

**Action code: WHEN CONVENIENT****Ridge Wear at Crankpin Journals**

Replacement of SL2017-647/JNN

SL2018-667/JNN  
November 2018**Concerns**Owners and operators of  
MAN four-stroke diesel engines.

Type:

Marine: L16/24, L21/31, L27/38,  
L23/30H, L28/32HStationary: L16/24S, L21/31S, L27/38S,  
L23/30S, L28/32S, V28/32H, V28/32SPropulsion: L21/31, L27/38, L23/30(A),  
V23/30(A), L28/32(A), V28/32(A)

Dual Fuel: L23/30DF, L28/32DF

**Change compared to SL2017-647/JNN**

Test shell procedure added.

Limits for ridge wear updated.

Geometrical tolerances added.

Dear Sirs

This service letter contains important information regarding development of ridge wear at the crankshaft journal and needed precautions in connection with replacement of connecting rod bearings, in case the ridge not is addressed this may cause severe engine damage with possible loss of property and life.

Ridge wear will inevitably develop over time at the crank pin journal, the wear pattern is caused by abrasive impurities that remain in the lube oil, efficient lube oil cleaning is therefore essential to keep the development of ridge wear as low as possible in trunk engines.

In case you have any questions or comments please forward your mail to [Engineering-Support-Holeby@man-es.com](mailto:Engineering-Support-Holeby@man-es.com) with reference to this service letter.

Yours faithfully



**Mikael C. Jensen**  
Vice President  
Engineering



**Henrik Møller Hansen**  
Senior Manager  
Production Support

**MAN Energy Solutions**

H. Christoffersensvej 6  
4960 Holeby  
Denmark  
Phone: +45 54 69 31 00  
Fax: +45 54 69 30 30  
info-hol@man-es.com

www.marine.man-es.com

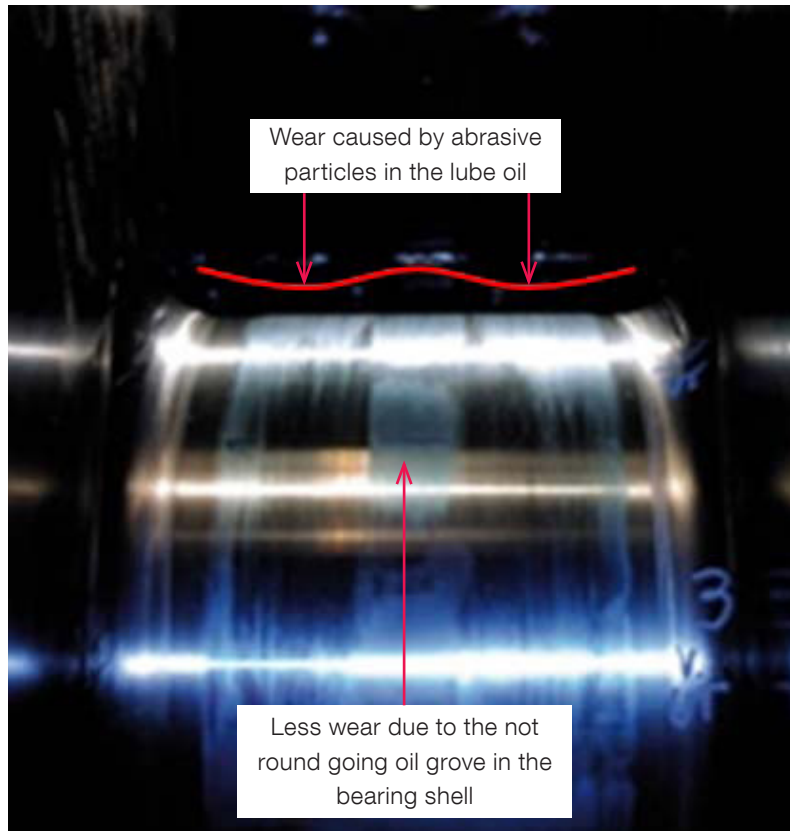
**MAN Energy Solutions**

Niels Juels Vej 15  
9900 Frederikshavn  
Denmark  
Phone: +45 96 20 41 00  
Fax: +45 96 20 40 30  
info-frh@man-es.com

