

ATTACHMENT 3

Nose Landing Gear Demonstration Plan

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

Nose Landing Gear Demonstration Plan

December 27, 2012

A. INCIDENT DCA12IA113

Location: El Paso, Texas
Date: July 27, 2012
Time: 1414 mountain daylight time (MDT)
Aircraft: Southwest Airlines flight 1871, a Boeing 737-3H4, registration N379SW

B. GROUP

The parties to the investigation are invited to participate in this activity.

C. SUMMARY

On July 27, 2012, about 1414 mountain daylight time, Southwest Airlines flight 1871, a Boeing 737-3H4, registration N379SW, experienced a structural failure of the nose gear actuator retract beam when the landing gear was selected down during approach to El Paso International Airport (ELP), El Paso, Texas. There were no injuries to the 71 passengers and 5 crewmembers on board and the airplane sustained minor damage. The flight was operating under the provisions of Title 14 Code of Federal Regulations (CFR) Part 121 on a regularly scheduled passenger flight from Las Vegas McCarran International Airport (LAS), Las Vegas, Nevada to ELP. Visual meteorological conditions prevailed at the time.

The group proposes to meet at the Southwest Airlines Maintenance facility in Dallas, Texas, on January 3, 2013 to witness the demonstration of the extension and retraction of the nose landing gear.

This document details the nose gear demonstration plan.

D. DETAILS OF INVESTIGATION

At all times, the demonstration should be conducted in a safe manner and following Southwest Airlines protocol and precautions.

For purposes of the demonstration, the airplane should be a 737-300, with the nose landing gear doors removed for access. The airplane should be jacked so that the nose gear can be actuated. In addition, coordination and precautions should allow for the removal of the flexible hose, if possible (e.g., collection of hydraulic fluid).

The following conditions are suggested for the demonstration:

1. Assessment/measurement of the flexible hydraulic line before and after the extension of the nose landing gear. The following conditions should be noted:
 - a. Extend and lower the gear several times; assess movement of the flexible hose during gear transit. Note:
 - i. Possible use of video camera to capture movement of the line. Note: the NTSB's Contour HD1080P camera is available. Camera size is 3.75"x1.5"x1.25".
 - ii. Note whether hose "returns" to same position during each extension.
 - b. Measure position of the flexible hose relative to the nose gear support beam;
 - c. Measure position of the flexible hose relative to nose gear tires/wheel structure, measurement of clearance – i.e., whether ½" or "no contact".
2. Witness the removal and installation of a flexible hydraulic hose, especially to assess whether the hose could be "kinked" or twisted during installation, such that the hose would end up closer to the tires.
3. Attempt assessments of relative vertical position of the nose retract actuator versus the position of the abraded flexible hose. Would fluid flow out of actuator and out of the rupture area?
 - a. Note "pitch" of airplane.
 - b. Possible to identify a coordinate system to measure from?
4. Possible examination of hydraulic hose in other similar airplanes in the maintenance hangar.
5. Conduct a visual inspection of the nose retract actuator to verify that the restrictor/union are in correct positions. How easy are the parts to identify while installed on the airplane?
6. Estimate the rub area of the nose gear tire against the abraded hose. This may need to be accomplished on an uninstalled tire/wheel?