

## CHAPTER 53 — FUSELAGE

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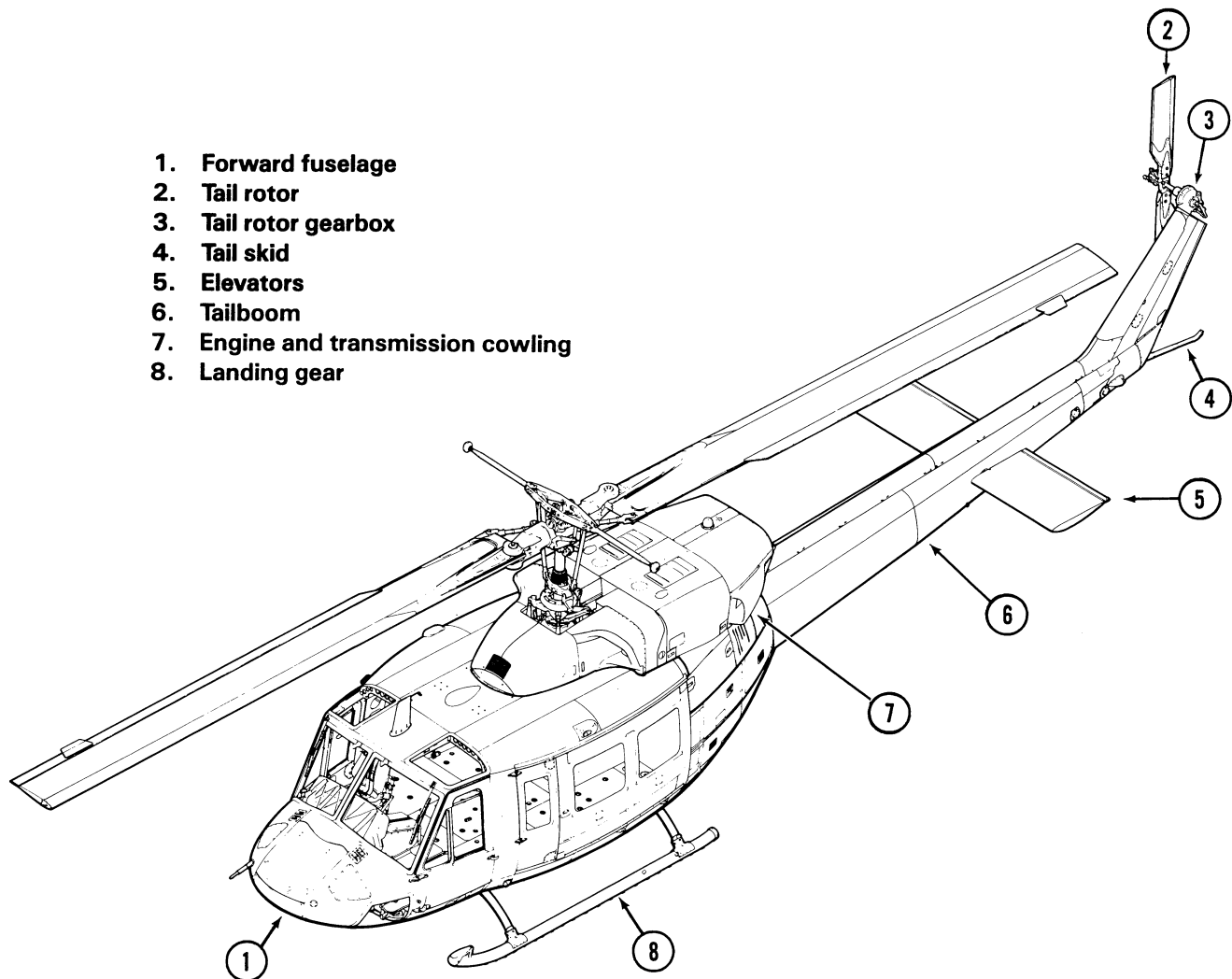
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## FUSELAGE

### 53-1. FUSELAGE

The fuselage consists of the forward fuselage and tailboom. The forward fuselage (1, [Figure 53-1](#)) is of combined semi-monocoque and reinforced shell construction. The tailboom (6) is of semi-monocoque construction.



212-M-53-1

Figure 53-1. Fuselage and Major Components

## FORWARD FUSELAGE

### 53-2. FORWARD FUSELAGE

The forward fuselage ([Figure 53-2](#)) is built up on two main longitudinal beams and is of combined semi-monocoque and reinforced shell construction with transverse bulkheads and metal covering. The longitudinal beams act as primary supporting structure for the cabin section, landing gear, fuel cells, engine, transmission, tailboom, and useful load. Work and engine decks, some main beams panels, as well as cabin floor and cabin roof panels are of aluminum alloy honeycomb construction. Avionics equipment is contained in the nose compartment. Lower and upper hinged nose compartment doors provide access to the electrical compartment. Crew doors, passenger/cargo doors, and hinged panel doors on both sides of the helicopter permit entrance and exit. Acrylic windows in lower nose compartment, roof, and doors permit a wide range of visibility. Transmission and engine cowling may be opened or removed for access to those areas. The cargo/passenger area is equipped with cargo tie-down rings and studs.

Repair of structural components on the forward fuselage is provided in [BHT-MED-SRM-1](#). Other structural inspection and repair procedures are included in FAA Publication 43.13-1B, Aircraft Inspection and Repair. Repair of components and assemblies installed on the fuselage is contained within appropriate chapters of this manual and companion publications.

### 53-3. CREW SEAT TRACKS

#### 53-4. Crew Seat Tracks — Removal

1. Remove the applicable crew seat ([Chapter 25](#)).
2. Remove right-hand track assemblies (3, [Figure 53-3](#)) as follows:
  - a. Remove the screws (1), washers (2), and the right-hand track assembly (3).
3. Remove left-hand track assemblies (6) as follows:

- a. Remove the two screws (4) and spacers (5).

- b. Remove the screws (1), washers (2), and the left-hand track assembly (6).

