

TAMD 162 A

6-cylinder, 4-stroke, direct injection turbo-charged diesel engine equipped with aftercooler. Crankshaft power output* 405 kW (551 hp).

The engine is intended for use on a marine propulsion engine's primary auxiliary engine by outboard, stern-drive and inboard outboard dies.

The TAMD 162 A is designed for high reliability and maximum operational reliability and service life.

An effective air supply and filtration system with, among other things, a coarse pre-cyclonic media centrally located in the intake manifold provides an effective contribution and thus a long service life.

TAMD 162 A has a wide maintenance-free interval due to the well-thought-out design of the engine components and the use of high-quality materials.

The engine design permits a low speed in wide speed range which makes it particularly suitable for work boat applications.

Constructional details such as the centrally located water pump and the centrally located cooling water pump with injection hoses which allows the connecting rail hoses to be removed without removing the pump. The

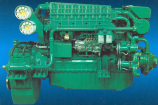
engine also has two oil and fuel filters with "spin-on" type.

The engine is adapted to specific customer and market requirements by an extensive range of equipment it can be equipped with: differential pump and steering-tilt bracket groups, compressors and oil-cooling systems, water-cooled, exhaust heat exchanger, regulator heat exchanger.

The engine is built for the toughest conditions at sea. To meet the "Specification 6000" and the shipping authorities' demands for propulsion in emergency engine mode, the engine can be delivered fully overhauled. All manufacturing is undertaken in easily accessible high-located production-line outboard sites.

Volvo Penta has a well-developed service dealer network in more than 100 countries. Authorized workshops equipped personnel using genuine parts, will ensure you get the best service.

*Crankshaft output according to ISO 1585.



**VOLVO
PENTA**

TAMD 162 A

Latest equipment for selection of the engine for marine project.

Model
 The TAMD 162 A is a 1620 cc, 4-cylinder, 4-stroke, diesel engine with a maximum power of 16.2 kW (22.0 hp) at 2400 rpm.

Construction
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Dimensions
 The TAMD 162 A is a 4-cylinder, 4-stroke, diesel engine with a maximum power of 16.2 kW (22.0 hp) at 2400 rpm.

Performance
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Technical details TAMD 162 A Marine Propulsion Diesel Engine

Model	TAMD 162 A
Displacement	1620 cc
Cylinder	4
Stroke	70 mm
Bore	65 mm
Compression ratio	17.5:1
Maximum power	16.2 kW (22.0 hp) at 2400 rpm
Maximum torque	12.5 Nm (9.2 lb-ft) at 1800 rpm
Speed range	1800 - 2400 rpm

RPM	Fuel consumption (liters/hour)		
	100%	75%	50%
1800	1.2	0.9	0.6
2000	1.3	1.0	0.7
2200	1.4	1.1	0.8
2400	1.5	1.2	0.9
2600	1.6	1.3	1.0
2800	1.7	1.4	1.1
3000	1.8	1.5	1.2

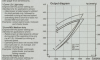


Figure 1: Output Power vs. Engine Speed for TAMD 162 A engine.

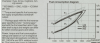


Figure 2: Fuel Consumption vs. Engine Speed for TAMD 162 A engine.

TAMD 162 B

6-cylinder, 4-stroke, direct-injected, turbocharged and aftercooled marine diesel engine — crankshaft power* 450 kW (612 hp)

The TAMD 162 B is our biggest engine. Its exceptional torque and excellent torque spread when the most optimum characteristics for starting and accelerating pleasure and work are required.

The engine produces massive torque over a wide speed range together with excellent torque characteristics, which provides improved acceleration properties.

Finally, high operational reliability owing to a reinforced design with robust reinforced bearings, an integrated vibration damper and an engine block which is strengthened by internal engine rigidity. The valve cover also helps ensuring protected cylinder "floating" sub-suspension units.

A wet sump lubrication system and improved coolant heater engine oil separator system and a carefully constructed cooling system with built-in automatic gas exchange which together with efficient ventilation, ensures a long engine life.

The electric system of starting is operated by the electrical starting system.

Some examples of boats which employ our work, especially motor yachts for racing, are shown with pleasure using what allows for connecting up a starting system to be turned without necessitating removal of the pump. The engine also features fuel-inject facilities in the "open" type.

Other Volvo has a well developed service network in over 100 countries. A thorough knowledge gained by our long experience using pleasure yachts ensure Volvo's prime reliability.

