IN-SITU MACHINING
Whenever a worn-out or damaged machine component is too large to be brought to a machining shop, or when doing so involves too much dismantling work and thus is too time consuming and costly, then the solution is to bring the machining tools to the site. This is what in-situ machining is all about and what we excel in.

For several years, QuantiServ has been supporting machinery owners and operators from various industries such as Marine, Energy, Petrochemical and Oil and Gas, to name a few, with cutting-edge in-situ machining services.

In thirteen locations across the globe we have highly trained technicians who are able to respond and travel to a site within hours.
CRANKSHAFT MACHINING AND POLISHING

QuantiServ is specialized in repairing crankshafts without removing them from the engine. Our highly trained in-situ technicians have over the years been able to save hundreds of crankshafts that would otherwise have been condemned and would have had to be replaced.

If a crankshaft can be recovered by machining it in-situ, then a lot of time can be saved compared to a renewal. In-situ machining is also cheaper and as long as the affected engine is not the vessel’s only propulsion one, the vessel usually does not have to be taken out of service.

It is possible to carry out in-situ machining on crankpin and/or main bearing journals.

After machining, under-size bearings will have to be fitted. These can be ordered from the engine manufacturer or, for most engine types, through us.

Typically our reliable partners are able to supply under-size bearings if not from stock then within about four weeks at most.

Besides crankshafts, we routinely repair other types of rotating shafts, such as propeller shafts, alternator shafts and turbine shafts.
LINE BORING

We are able to bore virtually any cylindrical or tapered inner diameter, from Ø 50 mm to Ø 1000 mm.

The maximum length that we are able to bore is around 10 meters, which means that we can work on nearly any type of equipment, including but not limited to two- or four-stroke engines, turbine casings, stern tubes and rudder stocks.

Because there are no line boring machines as versatile, accurate and efficient as we require them available in the market, we design and build them ourselves. Our tools are very advanced and very compact to reduce freight costs and to be able to work in very tight places.

Line boring assignments that we carry out frequently on marine and offshore installations include the following:

- Hinges for cargo hatch covers
- Hinges for car carrier / ferry door ramps
- Hinges for crane arms / knuckle booms
- Slewing of deck winch bearing pockets
- Gas compressor main bearing pockets
- Steering gear and rudder necks
- Propulsion thruster bearings
- Sand pumps for dredgers
In addition to line boring, we also provide all related services such as

- Supplying and installing repair sleeves and bushings, for example to the engine block around the cylinder liners
- Building up worn shafts, depending on the application and damage either by brush plating, welding, metal-spraying, chromium plating or by installing a repair bush
- Machining of key ways
- Skimming of landing surfaces
- Reaming of bores such as those for shaft line coupling bolts
- In-situ honing (polishing) of inner and outer diameters

Machining the bearing pockets inside a thruster
IN-SITU HEAT TREATMENT (ANNEALING)

The presence of hard spots in a crankshaft, that often are the consequence of a bearing failure, is very undesirable because it leads to uneven wear (cam effect) and because there is an increased risk for cracks to develop over time. Thus, if the crankshaft hardness is found to be too high, then in-situ heat treatment (annealing) becomes necessary.

We have gained considerable experience with this process and have been able to bring down the hardness on a large number of crankshafts to save them.

CRANKSHAFT STRAIGHTENING (PEENING)

When a four-stroke engine crankshaft suffers from an overheated crankpin or main journal, then it may buckle under the influence of the thermal stresses that are induced by the bearing failure. A trueness check of the crankshaft will reveal if the crankshaft has suffered from buckling.

It is often possible to straighten the crankshaft in-situ, without removing it from the crankcase. This process is known as “peening”. It is a cold process, whereby a small force is applied to the correct places repeatedly to bring the shaft back to its original straightness.
INSTALLATION OF BUSHES AND SLEEVES

If a diesel engine’s cooling water treatment is not maintained perfectly or if the cooling water pressure is too low, the engine block and cylinder liner can over time get damaged by cavitation and corrosion.

