

# TURBOCHARGER WORKSHOP

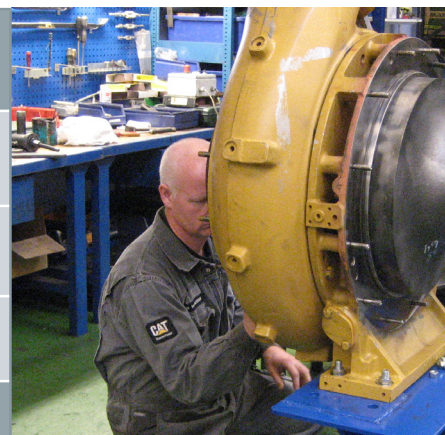
## AUTHORIZED BY NAPIER

Zeppelin Danmark A/S is an authorized Cat, MaK and Napier Turbochargers Service Centre. Our specialized Cat and MaK Service Engineers have taken extended Napier training courses, and we are thus qualified to carry out overhaul and balancing of Napier turbochargers.



- MaK authorized service engineers
- State of the art turbocharger balancing bench
- Worldwide MaK service teams
- Our workshop always uses genuine spare parts
- Troubleshooting and performance test are offered
- Highly competitive availability and pricing.

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# TURBOCHARGER LIP SEAL

## CONTINUOUS PRODUCT IMPROVEMENT

For many MaK engines operating under extended idling/low load conditions, or continuous slow steaming, the engine and turbocharger may benefit from an upgrade to an improved sealing arrangement.

Greater reliability maximizes your uptime and reduces the Total Cost of Operation. Therefore we have developed a turbocharger cartridge upgrade, which is offered as a factory guaranteed exchange through our authorized dealers. This includes the turbine bearing housing and rotor shaft, which both require replacement in a suitable exchange cartridge.

### WHAT'S THE RISK?

Oil leakage can rapidly lead to a significant accumulation of hard deposits between the bearing housing and the rear of the turbine. Consequential wear or damage to the sealing area and back of the turbine wheel may result in major malfunction, if the conditions are permitted to persist. Subsequent to recurring periods of extended low load operation, the risk of oil leakage past the piston ring seal is increased.

### LIP SEAL UPGRADE

Keeping up to date on changes in the industry and informing customers of product improvement to meet new operational conditions, add to our commitment to your success.

### LIP SEAL UPGRADES CAN BE REQUESTED

The new lip seal arrangement is a standard feature in the next generation turbochargers. The lip seal has proven its reliability and improved sealing function on many Cat® engines.

In addition, a number of turbochargers have already been tested and modified on MaK engines to take advantage of the enhanced sealing arrangement.

