FAA
Aircraft Certification Service

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: NE-08-44
SUBJ: Engine Thrust Reverser – Transcowl Clevis Pin **Date:** September 3, 2008

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin advises you, registered owners, operators, and certificated repair facilities of **all airplanes equipped with General Electric Company (GE) CF6-80C2 and CF6-80E1 series turbofan engines** of the discovery of substandard clevis pins, which can be found on thrust reverser actuators and central drive units (CDUs). There was one event where a translating cowl liberated from its engine upon thrust reverser deployment. These turbofan engines are installed on Airbus A300-600/R/F, A310-200/-300, and A330-200/-300 airplanes, Boeing 747-300/-400/-400ER, and 767-200/-200ER/-300/-300ER/-400ER airplanes, and MD-11 airplanes. At this time, the airworthiness concern is not an unsafe condition that would warrant airworthiness directive (AD) action under Title 14 of the Code of Federal Regulations (14 CFR) part 39.

Background

In January 2007, there was a single event in which a non-U.S. operator's airplane deployed its thrust reversers on a CF6-80C2 turbofan engine during landing. Upon deployment, the inboard translating cowl of the thrust reverser separated from the engine. This caused an uncommanded yaw of the aircraft due to asymmetric thrust. Also, several pieces of debris were left on the runway from the translating cowl, which posed a hazard to other aircraft operating on the runway until the debris was removed.

After inspection, it was determined that a clevis pin, which did not meet the specifications required for the certified part, was installed. These clevis pins pass through and secure the translating cowl's upper and lower actuators as well as the CDU. The source of the unapproved pin is undetermined at this time.

The material of the clevis pins approved for use on these thrust reversers is heat treated, stainless steel, while the material of the unapproved clevis pin was determined to be a low strength carbon steel, which was not heat treated. Installation of the unapproved clevis pin led directly to the failure of the thrust reverser. This failure took place at an unknown number of cycles after installation.

Recommendations

We recommend inspection of thrust reverser actuator and CDU clevis pins at the earliest opportunity, to ensure they meet approved specifications.

Significant surface corrosion is one sign that the pins are made of carbon steel, as opposed to the approved clevis pins, which are made of stainless steel. However, corrosion might not be present on carbon steel pins if they have not yet had enough time in service to corrode.

A rebound hardness test is a more conclusive method to determine whether a pin was made from low strength carbon steel. The stainless steel clevis pins should measure between 31-38 HRC (Rockwell Hardness scale C). Standard carbon steel measures a much lower hardness than this value.

Performing this test can be accomplished either on-wing with the pins still installed, or with the pins removed during a shop visit.

Further information on performing a hardness test can be found in GE's Standard Practices Manual, GEK 108792, Section 70-34, Hardness Measurement Procedures. GE Standard Practices Manual, Sections 70-34-03 and 70-34-04 specifically describe how to perform a Rockwell Hardness Test. The hardness test must be performed on a flat surface on the face of the pin. Any pin whose hardness does not fall in the range of 31-38 HRC must be considered to be made of an unapproved material, and therefore, unapproved for service.

General Electric distributed All Operators Wire (AOW), 07/CF6/012, CF6-80C2 Thrust Reverser Transcowl Liberation Related to a Non-OEM Part, to all GE CF6 operators on April 10, 2007, which provided additional relevant information. The AOW contains information including pin locations and photographs of one unapproved pin from the event engine compared with an approved pin, which is still in good condition. Note in the photographs in the AOW that in addition to the difference in corrosion levels of the pins, the shape of the notch cut in the pins is different. On the approved pin, the corners at the base of the notch are rounded, while on the unapproved pin, the corners are sharp.

For Further Information Contact

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