



VOLVO PENTA DIESEL ENGINES AND TRANSMISSIONS

for pleasure boats

**VOLVO
PENTA**

HIGH PERFORMANCE WITH PROPERLY MAINTAINED

The diesel engine is a concept immediately associated with power, durability and fuel efficiency. And these are also the cornerstones of Volvo Penta's philosophy for pleasure boat diesel engines.

The diesel is a compression-ignition (C.I.) engine – which relies on the heat generated during combustion to ignite the fuel – an obvious advantage in a boat where dampness can at times be troublesome to a sensitive ignition system that relies on an electric spark.

A diesel engine generates a large amount of torque and with the correct transmission, the propeller can therefore work very efficiently at relatively low propeller shaft speeds. In other words, the diesel does a very efficient job in a boat which is what one must expect of a good marine engine, whether it is powering a work boat or a pleasure boat!

And, it goes without saying, that all diesel engines also comprise a source of electricity and heat on board both work and pleasure boats.

Volvo started its development of diesel engines as long ago as the early 40s; introduced the series manufacture of diesels during the 1950s – and in 1954 presented the first series-manufactured turbocharged diesels.

The larger Volvo diesels feature an aftercooler – which lowers the temperature of the charge air downstream of the turbocharger thus enabling a greater quantity of air to be inducted into the cylinders to the improvement of efficiency, power output and specific fuel consumption.

Volvo Penta is unique in developing both its engines and transmissions within the same company. Engines have been made more and more efficient and new transmissions have been designed – reverse reduction gears and Volvo Penta world-firsts such as the Aquamatic and S-drive. The Aquamatic concept is still a leading product after more than 25 years and is the design platform for the Volvo Penta S-drive, the MS2 and MS3 reverse reduction gears – a transmission series which features the famous cone clutch that has now been used in more than 375,000 Aquamatic outboard drives!

The marine diesel programme comprises 1 to 6-cylinder engines with outputs ranging from 5.5 kW (7.5 hp) to 282 kW (384 hp). With a twin installation, outputs of almost 600 kW are available!

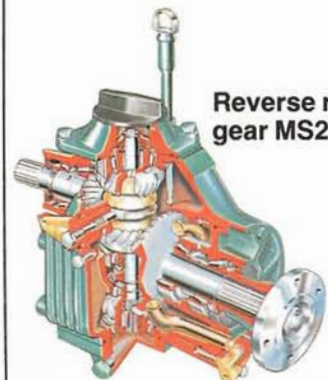
All of these power packages – with engine, transmission and optional equipment – are designs based on decades of experience within the field of marine engine technology.

Volvo Penta has a diesel for just about every single type of pleasure boat. For sail boats and other types of displacement vessel, to semi-planing and planing hulls. Normally aspirated engines where high speed is not essential, and aftercooled turbocharged diesels where the power-to-weight ratio is important.

Pilots, customs and excise, sea rescue units, river police and fishermen all choose Volvo Penta engines for their excellent operational economy, good service facilities and long life. The professionals know that diesel power is reliable power. They also know that a diesel from Volvo Penta can stand the pace – indefinitely!

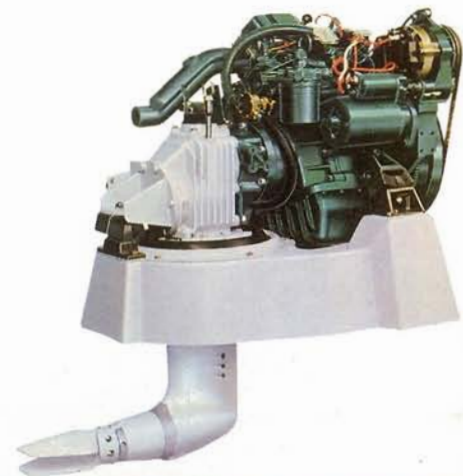
280 Outboard drive

The Volvo Penta 280 drive, famous for its long service life and resistance to corrosion enables a very compact and efficient marine power installation. It also incorporates an utterly reliable kick-up feature should the drive hit an obstacle in the water.



Reverse reduction gear MS2

The Volvo Penta MS2 reverse reduction gear has a downward angle of 7° on the output shaft which reduces the installation requirements and means that in many cases the engine can be installed horizontally. The integral slip clutch gives protection against overloading, thereby safeguarding the transmission should the boat run aground. Ratio 2.4:1 or 3.0:1.



ANCE DIESELS CHED TRANSMISSIONS

Drive 120S

is attached directly to the engine. The engine and drive unit is effectively insulated from the hull which means an exceptionally low level of vibration and noise.

Installation work is much easier since there is no propeller shaft, couplings or stern fitting involved and thereby no complicated alignment of the engine and shaft. Ratio 2.2:1 The S-drive and MS2 reverse reduction gear feature the same major components.



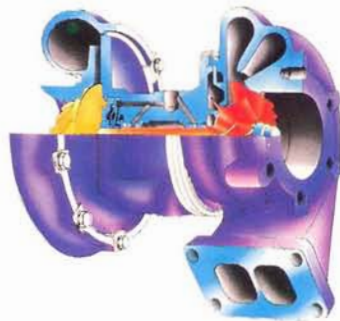
The MS3C is a new and highly efficient reverse reduction gear in the Volvo Penta transmission programme. The spring-balanced cone clutch makes shifting light and responsive. The reverse reduction gear

New reverse reduction gear

The MS3C is a new and highly efficient reverse reduction gear in the Volvo Penta transmission programme. The spring-balanced cone clutch makes shifting light and responsive. The reverse reduction gear



can be used with both right-hand and left-hand pitch propellers. The output shaft is angled downwards at 8° which in many cases will permit the engine to be installed horizontally.

