

Marine Propulsion Engines

Commercial / Military

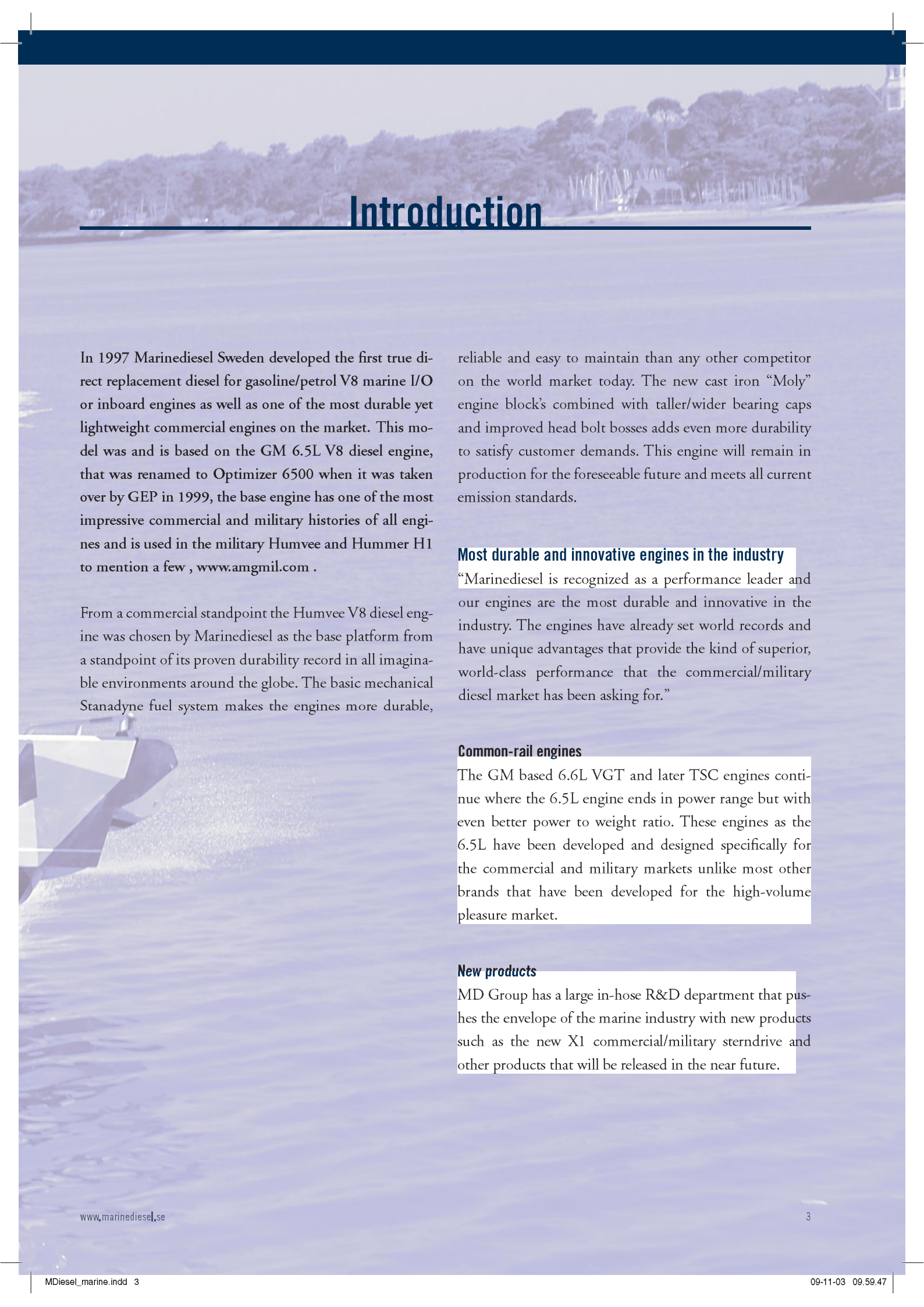


a Division of MD Group

www.marinediesel.se

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Introduction

In 1997 Marinediesel Sweden developed the first true direct replacement diesel for gasoline/petrol V8 marine I/O or inboard engines as well as one of the most durable yet lightweight commercial engines on the market. This model was and is based on the GM 6.5L V8 diesel engine, that was renamed to Optimizer 6500 when it was taken over by GEP in 1999, the base engine has one of the most impressive commercial and military histories of all engines and is used in the military Humvee and Hummer H1 to mention a few , www.amgmil.com .

From a commercial standpoint the Humvee V8 diesel engine was chosen by Marinediesel as the base platform from a standpoint of its proven durability record in all imaginable environments around the globe. The basic mechanical Stanadyne fuel system makes the engines more durable,

reliable and easy to maintain than any other competitor on the world market today. The new cast iron “Moly” engine block’s combined with taller/wider bearing caps and improved head bolt bosses adds even more durability to satisfy customer demands. This engine will remain in production for the foreseeable future and meets all current emission standards.

Most durable and innovative engines in the industry

“Marinediesel is recognized as a performance leader and our engines are the most durable and innovative in the industry. The engines have already set world records and have unique advantages that provide the kind of superior, world-class performance that the commercial/military diesel market has been asking for.”

Common-rail engines

The GM based 6.6L VGT and later TSC engines continue where the 6.5L engine ends in power range but with even better power to weight ratio. These engines as the 6.5L have been developed and designed specifically for the commercial and military markets unlike most other brands that have been developed for the high-volume pleasure market.

New products

MD Group has a large in-house R&D department that pushes the envelope of the marine industry with new products such as the new X1 commercial/military sterndrive and other products that will be released in the near future.

Features Unique To Marinediesel's Engine Design

Marinediesel is not encumbered by 40 years of history that says engine designs have to be flat and featureless. Conversely, starting with a clean sheet, Marinediesel's engines are the freshest in the industry. They feature state of the art technology, power and performance oriented design. Marinediesel's engines are among the fastest, most efficient and highest performing on the marine diesel market today.

Marinediesel engines start out as base engines from the GEP and GM factories in the US. Engines are then modified for marine use, calibrated, painted with high heat marine paint, assembled by skilled diesel technicians before dynorun and a final run in a test station with checklists before being boxed and ready to ship.

For the 6.5L range Marinediesel uses a positive displacement 4-stage intercooled supercharger system to maximize torque and performance at low and mid rpm as well as remove any black smoke tendency. The performance of a supercharged and intercooled 6.5 litre V8 diesel is incomparable to anything else on the market today.

The 6.6L common rail engines use Marinediesel/NIRA ECU which allows the engines to be reconfigured with unique features as required by clients. The engines also incorporate a variable geometry turbo system to provide the low rpm torque and fast throttle response that Marinediesel is known for.

