

STC GROUP LLC
480 RUDDIMAN DRIVE
MUSKEGON, MICHIGAN 49445

REPORT NO: 1006009 REV -

TRIO AUTO PILOT INSTALLATION INSTRUCTIONS

CESSNA 150/152

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TABLE OF CONTENTS

TABLE OF CONTENTS	3
LIST OF FIGURES	4
REFERENCES	5
ACRONYMS, ABBREVIATIONS, AND SYMBOLS.....	6
1.0 GENERAL	7
2.0 PREPARE THE SERVOS.....	10
3.0 PREPARE THE AIRCRAFT FOR THE INSTALLATION.....	11
4.0 SERVO INSTALLATIONS	15
5.0 PRO PILOT INSTALLATION & WIRING	27
6.0 CLOSEUP	32
APPENDIX A PRO PILOT SYSTEM WIRING DIAGRAM.....	33
APPENDIX B PITCH SERVO INSTALLATION FOR SN'S 17001 THRU 15060087	35
APPENDIX C PITCH SERVO INSTALLATION FOR SN'S 15060088 THRU 15061532.....	39
APPENDIX D RECOMMENDED INSTALLATION TOOLS.....	43



LIST OF FIGURES

Figure 1-1 AREAS OF MODIFICATION.....	8
Figure 2-1 ROLL SERVO.....	10
Figure 2-2 PITCH SERVO.....	10
Figure 3-1 REMOVE PANELS	12
Figure 3-2 ROLL SERVO LOCATION	12
Figure 3-3 AILERON CONTROL SYSTEM	13
Figure 3-4 PITCH SERVO LOCATION	14
Figure 3-5 ELEVATOR CONTROL SYSTEM	14
Figure 4-1 ROLL SERVO MOUNTING BRACKET RIB.....	15
Figure 4-2 ROLL SERVO BRACKET PLACEMENT	16
Figure 4-3 ROLL SERVO MOUNTING HOLES	17
Figure 4-4 ROLL SERVO HARDWARE.....	18
Figure 4-5 PUSH PULL TUBE MODIFICATION	20
Figure 4-6 PUSH PULL TUBE TRIMMING	20
Figure 4-7 BELLCRANK ATTACH HARDWARE	21
Figure 4-8 ROLL SERVO HARDWARE STACKUP	21
Figure 4-9 PITCH SERVO INSTALLATION	22
Figure 4-10 BOLT TO CABLE CLEARANCE	23
Figure 4-11 ANGLE TO UPPER PITCH CABLE CLEARANCE	23
Figure 4-12 PITCH INSTALLATION TOP VIEW.....	24
Figure 4-13 CENTER OF PITCH TRAVEL	25
Figure 5-1 MAINTENANCE SETTINGS	29
Figure 5-2 PITCH SERVO EXAMPLE.....	29
Figure 5-3 CONTROLLER TYPES.....	30
Figure 5-4 TYPICAL COCKPIT INSTALLATION	31



REFERENCES

The following documents form a part of this report. Unless a specific revision of one of these documents is specified, the revision in effect at the time of original issue of this document shall apply.

DWG 413000XX Trio Pro Pilot System Wiring Diagram

Cessna 150 Service Manual

Cessna 152 Service Manual

Cessna 150 Parts Catalog

Cessna 152 Parts Catalog

Industry Specifications and Standards:

1. MMPDS-09 Metallic Materials Properties Development and Standardization
2. AC 43.13-1B ACCEPTABLE METHODS, TECHNIQUES, AND PRACTICES – AIRCRAFT INSPECTION AND REPAIR

Other Data:

ER1006 – STC GROUP LLC Program Engineering Record.



ACRONYMS, ABBREVIATIONS, AND SYMBOLS

ASSY	Assembly
Autopilot	Trio Pro Pilot Autopilot
C.G.	Center of Gravity
ER	Engineering Record
FAA	Federal Aviation Administration
F.S.	Fuselage Station
ICA	Instructions for Continued Airworthiness
INCH	Inches
LH	Left Hand
OEM	Original Equipment Manufacturer
OUTBD	Outboard
PCS	Pilot Controlled Steering
Recover	Recover Button
RH	Right Hand
Servo	Trio Gold Standard Servo
STC	Supplemental Type Certificate
WS	Wing Station



1.0 GENERAL

Thank you for your purchase of the TRIO Pro Pilot Autopilot for your aircraft. This document is written to ensure your installation is simple, safe, and professionally completed. Before you begin: Read All Instructions!

This installation procedure provides information and data necessary to install the Trio Auto Pilot Controller along with the Pitch and Roll servos in Cessna 150 & 152 aircraft.

These Installation Instructions are applicable to all aircraft models listed on Type Certificate Data Sheet A13EU. Appendices B & C do not apply to these aircraft:

A13EU Models: F150F, F150G, F150H, F150J, F150K, FA150K, F150L, FA150L, FRA150L, F150M, FA150M, FRA150M, F152, & FA152

You may contact The STC Group LLC for hardware and servo installation questions. Contact Trio Avionics, Inc with all autopilot related questions.

Check all items included in the kit to ensure all parts are accounted for. You may compare the contents of the kit with the Illustrated Parts Catalog. Please contact us if there are missing items.

The STC Group Technical Support is available 0800 to 1700 Monday through Friday Pacific Time:

+1 (231) 220-9296 or +1 (888) 350-2998

Trio Avionics may be reached Monday through Saturday at +1 (619) 448-4619

Note:

Care should always be taken to avoid marring or scratching of any surfaces of autopilot assemblies including anodized surfaces. Painters tape may be used to prevent damaging hardware surfaces but must be removed after final assembly.

The STC Group LLC recommends that a flight test of the subject aircraft be conducted to assess aircraft rigging and handling characteristics prior to autopilot installation. Use Test 4 of The STC Group LLC Flight Test Cards, document F-1006-43. Documents can be found at The STC Group LLC website at www.thestcgroupllc.com/documents.

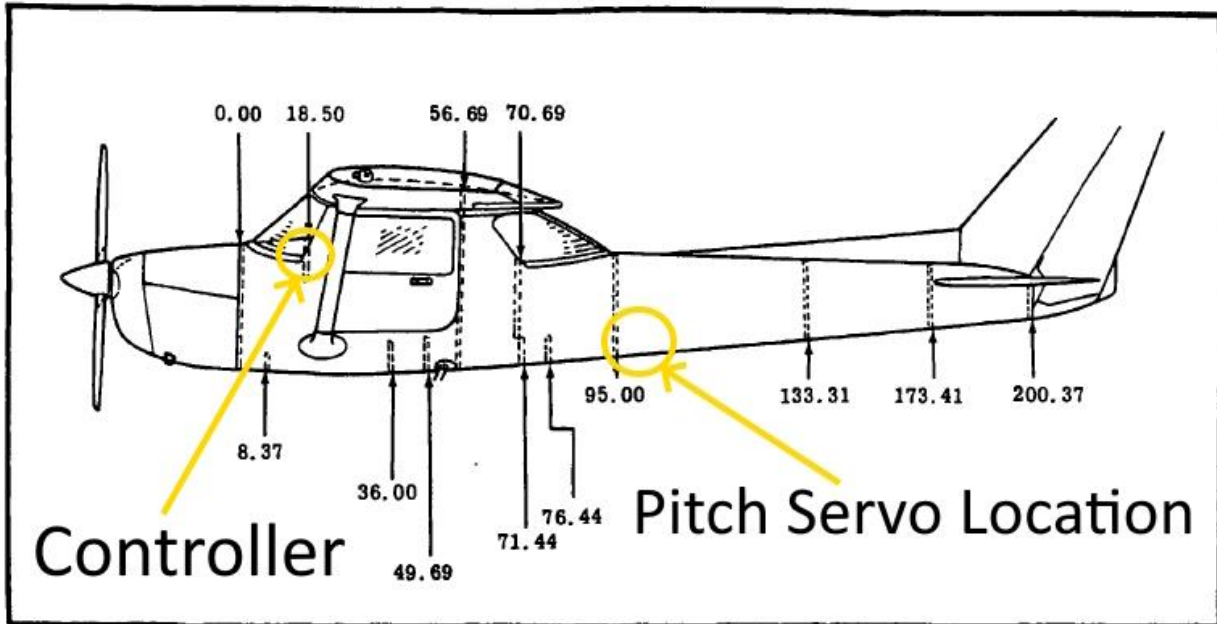


Figure 1-2. Fuselage Stations

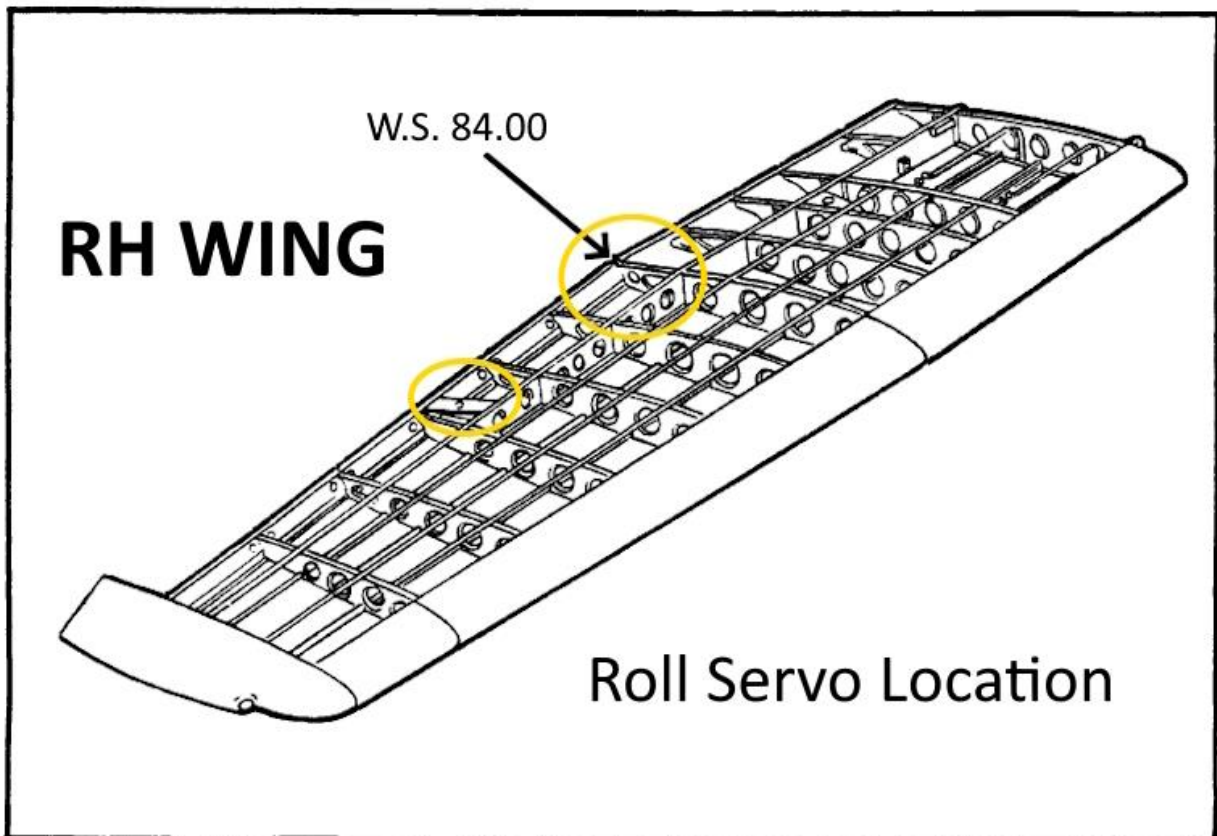


FIGURE 1-1 AREAS OF MODIFICATION



TABLE 1-1 PITCH INSTALLATION APPLICATION CHART

MODEL	SERIAL NUMBERS	PITCH SERVO INSTRUCTIONS
150	617, 17001 through 17999, 59001 through 59018	Appendix B
150A	628, 15059019 through 15059350	Appendix B
150B	15059351 through 15059700	Appendix B
150C	15059701 through 15060087	Appendix B
150D	15060088 through 15060772	Appendix C
150E	644, 15060773 through 15061532	Appendix C
150F	15061533 through 15064532	Section 4.0
150G	15064533 through 15067198 (except 15064970)	Section 4.0
150H	649, 15067199 through 15069308	Section 4.0
150J	15069309 through 15071128	Section 4.0
150K	15071129 through 15072003	Section 4.0
A150K	A1500001 through A1500226	Section 4.0
150L	15072004 through 15075781	Section 4.0
A150L	A1500227 through A1500523 (Except A1500433)	Section 4.0
150M	15075782 through 15079405	Section 4.0
A150M	15064970, A1500524 through A1500734	Section 4.0
152	15279406 through 15286033	Section 4.0
A152	681, A1500433, A1520735 through A1521049	Section 4.0



2.0 PREPARE THE SERVOS

- 2.1 Remove the Pitch and Roll servos from the shipping boxes.
- 2.2 Enlarge the 4 corner mounting holes on both servo baseplates using a #16 drill bit and deburr.
- 2.3 Install the Pitch and Roll servo arms, attach screws, safety washer, and large cotter pins in accordance with Figure 2-1, 2-2, and the Illustrated Parts Catalog Document # 1006907.
- 2.4 With the **roll servo** hub drift pin aligned with stop, the servo arm must be installed parallel to the servo base plate and facing away from the DB9 connection. See Figure 2-1.
- 2.5 With the **pitch servo** hub drift pin aligned with the stop, the servo arm must be installed in line with the drift pin facing away (perpendicular) from the servo baseplate. See Figure 2-2
- 2.6 Four (4) M3 screws supplied in the autopilot hardware kit have been coated with Loctite 202 thread locker. DO NOT apply additional thread locker to the M3 screws.
- 2.7 Torque to the screws 8.8 - 9.0 lb.-in. using a calibrated screwdriver with the proper tip inserted.

