





VISION DEVELOPED



LUTZ W. LESTER Managing Director



The time of real inventions in the domain of combustion engines seems to be long gone. Motors are made more efficient and offer wider variations. Inventive genius and an open mind let us re-think established technology. The principle of the double crankshaft becomes a name: **NEANDER**.

Where do we come from?

Until the millennium change we lived our passion for engines only on two wheels. Bringing the sheer torque of a turbo diesel engine to a motorcycle was our aim. A unique motorbike with a powerful 100 HP turbo diesel engine was our destination / purpose.

With the founding of **NEANDER** Motorfahrzeuge GmbH back in 2003 the idea found a new home. In 2006 the reorganization into the **NEANDER** Motors AG took place and just three years later – 2009 – the Schmidt-Römhild Technology-Award handed over by ministry of science, economy and traffic of Schleswig-Holstein, approved the genius of this idea.



VISION LIVED



Success lets you grow. So the idea to bring our technology to boats was born. From thought to realization was not a long way – the **NEANDER** Shark GmbH as a 100% daughter of the **NEANDER** Motors AG was born in the same year. Since then **NEANDER** Shark is consequently just working on bringing this unique concept to the marine world.

Soon extraordinary engineers and motor developers joined the team. Awakening passion – nobody can do better than Lutz W. Lester. "Inventors" from the likes as Porsche, Mercury Marine and Mahle accepted the challenge and joined the **NEANDER** team. With their know how and energy it will be possible to break new ground.

Target: the world's first turbo diesel outboard engine – from development to mass production.



PERFORMANCE EFFICIENCY



STEFAN UTERMANN Sales Manager



A modern outboard has to fulfill highest demands today. Especially in commercial applications. Safety on board is most important, followed by efficiency and ecological considerations.

A fisherman is expecting reliable performance and efficiency in his daily business so do Special Forces and Police in case of. Similar to the captain of a big container or cruise vessel, also they have to rely on the outboards for their tenders.

Particularly also in charter business reliability and low cost of operation are essential. For most of them, season is short and the boat/engine package has to run. In case of necessity, the outboard is switched fast and the paying customer can enjoy his boating trip with just a minor delay...

All these demands will be covered by a **NEANDER** Shark Turbo Diesel outboard motor:

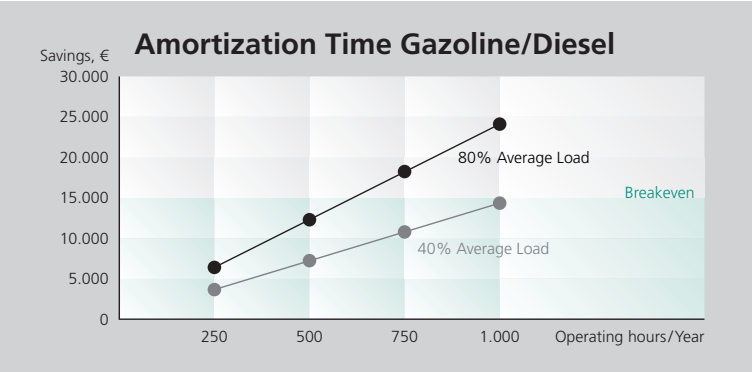
- Low fuel consumption
- High operational reliability
- Ease of availability of diesel fuel
- Powerful drive
- Diesel typical durability



PERFORMANCE EFFICIENCY



The superior fuel economy of a turbocharged diesel engine compared to a gasoline power unit are increasing the range and creates less pit stops. This way a **NEANDER** is paying off real soon:



Diesel has always been the fuel of the marine world. This makes the use of diesel assuring ideal logistics and high reliability of operation – especially also for boats made for outboards! Moreover the inflammability of diesel is much less than the one for gasoline – ending up in a massive gain of safety for storing diesel instead of gasoline. Not to mention the cost advantage.

No sparks provoking an explosion – the **NEANDER** Shark is making missions possible in inflammable areas, in example in oil fields. Areas out of reach so far with outboards.

