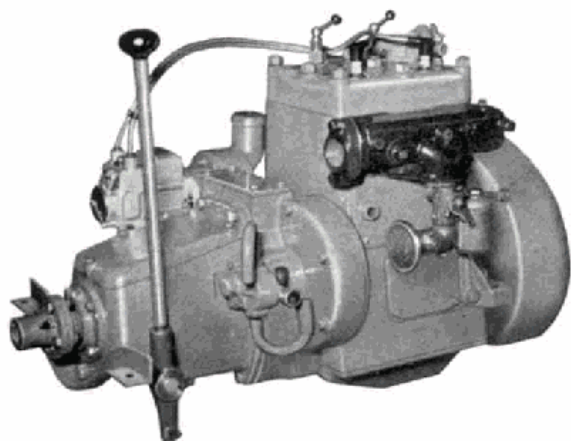


PENTA

MARINE ENGINE Type C2 7-11 hp



Engine designed for electric starting and generator. Standard engines are delivered with chain starter. (See dimension sketch.)

Principal Dimensions

Cycle of operation: 4-stroke.
Number of cylinders: 2.
Output: Petrol 7—11 hp at 1000—1500 r/m.
Kerosene approx. 10% lower output.
Fuel consumption: Petrol 265 g per hp-hour.
Kerosene 300 g per hp-hour.
Valid with 10% allowance.
Bore: 84.14 mm.
Stroke: 90 mm.
Cubic capacity: 1 litre.
Compression ratio: Petrol 6.15 : 1.
Kerosene 5.7 : 1.
Net weight: Engine with reverse gear approx. 155 kilos.
Propeller equipment approx. 25 kilos.

Specification:

Cylinder head. Detachable. Compression chamber adapted according to the latest experience in this sphere.

Cylinder block. Chrome-nickel-alloyed cast iron; provided with exchangeable wet cylinder liners of the highest quality. The cylinder bores are carefully honed. Crankcase has inspection door and dip stick for checking the oil level.

Pistons. Made of aluminium alloy and ground to accurate dimension, fitted with 4 piston rings of which one oil scraper ring.

Gudgeon pins. Hardened and ground, and fitted with an efficient locking device.

Connecting rods. Drop forged of steel in H-section and very sturdy. Bush for gudgeon pin.

Crankshaft. Ground journals and fitted with counterweights for keeping down vibration.

Brasses. Both connecting rod bearings and main bearings have exchangeable white-metal lined steel shells, ready for fitting without adjusting.

Camshaft. Of steel with the cams forged in one piece with the shaft. The cams are accurately machined and, like the bearing journals, hardened and ground.

Geared transmission for camshaft and ignition mechanism. Enclosed in a casing and thus well protected. The gears are accurately milled and of oblique-toothed type, which conduces to silent running.

Valves. Made of high-grade special steel and sliding in accurately machined, exchangeable cast iron guides. The valve seats are cast together with the cylinder block and effectively water cooled. The

valve mechanism is wholly enclosed, but all the same easily accessible for adjusting through a spacious door in the cylinder block.

Valve lifters. Adjustable, hardened and ground.

Cooling water pump. Of geared type and driven from the camshaft.

Temperature regulation. Simple and reliable.

Lubrication. Combined forced feed and splash lubrication. The pump is fitted on the outside of the engine and conveniently accessible, which also applies to the oil strainer. A gauge is fitted on the engine for control of the oil pressure.

Carburetter. The air filter of the carburetter also serves as a flame trap.

Magneto with Impulse Starter.

Reverse gear. Wholly enclosed disc clutch which is nevertheless easily accessible. The gear for running astern has silent-running hardened gears of high-grade special steel. The main parts of the reversing gear are supported on SKF bearings. The thrust of the reversing lever is absorbed by an SKF bearing. Clutch easily adjustable. The reverse gear is fitted with circulating lubrication.

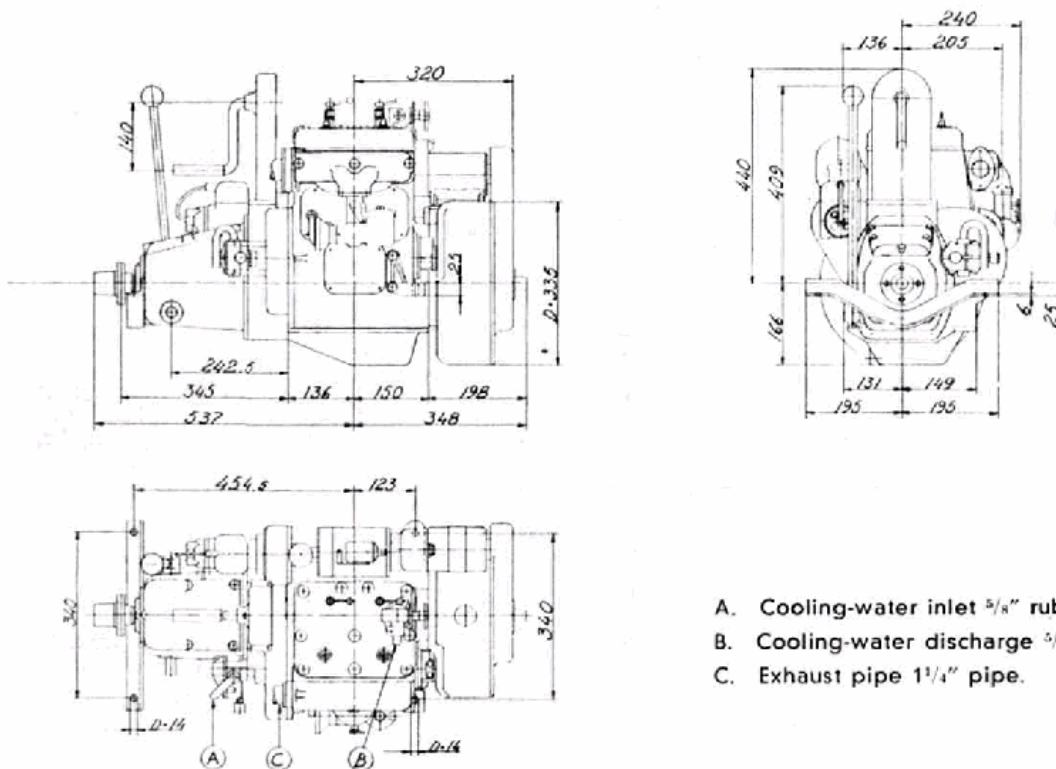
Thrust bearings of the propeller shaft: SKF.

Propeller equipment. Comprises bronze stern shaft, brass stern sleeve and 2- or 3-bladed bronze propeller.

Exterior finish. As standard the engines are painted in a discrete colour. The fine finish of the iron and careful painting give the engine an attractive appearance.

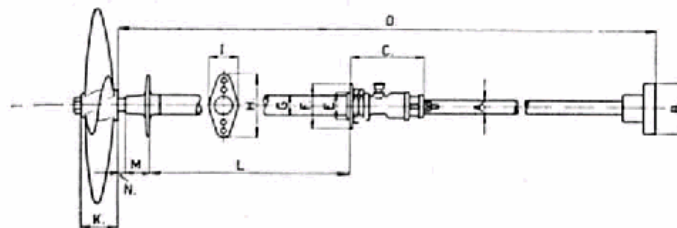
Dimension sketch

(All dimensions in mm)



- A. Cooling-water inlet $\frac{3}{8}$ " rubber hose.
- B. Cooling-water discharge $\frac{3}{8}$ " rubber hose.
- C. Exhaust pipe $1\frac{1}{4}$ " pipe.

Propeller and Stern Gear.



A	B	C	D	E	F	G	H	I	K	L	M	N
25	114	145	2000	52	80	42	130	52	64	1000	48	ca 15

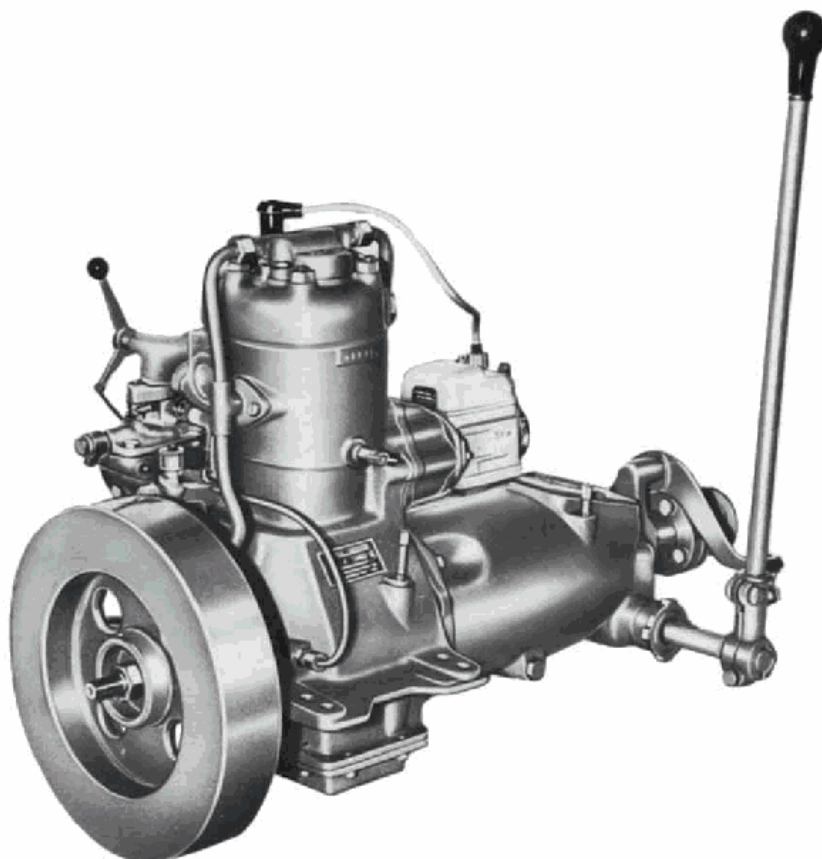
All specifications subject to change without notice.

PENTA Marine Engine Type C2 is a robustly built and hard-wear engine which runs smoothly and without appreciable vibration. The reverse gear is dimensioned with ample margin for the purpose of withstanding frequent reversings, something that is of particular importance to users like pilots and fishermen, and when the boat is used to carry passengers and goods in traffic.

Great care has been devoted to making the engine oil-tight and smokeless, in that way conducting to com-

fort on board when the boat is used as a pleasure craft. These are valuable properties also when the engine is installed in work-boats of different descriptions.

PENTA C2 is suitable for fitting in all types of boats between $6\frac{1}{2}$ and 8 meters, up to $2\frac{1}{2}$ tons' displacement. It is ideal as an auxiliary in sailing vessels on account of the compact design and its being easily installed in very cramped spaces.



C5

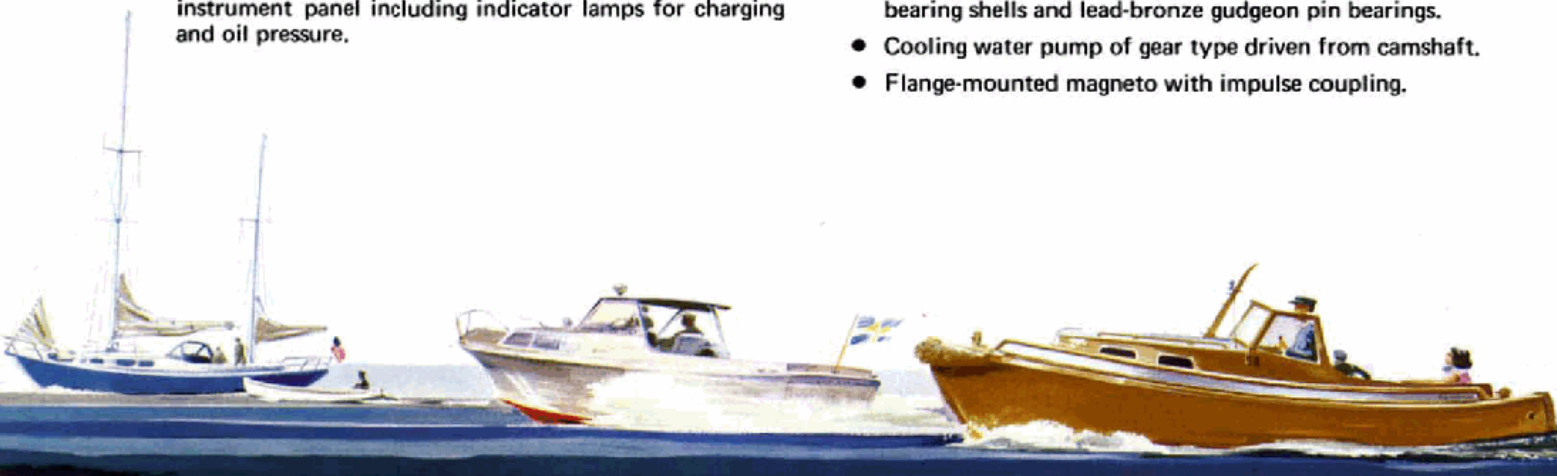
VOLVO PENTA 1-CYLINDER, FOUR-STROKE MARINE ENGINE FOR PETROL 5 HP AND PARAFFIN (KREOSENE) 4 HP.

The Volvo Penta C 5 is a single-cylinder spark ignition engine of the four-stroke type and has an output of 5 h.p. when running on petrol (gasoline) and 4 h.p. when running on paraffin (kerosene). It is suitable for use in small boats and as auxiliary engine in sailing craft. The C 5 has very low fuel consumption, is light-weight and has extremely compact dimensions.

The C 5 can be supplied in the following standard models:

1. Engine with flywheel starter
2. Engine with chain starter and flywheel cover
3. Engine with combined starter/dynamo, 12 V, 90 W, and instrument panel including indicator lamps for charging and oil pressure.

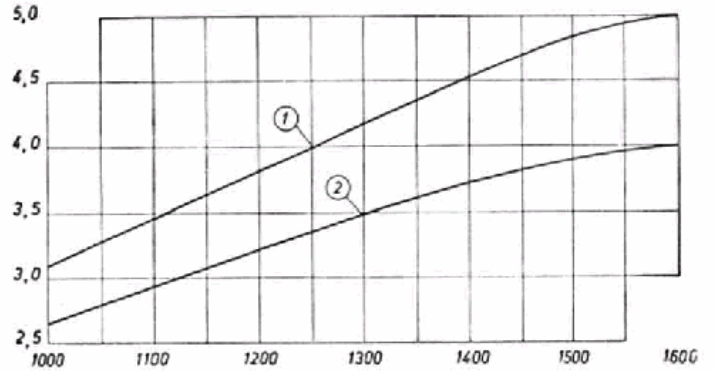
- Fully enclosed reverse gear of robust design.
- Modern up-draught carburetter with return channel to eliminate dripping.
- Water-cooled exhaust manifold.
- Thermostat-controlled cooling system
- Oil dipstick in crankcase and reverse gear.
- Combined splash and pressure lubrication.
- Connecting rod with drilled oil channels to gudgeon pin bearings.
- Big-end bearing with separate white-metal lined steel bearing shells and lead-bronze gudgeon pin bearings.
- Cooling water pump of gear type driven from camshaft.
- Flange-mounted magneto with impulse coupling.



C5

DATA

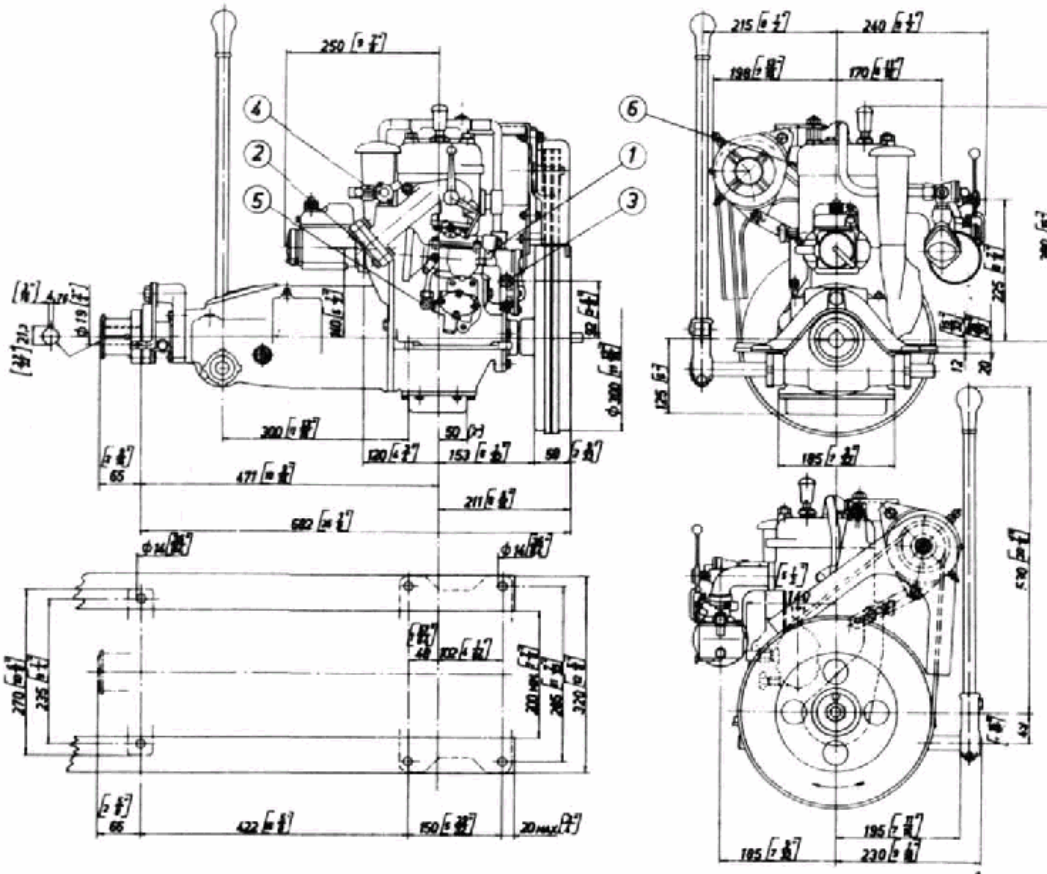
Type of operation	Four-stroke
Valves	Side-valve
Number of cylinders	1
Output, petrol (gasoline), h. p.	5
Output, paraffin (kerosene), h. p.	4
Engine speed, r. p. m.	1600
Bore, mm (in.)	78 (3.071")
Stroke, mm (in.)	92 (3.62")
Capacity litres (cu. in.)	0.44 (26.9)
Direction of rotation (viewed from reverse gear)	Anti-clockwise
Propeller	Left-hand thread
Weight with flywheel starter approx kg (lb)	92 (203)
Max. inclination of engine	10°



OUTPUT

Output curve showing the output with petrol (gasoline) (1) and paraffin (kerosene) (2).

Dimensions



1. Connection for fuel pipe 5/16"
2. Connection for exhaust system R 1"
3. Cooling water inlet. Pipe 7/16"
4. Cooling water outlet. Pipe 7/16"
5. Connection for oil pressure gauge pipe 5/16"
6. Connection for cooling water thermometer R 1/2"



AB VOLVO PENTA

Box 392, Gothenburg 1, Sweden

Cables: Penta

Telex: 207 55



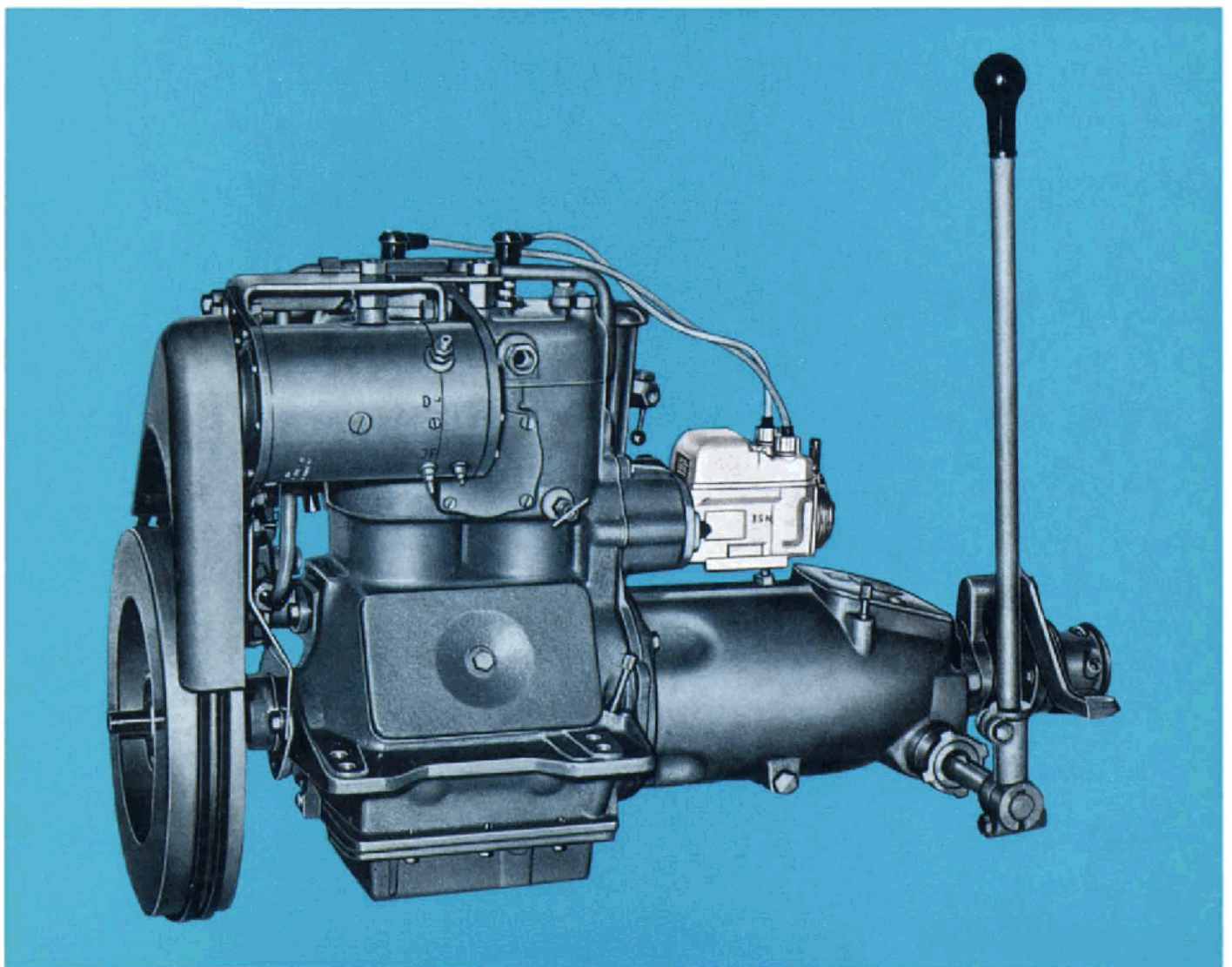
The Volvo Penta C 10 is a two-cylinder spark ignition engine of the four-stroke type for operation on petrol (gasoline) and paraffin (kerosene), suitable for boats in the 5—8 metres (16—27 ft) class and also ideal for use as an auxiliary in sailing craft due to its compact dimensions. This engine has low fuel consumption, is eminently reliable and has unusually vibration-free running.

The C 10 can be supplied in the following standard models:

1. Engine with flywheel starter
 2. Engine with chain starter and flywheel cover
 3. Engine with combined starter dynamo, 12 V, 90 w, and instrument panel including indicator lamps for charging and oil pressure.
- Fully enclosed reverse gear of robust design.
 - Modern up-draught carburettor with return channel to eliminate dripping.
 - Water-cooled exhaust manifold.
 - Thermostat-controlled cooling system
 - Oil dipstick in crankcase and reverse gear.
 - Combined splash and pressure lubrication.
 - Connecting rods with drilled oil channels to gudgeon pin bearings.
 - Big-end bearings with separate white-metal lined steel bearing shells and lead-bronze gudgeon pin bearings.
 - Cooling water pump of gear type driven from camshaft.
 - Flange-mounted magneto with impulse coupling.

VOLVO PENTA MARINE ENGINE

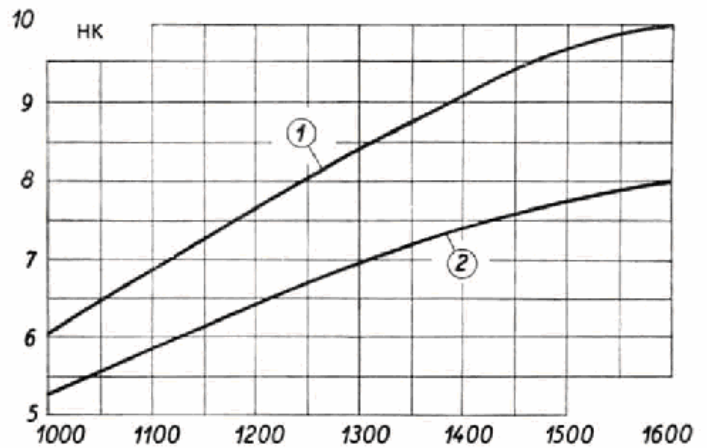
C 10



C 10

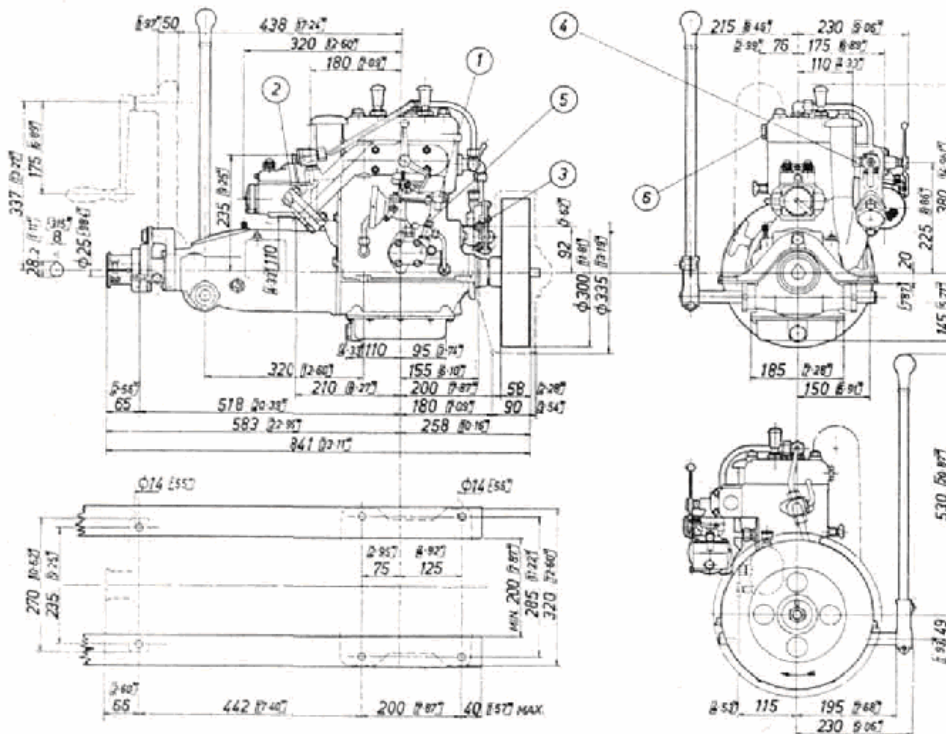
DATA

Type of operation	Four-stroke
Valves	Side-valve
Number of cylinders	2
Output, petrol (gasoline), h. p.	10
Output, paraffin (kerosene), h. p.	8
Engine speed, r. p. m.	1600
Bore, mm (in.)	78 (3.071")
Stroke, mm (in.)	92 (3.62")
Capacity litres (cu. in.)	0.88 (53.7)
Direction of rotation (viewed from reverse gear)	Anti-clockwise
Propeller	Left-hand thread
Weight with flywheel starter approx kg (lb)	116 (256)
Max. inclination of engine	10°



OUTPUT

Output curve showing the output with petrol (gasoline) (1) and paraffin (kerosene) (2).



Dimensions drawing, scale 1:15

1. Connection for fuel pipe 5/16"
2. Connection for exhaust system R 1 1/4".
3. Cooling water inlet. Pipe 7/16"
4. Cooling water outlet. Pipe 7/16"
5. Connection for oil pressure gauge pipe 5/16"
6. Connection for cooling water thermometer R 1/2"

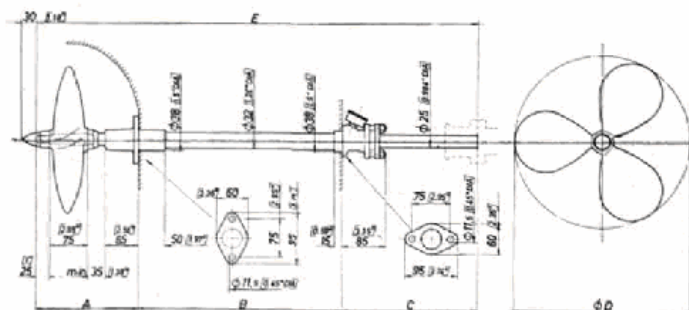
Standard lengths:

Propeller shaft, overall length E = 2000 mm (80")
 Sleeve for propeller shaft B = 1000 mm (40")
 If other lengths than those given as standard above are required for the propeller shaft and sleeve, the measurement B as well as A+B+C=E should be stated.

Min. required space for A = 200 mm (8")

Min. required space for C = 220 mm (8.6")

The last-mentioned space includes the min. space for re-packing of the stuffing box.



AB VOLVO PENTA

Box 392, Gothenburg 1, Sweden

Cables: Penta

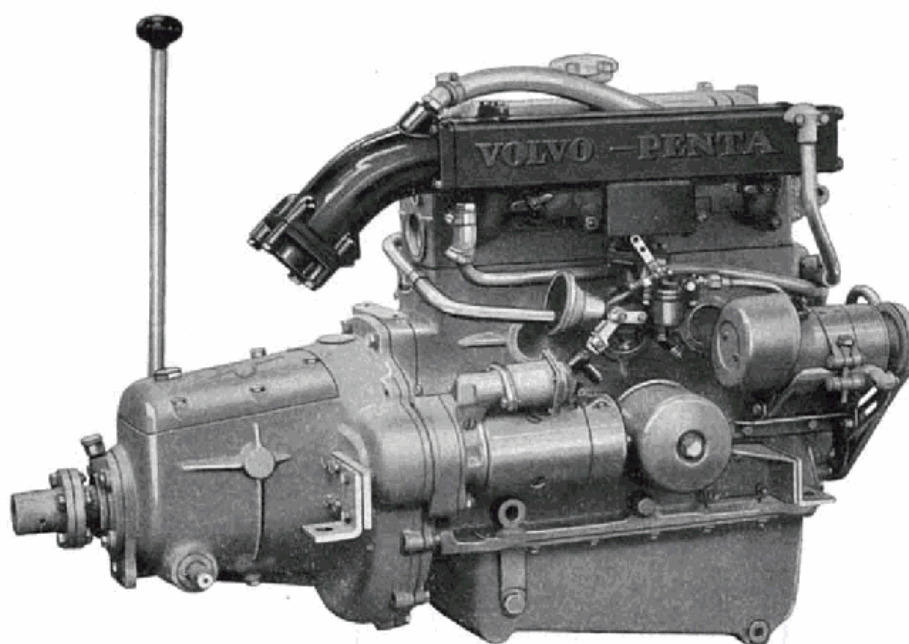
Telex: 207 55



BB 25

VOLVO PENTA MARINE ENGINE • 32 H.P.

