

## FedEx Express Analysis and Recommendations

### FDX 910, KFL 28OCT16

**Background:** On October 28, 2016 at approximately 1751 EDT, FDX 910, an MD10-10F, registration N370FE, experienced a left main landing gear collapse and resultant fire during the landing roll on runway 10L at Fort Lauderdale International Airport (KFL). The flight crew evacuated the aircraft without injury. The fire was limited to the left wing and was extinguished by CFR within 5 minutes. FedEx, as a Party to the investigation, submits the following analysis and recommendations in accordance with NTSB procedures.

#### Analysis:

- 1) The failure of the left main landing gear outer cylinder occurred at the fill valve bore. The cause of the failure was a stress fracture that emanated from a corrosion pit on the inner radius of the fill valve bore.
- 2) Corrosion in that area is mitigated through three means:
  - a. Cadmium (Cad) plating
  - b. Nitrogen servicing of the shock strut
  - c. Hydraulic fluid in the shock strut
- 3) There was no evidence of Cad plating in the fill valve bore area of the MLG cylinder.
- 4) There is no in-service inspection for Cad plating. Therefore, FedEx does not have data on percentage of cylinders that have no evidence of Cad plating wear.

#### FedEx Actions:

- 1) Following the incident on N370FE, FedEx accomplished inspections of all in-service MD10-10 outer cylinders in the fill valve bores. The inspection techniques were based on Boeing Alert Service Bulletin DC10-32A259 which included video and high frequency eddy current inspections.

Any outer cylinder that exhibited evidence of an anomaly (corrosion pits, machine steps, tooling marks, stray nickel or chrome, etc.) in the fill valve bore were removed from service and sent to an overhaul facility. Each of these outer cylinders was then inspected per CMM procedures which included magnetic particle inspections.

None of the removed outer cylinders were found to have cracks. All anomalies were addressed by local rework per CMM procedures. FedEx did elect to scrap one high-time outer cylinder due to it being near its end-of-life cycle.
- 2) For those outer cylinders that remained on-wing following the inspections, the fill valve bore was brush Cad plated to ensure further corrosion protection.
- 3) In addition, FedEx amended its policy sheet procedures for overhaul vendors to reinforce inspection and terminating action procedures for AD 2008-09-17 and to add additional part number outer cylinders that were not included in the original AD.
- 4) Further, FedEx elected to reduce the overhaul specification for the outer cylinder from 9 years to 8 years.

**FedEx Recommendations:**

In light of actions already taken, FedEx does not have any additional mitigation recommendations.