Action code: WHEN CONVENIENT

Fretting marks on piston crown and skirt assembly surfaces

SL2020-691/JNN
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Concerns
Owners and operators of
MAN four-stroke diesel engines.
Type:
Marine: L16/24, L21/31, L27/38, L23/30H Mk3
Stationary: L16/24S, L21/31S, L27/38S, L23/30S
Propulsion: L21/31, L27/38
Dual Fuel: L23/30DF, L28/32DF, V28/32DF

Dear Sir or Madam

This Service Letter contains important information regarding possible fretting marks on the piston crown and skirt assembly surfaces and the possibility to re-establish an acceptable mating surface.

More information is provided on the following page.

If you have any questions or comments, please forward your mail to engineering-support-holeby@man-es.com with reference to this Service Letter.

Yours faithfully

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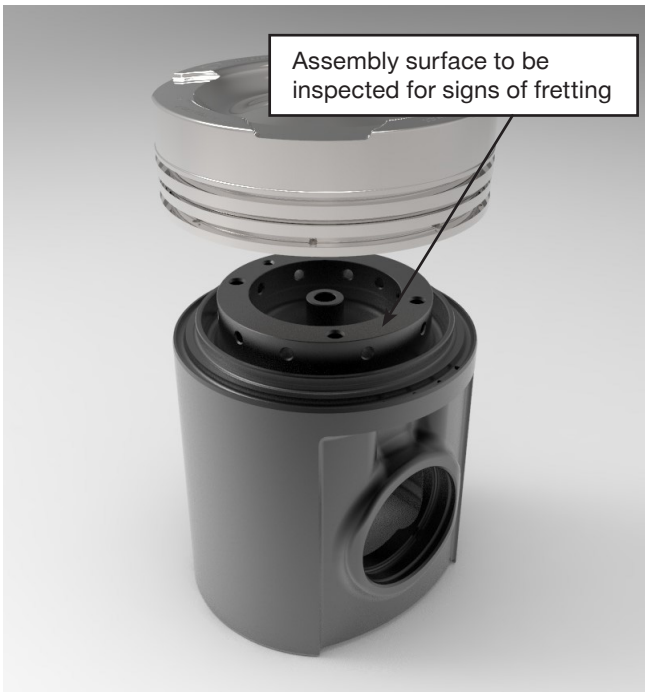
Pistons in diesel engines with high combustion pressure, are designed with a steel piston crown in order to endure mechanical stresses from high ignition pressures and thermal stresses caused by high mean effective pressures. Piston crowns and skirts are mechanically joined at the corresponding contact surfaces with studs or bolts.

Due to the high forces and temperatures that the piston parts are exposed to during operation, fretting may develop over time.
Fretting is caused by micro movements between two parts under high load.

Whenever the piston is disassembled, the assembly surfaces must be inspected for signs of fretting. In case fretting marks are observed, assembly surfaces must be cleaned and smoothened before reassembly of the piston skirt and crown.



Two-part piston dismantled for inspection

In order to ensure the best possible contact between the surfaces of the piston skirt and crown, any local material accumulation (high spots) of the fretting must be removed prior to reassembly.

If the fretted area exceeds 30% of the total mating surface the piston has to be scrapped.
If below 30% the fretted area can be reworked, see below.

The material accumulations are to be removed as follows:

Step 1: Remove local peaks by means of emery paper with increasingly finer grades (240 – 400).

Step 2: Finish by means of an oil stone. Move the oil stone in circumferential direction of the mating surface for removal of additional material on the surface.

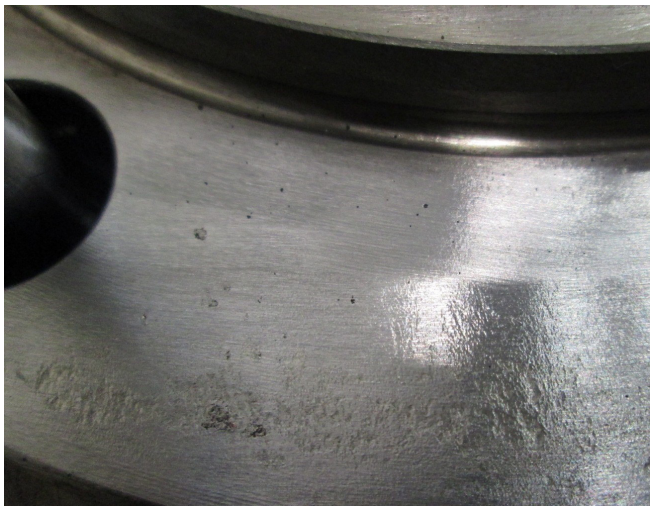
It is of utmost importance to completely remove any material accumulation (high spots) from the contact surfaces of the piston crown and skirt. This, in order to ensure uniform contact on the largest possible contact-area after re-assembly.

NOTICE

The assembly surface on the skirt is slightly tapered, and full contact between the mating surfaces will therefore not be obtained in cold condition.

All smoothed areas must be crack-tested by means of a penetrant test or a magnetic particle test method to detect potential cracks.

The piston crown and skirt must be without cracks. In case cracks are detected the complete piston must be replaced.



The above picture shows an example of fretting marks on the (cleaned) assembly surface of the piston crown.

NOTICE

During reassembling of the parts, the assembly surfaces have to be clean, dry and absolutely free of oil, grease or other fluids.

In case of any doubt regarding how to judge the fretting marks or any part of the above rectification procedure, we recommend contacting our worldwide PrimeServ organization for assistance.