

ACCIDENT AND EXAMINATION NOTES

HISTORY OF FLIGHT

On August 05, 2019, about 1445 mountain daylight time, a Cessna 182L, N3469R, departed controlled flight and collided with terrain while attempting to land on a private road in Wolf Point, Montana. The pilot, the registered owner, was operating the airplane under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91. The private pilot and front-seated passenger sustained fatal injuries; the airplane was destroyed. The business flight departed from Frank Wiley Field Airport, Miles City, Montana, about 1350 with a planned destination of the private road. Visual meteorological conditions prevailed and no flight plan had been filed.

A witness stated that he owned the farm adjacent to where the accident site was located. The pilot had built grain silos for him in the past and he had contracted him to build more. The pilot and passenger, an employee at the pilot's company, had planned to visit the farm that day and had discussed with the witness landing at the farm. The pilot had been to farm on prior occasions, but had never flown there. The witness recalled the pilot called him at 1423 saying that he was flying over the town of Wolf Point and would be landing at the farm shortly. The witness, positioned near his silos, observed the airplane fly over his location and make a left turn to the west paralleling the dirt road he intended to land. The airplane then began a turn to the east to come back and land. He observed the airplane make a sharp turn and descend into terrain. Upon impact, the airplane burst into flames in the witness drove his water truck to put up the fire.



Figure 1: Presumed Accident Flight Path (According to Witness)

DATE	FROM	TO	FLIGHT	FLIGHT TIME	STD	ATD	STA	STATUS			
05 Aug 2019	—	Wolf Point (OLF)	(N3469R)	0:52	—	7:48 PM	—	Landed 2:41 PM	KML	CSV	Play
05 Aug 2019	Miles City (MLS)	Miles City (MLS)	(N3469R)	0:16	—	1:32 PM	—	Landed 1:48 PM	KML	CSV	Play
05 Aug 2019	Gillette (GCC)	Miles City (MLS)	(N3469R)	0:55	—	12:08 PM	—	Landed 1:03 PM	KML	CSV	Play
02 Aug 2019	—	Gillette (GCC)	(N3469R)	1:25	—	6:42 PM	—	Landed 8:07 PM	KML	CSV	Play
01 Aug 2019	—	Billings (BIL)	(N3469R)	0:53	—	2:17 PM	—	Landed 3:09 PM	KML	CSV	Play
01 Aug 2019	—	—	(N3469R)	—	—	12:39 PM	—	Unknown	KML	CSV	Play

Figure 2: ADSB Information

WRECKAGE AND IMPACT

The accident site was located on a flat field about 21 nautical miles north of Wolf Point at the following coordinates: 48°26'9"N / 105°45'39 "W. In character, the terrain was composed of hard, dry dirt and short vegetation. The wreckage was found distributed over a 40-foot distance with the nose pointed on a median magnetic bearing of about 340°. The main wreckage, consisting of all of the major control surfaces, was about 60 feet south of the road. The fuselage and inboard sections of the wings had been consumed by fire.

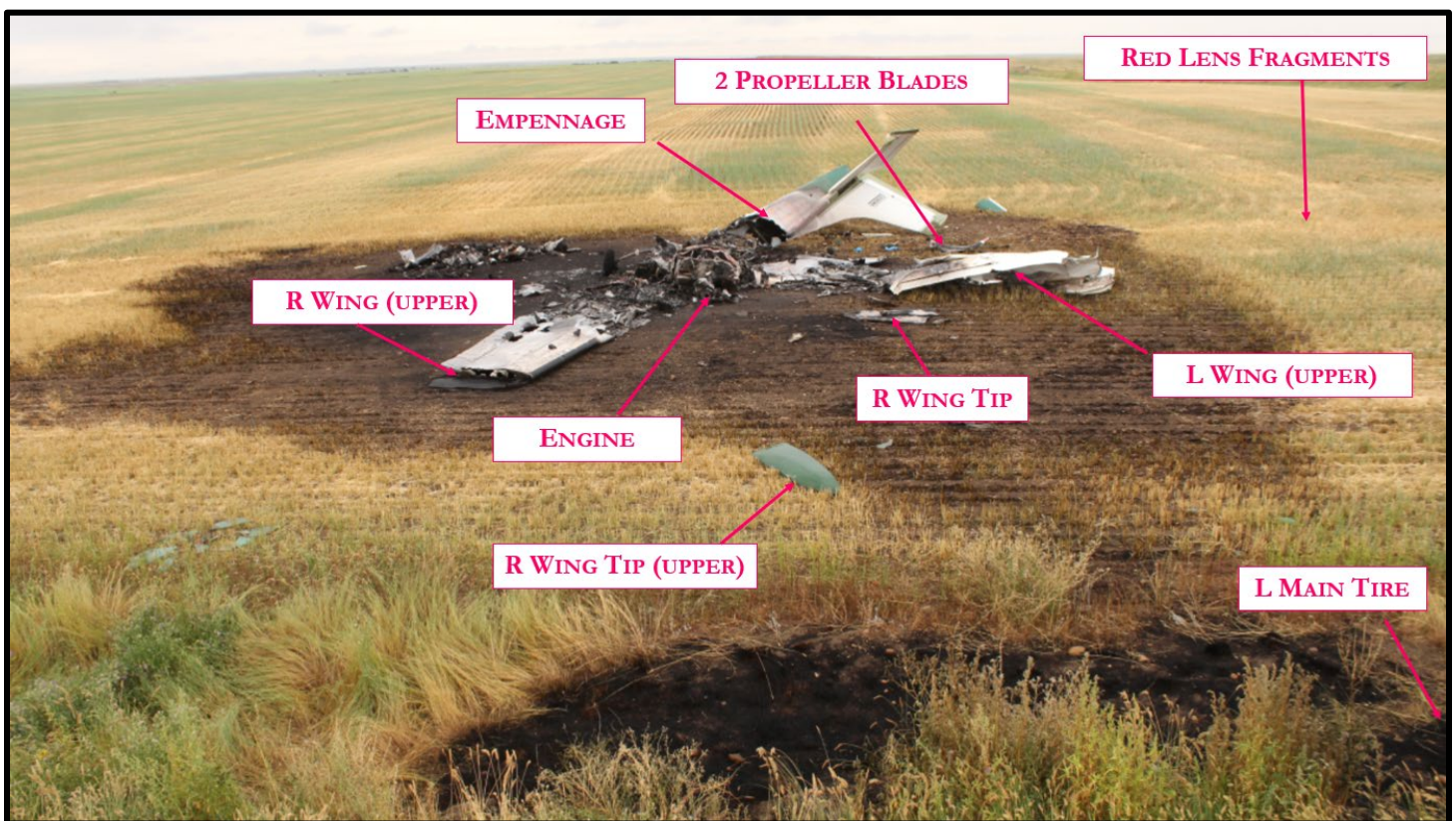


Figure 3: Wreckage

The first identified piece of debris was fragments of red lens, consistent with the tip of the left wing contacting the ground at the beginning of the accident sequence. From the lens was a disruption in the vegetation similar in shape and size to that of the leading edge of the left wing and pieces of lens consistent with the land light were in the dirt. Thereafter was a crater in the dirt with two propeller blades imbedded.

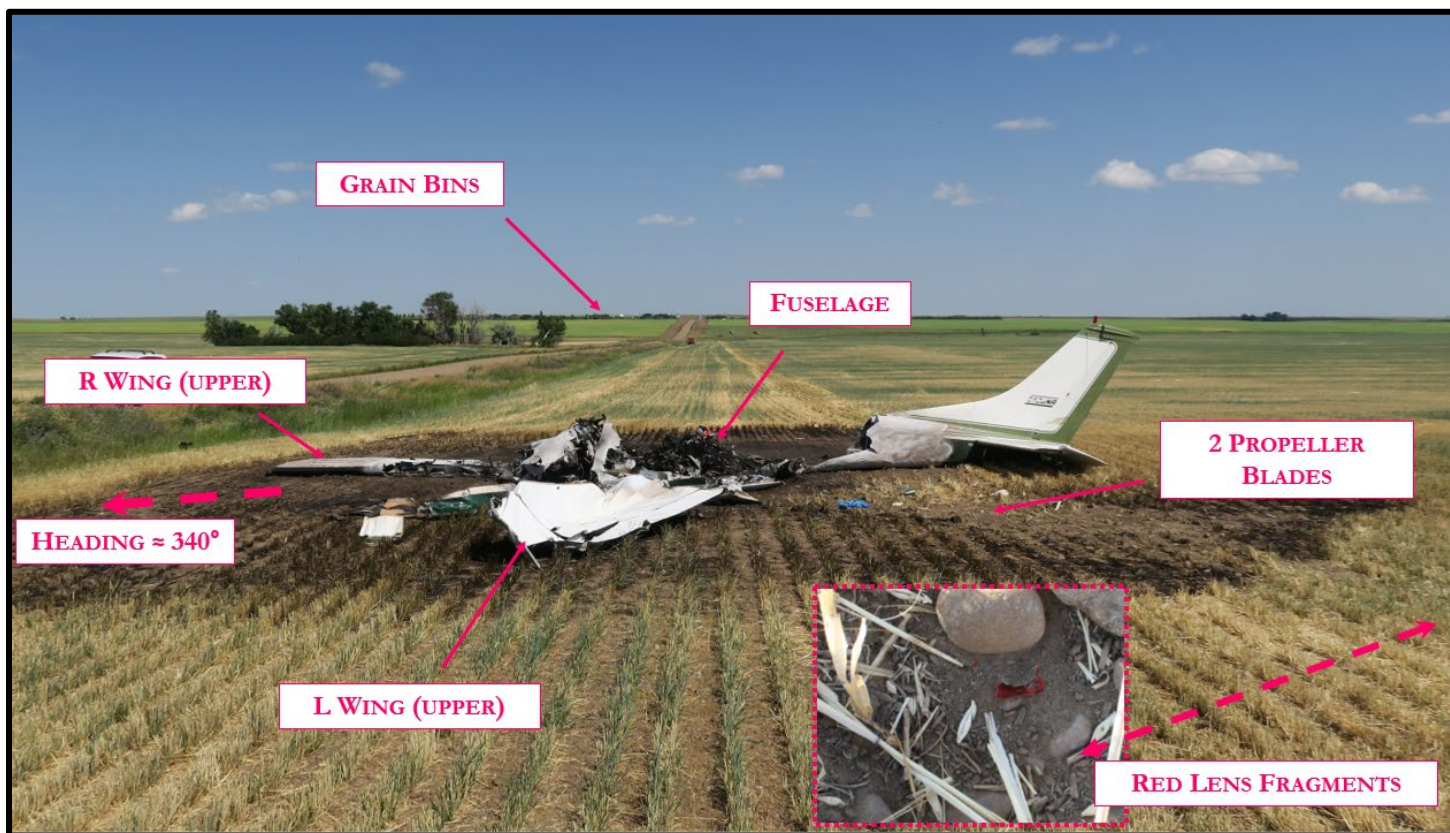


Figure 4: First Identified Point of Impact



Figure 5: Impact Site

AIRFRAME

The airplane's data plate identified it was a Cessna 182L, serial number 18258769



Figure 6: Airplane Data Plate

The right and left wing came to rest upright and the flap and aileron control surfaces remained attached at their respective hinges. The right direct cable was continuous from the right cable drum in the cockpit to the bellcrank. The carry-through cable was attached to the right bellcrank and separated with a broom-straw appearance several feet outboard consistent with overload. The other end had a similar broom-strawed appearance and that portion of the cable was continuous to the left bellcrank, where it was secured. The flaps cables were attached at the drive pulley. The flap actuator was measured at 1.7 inches, which the Textron representative stated was consistent with the flaps extended between 5-10°.

