Honing dismantled cylinder liners

Rehoning and concentric honing

During every overhaul in which the piston rings are replaced, the cylinder liners must also be re-honed. This is usually done with a transportable honing machine, and should only cover those areas where no honing marks can be seen any longer. However, with transportable machines, the wearing surface of the cylinder liner can only be roughened. Out-of-roundness cannot be eliminated.

If out-of-roundness that exceeds the permissible limits is found when measuring cylinder liners, then the cylinder liners must be honed concentric again. There are two ways to do this:

1. The cylinder liners can be honed concentric while in place by specialists from MAN B&W Diesel AG using a special concentric-honing device.

2. The cylinder liners can be dismantled and honed in a workshop.

Sources of faults

However, recently it has happened frequently that cylinder liners were not honed properly in workshops. Figure 1 shows such a case. Here, hollows and chatter marks have been honed into the bore. The hollows are 0.03–0.05 mm deep. As a result, the consumption of lubricating oil did not drop after honing, as would be expected, but increased substantially.

Causes and requirements

The honing head began to oscillate while these cylinder liners were being honed. This can happen if the honing stones are not suitable, or the contact pressure is too high or too low. The workshops and specialists of MAN B&W, by contrast, have the necessary know-how about the specifications of the honing stones, the required contact pressure, and the required lubricants and rates of lubrication. This know-how is tried and tested in extensive experiments and on-site application on unhardened and laser-hardened, new and worn cylinder liners.

It is also important to know that in trunk-piston engines, the lower part of the piston is guided by the cylinder liner. Therefore, the cylinder liners of such engines must not be honed to a larger diameter over their entire length. If this is ignored, the piston will lose its guide, and can make tilting motions, undergoing abrupt changes of the contact area. This has a negative effect on lubricating-oil consumption and on wear, due to increased “bore polishing”.

Therefore, cylinder liners must only be honed concentric in the area where they have become out-of-round. This is mainly near top dead centre in the piston rings. The transition to the normal diameter must be gradual; a step must not be honed into the surface.

MAN B&W Diesel Aktiengesellschaft • Postfach 10 00 80 • D-86135 Augsburg • Telefon (08 21) 3 22-0 • Telefax (08 21) 3 22 33 82

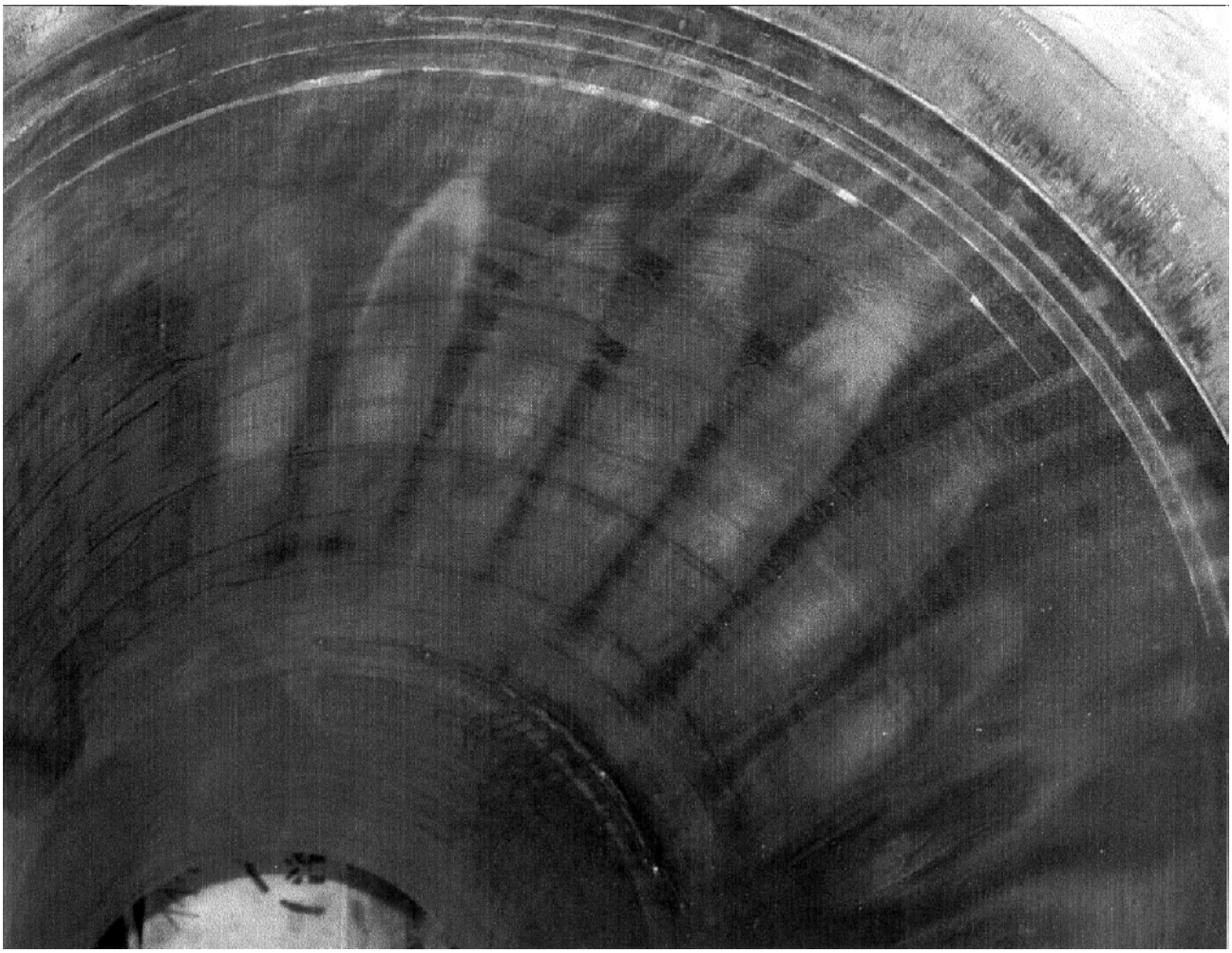

Figure 1. Cylinder liner with hollows and chatter marks, caused by improper rehoning

Conclusions

Honing cylinder liners requires suitable honing equipment, thorough knowledge of the subject, and plenty of experience. If you are not sure whether work waiting to be done will really be handled successfully, we suggest you get in touch with the workshops and specialists of MAN B&W. Here you will find competent helpers.

ST1/TKU

MAN B&W Diesel Aktiengesellschaft • Postfach 10 00 80 • D-86135 Augsburg • Telefon (08 21) 3 22-0 • Telefax (08 21) 3 22 33 82