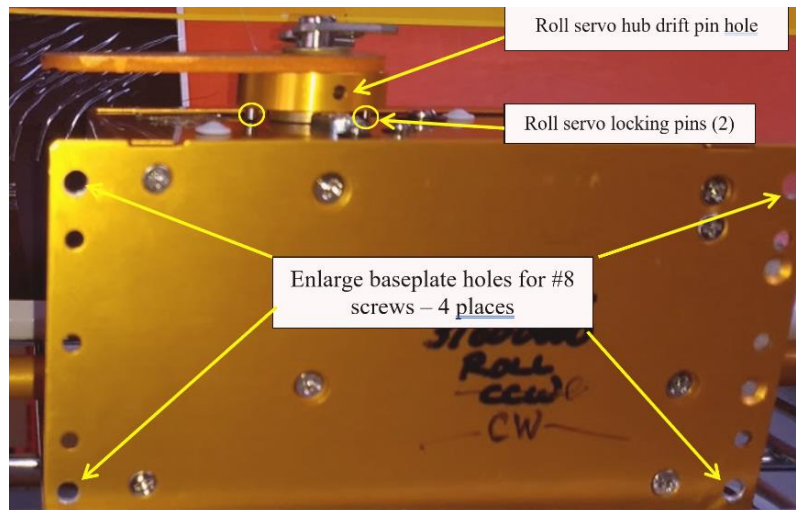


FIGURE 2-1 ROLL SERVO

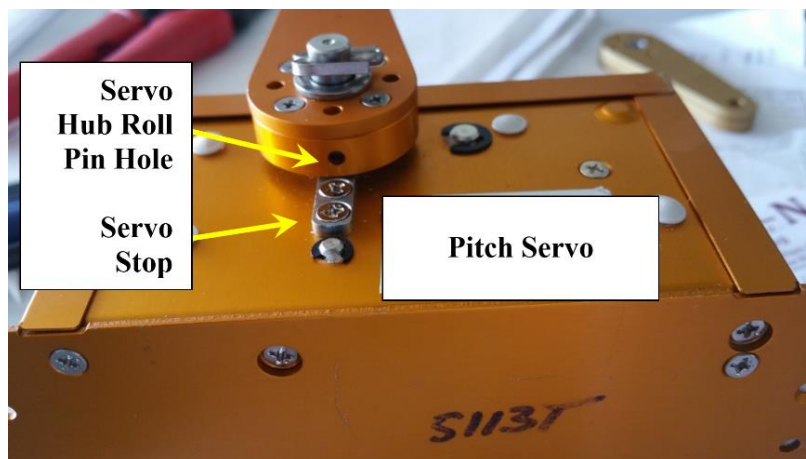


FIGURE 2-2 PITCH SERVO



3.0 PREPARE THE AIRCRAFT FOR THE INSTALLATION

- 3.1 Pitot and static system leak checks are recommended to be performed on the aircraft before any work begins. {i.e. FAR §43 Appendix E, Paragraph (a)}.
- 3.2 Remove any previously installed autopilot, servos, and harnesses. Record the station position of each component removed and weigh each component. This information will be used to update Weight & Balance data.
- 3.3 Remove seats and interior, as needed, for wiring installation and access to areas of modification. Refer to Figure 1-1, 3-1, 3-2, and 3-4. Fuselage sections of aircraft serial numbers prior to 15061533 are depicted in Appendix B Figure B-1 & Appendix C Figure C-1.
- 3.4 Verify pitch, roll, and yaw control system rigging and cable tensions are correct in accordance with the applicable Type Certificate Data Sheet and Maintenance/Service Manual.
- 3.5 Record pitch and roll control system cable tensions for reference later.
Pitch Cable Tension: _____
Roll Cable Tension: _____
- 3.6 Route the roll and pitch servo wires to their corresponding areas. Refer to Section 5.0 and Trio Pro Pilot Wiring Diagram Appendix A.

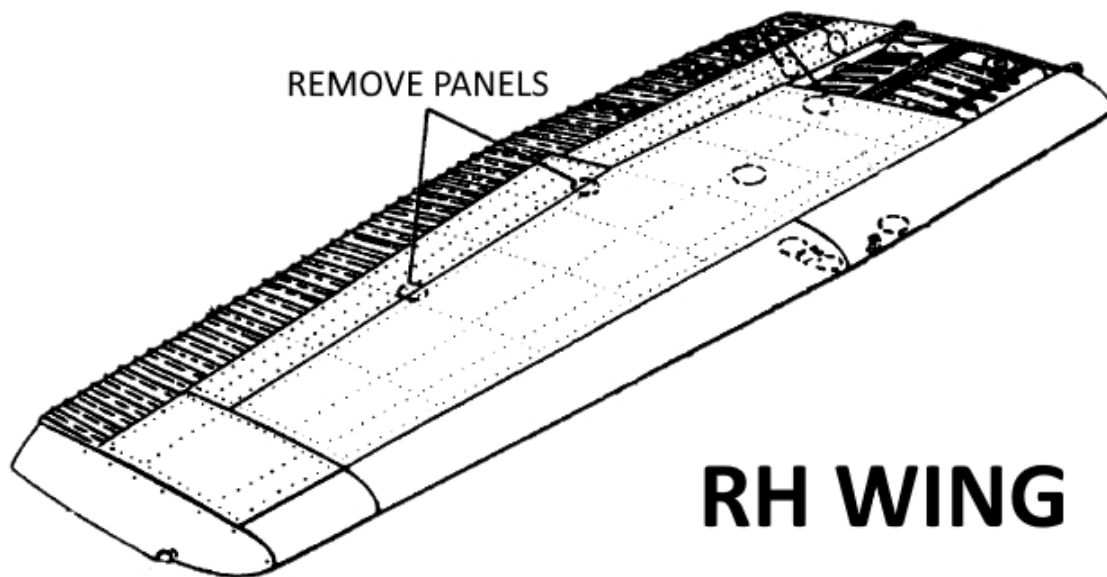
Note:

The electrical installation must be done before final setup of the servos.

- 3.7 If your aircraft does not have RH wing access panels at W.S.'s 93.0 and W.S. 128.5 then access panels will need to be fabricated in accordance with AC 43.13-1B.
- 3.8 If the assembled roll servo cannot fit through the wing access panel at W.S. 93.0 then it will need to be enlarged in accordance with AC 43.13-1B.

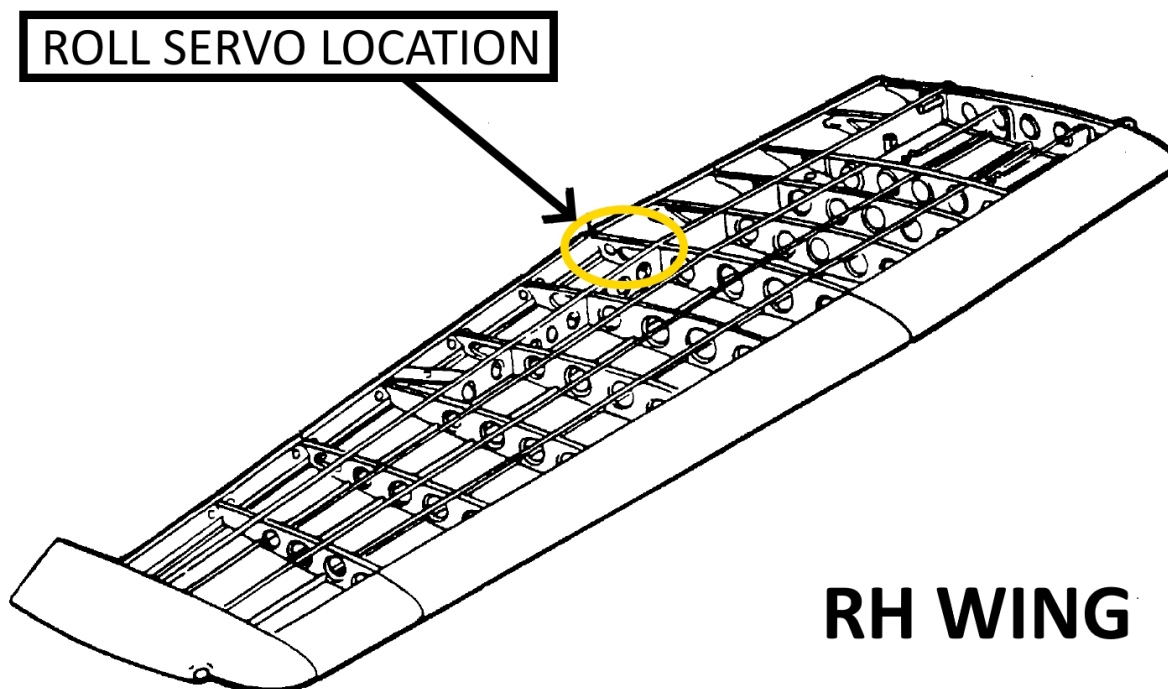
FOR PITCH INSTALLATION ON SERIAL NUMBERS 17001 THRU 15060087 SEE APPENDIX B

FOR PITCH INSTALLATION ON SERIAL NUMBERS 15060088 THRU 15061532 SEE APPENDIX C



RH WING

FIGURE 3-1 REMOVE PANELS



RH WING

FIGURE 3-2 ROLL SERVO LOCATION

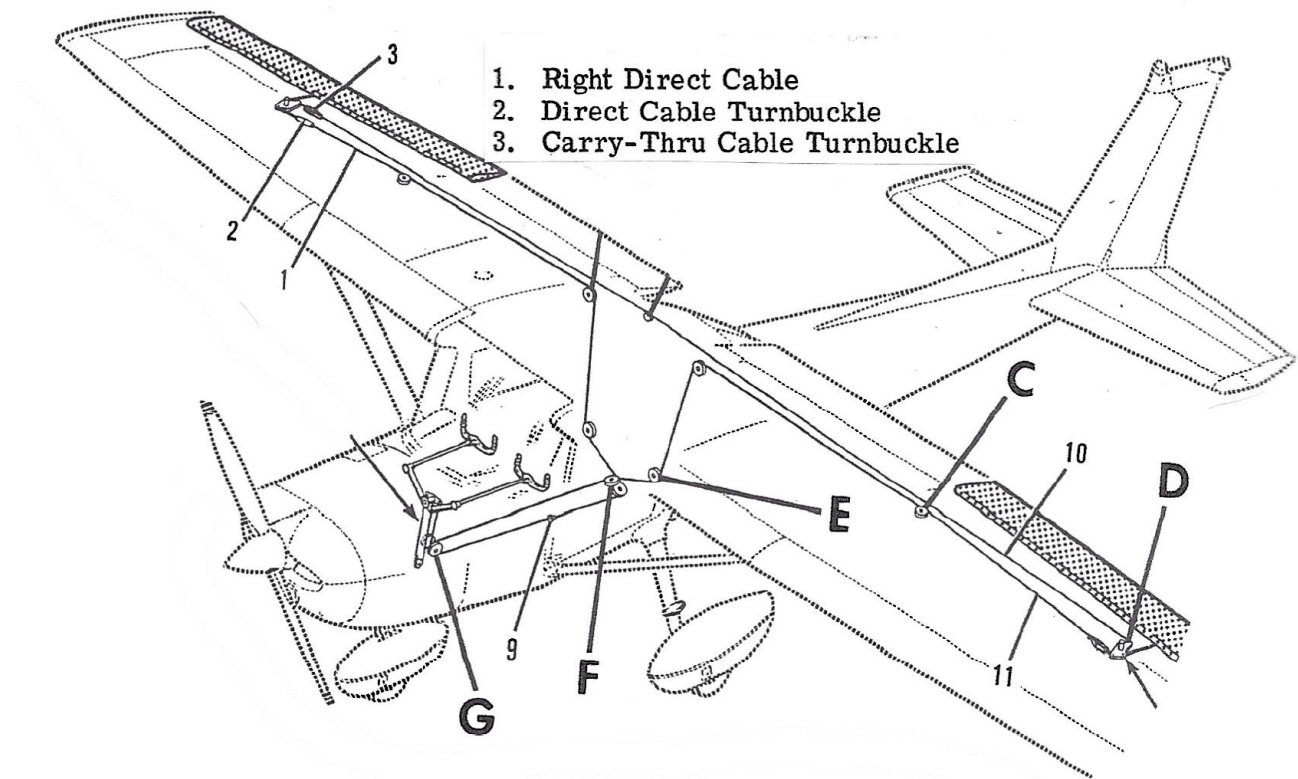


FIGURE 3-3 AILERON CONTROL SYSTEM

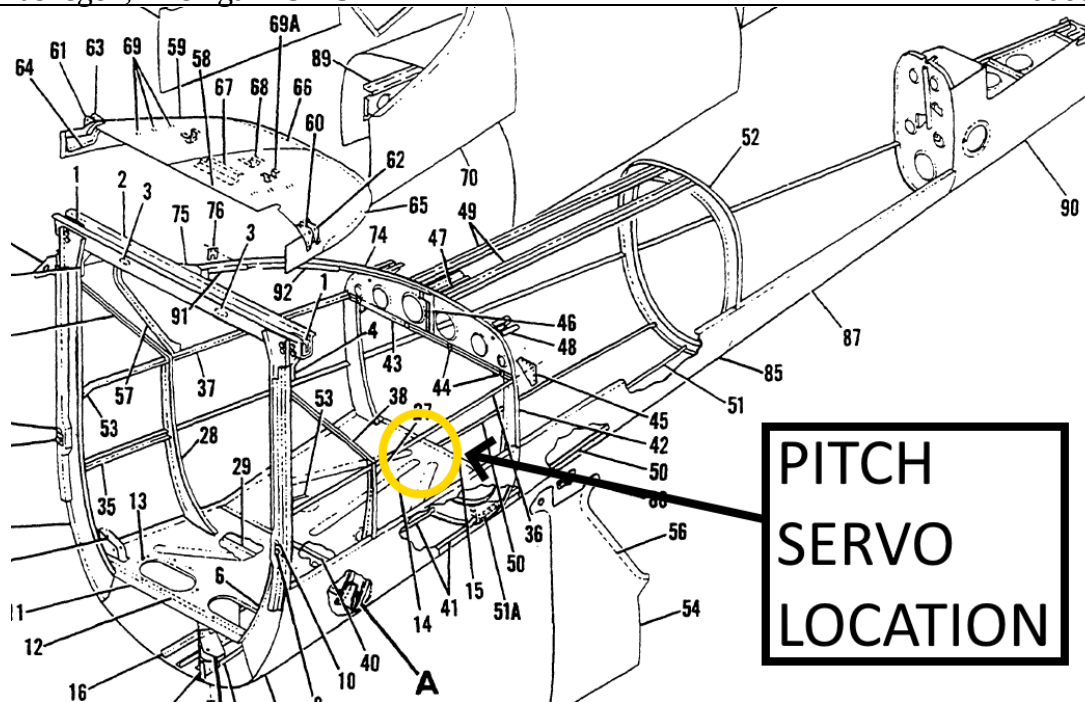


FIGURE 3-4 PITCH SERVO LOCATION

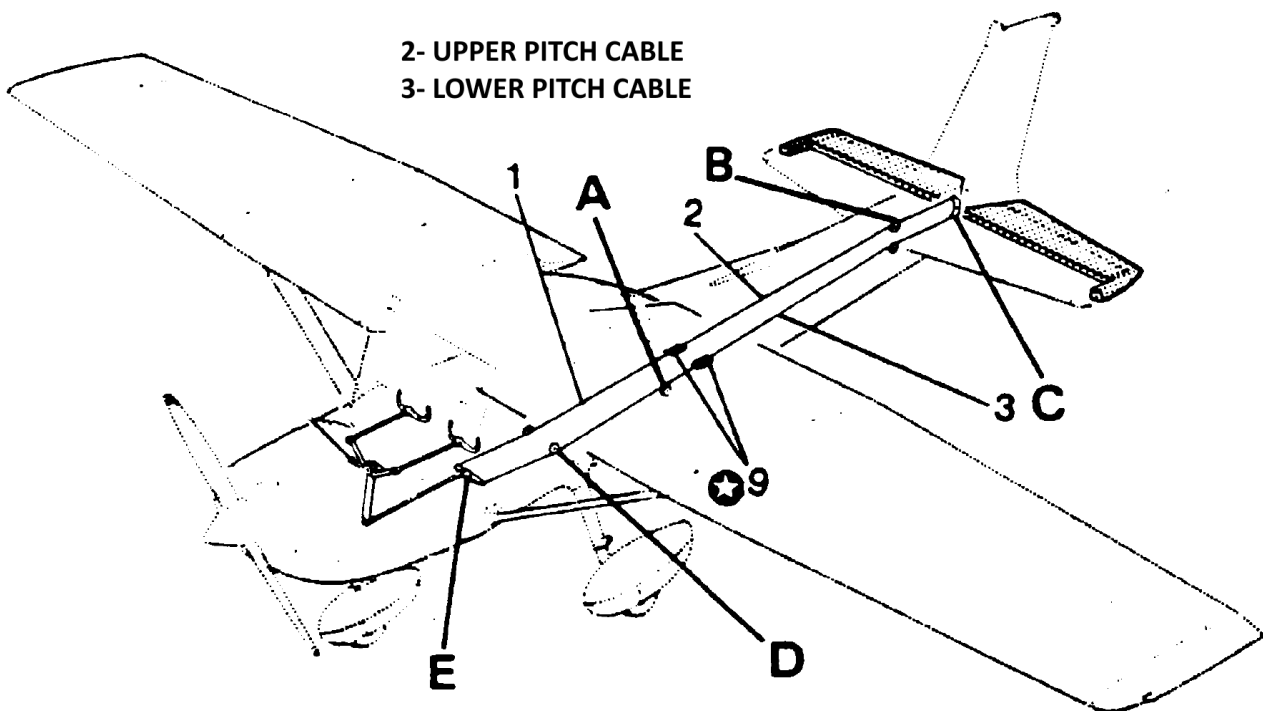


FIGURE 3-5 ELEVATOR CONTROL SYSTEM



4.0 SERVO INSTALLATIONS

4.1 ROLL SERVO INSTALLATION

- 4.1.1 This roll servo installation references The STC Group LLC Illustrated Parts Catalog Document # 1006907.
- 4.1.2 On the right-hand wing W.S. 84.0, drill out the rivet pictured in Figure 4-1 using the appropriate drill bit for the existing rivet.
- 4.1.3 Oversize and debur the removed rivet hole using a #16 drill bit.

