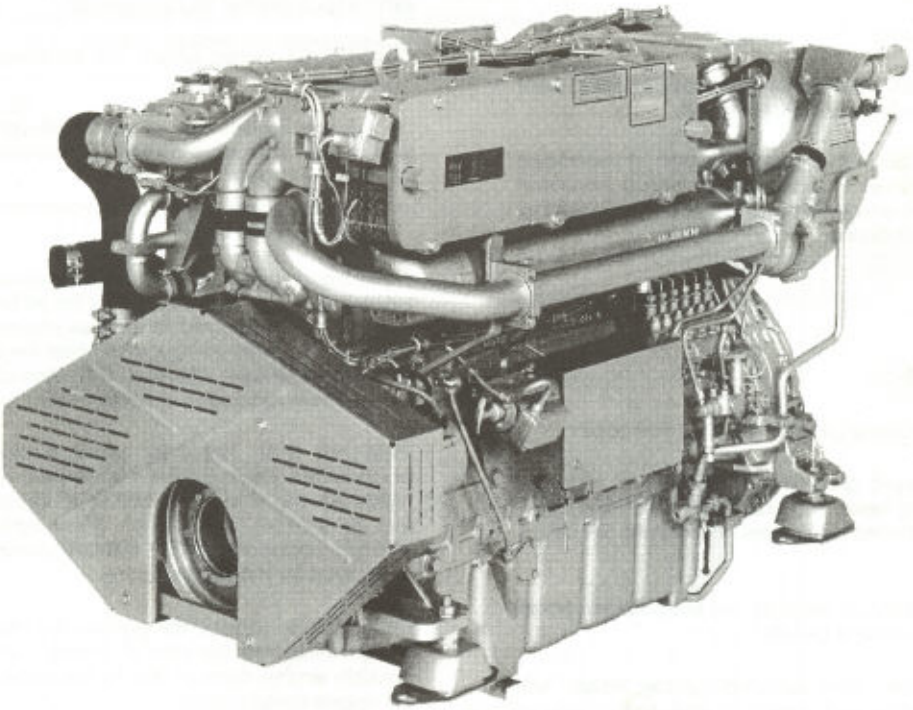
mtu
FRIEDRICHSHAFEN

Standard Quotation
6R 183 TE93

Propulsion Plant for Fast Ships

441 kW · 2300 rpm



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Series 183 engines are based on Mercedes-Benz's Series 400 industrial and vehicular engines, which have proven their worth by the hundred thousands on a global scale, setting quality standards in a multitude of applications.

They have been optimized by MTU for marine service through development and selection of application-specific engine components.

Essential marinization features:

- Newly designed auxiliary PTO with integrated raw water pump
- Titanium plate-core heat exchanger for coolant recooling, and integrated expansion tank
- Split-circuit coolant system
- Liquid-cooled exhaust manifold and turbocharger
- Electrical equipment (generator, starter, monitoring system)
- Air intake system
- Resilient mounting

Application-related accessories and ready-to-install plant concepts complement the marinization kit.

Mercedes-Benz technology and the wealth of experience that MTU has gained over decades in marine propulsion translate into renowned power system solutions backed by worldwide Product Support.

