



MEMORANDUM FOR RECORD – SCOOP CYCLE TESTING

Brice Banning
Senior Aviation Accident Investigator
Alaska Region

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NTSB Accident Number: ANC20LA069

Party Member Examinations

The following Party Members participated in the scoop cycle testing conducted at Wipaire's facilities from 9/22/2020 – 9/24/2020.

1. Brad Kutz, Wipaire Inc.
2. Chuck Wiplinger, Wipaire Inc.
3. Richard Simpson, Dauntless Air

Pages 2 – 8 of this document offer a detailed explanation of the scoop cycle testing.

Results of scoop cycle testing:

Over 1,000 cycles were performed on the scoop system during the testing with no functional faults detected.

Testing Goals:

- Setup automated test to cycle scoops
- Monitor scoop position
- Track faults during test when commanded position does not equal actual position
- Use as much of the accident airplane's installed scoop system as possible

Float Modifications and Preparation Performed Before Testing (See Figures 1-3):

- Hydraulic power pack and lines from accident airplane reattached to their respective attach points.
- Left float scoop sensor switches were intermittent (accident impact damage)
- Multiple pinch points observed on the wire harness (accident impact damage)
- Needed to trim existing hole in left float to safely access scooptunnel
- Trimming limited to side of skin and the bulkheads forward of the baggage compartment
- Had to bypass wire harness and access left float scoop tunnel
- No trimming of structure near scoop or scoop tunnel



Figure 1 - Left float damage before trimming.



Figure 2 - Left float after trimming.