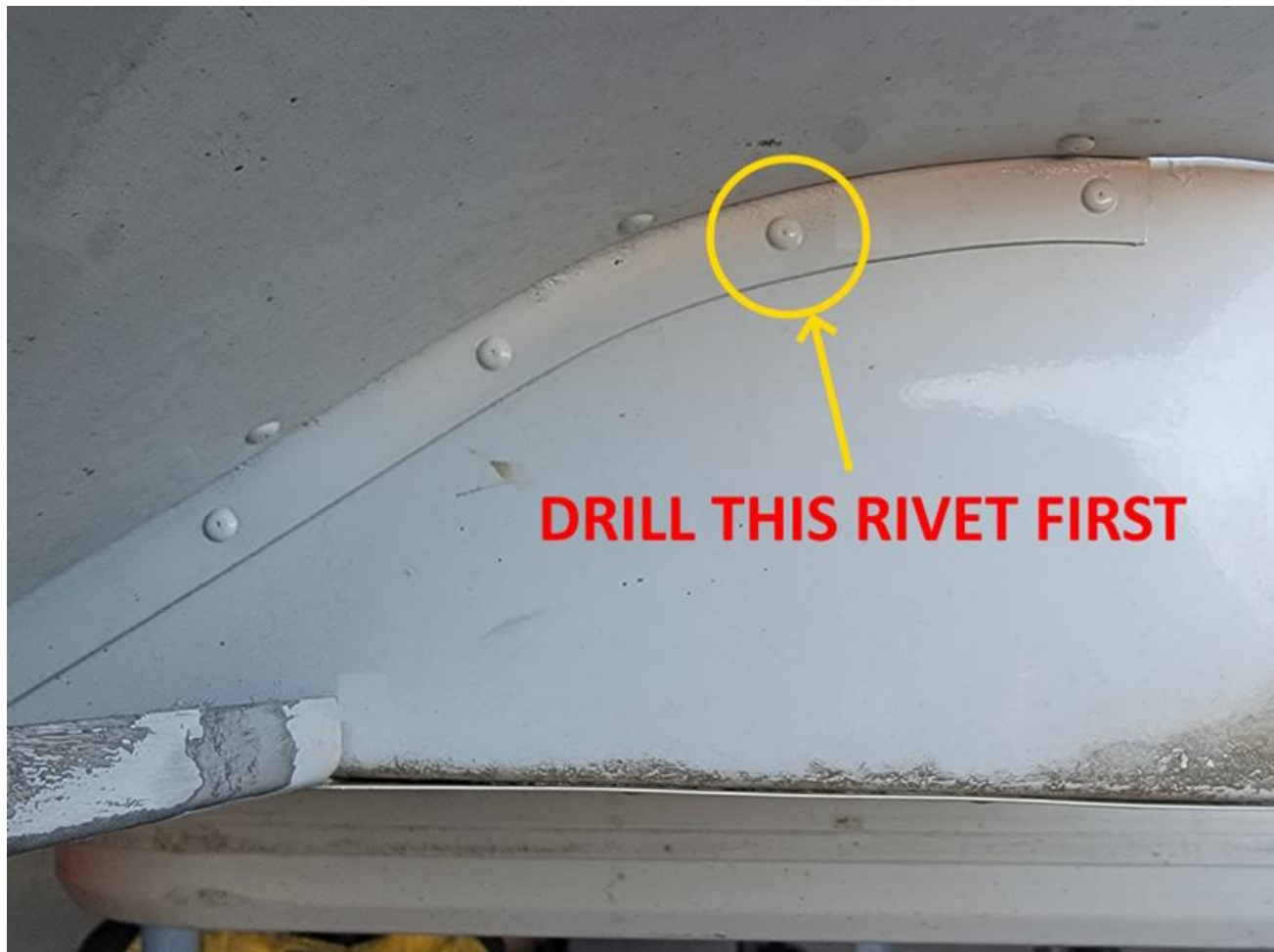


FIGURE 4-1 ROLL SERVO MOUNTING BRACKET RIB

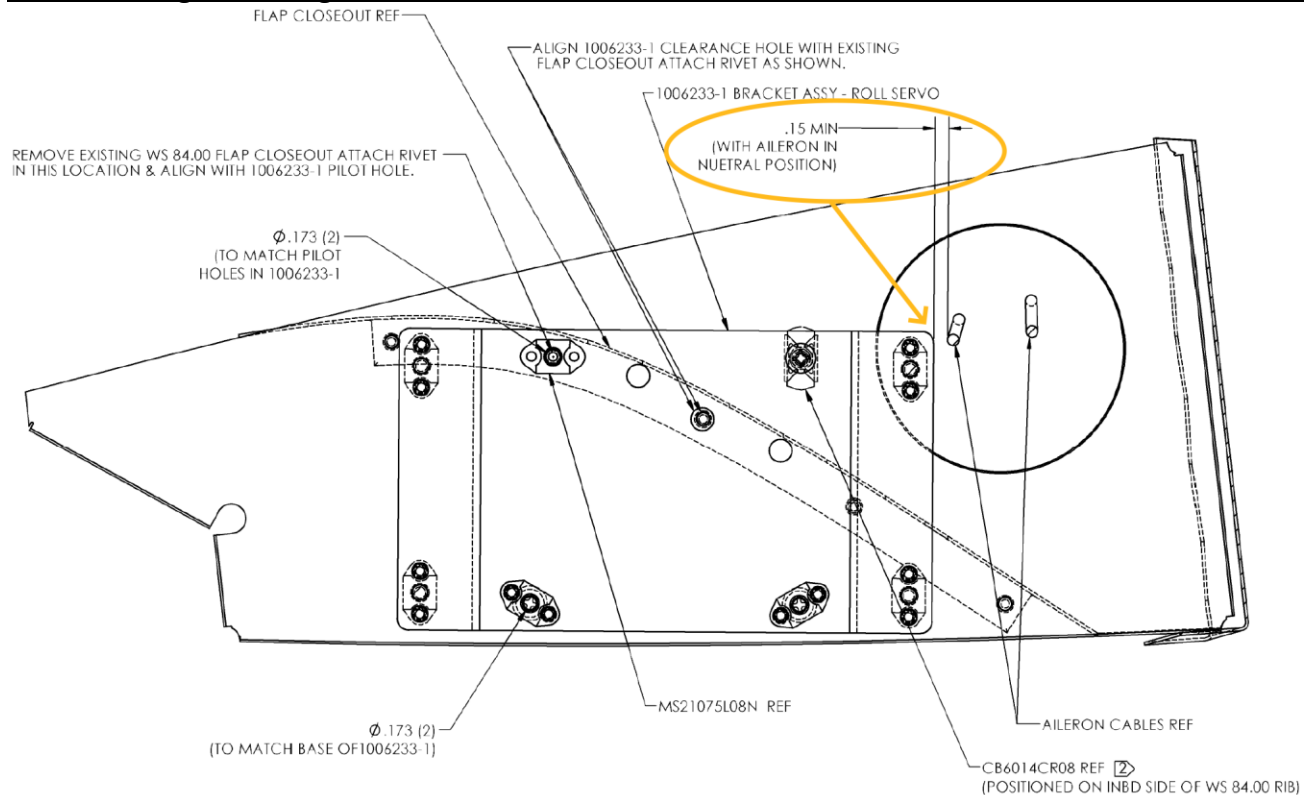
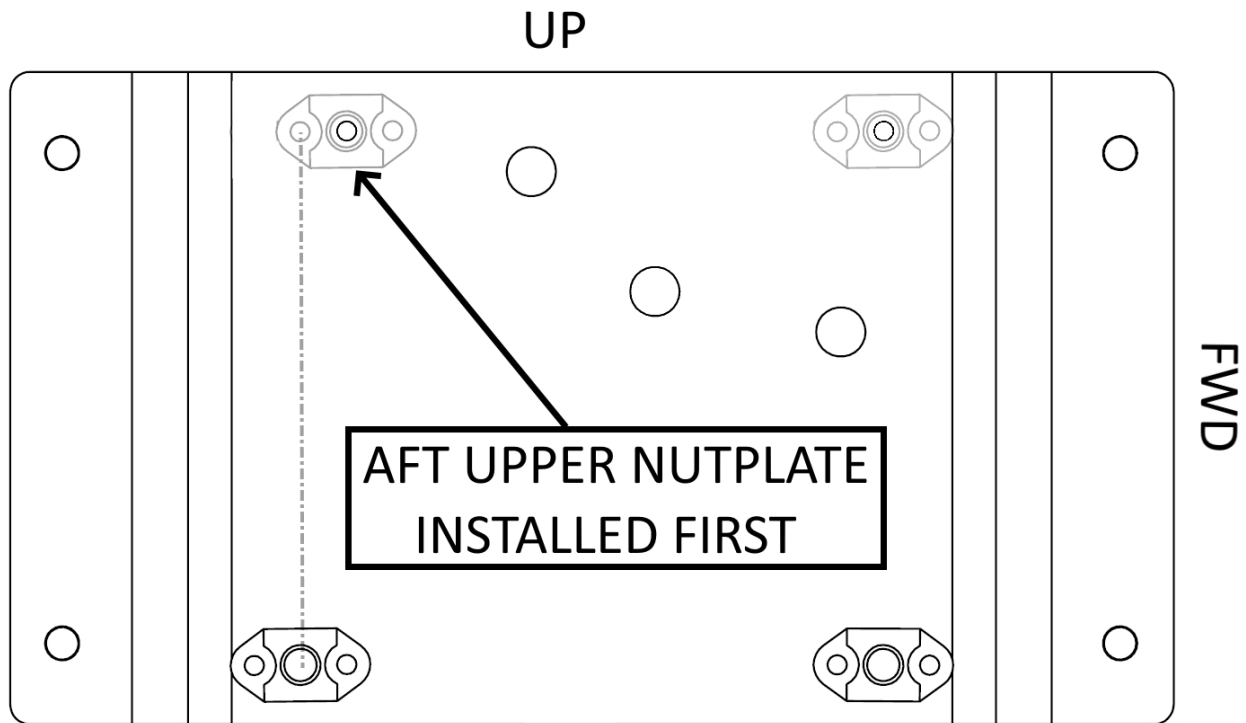


FIGURE 4-2 ROLL SERVO BRACKET PLACEMENT

- 4.1.4 Install the aft upper nutplate on the 1006235 bracket. Refer to Figure 4-3 for nutplate placement.
- 4.1.5 Put the bracket in the wing and align the bracket clearance hole with the existing flap closeout attach rivet. Refer to Figure 4-2.
- 4.1.6 Install the bracket upper aft AN525 screw.
- 4.1.7 With the ailerons in neutral, ensure there is a minimum of 0.15" between the aft aileron cable and the servo bracket. Refer to Figure 4-2.
- 4.1.8 With the bracket parallel to the bottom wing skin pick up the remaining mounting holes using the pilot hole and nutplates as guides with a #30 drill bit. Refer to Figure 4-3. The bracket should not be touching the bottom wing skin.



LOOKING INBOARD

FIGURE 4-3 ROLL SERVO MOUNTING HOLES

- 4.1.9 Remove the bracket from the wing.
- 4.1.10 Oversize and debur the 3 remaining rib holes with a #16 drill bit.
- 4.1.11 Install a clickbond nutplate on the inboard side of the W.S. 84.0 rib for the upper forward mounting screw. Follow the clickbond instructions for preparation and to ensure proper installation.
- 4.1.12 Install and torque (12-15 inch-pounds) the roll servo bracket with the hardware supplied.
- 4.1.13 Install the servo on the bracket. For ease of installation, the DB9 servo connection can be made before installing the servo. Refer to Figure 4-4 and Illustrated Parts Catalog Document # 1006907.

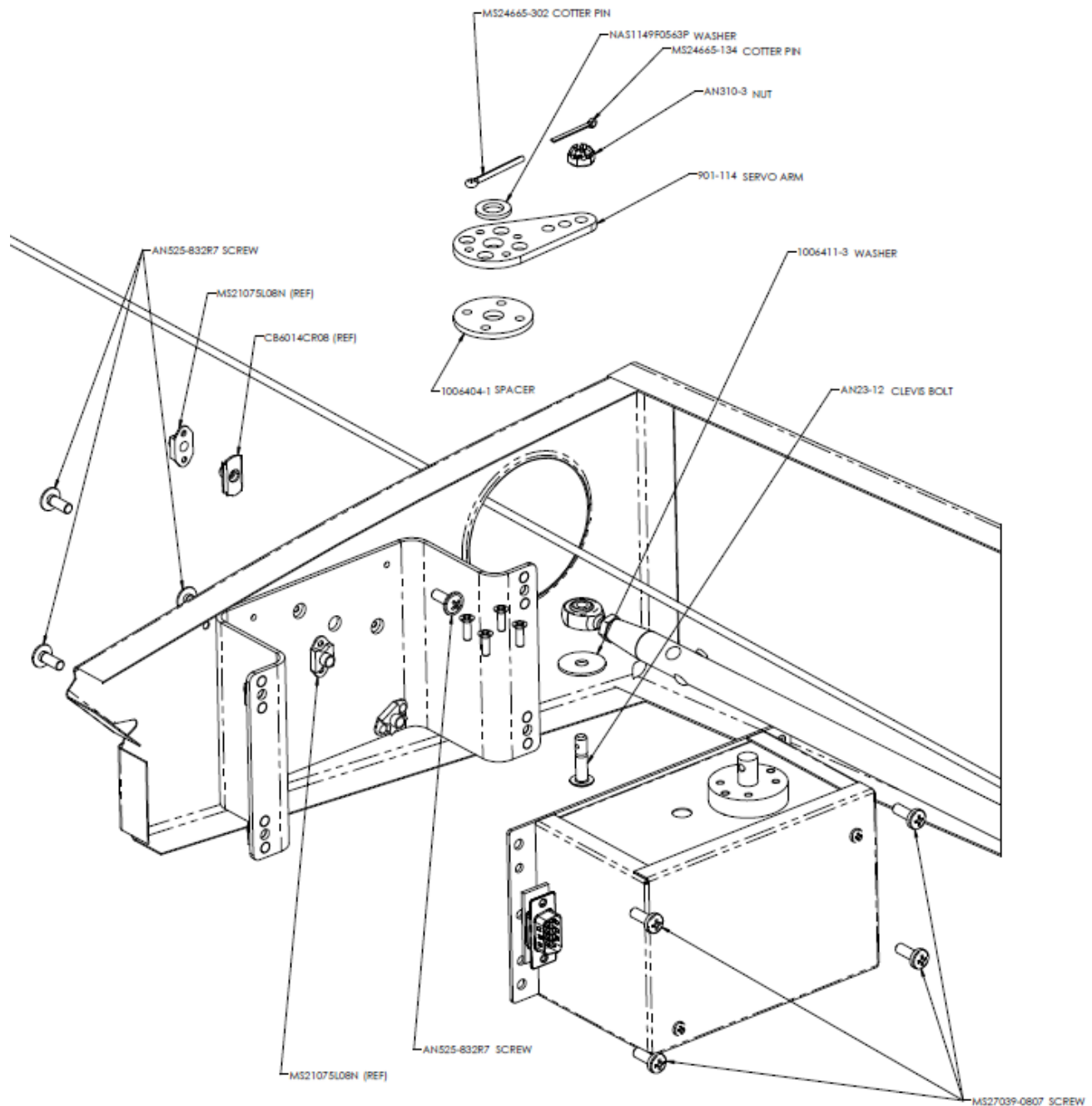


FIGURE 4-4 ROLL SERVO HARDWARE

4.1.14 With the ailerons in neutral, record the carry through cable tension.

Aileron carry through cable tension: _____.