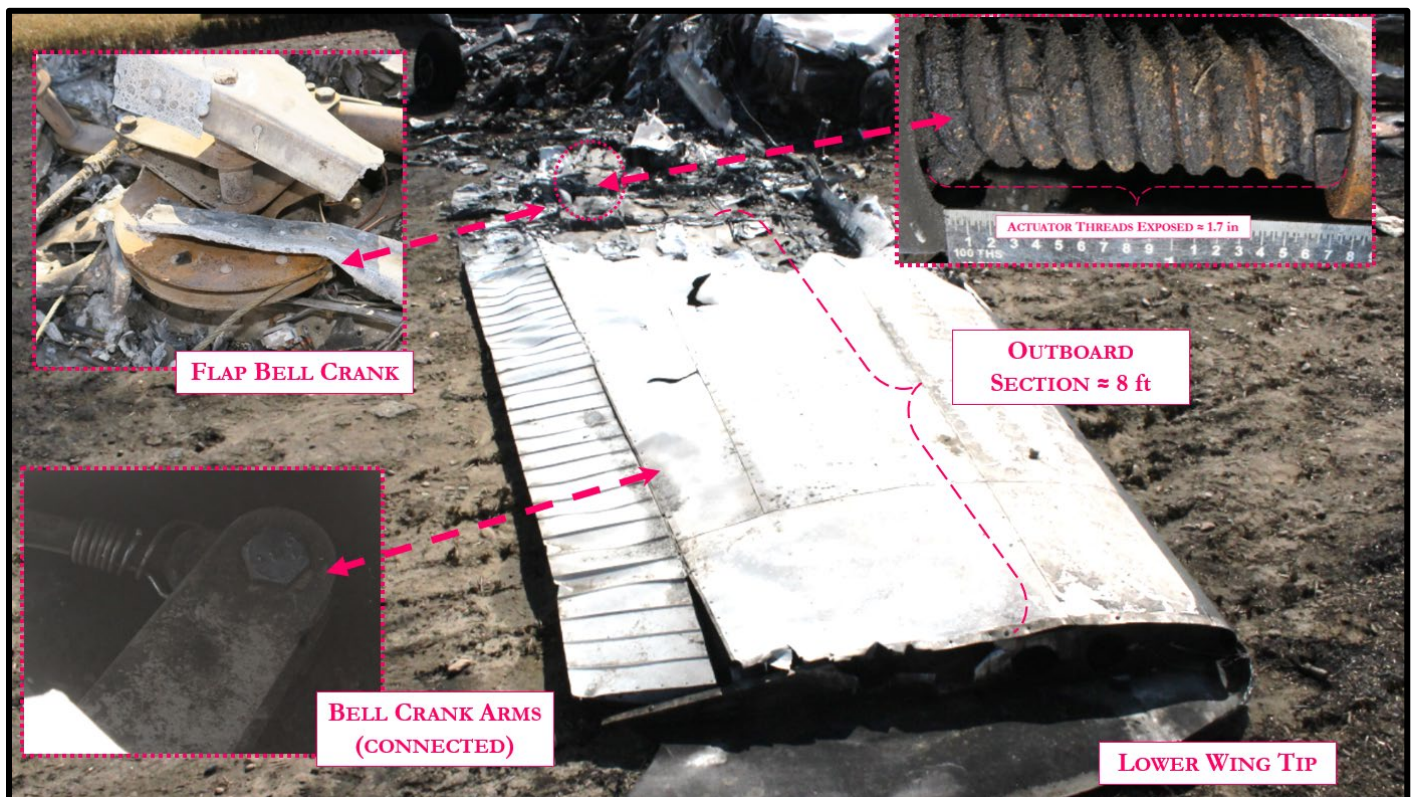


Figure 7: Left Wing

The left direct cable was attached to the bellcrank and the cable was continuous to an area it was trapped in the folded fuselage airframe. From that area the left cable was seen routed through the cable drum. The lower inner connect cable had been separated at the right drum. The left flap drive pulley had the direct cables swaged end pulled through and the retract cable swaged end was in the pulley.

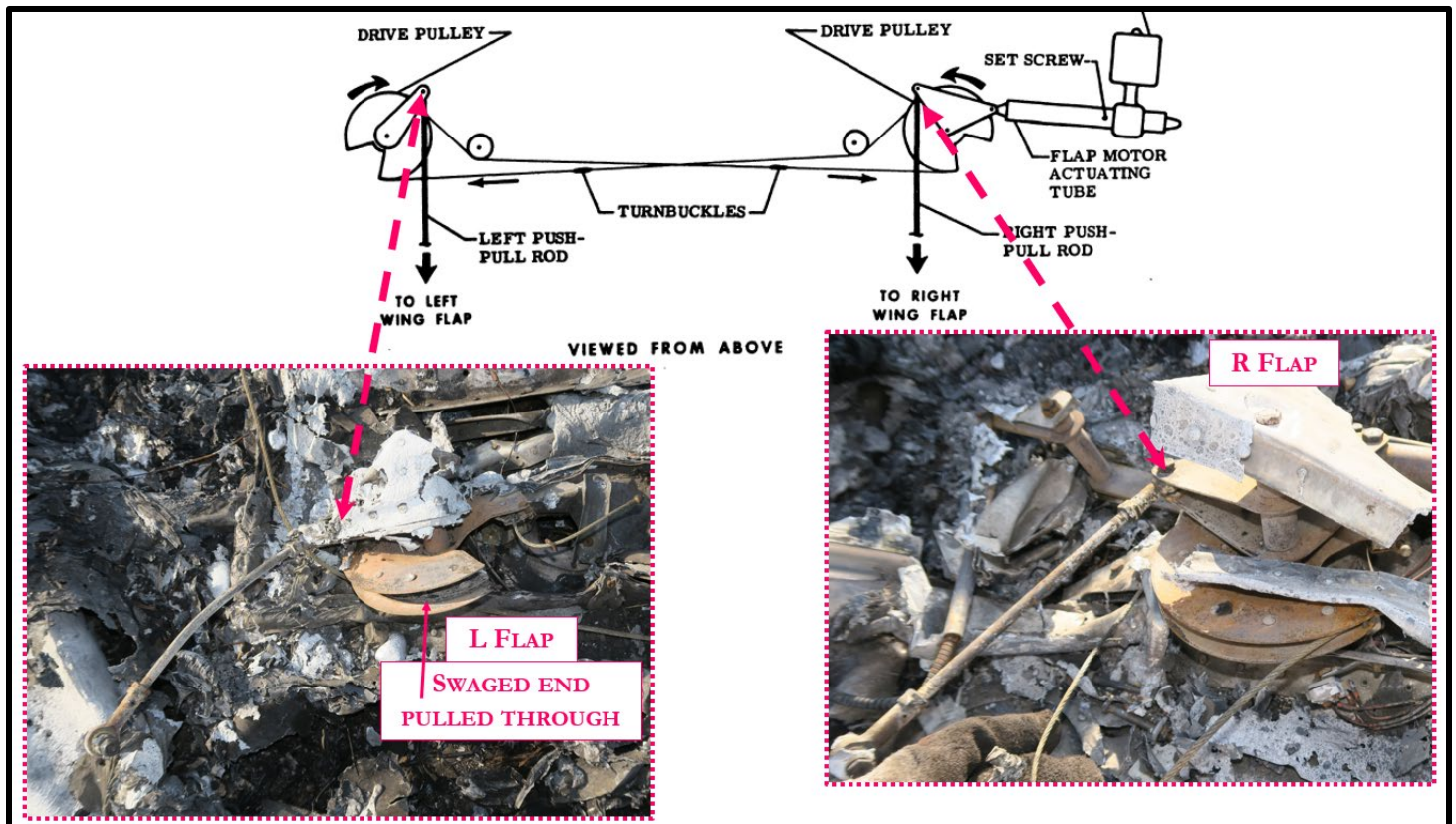


Figure 8: Flap System

EMPENNAGE

The elevator cables were connected in the cockpit and could not be traced through the crushed fuselage. From the fuselage they were continuous aft to the aft bellcrank. The push-pull tube was connected to the aft bellcrank (mounted on the aft bulkhead¹) and to the elevator control arm. There were marks on both the left and right torque-tubes where the bolt ends from the hardware that attaches the rudder cables to the rudder horn.

¹ The aft bulkhead contained the label 0712523-2; 26488380, with a date of March 09, 2017.