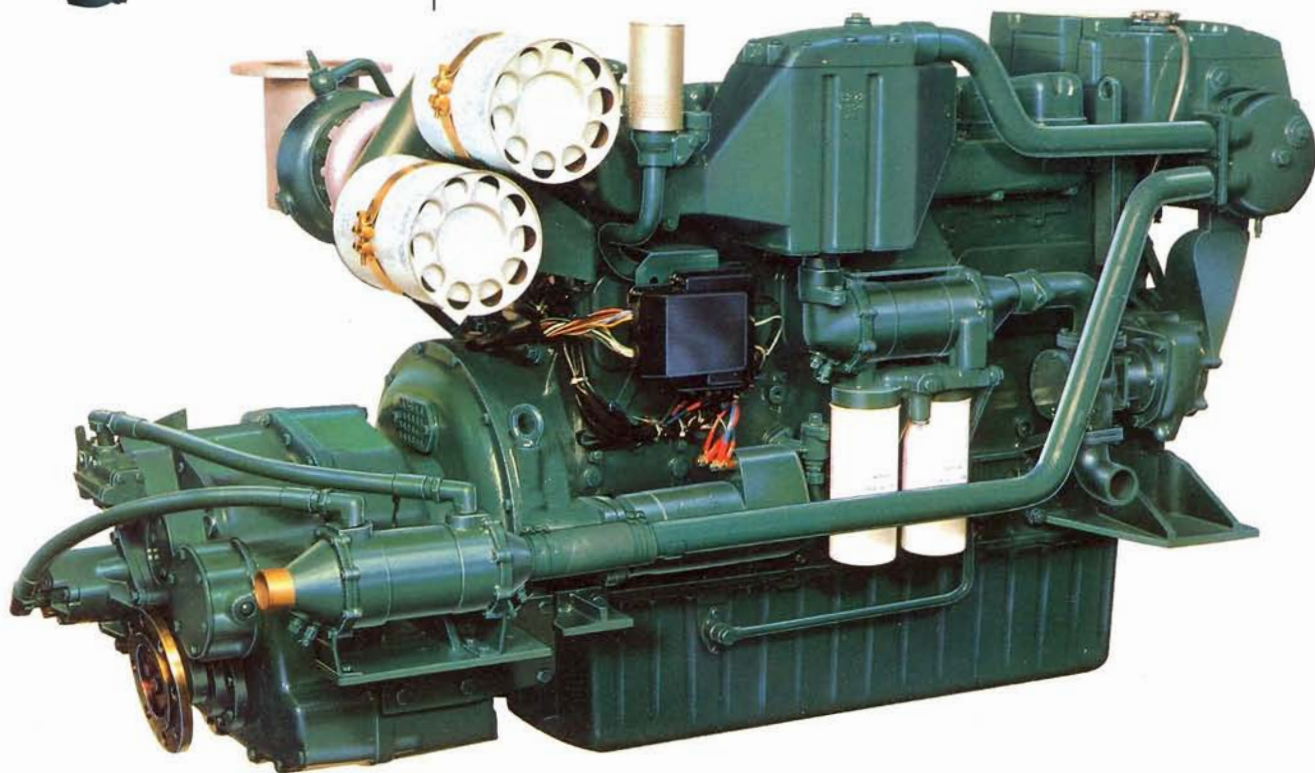


Turbocharger

The Volvo Penta turbo unit consists of an exhaust gas powered compressor which forces the combustion air into the cylinders. This boosted charge means that there is more air for combustion and both volumetric efficiency and combustion are improved.



Aftercooler is used in combination with the turbo unit on selected Volvo Penta engines and it reduces the temperature of the charge air downstream of the compressor. Cooler air is denser than warm air and therefore the air charge is increased. This means even better combustion and higher engine output.



THRUST!

3000
SERIES

Power. Reliability. Efficiency. Three of the salient features of Volvo Penta's 3000 Series. Compact diesels, easily installed.

Volvo Penta's 3000 Series: MD5C, MD7B, MD11D and MD17D. The letter suffix stands for the generation. MD stands for Marine Diesel.

All four are available with the new 120S drive – the third generation S-drive – and all except the MD5C can also be specified with our new reverse reduction gear the MS2. For optimum performance, the propeller speed must be perfect and therefore the MS2 comes with a choice of two ratios.

MD5C/120S

Single-cylinder marine diesel with direct injection and thermostat-controlled raw-water cooling. Propeller shaft output 7 kW (9.5 hp) at 3000 r/min. Capacity 0.443 litres (dm³). Type 120S drive, reduction ratio 2.2:1. Weight of engine with drive approx 131 kg (288 lb).

MD5B/110S

Propeller shaft output 5.5 kW (7.5 hp) at 2500 r/min. Capacity 0.443 litres (dm³). Type 110S drive, reduction ratio 1.66:1. Weight of engine with drive approx 128 kg (282 lb).

MD7B/120S

Two-cylinder marine diesel with direct injection and thermostat-controlled raw-water cooling. Propeller shaft output 12.5 kW (17 hp) at 3000 r/min. Capacity 0.744 litres (dm³). Type 120S drive, reduction ratio 2.2:1. Weight of engine with drive approx 181 kg (399 lb).



