Three Point Torso Restraint System
Raytheon (BEECHCRAFT) 33/35/36 - 55/56/58/95 Aircraft

FAA /STC SA01880CH EASA/STC 10071581

INSTALLATION AND MAINTENANCE MANUAL

Model 3RS-114FS, Fixed Restraint
Model 3RS-114IR, Inertial Reel Restraint

Alpha Aviation Inc.
1500 East Main Street
Owatonna, Minnesota 55060

Manual	Date	Change	Approved
AAI 4.5001	7/20/2003	Initial Issuance	
AAI 4.5001	8/20/2003	Revis[illegible]	
AAI 4.5001	6/28/2004	R[illegible] Aircraft	
AAI 4.5001	4/15/20[illegible]	[illegible]dd Minor Changes	
AAI 4.500[illegible]		Update and Add Changes 35-33	
AAI 4	[illegible]2019	Revise Pg 13 - Add to TSO C114 Items Or "Equivalent FAA Approved Restraint System"	DCM

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*** FOR REVIEW ONLY * NO STC AUTHORIZATION ***

1.0 Model Designations

Model Number	Product Description
3RS-114FS	Three-point restraint system, TSO114, Fixed torso strap
3RS-114IR	Three-point restraint system, TSO114, Inertial Reel torso strap

2.0 Product Description

Model 3RS-114FS

Accommodates the installation of a vendor supplied, FAA approved, TSO-C114 restraint system, at each pilot position. The restraint system incorporates a traditional pelvic restraint strap (lap belt) provided with the provision to attach, as needed, a single diagonal torso restraint strap. The upper end of the torso restraint strap is hard mounted to the airframe at a location aft and above the pilot position. The free end of the strap is attached to the pelvic restraint at the buckle location and adjusted, as necessary, by use of the cinch strap provided.

The attachment points for the pelvic restraint strap (lap belt) are continued in use, as they were provided by the manufacturer at the time of type certification.

This installation requires that the installing mechanic inspect the attachment hardware configuration for correctness and install the TSO-C114 pelvic restraint strap to the primary attachment points, using the original hardware configuration.

The attachment point of the fixed end of the torso restraint strap is accomplished by the installation of an aluminum doubler adjacent to each pilot position and the installation of the attachment hardware configuration as called out in the drawing package.

Model 3RS-114IR

Accommodates the installation of a vendor supplied, FAA approved, TSO-C114 restraint system, at each pilot position. The restraint system incorporates a traditional pelvic restraint strap (lap belt) provided with the provision to attach, as needed, a single diagonal torso restraint strap. The upper end of the torso restraint strap is routed through a guide, which is hard mounted to the airframe at a location aft and above the pilot position. The torso restraint strap passes through the guide and continues down, vertically, to a sidewall mounted inertial reel assembly. The free end of the strap is attached to the pelvic restraint strap at the buckle location and is self adjusting through the guide to the sidewall mounted inertial reel.

The attachment points for the pelvic restraint strap (lap belt) are continued in use, as they were provided by the manufacturer at the time of type certification. This installation requires that the installing mechanic inspect the attachment hardware configuration for correctness and install the TSO-C114 pelvic restraint strap to the primary attachment points, using the original hardware configuration.

The attachment of the torso restraint strap - webbing guide is accomplished by the installation of an aluminum doubler adjacent to each pilot position and the installation of the attachment hardware configuration called out in the drawing package.

3.0 Airframe Qualifications

Aircraft that have a standard airworthiness certificate are eligible for this installation

The airworthiness certificate must be issued in either the Normal or Utility Category

If the aircraft is a Utility category aircraft, its placards, markings and Aircraft Flight Manual (AFM) / Pilots Operating Handbook (POH) must PROHIBIT intentional spins or Aerobatic maneuvers; which by regulation, require that the occupants wear parachutes

Inspect the aircraft and its records to assure that any change in structure or window installation does not preclude the installation of the Model 3RS-114FS or Model 3RS-114IR restraint system.

3.1 Weight and Balance

Model 3RS-114FS requires a net weight change of +1.25 pounds per installation; two pilot positions. With an arm of 106.0" - 33/35/55/56/96 aircraft; 96.0" - 36/58 aircraft.

Model 3RS-114IR requires a new weight change of +4.50 pounds per installation; two pilot positions. With an arm of 105.5" - 33/35/55/56/96 aircraft; 95.5" - 36/58 aircraft.

3.2 FAA Documentation

The installation of either model restraint system is an FAA approved installation, when accomplished using the approved data and parts. All parts supplied by Alpha Aviation Inc. are either FAA/PMA modification parts or standard parts and installation manual AAI 4.5001 is approved data.

When the installation is completed, per the approved data, the installer should;

Update the aircraft equipment list

Update the aircraft weight and balance record

Install the "Instructions for Continued Airworthiness" in the aircraft maintenance records.

Make the appropriate maintenance entries in the aircraft log book.

Prepare and submit a Form 337 to the FAA.

3.3 Instruction for Continued Airworthiness

Model 3RS-114FS / 3RS-114IR - Three Point Restraint System

1. Introduction;
   This ICA is issued to provide information pertinent to the inspection and ongoing maintenance of the TSO-C114 Occupant Restraint System installed on this aircraft
2. Description;
   This aircraft has been modified with the installation of a TSO-C114 occupant restraint system, which consists of a lap belt arrangement and single fixed or inertial reel controlled diagonal shoulder strap
3. Operation;
   The occupant restraint system operated normally in all respects. The lap portion is connected via the lift lever buckle. Shortening or lengthening the strap using the adjuster, which is integral with the buckle connector half, adjusts the length and fit of the lap belt
4. Servicing information; No field service allowed
5. Maintenance Instructions;
   Inspection of the occupant restraint system shall be made on an Annual / 100 hour Inspection basis and consist of an operations check of each installed belt system, and a visual inspection of all mounting hardware. Field maintenance is limited to the replacement of mounting hardware.
6. Trouble shooting procedures; None
7. Removal and replacement; No special procedures apply
8. Diagrams; None required
9. Special Inspections; None required
10. Special Treatments; None required
11. Data; Standard procedures and torque values apply
12. Special tools; None required
13. Does not apply
14. Overhaul periods; Overhaul required “on condition” - no specific time in service requirement
15. Airworthiness limitations; None required
16. Revisions; All revisions to this document must be prepared and presented to an FAA inspector for field approval in the form of an FAA Form 337

*** FOR REVIEW ONLY * NO STC AUTHORIZATION ***

End

4.0,a Doubler, Right Hand Hard Point

INSTALLATION INSTRUCTIONS

UPPER ATTACH POINT
TORSO RESTRAINT - RIGHT SIDE

33/35/36/55/56/58/95 BONANZA - TRAVELAIR - BARON

Discussion;
These instructions over the installation of Part 4.2001, a 2024T3 - .040 aluminum doubler, to be installed on the interior side of the cabin cap splice adjacent to the right pilot position.

When installed, Part 4.2001 reinforces the cabin cap splice and provides the hard point required for the installation of the upper torso restraint strap or the upper torso restraint guide, as appropriate to the type of restraint system being installed.

To locate the right cabin cap splice, enter the cabin and be seated in the right rear seat. Examine the upper portion of the rear doorpost, where it meets the front of the right passenger window.

Some aircraft may require the removal of interior trim in order to expose the splice.

The cabin cap splice will appear as a horizontal line and inspection will reveal eight (8) rivets tying the cabin side panel and cabin cap together through a doubler installed internally to the post

The installation of Part 4.2001 will be accomplished through the addition of seven (7) nominal Cherry Max rivets, interspersed among the eight (8) existing rivets.

Step-by-Step Instructions; Right upper torso restraint attachment

Caution - Some aircraft have had wiring run through this doorpost. The installer must verify the existence of any wiring and prepare to work around or relocate the wiring as necessary.

1. Locate the right cabin cap splice, interior per drawing 4.3011. Station 96.0; 36/58 aircraft and station 106.0 on all other aircraft.

2. Using a permanent marker, mark the center of each of the eight (8) flush rivets, 4 above and 4 below the splice line. If the existing rivets are difficult to locate, complete step 3 and then remove the paint as necessary within the marked area.

If the cabin cap splice was covered by a Royalite window frame and the cabin cap splice was assembled using universal head rivets, the eight (8) universal head rivets will need to be drilled out and replaced with flush Cherry Max CR3212-4-2 rivets.

3. Locate the future position of Part 4.2001 by placing Part 4.2001, centered on the splice line, in place and mark its top and bottom position with a lead pencil.

4. Transfer the location of all eight (8) flush rivets onto Part 4.2001 by creating a horizontal and vertical grid on Part 4.2001 with a lead pencil.

5. Plot the location of the seven (7) additional rivets and the .250 inch restraint mounting hole onto Part 4.2001 by reference to Drawing 4.3001. These locations can be marked with permanent marker for clarity.

Note - When locating the additional rivets, insure that sufficient edge distance exists around the .250-inch mounting hole to accommodate the hardware installation. The minimum edge distance requirement from the edge of the .250-inch hole to any rivet is .150 inch.

6. Test fit Part 4.2001 by checking for proper edge distance from the existing flush rivets and the location of the .250-inch mounting hold per Drawing 4.3001.

7. Place Part 4.2001 in place and drill seven (7) rivet holes - # 30 drill.

8. Drill the .250-inch mounting hole - when drilling this hole, refer to Drawing 4.3001, and insure that the hole is perpendicular to the surface and that the drill angle accounts for the curvature of the rear door post.

DO NOT DRILL THROUGH TO THE OUTSIDE !

9. Remove Part 4.2001 - Debur - Reinstall with cleco's.

10. Rivet Part 4.2001 in place using seven (7) CR3213-4-3 Cherry Max Rivets.

11. Locate the exterior access hole, per Drawing 4.3001. The position is horizontally opposite the .250-inch interior hole and in the center of the exposed portion of the exterior door post on models equipped with passenger egress windows.

Note - A simple method to account for the compound curvature of the structure is to wrap a steel tape measure around the structure, centered on the interior .250-inch mounting hole.

Note - Aircraft not equipped with passenger egress windows will require that the Location of the right side exterior access hole be determined by measuring .50" back from the front edge of the passenger side window overlay panel.

12. Double check the access hole position and drill a .500 hole. Start with a small drill and finish with a power ream or rasp.

Note - Working through the access hole, temporarily fill the void with cotton or shredded cloth to prevent the loss of hardware

13. Install the upper torso restraint strap or belt guide using the hardware configuration shown on drawing 4.3007 (Fixed) or 4.3008 (Inertial Reel).

If the cabin cap splice was covered by a Royalite window frame, install the Royalite window frame and upper torso restraint strap or belt guide using the alternate hardware configuration as shown on drawing 4.3007 (Fixed) **or 4.3008** (Inertial Reel).

14. Torque the bolt / nut to 60 in/lbs dry torque and close exterior access hole with the nylon plug provided.

Lap Belt Attachment;

15. Remove the existing lap belts at their primary mounting point, saving the attachment hardware.

16. Install the new lap belt assembly with the buckle portion inboard, using the hardware configuration as shown on Drawing 4.3010.

