CHAPTER 53

FUSELAGE

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CHAPTER 53

FUSELAGE

53-00 Description

The R66 is a five-place, single main rotor, single engine helicopter constructed primarily of metal and equipped with skid type landing gear.

The primary fuselage structure is welded steel tubing and riveted aluminum sheet. The tailcone is a monocoque structure in which aluminum skins carry most primary loads. Fiberglass and thermoplastics are used in secondary cabin structure and in various ducts and fairings.

Several cowl doors provide access to the drive system, engine, engine oil tank, fuel filler cap, and fuel sump drain. A right-side door provides access to the main baggage compartment. Removable panels and cowlings allow additional access to controls and other components for maintenance.

The instrument console hinges up and aft for instrument and avionics access. The battery is installed behind an access panel under the left front seat, or in the main baggage compartment, depending on aircraft configuration.

The engine is located aft of the main baggage compartment. The engine compartment is isolated from the rest of the airframe by stainless steel firewalls in front of and above the engine.

53-10 Cabin Assembly

The cabin assembly is a non-field-replaceable assembly.

53-11 Repair

1. Vertical firewall replacement must be performed by an appropriately rated Repair Station using a calibrated jig. Firewall repairs may be accomplished in accordance with U.S. FAA Advisory Circular 43.13-1B Section 4-59. Firewall material is 0.016 inch, type 301, one-quarter hard corrosion-resistant (CRES) steel.
2. Keel panel replacement must be performed by an appropriately rated Repair Station using a calibrated jig. Keel panel repairs may be accomplished in accordance with U.S. FAA Advisory Circular 43.13-1B Sections 4-58 and 4-59. Keel panel material is 0.025 inch, 2024-T3 clad aluminum sheet.
3. To preserve crashworthiness, seat assembly maintenance is limited to replacement only.

