Supplement–Installing the Cabin Door

S.1 Introduction

Installing the cabin door requires one person inside the fuselage and a second person on the outside. The installation starts with a thorough prefit with just the doorframe and next with both the doorframe and door. This process requires the door assembly to be installed and removed several times, depending on the amount of trimming required to obtain a satisfactory fit. Do not trim any more than is necessary.

After the prefit is completed, the door assembly is prepared for bonding. All the bolts, spacers and shims are replaced and the epoxy/flox is applied.

Steps to Completion

- Remove the door from the doorframe.
- Prefit the doorframe to the fuselage and trim as necessary.
- Fit the door into the doorframe and adjust the fit.
- Insert bolts, spacers and shims as needed.
- Open and close the door to verify that it works smoothly and does not bind.
- Bond the door assembly in place using the same bolts, spacers and shims.

Before You Start

The top and bottom fuselage must be prefit and clecoed together.

Parts and Supplies

A specific parts list is not included with this document. Any of the parts used for the prefit are temporary and you should have them on hand. We recommend that you have the following supplies on hand before starting these instructions.

- both slow Jeffco and fast Jeffco epoxy
- tongue depressors
- packing and duct tape
- refillable caulking tubes

A Word about Sanding and Cleaning

The instructions in this chapter refer to preparing a surface or preparing a bonding area. When we recommend preparing a surface or a bonding area, we expect each of the following steps to be completed every time.

1. Sand the area using 40-grit sandpaper.
2. Vacuum all sanded areas.
3. Clean all sanded surfaces with Acetone.

S.2 Construction Procedures

S.2.A Fitting the Doorframe

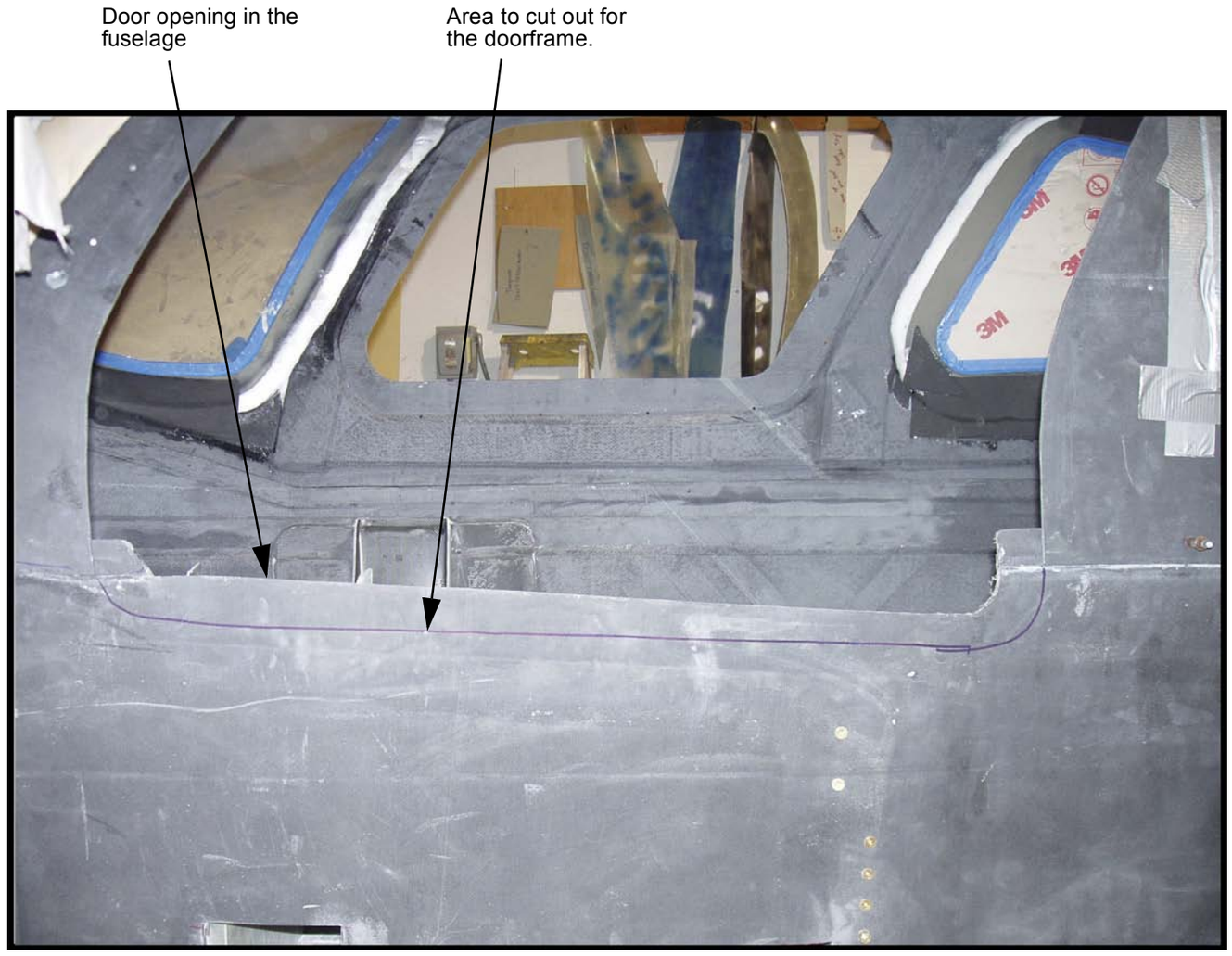
Before you can fit the cabin door, you need to remove the section of fuselage along the bottom of the door. First you will make a pattern of the doorframe and then you can trim the door opening in the fuselage.

