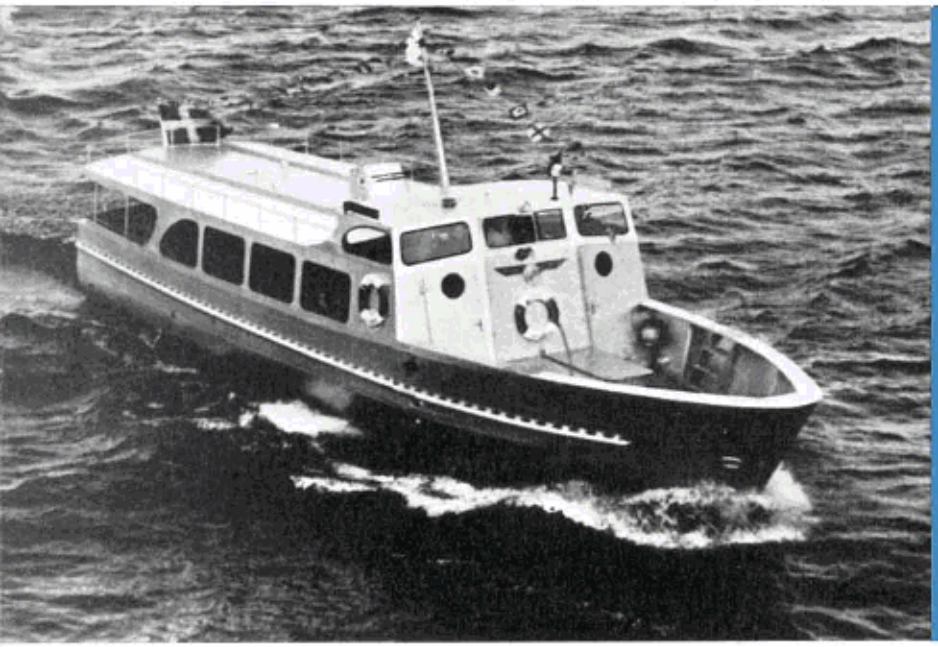
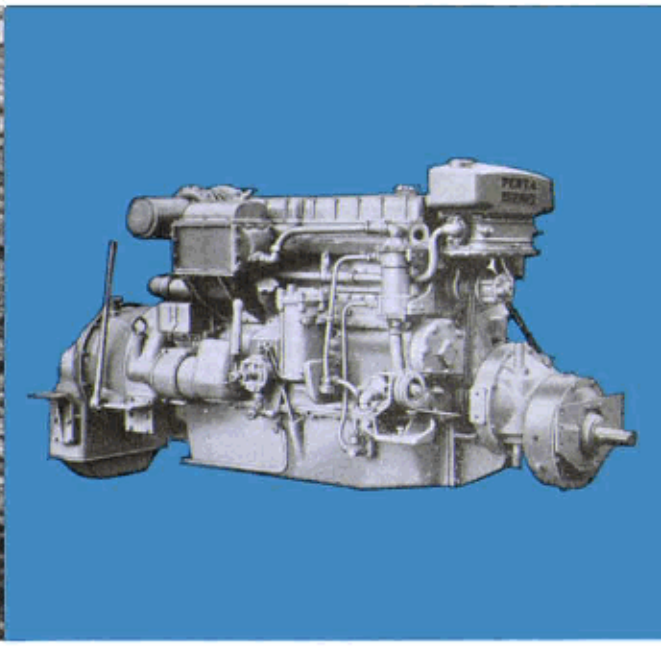
PENTA • TIMD 96

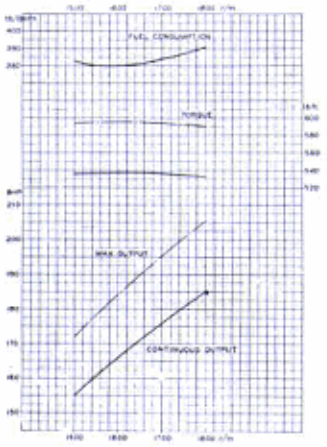
PENTA MARINE DIESEL ENGINE





Data for TIMD 96

Maximum output	205 h.p. at 1800 r.p.m.
Marine output	185 h.p. at 1800 r.p.m.
	155 h.p. at 1500 r.p.m.
Marine torque	74 kgm (535 lb.ft.) at 1500 r.p.m.
Capacity, total	9.6 litres
Number of cylinders	6
Bore	121 mm (4.75″)
Stroke	140 mm (5.51″)
Valves	Overhead
Compression ratio	17:1
Net weight	approx. 1300 kg (2870 lb.)



Technical specifications

Penta Marine Diesel Engine with type designation TIMD 96 is a four-stroke, direct-injection Diesel engine with the combustion chamber located to the greater part in the crown of the piston.

The cylinder block is made of cast-iron with separate cylinder liners, the block being integrally cast with the crankcase.

The cylinder head is made of special-alloy cast-iron with a high degree of heat resistance. Consists of two separate units each covering three cylinders and interchangeable. Replaceable special steel valve seats.

The oil sump is made of cast-iron. It is fitted with large inspection covers through which the bolts on the big-end bearing caps can be removed and thus enable piston and cylinder liner replacement to be carried out without having to lift the engine out of the boat.

The cylinder liners are of the wet type and are easily replaceable.

The pistons are of forged light-alloy.

The connecting rods are drop-forged and toughened.

The crankshaft is drop-forged, powerfully dimensioned, dynamically balanced and carried in seven bearings with all bearing journals surface-hardened. The total effective main bearing area is 297 cm² (46 sq.in.).

The bearing shells are easily replaceable and consist of steel shells with lead-bronze linings.

The camshaft is drop-forged and case-hardened with ground cams and bearing surfaces. Timing gears obliquely cut.

The valves. Nickel-steel inlet valves, Chrome-nickel steel exhaust valves with stellited seats. Hydraulic, self-adjusting tappets.

The fuel system. Fuel injection pump with centrifugal governor and directly driven feed pump. Twin fuel filters with one pre-filter. Four-hole type injectors.

The lubricating system. Pressure lubrication. All the oil under pressure passes through a tubular oil cooler and a cloth-type filter.

The cooling system. The engine and the exhaust manifold, are fresh-water cooled. The fresh water is, in its turn, cooled by sea-water in a heat exchanger. Automatic thermostat control system for control of engine temperature.

The electrical system. 24-volt system. 6 h.p. starter motor. Dynamo with a continuous output of 380 watts, maximum output 480 watts. Automatic charging relay.

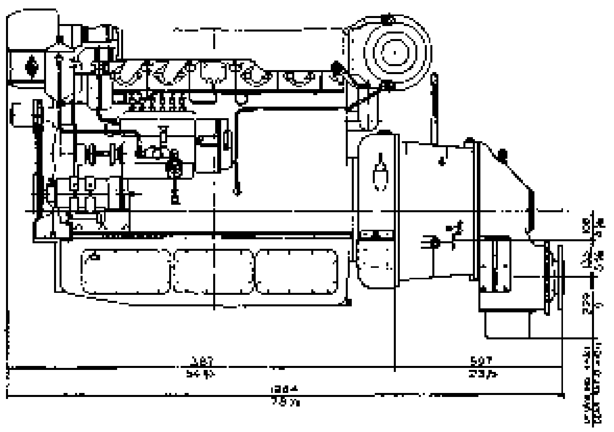
The turbo-compressor, which is fresh-water cooled and pressure-lubricated, is fitted on the rear end of the exhaust manifold. A flexible exhaust line connector is supplied with the engine. On the TIMD 96 the compressed air fed to the engine passes through a tubular cooler, the tubes of which are surrounded by sea water.

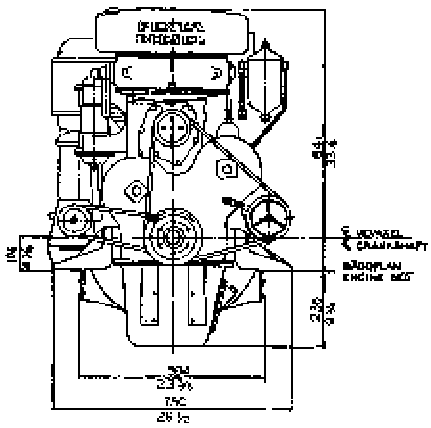
The instruments. Instrument panel with mechanical revolution counter, oil pressure gauge, remote reading temperature gauge for the cooling water, starter motor switch, stop button, key switch, charging control lamp and indirect lighting for instrument panel complete with switch. A connector line 3 metres (10 ft.) and other parts for connection to the engine are also supplied as well as a master switch for the complete engine electrical system and a wiring diagram.