MD11D/120S

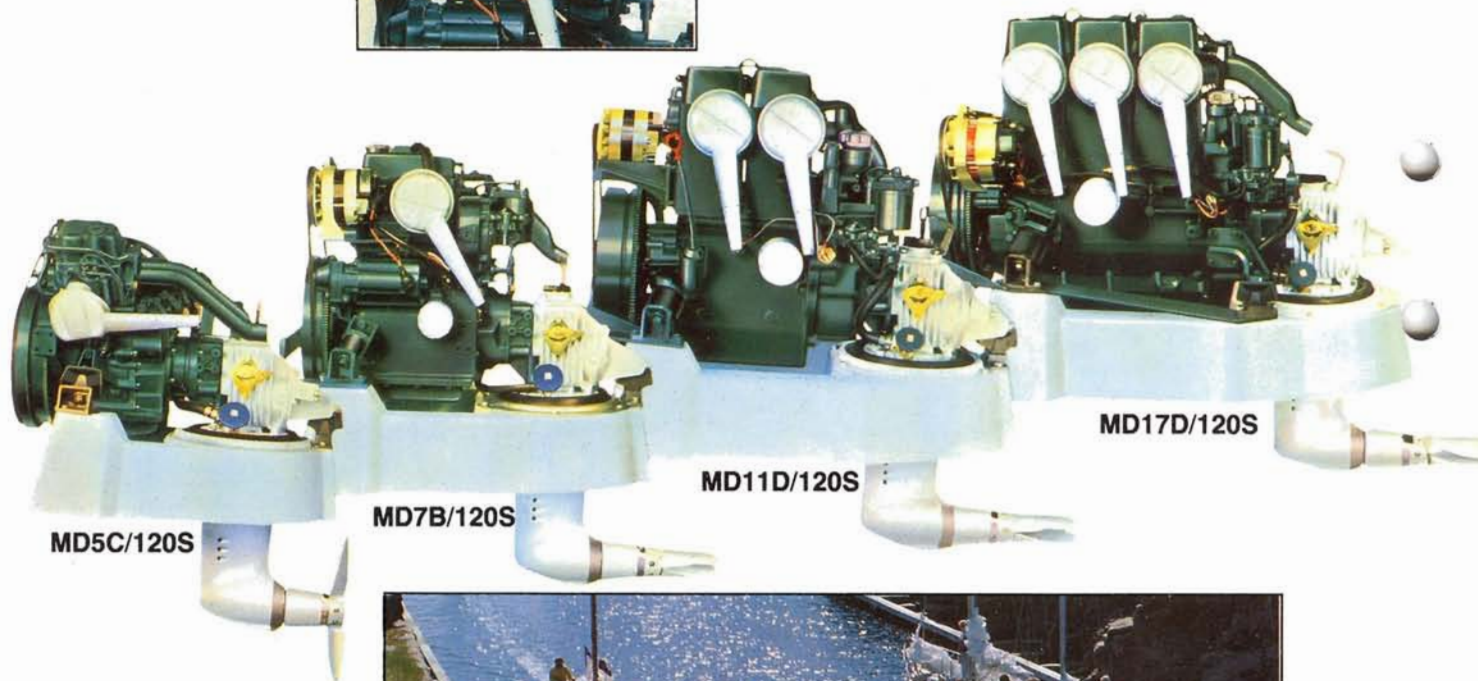
Two-cylinder marine diesel with direct injection and thermostat-controlled raw-water cooling. Propeller shaft output 18.4 kW (25 hp) at 3000 r/min. Capacity 1.12 litres (dm³). Type 120S drive, reduction ratio 2.2:1. Weight of engine with drive approx 238 kg (525 lb).

MD17D/120S

Three-cylinder marine diesel with direct injection and thermostat-controlled raw-water cooling. Propeller shaft output 26.5 kW (36 hp) at 3000 r/min. Capacity 1.68 litres (dm³). Type 120S drive, reduction ratio 2.2:1. Weight of engine with drive approx 308 kg (679 lb).

Marine alternator

A specially designed alternator with a rating as high as 50 A. The extra high charging capacity means that more and larger batteries can be used in the boat. If the charging distributor (available as accessory) is used, two independent battery circuits can be charged simultaneously.



Starting is electric, backed up on all engines by manual starting – except on the MD17 where manual starting is available as an extra option if required. Manual starting as a back-up system is a much appreciated safety feature afloat. The 3000 Series engines are all equipped with a 50 A alternator with ample capacity for the electric power requirements of your boat.

Robust construction, a power-packed electrical system and manual back-up starting on most models cost a few pounds extra in weight but this is a very low price to pay indeed for the many benefits provided.

MD17D/MS2

Three-cylinder marine diesel with direct injection and thermostat-controlled raw-water cooling. The MS2 reverse gear has its output shaft angled 7° downwards. Reduction ratio 2.4:1 or 3.0:1. Propeller shaft output 26.5 kW (36 hp) at 3000 r/min. Capacity 1.68 litres (dm³). Weight of engine with MS2 reverse gear approx 281 kg (680 lb).

MD11D/MS2

Two-cylinder marine diesel with direct injection and thermostat-controlled raw-water cooling. The MS2 reverse gear has its output shaft angled 7° downwards. Reduction ratio 2.4:1 or 3.0:1. Propeller shaft output 18.4 kW (25 hp) at 3000 r/min. Capacity 1.12 litres (dm³). Weight of engine with MS2 reverse gear approx 221 kg (487 lb).

MD7B/MS2

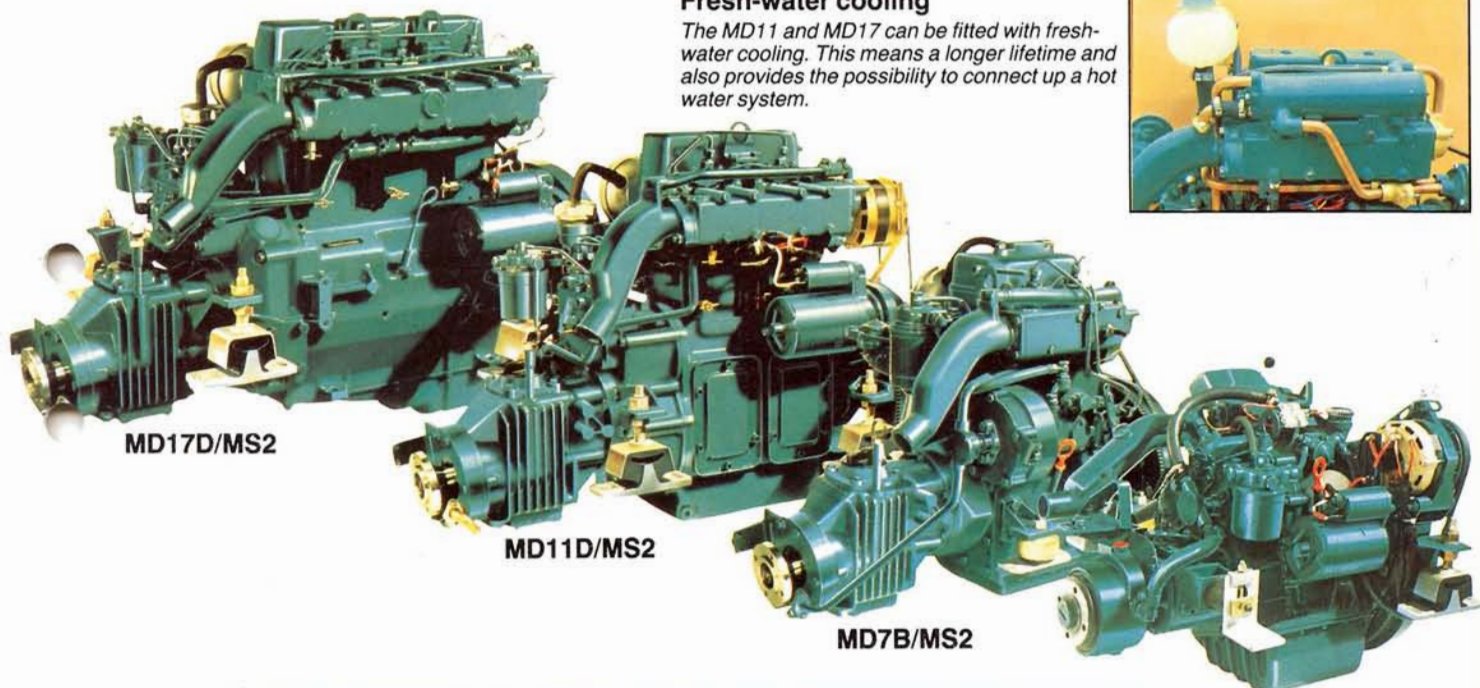
Two-cylinder marine diesel with direct injection and thermostat-controlled raw-water cooling. The MS2 reverse gear has its output shaft angled 7° downwards. Reduction ratio 2.4:1 or 3.0:1. Propeller shaft output 12.5 kW (17 hp) at 3000 r/min. Capacity 0.744 litres (dm³). Weight of engine with MS2 reverse gear approx 166 kg (366 lb).