- » Marinediesel use the same base engine as in the proven military Hummer Humvee platform
- » Base engine has exceeded production numbers of 2,000,000 and is hence a very proven platform
- » V8 6.5L or 6.6L displacements displacement compare to many competitors smaller displacement 4 or 6 cylinder versions
- » All engines are dyno tested before delivery
- » Full application manual available on request and includes information such as; Critical component limits, electromagnetic compatibility, operating environment information, vibration powertrain bending, shock impact limits etc.
- » Factory field application engineers and/or installation technicians available on request
- » Factory led project management available on request
- » Factory project presentations available on request
- » Technical training programs available in different stages, languages and locations
- » Comprehensive technical material available, such as; owners manuals, service books, workshop manuals, parts books etc.



Please contact Marinediesel Sweden headquarters
or your local representative for additional information.

www.marinediesel.se

Engine Reference Table

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Configuration	V8	V8	V8	V8	V8	V8	V8	V8	V8
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Max Power kW/HP	127 (170)	150 (200)	187 (250)	224 (300)	261 (350)	299 (400)	336 (450)	373 (500)	TBD
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Max Torque Nm	430	430	620	680	720	820	980	1130	TBD
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Weight dry kg	410	410	430	430	455	455	455	455	TBD
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Exhaust emissions	EPA Tier II IMO RCD 2003 /44	EPA Tier II IMO RCD 2003 /44	EPA Tier II IMO RCD 2003 /44	EPA Tier II IMO RCD 2003 /44	EPA Tier II IMO RCD 2003 /44	EPA Tier II IMO RCD 2003 /44	EPA Tier II IMO RCD 2003 /44	EPA Tier II IMO RCD 2003 /44	
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Marinediesel MD170

"Barracuda" 127 kW (170 bhp) @3600 rpm

The MD170 is a naturally aspirated 6.5L displacement V8 engine with mechanical injection system. With an output of below 20kW/L this engine is rated for medium duty commercial use and a durability that will surpass any competitor. As it is a naturally aspirated engine it has a very low operational and service cost.

Standard Engine Equipment

AIR INTAKE SYSTEM

Air filter with integrated crankcase ventilation system.

ALTERNATOR

12 volt 105 ampere standard, 24 volt systems available as option.

GOVERNOR CONTROL SYSTEM

Mechanical governor

OIL LUBRICATION SYSTEM

Remote twin oil filters, closed crankcase ventilation system.

MOUNTING SYSTEM

Adjustable mounts

WARNING SYSTEMS

Water temperature and oil pressure alarm system.

COOLING SYSTEM

Belt driven seawater pump, 9" oil cooler, closed cooling system.

FLYWHEEL HOUSING

Borg Warner

BOOST SYSTEM

Naturally aspirated

STARTING SYSTEM

Electric starter motor 12 volt (24 v optional). Topmount starter available as option.

OTHER

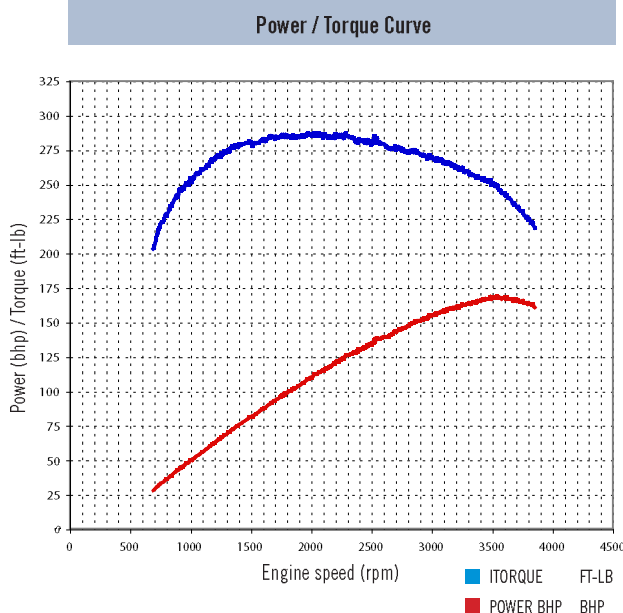
MD Marine paint (grey standard, others available), front and rear lifting eyes.



General Data

Engine type	V8
Injection type	IDI
Displacement	6.5L
Bore X stroke	103 X 97 mm
Compression ratio	21:1
Firing order	1-8-7-2-6-5-4-3
Rotation from flywheel	counterclockwise
Oil pressure (hot)	6psi min@idle
Oil pressure (hot)	30-43psi min@2000rpm
Operating Temperature	70°C
Injection System	Stanadyne Mechanical
Cooling system	Closed cooling
Boost system	Naturally aspirated
Exhaust system	356 alu w A4 ss raiser
Dry weight	410 kg
Oil Change intervals	100 hrs
Emissions	EC 2003/44, EPA & IMO

Marinediesel Marine propulsion applications. Revised data October 2009



Marinediesel MD200

"Barracuda" 150 kW (200 bhp) @3600 rpm

The MD200 is a naturally aspirated 6.5L displacement V8 engine with mechanical injection system. With an output of below 25kW/L this engine is rated for medium duty commercial use and a durability that will surpass any competitor. As it is a naturally aspirated engine it has a very low operational and service cost.

Standard Engine Equipment

AIR INTAKE SYSTEM

Air filter with integrated crankcase ventilation system.

ALTERNATOR

12 volt 105 ampere standard, 24 volt systems available as option.

GOVERNOR CONTROL SYSTEM

Mechanical governor

OIL LUBRICATION SYSTEM

Remote twin oil filters, closed crankcase ventilation system.

MOUNTING SYSTEM

Adjustable mounts

WARNING SYSTEMS

Water temperature and oil pressure alarm system.

COOLING SYSTEM

Belt driven seawater pump, 9" oil cooler, closed cooling system.

FLYWHEEL HOUSING

Borg Warner

BOOST SYSTEM

Naturally aspirated

STARTING SYSTEM

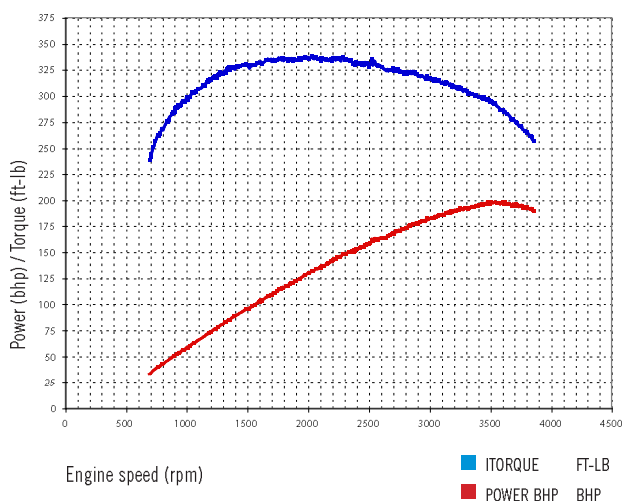
Electric starter motor 12 volt (24 v optional). Topmount starter available as option.

