



Engines for planing boats



- TDI 150-5
- TDI 165-5
- TDI 225-6



A motor boat can never be better than its engine.

At first glance, that statement might appear trivial. It is, however, of significant importance, especially in the case of fast motor boats.

And it serves prospective owners only as long as their engine choice is not yet finalized. Let us hereby offer some assistance for that choice:

Volkswagen is a leading motor company and our full competence in the field of diesel power is also available for your motor boat: In view of far over 20 million diesel engines being made, and taking into account the stunningly high diesel portion among over 5 million vehicles that we sell per year, one discovery is completely obvious:

Volkswagen TDI diesel engines are great fun to use, this being mainly a result of their immense torque and silent operation. And this is not only true on the road, but at least equally at sea.

Realising this, along with numerous challenges from the marine engine market, was the motivation for Volkswagen group to inaugurate the business unit “marine engines”. In the meantime, the Volkswagen Marine Power is chosen even by many commercial users of fast motor boats, e.g. for water taxis or police patrol craft.



Because our TDI's are not only fun to use – long engine life, minimized emissions and surprisingly low fuel consumption come along with it!

Uncompromising marine technology gives the leading edge to your boat.

- Compact dimensions and extremely low weight.
- Extremely silent operation – explained by the origin of the engines
- High performance and impressive torque over a wide engine speed range
- Special engine management for marine use: Marine Diesel Control (MDC)
- Innovative instrumentation with integrated onboard computer¹

¹ individual instrumentation alternatively available

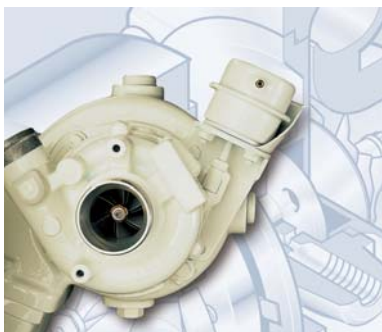


Love for detail:

- Extensive corrosion protection for engine and all add-on parts, including non-corroding screws and attachment components
- Multi layer, especially fine tuned dual component paintwork
- Volkswagen standards apply not only to the base engine, but also the marinisation which is fully done in house!

Minimised maintenance, outstanding reliability and a long engine life.

- Check free valve clearance adjustment by means of hydraulic tappets
- Check free drive belt trimming via automatic tensioners – no worry, instead maximised drive belt life
- Oil change only every 200 hours or once per year, depending on which occurs first. The operation as such is child's play thanks to built in electric drain pump and vertically mounted oil filter which comes off dry when detached. Do it all cleanly and at the touch of a button.



Utmost attention to environmental aspects.

- Minimised fuel consumption saves resources
- No visible exhaust smoke
- Easy compliance with EU-emission regulations and all expected future emission laws. You can run our engines legally on waters where many other combustion engines are banned.
- Well thought-through recycling: Nearly all engine components can be disposed of cleanly or may be re-used

A service philosophy that set standards.

We invested a lot of effort and patience in establishing a specialised marine dealer network. Because a marine engine and its installation require marine service and nothing else.

Regarding spare parts supply, however, we use the massive and extremely efficient structure of Volkswagen group – at very fair pricing for you!

TDI-engines are, so to say, intelligent. You feel it with every throttle command!



The Marine Diesel Control (MDC) establishes injection amount and -timing up to 50 times per second, taking multiple parameters into account – from outside temperature right to the slightest move of your hand on the throttle!

When piloting your boat, you will firstly enjoy that through immediate throttle response, which is of course not only fun but also makes riding out heavy seas much easier. But on top of that, a lot of common sense mandates the use of advanced engine control electronics:

This very same management makes the very low emission level of our engines possible – and consequently, their operation without any visible exhaust smoke for which they are famous. The exceptional fuel economy of Volkswagen Marine engines is another benefit of the Marine Diesel Control.

And if developed by Volkswagen, such an electronic control unit will withstand corrosion impacts much better than mechanical systems of the past!

The complete unit is housed in a specially sealed, well-protected case which is attached directly to the engine. The MDC serves as brain for all electrical and electronic functions and is individually tuned for each engine specification.

The MDC further features an emergency operation program and a memory that functions essentially as an electronically kept engine logbook.



