

IMPROVED METHOD FOR INSTALLING AEROSPACE HARDWARE



FTI's FleXmate™ process uses our proven cold expansion technology to simplify and improve the installation of aircraft hardware. FleXmate can be designed for any type of aircraft fitting - from fuel and fluid couplings to electrical connectors, and from hydraulic fittings to drain plugs. FleXmate hardware can also be installed in many different types of metal or composite structures. Legacy fittings are usually large

and heavily flanged, requiring a thick or large pad-up around the penetration hole. The assembly is often complex with multiple holes to accept satellite fasteners to the structure. The process adds weight to the structure and limits its design flexibility.

FleXmate is all about flexible design. FTI can manufacture any type of fitting to your design specifications. And using the same PowerPak and puller units as other FTI processes, the FleXmate part can be cold expanded into place without the need for satellite holes, a thick pad-up or complex assembly. One hole – one fitting, that's it. The fitting receives all the advantages of a high interference fit installation, and in most metallic cases, the benefit of residual compressive stresses to the surrounding structure. The synergistic benefits of interference fit and residual

stresses combine to give the aircraft an installation that has superior life and fatigue strength.

FleXmate also allows the engineer the flexibility to design a more efficient aircraft. A thick pad-up and/or bulky assembly no longer limits the number of bulkhead web penetrations. FleXmate allows for a smaller footprint and the ability to fit into much tighter spaces.

The FleXmate process has been thoroughly tested and manufactured to the high aerospace quality standards that FTI is known for and is already being used on flying aircraft. Our FleXmate fuel fittings, grease fittings, drain plugs, and electrical connectors are installed on some of today's

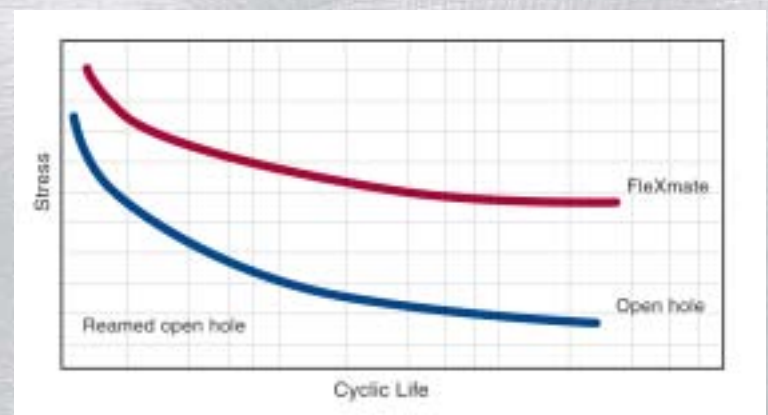


high profile military and commercial aircraft.

For more information on FleXmate, please visit us at www.fatiguetechnology.com or call one of our technical support people at 206.246.2010. ✈

FleXmate Benefits

- More durable fitting
- Weight reduction
- Interference fit installation
- Reduced installation labor
- Smaller footprint
- Excellent sealing characteristics
- Replaces excessive existing hardware
- Meets aerospace quality standards



FleXmate's high interference installation accommodates higher operating stress levels and/or longer structure life. Aircraft design can be optimized with tighter edge distances and possible reduced structural weight.

Successful TukLoc Kit Trial Performed on the F-16



On July 19-21, FTI Technical Support team traveled to Hill AFB, Utah, to provide training and a trial installation of the new TukLoc blind fastening system.

Installation of TukLoc in the wing structure of the F-16 Fighting Falcon was performed in

anticipation of the adoption of this process by the USAF and FMS users of the F-16 aircraft to prevent fuel leaks, improve the fastener performance, and increase durability of the wing structure. The TukLoc qualification process

has progressed over the past twelve months, culminating in this installation on a flying wing. The performance of TukLoc in all phases of testing has proven it's effectiveness. This trial installation proved that the application in the depot, or in remote field locations, is simple and effective. ✈



Hill AFB mechanic removing old nut.



