Committed to the mission
Military engine programs
MTU Aero Engines is Germany’s leading engine manufacturer and a key player in the industry both in Germany and on an international level. The company designs, develops, manufactures, markets and supports commercial and military propulsion systems and stationary gas turbines, and offers full system capability in engine construction. In close cooperation with the world’s leading engine manufacturers as well as partners from industry and research, MTU is developing the innovative propulsion systems of the future. It participates in advanced technology programs, providing valuable impetus with its developments. Low-pressure turbines, high-pressure compressors and turbine center frames made by MTU rank among the best in their class. Its manufacturing processes, repair techniques and comprehensive service offerings are some of the best the global market has to offer.

MTU’s expertise has a long history, the company’s roots date back to the early days of powered aviation. For more than 80 years now, the military business has formed the basis of the company’s system capabilities. Over the decades, MTU has repeatedly set technological benchmarks to drive forward the development of aviation, initially for military aircraft and later for the commercial sector too. Thanks to its experience, expertise and innovative strength, the company has carved out a position for itself as a technology leader in key areas and has established itself as an essential partner.

Strong and capable partner
Innovative, capable and reliable—with its first-class technologies, products and services, MTU Aero Engines ensures that military customers can count on the full availability of their fleets at all times.

MTU is the leading industrial company for engines operated by the German Armed Forces and plays a key role in major European military engine programs—such as the EJ200 for the Eurofighter Typhoon, the TP400-D6 for the Airbus A400M military transport and the MTR390 for the Tiger combat helicopter. The company is also a successful player in the military market outside of Europe, holding stakes for instance in the F414 and F110 U.S. engine programs. With its workshare in the T408 engine for the CH-53K heavy-lift helicopter, MTU takes full development responsibility for components in a U.S. military program for the first time in its history.

Mutual trust, proximity to the customer, reliability and expertise: these are the foundations for a successful partnership in the military arena. MTU works in close collaboration with its customers to develop and implement tailor-made service support concepts. MTU’s comprehensive support services throughout an engine’s lifecycle—from development and manufacture, customized maintenance, facility and training concepts, right up to the provision of technical documentation and on-site support—enable partners such as the German Forces to secure valuable know-how in their own ranks. This approach has proven highly successful worldwide.

MTU draws on decades of experience to provide the best possible support for military engines such as the EJ200.
MTU Aero Engines is one of the world’s leading industrial system partners for the military engines that power combat jets, helicopters and military transport aircraft. Propulsion technology for military aircraft is geared toward maximum availability and long on-wing times. Where helicopter engines are concerned, MTU applies its expertise with advanced turboshaft engines and makes a valuable contribution to U.S. programs with its development activities. The company moreover provides powerful propulsion solutions for military transport aircraft that are required to carry high payloads over long distances.

Development and production of military engines calls for the combined expertise of several highly specialized companies, including MTU. Each bringing their specialist skills to the table, the participating partners join forces to ensure the overall success of the engine program. At a European level, MTU cooperates with all of the leading players in the industry and contributes its technological expertise to provide first-class products and services, as can be seen from the following examples:

**EJ200 for the Eurofighter Typhoon**

A two-shaft turbofan engine with an afterburner, the EJ200 is built by EUROJET Turbo GmbH, a consortium with MTU, Rolls-Royce, Avio Aero and ITP Aero as stakeholders. The engine powers the Eurofighter and its export version, the Eurofighter Typhoon. MTU developed the low-pressure and high-pressure compressors as well as the electronic control unit, and manufactures these components for all EJ200 engines. In addition, the company is responsible for assembly, testing and repair of all engines ordered by the German Armed Forces.

**TP400-D6 for the A400M military transport aircraft**

The TP400-D6 for the A400M military airlifter is the most powerful turboprop engine of the Western world. It is developed and built jointly by MTU, ITP Aero, Rolls-Royce and Safran Aircraft Engines. MTU is responsible for the TP400-D6’s intermediate-pressure compressor, turbine and shaft and has a stake in several accessories. Furthermore, final assembly of all TP400-D6 production engines takes place at MTU Aero Engines in Munich and acceptance testing at MTU Maintenance Berlin-Brandenburg.
As regards the RB199, MTU now focuses on spare parts production, MRO and other support services.

Complex systems fully under control: Assembling the MTR390 engine for the Tiger combat helicopter.

**MTR390 for the Tiger combat helicopter**

Developed in cooperation with Safran Helicopter Engines and Rolls-Royce, the MTR390 is a turbo-shaft engine featuring a free power turbine. It powers the Tiger support helicopter co-developed by France and Germany. MTU’s workshare comprises the core engine—the combustion chamber and gas generator turbine—and some of the engine accessories. In collaboration with ITP Aero, an uprated version of the engine (the MTR390-E) has been developed, delivering a power increase of 14 percent. All production engines are assembled at MTU.