17. Test fit and inspect the completed right side installation. All end fittings and guides should be firmly attached, all hardware should be tight and each belt segment should be free to rotate in response to any restraint system loading.

4.0, b Doubler, Left Hand Hard Point

INSTALLATION INSTRUCTIONS

UPPER ATTACH POINT
TORSO RESTRAINT - LEFT SIDE

33/35/36/55/56/58/95 BONANZA - TRAVELAIR - BARON

Discussion;
These instructions over the installation of Part 4.2002, a 2024T3 - .040 aluminum doubler, to be installed on the interior side of the cabin cap splice adjacent to the left pilot position.

When installed, Part 4.2001 reinforces the cabin cap splice and provides the hard point required for the installation of the upper torso restraint strap or the upper torso restraint guide, as appropriate to the type of restraint system being installed.

To locate the left cabin cap splice, enter the cabin and be seated in the left rear seat. Examine the upper portion of the rear doorpost, between the pilots side window and the left egress window.

Some aircraft may require the removal of interior trim in order to expose the splice.

The splice will appear as a horizontal line and inspection will reveal twelve (12) rivets, tying the cabin side panel and cabin cap together through a doubler installed internally to the post

The installation of Part 4.2002 will result in a partial three ply splice, through the addition of two (2) nominal Cherry Max rivets interspersed among the four (4) existing flush rivets on the fore and aft surfaces of the upper splice half, and the placement of seven (7) nominal Cherry Max rivets through Part 4.2002.

Step-by-Step Instructions; Left upper torso restraint attachment

Caution - Some aircraft have had wiring run through this doorpost. The installer must verify the existence of any wiring and prepare to work around or relocate the wiring as necessary.

1. Locate the left cabin cap splice, interior at Station 96.0; 36/58 aircraft and station 106.0 on all other aircraft.

2. Remove as necessary the pilots side window trim to allow access to the forward surface of the cabin cap splice. Using a lead pencil, mark the center of each of the twelve (12) flush rivets - 4 on the aft surface, 4 on the forward surface and 4 on the interior surface.

   If any of the existing rivets are difficult to locate, complete step 3 and then remove paint as necessary within the marked area.

If the cabin cap splice was covered by a Royalite window frame and the cabin cap splice was assembled using universal head rivets, the six (6) universal head rivets BELOW the splice line will need to be drilled out and replaced with flush Cherry Max CR3212-4-2 rivets

3. Locate the future position of Part 4.2002 by placing Part 4.2002 in place, with the top of Part 4.2002 laying across the center of the first row of rivets BELOW the splice line. Refer to Drawing 4.3002 for guidance. Mark the top and bottom position of Part 4.2002 with a lead pencil. Note that the AFT edge of Part 4.2002 will overlap the egress window trim.

Note - This test fit may require trimming as necessary to insure a tight fit.

4. Refer to Drawing 4.3002, locate and install the two (2) CR3213-4-3 Cherry Max rivets shown ABOVE the cabin cap splice line. These are added to increase the rivet density above the splice line.

5. Plot the location of the four (4) existing rivets on the fore and aft surfaces, below the splice line, onto Part 4.2002. These locations can be marked with pencil for clarity. Refer to Drawing 4.3002 and mark the location of the seven (7) rivets and .250 mounting hole to be added to Part 4.2002 These locations can be marked with a permanent marker for clarity.

Note - A potential conflict exists; some aircraft are equipped with a left side passenger assist handle. If installed, the upper assist handle mount may require relocating of the assist handle will need to be removed. In this case, drill out the upper assist handle nut plate rivets, let the nut plate fall into the cavity and close the bottom nut plate mounting hole with a flush Cherry Max Rivet, CR3212-4-2. Leave the assist strap mounting hole open and center the .250 hole in Part 4.2002 on the upper nut plate mounting hole.

6. Test fit Part 4.2002 checking for proper edge distance from the existing flush rivets on the fore and aft surfaces and the correct location of the .250 mounting hole. The mounting hole must be centered on the window post

7. With Part 4.2002 in place - at the location of the .250 mounting hole, drill a #30 guide hole through Prat 4.2002 and the window post. * Use a drill stop * Install a Cleco and pull Part 4.2002 firmly against the window post.

8. Drill the seven (7) remaining rivet holes through Part 4.2002 and the window post as marked in step 5. Insure that Part 4.2002 is pulled up tight.

9. Enlarge the mounting hole from # 30 drill to .250".

10. Remove Part 4.2002 - Debur - Reinstall with Cleco's.

11. Rivet Part 4.2002 in place using seven (7) CR3213-4-3 Cherry Max rivets

12. Locate the exterior access hole per Drawing 4.3002.
The position is horizontally opposite the .250-inch mounting hole, as shown, just aft of the center of the exterior window post.

A good way to locate its position is from the interior through the .250 mounting hole. Use a scribe and cause a dimple in the outer skin directly opposite the mounting hole.

13. Double check the exterior access hole position and drill a .500-inch hole. Start with a small drill and finish with a power rear or rasp from the exterior.

Note - Working through the access hole, temporarily fill the void with cotton or shredded cloth to prevent the loss of hardware during step 14.

14. Install the upper torso restraint strap or belt guide, as appropriate, using the hardware configuration shown on drawing 4.3007 (Fixed) or 4.3008 (Inertial Reel).

If the cabin splice was covered by a Royalite window frame, install the Royalite window frame and upper torso restraint strap or belt guide at this time.

15. Torque bolt / nut to 60 in/lbs dry torque and close the exterior access hole with the nylon plug provided.

Lap Belt Attachment;

16. Remove the existing lap belts at their primary mounting point, saving the attachment hardware.

17. Install the new lap belt assembly with the buckle portion inboard, using the hardware configuration as shown on Drawing 4.3010.

18. Test fit and inspect the completed right side installation. All end fittings and guides should be firmly attached, all hardware should be tight and each belt segment should be free to rotate in response to any restraint system loading.

INSTALLATION INSTRUCTIONS

33/35/36/55/56/58/95 BONANZA - TRAVELAIR - BARON

Mount, Inertial Reel

Discussion;

These instructions cover the installation of Part 4.2003 and Part 4.2004, which combine to form a 2024TC - 0.40 aluminum mounting plate, on which the inertial reel is mounted.

Parts 4.2003 and 4.2004 are sidewall mounted by attachment to the two lower horizontal "J" channels and fastening to the cabin skin just above the lower cabin chine.

The left and right side installation of Parts 4.2003 and 4.2004 are similar, with the only exceptions being the proximity of the door frame brace on the right side installation and the temporary relocation of the static line during the left side installation.

The layout of the attachment holes, both right and left, are identical and can be done simultaneously.

Note: Early 35-33 Aircraft - A number of 35-33 aircraft incorporated a hammock style rear assembly which utilized a horizontal support beam on each sidewall. Aircraft so equipped will require the trimming of the side flanges, PN 4.2003. The side flanges are removed in the area of the horizontal beam to allow the assembled mount to lie flat against the inboard surface of the beam.

The assembled mount is then directly attached to the beam by moving the top row of 5 ea. AN526 bolts down an additional .75" and substituting 8 ea. CR 3213-4-3 Cherry Max rivets (#30 Drill) for the AN526 bolts in rows 1 and 2.

The 5 ea. AN526 bolt attachments along the upper longeron are omitted, the un used upper flange may be removed.

58 Series Aircraft - A small number of aircraft are equipped with a wet wing option that will require a modification to PN 4.2003. Please contact Alpha Aviation for a copy of the approved modification.

Referring to Drawing 4.3003, the hole pattern used on the attachment flanges of Parts 4.2003 and 4.2004 is repeated on the "J" channels and mounting face of the assembled parts. Therefore, it is advisable for the installer to fabricate a simple jig to facilitate locating and drilling these many similar holes.

Step-by Step Instructions

1. Remove the cabin sidewall interior finish, aft of each position / directly below each upper attachment point.
2. Holding Part 4.2002 in place, verify that the centerline of Part 4.2004 runs vertically .500 inches forward of the center Belt guide installed earlier. A simple plum bob hung from the center of the Belt Guide will aid this work operation.
3. Referring to Drawing 4.3003, layout the hole pattern on Part 4.2003. Marking each holes location with a permanent marker.

4. Referring to Drawing 4.3009, install the nut plates on Part 4.2004

5. Referring to Drawing 4.3003, place Parts 4.2002 and 4.2004 in position against the interior sidewall. Hold them firmly against the bottom of the "J" channels and clamp them together to establish their relative positions.

6. Remove the assembly from 5, above, and drill out the holes on the mounting surface and the holes required through Part 4.2003 to access the nut plates. Hold the alignment and cleco as you drill.

7. Using a drilling template, drill the mounting flange and "J" channel holes as shown on Drawing 4.3003.

8. On Part 4.2003, layout the rivet pattern as shown on Drawing 4.3003. Drill each hole, #40 drill.

9. Using the hardware provided, install the inertial reel mount as shown on Drawing 4.3003, starting with the bottom flange on Part 4.2004. Next, bolt the top flange on Part 4.2003, followed by the mounting bolts that secure the two parts together.

10. Verify that the two inertial reel mounting holes are clear and that the AN4-6A bolts will engage the nut plates.

11. Working through the landing gear hole, verify that the drain line, which is routed between the cabin exterior wall and inboard wing rib, is clear of the area where the lower attachment of Part 4.2003 will be riveted.

12. Rivet Part 4.2003 to the lower cabin wall by enlarging the # 40 guide holes to # 30 drill size and installing nine (9) CR3213-4-2 Cherry Max Rivets.

Use a drill stop to prevent damage!

