Action code: AT FIRST OPPORTUNITY

Reconditioning of exhaust valve spindles

Do not recondition some spindle types until further notice

SL2023-735/AGC
April 2023

Concerns

Owners and operators of MAN B&W two-stroke marine combustion engines.

- All 35-98 bore engines with valve spindles of the material DSA760
- All 35-95 bore engines with exhaust valve design type XV3 and of the spindle material DSA760 or Nimonic80A.

Summary

References

Service Letter SL2022-729/AGC,
Preventive grinding of exhaust valve seats

Service Letter SL2013-573/JAG,
Exhaust valve condition

Dear Sir or Madam

Due to a regrettable delay in the development work and necessary service documentation of our reconditioning procedure for the exhaust valve spindles mentioned in this Service Letter, we inform you that reconditioning of those spindles is not allowed until further notice.

We expect to have a reconditioning procedure available by mid-2026.

Recondition trials and service tests are ongoing to validate a reconditioning procedure. New material solutions need validation and service testing to obtain performance results comparable to a new DSA760 exhaust valve spindle or an XV3 spindle. This process has proven more time consuming than anticipated, and therefore further development and service tests are still required.

Reconditioning of DSA760 and Nimonic80A spindles in the below-60 bore size segment is expected to be uneconomic. Therefore, we do not recommend reconditioning within this engine segment and, accordingly, we will not develop a reconditioning procedure, unless a business case can be established.

This Service Letter describes for which spindles reconditioning is still possible, and how to establish which exhaust valve type is installed on the engine in question.

We recommend using the flow diagram in Fig. 3 and Table 1 to evaluate whether or not spindle reconditioning is possible.

Yours faithfully

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How to proceed

We recommend to start the necessary planning work that this information gives cause to as soon as possible. Pay extra attention to measurements of wear on existing spindles. Extra spare valves should be considered to mitigate the missing reconditioning option and the long lead time on delivery of new fully-forged spindles.

Currently, we see prolonged lead times of up to 10-12 months on delivery within the spindle segments DSA760 and Nimonic80A type materials.

In case a spindle needs reconditioning before our procedure is available, the worn spindle should be put on stock until reconditioning becomes available.

Spindles of non-XV3 design

Spindle reconditioning of non-XV3 design is still possible provided the spindle is of the Dura or Nimonic type.

The following applies for non-XV3 design only:
- Dura spindles in all bore sizes can be reconditioned with IN718 on the seat and IN625 on the disc bottom.
- Nimonic80A spindles in all engine sizes can be reconditioned with IN718 on the seat and IN625 on the disc bottom. Note that an IN718/IN625 reconditioned Nimonic80A spindle will experience a degrade in toughness compared to the original fully-forged Nimonic80A spindle and, as regards heat load, will perform like the less heat-resistant Dura-type alternative.
- Maximum two times re-welding regardless of bore size.
  - Three times re-welding, as allowed since SL2013-573/JAG August 2013, no longer applies.
  - Service experience has shown that three times re-welding is rarely applied, and spindle cracks in re-welded spindles has shown that three times re-welding cannot be allowed.

How to establish the valve spindle type

To distinguish between the spindle types, see Fig. 1.

All XV3 type spindles have:
- Smaller stem diameter below the vane wheel compared to above the vane wheel.
- 18° degree angle between the spindle disc bottom and the spindle disc top.

All non-XV3 spindles have:
- Approximately same stem diameter above and below the vane wheel.
- 24° degree angle between the spindle disc bottom and the spindle disc top (see Fig. 1).