*Crankshaft power according to ISO 1585

Technical description advantages:

- Integrated wet sump lubrication system
- Wet sump lubrication system with oil separator
- Improved cooling system with built-in automatic gas exchange
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Electrical equipment

- Engine equipped with 12V electrical system
- Engine equipped with 24V electrical system
- Engine equipped with 24V electrical system
- Engine equipped with 24V electrical system
- Engine equipped with 24V electrical system

Cooling system

- Two stage cooling system with built-in automatic gas exchange
- Two stage cooling system with built-in automatic gas exchange
- Two stage cooling system with built-in automatic gas exchange

Fuel system

- Fuel injection system
- Fuel injection system

Control system

- Turbocharger control system with built-in automatic gas exchange

Electrical equipment

- 12V electrical system
- 24V electrical system, 24V electrical system
- 24V electrical system

Power characteristics

- Crankshaft power 450 kW (612 hp)
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Exhaust system

- Two stage cooling system
- Two stage cooling system
- Two stage cooling system

Maintenance

- Two stage cooling system with built-in automatic gas exchange



Model TAMD 162 B according to ISO 1585
Crankshaft power 450 kW (612 hp)

Information on
this engine

TAMD 162 B

Technical data for TAMD 162 B

Marine Propulsion Engine for propulsion of pleasurecraft

ENGINE

Year introduced	1982 (1981)
60 cylinders	16 x 160
Configuration: 4 stroke, four-cylinder, turbocharged engine with aftercooler	
Maximum output	1 600 kW
Rev./min.	2 000/2 200
Stroke (mm)	160 (6.3)
Compression ratio	16.5:1
Compression ratio	16.5:1
Stroke length (mm)	160 (6.3)

Maximum power** (kW) (hp)	400 (536)
Maximum speed (km/h)	120
Weight** (kg)	1 000
Wet fuel consumption** (g/kWh)	210
Specific output/kilowatt-hour (g/kWh)	210

ENGINE DATA

Year introduced	1982 (1981)
60 cylinders	16 x 160
Stroke	160 (6.3)

REV./MIN.	MAX. POWER
2 000	1 600
2 200	1 710
2 500	1 800

ENGINE WITH AFTERCOOLER**

Maximum power** (kW) (hp)	400 (536)
Maximum speed (km/h)	120
Weight** (kg)	1 000
Wet fuel consumption** (g/kWh)	190 (75)

**Values are based on ISO 1585 and ISO 1585-1 and should not be regarded as maximum values.
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Specific performance according to ISO 1585

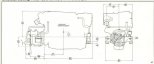


Performance graph



Values are based on the engine's operating conditions, average and maximum, and should not be regarded as maximum values.

Dimensions drawing, TAMD 162 B with 80/215 B shaft gear

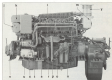
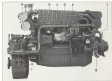


TAMD 162C

6-cylinder, 4-stroke, direct injected turbocharged marine diesel with aftercooler

Top technology for extreme demands

- Overdimensioned high output with constant full-throttle power increases fuel on/off depending on the oil without extra per cylinder
- Compact and excellent operation in demanding environments
- Consistent output with minimum fuel injection
- Displacement increases in heavy duty operation
- Additional additional auxiliary applications due to high torque without extra-percylinder
- Fully consistent high demands in operation reliability and while the efficient aftertreatment with well matched injection system, low maintenance, adaptability and low emissions. Through it also designed for long periods of low load being.
- Efficient turbochargers design combined with latest combustion technology results steady and efficient operation throughout the maximum degree of load cycles.
- Comprehensive, well developed machine systems factory fitted equipment (just perfect) meeting to specific customer requirements, e.g. remote gear, PTO, cooling systems, electrical system.
- Easy adaptability comply with the demands of the classification societies and marine authorities concerning operation in confined engine rooms.
- Large oil volume and easy to service construction for easy operation and maintenance tasks.
- Well established service network in more than 100 countries using genuine parts and professional technical staff (operational time and more).



The engine features a well-proven standard set.