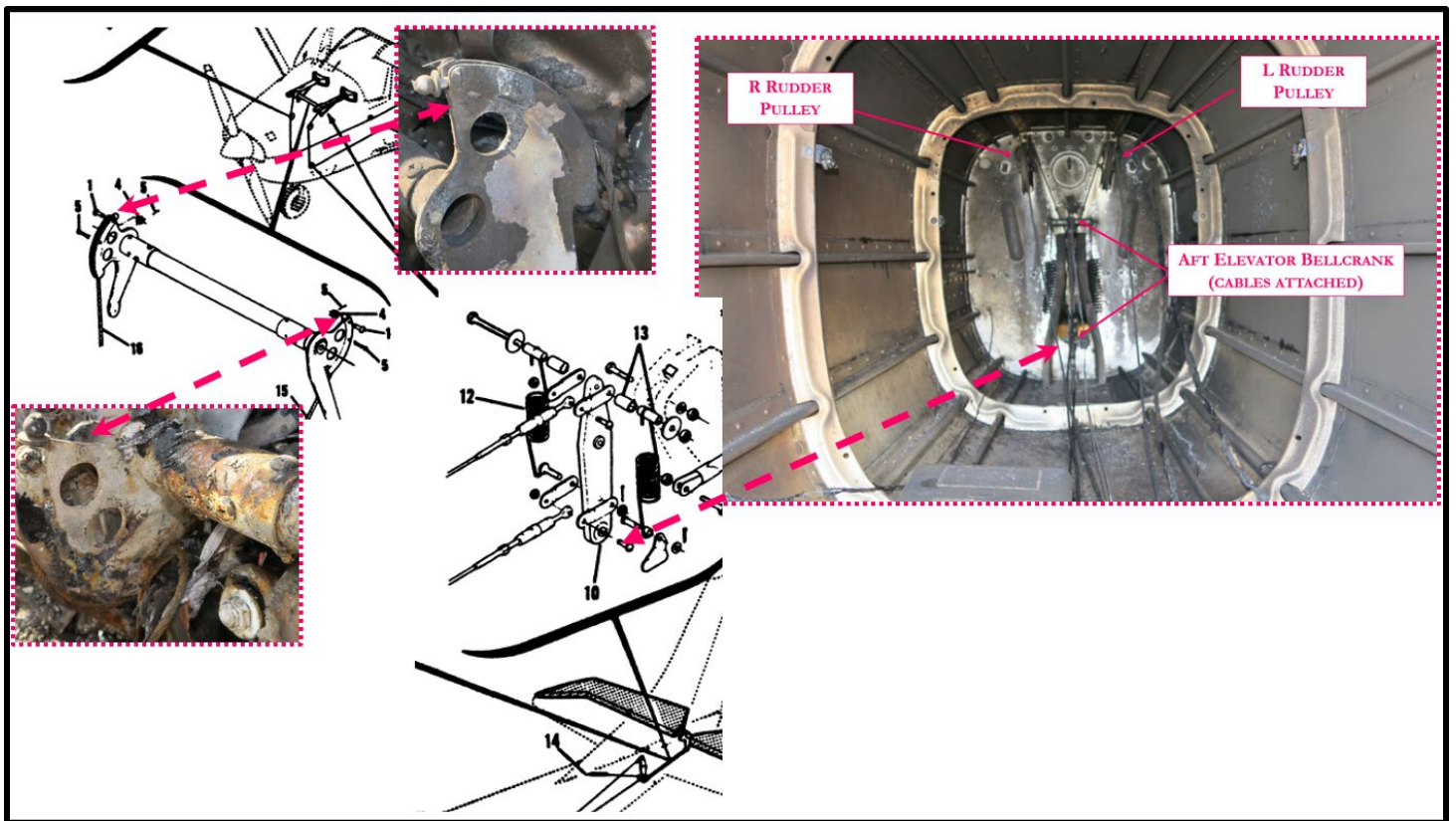


Figure 9: Elevator System

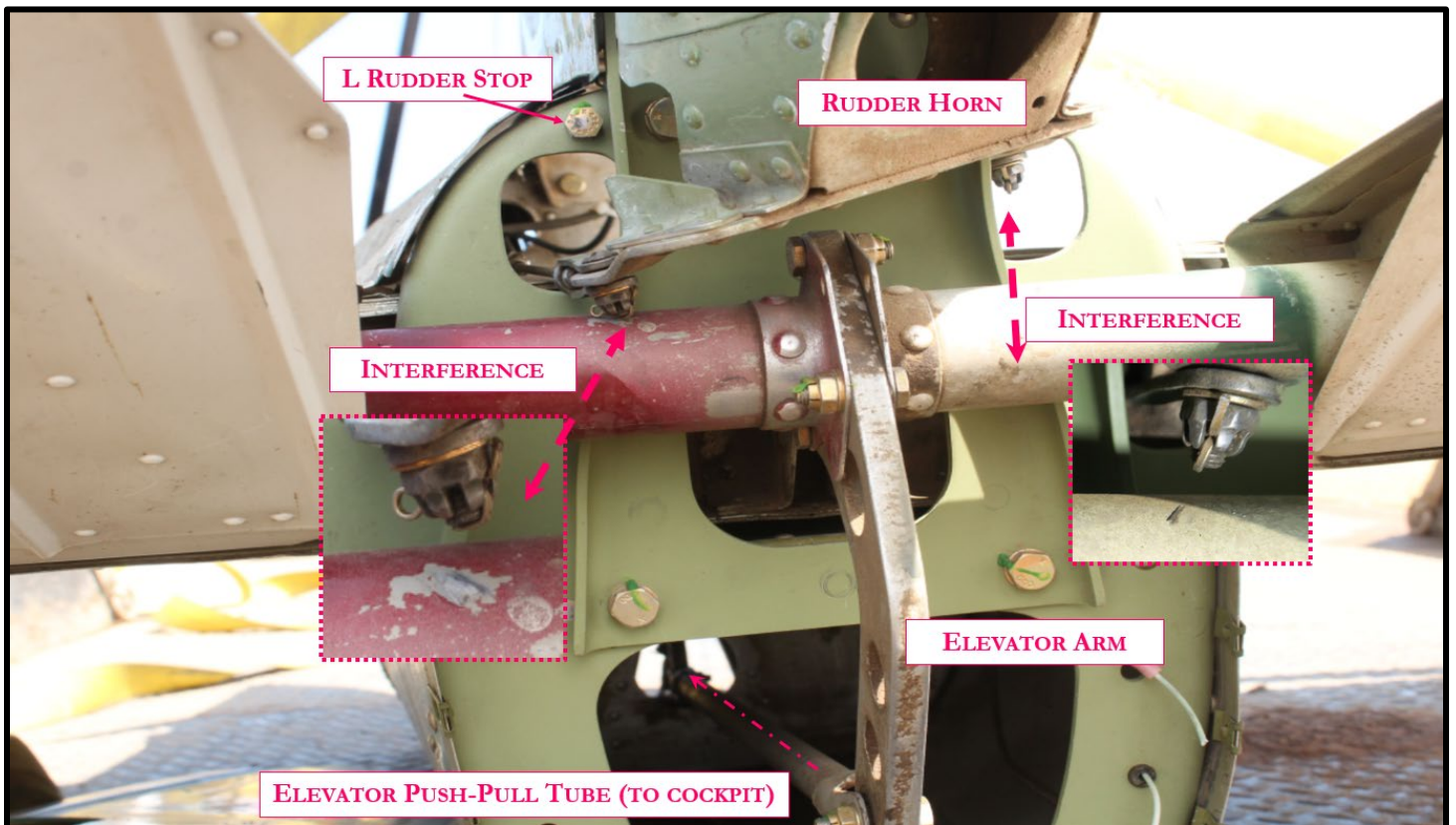


Figure 10: Elevator Torque Tube

The rudder cables were attached at the pedal in the cockpit and could not be traced through the crushed fuselage. From the fuselage, the cables continued back through the pulleys mounted on the aft bulkhead and were attached to their respective arm on the rudder horn.