MD5B/MSB

Single-cylinder marine diesel with direct injection and thermostat-controlled raw-water cooling. The reverse gear is of the MSB (Mono Shift) type, reduction ration 1.91:1. Propeller shaft output 5.5 kW (7.5 hp) at 2500 r/min. Capacity 0.443 litres (dm³). Weight of engine with reverse gear approx 111 kg (245 lb).

Fresh-water cooling

The MD11 and MD17 can be fitted with fresh-water cooling. This means a longer lifetime and also provides the possibility to connect up a hot water system.



MD17D/MS2

MD11D/MS2

MD7B/MS2

MD5B/MSB



DIESEL ECONOMY



MD21B MD21B/110S

Four-cylinder marine diesel with overhead valves and swirl chambers.
Thermostat-controlled fresh-water cooling with heat exchangers.
Propeller shaft output 45 kW (61 hp) at 4500 r/min.
Capacity 2.11 litres (dm³).
Type 110S drive, reduction ratio 2.15:1.
MS3B reverse gear, ratio 1.91:1 or 3.0:1.
BW reverse gear reduction ratio 2.1 or 2.9:1.
Weight of engine with MS3 reverse gear approx 285 kg (630 lb).
Weight with type 110S drive, reduction ratio 2.15:1 approx 325 kg (715 lb).

MD40A

Six-cylinder marine diesel of swirl chamber type with overhead valves. Thermostat-controlled fresh-water cooling with heat exchanger.
Propeller shaft output 62 kW (85 hp) at 3600 r/min.
Capacity 3.59 litres (dm³).
MS3 reverse gear, reduction ratio 1.91:1.
Borg Warner reverse gear, reduction ratio 1.91:1, 2.1:1 and 2.9:1.
Weight of engine with MS3 reverse gear approx 435 kg (960 lb), with BW approx 465 kg (1025 lb).

TMD40A

Six-cylinder turbo-charged marine diesel of swirl chamber type with overhead valves. Thermostat-controlled fresh-water cooling with heat exchanger.
Propeller shaft output 91 kW (124 hp) at 3600 r/min.
Capacity 3.59 litres (dm³).
MS3B reverse gear, reduction ratio 1.91:1.
Weight of engine with MS3 reverse gear approx 460 kg (970 lb).

AQD40A/280

Type 40 engine combined with 280 drive.
Flywheel output 96 kW (130 hp) at 3600 r/min.
Weight including drive approx 505 kg (1110 lb).

TAMD40B

Six-cylinder turbo-charged marine diesel of swirl chamber type with overhead valves. Aftercooler and thermostat-controlled fresh-water cooling with heat exchanger. (Tubular type).
Propeller shaft output 116 kW (158 hp) at 3600 r/min.
Capacity 3.59 litres (dm³).
MS3C reverse gear, reduction ratio 1.93:1 or 2.73:1.
Weight of engine with MS3 reverse gear approx 475 kg (1070 lb).

AQAD40B/280

The aftercooler 40 engine combined with 280 drive.
Flywheel output 121 kW (165 hp) at 3600 r/min.
Weight including drive approx 520 kg (1145 lb).

A step up in the power range. To the 4-cylinder MD21B and 6-cylinder 40 Series.

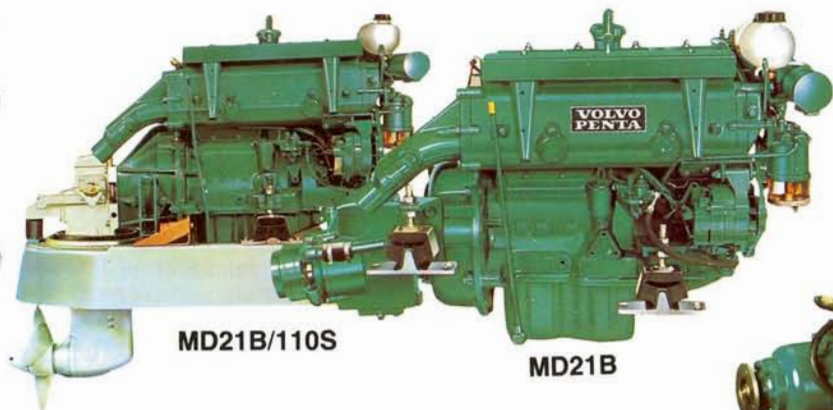
The MD21 is available in three versions, MD21B with MS3 reverse reduction gear; and its Aquamatic counterpart AQD 21B/280D; and with the S-drive, then designated MD 21B/110S.

