

GLASTAR/SPORTSMAN SEAT BELT ANCHOR POINT CAGE MODIFICATION INSTRUCTIONS

WELDED OPTION PER SERVICE BULLETIN 69

Notes:

1. There are two methods to comply with Service Bulletin 69 – a welded option (instruction p/n: 633-0195-026) and a clamp-up option (instruction p/n 633-0195-029). Please review both sets of instructions to determine which method you would prefer to use.
2. Glastar Aircraft must also install the shoulder harness anchor point retrofit kit (p/n 930-07300-201) to comply with Service Bulletin.
3. These instructions detail the steps required to complete the anchor point retrofit with new longer seatbelts. Extension links are available that eliminate the need for longer seatbelts. Longer seatbelts may still be used instead of the extension links. See Service Bulletin 69 for applicable part information.

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Warning: Prior to welding, to avoid damage to any installed avionics, radios or electronic devices be sure to:

- 1. Disconnect the battery “+” and “-” cables.**
- 2. Remove any avionics, radios or electronic devices if easy to disconnect from mounting tray.**
- 3. If any electronic equipment is difficult to remove, disconnect each device’s ground wire to avoid electrical damage.**



Note: Since the anchor points have been located aft a total of 9”(center) + 6.5”(side) = 15.5”(total), the existing lap belts and shoulder straps may no longer be of adequate length other than for aft seat back locations. Longer seat belt/shoulder straps are available from Glasair Aviation. See SB#69



Note: All seat belt cage retrofit kits also include the metal brackets and hardware to install shoulder strap inertia reels. Even if you choose not to install inertia reels at this time, you may want to weld the brackets in place for future consideration and enhancement of resale value.



Note: GlaStars and early Sportsman aircraft with the push-rod style door latches will need to remove the non-structural single cage attach tabs located below and slightly behind the lower door latch to allow room for the lap belt to be routed below the door latch. (see step 2)

Modification to the cage as described in these instructions must be accomplished with TIG welding procedures to produce the best results. All factory welds on Sportsman and GlaStar cages are TIG welded. MIG, or wire feed welding, has a tendency to produce cold welds and is not as suitable for accomplishing the small fillets required in this retrofit. Oxy-Acetylene gas welding may be accomplished by someone experienced with the process, keeping in mind that controlling the heat and flame produced by such a torch will be necessary with adequate heat shielding of adjacent fiberglass, wiring, fuel lines and control system cables. Adjacent aluminum fuel lines should not be drained, as they pose a much higher risk of melting when empty of fuel. Leave them with fuel inside the lines to allow for heat sink purposes. **Be absolutely certain, however, that all fuel system fittings and hose ends inside the cabin are leak free.**

Warning: We strongly suggest having someone standing by with a fire extinguisher while all welding is being accomplished.

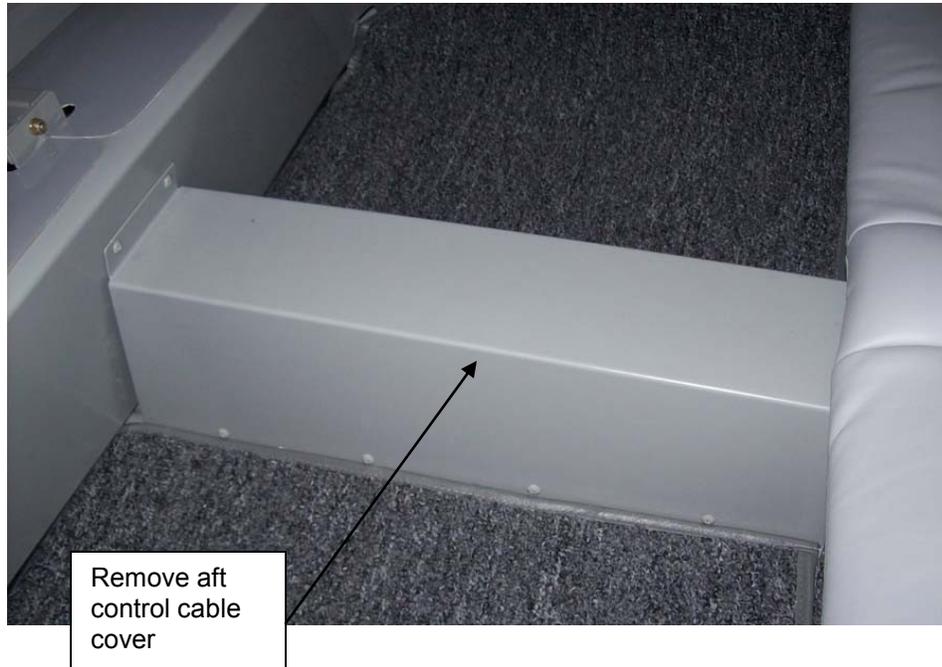
Step 1: Cabin Disassembly

Remove the seat backs and rails as assemblies by removing the AN3 bolts at the forward and aft end of the rails. Make notes as to the positioning fore-aft and side-to-side of the seat rail tabs to the cage tabs for ease of re-assembly. Bag and mark the hardware.

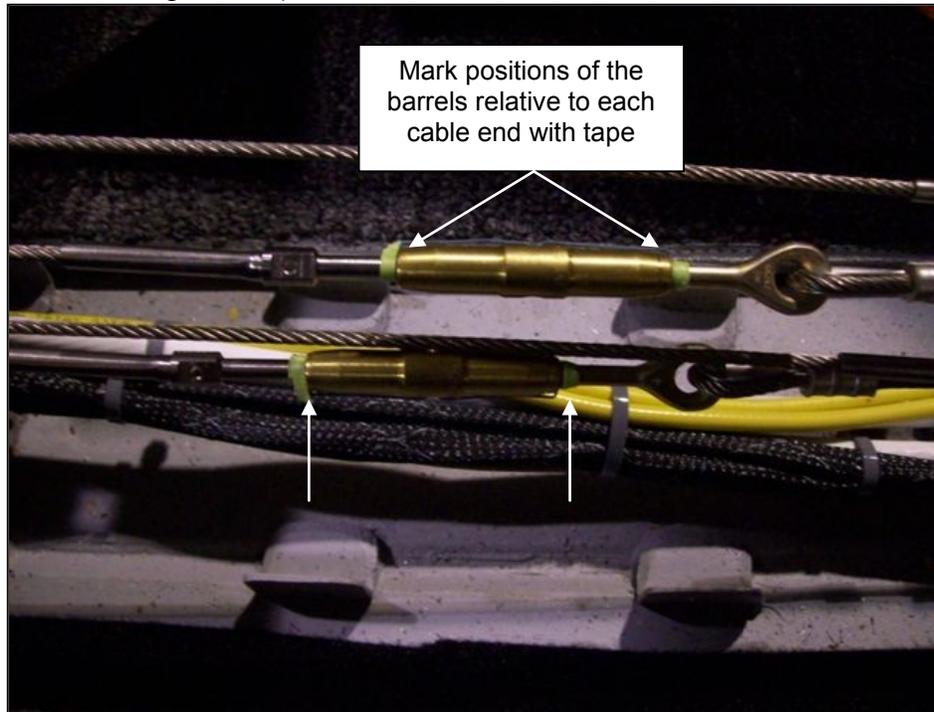


Remove both left and right seat pans.

