INSTALLATION and MAINTENANCE MANUAL

NUMBER BE194001

FAA/STC SA04310CH
BEECHCRAFT BE19, 23, 24 Series Aircraft
Three Point Torso Restraint System Installations

Per Approved Model List

Contains – Instructions for Continued Airworthiness

PN AAI-169-420000-81

Model BE19-IR

FOR REVIEW ONLY – NO STC AUTHORIZATION

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

Revision	Date	Change	Approved
A	11/10/2017	Initial Issuance	
B	06/05/2018	Revised ICA	
C	11/30/2019	Page 9; Paragraph 8.1 – Add "Or Equivalent FAA Approved Restraint System	

Table of Contents

1.0 Model Designations

Model Number	Product Description
BE19-114FS	Three-point restraint system, TSO-C114, Fixed torso strap
BE19-114IR	Three-point restraint system, TSO-C114, Inertial reel torso strap

2.0 Product Description

Model BE19-114FS

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 PN: MS21075-4N nut plate and PN: AAI-169-420000-81 (Left) / AAI-169-420000-82 (Right) gusset to the fuselage structure adjacent to each pilot position at fuselage station 132.0.

Model BE19-114IR

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.

The attachment of the fixed end of the torso restraint strap is accomplished by the installation of a PN: MS21075-4N nut plate and PN: AAI-169-420000-81 (Left) / AAI-169-420000-82 (Right) gusset to the fuselage structure adjacent to each pilot position at fuselage station 132.0

3.0Airframe Qualification

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

Aircraft licensed in the Aerobatic Category are NOT eligible.

The airworthiness certificate must be issued in the Normal or Normal / Utility category.

Inspect the aircraft and its records to assure that any changes in structure do not preclude the installation of the Model BE19-114FS or Model BE19-114IR restraint system.

4.0 Weight and Balance

Model BE19-114FS has a location of station +113.00 and a net weight change of 1.75 pounds per installation; total for two pilot positions.

Model PA23-114IR has a location of station +113.00 and a net weight change of 3.50 pounds per installation; total for 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, TSO appliances or standard parts and Installation Manual BE194001 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 "Instructions for Continued Airworthiness" (ICA)) in the aircraft maintenance records.

Make the appropriate maintenance entries in the aircraft logbook.

Prepare and submit FAA Form 337.

6.0 Instruction For Continued Airworthiness (ICA) Dated 11/10/2017

Models; BE19-114FS / BE-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 connecter 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.

Airworthiness Limitations

The Airworthiness Limitations section is FAA approved and specifies maintenance required under Parts 43.16 and 91.403 of Title 14 Code of Federal Regulations unless an alternate program has been FAA approved.

Mandatory component replacement times – None specified

Structural inspection interval – None specified

Structural inspection procedures – None specified

End

7.0

Issue A, Dated; 11/10/2017

INSTALLATION INSTRUCTIONS

UPPER MOUNT POINT

Beechcraft BE 19, 23, 24, Series Aircraft
Per Approved Model List

These instructions cover the installation of the torso restraint upper mount; centered at fuselage station 132.0, adjacent to each pilot position.

The upper mount installation is accomplished by reference to Drawings BE193001, BE193002 and BE193003. The attachment of the TSO-C114 restraint system is accomplished by reference to Drawing BE193003.

The left and right side upper attach point installations are identical.

Step-by-Step Instructions;

Caution – Some aircraft have had wiring run through the headliner and window channel area. 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 BE193001, locate the fuselage frame at fuselage station 132.0 on the right and left side. The location of the work area is at the junction of the vertical frame and the upper horizontal window channels. Part numbers AAI 169-420000-81 LH and -82 RH are to be riveted across the junction after the installation of the MS21075-4N nutplates.

2. Remove the interior trim and headliner to the extent necessary to gain access, exposing the work area.

3. Refer to Drawing BE193002, test fit gussets AAI 169-420000-81 LH and AAI-169-420000–82 RH respectively over the junction of the vertical frame and horizontal members. Set the gussets aside.

4. Refer to Drawing BE193003; Test fit the MS21075-4N nutplate on the back side of the inboard flange of the vertical frame.

   Locate the nutplate in the center of the vertical flange just above its junction with the aft horizontal member.

Mark the location of the .260 hole on the outside of the flange. Set the nutplate aside.

Note – Before drilling the nutplate location test fit with the gusset to insure your location will allow the gusset to be installed over the nutplate with adequate edge distance in all directions.

Drill a .260 hole in the vertical flange.