The reverse gear is machanically operated with a 1:1, 2:1, 3:1 or 4.4:1 reduction gear or hydraulically operated with a 1:1, 2:1, 3:1, 4.4:1 or 4.7:1 reduction gear.

Friction clutch with a 4.7:1 reduction gear intended for use with variable pitch propeller equipment.

Power take-off on forward end of engine. Friction clutch or flexible coupling.





AKTIEBOLAGET

PENTA

Box 392, Göteborg 1
Sweden
Cables: Penta
— a Volvo company

Printed in Sweden, Holmqvists, Gbg.

VOLVO PENTA
MD 100B

All the components in this engine are designed and constructed to stand up to the severe demands that may be made on a modern marine diesel engine intended for very heavy duty operation.

A separate cylinder head for each cylinder ensures individual sealing, a more stable head system and also facilitates servicing.

Oil sump with inspection covers for lower part of crankcase.

Special ring carriers increase the lifetime of the pistons, the piston rings and the cylinder liners.

The extremely liberally dimensioned crankshaft has a polygon profile on its front end to drive larger units of auxiliary machinery such as winches, pumps, etc.

Camshaft carried in seven bearings.

Gear drive of the camshaft, sea-water pump, injection pump and oil pump which ensures reliable operation and a compact engine unit.

Gear-driven power take-offs on front end for bilge pumps, etc.

Designed so that two starter motors can be fitted.

Fuel injection pump with centrifugal governor.

Effective filter equipment through which the fuel oil is carefully cleaned before it is injected into the engine.

Pressure lubricating system with two oil filters of the full-flow type, easily replaceable. Oil cooler.

The engine is fresh-water cooled and fitted with a heat exchanger of the tubular type, completely protected from corrosion. An easily removable element facilitates cleaning of the system.

Engine temperature is regulated by means of three wax thermostats which ensure rapid warming-up of the engine and also an unvarying and suitable engine temperature.

Gear driven 1 1/4" sea-water cooling pump with high capacity.

Outstanding cooling of the injectors prevents the formation of carbon deposits.

Fresh-water-cooled exhaust manifold and outlets.

Standard equipment includes an electrical stop device.

An electrical system with an alternator, 24 V – 25 A (600 W), provides battery charging even at idling speed. Optional outputs: 24 V – 70 A (1700 W) and 32 V – 70 A (2200 W). 6 h.p. starter motor.

Instrument panel with electric revolution counter, oil and temperature gauges, starter motor switch, electrical stop control, key switch, charging control lamp and switch for the indirect instrument lighting as well as master switch for the entire engine electrical system.

One single connector for electrical cables facilitates installation.

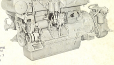
The engine can be supplied with various types of reverse gears and clutches with reduction gears as well as front end power takeoffs with various reduction ratios.

TD 100 B (THD 100)
220 KW 2200 rpm

Volvo Penta
six-cylinder, four stroke
marine diesel engine
with direct injection

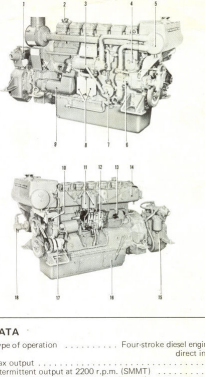
195 h.p.

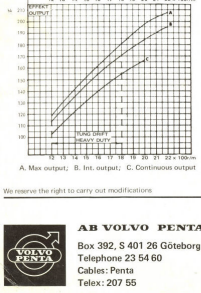
CEMBERCI



Volvo Penta marine diesel engine type MD 100B

1. Oil cooler for reverse gear
2. Oil filler cap
3. Oil cooler
4. Inspection cover
5. Heat exchanger
6. Sea-water pump
7. Sump emptying pump
8. Lubricating oil filters
9. Starter motor
10. Charging relay
11. Fuel filters
12. Fuel injection pump
13. Solenoid cut-out for fuel injection pump
14. Exhaust manifold (water cold)
15. Reverse gear, SCG 350 HD Mk II ratio 4:1
16. Inspection cover
17. Alternator
18. Bilge pump





A. Max output; B. Int. output; C. Continuous output

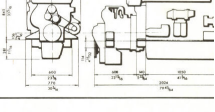
We reserve the right to carry out modifications

DATA

Type of operation . . . . . Four-stroke diesel engi
direct in

Max output . . . . .
Intermittent output at 2200 r.p.m. (SMMT) . . . . .
Continuous output at 1800 r.p.m. (SMMT) . . . . .
Intermittent torque at 1500 r.p.m. . . . . 69.7 kgm (504
Continuous torque at 1500 r.p.m. . . . . 63.0 kgm (456
Number of cylinders . . . . .
Displacement, total . . . . . 9.6 litres (585
Bore . . . . . 120.65 mm (4
Stroke . . . . . 140 mm
Net weight, engine unit, approx. . . . . 1140 kg (25
Max inclination of engine under way . . . . .

DIMENSION DRAWING (Engine with SCG reverse gear



AB VOLVO PENTA

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Printed in Sweden, Gotab

ENGINE DIAGRAM

MARIN DIESELMOTOR
MARINE DIESEL ENGINE

Grupp Nr / Group No: 21 125

Distr.

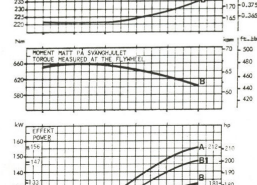
Motor / Engine: MD100B

NÖJESBÅTSDRIFT / PLEASURE CRAFT DUTY

Date: 10/1981

ALLMÄNNA DATA / GENERAL DATA

Fyrtakts dieselmotor med direktinsprutning. Four stroke diesel engine with direct injection.		
Topventiler. Overhead valves.		
Cylinderantal / No of cylinders		6
Slagvolym total / Displacement total	dm3	9,6
	in3	585
Slaglängd / Stroke	mm	140
	in	5.51
Cylinderdiameter / Bore	mm	120,65
	in	4,75
Kompressionsförhållande / Compression ratio		17:1
		17:1
Max tillåten lutning bakåt under gång / Max permissible inclination backwards under way		15°
		15°
Rotationsriktning, moturs sett mot svänghjul / Rotation direction, anti-clockwise viewed towards flywheel		



Kurva A: Högsta svänghjulseffekt som kan tas ut i provrun utan termisk överbelastning. Effekten motsvarar DIN 6270 "Höchstleistung".

Kurva B1: Svänghjulseffekt för nöjesbåtsdrift vid havets nivå, Lufttryck 1,01 bar (760 mm Hg), temperatur + 15,0°C.

Kurva B: Propelleraxeleffekt för nöjesbåtsdrift enligt DIN 6270 Leistung B (motsvarar för praktiskt bruk även 1-timmes effekt enligt BS 649, 1958). Full effekt får endast utnyttjas undantagsvis. Båtens marschfart måste dessutom ligga avsevärt under maxfarten.

Motorns svänghjulseffekt är ca 4% högre än angivna värden för B-kurvan.

Samtliga mätningar gäller för inkörd motor.

OBS! Önskad effektinställning skall anges på motorordern.

Curve A: Highest flywheel power obtainable in the test room without thermal overload. Unit power corresponds to DIN 6270 "Höchstleistung".

Curve B1: Flywheel power for pleasure craft duty (sea level conditions). Air pressure = 1,01 bar (29.2 in merc), temperature + 15.0°C (60°F).

Curve B: Propeller shaft power for pleasure craft duty according to DIN 6270 Leistung B (corresponds for practical use also to 1-hour's power according to BS 649, 1958). Only occasional use at full engine throttle. Normal cruising is expected to be at a comfortable part-throttle operation.

The flywheel power for the engine is approx 4% higher than the indicated values for B-curve.

All measurements apply to a run-in engine.

NOTE! Desired power set should be stated on the engine order.

Postal address
S-405 08 Göteborg

Telex
20755 PENTA S

MD 100B Commercial Duty

ENGINE DIAGRAM

MARIN DIESELMOTOR
MARINE DIESEL ENGINE

Grupp Nr / Group No: 21 125-1

Distr:

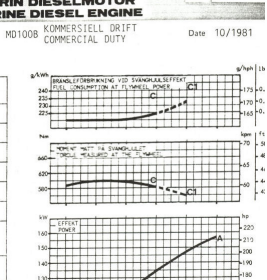
Motor / Engine MD100B

KOMMERSIELL DRIFT / COMMERCIAL DUTY

Date 10/1981

ALLMÄNNA DATA
GENERAL DATA

Fyrtakts dieselmotor med direktinsprutning. Four stroke diesel engine with direct injection.		
Topventiler. Overhead valves.		
Cylinderantal / No of cylinders		6
Slagvolym total / Displacement total	cm³ / in³	9,6 585
Slaglängd / Stroke	mm / in	140 5,51
Cylinderdiameter / Bore	mm / in	120,65 4,75
Kompressionsförhållande / Compression ratio		17:1 17:1
Max tillåten lutning bakåt under gång		15°
Max permissible inclination backwards under way		15°
Rotationsriktning, motors sett mot svänghjul / Rotation direction, anti-clockwise viewed towards flywheel		



Kurva A: Högsta svänghjulseffekt som kan tas ut i provrun utan termisk överbelastning. Effekten motsvarar DIN 6270 "Höchstleistung".