Options

- | | |
|------------------|----------------------------|
| 1. Oil filter | 6. Turbo charging system |
| 2. Oil separator | 7. Remote start "off gear" |
| 3. Governor | 8. PTO shaft |
| 4. Aftercooler | 9. Remote start gear |
| 5. Aftercooler | 10. PTO |
| 6. Aftercooler | 11. Aftercooler |
| 7. Aftercooler | 12. Aftercooler |
| 8. Aftercooler | 13. Aftercooler |
| 9. Aftercooler | 14. Aftercooler |
| 10. Aftercooler | 15. Aftercooler |
| 11. Aftercooler | 16. Aftercooler |
| 12. Aftercooler | 17. Aftercooler |

General data

Year introduced	1989 (1991)
Displacement	4
Configuration	4 stroke, four cylinder air-cooled, overhead valves
Stroke/cylinder	57.0/66.0
Valve gear ratio	1.000
Stroke per rev	142.5
Compression ratio (cr)	16.0/16.5
Compression ratio (cr)	16.0/16.5
Oil capacity (litres)	3.5
Oil capacity (quarts)	3.7
Oil capacity (US gallons)	0.93
Oil capacity (UK gallons)	0.84
Weight	440 (450)
Weight (dry)	380 (390)
Weight (with oil)	440 (450)
Weight (with oil and accessories)	470 (480)
Weight (with oil and accessories)	470 (480)
Weight (with oil and accessories)	470 (480)

- 1) Service valve positions: (1) closed, (2) normal running mode, (3) winter economy, (4) lean mixture mode or winter economy and (5) stop in this order.
- 2) These are typical fuel consumption rates at 60 mph (96.5 km/h).

Standard equipment

Plastic fuel tank, Range (over 1000) Fuelmeter, speed/tachometer and oil level monitor.
Standard accessories
 Motor connection to carburettor, oxidation.
Air cleaner paper type
Fuel injection pump with centrifugal regulator and brake filter
Pump-driving mechanism
 Fuel pump and filter for fuel filter
 Valve at inlet of air-inlet pipe, air bypass at filter
Fuel water control of water
 Cooling water filter with bypass
Oil pump with injection pump
 Oil, using correct viscosity
Maintenance (4 100) 1 unit

Technical features (in brief)

- Engine block constructed for high adjustment to motor load. Cylinder liner and cylinder head have air separating features.
- Separate cylinder head retains the valve thermal stresses. Separation cooling design prevents high viscosity against gas and carbon buildup.
- Separate cylinder treatment with water. Four valves per cylinder and a centrally located injector provide effective combustion leading to lower fuel consumption.
- New improved aluminium pistons with anti-rattle design. With effective piston cooling to minimise carbon deposits and knock/ignition and fuel service life.
- Following of injection type (see the operating instructions for fuel).
- Tough high located cover housing control of gears from front and outside using valve springs resulting in easy start and quiet operation. Water can flow for maintenance and easy service.
- Down-pulling (down-cast) type combined with generous streamlining surfaces for low loading fuel.
- Working with injection pump allow removal of increasing soot. Cooling pipe without removing the pump.
- Powerful injection pump with dual fuel rack (see the operating instructions) and automatic injection amount control speed 4 stroke (this reduces exhaust smoke during rapid acceleration).



Heavy Duty (HD)

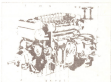
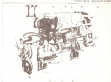
6-cylinder, 4-stroke, direct injected turbocharged marine diesel engine with after-cooler - maximum power* 404 kW (540 hp)

*Maximum power at 2200 rpm

Available power for commercial use helps operators in demanding environments at sea.

- Specialized fuel injection system with 100% electronic control at the injection valve as well as fuel valve per cylinder.
- Proprietary fuel system.
- Variable, adjustable fuel injection and turbocharger.
- Suitable for work that requires fast response control under load.
- Fully electronic fuel injection and turbocharger control and software.
- Fuel for electronic control working with wet-lube oil and dry-lube oil. Fuel having good anti-polluting characteristics is also supported. The engine is also designed for any possible emissions.
- Efficiency with reduced engine design combined with good combustion and low specific fuel consumption in a controlled manner for 100% throttle operation at 100% rpm.
- Comprehensive test program that includes work for reduced fuel consumption under various operating conditions and various conditions. It also includes special emission tests.
- Fully adaptable to engine control software in the 2nd generation product and comprehensive customer support in various environments.
- Original engine structure suitable for modification for various auxiliary and performance.

For detailed technical information, contact your Volvo Penta distributor. These engines are also available in other Volvo Penta divisions worldwide. Contact your Volvo Penta dealer.