OTHER

MD Marine paint (grey standard, others available), front and rear lifting eyes.



Power / Torque Curve



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General Data

Engine type	V8
Injection type	IDI
Displacement	6.5L
Bore X stroke	103 X 97 mm
Compression ratio	18:1
Firing order	1-8-7-2-6-5-4-3
Rotation from flywheel	counterclockwise
Oil pressure (hot)	6psi min@idle
Oil pressure (hot)	30-43psi min@2000rpm
Operating Temperature	70°C
Injection System	Stanadyne Mechanical
Cooling system	Closed cooling
Boost system	Naturally aspirated
Exhaust system	356 alu w A4 ss raiser
Dry weight	410 kg
Oil Change intervals	100 hrs
Emissions	EC 2003/44, EPA & IMO

Marinediesel Marine propulsion applications. Revised data October 2009

Marinediesel MD250SC

"Stingray" – 187 kW (250 bhp) @3600 rpm

The MD250SC is the lowest rated engine in Marinediesels supercharged model program. The engine is highly suitable for medium performance planning craft and has a light duty rating (medium duty as option). The engine is based on the same proven 6.5L platform with mechanical fuel injection system. The twin screw Swedish made Lysholm supercharger provide unequalled low and midrange torque while maintaining low operational and service costs.

Standard Engine Equipment

AIR INTAKE SYSTEM

Air filter with integrated crankcase ventilation system.

ALTERNATOR

12 volt 105 ampere standard, 24 volt systems available as option.

GOVERNOR CONTROL SYSTEM

Mechanical governor

OIL LUBRICATION SYSTEM

Remote twin oil filters, closed crankcase ventilation system.

MOUNTING SYSTEM

Adjustable mounts

WARNING SYSTEMS

Water temperature and oil pressure alarm system.

COOLING SYSTEM

Belt driven seawater pump, 9" oil cooler, closed cooling system.

FLYWHEEL HOUSING

Borg Warner

BOOST SYSTEM

Lysholm mechanical positive displacement supercharger system, sea water intercooler.

STARTING SYSTEM

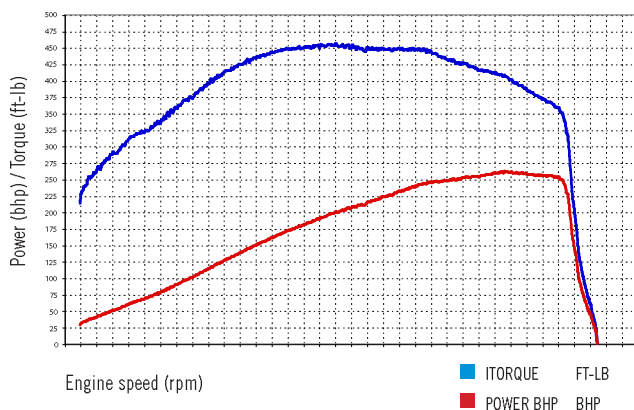
Electric starter motor 12 volt (24 v optional). Topmount starter available as option.

OTHER

MD Marine paint (grey standard, others available), front and rear lifting eyes.



Power / Torque Curve



General Data

Engine type	V8
Injection type	IDI
Displacement	6.5L
Bore X stroke	103 X 97 mm
Compression ratio	18:1
Firing order	1-8-7-2-6-5-4-3
Rotation from flywheel	counterclockwise
Oil pressure (hot)	.6psi min@idle
Oil pressure (hot)	.30-43psi min@2000rpm
Operating Temperature	70°C
Injection System	Stanadyne Mechanical
Cooling system	Closed cooling
Boost system	Lysholm Supercharger
Exhaust system	.356 alu w A4 ss raiser
Dry weight	430 kg
Oil Change intervals	100 hrs
Emissions	EC 2003/44, EPA Tier 2 pending, IMO

Marinediesel Marine propulsion applications. Revised data October 2009

Marinediesel MD300SC

"Hammerhead" – 224 kW (300 bhp) @3600 rpm

The MD250SC is the highest commercially rated engine in Marinediesels supercharged model program. The engine is highly suitable for high performance planning craft and has a light duty rating. The engine is based on the same proven 6.5L platform with mechanical fuel injection system. The twin screw Swedish made Lysholm supercharger provide unequalled low and midrange torque while maintaining low operational and service costs.

Standard Engine Equipment

AIR INTAKE SYSTEM

Air filter with integrated crankcase ventilation system.

ALTERNATOR

12 volt 105 ampere standard, 24 volt systems available as option.

GOVERNOR CONTROL SYSTEM

Mechanical governor

OIL LUBRICATION SYSTEM

Remote twin oil filters, closed crankcase ventilation system.

MOUNTING SYSTEM

Adjustable mounts

WARNING SYSTEMS

Water temperature and oil pressure alarm system.

COOLING SYSTEM

Belt driven seawater pump, 9" oil cooler, closed cooling system.

FLYWHEEL HOUSING

Borg Warner

BOOST SYSTEM

Lysholm mechanical positive displacement supercharger system, sea water intercooler.

STARTING SYSTEM

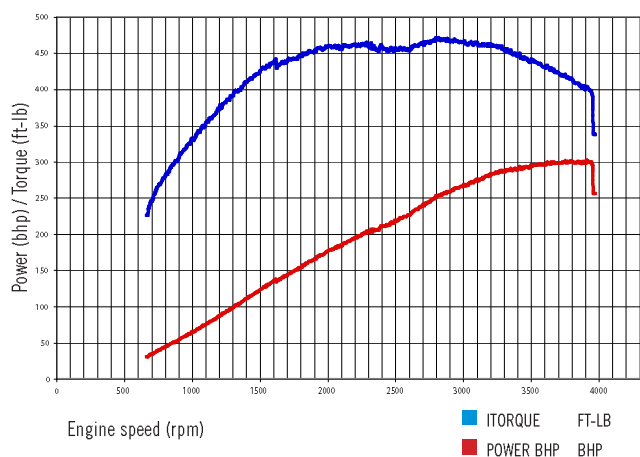
Electric starter motor 12 volt (24 v optional). Topmount starter available as option.

OTHER

MD Marine paint (grey standard, others available), front and rear lifting eyes.



