

MAN Energy Solutions
Future in the making



MAN Energy Solutions Chile

Workshop



Overview

Workshop

- **Turbocharger Job scope / radial and axial**
- **4 stroke engine job scope / médium and high speed**
- **2 stroke engine job scope**
- **Workshop machines**
- **Workshop Instruments**
- **Team**

Turbocharger Capabilities / radial and axial

For complete turbochargers

- Dismantling / disassembly / assembly complete turbocharger.
- Standard overhaul
- Root cause analysis
- Dimensional control and NDT (all types)
- Sandblasting by ceramic
- Rotor cleaning, visual inspection and dimensional control
- Rotor balancing

For turbocharger components (for our bigger TCs types)

- Rotor disassembly / Reblading
- Rotor cleaning, visual inspection, dimensional control + true running
- Rotor NDT inspection
- Rotor assembly
- Rotor balancing
- Nozzle ring cleaning by sandblasting or ultrasonic machine.

For turbocharger cartridges

- Dismantling / disassembly / assembly of cartridge
- Major overhauls during vessel short port stay.
- Rotor cleaning, dimensional control, NDT
- Rotor balancing



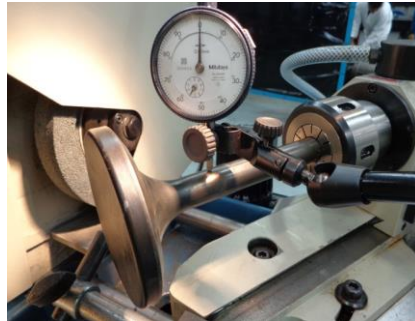
4 Stroke Capabilities / Medium and High speed

4 strokes Cylinder Heads / Piston / Liners

- Disassembly of Cylinder head
- Cleaning of all components (ultrasonic cleaning in case of needed)
- Rotocups and axial bearings inspection (Disassembly, visual inspection)
- Springs inspection (Visual inspection, dimensional control)
- Valve spindle crack detection
- Valve spindle grinding
- Valve spindle dimensional control
- Valve guides measuring
- Valve seats grinding
- Valve seat crack detection
- Safety valve overhaul
- Rocker arm inspection
- Assembly of cylinder head
- Pressure test
- Honing / diameter and roughness measurement

4 strokes fuel oil systems

- Fuel valve inspection / overhaul
- Fuel pump inspection / overhaul



Air and lube oil coolers

- Disassembly and mechanical cleaning
- Chemical / ultrasonic cleaning
- Refurbishment of landing surfaces
- Dressing up of fins
- Cleaning and painting of side walls
- Pressure test
- Preparations ready for installation



2 Stroke Capabilities

For 2 stroke ME components

- **Valve spindles**
 - Cleaning, visual inspection
 - Dimensional control (incl. Concentricity and burn off)
 - NDT
 - Seat grinding
- **Bottom pieces**
 - Cleaning, visual inspection
 - Dimensional control (Using wear template + drawings)
 - NDT
 - Seat grinding
- **Fuel valves**
 - Disassembly and cleaning
 - Visual inspection (boroscopy)
 - Lapping of surfaces (if needed)
 - Testing according to service manual.



Workshop and on site equipment

VSL vertical lathe for valve seat (For valve seat diameters from 50 - 230 mm or valve guide diameter 16 – 28 mm)

VRL vertical lathe for recess and valve seat (For diameters from 74-200 mm)

Valve spindle grinding machine

Honing machine (For liners from 150 - 700 mm of diameter)

Balancing machine (Rotor diameter until 1600 mm, 3 ton)

Turret milling machine

Lathe machine



Workshop and on site equipment

2 stroke fuel valve testing

4 stroke fuel valve testing

Blasting machine

Ultrasonic cleaning machine

- large 2400 mm
- Width 1300 mm,
- High 1200 mm
- Max piece weigh 3000 Kg.

Lapping machine

- Working table of 20" max diameter.

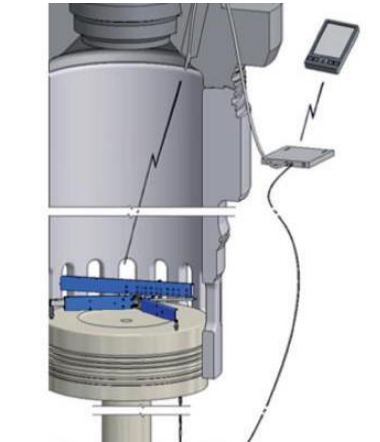
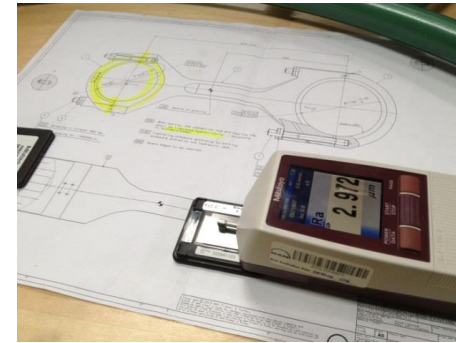
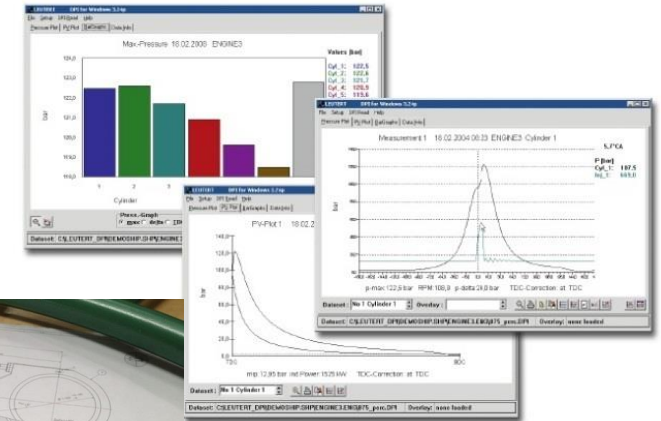
5 tons crane, 4.5 m

Magnetic drilling machine



Workshop instruments

- Hardness measurement.
- Roughness measurement
- Laser thermometer
- Boroscopy
- Peak pressure test equipment Leutert
- VAK, 2 stroke liners measurement
- Ovality kit measurement digital, 4 stroke engines
- Digital deflection equipment, 4 stroke engines
- Repliset kit for 2 stroke liners
- Magnaflux crack test equipment
- Ridge wear measurement instruments
- Non destructive testing equipment.
- Fluke multimeters and process calibrator.
- Re commissioning tools, pneumatic hand pump, etc
- Standard and digital micrometers
- Liner condition camera
- Replica samples analysis



Team



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A wide-angle photograph of a mountain valley at sunset. The sun is low on the horizon, casting a warm, golden glow across the scene. The sky is a mix of blue and orange, with some clouds catching the light. The mountains are rugged and appear to be covered in snow or light-colored rock. The foreground is a rocky, uneven terrain with patches of snow.

Thanks!