This “logbook” can be read out by our Volkswagen Marine partner within minutes during annual service.

We have been using electronic management from the beginning and on all models – because there is only one standard for a Volkswagen marine engine.

Also included in the standard delivery, and individually fine-tuned to each engine type, is a sophisticated instrument panel, which incorporates our so-called “Multi Function Display”: Positioned in the centre of the rev counter, it provides you with information from the on-board computer at the push of a button. That includes data such as:

- Actual and average fuel consumption per hour, nautical mile, statute mile or kilometre ¹
- Overall fuel consumption
- Distance made good ¹
- Speed in various scales ¹
- Engine service hours

¹ if interfaced with navigational instruments



“Safety at sea” means “being properly informed at all times”.

We offer our engines intentionally only in combination with rather extensive instrumentation, as we regard that as crucial for safe assessment of available range and safety at sea in general.

On top of that, we deliver all engines with a surveillance system that is otherwise unusual for marine engines used in pleasure craft application:

We install an electric monitoring system in the fuel filters of all marine engines that warns of a rather common and dangerous hazard at sea: “Water in the fuel” occurs much more often aboard small boats than, for example, on the road. And not even Volkswagen Marine engines can burn water instead of fuel.

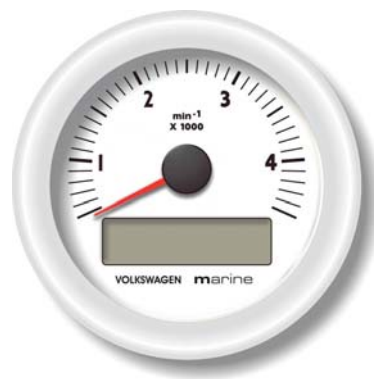
In such a case, Volkswagen Marine skippers are warned optically and acoustically and can easily drain the water from the filter. They can then simply proceed, rather than floating around without power in a potentially dangerous situation!

The panel is connected to the engine’s electronic system via one central plug (wiring available in various lengths). And finally, the entire wiring is designed shock- and vibration proof as well as carefully sealed watertight. Alternatively, a solution with individual instrumentation is offered.

Volkswagen Marine engines are designed to meet highest reliability standards. Nevertheless, some components are invariably subject to natural wear and tear. We made it a mission to ensure that all Skippers who trust Volkswagen Marine engines can rely on prompt and easy supply of practical accessories plus, needless to say, immediate availability of spare parts.

This includes, for example, our 230 V generator package for most of our engines which provides you with up to 3,5 kW electricity for any normal home appliance from your main engine – without the noise, expense, weight and fuss of a separate generator set.

Your Volkswagen Marine dealer will inform you about the wide range of available combinations with Z-Drives and gear units in various reduction ratios. We offer more than an engine: Support, perfect after sales service and peripheral technology are just as important.





Athletic performance – full power as long as you need it.

About dynamic, powerful non smokers.

In former times, diesel engines used to be known as economic, simple and highly reliable, if somewhat phlegmatic and heavy power plants. That reputation has not changed insofar as its positive aspects are concerned but today's TDI technology is anything but simple or phlegmatic.

Volkswagen's high output diesel engines combine lots of horsepower with immense torque at low engine speeds and an extremely wide usable engine speed range. That makes sporty applications not only possible, but especially in case of regular use also strongly advisable.



It is globally accepted that Volkswagen has been among those whose research made such light, efficient, compact and impressively performing engines reality – with the additional plus of minimum maintenance requirements. Volkswagen Marine engines fully profit from all these achievements and take the sporty aspects of Volkswagen Diesel Technology to sea – with such a perfect combustion that visible exhaust smoke is eliminated in all circumstances.