Design Features

- TE variant: turbocharged and internally intercooled
- Monobloc, alloyed grey cast-iron crankcase with side walls extending below the crankshaft centerline. Lightmetal oil pan. Bolted-on flywheel housing with SAE No. 1 flange.
- Liquid-cooled exhaust manifold and turbocharger (linked up with engine coolant circuit).
- Individual alloyed grey cast-iron cylinder heads with shrink-fitted valve seat inserts. 1 inlet and 1 exhaust valve of heat-resistant alloy steel per cylinder head. Wear-resistant valve guides. Partition between injector and lube oil space.
- Precision-forged crankshaft with hardened journal fillets and bolt-on counterweights. Triple-layer sleeve bearings with steel backing shells. Alignment bearing at the flywheel end. Torsional vibration damper at the aux. PTO end (dependent on torsional vibration computation).
- Precision-forged, angle-split conrods serrated at the split line. Triple-layer sleeve bearings with steel backing shells. Wear-resistant bronze bushing for piston pin.
- Centrifugally cast wet-type, special-alloy, replaceable cylinder liners.
- Lightmetal pistons with two compression rings and one oil control ring. Cast-in insert in top groove. Internal piston cooling via oil spray nozzle. Piston-conrod removal from above.
- Valves operated through gear-driven camshaft (individual cam lubrication), tappets, pushrods and rocker arms. Valve clearance adjustment through adjusting screws located in rocker arms.
- Maintenance-free, automatically vented block-type fuel injection pump and injection timer. Multi-hole fuel injectors, fuel delivery pump and duplex filter.
- Governor flanged to injection pump.
- Forced-feed lubrication via gear pump. Oil flow proceeds through liquid-cooled heat exchanger and fine filter to lubrication points. Replaceable-element oil filter and heat exchanger combined into a single unit.
- Closed-circuit coolant system with centrifugal pump and thermostat.

  "TE" engine models use a split-circuit coolant system with internal charge air cooling. The system is split up into two sub-circuits:

  . Charge-air coolant circuit (low-temperature circuit)
  . High-temperature circuit

  Thermostatic control of the charge-air coolant flow as a function of engine load determines the air temperature to the cylinders. Compared to external charge air cooling, this coolant system configuration offers the advantage of enhanced low-load operation and eliminates possible hazards from aggressive or contaminated raw water.
- Plate-core heat exchanger using stacked-up plates which isolate engine coolant from raw water, with the two media passing through the unit in an opposed-flow pattern for optimum heat transfer. These lightweight, high-strength, corrosion-resistant titanium plates can be disassembled for individual cleaning.

  Unlike tubular coolers, the non-welded heat exchanger design minimizes the risk of leakage and, therefore, possible engine damage due to raw water ingress into the engine coolant circuit.

Engine Rating

Engine Model	Basis: Mercedes-Benz	Application Group	Fuel Stop Power		
			rpm	**kW**	HP (metric)
6R 183 TE93	OM 447LA	**1DS**	2300	**441**	600

The rating shown represents net brake power (DIN/ISO 3046) at the PTO flange (raw-water pump requirement deducted).

To calculate the power available at the gearbox output flange, a gearbox efficiency of 0.97 must be taken into account.

Application Group **1DS:** Fast ships with low load factors.

Reference Conditions:				
	Intake air temperature	25°C*	Barometric pressure	1000 mbar
	Raw water temperature	25°C*	Intake depression	15 mbar
			Exhaust back pressure	30 mbar

