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**DEPOT MAINTENANCE  
WORK REQUIREMENT  
FOR  
  
ALL H-1 SERIES  
TAILBOOM STRUCTURAL ASSEMBLIES**

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**THIS PUBLICATION IS A REPRINT OF DMWR 55-1560-222, DATED 15 NOVEMBER 1973,  
INCLUDING CHANGES 1 THROUGH 6.**

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**US ARMY AVIATION  
AND MISSILE COMMAND  
15 NOVEMBER 1973**



CHANGE  
NO. 6

CHQSOFTWARE

U.S. ARMY AVIATION AND MISSILE COMMAND  
REDSTONE ARSENAL, AL 35898-5000  
18 June 2002

## Depot Maintenance Work Requirement

### AII H-1 SERIES TAILBOOM STRUCTURAL ASSEMBLIES

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#### REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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#### ENVIRONMENTAL/HAZARDOUS MATERIAL INFORMATION

This document has been reviewed for the presence of Class I Ozone Depleting Chemicals. As of change 5, 30 November 1992, all references to Class I Ozone Depleting Chemicals have been removed from this document by substitution with chemicals that do not cause atmospheric ozone depletion.

DMWR 55-1560-222, 15 November 1973, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

#### Remove pages

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i and ii  
1-1 and 1-2  
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2-13 through 2-18  
2-18.1/(2-18.2 blank)  
3-3 through 3-6  
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3-7 and 3-8  
3-27 and 3-28

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a and b  
A through C/(D blank)  
i and ii  
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FOR THE COMMANDER:

EDWARD L. STONE  
*Colonel, OD*  
*Chief of Staff*

OFFICIAL:



JOHN E. MCCLURE  
*Director*  
*Maintenance Directorate*  
*Integrated Materiel Management Center*



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**WARNING****PRECAUTIONARY DATA**

Personnel performing operations, procedures, and practices which are included or implied in this work requirement shall observe the following warnings. Disregard of these warnings and precautionary information can cause serious injury, death, or destruction of material.

**CLEANING SOLVENTS**

Cleaning solvents may be toxic. Use in well-ventilated areas. Avoid prolonged inhalation of fumes or direct contact with skin. Do not use solvents near open flames or in areas where very high temperatures prevail. Solvent flash point must not be less than 100°F (37.8°C).

**COMPRESSED AIR**

Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi and only then with an effective chip guarding and personnel protection equipment.

**FLIGHT SAFETY PARTS**

This manual contains procedures identifying critical characteristics of flight safety parts. Critical characteristics may be identified as dimensions, tolerances, finishes, materials, assembly, or inspection procedures. Some processes may require qualified sources. Flight safety parts indicating a maximum allowable limit shall not be continued in use when limits have been exceeded. These parts must be replaced.

**ACETONE**

Acetone is flammable and toxic to eyes, skin and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas or use approved respirator as determined by local safety/industrial hygiene personnel. Keep away from open flames, sparks, hot surfaces or other sources of ignition.

**ISOPROPYL ALCOHOL TT-I-735**

Isopropyl alcohol is flammable and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas or use approved respirator as determined by local safety/industrial hygiene personnel. Keep away from open flames, sparks, or other sources of ignition.

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**WARNING****ELECTRON DIELECTRIC SOLVENT**

Electron is combustible and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas. Use approved organic vapor respirator, with dust and mist filter, if exposed to vapor mist. Keep away from open flames or other sources of ignition.

**N-PROPYL BROMIDE**

n-Propyl Bromide is toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in areas with adequate mechanical or local exhaust ventilation or use approved respirator as determined by local safety/industrial hygiene personnel.

**DS-108**

DS-108 is combustible, reactive with strong oxidizers, and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas or use approved respirator as determined by local safety/industrial hygiene personnel. Keep away from open flames or other sources of ignition. Do not mix or cross-apply with other cleaners or chemicals.

**POSITRON DIELECTRIC SOLVENT**

Positron is combustible and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas. Use approved organic vapor respirator, with dust and mist filter, if exposed to vapor mist. Keep away from open flames or other sources of ignition.

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## LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with regulations.

NOTE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

Original	15 November 1973	Change 4	28 February 1992
Change 1	15 April 1974	Change 5	30 November 1992
Change 2	01 November 1974	Change 6	18 June 2002
Change 3	15 January 1987		

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NO. DMWR 55-1560-222

CHQSOFTWARE.COM US ARMY AVIATION AND MISSILE COMMAND  
REDSTONE ARSENAL, AL 35898-5000  
15 NOVEMBER 1973

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## CHAPTER 1 INTRODUCTION

### Section I. GENERAL

**1-1. Purpose.** This Depot Maintenance Word Requirement (DMWR) contains all the information necessary for the modification, repair, and overhaul of H-1 series tailbooms.

**1-2. Scope.** This DMWR establishes requirements for disassembly, cleaning, inspecting, repair, reconditioning, rehabilitation, modification, reassembly, servicing, testing, shipping and storage of the following H-1 tailbooms.

<u>Part Number</u>	<u>National Stock Number</u>
204-030-800-13	1560-00-605-5099
204-030-800-249	1560-00-875-1438
204-030-800-289	1560-00-911-4802
204-030-800-297	1560-00-475-2531
204-030-800-311	1560-00-980-9426
204-030-800-369	1560-00-075-3382
204-030-800-395	1560-00-021-3635
204-030-800-441	1560-00-759-9934
204-030-800-465	1560-00-909-7061
204-030-800-447	1560-00-872-7845
204-030-800-471	1560-00-918-1524
204-030-800-473	1560-00-918-1525
204-030-800-469	1560-00-908-1643
205-032-800-1	1560-00-754-7417
205-032-800-101	1560-01-160-6623
205-032-800-3	1560-00-736-0575
205-032-800-5	1560-00-908-0687
205-032-800-11	1560-00-133-9442
205-032-800-15	1560-00-133-6211
205-032-800-57	1560-00-879-0851
205-032-800-71	1560-00-483-1273
209-030-800-1	1560-00-986-6291
209-030-800-3	1560-00-877-6517
209-030-800-5	1560-00-135-0312
209-030-800-7	1560-00-183-5972
209-030-800-9	1560-00-119-1166
209-030-800-11	1560-00-179-1262
209-030-800-15	1560-00-181-4784

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*a. Worn or Defective Parts.* Parts, components, subassemblies, or assemblies found worn or defective beyond the repairable limits established by this DMWR will be condemned and disposed of as directed.

*b. Repair or Rehabilitation and Reconditioning.* The repair or rehabilitation and reconditioning of equipment and components specified herein shall be accomplished in accordance with specific instructions set forth in this DMWR. Tolerance and limits set forth herein are the minimum acceptable standards. Any repair procedure developed by the overhaul facility and not specified herein shall be subject to approval by the Contracting Officer or his/her designated representative.

#### NOTE

When manufacturing tolerances apply, this DMWR will not list these tolerances.

**1-3. Maintenance Forms and Records.** Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-751 and in the appropriate contractual documents.

#### 1-4. Deviations and Exceptions.

##### *a. Contractors.*

(1) These instructions are for use by contractor personnel. They apply to requests for work deviations and exceptions and take precedence over similar procedures specified in the applications Depot Maintenance Work Requirement (DMWR). Care must be taken to assure that all active AMCOM Engineering Directives (AEDs) relevant to the DMWR have been considered.

(2) When any work segment as set forth in this Depot Maintenance Work Requirement (DMWR) cannot be accomplished or can be accomplished only in a manner other than specified, the contractor shall submit a Request for Depot Engineering Support (AMSAT-I-M Form 1379, located in the back of this manual), through the Contracting Officer to AMSAM-MMC-VS-EC with a copy to AMSAM-MMC-BM-D. The request shall state the problems, the reason for urgency, and give the specifics listed below:

(a) Serial Number (SN), if applicable, Part Number (PN), and National Stock Number (NSN) of the affected equipment.

(b) Work elements which will not be completed or which will not be accomplished as specified herein.

(c) Reason for non-accomplishment or deviation.

(d) Action taken to correct the condition causing non-accomplishment or need for deviation.

(e) Data relative to non-availability of parts required, if applicable.

(f) Estimated man-hours.

(g) Instructions and inspection required to maintain the integrity of the end item because of such omission or deviation.

(h) For Reporting of Errors submittal, refer to Table of Contents of this publication. Provide a copy of the DA Form 2028-2, located in the back of this manual to AMSAM-MMC-VS-EC.

*b. Depots Defects* shall be processed in accordance with DESCOM-R-702-1.



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## Section II. DESCRIPTION AND DATA

## 1-5. Description.

a. *Tail Boom Structure.* See Figure 1-1 thru Figure 1-4.

(1) The tailboom is of semi-monocoque construction, consisting of continuous longerons and stringers, and longitudinally stiffened thin skins. The skins and longitudinal members are supported by bulkheads located at approximately 21 inches spacing, except in the aft redistribution area 194.30 and aft (Boom Station). In this region, load distribution bulkheads are required to transfer loads from the vertical fin to the basic tail boom structure.

(2) The forward redistribution area of the tail boom is utilized to redistribute tail boom loads into the midsection of the fuselage by means of four attachment bolts. These four bolts and associated fittings must transmit all axial tension and compression loads due to bending, and all transverse and torsional shear loads. Tail boom bulkheads in this area are utilized to connect and support the primary tail boom structure. Only the four longerons are considered effective in bending. Due to these bolt locations, the longerons and continuous stringers are effective due to the shear redistribution capability of the forward redistribution area.

(3) The basic tail boom structure is utilized to transfer loads forward to the fuselage. The four longerons and all other bending elements are considered effective except for those below the lower longerons, which are not continuous due to the presence of inspection doors. These doors are considered to be basic structure and should always be in place for all helicopter operations.

(4) The aft redistribution area (Figure 1-1 thru 1-4, BS 194.30 to BS 227.00) introduces loads from the vertical fin into the basic tail boom structure. At the aft bulkhead at BS 227.00, rear spar and trailing edge member axial loads and shears are introduced at BS 206.17. A canted bulkhead (which is actually a continuation of the fin front spar) introduces loads from the fin front spar. Angles along the top of the tail boom between the two bulkheads introduce shear into the boom. Standard longeron and stringers are utilized aft to the canted bulkhead at BS 206.17. Aft of this bulkhead only stringer sections are used except for two channel sections running along the bottom of the tail boom (used to introduce high fore and aft loads at the base of bulkhead at BS 227.00). Although the bending elements are not physically continuous through the canted bulkhead, they are considered structurally continuous due to the skin panels overlapping in this area. The skin panels in this area are of higher gauge than any other tail boom section. This is required due to the load magnitudes and directions that must be transferred from the fin to the tail boom. The intermediate gear box for the tail rotor drive system is mounted on top of the tail boom, just forward of the canted bulkhead.

b. *Vertical Tail Fin.* The vertical tail fin is utilized to provide the support structure and load paths for the loads imposed by the tail rotor, and aerodynamic loads produced. The tail rotor is attached to the forward upper tip of the tail fin with a tail rotor gear box support fitting. The aerodynamic pressure loading is distributed over the entire surface of the tail fin. The basic bending elements of the tail fin are a front spar, an aft spar, rib structure, and trailing edge structure. The spars are basic built-up angle chords with sheet metal webs. The trailing edge structure connects the left and right hand skin panels together. The tail rotor gear box support fitting is attached directly to the front spar. Two ribs, one above FS 5.08 and one below the fitting at FS 10.08, are required to distribute the loads to the rest of the tail fin structure. Shear and torsion loads are reacted by the two-cell torque box formed by the above mentioned elements. The rib structure serves as panel stiffeners and load introduction members.

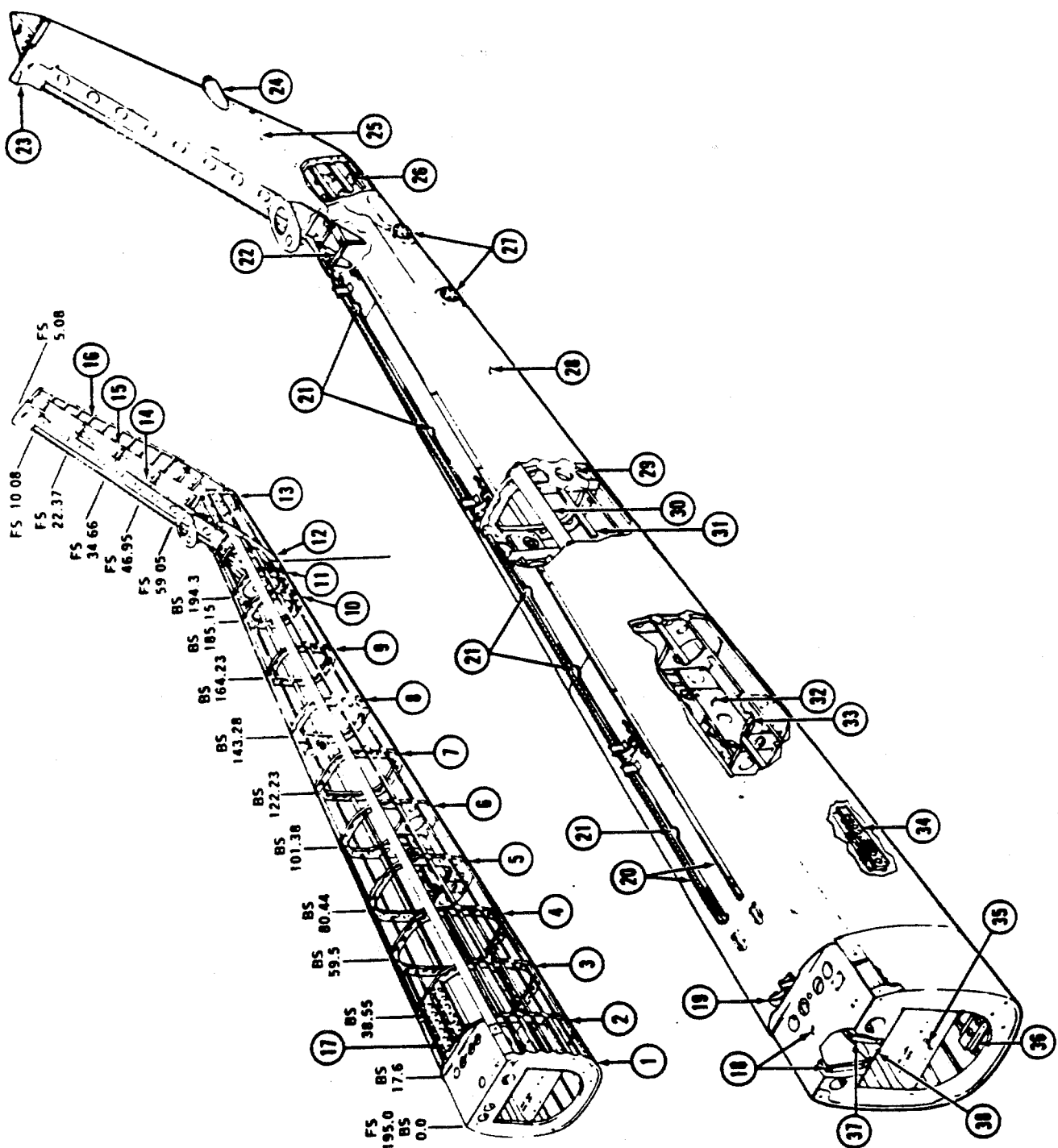


Figure 1-1. 204-030-800-469 tail boom (Sheet 1 of 2)

INDEX	NOMENCLATURE
1	Bulkhead
2	Bulkhead
3	Bulkhead
4	Bulkhead
5	Bulkhead
6	Bulkhead
7	Bulkhead
8	Bulkhead
9	Bulkhead
10	Bulkhead
11	Bulkhead
12	Bulkhead
13	Bulkhead
14	Fwd Spar
15	Aft Spar
16	Rib Inst
17	Support Installation
18	Support Installation
19	Fitting Installation
20	Support Angle Installation
21	Fairlead Support Installation
22	Support Installation
23	Support Fitting
24	Fairing Installation
25	Vertical Fin Assembly
26	Vertical Fin Stringers
27	Antenna Support Installation
28	Skin Requirements
29	Elevator Support Installation
30	Longerons
31	Stringers
32	Support Installation
33	Bracket Installation
34	Support Installation
35	Shelf Installation
36	Shelf Installation
37	Bracket Installation
38	Pad Installation

Figure 1-1. 204-030-800-469 tail boom (Sheet 2 of 2)

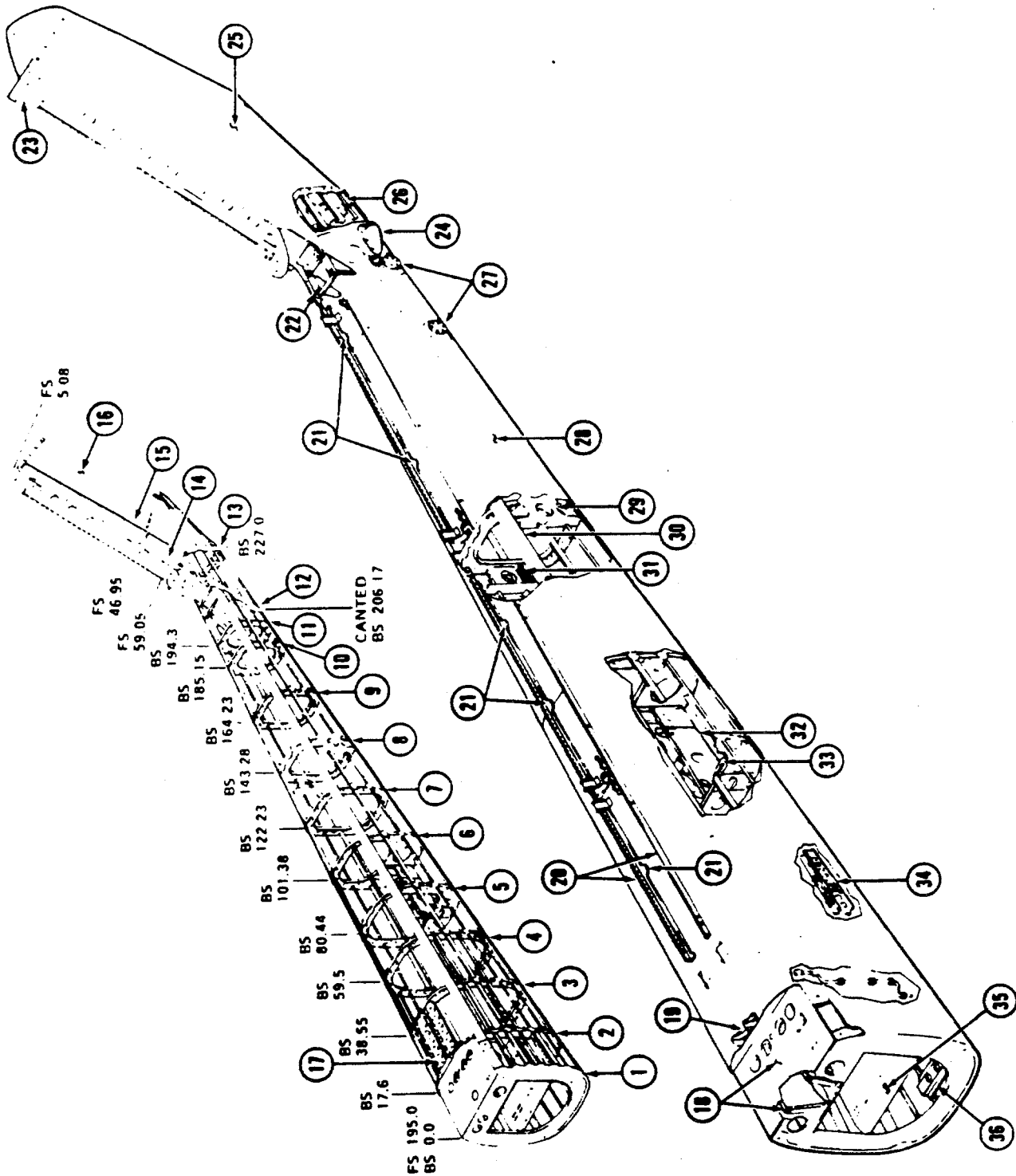


Figure 1-2. 204-030-800-491 tail boom (Sheet 1 of 2)

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INDEX	NOMENCLATURE
1	Bulkhead
2	Bulkhead
3	Bulkhead
4	Bulkhead
5	Bulkhead
6	Bulkhead
7	Bulkhead
8	Bulkhead
9	Bulkhead
10	Bulkhead
11	Bulkhead
12	Bulkhead
13	Bulkhead
14	Fwd Spar
15	Aft Spar
16	Rib & Support
17	Support Installation
18	Support Installation
19	Fitting Installation
20	Support Angle Installation
21	Fairlead Support Installation
22	Support Installation
23	Support Fitting
24	Fairing Installation
25	Fin Installation
26	Vertical Fin Stringers
27	Antenna Support Installation
28	Skin Requirements
29	Elevator Support Installation
30	Longerons
31	Restrictor Installation
32	Support Installation
33	Bracket Installation
34	Support Installation
35	Shelf Installation
36	Shelf Installation

Figure 1-2. 204-030-800-491 tail boom (Sheet 2 of 2)

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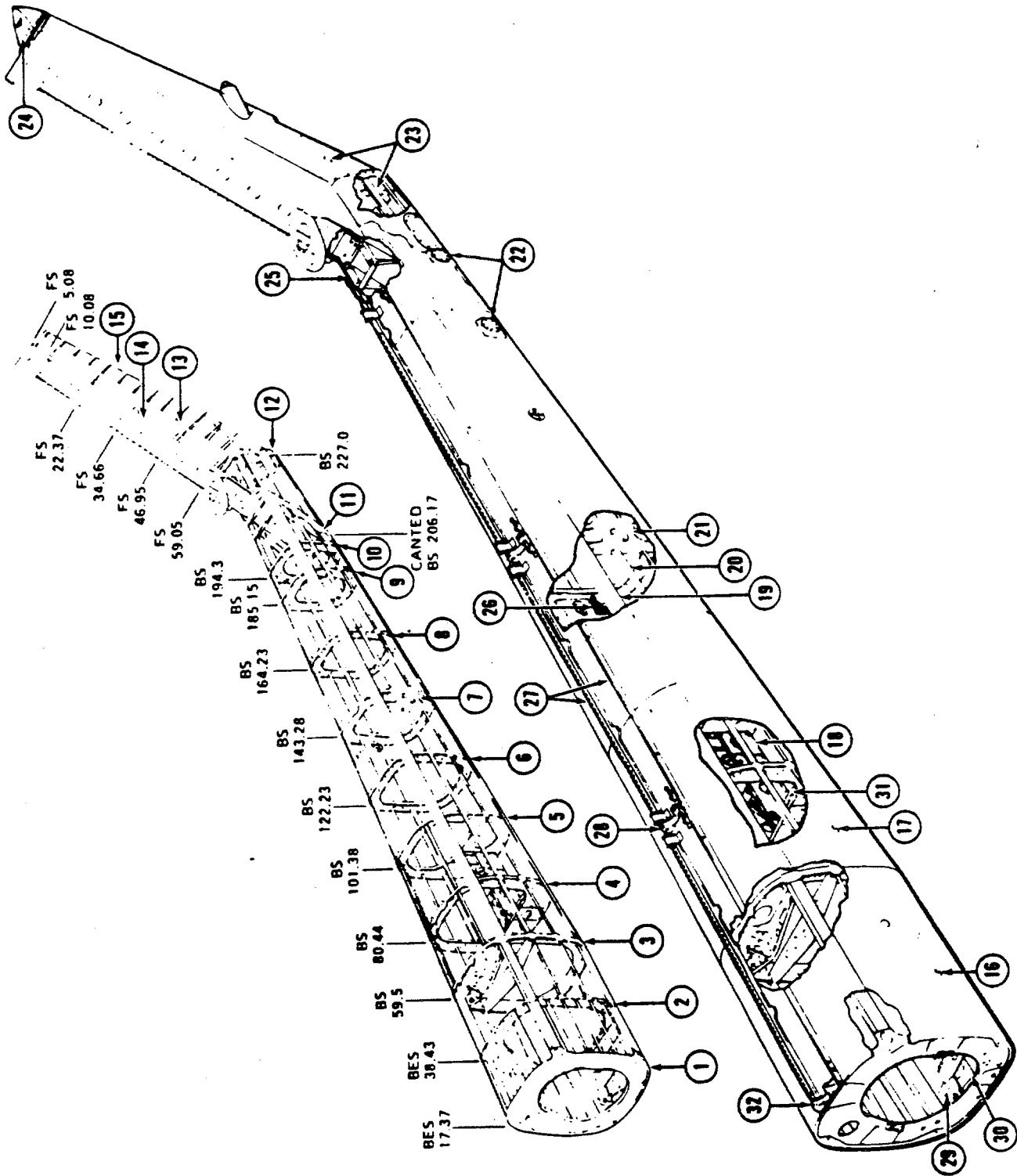


Figure 1-3. 205-032-800-71 tail boom (Sheet 1 of 2)

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INDEX	NOMENCLATURE
1	Bulkhead
2	Bulkhead
3	Bulkhead
4	Bulkhead
5	Bulkhead
6	Bulkhead
7	Bulkhead
8	Bulkhead
9	Bulkhead
10	Bulkhead
11	Bulkhead
12	Bulkhead
13	Aft Spar
14	Fwd Spar
15	Fin Rib Installation
16	Forward Section
17	Skin and Fasteners
18	Support Installation
19	Longerons
20	Stringers
21	Bracket Installation
22	Antenna Support Installation
23	Vertical Fin Assembly
24	Rib Installation Fin Closure
25	Support Installation 42° Gear Box
26	Restrictor Installation
27	Support Angle Installation
28	Fitting
29	Support Installation
30	Channel Installation
31	Bracket Installation
32	Fitting Installation

Figure 1-3. 205-032-800-71 tail boom (Sheet 2 of 2)

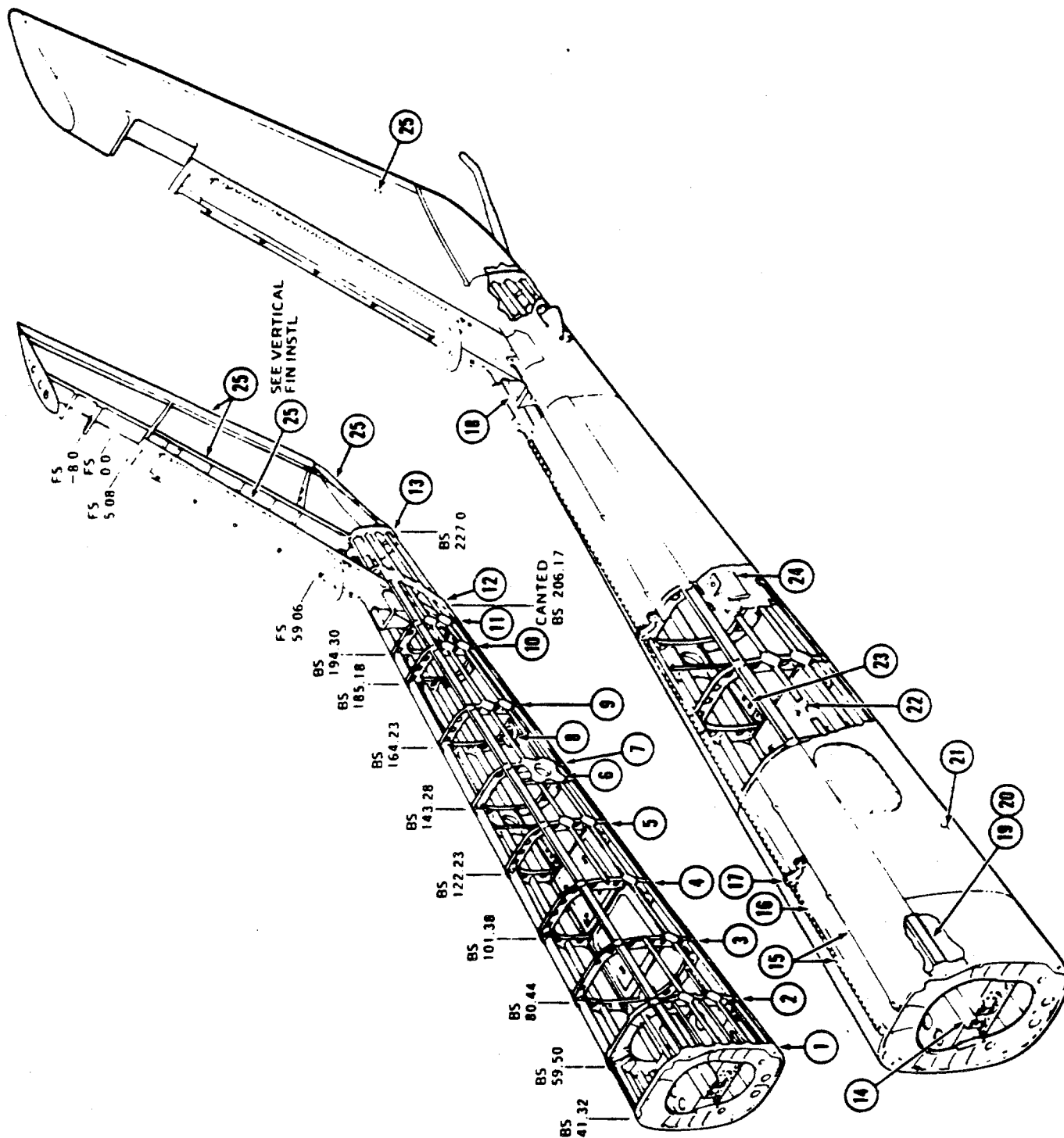


Figure 1-4. 209-030-800-15 tail boom (Sheet 1 of 3)



INDEX	NOMENCLATURE
1	Bulkhead Instl. at B.S. 41.32
2	Bulkhead Instl. at B.S. 59.50
3	Bulkhead Instl. at B.S. 80.44
4	Bulkhead Instl. at B.S. 101.38
5	Bulkhead Instl. at B.S. 122.33
6	Elevator Support Instl.
7	Bulkhead Instl. at B.S. 143.28
8	Bracket Instl., Flux Valve, and Compensator, at B.S. 164.23
9	Bulkhead Instl. at B.S. 164.23
10	Bulkhead Instl. at B.S. 185.18
11	Bulkhead Instl. at B.S. 194.30
12	Bulkhead Instl. at Canted B.S. 206.17
13	Bulkhead Instl. at B.S. 227.00
14	Shelf Instl. at B.S. 41.30 to B.S. 59.50
15	Support Instl., Drive Shaft Cover
16	Hinge Half Instl., Lower
17	Bearing Hanger Support Fitting
18	Support Instl., 42° Gear Box
19	Longerons and Stringers
20	Tail Boom Stringers
21	Skins and Access Doors, Tail Boom
*	Fasteners, Tail Boom Skin and Structure
*	Baggage Door Instl. 209-030-846-7, and Doubler Instl. 209-030-846-3
*	Center Access Door Instl. 209-030-849-55, and Doubler Instl. 209-030-849-7
*	Aft Access Door Instl. 209-030-849-53, and Doubler Instl. 209-030-849-7
22	Shelf Instl. B.S. 80.44 to B.S. 122.33
23	Support Instl., Anti-Torque Lever
24	Support Instl., Anti-Torque
25	Vertical Tail Fin Installation
	**The following assemblies and installations are part of the 209-030-801-69 vertical tail fin installation.

Figure 1-4. 209-030-800-15 tail boom (Sheet 2 of 3)

INDEX	NOMENCLATURE
**	Spar Instl., Fwd.
**	Rib Installation
**	Rib Installation
**	Rib Installation
**	Rib Installation
**	Rib Installation
**	Rib Installation
**	Rib Installation
**	Nose Rib Instl.
**	Conduit Instl., Electric Wires
**	Spar Instl., Aft
**	Fairing Instl., Tail Fin Tip
**	Support Instl., Fin Trailing Edge
**	Fairing Assembly
**	Support Instl., Trailing Edge

Figure 1-4. 209-030-800-15 tail boom (Sheet 3 of 3)

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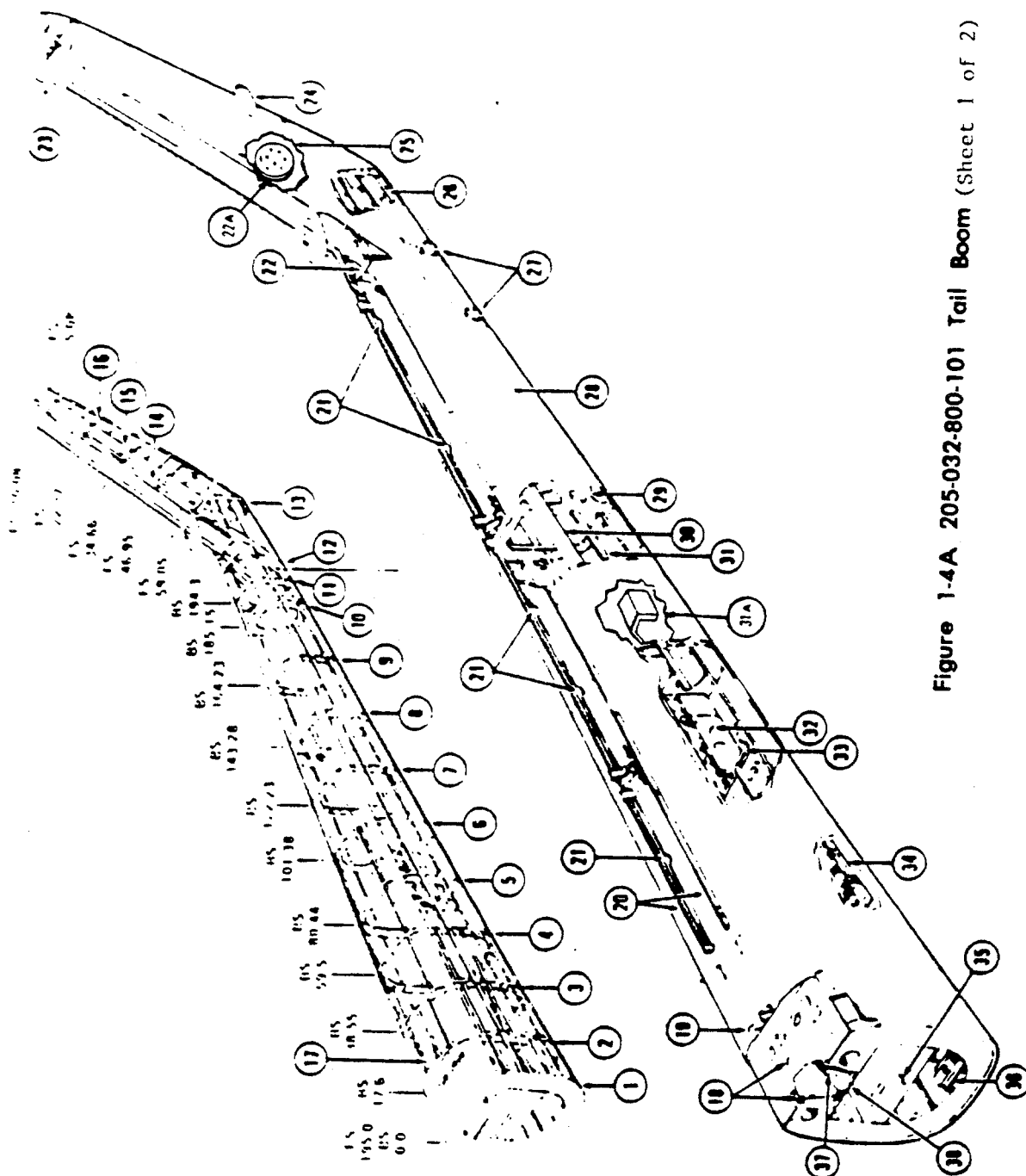


Figure 1-4A 205-032-800-101 Tail Boom (Sheet 1 of 2)

INDEX	NOMENCLATURE
1	Bulkhead
2	Bulkhead
3	Bulkhead
4	Bulkhead
5	Bulkhead
6	Bulkhead
7	Bulkhead
8	Bulkhead
9	Bulkhead
10	Bulkhead
11	Bulkhead
12	Bulkhead
13	Bulkhead
14	Fwd Spar
15	Aft Spar
16	Rib Inst
17	Support Installation
18	Support Installation
19	Fitting Installation
20	Support Angle Installation
21	Fairlead Support Installation
22	Support Installation
22A	Antenna Installation
23	Support Fitting
24	Fairing Installation
25	Vertical Fin Assembly
26	Vertical Fin Stringers
27	Antenna Support Installation
28	Skin Requirements
29	Elevator Support Installation
30	Longerons
31	Stringers
31A	Receiver Mount Bracket Assembly Installation
32	Support Installation
33	Bracket Installation
34	Support Installation
35	Shelf Installation
36	Shelf Installation
37	Bracket Installation
38	Pad Installation

Figure 1-4A 205-032-800-101 tail boom (Sheet 2 of 2)

## 1-6. Data Plates.

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a. *Plate Location.* See figure 1-5 for locations of the identification, overhaul, and/or modification data plates. The plates shall conform to the standards prescribed in MIL-STD-130 and MIL-P-514. (See para 1-6., b thru e.)

**CAUTION**

Do not stamp directly on surface of installed data plate.

b. *Identification Plate.* This plate contains the manufacturer's identity code, name, address, and system to which the part applies. In addition, the specification, stock, manufacturer's part and serial numbers, contract or order number, and ownership are stamped on the plate.

c. *Overhaul Data Plate.* This plate, P/N 100-068-1, is installed at first overhaul and replaced at subsequent overhaul. The overhaul data plate is stamped with the overhaul agency symbol, contact number, date of overhaul, and part number. Any pertinent data should be transferred from old data plate.

d. *Modification Data Plate.* The modification data plate will be locally manufactured using 0.060-inch thick soft aluminum plate (item 98, table 2-2), 1-inch wide by 2-inches long.

e. *Stamping and/or Replacement of Data Plate.* The data shall be stamped on the data plate using letters and figures 1/8 inch high, placed in the area adjacent to the manufacturer's data. In the event modification numbers have exceeded stamping spaces on the data plate, the plate shall be replaced and all pertinent data will be transferred to the new plate. (The data plates will be attached to the upper forward skin with four rivets.) (Figure 1-5.)

**1-7. Differences Between Models.** Overhaul instructions contained in this DMWR pertain to the H-1 Series Tailboom. Differences in procedures for a particular tailboom will be noted in this DMWR where the differences are applicable. Refer to Chapter 2, Section III, and Chapter 3, for Modification Criteria. Tailbooms input for overhaul shall be output in one of four possible configurations. Refer to table 1-1 in order to determine which output configuration will be required for a given tailboom.

**1-8. Reporting Equipment Improvement Recommendations (EIR).** EIRs will be prepared using SF 368, Quality Deficiency Report. Instructions for preparing EIRs are provided in DA PAM 738-751. The Army Maintenance Management System-Aviation (TAMMS-A). EIRs should be mailed directly to Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-RE-FD, Redstone Arsenal, AL 35898-5000. A reply will be furnished directly to you.

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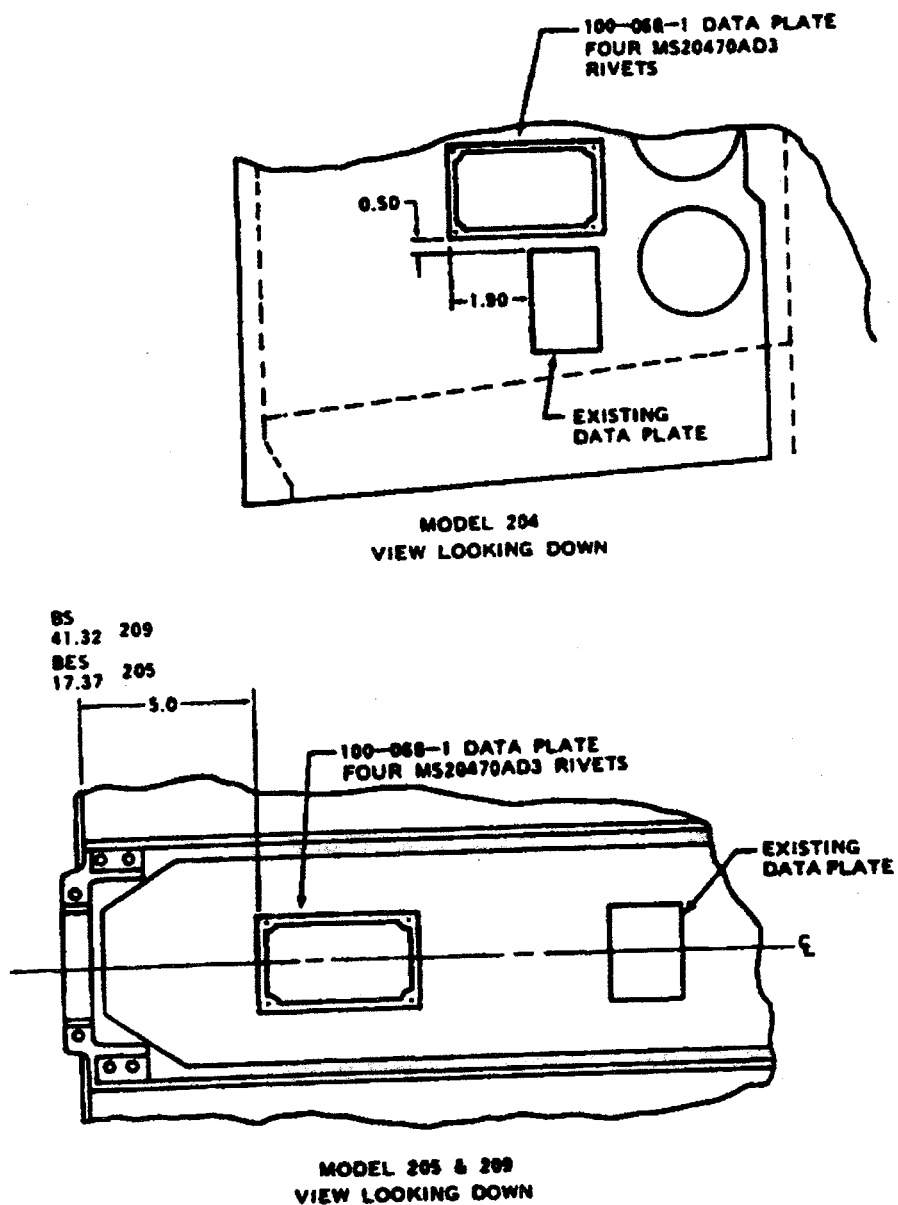


FIGURE 1-5. DATA PLATES

Table 1-1. Tail Room Output Configuration

INPUT CONFIGURATION PART NUMBER	OUTPUT CONFIGURATION PART NUMBER
204-030-800-13	204-030-800-469
204-030-800-249	or
204-030-800-289	*204-030-800-191
204-030-800-297	
204-030-800-311	
204-030-800-369	
204-030-800-395	*Any tail boom listed
204-030-800-433	under input column
204-030-800-435	requiring vertical fin
	replacement, shall be
	output to 204-030-800-
	491 configuration.
204-030-800-441	
204-030-800-465	
204-030-800-469	
204-030-800-491	
204-030-800-447	
204-030-800-451	204-030-800-491
204-030-800-471	
204-030-800-473	
205-032-800-1	205-032-800-71
205-032-800-3	
205-032-800-5	
205-032-800-11	
205-032-800-15	
205-032-800-57	
205-032-800-71	
209-030-800-1	209-030-800-15
209-030-800-3	
209-030-800-5	
209-030-800-7	
209-030-800-9	
209-030-800-11	
209-030-800-15	**205-032-800-101
	**Any tail boom listed
	under input column
	previously modified
	for incorporation of
	AN/APR-39 will be
	outputted to
	205-032-800-101.

Table 1-2. Tail Boom Modification Requirements (204-030-800-469 Output Configuration)

TAIL BOOM EFFECTIVITY														
INPUT CONFIGURATION PART NO. 204-030-800														
NO.	MODIFICATION REQUIREMENTS	-13	-249	-289	-297	-311	-369	-395	-399	-433	-435	-441	-465	
1	Replace Upper Left Longeron and Fitting	X	X	X	X	X	X	X		X	X			
2	Mod 42 Degree Gear Box Supports	X	X	X	X									
3	Doubler Installation BS 205.0- BS 213.94	X	X	X	X	X								
4	Forward Fin Spar Modification	X	X	X	X	X	X	X	X	X	X		X	
5	Tie-Down Ring Installation	X	X	X										
6	Tail Light Fairing Installation	X	X	X	X	X	X	X		X	X			
7	Replace RH Skins BS 17.60-BS 122.23 and Bumpers	X	X	X	X	X								
8	Bulkhead and Skin Modification BS 17.60	X	X	X	X	X	X	X		X	X			
9	Stringer Installation	X	X	X	X	X	X	X		X	X			
10	Pad and Support Bracket Installation	X	X	X	X									
11	Antenna Mount Modification	X	X	X	X	X	X	X	X	X	X	X		
12	Bulkhead Replacement BS 143.28	X	X											
13	Elevator Support Modification	X												
14	Antenna Support Provisions	X	X	X	X	X	X	X		X	X			
15	Communications Shelf and Cable Installation	X	X	X	X	X	X	X	X	X	X		X	
16	Forward Bulkhead Modification	X	X	X	X	X	X	X		X	X			
17	Fairlead Installation	X	X	X	X									
18	Chaffing Strip Installation	X	X	X	X	X								
19	Longeron Replacement	X	X	X	X	X	X							
20	Bumper Installation	X		X	X	X								
21	Communications Shelf Modification								X					

## NOTE

1. Identify modified tail boom as 204-030-800-469.



Table 1-3. Tail Boom Modification Requirements (204-030-800-491 Output Configuration)

NO	MODIFICATION REQUIREMENTS	TAIL BOOM EFFECTIVITY INPUT CONFIGURATION PART NO. 204-030-800			
		-447	-451	-471	-473
1	Communication Shelf Modification	X	X		
2	Cable Assembly	X		X	
3	Antenna Mount Modification	X	X		
4	Rigging Rivets and Decals	X		X	X
5	Elevator Restrictor	X	X	X	X
6	Skin Replacement	X	X	X	X

NOTE: Tail booms modified to above requirements will be identified as Part No. 204-030-800-491.

Table 1-4. Tail Boom Modification Requirements (205-032-800-71 Output Configuration)

NO	MODIFICATION REQUIREMENTS	TAIL BOOM EFFECTIVITY INPUT CONFIGURATION PART NO. 205-032-800					
		-1	-3	-5	-57	-11	-15
1.	Fm Modification						
	a. Electrical Provisions BS 216.15	X	X				
	b. Modification Nose Rib	X	X				
	c. Replace Rib FS 5.08	X					
	d. Replace Antenna Mount Support Bracket		X	X	X	X	X
	e. Replace Antenna Mount	X	X	X			
	f. Installation Doublers, BS 227.0 and FS 59.05	X					
	g. Installation Rub Strip Driveshaft Doors	X	X	X			
	h. Electrical Provisions FS 5.08		X				
	i. Modification Rib FS 5.08		X	X	X	X	X
2	Installation Rub Strip Driveshaft Doors	X	X	X			
3.	Installation Elevator Restrictor	X	X	X			
4.	Installation Stiffener BS 80.44 - BS 101.38	X	X	X			
5.	Installation Two Stiffeners Forward Section	X					
6.	Antenna Support Provisions	X					
7.	Modify Bulkhead BES 17.37	X					
8.	Replace Lower Skin Forward Section	X	X	X	X	X	X

NOTE: Tail booms modified in accordance with above requirements will be identified as 05-032-800-71.

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Table 1-6. Tail Boom Modification Requirements (209-030-800-15 Output Configuration)

NO.	MODIFICATION REQUIREMENTS	TAIL BOOM EFFECTIVITY INPUT CONFIGURATION PART NO. 209-030-800					
		-1	-3	-5	-7	-9	-11
1.	Relocate Tail Light	X	X				
2.	Radio Shelf Modification	X	X	X			
3.	Antenna Modification	X	X	X	X		
4.	Vertical Fin Modification Tractor Tail Rotor Configuration	X	X	X	X	X	X

## NOTE:

Tail booms modified to above requirements will be identified as Part No. 209-030-800-15.

## CHAPTER 2

## TECHNICAL REQUIREMENTS

## Section I. FACILITIES, TOOLS, AND INSPECTION EQUIPMENT

2-1. Facilities. The tailboom overhaul facilities shall be equipped to perform all phases of operation as prescribed by this DMWR. In addition, the following requirements shall be complied with:

a. *Inspection Shop Area. (Detailed Close Tolerance Parts)* A totally enclosed inspection shop space is required with forced air ventilation. Inexpensive commercial filters capable of arresting particle sizes in excess of 50 to 100 microns shall be employed. Fans capable of maintaining a slight positive pressure within the inclosed area shall be utilized. Walls and ceilings should be smooth and with chip resistant surfaces. The flooring should be sealed cement or tiled to provide a dust free and easily maintained surface. The floor space should be adequate to maintain quality and production. The temperature of the inspection area is to be 78 degrees  $\pm$  4 degrees F. The relative humidity should be between 45-50 percent. All lighting is to be flush or of the type that will neither retain nor discharge foreign particles. The recommended value of illumination is 150-200 foot-candles of total illumination. Magnification shall be provided to accomplish those tasks which cannot be done without visual assistance. No grinding, filing or sanding other than final hand polishing of bits and pieces, such as forgings shall be allowed in the inspection area. Clean conditions to include clothing and hand tools are mandatory.

b. *PSA, Inspection, and Repair Shop Area.* A totally inclosed area is required, and isolated from corrosion generating materials or environment. The shop area room temperature shall be 70-90 degrees F. The flooring shall be sealed cement or tile to provide an easily maintained surface. In addition the floor should be of sufficient strength to support the major assembly tools. The major assembly tools also should be free of vibration. The environment should be such that the overhaul items remain moisture free at all times. The recommended value of illumination is 75-100 foot candles of total illumination. The general areas shall be void of material or equipment not directly connected with the overhaul of the tailbooms.

c. *Paint Shop Area.* A totally inclosed area is required, and isolated from corrosion generating materials or environment. The flooring shall be sealed cement or tile to provide an easily maintained surface. Paint shops at all rework facilities should have adequate ventilation system, to protect the health of the workers and to prevent deposition of over spray on newly painted or about-to-be-painted surfaces. The recommended value of illumination is 75-100 foot candles of total illumination. The air flow should be from ceiling to floor. Exhaust air should pass through a suitable filter or scrubber to minimize air pollution outside the hanger. Temperature shall be controlled between 65-90 degrees F and humidity between 35-70%. The paint shop should not be used for other operations such as paint stripping, cleaning, blasting, etc.

d. *Cleaning and Stripping Shop Area.* Area should be capable of performing all of the requirements of the DMWR. In addition, corrosion removal will be performed in this area.

## NOTE

All stripping operations shall be performed in a shaded area. Never in direct sunlight.

e. *Packaging, Unpacking, and Storage Area.* This area should be totally inclosed, and should insure that there is no environmental conditions detrimental to the overhaul component.

2-2. **Tools and Equipment.** Tools and equipment required for overhaul of tailbooms are listed in table 2-1.

2-3. **Special Tools and Equipment.** The special tools and equipment needed to accomplish the requirements of this DMWR are listed in table 2-1. Table 2-1 lists the tools by nomenclature, part number and figure reference. The special tools and equipment are Government furnished.

TABLE 2-1. SPECIAL TOOLS LIST

<u>NOMENCLATURE</u>	<u>PART NUMBER</u>	<u>FMC</u>	<u>REFERENCE FIGURE</u>
Fixture, Holding. Universal, Tailboom	65SSMAC-D003	12757	2-1
*Fixture, Alignment	65SSMAC-D0003-59	12757	2-2
Fixture Alignment	65SSMAC-D0106-1	12757	2-3
Hanger Bearing Fixture, Alignment	65SSMAC-D0106-2	12757	2-4
*Fixture, Alignment	65SSMAC-D0106-21	12757	2-5
Fixture, Adapter	66SSMAC-D0311-1	12757	2-6
42 Degree Gearbox Fixture, Alignment	66SSMAC-D0318	12757	2-7
Sling, Tailboom Lifting	67AMXAC-D0311	12757	2-8
90 Degree Gearbox Mount Fixture, Reaming	69SAVAE-D0080	12757	2-9
Drill Jig, Rigging Rivets, Tailboom UH-1B/C/M	74SAVAE-D0011	12757	2-10
Drill Jig, Rigging Rivets, Tailboom AH-1G/UH-1H	74SAVAE-D0017	12757	2-10
Spacer Alignment Bulkhead Replacement Tailboom AH-1G & UH-1 Series	74SAVAE-D0015	12757	2-11

\*Component of fixture universal, tailboom, AH-1G application

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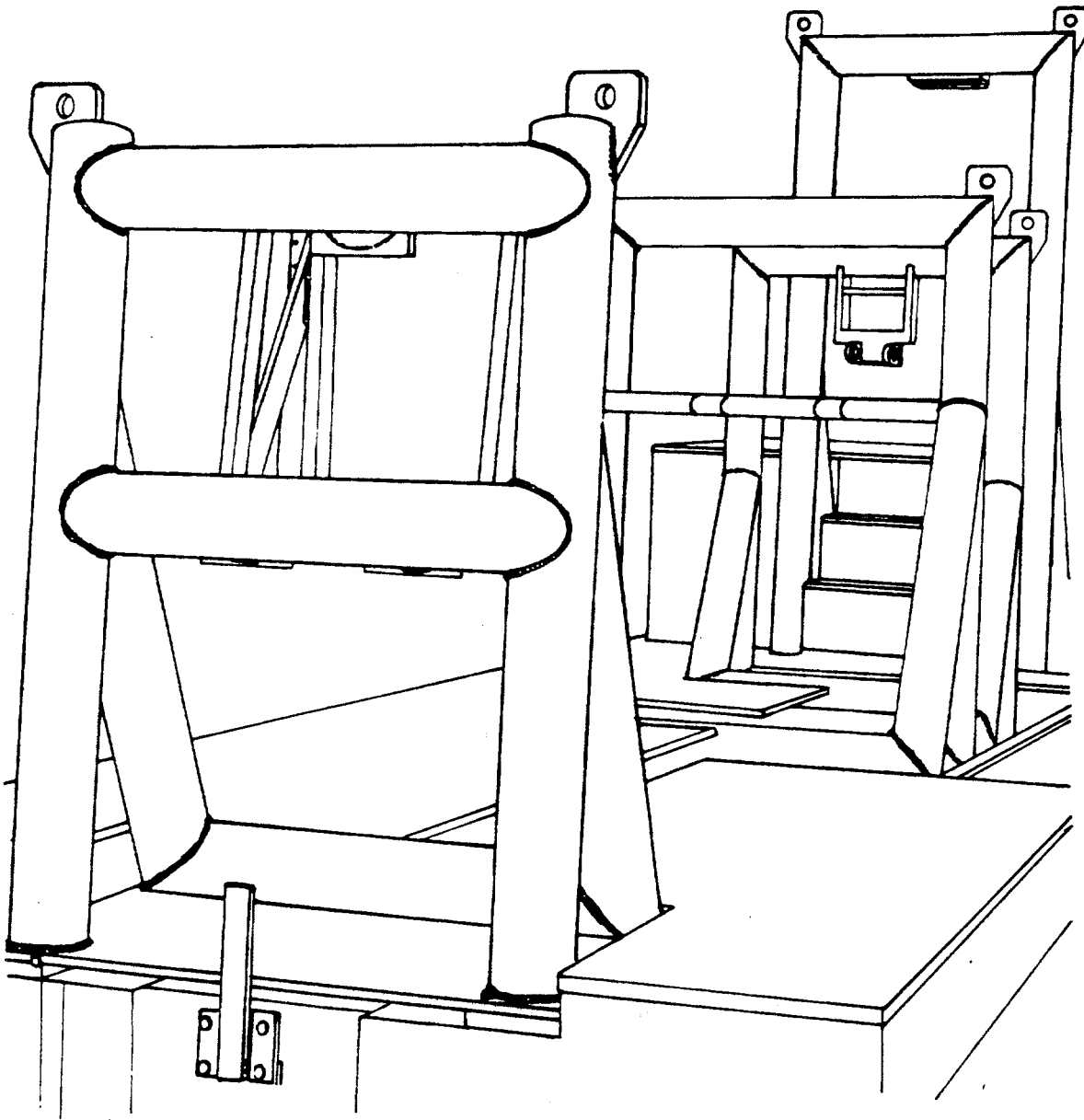


Figure 2-1. UNIVERSAL TAILBOOM HOLDING FIXTURE

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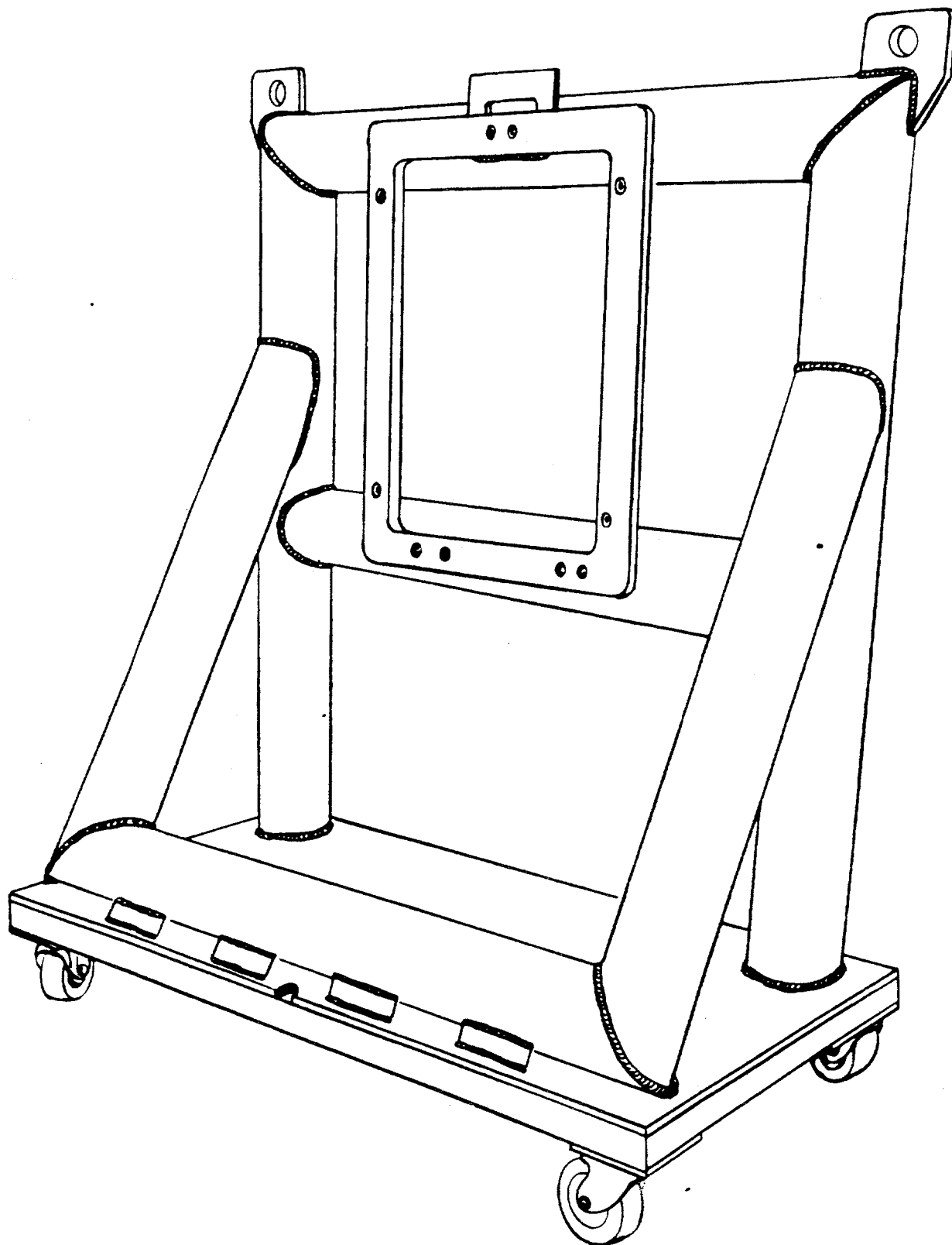


Figure 2-2. BULKHEAD ALIGNMENT FIXTURE (AH-1G)

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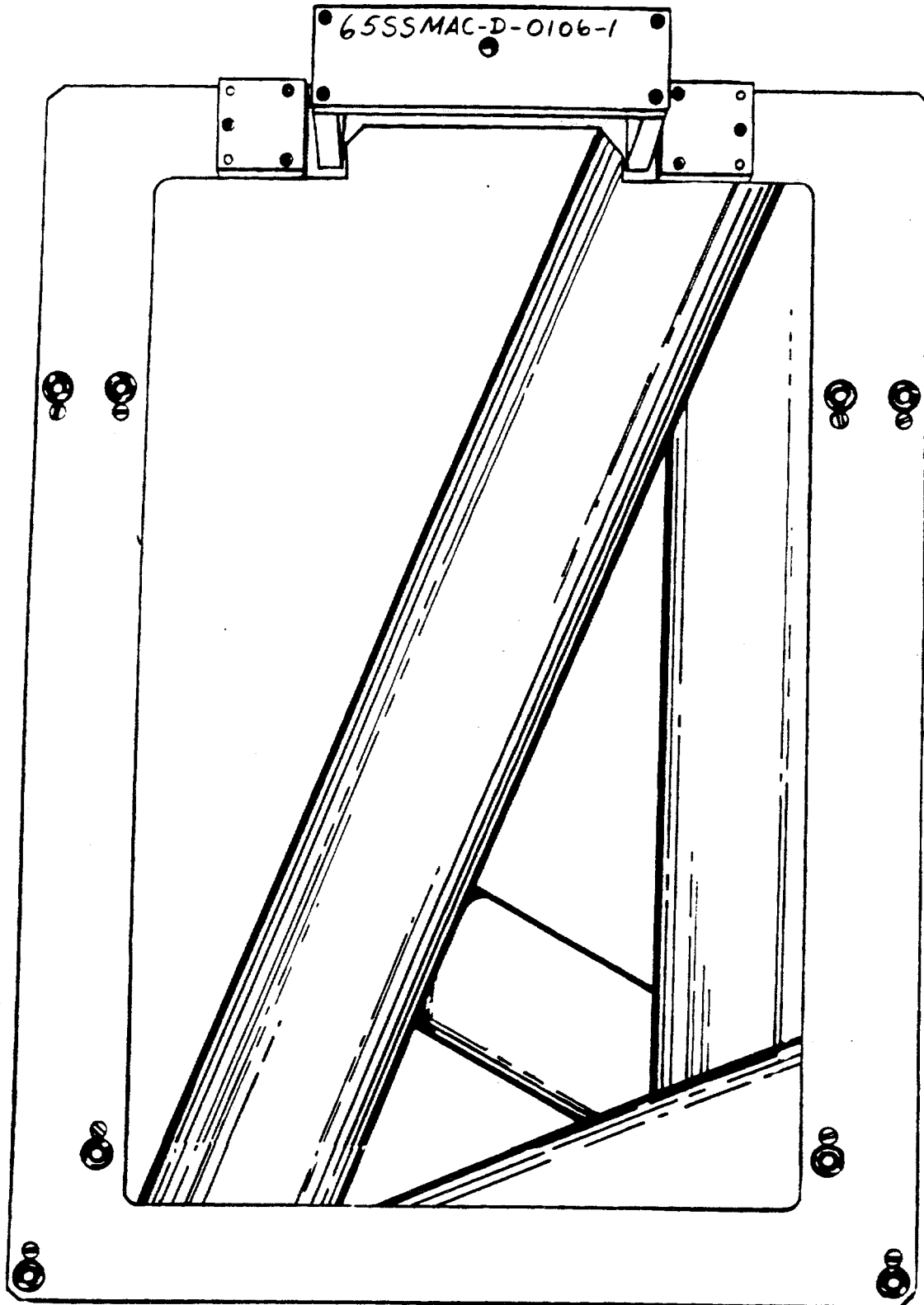
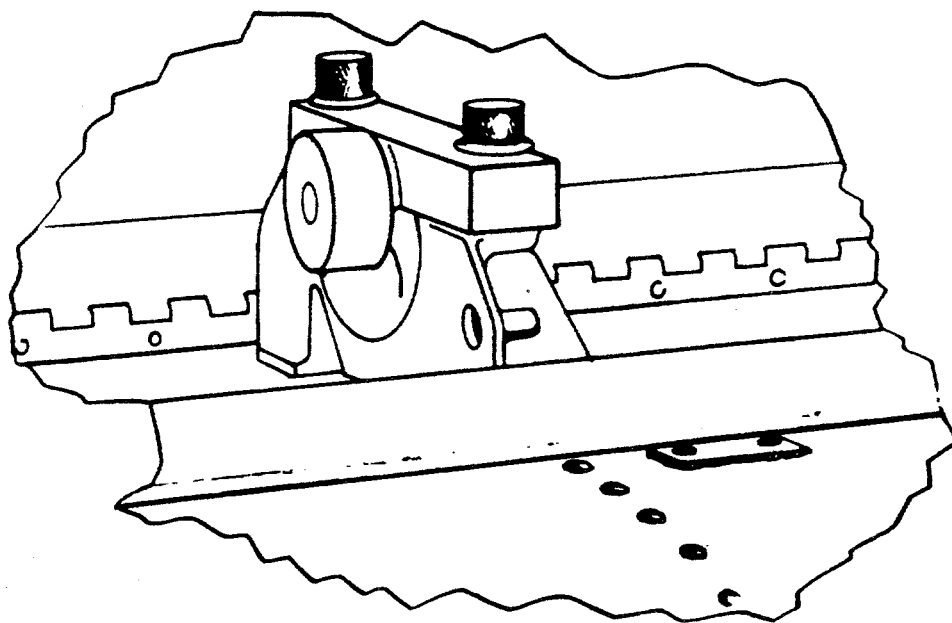


Figure 2-3. ALIGNMENT FIXTURE (UH-1 SERIES)

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**Figure 2-4. ALIGNMENT FIXTURE (HANGER BEARING)**



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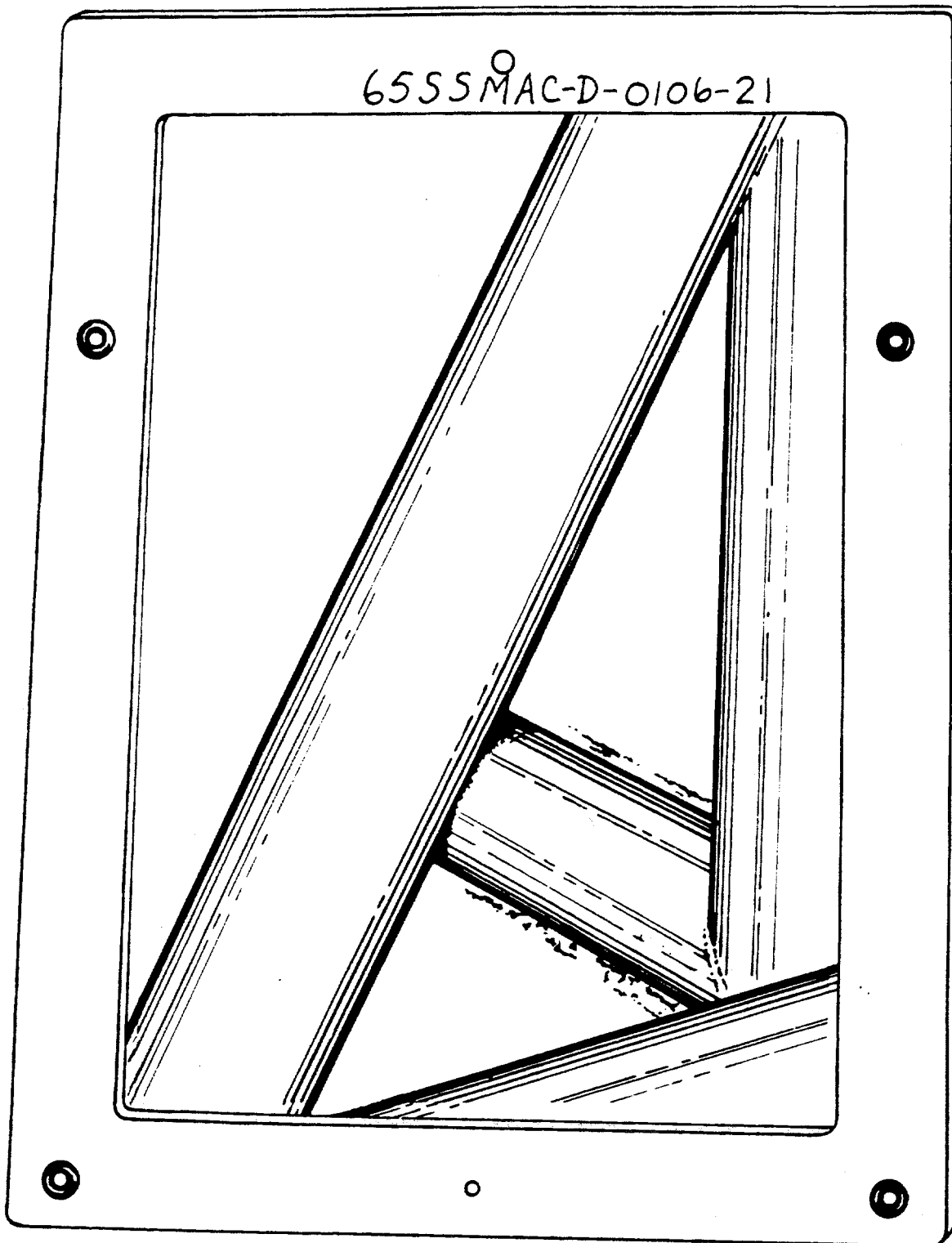


Figure 2-5. ALIGNMENT FIXTURE (AH-1G)

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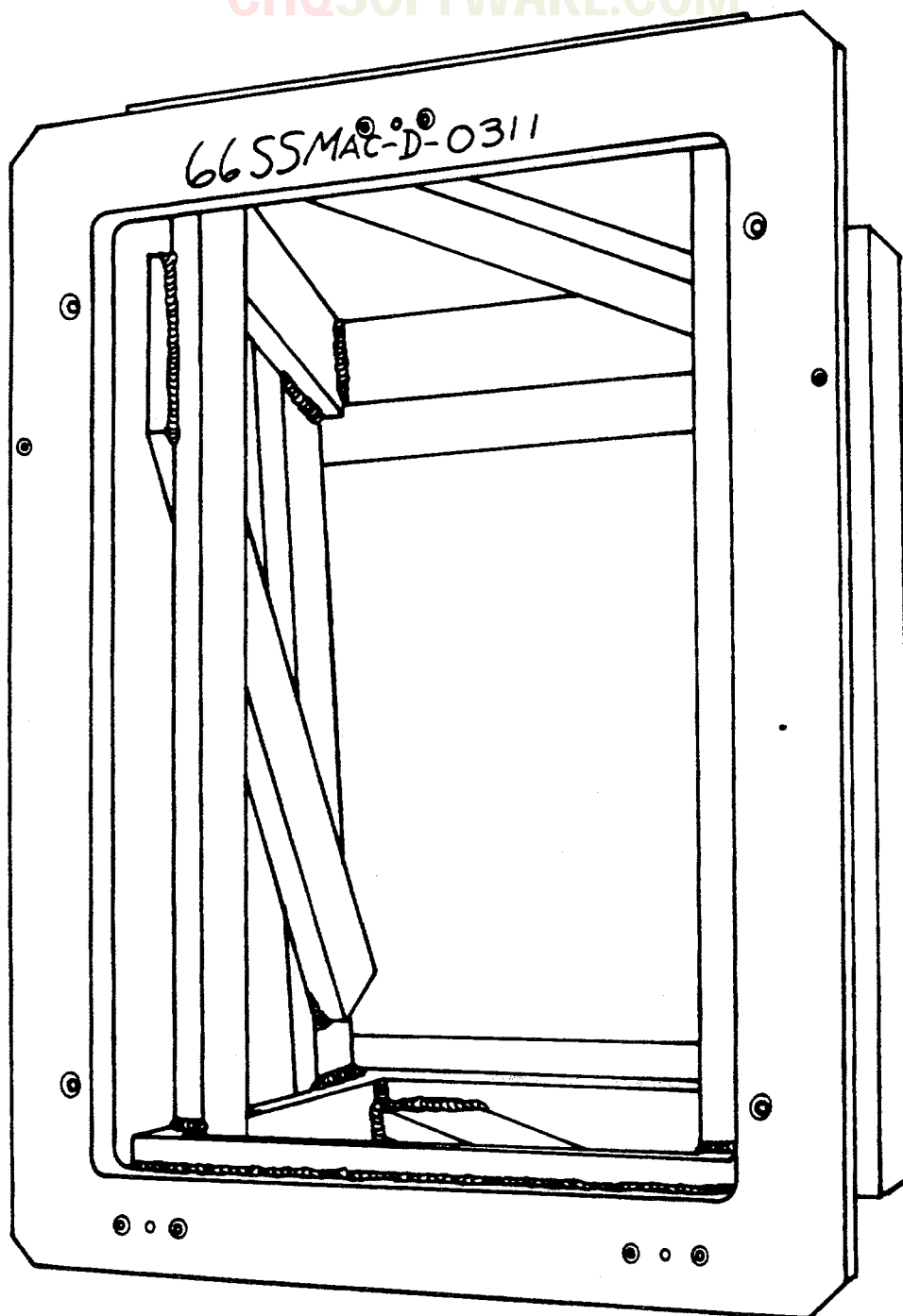


Figure 2-6. ADAPTER FIXTURE (UH-1H)

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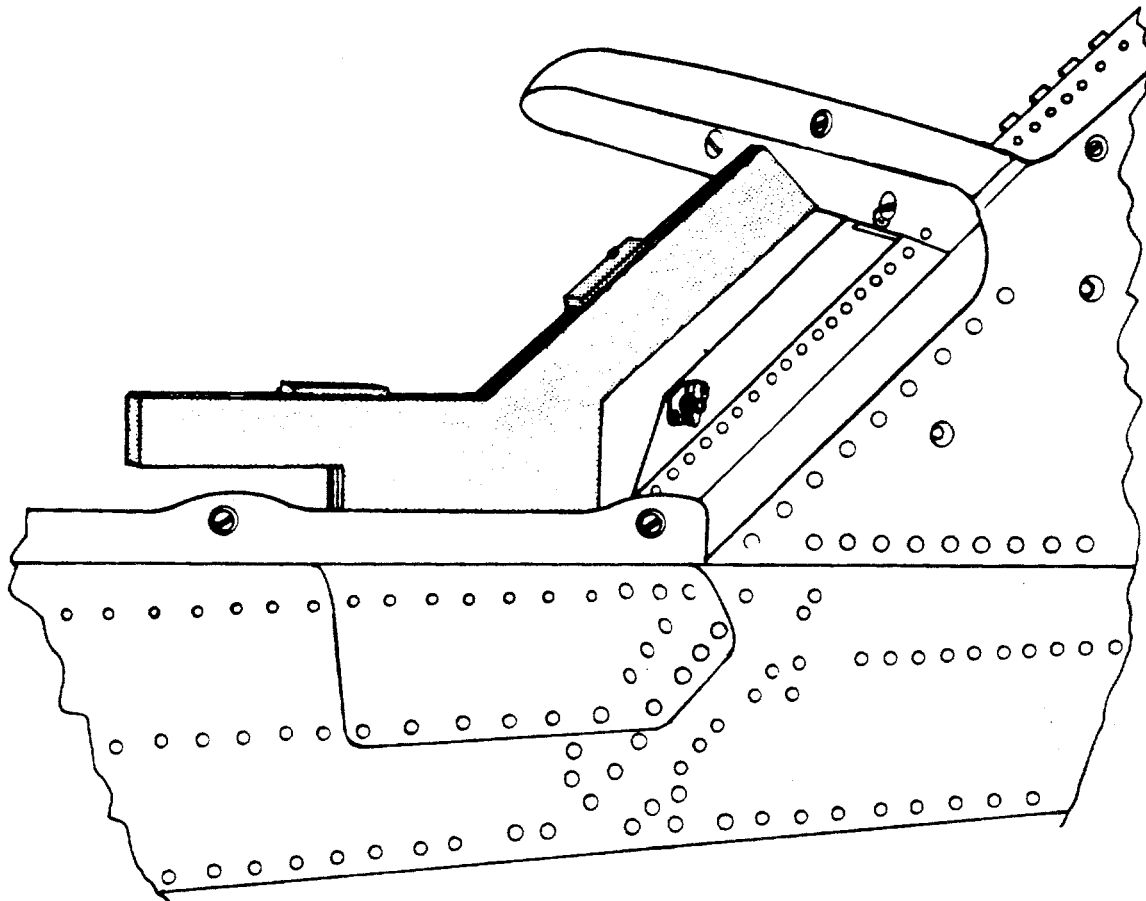


Figure 2-7. ALIGNMENT FIXTURE (42° GEARBOX)

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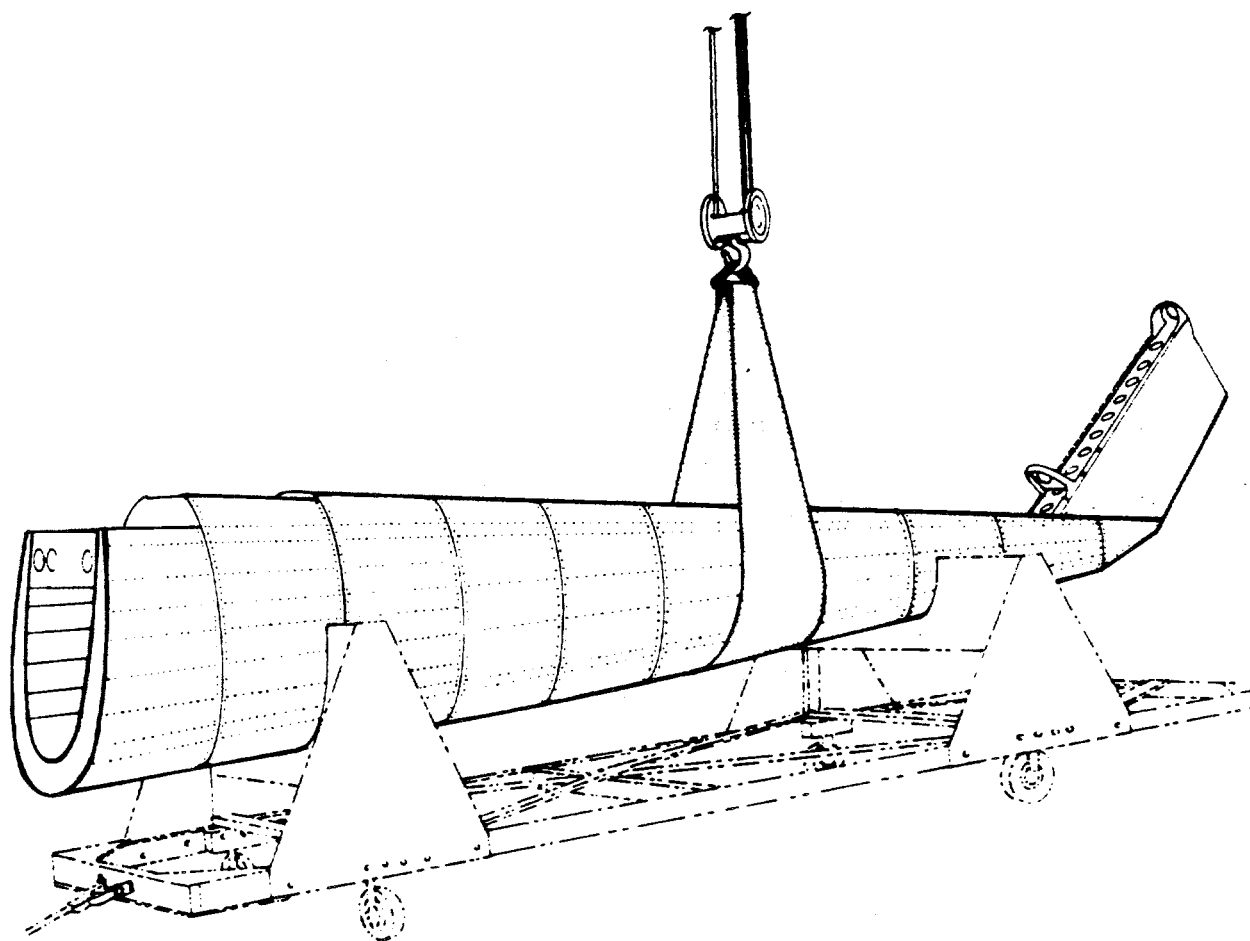


Figure 2-8. TAILBOOM LIFTING SLING

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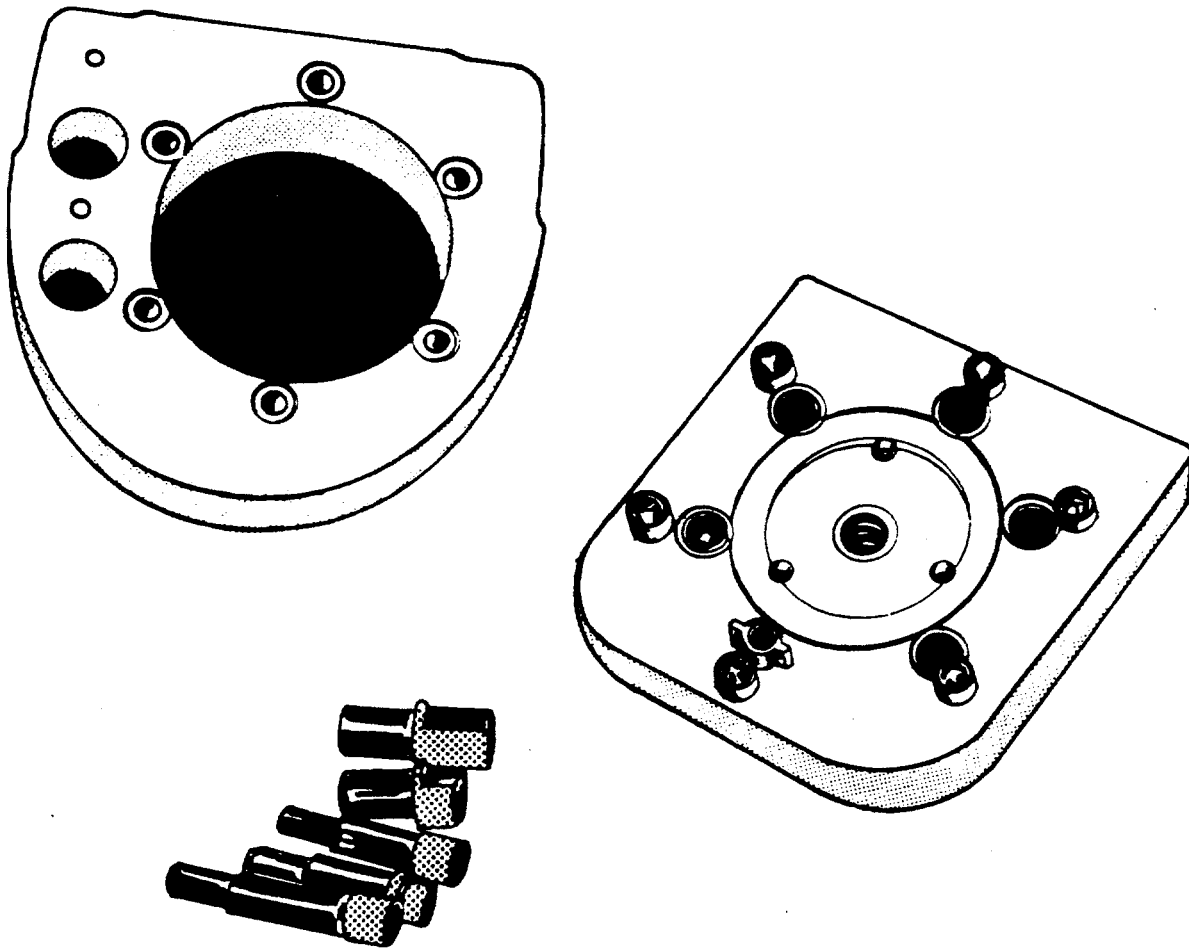


Figure 2-9. REAMING FIXTURE (90° GEARBOX MOUNT)

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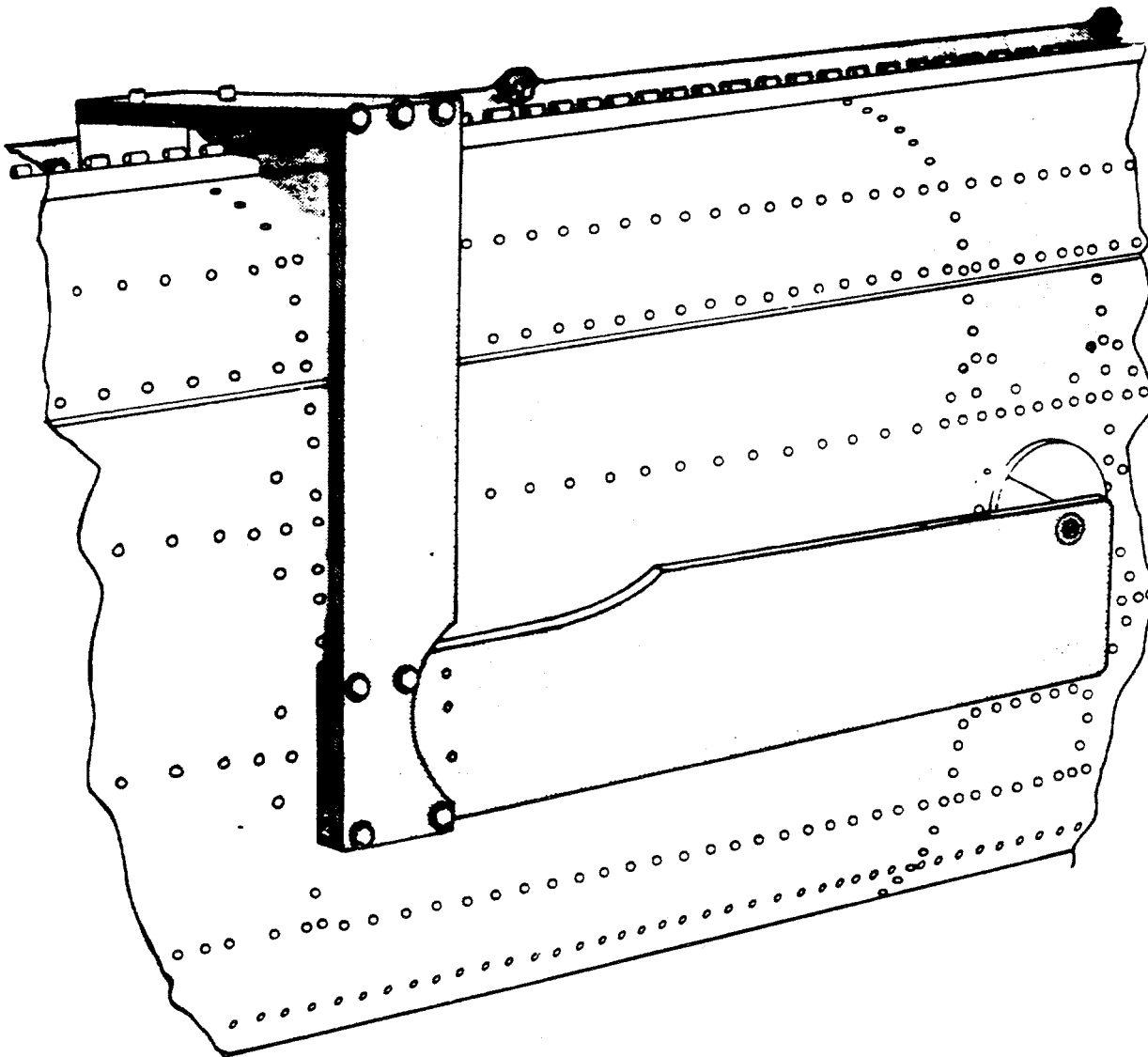


Figure 2-10. DRILL JIG RIGGING RIVETS TAILBOOM

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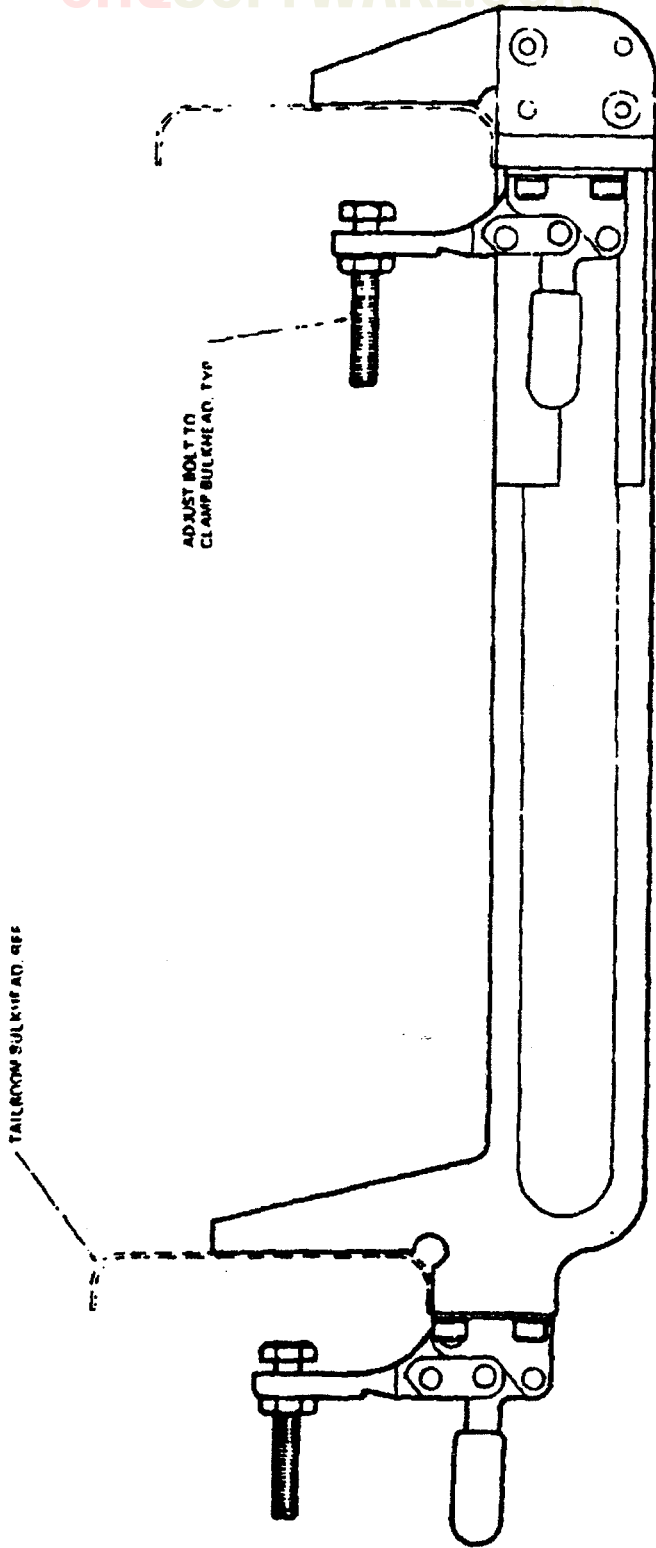


FIGURE 2-11. SPACER ALIGNMENT BULKHEAD REPLACEMENT

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**2-4. Consumable Materials.** Table 2-2 contains a listing of the consumable materials required for use in this DMWR. Consumable materials are those which may be consumed in use or that lose their identity in an assembly.

**TABLE 2-2. CONSUMABLE MATERIALS**

ITEM NO.	NOMENCLATURE	FEDERAL OR MILITARY SPECIFICATION NO. OR SOURCE
1	PRIMER Coating, Zinc Chromate	TT-P-1757
2	Adhesive EC-2216 (Parts A & B)	FSCM 76381 (or equivalent)
3	Tape Vinyl No. S53	L-T-100
4	Deleted	
5	Methyl-Ethyl-Ketone	TT-M-261B
6	Sealant Compound	MIL-S-8802, Class B-2
7	Naphtha	TT-N-95
8	Tape, Pressure Sensitive Adhesive (Aluminum Backed)	L-T-80
9	Cleaning Compound Alkaline Water-base	MIL-C-25769
10	Barrier Material, Water Proof (Heat Sealable)	MIL-B-131
11	Tape, Packing (Water Proof)	PP-P-T-60
12	Deleted	
13	Deleted	
14	Plastic Putty RP1257-3	FSCM 02684 (or equivalent)
15	Deleted	
16	Adhesive, Metalset A-4	FSCM 90444 (or equivalent)
17	NYLATRON GS Sheet (Nylon)	FSCM 83616 (or equivalent), L-P-410
18	Chemical Film, Alodine	MIL-C-5541, Class 1A
19	Adhesive EA 934 NA (Repair Kit)	FSCM 33564 (or equivalent) NSN 8040-01-180-5820 or 8040-01-201-0734



TABLE 2-2. CONSUMABLE MATERIALS CONT.

ITEM NO.	NOMENCLATURE	FEDERAL OR MILITARY SPECIFICATION NO. OR SOURCE
20	Deleted	
21	Epoxy Prime	MIL-P-23377
21A	Deleted	
22	Deleted	
23	Deleted	
24	Abrasive Pads, Nylon Web (Very Fine)	L-P-50, Type 2, Class 1, Size 1
25	Deleted	
26	Acrylic Lacquer, Fed Std. 595, Color Numbers 17178 or 34087	MIL-L-81352
27	Deleted	
28	Deleted	
29	Deleted	
30	Aluminum Wool	MIL-A-4864, Type II
31	Deleted	
32	Adhesive, Heat Resistant Metal-to-Metal, Epoxy	MMM-A-132, Type II
33	Deleted	
34	Deleted	
35	Pressure Sensitive Tape	PPP-T-30
36	Deleted	
37	Deleted	
38	Deleted	
39	Brush	H-B-643
40	Deleted	
41	Deleted	
42	Paper, Abrasive	P-P-101

TABLE 2-2. CONSUMABLE MATERIALS CONT.

ITEM NO.	NOMENCLATURE	FEDERAL OR MILITARY SPECIFICATION NO. OR SOURCE
43	Deleted	
44	Deleted	
45	Deleted	
46	Deleted	
47	Remover, Paint (Epoxy and Polyurethanes)	MIL-R-81294, Type II
48	Deleted	
49	Deleted	
50	Boric Acid	O-C-265
51	Alkaline Cleaner Oakite NST	P-C-436
52	Abrasive Glass Beads	MIL-G-9954
53	Cloth: Abrasive (Scotch Brite)	FSCM 76381 (or equivalent)
54	Tyero Wheel	FSCM 53510 (or equivalent)
55	Cloth: Abrasive (Aluminum Oxide)	P-C-451, Class 2, Grit Size 320 thru 24
56	Abrasive, Paper Artificial	P-P-101, Grade 60
57	DEVCON F	MIL-C-24176, Type II
58	Deleted	
59	Deleted	
60	Deleted	
61	Deleted	
62	Tape, Pressure Sensitive Adhesive Dissimilar Metal Separation	MIL-T-23142
63	Carbon Dioxide, Technical (Dry Ice)	BB-C-104
64	Alcohol, Ethyl (denatured)	O-E-760
65	Epoxy Epon 828	FSCM 36131 (or equivalent)

TABLE 2-2. CONSUMABLE MATERIALS CONT.

ITEM NO.	NOMENCLATURE	FEDERAL OR MILITARY SPECIFICATION NO. OR SOURCE
66	DTA (Diethylenetriamine)	O-D-1271
67	Deleted	
68	Synthesine 200	Mobile Chemical Company, Chemical Coatings Div., Mobile Oil Corp., New York, N.Y. (or equivalent)
69	Thinner P/N 4-111	TT-T-291
70	Paint, Olive Drab	MIL-P-19538
71	Deleted	
72	320 Grit Non-Silicon Abrasive Paper	
73	Deleted	
74	Cheesecloth	CCC-C-440, Type II Class 2
75	Deleted	
76	Scrimcloth, Fiberglass, Thalco 196	FSCM 00250 (or equivalent)
77	Paper, Draft, Untreated, Wrapping	UU-P-268
78	Deleted	
79	Deleted	
80	Deleted	
81	Adhesive AF-126	3M Company 3211 East Traffic Way Springfield, MO (or equivalent)
82	Adhesive FM 123-2	FSCM 07542 (or equivalent)
83	Deleted	
84	Adhesive AF-126-2	3M Company, 3211 East Traffic Way, Springfield, MO (or equivalent)
85	Deleted	

TABLE 2-2. CONSUMABLE MATERIALS CONT.

ITEM NO.	NOMENCLATURE	FEDERAL OR MILITARY SPECIFICATION NO. OR SOURCE
86	Deleted	
87	Corrosion Preventative	MIL-M-3173, Type 1
88	Adhesive, EA9309-3	8040-01-163-3481
89	Sealing Compound	MIL-S-8802 (NSN 8030-00-723-2746)
90	Insulation Sleeve, Heat Shrink	M23053/5-105-0 (NSN 5970-00-954-1622)
91	Strap, Tie-Down (Black) Electrical Component	MS3367-1-0 (NSN 5975-00-984-6582)
92	n-Propyl Bromide	NSN 6850-01-450-6165
93	Isopropyl Alcohol	TT-I-735, NSN 6810-01-220-9907
94	Solvent	DS-108, NSN 7930-01-367-0995
95	Positron	NSN 6850-01-411-8815
96	Electron	NSN 6850-01-375-5554
97	Acetone	NSN 6810-01-003-0262
98	0.060 inch thick soft Aluminum Plate	
99	Dye-Penetrant	MIL-STD-6866
100	Adhesive	MMM-A-121
101	Pro Seal 890	Essex Chemical, CAGE 83527, MIL-S-8802. Available in classes A, B, C. Class A: 8030-00-723-5343 Kit. Class A: 8030-00-723-5344 QT. Class B: 8030-01-037-1418 QT. Class C: 8030-00-152-0012 6 oz. Class R: 8030-00-732-3478.
102	400 Grit Abrasive Paper	BD101
103	Latex Foam Sponge	MIL-R-5001

TABLE 2-2. CONSUMABLE MATERIALS CONT.

ITEM NO.	NOMENCLATURE	FEDERAL OR MILITARY SPECIFICATION NO. OR SOURCE
104	Anti-Chafing Tape No. 366	
105	Teflon Tape 549	AMS3651
106	Adhesive Tape	Y9265
107	Clean, Dry, Lint-Free Cloth	
108	Aluminum Alloy ALCAD2024, Plate and Sheet	QQ-A-250/5F



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**Section II. REPAIR PARTS**

**2-5. Repair Parts.** Repair and replacement parts and kits as required for overhaul, modification, and repair may be found in TM 55-1520-210-34P and TM 55-1520-221-34P.

### Section III. MODIFICATION

**2-6. Modification Criteria.** All tailbooms shall be modified to the latest configuration unless other wise directed. All modification work orders (MWO) will be complied with as specified in contract document or PWDS. All tailbooms shall be identified with a modification data plate, attached to the tailboom immediately adjacent to the existing identification plate. (Reference Chapter 1, Figure 1-5.)

**2-7. Kits and Parts Required.** Kits and parts required to accomplish modification are listed in appropriate modification work order (MWO) TM 55-1520-210-34P and TM 55-1520-221-34P. Consumable materials required are listed in Table 2-2.

**2-8. Modification Requirements.** Applicable modification work orders and/or drawings that will be required to update all tailbooms to the latest configuration are listed below.

**a. UH-1 M Application.** Update to latest configuration will be performed in accordance with Drawing 204-35M-800, FMC 97499.

**b. UH-1 H Application.**

- (1) MWO 55-150-200-30/25 Mod of Whip Antenna Mount.
- (2) MWO 55-150-206-20/2 Mod Elevator Stop.
- (3) Modify bulkhead B.E.S. 17.37 in accordance with drawing X0332-UH-1H-800-15.
- (4) Modify nose rib F.S. 59.05 in accordance with drawing X0332-UH-1H-800-13.
- (5) Modify Fin P/N 205-030-899-11 in accordance with drawing X0332-UH-1H-800-11.
- (6) Modify Rib P/N 205-031-837-5 in accordance with drawing X0332-UH-1H-800-17.
- (7) Modify Lower Skin B.E.S. 17.37 in accordance with drawing X0332-UH-1H-800-19.
- (8) Modify Skin B.E.S. 40.43 in accordance with drawing X0332-UH-1H-800-35.
- (9) Modify cover B.S. 168.14 in accordance with drawing X0332-UH-1H-800-37.
- (10) MWO 55-1520-210-50-6 Installation Provisions for Radar Warning Receiver (RWR) AN/Apr-39 UH-1H
- (11) MWO 55-1520-210-50-10 Modification Instructions For Night Vision Goggles Compatibility (UH-1H Helicopters which have not been modified by MWO 55-1520-210-50-7.

**c. AH-1G Application.**

- (1) MWO 55-1520-221-30/10 provides improved tail light configuration.
- (2) MWO 55-1520-221-30/13 updates provisions for AN/APX-72 Transponder.
- (3) MWO 55-1520-221-30/17 Relocates ARC-54 and UHF/VHF antennas.
- (4) MWO 55-1520-221-40/3 Improved anti-Torque system.
- (5) Deleted.



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## NOTE

Accomplish only if 209-030-859-1 and/or -2 is damaged beyond repair or adjacent parts are installed per note 8 on drawing X0332-AH-1G-800.

- (6) Modify cover B.S.168.14 in accordance with drawing X0332-AH-1G-800-33.

## NOTE

Accomplish only if 205-030-837-7 is damaged beyond repair or adjacent parts are installed per note 8 on drawing X0332-AH-1G-800.

**2-9 Flight Safety Parts Program.** Parts, assemblies, or installations identified under the flight safety parts program require special handling during overhaul. Throughout the overhaul procedures, warnings appear emphasizing critical instructions to be followed. These warnings are identified as "Flight Safety Parts" warnings and are inserted whenever and wherever necessary.

*a.* A flight safety part is defined as a part, assembly, or installation procedure with one or more critical characteristic that, if not conforming to the design data or quality requirements, could result in serious injury or death of crew member and/or serious damage to the aircraft.

*b.* A critical characteristic is any dimension, tolerance, finish, material, manufacturing, assembly or inspection process, or other feature which, if nonconforming or missing could cause failure or malfunction of the critical item.

- c.* Flight safety parts are listed in table 2-3.

Table 2-3 Flight Safety Parts

Nomenclature	Part No.	Critical Characteristic
Fittings	205-031-820-1/2 205-031-821-1/2	Upon installation of all tailboom attachment fittings to longerons, deburr rivet holes on each side of each member when room temperature cure adhesive is used. Deburr rivet holes on each side of assembly when hot bond adhesive film is used.

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## CHAPTER 3

### PRESHOP ANALYSIS (PSA)

#### Section I. UNPACKING/DISASSEMBLY/CLEANING

**3-1. General.** Preshop Analysis instructions are provided as a systematic method of examining the condition of incoming tailbooms. Information obtained from this examination should be used by the overhaul facility in preparing estimates required to determine extent of repair, modification, and replacement needed to perform overhaul of the tail boom in order to make the tailboom a completely serviceable unit. Quality standards contained in the DMWR shall be adhered to. Detail cleaning and corrosion treatment methods have been integrated where applicable throughout this DMWR. Items pending performance of maintenance shall be preserved to prevent damage or deterioration due to corrosion or decay.

**3-2. Unpacking.** Remove tailboom from shipping cradle. Retain all cushioning, material, tiedown straps, etc. for future use in resecuring the tailboom after overhaul.

**3-3. Disassembly.** The contractor will disassemble the tailboom only to the extent specified herein in order to perform a complete evaluation of the components or subassemblies to determine the repair, modification, and replacements required to overhaul the tailboom as specified in this DMWR.

Prepare tail boom for evaluation by removing parts listed below. Tag all removed parts.

- a. Power train components.
- b. Tail rotor components.
- c. Flight controls including elevator horn support bearings.
- d. Electrical, electronic and navigation equipment.
- e. Access doors and covers.
- f. Drive shaft bearing support fittings and shims. Retain shims.
- g. Stinger.

#### NOTE

Refer to the following technical manuals for removal instructions.

<u>TAIL BOOM PART NO.</u>	<u>TECHNICAL MANUAL NO.</u>
*204-030-800-469	TM 55-1520-219-20
*204-030-800-491	TM 55-1520-220-20
*205-032-800-71	TM 55-1520-210-20
*209-030-800-15	TM 55-1520-221-20

See applicable table for prior tail boom part numbers.

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**3-4. Parts Disposition.** Disposal of removed parts shall be as follows.

- a. Parts which are a part of the basic tail boom configuration shall be tagged and processed for repair. A basic tail boom is equipped only with hanger supports, gearbox supports and stinger.
- b. Parts which do not constitute a part of the basic tail boom configuration, shall be disposed of in accordance with the procurement work directive or the contract.

**3-5. Cleaning and Preparation.** Prior to cleaning, visually inspect honeycomb panels for punctures that would expose the core to moisture. If punctures are detected, seal the holes using the following method.

**CAUTION**

Do not allow cleaning solvents to penetrate honeycomb.

- a. Clean area around hole with a damp cloth wetted with MEK (item 5, table 2-2).
- b. Apply a layer of high-temperature lead foil tape (item 8, table 2-2) to cover hole and overlap edges one half inch minimum.
- c. Press tape to establish a water tight bond.

**3-6. Cleaning.**

**WARNING**

Avoid contact with alkaline cleaners on exposed skin or eyes. Should cleaner get into eyes, flush immediately with water and seek medical assistance at once. Goggles shall be worn whenever these cleaners are sprayed or applied under pressure.

Two types of alkaline waterbase cleaning compounds may be used: liquid concentrate (Type I) and powder form (Type II).

- a. The ratio of Type I cleaning compound, (item 9, table 2-2), to water for different areas and conditions is as follows.

(1) Painted and unpainted surfaces require dilution of one part concentrate to seven parts water. When cleaning badly soiled surfaces, the ratio of concentrate may be increased to one part concentrate to three parts water.

(2) Normal cleaning of exhaust areas requires a mixture of one part concentrate to three parts water. Concentrate may be used without dilution on those areas that are difficult to clean.

**WARNING**

Avoid contact with alkaline cleaners on exposed skin or eyes. Should cleaner get into eyes, flush immediately with water and seek medical assistance at once. Goggles shall be worn whenever these cleaners are sprayed or applied under pressure.

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b. The ratio of Type II cleaning compound (item 9, table 2-2) to water for different areas and conditions is as follows:

(1) Painted and unpainted surfaces are normally cleaned with a mixture of four 5-pound packages of cleaning compound dissolved in approximately 50 gallons of water (a 55-gallon drum is suitable for mixing). Agitate thoroughly to insure proper mixing. When cleaning badly soiled surfaces, the ratio of concentrate may be increased as necessary to remove the soil without removing or discoloring paint or decals in the affected areas.

(2) Normal cleaning of exhaust areas requires a mixture of two 5-pound packages of cleaning compound dissolved in 10 gallons of water. When cleaning badly soiled surfaces, the ratio of concentrate may be varied to match each particular situation.

#### NOTE

Do not use dry cleaning solvent mixture with this material.

c. Apply only enough cleaner to cover the surface being worked. Do not allow cleaning compounds to dry on the surfaces before rinsing, as less effective cleaning will result.

(1) Apply cleaning compound through a nonatomizing spray to surface.

#### NOTE

When the compound is not being directed on the surface, shut off the flow to prevent waste.

(2) Allow compound to remain on surface 5 to 10 minutes, agitate compound, and scrub surface with a mop or brush to remove soils and/or stains.

(3) Rinse thoroughly with a stream of water heated to 120 degrees to 140 degrees F (48.9 degrees to 60 degrees C.). Cold water may be used when heating equipment is not available.

(4) Repeat application process until a clean surface is obtained.

d. Remove foreign matter and debris from tail boom bays.

**3-7. Paint Removal.** Remove paint in areas where paint has deteriorated, damaged areas to facilitate inspection, corroded areas and areas where dye penetrant inspection is required. Stripping of exterior finishes will be in accordance with the following note.

#### CAUTION

Seal holes in honeycomb panels prior to paint removal. (Refer to paragraph 3-5.)

#### NOTE

Tail booms requiring less than 25 percent total exterior surface refinishing shall be stripped only as required for corrosion control and refinish, however, tail booms requiring over 25 percent total exterior refinishing shall be stripped completely of all paint. The epoxy primer will be stripped only in areas of deterioration and inspection.

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- a. Mask off areas not requiring print stripping with barrier material (item 10, table 2-2) and tape (item 11, table 2-2).
- b. In addition to the damaged and corroded areas, the following areas shall be stripped.
  - (1) Ninety degree gear box support fitting.
  - (2) Drive shaft hanger bearing support fitting.
  - (3) Tail boom attach fittings (fwd bay area).
  - (4) Elevator support brackets.
  - (5) Forward bulkhead formers.
  - (6) Tailskid block area of Bulkhead, B.S. 227.
  - (7) Forty-two degree gear box mount surface.
  - (8) Strip all non-standard paint, aircraft tail numbers and organizational insignia.
- c. Use the following stripping procedures:

**WARNING**

Some paint strippers are highly flammable. Use in well-ventilated area and avoid skin contact by use of protective clothing and appropriate eye protection. If stripper comes in contact with skin or eyes, promptly flush with water and seek medical attention.

**CAUTION**

Do not allow alkaline remover to remain on magnesium longer than 12 hours. Do not allow stripper solution to come in contact with adhesive bond lines or enter exposed honeycomb core.

■ (1) Strip exterior finish coats and zinc chromate primer with paint remover (item 47, table 2-2). Where the possibility exists of solution entrapment in crevices or seams or if honeycomb panels are damaged, use methyl-ethyl-ketone (item 5, table 2-2) and Scotch Brite pads (item 53, table 2-2) to remove paint. In areas where the epoxy primer requires removal, use MEK and Scotch Brite pads.

■ (2) Using a stiff bristle brush (item 39, table 2-2), start on the top surfaces and work down, applying the stripper liberally to the areas requiring stripping. If the paint is extremely heavy, allow the first application to work for 15 to 45 minutes, rinse as required by step (5), then dry. This cycle may be repeated until parts are stripped. Observe restrictions of CAUTION above in regards to magnesium surfaces.

(3) Allow 15 to 45 minutes for the remover to act. Do not allow surfaces to dry because this makes removal more difficult. Soaking time will depend on the atmospheric conditions in which the work is accomplished.

(4) Surfaces covered and softened by the paint remover may be scrubbed with a brush to loosen the paint. When spots are encountered from which the finish is not thoroughly loosened by the scrubbing, apply additional coats of stripper until the paint breaks loose.

(5) To rinse, apply water onto the stripped areas beginning at the topmost surfaces. After rinsing with water, apply a low pressure and small volume of water directly onto a clean scrub brush while brushing the part. Begin at the topmost surfaces.

**WARNING****ISOPROPYL ALCOHOL TT-I-735**

Isopropyl alcohol is flammable and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas or use approved respirator as determined by local safety/industrial hygiene personnel. Keep away from open flames, sparks, or other sources of ignition.

**ELECTRON DIELECTRIC SOLVENT**

Electron is combustible and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas. Use approved organic vapor respirator, with dust and mist filter, if exposed to vapor mist. Keep away from open flames or other sources of ignition.

**N-PROPYL BROMIDE**

n-Propyl Bromide is toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in areas with adequate mechanical or local exhaust ventilation or use approved respirator as determined by local safety/industrial hygiene personnel.

**DS-108**

DS-108 is combustible, reactive with strong oxidizers, and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas or use approved respirator as determined by local safety/industrial hygiene personnel. Keep away from open flames or other sources of ignition. Do not mix or cross-apply with other cleaners or chemicals.

**POSITRON DIELECTRIC SOLVENT**

Positron is combustible and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas. Use approved organic vapor respirator, with dust and mist filter, if exposed to vapor mist. Keep away from open flames or other sources of ignition.

**ACETONE**

Acetone is flammable and toxic to eyes, skin and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas or use approved respirator as determined by local safety/industrial hygiene personnel. Keep away from open flames, sparks, hot surfaces or other sources of ignition.

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d. Dye penetrant inspect the following per ASTM 1417. Approval from airworthiness authority is needed to waive the coating removal requirement prior to penetrant inspection. Parts requiring fluorescent penetrant inspection will be final cleaned, prior to inspection, with n-propyl bromide (item 92, table 2-2), DS-108 (item 94, table 2-2), Electron (item 96, table 2-2), or Positron (item 95, table 2-2). DS-108, Electron or Positron must be followed by an acetone (item 97, table 2-2) or isopropyl alcohol (item 93, table 2-2) rinse or wipe. Parts must be dried until there is no visible solvent residue before applying penetrant.

- (1) Ninety degree gear box support fitting.
- (2) Drive shaft hanger bearing support fitting.
- (3) Tail boom attach fittings (fwd bay area).
- (4) Elevator support brackets.
- (5) Forward bulkhead formers.
- (6) Forty-two degree gearbox mount surface.
- (7) Strip all non-standard paint aircraft tail numbers and organizational insignia.
- (8) Tail skid block area of bulkhead, B.S. 227.

e. Cracks in attach fittings, doublers, longerons, 90 degree gear box fitting, antenna mount casting, and bearing hanger support fittings require part replacement. Cracks in other areas require repair.

**3-8. Battery Acid Removal.** Treat potassium hydroxide (used in nickel cadmium batteries) electrolyte affected areas with a 3 percent by weight solution of boric acid, (item 50, table 2-2). Remove solution by rinsing with clear water, then dry.

### 3-9. Corrosion Removal

#### CAUTION

Corrosion removal must be complete. Failure to remove all corrosion allows corrosion to continue even after cleaning and refinishing. All surfaces to be treated for corrosion must be clean, unpainted, and free from oil and grease.

a. Clean affected as follows:

- (1) Degrease with DS-108 (item 94, table 2-2), Electron (item 96, table 2-2), Positron (item 95, table 2-2) or Isopropyl Alcohol (item 93, table 2-2).
- (2) Alkaline clean area with cleaner (item 51, table 2-2) heated 140 degrees - 180 degrees F for 5-10 minutes.
- (3) Rinse with water as required.
- (4) Final rinse with water heated 180 degrees - 200 degrees F for minimum of one minute.
- (5) Dry with filtered air.

#### NOTE

The above procedure does not remove corrosion or corrosion products from metallic surface.

#### NOTE

If maximum allowable corrosion limits cannot be determined, consult engineering authority.



b. Use mechanical removal method for corroded areas on all aluminum and magnesium alloys. Mask adjacent areas to prevent additional corrosion damage from corrosive products removed during mechanical removal.

c. Remove light corrosion products with pads (item 24, table 2-2). Heavy corrosion may be removed by hand scraping with a suitable carbide tipped scraper or fine fluted rotary file.

Text deleted.

d. Uniform etch corrosion may be removed by the use of approved hand operated pneumatic drills and/or explosion proof electric drills. The tool should have a minimum speed of approximately 3000 RPM and a maximum speed of approximately 6000 RPM. The power tool may be used with an aluminum oxide impregnated nylon abrasive wheel (item 54, table 2-2). Standard Abrasive Laminated Wheels, Scotch-Brite buffing wheels, and/or other approved power wheels. Aluminum oxide cloth (3M) (item 55, table 2-2) may also be used.

**CAUTION**

Do not use carbon steel brush or carbon steel wool on aluminum or magnesium surfaces. Tiny dissimilar metal particles will become embedded in the metal causing further corrosion and subsequent damage to equipment. Power tools should not be used on magnesium parts due to fire hazard.

e. Corrosion can be removed from aluminum or magnesium alloy plates, sheets, and in the area of fasteners by use of air-powered drill or grinder and aluminum oxide abrasive wheels (item 54, table 2-2). Standard abrasive laminated wheels and aluminum oxide cloth may also be used.

**CAUTION**

It is recommended that only aluminum oxide abrasives be used on aluminum, thereby reducing the possibility of setting up galvanic couples which would later cause corrosion.



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**CAUTION**

Abrasive grinding or wire brushing of skins thinner than 0.0625 inch is prohibited. Vigorous, heavy, continuous rubbing (such as with power driven tools) can generate enough heat to cause metallurgical change, as well as abrading the skin beyond allowable tolerances. Corrosion and stains may be removed from these thin areas using pads (item 24, table 2-2) and hand rubbing only.

**CAUTION**

Excessive and unwarranted use of abrasives causes unnecessary removal of protective cladding on aluminum.

*f.* Dry abrasive blasting, utilizing glass beads (item 52, table 2-2) or 80 grit aluminum oxide (item 55, table 2-2) as the abrasive is an approved method for removing most light corrosion products.

*g.* After removing all visible corrosion products, an additional amount of material must be removed to insure that absolutely no corrosion products remain. The procedure is to remove twice the depth of the corrosion on aluminum or magnesium alloys. In cases of intergranular corrosion it is almost impossible to be sure all corrosion has been removed, except through metallurgical examination. The surface of the repaired area should be blended smoothly and evenly with the surrounding original surface so that a saucer shaped depression is formed to eliminate sharp transition and possible stress concentration. It must also be at least as smooth as the original surface.

*h.* Following corrosion removal, the area should be wiped with a clean, damp cloth followed by wiping dry with a clean, dry, lint-free cloth (item 107, table 2-2). The area may also be cleaned with Methyl-Ethyl-Ketone (MEK), (item 5, table 2-2) and/or blown dry with oil-free air.

**NOTE**

The area under treatment should be kept as clean as possible during repair so as not to allow a buildup of metallic or corrosion particles on the working area.

**3-10. Treatment of Repaired Areas.** Treat repaired areas in the manner prescribed for all type metal involved as follows:

*a.* Treat aluminum alloys by applying chemical film (item 18, table 2-2) to repaired areas. Mixing and application instructions are contained on each can of solution.

**CAUTION**

Never use alcohol or materials containing alcohol on magnesium alloys due to severe corrosion effect.

*b.* Treat magnesium alloys for corrosion protection in accordance with Military Specification MIL-M-3171, Type II.

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(1) Apply solution to affected area with a brush and allow to remain for one minute. Add more solution when necessary to keep surface wet. The temperature of the solution must be from 65 degrees to 90 degrees F (18.3 degrees to 32.2 degrees C).

(2) Proper application time will be the least time required to produce desired finish color (iridescent to dark brown). Treat surface for at least 30 seconds and not longer than three minutes. Excessive time will cause deposits affecting paint adhesion.

(3) Wipe off solution with a damp, lint-free cloth, frequently rinsing with clean water. Air dry surface. Drying may be speeded by use of low pressure clean air or gaseous nitrogen.

#### NOTE

Parts containing bronze, steel or cadmium plated inserts may be treated by process in steps (1) through (3) above.

## Section II. PRESHOP ANALYSIS

**3-11. Preshop Analysis Applicability.** The Preshop Analysis (PSA) pertains to all UH-1 H/M and AH-1G tailbooms prior to induction into an overhaul facility. PSA should not be performed on tailbooms that are determined uneconomically repairable by obvious visual inspection at time of unpacking.

**3-12. PSA Team.** The recommended working team required to perform the PSA is a quality inspector and a recorder. The inspector should physically perform the analysis and the recorder should record the data and determine the extent of repair. During alignment check additional personnel will be required, dependent on the facility and handling equipment. The total PSA time, however, should not exceed six manhours total.

### NOTE

When this DMWR is used by a commercial contractor, the resident or assigned Government inspector will participate in the conduct of the PSA to the maximum extent possible.

### CAUTION

Extreme care should be exercised while performing the PSA to insure additional damage does not occur to the tailboom.

**3-13. PSA Inspection Points.** The PSA requirements for the tailbooms are presented in an orderly arrangement whereby accomplishing the PSA and recording the results are done systematically. The PSA consists of an evaluation of the following inspection points.

- a. Overall Condition.
- b. Alignment Check.
- c. Paint Condition.
- d. MWO Compliance.
- e. Fin Assembly (Interior).
- f. Fin Assembly (Exterior).
- g. Tailboom Assembly (Structure).
- h. Tailboom Assembly (Skin).

**3-14. PSA Worksheet.** PSA Worksheet provides the basis for recording the results of inspection and examination of tailbooms. Information and data collected will be used for determining the extent of repair, modification or replacement necessary to make tailbooms completely serviceable. Information and data collected will also be used for the preparation of manhour and cost estimates and determining parts required. Table 3-1 lists the mandatory items to be inspected. These are in the sequence required for conduct of the PSA.

**3-15. Instructions for Completing a PSA Worksheet.** PSA Worksheet shall list those items to be inspected; reference the appropriate figure that contains the inspection criteria and record appropriate inspection and disposition information (ref para 3-16). It is expected that the individual

government or contractor activity overhauling tailbooms will develop the necessary process details required to conduct a PSA at their facilities. The use of locally designed and reproduced worksheets to facilitate recording information is authorized subject to the approval of AMSAV-FC. At a minimum, the following information will be included in the design of any such worksheet:

#### NOTE

Assure that all tags and forms are checked to determine the reason for removal from service. Also determine what open items of work or delayed discrepancies, including any TM's, TB's, or MWO's are not accomplished.

- a. *Item 1 - Type/Model/Series.* Indicate either UH-1H, UH-1M or AH-1G.
- b. *Item 2 - Part Number.* Physically verify the part number from the tailboom records with the data plate.
- c. *Item 3 - Serial Number.* Physically verify the serial number from the tailboom records with the data plate.
- d. *Item 4 - Date.* Annotate in month/day/year.
- e. *Item 5 - Overall Condition.* Provide a statement of overall condition. There are three basic classifications for describing the condition of a tailboom.
  - (1) Crash Damage which was caused by an accident or an incident outside of normal usage resulting in severe structural damage and misalignment.
  - (2) Battle Damage caused by weapons resulting in structural damage or misalignment.
  - (3) General Deterioration includes structural damage or misalignment due to normal or prolonged usage.
- f. *Tailboom Alignment Check.* The following procedure will be used when performing a tailboom alignment check.
  - (1) Install (2) bolts in top front tailboom attachment fittings.
  - (2) Install (8) bolts in elevator locator bar adapter (do not tighten).
  - (3) Install (1) bolt in 42° gear box fitting tighten until 42° gear box mount touches pad on fixture.
  - (4) Tighten elevator locator adapter bar bolts. Install lock pins in elevator bar. This establishes the butt line.
  - (5) Remove bolt from 42° gear box fitting.
  - (6) Check 42° gear box holes, 0.060, max misalignment.
  - (7) Check 90° gear box holes, 0.200, max misalignment.
  - (8) Check bottom (2) tailboom attach holes. Attach bolts must fit.

*g. Item 7 - Paint Condition.*

(1) Visually examine the exterior paint of the tailboom undergoing PSA. Look for areas not covered with paint, other areas of non-adherence of paint and evidence of weathering, burned, chipped, cracked, oxidized, and peeling of painted surfaces to the extent that complete stripping and repainting is necessary. If a composite of defects exceeds 25 percent or more of the boom, completely strip and repaint the component. If less than 25 percent, locally strip and repaint. If defects are only minor and superficial, smooth the local areas using aluminum wool and repaint.

(2) Examine a number of rivet heads, selected at random, for crack marks in the paint covering the rivet head. Crack marks are another indicator of paint failure.

(3) Indicate No Defect, Burned, Chipped, Cracked, Oxidized or Peeling, as applicable.

*h. Item 8 - MWO Compliance.* For ready identification of MWO's, see figures 3-1 through 3-6. Indicate Not Complied With, Previously Complied With and No Action, Remove, Incorporate.

*i. Items 9 through 19 - Structural Inspection.* Inspect tailboom according to criteria established in the PSA Worksheet and applicable figures. Sequence of inspection is provided in Table 3-1.

### 3-16. Use of Table 3-1 and PSA Worksheets.

*a.* The information contained in Table 3-1 represents minimum requirements for performing a PSA on H-1 series tailbooms. This information is in a logical sequence which shall be maintained when information is placed on an overhaul facility's internally designed worksheet. The PSA figure number references the figure within this DMWR where the inspection data may be found.

*b.* Overhaul facilities will provide space on their PSA Worksheet for recording the condition of a particular inspected item such as: bent, buckled, burned, chipped, corroded, cracked, delaminated, missing, deteriorated, punctuated, worn excessively, no defects, etc. Use of failure information and codes in Appendix A, TM 38-751 is required. Additionally, provisions shall be provided on this worksheet to record disposition, direction or action required as a result of the conditions noted during the PSA. Such disposition/actions/directions should include as a minimum such phrases as no action, replace, do not remove, remove, clean, reinstall, repair, strip, splice, incorporate, complied with, not complied with, functional tests, etc.

*c.* Information and data collected shall be considered as objective evidence for Quality Assurance purposes and will be maintained accordingly.

**3-17. Modification Data.** The illustrations to aid in identifying MWO compliance are contained in pages 3-24 through 3-29, figures 3-1 through 3-6. These illustrations are provided to support the inspection requirements of items 8a - 8f in Table 3-1.

**3-18. Use of the Visual Data.** To aid in performing the Preshop Analysis, figures 3-7 through 3-66 have been provided. These figures contain the following information:

**Item and Sequence Number** - This number corresponds with the Item and Sequence Number in Table 3-1.

**Inspect For** - This includes the most commonly found defects for that particular part (i.e. cracks, dents, nicks, etc.).

**Limits** - Limits contains the information to make the decision whether to repair or replace.

**Repair** - A quick reference to the applicable repair procedure contained in Chapter 4 will be found.

Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, 11-1 Series Tailboom (Sheet 1 of 12)

## Item &amp; Sequence No.

- |                                 |                         |
|---------------------------------|-------------------------|
| 1. Type/Model/Series            | <u>Ref para 3-15a.</u>  |
| 2. Part Number                  | <u>Ref. para 3-15b.</u> |
| 3. Serial Number                | <u>Ref. para 3-15c.</u> |
| 4. Date of PSA                  | <u>Ref. para 3-15d.</u> |
| 5. Overall Condition            | <u>Ref. para 3-15e.</u> |
| 6. Alignment Check              | <u>Ref. para 3-15f.</u> |
| a. Tail Boom Attachment         |                         |
| (1) Upper L/H Hole              |                         |
| (2) Upper R/H Hole              |                         |
| (3) Lower L/H Hole              |                         |
| (4) Lower R/H Hole              |                         |
| (5) Deleted.                    |                         |
| b. 42 Degree Gearbox Attachment |                         |
| (1) 6 Attachment Holes          |                         |
| (2) Deleted.                    |                         |
| c. 90 Degree Gearbox Attachment |                         |
| (1) 6 Attachment Holes          |                         |
| (2) 90 Degree Gearbox Plane     |                         |
| d. Deleted.                     |                         |
| 7. Paint Condition              | <u>Ref para 3-15g.</u>  |



Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 2 of 12)

Item & Sequence No.	PSA Figure
8. MWO Compliance <u>UH-1 D/H only</u>	
a. MWO 55-1500-200-30/25 Mod of Whip Antenna Mount	Fig 3-1
b. MWO 55-1500-206-20/2 Mod Elevator Stop	Fig 3-2
<u>AH-1G only</u>	
c. MWO 55-1520-221-30/13 & Chg's AN/APX 72 Transponder	Fig 3-3
d. MWO 55-1520-221-30/17 & Chg's ARC-54 Antenna	Fig 3-4
e. MWO 55-1520-221-40/3 & Chg's Anti-Torque System	Fig 3-5
f. TB 55-1520-221-20/7 Tailboom Missing Rivets	Fig 3-6
9. Fin Assembly (Interior) (D/H only) B.S. 194.30 - F.S. 5.08	Fig 3-8
a. Fitting, 90 Degree Gearbox Support	Fig 3-7
b. Spar Assy's, Forward and Aft	Fig 3-8
c. Rib, Fairing Support	Fig 3-9
d. Hinge Half	Fig 3-10
e. Rib, F.S. 5.08	Fig 3-11A
f. Rib, F.S. 10.08	Fig 3-11A
g. Rib, F.S. 22.37	Fig 3-11A
h. Rib, F.S. 34.66	Fig 3-11A
i. Rib, F.S. 46.95	Fig 3-11A
j. Rib, F.S. 59.05	Fig 3-11A
k. Rib, Forward F.S. 46.95	Fig 3-11A

Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 3 of 12)

Item & Sequence No.	PSA Figure
l. Trailing Edge	Fig 3-11
m. Stiffener, L & R F.S. 59.05 - 10.08	Fig 3-11
n. Stiffener, Lower L & R F.S. 51.0	Fig 3-11
o. Stiffener, Lower L & R F.S. 55.0	Fig 3-11
p. Fittings, Upper & Lower B.S. 227.0	Fig 3-12
q. Angle, Extrusion B.S. 227.0	Fig 3-11
r. Angle, Extrusion B.S. 215.0 - 227.0	Fig 3-11
s. Bulkhead, B.S. 227.0	Fig 3-11
t. Bulkhead, Canted B.S. 206.17	Fig 3-13
u. Fitting, 42 Degree Gearbox Support	Fig 3-13
v. "J" Stringer B.S. 185.18 - 227.0	Fig 3-11
w. "J" Stringer B.S. 213.0 - 227.0	Fig 3-11
x. Channel, Lower B.S. 213.0 - 227.0	Fig 3-11
y. Clips, L & R F.S. 59.05 - 10.08	Fig 3-14
10. Fin Assy (Exterior) (B/D/H only) B.S. 194.30 - F.S. 5.08	Fig 3-15
a. Skin, Top B.S. 194.30 Aft	Fig 3-16

## NOTE

The skin limits shown in Fig 3-16  
apply to all H-1 series tailbooms.

Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 4 of 12)

Item & Sequence No.	PSA Figure
b. Skin, Bottom B.S. 194.30 Aft	Fig 3-17
c. Skin, B.S. 210.0 - 227.0	Fig 3-18
d. Skin, Upper L/H B.S. 215.0 - F.S. 5.08	Fig 3-19
e. Skin, Lower L/H B.S. 227.0 - F.S. 5.08	Fig 3-19
f. Skin, Upper R/H B.S. 215.0 - F.S. 5.08	Fig 3-20
g. Skin, Lower R/H B.S. 227.0 - F.S. 5.08	Fig 3-20
h. Bracket Assy, Taillight	Fig 3-21
i. & j. Doublers, Aft L & R B.S. 227.0	Fig 3-22
k. & l. Doublers, Lower L & R F.S. 46.95	Fig 3-23
m. Skid, Tail	Fig 3-24
11. Fin Assy (C/M/G only) B.S. 194.30 - F.S. 5.08	Fig 3-25
a. Spar Assy, Front	Fig 3-26
b. Fitting, 90 Degree Gearbox Support	Fig 3-26
c. Hinge Half	Fig 3-26
d. Rib, Fairing Support	Fig 3-26
e. Rib, F.S. 46.95	Fig 3-27
f. Rib, F.S. 5.08	Fig 3-27
g. Trailing Edge	Fig 3-27
h. Rib, Lower F.S. 46.95 Fwd	Fig 3-27
i. Spar Assy, Rear	Fig 3-27

Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 5 of 12)

Item & Sequence No.	PSA Figure
j. & k. Panel, Honeycomb L/R	Fig 3-28
l. Bulkhead, B.S. 227.0	Fig 3-29
m. & n. Upper & Lower Fittings B.S. 227.0	Fig 3-30
o. Angle, Extrusion L & R B.S. 227.0	Fig 3-31
p. Bulkhead, Canted B.S. 206.17	Fig 3-13 (Ref. item 9t.)
q. Fitting, 42 Degree Gearbox Support	Fig 3-13 (Ref. item 9u.)
r. Angle, Extrusion L & R B.S. 215.0 - 227.0	Fig 3-32
s. "J" Stringer B.S. 185.18 - 227.0	Fig 3-11A (Ref. item 9v.)
t. Channel, Lower B.S. 210.0 - 227.0	Fig 3-11A (Ref. item 9x.)
u. Skin, Top B.S. 194.30 - 227.0	Fig 3-33
v. Skin, Bottom B.S. 194.30 - 227.0	Fig 3-34
w. Skid, Tail	Fig 3-25 (Ref. item 10m.)
12. Fin Assy (1G only) Extension	Fig 3-35
a. Spar Assy, Rear	Fig 3-36
b. Rib, Upper	Fig 3-37
c. Cover, Top	Fig 3-38
d. Skin, Top	Fig 3-38
e. Panels, Honeycomb L & R	Fig 3-39

Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 6 of 12)

Item & Sequence No.	PSA Figure
13. Tail Boom Assembly (H/M/1G) B.S. 595.50 - 194.30	
a. Bulkhead B. S. 59.50	Fig 3-40
b. Bulkhead B. S. 80.44	Fig 3-40
c. Bulkhead B. S. 101.38	Fig 3-40
d. Bulkhead B. S. 122.33	Fig 3-40
e. Bulkhead B. S. 143.28	Fig 3-40
f. Bulkhead B. S. 164.23	Fig 3-40
g. Bulkhead B. S. 185.18	Fig 3-40
h. Bulkhead B. S. 194.30	Fig 3-40
i. Bracket L & R Elevator Mount B.S. 138.0 - 143.28	Fig 3-40
j. Longerons, L/H Upper	Fig 3-41
k. Longerons, L/H Lower	Fig 3-41
l. Longerons, R/H Upper	Fig 3-41
m. Longerons, R/H Lower	Fig 3-41
n. "J" Stringer, L/H Upper	Fig 3-41
o. "J" Stringer, L/H Lower	Fig 3-41
p. "J" Stringer, R/H Upper	Fig 3-41
q. "J" Stringer, R/H Lower	Fig 3-41
r. "J" Stringer, Bottom	Fig 3-41
s. Frame, L & R B.S. 137.42	Fig 3-42
4. Tail Boom Assy (B/C/D/H/M only) B.S. 59.50 - 194.30	
a. Bellcrank, Support Lower B.S. 80.44 - 101.38	Fig 3-43

Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 7 of 12)

Item & Sequence No.	PSA Figure
b. Stiffener, Lower B.S. 80.44-101.38	Fig 3-43
c. Doubler, Lower	Fig 3-44
d. Door, Access	Fig 3-44
e. Support, Compass Lower B.S. 80.44 Aft	Fig 3-43
f. Gusset, L & R	Fig 3-45
g. Doubler, Bulkhead (B only) B.S. 194.30	Fig 3-46
15. Tail Boom Assy (H/M/1G) B.S. 0.0 - 59.50	
a. Bulkhead, Fwd B.S. 0.0	Fig 3-40
b. Bulkhead B.S. 17.60	Fig 3-40 (Sheet 2 of 2)
c. Bulkhead B.S. 38.55	Fig 3-41 (Sheet 2 of 2)
d. Shelf, Lower B.S. 0.0 - 17.60	Fig 3-47
e. Shelf, Center B.S. 0.0 - 17.60	Fig 3-47
f. Shelf, Top B.S. 0.0 - 17.60	Fig 3-47
g. Skin, Top B.S. 0.0 - 17.60	Fig 3-48
h. "J" Stringer B.S. 0.0 - 17.60	Fig 3-49
i. Intercostal, Top B.S. 17.60 - 38.55	Fig 3-48
j. "J" Stringer B.S. 17.60 - 38.55	Fig 3-49
k. Gusset, L & R	Fig 3-45

Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 8 of 12)

Item & Sequence No.	PSA Figure
l. Support, Idler B.S. 38.55 - 59.50	Fig 3-49
m. "J" Stringer B.S. 38.55 - 59.50	Fig 3-49
n. "J" Stringer B.S. 0.0 - 59.50	Fig 3-49
o. Bulkhead, Fwd (D/H only) B.S. 17.37	Fig 3-50
p. Bulkhead B.S. 38.43	Fig 3-40 (Sheet 2 of 2)
q. "J" Stringer B.S. 17.37 - 38.43	Fig 3-49
r. Shelf, Lower B.S. 17.37 - 38.43	Fig 3-50
s. Support, Idler Lower B.S. 38.43 - 59.50	Fig 3-50
t. "J" Stringer B.S. 38.43 - 59.50	Fig 3-49
u. Support, Quadrant Top B.S. 59.50 Fwd	Fig 3-50
v. Bulkhead, Fwd (1G only) B.S. 41.32	Fig 3-51
w. Shelf, Avionics B.S. 41.32 - 59.50	Fig 3-51
x. "J" Stringer	Fig 3-51
y. Shelf, Lower Fwd (1G only)	Fig 3-51
z. Shelf, Lower Aft (1G only)	Fig 3-51
aa. Support, Compass Lower	Fig 3-52
ab. Gusset R/H (1G only)	Fig 3-53
ac. Quadrant Support (1G only)	Fig 3-52

Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 9 of 12)

Item & Sequence No.	PSA Figure
16. Tail Boom Assy, Skin (B/C/M only) B.S. 0.0 - 194.30	
a. Skin, Top B.S. 17.60 - 101.38	Fig 3-54
b. Skin, Top B.S. 101.38 - 194.30	Fig 3-54
c. Skin, L/H B.S. 0.0 - 17.60	Fig 3-55
d. Skin, L/H B.S. 17.60 - 59.50	Fig 3-55
e. Skin, L/H B.S. 59.50 - 122.33	Fig 3-55
f. Skin, L/H B.S. 122.33 - 194.30	Fig 3-55
g. Skin, R/H B.S. 0.0 - 17.60	Fig 3-56
h. Skin, R/H B.S. 17.60 - 59.50	Fig 3-56
i. Skin, R/H B.S. 59.50 - 122.33	Fig 3-56
j. Skin, R/H B.S. 122.33 - 194.30	Fig 3-56
k. Skin, Bottom B.S. 0.0 - 80.44	Fig 3-57
l. Skin, Bottom B.S. 80.44 - 143.28	Fig 3-57
m. Skin, Bottom B.S. 143.28 - 194.30	Fig 3-57
n. Angle, Top L & R B.S. 38.55 - 213.0	Fig 3-54
o. Hinge Half, Top R/H B.S. 38.55 - 194.30	Fig 3-54
p. Cable Guard	Fig 3-54



Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 10 of 12)

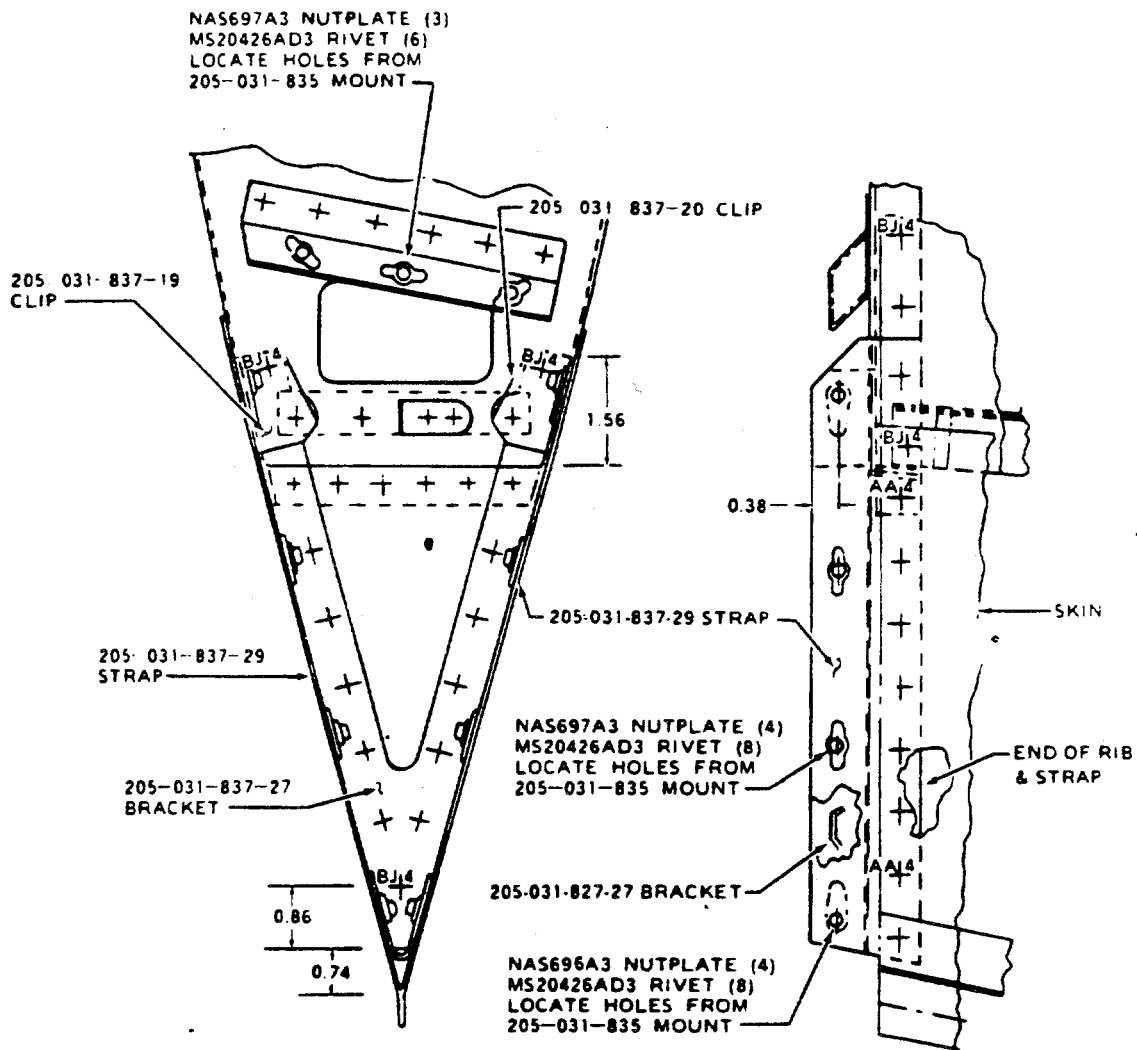
Item & Sequence No.	PSA Figure
q. Cable Guides	Fig 3-54
17. Tail Boom Assy, Skin (D/H only) B.S. 17.37 - 194.30	
a. Skin, Top B.S. 17.37 - 59.50	Fig 3-58
b. Skin, Top B.S. 59.50 - 101.38	Fig 3-58
c. Skin, Top B.S. 101.38 - 194.30	Fig 3-58
d. Skin, L/H B.S. 17.37 - 59.50	Fig 3-59
e. Skin, L/H B.S. 59.50 - 122.33	Fig 3-59
f. Skin, L/H B.S. 122.33 - 194.30	Fig 3-59
g. Skin, R/H B.S. 17.37 - 59.50	Fig 3-60
h. Skin, R/H B.S. 59.50 - 122.33	Fig 3-60
i. Skin, R/H B.S. 122.33 - 194.30	Fig 3-60
j. Skin, Bottom B.S. 17.37 - 59.50	Fig 3-61
k. Skin, Bottom B.S. 59.50 - 143.28	Fig 3-61
l. Skin, Bottom B.S. 143.28 - 194.30	Fig 3-61
m. Angle, Top, L/R B.S. 17.37 - 213.30	Fig 3-58
n. Hinge, Half Top B.S. 17.37 - 194.30	Fig 3-58

Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 11 of 12)

Item & Sequence No.	PSA Figure
18. Tail Boom Assy, Skin (1G only) B.S. 41.32 - 194.30	
a. Skin, Top B.S. 41.32 - 59.50	Fig 3-62
b. Skin, Top B.S. 59.50 - 101.38	Fig 3-62
c. Skin, Top B.S. 101.38 - 194.30	Fig 3-62
d. Skin, L/H B.S. 41.32 - 59.50	Fig 3-63
e. Skin, L/H B.S. 59.50 - 122.33	Fig 3-63
f. Skin, L/H B.S. 122.33 - 194.30	Fig 3-63
g. Skin, R/H B.S. 41.32 - 59.50	Fig 3-64
h. Skin, R/H B.S. 59.50 - 122.33	Fig 3-64
i. Skin, R/H B.S. 122.33 - 194.30	Fig 3-64
j. Skin, Bottom B.S. 41.32 - 59.50	Fig 3-65
k. Skin, Bottom B.S. 59.50 - 122.33	Fig 3-65
l. Skin, Bottom B.S. 122.33 - 164.23	Fig 3-65
m. Skin, Bottom B.S. 164.23 - 194.30	Fig 3-65
n. Angle, Top B.S. 41.32 - 213.30	Fig 3-62
o. Hinge Half, Top B.S. 41.32 - 194.30	Fig 3-62

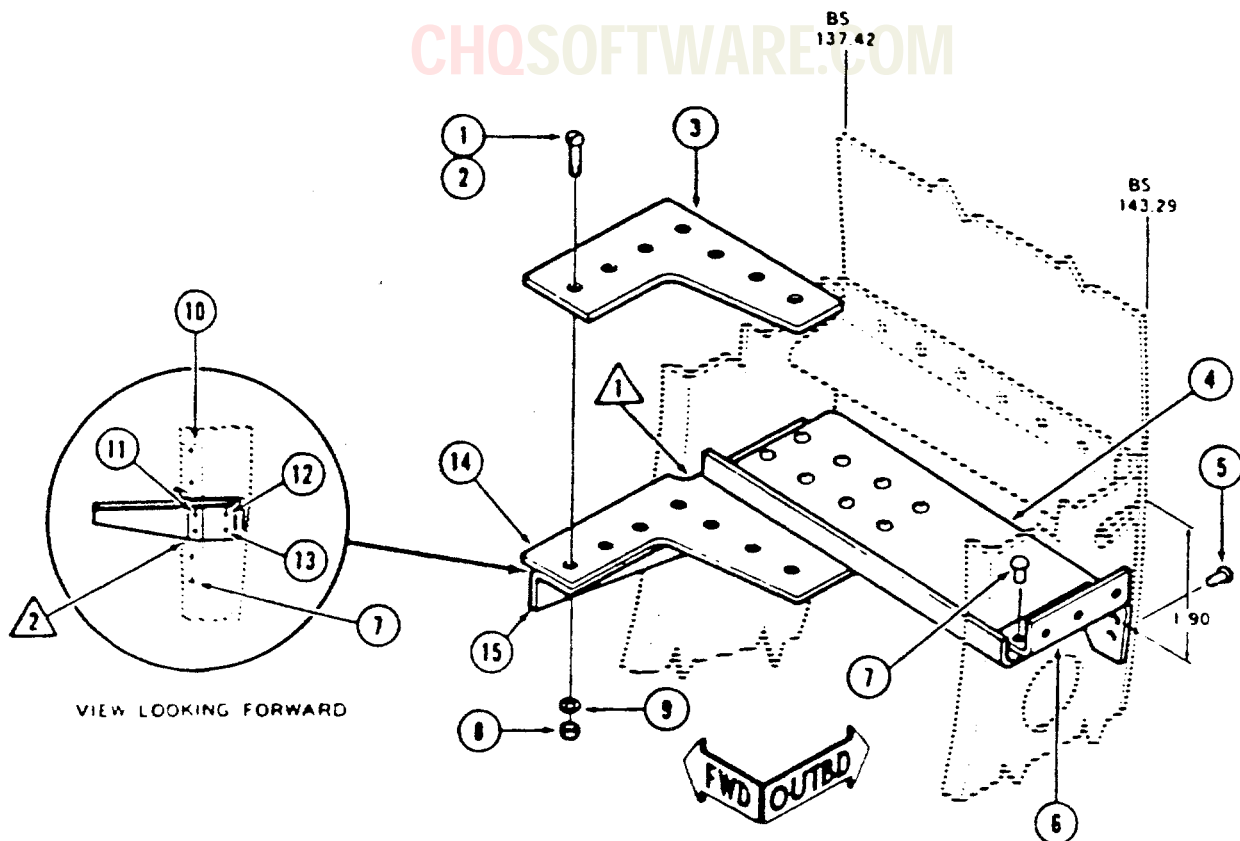
Table 3-1. Preshop Analysis (PSA) Item and Sequence Listing, H-1 Series Tailboom (Sheet 12 of 12)

Item & Sequence No.	PSA Figure
19. Miscellaneous (All Tail Booms)	
a. Fittings, Bearing Hanger Support	Fig 3-59
b. Tail Boom Attach Fittings	Fig 3-49
c. Tail Skid and Support Block	Fig 3-66
d. Antenna Mount	Fig 3:55
e. Rivets - Inspect For: Loose, Missing, Sheared, Incorrect Installation and Clenched.	
f. Fasteners and Nutplates - Inspect For: Stripped Threads, Cracked, Loose, Missing and Rusty.	
g. Rub strip drive shaft cover chafing pads - Inspect For: Missing, Loose, Excessively Worn. No Repair - Replace.	



BRACKET, CLIP AND STRAP INSTALLATION

Figure 3-1. MODIFICATION OF WHIP ANTENNA MOUNT  
PSA IDENTIFICATION (MWO 55-1500-200-30/25)



LEGEND



WORK STATEMENTS

1. MS27039-1-09 (4 reqd) (Model 205)
2. MS27039-1-11 (7 reqd) (Model 204)
3. 204-031-318-15 Stop (Model 204)
4. 204-031-318-3 Support
5. MS20470B4-5 Rivet (9 reqd)
6. 205-031-013-17 Clip
7. MS20470AD4-4 Rivet (11 reqd)
8. NAS679A3 Nut
  - 4 Reqd (Model 205)
  - 7 Reqd (Model 204)
9. AN960PD10 Washer
  - 4 Reqd (Model 205)
  - 7 Reqd (Model 204)
10. 204-031-318-17 Stiffener (Model 204)
11. MS20470AD4-5 Rivet (2 reqd)
12. MS20470AD4-4 Rivet (1 reqd)
13. MS20470AD6-4 Rivet (1 reqd)
14. Restrictor
15. Bracket

1. On model 204 tail booms remove inboard flange of forward frame to clear support 0.25 inch above and below angle.
2. Install stiffener 204-031-318-17 on model 204 tail booms only.

#### NOTE

Refer to Table 1-3 for applicability.

Figure 3-2. ELEVATOR RESTRICTOR (STOP) INSTALLATION  
PSA IDENTIFICATION (MWO 55-1500-206-20/2)

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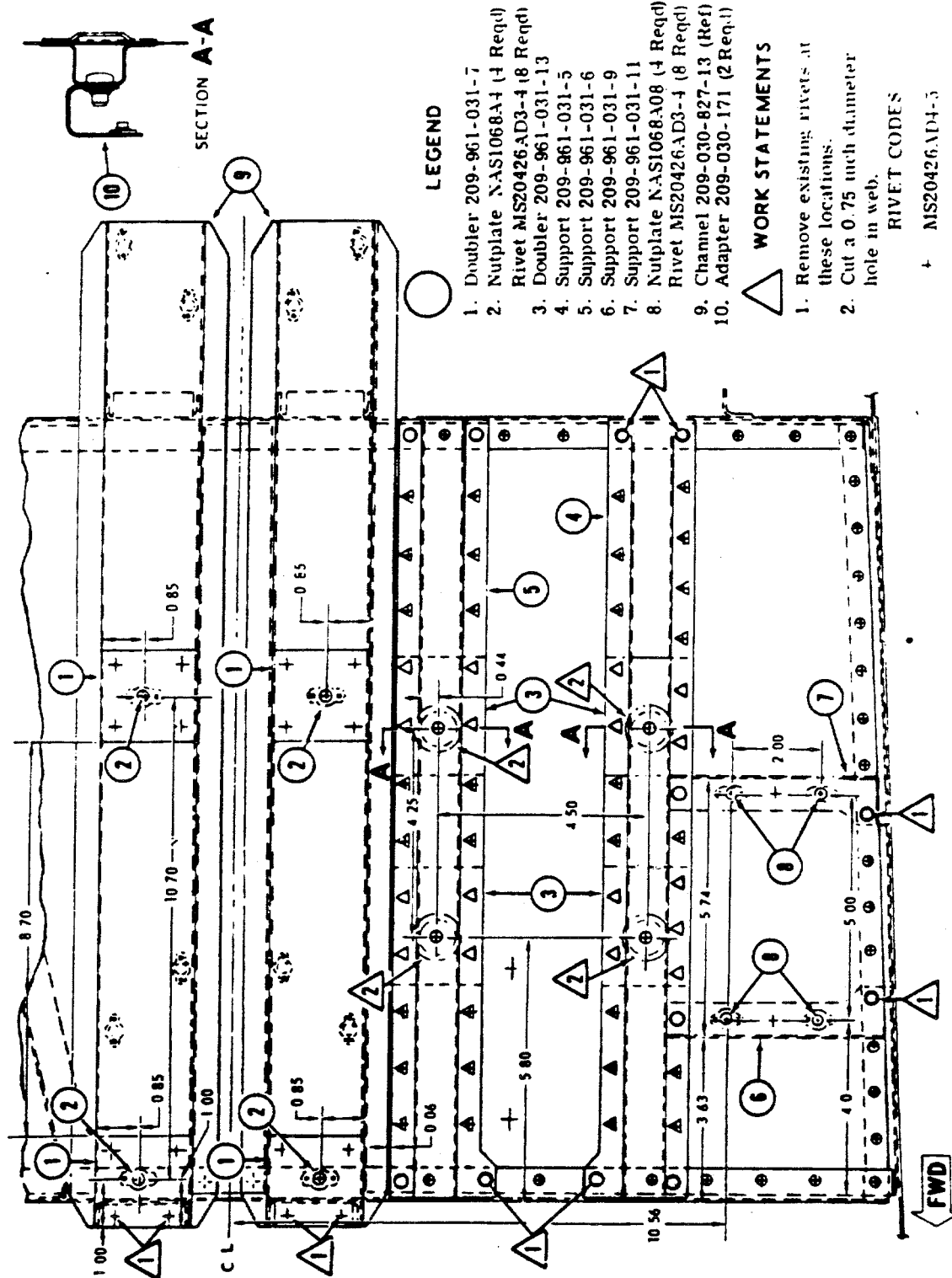


Figure 3-3. AN/APX 72 TRANSPONDER  
PSA IDENTIFICATION (MWO 55-1520-221-30/13)

CHQSOFTWARE.COM

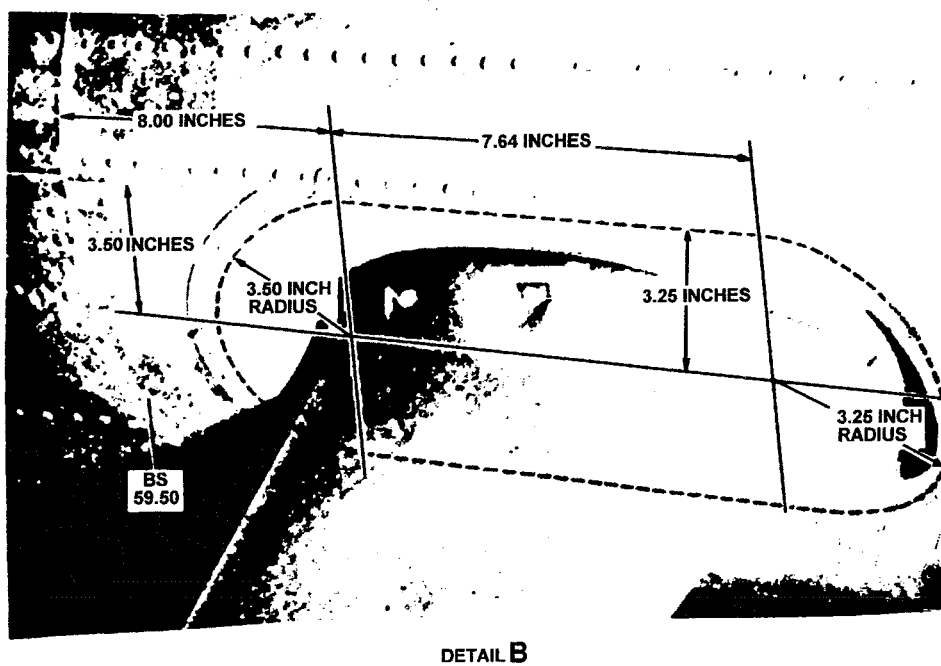
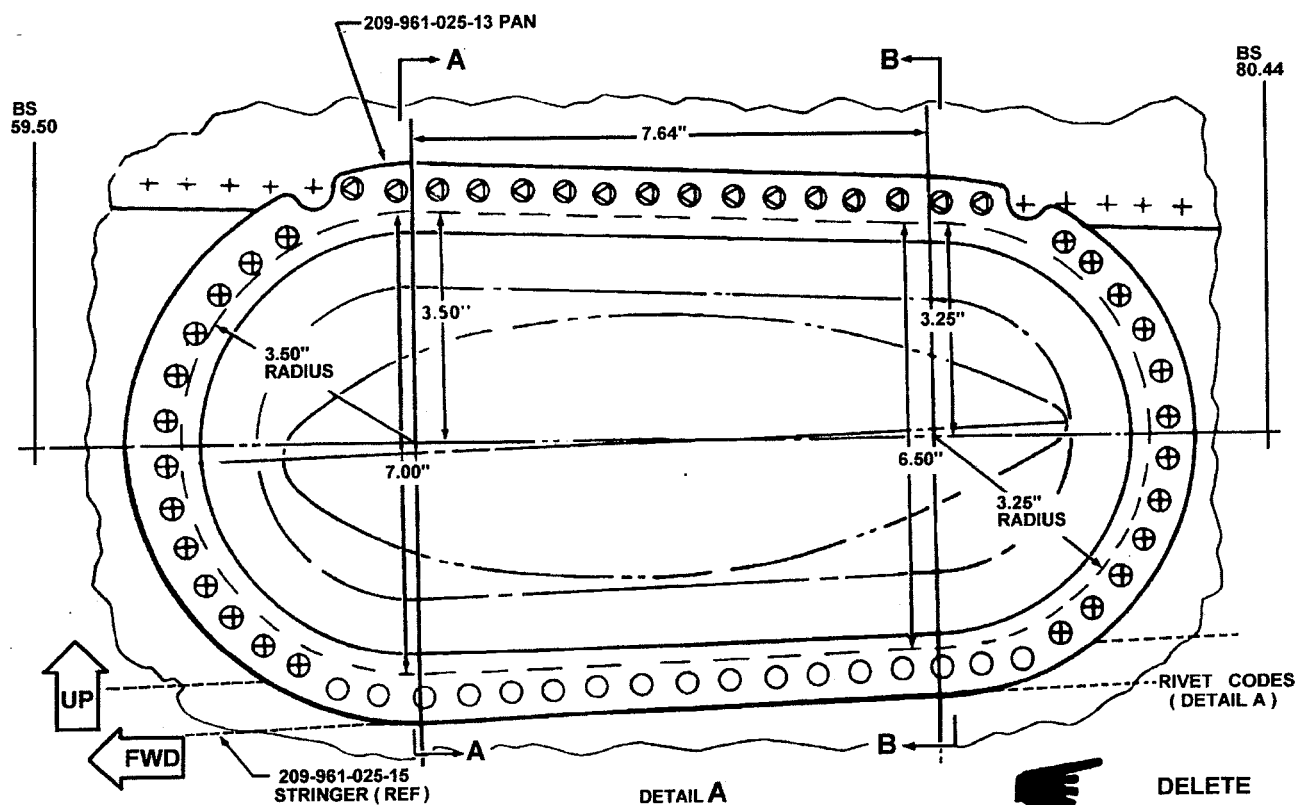


FIGURE 3-4. ARC-54 PSA IDENTIFICATION  
(MWO 55-1520-221-30/17)

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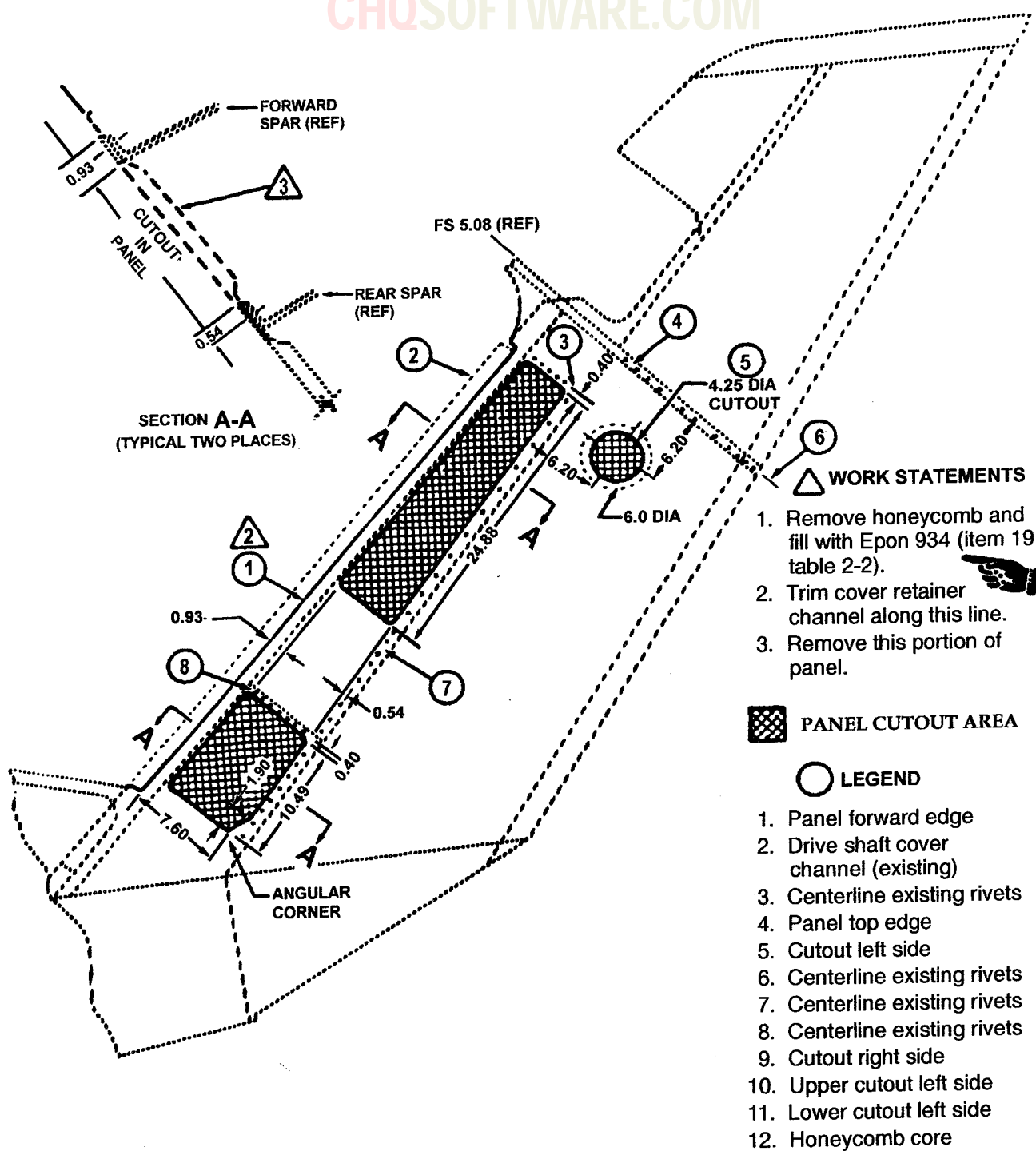


FIGURE 3-5. ANTI-TORQUE SYSTEM PSA IDENTIFICATION (MWO 55-1520-221-40/3)



Figure 3-6. Deleted.

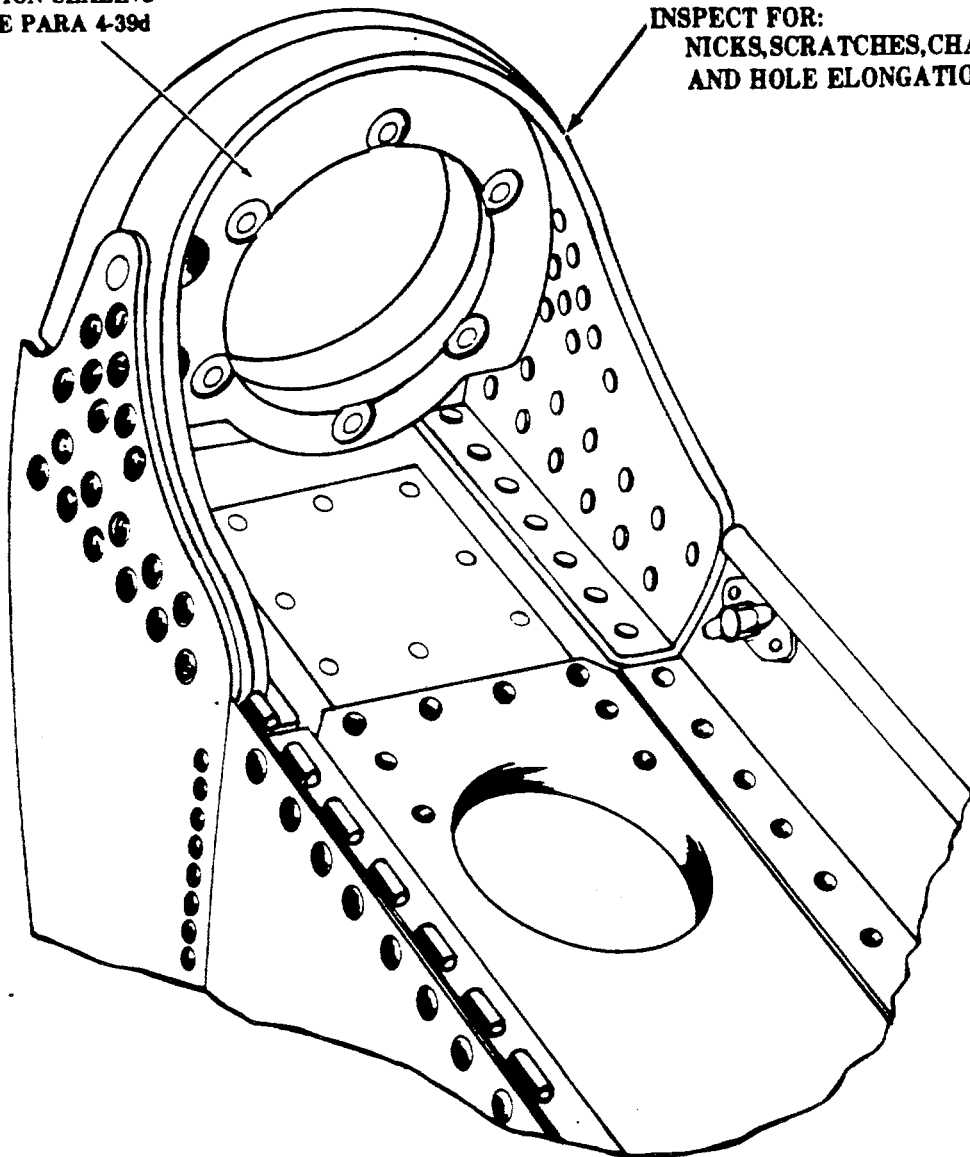
Figure 3-6. TAILBOOM MISSING RIVETS  
PSA IDENTIFICATION (TB 55-1520-221-20/7)

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FOR INSTALLATION SEALING  
PROCEDURE SEE PARA 4-39d

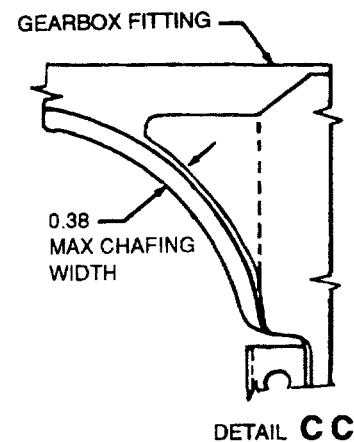
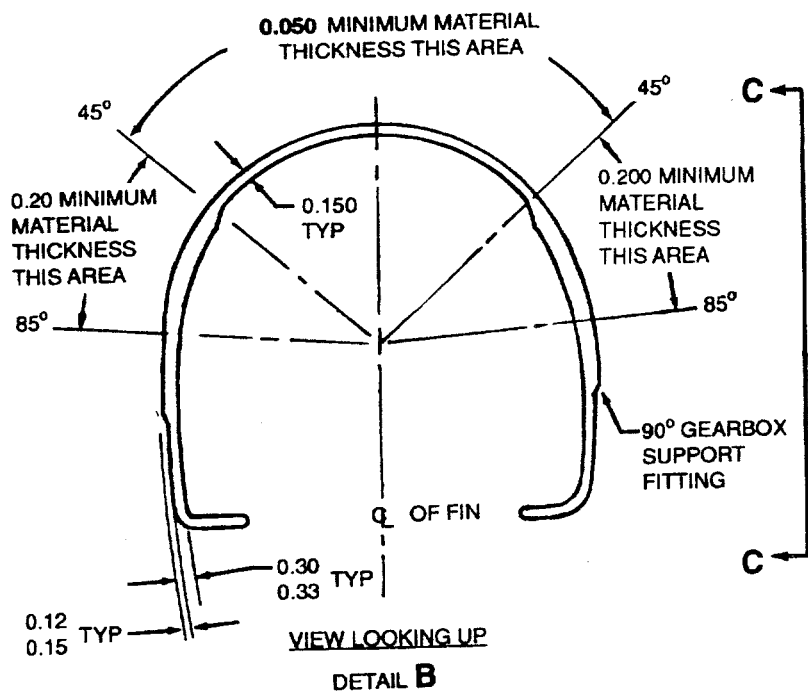
INSPECT FOR:  
NICKS, SCRATCHES, CHAFING  
AND HOLE ELONGATION



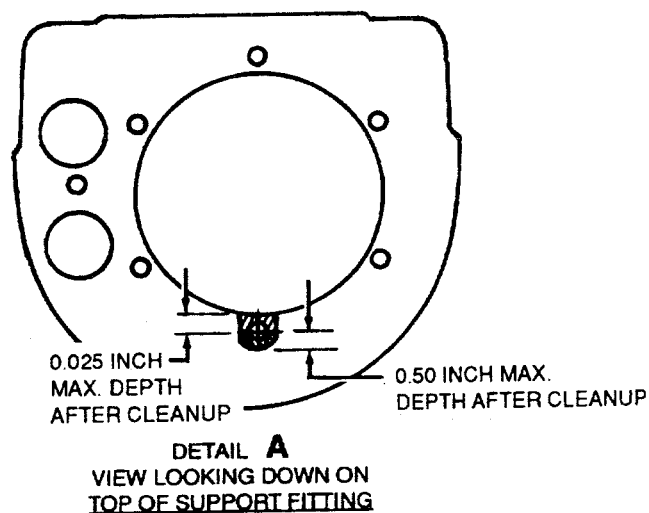
REPAIR:  
REFERENCE PARAGRAPH 4-39

**Figure 3-7. FITTING, 90° GEARBOX SUPPORT (Sheet 1 of 2)**

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TOP SURFACE DAMAGE LIMITS  
(See Detail A)



0.025 Inch  
Max. Depth  
After Cleanup

0.060 Inch  
Max. Depth  
After Cleanup

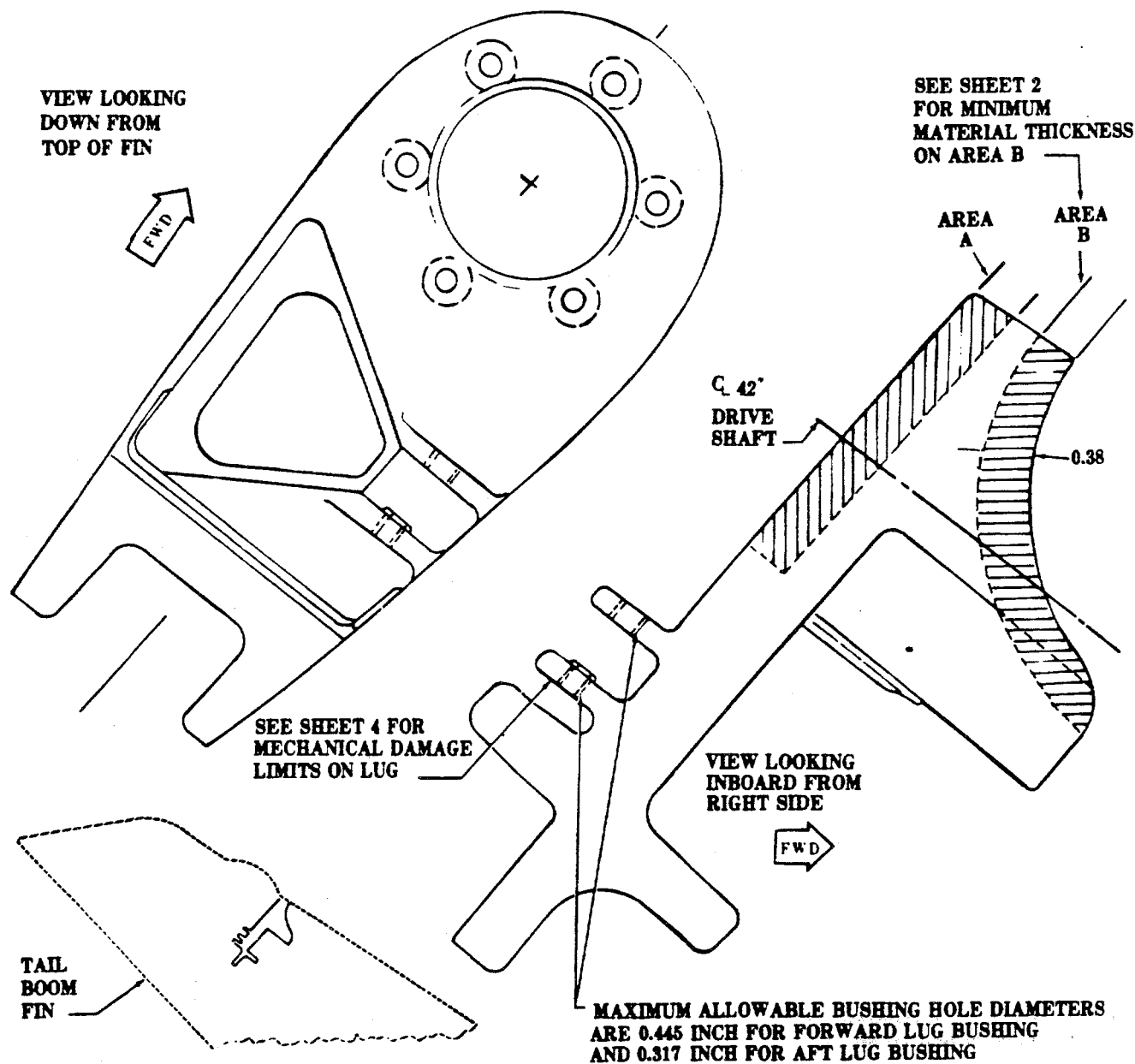
0.000 Inch  
Max. Depth  
After Cleanup  
0.200 Inch  
Max. Width  
After Cleanup

## NOTES

1. The particular damage limits adjacent to holes is applicable to each of the six gearbox stud holes; however, if the area around two or more holes is damaged to the limits shown above, engineering approval must be requested on an individual basis.
2. The total reworked surface area on the top surface of the fitting must not exceed thirty percent of the total area.
3. The wear limits (elongation) of stud holes is 0.329 inch. Holes may be repaired by installation of bushing.
- 3.1 Corrosion limits for the six gearbox holes are shown in figure 4-34B.
4. Maximum chaffing wear. (See detail B.)
  - a. In the area 45° either side of the vertical fin center line (viewed from forward side looking up), the minimum material thickness is 0.050 inch.
  - b. In the area 45° to 85° either side of the vertical fin center line, the minimum material thickness is 0.200 inch.

Figure 3-7. Fitting, 90° Gearbox Support (Sheet 2 of 2)

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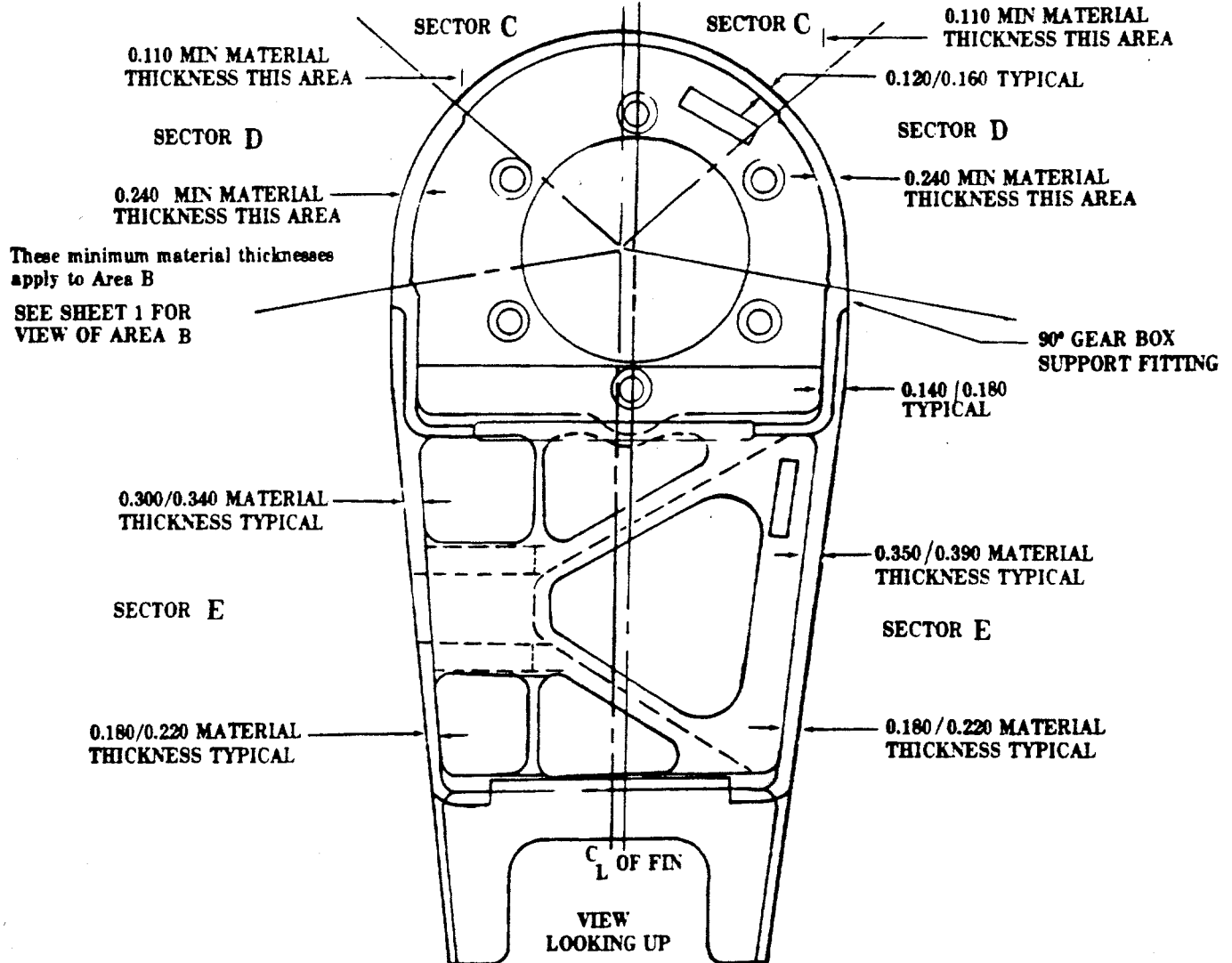


**NOTES:**

1. Chafing damage limit in area B is shown on sheet 2 as "minimum material thickness."
2. Chafing damage limit in area A is 0.075 inch total depth of chafing.
3. Nick, scratch, dent and corrosion damage limits on the top surface of the fitting are shown on sheet 3.

Figure 3-7A Damage limits - tail rotor drive support fitting (Sheet 1 of 4)

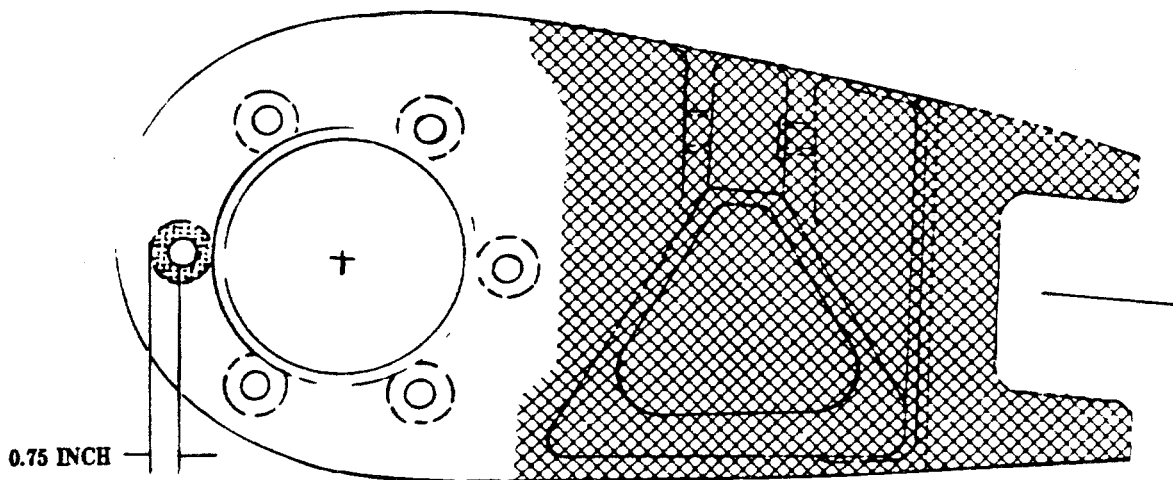
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**DAMAGE LIMITS FOR AREAS BEYOND AREA B**

SEE SHEET 1 FOR VIEW OF AREA B

DAMAGE SECTOR	DAMAGE QUANTITY	MAX. LENGTH	MAX. DEPTH	MAX. BLEND DEPTH	MIN. DAMAGE SPACING
C-LEFT	3	0.75	0.005	0.006	2X LENGHT OF LONGEST DAMAGE
C-RIGHT	2	0.75	0.005	0.006	
D-LEFT	2	1.00	0.01	0.012	2X LENGHT OF LONGEST DAMAGE
D- RIGHT	3	1.00	0.01	0.012	
E	3	0.75	0.01	0.012	2X LENGHT OF LONGEST DAMAGE

Figure 3-7A Damage limits - tail rotor drive support fitting (Sheet 2 of 4)



VIEW LOOKING DOWN ON TOP SUPPORT FITTING

TYPE OF DAMAGE

NICKS, SCRATCHES,  
SHARP DENTS AND  
CORROSION



0.025 in.  
maximum  
depth after  
blending

DAMAGE LOCATION SYMBOLS



MAXIMUM DEPTH AND REPAIR AREAS ALLOWED  
ON EXPOSED UPPER SURFACE

0.060 in.  
maximum  
depth after  
blending



0.080 in.  
maximum  
depth after  
blending  
0.200 in.  
maximum width



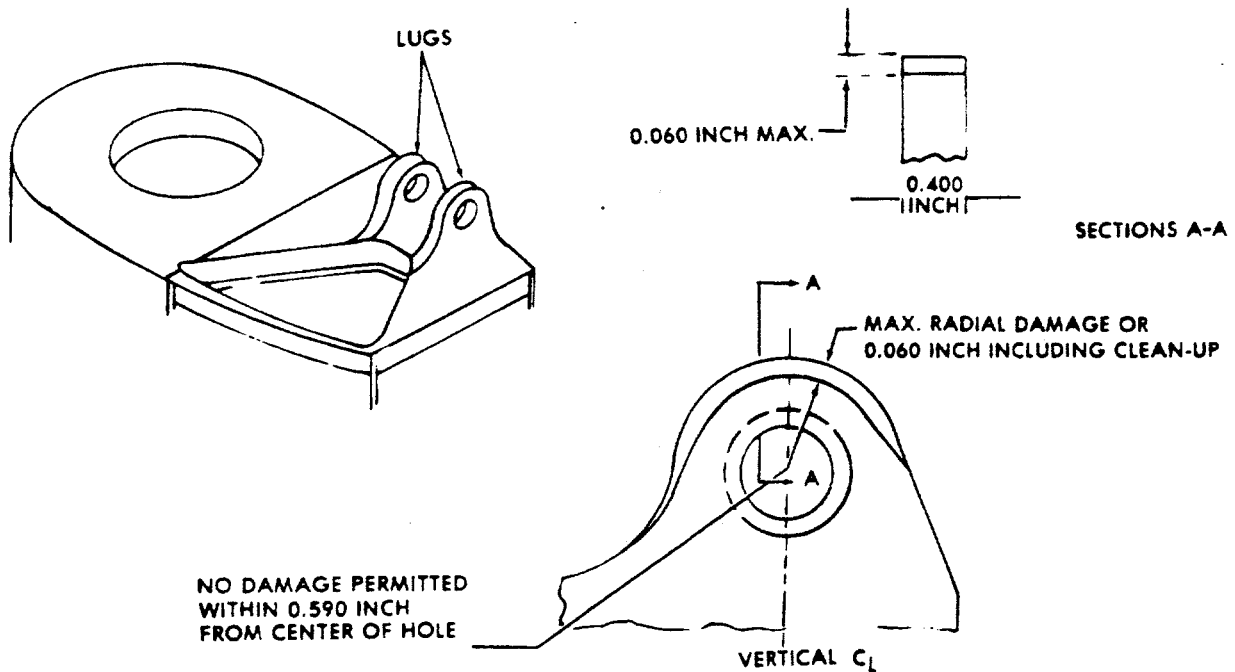
0.010 in.  
maximum  
depth after  
blending

NOTES

1. Damage limits adjacent to holes are applicable to each of six gearbox stud holes; however, if area around two or more holes is damaged to limits shown, part must be replaced.
2. Total reworked area on top surface of fitting must not exceed 30 percent of total area.
3. Wear Limit: Maximum diameter of holes for gearbox studs is 0.400 inch.
4. See sheet 4 for additional limits in area of lugs.

Figure 3-7A Damage limits - tail rotor drive support fitting (Sheet 3 of 4)

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**NOTES:**

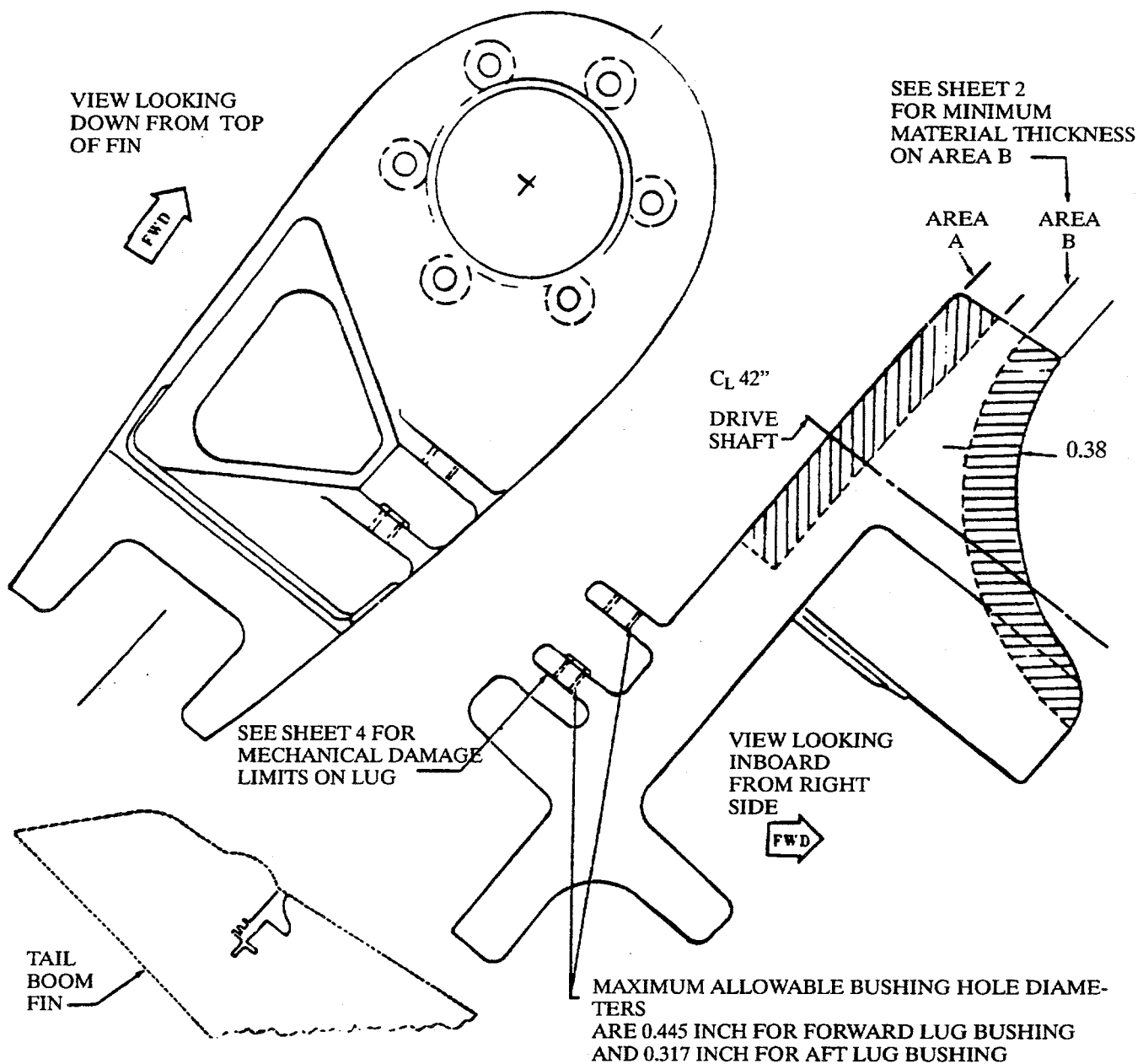
1. Nicks and scratches on fitting lug faces to a maximum depth of 0.010 inch a maximum length of 0.500 inch are repairable.
2. Only two repairs allowed on each lug face.
3. Both damages should not occur on same side of vertical lug face.

**Figure 3-7A Damage limits- tail rotor drive support fitting (Sheet 4 of 4)**

**a. Inspection. see figure 2-67**

- (1) Inspect fitting for nicks, scratches, sharp dents and corrosion.
- (2) Inspect fitting for chafing damage where driveshaft cover and tail rotor gearbox cover contact the fitting.
- (3) Inspect fitting for worn bushings in bellcrank support lugs.
- (4) Inspect fitting for worn bushings in six holes for gearbox studs

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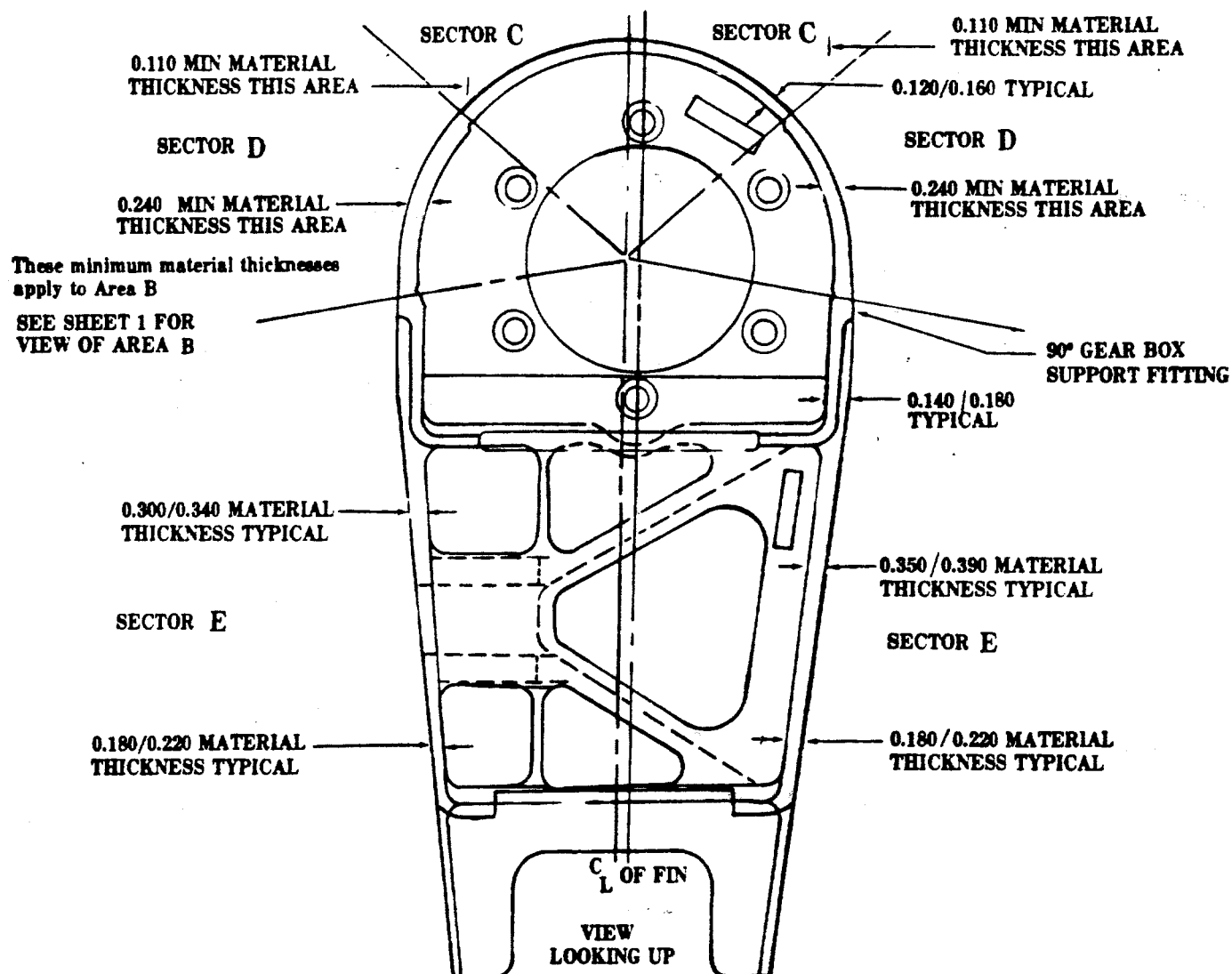


## NOTES:

1. Chafing damage limit in area B is shown on sheet 2 as "minimum material thickness."
2. Chafing damage limit in area A is 0.075 inch total depth of chafing.
3. Nick, scratch, dent and corrosion damage limits on the top surface of the fitting are shown on sheet 3.

Figure 3-7A Damage limits – tail rotor drive support fitting (Sheet 1 of 4)

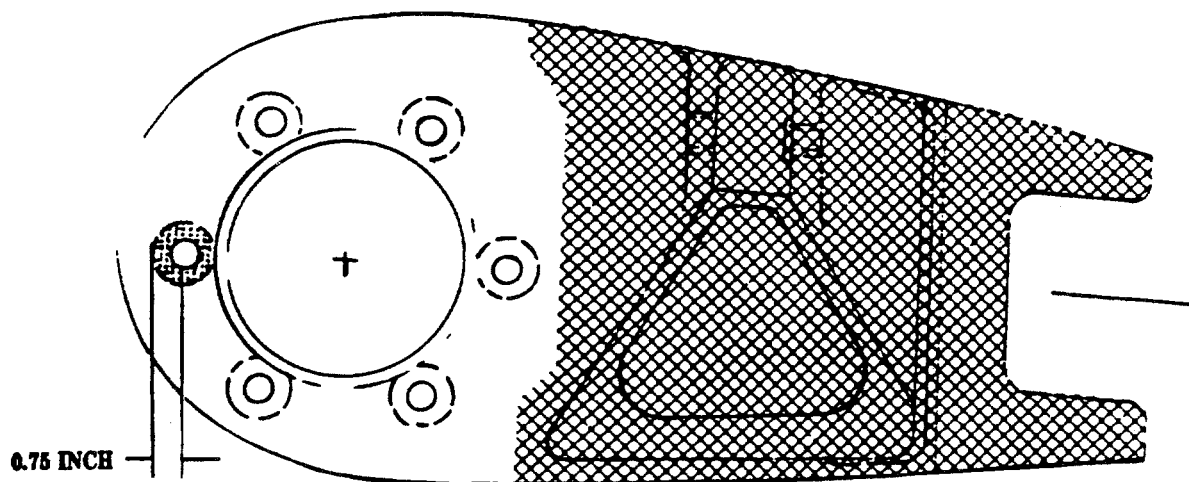




**DAMAGE LIMITS FOR AREAS BEYOND AREA B**  
**SEE SHEET 1 FOR VIEW OF AREA B**

DAMAGE SECTOR	DAMAGE QUANTITY	MAX. LENGTH	MAX. DEPTH	MAX. BLEND DEPTH	MIN. DAMAGE SPACING
C-LEFT	3	0.75	0.005	0.006	2X LENGHT OF LONGEST DAMAGE
C-RIGHT	2	0.75	0.005	0.006	
D-LEFT	2	1.00	0.01	0.012	2X LENGHT OF LONGEST DAMAGE
D- RIGHT	3	1.00	0.01	0.012	
E	3	0.75	0.01	0.012	2X LENGHT OF LONGEST DAMAGE

**Figure 3-7A Damage limits - tail rotor drive support fitting (Sheet 2 of 4)**



VIEW LOOKING DOWN ON TOP SUPPORT FITTING

## TYPE OF DAMAGE

NICKS, SCRATCHES,  
SHARP DENTS AND  
CORROSION0.025 in.  
maximum  
depth after  
blending

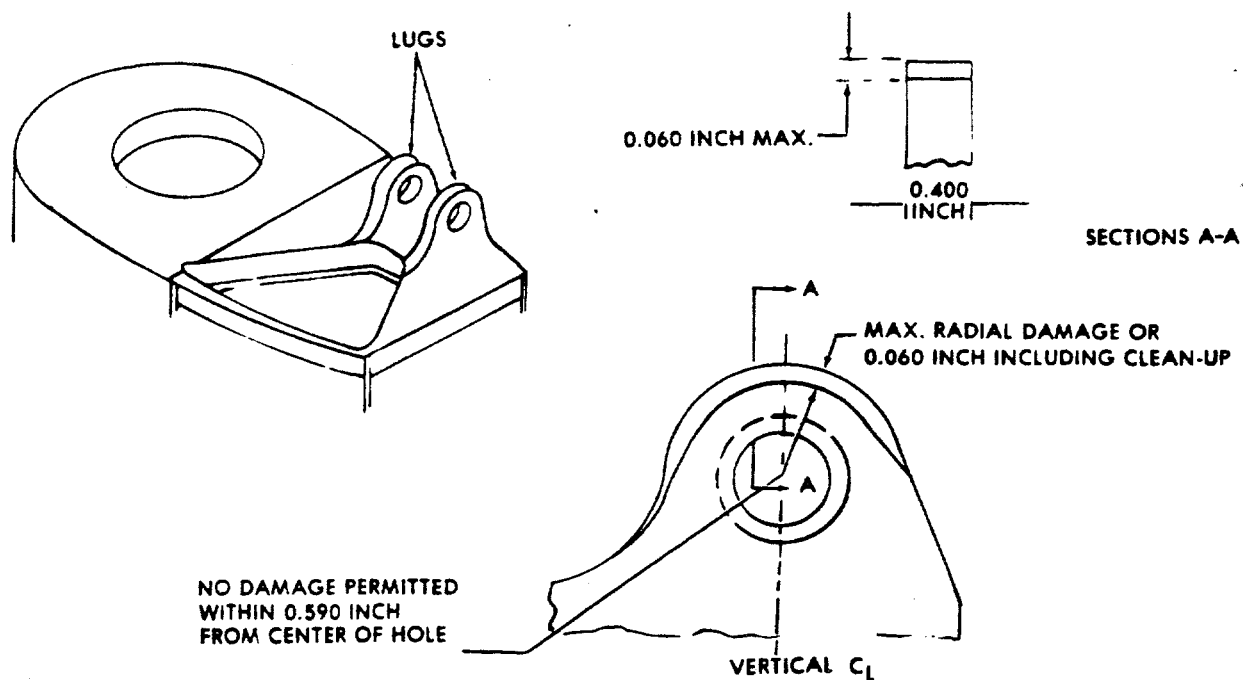
## DAMAGE LOCATION SYMBOLS

MAXIMUM DEPTH AND REPAIR AREAS ALLOWED  
ON EXPOSED UPPER SURFACE0.060 in.  
maximum  
depth after  
blending0.080 in.  
maximum  
depth after  
blending  
0.300 in.  
maximum width0.010 in.  
maximum  
depth after  
blending

## NOTES

1. Damage limits adjacent to holes are applicable to each of six gearbox stud holes; however, if area around two or more holes is damaged to limits shown, part must be replaced.
2. Total reworked area on top surface of fitting must not exceed 30 percent of total area.
3. Wear Limit: Maximum diameter of holes for gearbox studs is 0.400 inch.
4. See sheet 4 for additional limits in area of lugs.

Figure 3-7A Damage limits - tail rotor drive support fitting (Sheet 3 of 4)

**NOTES:**

1. Nicks and scratches on fitting lug faces to a maximum depth of 0.010 inch a maximum length of 0.500 inch are repairable.
2. Only two repairs allowed on each lug face.
3. Both damages should not occur on same side of vertical lug face.

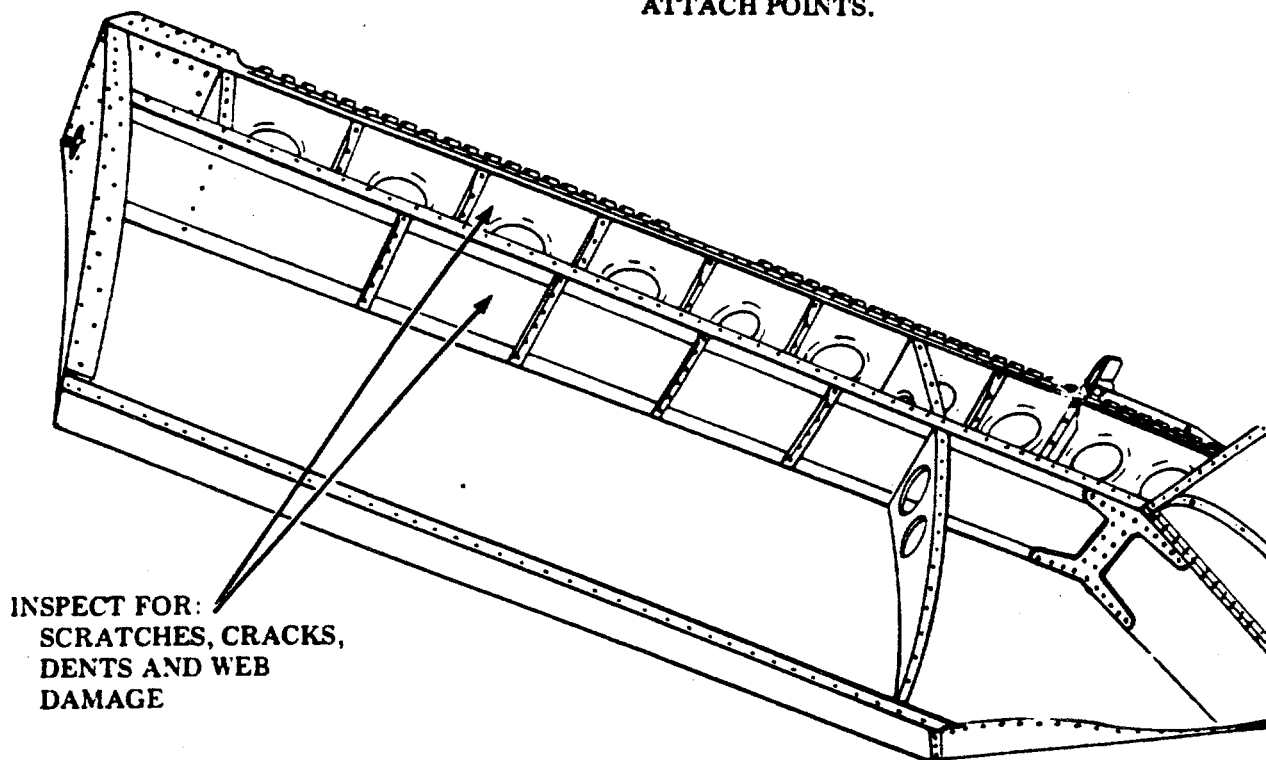
**Figure 3-7A Damage limits- tail rotor drive support fitting (Sheet 4 of 4)**

**a. Inspection. see figure 2-67**

- (1) Inspect fitting for nicks, scratches, sharp dents and corrosion.
- (2) Inspect fitting for chafing damage where driveshaft cover and tail rotor gearbox cover contact the fitting.
- (3) Inspect fitting for worn bushings in bellcrank support lugs.
- (4) Inspect fitting for worn bushings in six holes for gearbox studs

**LIMITS:**  
**(NEGLIGIBLE)** SURFACE SCRATCHES NO DEEPER THAN 10% OF MATERIAL THICKNESS AFTER BLENDING, SMOOTH DENTS FREE OF CRACKS AND GOUGES NOT EXCEEDING 1/64 INCH DEPTH AND 1.0 INCH DIAMETER.

**(REPARABLE)** FORWARD SPAR. CRACKS, HOLES, CUTS IN CAP FLANGES THAT DO NOT EXTEND INSIDE RIVET LINE. WEB DAMAGE NOT TO EXCEED 3.0 SQ. INCHES AFTER CLEANUP, MAY BE REPAIRED IN AREAS CLEAR OF FITTING ATTACH POINTS.



**(REPARABLE)** AFT SPAR. ALL DAMAGE EXCEPT IN AREA OF BOTTOM ATTACH FITTING.

**(REPLACE)** FRACTURES IN AREAS OF FITTINGS AND BOND SEPARATION IN CAP ANGLES THAT CANNOT BE BONDED AND PULLED INTO PLACE OR ANY DAMAGE THAT EXCEEDS REPARABLE LIMITS ARE CAUSE FOR REPLACEMENT.

**REPAIR:** REFERENCE PARAGRAPH 4-49

**NOTE**

THIS FIGURE ALSO USED TO SHOW AREA 9 COMPOSITE OF INTERIOR FIN ASSEMBLY UH-1B/D/H ONLY.

**Figure 3-8. FORWARD & AFT SPARS**

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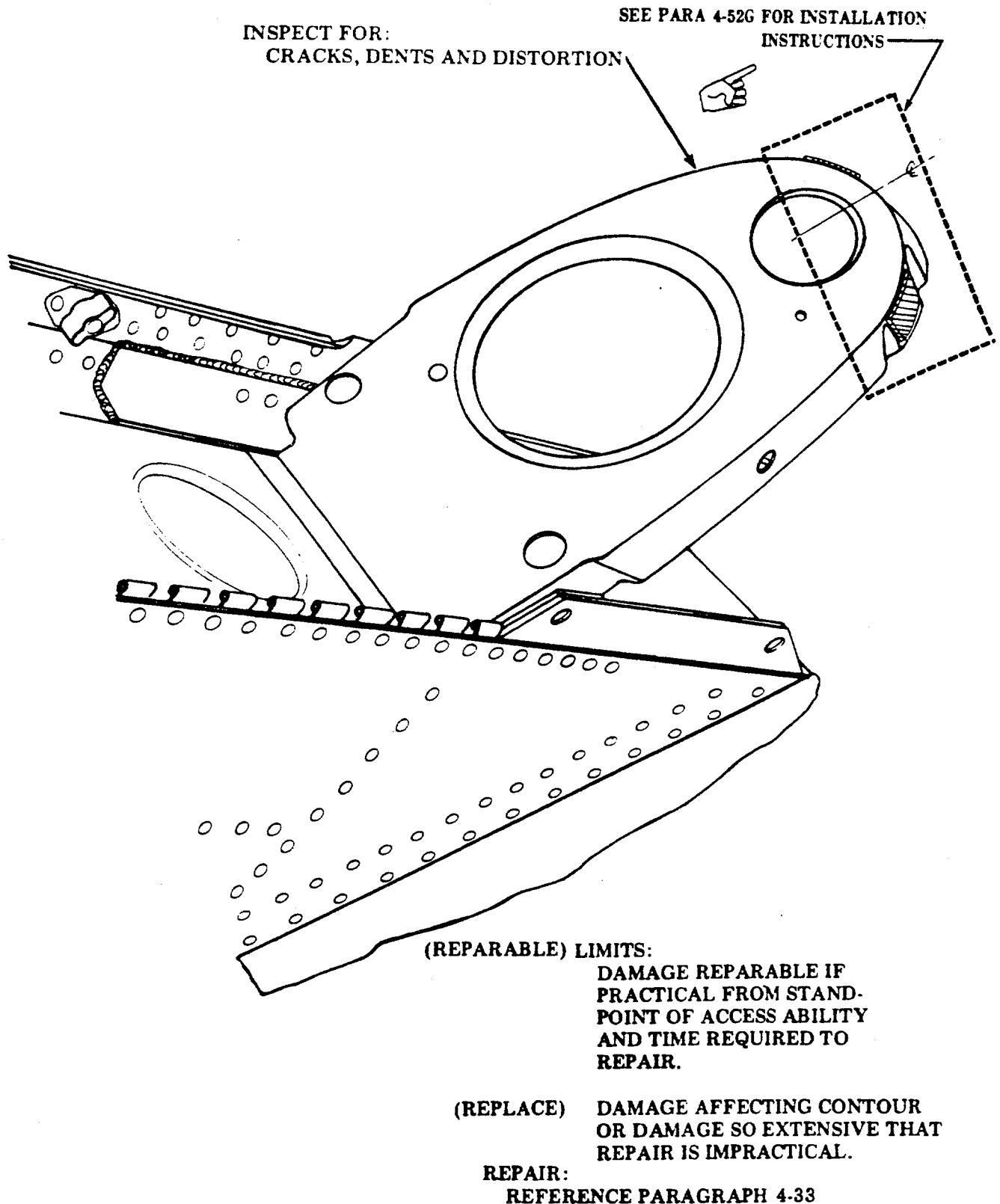
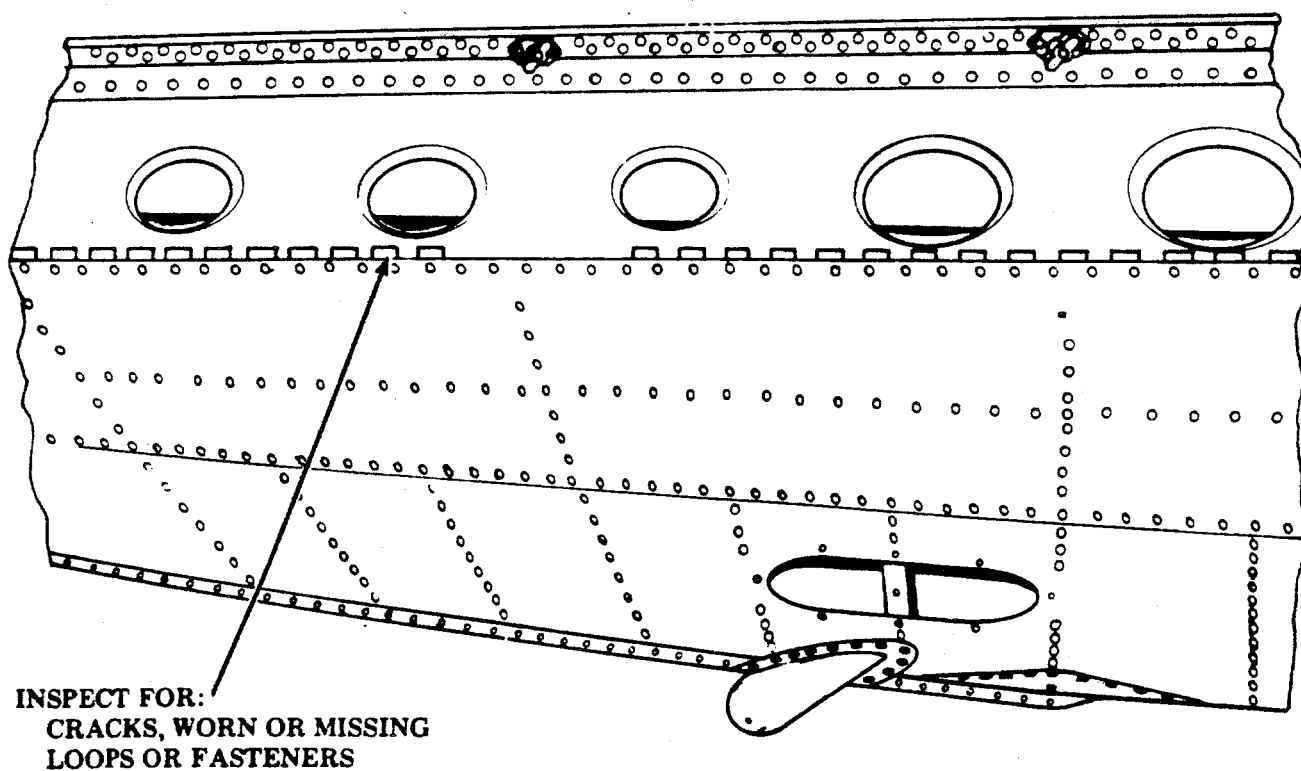


Figure 3-9. RIB, FAIRING SUPPORT

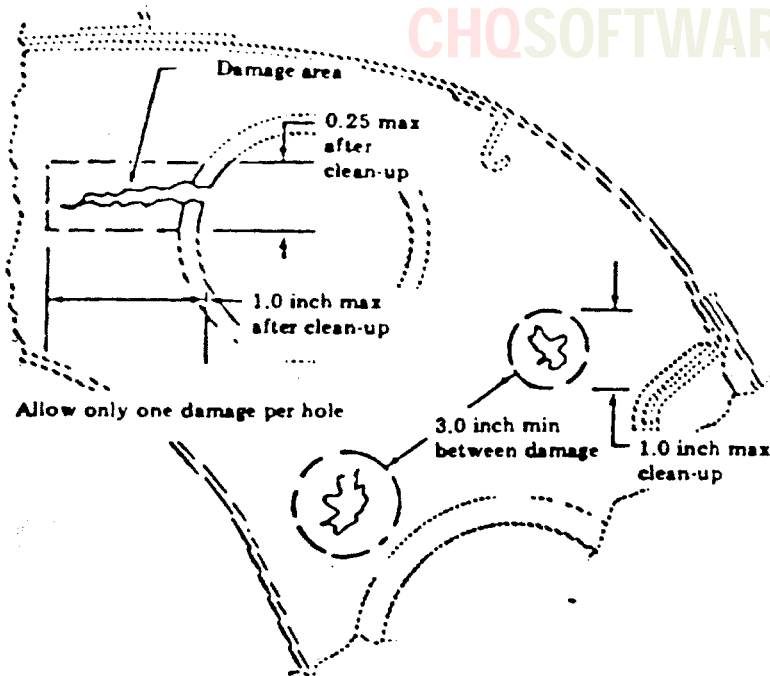
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**LIMITS:**  
HINGE DAMAGE AREA MAY BE  
REMOVED AND A 6 INCH MINIMUM  
LENGTH OF NEW HINGE INSERTED.

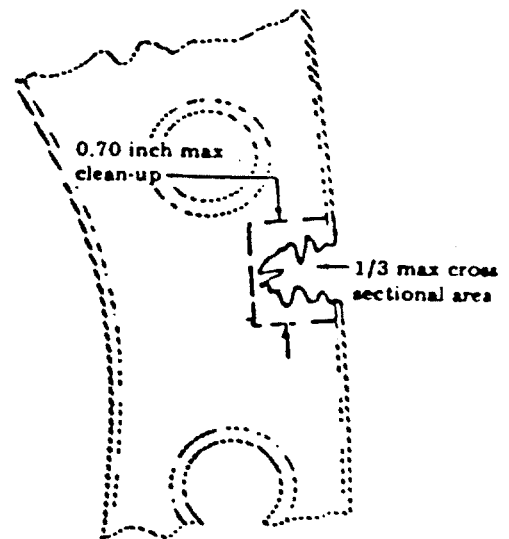
**REPAIR:**  
REFERENCE PARAGRAPH 4-36

Figure 3-10. HINGE HALF



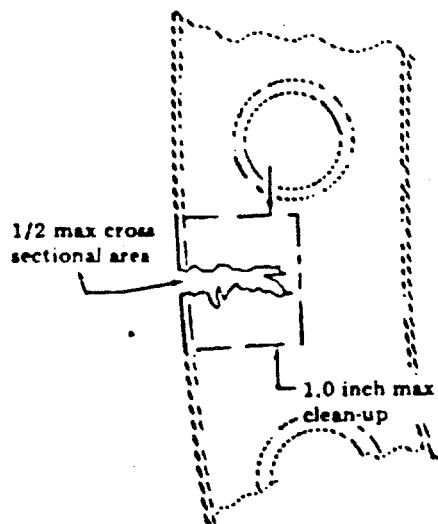
DETAIL A (See Note)

Hole and Crack Damage Limits



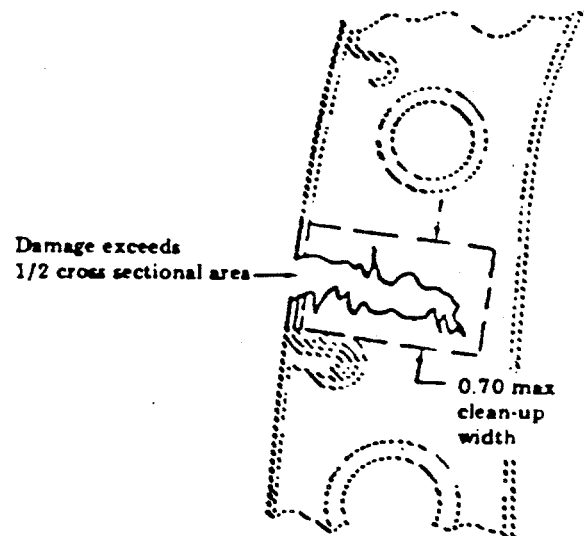
DETAIL B (See Note)

Damage Limits Affecting 1/3 or less of Cross Section



DETAIL C (See Note)

Damage Limits Affecting 1/2 or less of Cross Section



DETAIL D (See Note)

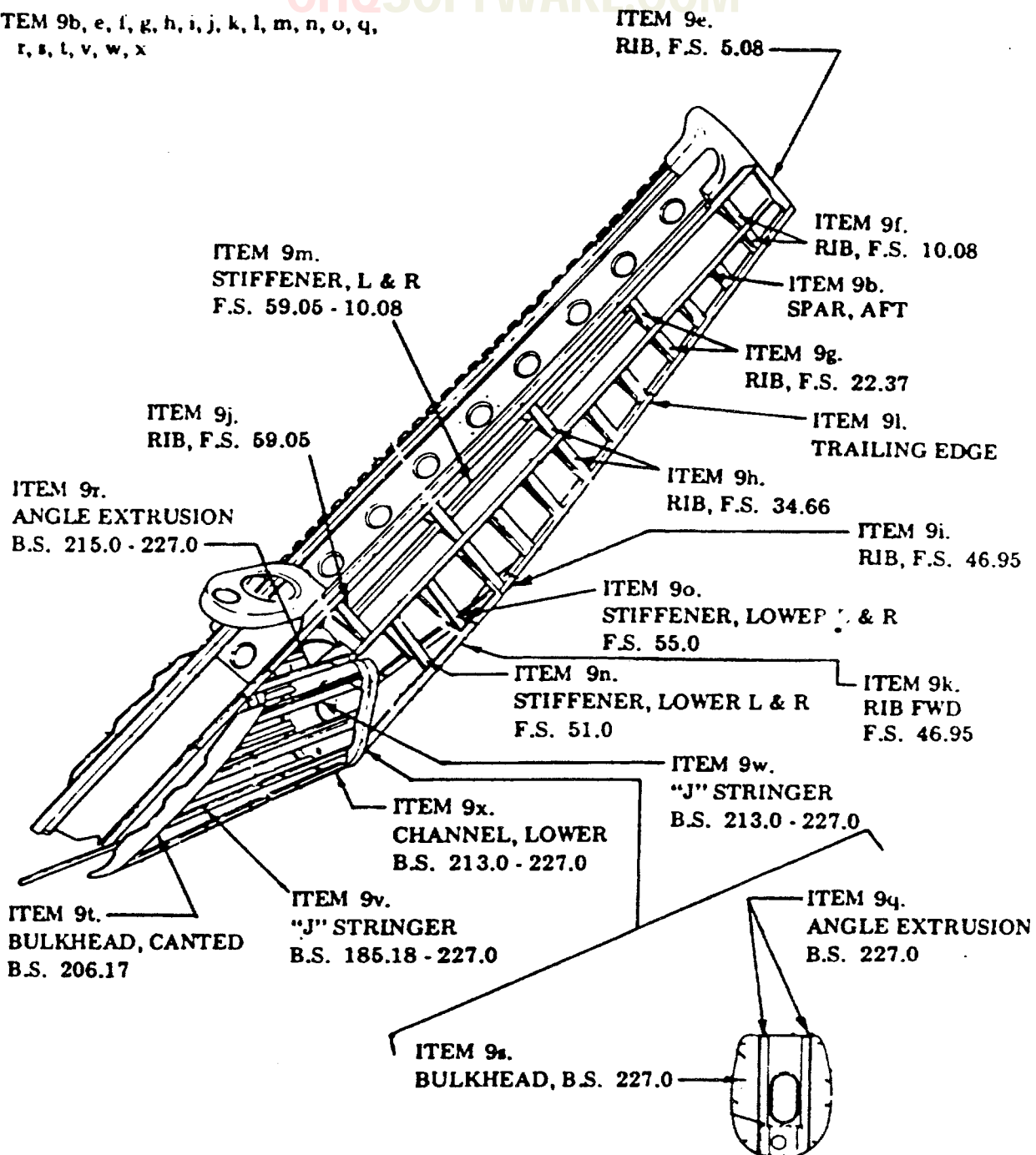
Damage affects more than 1/2 Cross Sectional Area

NOTE

Three repairs not exceeding the limits of detail "A" or "B" and minimum 3.0 inches between damage areas are allowed for each quadrant of a bulkhead. One repair not exceeding the limits of detail "C" is allowed in each quadrant of a bulkhead. One repair not exceeding the limits of detail "D" is allowed for each bulkhead. Damage affecting more than one-half of a cross sectional area requires a full splice.

Figure 3-11. BULKHEAD

ITEM 9b, e, f, g, h, i, j, k, l, m, n, o, q,  
r, s, t, v, w, x



REPAIR:  
REFERENCE PARAGRAPH 4-33

Figure 3-11A. FIN ASSEMBLY (Sheet 1 of 4)



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**Inspect For:**Angles - Cracks, holes, or distortionStringers - Dents, cracks, holes, tears, corrosion and distortion.**NOTE**

Dye Penetrant Inspect bent stringers not requiring section removal.

Bulkhead - Corrosion, dents, cracks, holes, nicks and wrinkles.Trailing Edge - Scratches, nicks, dents and deformationRibs - Cracks and dentsMisc Brackets, Clips and Supports - Cracks, tears and distortion**Limits:**Angles - No repair - replace

Stringers - (Negligible) Scratches or smooth shallow dents not extending into formed radius and less than 10% of material thickness and 0.50 inch length after cleanup. Damage in radius treat as crack. One treated area per length between bulkheads. Edge damage not to exceed 0.025 inch depth and 0.75 inch length after cleanup.

(Repairable) Damage repairable by Patching: Lateral cracks and smooth contour dents less than 0.10 inch depth that are less than 1/2 stringer width and do not extend into radius, stringer splice or bulkhead.

Longitudinal cracks maximum 0.10 inch width and 1.0 inch length.

Damage repairable by Insertion: Damage exceeds limits for patching, but does not exceed 12.0 inch length after cleanup. One repair per length between bulkheads. Damage not to extend into splice or bulkheads.

(Replace) Damage requires more than one insertion type repair between bulkheads. Damage exceeds repairable limits or repair does not warrant time expended.

**Figure 3-11A. FIN ASSEMBLY (Sheet 2 of 4)**

Bulkhead - (Negligible) Corrosion less than 10% of web material thickness and not exceeding 4.0 sq. inch after cleanup. Damage no closer than 0.250 inch to a former, stiffener or radius. Dents, nicks, scratches in bulkhead web refer to skin damage limits. Damage in a radius, treat as a crack.

■ (Repairable) (Ref Figure 3-11A) Patching: Corrosion damage greater than negligible but does not exceed 0.70 inch width or 1/3 of a cross section after cleanup (detail B). Damage no closer than 0.50 inch to a stiffener or attaching parts after cleanup. Dents, cracks, holes and scratches greater than negligible but does not exceed limits of detail A & B. Maximum three damages not to exceed limits of Detail A allowed for each bulkhead quadrant.

■ Insertion: (Ref Figure 3-11A)

- a. Corrosion damage exceeds repairable by patching but does not exceed limits of Detail C.
- b. Dents, cracks, or hole damage exceeds limits of Details A and B, but less than limits of Detail C.

Damage exceeding limits of detail C require full splice.

(Replace) Replace stiffeners or any attaching parts for damage other than negligible. Replace bulkhead if

■ repairable limits are exceeded or if more than one repair to the limits of figure 3-11A, detail D is required.

Trailing Edge - (Negligible) Scratches, nicks, and smooth dents which do not deform the air foil shape of fin. Scratches and nicks are acceptable after blending.

Repair - No repair - Replace.

**Figure 3-11A. FIN ASSEMBLY (Sheet 3 of 4)**

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Ribs - (Negligible) Smooth, crack free dents which do not affect fin contour.

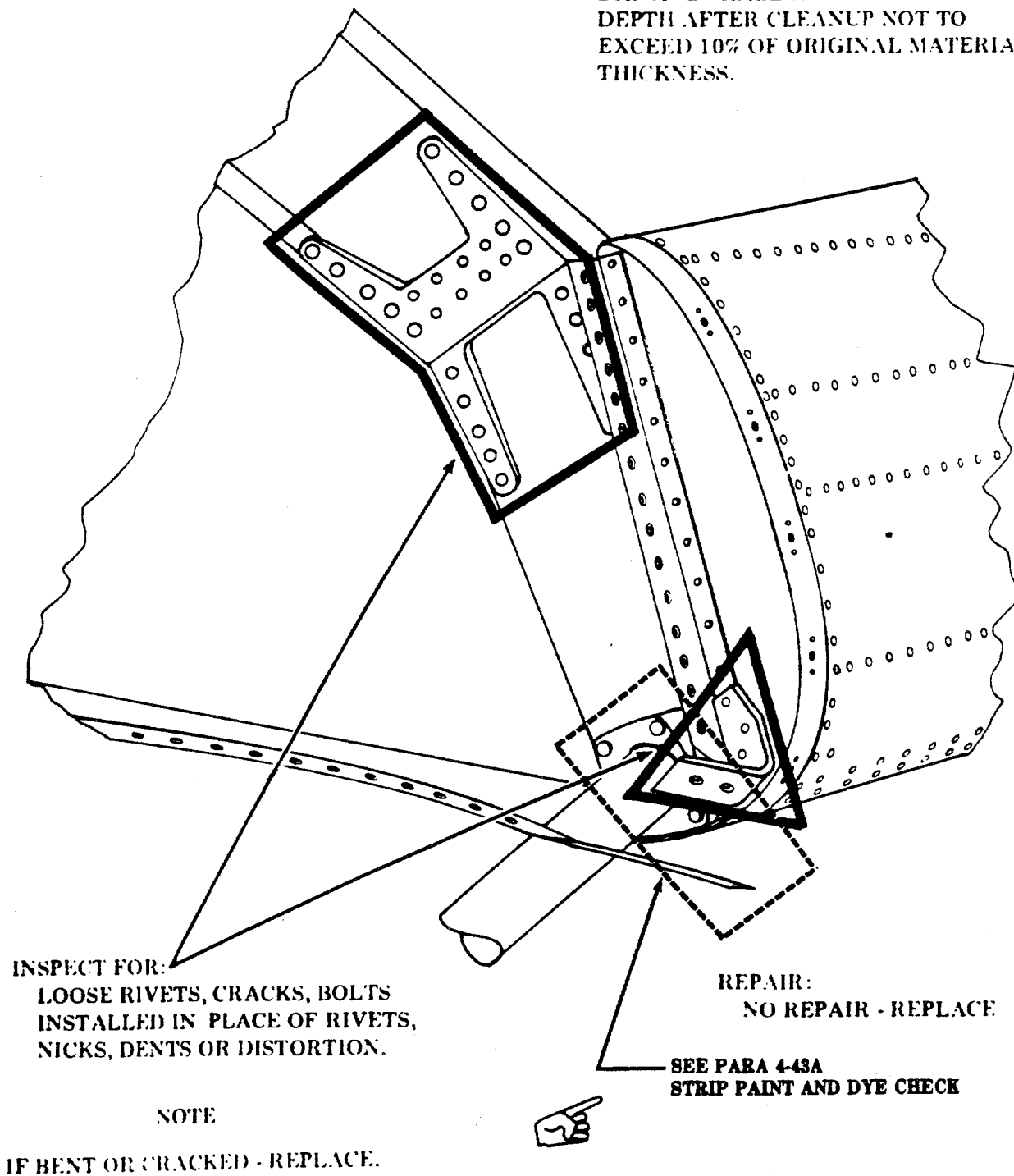
(Repairable) All damage repairable if practical from standpoint of accessibility and time required to repair.

(Replace) Damage affecting contour or damage so extensive that repair is impractical.

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**LIMITS:**

MECHANICAL OR CORROSION  
DAMAGE SHALL HAVE A MAXIMUM  
DEPTH AFTER CLEANUP NOT TO  
EXCEED 10% OF ORIGINAL MATERIAL  
THICKNESS.



**Figure 3-12. FITTINGS, UPPER AND LOWER B.S. 227.0**

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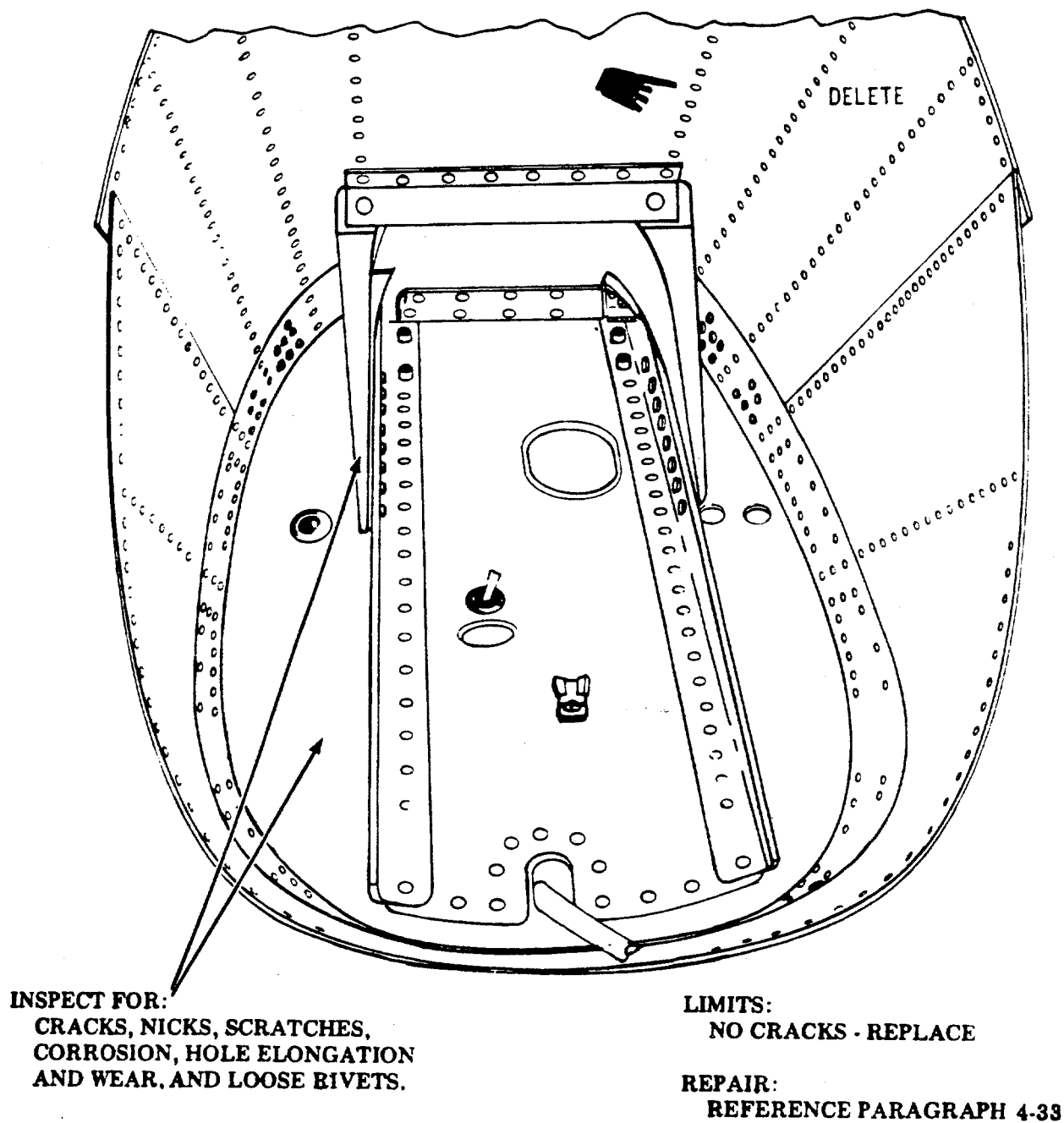


Figure 3-13. CANTED BULKHEAD AND 42° GEARBOX SUPPORT FITTING

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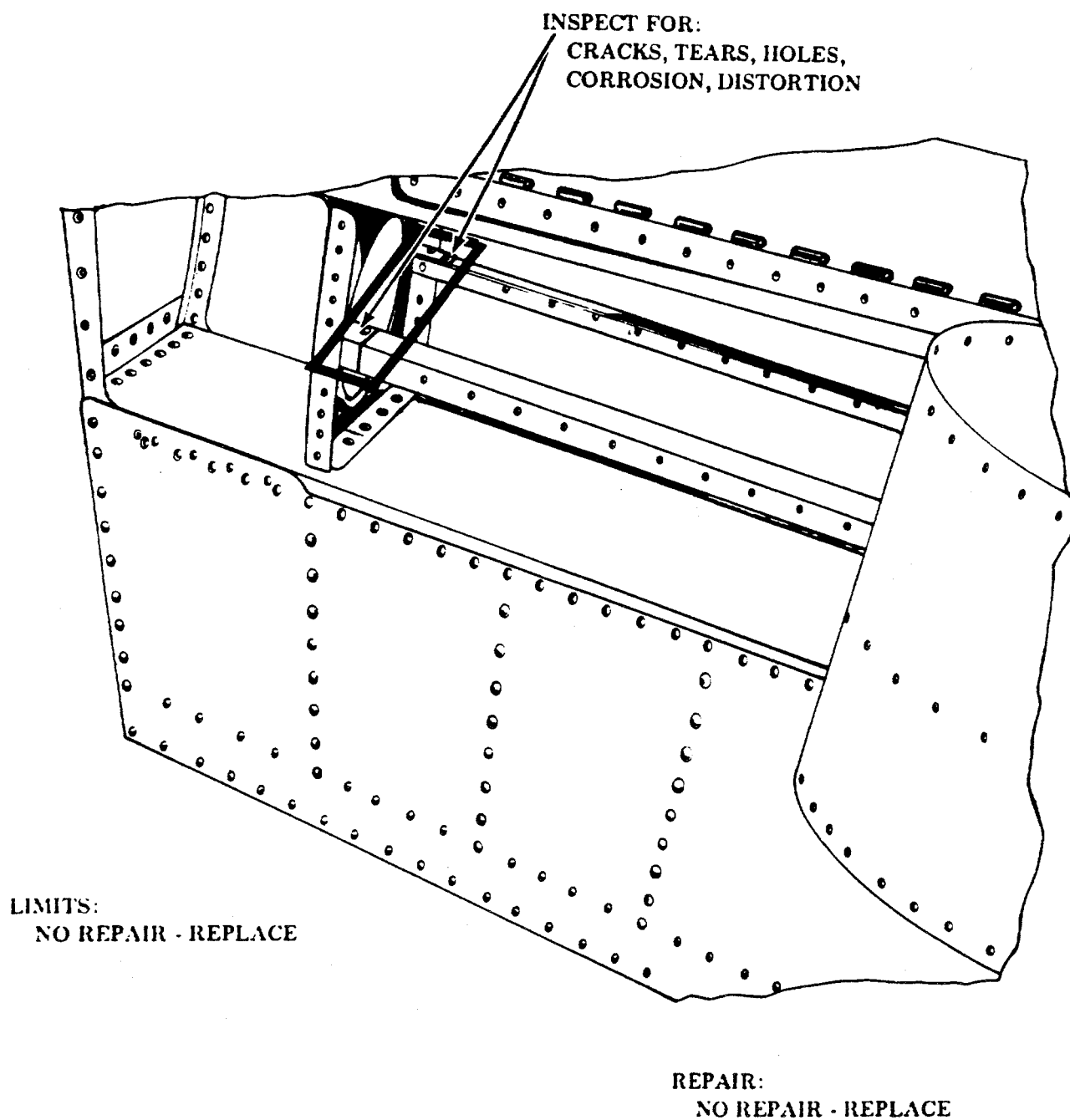


Figure 3-14. CLIPS L/R

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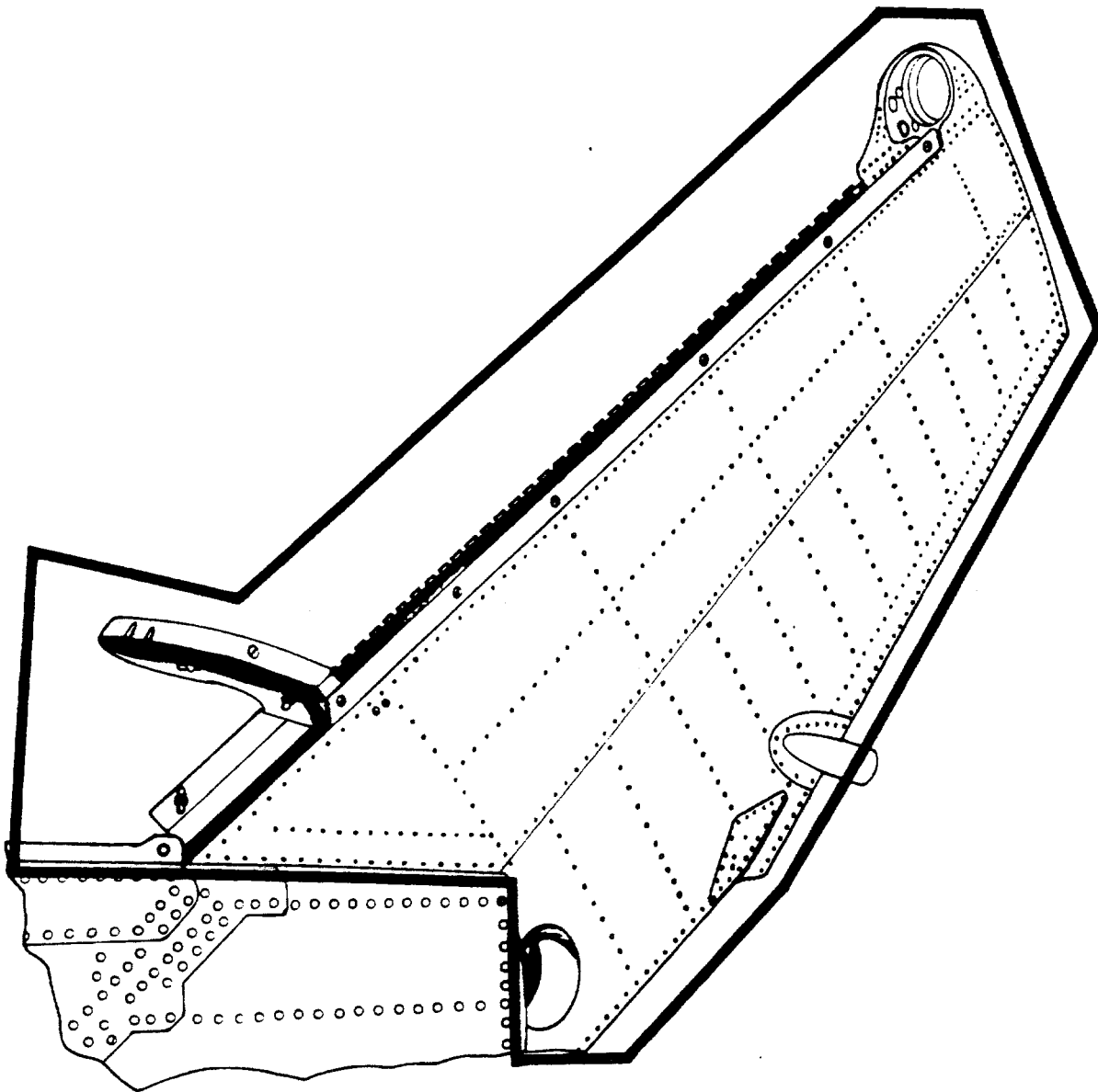
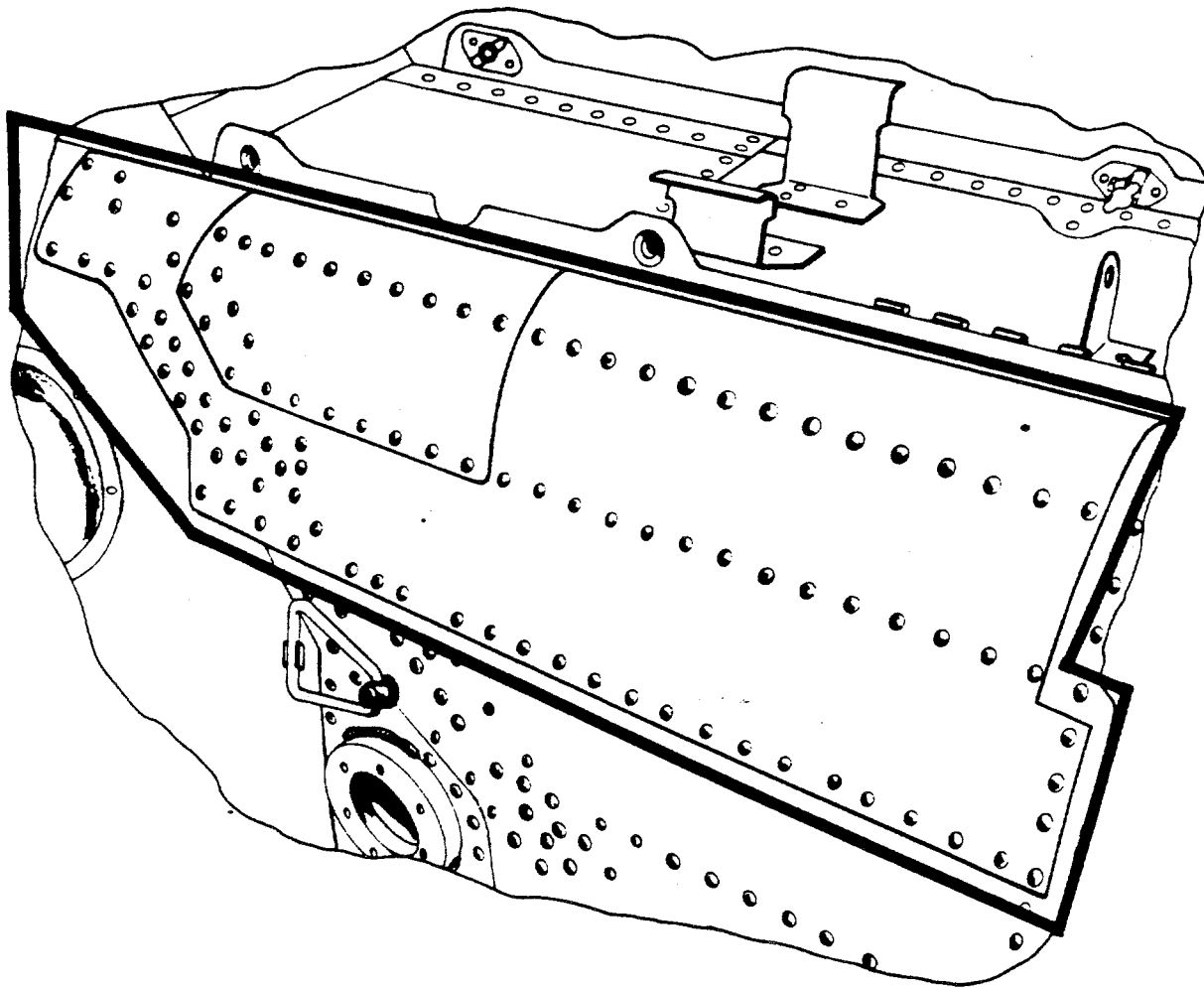


Figure 3-15. COMPOSITE, AREA 10, UH-1H

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INSPECT FOR:  
DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
TRAPPED OR STRETCHED SKIN.



REPAIR:  
REFERENCE PARAGRAPH 4-7

Figure 3-16. SKIN, TOP AFT, B.S. 194.30 (Sheet 1 of 3)



Limits: (ALL SKIN)

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## NEGLECTIBLE

(DENTS) a. Smooth contour free of cracks, nicks or wrinkles. Depth and diameter not to exceed:

DEPTH	DIAMETER
1/64	1.0 inch
3/64	2.0 inch
1/16	3.0 inch

3.0 inch minimum undamaged material between dents and 1.0 inch minimum from internal structure. Nicks and scratches which can be blended out not to exceed 10% of material depth.

(CRACKS, HOLES, TEARS, NICKS, SCRATCHES, CORROSION, WRINKLES)

b. Nicks and scratches no deeper than 10% of material thickness and not exceeding 1.0 inch length by 0.25 inch width after cleanup. Corrosion damage less than 10% of material thickness and not exceeding 4.0 sq. inch after cleanup. Damage no closer than 1.0 inch to a supporting structure.

(TRAPPED OR STRETCHED SKIN).

c. Inward or outward bulges located in a sectional area, that can be corrected by removing attaching hardware, allowing skin to shift. Mismatch of rivet holes shall not exceed that which can be cleaned up by drilling and installing one size larger rivet and maintaining proper rivet edge distance. However, if condition does not disappear after unloading panel, area is stretched or oil canned and must be replaced or repaired. Oil canning or stretched condition can be determined by pressing on a sectional area and that section remains depressed and a bulge appears in that section or adjacent structure.

## REPAIRABLE

(DENTS) a. Cracks or sharp nick in dent. Damage areas after cleanup

Figure 3-16. SKIN, TOP AFT, B.S. 194.30 (Sheet 2 of 3)

(including prior repairs) shall not exceed 25% of total area for a single skin panel. Damage 6.0 inch minimum from similar repair.

(CRACKS, HOLES, TEARS, NICKS, SCRATCHES, CORROSION, WRINKLES)

b. Damage exceeds negligible limits but does not exceed 25% (including prior repairs) of total area for a single skin panel.

(TRAPPED OR STRETCHED)

c. Creased dents not classified as oil can or stretched skin, not exceeding 25% of a sectional area and no closer than 1.0 inch to a supporting structure. Oil can condition, free of sharp dents or creases and not extending over or into supporting structure may be repaired by inserting a backup stiffener over the damaged area.

#### REPLACE

(DENTS) a. Total damage (including prior repairs) exceeds 25% of total area of a single skin panel, or damage spans entire distance between two bulkheads or longerons.

(CRACKS, HOLES, TEARS, NICKS, SCRATCHES, CORROSION, WRINKLES)

b. Same as Dents.

#### NOTE

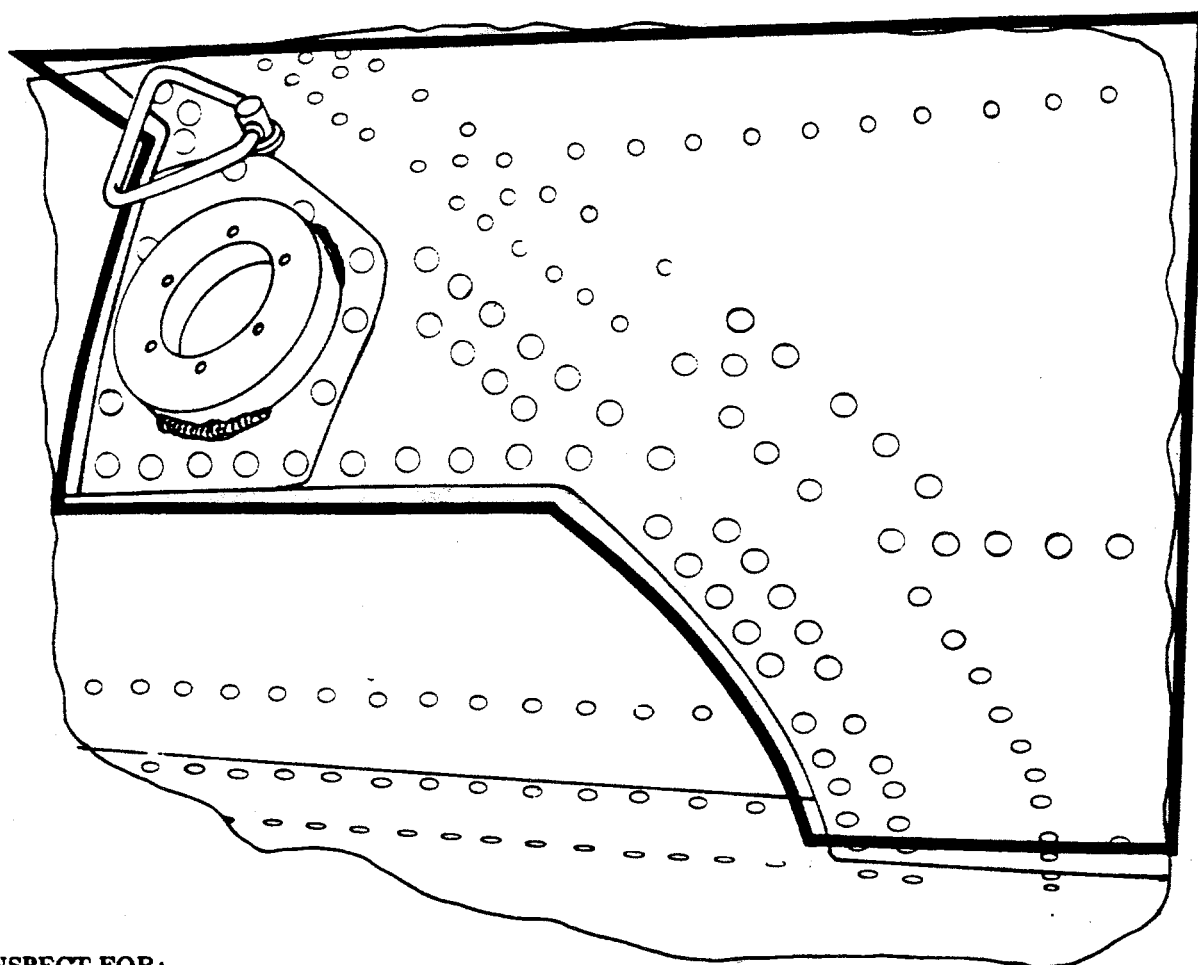
Existing lap patches are acceptable provided they meet the criteria of paragraph 4-16a and b.

(TRAPPED OR STRETCHED)

c. Stretched skin, oil cans, or creased dents that cannot be repaired by unloading, insertion repair or back up stiffeners.

Figure 3-16. SKIN, TOP AFT, BLS. 194.30 (Sheet 3 of 3)

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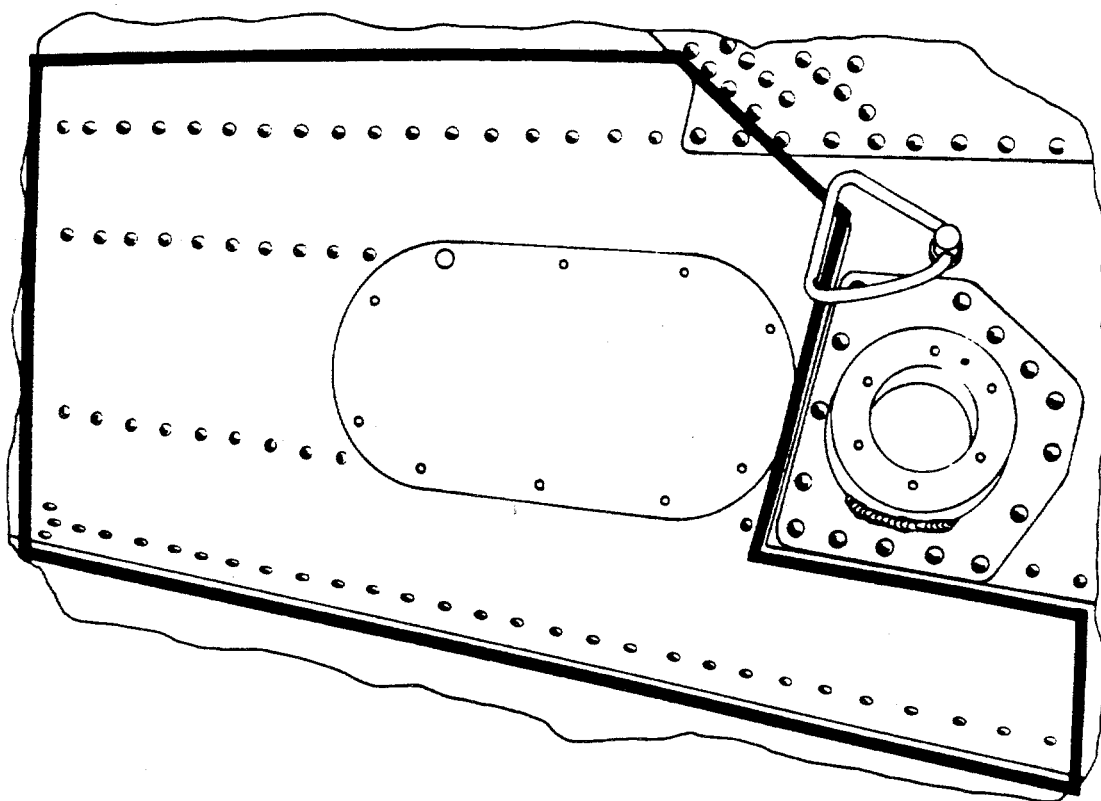
**INSPECT FOR:**  
DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
TRAPPED OR STRETCHED SKIN

**LIMITS:**  
REFERENCE FIGURE 3-16

**REPAIR:**  
REFERENCE PARAGRAPH 4-7

Figure 3-17. SKIN, BOTTOM B.S. 194.30 AFT

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**LIMITS:**  
**REFERENCE FIGURE 3-16**

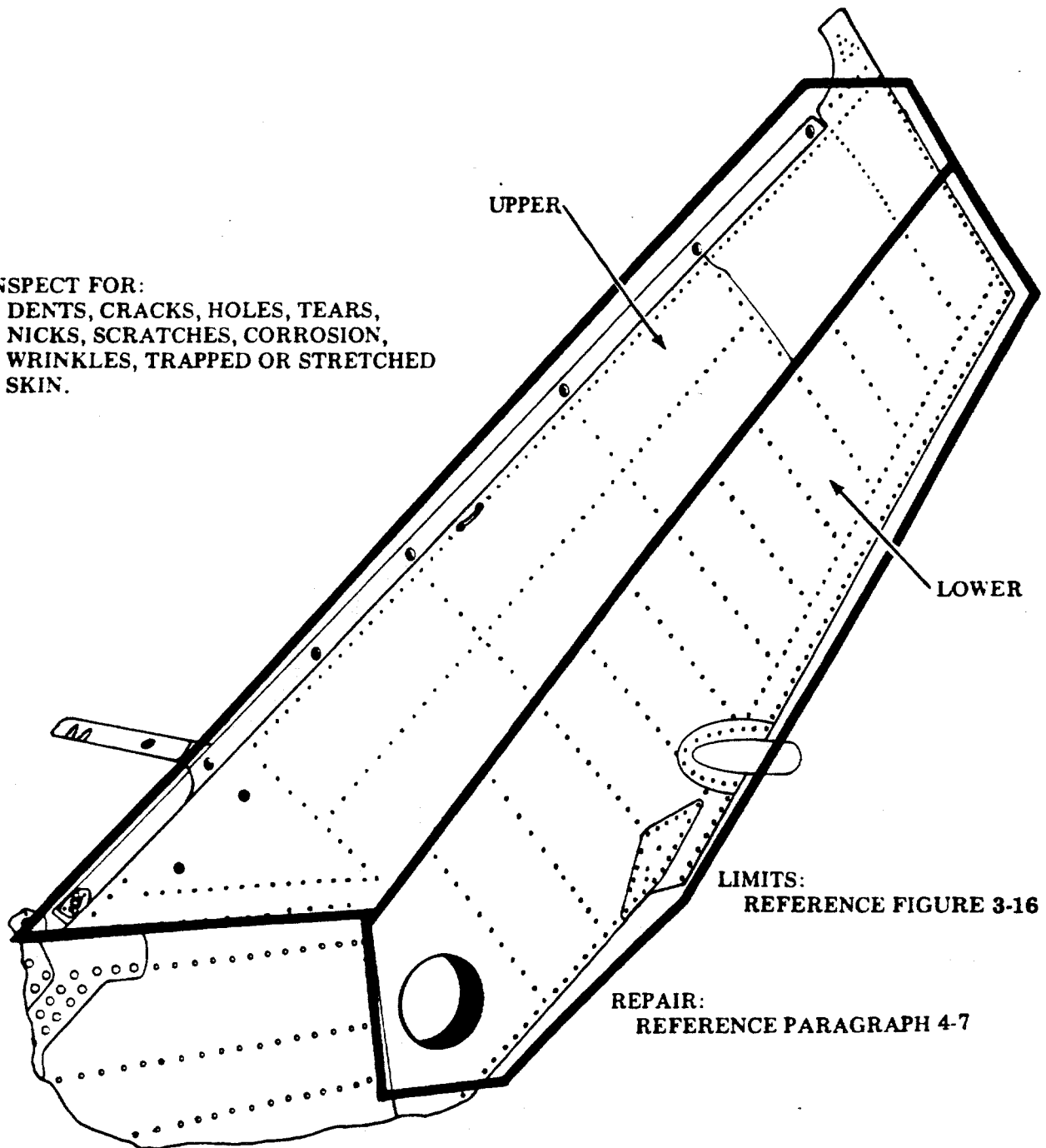
**INSPECT FOR:**  
**DENTS, CRACKS, HOLES, TEARS,**  
**NICKS, SCRATCHES, CORROSION,**  
**WRINKLES, TRAPPED OR STRETCHED**  
**SKIN.**

**REPAIR:**  
**REFERENCE PARAGRAPH 4-7**

**Figure 3-18. SKIN, B.S. 210.0 - 227.0**

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**INSPECT FOR:**  
DENTS, CRACKS, HOLES, TEARS,  
NICKS, SCRATCHES, CORROSION,  
WRINKLES, TRAPPED OR STRETCHED  
SKIN.



