



U.S. Department
of Transportation

**Federal Aviation
Administration**

Flight Standards District Office

Hillsboro, Oregon 97124

Fax: [REDACTED]

AIRCRAFT AND LANDING GEAR SYSTEM INSPECTION/FUNCTION REPORT

Date: January 8, 2018

Arrived at aircraft: 10:00 PST

Departed from aircraft: 11:15 PST

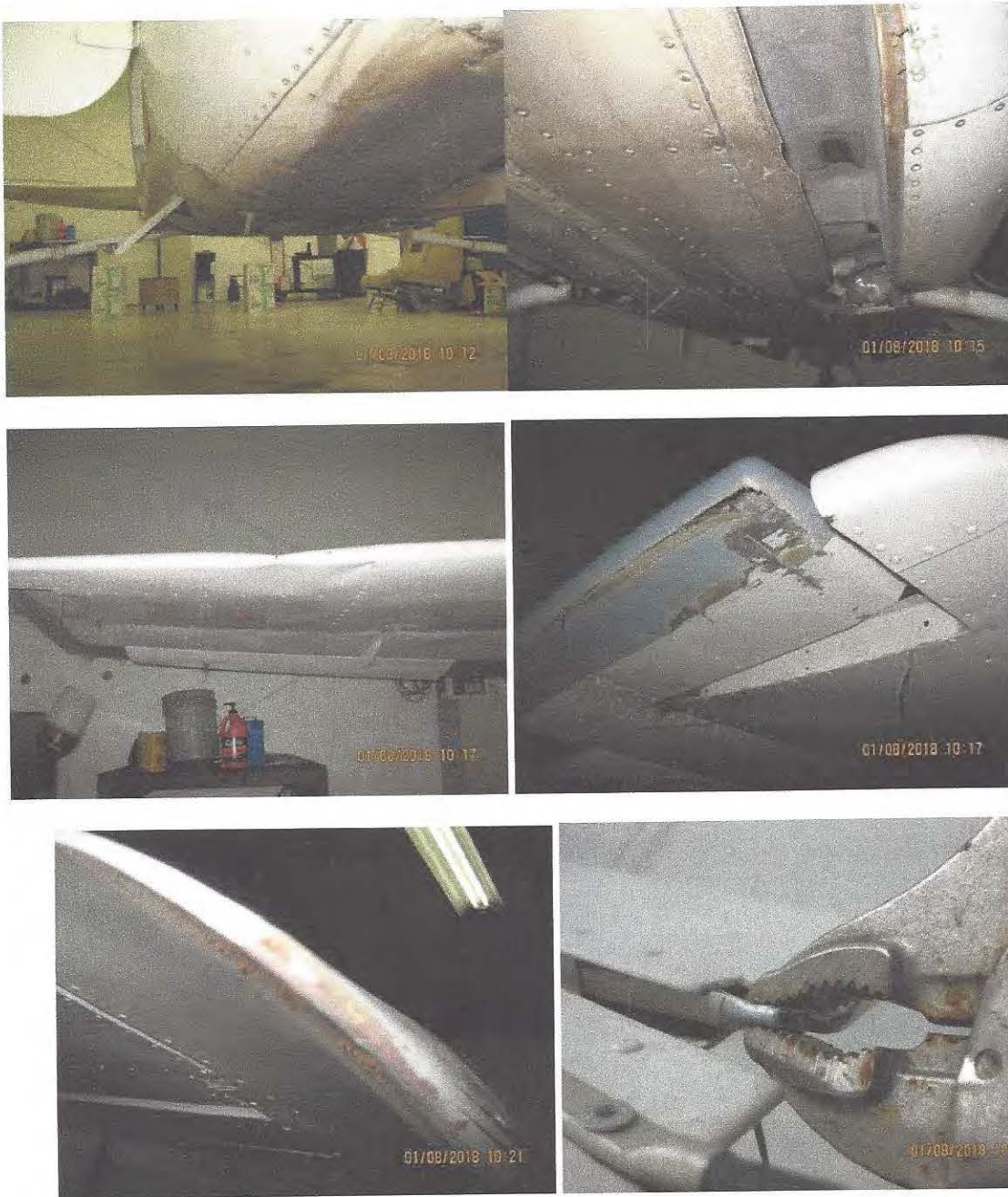
Location: Willamette Aviation, [REDACTED] Aurora, OR 97002

