



Appendix B

Vizion PMA Autopilot 177 Installation

**RESTRICTION ON USE, DUPLICATION, OR DISCLOSURE OF
PROPRIETARY INFORMATION**

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF TRUTRAK FLIGHT SYSTEMS, INC. AND MAY NOT BE REPRODUCED, COPIED, DISCLOSED OR UTILIZED IN ANY WAY, IN WHOLE OR IN PART, WITHOUT THE PRIOR WRITTEN CONSENT OF TRUTRAK FLIGHT SYSTEMS, INC.

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1) Document Revision History

Rev	Description	Pages	Date
Init.	Document created	43	11-1-17
A	Added IPC diagrams	46	1-8-18
B	Removed reference to 177 Wiring diagram, Added 177RG Wire Routing	37-39	1-17-18
C	Added provisions for hole placement and spacer for roll bracket installation	48	10-31-18
D	Added roll bracket doubler, moved holes from spar caps.	46	11-8-2018
<u>E</u>	<u>Added BK part numbers, made changes for PV.40 software</u>	<u>47</u>	<u>5-15-19</u>

2) Cessna 177 Roll Servo Installation

For use with Cessna 177 Roll Hardware (P/N 8200-128) Rev A or later. For Cessna 177 Roll Hardware (P/N 8200-128) IR see revision C of this document.

a) Roll Materials List

QTY	PART NUMBER	DESCRIPTION
1	8100-064 (12V Volt) OR 8100-065 (24 Volt)	PMA in-lb PMA Servo
	8200-128	Cessna 177 Roll Hardware (Includes following items)
1	7200-096 IR	2.5" PMA Servo Arm Assembly
1	7200-093 Rev A or later	Cessna 177 Roll Bracket Assy
1	2520-061	4.75" Push Rod Tapped 1/4-28 and 10-32
1	2510-202	Steel Bushing .250 OD X .199 ID X .195L
1	2510-073	.250 L X .375 OD X .199 ID Aluminum Spacer
1	2510-052	CM-3B-14
1	2510-051	Small Rod End Bearing MM-3-300
3	2500-216	8-32 x 3/8 Flat Head Socket Cap Screw SS
1	2500-210	AN3-13A
1	2500-209	AN90-416L
1	2500-208	AN90-416
3	2500-132	AN3-4A Bolt
3	2500-081	MS35333-39 Internal Lock Washer
9	2500-076	AN960-10
6	2500-075	AN3-3A
1	2500-072	AN3-11A
1	2500-055	AN345-10
1	2500-054	AN315-4
2	2500-047	AN970-3 Washer
1	2500-042	MS20364-1032
1	1450-133	C177 Roll Doubler
1	1450-116 Rev B or later	Cessna 177 Roll Drill Jig

b) Roll Servo Mounting Instructions

- i) The roll servo will be mounted in the right wing just forward of the inboard end of the aileron. [Figure 2-1](#) shows the roll servo mounting location from below the right wing.
- ii) Begin by removing the inspection covers 1, 2 and 3 on the lower wing skin located forward of the inboard end of the aileron.

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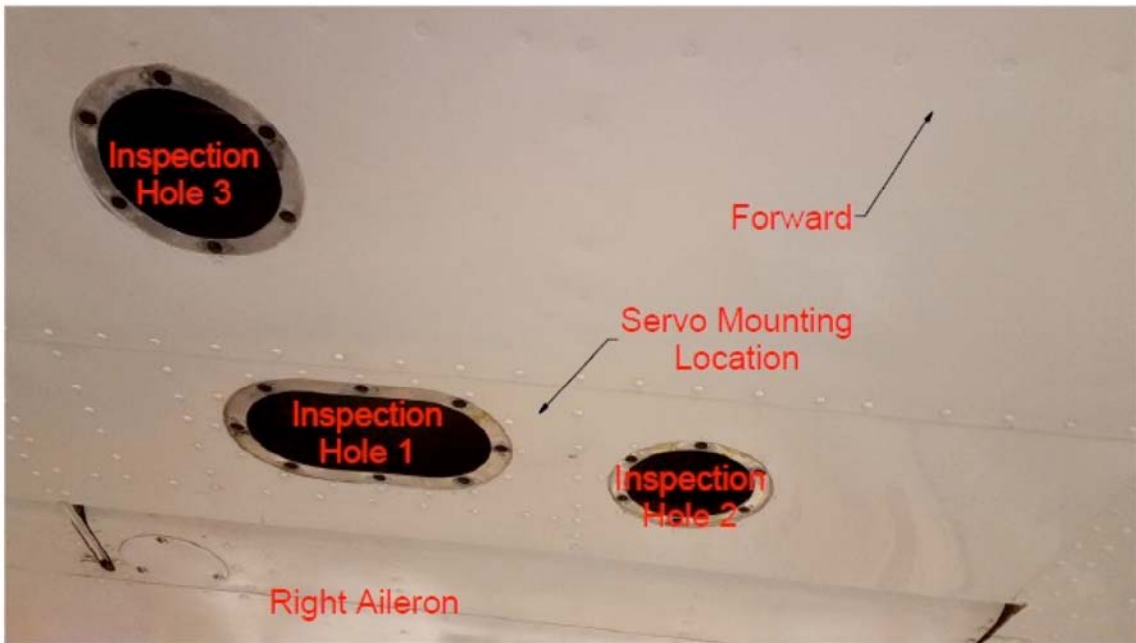


Figure 2-1

iii) Drill Cessna 177 Roll Bracket Mounting Holes

- (1) Working through inspection hole 1, locate Cessna 177 Roll Drill Jig (P/N 1450-116) as shown in [Figure 2-2](#), Vertical spacing of the drill jig is accomplished by placing the top surface of the forward portion of the jig against the upper spar flange.
- (2) Clamp the drill jig to the rib through the lightening hole as shown. Ensure that the drill jig is firmly against the spar and rib.
- (3) Match drill the spar and rib in 6 places through the drill jig. After drilling each hole secure the drill jig to the aircraft using a cleco or 10-32 fastener to restrict movement of the drill jig.
- (4) After drilling is complete remove the drill jig from the aircraft.
- (5) Place the Cessna 177 Roll Bracket Assembly (P/N 7200-093) in the wing and position as shown in [Figure 2-3](#), Align the holes in the bracket assembly with the holes in the spar.
- (6) Check to see if the see if the Cessna 177 Roll Bracket Assembly (P/N 7200-093) sets on top of the rivets in the upper and lower spar caps. If the rivet heads are covered by the bracket assembly it will be necessary to clearance the bracket assembly so that it sits flat against the spar web.

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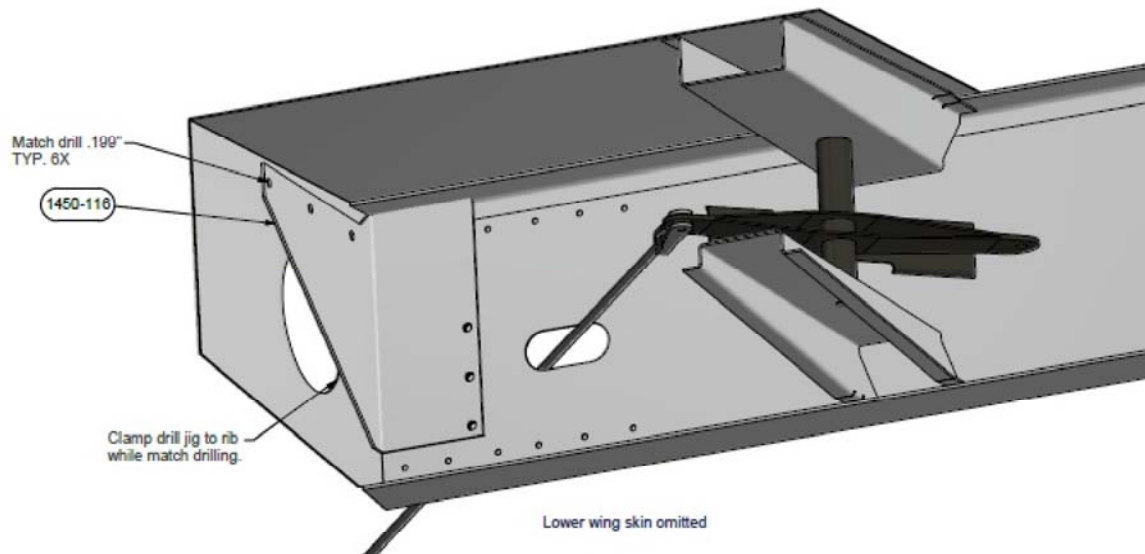


Figure 2-2

iv) Install Cessna 177 Roll Bracket Assembly (P/N 7200-093)

- (1) Place the Cessna 177 Roll Bracket Assembly as shown in [Figure 2-3](#).
- (2) Place the Cessna 177 Roll Doubler (P/N 1450-133) on the front side of the spar as shown in [Figure 2-3](#).
- (3) Check to see if the see if the Cessna 177 Roll Doubler (P/N 1450-133) sets on top of the upper or lower spar caps. If the either spar cap is covered by the doubler it will be necessary to trim the doubler so that it sits flat against the spar web.
- (4) Install AN3 bolts in locations shown in figure 2-3 placing an AN960-10 washer under each bolt head. Torque bolts to 20-25 in-lb.