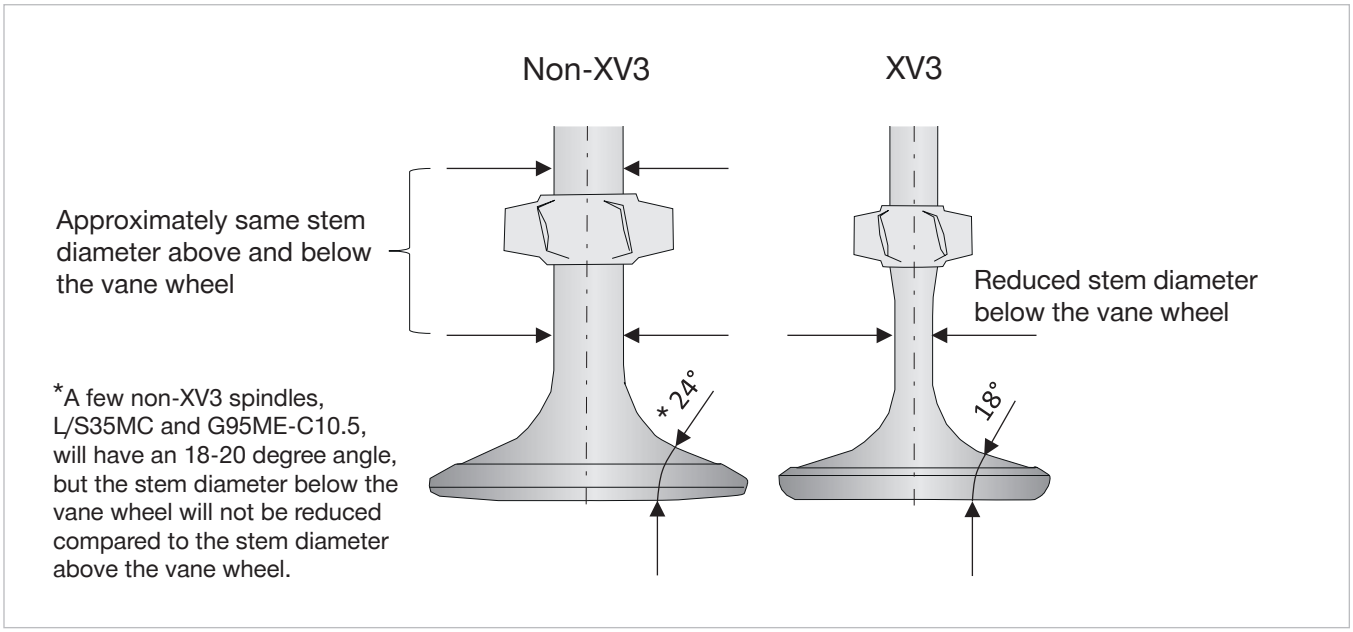

Fig. 1: Exhaust valve spindle types

If the spindle marking was performed in accordance with MAN Energy Solutions guidelines, the following marking should clarify which spindle material was utilised originally when the spindle was new and prior to any reconditioning, see Fig. 2.

