



Joshua Young
Air Safety Investigator
AS-ERA

Date: 10/24/2025

Subject: ERA26LA009, FAA Wreckage Examination

Contact: Christi Cushing, Principal Operations Inspector, FAA

Inspector Cushing uploaded a wreckage examination and findings to a shared folder. The following is that document.

N1998X Cessna 182H SN 18256098

Inspection for accident investigation ERA26LA009 conducted on 10/10/2025 at North Central, RI; Boston Skydive Center

G:\Shared\8020.3.a.(2) - ACCIDENTS\ERA26LA009 N1998X hard landing

Damage assessment:

Mechanic Interviewed: [REDACTED]: Certificate Number: [REDACTED], Newport Aero

Firewall station 0.0 shows wrinkling on the RH side outboard and above the nose landing gear attachment area with the nose landing gear appearing to be slightly skewed to the left. The fuselage skin was also buckled at the exterior where it joins the firewall center RH side. Inside the cockpit, the rudder pedal area showed signs of bending along the center pedestal support tunnel and support brackets. The jump door (located on the RH side), door frame and locking mechanism show wear and damage through repeated operational use. The difficulty in closing and locking this door, could have resulted in the door not being properly closed during this flight. The door assembly was likely further damaged by being pulled open in flight. The door assembly was noted to be difficult to pull close and lock while occupying the pilot seat.

An inspection of aircraft and records for N1998X revealed the following irregularities:

1. The Jump door assembly was installed by FAA Form 337 Dated November 5, 1992 (page 23 of AW Registry Documents).
2. Cabin Jump door assembly and interior door frame locking mechanism has misalignment. Multiple cracks are present in the "formed aluminum" supporting door structure and in the area where the locking mechanism attaches. (there are minimum of 10 significant cracks with the airframe also cracked at a locking hole).
3. The Door locking mechanism shows damage by bending of the rod end and locking rods, creating misalignment of the aft locking rod to door frame contact location. The door assembly supporting structure is distortion from bending and the flexibility from the structure cracks. The distortion of the door, coupled with the bent locking mechanism, creates excessive resistance when attempting to close and lock the door.
4. A door pull handle, or strap is not present to assist closing the door (and there is none indicated in the alteration), with the only option to pull the door closed by using one of the two locking rods (which show bending, conceivably related to this action). This bowing causes the locking rods (which extend from the forward and aft edges of the door) to be misaligned with the door frame. This misalignment has

caused wear, distortion and cracks to the airframe skin, door frame, door supporting structure, locking rods and lock rod holes (located in the fuselage).

5. Conclusion: The compromised integrity of the door and locking system results in difficulty of being able to close and lock the door by the pilot, especially while manipulating the aircraft controls.

















Installation of the right door (co-pilot side) to hinge at the top edge, to allow for inflight operation of parachute jump operation.

The original door removed and the modified door installed for sport parachute operation. The modification is described below:

Installed two (2) 5 inch each stainless steel hinges with 3/16" stainless steel hinge pins equally spaced along the fuselage at the upper door sill rivet joint. Installed the bottom half of the hinge along the top edge of the door. Both halves of the hinges are secured in 4 places with AN507-1032R8 screws, AN365-1032A nuts and AN960-10 washers. Cut lower front corner of the door at a proper angle to permit the door to open and clear the wing strut. The cut off section of the door is secured to the fuselage door frame with two (2) AN526-1032R8 screws and MS24130 rivnuts to seal the opening when the door is in closed position.

Fabricated and installed in the center of the modified door a locking handle that actuates a 3/8" stainless steel rod locking mechanism that, when in the closed position, it simultaneously locks the leading and trailing edge of the door to the fuselage door frame.

The door is placarded with "unlocked" and "locked" positions. See attached sketch.

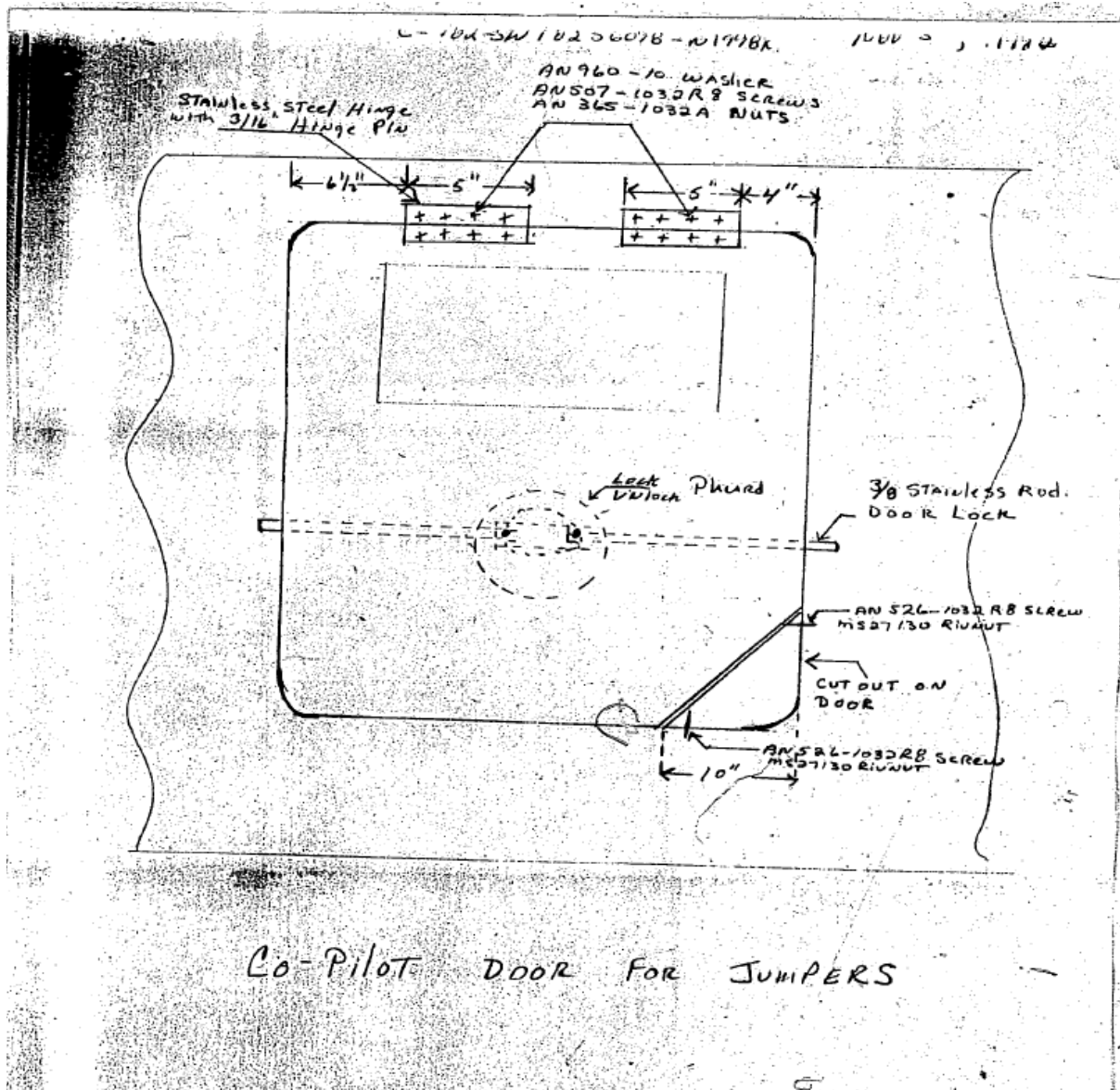
The instrument panel is placarded with "door open" operation.

Note: Placards in reference to modification previously approved on other Cessna 182 - FAA Form 337.