For fast motor boats, Volkswagen Marine is now offering a range of three engines with 111 kW (150 hp), 121 kW (165 hp) and, brand new as of October 2005, 165 kW (225 hp). All these engines share the huge advantages of turbochargers with variable turbine geometry (VTG):

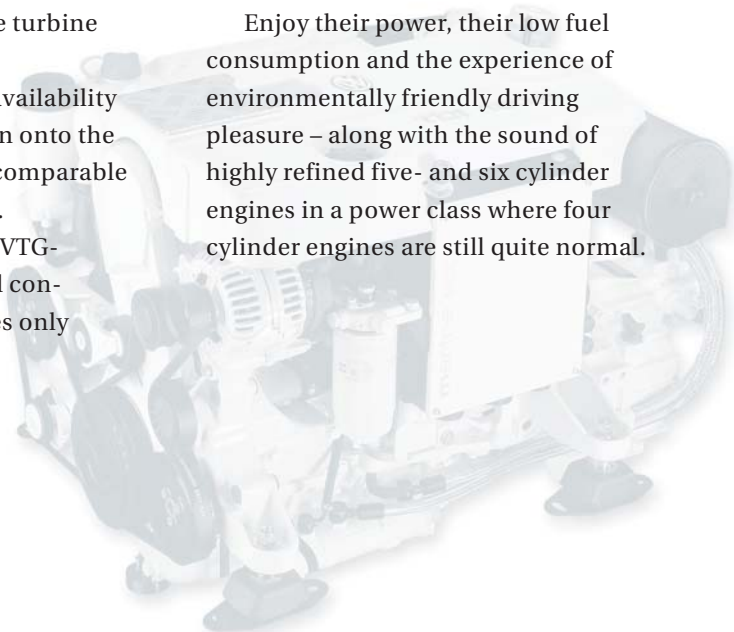
At low engine speeds, the immediate availability of full boost ensures powerful acceleration onto the plane – a tremendous advantage against comparable engines with conventional turbochargers.

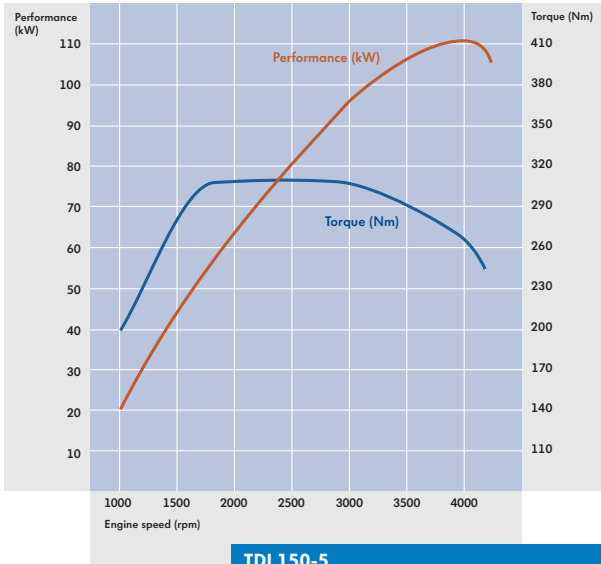
But with increasing engine speed, our VTG-chargers continuously auto-adjust to load conditions: Exhaust gas pressure is at all times only

used to the necessary extent, which minimises mechanical stress on the engine and wins additional horse powers at top speed.

The extreme efficiency of all three engines enables them to pass currently applying EU-emission standards and all expected future emission laws for marine engines without difficulty. This has been recognised by leading boatyards as a major advantage and ensures that Volkswagen Marine engines are a safe investment into the future.

Enjoy their power, their low fuel consumption and the experience of environmentally friendly driving pleasure – along with the sound of highly refined five- and six cylinder engines in a power class where four cylinder engines are still quite normal.





TDI 150-5	
Capacity	2.461 cm ³
Performance	111 kW (150 hp) at 4.000 rpm
Max. Torque	310 Nm at 2.500 rpm
Weight	265 kg (dry, without gearbox)

TDI 150-5

5-cylinder turbo diesel

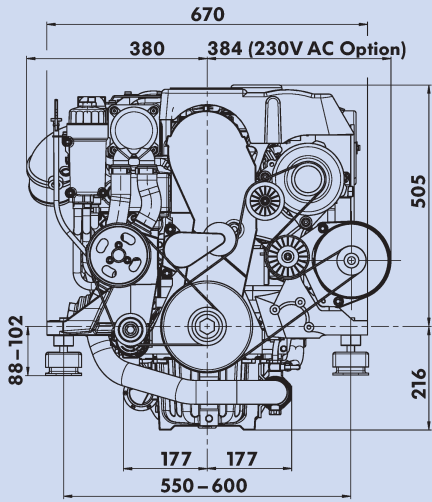
Five straight jokers.