Kurva C1: Intermittent effekt för lätt kommersiell drift mätt på propelleraxeln enligt DIN 6270 Leistung B för Dauerbetrieb (motsvarar för praktiskt bruk även kontinuerlig effekt enligt BS 649, 1958). Full effekt får endast utnyttjas några få timmar/dag. Vidare får den totala körtiden inte överstiga 2000 timmar/år.

Kurva C: Effekt för kontinuerlig drift mätt på propelleraxeln enligt DIN 6270 Leistung B für Dauerbetrieb (motsvarar för praktiskt bruk även kontinuerlig effekt enligt BS 649, 1958).

Motorns svänghjulseffekt är ca 4% högre än angivna värden för C1- resp C-kurvan.

Samtliga mätningar gäller för inkörd motor.

OBS! Önskad effektinställning skall anges på motorordern.

Curve A: Highest flywheel power obtainable in the test room without thermal overload. This power corresponds to DIN 6270 "Höchstleistung".

Curve C1: Intermittent power for light commercial duty measured on the propeller shaft according to DIN 6270 Leistung B (corresponds for practical use also to continuous power according to BS 649, 1958). May be taken out max 4-hour per 12-hour period. Total operating time max 2000 hours/year.

Curve C: Power for continuous duty measured on the propeller shaft according to DIN 6270 Leistung B für Dauerbetrieb (corresponds for practical use also to continuous power according to BS 649, 1958). Highest power may be utilized only a few hours per day and the total annual usage must not exceed 2000 hours.

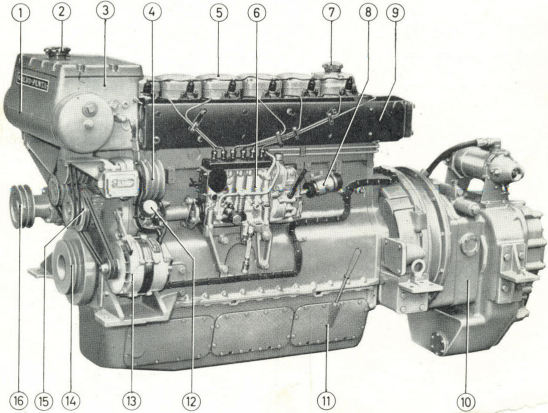
The flywheel power for the engine is approx 4% higher than the indicated values for C1- and C-curves.

All measurements apply to a run-in engine.

NOTE! Desired power set should be stated on the engine order.

114 kw 2000 rpm , 106 kw 1800 rpm

TMD 100A



un moteur

Caractéristiques techniques

Moteur

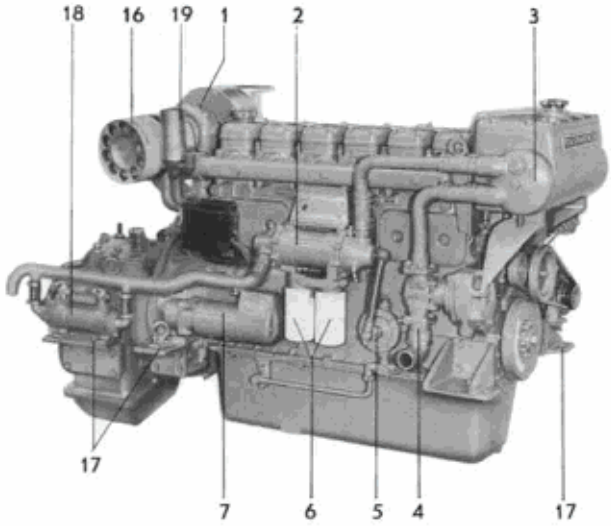
	MD 100 A	TMD 100 A
Désignation de type	9747/497251	9749/497254
Spécification	9748/497252	—
Nombre de cylindres	6	6
Alésage	120,65 mm	120,65 mm
Course	140 mm	140 mm
Cylindrée totale	9,6 litres	9,6 litres
Puissance marine maxi, en service continu (SMMT)	148 ch à 2200 tr/mn	225 ch à 2000 tr/mn
	143 ch à 2000 tr/mn	210 ch à 1800 tr/mn
	135 ch à 1800 tr/mn	
Couple maxi.	56,7 m.kg à 1100 tr/mn	86 m.kg à 1500 tr/mn
Pression en fin de compression, kg/cm² à tr/mn (nombre de tours du démarreur)	26/220	26/230
Ordre d'injection	1—5—3—6—2—4	
Régime d'emballement au régime de service de tr/mn	2345/2200	2175/2000
	2145/2000	1975/1800
	1975/1800	
Régime de ralenti, tr/mn	env. 450	
Sens de rotation, vu de l'avant	Sens des aiguilles d'une montre	
Chemises de cylindres, type	Humide, amovible	
Distribution	Soupapes en tête	
Jeu des soupapes, moteur froid ou chaud	Admission 0,40 mm	
	Echappement 0,70 mm	
Poids, moteur sans inverseur ou accouplement, en kg. env.	1120	1140
Culasses individuelles, nombre	6	

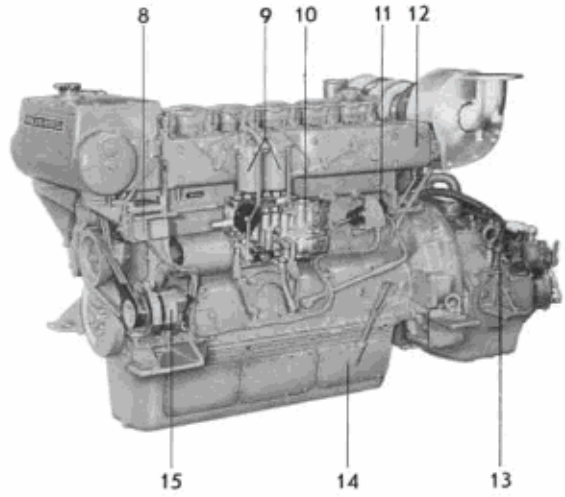
VOLVO PENTA

Ref. no 8503 Eng.

TMD 100A

6-cylinder, direct-injected 4-stroke diesel engine with turbo-charging.
Flywheel power at sea level conditions 175 kW (238 hp).
Air pressure 1,01 bar (29,2 in. merc), temperature 15°C (60°F).





STANDARD EQUIPMENT

ENGINE BODY – Cylinder block and cylinder heads of special alloy cast iron. Separate cylinder heads, one for each cylinder, with steel gaskets. Replaceable, wet-type cylinder liners. Pistons of light-alloy with cast iron ring carriers. Three compression rings and one oil scraper ring. The upper compression ring is chromed. Crankshaft and camshaft are journalled in seven bearings and have surface-hardened bearing races. Main- and big-end bearing shells of lead-bronze. At the front the crankshaft has a ploygon profile intended for driving winches, pumps, etc. The camshaft, drive outputs, raw-water, injection and lubricating oil pumps are gear-driven. Overhead valves with replaceable valve seats.
Tool kit is supplied.

FUEL SYSTEM – Injection pump with centrifugal governor (10) and feed pump as well as flexible hoses with fuel pipe connections for the suction and return lines. Electrically operated stop (11). Twin fine filters (9).

COOLING SYSTEM – Fresh-water cooling with heat exchanger (3) and removable, tubular type insert. 1 1/4" raw-water pump (4). The engine temperature is regulated by means of three thermostats.

LUBRICATING SYSTEM – Pressure lubricating system with double lubricating oil filters of spin-on type (6).
Raw-water cooled oil cooler (2). Scavenging pump for lubricating oil (5). Oil sump with inspection covers for lower crankcase (14).
Oil separating filter for crankcase ventilation (19).

SUPERCHARGING SYSTEM – Exhaust gas driven turbo-compressor for supercharging the intake air (1). Air cleaner with paper element (16).

EXHAUST SYSTEM – Fresh-water cooled exhaust manifold (12). The turbo compressor exhaust outlet has an exhaust elbow which can be fitted in different positions. Flexible compensator hose, 500 mm (20 in) in length, with connection flanges supplied separately.