If the damage is severe, then the o-rings cannot function anymore and cooling water will leak from the cooling water space around the cylinder liners into the engine crankcase.

The best remedial action is to re-machine the engine block in-situ and to shrink fit repair sleeves.

FLANGE FACING AND X-Y MILLING

For circular flanges, the maximum diameter that we are able to machine with high accuracy is around Ø 5,000 mm.

For rectangular or square shaped surfaces limits lie around 10,000 mm x 8,000 mm.

Most of the flange facing and X-Y milling machines that we use were designed and built by ourselves. These machines are very advanced and very compact to reduce freight costs and to be able to work in very tight places.
METAL STITCHING

We use the most technologically advanced metal stitching products available. Our technology allows us to repair the most severe damage, while delivering a permanent repair. From catastrophic connecting rod failures resulting in large holes to the smallest of cracks from a bolt hole – we have the solution. With our portable 3D scanning capabilities, we can reproduce new castings to replace badly damaged or missing sections of your castings.

**Metal stitching repairs are available in:**
- Grey iron
- Nodular iron
- Cast aluminum
- Cast steel
- Bronze
- Stainless steel

**We repair:**
- Engine frames
- Cylinder heads
- Pumps
- Gear boxes
- Gears
- Turbo charger casings

**Capabilities of our metal stitching technology:**
- Pressure tight seal
- Provides strength over entire repair
- Machinable
- Repairable thickness from 2 mm to 150 mm
- Permanent repairs
- Minimal disassembly
- Minimal downtime
- Classification approved
- Up to 5-year extended warranty available

*Damaged four-stroke engine block*
Threaded bolt hole repair services:

We offer permanent threaded bolt hole repair both in-situ and in our facilities.

- Cracked or stripped bolt hole repair
- Head stud bolt hole repair
- Permanent thread repair
- "Stronger than new" repairs
- Metric and inch inserts
- Blind inserts
- O-ring boss and NPT inserts
- Solid plug and through insert

Welding is not an alternative to metal stitching. The welding of castings requires a high preheat temperature that is impossible to achieve in-situ. Hardening in the heat affected zone, distortion and re-cracking are the most common problems affiliated with in-situ welding.

Because metal stitching is done cold it eliminates these issues and allow us to complete repairs with minimal disassembly and costly downtime anywhere in the world.
We have a long experience in carrying out various laser measurements for a wide range of applications. Our offering includes:

- Flatness checks for foundations or flanges
- Roundness and bore alignment measurements for stern tubes, intermediate bearings, engine blocks, turbine casings, etc.
- Coupling and shaft alignments for electro motors, alternators, steam turbines, pumps, fans, etc.

We offer laser alignment services either as a stand-alone service, for example to verify the alignment of newly installed equipment or to determine a cause of failure. We also offer laser alignment in combination with machining work such as line boring, flange facing, coupling bolt reaming or epoxy grouting.
OTHER SERVICES THAT WE PROVIDE

Reconditioning
Professional and economical reconditioning of engine components such as pistons, cylinder covers, exhaust valves, etc, for any brand of engine in one of our six reconditioning centres in Asia, Europe and North America.

Mobile Teams
Our Mobile Teams specialize in carrying out engine overhauls during the voyage. They are well trained, hold valid seafarer’s certification, fly on seaman’s tickets and carry out the work on board at fixed prices, with no overtime or daily allowance charges.

Epoxy Resins
Our resin engineers and technicians are able to carry out virtually any epoxy resin grouting work. Our regular customers include new building and repair ship yards, refineries and various EPC contractors.

Bearing Re-babbitting
We have built up a lot of experience in white metal bearing reconditioning. Depending on the bearing’s application, we apply either a static or a centrifugal casting process and then carry out all post-casting machining work in-house. Guide shoes, connecting rod bearings, intermediate bearings, stern tube bushes and alternator bearings are some of the engine and machinery components that we recondition most frequently.
GLOBAL PRESENCE
15 locations