

Action code: AT FIRST OPPORTUNITY

High Exhaust Gas Temperatures and Turbine Cleaning

SL2015-597/HCL
March 2015

Concerns

Owners and operators of
MAN four-stroke diesel engines.
GenSets type:
L16/24, L21/31, L23/30H, L27/38,
L28/32H, V28/32S

Attachments:

Description 501.15 (03)/601.15 (03H), Guidelines for longterm low-load operation on HFO

Description 512.14 (01)/612.14 (01H), Cleaning the turbocharger in service - turbine side

Work Card 512-10.00 (05)/612-10.00 (03H), Cleaning the turbine, dry cleaning

Work Card 512-15.00 (05)/612-15.00 (03H), Water washing of turbine side

Plate 51215-04/61215-01H, Water washing of turbine side



Dear Sirs

Service experience from vessels operating on heavy fuel oil, which is the most common fuel on many vessels, has shown that insufficient cleaning of the turbocharger will eventually result in a decreasing turbocharger performance.

Fouling of the turbine side of the turbocharger is a common cause for high exhaust gas temperatures.

The sequence of events is often as follows:

- Fouling of turbine (coke deposit)
 - Bad turbocharger performance
 - Lower airflow and charge air pressure
 - Higher exhaust gas temperatures.

Fouling of the turbine and, consequently, a higher exhaust gas temperature is influenced by the:

- level of maintenance
- condition of the fuel injection nozzles / fuel pumps
- fuel oil quality
- long-term low-load operation.

Service experience shows that proper and timely cleaning of the turbocharger will result in good turbocharger performance, longer overhaul intervals and fuel consumption according to specified values.

Yours faithfully


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In this regard, please also note:

Description 501.15 “Guidelines for long-term Low-load operation on HFO”

Description 010.000.023-05: “Heavy fuel oil (HFO) specification”

The expected turbine cleaning intervals must be the following when operating on HFO:

“D-D” Dry-cleaning Daily cleaning

“W-W” Wet-cleaning Weekly

Cleaning intervals can be shorter/longer based on operational experience. Regular performance observations will show the trend in charge air pressure and exhaust gas temperatures, and define the cleaning intervals for the turbine. However, the turbine must be cleaned when exhaust gas temperature before turbine are about 20°C above the normal temperature (ISO corrected) (sea trial).

Due to the area-relation in matching parts, smaller turbochargers are more sensitive to coke deposits than larger turbochargers and, consequently, low-power engines such as the L16/24 or L23/30H will need more frequent turbine cleaning than more powerful engines.

Nutshell dry or Water washing cleaning has been the turbine cleaning method for many years.

Recent service experience based on current emission standards reveals that the turbocharger must always be in good condition to obtain the expected engine performance.

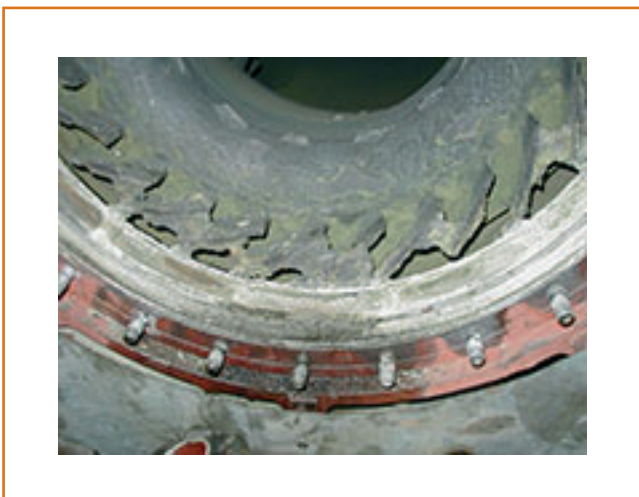
New standard for HFO engines is a combination of dry cleaning and water washing of turbine side

No further action is needed for engines delivered with a piping arrangement for water washing. Other engines will need the newly developed tool for water washing of the turbine. The tool uses the same connection as for dry cleaning. For most engines no further changes are needed. Please contact PrimeServ MAN Diesel & Turbo for purchasing new water washing tool.

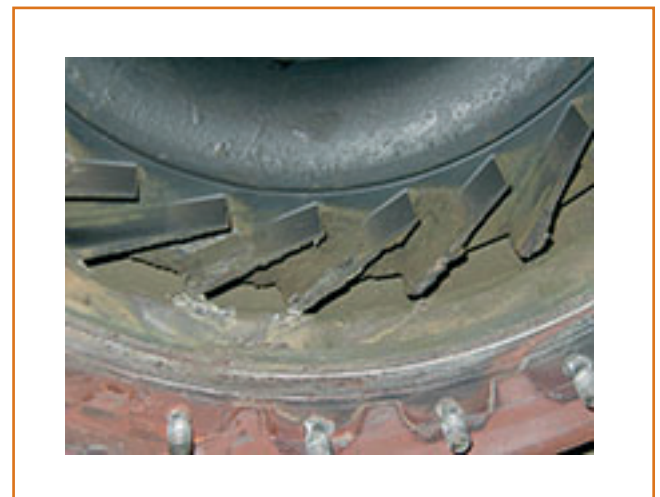
As not all injected water is evaporated, turbochargers need to be fitted with a drain from the exhaust gas outlet. For engines delivered without drain, customers of these engines must contact MAN Diesel & Turbo.



Tool for cleaning of turbine



Before cleaning of turbine



After cleaning of turbine