ELECTRICAL SYSTEM – 24 V starter motor (7) 4,7 kW (6 hp).

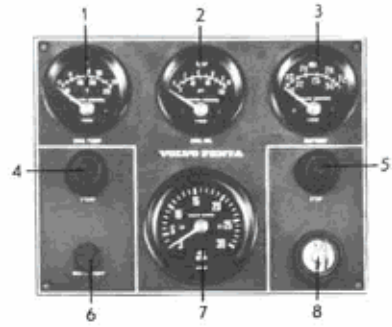
ENGINE MOUNTING – The engine is supplied with engine brackets for fixed mounting (17).

EXTRA EQUIPMENT

ELECTRICAL SYSTEM – Two-pole electrical system in marine design, complete instrument panel. Connector on instrument panel and terminal board on engine. Alternator (15), 24 V/25 A (600 W) with fully transistorized charging regulator (8). Overvoltage protector of 24 V type.

Instrument panel with:

1. Temperature gauge
2. Oil pressure gauge
3. Voltmeter
4. Start contact
5. Stop contact
6. Rheostat, instrument lighting
7. Rev counter
8. Key switch



POWER TRANSMISSION – The engine is supplied with hydraulically operated reverse gear equipped with oil cooler (18) and pre-drilled propeller shaft flange according to the following alternatives:

Alt. 1. Twin Disc MG 509 ratio 1,5:1 R-H and L-H prop.* (13).
2. red. ratio 2:1 for L-H and R-H prop.* (13)
3. red. ratio 3:1 for L-H and R-H prop.* (13)
4. red. ratio 3,8:1 for L-H and R-H prop.* (13)
5. red. ratio 4,5:1 for L-H and R-H prop.* (13)

* With or without trolling-device = slip valve for slow running.

CLASSIFICATION – The engine can be delivered classified in accordance with the requirements of the major classification societies.

PRODUCT BULLETIN

EXTRA EQUIPMENT

FUEL SYSTEM
Twin fuel filters
Water-separating fuel filter with glass or metal housing

COOLING SYSTEM
Fresh-water filter
Raw-water filter

LUBRICATING SYSTEM
Shift valve for oil filter

EXHAUST SYSTEM
Compensator for straight installation
Silencer, dry

POWER TRANSMISSION
Connection parts for Volvo Flygmotor's hydraulic pumps
Disengagable front-mounted power take-off
Drive outputs at front and rear of timing gear casing
Drive output for side fitting
Vee-belt pulley for crankshaft

ELECTRICAL SYSTEM
Alternator, 24 V 80 A
Charging distributor for charging 2-battery system
Electrically operated hourmeter
Automatic alarm for oil pressure and water temperature – optical or acoustical
Master switch

ENGINE MOUNTING
Flexible engine mounting

BOAT ACCESSORIES
Bilge pump direct-driven mounted on timing gear casing
Bilge pump for separate mounting
Ejector for bilge pump
Oils
Paints
Anti-freeze
Rustproofing

PARTS
Parts for classifiable engines

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
S-type control. Top-mounted, only speed regulation, or monoeuvering slip valve
Control cables

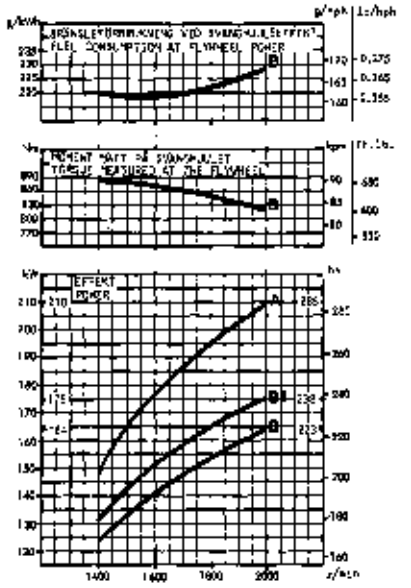
PROPELLER EQUIPMENT
Flexible propeller shaft coupling
Propeller shafts
Propeller shaft sleeves
Propellers

DATA

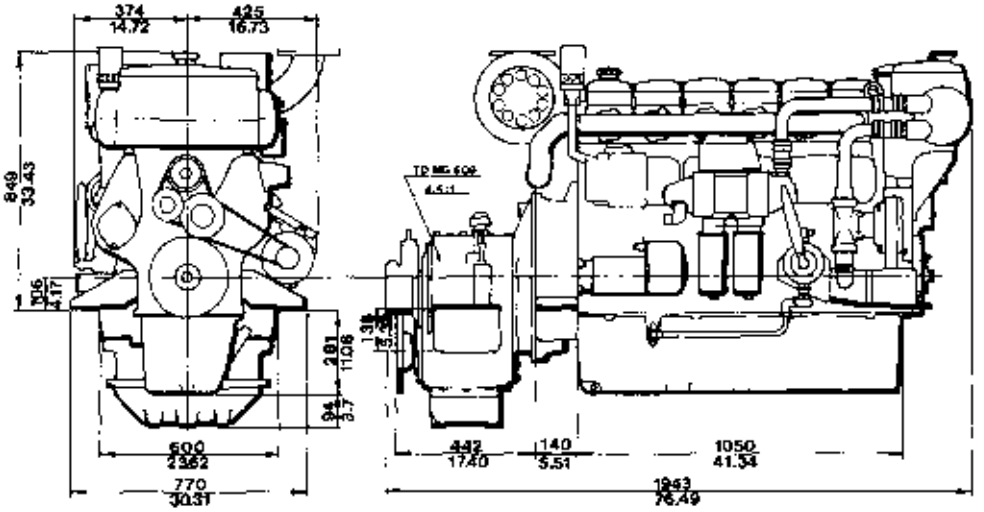
Type of operation	4-stroke, turbo-charged deisel engine with direct injection and overhead valves
Designation	TMD 100A
Porpeller shaft power	
Pleasure craft duty (B)[1]	164 kW (223 hpt at 2000 r/min
Light commercial duty (CI)[2]	154 kW (209 hp) at 2000 r/min
Continous duty (C)[2]	143 kW (195 hp) at 1800 r/min
Number of cylinders	6
Capacity, total, dm³ (liters) (in.³)	9.6 (585)
Bore, mm (in.)	120.65 (4.75)
Stroke, mm (in.)	140 (5.51)
Total weight, engine with TD MG 509 3:1, approx. kg (lb.)	1415 (3120)

[1] **Curve A:** Highest flywheel power obtainable in the test room without thermal overload. This power corresponds to DIN 6270 "Höchstleistung".
Curve B1: Flywheel power for pleasure craft duty (sea level conditions). Air pressure – 1,01 bar (29.2 in merc), temperature = 15.0°C (60°F).
Curve B: Propeller shaft power for pleasure craft duty according to DIN 6270 Leistung B (corresponds for practical use also to 1-hour's power according to BS 649, 1958). Only occasinal use at full engine throttle. Normal cruising is expected to be at a comfortable part-throttle operation.
The flywheel power for the engine is approx 4% higher than the indicated values for B-curve.
All measurements apply to a run-in engine.

[2] Engine Diagram see separate sheet Group 21 no 130:1.



DIMENSION DRAWING



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Telephone: 031/23 54 60
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Telex: 207 55 PENTA S

TMD 100A Pleasure Craft Duty

VOLVO PENTA

ENGINE DIAGRAM

MARIN DIESELMOTOR
MARINE DIESEL ENGINE

Grupp Nr
Group No
21 130

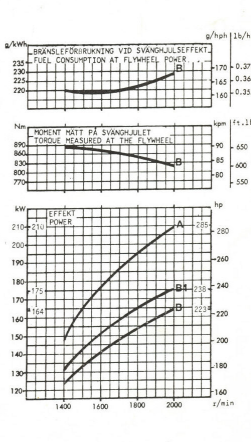
Distr. **100 Serisi**

Motor / Engine TMD100A NÖJESBÅTSDRIFT / PLEASURE CRAFT DUTY

Date 10/1981

ALLMÄNNA DATA
GENERAL DATA

Fyrtakts dieselmotor med direktinsprutning. Four stroke diesel engine with direct injection.			
Toppventiler. Turbo. Overhead valves. Turbo charged.			
Cylinderantal No of cylinders		6 6	
Slagvolym total Displacement total	dm3 in3	9,6 585	
Slaglängd Stroke	mm in	140 5,51	
Cylinderdiameter Bore	mm in	120,65 4,75	
Kompressionsförhållande Compression ratio		15:1 15:1	
Max tillåten lutning bakåt under gång Max permissible inclination backwards under way		15°	
Rotationsriktning, motorn sett mot svänghjul Rotation direction, anti-clockwise viewed towards flywheel			



Kurva A: Högsta svänghjulseffekt som kan tas ut i provrum utan termisk överbelastning. Effekten motsvarar DIN 6270 "Höchstleistung".

