Action code: AT FIRST OPPORTUNITY

Exhaust valve spindle disc burn-off measuring and measuring tool

New improved design

SL2024-758/PRP
June 2024

Concerns

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

Summary

Measuring of exhaust valve spindle disc burn-off and correct measuring tool.

Reference

SL2019-682/JAG
SL2023-744/SRJ
Work card 2265-0201 *Exhaust valve*

Enclosures

- Two observation sheet examples
- Difference between new and old spindle design

Dear Sir or Madam

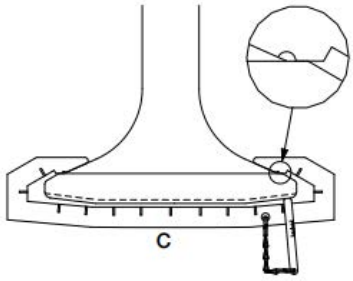
Reliable operation of your two-stroke engine is conditional on its correct operation and maintenance. With this in mind, this Service Letter highlights the importance of ensuring correct monitoring of wear on the exhaust valve spindle.

Questions regarding this Service Letter should be directed to our Maintenance Tools department at:
MaintenanceTools2S@man-es.com

Yours faithfully

Susanne Kindt
Vice president, Two-stroke Engineering

Lars Danefeld Sønderby
Senior manager, Engine Installation



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Exhaust valve spindle disc burn-off measuring

As described in SL2023-744 and instruction No. 2265-0201, it is imperative to conduct initial exhaust valve inspections after 6,000 and 12,000 running hours (bore sizes 60–95) and after 4,000 and 8,000 running hours (bore sizes 35–50). A vital part of this initial inspection is to measure the spindle disc burn-off/hot corrosion. The measured burn-off should be used to calculate the disc burn-off rate (mm/running hours) and, thereby, to predict the time between overhaul. As a minimum, two valves must be inspected.

We would appreciate receiving all measured burn-off readings in order for us to be able to evaluate the exhaust valve spindle performance and, thereby, the guidelines on time between overhauls and optimal running (initial inspections, subsequent inspections, overhauls, and whenever a measurement has been carried out).

When inspecting/overhauling exhaust valves, we recommend using the following two observation sheets to obtain the data needed:

1. Exhaust Valve Condition Report
2. Exhaust valve burn-off inspection - a new specific burn-off version

Examples of the two sheets are also enclosed with this SL.

Please use the e-mail address below to request the observation sheets and, more importantly, to return them when completed with burn-off observations.

EOSExhValve@man-es.com

Measuring tool

In 2019, MAN Energy Solutions changed the recommended grinding angle on the exhaust valve spindle and, at the same time, introduced an improved design of the exhaust valve spindle measuring tool.

New exhaust valve spindles, including spare parts, are delivered with the new geometry only.
The old measuring tool is not interchangeable with the new measuring tool due to the modified spindle geometry. We therefore recommend you to check and ensure that your particular engine has the correct match between exhaust valve spindle and measuring tool. Similarly, if the improved measuring tool is not already on board, it is important to order/deliver a new measuring tool together with a new exhaust valve spindle.

The enclosure “Difference between new and old spindle design” offers a more detailed explanation.

For a quote on the exhaust valve spindle measuring tool, please contact PrimeServ at:

Primeserv-cph@man-es.com

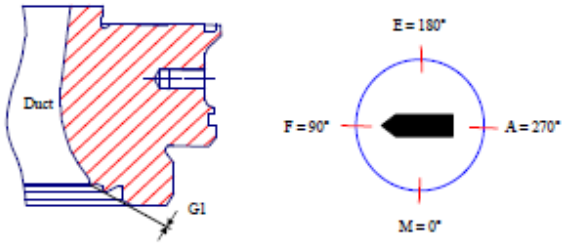
Exhaust Valve Condition Report

Vessel:		IMO no.:	
Eng. builder:	Eng. no.:	No. of cyl.:	Eng. type:
Valve no.:	Valve hours:	Kept as spare (yes/no):	Test (yes/no):
Valve dismounted from cyl.:	Date (yymmdd):	Engine hours (total):	
Valve checked/overhauled by:	Date (yymmdd):	Place:	
Valve mounted on cyl.:	Date (yymmdd):	Engine hours (total):	
Remarks:			