**Partner of the U.S. military**

As a risk-and-revenue-sharing partner of GE Aviation, MTU holds stakes in the F414, F110 and T408 programs. MTU’s workshare in the T408 for the CH-53K heavy-lift helicopter, the latest model in the CH-53 series produced by Lockheed Martin/Sikorsky, marks another milestone in its collaboration with its U.S. partner. MTU develops and manufactures the power turbine, for the first time acting as a development participant with full responsibility for an entire module in a U.S. military engine program. Compared to its predecessor, the T64, the T408 is 1.7 times more powerful and delivers an 18 percent reduction in specific fuel consumption.
Owing to its extensive experience and technological expertise, MTU Aero Engines is a key player in the military arena. In Germany, MTU is the lead industrial company for practically all engines flown by the country’s military. Alongside the development and manufacture of innovative engine modules and components, MTU offers the best in maintenance, repair and overhaul solutions and a comprehensive range of additional engine services.

Development

MTU is one of the world’s leading development partners and has for decades taken an active role in numerous military engine development programs. The company contributes its expertise to newly developed propulsion systems, such as the T408 powering the CH-53K heavy-lift helicopter, while also specializing in models that have been in service for many years, such as the RB199 engine for the Tornado and the EJ200 engine for the Eurofighter. MTU’s broad experience and know-how forms a solid basis for the new and further development of advanced engine components and the associated control systems.

Production

Engines used in military operations are subjected to extremely high stresses that vary greatly with the respective missions and operating environments. For this reason, the experts at MTU develop customized and innovative processes and technologies for manufacturing highly stressed components. Blisk technology is a prime example. Rotors featuring a blisk (blade-integrated disk) design, originally developed for the EJ200 Eurofighter engine, are now used in compressors for commercial engines too. MTU has established itself as one of the world’s leading blisk manufacturers. At its site in Munich, Germany, the company operates one of the most advanced compressor blisk production systems of its kind.

Maintenance

MTU draws on its decades of experience in the maintenance of military propulsion systems to develop innovative repair processes, with which it achieves unrivalled levels of restoration and on-wing times. Components that previously had to be replaced with new and expensive parts, which were not always readily available, are now...
Compressors that feature rotors in blisk design such as the low-pressure compressor for the EJ200 are an excellent example of MTU’s manufacturing expertise.

Services

Going by the motto “Committed to the mission”, MTU Aero Engines aims to satisfy all of its military customers’ operational requirements. In addition to providing conventional maintenance, this includes a wide range of support services, such as comprehensive fleet and spare parts management. MTU works in close collaboration with its military customers to develop and implement tailor-made service support concepts. Intensive cooperation based on mutual trust enables MTU to promptly and reliably satisfy its customers’ individual requirements. A tried-and-true basis for ensuring mission success.

MTU’s extensive repair expertise also includes adaptive milling for restoring damaged blade tips. Damaged blisks are repaired by patching: MTU is the only company worldwide able to do this on a large scale.

MTU is the only company in the world to offer a repair technique for blisks. Other examples of its comprehensive repair expertise include adaptive milling to restore damaged compressor blades tips, and innovative coating methods for protecting compressor airfoils from erosion.
MTU Aero Engines supports its military customers with a wide range of services. In addition to conventional engine maintenance and innovative repair techniques, MTU’s customers benefit from the all-round support they need to ensure smooth operations at all times. MTU’s comprehensive and flexible service package is tailored to satisfy its military partners’ specific needs.

Technical support
The technical support MTU provides for military aircraft engines comprises services and hands-on assistance for all technical engine matters. Irrespective of whether customers require maintenance, solutions to in-service problems or technical optimization programs, MTU, in its capacity as a central point of contact, holds detailed information about its customers and their engines, and coordinates all inquiries to provide prompt and effective solutions.

Fleet management
MTU makes its partners’ missions and operations its top priority. The company’s experts ensure optimum availability and efficiency of the entire fleet and work to keep the cost of operation as low as possible. Fleet management aims to maximize the availability of each engine throughout its entire lifecycle. Engine health monitoring forms a key part of fleet management, whereby a control and monitoring system is used to keep track of the engine parameters. In this way, the MTU experts can evaluate the data and promptly identify indications of abnormal engine behavior and take action long before a real problem occurs. If an issue is detected, MTU has the right service solution to rectify it.
Logistic support

To ensure the operational readiness of customers’ engines at all times, MTU offers an extensive portfolio of logistics services, including comprehensive spare parts logistics. On request, the company takes on responsibility for all logistic support services, including spare parts provisioning, forecasting and inventory management.

Test facilities and training

MTU has the requisite experience and resources to provide customers with all the equipment they need to build up their own in-house maintenance capacities, such as aircraft ground equipment and engine testing facilities.