**Figure 3-19. SKIN, UPPER & LOWER**  
B.S. 215.0 - F.S. 5.08 (UPPER) | B.S. 227.0 - F.S. 5.08 (LOWER)

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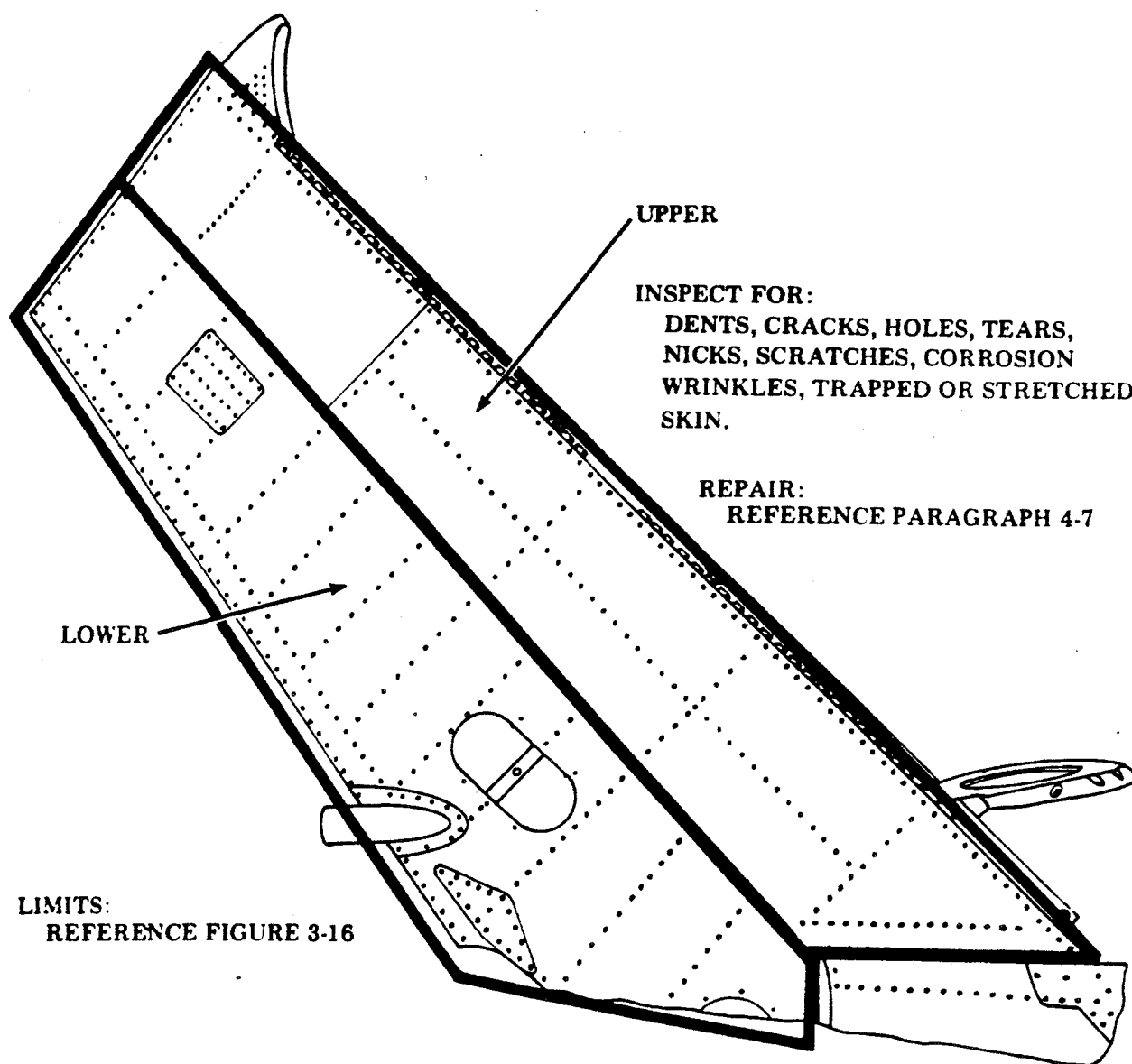
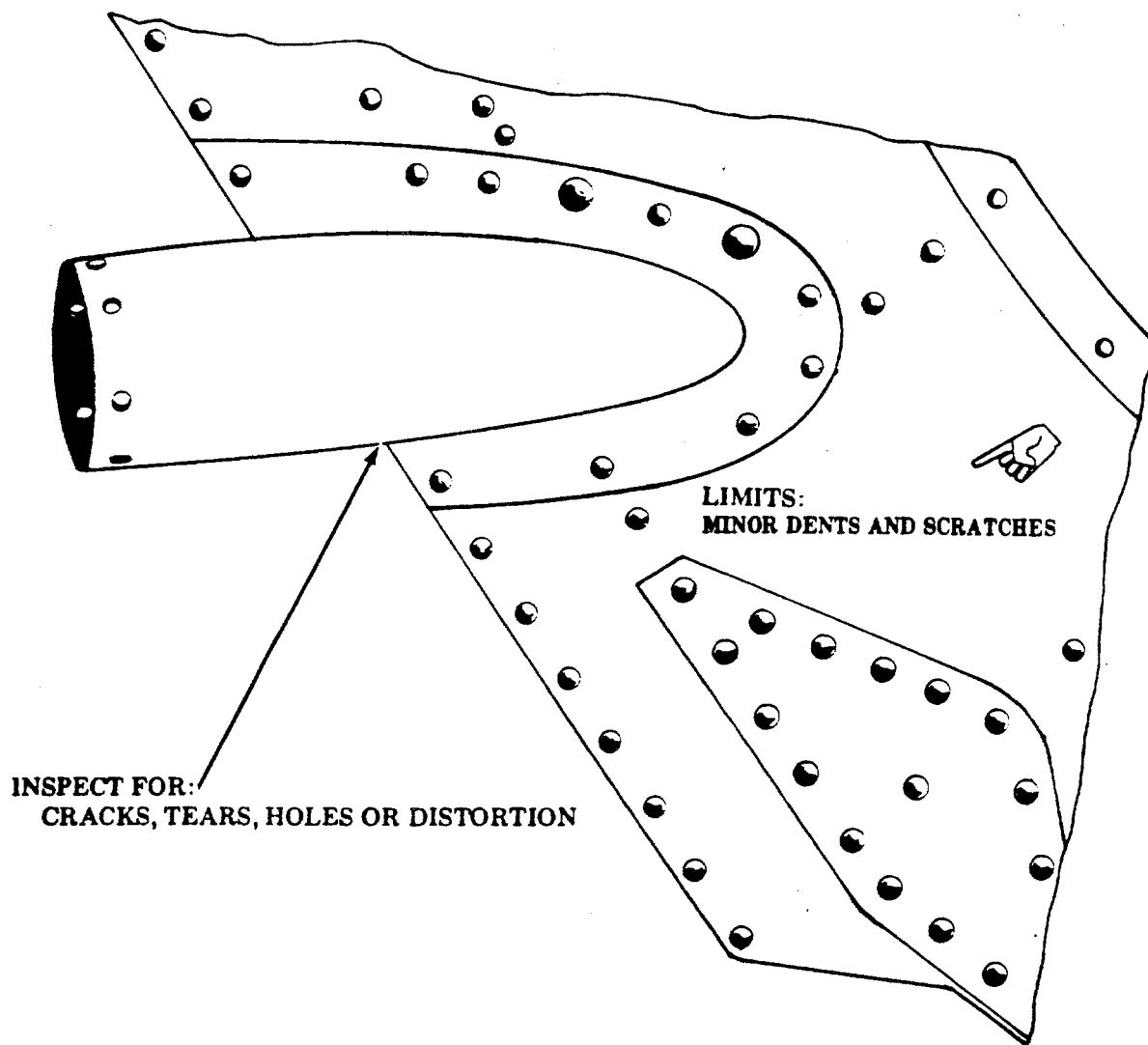


Figure 3-20. SKIN, UPPER & LOWER B.S. 227.0 - F.S. 5.08 (LOWER) B.S. 215.0 - F.S. 5.08 (UPPER)

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REPAIR:  
NO MAJOR REPAIR - REPLACE

Figure 3-21. TAIL LIGHT BRACKET (TYPICAL)

CHQSOFTWARE.COM

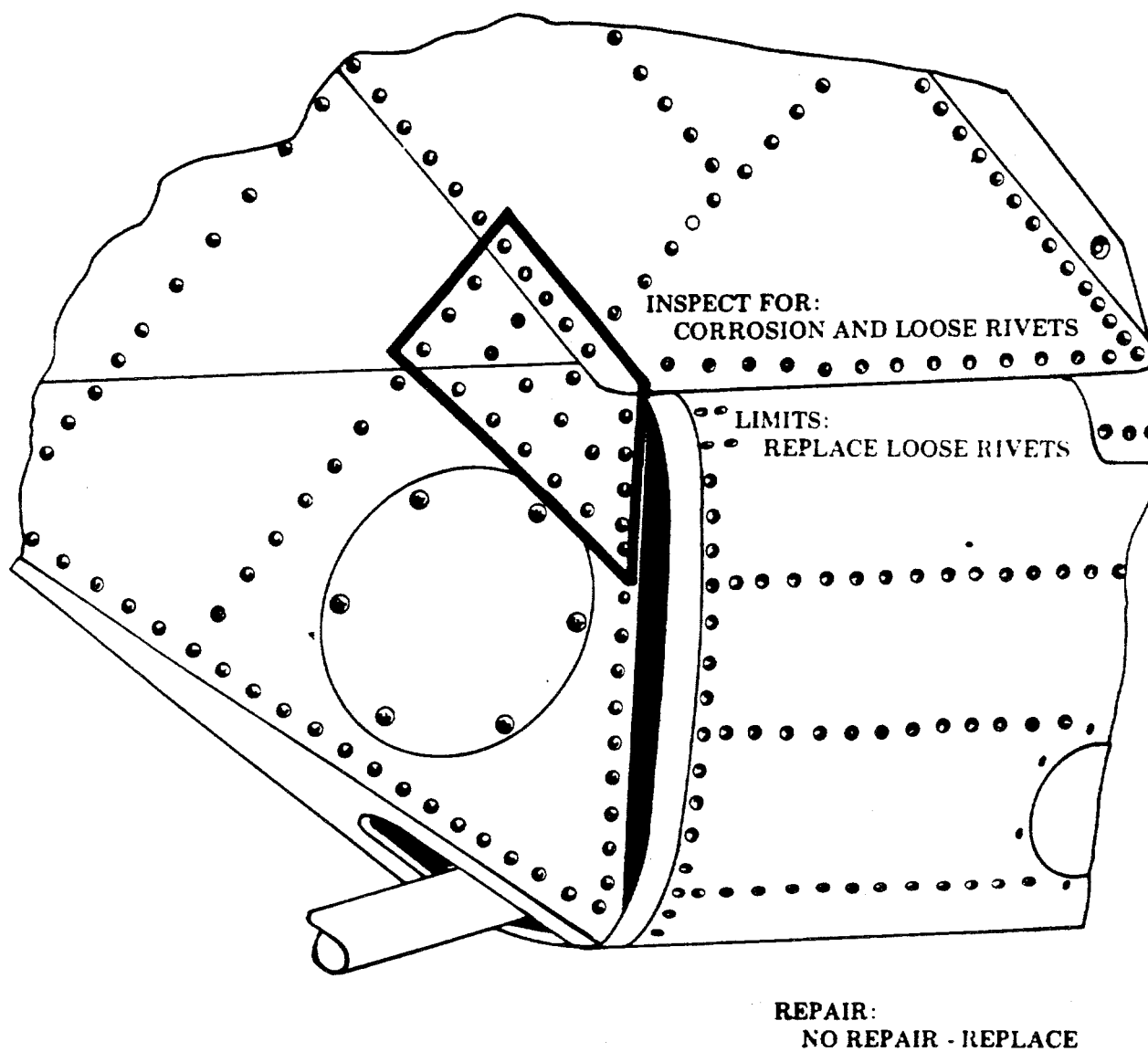
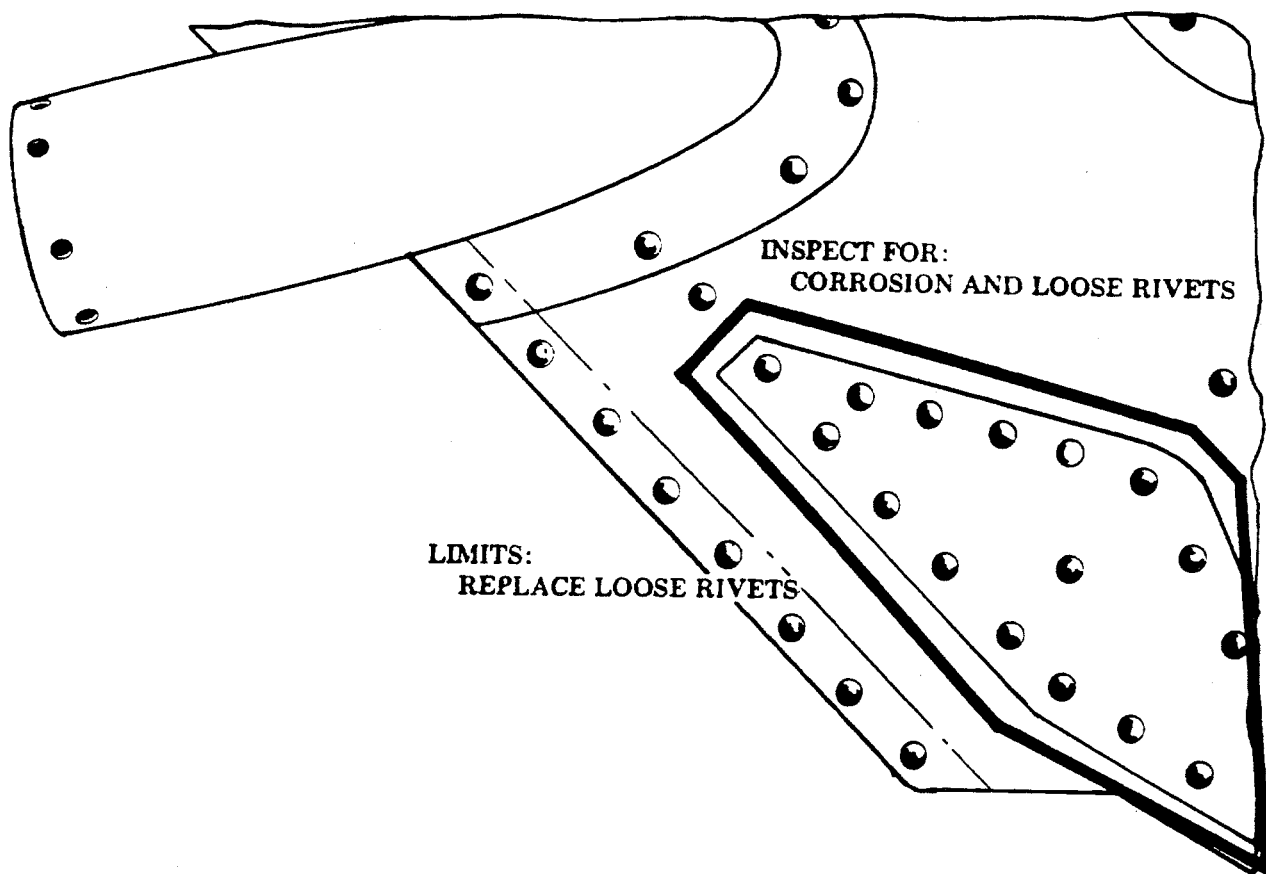


Figure 3-22. DOUBLER, AFT B.S. 227.0 (R/H SHOWN - L/H SIMILAR)



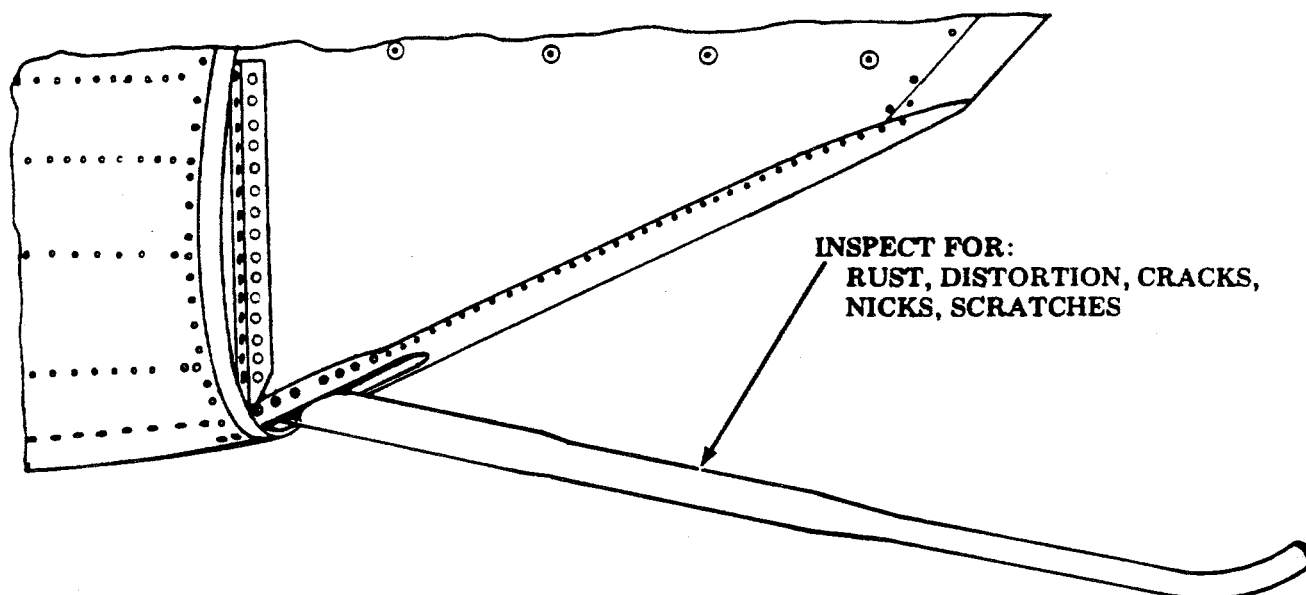
CHQSOFTWARE.COM



REPAIR:  
NO REPAIR - REPLACE

Figure 3-23. DOUBLER, LOWER, F.S. 46.95, R/H SHOWN - L/H SIMILAR

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**LIMITS:**  
**(NEGLIGIBLE)** SMOOTH CONTOURED DENTS,  
FREE OF NICKS OR NOTCHES.

**(REPAIRABLE)** CORROSION, NICKS OR  
SCRATCHES NOT TO EXCEED  
10% OF TUBE WALL THICKNESS  
AFTER CLEANUP.

**(REPLACE)** REPLACE TUBE IF YIELDED IN  
EXCESS OF 8 DEGREES ABOUT  
CENTERLINE OR IF CRACKED.

**REPAIR:**  
NO REPAIR - REPLACE

Figure 3-24. TAIL SKID

CHQSOFTWARE.COM

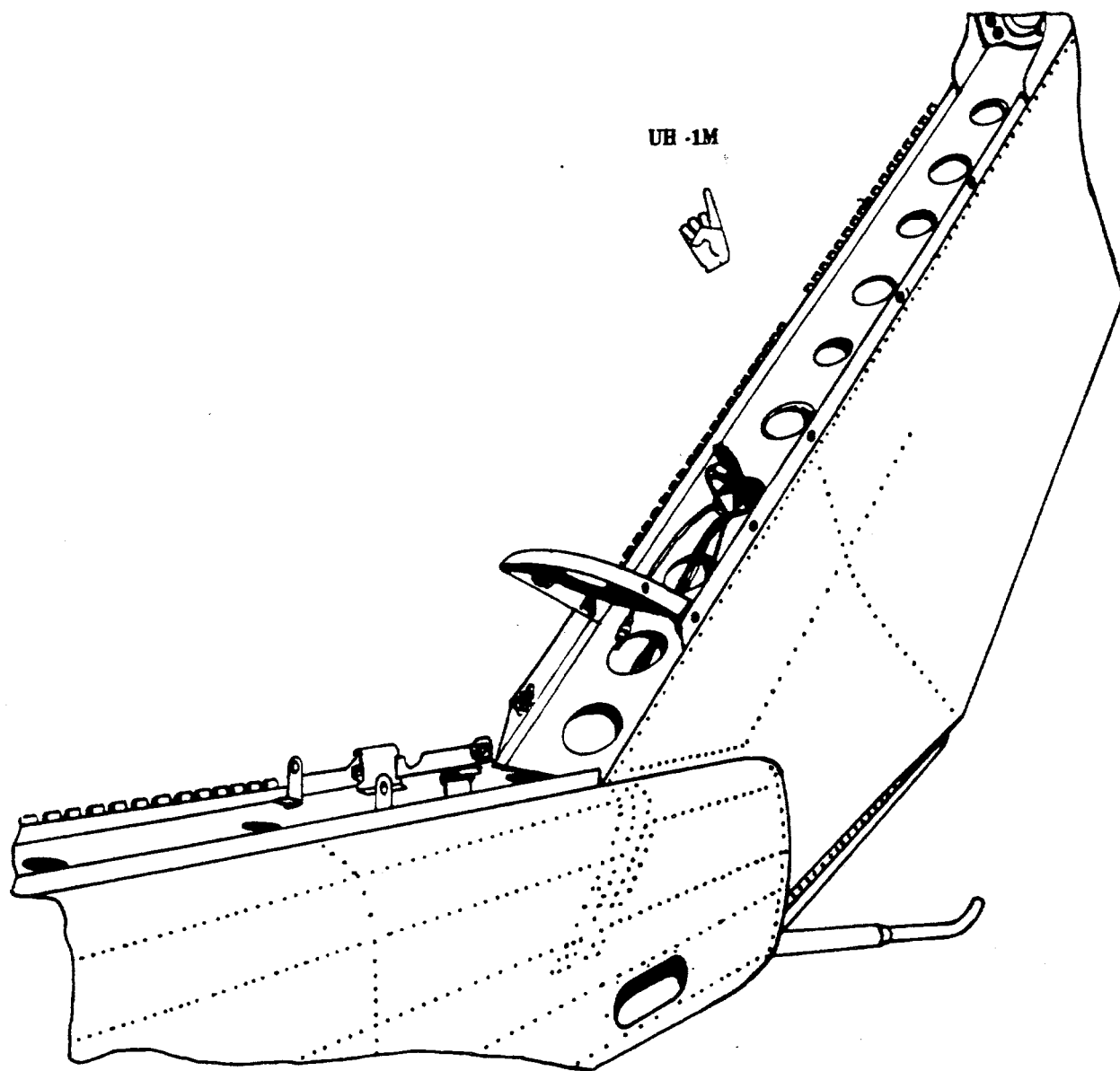


Figure 3-25. FIN ASSEMBLY (M/G) B.S. 194.30 - F.S. 5.08 (Sheet 1 of 2)

CHQSOFTWARE.COM

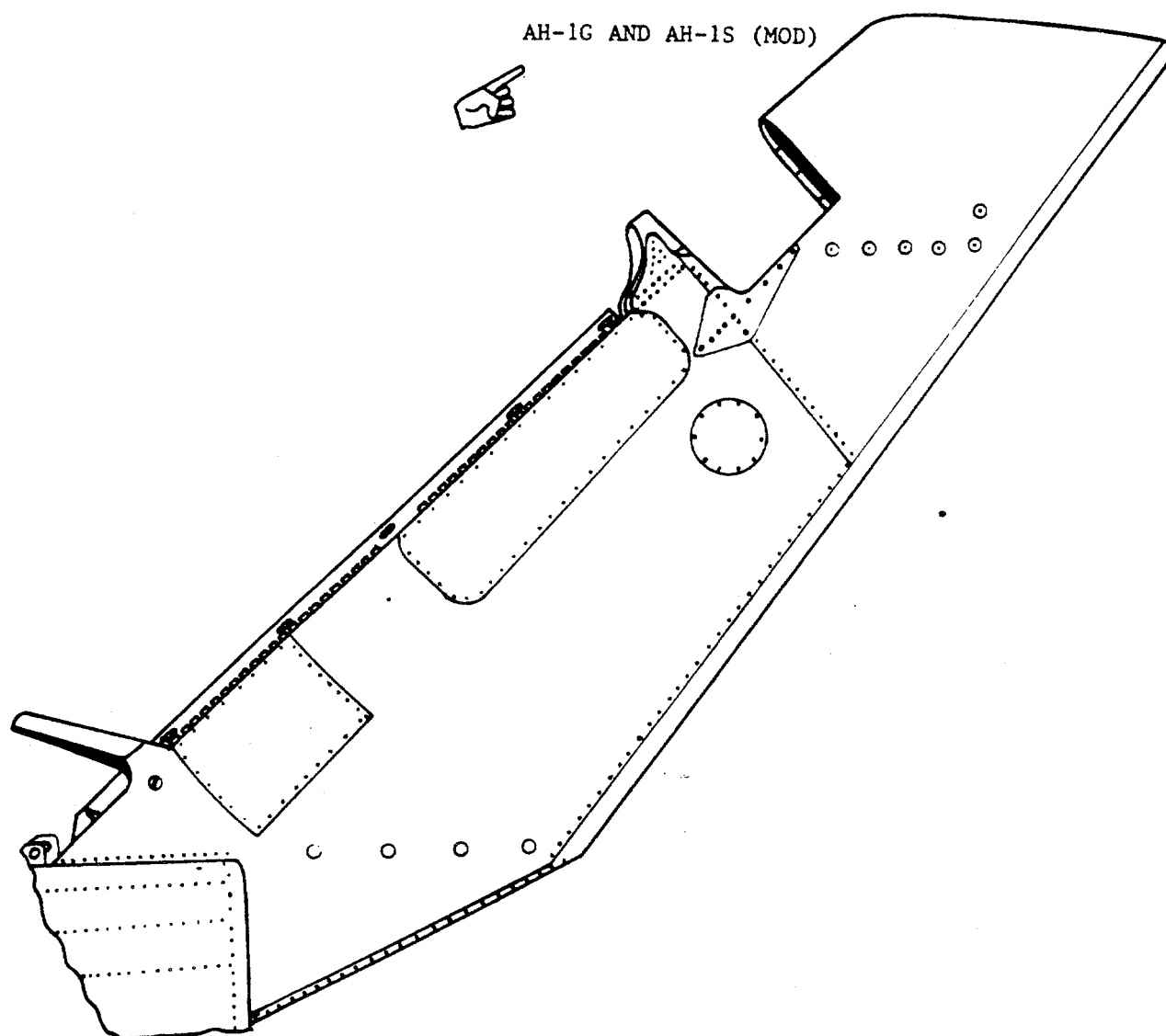
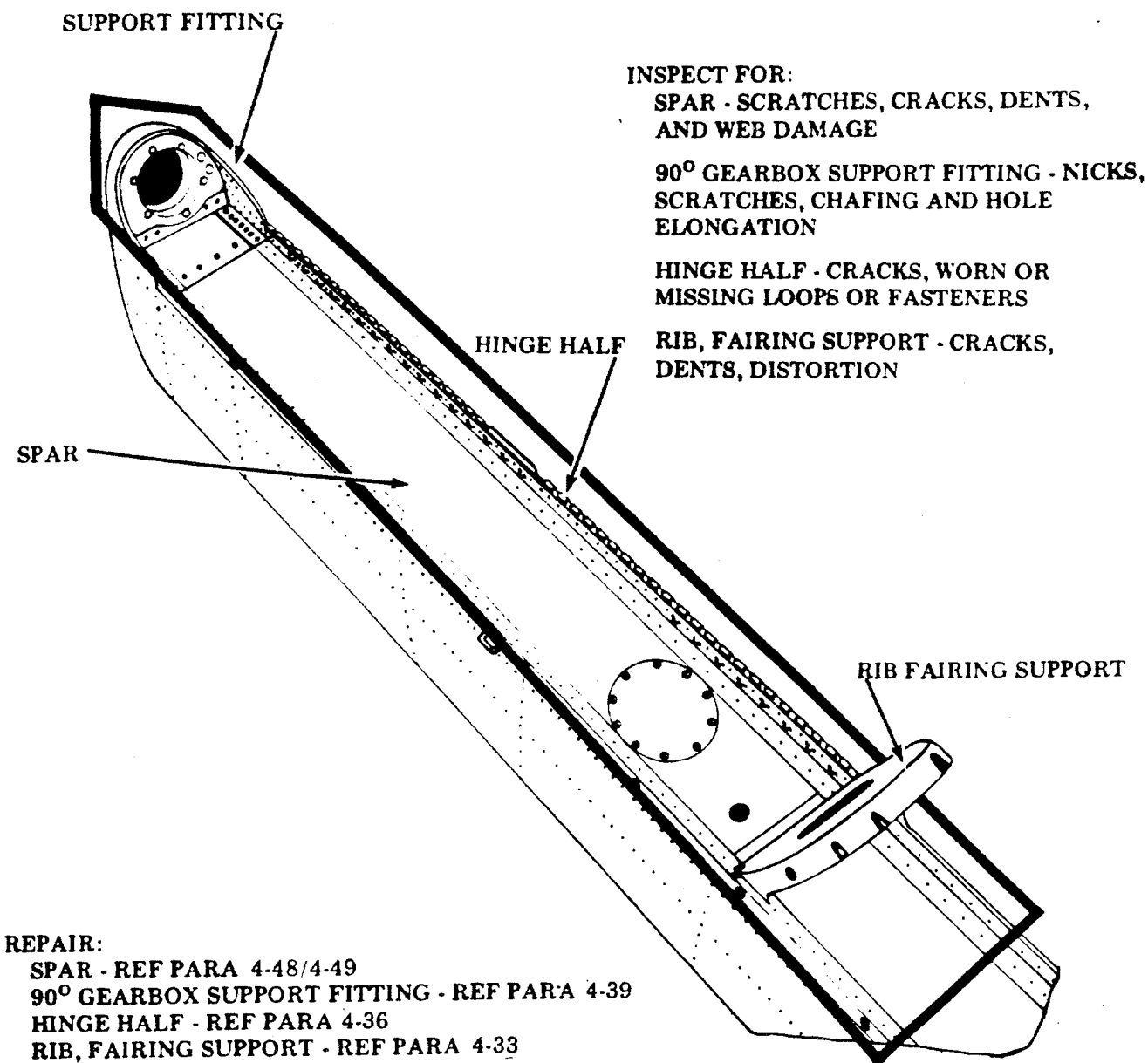


Figure 3-25. FIN ASSEMBLY (M/G/S/ MOD) B. S. 194.30 - F.S. 5.08 (Sheet 2 of 2)

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**LIMITS:**  
 SPAR - REF FIG 3-8  
 90° GEARBOX SUPPORT FITTING - REF FIG 3-7  
 HINGE HALF - REF FIG 3-10  
 RIB, FAIRING SUPPORT - REF FIG 3-9.

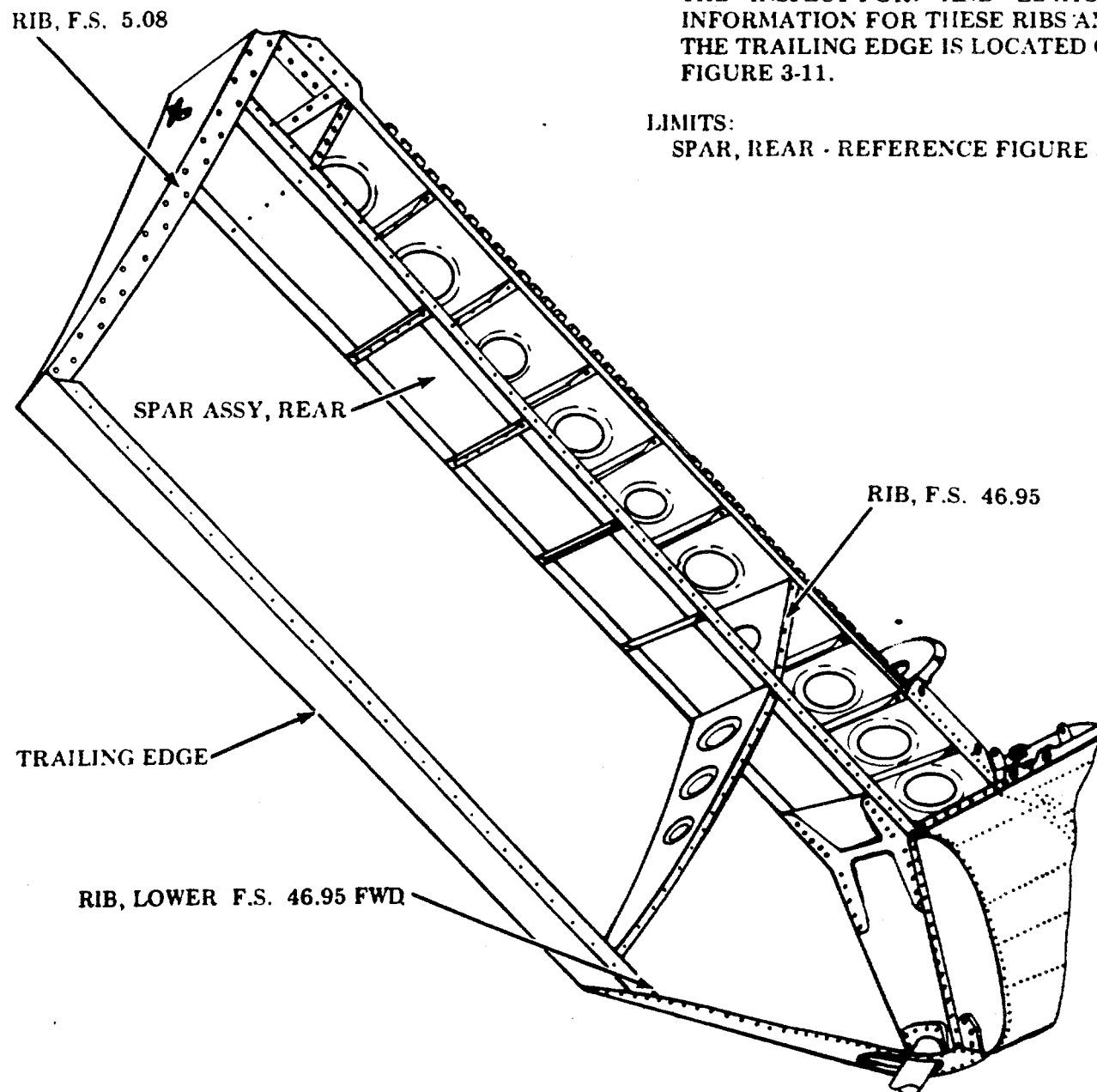
Figure 3-26. SPAR ASSY, FRONT, 90° GEARBOX SUPPORT FITTING, HINGE HALF AND RIB FAIRING SUPPORT.

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NOTE

THE "INSPECT FOR:" AND "LIMITS:" INFORMATION FOR THESE RIBS AND THE TRAILING EDGE IS LOCATED ON FIGURE 3-11.

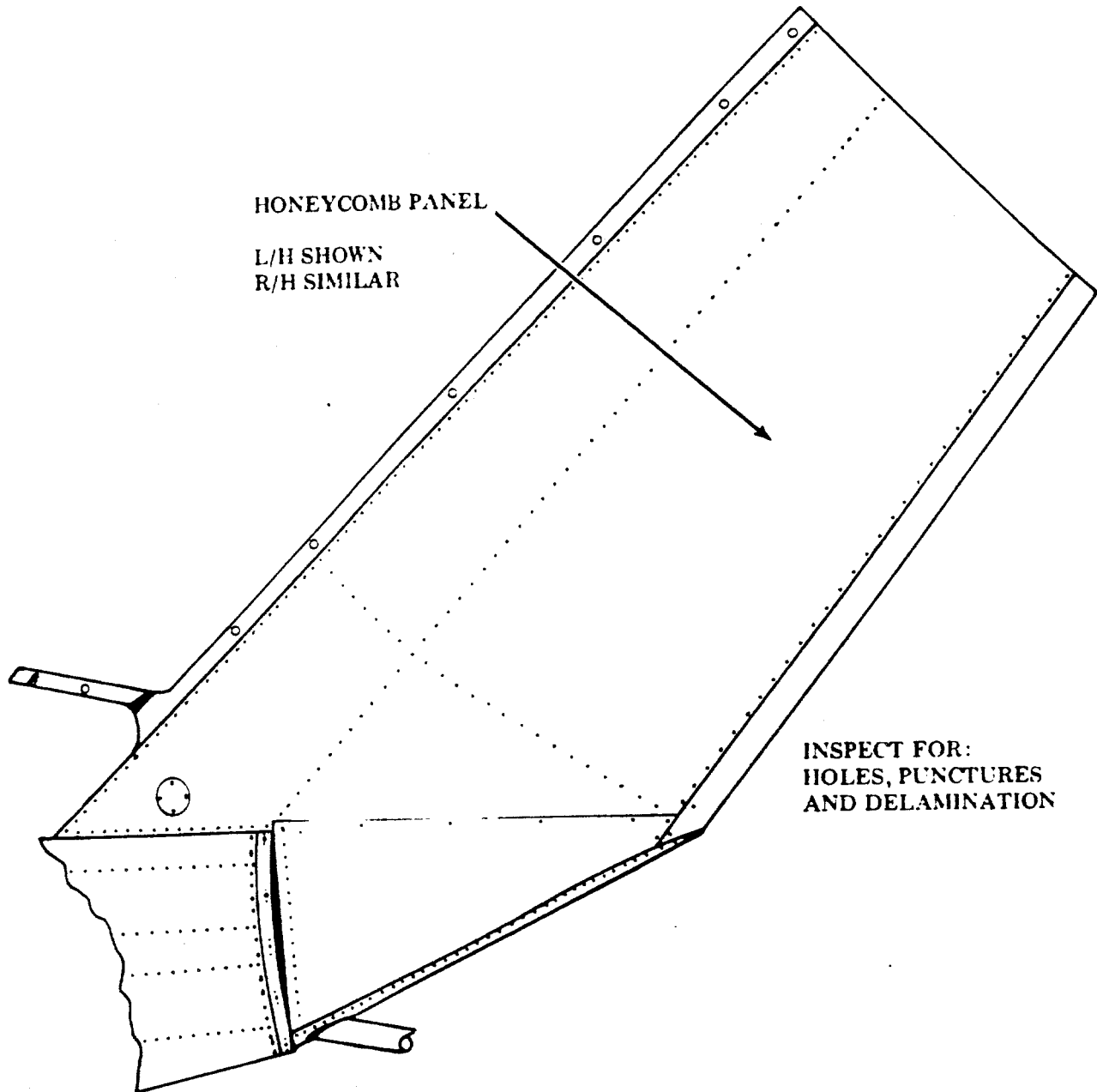
LIMITS:  
SPAR, REAR - REFERENCE FIGURE 3-8



REPAIR:  
RIBS - REFERENCE PARAGRAPH 4-33  
TRAILING EDGE - NO REPAIR - REPLACE  
REAR SPAR - REFERENCE PARAGRAPH 4-48/4-49

Figure 3-27. RIBS, F.S. 46.95 AND F.S. 5.08, TRAILING EDGE, LOWER RIB F.S. 46.95 FWD AND REAR SPAR ASSEMBLY

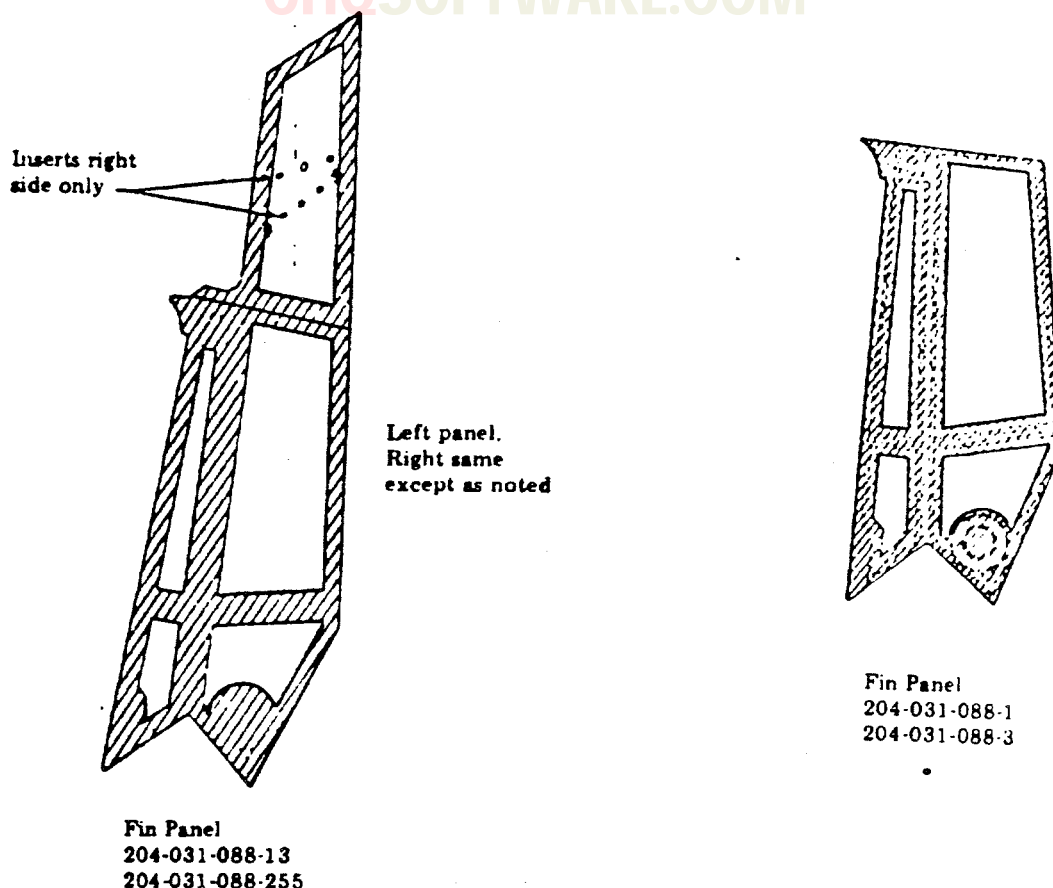
CHQSOFTWARE.COM






REPAIR:  
REFERENCE PARAGRAPH  
4-53 thru 4-60

Figure 3-28. HONEYCOMB PANEL DAMAGE LIMITS (SHEET 1 OF 5)

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#### REPAIR CODES

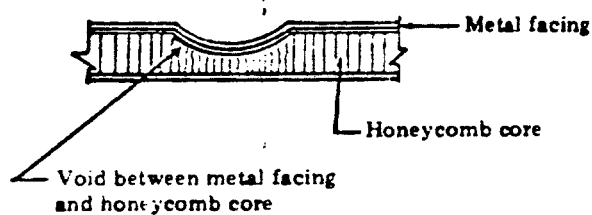
-  Repairable Areas. (See details A through F)
-  Critical Area. Repair only with qualified Engineering approval.
-  Mounting Surfaces. Must be kept level by repairs.

#### NOTES:

1. Minor surface scratches and smooth, scratch free dents which does not crush core, may be classed as negligible.
2. Remove all previous installed patches and inspect repaired area.
3. Replace panel if water or corrosion is found in core or repair limits exceeded, or if four or more patch type repairs are required to a panel.
4. Inspect for corrosion in core and skin with 10 power glass.

Figure 3-28. HONEYCOMB PANEL DAMAGE LIMITS (SHEET 2 OF 5)



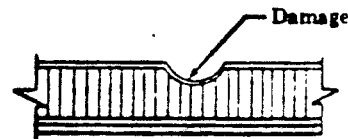


DETAIL A

**SURFACE DENT WITH CRUSHED CORE AND VOID BETWEEN SKIN AND CORE.**

**LIMITS**

1. No sharp dents, holes, or damages that penetrate metal facing.
2. Maximum diameter of damage 2.0 inches, or maximum length of damage 1.50 inches.
3. Maximum depth of damage 20 percent of panel thickness.
4. Total damage not to exceed 10 percent of a bay area.
5. Minimum distance of 0.5 inch from adjacent structure, inserts or beveled edge.



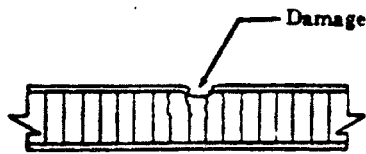
DETAIL B

**SURFACE DENT WITH CRUSHED CORE. NO VOIDS UNDER DENT.**

**LIMITS**

1. Smooth, crack free dent.
2. Maximum diameter of single dent 1.0 inch. Two or more dents in any 6.0 inch diameter area, consider as one dent.
3. Maximum depth: 20 percent of panel thickness.
4. Maximum area of all dents combined: 10 percent of a bay area.
5. Maximum of five dents in a 9.0 square inch area.
6. No voids may be present under the damage.
7. Minimum distance of 0.5 inch from inserts or beveled edge.

**Figure 3-28. HONEYCOMB PANEL DAMAGE LIMITS (SHEET 3 OF 5)**

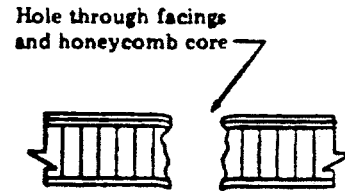


DETAIL C

OUTER SKIN AND CORE  
DAMAGED. DAMAGE  
PENETRATES OUTER  
SKIN AND CORE ONLY

LIMITS

1. Maximum diameter of 3.0 inches after clean-up.
2. Maximum of three patch repairs in a panel. Damage after clean-up comes no closer than 1.5 inch to a similar repair or insert and no closer than 1.5 inch to a beveled edge.
3. Replace panel if water or corrosion found in core.
4. Total damage not to exceed 10 percent of total panel area or 25 percent of a single bay area after clean-up.



DETAIL D

DAMAGE PENETRATES  
THROUGH BOTH SKINS  
AND CORE

LIMITS

1. Maximum diameter of hole 3.0 inches, after clean-up.
2. Minimum distance from structural members or other repair; 2.0 inches.
3. Minimum distance of completed repair from an edge bevel; 0.50 inches.
4. Total damage not to exceed 10 percent of a bay area.
5. Maximum of three patch repairs in a panel.
6. Replace panel if water or corrosion found in core.

Figure 3-28. HONEYCOMB PANEL DAMAGE LIMITS (SHEET 4 OF 5)

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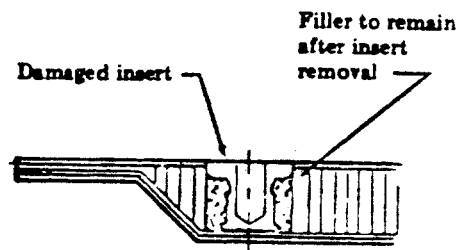


DETAIL E

**VOID AREA BETWEEN METAL  
FACING AND CORE**

**LIMITS**

1. Maximum total void area not to exceed 5 percent of panel surface area.
2. Maximum area of a single void: 1.5 square inch and a minimum of 2.0 inches between voids. Maximum length of a void: 3.0 inches in any direction.
3. Damage not closer than 0.5 inch of a beveled edge or within 1.0 inch of an insert, hole or adjacent structure. Void in area of insert limited to 0.62 square inch with no damage to insert.



DETAIL F

**DAMAGED OR LOOSE  
INSERTS**

**LIMITS**

1. Remove insert by counterboring without enlarging hole size in panel facing.
2. Original hole diameter in panel facing must be maintained in the replacement process.
3. No damage in area adjacent to insert.

**Figure 3-28. HONEYCOMB PANEL DAMAGE LIMITS (SHEET 5 OF 5)**

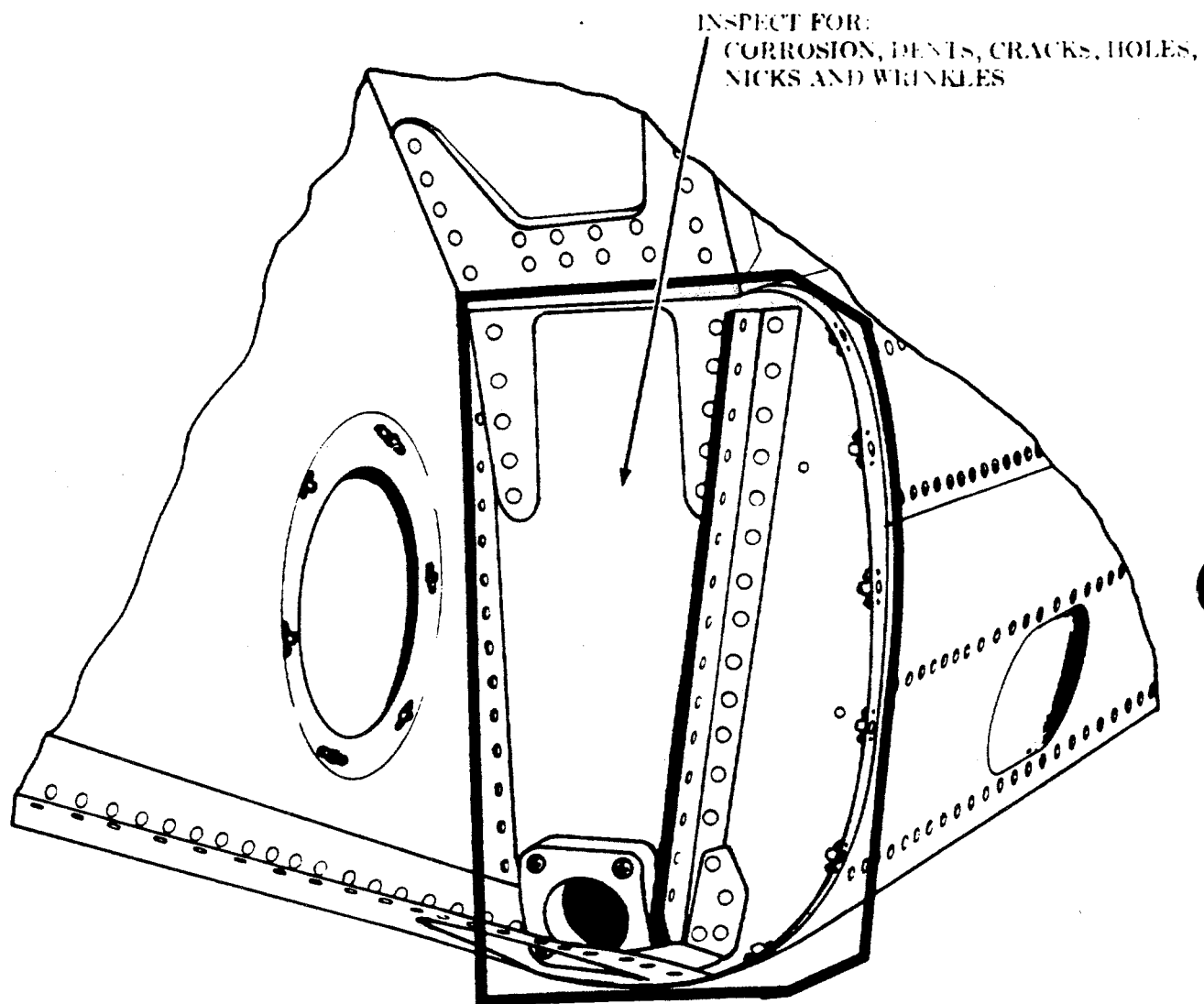
Table 3-2. Detailed Inspection Requirements

ITEM	DEFECT	METHOD OF INSPECTION	NEGLIGIBLE DAMAGE	REPAIRABLE DAMAGE	DAMAGE REQUIRING REPLACEMENT
Honeycomb Panels		Fiberglass skins.	None	Damage not to exceed 14 sq. in. after cleanup not to exceed 10% of a bay area when honeycomb panels made up of metal and fiberglass; the metal damage limits shall be applied.	Damage that exceeds 14 sq in. after cleanup or 10% of a bay area.
	Core	Visual inspect for corrosion in core with a 10 power glass.	None	Core with aluminum skin damage shall not exceed 10 sq. in. after cleanup.	Core with aluminum skin, damage that exceeds 10 sq. in. after cleanup.
				Core with fiberglass skin, damage shall not exceed 12 sq. in. after cleanup.	Core with fiberglass skin damage that exceeds 12 sq. in. after cleanup.
				Fiberglass skin damage shall not exceed 12 sq. in. after cleanup.	Fiberglass skin damage that exceeds 12 sq. in. after cleanup.
			5% of a Bay Area.		

Table 3-2. Detailed Inspection Requirements

ITEM	DEFECT	METHOD OF INSPECTION	NEGLIGIBLE DAMAGE	REPAIRABLE DAMAGE	DAMAGE REQUIRING REPLACEMENT
Honeycomb Panels	Edge damage between rivet pattern & edge of part.	Visual	None	Damage not to exceed 10 sq. in. after cleanup not to exceed 10% of the edge length.	Damage that exceeds 10 sq. in. after cleanup or exceeds 10% of the edge length.
	Cracks, tears, & punctures, aluminum skins.	Visual	None	Damage not to exceed 10 sq. in. after cleanup not to exceed 10% of a bay area.	Damage that exceeds 10 sq. in. after cleanup or exceeds 10% of a bay area.
	Abrasions, nicks scratches & corrosion	Visual	Damage less than 20% of the material thickness not to exceed 25% of a bay area. Corrosion shall be arrested and treated.	Damage that exceeds 20% of a bay area. Smooth and treat abrasions, nicks and scratches to remove stress concentrations.	Damage that exceeds 20% of the material thickness and exceeds 25% of a bay area.

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LIMITS:  
REFERENCE FIGURE 3-11

REPAIR:  
REFERENCE PARAGRAPH 4-33

**Figure 3-29. BULKHEAD, B.S. 227.0**

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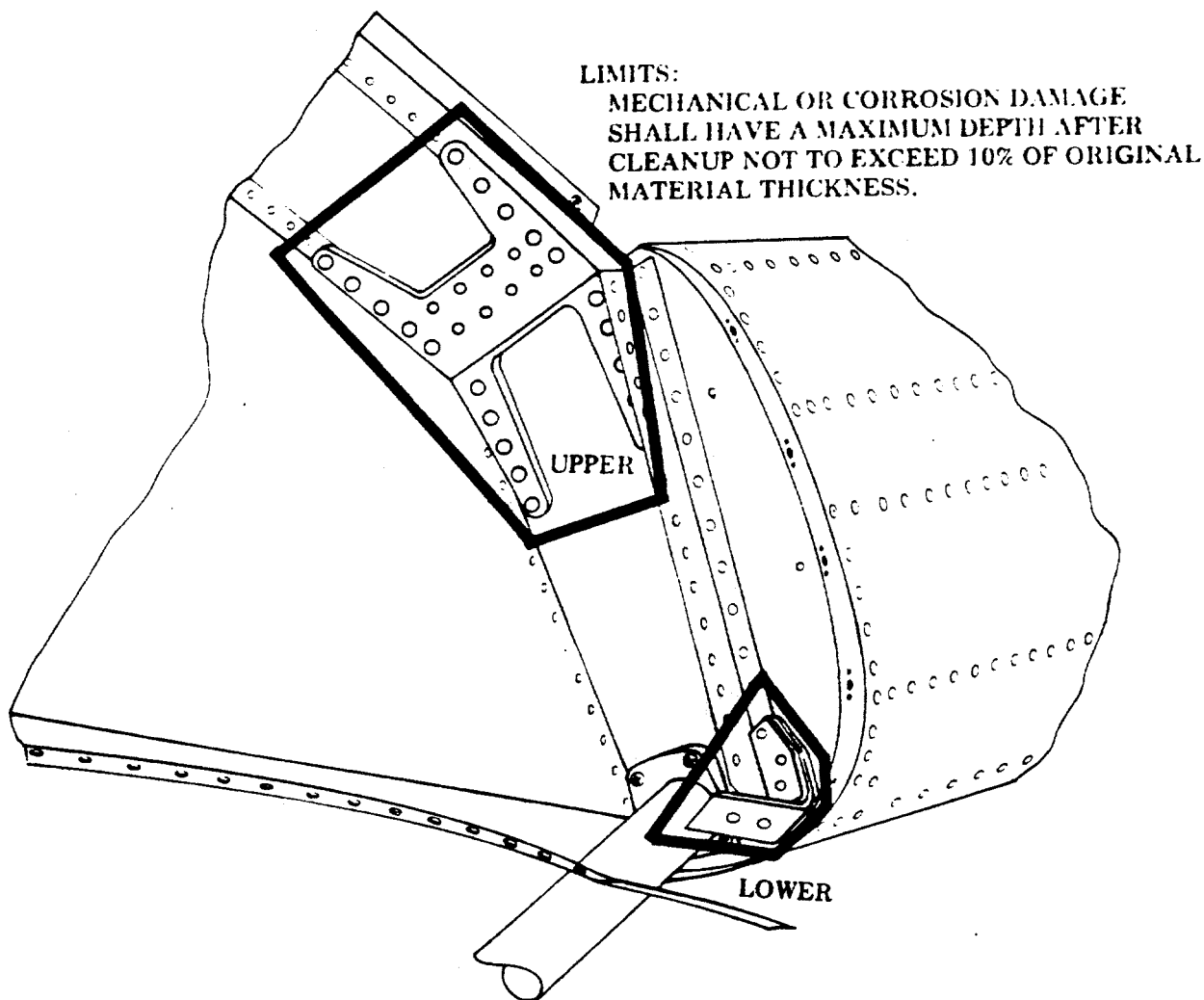
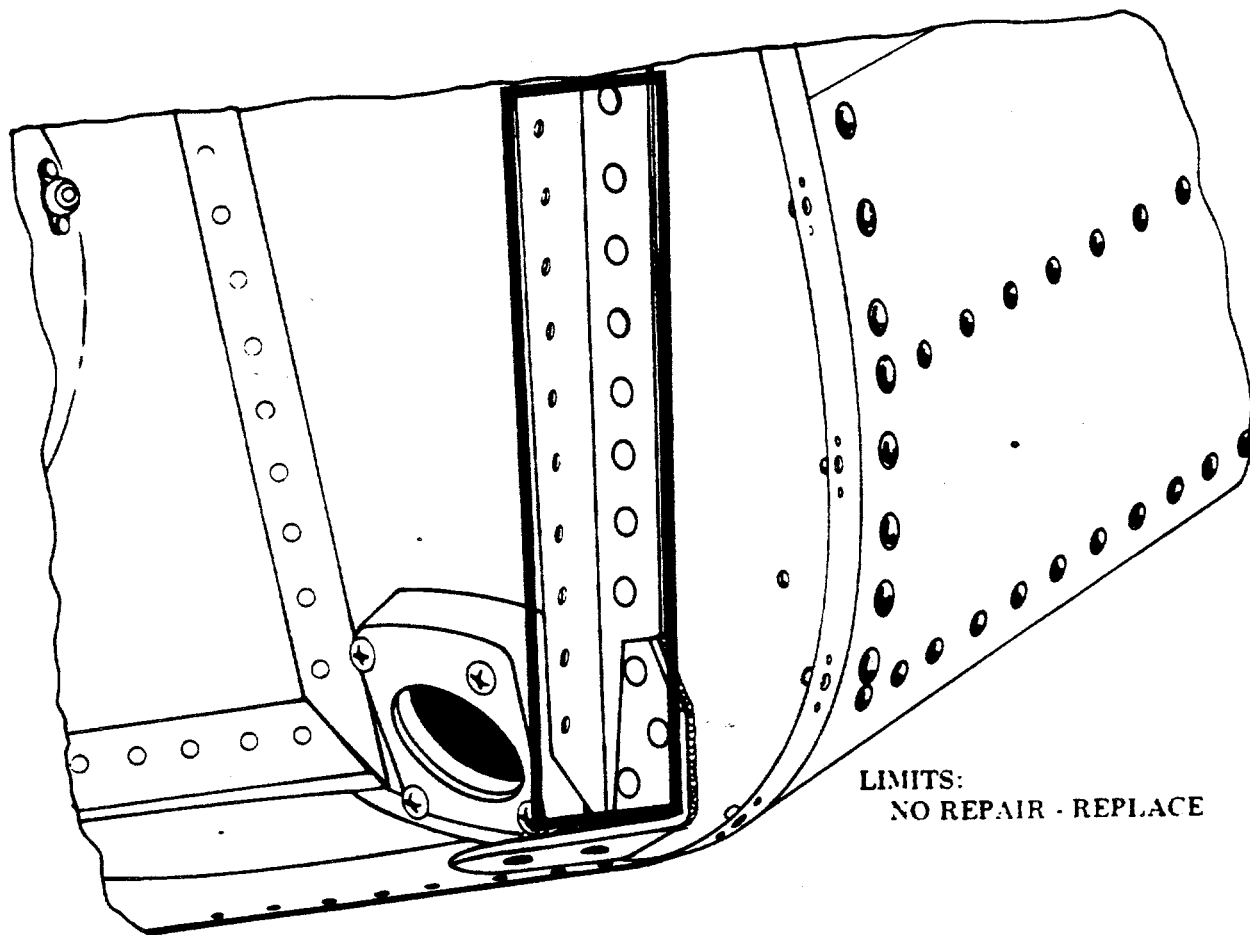


Figure 3-30. FITTINGS, UPPER AND LOWER, B.S. 227.0

CHQSOFTWARE.COM

INSPECT FOR:  
CRACKS, HOLES AND DISTORTION



REPAIR:  
NO REPAIR - REPLACE

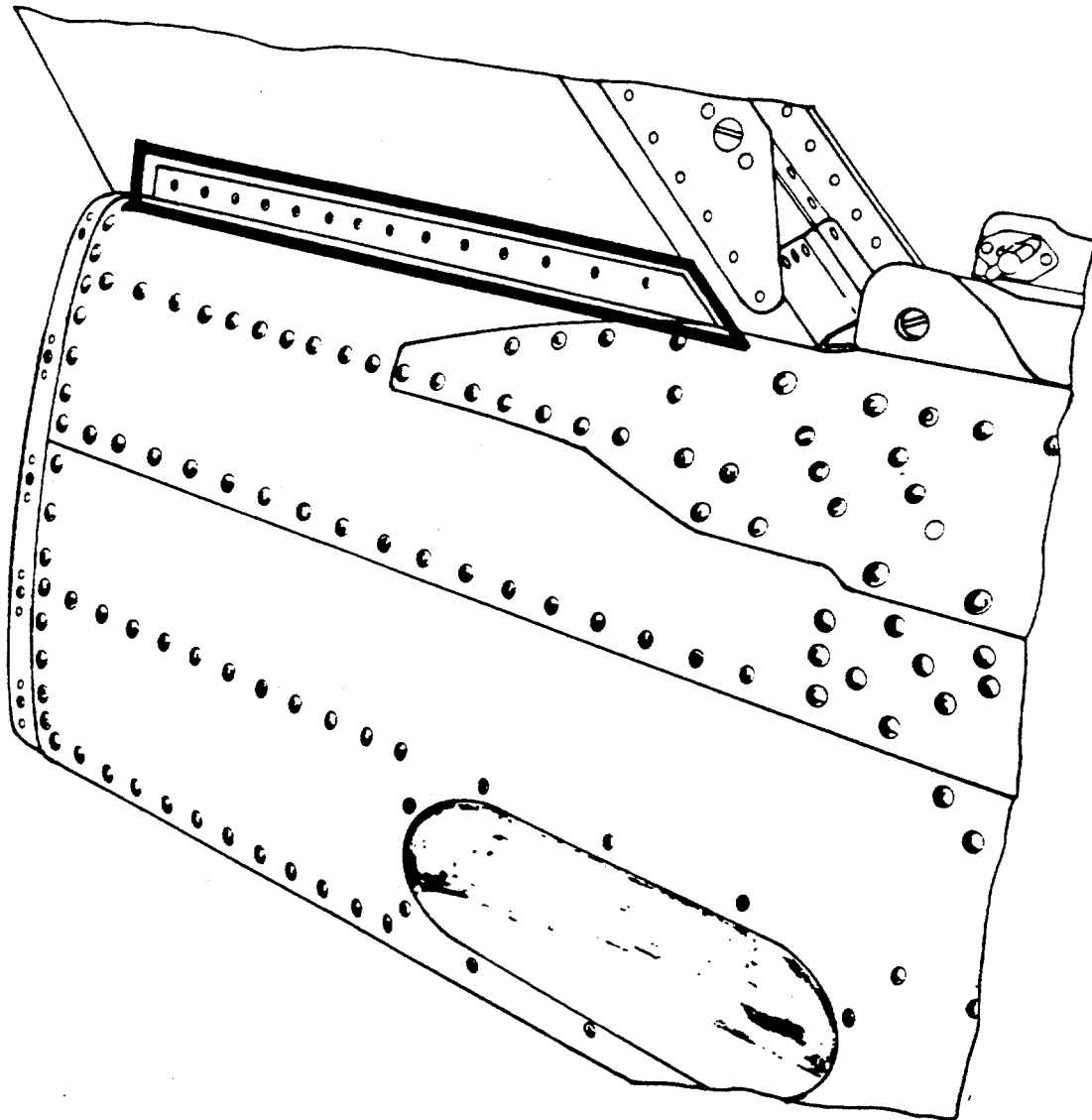
Figure 3-31. ANGLE, EXTRUSION, LEFT AND RIGHT (RIGHT HAND SHOWN) B.S. 227.0



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INSPECT FOR;  
CRACKS, HOLES, DISTORTION

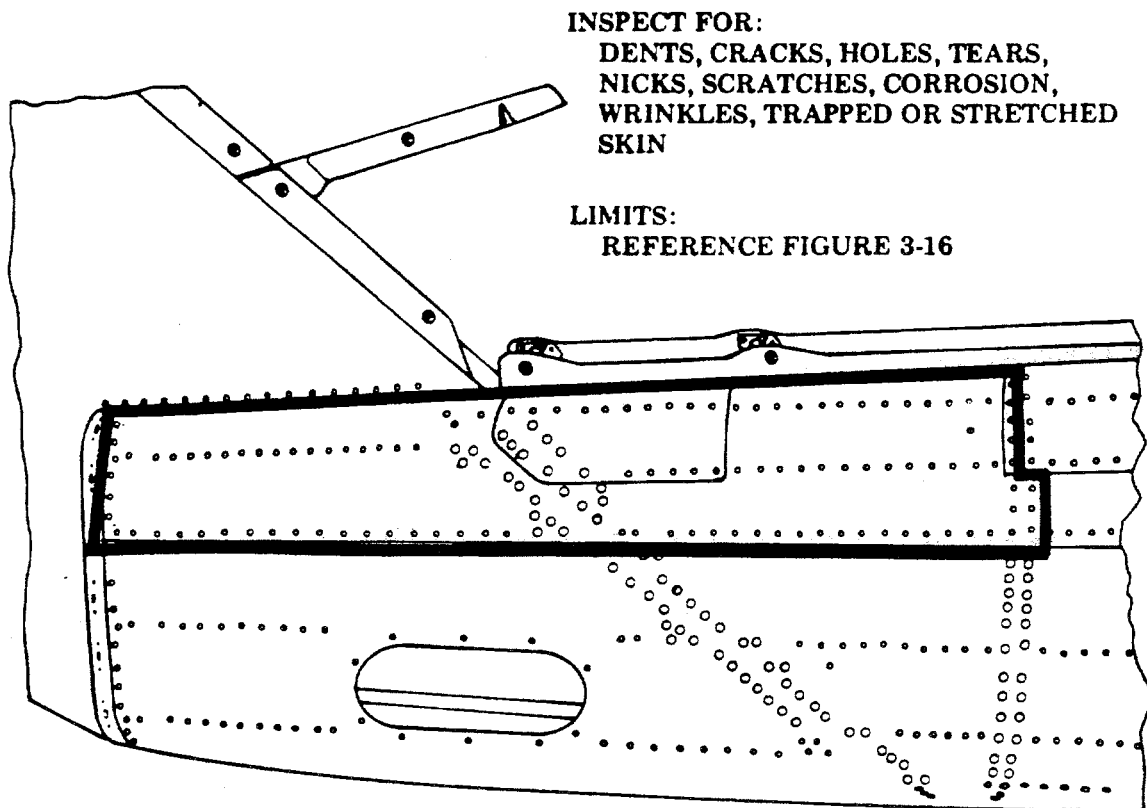
LIMITS  
NO REPAIR - REPLACE



REPAIR:  
NO REPAIR - REPLACE

Figure 3-32. ANGLE. EXTRUSION. LEFT AND RIGHT (R/H SHOWN) B.S. 215.0 - 227.0

CHQSOFTWARE.COM



**REPAIR:**  
REFERENCE PARAGRAPH 4-7

**Figure 3-33. SKIN, TOP, B.S. 194.30 - 227.0**

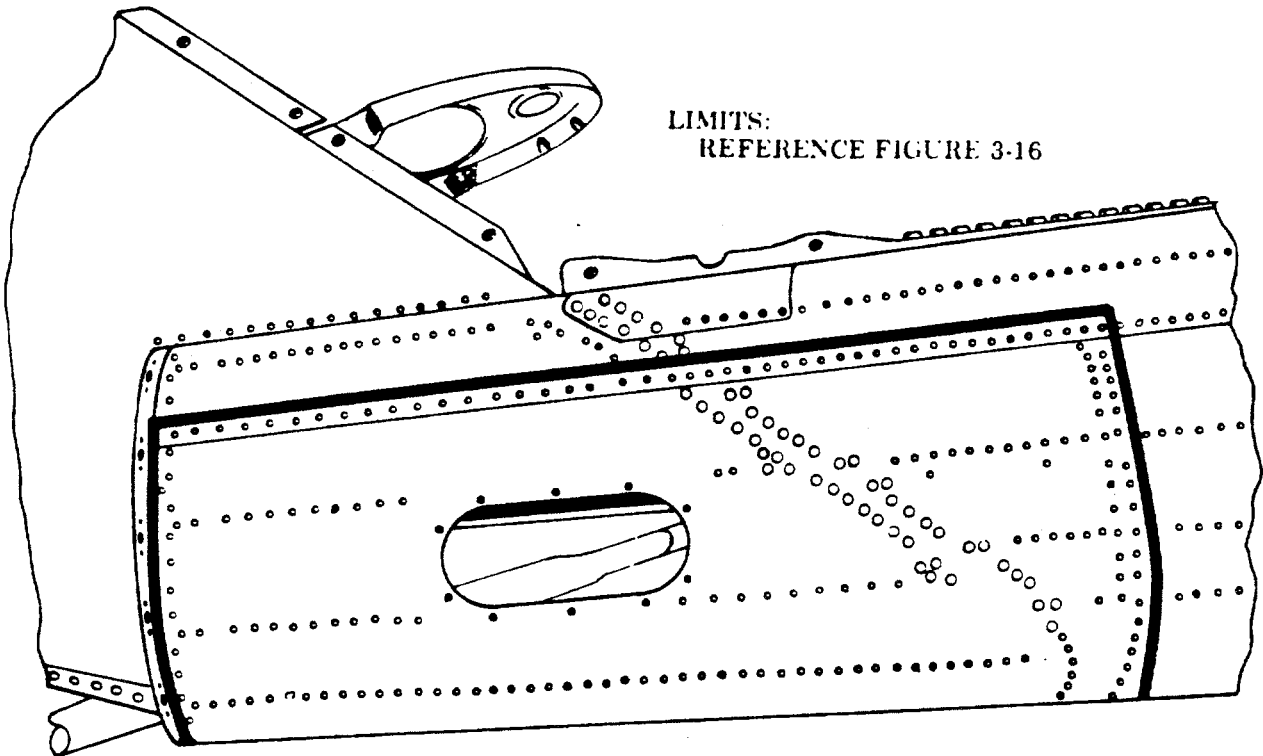
CHQSOFTWARE.COM

INSPECT FOR:

DENTS, CRACKS, HOLES, TEARS,  
NICKS, SCRATCHES, CORROSION,  
WRINKLES, TRAPPED OR STRETCHED  
SKIN

LIMITS:

REFERENCE FIGURE 3-16

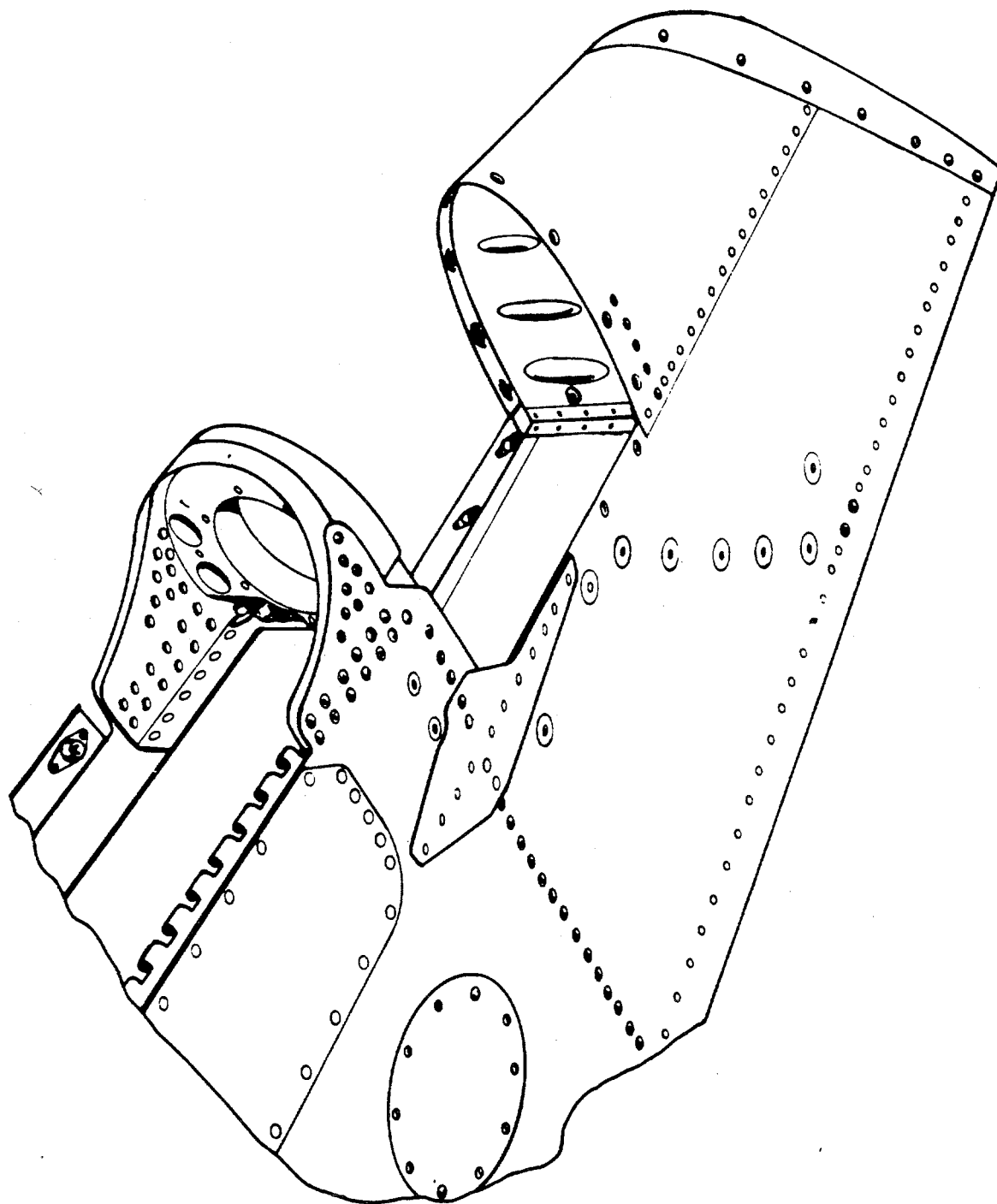


REPAIR

REFERENCE PARAGRAPH 4-7

Figure 3-34. SKIN, BOTTOM B.S. 194.30 - 227.0

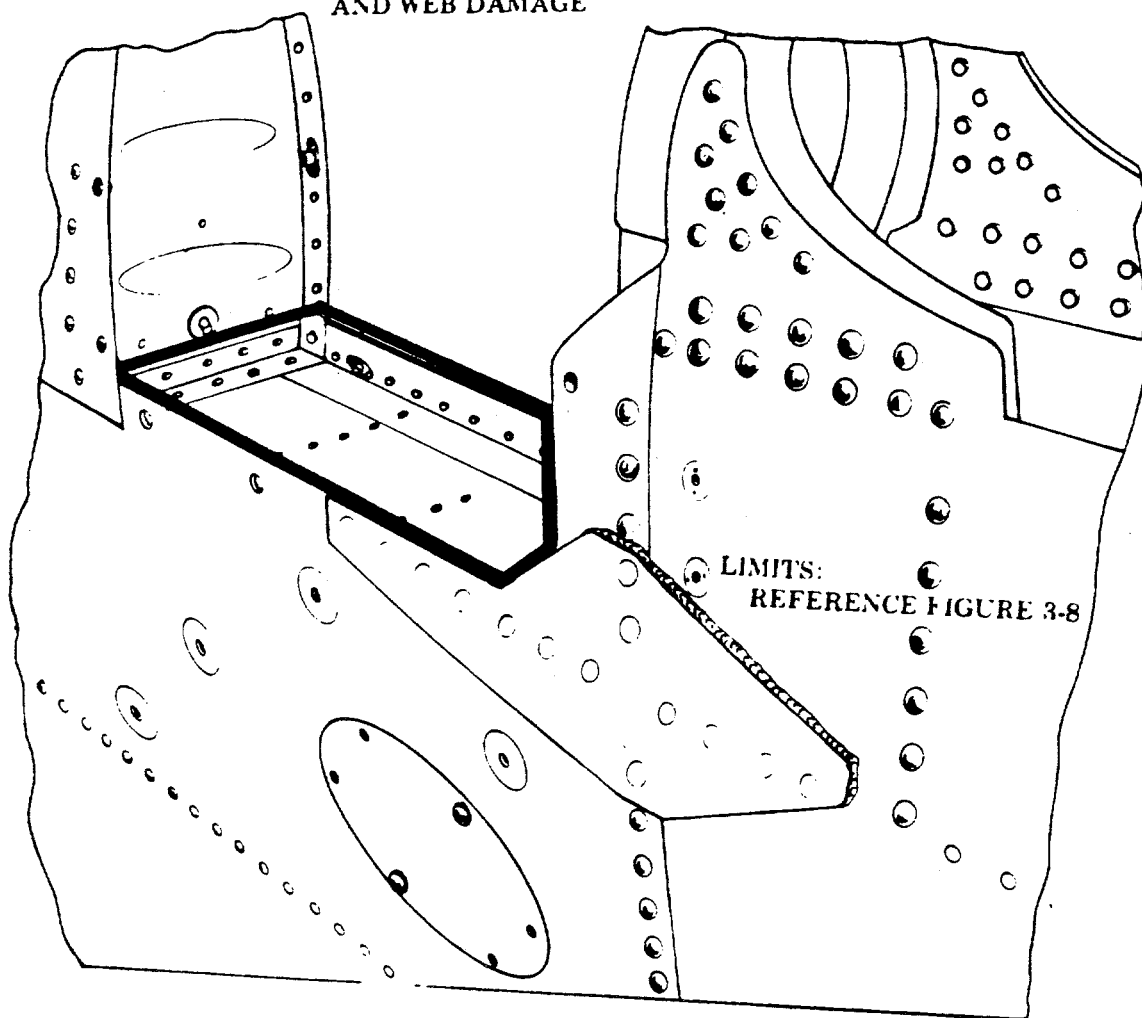
CHQSOFTWARE.COM



**Figure 3-35. FIN ASSEMBLY, EXTENSION (AH-1G and AH-1S (MOD))**

CHQSOFTWARE.COM

INSPECT FOR:  
SCRATCHES, CRACKS, DENTS  
AND WEB DAMAGE



REPAIR:  
REFERENCE PARAGRAPH  
4-48/4-49

Figure 3-36. SPAR ASSEMBLY, REAR

CHQSOFTWARE.COM

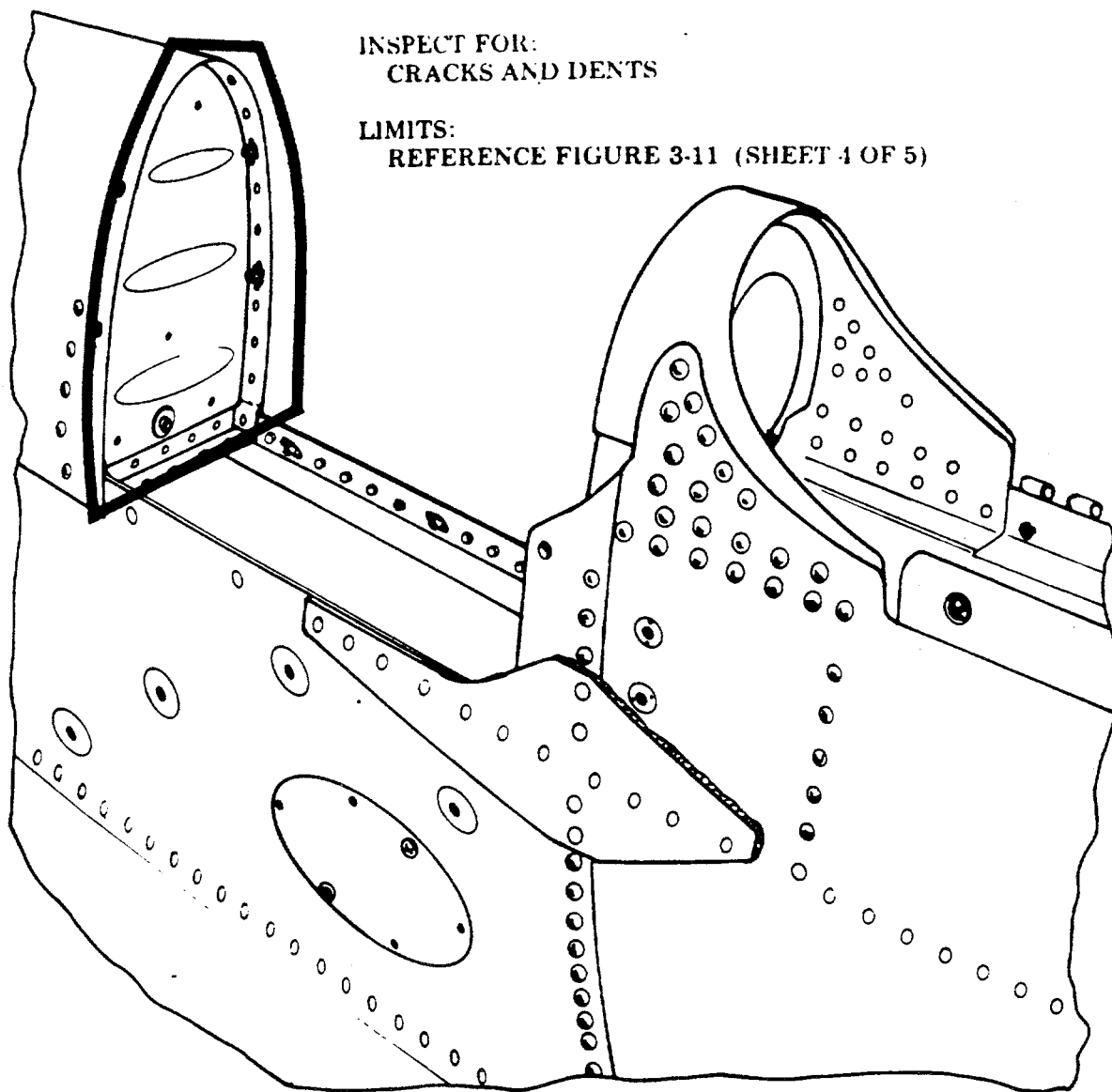
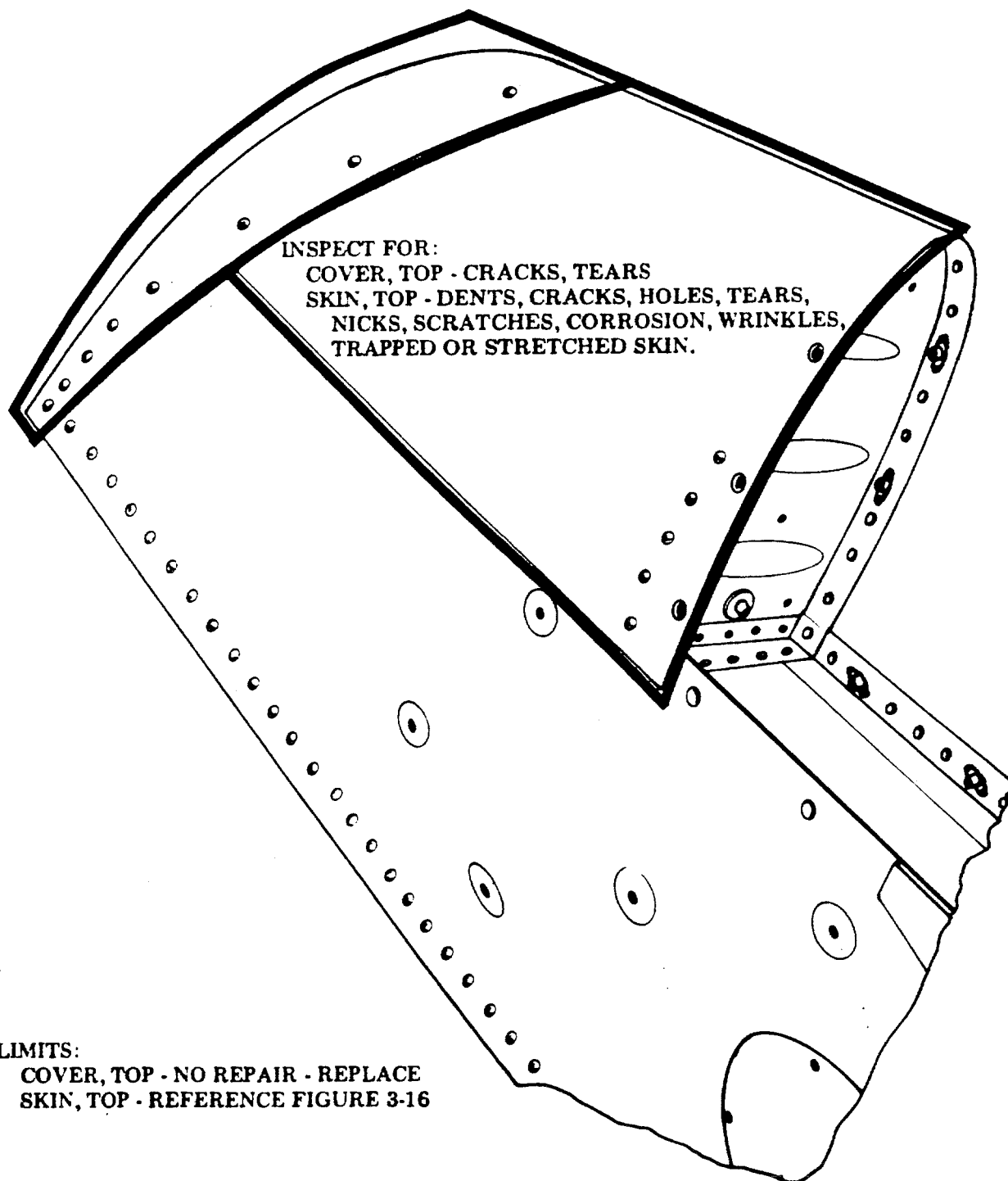


Figure 3-37. RIB UPPER

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**LIMITS:**

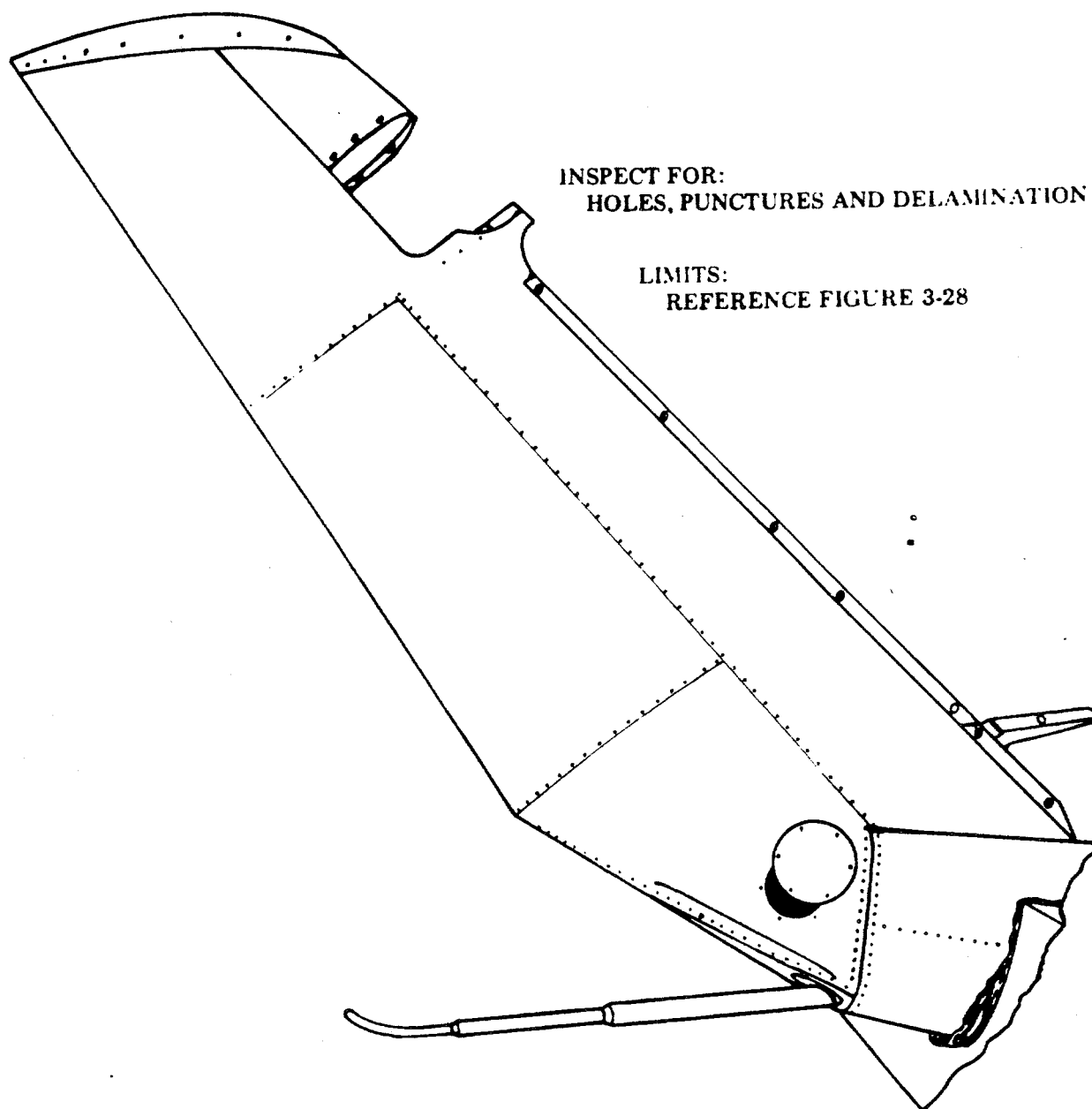
COVER, TOP - NO REPAIR - REPLACE  
 SKIN, TOP - REFERENCE FIGURE 3-16

**REPAIR:**

COVER, TOP - NO REPAIR - REPLACE  
 SKIN, TOP - REFERENCE PARAGRAPH 4-7

**Figure 3-38. COVER, TOP AND SKIN, TOP**

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INSPECT FOR:  
HOLES, PUNCTURES AND DELAMINATION

LIMITS:  
REFERENCE FIGURE 3-28

REPAIR:  
REFERENCE PARAGRAPH  
4-53 UIC 4-60

Figure 3-39. HONEYCOMB PANEL, L/R (R/H SHOWN)



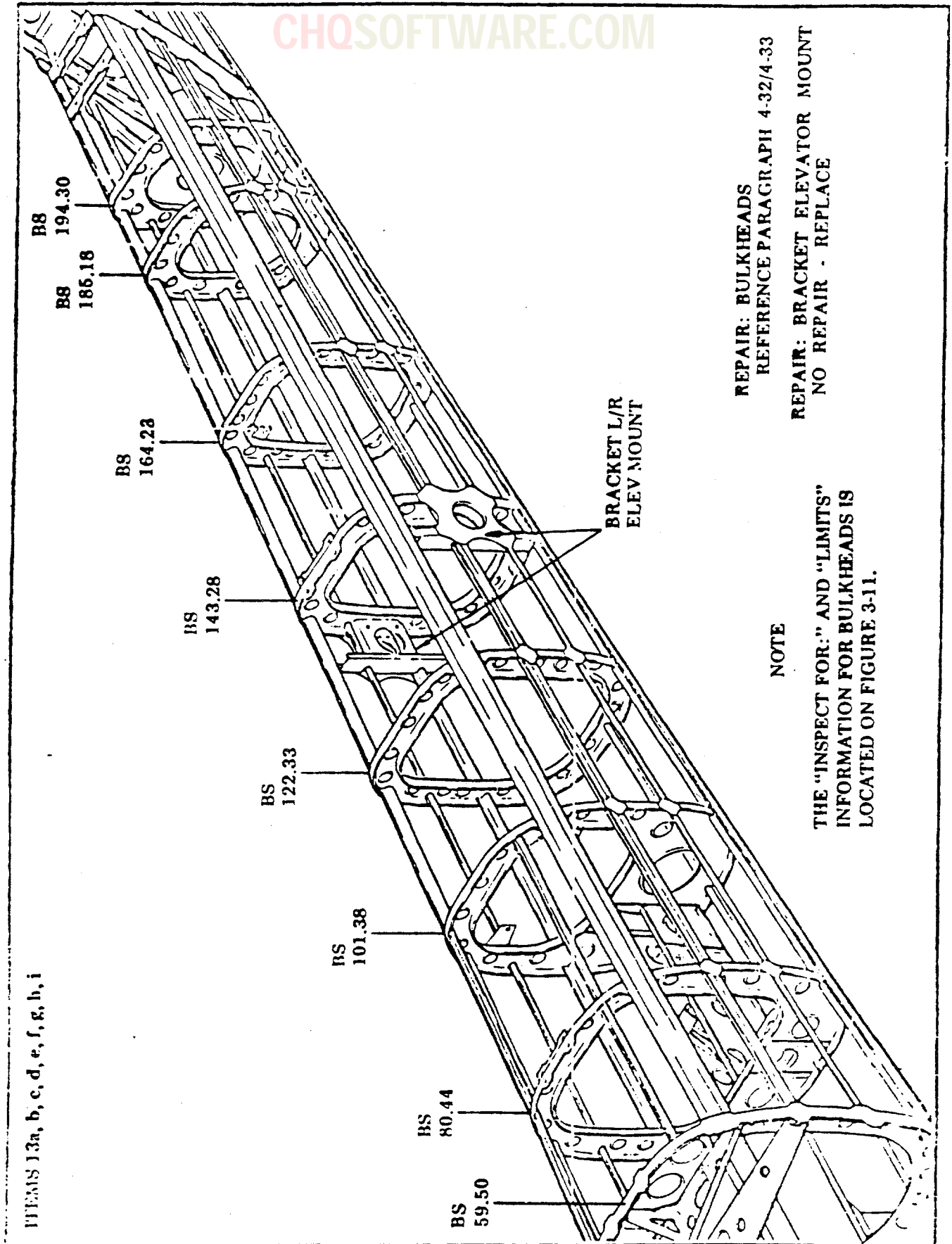
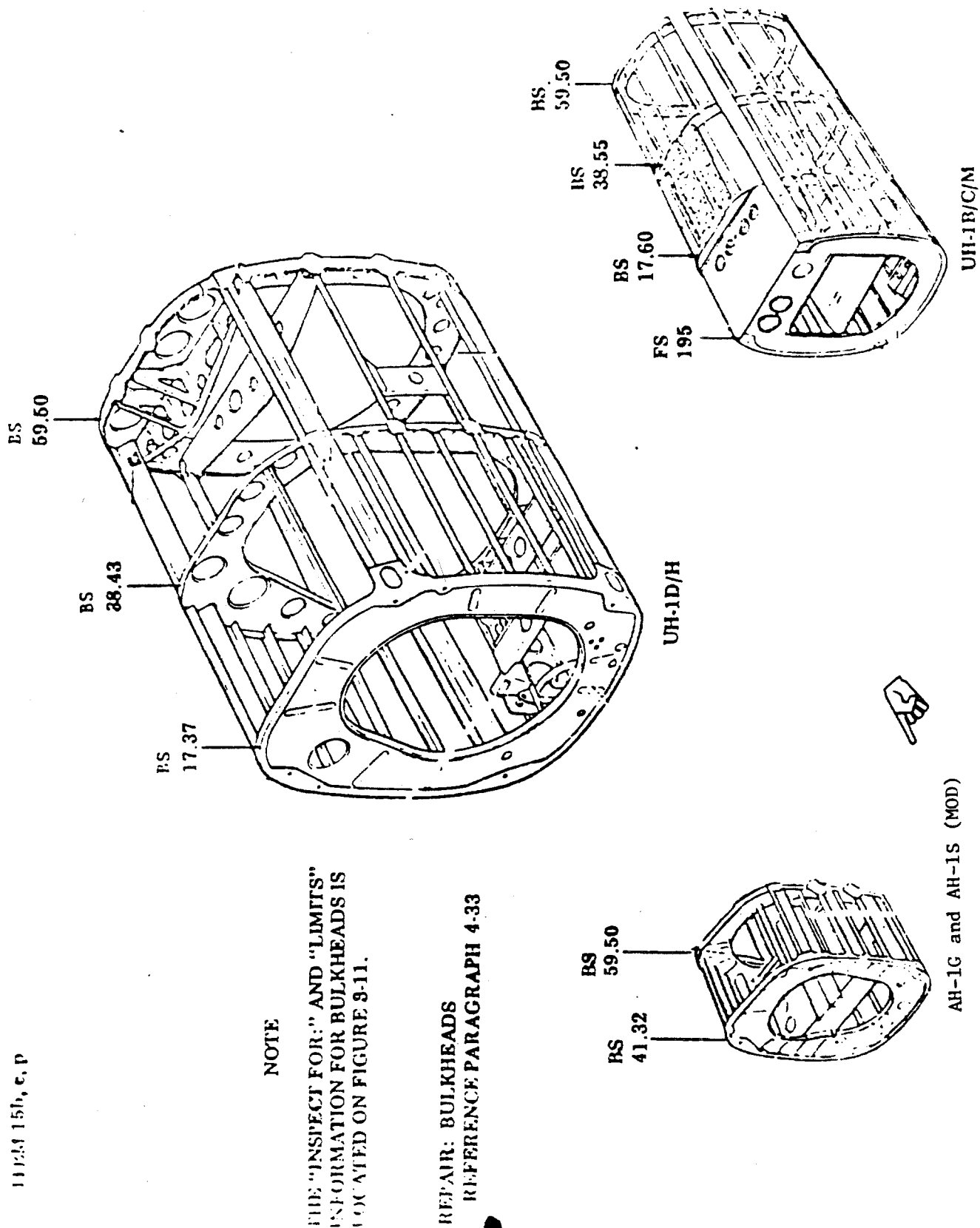


Figure 3-40. TAIL BOOM ASSEMBLY BULKHEADS (H/M/1G/1S (MOD) (SHEET 1 of 2)



NOTE

THE "INSPECT FOR:" AND "LIMITS" INFORMATION FOR BULKHEADS IS LOCATED ON FIGURE 3-11.

REPAIR: BULKHEADS  
REFERENCE PARAGRAPH 4-33

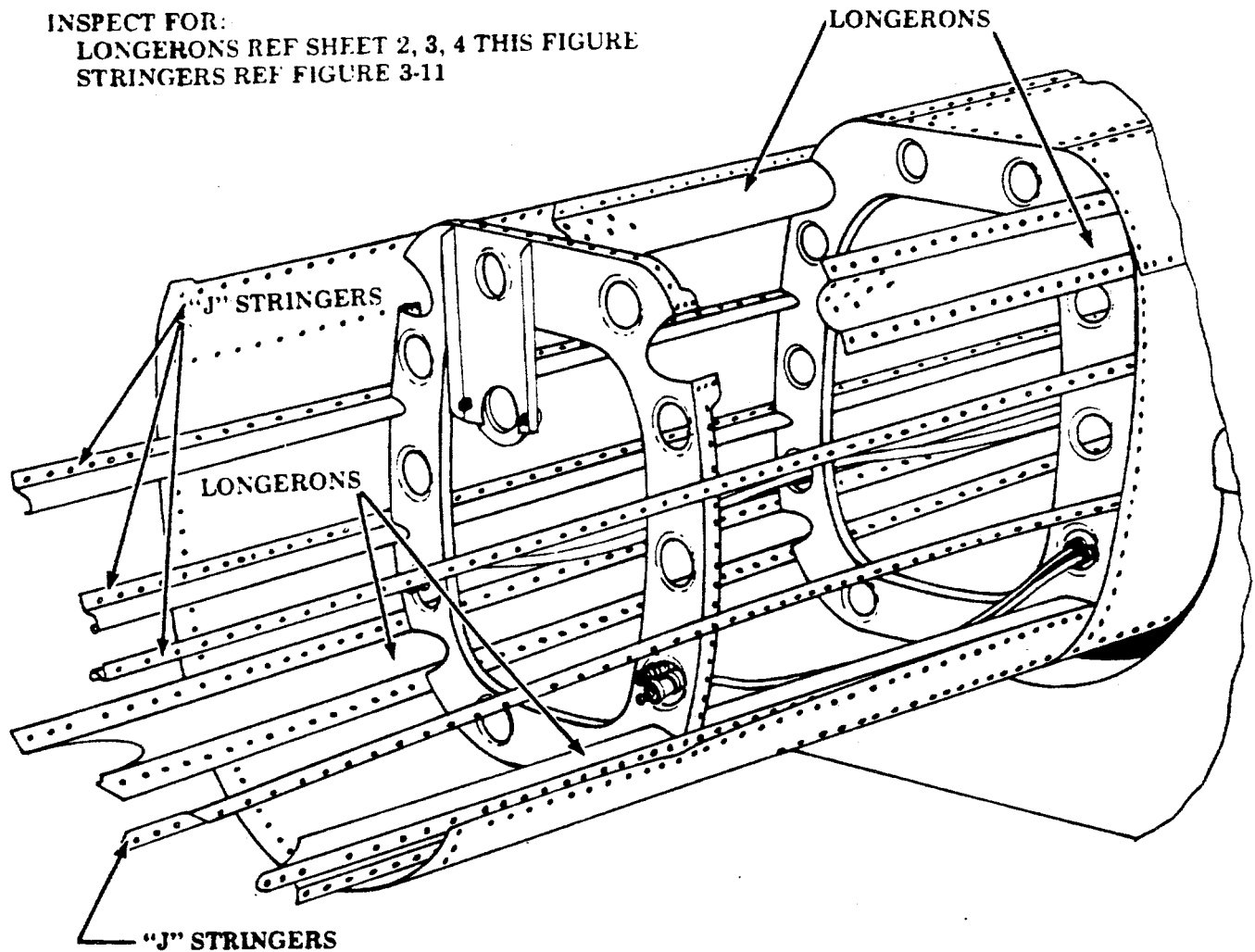
AH-1G and AH-1S (MOD)

UH-1B/C/M

Figure 3-40. TAIL ROOM ASSEMBLY BULKHEADS (H/M/1G/1S (MOD)) (SHEET 2 of 2)

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INSPECT FOR:  
LONGERONS REF SHEET 2, 3, 4 THIS FIGURE  
STRINGERS REF FIGURE 3-11



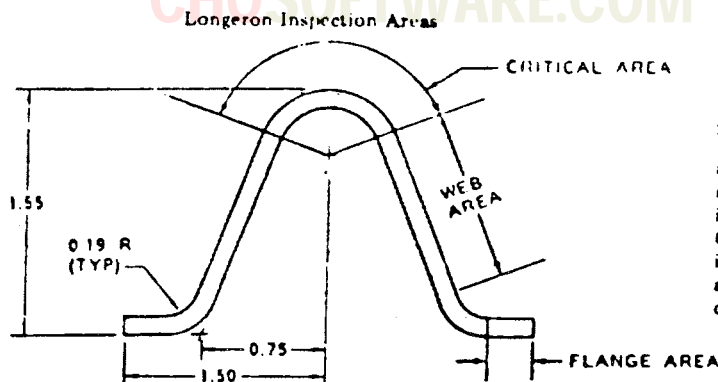
REPAIR:  
REFERENCE PARAGRAPH 4-46/4-47

Figure 3-41. LONGERONS AND "J" STRINGERS (SHEET 1 OF 4)

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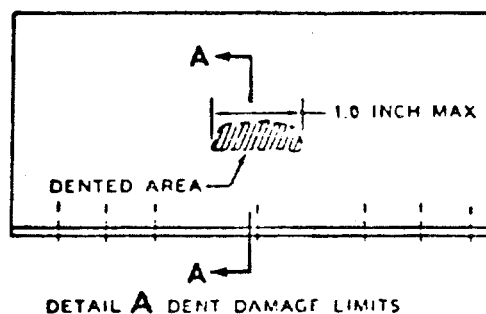
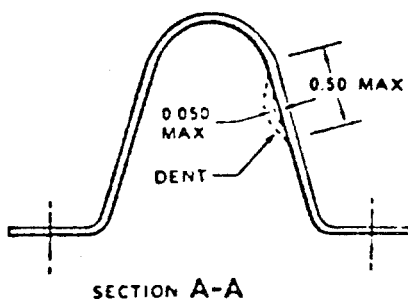
# DEFECT

a. Cracks,  
Corrosion,  
Dents, Holes,  
Tears, Nicks,  
Scratches  
Buckled or  
Wrinkled.



Damage Repairable by Patching

a. Smooth contoured dents, length not exceeding 1.0 inch longitudinal, 0.5 inch lateral and 0.050 inch depth. If dent limits are exceeded, treat as a crack.

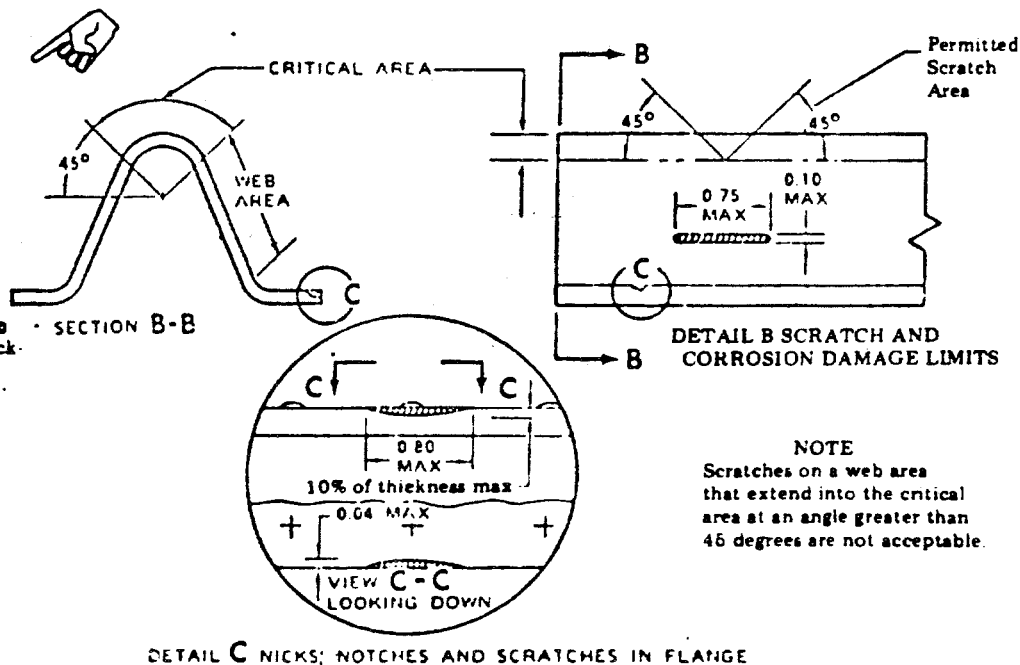


## NEGLECTIBLE DAMAGE

Corrosion: Less than 10% of material thickness and not exceeding an area 0.10 inch width by 0.75 inch length after cleanup.

One repair for each longeron in a bay area. No damage in forward bay.

Nicks and Scratches: Not to exceed 10% of material thickness, 0.010 inch width and 0.75 inch length after cleanup. Scratches in web area that extend into radius or at angle greater than 45° into critical area, treat as a crack. (See detail B.) Nicks or notches in flange area not to exceed 0.80 inch length, 0.04 inch width and no deeper than 10% of material thickness after cleanup. (See details B and C.)

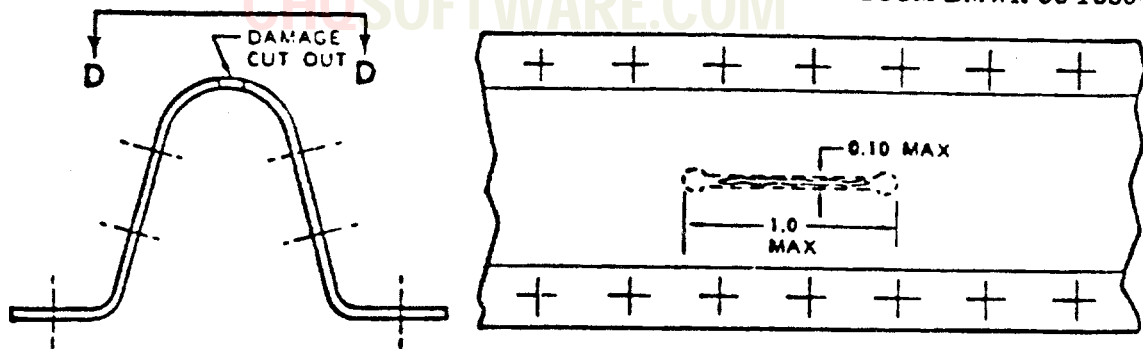


### NOTE

Scratches on a web area that extend into the critical area at an angle greater than 45 degrees are not acceptable.

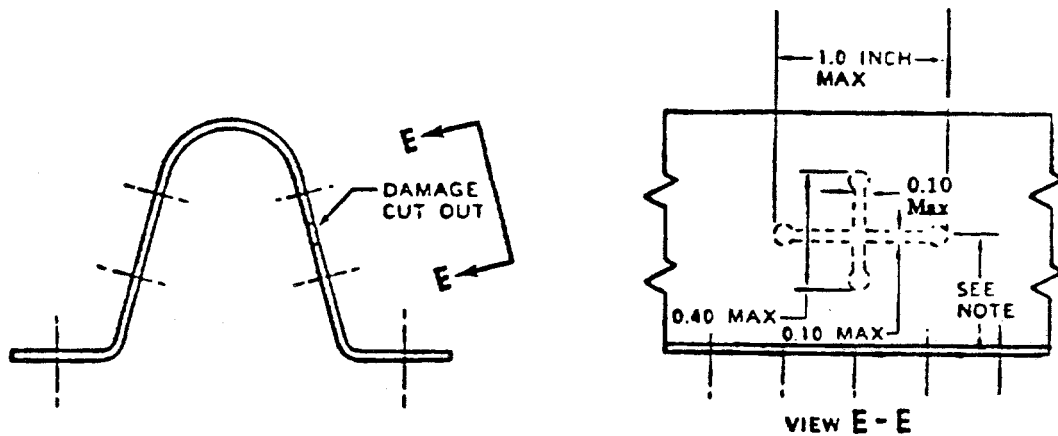
Refer to attach fitting illustration for damage limits to fittings.

Figure 3-41. LONGERONS AND "J" STRINGERS (SHEET 2 OF 4)



VIEW D - D

DETAIL D LONGITUDINAL CRACKS IN CRITICAL AREA



VIEW E - E

NOTE

All longitudinal cracks are repairable if they are located within the following limits: 0.45 inch minimum height from longeron flange, 1.04 inches maximum height from longeron flange.

DETAIL E LONGITUDINAL OR LATERAL CRACKS IN WEB AREA

c. Crack, hole or tear damage not exceeding limits of details D and E,

DAMAGE REQUIRING REPLACEMENT

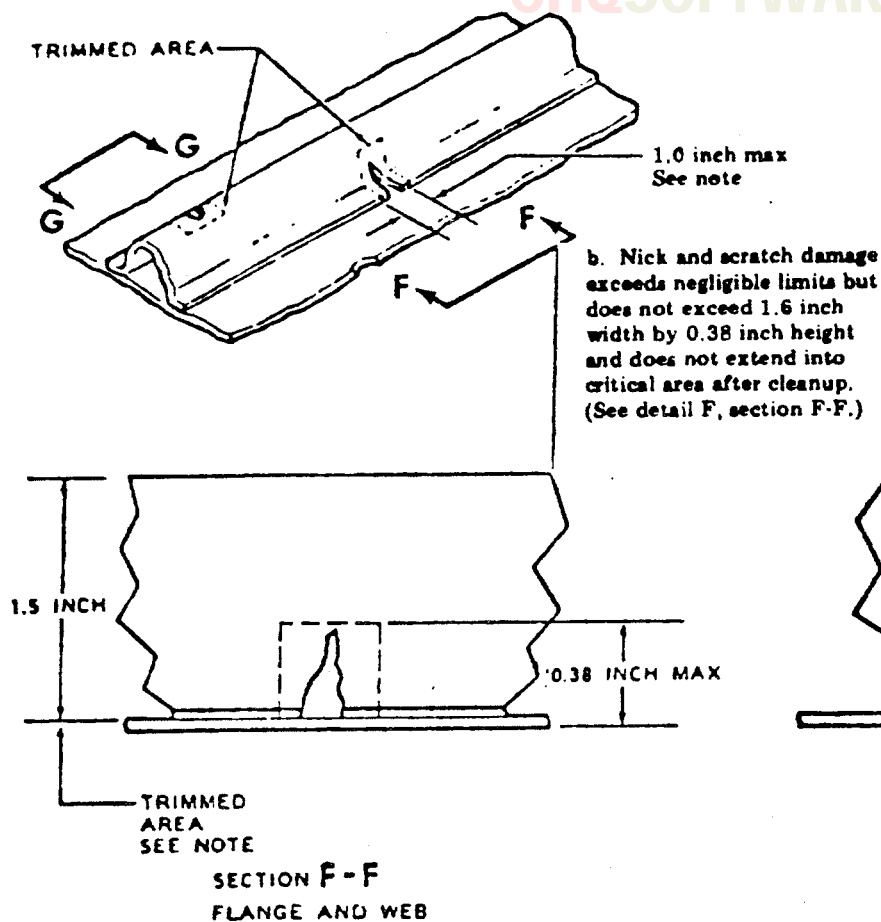
- Damage exceeds repairable limits of two or more repairs required in a single bay.
- Damage other than negligible occurs in a bay containing either a splice joint or a previous repair.
- Damage other than negligible in forward bay.
- Splice required in second bay.

NOTE

Damage in forward bay area (other than negligible), requires replacement of both the longeron and fitting. Cut longeron in an area suitable for splicing aft of second bay area. No splicing permitted in first two bays of tail boom.

Remove forward longerons on Model 205 at BS 59.50. Replace any longeron damaged a sufficient amount to cause permanent buckles in tail boom, sharp wrinkles in skin or excessive misalignment.

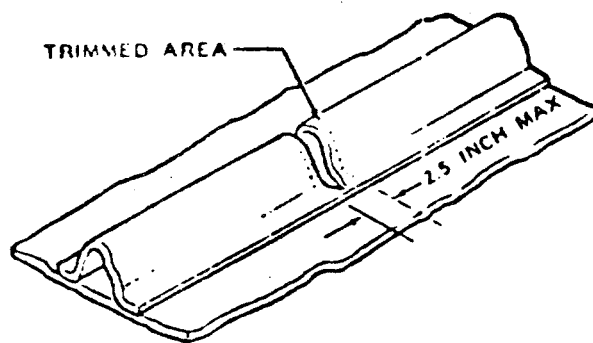
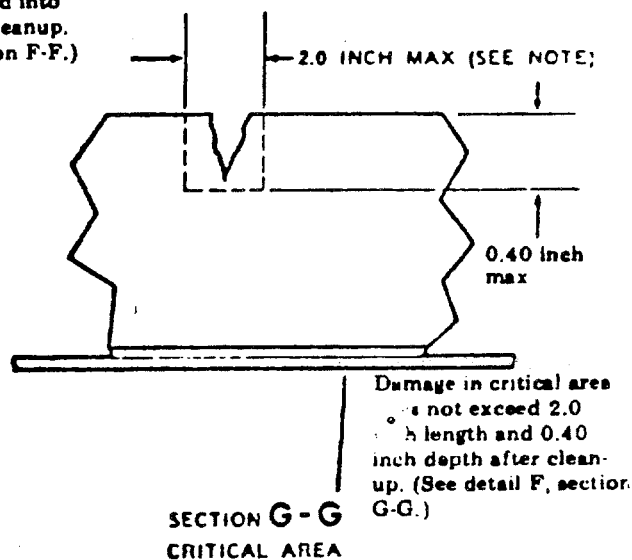
Figure 3-41. LONGERONS AND "J" STRINGERS (SHEET 3 OF 4)



DETAIL F DAMAGE LIMIT TO CRITICAL AREA, FLANGE OR WEB

# NOTE

When trimmed area exceeds limits shown for either critical area or flange and web, or if combined damage extends from the flange and web into critical area, inspect to limits of detail G.



DETAIL G DAMAGE LIMIT TO CRITICAL AREA, FLANGE AND WEB

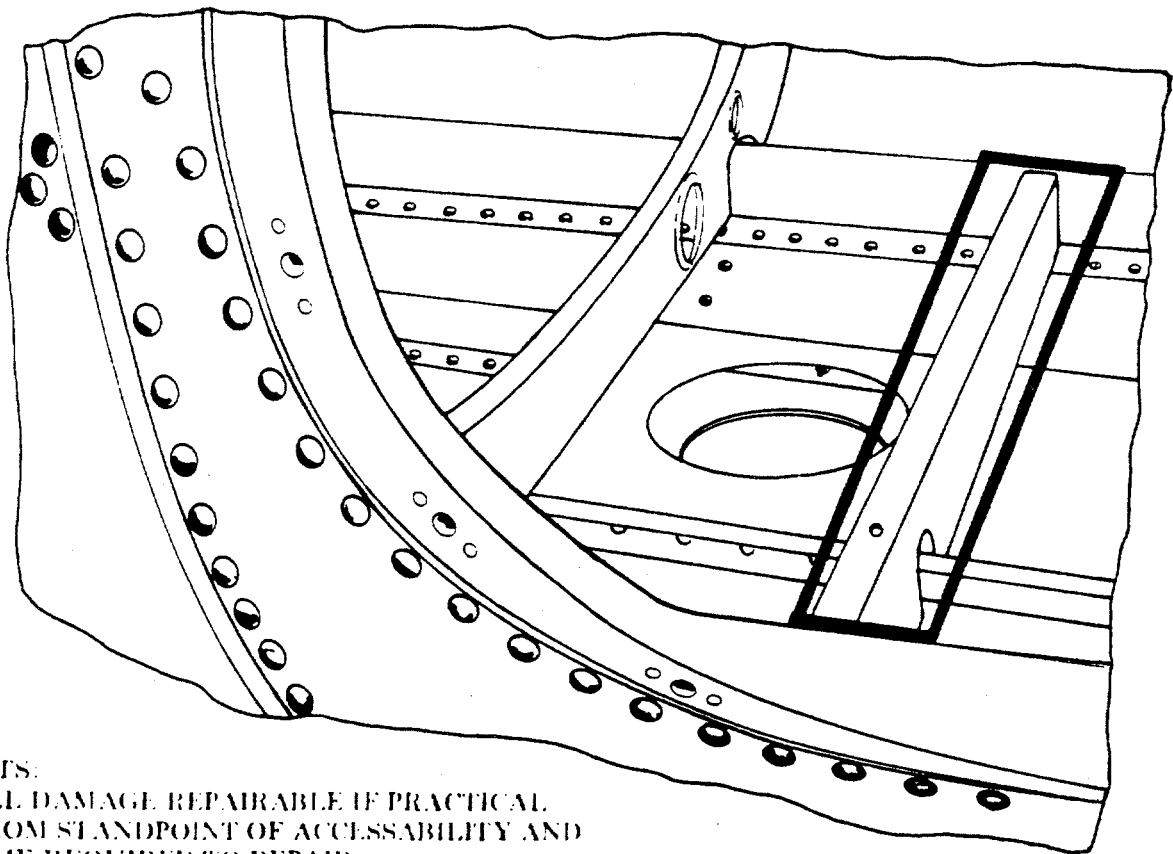
# Damage Repairable by Insertion

- a. Repairable by patching limits exceeded but less than 2.50 inch length after cleanup. (See details F and G.)
- b. Cracks or sharp nicks in dent or damage exceeds repair by patching, but less than 2.50 inch after cleanup.

Figure 3-41. LONGERONS AND "J" STRINGERS (SHEET 4 OF 4)

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INSPECT FOR  
CRACKS, TEARS AND DISTORTION



LIMITS:  
ALL DAMAGE REPAIRABLE IF PRACTICAL  
FROM STANDPOINT OF ACCESSABILITY AND  
TIME REQUIRED TO REPAIR

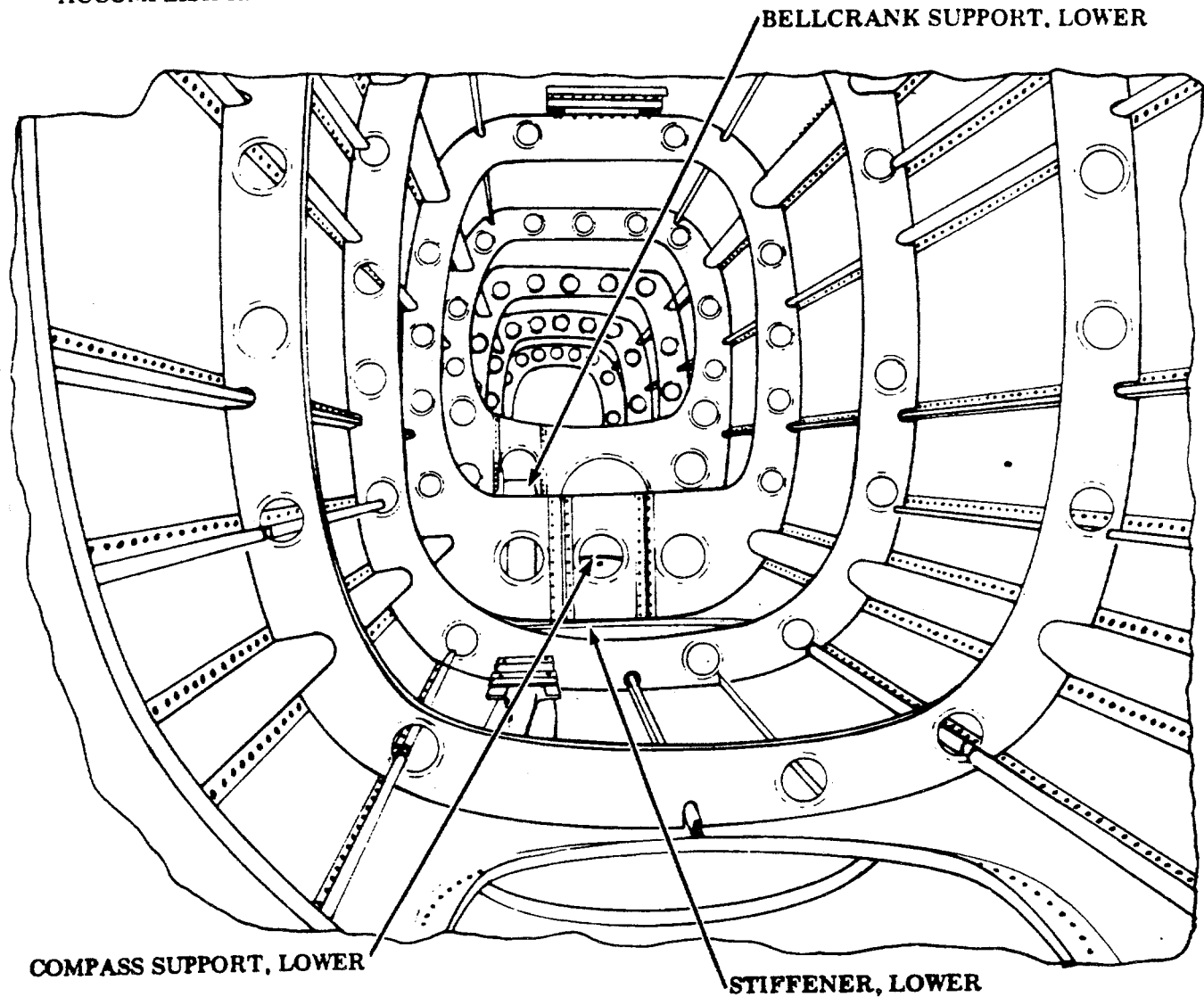
REPAIR:  
REFERENCE PARAGRAPH 4-33

Figure 3-42. FRAME, LEFT AND RIGHT, B.S. 137.42

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INSPECT FOR:  
CRACKS, TEARS, HOLES AND DISTORTION

LIMITS:  
REPAIR IF PRACTICAL FROM A STANDPOINT  
OF ACCESSABILITY AND TIME REQUIRED TO  
ACCOMPLISH REPAIR



REPAIR:  
REFERENCE TM 55-1500-204-25/1

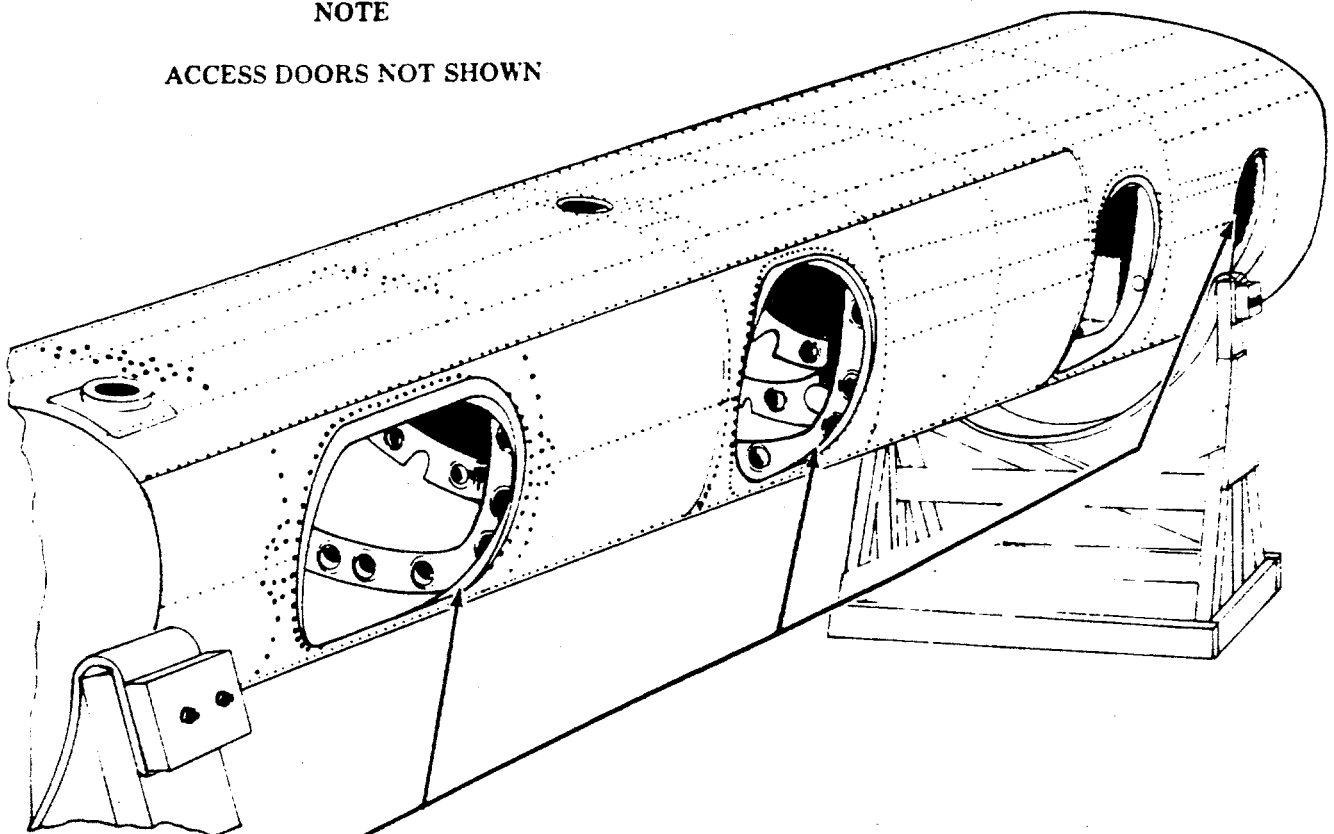
Figure 3-43. BELLCRANK SUPPORT LOWER, STIFFENER LOWER, AND LOWER COMPASS SUPPORT.



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**NOTE**

**ACCESS DOORS NOT SHOWN**

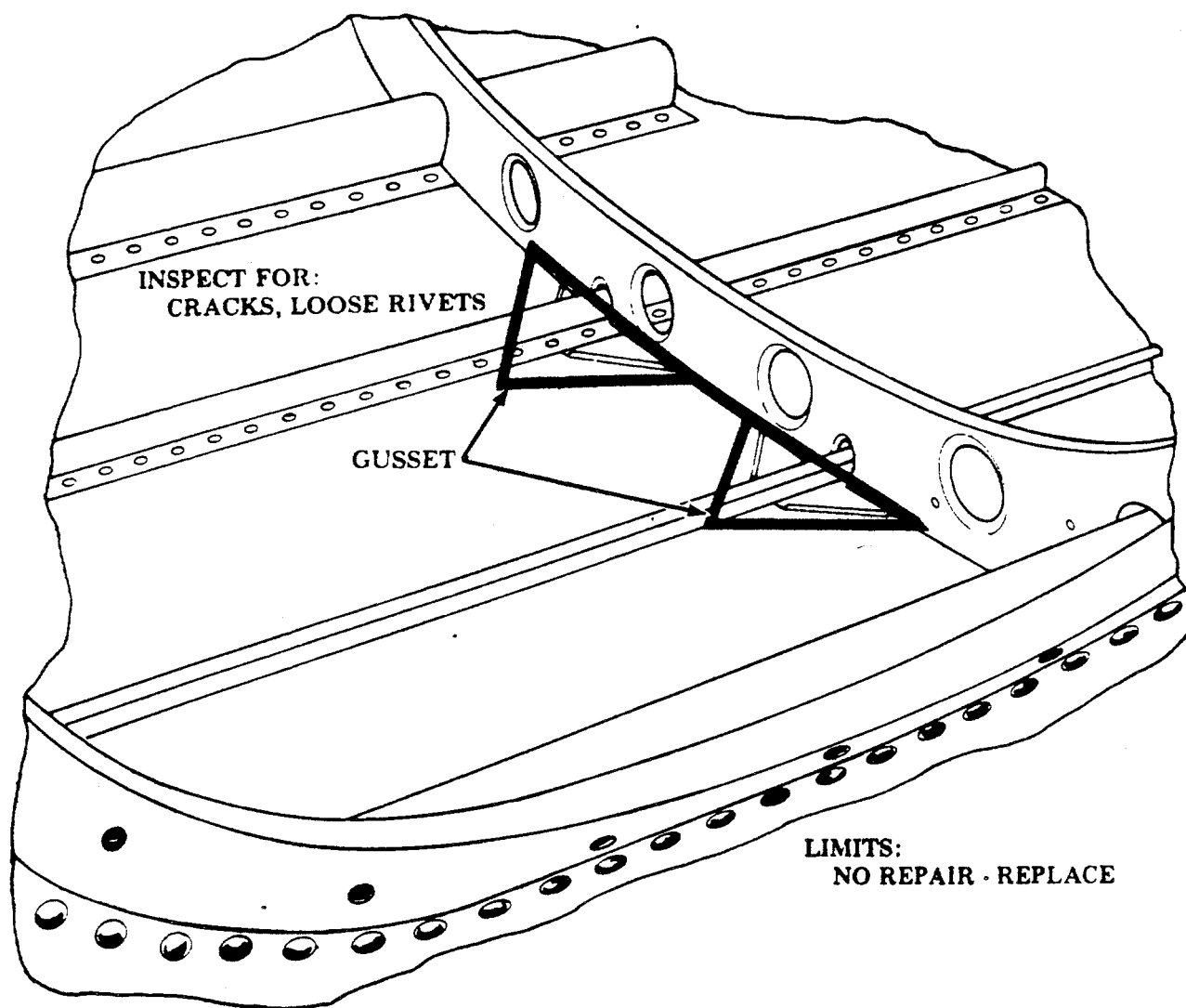


**INSPECT FOR:**  
**DOUBLERS - CHAFING, LOOSE RIVETS OR NUTPLATES**  
**ACCESS DOORS - DISTORTION, CRACKS OR**  
**ELONGATED HOLES**

**REPAIR:**  
**DOUBLERS - REFERENCE TM 55-1500-204-25/1**  
**ACCESS DOORS - NO REPAIR - REPLACE**

**Figure 3-44. DOUBLERS, LOWER AND DOORS, ACCESS**

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REPAIR:  
NO REPAIR - REPLACE

Figure 3-45. GUSSET, LEFT & RIGHT

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Figure 3-46 Deleted

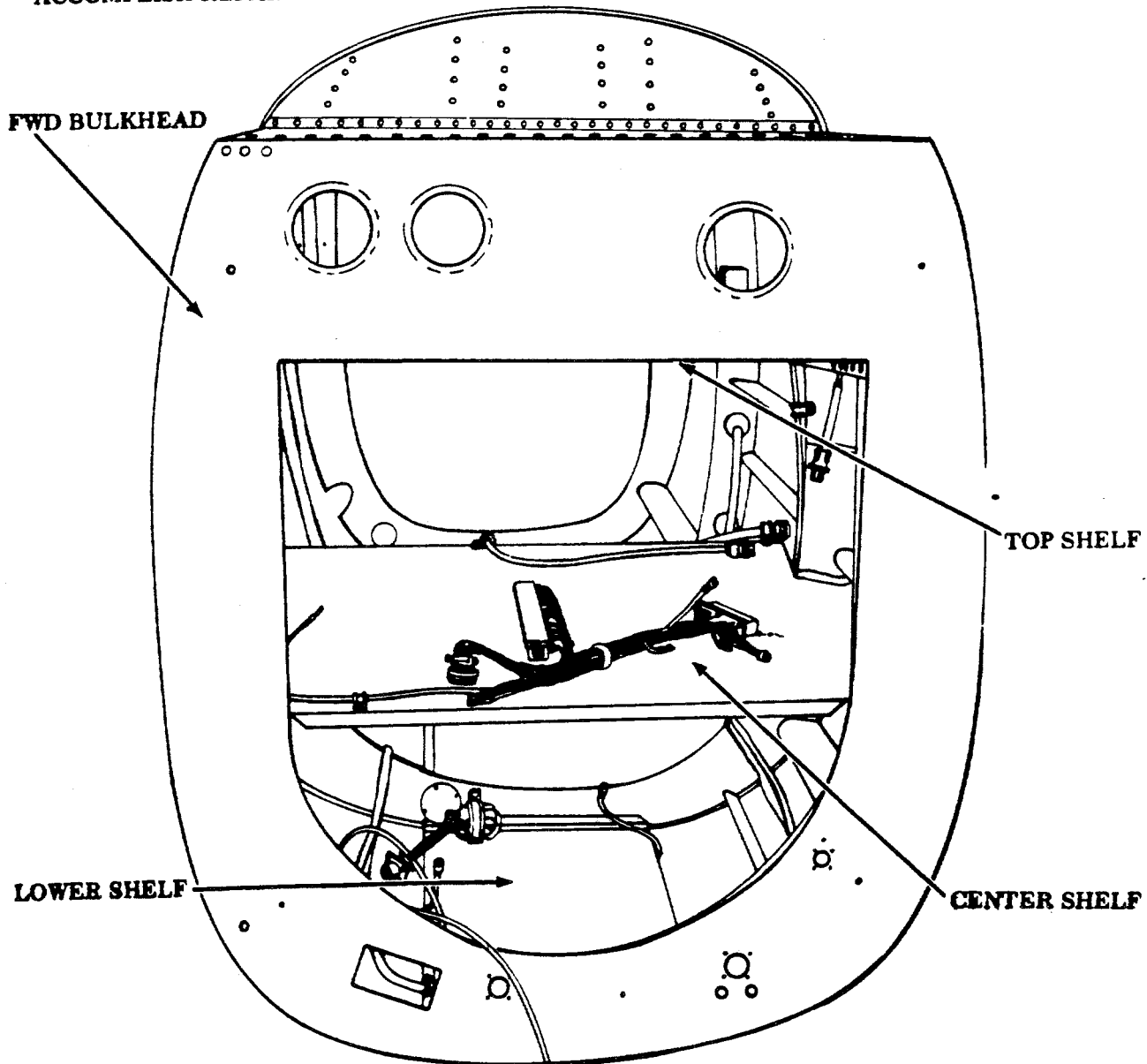
Figure 3-46. DOUBLER, BULKHEAD (UH-1B ONLY) B.S. 194.30

**INSPECT FOR:**

**BULKHEAD - CORROSION, DENTS, CRACKS,  
HOLES, NICKS AND WRINKLES  
SHELVES - CRACKS, TEARS, HOLES, DISTORTION**

**LIMITS:**

**BULKHEAD - REFERENCE FIGURE 3-11  
SHELVES - REPAIR IF PRACTICAL FROM  
A STANDPOINT OF TIME REQUIRED TO  
ACCOMPLISH REPAIR**



**REPAIR:**

**BULKHEAD - REFERENCE PARAGRAPH 4-32/4-33  
SHELVES - REFERENCE TM 55-1500-204-25/1**

**Figure 3-47. FORWARD BULKHEAD, AND SHELVES (LOWER, CENTER AND TOP)**

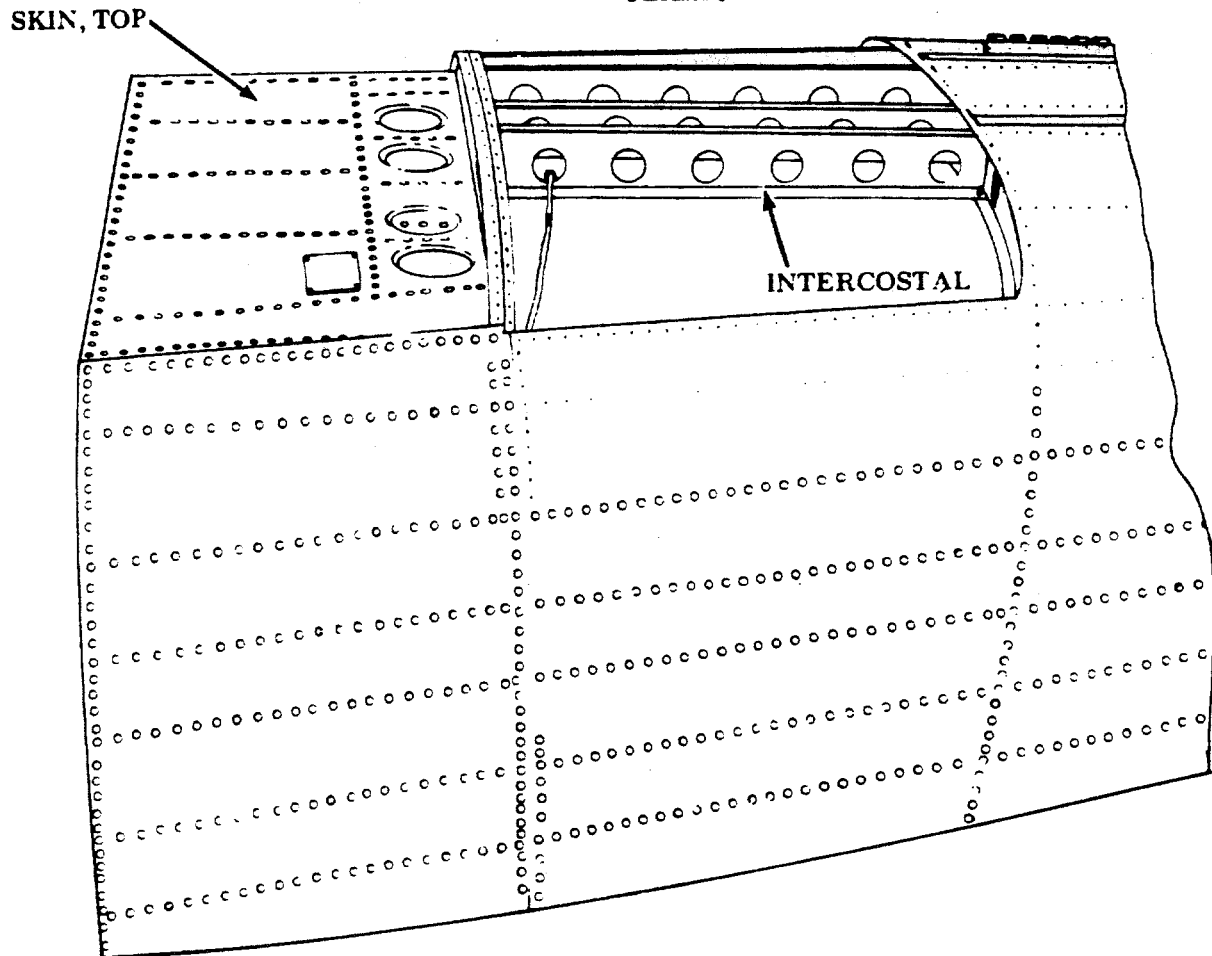
CHQSOFTWARE.COM

**LIMITS:**

**SKIN, TOP - REFERENCE FIGURE 3-16**  
**INTERCOSTAL - REPAIR IF PRACTICAL**  
**FROM STANDPOINT OF TIME TO**  
**ACCOMPLISH REPAIR**

**INSPECT FOR:**

**SKIN, TOP - DENTS, CRACKS, HOLES, TEARS,**  
**NICKS, SCRATCHES, CORROSION, WRINKLES,**  
**TRAPPED OR STRETCHED SKIN**  
**INTERCOSTAL - CORROSION, LOOSE RIVETS,**  
**TEARS, DISTORTION**



**REPAIR:**

**SKIN - REFERENCE PARAGRAPH 4-7**  
**INTERCOSTAL - REFERENCE RIB REPAIR 4-33**

**Figure 3-48. SKIN, TOP - B.S. 0.0 - 17.60 AND INTERCOSTAL, TOP - B.S. 17.60 - 38.55**

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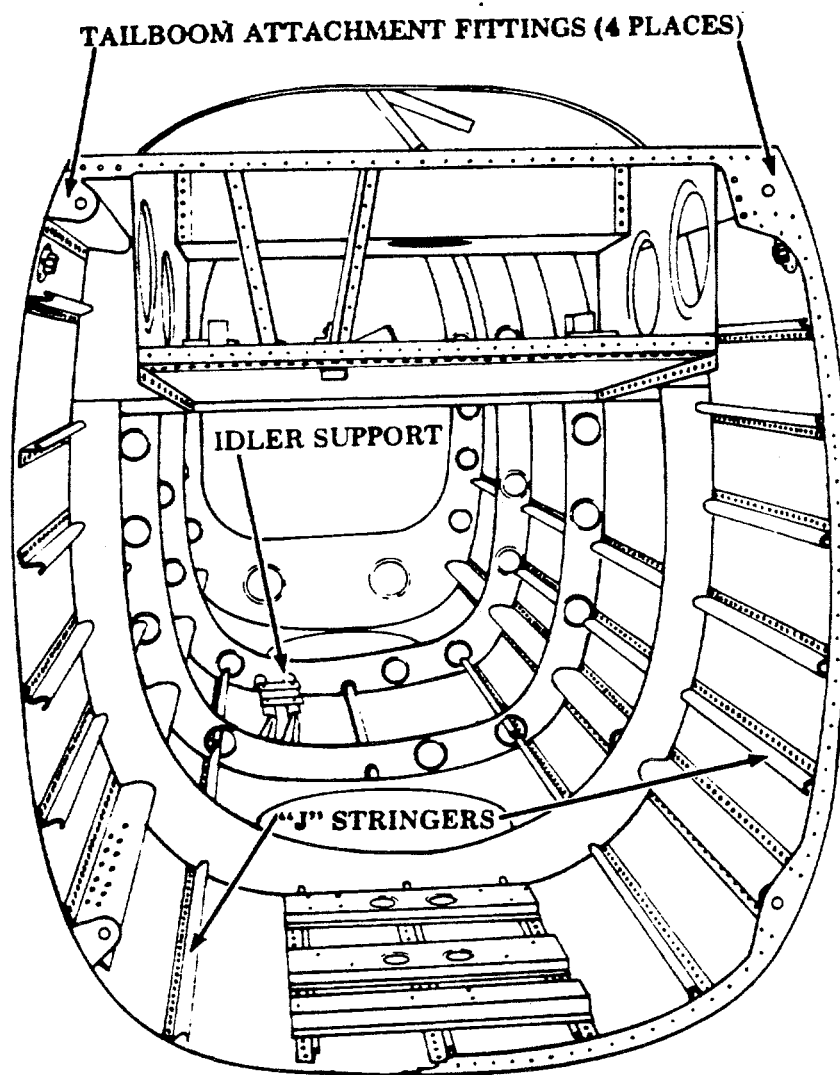


Figure 3-49. "J" STRINGERS, IDLER SUPPORT  
AND TAIL BOOM ATTACHMENT FITTINGS (SHEET 1 OF 3)

**INSPECT FOR:**

**"J" STRINGERS - DENTS, CRACKS, HOLES,  
TEARS, CORROSION AND DISTORTION  
IDLER SUPPORT - CRACKS, TEARS, HOLES  
AND DISTORTION  
TAILBOOM ATTACH FITTINGS - DYE  
PENETRANT CHECK (FORWARD  
BAY AREA)**

**LIMITS:**

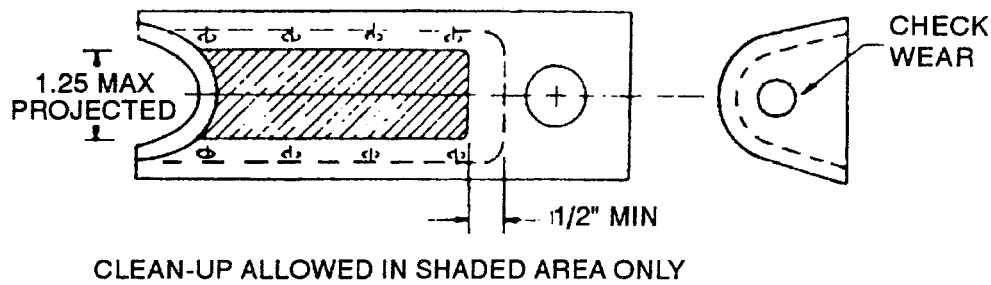
**"J" STRINGERS - REFERENCE FIGURE 3-11  
IDLER SUPPORT - REFERENCE FIGURE 3-11  
TAILBOOM ATTACHMENT FITTINGS -  
(REPAIRABLE) - CRACKS IN AREAS  
OTHER THAN AREAS SPECIFIED  
IN "REPLACE" INFORMATION  
(FOLLOWING). REPLACE ALL  
PARTS IF REPAIR DOES NOT  
WARRANT TIME EXPENDED.  
(REPLACE) - CRACKS IN ATTACH-  
MENT FITTINGS REQUIRE PART  
REPLACEMENT. CRACKS IN OTHER  
AREAS REQUIRE REPAIR.**

**REPAIR:**

**"J" STRINGERS - REFERENCE PARAGRAPH 4-47  
IDLER SUPPORT - REFERENCE TM 55-1500-204-25/1  
ATTACHMENT FITTINGS - REFERENCE PARAGRAPH 4-43**



Upon installation of all tailboom attachment fittings to longerons, insure that rivet holes on each side of each member are deburred when room temperature cure adhesive is used. If hot bond adhesive film is used, deburr each side of assembly.