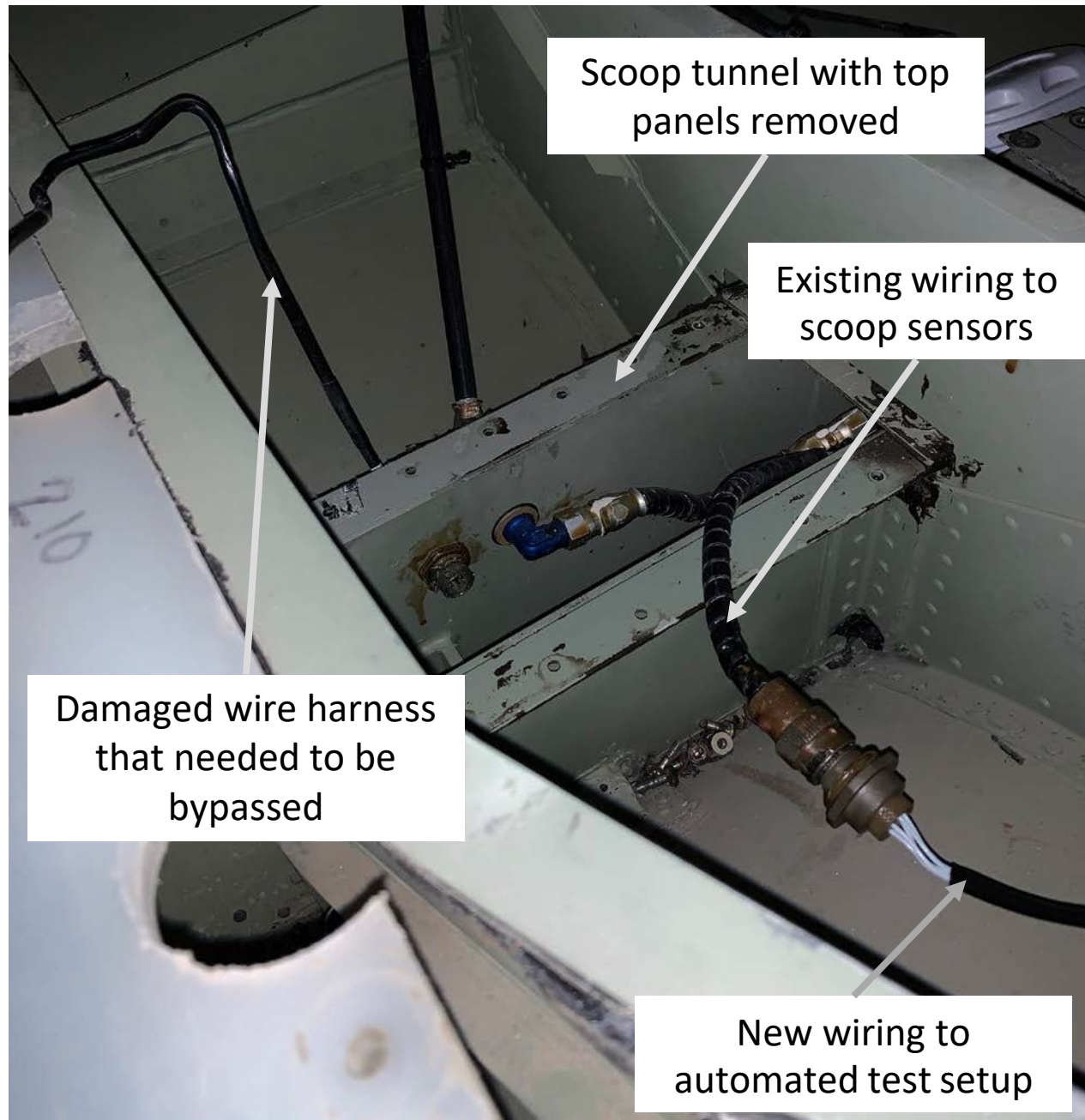
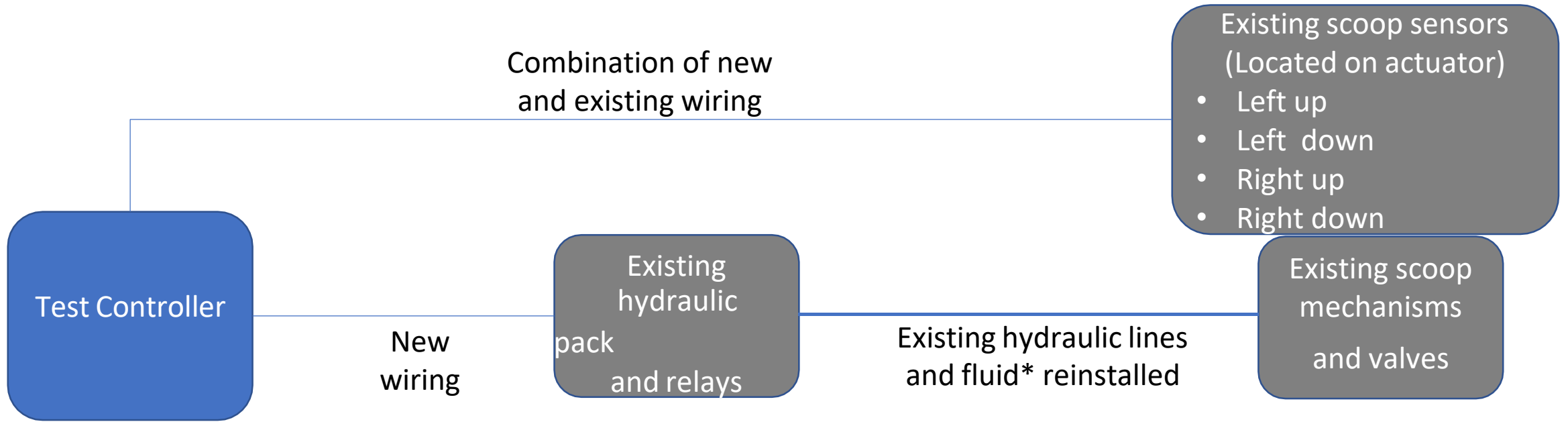