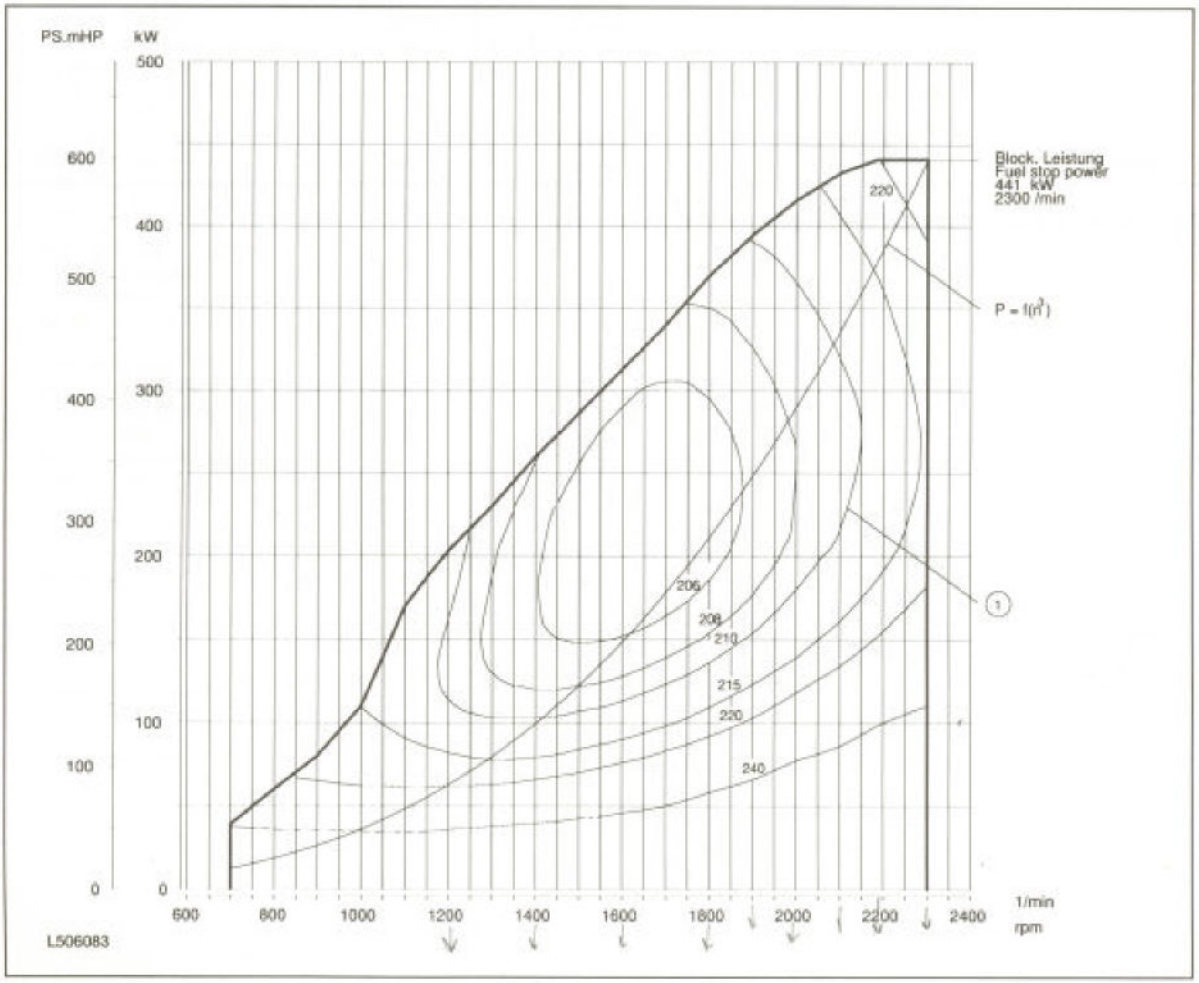
* No derating up to 45°C intake air temperature and 32°C raw water temperature.