BOTTOM PIECE

Type:	Marking:	Seat material:
Drawing no.:	Hours since last overhaul:	Hours total:

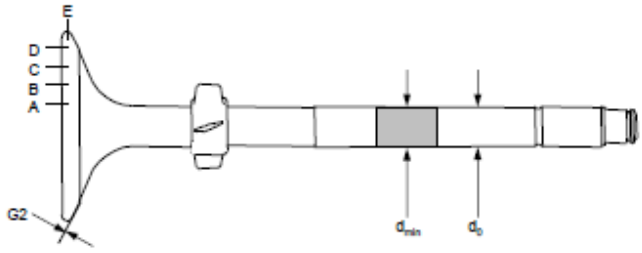
Cracks (yes/no):	Blow-by (yes/no):	Seat contact (inner/outer/parallel):
No. of dent marks larger than Ø = 7 mm:		Seat ground: Total grinding, G1 (mm): at hrs.:
Deposit in chamber: Extend on circumference (mm):		Maximum deposit thickness in duct (mm):
Angular position of max. deposit (0° = port side):		
Deposit in way of fuel valves (yes/no):		
Remarks		



SPINDLE

Marking:	Base material:	Disc underside material:
Seat material:	Stem surface:	Drawing no.:
Hours since last overhaul:	Hours total:	

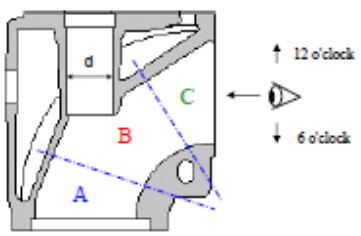
Cracks (yes/no):	Blow-by (yes/no):	Seat contact (inner/outer/parallel):
Spindle disc max burn-off (mm):	at position (A, B, C, D or E):	Burn-off rate (mm/1000 hrs):
No. of dent marks larger than Ø = 7 mm:		Seat ground: Total grinding, G2 (mm): at hrs.:
Stem diameter d_0 above sealing area (mm):		
Min. stem diameter d_{min} at sealings (mm):		
Wear of stem sealing ring (%):		
Remarks		



HOUSING

Marking:	Drawing no.:	Hours since last overhaul:	Hours total:

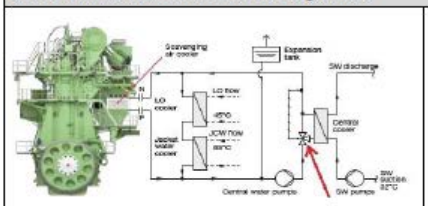
Spindle guide diameter						Spindle guide, hours total		
Minimum / Top (mm)			Maximum / Top (mm)					
Minimum / Bottom (mm)			Maximum / Bottom (mm)					
Corrosion								
Section	A			B			C	
mm								
Position (o'clock)								

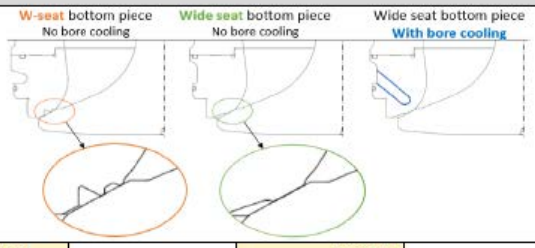


Remarks:

Please fill data in white fields Blue fields are optional	**Exhaust valve burn-off inspection**					
Vessel		IMO no.		Eng. builder		Eng. no.	
No. of cylinders		Eng. type		Product ID		Eng. running hrs.	
Observation date		Data source		Measured by		Archived by	