NOTES

- 1. MECHANICAL AND CORROSION DAMAGE LIMITED TO SHADED AREAS OF ABOVE FIGURE. MAXIMUM DEPTH AFTER CLEAN-UP SHALL NOT EXCEED 10 PERCENT OF MATERIAL THICKNESS.
- 2. INSPECT ATTACH HOLES FOR WEAR.

TAIL BOOM P.N.	FITTING LOCATION	(NEW PART)		WEAR LIMIT
		MIN	MAX	
204-030-800-469	LL LR UR	0.376	0.381	0.391
	UL	0.439	0.444	0.454
204-030-800-491	LL LR UR	0.376	0.381	0.391
	UL	0.439	0.444	0.454
204-032-800-71	LL LR	0.376	0.381	0.391
	UL UR	0.501	0.506	0.516
204-030-800-15	ALL	0.501	0.506	0.516

Figure 3-49. "J" Stringers, Idler Support and Tailboom Attachment Fittings (Sheet 3 of 3)



## INSPECT FOR:

BULKHEAD - CORROSION, DENTS, CRACKS, HOLES,  
NICKS AND WRINKLES

SHELF - CRACKS, TEARS, HOLES AND DISTORTION

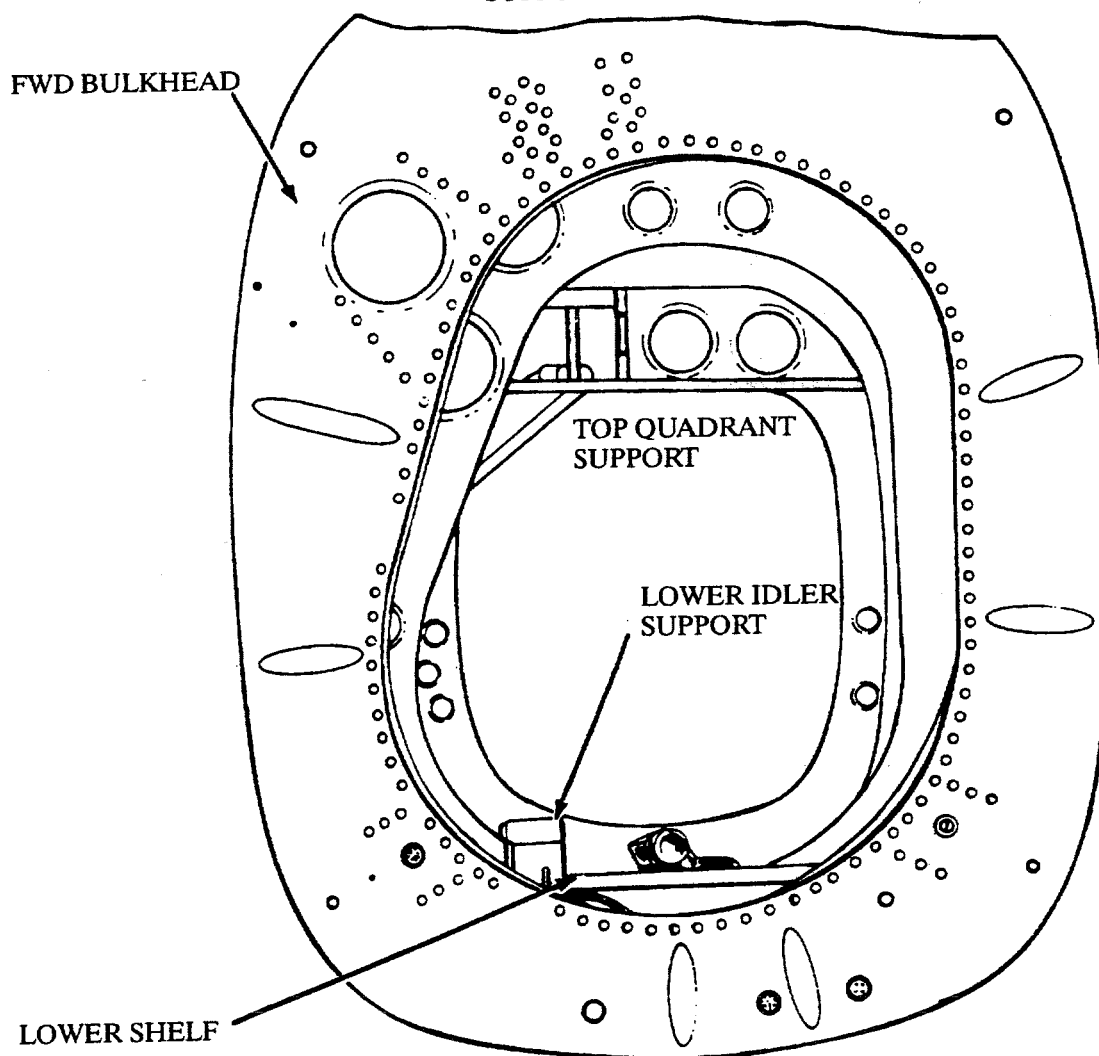
SUPPORTS - CRACKS, TEARS AND DISTORTION

## LIMITS:

BULKHEAD - REFERENCE FIGURE 3-11.

SHELF - REPAIR IF PRACTICAL FROM STANDPOINT  
OF ACCESSIBILITY AND TIME REQUIRED TO  
ACCOMPLISH REPAIR.

SUPPORTS - REFERENCE FIGURE 3-11.



## REPAIRS:

BULKHEAD - REFERENCE PARAGRAPH 4-32/4-33

SHELF - REFERENCE TM 55-1500-204-25/1

SUPPORTS - REFERENCE TM 55-1500-204-25/1

Figure 3-50. FORWARD BULKHEAD, LOWER SHELF LOWER IDLER SUPPORT  
AND TOP QUADRANT SUPPORT

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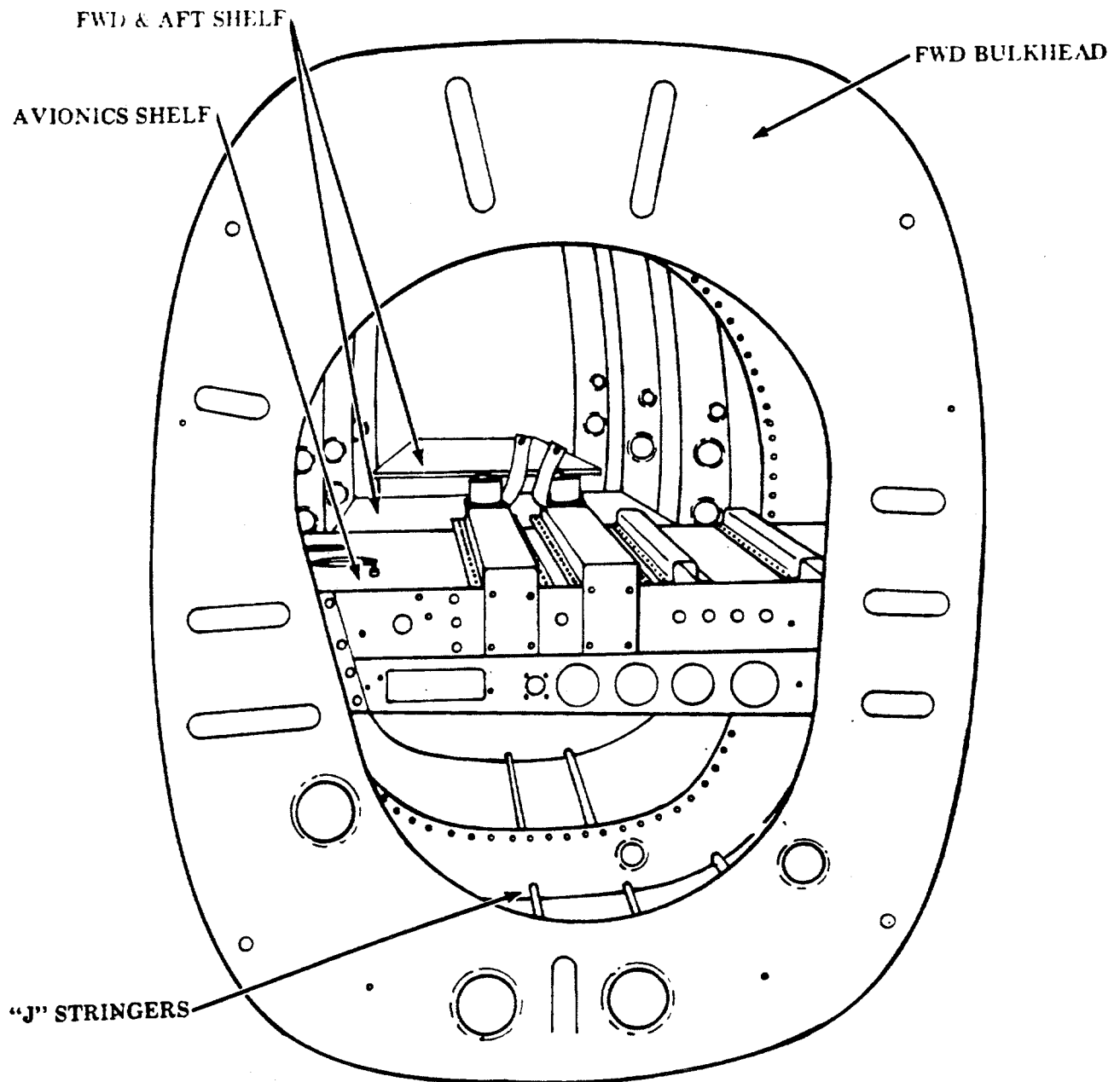
CHQSOFTWARE.COM

**INSPECT FOR:**

**BULKHEAD - CORROSION, DENTS, CRACKS, HOLES  
NICKS AND WRINKLES**

**SHELVES - CRACKS, HOLES, TEARS & DISTORTION**

**STRINGER - DENTS, HOLES, CRACKS, TEARS,  
CORROSION AND DISTORTION**



**REPAIR:**

**BULKHEAD - REFERENCE PARA 4-32/4-33  
SHELVES - REFERENCE TM 55-1500-204-25/1  
STRINGER - REFERENCE PARAGRAPH 4-47**

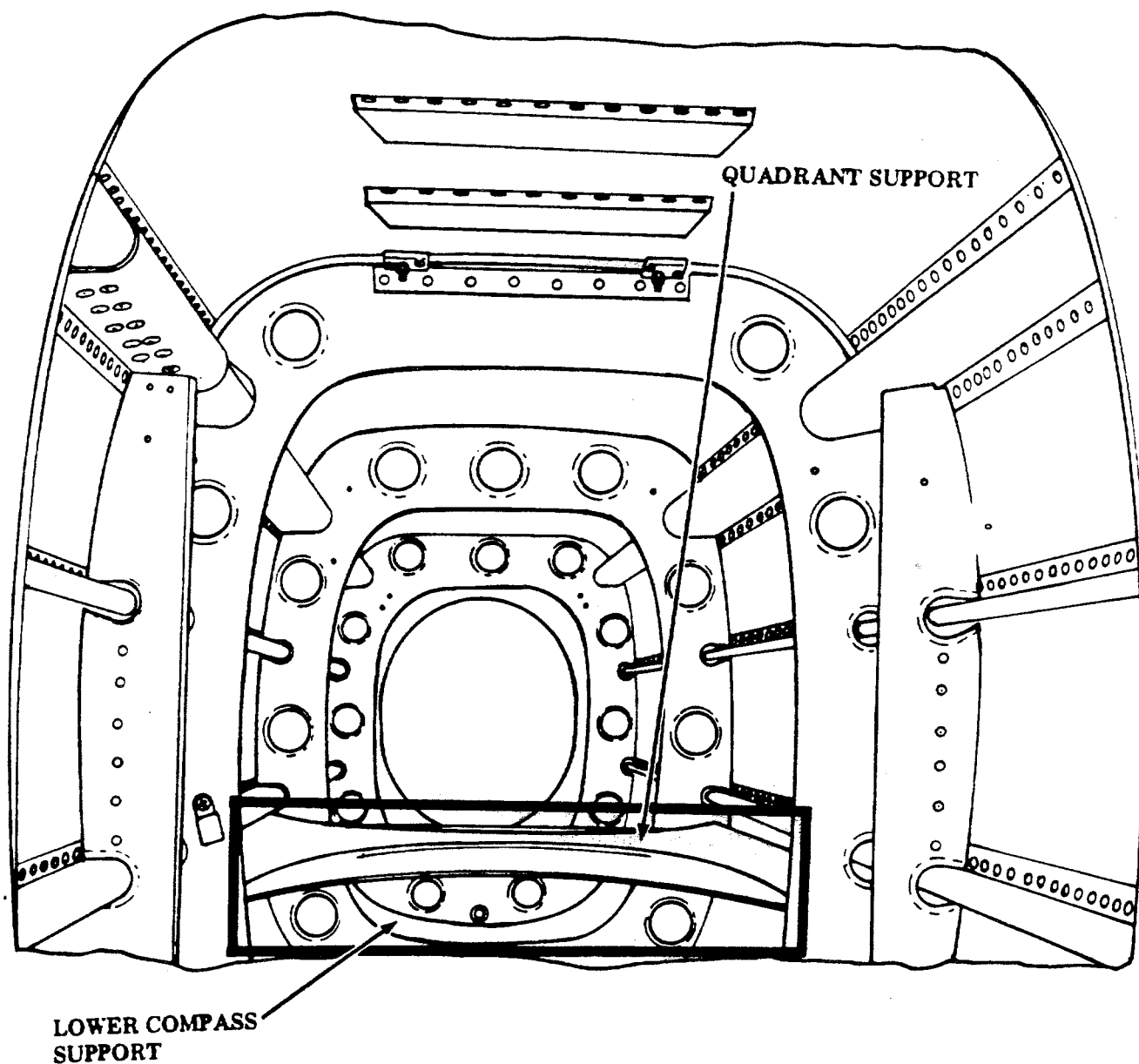
**LIMITS:**

**BULKHEAD - REFERENCE FIGURE 3-11  
SHELVES - REPAIR IF PRACTICAL FROM  
STANDPOINT OF ACCESSIBILITY AND  
TIME REQUIRED TO ACCOMPLISH REPAIR.  
STRINGER - REFERENCE FIGURE 3-11**

**Figure 3-51. FWD BULKHEAD (AH-1G AND AH-1S (MOD)), AVIONICS SHELF, "J" STRINGER  
AND AFT SHELF (AH-1G ONLY)**

INSPECT FOR:  
CRACKS, TEARS, HOLES AND DISTORTION

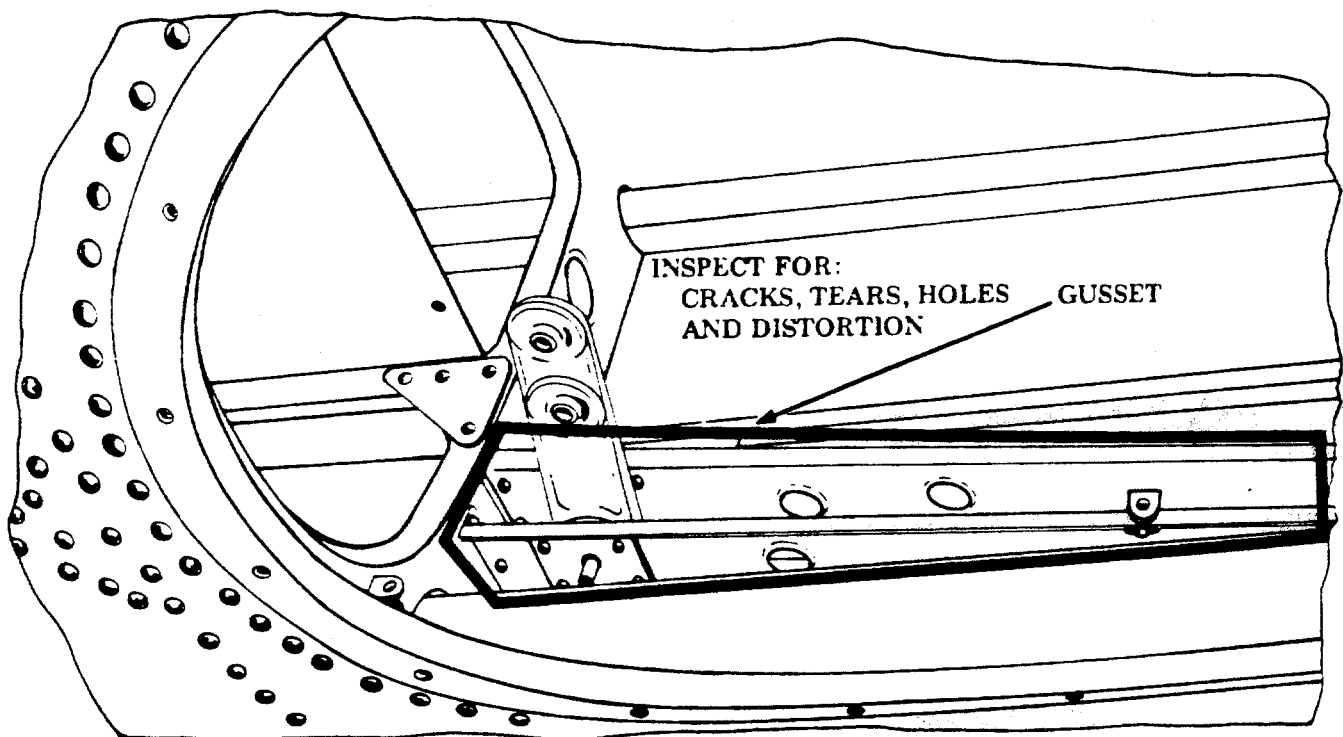
LIMITS:  
REPAIR IF PRACTICAL FROM A  
STANDPOINT OF ACCESSABILITY  
AND TIME REQUIRED TO ACCOMPLISH  
REPAIR.



REPAIR:  
REFERENCE TM 55-1500-204-25/1

Figure 3-52. LOWER COMPASS SUPPORT AND QUADRANT SUPPORT (AH-1G AND  
AH-1S (MOD))

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**LIMITS:**  
**REPLACE IF DAMAGE IS EXTENSIVE**  
**AND IMPRACTICAL TO REPAIR.**

**REPAIR:**  
**REFERENCE PARAGRAPH 4-33 (RIB REPAIR)**

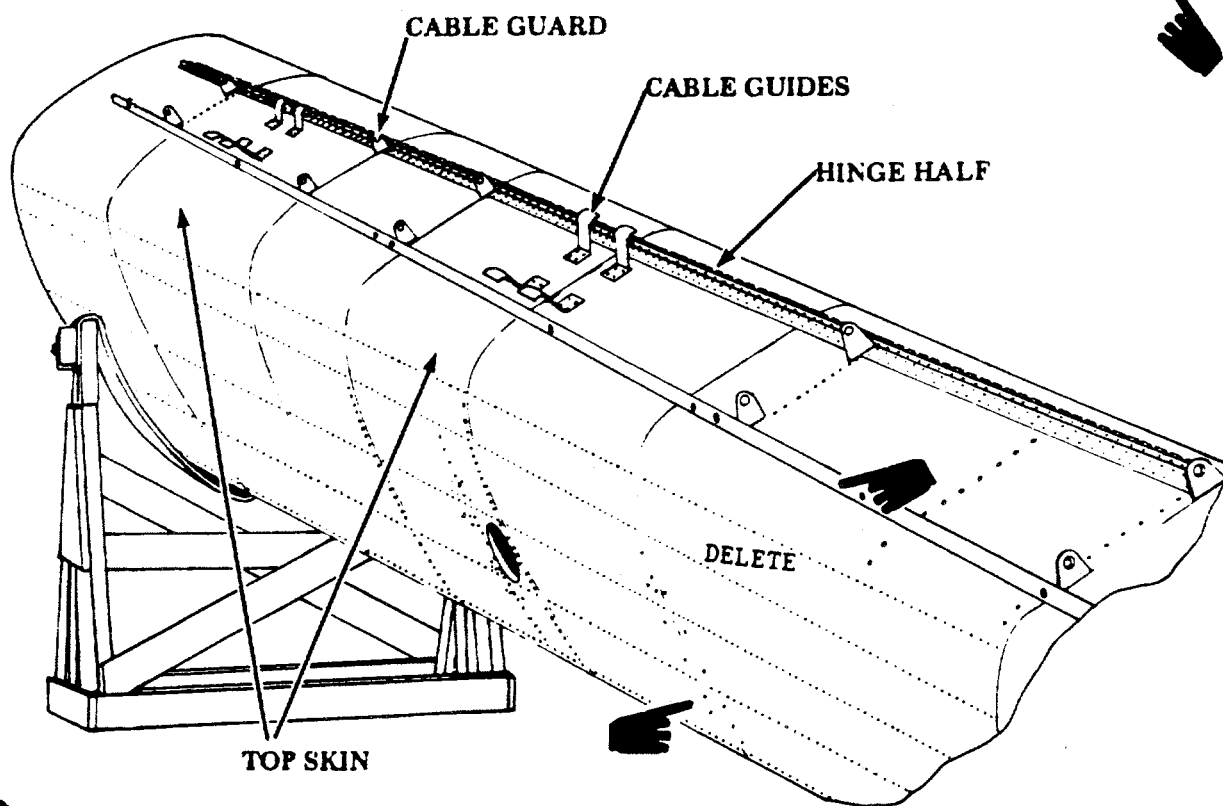
**Figure 3-53. GUSSET, R/H (AH-1G AND AH-1S (MOD))**

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LIMITS:

SKIN-REFERENCE FIGURE 3-16  
HINGE HALF-HINGE DAMAGE AREA  
MAY BE REMOVED AND A 6 INCH  
MINIMUM LENGTH OF NEW HINGE  
INSERTED.

GUARDS & GUIDES - NO REPAIR-REPLACE  
HOLE SIZE: 0.337-0.447



INSPECT FOR:

SKIN-DENTS, CRACKS, HOLES, TEARS,  
NICKS, SCRATCHES, CORROSION,  
WRINKLES, TRAPPED OR STRETCHED  
SKIN

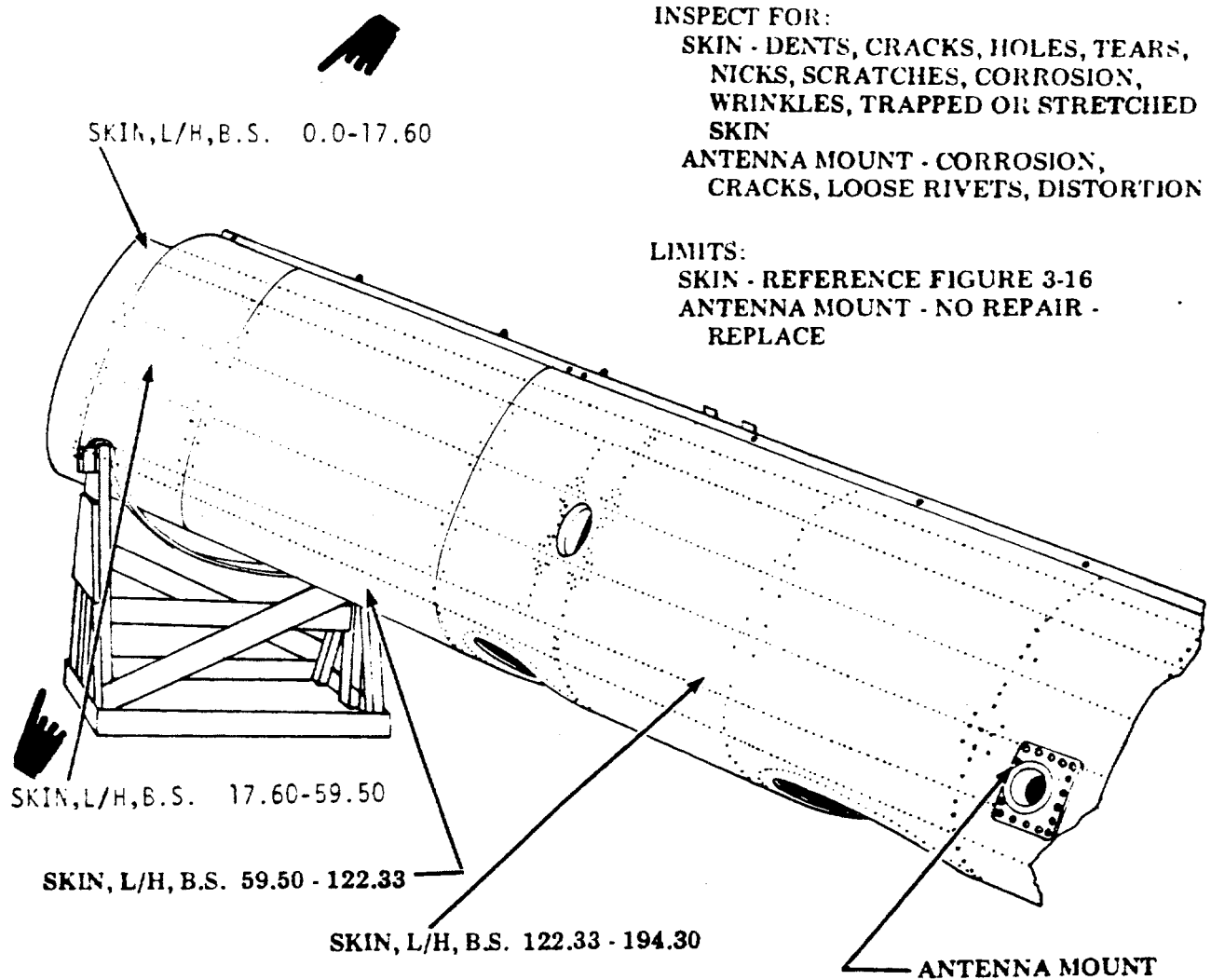
HINGE HALF-CRACKS, WORN OR  
MISSING LOOPS, FASTENERS  
GUARDS & GUIDES-CRACKED,  
CORROSION, DISTORTED, ELONGATION

REPAIR:

SKIN-REFERENCE PARAGRAPH 4-7  
HINGE-REFERENCE PARAGRAPH 4-36  
GUARDS & GUIDES - NO REPAIR - REPLACE  
REFER TO FIGURE 3-1

Figure 3-54. TOP SKIN, ANGLE, HINGE HALF, CABLE GUARD, CABLE GUIDES

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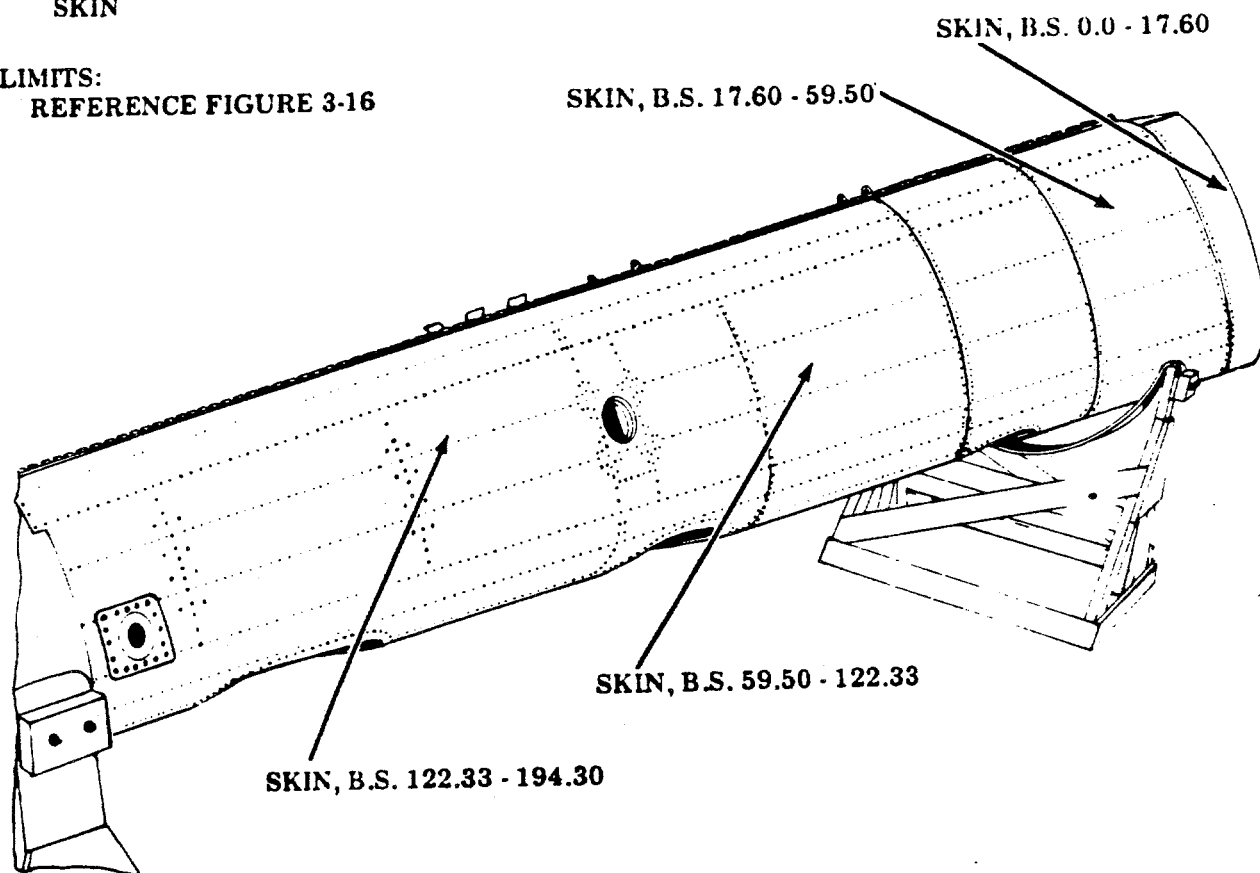
**REPAIR:**  
 SKIN - REFERENCE PARAGRAPH 4-7  
 ANTENNA MOUNT - NO REPAIR - REPLACE

Figure 3-55. LEFT HAND SKIN AND ANTENNA MOUNT

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INSPECT FOR:  
DENTS, CRACKS, HOLES, TEARS,  
NICKS, SCRATCHES, CORROSION,  
WRINKLES, TRAPPED OR STRETCHED  
SKIN

LIMITS:  
REFERENCE FIGURE 3-16



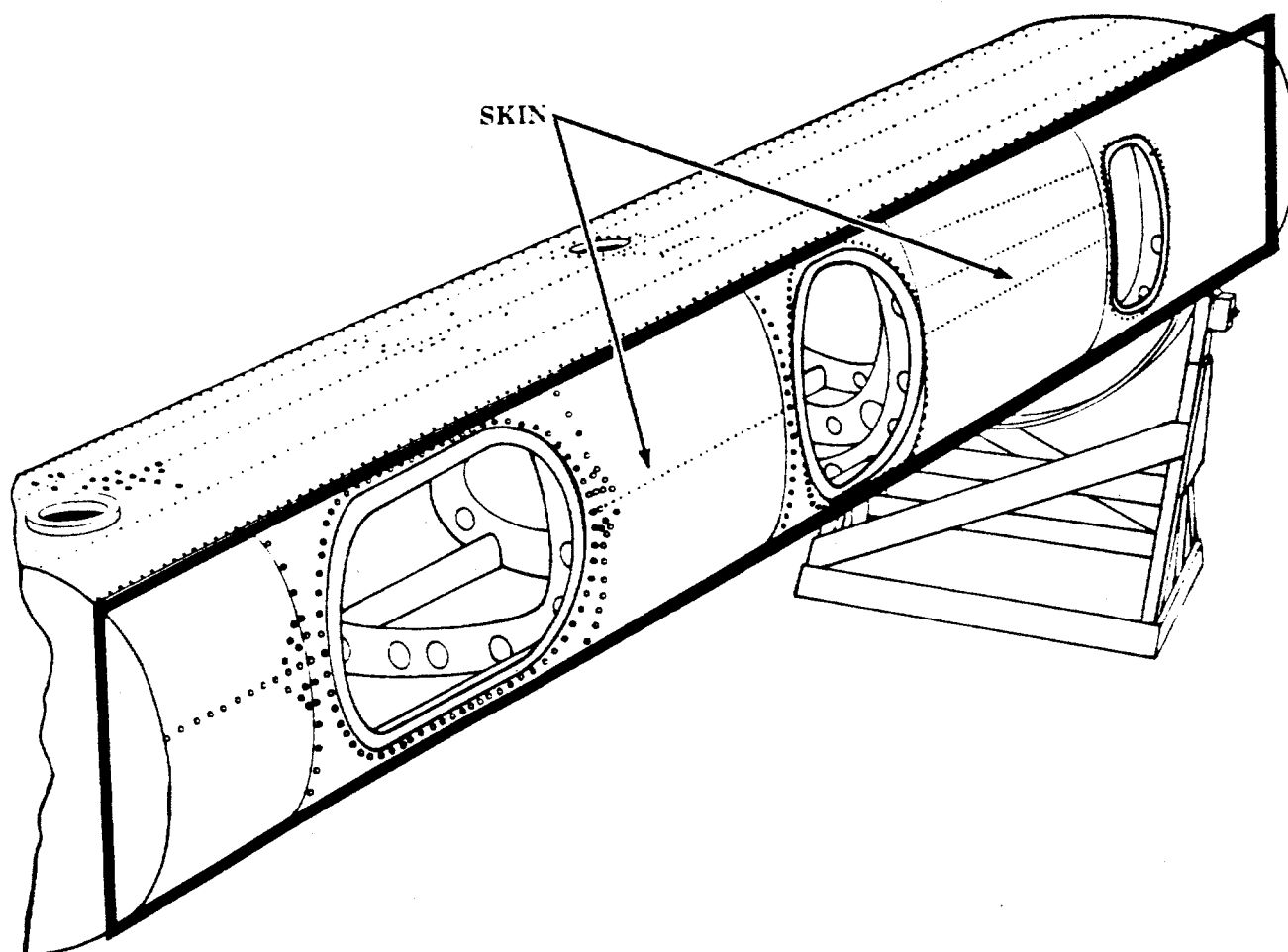
REPAIR:  
REFERENCE PARAGRAPH 4-7

Figure 3-56. R/H SKIN, B.S. 0.0 - B.S. 194.30



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INSPECT FOR:  
DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
TRAPPED OR STRETCHED SKIN



LIMITS:  
REFERENCE FIGURE 3-16

REPAIR:  
REFERENCE PARAGRAPH 4-7

Figure 3-57. BOTTOM SKIN, B.S. 0.0 - B.S. 194.30

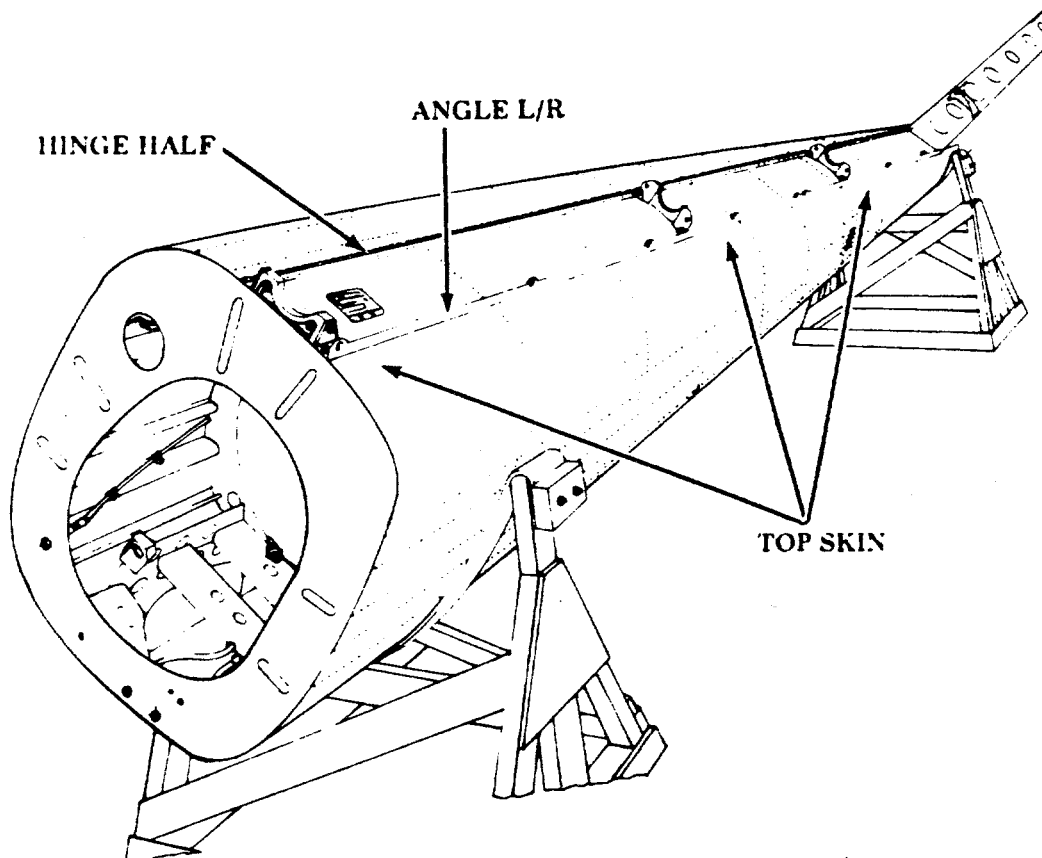
CHQSOFTWARE.COM

**INSPECT FOR:**

**SKIN - DENTS, CRACKS, HOLES, TEARS,  
NICKS, SCRATCHES, CORROSION,  
WRINKLES, STRETCHED OR TRAPPED  
SKIN**

**ANGLE - CRACKS, HOLES, DISTORTION**

**HINGE HALF - CRACKS, WORN OR  
MISSING LOOPS OR FASTENERS**



**LIMITS:**

**SKIN - REFERENCE FIGURE 3-16**

**ANGLE - REFERENCE FIGURE 3-11**

**HINGE HALF - HINGE DAMAGE AREA  
MAY BE REMOVED AND A 6 INCH  
MINIMUM LENGTH OF NEW HINGE  
INSERTED**

**REPAIR:**

**SKIN - REFERENCE PARAGRAPH 4-7**

**ANGLE - NO REPAIR - REPLACE**

**HINGE HALF - REFERENCE PARAGRAPH 4-36**

**Figure 3-58. TOP SKIN, ANGLE L/R, HINGE HALF**

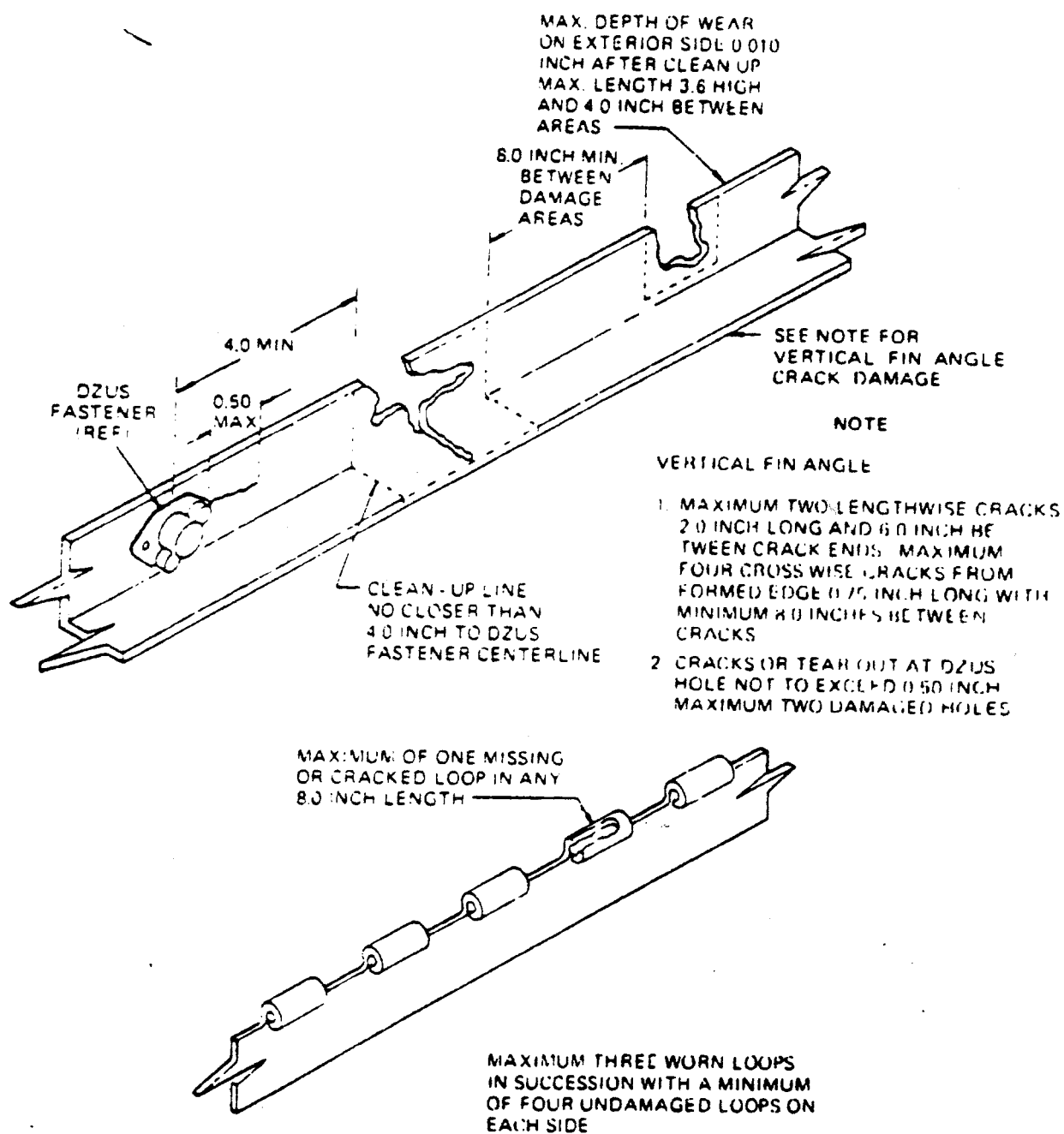


Figure 3-58A Drive Shaft Cover Hinges and Angles Damage Limits

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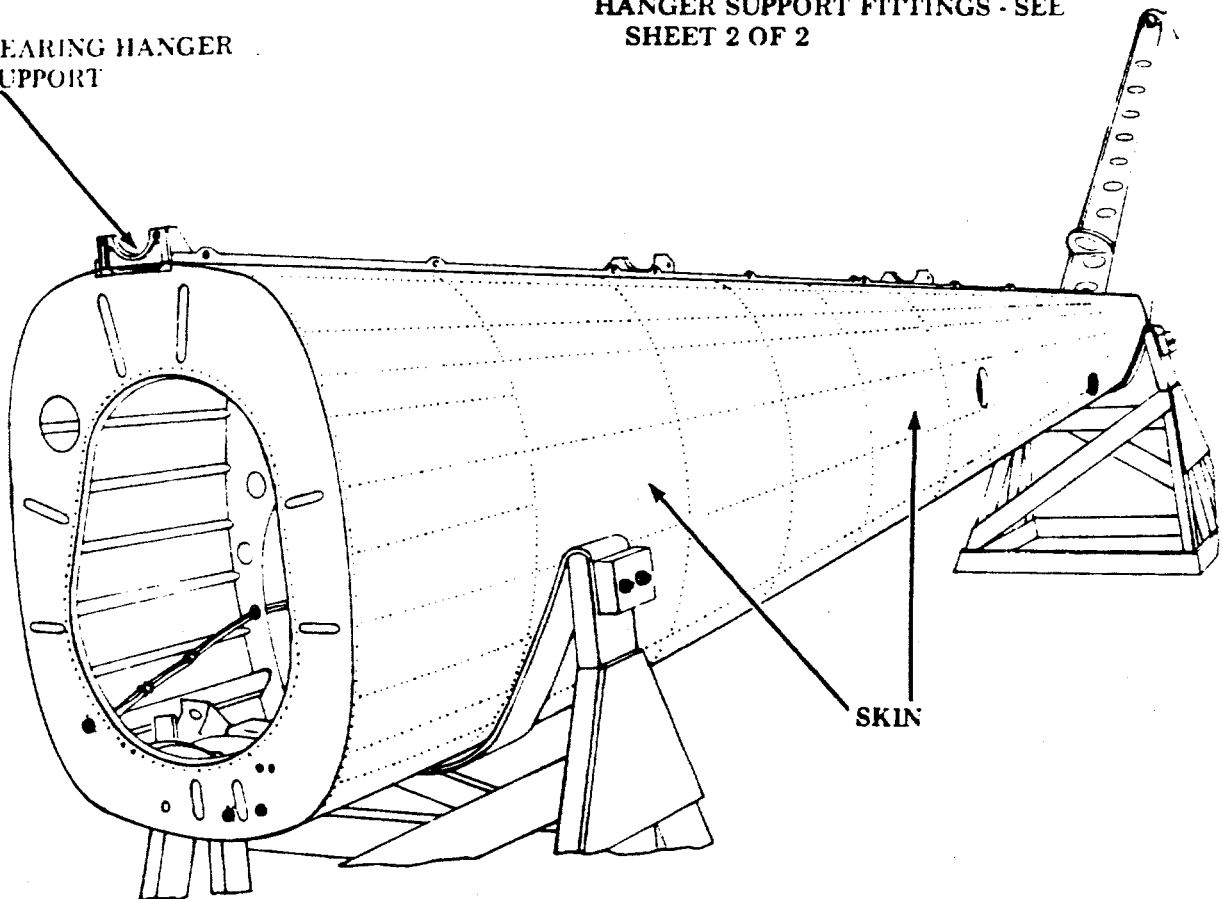
**INSPECT FOR:**

SKIN - DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
TRAPPED OR STRETCHED SKIN  
HANGER SUPPORT FITTINGS - SEE SHEET  
2 OF 2

**LIMITS:**

SKIN - REFERENCE FIGURE 3-16  
HANGER SUPPORT FITTINGS - SEE  
SHEET 2 OF 2

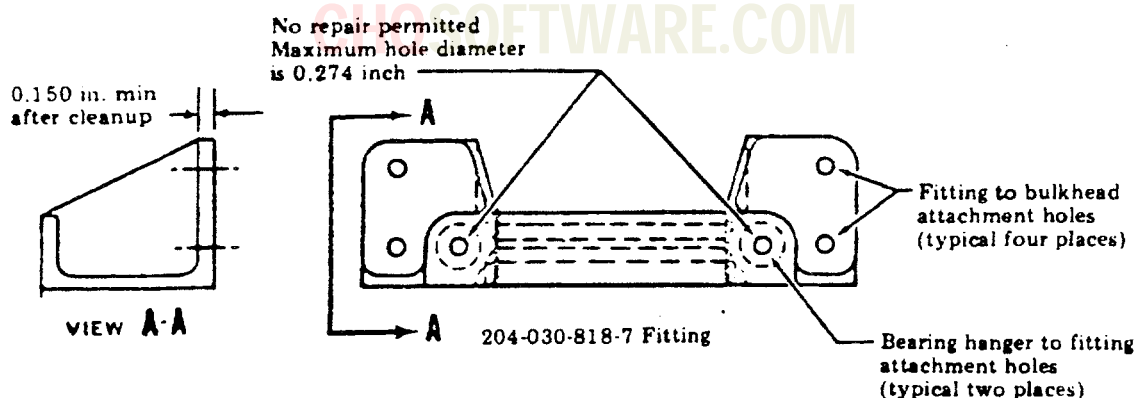
BEARING HANGER  
SUPPORT



**REPAIR:**

SKIN - REFERENCE PARAGRAPH 4-7  
HANGER BEARING SUPPORT FITTINGS  
REFERENCE PARAGRAPH 4-65

**Figure 3-59. SKIN L/H AND BEARING HANGER SUPPORT FITTINGS (SHEET 1 OF 2)**



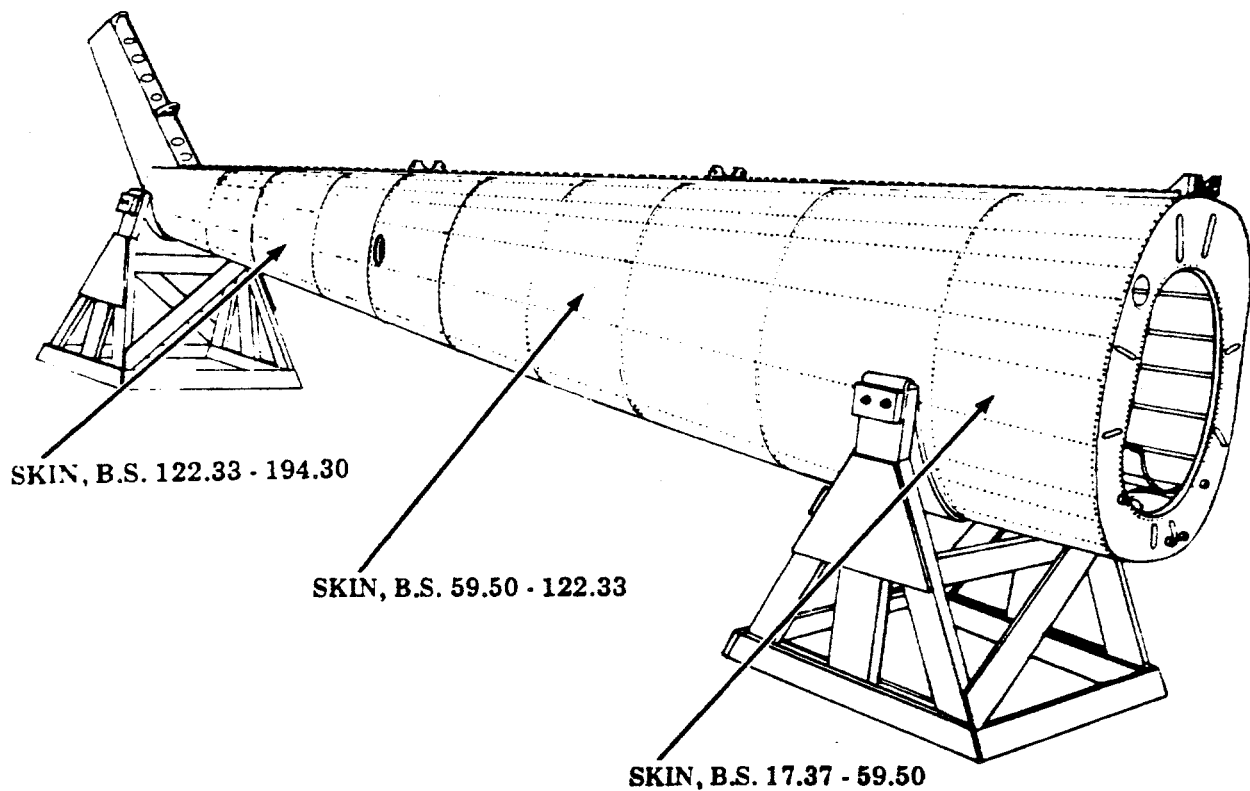
DEFECT	NEGLIGIBLE DAMAGE	REPAIRABLE DAMAGE	DAMAGE REQUIRING REPLACEMENT
1. Scratches, Nicks, Dents and Corrosion on Hole Surfaces.	Maximum depth of 0.01 inch and total discrepant area of 40% after cleanup	Maximum of one bulkhead attach hole exceeding negligible limits.	Two or more bulkhead attach holes and either bearing hanger attach hole exceeds negligible damage limits.
2. Wear or Elonga- tion in Fitting to Bulkhead Attach Holes.	Maximum elongation not to exceed 0.198 inch for three holes and 0.212 for one hole.		Damage exceeding negligible.
3. Wear or Elonga- tion in Hanger to Fitting Attach Holes.	Maximum diameter of 0.274 inch for one or both holes.	None.	Either hole diameter exceeds 0.274 inch.
4. Corrosion Around Fitting to Bulk- head Attach Holes.		A maximum 11/16 inch spot-face with 0.06 inch radius may be used, pro- viding spot-face clears forging. Minimum wall thickness after cleanup is 0.150 inch. (See View A.)	Damage exceeding repairable limits.

Figure 3-59. SKIN L/H AND BEARING HANGER SUPPORT FITTINGS (SHEET 2 OF 2)

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**INSPECT FOR:**  
DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
TRAPPED OR STRETCHED SKIN

**LIMITS:**  
REFERENCE FIGURE 3-16



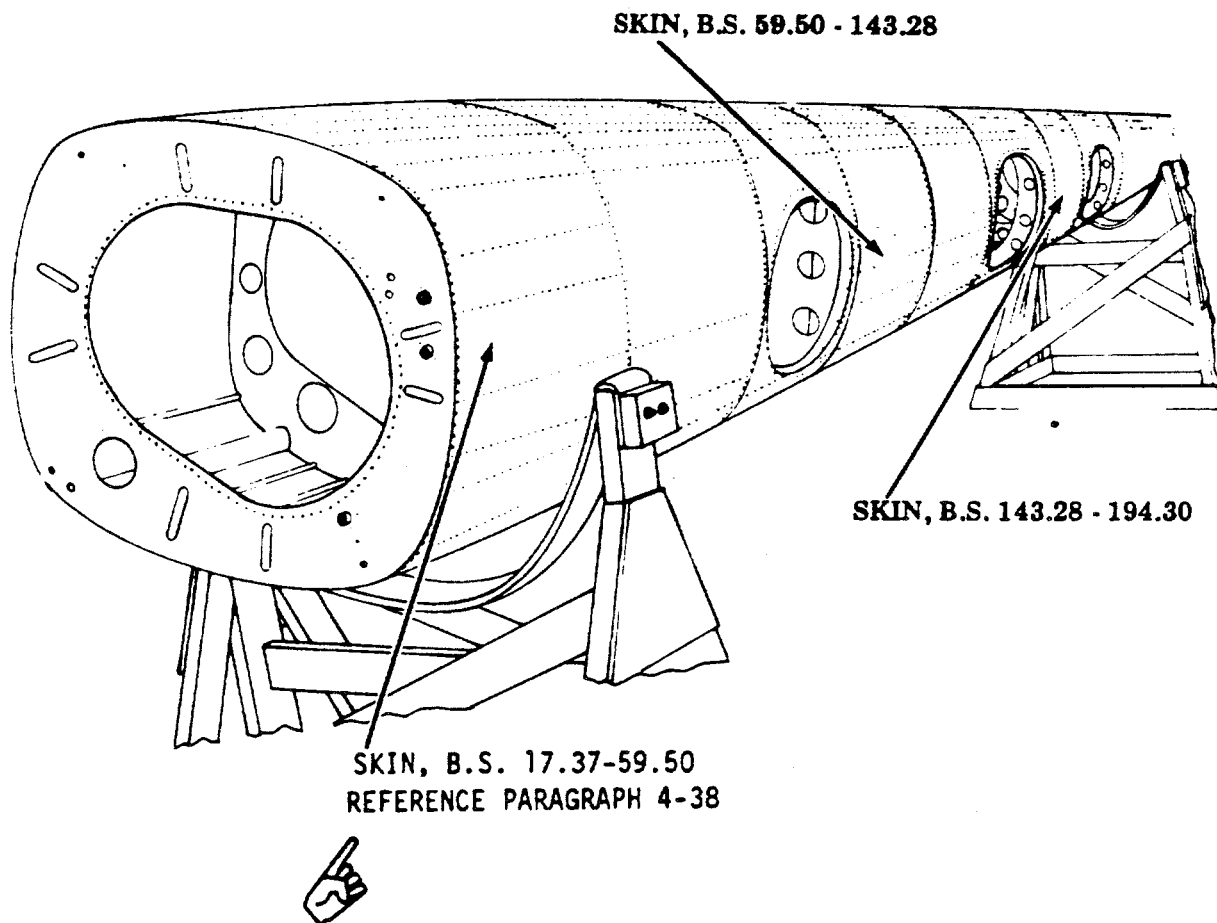
**REPAIR:**  
REFERENCE PARAGRAPH 4-7

**Figure 3-60. SKIN R/H**

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**INSPECT FOR:**  
DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
STRETCHED OR TRAPPED SKIN

**LIMITS:**  
REFERENCE FIGURE 3-16



**REPAIR:**  
REFERENCE PARAGRAPH 4-7

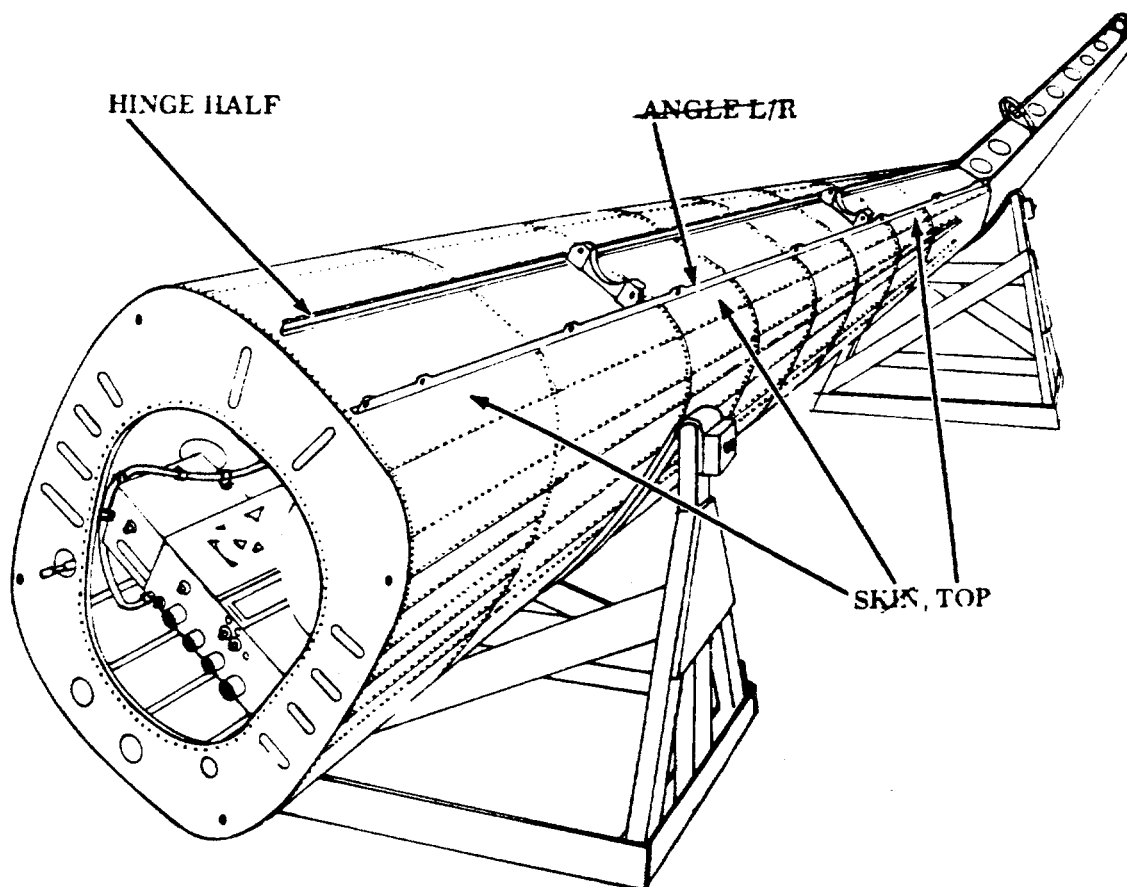
**Figure 3-61. SKIN, BOTTOM B.S. 17.37 - B.S. 194.30**



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**INSPECT FOR:**

SKIN - DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
TRAPPED OR STRETCHED SKIN  
ANGLE - CRACKS, HOLES, DISTORTION  
HALF HINGE - CRACKS, WORN OR MISSING  
LOOPS OR FASTENERS



**LIMITS:**

SKIN - REFERENCE FIGURE 3-16  
ANGLE - REFERENCE PARAGRAPH 4-35  
HALF HINGE - HINGE DAMAGE MAY BE  
REMOVED AND A 6 INCH MINIMUM  
LENGTH OF NEW HINGE INSERTED

**REPAIR:**

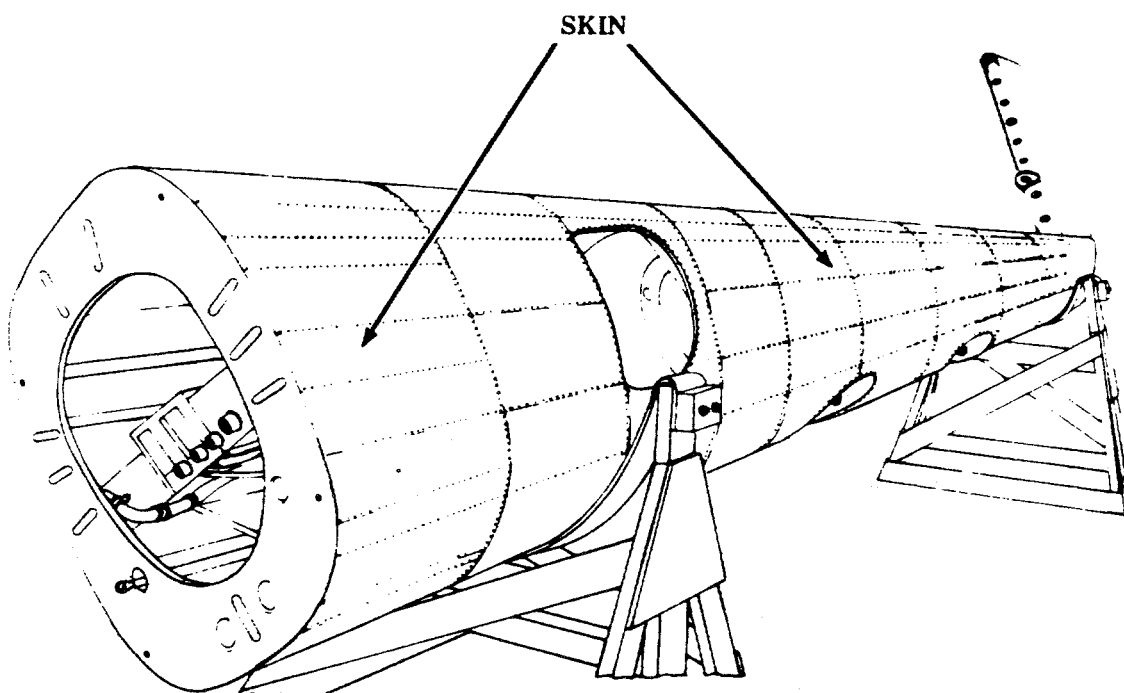
SKIN - REFERENCE PARAGRAPH 4-7  
DELETE  
HALF HINGE - REFERENCE PARAGRAPH 4-36

**Figure 3-62. SKIN, TOP, ANGLE L/R AND HINGE HALF**

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**INSPECT FOR:**

**DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
TRAPPED OR STRETCHED SKIN**



**LIMITS:**

**REFERENCE FIGURE 3-16**

**REPAIR:**

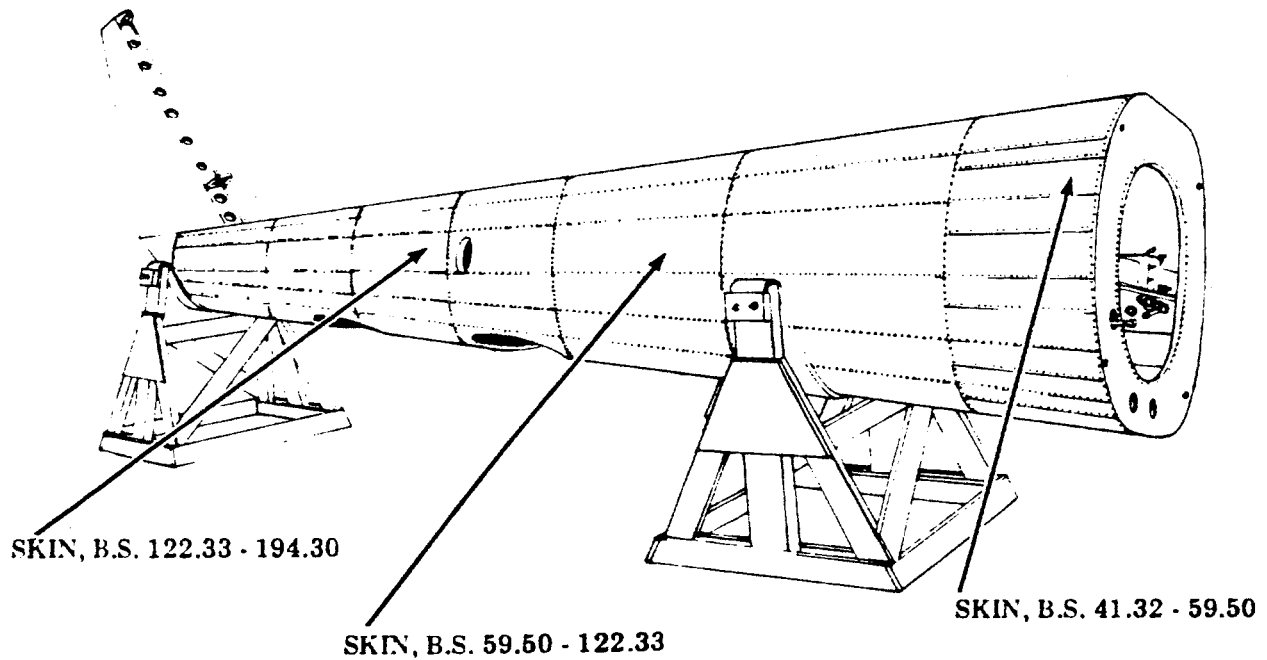
**REFERENCE PARAGRAPH 4-7**

**Figure 3-63. SKIN, L/H, B.S. 41.32 - B.S. 194.30**

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**INSPECT FOR:**

**DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
TRAPPED OR STRETCHED SKIN**



**LIMITS:**

**REFERENCE FIGURE 3-16**

**REPAIR:**

**REFERENCE PARAGRAPH 4-7**

**Figure 3-64. SKIN, R/H, B.S. 41.32 - B.S. 194.30**

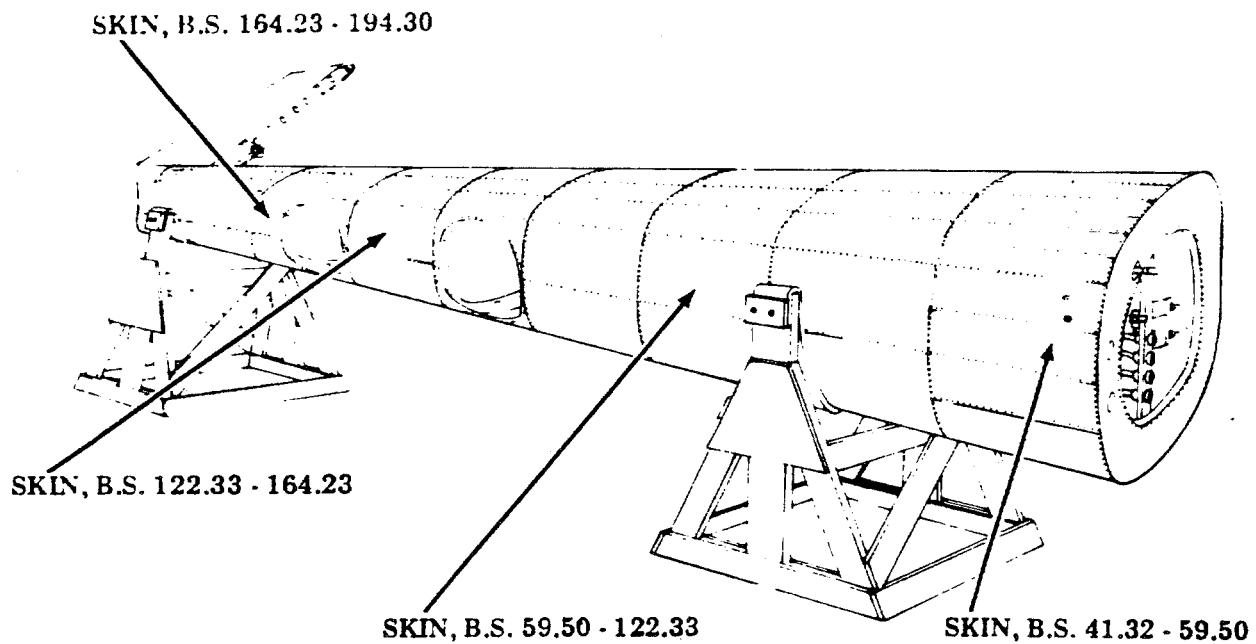
CHQSOFTWARE.COM

**INSPECT FOR:**

**DENTS, CRACKS, HOLES, TEARS, NICKS,  
SCRATCHES, CORROSION, WRINKLES,  
TRAPPED OR STRETCHED SKIN**

**LIMITS:**

**REFERENCE FIGURE 3-16**

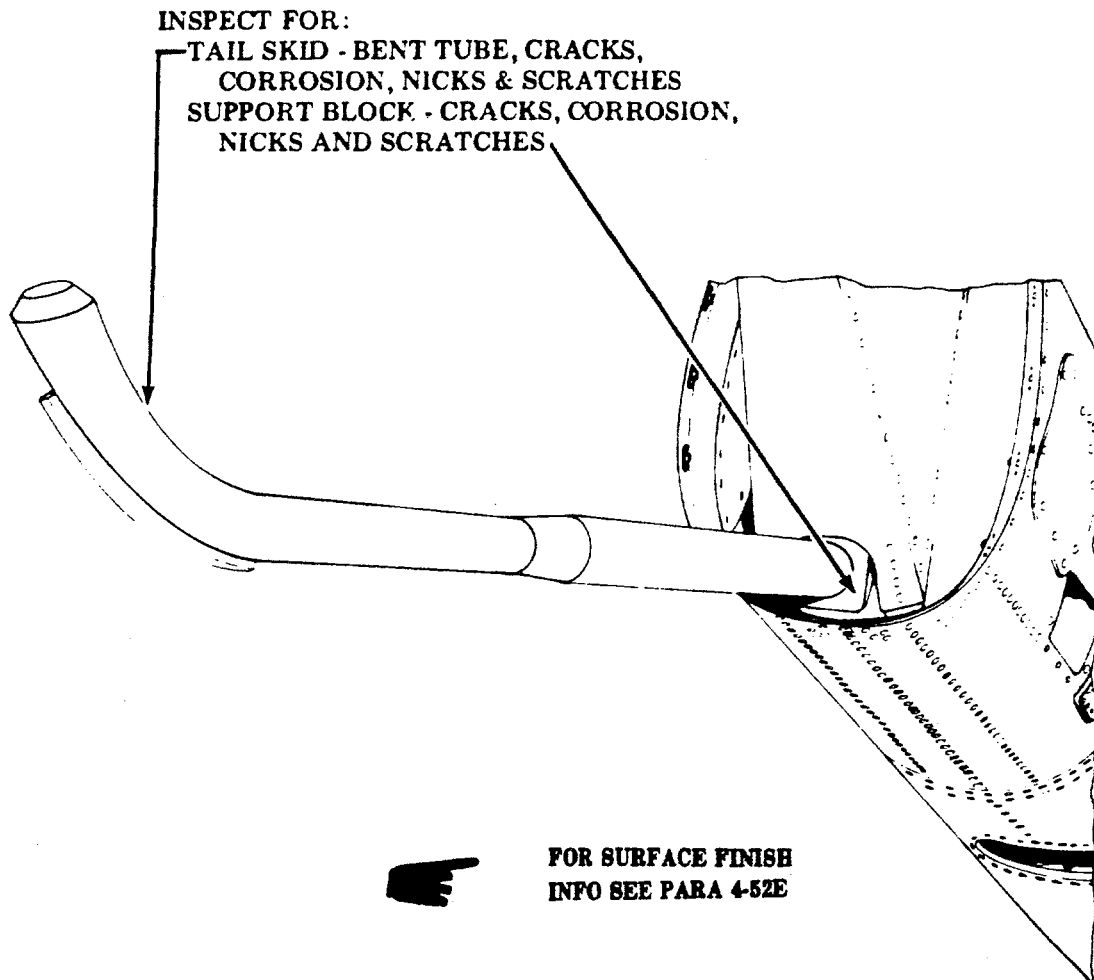


**REPAIR:**

**REFERENCE PARAGRAPH 4-7**

**Figure 3-65. SKIN, BOTTOM, B.S. 41.32 - B.S. 194.30**

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**LIMITS:**

TAIL SKID & SUPPORT BLOCK - SMOOTH CONTOURED DENTS, FREE OF NICKS OR NOTCHES. CORROSION NOT TO EXCEED 10% OF TUBE WALL THICKNESS AFTER CLEANUP. REPLACE BLOCK IF CRACKED OR CORRODED. REPLACE TUBE IF YIELDED IN EXCESS OF 8 DEGREES ABOUT CENTERLINE OR IF CRACKED.

**REPAIR:**

TAIL SKID - NO REPAIR - REPLACE  
SUPPORT BLOCK - NO REPAIR - REPLACE

**Figure 2-46. TAIL SKID AND SUPPORT BLOCK**

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## CHAPTER 4 MAINTENANCE

### Section I. GENERAL SHEETMETAL REPAIR

**4-1. General.** Use the preshop analysis (PSA) worksheets contained in Chapters 3, (page 3-12 through 3-23) to determine all items requiring repair. The PSA worksheet will specify necessary repair requirements and Chapter 4 defines the necessary repairs required to return the tailboom to a serviceable condition. All rework/repair shall be accomplished in accordance with information contained in Chapters 3, 4 and TM 1-1500-204-23 unless otherwise stated by this DMWR. Applicable engineering drawings shall be furnished for further clarification and configuration identification. If no repair instructions are available, contact the authorized engineering organization.

#### NOTE

All repairs and adjacent structure shall be primed with one coat of primer (item 1, table 2-2) prior to assembly.

#### NOTE

All 7075-T6 material requiring dimpling shall be "hot dimpled".

#### CAUTION

Rivets (P/N's MS20470D, MS 20426D, MS20470DD AND MS20426DD), commonly called "ICEBOX RIVETS", will be treated, refrigerated and driven in accordance with TM 55-408.

#### NOTE

DD type rivets may be stored or held for approximately two weeks in dry ice (item 63, table 2-2) or for 24 hours in ordinary ice.

#### 4-2. Substitutions.

a. *Cherry Bulb Rivets (NAS 1738 and NAS 1739) for MS20426AD or MS20470AD, MS20426B rivet.* This repair will be utilized when MS20426AD, MS20470AD, or MS20470B rivets have been omitted or must be replaced in a blind area. This repair shall not apply to MS20426DD, MS20470DD or hi-shear rivets. Drill hole to correct size for appropriate cherry bulb rivet. Deburr hole and install rivet.

b. *Aluminum Skin Panels for Magnesium Skin Panels (UH-1H).* When magnesium skin panels installed on UH-1H H model tailbooms require replacement, they will be replaced with skin panels fabricated from 2024-T3 aluminum alloy material of the same thickness as that of the skin panel removed, except for skin, lower center forward, P/N 205-031-801-61, which will be fabricated from .032 inch and skin, upper center forward, P/N 205-031-801-47, which will be fabricated from .025 inch. All replacement skins will be anodized and painted with aluminum a minimum of one cross coat of epoxy primer (MIL-P-23377) (item 21, table 2-2) on both surfaces.

c. The following is a list of skins by P/N, material and thickness to be used when replacing tailboom skins per DMWR 55-1560-222, paragraph 4-2b.

<u>NAME</u>	<u>P/N</u>	<u>MAT/COND</u>	<u>THICKNESS</u>
Extension-Top	205-031-801-47	2024-T3	.025
Extension-L/H Side	205-031-801-81	2024-T3	.025
Extension-R/H Side	205-031-801-82	2024-T3	.040
Extension-Bottom	205-031-801-61	2024-T3	.032
Top-Fwd B.S. 59-101	205-032-800-23	2024-T3	.025
Side-Fwd L/H B.S. 59-122	205-032-800-47	2024-T3	.025

<u>NAME</u>	<u>P/N</u>	<u>MAT/COND</u>	<u>THICKNESS</u>
Side-Fwd R/H B.S. 59-122	205-032-800-48	2024-T3	.040
Bottom-Fwd B.S. 59-143	205-032-800-49	2024-T3	.025
Top-Center B.S. 101	205-032-800-55	2024-T3	.032
Side-Center L/H B.S. 122-194	205-032-800-69	2024-T3	.032
Side-Center R/H B.S. 122-194	205-032-800-70	2024-T3	.032
Top-Center B.S. 122-194	205-032-800-53	2024-T3	.032
Fin Aft-L/H	205-030-899-3	2024-T3	.032
Fin Aft-R/H	205-030-899-5	2024-T3	.032
Fin Fwd-L/H	205-030-899-7	2024-T3	.025
Fin Fwd-R/H	205-030-899-9	2024-T3	.025

**CAUTION**

Dissimilar metal must be isolated IAW TM 1-1500-204-23.

*d. Substitution of 2024 Aluminum.* Substituting aluminum alloy 2024-T3, specification QQ-A-250/5F (item 108, table 2-2), for aluminum alloy 2024-0 and 2024-T42 used in fabricating flat non-formed detail parts is permissible. Small 2024 aluminum alloy sheet metal parts may be fabricated in the "O" condition and solution heat treated to the final condition of T42, per MIL-H-6088. These parts are not to be marginal on their structural application.

**NOTE**

Bolts in lieu of Hi-lock and Hi-shear fasteners shall not be substituted. Where bolts have been used on incoming booms they shall be replaced with the correct hardware.

**4-3. Repair Special Tooling Requirement.** During the repair of all tailbooms, the applicable major assembly fixture shall be utilized during the following circumstances (Table 2-1).

- a. Removal or loosening of any primary structures such as longerons, bulkheads, stringers, or fittings.
- b. Removal or loosening of any hard points.
- c. Removal or loosening of two or more skins at the same time.
- d. Removal or loosening of 42 degree gearbox fitting.
- e. Tailbooms known to have been involved in an accident, crash or hard landing.
- f. Any deterioration, wrinkling of skin, excessive buckling or other indications which would create doubt as to correct alignment.

**4-3A. Installation in Major Assembly Fixture.** Install the tailbooms in applicable major assembly fixture as follows:

- a. Prepare the tailboom by removing the 42 degree gearbox mounting shims.
- b. Remove the elevator bar from the fixture.
- c. If the tailboom to be installed in the tailboom fixture is in one piece or is cut in two forward of the 42 degree gearbox, remove the 0.050 inch shim from the fixture at the 90 degree gearbox mount. If it is cut in two aft of the 42 degree gearbox, 0.050 inch shim should be left in place on the fixture.
- d. Insert the tail boom into the fixture from the aft end of the fixture and push it through the adapters until the front tailboom mounting bulkhead is against the forward adapter assembly.
- e. With the tailboom in fixture, tighten all four forward attach bolts.
- f. Lift tailboom up to 42 degree fixture and check alignment of fixture holes to tailboom 42 degree gearbox mount holes. Maximum misalignment is 0.060 inches. A number 12 drill bit may be used as a go no-go gage.



g. Install 4 bolts in 42 degree gear mount to fixture if possible, and check misalignment between 90 degree gearbox casting and holes in surface plate of fixture. Only the three holes in the fixture which have been bushed for pin engagement are required to be aligned. Maximum misalignment not to exceed 0.200 inches. This can be checked by using a number 35 drill bit through the holes. Number 35 drill bit will suffice for a go no-go gage.

h. The elevator bar will be installed anytime the elevator box is being replaced or relocated, or any other structure connected with the location of the elevator box is being worked.

i. During skin replacement or major structure repair, which may cause the boom to bow, a 0.020 inch music wire shall be strung from the forward side of the 42 degree gearbox support through the fixture at the forward end and maintained tight. This wire should be used as a reference center line in relation to the drive shaft hangar bearing bracket holes.

j. On tail fins, when one honeycomb panel has been installed and the alignment of the 90 degree gearbox has been verified, the opposite panel may be temporarily installed using cleco fasteners. All the installation holes for the rivets in the panel must be drilled and be aligned with the original holes in the structure, clecos installed approximately every 6 to 8 inches and 90 degree gearbox within alignment limits. Tailboom may be removed from the fixture and panel installed. Under no circumstances shall a drill be used to enlarge the holes in the structure to attain alignment of the temporarily installed panel without the boom being rechecked for alignment.

#### NOTE

If the 0.050 inch shim has been removed from the fixture the 90 degree mounting surface may not fit flush with the assembly depending on how much the tailboom has grown through usage.

#### 4-3B. Fixture Alignment

Fixture alignment is not required during the following specific conditions.

- a. The removal of a single fin panel will not necessitate the tailboom being placed in the fixture for alignment check.
- b. Installation of new 90 degree gearbox support will not necessitate an alignment check.
- c. Alignment will not be required when work on the fin assembly has been accomplished, provided the spar assemblies have not been loosened on both sides at any one time.
- d. Installation of one or both fin panels may be accomplished without necessitating a fixture alignment providing only one panel at a time is removed and upon installation of the original or new panel, the structure of the fin assembly does not require rivet holes to be enlarged or elongated.

**4-4. Requirements for Rivet Edge Distance (fig. 4-1).** The minimum edge distances applicable to the material thickness are listed in figure 4-1. Fractional distances are taken to the nearest 1/32 inch. Edge distance is defined as the measured distance from the center of the hole (or rivet) to the edge of the sheet. The edge distance specified above may be used for 2024T, 2017T clad and 7075T. Values contained in figure 4-1 are to be used for standard repairs and for standard acceptance where there are no conflicts with engineering drawings as to minimums.

- a. Edge distance is equal to  $2 \times "D"$  (diameter of rivet).
- b. Determine proper rivet size by the thickness of the material. The size equals  $3 \times$  the thickness of the material rounded to nearest 1/32 inch rivet diameter.
- c. Single row rivet spacing is equal to  $4 \times "D"$  (diameter of rivet) minimum.
- d. Double row rivet spacing is equal to  $4 \times "D"$  (diameter of rivet) and should equal "S" in figure 4-2.

MATERIAL GAGE (IN.)	DECIMALS						FRACTIONS					
	MINIMUM EDGE DISTANCE						MINIMUM EDGE DISTANCE					
	AD-2 1/16	AD-3 3/32	AD-4 1/8	AD-5 5/32	AD-6 3/16	AD-8 1/4	AD-2 1/16	AD-3 3/32	AD-4 1/8	AD-5 5/32	AD-6 3/16	AD-8 1/4
.016	.125						1/8					
.020	.125	.20					1/8	7/32				
.025	.125	.23 .20	.26				1/8	7/32	9/32			
.032	.094	.23 .19	.26	.32			3/32	3/16	9/32	11/32		
.040	.094	.19 .18	.27 .24	.32 .30	.38 .37		3/32	3/16	1/4	5/16	3/8	
.051	.094	.18	.24 .23	.32 .29	.38 .34		3/32	3/16	1/4	5/16	11/32	17/32
.064	.094	.18	.23 .20	.29 .26	.35 .32	.51 .48	3/32	3/16	7/32	9/32	11/32	1/2
.072	.094	.18	.20	.27 .24	.34 .30	.51 .45	3/32	3/16	7/32	1/4	5/16	15/32
.081	.094	.18	.20	.26 .24	.32 .30	.48 .43	3/32	3/16	7/32	1/4	5/16	7/16
.091	.094	.18	.20	.26 .24	.32 .30	.45 .38	3/32	3/16	7/32	1/4	5/16	3/8

FIGURE 4-1. RIVET EDGE DISTANCE REQUIREMENTS

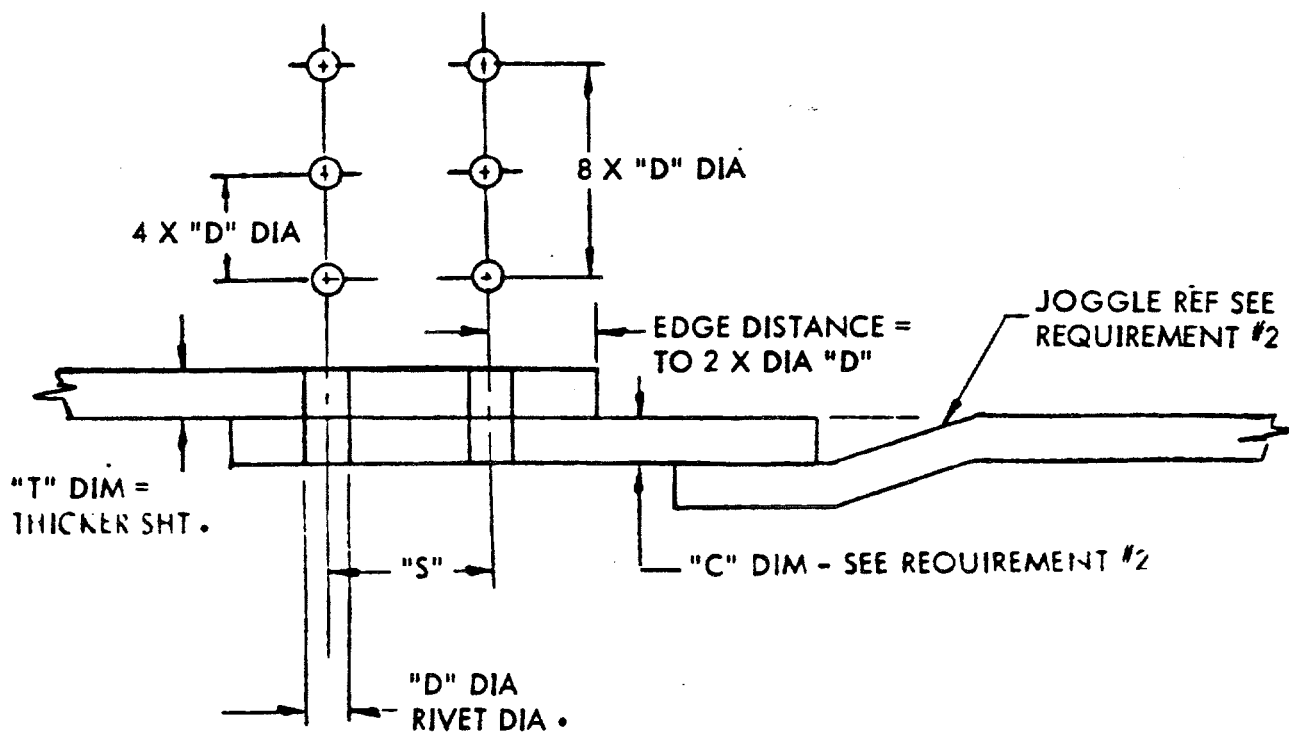


FIGURE 4-2. RIVET SPACING AND EDGE DISTANCE

e. Material gauge shall be one gauge higher than discrepant detail where no original rivets are to be used in repair. Material gauge shall be of like thickness where original pattern is to be used.

#### NOTE

Text deleted.

**4-6. Repair of Holes with Short Edge Distance or Tear-Out** (refer figures 4-8 and 4-9). Repair is limited to no more than 50% or five (5) consecutive holes. Minimum spacing is 3 x "C" diameter with the same limitations.

**4-7. Skin Patch Repairs** (fig. 4-4).

#### NOTE

Overlap patches, commonly referred to as scab patches, are acceptable provided they meet the following criteria:

- (1) Are in accordance with TM 55-1500-204-25/1.
- (2) The number of these patches does not exceed two per any one bay and not more than a total of eight for the complete tailboom.

a. The skin patch shown in figure 4-4 is for small holes in exterior surface sheet and for damaged details where edge of damage is located a minimum of 2 x the diameter from adjacent structure.

b. Use smallest 100 degree CTSK head rivet that will plug hole and machine CTSK or dimple sheet to accommodate rivet. The hole diameter is limited to 3/16 inch. Where hole diameter exceeds 3/16 inch diameter repair per paragraph 4-16.

c. For holes surrounded by universal head (MS20470) rivet pattern use a like rivet to fill the hole in lieu of (MS20426).

d. Patches must be sealed with EA934 NA and workmanship must be of good quality.

#### NOTE

Text deleted.

**4-8. Repair of Open Holes** (fig. 4-5).

a. Use the repair described in figure 4-5 for open loft holes in details where holes are mislocated and are a minimum of 1.5 inch diameter from drawing pattern. This repair is limited to 50% of pattern or five (5) consecutive holes, whichever is greater.

b. For lot parts or details in fabrication, strip any organic finishes and prepare for spotweld. Install 3/32 inch diameter plug of like material and thickness by spotwelding per MIL-W-6858C. Relocate 3/32 inch diameter hole as required. Finish as required for stock.

c. For details having above condition during assembly, plug 3/32 inch diameter hole using 3/32 inch diameter soft rivet wire, double flush required.

#### NOTE

3/32 inch diameter holes which are mislocated a minimum of three diameters, and which do not interfere with drawing installation, and are located on inside structure, may be left open. In lieu of spotwelding, a double flush plug may be used utilizing the same material. Or prepare for a double flush plug and fill with adhesive, (item 16, table 2-2).

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FIGURE 4-3. HOLES WITH SHORT DISTANCE OR TEAR-OUT

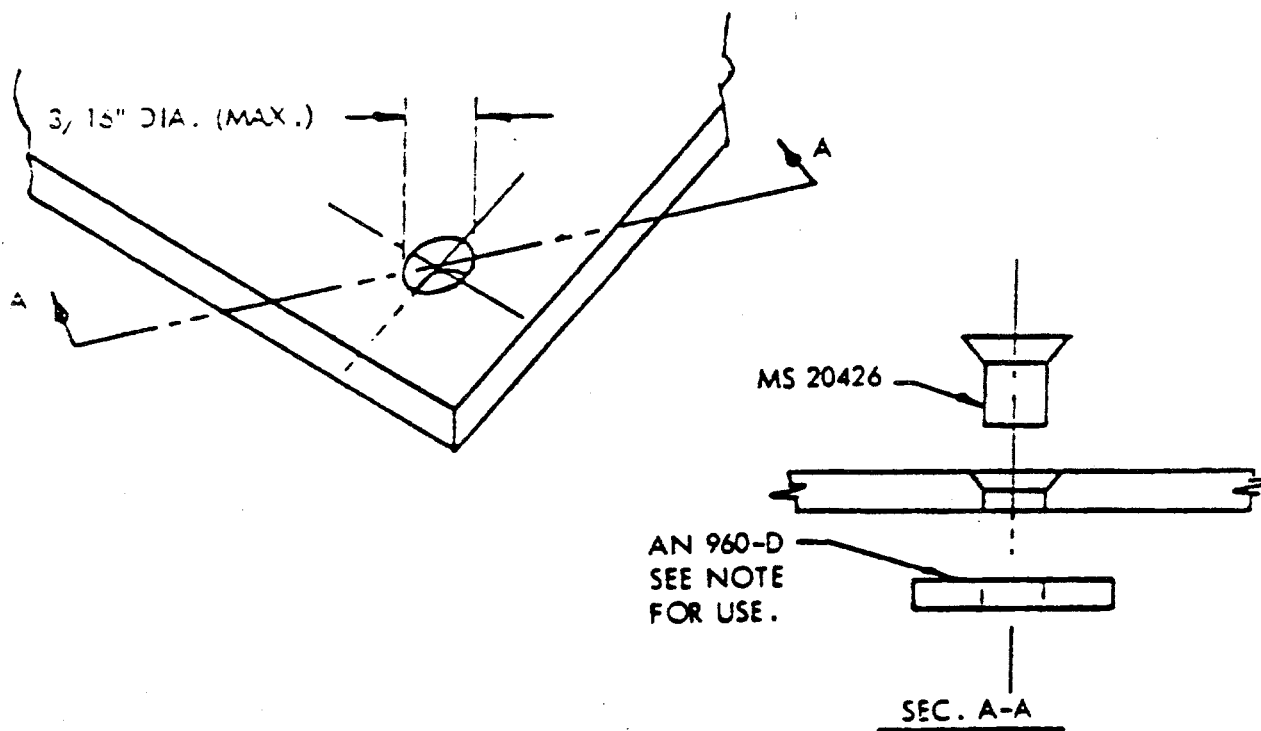


FIGURE 4-4. SKIN PATCH

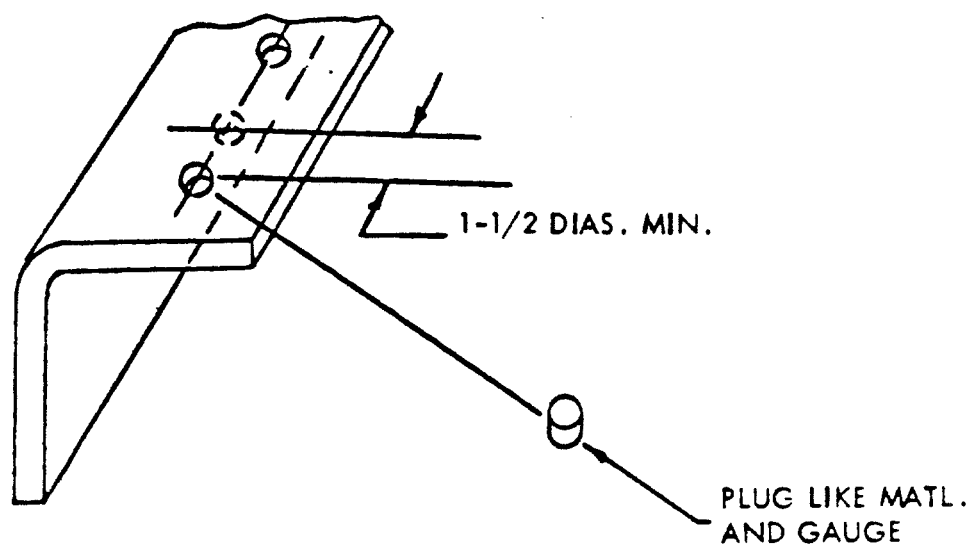


FIGURE 4-5. OPEN HOLES IN DETAIL

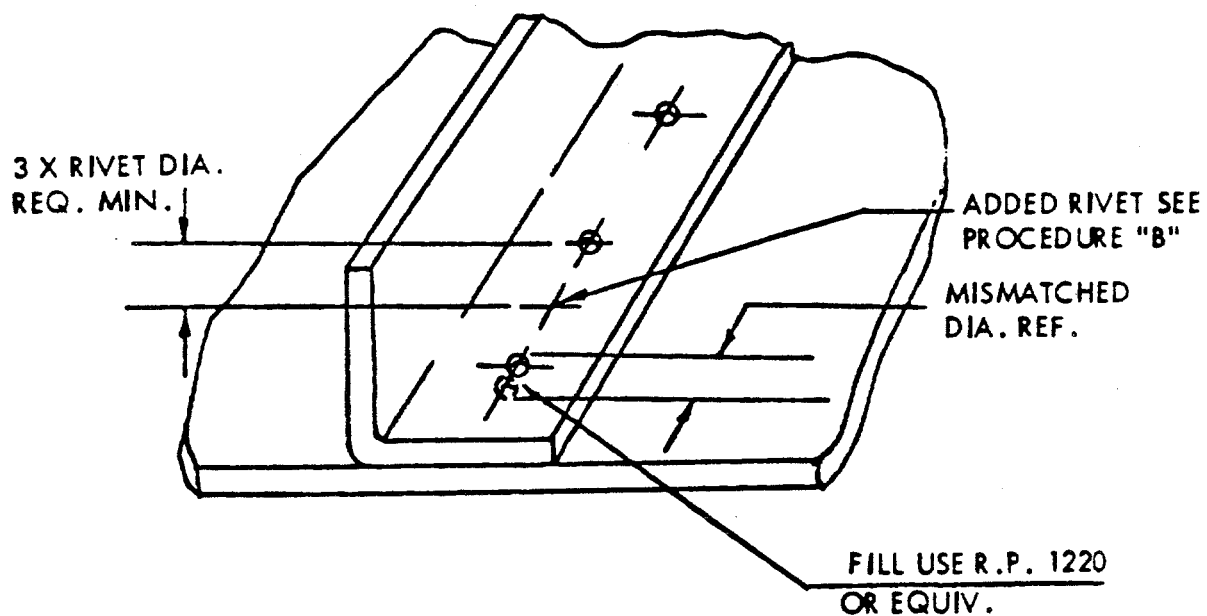


FIGURE 4-6. MISMATCHED HOLES

#### 4-9. Repair of Mismatched Holes (fig. 4-6).

a. Use this repair for mismatched holes, up to and not in excess of 1/16 inch maximum oversize rivet. The repair is limited to 50% or five (5) consecutive holes, not drilled through.

b. For mismatches up to 1/16 inch diameter oversize, drill through for applicable rivet size. See AND10387 for tolerance. Deburr and install rivets. Do not exceed 50% for one size up or 25% for two (2) sizes up or five (5) consecutive holes, whichever is greater.

c. For mismatches in excess of para 4-9b, locate 3 x rivet diameter minimum diameter distance between discrepant hole and next rivet in pattern. Drill for and install proper type rivet. Fill mismatched holes using plastic putty (item 14, table 2-2).

#### 4-10. Repair of Elongated or Oversize Holes (fig 4-7).

a. Elongated or oversize rivet holes in stringer general patterns and normal skin splices are limited to:

(1) Not more than five (5) consecutive holes or 50% of the pattern, whichever is greater, for 1/32 inch oversize holes.

(2) Not more than five (5) consecutive holes or 25% of the patterns, whichever is greater, for 1/16 inch maximum oversize.

b. Drill through for applicable rivet. See AND10387 for tolerance.

c. Deburr and install rivets. Do not exceed 50% or 25% of the pattern.

#### NOTE

Where elongation or oversize condition exceeds above application, refer to paragraph 4-11.

#### 4-11. Short Edge Distance or Elongated Hole Repairs (fig 4-8).

a. For elongated holes in excess of two (2) sizes greater or short edge distance limited to inside of structure and 50% of rivet pattern or five (5) consecutive holes.

b. Fabricate doubler or angle of like material and thickness.

c. Deleted.

d. Attach by picking up discrepant holes and a minimum of three (3) extra fasteners.

e. Deleted.

f. Deleted.

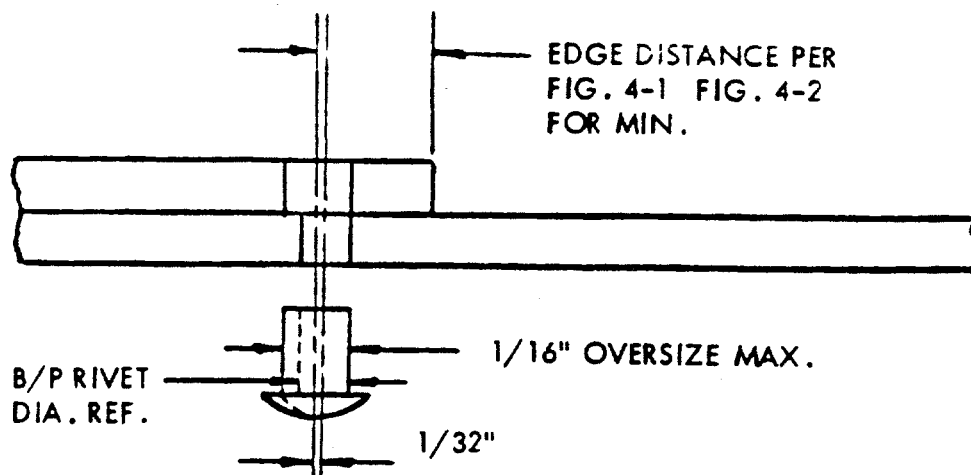


FIGURE 4-7. ELONGATED OR OVERSIZE HOLES

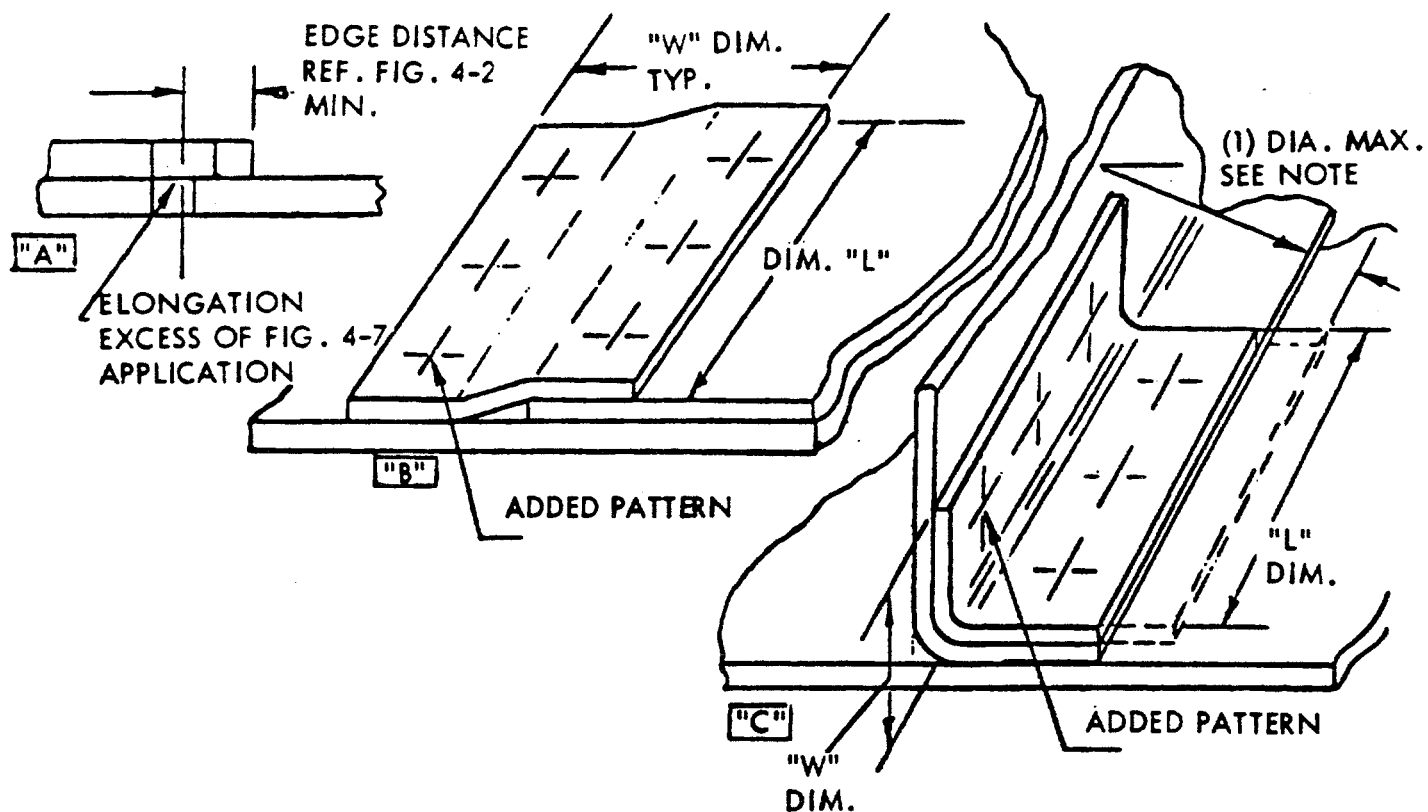


FIGURE 4-8. REPAIR OF ELONGATED HOLES OR SHORT EDGE DISTANCE

#### 4-12. Rivet Pattern for Short Edge Distance Repairs (fig 4-9).

- a. For rivet pattern where short edge distance exists in exterior skin. Limited to no more than five (5) consecutive rivets or 50% of rivet pattern. Condition shown in "B", figure 4-9 should not exist.
- b. Install additional rivets, maintain edge distance per figure 4-1.
- c. Spacing = to four (4) times the rivet diameter minimum.
- d. If condition B, figure 4-9 exists, fill old holes using plastic putty (item 14, table 2-2). Allow to dry and dress smooth.

#### NOTE

For exterior and interior surfaces, fill old holes with plastic putty (item 14, table 2-2) where rivets cannot be applied.

#### 4-13. Repair of Mislocated Holes in Flanges (fig. 4-10).

- a. This repair is for mislocated holes where fastener would normally ride or interfere with radius.
- b. In figure 4-10, "T" = to radius block gauge and gauge size is dependent on radius size "L" = length of radius block. Minimum length shall extend to pickup one (1) additional fastener in rivet hole. For application use four (4) times rivet diameter, plus one (1) rivet space minimum for other fasteners. Proportionate distances are applied.
- c. Install radius block with one (1) side radiused to match discrepant angle radius.
- d. Attach by picking up discrepant hole through radius block and minimum of one (1) extra fastener to secure block to angle.
- e. For edge distance, spacing or rivet size for hole tolerance. See figure 4-1.
- f. Where bolt holes are involved secure radius with minimum of two (2) extra fasteners.

#### 4-14. Repair of One Cracked Rivet Dimple (fig. 4-11).

- a. Use this repair for cracked dimples where damage does not extend into flat sheet. Limited to not more than one (1) crack per dimple and only five (5) consecutive dimples or 50% of pattern.
- b. When crack extends from "A" to "B" or crack is equal to or less than  $1/3$  the dimple width ( $W/3$ ), shave (off) to eliminate the crack and deburr.
- c. When crack extends greater than  $W/3$  but less than "A" to "C" stop drill crack using a No. 60 drill for gauges up to 0.032 inch, use No. 40 Drill for gauges above 0.032 inch.



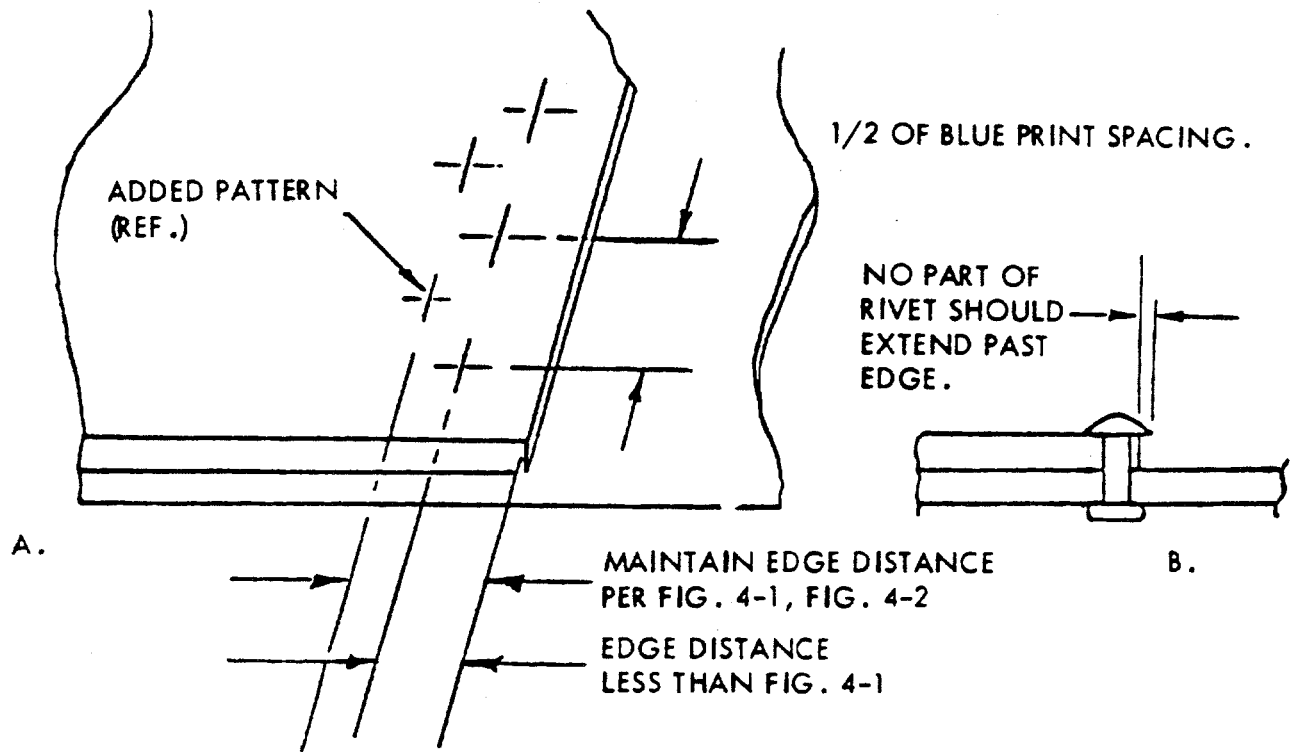


FIGURE 4-9. RIVET PATTERN SHORT EDGE DISTANCE

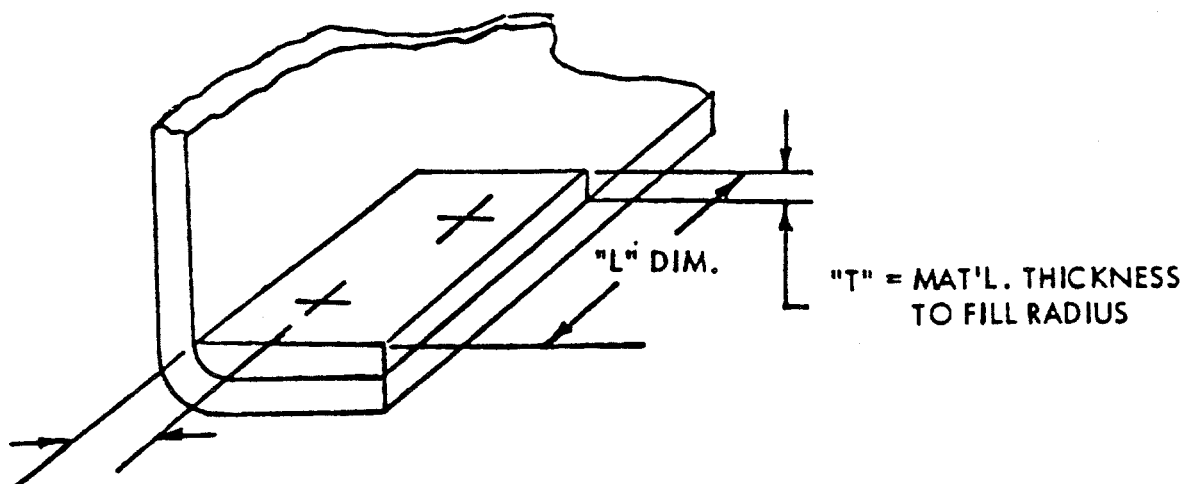


FIGURE 4-10. MISLOCATED HOLES IN FLANGES

STOP DRILL REF.  
SEE PROCEDURE

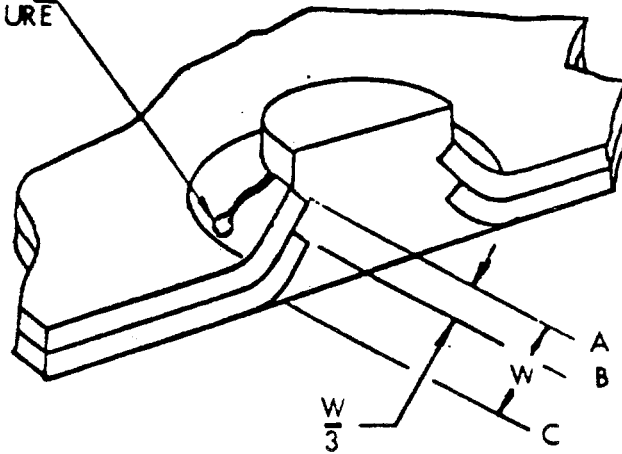


FIGURE 4-11. CRACKED RIVET DIMPLES

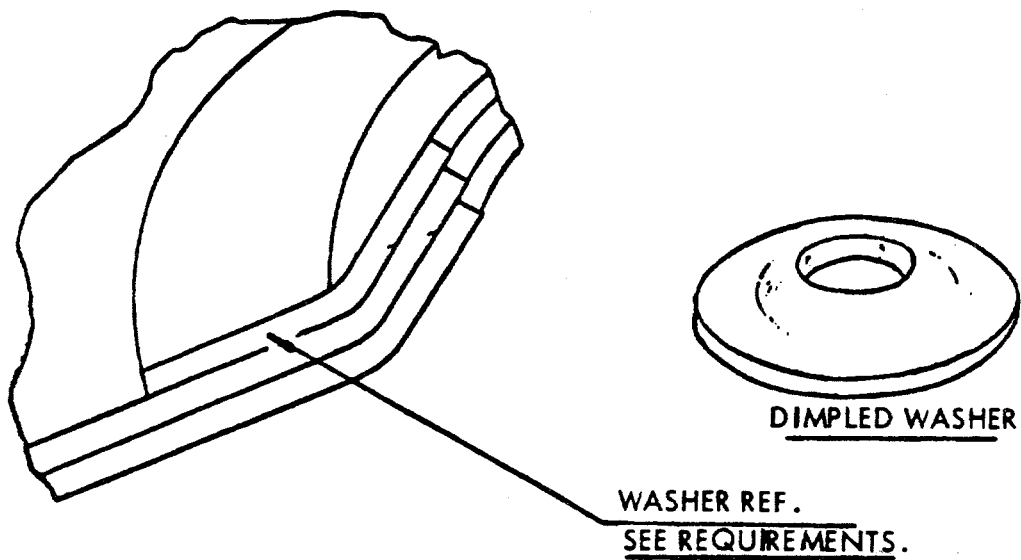


FIGURE 4-12. CRACKED RIVET DIMPLES

d. Fill stop drill hole with plastic putty (item 14, table 2-2). Allow to dry, dress smooth, touch up finish requirement.

#### 4-15. Repair of Multi-Cracked Rivet Dimples (fig. 4-12).

a. Use this repair for cracked dimples where damage does not extend into flat sheet. Limited to not more than three (3) cracks per dimple, and not more than five (5) consecutive dimples or 50% of rivet pattern.

b. Fabricate dimpled washer from 0.032 inch stainless steel with minimum diameter or 0.37 inch or larger as required. May also be fabricated from (AN960D) standard aluminum alloy washer of appropriate size for rivet. Washer gauge not to exceed 0.064 inch without a machined CTSK.

c. Stop drill crack, use No. 60 drill for gauge up to 0.032 inch, use No. 40 drill for 0.032 inch and above.

d. Add pre-dimpled washer and attach with longer rivet.

#### 4-16. Repair Using Flush Patches (fig. 4-13).

##### NOTE

This repair shall be used for tears or similar damage to skins or webs. Maximum of two (2) repairs, regardless of type, permitted per tailboom bay.

##### a. *Circular Flush Patch.* (fig. 4-13)

(1) Damage limits to be removed for cleanup are 3/8 inch diameter minimum and 3 inch diameter maximum.

(2) Remove damaged material.

(3) Install doubler. Reference paragraph 4-5 for edge distance, material gauge and rivet spacing.

(4) Install patch, thickness to be same as damaged skin and diameter to allow  $0.030 \pm 0.010$  inch gap after installation. Refer to paragraph 4-5 for rivets.

(5) Use normal stop drilling procedures for lengthwise skin cracks.

##### b. *Rectangular Flush Patch.* (fig. 4-13)

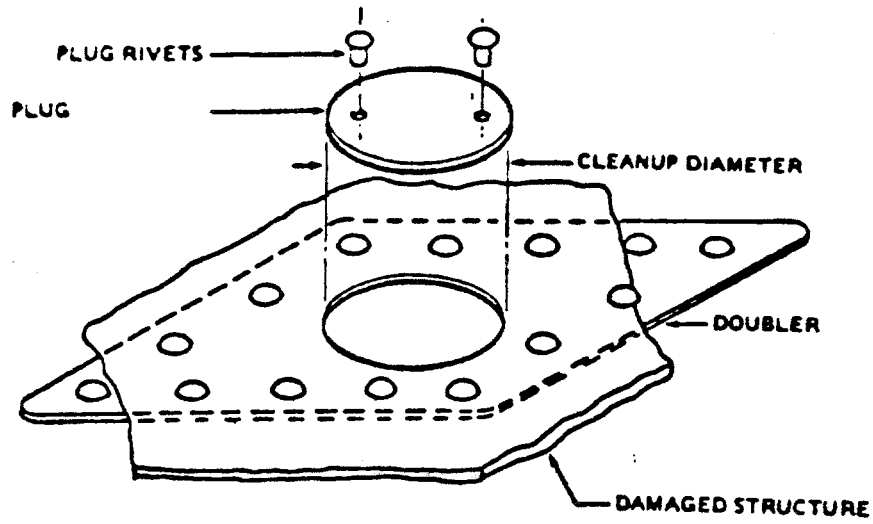
##### NOTE

This repair to be used for cracks, tears, or similar skin damage.

(1) Cut out damaged areas, using minimum 0.250 inch radii. Cut out must include any cracks resulting from damage.

(2) Fabricate doubler and patch to original contour, using same material and gauge as damaged web. Doubler may be one gauge heavier. Doubler shall have a minimum 0.250 inch radii at

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SHEET METAL PATCH

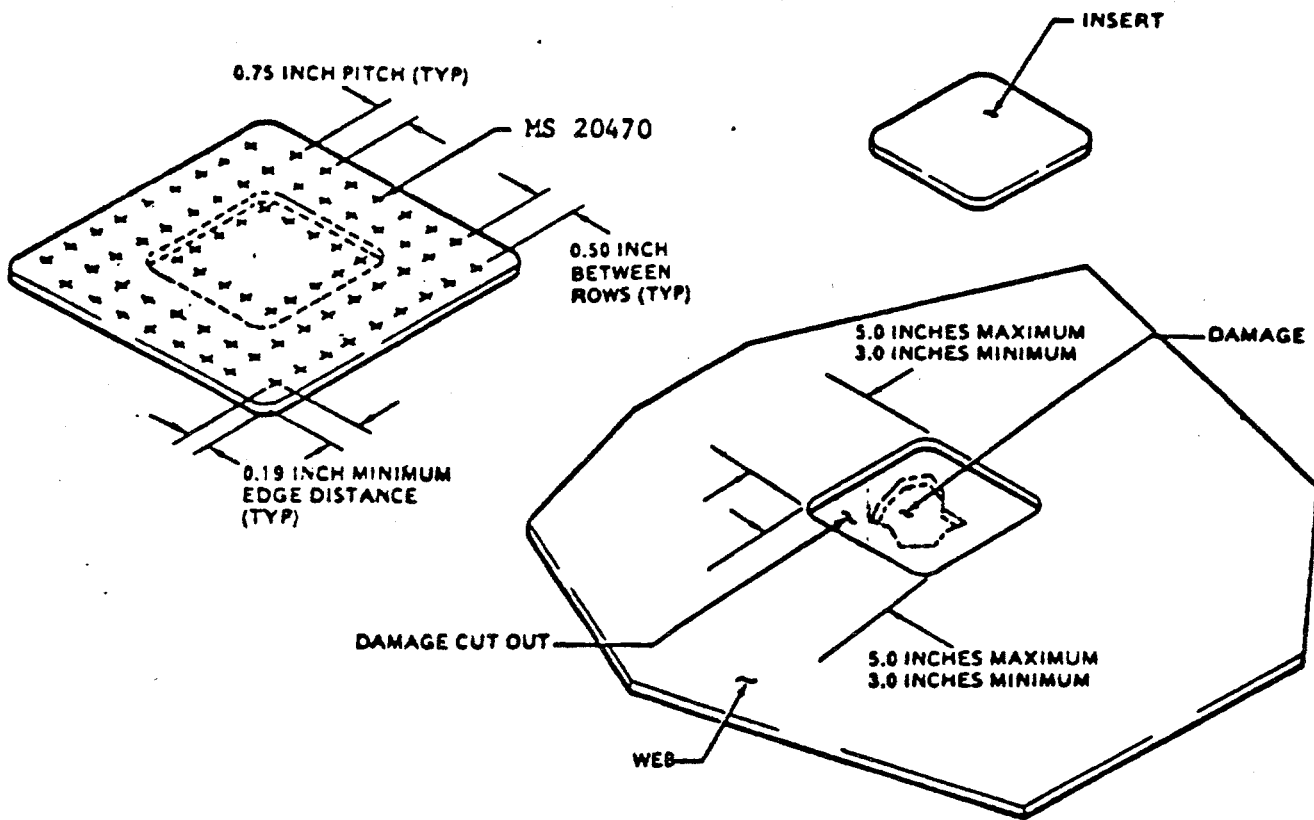


Figure 4-13. FLUSH SKIN PATCH BLIND INSTALLATION

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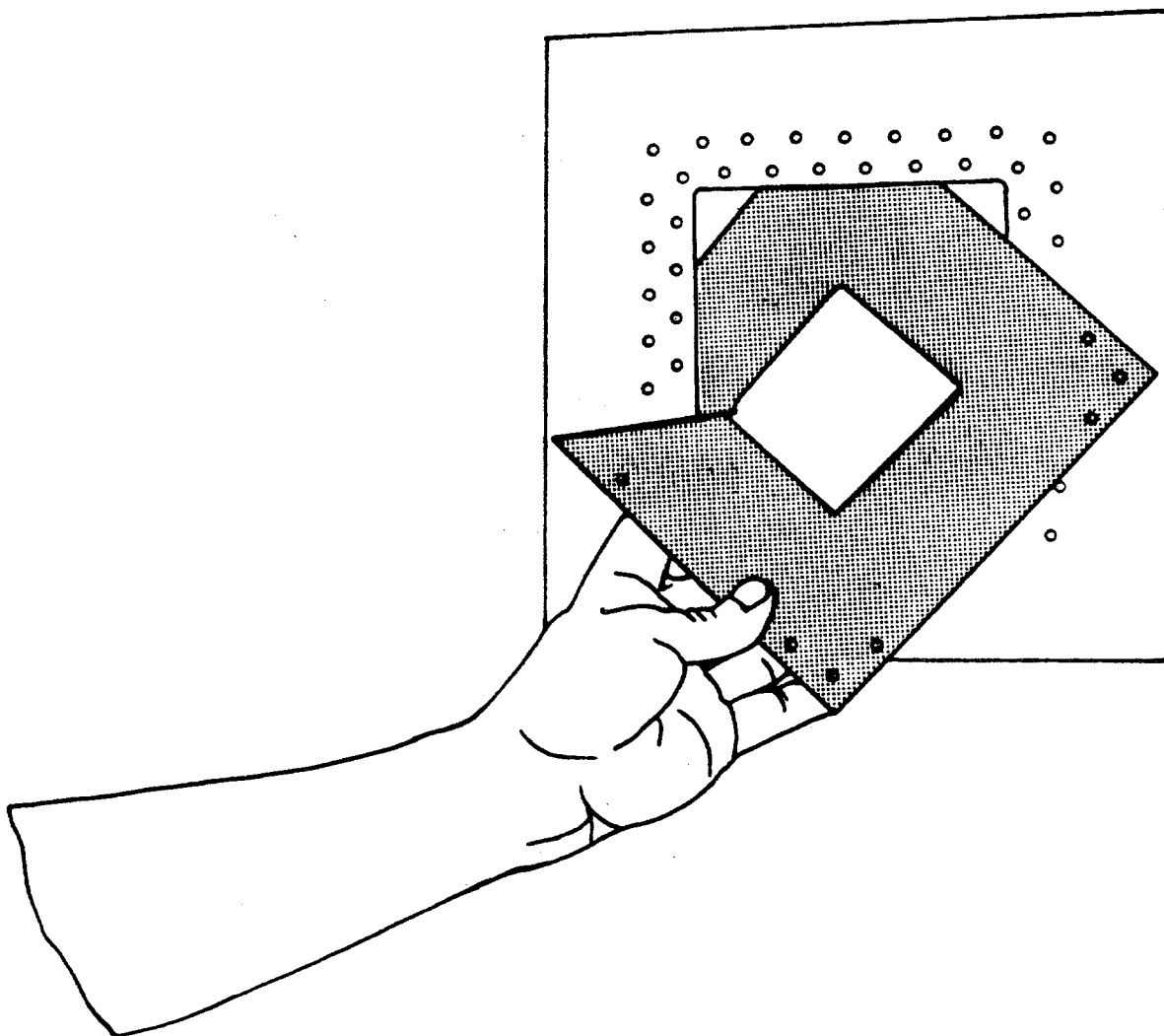


Figure 4-13 A . FLUSH SKIN PATCH BLIND INSTALLATION (SHEET 1 OF 3)

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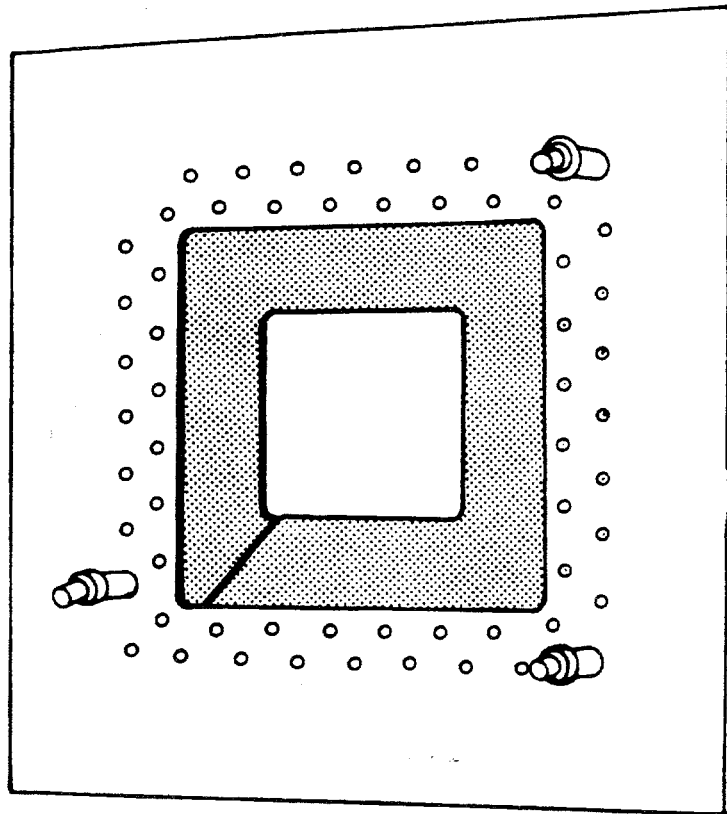


Figure 4-13A. FLUSH SKIN PATCH BLIND INSTALLATION (SHEET 2 OF 3)

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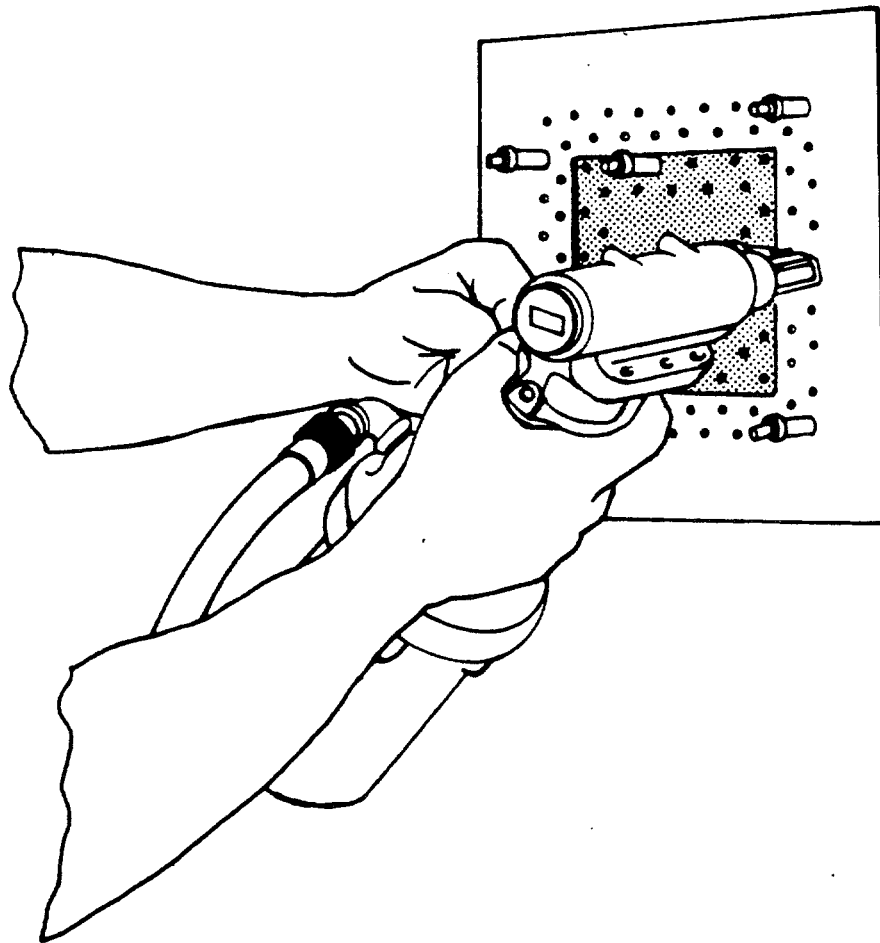


Figure 4-13A. FLUSH SKIN PATCH BLIND INSTALLATION (SHEET 3 OF 3)

corners. Doubler shall be large enough to provide minimum edge distances as shown and to accommodate two (2) rows of rivets.

- (3) Clean paint and dirt from repair area with Methyl-Ethyl-Ketone, (item 5, table 2-2) and wipe dry.
- (4) Secure patch and doubler in place, drill and deburr necessary holes and rivet per paragraph 4-5, except as noted in figure 4-13.
- (5) Gap between patch and skin shall be  $0.030 \pm 0.010$  inch.
- (6) Use normal stop drill procedures for lengthwise cracks.
- (7) Fill gap between patch and damaged areas with sealant (item 6, table 2-2).

c. *Flush Patch Blind Installation.* (fig. 4-13) Utilize repair procedure in 4-16b except doubler must be cut and installed as shown in figure 4-13.

d. *External Patch.* Are acceptable provided that they meet the following criteria.