Note:

The STC Group LLC is shipping a modified Push Pull Tube Assembly, P/N 1006231-1, that has been terminated on a single end to allow for manufacturing variations between Cessna Aircraft 100 Series models. The 1006231-1 tube will require shortening to fit each specific aircraft.

- 4.1.15 Ensure that the aileron surfaces are locked in the neutral flight position using padded blocks before starting this procedure. Contact The STC Group LLC if you have any questions or require assistance with adjusting the 1006231-1 tube length.

Note:

This is a critical operation.

P/N 1006231-1, Push Pull Tube, should be modified using the 1006405-1 insert, rod end, AN315, and AD4-11 rivets supplied in the installation kit. These parts (excluding rivets) have been pre-assembled and bagged. A steel drill jig has been supplied to assist the installer with proper rivet hole locations and to ease drill operations.

- 4.1.16 The rod end should have four (4) threads showing at each end.
4.1.17 The modified push pull tube should be protected from marring using painter's tape.
4.1.18 Insert the Push Pull tube assembly through the access panel at W.S 128.5.
4.1.19 Attach the push pull tube to the servo arm in the outer hole on the servo arm.
4.1.20 Attach the DB9 plug to the servo DB9 connector after completing the Wiring harness installation in Appendix A.
4.1.21 Power on the Trio Pro Pilot autopilot and enter the Maintenance menu by pressing the Encoder knob and VMODE button simultaneously.

Note:

Both servos need to be connected to enter MAINTENANCE MODE.

- 4.1.22 Turn, or Press, the Encoder knob until the LNAV SERVO SET screen is displayed.
4.1.23 Set the servo arm to 0 degrees or turn the HNAV servo on to keep at 0 degrees. Alternatively, if you do not have the electrical side of the installation done then you can ensure the roll servo arm is facing forward parallel to its base.
4.1.24 With the ailerons in the neutral position mark the RH aileron bellcrank forward attach point on the open end of the tube with a sharpie, or equivalent marking device. Refer to Figure 4-6.
4.1.25 Remove the 1006231-1 tube from the aircraft and on the open end of the tube place the provided rod- insert bolt hole next your mark. (with 4 threads showing on the rod end). Make a new marking on the tube at the base of the taper of the insert. Cut the tube at the new marking. Refer to Figure 4-6.
4.1.26 Install the rod end insert with the rivets and drill guide provided.

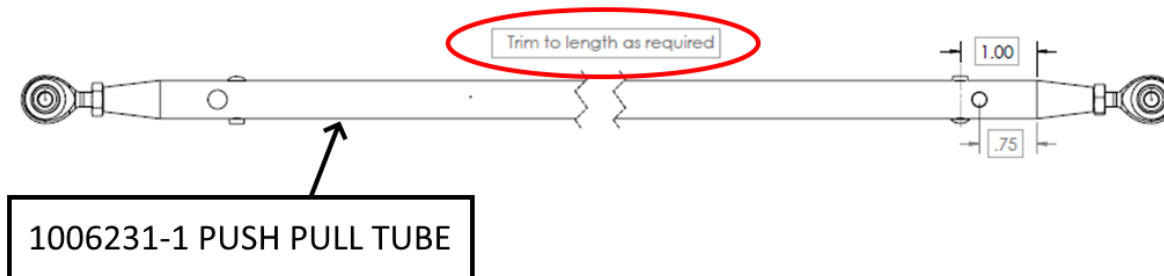


FIGURE 4-5 PUSH PULL TUBE MODIFICATION

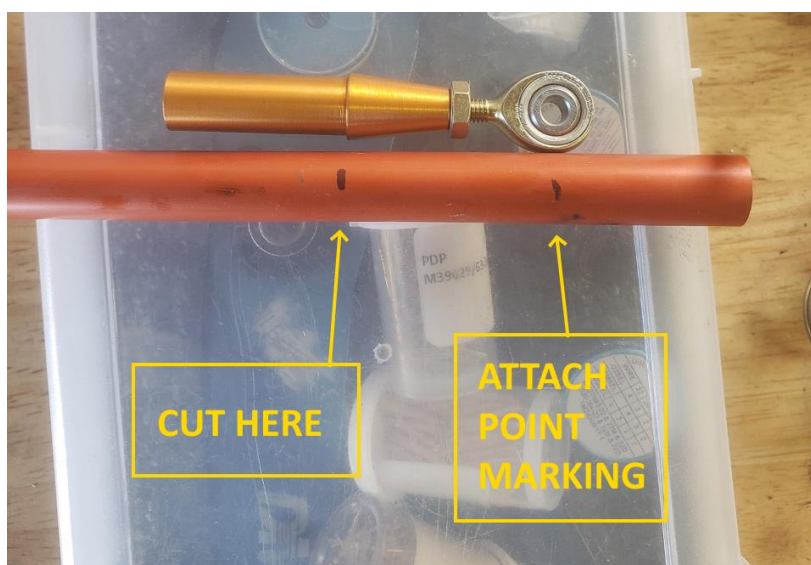


FIGURE 4-6 PUSH PULL TUBE TRIMMING

- 4.1.27 Remove the safety pins/wire and loosen the carry-thru cable. See Figure 3-3.
- 4.1.28 Install the push-pull tube through the access panel at W.S. 128.5 and attach to the outer hole of the servo arm and RH FWD bellcrank with the hardware pictured in Figures 4-7, 4-8, and the Illustrated Parts Catalog Document # 1006907.
- 4.1.29 Re-tension and safety the carry through cable in accordance with your aircrafts Maintenance Manual.

Note:

Both servos need to be connected to enter MAINTENANCE MODE.

- 4.1.30 Power on the Trio Pro Pilot autopilot and enter the Maintenance menu by pressing the Encoder knob and VMODE button simultaneously.
- 4.1.31 Turn, or Press, the Encoder knob until the LNAV SERVO SET screen is displayed.

Note:

The rod ends require a minimum of 1.5 x thread diameter for rod end engagement in the push pull rods.



- 4.1.32 Adjust the rod ends until the LNAV SERVO SET reading is 0.00 degrees, +/- 1 degree.
- 4.1.33 Tighten the jam nuts, P/N AN315-3R, on the rod ends.
- 4.1.34 Install the MS24665-134 cotter pins on both ends of the push pull tube. Refer to the Illustrated Parts Catalog Document # 1006907.
- 4.1.35 Continue to Pitch Installation Section 4.2, or Appendix B or C depending on model.



FIGURE 4-7 BELLCRANK ATTACH HARDWARE



FIGURE 4-8 ROLL SERVO HARDWARE STACKUP



4.2 PITCH SERVO INSTALLATION

FOR SERIAL NUMBERS 17001 THRU 15060087 SEE APPENDIX B

FOR SERIAL NUMBERS 15060088 THRU 15061532 SEE APPENDIX C

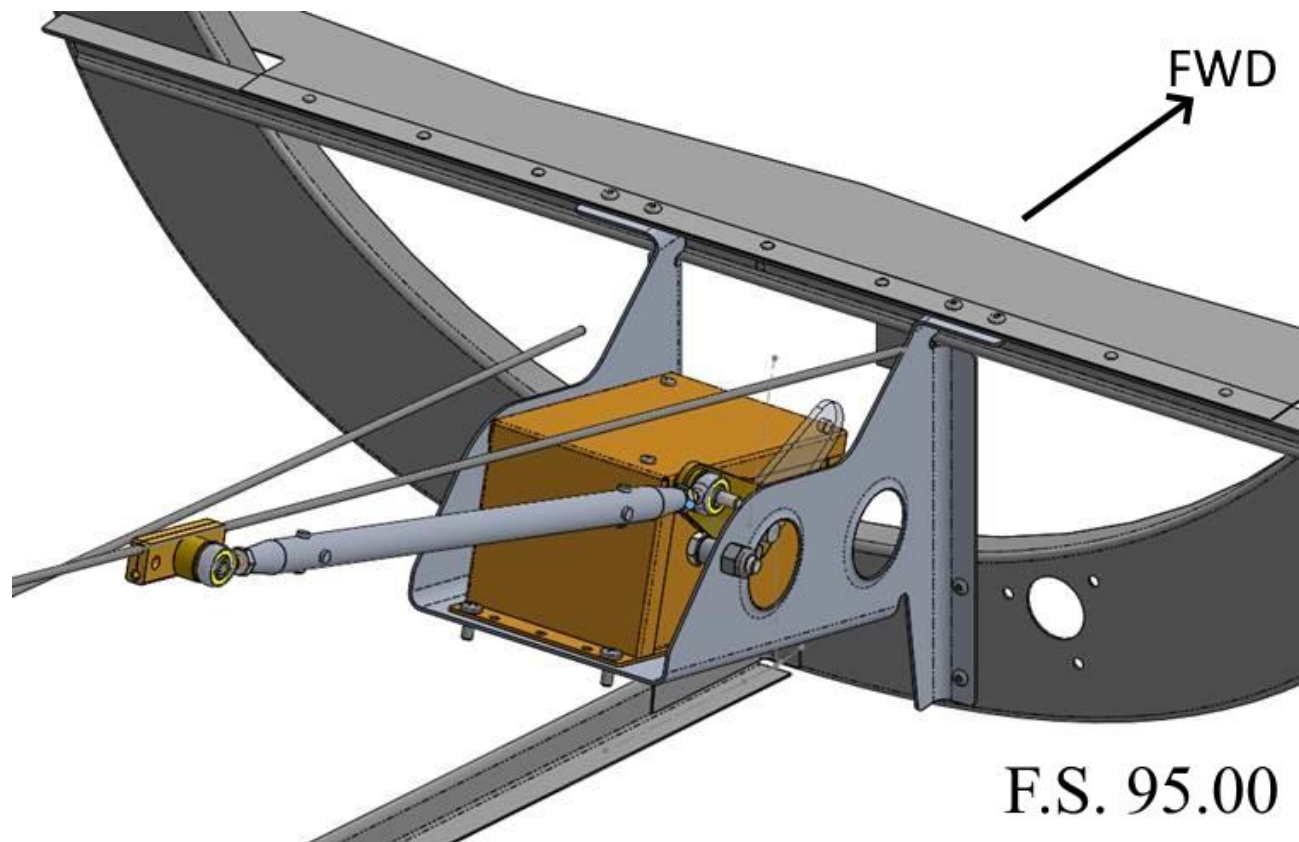


FIGURE 4-9 PITCH SERVO INSTALLATION

- 4.2.1 This pitch servo installation references The STC Group LLC Illustrated Parts Catalog Document # 1006907.
- 4.2.2 Install the assembled pitch servo onto the bracket with the servo arm facing up and towards the RH side of the aircraft. Refer to Figures 4-9 & Illustrated Parts Catalog Document # 1006907.
- 4.2.3 Clamp the 1006235 bracket to the aft baggage floor angle and the lower aft side of F.S. 95.00. Refer to Figure 4-9.
- 4.2.4 With just the bolt in the servo arm and the servo arm facing up 90 degrees from the baseplate, use a scale to measure the distance between the edge of the elevator cable and inboard surface of the servo arm bolt. Slide the bracket left or right to achieve the 0.25" +0.125"/-0" tolerance as shown in Figure 4-10.

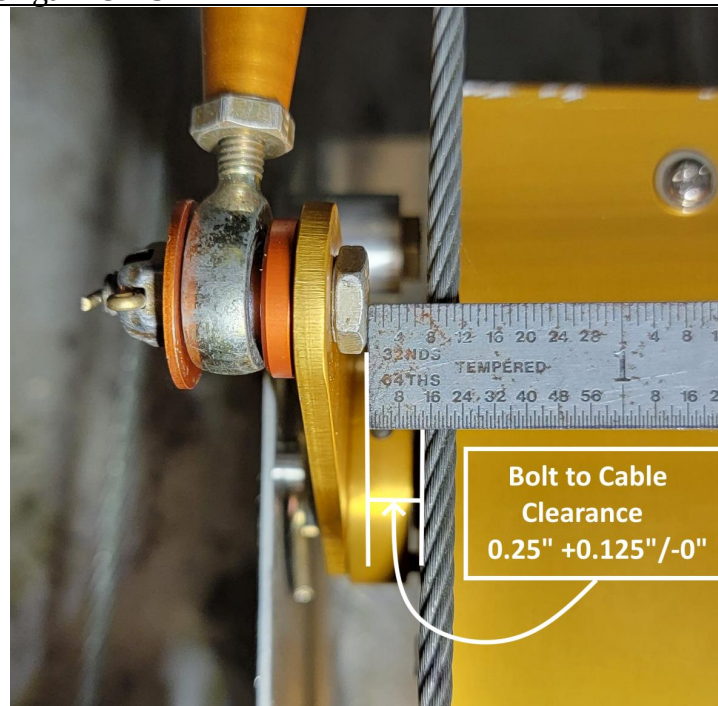


FIGURE 4-10 BOLT TO CABLE CLEARANCE

- 4.2.5 Verify the upper pitch cable is approximately 7/8" (0.875") below the angle. Refer to Figure 4-11.