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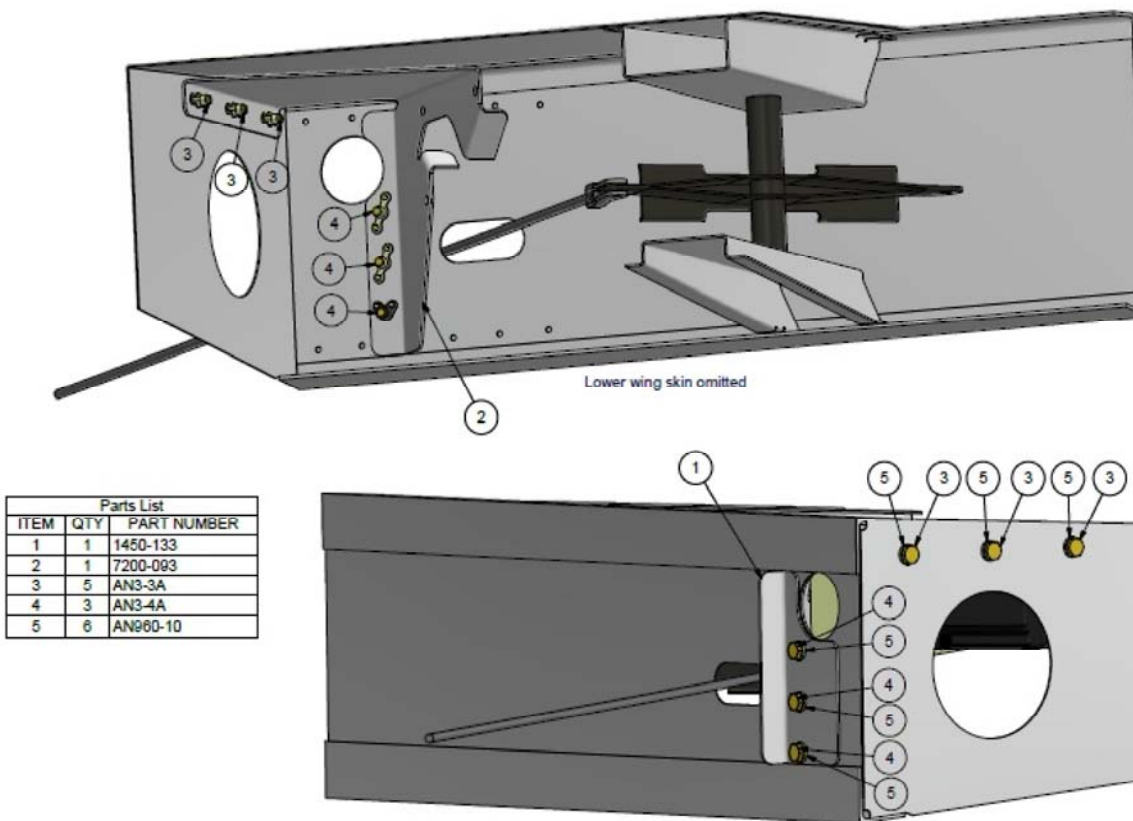


Figure 2-3

- v) Install Rod End on Aileron Bellcrank
 - (1) Remove existing bolt connecting the aileron control cable to the aileron bellcrank
 - (2) Enlarge the hole in the bellcrank where the aileron control cable was attached using a .257" (F size) drill bit.
 - (3) Place the steel bushing (P/N 2510-202) in the .257" hole and reconnect the aileron control cable as shown in [Figure 2-4](#). Torque AN3-13A bolt to 20-25 in-lb.

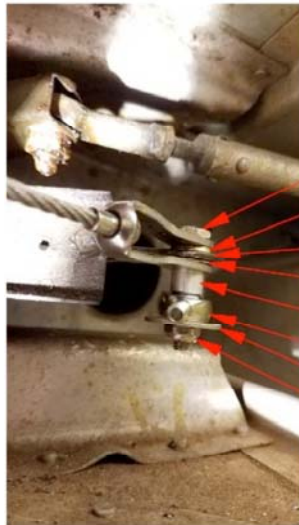


Figure 2-4

- (4) Verify that the feel of the controls in roll have not changed as this could indicate that a control cable has come off of the pulley. This bolt replacement should be able to be accomplished without re-tensioning the aileron control cables.
- vi) Assemble Servo Arm (P/N 7200-096) and 60 inch/lb PMA servo (P/N 8100-064 for 12 volt or P/N 8100-065 for 24 volt).
 - (1) Attach the Servo Arm (P/N 7200-096) to the 60 inch/lb PMA servo (P/N 8100-064 for 12 volt or P/N 8100-065 for 24 volt) using the provided 8-32 x 3/8" flat head screws.
 - (2) Use blue threadlocker (Loctite 242 or equivalent) and torque the screws to 18-20 in-lb.
- vii) Pause the servo installation and move to the Wiring Harness Mounting Instructions
- viii) Trim the roll wiring harness to length and terminate wiring harness per the Vizion wiring diagram in the Vizion PMA Installation Guide (TruTrak Doc. 166) using Connector Backshell 9 Pin (P/N 2100-010).

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ix) Install 60 inch/lb PMA servo (P/N 8100-064 for 12 volt or P/N 8100-065 for 24 volt).

(1) Attach the electrical connector to the roll servo and secure it in place with the mounting screws. Torque to approximately 2-3 in-lb.

(2) Place the servo behind the mounting bracket with the arm oriented between the servo stops as shown in [Figure 2-5](#),

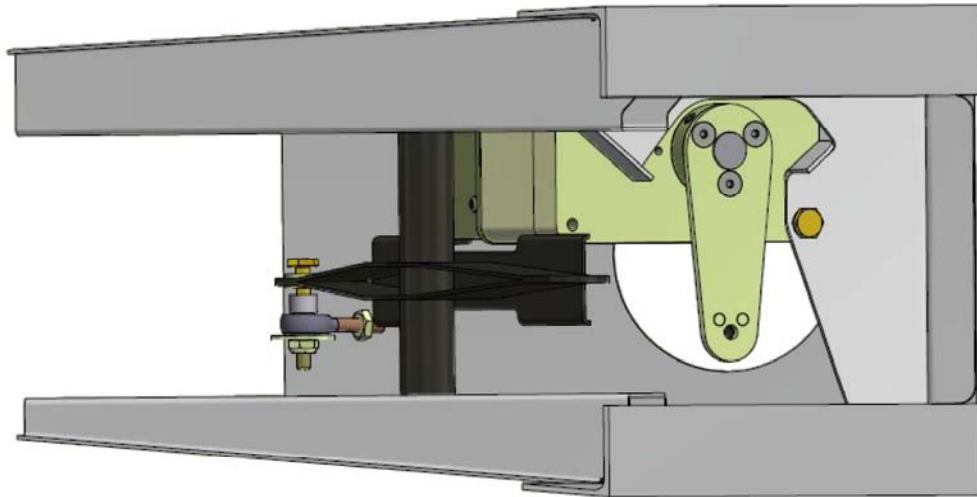


Figure 2-5

(3) Attach the servo to the Cessna 177 Roll Bracket Assembly (P/N 7200-093) using 3 AN3-3A bolts with MS35333-39 lock washers and blue threadlocker (Loctite242 or equivalent) torqued to 20-25 in-lb.

x) Install Push Rod

(1) Fully thread an AN315-4 nut on the CM-3B-14 Rod End Bearing (P/N 2510-052) then thread the push rod (P/N 2520-061) approximately half way on the rod end bearing.

(2) Fully thread an AN345-10 nut on the MM-3-300 Rod End Bearing (P/N 2510—051) that is attached to the aileron bellcrank.

(3) Thread the push rod (P/N 2520-061) approximately half way on MM-3-300 Rod End Bearing (P/N 2510—051).

(4) Adjust just rod end bearings so that full aileron deflection will move the servo arm equally between the stops built in to the Cessna 177 Roll Bracket Assembly (P/N 7200-093).

(5) Attach the inboard end of the push rod assembly to the servo arm as shown in [Figure 2-6](#), Torque AN3-11A bolt to 20-25 in-lb.

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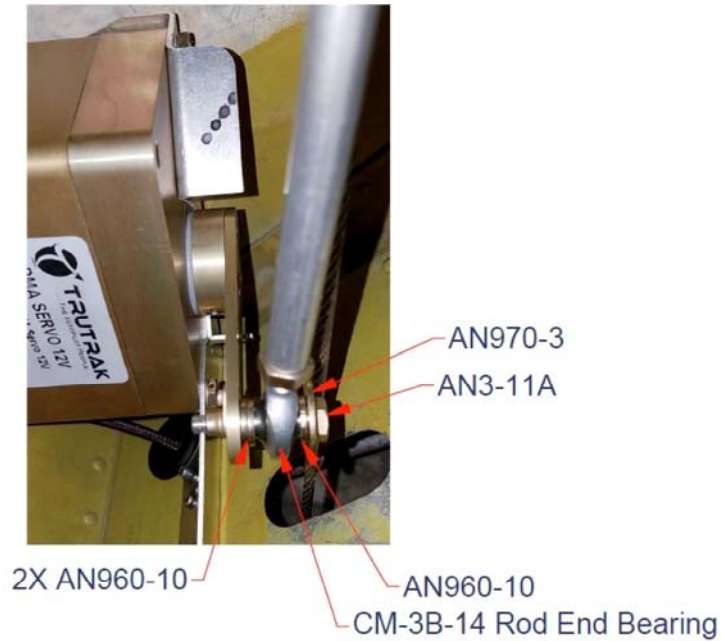


Figure 2-6

- (6) Adjust push rod so that both rod end bearings are threaded evenly.
- (7) Use blue threadlocker (Loctite 242 or equivalent) and torque the jam nuts to 20-25 in-lb. Verify that both rod ends can move freely throughout full aileron travel.