Power / Torque Curve

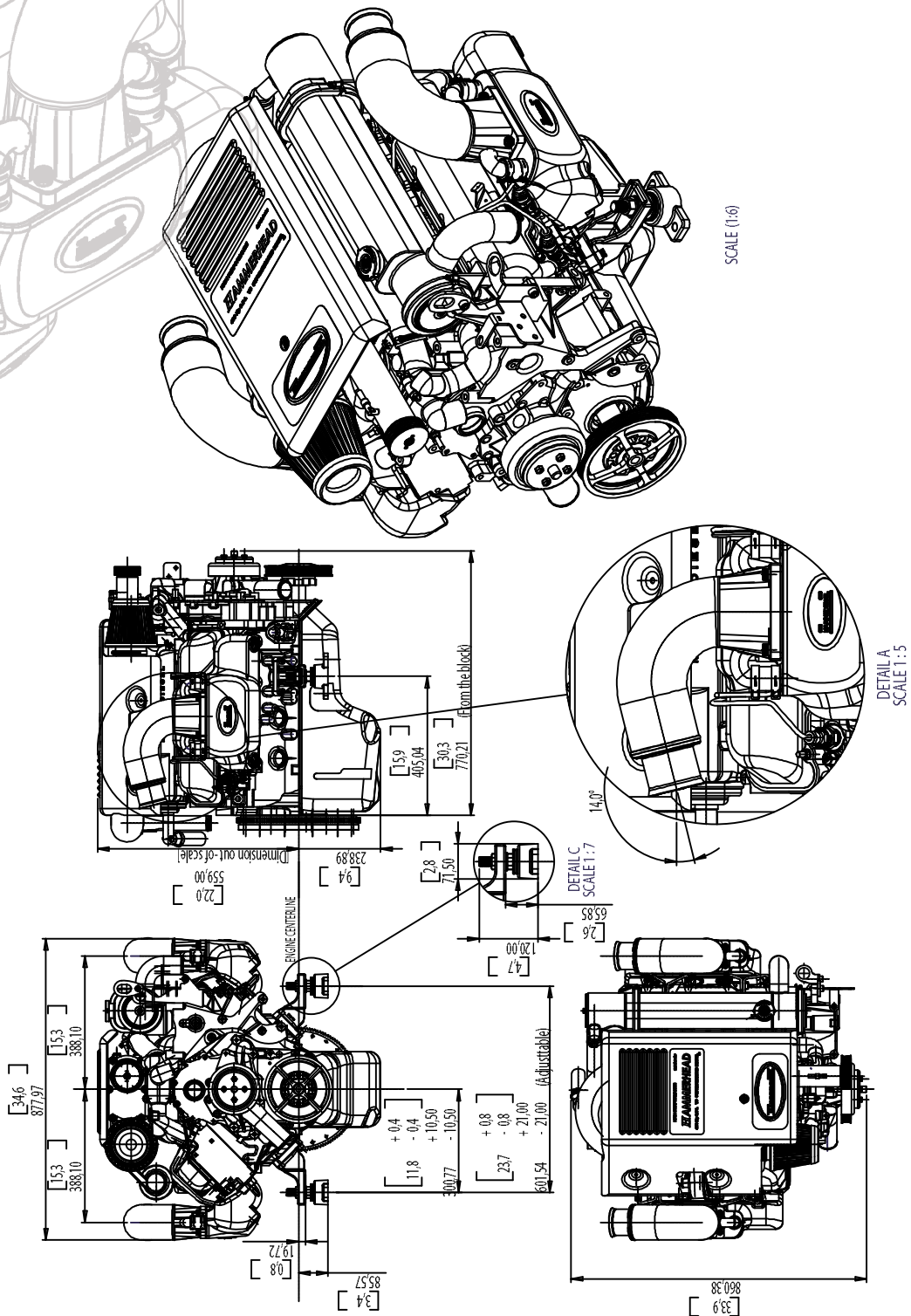


General Data

Engine type	V8
Injection type	IDI
Displacement	6.5L
Bore X stroke	103 X 97 mm
Compression ratio	18:1
Firing order	1-8-7-2-6-5-4-3
Rotation from flywheel	counterclockwise
Oil pressure (hot)	6psi min@idle
Oil pressure (hot)	30-43psi min@2000rpm
Operating Temperature	70°C
Injection System	Stanadyne Mechanical
Cooling system	Closed cooling
Boost system	Lysholm Supercharger
Exhaust system	356 alu w A4 ss raiser
Dry weight	430 kg
Oil Change intervals	100 hrs
Emissions	EC 2003/44, EPA Tier 2 pending, IMO

Marinediesel Marine propulsion applications. Revised data October 2009

MD – Engine Drawing



VGT-series High-Output engines

Marinediesels new VGT-series High-Output engines are finally available after over four years of intensive development.

The design goals have been:

- » High Power output
- » Commercial rating
- » Best power to weight ratio on the market
- » EPA, EU and IMO compliant
- » Drastically reduced noise level at idle and through the entire rpm range
- » Variable geometry turbo technology to continue with Marinediesels tradition of low end torque and very fast throttle response
- » Improved fuel economy
- » Instant start-up in cold weather
- » Marinediesels new common rail marine grade ECU system

Durability, diesel economy and dependable power will be synonymous with the new VGT-series. All maintenance items have been integrated at an early design stage to these components easily accessible.

Quick acceleration

The variable geometry turbo system will allow vessels to accelerate quicker and with faster throttle response than any other conventional turbo engines on the market. The technology also improves the fuel economy over the entire rpm-range of the engine. The Bosch common rail system in conjunction with Marinediesels own ECU system reduces the noise levels at idle with up to 80%.

CAN-bus J1939 system allows for full integration with the vessels electronic systems.

A large corrosion resistant after cooling system.

Small package with low weight

The new VGT engines are all based on the 6.6L 32-valve V8 configuration, a much larger displacement platform than other engines in the same power range. Even with its large displacement it is at the same time a much smaller package and with a lower weight. Laptop diagnostics tool available.

Noise suppression

The rigidity of the cylinder block is a concern not only for durability but for noise suppression as well. This strength was accomplished with a deep-skirt cylinder block structure and by connecting the bearing caps to the lower part of the block with side bolts, in addition to the two main bolts. The block is manufactured from a special gray iron alloy. The 4340 forged steel crankshaft and six 14mm head bolts per cylinder all indicate the strength of the design.



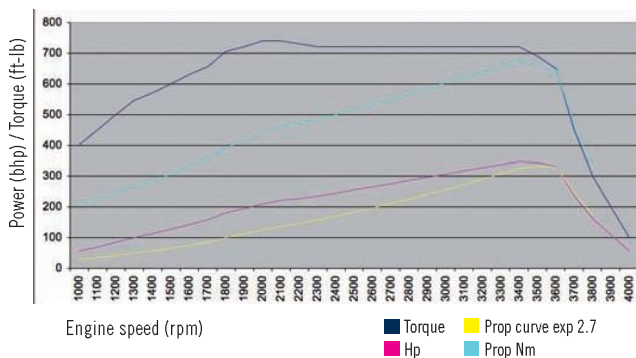
Marinediesel VGT350

261 kW (350 bhp) @3500 rpm

All Marinediesel VGT Common-Rail engines are based on the 6.6L V8 configuration and are designed to be as compact and light weight as possible while maintaining durability and serviceability. The VGT350 is intended for medium to high speed vessels and has a light duty rating (Medium Duty as option). Laptop based diagnostics tool is available for all VGT and TSC engines. J1939 and NEMA2000 CAN communication.



