

4.5 Installation and Maintenance Manual

INSTALLATION and MAINTENANCE MANUAL NUMBER C1004001

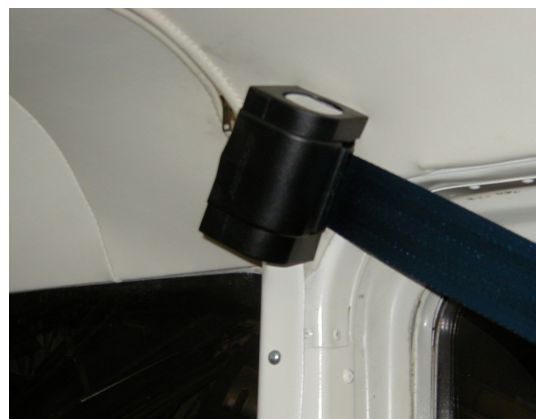
FAA/STC SA02211CH EASA/STC 10070260

CESSNA 100 Series Aircraft Three Point Torso Restraint System Installations

Cessna 170, 172, 175, 180, 182, 185
Per Approved Model List

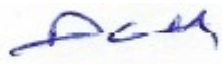


Model C100-114FS



Model C100-114IR

**Alpha Aviation Inc.
1500 East Main Street
Owatonna, Minnesota 55060
800-653- 5112**

Revision	Date	Change	Approved
A	10/10/2005	Initial Issuance	-
B	11/07/2005	Drawing Change C1003003	-
C	5/15/2006	Add Models 182E thru 182P	-
D	2/12/2017	Address Change	
E	11/01/2019	Add at page 12; TSO ITEMS – Or “Equivalent FAA Approved Restraint System”	

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

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1.0 Model Designations

Model Number	Product Description
C100-114FS	Three-point restraint system, TSO-C114, Fixed torso strap
C100-114IR	Three-point restraint system, TSO-C114, Inertial reel torso strap

2.0 Product Description

Model C100-114FS

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 strap 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 of the fixed end of the torso restraint strap is accomplished by the installation of a MS21075-4N nut plate to the existing cabin structure at fuselage station 65.33, as called out in the drawing package.

Model C100-114IR

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 equipped with an inertial reel assembly, which 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 strap at the buckle location and is self adjusting through the inertial reel.

The attachment points for the pelvic restraint strap (lap belt) are continued in use, as the manufacturer provided them, 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.

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The attachment of the fixed end of the torso restraint strap is accomplished by the installation of a MS21075-4N nut plate to the existing cabin structure at fuselage station 65.33, as called out in the drawing package.

3.0 Airframe Qualification

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.

Inspect the aircraft and its records to assure that any change in structure or window installation does not preclude the installation of the Model C100-114FS or Model C100-114IR restraint system.

4.0 Weight and Balance

Model C100-114FS has a location of station 65.33 and a net weight change of 1.75 pounds per installation; two pilot positions.

Model C100-114IR has a location of station 65.33 and a net weight change of 3.50 pounds per installation; two pilot positions.

5.0 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 the installation manual C1004001 is FAA 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 appropriate “Instructions for Continued Airworthiness” (ICA)) in the aircraft maintenance records.

Make the appropriate maintenance entries in the aircraft log book.

Prepare and submit FAA Form 337.

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6.0 Instruction For Continued Airworthiness (ICA)

Instructions for Continued Airworthiness

Dated 10/10/2005

Models; C100-114FS / C100-114IR 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 by FAA approval for the installation of a TSO-C114 occupant restraint system, which consists of a lap belt arrangement and single diagonal shoulder strap. The shoulder strap is controlled by a cinch strap or inertial reel. One restraint system is installed at each pilot position.
3. Operation;
The occupant restraint system operates normally in all respects. The lap belt portion is connected via a lift lever buckle. The strap is shortened or lengthened by the use of the adjuster, which is integral with the connector half of the buckle assembly .

The shoulder strap originates at the sidewall upper attach point and is available to the pilot over the shoulder. It is connected to the lap belt portion of the system by adjusting the length and attaching the shoulder belt to the lap belt connector half.
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 operational 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".
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.

End

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7.0

Dated; 5/15/2006

INSTALLATION INSTRUCTIONS

UPPER MOUNT POINT

**Cessna 100 Series Aircraft, Models 170, 172, 175, 180, 182, 185
Per Approved Model List**

These instructions cover the installation of Part Number MS21075-4N, which creates a torso restraint upper mount centered at fuselage station 65.33, adjacent to each pilot position.