xi) Figure 2-7 and Figure 2-8 show full servo installation

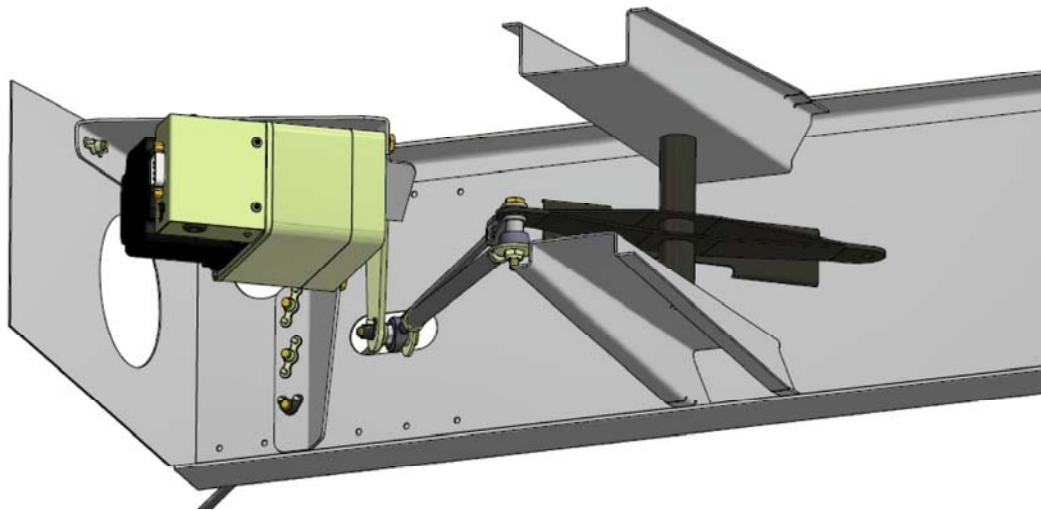


Figure 2-7

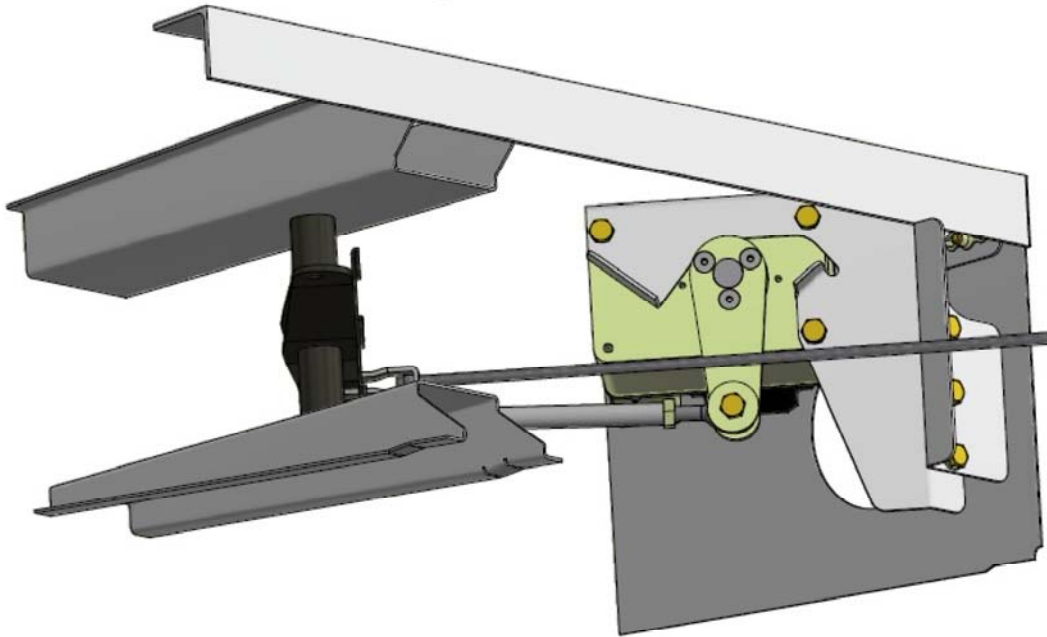


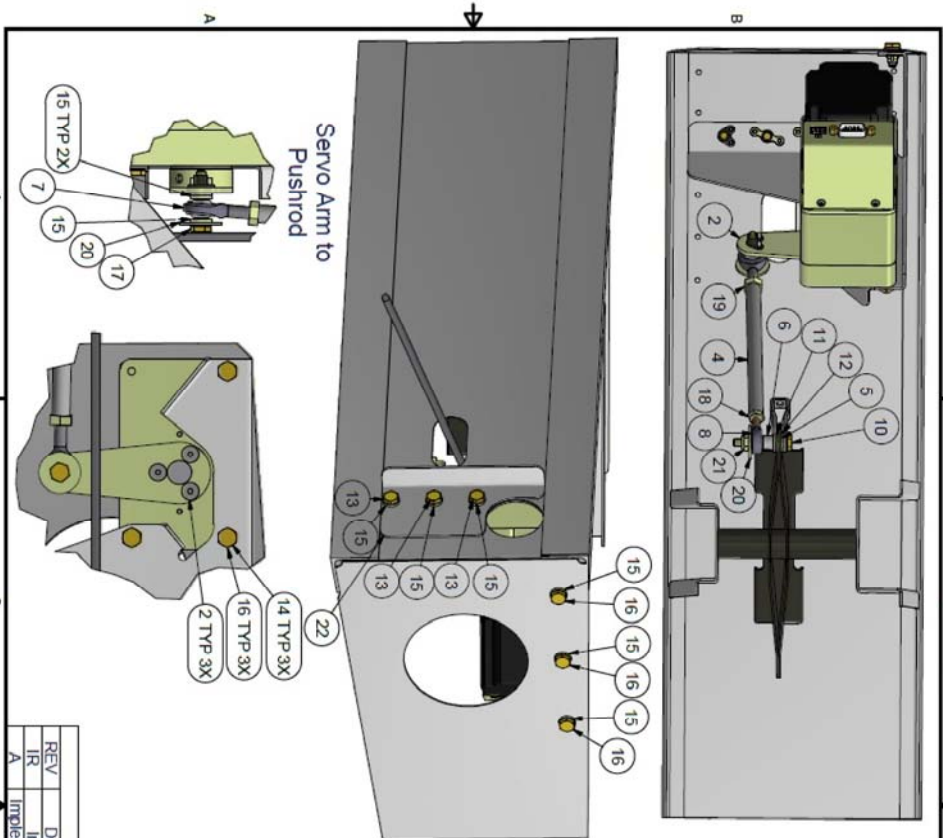
Figure 2-8

xii) Reinstall Inspection Covers

- (1) Verify that the roll controls move freely and that there is not contact interference between the mounted roll servo assembly and the aileron controls.
- (2) Reinstall the inspection covers removed at the beginning of the roll servo installation.

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c) Cessna 177 Vizion Roll IPC



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	8100-064 (12V Volt) 8100-065 (24 Volt)	PMA In-Hp PMA Servo
		8200-128	Cessna 177 Roll Hardware (Includes following items)
2	1	7200-096 IR	2.5" PMA Servo Arm Assembly
3	1	7200-093 Rev A or later	Cessna 177 Roll Bracket Assy
4	1	2520-061	4.75" Push Rod Tapped 1/4-28 and 10-32
5	1	2510-202	Steel Bushing .250 OD X .199 ID X .196L
6	1	2510-073	250 L X .375 OD X .199 ID Aluminum Spacer
7	1	2510-052	CM-3B-14
8	1	2510-051	Small Rod End Bearing MM-3-300
9	3	2500-216	8-32 X 3/8 Flat Head Socket Cap Screw SS
10	1	2500-210	AN3-13A
11	1	2500-209	AN90-416L
12	1	2500-208	AN90-416
13	3	2500-132	AN3-4A Bolt
14	3	2500-081	MS35333-39 Internal Lock Washer
15	9	2500-076	AN960-10
16	6	2500-075	AN3-3A
17	1	2500-072	AN3-11A
18	1	2500-055	AN345-10
19	1	2500-054	AN315-4
20	2	2500-047	AN970-3 Washer
21	1	2500-042	MS20364--1032
22	1	1450-133	C177 Roll Doubler
Not Shown	1	1450-116 Rev B or later	Cessna 177 Roll Drill Jig

REV	DESCRIPTION	DATE	APPROVED
IR	Initial Release	11/1/2017	ZDW
A	Implemented 1450-133	11/8/2018	ZDW

TITLE		C177 Roll IPC	
SIZE	DWG NO	REV	A
B	Document 238		
SCALE	SHEET	1 OF 1	DRAWN BY
None			ZDW
MATERIAL	TOLERANCE		
ENG APPROVAL	ZDW	DATE	11/1/2017

3) Cessna 177 Pitch Servo Bracket Installation

a) Pitch Materials List

Qty.	Description	Trutrak P/N
1	Cessna 177 Pitch Plate	1450-112
1	Cessna 177 Pitch Arm	1450-114
7	MS20364-1032	
2	AN970-3	
2	AN315-4	
1	AN3-10A	
1	AN3-7A	
14	AN3-3A	
10	AN960-10	
4	MS35333-39	
3	8-32 x 3/8 Flat Head Socket Cap Screw SS	2500-216
2	CM-3B-14 Rod End Bearing	2510-052
5	BSPQ-44 Rivet	
1	Microfit 6 Position Cable 1M	6000-063
1	MS-34589-20	
1	Servo Arm	7200-091
1	Cessna 177 Pitch Bracket Assembly	7200-092
1	Cessna 177 Pitch Push Rod Assembly	7200-098
1	60 inch/lb PMA servo	8100-064
	OR	OR
	60 inch/lb 24 Volt PMA servo	8100-065

b) Pitch Servo Bracket Mounting Instructions

- i) The Cessna 177 pitch servo will be mounted in the rear fuselage at the former location (station 263.0) shown in figure 3-1.



Figure 3-1

- ii) Remove bulkhead aft of the baggage compartment.
- iii) Remove the inspection covers located fore and aft of the servo mounting former (station 263.0) of both sides of the aircraft.
 - (1) Remove the tailcone exposing the upper side of the stabilator.



Figure 3-2

- iv) 177 RG only- Insert Cessna 177 Pitch Plate (P/N 1450-112) in rear portion of fuselage as shown. Non-RG's may insert the plate through the bulkhead aft of the baggage compartment.