Like the 40 Series engines, the MD21 is a swirl-chamber diesel with thermostatically controlled fresh-water cooling, efficient air cleaner and silencer for induction air and a raw water cooled exhaust system. The 12 volt electrical system with its 50 A alternator provides an ample supply of current. This is an engine for convenience and power in sail boats and motor boats.

The 40 Series covers outputs ranging from 62 kW

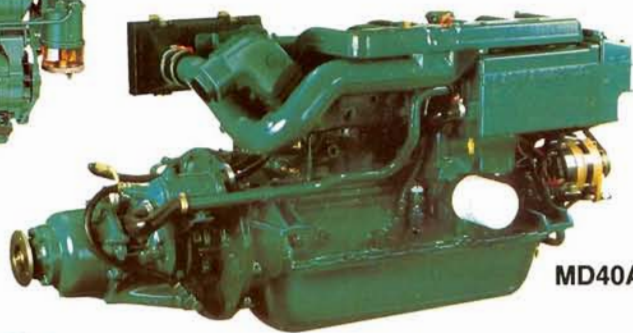
(85 hp) to 121 kW (165 hp) with the normally aspirated MD 40A; the turbocharged TMD40A and AQD40A; and the charge-air cooled turbos, the TAMD40B and AQAD40B. All of these engines have a 12 volt electrical system and a 50 A alternator. These engines are some of the best-selling marine power units available today for both work and pleasure boats all over the world.

With their compact installation dimensions, high output and beneficial power-to-weight ratio, the engines of the 40 Series can in many cases replace petrol engines, even in fast boats. In combination with the low fuel consumption and long service life the Volvo Penta 40 Series has little competition in the field of marine engines.

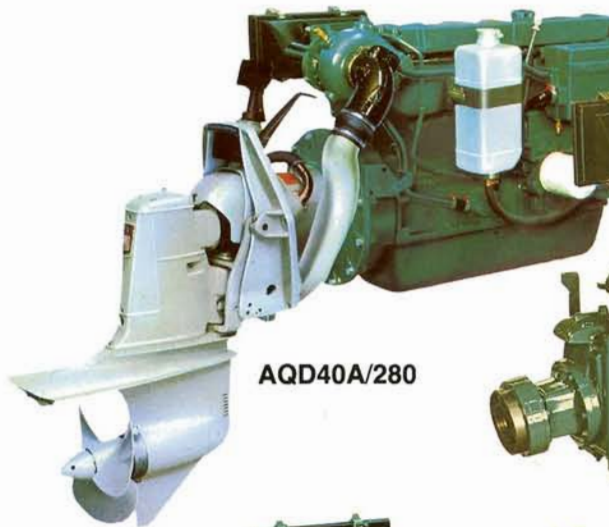


MD21B/110S

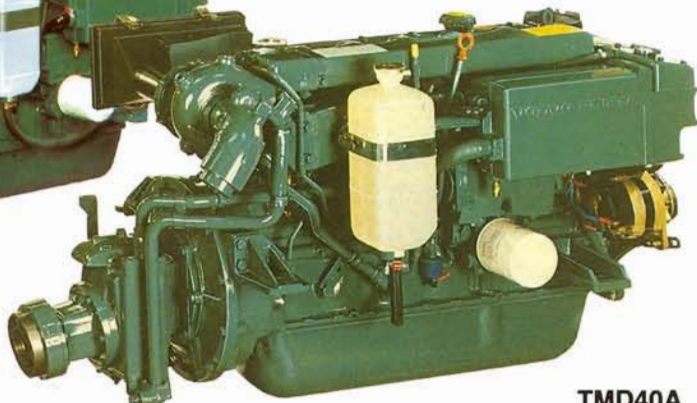
MD21B



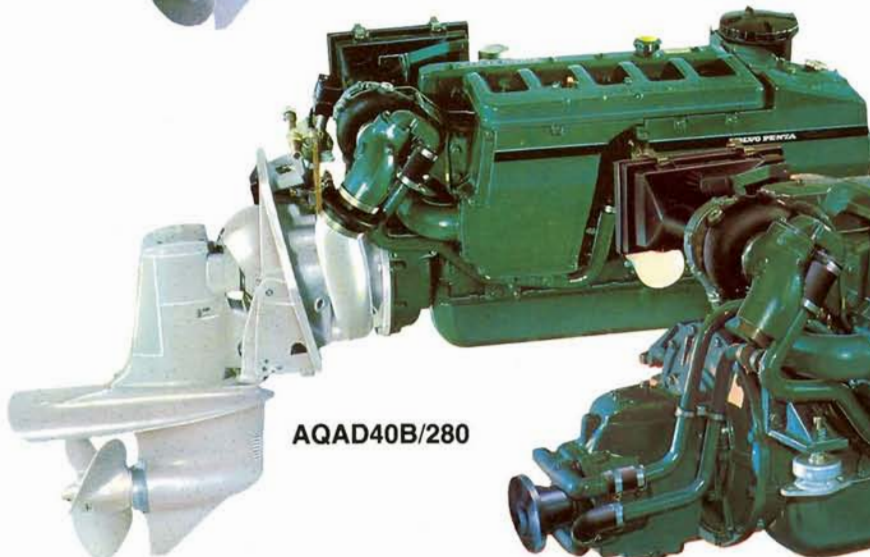
MD40A



AQD40A/280



TMD40A



AQAD40B/280



TAMD40B

POWER, RELIABILITY AND LONG SERVICE LIFE COMBINED

TAMD60B

Six-cylinder, direct-injection marine diesel with turbo-charging and aftercooler. Thermostat-controlled fresh-water cooling with heat exchanger.

Propeller shaft output 163 kW (221 hp) at 2800 r/min. Capacity 5.48 litres (dm³).

Twin Disc 502 reverse gear angled 10° downwards, reduction ratio alternatives 1.5:1, 2:1 and 2.5:1.

Borg Warner with reduction ratio of 2:1 or 3:1.