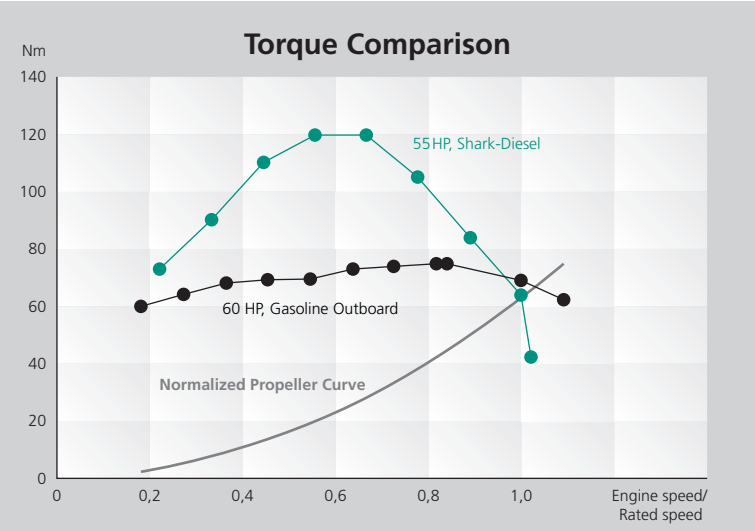


PERFORMANCE EFFICIENCY



The **NEANDER** Shark turbo diesel outboard was developed having a number of applications in mind. Pushing heavy vessels, trawling, or idling for hours – the engine construction is made to last endless hours!

The excellent torque shows the powerful drive. The following graph is comparing our **NEANDER** Shark (41 kW/55 HP at the propeller shaft) with a standard gasoline outboard (44.13 kW/ 60 HP).





PERFORMANCE SERVICE



The use of approved and already developed components secures high endurance and reliability. Your **NEANDER** Shark won't let you down after thousands of hours of operation (service according plan required) and start its work every day like the first day. This ensures reliability and performance after years.

The **NEANDER** technology is based on the actual developments of modern combustion engines. The world premiere is the use of the double crankshaft. This design principle is allowing powerful, efficient, light and compact engine construction adding an engine running with next to zero vibrations.

The **NEANDER** Shark was consequently developed for the challenges of the commercial boating.

Making your decision for a **NEANDER** Shark is getting you performance and efficiency onboard. Sometimes things go wrong, but **NEANDER** is offering you reliable and professional service. We count on strong partners. This way, service and parts availability are there right from the beginning.

Based on long contraction relationships with excellent production partners like capricorn group, Selva Marine, Borg Warner we create a reliable spare parts supply. A network of special trained service personnel and experienced, well-known distributors will end in perfect service.



PERFORMANCE SERVICE



Davis Engineering, USA



Construction (www.seven-marine.com)

The managing director of DE, Rick Davis has been CTO for Mercury, USA. So Rick is one of the outboard engine developers with the longest experience in the marine world.

Bosch, India



Motor Management (www.bosch.de)

Reliable electronics and state of the art injection systems.

capricorn group, Germany



Power head (www.capricorngroup.net)

Production of the new **NEANDER** powerhead using the high-end production for engine and composite technology.

Emitec, Germany



Exhaust gas after-treatment (www.emitec.com)

Technology to reduce fuel consumption, particle emissions and CO₂-outlet.

FEV, USA & Germany



Analyses and calculations (www.fev.com)

FEV is one of the worlds biggest engineering companies focussing in automotive industry and specialized in high output & commercial engines.

University of Applied Sciences Munich, Germany



Combustion optimizing (www.hm.edu)

NEANDER is making use of the excellent engine competence for the test runs and the optimization of the motor.

Selva Marine, Italy



Transom / Leg (www.selvamarine.com)