- (1) Are in accordance with TM 55-1500-204-25/1.
- (2) The number of these patches does not exceed two per bay and not more than eight for the complete tailboom.

#### NOTE

A bay is defined as the area bounded by two adjacent longerons and two adjacent bulkheads.

### 4-17. Repair of Cracked Lightening Hole Flange (fig. 4-14).

a. The following codes are used in figure 4-14:

- (1)  $W/3 = 1/3$  of flange width.
- (2)  $L = 1/2$  flange width.
- (3)  $W =$  full flange width.
- (4)  $A = "W" + 4 \times$  rivet diameter.
- (5)  $B = 12 \times$  rivet diameter.

b. Repair procedures are identified as A, B and C (fig. 4-14).

(1) Procedure A shall be used for a crack in a flange which extends to  $W/3$  of width or less, limited to one crack. Use  $1/8$  inch clean up radius and blend to dimension L. Depth not to exceed  $W/3$ .

(2) Procedure B shall be used for a crack in a flange that exceeds  $W/3$  but is less than W. Stop drill crack, use No. 60 drill for gauges up to 0.032 inch, use No. 40 drill for 0.032 inch and above. Limited to one (1) crack. Fabricate angle to cover crack and conform to contour. Use five (5) equally spaced rivets as indicated in figure 4-14. Refer to figure 4-1 for rivet size and edge distance.

(3) Procedure C shall be used to repair cracks that extend "W" length or for multiple cracks up to a maximum of three (3) cracks. Stop drill cracks, use No. 60 drill for gauges up to 0.032 inch.



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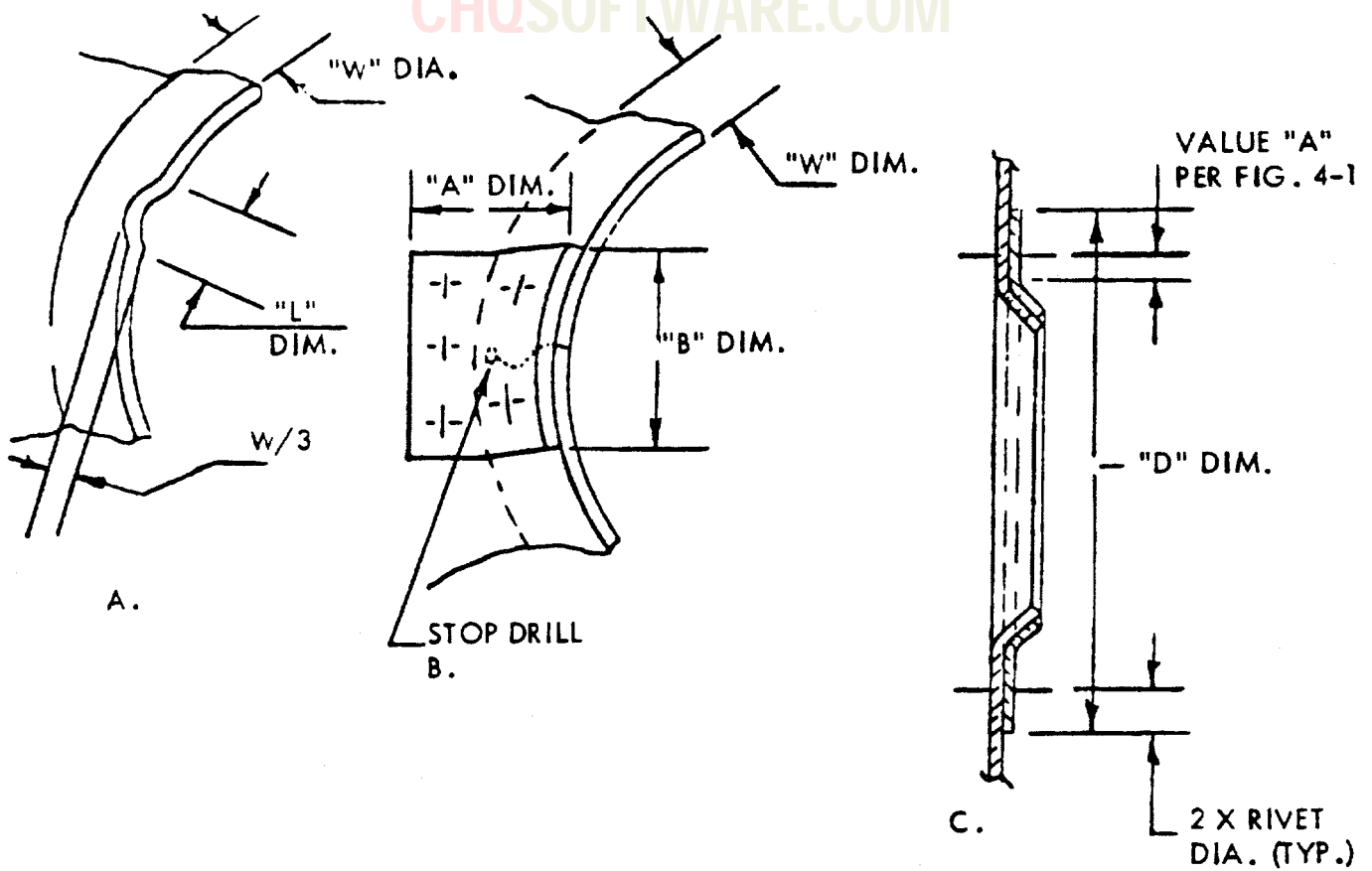


FIGURE 4-14. CRACKED LIGHTNING HOLE FLANGE

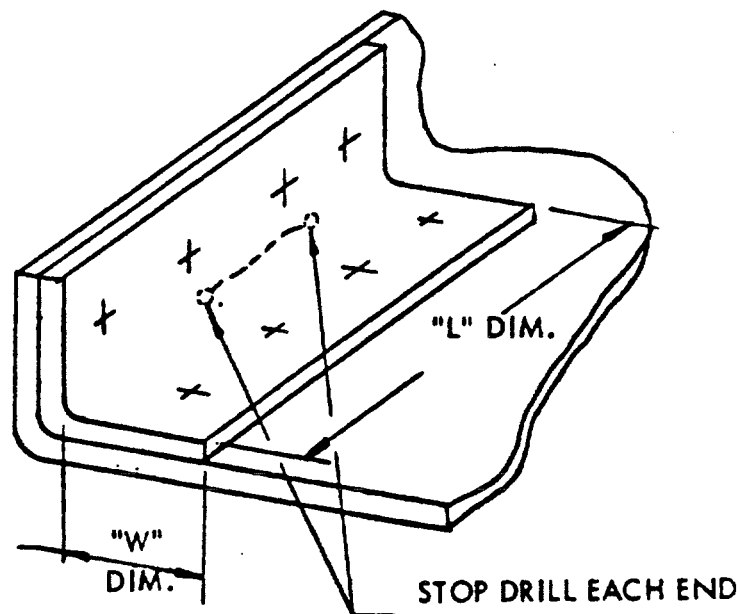


FIGURE 4-15. LENGTH-WISE CRACKS IN FLANGES

**4-18. Repair of Lengthwise Cracks in Flanges (fig. 4-15).**

- a. Use this repair for a crack in a formed flange. Limited to a crack length of 25 x thickness of flange or 1.0 inch, whichever is the greater.
- b. Stop drill cracks, use No. 60 drill for gauges up to 0.032 inch, use No. 40 drill for gauges 0.032 inch and above.
- c. Fabricate a formed angle of like material. Center formed angle over discrepant area. Pick up a minimum of four (4) rivets. Locate one rivet past each end of stop drill.
- d. Add four (4) rivets through opposite leg, or an equal amount to match discrepant pattern.

**NOTE**

For a crack located at the edge of a formed flange, where only one stop drill is used, delete the centering operation; otherwise the above requirements are applicable. For formed flanges so shaped that the length only allows one (1), two (2) or three (3) rivets, refer to paragraph 4-23.

**4-19. Repair of Lengthwise Cracks on Bend Radius of Flanges (fig. 4-16).**

- a. Use this repair for a crack in the bend radius of a formed flanges. Crack length not to exceed 25 x thickness of flange or 1.0 inch, whichever is the greater. This repair can be used as an alternate where clearance prohibits use as outlined in paragraph 4-18.
- b. Stop drill cracks, use No. 60 drill for gauges up to 0.032 inch, use No. 40 drill for gauges 0.032 inch and above.
- c. Deleted.
- d. Install formed angle back to back with discrepant flange. Attach with a minimum of four (4) rivets in each leg. One end rivet will extend past each stop drill hole.
- e. Add four (4) rivets through opposite leg, or an equal amount to match discrepant pattern.

**NOTE**

For cracked flanges exceeding above limitations, refer to paragraph 4-20.

**4-20. Repair of Damaged Flanges with Excessive Lengthwise Cracks. (fig. 4-17).**

- a. This repair shall be used for cracks in the bend radii of flanges, where the crack length exceeds the limitations of paragraphs 4-18 and 4-19. This repair is limited to webs and/or details located in an assembly, and it is more economical and/or practical to repair rather than remove and replace.
- b. Codes used in figure 4-17 are as follows:
  - (1) W = width cut off or drawing dimension.

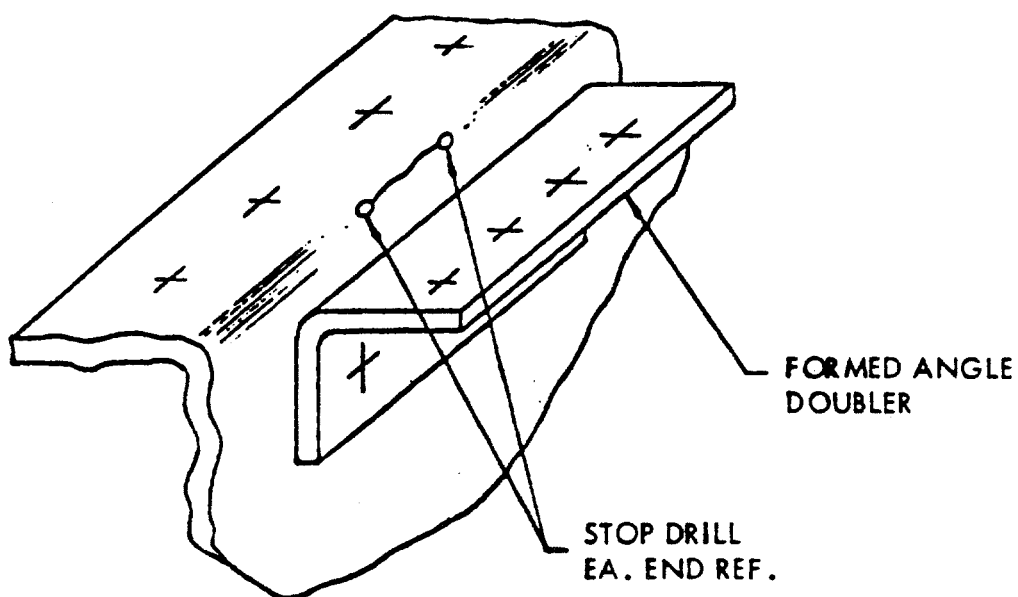


Figure 4-16. LENGTHWISE CRACKS ON BEND RADIUS OF FLANGES

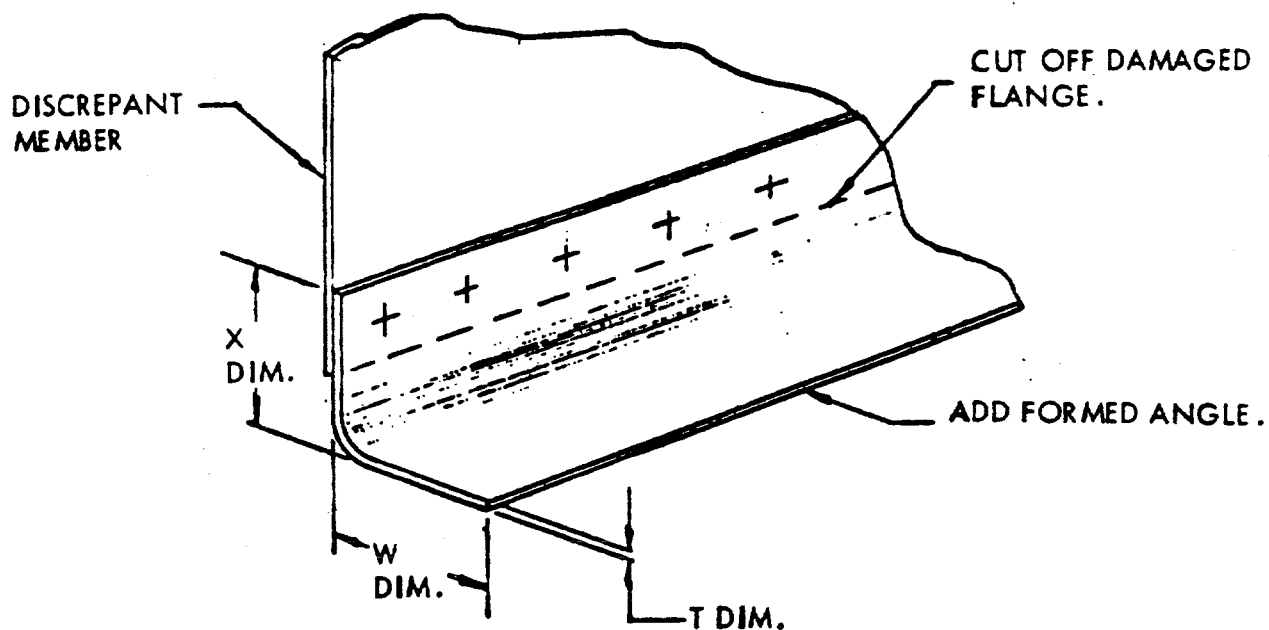


FIGURE 4-17. DAMAGED FLANGES

(2)  $X = T \text{ dimension} + 4 \times \text{rivet diameter minimum.}$

(3)  $T = \text{Gauge same as existing material.}$

- c. Cut off discrepant flange at bend radius as shown in figure 4-17. Deburr.
- d. Attach formed angle to replace cut off requirements. Use rivets and spacing.
- e. For repair areas where rivet patterns are not available, refer to figure 4-1.

#### 4-21. Repair of Minor Corner Cracks in Double-Formed Flange (fig. 4-18).

- a. This repair shall be used for a crack in the corner of a double-formed flange. Length of the crack is limited to  $8 \times \text{sheet thickness.}$
- b. Drill a No. 40 stop hole at end of crack.
- c. Remove area outward from drilled hole as shown in detail "A" of figure 4-18. Notch with minimum radius of 0.125 inch, and smooth to remove burrs.

#### NOTE

For cracks exceeding the above limitations, refer to paragraph 4-22.

#### 4-22. Repair of Major Corner Cracks in Double-Formed Flange (fig. 4-19).

- a. This repair shall be used for cracks located in corner of double-formed flange. Length of crack exceeds  $8 \times \text{material thickness}$  but does not exceed  $25 \times \text{the material thickness}$  or 2.0 inch, whichever is greater.
- b. L code used in figure 4-20 =  $1 \text{ rivet spacing} + 4 \times \text{rivet diameter}$  for each angle leg.
- c. Fabricate one (1) double flange doubler of like material and gauge and adhering to paragraph 4-5.
- d. Stop drill crack, use No. 60 drill for gauges up to 0.032 inch, use No. 40 drill for gauges 0.032 inch and above.
- e. Install one (1) double formed flange doubler, fabricated per paragraph 4-5. above. To attach use two (2) rivets in each leg and add one (1) rivet on each side of stop drilled hole equally spaced and maintaining edge distance per figure 4-1.
- f. For details or subassemblies where rivets are not present, use size and spacing as defined in figure 4-1.

#### NOTE

In the event this repair is to be considered for detail parts where spotwelds would be a more practical fastener, substitute spotweld for rivets. Number of

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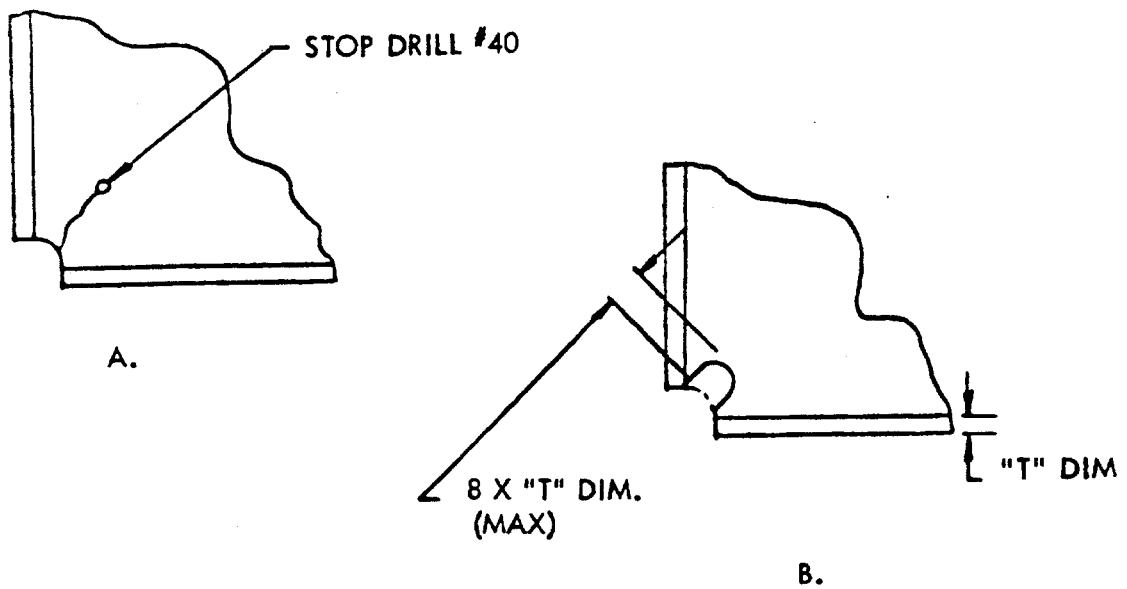


FIGURE 4-18. MINOR CORNER CRACKS IN DOUBLE-FORMED FLANGE

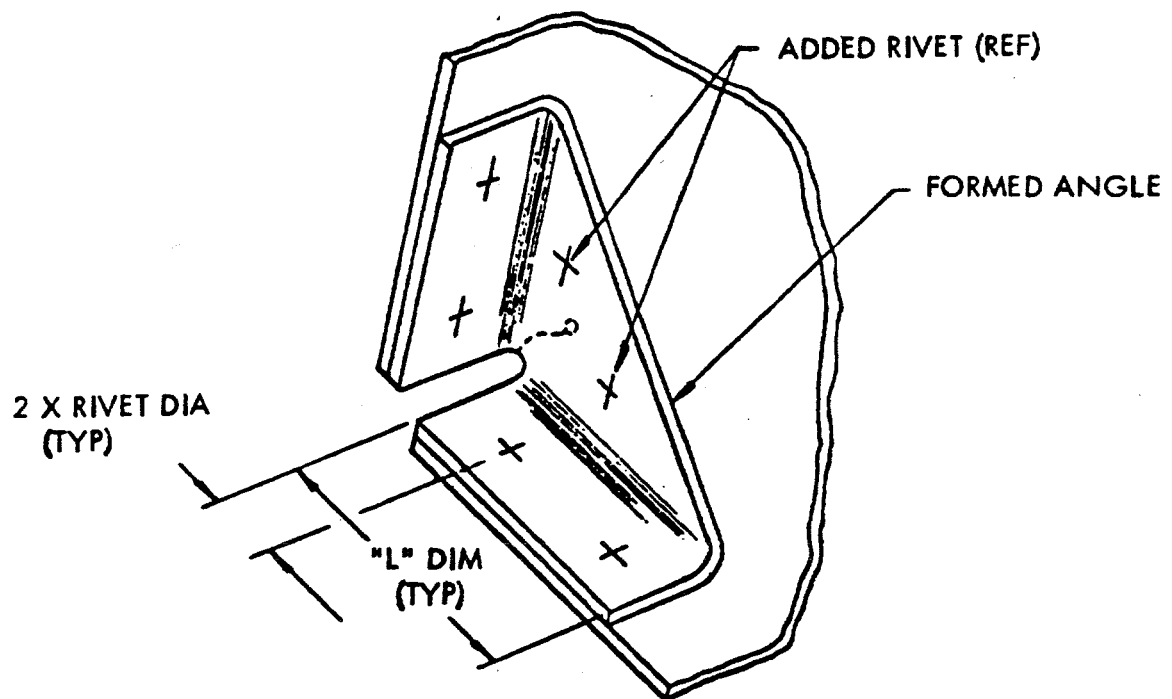


FIGURE 4-19. MAJOR CORNER CRACKS IN DOUBLE-FORMED FLANGE

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spotwelds to be used can be determined by using Table 1 of MIL-W-6858C. Insure sufficient spotwelds are used to provide same shear strength as rivets used per subparagraph e. above.

#### 4-23. Repair of Lengthwise Cracks in Flange Tab (fig. 4-20).

- a. Use this repair for lengthwise cracks in flange tabs where the length of the flange is less than requirement for four (4) draining type rivets.
- b. Fabricate a formed angle doubler of like material and gauge. Let "Y" dimension equal "L" dimension.
- c. Stop drill crack, use No. 60 drill for gauges up to 0.032 inch, use No. 40 drill for gauges 0.032 and above.
- d. Install formed angle doubler and pick up existing drawing rivets. Add an equal amount in the opposite flange.

#### NOTE

In the event this repair is to be considered for detail parts where spotwelds would be a more practical fastener, substitute spotwelds for rivets. Number of spotwelds to be used can be determined by using Table 1 of MIL-W-6858C. Insure sufficient spotwelds are used to provide same shear strength as rivets used per subparagraph d. above.

#### 4-24. Repair to Angle Section Members (fig. 4-21).

- a. This repair is for damages in angle members such as a crack from hole to edge of material resulting in damage separations.
- b. Fabricate angle doubler from like section of material. Length "L" = dimension "C" =  $8 \times \text{rivet diameter} + 2 \text{ equal rivet spaces}$ .
- c. Stop drill crack, use No. 60 drill for gauges up to 0.032 inch, use No. 40 drill for gauges 0.032 inch and above.
- d. Notch out separation, use 1/4 inch radii or drill to clean out depths not exceeding 1/3 of "W" dimensions. If depth does not exceed 1/3 "W", it is permissible to leave notch without adding angle. Exception is a member cracked from rivet hole to edge of material, in these instances a doubler angle is mandatory.
- e. For clean up in excess of 1/3 "W" dimension add angle doubler of like section and material. Attach angle doubler with rivet pattern equal to that of opposite flange. Minimum requirements are two (2) rivets each side of discrepancy, refer to figure 4-1.

#### NOTE

In the event this repair is to be considered for detail parts where spotwelds would be a more practical fastener, substitute spotwelds for rivets. Number

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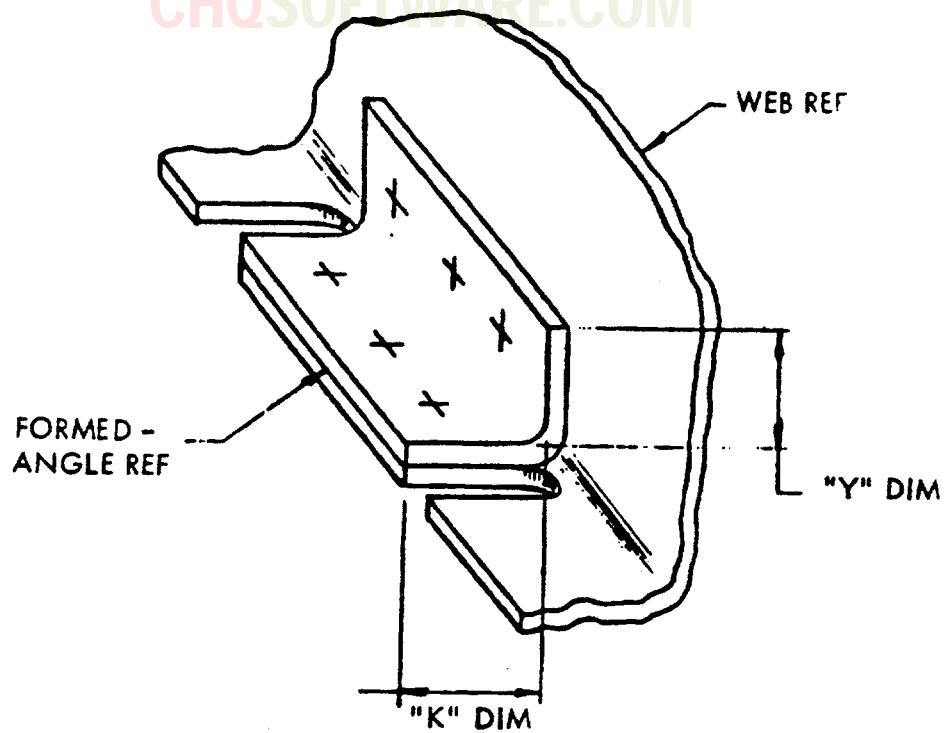


FIGURE 4-20. DAMAGE TO FLANGE TAB

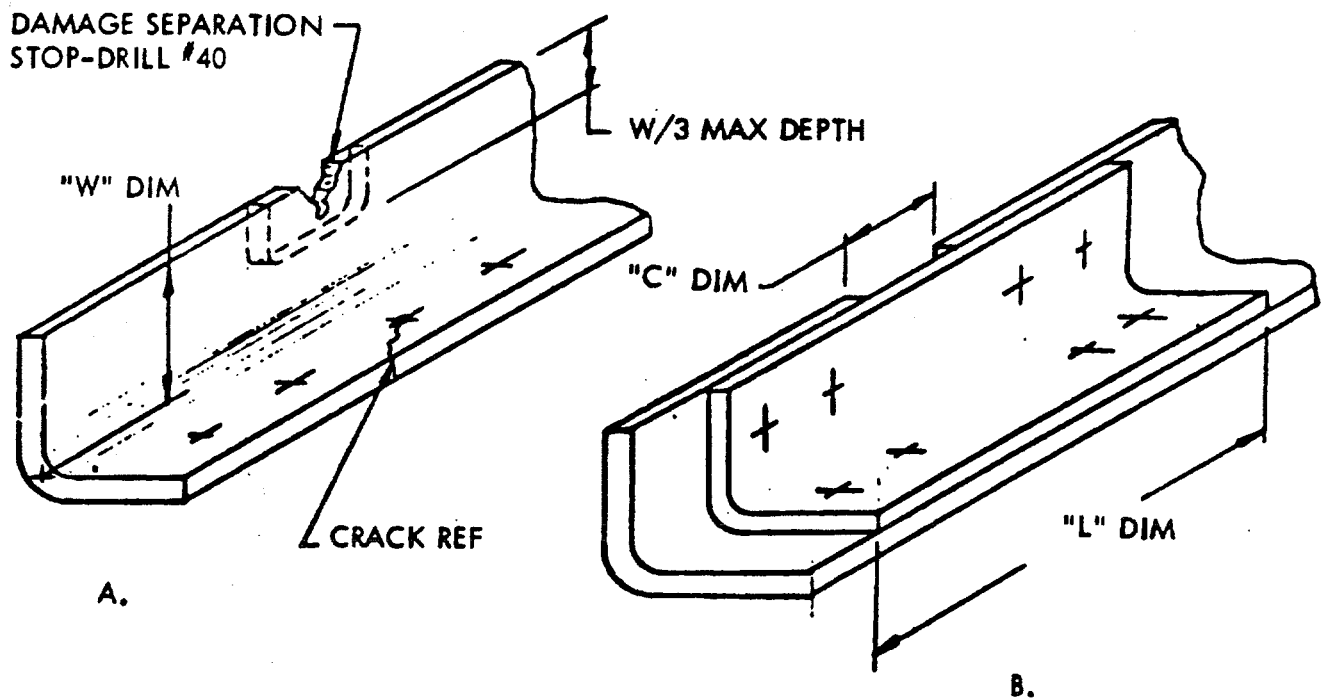


FIGURE 4-21. ANGLE SECTION REPAIR

of spotwelds to be used can be determined by Table 1 of MIL-W-6858C. Insure sufficient spotwelds are used to provide same shear strength as rivets used per subparagraph e. above.

#### 4-25. Repair of Cracks in Rivet Holes (fig. 4-22).

a. This repair shall be used for cracks in skin or flanged members extending from rivet hole to edge of material. Procedure A shall be used for cracks in skin or flange from rivet hole to edge of material where proper edge distance is maintained. Procedure B shall be used for cracks in skin or flange from rivet hole to edge of material and where a short edge distance exists.

b. Codes used in figure 4-22 are as follows:

(1) L = length required to cover discrepancy (minimum required 4 x rivet diameter + 2 equal rivet spaces) or three (3) rivets.

(2) T = thickness of discrepant material.

(3) W = 4 x rivet diameter minimum otherwise match discrepant flange width.

c. Fabricate doubler of like material and gauge as indicated in figure 4-25.

d. Procedure A: Install fabricated doubler with a minimum of three (3) rivets (fig. 4-22).

e. Procedure B:

(1) Select doubler application per detail "B" of figure 4-8 for skin repairs.

(2) Select angle application per detail "C" of figure 4-8 for flange repair.

(3) Install doubler or angle as applicable per requirements and procedures of paragraph 4-11.

#### 4-26. Repair of Edge Tears in Skins and Webs (fig. 4-23).

(a) This repair shall be broken down into the following procedures:

(1) A - for cracks where dimension "X" is greater than 1-1/2 x dimension "Z" but no greater than 2-1/2 x dimension "Z".

(2) B - for cracks where dimension "X" is greater than 1/2 of, but not greater than 1-1/2 x dimension "Z".

(3) C - for cracks when dimension "X" is 1/2 or less of dimension "Z".

(4) D - for edge cracks in internal skins and webs.

b. Procedure A.

(1) Stop drill cracks. Use No. 60 drill for gauges up to 0.032 inch, use No. 40 drill for gauges 0.032 inch and above.



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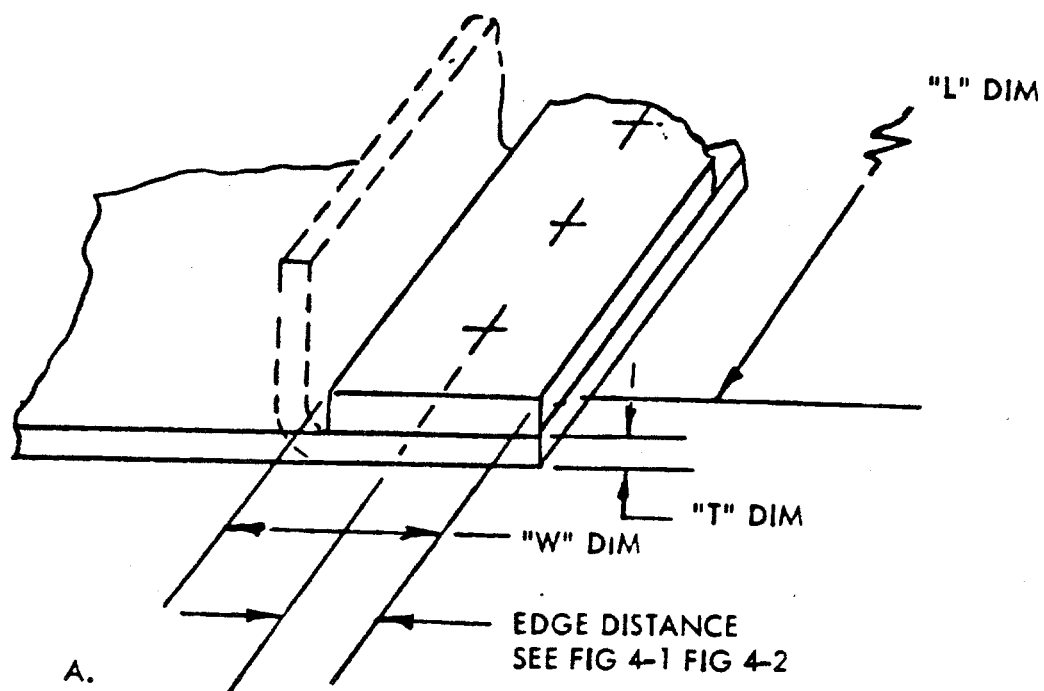


FIGURE 4-22. CRACKS IN RIVET HOLES

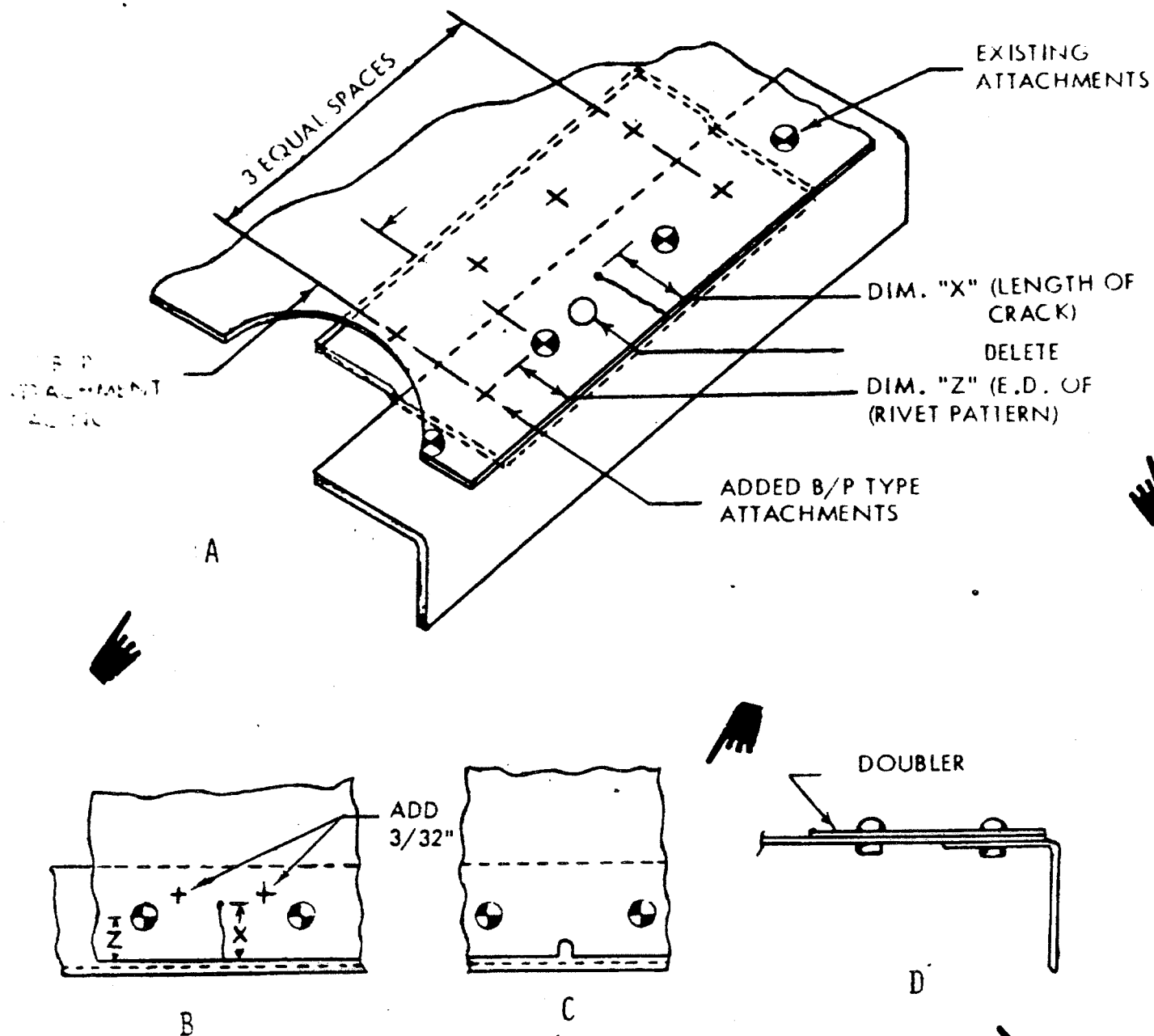


FIGURE 4-23. EDGE TEARS IN SKIN AND WEBS

(2) Fabricate doubler of same material as sheet but one gauge heavier and of sufficient length and width to install a double row of four (4) each rivets. Joggle doubler if step from skin over adjacent structure is greater than 0.032 inch. Radius edge of doubler to nest in angled member.

(3) Clean doubler surface and skin to be under doubler with methyl-ethyl-ketone (item 5, table 2-2), abrade surface with No. 60 grit sandpaper, (item 56, table 2-2), reclean with methyl-ethyl-ketone (item 5, table 2-2), and wipe dry. Nest doubler to under side of sheet and adjacent structure as shown in figure 4-23 and bond in place using adhesive (item 16, table 2-2).

(4) Install double row of rivets per figure 4-23. Maintain minimum edge distance and spacing per figure 4-1.

(5) Add one (1) extra rivet when crack is off center between attachments, and sufficient edge distance remains per figure 4-1.

(6) Apply two (2) coats primer (item 1, table 2-2) to repaired area.

c. Procedure B.

(1) Stop drill crack. Use No. 60 drill for gauges up to 0.032 inch, use No. 40 drill for gauges 0.032 inch and above.

(2) Add one (1) 3/32 inch rivet on each side of drilled hole. Insure that proper spacing and edge distance are available.

(3) Apply two (2) coats primer (item 1, table 2-2) to repaired area.

d. Procedure C.

(1) Radius out crack to 0.10 inch width.

(2) Fill and fairout with plastic putty (item 14, table 2-2).

(3) Apply two (2) coats primer (item 1, table 2-2) to repaired area.

e. Procedure D.

(1) Make and install doubler same as for procedure A except doubler may be flat and installed per figure 4-23.

(2) Apply two (2) coats primer (item 1, table 2-2) to repaired area.

4-27. Oil Can Repair (fig. 4-24).

a. This repair shall be used for components where excess metal exists between structure creating a false contour. This repair will not be used for minor skin distortions caused by normal flight loads.

b. The use of J-stringer or angle shall be determined by the gauge of the skin material. J-stringer shall be used for gauges up through 0.040 inch. Angle shall be used for gauges 0.041 inch and up. Angle and J-stringer to be fabricated from same gauge and material as skin.

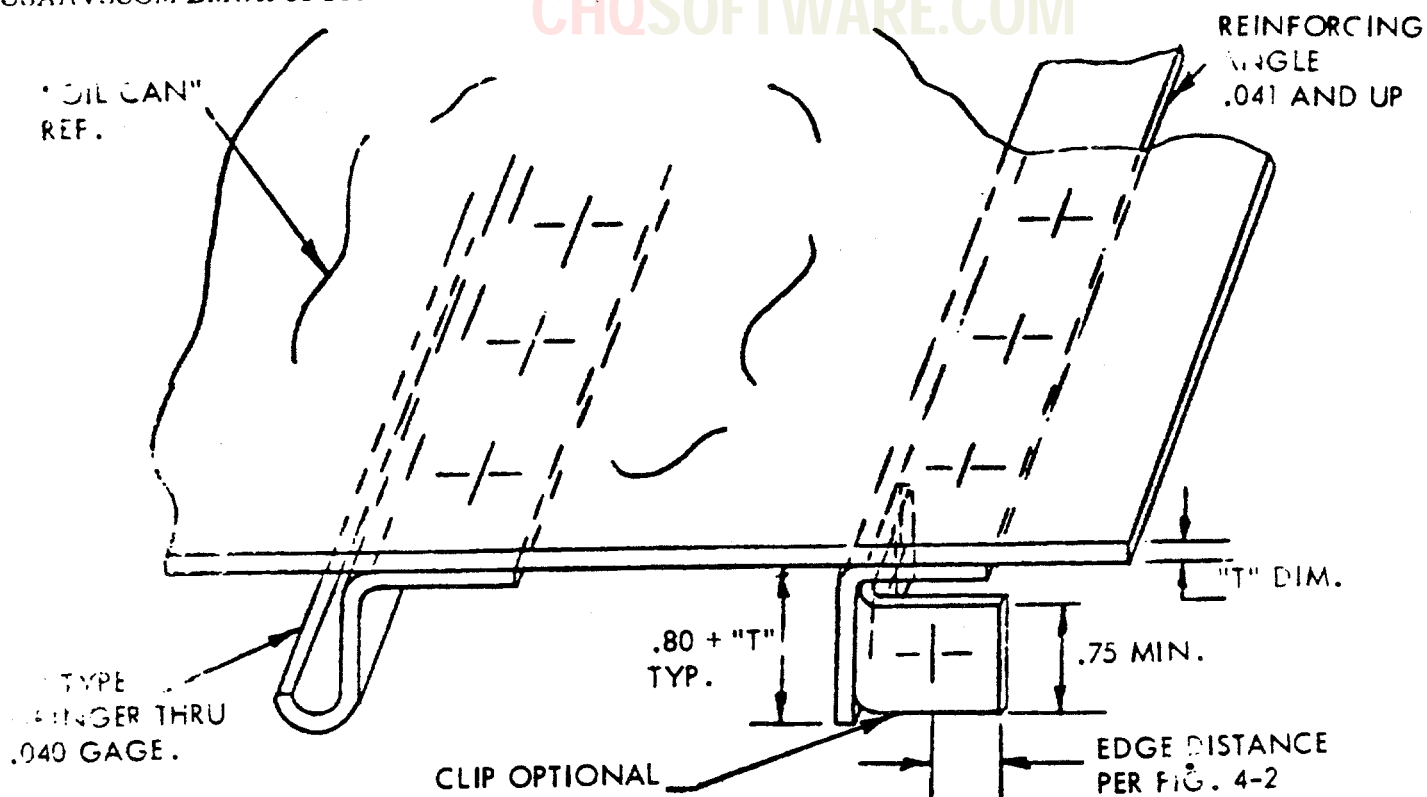


FIGURE 4-24. OIL CAN REPAIR

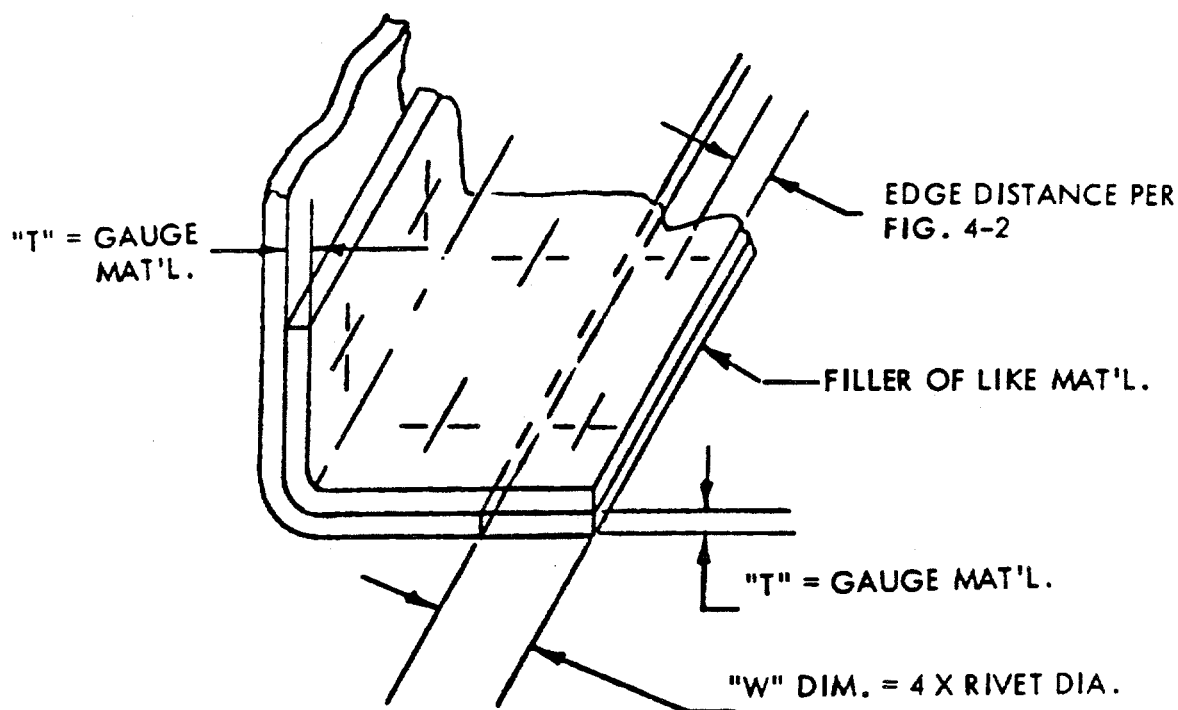


FIGURE 4-25. HOLE OR MEMBER MISLOCATION

c. Use rivets to attach angle or J-stringer. For rivet spacing and size, see figure 4-1. Locate stringer or angle through center of oil can.

d. Use material and gauge to be same as J-stringer or angle in selecting clips. Use of clips is restricted to applications where adjacent structure permits use and where clips are needed to secure added member; otherwise, clips are not necessary.

#### NOTE

For small areas within limitations of 3.0 inch diameter area, refer to paragraph 4-16. for repair.

#### 4-28. Repair of Hole or Member Mislocation (fig. 4-25).

a. This repair shall be used for all mislocated holes or members and where the extension or doubler exceeds paragraph 4-11. or where joggle member will not apply.

b. Codes used in figure 4-25 are as follows:

(1) W = Width of filler (4 x rivet diameter minimum).

(2) T = Thickness of filler material and angle doubler = gauge of existing material.

c. Fabricate angle doubler and filler as indicated in figure 4-25. Use same gauge and material of discrepant member.

d. Extend flange of angle doubler 4 x diameter of discrepant hole past original (discrepant) member.

e. Attach filler with a minimum of two (2) rivets past or one (1) rivet each end of discrepant hole.

#### NOTE

For shim repairs refer to paragraph 4-29.

#### 4-29. Shim Repairs (fig. 4-26).

a. This repair shall be used for gaps created by short or mislocated minor members where it is considered more practical to support members rather than relocate or remove. Limited to a gap of 0.250 inch maximum.

b. Fabricate shim as indicated in figure 4-26. Use same type material, "T" dimension to be a maximum of 2 x rivet diameter where rivets are used for attaching; otherwise, as required. Taper shim to fit gap from "T" dimension to 0.010 inch minimum over the distance "L".

c. Attach shim using method most suitable: rivets, bond, tackweld, spotweld, screws, or bolts. Attachment to permanently installed members is preferred.

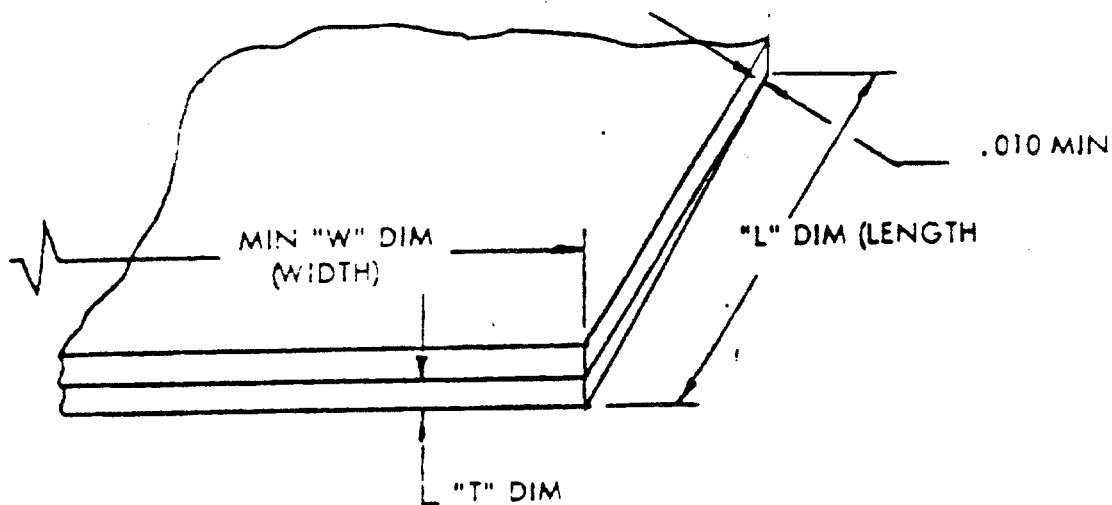


FIGURE 4-26. SHIM REPAIR

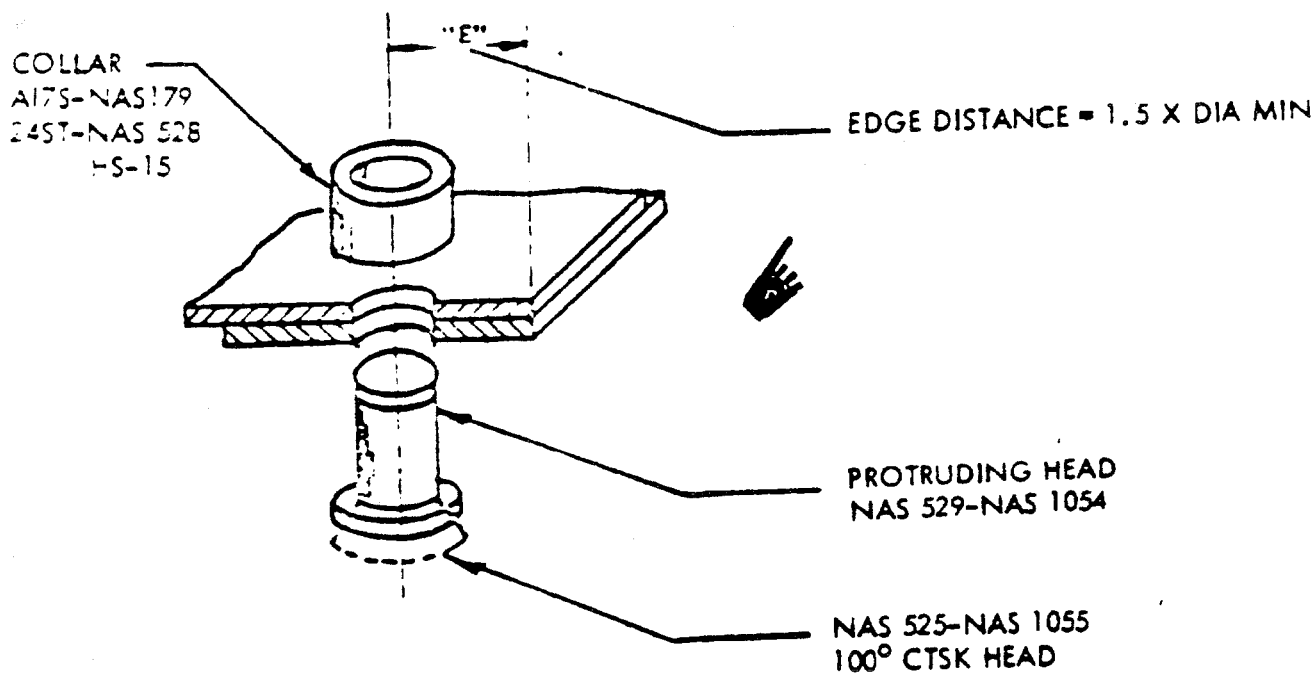


FIGURE 4-27. OVERSIZE HI-SHEAR RIVET HOLES

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## NOTE

For rivets used in above application, refer to figure 4-1 for limitations on edge distance, spacing, and size.

**4-30. Repair of Oversize Hi-Shear Rivet Holes (fig. 4-27).**

a. This repair shall be used for oversize or elongated hi-shear rivet holes and oversize or elongated hi-loc bolts up to 1/16 inch oversize, limited by dimension "E" in figure 4-27.

b. The following combinations may be used to provide the oversize needed:

(1) NAS1055 - (CTSK Head) to 1/16 inch oversize with NAS179 collar corresponding. See NAS525 - NAS528.

(2) NAS1054 - (Protruding Head) up to 1/16 inch oversize with NAS179 collar corresponding. See NAS525 - NAS528.

(3) HS41F - (CTSK Head) up to 1/32 inch oversize - use HS15 collar corresponding.

(4) HS42P - (Protruding Head) up to 1/32 inch oversize - use HS15 collar corresponding.

(5) HS39P - (CTSK Head) up to 1/64 inch - use HS15 collar corresponding.

(6) HS40P - (Protruding Head) up to 1/64 inch - use HS15 collar corresponding.

c. Drill hole sizes per AND10387. Ream for close tolerance holes.

d. Edge distance, tearout, or minimum wall shall be checked prior to drill or ream operation to select proper oversize rivet.

**4-31. Repair of Oversize Bolt Holes.**

a. Where tear out or minimum wall is not a structural factor and where interchangeability is not affected, bolt holes may be increased to a maximum oversize of 0.0625 inch.

b. Deleted.

**4-32. Repair for Oil Can in Tailboom Bulkhead (fig. 4-28).**

a. This repair shall be used for oil cans in tailboom bulkheads. This repair is applicable to other areas in all bulkheads.

b. Limitations to the above repair are as follows:

(1) Rivet edge distance and spacing must be available with ends of doubler extending past discrepant area a minimum of 1.5 inch.

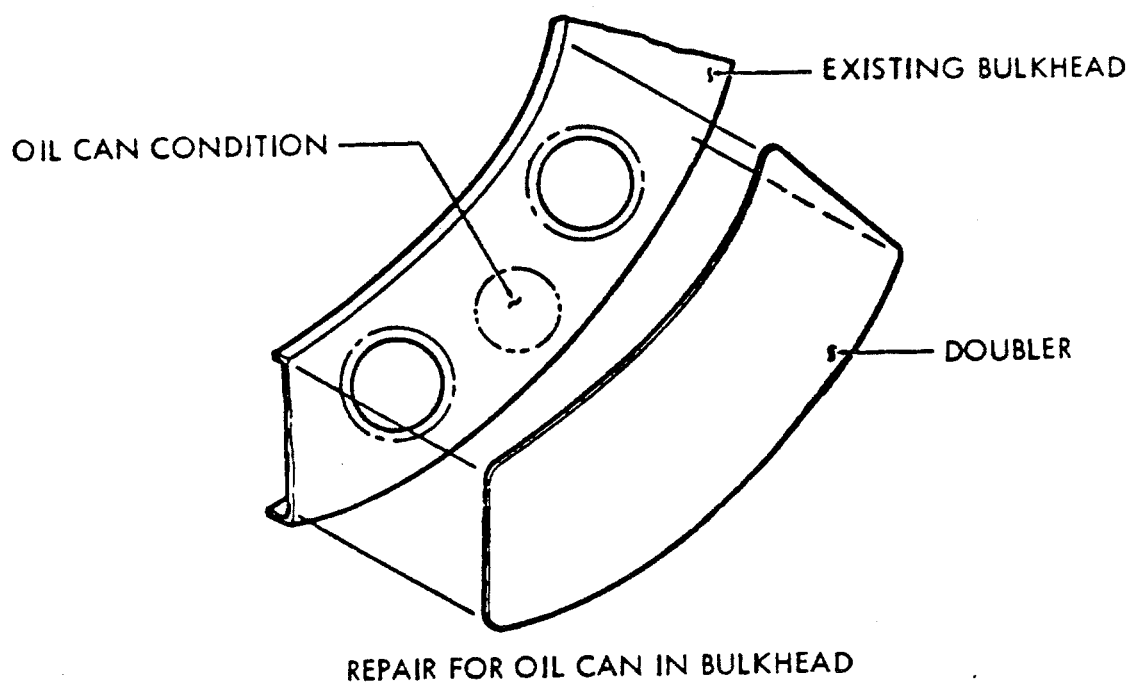


Figure 4-28. OIL CAN REPAIR IN BULKHEAD (SHEET 1 OF 3)



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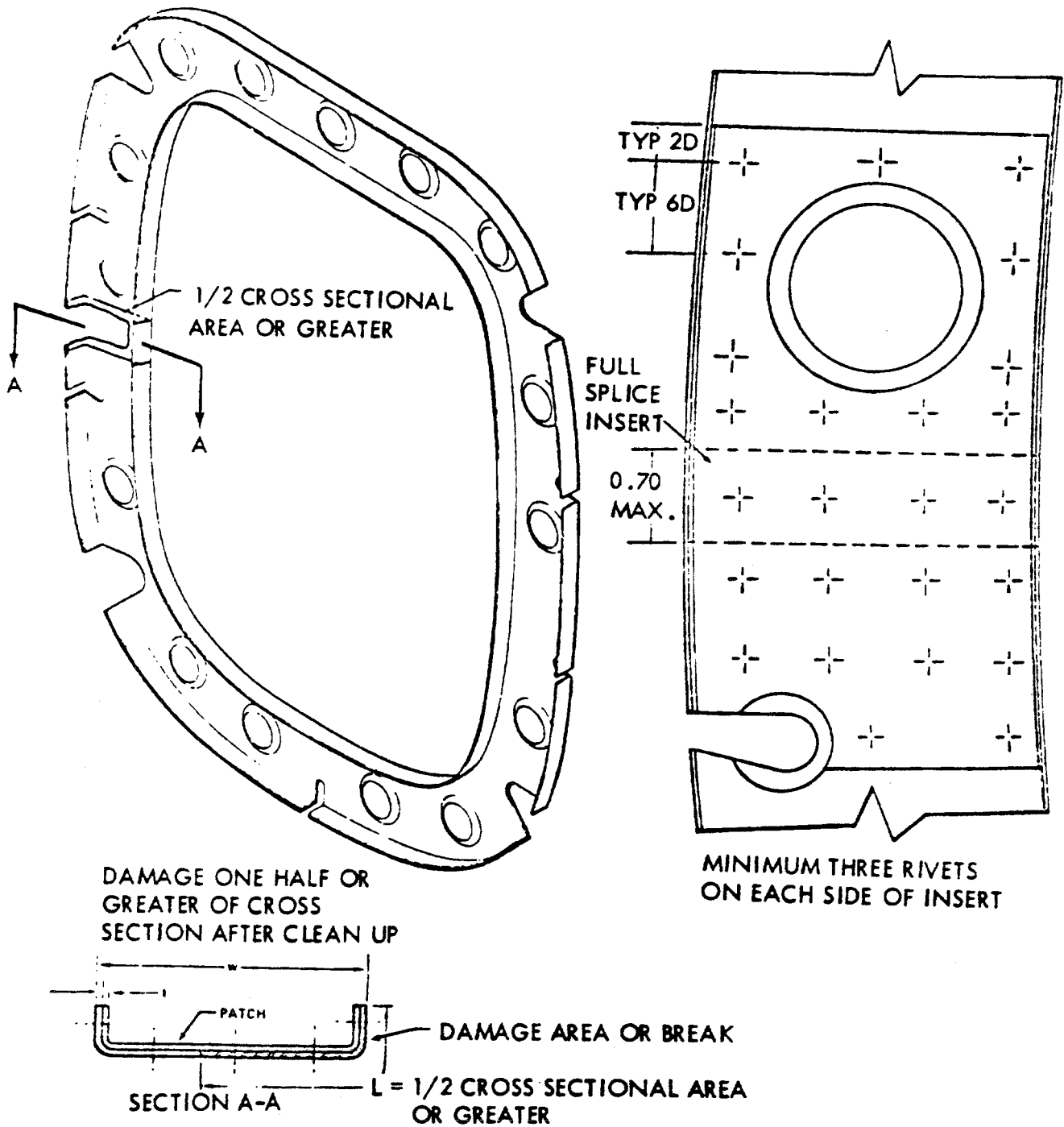


Figure 4-28. OIL CAN REPAIR IN BULKHEAD (SHEET 2 OF 3)

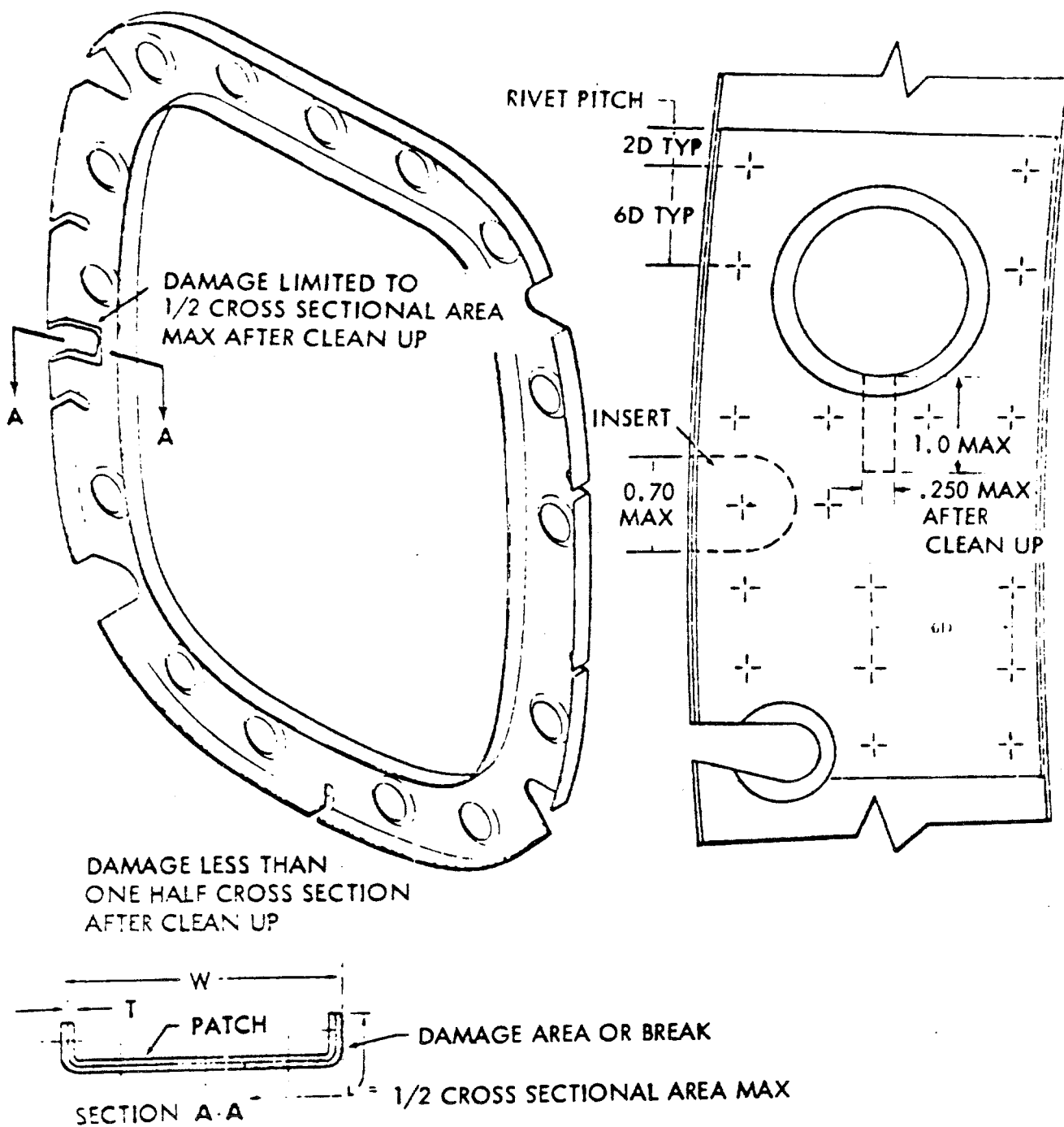


Figure 4-28. OIL CAN REPAIR IN BULKHEAD (SHEET 3 OF 3)

- (2) Edge distance is available for a single row of rivets around each lightening hole over which the doubler extends.
- (3) Riveted flange of bulkhead is on station.
- (4) Flanges of bulkhead are not buckled.

c. Fabricate doubler from like material and gauge, (ends to extend past can a minimum of 1.5 inches). Overlap first lightening hole if necessary. Trim to remove flange from outside edge and around lightening holes and recesses. Remove minimum material to make part nest.

d. Remove any interfering clips, rivets, or decals from bulkhead.

e. Nest doubler in bulkhead. Drill 1/8 inch rivet pattern including single row around lightening holes and through the nested flanges. Exclude the canned area. Maintain spacing and edge distance per figure 4-1. Remove and deburr.

f. Apply adhesive (item 16, table 2-2) to mating surfaces and rivet complete, using (MS20470AD4) rivets.

g. Reinstall any details removed in subparagraph d. above.

#### 4-33. Repair of Bulkhead, Frame, and Rib Damage (fig. 4-29).

- a. Repair bulkheads, frames and ribs in accordance with criteria for typical damage, as illustrated in figure 4-29.
- b. Fabricate parts from same material and gauge as damaged member. Doublers may be one (1) gauge heavier.
- c. Install repair parts with rivets.

**4-34. Repairs Using Skin Insertions or Seam Patches.** Skin damage that exceeds the repair limits of paragraph 4-16, should have a patch installed with repair seams that lie along stringers and bulkhead. Each patch seam must have rivets of the same size as the rivets in the adjacent parallel manufactured seams. If the two adjacent vertical manufactured seams are different, the stronger one should be copied. If the two adjacent horizontal manufactured seams are different, the stronger one should be copied. Additional rivets may be added if a center to center spacing of at least 3 x rivet diameter can be maintained. Forward and upper skins shall lap over lower and aft skins whenever this is practical. Insertions that overlap all existing structures are authorized; overlap must be adequate to accommodate rivets to existing pattern. If damage is sufficient to warrant replacement of a complete skin, installation should be identical to the original factory installation.

**4-35. Repair of Angle - Drive Shaft Cover.** R/H and L/H repair of angle should be made using six (6) six-inch minimum splice angle. Splice must be normal (90 degrees) to tailboom top surface. Gap between splice is to be  $0.030 \pm 0.010$  inch. Backup angle should be of same thickness (or one gauge thicker) and material as parent angle. Splice backup shall be nested on inboard side of angle and extend three (3) inches on each side of the splice gap minimum. Rivets and pattern shall be per paragraph 4-5.

**4-36. Repair of Drive Shaft Cover Hinges.** Repair to hinge shall be made by six (6) inch insertion minimum. Remove damage area. Replace damaged hinge with like hinge insertion. Maintain  $0.030 \pm 0.010$  inch gap at both splices. No additional structural backup is necessary.

**NOTE**

Insure hinge lugs match mating hinge half.

**NOTE**

Tailbooms received with previous repairs to driveshaft cover hinge halves which are inserts with three or more hinge loops and four or more rivets are acceptable to be left in service, providing the loops are not worn, cracked or misaligned.

• Contour of Drive Shaft Cover.

*a.* The contour of the tail rotor drive shaft cover on the fin shall match the nose rib contour at bottom of fin within 1/4 inch inside or outside of contour. The same tolerance applies to matching the contour of the 42 degree gear box cover with the contour of the aft end of the tail rotor drive shaft cover of the tailboom.

*b.* The gaps between the tail rotor drive shaft covers and either end of the 42 degree gearbox cover shall not be more than 1/4 inch.

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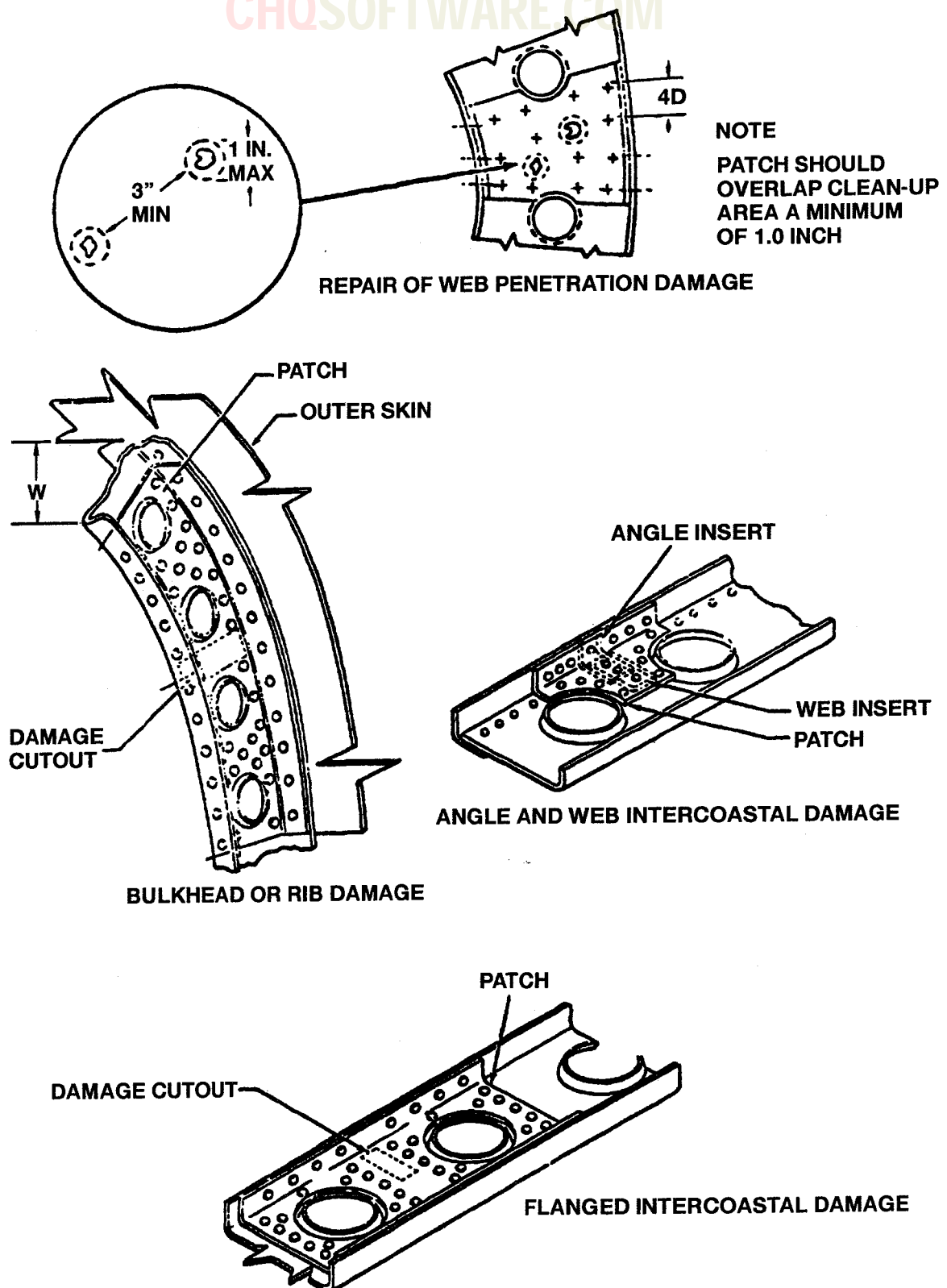


FIGURE 4-29. REPAIR OF BULKHEAD, FRAME, AND RIB DAMAGE

## Section II. SPECIFIC STRUCTURAL REPAIR

**4-37. Installation of Chafing Pads (fig. 4-30).** Install pads to prevent chafing damage to tailboom skin caused by tail rotor drive shaft cover doors.

a. Install six (6) Nylatron bumper tabs (item 17, table 2-2) 3/4 inch wide x 1-1/2 inch long x 0.062 inch thick along the top of the tailboom.

b. Bumper are to be retained by bonding with sealant (item 6, table 2-2) and two (2) rivets (MS20600AD4). Rivets to be installed outboard of drive shaft cover.

c. On UH-1B, C and M tailbooms (204 series) locate bumper tabs centered at boom stations 61.5, 97.38, 120.23, 145.28, 166.23, and 192.60. On UH-1D and H tailbooms (205 series) locate bumper tabs centered at boom stations 40.43, 78.44, 120.33, 145.28, 166.23, and 192.60. On AH-1G tailbooms (209 series) locate bumper tabs centered at tailboom stations 56.50, 83.00, 100.00, 120.20, 145.70, and 192.60.

d. To prevent chafing of 42 degree gearbox double skin install Nylatron (item 17, table 2-2) bumper tabs on both sides of 42 degree gearbox outboard of the tail rotor drive shaft cover closing support, as depicted in figure 4-30. Bumpers to be fabricated from Nylatron (item 17, table 2-2) 3/4 inch wide x 1 inch long x 0.62 inch thick. Bond bumpers in place, located on forward and aft edges of the 42 degree gearbox doubler, using adhesive MMM-A-121 or equivalent. Do not use rivets to retain bumpers on doubler (see figure 4-30A).

e. To prevent chafing of driveshaft cover attach angle install rubber bumper pads, P/N 4237, along the attach angle as per figure 4-30. All previously installed chafing material shall be removed after rubber bumpers are installed. Detail "B" installation of bumpers shall be accomplished only if it does not effect fit of cover.

f. Install pressure sensitive teflon tape, NSN 8135-00-923-0591, on the doublers around access openings in the bottom of the tailboom. Also install tape on tailfin and tailboom skin at boom station 228 where tail skin fairing attaches.

**4-38. Repair of Cracks in Lower, Forward Skin and Addition of Stiffeners (UH-1H) (fig. 4-31, 32, and 33).**

a. Repair above skin cracks as follows:

(1) Deleted.

(2) If cracks are numerous and it is more practicable to replace the lower skin panel, replace skin panel with 0.032 inch gauge 2024-T3 aluminum sheet.

b. To increase the strength of the tailboom structure and prevent the possibility of cracks occurring in the lower, forward skin from boom station 38.43 to boom station 101.38, additional stiffeners shall be added. These stiffeners shall be located in accordance with figures 4-31 and 4-32. Two (2) stiffeners added to lower skin between station 38.43 and station 59.50, right-hand side only, and one (1) stiffener added to lower skin between station 80.44 and station 101.38, left-hand side. Fabrication and installation of the above listed stiffeners may be accomplished as follows:

(1) Fabricate two (2) stiffeners from 2024 aluminum alloy T3, 0.040 x 1.775 x 21.4 inch stock.

### NOTE

For details of these stiffeners, identified as (205-031-801-67) see figure 4-31. Also, use dimensions provided for finished length. Rubber stamp FMC and part numbers on all fabricated parts.

(2) Fabricate four (4) each clips (20-038-1) from 2024 aluminum alloy T3, 0.032 inch. See figure 4-33 for details. Rubber stamp FMC and part number on all fabricated parts.

(3) Locate and place in position the two (2) stiffeners between boom stations 38.43 and 39.40 as indicated in figures 4-31 and 4-33, View C-C.

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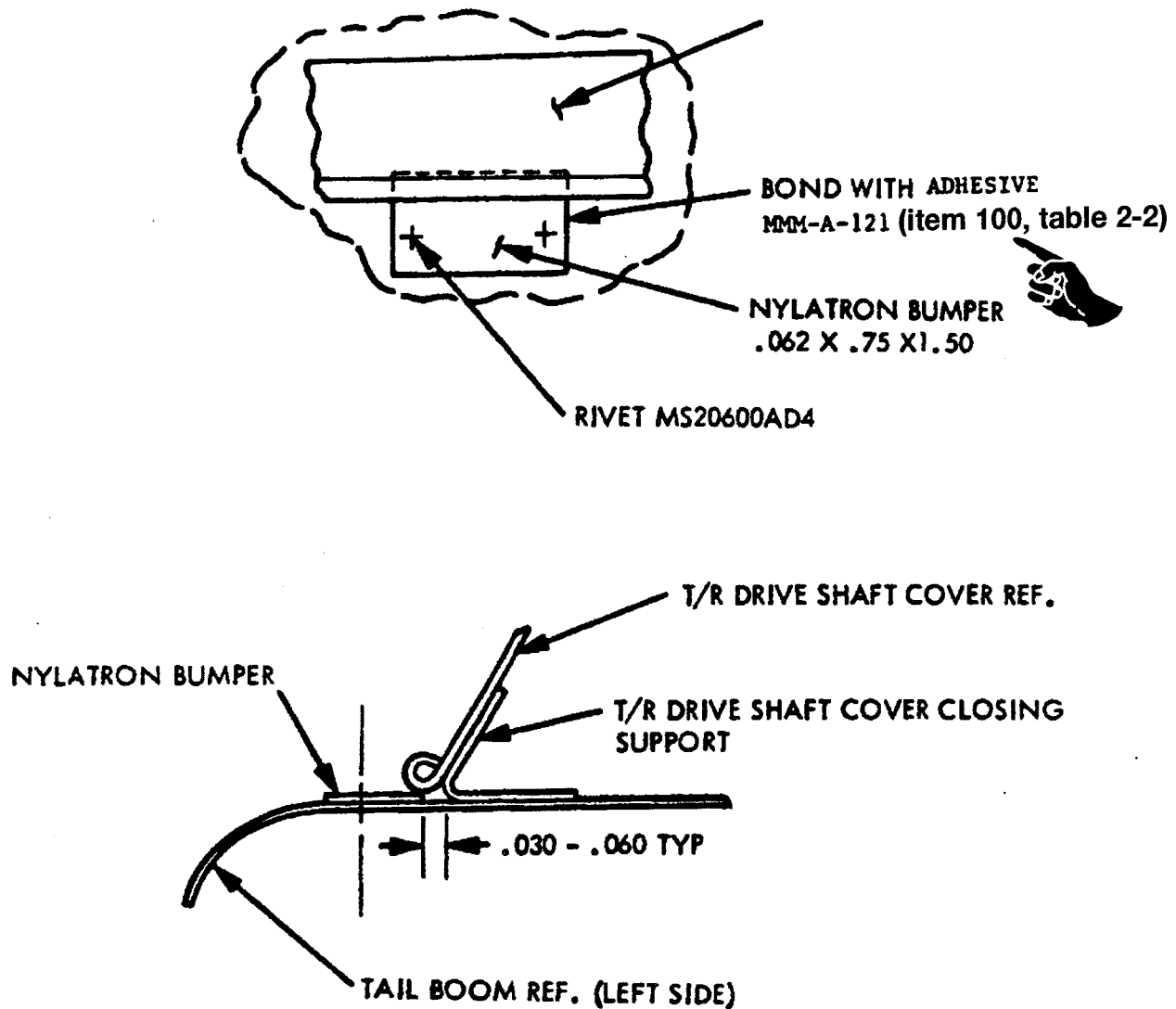


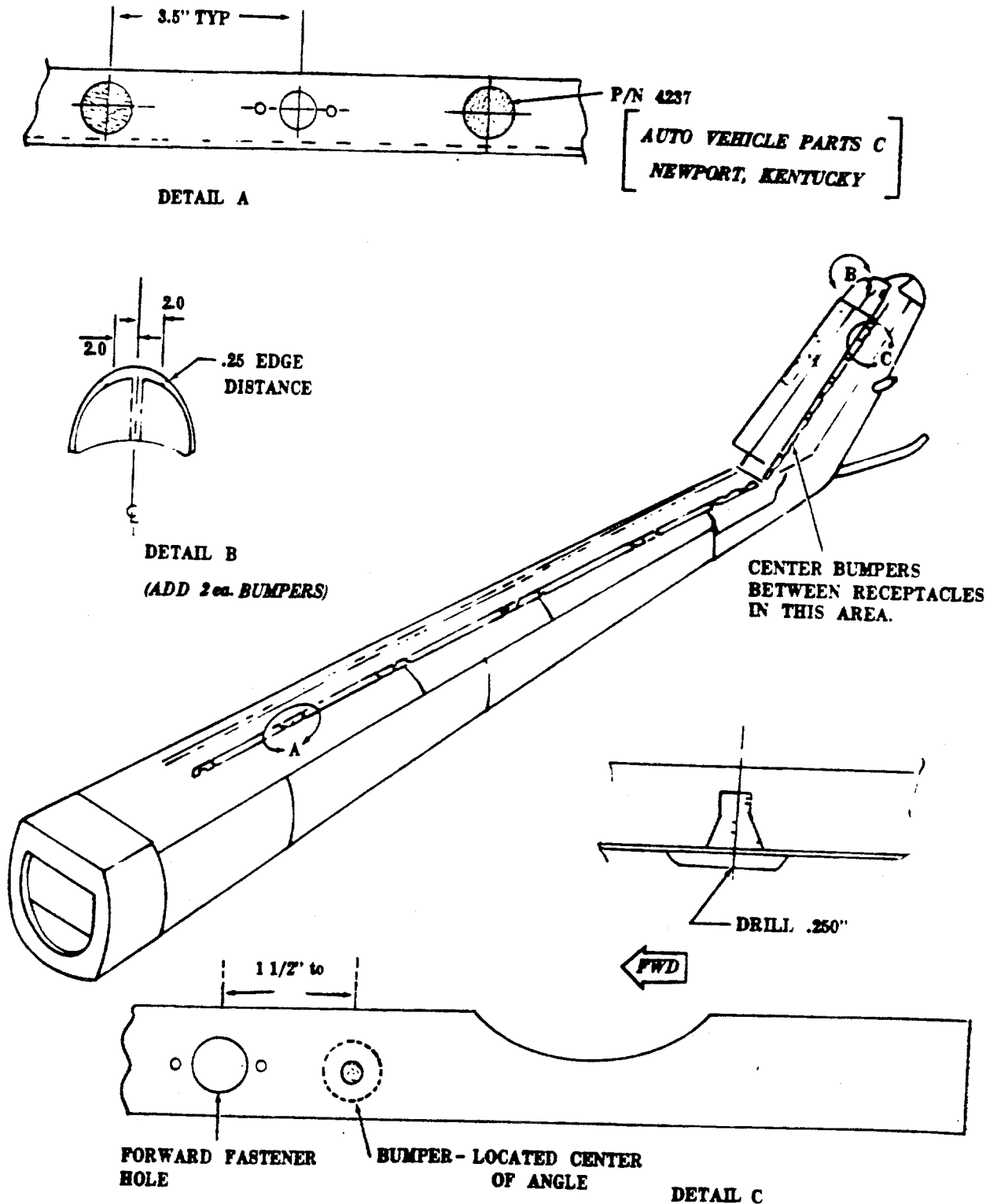
FIGURE 4-30. CHAFING PAD INSTALLATION

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42 DEGREE GEARBOX COVER, R/H ATTACH ANGLE  
VIEWED FROM R/H SIDE INBOARD

Figure 4-30A DRIVESHAFT COVER CHAFING PADS

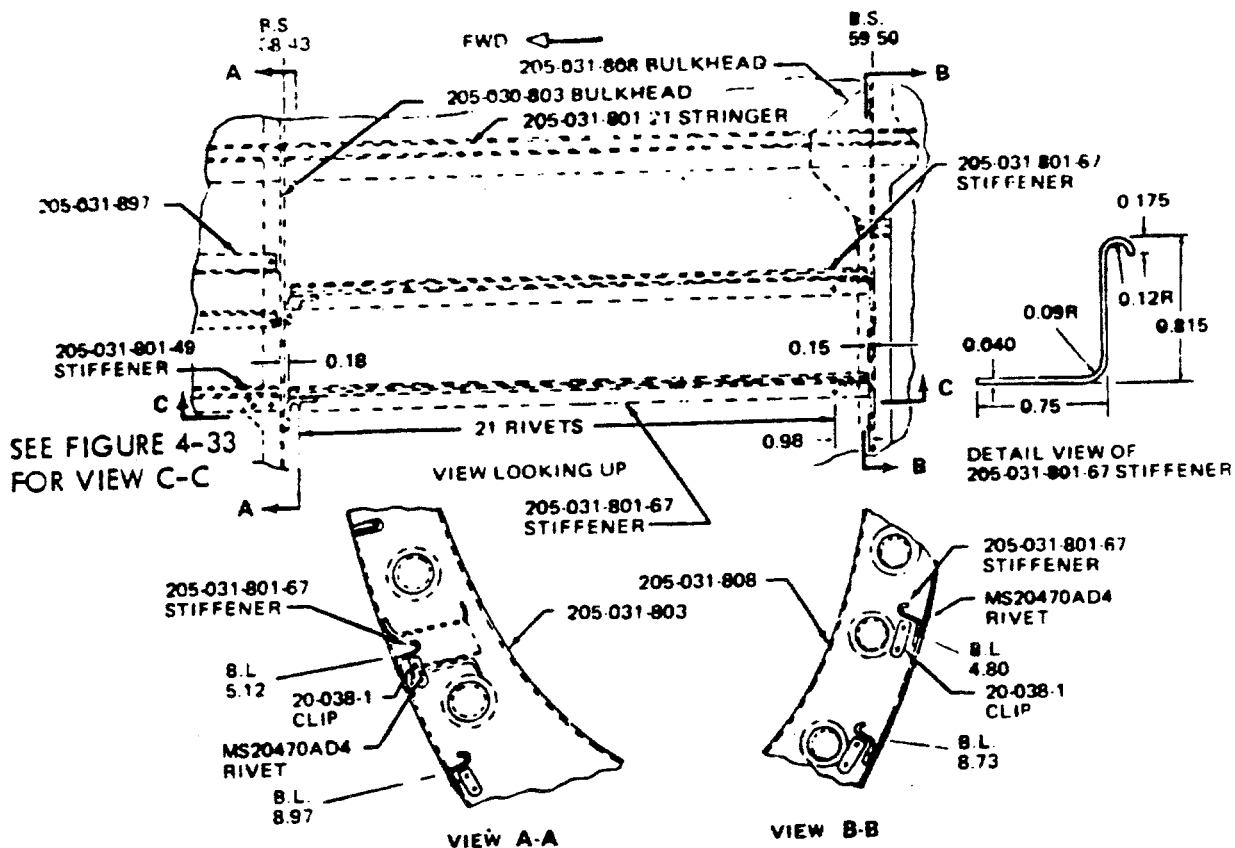


FIGURE 4-31. LOCATION OF STIFFENERS (P/N 205-031-801-67)

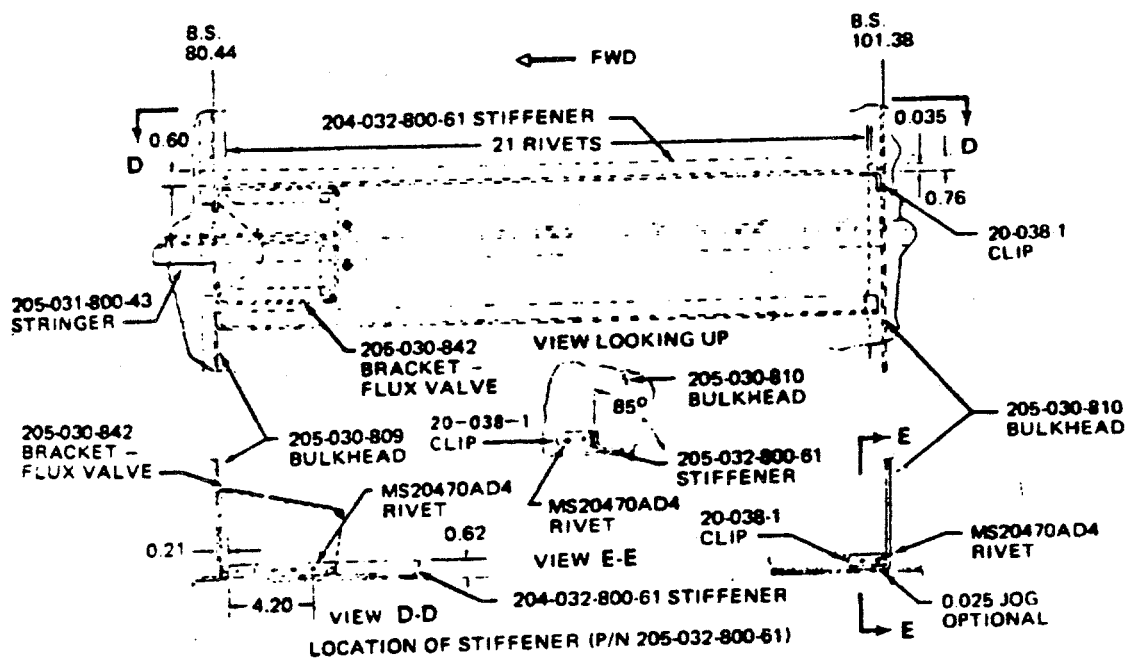
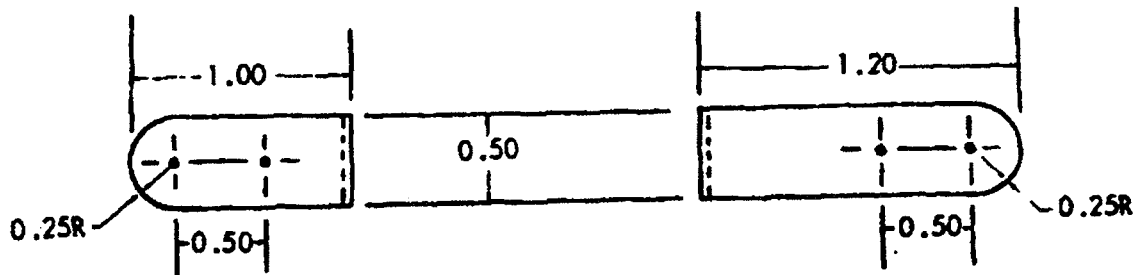
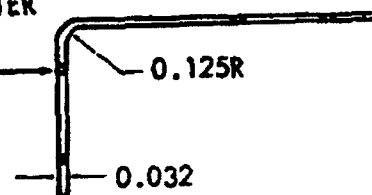


FIGURE 4-32. TAIL BOOM STIFFENER-FABRICATION AND INSTALLATION

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0.040 DIAMETER  
PILOT HOLES  
(4 REQD)



PART NO. 20-0381 CLIP  
MATERIAL ALUMINUM ALLOY 2025-T3

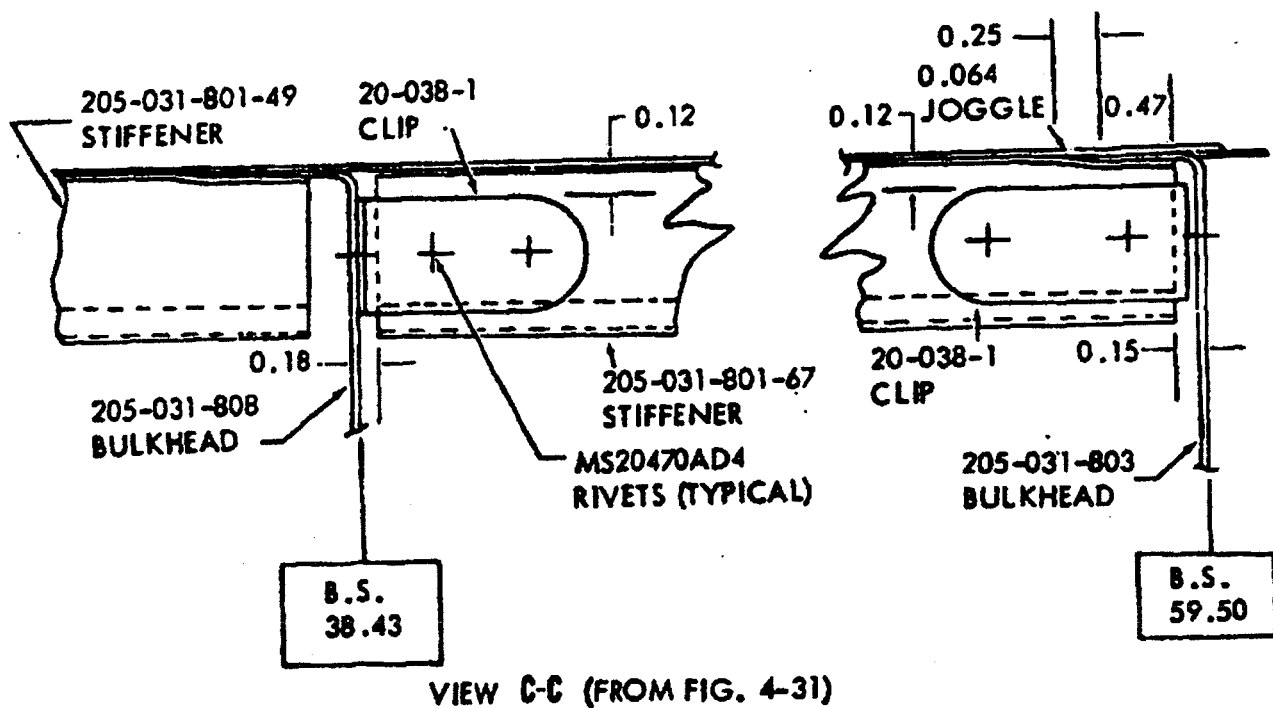


FIGURE 4-33. TAIL BOOM STIFFNER-FABRICATION

(4) Clamp, drill and cleco parts to tailboom skin. After drilling in stiffeners, locate, clamp and drill the (20-038-1) clips. See figures 4-31 and 4-33, view C-C for location of clips.

(5) Remove stiffeners and clips from tailboom. Clean and deburr parts and coat with two (2) coats primer (item 1, table 2-2). Install stiffeners and clips in tailboom using (MS20470AD4) rivets. Insulate for dissimilar materials where applicable.

(6) Fabricate one (1) stiffener from 2024 aluminum alloy T3, 0.040 x 1.8 x 21.5 inch. For details of this stiffener, identified as (205-032-800-61), see figure 4-32, also use dimensions provided for finish length and taper.

(7) Fabricate one (1) each clip (20-038-1) from 2024 Aluminum Alloy T3, 0.032 inch thick (fig. 4-33).

(8) Locate and place stiffener in position, between boom stations 80.44 and 101.38, with the 0.60 inch width leg of stiffener located on left side of the (205-030-842) bracket, as indicated in figure 4-32.

(9) Clamp, drill and cleco parts to tailboom skin and side of (205-030-842) bracket. Locate the one (1) (20-038-1) clip on aft end of stiffener at boom station 101.38, bulkhead (205-030-810), and drill in.

(10) Remove parts from tailboom, clean, deburr, and coat with two (2) coats primer (item 1, table 2-2). Install stiffener and clip in tailboom using (MS20470AD4) rivets. Insulate for dissimilar materials where applicable.

#### 4-39. Rework of 90 Degree Gearbox Attachment Fitting (fig. 4-34).

#### CAUTION

If casting is removed from boom for processing, insure casting is identified against the tailboom serial number. Do not intermix parts.

#### NOTE

Refer to figure 3-7 for limits.

a. Repair chafed flange. Clean chafed area with acetone (item 97, table 2-2). Sandblast or roughen chafed area using No. 60 grit paper (item 56, table 2-2). Clean chafed area with acetone (item 97, table 2-2) and air dry. Immediately coat area with Devcon F (item 57, table 2-2). Devcon is to be in excess of original surface by approximately 1/16 inch. Room temperature cure for 24 hours. File, sand or machine affected area to a smooth contour.

#### NOTE

If casting is removed from tailboom, it shall be anodic treated per MIL-M-45202, Type II, Class A, Grade 3, followed by application of Devcon F (item 57, table 2-2) filler as required to fill to contour. Remove nut plate prior to anodic treatment.



b. Scratches, nicks, dents, and corrosion shall be repaired. Mechanically treat corrosion and all reworked areas per MIL-M-3171, Type VI. No cracks or breaks allowed. Damage, such as nicks, scratches, corrosion, burrs, etc., shall not exceed 0.015 inch deep 0.250 inch square, nor 0.500 inch long on casting body. Main bore shall not exceed 3.713 inches internal diameter before or after repairs. Damage to bore can be same as above dimensions except that not more than three damaged areas are acceptable. Corrosion around rivets is not acceptable.

c. Damage to the stud holes exceeding limitations of figure 3-7 may be repaired as follows:

(1) Ream out existing hole (use remaining fixture, table 2-2) to maximum diameter of  $.3594 + .0003$  inch -  $.0000$ . Maintain hole relationship. If corrosion is still present, the limit shown in figure 4-34B shall be used. If corrosion exceeds the limit of figure 4-34B, replace fitting.

(2) Treat machined surface per MIL-M-3171, Type VI, if casting remains on tailboom. If casting is removed from boom, treat casting per MIL-M-45202, Type II, Class A, Grade 3, followed by a primer coat of Synthetessine 200 (item 68, table 2-2). The coating shall consist of a mixture of one (1) part by volume of synthetessine 200 (item 68, table 2-2), to one (1) part by volume thinner (item 69, table 2-2) to give a  $42 \pm 2$  second viscosity at 80 degrees F using a (Ford No. 4 cup). Spray or dip one light primer coat ( $0.0002 - 0.0003$  inch thickness). Cure coating at 350 degrees F  $\pm 10$  degrees F for 30 minutes.

(3) Fabricate a bushing from 310 or 321 stainless steel. Machine O.D. to  $0.3598 + 0.0002 - 0.0000$  inch, I.D. to  $0.312 + 0.005 - 0.000$  inch and length  $1.07 + 0.06 - 0.00$  inch.

#### NOTE

Machine O.D. to provide an interference fit of 0.0001 to 0.0004 inch.

(4) Heat casting with heat gun in area of bushing replacement for approximately 1/2 hour (Temperature 350 degrees F  $\pm 25$  degrees F). Chill bushing in dry ice (item 63, table 2-2) and alcohol (item 64, table 2-2) for a minimum of 1/2 hour. Remove bushing from dry ice and install in casting using wet primer (item 21, table 2-2).

d. Preparation of spar F.S. 5.08 to F.S. 12.0.

(1) Remove all old sealant and/or adhesive. Avoid removing any of alclad aluminum surface, as much as possible.

(2) Inspect area for damage to surface or rivets holes.

e. Preparation of fitting:

(1) Inspect fitting for excessive casting flaws or other imperfection.

(2) Position fitting in spar in proper location, mark or drill holes to match spar, remove from spar.

f. *Fitting Installation.* Install fitting with pre-seal 890 (item 101, table 2-2) or equivalent sealant meeting requirements of MIL-S-8802. Insure that fitting is seated accurately in place before pre-seal (item 101, table 2-2) cures.

#### 4-39A. Replacement of 90° Support Fitting (UH-1).

The following shall be accomplished when the 90° fitting requires replacement:

a. Remove nonserviceable support fitting.

b. Prepare and install serviceable 90° support except for fin skin, P/N 205-030-899-9, upper portion which rivets to upper R/H side of 90° support.

c. Do not drill hole in support for the upper most skin attach rivet. Remove from skin the uppermost portion where rivet originally was to be installed. Ensure proper edge distance is maintained from lower skin attach rivets and edge of skin is radiused at cut.

- d. Alodine cut edge of metal, drill remaining rivet holes in support and install skin.
- e. See Figure 4-34A, Not to scale.

**4-40. Installation of Air Inlets for Avionics Access Door, (209-030-849-13) and (209-030-849-45) (AG-1G) fig. 4-35 and 4-36).**

- a. Repair tailboom aft access door (209-030-839-13) as follows:

- (1) Remove door (209-030-839-13).
- (2) Locate and cut two (2) holes 3.5 inch diameter as shown in figure 4-35.
- (3) Remove honeycomb material, between the skin surfaces at the hole location to a depth of 0.75 inch (fig. 4-35) fill void area between skin with adhesive (item 16, table 2-2) and allow to cure.
- (4) Using the (205-072-412-1) screen assembly as a pattern, locate and drill six (6) 0.208 to 0.214 inch holes for attachment of each screen.
- (5) Attach (205-072-412-1) screen using six (6) (MS27039DD1-11) screws and six (6) (NAS679A3) nuts. Install one (1) (AN960PD10L) washer under the head and nut for each screw.

- (6) Install door.

- b. Repair tailboom aft access door (209-030-849-45) as follows:

- (1) Remove door.

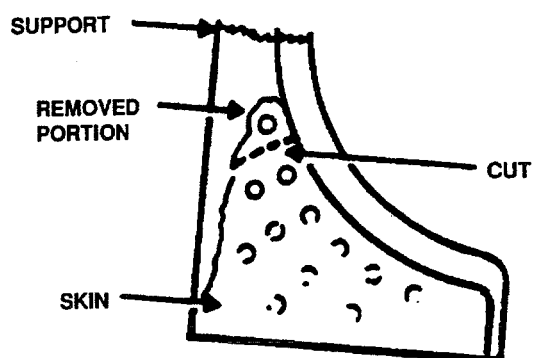
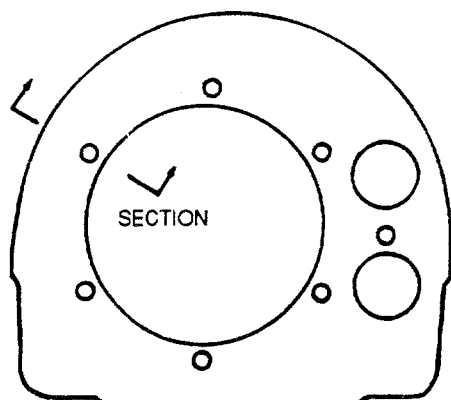
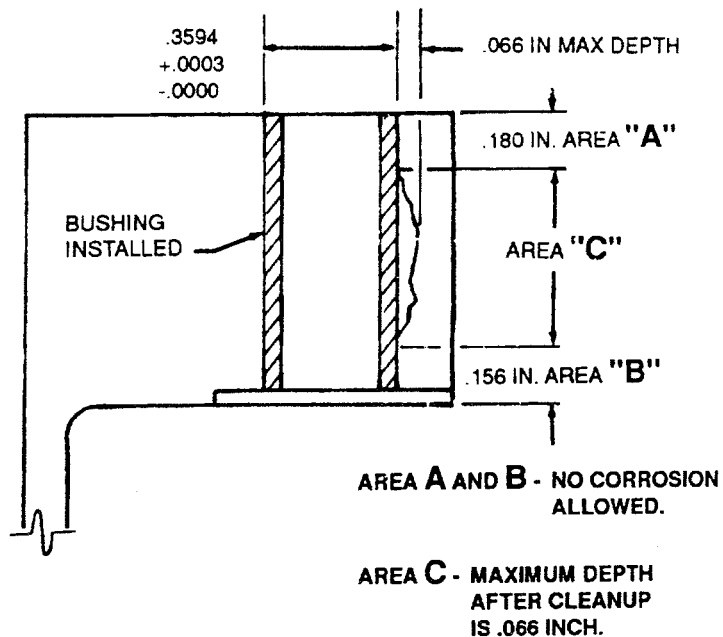


Figure 4-34A. Support Fitting (UH-1)

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VIEW LOOKING DOWN ON  
TOP OF SUPPORT FITTING



#### NOTES

1. The diameter of the 6 gearbox stud holes may not exceed .329 inch after cleanup of corrosion damage. Holes may be repaired by installation of a bushing.
2. If corrosion is still evident after reaming for bushing additional cleanup is authorized, however, the maximum depth of corrosion cleanup cannot exceed the limits shown in this figure.

Figure 4-34B. 90° Gearbox Support Fitting, Corrosion and Repair Limits



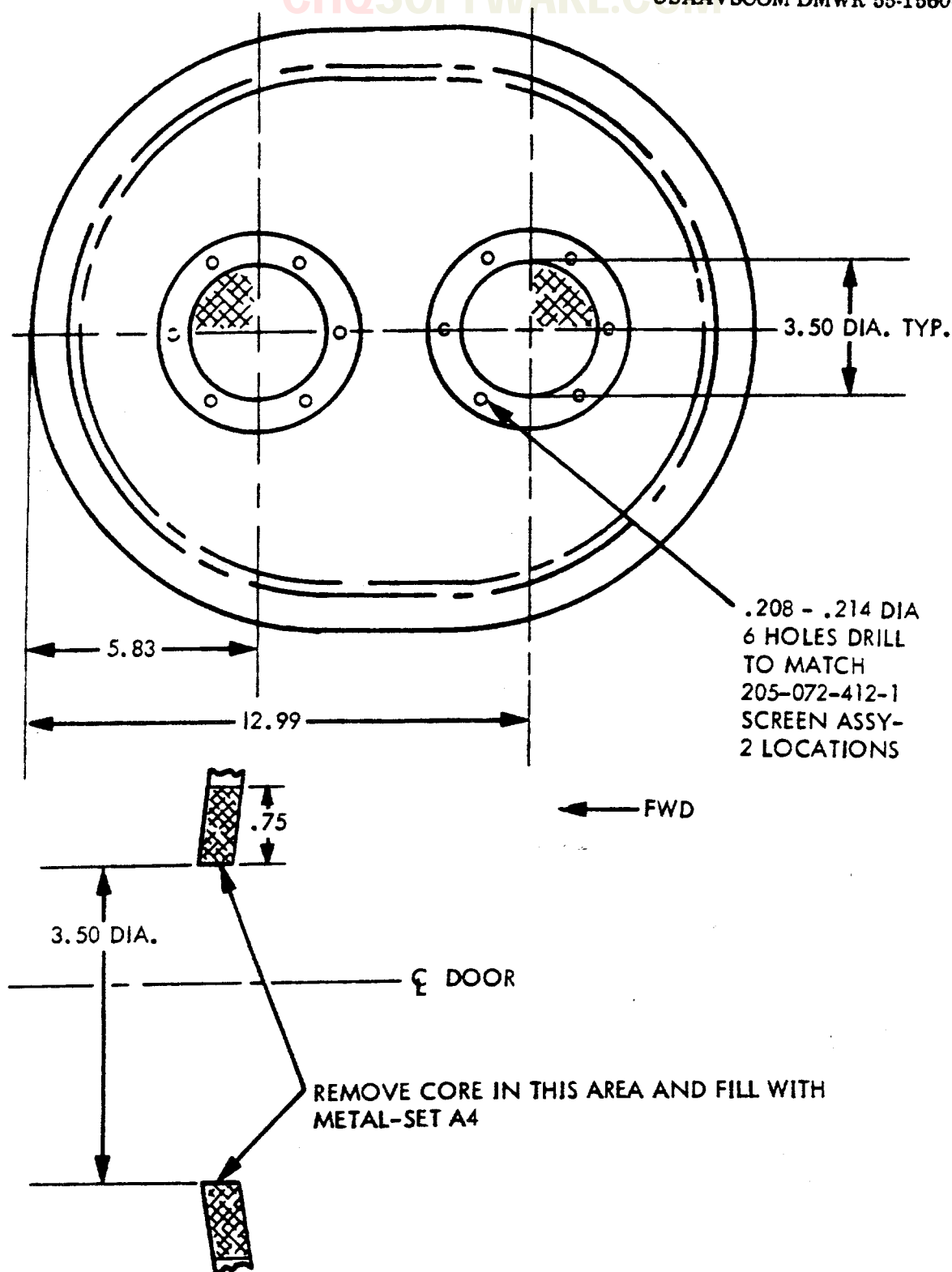


Figure 4-35. DOOR (P/N 209-030-849-13)

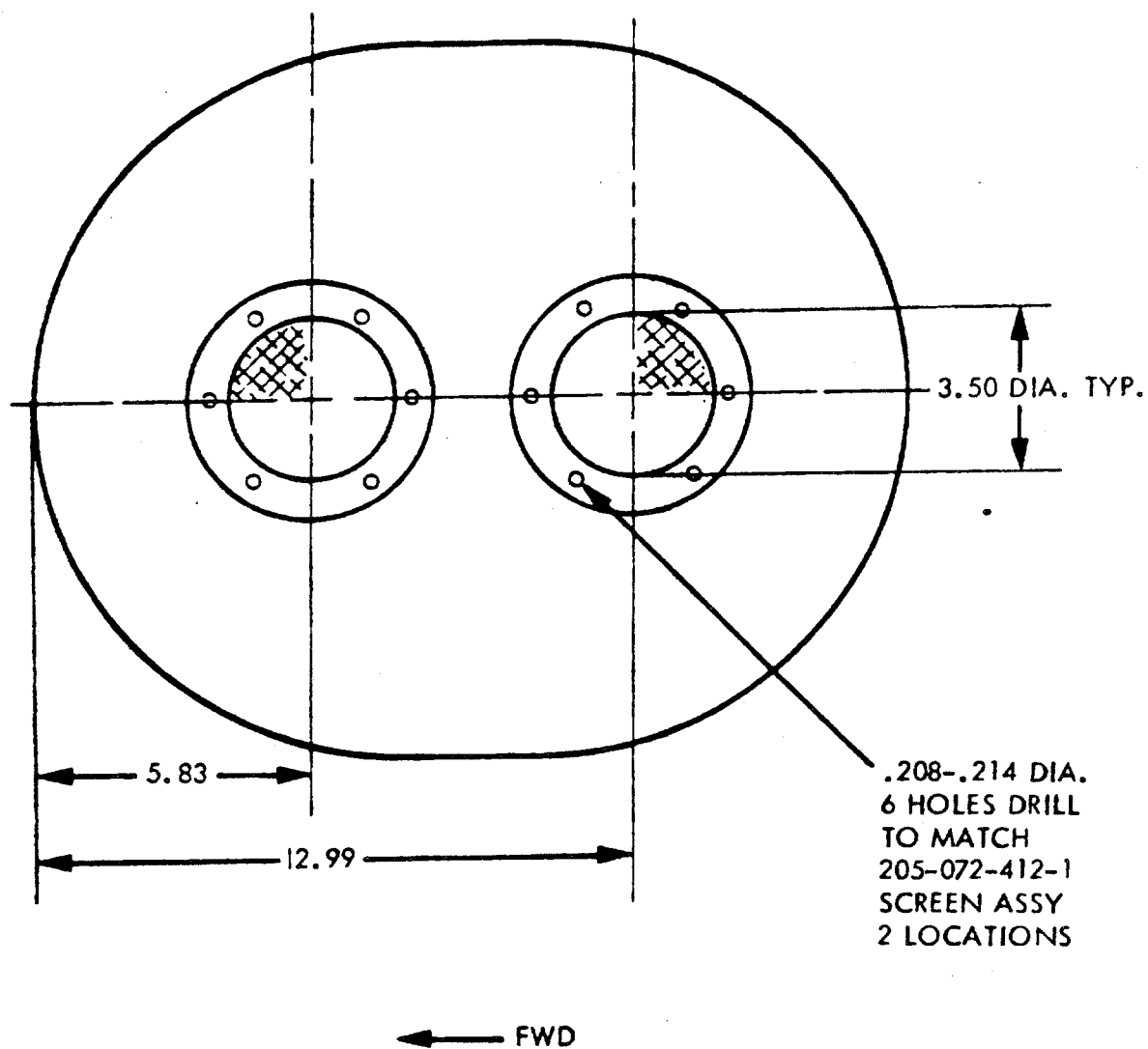


Figure 4-36. AFT ACCESS DOOR (P/N 209-030-849-45)

(2) Locate and cut two (2) holes 3.5 inch diameter as shown in figure 4-36.

(3) Using the (205-072-412-1) screen assembly as a pattern, locate and drill 0.208 to 0.214 inch holes for attachment of each screen (fig. 4-36).

(4) Attach each (205-072-412-1) screen using six (6) (MS27039DD1-09) screws and six (6) (NAS679A3) nuts. Install one (1) (AN960PD10L) washer under the head and nut of each screw.

(5) Install door.

#### **4-41. Repair Procedure for APX-72 Receiver Transceiver Mount Rail AH-1G (fig. 4-37).**

a. The mount rails, (209-030-827-13), consists of two (2) 0.025 x 1.98 x 0.70 inch "C" flanges mounted horizontally between tailbooms stations 41.32 and 63.55. Receiver-transceiver mount MT-3809/APX-72 is attached to the "C" flanges through four (4) (MS21075L4) nut plates. Cracking around any nut plate rivet (MS20426AD3) requires repair modification of all nut plate locations.

b. Repair as follows:

(1) With a hole saw, cut out four (4) nut plates (MS21075L4) within a diameter range of 0.82 to 1.00 inch. Choose minimum diameter to remove nut plate rivet holes and cracking around rivet holes.

(2) Manufacture a 0.050 inch 2024-T3 aluminum alloy, QQ-A-250/15 channel and pick up existing rivets on the original supports, (209-030-827-13). Install removed floating nut plates on manufactured doublers to coincide with locations given in figure 4-37.

(3) Surface preparation of doubler:

(a) Alodine treat per MIL-C-5541.

(b) Apply primer (item 11, table 2-2).

(c) Paint doubler with lusterless olive drab paint (item 70, table 2-2).

(d) Prior to installation of the doubler channel, apply barrier tape (item 62, table 2-2) MIL-T-23142 between contact surfaces.

#### **NOTE**

Doubler (209-961-013-7) must be removed at time repair is accomplished.

**4-42. Repair of AH-1G Antenna Mounting Surfaces (209-030-800-101).** Cracks in antenna mounting surface, not extending into a radius, shall be stop drilled at each end using a No. 40 drill. Fabricate a doubler from 0.063 inch, 2024-T42 material to match pan surface on the interior of tailboom. Ensuring doubler is sufficient in length to extend a minimum of one (1) inch beyond the existing forward and aft antenna mount screw holes, remove existing plate nuts and install doubler using (MS20426AD4) rivets. Rivet pattern shall be flush on near side, maintaining edge distance two (2) x rivet diameter with one (1) inch spacing, single row. Install plates nuts on doubler to match holes in pan surface. Fill stop drilled holes and cracks with Metalset (item 16, table 2-2) and smooth to surrounding area. Cracks extending into any radius of pan will require pan replacement.

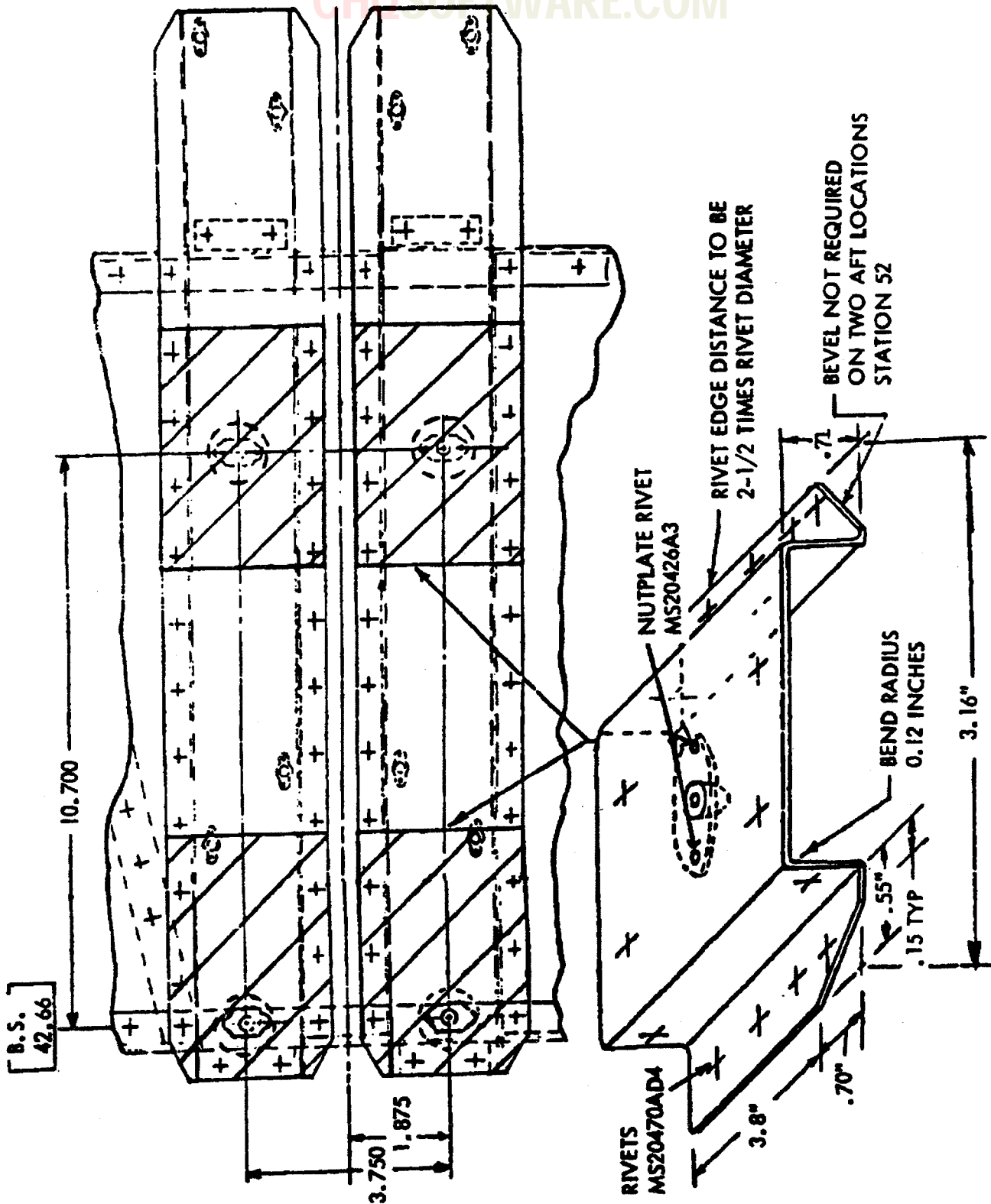


FIGURE 4-37. APX-72 RECEIVER TRANSCEIVER MOUNT RAIL

**4-43. Repair of Lower Attach Fittings; B.S. 227.0 AH-1G, AH-1S (MOD) and UH-1M (fig. 4-38).** Hi-loc fasteners may be used in place of Hi-shear fasteners in R/H and L/H fittings. Fasteners found loose shall be replaced. When tailboom skin has been chafed or worn through by heads of fasteners, a lay-on patch must be installed. Lay-on patch shall match contour of the tailboom and extend from the first stringer above the L/H fitting to the first stringer above the R/H fitting and from B.S. 227.0 forward six(6) existing fasteners on each stringer. Material to be same as tailboom skin to one gauge thicker. Pickup all existing fasteners and add same type and size on leading edge of patch to conform with rivet pattern used in stringers.

**4-43A. Repair of Lower Bulkhead.**

a. Inspect bulkhead web in tailskid block area of bulkhead B.S. 227 as follows:

(1) Dye-penetrant check (MIL-I-6866) area between the right and left fitting, T/L to fin, for cracks.

(a) Cracks found in area of anchor nuts which terminate at anchor nut mount rivets, screw hole or tailskin hole itself may be repaired as outlined below.

(b) Cracks which are found to extend into radius of bulkhead shall have bulkhead replaced or standard repair doubler installed. (AEM FESA 7038 dtd Oct 74.)

a. Repair of bulkhead web – Cracks described in 1.a above may be stop drilled using #40 drill bit. Reinforcement plate on forward side of bulkhead is not to be drilled. Fabricate a doubler from same material as bulkhead web, same thickness or one gauge thicker, to nest on aft side of web between fittings of T/B to fin. Doubler to extend upward to give E.D. of rivets retaining the forward reinforcement plate. Plate-nuts for tailskid retaining block are to be replaced with floating type nuts and the nut retaining screws shall be used to attach the doubler to the bulkhead web. The doubler shall extend downward to the lower edge of bulkhead and have a flange turn forward nesting against bulkhead. Add fasteners in spaces between plate-nuts as spacer permits.

**NOTE**

Doubler may be fabricated from repair part P/N 205-030-819-9-1.

b. Tailbooms received with a doubler on the aft side of F.S. 227 bulkhead shall have the doubler removed and inspected IAW A.1 above.

**4-44. Repair Fin Skin B.S. 227.0 (fig. 4-39).**

a. Remove fairing assembly (204-030-768-1) and inspection panels (205-030-899-51) on the tailboom, approximately B.S. 227.0. Any AH-1 tailboom found to have tail rotor securing (tie down) loop mounted in the honeycomb portion of the fin panel shall have loop removed. The inserts for mounting the loop shall be filled with A-4 Metalset (item 16, table 2-2) or EA934 (item 19, table 2-2). Allow filling to cure 24 hours and smooth to surrounding area. Relocate loop to R/H flange of forward fin spar at same F/S as the remove from.

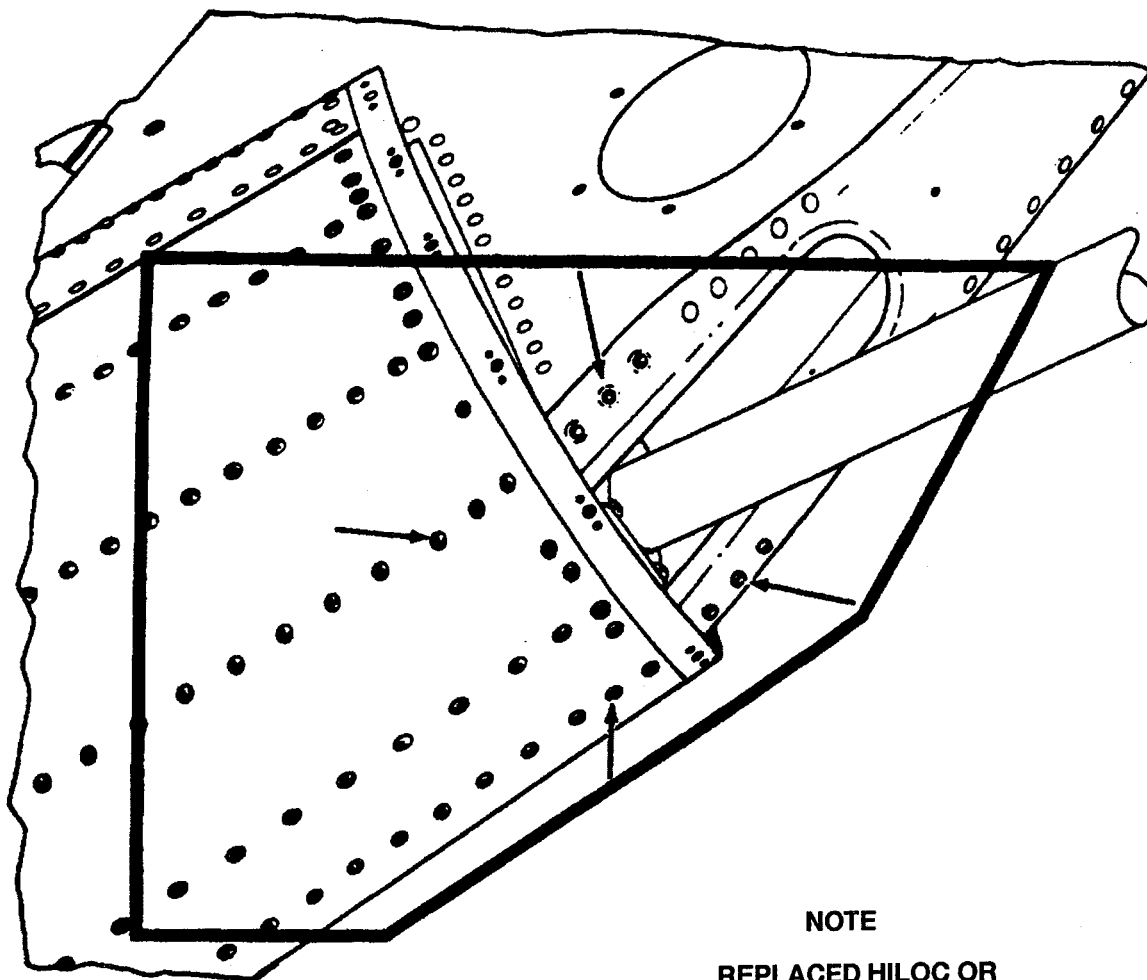
b. Inspect the left and right hand sides of the tailboom in the area of the doubler installation as indicated in figure 4-39 for evidence of skin cracking.

**NOTE**

Stop drill any crack using a No. 40 drill; clean and deburr drilled holes.

c. Fabricate two (2) doublers as shown in figure 4-39 and paint with primer (item 1, table 2-2).

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NOTE  
REPLACED HILOC OR  
HISHEAR FASTENERS.

FIGURE 4-38. REPAIR OF LOWER ATTACH FITTINGS

**4-45. Structural Bonding Al Aly 2024-T3.**

- a.* The number of batches of adhesive mixed for each application should be held to a minimum. Attempt to mix a batch of sufficient quantity to cover work on hand. Do not exceed the pot life of the mixture.
- b.* Surfaces to be bonded shall be degreased with methyl-ethyl-ketone (item 5, table 2-2) and acid etched. Rinse with distilled water. For best results, adhesive should be applied to the surface as soon after drying as possible.
- c.* Adhesives approved for use on Al Aly 2024-T3 with room temperature cure (75 degrees and above):
- (1) EPON 934 (item 71, table 2-2) parts A and B.
  - (2) Adhesive (item 16, table 2-2).
- d.* Spread a thin layer of adhesive evenly on each of the surfaces to be bonded. Parts should be assembled immediately after spreading the adhesive.
- e.* A minimum of 24 hours is required for room temperature cure. When possible, adhesive should be cured under heat lamp. Parts should be handled as little as possible during cure. Parts must be kept aligned during cure.

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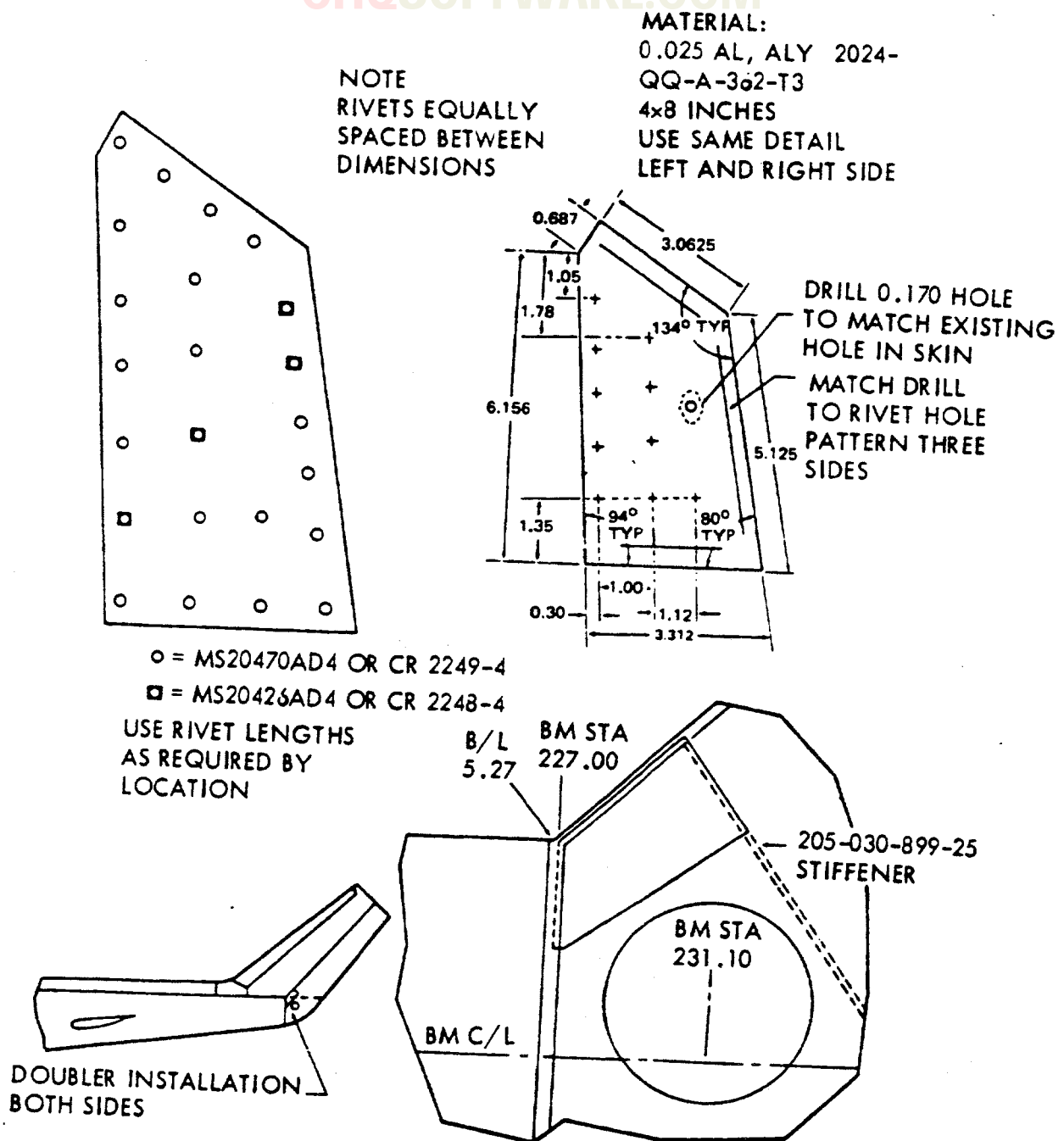


FIGURE 4-39. TAILBOOM DOUBLER INSTALLATION

**4-46. Repair of Damaged Longerons (fig. 4-40).** Only one repair may be made on each longeron in any one bay area. No repairs allowed in forward bay and splice joints must be aft of second bay.

**4-47. Repair Damaged Stringers (J Sections) (fig. 4-41).**

- a. Only one repair per stringer in any one bay area is permitted.
- b. Refer to figure 3-11A for damage limits.

**4-48. Repair Fin Spar at Fin Station 10.08 (UH-1 Series) (fig. 4-43).**

a. Inspect spar cap at fin station 10.08 for chafing wear cracks. All cracks and chafing in excess of 10% of cap thickness shall be repaired. Chafing that does not exceed 10% of cap thickness shall be cleaned and dye penetrant checked for cracks. If no cracks are indicated, surface shall be cleaned and protected with two (2) coats of primer (item 1, table 2-2).

b. Repair as follows:

(1) Remove rivets from port side of 90 degree gearbox attachment fitting and in forward spar, approximately 15 to 17 inches from aft end of spar. Remove rivets from starboard side as required to remove fitting.

(2) Cut spar approximately 12 inches (fin station 17.08) from aft end of spar.

#### CAUTION

Exercise extreme caution to prevent cutting into existing spar web.

(3) Separate and remove damaged spar cap section. Use dry ice (item 63, table 2-2) to separate bond if necessary.

(4) Install insert (fig. 4-43) between the 90 degree gearbox attachment fitting and spar, burring existing spar cap. Install doubler on inboard side of spar. All mating parts shall be bonded with EPON 934 (item 71, table 2-2) and clamped and riveted during the adhesive pot life. Pick up existing rivet holes and new rivets.

(5) Paint repaired area with two (2) coats primer (item 1, table 2-2).

**4-49. UH1-ST0019 Spar Cap Flange Repair.**

a. Fabricate a doubler .032 inch thick, 321 or 301 1/4 hard stainless steel to nest on the outboard side of L/H forward spar flange extending forward from 1 inch from end of spar forward to 10.5 inches from end of spar. Doubler to be 2 inches wide from lower edge to top of upper flange radius. Identify as repair part UH1-ST0019.

b. *Installation Procedure:*

(1) When driveshaft cover flange is cracked in the F/S 10.80 area and crack does not progress down to the spar web, the crack shall be stop drilled with a #30 drill. Cracks extending from receptacle hole to upper edge of flange may be repaired using the fabricated doubler. Severely chafed area surrounding receptacle may be repaired by use of the doubler.

(2) Remove receptacle and rivets necessary to insert fabricated doubler between the spar flange and skin doubler. Nest doubler into joggle of spar flange. Mark receptacle hole, receptacle retaining rivet holes, and rivet holes at upper end of spar. Mark all holes of original skin installation rivet pattern and holes for attaching doubler to flange which will have to be dimpled for flush type rivets for driveshaft cover fit. Remove doubler from fin assembly and drill or punch holes marked and dimple those required. Countersink holes in flange to receive dimples installed in doubler. Chamfer forward end of doubler for smooth skin installation. Coat surface of doubler, which will nest against spar flange, with EA934 or equivalent adhesive and insert doubler between spar flange and skin doubler. Install rivets while adhesive is wet.

4-50. Inspection and Repair of Elevator Rigging Rivets. Inspect the three (3) or six (6) rigging rivets approximately 20 inches aft of the elevator mount centerline location. Location to be within  $\pm 0.030$  inch. Use tools 74SAVAE-D0011 (B/C/M), and 74 SVAE-D0017 (D/H) (AH-1G) for inspection and repair of rivets. Where rivets are mislocated, use previous repairs as applicable to correct structural defects. (Reference figure 4-44A for Decal and Rigging Rivet Installation.)

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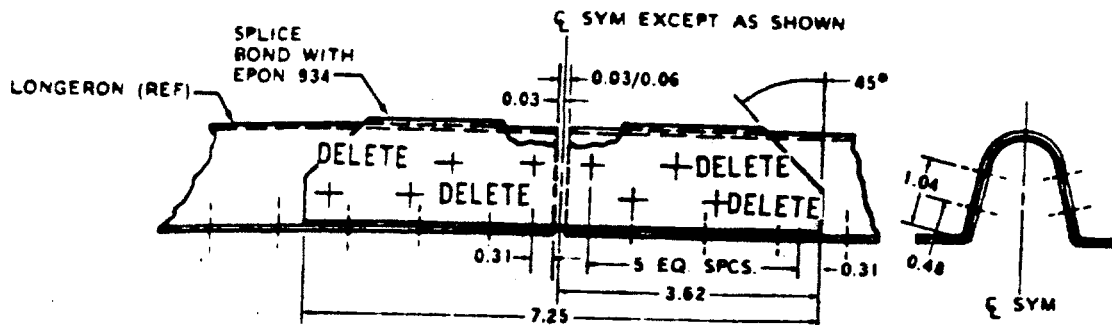
MATERIAL CHART									
NOTE: On all repairs requiring like material, 7075-T6 Al Aly is to be used with the following thickness									
TAILBOOM MODEL	QUADRANT LOCATION	BOOM STATION LOCATION	NOMEN-CLATURE	MATERIAL THICKNESS					
				0.025	0.032	0.040	0.050	0.063	0.071
204	Upper L.H.	B.S. 0-66	Longeron			X			
204	Upper L.H.	B.S. 66-106	Longeron			X			
204	Upper L.H.	B.S. 106 Aft	Longeron	X					
204	Upper L.H.	B.S. 66	Splice		X				
204	Upper L.H.	B.S. 106 & 175	Splice	X					
204	Lower L.H.	All	Longeron		X				
204	Lower L.H.	All	Splice			X			
204	Upper R.H.	All	Longeron & Splice	X					
204	Lower R.H.	All	Longeron & Splice			X			
205	Upper L.H.	All	Longeron & Splice	X					
205	Lower L.H.	All	Longeron & Splice		X				
205	Upper R.H.	All	Longeron & Splice		X				
205	Lower R.H.	B.S. 63 Aft	Longeron & Splice			X			
205	Lower R.H.	B.S. 17-63	Longeron & Splice				X		
209	Upper L.H.	B.S. 41-94	Longeron			X			
209	Upper L.H.	B.S. 94 Aft	Longeron	X					
209	Upper L.H.	All	Splice			X			
209	Lower L.H.	All	Longeron & Splice					X	
209	Upper R.H.	B.S. 41-133	Longeron					X	
209	Upper R.H.	B.S. 133 Aft	Longeron				X		
209	Upper R.H.	All	Splice					X	
209	Lower R.H.	B.S. 41-94	Longeron						X
209	Lower R.H.	B.S. 94 Aft	Longeron					X	
209	Lower R.H.	All	Splice						X

Figure 4-40. REPAIR OF DAMAGED TAILBOOM LONGERONS (SHEET 1 OF 7)

APPLICATION CHART			APPLICABLE APPLICATION (Shown on Following Sheets)						
ITEM	MODEL	DESCRIPTION AND LOCATION OF LONGERON DAMAGE	A	B	C	D	E	F	G
1	204	Forward of B.S. 52.5 requiring removal (cut at B.S. 52.5)	X						
2	204	Between B.S. 52.5 and 66.5 for upper L.H. only requiring removal (cut at B.S. 52.5)	X						
3	204	Aft of B.S. 52.5 for upper R.H., lower R.H. and lower L.H. requiring removal less than 8.0			X				
4	204	Aft of B.S. 66.0 for upper L.H. only requiring removal less than 8.0			X				
5	204	Aft of B.S. 52.5 for upper R.H., lower R.H. and lower L.H. requiring removal of more than 8.0				X			
6	204	Aft of B.S. 66.0 for upper L.H. only requiring removal of more than 8.0				X			
7	204	Aft of B.S. 52.5 where part of removed section will be in the same bay as an existing splice					X		
REFER TO PARAGRAPH 4-46									
3	205	Aft of B.S. 56.0 requiring removal of less than 8.0			X				
4	205	Aft of B.S. 56.0 requiring removal of more than 8.0				X			
5	205	Aft of B.S. 56.0 where part of removed section will be in the same bay as an existing splice					X		
3	209	Aft of B.S. 94.3 requiring removal of less than 10.5			X				
4	209	Aft of B.S. 94.3 requiring removal of more than 10.5				X			
5	209	Aft of B.S. 94.3 where part of removed section will be in the same bay as an existing splice					X		
1	All	DELETE longerons with minor damage						X	
2	All	Holes in longerons not exceeding 1.0 diameter after cleanup and a minimum of 24.0 from attach fittings							X

Figure 4-40. REPAIR OF DAMAGED TAILBOOM LONGERONS (SHEET 2 OF 7)

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TYPICAL SPLICE INSTALLATION TO REPAIR DAMAGED LONGERONS.  
FOR 204 AND 205 (UH-1) TAIL BOOMS ONLY.