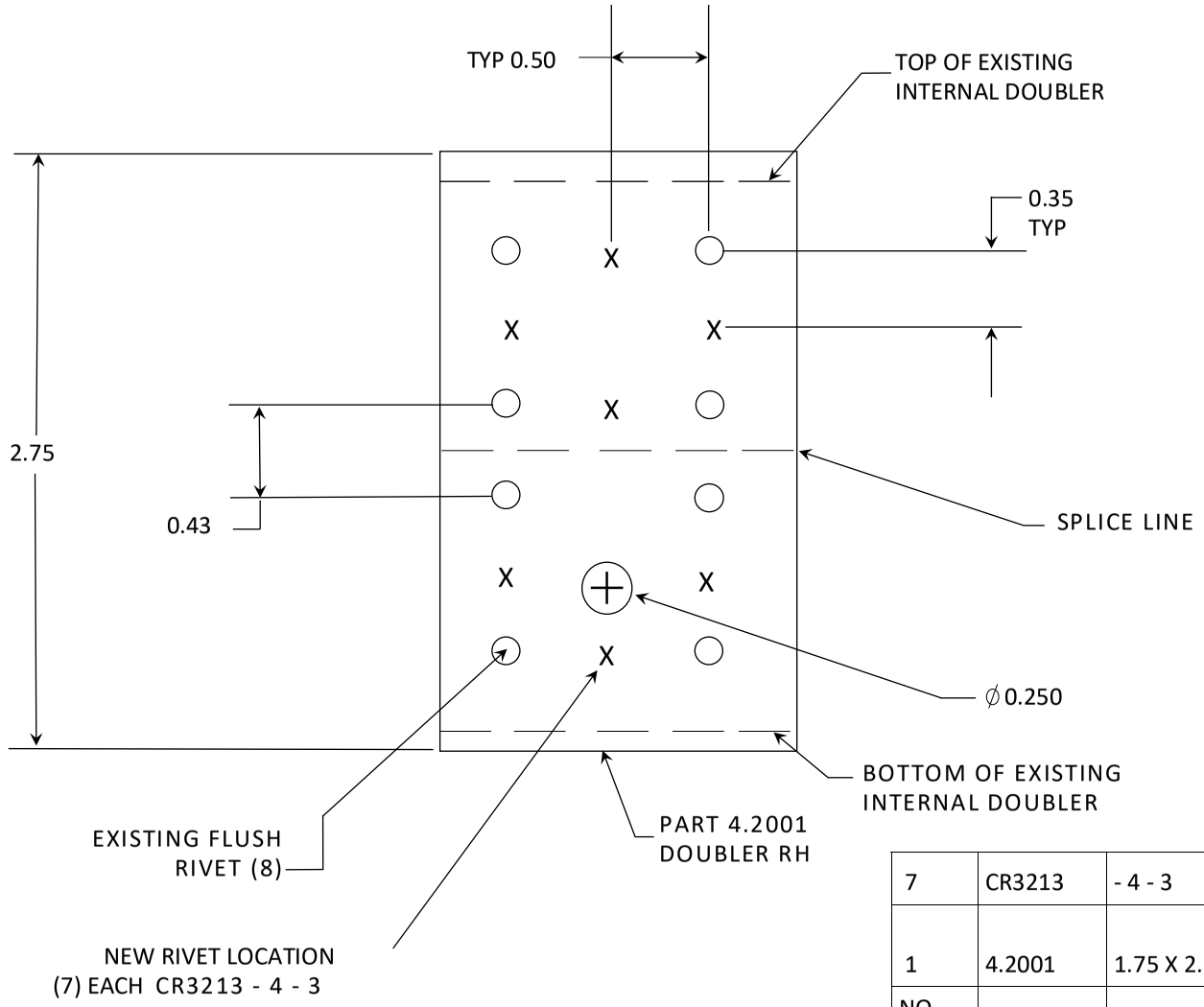
13. Verify the completeness of your installation and reinstall the insulation and interior panel.

14. During the installation of the interior, identify the two nut plate locations and open a .500 inch hole in the side panel at each location.

15. Referring to Drawing 4.3009, install the inertial reel and route the restraint strap up through the Belt Guide and secure using the Velcro provided.

16. Install the inertial reel and belt guide covers, Inspect the installation to insure that it is functioning normally.

NOTE - AIRCRAFT E/W INTERIOR ROYALITE TRIM MAY HAVE
BEEN SPLICED USING UNIVERSAL HEAD RIVETS.
UNIVERSAL HEAD RIVETS THAT FALL UNDER PART 4.2001
REPLACE WITH CHERRY MAX RIVET CR3212-4-2



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MAY 08 2020

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NO STC AUTHORIZATION

NO. REQ.	PART NO.	SIZE	DESCRIPTION	SPEC
7	CR3213	- 4 - 3	RIVET	STANDARD
1	4.2001	1.75 X 2.75	2024 T3 ALCLAD ALUM 0.40	FAA/PMA

REV	DATE	DESCRIPTION
C	6/14/04	ADD NOTE
B	8/20/03	DETAIL CHANGE
A	8/10/03	ISSUE

Alpha Aviation
Burnsville MN.

DOUBLER RH RIVET PLACEMENT

4.3001

REV. C

FIN: SEE NOTE

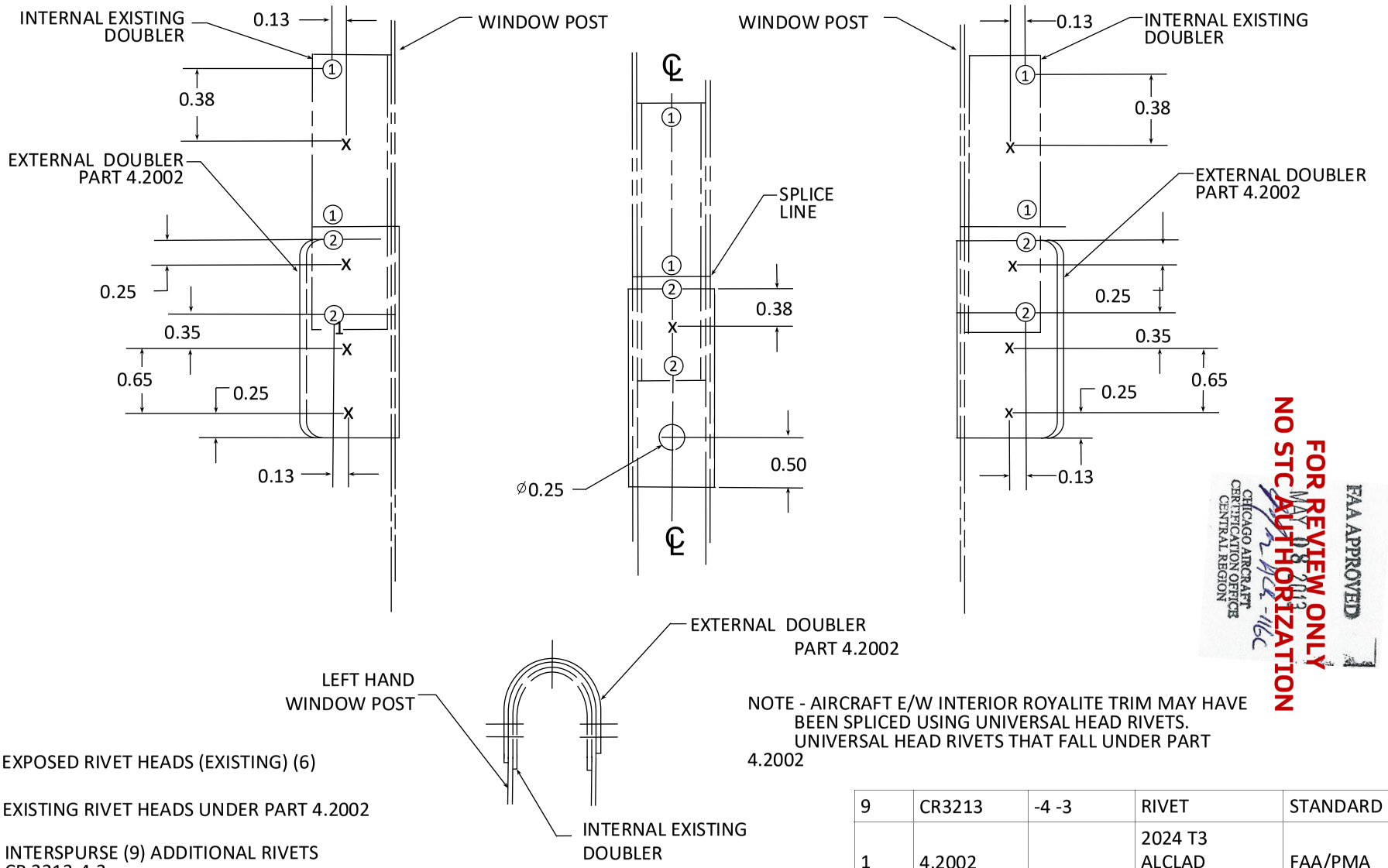
TOL XX+/- .03, XXX+/- .010. OR NOTED

DRAWN MCW 8/10/0

CHK. DCM

APPR. DCM

DRAWING REVISED 4.15.2020 FOR CLARITY ONLY



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CENTRAL REGION

NOTE - AIRCRAFT E/W INTERIOR ROYALITE TRIM MAY HAVE BEEN SPLICED USING UNIVERSAL HEAD RIVETS. UNIVERSAL HEAD RIVETS THAT FALL UNDER PART 4.2002

① EXPOSED RIVET HEADS (EXISTING) (6)

② EXISTING RIVET HEADS UNDER PART 4.2002

X INTERSPURSE (9) ADDITIONAL RIVETS
CR 3213-4-3
STANDARD SPACING

NO. REQ.	PART NO.	SIZE	DESCRIPTION	SPEC
9	CR3213	-4 -3	RIVET	STANDARD
1	4.2002		2024 T3 ALCLAD ALUM. .040	FAA/PMA

REV	DATE	DESCRIPTION
C	6/28/04	ADD NOTES
B	8/20/03	DETAIL CHANGE
A	8/10/03	ISSUE

Alpha Aviation
Burnsville MN.

DOUBLER LH RIVET PLACEMENT

4.3002

REV. C

FIN: N/A

TOL XX+/- .03, XXX+/- .010. OR NOTED

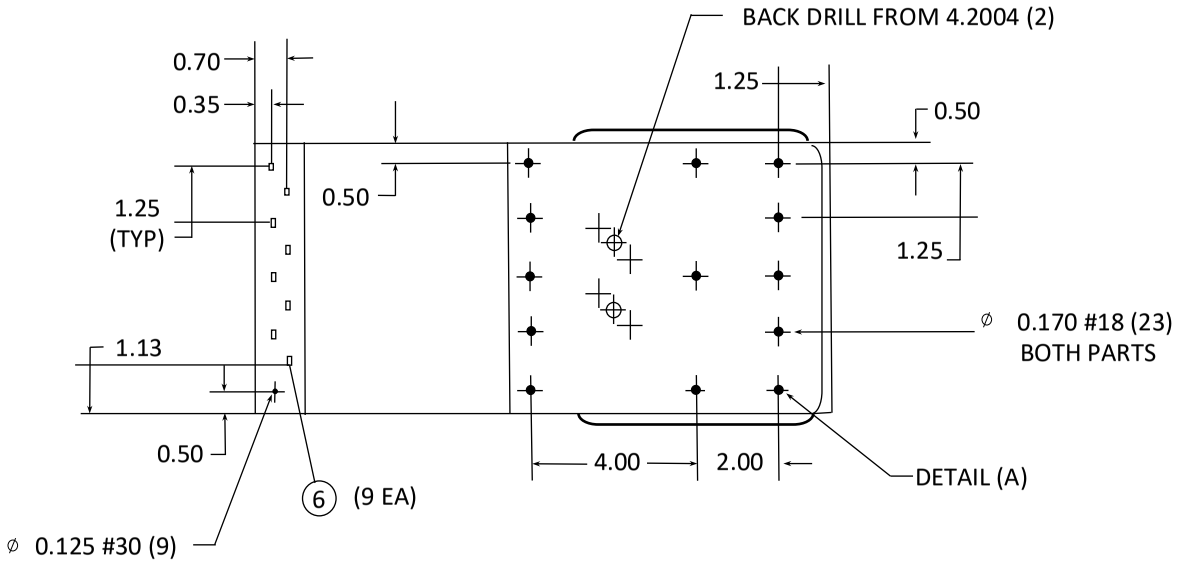
DRAWN MCW 8/10/0

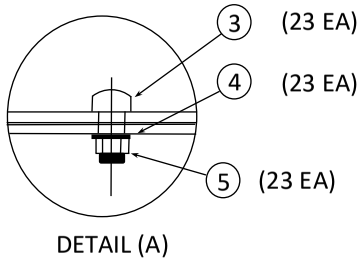
CHK. DCM

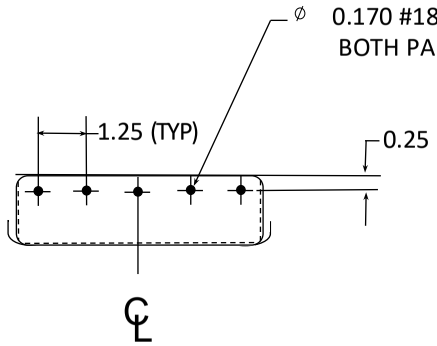
APPR. DCM

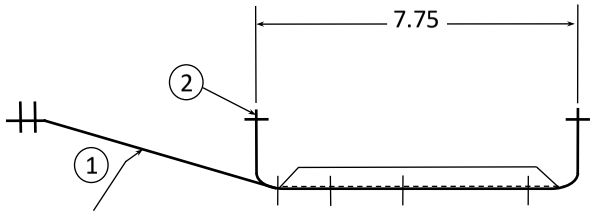
DRAWING REVISED 4.15.2020
FOR CLARITY ONLY