Kurva B1: Svänghjulseffekt för nöjesbåtsdrift vid havets nivå, lufttryck 1,01 bar (760 mm Hg), temperatur + 15,0°C.

Kurva B: Propelleraxeleffekt för nöjesbåtsdrift enligt DIN 6270 Leistung B (motsvarar för praktiskt bruk även 1-timmes effekt enligt BS 649, 1958). Full effekt får endast utnyttjas undantagsvis. Båtens marschfart måste dessutom ligga avsevärt under maxfarten.

Motorns svänghjulseffekt är ca 5% högre än angivna värden för B-kurvan.

Samtliga mätningar gäller för inkörd motor.

OBS! Önskad effektinställning skall anges på beställningen.

Curve A: Highest flywheel power obtainable in the test room without thermal overload. This power corresponds to DIN 6270 "Höchstleistung".

Curve B1: Flywheel power for pleasure craft duty (sea level conditions). Air pressure = 1,01 bar (29.2 in merc), temperature = 15.0°C (60°F).

Curve B: Propeller shaft power for pleasure craft duty according to DIN 6270 Leistung B (corresponds for practical use also to 1-hour's power according to BS 649, 1958). Only occasional use at full engine throttle. Normal cruising is expected to be at a comfortable part-throttle operation.

The flywheel power for the engine is approx 5% higher than the indicated values for B-curve.

All measurements apply to a run-in engine.

NOTE! Desired power set should be stated on the engine order.

VOLVO PENTA

VGV/P10

Postal address:
S-405 08 Göteborg

285 hp - 238 hp - 223 hp 2000 rpm

Telex
20755 PENTA S

TMD 100 A Commercial Duty

VOLVO PENTA

ENGINE DIAGRAM

MARIN DIESELMOTOR
MARINE DIESEL ENGINE

Grupp Nr / Group No: 21 130-1

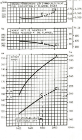
Distr.

Motor / Engine: TMD100A KOMMERSIELL DRIFT / COMMERCIAL DUTY

Date 10/1981

ALLMÄNNA DATA
GENERAL DATA

Fyrtakts dieselmotor med direktinsprutning. Four stroke diesel engine with direct injection.		
Toppventiler. Turbo. Overhead valves. Turbo charged.		
Cylinderantal / No of cylinders		6 / 6
Slagvolym total / Displacement total	dm3 / in3	9,6 / 585
Slaglängd / Stroke	mm / in	140 / 5,51
Cylinderdiameter / Bore	mm / in	120,65 / 4,75
Kompressionsförhållande / Compression ratio		15:1 / 15:1
Max tillåten lutning bakåt under gång / Max permissible inclination backwards under way		15° / 15°
Rotationsriktning, motors sett mot svänghjul / Rotation direction, anti-clockwise viewed towards flywheel		



Kurva A: Högsta svänghjulseffekt som kan tas ut i provrum utan termisk överbelastning. Effekten motsvarar DIN 6270 "Höchstleistung".

Kurva C1: Intermittent effekt för lätt kommersiell drift mätt på propelleraxeln enligt DIN 6270 Leistung B für Dauerbetrieb (motsvarar för praktiskt bruk även kontinuerlig effekt enligt BS 649, 1958). Full effekt får endast utnyttjas några få timmar/dag. Vidare får den totala körtiden inte överskrida 2000 timmar/år.

Kurva C: Effekt för kontinuerlig drift mätt på propelleraxeln enligt DIN 6270 Leistung B für Dauerbetrieb (motsvarar för praktiskt bruk även kontinuerlig effekt enligt BS 649, 1958).

Motorns svänghjulseffekt är ca 4% högre än angivna värden för C1- resp C-kurvan.

Samtliga mätningar gäller för inkörd motor.

OBS! Önskad effektinställning skall anges på motorordern.

Curve A: Highest flywheel power obtainable in the test room without thermal overload. This power corresponds to DIN 6270 "Höchstleistung".

Curve C1: Intermittent power for light commercial duty measured on the propeller shaft according to DIN 6270 Leistung B (corresponds for practical use also to continuous power according to BS 649, 1958). May be taken out max 4-hour per 12-hour period. Total operating time max 2000 hours/year.

Curve C: Power for continuous duty measured on the propeller shaft according to DIN 6270 Leistung B für Dauerbetrieb (corresponds for practical use also to continuous power according to BS 649, 1958). Highest power may be utilized only a few hours per day and the total annual usage must not exceed 2000 hours.

The flywheel power for the engine is approx 4% higher than the indicated values for C1- and C-curves.

All measurements apply to a run-in engine.

NOTE! Desired power set should be stated on the engine order.

154 kw 2000 rpm - 143 kw 1800 rpm

Postal address
S-405 08 Göteborg Sweden ... AB VOLVO PENTA

TMD 100C Pleasure Craft Duty

VOLVO PENTA

ENGINE DIAGRAM

MARIN DIESELMOTOR
MARINE DIESEL ENGINE

Grupp N
Grupp N

21

Distr.

Motor TMD100C NÖJESBÅTSDRIFT
Engine PLEASURE CRAFT DUTY

Date 12

ALLMÄNNA DATA
GENERAL DATA

Fyrtakts dieselmotor med direktinsprutning. Four stroke diesel engine with direct injection.		
Toppventiler. Turbo. Overhead valves. Turbo charged.		
Cylinderantal No of cylinders		6 6
Slagvolym total Displacement total	dm3 in3	9,6 585
Slaglängd Stroke	mm in	140 5.51
Cylinderdiameter Bore	mm in	120,65 4,75
Kompressionsförhållande Compression ratio		14,3:1 14,3:1
Max tillåten lutning bakåt under gång Max permissible inclination backwards under way		15° 15°
Rotationsriktning, motorn sett mot svänghjul Rotation direction, anti-clockwise viewed towards flywheel		

Kurva A: Högsta svänghjulseffekt som kan tas ut i provrum utan termisk överbelastning. Effekten motsvarar DIN 6270 "Höchstleistung".

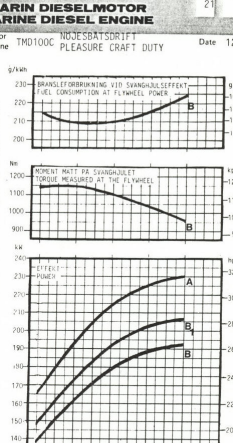
Kurva B1: Svänghjulseffekt för nöjesbåtsdrift vid havets nivå, lufttryck 1,01 bar (760 mm Hg), temperatur = 15,0°C.

Kurva B: Propelleraxeleffekt för nöjesbåtsdrift enligt DIN 6270 Leistung B.

Motorns svänghjulseffekt är ca 5% högre än angivna värden för B-kurvan.

Samtliga mätningar gäller för inkörd motor.

OBS! Önskad effektinställning skall anges på motorbeordern.



Curve A: Highest flywheel power obtainable in the test room without thermal overload. This power corresponds to DIN 6270 "Höchstleistung".

Curve B1: Flywheel power for pleasure craft duty (sea level conditions). Air pressure = 1,01 bar (29.2 in merc), temperature = 15.0°C (60°F).

Curve B: Propeller shaft power for pleasure craft duty according to DIN 6270 Leistung B.

The flywheel power for the engine is approx 5% higher than the indicated values for B-curve.

All measurements apply to a run-in engine.

NOTE! Desired power set should be stated on the engine order.

VGV/PE

Postal address
S-405 08 Göteborg Sweden

Telephone
Switchboard + 46 31 23 54 60

Cables
Penta Göteborg

Telex
20755 PENTA S

Ref. nr. 7731638-8 eng

TMD 102A

6-cylinder, 4-stroke, direct-injected turbocharged diesel engine for marine propulsion and marine emergency and auxiliary purposes. Crankshaft output* 200 kW (272 hp).

The TMD 102A is a marine diesel engine designed and built specifically for marine use in demanding environments. The intended use is as a marine propulsion engine or as a marine auxiliary engine to power pumps, generators and compressors on board vessels, ferries, tug boats, etc.

The tried and tested, uncomplicated design of this Volvo Penta engine makes for a low noise level and makes service work extremely easy. The engine runs smoothly and vibration-free, thanks to its well balanced construction and generously dimensioned crankshaft bearings. Water-cooled exhaust pipe and water-cooled turbo contribute to a low engine room temperature.