Performance Diagram

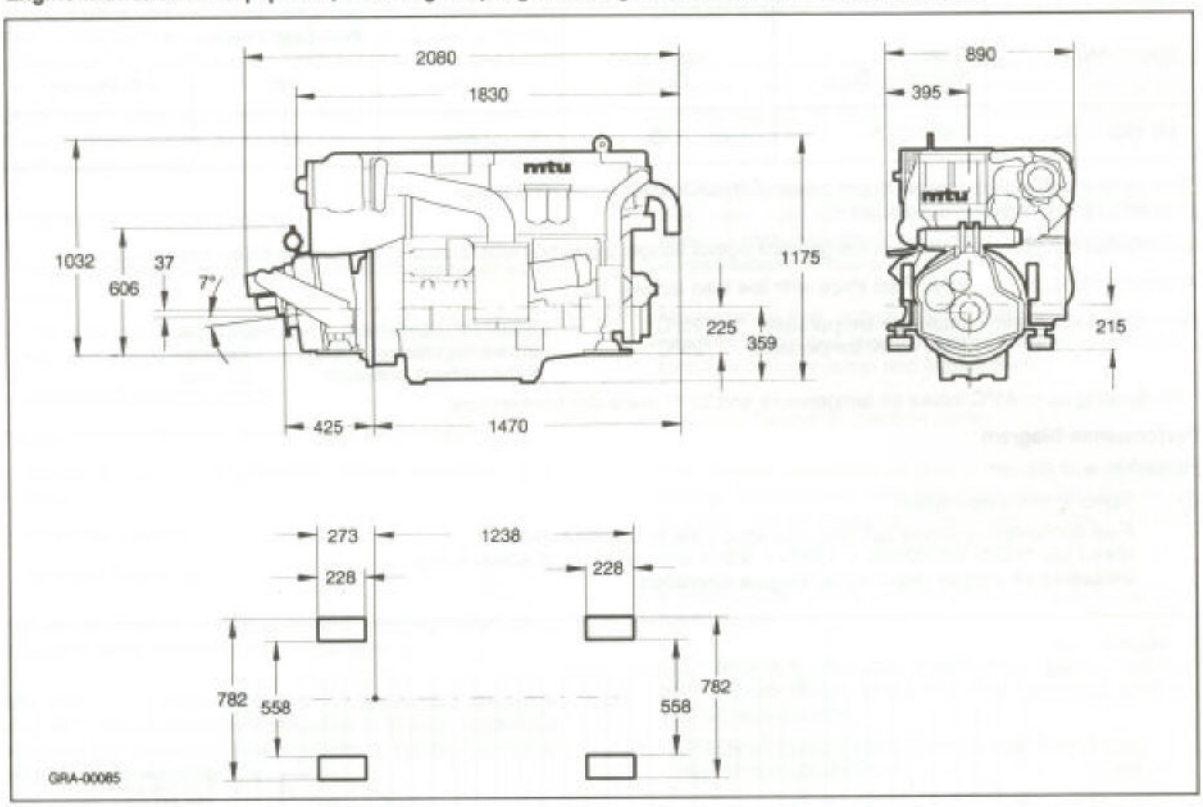
Remarks:

① Specific fuel consumption

Fuel consumption curves (g/kWh), tolerance +5% to DIN/ISO 3046, diesel fuel to DIN EN590/MIL-F 16884 F with a minimum LHV of 42800 kJ/kg.
Including all pumps required for engine operation.



Engine with standard equipment, including coupling and flange-mounted MPM IRM 311A gearbox



Total dry weight (with standard equipment and IRM 311A): 1500 kg

Technical Data

Engine Model		6R 183 TE93
General specifications		4-stroke diesel, liquid-cooled, turbocharged, intercooled, direct injection, wet-type cylinder liners, piston cooling, triple-wall liquid-cooled exhaust manifold
Crankcase		cast iron
Direction of rotation		c.c.w. (facing main PTO end)
Valves per cylinder		1 inlet, 1 exhaust
Cylinder arrangement		in-line
Bore/stroke	mm	128/155
Displacement, cylinder	lit.	1.99
Displacement, total	lit.	11.97
Number of cylinders		6
Compression ratio		16.25
Cold start: Air temperature (unassisted, without preheating)	°C	- 10
Mean piston speed	m/sec	11.9
M.E.P.	bar	19.3
Oil capacity	lit.	24
Coolant capacity incl. recooling system	lit.	45
SFC (tolerance +5% to ISO/DIN)		
- at rated power	(g/kWh)	224
- optimum on performance map	(g/kWh)	206
Oil consumption (after approx. 100 hours)	(g/kWh)	approx. 0.5% of fuel consumption
Intake depression, new/max. permissible	mbar	15/50
Exhaust back pressure, new/max. permissible	mbar	30/100
Radiation and convection heat	kW	27
Coolant heat dissipation	kW	360
Raw water flow requirement, approx.	m^3/h	27
Combustion air flow	m^3/sec	0.55
Exhaust flow	m^3/sec	1.50
Exhaust temperature after turbine	°C	555
Inclinations relative to waterline:		
(main PTO end down) Trim, permanent	∠°	12
(main PTO end up) Trim, permanent	∠°	6
List, permanent (left)	∠°	10
List, permanent (right)	∠°	30

