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National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: July 7, 1986
In reply refer to: A-86-51

Honorable Donald D. Engen
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On January 17, 1986, a Boeing 727-225, N802EA, was being operated by Eastern Airlines Inc. (EAL) as Flight 974, a scheduled passenger flight from Miami, Florida, to Washington National Airport, Washington, D.C., with 137 passengers and 6 crewmembers on board. Shortly after being cleared to land at Washington National Airport, the captain of EAL Flight 974 advised the control tower that the flight would have to go-around because of an unsafe right main landing gear condition.

The flightcrew subsequently requested and received vectors to an area where the airplane could hold while the crew attempted to correct the unsafe condition. The crew executed the procedures from the emergency checklist and the procedures from the company manual in an attempt to get a down-and-locked indication for the right main landing gear. The flight engineer viewed the landing gear position indicator through the viewing port in the passenger cabin and confirmed that the right gear was down. However, misalignment of the index marks indicated to the flight engineer that the downlock was not engaged. When all attempts to achieve a safe downlock condition failed, the captain elected to divert to Dulles International Airport to take advantage of its longer runways and to avoid blocking the runway at National Airport. He declared an emergency and requested that crash, fire, and rescue equipment stand by.

In accordance with EAL procedures, the captain elected to land with all gear retracted. The airplane landed on runway 19R at 1851 e.s.t. It slid approximately 3,000 feet along the runway on the bottom of the fuselage. The captain ordered an emergency evacuation which was accomplished using four emergency evacuation slides at the main cabin doors and four overwing emergency exits. There were no injuries, and there was no fire.

Airplane damage was confined to the inboard flap segment trailing edges, the lower fuselage skin, stringers and frames, the keel beam chord, and the inboard main landing gear doors. The structural damage to the lower fuselage, gear doors, and wing flaps was repaired at Dulles International Airport. On March 5, 1986, the airplane was ferried, with the nose and main landing gear pinned in the down-and-locked position, to the EAL maintenance facility in Miami, Florida, to examine the right main landing gear extension/retraction systems.

The airplane was raised on jacks in a hanger and an external hydraulic power source was connected to the airplane's hydraulic system. Two attempts to retract the right main landing gear failed. However, after prying apart the downlock links, the landing

gear retracted and locked in the up position. The landing gear was lowered by the manual extension system but would only extend about 85°. The landing gear could not be forced into the down-and-locked position with the manual system. EAL then tried to remove the downlock outer link, part number (P/N) 65-24486, to permit inspection of the forward and aft sealed needle bearing units (P/N BACB10B107) which were installed in the side strut upper segment. However, the pivot bolt (P/N NAS1110-100 DW), which secured the downlock outer link to the side strut upper segment, could not be removed. The side strut upper segment was removed from the airplane, and the pivot bolt was removed using a hydraulic press. The forward needle bearing unit had seized because of severe corrosion of the needle bearings. The aft needle bearing unit was in a somewhat better condition. However, both needle bearing units had seized on the pivot bolt. The side strut upper segment was fitted with new downlock outer link bearings and reinstalled on the airplane. Subsequent tests of the automatic retraction/extension system and the manual extension system were satisfactory.

Six days after the EAL incident, the flightcrew of a Northwest Airlines Boeing 727-251, N263US, had to execute a go-around during an approach to the Minneapolis-St. Paul International Airport, Minneapolis, Minnesota, because they were unable to get a down-and-locked indication for the right main landing gear. The flightcrew eventually was able to extend the right main landing gear to get a down-and-locked indication. After landing without incident, the downlock outer link was examined, disclosing that the forward and aft needle bearing units were corroded and were seized on the pivot bolt.

A review of Federal Aviation Administration Service Difficulty Reports for a 5-year period revealed another incident involving corroded needle bearings that had seized on the pivot bolt for the downlock outer link. In this incident, which occurred on May 15, 1980, the left main landing gear warning light illuminated and the warning horn sounded intermittently while a Federal Express Corporation Boeing 727-24C, N114FE, was taxiing.

The Safety Board is aware that there is no external provision to lubricate the sealed needle bearing units or to inspect the bearings once they are installed in the side strut upper segment and that these parts are to be replaced only when their condition warrants. However, the Safety Board believes that these incidents indicate that deterioration of these parts often is not detected until failure of the landing gear system, and this could result in a serious accident.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

> Issue an Airworthiness Directive to require in a specified number of flight cycles the replacement of or the inspection and repair, if necessary, of the sealed needle bearings in the downlock outer link of the side strut upper segment of the main landing gear assemblies on Boeing 727 airplanes to prevent seizure of these bearings from corrosion. (Class II, Priority Action) (A-86-51)

GOLDMAN, Acting Chairman, and BURNETT, LAUBER, and NALL, Members, concurred in this recommendation.

By: Patricia A. Goldman
Acting Chairman