Examples of features designed to facilitate service work include: separate cylinder head for each cylinder, oil sump with inspection covers which, for example enable the crankshaft bearing caps to be removed without needing to drop the sump pan, oil and fuel filters of spin-on type.

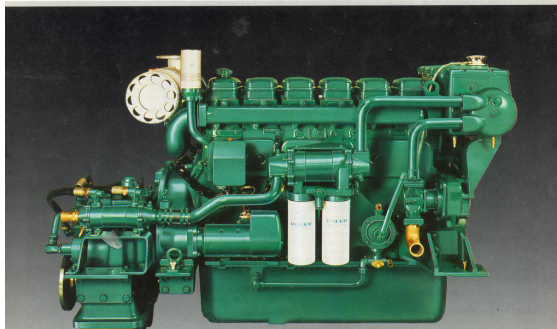
Thanks to a comprehensive range of equipment, the engine can be customized to suit specific customer and market requirements. It can be fitted with various power and propulsion take-offs for purposes including pump and compressor drives etc. The electrical system and alternator can be specified to suit requirements.

To comply with the demands of classification societies and marine authorities concerning operation in unmanned engine rooms, the TMD 102A can be supplied with watchdog components as currently specified for such installations. Various cooling systems can be used including heat exchanger cooling, radiator cooling, and keel cooling.

For auxiliary engine or emergency engine systems, where demands are high with regard to frequency stability or parallel operation, the engine can be equipped with an electronic regulator.

Volvo Penta has a well-established service network in more than 100 countries. Authorized workshops, with genuine parts and staffed by qualified personnel, make sure you get the best service.

*** Crankshaft output according to ISO/DIS 8665**



Engine TMD 102A with heat exchanger and reverse gear for marine propulsion.

VOLVO PENTA

TMD 102 A

Optional equipment for fitting out engine to Marine Propulsion engine:

Engine block:
Flexible mountings for engine and reverse gear.

Cooling system:
Fresh water cooling with heat exchanger and raw water pump.
Keel-cooling system for engine.
Fresh water filter, type "Perry".
Raw water filter.

Fuel system:
Jacketed fuel pressure pipes.
Single fuel filter/water separator.
Twin fuel filter/water separator (approved by the classification societies).

Control system:
Speed controls and control cables.
Emergency stop.

Electrical system:
24 volt, marine standard.
24 volt, marine classification.
Alternator 24 V/55 A and 24 V/100 A.
Electrical pre heater element.
Instrument panels and extension cables between engine and instrument panel.

Power transmissions:
Crank shaft pulley.
Power take-off at front end (with outgoing shaft or with flange attachment for hydraulic pump).
Side-mounted power take-off.
Drive output with pulley.
Reverse gear TWIN DISC MG509 (ratios 1.45–4.5:1).
Trolling valve for rev. gear MG509.
Hydraulic pump for steering or other purposes.

Pumps:
2" Bilge pump and 2" Flushing pump.

Exhaust system:
Flexible exhaust hose.
Silencer.

Other optional equipment:
Tool kit and spare parts kits for engine and rev. gear.

For further information, contact your local dealer.

Technical description of engine:

Cylinder block and cylinder heads of special alloy cast iron.
Replaceable wet cylinder liners and valve seats.
Individual cylinder heads.
Seven bearing crankshaft.
Oil pan with inspection covers.
Fly-wheel housing SAE1.
Freshwater-cooled turbocharger.
Freshwater-cooled exhaust manifold.
Injection pump with centrifugal governor.
Pump coupling direction.
Twin fine fuel filters.
Manual feed pump.
Exhaust elbow, dry type.
Air cleaner with paper insert.
Oil separating filter for crankcase ventilation.

Technical data for TMD 102A Marine Propulsion Diesel Engine

ENGINE:

Type designation	TMD 102A
Number of cylinders	six inline
Configuration	4-stroke direct-injected, turbocharged diesel
Fuel grade ASTM	1D or 2D
Bore, mm (in)	120.65 (4.75)
Stroke, mm (in)	140 (5.51)
Displacement, litres (in³)	9.6 (585)
Compression ratio	14.3
Dry weight, kg (lb)	1140 (2513)

	TYPE OF OPERATION MD*	HD*
Crankshaft output**, kW (hp) at crankshaft speed, r/min	200 (272) 2000	175 (238) 1800
Torque***, Nm (ft lb)	956 (705)	928 (685)
Spec. fuel consumption****, g/kWh (lb/hph)	228 (0.370)	220 (0.357)
REVERSE GEAR		
Type designation	TD MG509	TD MG509
Ratios	1.45:1	1.45:1
	2.00:1	2.00:1
	2.95:1	2.95:1
	3.83:1	3.83:1
	4.50:1	4.50:1
ENGINE WITH REVERSE GEAR**		
Propeller shaft output**, kW (hp) at crankshaft speed, r/min	192 (261) 2000	168 (228) 1800
Dry weight, kg (lb)	1443 (3150)	1443 (3150)

See page 4 for dimensions.

Curve MD: Medium duty
Engines with this power setting are intended for applications where:
– Rated power at rated speed is utilized during part of the operating time only (up to 1/3), followed by cruising at reduced speed.
– Operating time does not exceed 2000 hours per year or, on average, one shift per working day.
Examples: Patrol boats, pilot boats, police boats, and certain fishing vessels.

Curve HD: Heavy duty
Engines with this power setting are intended for applications where:
– MD does not apply.
– Rated power at rated speed can be needed continuously. No interruption of load cycling is other than for service and maintenance.
Examples: Tugs, ferries, freighters, fishing vessels.

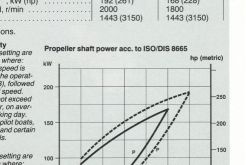
**ISO/DIS 8665 (– SAE J1228 – ICOMIA 28 – 83)

***Torque and specific fuel consumption apply at specified crankshaft output.

****Ratings apply with the first reverse gear specified under "reverse gear" and with the first specified data. Propeller shaft output and weight can differ for other reverse gears and ratios.

Power, torque and fuel consumption ratings are based on run-in engine at ISO standard atmospheric conditions, 25°, 100 kPa and 30% relative humidity. The same data apply to DIN 6271 and BS 5514. Ratings are based on diesel fuel having LVH 42,700 kJ/kg and density 840 g/litres.

Propeller shaft power acc. to ISO/DIS 8665



Calculated propeller load curve for fixed propeller. Exponent: 3.0 (P).

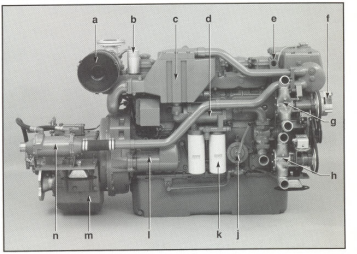
Classification:
TMD 102A can be delivered classified in accordance with the requirements of the major classification societies. (Some modifications may be necessary depending on type and class.) Preliminary classification certificates can also be supplied.

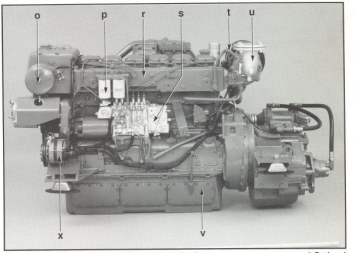
TAMD 102A

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

Powerful, reliable and economical

- A high performance, long life engine built on the dependable in-line six design.
- Designed for workboat operation in demanding environments – semiplaning workboats in Medium duty operation
- Built for effective turbocharging with high output/fuel consumption ratio, thus achieving excellent fuel economy.
- Extremely well balanced construction with powerfully dimensioned crankshaft bearings result in steady and vibrationfree running for highest possible degree of boat comfort.
- Simplified, thus time and cost saving, servicing. Well established service network in more than 100 countries using genuine parts and skilled personnel – minimizes non operational time and costs.





The engine shown is not an entirely standard unit. * Optional

a. Air filter
b. Crankcase ventilation
c. After cooler
d. Oil cooler
e. Lift eyelet
f. Extra alternator *
g. Flush pump *
h. Bilge pump *
j. Manual oil scavenger pump *
k. Twin oil filterl.
l. Starter motor
m. Reverse gear *
n. Oil cooler, reverse gear *
o. Heat exchanger
p. Twin fuel filter
r. Water cooled exhaust manifold
s. Injection pump
t. Turbo charger
u. Exhaust elbow, dry type *
v. Inspection cover with oil dipstick
x. Alternator

VOLVO PENTA

General data

Type designation	TAMD 102A
No of cylinders	6
Operation	4-stroke direct-injected and turbocharged diesel engine with aftercooler
Fuel grade ASTM	1D or 2D
Bore, mm (in)	120.65 (4.75)
Stroke, mm (in)	140 (5.5)
Displacement, litres (in^3)	9.6 (585.8)
Compression ratio	15:1
Dry weight, kg (lb)	1210 (2667)
Crankshaft output, 1) at crankshaft speed, r/min	
LD, kW (hp) (2200 r/min)	294 (400)
MD, kW (hp) (2000 r/min)	265 (360)
Torque 2)	
LD, Nm	1276
Spec. fuel consumption 2)	
LD, g/kWh	230
Optimum specific fuel consumption at full load	
LD, g/kWh	216

1) ISO 8665 (=SAE J1228-ICOMIA 28-83)
2) Torque and specific fuel consumption apply at the specified crankshaft output.