AAI 4.5001 6/28/04 P15









ITEM	NO. REQ.	PART NO.	SIZE	DESCRIPTION	SPEC
6	9	CR3213- 4 - 2		RIVET	STANDARD
5	23	MS21044N08		NUT	STANDARD
4	23	NAS1149FN832P		WASHER	STANDARD
3	23	AN526-832R8		SCREW	STANDARD
2	1	4.2004	-	INERTIAL REEL MOUNT - INNER	FAA/PMA
1	1	4.2003	-	INERTIAL REEL MOUNT - OUTER	FAA/PMA

REV	DATE	DESCRIPTION
C	6/28/04	CHANGE EDGE DISTANCE
B	8/20/03	ADD SPEC
A	8/10/03	ISSUE

Alpha Aviation
Burnsville MN.

INERTIAL REEL MOUNT - DETAIL

4.3003

REV. C

FIN: N/A

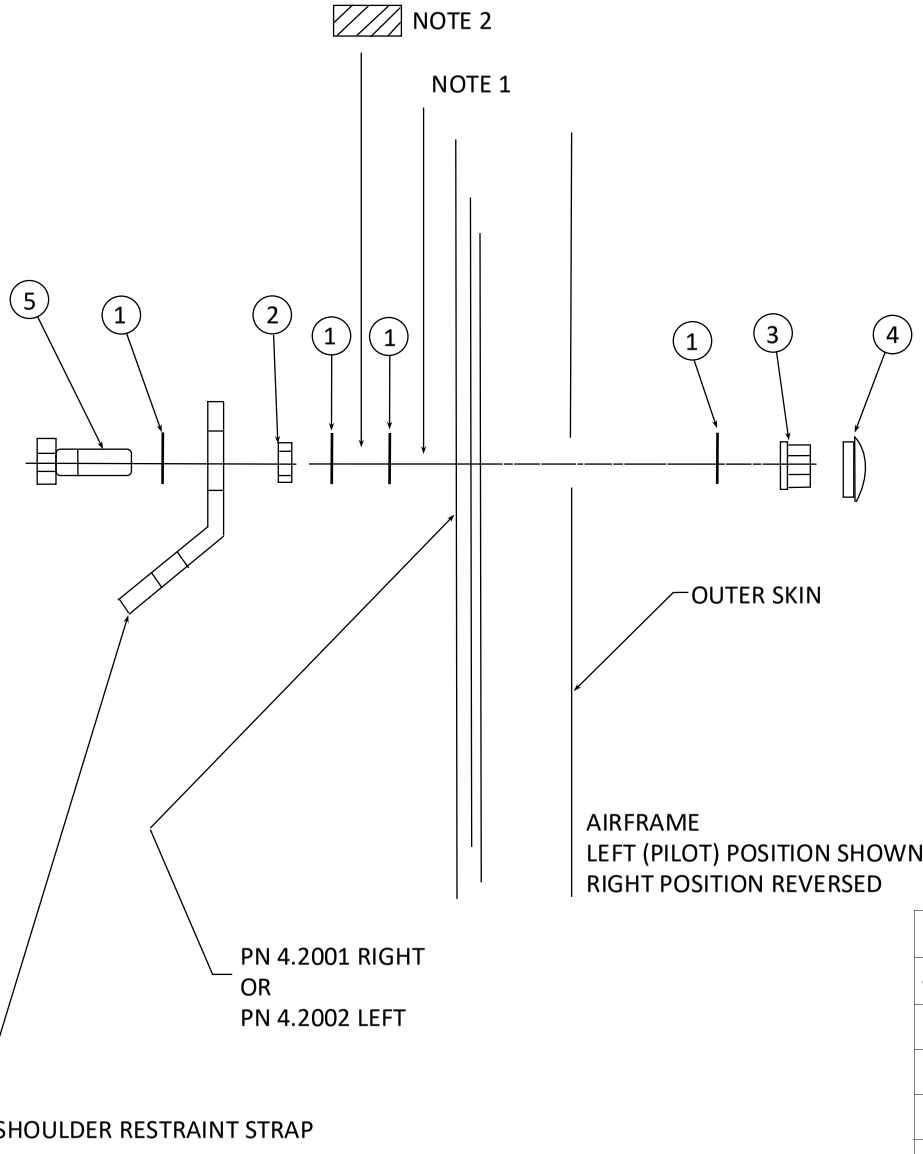
TOL XX+/- .03, XXX+/- .010. OR NOTED

DRAWN MCW 8/10/0

CHK. DCM

APPR. DCM

DRAWING REVISED 4.15.2020 FOR CLARITY ONLY



NOTE 1 - LEFT, E/W INTERIOR ROYALITE TRIM / MAY REQUIRE AN ADDITIONAL AN960-416 WASHER FOR SPACING.

NOTE 2 - RIGHT, E/W INTERIOR ROYALITE TRIM / CHANGE ITEM 6 TO AN4-12A, ADD 1/4" X 1/2" SPACER, PN 4.2600 OR AN/MS/NAS EQUIVALENT.

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NO STC AUTHORIZATION

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MAY 08 2013
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ITEM	NO. REQ.	PART NO.	SIZE	DESCRIPTION	SPEC
5	1	AN4-6A		BOLT	STANDARD
4	1	.500		NYLON CAP	STANDARD
3	1	MS21042-4		NUT	STANDARD
2	1	NAS75-4-004		BUSHING	FAA/PMA
1	4	AN960-416		WASHER	FAA/PMA

DRAWING REVISED 4.15.2020 FOR CLARITY ONLY

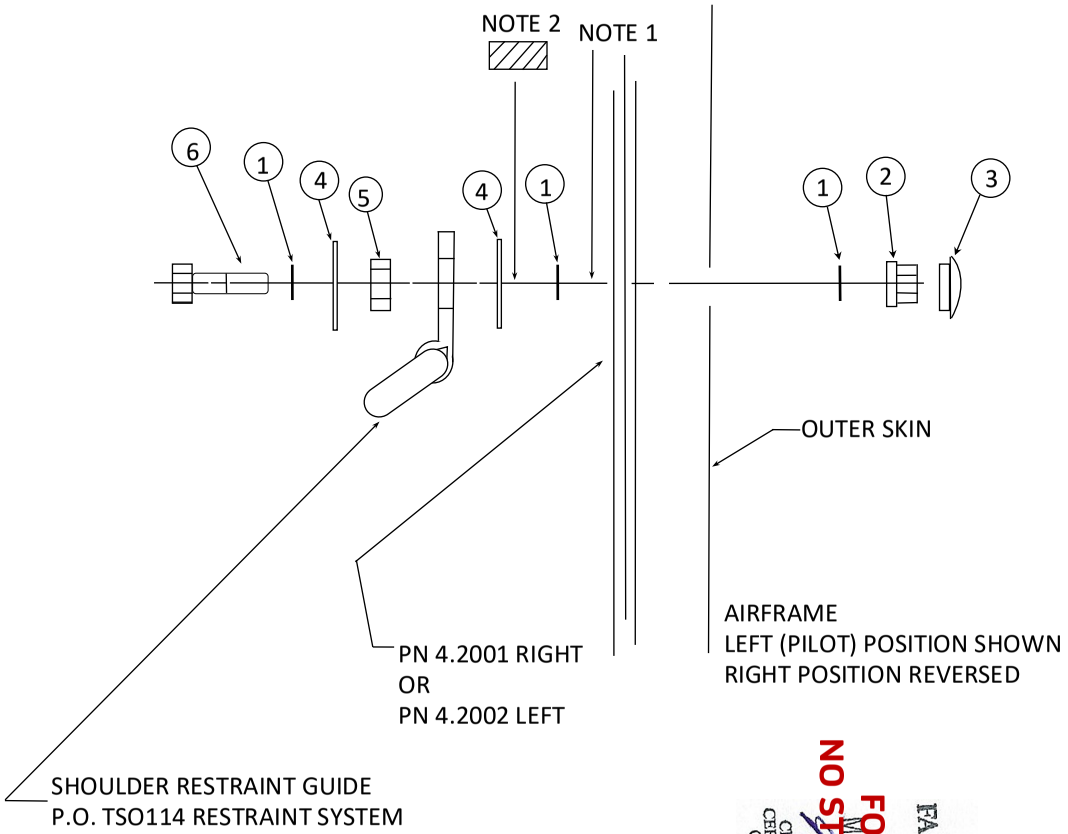
REV	DATE	DESCRIPTION
C	6/28/04	ADD NOTES 1 + 2
B	8/20/03	DETAIL CHANGE
A	8/10/03	ISSUE

Alpha Aviation
Burnsville MN.

RESTRAINT STRAP FIXED | **4.3007** | **REV. C**

FIN: N/A | TOL XX+/- .03, XXX+/- .010. OR NOTED

DRAWN MCW | CHK. DCM | APPR. DCM



NOTE 1 - LEFT, E/W INTERIOR ROYALITE TRIM / MAY REQUIRE AN ADDITIONAL AN960-416 WASHER FOR SPACING.

NOTE 2 - RIGHT, E/W INTERIOR ROYALITE TRIM / CHANGE ITEM 6 TO AN4-13A, ADD 1/4" X 1/2" SPACER, PN 4.2006 OR AN/MS/NAS EQUIVALENT.

NOTE 3 - HARDWARE ITEM 4; UPSIZE THE THROUGH HOLE TO 2.65, 17/64" DRILL SIZE TO ACCOMMODTATE THE AN4 BOLT.

FOR REVIEW ONLY
NO SEC AUTHORIZATION

FAA APPROVED
CHICAGO AIRCRAFT CERTIFICATION OFFICE
CENTRAL REGION
MAY 08 2013

ITEM	NO. REQ.	PART NO.	SIZE	DESCRIPTION	SPEC
6	1	AN4-7A		BOLT	STANDARD
5	1	4.2005		BUSHING	FAA/PMA
4	2	AN970-3	or AAI-12303	WASHER	STANDARD
3	1	.500		NYLON CAP	STANDARD
2	1	MS21042-4		NUT	STANDARD
1	3	AN960-416		WASHER	STANDARD

REV	DATE	DESCRIPTION
D	4/15/13	ADD NOTE 3
C	6/28/04	ADD NOTES 1 + 2
B	8/20/03	ADD SPEC
A	8/10/03	ISSUE

Alpha Aviation
Burnsville MN.