Steps...

1. Remove the door from the doorframe.
2. Make a paper pattern of the doorframe and secure the pattern over the cabin door opening in the fuselage.
3. Mark the fuselage along the bottom of the pattern.
4. Remove the pattern and cut out the marked area.

   You may also need to trim the armrest supports inside the fuselage.

Figure S.2.A.1 Trim line on the fuselage for the cabin door



5. Fit the doorframe in the opening by aligning the two hinge pockets at the top.

   The doorframe hinge pockets need to fit up and into the fuselage hinge pockets.

6. Mark the fuselage hinge pockets for the trim area.

   Trimming the fuselage pocket at a 45° angle may be all that is needed to snugly fit the hinge pockets together. Mark only to the height that is needed to fit the hinge pocket. Refer to the blue mark in Figure S.2.A.2.

7. Check and mark the following areas for possible notching of the doorframe.
   - shear panel supports
   - gear box bracket

   Review the photographs on the next page for notching the doorframe. Do not make the notches any larger is necessary.

Figure S.2.A.2 Mating the fuselage hinge pocket to the doorframe hinge pocket

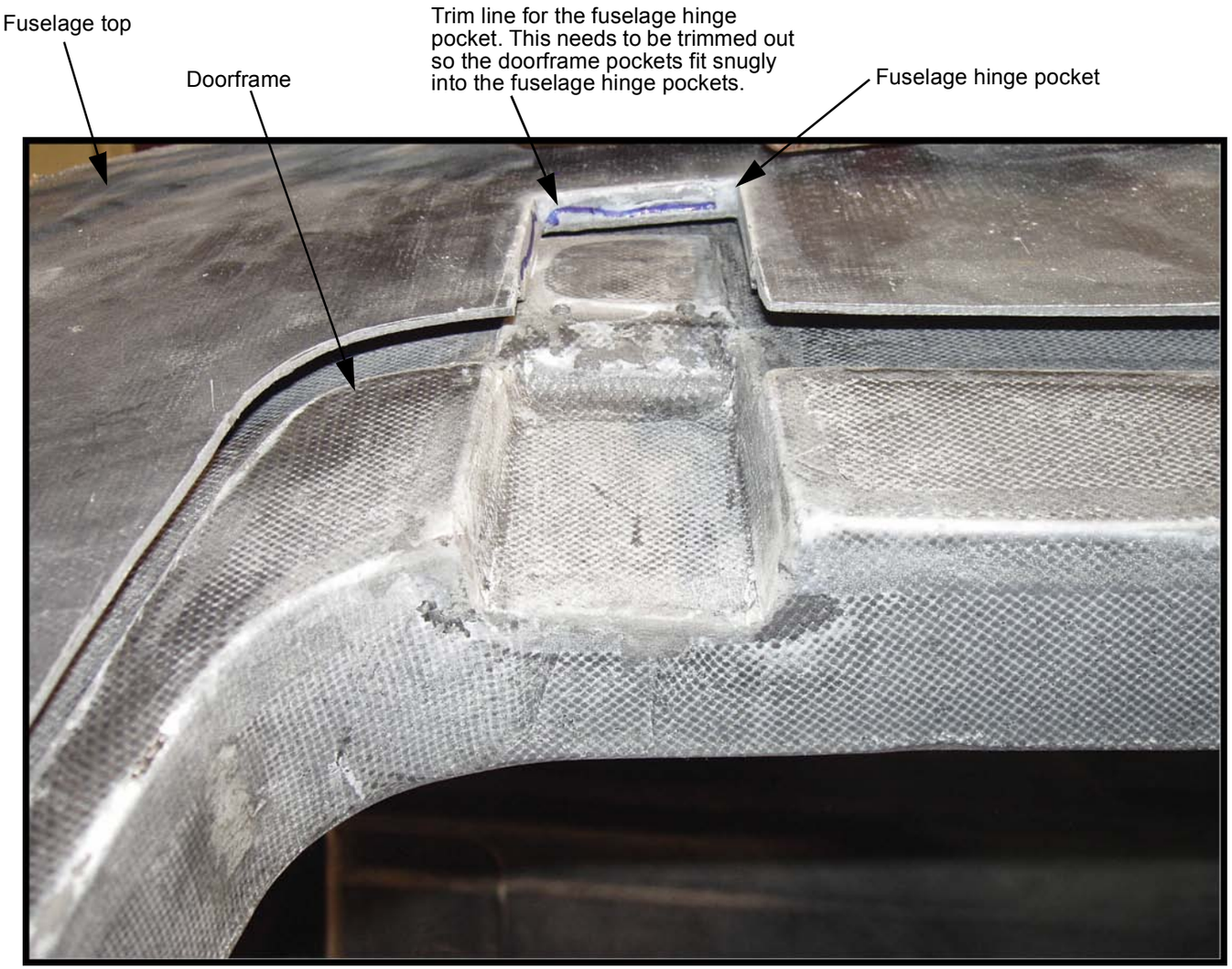
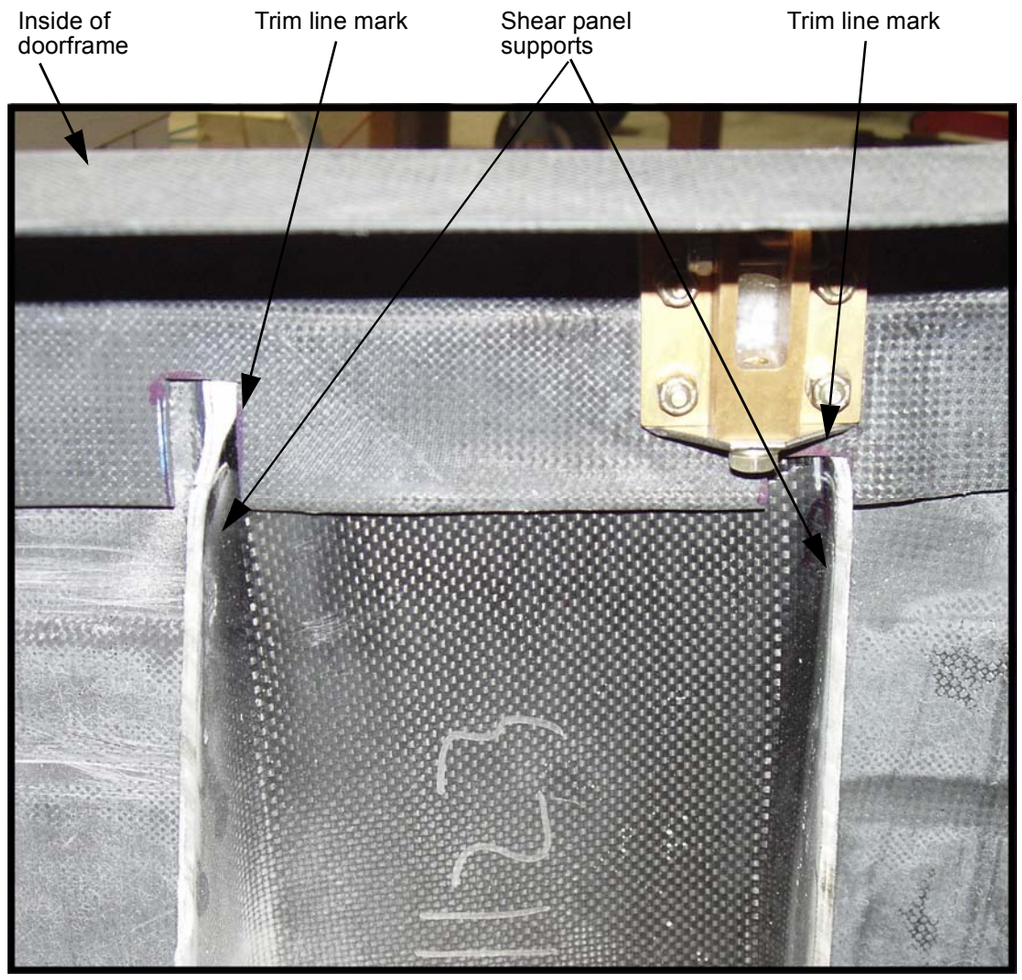