Five cylinders, 2,5 litre engine capacity, 111 kW (150 hp), direct injection with electronic engine management (MDC) and extremely low weight per horsepower – that is our marathon champion for speedboats.

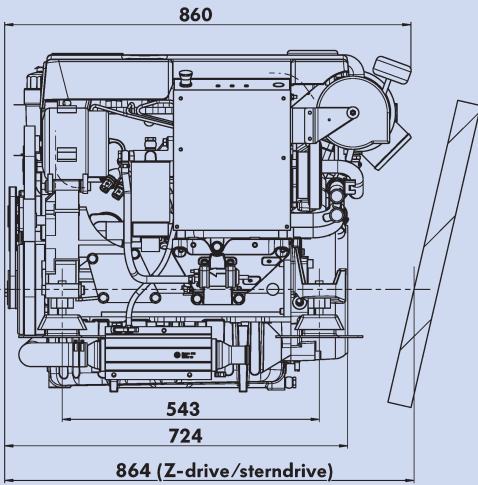
This exceptionally sturdy and refined 5 cylinder draws its power, among other factors, from a turbocharger with variable turbine geometry (VTG-charger) and from boost intercooling. The engine will brighten your day with a torque of over **300 nm** at any engine speed between **1.700 and 3.100 rpm** – on top of which you enjoy maximised fuel efficiency coming along with minimum emissions.

Easily meets EU emission standards and all expected future emission standards for marine engines.





Frontal View TDI 150-5



Lateral View TDI 150-5





TDI 165-5

*5-cylinder turbo diesel
with boost intercooling*

Desire for some extra power?

Today, it is mainly remembered among performance oriented offshore sailing people that already in the nineteen seventies, Volkswagen diesel engines of those days were installed aboard fast sailing craft. That happened simply because no other base diesel engine of the time offered the required power at such low weight.

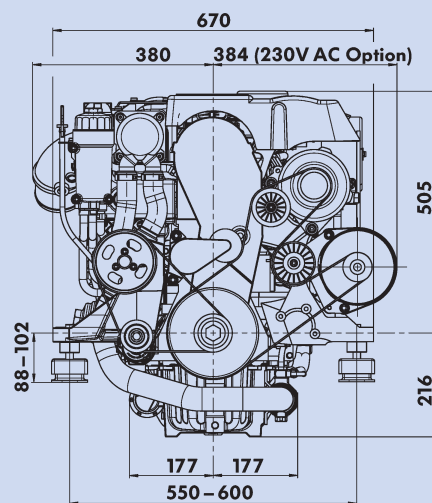
With the advent of TDI technology and the decision of Volkswagen to enter the marine market directly, possibilities have developed of which even we did not dream in the seventies.

And given the huge mechanical and thermal reserves of our TDI 150-5, which is highly successful even in many commercial applications, it was a logical step to offer a version with higher performance for light speed boats.

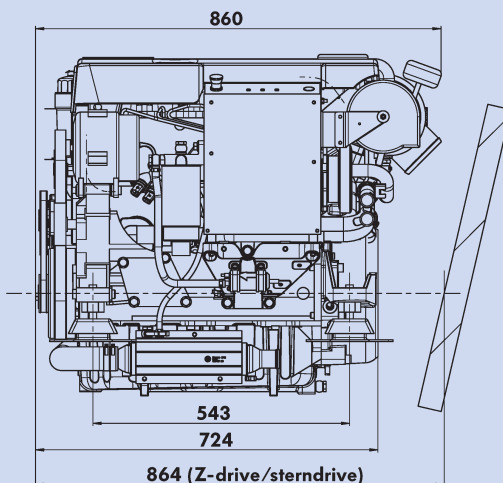
The additional 11 kW (15 hp), however, are not a consequence of simple “tuning” but come along with further increased oil cooling capacity and some other flanking design changes, so that you can count on completely healthy Volkswagen power also in this case.

Some extra power, simply, for those who like to stay half a length ahead.

Easily meets EU emission standards and all expected future emission standards for marine engines.