The upper mount installation is accomplished by reference to Drawings C1003001 and C1003002.1 / C1003002.2. The attachment of the TSO-C114 restraint system is accomplished by reference to Drawing C1003003.

Except as noted below, the right and left side upper attach point installations are identical.

Step-by-Step Instructions:

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

1. By reference to Drawing C1003001, locate fuselage station 65.33 on the right and left side of the fuselage. The vertical location is above and horizontally aft of the passenger door opening.
2. Remove the interior trim and open the headliner to the extent necessary to gain access to the inboard flange of the vertical fuselage frame.

Note – The use of a heat gun or hair dryer to aid the release of any headliner adhesive can reduce the risk of damage to the headliner material.

3. Refer to Drawing C1003002.1 or C1003002.2 (Model 182E thru 182P) Locate and mark a horizontal line on the face of the fuselage gusset, centered between the upper two rivets, which hold the gusset to the inboard flange of the fuselage frame.

Cessna 170 / 172 / 175 / 180 / 182 Thru 182D / 185

4. Mark a **vertical** line on the face of the gusset, which depicts the **centerline** of the inboard flange of the fuselage frame.

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Cessna 182E Thru 182P

4. Mark a **vertical** line on the face of the gusset, which depicts the **centerline** of the upper two rivets, which hold the gusset to the inboard flange of the fuselage frame.
5. At the intersection of the fuselage flange vertical line and the horizontal location, drill a .257 hole through the gusset and fuselage frame. (Letter Drill “F”)
6. Using the MS21075-4N nut plate as a template, mark the nut plate mounting hole locations on the face of the gusset. Drill the #40 (3/32”) mounting holes, as marked and mount the nut plate to the **inside** of the fuselage frame flange, as shown on drawing C1003003.
7. Test fit the AN4-7A bolt to the nut plate and adjust as necessary to assure ease of installation.
8. Reinstall the headliner and moldings, locate and open the .250-inch mounting hole.
9. Install the upper torso restraint strap or inertial reel using the hardware configuration shown on Drawing C1003003.
10. Torque each bolt to 60 in/lbs dry torque.

Lap Belt Attachment;

11. Remove the existing lap belts at their primary mounting point, saving the attachment hardware.
12. Install the new lap belt assembly, **buckle portion inboard**, using the original hardware configuration; as shown in Cessna 100 Series Maintenance Manual.
13. Test fit and inspect each completed installation. All end fittings and inertial reels 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.

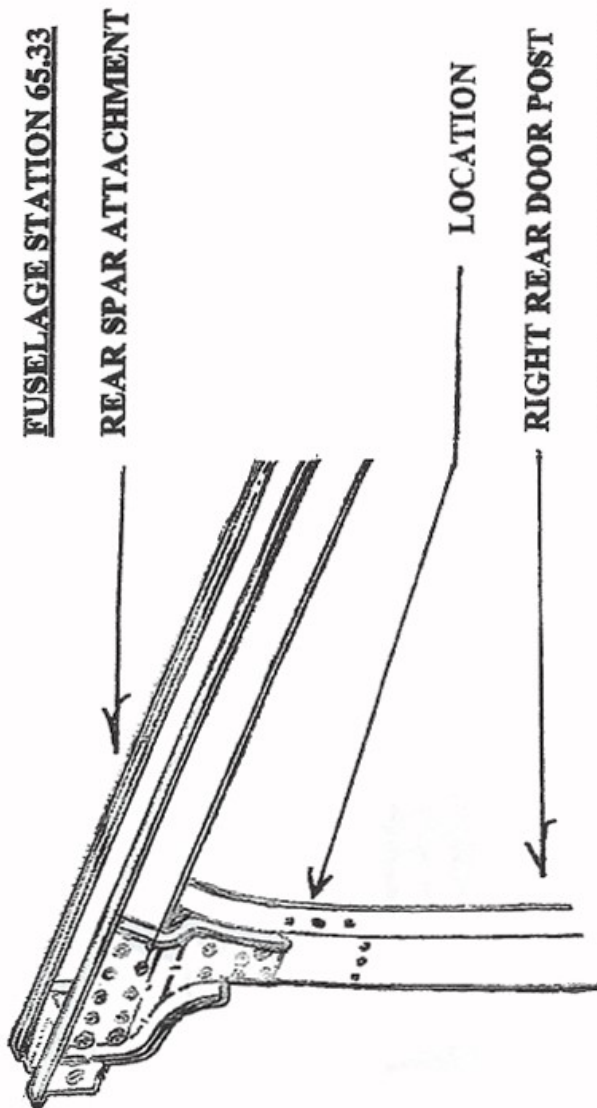
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8.0 Installation Drawing