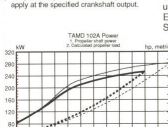
Standard equipment

Flywheel housing, flange size SAE 1
Freshwater cooled turbocharger and exhaust manifold
Watercooled aftercooler
Oil separating filter for crankcase ventilation
Air cleaner, foam type
Fuel injection pump with centrifugal regulator and smoke limiter
Pump coupling protection
Feed pump and double fine fuel filters
Twin oil filters of spin-on type
Sea water cooled oil cooler
Oil pan with inspection covers
Oil filler in valve cover
Electrical system 24 V, fully wired. Incl alarm for oil pressure and temperature
Starter motor 24 V
Oil pressure and temperature sender units
Electrical terminal box
Sender unit for electrical tachometer

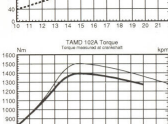
Technical features in brief

- Cylinder block and cylinder heads are of special alloy cast iron.
- Separate cylinder heads reduce the risk for thermal stresses and ensures effective sealing.
- Replaceable wet cylinder linings and valve seats.
- Seven bearing crankshaft with very moderate load on both main and big-end bearings.
- Rigid camshaft with well designed cams. Large overlap between inlet and exhaust valves ensure excellent air flow, efficient fuel supply, good cooling and low exhaust gas temperature.
- Gear pump pressurized lubricating system. Two full flow oil filters clean the entire oil flow, even at low speeds.
- Piston cooling for low position temp. and less thermal stresses.

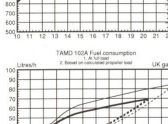
TAMD 102A Power
1. Propeller shaft power
2. Calculated propeller load



TAMD 102A Torque
Torque meets net at crankshaft



TAMD 102A Fuel consumption
1. At full load
2. Based on calculated propeller load



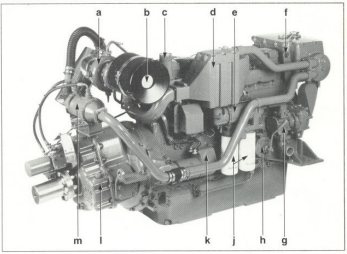
TAMD 102D

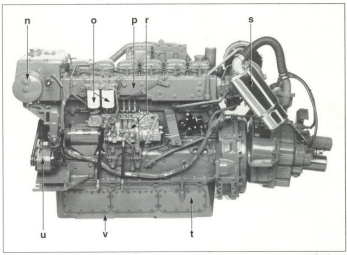
Special Light Duty (SLD)

6-cylinder, 4-stroke, direct injected turbocharged marine diesel with aftercooler, crankshaft output 335 kW (455 hp)

Powerful, reliable and economical

- A high performance, long life engine built on the dependable in-line six design.
- Designed for fast planing workboat operation in Special Light Duty (SLD) and Light Duty (LD) operation.
- Built for effective turbocharging with high output/fuel consumption ratio, thus achieving excellent fuel economy.
- Superior torque characteristics resulting in excellent acceleration and load variation response.
- Advanced combustion process ensuring low smoke levels.
- Extremely well balanced design with powerfully dimensioned crankshaft bearings result in steady and vibrationfree running for highest possible degree of boat comfort.
- Comprehensive programme of factory fitted equipment for perfect matching to specific customer requirements, e.g. reverse gears, PTO's systems, electrical systems.
- Simplified, thus time and cost saving, servicing. Highly professional installation support, well established service network in more than 100 countries using genuine parts and skilled personnel – minimizes non operational time and costs.





The engine is shown with optional equipment

* Optional

a. Turbo charger
b. Air filter
c. Crankcase ventilation
d. After cooler
e. Oil cooler
f. Lift eyelet
g. Cooling water pump
h. Manual oil drain pump *
j. Twin oil filter
k. Starter motor
l. Reverse gear *
m. Oil cooler, reverse gear *
n. Heat exchanger
o. Twin fuel filter *
p. Water cooled exhaust manifold
r. Injection pump
s. Exhaust elbow, wet type *
t. Inspection cover with oil dipstick
u. Alternator *
v. Also available with shallow case (Autumn -93)

VOLVO PENTA

General data

Type designation	TAMD 102D
No of cylinders	6
Operation	4-stroke direct-injected and turbocharged diesel engine with aftercooler
Fuel grade ASTM	1D or 2D
Bore, mm (in)	120.65 (4.75)
Stroke, mm (in)	140 (5.5)
Displacement, litres (in^3)	9.6 (585.8)
Compression ratio	15:1
Dry weight, kg (lb)	1200 (2646)
Crankshaft output, 1) at crankshaft speed, r/min	
SLD, kW (hp) (2250 r/min)	335 (455)
LD, kW (hp) (2200 r/min)	315 (428)
Torque 2)	
SLD, Nm (lb.ft)	1424 (1050)
LD, Nm (lb.ft)	1367 (1008)
Spec. fuel consumption 2)	
SLD, g/kWh (lb/hph)	232 (0.376)
LD, g/kWh (lb/hph)	225 (0.365)

1) Technical data according to ISO 3046 Standard Fuel Stop Power. Fuel 40°C (104°F), lower calorific value of 42 700 kJ/kg and density of 840 g/litre.

2) Torque and specific fuel consumption apply at the specified crankshaft output.

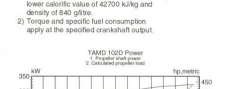
Engine equipped with

Flywheel housing, flange size SAE 1
Freshwater cooled turbocharger and exhaust manifold
Watercooled aftercooler
Oil separating filter for crankcase ventilation
Air cleaner, foam type
Fuel injection pump with centrifugal regulator and smoke limiter
Pump coupling protection
Feed pump
Twin oil filters of spin-on type
Sea water cooled oil cooler
Oil pan with inspection covers
Oil filler in valve cover
Electrical system 24 V
Starter motor 24 V

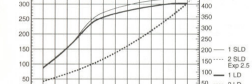
Technical features in brief

- Cylinder block and cylinder heads are of special alloy cast iron.
- Separate cylinder heads reduce the risk for thermal stresses and ensures effective sealing.
- Replaceable wet cylinder linings and valve seats.
- Seven bearing crankshaft with moderate load on both main and big-end bearings.
- Rigid camshaft with well designed cams. Large overlap between inlet and exhaust valves ensure excellent air flow, efficient fuel supply, good cooling and low exhaust gas temperature.
- Reinforced timing gear with compact, high stress capacity gear wheels, nitrocarburated.
- Gear pump pressurized lubricating system. Two full flow oil filters clean the entire oil flow, even at low speeds.
- Piston cooling for low position temp. and less thermal stresses.

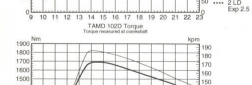
TAMD 102D Power
Torque measured at crankshaft
2. Calculated propeller load



TAMD 102D Torque
Torque measured at crankshaft



TAMD 102D Fuel consumption
Torque curve
2. Based on calculated propeller load



VOLVO PENTA INBOARD DIESEL

TAMD103A

* Power rating – see Technical Data

Reliable and powerful

The TAMD103A is a powerful, reliable and economical marine diesel built on the dependable in-line six design.

Developed for Medium and Heavy duty operation for displacement, semi-planing and planing craft.

Durability and low noise levels

The Volvo Penta in-line six cylinder engine is a traditional well-balanced unit with powerfully dimensioned crankshaft bearings. This ensures smooth, vibration-free operation and low noise levels, which, together, provide the highest level of on-board comfort.

The torsionally rigid cylinder block and crank mechanism are designed to withstand many hours of demanding operation.

To maintain a stable working temperature in cylinders and combustion chambers, the engine is equipped with piston cooling and seawater-cooled oil cooler. The engine is also fitted with replaceable cylinder liners and valve seats/guides to ensure maximum durability and service life of the engine.

Low exhaust emission and fuel consumption

High-pressure injection through six-hole injection nozzles optimizes fuel-air mixture.