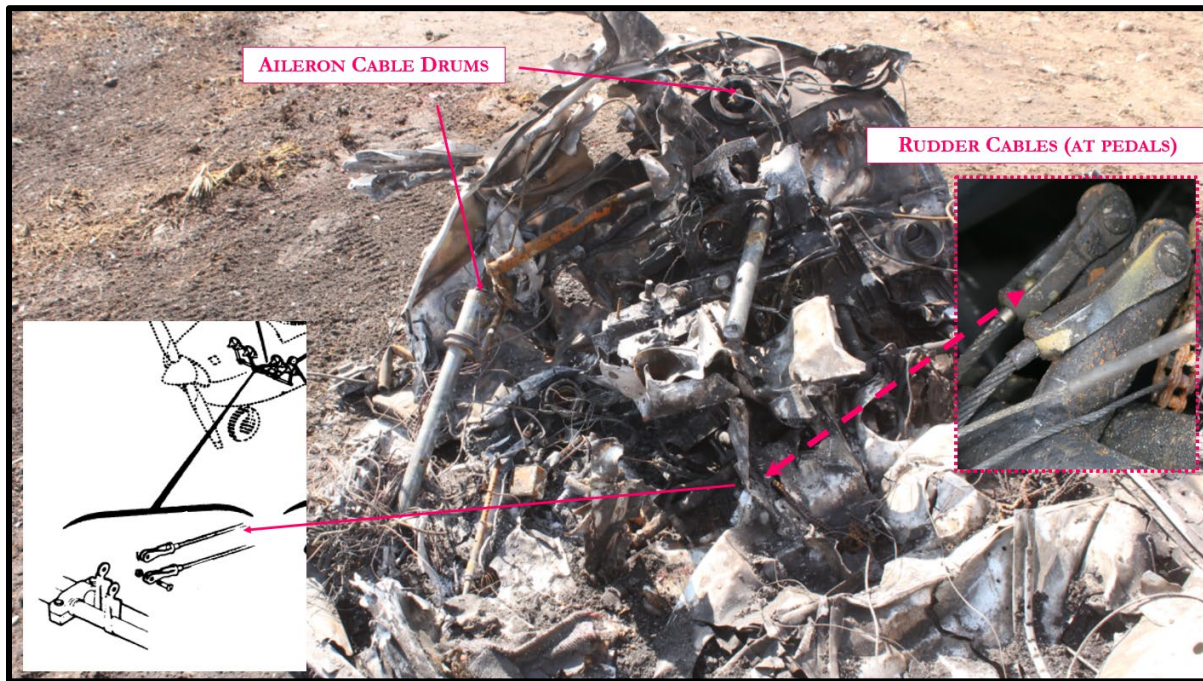


Figure 11: Rudder Cables

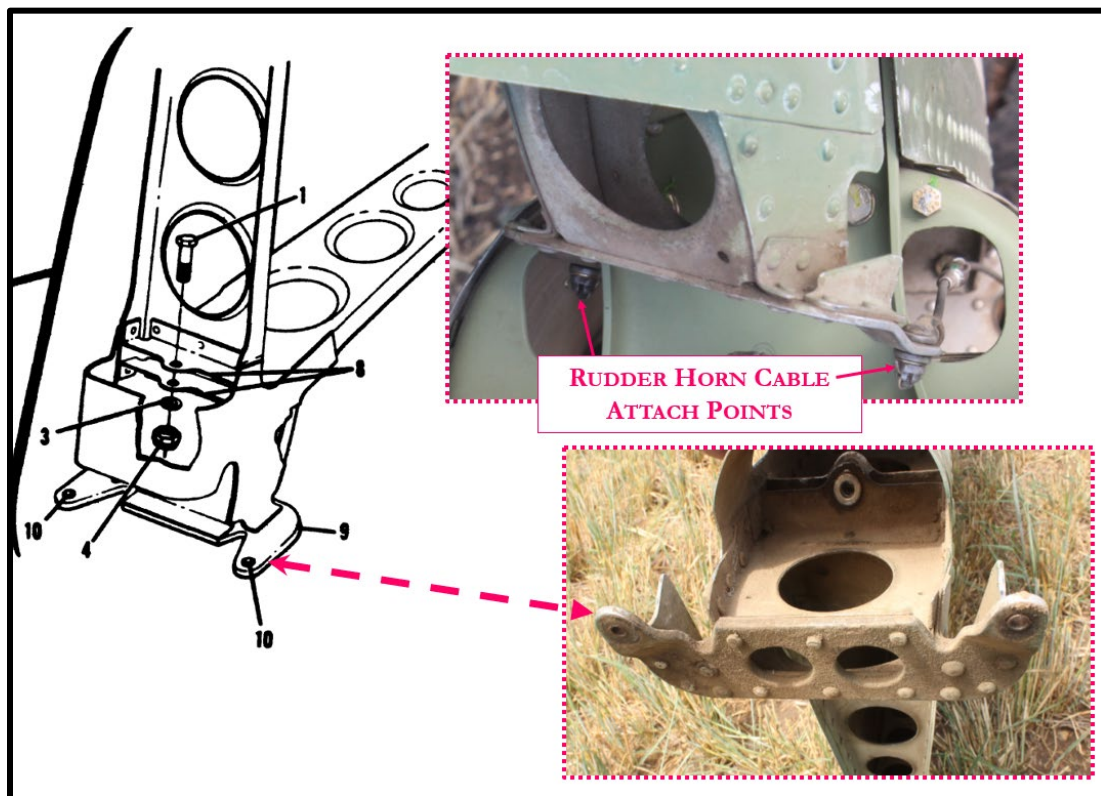


Figure 12: Rudder Horns

Investigators moved the rudder to the full left and right deflection where the rudder would hit the stops.

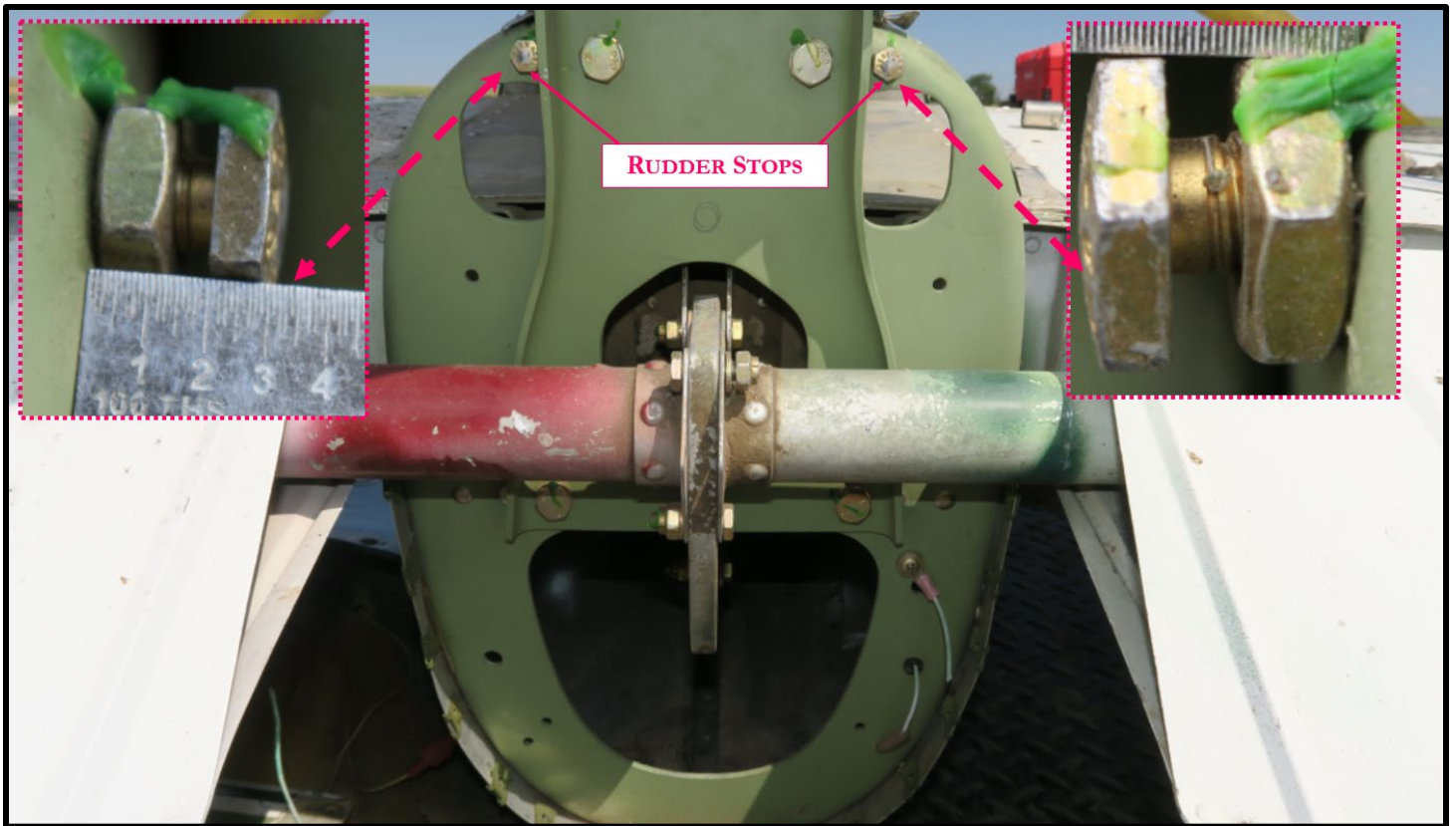


Figure 13: Rudder Stops

With the elevator control surface in the down position. When the rudder was near full deflection (both right and left), investigators attempted to move the elevator up, but the travel was hindered from the elevator contacting the bottom of the rudder surface. When the elevator was in the up position, investigators moved the rudder to the stops. When the rudder was near full deflection (both right and left), investigators attempted to move the elevator down, but the travel was hindered from the elevator contacting the rivets on the rudder control surface. There were signatures of rubbed-off paint from the rivets located at the bottom of the rudder consistent with the interference occurring in the past. Additionally, the area the elevator control surface contacted the rudder appeared to have paint that was reapplied.

The rudder deflection was measured to be 9.25 inches left and 9 inches right (see picture below). The Maintenance Manual shows the rudder travel limits are 8.12 inches minimum to 8.72 inches maximum. The left elevator was measured 23° up and 20° down; the right elevator was measured 25° up and 17° down (see pictures below). The Maintenance Manual shows the elevator travel limits were up: 26° +/- 1° up and 17° +/- 1° down.