#### 53-5. Crew Seat Tracks — Inspection

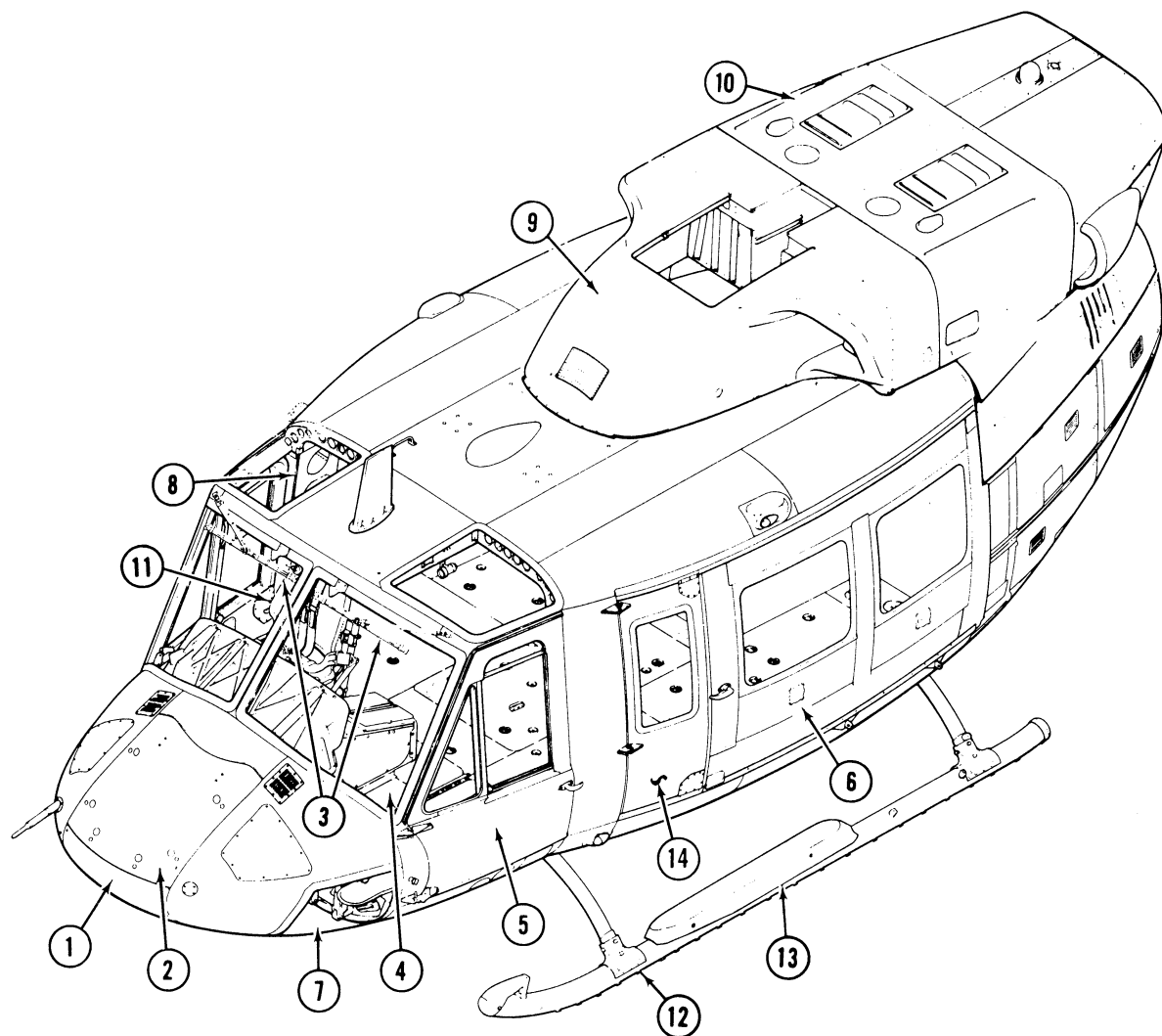
##### NOTE

It is not necessary to remove a track assembly (3 or 6, [Figure 53-3](#)) to inspect it for wear; however, the seat assembly must be removed.

1. Hold a straightedge against the crown of the central rail of the right-hand or left-hand track assembly (3 or 6) as shown. The straightedge must be at least as long as the track assembly.
2. Look for gaps between the bottom of the straightedge and the rail, particularly near the adjustment holes at the forward end.
3. If you find a gap that is more than 0.050 inch (1.27 mm), remove and replace the right-hand or left-hand track assembly (3 or 6) with a serviceable part ([paragraph 53-4](#) and [paragraph 53-6](#)).
4. Visually examine the exposed areas of the right-hand or left-hand track assembly (3 or 6) for cracks, mechanical damage, and corrosion damage. Replace as required.
5. Visually examine the exposed areas of the attaching hardware for wear, mechanical damage, and corrosion damage. Replace as required.

#### 53-6. Crew Seat Tracks — Installation

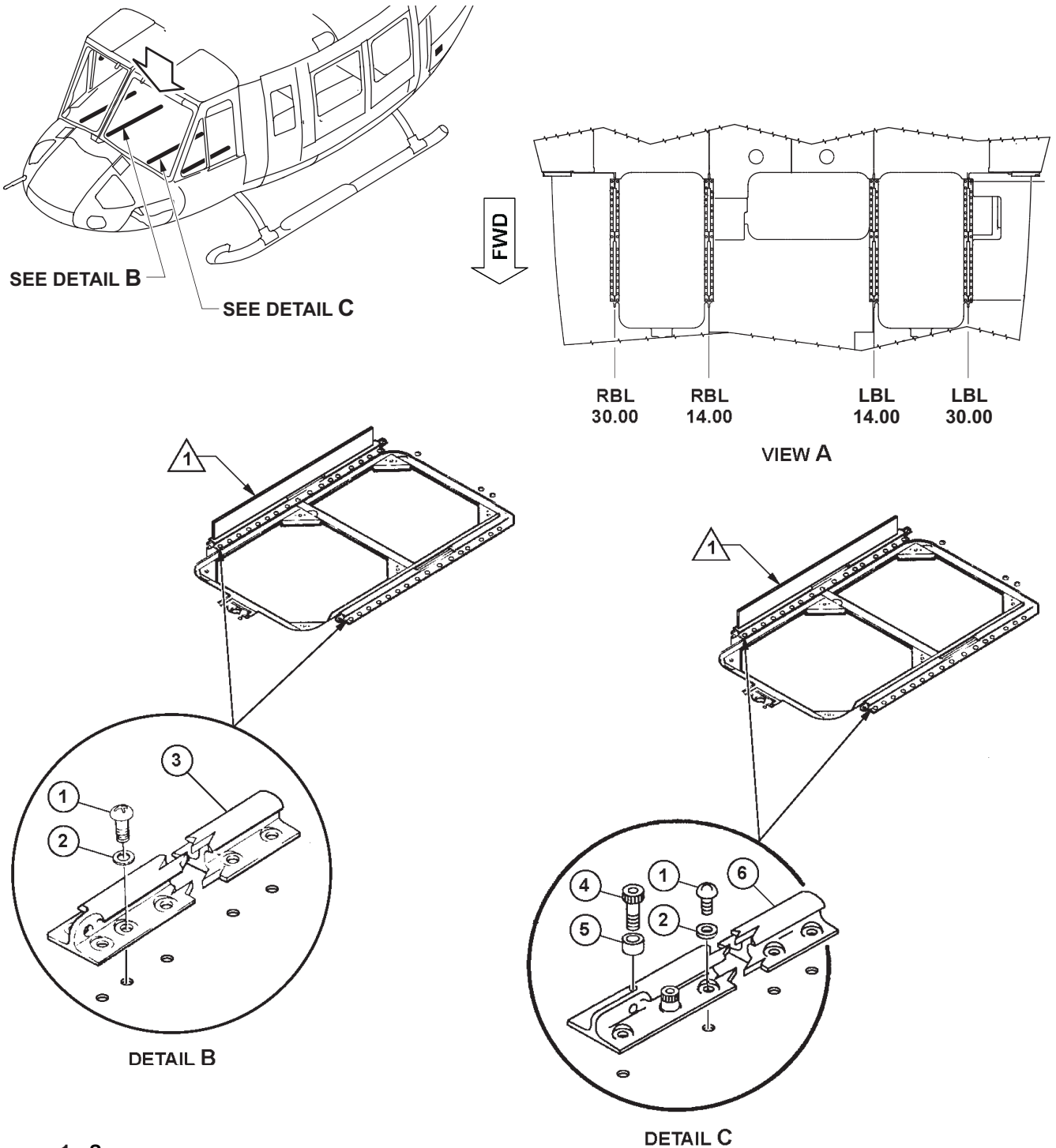
1. Install right-hand track assemblies (3, [Figure 53-3](#)) as follows:
  - a. Make sure the mating surfaces are clean.
  - b. Install the right-hand track assembly (3) with the screws (1) and the washers (2).



