NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

22 January, 2014

Brake System Component Examination

WPR13FA430

This document contains 18 embedded photos.

Examination Report - N194SJ Cessna 525A

Wednesday, January 22, 2014
11:08 AM

Exam Location:

Crane Aerospace
3000 Winona Ave
Burbank, CA 91510
Participants:

Van McKenny	NTSB
Brian Ramsey	Crane Aerospace
Ricardo Asensio	Cessna

Examination Summary:

The following brake system components were tested and/or examined at Crane Aerospace.

- Skid Control Unit Fault Display
- Left & Right Wheel Transducers
- Brake Control Valve Assembly
- Skid Control Box- Skid Control Braking System

Left & Right Wheel Transducers:
Technician: Hector Vicente

Fig 1 - Left Wheel Transducer

Fig 2 - Right Wheel Transducer

Left Transducer:

PN: 40-955
SN: 6559
The transducer's electrical connector was removed and pins visually examined. The wheel adaptor end was cleaned and placed on the test fixture. A full acceptance test was performed with the results documented on the test data sheet. No anomalies identified.

Right Transducer:

PN: 40-955
SN: 6557
The transducer's electrical connector was removed and pins visually examined. The wheel adaptor end was cleaned and placed on the test fixture. A full acceptance test was performed with the results documented on the test data sheet. No anomalies identified.

Skid Control Braking System- Control Box
Technician: Eder Villalbazo

Fig 3 - Control Box (top view)

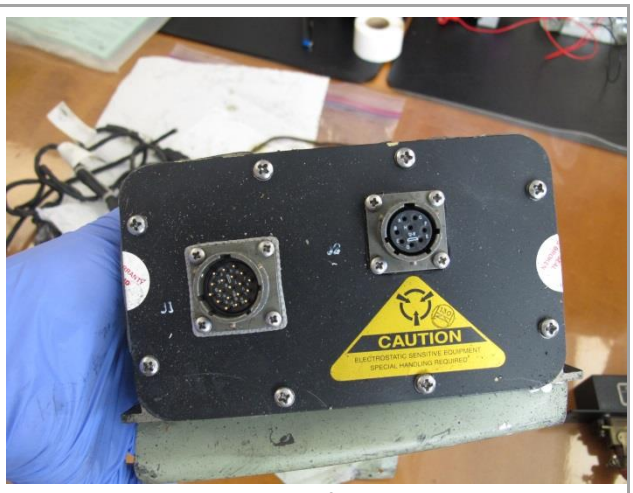

Fig 4 - Control Box - view of the canon plugs

PN: 142-031-1
SN: 334

Control box and canon plug pins were visually inspected. The control box was connected via canon plug terminals to the Antiskid Field Tester (99-791). A full manufacturing acceptance test was performed with the results documented on the test data sheet. No anomalies identified.

Skid Control Unit Fault Display
Technician: Eder Villalbazo

Fig 5 - Skid Control Unit Fault Display - 4/5 flags displayed.

Fig 6 - Skid Control Unit Fault Display (top view).

PN: 4292750
SN: 1336A

A SK 16641 Test Fixture was attached to the Skid Control Unit Fault Display via the J1 connector. The fault indicators (rotary flag) were manually reset (all black). Individually each fault circuit was grounded resulting in a fault indication to operate by displaying a white & black flag. All rotary flags operated correctly.
Left XCDR
Right XCDR
Squat Disagree
Valve
Control Unit

Fault indications could be mechanically imparted by a moderate impact load to the fault display unit.

Control Valve Assembly
Technician: Jason Hopper

The control valve assembly was discolored black and sooted. Airframe aluminum material had melted onto the back side of the valve body. The melted and deformed aluminum was removed by separating the valve body from the mounting screws. All hydraulic line ports had unions attached. No evidence of hydraulic stains or leaks were evident.

