Service Information

Caterpillar Motoren GmbH & Co. KG product support information for medium-speed engines

Engine platform: all
Engine section: Fuel

Engine type: all
Validity: until further notice

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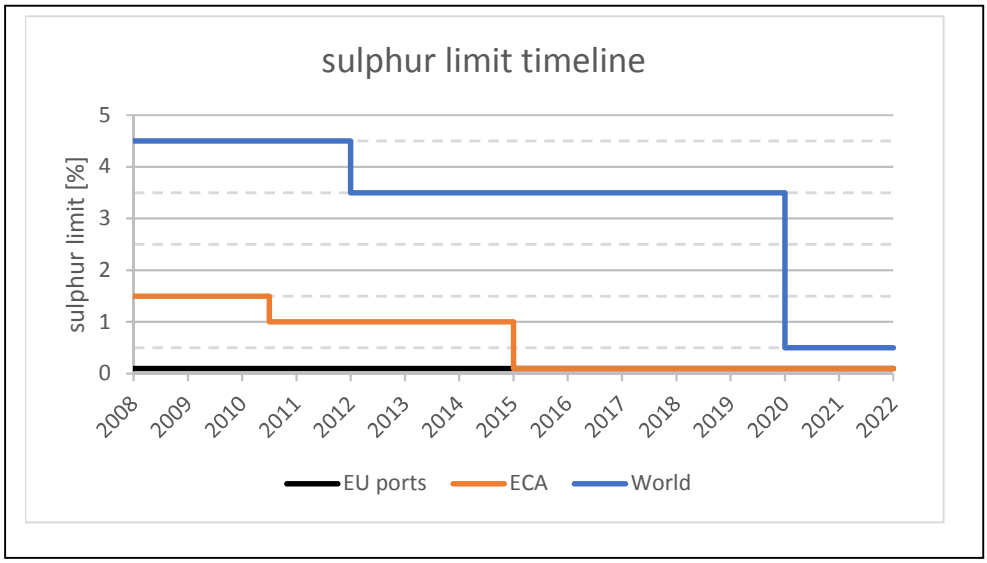
Information for all recipients of Service Information

Action: for your information

Engine operation considering IMO regulations after 2020

In accordance with MARPOL Annex VI, new limits for the sulfur content of marine fuels will be implemented globally on January 01, 2020. In certain emission-controlled areas (ECA) a limit of 0.1% for sulfur content in marine fuels is valid since 2015 already.



Only vessels with on-board desulfurization are exempted from the sulfur cap and can continue to operate on fuels with higher sulfur content.

Therefore, the new limit of 0.5 % sulfur content also outside of ECAs has a significant impact on the marine industry worldwide, as shipping companies will have to choose to either operate on more expensive fuel or to install after-treatment technology on their vessels, both increasing the overall cost of shipping.

Consequently, ship operators are facing major decisions to take about how to proceed in this regard with their existing vessel fleets and with future new building projects.

- We currently observe a tendency for existing ships being equipped with scrubbers to be able to continue using heavy fuel oil with higher sulfur content than allowed by MARPOL Annex VI. This option has the obvious advantage that relatively cheap fuels can be used, reducing operating cost. The disadvantages are high capital cost for scrubbers, cost of scrubber maintenance and difficulties entering harbors with open loop scrubber banns.
- Using low sulfur and ultra-low sulfur fuels with max. 0.1 % S content will be the easiest option for an older fleet where high investments are not an option. However, besides the higher fuel cost, higher wear and tear rates on inlet valve seats have to be expected with this option.

Caterpillar Motoren GmbH & Co. KG, Kiel, Germany • Phone: +49 (0) 431 3995-3197 • Fax: +49 (0) 431 3995-3894 • E-mail: ju_tecservice@cat.com

- Operating on gaseous fuels such as LNG or CNG will assure compliance with new regulations and seem to be the most environmentally friendly solution and often an option for new building projects today. Caterpillar offers a growing range of Dual Fuel engines for new buildings. Depending on vessel type and operation area, an engine conversion from Diesel/HFO to dual fuel (DF) can also be a viable option for existing fleets, too to meet today's and future emission requirements. Dual Fuel retrofit solutions are currently available for M43C and M32C engines.

Regarding engine operation with low sulfur fuel oil, ultra-low sulfur fuel oil and hybrid fuels we would like to refer to our former **Service Information 0005com and 0006com** with focus on:

- Checking lubricity of ULSFO
- Injection viscosity limit (see below)
- Increased wear at inlet vale seats (check valve projection and/or change to different valve type)
- Lubrication oil recommendations (additional information see below)
- Fuel incompatibility

Please note:

- Contrary to information stated in service information 0005com, the limit of the **injection viscosity is 2 cSt (instead of 1.5 cSt)**.
- Contrary to information stated in service information 0006com, we revised our recommended limit for the **temperature gradient during change over** from HFO to distillate fuel or vice-versa to **2 K/min** (instead of 7 K/min).

The new low sulfur hybrid fuels have different requirements on the lubrication oil than standard fuels. Due to the low sulfur content (0.5% S) the demand on alkalinity in the lube oil is much lower compared to current HFO quality (3.5% S), but the aromatic compounds in hybrid fuels still require detergent and dispersant ability. New lubrication oil qualities meeting these requirements will certainly be introduced by the oil industry in the near future. Until then **we recommend using lubrication oils for HFO (0.5% S) operation with the lowest TBN** for such cases. Please ask your lubrication oil supplier for assistance in case of any doubts.

In case of any further questions regarding this service information please contact the CAT / MaK service company of your choice.