# GLASTAR SERVICE BULLETIN 4

## MANDATORY

**Subject:** Flap-Track Reinforcement

**Applicability:** All GlaStar kits shipped before publication of *GlaStar Assembly Manual* Revision B. The modifications described in this Service Bulletin will be standard for all subsequent GlaStar kits.

**Discussion:** This Service Bulletin requires reinforcement of the flap track guide arms where they mount to the flaps and the flap tracks themselves where they mount to the wings. The flap track guide arm reinforcements consist of skin doublers installed on both the upper and the lower surfaces of the flaps; the reinforcements for the flap tracks consist of aluminum angles that tie the flap tracks to the lower flanges of the aft spars.

**Note** We are currently ordering the parts needed to comply with this Service Bulletin. The parts will be sent free of charge to all builders who have already received their wing kits and will be added to the standard parts list for all subsequent wing kit shipments. We apologize for any delay this may impose on you, and we appreciate your patience. Be assured that we will ship the parts absolutely as soon as possible.

## Required Action:

### *Step 1: Reinforce the Flap Track Guide Arms*

Fabricate four skin doublers for each flap from .050" thick aluminum sheet, as shown in Figure 1. Make each doubler large enough to pick up 3 rivets through the nose ribs forward of the spar, 3 rivets through the aft ribs behind the spar and 4 rivets in the spar, as shown. Using standard procedures, radius all inside and outside corners of the doublers and provide a minimum edge distance of twice the rivet diameter to the centers of all holes. Bend the **upper-side** skin doublers to conform to the flap contour.

**Hint** To bend the doublers, rest them on a large (2" to 3") diameter pipe or bar, and then strike them with a soft hammer a short distance from the point of contact with the pipe. (A lead hammer works well.) Hammer back and forth across the width of the material, changing the contact point of the doubler with the pipe frequently to achieve a uniform bend.

To drill the #30 rivet holes, slip the formed doublers one at a time between the spar/rib framework and the flap skin, and use the holes in the skin as a guide. Be careful not to enlarge or elongate existing rivet holes in the flaps. Cleco as you go.

**Note** If you have already riveted the flaps together, you will first have to drill out the rivets where the doublers mount and then use a hole duplicator to locate the rivet holes in the doublers.

Use a **120° countersink** tool to countersink the rivet holes on the outside surfaces of both the top and bottom doublers.

**Note** You must use a 120° countersink to countersink the rivet holes for the 1/8" AACQ-42 and -43 structural flush rivets that secure the doublers to the flaps. **Do not** use the 100° countersink that you use for the standard, AN426 rivets. If you have difficulty locating a 120° countersink, you can order one from Stoddard-Hamilton; contact our order desk and request part number 081-02001-01.

Deburr all rivet holes and corrosion-proof the doublers on the sides that contact the flap skins.

When you rivet your flaps together, as described in Steps 53 through 58 of "SECTION VII: AILERON AND FLAP ASSEMBLIES," do not install any rivets where the doublers will go. As a last step in riveting your flaps, Cleco the doublers in place and rivet them to the flaps with 1/8" AACQ-42 and AACQ-43 structural flush rivets. Use the longer, -43 rivets where the doublers and the flap skins are secured to the flap spars; use the shorter, -42 rivets where the doublers and flap skins are secured to the flap ribs.