Exhaust valve environment and configuration



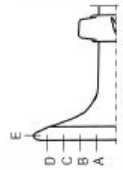


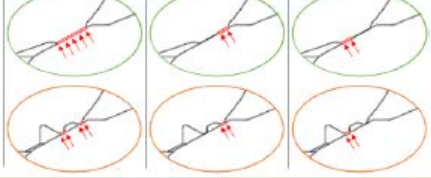
Set point on the 3-way temperature control valve [deg. C]				Fuel type		Second Fuel type	
Dismounted from cylinder no.		Seat type		Bore cooling		Valve damper type	

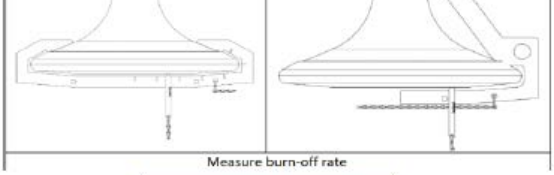
Spindle marking

Spindle base material		Number of reconditionings at date of inspection				Allowable burn-off	17
Disc underside material		Seat material					
Spindle producer		Producer serial number		Production year		Production week	
Trust marking no.		Spindle marking text					

Burn-off measurements







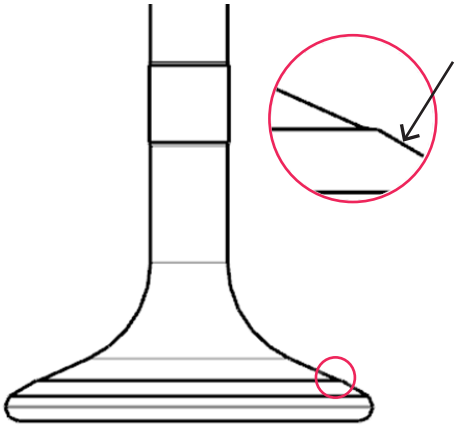
Component running hours since new		Seat contact appearance		Burn-off rate [mm/1000hrs]	#DIV/0!

	Position A	Position B	Position C	Position D	Position E
Burn-off measurement - section 1 [mm]					
Burn-off measurement - section 2 [mm]					
Burn-off measurement - section 3 [mm]					
Burn-off measurement - section 4 [mm]					
Burn-off average [mm] - can be typed in one white line above					
Remarks:					

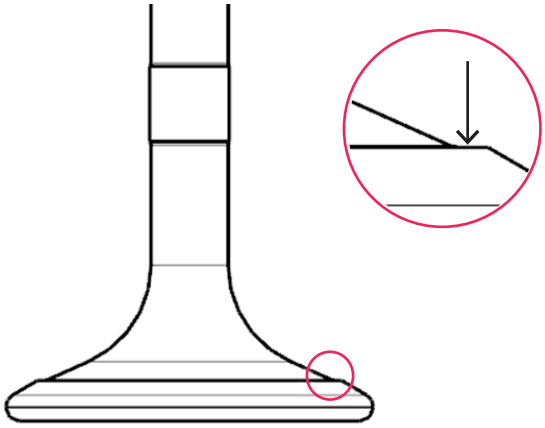
Contact: Jakob Gjertsvang Knudsen E-Mail: EOSExhValve@man-es.com