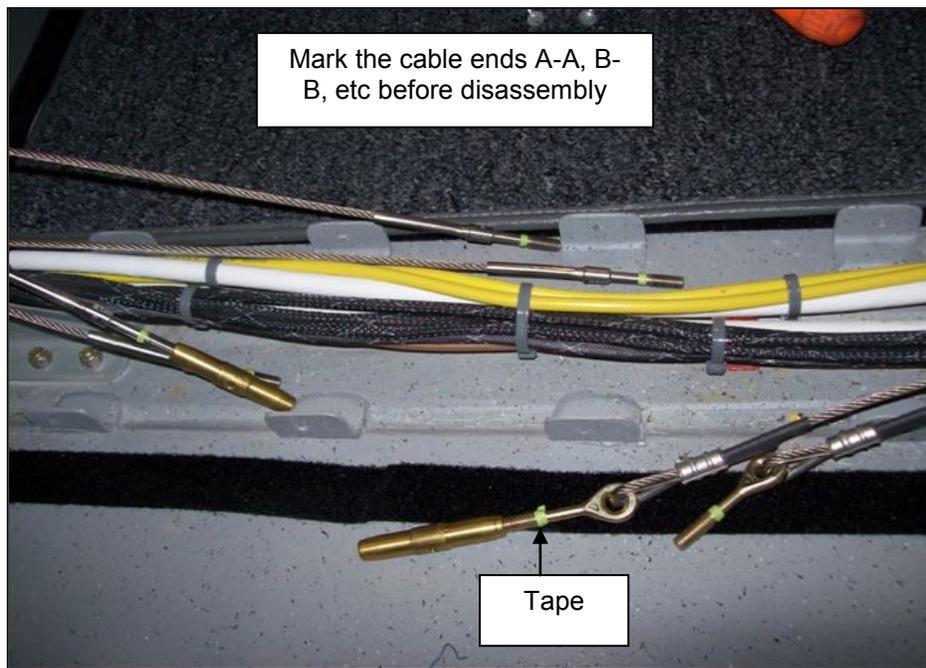
Remove the aft control cable cover to gain access to the elevator and rudder cable turn buckles.



Mark the position of the turnbuckle barrels on the cable terminal end fittings with a permanent ink pen or small pieces of masking tape. This will allow quick re-assembly of the control cables to the pre-existing cable tension (assuming it was correct to begin with.)



For ease of re-assembly mark the cable ends in pairs A-A, B-B, C-C, D-D before removing the safety clips or wire and loosening the turn barrels.

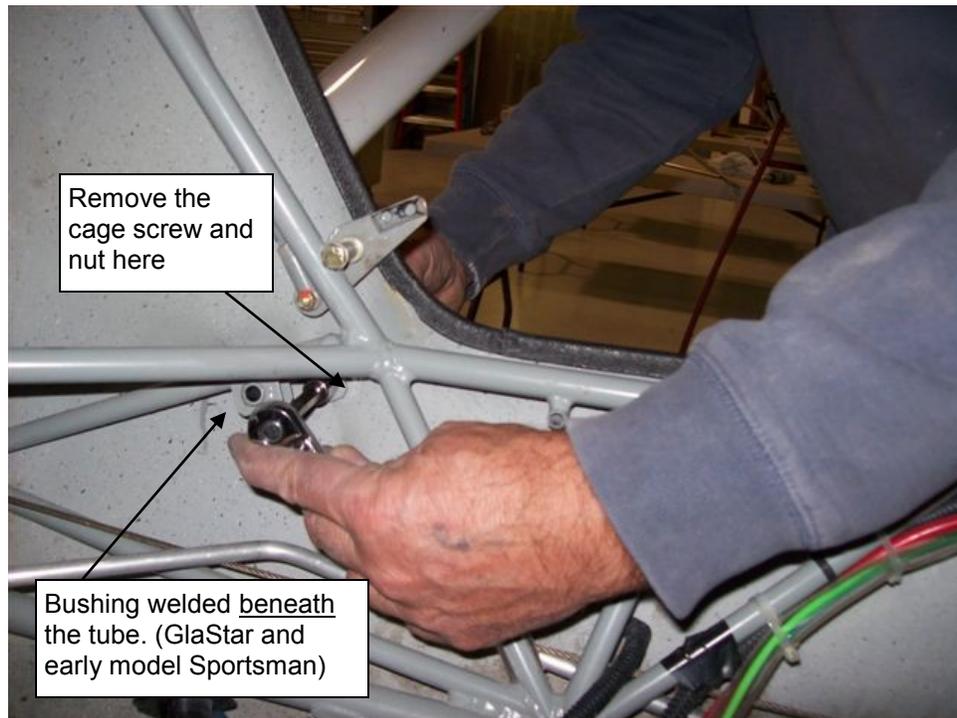


Step 2: Cage Tab Removal (GlaStar & Early Model Sportsman only)

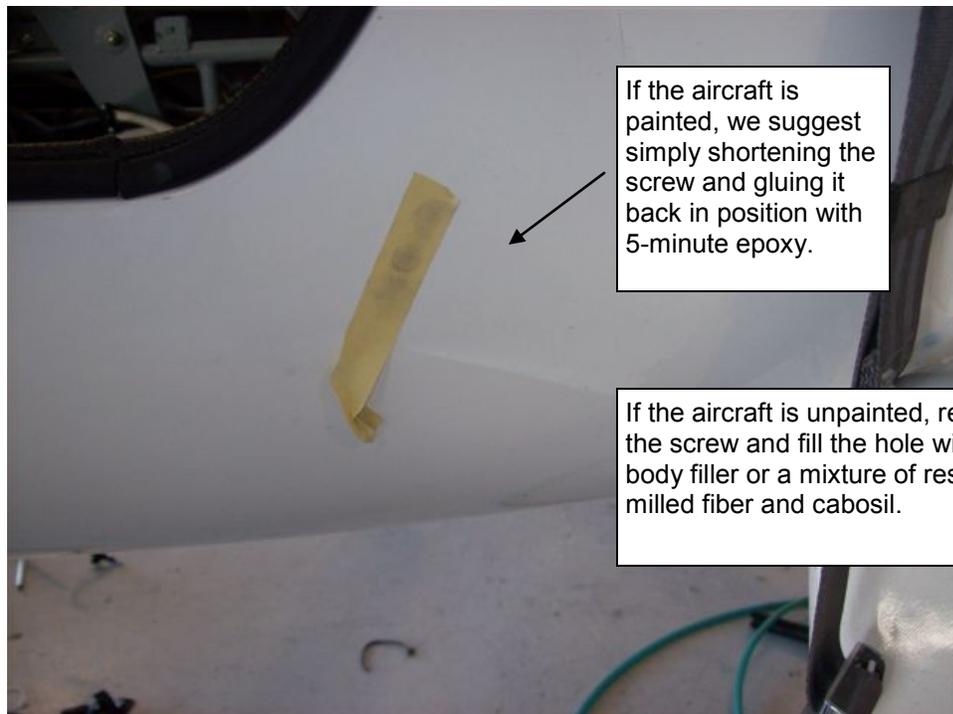
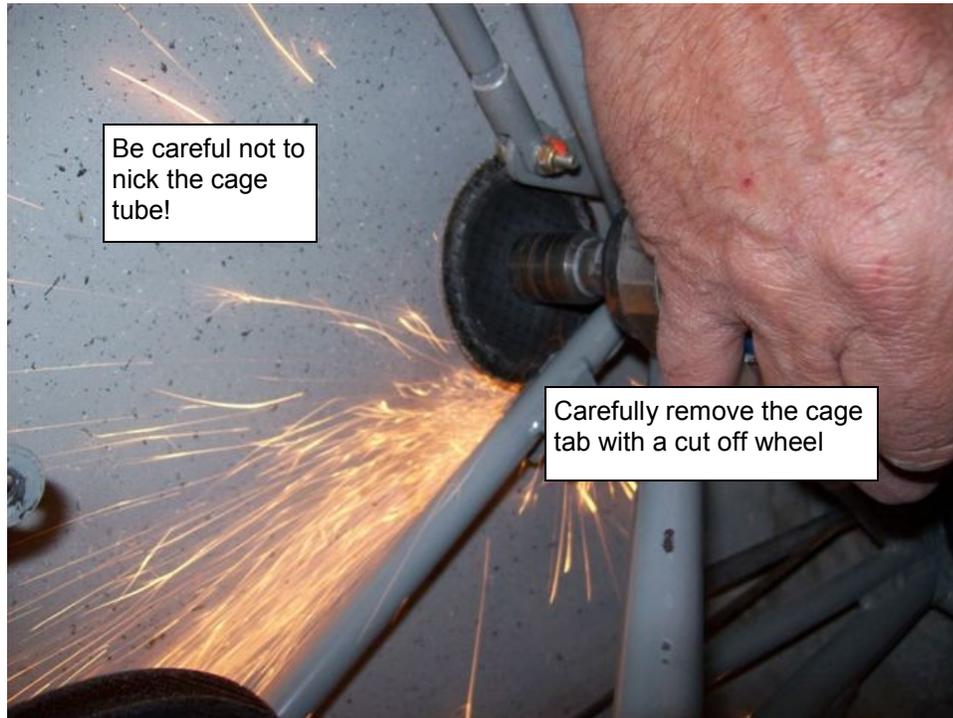