Using custom punch to remove old style nuts.



Hill AFB equipment specialist installing new TukLoc nut.



Area of interest under the wing attach fittings.

FTI Adds to Its Staff

Fatigue Technology Inc. is pleased to announce several new additions to our staff.

Doug Bakken has been hired as FTI's new Vice President of Engineering. Mr. Bakken earned an MBA from the University of Washington and also holds a BS in Structural Engineering. He brings 20 years' engineering and managerial experience to his new position.

Robert J. Trembicki joins us as the new Northeast Regional Manager. Mr. Trembicki has a Bachelor of Science from University of New Haven, as well as a Master of Science from Rensselaer Polytechnic Institute. Rob will oversee sales and support of FTI products to our customers in the northeastern U.S., as well as eastern Canada.

Stephen L. Aubrey comes to FTI as the new Northwest Regional Manager. He obtained a Master of Science from Troy State University and a Bachelor of Science in Engineering Mechanics from the U.S. Air Force Academy. Stephen will handle the Northwestern U.S. and Western Canada. ✈



TITLE: Life Enhancement of the F-15 Wing Pylon Rib to Prevent In-Flight Failures

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Dave Curry - United States Air Force (USAF)
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ForceMate Solves F-15 Bushing Migration and Corrosion Problem

ABSTRACT:

The USAF has experienced several failures of the Wing Pylon Attach Rib on the F-15 aircraft. Fatigue cracking has been determined to be the cause of the failures. Fatigue cracks were found to initiate from corrosion pits on the fitting.

Part of the failure mechanism was the failure of the shrink fit bushing at the weapon pylon interface. The existing shrink fit bushings migrate out of the hole causing fretting and corrosion.

The USAF contracted UDRI to analyze the loads and failures of the ribs. The USAF also requested that the existing shrink fit bushing process be evaluated for adequacy.

It was determined by the OEM that to solve the recurring problem of rib failure, the rib material would have to be changed from 7075-T7351 to titanium. To prevent bushing migration the USAF requested an evaluation of the FTI ForceMate high interference fit bushing process to replace the existing shrink fit process.

The FTI high interference fit bushing process results in a much higher level of interference between the bushing and the rib, which prevents migration of the bushing. The higher level of

interference also results in a fatigue life enhancement. This fatigue life enhancement can be on the order of ten to one.

Until the fleet of F-15s can be retrofitted with titanium ribs, the existing aluminum ribs will be reworked to incorporate the FTI ForceMate bushing process to prevent bushing migration.

This paper will discuss the failure scenario of the ribs, the load re-evaluation and the evaluation of the enhanced bushing process. ✈

To receive a technical spec or copy of this paper, please call 206.246.2010 and ask for the Marketing Department, or e-mail your request to marketing@fatiguetechnology.com



Staying Ahead in Composite Installations

We have successfully tested and installed our products in composites on flying aircraft for years. And because of this success and the increased demand from our customers and the aerospace market, FTI is embarking on a very large-scale comprehensive test of all our products in six of the most

commonly used aerospace composite materials.

FTI will be running a series of tests looking at:

- Damage to the composite materials
- Mechanical performance
- Static bypass

- Fatigue bypass
- Static joint
- Fatigue joint
- Lightning strike
- Corrosion and conductivity

Test results will be available once the tests have been completed. ✈



2004-2005 Tradeshow and Events

FTI will be exhibiting at the following events. Stop by our display and say hello to our delegates.

October 25-28
DoD Maintenance Symposium
Houston, TX

November 30 - December 2
ASIP
Memphis, TN

January 31 - February 3
Aging Aircraft
Palm Springs, CA

Receive Focus on FTI via E-Mail

If you would like to receive FTI's quarterly newsletter via e-mail, please send an e-mail to: focus@fatiguetechnology.com with "e-newsletter" written in the subject line.

Focus on



INSIDE THE OCTOBER 2004 ISSUE:

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- Successful TukLoc™ Kit Trial
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