- |                             |                         |
|-----------------------------|-------------------------|
| 1. Lower hinged nose door   | 8. Roof windows         |
| 2. Upper hinged nose door   | 9. Transmission cowling |
| 3. Windshield wipers        | 10. Engine cowling      |
| 4. Windshields              | 11. Crew seat           |
| 5. Crew doors               | 12. Landing gear        |
| 6. Passenger — cargo doors  | 13. Passenger step      |
| 7. Nose compartment windows | 14. Hinged panel door   |

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Figure 53-2. Forward Fuselage



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Figure 53-3. Crew Seat Track Assemblies — Removal and Installation

**WARNING**

MAKE SURE YOU INSTALL THE SPACERS (5) ON THE LEFT-HAND TRACK ASSEMBLY (6) AS SHOWN. IF THE SPACERS ARE OMITTED, THE SEAT CAN INTERFERE WITH COLLECTIVE STICK TRAVEL.

2. Install left-hand track assemblies (6) as follows:
  - a. Make sure the mating surfaces are clean.
  - b. Install the left-hand track assembly (6) with the two screws (4) and spacers (5) in the second hole position from the front of the track.
  - c. Install the screws (1) and the washers (2) in the remaining holes.
3. Install the applicable crew seat ([Chapter 25](#)).

**53-7. TENSION ROD ASSEMBLY****53-8. Tension Rod Assembly — Removal**

1. Remove the nut (1, [Figure 53-4](#)), bolt (3), and washers (2) from the aft end of the tension rod assembly (4).
2. Remove the nut (1), bolt (3), washers (2), and tension rod assembly (4) from the bulkhead attachment point.

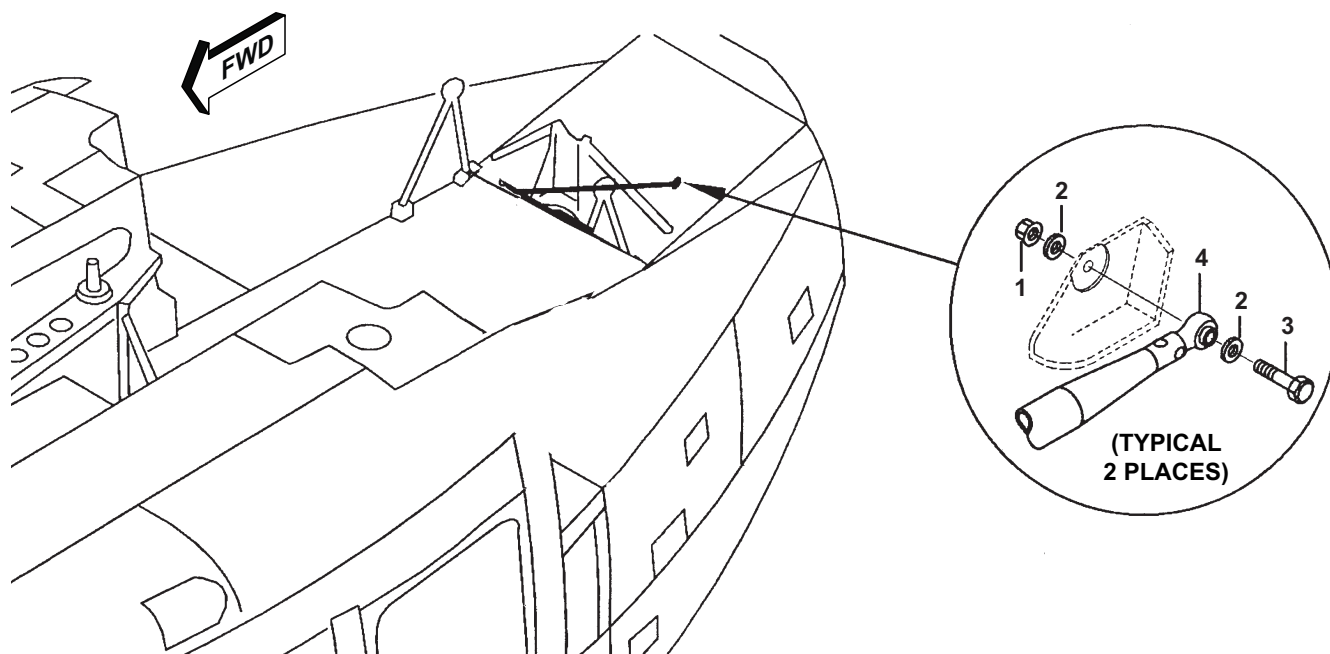
**53-9. Tension Rod Assembly — Inspection**

1. Examine the tension rod assembly (4, [Figure 53-4](#)) for cracks, wear, mechanical damage, and corrosion damage ([Figure 53-5](#)). Repair or replace as applicable.

**53-10. Tension Rod Assembly — Installation**

1. Install the tension rod assembly (4, [Figure 53-4](#)) on the bulkhead attachment point with the bolt (3), washers (2), and nut (1). Tighten the nut.
2. Install the aft end of the tension rod assembly (4) with the bolt (3), washers (2), and nut (1). Tighten the nut.