Power / Torque Curve



General Data

Model MD-VGT32
 Number of cyl. 8
 Bore and stroke mm. 103/98
 Displacement L 6.6
 Compression ratio 16.8:1
 Valves per cyl. 4
 Firing order 1-2-7-8-4-5-6-3
 Combustion system DI Common rail
 Engine type V8
 Aspiration Variable geometry turbo
 Charge air cooling Air to water
 Engine crankcase vent syst. Closed
 Max crankcase press kPa. 0.5

Physical Data

Length mm 779
 Width mm 825
 Height mm. 969
 Weight dry kg. 450

Air System

Max intake restriction kPa 6
 Engine air flow m³/min 30
 Rec air intake pipe diam mm (min). 100
 Minimum intake air per eng (cm²) 600

Cooling System

Cooling system closed cooling
 Closed system coolant flow L/min 304
 Raw water pump flow L/min 180
 Thermostat start to open °C. 7
 Thermostat fully open °C 93
 Engine coolant capacity L 18
 Recommended press cap psi. 16

Fuel System

Fuel injection pump Bosch common rail
 Governor regulation 1%
 Governor type. Electronic

Maximum fuel transfer pump suction

Distance of fuel m 2.5
 Fuel filter micron size. 10

Lubrication System

Oil pressure@2000rpm – psi 30-45
 Oil pressure at low idle – psi. 12
 In pan oil max temperature °C 120

Exhaust System

Exhaust flow m³/min (max). 60
 Exhaust temperature °C(max) 700
 Max allowable exh backpress kPa 7.5

Electrical System

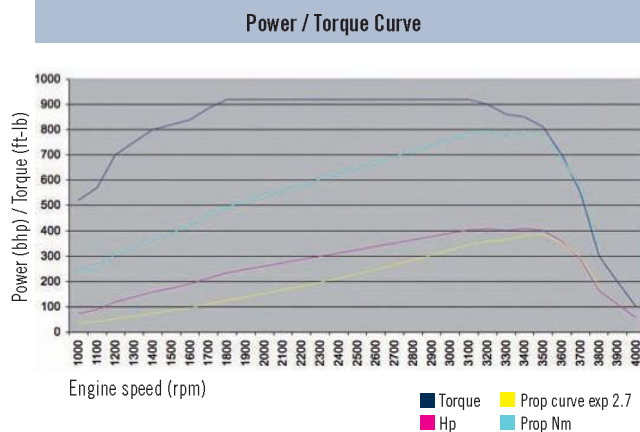
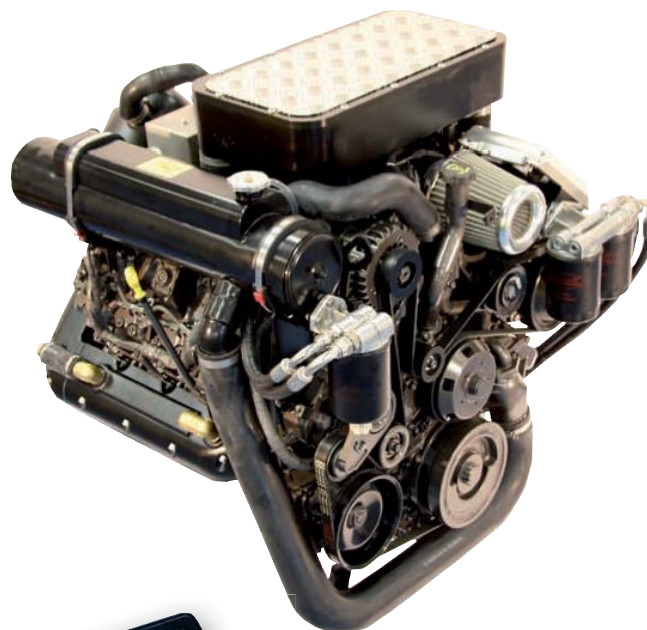
Recommended battery capacity CCA
 12 volt system – amp 050
 Maximum allowable start circuit resistance
 12 volt system – ohm 0.001

Marinediesel Marine propulsion applications. Revised data October 2009

Marinediesel VGT400

299 kW (400 bhp) @3500 rpm

All Marinediesel VGT Common-Rail engines are based on the 6.6L V8 configuration and are designed to be as compact and light weight as possible while maintaining durability and serviceability. The VGT400 is intended for light high speed vessels and has a light duty rating. Laptop based diagnostics tool is available for all VGT and TSC engines. J1939 and NEMA2000 CAN communication.



General Data

Model MD-VGT32
Number of cyl. 8
Bore and stroke mm. 103/98
Displacement L 6.6
Compression ratio 16.8:1
Valves per cyl. 4
Firing order 1-2-7-8-4-5-6-3
Combustion system DI Common rail
Engine type V8
Aspiration Variable geometry turbo
Charge air cooling Air to water
Engine crankcase vent syst. Closed
Max crankcase press kPa. 0.5

Physical Data

Length mm 779
Width mm 825
Height mm 969
Weight dry kg. 450

Air System

Max intake restriction kPa 6
Engine air flow m³/min 30
Rec air intake pipe diam mm (min) 100
Minimum intake air per eng (cm²) 600

Cooling System

Cooling system closed cooling
Closed system coolant flow L/min 304
Raw water pump flow L/min 180
Thermostat start to open °C 7
Thermostat fully open °C 93
Engine coolant capacity L 18
Recommended press cap psi 16

Fuel System

Fuel injection pump Bosch common rail
Governor regulation 1%
Governor type Electronic

Maximum fuel transfer pump suction

Distance of fuel m 2.5
Fuel filter micron size 10

Lubrication System

Oil pressure@2000rpm – psi 30-45
Oil pressure at low idle – psi 12
In pan oil max temperature °C 120

Exhaust System

Exhaust flow m³/min (max) 60
Exhaust temperature °C(max) 700
Max allowable exh backpress kPa 7.5

Electrical System

Recommended battery capacity CCA
12 volt system – amp 050
Maximum allowable start circuit resistance
12 volt system – ohm 0.001

Marinediesel Marine propulsion applications. Revised data October 2009

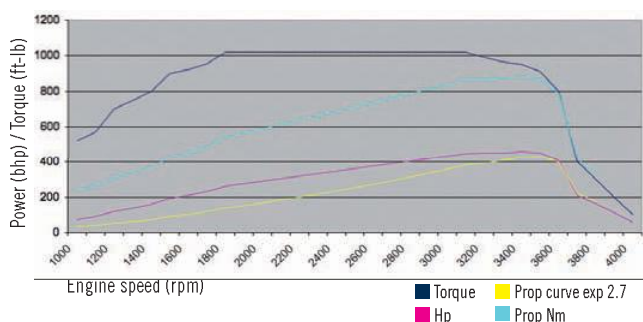
Marinediesel VGT450

336 kW (450 bhp) @3500 rpm

All Marinediesel VGT Common-Rail engines are based on the 6.6L V8 configuration and are designed to be as compact and light weight as possible while maintaining durability and serviceability. The VGT450 is intended for light high speed vessels and has a light duty rating. Laptop based diagnostics tool is available for all VGT and TSC engines. J1939 and NEMA2000 CAN communication.