DETAIL A

**CAUTION:** Before making longeron repair or longeron replacement, refer to figure 3-41.

**APPLICATION A:**

As noted on Application Chart, sheet 2.

**LIMITATION APPLICATION A:**

See CAUTION above.

**PARTS REQUIRED:**

- (1) A front section longeron assembly and a splice fabricated from an existing longeron. See material chart, sheet 1.

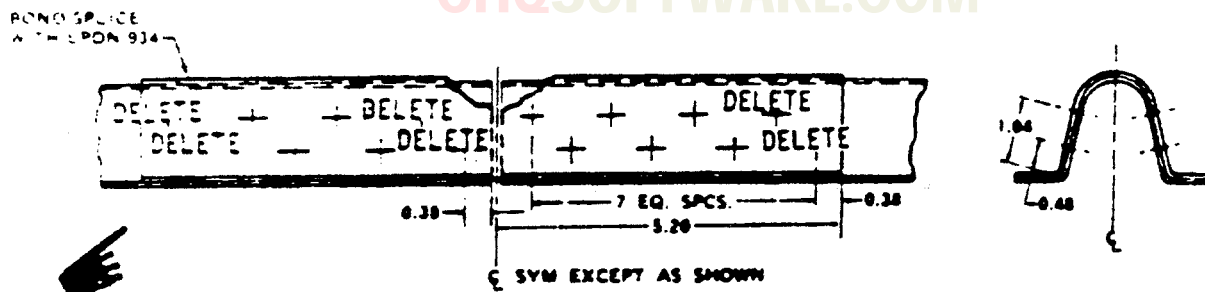
**PROCEDURE A:**

Reference detail A.

- (1) Cut longeron at boom station for applicable model as noted on application chart, sheet 2. Center cut between existing rivets. Remove forward section.
- (2) Install new forward assembly with 0.03-0.06 gap between new and existing section.
- (3) Apply Epon 934 and bond splice centered over gap between new and existing section. Pick up existing rivet pattern and add rivets in pattern, as shown in detail A, while Epon 934 is still tacky.

Figure 4-40. REPAIR OF DAMAGED TAILBOOM LONGERONS (SHEET 3 OF 7)

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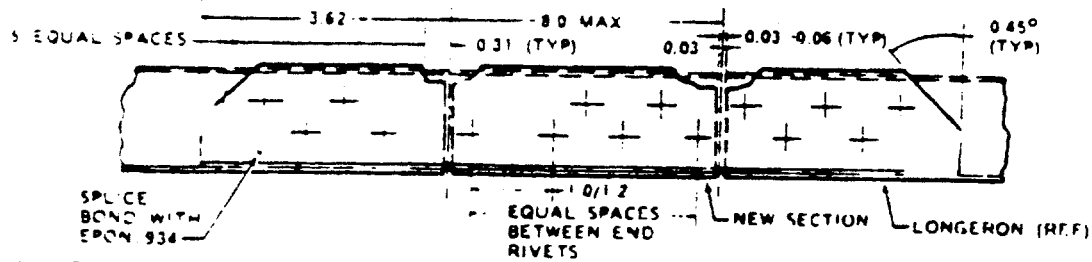


TYPICAL SPICE INSTALLATION TO REPAIR DAMAGED LONGERONS FOR 209 TAIL BOOMS ONLY (SAME AS DETAIL A EXCEPT AS SHOWN)

DETAIL A-1

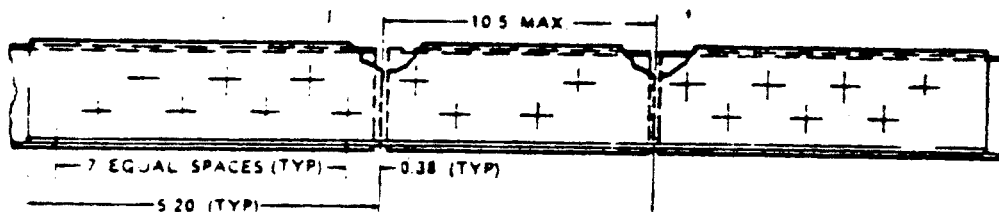
Figure 4-40. REPAIR OF DAMAGED TAILBOOM LONGERONS (SHEET 4 OF 7)





TYPICAL SPLICE INSTALLATION TO REPAIR DAMAGED LONGERONS FOR 204 AND 205 (UH-1) TAIL BOOMS ONLY, FOR APPLICATION C. FOR DIMENSIONS NOT SHOWN SEE DETAIL A.

DETAIL C



TYPICAL SPLICE INSTALLATION (SAME AS SHOWN ON DETAIL C, EXCEPT AS SHOWN), FOR APPLICATION C ON 209 (AH-1) TAIL BOOMS ONLY.

DETAIL C-1

#### APPLICATION C:

As noted on Application Chart, sheet 2. Reference Detail. Reference Details C and C1.

#### LIMITATIONS APPLICATION C

- (1) See CAUTION on sheet 3.
- (2) If part of the removed section is in the same bay as an existing splice of that longeron, repair as per Procedure E.

#### PARTS REQUIRED:

A like section same as removed section and a like section of longeron long enough to overlap existing longeron forward and aft of butt joints, as shown in detail C. See Material Chart, sheet 1.

#### PROCEDURE C:

Reference detail C and C1 and Application Chart, sheet 2.

- (1) Cut and remove longeron as required (maximum per detail C or C1. Center longeron cuts between rivets. 0.03-0.06
- (2) Replace with like section, maintain 0.03-0.06 gap between joints.
- (3) Install the overlapping section with Epon 934.

DELETE Rivet pattern as shown in details C and C1, while adhesive is still tacky.

Figure 4-40. REPAIR OF DAMAGED TAILBOOM LONGERONS (SHEET 5 OF 7)

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**APPLICATION D:**

As noted on Application Chart, sheet 2. Reference detail C1.

Text deleted.

**LIMITATIONS APPLICATION D:**

- (1) See CAUTION on sheet 3.
- (2) If part of the removed longeron section is in the same bay as an existing splice of that longeron, repair as described in Procedure E.

**PARTS REQUIRED:**

1. Like butt section of longeron same as removed section and two splices fabricated from matching section of existing longeron.
2. Text deleted.

**PROCEDURE D:**

- (1) Cut longeron two places as required, 7.0 inches from bulkhead. Do not make cuts in same bay. Center cut between existing rivets. Remove damaged section.
- (2) Replace longeron with like section, maintaining 0.03 to 0.06 gap between joints.
- (3) Install splices as directed in Procedure A.

**APPLICATION E:**

Longeron damage where part of removed section will be in the same bay as an existing splice of that longeron, as noted on Application Chart, sheet 2.

**PRIOR APPROVAL:**

No Engineering authorization required.

**LIMITATIONS APPLICATION E:**

See CAUTION on sheet 3.

**PARTS REQUIRED:**

1. Like section of longeron same as removed section and splice fabricated from matching sections of existing longeron.
2. Text deleted.

**PROCEDURE E:**

- (1) Cut damaged longeron as required, 7.0 inches from bulkhead. Center cut between rivets.
- (2) Remove rivets attaching splice to damaged longeron.
- (3) Remove damaged section and replace with like section.
- (4) Install splice as directed in Procedure A.
- (5) Bond new section to existing splice with Epon 934. Install rivets while adhesive is still tacky.

Figure 4-40. REPAIR OF DAMAGED TAILBOOM LONGERONS (SHEET 6 OF 7)

## APPLICATION F:

For longerons with minor damage, as noted on Application Chart, sheet 2.

Text Deleted.

## LIMITATIONS APPLICATION F:

See CAUTION on sheet 3.

## PARTS REQUIRED:

1. A like section of longeron long enough to overlap any damage by 3.75 inches both ends for 204 and 205 (UH-1) and 5.26 inches for 209 (AH-1) tail booms. See Material Chart, sheet 1.
2. Text deleted.

## PROCEDURE F:

- (1) Hand form if required.
- (2) Dye check for cracks. Stop drill with No. 40 drill if required.
- (3) Install overlapping like section as directed in Procedure C.

## APPLICATION G:

For holes in longerons not exceeding 1.0 inch diameter after cleanup and a minimum of 24.0 inches from attachment fitting, and a minimum of 5.0 from existing splice or repair. As noted on Application Chart, sheet 2.

Text deleted.

## LIMITATIONS:

See CAUTION on sheet 3.

## PARTS REQUIRED:

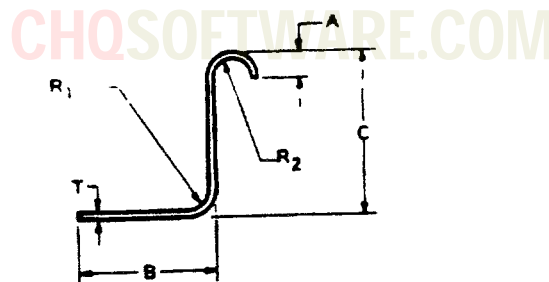
1. A like filler section same as removed section and an overlapping like section 8.0 long. See Material Chart, sheet 1.
2. Rivets: AAQ6 - NAS1738B6

## PROCEDURE G:

- (1) Clean out damage to a maximum of 1.0 inch diameter and replace with a filler if in flange only.
- (2) Install overlapping section per Procedure C, Step(3).

NOTE: If damage is in the hat crown area install full hat. Otherwise install 1/2 hat section.

Figure 4-40. REPAIR OF DAMAGED TAILBOOM LONGERONS (SHEET 7 OF 7)



### REPAIR FOR DAMAGED TAIL BOOM "J" SECTIONS

PART NUMBER (BELL STANDARD)	± 0.015	B	C ± 0.015	R <sub>1</sub>	R <sub>2</sub>	T	DEVEL. WIDTH
110-001-1	0.175	0.75	0.815	0.09	0.12	0.032	1.775
110-001-3	0.175	0.75	0.815	0.09	0.12	0.040	1.775
110-001-5	0.220	0.93	1.000	0.16	0.16	0.063	2.163
110-001-7	0.215	0.71	0.815	0.09	0.16	0.040	1.818
110-001-9	0.283	0.87	1.000	0.12	0.22	0.063	2.246

**MATERIAL:** Aluminum Alloy Clad, 7075-0, QQ-A-250/13

**TENSILE:** Heat Treat to T-6 in Accordance with MIL-H-6088

**LIMITS UNLESS OTHERWISE NOTED:** .XX ± 0.03  
.XXX ± 0.010

**NOTE** For all repairs requiring like material, Bell Standard 110-001 must be used. Dash number is determined by existing stringer size and thickness.

#### APPLICATION A:

For damaged stringers requiring removal of a section.

#### PARTS REQUIRED:

- (1) Like butt section same as removed section.
- (2) Overlapping like section long enough to pick up five existing rivets in horizontal flange both sides of joint.

Figure 4-41. REPAIR OF DAMAGED TAILBOOM "J" SECTIONS (SHEET 1 OF 2)

**PROCEDURE A:**

- (1) Cut out and remove damaged section. Center cut between existing rivets.
- (2) Replace with like section.
- (3) Install the splice centered over joint with Epon 934. Pick up five existing rivets each side of joint and add five additional rivets each side of joint in vertical flange.

**PRIOR APPROVAL:** No engineering authorization required application "A".

**APPLICATION B:**

For bent stringers not requiring section removal.

**PARTS REQUIRED:**

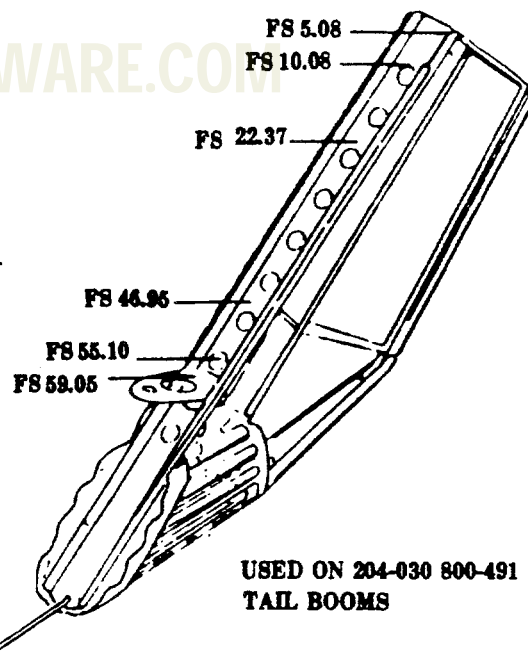
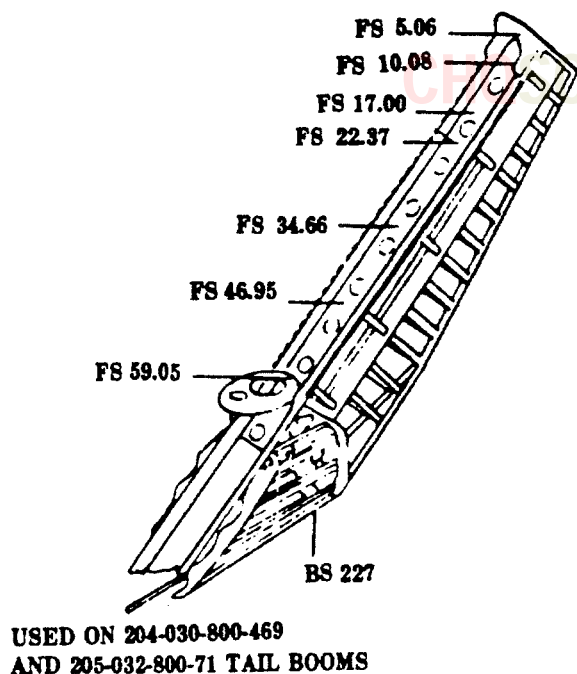
None.

**PROCEDURE B:**

Hand form and dye check for cracks.

**PRIOR APPROVAL:** Engineering authorization required application "B".

**Figure 4-41. REPAIR OF DAMAGED TAILBOOM "J" SECTIONS (SHEET 2 OF 2)**



**REPAIR FOR DAMAGED FORWARD SPAR OF VERTICAL FIN FOR 204 030-800-469, 204 030-800-491, 205-032-800-71 TAIL BOOMS**

**APPLICATION A:**

For damage to forward vertical fin spar that does not extend below fin station 28.5

**MATERIALS REQUIRED:**

- (1) Prior Approval. No engineering authorization required.
- (2) Like Section of Forward Vertical Fin Spar.
- (3) R204.0044-1 Doubler (see sheet 2). (one each required).
- (4) R204.0044-7 Doubler (two required). (See sheet 2).
- (5) R204.0044-5 Doubler (see sheet 2). (one each required).
- (6) HS40P.4.2, HS40P.4.3, HS40P.4.4 and HS40P.4.5, MS20470AD4, MS20426AD4 Rivets.

**PROCEDURE A:** NOTE: Tail Boom shall be supported in tail boom holding fixture.

- (1) Remove angle from lower side of forward spar and save for reinstallation.
- (2) Remove damage by cutting forward spar at fin station 28.5. Cut is to be made such that remaining rivet holes have proper edge distance.
- (3) Butt splice in a forward spar section like remove section using R204.0044-7 doublers on each side of forward spar as shown on sheet 3.
- (4) Reinstall angle removed in step (1).

**APPLICATION B:**

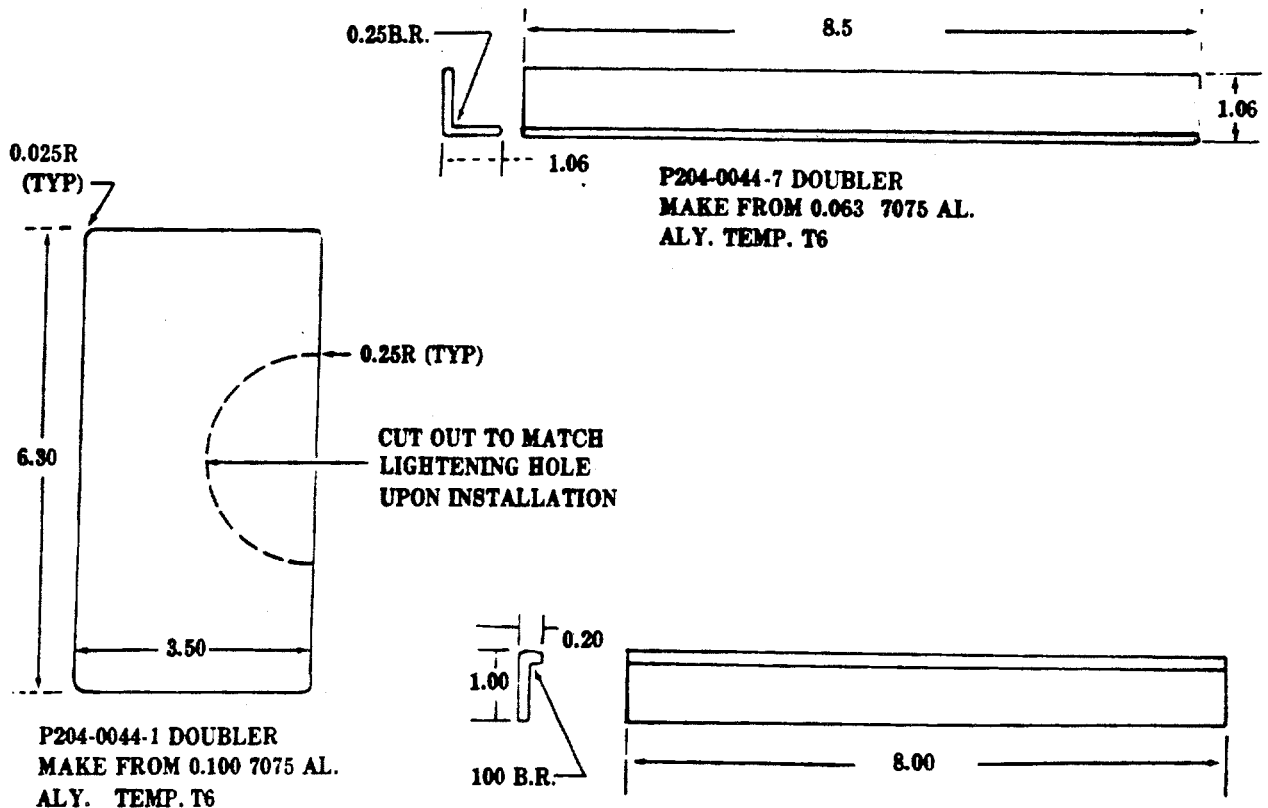
For severe damage to forward spar that does not extend below fin station 40.8.

**MATERIALS REQUIRED:**

- (1) Prior Approval. No Engineering authorization required.
- (2) Like section of forward vertical fin spar.
- (3) R204.0044-1 and R204.0044.5 doublers (one each required).
- (4) R204.0044-7 doubler.
- (5) HS40P-4-2, HS40P-4-3, HS40P-4-5, MS20470AD4 and MS20426AD4 rivets.

Figure 4.42. REPAIR OF FORWARD SPAR, VERTICAL FIN (Sheet 1 of 3)

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20-532-217-3

# PROCEDURE B:

Note: Tail boom shall be supported in tail boom holding fixture.  
Same as procedure A except:

- (1) Cut forward spar at fin, station 40.8 instead of fin, station 28.5.

## NOTES:

- |  |   |                                              |
|--|---|----------------------------------------------|
|  | 4 | Indicates MS20426AD4 Rivets                  |
|  | 4 | Indicates MS20470AD4 Rivets                  |
|  |   | Indicates HS40P-4 Rivets                     |
|  |   | Center each doubler over cut in forward spar |

## APPLICATION D:

This repair may be used for damage which does not require splicing: (punctures, dents, chafing, etc.) omit doublers to undamaged parts

## MATERIALS REQUIRED:

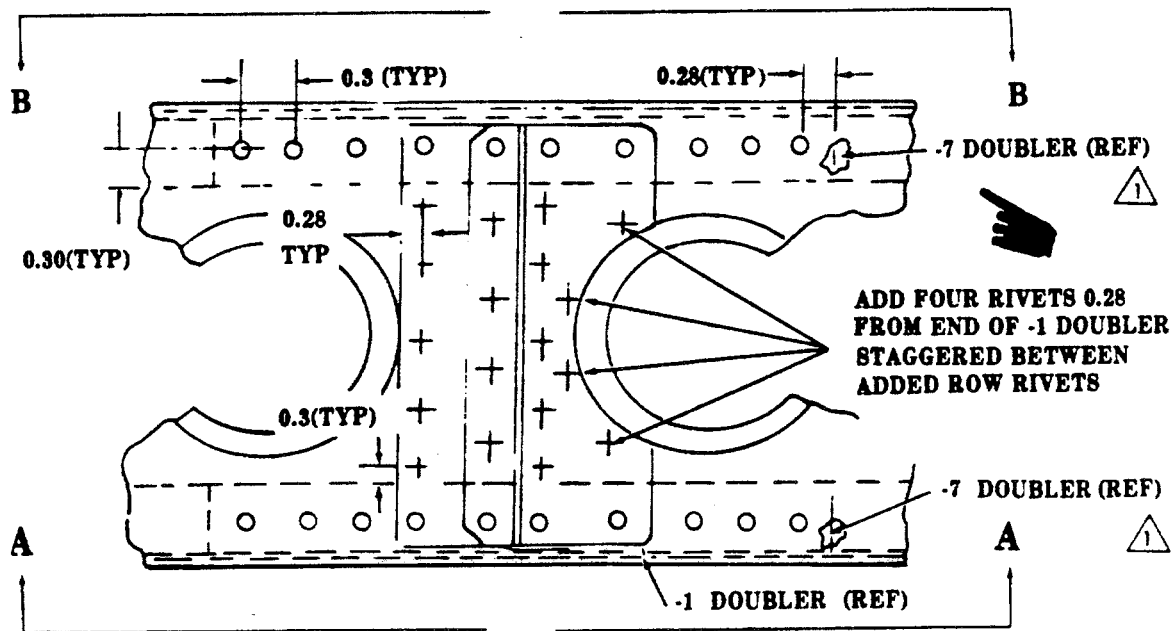
- (1)-1 doubler (See sheet 2)

## PROCEDURE D:

- (1) Cut out damage, 1 inch diameter max or blend out (not to exceed 10% mat thickness and install -1 doubler (See sheet 3)

Figure 4-42. REPAIR OF FORWARD SPAR, VERTICAL FIN (Sheet 2 of 3)

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VIEW LOOKING UP AND FORWARD APPLICATION A

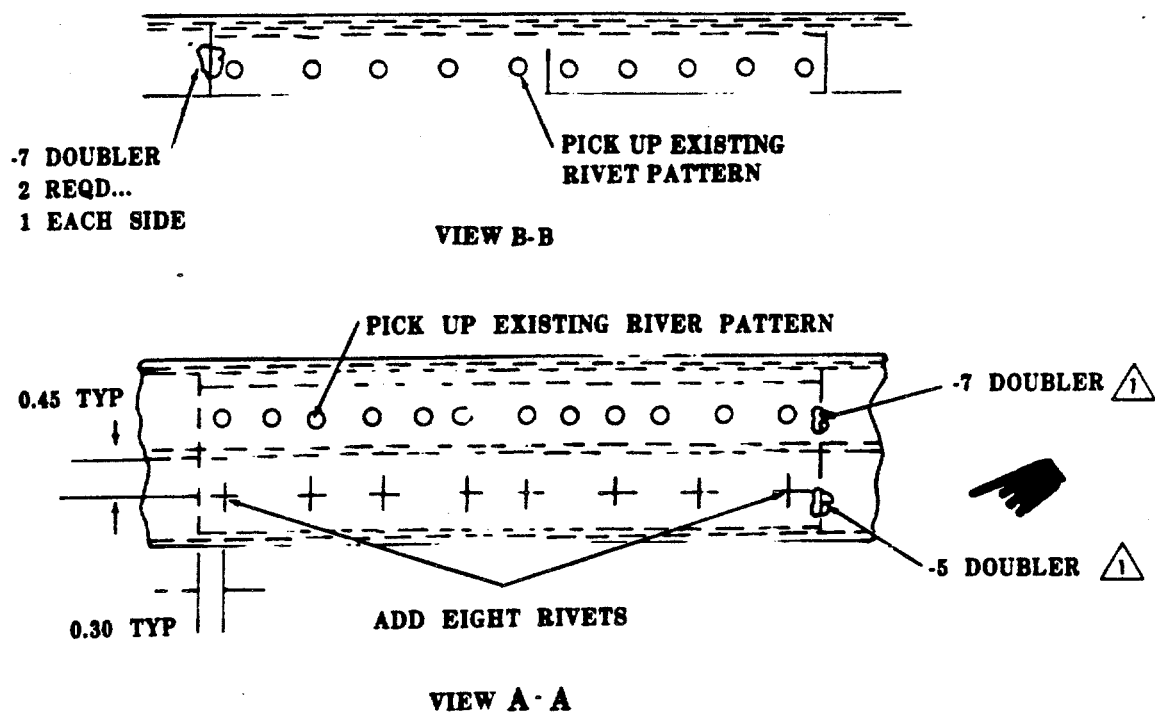
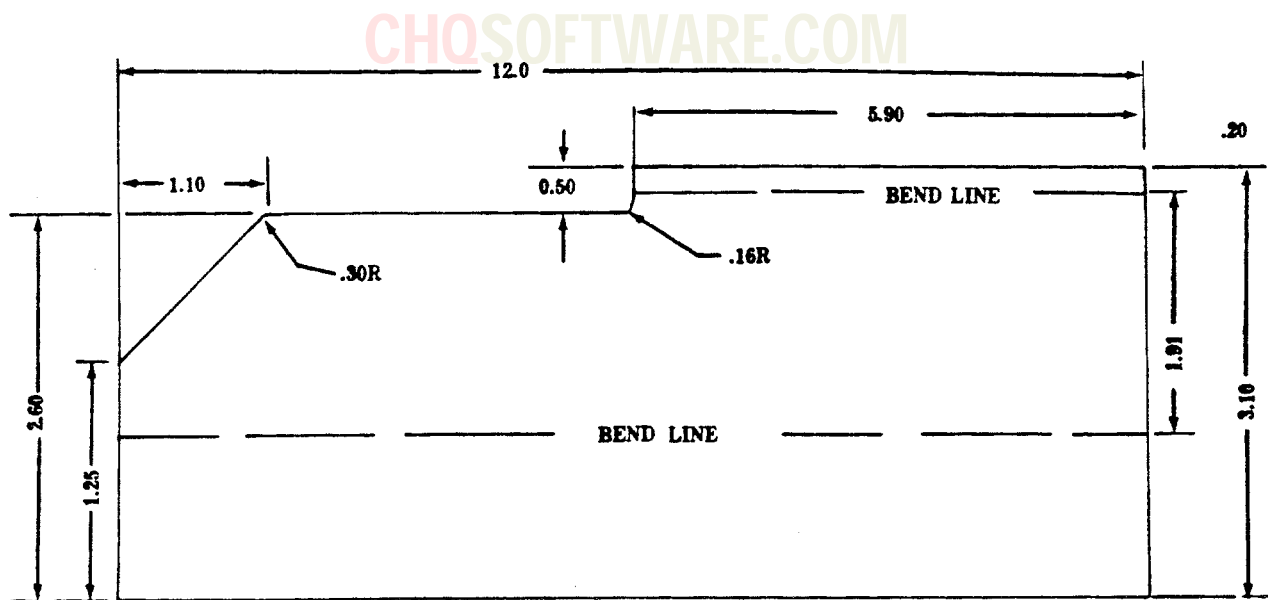
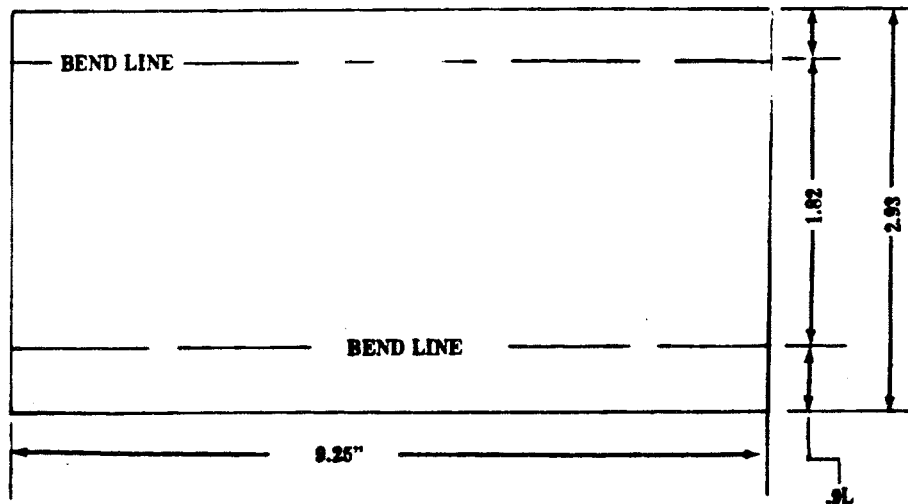


Figure 4-42. REPAIR OF FORWARD SPAR, VERTICAL FIN (Sheet 3 of 3)





1. MATERIAL .050 x 2024 - T3.
2. ALL MEASUREMENTS ARE IN INCHES.
3. BEND ALL FLANGES UP 90°.
4. TOP HAND RADIUS IS 5/32, BOTTOM BEND RADIUS IS 1/4.
5. ALODINE PER MIL-C-5541.
6. BREAK ALL SHARP EDGES.



1. MATERIAL .050 x 2024-T3.
2. ALL MEASUREMENTS IN INCHES.
3. BEND ALL FLANGES DOWN 90°.
4. TOP BEND TO HAVE A 1/8" RADIUS. BOTTOM BEND TO HAVE 3/16 RADIUS.
5. ALODINE PER MIL-C-5541.
6. BREAK ALL SHARP EDGES.

SPLICE ANGLE SEO UH1-80052-1

Figure 4-43. INSERT INSTALLATION (Sheet 1 of 2)

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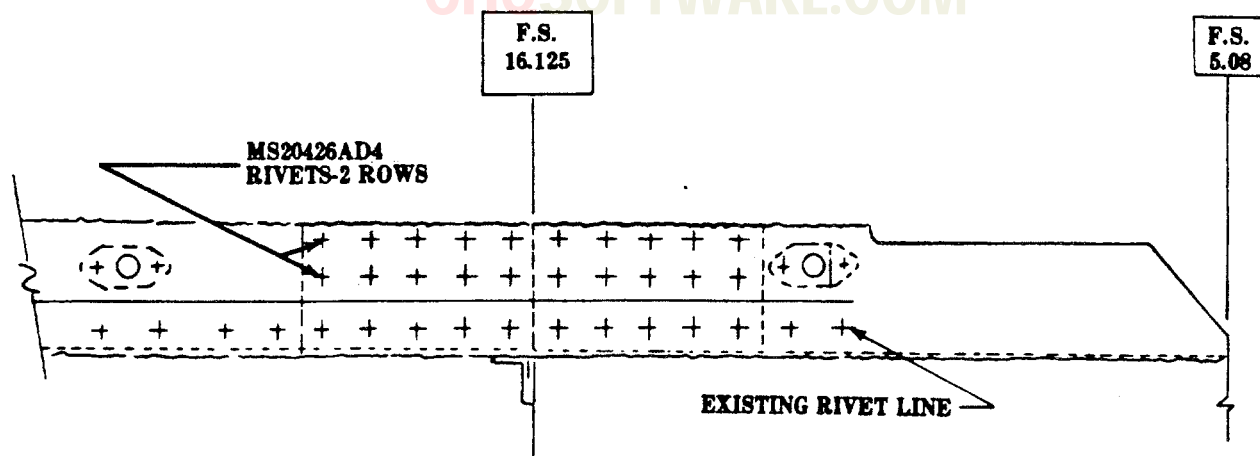
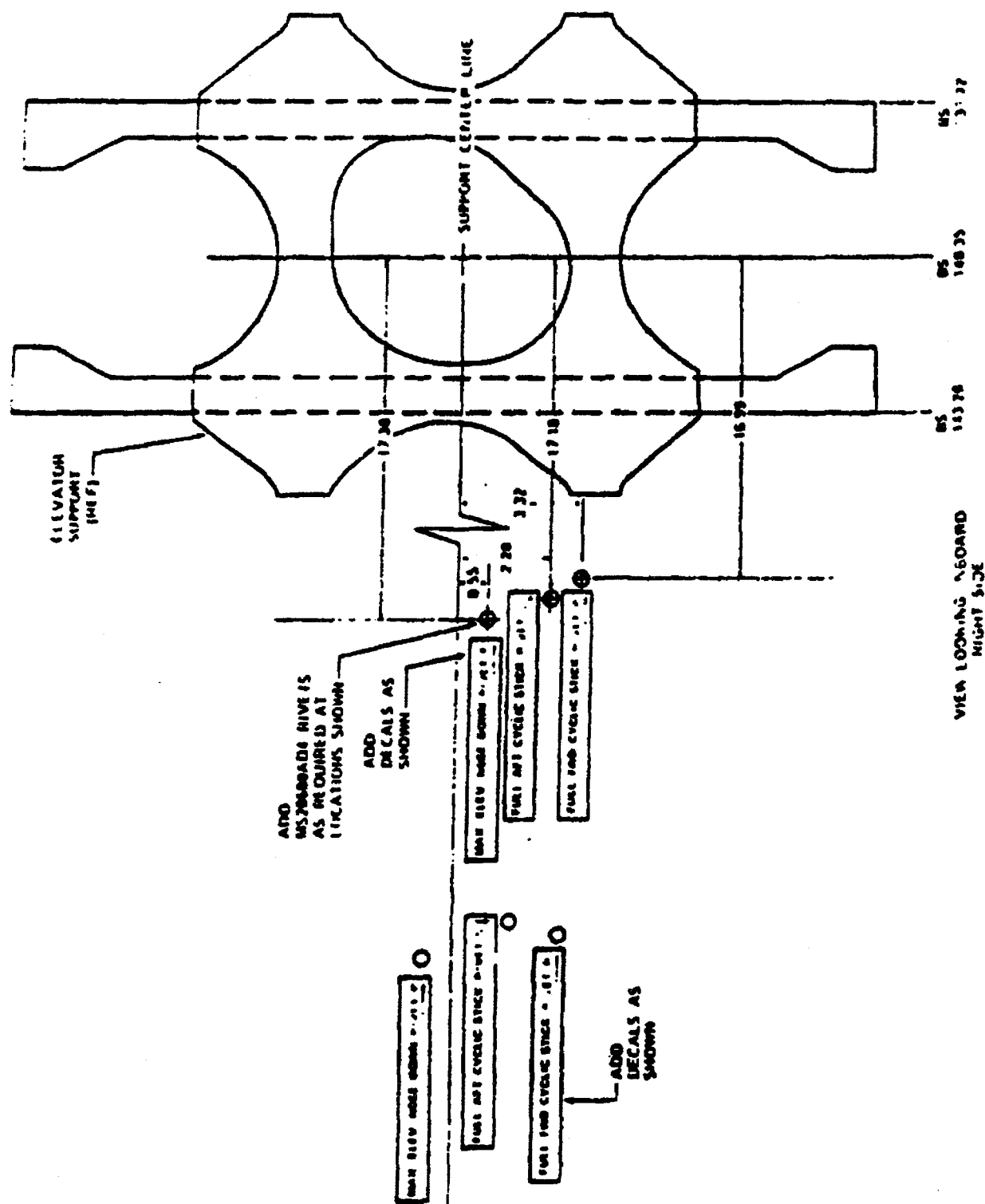


Figure 4-43. INSERT INSTALLATION (Sheet 2 of 2)

#### INSERT INSTALLATION INSTRUCTIONS.

1. Cut spar at F.S. 16.125.
2. Install five(5) Rivets on each side of splice, starting with third Rivet from aft end of top row of Skin Rivets. Trim insert to fit existing Skin Rivet pattern.
3. Add ten(10) Rivets, MS 20470AD5, through lower flange of insert.
4. Top two rows of added Rivets will be MS20426AD4.



**FIGURE 4-44. DECAL AND RIGGING RIVET INSTALLATION ELEVATOR**

**4-51. Typical Broken Clip Replacement (fig. 4-45).** Cracked and/or damaged clips must be replaced. Replace the 204-030-827-13S clip with the 205-032-855 clip. Make from Bell Standard Extrusion #40-010-29 x 1.0 inch.

a. Typical Damaged Stiffener Replacement. Cracked or damaged stiffeners. PN 205-030-899 will be repaired using stiffener PN 212-030-099. Make from Bell Standard Extrusion #110-001-1.

**4-52. Repair for Damaged Hanger Bearing Support Holes (fig. 4-46).**

a. Remove hanger bearing support, remove shims, remove radius blocks on underside, remove bulkhead angles for support of hanger on underside, cut out 6.00 inch section (3.00 inch forward and 3.00 inch aft of center of bearing hanger support) of tail rotor drive shaft cover support and hinge half.

b. Pack discrepant holes in skin with adhesive (item 16, table 2-2).

c. Attach new doubler as shown with sealant (item 6, table 2-2) and apply a staggered row of blueprint rivets along each side and across each end. Maintain 1.00 inch pitch distance and 0.25 inch edge distance. Fabricate a new doubler made from 0.032 inch 7075 T6 AL ALY QQ-A-250/5. Size as shown.

d. Splice in like sections of tail rotor drive shaft cover support and hinge half (paragraphs 4-35 and 4-36).

e. Replace bulkhead angles for hanger bearing support and radius blocks as shown.

f. Locate and drill hanger bearing support attachment by positioning bearing hanger over any two (2) undamaged support holes and locate other two (2) holes and drill. Attach nutplates on radius block and install hanger bearing support. Check alignment in accordance with paragraph 4-3.

**4-52A. Access Hole for Inspection and Structural Repair in Area of 42° Gearbox (UH-1H UH-1M).**

**NOTE**

To be performed only if required.

a. Cut access hole in skin, centered about B.S. 202 and C/L of T/B, max dimensions of the cutout shall be 5-3/4 x 4-1/4.

b. Make and install doubler from 0.050" thick 2024T4 aluminum alloy material. Doubler shall extend a minimum of 5/8" beyond edges of cutout. Install row of MS20470AD4 rivets around edge of doubler. Maintain (2) Dia E.D. and (3) Dia pitch dist.

c. Locate holes for cable guard (B,C,M,E) in doubler by using cutout section as a template. Install cable guards using MS20470AD4 fasteners and pressure sensitive tape (item 35, table 2-2).

**4-52B. Fair Lead Support Installation UH-1H.**

a. Tie two suitable cords (approximately 3/16" diameter) to fin nose rib.

b. Insert cords through cable holes, top of boom, aft of 42° gearbox mount.

c. Insert cords through both pulleys P/N MS20220-2 of dummy pulley bracket assembly, P/N 203-001-709-1, and install pulley assembly on fin, fwd spar.

- d. Insert cords through cable fair lead supports to be installed at boom stations 101.38 and 164.23.
- e. Bolt bull wheel in place route cords around bull wheel and apply approximately 25 pounds tension to cords.
- f. Assure that cords are approximately centered in holes in the fair lead support and rivet supports to bulkheads.

#### 4-52C. Fairlead Support Installation UH-1B/C/M.

- a. Attach two suitable cords (approximately 3/16" diameter) to fin nose rib.
- b. Install dummy pulley bracket P/N 204-001-823-1, on boom, at approximately B.S. 203 using six standard shims, P/N 204-001-788-1. Install two pulleys, P/N MS20220-2.
- c. Install dummy pulley brackets, P/N 204-001-826-1 L/H and 204-001-826-2 R/H at approximately B.S. 32, with pulleys, P/N MS20220-2 in place.
- d. Insert cords through pulleys at B.S. 203, fair lead supports, cable guide holes in drive shaft hanger supports and pulleys at B.S. 32 and apply approximately 25 pounds tension to cords.
- e. Shim fair lead supports as required to assure that cords are approximately centered in cable holes, and rivet supports to boom.

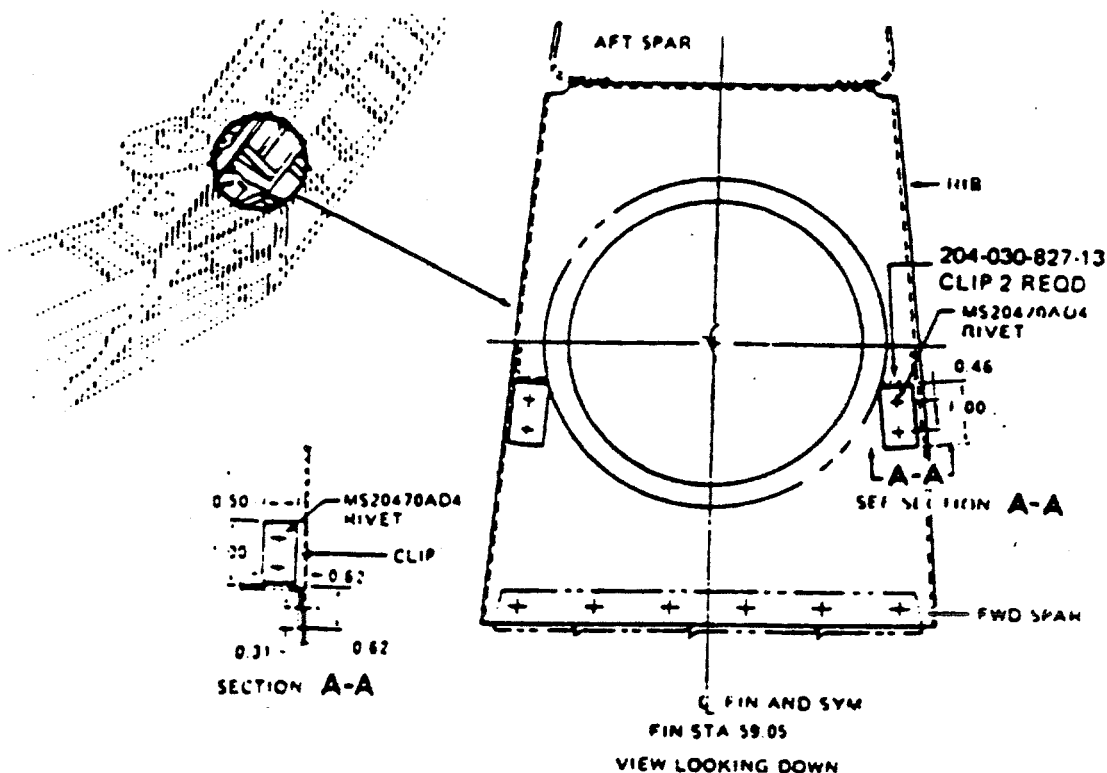


Figure 4-45. TYPICAL BROKEN CLIP REPLACEMENT

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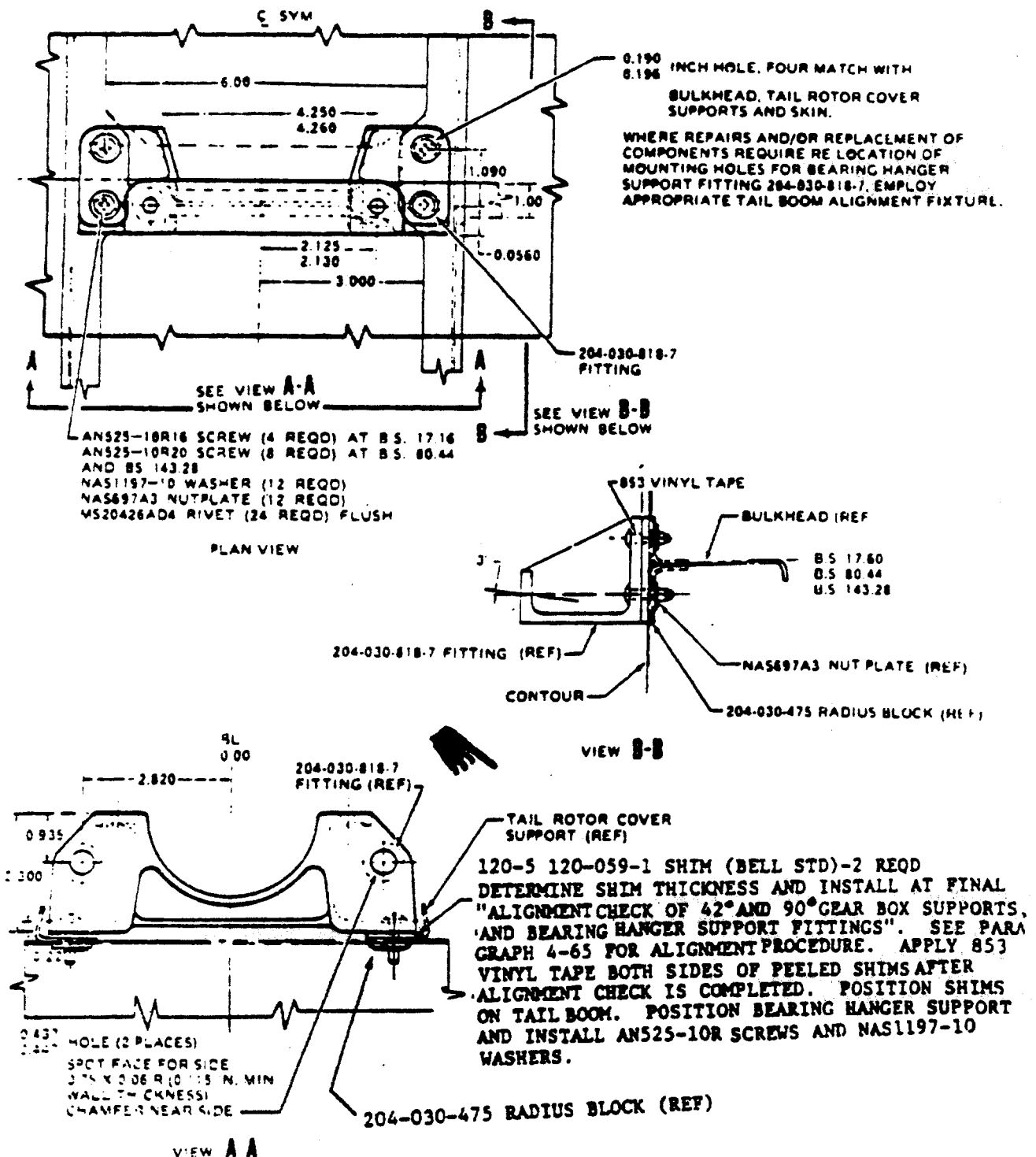


Figure 4-46. DAMAGED HANGER BEARING SUPPORT HOLES (SHEET 1 OF 2)

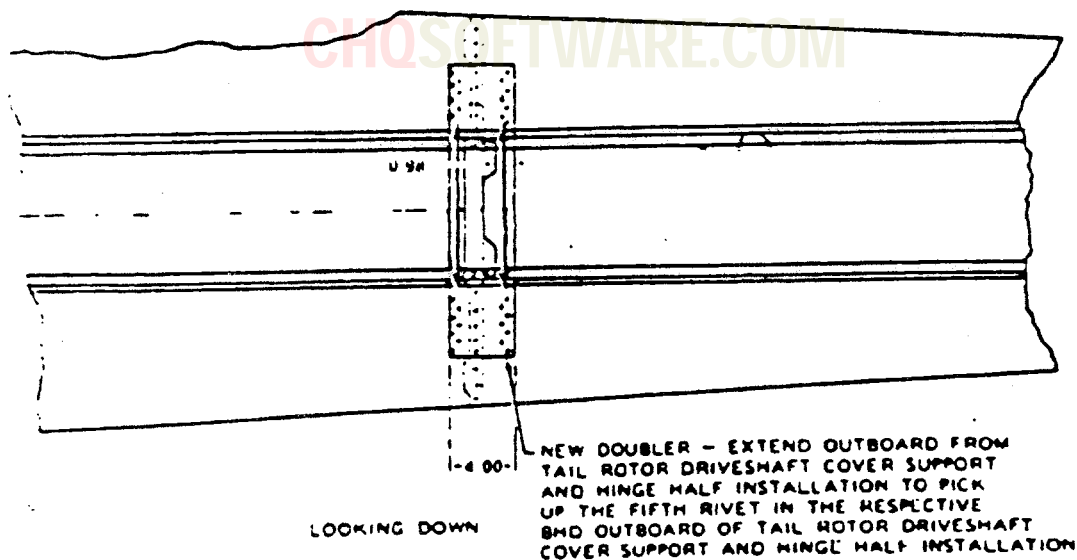


Figure 4-46. DAMAGED HANGER BEARING SUPPORT HOLES (Sheet 2 of 2)

#### 4-52D. Repair of Cable Guide Support.

a. Inspect cable guide support grommet hole for excessive wear. Maximum wear limit 0.465 inch. Support must be replaced or repaired IAW paragraph "6" below when grommet hole exceeds maximum wear of 0.465 inch.

b. Repair cable guide support using the following procedure to alleviate removal of supports, loss of shims, damaging tailboom skin structure.

(1) Measure down from top of support one inch. Cut support at this horizontal measurement line.

(2) Fabricate from sheet of 0.063, 2024T3 aluminum repair parts for support as per Figure 4-1. Repair parts shall be inked stamped with part numbers as follows: AGEN-ST0018-1 for P/N 204-001-849-1 support, AGEN-ST0018-2 for P/N 204-001-849-2 Support, AGEN-ST0018-3 for P/N 204-001-790-1 support.

#### NOTE

Tool information for fabricating above part numbered supports may be used to fabricate repair parts.

(3) Establish proper cable alignment and install supports repair part as follows:

(a) Install pulley brackets and pulleys fore and aft.

(b) Slide the number of repair parts being required over cable or alignment cord with chamfer of grommet hole facing forward. Tighten cord or cable sufficient to assure proper line between pulleys has been obtained.

(c) Slide repair part to original support (which has been cut off one inch from top of piece), and position so cable or cord is centered. Clamp repair part in this position.

(d) Drill two holes through repair part and remaining portion of original support and install with two 1/8 inch MS20470 AD rivets. Maintain standard edge distance on both parts.



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**4-52E. Tailboom Skid Tube Surface Finish.**

Tail skids tubes which have been inspected IAW the applicable technical data and found to be serviceable other than exterior finish shall be processed as follows:

- a. Strip paint from complete tube.
- b. Bead (item 52, table 2-2) blast to remove corrosion when it exists.
- c. Apply a minimum of one coat epoxy primer, MIL-P-23377 (item 21, table 2-2).

**4-52F. Repair of Forward Fin Spar L/H Flange.**

a. Repair part for replacement of driveshaft cover attach flange is authorized to be fabricated. This repair part shall be identified by ink stamping part number TED UH1-ST0016-1 on part after chemical treatment (alodine) per MIL-C-5541.

- b. Repair part to be fabricated from .050 thick 2024-T3 material 43 inches in length as per figure 4-46A.

**4-52G. Chafing of Rib Fairing Support, Fin.**

a. Fabricate two (2) nylatron pieces 2 inches long, 3/4 inch wide, 1/16 inch in thickness from nylatron GS sheet L-P-410 (item 17, table 2-2).

b. Install fabricated nylatron tabs on fin rib, either side of center line of tailboom, approximately 2 inches. Bend tab to fit flush with lower forward edge of rib flange, upward and onto the flat upper side of nose rib. Bond in place using EA934 adhesive (item 19, table 2-2). (See figure 3-9, page 3-33.)

c. Installation of tabs will prevent chafing on upper surface of the rib by the fin drive shaft cover and ensure a tight fit of the 42 degree gearbox cover.

**4-52H. Aft Fin Spar Splice Repair.****NOTE**

After replacement section has been removed from new spar, doublers may be fabricated from new spar also by using area above removed section.

- a. Cut spar at F.S. 51 approximately so the cut falls between skin to spar flange rivet holes.
- b. Fabricate a doubler from T-42, 0.071 thick 2024 aluminum. Doubler should be full width of the spar (4.92 inch) and sufficient in length to accommodate three rows of (MS20470AD5) rivets either side of cut maintaining 2 diameters E.D. with minimum spacing of 3 diameters.
- c. Fabricate two angle doublers from 0.071 inch, 2024-T42 aluminum shaped to nest into the flanges of the spar. Length of angle doublers shall be a minimum of 5 fasteners (MS20470AD5) either side of the spar cut with rivet spacing a minimum of 4 diameters.
- d. Using lower 8 inch section of new spar, install doublers by first laying-out and drilling of holes for fasteners. Prepare surfaces for bonding where doublers will mate. Using EA934 adhesive, install doubler on upper surface of spar and hold in place with clecos. Install angle doublers and retain in place with clecos. Install rivets while adhesive is wet. Remove excess adhesive prior to curing.

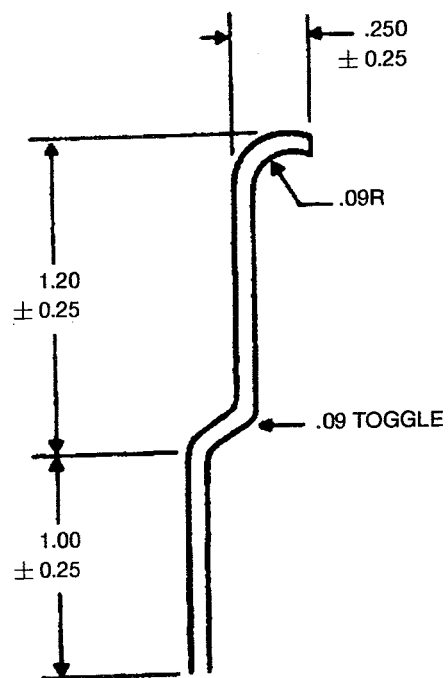


FIGURE 4-46A. FORWARD FIN SPAR 4H FLANGE

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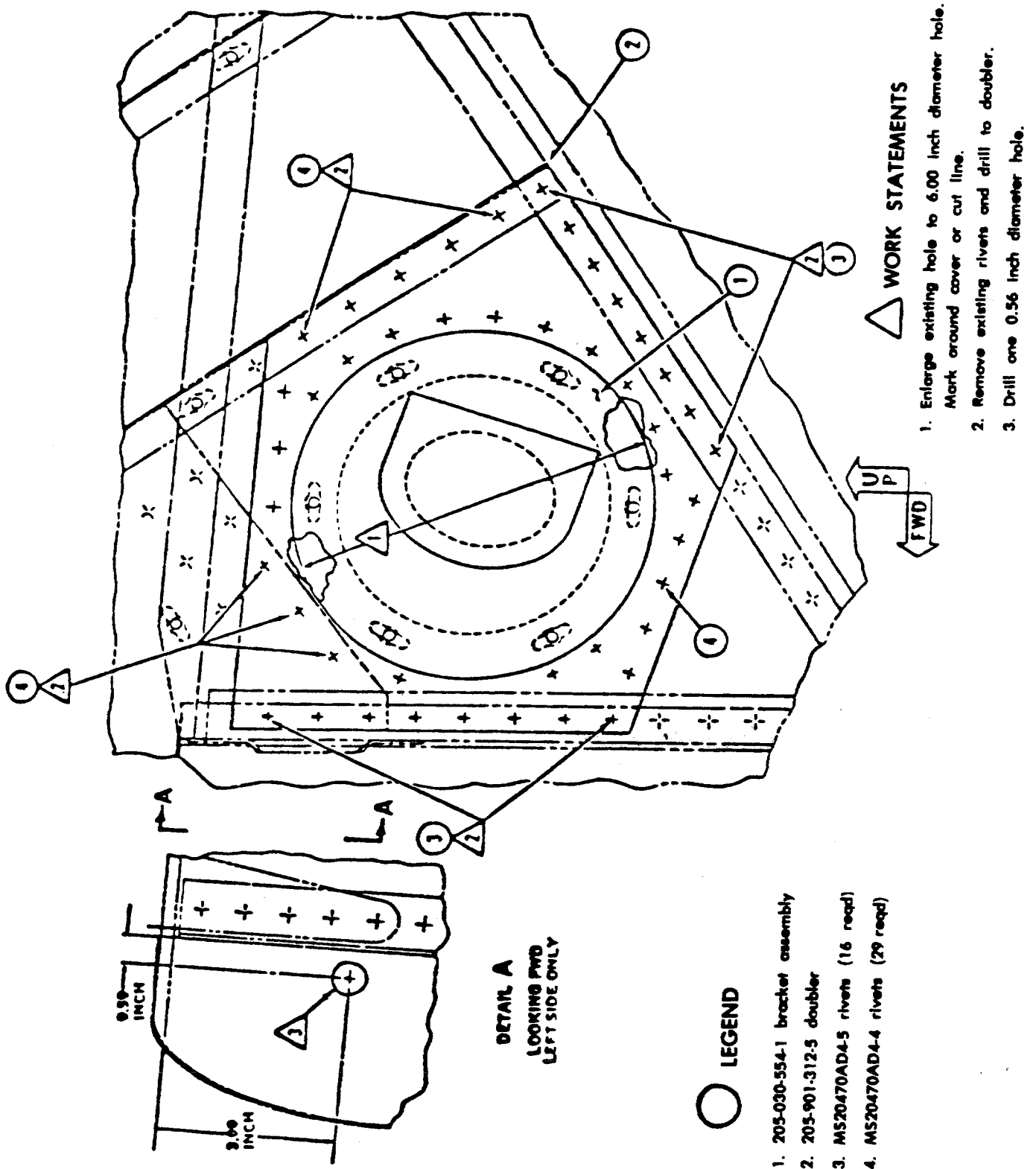


Figure 4-46B Rear Antenna Bracket Installation

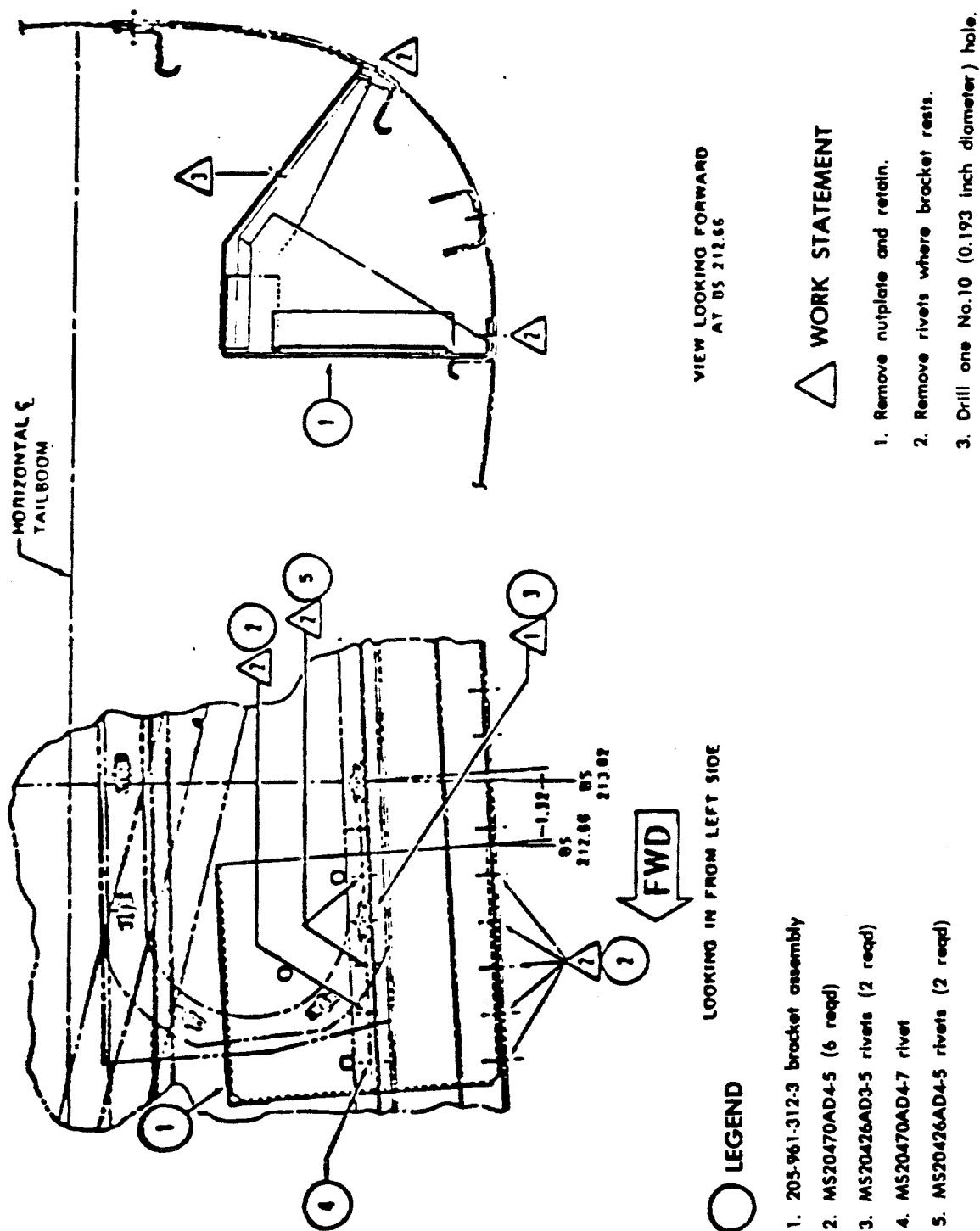


Figure 4-46(c). Receiver Mount Bracket Assembly Installation

**4-52I. Left and Right Rear Antenna Bracket Assembly Installation (UH-1H) (Figure 4-46B).**

**NOTE**

To be performed only if required.

- a. Outlined existing cover plate (205-030-889-51) for 6.00 inch diameter hole. Remove cover, drill out nut plates and remove doubler. Cut web and remove cutout. Discard cover plate and cut-out parts.
- b. Position doubler (205-961-312-5) on fin and mark for location maintaining rivet edge distance on three sides. Remove and drill out rivets covered by doubler.
- c. Position doubler on fin web and using existing holes in fin and doubler drill 46 No. 30 (0.128 inch diameter) holes. Burnish the holes on both the airframe and on the doubler to assure good bonding. Install doubler with sealant (item 89, table 2-2), 16 rivets (MS20470AD4-5) and 29 rivets (MS20470AD4-4). Enlarge one hole to No. 10 (0.193 inch diameter) for cable assembly.
- d. Drill one 0.56 inch diameter hole on left side only as shown in detail A for antenna cable.
- e. Install bracket assembly (204-030-554-1) with screws removed from cover plate. Ensure antenna mount hole opens aft and slightly down.
- f. Install right rear antenna bracket assembly (205-030-554-3) using same procedures as left side, except use doubler (205-961-312-6) in step b and eliminate step d.

**4-52J. Receiver Mount Bracket Assembly Installation (UH-1H) (Figure 4-46C).**

**NOTE**

To be performed only if required.

- a. Remove nutplate on right inspection door hole and retain for reinstallation.
- b. Position bracket assembly (205-961-312-3) inside tailboom and mark rivets for removal where bracket rests in place.
- c. Remove rivets, put bracket back in place and using existing holes drill nine No. 30 (0.128 inch diameter) and two No. 40 (0.098 inch diameter) holes for nutplate reinstallation. Drill nutplate center hole with No. 9 (0.196 inch diameter) drill.
- d. Install bracket with sealant item 89, table 2-2), six rivets (MS20470AD4-5), two rivets (MS20426AD4-5), one rivet (MS20470AD4-7) and nutplate with two rivets (MS20426AD3-5).
- e. Drill a No. 10 (0.193 inch diameter) hole in bracket for bonding strip.

#### 4-52K. Installation of NVG position lights. (Figure 4-46D).

- a. Remove all applicable access panels on tail boom and vertical fin for access to existing position lights wiring.

#### NOTE

All instructions provided in this paragraph for mounting NVG tail light assembly apply to both side of aircraft.

- b. Drill out rivets at five places as shown in (2, sequence 1, Figure 4-46C). Install countersink rivets P/N RV201-4-2, in four of the five drilled out holes, as shown in (3, sequence 2).

- c. Mark a rivet centerline on the forward edge of the light mount as shown in (sequence 3). Index and temporarily secure light mount in position, aligning the scribed top edge rivet centerline on the centerline of the original tail light and the bottom light mount rivet hole on the remaining drilled out rivet hole. Drill a hole pattern for 1/8" rivets as shown in (sequence 4).

- d. Remove light mount for installation of light. Remove original tail light from it mount to gain access to grommeted tail light wire feed-thru hole. Do not disconnect original tail light wiring but allow light assembly to hang in place.

- e. Install a 6" length of heat shrink tubing (insulation sleeve), P/N M23053/5-105-0 (item 90, table 2-2), on tail light wire prior to installation as on anti-chafing measure.

- f. Mount NVG position light, P/N EGD-0930-3, with sealing gasket, P/N EGD-0963-1, on rear mount, P/N EGD-0947-3, and, after routing wires through mount and drain opening of existing rear position light, insert wire through grommet to access area in vertical fin.

- g. Rivet mount in place using rivets, P/N's RV200-4-3, RV200-4-2, RV 201-4-2 and CR3243-4-2, Items (4), (6), (3), (5) respectively, shown in sequence 2), The finished configuration will appear as shown in (sequence 4).

#### NOTE

The NVG position lights are electrically polarized systems. It is absolutely necessary that the red leads (positive) and black leads (negative ground) configuration be adhered to.

- h. Cut, strip, and attach one end of wire LC1D20 to bulkhead connector P98 inside tailboom. Route and secure this wire to the existing tail light wiring through the access area in the vertical fin.

- i. Adjust the lengths of wire LC1D20 and the red lead from the NVG position light for splice connection in the access area. Strip both wires and complete the splice connection, using splice conductor, P/N M792815-3.

- j. Adjust the length of the black lead from the rear NVG position light for attachment to existing tail light grounding location. Cut and strip the black lead and attach a terminal lug, P/N MS25036-103. Remove lug nut, retaining the existing position light grounding wire. Install black wire terminal lug and secure with the existing lug nut.

- k. Secure wire LC1D20 to existing wire bundles with tie down straps, P/N MS3367-1-0 (item 91, table 2-2). Cut and discard excess tie down material.

- l. Reinstall, attach, or secure all access panels and acoustical blanket areas removed or loosened during the modification process.

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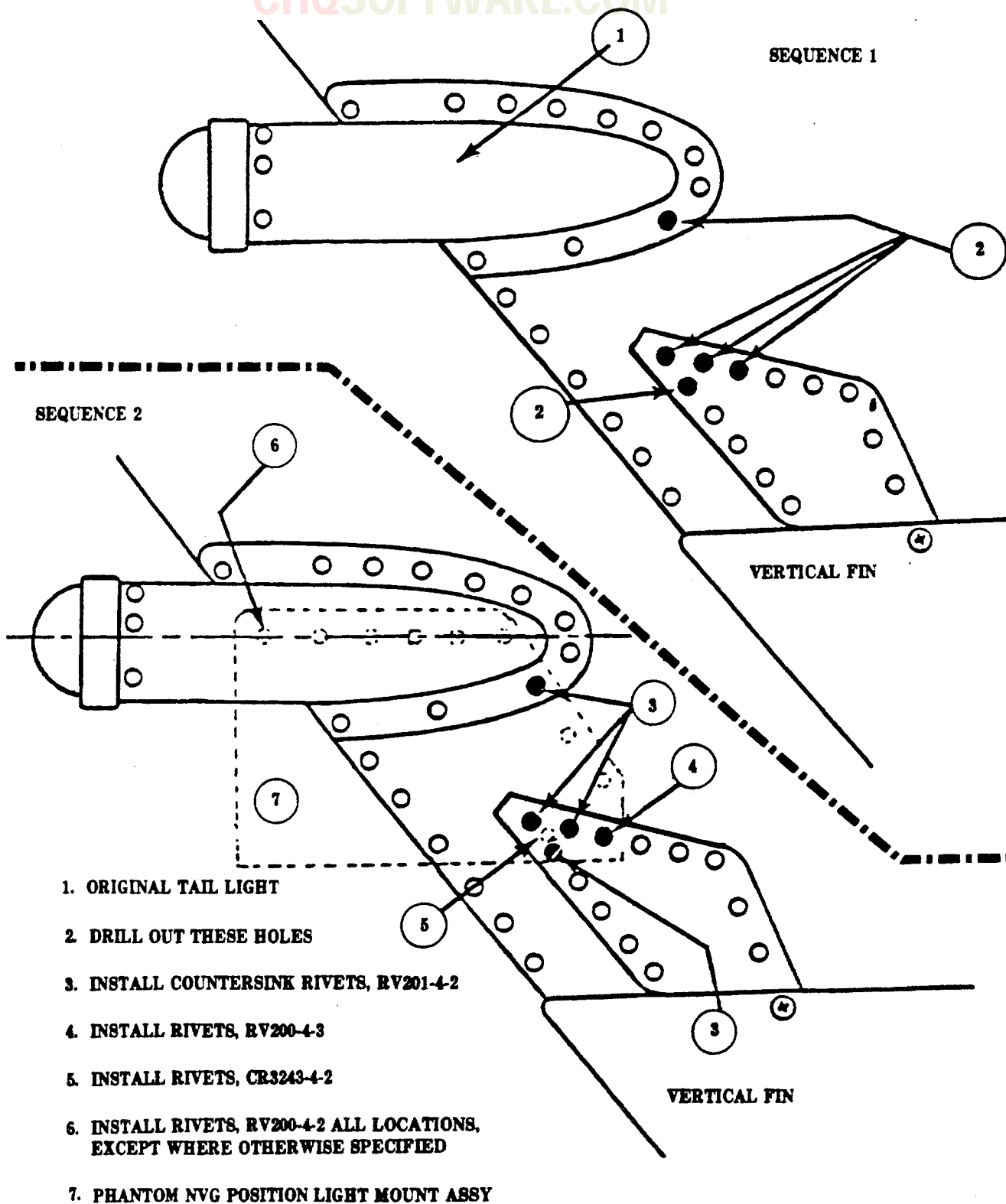


Figure 4-46D. REAR POSITION LIGHTS (Sheet 1 of 2)

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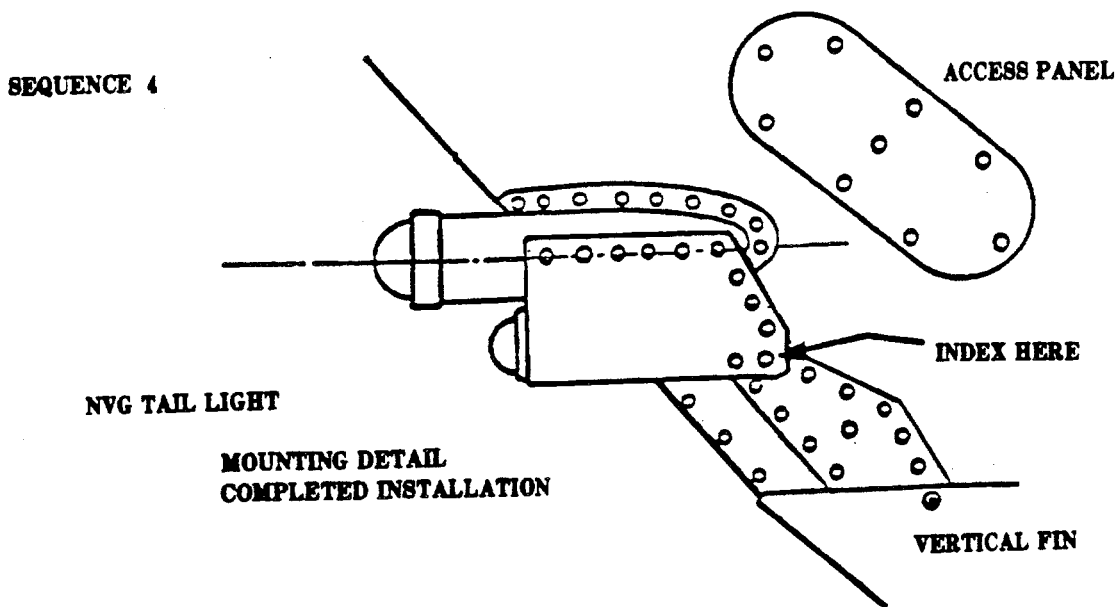
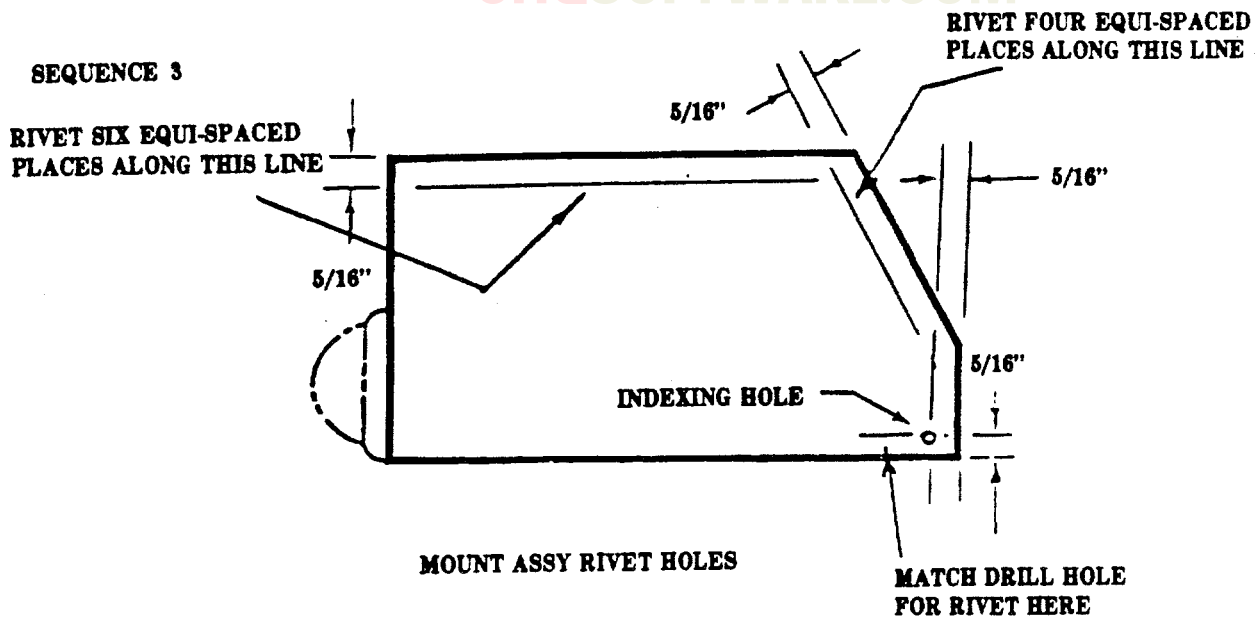


Figure 4-46D. REAR POSITION LIGHT (Sheet 2 of 2)



### Section III. HONEYCOMB REPAIR PROCEDURES

**4-53. Metal and Fiberglass Panels.** Repair of skin delaminations on installed panels is limited as follows:

*a. Voids less than 3.0 square inches.* Voids between skin and cover shall not exceed 5 percent of the surface area. There shall be a minimum of 2.0 inches between voids and 1.0 inch from adjacent structure. If void spreads when injected, remove panel and repair in accordance with subparagraph.

*b. Edge delaminations.* Void limitations are as follows:

(1) Voids shall not extend into attaching holes other than rivet patterns.

(2) Void shall be less than 4.0 inches in length.

(3) There shall be no more than 3 edge voids per assembly and a minimum of 1.0 inch between voids.

*c. Repair procedure.* If voids fall within limits given above, use the following procedure for repairs.

(1) Drill No. 40 or smaller hole at each end of the void.

(2) Mix adhesive Hy50L 9309 Parts A and B (item 88, table 2-2). Using plastic hypodermic syringe inject into one hole until resin flows out opposite hole.

(3) Apply pressure with weights, clamps, or other suitable means.

(4) Cure at room temperature 77 degrees F (25 degrees C) for 8 hours or 2 hours at 150 degrees F (66 degrees C).

(5) Refinish as necessary.

**4-54. Preparation of Bonding Surface.**

*a.* Clean foreign material from parts to be bonded with clean cheesecloth moistened with methylethylketone (item 5, table 2-2).

*b.* Thoroughly abrade surfaces to be bonded or to which filler is to be applied until all surfaces finish, primer, foreign material, and oxides are removed. Abrasive blasting using sand, glass, beads, or aluminum oxide is acceptable on faying surfaces of panel. Do not abrasive blast on skin patches.

*c.* Wipe abraded area with clean cheesecloth moistened with acetone (item 97, table 2-2). Change cheesecloth (item 74, table 2-2) frequently until all evidence of cleaning residue is removed.

*d.* Protect surface from contamination until final bonding is accomplished; use of clean wrapping paper is (item 77, table 2-2) recommended.

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## NOTE

Composite material does not require cleaning in accordance with above instruction.  
Remove peel ply only and bond.

## 4-55. Bonding Adhesives Applications.

- a. The following adhesive (item 81, table 2-2) systems are approved for bonding metal to metal "Structural", high lap shear and high peel strength.

<u>ADHESIVE</u>	<u>CURE TEMP °F</u>	<u>PERFORMANCE RANGE °F</u>	<u>MANUFACTURER</u>	<u>REMARKS</u>
FM1000	350	-67 to 250	American Cynamid	Good Strength
FM-123-2	265	-67 to 250	American Cynamid	Low tack
AF126	265	-67 to 250	3M Co.	Very Tacky
AF126-2	265	-67 to 250	3M Co., 76381	Pressure Tack
EPON9600	180	-67 to 180	Shell Chemical Co.	Use only with Engr approval for each application
AF 127	200	-67 to 180	3M Co.	

- b. The following adhesive systems are approved for bonding metal to metal "Structural" high lap shear strength. High peel strength not required.

<u>ADHESIVE</u>	<u>CURE TEMP °F</u>	<u>PERFORMANCE RANGE °F</u>	<u>MANUFACTURER</u>	<u>REMARKS</u>
Armstrong Ap-E	165	-67 to 200	Armstrong Prod Co.	
EPON 934	Rt to 250	-67 to 300	Shell Chemical Co.	Does not run and will rot in 4 hrs.
EPIBOND	Rt to 250	-67 to 300	Furane Plastic	Paste Liquid 2 part
S510 A/S EC1 469	350	-67 to 350	3M Co.	Will run at temp must be contained.
EPON 917	300	-67 to 350	Shell Chemical Co.	Powder, will liquify at 120 - 150°F.

- c. The following adhesive systems are approved for bonding metal to metal "Non-Structural."

<u>ADHESIVE</u>	<u>CURE TEMP °F</u>	<u>PERFORMANCE RANGE °F</u>	<u>MANUFACTURER</u>	<u>REMARKS</u>
Metal Set -A-	Rt	-67 to 180	Smooth on Corp	2 part paste

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<u>ADHESIVE</u>	<u>CURE TEMP °F</u>	<u>PERFORMANCE RANGE °F</u>	<u>MANUFACTURER</u>	<u>REMARKS</u>
Armstrong -A6/E	200	-67 to 180	Armstrong Prod Co.	2 parts paste
EC1469/ EC1470 EPON S28	200 Rt	-67 to 180	3M Co. Shell Chemical Co.	Very Fluid Very Fluid, requires curing against agent
EPON 934	Rt	20 to 150	3M Co.	Flexible - 2 part paste
Armstrong -A-35	Rt		Armstrong Prod Co.	2 part paste
EPIBOND -8510	Rt	-67 to	Furane Plastics	Paste Liquid 2 parts

d. Adhesive materials used must not exceed shelf life and all special handling details such as cold storage must be strictly adhered to.

#### NOTE

Fabricate core insert of same material as damaged area. Lightly abrade adhesive film on panel backing. Coat honeycomb insert and cleanup area of assembly with adhesive paste, (item 19, table 2-2) and set insert into cleanup area.

All structural adhesives must be tested by batch number for conformance to Fed Spec MMM-A-132, Type 1, Class 2 or 3, whichever is applicable.

e. When requesting a certain type adhesive, the curing temperature required and other pertinent data should be specified to avoid confusion and improper substitution of adhesives.

**4-56. Edge Repair All Panels (Figure 4-47)** This repair returns the external portion of the panel to serviceable condition.

**4-57. Minor Damage, Aluminum and Fiberglass Skins (Figure 4-48).** This repair provides a fill procedure for minor damage.

**4-58. Aluminum Skin Repair (Internal Structure) (Figure 4-49).** This repair provides a major repair for the above type panel.

**4-59. Fiberglass Skin Repair (Figure 4-50).** This repair provides a major repair for the above type panel.

**4-60. Aluminum (Flush Patch) (Figure 4-51).** This repair provides a major repair for the above type panel.

**4-61. Surface Damage Repair (Figure 4-53).** This repair fills dents with adhesive to return panel to serviceable condition.

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**4-62. Honeycomb Panels - Replacement of Inserts (Figure 4-54, Sheets 1 and 2).** This repair provides a method of replacing inserts.

a. Inspect tail fin honeycomb panels, upper and lower sections where fairings mount, for voids and delaminations around inserts.

b. Panels found with delaminations and voids will be removed and repaired as follows:

(1) Remove original inserts and repair any delamination.

(2) Install grommet type threaded fasteners, P/N P103D8-32-04/S103D8-0 or equivalent on lower section and fasteners, P/N P103D1032-06/S103D10-0 or equivalent on upper section. When one or more fasteners of this type is installed, the remaining fasteners shall be replaced to prevent further chafing or delamination.

**WARNING**

n-Propyl Bromide is toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in areas with adequate mechanical or local exhaust ventilation or use approved respirator as determined by local safety/industrial hygiene personnel.

**4-63. Repair Procedure for Delamination (Void) of Metal Opposite Fiberglass Skin Honeycomb Panels (Figure 4-52).**

a. *Repair procedure.*

(1) Outline delaminated area, using a red grease pencil, on the metal skin.

(2) Remove fiberglass skin and honeycomb core opposite marked area of delamination. This is to be accomplished using a drill with a hole saw adapter or a high speed drill with a #1 router kit.

(3) Break the surface glaze of the existing adhesive on the metal with a hard router or disc sander.

(4) Remove core chips, adhesive and debris using clean, filtered dry compressed air. Be sure air blast does not damage surrounding core.

(5) Abrade the exposed metal skin where the new core is to seat with 320 grit non-silicon abrasive paper (item 72, table 2-2), cloth or lightly sand blast. Disc sander may be used at low speed and with light pressure in areas too small to sand blast.

(6) Remove the sanding residue using cheesecloth (item 74, table 2-2) dampened with aliphatic naphtha (item 7, table 2-2), MEK (item 5, table 2-2), or other suitable solvent.

(7) Prefit honeycomb replacement core of the same material and density as the removed core. The fit should be as close as possible, without crushing honeycomb. The core plug shall be fabricated so that the ribbon direction matches the ribbon direction of the existing core.

(8) Clean aluminum core plug in n-propyl bromide (item 92, table 2-2) vapor for 10 minutes or until condensation stops. Flush plug thoroughly with liquid n-propyl bromide (item 92, table 2-2). Remove trapped liquid from core cells using clean dry compressed air until all odor is gone. Wrap plug in clean wrapping paper (item 77, table 2-2) until ready for use.

(9) Fabricate a plate from .0125 inch thick aluminum sheet the same dimensions as the core plug. Coat with mold release.

(10) Mix Epon 934 adhesive (item 71, table 2-2) or Hysol Adhesive 9309 (item 88, table 2-2) as per manufacturers instructions.

(11) Coat the edge of existing core and metal skin which is being repaired with adhesive 3 to 5 mils thick on the edges and the surface which is to be bonded to the metal skin.

(12) Insert repair plug into panel cavity. Ensure plug ribbon direction is the same as existing ribbon in panel.

(13) Lay fabricated plate over the repair plug. Cover the plate with one layer of perforated plastic sheet and one layer of bleeder material. (Burlap cloth or fiberglass material.)

(14) Surround repair area (minimum of 2-inch outside of repair area) with a bead of zinc chromate paste. Embed vacuum hose in paste with hose extending onto bleeder sheet material a minimum of 2 inches.

(15) Cover complete lay up with vacuum bag or plastic sheet 0.050 inch thick and press into bead of paste to form a bag.

(16) Apply vacuum of  $24 \pm 4$  inches to repaired area. Ensure the vacuum bag is not leaking and will maintain required vacuum. Allow repair to cure with vacuum applied a minimum of 12 hours at a minimum of 75°F.

(17) Remove vacuum lay up and bead of zinc chromate paste.

(18) Abrade fiberglass skin a minimum of 3 inches from repair edge.

(19) Wipe clean the core plug and surrounding skin with cheesecloth (item 74, table 2-2) dampened in MEK (item 5, table 2-2) or equivalent.

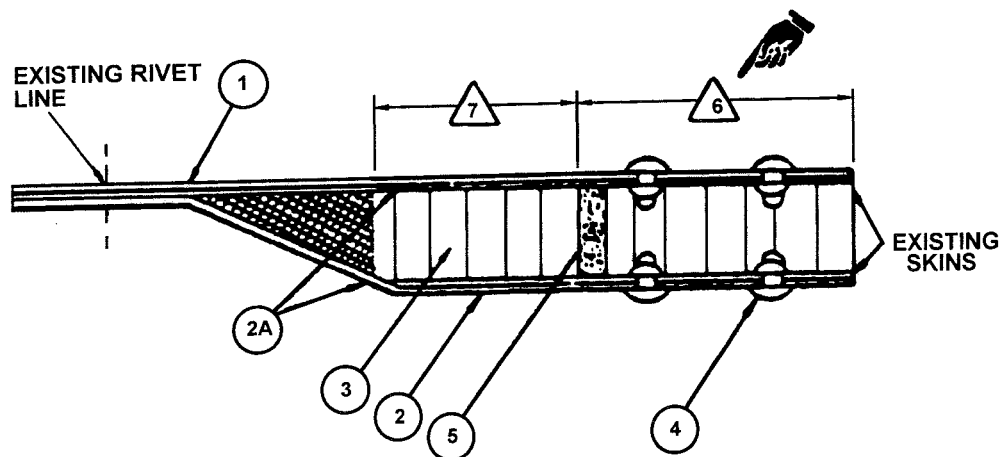
(20) Cut fiberglass patches, same number as original skin, the size and shape of repair plug. Coat repair plug with adhesive, Epon 934 (item 88, table 2-2) or Hysol 9309. Lay up the fiberglass patches over the adhesive. Ensure patches are thoroughly impregnated with the adhesive.

(21) Cut fiberglass lay up patches in the quantity of layers equal to the original skin, with the patch next to repair, 1-1/2 inch larger than repair and each additional layer shall overlap the previous layer by 1-1/2 inch. Allow to cure 8 hours at a minimum of 75°F.

(22) After adhesive has thoroughly cured, blend edges of fiberglass lay up repair to original fiberglass.

b. Coin tap repaired area on metal skin side to check bonding of repair plug. See Table 3-28 for void limits.

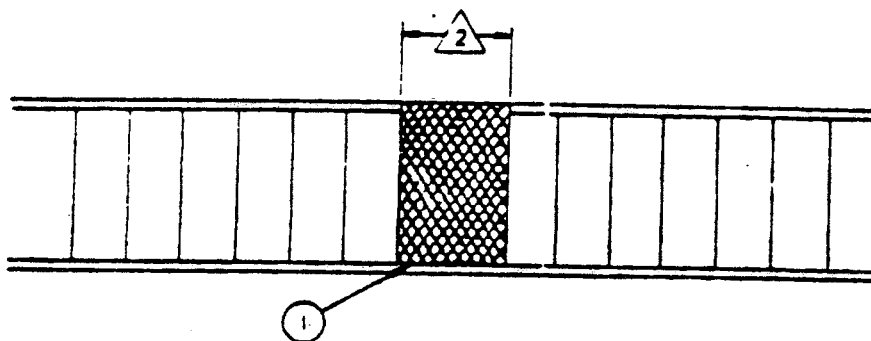
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## EDGE REPAIR ALL PANELS

- ① OUTER SKIN PATCH COMPOSITE SHEET (PEEL PLY ONE SIDE)  
MATERIAL AND GAGE SAME AS EXISTING SKIN
- ② INNER SKIN PATCH SAME AS EXISTING SKIN. IF ALUMINUM MATERIAL TO BE  
COMPOSITE (PEEL PLY ONE SIDE). IF NO DAMAGE SUSTAINED  
TO INNER SKIN PATCH NOT REQUIRED
- ②A FILLERS SAME AS EXISTING SKIN (PEEL PLY BOTH SIDE)
- ③ CORE PLUG HONEYCOMB ALUMINUM ALLOY
- ④ RIVET BLIND NAS 1738B5 MAINTAIN 2 DIA EDGE DISTANCE. RIVET SPACING  
NOT TO EXCEED 1.5 INCHES. INSTALL RIVETS BEFORE ADHESIVE  
SETS. RIVETS NOT REQUIRED IN FIBERGLASS SKINS
- ⑤ CORE PLUG ADHESIVE 2-PART EPOXY FED SPEC MMM A 132
- △⑥ DAMAGE AREA NOT TO EXCEED 10 SQUARE INCHES OR 10% OF EDGE LENGTH
- △⑦ PATCH OVERLAP OUTER SKIN 1.5 INCH  
INNER SKIN 1.5 INCH
- 8 SKIN PATCH ADHESIVE 2 PART EPOXY FED SPEC MMM A 132
- 9 REMOVE ALL FOREIGN MATERIAL AND OXIDES FROM FAYING SURFACES PRIOR TO  
APPLYING ADHESIVE.
- 10 APPLY 10 TO 40 PSI TO PATCHES DURING CURE CYCLE.
- 11 MIXING AND CURING OF ADHESIVES TO BE ACCOMPLISHED PER MANUFACTURERS  
REQUIREMENTS.

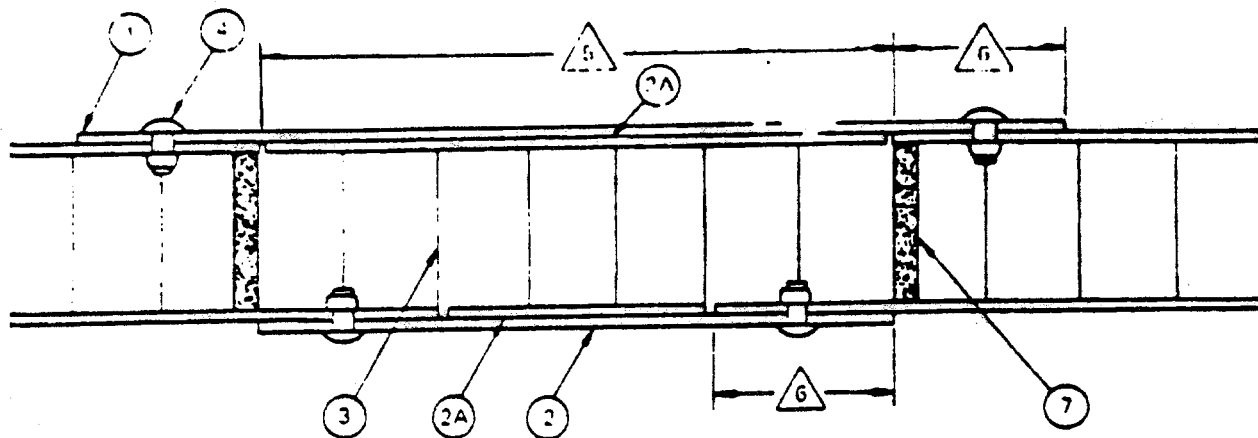
FIGURE 1-1. EDGE REPAIR ALL PANELS

**MINOR DAMAGE, ALUMINUM AND FIBERGLASS SKINS**

- ① CORE FILLER - FED SPEC. MMM-A-132
- ② DAMAGE AREA - NOT TO EXCEED 0.5 INCH DIAMETER
- 3. COUNTERBORE DIAMETER TO CLEAN UP DAMAGED SKIN AND CORE - CLEAN OUT BORED AREA.
- 4. FILL HOLE FLUSH WITH ITEM 1
- 5. ALLOW FILLER TO CURE
- 6. SAND SMOOTH AND REFINISH AS NECESSARY
- 7. MIXING AND CURING OF ADHESIVES TO BE ACCOMPLISHED PER MANUFACTURER'S INSTRUCTIONS.

**Figure 4-48. MINOR DAMAGE, ALUMINUM AND FIBERGLASS SKINS**

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## ALUMINUM SKIN REPAIR (INTERNAL STRUCTURE)

- ① OUTER SKIN PATCH - COMPOSITE SKIN (PEEL PLY, ONE SIDE) GAGE SAME AS EXISTING SKIN.
- ② INNER SKIN PATCH - COMPOSITE SKIN (PEEL PLY, ONE SIDE) GAGE SAME AS EXISTING SKIN. IF NO DAMAGE SUSTAINED TO INNER SKIN, PATCH IS NOT REQUIRED.

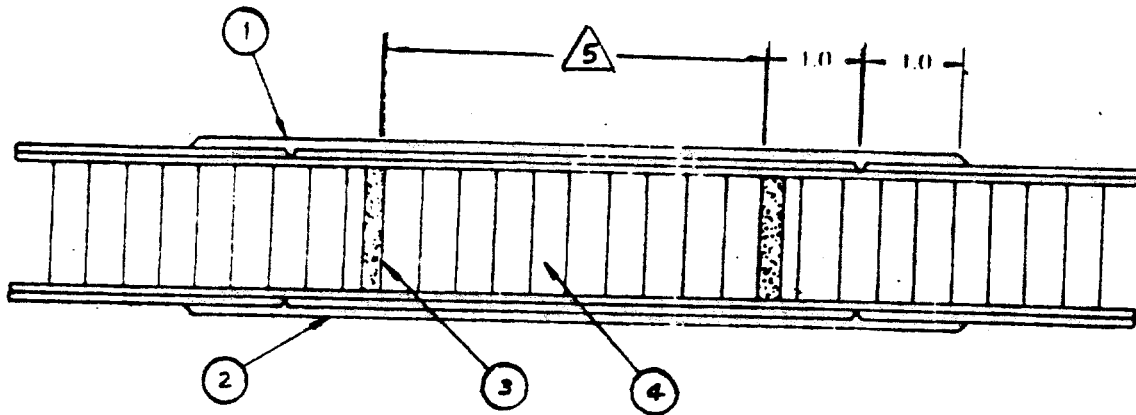
NOTE (FOR FIBERGLASS SKIN SEE EXTERIOR STRUCTURES)

- ②A FILLER - COMPOSITE SKIN (PEEL PLY, BOTH SIDES)
- ③ CORE PLUG - HONEYCOMB ALUMINUM ALLOY.
- ④ RIVET, BLIND - NAS 1738B5. MAINTAIN 2 X DIA. EDGE DISTANCE. RIV. 1 SPACING NOT TO EXCEED 1.5 INCHES. INSTALL RIVETS BEFORE ADHESIVE SETS.
- ⑤ DAMAGE AREA - NOT TO EXCEED 10 SQUARE INCHES ALUMINUM.
- ⑥ PATCH OVERLAP - OUTER SKIN - 1.5 INCH.  
INNER SKIN - 1.0 INCH
- ⑦ CORE PLUG ADHESIVE - 2 PART EPOXY, FED. SPEC. MMM A-132.
- 8. SKIN PATCH ADHESIVE - 2 PART EPOXY, FED. SPEC. MMM A-132.
- 9. REMOVE ALL FOREIGN MATERIAL AND OXIDES FROM FAYING SURFACES PRIOR TO APPLYING ADHESIVE.
- 10. APPLY 10 TO 40 PSI TO PATCHES DURING CURE CYCLE.
- 11. MIXING AND CURING OF ADHESIVES TO BE ACCOMPLISHED PER MANUFACTURER'S REQUIREMENTS

Figure 4-49. (INTERNAL STRUCTURE) ALUMINUM SKIN REPAIR



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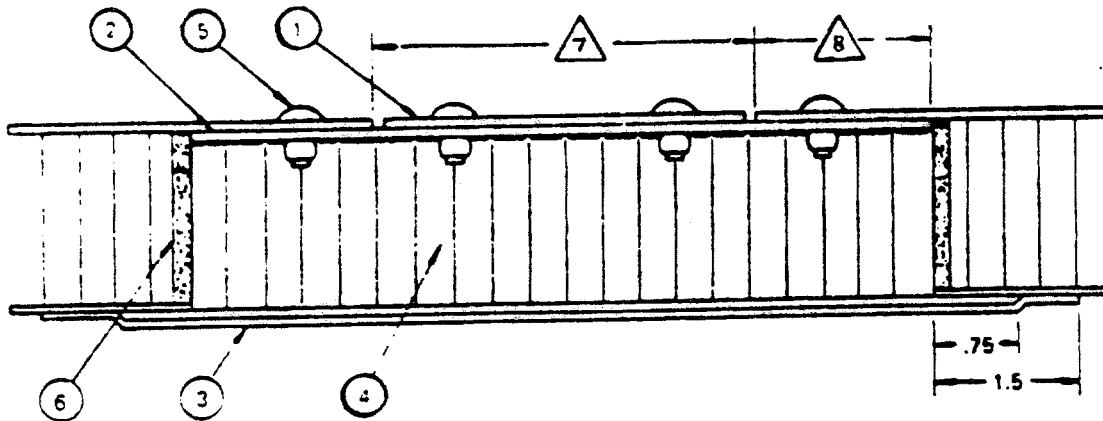


## FIBERGLASS SKIN REPAIR

- ① OUTER SKIN PATCH - FIBERGLASS. PLIES EQUAL TO EXISTING SKIN.
- ② INNER SKIN PATCH - FIBERGLASS. PLIES EQUAL TO EXISTING SKIN.
- ③ CORE PLUG ADHESIVE - 2 PART EPOXY FED. SPEC. MMM A-132.
- ④ CORE PLUG - HONEYCOMB. SAME AS EXISTING CORE.
- ⑤ DAMAGE AREA - 12 SQUARE INCHES.
- 6 FIBERGLASS RESIN - MIL-R-9300.
- 7 REMOVE ALL FOREIGN MATERIAL FROM FAYING SURFACES.
- 8 APPLY 10 TO 40 PSI PRESSURE TO PATCHES DURING CURE CYCLE.
- 9 MIXING AND CURING OF ADHESIVES TO BE ACCOMPLISHED PER MANUFACTURER'S INSTRUCTIONS.

Figure 4-50. FIBERGLASS SKIN REPAIR

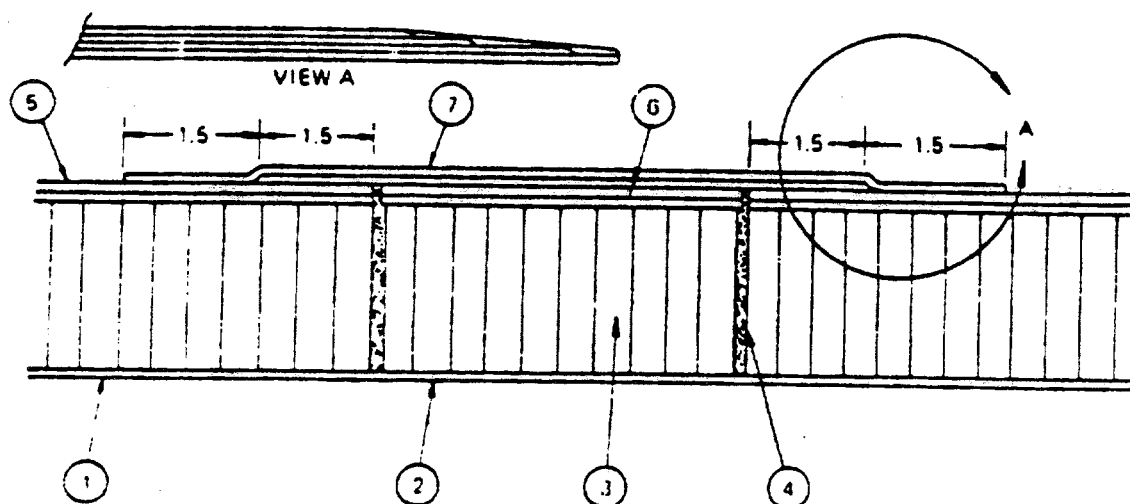
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# ALUMINUM (FLUSH PATCH) (EXTERIOR STRUCTURE)

1. OUTER SKIN PATCH COMPOSITE SKIN (PEEL PLY, ONE SIDE) GAGE SAME AS EXISTING SKIN.
2. DOUBLER OUTER SKIN PATCH COMPOSITE SKIN (PEEL PLY, TWO SIDES). GAGE SAME AS OUTER SKIN PATCH
3. INNER SKIN PATCH FIBERGLASS (TWO PLYS). NOTE IF METAL SEE INTERIOR SKIN PATCH
4. CORE PLUG HONEYCOMB ALUMINUM ALLOY
5. RIVET BLIND - NAS 1738 B5 MAINTAIN 2 X DIA. EDGE DISTANCE RIVET SPACING NOT TO EXCEED 1.5 INCHES. INSTALL RIVETS BEFORE ADHESIVE SETS
6. ADHESIVE, CORE PLUG - 2-PART EPOXY (FED. SPEC. - MMM-A-132).
7. DAMAGE AREA NOT TO EXCEED 10 SQUARE INCHES ALUMINUM.
8. DOUBLER OVERLAP - UP TO 1/2 INCH PANEL - 1.0 INCH.  
OVER 1/2 INCH PANEL - 1.5 INCH.
9. ADHESIVE, OUTER SKIN - 2-PART EPOXY (FED. SPEC. - MMM-A-132).
10. ADHESIVE, INNER SKIN - 2-PART EPOXY RESIN.
11. REMOVE ALL FOREIGN MATERIAL AND OXIDES FROM FAYING SURFACES PRIOR TO APPLYING ADHESIVE.
12. APPLY 10 TO 40 PSI TO REPAIR DURING CURE CYCLE.
13. MIXING AND CURING OF ADHESIVES TO BE ACCOMPLISHED PER MANUFACTURER'S REQUIREMENTS

Figure 4-51. ALUMINUM (FLUSH PATCH)



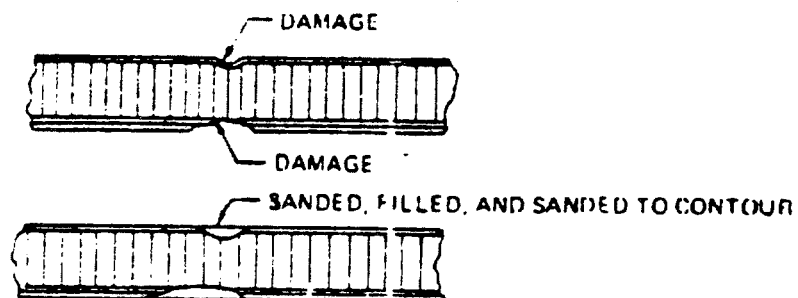
- ① METAL SKIN
- ② DELAMINATED METAL SKIN AREA
- ③ CORE PLUG - ALUMINUM ALLOY
- ④ ADHESIVE
- ⑤ FIBERGLAS SKIN
- ⑥ FIBERGLAS MATERIAL FILLER OVER REPAIR PLUG TO FLUSH REPAIR WITH EXISTING
- ⑦ FIBERGLAS LAY UP PATCHES - EQUAL TO EXISTING SKIN

NOTE

VIEW A DEPICTS SMOOTHING OF FIBERGLAS LAY UP PATCH EDGE TO SURROUNDING EXISTING SKIN

Figure 4-52. REPAIR FOR METAL SKIN DELAMINATION OPPOSITE FIBERGLAS SKIN

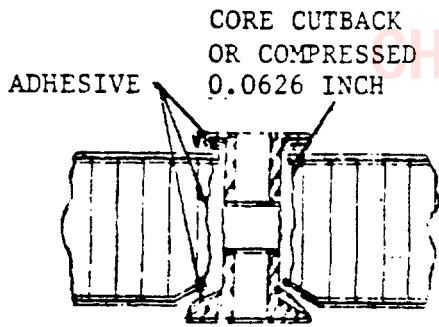
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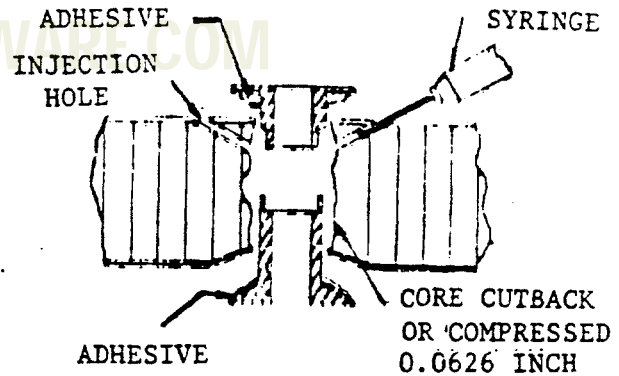
#### SURFACE DAMAGE REPAIR

- 1 SAND LIGHTLY TO REMOVE RAISED OR ROUGH SURFACE AND FINISH FROM DENT AREA
- 2 CLEAN WITH METHYL ETHYL KETONE (TT M 261B) AND WIPE DRY
- 3 APPLY ADHESIVE (METALSET 4-4 CEMENT) WITH A SUITABLE TOOL (SPATULA OR TONGUE DEPRESSOR) DRESS SMOOTH AND CURE.
- 4 LIMITS (SEE FIG 3-3)

Figure 4-53. SURFACE DAMAGE REPAIR



GROMMET TYPE INSERTS METHOD "A"



GROMMET TYPE INSERTS METHOD "B"

# NOTE

If water corrosion is found in the honeycomb, the entire panel must be replaced.

1. Drill out damaged insert using drill of same size as body of insert. Do not enlarge hole in panel. Clean up and deburr hole.
2. Remove or compress honeycomb core to a minimum of 0.0626 inches larger than diameter of insert.
3. Apply Metalset A-4 adhesive FSCM 00414 to flanges of new insert.

A. If Method "A" is being used, install one half of new insert into hole and apply adhesive around inside of hole approximately one half of panel thickness. Install other half of insert.

# NOTE

If Method "A" is being used, bolt, nut and washers coated with wax or grease may be used to pull and seal insert halves.

B. If Method "B" is being used, install both halves of new insert into hole. Drill two 0.0625 inch injection holes 180 degrees apart, through facing of panel just outside outer circumference of insert and at an angle to penetrate cavity in core around insert. Use hypodermic syringe to inject adhesive into only one of the drilled injection holes until a steady flow of adhesive is flowing from the other hole.

Seal inserts with Metalset A-4 Adhesive and remove excess with a clean cloth dampened with Methyl-ethylketone. Specification TTM261 if Method "A" is being used clean adhesive from center of insert.

Allow adhesive to cure. Sand lightly with Scotchbrite FSCM 76381 or No. 400 grit Abrasive Paper specification BD101 and clean area with Methyl-ethylketone, wipe dry and apply two coats of Lacquer MIL-81352 of color to match original finish.

Figure 4-54 Replacement of Inserts, Honeycomb Panels (Sheet 1 of 2)

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Section IV. PAINTING REQUIREMENTS

Refer to TM55-1500-345-23 for Painting Requirements.

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## Section I. FINAL INSPECTION, REASSEMBLY & ALIGNMENT

**1-1. Final Inspection.** Final inspection shall require a visual inspection of the complete structure to insure compliance with TM 55-1500-204-23, the data in this DMWR and all other contractual requirements and changes. In addition an alignment check shall be performed in accordance with subparagraph 3-15.f.

### NOTE

All items marked during pre-shop analysis shall be corrected.

**1-2. Reassembly.** Replace all loose items using data reference in Chapter 3, subparagraph 3-3.e, f, g.

**1-3. Alignment of Drive Shaft Hangers and 42 Degree Gearbox (Figure 1-1).** Torque seal (NSN 8030-01-163-3483) is to be applied under the heads of the four temporary 42 degree gear box mount screws to ensure that the the shims have not been mislocated after alignment of the 42 degree gearbox.

a. Install tooling on tailboom, figure 1-1, using standard size shim approximately 0.184 inch thick under each side of the 42 degree gearbox locator, and under each leg of the bearing hanger supports. Tighten bolts.

b. Run 0.020 inch gauge wire through hole in 90 degree gearbox plug, making sure end of wire is secured to top side of plug. Continue through bushing in top leg of 42 degree gearbox locator, around pin groove, through bushing in horizontal leg of 42 degree gearbox locator and through bushing in bulkhead tool. Tighten until all slack is removed from wire. Insure that no kinks are in wire.

c. When proper shim thickness has been established, remove all tooling, coat the shim and tailboom with epoxy primer, install shim and secure with rivets. Upon completion of shim installation, seal around edges of shims with proseal 890 or equivalent.

### NOTE

Do not rig the hanger bearing locator until 42 degree gearbox alignment is complete.

d. Align 42 degree gearbox locator using shims until wire is approximately centered in bushings located in top and horizontal legs of tool. Jackscrew holes are provided to aid in determining the correct amount of shim to utilize for positioning.

### NOTE

It may be necessary to taper 42 degree gearbox shim. Insure hanger bearing locator is installed between 42 degree gearbox locator and bulkhead tool. Use only one hanger bearing locator and move along wire to successive locations.

e. When proper shim dimension has been determined for the 42 degree gearbox, use hanger bearing locator to determine the shim thickness for the drive shaft hanger bearing supports. Support will be correctly located when wire does not touch sides of holes in bearing support locator tool bushings (two bushings per tool). Locate one (1) support at a time.

f. Deleted.

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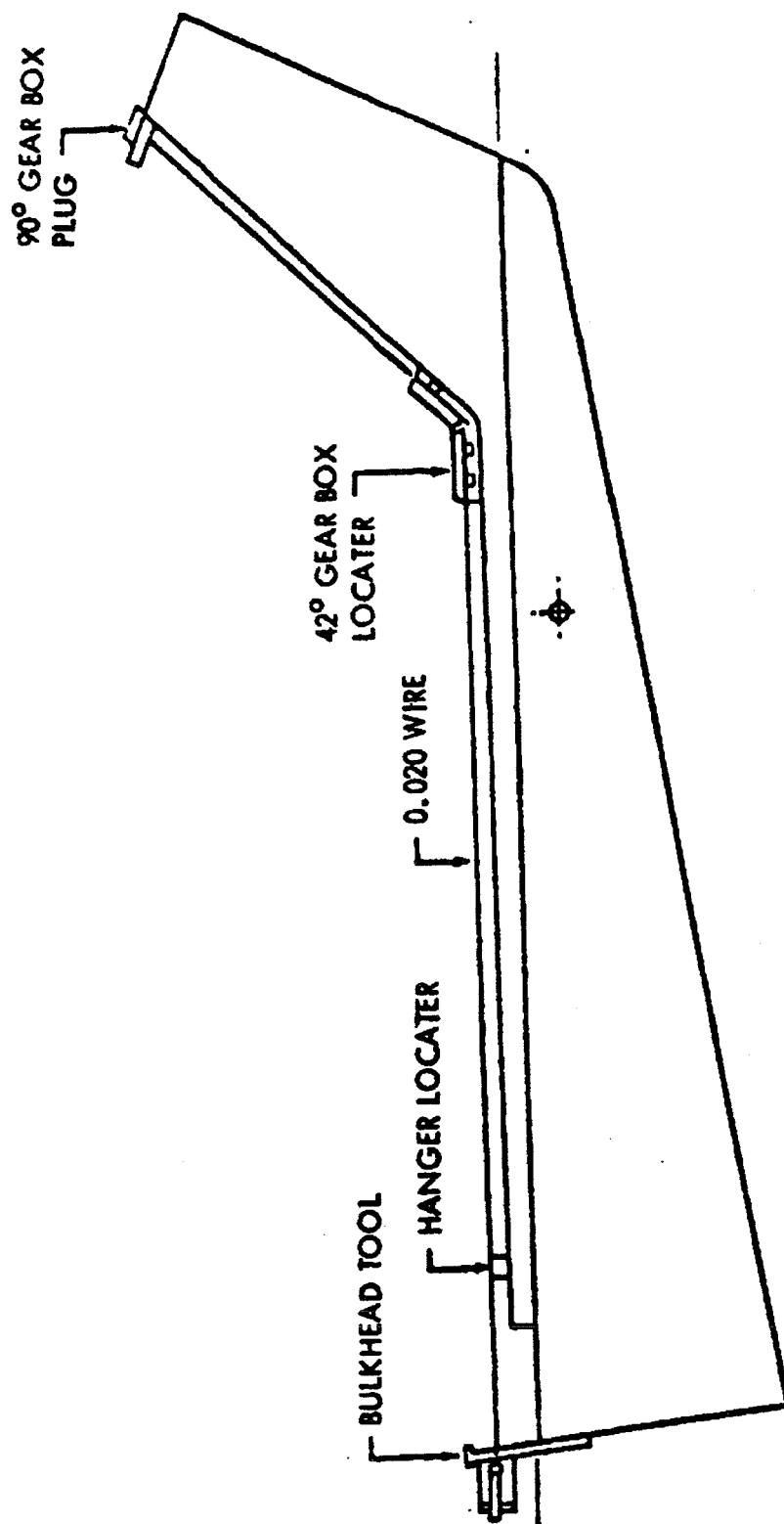


FIGURE 4-55. ALIGNMENT OF DRIVE SHAFT HANGER AND 42° GEAR BOX

## CHAPTER 5 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

### Section I. GENERAL

**5-1. Responsibility.** The contractor/depot quality assurance activity is responsible for the performance of the inspections specified in the DMWR. The contractor/depot may utilize their own facilities or any commercial laboratory acceptable to the procuring activity/commodity manager (PA/CM). The PA/CM reserves the right to perform any of the inspections specified in the DMWR, when such inspections are necessary to assure that supplies or services conform to the prescribed requirements.

**5-2. Quality Assurance Terms and Definitions.** For quality assurance terms and definitions refer to MIL-STD-109.

**5-3. Test, Measurement and Diagnostic Equipment (TMDE).** The overhaul facility is responsible for acquisitions, maintenance, calibration, and disposition of all TMDE. Items of TMDE to be used by AMC (Army) elements will be acquired in accordance with AR 750-43 and AMC Supplement 1 to AR 750-43. All TMDE used in compliance with this DMWR shall be maintained and controlled in accordance with MIL-I-45607 (Acquisition, Maintenance and Disposition of Inspection Equipment), MIL-STD-45662A (Calibration Systems Requirements) and DESCOR-R 701-1 (Depot Quality Systems - Army facility). Calibration documents for all TMDE shall be traceable to the National Institute of Standards and Technology (NIST).

**5-4. Certification of Personnel, Materials, and Processes.** The contractor/depot QA activity shall be responsible for ascertaining and certifying personnel skills, equipment, and material meet the requirements of the work to be accomplished. Unless otherwise specified in the contract or by PA/CM representative, the contractor/depot QA activity shall provide the PA/CM with statements or other evidence that specifications for such special processes as welding, nondestructive testing, plating, and the like, have been complied with. Personnel performing magnetic particle and penetrant tests shall be certified in accordance with MIL-STD-410.

### Section II. INSPECTION REQUIREMENTS

#### 5-5. General.

a. Quality Inspectors (QI) are required to witness all tests and those inspections which are marked "QI" or otherwise designated by the PA/CM.

b. The Maintenance Technicians shall inspect, check, and determine the conditions of all other areas to insure compliance with the DMWR.

**5-6. Product Verification Audit.** A product verification audit may be performed in accordance with AVSCOM-R-702-1 on one of the first five items produced to verify compliance with the DMWR and contractual terms.

#### 5-7. In-Process and Acceptance Inspections.

a. Used components and refinished parts recovered as products of disassembly shall be examined 100% by the contractor/depot, to determine serviceability. The contractor/depot shall maintain a log containing the Maintenance Technician's comments for all parts removed; such as parts inspected, replaced, inspected by QI, tested by NDI, modified by MWO, or other notes of actions.

b. Diagnostic and nondestructive tests such as magnetic particle, penetrant, radiographic, and ultrasonic inspections as required by this DMWR shall be in accordance with referenced military specifications, and AVSCOM AA-STD-1 and AA-STD-2 where not otherwise specified. Personnel performing magnetic particle, penetrant, or other nondestructive inspections will be certified in accordance with MIL-STD-410.

c. A list of inspection definitions, Table 5-1, are included at the end of this chapter. Accept and reject criteria for these inspections and unique repair methods are found in applicable areas of this DMWR.

**5-8. Test Check List.** A check list indicating each required test shall be included as part of this DMWR. The list shall show name of test and test set-up (per figure if applicable). List the input readings, such as position of valves, switches, etc. List the required readings, such as time, meter readings, etc. List the accept/reject criteria for each test as applicable.

**TABLE 5-1. Inspection Definitions**

TERM	DEFINITION	PROBABLE CAUSE
Abrasion	Roughened surface, varying from light to severe.	Foreign material present between moving parts.
Bend	Any change in the intended configuration.	Application of severe or excessive force.
Break	Separation of part.	Severe force, pressure or overload.
Brinelling (False)	Surface marks or blemishes on balls, rollers, and raceways that normally have a polished or satin finish appearance. These marks will appear as lines at each position for roller bearings, and as points (or ellipses) at each ball position on ball bearings.	Vibration or low-radial angle oscillation, or to both, while not rotating.
Brinnelling (True)	Shallow, smooth indentations on balls, rollers, or raceways that have the original surface finish lines at the bottom of the depressions. The contour on the indentation in the raceway is the same as the ball or roller radius.	Impact during mounting, or stationary overload.
Burn	Loss of metal.	Excessive heat.
Burnishing	The smoothing of a metal surface by mechanical action, but without loss of material. Generally found on plain bearing surfaces. Surface discoloration is sometimes present around outer edges of burnished area.	Excessive heat.
<p style="text-align: center;"><b>NOTE</b></p> <p style="text-align: center;">Normal burnishing from operational service is not detrimental if coverage approximates the carrying load and if there is no evidence of burns.</p>		
Burr	A rough edge or sharp projection.	Impact from foreign object, or poor machining.

TABLE 5-1. Inspection Definitions (Cont.)

TERM	DEFINITION	PROBABLE CAUSE
Chipping	Breaking away of small metallic particles.	Heavy impact of foreign object.
Corrosion	Surface chemical action that results in surface discoloration, a layer of oxide, rust, and removal of surface metal.	Improper corrosion preventive procedures and excessive moisture.
Crack	A break in material.	Severe stress from overloading or shock; possible extension of a scratch.



Table 5-1. Inspection Definitions (continued)

TERM	DEFINITION	PROBABLE CAUSE
Dent	A small smoothly rounded depression	A sharp blow or excessive pressure
Distortion	A change from original shape	Application of severe heat or irregular forces
Erosion	Wearing away of metal	Hot gases, corrosive liquids, or grit
Fatigue failure	Sharp indentions, cracks toolmarks, and inclusions that result in progressive yielding of one or more local areas	Cyclic stress. As stress is repeated, cracks develop, then spread, usually from surfaces (or near surface) of the particular section. Finally, so little sound material remains that normal stress on part exceeds strength of the remaining material. This type of failure is not caused by metal crystallization. This condition can easily be determined by visual inspection of part. Striations will be evidence by several lines, more or less concentric. The center (or focus) of lines indicates origin of the failure
Flaking	Loose particles of metal or evidence of surface covering removal	Imperfect bond or severe load
Fracture	See break	
Gouging	Removal of surface metal. Typified by rough and deep depressions	Protruding objects, misalignment
Heat oxidizing	Characterized by a discoloring film. Color varies from yellow to brown and blue to purple	High temperature operation
Indenting	Cavities with smooth bottoms and sides. Occurs on rolling contact surfaces of bearing components	Loose or foreign particles rolling between rotating elements of a bearing
Nick	A sharp-bottomed depression that may have rough outer edges	Dropping, banging
Off-square or misalignment of Anti-Friction Bearing	Indicated by retainer deterioration, retainer bore erosion, and gouged retainer rolling element pockets of the inner and outer race. Two distinct rolling element paths may be seen on the race where off-square conditions exist	Caused by rolling element speed variation, which jams rolling elements into separator pockets

Table 5-1. Inspection Definitions (continued)

TERM	DEFINITION	PROBABLE CAUSE
Pitting	Small indentions in a surface	Chemical pitting: Oxidation of surface or electrolytic action. Mechanical pitting: Chipping of loaded surfaces caused by improper clearances and over-loading, and by pressure of foreign material
Scoring	Deep scratch following path of part travel	Result of localized lubrication breakdown between sliding surfaces
Scraping	A furrow	Rubbing with any hard, or rough pointed object
Scratch	A very shallow furrow or irregularity, usually longer than wide	Movement of a sharp object across the surface
Seizure	Fusion or binding of two adjacent surfaces preventing continued movement	Improper lubrication or wear
Stripped thread	Thread of a nut, stud, bolt, or screw damaged by tearing away part of thread	Improper installation or thread pitch or size
Tear	Parting of parent material	Excess tension, caused by an external force
Wear	Slow removal of parent material. Frequently, wear is not visible to the naked eye	Result of abrasive substances contacting rolling surfaces, and acting as a lapping compound



## CHAPTER 6 PACKAGING

**6-1.** Output components will be preserved, packed, and marked in accordance with the Delivery Order/Contract, Depot Maintenance Interservice Support Agreement (DMISA), Statement of Work (SOW) Memorandum of Agreement or other authorization document. Overhaul will not be considered until the output component is properly packaged.

**6-2.** Output components from organic depot maintenance and overhaul (M & O) programs will be packaged in accordance with FEDLOG Packaging File and marked in accordance with MIL-STD-129. Components for which a special or multi-application container is specified will be packed in the assigned container. All other components will be packaged level A/B unless weight and dimension requirements of MIL-STD-2073-1 and -2 specify a wood container. The level of packaging shall be level A/A when a special/multi-application reusable container or wooden container is specified. When components are received at the overhaul maintenance facility, the container will be inspected for serviceability in accordance with Chapter 2, TB 55-8100-200-24. Containers will be requisitioned as required to replace missing, improper, or unserviceable containers to insure availability of container when component is returned from the overhaul maintenance facility. Waivers, deviations, container substitution must be approved by the AMCOM Packaging Branch. Written communication should be submitted to HQ AMCOM AMSAM-MMC-LS-DP, Redstone Arsenal, AL 35898-5000. Telephone inquiries may be made to commercial (256) 876-5972/2526 or DSN 746-5972/2526.

**6-3.** All contractual matters shall be through the assigned Contracting Officer (KO). Technical communication should be submitted to HQ AMCOM AMSAM-MMC-LS-DP, Redstone Arsenal AL 35898-5000. Telephone inquiries may be made to commercial (256) 876-5972/2526 or DSN 746-5972/2526.

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## APPENDIX A

### REFERENCES

The following references of the issue in effect are required for use to accomplish the instructions set forth in this DMWR.

NUMBER	TITLE
AMC SUPP 1, AR 750-43	Army Test, Measurement and Diagnostic Equipment Program
AND10387	Drill Sizes and Drilled Hole Tolerances
AR 750-43	Army Test, Measurement and Diagnostic Equipment Program
ASTM 1417	
AVSCOM 702-1	Product Verification Audit Requirements
BELL STD 110-001	
DA Form 2028	Recommended Changes to DA Publications
DA PAM 738-751	Functional User's Manual for The Army Maintenance Management Systems—TAMMS-A
DESCOM-R 702-1	Product Verification Audit Requirements
EC 1469	
MIL-C-25731A	Crates for CONUS and OCONUS Shipment of Airframe Components
MIL-C-5541	Chemical Films and Chemical Film Materials for Aluminum and Aluminum Alloys
MIL-H-6088	Heat Treat
MIL-I-45607-C	Inspection, Acquisition, Maintenance and Disposition of Equipment
MIL-I-6866	Penetrant Inspection
MIL-M-3171	Process for Corrosion Protection of Magnesium Alloys Type VI, II
MIL-M-45202, Type II, Class A, Grade 3	Anodic Application of HAE
MIL-P-514	Plates, Identification, Instruction and Marking, Blank
MIL-P-514D	Instructions for Marking Blank Identification Plates
MIL-STD-109	Quality Assurance Terms and Definitions
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-410	Non-Destructive Testing Personnel Qualification and Certification
MIL-STD-45662A	Calibration System Requirements (Use ISO 10012, 10002, ANSI 2540-10002)
MIL-STD-6868	Magnetic Particle Inspection
MIL-W-6858C	Spotwelding

## NUMBER

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MMM-A-132

MWO 55-1500-200-30/25

MWO 55-1500-206-20/2

MWO 55-1520-210-50-6

MWO 55-1520-210-50-10

MWO 55-1520-211-34/23

MWO 55-1520-221-30/10

MWO 55-1520-221-30/13

MWO 55-1520-221-30/17

MWO 55-1520-221-40/3

TB 55-1520-221-20/7

TM 55-408

TM 55-1500-204-23

TM 55-1500-345-23

TM 55-1520-210-20

TM 55-1520-210-34P

TM 55-1520-219-20

TM 55-1520-220-20

TM 55-1520-221-20

TM 55-1520-221-34P

TM 55-1500-345-23

X0332-AH-1G-800

X0332-UH-1D/H-800

A-1 (Pretreatment)

Modification of UH-1B/D Antenna

Elevator Restrictor (Stop) Installation

Installation Provisions for Rada Warning Receiver (RWR)  
AN/APR-39Complete Provisions for AN/ARC-102 Single Side Band  
HF Radio

Provide Improved Tail Light Configuration

Update Provisions for AN/APX Transponder

Relocation of ARC-54 and UHF/VHF Antennas

Installation of Improved Anti-Torque System

Inspection of Tailbooms

Fundamentals of Airframe Maintenance

General Aircraft Maintenance Manual

Painting and Marking of Army Aircraft

Organizational Maintenance Manual Army Models  
UH-1D/H HelicoptersDS and GS Maintenance Repair Parts and Special Tools  
List (including Depot Maintenance Repair Parts and  
Special Tools), Army Model UH-1B/C/D/H/M

Organizational Maintenance Manual Army Model UH-1B

Organizational Maintenance Manual Army Models  
UH-1C/M

Organizational Maintenance Manual Army Model AH-1G

DS and GS Maintenance Repair Parts and Special Tools  
List (including Depot Maintenance Repair Parts and  
Special Tools), Army Model AH-1G

Painting and Marking of Army Aircraft

Configuration Update drawing (FMC 12757)

Configuration Update drawing (FMC 12757)

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## APPENDIX B

## ILLUSTRATED MANUFACTURE ITEMS LIST

B-1. This appendix includes complete instructions, including bills of material, for manufacture of the following listed items.

B-2. Where skin dimensions are absent in figure presentation, utilization of replaced skin as a pattern is required.

B-3. The Part Number Index lists all items in part number order with a cross-reference to the figure in which the item appears. All materials necessary for manufacture of an item are listed by Federal Stock Number in the bill of material for the item.