Maximum operating speed at 2200 rpm:

- | | | |
|------------|------------|------------|
| • 100 kW | • 1000 rpm | • 1000 rpm |
| • 1000 rpm | • 1000 rpm | • 1000 rpm |
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**VOLVO
PENTA**

VOLVO PENTA INBOARD DIESEL

TAMD 165A

6-cylinder, 4-stroke, direct-injected, turbocharged marine diesel engine with aftercooler – crankshaft power* 404–441 kW (550–600 hp)

* Power rating – see Technical Data

Powerful and reliable engine for demanding operation in commercial applications

TAMD165A is the latest version of the proven 16-liter engine. A great number of items have been improved, resulting in entirely new levels of quality, power and low emissions. The engine is specially developed for displacement craft in Heavy Duty (Rating 1) and Medium Duty (Rating 2) operation and suitable for workboat applications thanks to high torque across a wide speed range.

TAMD165A has effective aftercooling and turbocharging including a new turbocharger with higher efficiency for more power. The engine fulfils extremely high demands on operational reliability and service life. The engine is also designed for long periods of low load idling.

Durability and low sound levels

The Volvo Penta in-line six cylinder engine is a well-balanced unit. The reinforced cylinder block, cylinder heads, pistons and piston rings, intake and exhaust valves give increased rigidity and stability. All improvements lead to minimized oil consumption and longer service life.

Twin vibration dampers reduce the crankshaft torsional tension and contribute to the vibrationfree operation and very low sound levels. New, freshwater-cooled, oil cooler and heat exchanger with high capacity to maintain low oil temperature, also with increased margin against contaminated water.

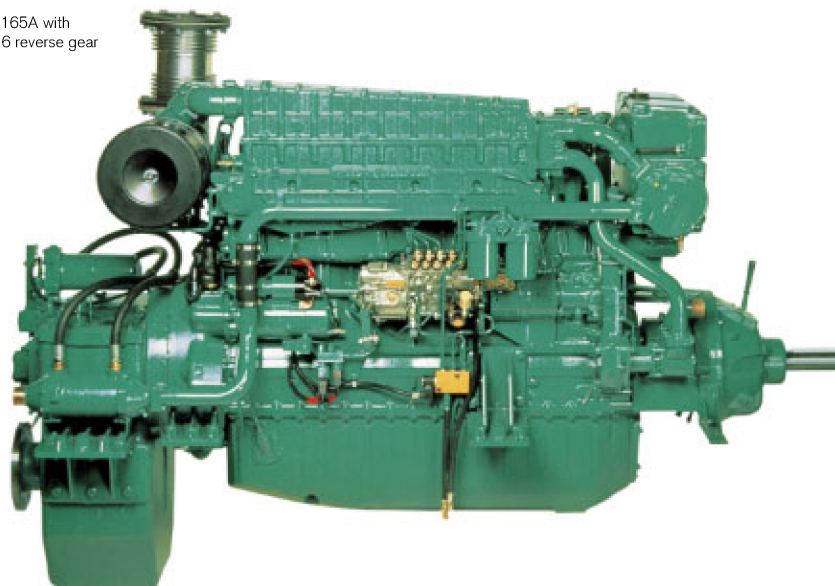
Low exhaust emission levels

Carefully balanced, new combustion and fuel systems for maximum power, minimum noxious emissions and low fuel consumption. This also results in good cold starting and load acceptance characteristics. The engine is certified according to River Rhine emission regulations and complies with MARPOL 73/78 Annex VI (IMO NO_x Techn. code) and the US/EPA 2004 Marine Commercial regulation.

Marine electrics

New electrical system incorporating electromagnetic shut-off valve for immediate engine shutdown, for increased reliability. The electrical system is specially adapted to demanding marine environments with

TAMD165A with MG516 reverse gear



moisture-proof connectors and flex-mounted terminal box and senders.

Ease of service and maintenance

Large oil volumes and easily accessible service and maintenance points contribute to ease of service and low running costs.

Comprehensive service network

Volvo Penta has a well-established network of authorized service dealers in more than 100 countries throughout the world. These service centers offer Genuine Volvo Penta Parts as well as skilled personnel to ensure the best possible service.

Technical description:

Engine and block

- Reinforced cylinder block dimensioned for high output and low sound level. Cylinder block and the new improved cylinder heads of special alloy cast iron.
- Separate cylinder heads. Gasketless sealing design ensures high reliability against gas and coolant leakage.
- Replaceable cylinder liners and valve seats/guides. Four valves per cylinder and a centrally located injector provide effective combustion leading to lower fuel consumption.
- New improved aluminum pistons with uplifted piston rings of Keystone type. With effective piston cooling for minimum carbon deposits and increased piston and liner service life.
- Trapeze-shaped connecting rods with large bearings for lower tension.