RESTRAINT BELT GUIDE

4.3008

REV. D

FIN: N/A

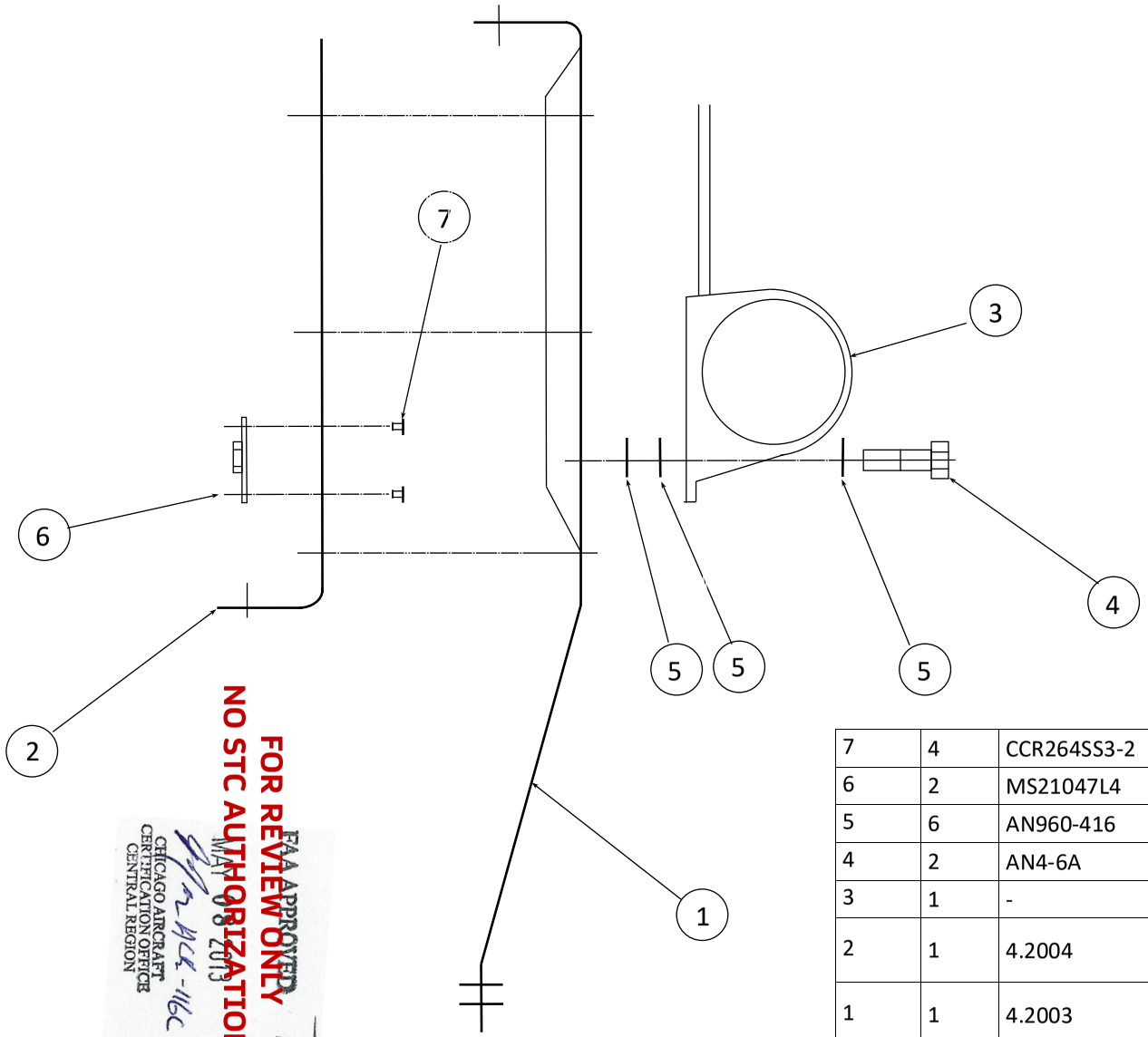
TOL XX+/- .03, XXX+/- .010. OR NOTED

DRAWN MCW

CHK. DCM

APPR. DCM

DRAWING REVISED 4.15.2020 FOR CLARITY ONLY



FOR REVIEW ONLY
NO STC AUTHORIZATION

FAA APPROVED
MAY 08 2013
CHICAGO AIRCRAFT CERTIFICATION OFFICE
CENTRAL REGION

ITEM	NO. REQ.	PART NO.	SIZE	DESCRIPTION	SPEC
7	4	CCR264SS3-2		RIVET	STANDARD
6	2	MS21047L4		NUT PLATE	STANDARD
5	6	AN960-416		WASHER	STANDARD
4	2	AN4-6A		BOLT	STANDARD
3	1	-		INERTIAL REEL	TSO 114
2	1	4.2004		INERTIAL REEL MOUNT - INNER	FAA/PMA
1	1	4.2003		INERTIAL REEL MOUNT - OUTER	FAA/PMA

REV	DATE	DESCRIPTION
B	8/20/03	ADD SPEC
A	8/10/03	ISSUE

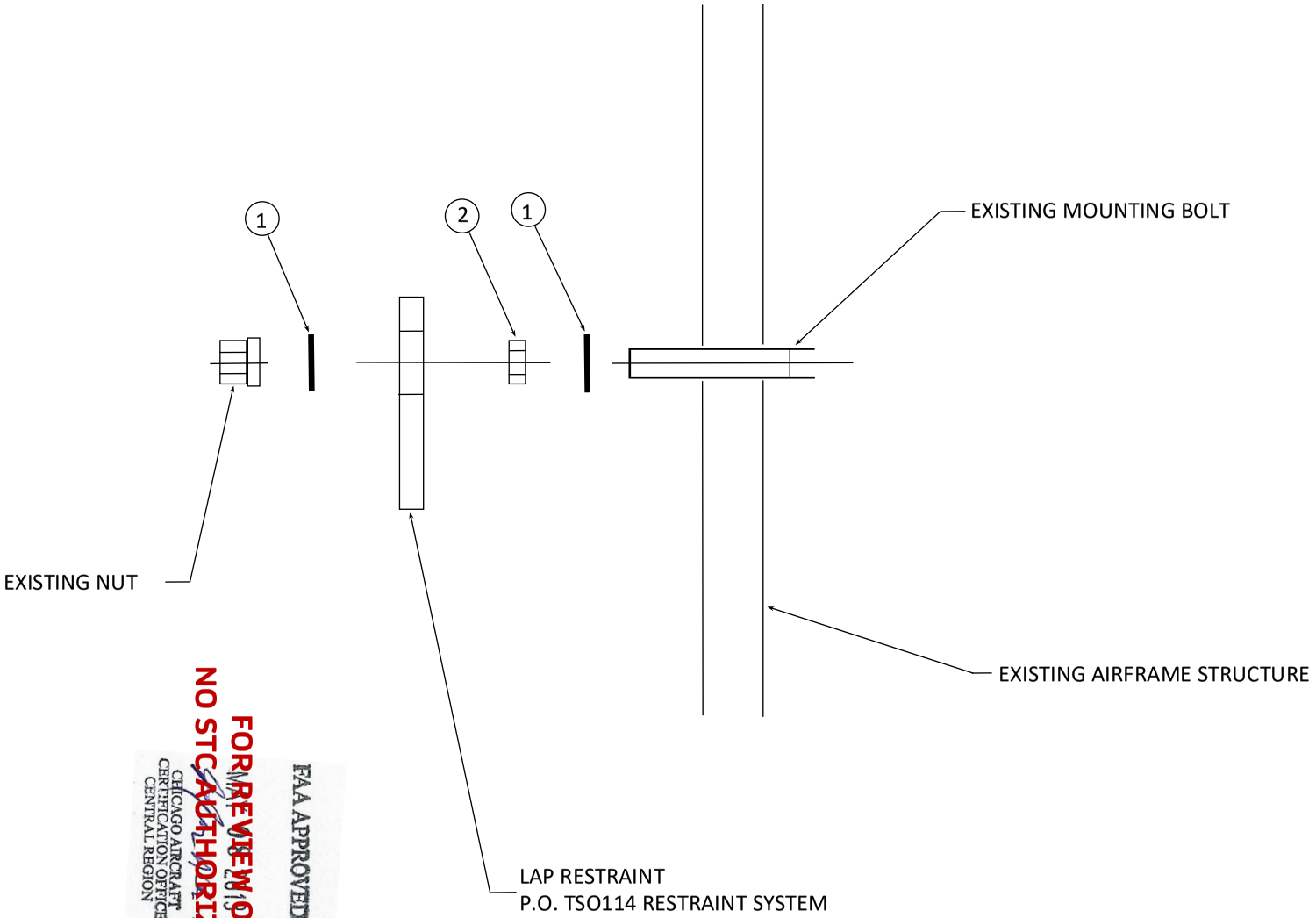
Alpha Aviation
Burnsville MN.

INERTIAL REEL DETAIL | **4.3009** | **REV. B**

FIN: N/A | TOL XX+/- .03, XXX+/- .010. OR NOTED

DRAWN MCW | CHK. DCM | APPR. DCM

DRAWING REVISED 4.15.2020 FOR CLARITY ONLY



FAA APPROVED
CHICAGO AIRCRAFT CERTIFICATION OFFICE CENTRAL REGION

FOR REVIEW ONLY
NO STC AUTHORIZATION

ITEM	NO. REQ.	PART NO.	SIZE	DESCRIPTION	SPEC
2	1	NAS75-4-004	0.250	BUSHING	STANDARD
1	2	AN960-416	0.250	WASHER	STANDARD

REV	DATE	DESCRIPTION
B	8/20/03	ADD SPEC
A	8/10/03	ISSUE

Alpha Aviation
Burnsville MN.