Flight operation with door open
80 mph TAS max operation
120 mph TAS max cruise door open
10 degrees maximum yaw
15 degrees maximum bank

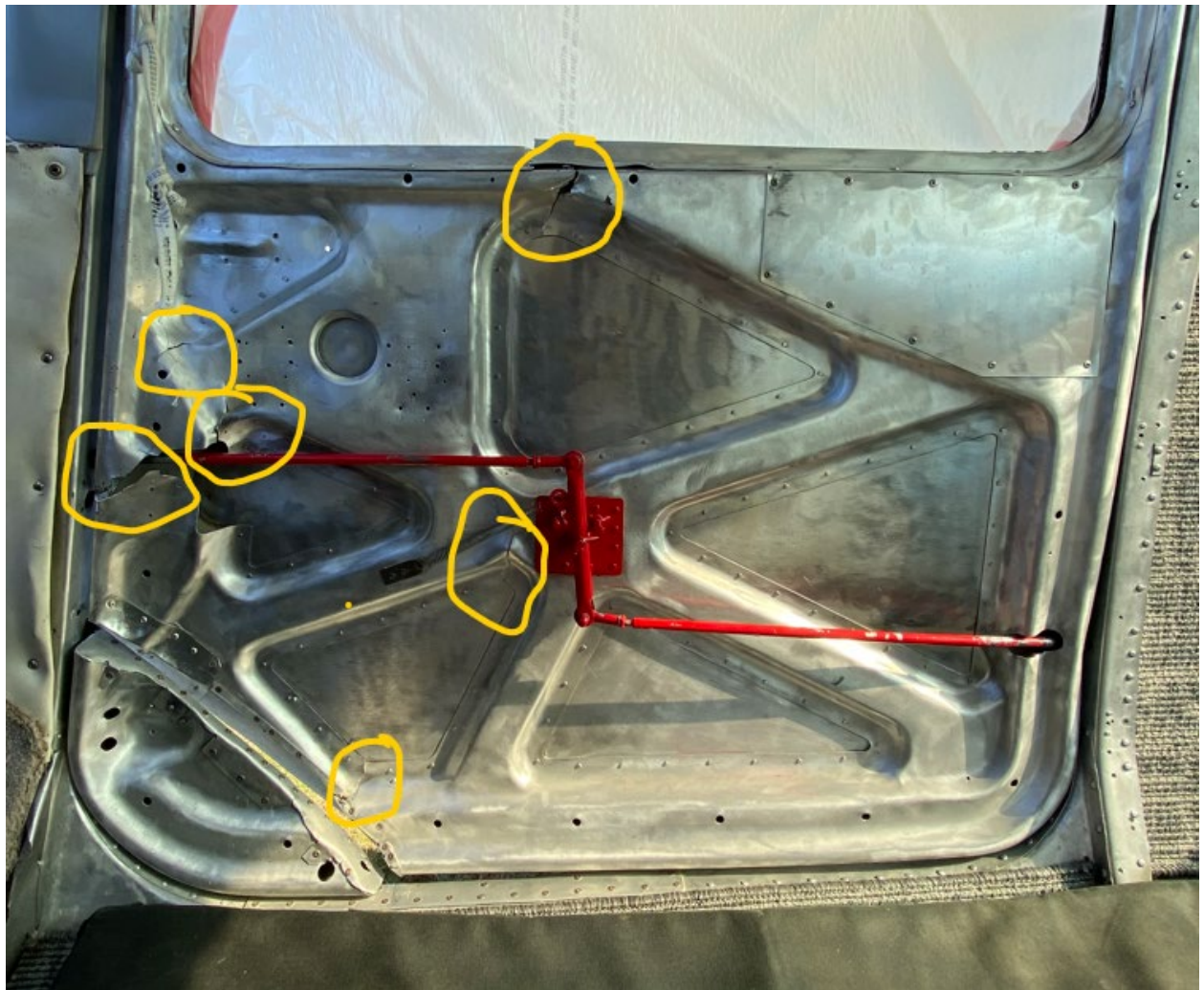
No aerobatic flight maneuvers including spins are approved

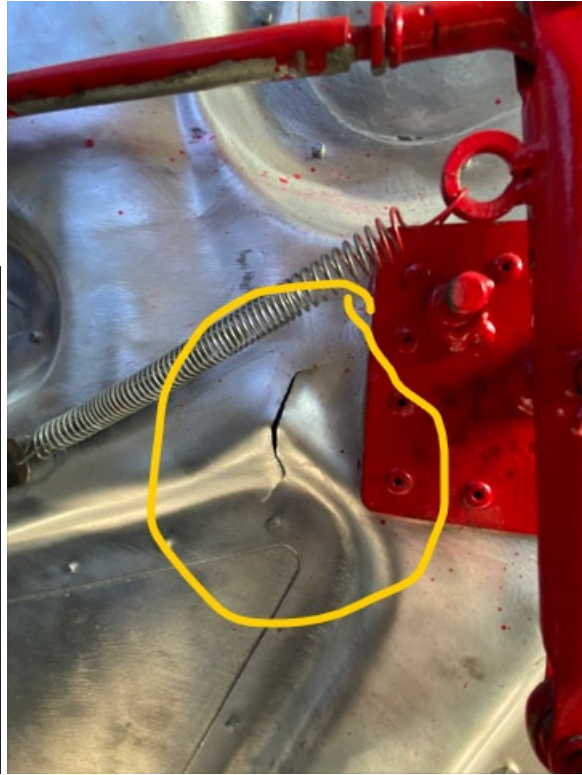
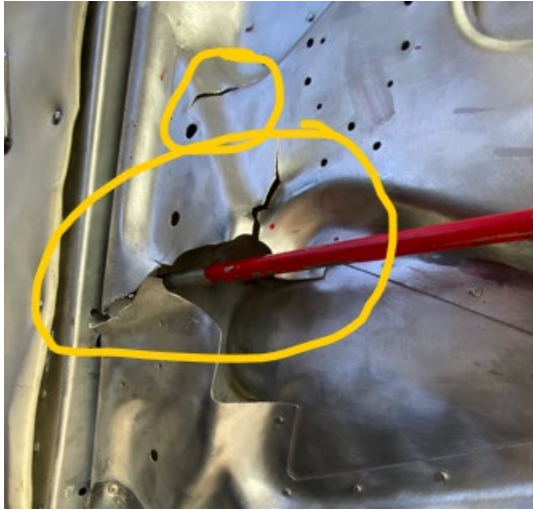
Refer to weight and balance data for loading





