Is the heart of your engine protected?

Avoid open-up inspections and protect the heart of your engine with the AMOT Bearing Condition Monitor - XTS-W

Bearing Condition Monitor
Overview

amot

An essential tool for Condition-based Maintenance

The XTS-W is a bearing condition monitor for 2-stroke low speed engines. It indicates wear in the crank train: main; crankpin; and crosshead bearings. In addition it can monitor water in oil content and electrical potential between the propeller shaft and hull, both of which may have an adverse effect on bearing life.

Accessibility

The XTS-W can be accessed in a variety of ways to suit the preferences of the ship owner:

- Locally, in the engine control room using a standard monitor keyboard and mouse
- Remotely, via an ethernet connection:
  - to a PC on the ship's network or
  - to a dedicated PC or
  - integrated to a suitable AMS system

The system comprises …

- 2 custom analogue inductive sensors per cylinder mounted on a bracket located on the engine frame
- a central processing unit (CPU) providing data storage, full class reporting and local or remote user interface
- a signal processing unit (SPU) mounted onto the outside of the engine
- a water-in-oil sensor mounted in the main lube oil feed pipe (optional)
- a shaft earth device monitor to measure the electrical potential between propeller shaft and hull (optional)
- an interface unit mounted in the engine control room for connection to the AMS system and local system access

How it works

The XTS-W maps the characteristics of your individual engine, ensuring accurate real time measurement of bearing wear.

The sensors convert any physical displacement due to bearing wear into a pulsed electrical signal, which is sent to the signal processing unit. Each microprocessor-based SPU generates continuous signals proportional to the wear detected, compensating for environmental and engine load conditions.

The calibrated SPU communicates wear data to the HMI which provides a clear graphic display of bearing wear. Each sensor can be calibrated individually or simultaneously.

The SPU calibration is fully automatic with engine protection only 30 minutes from start-up.

proximity sensor

shaft earth device monitor (SEDM)

water in oil sensor (WIO)

signal processing unit

central processing unit

A proven solution to maximise revenue and reduce costs

Avoid Open-Up Inspections

MAN Diesel & Turbo has stated that if a system such as the XTS-W is installed, open-up inspections of all crank train bearings are no longer required, providing **operational cost savings** and **removing the high risk of bearing damage** during such inspections. Exposure of key personnel to potentially hazardous situations is also removed, offering a **safer working environment**.

Cost-effective, planned maintenance

The XTS-W Bearing Condition Monitor provides 'real-time' data on crank train bearing condition. It displays the rate of degradation, bearing wear and the water-in-oil content to fully protect the crank train bearings. The XTS-W provides 'real time' information allowing the user to take appropriate corrective action, thus avoiding consequential damage, costly unplanned repairs and loss of revenue.

Maximum Availability

The XTS-W continually measures the condition of the bearing, offering an intuitive and reliable **definitive monitoring device**. Easily installed, the XTS-W is suitable for both new build installations and retrofitting to existing engines.

Proven Product

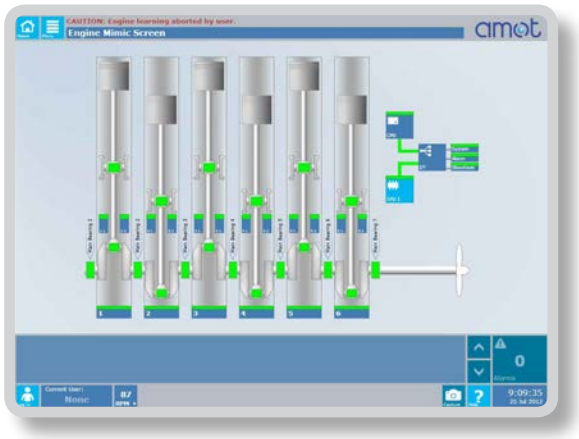
The XTS-W is Type Approved by major IACS and is a valuable component of the condition-based maintenance programmes provided by Classification Societies.

typical user HMI interface

The XTS-W has many benefits

- Avoids open-up inspections providing:
  - operational cost savings
  - removing high risk of damage during such inspections
  - minimising crew exposure to potentially hazardous situations
- Provides real-time information on bearing condition allowing effective operating decisions to be made - maximum uptime, minimum cost
- Monitors crank train bearings 24 hours a day, 7 days a week
- Simple to install on both new build and existing vessels
- Easy to use and comprehensive reporting
- User-friendly home screen indicating both system and alarm status real-time
- MAN Diesel &Turbo has reduced the frequency of external inspections if BCM is applied

