



Service Letter

SL00-383/SBJ
June 2000

26-98MC/MC-C/MC-S Engines
Removal of Wear Ridges on Cylinder Liners
Action Code: AT FIRST OPPORTUNITY

Dear Sirs

We have recently experienced some cases where wear ridges on cylinder liners have not been properly removed in connection with piston overhauls. We would like to emphasize the importance of removing such wear ridges in order to maintain/re-establish a good cylinder condition.

If a cylinder liner has suffered from abnormal running conditions, such as scuffing, or if wear ridges have developed after many thousands of hours in service, we recommend that the cylinder liners be reconditioned when replacing the piston rings ([see our Service Letter SL99-370/MIJ](#)).

The removal of wear ridges and the creation of a groove by milling or grinding in the upper part of the cylinder liner is of the utmost importance in this connection. The groove serves to prevent the build-up of a new wear ridge.

The introduction of the so-called Controlled Pressure Relief (CPR) top piston ring has further highlighted the importance of removing wear ridges. The reason for this is that the gas-tight seal of the CPR ring is susceptible to breakage in the event that a wear ridge is not removed when the piston is overhauled.

In the following, two methods of removing wear ridges are described:

- Milling
- Grinding

Milling

The following instructions describe a procedure which has been developed by MAN B&W Diesel A/S in cooperation with Chris Marine of Malmö, Sweden, for the reconditioning of the cylinder liners of large bore diesel engines.

The task is to remove the wear ridge at the TDC position of the top piston ring and to create a groove of a defined dimension, shape and position. See Figures 1 – 3. A Chris Marine milling machine type VKS, or similar, is suitable for this job.

If no such equipment is available, we suggest that an angle grinder with a coarse stone wheel of adequate thickness be used.

Estimated time consumption for this process : 30 - 60 minutes.

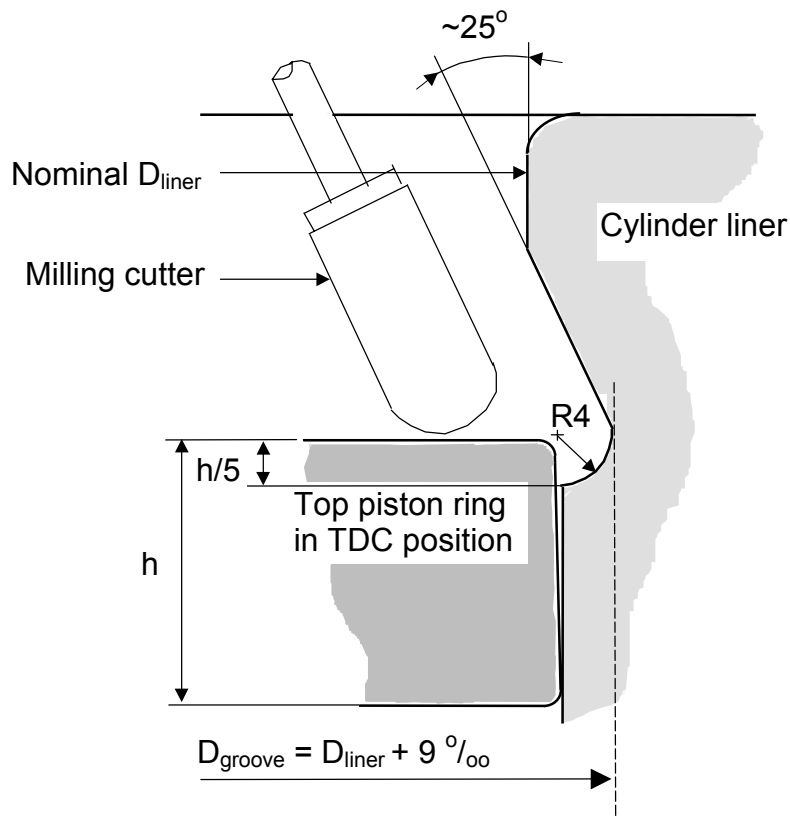


Fig. 1 Top piston ring in TDC position

For the mounting and operation of the machine, see the maker's instructions.

