



mtu Series 4000 Mx3 marine engines

IN-SITU OVERHAUL SOLUTIONS

Standard in-situ & condition based in-situ overhauls

Overhauls are essential for maximizing the performance and efficiency of engines like our *mtu* Series 4000 Mx3. Original parts and manufacturer know-how are equally important. In addition to factory based overhauls, we also offer in-situ overhaul solutions directly inside the ship – saving time and costs while benefitting the environment. Our in-situ overhaul solutions are ideally when circumstances do not allow to remove the engine from the vessel.

General benefits of *mtu* in-situ overhauls



On-site overhauls save time



Environmentally friendly solution



Globally consistent standards & processes



Avoiding engine removal & installation saves costs



Performed by the experts that built your engine



A Rolls-Royce solution

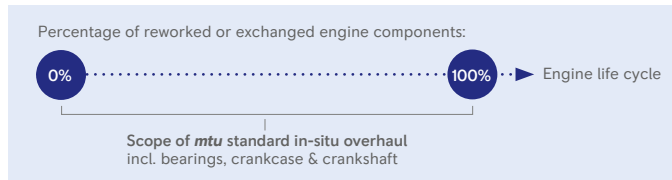
OVERHAULS TAILORED TO YOUR NEEDS

Overhaul projects differ in terms of the scope of work and components involved. With our in-situ options, customers can choose between a comprehensive standard overhaul or a more basic, condition based service.




mtu standard in-situ overhaul

This comprehensive offer covers the replacement, overhaul and/or reconditioning of all engine components. The work performed fully complies with overhaul manual and maintenance specifications. The engine's service life is extended by a full cycle before the next scheduled overhaul.

- Replacement, overhaul and/or reconditioning of all components (incl. crankcase, base bearing, crankshaft)
- Compliance with the specifications of the maintenance schedule/overhaul manual
- Extension of engine service life by a full cycle (TBO)



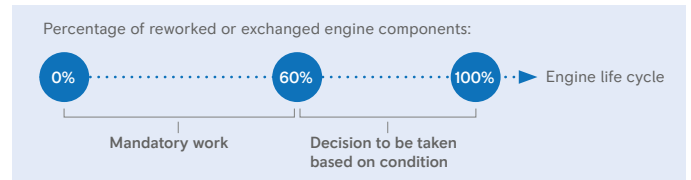
Advantages of an *mtu* standard in-situ overhaul

-  All engine components are new or reconditioned
-  High protection against downtime
-  Optimized lifecycle costs in terms of overall investment




mtu condition based in-situ overhaul

With this more basic in-situ offer, replacement and overhaul of a defined scope of parts and components is mandatory. A list of other parts and components are also examined to determine whether to overhaul, exchange or continue using them. This option can potentially reduce the work scope, downtime and costs.

- Defined scope of parts to be exchanged or overhauled
- Examination of additional listed parts and decision whether to replace, overhaul, or reuse based on condition
- Crankshaft, crankcase and bearings are reused
- Cost-optimized, condition based overhaul solution
- Extension of engine service life



Advantages of an *mtu* condition based in-situ overhaul

-  Maintenance cost optimization
-  Focused on the condition of individual components
-  Environmentally friendly solution, through the reuse of components

Implementation

4-step implementation by your local **mtu** service partner:

- 1** Clarification of customer requirements & engine condition (maintenance history, load profile, hours of operation, etc.)
- 2** Pre-inspection to determine feasibility of an in-situ overhaul
- 3** Engine overhaul, including disassembly, assembly and component disposal
- 4** Commissioning & run-in conducted on the vessel

Preconditions

- Sufficient space and accessibility in the engine room
- Suitable technical condition of the engine (load profile, wear, operating hours, etc.)
- Execution on-site by **mtu** certified service technicians
- Offer subject to confirmation; our general terms and conditions of sale and service apply

Contact your local **mtu** service partner to learn more about our in-situ overhaul solutions. Find your service partner at www.mtu-solutions.com

Rolls-Royce Group

www.mtu-solutions.com/marine