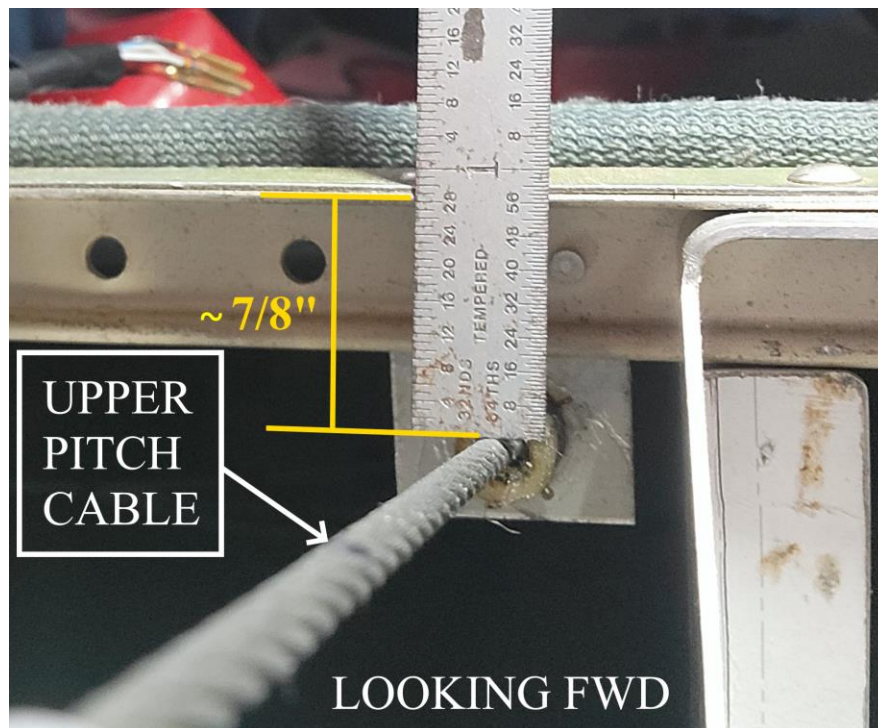


FIGURE 4-11 ANGLE TO UPPER PITCH CABLE CLEARANCE



- 4.2.6 If the position of the assembly is not within limits, then contact The STC Group LLC before proceeding.
- 4.2.7 Back drill through the 4 nutplates on the lower bracket with a #30 drill bit through F.S. 95.00 and cleco into place.
- 4.2.8 Drill the 4 upper bracket holes through the baggage floor and angle with a #30 drill bit ensuring proper edge distance on the angle and bracket. Install clecos. Refer to Figure 4-12.

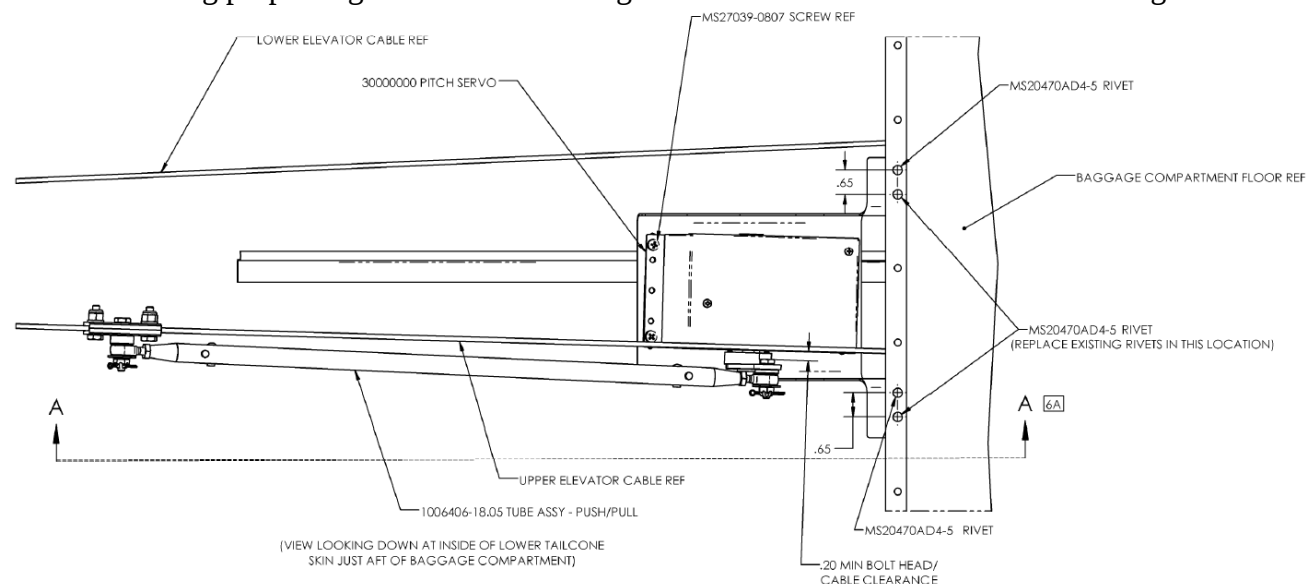


FIGURE 4-12 PITCH INSTALLATION TOP VIEW

- 4.2.9 Remove the bracket assembly.
- 4.2.10 Enlarge the 4 lower bracket mounting holes in F.S. 95.00 with a #16 drill bit.
- 4.2.11 Debur all holes on F.S. 95.00, bracket 1006235, and baggage floor/angle.
- 4.2.12 For ease of the next steps, the servo can be removed from the bracket.
- 4.2.13 Attach bracket 1006235 assembly to lower F.S. 95.00 using supplied screws.
- 4.2.14 Install all 4 rivets attaching the bracket to F.S. 95.00 angle.
- 4.2.15 Install the DB9 connector to the servo and install the servo on the bracket.
- 4.2.16 Before the next step is accomplished you must first determine where the center of pitch cable travel is (Not flight neutral). One method is shown in Figure 4-13.

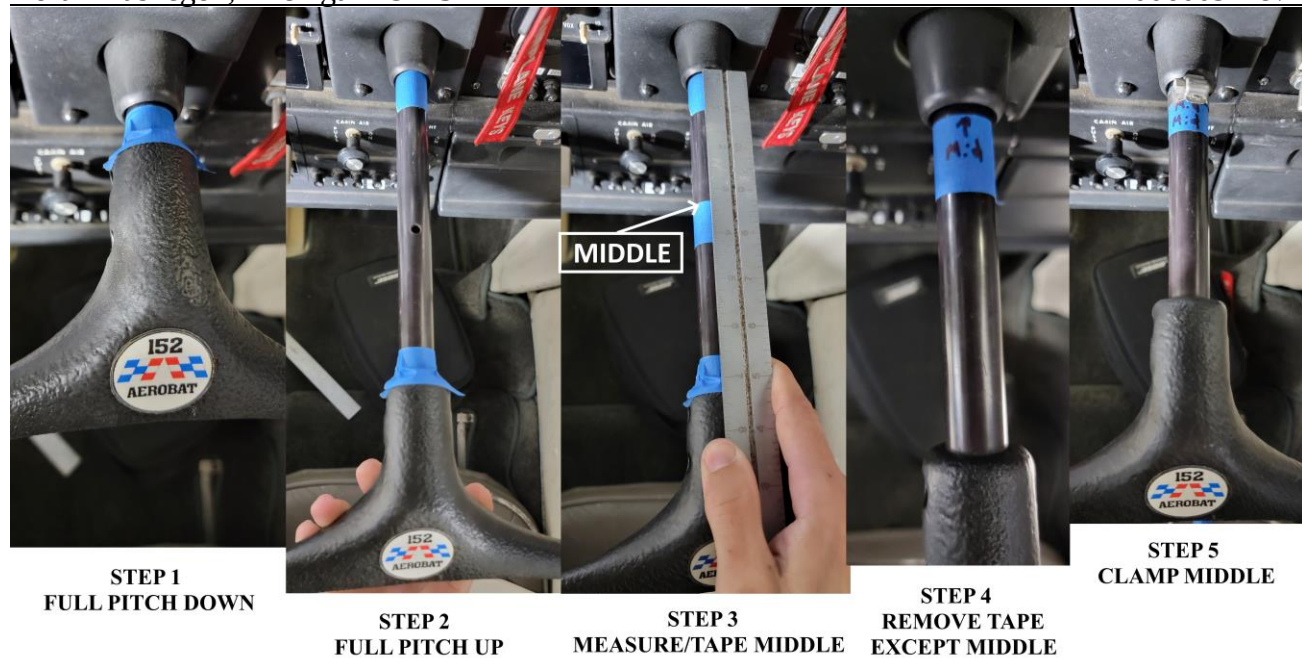


FIGURE 4-13 CENTER OF PITCH TRAVEL

- 4.2.17 Once the center of travel is found, fix the pitch control system to stay at the MIDDLE OF TRAVEL location. A hose clamp around the yoke or tail stand under the elevator can be used if another person is not available for this step.
- 4.2.18 Temporarily attach the pitch servo push/pull tube to the servo and upper elevator cable. Refer to Figure 4-10 and Illustrated Parts Catalog Document # 1006907.
- 4.2.19 Power on the Trio Pro Pilot autopilot and enter the Maintenance menu by pressing the Encoder knob and VMODE button simultaneously.

Note:

Both servos need to be connected to enter MAINTENANCE MODE.

- 4.2.20 Turn, or Press, the Encoder knob until the VNAV SERVO SET screen is displayed.
- 4.2.21 When the pitch servo arm is pointing up 90 degrees from the servo baseplate, ensure that the push pull tube bolt is at or a maximum of 0.25" above the upper pitch cable vertically. Engage the V NAV servo, press the HMODE button and set the "V NAV SERVO SET" to 0 degrees for this step.
- 4.2.22 With the pitch cable still in the center of travel, finish installing the servo, push pull tube, and cable clamps. Refer to the Illustrated Parts Catalog Document # 1006907.

Note:

The rod ends require a minimum of 1.5 x thread diameter for rod end engagement in the push pull rods.

- 4.2.23 Standard installations have 4 threads showing on each rod end.
- 4.2.24 Tighten both push pull tube rod end jam nuts.
- 4.2.25 Removed the clamp and tape from the yoke.



- 4.2.26 Ensure that the servo arm bolt is 0.25" to 0.3125" to the right (laterally) of the upper pitch cable and does not contact the cable throughout the servo's full travel.
- 4.2.27 Install the MS24665-134 cotter pins on the castle nuts at each end of the push pull tube. Refer to Figure 4-9 and the Illustrated Parts Catalog Document #1006907.
- 4.2.28 Continue to Pro Pilot Installation and Wiring in Section 5.0.



5.0 PRO PILOT INSTALLATION & WIRING

Note:

Prior to connecting the wiring harness DB9 or DB37 connectors into the servos or autopilot control head perform complete power, ground, and data pinout tests on the harness.

Reference the STC Group LLC Avionics Addendum for information not mentioned here.

5.1 SERVO WIRE HARNESSES INSTALLATION

- 5.1.1 Route Trio servo wire harnesses along same path and using the same clamps as factory autopilot wiring. If there was no previously installed autopilot, then use best practices for routing wires. Typically, the roll servo harness is routed from the control head up the right side of the fuselage to the right wing and the pitch servo harness is routed along the bottom of the fuselage with existing wire bundles ending just aft of the baggage compartment by F.S. 95.00.
- 5.1.2 Take care to protect harness pins at the end of the harnesses.
- 5.1.3 Terminate supplied DB9 connectors per latest revision Trio Wiring Diagram included with the harness assembly.
- 5.1.4 Install the DB9 connectors onto the servos.
- 5.1.5 Secure the harnesses, as necessary.

5.2 TRIO AUTOPILOT CONTROLLER

- 5.2.1 The Trio autopilot controller is ordered in Panel Mount or Instrument Mount versions. Refer to Figure 5-3.
- 5.2.2 The Trio autopilot controller will support 12 to 30 volt inputs.
- 5.2.3 Install the autopilot controller using best practices in either panel or instrument hole locations. Refer to AC 43.13-1 for this step and all following steps.
- 5.2.4 Utilize Trio Wiring Diagram for the following steps. Refer to Appendix A.
- 5.2.5 Install Klixon 7274-2-5 (or equivalent) 5 ampere circuit breaker within easy reach of the pilot and label.
- 5.2.6 If installing a Panel Mount unit then install the supplied power switch and label.
- 5.2.7 Install the supplied Red Disconnect button on the left side of the pilots control yoke and label "AP DSC" "PCS" or "Autopilot Disconnect."
- 5.2.8 Install the supplied Recover button (Black) in an available convenient location within easy reach of the pilot and label "AP Recover."
- 5.2.9 Install Limitation Placard in plain view of Pilot.

5.3 PITOT AND STATIC PORTS

- 5.3.1 The Trio Pro Pilot autopilot controller is provisioned with Pitot and Static ports on the rear of the controller.



- 5.3.2 The controller pitot and static ports must be integrated (plumbed) into the aircraft pitot and static systems.
- 5.3.3 Every aircraft pitot and static system is different. The following are for example only as the aircraft systems will vary.
- 5.3.4 The following components, or equivalent, will be used in most installations:
 - Tygon tubing. 2 each x 24" pieces. Aircraft Spruce P/N: 05-00944.
 - Nylo Seal tubing. 2 each x 6" pieces. Aircraft Spruce P/N: 44-P
 - Nylo Seal "T" fittings. 2 each. Aircraft Spruce P/N: 264-N04.
 - Nylo Seal Inserts. 8 each. Aircraft Spruce P/N: 259-N04.
- 5.3.5 Extend the pitot & static hoses & cable connector through the tray (if applicable) and out through the front of the instrument panel or radio rack to allow for ease of servicing.
- 5.3.6 Mate the pitot and static hoses to the control head.
- 5.3.7 Secure pitot and static connections at the rear of the autopilot controller with clamps or steel locking Ty-Raps.
- 5.3.8 Mate the DB37 connector to the control head using the screws provided.
- 5.3.9 If using an Instrument mount control head secure the control head using #6 brass instrument screws.
- 5.3.10 For the instrument type controller mounting screws, the maximum screw length should not be more than the panel thickness plus 0.25". CAUTION: Installing longer screws may cause damage to the controller mounting inserts.
- 5.3.11 If using a Panel mount control head slide the control head into the tray, then tighten the securing screw (1.5mm allen). Do not over tighten control head in the tray.
- 5.3.12 It is required that pitot and static system leak tests and inspections be performed after autopilot installation. Refer to your local authorities' regulations. {i.e. FAR §43 Appendix E, Paragraph (a)}

5.4 TRIO AUTOPILOT DATA CONNECTIONS

- 5.4.1 For most RS-232 connections, set the output of the GPS unit to "Aviation w/ no altitude" or NMEA 0183 OUT.

Note:

- 1) The RS-232 connection is required in all installations.
 - 2) For Avidyne IFD Series GPS Navigators use "Aviation" format.
- 5.4.2 If your aircraft is equipped with a GPS that has ARINC 429, set unit to output "GAMA" Low or High Speed. If you have Trio software version 220322E, or later, see Installation Instructions for External Flight Guidance Equipment Control Document # 1006100 for ARINC 429 connections.
 - 5.4.3 Prior to making the connections to the GPS unit in the aircraft determine what else is connected.
 - 5.4.4 It may be necessary to parallel the connections.
 - 5.4.5 If parallel connections are required, verify that the lines you are paralleling use, or can use, the same data format that is required.



- 5.4.6 Both the RS-232 and the ARINC 429 can be paralleled with like connections.
- 5.4.7 Ensure that the analog alarm output is connected to the un-switched audio input on the Audio Panel.



FIGURE 5-1 MAINTENANCE SETTINGS



FIGURE 5-2 PITCH SERVO EXAMPLE



INSTRUMENT MOUNT CONTROLLER 3.125"



PANEL MOUNT CONTROLLER 6" X 2" X 4"

FIGURE 5-3 CONTROLLER TYPES

5.5 TRIO INITIAL SETUP AND CHECKS

- 5.5.1 Refer to the STC Group Avionics Addendum for initial checks and setup of the autopilot installation.
- 5.5.2 Complete applicable ground tests of the STC Group Post Installation Flight Checks Document # F-1006-43.
- 5.5.3 Individual aircraft may require fine tuning of servo gains on the first few flights. The following rough gain sets are a common starting point for Cessna 150/152 aircraft:

SET SERVO GAINS
HNAV=20 VNAV=20

Note:

Gains are not to be changed by the aircraft owner / operator / pilot without contacting Trio Avionics or The STC Group LLC in advance for guidance.
The procedures for “fine tuning” gains are in the Avionics Addendum available on The STC Group LLC website: www.thestcgroupllc.com/documents.