Revision: 2022-04

Difference between new and old spindle design



Old spindle design – contact face for gauge

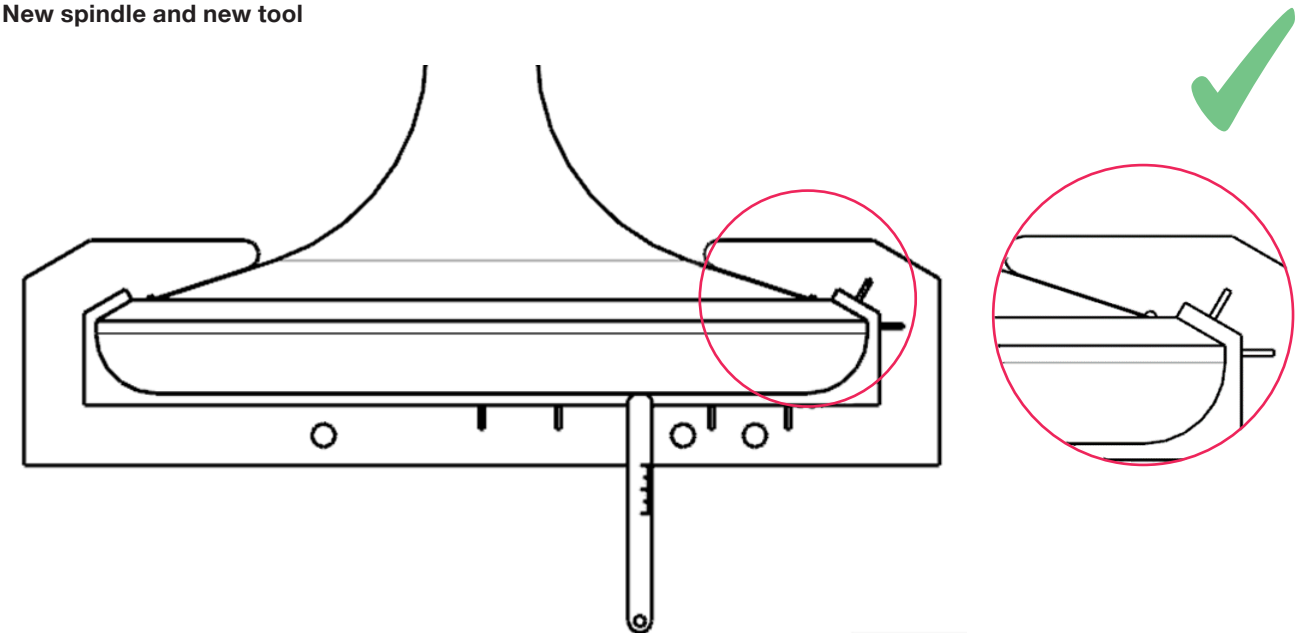


New spindle design – machined plateau for gauge

Correct measuring

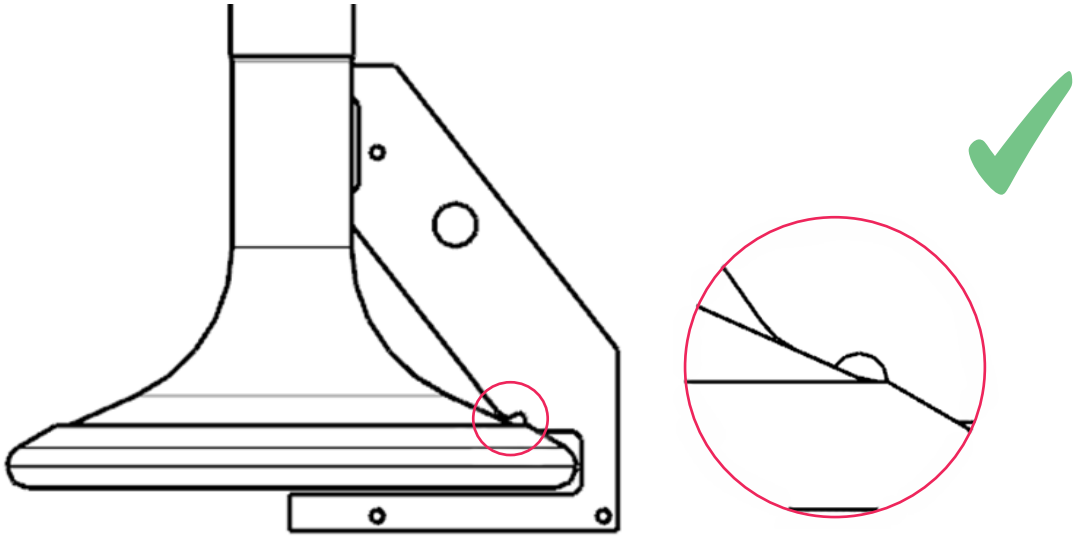
Note that in order to generate the most precise measurements, the new measuring tool must rest against the flat machined plateau of the spindle. The pictures following show the correct matching of template and spindle.