The correct dimension of the groove is based on the nominal liner dimension as follows: $D_{\text{groove}} = D_{\text{liner}} + 9 \text{ } \mu\text{m}$.

The correct shape of the groove is obtained by using a high-speed 8 mm cylinder-shaped standard milling cutter, type C0820M06 from Sandvik, or similar. During the milling process the groove is to be created by working the cutter horizontally into the liner material at an angle of approx. 25° .

The correct position of the groove can be obtained by either of the following two methods:

1. Locate the wear ridge (TDC of the top piston ring) visually or by measuring. See *dimension C, Figure 2*.

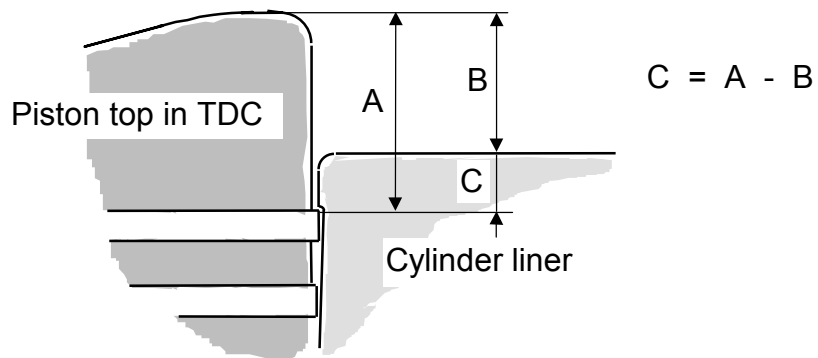


Fig. 2 Piston top in TDC

2. Adjust the milling machine until the milling cutter makes contact with the cylinder liner wall $(4 - h/5)$ mm above the wear ridge ($h =$ height of top piston ring). Start the machine and make a small test mark, if necessary. See *Figure 3*.