Figure S.2.A.3 Marking the doorframe for notching around the gear box corner bracket

Figure S.2.A.4 Marking the doorframe for notching around the shear box supports

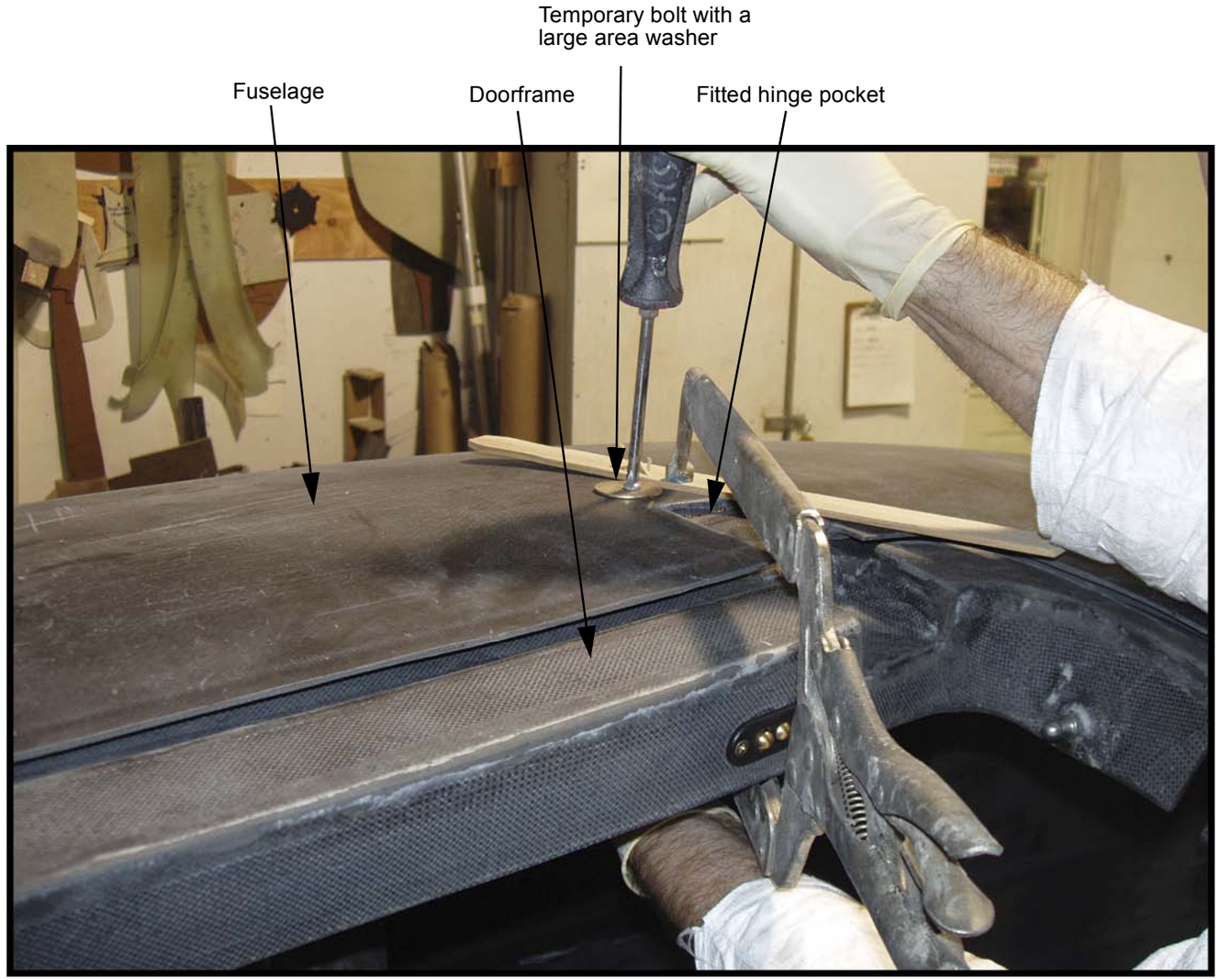


8. Remove the doorframe and trim the marked areas.
9. Fit the doorframe again.

   Continue this process of fitting, marking and trimming until the doorframe fits the fuselage.
10. Clamp the hinge pockets in place and check the fit of the doorframe.
    - doorframe hinge pockets need to fit snugly into the fuselage pockets
    - all corners of the doorframe need to fit the fuselage