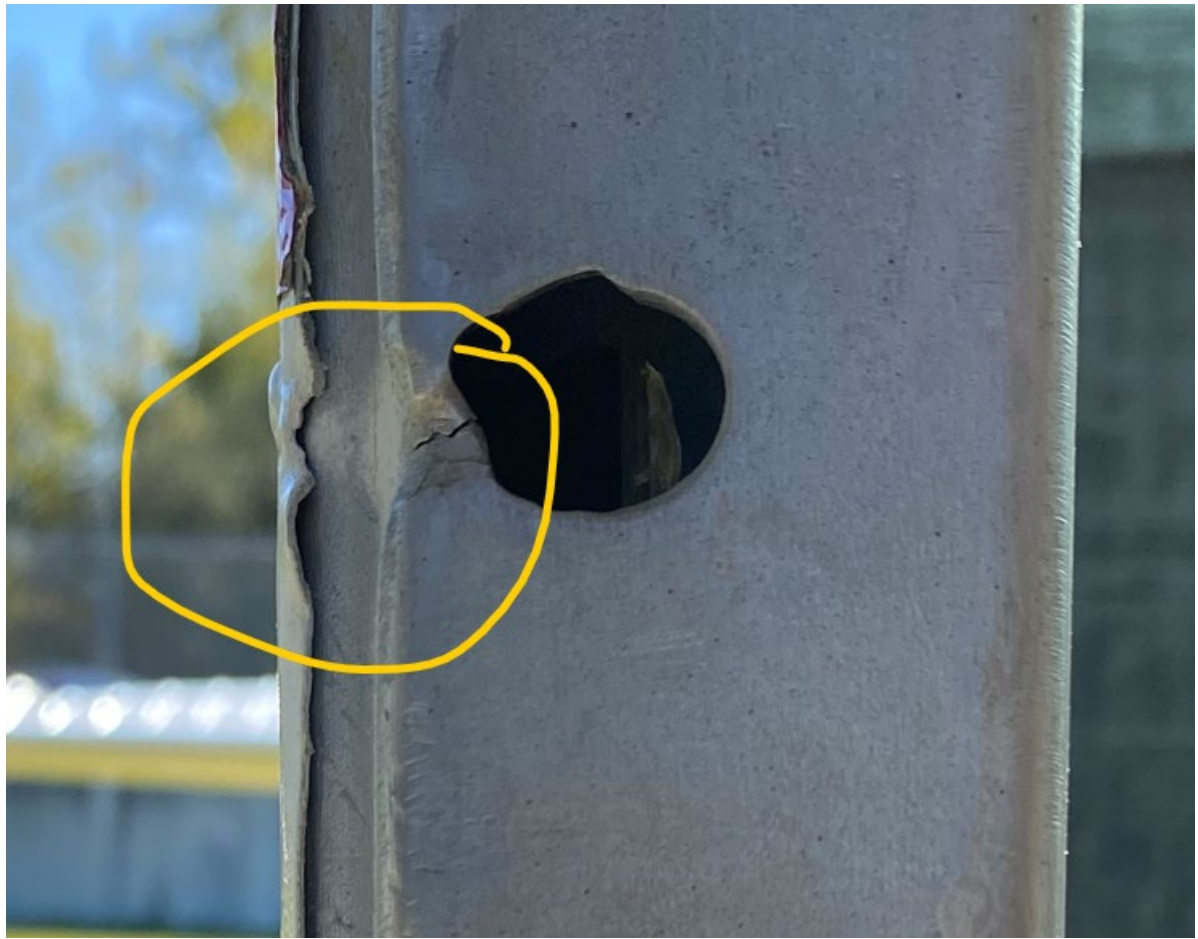






Door Assembly Frame Structure Cracks

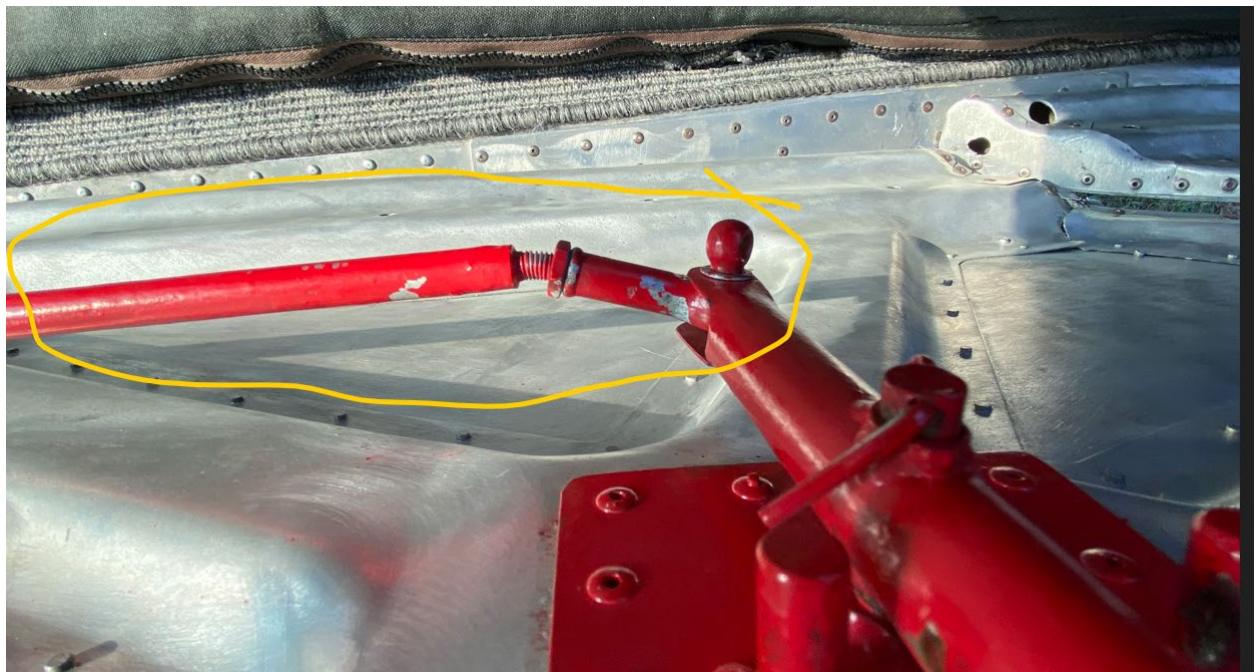






Document was last







Aft Locking rod bent: Noted that this is the location required to be pulled, to close the door.



The locking rod is bowed as noted in these photographs.

