

ACTION CODE: AT FIRST OPPORTUNITY

**Increase of Cylinder Oil Dosage or
Increase of Cylinder Oil BN to Reduce
Corrosive Cylinder Wear**
Concerns

Owners and Operators of MAN B&W Two-Stroke Marine Diesel Engines.

Types: S50ME-B9.2&3

G50ME-B9.3

S60ME-C8.2

G60ME-C9.2

S70ME-C8.2

G70ME-C9.2

S80ME-C9.2

S80ME-C9.4

G80ME-C9.2

S90ME-C8.2

S90ME-C9.2



Onboard BN "Digi-cell" Test Kit

22 August 2013

Dear Sirs,

Recent inspections of the first engines in service of the above types have unfortunately shown a relatively high corrosive level, which affects cylinder liners and piston rings leading to increased wear and exhaustion of the cylinder oil.

As a temporary measure to stabilise cylinder condition and to reduce wear rates, the cylinder oil dosage must be increased when burning higher sulphur fuels, i.e. when the sulphur content is higher than 1.3%.

The increase should be done by increasing the ACC factor to 0.40 g/kWh x S%, based on a cylinder oil alkalinity level of BN70. With lower sulphur fuels the cylinder oil dosages should be 0.60 g/kWh absolute, obtained automatically by setting 0.60 as min. setting on the MOP.

An advantage can be obtained by using cylinder oils with a higher BN level than 70. Then the sulphur compensation can be lowered in relation to the increased BN level. As an example, when using BN100 cylinder oil, the ACC factor may be lowered from 0.40 to 0.28 g/kWh x S%, as a result of the following equation:

$$\text{Example 1: } ACC_{BN100} = ACC_{BN70} \times 70/100 = 0.40 \times 70/100 = 0.28 \text{ g/kWh} \times S\%$$

$$\text{Example 2: } ACC_{BN85} = ACC_{BN70} \times 70/85 = 0.40 \times 70/85 = 0.33 \text{ g/kWh} \times S\%$$



The cylinder oil control at part load is done proportionally with the load, as examples meaning that the consumption at 55% load is reduced to 55% of the full load consumption and to 70% at 70% load. At lower loads, the Engine Control System (ECS) change over to RPM-proportional Cylinder Oil Control and hereby increases the cylinder lubrication.

The change-over point from load to RPM-proportional dosage control should stay at 25% load in connection with the increased ACC factor.

After having stabilised the cylinder condition with the high feed rate the ACC factor may be optimised (lowered) by means of a drain oil analysis and actual scavenge port inspections.

The optimisation of the sulphur neutralisation may be based on simple onboard BN measurements of the drain oil from each cylinder. For the measurements a portable test kit such as the "Digi-cell" from Kittiwake or similar equipment should be used, in accordance with the following procedure:

1. *Adjust the "Feed Rate Factor" in the "MOP" to ACC-factor = 0.40 g/kWh x S%.*
2. *After 24 hours at stable load running on fuel with more than 2% sulphur, drain oil samples are to be taken from all cylinders.*
3. *Carefully calibrate the "Digi-cell" with the fresh, actual cylinder lube oil in accordance with the maker's instruction.*
4. *Measure the BN value using the "Digi-cell".*
 - a. *If the BN value is above BN20 the ACC-factor may be reduced by 0.05 to 0.35 g/kWh x S%*
 - b. *After further 24 hours at stable load with the new dosage, new drain oil samples are to be collected and measured. If the BN Value is still above BN20, the ACC-factor may be reduced further by 0.05 g/kWh x S%.*
 - c. *The above procedure is to be repeated until the BN is close to but above BN20. Please note that the "Digi-cell" must be calibrated frequently.*
5. *The corrosive level varies with the engine load. Therefore, check the BN level every time the load is changed and possibly adjust the ACC factor correspondingly.*
6. *Check the BN level every time the fuel is changed and possibly adjust the ACC factor correspondingly.*

It is recommended to regularly check the cylinder condition by normal scavenge port inspections and by taking drain oil samples from each cylinder and have them analysed for iron content and BN level at a laboratory on shore. Regarding reference values, please see SL2013-571.

In case of an abnormal cylinder condition, such as broken or sticking piston rings, the cylinder oil dosages must be increased to a fixed level of no less than 1.2 g/kWh until an overhaul can be done.



Availability of High BN cylinder oils:

Most major cylinder oil suppliers are preparing high BN cylinder oils for the marine market these days. Some high BN cylinder oils have already obtained our "No Objection Letter" (NOL). Other high BN cylinder oils have obtained our "Interim NOL", which is officially identical to our full NOL, and which will also soon be replaced by our full NOL.

Consequently, we recommend you to contact your oil supplier and ask for high BN cylinder oil.

Best regards

MAN Diesel & Turbo

Low Speed Engineering Operation

A handwritten signature in blue ink, appearing to read 'Henrik Rolsted'.

Henrik Rolsted

Senior Research Engineer, Cylinder Condition Group