- Tough, high located, seven bearing camshaft of special steel. Short stiff push rods, strong valve springs resulting in a very stable and durable valve system. Roller cam followers for minimum friction and easy service.
- Seven-bearing nitrocarburized rigid crankshaft with generously dimensioned bearing surfaces for low bearing load.

Lubrication system

- Oil sump with inspection covers
- Twin oil filter of spin-on type, plus by-pass filter
- Freshwater-cooled oil cooler

Fuel system

- Fuel injection pump with centrifugal governor, smoke limiter and fuel feed pump
- Seven-hole injectors
- Fuel shut-off valve 24V, electrically operated
- Twin fine fuel filters of spin-on type

Turbocharger

- Freshwater-cooled turbocharger and exhaust manifold

Cooling system

- Seawater-cooled aftercooler
- Tubular heat exchanger or 2-circuit keel cooling
- Cooling pipes in copper/nickel give greater resistance to corrosion and longer service life
- Freshwater filter incl. corrosion protection
- Gear-driven freshwater pump

Electrical system

- 24V electrical system incl. 60A alternator with integrated charging sensor
- Rubber-suspended electrical terminal box

**VOLVO
PENTA**

TAMD165A

Technical Data

Engine designation **TAMD165A**
 No. of cylinders and configuration in-line 6
 Method of operation 4-stroke, direct-injected, turbocharged diesel engine with aftercooler
 Bore, mm (in.) 144 (5.67)
 Stroke, mm (in.) 165 (6.5)
 Displacement, l (in³) 16.12 (983.7)
 Compression ratio 17:1
 Dry weight, kg (lb) 1765 (3891)
 Crankshaft power,
 Rating 2, kW (hp) 1800 rpm 441 (600)
 Rating 1, kW (hp) 1800 rpm 404 (550)
 Torque,
 Rating 2, Nm (lbf.ft) 1800 rpm 2340 (1726)
 Rating 1, Nm (lbf.ft) 1800 rpm 2143 (1581)
 Recommended fuel to conform to ASTM-D975 1-D & 2-D, EN 590 or JIS KK 2204

Specific fuel consumption,
 Rating 2, g/kWh (lb/hph) 1800 rpm 214 (0.347)
 Rating 1, g/kWh (lb/hph) 1800 rpm 212 (0.343)
 Fuel temperature 40°C (104°F).

Technical data according to ISO 3046 Fuel Stop Power and ISO 8665. With fuel having an LHV of 42700 kJ/kg and density of 840 g/liter at 15°C (60°F). Merchant fuel may differ from this specification which will influence engine power output and fuel consumption.

The engine is certified according to River Rhine emission regulations and complies with MARPOL 73/78 Annex VI (IMO NOx Techn. code) and the US/EPA 2004 Marine Commercial regulation.

N.B. The product can also be used in an application with a higher rating than stated, e.g. R2 can be used for R3, R4 or R5.

Optional equipment:

Engine

- Adapter kit for flywheel and flywheel housing acc. to SAE 0
- Flexible suspension for engine and reverse gear

Lubrication system

- Manual oil drain pump, engine-mounted
- Extra oil dipstick
- Shallow oil sump

- Twin oil filter with shift valve

Fuel system

- Shift valve for fuel filter
- Twin fuel filter/water separator with shift valve
- Jacketed fuel pipes

Exhaust system

- Exhaust elbow, dry or wet 8"
- Silencer, dry
- Flexible compensator, dry

Cooling system

- Seawater strainer
- Adapter for connection of extra expansion tank

Electrical system

- 24V/60A or 100A extra alternator
- Various instrument panels
- Cable harness in different lengths
- Classifiable electrical equipment acc. to IP44

Power transmission

- PTO 11.5"/14", disengageable, crankshaft front or rear end
- Auxiliary drive
- Extra pulley for crankshaft
- Hydraulic pump for steering and other duties

Reverse gear

- MG516

Other equipment

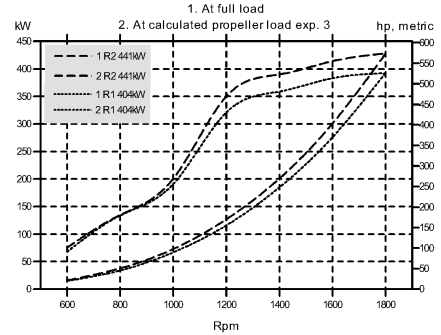
- 2" bilge/flush pump
- Belt guard
- White-painted engine and reverse gear
- Autostop equipment acc. to IP44
- Engine heater 2000 W, separately fitted

Contact your local Volvo Penta dealer for further information.