Persons in Attendance: David Waggoner (owner Willamette Aviation), Ed Stearns (A&P mechanic) and Darren K. Vaughn (FAA ASI)

Aircraft: The subject aircraft was identified as N2122S, a Cessna T210L, serial number 21061084 by the presence of registration markings and the aircraft internal and external data plates. The aircraft was in Willamette Aviation's maintenance hangar on the ground with the wing jacks in place with the appropriate wing jack adapters installed on each wing. The aircraft interior furnishings, including the front seats, carpet, left and right forward side panels and floorboard inspection panels had been removed. Willamette Aviation mechanic Ed Stearns reported that no other maintenance had been completed on the aircraft.



The aircraft exterior was inspected and it was noted that there is very minimal, if any damage to the fuselage of the aircraft. The right horizontal stabilizer and elevator are damaged both by bending upward and abrasive damage on the bottom outboard portions. The right wing tip is very minimally damaged by the scraping of paint at the aft lower portion of the tip but not with enough force to break the plastic wing tip. Someone has crimped the end of the right wing fuel tank vent line shut with a pair of vise grip style pliers, most likely in an effort to stop or slow the leakage of fuel while the aircraft was leaning on its right wing. No other exterior damage attributable to the accident was noted.



N2122S's tachometer recording device registers 4804.2.

Inspection: The landing gear hydraulic lines, electrical wires, actuators, locks, valves and other landing gear system components were visually inspected for condition, security and leakage prior to the application of power to the system. No obvious defects were noted. The hydraulic system fluid was visually inspected, appeared bright, of appropriate color and was noted as smelling normal (lack of burnt or contaminated smells). The fluid level was noted as being adequately above the "ADD" mark on the hydraulic reservoir dip stick.



There was a slight (trace) amount of hydraulic fluid in the belly of the aircraft in the compartments where hydraulic components were located but no obvious leaks from any specific component were noted. Also, there was excess grease noted on and around the main landing gear actuators but appeared to be from excessive servicing rather a sign of a failure.

Electrical systems switch positions were observed as the aircraft was presented and it was noted that the "BEACON" and "STROBE LIGHTS" switches were in the "on" position while all others were "off". The landing gear switch handle was in the "GEAR DOWN" position and all three gear were visually and physically confirmed to be in the down and locked positions.

The landing gear down lock actuators were both extended and the locks themselves were over the lock pins in a position appropriate to "locked" in the down position with visually affirmed engagement.

No abnormalities were noted by visual inspection of the system other than as noted above.

Function: Electrical power was applied to the aircraft by switching the master switch to the on position with the aircraft on the ground, resting on its landing gear. The green "GEAR DOWN" indicator light was illuminated and the hydraulic power pack ran for a short one (1) second period which is normal in my experience. The master switch was then switched off.

The aircraft was jacked using tripod jacks, wing mounted jack adapters and a weighted tail stand.

Once the aircraft was in the air, electrical power was applied by switching the master switch to the on position, the gear pump circuit breaker was pulled and the gear handle was placed in the "GEAR UP" position. The gear pump circuit breaker was then intermittently activated to allow the gear to unlock from the "GEAR DOWN" position and travel to approximately half retracted before interrupting the circuit breaker in order to confirm clearance between the main gear tires and the ground during the retraction cycle. Although the main gear cleared the floor, the jacks were adjusted higher to increase the ground clearance between the main landing gear tires and the shop floor at the lowest portion of the gear travel.