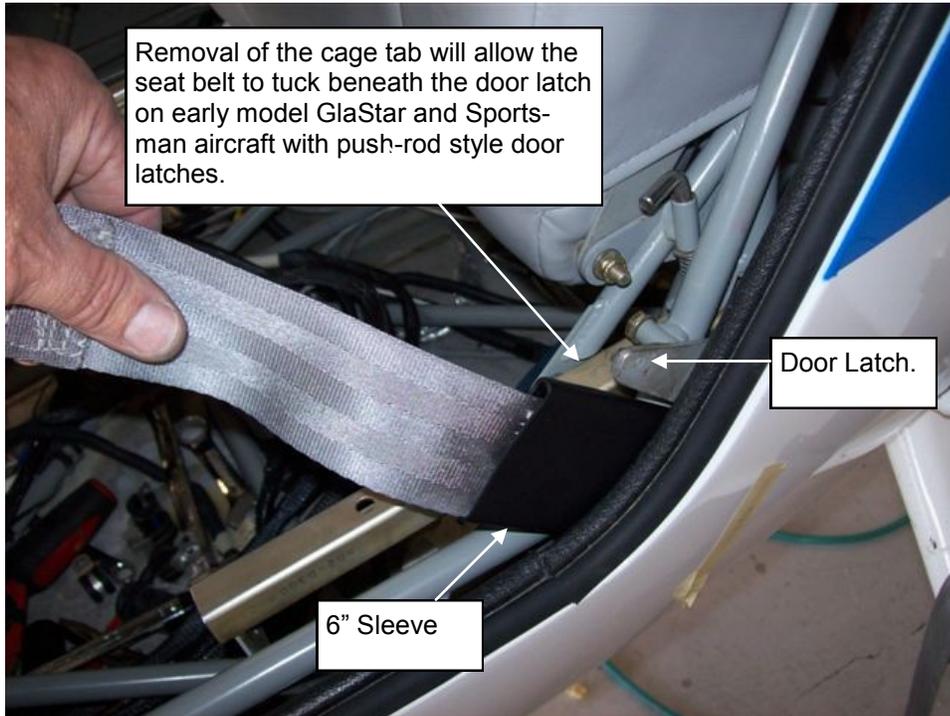
This step is for GlaStar and early Sportsman aircraft equipped with the push-rod door latch design attached to the cage. Later model Sportsman and GlaStar aircraft equipped with door latches integral to the doors may skip this step and proceed to step 3..

To allow room for the seat belts to be installed beneath the door latch, remove the cage tab as shown:



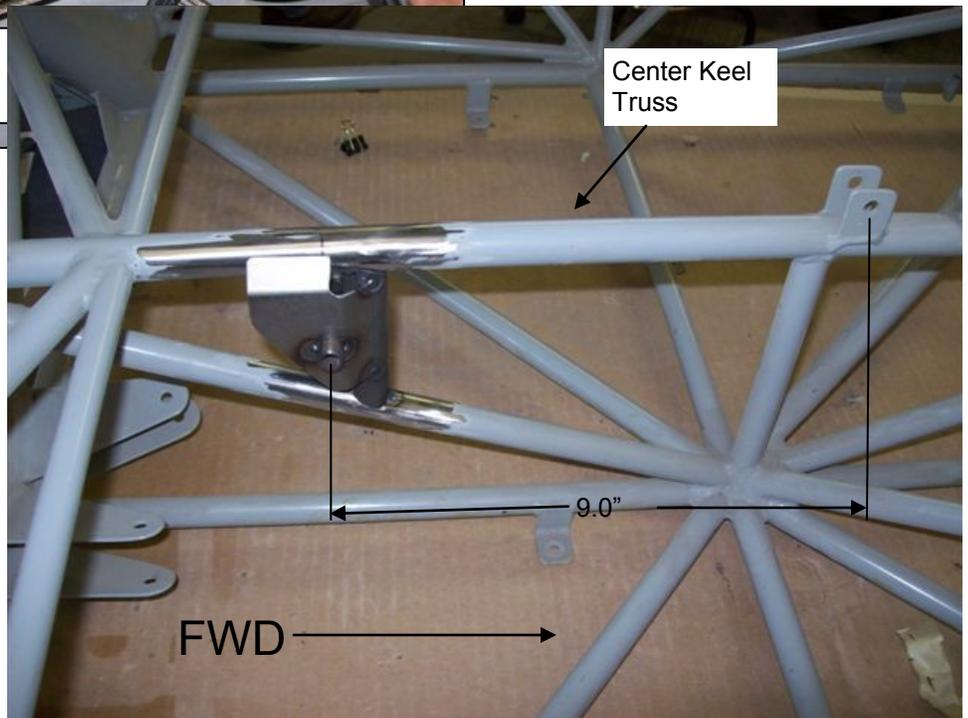
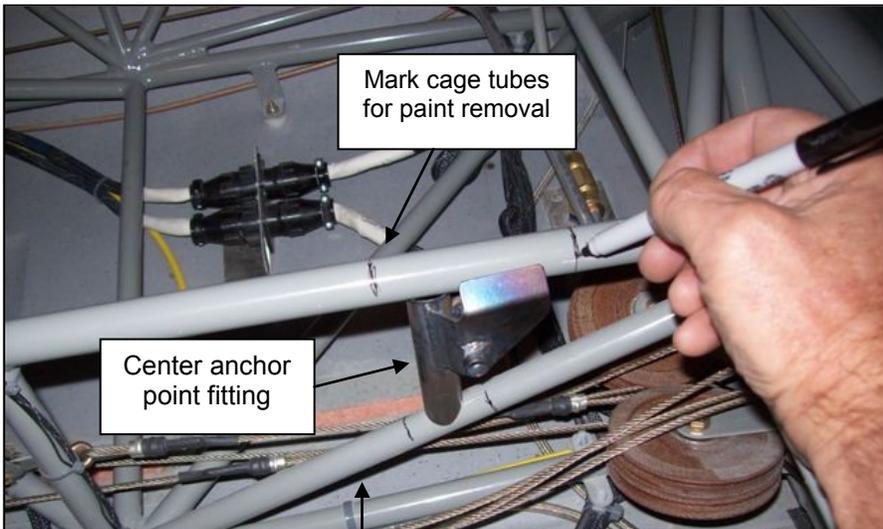
To provide door latch clearance for the exterior lap belts, the bushing is to be welded beneath the tube as shown here, rather than above the tube as shown in step 5.