New spindle and new tool



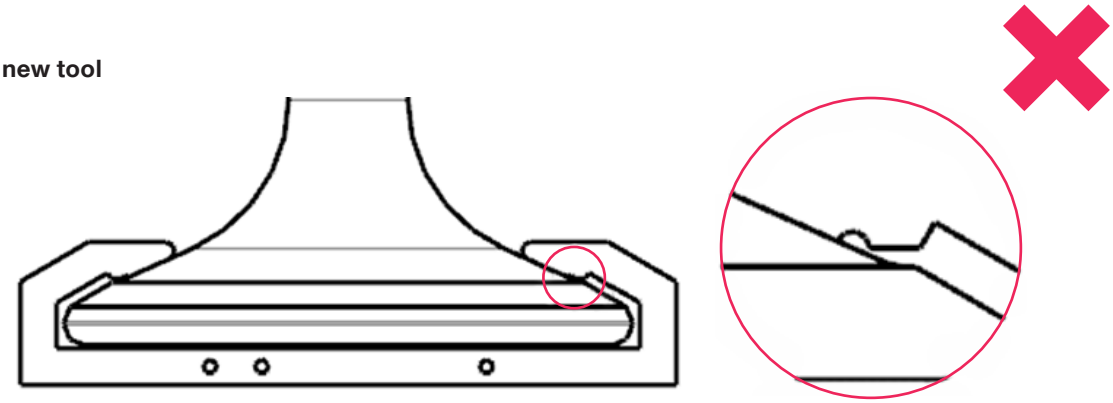
Tool sets against the horisontal surface and is “centred” on the “instep”

Old spindle and old tool



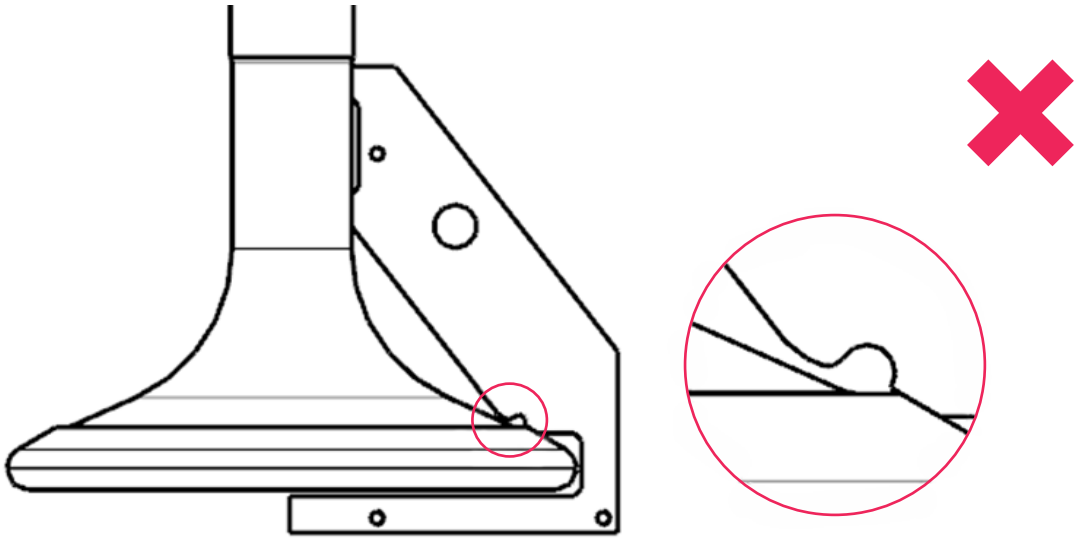
Tool is supported on spindle stem and sets against the “instep”

Old spindle and new tool



Tool sets against the “instep”

New spindle and old tool



Tool is supported on spindle stem and sets against the spindle seat