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News

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Evolution of excellence: new MaK M 25 C marine engine combines proven design with technology enhancements

Hamburg, Germany – How to improve on a bestseller? This was the question when developing the C-version of the well-known MaK M 25 marine engine. After 12 years in service and millions of miles logged, the M 25 series of 6, 8 and 9-cylinder, medium-speed, heavy-fuel capable, marine diesel engines is recognised for its performance and durability. Building upon this, the new M 25 C provides added value in four major areas: reliability, safety, ease of maintenance and guaranteed future.

The trademark for reliable propulsion

Introduced in 1996, the M 25 was the third member of the new MaK long-stroke marine diesel generation, which today comprises the M 20 C, M 25 C, M 32 C and M 43 C. Since then, some 1,250 MaK M 25 engines have been sold – roughly 77 % for main propulsion and 23 % for generating-set usage. Almost half are operated with Heavy Fuel Oil (HFO).

More than 700 M 25 engines, with cumulated power of about 1,600,000 kW, are already in service, having jointly logged over 11,000,000 operating hours. The M 25's specific combination of size, power and reliability has led to three major application areas: propulsion of smaller general purpose cargo vessels and coasters; propulsion of commercial vessels, especially tugs, fishing boats and offshore supply vessels; and as generator drives for on-board electrical supply on container vessels and passenger ferries.

A strategy of smart improvement

The M 25 standard power range is from 1,800 to 2,970 kW at 720 to 750 rpm, with a cylinder rating of 300 to 330 kW and fuel consumption of 183 to 184 g/kWh. The new M 25 C provides a slightly increased cylinder rating of up to 334 kW, resulting in a power range of 1,920 to 3,000 kW, while fuel consumption is unchanged.

Many minor changes in the M 25 C crankcase area have led to both smoother engine operation and easier engine maintenance. They include a modular lower valve drive, improved crankcase covers and the new speed-governor drive. This governor drive has the well-proven design of the M 32 C and M 43 C engines and is actually a pre-assembled module with fewer parts and a lower parts wear rate. Governor drive by gearwheel with straight teeth is absolutely safe and requires no further adjustment.

Production procedures optimised

The M 25 C crankcase is cast in an improved process which gives increased dimensional precision. The optional deep oil pan also benefits from strengthened design and is approved for HFO operations. To cope with existing engine room designs, however, the engine footprint for rigid installation and gearbox connection has not changed. For applications with resilient mounting, the use of improved dampers will further reduce engine vibrations and their transmission to the hull. In the case of compact engine rooms, resilient mounting is also available for M 25 C engines with deep oil pans.

The complete turbo-charger group, comprising turbo-charger, charge-air cooler and turbo-charger bracket, is now being pre-assembled, which increases manufacturing quality. In order to cope with the latest Safety of Live at Sea Convention (SOLAS), the turbo-charger itself is completely covered. The new cladding prevents hot spots while still enabling easy maintenance of turbo-charger and piping.

Future technology built in

Caterpillar Marine Power Systems is earning tremendous recognition for its suite of emission reduction technologies. Designed especially for MaK medium-speed engines, both Flexible Camshaft Technology (FCT) and Caterpillar Common Rail (CCR) are tailor-made solutions, enabling vessel operators to cope with ever-stricter emission legislation. To date, FCT is available for M 32 C and M 43 C engines and CCR is being introduced for M 32 C engines. However, the M 25 C crankcase is already designed to incorporate advanced technologies like these.

Two resiliently-mounted boxes on the engine contain all the engine control systems and there is no need for any external control cabinet. The first control box contains the Large Engine Protection/Safety System (LESS), comprising the engine protection system, the rpm switch unit and the start/stop control. This box also features both LED and graphic display on the front. The second box provides ample space for the engine monitoring system and the MOD bus output to the alarm system.

The new control box configuration permits complete assembly and pre-testing of engine control prior to delivery, which means reduced engine installation time at the shipyard. Control data transfer via MOD bus (RTU protocol) to the alarm system reduces wiring needs. Similar, the MaK DICARE remote engine monitoring system is connected via CAN bus to the DICARE PC station. The setup also provides the opportunity to implement an exhaust gas mean-value system. After all, the new control philosophy eases engine installation for the customer, enables updates on demand and provides the M 25 C with a guaranteed future.

Prepared to win

The change from M 25 to M 25 C will affect engine deliveries from January 1, 2008. Continued M 25 delivery for vessel series currently under construction is guaranteed. However, the advanced features of the M 25 C also encourage innovative application designs.

With a slightly higher power rating, advanced manufacturing and pre-assembly procedures, improved components and a guaranteed future in engine control and emissions reduction, the MaK M 25 C is well prepared to serve a variety of marine propulsion and generating set needs. Combined with the M 25's proven HFO compatibility, good fuel efficiency and long service intervals, there is no reason why the M 25 C should not further increase its market share in ocean-going and commercial shipping and in on-board electrical power supply. And with two high-quality M 25 production lines established at Caterpillar Motoren facilities in Kiel, Germany, and Guangdong, in the P. R. China, there is ample capacity to cope with growing market demand.

Characters: 6,042

Pictures available on request:

1.) **MaK M 25 C Marine Engine - Control Side**
2.) **MaK M 25 C Marine Engine - Exhaust Side**
3.) **MaK M 25 C Marine Engine - Lower Valve Drive**
4.) **General Cargo Flinterbrise powered by MaK 6 M 25**
5.) **Tanker Solway Fisher powered by MaK 8 M 25**
6.) **Tug Ems powered by 2x MaK 8 M 25**
7.) **Train Ferry Zhong Tie Bo Hai 1 Hao with 4x MaK 9 M 25**

About Caterpillar Marine Power Systems

Caterpillar Marine Power Systems, with headquarters in Hamburg, Germany, brings together all the sales and service activities for Cat and MaK branded marine products within Caterpillar Inc. This organization provides premier marine power solutions (high and medium speed with outputs from 11 kW to 16,000 kW) and customer service from a single source for the global ocean-going, commercial and pleasure craft markets. The Caterpillar Marine Power Systems sales and service network includes more than 2,100 dealer locations world-wide and is well positioned to support customers wherever they are.

More information is available at www.cat-marine.com or www.mak-global.com.

About Caterpillar

For more than 80 years, Caterpillar Inc. has been making progress possible and driving positive and sustainable change on every continent. With 2006 sales and revenues of $41.517 billion, Caterpillar is a technology leader and the world's leading manufacturer of construction and mining equipment, clean diesel and natural gas engines and industrial gas turbines.

More information is available at www.cat.com.

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