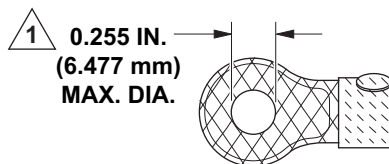
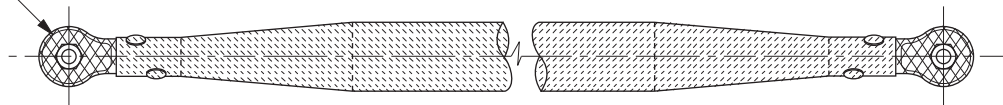


1. Nut
2. Washer
3. Bolt
4. Tension rod assembly

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**Figure 53-4. Tension Rod Assembly — Removal and Installation**

SEE DETAIL A


**DETAIL A**  
**TYPICAL 2 PLACES**

TENSION ROD (212-030-170)

**DAMAGE AREA REPAIR SYMBOLS****TYPE OF DAMAGE****MAXIMUM DEPTH AND REPAIR AREAS ALLOWED****SCRATCHES AND NICKS**
 0.010 In. (0.254 mm)  
 after cleanup
**SCRATCHES**
 0.005 In. (0.127 mm)  
 after cleanup
**2****DENTS**
 Depth: 0.005 In. (0.127 mm)  
 Length: 1.00 In. (25.40 mm)  
 maximum
**2****CORROSION**
 0.005 In. (0.127 mm)  
 to  
 0.010 In. (0.254 mm)  
 after cleanup

 0.0025 In. (0.0635 mm) before  
 and  
 0.005 In. (0.127 mm)  
 after cleanup
**3****NOTES**

- 1** Bushings 20-006J-8 or 20-006C-8 can be installed in the holes. Wet install with epoxy polyamide primer (C-204). Ream bushings from 0.249 to 0.251 inch (6.325 to 6.375 mm) after installation.
- 2** Cleanup in longitudinal direction only and must not be more than 25% of the circumference at each location.
- 3** Dent must be to a minimum of 3.00 inches (76.20 mm) apart and no dent is permitted in the neck area.

412\_MM\_53\_0002

**Figure 53-5. Tension Rod Assembly — Damage Limits**

## TAILBOOM

### 53-11. TAILBOOM

The tailboom ([Figure 53-6](#)) is of semi-monocoque construction. External components consist of formed aluminum alloy skins and driveshaft covers, a fiberglass fairing, aluminum honeycomb panels, and one aluminum alloy honeycomb cover. Internal components of the boom and synchronized elevator are of aluminum alloy. The tailboom supports the tail rotor driveshafts, gearboxes, and driveshaft hangers. The baggage compartment is located in the forward end with the door on the right side.

### 53-12. TAILBOOM — REMOVAL

#### SPECIAL TOOLS REQUIRED

NUMBER	NOMENCLATURE
T102012	Tailboom Support

1. Open combining gearbox side panels.
2. Remove clamps from No. 2 driveshaft and remove driveshaft section ([Chapter 63](#)).
3. Open access door on right aft side of forward fuselage. Disconnect electrical harnesses and antenna cables.
4. Disconnect tail rotor and synchronized elevator control tubes ([Figure 53-7](#) and [Chapter 63](#)).
5. Remove plug buttons (Carr fasteners) from four tailboom attaching points.
6. Place T102012 or equivalent tailboom support under tailboom ([Figure 53-8](#)) and remove bolts attaching tailboom to fuselage ([Figure 53-9](#)).

#### NOTE

If tailboom is to be hoisted, refer to [Chapter 7](#).

7. Remove tailboom.

### 53-13. TAILBOOM — INSPECTION

#### MATERIALS REQUIRED

Refer to [BHT-ALL-SPM](#) for specifications.

NUMBER	NOMENCLATURE
C-308	Sealant
C-309	MEK

1. Inspect doors, covers, and access panels for misalignment, damage, and security of mounting.
2. Inspect tailboom skin for dents, corrosion, scratches, or other damage.
3. Inspect structure (longerons, spar caps, bulkheads, and ribs) for cracks, distortion, corrosion, or loose rivets.
4. Inspect forward side of vertical fin spar caps and web from upper tailboom skin to approximately 4.0 inches (101.6 mm) below upper tailboom skin as follows:
  - a. Remove aft tailboom flight control inspection door ([Chapter 52](#)).

#### NOTE

If necessary, clean area to be inspected with cloth dampened with MEK ([C-309](#)).

- b. Face aft from inside of tailboom and use bright light and small mirror to inspect areas for cracks. Pay particular attention to areas near rivet holes, especially cold worked holes ([ASB 212-90-63](#)).

5. Inspect tailboom upper longerons as follows:

- a. Remove plug button at B.S. 99.00.