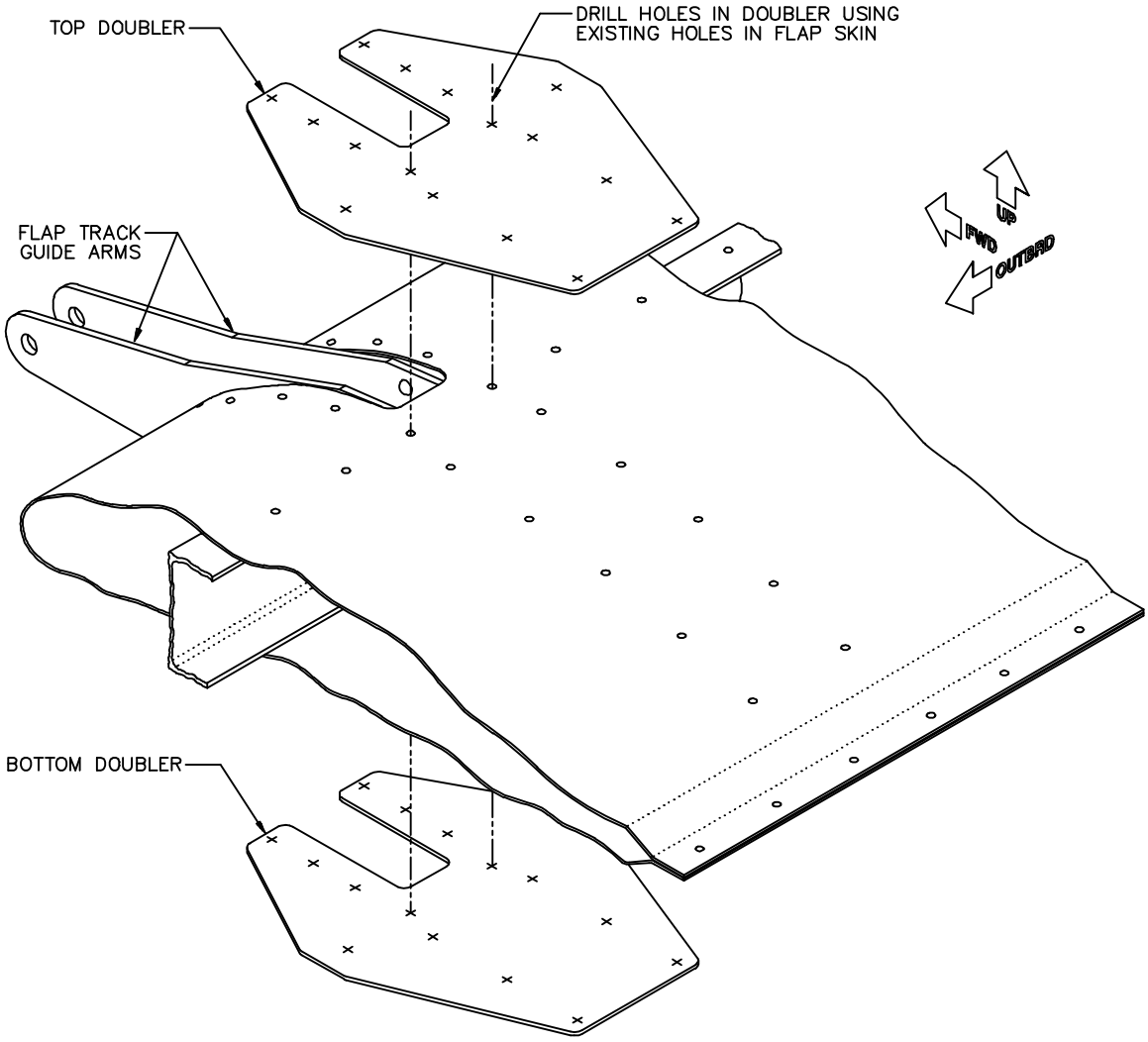



**Figure 1: Flap Skin Doublers**

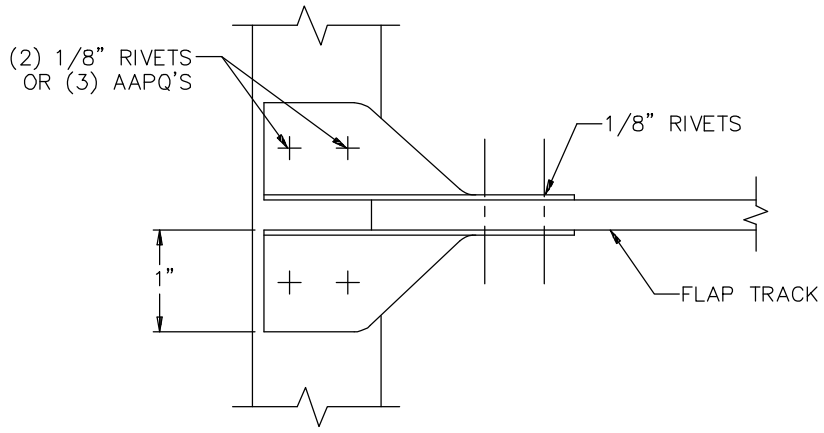
## *Step 2: Reinforce the Flap Tracks*

Fabricate two reinforcement angles for each flap track (eight total; four left-flange and four right-flange) from .063" X 1" X 1" extruded aluminum angle, as shown in Figure 2. Trim the legs of the angles that fasten to the flap track to a 3/4" width and shape them to eliminate interference with the flap track guide arms.