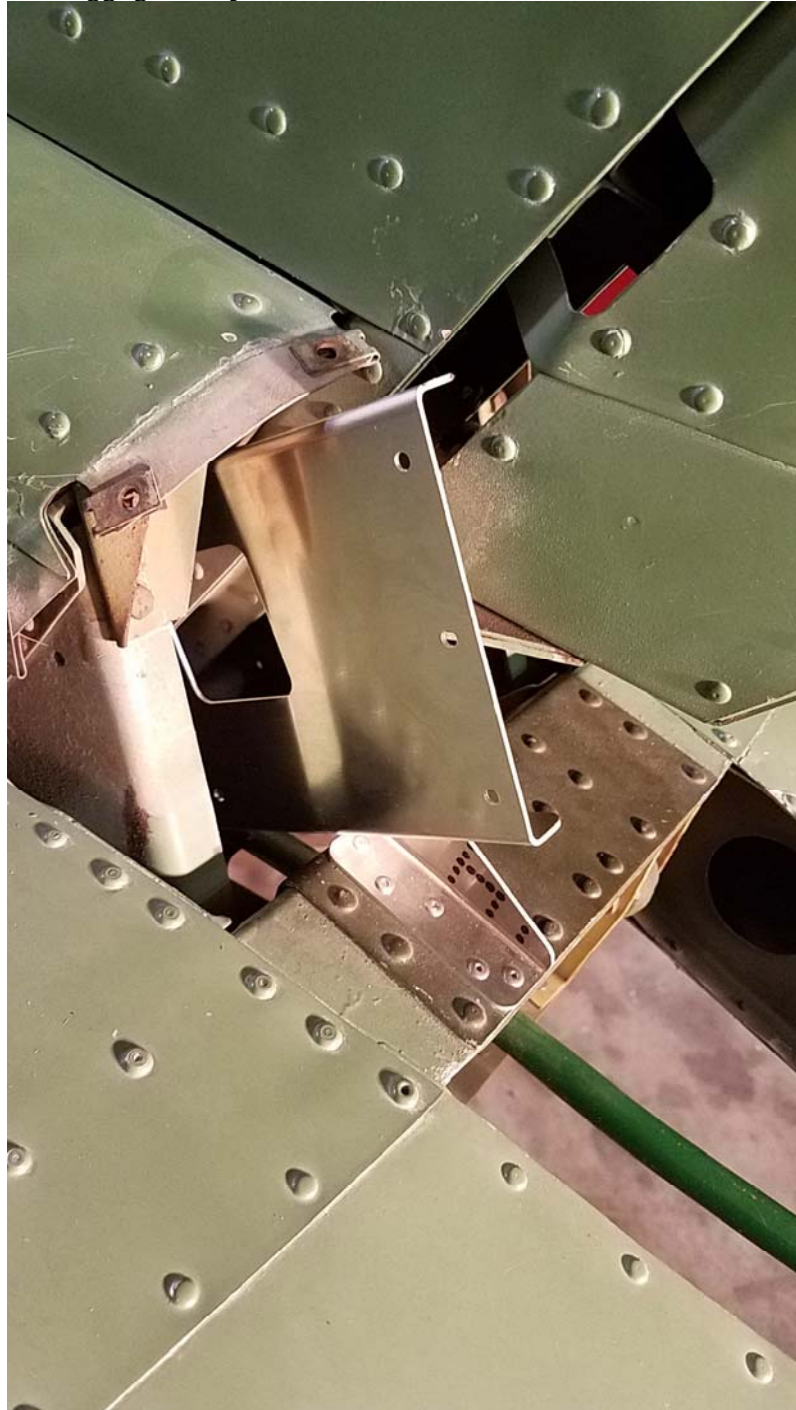


Figure 3-3

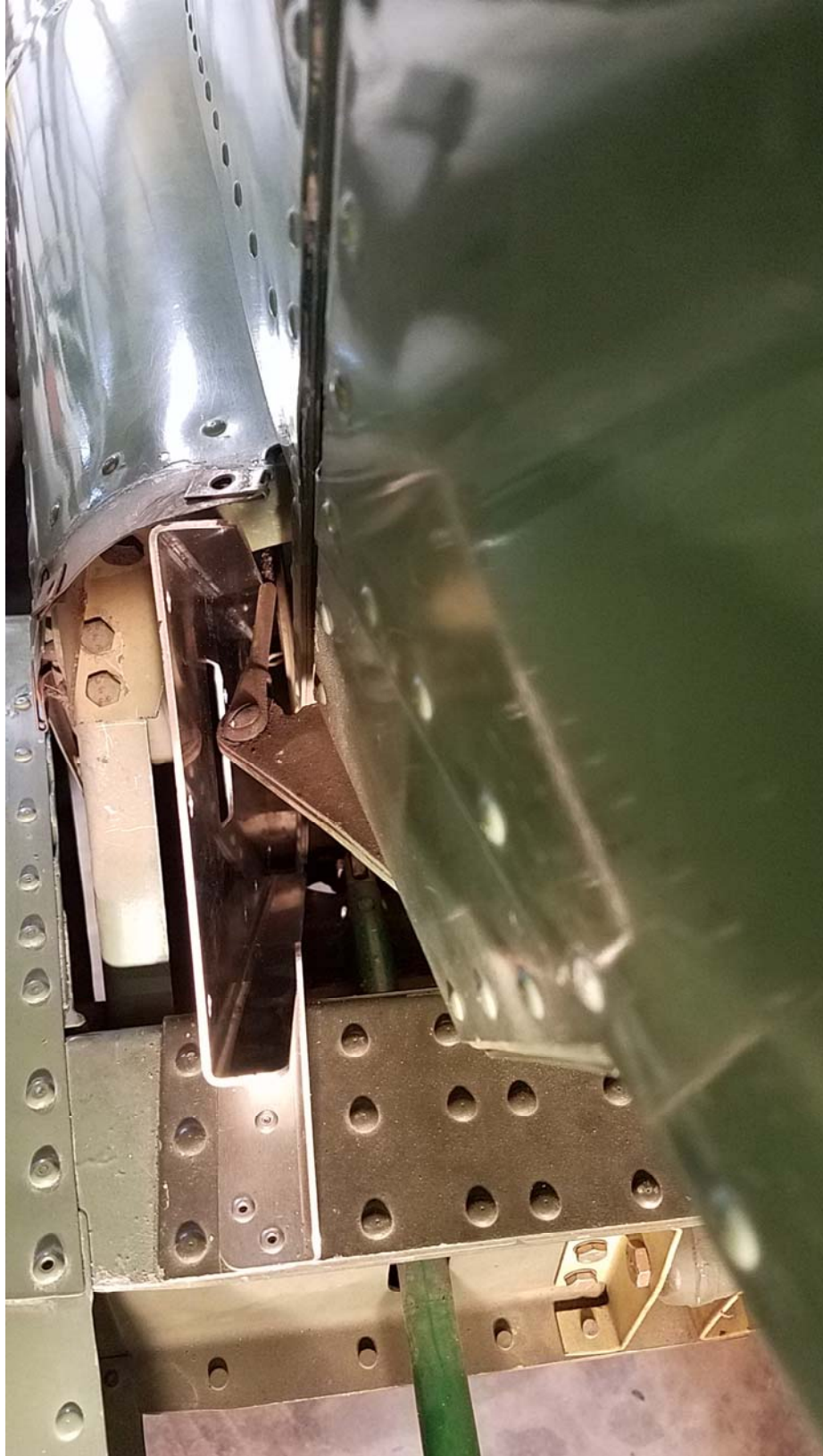


Figure 3-4

- v) Drill holes for mounting of Cessna 177 Pitch Plate, (P/N 1450-112)
(1) Clamp the Cessna 177 pitch plate to the rear side of the former. The upper flange on the pitch plate must be level with seam in the former shown in [Figure 3-5](#). Center the pitch plate left to right in the fuselage.

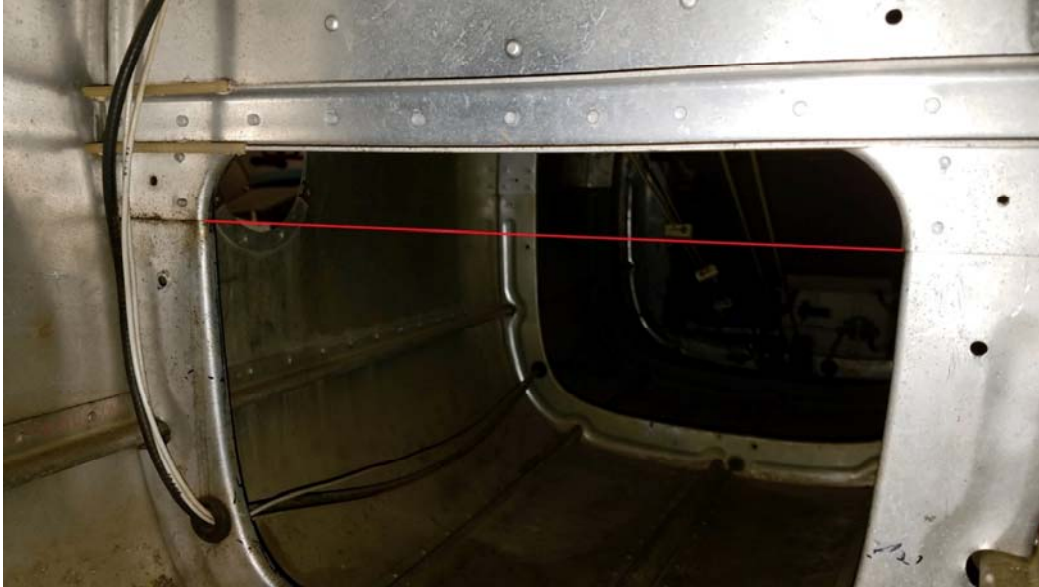


Figure 3-5

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- vi) 177RG only – The 177RG has a cover riveted to the former. Once the plate is properly located against the aft side of the cover mark the location of the rivets on the plate and drill clearance holes so that the plate sets flat against the cover.
- vii) Match drill the former with the 6 holes in the Cessna 177 Pitch Plate, (P/N 1450-112) as shown in [Figure 3-6](#). After drilling each hole secure the pitch plate to the aircraft using a cleco or 10-32 bolt.

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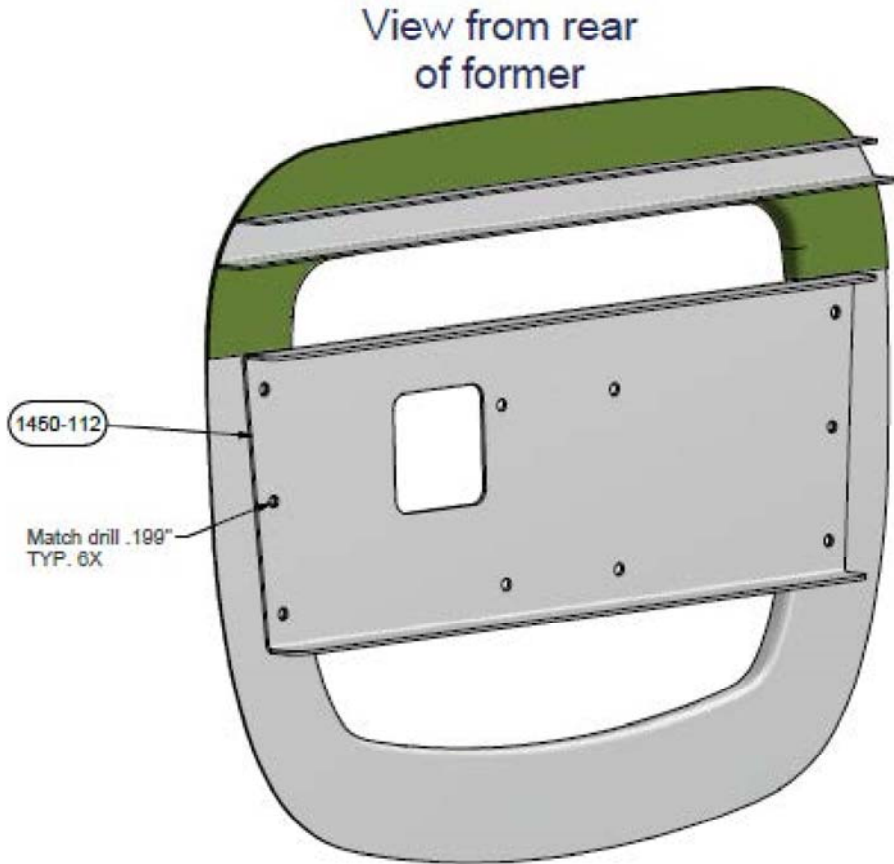


Figure 3-6

- viii) 177RG only- Match drill the 4 pitch bracket mounting holes with the former cover. Mark the outline of the rectangular opening on the former cover and cut to match. The rectangular opening may be cut slightly larger than the opening on the pitch plate.
- ix) Attaching the Pitch Bracket Assembly (7200-092) to the Pitch Plate (P/N 1450-112)
- x) Attach the Pitch Bracket Assembly to the Pitch Plate as shown in [Figure 3-7](#). Torque AN3-3A bolts to 20-25 in-lb. In the 177RG the former cover will be located between the Pitch Bracket Assembly (7200-092) the Pitch Plate (P/N 1450-112).

