**Action code: IMMEDIATELY**

# Safety Information

## INDICATOR VALVES

SL2018-658/PRP
March 2018

**Concerns**

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

**Summary**

Updated instruction for indicator valves. By following precautionary measures and actions as recommended by MAN Diesel & Turbo increased safety and reliability can be achieved.


Encl.: 6345-0330-0004

Dear Sirs

Recently, we have received reports of a few incidents with damaged indicator valves that involved a potential risk of damage to property and serious personal injuries.

The long-standing service experience of MAN Diesel & Turbo approved indicator valves is generally very good and shows a low failure rate. Nevertheless, a service letter (SL2016-621) concerning the PMI sensors, introducing proper precautions for use, was issued due to reported failure incidents relating to the usage of the indicator valve. However, as the indicator valve is used on all MAN B&W engines, this service letter provides a general update of the required safety information.

Yours faithfully

**Mikael C Jensen**
Vice president
Engineering

**Per Pallisgaard**
Manager
Product safety

**Head office (& postal address)**
**MAN Diesel & Turbo**
Teglholmsgade 41
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 30
info-cph@mandieselturbo.com
www.mandieselturbo.com

**PrimeServ**
Teglholmsgade 41
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 49
PrimeServ-cph@mandieselturbo.com

**Production**
Teglholmsgade 35
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 17
manufacturing-dk@mandieselturbo.com

**Forwarding & Receiving**
Teglholmsgade 35
2450 Copenhagen SV
Denmark
Phone: +45 33 85 11 00
Fax: +45 33 85 10 16
shipping-cph@mandieselturbo.com

**MAN Diesel & Turbo**
Branch of MAN Diesel & Turbo SE, Germany
CVR No.: 31611792
Head office: Teglholmsgade 41
2450 Copenhagen SV, Denmark
German Reg.No.: HRB 22056
Amtsgericht Augsburg

Indicator valves are designed to withstand high temperatures at any engine operating conditions. Nevertheless, incorrect installation, lack of maintenance or irregular/ wrongful use may result in higher temperatures exceeding the design limit. This may lead to faulty measurements, reduced lifetime and damage to the indicator valve.

In order to ensure the operational integrity of the indicator valve, the precautions listed below must be followed:

1. Opening of indicator valve
   The temperature in the valve arrangement increases dramatically if the indicator valve is opened while the engine is running. This may cause damage to the valve and PMI pressure sensor. Therefore, it is recommended only to open the indicator valve while the engine is turned by air or by turning gear. Blow-through of the indicator valve is recommended during slow turning. However, opening of the indicator valve is of course allowed when the valve is connected to measuring instruments (PMI or similar).

   *Do not blow through the indicator valve for cleaning purposes during running of the engine, as this will deteriorate the indicator valve and increase the risk of malfunction which could lead to valve rupture and damage to the PMI sensor.*

2. Check for leakages
   Leakages may lead to an excessive temperature at the indicator arrangement. Make sure there are no leaks in the indicator valve and assembly. Check for leakages between the adapter, cylinder cover, and valve flange. Seals must be used to seal the mating surfaces. If the indicator valve assembly is dismounted, always replace the seals with new ones.

3. Cleaning
   A thin layer of deposits inside the valve arrangement does not influence the measurement results and, thus, disassembly is normally not necessary. Only heavy deposits should be removed. Disassemble and clean the indicator valve arrangement manually, heavy deposits may be dissolved using sparkling water.

4. Prevent acid condensation
   Corrosion from sulphuric acid condensation in the indicator valve arrangement must be prevented by maintaining the arrangement at temperatures above the acid dew point.

   In order to prevent sulphuric acid condensation, ensure that the insulation of the indicator valve arrangement is intact.

A new description with updated safety precautions is enclosed, ref.: 6345-0330-0004.

Please replace the chapter in the Instruction Manual and inform your crew of the update.

For any questions regarding this service letter, please write to: leo@mandieselturbo.com

# 1 Thermometers and pressure gauges

The thermometers and pressure gauges fitted on the engine are often duplicated with instruments for remote indication.

Owing to differences in the installation method, type and make of sensing elements, and design of pockets, the two sets of instruments cannot be expected to give exactly the same readings.

During shoptest and sea trials, readings are taken from the local instruments. Use these values as the basis for all evaluations.