RESTRAINT LAP BELT

4.3010

REV. B

FIN: N/A

TOL XX+/- .03, XXX+/- .010. OR NOTED

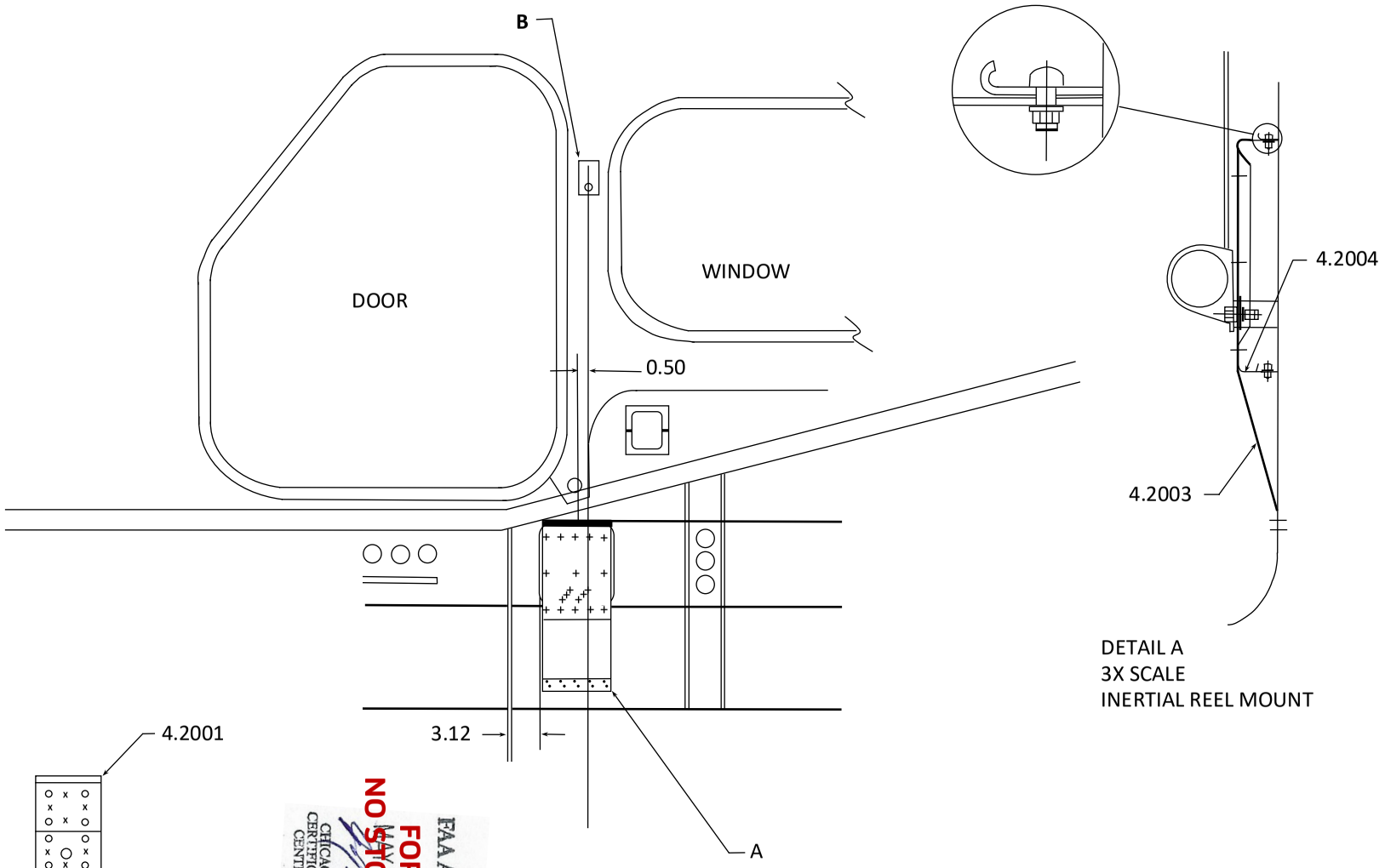
DRAWN MCW

CHK. DCM

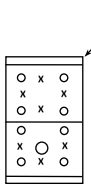
APPR. DCM

DRAWING REVISED 4.15.2020 FOR CLARITY ONLY

AAI 4.5001 6/28/04 P20



DETAIL A
3X SCALE
INERTIAL REEL MOUNT



DETAIL B
4X SCALE
CABIN CAP SPLICE

DRAWING REVISED 4.15.2020 FOR CLARITY ONLY

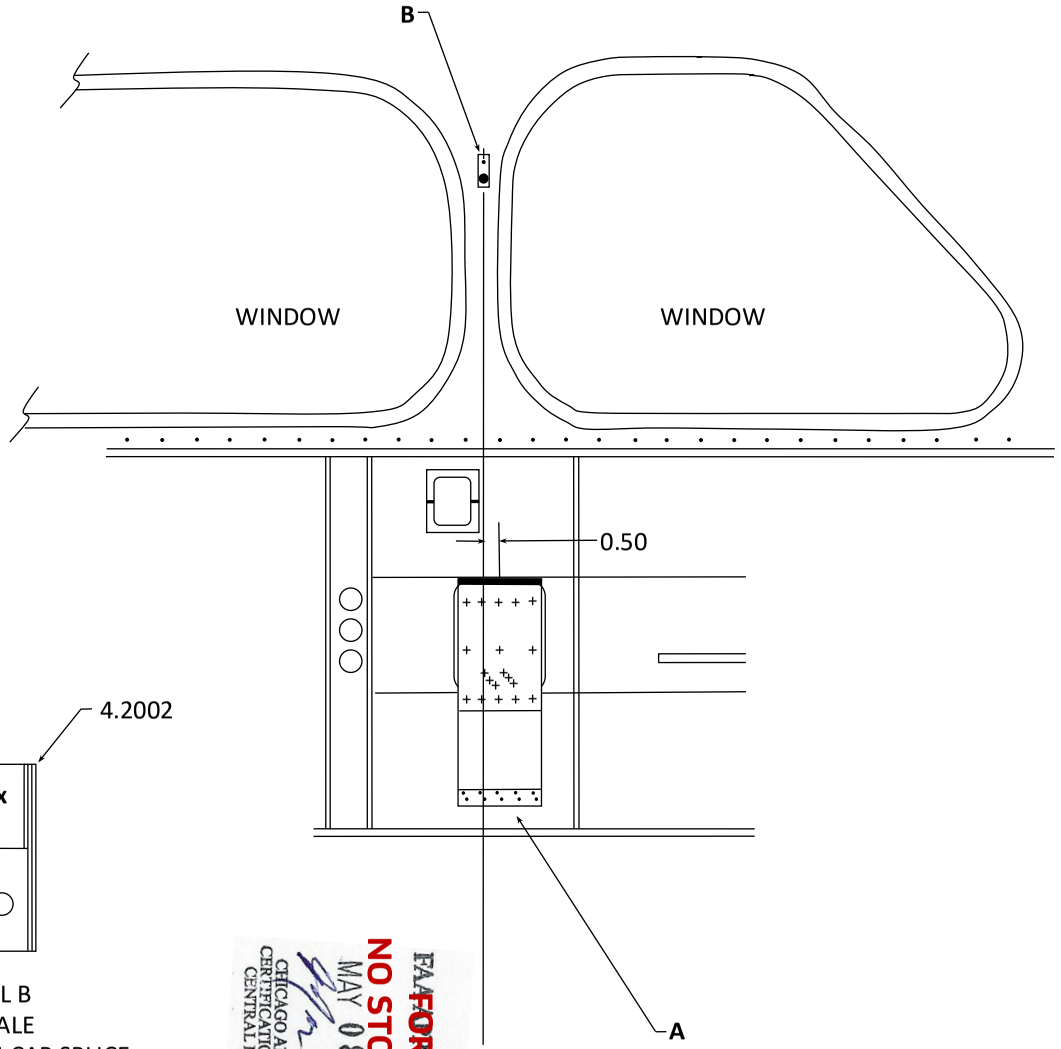
ITEM	NO. REQ	PART NO.	SIZE	DESCRIPTION	SPEC.
Alpha Aviation Burnsville MN.		**INTERTIAL REEL MOUNT RIGHT SIDE**		**4.3011**	**REV. A**

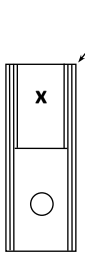
REV	DATE	DESCRIPTION	DRAWN	CHK.	APPR.
A	8/10/03	ISSUE	MCW	DCM	DCM

FIN: N/A

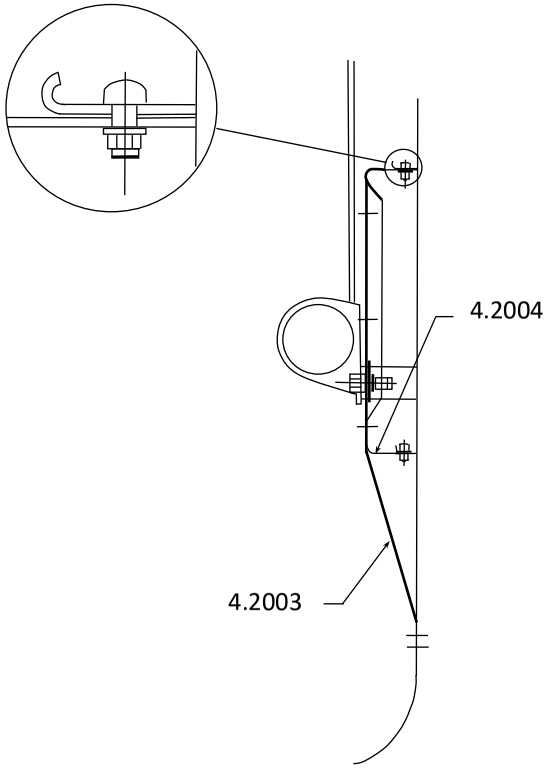
TOL XX+/- .03, XXX+/- .010. OR NOTED

AAI 4.5001 6/28/04 P21





DETAIL B
4X SCALE
CABIN CAP SPLICE



DETAIL A
3X SCALE
INERTIAL REEL MOUNT

DRAWING REVISED 4.15.2020 FOR CLARITY ONLY

AAI 4.5001 6/28/04 P22

NO. REQ.	PART NO.	SIZE	DESCRIPTION	SPEC.
Alpha Aviation Burnsville MN.		**INTERTIAL REEL MOUNT LEFT SIDE**	**4.3012**	**REV. A**

A	8/10/03	ISSUE	FIN: N/A	TOL XX+/- .03, XXX+/- .010. OR NOTED	
REV	DATE	DESCRIPTION	DRAWN MCW 8/10/0	CHK. DCM	APPR. DCM

FAA APPROVED MODEL LIST (AML) NO. SA01880CH
ALPHA AVIATION INC.
FOR
INSTALLING THREE POINT TORSO RESTRAINT SYSTEM

ISSUE DATE: 9/5/03

ITEM	AIRCRAFT MAKE	AIRCRAFT MODEL	ORIGINAL TYPE CERTIFICATE NUMBER	CERTIFICATION BASIS FOR ALTERATION	INSTALLATION INSTRUCTIONS		AFM SUPPLEMENT NUMBER/DATE	AML AMENDMENT DATE
					NUMBER	REVISION NO. & DATE		
1	Raytheon Aircraft Company (Beech)	35, A35, B35, C35, D35, E35, F35, G35, 35R	A-777	CAR 03	Installation and Maintenance Manual, AAI 4.5001	Revised 8/20/03*	N/A	12/20/16
2	Raytheon Aircraft Company (Beech)	35-33, 35-A33, 35-B33, 35-C33, 35-C33A, E33, E33A, E33C, F33, F33A, F33C, G33, H35, J35, K35, M35, N35, P35, S35, V35, V35A, V35B, 36, A36	3A15	CAR 3	Installation and Maintenance Manual, AAI 4.5001	Revised 6/28/04*	N/A	12/20/16
3	Raytheon Aircraft Company (Beech)	B95A, D95A, E95, 95-55, 95-A55, 95-B55, 95-B55A, 95-B55B, 95-C55, 95-C55A, D55, D55A, E55, E55A, 95, B95, A56TC, 58, 58A	3A16	CAR 3	Installation and Maintenance Manual, AAI 4.5001	Revised 6/28/04*	N/A	12/20/16

* or latter FAA Approved Revisions.

