



Thrust is our business.

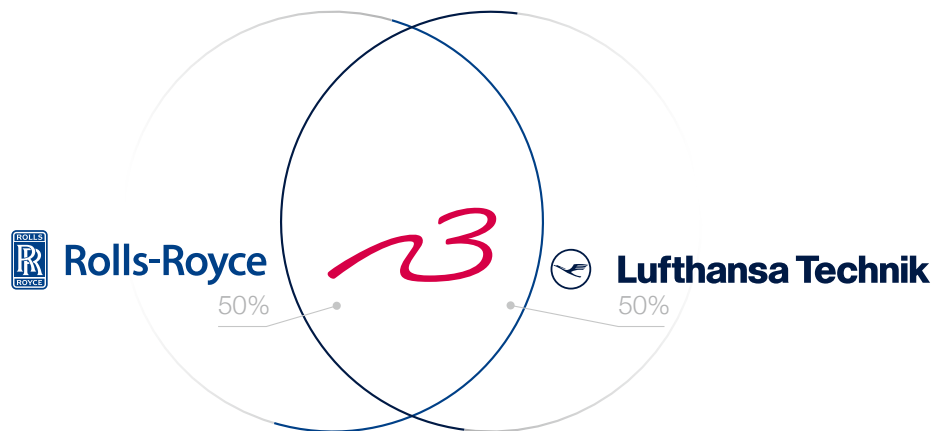
www.n3eos.com

N3 Engine Overhaul Services



N3 Engine Overhaul Services (N3) in Arnstadt, Thuringia, is the European Technology Centre for the maintenance and repair of Rolls-Royce Trent engines and components. The joint venture between Lufthansa Technik AG and Rolls-Royce plc has gained an international reputation as one of the most advanced overhaul centres for large civil aircraft engines, thanks to the high level of reliability, excellent product quality and outstanding process orientation. The growing customer base underlines the positive development of N3.

A highly qualified and motivated workforce of 760 employees including 27 apprentices, modern machinery, strong customer and process orientation and more than 15 years of experience with Rolls-Royce Trent engines enable the company to provide reliable and efficient flight operations for all its customers.





Location



The N3 Engine Overhaul Services (N3) plant is located in the Erfurter Kreuz industrial area near Arnstadt, one of the most dynamic economic areas in Thuringia. The state capital Erfurt and its international airport is also just a few kilometres away. This central location and the modern transport infrastructure provide links to Germany's most important air traffic hubs in Frankfurt am Main and Munich, as well as European airports such as Luxembourg and Amsterdam.

Engines can be transported to Arnstadt from both locations within a few hours, via the A4 and A71 motorways. Leipzig and Berlin are also within easy reach.

There is excellent potential for skilled workers within the Arnstadt region. The local universities and technical colleges enjoy an excellent reputation, throughout Germany. The region has a long tradition in the metall industry and is also a great place to live.



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Traglast 200 kg oder max. 2 Personen

Our services at a glance – Engine Overhaul



N3 Engine Overhaul Services (N3) is the European Technology Centre for the maintenance and repair of the Rolls-Royce engine models Trent 500, 700, 900, Trent XWB and most recently Trent 1000 TEN plus their components.

Within the Rolls-Royce Trent Overhaul network, N3 is the European shop. This is reflected in over 1.360 engines the company has overhauled in the past 15 years in operation. About 160 shop visits per year can currently be processed in the state-of-the-art workshop.

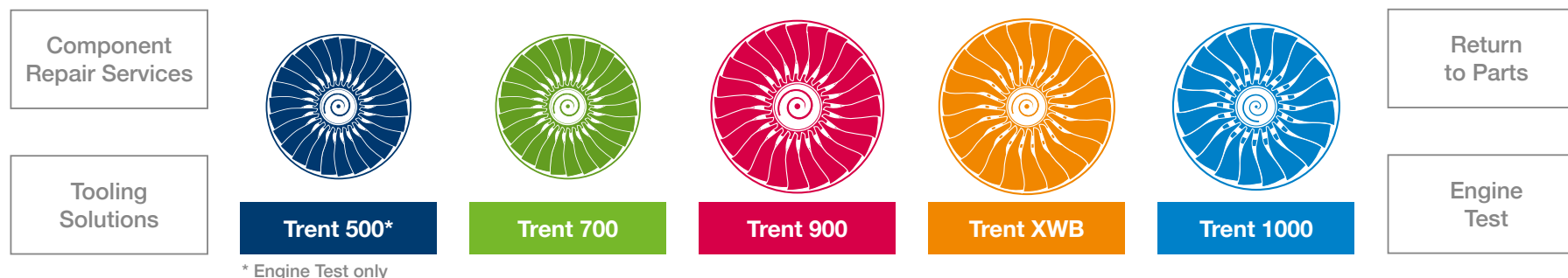
The engine testing facility has a capacity of more than 300 tests per year.

In 2007 N3 started its operation as the first overhaul centre in the world to employ the efficient and material-saving vertical disassembly and assembly process known as “Vertical Strip & Build”. This prevents vibration and achieves greater fuel efficiency. The success of this method is confirmed by the impressively low rejection rate from the testing facility.

