NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594
February 12, 2013

Group Chairman's Factual Report

STRUCTURES

DCA12IA113

A. INCIDENT

Location:	El Paso, Texas
Date:	July 27, 2012
Time:	1414 (CDT) Central daylight time
Airplane:	Boeing 737-3H4, N379SW

B. STRUCTURES GROUP

Chairman:	Brian Murphy National Transportation Safety Board (NTSB) Office of Aviation Safety (AS-40) Washington, DC 20594
Member:	Mickey McConnell Southwest Airlines Company Senior Liaison Engineer Dallas, Texas 75235

C. SUMMARY

After an uneventful taxi and takeoff from Mc Carran International Airport (KLAS) and a normal flight to El Paso International Airport (KELP) the flight crew lowered the landing gear on the approach into KELP. A loud bang was then heard from the nose wheel compartment. The nose gear indications in the Flight Deck were normal with three green lights indicating all gear down and locked. A tower fly by over runway 8R was conducted and no damage or abnormalities were noted by the tower staff. A normal go around was conducted with the gear extended and the subsequent approach and landing were normal. Touchdown of the nose wheel was soft and uneventful and the aircraft taxied to gate normally. A post-flight examination of the nose wheel well revealed a substantial amount of hydraulic fluid leaking and damage to the lower T chord and web of the nose landing gear (NLG) retract actuator beam assembly.

D. DETAILS OF THE INVESTIGATION

1.0 Aircraft Description

N-number:	N379SW
Airplane Serial Number:	26586
Airplane Manufacturer:	Boeing
Model:	737-3H4
Engine Manufacturer:	CFM International
Model:	CFM56 Series
Airplane Year:	1994
Airworthiness Certificate:	Standard
Approved Operations:	121
Aircraft Type:	Fixed Wing Multi-Engine
Engine Type:	Turbo-fan
Airplane Category:	Transport
Number of Engines:	2
Total Time hours:	59,933
Total Cycles:	49,776
Type Certificate	A16WE

2.0 Structure

2.1 Nose Gear Retract Actuator Support Beam Assembly (65-45819-139)

The lower T chord, part number 65-45819 -42 (Attachment 1 photos 1 and 2), of the actuator retract beam was fractured across the horizontal leg of the T chord and into the radius of the vertical leg (Attachment 1 photos 3 thru 6) at about fuselage Station (STA) 243.7 common to the location of the 65-45819 -57 stiffener. STA 243.7 is located about 16 inches aft (Attachment 1 photos 2 and 5) of the nose wheel forward bulkhead. The lower T chord was rotated outboard to the left by several degrees from its nominal position at butt line (BL) 0. The actuator retract beam is comprised of 4 individual web bays each separated by a vertical web stiffener. For the investigation the bays were

numbered 1 thru 4 beginning with the aft most bay. Bay 1 located between fuselage stations 259.12 and 251.625 was undamaged. Bay 2 located between Stations 251.625 and 243.7 was buckled along a 45 degree angle forward and down from the aft upper fastener common to the 65-45819-116 upper T chord and the 65-45819-118 vertical stiffener at FS 251.625 to the intersection of the 65-45819-42 lower T chord and the 65-45819-57 vertical stiffener located at FS 243.7 (Attachment 1 photo 6). Bay 3 located between fuselage stations 243.7 and 235.825 was also buckled along a 45 degree angle forward and down from the aft upper fastener common to the 65-45819-116 upper T chord and the 65-45819-57 vertical stiffener at STA 243.7 to the intersection of the 65-45819-42 lower T chord and the 69-35928-1 vertical stiffener located at STA 235.825 (Attachment 1 photo 6). The 69-35928-1 vertical stiffener was cracked vertically along the radius at the lower fastener location. A gap of about 3/8 of an inch was also present between the lower portion of the stiffener and the web. The entire lower edge of the web in Bay 4 from STA 235.825 to 227.5 was displaced outboard to the left consistent with the lower T chord displacement with no other obvious signs of damage.

The centerline of the undamaged actuator retract beam is located at BL 0. In order to quantify the displacement outboard and to the left of the lower T chord of the actuator retract beam the distance between the right side wall of the nose gear wheel well and the upper and lower edges of the actuator retract beam webs were measured at each of the vertical stiffener locations. The upper and lower measurements at STA 259.12 were 15 ½ and 15 ½ inches, STA 251.625 15 ½ and 16 ½ inches, STA 243.7 15 ½ inches and 17 ½ inches, STA 235.825 15 ¾ inches and 16 ½ inches and at STA 227.5 15 ¼ inches and 15 ½ inches. The lower T chord was displaced outboard and to the left by as much as 2 inches at STA 243.7 in the area of the lower T chord fracture.

During the visual inspection common to the upper ceiling of the nose wheel well, upper surface at STA 251.625 the 65-45819-39 lateral stiffener was also found to be cracked across the upper horizontal leg. The crack continued down the vertical leg and into the lower radius (Attachment 1 photos 8 and 9) of the lateral stiffener. An HFEC Hole Probe Inspection was further conducted to the existing fasteners holes (Attachment 1 photo 7) in the cracked area and no further damage was found to the upper ceiling panel. The discrepant -39 lateral stiffener will be removed and replaced in accordance with Boeing drawing 65-45819 and Structural Repair Manual (SRM) standards.

All of the examined fracture surfaces exhibited features consistent with overstress with no evidence of fatigue.

3.0 Systems

3.1 Nose Gear Hydraulics

The nose gear retract actuator hydraulic line was ruptured (Attachment 1 photos 10 and 11).

Submitted by:
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