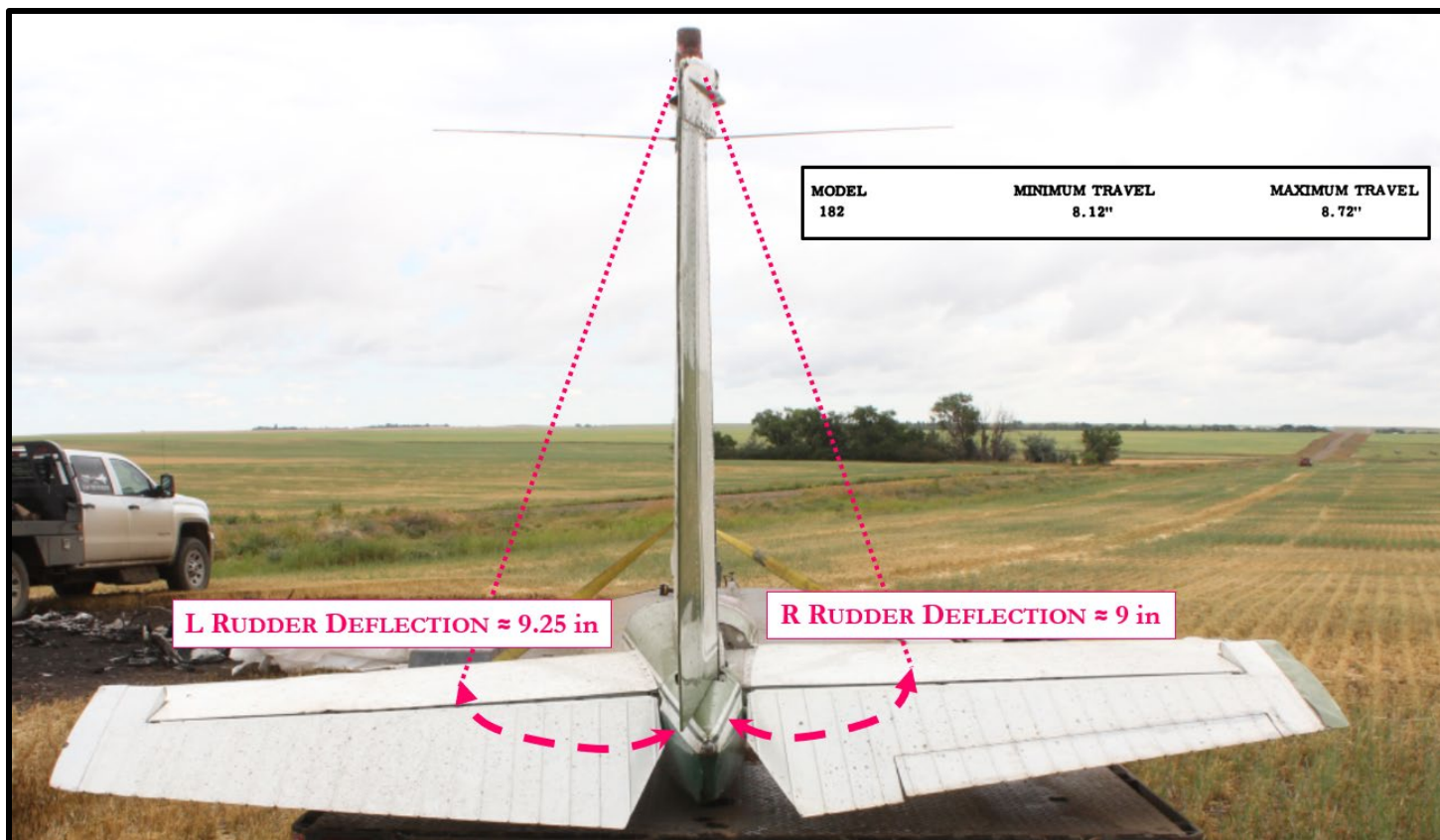


Figure 14: Rudder Deflection

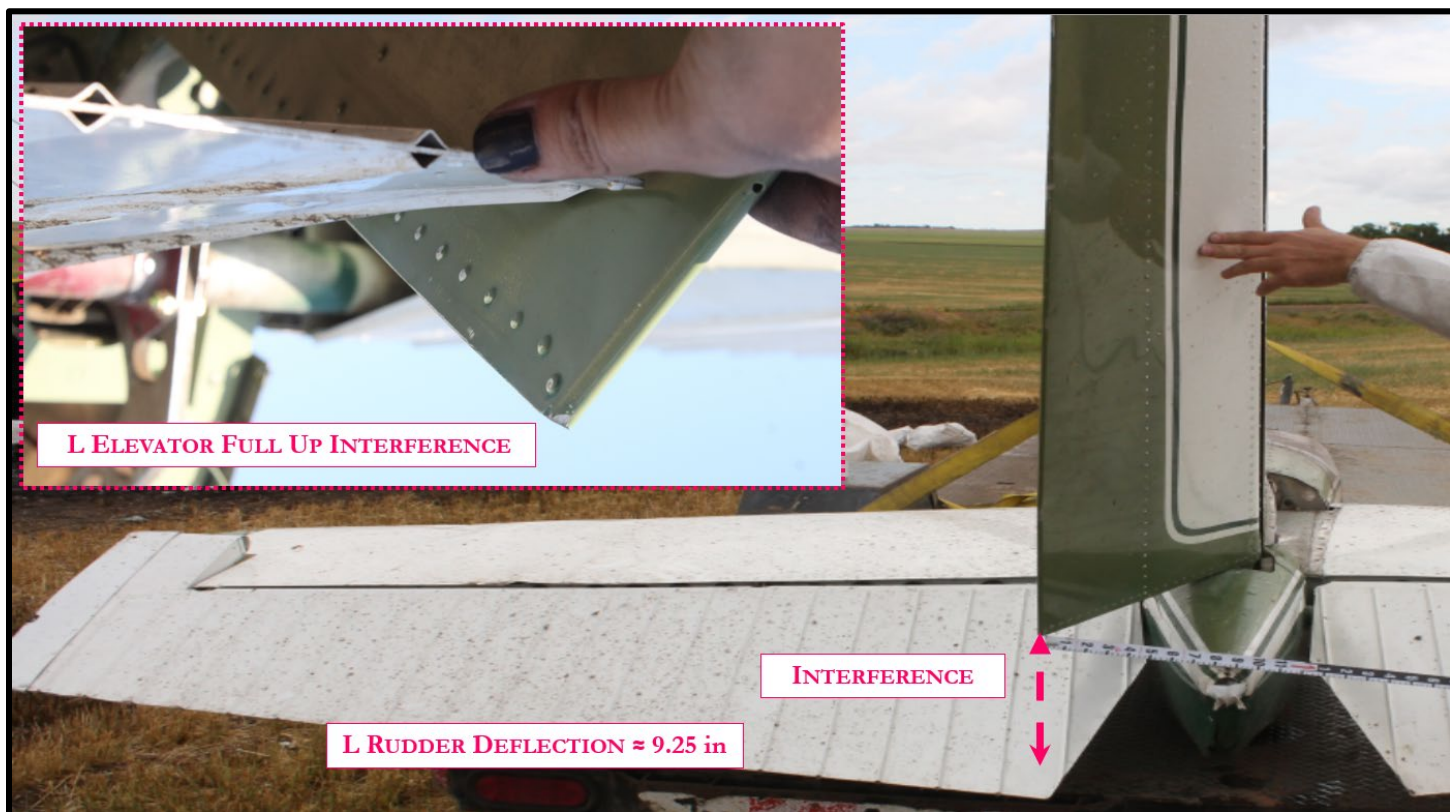


Figure 15: Interference Between Rudder and Elevator



Figure 16: Close Up of Interference

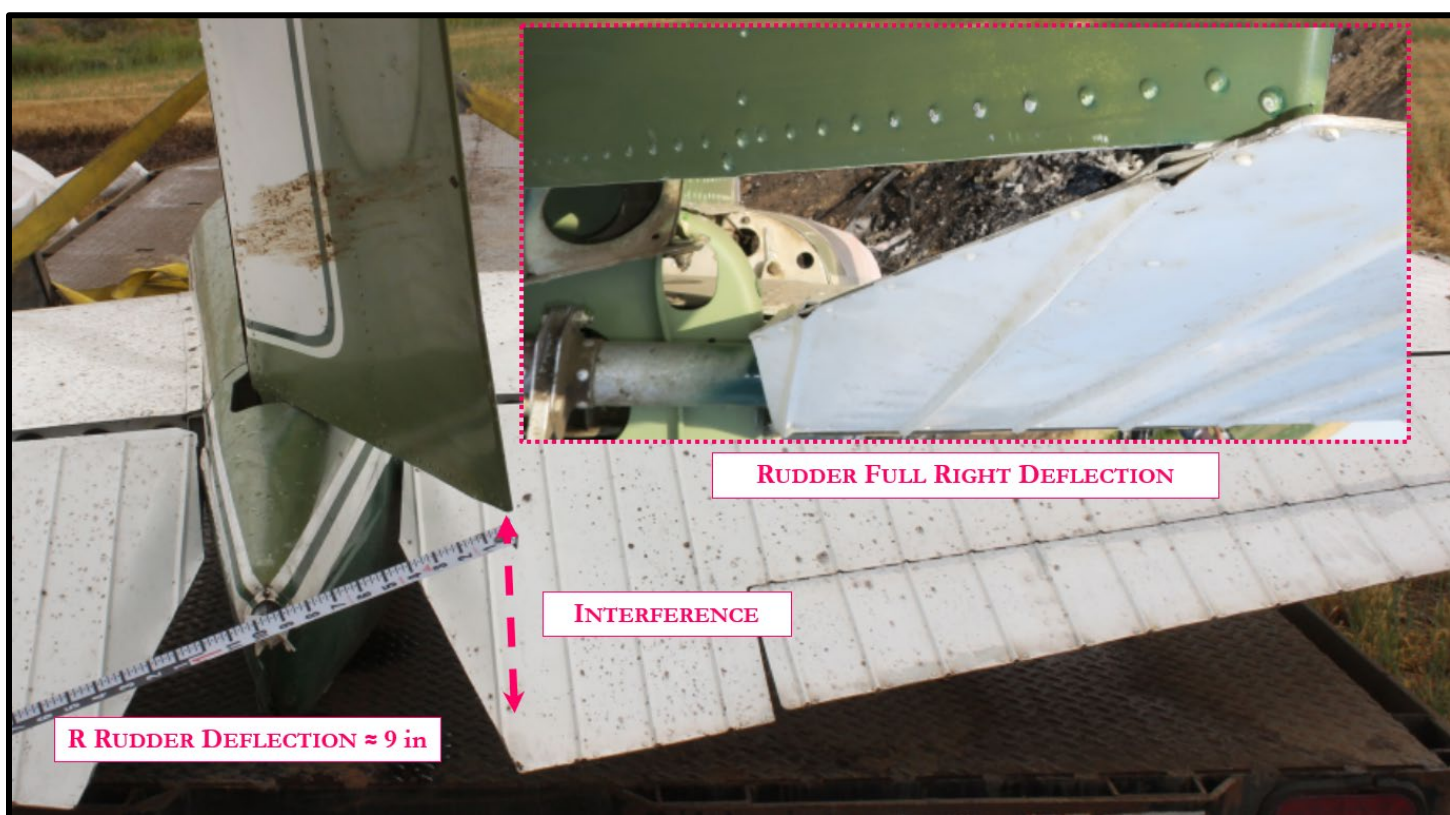


Figure 17: Interference of Right Rudder

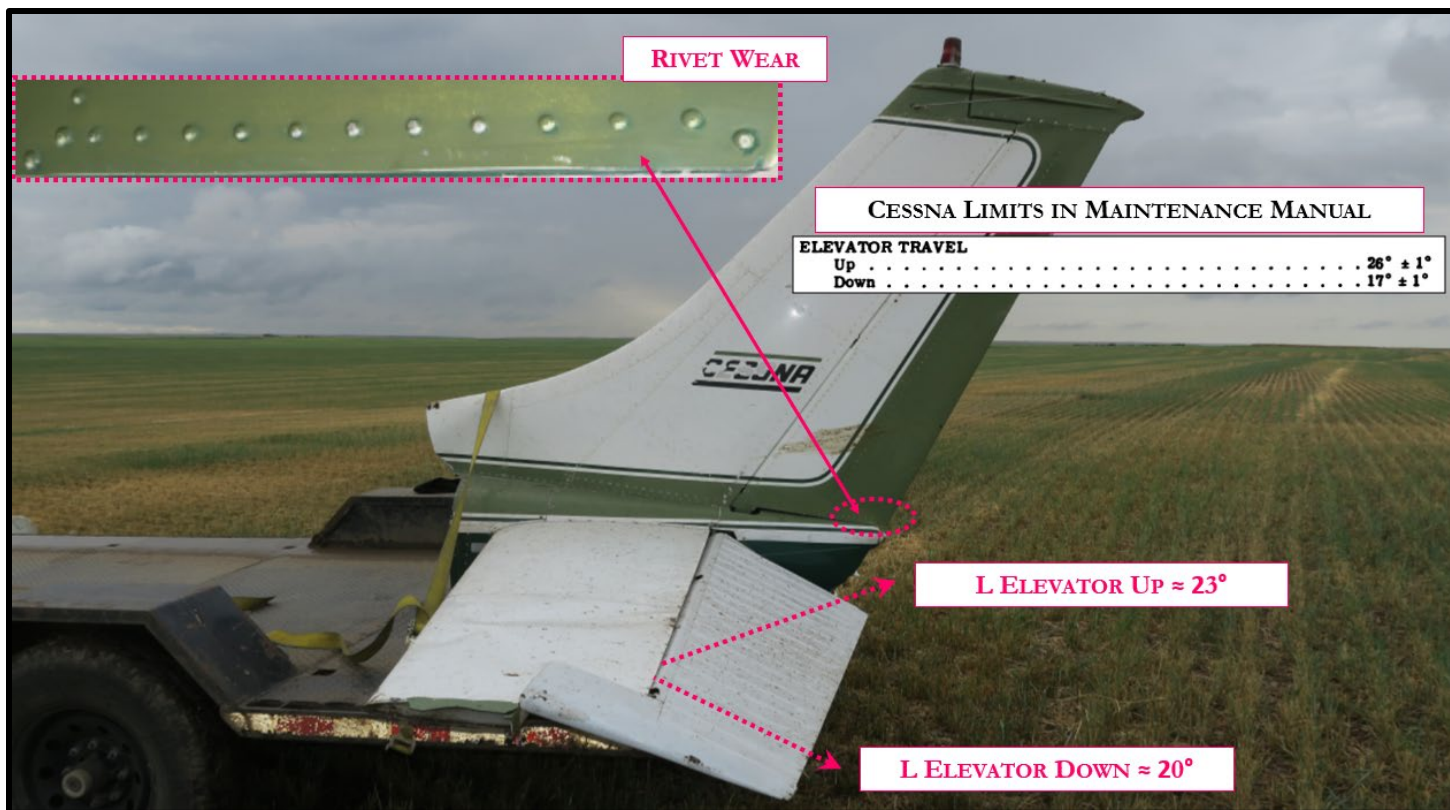


Figure 18: Left Elevator Interference

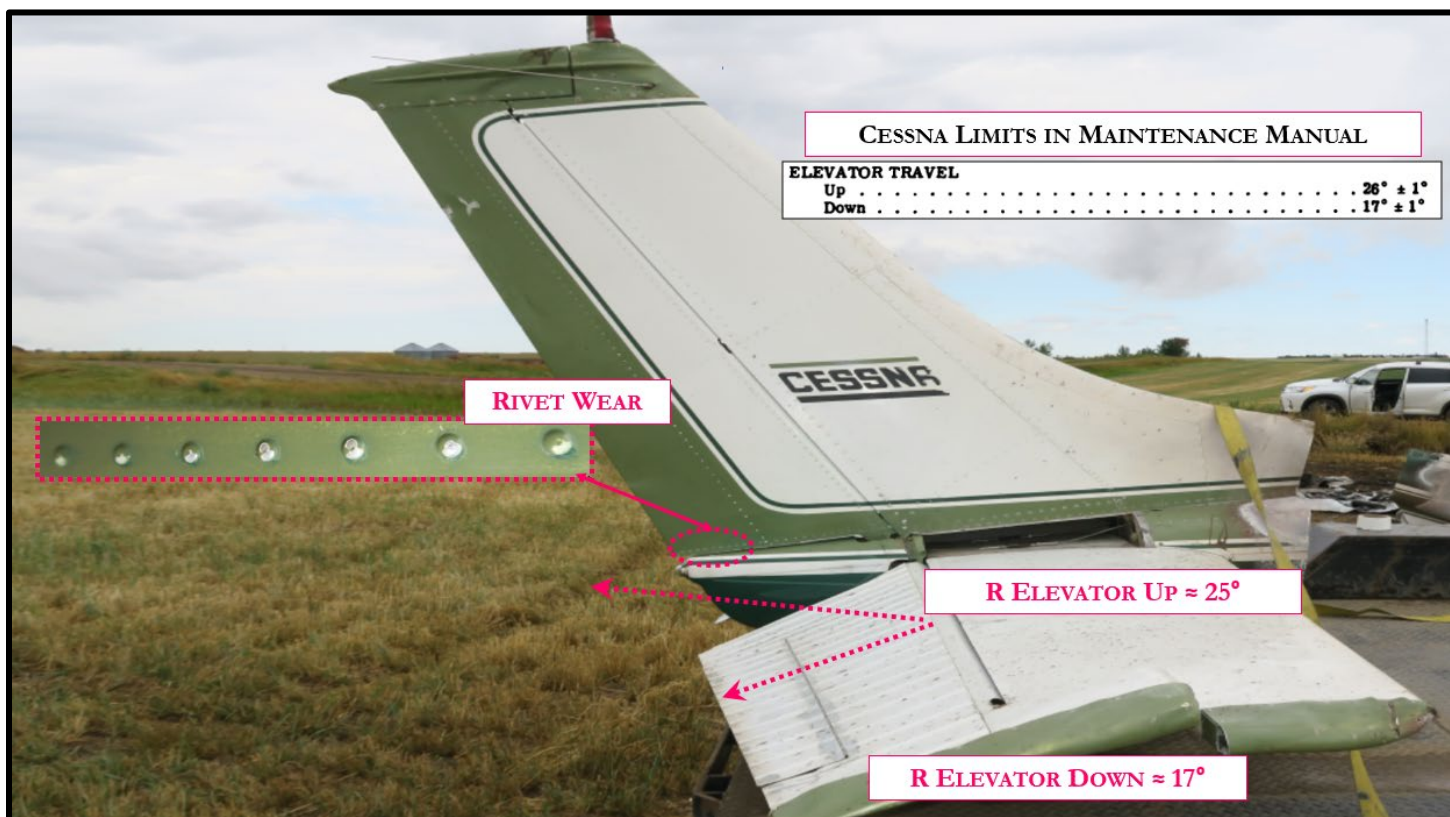


Figure 19: Right Elevator Interference

RIGGING

In the Cessna Maintenance Manual section 10-7, Cable Tensions, states: on the Models 182 and 185, the rudder control system is "closed" by a bellcrank or a cable, and the 20 to 40 pounds cable tension shown in figures 10-5 and 10-6 is applicable.

RUDDER RIGGING 10-9

Model 182.

- a. Adjust rudder travel stop bolts to attain correct rudder travel, listed in Section 1. Figure 10-14 shows one method of checking rudder travel. NOTE Rudder stop bolts are located at the rear fuselage bulkhead, and may be screwed in or out to adjust travel. Some screw into self-locking nutplates, others use a jam type locknut for security.
 - b. Remove rudder trim chain by removing screws (17, figure 10-9) using care not to drop washers (15) which are used as shims to adjust chain tension. Spring the bracket downward until chain can be removed.
 - c. Disconnect bungee from bellcrank (12, figure 10-8).
 - d. Loosen rudder cable turnbuckles and clamp rudder pedals in neutral.
 - e. Center bellcrank (12, figure 10-8) by adjusting push-pull rods (15 and 20). Bellcrank is centered when bolts in each end are the same distance from the bulkhead just in front of the bellcrank. Tighten jam nuts.
 - f. Maintaining rudder pedals in neutral, adjust rudder cable turnbuckles to obtain 20 to 40 pounds cable tension while the rudder is offset one degree to the right (5/16" at lower trailing edge). Safety the turnbuckles.
- NOTE: After completing the preceding steps, the rudder control system is rigged. The following steps outline rudder trim control system and nosewheel steering system rigging. The rudder control system must be correctly rigged prior to rigging of the trim and steering systems.
- g. Tie down or weight the tail to raise nosewheel off the ground.
 - h. Make sure nose gear is centered against external centering stop and rudder pedals are still clamped in neutral.
 - i. Screw bungee sprocket all the way into bungee shaft, then screw rod end all the way into sprocket threads. This sets the bungee at its shortest free length.