Typical display screens



- **Home Screen - an intuitive overview indicating:**

  - Bearing status
  - System status, including component failure, malfunction or cable damage
  - Any active alarms or slowdowns for BCM or WIO and SEDM if fitted

- **Bar Screen - indicating bearing wear:**

  Sensor values

  - Absolute wear values
  - Deviation wear values

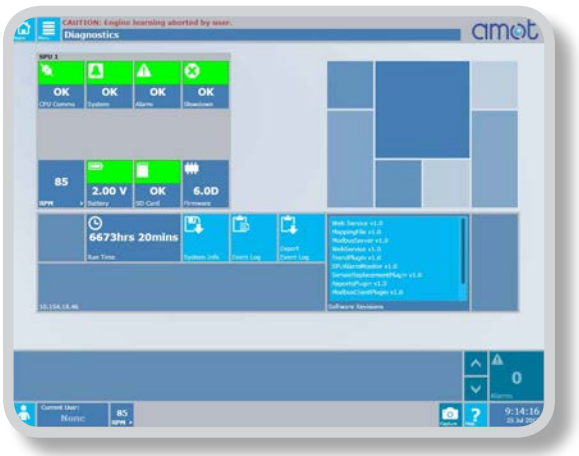
  Cylinder values

  - Absolute wear values
  - Deviation wear values

  Alarm and slowdown thresholds

- **Trend Screen - indicating wear over a pre-specified time:**

  - Historical access to identify when problems began
  - Realtime, allowing rate of change to be monitored



- **Diagnostic Screen - indicating indepth system status:**

  - Hardware status including sensors, SD card and SPU
  - Communication status
  - Alarms and slowdowns
  - Firmware and software versions
  - General information, runtime, RPM, GMT

Protection you cannot afford to be without

Open-up inspections and bearing failure

There is an increased risk of damage to a healthy bearing after a regular unnecessary open-up inspection – as statistics prove!

Experience shows that main bearings are particularly vulnerable to mis-assembly, dirt and scratches during such inspections. All this increases operational costs and exposes key staff to potential hazards. Importantly, MAN Diesel & Turbo does not recommend unnecessary opening up of the crank train bearings on its 2-stroke low speed engines.

Better to eliminate the risk of bearing failure.

Better to fit an XTS-W.

- MAN Diesel & Turbo does not recommend unnecessary open up inspections of the crank train bearings in its 2 stroke engines: “We consider scheduled open-up inspections as obsolete.”
- MAN Diesel & Turbo Checking & Maintenance Schedule states: “Bearings should only be opened if bearing material fragments fall out or top clearance is outside limits.”
- MAN Diesel &Turbo has now omitted scheduled open-up inspections of all bearings in its instruction material. Additionally, the company will reduce the frequency of external inspections (crank shaft deflection, bearing clearance measurements, bearing edge check and inspection of crank case for bearing material) if BCM is applied.
- Less than 1% of bearing problems are found during open-up inspections, but more than 2% of bearing problems are caused by open-up inspections.*
- More than 7,000 ships have open-up inspections every year.
- Germanischer Lloyd says that open-up inspections can be omitted if the following MAN Diesel & Turbo approved equipment is fitted:
  - Bearing Condition Monitor (BCM)
  - Water in Oil Monitor (WIO)
  - Shaft Earth Device Monitor (SEDM)

  Once an engine has the above monitoring systems installed, and provided the vessel has a computerised Planned Maintenance System (PMS), the owner may apply for Survey Arrangement Condition Monitoring (SACM).

** Source: MAN Diesel & Turbo*

AMOT has pioneered the development of bearing condition monitoring since 2000, when the company produced its first concepts of the XTS-W in collaboration with MAN Diesel & Turbo. From its initial sea trials through to class, licensee and ship owner adoption, the XTS-W has evolved to become the leading bearing condition monitor on the market today.

A manufacturer of quality components for marine rotating machinery since 1948, AMOT currently has three manufacturing sites and seven sales offices positioned strategically around the world to support new build, ship owners and operators globally. Our manufacturing plants are ISO 9001 accredited and many of our products have industry standard certification such as LR, GL, ABS, DNV and BV.

AMOT recognises the key to your business is keeping your equipment operational and minimising downtime. We continue to work closely alongside the technical teams of our customers to ensure our solutions meet their ever-changing needs.

With over 400 vessels installed by 50 different ship owners worldwide, combined operation time exceeds 1000 years - making the XTS-W the most proven bearing condition monitor!

Contact us for more information

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