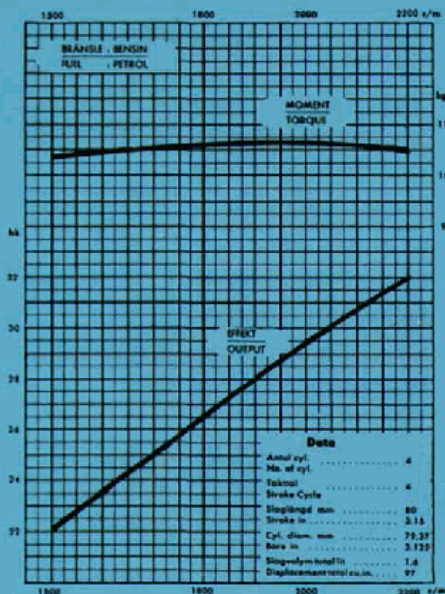
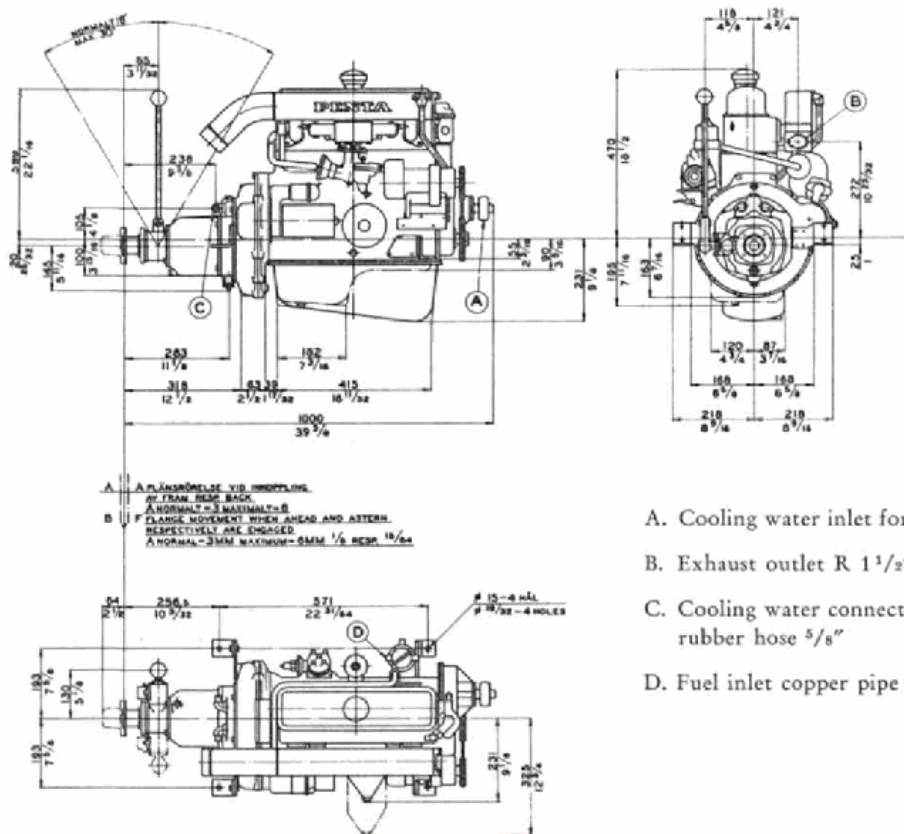
The Volvo Penta BB 25 engine is available for both petrol and paraffin operation. The engine is fitted with an up-draught carburetter and the design of the BB 25 with overhead valves and a temperature-regulating thermostat makes it particularly suitable for paraffin operation. The engine can also be fitted with a 1.91:1 reduction-reverse gear if desired. The Volvo Penta BB 25 is suitable for use in a large range of working and pleasure boats.



Engine with 1:1 reverse gear

VOLVO PENTA MARINE ENGINE, TYPE BB 25

Dimension drawings



Data

Type of engine	Four-stroke
Valves	Overhead
Number of cylinders	4
Output, petrol	22—32 h.p.
Output, paraffin	17—25 h.p.
Engine speed	1500/2200 r.p.m.
Bore	79 mm (3.125")
Stroke	80 mm (3.15")
Compression ratio, petrol	7.4: 1
Compression ratio, paraffin	5.0: 1
Capacity	1.6 litres (97 cu.in.)
Weight, with reverse gear, approx.	180 kg (400 lb.)

AB VOLVO PENTA

Box 392, Göteborg 1, Sweden

Tel. 2354 60

Cables: Penta



The BB 30 is a new unit which will be welcomed by boat-owners who want to combine economical running with a reasonably high engine output. The BB 30 has an output range of 24—45 h.p. and can be run on both petrol (gasoline) and paraffin (kerosene). Engine equipment is identical no matter which of these fuels is used and the output also remains unchanged. The fuel consumption of the BB 30 when running on paraffin (kerosene) is as low as 250 g/h.p./hr. at 3000 r.p.m.

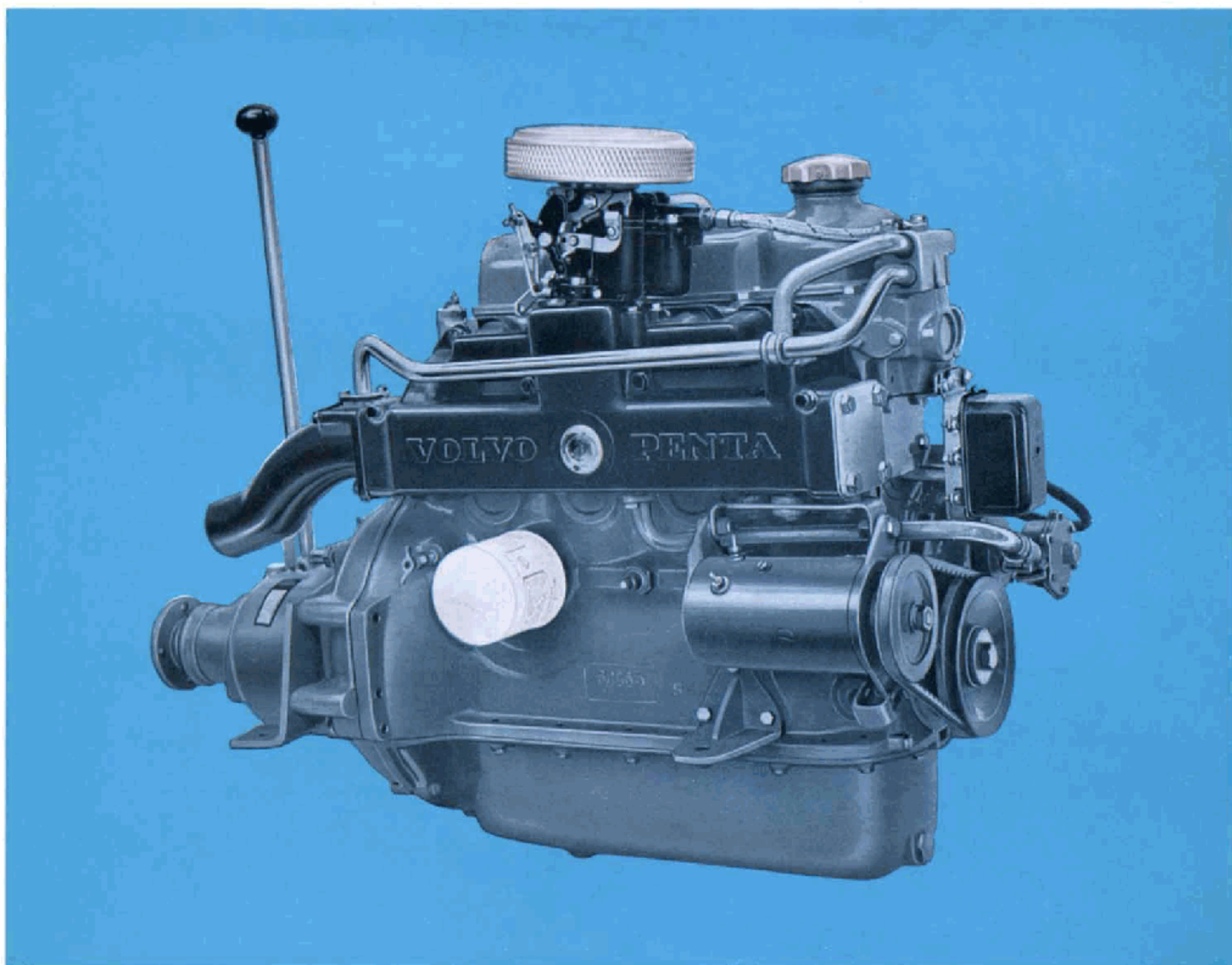
The Volvo Penta reduction-reverse gear, ratio 1.91 : 1, for left-hand thread propeller, dimensioned for a much higher torque, makes the BB 30 ideal also for work boats.

Standard equipment on the BB 30 includes:

- Water-cooled exhaust elbow for attachment of rubber hose.
- Five-bearing induction-hardened crankshaft.
- Lead-bronze main bearings and big-end bearings.
- Hyper-efficient lubricating oil filter ensures low bearing wear and maximum dependability.
- A down-draught carburettor which has been specially corrosion-proofed for marine operation. Internal ventilation of the float chamber, i.e. in the case of eventual flooding of the float chamber should the float jam, the fuel runs down into the inlet manifold. An acceleration pump prevents the engine from stalling and also prevents carburettor blow-back during sudden acceleration. This pump also assists cold starting.
- A fuel pump driven from the camshaft and fitted with a fuel filter and a hand primer pump.
- High level starter motor and fully enclosed flywheel to decrease the risk of damage caused by bilge water.
- Exhaust manifold of high-class alloy cast-iron.
- Sea-water filter.
- 12 V electrical equipment. Fully enclosed 90 W dynamo.
- Instrument panel with warning lamps for charging and oil pressure.

VOLVO PENTA MARINE ENGINE

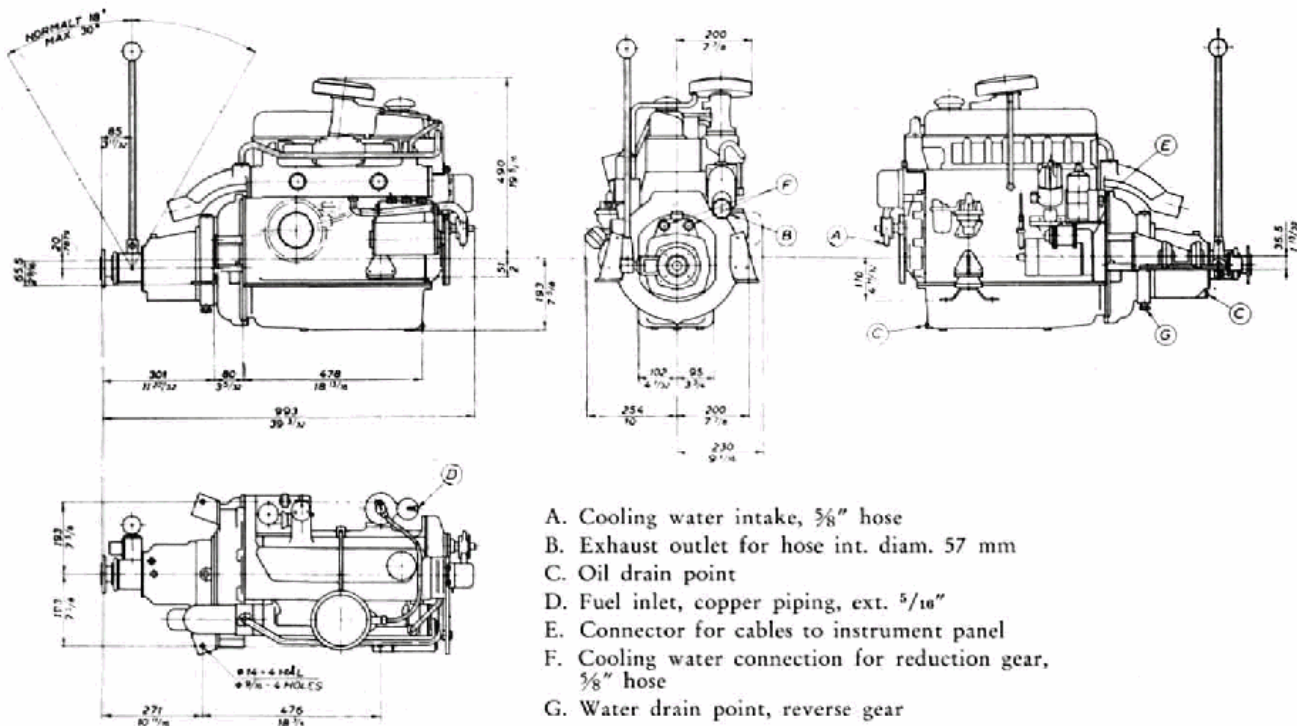
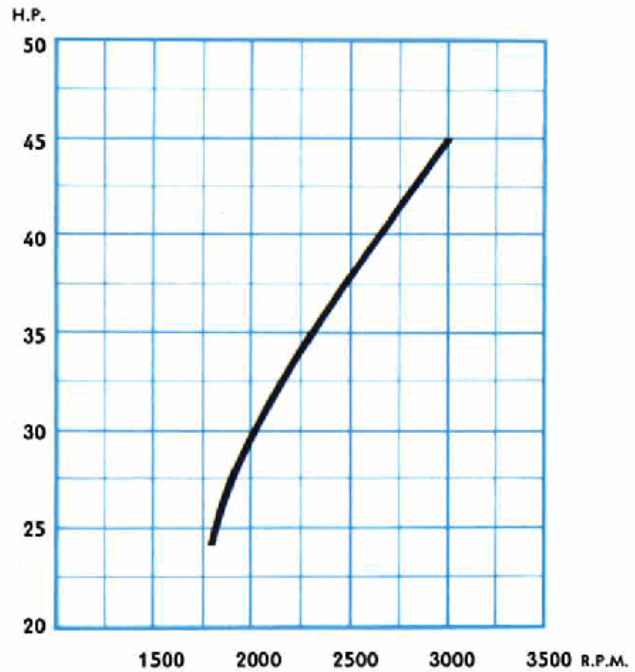
BB 30



BB 30

DATA

Type	Four-stroke
Valves	Overhead
Number of cylinders	4
Output, h.p.	24—45
Speed, r.p.m.	1800/3000
Bore	84.14 mm (3.313")
Stroke	80 mm (3.15")
Capacity	1.78 litres (109 cu.in.)
Weight, approx.	195 kg (430 lb.)
Max. inclination of engine	18°



Dimensions in millimetres and inches

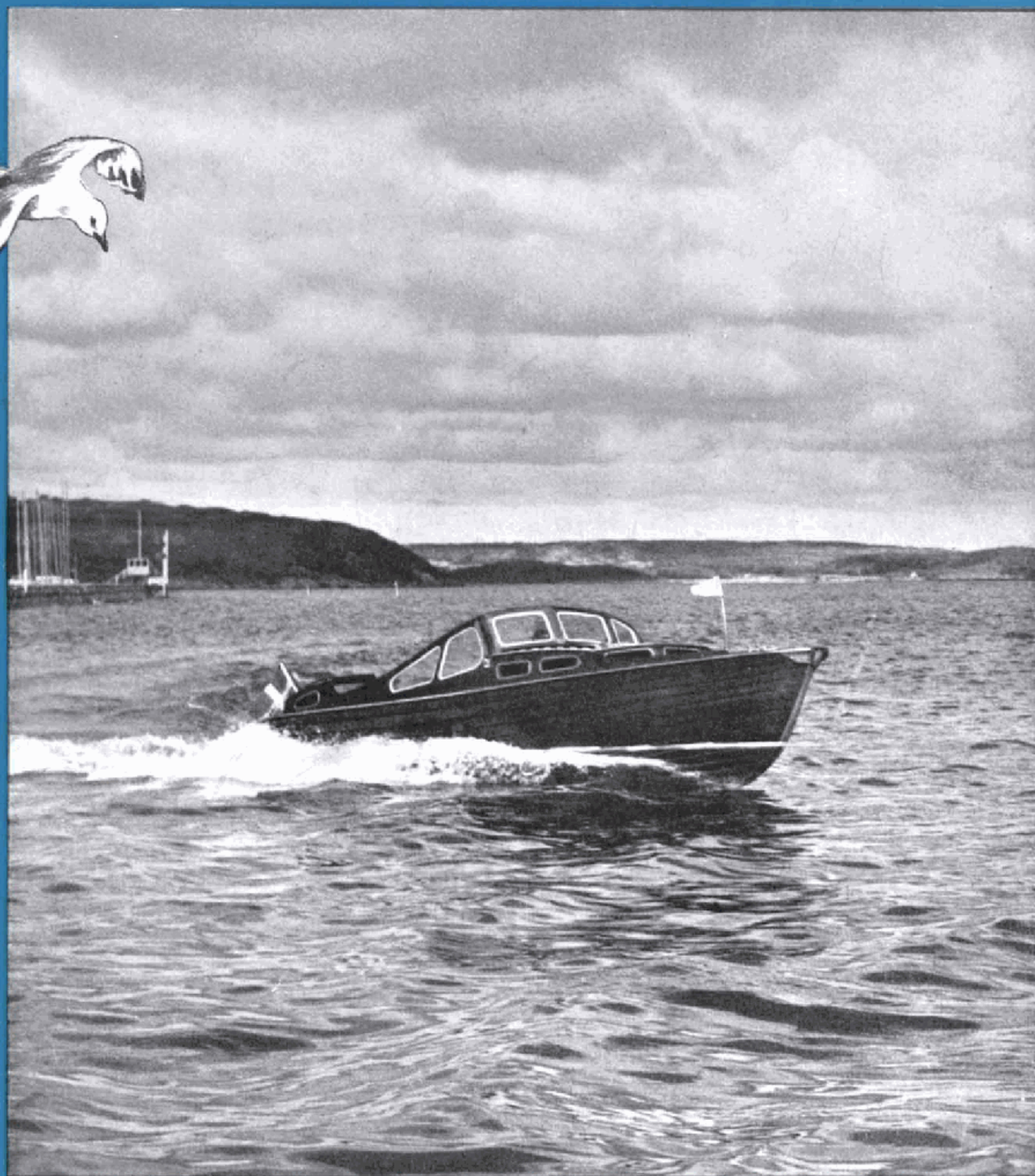
AB VOLVO PENTA



Box 392, Göteborg 1
 Sweden
 Tel. 23 54 60
 Cables: Penta
 Telex 2370

PENTA

MARINE ENGINE MODEL BB41
16-35 H. P.



AKTIEBOLAGET

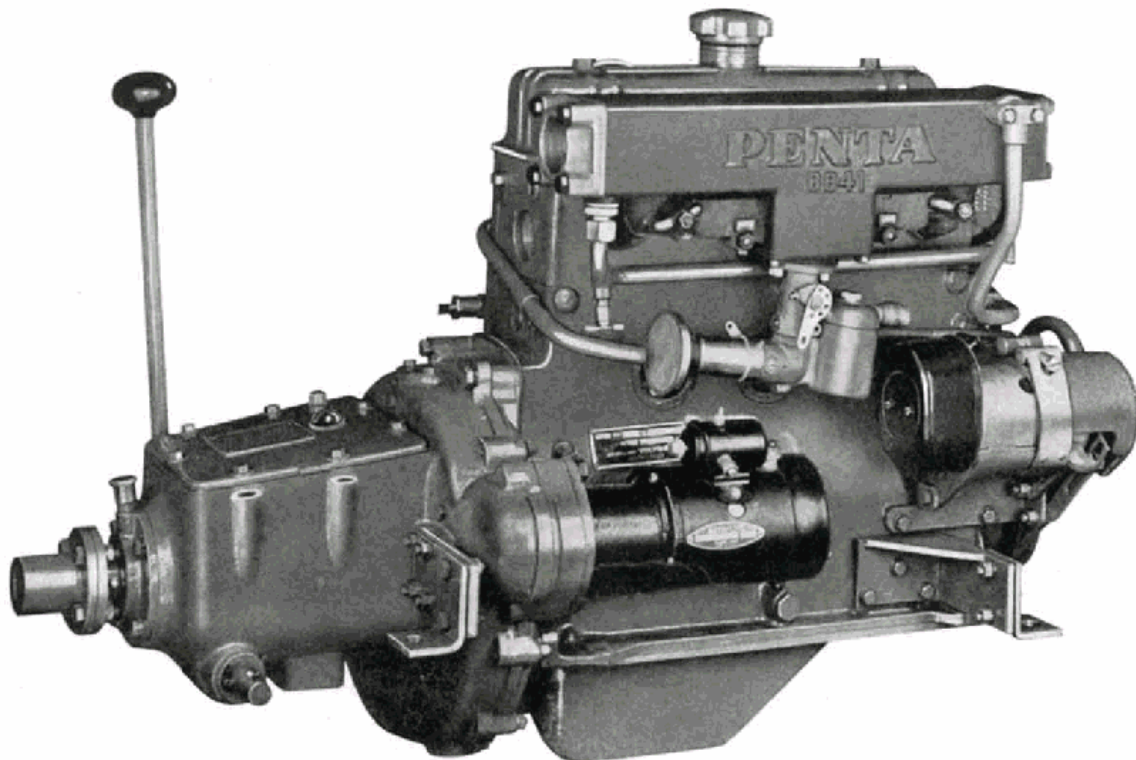
PENTA

GOTHENBURG

SWEDEN

PENTA

MARINE ENGINE MODEL BB41 16—35 H. P.

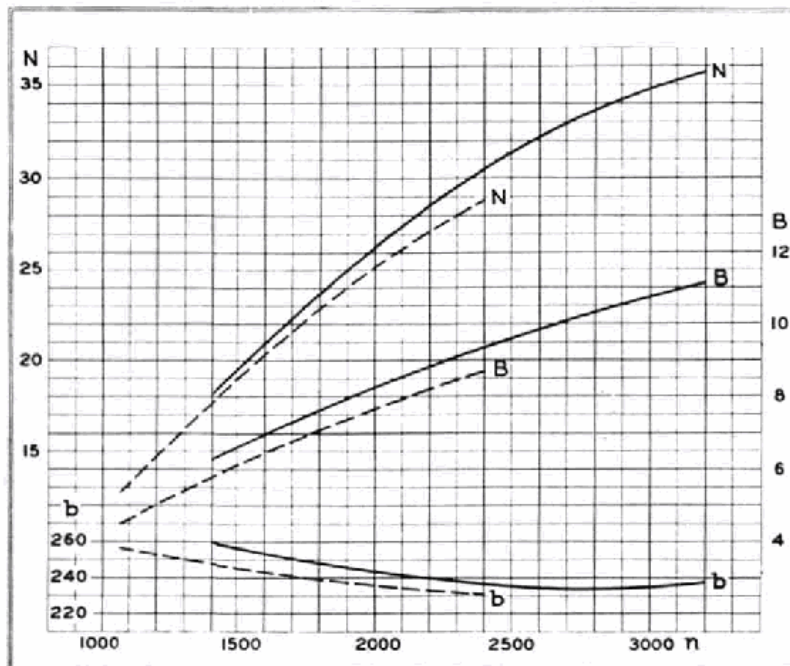


A modern superefficient four cylinder head valve engine having a cylinder capacity of 1,42 litres (86,6 cubic inc) and a wide range of power. A suitable engine not only for small utility craft but also for light patrol boats, where a good turn of speed can be attained at high number of revolutions. In the equipment with reduction gear 2 : 1 the engine can also be used in comparatively heavy boats. The net weight of the engine including electric starter, generator and reverse gear etc. is only about 185 kilos (415 lbs). The fuel consumption is extremely low — about 240 g/hph.

One does not buy, one invests in a PENTA.

Brake test of

Penta Marine Engine Model BB 41

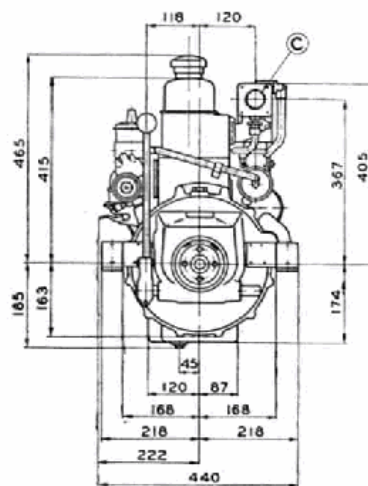
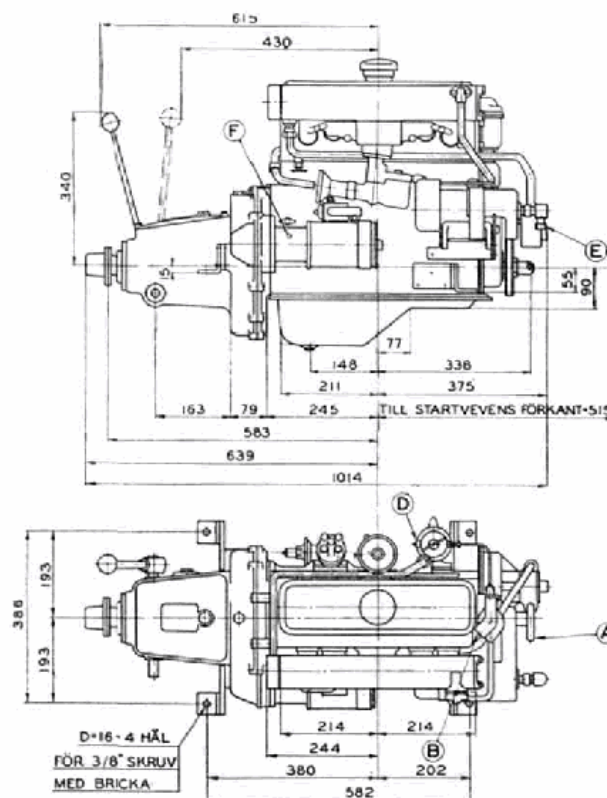


- N. Brake horse power.
- n. Revolutions per minute.
- b. Fuel consumption in grams per horse power hour.
- B. Fuel consumption in litres per hour.

The fuel line curves refer to the original jet of the carburetter, and the dotted ones to the smaller jet in the tool kit. We would like to point out that although all Penta engines are subjected to a rigorous bench test a longer running-in period is necessary before the power unit attains maximum output. On delivery, a 10% allowance must be made with regard to the results recorded.

Dimension drawing

Standard engine
(All dimensions in millimetres)

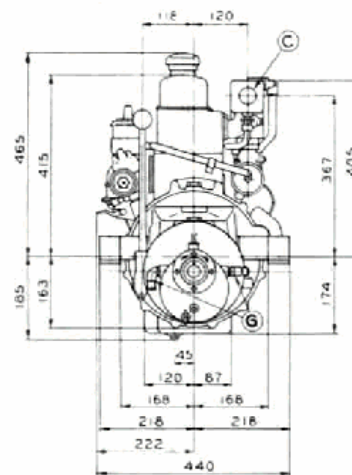
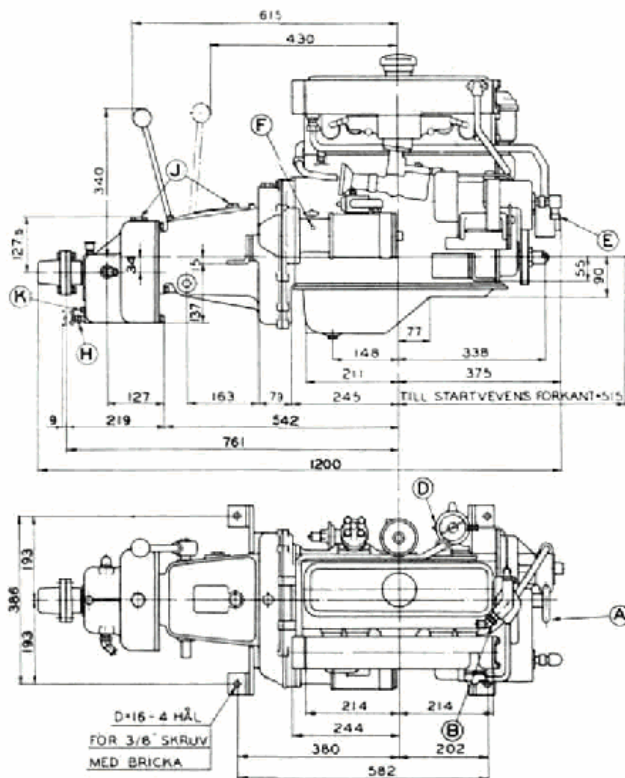


- A. Cooling water inlet for rubber hose $\frac{5}{8}$ " and copper pipe 14×16 mm.
- B. Cooling water outlet $\frac{1}{2}$ ".
- C. Exhaust outlet pipe $1\frac{1}{2}$ ".
- D. Fuel pipe, copper, outer diam. $\frac{5}{16}$ ".
- E. Revolution counter connection.
- F. Connection for manometer.

All specifications subject to change without notice.

Dimension drawing Engine with reduction gear.

(All dimensions in millimetres)

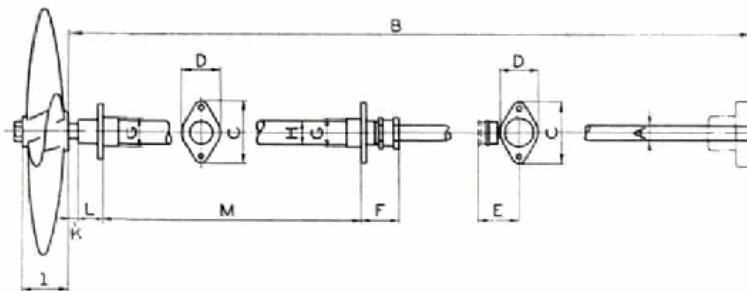


- A. Cooling water inlet for rubber hose $\frac{5}{8}$ " and copper pipe 14×16 mm.
- B. Cooling water outlet for rubber hose $\frac{5}{8}$ ".
- C. Exhaust outlet pipe $1\frac{1}{2}$ ".
- D. Fuel pipe, copper, outer diam $\frac{5}{16}$ ".
- E. Revolution counter connection.
- F. Oil pressure gauge connection.
- G. Cooling water in- and outlet for rubber hose $\frac{5}{8}$ ".
- H. Cooling water drainage.
- J. Oil replenishing.
- K. Oil drainage.