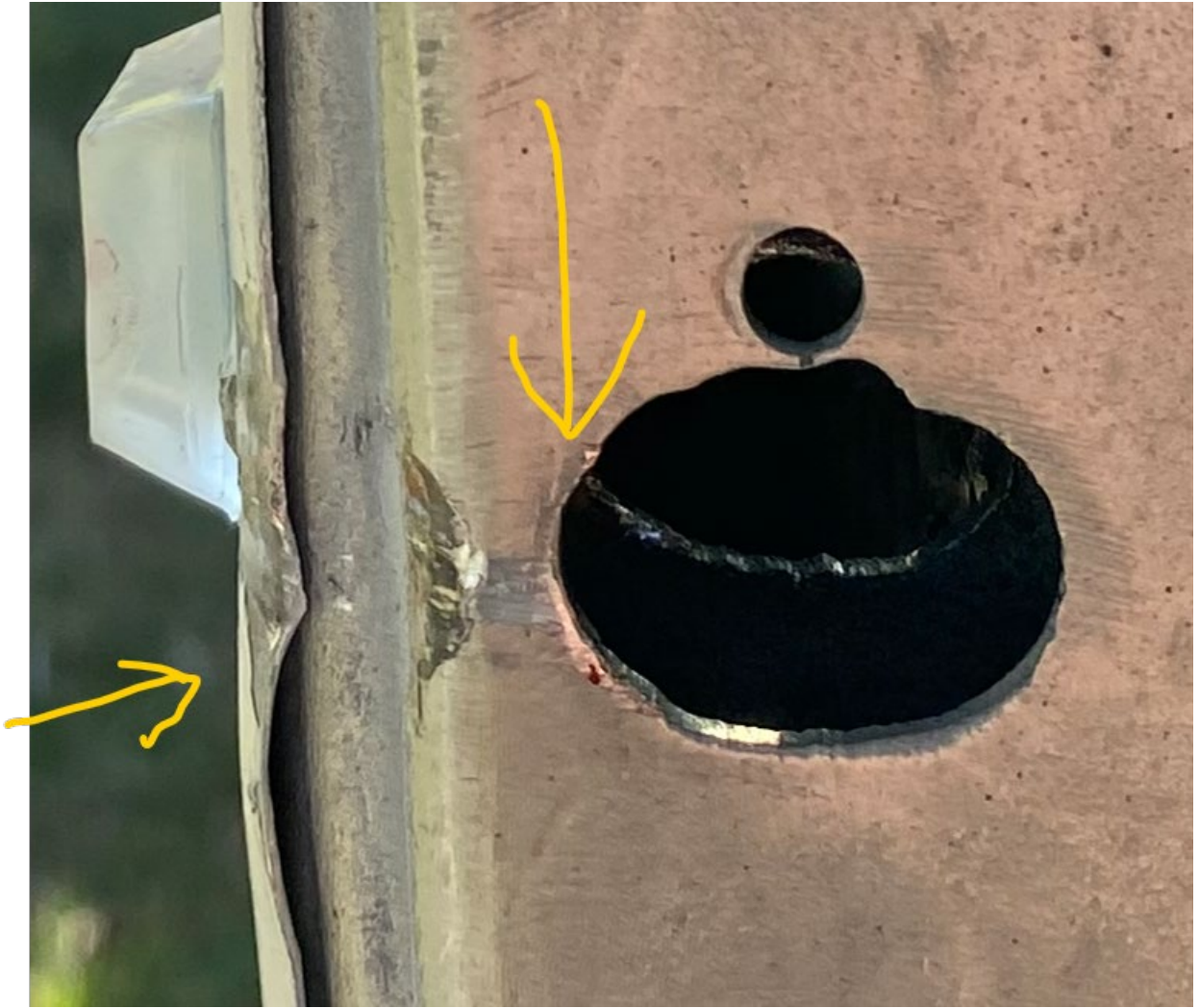


Damaged Locking Rod and Door Structure located at the Trailing Edge of Door.



Trailing edge Alignment with the door pulled firmly closed, the locking rod does not align with airframe locking rod receptacle (hole) in the fuselage door frame. The locking rod is bowed inboard toward the pilot causing the locking rod extending beyond the edge of the door assembly, to bow outboard. Additionally, repeated striking of the locking rod against the fuselage door from attempting to close the door with the rod extended also contributes to the bending of the rod outboard. The damage on the outside of the fuselage door frame indicates occurrence of this action repeatedly. The door supporting structure can also be seen cracked in this location.





Fuselage door frame looking aft: Damaged airframe skin and door frame with elongated hole caused by misalignment of locking rod.



Fuselage door frame looking forward.

An inspection of aircraft and records and interview of the maintenance technician for N1998X revealed the following:

A review of the aircraft Annual inspection checklist dated 8/1/2025, indicates that a control check was completed as part of the empennage group. "Check trim tabs and stabilizer adjustment mechanism for attachment, excessive looseness and proper operation." The Airframe Annual Inspection, however, was signed off on 9/22/2025. The return to service for the repairs involving the removal of the pedestal and disassembly of the elevator trim system was made approximately 7 weeks later according to these two documents

6. The Elevator trim system was found to have reversed function. Rotation of the elevator trim wheel, nose up (trim wheel rotated down) causes the trim tab to move up. Rotation of the elevator trim wheel, nose down (trim wheel rotated up), causes the trim tab to move down.

Trim tab travel should be down 15 (+/-1 degree) and up 25 (+/-2 degrees) per the Cessna 182 Maintenance Manual Section 9 for the elevator trim system. Noting that down trim corresponds to the tab up position.

A review of maintenance records from 5-28-2015 to present does not show any specific entry for elevator trim tab rigging or maintenance; however, on September 22, 2025, an entry was made that discusses removing the forward cabin floor pan, center console, rudder pedal tube assembly, brake master cylinders and fuel selector valve. The entry indicates that PN 0713631-2(1?) and 0713671-3 LH tunnel supports, and 0713631-2 and 0713671-4 RH tunnel supports were removed and replaced, and the parts were replaced in reverse order, and the rudder cables were rigged. (Possible typo in the PN for the LH and RH tunnel supports 0713631-2 as the LH is indicated as 0713631-1 in the Illustrated Parts Catalog).

There was no mention of elevator trim system maintenance or rigging in this entry; however, the elevator trim wheel, rudder trim and fuel shut off valve are located in the center pedestal which was removed for the replacement of these tunnel supports. On 10/17/2025 the mechanic that performed this work stated that the elevator trim cables were blocked to conduct this maintenance action. (blocking is a term which indicates the control cables were secured to prevent movement of the cables while the pedestal was removed) The elevator trim chain was removed from the sprocket (detail Fig 9-5) to complete the removal the pedestal, for reinstallation the chain was installed onto the sprocket as part of reinstalling the pedestal and the elevator trim blocking was removed. The mechanic stated he did not recall making

a functional control check of this system, post maintenance. The mechanic stated that a post operational check flight however was conducted by a pilot with no discrepancies noted. He stated that several jump flights were then conducted, and no mention was made of reversed controllability of the elevator trim, that the elevator trim would have been in consistent use during these flights. The mechanic also stated that he was not sure how it was possible to hold the door shut during the landing with one hand, while simultaneously holding the yoke, adjusting the trim and throttle for landing.

The elevator trim wheel pointer was also noted to go to full travel in the nose down position, moving only about 1/3 of the pointer window.

The Cessna 182 MM section 9-14 requires the following for maintenance of the elevator trim system with the following Warning.

(12) Make sure that the trim wheel pointer travels the same distance from the ends of the slot in

the cover. Move the trailing leg of the pointer to a new position if necessary.

WARNING: Make sure that the elevators travel in the correct direction when you operate the control column.

(13) Move the control column to make sure that the elevators travel in the correct direction.

(14) Make sure that the trim tab moves in the correct direction when it is operated by the trim wheel.

NOTE: Nose down trim corresponds to the tab UP position.

Airframe	
N1998X	CESSNA, 182H, S/N: 18256098
AFTT: 7905.7	TACH: 1.3
September 22, 2025	
1. C/W Annual Inspection IAW FAR 91.409 (a)(1) per Inspection meeting the requirements of FAR PART 43.15(c)(2) and FAR PART 43 APP "D".	
NEXT DUE	

CHECK LIST

ANNUAL or 100 HOUR AIRCRAFT INSPECTION REPORT

INSPECTING OPERATOR N1998X LLC
 W. O. No. _____
 DATE 8/1/25

Page _____ of _____ Pages
 TAC TIME THIS DATE 0

OWNERS NAME N1998X
 OWNERS ADDRESS _____

FAA REGISTRATION NO. N1998X
 AIRCRAFT SERIAL NO. 18256098

EMPENNAGE GROUP

Check surface condition of fabric & dope or skin for general condition, deterioration, cracks, other evidence of failure and security of attachment.

Remove fairings and inspect all surface attachments and adjacent areas.

Check cables for proper tension and safety.

Check trim tabs and stabilizer adjustment mechanism for attachment, excessive looseness and proper operation.