Frontal View TDI 165-5

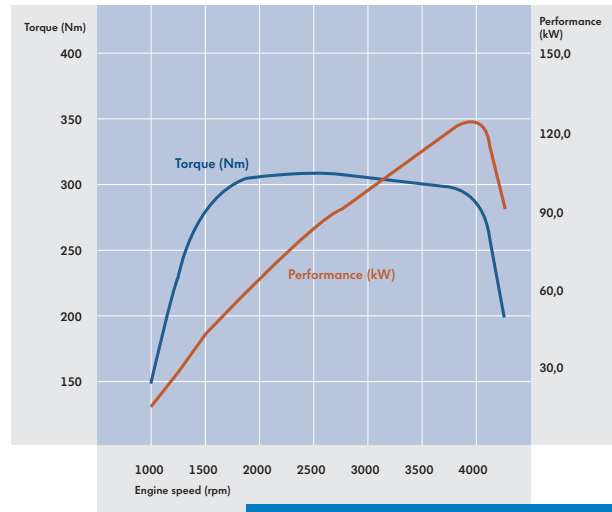


Lateral View TDI 165-5



The engine retains all the characteristics that already convinced so many demanding boatyards and yacht owners ever since we do engines for boats:

- Particularly low fuel consumption, undercutting conventional marine diesel engines by 10 to 15 per cent and petrol engines easily by 50 per cent
- Extreme refinement, achieved through five cylinders in line, noise absorption cover, dual mass flywheel and two-stage direct injection – at full power, we undercut the noise level of V8-petrol engines by up to 8db/A
- Stunning acceleration onto the plane, this being achieved by a specially developed, watercooled marine turbocharger with variable turbine geometry (VTG)



TDI 165-5	
Capacity	2.461 cm ³
Performance	121 kW (165 hp) at 4.000 rpm
Max. Torque	310 Nm at 2.500 rpm
Weight	265 kg (dry, without gear unit)



TDI 225-6

165 kW (225 hp), 6-cylinder turbo diesel



Business Class Comfort at full planing speed.

Marine engine producers are fond of creating huge imageries around their products, particularly so if new engines are mainly aimed at the pleasure craft sector.

That is respectable, part of the trade and often also a requirement as hardly any of the base engines in question were designed for marine propulsion from scratch up. Neither were ours.

Nevertheless it is interesting hard fact analysis to check where such engines really originate from, and which product philosophy was used to marinize them. So consider for yourself the following proposal:

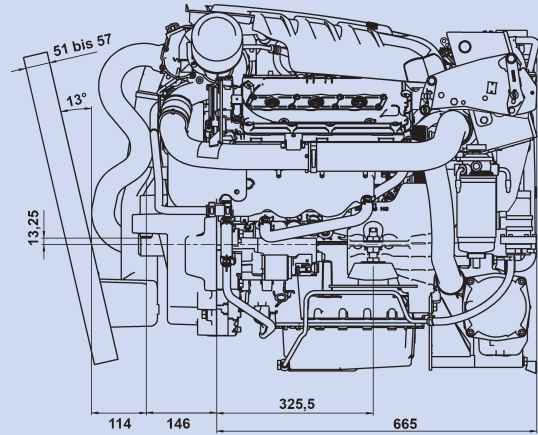
- One of the most advanced diesel engine designs for german executive cars – designed to make it over motorways without speed limit and into the hearts of decision takers who will only consider the “top three” brands
- Marinisation by Volkswagen Marine, where cheap solutions were never considered. Instead, user friendliness, refined sound and extremely low emissions have characterized our engines from the beginning.

Imagine how such an engine will establish itself in a power class where competitor’s products often originate from industrial application. Better even, let us assist your imagination:

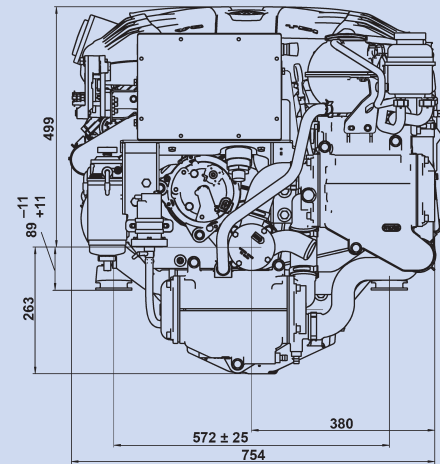
- Weight savings against immediate competitors of far over 100 kg per engine, resulting in huge benefits especially for twin installations
- More room for storage or a larger cabin as a V-6 builds much shorter than competing inline engines
- Ultimately, you will hear your engine only if you fully challenge it. And in that case you will enjoy what you hear
- Easy compliance with EU emission standards and all expected future emission standards for marine engines.