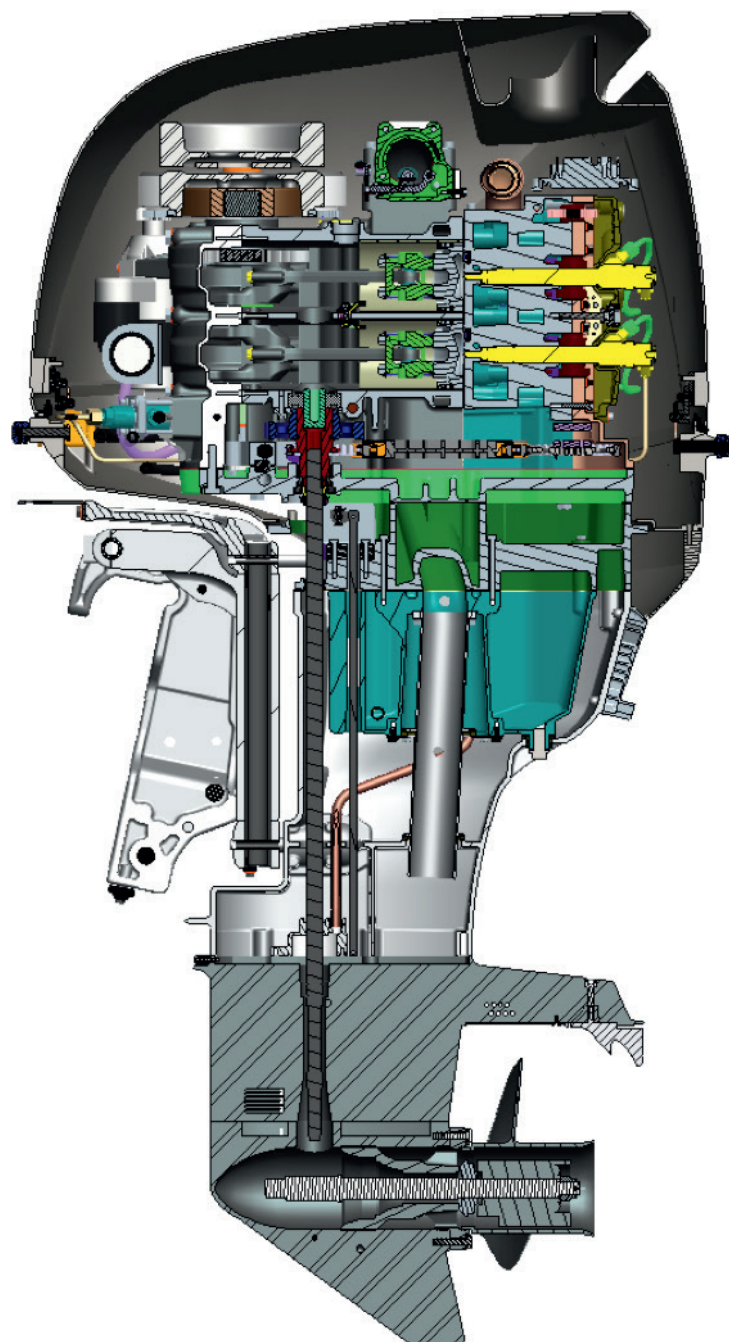
Development and Production of the tailor-made transom.

BorgWarner, Germany



Turbo Charger (www.borgwarner.com)

Developing, calculating and supplying the turbo charger.