Use the nutplate as a drill guide by installing it on the outside of the flange using a ¼ X 28 bolt inserted from the back of the flange.

Orient the nutplate vertically, center the floating plate and drill 2ea #40 holes. Counter sink the outside for the CCR264SS3-3 pull rivets.

Move the nutplate to the inside of the flange and install with 2ea CCR264SS3-3 rivets.

5. Clamp the gusset in place, mark the centerline of each member. Lay out your rivet pattern as shown on Drawing BE193002.

   Note – If the headliner is mounted using aluminum extrusions that will cross over the newly installed gusset, drill out the 2 pull rivets holding the extrusion to the frame flange, upsize (#30 drill) and countersink the holes in the extrusion. Lay out the 3 rivet pattern to pick up the flanges of the extrusion.

6. Mark the nutplate location; unclamp and drill a .260 hole in the gusset, re-clamp and secure the gusset in position firmly by installing a bushed out AN-4 bolt into the nutplate.

7. Align the gusset and pull it up in all four directions using clamps and/or wing nut clecos as you drill the 12 rivet holes using a #30 drill.

8. Remove the gusset, countersink, and deburr all holes.

9. Reinstall the gusset using the bushed out AN-4 alignment bolt and pull in the flanges firmly using Cleo's and clamps. Install the CR3212-4-03 Cherry Max rivets.

10. Reinstall the headliner and moldings, locate and open a .500-inch mounting hole through the headliner or trim to allow the hardware to establish metal to metal contact as the shoulder belt is being bolted in place.

11. Complete the upper torso restraint strap or inertial reel installation using the hardware configuration as shown on Drawing BE193003. Assure that the inertial reel is bushed out enough to aim it, allowing the belting to flow out over the Pilots shoulder.

12. Torque each bolt to 40 in/lbs dry torque.

Lap Belt Attachment;

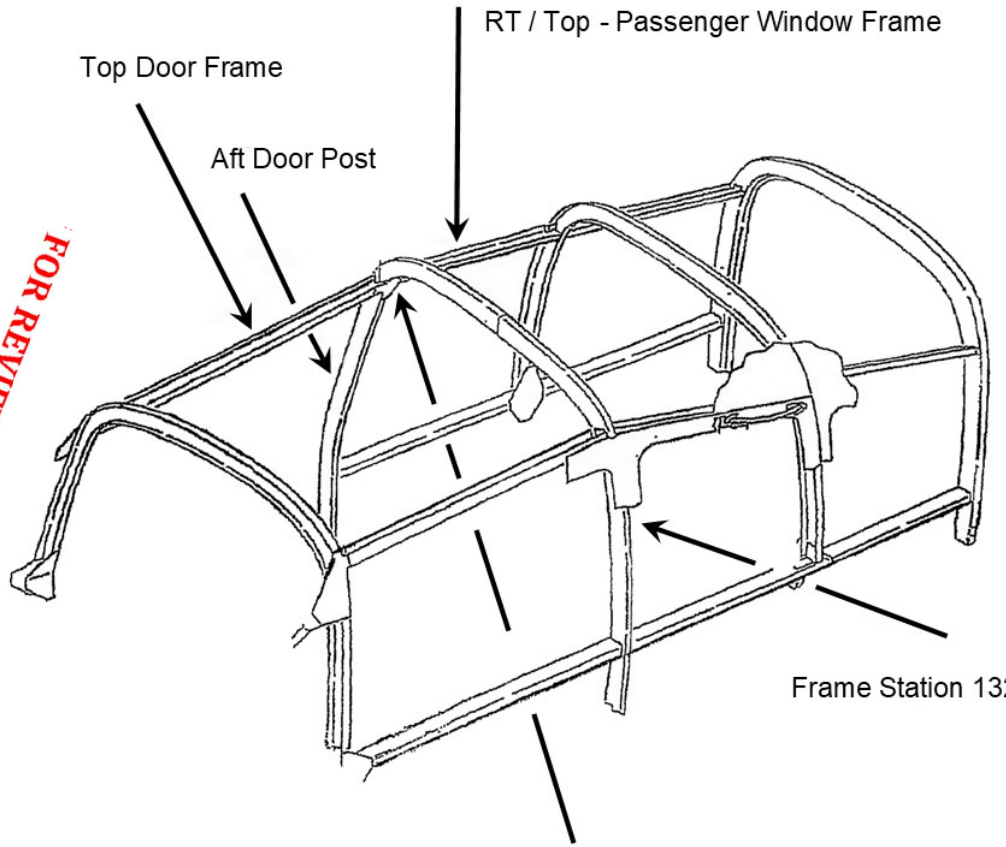
1. Remove the existing lap belts at their primary mounting point, saving the attachment hardware.