BW elbow gear, reduction ratio 1.51:1, 1.53:1, 1.98:1 and 1.99:1.

Weight of engine with TD 502 reverse gear approx 750 kg (1655 lb).

TAMD70D

Six-cylinder, direct-injection marine diesel with turbo-charging and aftercooler. Thermostat-controlled fresh-water cooling with heat exchanger.

Propeller shaft output 199 kW (270 hp) at 2500 r/min. Capacity 6.73 litres (dm³).

Twin Disc 506 reverse gear, reduction ratio alternatives 1:1, 1.5:1, 2:1 and 3:1.

Weight of engine with reverse gear approx 920 kg (2030 lb).



TAMD60B



TAMD70D

TAMD60B, TAMD70D, TMD70C and MD70C are Volvo Penta engine designations that go hand in hand with larger pleasure boats. In-line sixes like all other Volvo Penta big diesels, the 6 and 7-litre engines have propeller shaft outputs ranging from 102 kW (139 hp) to 199 kW (270 hp). And they come with tried and tested reverse reduction gears, Twin Disc or Borg Warner and a choice of ratios which give a power line that combines speed with economy.

Volvo Penta high output turbocharged engines incorporate special features to keep the temperature of vital engine components at moderate levels.

Piston cooling is one such feature. Volvo Penta has developed an ingenious and very efficient piston cooling system. The lubricating oil, which in its circuit

round the engine passes through a separate oil cooler, is sprayed up through jets into the insides of the pistons, thereby cooling the piston crowns and the ring zones. The aftercooler is another such feature. Primarily, it boosts the charge of air and thereby the output, but by lowering the combustion temperature, it also reduces thermal stress and increases the engine's service life.

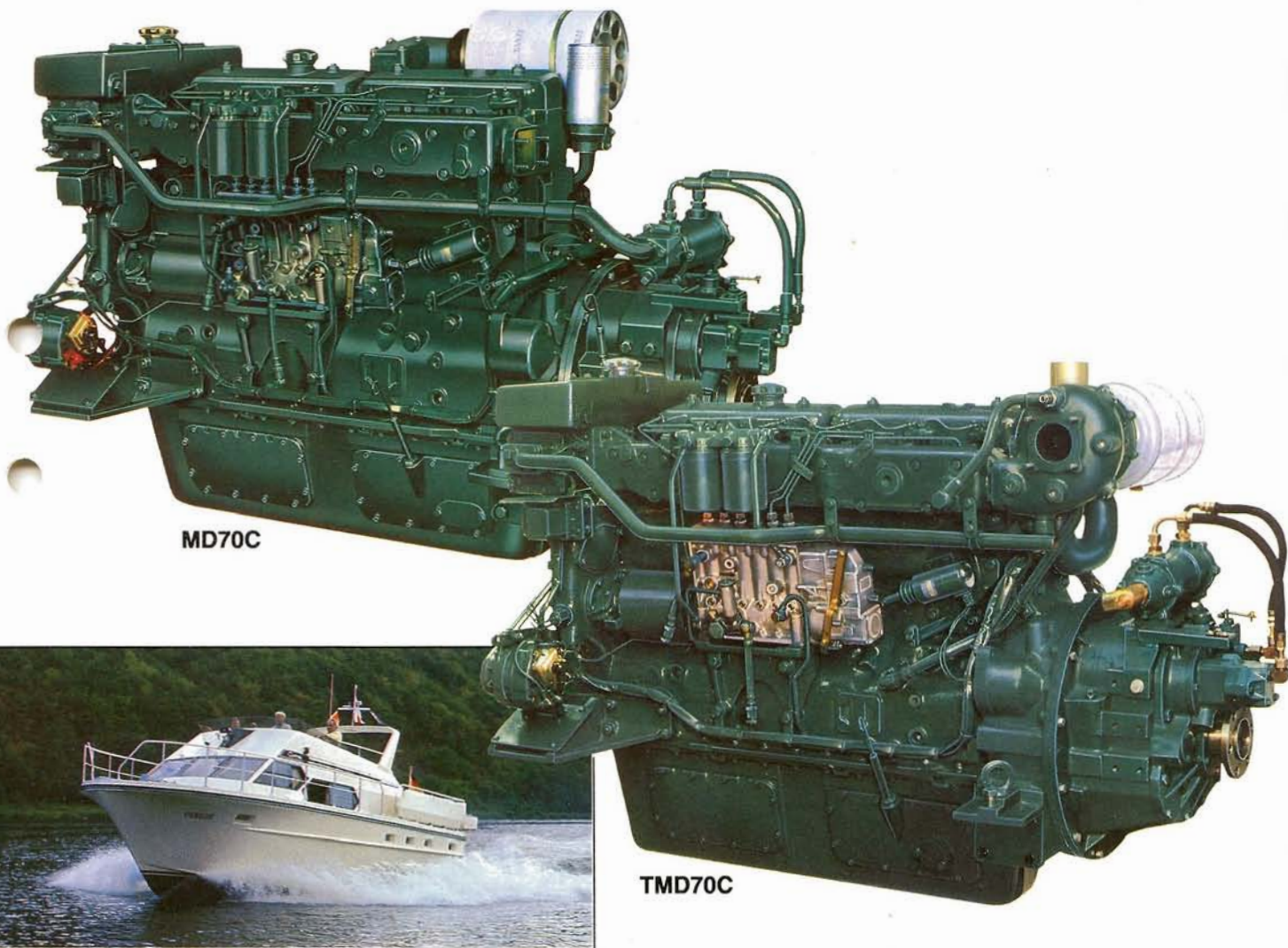
Thermostatically controlled fresh-water cooling and raw water cooling of the exhaust system also contribute to maintaining the engine at a beneficial operating temperature. This is why Volvo Penta engines while maintaining their long service life can simultaneously give an excellent power-to-weight ratio.

MD70C

Six-cylinder marine diesel with direct injection and fresh-water cooling with heat exchanger.
Propeller shaft output 102 kW (139 hp) at 2500 r/min.
Capacity 6.73 litres (dm³).
Twin Disc 506 reverse gear, reduction ratios 2:1, 3:1, 3.8:1 and 4.5:1.
Borg Warner reverse gear, reduction ratio 2:1 or 3:1.
Weight of engine with BW reverse gear approx 885 kg (1950 lb).