Ultimately, this engine aboard your boat will mainly ensure one thing: Elegant performance without a bad conscience. Take our word for it.

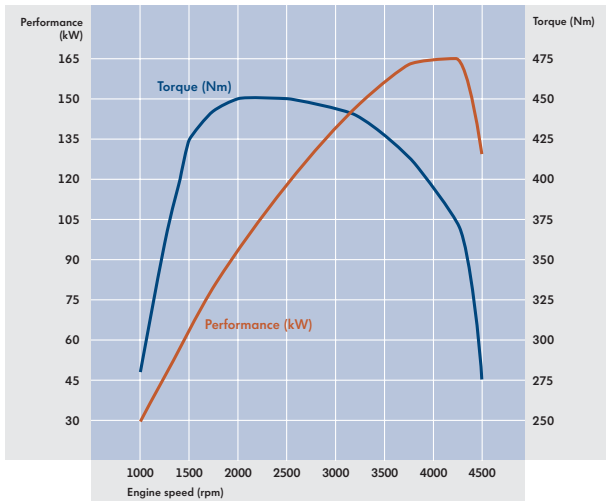




Lateral View TDI 225-6



Frontal View TDI 225-6



TDI 225-6	
Capacity	2.967 cm ³
Performance	165 kW (225 hp) at 4.200 rpm
Max. Torque	450 Nm at 2.000 rpm
Weight	325 kg (dry, without gearbox)

Specifications	TDI 150-5	TDI 165-5
Engine type	5-cylinder turbo diesel	5-cylinder turbo diesel
Fuel system	direct injection ¹	direct injection ¹
Charge	turbocharger VTG ²	turbocharger VTG ²
Boost intercooling	seawater tube heat exchanger	seawater tube heat exchanger
Cylinders	inline 5	inline 5
Displacement [cm ³]	2.461	2.461
Stroke [mm]	95,5	95,5
Bore [mm]	81,0	81,0
Compression ratio	19,0 : 1	19,0 : 1
Performance (ISO 3046) [kW]	111	121
Performance [hp]	150	165
at	4.000 rpm	4.000 rpm
Specific power output [kW/l]	45,1	49,2
Appr. piston speed [m/s]	12,7	12,7
Max. torque [Nm]	310	310
at	2.500 rpm	2.500 rpm
Min. specific fuel consumption [g/kWh]	203	203
Weight* [kg]	265	265
Alternator	120 A	120 A
Electrical system	12 V	12 V

¹ Distribution injection pump

² Turbocharger with variable turbine geometry

* dry, without gearbox (ZF 25A: + 35 kg; Z-Drive: + 101 kg)



TDI 225-6

6-cylinder turbo diesel

common rail direct injection

turbocharger VTG²

seawater tube heat exchanger

V 6

2.967

91,4

83,0

19,5 : 1

165

225

4.200 rpm

55,61

12,8

450

2.000 rpm

209

325

180 A

12 V

Oil change

Once a year or after 200 hours of operation (depending on which occurs first)

Cooling

Thermostatically controlled double circuit cooling system with heat exchangers, collective exhaust pipe and water-cooled exhaust turbocharger, (TDI 225-6: oil cooled charger), engine oil cooling, hydraulic oil cooling, fuel cooling for TDI 150-5 and TDI 165-5

Standard supply includes

Piping for hot water preparation or heating, wiring and instrumentation, on-board computer, electric oil suction pump, engine mounts

Options

- 230-V-generator set (except for TDI 225-6 in single sterndrive configuration),
- Power steering pump (standard for sterndrive configuration),
- Bipolar electrical system

Subject to change without prior notice

VOLKSWAGEN **marine**
SUPERIOR TECHNOLOGY



Volkswagen Marine
P.O. Box 31 11 76
D-38231 Salzgitter, Germany
Hotline (+49) 18 01-89 89 00
www.volkswagen-marine.com