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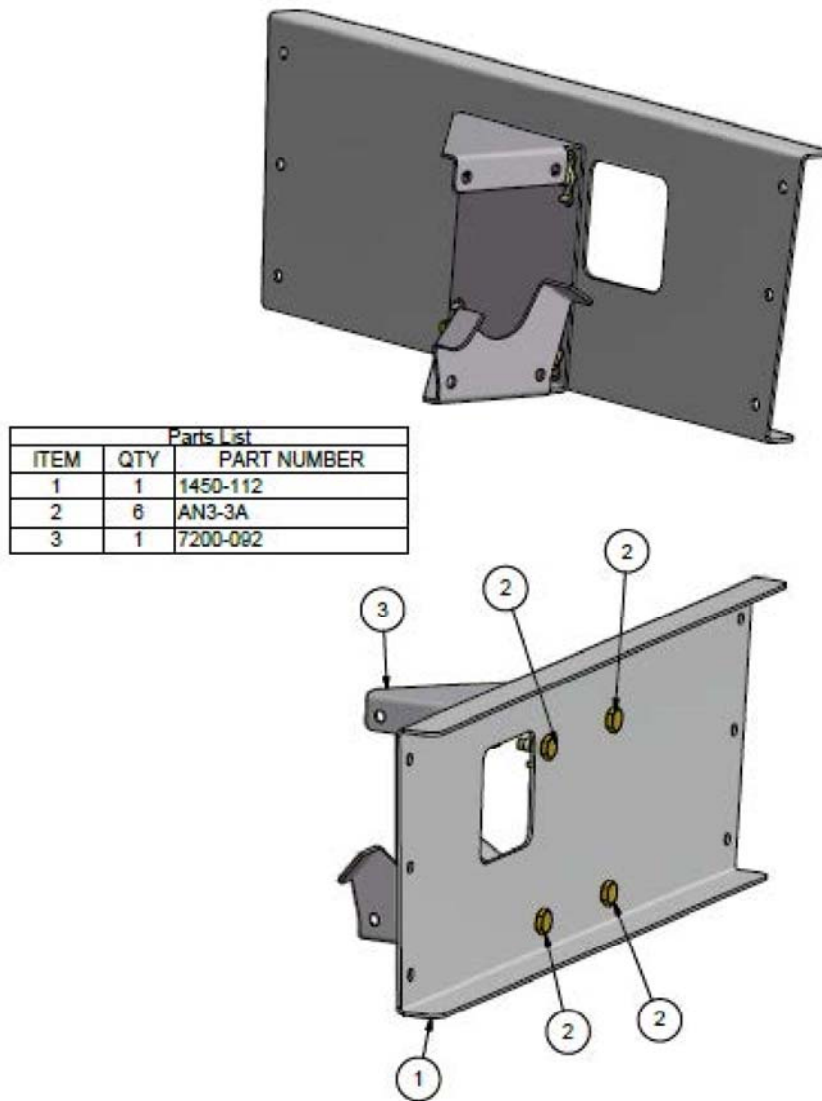


Figure 3-7

xi) Attach the Cessna 177 Pitch Plate, (P/N 1450-112) and Pitch Bracket Assembly (7200-092) to the former.

(1) Attach the Torque Pitch Plate and Pitch Bracket Assembly to the former as shown in [Figure 3-8](#), Torque bolts to 20-25 in-lb.

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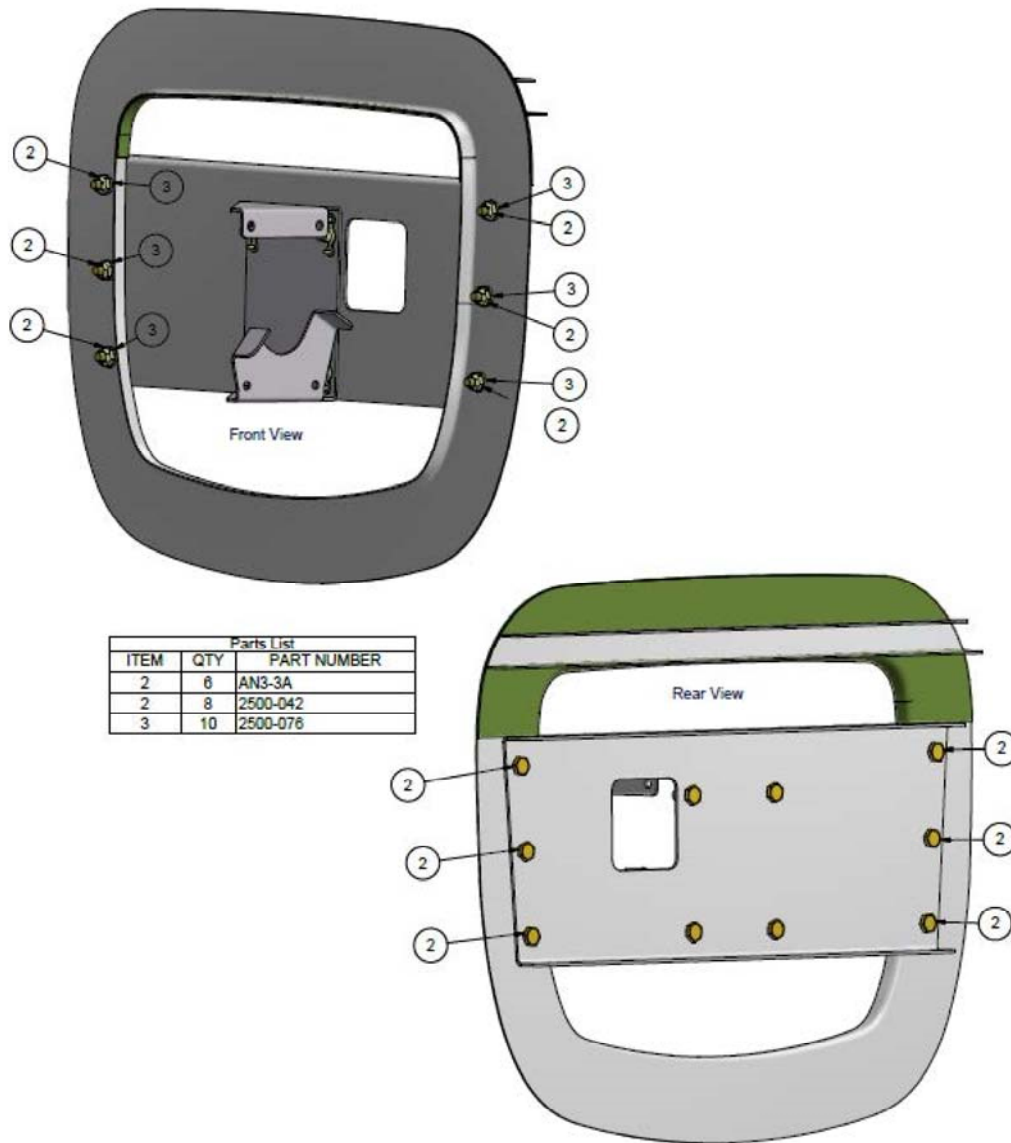


Figure 3-8



- xii) Assemble Servo Arm (P/N 7200-091) and 60 inch/lb PMA servo (P/N 8100-064 for 12 volt or P/N 8100-065 for 24 volt).
- (1) Attach the Servo Arm (P/N 7200-091) to the 60 inch/lb PMA servo (P/N 8100-064 for 12 volt or P/N 8100-065 for 24 volt) using the provided 8-32 x 3/8" flat head screws.
 - (2) Use blue threadlocker (Loctite 242 or equivalent) and torque the screws to 18-20 in-lb.
- xiii) Attach the 60 inch/lb PMA servo (P/N 8100-064 for 12 volt or P/N 8100-065 for 24 volt) to the Cessna 177 Pitch Bracket Assembly (P/N 7200-092)
- (1) Trim the pitch wiring harness to length and terminate the pitch servo wiring harness per the Vizion wiring diagram **USING OPTION B** in the Vizion PMA Installation Guide (TruTrak Doc. 166).
 - (2) Install Connector Backshell 9 Pin (P/N 2100-010).
 - (3) Attach the electrical connector to the roll servo and secure it in place with the mounting screws. Torque to approximately 2-3 in-lb.