The services offered by N3 include technical support for Rolls-Royce Trent engines throughout their life cycle. The core business consists of overhaul and repair of civil large engines of the Rolls-Royce Trent family. In addition to continuous expansion of the core business, N3 has also broadened its expertise with the development of supplementary services like tear-down of engines, component repairs and engine test.

Product Portfolio

Maintenance, Repair and Overhaul (MRO) of Rolls-Royce Trent Engines



Assembly/Disassembly

- Predominantly vertical disassembly and assembly of engines and enabling min. vibration results at test
- Hospital and Return-to-Parts

Component Repair

- Standard shop repairs and selected source controlled repairs
- External component repair orders supported in addition to engine repairs

Engine Testing

- > 300 test per year possible - testing of engines with up to 150,000 pounds thrust
- Test capacity for various Rolls-Royce projects (incl. Trent 500 tests)



Our services at a glance – Component Repair



A wide range of innovative inspection and repair procedures is employed in N3 Engine Overhaul Services (N3) to provide customers with optimal maintenance results and the highest product quality. The product portfolio embraces the maintenance and repair of the Rolls-Royce engine types Trent 700, 900, XWB and 1000. As part of the repair of external customer components, other engine types of the Rolls-Royce Trent family can also be reviewed at the customer's request.

In order to give customers the option of inducting components for inspection and repair, the parts business will be further expanded in the next years. N3 focuses mainly on the commodities Discs, Blisks, Cases, Shafts and LRPs (Line Replaceable Parts).

Component Repair

· Component cleaning, Non Destructive Testing	· Lab Capabilities
· Component Painting and Thermal Coating	· Standard Repairs
· Machining Capabilities	· Composite Repairs / Fan Case Milling
· Blasting Capabilities	· Thermal Spraying
· Welding and Heat Treatment	· Shot Peening
· Fan Case Milling	· Newest standard CMM measuring equipment



Customer Relationship Management



More than 50 airlines from around the world now rely on the expertise of N3 Engine Overhaul Services (N3). Embedded in the Rolls-Royce Total Care business model, N3 provides highly qualified and personalized customer support for technical inquiries as well as information on product costs and delivery status. Excellent logistical links to the most important aviation hubs in Frankfurt and Munich allow engines to be delivered quickly to N3 for processing.

Regular surveys show that N3 customers are extremely satisfied with the service performed by N3.

N3 customer service includes:

- Orders handled by interculturally experienced account managers
- Access to the N3 online Customer Information Platform, with the option to download all engine overhaul documents, always available and up to date
- Fully equipped offices for customer representatives to arrange on-site appointments
- Strong link of N3 Engineering team to Rolls-Royce experts
- Continuously extended status information platform for real-time order status (Share MRO)



Quality & Responsibility



N3 Engine Overhaul Services (N3) has approval to undertake maintenance and repair work for the Rolls-Royce Trent 700, 900, XWB and 1000 engine models. The company has an integrated management system and a safety management system to ensure highest product safety and quality standards.

The quality assurance mechanisms that have been introduced and the internal database for dealing with non-conformance and problems ensure zero-defect delivery of overhauled engines to the customer. The entire N3 team is aware of this great responsibility.

Numerous certificates from business partners and organizations as well as regular audits confirm the high quality standard and process compliance at N3.

An important principle at N3 is the protection of the environment, and the obligation to promote the welfare of employees and the community. All new business processes are checked at an early stage for their environmental impact, and any necessary measures are implemented.