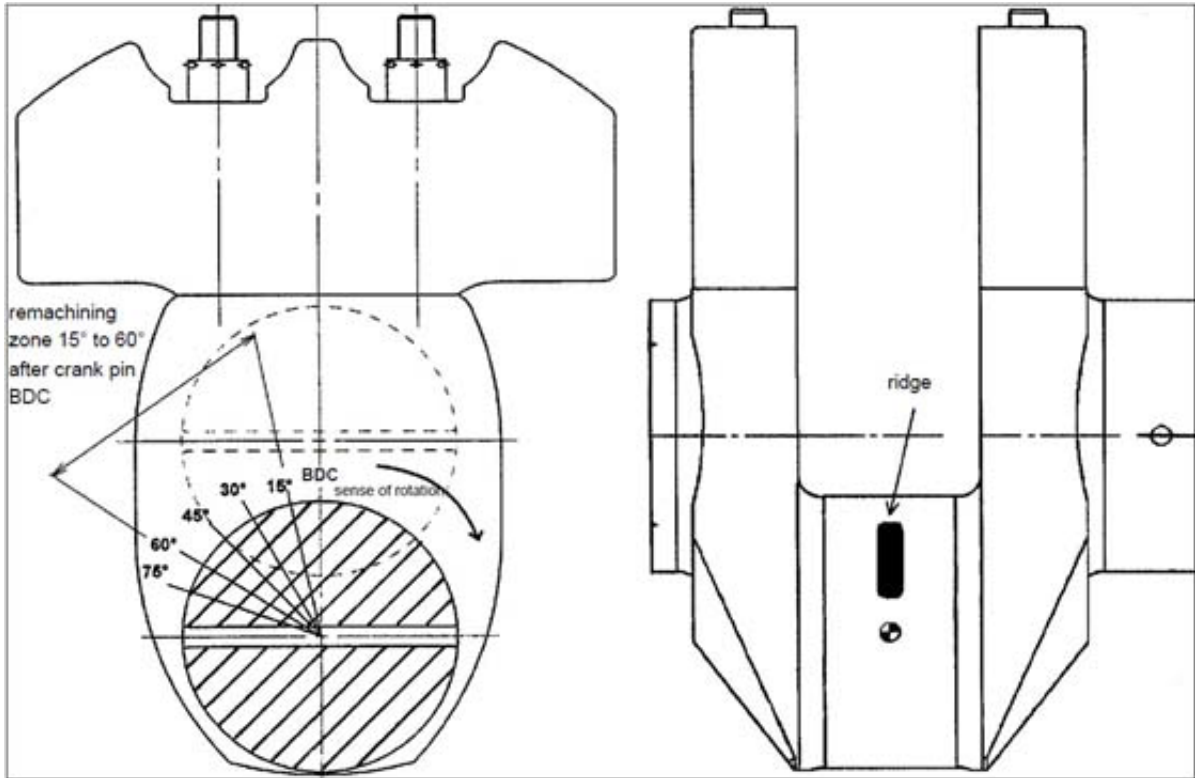
**MAN Energy Solutions**

Branch of MAN Energy Solutions SE,  
Germany  
CVR No.: 31611792  
Head office: Teglholtsgade 41  
2450 Copenhagen SV, Denmark  
German Reg.No.: HRB 22056  
Amtsgericht Augsburg

Ridge wear will inevitably develop over time at the crank pin journal. The wear pattern is caused by abrasive impurities that remain in the lube oil. Efficient lube oil cleaning is therefore essential in order to keep the development of ridge wear as low as possible in trunk engines.



Ridge wear can be observed as wear on both sides of the centre of the crankpin journal. Ridge wear is often observed 15-60° after BDC, but can be extended to larger part of the journal.