 - j. Holding rod end to prevent it from turning, rotate sprocket until hole in rod end aligns exactly with attaching hole in bellcrank, and install.
 - k. Rotate rudder trim control wheel until indicator is centered in neutral, and without moving bungee sprocket, engage chain with sprocket (11, figure 10-8).
 - l. Tighten chain to 1/2 inch free play at its midpoint by adding washers (15, figure 10-9) as required (maximum of four each side), then install the bracket with screws (17).
 - m. Lower nosewheel to ground, remove clamps from rudder pedals, be sure all turnbuckles are safetied and jam nuts are tight, then reinstall all parts removed for access.

WARNING: Be sure rudder moves in correct direction when operated by the rudder pedals

ELEVATOR RIGGING 8-11

The Model 182 is equipped with elevator stops which are four-sided bushings, drilled off-center so they may be rotated to any one of four positions to attain correct travel. Each 90-degree rotation changes elevator travel approximately one degree. Travels are relative to horizontal stabilizer. Neutral position of elevators is the position where elevators are streamlined with the stabilizer. Disregard counterweight areas of elevators when streamlining, since some models have these areas contoured to streamline elevator tabs in cruise flight.

- a. Set elevator stops to attain travel specified for particular model in the applicable chart in Section 1.
- b. Tighten elevator cables to tension shown on applicable illustration in this section. Turnbuckles should be adjusted so the control column does not contact the instrument panel in the full-up position and the forward bellcrank does not contact the firewall in the full-down position.

If the airplane was in a nose-low pitch the elevator would be down; if the airplane was making a left turn, the rudder would be deflected left. Depending on which was initiated first, the rudder would either not be able to fully deflect left or the rudder would not be able to deflect up.

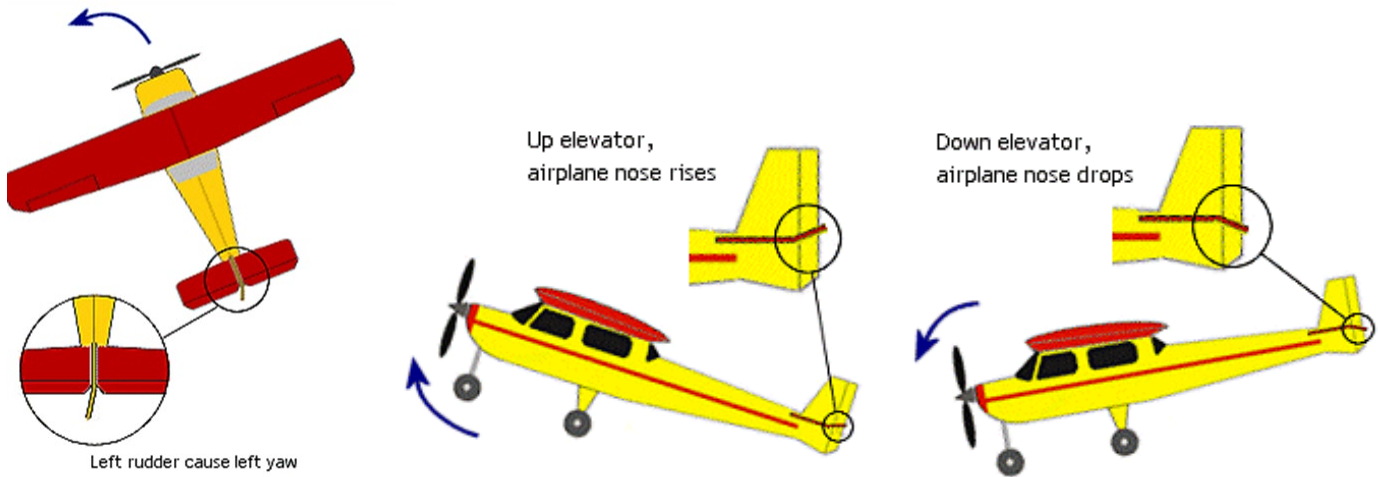


Figure 20: Illustrations of Flight Controls Positions

The Cessna Owner’s Manual stated that the stall characteristics were conventional and an aural warning is provided by a stall warning horn which sounds between 5 and 10 MPH above the stall in all configurations. The Owner’s Manual indicated a stall speed of 64 mph at a gross weight of 2,800 lbs, with no flaps. At bank angles of 30°, and 60°, the stall speed increased to 69, 91 mph, respectively. The maximum flap extension speed was 110 mph, and the recommended final approach speed was 75 KIAS.