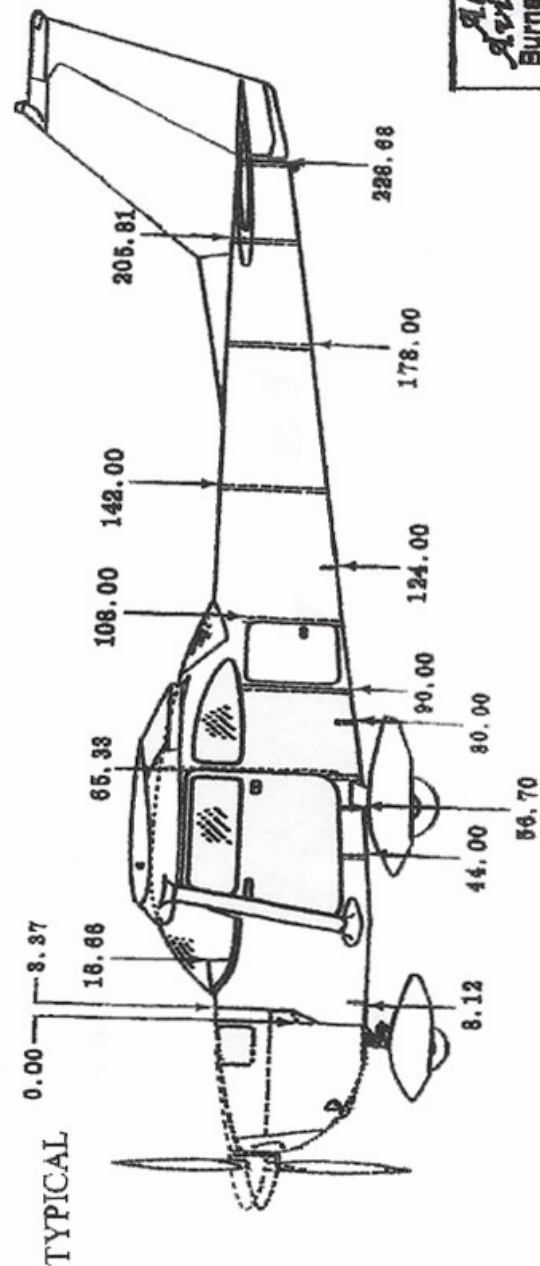
ATTACHED DOCUMENTS

Page 8	8.1	Drawing C1003001	Mount Location
Page 9	8.2	Drawing C1003002.1	Mount Detail, Typical
Page 10	8.3	Drawing C1003002.2	Mount Detail, 182E thru 182P
Page 11	8.4	Drawing C1003003	Restraint Strap, Attachment
Page 12	8.5		Required Installation Parts

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NOTE - RIGHT SIDE SHOWN / LEFT SIDE REVERSED



FAA APPROVED

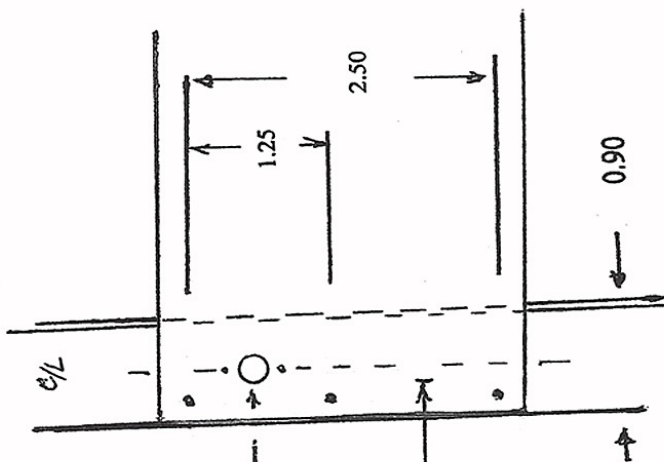
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CHICAGO AIRCRAFT
CERTIFICATION OFFICE
CENTRAL REGION