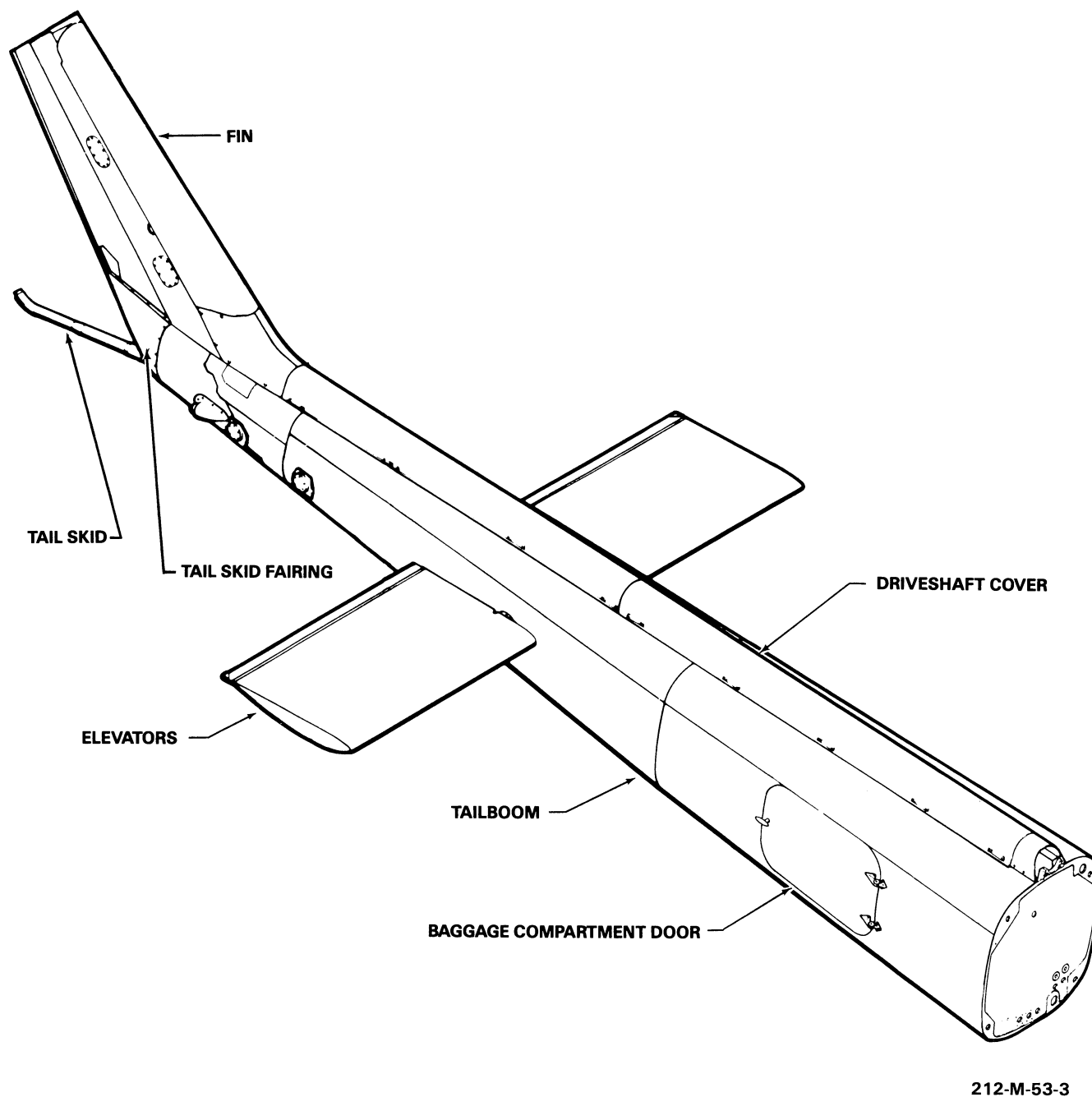


Figure 53-6. Tailboom

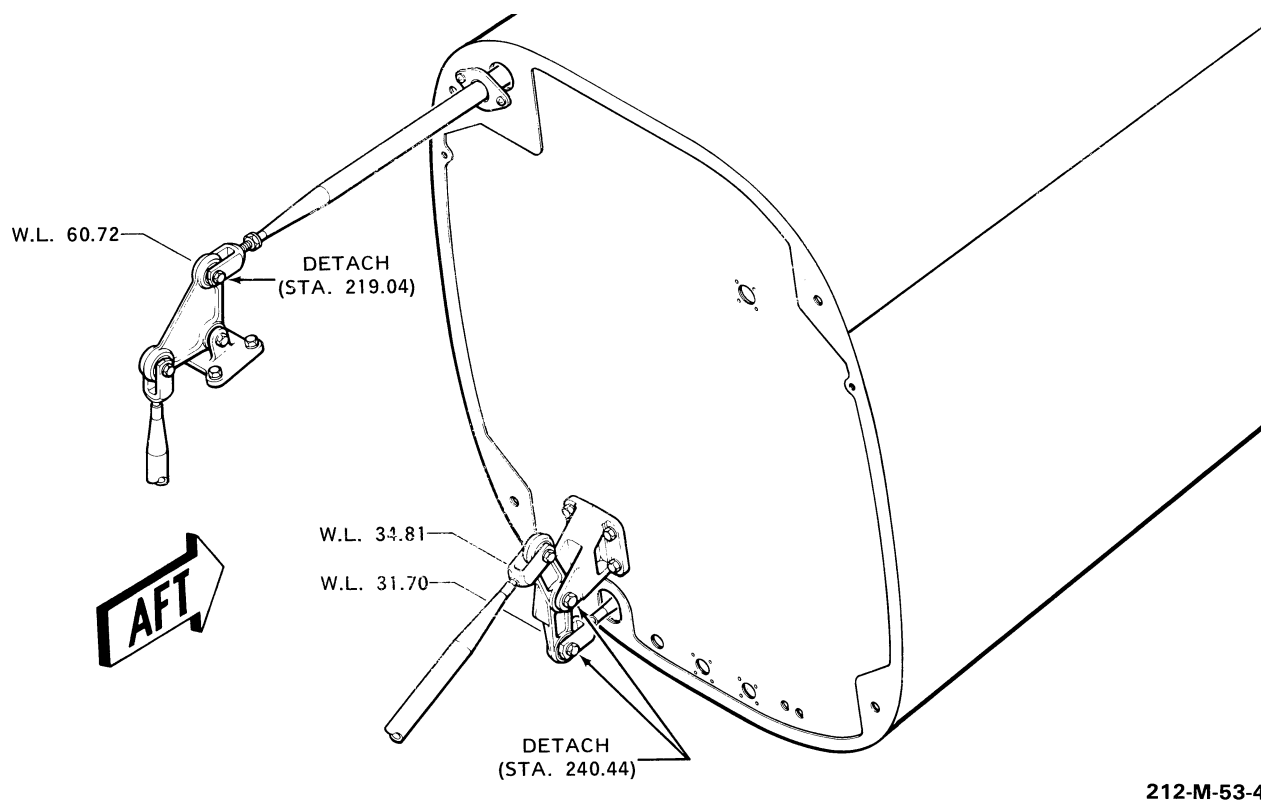
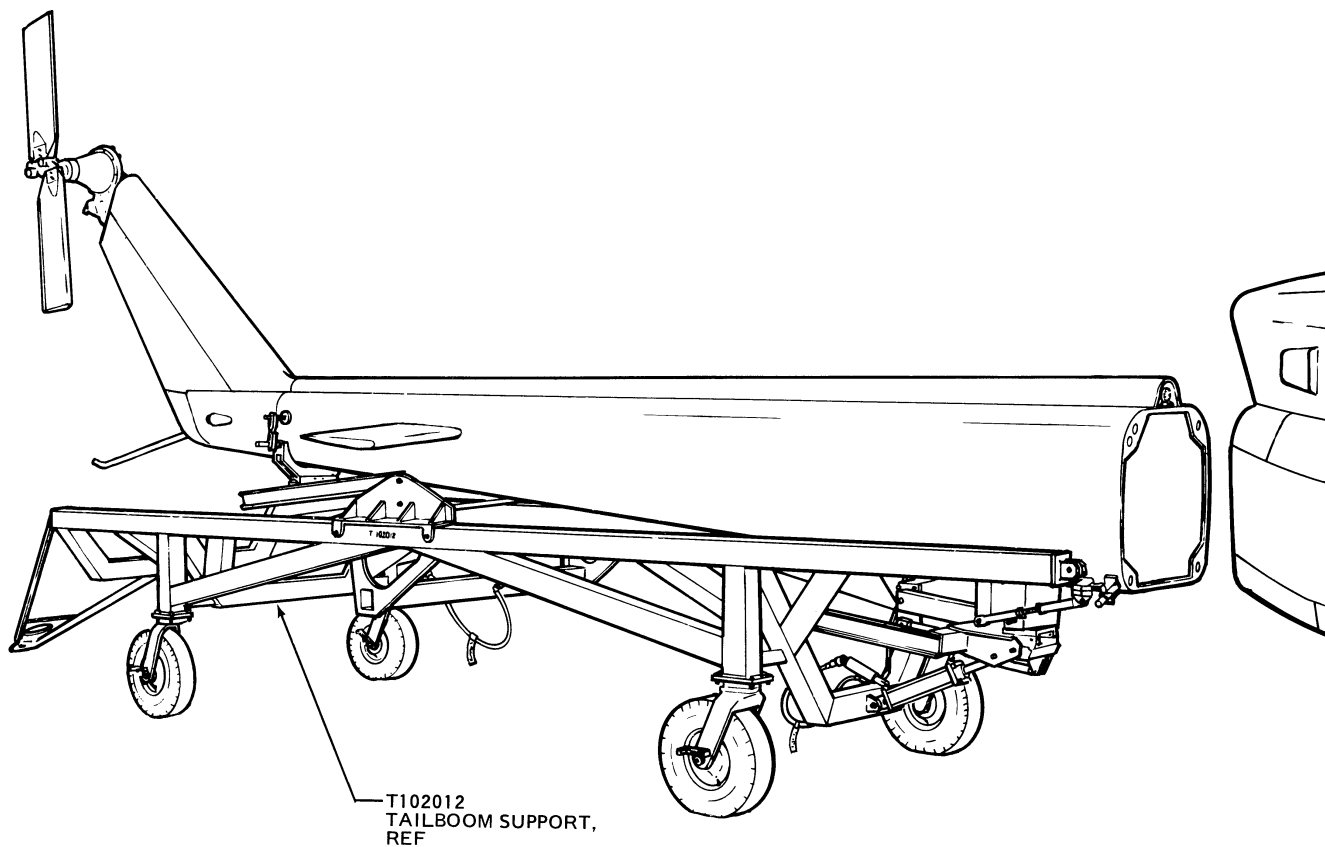