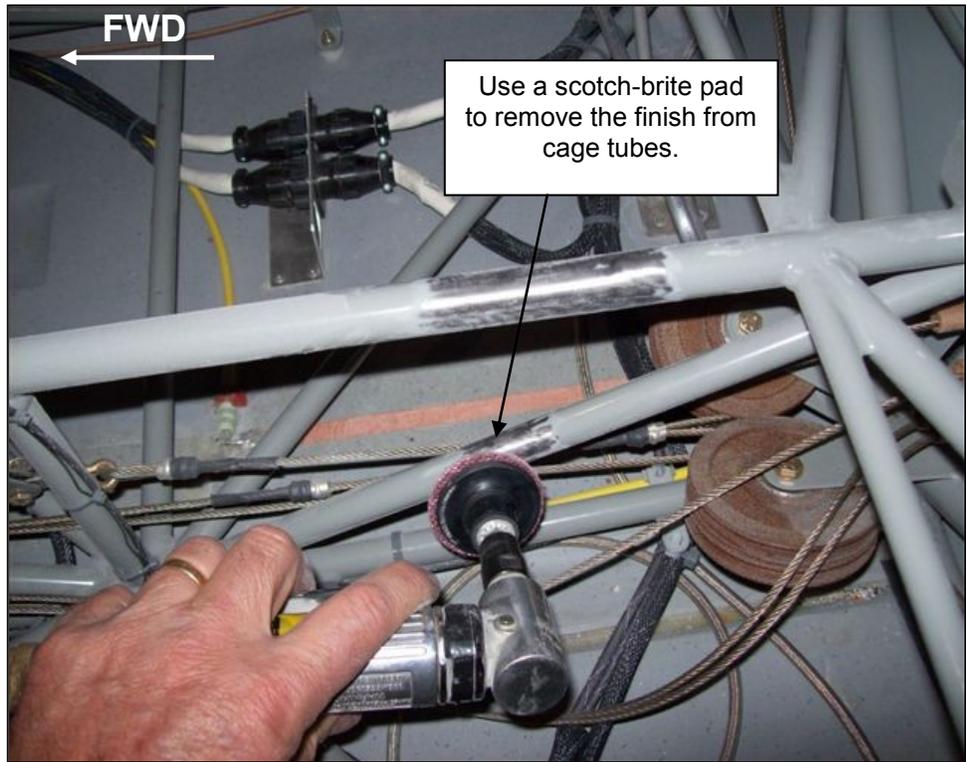


Step 3: Powdercoat Removal

Position the center anchor point fitting in the keel truss as shown (Approximately 9" aft of the existing location at the front of the seatback center rails) and mark the cage tubes for removal of the powder coat finish. Be sure to mark the tubes 1" beyond the areas to be welded, as it is much easier to sand a smooth transition edge in the powder coat for re-painting before the fitting is welded in place.



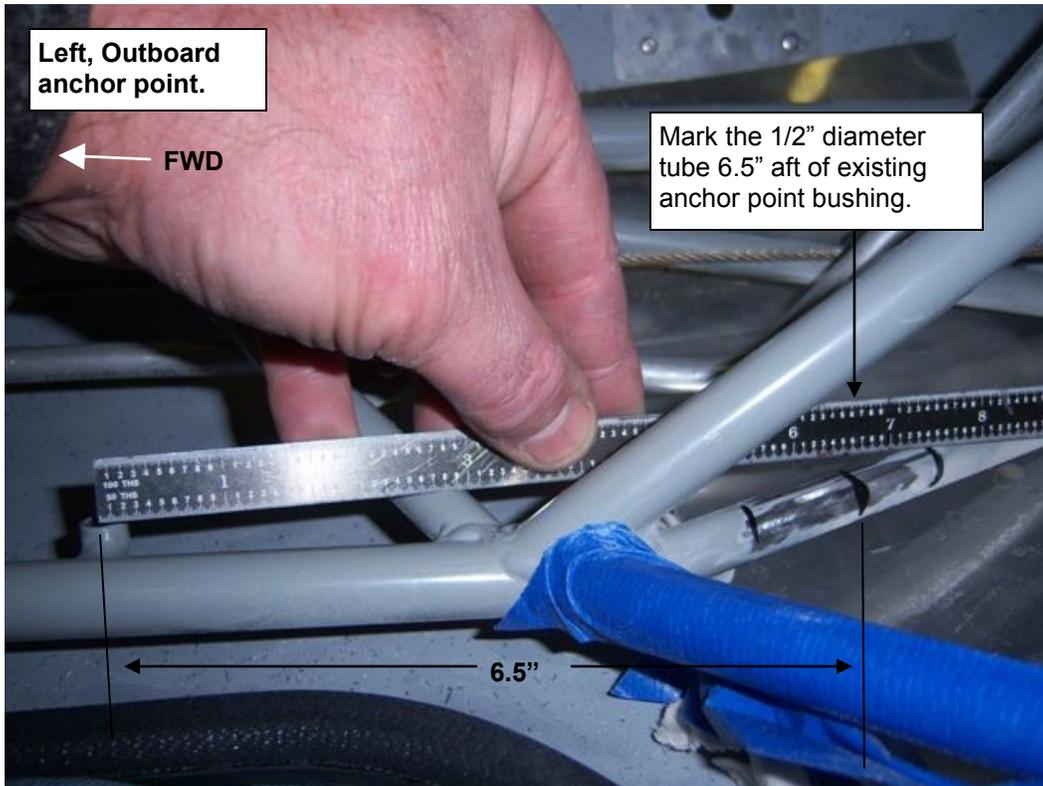
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Note: The cage tubing is relatively thin wall .035" or .049" thickness. Carefully use a Scotch-brite pad with slow RPM as shown or hand-sand the weld areas with sandpaper. Do not use any type of power-abrasive tool combinations that will result in removing any of the tubing wall thickness.



Note: For a quality weld, remove all traces of surface finish from the tubes in the weld areas.

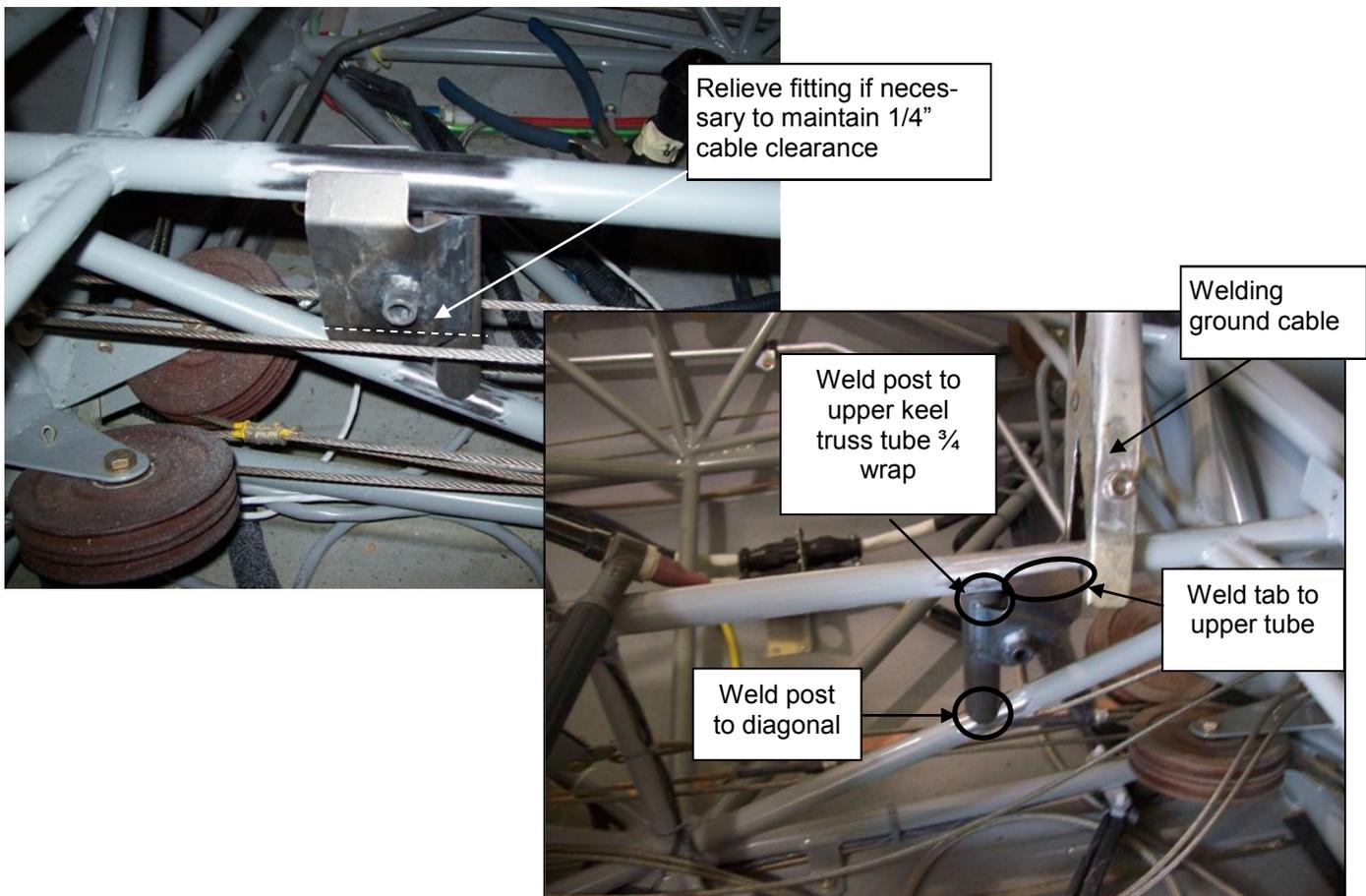


Mark the outboard cage tubes for the new anchor points per the following drawing. Verify measurement and then remove powdercoat. Be sure to mark the tubes 1" beyond the areas to be welded, as it is much easier to sand a smooth transition edge in the powder coat for re-painting before the fitting is welded in place.