REV.	A
LOCATION	C1003001
FIN: N/A	TOL. XX+/-.03, XXX+/-.010, OR NOTED
DRAWN 11/19/05	CHK. Dem APPR. Dem

CESSNA 170, 172, 175, 180, 182-182D, 185

FORWARD

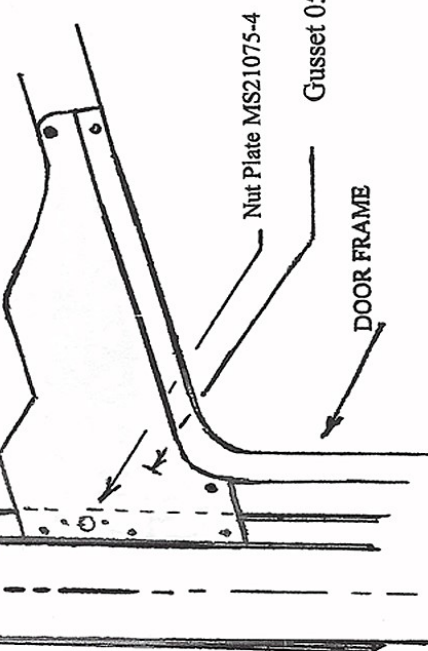


VERTICAL MEMBER / FLANGE

LEFT SIDE SHOWN / RIGHT SIDE REVERSED

REAR SPAR ATTACHMENT

PULLEY LOCATION



LEFT SIDE DOOR POST / FACING FORWARD

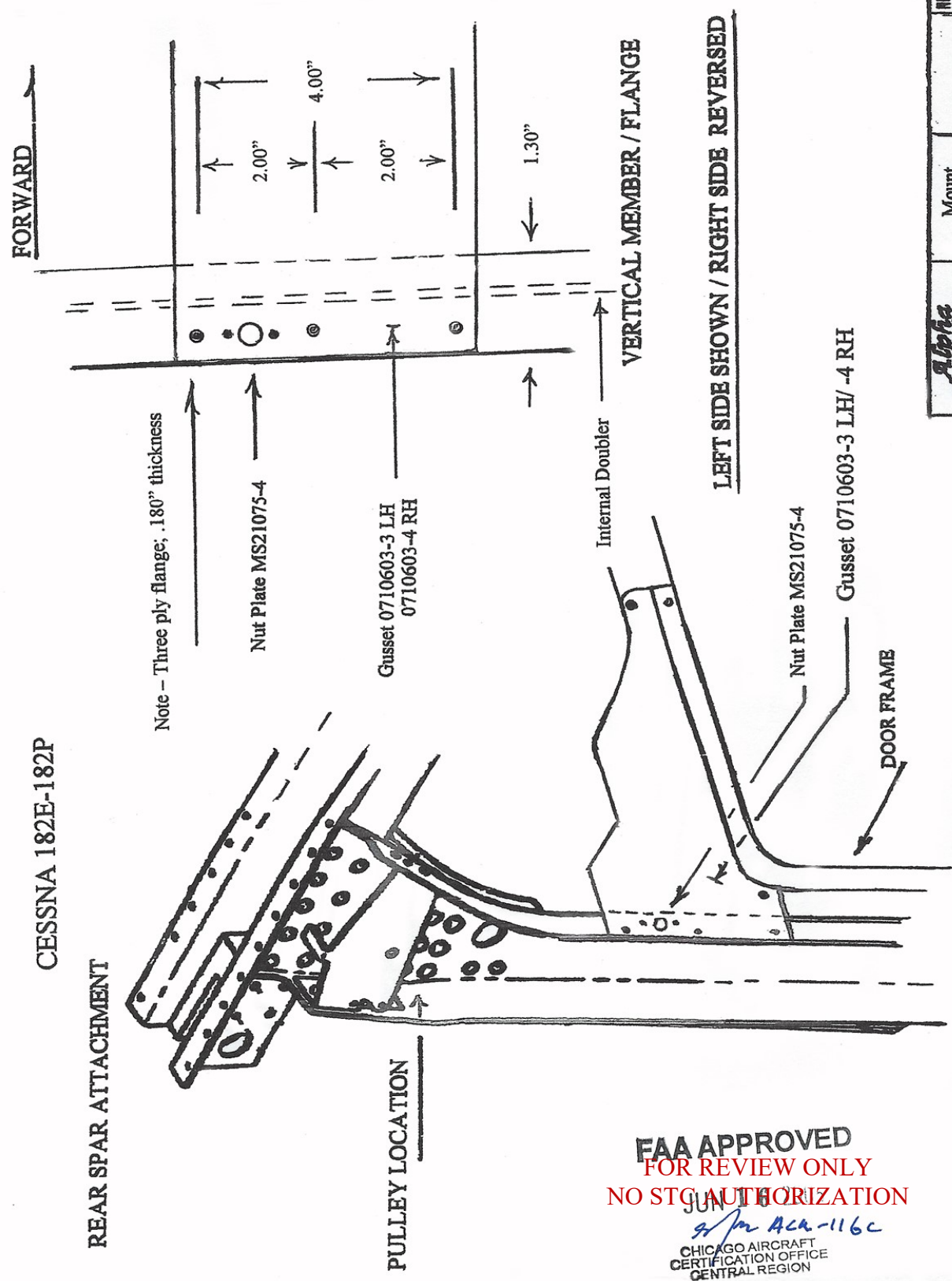
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JUN 16 2006
FOR REVIEW ONLY
NO STAMPEZATION
CERTIFICATION OFFICE
CENTRAL REGION