- (4) Place the servo behind the mounting bracket with the arm oriented between the servo stops as shown in [Figure 3-9](#)

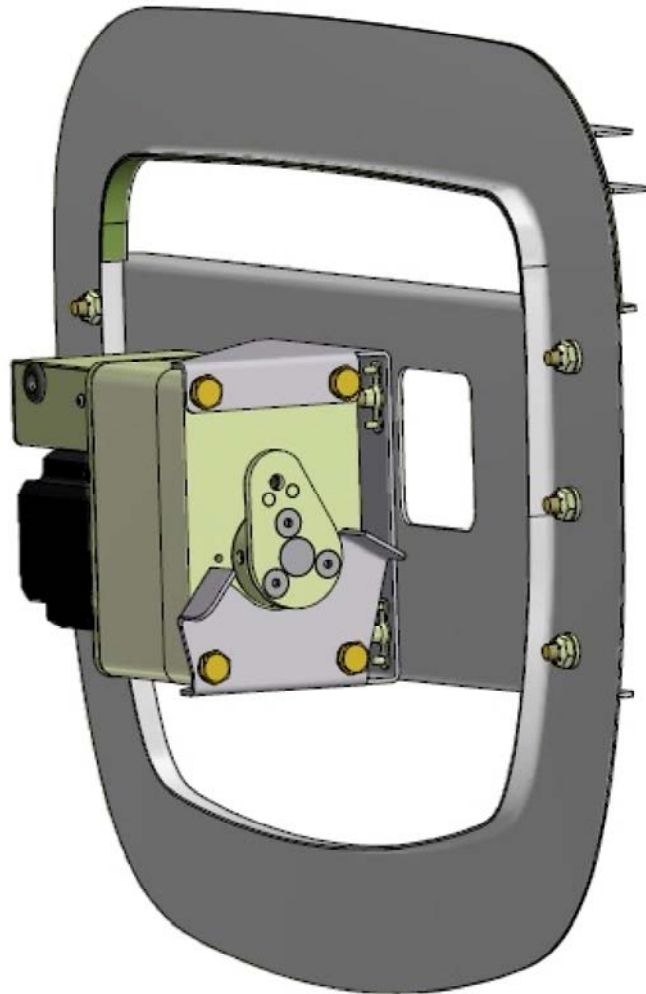


Figure 3-9

- (5) Attach the servo to the Cessna 177 Pitch Bracket Assembly (P/N 7200-092) using 4 AN3-3A bolts with MS35333-39 lock washers and blue threadlocker (Loctite242 or equivalent) torqued to 20-25 in-lb.
- xiv) Attach the Cessna 177 Pitch Arm (P/N 1450-114) to the stabilator
- (1) Position the Cessna 177 Pitch Arm (P/N 1450-114) on top of the stabilator as shown in [Figure 3-10](#).

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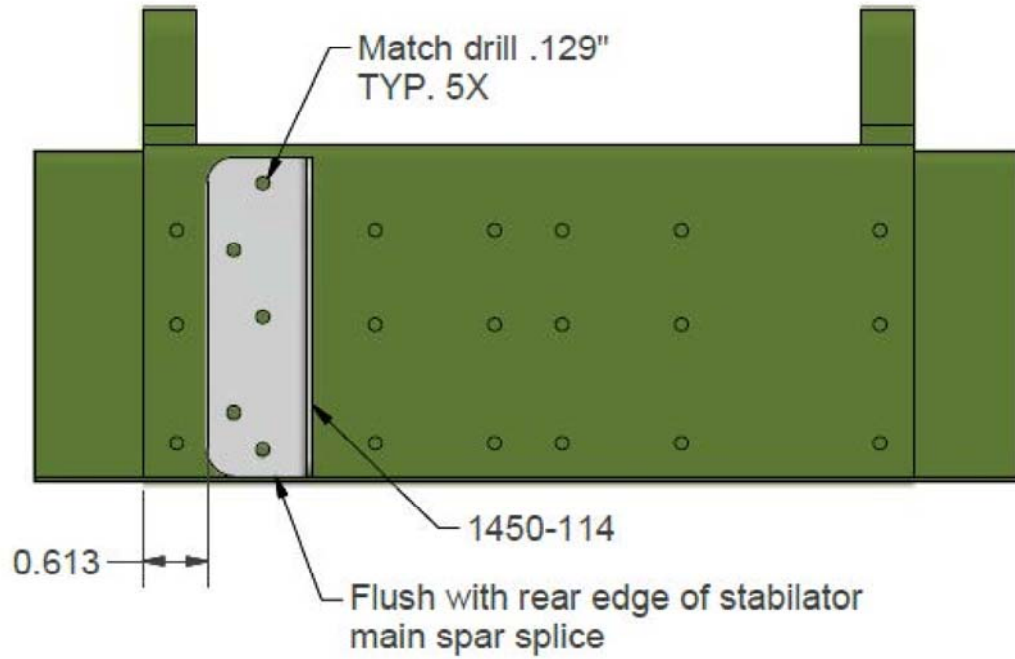


Figure 3-10

(2) Match drill and the stabilator and rivet the Cessna 177 Pitch Arm (P/N 1450-114) in place using 5 ea. BSPQ-44 rivets.



Figure 3-11

- xv) Attach the Cessna 177 Pitch Push Rod Assembly (P/N 7200-098)
- (1) The Cessna 177 Pitch Push Rod Assembly (P/N 7200-098) is a factory built assembly and should not be disassembled.
 - (2) Fully thread an AN315-4 nut on each of the CM-3B-14 Rod End Bearings (P/N 2510-052).
 - (3) Thread one of the CM-3B-14 Rod End Bearings (P/N 2510-052) half way into each end of the Cessna 177 Pitch Push Rod Assembly (P/N 7200-098).
 - (4) Attach the forward end of the Cessna 177 Pitch Push Rod Assembly (P/N 7200-098) to the pitch servo arm (P/N 7200-091) as shown in [Figure 3-12](#). Torque AN3-10A bolt to 20-25 in-lb.

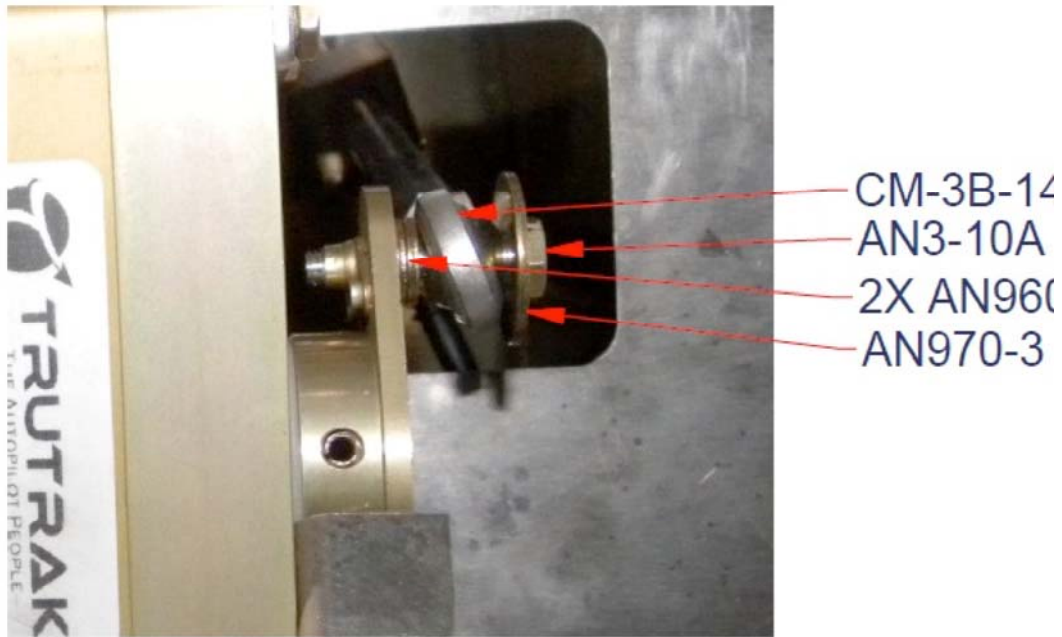


Figure 3-12

- (5) Place the stabilator in the full down position. Adjust the rod ends on the push rod assembly so that the rear rod end bearing aligns with the hole in the pitch arm on the stabilator and the servo arm has approximately 1/8" clearance from the rear servo stop.
- (6) Secure the rear rod end bearing to the Cessna 177 Pitch Arm (P/N 1450-114) as shown in Figure 3-13. Verify that the servo arm does not contact either stop when the stabilator is at full up or down deflection. If necessary adjust the rod ends to allow clearance. Torque AN3-7A bolt to 20-25 in-lb.

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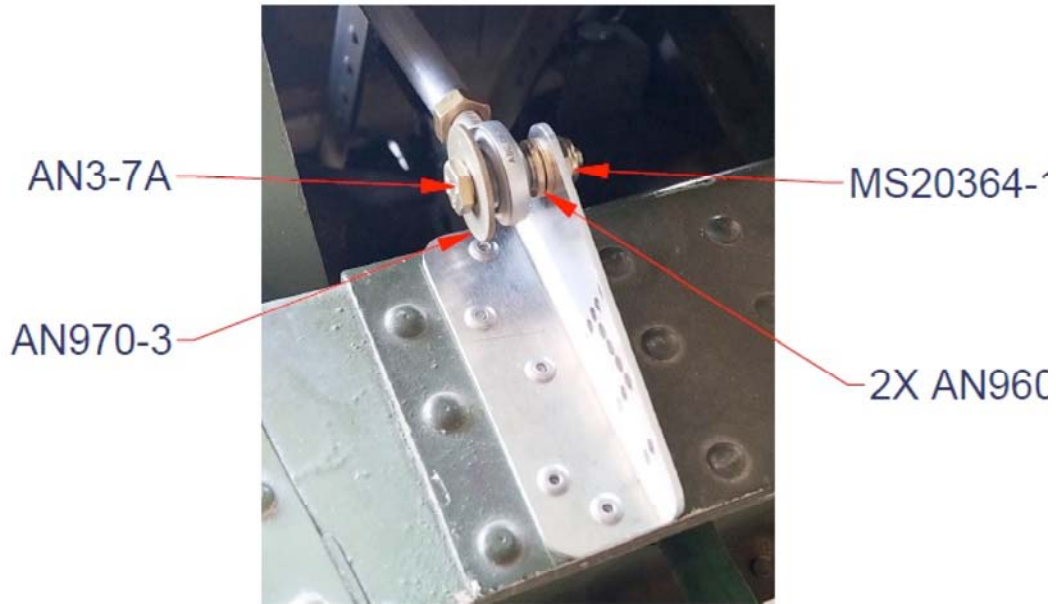


Figure 3-13

- (7) Rotate the Cessna 177 Pitch Push Rod Assembly (P/N 7200-098) so that the 6 pin connector is pointed downward and the assembly is centered on the rod end bearings.
 - (8) Use blue threadlocker (Loctite 242 or equivalent) and torque the jam nuts to 20-25 in-lb. Verify that both rod ends can move freely throughout full stabilator travel.
- xvi) Install Microfit 6 Position Cable 1M (P/N 6000-063)
- (1) Connect the Microfit 6 Position Cable 1M (P/N 6000-063) to the mating connector of on the pitch servo.
 - (2) 177RG only – Drill a 1-1/16” hole in the lower portion of the former cover and install a MS-34589-20 grommet. Position this hole to allow cable routing as shown in [Figure 3-14](#). Route the Microfit 6 Position Cable 1M (P/N 6000-063) through this hole.

