



MARINE DIESEL ENGINES
TRACTOR SERIES
TECHNICAL SPECIFICATIONS



CRM 12-Cylinder Engines

Construction Features

- V type configuration with 60° angle
- Prechamber fuel injection
- Closed-circuit fresh-water cooling
- Pressure-pulse supercharging
- Supercharging-air cooling by sea water

Main Features

- Compact construction
- Very high power: mass ratio
- Optimized diameter for the highest mechanical and thermal efficiencies
- Modular construction

12 D/A
(Aspirated, only on request)

12 D/S
(Supercharged)

12 D/SS
(Turbosupercharging)



Description

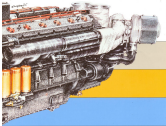
The very extended range of power output in the sub-range of using the best materials with the most advanced, precision machining techniques specially conceived for their most current applications.

The following components in particular are used:

- Cast light alloy and aluminum treated castings and cylinder heads, treated in the finished or dimensional condition so that the material can be used to the full while maintaining stresses at critical points within safe limits.
- Forged steel cylinders with integral combustion chambers.

- Forged, nitrided steel crankshafts, with specially designed cooling rings for the large cranks and high safety coefficients on ideal static and dynamic stresses.
- Ball-to-roller-roller bearing friction pairs dynamically balanced together with the crankshaft.
- Master ball and connecting rod in high-resistance steel alloy machined for greater following with minimum clearance on the ball face.
- Master-rod and connecting rod head and foot bearings designed to contain specific phenomena.

- Forged lightweight pistons capable of withstanding considerably thermal loads, sodium-water cooler and exhaust valves driven by force constantly per inch.
- Cast-ironed in gas carburizing, where finished transmission gearing with hardness 58HRC ± 2 HRC.



Performance

Index: Score Point Standard

12 D/A	1% rpm	140,000 rpm	1% rpm	140,000 rpm	1% rpm	140,000 rpm	1% rpm	140,000 rpm
12 D/S	1% rpm	140,000 rpm	1% rpm	140,000 rpm	1% rpm	140,000 rpm	1% rpm	140,000 rpm
12 D/SS	1% rpm	140,000 rpm	1% rpm	140,000 rpm	1% rpm	140,000 rpm	1% rpm	140,000 rpm

12000 rpm

12 D/A	Continuous rating rpm	140,000 rpm	140,000 rpm	140,000 rpm
12 D/S	Continuous rating rpm	140,000 rpm	140,000 rpm	140,000 rpm
12 D/SS	Continuous rating rpm	140,000 rpm	140,000 rpm	140,000 rpm

12000 rpm

12 D/A	Continuous rating rpm	140,000 rpm	140,000 rpm	140,000 rpm
12 D/S	Continuous rating rpm	140,000 rpm	140,000 rpm	140,000 rpm
12 D/SS	Continuous rating rpm	140,000 rpm	140,000 rpm	140,000 rpm

Engine design features

		Q 03A	Q 03S	Q 03S1
Configuration		V	V	V
No. of cylinders		12	12	12
Angle between cylinder banks		90°	90°	90°
Bore x Stroke	in	5.91 x 5.91		
Overall piston displacement	m³	600/64		
Individual piston displacement	m³	50/54		
Compression ratio		14.25	14.25	14
Supercharging ratio		A	175	1.85
Source of coolant		Cooler or COOL		
Cooling system		Fresh and sea water		
Supercharging system		pressure pulses		
Working system		electric or air type		
No. of valves per cylinder		4	4	4
Camshaft		4	4	4
Revs.		crankshaft type roller		
Cylinder		ground and hardened steel		
Piston skirt				al
Crankshaft		ground and treated steel		
No. of crankshaft bearings		7	7	7
Crank pin diameter	mm	54	54	54
Main journal diameter	mm	105	105	105
Injection pumps		12/12, 12/12	12/12, 12/12	12/12, 12/12
Sea pressure		variable speed mechanical type (sea pressure, 12/12, 12/12, 12/12)		
Headlight fresh water pump delivery	m³/h	50	50	50
Cooling sea water pump delivery	m³/h	50	50	50
Bottom stop type air cooling seawater pump delivery	m³/h	-	-	50
Overhaul oil pump delivery	m³/h	50	50	50
Lubricating system		dry, water		
Oil, weight and standard accessories (oil)	kg	1.000	1.000	1.000
Oil	kg	1.000		

Nonmagnetic features

permissible limit if all below the crankshaft

Standard construction	al	12	50	50
Special construction	al	12	50	50
With antipulse treatment	al	1	1	1

Application Areas

- Deploying, reel-deploying, reeling-in, and placing boats for medium-to-high speed
- Pulling and reeling in mooring boats

Coupling Options

- Fixed plate or adjustable plate reeling-in, reel-reeling, and reel-reel-out
- Propellers by means of reduction gear, torque-reduction gear, or overgear
- Winch by means of clutch or reduction gear with clutch

A's type CSM engine with reel-reeling propeller



A's type CSM engine with reel-reeling propeller



A's type CSM engine with reel-reeling propeller



A's type CSM engine with reel-reeling propeller



Shock Resistance Characteristics

A complete dynamic analysis of engine performed according

to publication
ISO 15000-1:2000

is available on request.

Drives

Standard

Power take-off		Rp	10
Direct power (retract gear)	Epicycle type	Rp	140
Reduction gears	1.21 to 1.761 Rp	Rp	150
Reduction gear	2.1 to 3.733 Rp	Rp	160
Reverse-reduction gear	Rp up to 3.1	Rp	200
Free-wheel	1.343 Rp	Rp	150
Reverse clutch	Hydraulically driven multiple-disc type	Rp	140

On Request

Reverse clutch and reduction gear	1.11 to 1.51 Rp	Rp	160
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On Request

The following complete assemblies:

- Engines - Reduction gears - Shaft drives - Propellers

- Engines - shaft reduction gears - integrated. Each assembly is individually designed and optimized for each hull.

T.B.O. (Time Between Overhauls)

According to the curves below depending on power. The curves are valid only if:

the engine is used within the limits of operation for diesel-pump propellers.



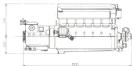
Base Plate

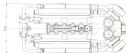
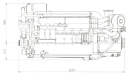
- Right: Light-duty bearing bases (numbers) are supplied on request.

- Flange: or with 4 stainless steel bearings b) with 16 rubber bearings c) with suitable number of

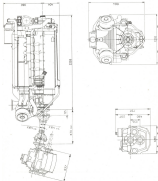
flexible, antishock bearings per engine.

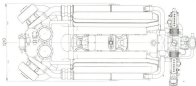
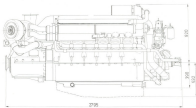
Weight limit: 100 kg according to type





2 D.5 engine V-DIM configuration







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