At each flap track location, make sure the flap track is square to the aft side of the spar when viewed from above. Hold a pair of reinforcement angles in place between the lower wing skin and the flap track, as shown. Clamp the angles to the flap track, and drill two **#30** holes through the vertical arms of the angles and the track in the locations shown in Figure 2, being careful to maintain the minimum edge distance (twice the rivet diameter) to the centers of the holes. These legs of the angles will be fastened to the flap tracks with 1/8" universal head rivets (AN470AD4).

The other, horizontal legs of the angles fasten to the lower flange of the aft spar with either two 1/8" universal head rivets (AN470AD4) or three 1/8" pull rivets (AAPQ-44), depending on space available to install the rivets.

For the inboard flap track, the rivets for the reinforcement angle on one side will be under one of the hat section stiffeners, as shown in Figure 3; these rivets must either be driven before the hat section is installed or pull rivets (AAPQ-44) must be used in this location.




VIEW LOOKING UP

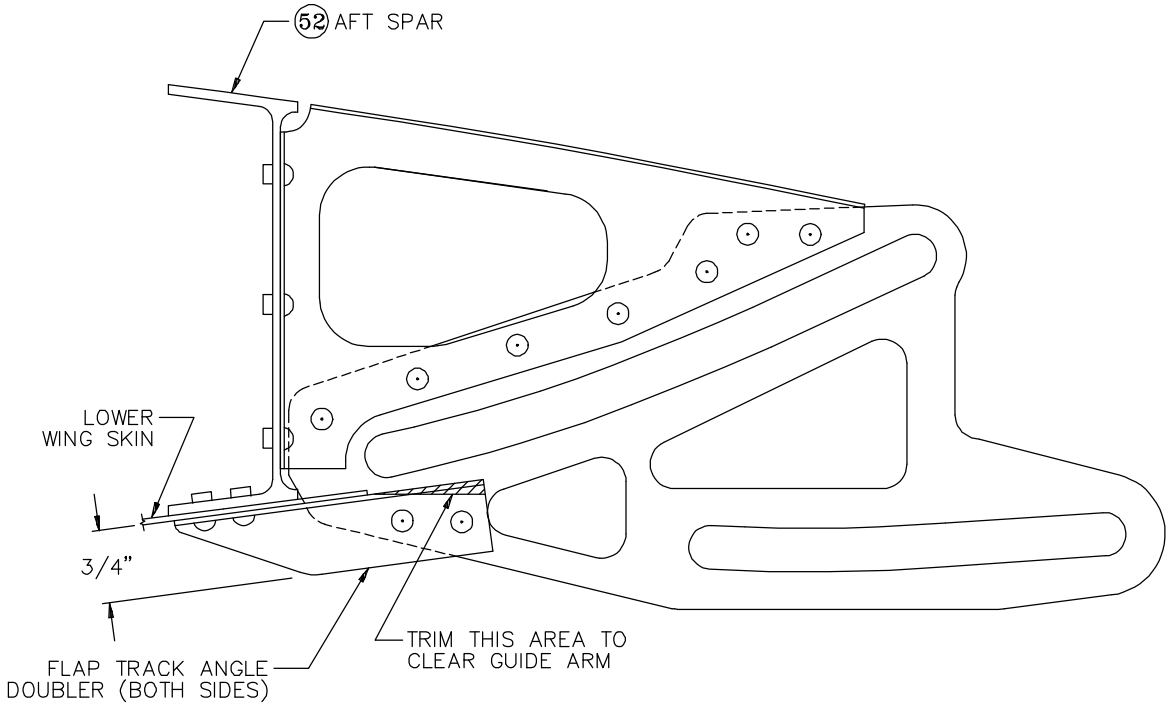



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**Figure 2: Flap Track Reinforcement Angles**