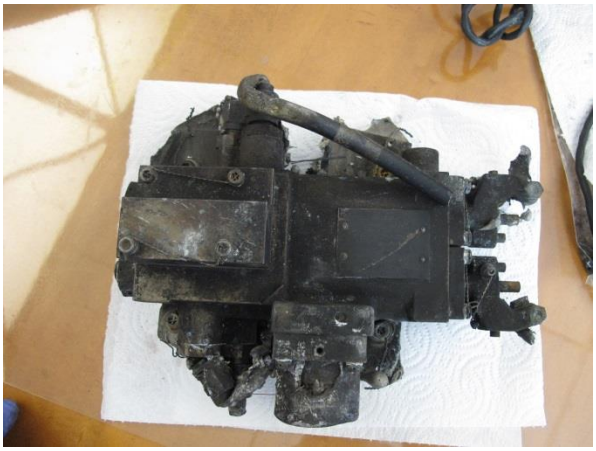
Fig 7 - Control Valve Assembly (top)


Fig 8 - Control Valve Assembly (bottom)

The brake lever assembly was removed from the left brake valve, the main spring, shims, spring keeper, and spring stop were removed. The o-rings that seal the sleeve end assembly were brittle and easily broken. Black flakes were observed inside the valve body.

Fig 9 - Left Brake Lever Assembly

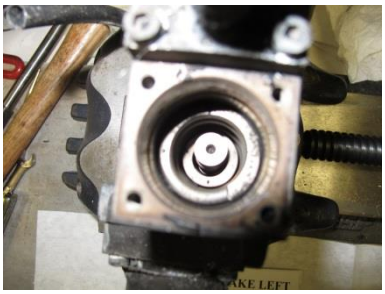
Fig 10 - Left Valve Body Interior

Fig 11 - Left Valve Spring Assembly

The brake lever assembly was removed from the right brake valve, the main spring, shims, spring keeper, and spring stop were removed. The o-rings that seal the sleeve end assembly were brittle and easily broken. Black flakes were observed inside the valve body.

Fig 12 - Right Brake Lever Assembly

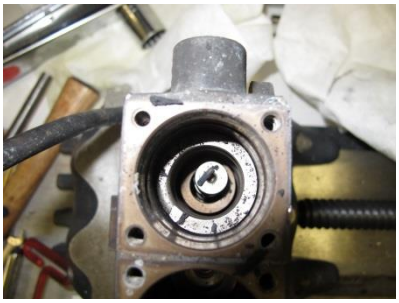

Fig 13 - Right Valve Body Interior

Fig 14 - Right Valve Spring Assembly

The dampening chamber was removed from the valve body. The chamber ports were clear and o-rings were brittle and cracked. The right return union, the right break pressure union was removed. The left side pressure port union was removed.

Fig 15 - Damping Chamber Removed

The servo was discolored black and part of the outer case was melted away. The servo assembly was removed and the armature flapper was present.

Fi g 16 - Servo (end view)

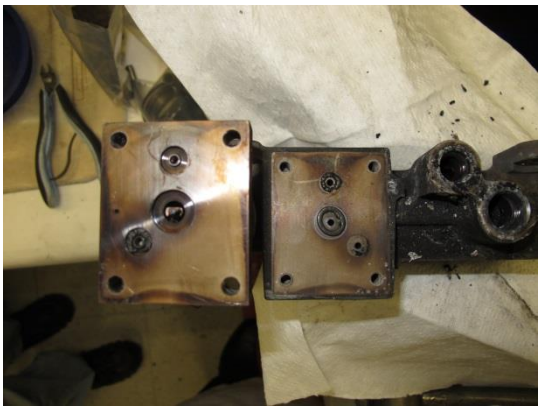

Fig 17 - Servo removed and interior exposed

The right valve end cap was removed and the valve sleeve and spool were extracted. All o-ring elements had disintegrated into carbon powder. The valve sleeve and spool were observed to be seized in an OFF position (brake port connected to return port) which corresponds to no brake pressure being delivered to the brakes. As figure 18 shows, the return edge of the spool is within the return slot of the sleeve (brake port connected to return pressure), which is the default position of the spool, without command being applied.

The left valve end cap was removed and the valve sleeve and spool were extracted. All o-ring elements had disintegrated into carbon powder. The valve sleeve and spool were observed to be seized in an OFF position (brake port connected to return port) which corresponds to no brake pressure being delivered to the brakes. As figure 18 shows, the return edge of the spool is within the return slot of the sleeve (brake port connected to return pressure), which is the default position of the spool, without command being applied.

Fig 18 - Left & Right Brake Valve Sleeves and Spools - Return port closed.