MTU’s customized training concepts ensure that personnel, including those at the customer, receive the first- and second-line maintenance training they require.
Strong and capable partners

MTU’s collaboration with the German Armed Forces is a prime example of its ability to develop and implement service concepts tailored to customers’ specific needs. MTU supports a large share of Germany’s military systems and was the first company to successfully establish a cooperation of this kind with the German Armed Forces—one in which many new trails have been blazed at a national level. Their collaboration began in 2002 as a pilot project with the EJ200 engine for the Eurofighter, and the model was later expanded to include the RB199 in 2006 and the MTR390 in 2008. Since 2014, work on the EJ200, RB199 and MTR390 programs has been performed under the same roof in Erding, Bavaria.

MTU experts and specialists from the German Air Force work shoulder to shoulder to maintain the military propulsion systems. The combination of MTU’s technical expertise and the military’s operational experience enables engine operating costs to be fully optimized. Involving military personnel in the maintenance and repair work, in quality assurance management, logistics and in service support in this way secures the assessment skills and technical abilities of the German Air Force and Army long term. The cooperation will be further expanded, the ultimate goal being to ensure full availability of the engines operated by the German Armed Forces at all times.
The three T408 engines give the CH-53K transport helicopter all the power it needs.
First-class quality for safe operations

The products and services delivered by MTU Aero Engines fulfill the highest standards of quality and reliability to which certifications and approvals from major worldwide airworthiness authorities testify. To ensure such high quality standards are maintained, the company places particular emphasis on continuous improvement in its engine development, production and maintenance activities. All products and processes are continuously monitored and subjected to regular internal audits to identify and leverage all improvement potential. An approach that benefits all parties.

The success of any company is contingent on the expertise and commitment of its workforce. MTU’s employees are highly motivated and highly qualified specialists in their fields. Dedicated young professionals work alongside seasoned experts, all invaluable assets to the company. Training and development of its employees’ professional and personal skills are high on the agenda at MTU. In this way, MTU makes sure its workforce remains highly qualified and internalizes the exacting quality standards stipulated by the company and its military partners—putting them into practice in day-to-day operations and continually developing them.

First-class quality management ensures consistently high quality standards across all parts and modules. MTU holds the following approvals, permitting it to develop, manufacture and maintain authorized airworthy engine components and modules.

**Certifications**
- ISO 9001:2015
- EN 9100:2016
- BS OHSAS 18001:2007
- GOA
- EMAS

**Approvals**
- Certificate of approval as a Contractor for German Armed Forces Aeronautical Equipment as per A1-1525/0-8901
- Design organization approval as per EASA Part 21J
- Production organization approval as per EASA Part 21G
- Maintenance organization approval as per EASA Part 145
- Maintenance organization approval as per CFR 145
- Maintenance organization approval as per CAR 573
- Maintenance organization approval as per CCAR 145
- Maintenance organization approval as per DEMAR 145
- Authorized Economic Operator (AEO)

**International specifications**
- Preparation of technical documentation as per ASD S1000D
- Material management as per ASD S2000M
Full power ahead

With its broad portfolio of products and maintenance services for commercial and military propulsion systems, MTU Aero Engines is well positioned for the future. As a well-established player in the industry, the company has secured stakes in major engine programs for next-generation aircraft. MTU’s cutting edge technology is found, for example, in Pratt & Whitney’s PW1000G family of energy efficient Geared Turbofan™ (GTF) engines. Its workshare includes responsibility for the high-speed low-pressure turbine, a key component in this advanced engine series.

In its military business, MTU has again blazed new trails in collaboration with the German Armed Forces. In 2002, MTU and the German Air Force became the first in the market to establish a collaborative maintenance agreement. Now, MTU is the first certified company to maintain the TP400-D6 engine for the Airbus A400M military transporter based on civil MRO procedures. The maintenance framework agreement was concluded with the German Armed Forces in 2017. Over the next five years, MTU will provide maintenance support for all TP400-D6 engines powering Germany’s A400Ms. This agreement is further testimony to MTU’s role as the leading industrial partner for engines operated by the German military.

MTU is also successful on the international stage. With its workshare in the T408 engine for the CH-53K heavy-lift helicopter and its first ever total development responsibility for components in a U.S. military program, MTU has reached a new milestone in the company’s history. Deliveries of 200 CH-53Ks to the U.S. Marine Corps are scheduled to begin in 2018. This order includes 800 T408 powerplants for the helicopters.

Committed to mission success

Germany’s plans to procure a new heavy-lift transport helicopter are gathering momentum: under the banner of the Next-Generation Weapon System (NGWS), a potential new Franco-German combat-aircraft program is under discussion. Together with other members of the industry association, MTU is already working on plans to ensure German industry takes adequate stakes in the program. Thanks to its many years of experience in the military business and its technological expertise, MTU is well positioned to find and implement the best solution for its military customers. MTU continues to prove itself as a reliable partner to the military—now and in the future.