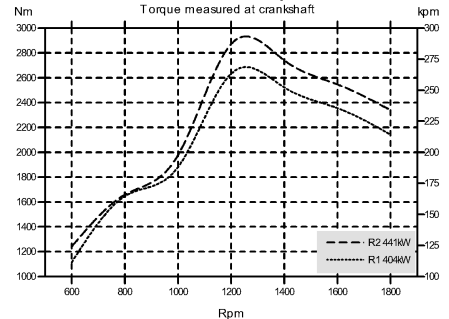
Not all models, standard equipment and accessories are available in all countries. All specifications are subject to change without notice.

The engine illustrated may not be entirely identical to production standard engines.

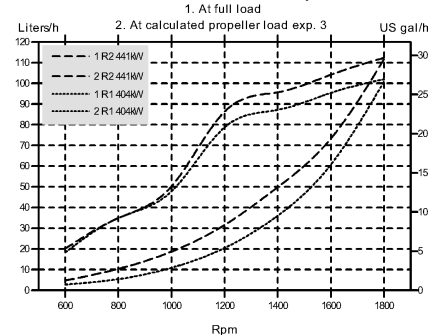
TAMD165A Propeller Shaft Power



TAMD165A Torque



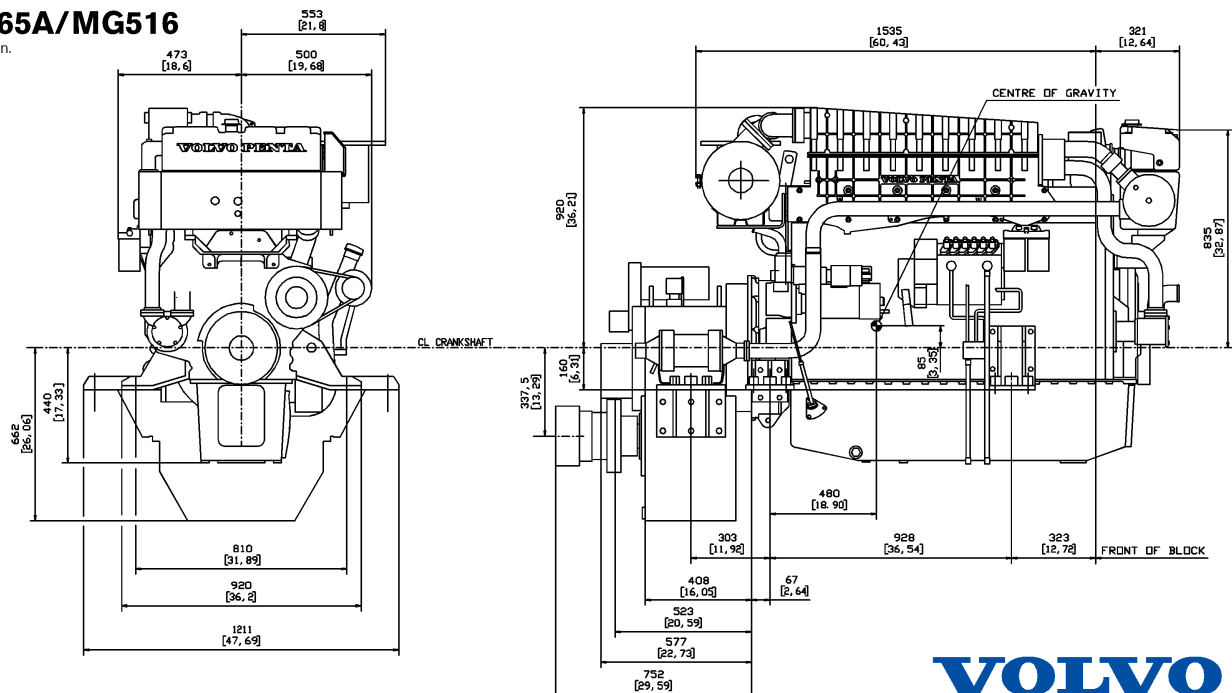
TAMD165A Fuel Consumption



Dimensions

TAMD165A/MG516

Not for installation.



VOLVO PENTA

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