

Technical Brief

Using the Right Lubricant and Condition Monitoring

- Key to Optimal Engine Performance and Improved Durability

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It is critically important for vessel operators to regularly monitor their engine conditions. For instance, some engine types can be more susceptible to deposit formation if the cylinder oil and feed rate used are not suitable. Operating pattern, ambient conditions, and the condition of the engine components can also affect the engine performance. Failing to make timely and necessary changes or adjustments could result in serious operational and maintenance issues.

MAN ES suggests performing a monthly inspection of the cylinder condition, and more frequently when reducing the cylinder oil feed rate. Continuous evaluation of scavenge drain oil analysis results is also recommended. For engines running on low-sulfur fuels, abrasive or adhesive wear elements (iron in metallic form) can be expected. In addition, frequent scavenge port inspections of piston rings and cylinder liners are crucial for maintaining a safe cylinder condition. For example, if there is excessive build-up of deposits on the ring lands, it is recommended to change to a cylinder oil with higher detergency, and/or increase the feed rate. ^[1]

In addition to condition monitoring, MAN ES strongly recommends the use of Category II 40BN cylinder oils for their newest engine models – Mark 9 or newer. The advantages obtained on these newer engines can be



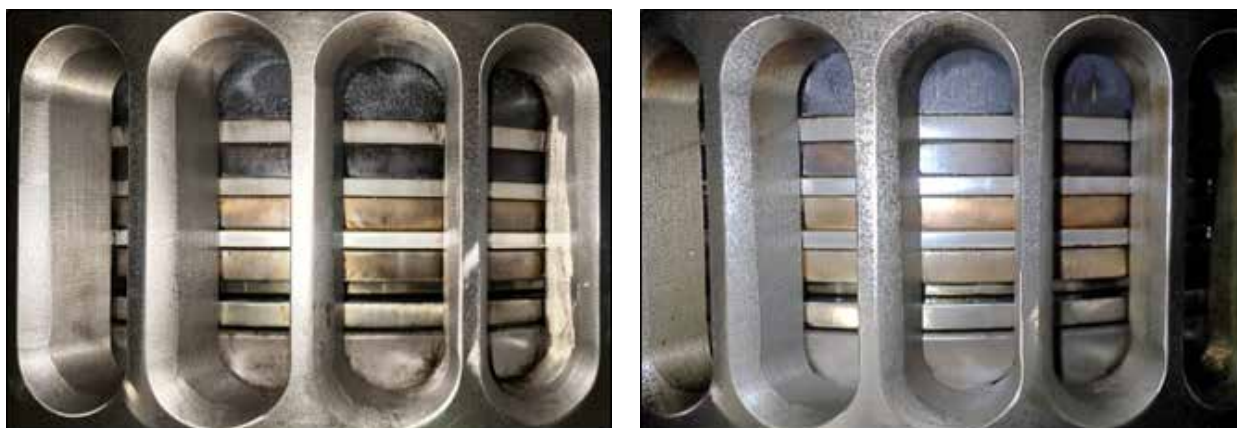
No heavy carbon deposit or excessive calcium carbonate was observed on piston crown top and side.

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gained on older engines as well. **Gulf Marine**'s MAN ES Category II 40BN cylinder oil - **GulfSea Cylcare XP 5040** has successfully demonstrated prolonged piston cleanliness and wear protection as evidenced by extensive condition monitoring data.

For instance, a container ship powered by a MAN B&W6G60ME-C9.5 engine and running on VLSFO has been lubricated with **GulfSea Cylcare XP 5040** since 20 March 2022, and engine conditions have been monitored on a regular basis. The results of the latest inspection carried out on 19 July 2023 after 8,077 hours of operation show satisfactory engine cleanliness, which is consistent with all previous data. Measurements of piston ring coatings, piston ring gap clearance and carbon thickening were taken and all values were found to be acceptable by OEM standards. In addition, no abnormality was found in used oil analysis and scrape-down analysis. Also, scavenge port inspection results (see selected images below) indicate excellent conditions of the piston crown, piston rings, cylinder liners.



No abnormality was observed.



Honing marks were visible which indicates satisfactory condition. No abnormality was observed.

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Compared to a typical MAN ES Category I 40BN oil, MAN ES Category II 40BN oils are substantially improved in terms of dispersancy, wear protection and oxidation inhibition. A MAN ES Category II 40BN oil is expected to provide piston cleanliness equal to that of a 100BN cylinder oil, yet without the added risk of supplying excessive alkalinity, which can result in increased deposits on the piston crown as well as turbo wear and after-treatment system fouling.

In summary, apart from using the right cylinder oil, it is equally vital for vessel operators to regularly monitor the conditions of their engines. This will help ensure optimal engine performance and increase equipment longevity. As alternative fuels such as LNG, biofuels, methanol and ammonia enter the fray, condition monitoring will no doubt become even more important for vessel operators.

Reference: [1] MAN ES Letter SL2023-737/NHN

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