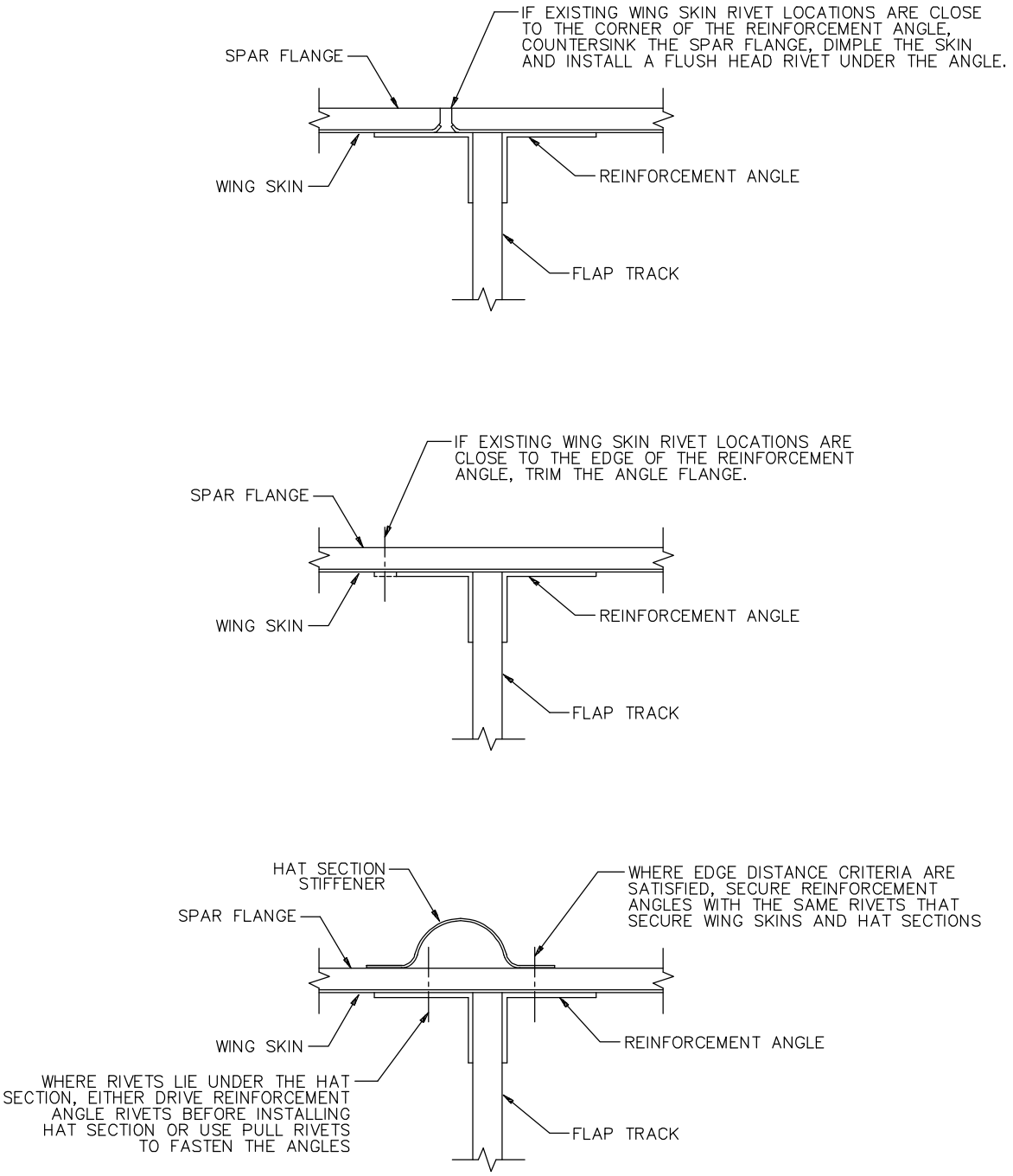


**Figure 3: Installing the Reinforcement Angles**

The reinforcement angles will also interfere with the locations of other rivets that fasten the lower main skin to the aft spar flange, as shown in Figure 3. Where the interfering rivet is near the **edge** of the angle's flange, trim the flange off to clear the rivet. Where the interfering rivet is close to the **corner** of the angle, countersink the spar flange, dimple the skin and use a flush rivet to fasten the skin at that location.

**Note** If the lower wing skins have already been riveted in place you will have to countersink both the spar and **the skin** to install a flush rivet near the corner of the reinforcement angle. This deviates from standard practices, but you have no other reasonable choice in this situation. The deviation from standards is not serious here, since riveting the angle in place on the outside of the skin reinforces the attachment of the skin to the spar.

The same rivets that secure the lower skin to the aft spar can be used to secure the reinforcement angles in locations where such rivets satisfy the minimum edge-distance criteria: twice the rivet diameter from the edge of the angle to the center of the rivet hole.