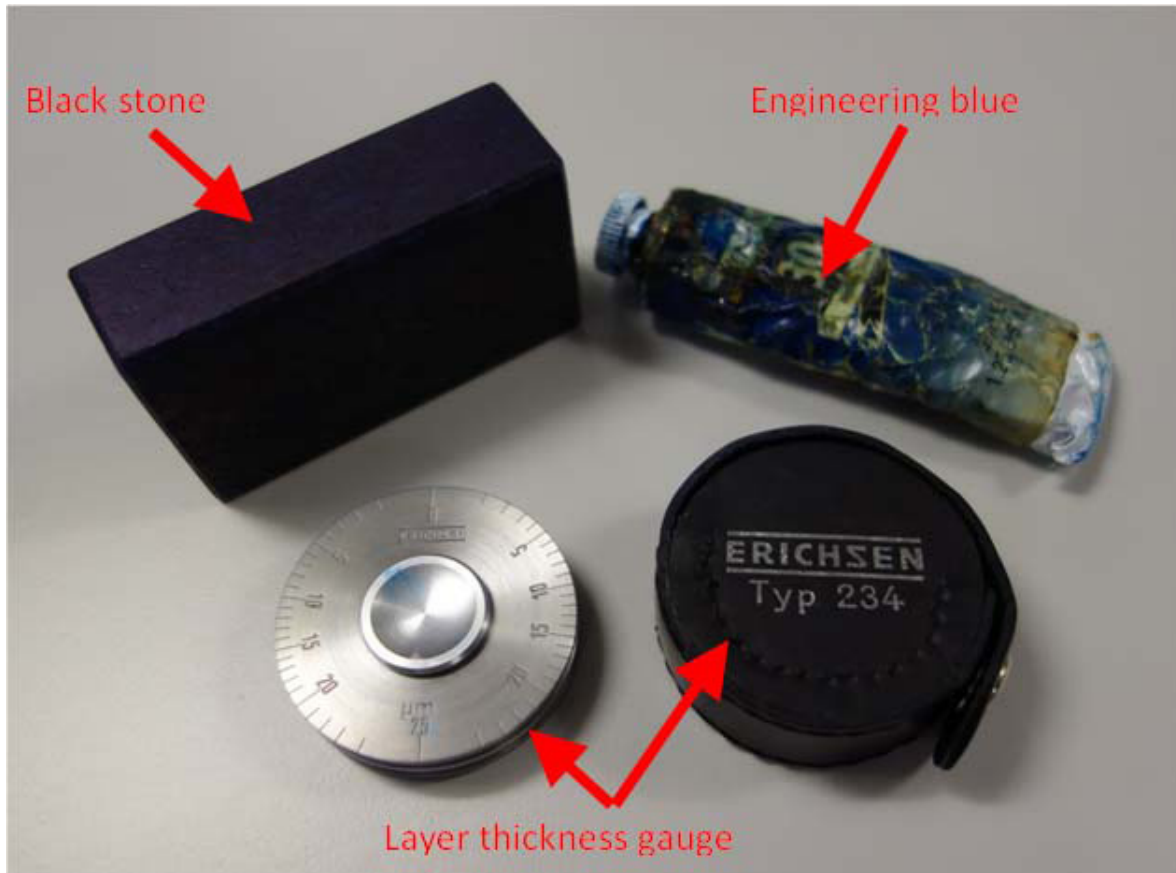
The sketch shows the location of the ridge wear in the highest loaded zone 15-60° after BDC.

Careful inspection and judgement of the crankpin journals must be carried out whenever a new crankpin bearing is installed. In case ridge wear is observed this must be rectified before new upper and lower bearing shells are installed. In case rectification is not carried out, the bearing damage as shown in the following will occur after a few hours of operation. In case of continuous operation serious damage might occur to the bearing and journal.



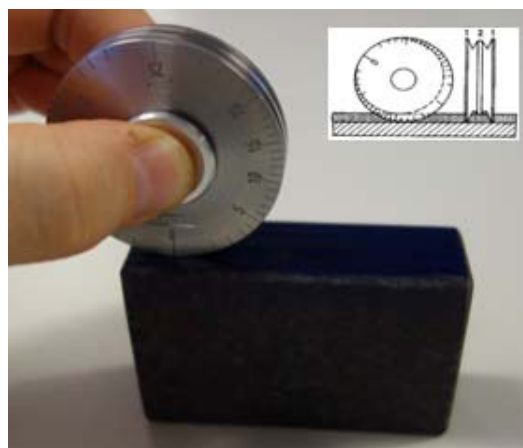
Bearing shell with damage from ridge wear.

In order to check the journal for ridge wear a set of tools (see below), consisting of a black stone, Prussian blue or similar and a gauge to measure the thickness of the marking paste.



Example of a tool kit used for checking for ridge wear

To measure ridge wear on a journal, blue paste should be applied to the black stone in a thin uniform layer, and it is best applied with a sponge. The thickness of the layer should be 4-5 microns. Use the layer thickness gauge to check the thickness before the contact test at the journal is carried out.



The layer thickness of the marking paste is checked before the test is carried out.