- 5.5.4 Continue to Close up Section 6.0



- NOTES:
1. SEE FILE 1006103.SLDASM FOR SOLID MODEL.
2. ROUTE WIRE HARNESS WITH EXISTING WIRE BUNDLES & SECURE PER AC43.13-18.
3. POSITION INSTR PANEL MOUNTED COMPONENTS APPROXIMATELY AS SHOWN.
▶ IF YOKE IS NOT PROVIDED FOR SWITCH INSTL, FABRICATE BRACKET & ATTACH TO YOKE FOR MOUNTING SWITCH AS REQD.

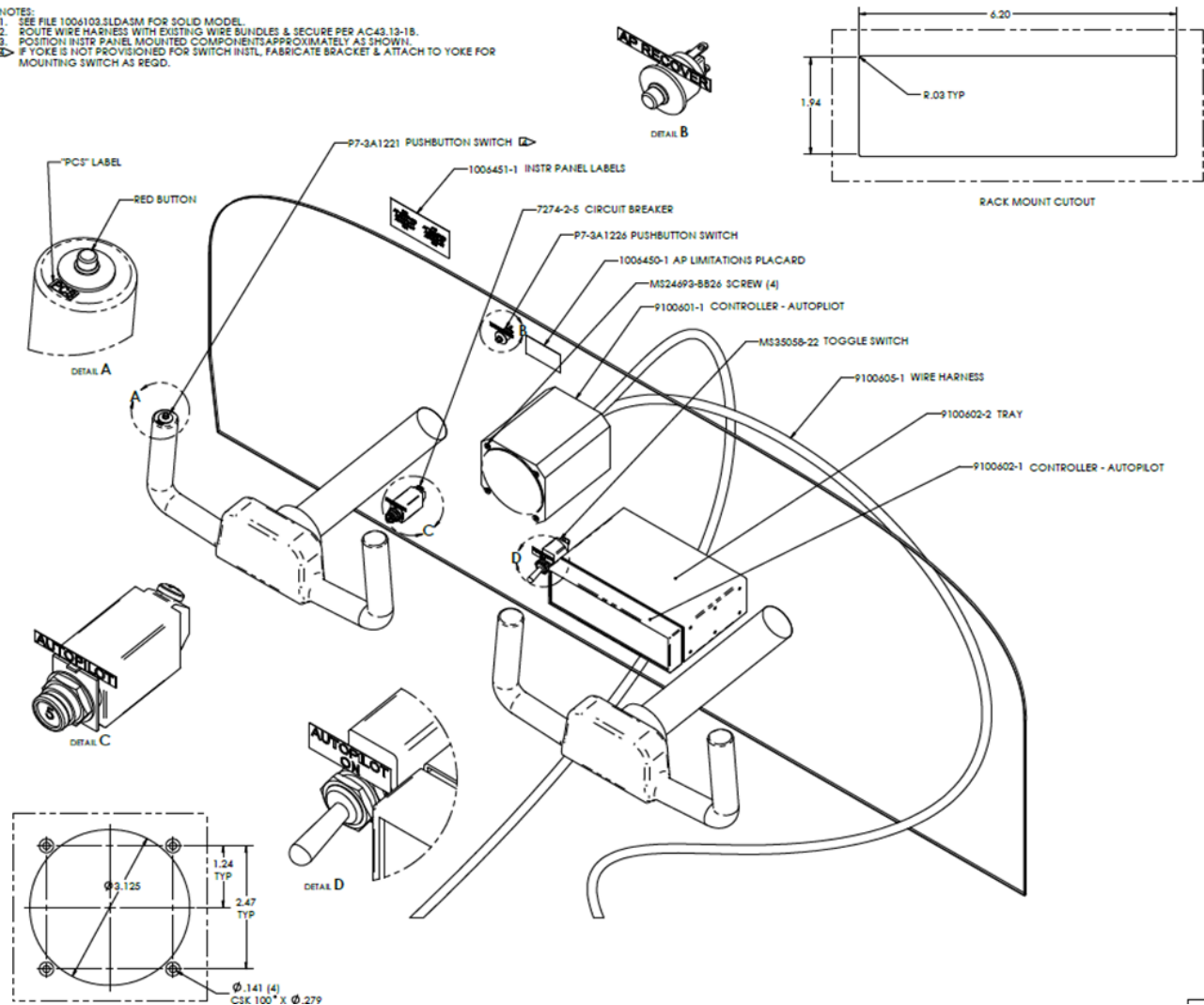


FIGURE 5-4 TYPICAL COCKPIT INSTALLATION



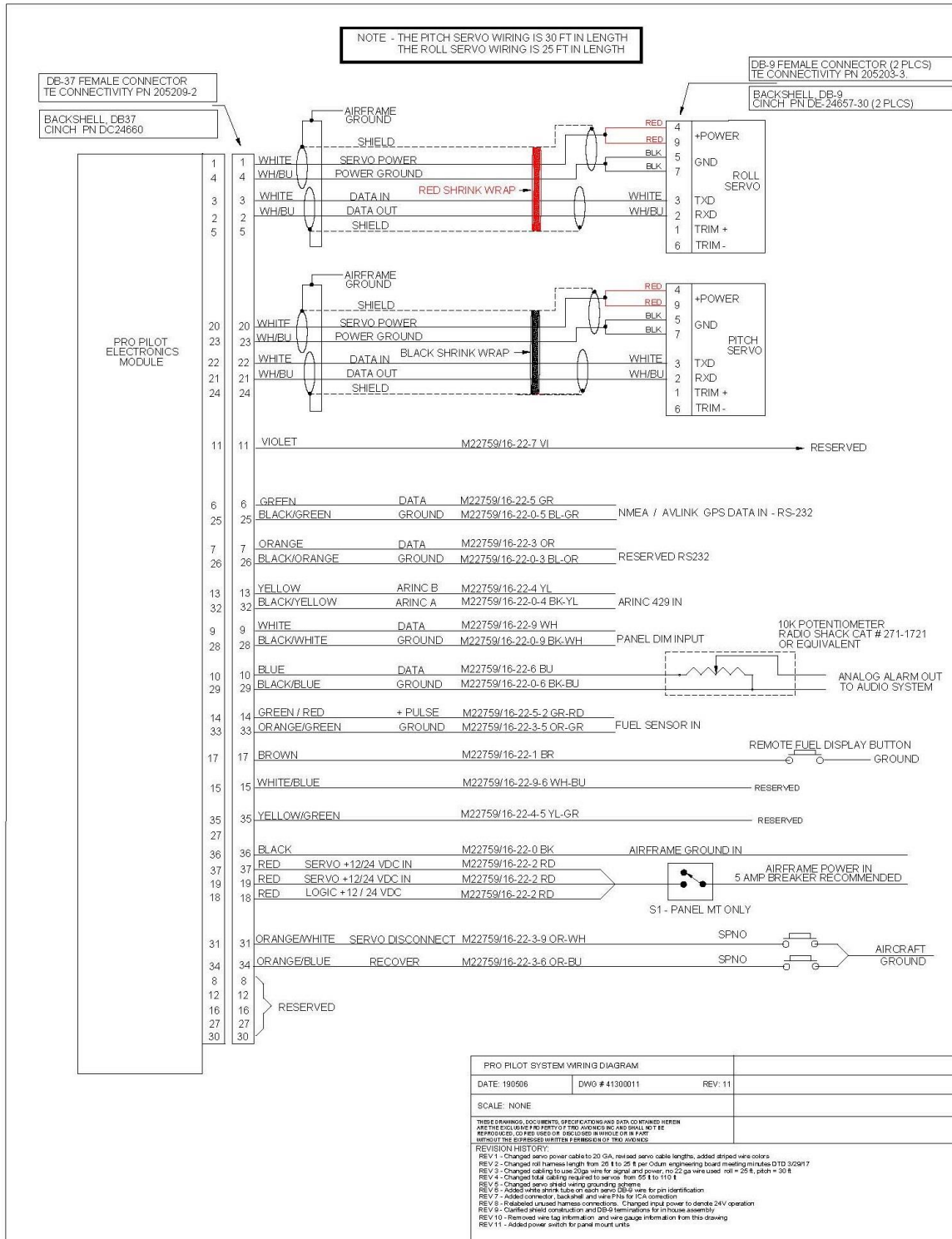
6.0 CLOSE UP

- 6.1** Install all items removed in Sections 3.3 through 3.8 of this document.
- 6.2** It is required that pitot and static system leak tests and inspections be performed after autopilot installation. Refer to your local authorities' regulations. {i.e. FAR §43 Appendix E, Paragraph (a)}
- 6.3** Amend the Weight & Balance and Equipment List.
- 6.4** Install FAA Approved Aircraft Flight Manual Supplement into the AFM, POH, or applicable flight manual for the aircraft.
- 6.5** Complete all logbook entries as required to return the aircraft to service.
- 6.6** Submit applicable paperwork in accordance with local authority regulations. (i.e. FAA Form 337)



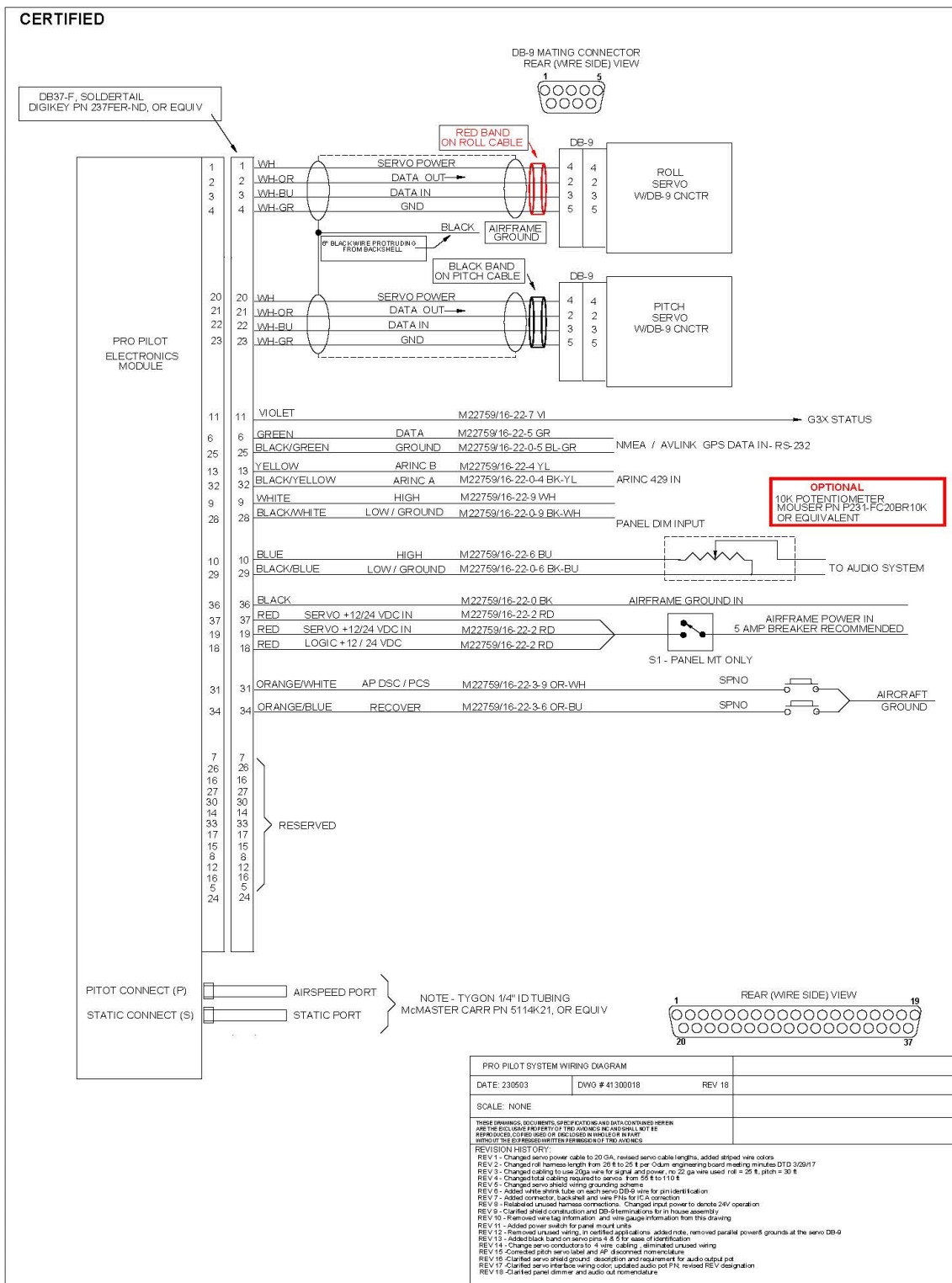
APPENDIX A PRO PILOT SYSTEM WIRING DIAGRAM

ORIGINAL WIRING DIAGRAM





NEW WIRING DIAGRAM (CURRENT DIAGRAM SHIPPED WITH HARNESS)