    - doorframe joggle needs to fit with an even gap with the fuselage
11. Drill two 3/16” (4.5 mm) holes, one above each hinge pocket.
12. Insert a temporary bolt with a large area washer and tighten using a wing nut from inside the fuselage.

    Tip: We recommend the wing nuts because they are easier to loosen when the doorframe is removed.

Figure S.2.A.5 Doorframe fitted and clamped to the fuselage



S.2.B Fitting the Door

Now with the help of a second person you can fit the door into its frame.

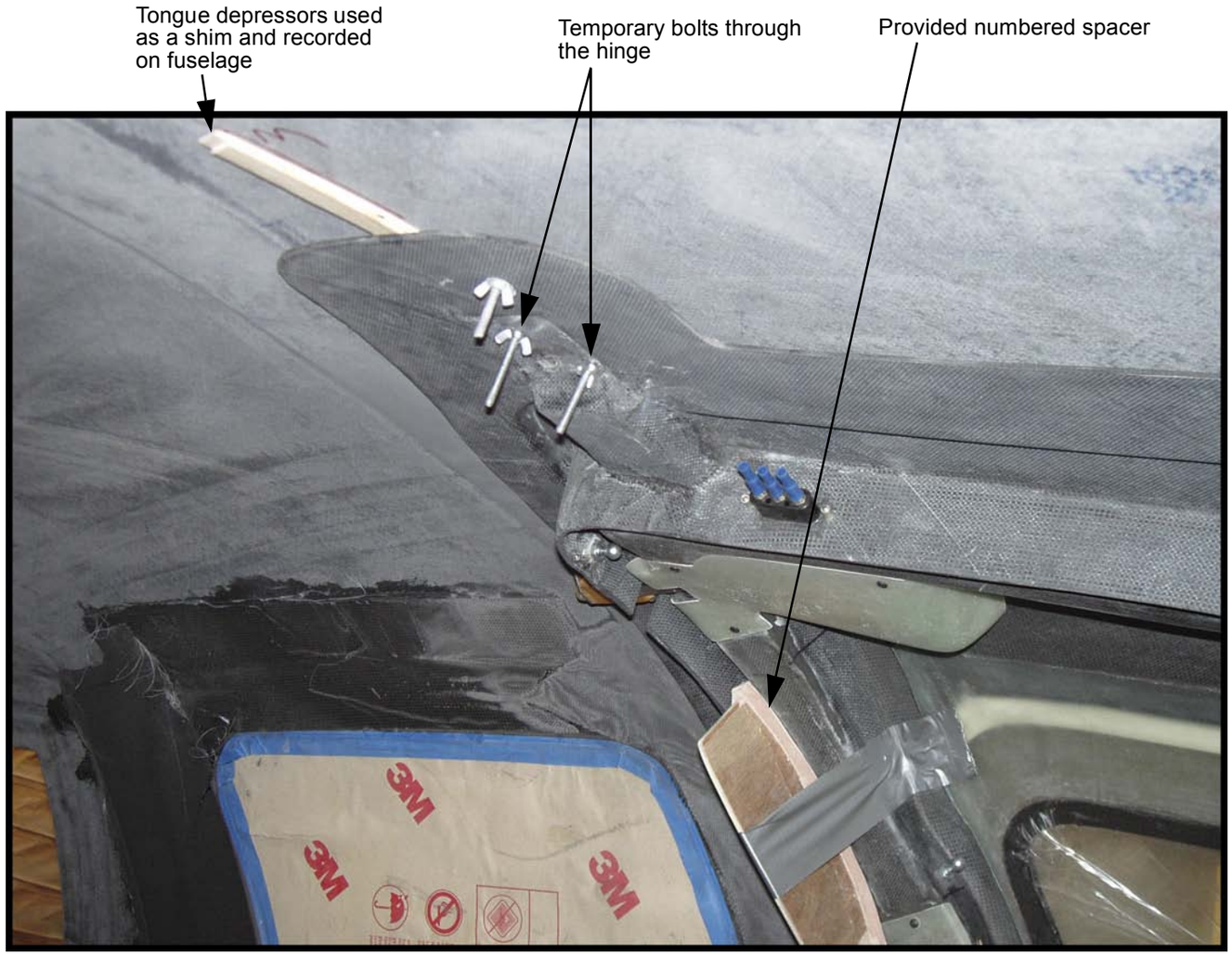
Steps...