Step 4: Position and Weld the Center Anchor Point Fitting

Position the Center Anchor Point Fitting on the center keel truss as shown. Verify that all control cables are clear of the area or shielded from heat (thin, aluminum sheet metal scraps work well for this.) Temporarily pull the cables tight to verify clearances to the fitting.

Warning! Keep a fire extinguisher within easy reach at all times during welding operations.



Note: To avoid magnetization of the cage, keep the ground cable as close to the weld area as possible. This will minimize current traveling throughout the cage.

Begin by placing several small tack welds on the fitting to secure it in place before welding it complete. Weld the post complete on the lower end; however, the upper end is only accessible to get a $\frac{3}{4}$ " wrap around. Weld it as far as possible, but it is not necessary to complete the weld between the sheet metal brackets.



Remember to stand by with a fire extinguisher handy.

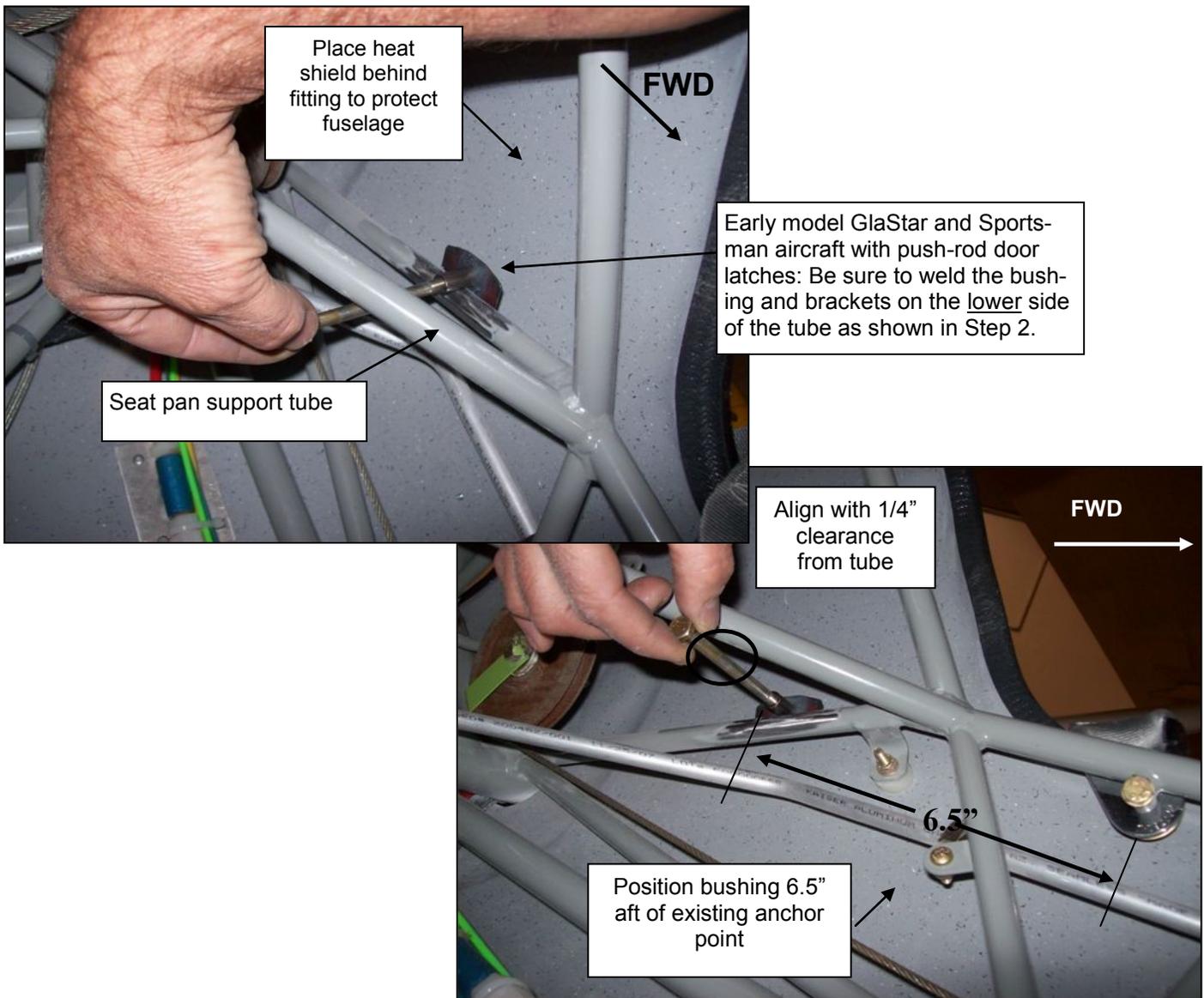


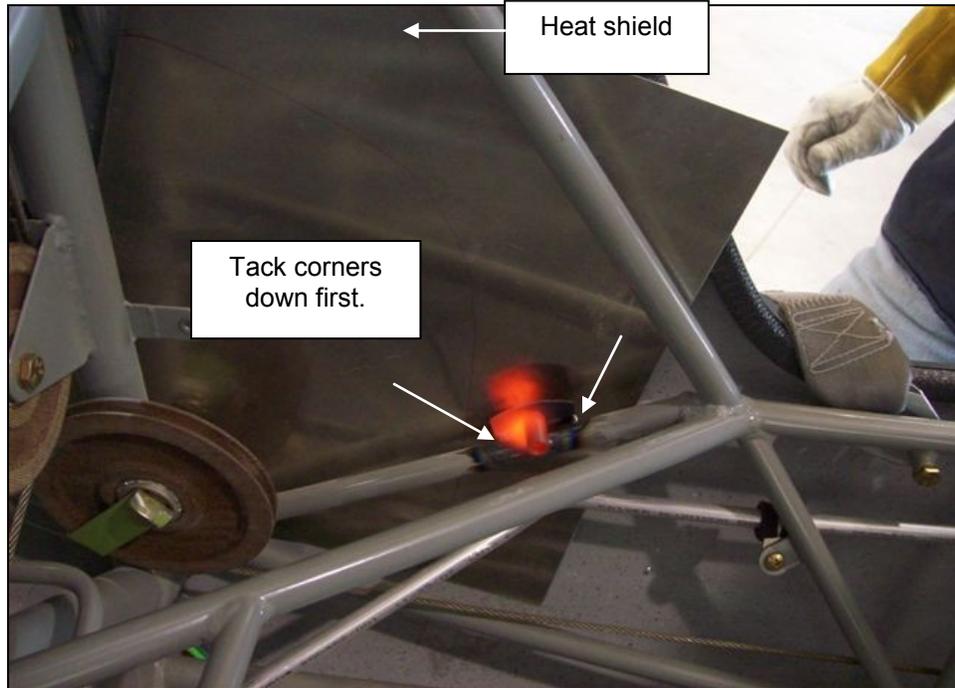
The air trapped inside sealed tubes will heat up/expand and typically result in a small pin-hole. Leave the pin-hole open until welding is complete. Once the welds and tubing have cooled down the pin-hole may be welded closed before the internal air has a chance to expand again.

