Engine Maintenance

Repairing for today.
Maintaining for tomorrow.

UNITED SERVICES

Unparalleled service. Unbeatable quality. Unsurpassed safety.

That's what you'll get when you work with United Services' engine shop at our maintenance center in San Francisco. We have more than 1,000 skilled employees and the technical expertise and flexibility to handle virtually any request. With our quick turn times and competitive pricing, we can have your aircraft flying again with a minimum of downtime and expense. As part of United®, everything we do is backed by eight decades of operational experience.

Never content to settle for just good enough, United Services® is an industry leader in engine maintenance, repair, and overhaul (MRO):

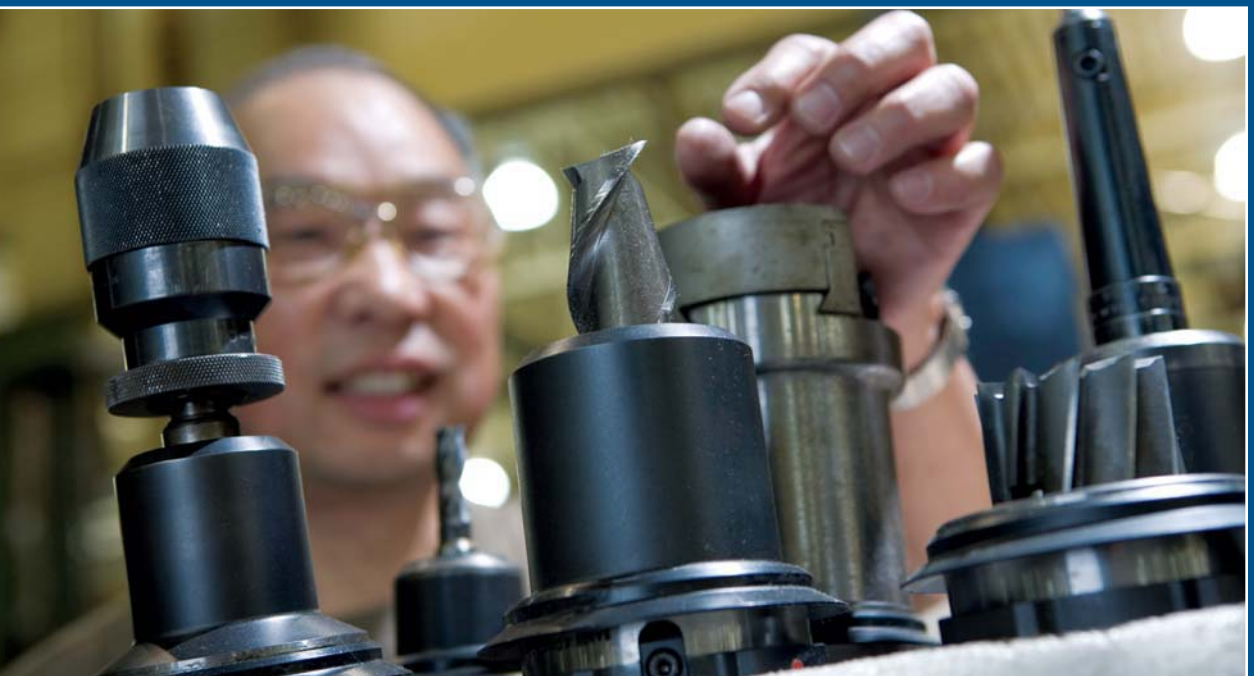
- Our shop is the only airline engine facility of a U.S. carrier to hold the International Organization for Standardization (ISO) 9001:2000 certification. It's a standard we've met each year since 1997, signifying a commitment to continually updating and improving our processes.
- With United Services' expertise and resources backing each flight for the past 15 years, United is the industry leader in total extended twin operations (ETOPS) flights flown. United's 330,000 ETOPS operations add up to almost 2.1 million hours of flight time. Airlines around the globe turn to United Services for regular ETOPS maintenance, ETOPS-certified parts or repairs, and advice on meeting and exceeding ETOPS requirements.
- As the launch customer for Boeing 777s, our experience with PW4077s and PW4090s is unequaled. Our engine shop is the only airline maintenance center equipped to work on the PW4000 series 112 inch engine.
- On January 30, 2005, United's PW2000 engine fleet—maintained by United Services—completed 1,094,284 combined flight hours and 188,700 cycles (consecutive flights) without an inflight shut down (IFSD). This achievement set the IFSD record for Pratt & Whitney engines throughout the commercial airline industry. Many of our other engine fleets hold industry-leading IFSD rates as well.

- United Services carries both FAA 121 and 145 certifications and is recognized by aviation regulatory authorities in countries around the globe. Both commercial and military aircraft operators in the United States and abroad have chosen United Services for their engine MRO.