REV.	C1003002.1	Mount Detail	REV.
Alpha Aviation Burnsville MN.	FIN: N/A	TOL: XX +/- .03, XX +/- .010, OR NOTED	CHK. Dem APPR. Dem
DRAWN 5/15/06			

CESSNA 182E-182P

REAR SPAR ATTACHMENT



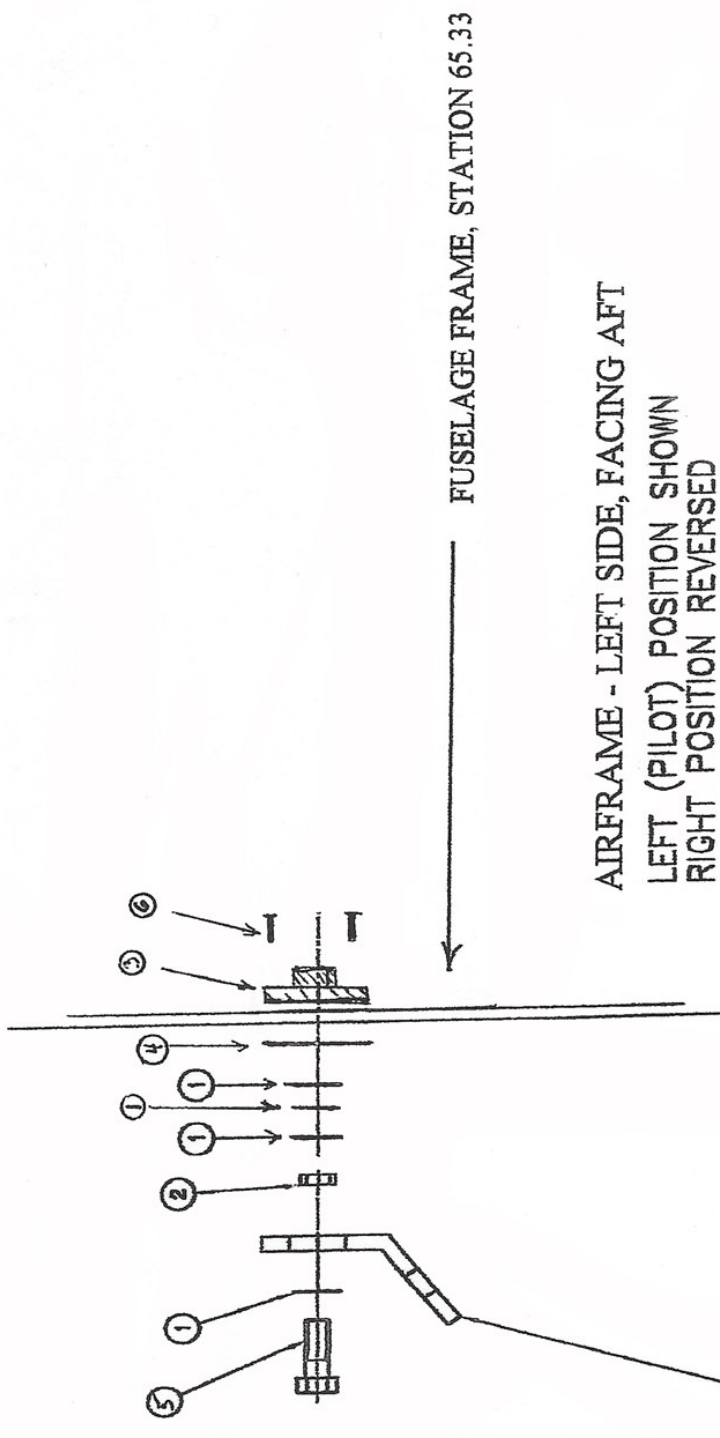
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CHICAGO AIRCRAFT
CERTIFICATION OFFICE
CENTRAL REGION