Spindle marking:
- SEAT
- HEAT RESISTANT LAYER

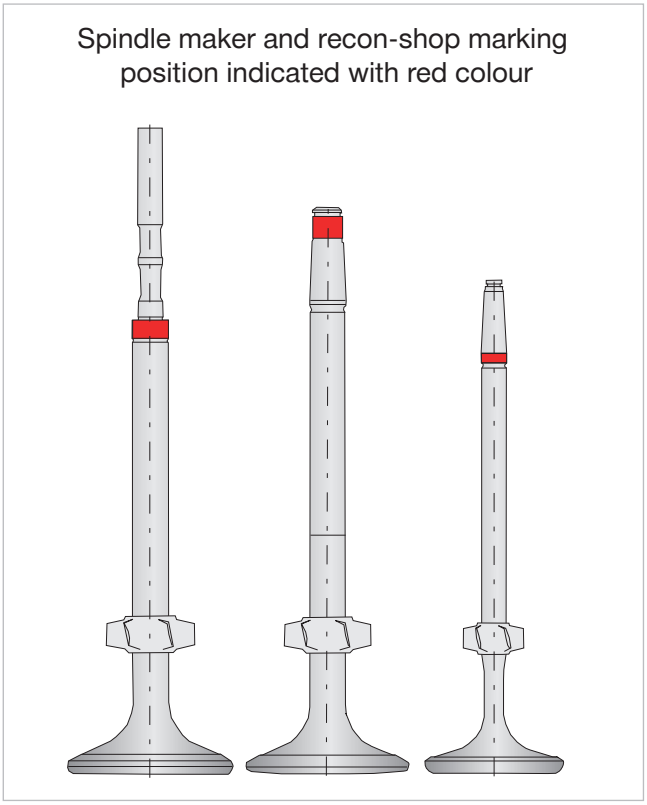

Fig. 2: Spindle marking position

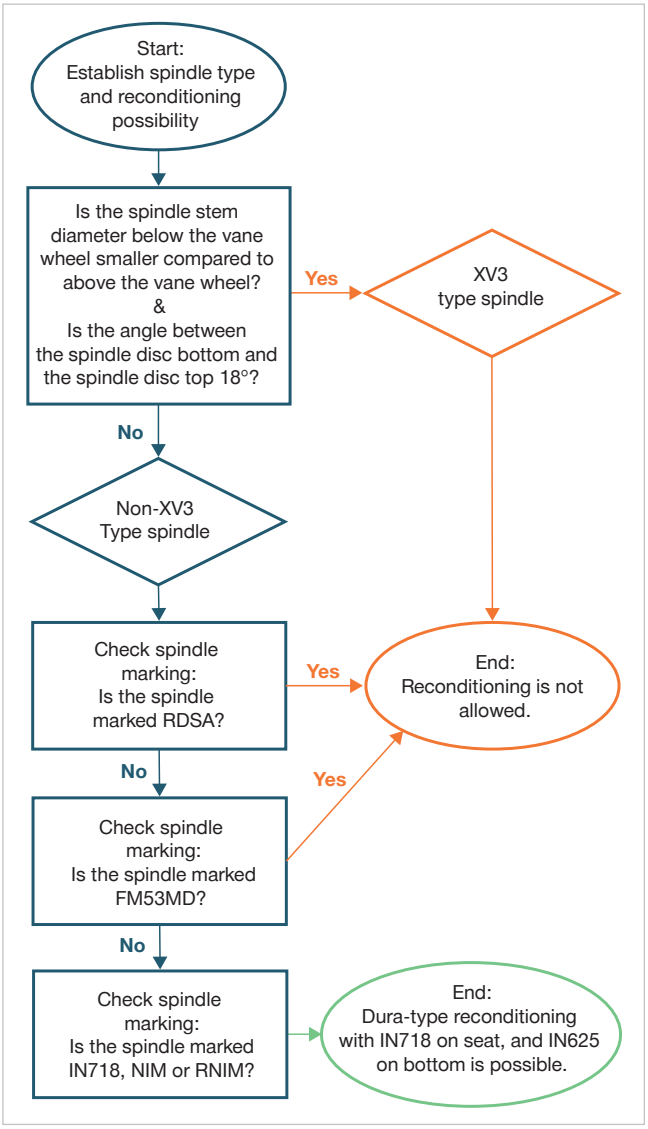

Fig. 3: Flow diagram – spindle types

Spindle marking	Definition	Consequence
RDSA	Seat made of rolled DSA760	No reconditioning available regardless of the spindle type
FM53MD	Spindle bottom corrosion layer made of FM53MD	No reconditioning available regardless of the spindle type
RNIM	Seat made of rolled Nimonic80A	No reconditioning available if the spindle type is XV3 Dura-type reconditioning is available if the spindle type is non-XV3
NIM	Seat made of Nimonic80A without rolling applied (older-type spindles)	Dura-type reconditioning is available if the spindle type is non-XV3
IN718	Seat made of rolled Inconel 718	Dura-type reconditioning is available

Table 1: Spindle marking translation

If you have any questions or inquiries regarding this Service Letter, contact our Operation Department: Operation2S@man-es.com

For questions or a quote on new spindles, please contact: Primeserv-cph@man-es.com