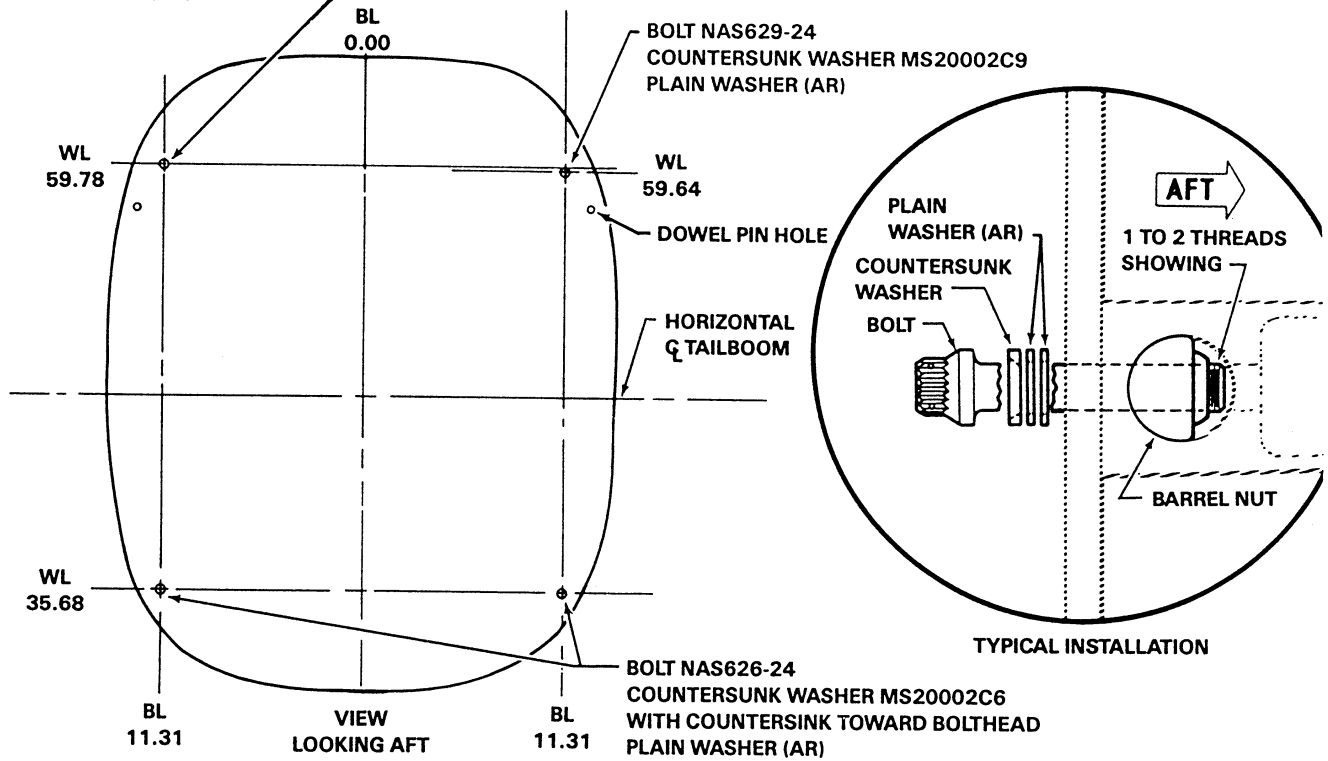
Figure 53-7. Control Disconnect Points for Tailboom Removal



212-M-53-5

Figure 53-8. Tailboom Support Assembly T102012

BOLT NAS628-26  
COUNTERSUNK WASHER MS20002C8  
WITH COUNTERSINK TOWARD BOLTHEAD  
PLAIN WASHER (AR)



212-M-53-6

Figure 53-9. Tailboom Attaching Bolts

**NOTE**

Paint fissures are common in the splice area. Cracks will be evident by black powder emanating from cracked area, and corrosion will leave evidence of white powder.

**b.** Using a borescope or suitable means, inspect inside of longeron paying particular attention to cracking and/or corrosion in area of splice.