2. Install the new lap belt assembly, **buckle portion inboard** using the original hardware configuration; as shown in Beechcraft Series Maintenance and parts Manual.

3. Test fit and inspect each completed installation. All end fittings and inertial reels should be firmly attached, the inertial reel should be positioned, and all hardware should be tight and each belt segment should be free to rotate in response to any restraint system loading.

Attachments

DRAWING RE-TRACED 9.16.2021
FOR CLARITY ONLY

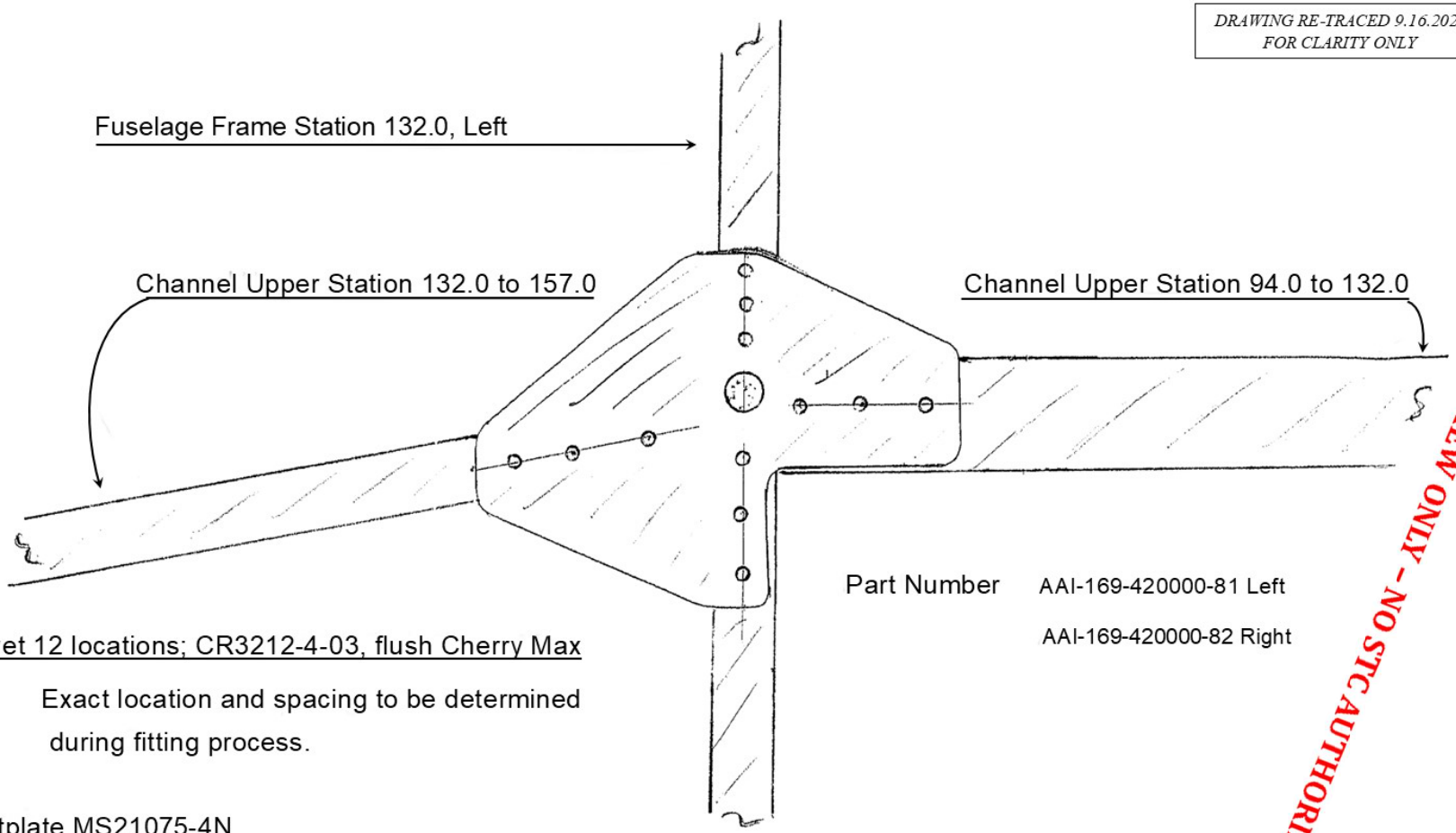


Cabin Top Structure

Location Part AAI-169-420000-81 LH
AAI-169-420000-82 RH

Drawn	Date	Revision	Name	Drawing Number
DCM	11/10/2017	A	MOUNT LOCATION	**BE193001**
	Tolerance	XX +/- .30	ALPHA AVIATION INC.	OWATONNA, MN 55060

DRAWING RE-TRACED 9.16.2021
FOR CLARITY ONLY



Part Number AAI-169-420000-81 Left

AAI-169-420000-82 Right

Rivet 12 locations; CR3212-4-03, flush Cherry Max

Exact location and spacing to be determined during fitting process.