5. Inspect rudder and elevator hinge fittings, pins and horns for cracks, looseness and proper installation.

6. Operate rudder and elevator and check for ease of operation and proper travel and stops.

7. Check empennage brace wires and struts for condition, safety, and proper tension.

8. Inspect fairings and screws.

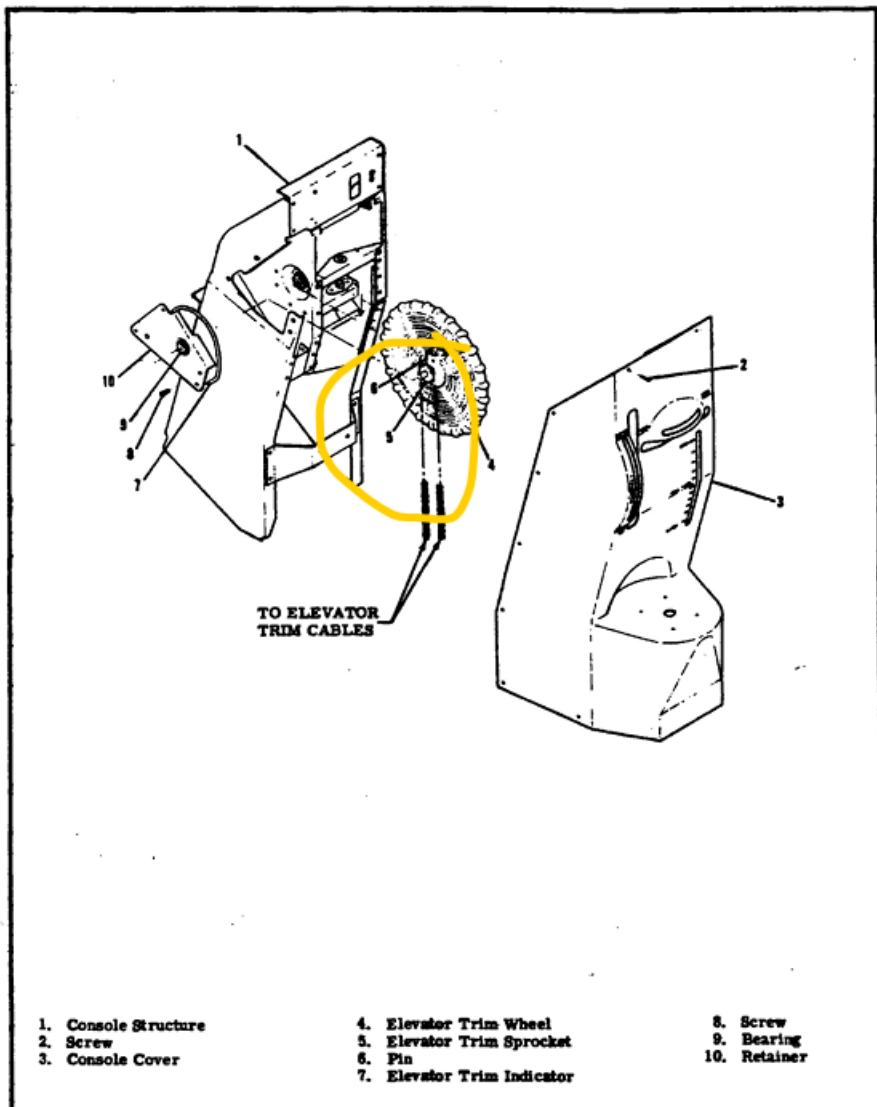


Figure 9-5 Model 182 Elevator Trim – Console Components

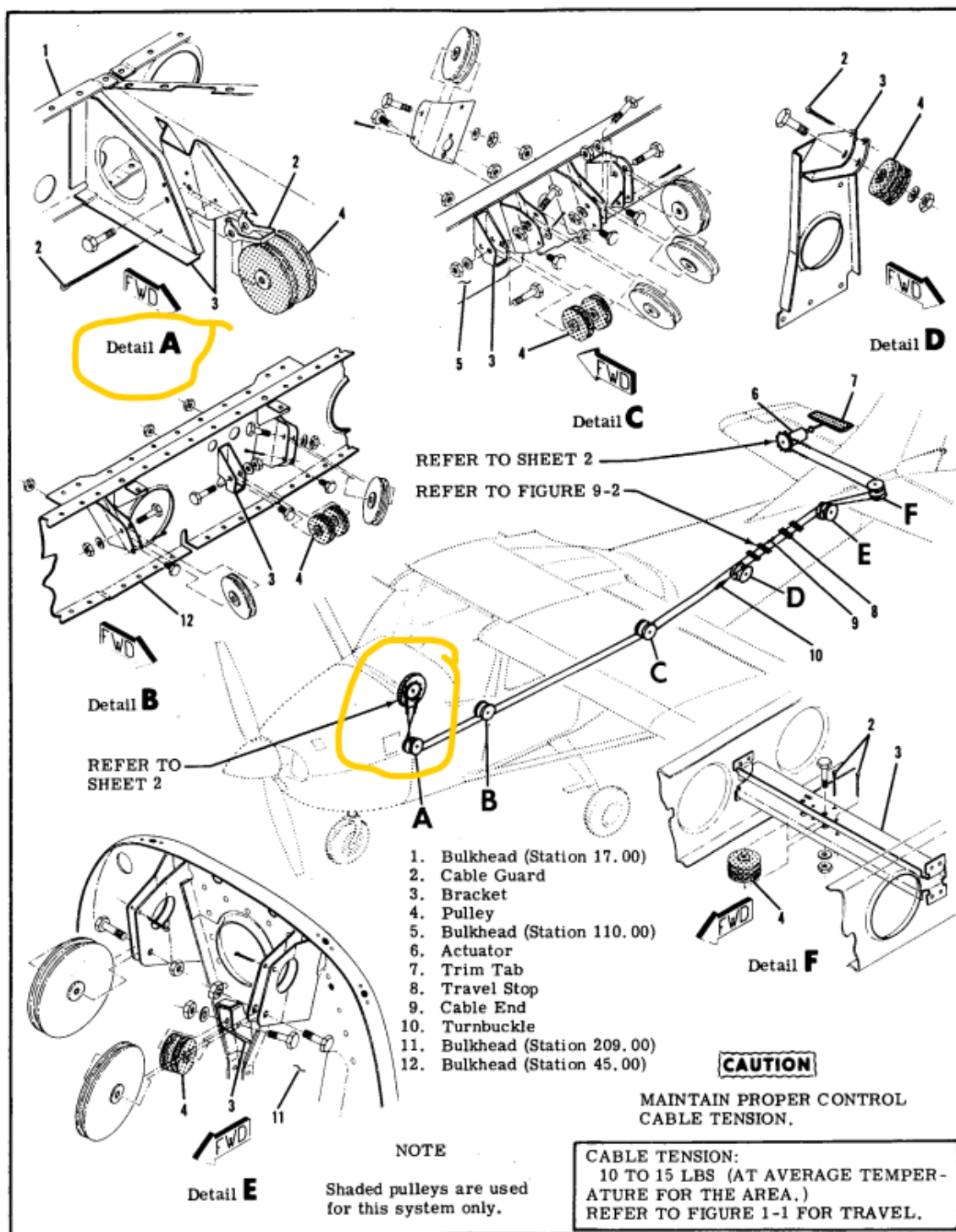


Figure 9-1. Elevator Trim Tab Control System (Sheet 1 of 2)