The reduction gear can be delivered either with the propeller shaft 34 mm (abt $1\frac{21}{64}$ ") below the reverse gear shaft or 34 mm (abt $1\frac{21}{64}$ ") above the reverse gear shaft.

The above drawing is showing the first alternative.

Stern gear for Engine with reduction gear 2:1.



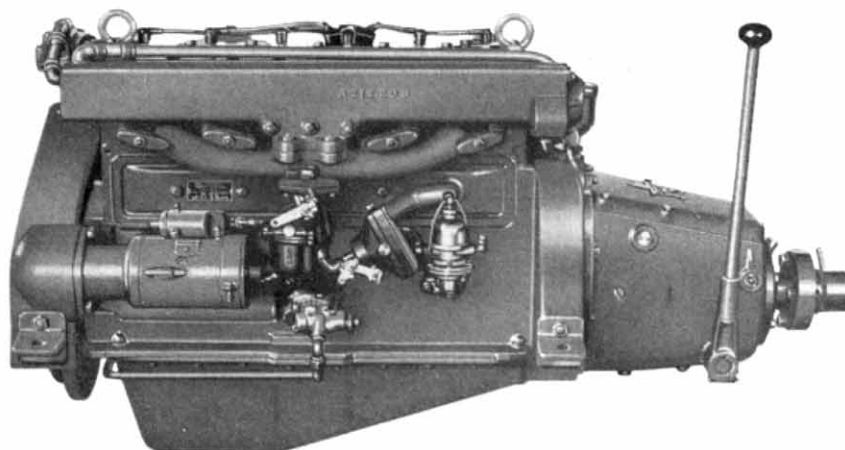
	A	B	C	D	E	F	G	H	I	K	L	M
mm.	30	2000	121	76	76	80	58	48	78	ca 15	56	1500



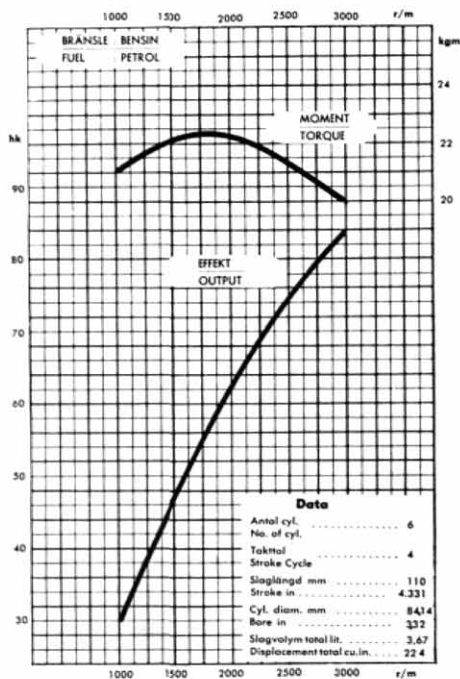
ED 6

VOLVO-PENTA MARINE ENGINE

The Volvo-Penta ED 6 is a six-cylinder engine specially built for medium speed boats. When fitted with 2:1 reduction gear and run on paraffin, it is ideal for motor cruisers and similar types of boats. The Volvo-Penta ED 6 is renowned for its dependable smooth operation. The Volvo-Penta name is your guarantee for top quality and excellent service. The Volvo-Penta ED 6 is an engine that will soon become your best friend in your boat.

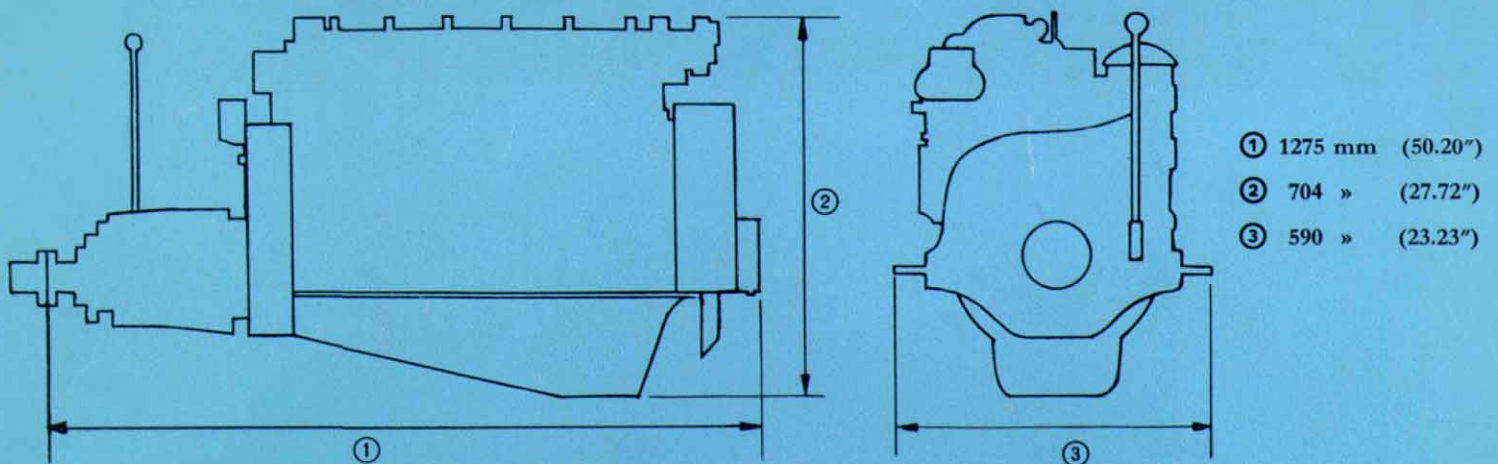


VOLVO-PENTA MARINE ENGINE, TYPE ED 6



Data

Output range, petrol 30—84 h.p.
 „ „ paraffin 31—60 h.p.
 Speed range, petrol 1000—3000 r.p.m.
 „ „ paraffin 1200—2500 r.p.m.
 Number of cylinders 6
 Capacity 3.67 litres (224 cu.in.)
 Bore 84.14 mm (3.312")
 Stroke 110 mm (4.33")
 Compression ratio, petrol 6.5:1
 „ „ paraffin 4.8:1
 Type of engine Four-stroke
 Valves Side
 Max. inclination while running 8°
 Net weight including reverse gear,
 approx. 370 kg (815 lb.)
 Net weight including reverse gear
 and reduction gear, approx. 420 kg (926 lb.)



Dimensions with Penta BS 1:1 reverse gear

AKTIEBOLAGET

PENTA

Box 392, Göteborg 1

Sweden

Cables Penta

— A Volvo Company

PENTA F12A

FOR SMALL CRAFT

LIGHT, COMPACT - LOW PRICE, HIGH QUALITY

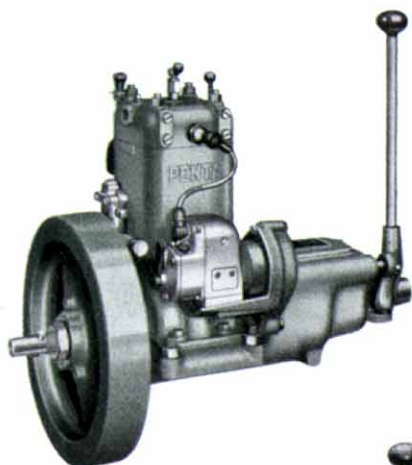


PENTA

Type **F12A** marine engine, 5 1/2 b.h.p.

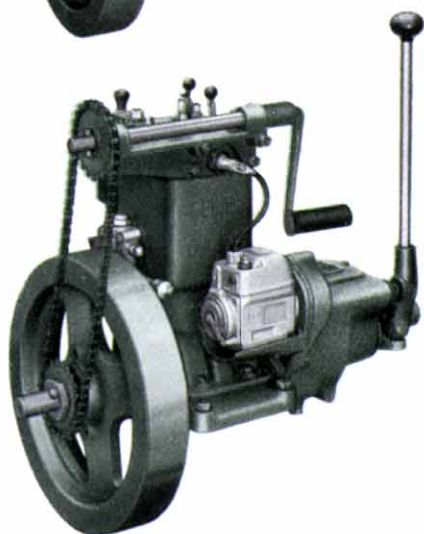
1-cylinder • 2-stroke

The Penta F12 A has a cylinder capacity of 600 cubic centimetres and an output of 5 1/2 b.h.p. at 1350 r.p.m. The total weight is only 176 lbs. (90 kg) with reverse gear. It is easy to operate, reliable, strongly constructed and very economical to maintain. The Penta F12 A can be run on either petrol or paraffin without any adjustment or additional equipment. It is the ideal power unit for small fishing boats, pleasure boats and as an auxiliary for sailing craft.



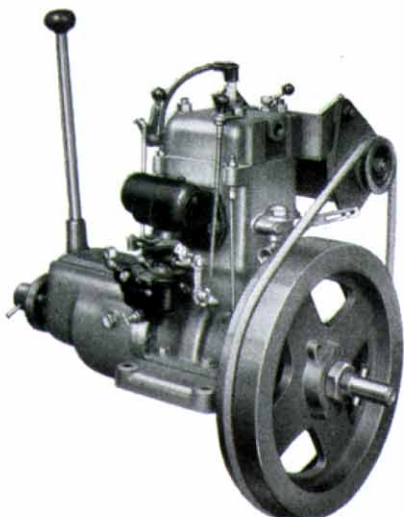
The Penta **F12A** as standard

This engine is very easy to start and standard equipment includes a starting handle on the forward end of the crankshaft. For even more convenient starting there are two special models of the F12 A as specified below; the Penta F12 A with raised starting and the Penta F12 A with dynamotor.



The Penta **F12A** with raised starting

The engine can also be fitted with raised chain starting equipment with provision for the starting handle at both the fore and after ends of the engine. In addition, the original crankshaft-level starting handle can still be used.

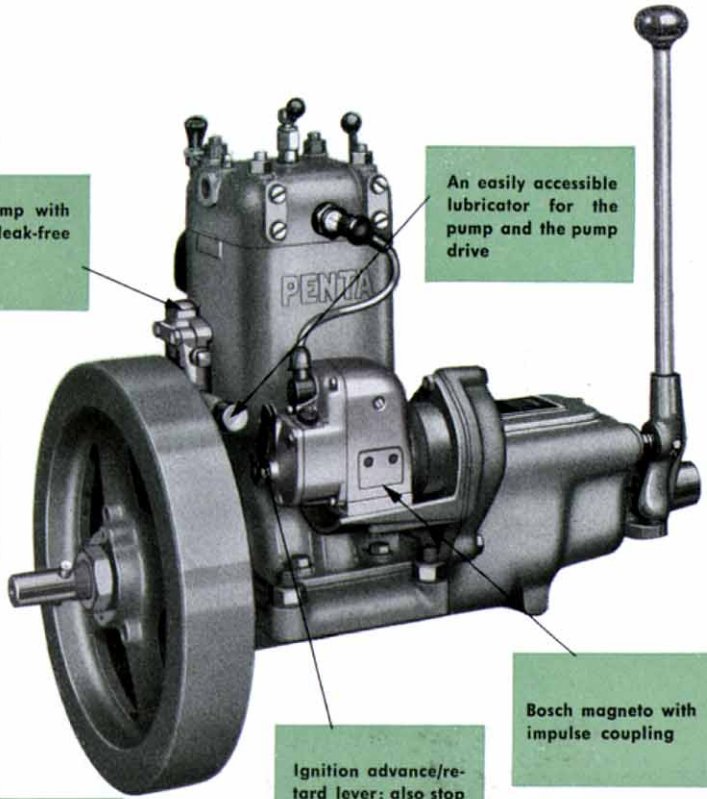


The Penta **F12A** with 6 V dynamotor

If desired, the engine is also available with a dynamotor. This consists of a combined electric starter motor and dynamo. It is fitted on top of the engine and is driven from the flywheel by means of a belt. The dynamotor functions first as a starter motor and then, when the engine is running, it operates as a dynamo to charge the battery. The changeover from starter to dynamo is automatic. The equipment includes an instrument panel with a starter button. The dynamotor equipment is particularly suitable if the engine is to be used as an auxiliary engine in a sailing boat.



Details that
 make a **F12A**
 Penta
 really worth having



Coolant pump with a modern leak-free gland

An easily accessible lubricator for the pump and the pump drive

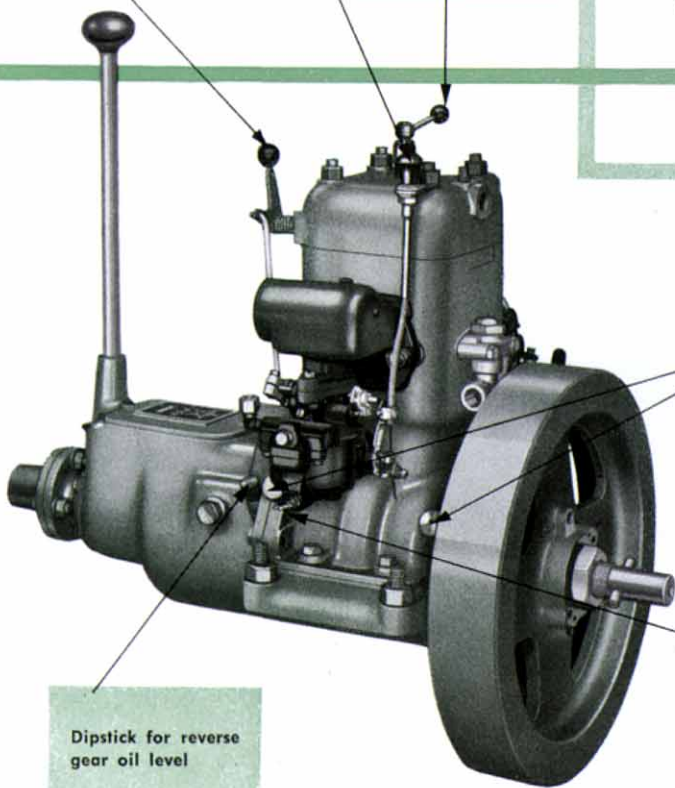
Easily accessible choke control on cylinder head

Throttle control in a convenient position

Compression tap

Ignition advance/retard lever: also stop button

Bosch magneto with impulse coupling

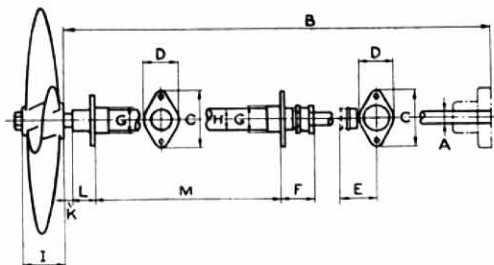


Lubricators for main bearings with catch so that they do not shake open

Dipstick for reverse gear oil level

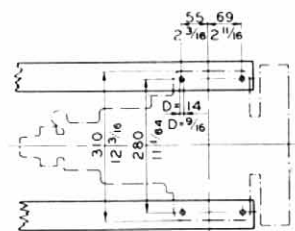
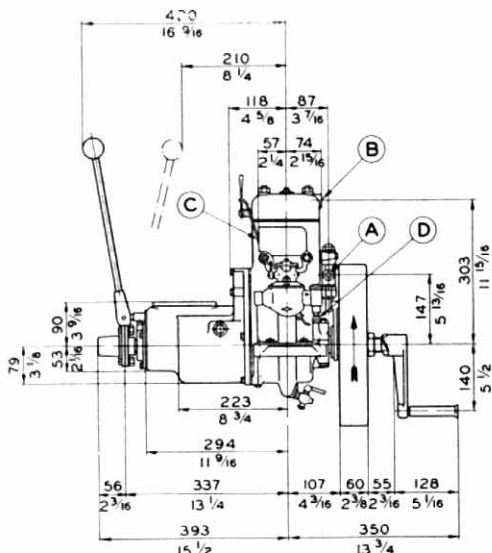
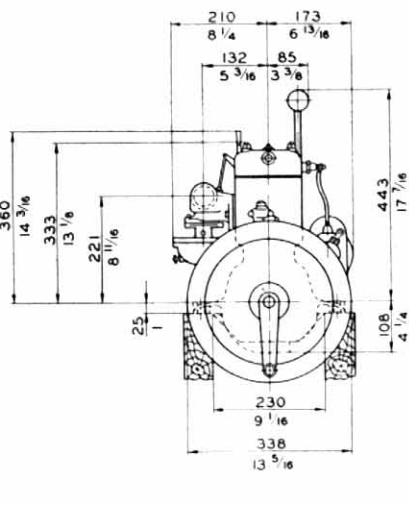
Adjustable needle valve on the carburetter





	A	B	C	D	E	F	G	H	I	K	L	M
mm	22	2000	90	57	60	75	35	28	64	c.a 15	35	750
inch	7/8	78 7/64	3 7/16	2 1/4	2 3/8	2 7/8	1 3/8	1 1/8	2 1/2	5/8	1 3/8	29 1/2

- A. Cooling water inlet R 3/8"
- B. Cooling water outlet R 3/8"
- C. Exhaust outlet R 1 1/4"
- D. Fuel inlet, copper pipe outer dia. 5/16"



Specification

Cylinder head, detachable, of special cast iron.

Cylinder block and crankcase are cast in one unit. The material used is Penta high-quality iron. The cylinder bore is precision ground.

Piston, aluminium alloy, ground finish, fitted with four rings.

Gudgeon pin — hardened, ground and secured with circlips.

Connecting rod — drop-forged steel, H-section, robustly dimensioned. Bronze bush for gudgeon pin.

Crankshaft of the highest quality steel with ground bearing surfaces and balanced to eliminate vibration.

Connecting rod big-end bearing consists of replaceable steel bearing shells with white metal linings.

Main bearings are SKF ball races. Effective seals protect them from the fuel-air mixture in the crankcase. The forward main bearing has a new and even more effective seal, which also gives protection from dirt and externally.

Gearing for the magneto is built into the reverse-gear casing and is thus completely protected. The gears are precision machined to ensure silent running.

Coolant pump of the plunger type is constructed of bronze alloy and has disc valves. It is driven from the crankshaft by means of an eccentric. The pump is fitted with the latest type of leak-free gland.

Carburettor is simple and easy to service. Choke and throttle controls on top of the engine block are conveniently to hand.

Magneto, Bosch, with impulse coupling, on a bracket on the port side of the engine. The ignition control is easily accessible.

Sparking plug AC 88 or corresponding type. For engines with dynastarter Bosch W 95 T 2/0,5 or corresponding type. The HT lead is of marine quality and the spark plug is fitted with a water proof cover.

Reverse gear is compactly but sturdily built and is in unit with the engine. It is of the epicyclic type with the gear wheels of special hardened steel and designed for silent operation. The ahead clutch is of the all metal multiplate type and like the main shaft of the gear box it runs on a ballrace. The aft ballrace in the gear box also acts as a thrust bearing for the propeller shaft and aft of that again is fitted an oil seal of the same type as that fitted outside the forward main engine bearing; it will also prevent ingress of dirt, water etc.

Silencer — designed for 1 1/4" piping.

Lubrication. The main engine lubrication is taken care of by the oil that is mixed with the fuel. The reverse gear is separately oil-lubricated. There is a dipstick on the reverse gear. The main bearings and the reverse-gear thrust bearing are lubricated with ball bearing grease. The coolant pump is lubricated with water pump grease.

Equipment

If so desired, the stern gear can be supplied as shown in the diagram above, a two-bladed 12"×10" or three-bladed 10"×10" bronze propeller, stern tube complete with bearings, stuffing box and greaser and a bronze propeller shaft.

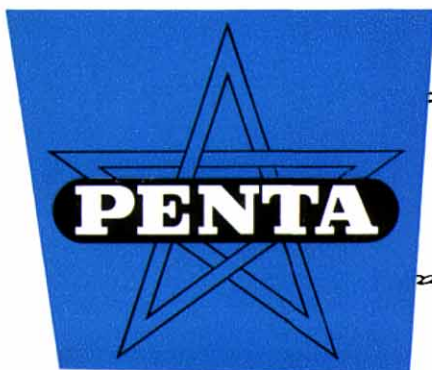
Complete installation equipment is available. This consist of a double fuel tank of leaded iron sheet, riveted and soldered, with a capacity of 17 1/2+3 1/2 Imp. pints (10+2 litres).

The plumbing includes a 3/8" sea-cock with the necessary connections, a strainer and a generous allowance of copper piping and rubber hose, so that any normal installation can be made without any further equipment. All the equipment is of the highest quality and has been carefully selected not only for style and appearance but also for convenience and safety. This last is naturally most important.

Extra equipment

Raised chain starting.
Electric starter and dynamo i.e. dynamotor.

All specifications are subject to change without notice.



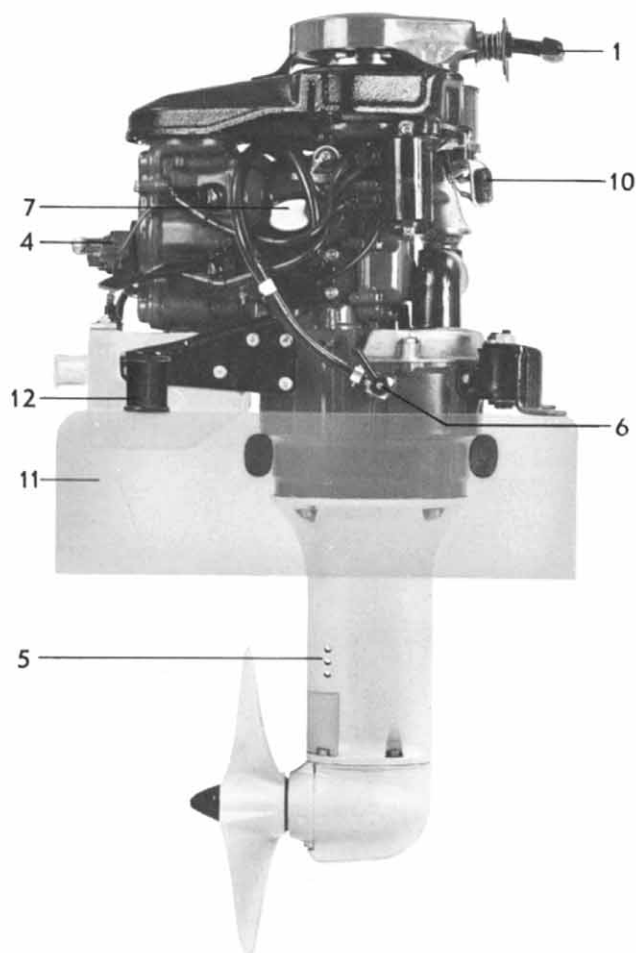
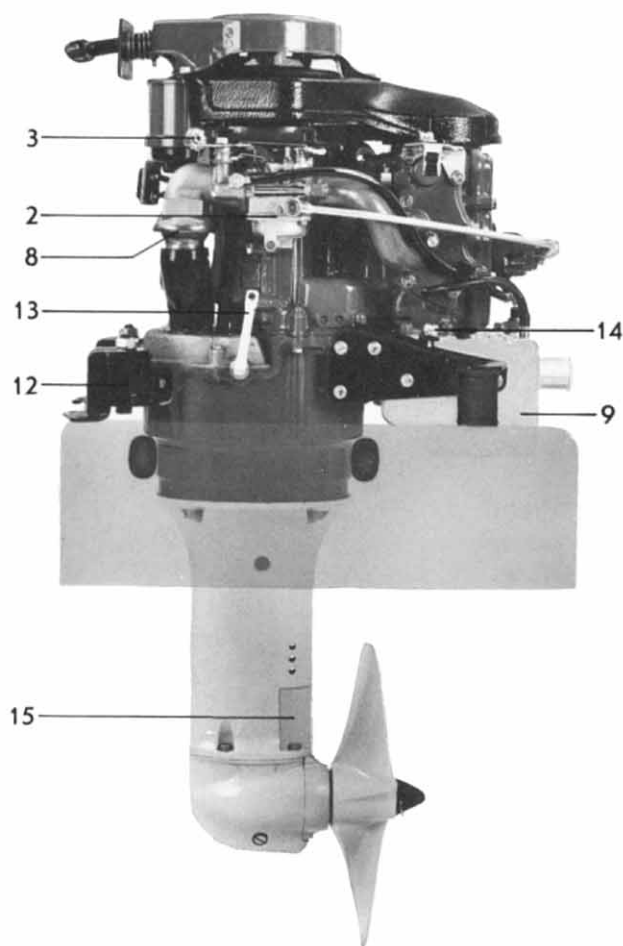
In the United Kingdom
BOLINDERS Company LTD
Coronation House, 4 Lloyds Avenue, London E C 3
Royal 3582

AKTIEBOLAGET PENTA Gothenburg, Sweden
A Volvo Company

MB 2A/50S



2 cylinder 4 stroke carburetor engine with drive model 50S
Output 7.5 hp (5.5 kW)



STANDARD EQUIPMENT

ENGINE BODY – Aluminium cylinder block and head, dry liners. The pistons are made of aluminium alloy with two compression rings and one oil scraper ring. Overhead camshaft. Hand start equipment with three alternative horizontal positions (1).

FUEL SYSTEM – Horizontal carburetor (2) with choke and levers for control cables (3). Fuel pump with connection for hose (4). Hand priming device for remote installation. Choke control is supplied.

COOLING SYSTEM – Thermostatically controlled sea-water cooling. Sea-water pump with a neoprene rubber impeller. Sea-water intake (5) with cock (6). Vacuum valve.

LUBRICATING SYSTEM – Pressure lubricating system with gear pump. Oil filter and oil dipstick (7). Sealed crankcase ventilation.

INTAKE SYSTEM – Flame arrester of type approved by USCG (8).

EXHAUST SYSTEM – Sea-water cooled exhaust muffler with connection for exhaust hose (9).

ELECTRICAL SYSTEM – Capacitue discharge ignition system, 12V 60W electrical socket for connection of rectifier (10). Instrument panel is equipped with cut-out (stop) button, warning lamps for temprature and oil pressure and acoustic alarm. Cable harness, length 2 m (6.6 ft) with "plug-in" terminal block for direct connection to the engine. Cable harness from the engine, length 0.5 m (1.7 ft). Rectifier for battery charging.

ENGINE MOUNTING – Glassfibre reinforced plastic bed with installation parts (11). Engine brackets with flexible attachment to the bed (12).

SUBMERGED PARTS – with propeller gear housing and gear mechanism. Both speed and gear are operated by a single lever control. Gear lever (13). Attachment for control cable (14). Zinc corrosion protector (15).

EXTRA EQUIPMENT

FUEL SYSTEM

Water separating filter with flexible hose, USCG-approved
Fuel line kit with copper piping and installation parts

EXHAUST SYSTEM

Rubber exhaust hose
Water-cooled silencer
Through-hull fitting
Water-cooled silencer

STARTING DEVICE

Vertical starting device

ELECTRICAL SYSTEM AND INSTRUMENT

Master switch

BOAT ACCESSORIES

Electrically operated bilge pump
Original paint
Oils

CONTROLS AND CONTROL SYSTEM

VP single-control lever for both speed and forward-reverse operation, topmounted or side-mounted
Control cables

PROPELLERS

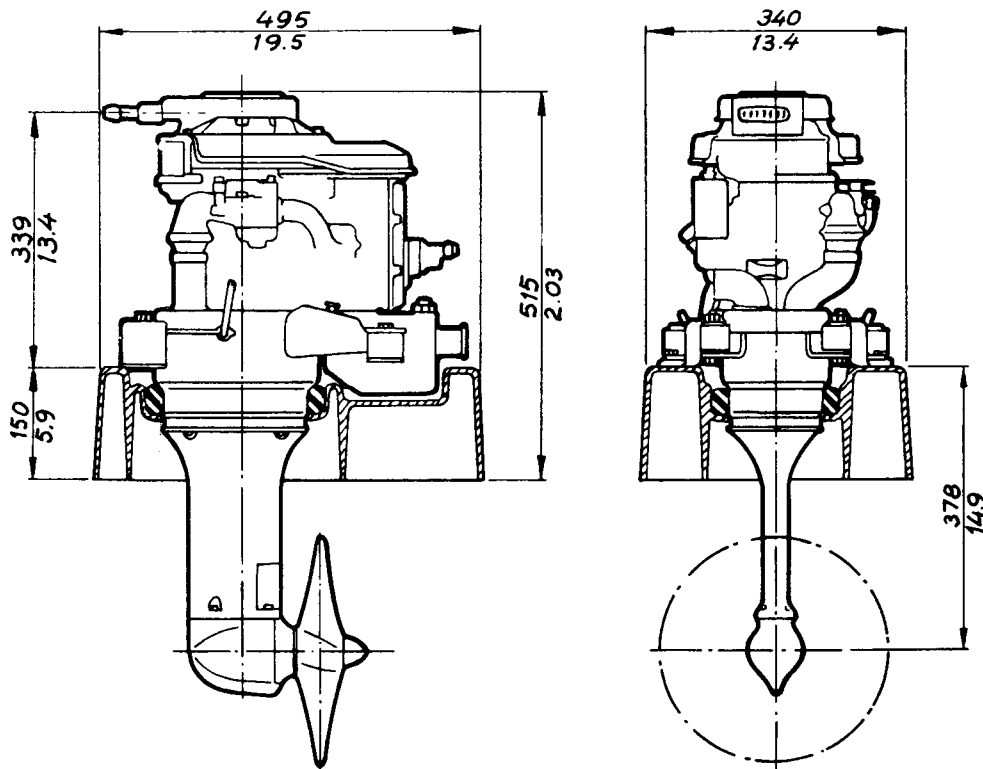
Two-bladed "IOR" 12" x 8"
Folding 11" x 8"
Three-bladed 9" x 10"

DATA

Type of operation	4-stroke carburetor engine with overhead camshaft
Designation	MB2A/50S
Output ¹⁾	7.5 hk (5.8 kW)
Number of cylinders	2
Idle speed	1200 r/min (20.0 r/s)
Max propeller speed	1767 r/min (29.5 r/s)
Max operating speed	5000 r/min (83.3 r/s)
Bore/Stroke	56 mm/40 mm (2.20 in/1.57 in)
Capacity	0.197 dm ³ (12.0 cu.in)
Compression ratio	8.6:1
Fuel quality	90-97 octane, also unleaded fuel
Drive type/ratio	50S/2.83:1
Total weight, engine without bed	29 kg (64 lb)

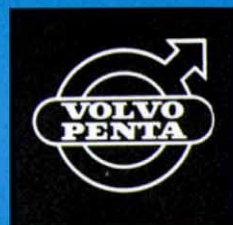
¹⁾ Flywheel output for a run-in engine according to DIN 6270 Leistung B.