The Cessna Owner’s Manual provides the following stall speeds at gross weight:

STALL SPEED, POWER OFF			
Gross Weight 2800 LBS.	ANGLE OF BANK		
	0°	30°	60°
CONFIGURATION			
FLAPS UP	64	69	91
FLAPS 20°	57	61	81
FLAPS 40°	55	59	78
SPEEDS ARE MPH, CAS			

Figure 21: Stall Speeds

ENGINE

The Continental Motors O-470- R, serial number 191534-7-R, was installed on the engine.



Figure 22: Engine Data Plate

Investigators rotated the engine via the vacuum pump drive. They established the engine's internal mechanical continuity during rotation of the crankshaft and upon attainment of thumb compression. A borescope examination on all cylinders found no foreign object damage, no evidence of detonation, and no indication of excessive oil consumption. The engine representative removed the top spark plugs. The spark plug electrodes were gray in color, which corresponded to normal operation according to the Champion Aviation Check-A-Plug AV-27 Chart.

The carburetor was fractured from its mount but remained attached by the control cables and fuel inlet line. Despite impact damage to the control arms, they were able to move stop to stop. The fuel screen inside the carburetor was free of obstruction and the floats sustained thermal damage. Disassembly of the oil pump revealed that the gear were intact and the cavity was lightly scored consistent with small debris passing through. The No. 6 rocker cover was thermally destroyed and the rocker arms, valve stems and springs were thermally damaged. The ignition harness was thermally damaged. The magnetos remained attached to their mounts. Removal of the magnetos revealed that they turned freely by hand with impulse coupling engagement observed. The left magneto produced spark on all six thermally damaged ignition leads. The right magneto did not produced spark on the thermally damaged ignition lead. Partial disassembly (removing the distributor cap) of the right magneto and turning the drive by hand displayed spark on the points. The thermal damaged oil filter was cut open and the filter element was clean of debris.

There was no evidence of pre-mishap mechanical malfunctions observed during the examination of the engine.

PROPELLER

The three-bladed McCauley propeller hub was crushed, and all blades separated. All blades exhibited twisting and had leading edge gouges and chordwise scoring.

RECORDS

The pilot purchased the airplane in October 2017. At an airframe total time of 3191.41 hours on May 30, 2018 the airplane underwent major repairs to the wings from the pilot colliding into a barn. The tachometer at the accident site was destroyed and no meaningful reading could be made.

The last recorded maintenance performed on the airplane consisted of an annual inspection completed on June 10, 2019; the engine was overhauled at that time. The squawk sheet indicated that the rear bulkhead was cracked and was subsequently repaired and replaced. It additionally listed damage to the rudder (within limits) and damage to the left elevator (repaired and replaced). The elevator cables were "too high" and corrected by being adjusted "30 +/- 10" Rigged.

Propeller Maintenance Log, Propeller Certificate 12.06.18
Engine Log, Maintenance Record, Weight and Balance 3.03.99 to 6.07.19
Repairs 6.07.19
Repair order 5.31.19 to 6.10.19
Repair 11.21.2017
Repair 5.03.18a
Repair 5.03.18b
Repair 5.03.18c
Repair 2.28.18
Stratus ESD transponder 7.12.19

May 07, 2018: Annual performed at Flightline, Gillette, Montana:

Make Model		Registration	Tach/Hobbs Time
C-182L		3469R	2951.41
Quantity/Hours	Description		
	SERVICE AND LABOR		
18	2018 Annual		
18	Install rear bulkhead kit		
5	Remove and replace seals in nose strut		
5	Remove and replace hoses and sasket in Left hand fuel tank		
0.5	Remove and replace left hand elevator		
23	Repair left hand wing		
2	Rigg flaps system		
1	Rigg elevator system		
2	Rigg aileron system		
2	Remove and replace flap motor/clean and grease Txm		
1	Remove and replace intake tube		
2.5	Remove and replace prop. cable		
4	Remove and replace cabin hoses		
1	Install door steward		
1.5	Remove and replace elevator trim actuator after OH		
2	Remove and replace EGT system		
4	Rigg elevator trim system		
1.5	Rigg rudder system		
	SUBTOTAL LABOR		
1	632323 Elbow		
1	1220002-22 Skin		
1	SK210-161A1 Bulkhead kit		
1	C31002-0103 Flap motor		
1	0523541-46 Wing stringer		
1	200C10-1 door steward installation kit		
1	0-08700 Alcor EGT system		
1	0570026-1 Block		
1	Ship parts		
1	Ch Oil filter		
1	BA8103 Air filter		
1	51588-1 Gasket		
1	MCSK172-1F Nose strut seal kit		
2	Fuel Hose		
1	1/2 fuel hose		
1	1234600-1 Left hand elevator		
1	1260074-1 AAI702 Elevator trim actuator repair		

* Damage to Rudder	Within limits of AMM
* Damage to Elevator LH	signed R/R

Elevator cables too high	Adj. to 30 $\pm$ 10 Rigged
Elevator Trim stiff	PH Trim Act.
Rudder Trim stiff	A. Cleared



Gillette, WY 82716

5-3-18 N3469R TACH: 2951.41 AFTT: 3191.41
 R&R fuel sender gasket in LH wing w/ P/N S1588-1. R&R propeller control cable w/ MCC299506-0102. R&R prop control rod end w/ P/N MCS1104-3. R&R seals in nose strut w/ kit MCSK172-1F, serviced nose strut w/ Ni & Mil-5606. R&R engine induction filter w/ BA 8103-1. R&R LH Elevator w/ Serviceable P/N 1234600-1, est. Component TT: 2172.8. Installed elevator trim actuator P/N 1260074-1 S/N AAI702 after OH by Aircraft Accessories International. R&R flap motor w/ P/N C301002-0103. Cleaned and lubricated flap transmission IAW Cessna 100-Series Service Manual. R&R VOR antennae block w/ P/N 0570026-1. Installed Cessna rear bulkhead kit SK210-161A; AD 72-07-09 no longer applies IAW SEB99-12 Rev.1. Repaired damaged stringers, auxiliary spar, and spar on LH wing between Sta. 190.00 & 208.00 (see form 337 this date). R&R bottom skin on LH between Sta. 190.00 & 208.00 w/ P/N 1220002-22. Installed Alcor EGT system gage P/N 46150 S/N 268651 IAW STC SA522SW (see form 337 this date). Installed Mountain View Aviation P/N 200C10-1 Door Steward on LH door IAW STC SA01120SE (see form 337 this date). Adj Aileron Carry-thru Cable to 40lbs $\pm$ 10. Adj Elevator control cables to 30lbs $\pm$ 10. Adj. Rudder control cables to 30lbs $\pm$ 10. Adj. Elevator trim cables to 10-15lbs. Adj Flap control cables to 30lbs $\pm$ 10. Rigged ailerons, flaps, elevator, rudder, and elevator trim system IAW Cessna 100-Series Service Manual P/N D637-1-13. Inspected ELT IAW 91.207(d); battery due Feb. 2019. C/W AD 83-13-01 Fuel Cap Sealing IAW Part (a) & (b); due next May 2019. C/W AD 54-10-01R1 Bladder Fuel Cells IAW Part (A) & (d); due next May 2019. C/W AD 11-10-09 Seat track and seat pin IAW Part (g); due next @ AFTT: 3291.4 or May 2019. C/W AD 76-07-12 Bendix Switch IAW Part 1; due next @ AFTT: 3291.41. Run up, ops, and test flight ok. I certify that this aircraft has been inspected IAW Annual Inspection IAW FAR 43 Appendix D and has been found to be in airworthy condition. ----- Heath Rose A&P

Figure 23: Maintenance from the Repairs

DATE 08/01/2018 TACH: 3011.0 TSOH: 329.28

PERFORMED CYLINDER COMPRESSION CHECK WITH THE FOLLOWING READINGS: #1-40, #2-70, #3-70, #4-68, #5-70, AND #6-68. REMOVED #1 CYLINDER AND REPLACED WITH AN ENGINE READY OVERHAULED ASSEMBLY. SEE TAG FOR ALL PERTINENT DETAILS. REMOVED LIFTERS FOR CYLINDER #1 FOR BLEEDING AND FOUND THE INTAKE LIFTER COLLAPSED. INSTALLED AN OVERHAULED REPLACEMENT. DRAINED ENGINE OIL AND REMOVED OLD OIL FILTER. SERVICED ENGINE WITH AEROSHELL 100 STRAIGHT MINERAL OIL FOR BREAKIN AND INSTALLED A NEW CH48108-1 FILTER. REPAIRED CARB TEMP PROBE WIRING. TEST RAN ENGINE WITH ALL INDICATIONS GOOD. RECHECKED COMPRESSION ON CYLINDER #1 WITH A READING OF 74. ALL COMPRESSIONS WERE TAKEN AT 80 PSI. ALL WORK WAS DONE IN ACCORDANCE WITH TCM MANUAL X30556 DATED 10/15/2013.....**END.**

BRUCE MCWHORTER A&P

Figure 24: Last Engine Maintenance

DATE 06/07/2019 N3469R TACH: 3050.64 TTAF: 3290.64

THIS AIRCRAFT HAS BEEN INSPECTED IN ACCORDANCE WITH AN ANNUAL INSPECTION AS OUTLINED BY FAR 43 APPENDIX D. AIRCRAFT WAS OPENED UP FOR THE INSPECTION AND CLOSED UPON COMPLETION. ELT BATTERY WAS REPLACED AND ELT WAS TESTED IN ACCORDANCE WITH FAR 91.207(d) WITH ALL INDICATIONS GOOD. ELT BATTERY DUE 2021. A NEW ELT ANTENNA AND COAXIAL CABLE WERE INSTALLED. INSTALLED NEW MAIN GEAR TIRES, CLEANED AND REPACKED ALL WHEEL BEARINGS, INSPECTED BRAKES, AND SERVICED MASTER CYLINDERS. INSTALLED A NEW BRACKETT BA8103-1 AIR FILTER ELEMENT. REMOVED THE OLD KING KT76A TRANSPONDER AND INSTALLED A NEW STRATUS ESG TRANSPONDER WITH WAAS ANTENNA. SEE FAA FORM 337 FILED THIS DATE. NO CHANGE IN W&B. SEE PROP LOG FOR NEW PROP INSTALLATION. SEE AD LIST FOR AD COMPLIANCE. THIS AIRCRAFT HAS BEEN INSPECTED IN ACCORDANCE WITH AN ANNUAL INSPECTION AND HAS BEEN FOUND TO BE AIRWORTHY.....**END.**

BRUCE MCWHORTER A&P

Figure 25: Last Airframe Maintenance

ELEVATOR AND RUDDER RECORDS

On April 23, 2018 the elevator, part number 1234600-1 was purchased.