**NOTICE**

**In case the local and the remote sensors are installed i seperate pockets, a temperature difference of up to 50 ˚C can be expected. Consider this when evaluating performance measurements.**

Check the thermometers and pressure gauges at intervals against calibrated control apparatus.

Thermometers should be shielded against air currents from the engine-room ventilation.

If the temperature permits, keep thermometer pockets filled with oil to ensure accurate indication.

Keep all U-tube manometers perfectly tight at the joints.

Check the tightness from time to time by using soap-water.

To avoid polluting the environment, do not use mercury instruments.

Check that there is no water accumulation in tube bends, as this could falsify the readings.

If cocks or throttle valves are incorporated in the measuring equipment, check these for free flow, prior to taking readings.

If an instrument suddenly gives values that differ from normal, consider the possibility of a defective instrument.

The easiest method of determining whether an instrument is faulty or not, is to exchange it for another.

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## 2 Indicator valve arrangement

Each cylinder is equipped with an indicator valve and online pressure sensor arrangement (when applicable). It is mounted on top or on the side of the cylinder cover, which has a bore connecting the combustion chamber with the indicator valve and online pressure sensor adapter. The arrangement is insulated in order to prevent corrosion from sulfuric acid condensation.

The indicator valve arrangement serves the following purposes:

- It is normal procedure to slow turn the engine by starting air before first engine start after the engine has been stopped for a longer period. Slow turning will normally be carried out with open indicator valves, in order to determine if any liquid has entered the combustion chamber. In case liquid is present in any of the cylinders, a clear indication will be seen from the indicator valve.
  *For slow-turning and other preparations for starting see description 6645-0110.*
- The online pressure sensor is used for performance measurement by the PMI on-line system.
- An off-line pressure sensor can be connected to the indicator valve for performance measurement or for calibration of the on-line PMI system.

While the engine is running, deposits will accumulate in the indicator bore and valve arrangement. The deposits may consist of coke, soot, sulphur, additives or oil residues.

In order to ensure the operational integrity of the indicator valve, certain precautions must be followed:

- Opening of indicator valve
  The temperature in the valve arrangement increases dramatically if the indicator valve is opened while the engine is running. This may cause damage to the valve and PMI pressure sensor. Therefore, it is recommended only to open the indicator valve while the engine is turned by air or by turning gear. Blow through of the indicator valve is recommended during slow turning. However, opening of the indicator valve is of course allowed when the valve is connected to measuring instruments (PMI or similar).

**⚠ WARNING**

**Do not blow through the indicator valve for cleaning purposes during running of the engine, as this will deteriorate the indicator valve and increase the risk of malfunction which could lead to valve rupture and damage to the PMI sensor.**

- Check for leakages
  Leakages may lead to excessive temperature at the indicator arrangement. Make sure there are no leaks in the indicator valve and assembly. Check for leakages between the adapter, cylinder cover, and valve flange. Seals must be used to seal the mating surfaces. If the indicator valve assembly is dismounted, always replace the seals with new ones.
- Cleaning
  A thin layer of deposits inside the valve arrangement does not influence the measurement results, and thus, disassembly is normally not necessary. Only



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heavy deposits should be removed. Disassemble and clean the indicator valve arrangement manually, heavy deposits may be dissolved using sparkling water.

- Prevent Acid Condensation
  Corrosion from sulfuric acid condensation in the indicator valve arrangement must be prevented by maintaining the arrangement at temperatures above the acid dew point.

**NOTICE**

**In order to prevent sulfuric acid condensation ensure that the insulation of the indicator valve arrangement is intact.**

*For additional information see PMI Online Operation Guide: How to Calibrate the Online Sensors*

## 3 PMI System

The PMI System is designed to provide engineers and service personnel onboard ship and at power plants with a computerised tool for pressure measurements and analysis on two-stroke diesel engines. The main advantages of the system are:

- On-line measurement of cylinder pressure. Fully automated measurement routine for measurements conducted from engine control room.
- Graphic display of PT, PV and Balance Diagrams, together with Mean Indicated Pressure and Max. Pressure deviation limits.
- Calculated values of Effective Power, Mean Indicated Pressure $p_i$, Compression Pressure $p_{comp}$, Max. Pressure $p_{max}$, and Scavenge Pressure $p_{scav}$, including proposed values for index adjustments, etc.
- Software interface for use with MAN Diesel & Turbo's engine performance and engine diagnostics software, e.g. CoCos-EDS.





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