<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>	<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>
204-001-790-1	B-1	204-030-055-25	B-7
204-001-791-3	B-2	204-030-800-29S	B-23
204-001-791-5S	B-2	204-030-800-30S	B-23
204-001-791-7S	B-2	204-030-800-47S	B-23
204-001-849-1	B-3	204-030-800-48S	B-23
204-001-849-2	B-3	204-030-800-91S	B-8
204-030-030-3	B-4	204-030-800-93S	B-8
204-030-031-7S	B-5	204-030-800-97S	B-8
204-030-031-9S	B-5	204-030-800-98S	B-8
204-030-055-19S	B-6	204-030-800-99S	B-8
204-030-800-100S	B-8	204-030-800-233S	B-8
204-030-800-111S	B-8	204-030-800-235S	B-22
204-030-800-113S	B-9	204-030-800-245S	B-19
204-030-800-114S	B-9	204-030-800-291S	B-24
204-030-800-115S	B-10	204-030-800-301	B-25
204-030-800-116S	B-10	204-030-800-321S	B-8
204-030-800-141S	B-11	204-030-800-322S	B-8
204-030-800-147S	B-12	204-030-800-345S	B-26
204-030-800-155S	B-13	204-030-800-349S	B-26
204-030-800-156S	B-13	204-030-800-391S	B-8
204-030-800-169	B-14	204-030-800-393	B-14
204-030-800-177	B-15	204-030-800-413S	B-27
204-030-800-179S	B-15	204-030-800-415S	B-27
204-030-800-187S	B-16	204-030-800-417S	B-28
204-030-800-189S	B-17	204-030-800-419S	B-29

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<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>	<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>
204-030-800-191S	B-18	204-030-800-421S	B-33
204-030-800-193S	B-18	204-030-800-425S	B-30
204-030-800-195S	B-18	204-030-800-426S	B-30
204-030-800-203S	B-19	204-030-800-443	B-31
204-030-800-217S	B-20	204-030-800-445S	B-32
204-030-800-218S	B-20	204-030-800-453S	B-33
204-030-800-219S	B-20	204-030-800-463S	B-33
204-030-800-220S	B-20	204-030-800-479S	B-32
204-030-800-221S	B-21	204-030-800-481S	B-32
204-030-800-227S	B-12	204-030-806-117	B-34
204-030-808-163S	B-35	204-030-817-48S	B-46
204-030-812-47S	B-36	204-030-817-49S	B-47
204-030-812-49S	B-36	204-030-817-51S	B-48
204-030-812-51S	B-37	204-030-817-52S	B-48
204-030-812-53	B-38	204-030-817-53S	B-49
204-030-812-55	B-39	204-030-817-57S	B-50
204-030-812-65S	B-40	204-030-817-58S	B-50
204-030-812-67S	B-40	204-030-817-61S	B-51
204-030-813-21S	B-41	204-030-822-9S	B-53
204-030-813-25S	B-41	204-030-833-13	B-54
204-030-817-7S	B-52	204-030-833-15	B-54
204-030-817-8S	B-52	204-030-840-1S	B-41
204-030-817-9S	B-42	204-030-857-1S	B-55
204-030-817-10S	B-42	204-030-857-3S	B-55
204-030-817-15S	B-43	204-030-862-13S	B-56
204-030-817-16S	B-43	204-030-862-15S	B-56
204-030-817-37S	B-44	204-030-862-39S	B-57

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<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>	<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>
204-030-817-38S	B-44	204-030-865-7S	B-58
204-030-817-39S	B-45	204-030-879-19S	B-59
204-030-817-40S	B-45	204-030-879-21S	B-60
204-030-817-43S	B-45	204-030-879-23S	B-60
204-030-817-44S	B-45	204-030-879-25S	B-61
204-030-817-45S	B-45	204-030-879-27S	B-61
204-030-817-47S	B-46	204-030-879-29	B-62
204-030-894-13S	B-63	204-030-900-23S	B-76
204-030-894-15S	B-64	204-030-900-33S	B-77
204-030-894-19S	B-65	204-030-902-21	B-79
204-030-894-20S	B-65	204-031-075-3	B-80
204-030-894-21S	B-66	204-031-080-11	B-81
204-030-894-22S	B-66	204-031-080-7S	B-82
204-030-894-23S	B-67	204-031-084-17S	B-83
204-030-894-24S	B-67	204-031-085-5S	B-84
204-030-894-27S	B-68	204-031-086-9S	B-85
204-030-894-28S	B-68	204-031-088-9S	B-86
204-030-894-37S	B-69	204-031-090-35S	B-87
204-030-894-38S	B-69	204-031-090-39S	B-87
204-030-894-39S	B-70	204-031-090-37S	B-88
204-030-894-40S	B-70	204-031-090-41	B-89
204-030-894-41S	B-71	204-031-143-21S	B-90
204-030-894-42S	B-71	204-031-143-22S	B-90
204-030-894-43S	B-72	204-031-143-3S	B-91

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<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>	<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>
204-030-894-44S	B-72	204-031-239-1	B-92
204-030-894-45S	B-73	204-031-807-9S	B-93
204-030-894-49S	B-74	204-031-807-10S	B-93
204-030-900-7S	B-78	204-031-807-11	B-94
204-030-900-17S	B-75	204-031-811-1	B-95
204-030-900-19S	B-75	204-031-812-1	B-96
204-030-900-21S	B-76	204-031-826-5S	B-97
204-031-826-7	B-98	205-030-846-63S	B-114
204-031-866-5S	B-99	205-030-846-67S	B-114
205-001-707-1	B-100	205-030-846-69S	B-115
205-001-708-1	B-101	205-030-846-71S	B-121
205-030-111-21S	B-102	205-030-851-1	B-122
205-030-801-7S	B-103	205-030-899-3S	B-126
205-030-805-5S	B-104	205-030-899-5S	B-126
205-030-805-9S	B-105	205-030-899-7S	B-127
205-030-819-11S	B-106	205-030-899-9S	B-127
205-030-819-13S	B-106	205-030-889-19S	B-123
205-030-819-15S	B-107	205-030-899-33S	B-125
205-030-819-17S	B-108	205-030-899-34S	B-125
205-030-819-21S	B-109	205-030-899-35S	B-125
205-030-833-5	B-110	205-030-899-36S	B-125
205-030-833-7S	B-111	205-030-899-41S	B-128
205-030-833-31S	B-112	205-030-899-43S	B-128
205-030-846-17S	B-113	205-030-899-45S	B-129



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<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>	<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>
205-030-846-19S	B-114	205-030-899-47S	B-130
205-030-846-25S	B-115	205-030-899-48S	B-130
205-030-846-27S	B-116	205-030-899-61S	B-124
205-030-846-29S	B-117	205-030-899-62S	B-124
205-030-846-31	B-118	205-030-899-63S	B-131
205-030-846-33S	B-119	205-030-899-64S	B-131
205-030-846-45S	B-120	205-030-899-65S	B-132
205-030-899-66S	B-132	205-031-808-13S	B-151
205-030-899-67S	B-133	205-031-808-15S	B-151
205-030-899-73	B-134	205-031-808-31S	B-152
205-030-899-75	B-135	205-031-837-19S	B-153
205-030-899-77S	B-136	205-031-837-20S	B-153
205-030-899-99S	B-137	205-031-837-21S	B-154
205-030-899-105S	B-124	205-031-837-29S	B-155
205-030-899-107S	B-124	205-031-862-13S	B-156
205-031-013-15S	B-138	205-031-862-15S	B-156
205-031-013-17S	B-139	205-031-862-17S	B-157
205-031-013-19S	B-140	205-031-862-19S	B-157
205-031-013-21S	B-141	205-031-862-21S	B-157
205-031-013-23S	B-142	205-031-862-47S	B-158
205-031-013-25S	B-143	205-031-897-15S	B-159
205-031-800-43S	B-144	205-031-897-17S	B-160
205-031-800-45S	B-144	205-031-897-19S	B-161
205-031-800-57S	B-145	205-031-897-23S	B-162

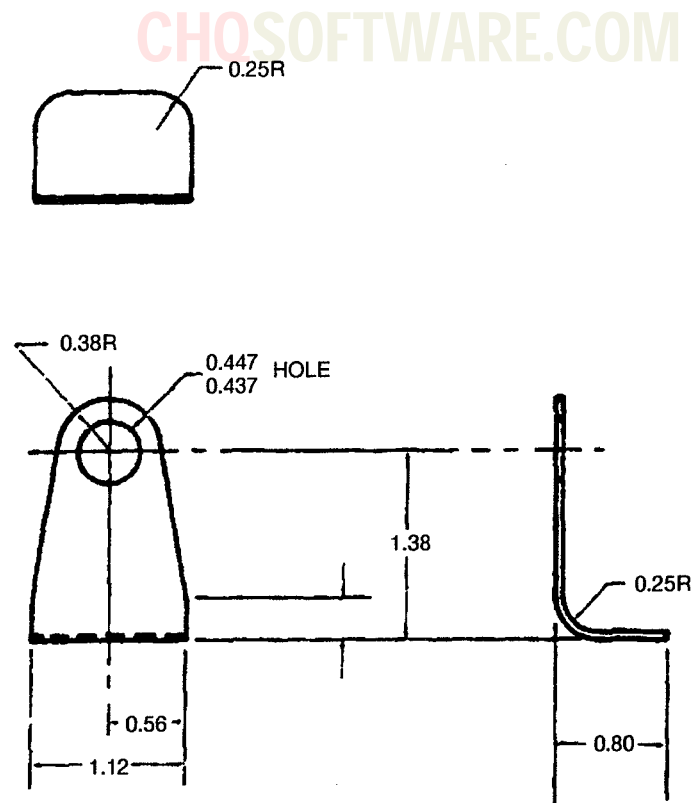
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<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>	<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>
205-031-800-59	B-146	205-031-897-25S	B-163
205-031-800-73S	B-147	205-031-897-29	B-164
205-031-801-73S	B-148	205-032-800-25	B-165
205-031-801-74S	B-148	205-032-800-27	B-166
205-031-803-15S	B-149	205-032-800-28	B-166
205-031-808-9S	B-150	205-032-800-39S	B-167
205-031-808-11S	B-150	205-032-800-59	B-168
205-032-800-61S	B-169	209-030-801-85	B-183
205-032-800-63	B-170	209-030-801-103S	B-178
205-032-800-64	B-170	209-030-803-17	B-184
209-030-800-43S	B-173	209-030-812-11S	B-185
209-030-800-53S	B-174	209-030-813-49S	B-186
209-030-800-79	B-175	209-030-815-23S	B-187
209-030-800-81	B-175	209-030-815-41S	B-188
209-030-800-83	B-175	209-030-817-27S	B-189
209-030-800-85S	B-176	209-030-817-28S	B-189
209-030-800-86S	B-176	209-030-817-29S	B-190
209-030-800-91	B-175	209-030-817-30S	B-190
209-030-800-99S	B-177	209-030-822-15S	B-191
209-030-800-107S	B-171	209-030-822-17S	B-191
209-030-800-109S	B-171	209-030-822-19S	B-191
209-030-800-115S	B-172	209-030-822-21S	B-192

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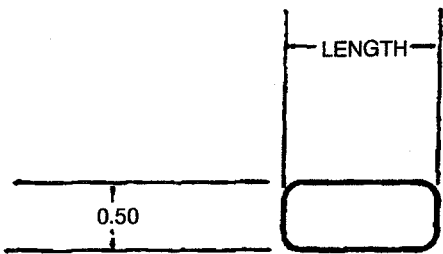
<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>	<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>
209-030-800-116S	B-172	209-030-823-49S	B-193
209-030-801-25S	B-179	209-030-825-17S	B-194
209-030-801-26S	B-179	209-030-827-13S	B-195
209-030-801-55	B-180	209-030-827-15S	B-196
209-030-801-57	B-180	209-030-827-19S	B-197
209-030-801-59S	B-181	209-030-827-27S	B-197
209-030-801-60S	B-181	209-030-827-33S	B-198
209-030-801-65S	B-182	209-030-827-45S	B-199
209-030-801-83	B-183	209-030-827-49	B-199
209-030-827-48S	B-200	209-030-845-16S	B-217
209-030-827-47	B-200	209-030-845-17S	B-218
209-030-827-51S	B-201	209-030-845-19S	B-217
209-030-827-57S	B-202	209-030-845-20S	B-217
209-030-827-59S	B-203	209-030-845-23S	B-219
209-030-827-61S	B-199	209-030-845-24S	B-219
209-030-827-79S	B-204	209-030-847-9S	B-220
209-030-827-81S	B-205	209-030-851-17S	B-221
209-030-827-83S	B-206	209-030-853-17S	B-222
209-030-827-85S	B-207	209-030-854-3	B-223
209-030-827-87S	B-207	209-030-858-5S	B-224
209-030-827-91S	B-208	209-030-858-15S	B-225
209-030-827-95S	B-209	209-030-874-17S	B-226
209-030-827-97S	B-210	209-030-874-19S	B-227
209-030-833-17S	B-211	209-030-874-33S	B-228

<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>	<u>PART NUMBER</u>	<u>FIGURE NUMBER</u>
209-030-833-18S	B-211	209-030-874-35S	B-229
209-030-833-19S	B-212	209-030-874-37S	B-230
209-030-833-20S	B-212	209-030-874-41S	B-231
209-030-835-17S	B-213	AGEN-ST0018-3	B-232
209-030-835-18S	B-213	AGEN-S70018-1 or -2	B-233
209-030-838-13S	B-214		
209-030-838-19	B-215		
209-030-838-21	B-216		
209-030-845-15S	B-217		



Part Number: 204-001-790-1 SUPPORT, Cable Fairlead  
Fabricate from: FSN 9535-232-0378  
Material: QQA250/5T3 0.063

FIGURE B-1



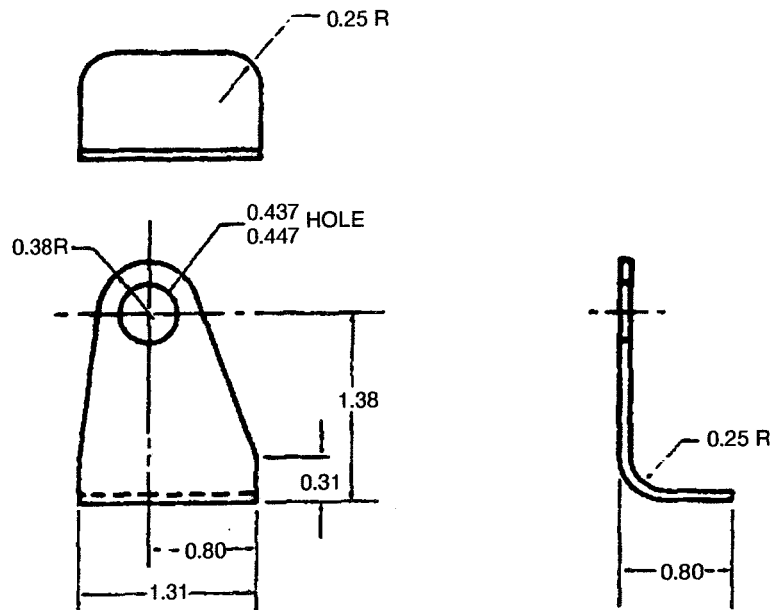
SHIM, Cable Fairlead Support

Fabricate from:

Part Number	FSN	Material	Length
204-001-791-3	9535-542-4705	QQM44 AZ31H24	0.032 1.31
204-001-791-5S	9535-084-4395	QQA250/5TO	0.032 1.12
204-001-791-7S	9535-084-4395	QQA250/5TO	0.032 1.31

FIGURE B-2

CHQSOFTWARE.COM



Part Number: 204-001-849-1 SUPPORT, Cable Fairlead (Shown)  
 204-001-849-2 SUPPORT, Cable Fairlead (Opposite)  
 Fabricate from: FSN 9535-232-0378  
 Material: QQA250/5T3 0.063

FIGURE B-3



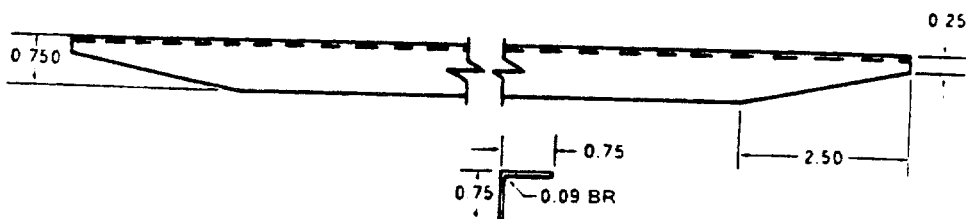
Part Number: 204-030-030-3 PAD  
 Fabricate from: FSN 9320-232-2473  
 Material: MIL-R-5001 Latex Foam Sponge (item 103, table 2-2)

FIGURE B-4



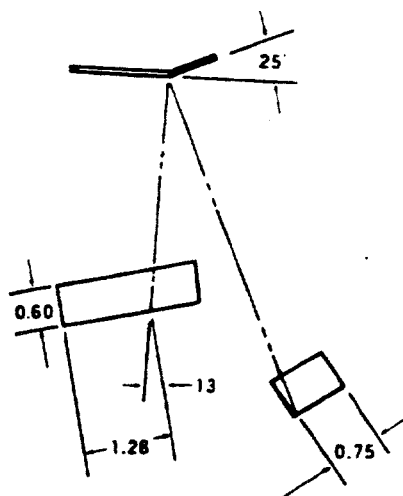
Part Number: 204-030-031-7S CLIP  
 204-030-031-9S CLIP  
 Material: QQA362 T3 0.032  
 Fabricate from: FSN 9535-484-4395

Figure B-5



Part Number: 204-030-055-19S SUPPORT  
 Fabricate from: FSN 9540-596-2821  
 Material: AND10133-0601x30.0

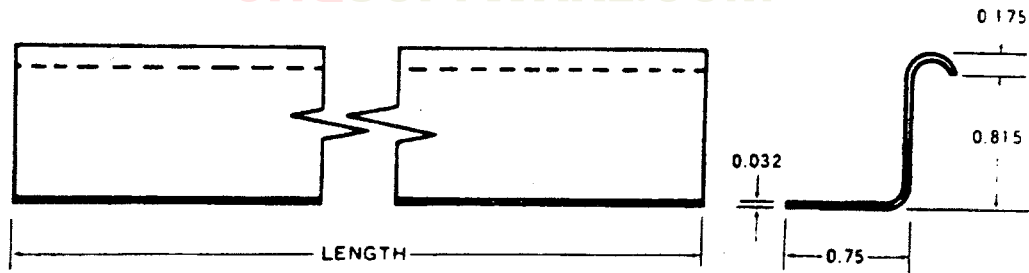
Figure B-6



Part Number: 204-030-055-25 CLIP  
 Fabricate from: FSN 9535-085-4155  
 Material: QQA250/5 T3 0.040x0.8x2.2

Figure B-7

CHQSOFTWARE.COM

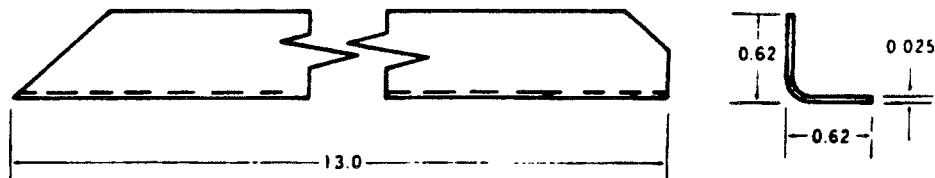


STRINGER

Part Number	Length
204-030-800-91S	46.0
204-030-800-93S	25.0
204-030-800-97S L.H.	20.58
204-030-800-98S R.H.	20.58
204-030-800-99S R.H.	20.56
204-030-800-100S L.H.	20.56
204-030-800-111S L.H.	22.0
204-030-800-233S	25.0
204-030-800-321S R.H.	20.62
204-030-800-322S L.H.	22.0
204-030-800-391S	21.0

Fabricate from: FSN 9540-159-6938  
Material: Bell Standard 110-001-1

Figure B-8

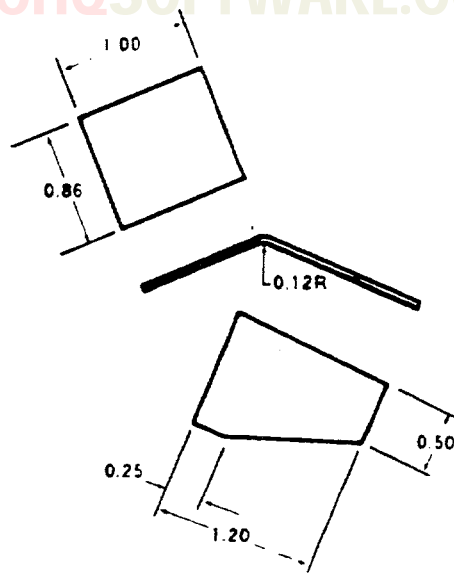


Part Number: 204-030-800-113S STRINGER (Shown)  
204-030-800-114S STRINGER (Opposite)  
Fabricate from: FSN 9535-086-9864  
Material: QQA250/13TO 0.025

Figure B-9

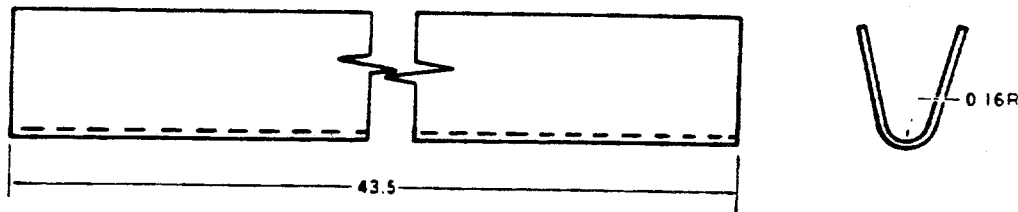


CHQSOFTWARE.COM



Part Number: 204-030-800-115S CLIP Left-Hand  
 204-030-800-116S CLIP Right-Hand  
 Material: QQA250/13T6 0.025  
 Fabricate from: FSN 9535-086-9864

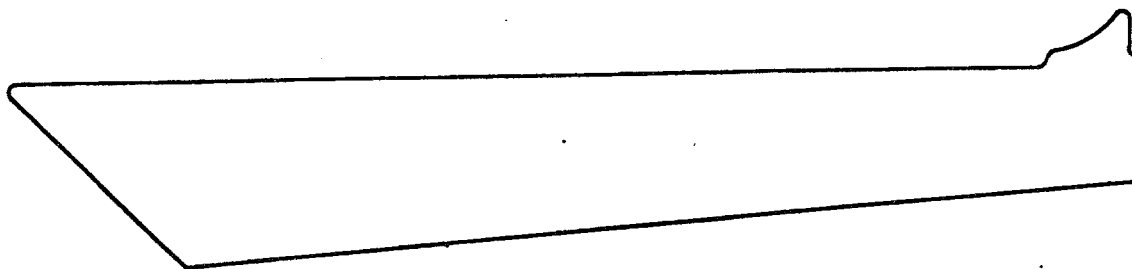
Figure B-10



Part Number: 204-030-800-141S CHANNEL  
 Fabricate from: FSN 9535-084-4551  
 Material: QQA250/5T3 0.040x2.5x43.5

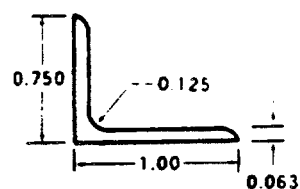
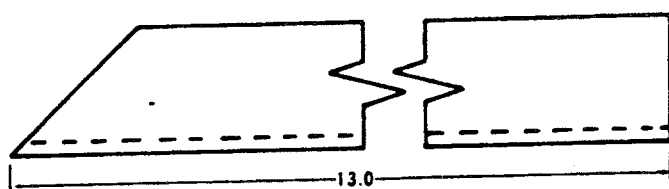
Figure B-11

CHQSOFTWARE.COM



Part Number: 204-030-800-147S SKIN, Forward Fin R.H.  
 204-030-800-227S SKIN, Forward Fin L.H.  
 Fabricate from: FSN 9535-084-4533  
 Material: Al Aly Sheet QQ-A-250 '5 T3 0.025 x 12.0 x 67.0

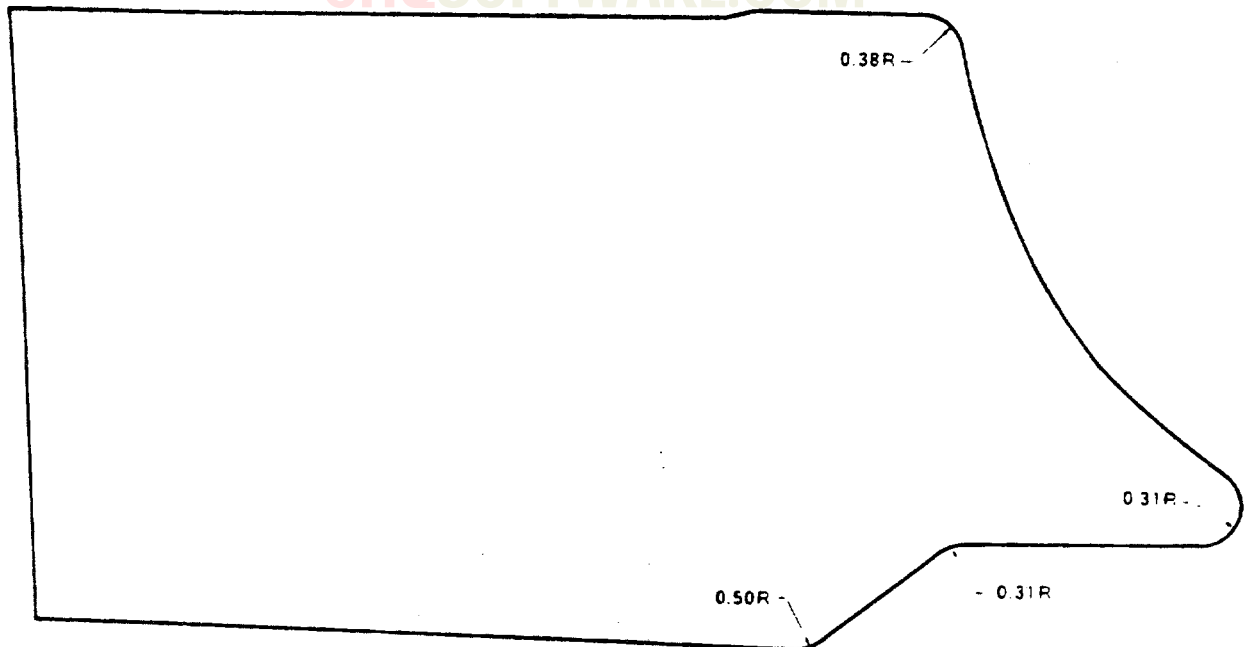
Figure B-12



Part Number: 204-030-800-155S ANGLE (Shown)  
 204-030-800-156S ANGLE (Opposite)  
 Fabricate from: FSN 9540-148-4311  
 Material: QQ-A-200/3 T4 AND 10134-1003 x 13.0

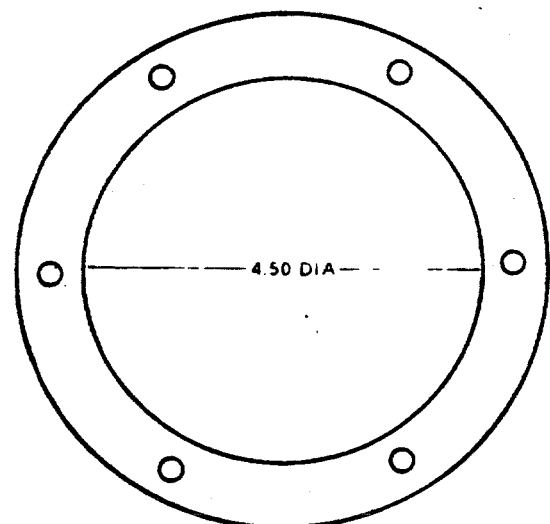
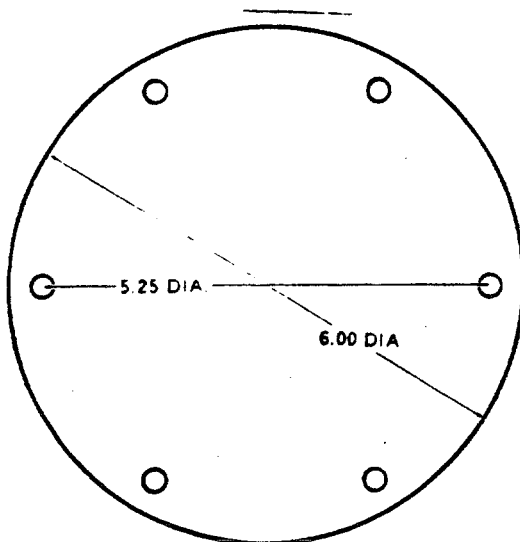
Figure B-13

CHQSOFTWARE.COM



Part Number: 204-030-800-169 DOUBLER (L.H.)  
 204-030-800-393 DOUBLER (R.H.)  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025 x6.0x12.0

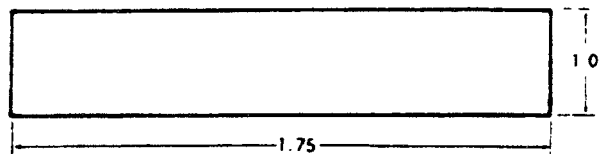
Figure B-14



Part Number: 204-030-800-177 DOOR  
 204-030-800-179S DOUBLER  
 Fabricate from: FSN 9535-167-2278  
 Material: QQ-A-250/5 T3 0.025

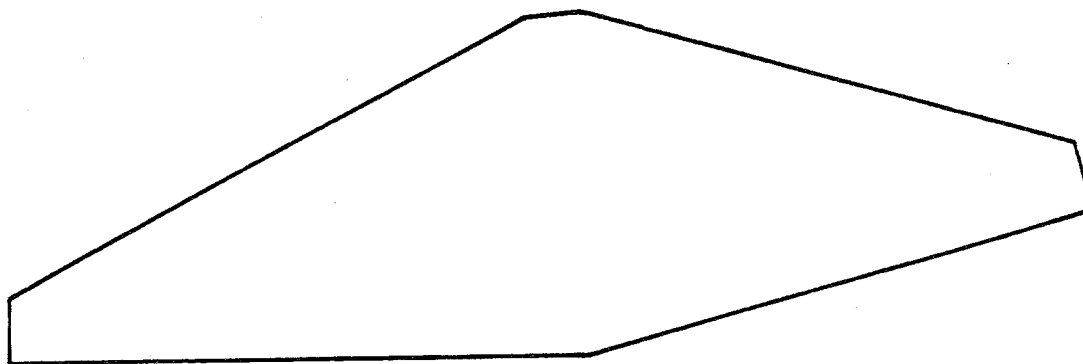
Figure B-15

CHQSOFTWARE.COM



204-030-800-187S SHIM  
FSN 9535-084-4395  
QQ-A-250/5 T3 0.032 x 1.0 x 1.75

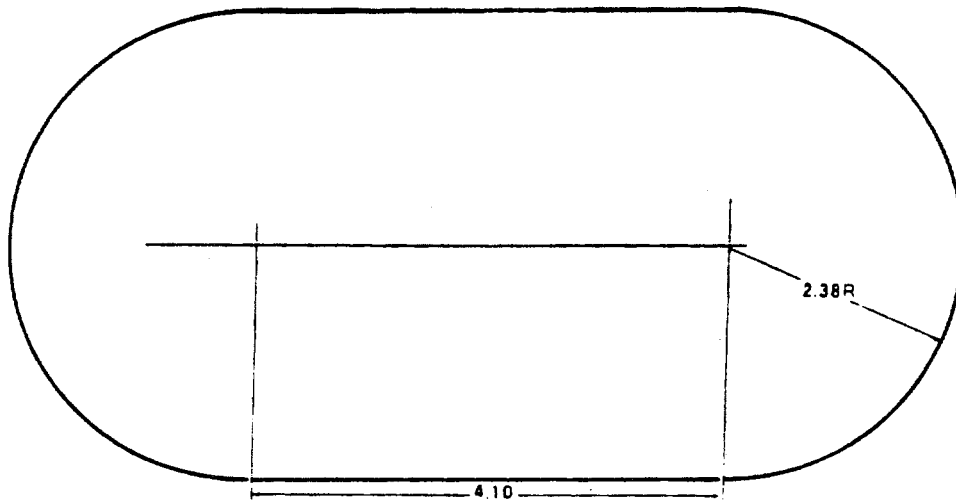
Figure B-16



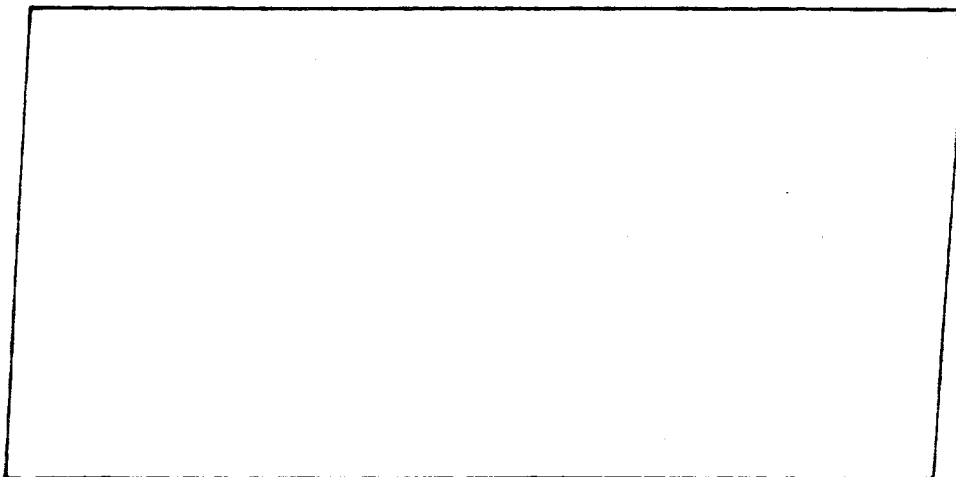
Part Number: 204-030-800-189S GUSSET  
Fabricate From: FSN 9535-084-4551  
Material: QQ-A-250/5 T3 0.040x3.5x9.0

Figure B-17

CHQSOFTWARE.COM



Part Number: 204-030-800-191S DOOR 5.2x9.2



204-030-800-193S DOUBLER 5.2x9.2



204-030-800-195S FILLER 0.8x4.0

Fabricate from: FSN 9535-084-4533  
Material: QQ-A-250/5 T3 0.025

Figure B-18

CHQSOFTWARE.COM

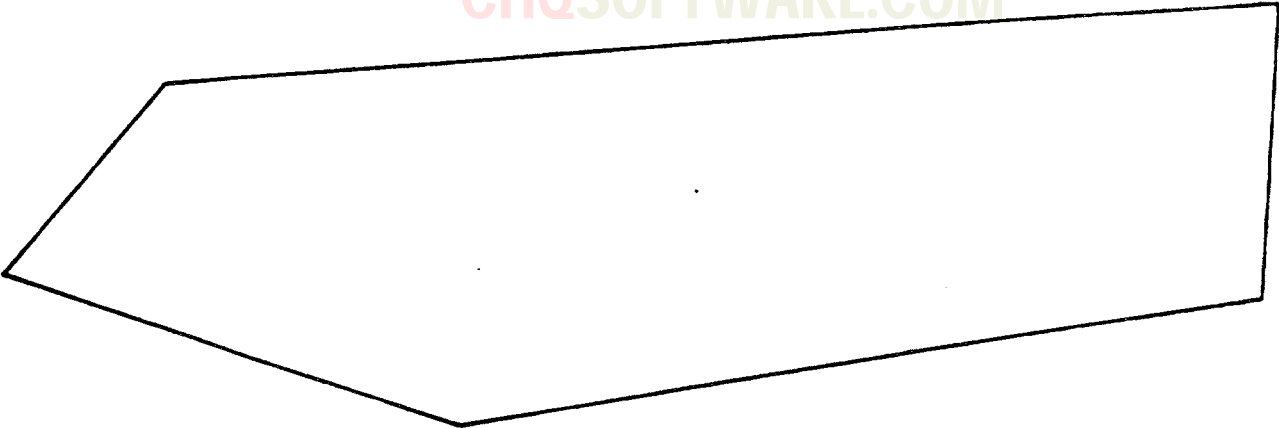
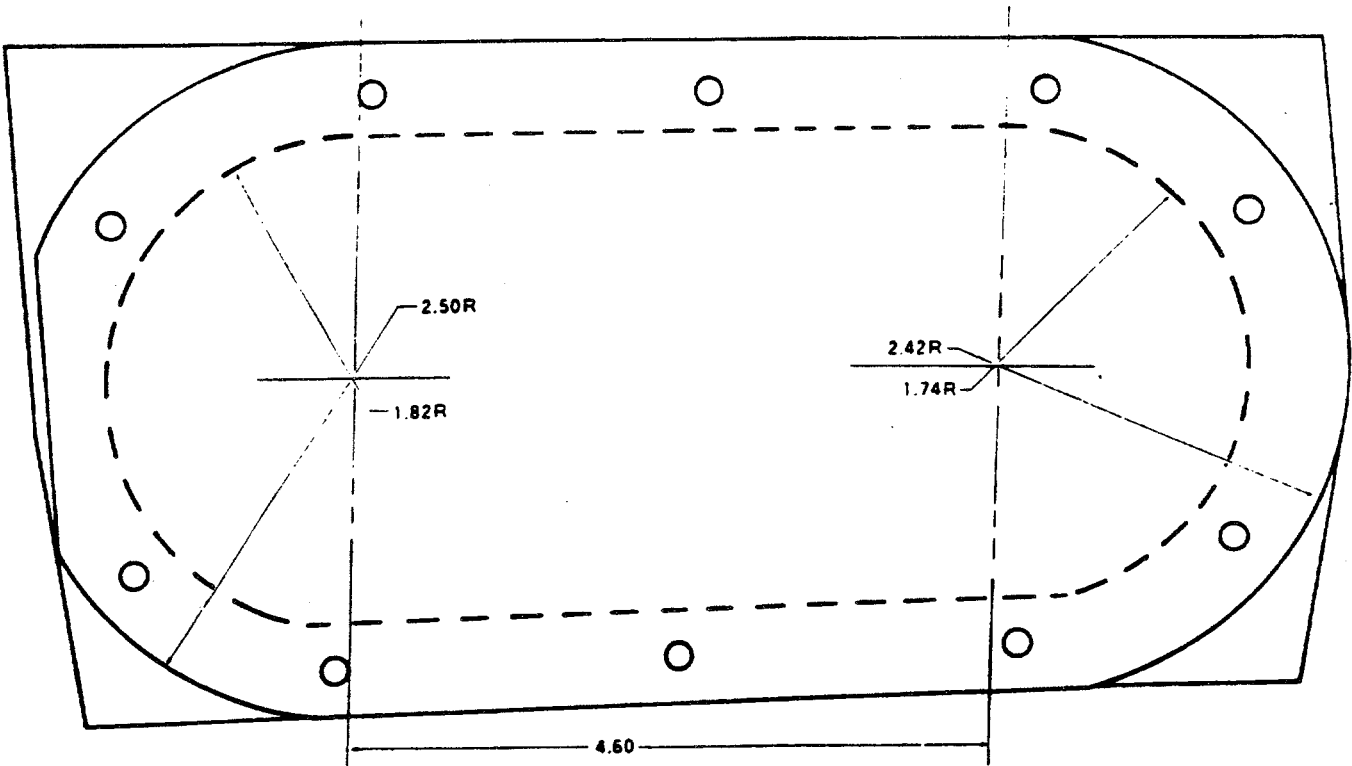


Figure Number: 204-030-800-203S SKIN Shown  
204-030-800-245S SKIN Opposite  
Fabricate From: FSN 9535-084-4533  
Material: QQ-A-250 '5 T3 0.025x14.5x67.0

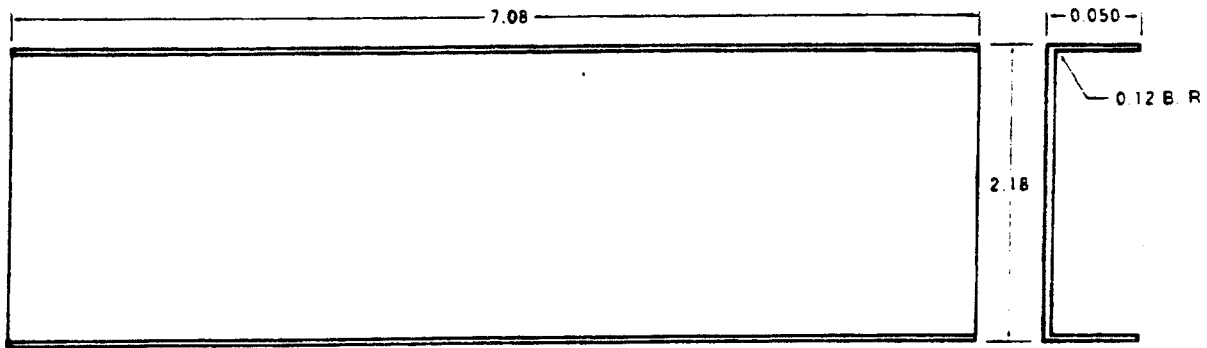
Figure B-19



Part Number	Fabricate from	Material
204-030-800-217S DOOR (Shown)	FSN 9535-084-4551	QQ-A-250 '5 T3 0.040
204-030-800-218S DOOR (Opposite)	FSN 9535-084-4551	QQ-A-250 '5 T3 0.040
204-030-800-219S DOUBLER(Shown)	FSN 9535-084-4395	QQ-A-250 '5 T3 0.032
204-030-800-220S DOUBLER (Opposite)	FSN 9535-084-4395	QQ-A-250 '5 T3 0.032

Figure B-20

CHQSOFTWARE.COM



Part Number: 204-030-800-2215 CHANNEL  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

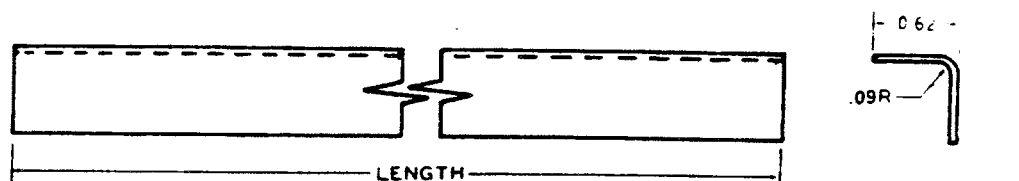
Figure B-21



Part Number: 204-030-800-235S STIFFENER  
 Fabricate from: FSN 9535-232-7535  
 Material: QQ-A-250/13 T6 0.032

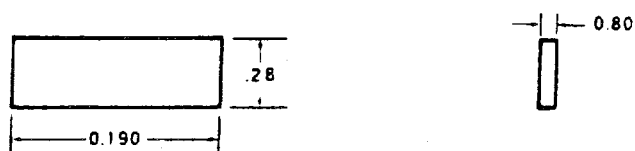
Figure B-22

CHQSOFTWARE.COM



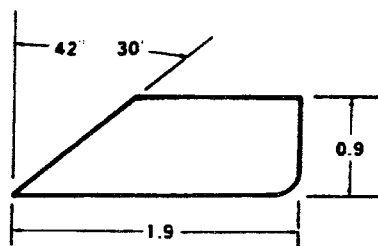
		Length
Part Number:	204-030-800-29S STIFFENER (Shown)	12.08
	204-030-800-30S STIFFENER (Opposite)	12.08
	204-030-800-47S STIFFENER (Shown)	11.93
	204-030-800-48S STIFFENER (Opposite)	11.93
Fabricate From:	FSN 9535-084-4533	
Material:	QQ-A-250 5 T3 0.025	

Figure B-23



Part Number:	204-030-800-291S SPACER
Fabricate From:	FSN 9535-236-7077
Material:	QQ-A-250/5 T3 0.190

Figure B-24



Part Number:	204-030-800-301 Filler
Fabricate From:	FSN 9535-084-4551
Material:	QQ-A-250/5 T3 0.040

Figure B-25

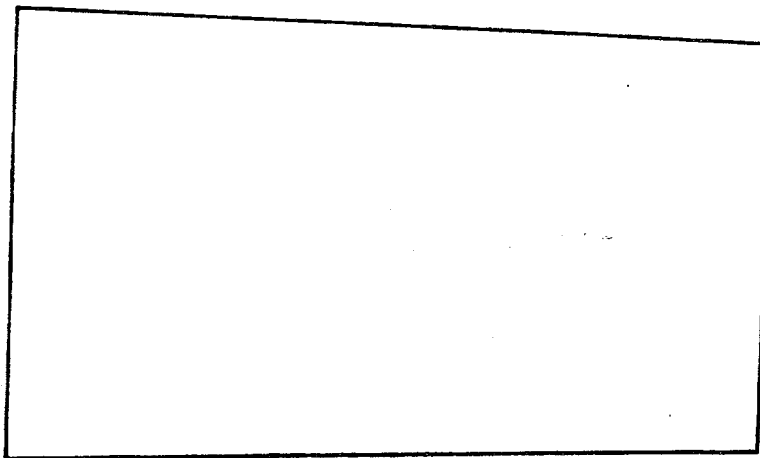


CHQSOFTWARE.COM



Part Number: 204-030-800-345S DOUBLER (R.H.)  
 204-030-800-349S DOUBLER (L.H.)  
 Fabricate from: FSN 9535-167-2278  
 Material: QQ-A-250/5 T3 0.025x1.8x2.4

Figure B-26



SKIN

Part Number	FSN	Material
204-030-800-413S L.H. (shown)	9535-084-4484	QQ-A-250/5 T3 0.020 x 32.0 x 45.0
204-030-800-415S R.H. (opposite)	9535-084-4551	QQ-A-250/5 T3 0.040 x 36.0 x 49.5

Figure B-27

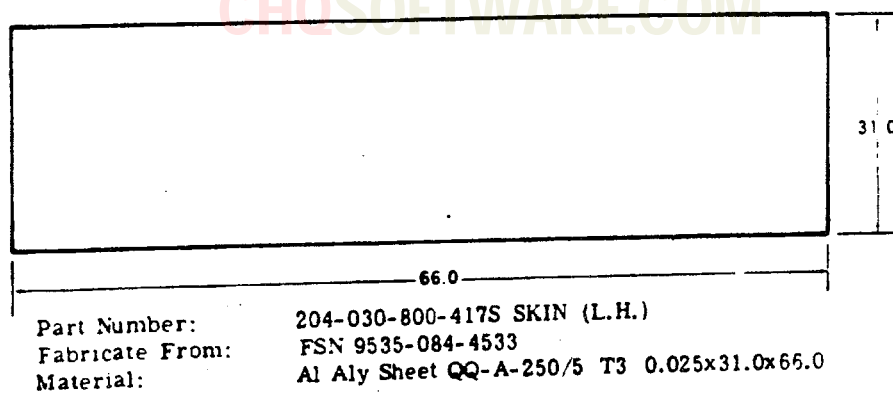


Figure B-28

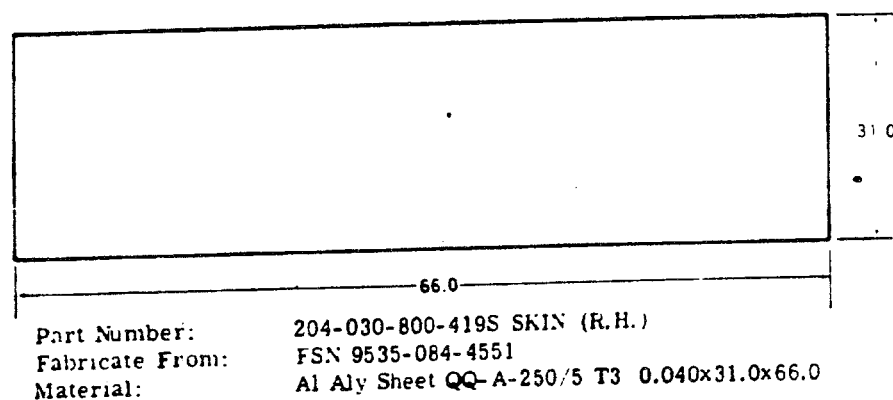


Figure B-29

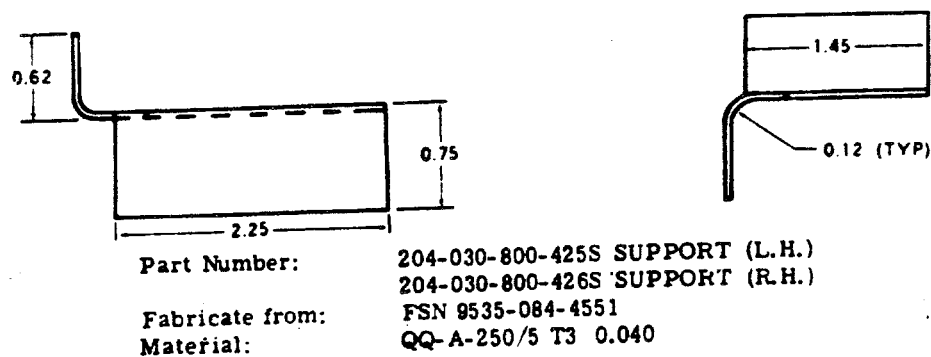
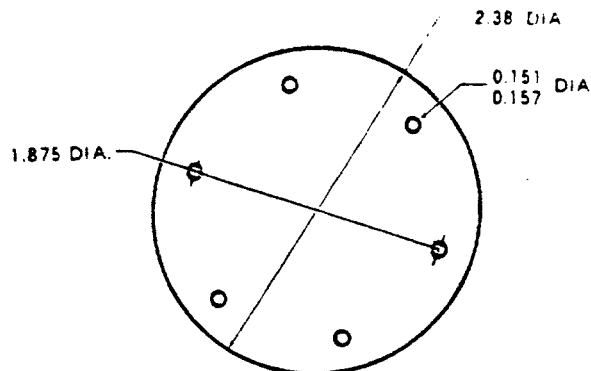


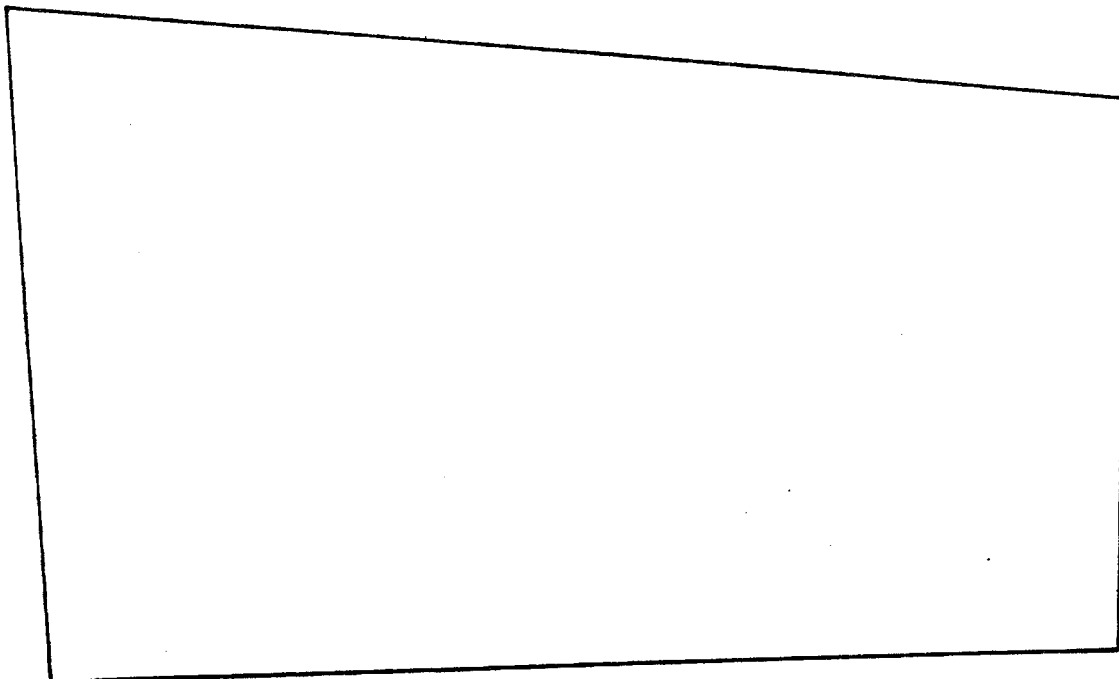
Figure B-30

CHQSOFTWARE.COM



Part Number: 204-030-800-443 COVER  
 Fabricate from: FSN 9535-167-2278  
 Material: QQ-A-250/5 T3 0.025

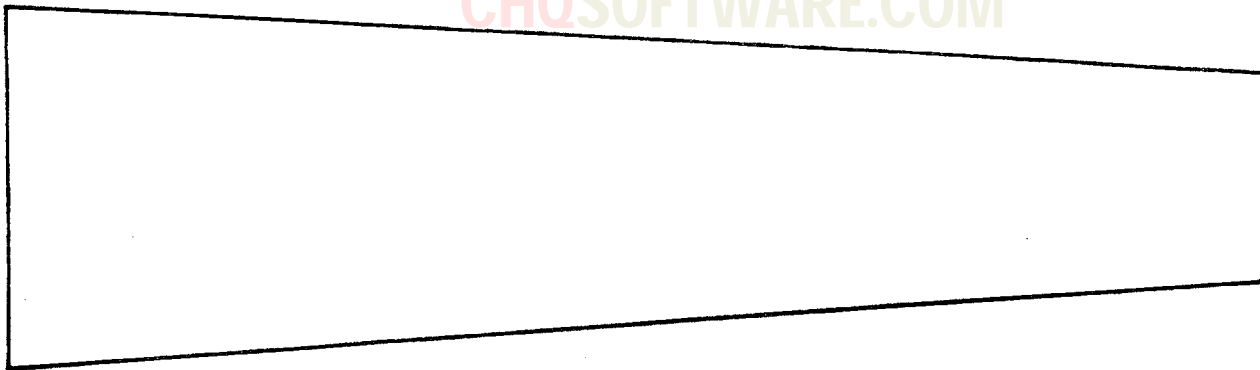
Figure B-31



Part Number: 204-030-800-445S SKIN (R.H.)  
 204-030-800-479S SKIN (L.H.)  
 204-030-800-481S SKIN (R.H.)  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032 x 22.0 x 36.0

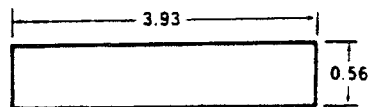
Figure B-32

CHQSOFTWARE.COM



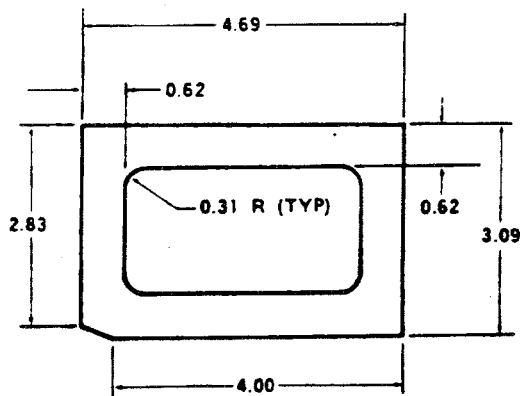
Part Number: 204-030-800-421S SKIN (L.H.)  
 204-030-800-453S SKIN (L.H.)  
 204-030-800-463S SKIN (R.H.)  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032 x 24.0 x 76.0

Figure B-33



Part Number: 204-030-806-117 SHIM  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

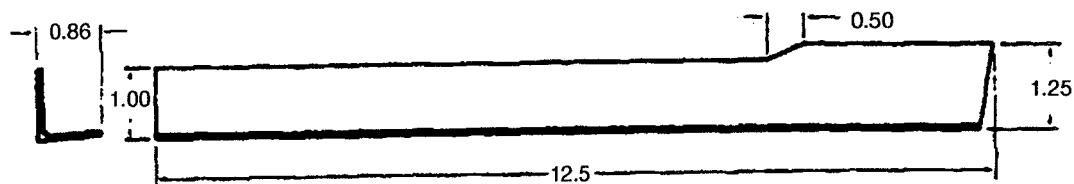
Figure B-34



Part Number: 204-030-808-163S DOUBLER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

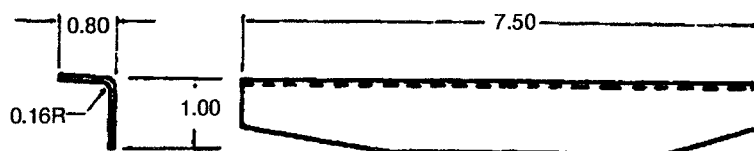
Figure B-35

CHQSOFTWARE.COM



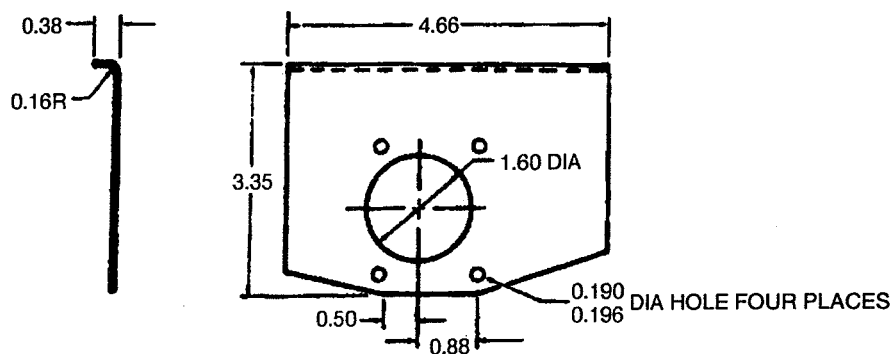
Part Number: 204-030-812-47S ANGLE (Shown)  
 204-030-812-49S ANGLE (Opposite)  
 Fabricate from: FSN 9540-145-4515  
 Material: QQ-A-200/13 T4 AND 10134-1204

FIGURE B-36



Part Number: 204-030-812-51S ANGLE  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

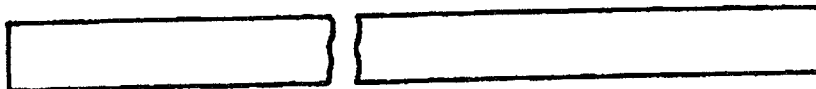
FIGURE B-37



Part Number: 204-030-812-53 DOUBLER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

FIGURE B-38

CHQSOFTWARE.COM



Part Number: 204-030-812-55 STRIP  
Fabricate from: FSN 5930-231-1465  
Material: Anti-Chafing Tape No. 366 (item 104, table 2-2)  
0.80 x 40.0

FIGURE B-39



Part Number: 204-030-812-65S BRACE (Shown)  
204-030-812-67S BRACE (Opposite)  
Fabricate from: FSN 9535-084-4395  
Material: QQ-A-250/5 T3 0.032 x 2.9 x 13.0

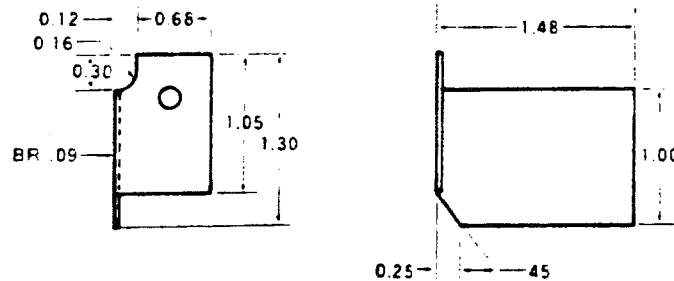
FIGURE B-40

CHQSOFTWARE.COM



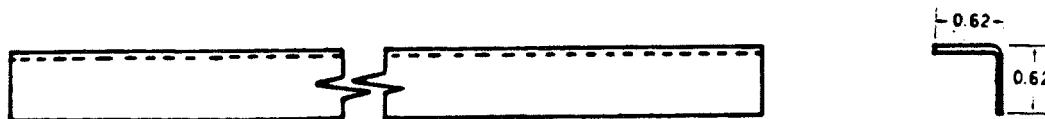
Part Number: 204-030-813-21S HINGE HALF Length 72.0  
 204-030-813-25S HINGE HALF Length 72.0  
 204-030-840-1S HINGE HALF Length 14.50  
 Fabricate from: FSN 5340-993-1461  
 Material: MS20257HP2-7200

Figure B-41



Part Number: 204-030-817-9S CLIP (Shown)  
 204-030-817-10S CLIP (Opposite)  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

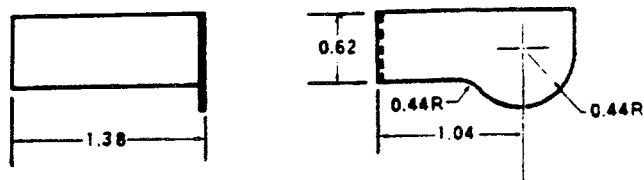
Figure B-42



Part Number: 204-030-817-15S ANGLE (Shown)  
 204-030-817-16S ANGLE (Opposite)  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

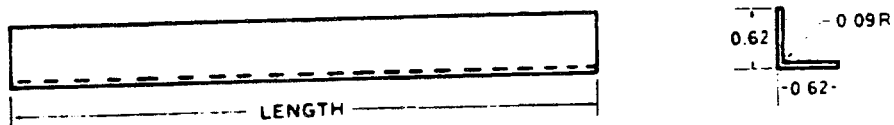
Figure B-43

CHQSOFTWARE.COM



Part Number: 204-030-817-37S CLIP (Shown)  
 204-030-817-38S CLIP (Opposite)  
 Fabricate from: FSN 9535-085-4155  
 Material: QQ-A-250/5 T3 0.040

Figure B-44

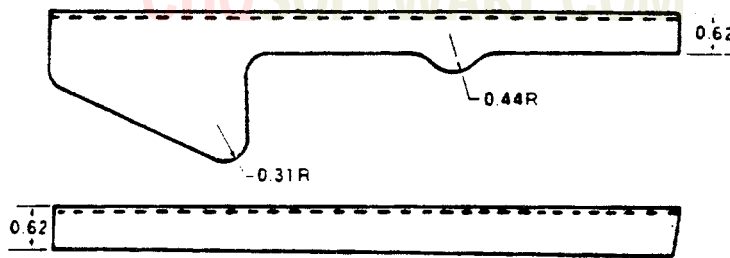


Part Number:	Length
204-030-817-39S CLIP (LH)	5.05
204-030-817-40S CLIP (RH)	5.05
204-030-817-43S CLIP (LH)	4.9
204-030-817-44S CLIP (RH)	4.9
204-030-817-45S CLIP (LH)	2.5

Fabricate from: FSN 9535-084-4484  
 Material: QQ-A-250/5 T3 0.020

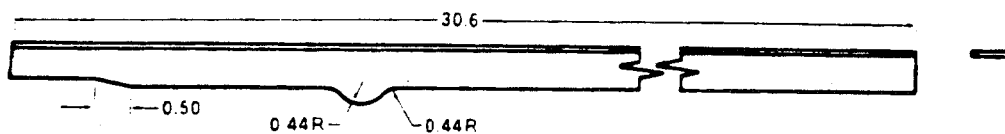
Figure B-45





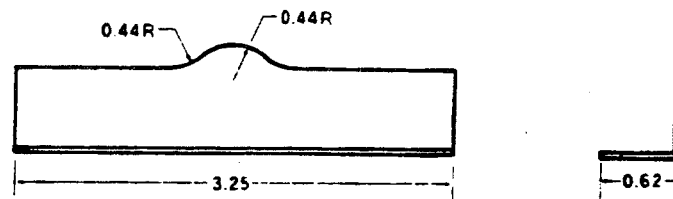
Part Number: 204-030-817-47S ANGLE (Shown)  
 204-030-817-48S ANGLE (Opposite)  
 Fabricate From: FSN 9535-084-4533  
 Material: QQ-A-250 5 T3 0.025

Figure B-46



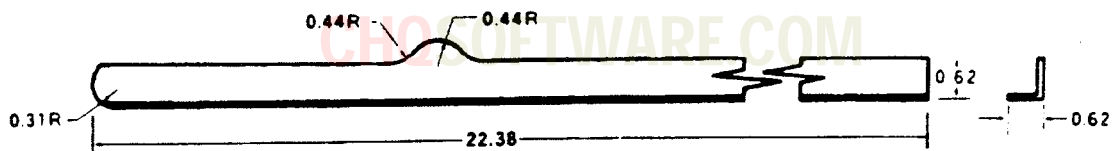
Part Number: 204-030-817-49S ANGLE  
 Fabricate From: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

Figure B-47



Part Number: 204-030-817-51S ANGLE (Shown)  
 204-030-817-52S ANGLE (Opposite)  
 Fabricate From: FSN 9535-085-4279  
 Material: QQ-A-250/5 T0 0.063

Figure B-48



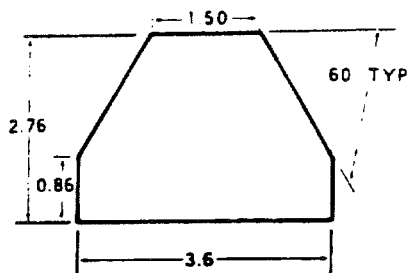
Part Number: 204-030-817-53S ANGLE  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

Figure B-49



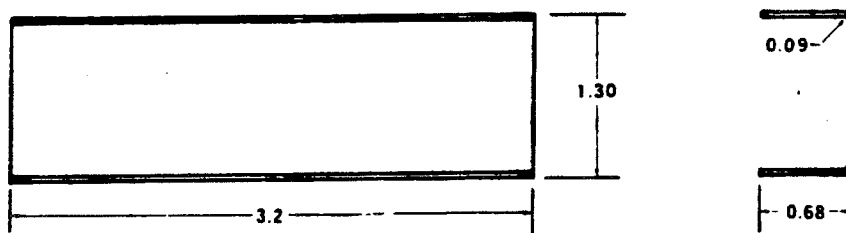
Part Number: 204-030-817-57S ANGLE (Shown)  
 204-030-817-58S ANGLE (Opposite)  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

Figure B-50



Part Number: 204-030-817-61S DOUBLER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

Figure B-51



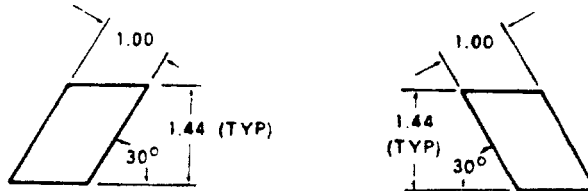
Part Number: 204-030-817-7S CHANNEL (Shown)  
 204-030-817-8S CHANNEL (Opposite)  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

Figure B-52



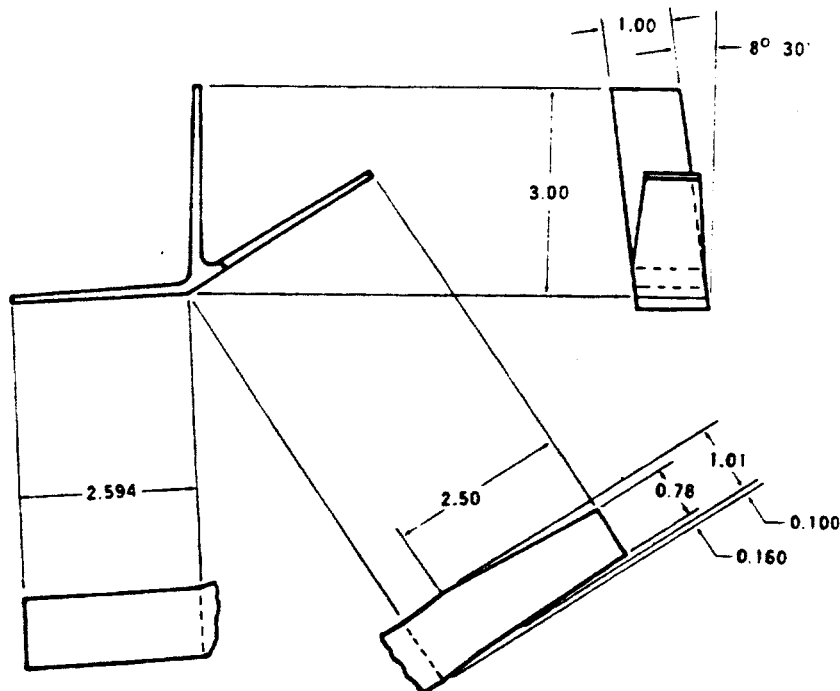
Part Number: 204-030-822-9S ANGLE  
Fabricate from: FSN 9535-084-4533  
Material: QQ-A-250/5 T3 0.025

Figure B-53



Part Number	Fabricate from	Material
204-030-833-13 FILLER (R.H.)	FSN 9535-084-4558	QQ-A-250/5 T3 0.125
204-030-833-15 FILLER (L.H.)	FSN 9535-084-4395	QQ-A-250/5 T3 0.032

Figure B-54



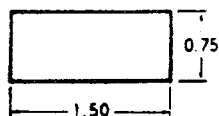
Part Number: 204-030-857-1S FITTING (Shown)  
204-030-857-3S FITTING (Opposite)  
Fabricate from: FSN 1560-435-4814  
Material: 40-005 Bell Standard

Figure B-55



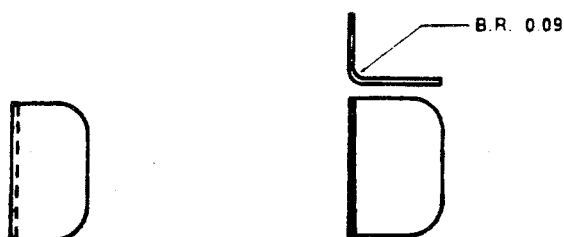
Part Number: 204-030-862-13S SPLICE (Shown)  
 204-030-862-15S SPLICE (Opposite)  
 Fabricate from: FSN 9535-086-9864  
 Material: QQ-A-250/13 T6 0.025

Figure B-56



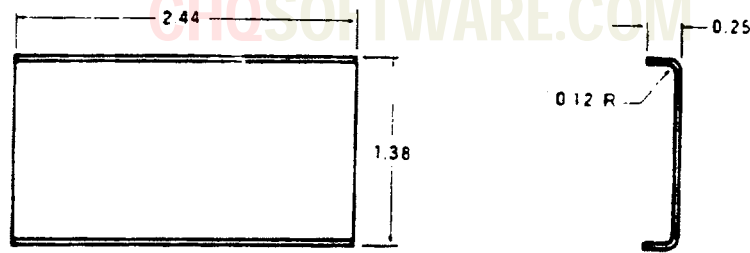
Part Number: 204-030-862-39S STRIP  
 Fabricate from: FSN 9330-531-3567  
 Material: MIL-M-20693GS 0.063

Figure B-57



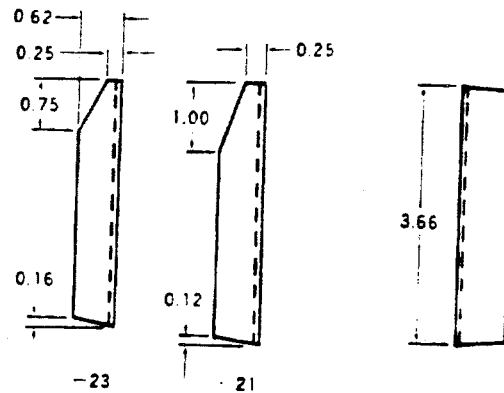
Part Number: 204-030-865-7S CLIP  
 Fabricate from: FSN 9535-086-9864  
 Material: QQ-A-250/13 T6 0.025 x 1.1 x 1.3

Figure B-58



Part Number: 204-030-879-19S STIFFENER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T6 0.032

Figure B-59



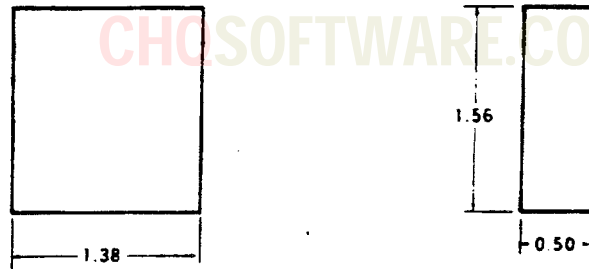
Part Number: 204-030-879-21S STIFFENER (Shown)  
 204-030-879-23S STIFFENER (Opposite)  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-60



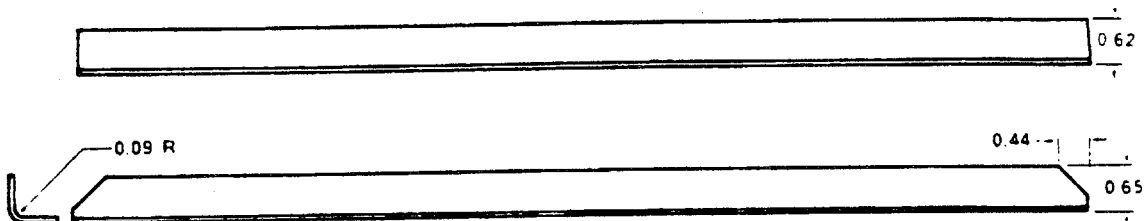
Part Number: 204-030-879-25S STIFFENER (Shown)  
 204-030-879-27S STIFFENER (Opposite)  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-61



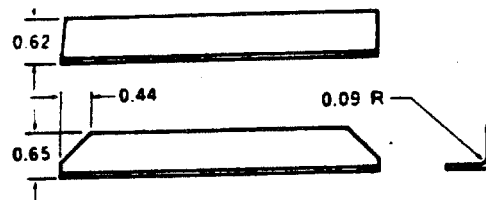
Part Number: 204-030-879-29 PAD  
 Fabricate from: FSN 9320-241-9765  
 Material: MIL-R-6855 CL 1-60 0.05

Figure B-62



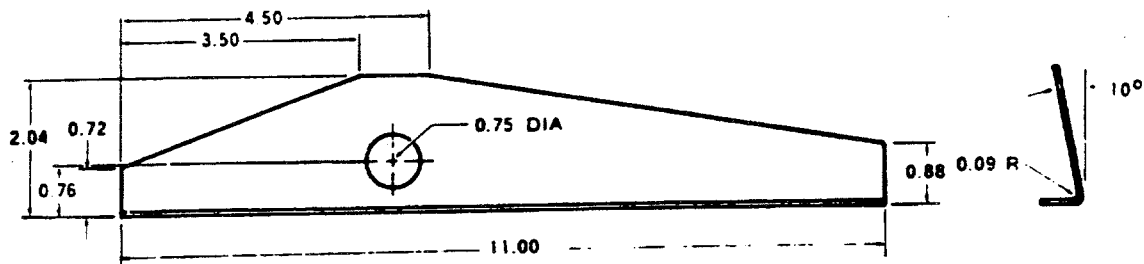
Part Number: 204-030-894-13S STIFFENER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025 x 1.20 x 14.6

Figure B-63



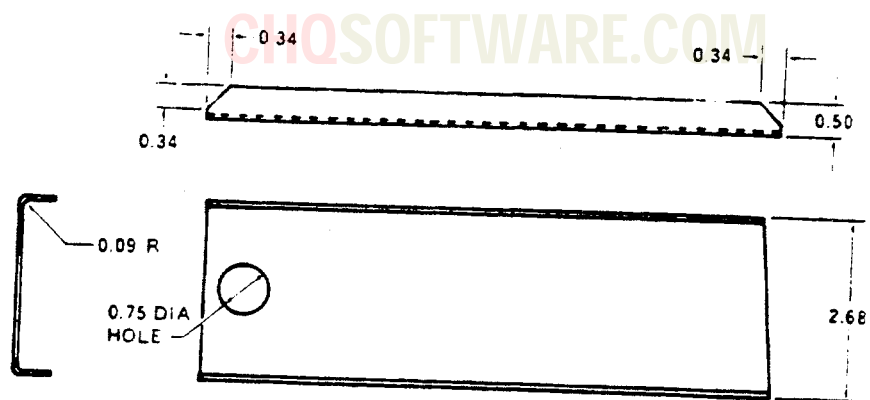
Part Number: 204-030-894-15S STIFFENER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025 x 1.20 x 4.57

Figure B-64



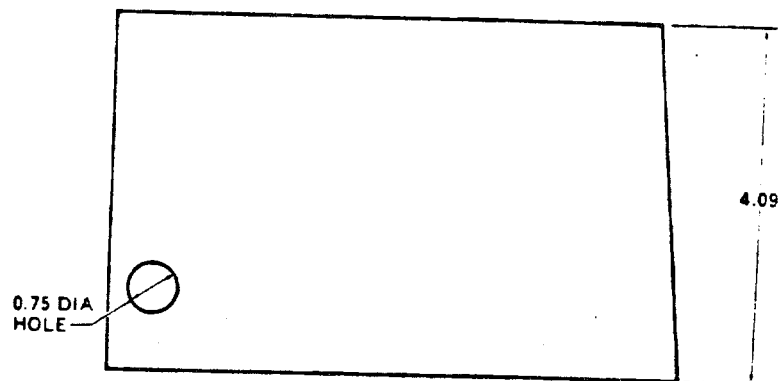
Part Number: 204-030-894-19S CLIP (Shown)  
 204-080-894-20S CLIP (Opposite)  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-65



Part Number: 204-030-894-21S SUPPORT (Shown)  
 204-030-894-22S SUPPORT (Opposite)  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025 x 4.0 x 9.3

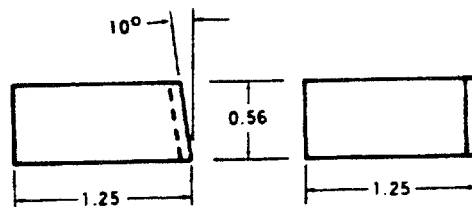
Figure B-66



Part Number: 204-030-894-23S WEB (Shown)  
 204-030-894-24S WEB (Opposite)  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025 x 6.0 x 9.0

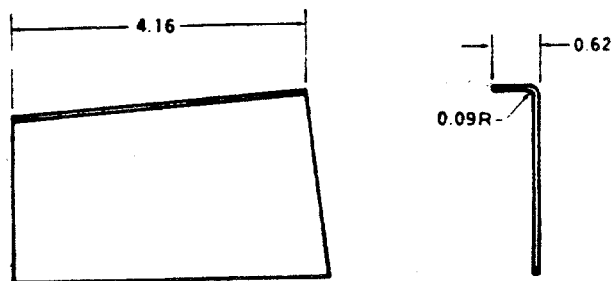
Figure B-67

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Part Number: 204-030-894-27S CLIP (Shown)  
 204-030-894-28S CLIP (Opposite)  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025 x 1.0 x 3.0

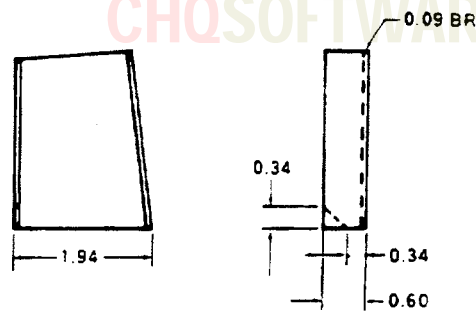
Figure B-68



Part Number: 204-030-894-37S BULKHEAD (Shown)  
 204-030-894-38S BULKHEAD (Opposite)  
 Fabricate from: FSN 9535-084-4484  
 Material: QQ-A-250/5 T3 0.020 x 4.0 x 6.0

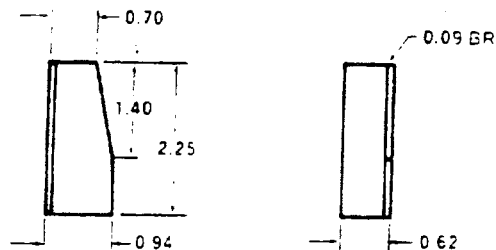
Figure B-69





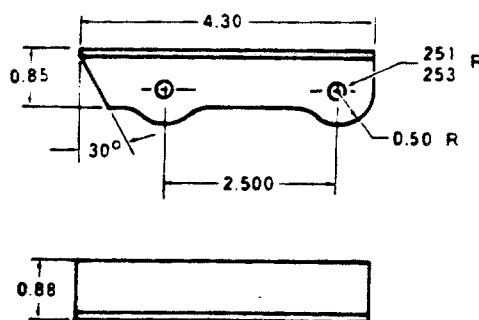
Part Number: 204-030-894-39S STIFFENER (Shown)  
 204-030-894-40S STIFFENER (Opposite)  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032 x 3.5 x 4.0

Figure B-70



Part Number: 204-030-894-41S CLIP (Shown)  
 204-030-894-42S CLIP (Opposite)  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

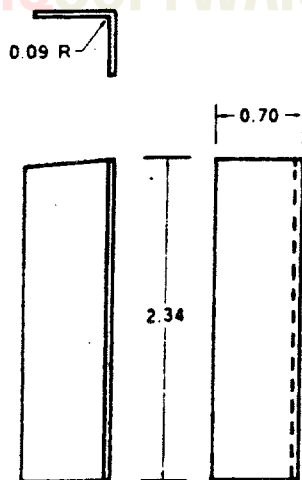
Figure B-71



Part Number: 204-030-894-43S SUPPORT (Shown)  
 204-030-894-44S SUPPORT (Opposite)  
 Fabricate from: FSN 9540-145-5724  
 Material: QQ-A-200/13 T4 AND 10134-1206

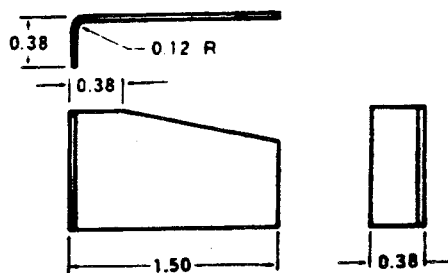
Figure B-72

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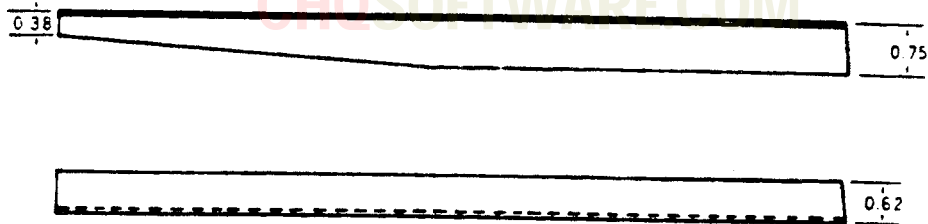
Part Number: 204-030-894-45S CLIP  
 Fabricate from: FSN 9535-084-4484  
 Material: QQ-A-250/5 T3 0.020

Figure B-73



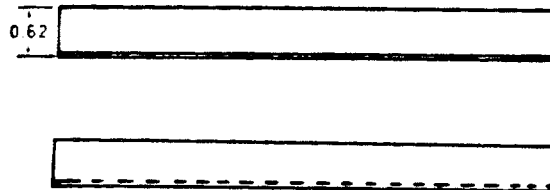
Part Number: 204-030-894-49S CLIP  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-74



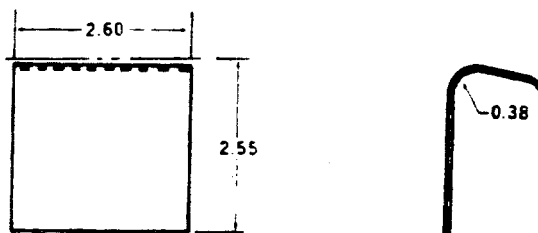
Part Number: 204-030-900-17S STIFFENER (Shown) 1.5x12.0  
 204-030-900-19S STIFFENER (Opposite) 1.5x11.5  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-75



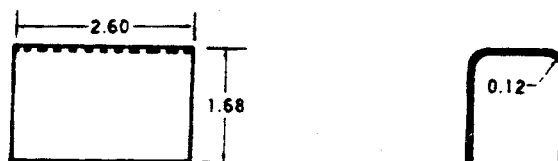
Part Number: 204-030-900-21S STIFFENER (Shown) 1.5x8.0  
 204-030-900-23S STIFFENER (Opposite) 1.5x7.0  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-76



Part Number: 204-030-900-33S STOP  
 Fabricate from: FSN 9535-084-4430  
 Material: QQ-A-250/5 T3 0.100

Figure B-77



Part Number: 204-030-900-7S STOP  
 Fabricate from: FSN 9535-232-0378  
 Material: QQ-A-250/5 T3 0.063

Figure B-78



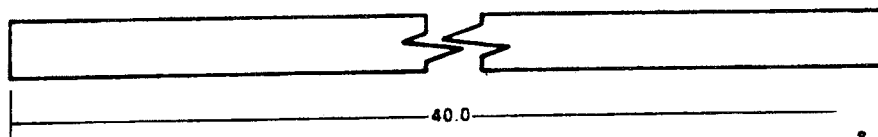
Part Number: 204-030-902-21 BUMPER  
Fabricate from: FSN 9390-103-0060

Figure B-79



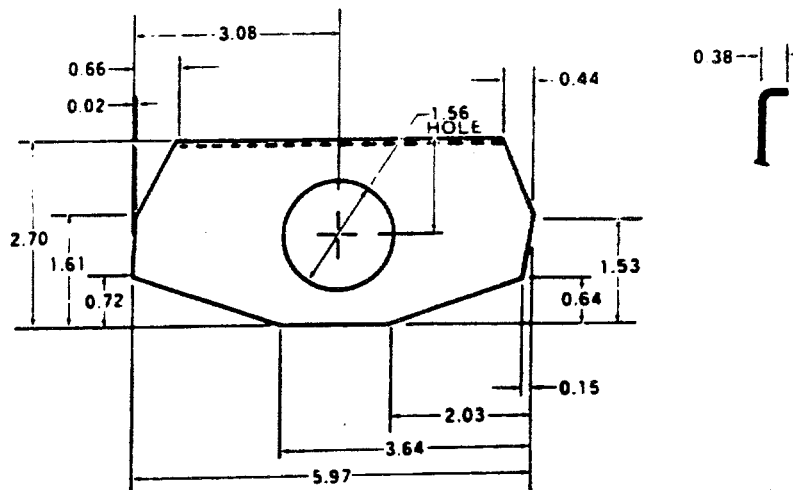
Part Number: 204-031-075-3 BUMPER  
Fabricate from: FSN 5330-868-2771

Figure B-80



Part Number: 204-031-080-11 STRIP  
Fabricate from: FSN 9530-231-1465  
Material: Anti-Chafing Tape No. 366 0.80x40.0

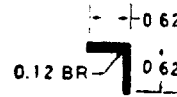
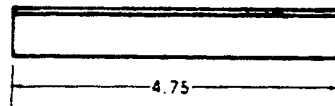
Figure B-81



Part Number: 204-031-080-7S DOUBLER  
Fabricate from: FSN 9535-084-4395  
Material: QQ-A-250/5 T3 0.032

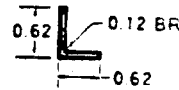
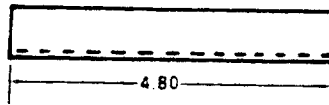
Figure B-82

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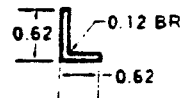
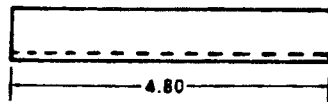
Part Number: 204-031-084-17S SUPPORT  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-83



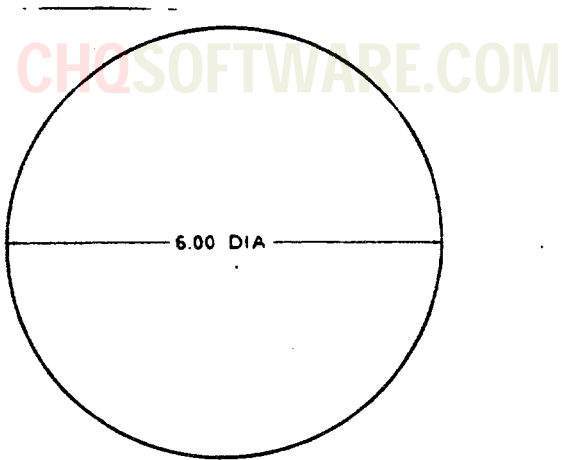
Part Number: 204-031-085-5S CLIP  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-84



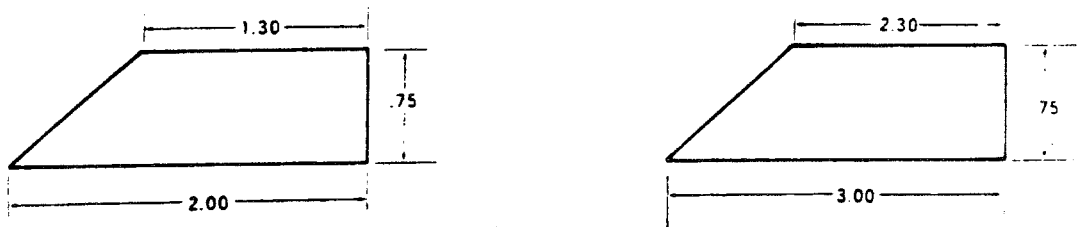
Part Number: 204-031-086-9S CLIP  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-85



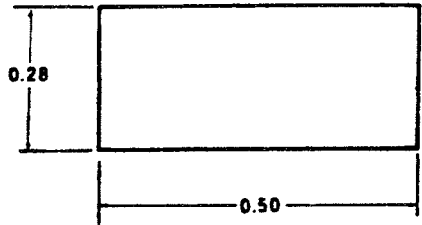
Part Number: 204-031-088-95 COVER  
Fabricate from: FSN 9535-084-4533  
Material: QQ-A-250/5 T3 0.025

Figure B-86



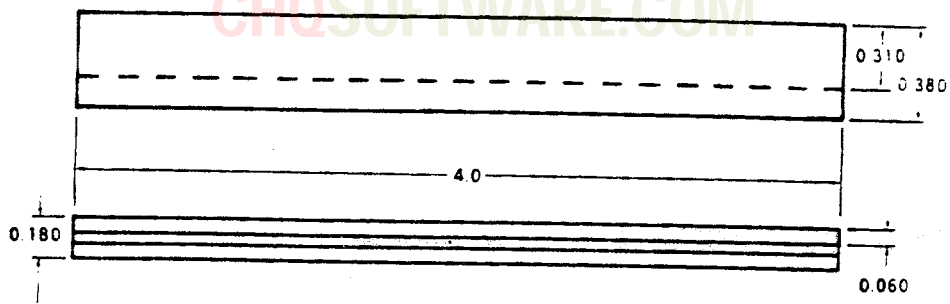
Part Number	Fabricate From	Material
204-031-090-35S FILLER	FSN 9535-232-0501	QQ-A-250/5 T3 0.050 x 1.3 x 2.5
204-031-090-39S FILLER	FSN 9535-084-4533	QQ-A-250/5 T3 0.025 x 1.0 x 3.25

Figure B-87



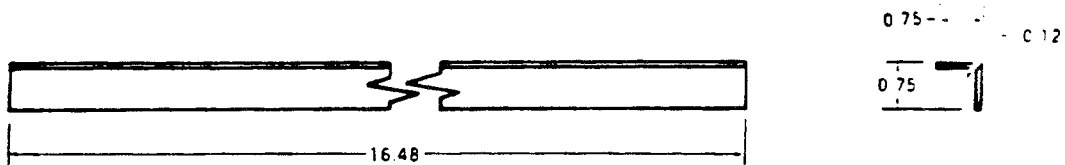
Part Number: 204-031-090-37S SPACER  
Fabricate from: FSN 9535-232-0501  
Material: QQ-A-250/5 T3 0.050

Figure B-88



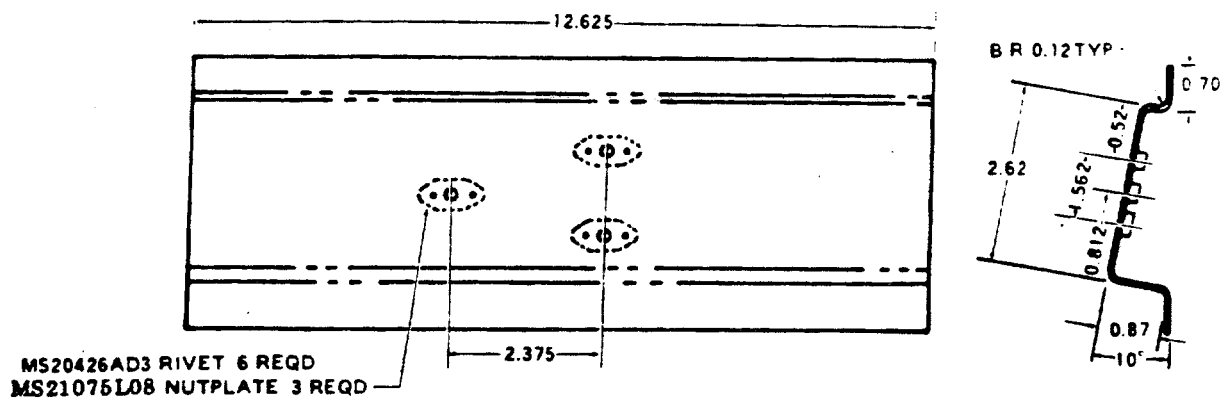
Part Number: 204-031-090-41 STRIP  
 Fabricate from: FSN 9390-103-0060  
 Material: Bell Std 110-029 x 4.0

Figure B-89



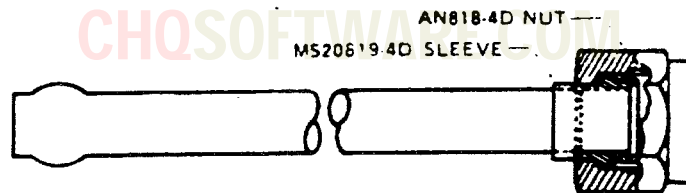
Part Number: 204-031-143-21S STIFFENER (Shown)  
 204-031-143-22S STIFFENER (Opposite)  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-90



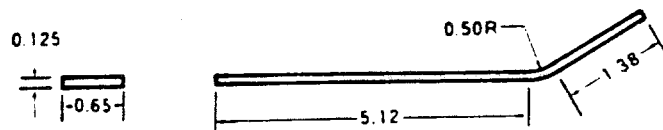
Part Number: 204-031-143-3S BRACKET ASSEMBLY  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-91



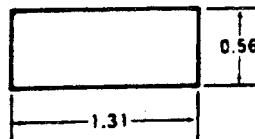
Part Number: 204-031-239-1 TUBE ASSEMBLY  
 Fabricate from: FSN 4710-279-0958  
 Material: WWT787-0-02500 0.028W

Figure B-92



Part Number: 204-031-807-9S STRAP (Shown)  
 204-031-807-10S STRAP (Opposite)  
 Fabricate from: FSN 9535-084-4558  
 Material: QQA250/5 T3 0.125

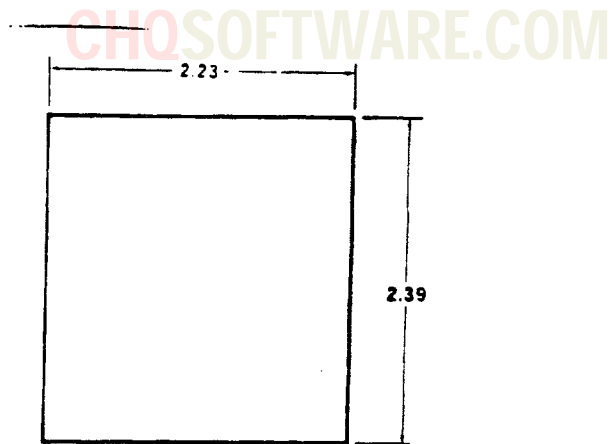
Figure B-93



Part Number: 204-031-807-11 FILLER  
 Fabricate from: FSN 9535-232-0501  
 Material: QQA250/5 T3 0.051

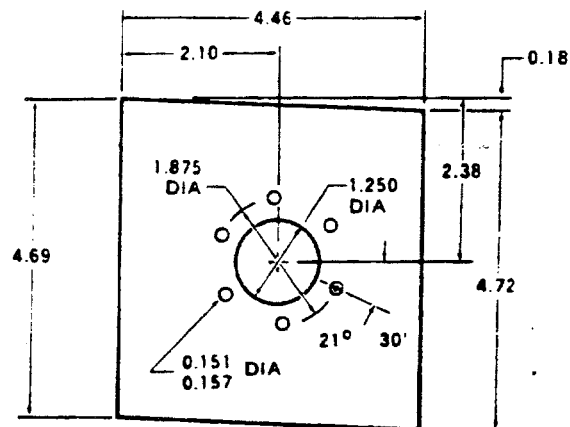
Figure B-94





Part Number: 204-031-811-1 DOUBLER  
 Fabricate from: FSN 9535-084-4551  
 Material: QQ-A-250/5 T3 0.040

Figure B-95



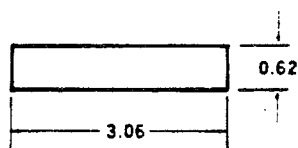
Part Number: 204-031-812-1 DOUBLER  
 Fabricate from: FSN 9535-084-4551  
 Material: QQ-A-250/5 T3 0.040

Figure B-96



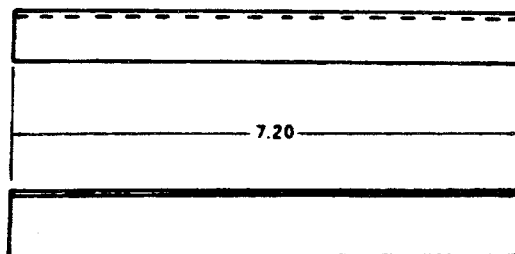
Part Number: 204-031-826-5S STIFFENER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

Figure B-97



Part Number: 204-031-826-7 FILLER  
 Fabricate from: FSN 9535-232-0378  
 Material: QQ-A-250/5 T3 0.063

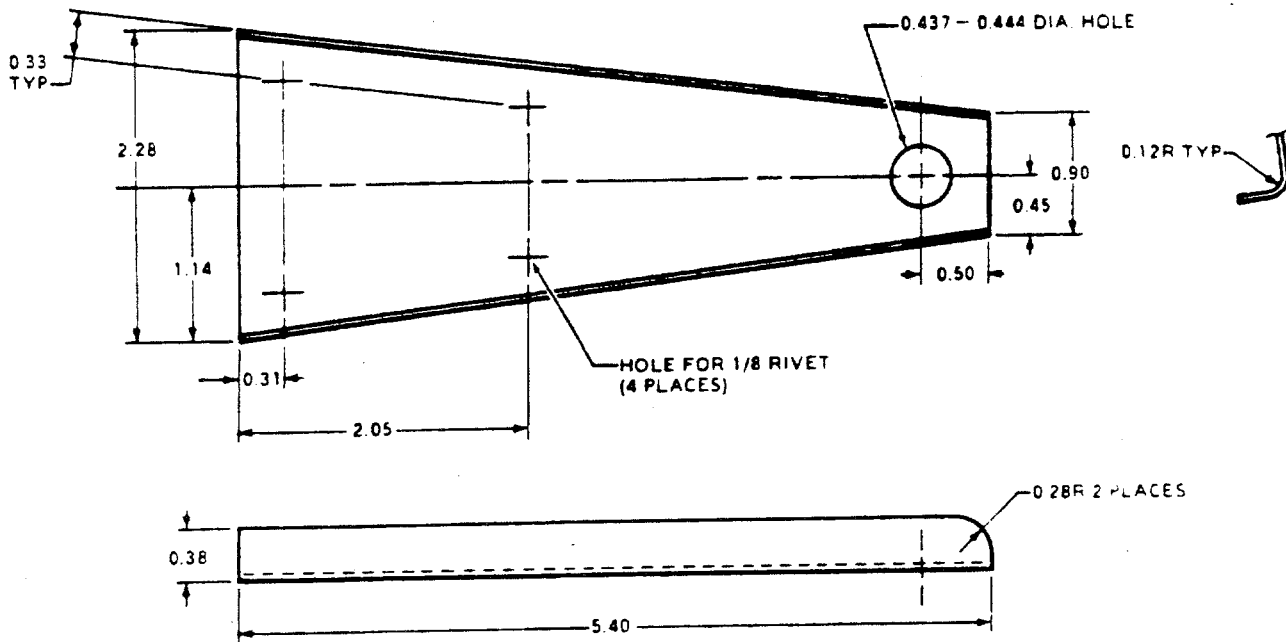
Figure B-98



Part Number: 204-031-866-5S STIFFENER  
 Fabricate from: FSN 9540-148-4311  
 Material: QQ-A-250/3 T4 AND 10134-1003

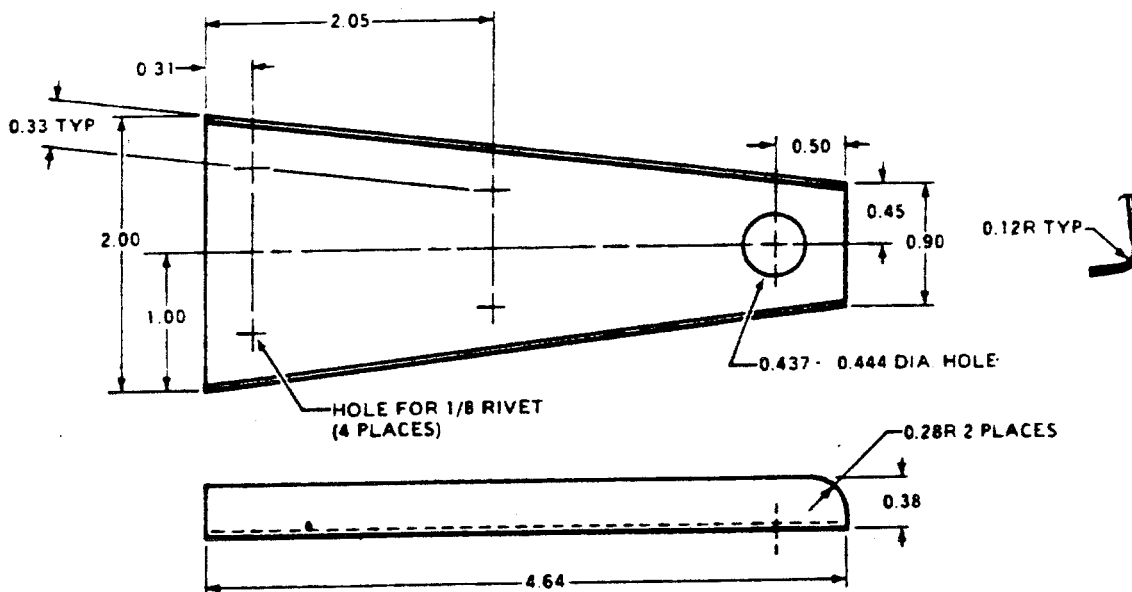
Figure B-99

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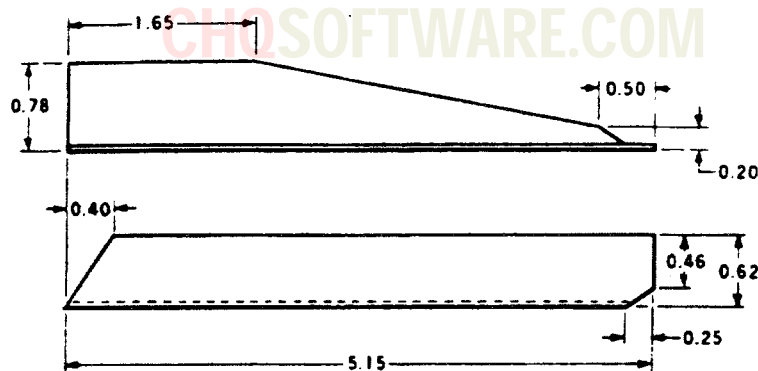
Part Number: 205-001-707-1 BRACKET  
 Fabricate from: FSN 9535-084-4395  
 Material: QQA 250/5 T3 0.032

Figure B-100



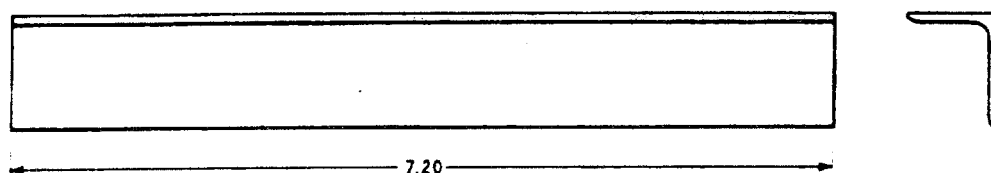
Part Number: 205-001-708-1 BRACKET  
 Fabricate from: FSN 9535-084-4395  
 Material: QQA 250/5 T3 0.032

Figure B-101



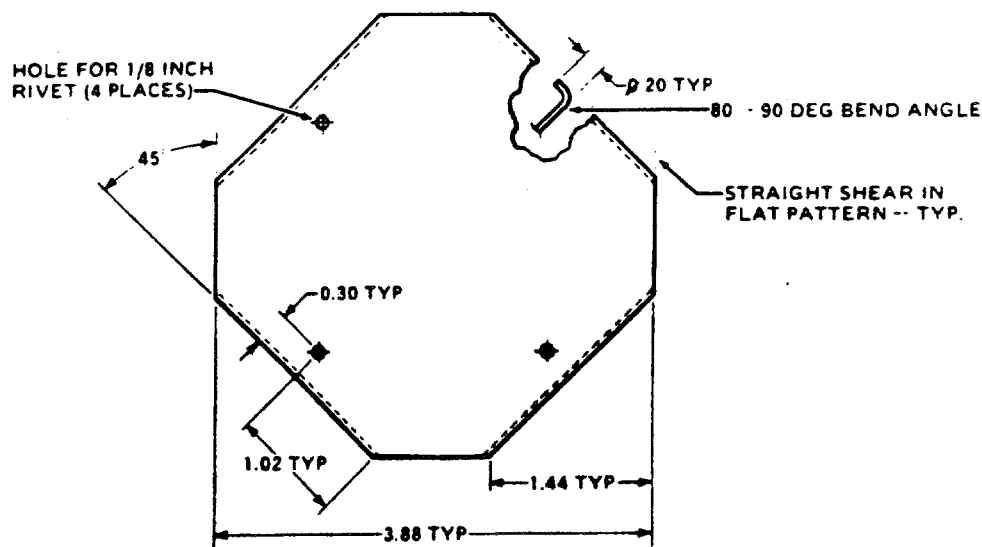
Part Number: 205-030-111-21S STIFFENER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQA 250/5 T3 0.032

Figure B-102



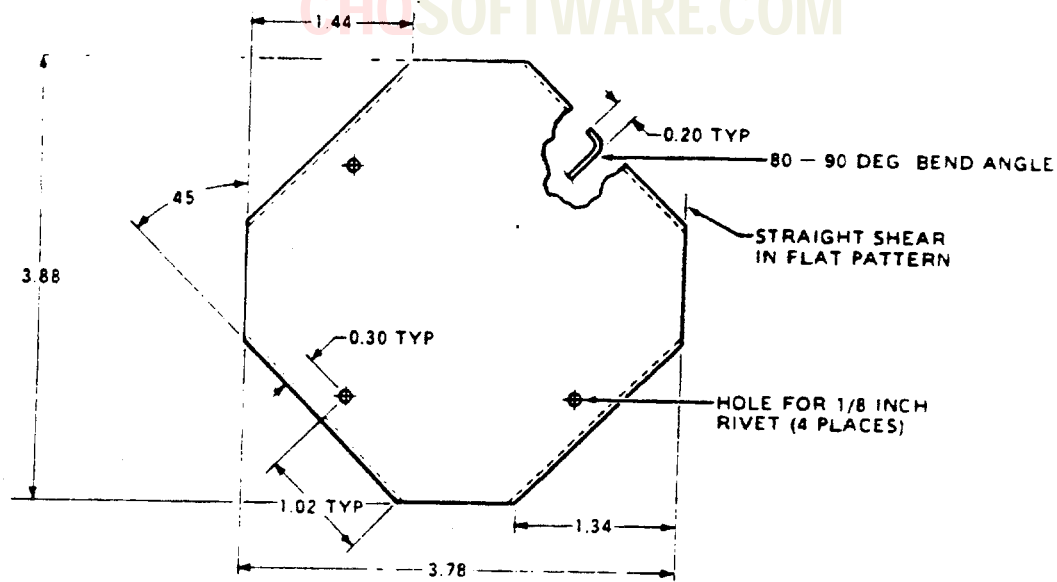
Part Number 205-030-801-7S STIFFENER  
 Fabricate from: FSN 9540-148-4311  
 Material: QQA 200/3 T4 AND 10134-1003

Figure B-103



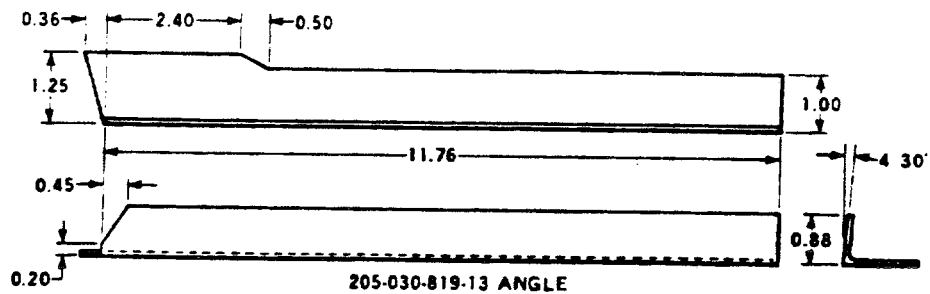
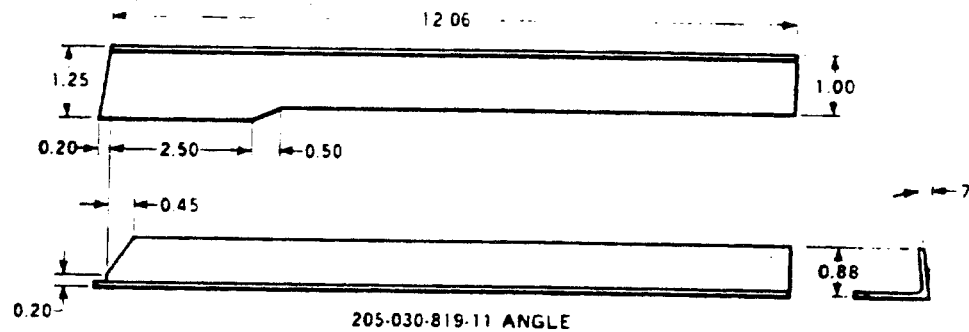
Part Number: 205-030-805-5S GUSSET  
 Fabricate from: FSN 9535-084-4450  
 Material: QQ-A-250/5 T3 0.016

Figure B-104



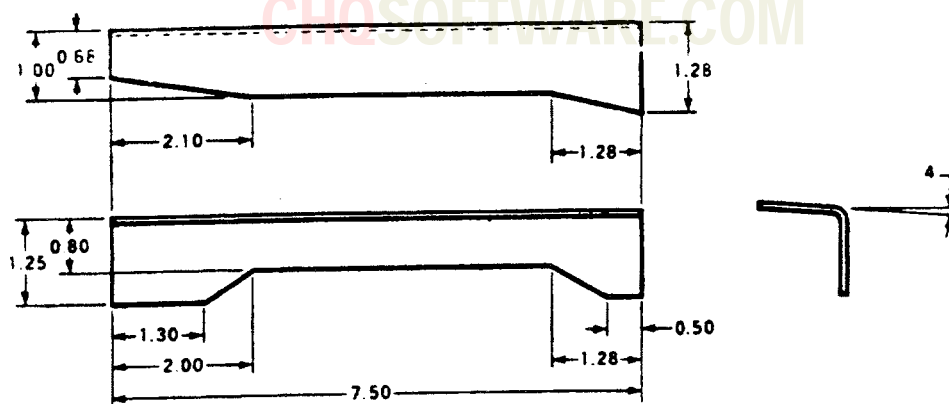
Part Number: 205-030-805-9S GUSSET  
 Fabricate from: FSN 9535-084-4450  
 Material: QQ-A-250/5 T3 0.016

Figure B-105



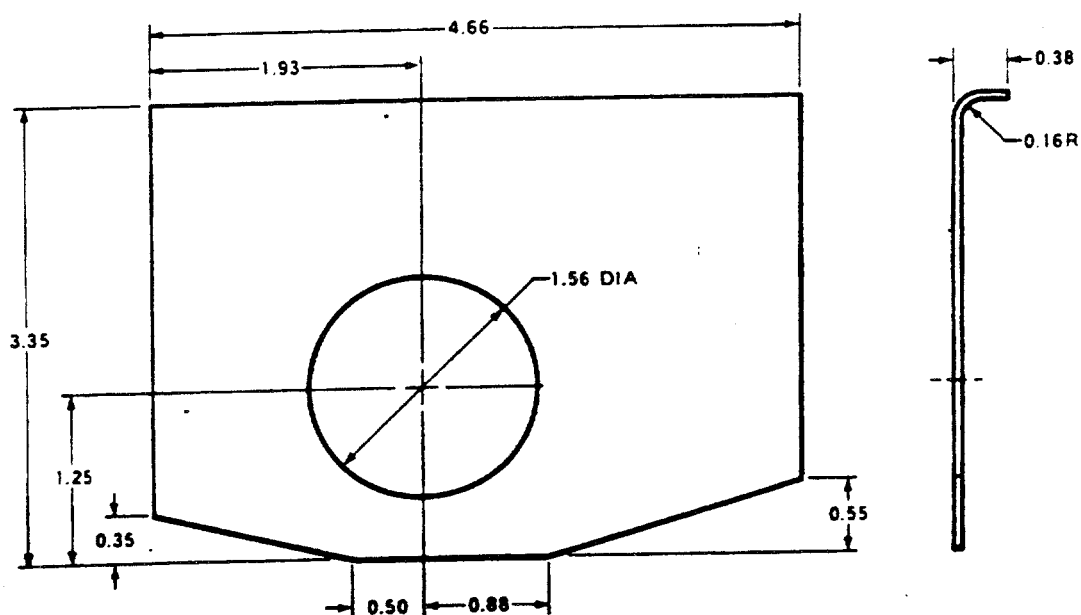
Part Number: 205-030-819-11S & -13S ANGLE  
 Fabricate from: FSN 9540-145-4515  
 Material: QQA 200/3 T4 AND 10134-1204

Figure B-106



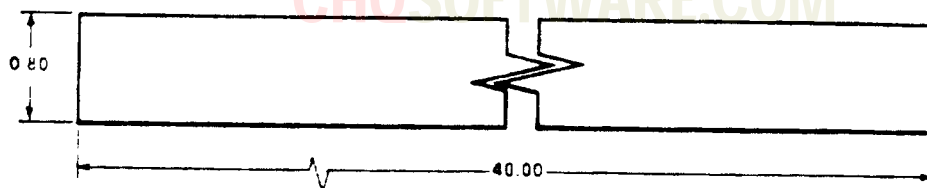
Part Number: 205-030-819-15S ANGLE  
 Fabricate from: FSN 9535-084-4395  
 Material: QQA 250/5 T3 0.032

Figure B-107



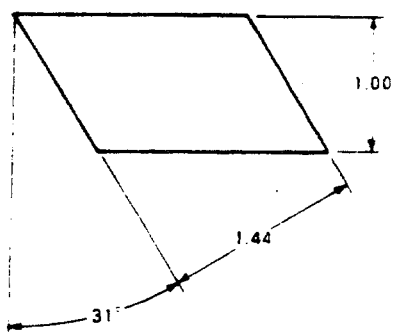
Part Number: 205-030-819-17S DOUBLER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQA 250/5 T3 0.032

Figure B-108



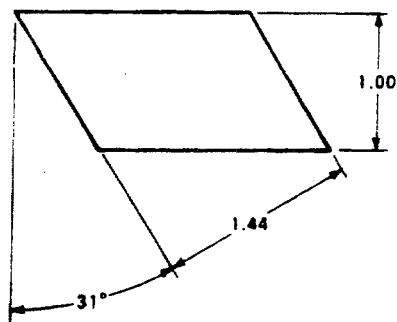
Part Number: 205-030-819-21S STRIP  
 Fabricate from: FSN 5930-231-1465  
 Material: Anti-Chafing Tape No. 366 0.80x40.0

Figure B-109



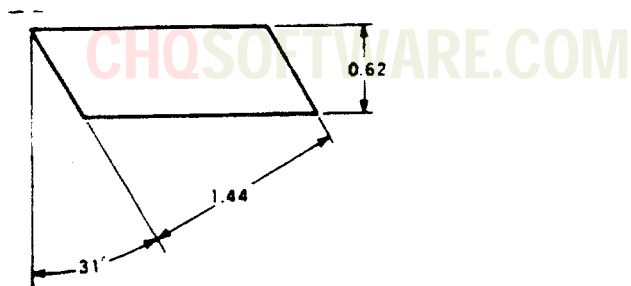
Part Number: 205-030-833-5 FILLER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQA250/5 T3 0.032

Figure B-110



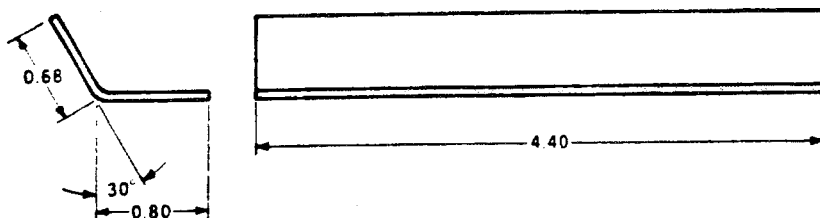
Part Number: 205-030-833-7S FILLER  
 Fabricate from: FSN 9535-084-4558  
 Material: QQA250/5 T3 0.125

Figure B-111



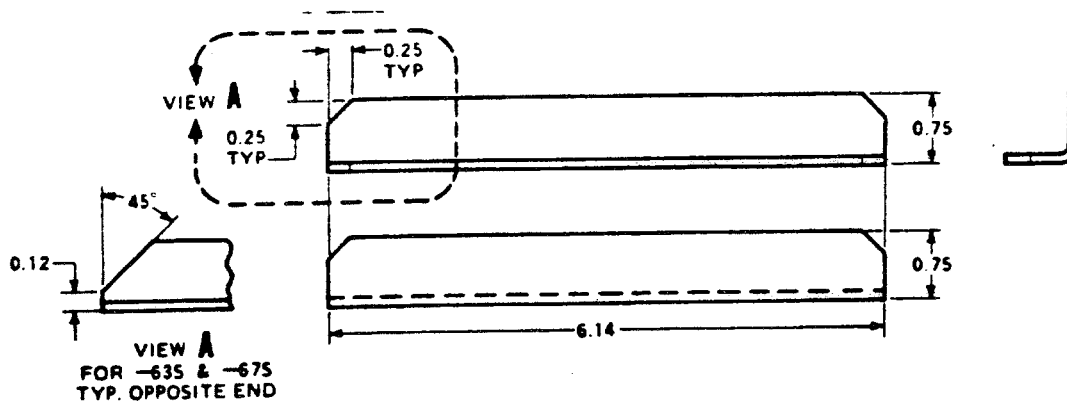
Part Number: 205-030-833-31S FILLER  
 Fabricate from: FSN 9535-085-4134  
 Material: QQA250/4 T3 0.220

Figure B-112



Part Number: 205-030-846-17S STIFFENER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQA250/5 T3 0.025

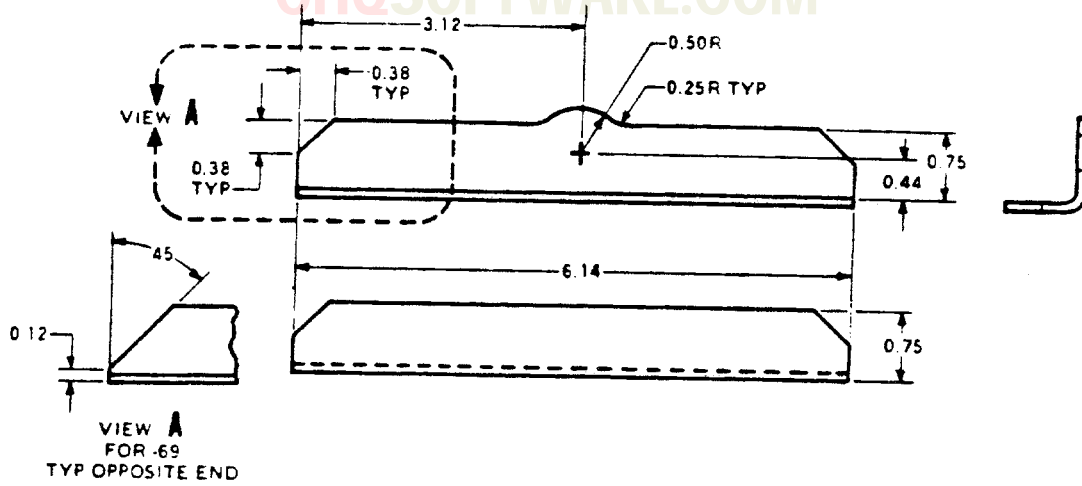
Figure B-113



Part Number: 205-030-846-19S, -63S & -67S STIFFENER  
 Fabricate from: FSN 9535-084-4551  
 Material: QQA250/5 T3 0.040

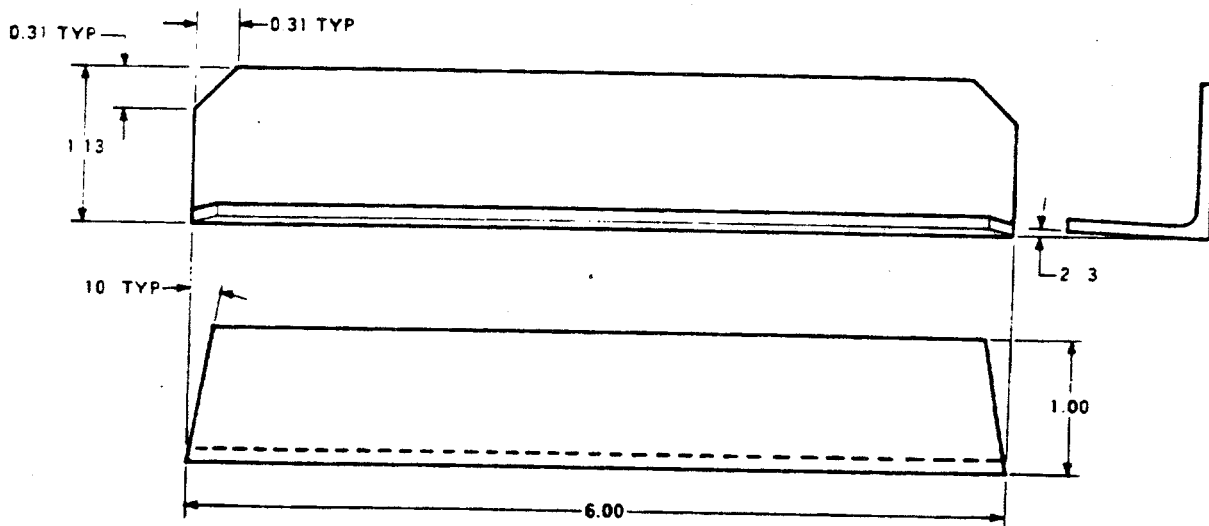
Figure B-114





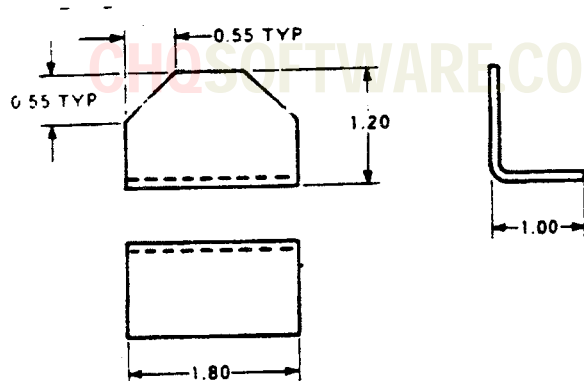
Part Number: 205-030-846-25S & -69S  
 Fabricate from: FSN 9540-148-4311  
 Material: QQA200 '3 T4 AND101134-1003

Figure B-115



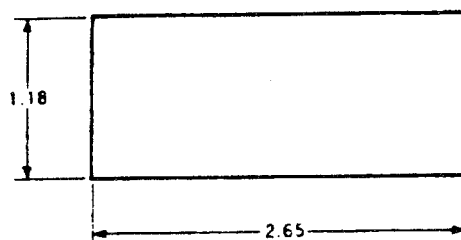
Part Number: 205-030-846-27S STIFFENER  
 Fabricate from: FSN 9540-145-5724  
 Material: QQA200/3 T4 AND10134-1206

Figure B-116



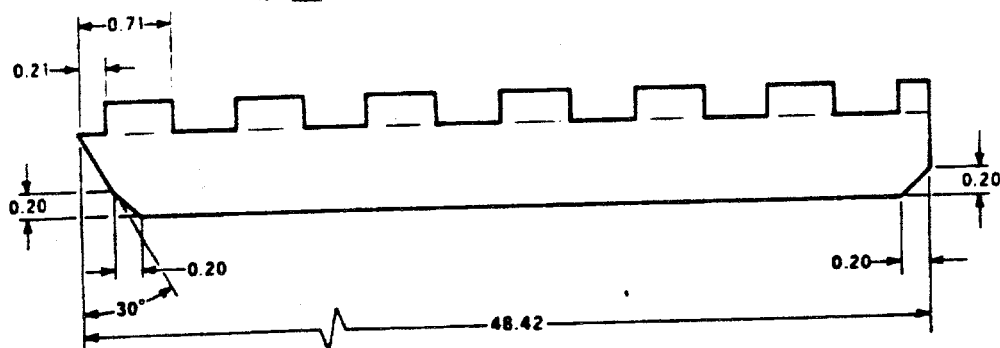
Part Number: 205-030-846-29S BRACKET  
 Fabricate from: FSN 9540-145-4515  
 Material: QQA200/3 T4 AND10134-1204

Figure B-117



Part Number: 205-030-846-31 FILLER  
 Fabricate from: FSN 9535-232-0405  
 Material: QQA250/5 T3 0.090

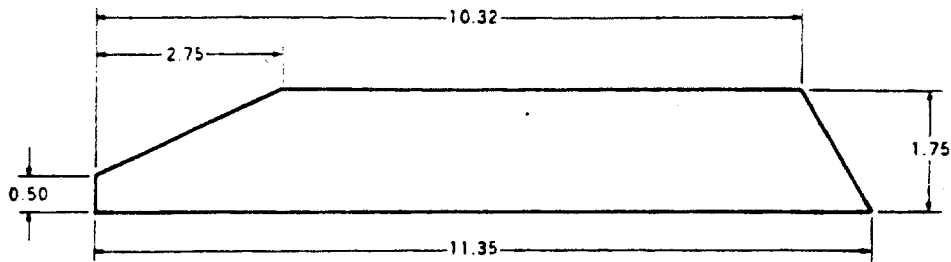
Figure B-118



Part Number: 205-030-846-33S HINGE  
 Fabricate from: FSN 5340-949-8274  
 Material: MS20001HP4

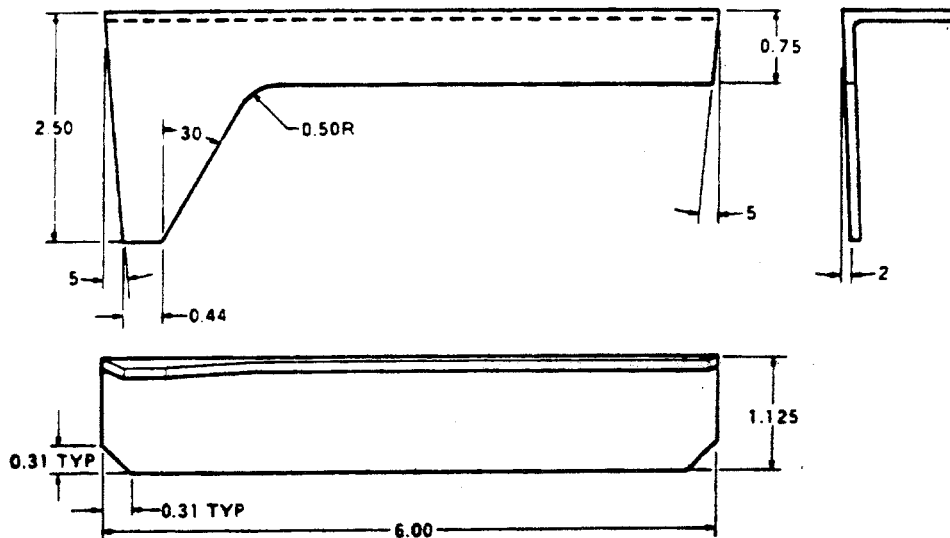
Figure B-119

CHQSOFTWARE.COM



Part Number: 205-030-846-45S DOUBLER  
Fabricate from: FSN 9535-232-0501  
Material: QQA250/5 T3 0.040

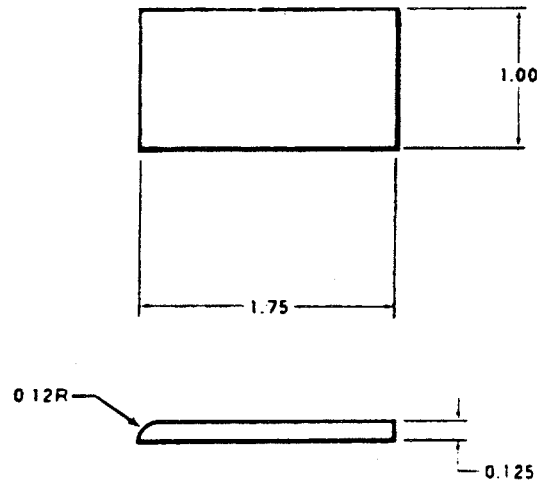
Figure B-120



Part Number: 205-030-846-71S STIFFENER  
Fabricate from: FSN 9540-982-0561  
Material: QQA362 T3 AND10139-2403

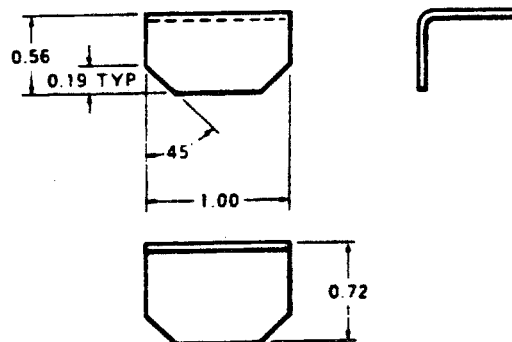
Figure B-121

CHQSOFTWARE.COM



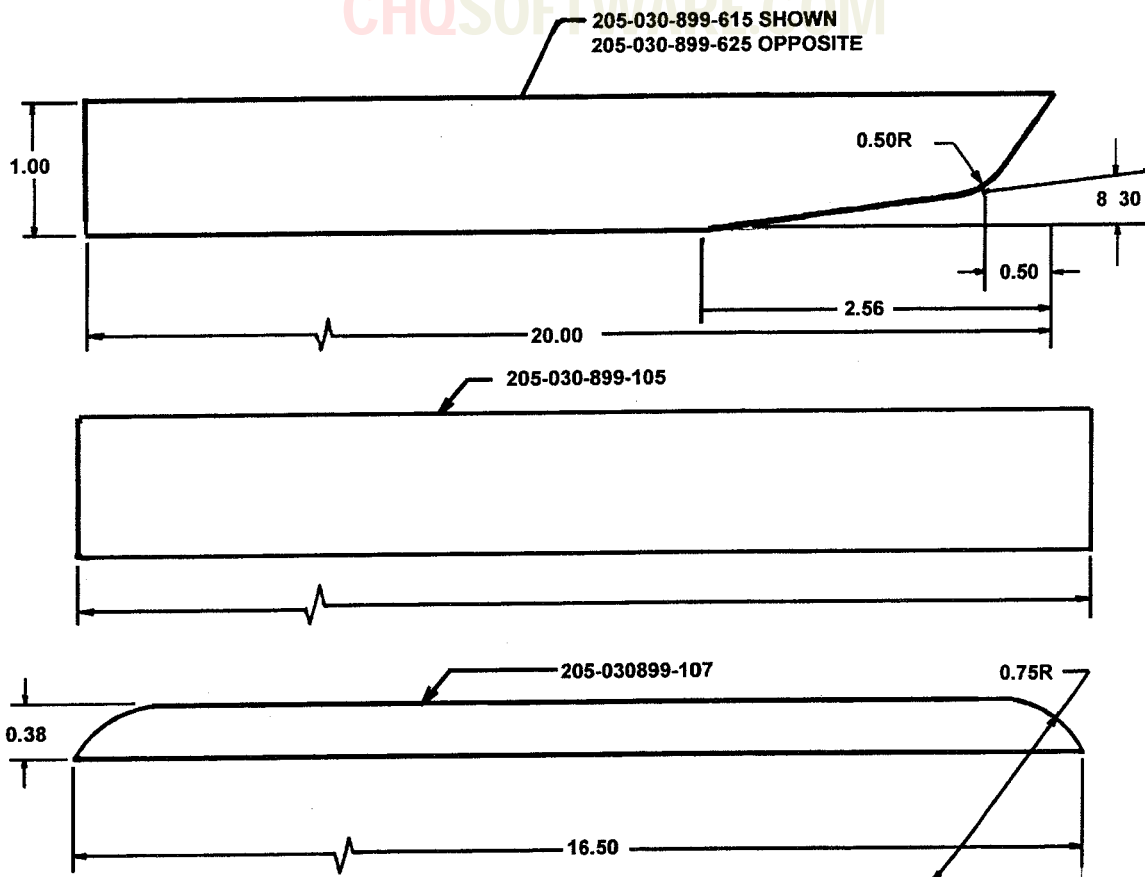
Part Number: 205-030-851-1 RADIUS BLOCK  
 Fabricate from: FSN 9535-084-4558  
 Material: QQA362 T3 0.125

Figure B-122



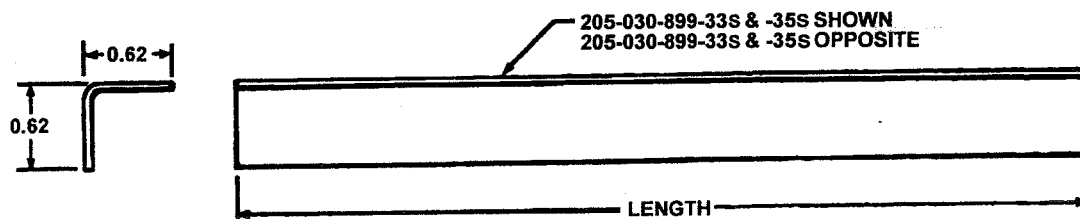
Part Number: 205-030-889-19S CLIP  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 TO 0.025

Figure B-123



Part Number	Fabricate from	Material
205-030-899-61S STRIP	FSN 5930-231-1465	549 Tape AMS3651 (item 105, table 2-2)
205-030-899-62S STRIP	FSN 5930-231-1465	549 Tape AMS3651 (item 105, table 2-2)
205-030-899-105S STRIP	FSN 7510-145-0171	Adhesive Tape Y9265 (item 106, table 2-2)
205-030-899-107S STRIP	FSN 7510-145-0171	Adhesive Tape Y9265 (item 106, table 2-2)

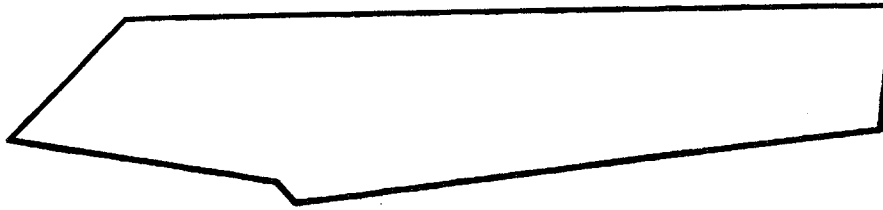
FIGURE B-124



Part Number	Fabricate from	Material	Length
205-030-899-33S STIFFENER	FSN 9535-084-4533	QQ-A-250/5 T3 0.025	12.11
205-030-899-34S STIFFENER	FSN 9535-084-4533	QQ-A-250/5 T3 0.025	12.11
205-030-899-35S STIFFENER	FSN 9535-084-4533	QQ-A-250/5 T3 0.025	11.92
205-030-899-36S STIFFENER	FSN 9535-084-4533	QQ-A-250/5 T3 0.025	11.92

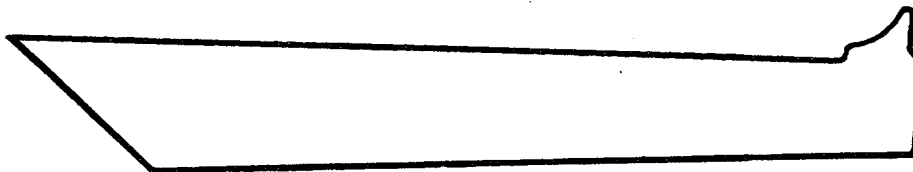
FIGURE B-125

CHQSOFTWARE.COM



Part Number:	205-030-899-3S SKIN (Shown) 205-030-899-5S SKIN (Opposite)
Fabricate from:	FSN 9535-084-4533
Material:	QQ-A-250/5 T3 0.025 x 14.5 x 67.0

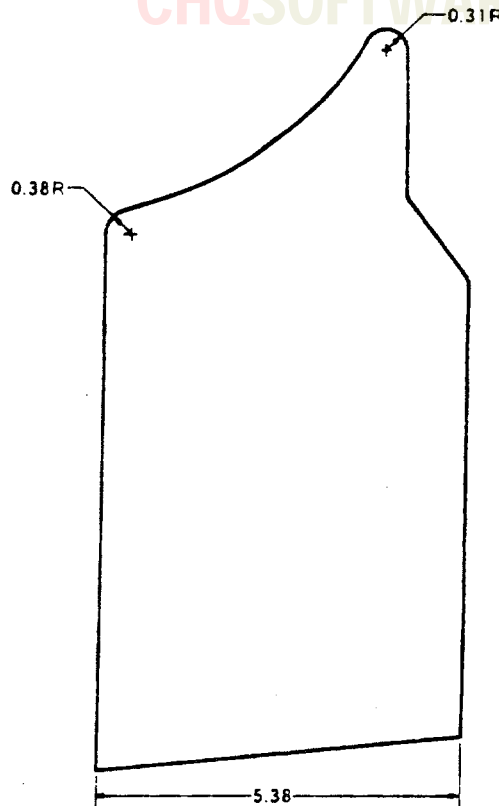
FIGURE B-126



Part Number:	205-030-899-7S SKIN (Shown) 205-030-899-9S SKIN (Opposite)
Fabricate from:	FSN 9535-084-4533
Material:	QQ-A-250/5 T3 0.025 x 12.0 x 67.0

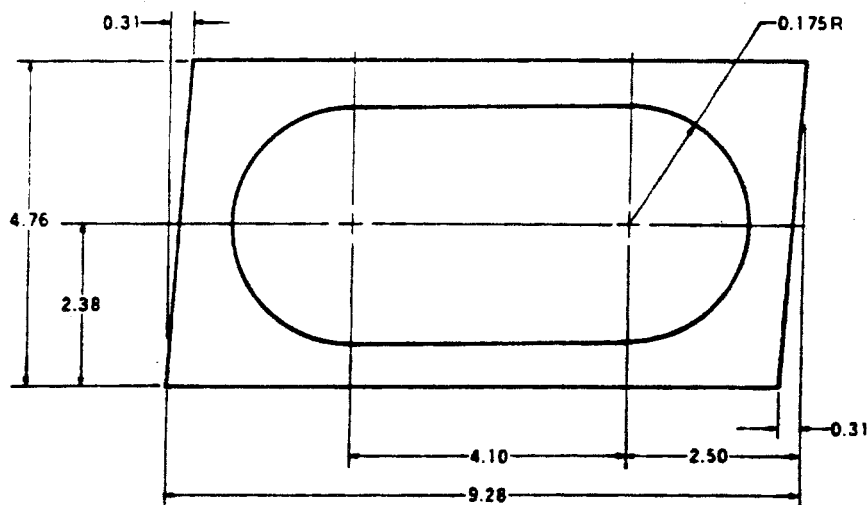
FIGURE B-127

CHQSOFTWARE.COM



Part Number: 205-030-899-41S DOUBLER (Shown) 6.0x11.0  
 205-030-899-43S DOUBLER (Opposite) 6.0x8.5  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