FAA APPROVED: _____

for Karol Mordasiewicz
Manager, Airframe & Administrative Branch
Chicago Aircraft Certification Office

Reissued: 12/20/16

Amended: 8/9/04

NOTES, ADDENDUMS & PHOTOS

Inertial Reel Mount - Early 35-33 Aircraft *(per page 11)*

Model 35-33 Debonair Not Equipped without Passenger Egress Windows

Window/Door Post Mounted Inertial Reel Using 3RS-114FS

Wet Wing Tip Fuel System Installation

FAA Minor Change Acknowledgements:

"or Equivalent FAA Approved Restraint System"

Window/Door Post Mounted Inertial Reel

Installation Photos

Per: Page 11

Beechcraft Model 35-33 Aircraft

Inertial Reel Mount - Early 35-33 Aircraft

A number of 35-33 aircraft incorporated a hammock style rear seat assembly which utilized a horizontal support beam on each sidewall. Aircraft so equipped will require the trimming of the side flanges, PN 4.2003. The side flanges are removed in the area of the horizontal beam to allow the assembled mount to lie flat against the inboard surface of the beam.

The assembled mount is then directly attached to the beam by moving the top row of 5 ea AN526 bolts down an additional .75" and substituting 8 ea CR 3213-4-3 Cherry Max Rivets (#30 Drill) for the AN526 bolts in rows 1 and 2.

The 5 ea, AN526 bolt attachments along the upper longeron are omitted, the unused upper flange may be removed.

Beechcraft Model 35-33 Aircraft

Debonair aircraft not equipped with passenger egress windows will require that the location of the right side exterior access hole be determined by measuring .50” aft from the forward edge of the passenger side window overlay panel.

INSTALLATION OF AN INERTIAL REEL ON THE WINDOW/DOOR POST USING THE FIXED STC KIT

RIGHT UPPER ATTACHMENT POINT

The Right Upper Attachment Point is created by the installation of an aluminum doubler on the interior side of the cabin door post at fuselage station 106.00

When installed the doubler reinforces the door post and provides the hard point required for the installation of the upper torso restraint strap

The installation of the doubler is accomplished through the addition of seven (7) nominal Cherry Max rivets interspersed amount the eight (8) existing flush rivets per the Fixed Strap Kit Instructions.

Left Upper Attachment
PN 4.2001

Right Upper Attachment
PN 4.2002

LEFT UPPER ATTACHMENT POINT

The Left Upper Attachment Point is created by the installation of an aluminum doubler that is installed on the interior side of the window post at fuselage station 106.00

When installed the doubler reinforces the window post and provides the hard point required for the installation of the upper torso restraint strap

Alpha aviation, inc.

Gregory J. Koenig

Digitally signed by Gregory J. Koenig
Date: 2021.04.02 10:02:28 -05'00'

1-800-653-5112 Fax 1-952-856-5158

1500 East Main Street
Owatonna, Minnesota 55060

Alpha Aviation Inc.
1500 East Main St,
Owatonna, MN 55060-3188

Federal Aviation Administration
Chicago Aircraft Certification Office
% Gregory Koenig, ACO Engineer
2300 East Devon Avenue
Des Plaines, Illinois 60018

Re: STC SA01880CH Beechcraft Torso Restraint Installation March 29, 2021

Mr. Koenig –

With this letter we are requesting a minor change approval for STC SA01880CH; adding an inertial reel option to accommodate customers requesting post mounted inertial reels and in recognition of enhanced belt systems currently in development.

We believe this change to be minor in nature.

DISCUSSION

Commonality

The post mounting installation remains unchanged.

The post mounting hardware configuration remains unchanged; and is identical when used with an inertial reel or a fixed strap installation.

Both Restraint assemblies meet TSO-C114

From an attachment and loading perspective both the fixed strap & inertial reel assemblies are Identical

Differences

Fixed Strap (Manually Adjustable) Restraint -vs- Inertial Reel Equipped Restraint

Option 1. Existing; Post mounted Fixed Strap Restraint 3021-8-xx1-xxxx, TSO-C114; unchanged.

Option 2. Adding; Post mounted inertial Reel Equipped Restraint PN 3052-3-xx1-xxxx, TSO-C114.

Documentation

STC Document	No change required
Approved Models	No change required
Parts List	The addition of Option 2; PN 3052-3-xx1-xxxx, TSO-C114 Inertial Reel Restraint Assembly. **This addition will be reflected in installation manual AAI 4.5001, Page 13 Required Installation Parts, dated 3/25/2021**
Master Drawing List	No Change Required

Structural Substantiation

Initial certification included fully proof testing both attachment methods with a post mounted fixed strap configuration and a post mounted inertial reel load test. This was witnessed by Larry G. Nelson, FAA/DER. A signed copy of his affidavit with regards to STC SA01880CH should be in the FAA archives.

We trust that this information adequately supports our request and that your approval will be forthcoming.

Sincerely;

Paula A. Deml Vice-President
952-210-8822 paula@alphaaviation.com

Attachments;

FAA approved test procedure, specifically we draw your attention to tests 2 & 3

2 photos from the pull test

AAI 4.5001, Page 13; Required Installation Parts dated 3/25/2021

September 14, 2006

ADDENDUM NUMBER 2
STC SA01880CH

INSTALLATION INSTRUCTIONS

58 – 58A Aircraft

MODEL 3RS-114IR
Mount, Inertial Reel

Discussion;

These instructions cover the installation of Part 4.2003 and Part 4.2004, which combine to form a 2024T3- .040 aluminum mounting plate, on which the inertial reel is mounted.

Parts 4.2003 and 4.2004 are sidewall mounted by attachment to the two lower horizontal "J" channels and fastening to the cabin skin just above the lower cabin chine.

The left and right side installations of Parts 4.2003 and 4.2004 are similar, with the only exceptions being the proximity of the door frame brace on the right side installation and the temporary relocation of the static line during the left side installation.

The layout of the attachment holes, both right and left, are identical and can be done simultaneously.

Additional Installation Data:

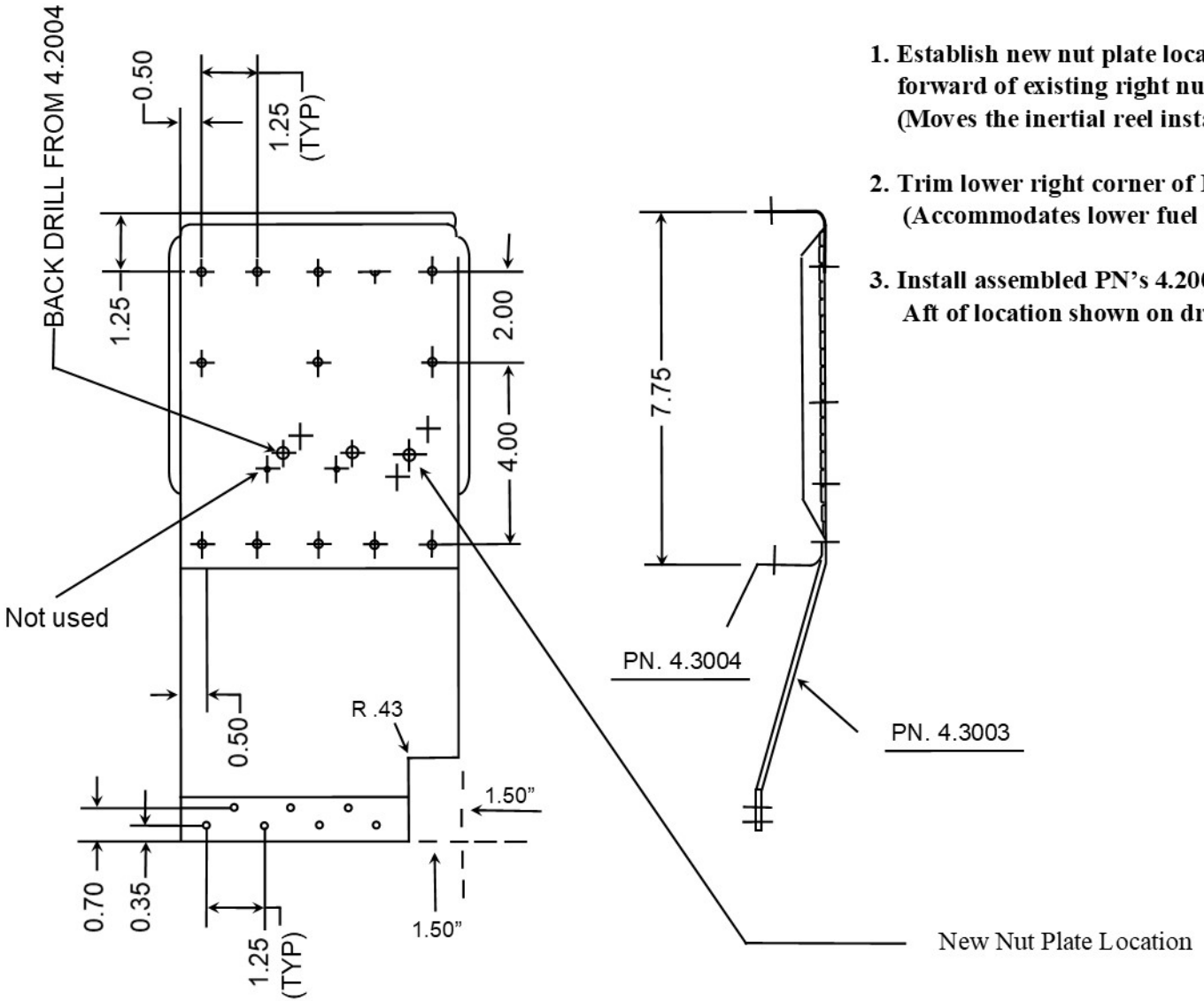
A small number of early production 58 and 58A aircraft incorporated an optional wet wing tip fuel system installation.

Aircraft so equipped will require the relocation of the assembled inertial reel bracket, PN's 4.2003 and 4.2004, 1.50 inches aft to accommodate the upper fuel cross feed line.

Relocation of the inertial reel on the assembled mount 1.50 inches forward.

Trimming of the PN 4.2003, lower attachment surface to accommodate the lower fuel cross feed line.

Details of these changes are shown on the attached Addendum #2 drawing.