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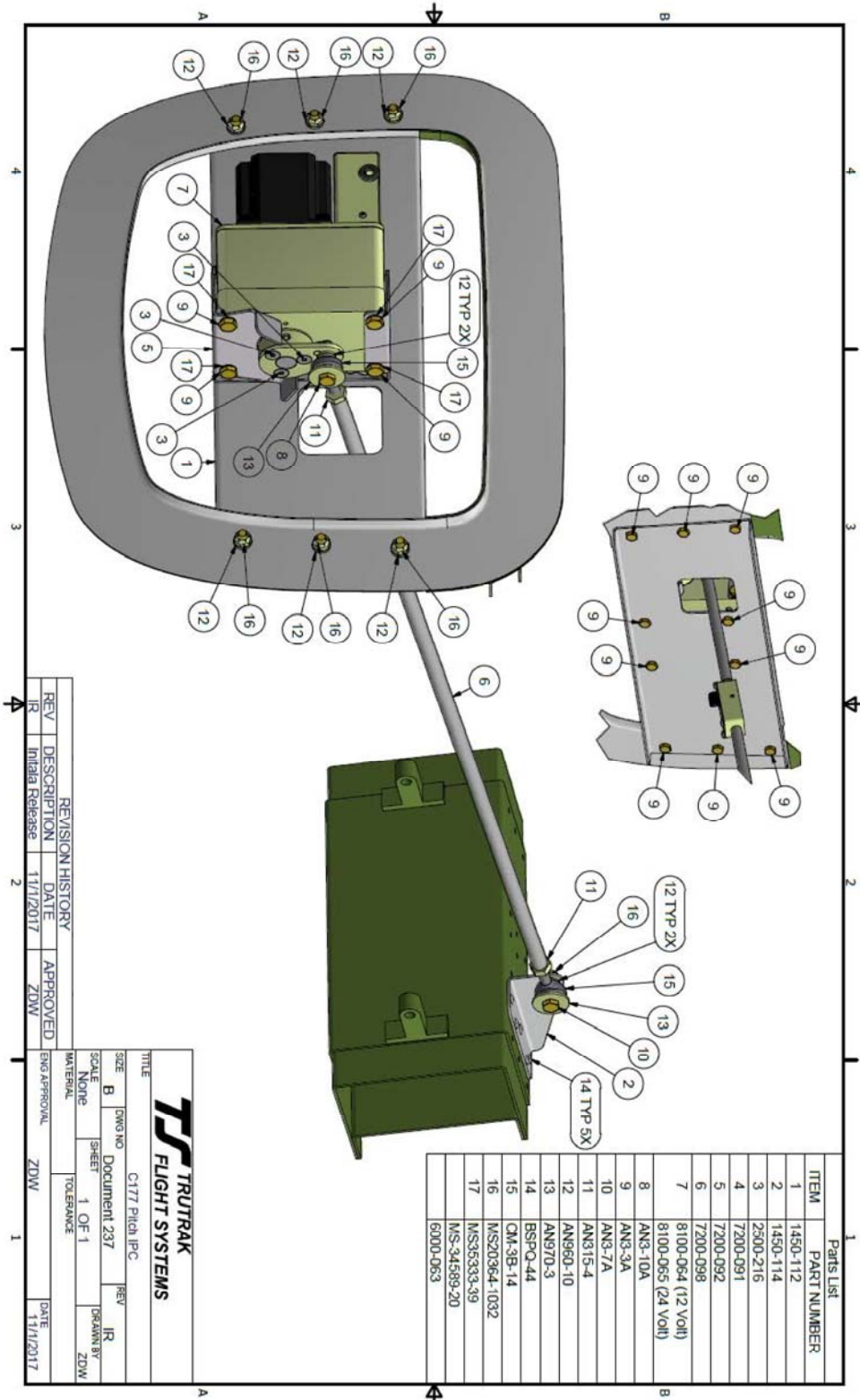
Figure 3-14

- (3) Connect Microfit 6 Position Cable 1M (P/N 6000-063) to the mating connector of on the pitch servo.
 - (4) Drill a hole in the area of the former shown in [Figure 3-14](#), to secure the Microfit 6 Position Cable 1M (P/N 6000-063) with a MS3367-1-0 cable tie.
 - (5) Ensure that Microfit cable cannot interfere with movement of the Cessna 177 Pitch Push Rod Assembly (P/N 7200-098) or the stabilator counterbalance throughout full deflection of the pitch controls.
 - (6) Secure excess Microfit cable to servo wiring harness using a MS3367-1-0 cable tie.
- xvii) Reinstall Inspection Covers, Tailcone, and bulkhead aft of the baggage compartment.

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c) Cessna 177 Vizion Pitch IPC



4) Cessna 177 Wiring Harness Installation

a) Wiring Harness Materials List

Qty.	Description	Trutrak P/N
2	Connector Backshell 9 Pin	2100-010
2	Connector D-sub Female 9 Pin Crimp	2100-044
16	Female Socket Crimp Connector Pin	2100-045
As Needed	MS3367-1-0	
6	MS22529/2-2R Grommet Edging	
1	Vizion Emergency Level Button	8200-113
1	Vizion Wiring Harness 25'	8220-033
1	Vizion Limitations Placard	8300-092
1	5A AP Circuit Breaker	N/A
1	Control Wheel Steering Switch (Must be Red)	N/A
1	AP Master Switch	N/A
4	6-32 x 3/8" Instrument Mounting Screws	N/A
1	Vizion 2" Controller OR Vizion 3" Controller OR Vizion Flat Pack Controller	8000-174 <u>or 8000-183</u> OR 8000-176 <u>or 8000-184</u> OR 8000-175 <u>or 8000-185</u>
N/A	1/8"-27 NPT male fittings and tees for connecting the A/P pitot and static to the aircraft systems	N/A
N/A	Various terminals and pins for connection of power and GPS	N/A

b) Wiring Harness Mounting Instructions

- i) Select a mounting location for the A/P controller (The controller will not be installed, but mounting location should be considered for wiring harness placement). Consider the overall mounting depth of the controller with pitot, static, and electrical connections and allow clearance where necessary, especially surrounding the moving yoke assembly.
- ii) Remove the left panel overlay and the left instrument panel.
- iii) Remove the left front seat and the rear seat
- iv) Remove Interior Trim
 - (1) Remove interior trim from the right forward door pillar.



Figure 4-1

(2) Remove interior trim from above the right door.



Figure 4-2

(3) Remove interior trim from the left and right kick panels.



Figure 4-3



Figure 4-4

(4) Remove interior baggage compartment trim allowing full access to the rear of the fuselage.



Figure 4-5

v) Open inspection covers for installation of wiring harness.

(1) Open right wing inspection covers as shown in [Figure 4-6](#),



Figure 4-6

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(2) Open cabin floor inspection covers as shown in [Figure 4-7](#).



Figure 4-7

vi) Routing of Cessna 177 Vizion Wiring Harness (P/N 8220-032)

(1) Route the pitch and roll servo harnesses down the left side of the center stack leaving plenty of service loop for selected autopilot controller mounting location.

(a) Secure harness to existing wiring bundle using MS3367-1-0 Cable Ties.

(2) Continue running the pitch servo (white sheathing) portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) across the lower left side of the instrument panel following existing wire routing.

(a) Secure harness using MS3367-1-0 Cable Ties.

(3) Continue running the pitch servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) down the left side of the fuselage behind the kick panel. Secure harness using MS3367-1-0 Cable Ties.

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Figure 4-8

- (a) Fixed Gear 177 Pitch Wiring Harness Routing
 - (i) Continue running the pitch servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) under the cabin floor to the baggage compartment area.
 - (ii) Secure harness using MS3367-1-0 Cable Ties.

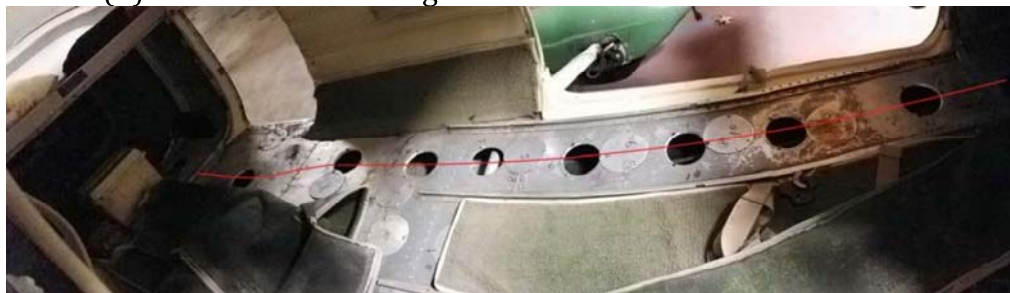


Figure 4-9

- (iii) Continue running the pitch servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) thru existing grommets in the left side of the rear fuselage.



Figure 4-10

(b) 177RG Pitch Wiring Harness Routing

- (i) Continue running the pitch servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) under the cabin floor under the door sill area to the rear of the left door.



Figure 4-11

- (ii) Continue running the pitch servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) up the rear door pillar.



Figure 4-12

- (iii) Continue running the pitch servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) over the left side window through the baggage compartment bulkhead.

- (4) Route the harness to the right side of the rear fuselage. Secure the harness to the former at station 238.00 using a MS3367-1-0 cable tie as shown in [Figure 4-13](#),



Figure 4-13

- (5) During the pitch servo installation the wires will be trimmed and terminated.
- (6) Route the roll servo (black sheathing) portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) under the center stack and follow the existing wire bundle to the right side of the panel. Secure harness to existing wiring bundle using MS3367-1-0 Cable Ties.
- (7) Locate the conduit that runs up the right forward door pillar and route the roll servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) through this conduit to the area above the right door.
- (8) Install M22529/2-2R grommet edging to the hole shown in [Figure 4-14](#). This is located above the right door just forward of the spar. Route the harness through this hole.

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Figure 4-14

(9) Continue running the roll servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) into the right wing route through the grommet shown in [Figure 4-15](#),



Figure 4-15

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- (10) Route the roll servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) through the right wing following the existing wiring bundle.
- (a) Secure harness using MS3367-1-0 Cable Ties.