Nutplate MS21075-4N

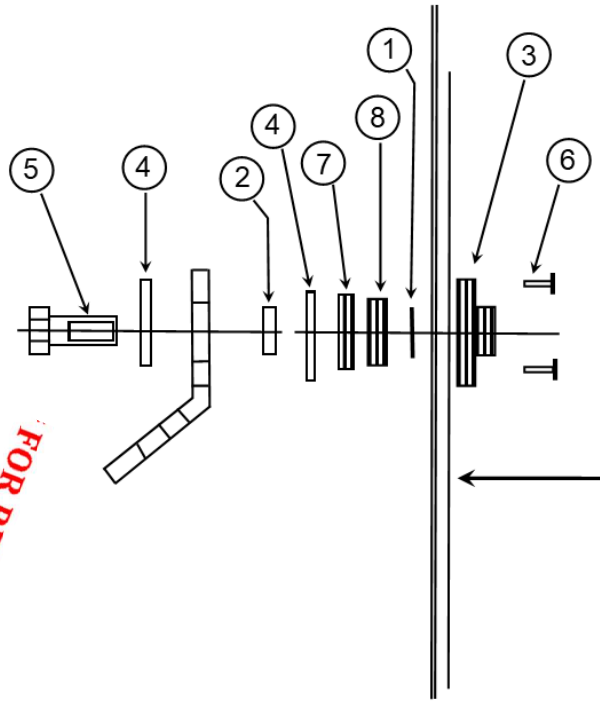
Exact location to be established per instruction, Installation detail Drawing BE193003

FOR REVIEW ONLY - NO STC AUTHORIZATION

LEFT SHOWN - RIGHT INSTALLATION REVERSED

Drawn	Date	Revision	Name	Drawing Number
DCM	11/10/2017	A	MOUNT, INSTALLATION DETAIL	**BE193002**
	Tolerance	XX +/- .30	ALPHA AVIATION INC.	OWATONNA, MN 55060

DRAWING RE-TRACED 9.16.2021
FOR CLARITY ONLY



FUSELAGE FRAME, STATION 132

AIRFRAME - LEFT SIDE, FACING AFT

LEFT (PILOT) POSITION SHOWN
RIGHT POSITION REVERSED

TSO-C114 SHOULDER BELT END FITTING
OR
INERTIAL REEL HOUSING

Per Assembly - Fixed Strap or Inertial Reel Installation

Item	Appl.	Qty	Part #		Specification
8	IR	2	AAI 4.2005	Spacer	STC/PMA
7	F/S	1	AAI 4.2005	Spacer	S TC/PMA
6	F/S, IR	2	CCR264SS3-3	Rivet	Standard
5	IR	1	AN4-10A	Bolt	Standard
5	F/S	1	AN4-7A	Bolt	Standard
4	F/S, IR	2	AN970-4	Washer	Standard
3	F/S, IR	1	MS21075-4N	Washer	Standard
2	F/S, IR	1	NAS75-4-004	Bushing	Standard
1	F/S, IR	3	AN960-416	Washer	Standard

Note - The Inertial Reel and Fixed Strap end fittings require different spacing to accommodate the installed headliner. Install the Fixed Strap end fitting to float freely on the bushing and the Inertial Reel to be snug and aimed to allow the belt to flow out over the pilots shoulder.

Drawn	Date	Revision	Name	Drawing Number
DCM	11/10/2017	A	UPPER RESTRAINT INSTALLATION	**BE193003**
	Tolerance	XX +/- .30	ALPHA AVIATION INC.	OWATONNA, MN 55060

AAI-169-420000-81 Installed

AAI-169-420000-82 Installed

STC SA04310CH APPROVED MODELS

BEECH BE19-FS / BEECH BE19-8IR
3-PT SHOULDER HARNESS KIT

19A	M19A	B19	23
A23	A23A	A23-19	B23
C23	A23-24	A24	A24R