Fuel prefilter with water separator and water-in-fuel indicator / alarm
- Gear driven low-pressure fuel pump
- Fine fuel filter with manual feed pump and fuel pressure switch
- Fuel shut-off valve

### Cooling system

- New TWD-cooling system with optimized priority and cold start valves
- Two water cooled charge air coolers
- Efficient cooling with accurate coolant control through a water distribution duct in the cylinder block. Reliable sleeve thermostat with minimum pressure drop
- Gear driven, maintenance-free coolant pump with high degree of efficiency
- Coolant filter as standard

### Turbo charger

- Efficient and reliable dual stage turbo chargers
- Intermediate charge air coolers for both turbo chargers
- Waste gate system for the high pressure turbo charger

### Electrical system

- Engine Management System 2 (EMS 2), an electronically controlled processing system which optimizes engine performance. It also includes advanced facilities for diagnostics and fault tracing
- The instruments and controls connect to the engine via the CAN SAE J1939 interface, either through the Control Interface Unit (CIU) or the Display Control Unit (DCU). The CIU converts the digital CAN bus signal to an anolog signal, making it possible to connect a variety of instruments. The DCU is a control panel with display, engine control, monitoring, alarm, parameter setting and diagnostic functions. The DCU also presents error codes in clear text.
- Sensors for oil pressure, oil temp, boost pressure, boost temp, exhaust temp, coolant temp, fuel temp, water in fuel, fuel pressure and two speed sensors.

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# TWD1643GE

## Technical Data

**General**

| | |
|---|---|
| Engine designation | TWD1643GE |
| No. of cylinders and configuration | in-line 6 |
| Method of operation | 4-stroke |
| Bore, mm (in.) | 144 (5.67) |
| Stroke, mm (in.) | 165 (6.50) |
| Displacement, l (in³) | 16.12 (983.7) |
| Compression ratio | 16.5:1 |
| Dry weight, kg (lb) | 1700 (3748) |
| Dry weight with Gen Pac, kg (lb) | 2200 (4850) |
| Wet weight, kg (lb) | 1770 (3902) |
| Wet weight with Gen Pac, kg (lb) | 2370 (5225) |

| **Performance** | **1500 rpm** | **1800 rpm** |
|---|---|---|
| with fan, kW (hp) at: | | |
| Prime Power | 536 (729) | 585 (796) |
| Max Standby Power | 596 (811) | 644 (876) |

| **Lubrication system** | **1500 rpm** | **1800 rpm** |
|---|---|---|
| Oil consumption, liter/h (US gal/h) at: | | |
| Prime Power | 0.10 (0.026) | 0.10 (0.029) |
| Max Standby Power | 0.11 (0.029) | 0.11 (0.032) |
| Oil system capacity incl filters, liter | 48 | |

| **Fuel system** | **1500 rpm** | **1800 rpm** |
|---|---|---|
| Specific fuel consumption at: | | |
| Prime Power, g/kWh (lb/hph) | | |
| 25 % | 215 (0.349) | 224 (0.363) |
| 50 % | 196 (0.318) | 201 (0.326) |
| 75 % | 196 (0.318) | 197 (0.319) |
| 100 % | 199 (0.323) | 202 (0.327) |
| Max Standby Power, g/kWh (lb/hph) | | |
| 25 % | 210 (0.340) | 220 (0.357) |
| 50 % | 195 (0.316) | 200 (0.324) |
| 75 % | 196 (0.318) | 198 (0.321) |
| 100 % | 200 (0.324) | 204 (0.331) |

| **Intake and exhaust system** | **1500 rpm** | **1800 rpm** |
|---|---|---|
| Air consumption, m³/min (cfm) at: | | |
| Prime Power | 44 (1541) | 53 (1874) |
| Max Standby Power | 47 (1658) | 55 (1937) |
| Max allowable air intake restriction, kPa (In wc) | 5 (20.1) | 5 (20.1) |
| Heat rejection to exhaust, kW (BTU/min) at: | | |
| Prime Power | 415 (23601) | 472 (26842) |
| Max Standby Power | 463 (26330) | 540 (30709) |
| Exhaust gas temperature after low pressure turbine, °C (°F) at: | | |
| Prime Power | 450 (842) | 422 (792) |
| Max Standby Power | 463 (865) | 461 (862) |
| Max allowable back-pressure in exhaust line, kPa (In wc) | 10 (40.2) | 10 (40.2) |
| Exhaust gas flow, m³/min (cfm) at: | | |
| Prime power | 101.6 (3586) | 119 (4201) |
| Max Standby Power | 111.8 (3949) | 130.1 (4593) |

**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% att 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**

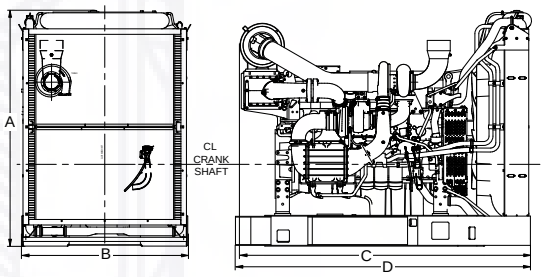
The TWD1643GE is certified for EPA Tier 2. An aditional feature is that TWD1643GE fulfils EU Stage 2 exhaust emis-sion levels.

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

## Standard equipment

| | Engine | Gen Pac |
|---|---|---|
| **Engine** | | |
| Automatic belt tensioner | • | • |
| Lift eyelets | • | • |
| **Flywheel** | | |
| Flywheel housing with conn. acc. to SAE 1 | • | • |
| Flywheel for 14" flex. plate and flexible coupling | • | • |
| 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 spin-on type | • | • |
| Electronic unit injectors | • | • |
| Pre-filter with water separator | • | • |
| **Intake and exhaust system** | | |
| Air filter without rain cover | • | • |
| Air restriction indicator | • | • |
| Air cooled exhaust manifold | • | • |
| Connecting flange for exhaust pipe | • | • |
| Exhaust flange with v-clamp | • | • |
| Turbo chargers, dual stage, right side | • | • |
| **Cooling system** | | |
| TWD-cooling system, tropical | • | • |
| Gear driven coolant pump | • | • |
| Fan hub | • | • |
| Pusher fan | • | • |
| Fan guard | • | • |
| Belt guard | • | • |
| **Control system** | | |
| Engine Management System (EMS) with CAN-bus interface SAE J1939 | • | • |
| CIU, Control Interface Unit | – | – |
| DCU, Display Control Unit | – | – |
| **Alternator** | | |
| Alternator 80A / 24 V | • | • |
| **Starting system** | | |
| Starter motor, 7.0kW, 24 V | • | • |
| Connection facility for extra starter motor | • | • |
| **Instruments and senders** | | |
| Temp. and pressure for automatic stop/alarm | • | • |
| **Other equipment** | | |
| Expandable base frame | – | • |
| **Engine Packing** | | |
| Plastic warpping | • | • |

– optional equipment or not applicable
• included in standard specification




A* = 1930 mm / 76 in
B* = 1350 mm / 53.1 in
C = 2362 mm / 93 in
D = 2399 mm / 94.5 in (During transport)
D = Max 3255 mm / 128.2 in
* Including radiator and intercooler

**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 govering 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

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