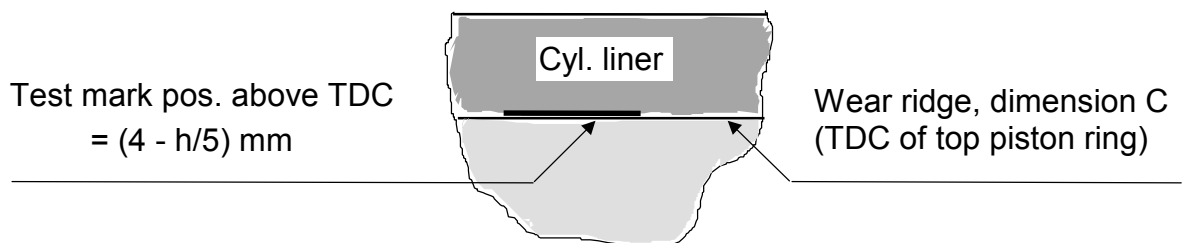
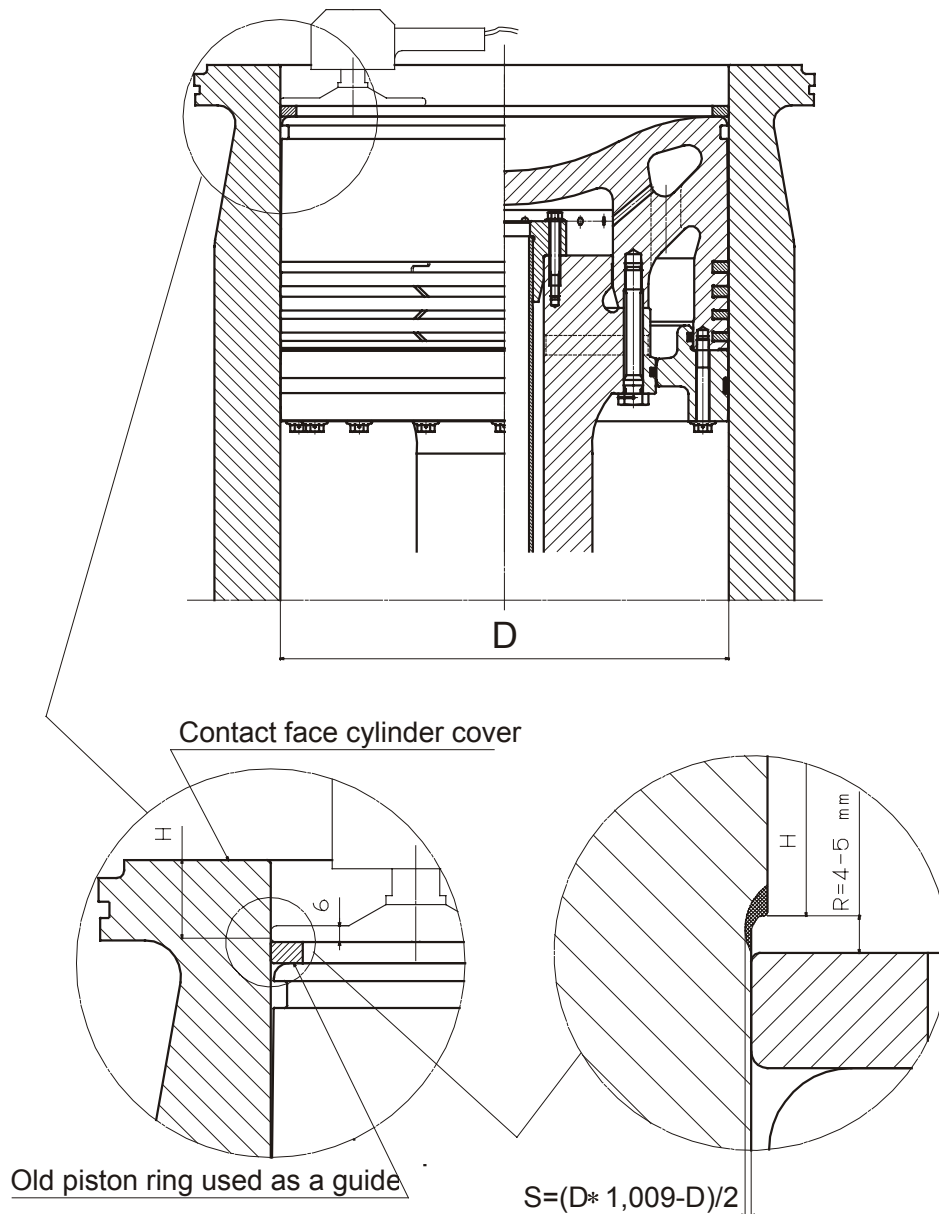


Fig. 3 Cylinder liner, upper part

Grinding

When hand grinding is applied with an angle grinder, we recommend that an old piston ring is placed on top of the piston crown, and that the piston crown is turned to a position that enables the grind stone to rest on the piston ring while removing the wear ridge. Figure 4 illustrates the method when using the angle grinder.

Endeavours should be made to create the groove as specified in Figure 1.



Note
Distance H must be checked carefully before grinding to ensure that the wear ridge was caused by the top ring at TDC.

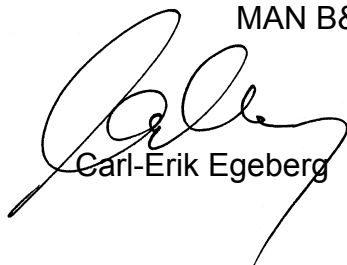
Fig. 4 Grinding of wear ridge in top of cylinder liner

General

If you have questions regarding the above procedures, please do not hesitate to contact MAN B&W Diesel A/S, Copenhagen.

Yours faithfully

MAN B&W Diesel A/S



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