

ENGINE HEALTH CHECK

Engine
diagnostics

Alarms and
shutdowns

Laser
alignment

Emissions
testing

Oil analysis

Thermo-
graphics

Peak pressure
testing

Cylinder
borescope

Royston 
diesel power

Regular **specialist engine diagnostics** can help prevent costly breakdowns and add to the useful life of your asset

ENGINE HEALTH CHECK LIST

Engine Diagnostics Comprises a function test of the engine; a boroscope examination of the combustion chamber (liner bores, piston crowns, cylinder heads and valves); peak pressures; exhaust gas analysis, typically NO_x, SO_x, CO₂ and particulate counts; fuel pump timing checks; lubricating oil analysis; laser alignment.

Diagnostics using hand-held computers and proprietary software for several engine manufactures of high and medium speed engines is also available, allowing quick and easy trouble-shooting, parameter programming and test operations.

Crankshaft Deflections Over a period of time as the engine keeps running, the wear in the bearings may not be uniform across the entire length of the crankshaft. The crankshaft will not remain in the initial straight line but will get bent either upward

or downwards to a slight degree which may not be visible with the naked eye but could be sufficient to cause dangerous levels of fatigue in the crank-webs and bearings, leading to a possible failure of the crankshaft.



Laser alignment The laser alignment of marine engines and propeller shafts is critical. The stresses and vibrations caused by rotation of misaligned shafts can not only lead to failures in the drive shaft assembly itself, but can also cause significant damage to structural items.

Marine engine drive systems gradually move out of alignment and must to be periodically checked and realigned accurately to reduce the stresses increased as a result. Laser alignment will significantly reduce wear to drive train propulsion units, engine components, and also the vessel itself.

Emissions Testing Ensuring compliance with MARPOL Annex VI on the set limits for NO_x and SO_x emissions from ship exhausts, and for measuring CO₂ production is essential. This can be readily checked on board by Royston's trained technicians using a portable emission analyser combined with a powerful and efficient software tool.

Engine Performance Electronically monitor cylinder's mean indicator pressure and indicator power without needing to stop the engine. It also offers combustion analysis graphs and provides an indication of pressure changes in the cylinders. All data will be analysed in real-time and suitable for 2-stroke and 4-stroke engines. It will provide information on engine performance and power deviation in cylinders.

Cylinder Borescoping Borescope inspection of engines can be used to prevent unnecessary maintenance. Royston can provide a video borescope with an accompanying report with sufficient clarity to provide an accurate assessment of the liner and piston condition to satisfy Owner and Class.

Thermographic surveys Electrical components such as connections, joints and contacts are subject to deterioration over time due to corrosion, loosening, over tightening, contamination and overloading, all of which causes an increase in electrical resistance and subsequently an increase in temperature. If left, further deterioration occurs, resulting in possible equipment failure, fire and possibly explosions.

Regular thermographic surveys of electrical distribution systems and components such as switchboards, distribution boards, control panels



and UPS / battery systems are non-invasive, relatively quick to carry out, cost effective and can form part of any predictive or planned maintenance strategy.

The survey is carried out by a Level I thermographer and a report is produced giving comprehensive details of all the items surveyed, highlighting faults and advising on the most effective solution.

PROCEDURES THAT PREVENT PROBLEMS
AND PROLONG ASSET LIFE



Engine health checks significantly extend overhaul schedules.

From ensuring that alarm and shutdown systems are fully functioning to making sure that faulty thermocouples and pressure sensors are replaced from our extensive spares stock, Royston can help your engines get a clean bill of health.



Royston are specialists in diesel power sales, repair and maintenance with a highly skilled and experienced team of over 40 OEM trained engineers with expertise across multiple disciplines and all engine types. They can be mobilised 24/7 wherever the engine...
...whatever the problem.