

patch to web with two rows of AN470AD5 rivets around the periphery of the cutout, spaced at 3/4 inch with a distance of 3/4 inch between rivet rows and maintain 5/16 inch minimum edge distance. A similar rivet spacing is shown for the web on Figure 2-4, and the type of patch on Figure B-3.

CAUTION

The above repair does not apply to the front spar inboard of Station 12, or the center spar outboard of Station 40.

2-25. DAMAGE TO WEB LIGHTENING HOLES REPAIRABLE BY PATCHING. (See Figure 2-5.) Clean out damaged area and burr edges. Cut reinforcement from .040 24ST alclad for front spar and .051 24ST alclad for center spar, allowing sufficient material for a 3/4 inch bent-up flange and proper edge distance on all rivets. Attach patch to spar web with AN470AD5 rivets spaced at an average of 3/4 inch with a minimum edge distance of 5/16 inch. There must be two rivet rows around each side of the break in the spar web. Damage or cracks to lightening holes not extending more than 4/3 the flange width may be repaired as shown in Figure B-6.

CAUTION

The above repair does not apply to the front spar inboard of Station 12, or the center spar outboard of Station 40.

2-26. DAMAGE REPAIRABLE BY SPLICING. (See Figure 2-4.) Cut out damaged area of the spar flange and web, removing all jagged edges and corners. Smooth all edges to remove burrs. Install splice repair using material, gages and rivets as shown in Figure 2-4. Install fillerstrips between spar caps and skin as necessary to attach skin to spar. This type of repair may be used for spanwise damage up to nine inches. Only one repair of this type is permitted to a spar on each side of the airplane centerline.

2-27. DAMAGE REPAIRABLE BY INSERTION. Damage to the front or center spars which exceeds approximately nine inches in a spanwise direction should be repaired by an insertion splice. The insertion member must be of the same gage, material and section as the existing structure. The insertion member must be spliced to the existing structure using the repair requirements shown in Figure 2-4. Damage to either extremities of the beams should be repaired by an extension splice. Only one insertion or extension splice is permitted on a spar on each side of the centerline of the airplane.

NOTE

Damage to the front spar inboard of Station 12, and the center spar outboard of Station 40 must be repaired by an extension splice.

2-28. DAMAGE NECESSITATING REPLACEMENT. Damage to the front and center spars which cannot be repaired by insertion requires the replacement of the spar. Any damage to stiffening angles, extrusions, fuselage attachment channels or fittings requires their replacement with identical parts or substitutes as listed in Section VIII.

2-29. REAR SPAR AND LOWER AFT WING SKIN.

2-30. DESCRIPTION. This spar is continuous from the airplane center line, Station 0, to the wing tip, Station 194-1/2. It is made by bending up the wing lower surface skin and flanging it to pick up the upper surface skin; .032 24ST alclad sheet is used between Stations 0 and 130, and .025 thickness outboard from Station 130 to 194-1/2. Flanged lightening holes and extruded angle stiffeners are introduced on the web between rib attachments.

2-31. NEGLIGIBLE DAMAGE. Smooth dents free of cracks and abrasions in the web and lower surface skin, one inch away from bends and lightening hole flanges may be disregarded, provided the dents do not exceed a depth of 1/8 inch and 1-1/2 inches in diameter and adjacent dents are at a distance of 15 inches. Dents exceeding the above limits and subsequently bumped back to contour without cracking or creasing the skin may be considered negligible damage. Scratches which do not penetrate beyond the alclad coating may be considered negligible damage. The spar effective flange is considered to be approximately one inch of web and one inch of skin adjacent to bends, and only dents free of cracks and abrasions which are worked back to contour are considered negligible damage.

2-32. DAMAGE TO LOWER SURFACE SKIN REPAIRABLE BY PATCHING, STATIONS 24.5 TO 130.0. Damage exceeding the specified limits of negligible damage to the lower surface skin portion of the rear spar, may be repaired by skin patches as described in Paragraphs 2-16 and 2-17 and shown in Figures B-1 and B-3. All riveting should be identical with Type II skin panels as described in Paragraph 2-12. The edge of the cut-out is restricted to 1-1/2 inches forward of the bend forming the rear spar.

2-33. DAMAGE TO LOWER SURFACE SKIN REPAIRABLE BY PATCHING, STATION 130.0 TO TIP. Damage exceeding the specified limits of negligible damage may be repaired as described in Paragraph 2-32, except all riveting shall be identical with Type I skin panels as described in Paragraph 2-11.

2-34. DAMAGE TO WEB OF REAR SPAR REPAIRABLE BY PATCHING, STATION 0 TO TIP. Damage to the rear web exceeding negligible damage and 1-1/2 inches clear of lightening holes and the bend forming the effective spar flange, may be repaired by a patch plate. Remove damaged area by cutting a circular or rectangular hole; minimum corner radii for rectangular cut-out 1/2 inch. Smooth all edges to remove burrs. Cut web patch from .032 24ST alclad and larger than cut-out to accommodate rivets to web with proper edge distance. Locate position of patch to provide equal overlap at all edges of cutout. Attach web patch to web with two rows of AN470AD5 rivets around the periphery of the cutout, spaced at 3/4 inch with a distance of 5/8 inch between rivet rows and maintain 5/16 inch minimum edge distance. This type of patch is shown in Figure B-3. Damage to the web at lightening holes may be repaired with a patch shown in Figure B-3. Clean out damaged area and burr edges. Cut patch larger than lightening hole and damaged area to permit riveting around the periphery of the lightening hole and damaged area. Attach patch on rear face of spar using rivet requirements as outlined above. Install an .032 x 3/4 x 3/4 24ST alclad angle stiffener on forward side of web and patch to replace stiffness of lightening hole flange. Attach with AN470AD4 rivets or CR-163C-4 cherry rivet to web and patch at one inch spacing.

2-35. DAMAGE TO REAR SPAR REPAIRABLE BY INSERTION, STATION 0 TO 130.0. Damage extending the width of the