DIMENSIONS DRAWING



VOLVO PENTA

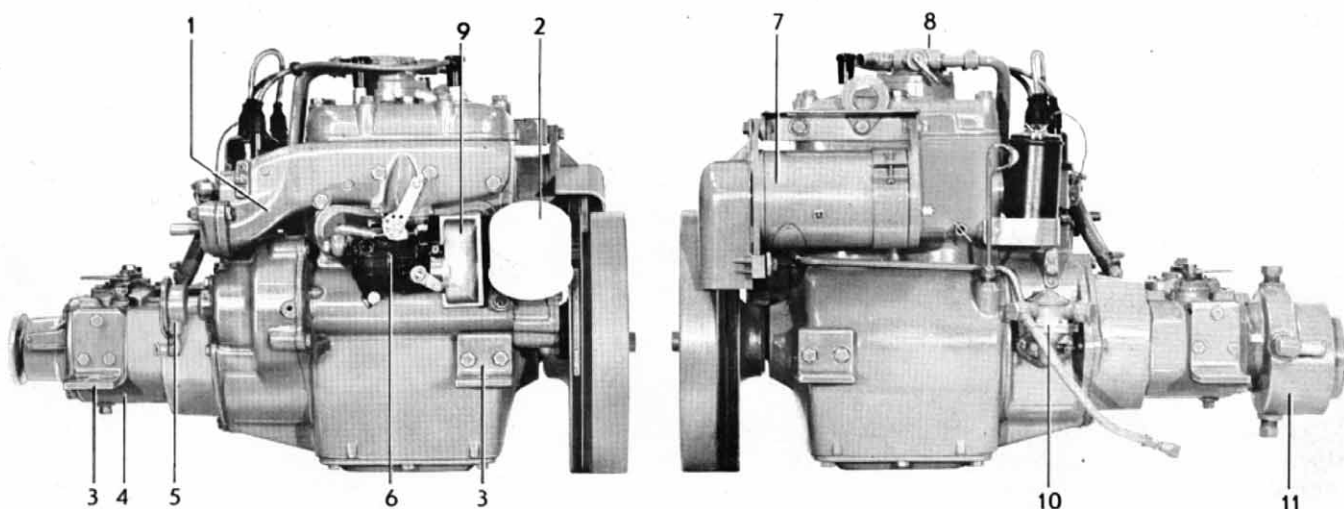
S-405 08 Göteborg, Sweden
Telephone: 031/23 54 60
Cables: Penta Göteborg
Telex: 207 55 PENTA S



MB 10A



2-cylinder, 4-stroke carburetor engine with side valves
Propeller shaft output 10.3 kW (14 kp)



STANDARD EQUIPMENT

ENGINE BODY — Cylinder block and head made of special cast iron. Light-alloy pistons with 2 compression rings and one oil scraper ring. Side valves.
Also supplied is a tool kit with starting crank.
Recess for starting crank in flywheel hub.

FUEL SYSTEM — Updraft carburetor with return-suction channel and drain plug (6). Fuel pump (10) equipped with hand primer and flexible hose with fuel pipe connection.

COOLING SYSTEM — Thermostat-controlled sea-water cooling system. Sea-water pump with neoprene rubber impeller (5). Sea-water cooled reverse gear reduction gear.

LUBRICATING SYSTEM — Pressure-lubricating system with full-flow lubricating oil filter of the spin-on type (2). Sealed crankcase ventilation.

INTAKE SYSTEM — Flame arrester of approved type with connection for crankcase ventilation (9).

EXHAUST SYSTEM — Sea-water cooled exhaust manifold (1) with R 1 1/4" connection flange and branch cock (8) for outgoing cooling water which makes it possible to install a wet or dry exhaust line.

ELECTRICAL SYSTEM — Corrosionproof 12 V electrical system, with complete instrument panel.
Main fusing with built-in spare fuses is supplied. Start-generator with max. generator output 135 W and starter motor output 735 W (1 h.p.) (7).

Instrument panel, which is included in standard equipment, is provided with key switch, warning lamps for battery charging and oil pressure, and one extra switch. Cable harness, 4 m (13 ft.) in length, with connector.



ENGINE MOUNTING — The engine is supplied with engine brackets for fixed suspension (3).

POWER TRANSMISSION — Mechanical MS (Mono-Shift) reverse gear. Engine speed and reverse gear are operated by a single control lever. Bracket for control cables included. Engine is supplied with reverse gear as follows:

- Alt. 1 Rev. gear type MS red. ratio 1:1, L-H prop. (4)
 - 2 Rev. gear type MS red. ratio 1.91:1, L-H prop. (11)
- Propeller shaft flange for 25 mm propeller shaft.

EXTRA EQUIPMENT

FUEL SYSTEM

Water-separating filter with or without flexible hoses.
 Fuel line kit with copper piping and installation parts.
 Electrically operated fuel pump.
 Fuel tank.

COOLING SYSTEM

Cooling water intake complete with cock and hose.
 Sea-water filter complete with attachment.

EXHAUST SYSTEM

Hose connection for water-cooled exhaust line
 Through - hull fitting
 Rubber exhaust hose
 Water-cooled silencer, complete
 Vacuum valve

Exhaust boot
 Silencer
 Compensator

ELECTRICAL SYSTEM AND INSTRUMENT

Charging distributor for charging 2-battery system
 Alternator 12 V 35 A
 Electric-hourmeter
 Master switch
 Cable harness extension

ENGINE MOUNTING

Flexible engine mounting

BOAT ACCESSORIES

Electrically operated bilge pump
 Original paint
 Oils

CONTROLS AND CONTROL SYSTEM

VP single-control lever for both speed and forward-reverse operation, top-mounted or side-mounted.
 Neutral-position switch - automatic safety interlock for VP-controls
 Push-pull controls
 Control cables
 Steering gears
 Steering cables
 Ball joint and fork kit for steering cable

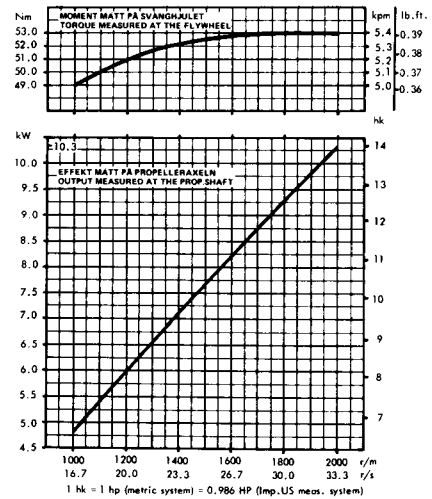
PROPELLER EQUIPMENT

Flexible coupling
 Clamp coupling
 Propeller shafts
 Propeller shaft sleeves
 Propellers

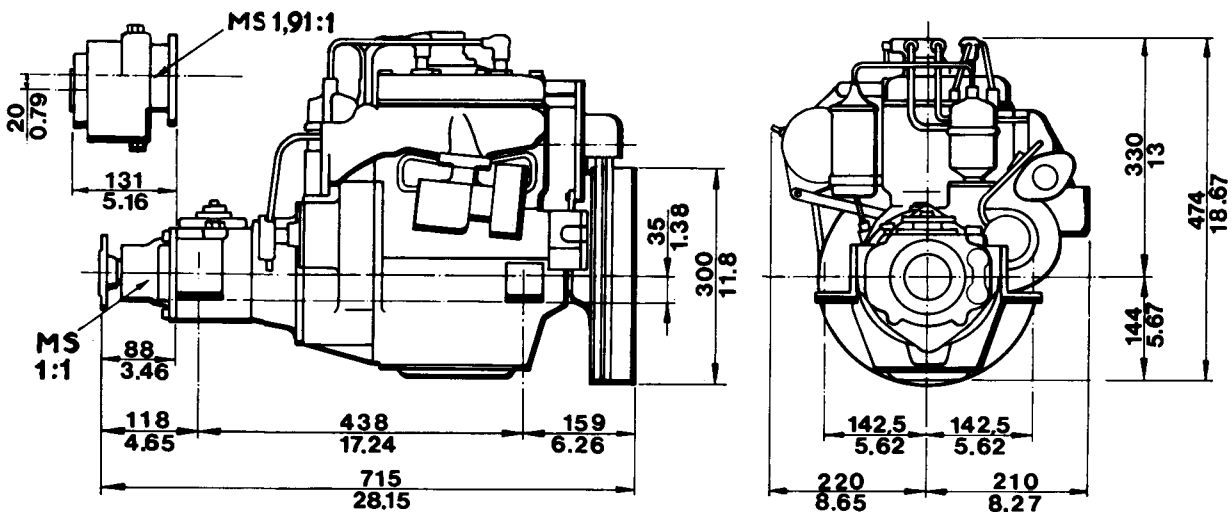
DATA

Type of operation 4-stroke carburetor engine with side valves
 Designation MB10A
 Propeller shaft output¹⁾ 10.3 kW (14 hp)
 Max. operating speed, r/s (rpm) 33.3 (2000)
 Number of cylinders 2
 Capacity, dm³ (in³) 1.018 (62)
 Bore/Stroke, mm (in) 88.9/82 (3.50/3.23)
 Compression ratio 6.5:1
 Fuel quality min. 87 octane
 Total weight, engine with MS reverse gear, 1:1 appr. kg (lb) . . . 120 (265)

1) The diagram indicates the propeller shaft output for a run-in engine with mechanical reverse gear according to DIN 6270 Leistung B. The engine flywheel output is approx. 7 % higher.



DIMENSION DRAWING

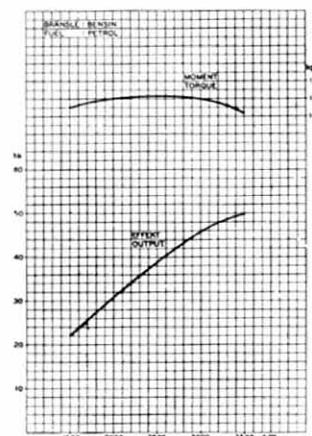
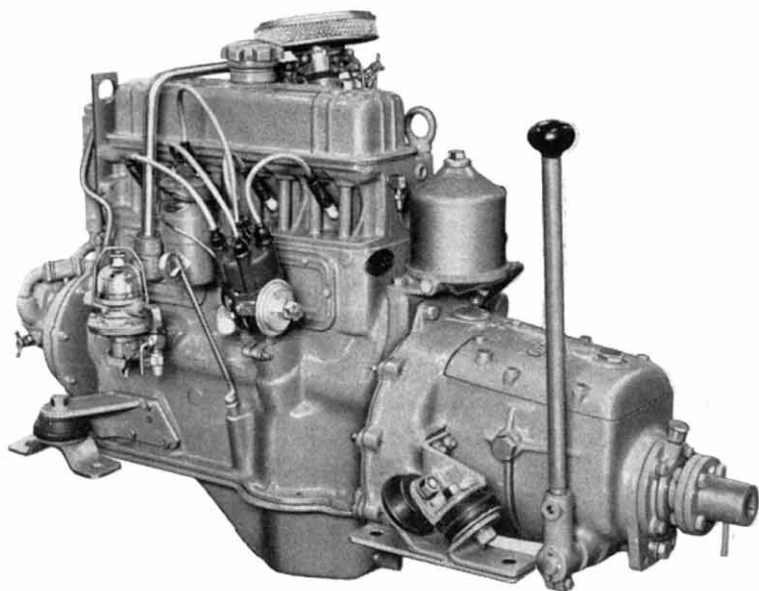


AB VOLVO PENTA

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We reserve the right to carry out modifications





VOLVO-PENTA • MB 16

M a r i n e E n g i n e

Main data

Type of operation	Four-stroke
Valves	Overhead
Number of cylinders	4
Marine output, petrol	22—50 h.p.
Marine output, paraffin	17—27 h.p.
Engine speed, petrol	1500/3500 r.p.m.
Engine speed, paraffin	1500/2500 r.p.m.
Bore	79.37 mm (3.125")
Stroke	80 mm (3.150")
Capacity	1.6 litres
Weight, approx.	180 kg (400 lb.)

Specifications

Cylinder block of special-alloy cast-iron, cast integral with the crankcase.

Cylinder head of special-alloy cast-iron with a high degree of heat resistance.

Oil sump of cast silumin permitting up to 18° while the engine is running.

Pistons of chill-cast light-alloy, each having two compression rings and one oil control ring. The upper compression ring on each piston is chromed.

Connecting rods, drop-forged and toughened. Easily replaceable lead-bronze lined big-end bearings.

Crankshaft, drop-forged and powerfully dimensioned. Dynamically balanced and carried in three main bearings. Easily replaceable white-metal lined main bearing shells.

Camshaft of special-alloy cast-iron with flame-hardened cams. Quiet-running fibre timing gears.

Valves of heat-resistant special steel.

Fuel system. The petrol version of the engine is fitted with a down-draught carburetter while the paraffin version has an up-draught carburetter. This up-draught carburetter has a needle valve and a return suction channel. Fuel pump with filter and water deflector. Pump driven from camshaft. Max. lift 1 metre (40").

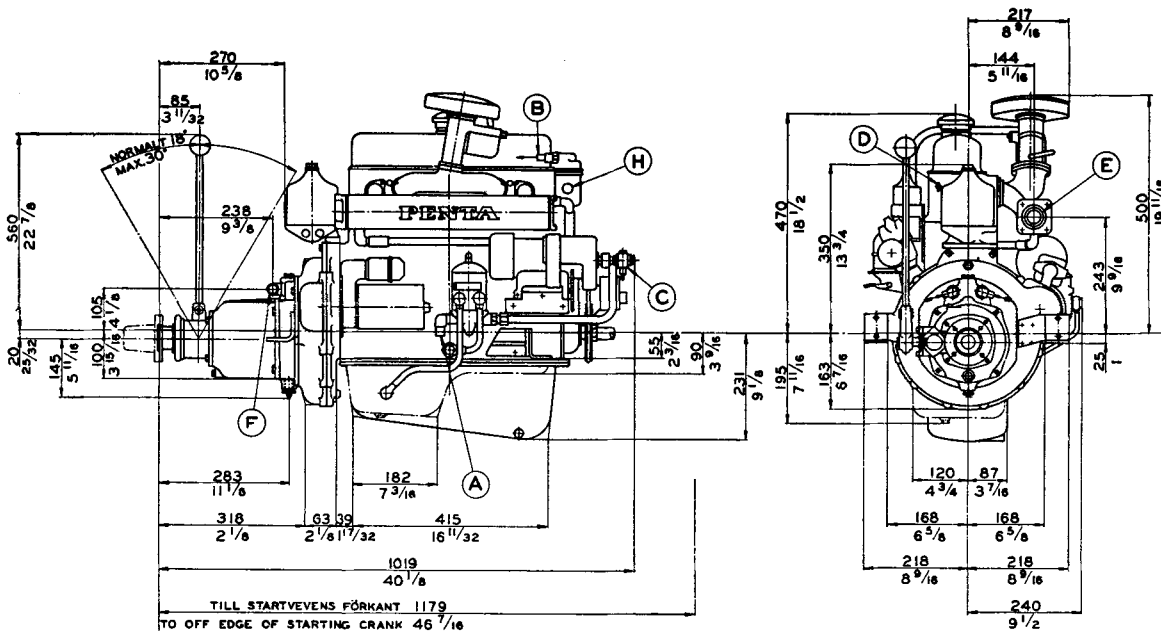
Lubricating system. Pressure lubrication. Oil to all the lubricating points passes through a full-flow filter with a replaceable element and then through a tubular oil cooler.

Cooling system. A thermostat automatically controls engine temperature. The engine is available in both sea-water and fresh-water cooled versions. On the fresh-water version, the cooling water is cooled in its turn by sea-water in a heat exchanger. The oil cooler and the exhaust manifold are sea-water cooled.

Electrical system. Six-volt battery ignition. Starter motor 0.6 h.p. Dynamo with built-in relay and a continuous output of 75 watts.

Instrumentation. Instrument panel with mechanical revolution counter, oil pressure gauge, engine temperature gauge, key switch, starter button, choke control, charging control lamp and switch for the indirect instrument lighting. Cable (3 metres = 10 ft.) and other components for connecting purposes are supplied together with the engine.





- A. Cooling water inlet for rubber hose 5/8"
- B. Cooling water outlet for rubber hose 5/8"
- C. Tachometer connection
- D. Oil pressure gauge connection
- E. Exhaust outlet R 1 1/2" pipe tap
- F. Cooling water connection reduction gear, rubber hose 5/8"
- G. Fuel inlet copper pipe outer diam. 5/16"
- H. Remote mounted cooling water thermometer connection

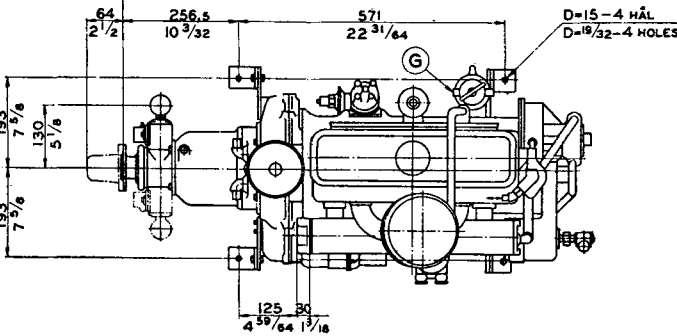
A A FLÄNSRÖRELSE VID INKOPPLING
AV FRAM RESER BACKA
A NORMALT = 3 MAXIMALT = 6
B B FLANGE MOVEMENT WHEN "AHEAD" AND "ASTERN"
RESPECTIVELY ARE ENGAGED
A NORMAL = 3 MM MAXIMUM = 6 MM 1/8 RESP. 15/64

Reverse gear. The engines can be fitted with either a Type BS reverse gear or a Type RB combined reduction and reverse gear.

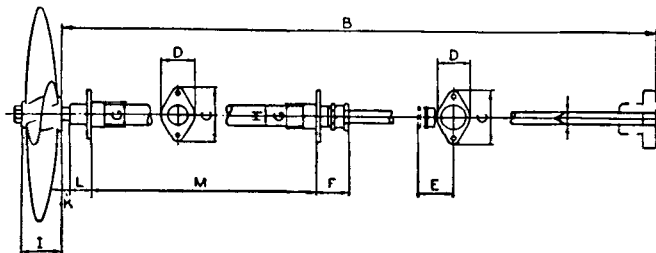
The Type BS reverse gear is of the multi-disc type with a marked neutral position and has ratio of 1:1. Separate splash lubrication.

The Type RB combined reduction and reverse gear — a revolutionary new PENTA patent — has cone clutches for both "Ahead" and "Astern" operation. It is designed in such a way that a ratio of 1.91:1 is automatically obtained without any increase in size or weight. The gear lever can be fitted in three different positions. Separate splash lubrication.

Direction of rotation. For both types of reverse gear, the direction of rotation requires the use of a left-hand thread propeller.



The dimensions drawing shows an engine with the combined reduction and reverse gear.



Propeller equipment for left-hand thread propeller

Dimensions

Reduction	A	B	C	D	E	F	G	H	I	K	L	M
1:1 mm	25	2000	90	58	70	75	42	34	64	approx. 15	37	1000
inch	63/64	79	3 1/2	2 1/4	2 3/4	3	1 5/8	1 3/8	2 1/2	5/8	1 1/2	39 1/2
2:1 mm	30	2000	120	62	76	80	50	40	78	approx. 15	50	1500
inch	1 1/8	79	4 3/4	2 1/2	3	3 1/8	2	1 1/2	3 1/8	5/8	2	59 1/4

Without engagement

AKTIEBOLAGET

PENTA

Box 392, Göteborg 1
Sweden

Cables: Penta

— a Volvo company



The MB 18 B is a petrol (gasoline) engine with an output of 85 h.p. at 4500 r.p.m. This engine is outstandingly suitable for both bulky boats and highspeed boats designed for planing and therefore satisfies the demands made both by sports enthusiasts and owners of sturdy family boats.

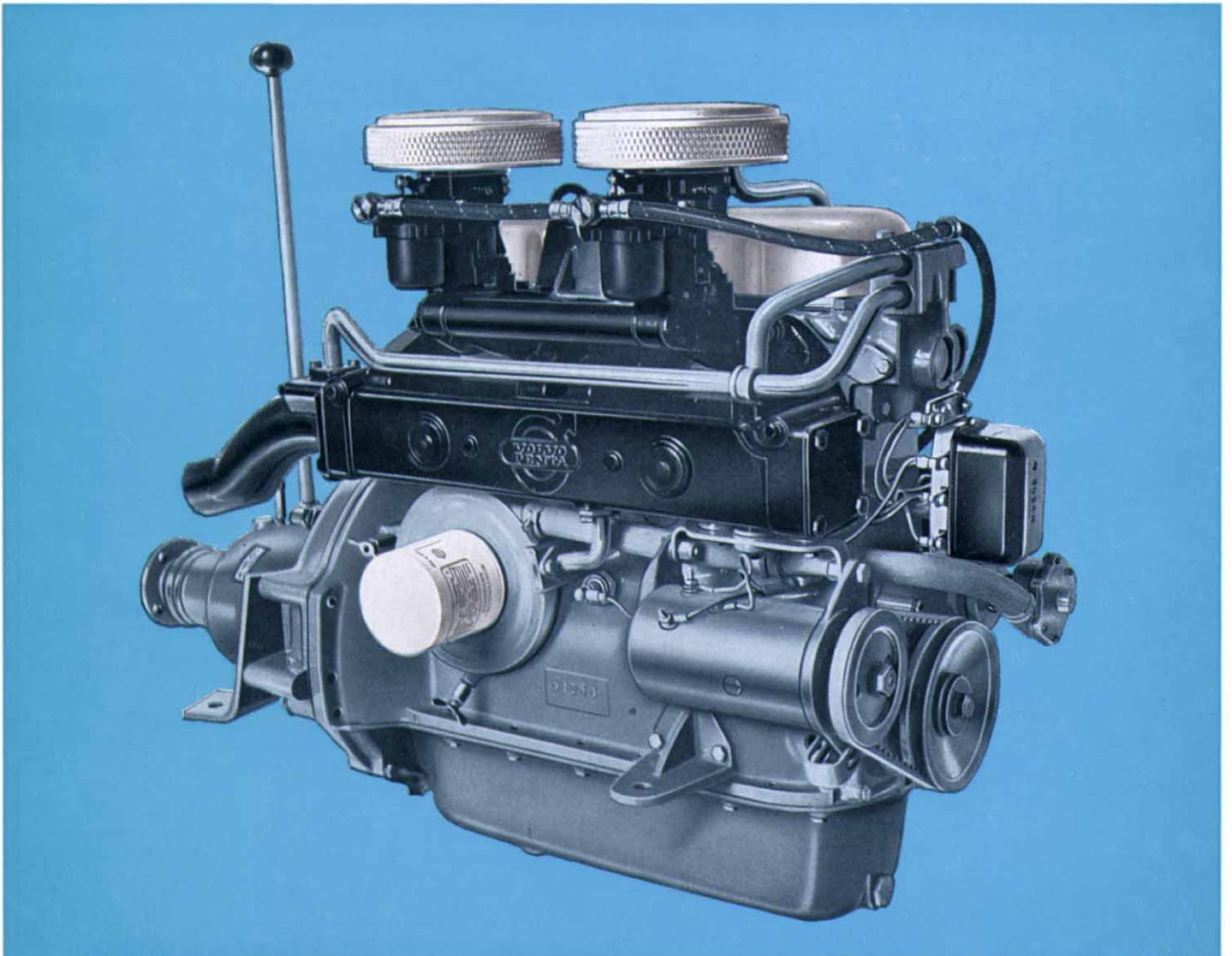
The fuel consumption of the MB 18 B is extremely low and the renowned Volvo Penta quality down to the smallest part guarantees a long life for this engine and reliable running. Readily accessible service and spares on all markets is an additional advantage in the purchase of a marine engine. Standard equipment on the MB 18 B includes the Volvo Penta reduction-reverse gear, ratio 1.91 : 1, for a propeller with a left-hand thread.

Installation is considerably facilitated by having all the electrical leads and cables on the engine attached to a fixed connector with a plug already attached for the instrument panel. Another installation feature is a water-cooled exhaust elbow for the attachment of a rubber hose.

Other features on this engine include the following:

- Five-bearing induction-hardened crankshaft.
- Lead-bronze main bearings and big-end bearings.
- Hyper-efficient oil cooler and oil filter which keeps the lubricating oil at its optimum temperature and guarantees low bearing wear and maximum dependability.
- Twin down-draught carburettors which have been specially corrosion-proofed for marine operation. Internal ventilation of the float chamber, i.e. in the case of eventual flooding of the float chamber should the float jam, the fuel runs down into the inlet manifold. An acceleration pump prevents the engine from stalling and also prevents carburettor blow-back during sudden acceleration. This pump also assists cold starting.
- A fuel pump driven from the camshaft and fitted with a fuel filter and a hand primer pump.
- High level starter motor and fully enclosed flywheel to decrease the risk of damage caused by bilge water.
- Exhaust manifold of high-class alloy cast-iron.
- Sea-water filter.
- 12 V electrical equipment. Fully enclosed 90 W dynamo.
- Instrument panel with electric revolution counter, temperature gauge and warning lamps for charging and oil pressure.

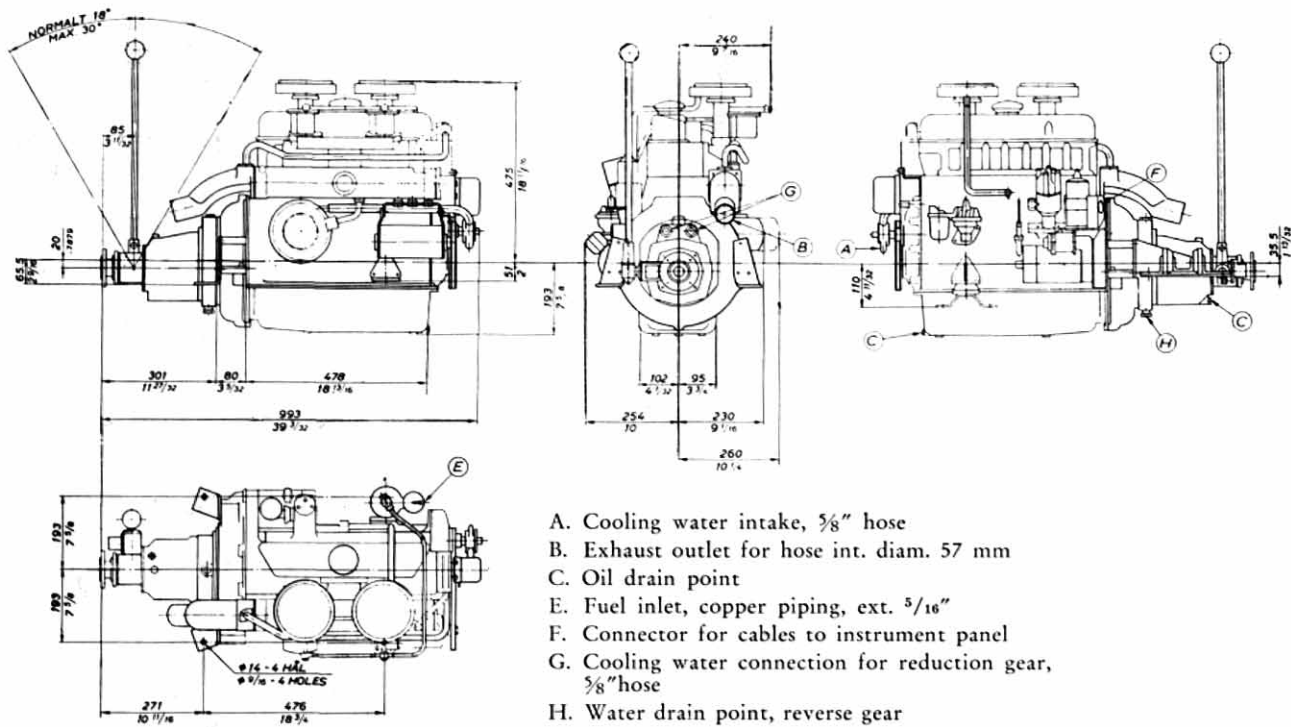
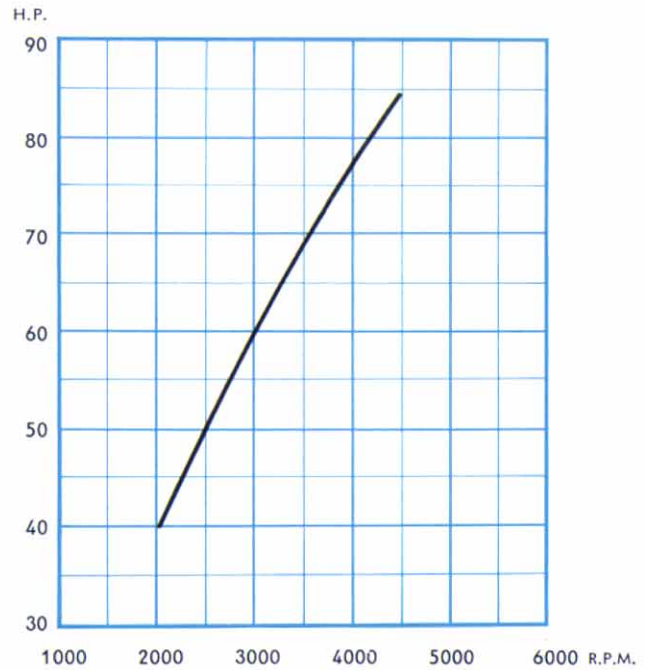
VOLVO PENTA MARINE ENGINE MB 18 B



MB 18 B

DATA

Type	Four-stroke
Valves	Overhead
Number of cylinders	4
Output, h.p.	40—85
Speed, r.p.m.	2000/4500
Bore	84.14 mm (3.313")
Stroke	80 mm (3.15")
Capacity	1.78 litres (109 cu.in.)
Weight, approx.	200 kg (440 lb.)
Max. inclination in boat under way	18°



Dimensions in millimetres and inches

AB VOLVO PENTA



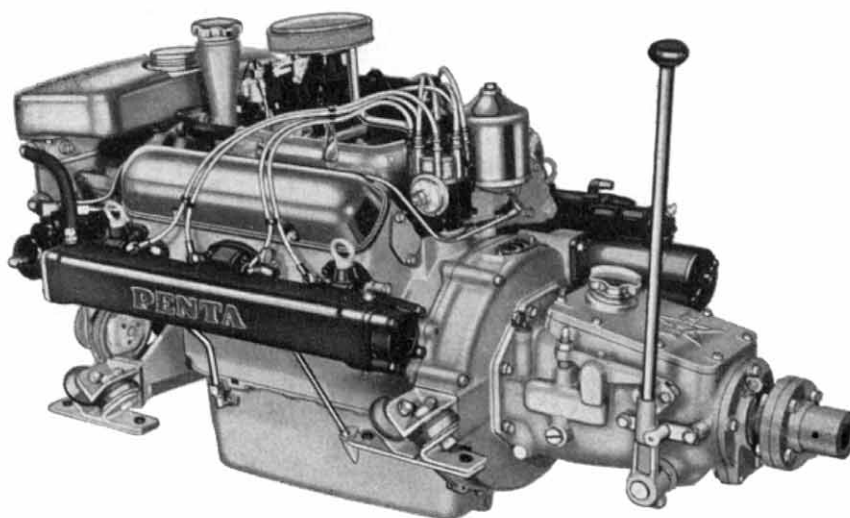
Box 392, Göteborg 1
Sweden
Tel. 23 54 60
Cables: Penta
Telex 2370



MB 36

VOLVO PENTA MARINE ENGINE • 120 HP

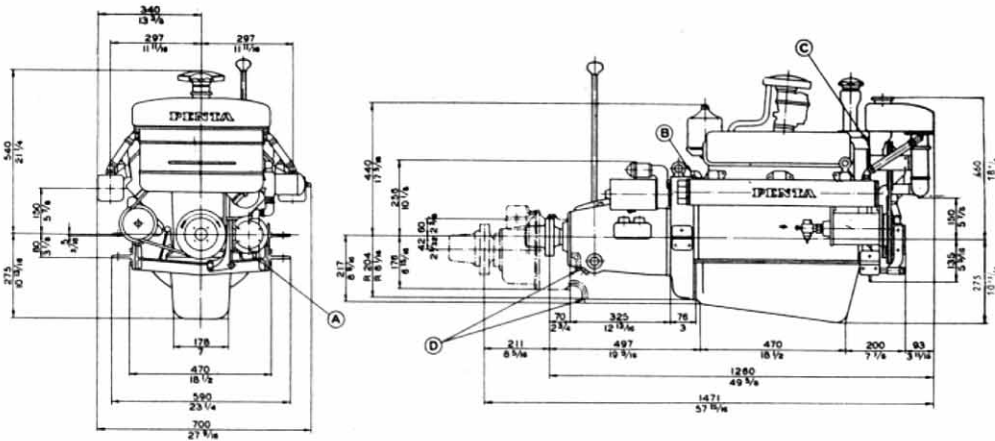
The Volvo Penta MB 36 is an overhead-valve, high output V-8 engine rated at 120 h.p. with quiet, smooth running. The high output of the engine compared with its low weight (approx. 340 kg = 750 lb.) makes it very suitable for light, fast boats. When used together with a reduction gear, the MB 36 is an ideal power unit for large motor cruisers and similar type boats. The fuel consumption of the MB 36 is outstandingly low, approx. 205 grams/h.p./hr. (0.450 lb./h.p./hr.). Down-draught carburetor, fresh-water cooling, full-flow oil filter and an oil cooler are all included as standard equipment with this engine.