The operator difference

As an MRO provider that is also an operator, we understand what airlines are looking for in a maintenance program. We understand what it takes to keep one of the world's largest airlines flying—safely and reliably—because it's a job we perform every day. Our total fleet management capabilities combined with United's eight decades of operational experience and our team of skilled technicians allow us to provide total technical support that is second to none.

- Our Engine Condition Monitoring program allows us to automatically test your airline's engines during flight, then analyze the results for any irregularities. This performance trending and alerting lets us catch any sign of a problem as early as possible.



- United Services has on-site capabilities in metallurgical, chemical, and failure analysis. Our technical experts can examine parts to determine suitability for service or to find the root cause of their failure—findings that can be used to substantiate technical cases related to third-party vendors, insurance claims, or other issues. Having this breadth of capabilities means United Services can offer its customers services that other MROs cannot.
- Our auxiliary power unit (APU) shop is equipped with two test cells, allowing United Services to offer its customers APU testing in-house. Having these test cells also enables United Services to keep costs and cycle times competitive.
- United Services has a staff of close to 200 inspectors who use the latest technology and innovations in non-destructive testing. Our on-site facilities for ultrasonic immersion testing and fluorescent and magnetic penetrant inspection allow us to detect flaws in engine parts that are not visible to the naked eye.

A customized experience

At United Services, we take pride in our ability to meet each customer's specific needs. We can service your engine to OEM standards, United program standards, or anywhere in between. And we aggressively pursue quality alternatives to traditional parts and repair sources, so that our customers have a variety of material options when it comes to maintaining their engines.

United Services works closely with many Parts Manufacturing Approval (PMA) suppliers to develop quality alternatives to OEM parts, giving customers material options that save money, and often improve engine performance and durability. Before offering a PMA part, we send it through a rigorous technical review process—going above and beyond FAA requirements—to make sure it is comparable or superior to the OEM part. We never offer customers a PMA part we wouldn't be comfortable installing on our own aircraft. In addition, using PMA parts saved United $24.5 million in 2005, savings we can pass on to our customers.

The same goes for part repair development and processes. United Services has a staff

of approximately 20 skilled engineers who are dedicated to developing new repairs and repair sources for parts that were previously unserviceable. This team can design a new repair scheme—often in just a few days—saving a part that might otherwise have to be replaced. Just take a look at some of the special repairs we've developed:

- United Services' technicians developed a repair process for the Pratt & Whitney 4077/90 forward high pressure compressor (HPC) split case, a part that previously could not be repaired when it developed wear in the seventh stage rail. United Services' automated weld repair is OEM- and FAA-approved and saves customers more than $300,000 for each part they would have otherwise had to replace.
- United Services also helped develop many applications for the high-velocity oxy-fuel (HVOF) process, a longer lasting coating that replaces traditional chrome plating on a variety of engine parts. The process is better for the engine and the environment, providing a more durable coating without the environmental impact of chrome plating.

Our engine maintenance facility offers complete MRO, as well as advanced computer-controlled testing and on-wing repair, for the following engine types:

- CFM56-3
- PW2000
- PW4000 94 inch
- PW4000 112 inch

We also offer complete MRO service for the following APUs:

- GTCP331-200
- GTCP331-500
- PW901A

United Services holds approvals for maintenance support issued by the following regulatory agencies:

- CAA
- CAAC
- CAAS
- CASA
- DGCA
- ECASA
- FAA
- GCAA
- JAA/EASA
- JCAB
- KCASA/AMO

For more information, contact us at 650.634.4104 or visit us at unitedsvcs.com. You can also reach us by e-mail at engine.maintenance@unitedsvcs.com.

UNITED SERVICES

A capable partner

Providing maintenance and repair for one of the world's largest airlines requires an extensive list of capabilities. As a customer of United Services, you have access to the same quality services we give United, ensuring total fleet management for your aircraft. Our advanced repair capabilities include:

Precision Machining

- Single point turning
- Milling and grinding
- Electric discharge machining (EDM)
- CNC milling, turning, and grinding

Precision Welding

- Manual GTAW (TIG)
- Extensive automatic GTAW welding capabilities (Sciaky Welding machines)
- Electron beam welding
- Resistance welding
- Furnace and torch brazing

Robotic Thermal Spray

- Plasma
- Arc wire
- High-velocity oxy-fuel (HVOF)

High-Speed Tip Grinder

- Optimized usage to create tight tolerances for turbine and compressor rotor
- Associated laser measuring device for optimal blade-tip clearances
- Environmentally controlled for optimum tolerances

Proactive Repair Development Strategies

- Aggressive development and approval of OEM and DER repairs
- Full technical review and analysis of Parts Manufacturing Approval (PMA) parts
- Engineering expertise to review, develop, and implement many unique part repairs
- Diligence at finding repairs or serviceable material versus buying new parts
- Ability to coordinate services with customers' existing piece part repair vendors

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