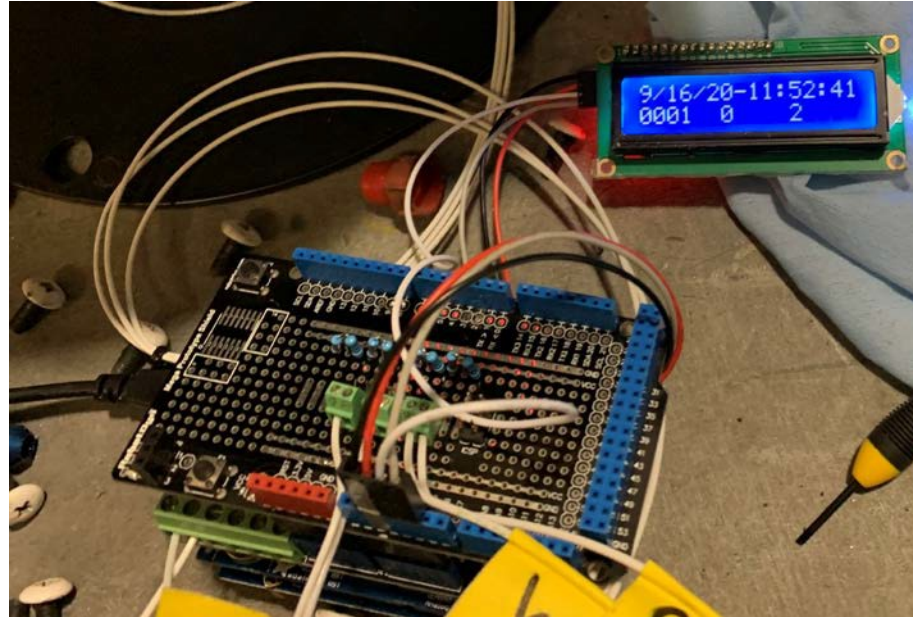
Figure 3 - Scoop tunnel as seen looking aft through baggage compartment access panel.