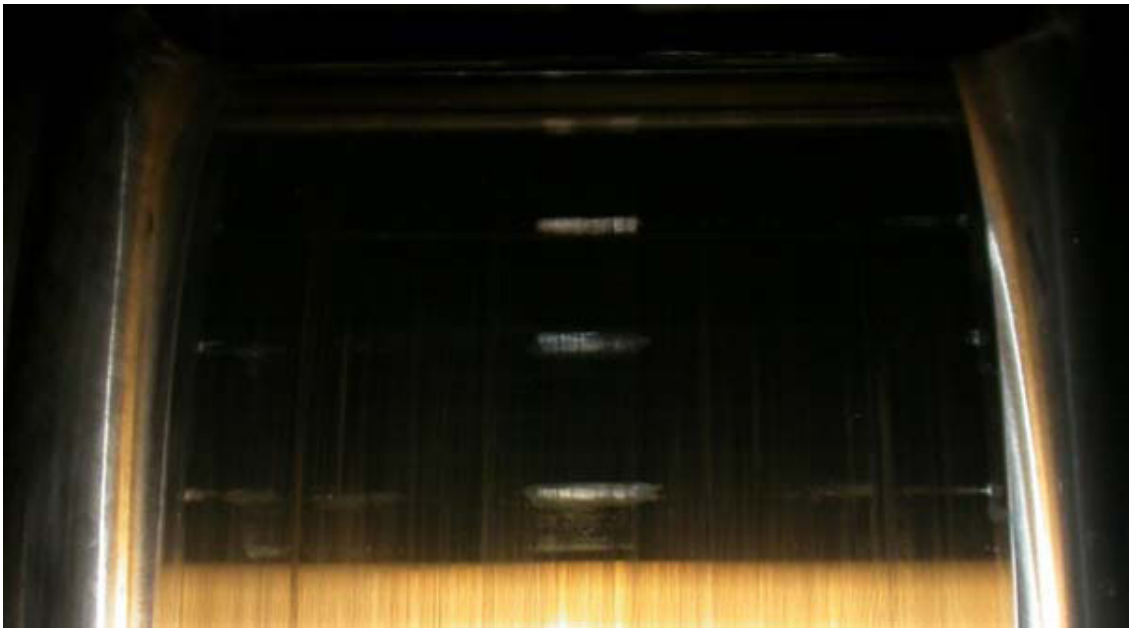


Test the journal by moving the stone back and forth on the journal to determine possible ridge wear on the journal.



Contact test at a journal with no ridge wear, indicated by an unbroken line of the marking paste.

If there are indications of ridge wear, the line will be broken and look similar to the picture below. The broken line will look different from case to case since the depth and shape of the ridge wear will be different.



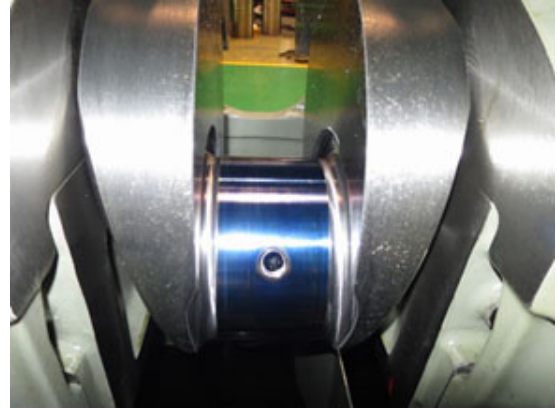
Example of journal with ridge wear – indicated by the broken lines of the marking paste.

As an alternative to the black stone a precision machined test shell can be used to perform the contact test.

Test shells are available for the standard crankpin size of each engine type.



Test with test shell in workshop



Contact area at crankshaft in engine

Procedure for test of the journal surface by means of a test shell.

- Ensure that journal to be inspected is free from grease and impurities.
- Ensure that journal and test shell has the same temperature.
- Apply marking paste on test shell.
- Distribute the marking paste on the test shell by means of a sponge or similar.

When the marking paste has been evenly distributed, it must be checked with the layer thickness gauge that the applied layer thickness does not exceed 3 microns.

The movement of test shell on journal should preferably not exceed 90°.

The contact area is assessed visually. After polishing a contact area of minimum 70% must be obtained. The surface of the journal must not be convex or concave.

Depending on the depth of the ridge wear, the affected journals must be polished or, in the worst case, machined to undersize.

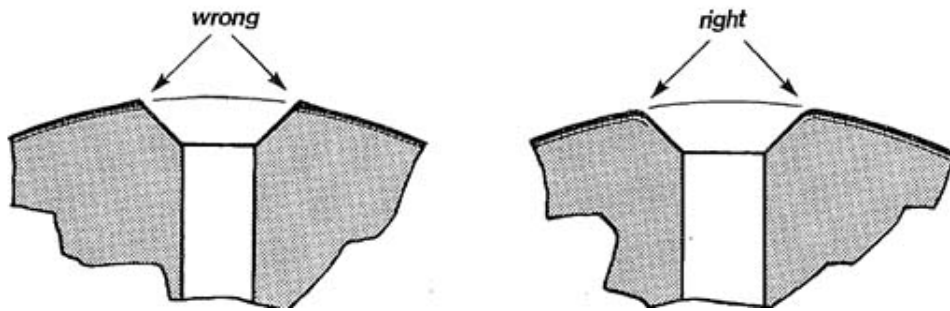
- < 5 micron: no action needed
- > 5-50 micron: polish the journal with 400 grid emery cloth mainly in the center of the journal in order to remove or bring the ridge wear below 5 micron. In case of excessive ridge wear, machining of the journal may be needed.
- > 50 micron: machining of the journal to undersize is recommended.

The following geometrical tolerances apply for all crankshaft journals:

- Max. ovality : 0.03 mm
- Max. conicity : 0.03 mm
- Max wear on nominal diameter: 0.1 mm

After polishing the surface roughness must be within Ra 0.2-0.4.

After any polishing it must be checked that no shape edge is formed in the transition zone between the lube oil supply holes and the journal.



In case of any doubt regarding the need for polishing of the journals or the above rectification procedure we recommend to contact our worldwide PrimeServ organization for assistance.