Power / Torque Curve



General Data

Model	MD-VGT32
Number of cyl.	8
Bore and stroke mm.	103/98
Displacement L	6.6
Compression ratio	16.8:1
Valves per cyl.	4
Firing order	1-2-7-8-4-5-6-3
Combustion system	DI Common rail
Engine type	V8
Aspiration	Variable geometry turbo
Charge air cooling	Air to water
Engine crankcase vent syst.	Closed
Max crankcase press kPa.	0.5

Physical Data

Length mm	779
Width mm	825
Height mm.	969
Weight dry kg.	450

Air System

Max intake restriction kPa	6
Engine air flow m ³ /min	30
Rec air intake pipe diam mm (min)	100
Minimum intake air per eng (cm ²)	600

Cooling System

Cooling system	closed cooling
Closed system coolant flow L/min	304
Raw water pump flow L/min	180
Thermostat start to open °C	7
Thermostat fully open °C	93
Engine coolant capacity L	18
Recommended press cap psi	16

Fuel System

Fuel injection pump	Bosch common rail
Governor regulation	1%
Governor type	Electronic

Lubrication System

Maximum fuel transfer pump suction	
Distance of fuel m	2.5
Fuel filter micron size	10

Exhaust System

Oil pressure@2000rpm – psi	30-45
Oil pressure at low idle – psi	12
In pan oil max temperature °C	120

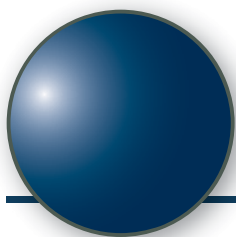
Electrical System

Exhaust flow m ³ /min (max)	60
Exhaust temperature °C(max)	700
Max allowable exh backpress kPa	7.5

Recommended battery capacity CCA

12 volt system – amp	050
Maximum allowable start circuit resistance	
12 volt system – ohm	0.001

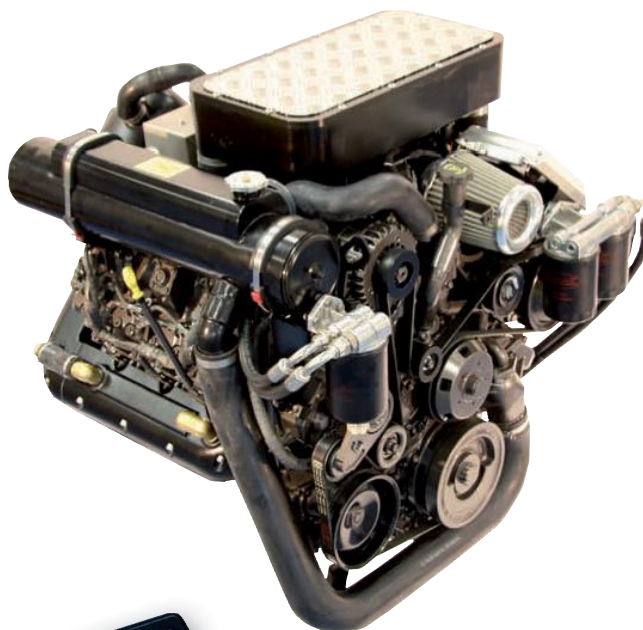
Marinediesel Marine propulsion applications. Revised data October 2009



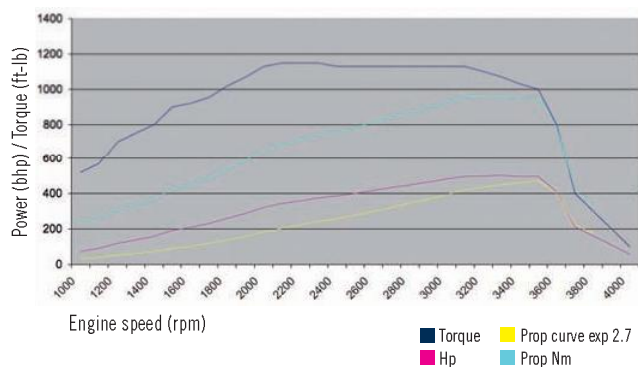
Marinediesel VGT500

373 kW (500 bhp) @3500 rpm

All Marinediesel VGT Common-Rail engines are based on the 6.6L V8 configuration and are designed to be as compact and light weight as possible while maintaining durability and serviceability. The VGT500 is intended for light, very high speed vessels and has a light duty rating. Laptop based diagnostics tool is available for all VGT and TSC engines. J1939 and NEMA2000 CAN communication.



Power / Torque Curve



General Data

Model MD-VGT32
 Number of cyl. 8
 Bore and stroke mm. 103/98
 Displacement L 6.6
 Compression ratio 16.8:1
 Valves per cyl. 4
 Firing order 1-2-7-8-4-5-6-3
 Combustion system DI Common rail
 Engine type V8
 Aspiration Variable geometry turbo
 Charge air cooling Air to water
 Engine crankcase vent syst. Closed
 Max crankcase press kPa. 0.5

Physical Data

Length mm 779
 Width mm 825
 Height mm. 969
 Weight dry kg. 450

Air System

Max intake restriction kPa 6
 Engine air flow m³/min 30
 Rec air intake pipe diam mm (min) 100
 Minimum intake air per eng (cm²) 600

Cooling System

Cooling system closed cooling
 Closed system coolant flow L/min 304
 Raw water pump flow L/min 180
 Thermostat start to open °C 7
 Thermostat fully open °C 93
 Engine coolant capacity L 18
 Recommended press cap psi. 16

Fuel System

Fuel injection pump. Bosch common rail
 Governor regulation 1%
 Governor type. Electronic

Maximum fuel transfer pump suction
 Distance of fuel m 2.5
 Fuel filter micron size. 10

Lubrication System

Oil pressure@2000rpm – psi 30-45
 Oil pressure at low idle – psi. 12
 In pan oil max temperature °C 120