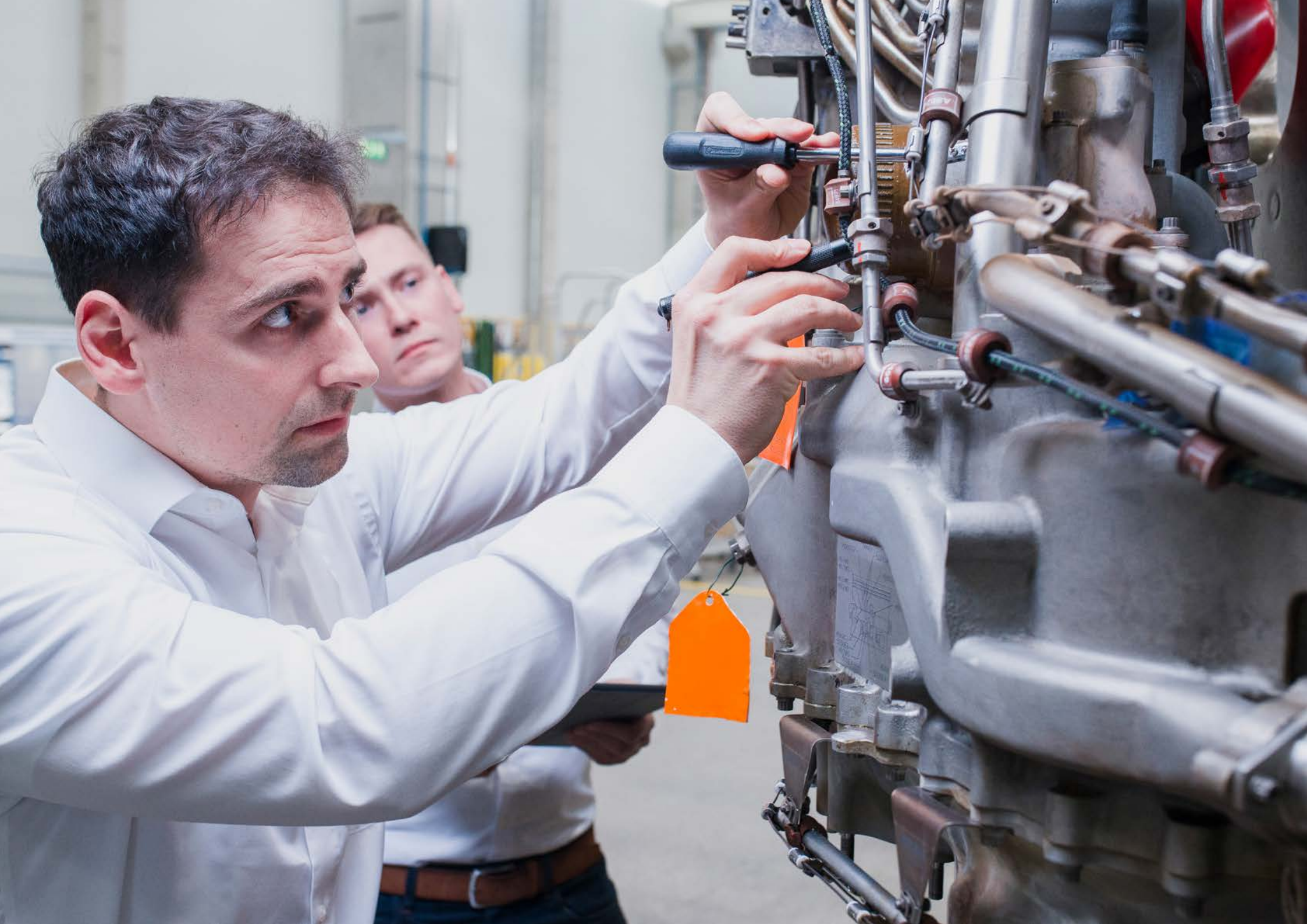
The engine testing facility is currently one of the most advanced, largest and most environmentally friendly facilities in an overhaul centre.

Nadcap

N3 Engine Overhaul Services has Nadcap certification for the following processes:

- **Aerospace Quality Systems (AQS)** - accredited since July 2014
- **Coatings (CT)** - accredited since July 2014
- **Non-destructive Testing (NDT)** - accredited since January 2015
- **Surface Enhancement (SE)** - accredited since October 2017
- **Chemical Processing (CP)** - planned in 2023
- **Heat Treatment (HT)** - planned in 2024
- **Welding (WLD)** - planned in 2024

Evidence of Nadcap accreditation for certain special processes is a specific requirement of Rolls-Royce plc for all "Maintenance, Repair and Overhaul" (MRO) suppliers, which includes N3.



Engineering



Engineering competencies are an essential value generator for MRO. The N3 Engine Overhaul Services (N3) engineering works on a continuous improvement and a sustainable development of the technologies to improve its products and services. A team of qualified engineers for engine overhaul, repair and tooling development and production planning constantly expand their technical expertise.

Customized solutions and tooling developed by N3 have already become best practice within the Rolls-Royce network. The service portfolio of N3 contains also individually created worksopes and product cost improvements. The in-house developed IT tool enables the planning team to provide transparent shop control at any time, and any place within the company. Gated work streams according to lean principles support best TRT performance.

The motivated engineering team is an innovation driver to improve the engine reliability, cost efficiency and provide a zero-defect delivery to N3 customers.



Employees



The highly qualified N3 Engine Overhaul Services (N3) workforce, with their passion for quality and continuous improvement, is the driving force behind the success.

The company offers its employees tasks with variety and responsibility and modern working conditions. Occupational health and safety are given top priority.

N3 is the most attractive employer and the best training organisation in the region.

Since 2008, N3 has been training the next generation of its specialist workforce. Graduates of the vocational training are among the best in their field in Germany.

Training and lifelong learning play an important role in the company. Daily interaction among employees is characterised by openness, respect and tolerance.



Prospects



New customer requirements, complex technologies and rapidly changing market conditions within the aviation industry demand an organisation that is flexible and able to adapt quickly. With its broad technological processing capacity, N3 is ready to meet this future demand for the overhaul and repair of engines and components. N3 facilities are at the cutting edge of technology and guarantee efficient, environmentally friendly processes in engine MRO.

N3 is founded on the collaboration and commitment between the parent companies Lufthansa Technik and Rolls-Royce and is established as European Trent MRO shop. With the experience and the market development for Rolls-Royce Trent products, the future is seen positively and the expansion of capacities and the adaptation of the product portfolio to the needs of customers is being driven forward.

The N3 team is constantly striving to be the world's best partner for the maintenance and repair of the Rolls-Royce Trent engines and their components.

Thrust is our business.

Contact



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**Joint venture between Lufthansa Technik
and Rolls-Royce plc**