TECHNOLOGY INNOVATION



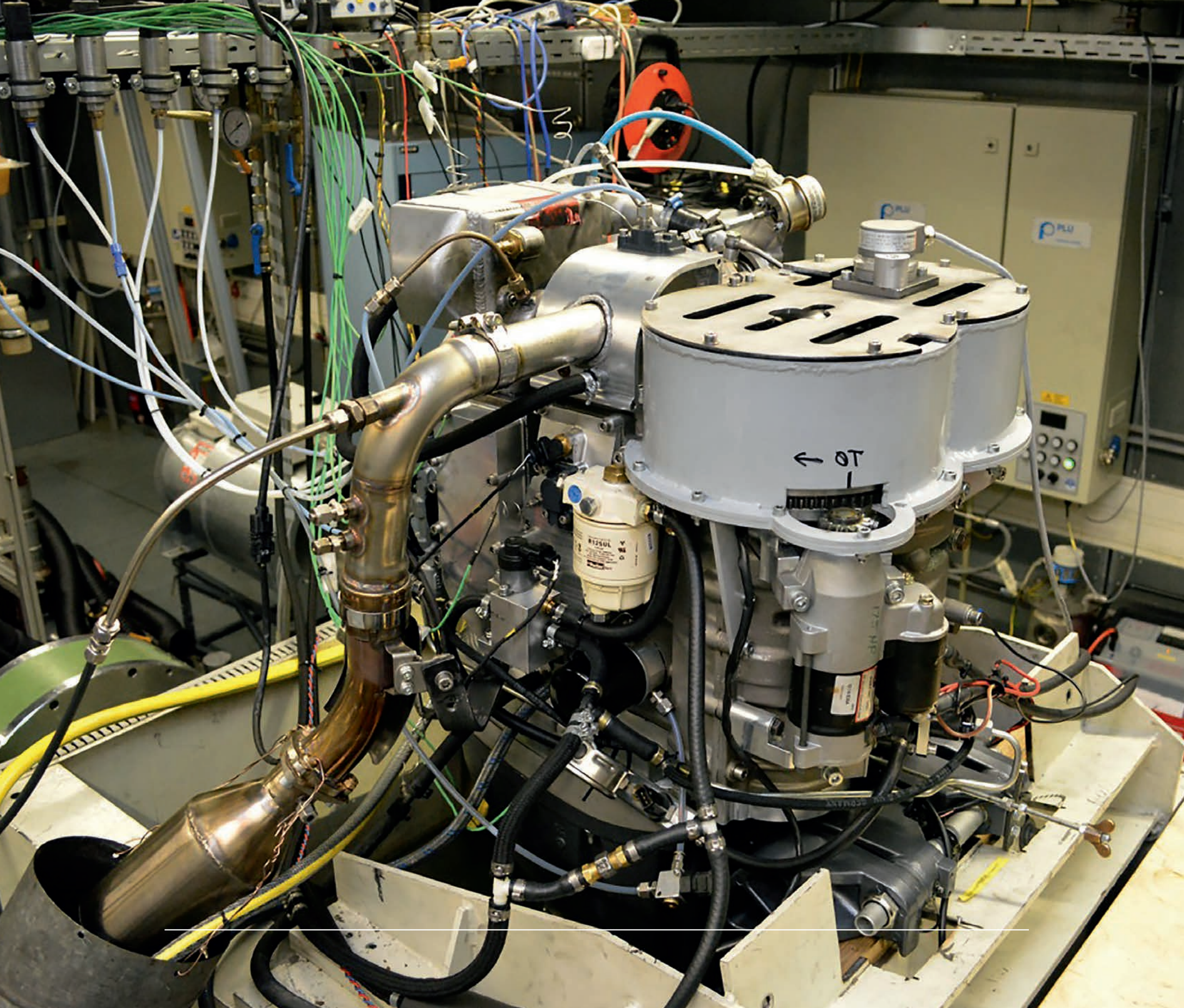
CLAUS BRÜSTLE Managing Director



Today's marine engine market is divided into two major segments, commercial and recreational use of propulsion systems. Actually no diesel outboard exists in the market segment of 30 to 52kW (40 to 70 hp), a segment interesting for commercial use, a segment, which is defined by transport, hauling, commercial fishing and others.

In the smaller engine segments with power below 75kW (100hp) gasoline engine technology is the dominant and sole available power generation to propel a boat. Outboard engines due to their favorable compactness, ease of installation, serviceability, weight and also cost govern the market

The diesel torque to weight ratio, beneficial specific fuel consumption and the tax-free diesel fuel for commercial applications make diesel engines extremely attractive. Also other typical outboard engine applications like rescue boats on larger ships are much more comfortable and more economical with a diesel outboard. Here also an additional advantage steps in: No need to maintain dual fuel storage capacity onboard with all aspects of safety and logistics.