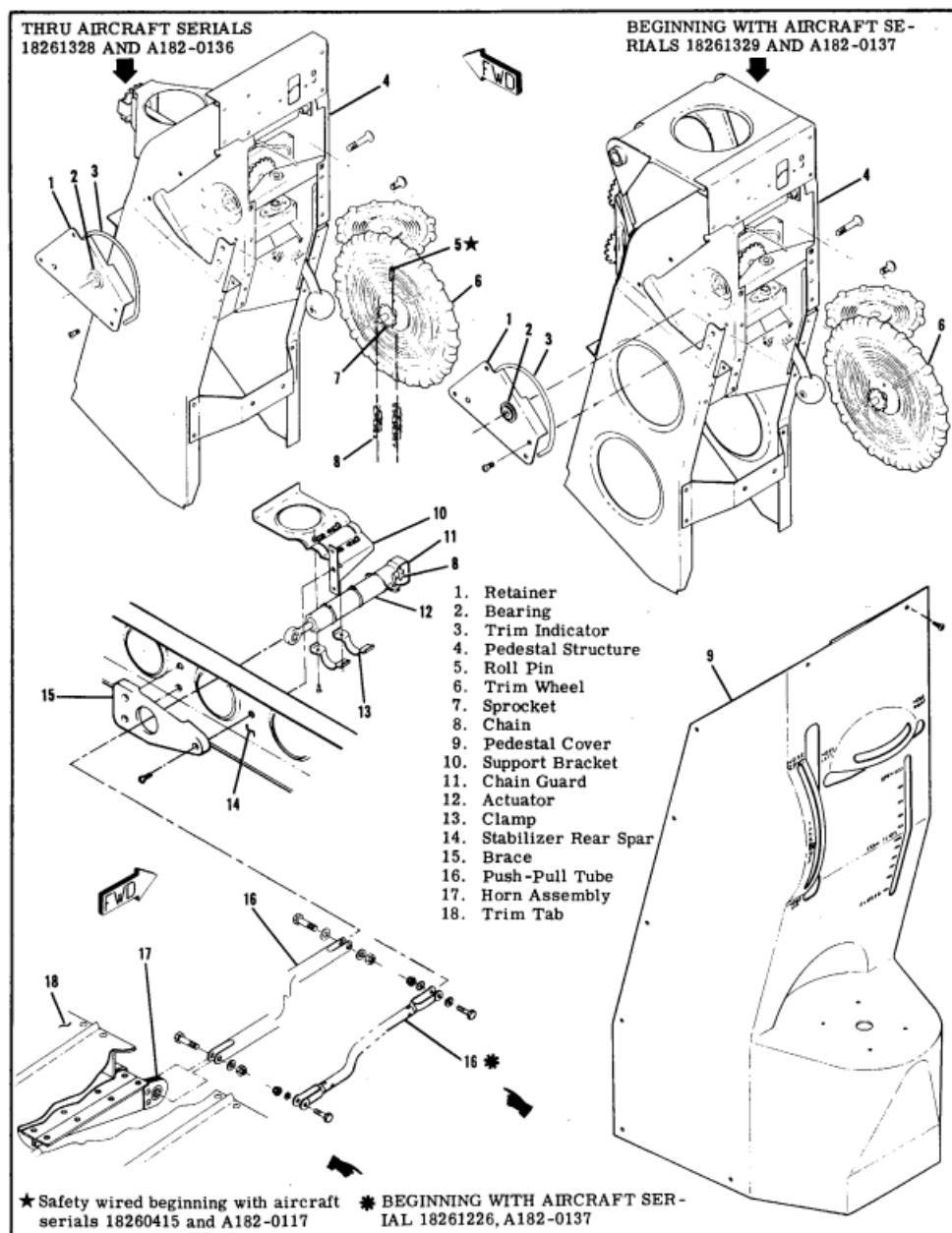
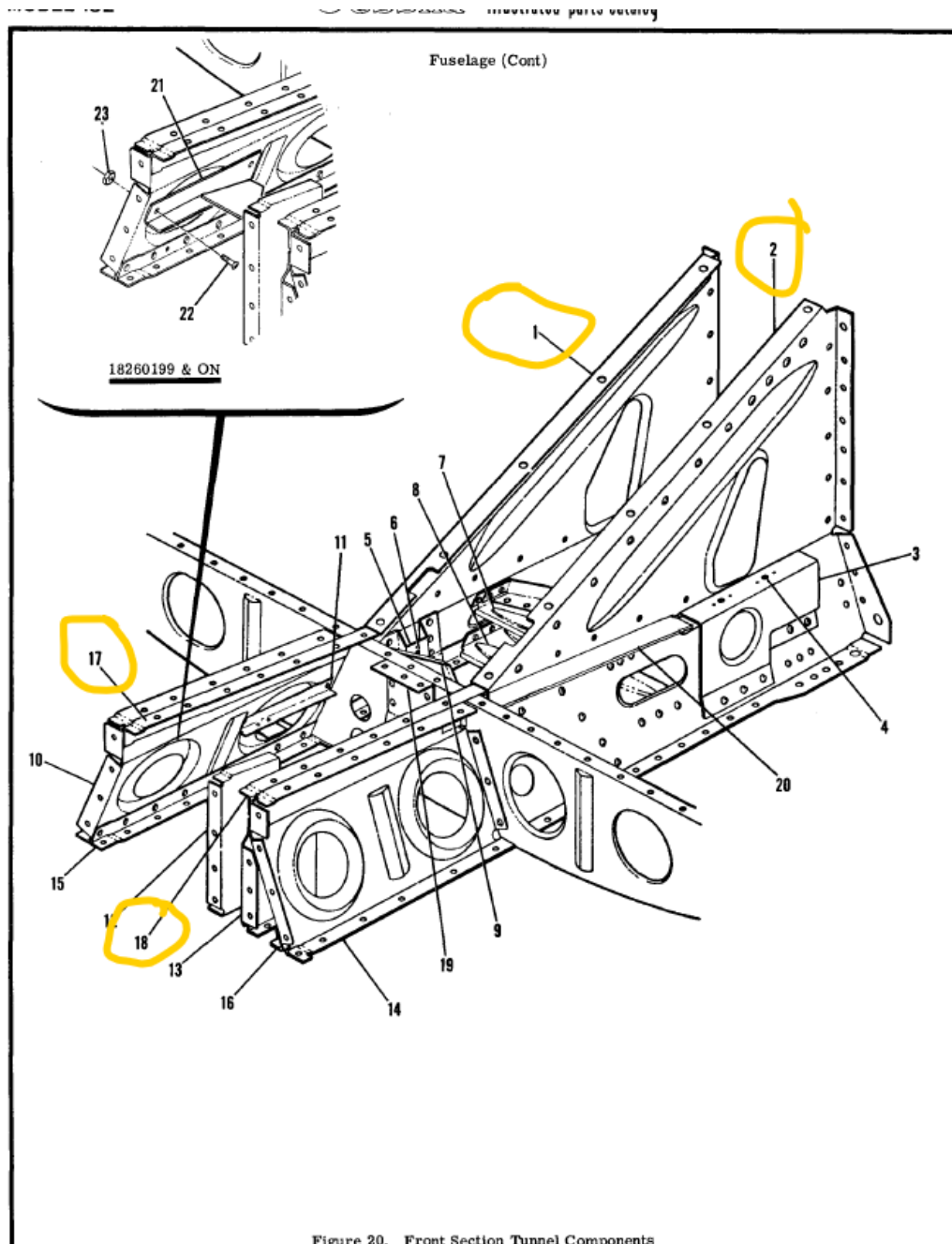


Figure 9-1. Elevator Trim Tab Control System (Sheet 2 of 2)



Tunnel support structure replaced during this maintenance event.