SALES #	DATE
5260	04/23/2018
PMT METHOD	
Visa - xxxxxxxxxxxx	
ACTIVITY	QTY
Cessna R182 Elevator P/N 1234600-1	1

Figure 26: Elevator Receipt

According to Cessna representative, the examination of the tail revealed the aft bulkhead at FS230 had been replaced. The replaced tailcone bulkhead was manufactured 03-09-17 and was stamped with Cessna part number 0712523-2, which per the illustrated parts catalog, is for a later model/serial Cessna 182. A review of Cessna service documents revealed the part is an applicable replacement per Cessna Service Kit SK210-161A. Per maintenance records, it was installed on the aircraft on 05-03-18. The rudder stop (bolt) dimensions were the same 428-3-6 as required by the manufacturer. With the only difference in the hardware that the bolt on the accident aircraft did not have a drilled head as denoted by the H in the parts catalog; however, it was not safety wired in this installation, it had a lock nut installed on it.

FUELING RECORDS

On the day of the accident, at 1327, the pilot refueled the airplane at Frank Wiley Field Airport, Miles City with the addition of about 45 gallons.

***** Headwaters Flying Service [REDACTED] Three Forks, MT 59752 [REDACTED] 08/01/2019 11:23:40 AM *****		FUELMASTER 08/ 5/2019 13:27 TCODE=6 TRANSACTION [REDACTED] Invoice [REDACTED] CARD: Visa ACCT#: ***** [REDACTED] PUMP: 1 PRODUCT: 1 AVGAS 100LL QUANTITY: 45.21 GL PRICE/UNIT: [REDACTED] TOTAL COST: [REDACTED]	
FUEL:100 LL PUMP #1 GALLONS Price/G	50.72 [REDACTED]		
Subtotal:	\$ [REDACTED]		

PURCHASE TOTAL	\$ [REDACTED]		
VISA CARD: [REDACTED] NAME: [REDACTED] Tail Number: 3469			

Figure 27: Fuel Receipts

PERSONNEL INFORMATION

PILOT

JAMES HEALD²

The pilot, a 50-year-old male, held a Private Pilot Certificate (Airplane Single Engine Land. This pilot reported civil flight experience that included 224 total and 53 hours in last six months as of exam dated 01/09/2019. A reconstruction of his logbooks revealed that he had a total time of 271.1 hours which equated to about 428 landings. This pilot was 70 inches tall and weighed 175 lbs at the time of the last exam. This pilot was issued a Third Class Medical Certificate with the following limitation(s): Must wear corrective lenses for distant vision

² Internet presence: <https://www.facebook.com/Grainbins12/> and <https://www.jpgrainbins.com/>
<https://www.gillettememorialchapel.com/obituary/james-heald>

and have glasses for near vision. The pilot owned J&P Grain Solutions in Recluse, WY, which was a construction company that builds grain silos.

The following is a compilation of the pilot logbooks:

Date	From	To	Time	Landings	Notes
	FNL	00U	3.1	3	1st Rough / 2nd *
	IYFL*	00U	2.1	2	Parts Retrieval oil*
	SOU*	IYFL*	1.1	1	Hard info rovel cat hay*****
5/18/2018	FNL	TOR	4.5	3	Olamor Meeting /Terrington*
5/18/2018	TOR	IYFL*	1.7	1	
5/18/2018	IYFL*	TOR	1.7	1	
6/1/2018	TOR	AUH	2.5	1	Aurora Parts
6/3/2018	AUH	TOR	2.3	1	Return oil filter
	TOR	82V	0.4	1	Pine Bluffs
6/16/2018	82V	IYFL*	2.1	3	KIYFL
Totals			244.1	410	
	IYFL*	82V	2.3	3	Ranch To Pine*
	82V	FNL	0.6	1	Pine To Loveland*
	FNL	IYFL*	2.8	1	Loveland To IYFL*
	IYFL*	BYG	2.4	1	IYFL To Loveland*
10/28/2018	FNL	IYFL*	2.8	1	Loveland To IYFL*
	IYFL*	BYG	0.6	4	Buffalo Maintenance*
6/7/2019	BYG	IYFL*	2.1	1	Engine Replacement*
	IYFL*	6S8	1.5	2	Ranch To Laurel
6/18/2019	6S8	IYFL*	1.9	2	Buffalo Fuel*
	IYFL*	6S8	3.2	2	17 Concrete
7/3/2019	IYFL*	9S5	2.8		Early Rise Fuel/ Columbus Ranch*
8/1/2019	9S5	IYFL*	2.0		Three forks 11,000 ft Ranch
	IYFL*	9S5	2.0		
Totals			271.1	428	
*IYFL - If You Feel Lucky Ranch					

Figure 28: Reconstruction of Pilot Logbooks

PASSENGER

BENJAMIN CASEY ROBERT

Front right-seated passenger: He was a foreman for the company.

WEATHER INFORMATION

Box L Farms - KMTLARSL3
Elev 2913 ft, 48.58 °N, 106.16 °W

Time	Temperature	Dew Point	Humidity	Wind	Speed	Gust	Pressure	Precip. Rate.	Precip. Accum.
2:39 PM	79.7 °F	47.1 °F	32 %	WNW	4.9 mph	13.2 mph	29.92 in	0.00 in	0.00 in
2:44 PM	79.5 °F	46.7 °F	32 %	West	6.5 mph	13.2 mph	29.93 in	0.00 in	0.00 in
2:49 PM	79.7 °F	48.2 °F	33 %	WNW	6.8 mph	13.2 mph	29.92 in	0.00 in	0.00 in
2:54 PM	79.9 °F	48.4 °F	33 %	WNW	5.7 mph	11.4 mph	29.93 in	0.00 in	0.00 in
2:59 PM	80.0 °F	48.3 °F	33 %	WSW	6.8 mph	11.4 mph	29.92 in	0.00 in	0.00 in
3:04 PM	80.8 °F	47.6 °F	31 %	West	7.0 mph	11.4 mph	29.92 in	0.00 in	0.00 in
3:09 PM	81.0 °F	47.5 °F	31 %	WNW	7.2 mph	11.4 mph	29.92 in	0.00 in	0.00 in
3:14 PM	81.0 °F	47.5 °F	31 %	WNW	6.9 mph	11.4 mph	29.92 in	0.00 in	0.00 in
3:19 PM	81.1 °F	47.7 °F	31 %	West	8.5 mph	11.8 mph	29.92 in	0.00 in	0.00 in
3:24 PM	81.1 °F	47.7 °F	31 %	WNW	7.4 mph	13.6 mph	29.92 in	0.00 in	0.00 in
3:29 PM	81.1 °F	47.5 °F	31 %	West	6.1 mph	13.6 mph	29.92 in	0.00 in	0.00 in
3:34 PM	81.3 °F	46.9 °F	30 %	West	6.3 mph	13.6 mph	29.91 in	0.00 in	0.00 in
3:39 PM	81.3 °F	46.9 °F	30 %	West	6.1 mph	13.6 mph	29.91 in	0.00 in	0.00 in

Figure 29: Weather Information from Local Farm

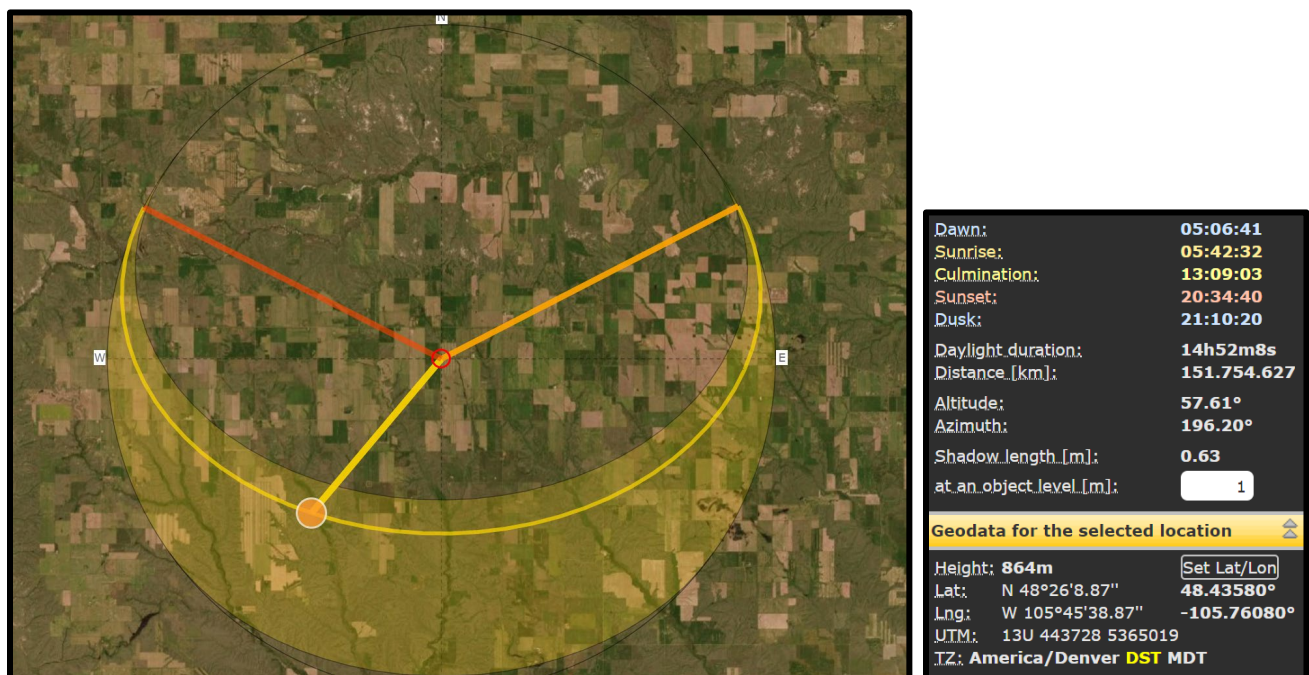


Figure 30: Sun Information at the Time of the Accident