

DATE: 26 April 2023

TO: Ms. Tealeye Cornejo
Air Safety Investigator
National Transportation Safety Board

FROM: Matthew J. Pantone
A&P, IA

RE: N210CU post-accident brake inspection conducted Monday 20 Mar 2023

Dear Ms. Cornejo,

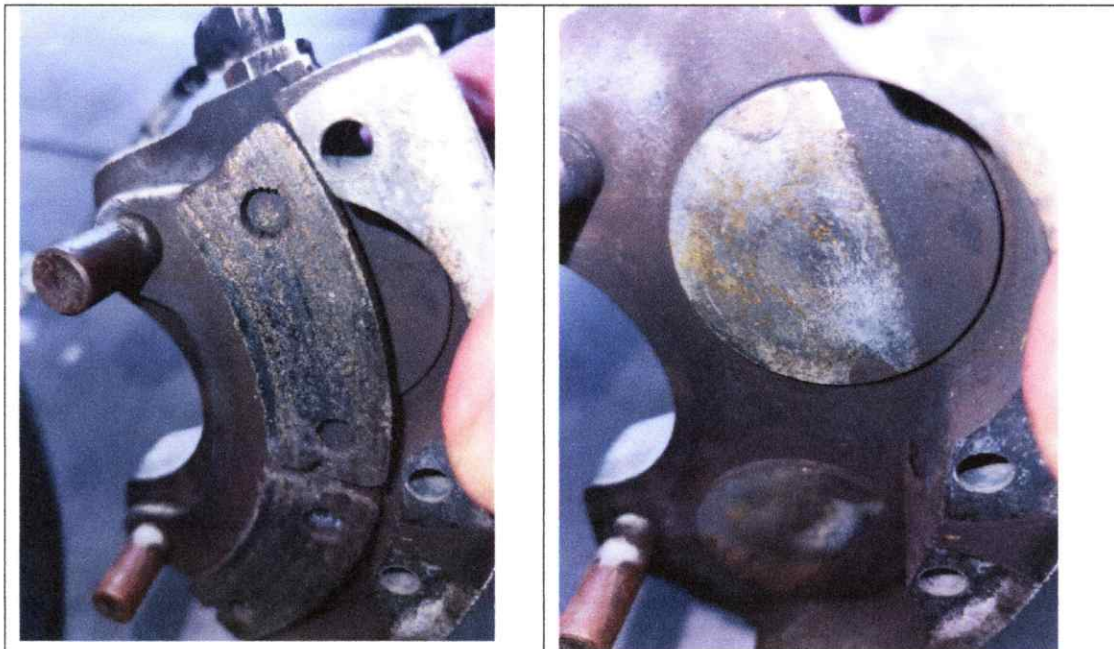
Per instructions from your office an inspection of Cessna 210N, N210CU, S/N 21064452 brakes was conducted at Morgan County Airport (42U) with Salt Lake FSDO representative Jon A. Hansen present. Focus of this inspection was directed at the left brake assembly of the subject aircraft due to pilot reporting this was the inoperative brake at the time of the runway excursion.

Findings:

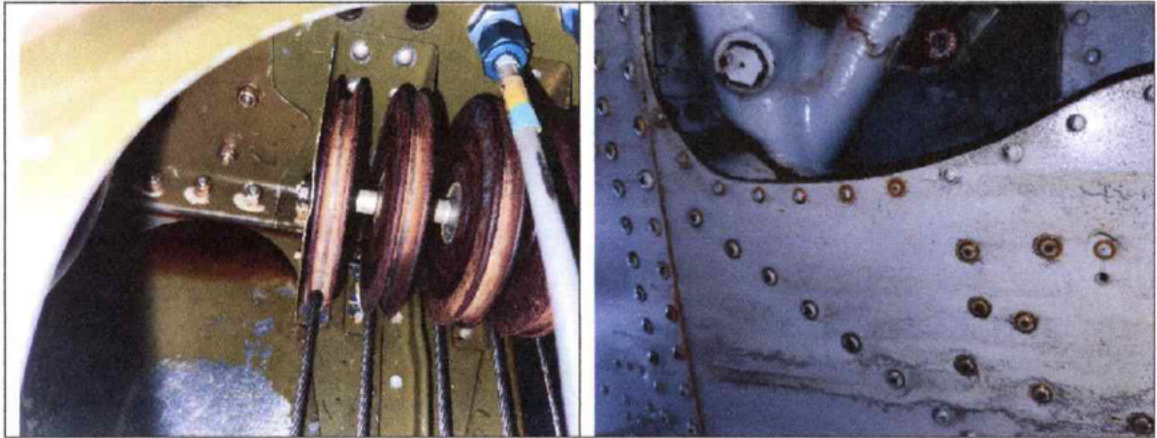
- 1) The Left brake was flat, no actuation. The Right brake operated in normal fashion with appropriate braking force applied to the right wheel.
- 2) The seats and floor panels were removed from the aircraft to facilitate brake component inspection for condition, potential damage and leaks.
- 3) The Left brake master cylinder was removed from the aircraft and disassembled for inspection. There was no evidence of leakage of brake fluid from the master cylinder or the brake lines in the forward cabin sub floor area.
 - The Left master cylinder was completely empty.
 - The "O" ring and master cylinder were in serviceable condition.



- 4) There was no evidence of leakage at wheel cylinder and the brake rotor is in serviceable condition.



- 5) There was significant brake fluid under the aft cabin floor and on the aircraft belly. Most of the brake fluid was pooled in front of the bulkhead forward of the landing gear and brake line pivot fitting . There was no damage or leakage apparent with close inspection of any of the Left brake system lines and components under the cabin sub floor and landing gear actuator zone.



- 6) The brake system was assembled and serviced with fluid. No defect or leak was apparent through the left side brake system from master cylinder to wheel cylinder. The brakes were actuated to maximum pressure that a pilot could apply for 5 minutes with no failure or leakage in the system.

There is one fitting located internally in the left landing gear leg that can't be inspected unless the landing gear is removed. Brake fluid may be leaking out the gear leg when the landing gear is rotated to the up position but due to time and equipment constraints a retract test was not performed to check potential brake fluid leakage when the landing gear is retracted. This leakage scenario seems improbable due to the brake system being static while the landing gear is retracted, though not impossible given the lack of an observed gross leak or failure in the system. Further disassembly of the system and a retract test to determine if the landing gear being retracted results in a leakage condition would need to be accomplished to increase confidence in where the left brake leak and ultimate failure occurred.

V/R

[REDACTED]

Matthew J. Pantone

A&P [REDACTED] IA

26 Mar 2023

[REDACTED]

DATE: 19 Aug 2023

TO: Ms. Tealeye Cornejo
Air Safety Investigator
National Transportation Safety Board

FROM: Matthew J. Pantone
A&P, IA

RE: N210CU post-accident brake inspection conducted Mar 20 and June 15 2023 and

Dear Ms. Cornejo,

Per instructions from your office an inspection of Cessna 210N, N210CU, S/N 21064452 brakes was conducted at Morgan County Airport (42U) with Salt Lake FSDO representative Jon A. Hansen present. Focus of this inspection was directed at the left brake assembly of the subject aircraft due to pilot reporting this was the inoperative brake at the time of the runway excursion.

Findings:

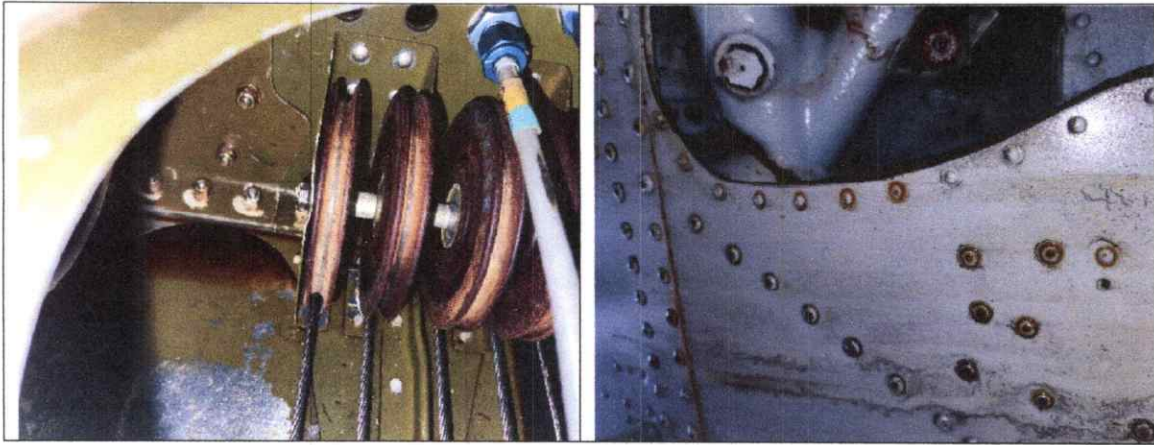
- 1) The Left brake was flat, no actuation. The Right brake operated in normal fashion with appropriate braking force applied to the right wheel.
- 2) The seats and floor panels were removed from the aircraft to facilitate brake component inspection for condition, potential damage and leaks.
- 3) The Left brake master cylinder was removed from the aircraft and disassembled for inspection. There was no evidence of leakage of brake fluid from the master cylinder or the brake lines in the forward cabin sub floor area.
 - The Left master cylinder was completely empty.
 - The "O" ring and master cylinder were in serviceable condition.



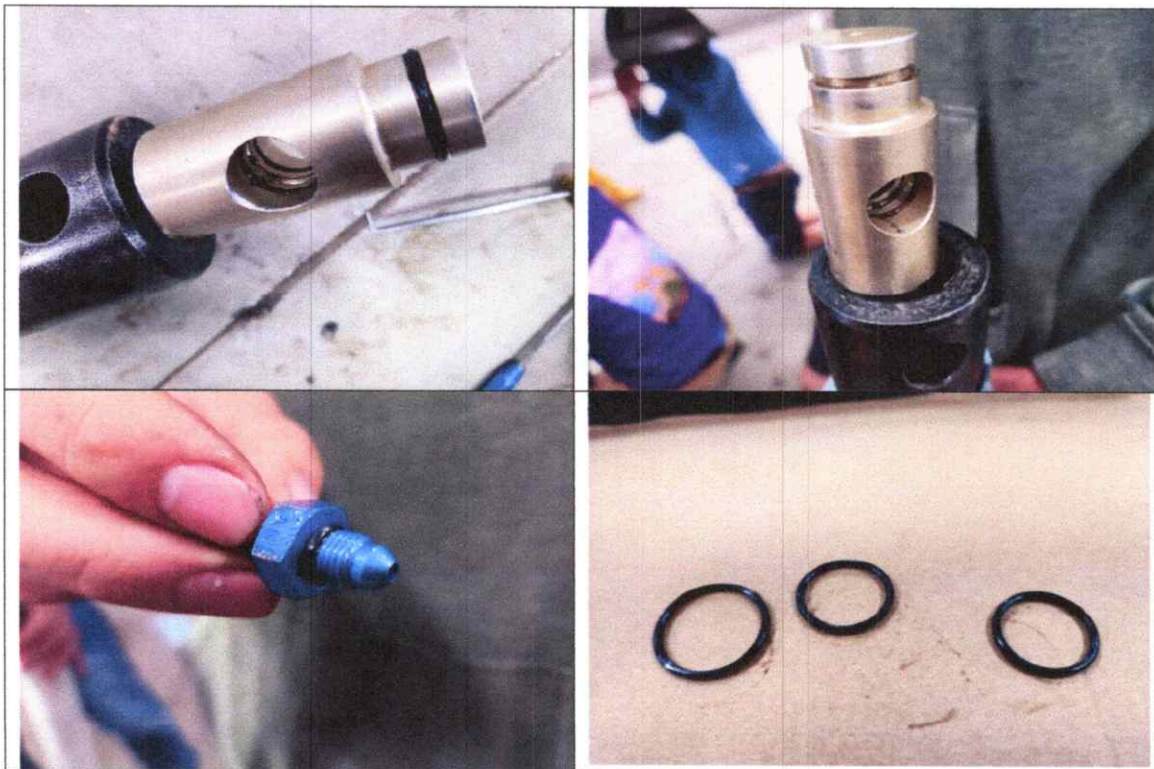
- 4) There was no evidence of leakage at wheel cylinder and the brake rotor is in serviceable condition.