REV.	C1003002.2	A
Mount Detail		
FIN: N/A	TOL. XXX/- .00, XXX/- .010, OR NOTED	
DRAWN: 5/15/06	CHK: Dem	APPR: Dem

LEFT SIDE DOOR POST / FACING FORWARD

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NO STATE AUTHORIZATION

CHICAGO AIRCRAFT
CERTIFICATION OFFICE
CENTRAL REGION



AIRFRAME - LEFT SIDE, FACING AFT
LEFT (PILOT) POSITION SHOWN
RIGHT POSITION REVERSED

TSO-C114 SHOULDER BELT END FITTING
OR
INERTIAL REEL HOUSING

6	2	CCR264SS3-3/4	Rivet	Standard	REV. B
5	1	AN4 - 7A	Bolt	Standard	
4	1	AN970-4	Washer	Standard	
3	1	MS21075-4	Nut Plate	Standard	
2	1	NAS75-4-004	Bushing	Standard	
1	4	AN960-416	Washer	Standard	
Item	No.	Part No.	Size	Description	Specification
<div> <div> Alpha Aviation Burnsville MN. FIN: N/A </div> <div> RESTRAINT STRAP ATTACHMENT </div> <div> REV. B </div> </div>					
<div> DRAWN 11/17/05 </div> <div> CHK. Dem </div> <div> TOL. XX+/- .03, XX+/- .010, OR NOTED </div> <div> APPR. Dem </div>					

FAA APPROVED MODEL LIST (AML) NO. SA02211CH
ALPHA AVIATION INC.


FOR
INSTALLING THREE POINT TORSO RESTRAINT SYSTEM

ISSUE DATE: 11/15/05

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	Cessna	170, 170A, 170B	A-799	CAR 3	Installation and Maintenance Manual No. C1004001	Revision B, dated 11/7/05*	N/A	1/11/06
2	Cessna	172, 172A, 172B, 172C, 172D, 172E, 172F, 172G, 172H, 172I, 172K	3A12	CAR 3	Installation and Maintenance Manual No. C1004001	Revision B, dated 11/7/05*	N/A	1/11/06
3	Cessna	175, 175A, 175B, 175C, P172D	3A17	CAR 3	Installation and Maintenance Manual No. C1004001	Revision B, dated 11/7/05*	N/A	1/11/06
4	Cessna	180, 180A, 180B, 180C, 180D, 180E, 180F, 180G, 180H	5A6	CAR 3	Installation and Maintenance Manual No. C1004001	Revision B, dated 11/7/05*	N/A	1/11/06
5	Cessna	182, 182A, 182B, 182C, 182D, 182E, 182F, 182G, 182H, 182J, 182K, 182L, 182M, 182N, 182P	3A13	CAR 3	Installation and Maintenance Manual No. C1004001	Revision C, dated 5/15/06*	N/A	6/16/06
6	Cessna	185, 185A, 185B, 185C, 185D, 185E, A185F, A185G	3A24	CAR 3	Installation and Maintenance Manual No. C1004001	Revision B, dated 11/7/05*	N/A	1/11/06

* or latter FAA Approved Revisions.

FAA APPROVED:


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

Reissued: 12/20/16

Amended: 1/11/06, 6/16/06

CESSNA 100 SERIES AIRCRAFT

Three Point Torso Restraint System Installation - STC SA02211CH

INSTALLATION PHOTOS