TMD70C

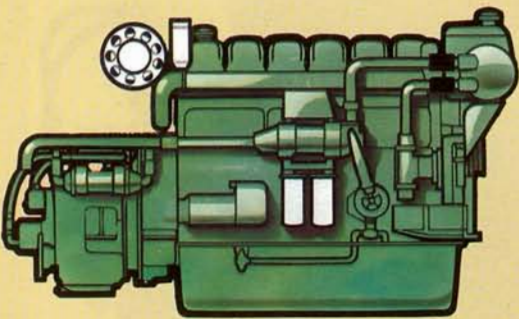
Six-cylinder direct injection marine diesel with turbo-charging and fresh-water cooling with heat exchanger.
Propeller shaft output 141 kW (192 hp) at 2500 r/min.
Capacity 6.73 litres (dm³).
Twin Disc 506 reverse gear, reduction ratios 1:1, 2:1, 3:1 and 4.5:1.
Borg Warner reverse gear, reduction ratio 2:1 or 3:1.
Weight of engine with BW reverse gear approx 885 kg (1950 lb).



MD70C

TMD70C

ADVANCED TECHNOLOGY AND ROBUST CONSTRUCTION



TMD100A

Six-cylinder, direct injection marine diesel with turbo-charging and fresh-water cooling with heat exchanger. Propeller shaft output 164 kW (223 hp) at 2000 r/min. Capacity 9.60 litres (dm³). Twin Disc 509 reverse gear, alternative reduction ratios: 1.5:1, 2:1, 3:1, 3.8:1 and 4.5:1. Weight of engine excluding reverse gear approx. 1160 kg (2560 lb).

TMD120B

Six-cylinder, direct-injection marine diesel with turbo-charging and fresh-water cooling with heat exchanger. Propeller shaft output 240 kW (326 hp) at 2000 r/min. Capacity 11.98 litres (dm³). Twin Disc 510 reverse gear, alternative reduction ratios: 1.5:1, 2:1 and 2.5:1. Weight of engine excluding reverse gear approx. 1350 kg (2970 lb).

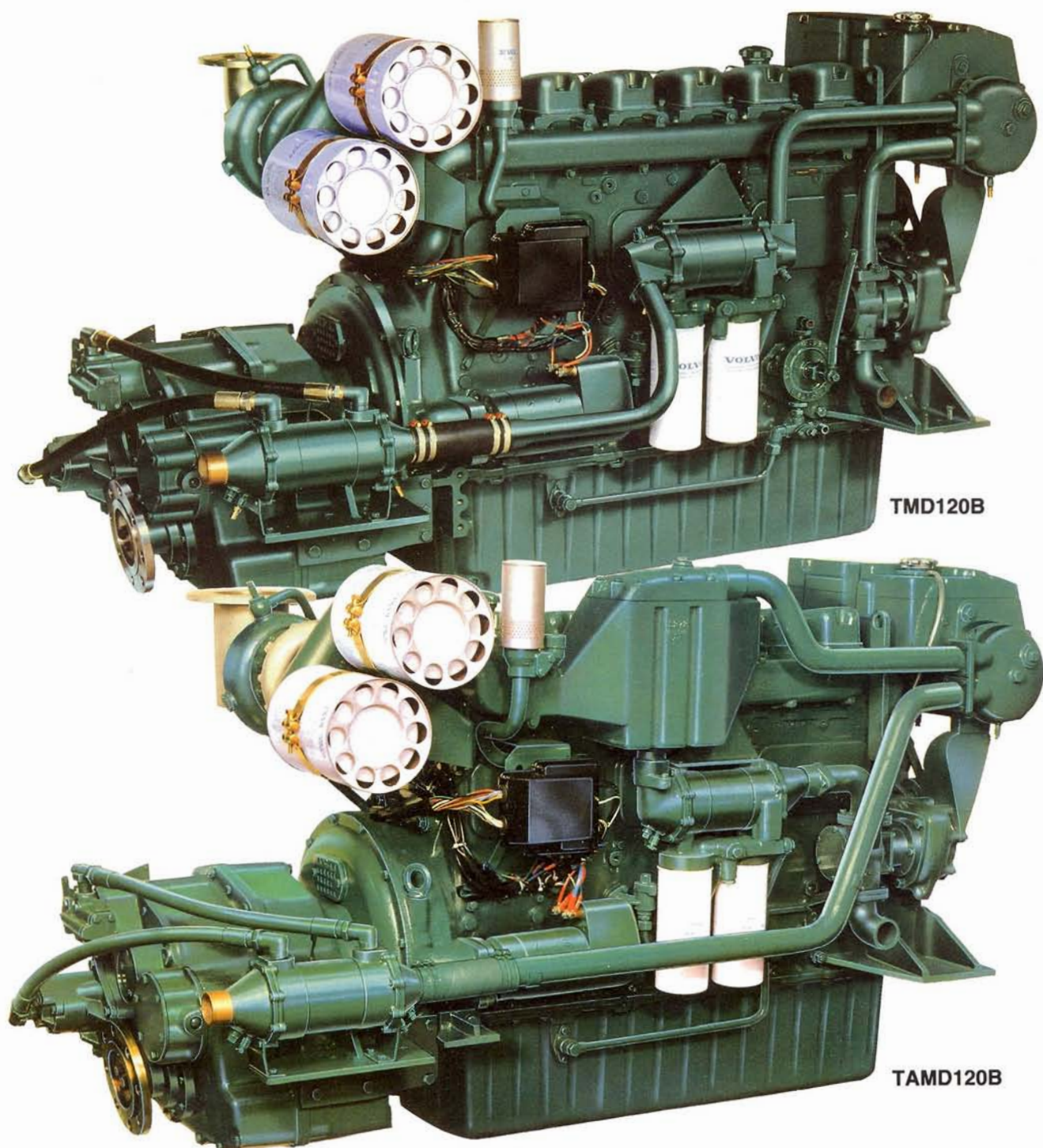
TAMD120B

Six-cylinder, direct injection marine diesel with turbocharging and aftercooler. Thermostat-controlled fresh-water cooling with heat exchanger. Propeller shaft output 282 kW (384 hp) at 2200 r/min. Capacity 11.98 litres (dm³). Twin Disc 510 reverse gear, alternative reduction ratios: 1.5:1, 2:1 and 2.5:1. Weight of engine excluding reverse gear approx. 1360 kg (3000 lb).