Exhaust System

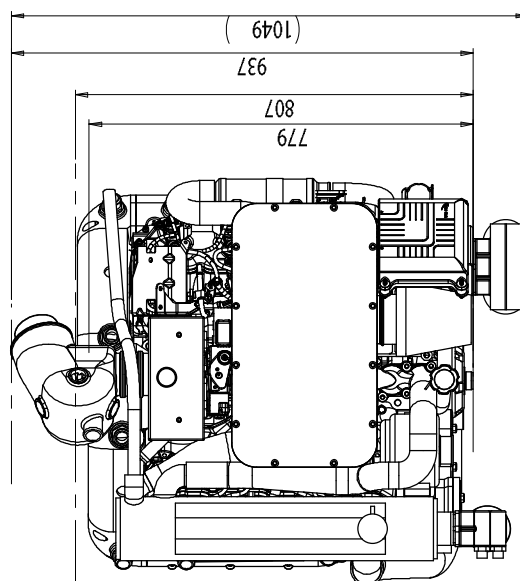
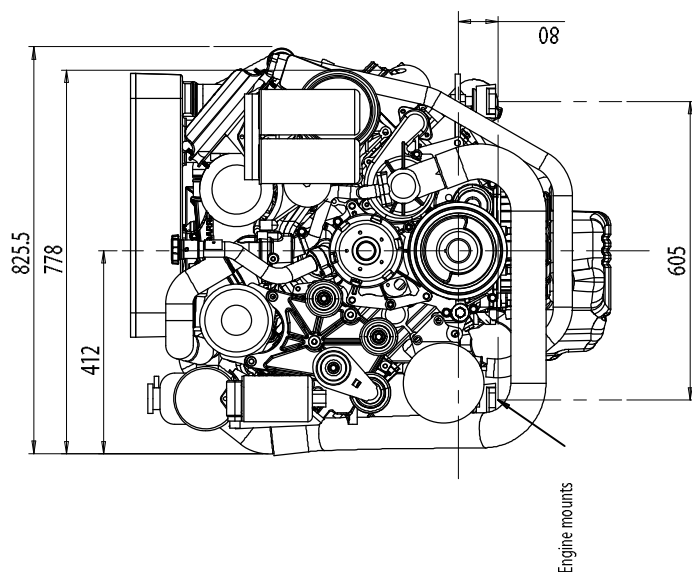
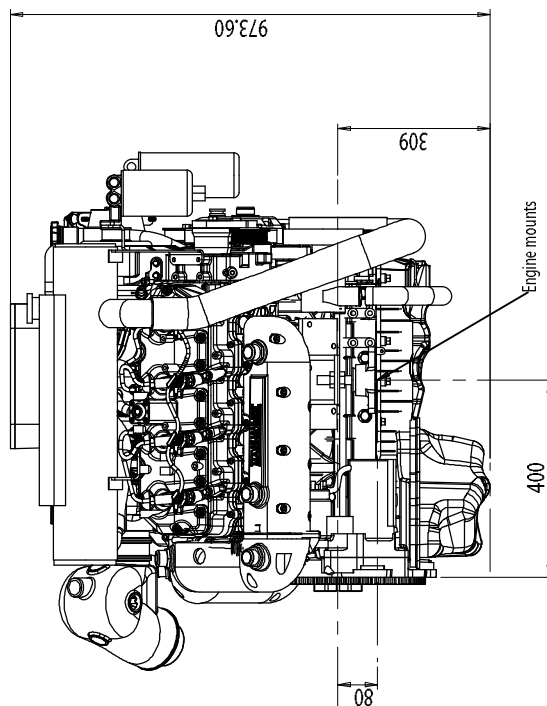
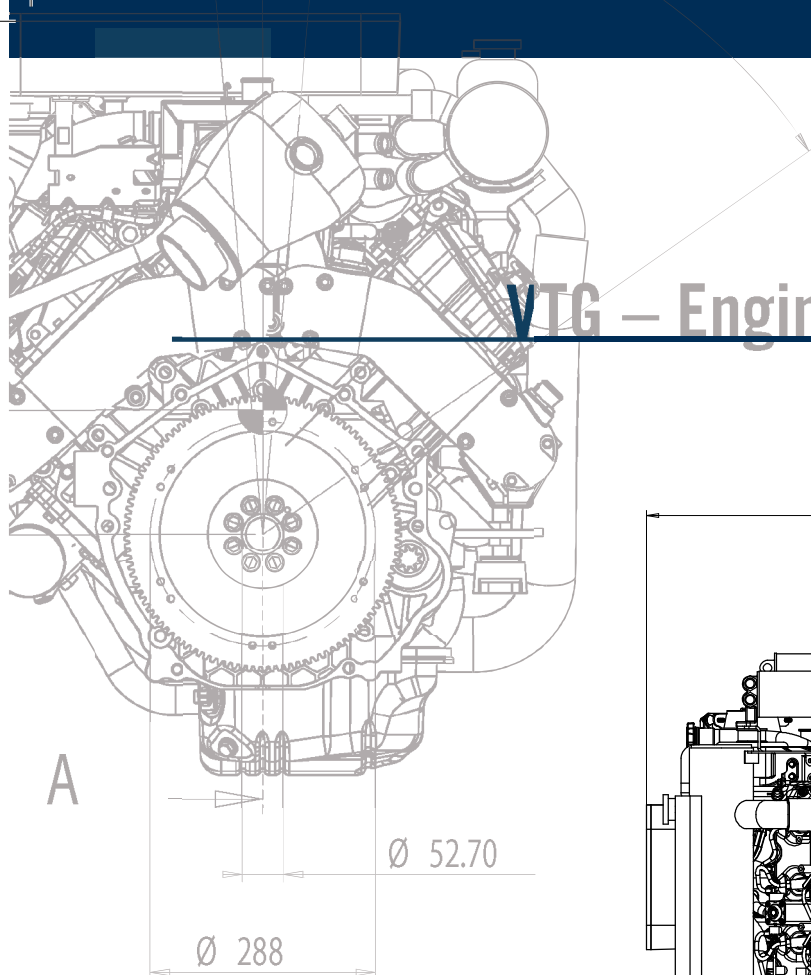
Exhaust flow m³/min (max) 60
 Exhaust temperature °C(max) 700
 Max allowable exh backpress kPa 7.5

Electrical System

Recommended battery capacity CCA
 12 volt system – amp 050
 Maximum allowable start circuit resistance
 12 volt system – ohm 0.001

Marinediesel Marine propulsion applications. Revised data October 2009

VTG – Engine Drawing



Scope of Supply

More options available - contact Marinediesel.