FIGURE AND INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
		1 2 3 4 5 6 7		
20 -		TUNNEL COMPONENTS—FRONT SECTION -----	NP	
- 1	0713631-1	BULKHEAD ASSEMBLY—TUNNEL LH -----	1	
- 2	0713631-2	BULKHEAD ASSEMBLY—TUNNEL RH -----	1	
- 3	0713628-2	BRACKET ASSEMBLY—INBOARD PEDAL SUPPORT RH -----	1	
	0713628-1	BRACKET ASSEMBLY—INBOARD PEDAL SUPPORT LH -----	1	
- 4	NAS686A3	NUTPLATE -----	2	
	0713624-2	ANCHOR—BRAKE CYLINDER LH ONLY -----	1	
- 5	0713677-1	BRACKET ASSEMBLY—LOWER SPROCKET LH -----	1	A
	0713677-3	BRACKET ASSEMBLY -----	1	B
- 6	NAS680A3	NUTPLATE -----	2	A
	NAS686A3	NUTPLATE -----	1	B
- 7	0713637-1	SUPPORT ASSEMBLY—NOSE STEERING BELLCRANK UPPER -----	1	
- 8	0713636-1	BRACKET—NOSE STEERING BELLCRANK LOWER -----	1	
- 9	0713678-1	BRACKET—TRIM SPROCKET -----	1	
-10	0713634-2	BULKHEAD ASSEMBLY—AFT TUNNEL LH -----	1	
-11	0713730-1	RUB BLOCK ASSEMBLY -----	1	A
-12	0713669-1	BRACKET—RUDDER PULLEY -----	1	
-13	0713669-2	BRACKET—RUDDER PULLEY -----	1	
-14	0713634-3	BULKHEAD—AFT TUNNEL RH -----	1	
-15	0713694-1	ANGLE—TUNNEL LH -----	1	
-16	0713694-2	ANGLE—TUNNEL RH -----	1	
-17	0713671-3	ANGLE—TUNNEL LH -----	1	
-18	0713671-4	ANGLE—TUNNEL RH -----	1	
-19	0713681-1	BRACKET—FUEL SELECTOR VALVE -----	1	
-20	0713290-2	REINFORCEMENT—RH -----	1	
	0713290-1	REINFORCEMENT—LH -----	1	
-21	0760014-1	GUARD ASSY -----	1	C
		ATTACHING PARTS -----		
-22	AN515-8R6	SCREW -----	2	
-23	NAS679A08	NUT -----	2	
		-----*		
		A---182 SERIAL 18253599 THRU 18253929		
		B---182 SERIAL 18253930 & ON		
		A182 SERIAL A182-0001 & ON		
		C---182 SERIAL 18260199 & ON		
		A182 SERIAL A182-0117 & ON		

9-11. REMOVAL AND INSTALLATION.

a. Remove seats, upholstery, pedestal cover and access plates as necessary.

CAUTION

Position a support stand under the tail tie-down ring to prevent tailcone from dropping while working inside.

b. Remove travel stop blocks (8) from control cables.

c. Disconnect control cables at turnbuckles (10) and at cable ends (9).

d. Remove cable guards and pulleys as necessary to work cables free of aircraft. Disengage roller chains from sprockets to ease cable removal.

NOTE

To ease routing of cables, a length of wire may be attached to end of the cable before being withdrawn from aircraft. Leave wire in place, routed through structure; then attach the cable being installed and pull cable into position.

e. After cable is routed in position, install pulleys and cable guards. Ensure cable is positioned in pulley groove before installing guards. Ensure roller chains are positioned correctly over sprockets.

f. Re-rig system in accordance with paragraph 9-14, safety turnbuckle and reinstall all items removed in step "a."

9-12. PEDESTAL COVER. (Refer to figure 9-1, sheet 2.)

9-14. RIGGING. (Refer to figure 9-1, sheet 1.)

CAUTION

Position a support stand under the tail tie-down ring to prevent tailcone from dropping while working inside.

- a. Remove rear baggage compartment wall and access plates as necessary.
- b. Loosen travel stop blocks (8) on trim tab cables.
- c. Disconnect push-pull tube from actuator (6).
- d. Check cable tension and readjust turnbuckle (10) if necessary.

NOTE

If chains and/or cables are being installed, permit actuator screw to rotate freely as chains and cables are connected. Adjust cable tension and safety turnbuckle (10).

- h. Rotate trim wheel to position trim tab up and down, readjusting actuator screw as required to obtain overtravel in both directions.
 - i. Position stop blocks and adjust as illustrated in figure 9-2 to degree of trim tab travel specified in figure 1-1.
 - j. Install pedestal cover and adjust trim tab pointer to the center of the "TAKE-OFF" triangle with the trim tab set at 0°.
- k. Safety turnbuckle and reinstall all items removed in step "a."

WARNING

Be sure trim tab moves in correct direction when operated by the trim control wheel.
Nose down trim corresponds to tab up position.

Down	17° ± 1°
ELEVATOR TRIM TAB TRAVEL	
Up	25° ± 2°
Down	15° ± 1°
PRINCIPAL DIMENSIONS	
Wing Span (Conventional Wing Type)	
221" 0"	

- e. (Refer to figure 9-1, sheet 2.) Rotate trim control wheel (6) full forward (nose down). Ensure pointer (3) does not restrict wheel movement. If necessary, reposition pointer using a thin screwdriver to pry trailing leg of pointer out of groove.

NOTE

Full forward (nose down) position of trim wheel is where further movement is prevented by the chain or cable ends contacting sprockets or pulleys.

- f. With elevator and trim tab both in neutral (streamlined), mount an inclinometer on tab and set to 0°. Disregard counterweight areas of elevators when streamlining. These areas are contoured so they will be approximately 3° down at cruising speed.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Service Parts Center. Refer to figure 6-4.

- g. Rotate actuator screw in or out as required to place trim tab up with a maximum of 2° overtravel, with actuator screw connected to push-pull tube (16).





Trim tab with control wheel in the nose up position.





Trim tab with the control wheel in the nose down position.

- Other issues noted: A review of these aircraft records it was discovered that there are numerous undocumented maintenance actions that have been performed on N1998X.
- Aircraft Maintenance Log entry regarding the alteration removal of the original Cessna Engine Indicating instruments and installation of the JPI EDM-930 could be located. No 337 was found on file with OKC, No 337 in the owner's records.
- No Aircraft Maintenance Log entry for the installation of STC SE4985N P.Ponk 0-470-R-50 SN2390 June 30 2004. No 337 on file with OKC.
- No flight manual supplement for STC P.Ponk per STC. No placarding as required in FMS installed on the aircraft or installation manual could be verified.
- No Aircraft Maintenance Log entry for the installation of STC SE5664NM N P.Ponk 0-470-R-50 SN2850 April 8, 2014. No 337 on file with OKC.
- Hartzell Propellers STC SA02278AK was found installed which approves installation of the Hartzell PHC-C3YF-1RF/F8068 and PHC-G3YF-1RF/F8068

Propellers (82" and 84" lengths) For Cessna 180 and 182 models equipped with one of the following engines:

- P. Ponk Super Eagle O-470-50(NorthPoint XP470); however, it could not be verified that this propeller is allowed installed as the STC SA5664NM states only D3A32C90/82NC-2 or D3A34C401/90DFA-10 in the STC and per the Approved FMS 09-22-2005. There was no Maintenance Log entry found for the installation of this propeller. There was no STC or 337 located with the owner's records or on file with OKC.