Step 5: Position and Weld the Side Anchor Points



Note: The side anchor points are a bit more of a challenge since they are relatively small and less accessible. To provide clearance for the bolt head, it is vitally important that they are angled slightly below the seat pan support tube as shown (but not more than necessary). Insert a 5/16" diameter bolt into the bushing to align it below the tube as shown so the head of the bolt has room to clear after weld. Use any 5/16 diameter bolt or rod to position the weldment.





Warning: Keep fire extinguisher within reach



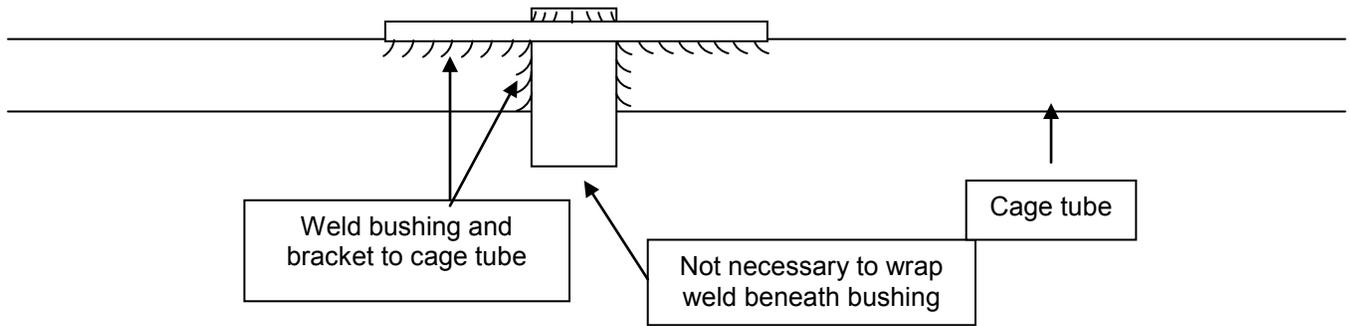
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Tack and weld the side fitting to the cage tube as shown in the following figure.

Figure 1



Once these welds are complete, position the inboard bracket onto the bushing.

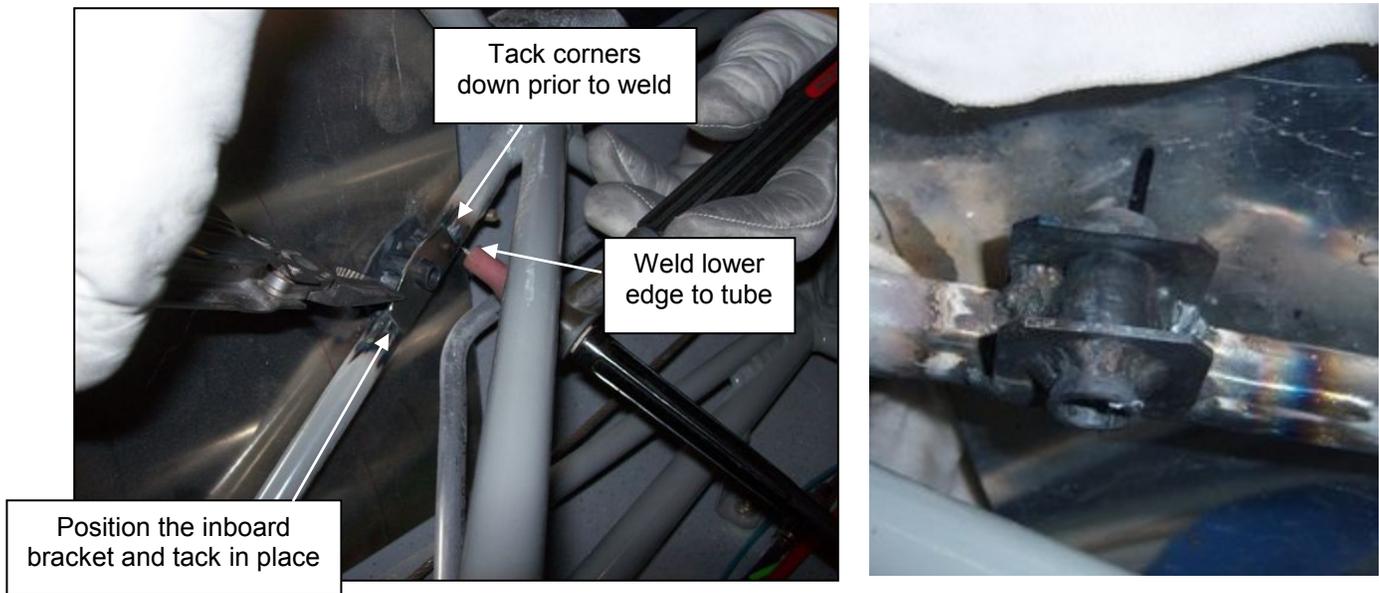
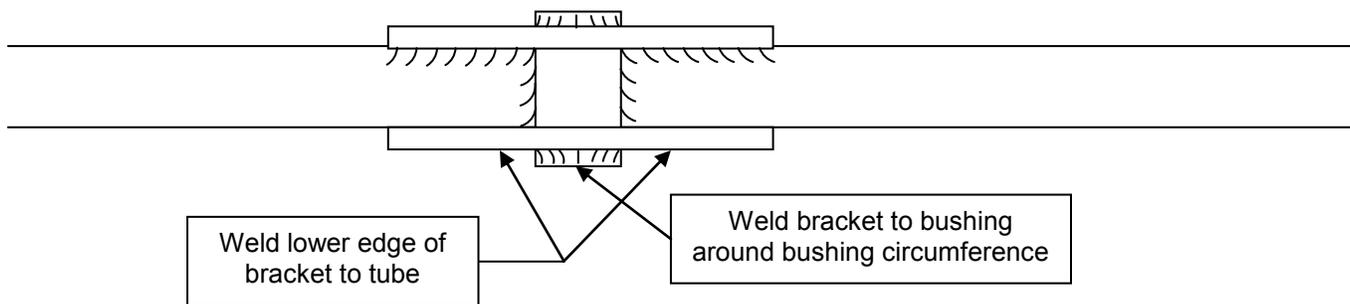


Figure 2



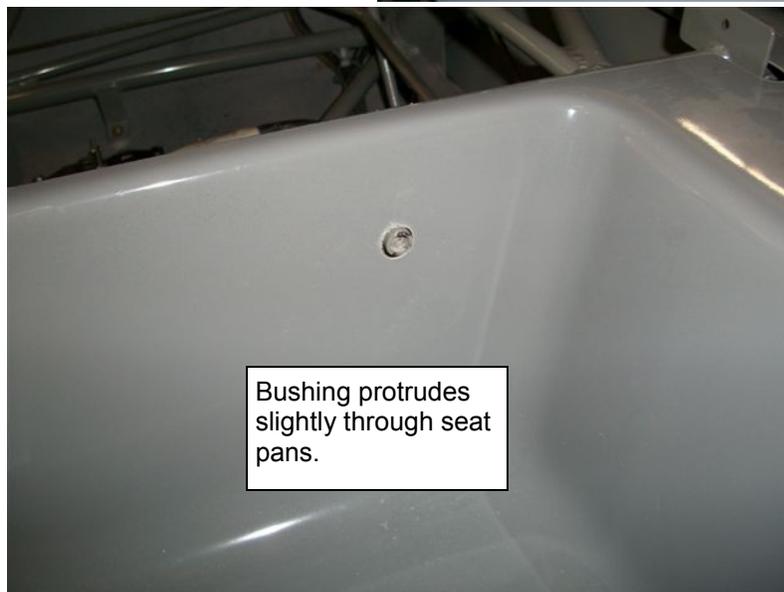
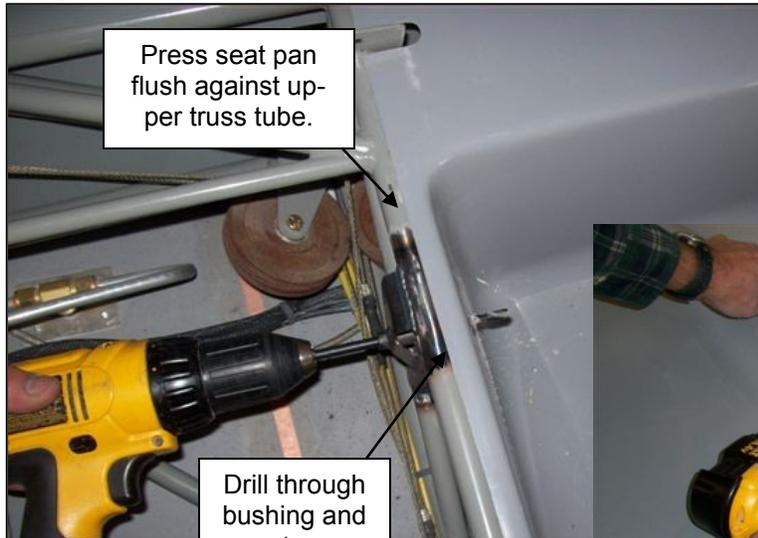
Step 6: Ream Bushing Holes

Use a 5/16 diameter (.312) drill or reamer to open up the center and side bushings.