APPENDIX B PITCH SERVO INSTALLATION FOR SN'S 17001 THRU 15060087

FOR SERIAL NUMBERS 15060088 THRU 15061532 SEE APPENDIX C

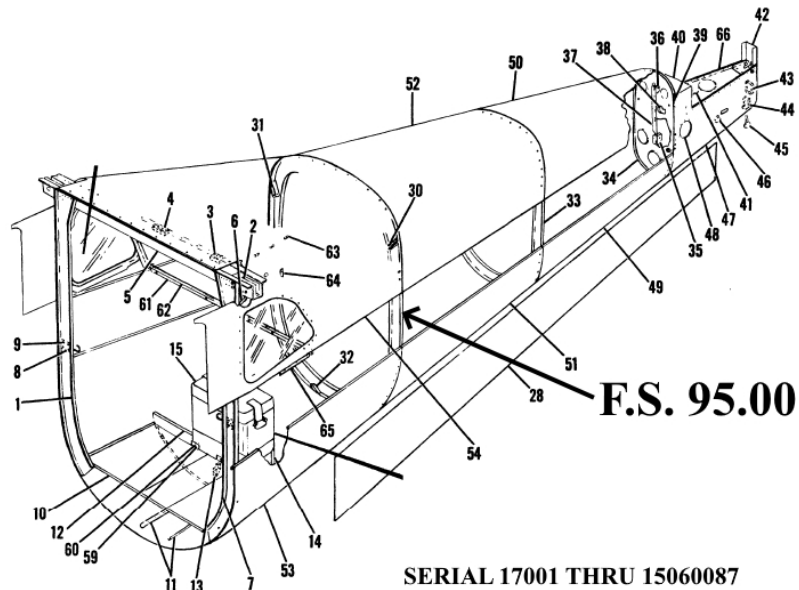


FIGURE B- 1 FUSELAGE TAILCONE ASSEMBLY

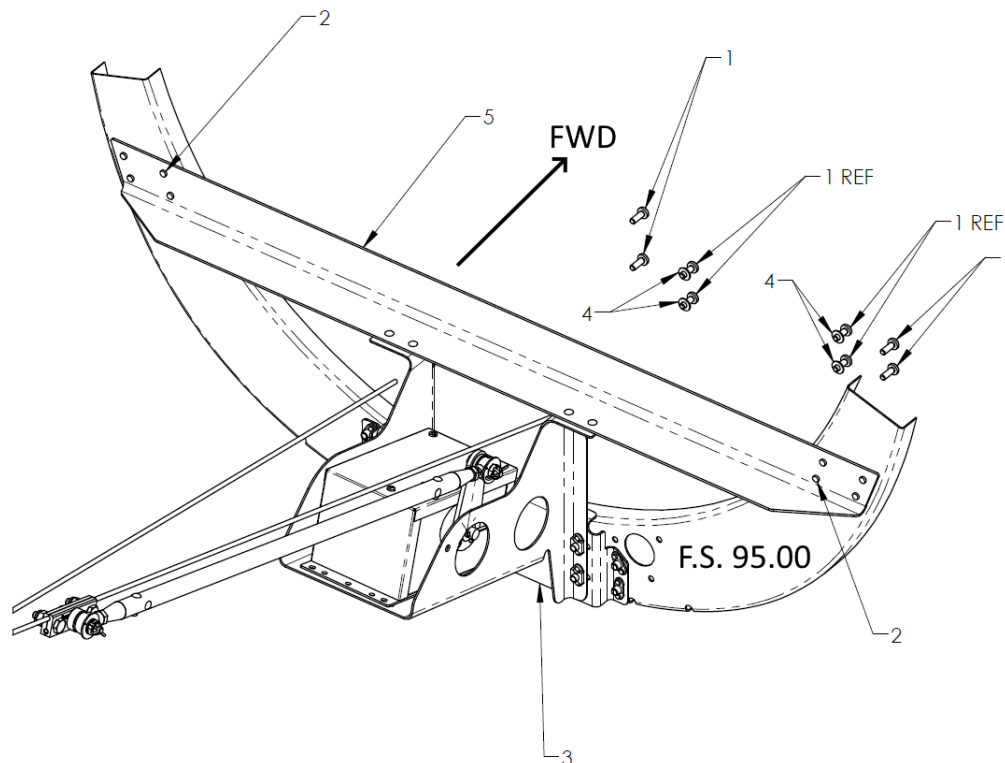


FIGURE B- 2 PITCH SERVO INSTALLATION



1. Install the assembled pitch servo onto the bracket with the servo arm facing up and towards the RH side of the aircraft. Refer to Figures B-2 & Illustrated Parts Catalog Document # 1006907.
2. Assemble 1006235 pitch servo bracket to 1006238 adapter with screws and washers leaving the screws loose enough to allow to slide in slots.
3. Position 1006238 pitch servo bracket adapter against the aft side of F.S. 95.00 frame centered about BL 0.00 as shown in Figure B-3 using bend relief cutouts as a guide and clamp into place.

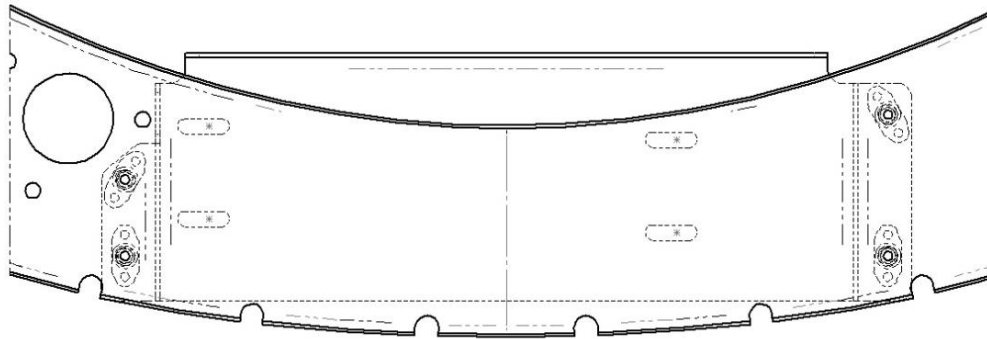


FIGURE B- 3 VIEW LOOKING AFT AT FS 95.00 FRAME

4. With just the bolt in the servo arm and the servo arm facing up 90 degrees from the baseplate, use a scale to measure the distance between the edge of the elevator cable and inboard surface of the servo arm bolt. Slide the bracket left or right to achieve the $0.25'' +0.125''/-0''$ tolerance as shown in Figure B-4. Mark the position of 1006235 bracket on 1006238 adapter.

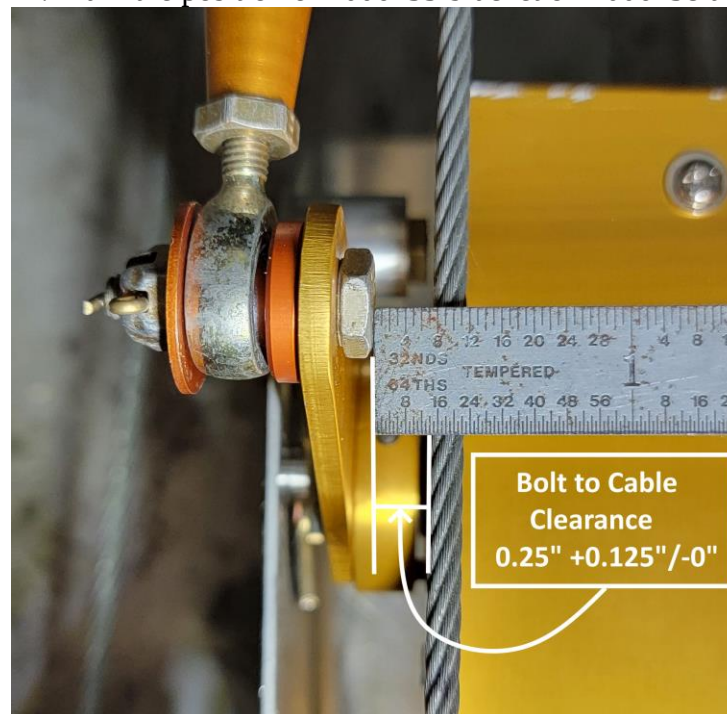


FIGURE B- 4 BOLT TO CABLE CLEARANCE



5. Position the 1006236 angle such that the upper pitch cable is approximately 7/8" (0.875") below the 1006236 angle. Refer to Figure B-5.

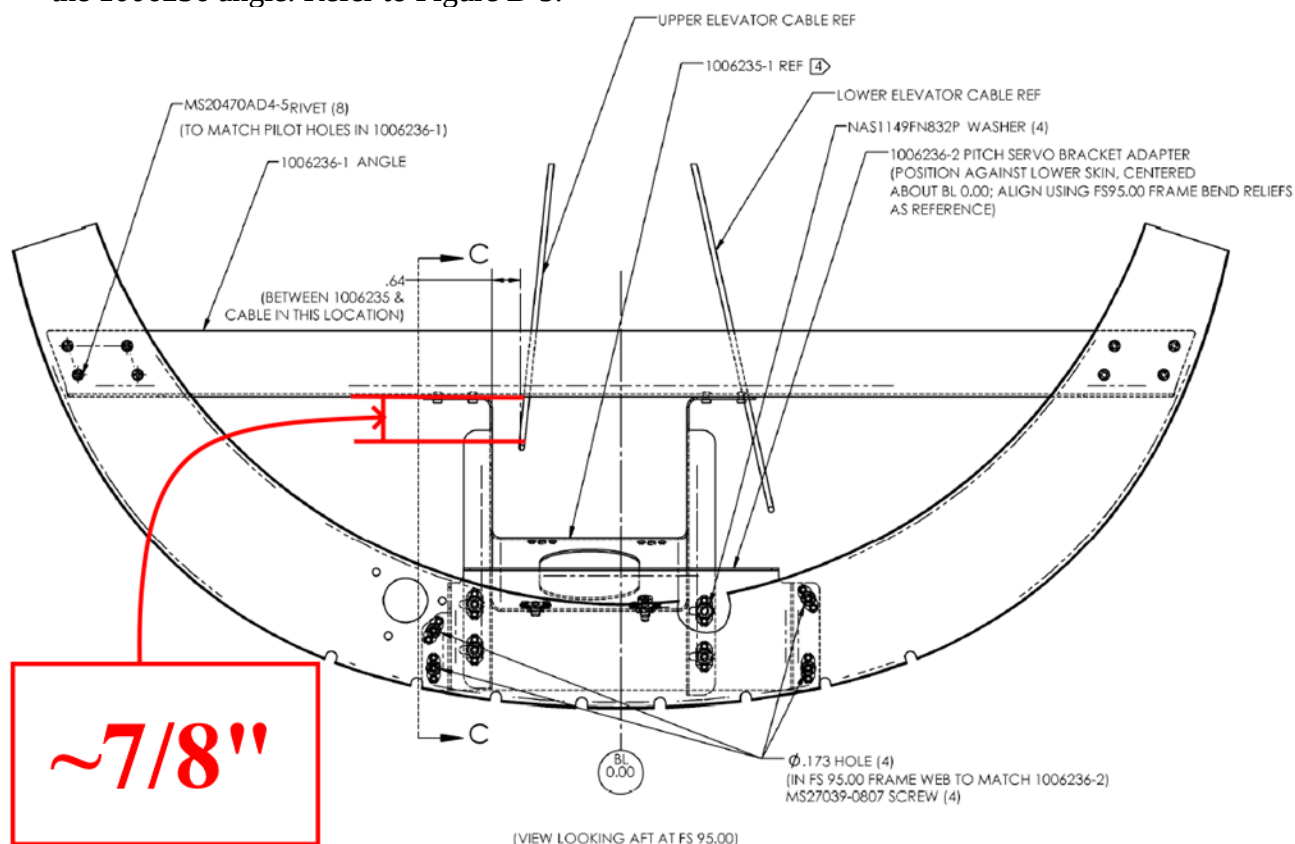


FIGURE B- 5 ANGLE TO UPPER PITCH CABLE CLEARANCE

6. Clamp the 1006235 bracket to the 1006236 angle piece and to F.S. 95.00. Refer to Figure B-2.
7. Use an inclinometer (or equivalent tool) to ensure the angle piece is approximately level, side to side, with the aircraft +/- 3°. On most aircraft, leveling the aircraft laterally can be measured on the floor above the main landing gear. This step is only critical to ensure proper edge distance of the 8 outer mounting rivets of the 1006236 angle.
8. If the position of the assembly is not within limits, then contact The STC Group LLC before proceeding.
9. Drill the outer 8 angle pilot holes through F.S. 95.00 with a #30 drill bit and cleco.
10. Back drill through the 4 nutplates of the outer lower adapter bracket with a #30 drill bit through F.S. 95.00 and cleco.
11. Drill the 4 upper bracket holes through the angle with a #30 drill bit ensuring proper edge distance on the angle and bracket. Install clecos. Refer to Figure B-6.

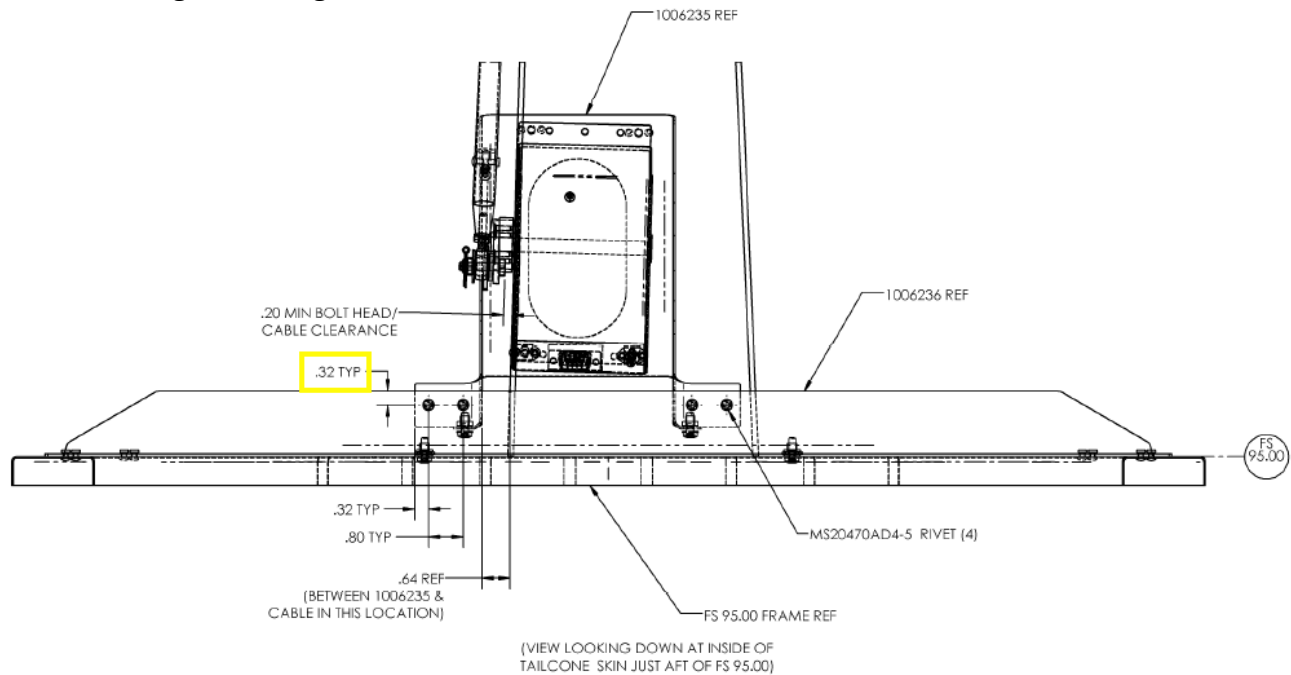


FIGURE B- 6 PITCH INSTALLATION TOP VIEW

12. Remove the entire assembly.
13. Tighten screws attaching 1006235 to 1006238 in previously marked location.
14. Enlarge the 4 lower bracket mounting holes in F.S. 95.00 with a #16 drill bit.
15. Debur all holes on F.S. 95.00, angle 1006236, and bracket 1006235.
16. For ease of the next steps, the servo can be removed from the bracket.
17. Attach bracket 1006235/1006238 assembly to F.S. 95.00 using supplied screws.
18. Install all 12 rivets attaching the angle to F.S. 95.00 and bracket.
19. Install the DB9 connector to the servo and install the servo on the bracket.
20. Continue to 4.2.16.