Basic Configuration

***A.S STANDARD ENGINE EQUIPMENT**

Marine diesel engine with exhaust turbocharging and charge air cooling; liquid-cooled, triple-wall exhaust manifold; fuel filter; fuel delivery pump with hand pump; BOSCH in-line injection pump with flanged-on BOSCH governor; lube oil pump; lube oil heat exchanger, lube oil filter; coolant pump; coolant thermostat; coolant distribution housing with expansion tank and breather valve

Electric starter (24 VDC; 6.6 kW; 2-pole);
Electric control unit for engine start/stop

Generator (28 VDC; 120 A; 2-pole)

Flame-proof hose lines for fuel connection

Oil dipstick on left and right sides;
oil change equipment (for use on engine and gearbox) with semirotary hand pump

Dry-type combustion air filter with restriction indicator

Coolant-to-raw water, plate-core heat exchanger; self-priming raw water centrifugal pump;
flame-proof hose line for raw water connection

Engine carrier for resilient engine mounting

V-belt drive for engine coolant pump,
generator and raw water pump

Engine shutdown solenoid
(24 VDC, 2-pole)

On-engine sensors, wiring, and terminal box
(24 VDC, 2-pole)

Factory acceptance testing; engine preservation; installation, operation and maintenance instructions

Weight (standard engine equipment): 1260 kg

*** Standard package scope**

Additional and Alternative Equipment

		Weight kg
	ENGINE ACCESSORIES	
***A1.S1**	Injection-type exhaust elbow (raw water injection) for connection of exhaust metal tube by band clamp	33.0
	Alternative to Item A1.S1:	
A1.A1	Bellows with elbow and connector (band clamp) to be connected to on-engine exhaust connection, for vertical exhaust discharge	21.0
***A1.S2**	Resilient engine mounting (in conjunction with flange-mounted gearbox)	5.4
A1.Z3	Fuel prefilter with water separator	2.8
A1.Z5	On-engine ZF hydraulic pump (100 bar, 16 lit./min.)	10.7
	GEARBOX	
	Flange-mounted MPM reverse-reduction gearbox, mechanically operated; hydraulic clutches and propeller thrust bearing; resilient coupling between engine and gearbox; resilient gearbox mounting, sensors; complete pipework for gearbox oil heat exchanger and oil change	
***A3.S1**	Model IRM 311A, i = 1.092, output flange 7° inclined	203.0
	Alternative to Item A3.S1:	
A3.A1	Model IRM 311A,, i = 1.501, output flange 7° inclined	203.0
A3.A2	Model IRM 311A, i = 2.033, output flange 7° inclined	203.0
	REMOTE CONTROL	
A4.Z1	Electric engine/gearbox remote control (for twin-engine plant) from main control stand (8-32 VDC; control panel with 2 single-lever controls; indicators and control elements; ready for installation in control console; incl. set of actuators, cables and assembly hardware)	35.0
A4.Z2	Electric engine/gearbox remote control (for twin-engine plant) from slave control stand (8-32 VDC; control panel with 2 single-lever controls; indicators and control elements; ready for installation in control console; incl. set of cables)	9.0

100	2530	05:08 PM 3.458067
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2100	433.57	90.46
2000	419.71	92.31
1900	401.09	87.07
1800	379.38	80.79
1600	331.31	53.17
1400	283.87	36.92
1200	234.59	

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Subject to modifications in the interest of technical progress
VTT 07192 (56 1E) 7/94 · Printed in Germany 1/94 6S93-94E