The improved combustion results in a very low fuel consumption, higher power and reduced noxious exhaust emissions. The engine is certified according to IMO and IMO US/EPA.

Marine electrics

The two-pole electrical system is specifically adapted to demanding marine environments. Flex-mounted electrical box, with semi-automatic fuses and plug-in electrical connections.

Ease of service and maintenance

Easily accessible service and maintenance points contribute to the ease of service of the engine.

Comprehensive service network

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

Technical description:

- Cylinder block and separate cylinder heads made of cast iron alloy
- Flywheel housing (aluminum) with connection acc. to SAE 1
- Replaceable cylinder liners and valve seats/guides
- Nitrocarburized crankshaft with seven main bearings
- Oil-cooled forged aluminum pistons
- Rigid camshaft with well designed cams. Large overlap between inlet and exhaust valves ensures excellent air flow, good cooling and low exhaust gas temperature.

- Seawater-cooled oil cooler
- Gear pump pressurized lubricating system
- Twin full flow oil filters of spin-on type
- Oil sump with inspections covers
- Oil filler in valve cover
- Oil separating filter incl. overpressure valve for crankcase ventilation

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

- Freshwater-cooled turbocharger

- Engine-mounted tubular heat exchanger with integrated expansion tank or bulkhead-mounted heat exchanger for reduced installation dimensions. Alternatively adapted for 2-circuit keel cooling.
- Seawater-cooled aftercooler
- Belt-driven freshwater pump and front-mounted seawater pump with neoprene impeller

- 24V electrical system, 24V/60A alternator
- Rubber suspended electrical terminal box with semi-automatic fuses and plug-in electrical connections

VOLVO PENTA

TAMD103A

Technical Data

Engine designation ..... □□□ □ □□□□□
No. of cylinders and configuration ..... in-line 6
Method of operation ..... 4-stroke, direct-injected, turbocharged diesel engine with aftercooler
Bore, mm (in.) 120.65 (4.75)
Stroke, mm (in.) 140 (5.5)
Displacement, l (in^3) 9.6 (585.8)
Compression ratio 17:1
Dry weight, kg (lb) 1190 (2623)
Dry weight with reverse gear MG5114SC, kg (lb) 1396 (3078)
Crankshaft power,
Rating 2, kW (hp) 1800 rpm 287 (390)
Rating 1, kW (hp) 1800 rpm 255 (347)
Rating 1, kW (hp) 1800 rpm (repowering) 199 (271)
Torque,
Rating 2, Nm (lbf.ft) 1800 rpm 1523 (1123)
Rating 1, Nm (lbf.ft) 1800 rpm 1353 (998)
Rating 1, Nm (lbf.ft) 1800 rpm (repowering) 1056 (779)
Recommended fuel to conform to ..... ASTM-D975 1-D & 2-D, ... EN 590 or JIS KK 2204
Specific fuel consumption,
Rating 2, g/kWh (lb/hph) 1800 rpm 212 (0.343)
Rating 1, g/kWh (lb/hph) 1800 rpm 212 (0.343)
Rating 1, g/kWh (lb/hph) 1800 rpm (repowering) 215 (0.348)

Fuel temperature 40°C (104°F)

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

N.B. The product can also be used in an application with a higher rating than stated, e.g. R1 can be used for R2.

The engine is certified according to IMO and IMO US/EPA.

Optional equipment:

□□□□□□
– Flexible suspension for engine and reverse gear
– Cast iron flywheel housing

□□□□□□□□□□□□□□□□
– Deep oil sump with inspection covers
– Oil filling on starboard side
– Engine-mounted manual oil drain pump for shallow oil sump

□□□□□□□□□□
– Single or twin fuel filter/water separator with shift valve

□□□□□□□□□□□□
– Exhaust elbow, dry or wet
– Silencer, dry
– Flexible compensator

□ □□□□□□□□□□
– Seawater strainer
– Freshwater filter

□□□□□□□□□□□□□□□
– 24V/100A extra alternator
– Various instrument panels
– Cable harness in different lengths

□□□ □□□□□□□□ □□□□□
– Auxiliary drive
– Extra pulley for crankshaft
– Hydraulic pump for steering and other duties

□□□□□□□□□□
– MG5114SC, MG5091DC (only R1 199 kW), ZF 311A

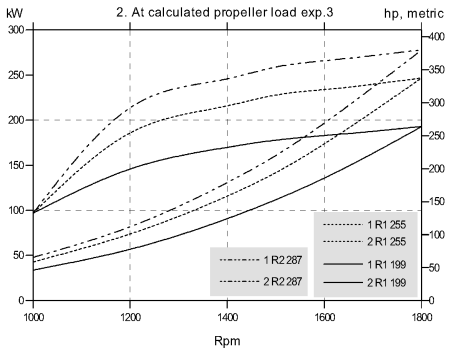
□ □□□□□□□□□ □□□
– 2" bilge/flush pump
– Belt guard
– White-painted engine and reverse gear

Contact your local Volvo Penta dealer for further information.

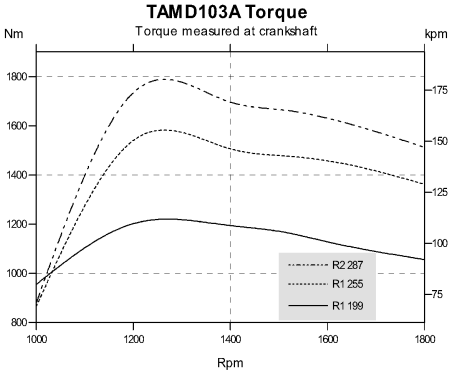
Not all models, standard equipment and accessories are available in all countries. All specifications are subject to change without notice.

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

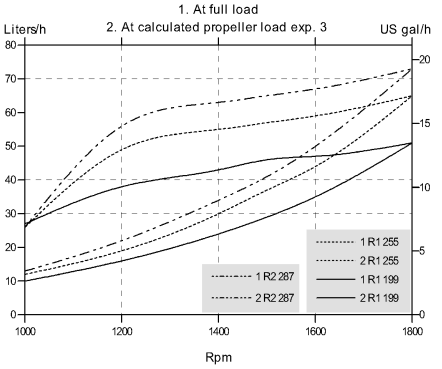
TAMD103A Propeller Shaft Power



TAMD103A Torque

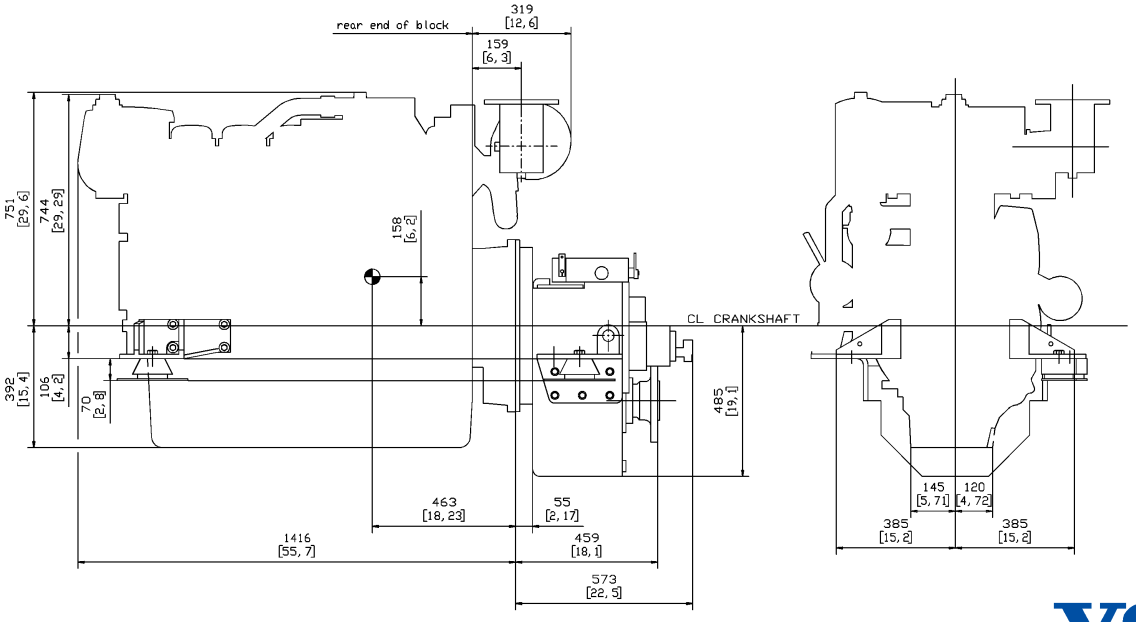


TAMD103A Fuel Consumption



Dimensions TAMD103A with MG5091DC

Not for installation



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