0 = Standard equipment

X = Optional Equipment

ENGINE MODEL	MD170	MD200	MD250SC	MD300SC	VGT-350	VGT-400	VGT-450	VGT-500	TSC
12v system	0	0	0	0	0	0	0	0	0
24v system	x	x	x	x	x	x	x	x	x
Heatexchanger cooling	0	0	0	0	0	0	0	0	0
Keel cooling	x	x	x	x	x	x	x	x	x
Instrumentation	0	0	0	0	0	0	0	0	0
Twin remote lube oil filters	0	0	0	0	0	0	0	0	0
Exhaust elbow wet	0	0	0	0	0	0	0	0	0
Seawater filter	x	x	x	x	x	x	x	x	x
Reverse gear	x	x	x	x	x	x	x	x	x
Bottom mount starter motor	0	0	0	0	0	0	0	0	0
Top mount starter	x	x	x	x	x	x	x	x	x
105 Amp alternator	0	0	0	0	0	0	0	0	0
Stainless steel hydraulic fittings	0	0	0	0	0	0	0	0	0
Paper element air filter									
Stainless steel mesh air filter	0	0	0	0	0	0	0	0	0
PTO	x	x	x	x	x	x	x	x	x
Fuel hand pump	x	x	x	x	x	x	x	x	x
Lube oil hand pump	x	x	x	x	x	x	x	x	x
Heavy duty raw water pump	0	0	0	0	0	0	0	0	0
Heavy duty oil cooler	0	0	0	0	0	0	0	0	0
Power steering pump	x	x	x	x	x	x	x	x	x
2-Pole alternator	x	x	x	x	x	x	x	x	x
Torsional flexible coupling	x	x	x	x	x	x	x	x	x
Flexible mounts	0	0	0	0	0	0	0	0	0
6-8m panel cable extension	0	0	0	0	0	0	0	0	0
Alarm system (light+audio)	0	0	0	0	0	0	0	0	0
Quick change belt system	0	0	0	0	0	0	0	0	0
Fuel filter	0	0	0	0	0	0	0	0	0
Fuel pre-filter	x	x	x	x	x	x	x	x	x
Flush system	x	x	x	x	x	x	x	x	x
Solas	x	x	x	x	x	x	x	x	x
Extended height exhaust elbow	x	x	x	x	x	x	x	x	x

Ratings

Ratings are based on ISO 8665 conditions of 100 kPa (29.612 in Hg) and 25°C (77°F) and 30% relative humidity. Rated power represents the net power available at crankshaft.

Fuel consumption has a tolerance of +7% and is based on fuel of 35° API gravity at 16°C (60°F) having an LHV of 42,780 KJ/KG (18,390 BTU/lb) when used at 29°C (85°F) and weighing 838.9 g/liter (7.001 lb/US gal) with LTA when available.

L Light Duty Commercial

For commercial vessels or craft with high demands on speed and acceleration, planing or semi-planing hulls in cyclical operation. Typical boats: Fast patrol, rescue, police, light fishing, fast passenger and taxi boats etc. Full power could be utilized maximum 2 h per 12 h operation period. Between full load periods, engine speed should be reduced at least 10 % from the obtained full load engine speed.

M Medium Duty Commercial

For commercial vessels with semiplaning or displacement hulls in cyclical operation. Typical boats: Most patrol and pilot boats, coastal

fishing boats in cyclical operation, light trawlers, passenger boats and coastal freighters with shorter trips. Full power could be utilized max 4 h per 12 h operation period. Between full load operation periods, engine speed should be reduced at least 10 % from the obtained full load engine speed.

C Continuous Duty Commercial

For vessels operating at rated load and rated speed up to 100% of the time without interruption or load cycling (80% to 100% load factor). This a SPE Special Purpose Engine option, please contact factory for information.

Generator Drive Engines

Engines with this rating are available for an unlimited number of hours per year in variable load applications. Variable load is not to exceed 70 percentage average of the rated power during any operating period of 250 hours. Total operating time at 100 percent prime power shall not exceed 500 hours per year.

Marine Emission

Marinediesel Sweden AB has always been at the front of current and future emissions regulations. All engines are designed with environmental concerns in mind while maintaining simple mechanical control and serviceability.

2003/44/EC

In effect in Europe from January 1st 2006. Only applies to Pleasure craft marine propulsion engines.

IMO

The international Maritime Organisation has issued regulation 13 to Annex VI of Marpol 73/78 which entered into effect on January 1, 2000 for diesel engines above 130 KW (175hp) installed on a ship.

EPA

On January 1, 2004, emissions regulations mandated by the EPA entered into effect for new commercial marine diesel engines installed

on a vessels flagged or registered in the United States. The EPA has set forth two Tiers of standards with a phased implementation based on per cylinder displacement. Tier 1 emission standards are set at the same level as Annex VI of MARPOL 73/78 (IMO), and regulate levels of Nitrogen Oxides (NOx). Tier 1 applies to all commercial propulsion and auxiliary diesel engines with a displacement above 2.5 liters per cylinder.

The more stringent Tier 2 standards entered into effect on January 1, 2004 for marine diesel engines with a displacement of 0.9 up to 2.5 liters per cylinder. Tier 2 regulates not only NOx, but also Hydrocarbons (HC), Carbon Monoxide (CO), and Particulate Matter (PM). Engines with a displacement of less than 0.9 liters per cylinder will be required to comply with Tier 2 standards beginning January 1, 2005 and engines at or above 2.5 liters per cylinder will be required to comply with Tier 2 standards beginning January 1, 2007.

Not all regulations apply to every engine, rating or application. Other local certifications may be available. Consult your local Marinediesel representative for more information on current emissions

www.marinediesel.se

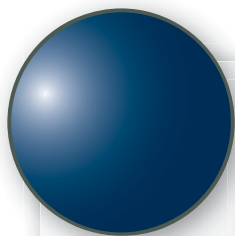
Propulsion Systems

Marinediesel has vast experience with different types of drive systems and can supply these together with the Marinediesel engines as complete packages to the client.

As an engine manufacturer we are not locked to any particular brand of supplier but can recommend a suitable unit should the client not have their own preference. It is highly beneficial for the client or operator to purchase the engine and drive system as one complete propulsion unit from one supplier as this will erase any concerns about fault should any issue arise. The most common types of drive systems used with Marinediesel engines are sterndrives, surface drives, water jets and conventional propeller shaft setups.

MD X1

For the higher engine- and duty- ratings there have not been many sterndrive options available and for this reason Marinediesel contracted MD Engineering to develop such a system. The MD X1 sterndrive will be available 2010, the system is commercially rated and is capable of 1000+ Nm. More information on this system is available in the Scandinavian Sterndrive Systems brochure.



TSC-series

With twin Lysholm superchargers this engine is not like anything the world propulsion market has ever witnessed. The engine is specifically designed for applications where ultra fast throttle and torque response is required such as boarding missions etc. The engine is scheduled for release 2011.

Service - Support - Reliability



Marinediesel, its services and products are highly targeted towards the commercial and military markets starting from the day the engines were designed. This focus has resulted in Marinediesel's market leading service and support programs. Marinediesel has an in-depth understanding of operational requirements in different regions of the globe and has adapted to meet and exceed the client demands. More information is available in the Diesel Service and Support folder.

Marinediesel represented by