- 5) There was significant brake fluid under the aft cabin floor and on the aircraft belly. Most of the brake fluid was pooled in front of the bulkhead forward of the landing gear and brake line pivot fitting . There was no damage or leakage apparent with close inspection of any of the Left brake system lines and components under the cabin sub floor and landing gear actuator zone.

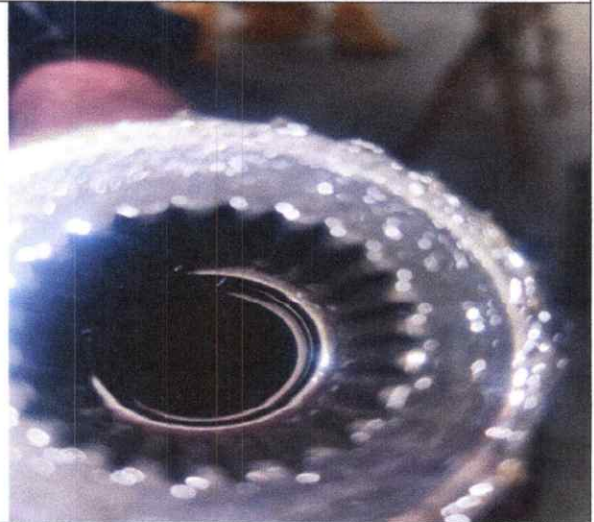
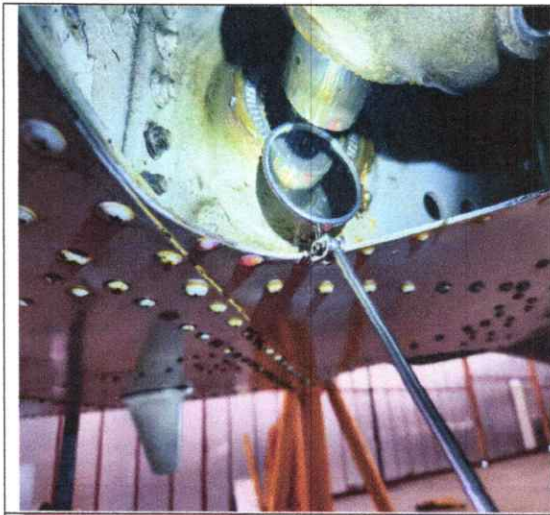


- 6) The brake system was assembled and serviced with fluid. No defect or leak was apparent through the left side brake system from master cylinder to wheel cylinder. The brakes were actuated to maximum pressure that a pilot could apply for 5 minutes with no failure or leakage in the system.
- 7) The Left landing gear leg and pivot assembly was removed from the aircraft. The "O" rings from the brake fluid transition assembly were flexible, normal shape and undamaged.



- 8) The main landing gear pivot trunnion was disassembled, and "O" rings inspected. These "O" rings were stiff and flattened but with no obvious damage. These are the most likely leak path as

the cavity they seal is full of hydraulic fluid for brake line and wheel cylinder use and with lading gear in the up position will leak directly into the belly of the aircraft.





With the entire left landing gear and trunnion removed all seals in the system were able to be inspected. It was determined the most likely brake fluid leakage path was through the main landing gear trunnion seals with the landing gear rotated to the up position, allowing brake fluid to leak into the belly of the aircraft through the trunnion to actuator interface joint.

V/R

Matthew J. Pantone

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