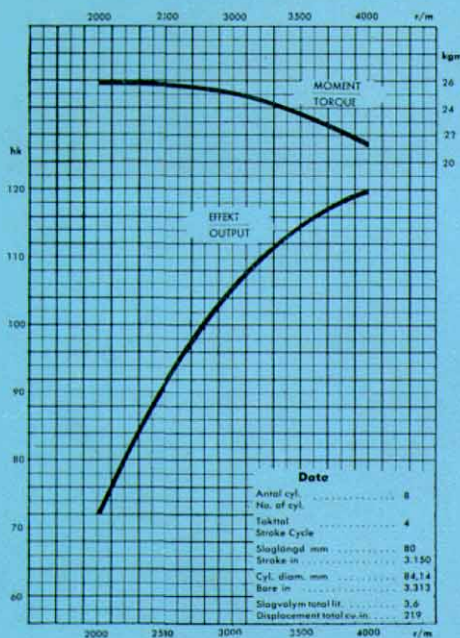
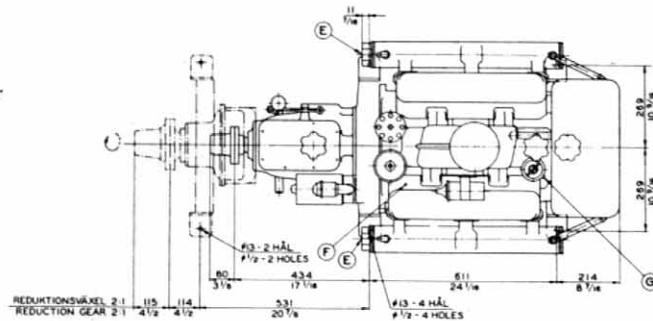
Engine with 1:1 reverse gear

VOLVO PENTA MARINE ENGINE, TYPE MB 36

Dimension drawings



- A. Cooling water inlet for rubber hose $\frac{3}{4}$ "
- B. Cooling water outlet for rubber hose $\frac{5}{8}$ "
- C. Remote mounted cooling water thermometer
- D. Cooling water connection reduction gear rubber hose $\frac{3}{4}$ "
- E. Exhaust outlet R 2" pipe tap
- F. Oil pressure gauge connection
- G. Fuel inlet copper pipe outer diam. $\frac{5}{16}$ "



Data

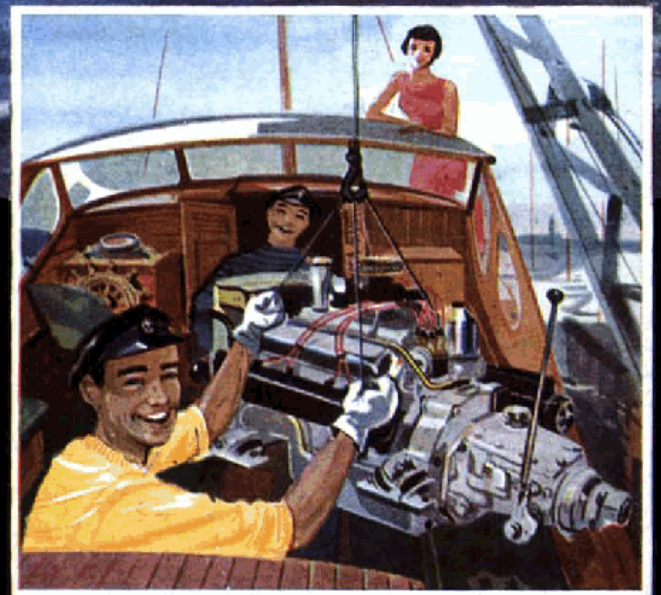
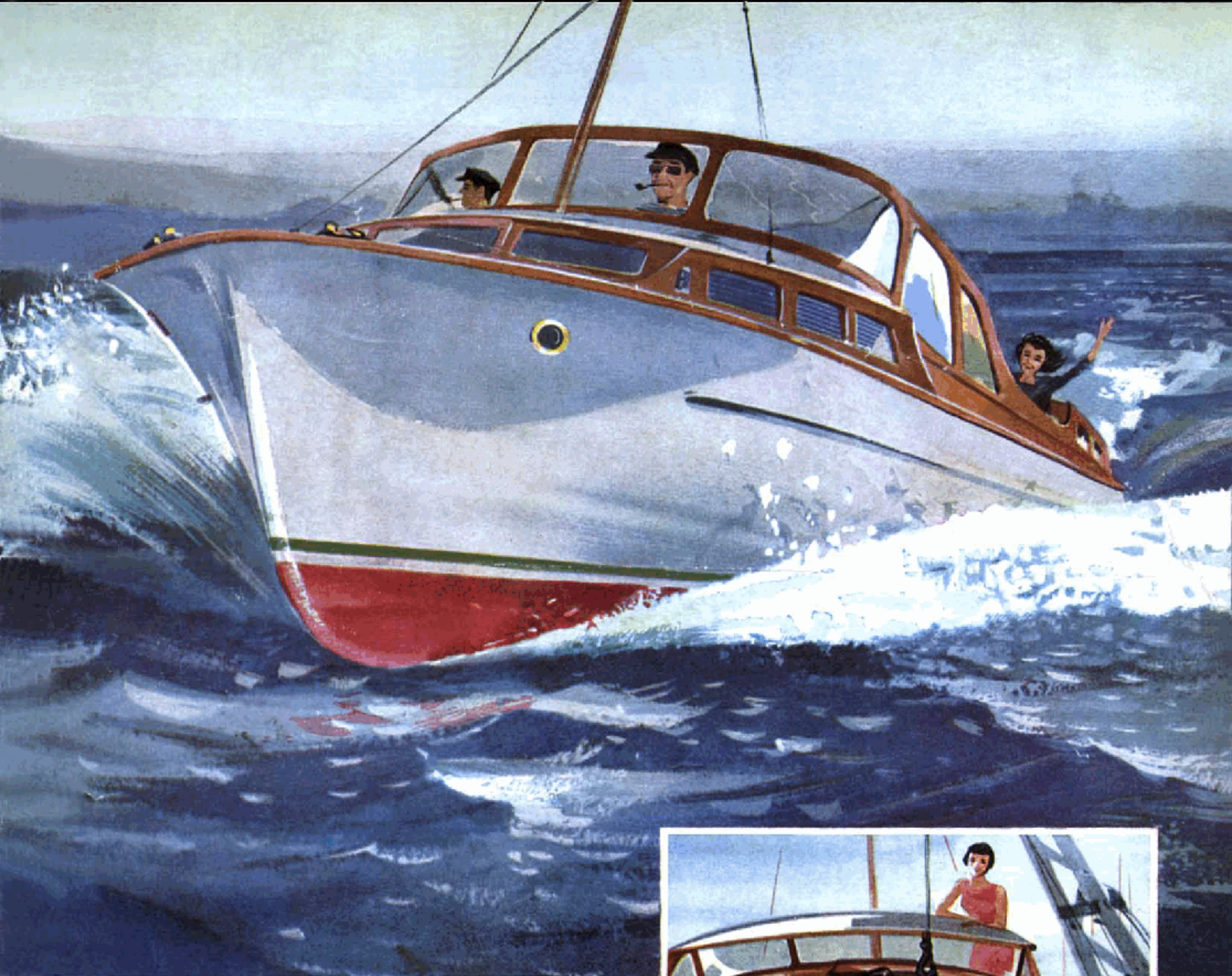
- Type of engine Four-stroke
- Valves Overhead
- Number of cylinders V 8
- Output 72—120 h.p.
- Engine speed 2000—4000 r.p.m.
- Bore 84.14 mm (3.312")
- Stroke 80 mm (3.15")
- Capacity 3.6 litres (220 cu.in.)
- Weight, including Penta 1:1 reverse gear, approx. 340 kg (750 lb.)
- Weight, including Penta reverse gear and reduction gear, approx. 390 kg (860 lg.)

AB VOLVO PENTA

Box 392, Göteborg 1, Sweden

Tel. 23 54 60

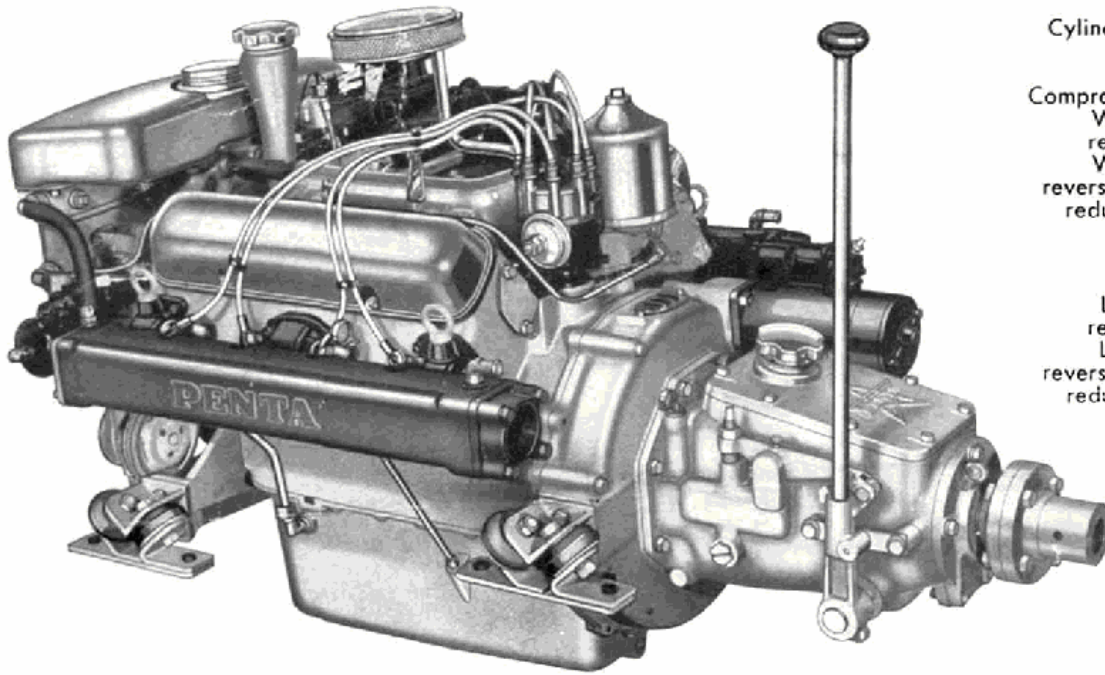
Cables: Penta



MB 36A

MAIN DATA MB 36 A

Potential	72—120 hp
R.p.m.	2000—4000
Number of cylinders	V 8
Valves	Overhead
Cylinder volume	3,6 l. (220 cu. ins.)
Stroke	80 mm (3,14 ins.)
Bore	84,14 mm (3,31 ins.)
Compression ratio	7,6:1
Weight with reverse gear	340 kilos (750 lbs)
Weight with reverse gear and reduction gear	390 kilos (890 lbs)
Height	824 mm (32,45")
Width	700 mm (27,56")
Length with reverse gear	1260 mm (49,60")
Length with reverse gear and reduction gear	1471 mm (57,91")



Penta Presents the MB 36 A

The MB 36 A is an overhead valve, four-stroke, V8 petrol (gasoline) engine with an output range of 70—120 bhp at 2000—4000 r.p.m. and a torque of 26 kgm (188 lb.ft.) at 2200 r.p.m. The displacement of the engine is 3,6 litres (219,6 cu.ins.) bore 84,14 mm. (3,31 ins.) stroke 80 mm. (3,14 ins.) and compression ratio 7,6:1. The engine is fitted with a double carburettor with manual choke and a mechanical fuel pump which permits low-level installation of the fuel tanks. The induction manifold is fresh-water warmed to counteract fuel condensation and to ensure the correct distribution of the fuel-air mixture to the eight cylinders. The air filter fitted on the double-down-draught carburettor also functions as a flash eliminator. The MB 36 has exceptionally low fuel consumption — about 205 grams/hp/hr. (0,452 lb./hp/hr).

The oil system has a capacity of about 10 litres (17,5 Imp. pints). All oil passes through a full-flow filter on its way to the bearings, valve mechanism etc. This filter has paper elements which are easily replaceable. This ensures that the oil is purified to a high degree. Standard equipment includes a tubular oil cooler.

Fresh water cooling is standard on the MB 36 A in order to avoid sea-water corrosion of the engine block and cylinder heads. A circulating pump forces fresh water through the engine. This fresh water is cooled by means of sea-water in the heat exchanger. The sea-water is fed by a "Jabsco" pump with a neoprene rubber impeller which is not affected by sludge etc. The temperature of the cooling water is automatically regulated by means of a thermostat which ensures a rapid warm-up and maintains the correct working temperature in the engine. This "Jabsco" pump also delivers water to the oil cooler and the exhaust pipe jacket. The capacity of the fresh water system is about 17 litres (3,75 Imp. gallons).

Electrical equipment consists of a 12-volt battery system with automatic centrifugal and vacuum ignition advance mechanisms, 1 bhp starter motor, 130-watt built-in dynamo and a voltage regulator. The reverse gear is of the planetary type with a wet multi-disc clutch for travel ahead and brake hands for travel astern. It has a

fixed neutral position and perfect neutral operation so that the propeller does not rotate when the engine is idling.

This engine can be used to good advantage in heavier boat types if it is supplemented with a reduction gear. This gear is water-cooled and has a ratio of 2:1.

The steady, vibration-free operation which is typical of V8 engines can be improved even more by fitting Penta-type rubber mounting blocks. The elegant instrument panel accompanying the engine should be fitted in the wheel-house. Perfect control of the function of the engine is ensured by means of the gauges and switches on the panel: choke control, thermometer, oil pressure gauge, tachometer, charging control indicator, starter switch, ignition switch and indirect instrument lighting.

Compared with its output of 120 hp the weight of the MB 36 is low about 340 kgs (750 lb.) with the reverse gear and about 390 kg (860 lb.) with reverse gear and reduction gear. This is important when the aim is to achieve high speeds in light-weight boats.

This new V8 engine is very compactly constructed and has the following overall external dimensions: height 824 mm 32,45", width 700 mm 27,56", length with reverse gear 1260 mm 49,60", length with reverse gear and reduction gear 1471 mm 57,91".

Further information about the MB 36 A:

Special-alloy cast-iron cylinder heads with fully finished spheroidal combustion chambers. The block is carried down below the crankshaft line ensuring rigidity and giving an unbroken, completely oil-tight sealing edge. Chill-cast light-alloy pistons, each with two compression rings and one three-part oil control ring. The upper compression ring on each piston is chromed. Drop-forged, case-hardened connecting rods. Crankshaft of hardened special steel, statically and dynamically balanced, carried in five bearings. Main bearings and big-end bearings consist of replaceable shells of the tri-metal type. Cast, flame-hardened camshaft, carried in five white-metal lined steel bushings, chain driven. Nickel-steel inlet valves, chrome-nickel alloy steel exhaust valves resistant to tetra-ethyl fuel.

AKTIEBOLAGET

PENTA

Göteborg, Sweden

P.O. Box 392

Telephone 22 84 20

Telegrams Penta

— a Volvo company

BB 70, BB70R, MB 16



Fig. 1. Motore BB 70, BB 70 R, MB 16

- | | |
|-------------------------------|--|
| 1. Carburatore d'aria | 3. Innesco a bobina 36 ohmi |
| 2. Rotore a pignone d'acciaio | 4. Cassetta di legno d'isolamento, schiacciata per uso |



Fig. 2. Motore BB 25

- | | |
|-------------------------------|--|
| 1. Carburatore d'aria | 3. Innesco a bobina d'isolazione 36 ohmi |
| 2. Rotore a pignone d'acciaio | 4. Cassetta di legno d'isolamento, schiacciata per uso |

BB 25

DONNÉES TECHNIQUES

Moteur

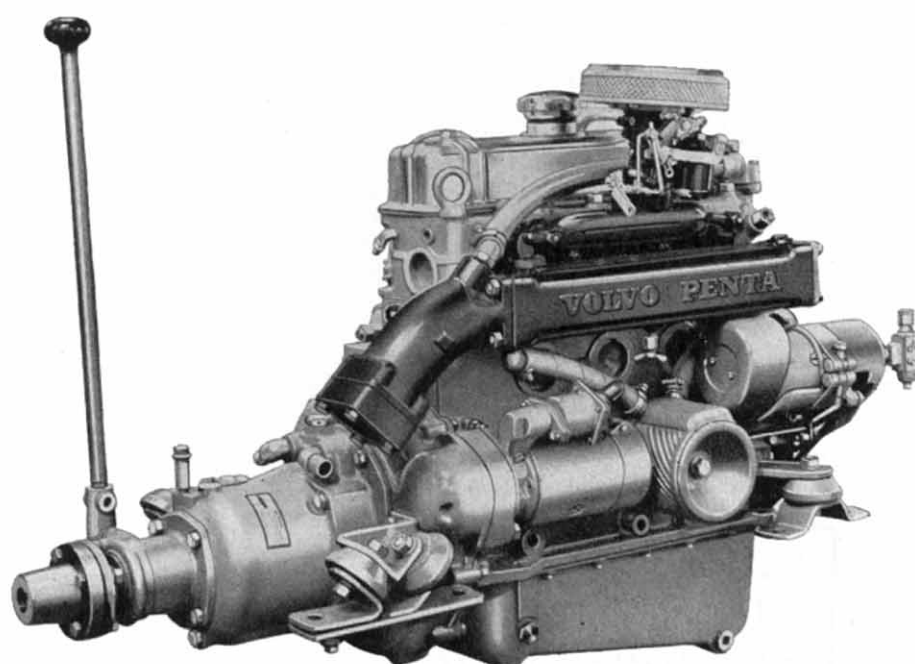
Designation de type	88-70	88-74	88-70, 88-70B
Puissance maxime nom. ch/m/min			
moteur à essence	10/3000	10/3000	10/4000
moteur à pétrole	10/3000	—	—
Cycle		4 temps	
Nombre de cylindres		4	
Alésage mm		79,27	
Course mm		80	
Cylindrée cm ³		1280	
Taux de compression			
moteur à essence	7,4:1	7,4:1	8,3:1
moteur à pétrole	21:1	—	—
Pression de compression (280 h/min)			
kg/cm ²			
moteur à essence		9,8 à 10,2	10 à 11
moteur à pétrole	4 à 7	—	—
Régime de ralenti tr/min	600	800	600
Taux de rotation, vs de l'avant de			
moteur		sens des aiguilles d'une montre ¹⁾	
Pilotes		Pas à gauche ²⁾	
Indicateur max. de moteur dans le			
moteur en marche	10°	18°	18°
Poids de moteur, y compris levateur,			
axe, kg		190	



BB 70

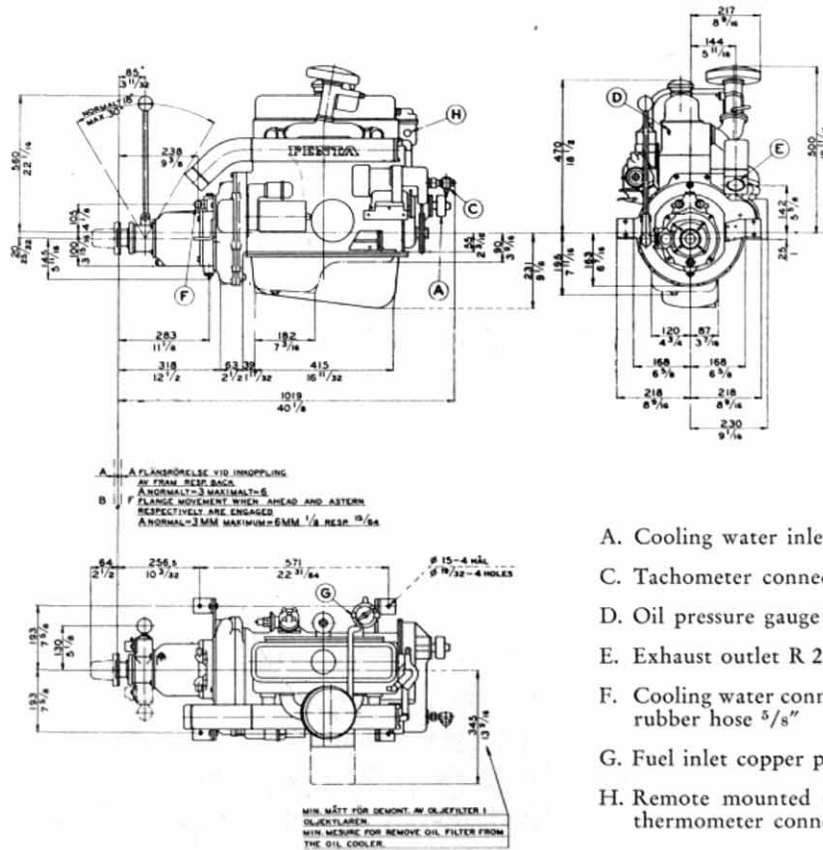
VOLVO-PENTA MARINE ENGINE

The Volvo-Penta BB 70 is very economical in operation, a fact greatly appreciated by speed enthusiasts. When fitted with the 1.91:1 pulling reduction-reverse gear, the BB 70 delivers the extra power needed for water skiing and other water sports. The BB 70 can also be supplied with the direction of rotation reversed for twin installations (BB 70 R).

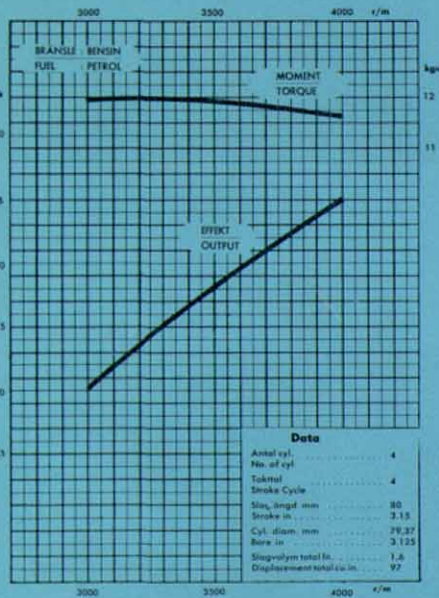


VOLVO-PENTA MARINE ENGINE, TYPE BB 70

Dimension drawings



- A. Cooling water inlet for rubber hose 5/8"
- C. Tachometer connection
- D. Oil pressure gauge connection
- E. Exhaust outlet R 2" pipe tap
- F. Cooling water connection reduction gear, rubber hose 5/8"
- G. Fuel inlet copper pipe outer diam. 5/16"
- H. Remote mounted cooling water thermometer connection



Data

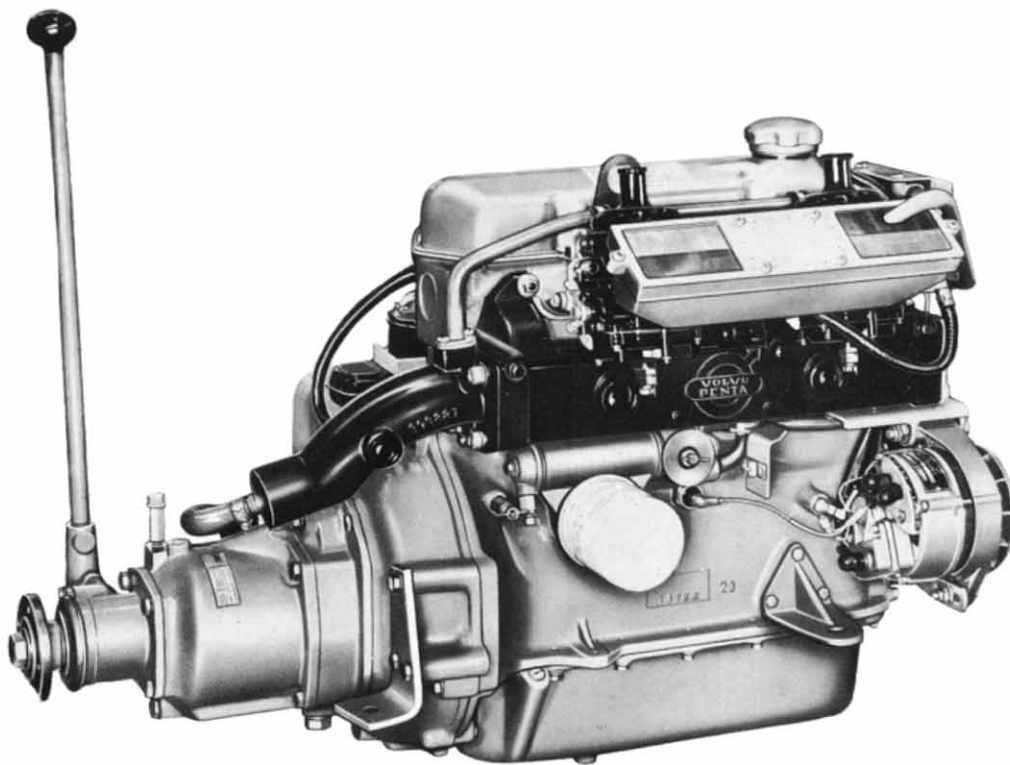
- Type of engine Four-stroke
- Fuel Petrol
- Valves Overhead
- Number of cylinders 4
- Output 50—65 h.p.
- Engine speed 3000/4000 r.p.m.
- Bore 79.37 mm (3.125")
- Stroke 80 mm (3.15")
- Capacity 1.6 litres (98 cu.in.)
- Compression ratio 8,2: 1
- Weight, approx. 180 kg (400 lb.)

AKTIEBOLAGET

PENTA

Box 392, Göteborg 1, Sweden
 Cables: Penta

— a Volvo Company



BB 100A

VOLVO PENTA 4-CYLINDER 4-STROKE MARINE GASOLINE ENGINE · 100 HP

The BB 100A—one of the most renowned Volvo Penta engines — has an output of 100 h p at 5000 r p m. Intensive research and comprehensive tests in the Volvo engine laboratory — one of the most modern in the world — as well as practical tests in boats preceded the presentation of the BB 100A.

Competition results from American and European boat events have clearly demonstrated the maximum output, reliability and extremely low fuel consumption of this engine.

Standard equipment on the BB 100 includes the Volvo Penta reduction/reverse gear, ratio 1.91:1 for a left-hand thread propeller.

Installation is considerably facilitated by having all the electric cables in the form of one single harness which is permanently fitted to the engine with a wired-up plug for the instrument panel. Another factor in this connection is the water-cooled exhaust bend for connecting to a rubber hose.

Further technical features of this engine include:

Five-bearing induction-hardened crankshaft.

Lead-bronze main and big-end bearings.

Lubricating oil filter and hyper-effective oil cooler which maintains the lubricating oil at its most favourable temperature and guarantees low bearing wear and maximum dependability.

Double Zenith-Stromberg carburettors which are designed so that they automatically provide the correct fuel/air mixture under all conditions of operation. These carburettors are specially treated for marine use by a corrosion-proofing process.

Air intake silencer with flame arrestor.

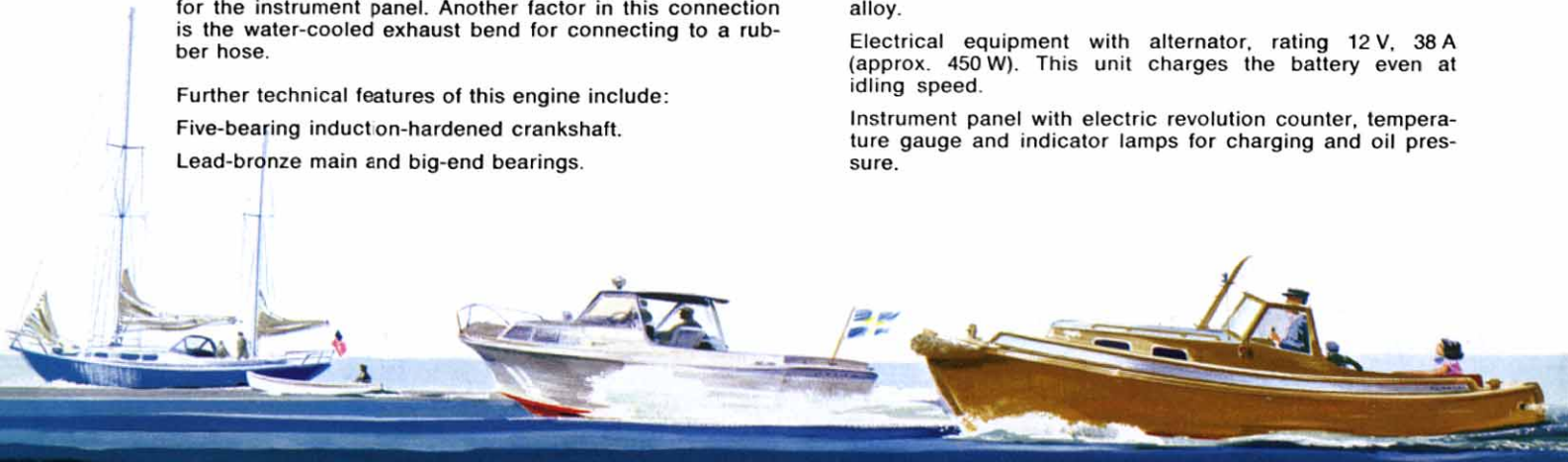
Fuel pump, driven from camshaft and fitted with a fuel filter and a hand primer.

