

inch with 1/4 inch minimum edge distance. If the damage occurs over attaching structural members, pick up the existing rivet spacing throughout the damaged area. Trim the damaged area using a circular or rectangular cutout, use 1/2 inch corner radii on rectangular cutouts. Smooth all edges to remove burrs. If any beads occur in the damaged area, they must be replaced by .020 x 3/4 x 3/4 SAE 1020 steel angles, of the same length as the beads, and attached to the patch in locations equivalent to those occupied by the beads in the damaged area. Use AN470AD4 rivets spaced 3/4 inch on centers.

4-20. DAMAGED BULKHEAD FLANGES REPAIRABLE BY PATCHING. Damage of the 24ST flanges at the edges of the web which exceeds negligible damage must be repaired by a splice angle, of .040 24ST clad sheet. It should have equal legs 3/4 inch long and a 1/16 inch bend radius. This splicing angle, nested within the damaged flange, is secured by 16 AN470AD4 rivets, eight on either side of the break, i.e. four in each leg.

4-21. DAMAGED SPLICE ANGLE BETWEEN THE UPPER AND LOWER WEB REPAIRABLE BY PATCHING. Damage to the splice angle between upper and lower webs that exceeds negligible damage shall be repaired by adding a splicing angle of .040 24ST clad sheet, with equal 3/4 inch legs. This angle, nested within the damaged angle, is secured by 20 AN470AD4 rivets; 10 on either side of the break, five in the horizontal flanges of the angles and five in the vertical flanges, spaced approximately 1/2 inch apart.

4-22. DAMAGED VERTICAL CHANNEL SUPPORTING NOSE GEAR HOUSING REPAIRABLE BY PATCHING. Damage to the vertical channels, that support the nose gear housing, that exceeds negligible damage shall be repaired by adding a splicing channel or angle. The damaged area should first be trimmed, using at least a 1/2 inch radius at all corners of the trimmed area. The splicing member should be .064 24ST alclad. The repair member should be a nesting channel where the damaged member is a channel. The channel flanges are to be 3/4 inch wide and the web height 1.898 inches. It should be secured to the existing channel by 48 AN470AD4 rivets; six thru each flange and two rows of six rivets each thru the web on each side of the damaged area. Because of the difficulty in manufacturing a properly nesting channel, it is permissible to use two angles to make up the channel provided they are lapped at one of the two rows of rivets in the web. The splicing member should be an angle when the damaged member has the shape of an angle. The leg of the splicing member adjacent to the bulkhead web should be 3/4 inch long and the other leg shall be as long as the outstanding leg of the damaged angle. The splice angle should be secured to the damaged angle by 24 AN470AD4 rivets; six thru each leg on each side of damaged area. Maintain a 1/4 inch minimum edge distance and a minimum rivet spacing of 5/8 inch. If the damage is in the flange of the channel or angle that is adjacent to the bulkhead web, and is more than 1/2 inch long, place on .051 filler between the web and splice angle. Pick up any existing rivets through splice angle, filler and web.

4-23. FRAMES AT STATIONS 65.0 AND 77.0.

4-24. DESCRIPTION. The frames are made of .040 24ST alclad and their cross sections are channels. The frames are made in three sections and are spliced at the cockpit floor and the lower longeron.

4-25. NEGLIGIBLE DAMAGE. Bent flanges and dents free of cracks and abrasions, which are worked back

to their original shape, free of waviness, without cracking or creasing the frame may be classified as negligible damage. Scratches which do not penetrate beyond the alclad coating may be disregarded.

4-26. DAMAGE REPAIRABLE BY INSERTION. Damage exceeding a length of approximately six inches may be repaired by an insertion member and spliced as shown in Figure 4-3, or by replacement of the part which ever is more expedient.

4-27. FORWARD WING ATTACHMENT FRAME, STATION 93.438.

4-28. DESCRIPTION. The wing attachment frame is made of .064 24ST alclad material and is horseshoe shaped and of channel cross section. The front spar of the wing is attached to the frame by means of four bolts. The upper and lower fuselage longerons are spliced at this bulkhead.

4-29. NEGLIGIBLE DAMAGE. See Paragraph 4-25.

4-30. DAMAGE REPAIRABLE BY PATCHING. Damage that exceeds the limits of negligible damage must be repaired by patching. As the wing bears against the aft face of this frame, all splices or patches must be on the forward side; also the web rivets must be countersunk on the aft side. To repair the lower half of the frame where the wing is on the aft side, will necessitate removing the wing. Repairs to this frame where the depth of the section is less than 1-3/4 inches shall be accomplished by two angles, making up a channel section and nesting inside the forward face of the frame. The angle flange adjacent to the frame flange is 3/4 inch, the flange adjacent to web should be of a width equal to the inside depth of the section, but trim back the lipped edges to prevent encroaching on the bend radii. The .064 24ST alclad angles are lapped, picking up the two rows of rivets in the web. The angles are attached with a single row of five AN470AD5 rivets thru each frame flange and by two rows of five AN426AD5 rivets thru the web each side of the damage, resulting in 20 rivets each side of the damaged area. Space all rivets at 5/8 inch with approximately 5/8 inch between web rivet rows. Figure 4-3 shows a similar type of repair.

#### NOTE

Rivets thru the web, for repairs occurring above the wing, may be AN470AD5 rivets.

Where the channel widens and the damage is restricted to the web and is at least 3/4 inch from bend radii after trimming, a .064 24ST alclad plate patch may be used. The patch plate should be of sufficient size to permit a single row of rivets at 5/8 inch spacing on two sides of the damaged area, parallel and adjacent to the flanges. Four rows of rivets spaced at 5/8 inch and with 5/8 inch between rows are required on the two other sides of the damaged area, and these rows are perpendicular to the flanges. All rivets are AN426AD5, countersunk on the aft face of the web and have a minimum edge distance of 5/16 inch. Complete damage to the cross section in the wide portion of the frame is repaired by two angles, making up a channel section and nesting inside the forward face of the frame. The angle flanges adjacent to the frame flanges are 3/4 inch. The flanges adjacent to the web should be of sufficient width to permit overlapping for a distance of two rivet rows. The repair angles are made from .064 24ST alclad. The angles are attached with a single row of five AN470AD5 rivets thru each frame flange, each side of the damage. The web is riveted with AN426AD5 rivets with five