*Hydraulic fluid – May need to be added if system is low

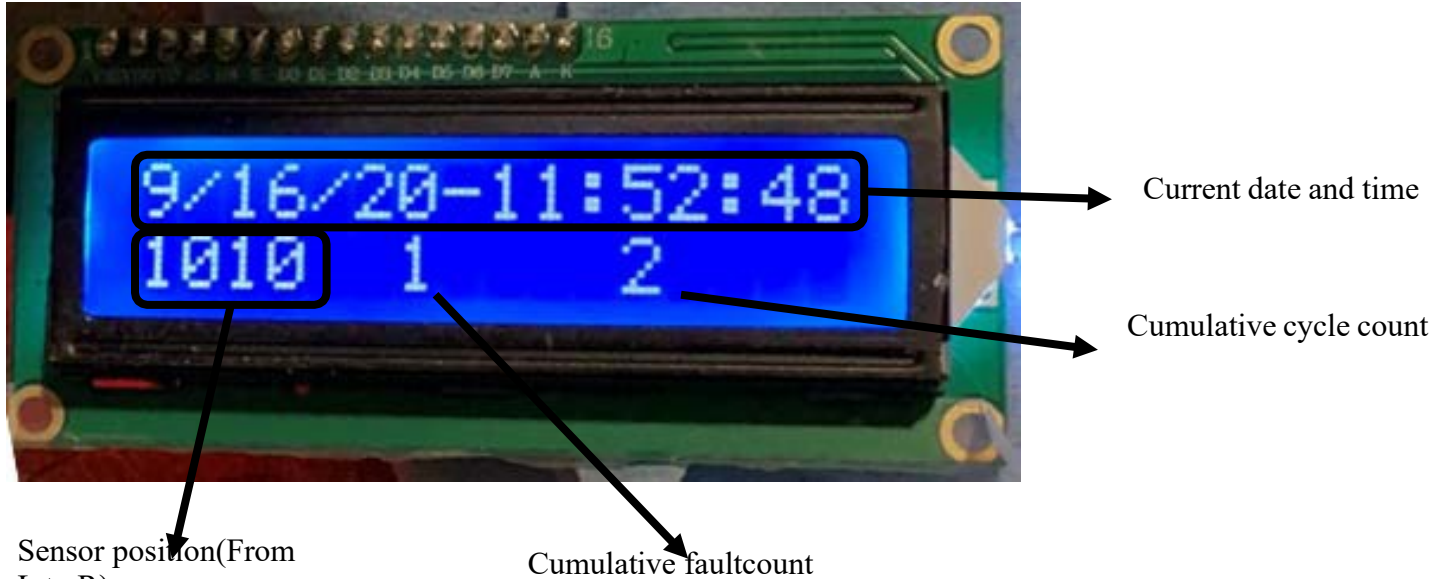
Test controller

- Arduino based controller
- Inputs 4 sensor switches (existing sensors on the scoop actuator)
- Output drives valve and hydraulic power pack (existing valve and power pack)
- Confirms position after every commanded up or down
- Does a complete up/down cycle every ~15 seconds
- Tracks cycle # and faults
- Writes faults to a txt file on an SD card
 - Time/date
 - Cycle #
 - Type of fault
 - Fault # (cumulative)



Test controller

- Display



- Left up
- Left down
- Right up
- Right down

Normal operation will show 1010
or 0101

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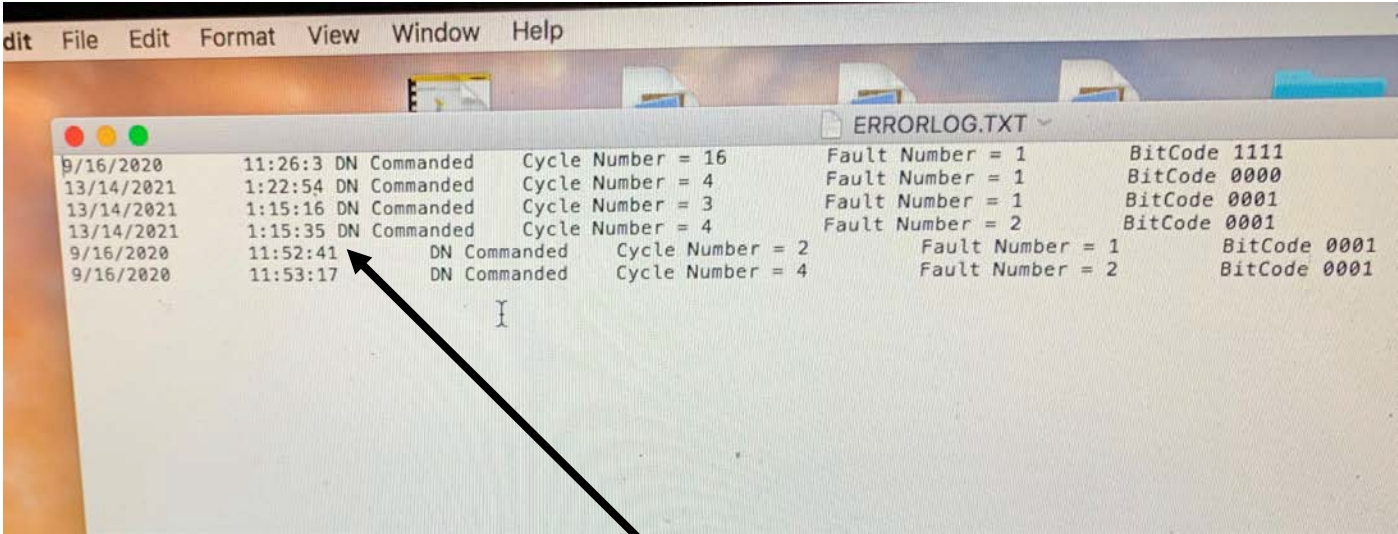
Functional check

- Verified normal operation works through 5 cycles
- Verified errors are detected and logged
 - Disconnected sensor wire to simulate error

Cycle 2 in Up position Left sensor disconnected



Cycle 2 in Down position error was logged



Fault logged to file on SD card