**c.** Report any cracks to Product Support Engineering.

**d.** Install plug button with sealant (C-308).

**6.** Inspect tailboom bonded panels for dents, scratches, delaminations, and corrosion.

**7.** Inspect diameter of tailboom-to-fuselage attaching bolt holes in tailboom fittings for elongation. The allowable limits are as follows:

LOCATION	MINIMUM DIAMETER INCH (MM)	MAXIMUM DIAMETER INCH (MM)
Upper right	0.501 (12.72)	0.516 (13.11)
Upper left	0.563 (14.30)	0.578 (14.68)
Lower left	0.376 (9.55)	0.391 (9.93)
Lower right	0.376 (9.55)	0.391 (9.93)

**8.** Inspect corresponding four tailboom-to-fuselage attaching bolt holes in fuselage fittings for elongation. The allowable limits are as shown in [step 7](#).

**9.** Inspect tail rotor gearbox support fitting in accordance with [Figure 53-10](#).

**53-14. TAILBOOM — REPAIR****MATERIALS REQUIRED**

Refer to [BHT-ALL-SPM](#) for specifications.

NUMBER	NOMENCLATURE
<a href="#">C-222</a>	Catalyzed Epoxy Primer
<a href="#">C-233</a>	Polyurethane Enamel
<a href="#">C-309</a>	MEK

**1.** Replace damaged or unserviceable doors, covers, and access panels.

**2.** Touch up paint on mating surfaces of tail rotor driveshaft covers as follows:

**a.** Clean area with MEK ([C-309](#)). Allow to air dry.

**b.** Apply one coat of catalyzed epoxy primer ([C-222](#)). Allow to dry 1 hour. Apply one coat of polyurethane enamel ([C-233](#)).

**3.** Perform necessary structural repairs in accordance with the [BHT-MED-SRM-1](#).

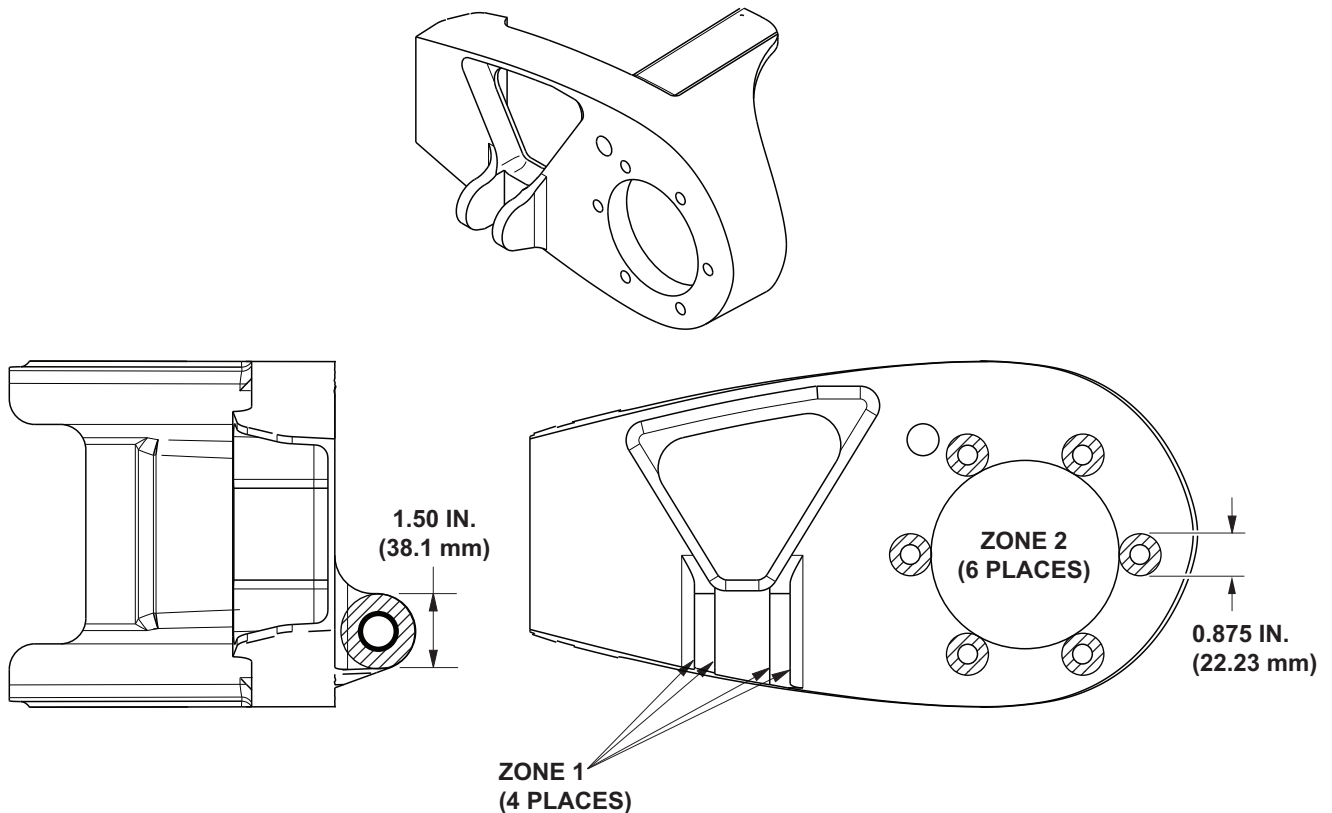
**4.** Replace damaged or unserviceable fasteners and hinges on tail rotor driveshaft covers.

**5.** Replace tailboom if attaching holes in tailboom fittings exceed maximum allowable diameter.

**NOTE**

If a new tailboom is installed, an alignment is recommended ([Chapter 65](#)).





**SUPPORT FITTING (212-030-103-001/-007)**  
**MATERIAL: ALUMINUM ALLOY**

NO.	CHARACTERISTIC	INSPECTION METHOD	LIMIT
1.	<b>ZONE 1</b> Corrosion on one lug face	Measure	For a corrosion depth of $\leq 0.020$ inch (0.51 mm), remove twice the depth of the corrosion. Do not remove more than 0.040 inch (1.02 mm) from the cross-hatched area.
2.	Corrosion of both lug faces	Measure	For a combined corrosion depth of $\leq 0.020$ inch (0.51 mm), remove twice the depth of the corrosion (the sum of the removed material on both sides of the cross-hatched area must not exceed 0.040 inch (1.02 mm)).
3.	Corrosion damage to outer edge of the lug	Measure	For a corrosion depth of $\leq 0.020$ inch (0.51 mm), remove twice the depth of the corrosion. Do not remove more than 0.040 inch (1.02 mm) from the outer edge of the lug.
4.	Corrosion damage to the lug hole (not the bushing hole)	Measure	For a corrosion depth of $\leq 0.010$ inch (0.25 mm), uniformly remove twice the depth of the corrosion around the periphery of the hole. Do not remove more than 0.020 inch (0.51 mm) from any part of the lug hole surface. Maintain original lug hole centerline. Rebush hole.

