## **National Transportation Safety Board**

Washington, D. C. 20594

## **Safety Recommendation**

Date: September 22, 1988

Og 2046

In reply refer to: A-88-109

Honorable T. Allan McArtor Administrator Federal Aviation Administration Washington, D.C. 20591

On June 22, 1987, a Lockheed L-382-30, S/N 4561, operated by Southern Air Transport, experienced a complete separation of the nose landing gear during landing roll at Wright Patterson AFB in Dayton, Ohio. The airplane was on lease from TransAmerica Airlines and the flight was a scheduled domestic, Part 121, air cargo flight.

Inspection of the nose landing gear assembly revealed a complete circumferential fracture through the steering collar area of the shock strut assembly, P/N 388071-3. Metallurgical examination established that the fracture was the result of progression of a preexisting crack emanating from small corrosion pits on the outer surface of the strut. The preexisting crack was the result of the sequential progression of small fatigue cracks and stress corrosion cracking.

Lockheed-Georgia Company had previously issued service bulletin (SB) 82-448 on September 5, 1979, calling for a one-time inspection for cracks and corrosion in the steering collar area of all P/N 388071-3 nose landing gear strut assemblies. P/N 388071-3 strut assemblies were initially installed on L-382 aircraft serial numbers (S/N) 3501 to 4637. Airplanes manufactured later were equipped with a redesigned strut assembly, P/N 3303591-1, on which cracking and corrosion have not been identified as a problem. The SB cites "about a dozen failures" related to stress corrosion cracking of P/N 388071-3 strut assemblies in commercial and military service. Lockheed SB 82-448 superseded SB 82-288, dated July 28, 1971, and revised the initially suggested compliance time and the inspection and repair techniques. Aircraft records indicate that SB 82-288 had been accomplished on the incident airplane but SB 82-448 had not.

Southern Air Transport owns and operates 17 L-382 airplanes and its maintenance program requires the SB inspection at every other "C" check. (Each "C" check occurs every 3,000 hours of service time.) However, the incident airplane was on lease from TransAmerica Airlines and was being maintained by Southern in accordance with the TransAmerica maintenance program, which did not require compliance with SB 82-448. Recently, Southern Air Transport further modified its

maintenance program to perform the inspections at every "C" check because of other strut assembly fractures, which had resulted in loss of nose wheel steering but not gear collapse.

This incident highlights the variance of in-house maintenance practices between operators in complying with SB recommendations. The incident also reveals a shortcoming in SB 82-448 in that it does not provide for recurrent inspections. The Safety Board is concerned that other L-382 airplanes with P/N 388071-3 strut assemblies could develop cracks that propagate to failure even though SB 82-448 has been accomplished.

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

Issue an airworthiness directive for Lockheed L-382 airplanes with P/N 388071-3 nose landing gear strut assemblies requiring periodic inspections to detect cracking in the steering collar area at intervals that will preclude the cracking from reaching a critical size and causing failure of these struts. (Class II, Priority Action) (A-88-109)

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

Ry: James L. Kolstad Acting Chairman

- J. Kolskul

## Brief of Accident

I, 6/22/87	DAYTON, OH	A/C Res. No. N20ST		Time (Lc1) - 1256	Ep.T
asic Information	SUPPLEMENTAL A RANSFORT, IN STIC, PASSENGER F	Aircraft Domase SURSTANTIAL Fire NONE Fass	Fatal 0 0	Injuries Serious Hinor 0 0 0	Or None
Hake/Hodel - LOCKHEED L-382-30 Landing Gear - TRICYCLE-RETRACTARLE Max Gross Wt - 155000 No. of Seats - 8	Eng Muke/Model Number Engines Engine Type Rated Power	- ALLISON 501-D22A - 4 + TURBOFKOF - 4368 HF	ELT I	ELT Installed/Activated Stall Warning System	ted - YES/NO
ALLITARY IN PERSON JHC 250/010 K 6.0 6.0 6.0 7 In Sion - H	ation Itinerary Last Departure Foint WRIGHTSTOWN'NJ OT PERTINENT Destination SAME AS ACC/INC TS SAME AS ACC/INC TS ATC/Airspace 1600 FT SCATTERED Type of Flight Flan 3000 FT BROKEN Type of Clearance AZE AYLIGHT	oint  C  lan - IFR  e - IFR  FUL STOP	Airport Proximity ON AIRPORT Airport Data WRIGHT PATTERSO Runway Ident Runway Surface Runway Status	Airport Froximity ON AIRFORT Airport Data WRIGHT FATTERSON AFB Runway Ident - 23R Runway Lth/Wid - 12600/ Runway Surface - ASPHALT Runway Status - DRY	300 aLT
Personnel Information Pilot-In-Command Certificate(s)/Rating(s) COMMERCIAL,ATP SE LAND,NE LAND	Ase - 55 Biennial Flight Review Current - YES Months Since - 6 Aircraft Type - L-3	Hedical Certi S Total Make/Mode 382 Instrumen Multi-End		CAL-WAIVERS ast 24 Hrs ast 30 Days	/LIMIT 33 223
Instrument Rating(s) - AIRPLANE			# #		

THE FLIGHT EXPERIENCED SEPARATION OF THE NOSE LANDING GEAR DURING THE LANDING ROLL, INVESTIGATION SHOWED THAT THE FLIGHT EXPERIENCED SEPARATION OF A PREEXISTING CRACK ON THE NOSE LANDING GEAR STRUT ASSEMBLY, THE THE FAILURE WAS RELATED TO THE PROBELMS WITH THE NOSE LANDING GEAR WERE RECOGNIZED BY THE MANUFACTURER WHO RECOMMENDED COMPLIANCE WITH SERVICE BUTTETIN 82-448 THAT WAS ISSUED TO DETECT CRACKS SIMILAR TO THAT EXPERIENCED IN THIS INSTANCE, THE SERVICE BULLETIN, THAT WAS ISSUED IN 1979, HAD NOT BEEN ACCOMPLISHED ON THE AIRCRAFT.

Brief of Accident (Continued)

File No. - 1892 6/22/87 DAYTON, OH A/C Rus. No. N20ST

Time (Lc1) - 1256 EHT

Phase of Operation Occurrence #1

NOSE GEAR COLLAPSED LANDING - ROLL

Finding(s)

- 1. LANDING GEAR, NOSE GEAR FAILURE, TOTAL
  2. MAINTENANCE INADEQUATE COMPANY/OFERATOR MGMT
  3. LANDING GEAR, NOSE GEAR SEPARATION
  4. MAINTENANCE, SERVICE BULLETINS DISREGARDED COMPANY/OFERATOR MGMT
  5. LANDING GEAR, NOSE GEAR FATIGUE

---Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident is/are finding(s) 1:3:5

Factor(s) relating to this accident is/are finding(s) 2,4