High location starter motor and completely enclosed fly-wheel eliminating the risk of bilge water damage.

Water-cooled exhaust manifold of top quality cast-iron alloy.

Electrical equipment with alternator, rating 12 V, 38 A (approx. 450 W). This unit charges the battery even at idling speed.

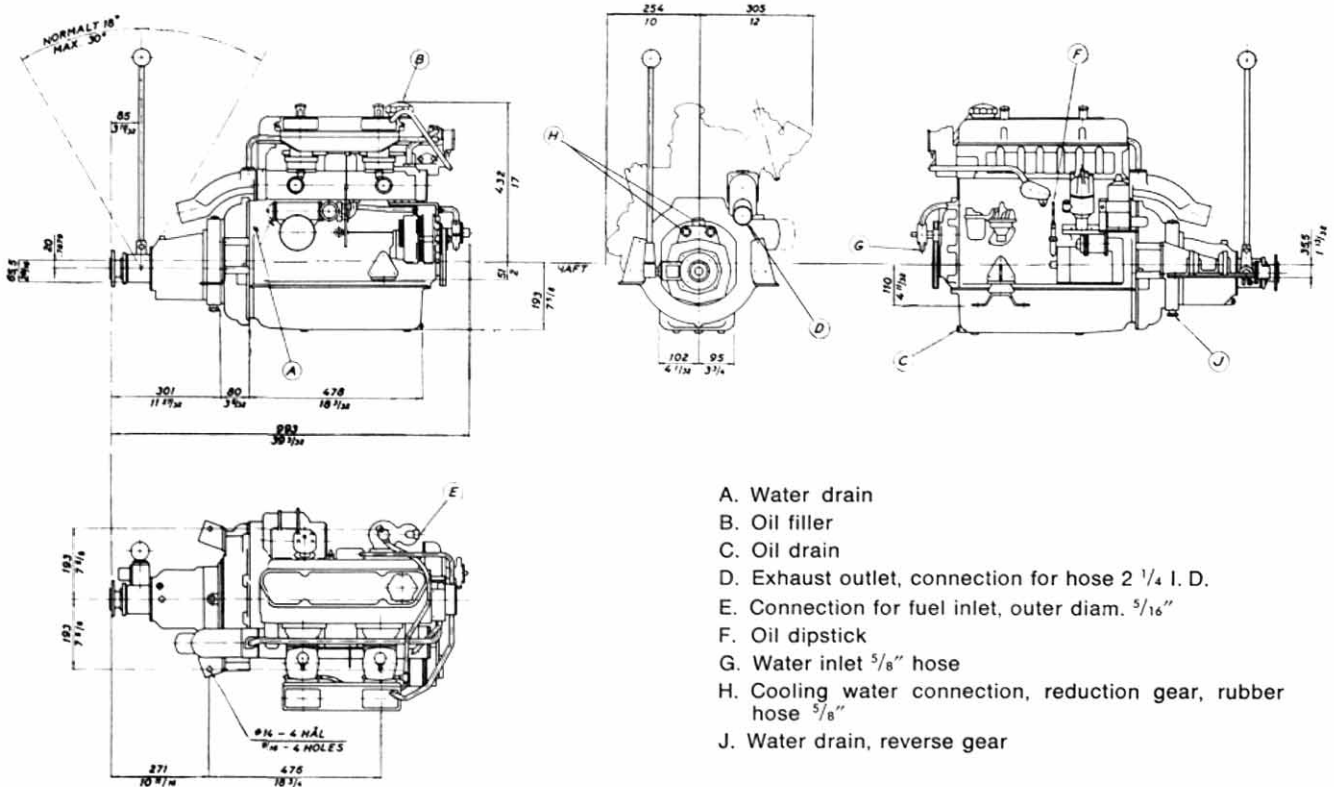
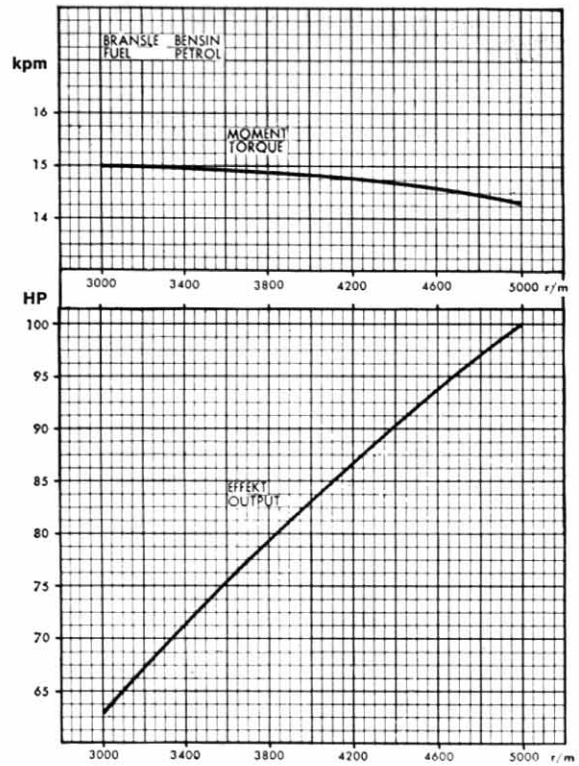
Instrument panel with electric revolution counter, temperature gauge and indicator lamps for charging and oil pressure.



BB 100A

DATA

Type of operation	Four-stroke
Valves	Overhead
Number of cylinders	4
Output	63–100 h p
Engine speed range	3000–5000 r p m
Bore	84.14 mm (3.312")
Stroke	80 mm (3.15")
Capacity	1.78 litres (109 cu.in.)
Weight, approx.	200 kg (440 lb.)
Maximum inclination of engine	18°



Measurements in mm and inches

- A. Water drain
- B. Oil filler
- C. Oil drain
- D. Exhaust outlet, connection for hose 2 1/4 I. D.
- E. Connection for fuel inlet, outer diam. 5/16"
- F. Oil dipstick
- G. Water inlet 5/8" hose
- H. Cooling water connection, reduction gear, rubber hose 5/8"
- J. Water drain, reverse gear

AB VOLVO PENTA



Box 392, Göteborg 1
 Sweden
 Tel. 23 54 60
 Cables: Penta
 Telex: 207 55

VOLVO PENTA

BB 115 A



The BB 115 A is a further development of the world-renowned Volvo Penta four-cylinder, four-stroke marine engine and is by far the most modern inboard engine version on the market. The engine with its equipment is completely built for salt water operation under extremely hard marine running conditions and this guarantees the highest running reliability and durability.

The quiet vibration-free engine with hyper-effective intake silencer, through its high marine output in combination with particularly low fuel consumption is specially suitable for installation in fast planing boats. Its compact dimensions when installed and low weight make it easy to fit in limited spaces.

The BB 115A is supplied with the patented Volvo Penta reduction/reverse gear, ratio 1.91:1 or a hydraulically actuated reverse/reduction gear of the Borg Warner Velvet Drive type with a ratio of 1.91:1 (right-hand rotation), 2.1:1 and 2.91:1 (left-hand rotation).

Installation is facilitated considerably by having all the electric cables collected into one single harness connected to the engine with a ready-for-use connector for the instrument panel.

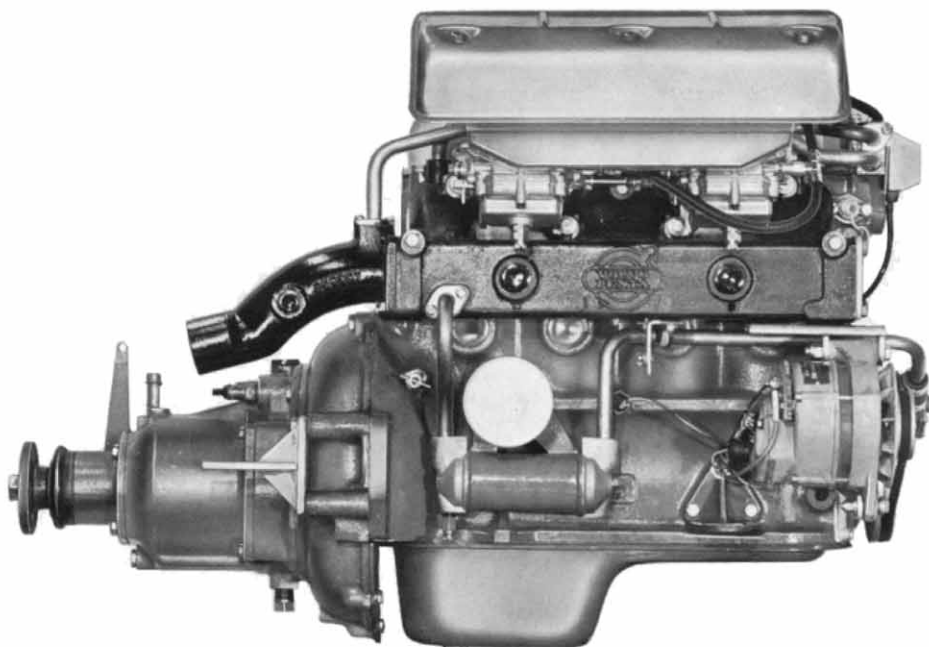
The many other outstanding features of the engine include:

- Five-bearing induction-hardened crankshaft. Lead-bronze main and connecting rod bearings.
- Stellite-flashed exhaust valves and hardened intake valves of the self-rotating type which seal against replaceable seats.

- Hyper-effective oil cooler and lubricating oil filter which keep the lubricating oil at its optimum operating temperature and guarantee maximum dependability.
- Twin horizontal Zenith-Stromberg carburetors, specially designed so that they automatically provide the correct fuel-air mixture under all conditions of operation.
- Intake air silencer with flame arresters.
- Fuel pump driven from the camshaft and fitted with a fuel filter and also a hand primer.
- The electrical system includes an alternator with a particularly high charging capacity and is also fully protected from corrosion even down to the electric cable flat pin connectors.
- High location starter motor and alternator and a completely enclosed flywheel to eliminate the risk of bilge water damage.
- Water-cooled exhaust manifold of top quality alloy cast-iron. Water-cooled exhaust elbow for connecting up to rubber hose.
- Rubber mounting with adjustable installation height as extra equipment.
- Instrument panel with electric revolution counter, temperature gauge and warning lamps for charging and oil pressure.

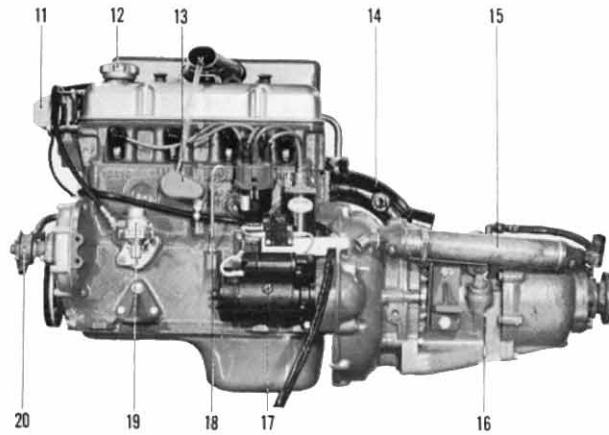
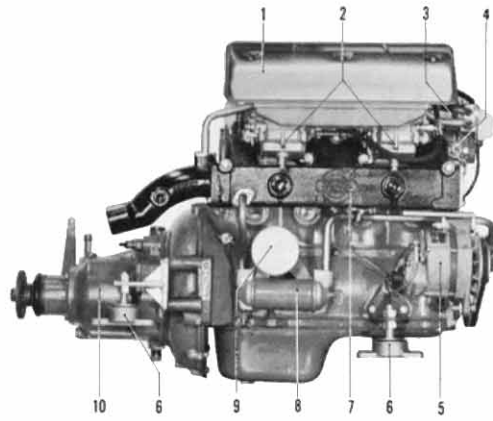
Volvo Penta four-cylinder, four-stroke marine engine

115 h.p.

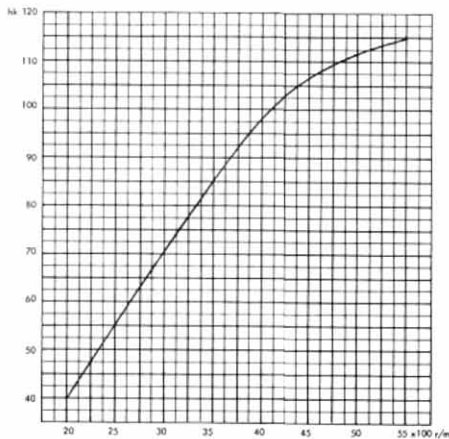
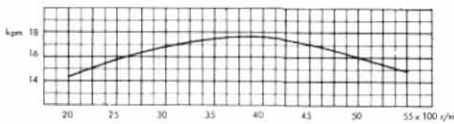


VOLVO PENTA MARINE ENGINE TYPE BB 115A

1. Air intake silencer with flame arresters
2. Twin carburetors (Zenith Stromberg)
3. Thermostat housing
4. Temperature gauge sender
5. Alternator, 12 V, 38 Amp.
6. Adjustable rubber mountings (extra)
7. Water-cooled exhaust manifold
8. Oil cooler
9. Spin-on full-flow oil filter
10. Reduction/reverse gear, type RB
11. Transistorized regulator
12. Oil filler
13. Crankcase breather
14. Water-cooled exhaust elbow
15. Oil cooler
16. Hydraulically actuated reverse/reduction gear, type "Velvet Drive"
17. Starter motor
18. Oil dipstick
19. Fuel pump
20. Sea-water pump



BB 115A

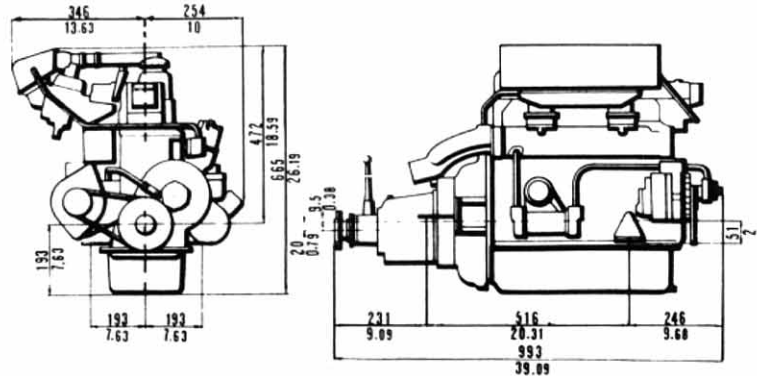


DATA

Type of operation . . . Four-stroke carburetor engine with overhead valves
 Type designation BB 115A
 Max. output (SAE) 71-115 h.p.
 Max. operating speed 3000-5500¹⁾
 Number of cylinders 4 in line
 Capacity, litres(cu.in.) 1.986 (121)
 Bore/stroke, mm(in.) 88.9/80(3.50/3.15)
 Compression ratio 8.4:1
 Total weight, kg(lb.)approx. 200(440)
 Max. engine inclination 18°

1) Max. operating speed 5000 r.p.m. with RB reduction/reverse gear.

DIMENSION DRAWING (engine with RB reduction/reverse gear)



We reserve the right to carry out modifications



AB VOLVO PENTA

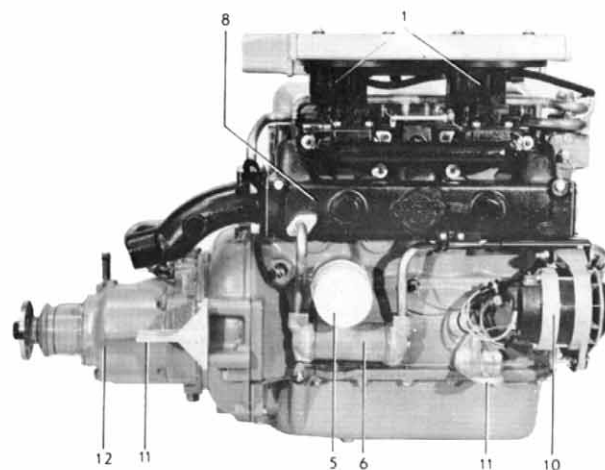
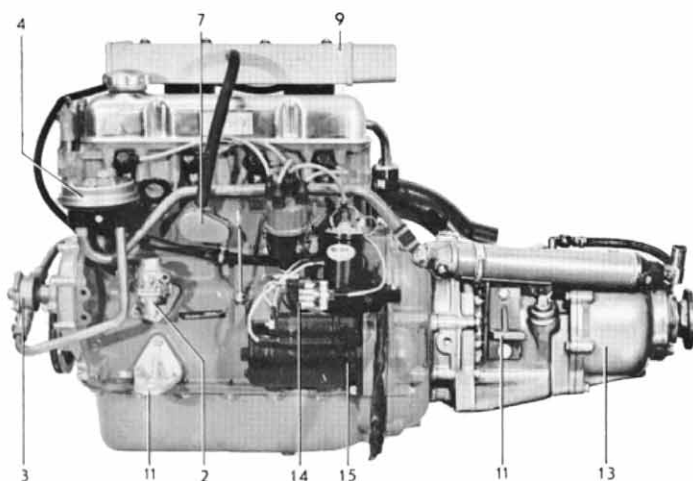
Box 392, 401 26 Göteborg 1, Sweden
 Telephone 23 54 60
 Cables: Penta
 Telex 207 55



BB 115 B



4-cylinder, 4-stroke carburetor engine
Propeller shaft output 70 kW (95 hp)



STANDARD EQUIPMENT

ENGINE BODY — Cylinder block and head made of special cast iron. Light-alloy pistons with 2 compression rings and one oil scraper ring. Crankshaft journalled in 5 bearings. Self-rotating, overhead valves.

A tool kit for minor adjustment is supplied.

FUEL SYSTEM — Double downdraft carburetors with acceleration pumps (1). Fuel pump (2) driven from camshaft, equipped with hand primer and flexible hose with fuel pipe connection.

COOLING SYSTEM — Thermostat-controlled sea-water cooling system. Sea-water pump with neoprene rubber impeller (3). Cleanable sea-water filter (4). Sea-water cooled RB reduction gear. BW type reverse gear has sea-water cooled oil cooler.

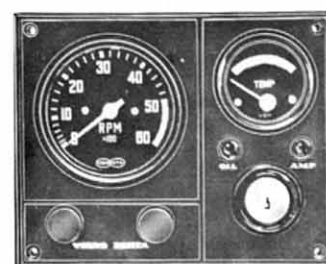
LUBRICATING SYSTEM — Pressure-lubricating system with full-flow lubricating oil filter of the spin-on type (5). Sealed crankcase ventilation (7). Cleanable, tubular-type oil cooler (6).

INTAKE SYSTEM — Silent Flow type intake silencer with built-in flame guard (9).

EXHAUST SYSTEM — Sea-water cooled exhaust manifold and manifold elbow of cast iron (8).

ELECTRICAL SYSTEM — Corrosionproof 12 V electrical system, with complete instrument panel. Main fusing mounted on engine with built-in spare fuses (14). Brushless alternator with built-in transistor regulator, 35 A, 420 W (10). Starter motor output 735 W (1 h.p.) (15).

Instrument panel is provided with key switch, rev counter, temperature gauge, warning lamps for battery charging and oil pressure, switch for instrument lighting and one extra switch. Cable harness, 7 m (23 ft.) in length, with plug-in contact.



ENGINE MOUNTING — The engine is supplied with engine brackets for fixed suspension (11).

POWER TRANSMISSION — Mechanical reverse gear type RB or hydraulic type Borg Warner. Engine speed and reverse gear on type BW is operated by a single control lever. Bracket for control cables included.

Engine is supplied with reverse gear as follows:

- Alt. 1 Rev. gear type RB red. ratio 1.91:1, L-H prop. (12)
- 2 Rev. gear type BW red. ratio 2:1, R-H prop. (13)
- 3 Rev. gear type BW red. ratio 2:1, L-H prop. (13)
- 4 Rev. gear type BW red. ratio 2.9:1, L-H prop (13)

Propeller shaft flange for 30 mm propeller shaft — red. ratios 1.91:1 and 2:1

Propeller shaft flange for 35 mm propeller shaft — red. ratio 2.9:1

EXTRA EQUIPMENT

FUEL SYSTEM

Water-separating filter with or without flexible hoses.
 Fuel line kit with copper piping and installation parts.
 Electrically operated fuel pump

COOLING SYSTEM

Cooling water intake complete with cock and hose.

EXHAUST SYSTEM

Through - hull fitting
 Rubber exhaust hose
 Connection flanges for exhaust line

ELECTRICAL SYSTEM AND INSTRUMENT

Charging distributor for charging 2-battery system
 Electric-hourmeter
 Master switch
 Cable harness extension
 Instrument panel for extra instruments
 Automatic alarm for oil pressure and water temperature

ENGINE MOUNTING

Flexible engine mounting

BOAT ACCESSORIES

Electrically operated bilge pump
 Original paint
 Oils
 Electro-mechanical trim tabs
 On board kits

CONTROLS AND CONTROL SYSTEM

VP single-control lever for both speed and forward-reverse operation, top-mounted or side-mounted.
 Neutral-position switch — automatic safety interlock for VP-controls
 Two levers control — side mounted
 Push-pull controls
 Control cables
 Steering gears
 Steering wheels
 Steering cables
 Ball joint and fork kit for steering cable

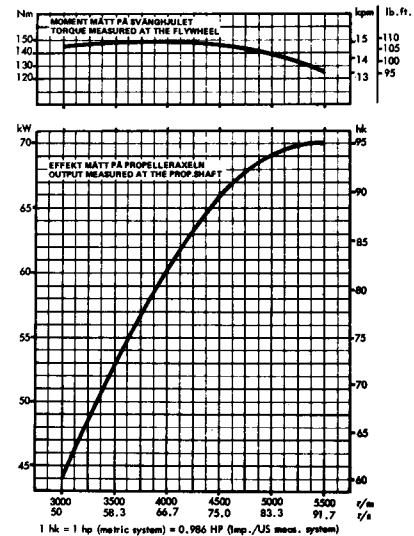
PROPELLER EQUIPMENT

Flexible coupling
 Clamp coupling
 Propeller shafts
 Propeller shaft sleeves
 Propellers

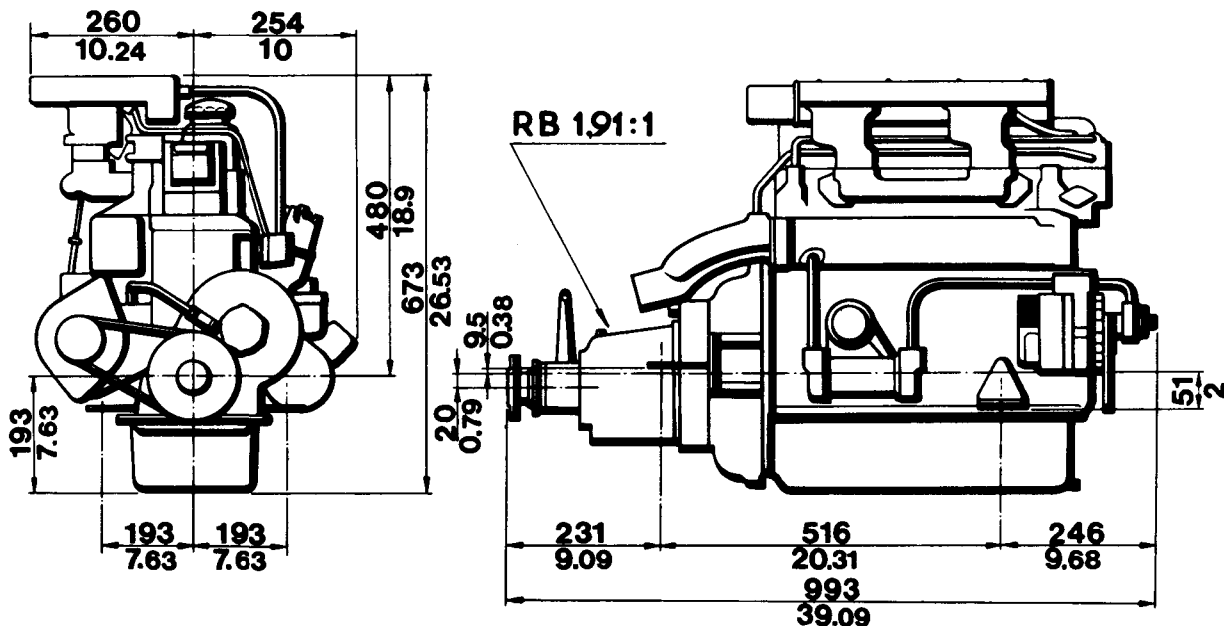
DATA

Type of operation	4-stroke carburetor engine with overhead valves
Designation	BB115B
Propeller shaft output ¹⁾	70 kW (95 hp)
Max. operating speed, r/s (rpm)	91.7 (5500)
Number of cylinders	4 in-line
Capacity, dm ³ (in ³)	1.986 (121)
Bore/Stroke, mm (in)	88.9/80 (3.50/3.15)
Compression ratio	8.4:1
Fuel quality	min. 87 octane
Total weight, engine with RB reverse gear, appr. kg (lb)	215 (475)

1) The diagram indicates the propeller shaft output for a run-in engine with mechanical reverse gear according to DIN 6270 Leistung B. The engine flywheel output is approx. 3 % higher. To calculate the propeller shaft output with a hydraulic reverse gear type BW, reduce the indicated output by 16 % at maximum speed.



DIMENSION DRAWING



AB VOLVO PENTA

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 Telex: 207 55

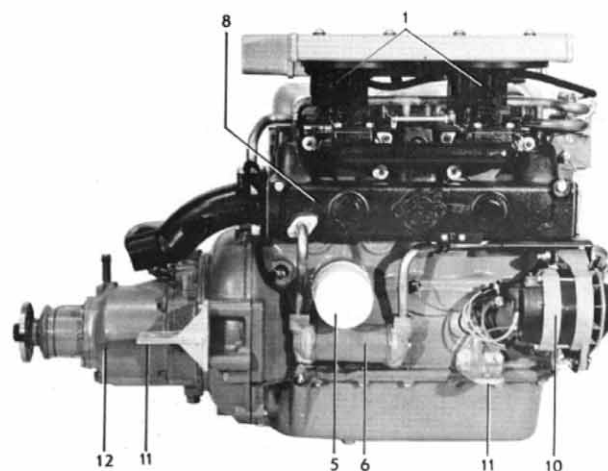
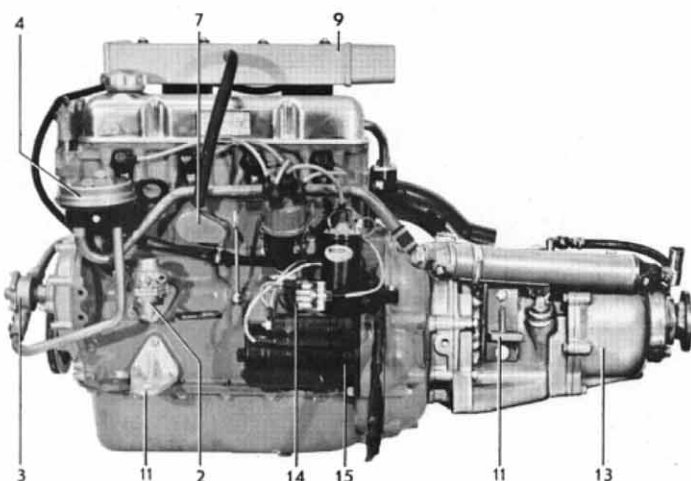
We reserve the right to carry out modifications



BB 115 C



4-cylinder, 4-stroke carburetor engine
Propeller shaft output 70 kW (95 hp)



STANDARD EQUIPMENT

ENGINE BODY – Cylinder block and head made of special cast iron. Light-alloy pistons with 2 compression rings and one oil scraper ring. Crankshaft journalled in 5 bearings. Self-rotating, overhead valves.

A tool kit for minor adjustment is supplied.

FUEL SYSTEM – Double downdraft carburetors with acceleration pumps (1). Fuel pump (2) driven from camshaft, equipped with hand primer and flexible hose with fuel pipe connection.

COOLING SYSTEM – Thermostat-controlled sea-water cooling system. Sea-water pump with neoprene rubber impeller (3). Cleanable sea-water filter (4). Sea-water cooled RB reduction gear. BW type reverse gear has sea-water cooled oil cooler.

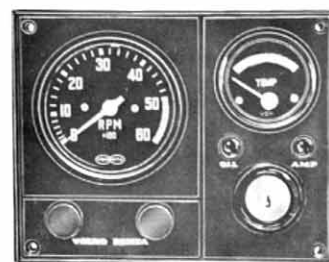
LUBRICATING SYSTEM – Pressure-lubricating system with full-flow lubricating oil filter of the spin-on type (5). Sealed crankcase ventilation (7). Cleanable, tubular-type oil cooler (6).

INTAKE SYSTEM – Silent Flow type intake silencer with built-in flame guard (9).

EXHAUST SYSTEM – Sea-water cooled exhaust manifold and manifold elbow of cast iron (8).

ELECTRICAL SYSTEM – Corrosionproof 12 V electrical system, with complete instrument panel. Main fusing mounted on engine with built-in spare fuses (14). Brushless alternator with built-in transistor regulator, 35 A, 420 W (10). Starter motor output 735 W (1 h.p.) (15).

Instrument panel is provided with key switch, rev counter, temperature gauge, warning lamps for battery charging and oil pressure, switch for instrument lighting and one extra switch. Cable harness, 7 m (23 ft.) in length, with plug-in contact.



ENGINE MOUNTING – The engine is supplied with engine brackets for fixed suspension (11).

POWER TRANSMISSION – Mechanical reverse gear type RB or hydraulic type Borg Warner. Engine speed and reverse gear on type BW is operated by a single control lever. Bracket for control cables included.

Engine is supplied with reverse gear as follows:

Alt. 1 Rev. gear type RB red. ratio 1.91:1, L-H prop. (12)

2 Rev. gear type BW red. ratio 2:1, R-H prop. (13)

3 Rev. gear type BW red. ratio 2:1, L-H prop. (13)

4 Rev. gear type BW red. ratio 2.9:1, L-H prop (13)

Propeller shaft flange for 30 mm propeller shaft – red. ratios 1.91:1 and 2:1

Propeller shaft flange for 35 mm propeller shaft – red. ratio 2.9:1

EXTRA EQUIPMENT

FUEL SYSTEM

Water-separating filter with or without flexible hoses.
 Water separator
 Fuel line kit with piping and installation parts.
 Electrically operated fuel pump.
 Cap with connections for fuel tank.