1. Install the door by attaching the two top hinges with two temporary bolts per hinge.
2. Shut and latch the door.

   The gap should be as small as possible between the fuselage and the edge of the door.
3. Insert the four spacers that came with the door from inside the fuselage. Each numbered spacer needs to be inserted at the corresponding number on the inside of the doorframe.

   These four spacers are important for setting the proper gap for the door seal.
4. Use tongue depressors to shim other areas of the doorframe.

Figure S.2.B.1 Interior of fuselage after the door is reattached to the doorframe



5. Continue to adjust the door by securing the doorframe with two or three bolts. Select the locations where the fitting may be difficult but do not twist of force it out of shape.
   - Drill two or three 3/16” (4.5 mm) holes at different locations. Refer to Figure S.2.B.2 for possible locations.
   - Insert a temporary bolt with a large area washer and tighten using a wing nut from inside the fuselage.

   WARNING: Do not insert more bolts than you need. Too many bolts can tweak the door out of shape and it will not close properly. Four bolts is the most we recommend.
6. Loosen the bolts as necessary to allow the door to fit all the way around.

   A good fit meets the following criteria:
   - Door does not bind when it is opened. Check it for proper operation and do not stress the door.
   - Gap around closed door should equal at least the width of one tongue depressor.
   - The gap at the top of the door needs to be slightly larger to accommodate opening the door.
   - Align the door to fuselage surface should.

   To obtain a good fit:
   - Loosen the bolts as needed to allow the doorframe to recess level to the surface of the fuselage.
   - Tighten the bolts as needed to list the doorframe level with the fuselage’s surface.
   - Mark areas on the fuselage where the door to fuselage gap is too close and trim as necessary.
   - Use as many shims (tongue depressors) as needed on the inside to recess or lift the doorframe level with the fuselage’s surface.
   - Mark the inside of the fuselage where the shims are inserted and how many tongue depressors are used. See Figure S.2.B.1.

Figure S.2.B.2 Door reattached to the doorframe and fitting is in process

S.2.C Bonding the Doorframe to the Fuselage

In this section the bonding surfaces are prepared and the door is reinstalled and bonded to the fuselage. But only the doorframe and the fuselage top are bonded together. The bottom is not bonded until the fuselage top is permanently installed.

Steps...

1. Remove all the shims and bolts from the door fitting. Set them aside since they will be used again when bonding the door to the fuselage.
2. Remove the door first and then remove the doorframe.
3. Prepare all the bonding surfaces on the doorframe and the fuselage.
4. Tape or wax any areas that should not be bonded.

   These areas need to be protected so the door will open.

   - tape the edge of door
   - tape the corresponding edge on the doorframe
   - wax the hinges and latches

   This area needs to be protected so the door bottom does not bond to the fuselage.

   - cover the bottom fuselage where it meets the doorframe
5. Mix a thick batch of epoxy/flox.
6. Wet all bonding surfaces on the doorframe and the fuselage.
7. Apply the epoxy/flox to the doorframe joggle.
8. Carry the doorframe, with the flox on it, to the fuselage.
9. Refit the frame and insert all the bolts and shims.
10. Clean up any squeezeout on the inside or add more epoxy/flox in areas.
11. Wrap tongue depressors with clear tape and insert them in the joggle between the bottom and top fuselage. These will act like a dam to prevent the epoxy/flox from running down and bonding the lower doorframe.
12. Install the door into the doorframe.
13. Fill a plastic bag or caulking tube with the epoxy/flox mixture. From inside the fuselage, squeeze the mixture into any areas that need additional epoxy/flox.
14. Monitor the cure until it begins to get firm. From the exterior drag a tongue depressor around the perimeter of the door to create a small clearance between the door and the fuselage.

Steps after cure...

1. Remove the door. It may take some firm pressure to dislodge the door.
2. Sand any areas where there is excess squeezeout.

This completes the installation of the cabin door.

Now return to the section of the manual where you were working.

Figure S.2.C.1 Doorframe bonded to the fuselage