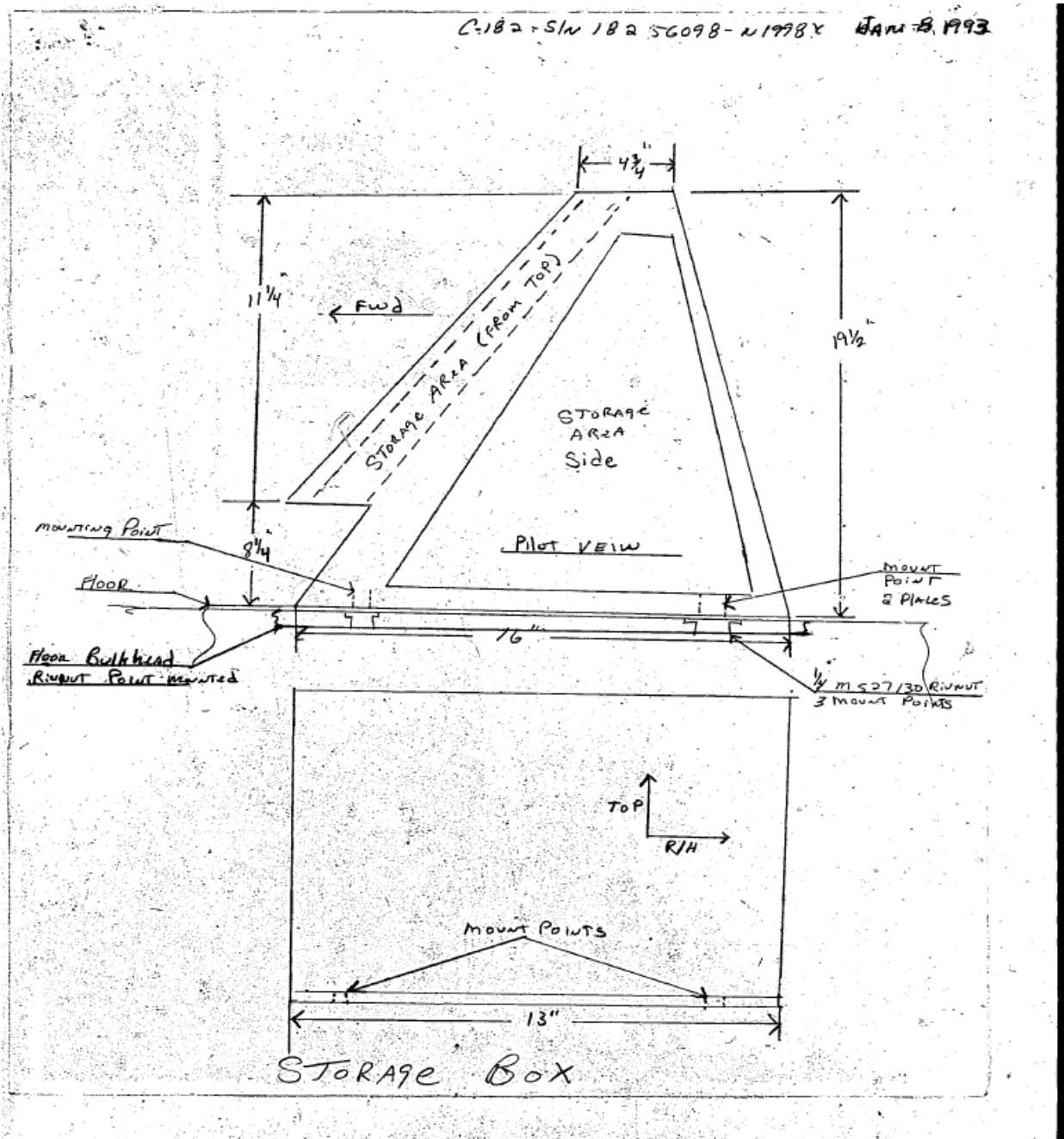


- Instrument markings cannot be verified: Green Yellow and Red Arc Warning for RPM missing and/or unknown for this propeller type installed. A FMS for this propeller type installed could not be located in the aircraft or records. The oil pressure, cylinder head temp and oil temp appear accurate per Approved FMS 09-22-2005.
- Engine Serial Number is indicated on the invoice for this installation as Engine Model O-470-R-50 Serial Number 275712-R/P.PONK 2690. The Propeller, PHC-

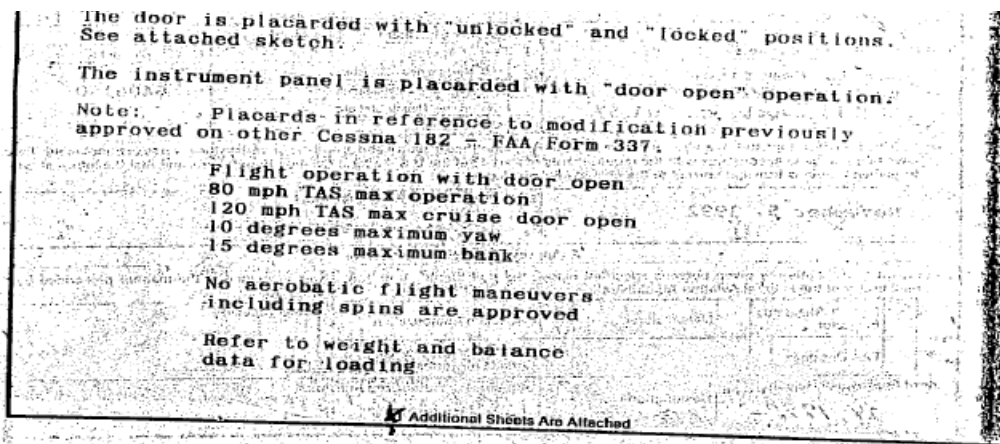
G3YF-1RF/F8068 STC SA02278AK SN P10678 indicates Engine Identification for this installation as an O-470-50 SN: 2350. This STC was purchased for N1998X. These serial numbers and model numbers do not match. The STC SE5664NM N P.Ponk O-470-R-50 SN2850 April 8, 2014, does not list this as a valid Propeller for installation.

- Missing from the aircraft was the alteration for the control cover. This Alteration is part of the jump configuration and required to be installed to prevent personnel from being caught in the controls. Part of this alteration contains the RH gear leg step, which is installed. This Alteration can be noted on FAA Form 337 Dated 1/28/1993

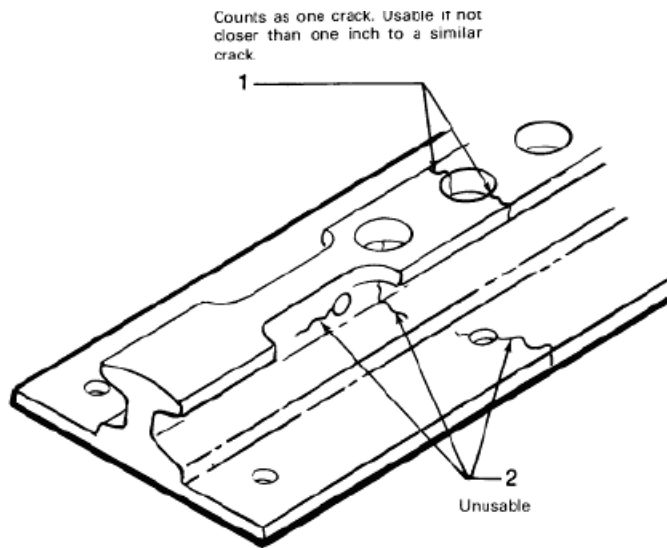
- (E) Modified aircraft for jump configuration - manufactured and installed storage box and R/H gear leg step.
- (A) Manufactured and installed wooden box in front of copilot rudder pedal and control wheel at Station 22. The purpose of the box is installed for safety so the jumper will not accidentally move or hit the control wheel and rudder pedal, and for storage of jumper equipment.
- (B) The box is made of plywood. It is mounted to the floor at 3 locations with 1/4 inch MS27130 rivenut and AN4 bolt.
- (C) The box is installed only in jump configuration.
- (D) See attached sketch for detail.



- The placarding for the Jump Operations was not legible. Flight Operations with door open and door locking instructions are missing.



- A current 14 CFR 91.413 transponder certification entry could not be located.
- Seat track AD 11-10-09 was completed; however, should be reevaluated for cracks in the seat track after the hard landing. It appears that more than the maximum amount of cracks have developed in rail exceeding the total of 4.



REPLACE SEAT RAIL WHEN:

- (1) Any portion of web or lower flange is cracked (index 2).
- (2) Any crack in crown of rail is in any direction other than right angle to length of rail.
- (3) Number of cracks on any one rail exceeds four, or any two cracks (index 1) are closer than one inch.

NOTE

Use of seat rail cargo tie-downs is not permissible on seat rails with cracks.

Figure 5. Seat rail



No 4 seat track pin hole.



No 5 seat track pin hole.



No 6 seat track pin hole.



No 7 seat track pin hole.



No 8 seat track pin hole