Step 7: Drill the Seat Pans

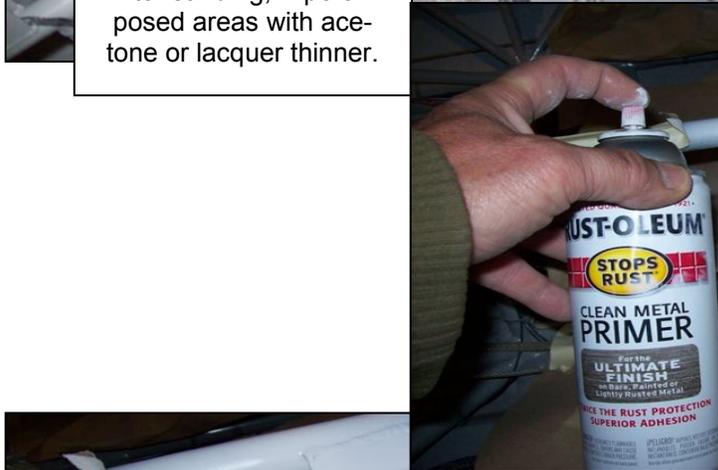
Temporarily place the seat pans in position (one at a time) and drill through the center bushing and through each seat pan as a means of “marking” the bushing location that will need to protrude through the seat pan.



Step 8: Prime and Paint the Bushing Assemblies



Sand and remove all weld scale and charred paint.



After sanding, wipe exposed areas with acetone or lacquer thinner.



Tape and paper surrounding areas.

Shoot primer inside brackets.

Spray all exposed metal with primer.



Use a small paint brush or make-shift "rag brush" to wipe primer on underneath side of lower tube.



After primer is dry, use cage gray touch-up paint to complete cosmetic painting.

Step 9: Tension and Safety the Control Cables

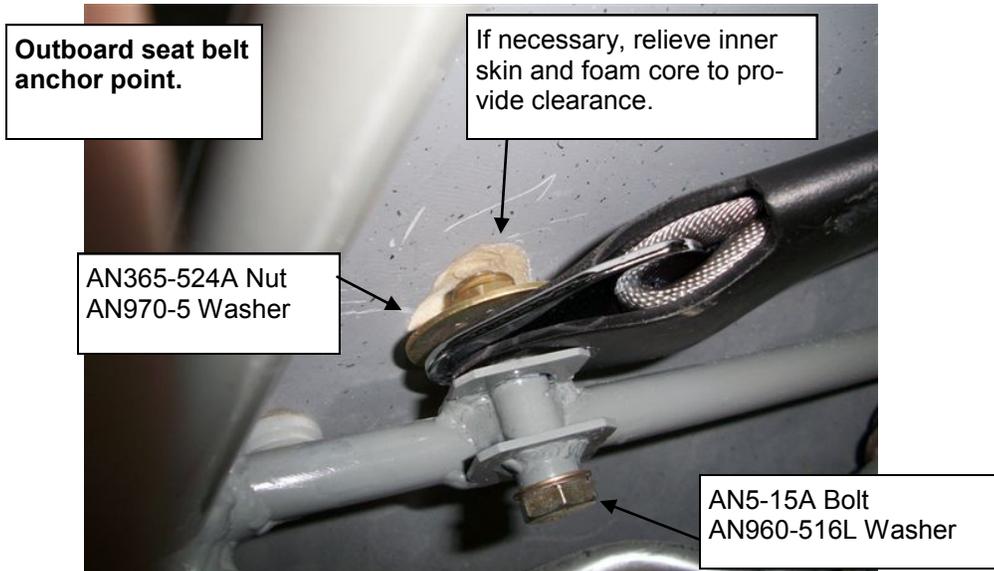
Re-assemble the control system turn barrels to the positions previously marked and insert MS21256-1 safety clips or safety wire to secure them.



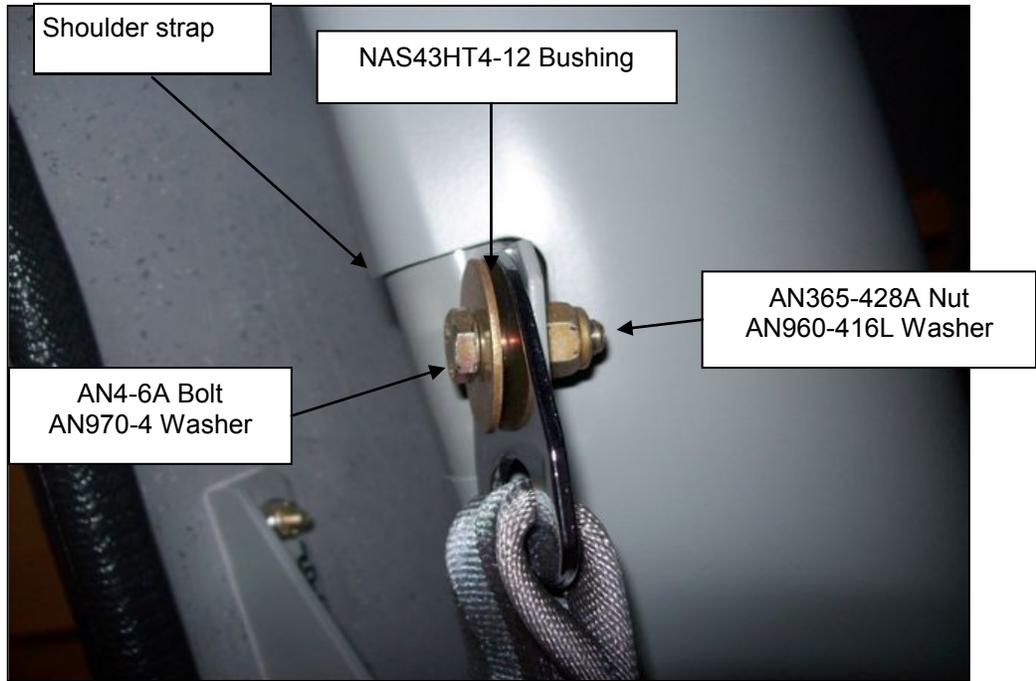
Step 10: Attach the Shoulder Strap and Outboard Seat Belt



Note: Plastic sleeves are provided in the new seat belt and inertia reel kits to protect the belts and keep them conveniently positioned. Install the sleeves on the belts prior to attachment to the anchor points.