1. **Establish new nut plate location 1.50 inches forward of existing right nut plate location. (Moves the inertial reel installation 1.5 inches forward.)**

2. **Trim lower right corner of PN 4.2003 as shown. (Accommodates lower fuel cross feed line.)**

3. **Install assembled PN's 4.2003 and 4.2004 1.50 inches Aft of location shown on drawings AAI 4.3011 and 4.3012**

Left Side Installation Shown - Right Side Reversed

FAA APPROVED
OCT 03 2006
CHICAGO AIRCRAFT CERTIFICATION OFFICE CENTRAL REGION
ACE-116C

FOR REVIEW ONLY
NO STC AUTHORIZATION

Drawing Re-Traced for Clarity Only 10.26.2021

U.S. Department
of Transportation
**Federal Aviation
Administration**

Small Airplane Directorate
Chicago Aircraft Certification Office
2300 E. Devon Avenue
Des Plaines, IL. 60018

October 3, 2006

Mr. Donald C. McDonald
Alpha Aviation Inc.
1505 Chateaulin Lane
Burnsville, MN 55337

Dear Mr. McDonald:

This is in response to your letter of July 7, 2005, transmitting changes to the data associated with your Supplemental Type Certificate (STC) SA01880CH. We have reviewed these changes and have found them to be acceptable. Therefore, no further tests or investigations are deemed necessary. As evidence of this, we have enclosed a copy of Addendum Number 2 to the Installation Instructions for STC SA01880CH, dated September 14, 2006, stamped to indicate our approval.

The approved data should be retained on file at your facility, as indicated by 14 Code of Federal Regulations (CFR) Section 21.303(h)(6), and made available upon request to FAA representatives during visits to your facilities or for submittal to this office should it be necessary in the future.

Design changes to these parts should be submitted to the FAA at regular intervals. If there are minor changes (reference 14 CFR 21.93, 21.95 and 21.97) to the design data, they should be submitted every six months, and accompanied by one copy of the top assembly drawings, explanation of minor changes, and the change in aircraft eligibility, if affected. Major changes should be handled in the same manner but should be submitted and FAA Approved before production.

Please be aware of your responsibilities under the requirements of 14 CFR 21.3, regarding the reporting of any failure, malfunction, or defect in any article manufactured under this approval.

If you have any questions, please contact me at (847) 294-7135.

Sincerely,

Gregory J. Michalik
Senior Aerospace Engineer
Airframe & Administrative Branch
Chicago Aircraft Certification Office

Enclosure

Donald C. McDonald
Alpha Aviation Inc.
1500 East Main Street
Owatonna, MN 55060

Control number
19-DOC-20480

AO SECY FILES MISO

October 30, 2019

NOV 5 2019

Federal Aviation Administration
Chicago Aircraft Certification Office
% Shawn Malekpour, Engineer ACO
2300 East Devon Avenue
Des Plaines, Illinois 60018

Federal Aviation Administration
Chicago ACO Branch
Acknowledgement of Minor Design Change
Shawn Malekpour

Re: STC SA01880CH Minor change request. (Beechcraft 35,36,55,58 Series)

Dear Mr. Malekpour

STC SA01880CH approves the installation of upper torso restraint hard points and TSO C114 approved Torso Restraint Systems at both pilot positions of certain Textron (Beechcraft) aircraft. The STC was approved in 2003 and has been and widely applied.

This Minor Change request seeks to modify the currently approved Installation and Maintenance Manual at page 13; "Required Installation Parts Listing" to allow the use of an "Equivalent FAA Approved Restraint System" as an option.

Enclosed, please find 3 revised copies of the cover page - Installation and Maintenance Manual (AAI 4.5001) dated 10/30/2019 and Page 13 dated 10/30/2019 for your approval.

Note: The installation manual AAI-4.5001 is a standalone document and these changes will not affect the Master Drawing List or other documents.

Upon your approval, I would appreciate a stamped and initialed copy either via USPS or scanned and emailed.

I trust this effort meets with your approval and we have provided all items required for your approval.

If questions arise, please feel to contact me at any time.

Sincerely; Donald C. McDonald

Donald C. McDonald President

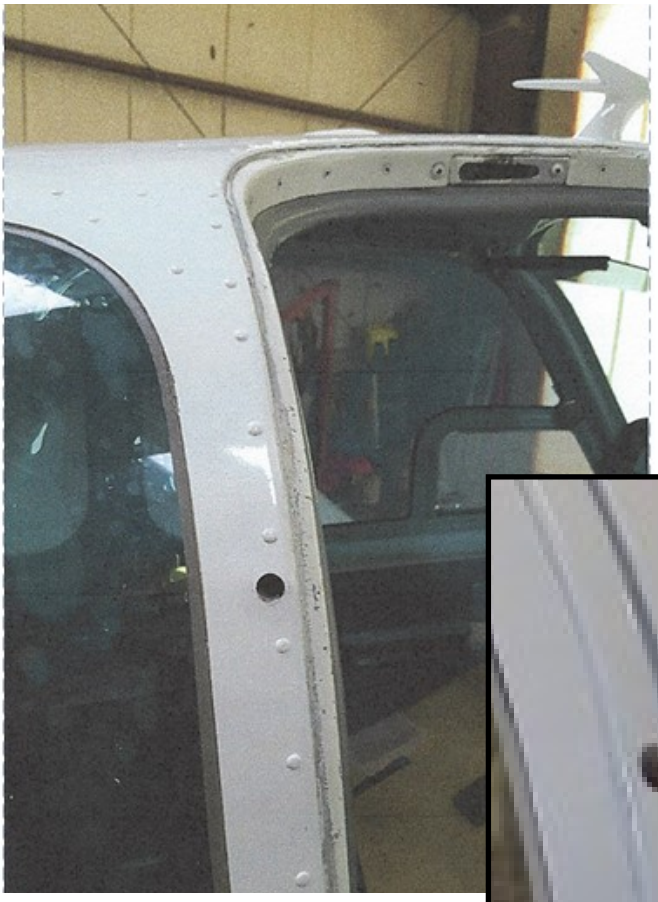
don@alphaaviation.com
952-210-1915

Attachments (3ea)
Installation and Maintenance Manual AAI-4.5001, dated 10/30/2019, Cover Page.
Installation and Maintenance Manual AAI-4.5001, dated 10/30/2019, page 13.

Photo Gallery

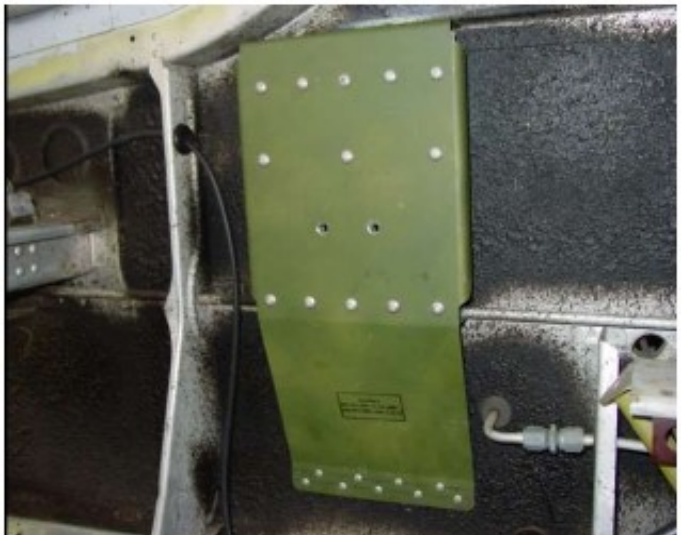
Left Upper Attachment

Right Upper Attachment

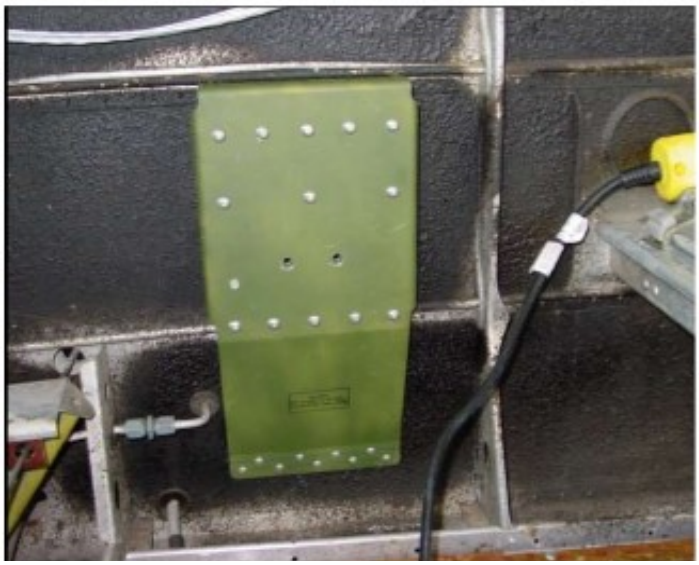


Black Nylon Plug Inserted - White Plug Also Included w/STC Kit

Fixed Strap End Fitting or Inertial Reel D-Ring Attachment Point



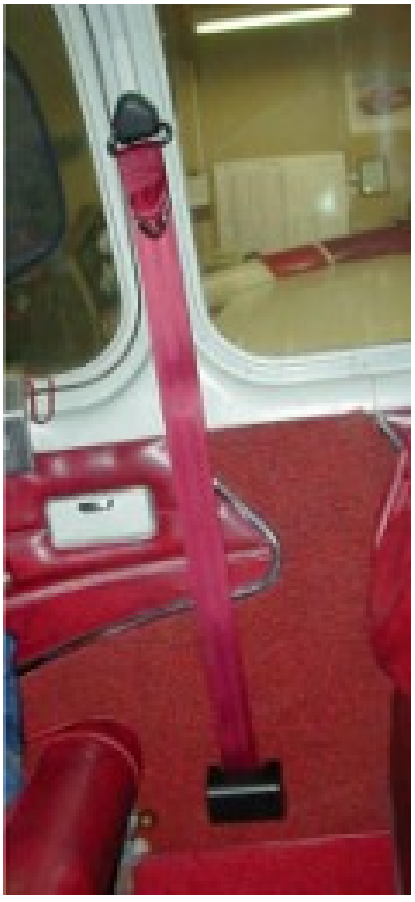
Beech Right Inertial Reel Mount



Beech Left Inertial Reel Mount

Right Inertial Reel Mount

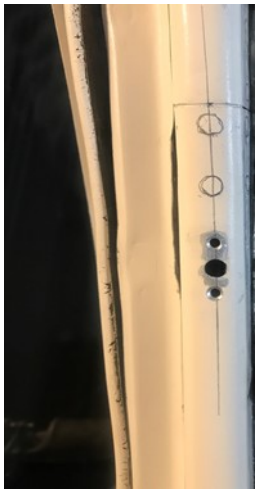
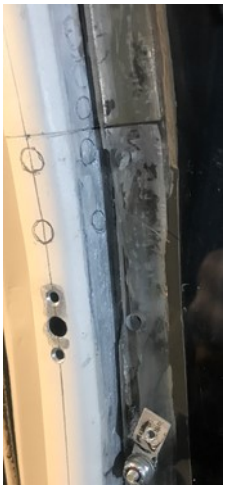
K35



B55 - IR on Door Post

PILOT SIDE

Photos Courtesy of E. Loskill






PILOT-SIDE Continued

Photos Courtesy of E. Loskill

CO-PILOT SIDE ➡

CO-PILOT SIDE

Photos Courtesy of E. Loskill

Mr Loskill came up with a great idea; Grind down a wrench so it will fit into the 1/2" exterior hole, and heat/bend it to an angle.

This allowed him to hold the nut/washer/get the nut started & hold the nut while he torqued the bolt. in order to hold on to the washer/nut he used use sticky tape!

Per E. L - That hole looks bigger than it really is.