APPENDIX C PITCH SERVO INSTALLATION FOR SN'S 15060088 THRU 15061532

FOR SERIAL NUMBERS 17001 THRU 15060087 SEE APPENDIX B

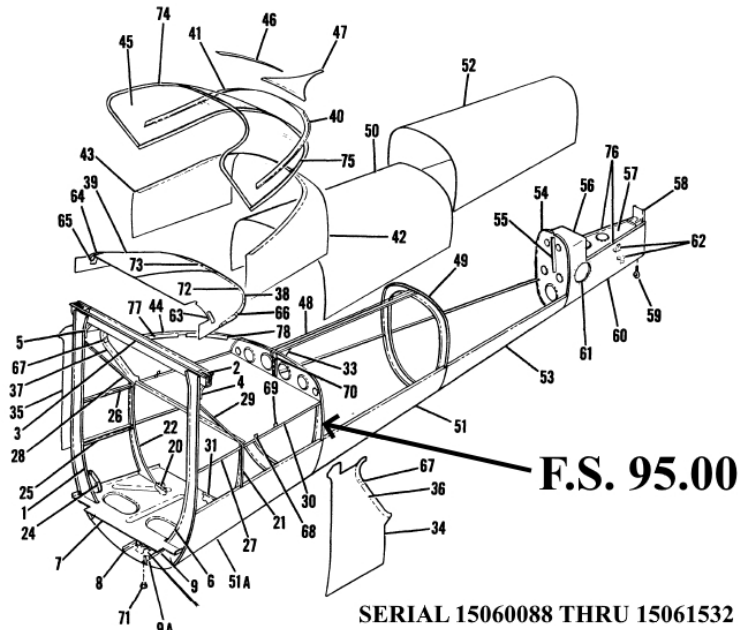


FIGURE C- 1 FUSELAGE TAILCONE ASSEMBLY

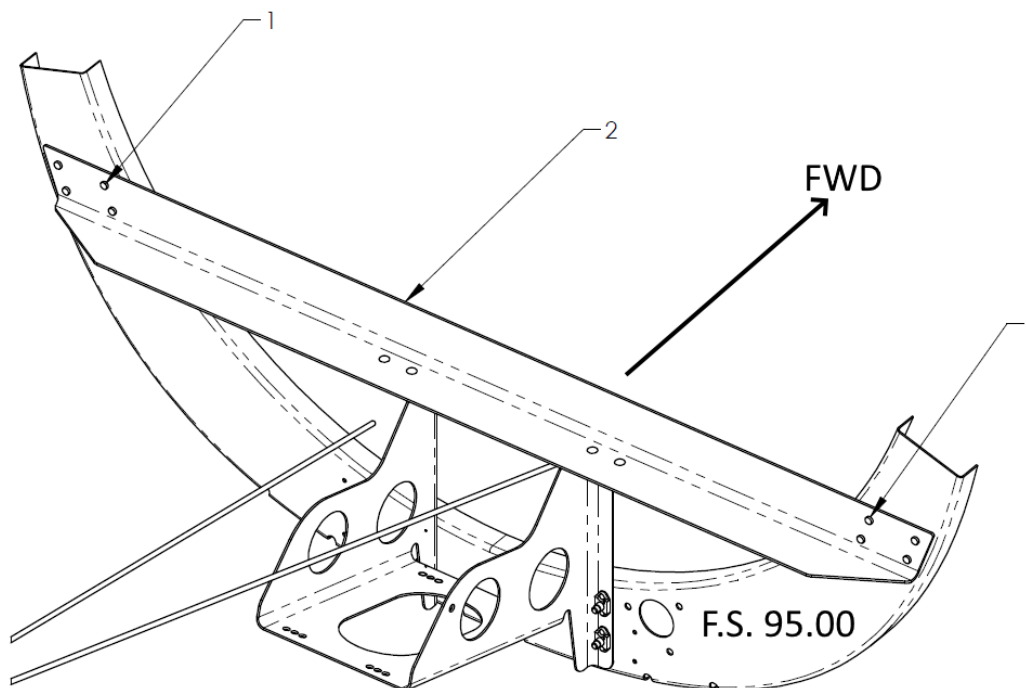


FIGURE C- 2 PITCH SERVO INSTALLATION



1. Install the assembled pitch servo onto the bracket with the servo arm facing up and towards the RH side of the aircraft. Refer to Figures C-2 & Illustrated Parts Catalog Document # 1006907.
2. With just the bolt in the servo arm and the servo arm facing up 90 degrees from the baseplate, use a scale to measure the distance between the edge of the elevator cable and inboard surface of the servo arm bolt. Slide the bracket left or right to achieve the $0.25'' +0.125''/-0''$ tolerance as shown in Figure C-3.

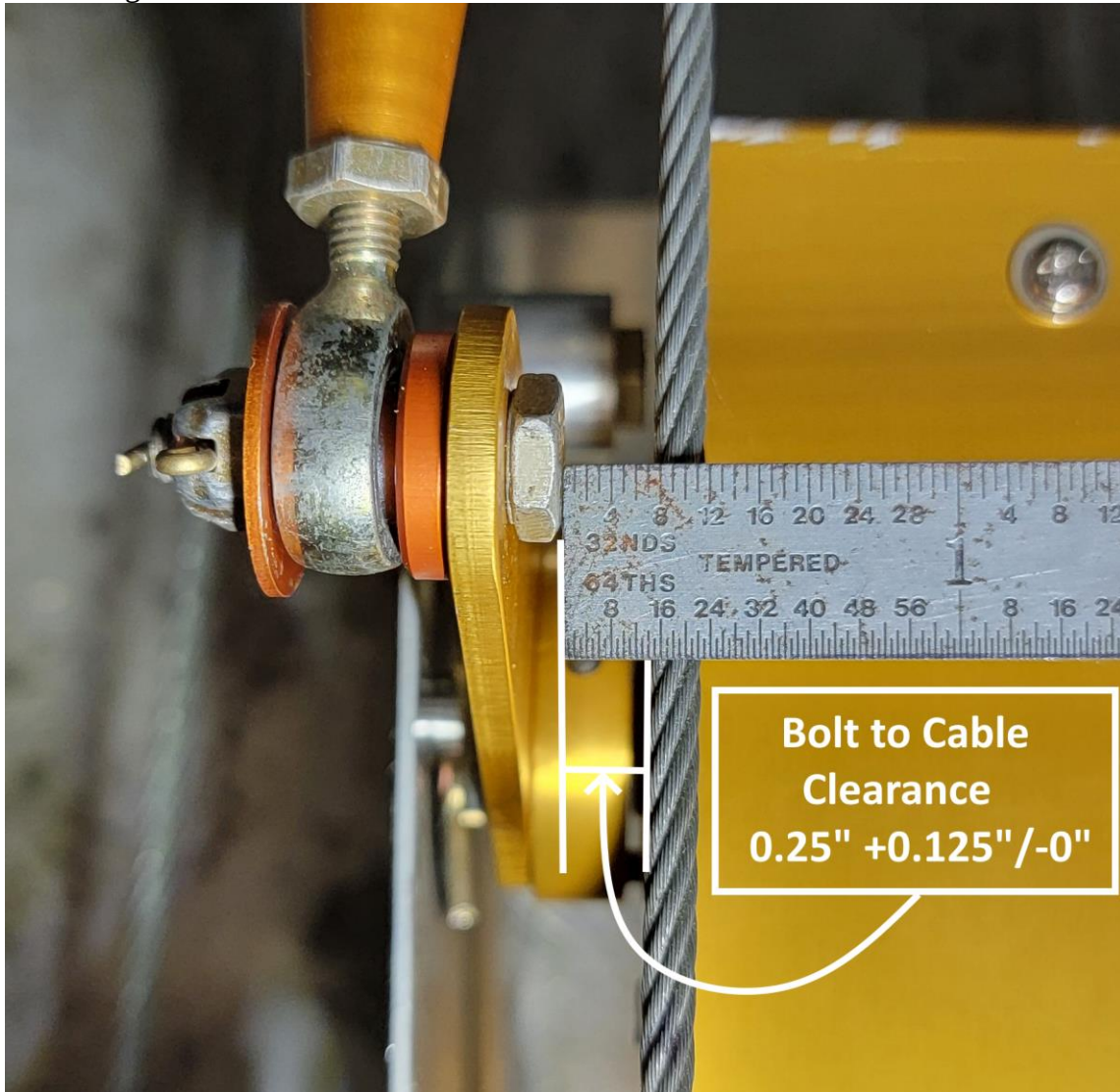


FIGURE C- 3 BOLT TO CABLE CLEARANCE

3. Position the 1006236 angle such that the upper pitch cable is approximately $7/8''$ (0.875'') below the 1006236 angle. Refer to Figure C-4.

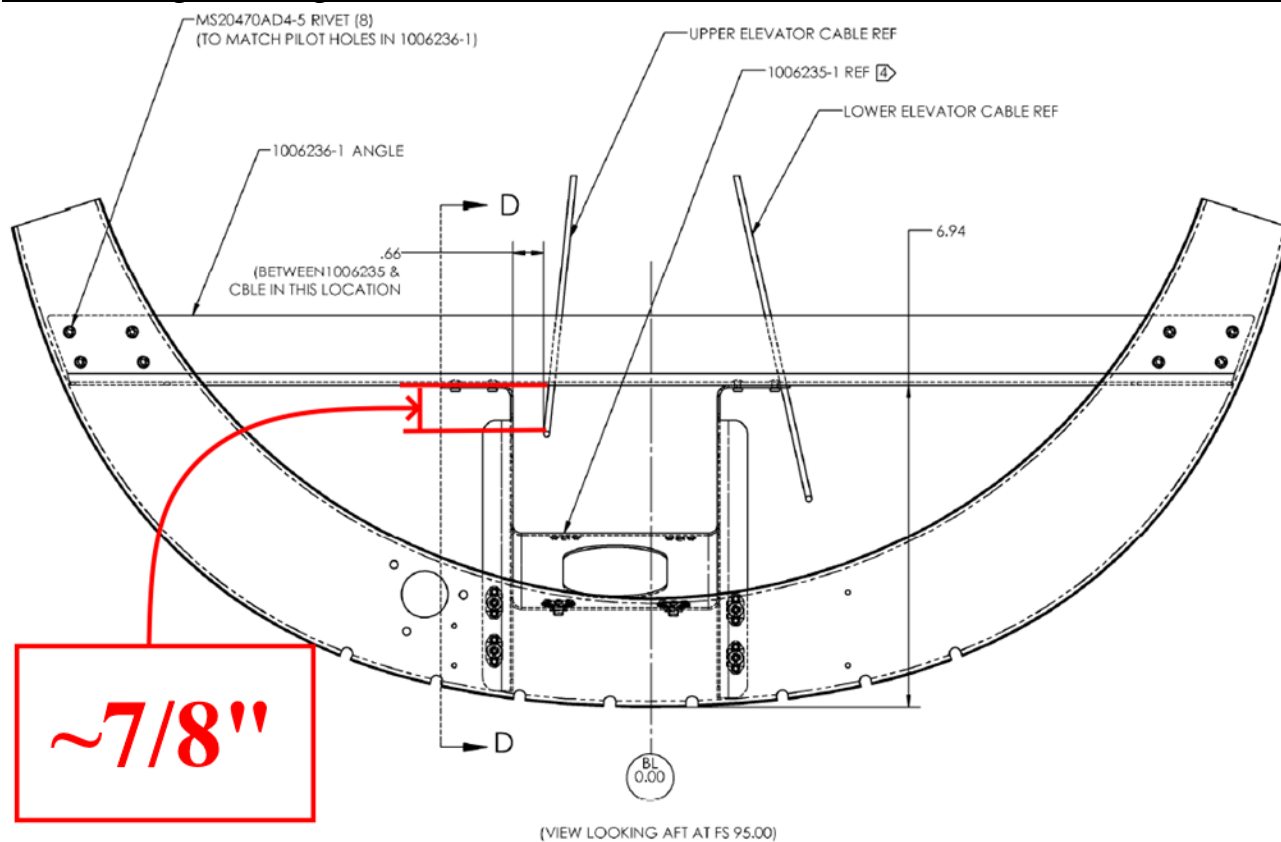


FIGURE C- 4 ANGLE TO UPPER PITCH CABLE CLEARANCE

4. Clamp the 1006235 bracket to the 1006236 angle piece and to F.S. 95.00. Refer to Figure C-2.
5. Use an inclinometer (or equivalent tool) to ensure the angle piece is approximately level, side to side, with the aircraft +/- 3°. On most aircraft, leveling the aircraft laterally can be measured on the floor above the main landing gear. This step is only critical to ensure proper edge distance of the 8 outer mounting rivets of the 1006236 angle.
6. If the position of the assembly is not within limits, then contact The STC Group LLC before proceeding.
7. Drill the outer 8 angle pilot holes through F.S. 95.00 with a #30 drill bit and cleco.
8. Back drill through the 4 nutplates of the lower adapter bracket with a #30 drill bit through F.S. 95.00 and cleco.
9. Drill the 4 upper bracket holes through the angle with a #30 drill bit ensuring proper edge distance on the angle and bracket. Install clecos. Refer to Figure C-5.

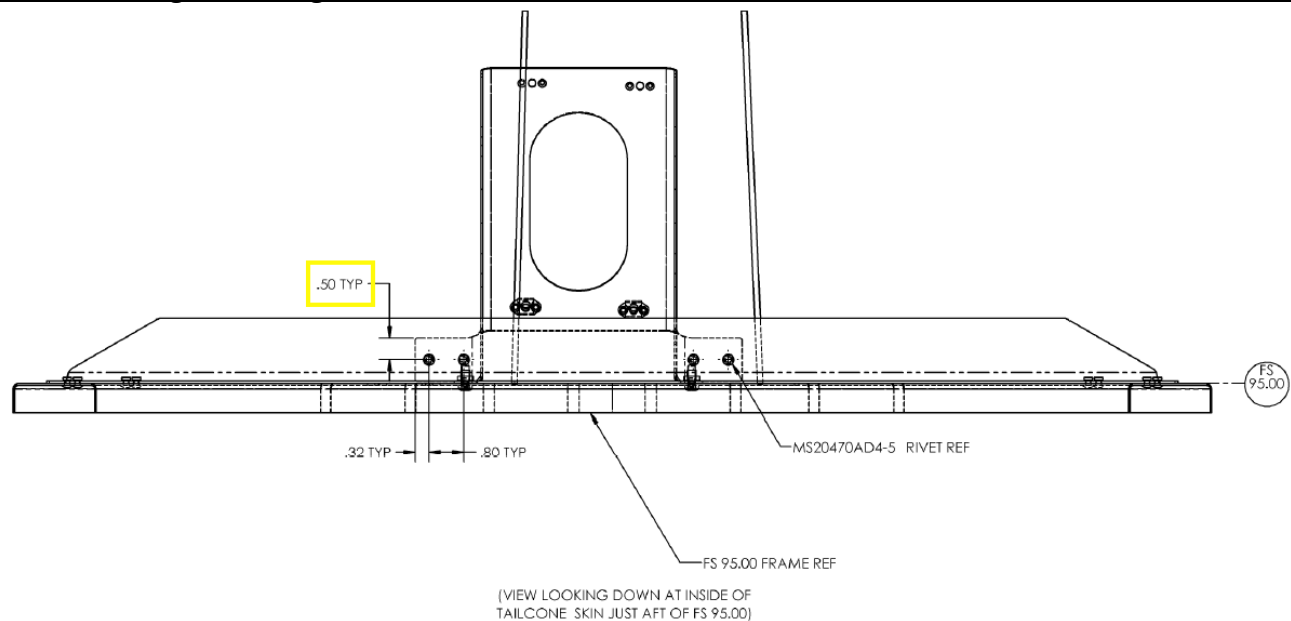


FIGURE C- 5 PITCH INSTALLATION TOP VIEW

10. Enlarge the 4 lower bracket mounting holes in F.S. 95.00 with a #16 drill bit.
11. Debur all holes on F.S. 95.00, angle 1006236, and bracket 1006235.
12. For ease of the next steps, the servo can be removed from the bracket.
13. Attach bracket 1006235 assembly to F.S. 95.00 using supplied screws.
14. Install all 12 rivets attaching the angle to F.S. 95.00 and bracket.
15. Install the DB9 connector to the servo and install the servo on the bracket.
16. Continue to 4.2.16.



APPENDIX D RECOMMENDED INSTALLATION TOOLS

Cleco P Series Temporary Fasteners



QTY	PART NUMBER	DIAMETER	COLOR CODE	GRIP	DRILL SIZE	PRICE EACH
☐	20-101	3/32	Zinc	0-1/4	#40	\$0.50
☐	20-102	1/8	Copper	0-1/4	#30	\$0.50
☐	20-103	5/32	Black	0-1/4	#21	\$0.50

Offset Angle Drill

PAN AMERICAN TOOL CORPORATION



Rivet Gun Set

