

5/5/2010

FOR YOUR INFORMATION

2010-68/3-18

868269

To: Boeing Commercial Airplane Company

Info: FAA (AFS-300, AFS-230, AFS-200, ANM-100, SEA-AEG, ASA-100), AASC, ALPA, IFALPA, AMFA, APA, ASAP, ATA, IATA, CAPA, IAM, ICASS, IPA, NTSB, PAMA, SWAPA, TWU, USAPA.

From: Linda J. Connell, Director
NASA Aviation Safety Reporting System

Re: B737-400 Trailing Edge Flap Jackscrew Gimbal Anomaly

We recently received an ASRS report describing a safety concern which may involve your area of operational responsibility. We do not have sufficient details to assess either the factual accuracy or possible gravity of the report. It is our policy to relay the reported information to the appropriate authority for evaluation and any necessary follow-up. We feel you should be aware of the enclosed deidentified report.

To properly assess the usefulness of our alert message service, we would appreciate it if you would take the time to give us your feedback on the value of the information that we have provided. Please contact Gary Brauch at (408) 541-2800 or email at gary.j.brauch@nasa.gov.



Aviation Safety Reporting System
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ACN: 868269

Time

Date: 200912

Local Time Of Day: 1201-1800

Place

Locale Reference.Airport: ZZZ.Airport

State Reference: US

Altitude.AGL.Single Value: 0

Environment

Aircraft 1

Make Model Name: B737-400

Component 1

Aircraft Component: Flap Control (Trailing & Leading Edge)

Component 2

Aircraft Component: Trailing Edge Flap

Component 3

Aircraft Component: Circuit Breaker / Fuse / Thermocouple

Person 1

ASRS Report Number: 868269

Events

Anomaly.Deviation - Procedural: MEL

Anomaly.Deviation - Procedural: Published Material / Policy

Detector.Person: Flight Crew

Result.General: Maintenance Action

Narrative 1

A B737-400 was maintenance ferried from ZZZ to ZZZ1 for the purpose of repair to a problem with the flap system. The problem was that the flaps would not extend past 30 units. This was a repeat write-up. ZZZ2 Maintenance Control directed the Contract Mechanic in the completion on the required paperwork. The ferry permit allows the aircraft to fly with a known defect. The Contract Mechanic completed the paperwork to release the aircraft for the intended ferry flight. Because of the history of the write-up Maintenance Control directed the Contract Technician to pull and collar the (flap) Load Relief Circuit Breaker (CB). This action was taken to prevent "secondary damage." However, existing maintenance relief via the use of an MEL was not used. Use of the MEL would have restricted the aircraft's maximum flaps to 30 units. There were no listed limitations to the ferry permit. In ZZZ1, we conducted the maintenance per a company issued request. The goal was to effect repairs for the purposes of conducting a test flight. We complied with the repair request which included additional items added due to my personal experience. Since we did not have a confirmed failure, the test flight was scheduled to see if the problem could be duplicated. Besides my role in directing the repairs, I signed both the company request and ferry flight deferral releasing the aircraft for a test flight. Upon conducting the test flight it was discovered by the flight crew that Load Limit System did not work. The aircraft returned to ZZZ1. After landing the maintenance crew discovered the reason for the load limit malfunction was that the CB that had been pulled and collared for the original ferry flight was still pulled and collared after maintenance. After resetting the CB, the Load Limit System performed as designed on a second test flight. The error was a failure to reset the

CB before returning the aircraft to service for its test flight. The mitigating factor was "fatigue." I had worked over 16 hrs prior to completing the paperwork. Failure of Maintenance Control to put the CB deferral on a second Log page and failure of Maintenance Control to remind me that secondary maintenance had been conducted for safety.

Callback 1

Reporter stated the original flap issue with the aircraft in his report, that required a maintenance ferry permit to his Station, was thought to be the same problem they were having with their other high cycle B737-400's. The thought was that certain flap transmissions were causing the flaps to lock-up and not allow the flaps to extend past 30. Many thought that changing transmissions would correct the problems. Reporter stated others believed the Flap Load Limiter was the problem, due to incorrectly sensing excessive air loads. The flight crew would position the flap handle to 40, somehow the Trailing Edge (T/E) flaps were either slipping back to 30 or jamming up. But there were no indications in the cockpit of a flap position discrepancy, and no flap asymmetry issue. Reporter stated that flap asymmetry is generally not an issue because the -400 flap transmissions are built with internal clutches that are allowed to slip and help prevent asymmetry problems. But they did change the #6 transmission as a suggestion from their engineering group with the thought the internal clutches were slipping excessively, or the yoke on the aft side of the transmission that the jackscrew attaches to had excessive play. The #6 Flap transmission is located at the right-hand wing inboard flap, outboard end. Reporter stated that in the past the flap jackscrew gimbal nut reservoirs on each jackscrew were found dry and not properly lubed or filled and possibly causing the problem. But all of the gimbal reservoir fluids were adequate this time. At that point, the Trailing Edge (T/E) flaps were fully extended, when one of their mechanics called him over and showed him that he could grab the flap T/E and push (or lift) the T/E up. That was when they noticed the gimbal nut was sliding over the flap jackscrew, or at the minimum, the gimbal nut was riding high on the jackscrew threads. Reporter stated they were stunned by the amount of play the gimbal nut had on the jackscrew threads. The original jackscrew gimbal nuts are smaller, compared to the replacement gimbal nuts which are thicker and larger and made by a different manufacturer. The B737-700,-800 and -900 flap jackscrew gimbal nuts are even larger. Reporter stated his carrier is changing the flap jackscrew gimbal nuts to the thicker modified nut that are made by a foreign manufacturer when similar flap problems occur.

Synopsis

A Lead Mechanic reports that after trouble shooting a repeat Flight Crew write-up for a B737-400 with flaps that would not go past 30, Mechanics found Trailing Edge Flap Jackscrew Gimbal Nuts were riding high on the Jackscrew threads and even appeared to be sliding over the Jackscrew threads when they applied a load to the Flap Trailing Edges.