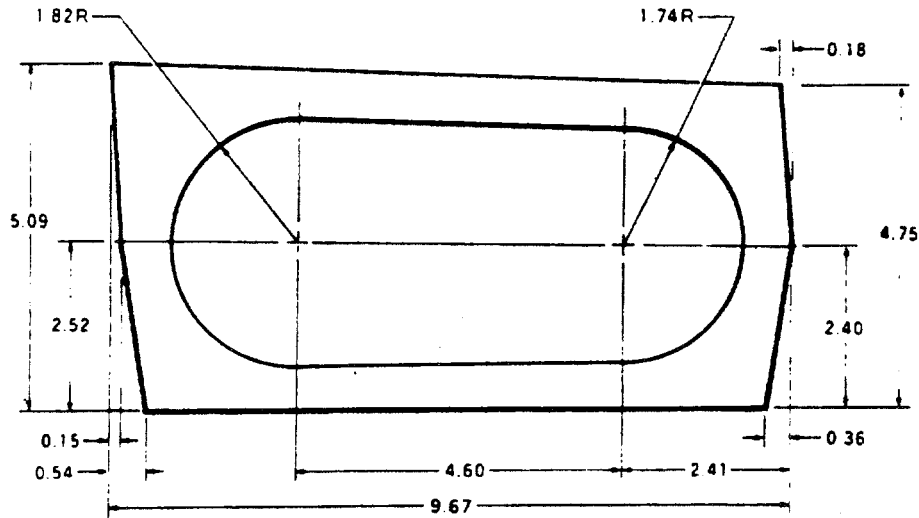
Figure B-128



Part Number: 205-030-899-45S DOUBLER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

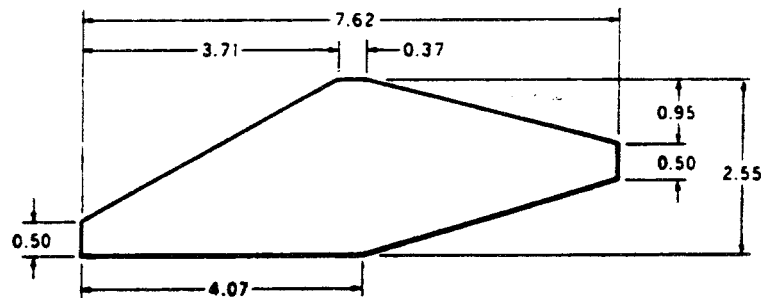
Figure B-129

CHQSOFTWARE.COM



Part Number: 205-030-899-47S DOUBLER (Shown)  
 205-030-899-48S DOUBLER (Opposite)  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-130

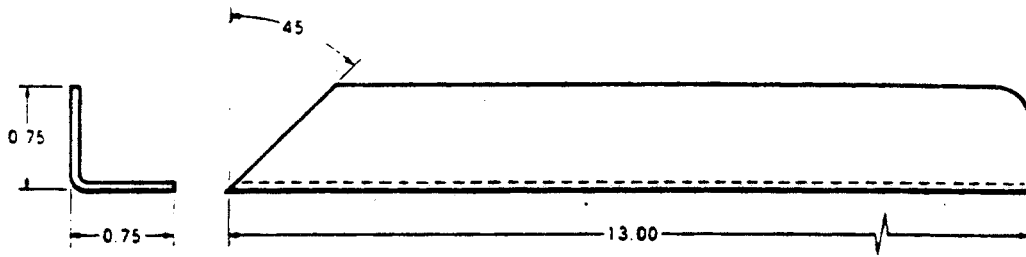


Part Number: 205-030-899-63S GUSSET (Shown)  
 205-030-899-64S GUSSET (Opposite)  
 Fabricate from: FSN 9535-084-4551  
 Material: QQ-A-250/5 T3 0.040

Figure B-131

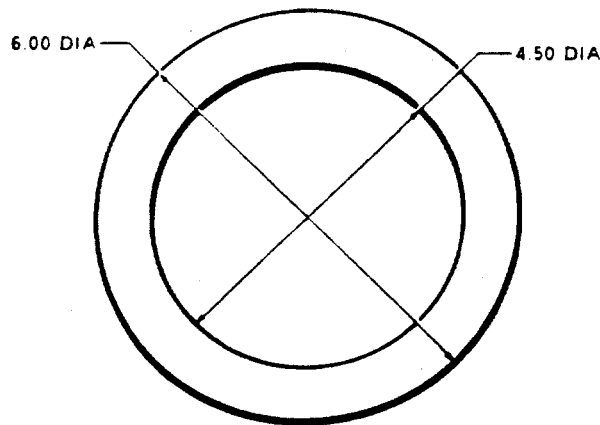


CHQSOFTWARE.COM



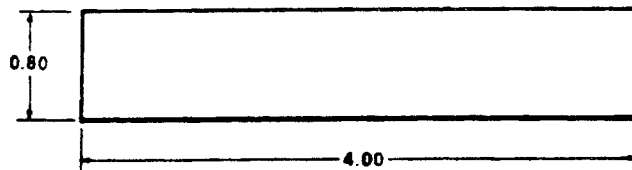
Part Number: 205-030-899-65S STIFFENER (Shown)  
 205-030-899-66S STIFFENER (Opposite)  
 Fabricate from: FSN 9540-148-4311  
 Material: QQ-A-200/3 T4 AND10134-1003

Figure B-132



Part Number: 205-030-899-67S DOUBLER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

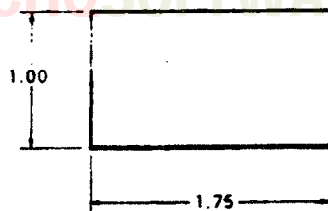
Figure B-133



Part Number: 205-030-899-73 FILLER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

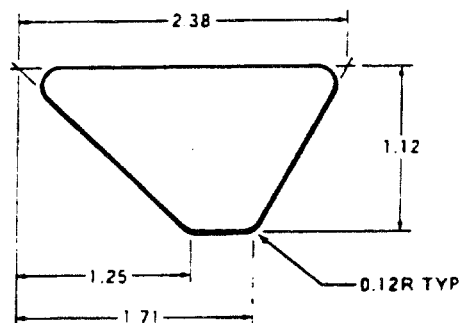
Figure B-134

CHO SOFTWARE.COM



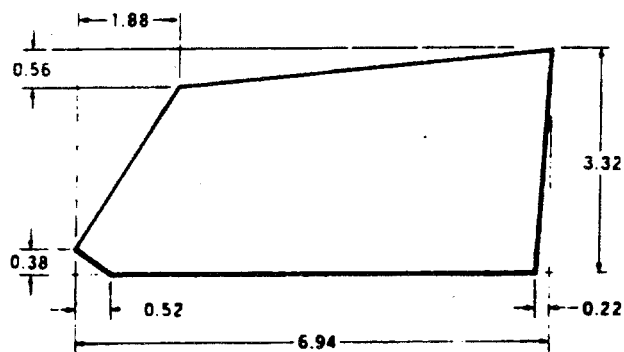
Part Number: 205-030-899-75 SHIM  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-135



Part Number: 205-030-899-77S FILLER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

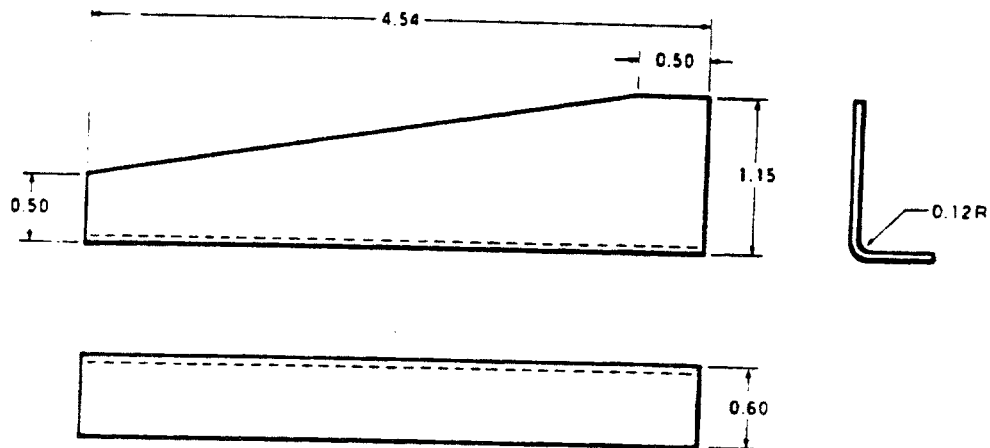
Figure B-136



Part Number: 205-030-899-99S DOUBLER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.032

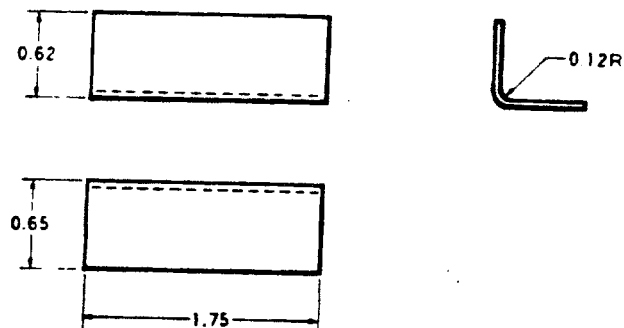
Figure B-137

CHQSOFTWARE.COM



Part Number: 205-031-013-15S CLIP  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

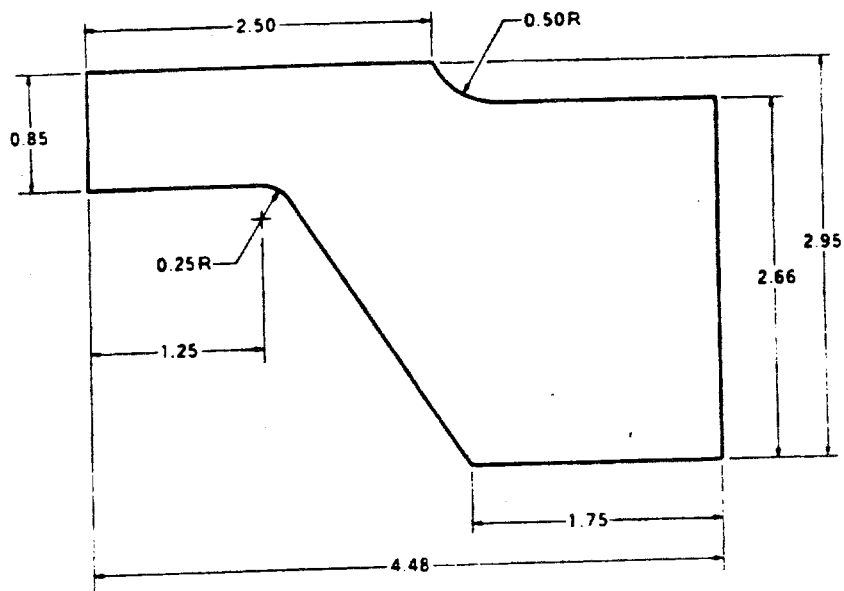
Figure B-138



Part Number: 205-031-013-17S CLIP  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

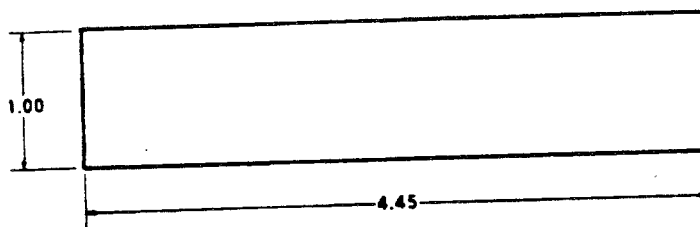
Figure B-139

CHQSOFTWARE.COM



Part Number: 205-031-013-19S STOP  
 Fabricate from: FSN 9535-084-4558  
 Material: QQ-A-250 5 T3 0.125

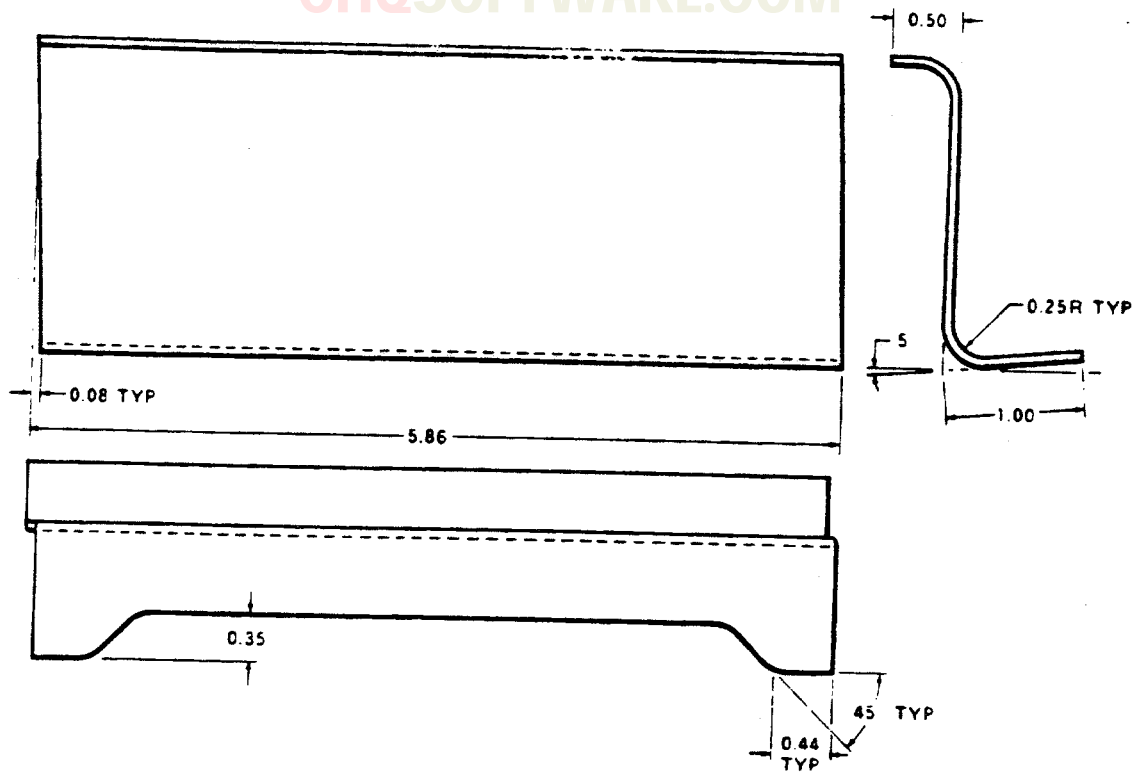
Figure B-140



Part Number: 205-031-013-21S DOUBLER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

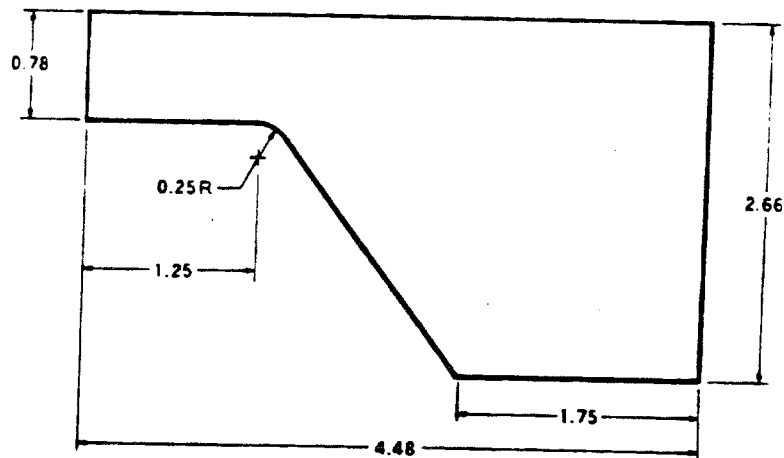
Figure B-141

CHQSOFTWARE.COM



Part Number: 205-031-013-23S SUPPORT  
 Fabricate from: FSN 9535-232-0378  
 Material: QQ-A-250/5 T3 0.064

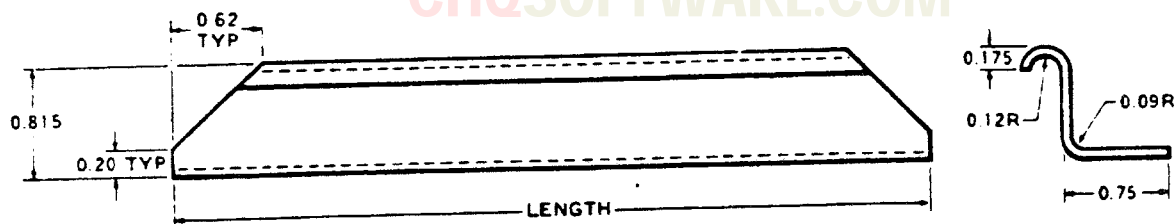
Figure B-142



Part Number: 205-031-013-25S STOP  
 Fabricate from: FSN 9535-084-4558  
 Material: QQ-A-250/5 T3 0.125

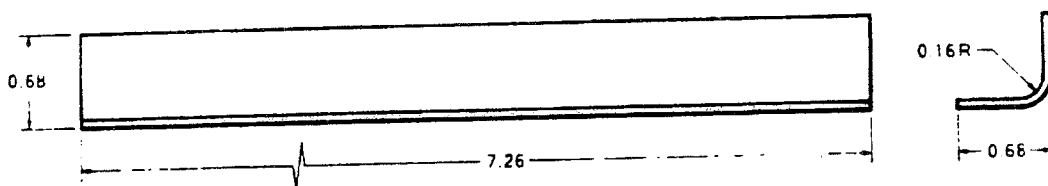
Figure B-143

CHQSOFTWARE.COM



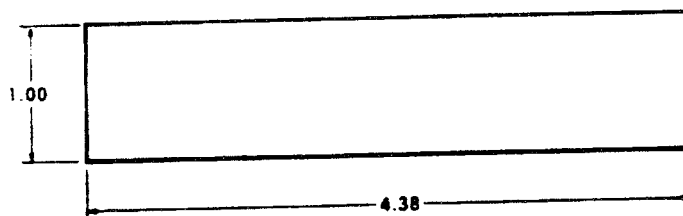
Part Number	Fabricate from	Material	Length
205-031-800-43S STRINGER	FSN 9540-159-6938	110-001-1 Bell Std	45.17
205-031-800-45S STRINGER	FSN 9540-159-6938	110-001-1 Bell Std	24.23

Figure B-144



Part Number: 205-031-800-57S STIFFENER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

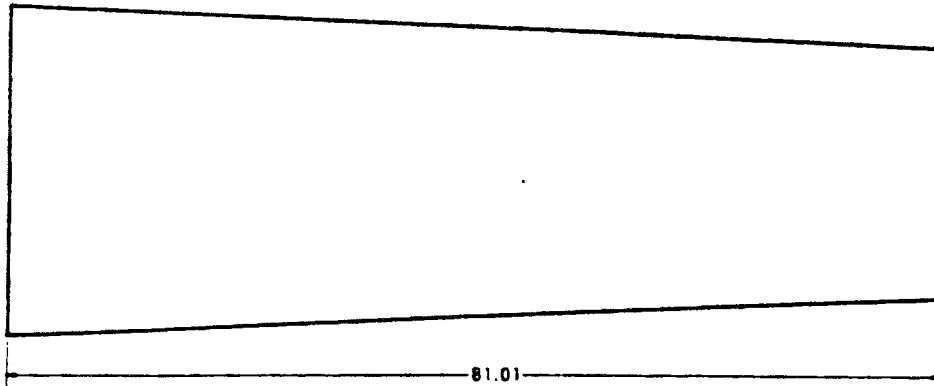
Figure B-145



Part Number: 205-031-800-59 FILLER  
 Fabricate from: FSN 9535-232-0437  
 Material: QQ-A-250/5 T3 0.190

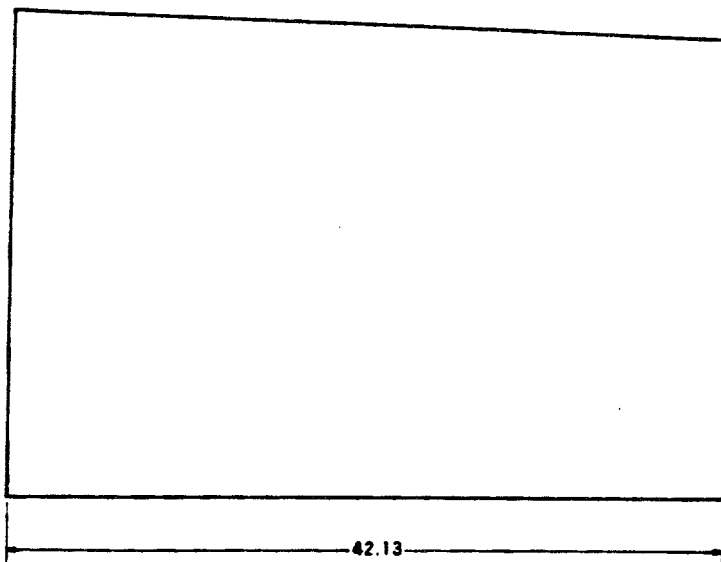
Figure B-146

CHQSOFTWARE.COM



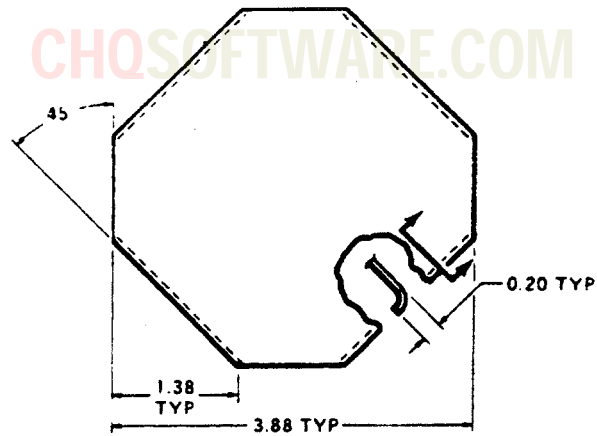
Part Number: 205-031-800-73S SKIN  
Fabricate from: FSN 9535-542-4704  
Material: QQM44/H24 0.040x32.0x82.0

Figure B-147



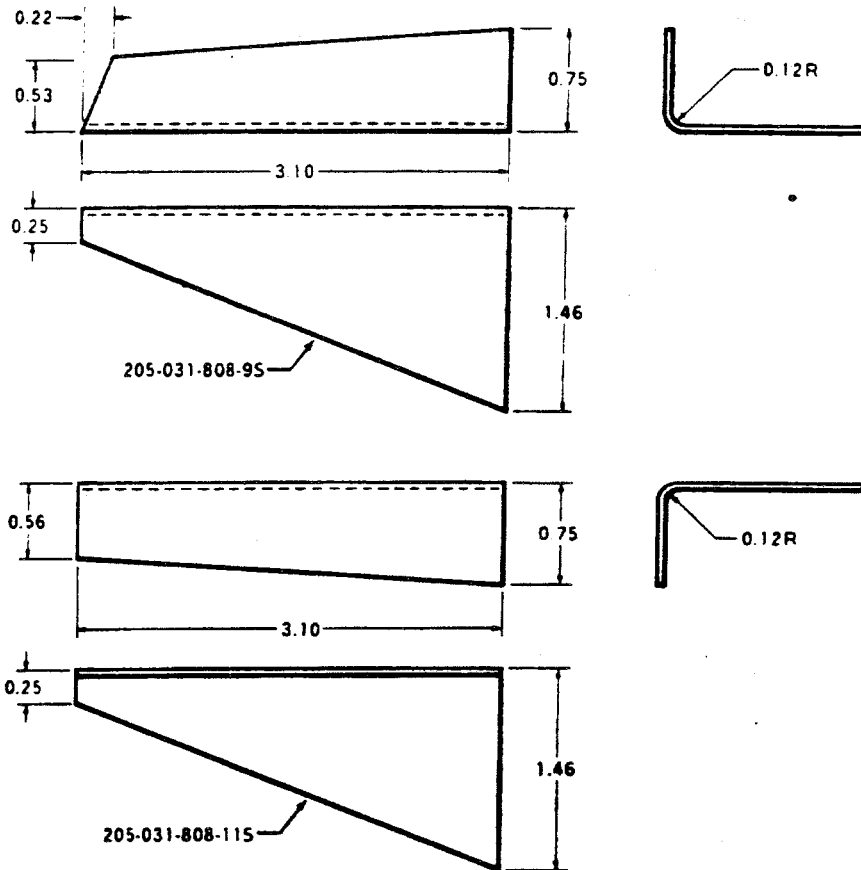
Part Number	Fabricate from	Material
205-031-801-73S SKIN (Shown)	FSN 9535-555-8862	QQM44/H24 0.025x32.0x44.0
205-031-801-74S SKIN (Opposite)	FSN 9535-542-4704	QQM44/H24 0.025x32.0x44.0

Figure B-148



Part Number: 205-031-803-15S GUSSET  
 Fabricate from: FSN 9535-084-4450  
 Material: QQ-A-250/5 T3 0.016

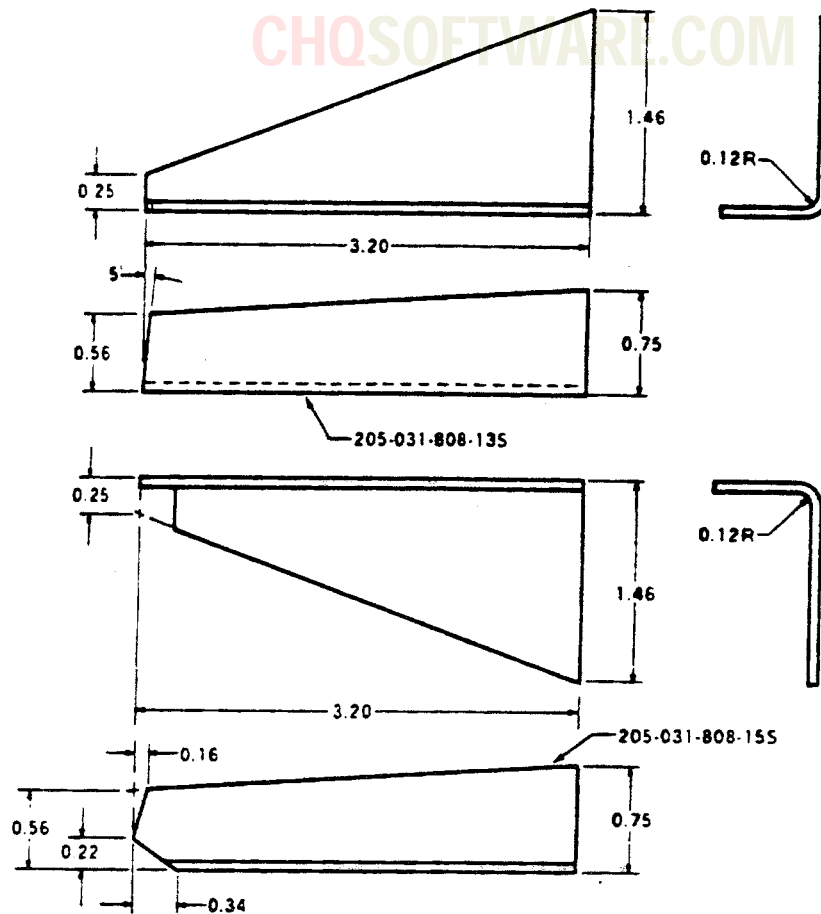
Figure B-149



Part Number: 205-031-808-9S STIFFENER  
 205-031-808-11S STIFFENER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

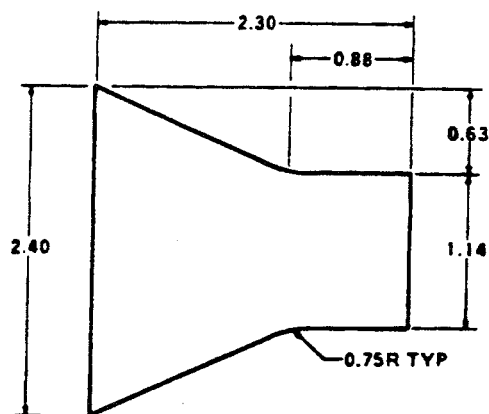
Figure B-150





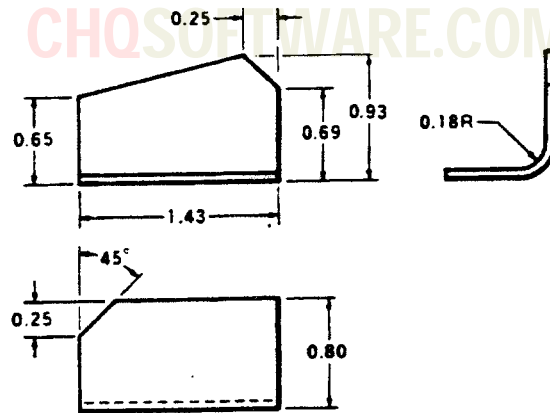
Part Number: 205-031-808-13S STIFFENER  
 205-031-808-15S STIFFENER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

Figure B-151



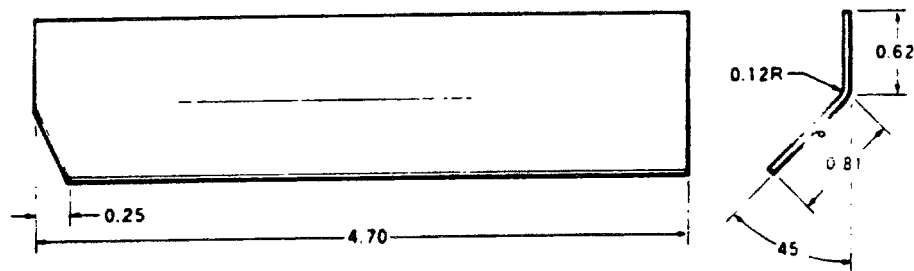
Part Number: 205-031-808-31S FILLER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

Figure B-152



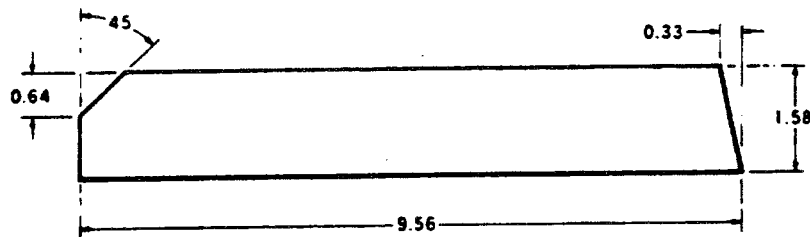
Part Number: 205-031-837-19S CLIP (Shown)  
 205-031-837-20S CLIP (Opposite)  
 Fabricate from: FSN 9535-640-2311  
 Material: QQ-A-362/5 T3 0.050

Figure B-153



Part Number: 205-031-837-21S CLIP  
 Fabricate from: FSN 9535-554-1412  
 Material: QQ-A-250/5 T3 0.025

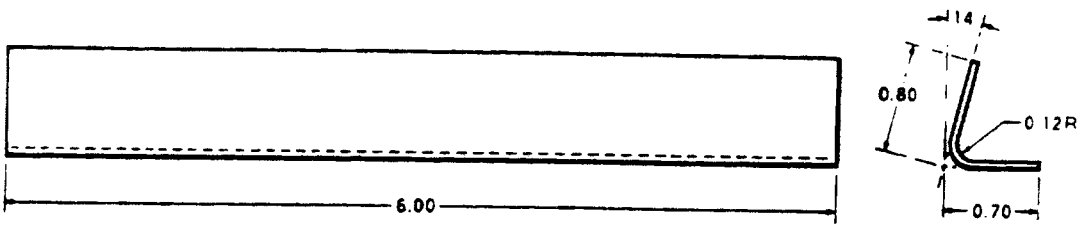
Figure B-154



Part Number: 205-031-837-29S STRAP  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

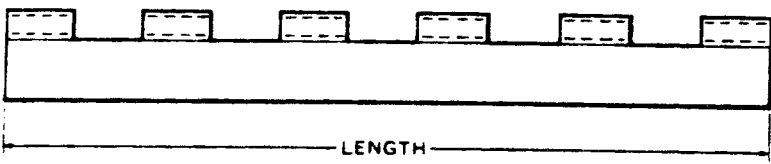
Figure B-155

CHQSOFTWARE.COM



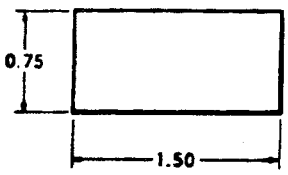
Part Number: 205-031-862-13S SPLICE (Shown)  
205-031-862-15S SPLICE (Opposite)  
Fabricate from: FSN 9535-086-9864  
Material: QQ-A-250/13 T6 0.025

Figure B-156



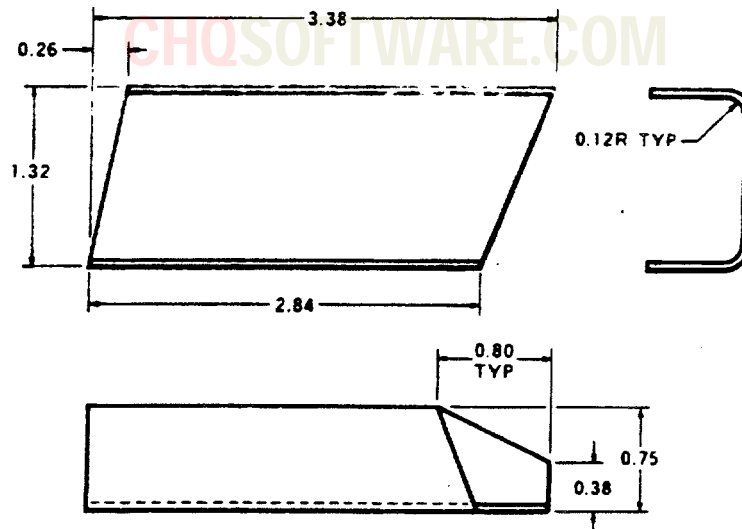
Part Number	Fabricate from	Material	Length
205-031-862-17S HINGE HALF	FSN 5340-993-1461	MS20257HP-7200	72.00
205-031-862-19S HINGE HALF	FSN 5340-993-1461	MS20257HP-3850	38.50
205-031-862-21S HINGE HALF	FSN 5340-993-1461	MS20257HP-7200	72.00

Figure B-157



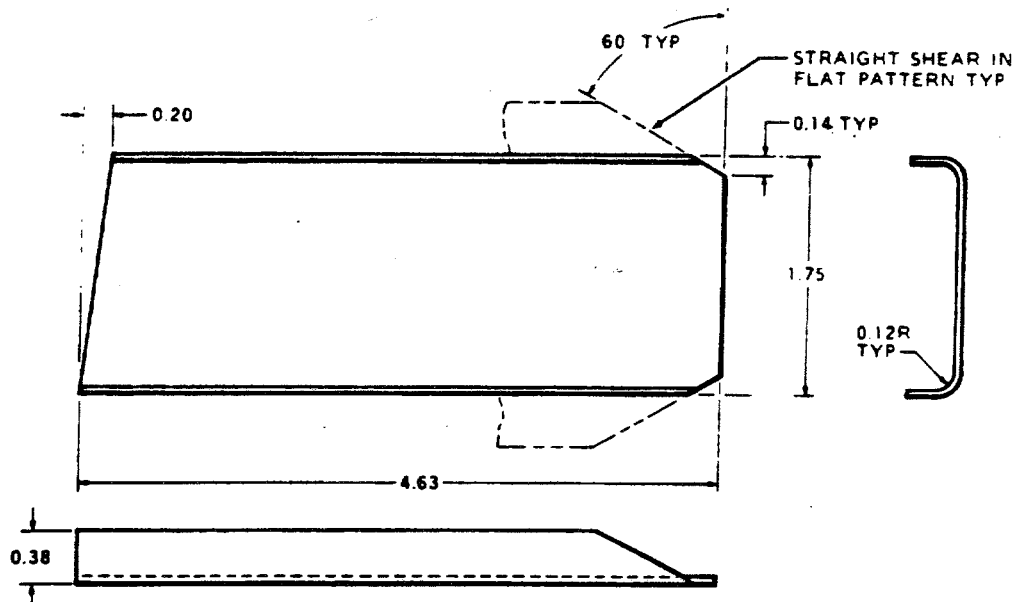
Part Number: 205-031-862-47S STRIP  
Fabricate from: FSN 9330-531-3567  
Material: MIL-M-20693 GS 0.063

Figure B-158



Part Number: 205-031-897-15S STIFFENER  
 Fabricate from: FSN 9535-084-4395  
 Material: QQ-A-250/5 T3 0.032

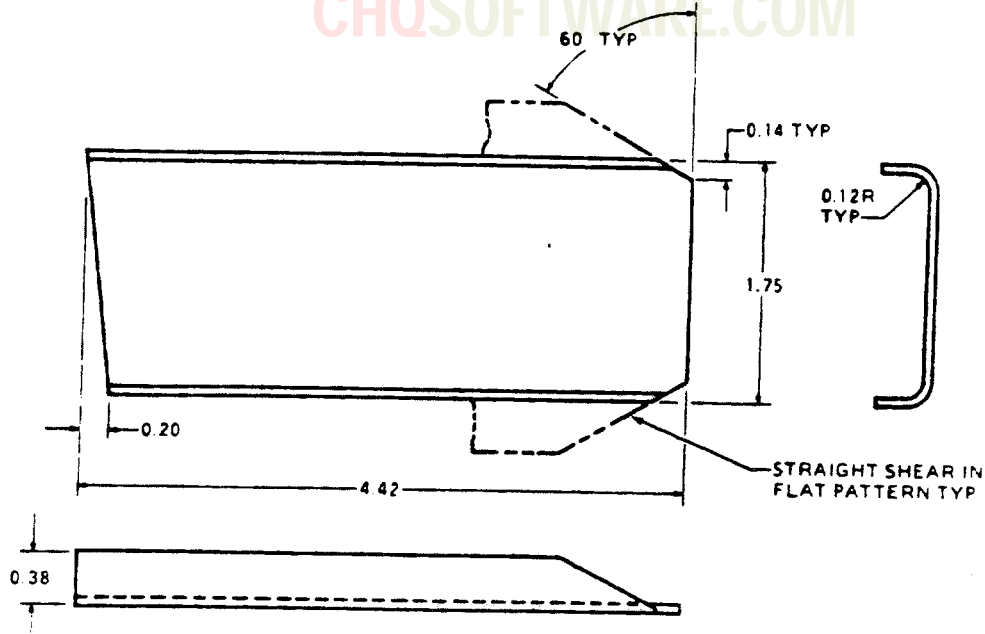
Figure B-159



Part Number: 205-031-897-17S STIFFENER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQA250/5 T3 0.025

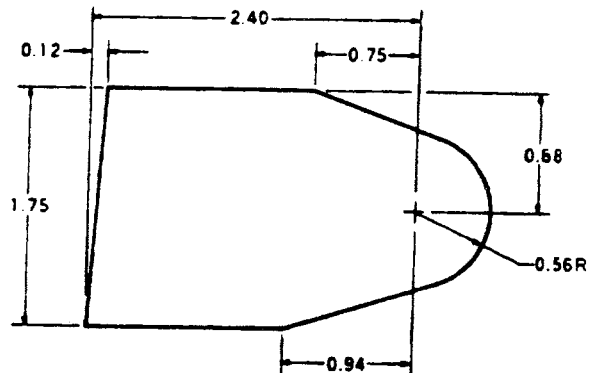
Figure B-160

CHQSOFTWARE.COM



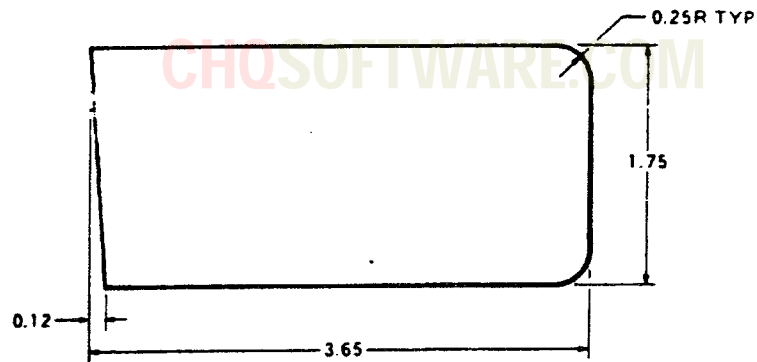
Part Number: 205-031-897-19S STIFFENER  
 Fabricate from: FSN 9535-084-4533  
 Material: QQ-A-250/5 T3 0.025

Figure B-161



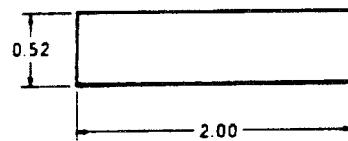
Part Number: 205-031-897-23S PLATE  
 Fabricate from: FSN 9535-086-9459  
 Material: QQ-A-250/5 T3 0.160

Figure B-162



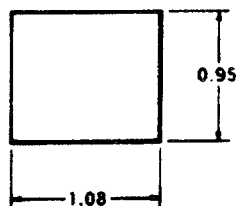
Part Number: 205-031-897-25S PLATE  
 Fabricate from: FSN 9535-086-9459  
 Material: QQ-A-250/5 T3 0.160

Figure B-163



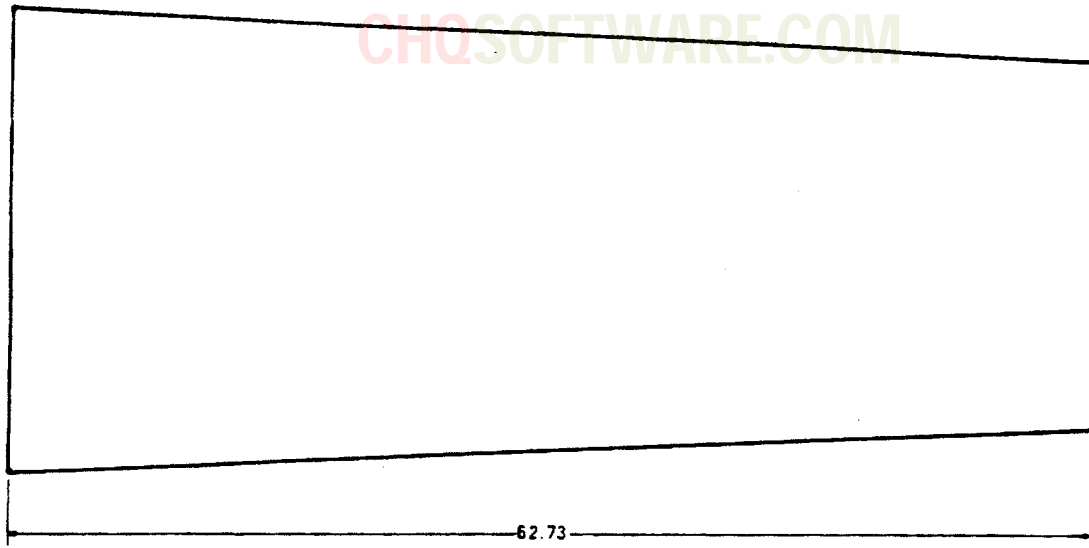
Part Number: 205-031-897-29 PAD  
 Fabricate from: FSN 9320-241-9763  
 Material: MIL-R-6855 CLI DR60 0.02

Figure B-164



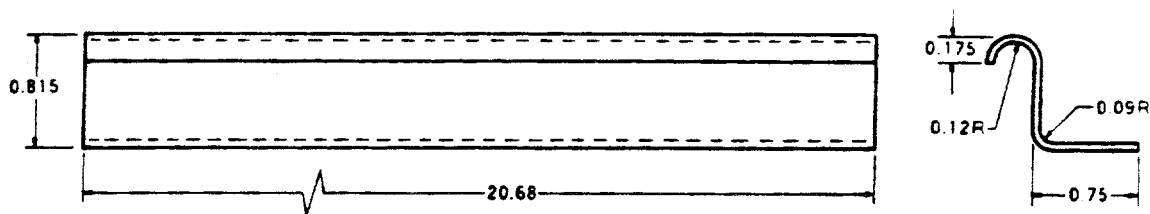
Part Number: 205-032-800-25 FILLER  
 Fabricate from: FSN 9535-084-4430  
 Material: QQ-A-250/5 T3 0.100

Figure B-165



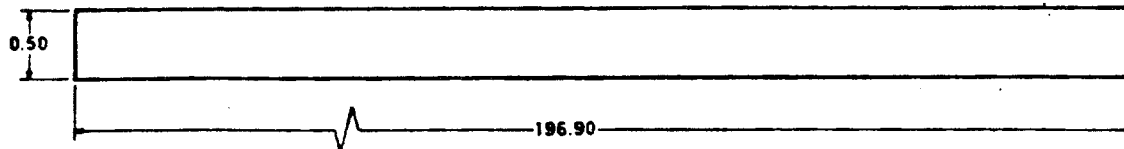
Part Number	Fabricate from	Material
205-032-800-27 SKIN (Shown)	FSN 9535-555-8862	QQM44H24 0.025x30.0x64.0
205-032-800-28 SKIN (Opposite)	FSN 9535-542-4704	QQM44H24 0.025x30.0x64.0

Figure B-166



Part Number	205-032-800-39S STRINGER
Fabricate from:	FSN 9540-159-6937
Material:	110-001-3

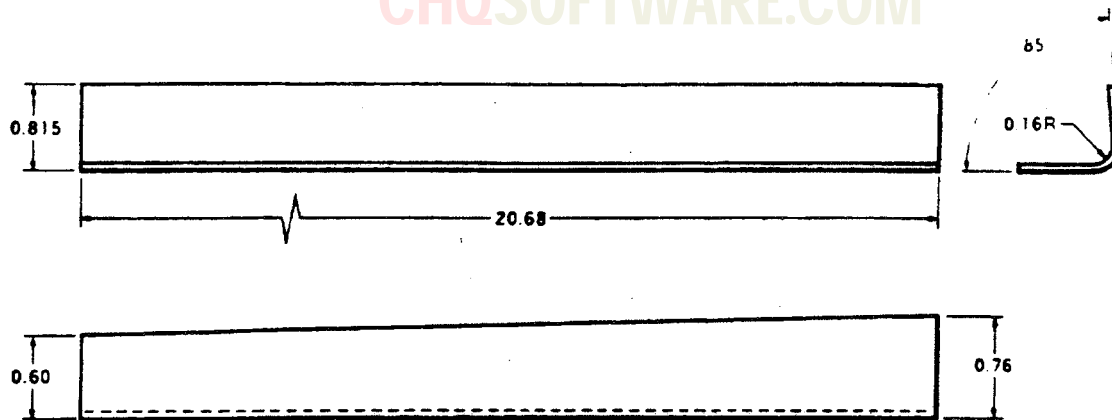
Figure B-167



Part Number:	205-032-800-59 STRIP
Fabricate from:	FSN 7510-145-0171
Material:	ADHESIVE TAPE Y9265

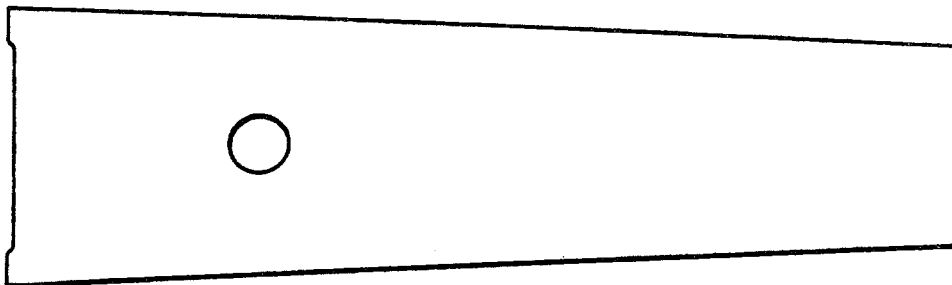
Figure B-168

CHQSOFTWARE.COM



Part Number: 205-032-800-61S STIFFENER  
 Fabricate from: FSN 9535-084-4551  
 Material: QQ-A-250/5 T3 0.040

Figure B-169

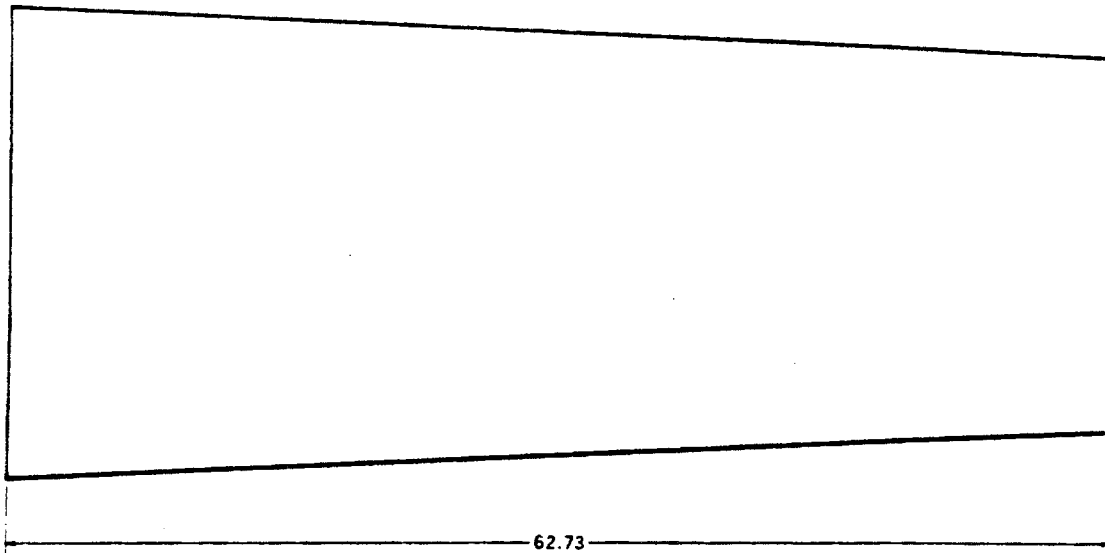


Part Number: 205-032-800-63 SKIN (Shown)  
 205-032-800-64 SKIN (Opposite)  
 Fabricate from: FSN 9535-542-4705  
 Material: QQM44H24 0.032x25.0x76.0

Figure B-170

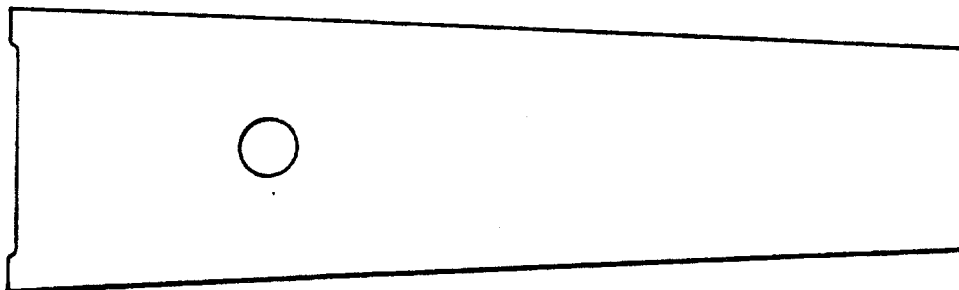


CHQSOFTWARE.COM



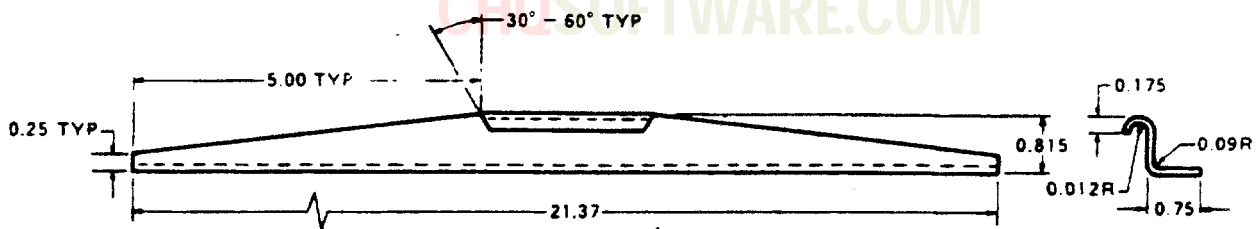
Part Number: 209-030-800-107S SKIN, Side Center L.H. Shown  
 209-030-800-109S SKIN, Side Center R.H. Opposite  
 Fabricate from: FSN 9535-086-9864  
 Material: Al Aly Sheet QQ-A-250/13 T6 0.025x31.0x66.0

Figure B-171



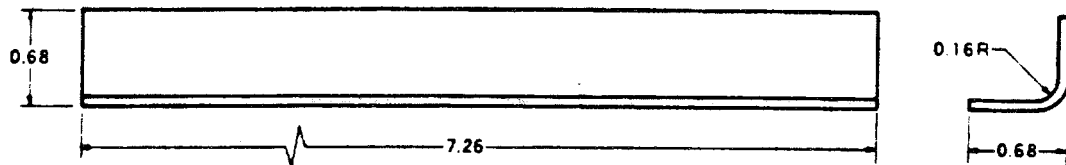
Part Number: 209-030-800-115S SKIN, Side Aft L.H. Shown  
 209-030-800-116S SKIN, Side Aft R.H. Opposite  
 Fabricate from: FSN 9535-232-7535  
 Material: Al Aly Sheet QQ-A-250/13 T6 0.032x25.0x75.0

Figure B-172



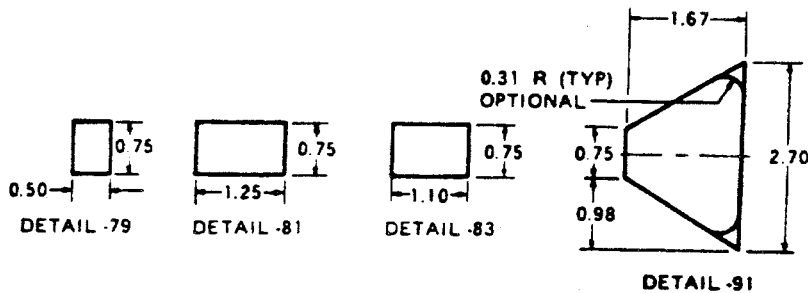
Part Number: 209-030-800-43S STRINGER  
 Fabricate from: FSN 9540-159-6938  
 Material: Bell Standard 110-001-1 25.0 Length

Figure B-173



Part Number: 209-030-800-53S STIFFENER  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032x1.9x7.7

Figure B-174



# FILLER

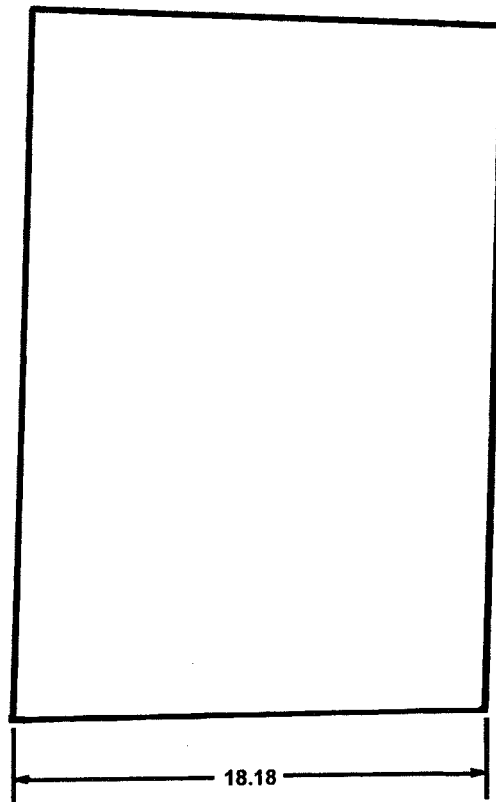
Part Number

209-030-800-79  
 209-030-800-81  
 209-030-800-83  
 209-030-800-91

Fabricate from: FSN 9535-236-7091  
 Material: QQ-A-250/13 T6 0.012

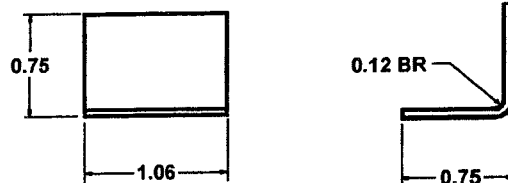
Figure B-175

CHQSOFTWARE.COM



Part Number: 209-030-800-85S SKIN, Side forward shown  
209-030-800-86S SKIN, Side forward opposite  
Fabricate from: FSN 9535-084-4581  
Material: Al Aly Sheet QQ-A-250/13 T6 0.040 x 20.0 x 32.0

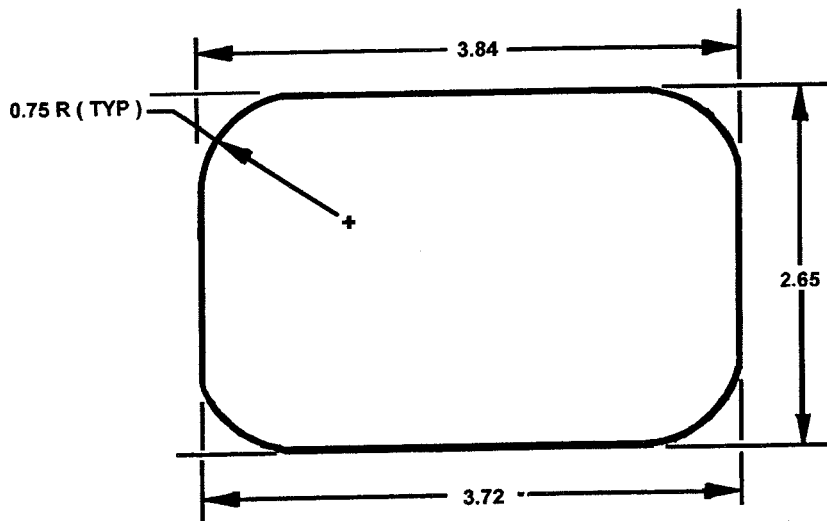
FIGURE B-176



Part Number: 209-030-800-99S CLIP  
Fabricate from: FSN 9535-084-4395  
Material: Al Aly Sheet QQ-A-250/5 T3 0.032 x 1.5 x 2.0

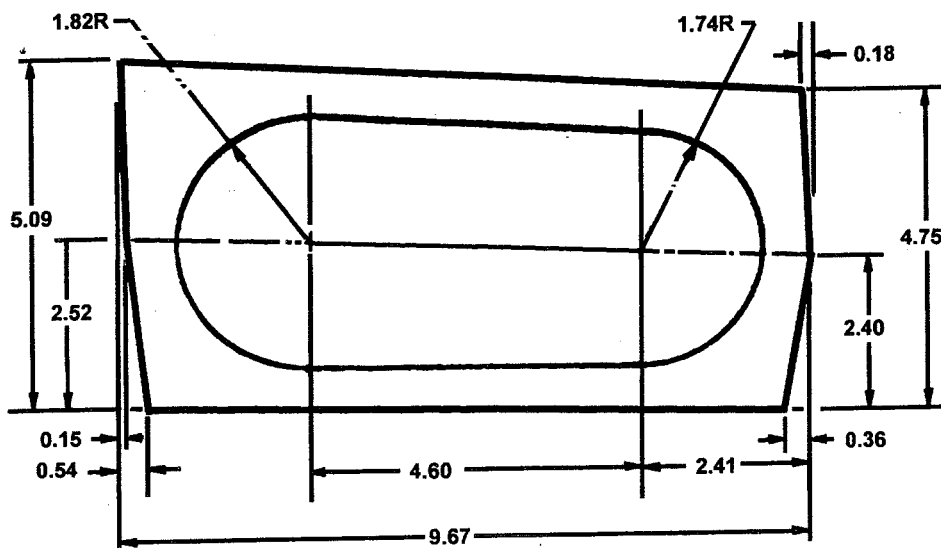
FIGURE B-177

CHQSOFTWARE.COM



Part Number: 209-030-801-1038 DOUBLER  
 Fabricate from: FSN 5970-892-1018  
 Material: AMS 3651 Teflon Sheet (item 107, table 2-2)  
 (0.060 x 3.1 x 4.4)

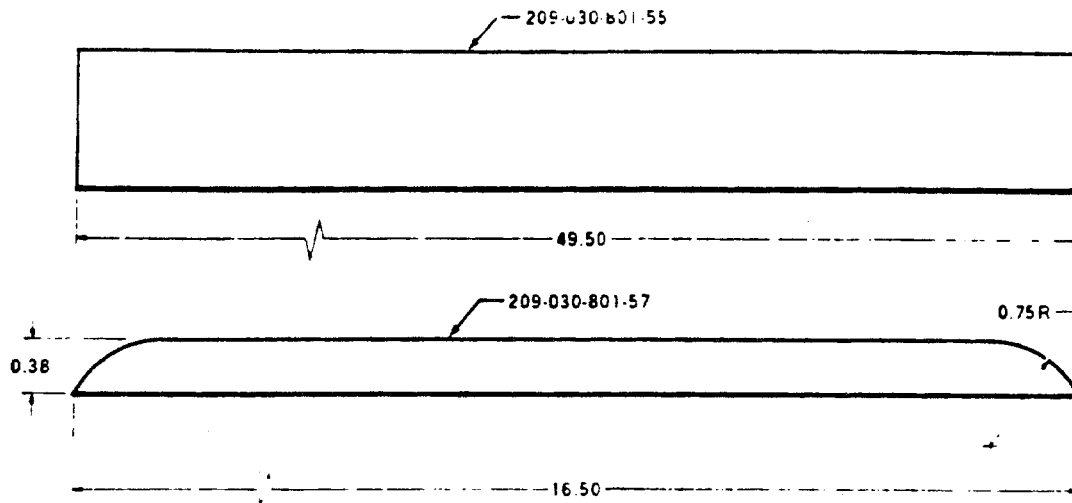
FIGURE B-178



Part Number: 209-030-801-25S DOUBLER, Shown  
 209-030-801-DOUBLER, Opposite  
 Fabricate from: FSN 9535-232-7535  
 Material: Al Aly Sheet QQ-A-250/13 T6 0.032 x 6.0 x 10.5

FIGURE B-179

CHQSOFTWARE.COM

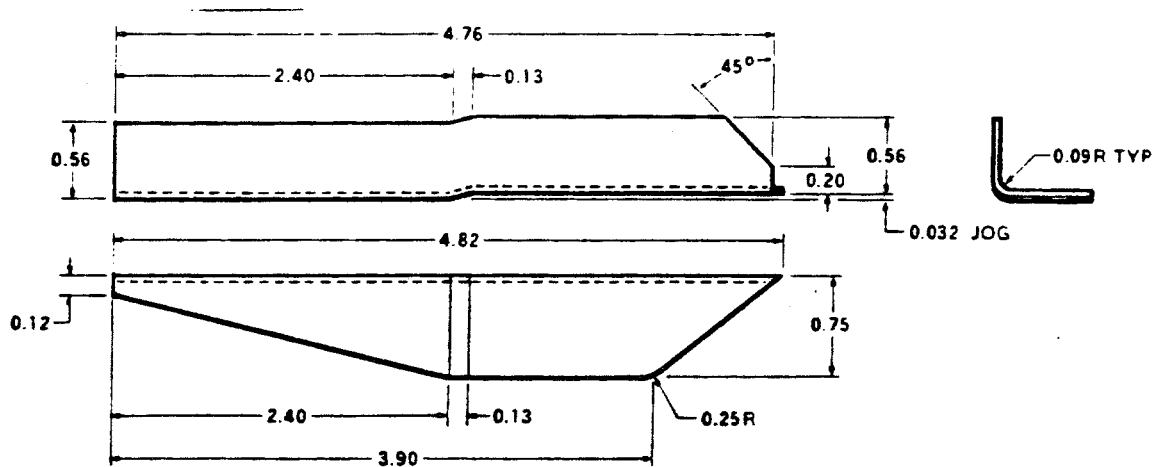


# TAPE

Part Number	Material
209-030-801-55	YZ 9265 1.50x50.0
209-030-801-57	YZ 9265 1.50x16.0

Fabricate from: FSN 7510-145-0171

Figure B-180

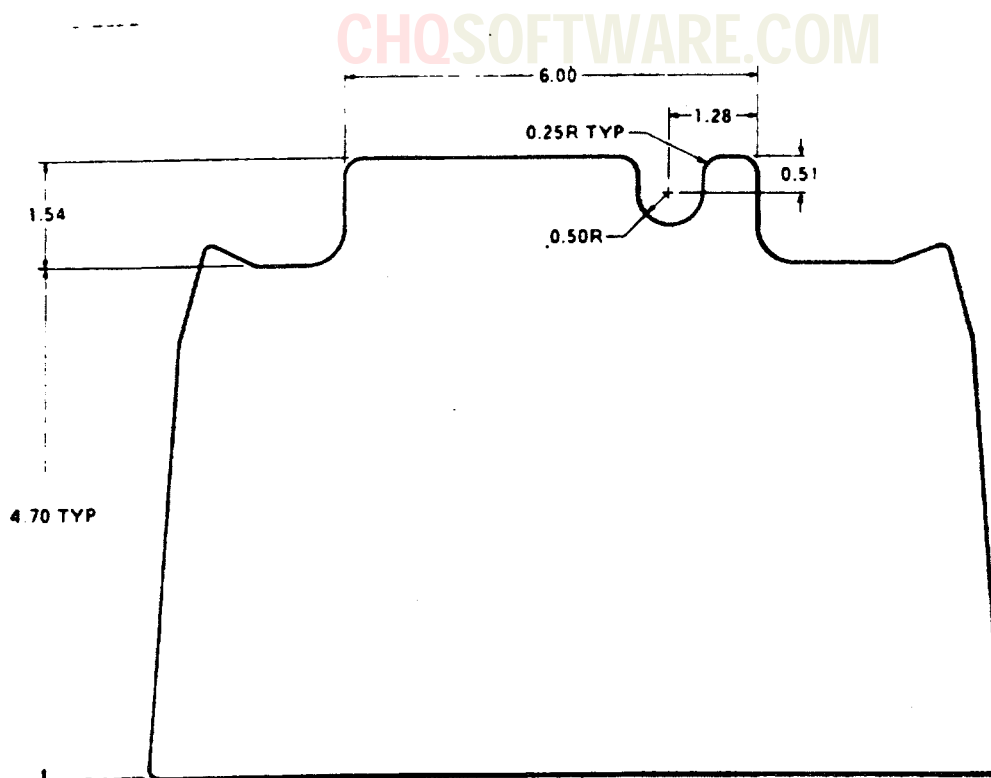


Part Number: 209-030-801-59S STIFFENER, Shown  
209-030-801-60S STIFFENER, Opposite

Material: Al Aly Sheet QQ-A-250/13 TO 0.032x1.8x5.3

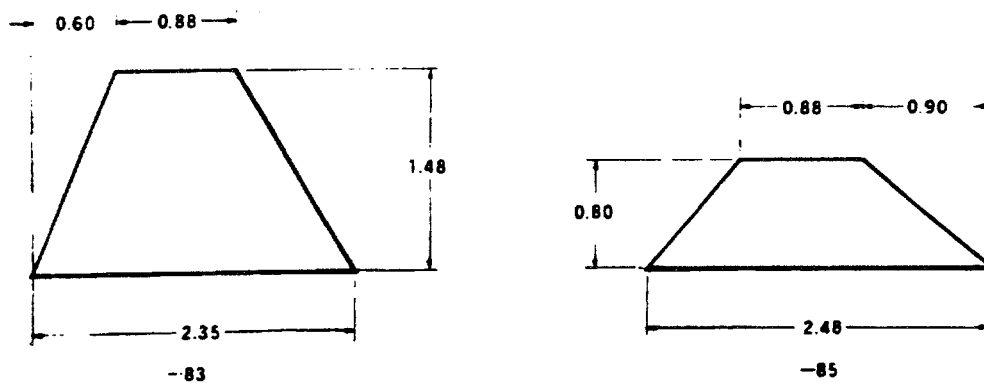
Fabricate from: FSN 9535-232-7535

Figure B-181



Part Number: 209-030-801-65S DOUBLER  
 Material: Al Aly Sheet QQ-A-250-5 TO 0.050x9.0x18.0  
 Fabricate from: FSN 9535-232-0501

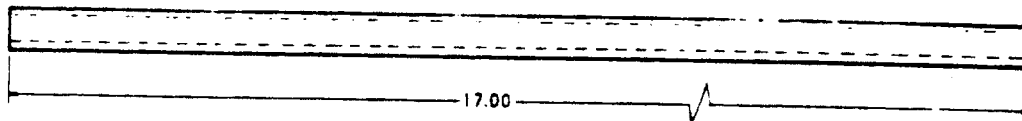
Figure B-182



Part Number: 209-030-801-83 FILLER  
 209-030-801-85 FILLER  
 Fabricate from: FSN 9535-086-9465  
 Material: Al Aly QQ-A-250/13 T6 0.050

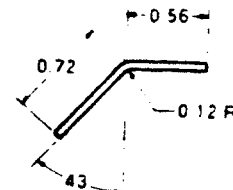
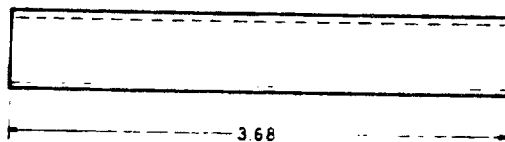
Figure B-183

CHQSOFTWARE.COM



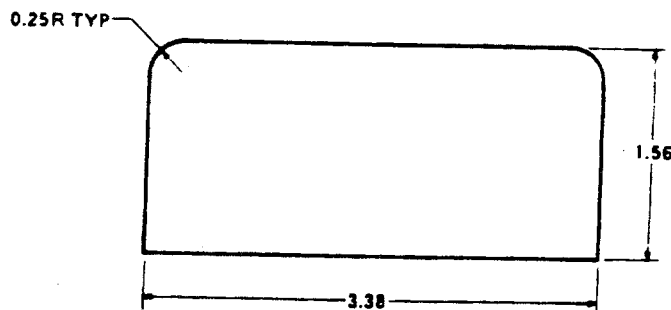
Part Number: 209-030-803-17 TUBE  
Fabricate from: FSN 9330-931-7097  
Material: 44N, Stock 17.0

Figure B-184



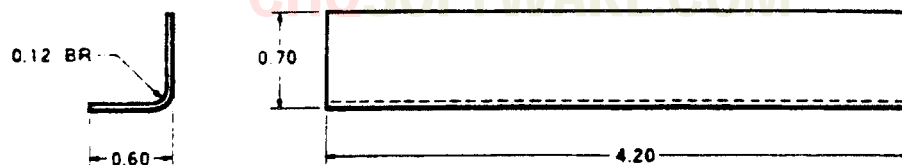
Part Number: 209-030-812-11S CLIP  
Fabricate from: FSN 9535-084-4533  
Material: Al Aly QQ-A-250/5 T3 0.025x2.2x4.2

Figure B-185



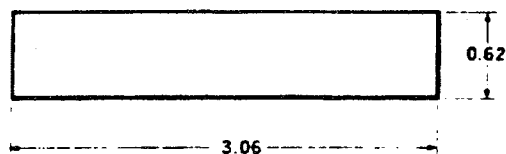
Part Number: 209-030-813-49S FILLER  
Fabricate from: FSN 9535-084-4484  
Material: Al Aly Sheet QQ-A-250/5 T3 0.020x1.4x2.0

Figure B-186



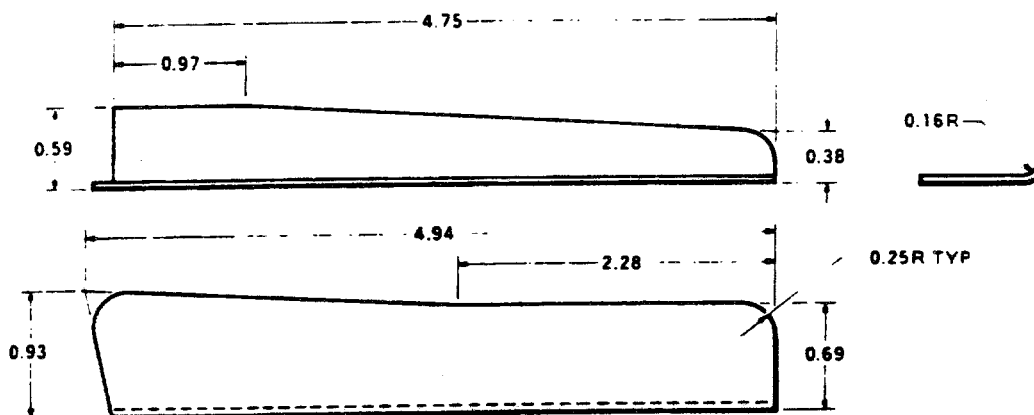
Part Number: 209-030-815-23S STIFFENER  
 Fabricate from: FSN 9535-086-9864  
 Material: Al Aly Sheet QQ-A-250/13 T6 0.025x1.7x4.7

Figure B-187



Part Number: 209-030-815-41S FILLER  
 Fabricate from: FSN 9535-088-6599  
 Material: Al Aly Sheet QQ-A-250/13 T6 0.063x1.7x3.6

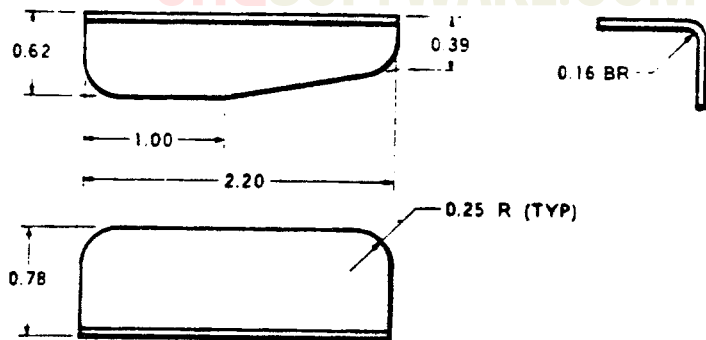
Figure B-188



Part Number: 209-030-817-27S CLIP, Shown  
 209-030-817-28S CLIP, Opposite  
 Fabricate from: FSN 9535-232-7535  
 Material: Al Aly Sheet QQ-A-250/13 0.032x2.0x5.2

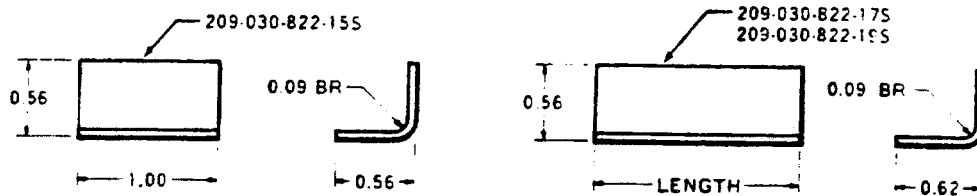
Figure B-189





Part Number: 209-030-817-29S CLIP Shown  
 209-030-817-30S CLIP Opposite  
 Fabricate from: FSN 9535-232-7535  
 Material: Al Aly Sheet QQ-A-250/13 T6 0.032x1.6x3.6

Figure B-190

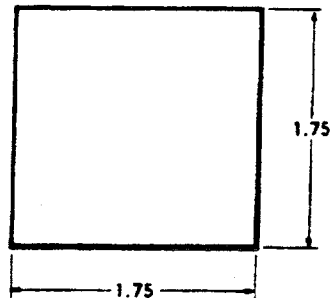


CLIP, Tailboom anti-torque support instl.

Part Number	Length
209-030-822-15S	1.00
209-030-822-17S	2.25
209-030-822-19S	2.00

Fabricate from: FSN 9535-084-4533  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.025

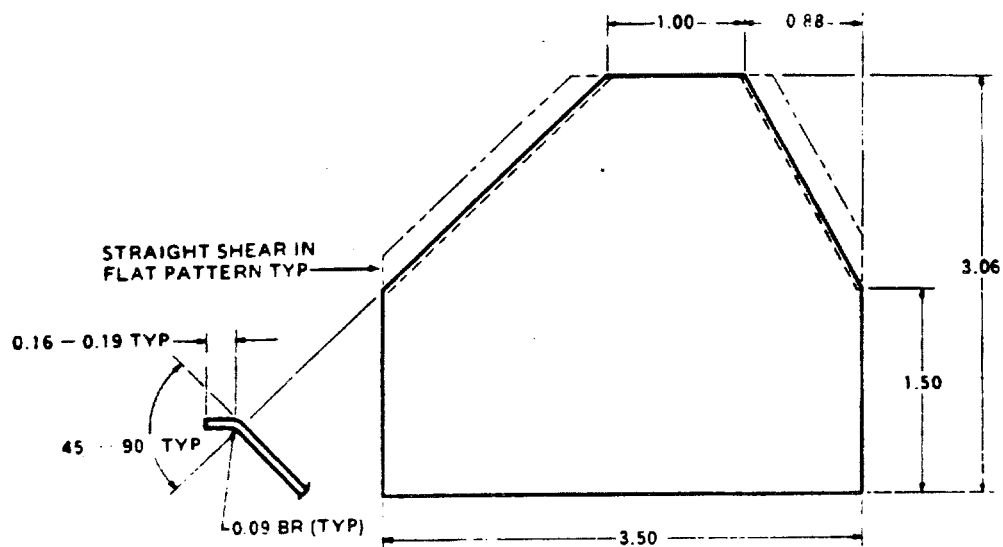
Figure B-191



Part Number: 209-030-822-21S PLATE  
 Fabricate from: FSN 9535-084-4430  
 Material: Al Aly Sheet 2024 QQ-A-250/5 T3 0.10x2.3x2.3

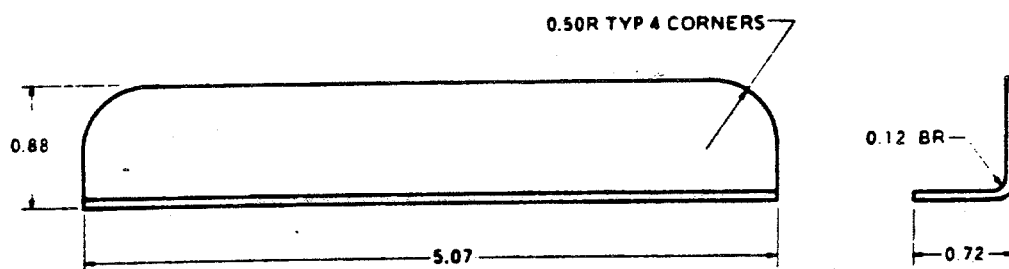
Figure B-192

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Part Number: 209-030-823-49S DOUBLER  
 Fabricate from: FSN 9535-084-4533  
 Material: Al Aly QQ-A-250 /5 T3 0.025x3.6x4.2

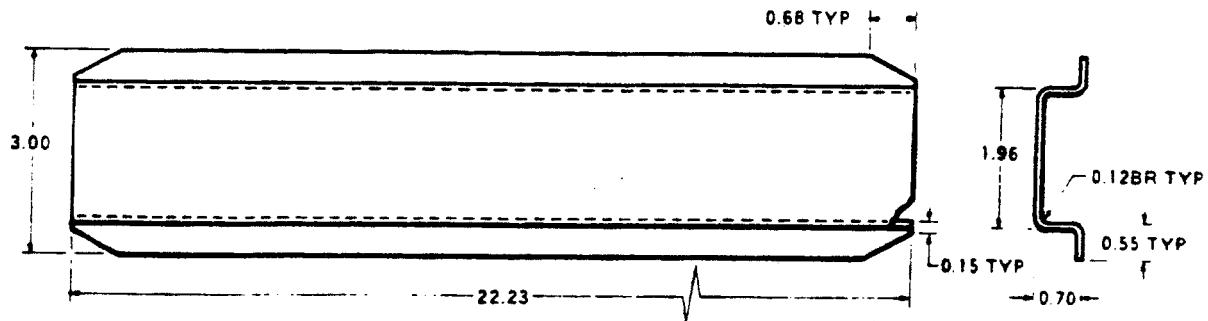
Figure B-193



Part Number: 209-030-825-17S SUPPORT  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032x2.1x5.4

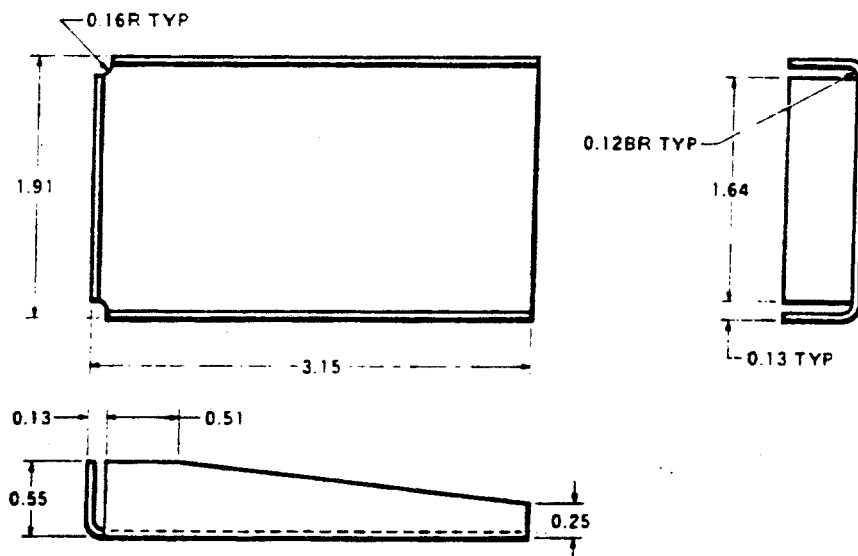
Figure B-194

CHQSOFTWARE.COM



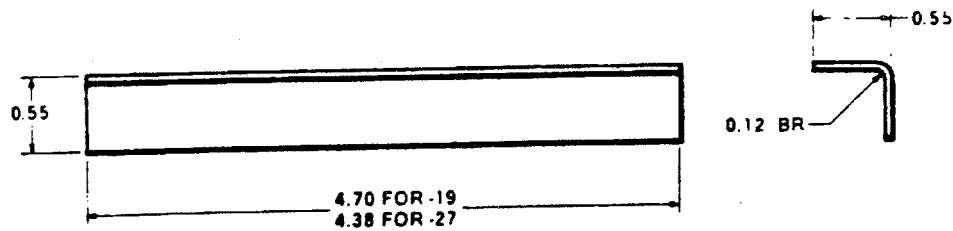
Part Number: 209-030-827-13S SUPPORT  
 Fabricate from: FSN 9535-084-4533  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.025x5.0x22.7

Figure B-195



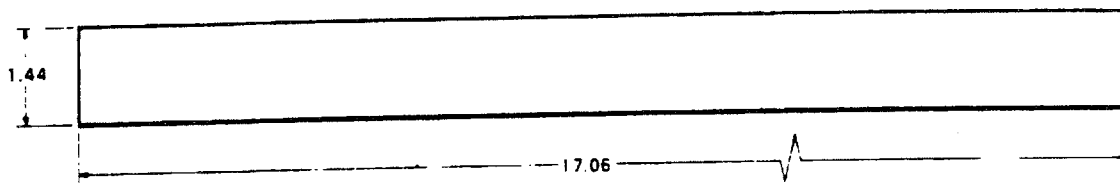
Part Number: 209-030-827-15S BRACKET  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032x3.6x4.2

Figure B-196



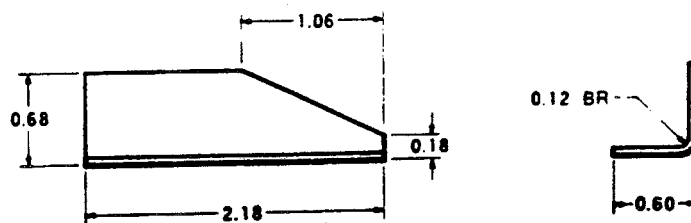
Part Number: 209-030-827-19S CLIP  
 209-030-827-27S CLIP  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032

Figure B-187



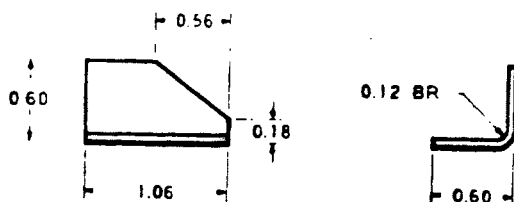
Part Number: 209-030-827-33S WEB  
 Fabricate from: FSN 9535-084-4450  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.016x1.9x17.4

Figure B-198



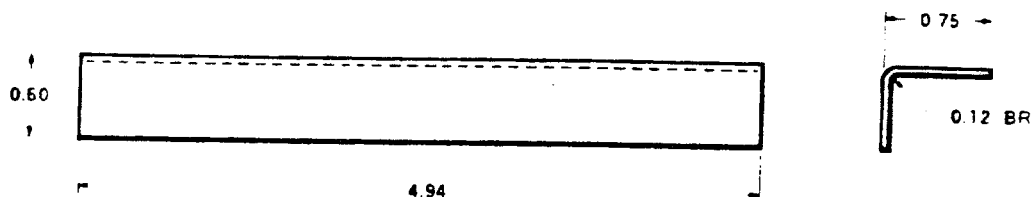
Part Number: 209-030-827-45S CLIP, Shown  
 209-030-827-49S CLIP, Opposite  
 209-030-827-61S CLIP, Shown  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032

Figure B-199



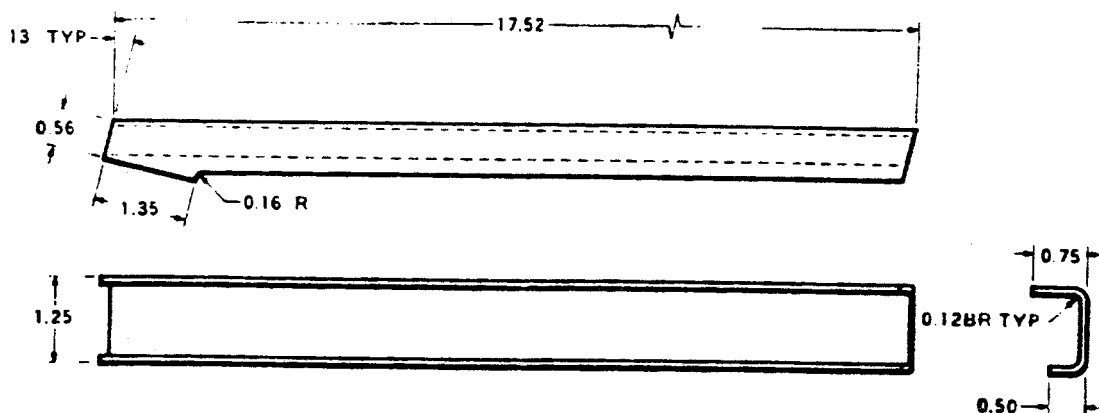
Part Number: 209-030-827-47S CLIP, Shown  
 209-030-827-48S CLIP, Opposite  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032x1.6x1.7

Figure B-200



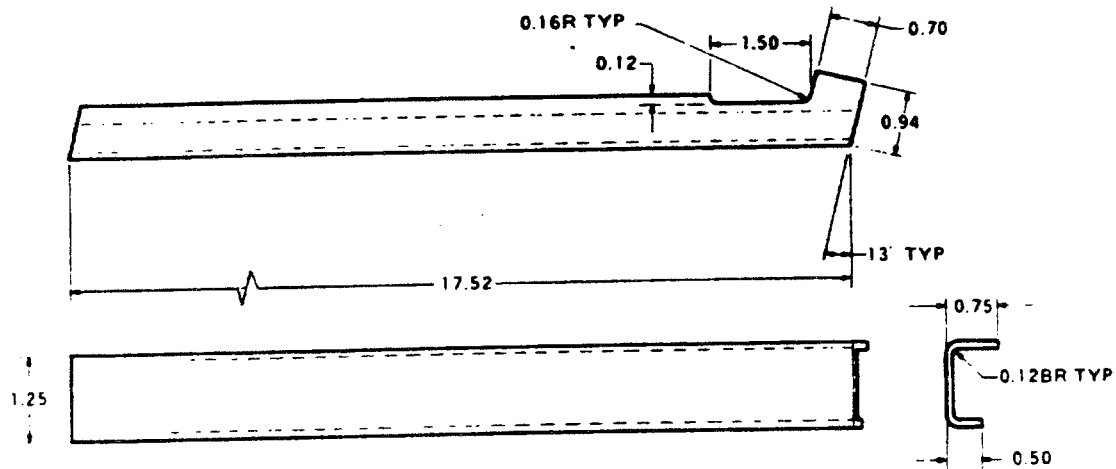
Part Number: 209-030-827-51S ANGLE  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032x1.9x5.5

Figure B-201



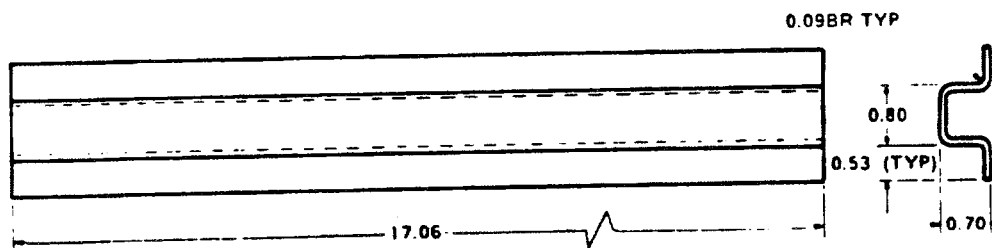
Part Number: 209-030-827-57S CHANNEL  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032x3.0x18.2

Figure B-202



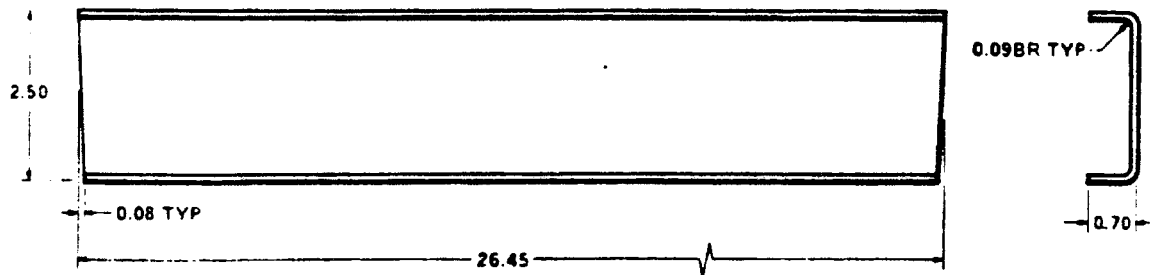
Part Number: 209-030-827-59S CHANNEL  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032x3.0x17.8

Figure B-203



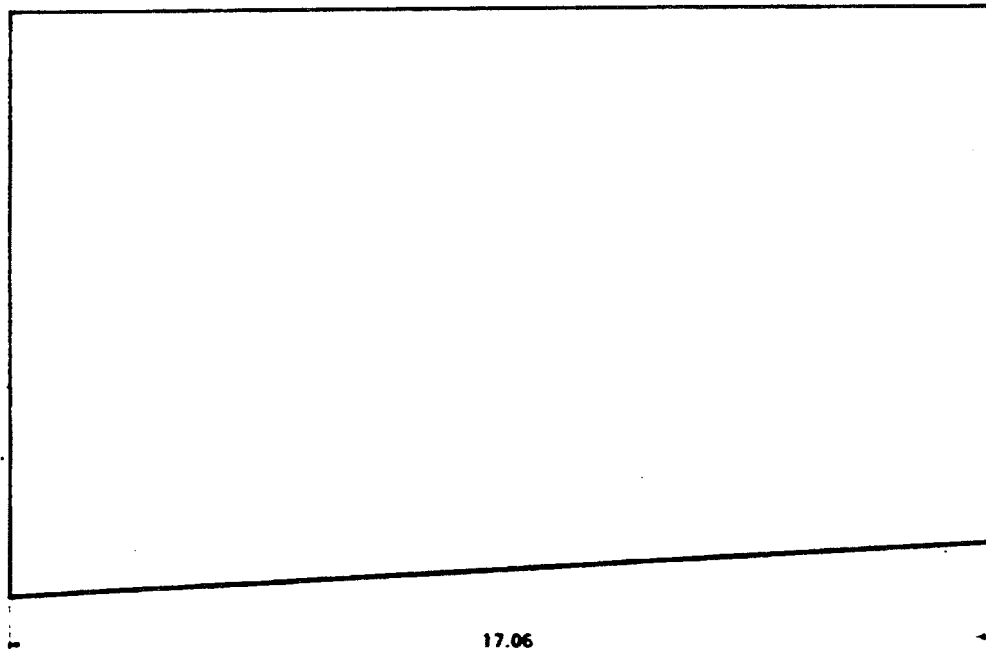
Part Number: 209-030-827-79S SUPPORT  
 Fabricate from: FSN 9535-084-4533  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.025x2.4x17.8

Figure B-204



Part Number: 209-030-827-81S SUPPORT  
Fabricate from: FSN 9535-084-4533  
Material: Al Aly Sheet QQ-A-250/5 T3 0.025x4.4x27.4

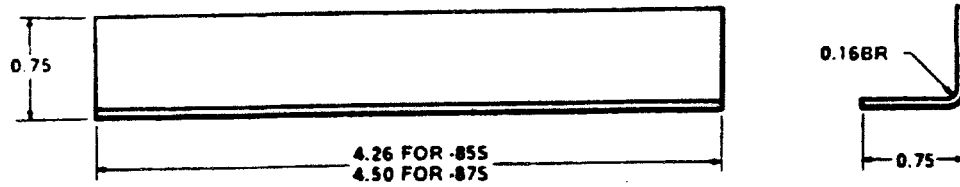
Figure B-205



Part Number: 209-030-827-83S WEB  
Fabricate from: FSN 9535-084-4450  
Material: Al Aly Sheet QQ-A-250/5 T3 0.016x10.3x17.4

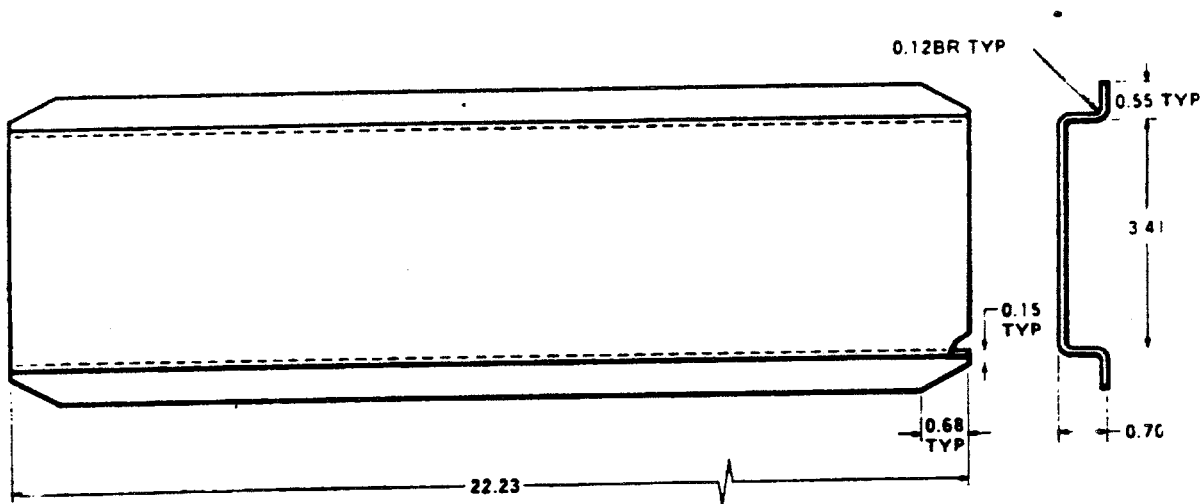
Figure B-206

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Part Number: 209-030-827-85S SUPPORT  
 209-030-827-87S SUPPORT  
 Fabricate from: FSN 9535-084-4551  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.040

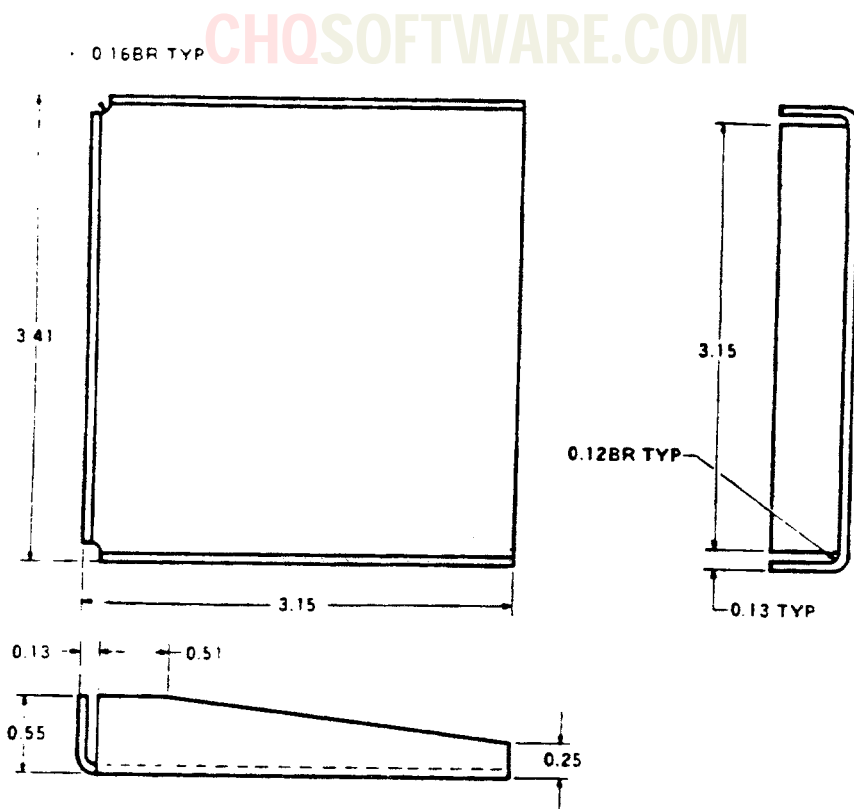
Figure B-207



Part Number: 209-030-827-91S SUPPORT  
 Fabricate from: FSN 9535-084-4533  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.025x6.5x22.7

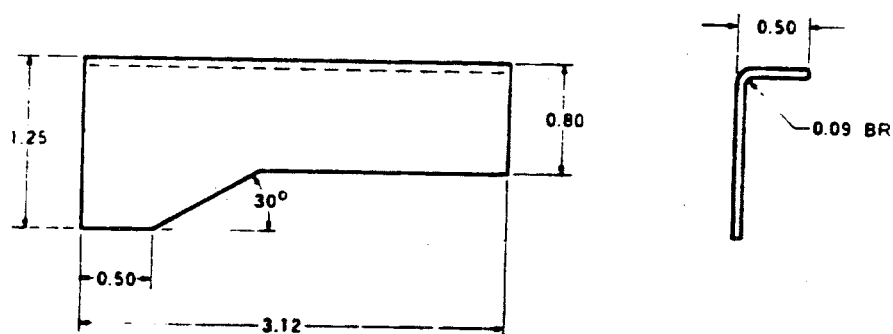
Figure B-208





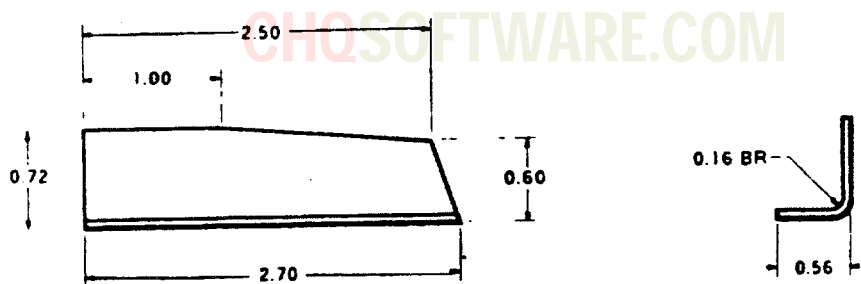
Part Number: 209-030-827-95S BRACKET  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQA-250/5 T3 0.032x4.2x5.0

Figure B-209



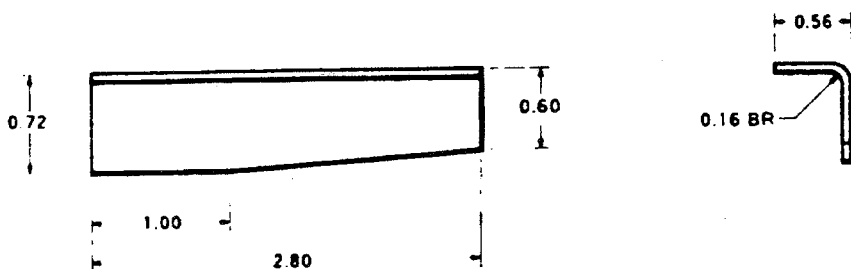
Part Number: 209-030-827-97S STIFFENER  
 Fabricate from: FSN 9535-084-4533  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.025 x 2.3 x 3.6

Figure B-210



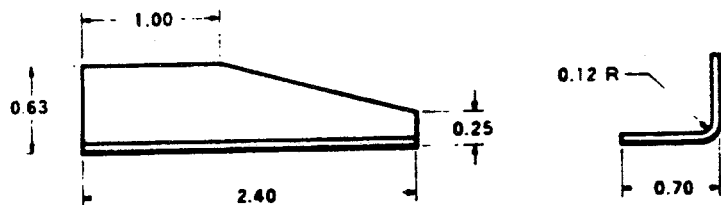
Part Number: 209-030-833-17S CLIP, shown  
 209-030-833-18S CLIP, opposite  
 Fabricate from: FSN 9535-084-4551  
 Material: Al Aly QQ-A-250/5 T3 0.040 x 1.6 x 3.3

Figure B-211



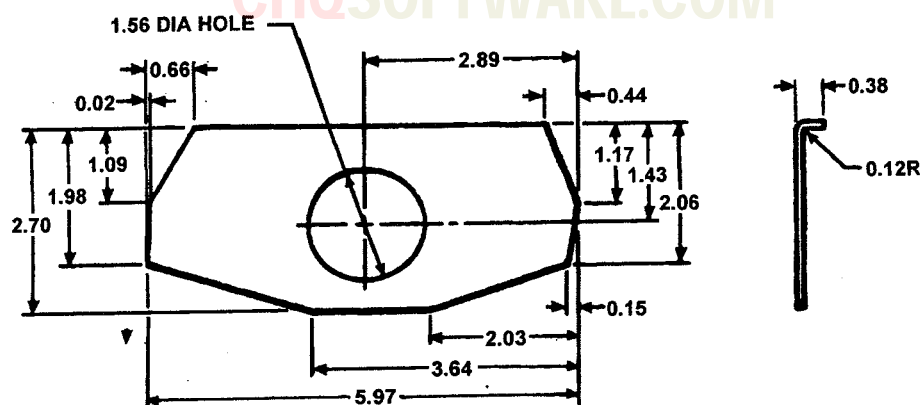
Part Number: 209-030-833-19S CLIP, shown  
 209-030-833-20S CLIP, opposite  
 Fabricate from: FSN 9535-084-4551  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.040 x 1.6 x 3.3

Figure B-212



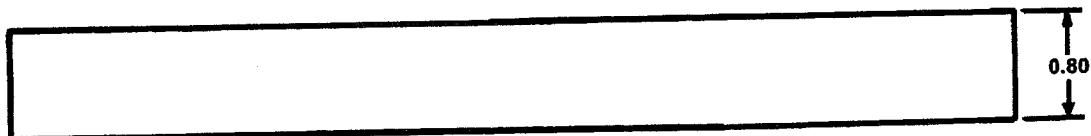
Part Number: 209-030-835-17S CLIP, shown  
 209-030-835-18S CLIP, opposite  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.025 x 1.6 x 2.6

Figure B-213



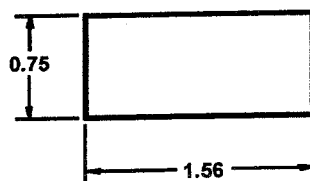
Part Number: 209-030-838-13S DOUBLER  
 Fabricate from: FSN 9535-084-4395  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.032 x 4.2 x 6.5

FIGURE B-214



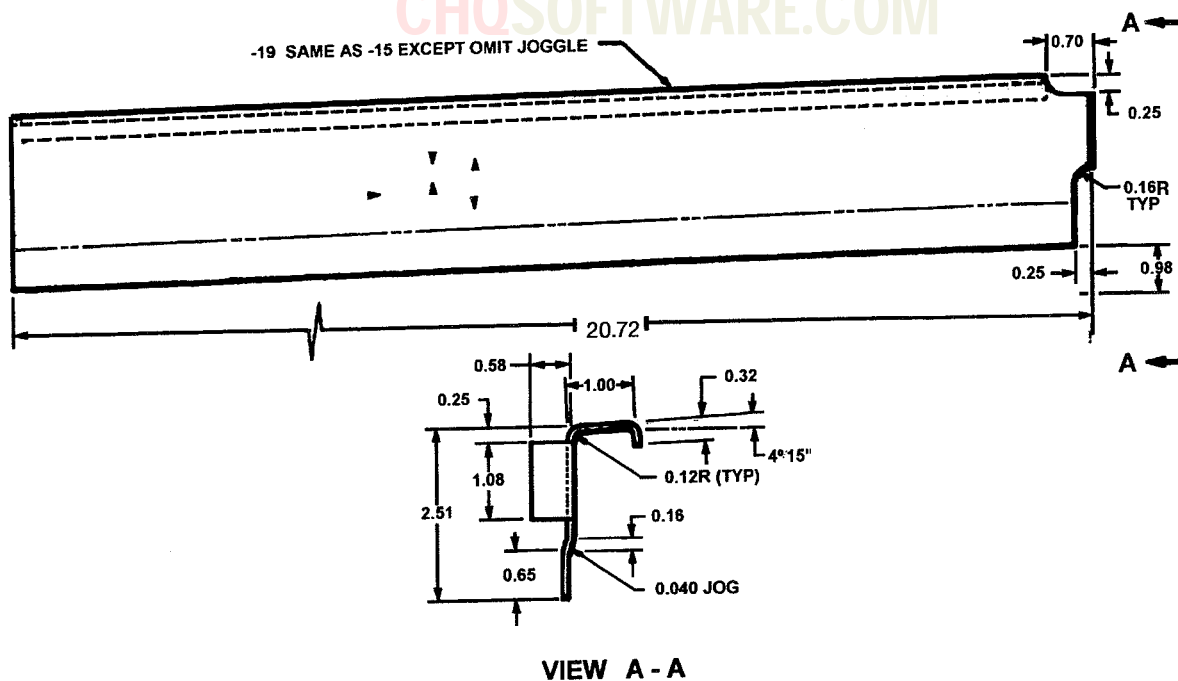
Part Number: 209-030-838-19 STRIP  
 Fabricate from: FSN 8135-923-0591  
 Material: Teflon Tape No. 549 (item 105, table 2-2)  
 (0.0035 Thick)

FIGURE B-215



Part Number: 209-030-838-21 FILLER  
 Fabricate from: FSN 9535-084-4484  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.020 x 0.90 x 1.7

FIGURE B-216

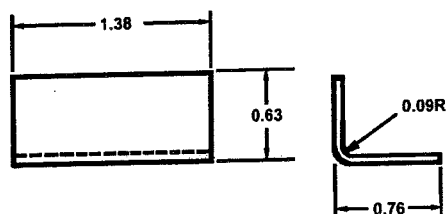


Part Number: 209-030-845-15S SUPPORT, shown  
 209-030-845-16S SUPPORT, opposite  
 209-030-845-19S SUPPORT, shown  
 209-030-845-20S SUPPORT, opposite

Fabricate from: FSN 9535-084-4484

Material: Al Aly Sheet QQ-A-250/5 T3 0.020 x 4.3 x 22.0

FIGURE B-217



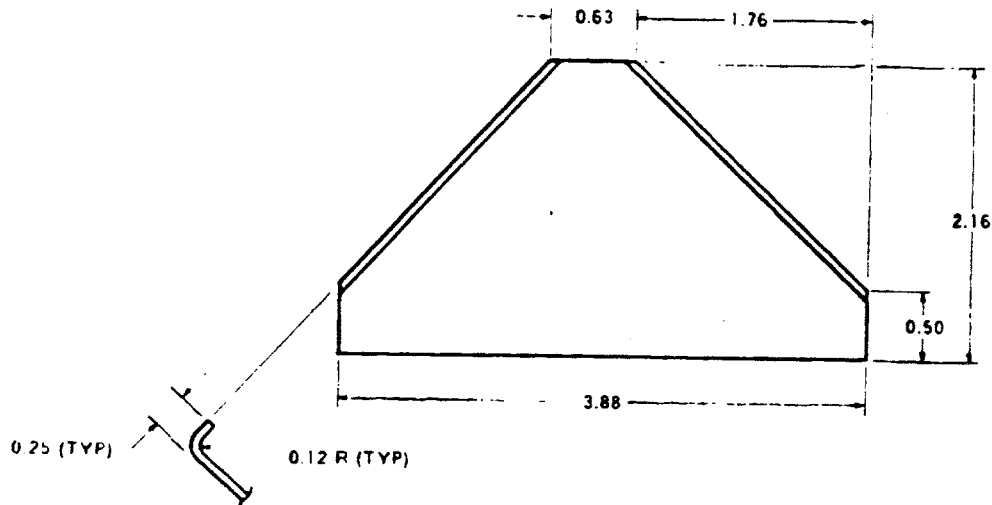
Part Number: 209-030-845-17S CLIP

Fabricate from: FSN 9535-084-4484

Material: Al Aly Sheet QQ-A-250/5 T3 0.020 x 1.9 x 1.9

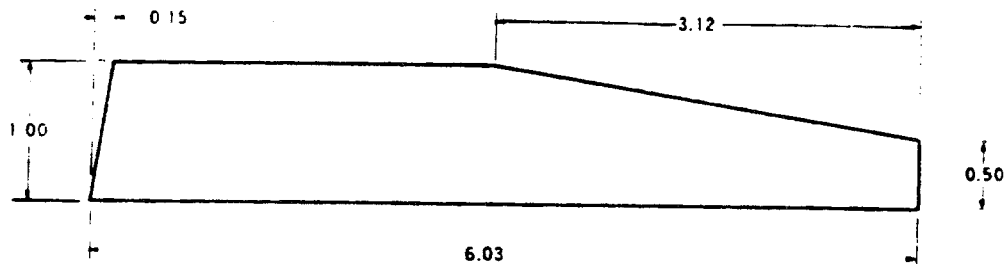
FIGURE B-218

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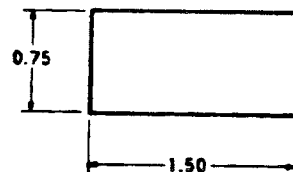
Part Number: 209-030-845-23S GUSSET, shown  
 209-030-845-24S GUSSET, opposite  
 Fabricate from: FSN 9535-084-4484  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.020 x 2.7 x 4.4

Figure B-219



Part Number: 209-030-847-9S STRAP, Fin Trailing Edge  
 Fabricate from: FSN 9535-084-4581  
 Material: Al Aly Sheet QQ-A-250/13 T6 0.040 x 1.5 x 6.4

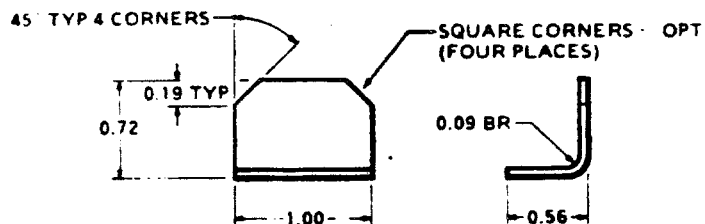
Figure B-220



Part Number: 209-030-851-17S STRIP  
 Fabricate from: FSN 9330-531-3567  
 Material: Plastic Sheet Nylatron G-5 0.063 x 1.25 x 2.00

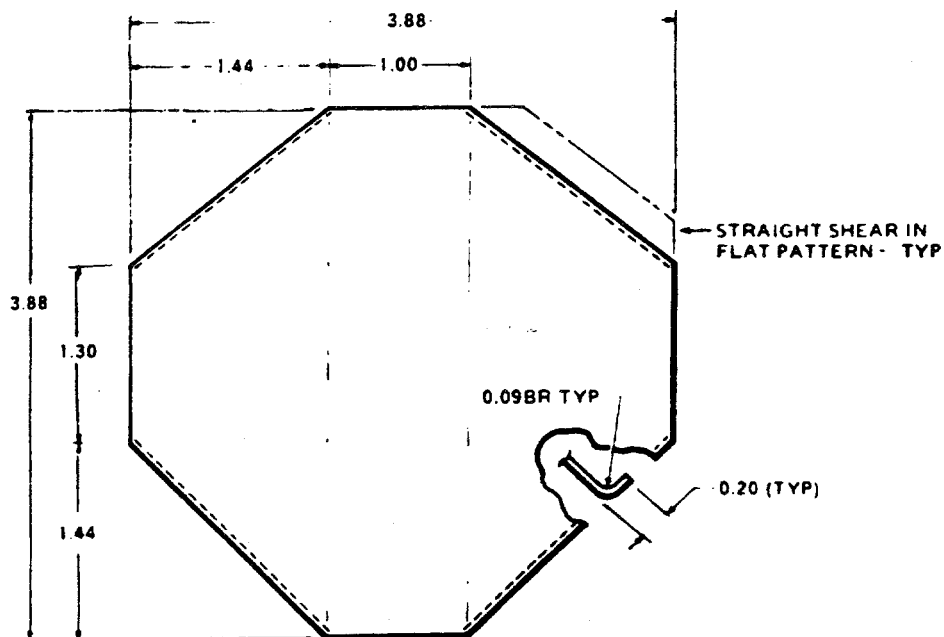
Figure B-221

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Part Number: 209-030-853-17S CLIP  
 Fabricate from: FSN 9535-084-4533  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.025 x 1.5 x 1.8

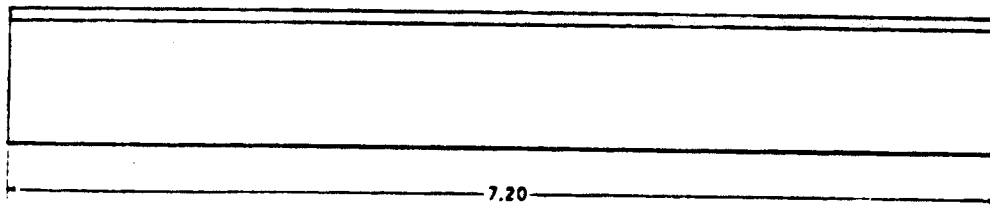
Figure B-222



Part Number: 209-030-854-3 GUSSET  
 Fabricate from: FSN 9535-084-4450  
 Material: Al Aly Sheet QQ-A-250/5 T3 0.016 x 4.3 x 4.3

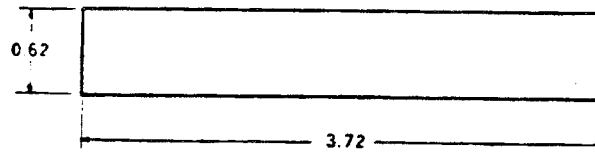
Figure B-223

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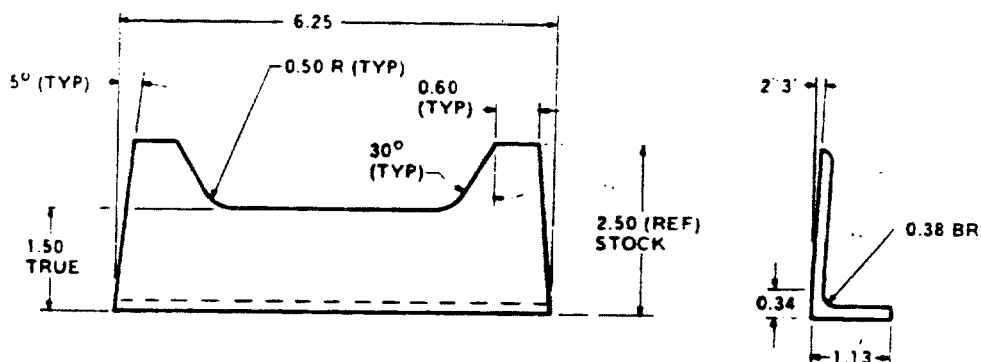
Part Number: 209-030-858-5S STIFFENER, 42° Gear Box  
 Fabricate from: FSN 9540-148-4311  
 Material: Al Aly Extrusion QQ-A-200/3 T4 7.7 AND 10134-1003

Figure B-224



Part Number: 209-030-858-15S SHIM  
 Fabricate from: FSN 9535-400-3622  
 Material: Al Sheet Laminations AMS 4013 0.063 x 1.0 x 4.2

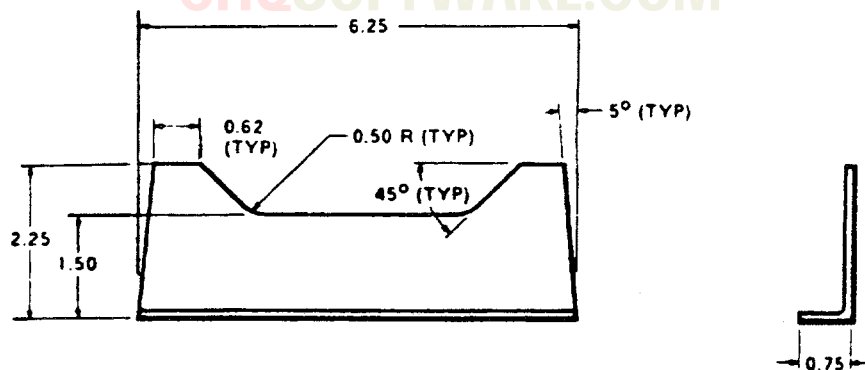
Figure B-225



Part Number: 209-030-874-17S STIFFENER, Fin Spar  
 Fabricate from: FSN 9535-148-4313  
 Material: Al Aly Extrusion QQ-A-200/11 T6 6.8  
 Bell Standard AND 10134-2401

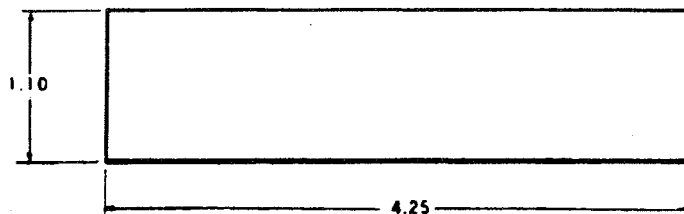
Figure B-226

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Part Number: 209-030-874-19S STIFFENER, Fin Spar  
Material: Al Aly Extrusion QQ-A-200/11 T6 6.8  
Bell Standard 40-011-9

Figure B-227



Part Number: 209-030-874-33S SPACER, Fin Spar  
Fabricate from: FSN 9535-086-9465  
Material: Al Aly Sheet QQ-A-250/13 T6 0.050 x 1.6 x 4.6

Figure B-228

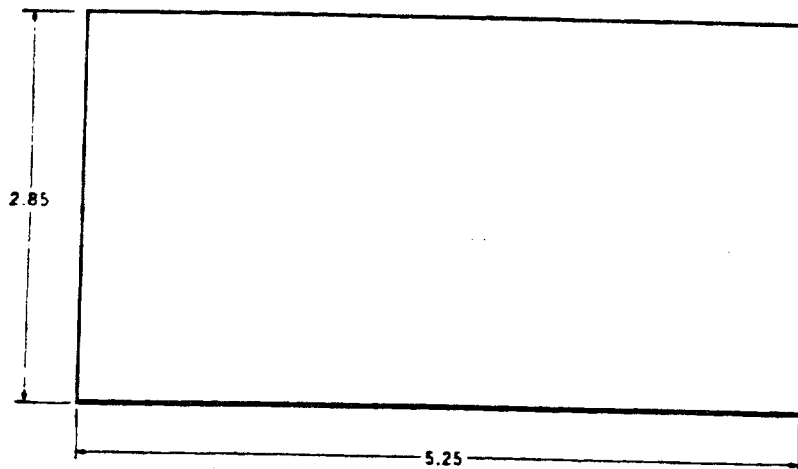


Part Number: 209-030-874-35S BRACKET, Fin Spar  
Fabricate from: FSN 9540-145-4515  
Material: Al Aly Extrusion QQ-A-200/3 T4 6.8  
Bell Standard AND 10134-1204

Figure B-229

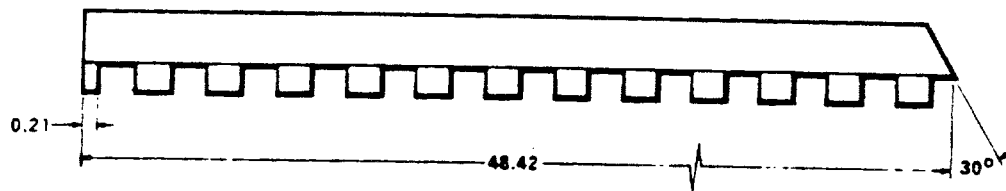


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Part Number: 209-030-874-37S SPACER, Fin Spar  
 Fabricate from: FSN 9535-085-4279  
 Material: Al Aly Sheet QQ-A-250/13 T6 0.063 x 3.3 x 5.6

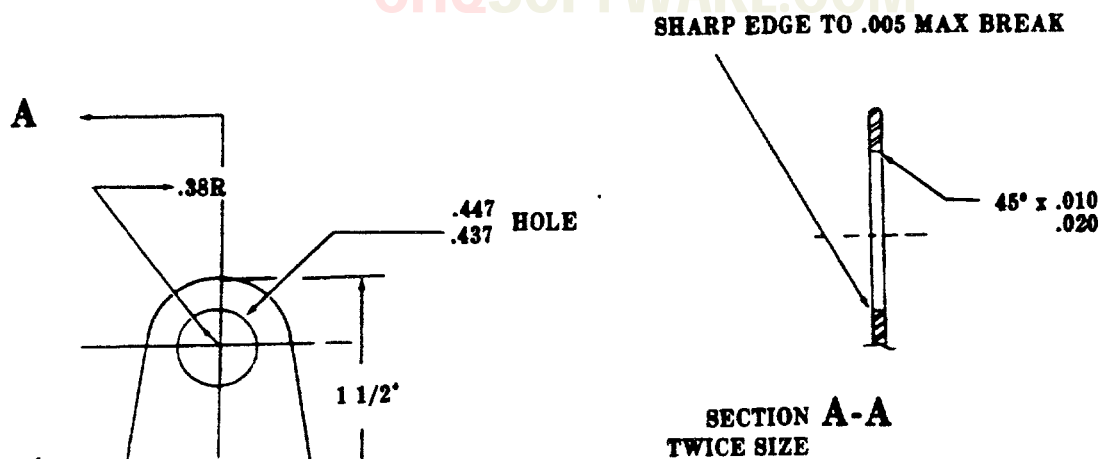
Figure B-230



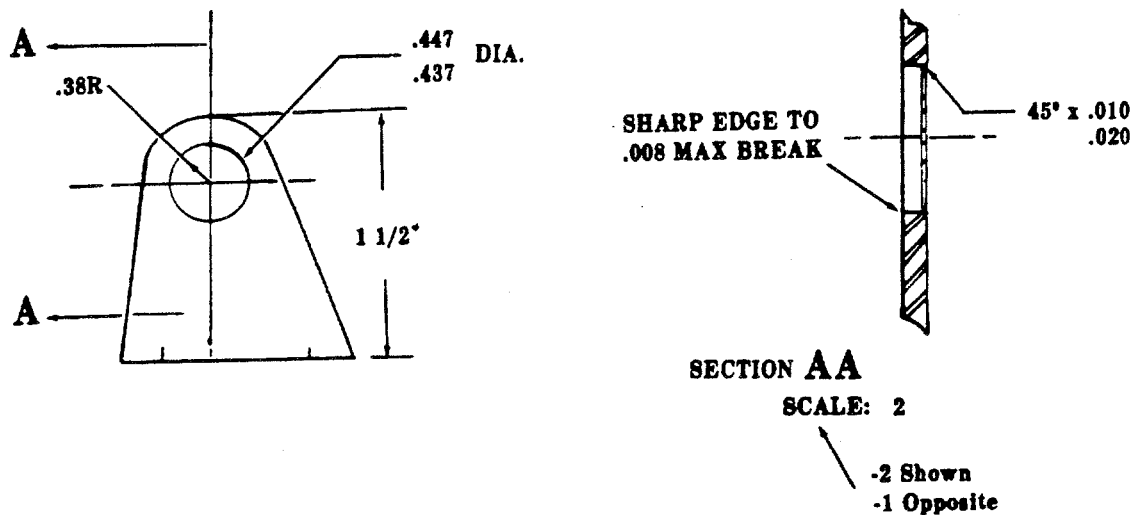
Part Number: 209-030-874-41S HINGE, Fin Spar  
 Fabricate from: FSN 5340-616-4803  
 MS20257HC-5 Length 50.0

Figure B-231

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AGEN - ST0018 -3  
FIG B-232



A-GEN -ST0018 -1 or -2  
FIG B-233

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## APPENDIX C

### GLOSSARY

#### NOTE

Abbreviations and symbols used in this DMWR are listed at the end of this glossary.

#### A

**ALLOWANCE** - A prescribed difference between the maximum condition of mating parts. The minimum clearance or maximum interference between such parts.

**ASSEMBLY** - A group of two or more physically connected and related parts, which is capable of disassembly, and when combined with other assemblies and parts, creates a component.

**ASSEMBLY CLEARANCE** - The actual fit between two or more mating parts is the relation existing between them with respect to the amount of clearance or interference which is present.

**ASSOCIATED PARTS** - A group of parts which could contain one or more unrelated parts of a subassembly, one or more subassemblies, and attaching hardware.

#### B

**BRINELLING** - Surface depressions produced by a severe blow, extremely heavy pressure, or rollers skidding or sliding instead of rolling.

#### C

**CHECK** - An examination for verifying.

**COMPONENT** - A group of physically connected assemblies and parts which is capable of independent operation but may be externally controlled, or derives its power from another source and, when combined with other components, assemblies, and/or parts, forms a functional group or end item.

**CONSUMABLE ITEMS** - Parts or materials which are consumed by usage or have a one-time usage normally losing identity upon application with, and/or assemblies into the equipment.

**CONTRACTING OFFICER - (CO)** is used herein to indicate the Department of the Army responsible for overall Administration of the Contract.

**CRITERIA** - Standards, rules - used to judge.

#### D

**DATA** - A group of facts.

**DISASSEMBLY** - As used herein, describes the operations necessary to reduce an assembly to its separate components and parts.

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**E**

**ELECTROLYTIC CORROSION** - There are two major causes for this type corrosion: contact between dissimilar metals and condensation. When dissimilar metals come in contact with each other with moisture present, an electrical current flows between the metals producing chemical by-products that dissolve one of the metals. Corrosion caused by condensation is a result of exhaust gasses, battery acid, etc., contacting the metal.

**F**

**FEDERAL STOCK NUMBER (FSN)** - The Federal Stock Number for end item of supply consists of the applicable four-digit Federal Supply Classification (FSC) Code Number, plus the applicable seven-digit Federal Item Identification Number (FIIN). The FSC code number relates the item to other like items of Supply; the FIIN merely identifies the item as a unit. The FSN is incomplete unless both of these numbers are included.

**G**

**GAP** - Clearance between faying surfaces, measurement of which is used to determine thickness of shims.

**H**

**HYGROSCOPIC MATERIAL CORROSION** - This form of corrosion is caused by such materials as sponge rubber, felt, cork, etc., absorbing water and holding it in contact with the part.

**I**

**INSPECT** - View or examine critically either visually or using prescribed method contained in this DMWR.

**M**

**MODIFICATION** - An alteration and/or integral change affecting the configuration of the equipment or its respective parts, components, subassemblies, and assemblies.

**O**

**OPERATION** - Method of functioning.

**OVERHAUL** - To restore an item to a completely serviceable condition as prescribed by serviceability standards developed and prescribed by USAAVSCOM.

**P**

**PITTING** - Small holes or indentations, generally caused by rust, corrosion, high compressive stresses or metal-to-metal pounding.

**PRACTICE** - Repeated or customary action.

**PROCEDURE** - A particular course of action.

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**PROCESS** - A series of actions conducive to an end.

## Q

**QUALITY AUDIT** - A teardown inspection and evaluation of an overhauled or modified item for the purpose of Government verification that all work directed in the DMWR has been properly accomplished and to establish the continued effectiveness of the contractor's quality control system including workmanship, materials used, and repair procedures. The quality audit shall include correction of any deficiencies, reassembly, test and calibration to assure serviceable end items in accordance with the requirements of this DMWR.

## R

**REASSEMBLY** - The assembling and aligning of all subassemblies and parts into a complete assembly to effect a serviceable item of equipment.

**RECONDITION** - As used herein, means to disassemble, cleaning, treating, lubrication, repair, and/or replacement of defective parts or components, and reassembly in accordance with the instructions contained in this DMWR.

**REHABILITATION** - The repair, modification, or reconditioning necessary to return the equipment to a serviceable condition equivalent to new.

**REMOVE** - To move by lifting, pulling, or pushing.

**RENOVATE** - To renew.

**REPAIR** - To restore a defective part, component, subassembly, or assembly to a serviceable condition in accordance with the instructions contained in this DMWR.

**REPLACE** - To supply an equivalent for.

**REWORK** - To work over again.

## S

**SCRATCHING** - Narrow shallow lines resulting from movement of foreign particles across a surface.

**SERVICING** - The lubrication, treating, cleaning, or preservation necessary to maintain the equipment and other respective parts in serviceable condition.

**STRESS CORROSION** - It is a result of sustained tension stress caused by (1) residual stress from heat treating or forming; (2) internal stress introduced by misfits during assembly; (3) applied stress from clamps or fittings.

**SUPERFICIAL CORROSION** - This type is the least serious on alclad parts. After deposits are removed, an etching will be noticed which results in the clad surface having a series of hills and valleys. Corrosion of this type on non-clad alloy parts is serious.

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**TEST** - As used herein, is the testing of equipment using shop test equipment to determine that the unit functions properly within the limits set forth in this DMWR.

**TOLERANCE** - The difference between two limiting sizes as a means of specifying the degree of accuracy.


#### ABBREVIATIONS

AMSAV-F	Directorate for Maintenance
DA	Department of the Army
DMWR	Depot Maintenance Work Requirement
EO	Engineering Order
MWO	Modification Work Order
RHR	Roughness Height Rating
SIE	Standard Inspection Equipment
TB	Technical Bulletin
TIR	Total Indicated Reading
USAAVSCOM	US Army Aviation Systems Command

FOR THE COMMANDER:

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Colonel, GS  
Chief of Staff

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To: 2028@redstone.army.mil

Subject: DA Form 2028

1. **From:** Joe Smith
2. **Unit:** home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub no:** 55-2840-229-23
9. **Pub Title:** TM
10. **Publication Date:** 04-JUL-85
11. **Change Number:** 7
12. **Submitter Rank:** MSG
13. **Submitter FName:** Joe
14. **Submitter MName:** T
15. **Submitter LName:** Smith
16. **Submitter Phone:** 123-123-1234
17. **Problem:** 1
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure:** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text:**  
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CO A 3rd Engineer Bn  
Ft. Leonardwood, MO 63108

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22 August 1992

PUBLICATION NUMBER

TM 1-1520-250-10

PUBLICATION DATE

15 June 1992

PUBLICATION TITLE

Operator's manual MH60K Helicopter

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GRAPH

FIGURE  
NO

TABLE  
NO

6

2-1  
a

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

B1

4-3

Callout 16 on figure 4-3 is pointed at a bolt. In key to figure 4-3, item 16 is called a shim. Please correct one or the other

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JOHN DOE, PFC (268) 317-7111

SIGN HERE

JOHN DOE

*John Doe*

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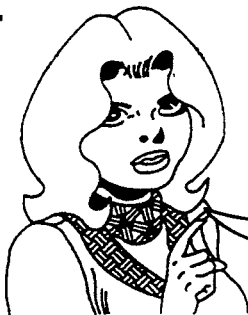
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ATTN: AMSAM-MMC-MA-NP  
REDSTONE ARSENAL, AL 35898-5230

TEAR ALONG PERFORATED LINE

## The Metric System and Equivalents

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### *Linear Measure*

1 centimeter = 10 millimeters = .39 inch  
 1 decimeter = 10 centimeters = 3.94 inches  
 1 meter = 10 decimeters = 39.37 inches  
 1 dekameter = 10 meters = 32.8 feet  
 1 hectometer = 10 dekameters = 328.08 feet  
 1 kilometer = 10 hectometers = 3,280.8 feet

### *Liquid Measure*

1 centiliter = 10 milliliters = .34 fl. ounce  
 1 deciliter = 10 centiliters = 3.38 fl. ounces  
 1 liter = 10 deciliters = 33.81 fl. ounces  
 1 dekaliter = 10 liters = 2.64 gallons  
 1 hectoliter = 10 dekaliters = 27.42 gallons  
 1 kiloliter = 10 hectoliters = 264.18 gallons

### *Weights*

1 centigram = 10 milligrams = .15 grain  
 1 decigram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 dekagram = 10 grams = .35 ounce  
 1 hectogram = 10 dekagrams = 3.52 ounces  
 1 kilogram = 10 hectograms = 2.2 pounds  
 1 quintal = 100 kilograms = 220.46 pounds  
 1 metric ton = 10 quintals = 1.1 short tons

### *Square Measure*

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 125.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. dekameters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

### *Cubic Measure*

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch  
 1 cu. decimeter = 1000 cu. decimeters = 61.02 cu. inches  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

## Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

## Temperature (Exact)

°F Fahrenheit Temperature

5/9 (after subtracting 32)

Celsius Temperature

°C