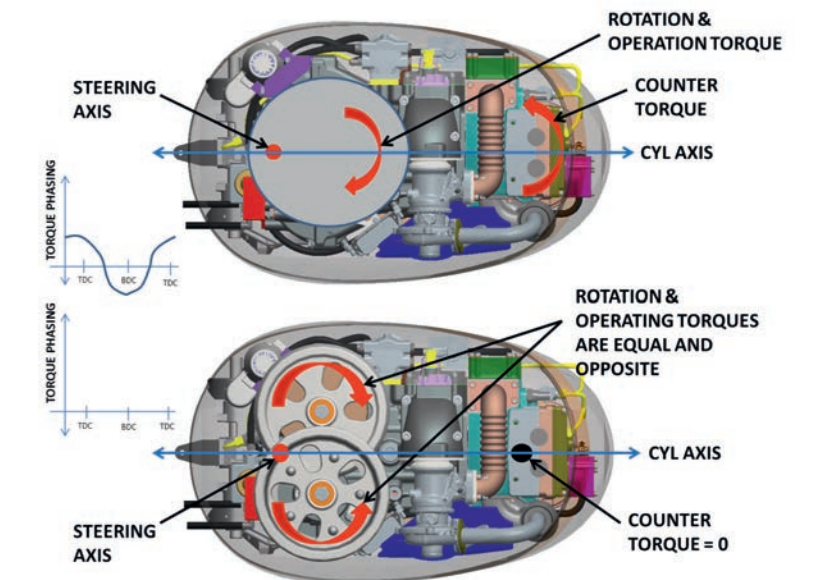


TECHNOLOGY INNOVATION



One focus on developing a diesel outboard motor is the vibration level. The typical diesel vibrations would make the whole boat shake.

The copyright protected **NEANDER** Shark double crankshaft design eliminates these mass forces using the 2 counter rotating crankshafts – providing a never seen nearly zero vibration engine run. A smooth running, which was formerly, achieved only by big 6 and more cylinder diesel engines!



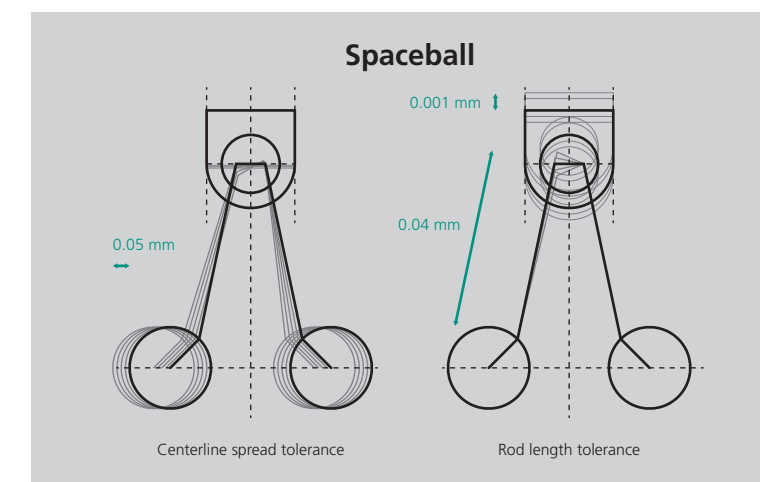


TECHNOLOGY INNOVATION



The key enabler for a dual crankshaft engine with a constrained piston movement by two con-rods with theoretically no piston side forces is provision for forgiveness towards tolerances, which can lead to off-design positions of the piston in its cylinder bore and unfavorable mechanical effects like scuffing, sticking or simply higher friction as the least bad of effects.

Inventing and introducing a so-called space ball design resolved the problem, giving the piston the additional degree of freedom of rotational adjustment around the two piston pins.