When the jacks were adjusted and locked, the gear pump breaker was reset and the gear continued to travel to, and lock in the "GEAR UP" position with the amber "GEAR UP" light illuminated and the hydraulic power pack ceasing to run shortly after the gear had locked in the up position.

The gear handle was moved to the "GEAR DOWN" position, the nose landing gear dropped out first, closely followed by the left and right main gear dropping out and continuing uninterrupted to the "GEAR DOWN" position with positive down lock engagement and a green "GEAR DOWN" light indication. Once the down locks were set, the hydraulic pump motor ran for approximately one (1) second before shutting off.

The landing gear system was retracted and extended eight (8) additional cycles over a period of about 40 minutes and functioned as described in the Cessna T210L maintenance manual every time with positive down lock engagement and a green "GEAR DOWN" light indication followed closely by the hydraulic pump shutting off. Each retraction cycle routinely completed in approximately eight (8) seconds and each extension cycle also completed in approximately eight (8) seconds. Each retraction/extension cycle was completed with lighting and electrical systems activated and deactivated appropriate to various phases of flight such as beacon, strobe and navigation lighting systems on/off, throttle applied and retracted and resistance applied to left and right main gear on retraction. Each of the cycles resulted in a normal gear retraction and extension cycle completion with only slight increases in cycle times when the gear was "de-synchronized by application of resistance to one or the other gear leg.

On the tenth (10th) retraction I checked the gear warning horn by retracting the throttle to the point of activation of the warning horn sounding and left it activated while selecting GEAR DOWN. During the tenth (10th) extension cycle I applied resistance (opposite the direction of travel) to the right main gear to "de-synchronize" the main gear movement. The left main gear continued to travel and reached the mechanical down limit at which point the right main gear began traveling against the resistance applied and reached the down position. All gear locked in

the "GEAR DOWN" position with positive down lock engagement and a green "GEAR DOWN" light indication, warning horn deactivation and the gear pump motor shutting off within approximately one (1) second.

The eleventh (11th) retraction was conducted normally. While the gear was in the "GEAR UP" position the warning horn was repeatedly checked for operation by retracting (to activate the horn) and applying (to deactivate the horn) the throttle approximately four (4) times with each time the warning horn activating and deactivating appropriate to the throttle position. During the eleventh (11th) extension cycle I applied resistance (opposite the direction of travel) to the left main gear to "de-synchronize" the main gear movement. The right main gear continued to travel and reached the mechanical down limit at which point the left main gear began traveling against the resistance applied and reached the down position. All gear locked in the "GEAR DOWN" position with positive down lock engagement and a green "GEAR DOWN" light indication, warning horn deactivation and the gear pump motor shutting off within approximately one (1) second.

The twelfth (12th) retraction was conducted normally. During the twelfth (12th) extension cycle I interrupted the gear pump motor by disengaging the gear pump circuit breaker to disconnect electrical power from the gear pump motor at approximately one half main gear extension. I then pumped the landing gear emergency extension pump to extend the gear to the down and locked position and continued to pump the handle until the green "GEAR DOWN" light illuminated and the pressure released once the lock actuators had traveled to the locked position. The landing gear system indicated down and locked with a green "GEAR DOWN" light and no warning horn when the throttle was retracted.

The thirteenth (13th) retraction and extension cycle was completed normally with no anomaly in function noted. The aircraft was lowered to the ground and the jacks and stand was removed.

Conclusion: The aircraft's (N2122S) landing gear system (both visually and functionally) appears to operate exactly as described in the Cessna 210L maintenance manual. No defects or abnormalities were observed in the operation of the landing gear system during the visual and functional tests.

DARREN
KEITH
VAUGHN

Digitally signed by
DARREN KEITH
VAUGHN
Date: 2018.01.09
13:53:11 -08'00'

Darren K. Vaughn
Aviation Safety Inspector