Two 6-cylinder turbocharged, 4-stroke direct injected 12-litre diesels which are possibly the most powerful in their class – the Volvo Penta TMD120B and TAMD 120B. The turbocharged TMD120B has a propeller shaft output of 240 kW (326 hp) and the turbocharged TAMD120 with charge air cooling gives 282 kW (384 hp).

Both have a hydraulic reverse reduction gear and a choice of ratios. The 24 volt electrical system has a starter motor of not less than 4.7 kW (6.5 hp) output.

The piston crowns are specially shaped for a low compression ratio and efficient mixing and distribution of the fuel and air which improves combustion and reduces thermal stress. The pistons are oil cooled. The engine block and cylinderheads – one for each cylinder – and the exhaust manifold are fresh water cooled. The cooling system is monitored by three thermostats – exact temperature control results in improved fuel economy.



SERVICE

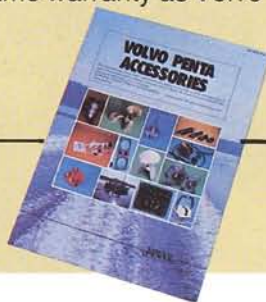
Even the very best engines need maintenance and for Volvo Penta products there is a well established service network all over the world. The specially trained personnel will take care of your engine or transmission using genuine Volvo parts and accessories.

ACCESSORIES

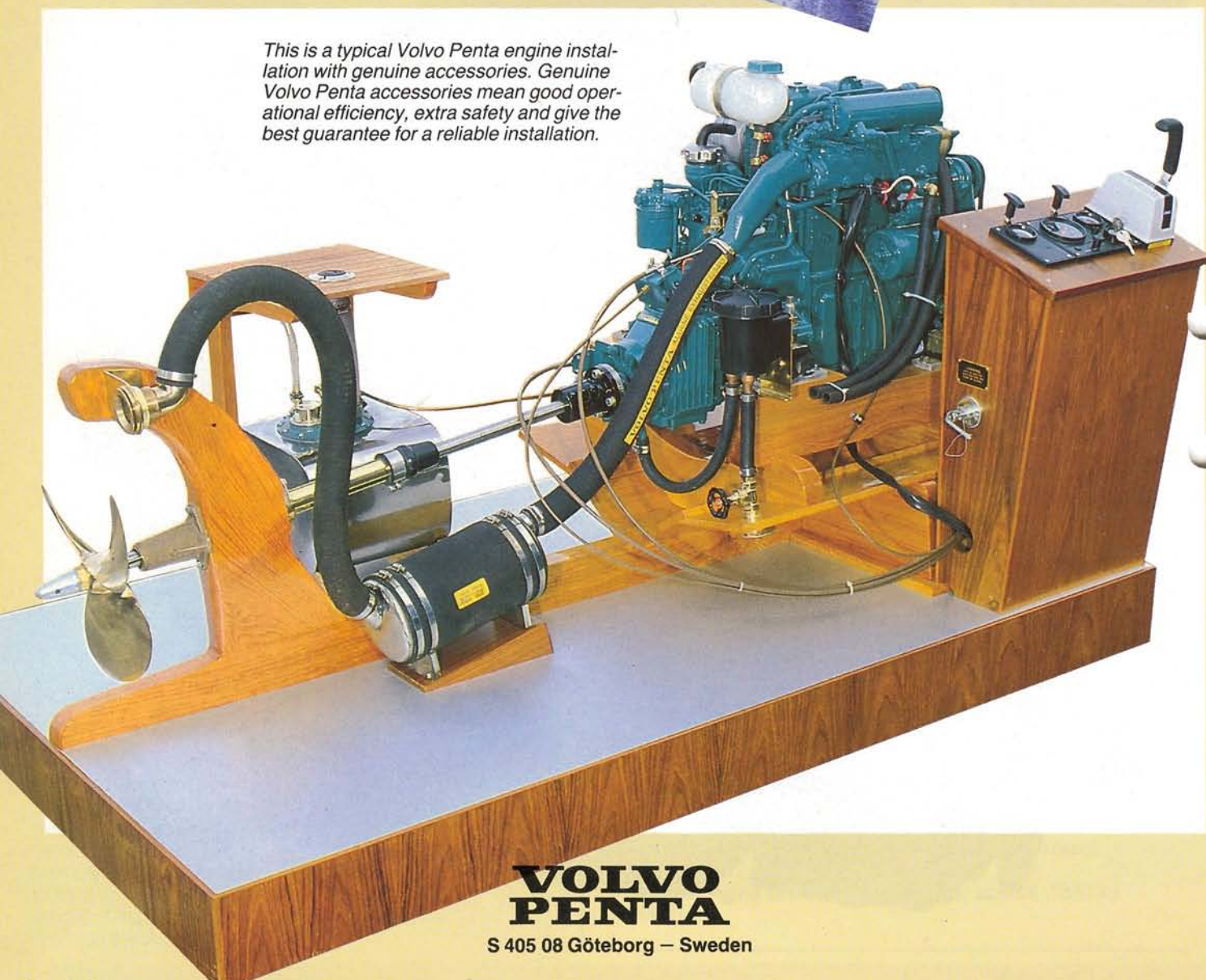
Volvo Penta has a comprehensive range of accessories all tested and approved.

Genuine accessories are covered by the same warranty as Volvo Penta engines and parts.

Write to Volvo Penta for our 32 page accessories catalogue "Ref no. 8225".



This is a typical Volvo Penta engine installation with genuine accessories. Genuine Volvo Penta accessories mean good operational efficiency, extra safety and give the best guarantee for a reliable installation.



**VOLVO
PENTA**

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