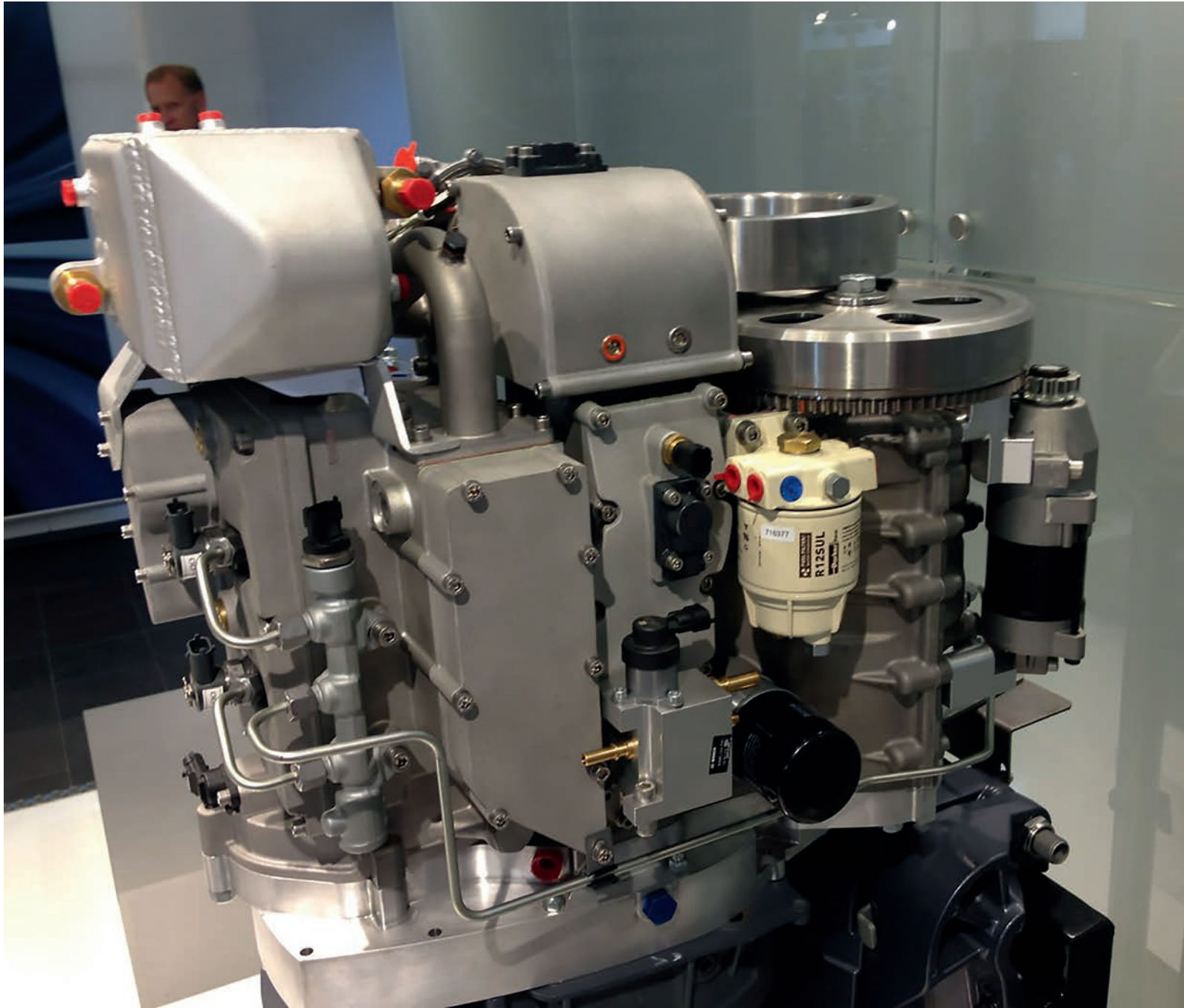


The cylinder block of the engine is an Aluminum design, closed deck with dry cast iron cylinder sleeves pressed in for robustness and simple serviceability.

The one-piece cylinder head, block and bedplate are joined by so called long bolts, which reach from the head into the bedplate main bearing saddles. This design allows the structural aluminum parts to be under compressive stress only, which is favorable for the durability of all structural components. For vibrational rupture protection, dampening, the boltholes are connected via calibrated oil holes into the main oil gallery. This design strategy was applied successfully to other high performance marine engines in the past.



Long bolts join cylinder head, block and bedplate.



TECHNOLOGY FACTS



Power	55 HP/40 kW at 4.500 U/min.
Max. Torque	120 Nm at 2000 U/min.
Motor Type	4-Stroke turbo diesel
Balance	Double counter-rotation crankshafts
Swept Volume C. C.	800 ccm
Bore x Stroke (mm)	80 x 80
No. Cylinders	2 In-Line
Induction	Turbo pressure charging
Lubrication	Wet sump – pressure lubricated
Fuel	Diesel
Injection	Bosch direkt injection
Starting	Electric
Alternator	Standard 12V/300W
Cooling	Water cooled with pump-forced circulation and thermostat

technical data are subject of change

Exhaust	Underwater thru-hub propeller
Steering System	Remote steering system with remote control box
Suspension	Silent-block-controlled compression and traction
Trim Adjustment	Power trim/tilt
Direction Reversal	Mechanical – dog-clutch gearing
Transmission Ratio	13/27 (2.07:1)
Available Shaft Versions	20” and 25”
Standard Propeller Type	3-bladed with built-in damper
Weight Basic Versions	155 kg



NEANDER SHARK GMBH

Werftbahnstraße 8

24143 Kiel

Germany

Phone: +49 (0) 431 - 70 28 230

Fax: +49 (0) 431 - 70 28 235

E-Mail: info@neander-shark.com

Website: www.neander-shark.com