COOLING SYSTEM

Cooling water intake complete with cock and hose.

EXHAUST SYSTEM

Through - hull fitting
 Rubber exhaust hose
 Connection flanges for exhaust line

ELECTRICAL SYSTEM AND INSTRUMENT

Charging distributor for charging 2-battery system
 Extra instruments: Hourmeter, fuel- and water gauge, voltmeter oil pressure gauge, rudder indicator
 Master switch
 Cable harness extension
 Instrument panel for extra instruments
 Automatic alarm for oil pressure and water temperature

ENGINE MOUNTING

Flexible engine mounting

BOAT ACCESSORIES

Electrically operated bilge pump
 Original paint
 Oils
 Electro-mechanical trim tabs
 On board kits

CONTROLS AND CONTROL SYSTEM

VP single-control lever for both speed and forward-reverse operation, top-mounted or side-mounted.
 Two levers control - side mounted
 Control cables
 Steering gears
 Steering wheel
 Steering lock
 Steering cables
 Ball joint and fork kit for steering cable

PROPELLER EQUIPMENT

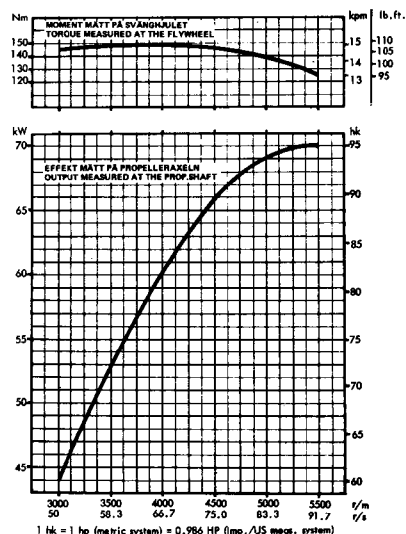
Flexible coupling
 Clamp coupling
 Propeller shafts
 Propeller shaft sleeves
 Propellers

DATA

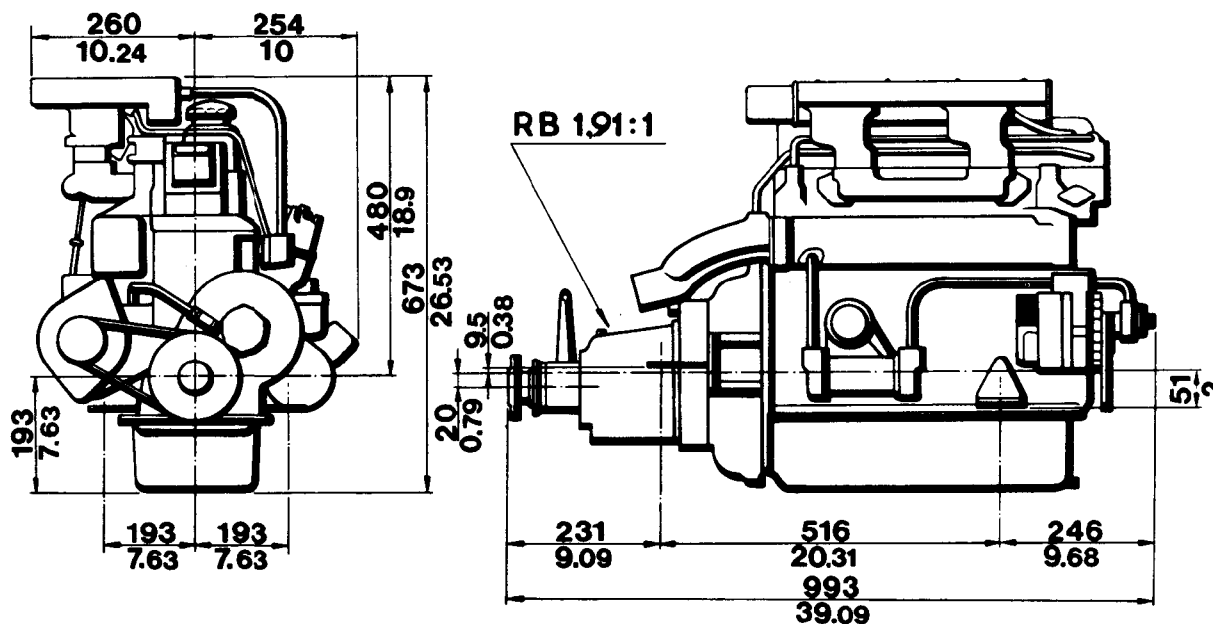
Type of operation 4-stroke carburetor engine with overhead valves
 Designation BB115C
 Propeller shaft output¹⁾ 70 kW (95 hp)
 Max. operating speed, r/s (rpm) 91.7 (5500)
 Number of cylinders 4 in-line
 Capacity, dm³ (in³) 1.986 (121)
 Bore/Stroke, mm (in) 88.9/80 (3.50/3.15)
 Compression ratio 8.4:1
 Fuel quality²⁾ min. 87 octane
 Total weight, engine with RB reverse gear, appr. kg (lb) 215 (475)

1) The diagram indicates the propeller shaft output for a run-in engine with mechanical reverse gear according to DIN 6270 Leistung B. The engine flywheel output is approx. 3% higher. To calculate the propeller shaft output with a hydraulic reverse gear type BW, reduce the indicated output by 16% at maximum speed.

2) The engine can be run on unleaded fuel.



DIMENSION DRAWING



AB VOLVO PENTA

S 405 08 Gothenburg, Sweden
 Telephone: 031/23 54 60
 Telegrams: Penta
 Telex: 207 55

We reserve the right to carry out modifications



VOLVO PENTA

BB 165 A



The BB 165 A — a new six-cylinder inboard engine with an output of 165 h.p. at 5000 r.p.m. The presentation of the BB 165 A has been preceded by intensive research work and intensive testing in the Volvo engine laboratory — one of the most modern in the world.

The high output of the engine and its high torque in combination with its low fuel consumption make it particularly suitable for installation in large planing boats. Its compact dimensions when installed and its low weight in relation to the output also make it easy to install even in limited spaces.

The BB 165 A is supplied with a hydraulically actuated reverse/reduction gear with alternative ratios of 1.91:1 (right-hand rotation) and 2.1:1 or 2.91:1 (left-hand rotation).

Installation is facilitated considerably by having all the electric cables collected into one single harness connected to the engine with a ready-for-use connector for the instrument panel.

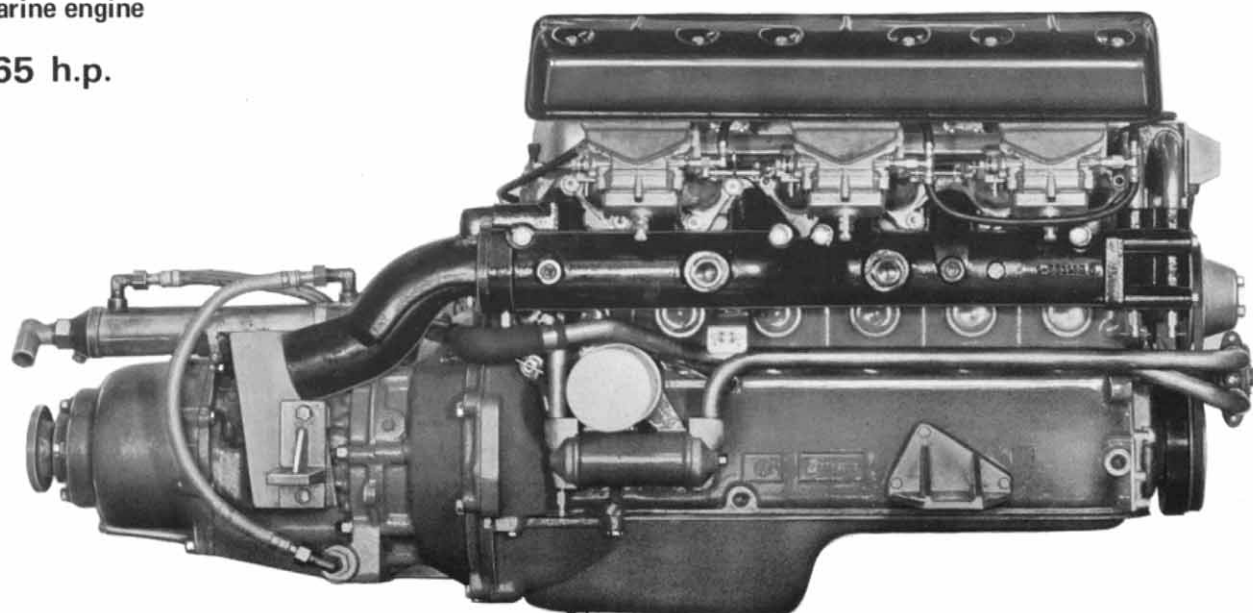
The many other outstanding features of the engine include:

- Seven-bearing induction-hardened crankshaft with vibration damper. Lead-bronze main and connecting rod bearings.
- Stellite-flashed exhaust valves and hardened intake valves of the self-rotating type which seal against replaceable seats.

- Hyper-effective oil cooler and lubricating oil filter which keep the lubricating oil at its optimum operating temperature and guarantee low bearing wear and maximum dependability.
- Three Zenith-Stromberg horizontal carburetors, specially designed so that they automatically provide the correct fuel-air mixture under all conditions of operation.
- Intake air silencer with flame arresters.
- Fuel pump driven from the camshaft and fitted with a fuel filter and also a hand primer.
- The electrical system includes an alternator with a particularly high charging capacity and is also fully protected from corrosion even down to the electric cable flat pin connectors.
- High location starter motor and alternator and a completely enclosed flywheel to eliminate the risk of bilge water damage.
- Water-cooled exhaust manifold of top quality alloy cast-iron. Water-cooled exhaust elbow for connecting up to rubber hose.
- Rubber mountings with adjustable installation height as extra equipment.
- Instrument panel with electric revolution counter, temperature gauge and warning lamps for charging and oil pressure.

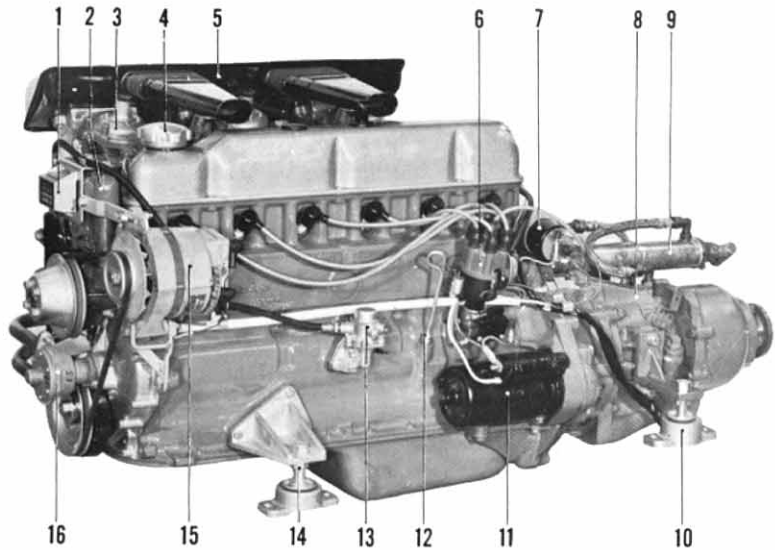
**Volvo Penta six-cylinder, four-stroke
marine engine**

165 h.p.

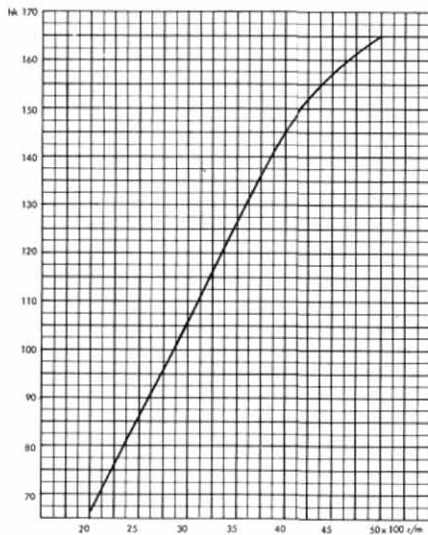
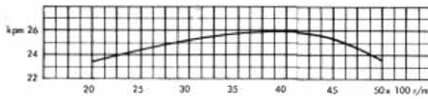


**VOLVO PENTA MARINE ENGINE
TYPE BB 165 A**

1. Transistorized regulator
2. Thermostat housing
3. Carburetors (3), Zenith Stromberg
4. Oil filler
5. Air intake silencer with flame arresters
6. Distributor
7. Ignition coil
8. Hydraulically actuated reverse/reduction gear type "Velvet Drive"
9. Oil cooler
10. Adjustable rear rubber mountings (extra)
11. Starter motor
12. Oil dipstick
13. Fuel pump
14. Adjustable front rubber mountings
15. Alternator, 12 V, 38 A.
16. Sea-water pump



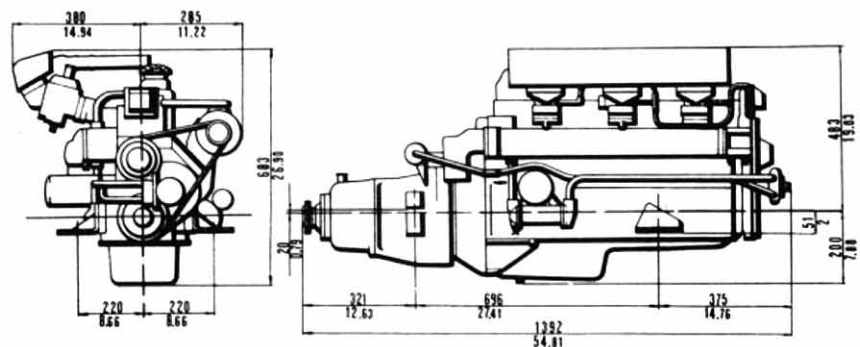
BB 165A



DATA

Type of operation . . . Four-stroke carburetor engine with overhead valves
 Type designation BB165A
 Output (SAE) 106-165 h.p.
 Engine speed, r.p.m. 3000-5000
 Number of cylinders 6 in line
 Capacity, litres (cu.in.) 2.979(182)
 Bore/stroke, mm (in.) 88.9/80(3.50/3.15)
 Compression ratio 9.2:1
 Total weight, including reverse gear, kg(lb.) approx. 290(640)
 Max. engine inclination 18°

DIMENSION DRAWING (engine with reverse/reduction gear)



We reserve the right to carry out modifications



AB VOLVO PENTA

Box 392, 401 26 Göteborg 1, Sweden
 Telephone 23 54 60
 Cable: Penta
 Telex 207 55

VOLVO PENTA

BB 170A



The BB 170 A — a new six-cylinder inboard engine with an output of 170 h.p. at 5000 r.p.m. The presentation of the BB 170 A has been preceded by intensive research work and intensive testing in the Volvo engine laboratory — one of the most modern in the world.

The high output of the engine and its high torque in combination with its low fuel consumption make it particularly suitable for installation in large planing boats. Its compact dimensions when installed and its low weight in relation to the output also make it easy to install even in limited spaces.

The BB 170 A is supplied with a hydraulically actuated reverse/reduction gear with alternative ratios of 1.91:1 (right-hand rotation) and 2.1:1 or 2.91:1 (left-hand rotation).

Installation is facilitated considerably by having all the electric cables collected into one single harness connected to the engine with a ready-for-use connector for the instrument panel.

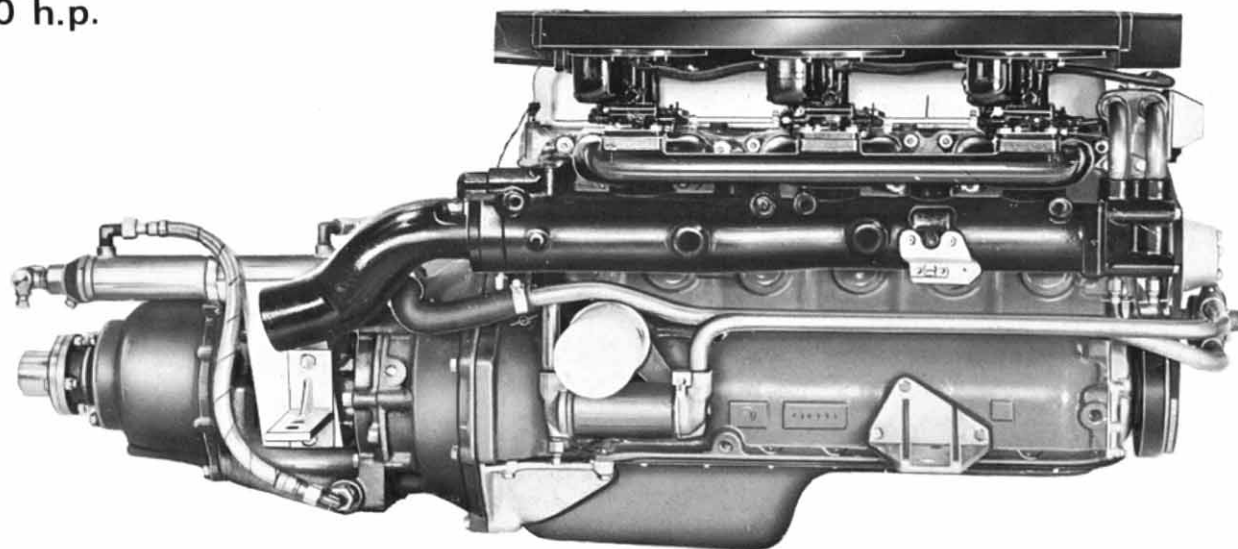
The many other outstanding features of the engine include:

- Seven-bearing induction-hardened crankshaft with vibration damper. Lead-bronze main and connecting rod bearings.
- Stellite-flashed exhaust valves and hardened intake valves of the self-rotating type which seal against replaceable seats.

- Hyper-effective oil cooler and lubricating oil filter which keep the lubricating oil at its optimum operating temperature and guarantee low bearing wear and maximum dependability.
- Three Solex down-draft carburetors connected in parallel. Each of the carburetors is fitted with fixed jets and acceleration pump.
- Intake air silencer with flame arresters.
- Fuel pump driven from the camshaft and fitted with a fuel filter and also a hand primer.
- The electrical system includes an alternator with a particularly high charging capacity and is also fully protected from corrosion even down to the electric cable flat pin connectors.
- High location starter motor and alternator and a completely enclosed flywheel to eliminate the risk of bilge water damage.
- Water-cooled exhaust manifold of top quality alloy cast-iron. Water-cooled exhaust elbow for connecting up to rubber hose.
- Rubber mountings with adjustable installation height as extra equipment.
- Instrument panel with electric revolution counter, temperature gauge and warning lamps for charging and oil pressure.

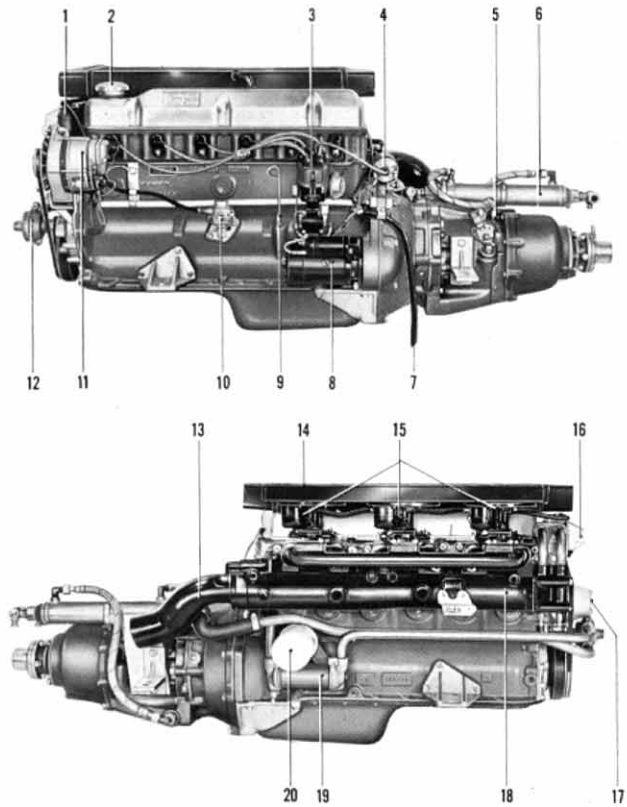
Volvo Penta six-cylinder, four-stroke
marine engine

170 h.p.

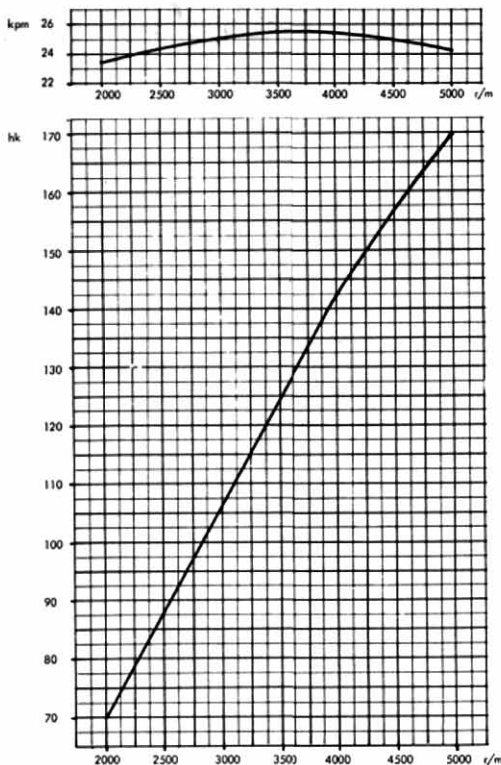


VOLVO PENTA MARINE ENGINE TYPE BB 170 A

1. Thermostat housing
2. Oil filler
3. Distributor
4. Ignition coil
5. Hydraulically actuated reverse/reduction gear type Borg Warner
6. Oil cooler, reverse gear
7. Cable harness
8. Starter motor
9. Oil dipstick
10. Fuel pump
11. Alternator, 12 V, 38 A
12. Sea-water pump
13. Water cooled exhaust elbow
14. Air intake silencer with flame arresters
15. Down-draft carburetors (3), Solex
16. Transistorized regulator
17. Circulation pump
18. Water cooled exhaust manifold
19. Oil cooler, engine
20. Spin-on full-flow oil filter



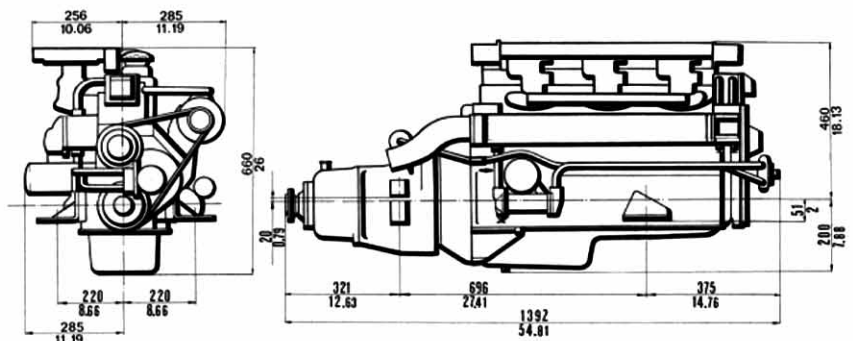
BB 170 A



DATA

Type of operation . . . Four-stroke carburetor engine with overhead valves
 Type designation . . . BB 170A
 Output (SAE) . . . 106-170 h.p.
 Engine speed, r.p.m. . . . 3000-5000
 Number of cylinders . . . 6 in line
 Capacity, litres (cu.in.) . . . 2.979(182)
 Bore/stroke, mm (in.) . . . 88.9/80(3.50/3.15)
 Compression ratio . . . 9.5:1
 Total weight, including reverse gear, kg(lb.)approx. . . 290(640)
 Max. engine inclination . . . 18°

DIMENSION DRAWING (engine with reverse/reduction gear)



We reserve the right to carry out modifications



AB VOLVO PENTA

Box 392, 401 26 Göteborg 1, Sweden
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 Telex 207 55



BB 170B



6-cylinder, 4-stroke carburetor engine
Propeller shaft output 104 kW (141 hp)

STANDARD EQUIPMENT

ENGINE BODY — Cylinder block and head made of special cast iron. Light-alloy pistons with 2 compression rings and one oil scraper ring. Crankshaft journalled in 7 bearings. Self-rotating, overhead valves. A tool kit for minor adjustment is supplied.

FUEL SYSTEM — Three downdraft carburetors with acceleration pumps (1) coupled in parallel. Fuel pump (2) driven from camshaft, equipped with hand primer and flexible hose with fuel pipe connection.

COOLING SYSTEM — Thermostat-controlled sea-water cooling system. Sea-water pump (4) with neoprene rubber impeller and circulation pump for effective cooling. Cleanable sea-water filter (3). BW type reverse gear has sea-water cooled oil cooler.

LUBRICATING SYSTEM — Pressure-lubricating system with full-flow lubricating oil filter of the spin-on type (5). Sealed crankcase ventilation (7). Cleanable, tubular-type oil cooler (6).

INTAKE SYSTEM — Silent Flow type intake silencer with built-in flame guard (9).

EXHAUST SYSTEM — Sea-water cooled exhaust manifold and manifold elbow of cast iron (8).

ELECTRICAL SYSTEM — Corrosionproof 12 V electrical system, with complete instrument panel. Main fusing mounted on engine with built-in spare fuses (11). Brushless alternator with built-in transistor regulator, 35 A, 420 W (10). Starter motor output 735 W (1 h.p.) (14).

ENGINE MOUNTING — The engine is supplied with engine brackets for fixed suspension (12).

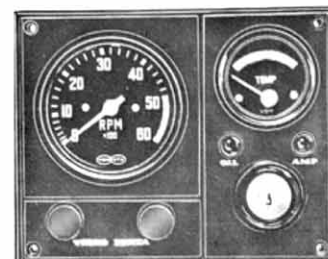
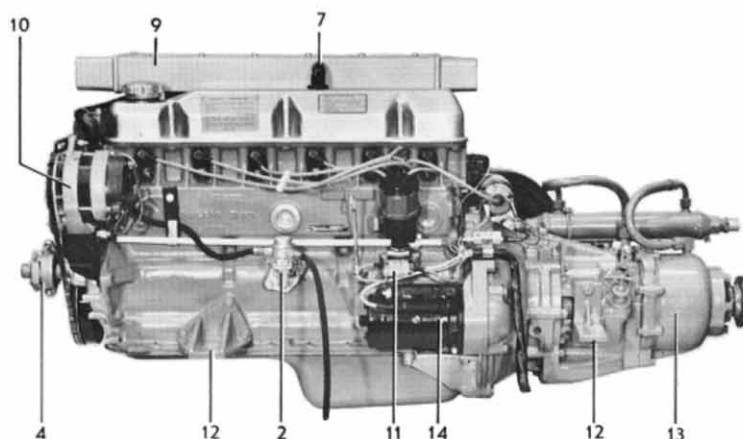
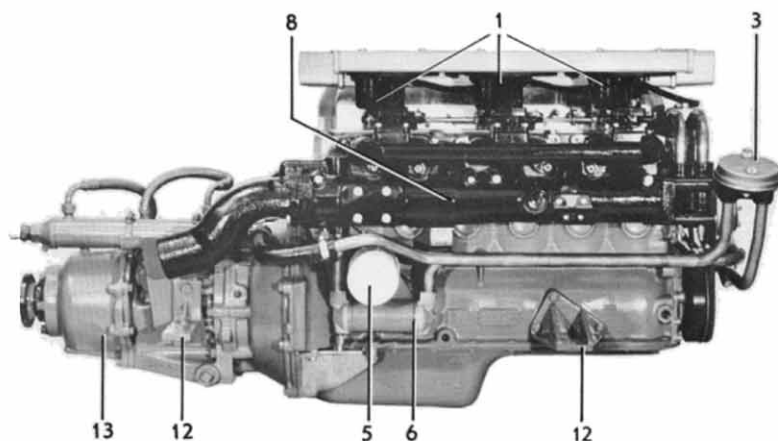
POWER TRANSMISSION — Hydraulic reverse gear type Borg Warner. Engine speed and reverse gear are operated by a single control lever. Bracket for control cables included.

Engine is supplied with reverse gear as follows:

- Alt. 1 Rev. gear type BW red. ratio 2:1, R-H prop. (13)
- 2 Rev. gear type BW red. ratio 2:1, L-H prop. (13)
- 3 Rev. gear type BW red. ratio 2.9:1, L-H prop. (13)

Propeller shaft flange for 35 mm propeller shaft — red. ratio 2:1

Propeller shaft flange for 40 mm propeller shaft — red. ratio 2.9:1



Instrument panel is provided with key switch, rev counter, temperature gauge, warning lamps for battery charging and oil pressure, switch for instrument lighting and one extra switch. Cable harness, 7 m (23 ft.) in length, with plug-in contact.

EXTRA EQUIPMENT

FUEL SYSTEM

Water-separating filter with or without flexible hoses.
 Fuel line kit with copper piping and installation parts.
 Electrically operated fuel pump

COOLING SYSTEM

Cooling water intake complete with cock and hose.