Upper shoulder strap anchor point

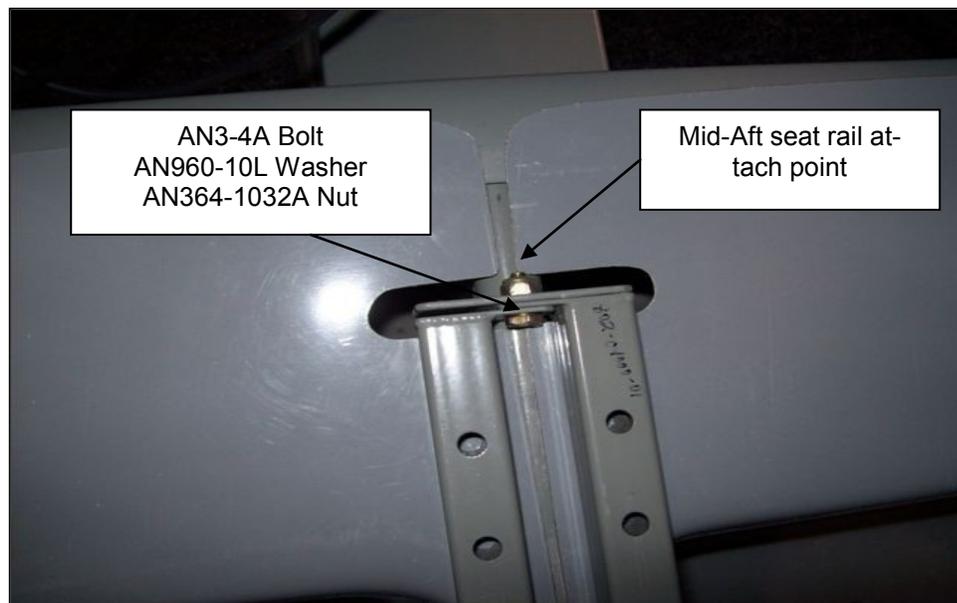


If you have purchased the inertia reel kit, the original shoulder strap anchor tabs located on the vertical truss tube at the door openings may be carefully removed. Use an abrasive cut-off wheel to remove the tab, leaving the weld bead, then carefully file the weld bead down to the original tube outer diameter. Do not file, cut or nick the original tube below the original diameter.

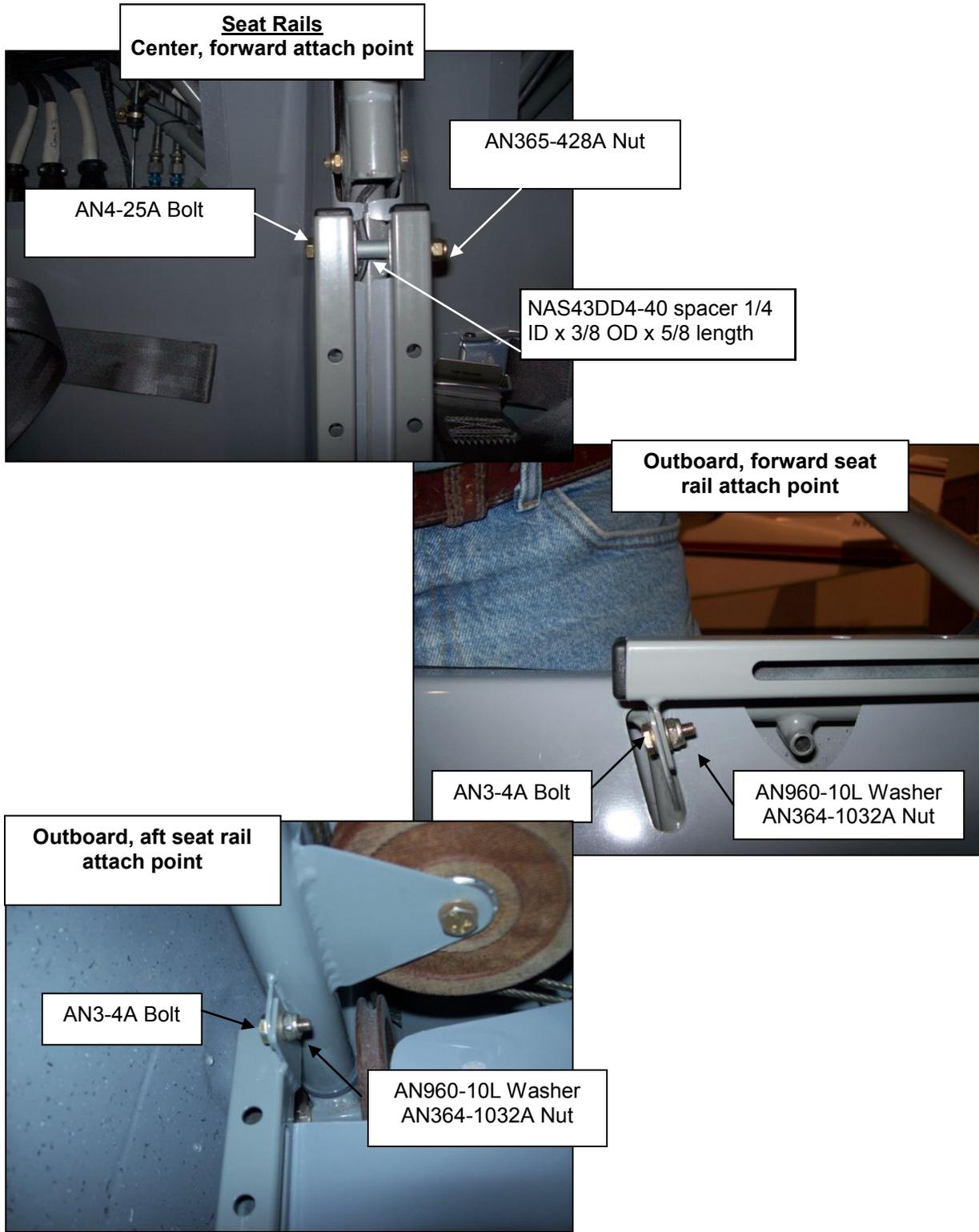
Step 11: Install Seat Pans and Seats

Remove all paper, tape, and perform a thorough cleaning of the cabin area and floor.

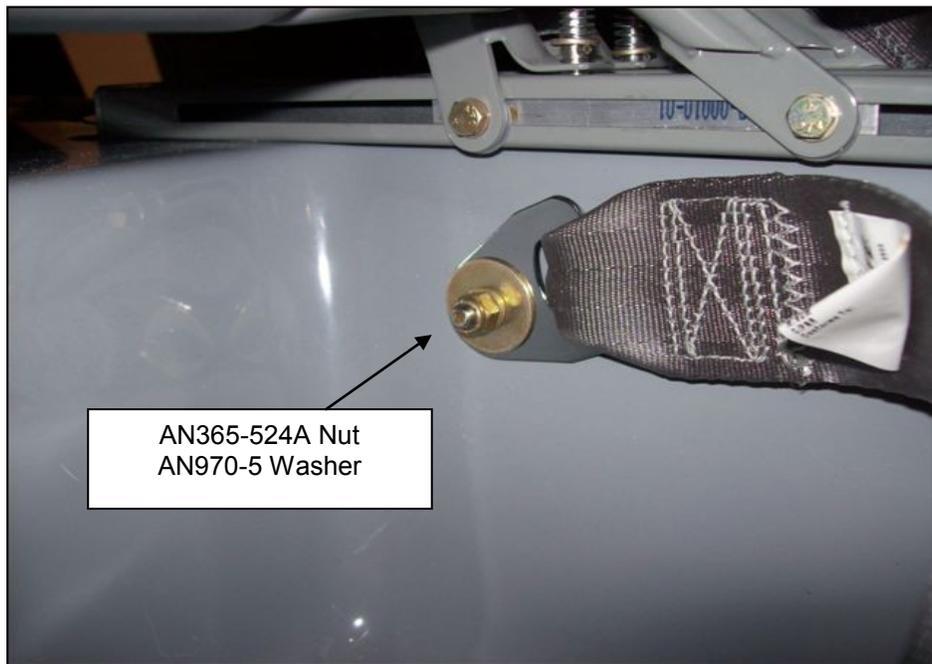
Carefully inspect the cage, wires, and controls prior to re-installing the seat pans. Verify the elevator and rudder control cables are tensioned correctly and secured. Observe that all cables are free and function normally throughout their respective travel limits.



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Step 12: Install the Center Seat Belts



Step 13: Install Aft Tunnel Cover

Install the aft control cable tunnel cover and seat cushions to complete the job.