412\_MM\_53\_0003a

**Figure 53-10. Tail Rotor Gearbox Support Fitting — Damage and Corrosion Limits (Sheet 1 of 2)**

NO.	CHARACTERISTIC	INSPECTION METHOD	LIMIT
5.	Corrosion damage to the bushing hole	Measure	Not allowed. Replace bushing.
6.	Mechanical damage on one lug face	Measure	For a mechanical damage of $\leq 0.040$ inch (1.02 mm), remove the depth of the damage. Do not remove more than 0.040 inch (1.02 mm) from the cross-hatched area.
7.	Mechanical damage on both lug faces	Measure	For a combined mechanical damage of $\leq 0.040$ inch (1.02 mm), remove the depth of the damage (the sum of the removed material on both sides of the lug must not exceed 0.040 inch (1.02 mm)).
8.	Mechanical damage to outer edge of the lug	Measure	For a mechanical damage depth of $\leq 0.020$ inch (0.51 mm), remove the depth of the damage. Do not remove more than 0.020 inch (0.51 mm) from the edge of the lug.
9.	Mechanical damage to the lug hole (not the bushing hole)	Measure	For a damage depth of $\leq 0.020$ inch (0.51 mm), uniformly remove the depth of the damage around the periphery of the hole. Do not remove more than 0.020 inch (0.51 mm) from any part of the lug. Maintain original lug hole centerline. Rebush hole.
10.	Mechanical damage to the bushing hole		Not allowed. Replace bushing.
<b>ZONE 2</b>			
1.	Corrosion on one spot face	Measure	For a corrosion depth of $\leq 0.020$ inch (0.51 mm), remove twice the depth of the corrosion. Do not remove more than 0.040 inch (1.02 mm) from the cross-hatched area.
2.	Corrosion damage to the lug hole (not the bushing hole)	Measure	For a corrosion depth of $\leq 0.010$ inch (0.25 mm), uniformly remove twice the depth of the corrosion around the periphery of the hole. Do not remove more than 0.020 inch (0.51 mm) from any part of the lug hole. Maintain original lug hole centerline. Rebush hole.
3.	Corrosion damage to the bushing hole	Measure	Not allowed. Replace bushing.
4.	Mechanical damage on one spot face	Measure	For a mechanical damage of $\leq 0.040$ inch (1.02 mm), remove the depth of the damage. Do not remove more than 0.040 inch (1.02 mm) from the cross-hatched area.
5.	Mechanical damage to the lug hole (not the bushing hole)	Measure	For a mechanical damage depth of $\leq 0.020$ inch (0.51 mm), uniformly remove the depth of the damage around the periphery of the hole. Do not remove more than 0.020 inch (0.51 mm) from any part of the lug hole surface. Maintain original lug hole centerline. Rebush hole.
6.	Mechanical damage to the bushing hole		Not allowed. Replace bushing.

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Figure 53-10. Tail Rotor Gearbox Support Fitting — Damage and Corrosion Limits (Sheet 2 of 2)

6. When replacing tailboom, remove the following and install on replacement tailboom:

- Tail rotor controls ([Chapter 67](#))
- Electrical and avionics ([Chapter 96](#) and [Chapter 97](#))
- Synchronized elevator controls ([Chapter 67](#))
- Synchronized elevator ([Chapter 67](#))
- Tail rotor driveshaft, hangers, and bearings ([Chapter 65](#))
- Intermediate gearbox ([Chapter 65](#))
- Tail rotor gearbox ([Chapter 65](#))
- Tail rotor driveshaft covers and vertical fin cover
- Access doors and inspection panels

- Upper right — 1000 to 1200 inch-pounds (112.98 to 135.58 Nm)
- Both bottom bolts — 400 to 430 inch-pounds (45.19 to 48.58 Nm)

4. Install plug buttons (Carr fasteners) in four tailboom attaching points.

5. Connect tail rotor and synchronized elevator control tubes ([Figure 53-7](#) and [Chapter 67](#)).

6. Connect electrical harnesses and antenna cables ([Chapter 97](#) and [Chapter 98](#)).

7. Install No. 2 tail rotor driveshaft section ([Chapter 63](#)).

8. Install matched clamp sets on couplings ([Chapter 63](#)).

9. Close access doors and inspection panels.

## 53-15. TAILBOOM — INSTALLATION

### MATERIALS REQUIRED

Refer to [BHT-ALL-SPM](#) for specifications.

NUMBER	NOMENCLATURE
<a href="#">C-104</a>	Corrosion Preventive Compound

1. Position tailboom to forward fuselage and line up bolt holes.

2. Apply a coating of corrosion preventive compound ([C-104](#)) to all bolt shanks prior to installation. Do not apply corrosion preventive compound to threads of bolts.

3. Place countersunk washer ([Figure 53-9](#)) on each bolt with countersunk side of washer toward bolt head. Install bolts using plain washers, as required, between countersunk washer and fitting so not less than one thread or more than two threads are showing. Torque bolts as follows:

- Upper left — 1300 to 1600 inch-pounds (146.87 to 180.77 Nm)

## 53-16. GENERIC SHEET METAL PART REPLACEMENT PROCEDURE

### MATERIALS REQUIRED

Refer to [BHT-ALL-SPM](#) for specifications.

NUMBER	NOMENCLATURE
<a href="#">C-251</a>	Sealant
<a href="#">C-308</a>	Sealant
<a href="#">C-328</a>	Sealing Compound

### NOTE

As no procedure can cover all sheet metal part replacements, the following guidelines can be used for most applications, but must be adapted as required. Refer to the [BHT-MED-SRM-1](#) for specific applications. For general practices, refer to FAA Publication AC 43.13-1B.

1. Once the part to be replaced has been determined, provide bracing and support as required. Refer to [BHT-MED-SRM-1 \(Table 4-1\)](#) for suggestions.

2. Identify the type, size, and location of fasteners by looking at the manufactured head of the fasteners and referring to information in the [BHT-MED-SRM-1](#).
3. Remove part while making a note which portion of the part was installed with sealant (if applicable).
4. Inspect supporting structure for cracks and damaged fastener holes. Repair or replace as required.
5. Trim and drill new part to fit in place. Maintain edge distance of 2D for all regular holes and 2.5D for all countersunk holes. Deburr.
6. Apply sealant on faying surfaces, as determined previously (if applicable). Unless otherwise stated, use sealant ([C-251](#)) or sealant ([C-308](#)) for general applications, or sealant ([C-328](#)) for screwed-on access panels (low adhesion).
7. Install fasteners as identified previously. Apply a small bead of sealant ([C-251](#)) or sealant ([C-308](#)) around the part (if required).
8. Refinish as required ([BHT-ALL-SPM](#)).