EXHAUST SYSTEM

Through - hull fitting
 Rubber exhaust hose
 Water-cooled silencer, complete
 Connection flanges for exhaust line

ELECTRICAL SYSTEM AND INSTRUMENT

Charging distributor for charging 2-battery system
 Electric-hourmeter
 Master switch
 Cable harness extension
 Instrument panel for extra instruments
 Automatic alarm for oil pressure and water temperature

ENGINE MOUNTING

Flexible engine mounting

BOAT ACCESSORIES

Electrically operated bilge pump
 Original paint
 Oils
 Electro-mechanical trim tab
 On board kits

CONTROLS AND CONTROL SYSTEM

VP single-control lever for both speed and forward-reverse operation, top-mounted or side-mounted. Single or twin installation.
 Neutral-position switch - automatic safety interlock for VP-controls
 Push-pull controls
 Control cables
 Steering gears
 Steering wheels
 Steering cables
 Ball joint and fork kit for steering cable

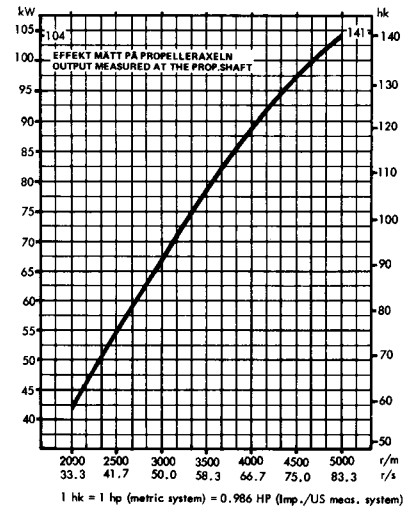
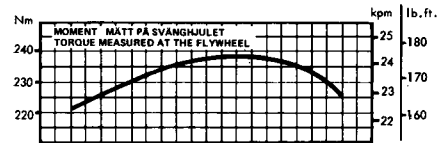
PROPELLER EQUIPMENT

Flexible coupling
 Propeller shafts
 Propeller shaft sleeves
 Propellers

DATA

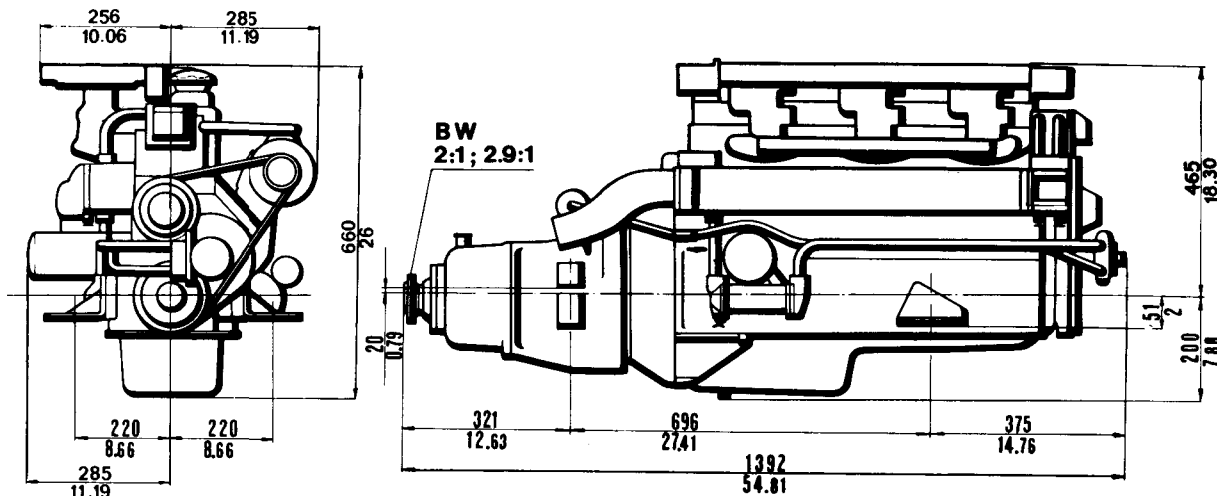
Type of operation 4-stroke carburetor engine with overhead valves
 Designation BB170B
 Propeller shaft output¹⁾ 104 kW (141 hp)
 Max. operating speed, r/s (rpm) 83.3 (5000)
 Number of cylinders 6 in-line
 Capacity, dm³ (in³) 2.979 (182)
 Bore/Stroke, mm (in) 88.9/80 (3.50/3.15)
 Compression ratio 9.5:1
 Fuel quality min. 97 octane
 Total weight, engine with reverse gear, appr. kg (lb) 310 (685)

1) The diagram indicates the propeller shaft output for a run-in engine with hydraulic reverse gear according to DIN 6270 Leistung B. The engine flywheel output is approx. 13.5 % higher.



1 hk = 1 hp (metric system) = 0.986 HP (Imp./US meas. system)

DIMENSION DRAWING



AB VOLVO PENTA

Box 392, S-401 26 Gothenburg 1, Sweden
 Telephone: 031/23 54 60
 Telegrams: Penta
 Telex: 207 55

We reserve the right to carry out modifications





BB 170C



**6-cylinder, 4-stroke carburetor engine
Propeller shaft output 104 kW (141 hp)**

STANDARD EQUIPMENT

ENGINE BODY — Cylinder block and head made of special cast iron. Light-alloy pistons with 2 compression rings and one oil scraper ring. Crankshaft journalled in 7 bearings. Self-rotating, overhead valves. A tool kit for minor adjustment is supplied.

FUEL SYSTEM — Three downdraft carburetors with acceleration pumps (1) coupled in parallel. Fuel pump (2) driven from camshaft, equipped with hand primer and flexible hose with fuel pipe connection.

COOLING SYSTEM — Thermostat-controlled sea-water cooling system. Sea-water pump (4) with neoprene rubber impeller and circulation pump for effective cooling. Cleanable sea-water filter (3). BW type reverse gear has sea-water cooled oil cooler.

LUBRICATING SYSTEM — Pressure-lubricating system with full-flow lubricating oil filter of the spin-on type (5). Sealed crankcase ventilation (7). Cleanable, tubular-type oil cooler (6).

INTAKE SYSTEM — Silent Flow type intake silencer with built-in flame guard (9).

EXHAUST SYSTEM — Sea-water cooled exhaust manifold and manifold elbow of cast iron (8).

ELECTRICAL SYSTEM — Corrosionproof 12 V electrical system, with complete instrument panel. Main fusing mounted on engine with built-in spare fuses (11). Brushless alternator with built-in transistor regulator, 35 A, 420 W (10). Starter motor output 735 W (1 h.p.) (14).

ENGINE MOUNTING — The engine is supplied with engine brackets for fixed suspension (12).

POWER TRANSMISSION — Hydraulic reverse gear type Borg Warner. Engine speed and reverse gear are operated by a single control lever. Bracket for control cables included.

Engine is supplied with reverse gear as follows:

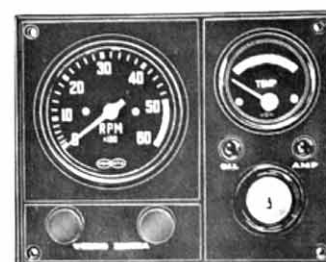
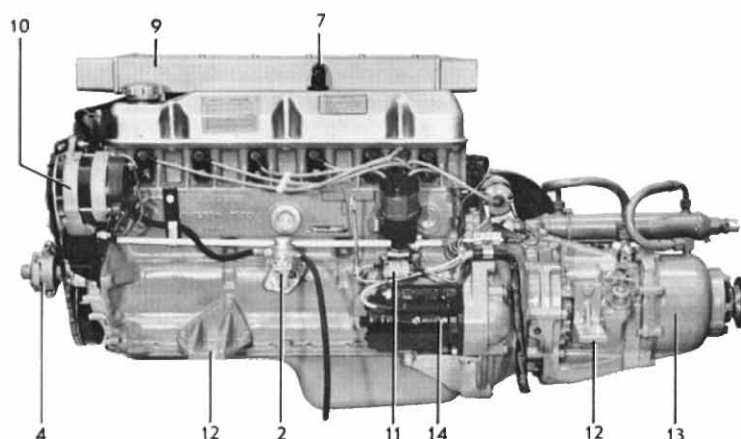
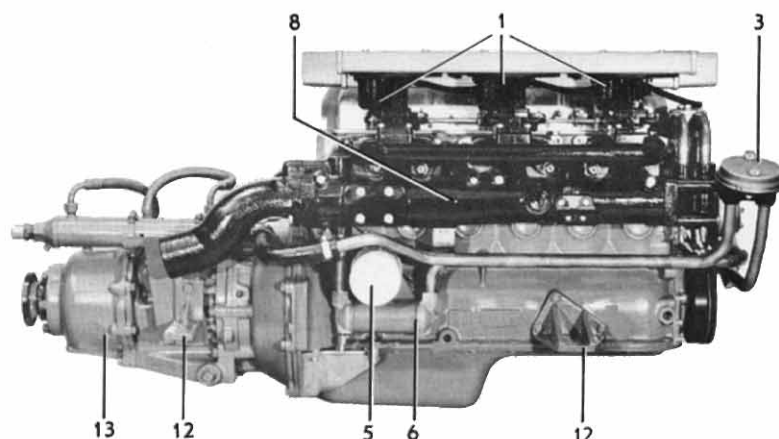
Alt. 1 Rev. gear type BW red. ratio 2:1, R-H prop. (13)

2 Rev. gear type BW red. ratio 2:1, L-H prop. (13)

3 Rev. gear type BW red. ratio 2.9:1, L-H prop. (13)

Propeller shaft flange for 35 mm propeller shaft — red. ratio 2:1

Propeller shaft flange for 40 mm propeller shaft — red. ratio 2.9:1



Instrument panel is provided with key switch, rev counter, temperature gauge, warning lamps for battery charging and oil pressure, switch for instrument lighting and one extra switch. Cable harness, 7 m (23 ft.) in length, with plug-in contact.

EXTRA EQUIPMENT

FUEL SYSTEM

Water-separating filter with or without flexible hoses.
Water separatet.
Fuel line kit with copper piping and installation parts.
Cap with connections for fuel tank.

COOLING SYSTEM

Cooling water intake complete with cock and hose.

EXHAUST SYSTEM

Through — hull fitting
Rubber exhaust hose
Water-cooled silencer, complete
Connection flanges for exhaust line

ELECTRICAL SYSTEM AND INSTRUMENT

Charging distributor for charging 2-battery system
Extra instruments: Hourmeter, fuel- and water gauge, voltmeter oil pressure gauge, rudder indicator.
Master switch
Cable harness extension
Instrument panel for extra instruments
Automatic alarm for oil pressure and water temperature

ENGINE MOUNTING

Flexible engine mounting

BOAT ACCESSORIES

Electrically operated bilge pump
Original paint
Oils
Electro-mechanical trim tabe
On board kits

CONTROLS AND CONTROL SYSTEM

VP single-control lever for both speed and forward-reverse operation, top-mounted or side-mounted. Single or twin installation.
Control cables
Steering gears
Steering lock
Steering wheel
Steering cables
Ball joint and fork kit for steering cable

PROPELLER EQUIPMENT

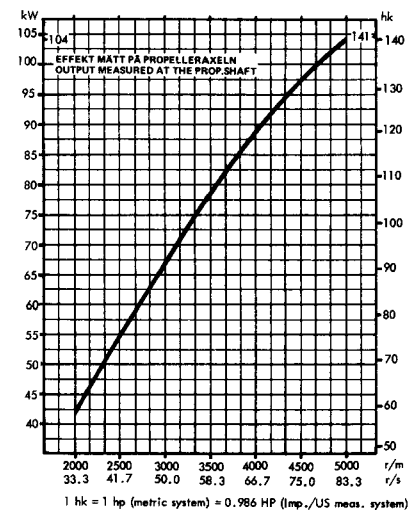
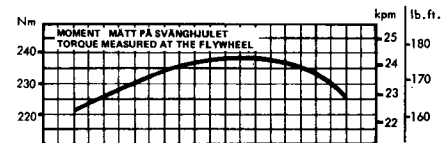
Flexible coupling
Clamp coupling
Propeller shafts
Propeller shaft sleeves
Propellers

DATA

Type of operation	4-stroke carburetor engine with overhead valves
Designation	BB170C
Propeller shaft output ¹⁾	104 kW (141 hp)
Max. operating speed, r/s (rpm)	83.3 (5000)
Number of cylinders	6 in-line
Capacity, dm ³ (in ³)	2.979 (182)
Bore/Stroke, mm (in)	88.9/80 (3.50/3.15)
Compression ratio	9.0:1
Fuel quality ¹⁾	min. 90 octane
Total weight, engine with reverse gear, appr. kg (lb)	310 (685)

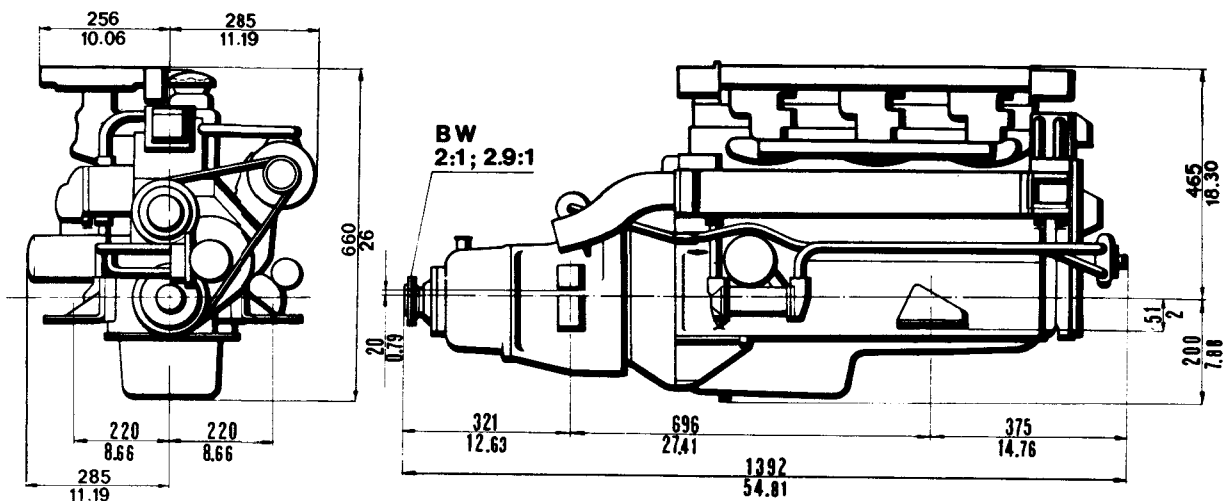
1) The diagram indicates the propeller shaft output for a run-in engine with hydraulic reverse gear according to DIN 6270 Leistung B. The engine flywheel output is approx. 13.5 % higher.

2) The engine can be run on unleaded fuel.



1 hk = 1 hp (metric system) = 0.986 HP (Imp./US meas. system)

DIMENSION DRAWING



AB VOLVO PENTA

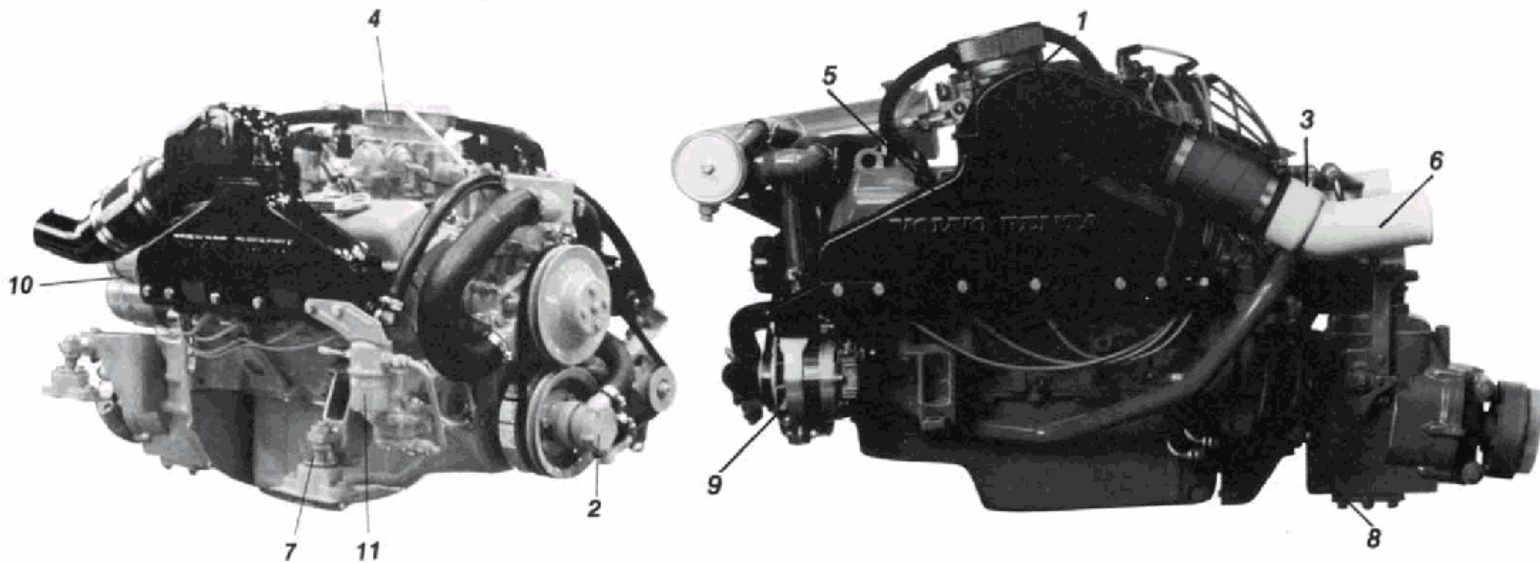
S 405 08 Gothenburg, Sweden
Telephone: 031/23 54 60
Telegrams: Penta
Telex: 207 55

We reserve the right to carry out modifications



BB231A/MS4A

PRODUCT BULLETIN



V-8, 4-stroke gasoline marine engine with "MS4" series transmission BB231A—output: 229 h.p.*

High quality, dependable gas inboard performance, delivering 229 h.p., combined with exclusive Volvo Penta easy maintenance, long life components. The BB231A utilizes special alloy cylinder block and heads designed for the marine environment, aluminized oil pan, a 5 main bearing crankshaft, overhead valves with hydraulic lifters, starter motor and remote mounted oil filter at the top of the bell housing, four barrel carburetor, and a thermostatically controlled cooling system. New swirl port cylinder heads designed for more efficient combustion and optimum fuel economy.

Combined with Volvo Penta's unique MS4A transmission, this powerful package puts the latest marine technology at your command. The MS4A mechanical gears provide up to 10% more horsepower at the propeller than comparable hydraulic transmissions. In addition to greater performance these gears incorporate an 8° down angle which allows for a lower overall engine installation and optimal open deck space. This transmission allows the use of identical engines for left or right handed propeller rotation, providing flexibility for either single or twin installation.

STANDARD EQUIPMENT

ENGINE BODY — Special cast iron cylinder block and "swirl port" cylinder heads made of special light-alloy. Aluminum alloy pistons with two compression rings and one oil scraper ring. Crankshaft mounted in five bearings. Overhead valves with hydraulic valve lifters and self-rotating exhaust valves. Newly designed larger diameter inlet valves.

FUEL SYSTEM — Four-barrel carburetor with automatic choke (1). Fuel pump driven from camshaft. Spin on fuel filter (11).

COOLING SYSTEM — Thermostatically controlled sea-water cooling system. Sea-water pump (2) with neoprene rubber impeller and a separate circulation pump for effective cooling.

LUBRICATING SYSTEM — Pressure-lubricating system with full-flow spin-on oil filter (3) remotely mounted above transmission for accessibility. Sealed crankcase ventilation system.

INTAKE SYSTEM — U.S. Coast Guard approved flame arrester (4).

EXHAUST SYSTEM — Sea-water cooled cast iron exhaust manifolds (5) with high exhaust risers and exhaust elbows (6).

ENGINE MOUNTING — Flexible front and rear rubber engine mounts (7), are adjustable laterally and vertically.

MARINE TRANSMISSION — MS4A (8) reverse gear with a respective reduction ratio of 1.54 or 1.93 and an 8° propeller shaft down angle. Easy access built-in oil cooler. Oil dipstick. Helical cut gears. Patented cone clutch. Slip coupling to help prevent transmission damage. Uses same type oil as engine. Permits operation with either right or left hand propeller rotation, making it ideal for twin engine installations.

ELECTRICAL SYSTEM — Corrosion resistant 12 V electrical system includes pre-wired engine harness. Optional full instrumentation, complete with panel and 23 ft. (7m.) cable harness with plug-in contact. Circuit breaker mounted on engine. UL-listed 50 Amp. (600 W) alternator (9) with voltage regulator. UL-listed starter motor (10) output 1.3 h.p. (.96 kw) is located high and dry above the transmission.

INSTRUMENT PANEL — (Optional). Includes key, ignition switch, tachometer, temperature gauge, oil pressure gauge, voltmeter, switch for instrument lighting, and covered recess for additional instrument installation. Other options provide above panel with matching fuel tank gauge and/or varied length wiring harnesses.

*Maximum flywheel output according to SAE J 607.

VOLVO PENTA

Volvo Penta 740 Series

A new "Big Block" 4-stroke V8 gasoline marine engine with the unique DUOPROP outdrive

Volvo Penta's new 740 marine engine – a 7.4 litre, V8 unit equipped with the unique DUOPROP drive or, as an alternative, with the MS5 gearbox for inboard installation – is a propulsion system which combines high top speed, first class driving comfort and excellent acceleration with fuel economy for a gasoline engine in the big block power class.

This new marine propulsion system boasts a range of practical features designed to help enhance both engine life and boating pleasure. Like all earlier Volvo Penta marine engines the 740 is characterized by particularly "clean" styling which is not only aesthetically appealing but also offers ease of service and even greater reliability.

Located at the front of the engine, the water pump is driven directly by the five bearing crankshaft, while the elevated position of the oil filter simplifies its replacement. The oil filler cap is located on top of the engine, to help decrease the chance of oil spillage. A specially coated oil pan is fitted for increased corrosion protection. The main electrical unit (incorporating an miniature circuit breaker) is located in a conveniently high position on the engine while a practical and well-designed molded "rainhat" helps to protect the carburetor and ignition system.

The cylinder block and head are of a special cast iron which helps minimize the risk of corrosion, while the self-adjusting hydraulic valve lifters help ensure accurate valve clearance and eliminate the need for adjustment. The exhaust system features fully waterjacketed manifolds to help reduce the engine compartment temperature and the breakerless ignition system is of the electronic type to help provide more reliable



Volvo Penta 740/DP

starting. With a capacity of 14 V/50A, the alternator is designed especially for marine applications. The system also incorporates a charge regulator sensor.

The engine can also be available with a new and unique **silencer system** which will meet stringent noise requirements. The exhaust system

provides low back-pressure and thereby minimal performance losses. The system is delivered in complete kits and is very easy to install. Two different designs are offered: One for direct connection to the stern and another where the outgoing exhaust gases are either led out through the stern or hull.

The unique qualities of the DUOPROP outdrive are utilized to maximum advantage in today's performance cruisers for single or twin installations. The drive is designed especially to match the high torque developed by the 740 engine with its 1.78:1 ratio and for this reason stainless steel propellers, are used as standard.

The Volvo Penta DUOPROP is a unique system featuring dual counter rotating propellers one behind the other – a configuration which produces a combination of low steering force, low noise levels, reduced planing threshold, excellent acceleration and low fuel consumption. Computer display instrument is standard, monitoring the trim and beach angle and with a digital display indicating the exact position of the outdrive under all running conditions.

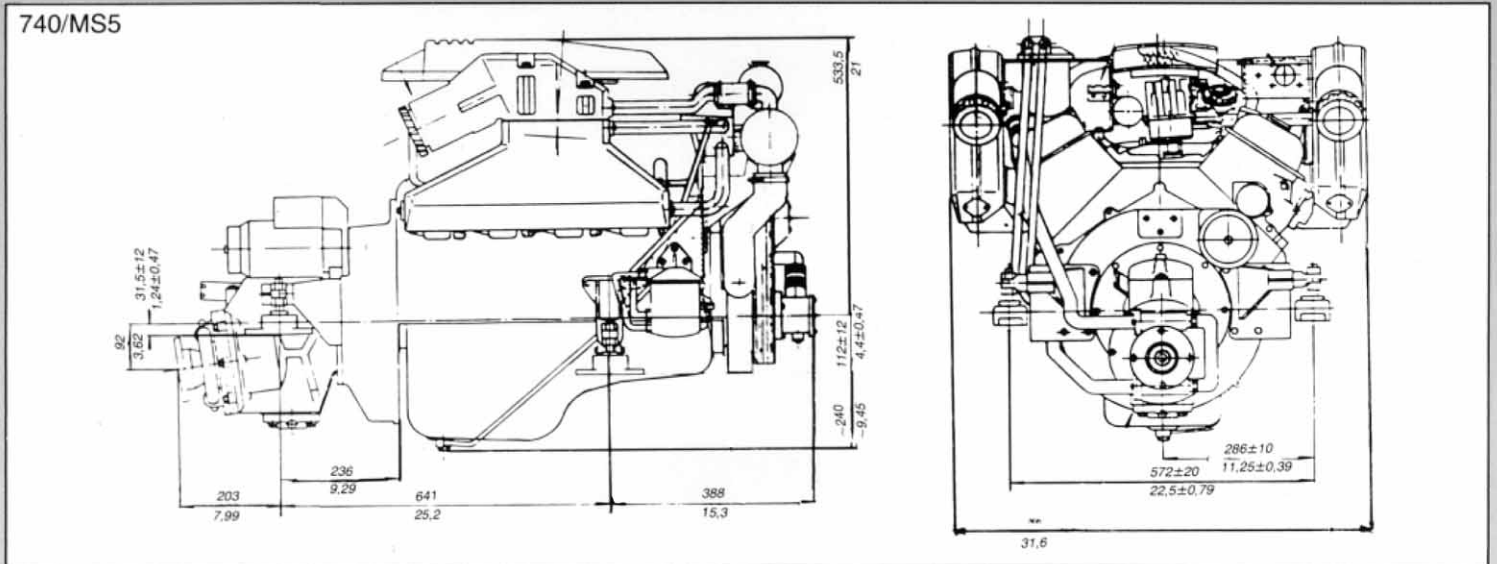
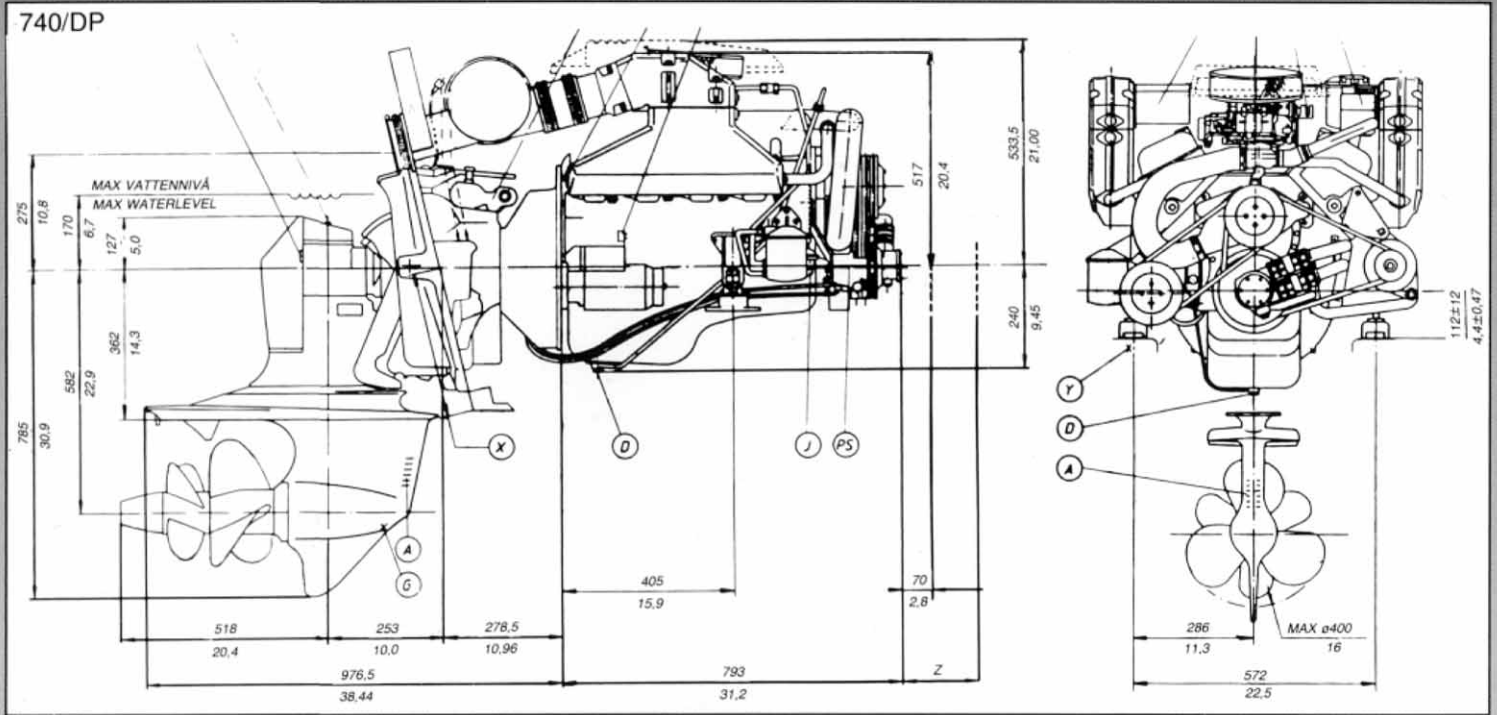
The engine is also available with the Volvo Penta MS5 reversing gearbox for inboard installations. With ratios of 1.5:1, 1.9:1 and 2.4:1, this gear has been designed especially for the 740 Series. In addition to its high efficiency, the gearbox may be operated continuously in either direction. The unit has an output shaft with a down angle of 8° to minimize installation height. Standard equipment includes oil pressure and cooling water temperatures sensors, while a new type of reversible exhaust gas risers have been developed for improved flexibility of installation.

The 740 – Volvo Penta's new V8 powerplant – leaves nothing to be desired in terms of top speed, acceleration or fuel economy. This "Big Block" engine is an exciting new development for all boating enthusiasts who demand the ultimate in performance.



Volvo Penta 740/MS 5

DIMENSION DRAWINGS (mm/inch.)



ENGINE DATA

Engine Designation: Sterndrive:	740/DP
Inboard:	740/MS5
Type/Number of Cylinders:	V8
Bore/Stroke:	108×101.6 mm (4.25/4.00)
Displacement:	7.4 Litres (454 cu.in.)
Compression Ratio:	8.0:1
Idling speed:	750 r/min
Crankshaft power	243 kW (330 h.p.)*
Propeller shaft power	220 kW (300 hp)*
Max. Speed Range:	4000–4400 r/min
Fuel Grade:	91 octane RON, RON + MON/2 = min. 87 octane
Outdrive, Type/Ratio:	DUOPROP, 1.78:1
Gear Box/Ratios:	MS5, 1.5:1, 1.9:1, 2.4:1
Dry Weight, Engine + DUOPROP:	522 kg (1150 lbs.)
Dry Weight, Engine + MS5:	456 kg (1005 lbs.)

*Prop.shaft power acc. to ISO 8665 or acc. to the technically identical standards SAE J1228 and ICOMIA 28-83.
Crankshaft power acc. to SAE J607.
Crankshaft power acc. to ISO 8665.
Usable power will be reduced by transmission or gearbox losses.

Power rated in accordance with NMMA procedure.
The power will be different for other optional configurations.
The Duoprop drive enables utilization of about 10% higher propeller thrust at full throttle when compared with a Singleprop drive.
Prop.shaft power indicated at mid of recommended speed range (gasoline models).

Volvo Pentadan
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O.C
29/4/2007

**VOLVO
PENTA**

AB Volvo Penta
S-405 08 Göteborg, Sweden

Volvo Penta reserves the right, without prior notice, to revise prices, materials, standard equipment, specifications, models and to discontinue models. Not all models, standard equipment, and accessories are available in all countries. The performance and power data presented in this brochure is for boats, engines and conditions as tested and may vary within manufacturing tolerances.