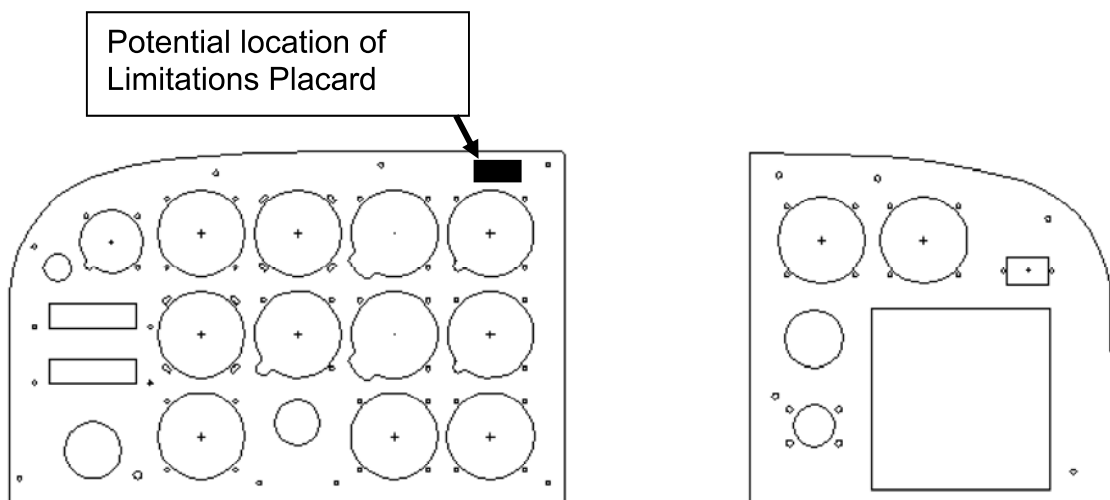
Figure 4-16

- (11) Route the roll servo portion of Cessna 177 Vizion Wiring Harness, (P/N 8220-032) through the grommet located at the inboard corner of the roll servo mounting location.



Figure 4-17

- (12) During the roll servo installation the wires will be trimmed and terminated according to the C177 Wiring Harness Diagram.
- vii) Complete the Wiring Harness Mounting Instructions once the pitch and roll servo installations are complete.
 - viii) Reinstall cover plates on inspection holes.
 - ix) Select appropriate mounting locations for the AP Master, AP Circuit Breaker, Emergency Level and control wheel steering switches. Connect these items per the C177 Wiring Harness Diagram.
 - x) **All items in step ix are required to be installed. The AP Master Switch, AP Circuit Breaker, and Control Wheel Steering switches must be labeled. The Control Wheel Steering Switch must be red.**
 - xi) Connect GPS inputs per the Vizion wiring diagram in C177 Wiring Harness Diagram.
 - xii) **Conduct pitot / static check of aircraft system before opening any pitot/ static connections!**
 - xiii) Mount autopilot controller in panel using 4 6-32 X 3/8" screws. Connect wiring harness and connect pitot and static per Vizion PMA Installation Guide (TruTrak Doc. 166).
 - xiv) Install Vizion Limitations Placard (Trutrak P/N 8300-092) near the Vizion autopilot. A sample panel with potential placard location is shown below:





- xv) Reinstall interior trim.
- xvi) Reinstall seats.
- xvii) Reinstall the instrument panel and panel overlay.
- xviii) Reconnect battery.
- xix) Once autopilot settings are confirmed, perform autopilot system test per the Vizion PMA Installation Guide (TruTrak Doc. 166).

5) Cessna 177 Autopilot Settings

Once all wiring is complete, verified, and the GPS setup has been completed (Vizion PMA Installation Guide (TruTrak Doc. 166)), follow the steps below to verify proper autopilot settings.

THIS STEP MUST BE COMPLETED PRIOR TO GROUND CHECK AND FLIGHT CHECK!!!

a) Lateral Autopilot Settings

For Vizion software version PV.30 follow the steps below:

- 1) PRESS and HOLD KNOB
- 2) Apply power to autopilot and GPS
- 3) Release KNOB.
- 4) PRESS KNOB to advance to min backlight
- 5) PRESS KNOB to advance to SETUP ENABLE.
- 6) ROTATE KNOB to select a value of **10**.
- 7) PRESS KNOB to exit.
- 8) PRESS and HOLD MODE button until LAT ACTIVITY is shown.
- 9) ROTATE KNOB to select a LAT ACTIVITY of **17**
- 10) PRESS ALT button to advance to next setup screen.
- 11) ROTATE KNOB to select a BAUD that matches the baud rate of the GPS (this will be either **4800** or **9600**, refer to Approved GPS List (Doc 186) for information about approved GPS units).
- 12) PRESS ALT button to advance to next setup screen.
- 13) ROTATE KNOB to select a BANK ANGLE of **MED**.
- 14) PRESS ALT button to advance to next setup screen.
- 15) ROTATE KNOB to select a MICROACTIVITY of **15**.
- 16) PRESS ALT button to advance to next setup screen.
- 17) ROTATE KNOB to select a GPSS GAIN of **16**.
- 18) PRESS ALT button to advance to next setup screen.
- 19) ROTATE KNOB to set ROLL REV to **N**.
- 20) PRESS KNOB to exit lateral setup and return to the home screen.
- 21) PRESS ALT AND HOLD alt button until VRT AVTIVITY is shown.
- 22) WHILE CONTINUING TO HOLD ALT, PRESS MODE.
- 23) RELEASE MODE AND ALT.
- 24) PRESS MODE until MAC is displayed.
- 25) ROTATE KNOB to set MAC to **1**.
- 26) PRESS KNOB to exit menu and return to home screen.
- 27) Do not remove power from autopilot.

For Vizion software version PV.40 follow the steps below:

- 1) PRESS and HOLD KNOB
- 2) Apply power to autopilot and GPS
- 3) Release KNOB.

- 4) PRESS ALT button to advance to min backlight
- 5) PRESS ALT button to advance to SETUP ENABLE.
- 6) ROTATE KNOB to select a value of **10**.
- 7) PRESS ALT button to exit.
- 8) PRESS and HOLD MODE button until LAT ACTIVITY is shown.
- 9) ROTATE KNOB to select a LAT ACTIVITY of **17**
- 10) PRESS ALT button to advance to next setup screen.
- 11) ROTATE KNOB to select a BAUD that matches the baud rate of the GPS (this will be either **4800** or **9600**, refer to Approved GPS List (Doc 186) for information about approved GPS units).
- 12) PRESS ALT button to advance to next setup screen.
- 13) ROTATE KNOB to select a BANK ANGLE of **MED**.
- 14) PRESS ALT button to advance to next setup screen.
- 15) ROTATE KNOB to select a MICROACTIVITY of **15**.
- 16) PRESS ALT button to advance to next setup screen.
- 17) ROTATE KNOB to select a GPSS GAIN of **16**.
- 18) PRESS ALT button to advance to next setup screen.
- 19) ROTATE KNOB to set ROLL REV to **N**.
- 20) PRESS KNOB to exit lateral setup and return to the home screen.
- 21) PRESS ALT AND HOLD alt button until VRT AVTIVITY is shown.
- 22) WHILE CONTINUING TO HOLD ALT, PRESS MODE.
- 23) RELEASE MODE AND ALT.
- 24) PRESS MODE until MAC is displayed.
- 25) ROTATE KNOB to set MAC to **1**.
- 26) Repeatedly PRESS ALT button until EFIS TYPE is displayed
- 27) ROTATE KNOB to set EFIS TYPE to:
 - 1** – if the autopilot is connected to an ASPEN,
 - 2** – if the autopilot is connected to a G5,
 - 0** – if the autopilot is connected to any other GPS
- 28) PRESS KNOB to exit menu and return to home screen.
- 29) Do not remove power from autopilot.

b) Vertical Autopilot Settings

For Vizion software version PV.30 follow the steps below:

- 1) PRESS and HOLD ALT button until VRT ACTIVITY is shown.
- 2) ROTATE KNOB to select a VRT ACTIVITY of **16**.
- 3) PRESS ALT button to advance to next setup screen.
- 4) ROTATE KNOB to select a MIN AIRSPD of (Refer to aircraft POH and set a value equal to **1.3 V_S** in knots).
- 5) PRESS ALT button to advance to next setup screen.
- 6) ROTATE KNOB to select a MAX AIRSPD of (Refer to aircraft POH and set a value equal to **0.9 V_{NE}** in knots).
- 7) PRESS ALT button to advance to next setup screen.
- 8) ROTATE KNOB to select a PITCH REV of **Y**.

- 9) PRESS ALT button to advance to next setup screen.
- 10) ROTATE KNOB to select a STATIC LAG of **1**.
- 11) PRESS ALT button to advance to next setup screen.
- 12) ROTATE KNOB to select a MICROACTIVITY of **10**.
- 13) PRESS ALT button to advance to next setup screen.
- 14) ROTATE KNOB to select a HALF STEP of **N**.
- 15) PRESS KNOB to exit vertical setup and return to the home screen.
- 16) Cycle power on the autopilot.

For Vizion software version PV.40 follow the steps below:

- 1) PRESS and HOLD ALT button until VRT ACTIVITY is shown.
- 2) ROTATE KNOB to select a VRT ACTIVITY of 16.
- 3) PRESS ALT button to advance to next setup screen.
- 4) ROTATE KNOB to select a MIN AIRSPD of (Refer to aircraft POH and set a value equal to 1.3 V_S in knots).
- 5) PRESS ALT button to advance to next setup screen.
- 6) ROTATE KNOB to select a MAX AIRSPD of (Refer to aircraft POH and set a value equal to 0.9 V_{NE} in knots).
- 7) PRESS ALT button to advance to next setup screen.
- 8) ROTATE KNOB to select a PITCH REV of Y.
- 9) PRESS ALT button to advance to next setup screen.
- 10) ROTATE KNOB to select a STATIC LAG of 1.
- 11) PRESS ALT button to advance to next setup screen.
- 12) ROTATE KNOB to select a MICROACTIVITY of 10.
- 13) PRESS ALT button to advance to next setup screen.
- 14) ROTATE KNOB to select desired DEFAULT VS (this is the vertical speed setting that the autopilot will use as the value to determine whether or not to synchronize to current vertical speed or synchronize to zero vertical speed, as well as the default vertical speed for altitude pre-select). For example, if the DEFAULT VS is set to 300 fpm, if the aircraft is climbing at 200 fpm, the autopilot select zero VS upon engagement. If the aircraft is climbing at 400 fpm, the autopilot will select 400 fpm upon engagement.
We suggest using 300-400 feet per minute.
CAUTION! Do not select a DEFAULT VS that is too high, or autopilot performance may be adversely affected.
- 15) PRESS KNOB to exit vertical setup and return to the home screen.
- 16) Cycle power on the autopilot.



TruTrak Flight Systems, Inc.