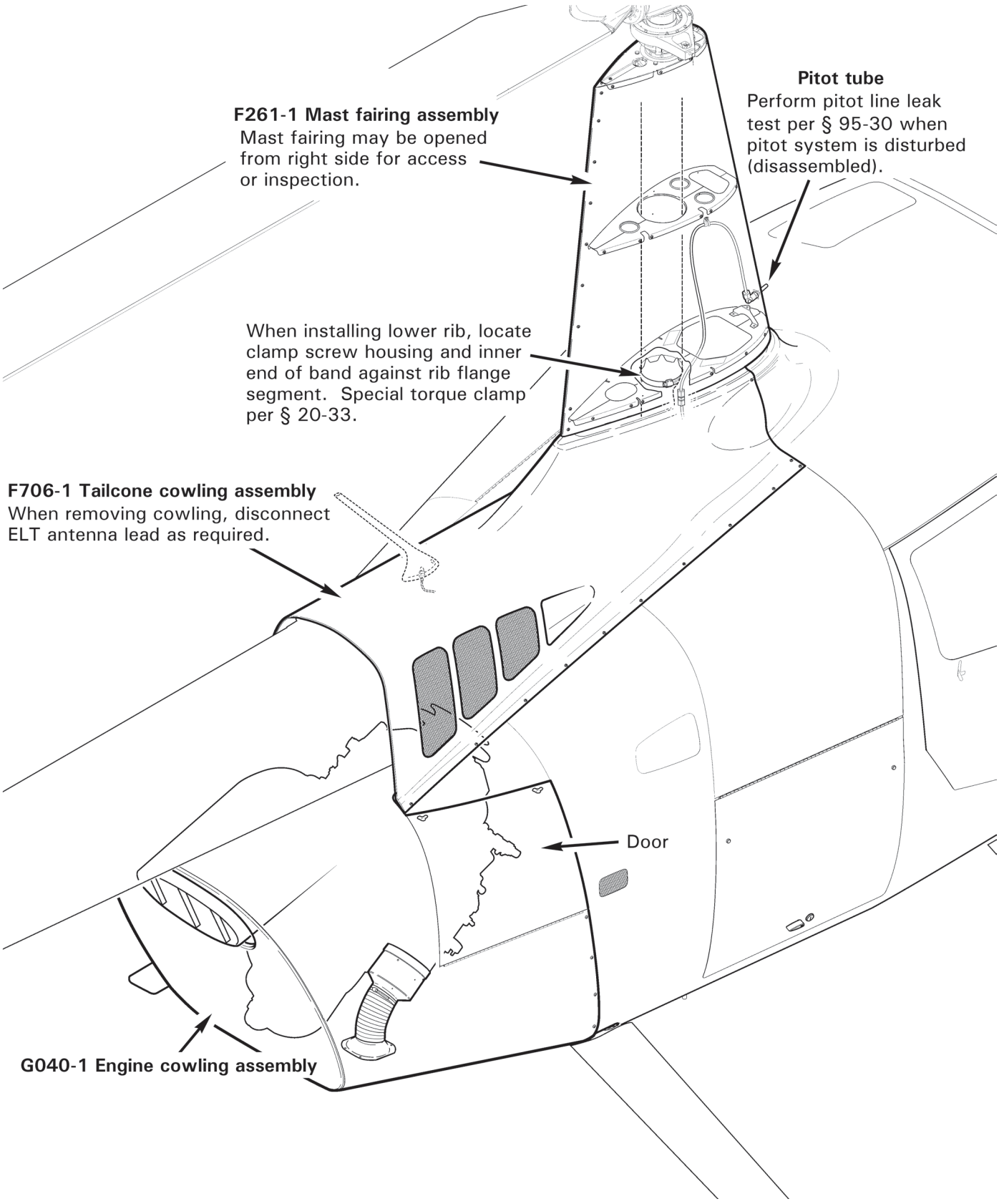


FIGURE 53-1 FAIRING, COWLINGS, AND PANELS

53-20 Fairing, Cowlings, and Panels

CAUTION

Mast fairing, cowlings, and panels must be installed for flight.

53-21 Engine Cowling

A. Removal

1. Refer to Figure 53-1. Open G040-1 engine cowling assembly right and left doors.
2. Loosen clamp securing starter-generator hose to air inlet. Slide hose off of inlet.
3. Remove screws securing cowling to fuselage, unfasten cowling doors, and remove cowling.

B. Installation

1. Refer to Figure 53-1. Position G040-1 engine cowling assembly on helicopter, fasten cowling doors, and install screws securing cowling to fuselage.
2. Slide starter-generator hose onto air inlet and tighten clamp. Close right and left doors.
3. Ensure G039 ring is centered on exhaust weldment within 0.1 inch. Remove and reinstall/replace ring as required.

53-22 Mast Fairing

A. Opening and Closing

1. Refer to Figure 53-1. Remove right-side screws securing F261-1 mast fairing assembly at aft, vertical seam.
2. Remove right-side screws securing fairing to ribs. Keep fairing from springing open and minimize strain on nutplates by holding fairing closed until all right-side screws are removed. Slowly open fairing.
3. Hold fairing closed. Install right-side screws securing fairing to ribs, and screws securing fairing at aft, vertical seam.

B. Removal

1. Open mast fairing assembly per § 53-22 Part A.
2. Disconnect (pitot system) 15-4-N-O union near G201-1 (servo support) frame assembly. Cap fitting and plug line.
3. Remove remaining screws securing fairing to ribs and remove fairing.

53-22 Mast Fairing (continued)

C. Installation

1. Refer to Figure 53-1. Install left-side screws securing F261-1 mast fairing assembly to ribs.
2. Remove cap and plug and connect (pitot system) 15-4-N-O union near G201-1 (servo support) frame assembly.
3. Hold fairing closed. Install right-side screws securing fairing to ribs, and screws securing fairing at aft, vertical seam.
4. Perform pitot line leak test per § 95-30.

53-23 Tailcone Cowling

A. Removal and Installation

1. Refer to Figure 53-1. Thru left access door, disconnect ELT antenna lead from antenna mounted to F706-1 tailcone cowling assembly, as required.
2. Remove screws securing cowling to fuselage and remove cowling.
3. Reinstall cowling and install screws securing cowling to fuselage.
4. Connect ELT antenna lead to cowling thru left access door, as required.

53-24 Access and Inspection Panels

Refer to § 6-70 for access and inspection panel location and illustration.

53-30 Frame Assemblies

NOTE

See § 54-40 for F237-1 tailcone attachment frame weldment replacement.

WARNING

R66 welded steel tube frames are stress relieved. Field weld repairs are not allowed; send frames to RHC for repair.

53-31 Lower Frames

A. Removal

1. Remove engine per § 71-10.
2. Refer to Figure 53-2.
   a. F046-1 (LH) only: Remove hardware securing power turbine governor control cable clamps, F723-3 line assembly clamp, and firewall clamp to F046-1 lower frame.
   b. F046-2 (RH) only: Remove hardware securing battery cable harness clamp, external power block, and firewall clamp to F046-2 lower frame.
3. Remove hardware securing clamps to firewall securing F049-03 harness assembly, as required. Cut and discard ty-raps as required, mark wires, and disconnect wires at plastic connectors to liberate frame.
4. Using plastic scraper, remove sealant around frame weldment(s) at firewalls.
5. Support tailcone (until frames are reinstalled).
   a. F046-1 (LH) only: Remove hardware securing frame to F574-5 block (access bolt thru G246-1 brace, inside baggage compartment). Remove hardware securing shackle and frame to F574-8 block (threaded).
   b. F046-2 (RH) only: Remove hardware securing frame to F574-1 support assembly (access bolts from inside baggage compartment).
6. Remove hardware securing F174-1 support weldment rod end(s) to F046 lower frame(s).
7. Remove two bolts and associate hardware securing F020-1 frame weldment, firewall, and F046 lower frame.
8. Remove hardware securing F046 lower frame to F574-10 block assembly (threaded). Remove lower frame.

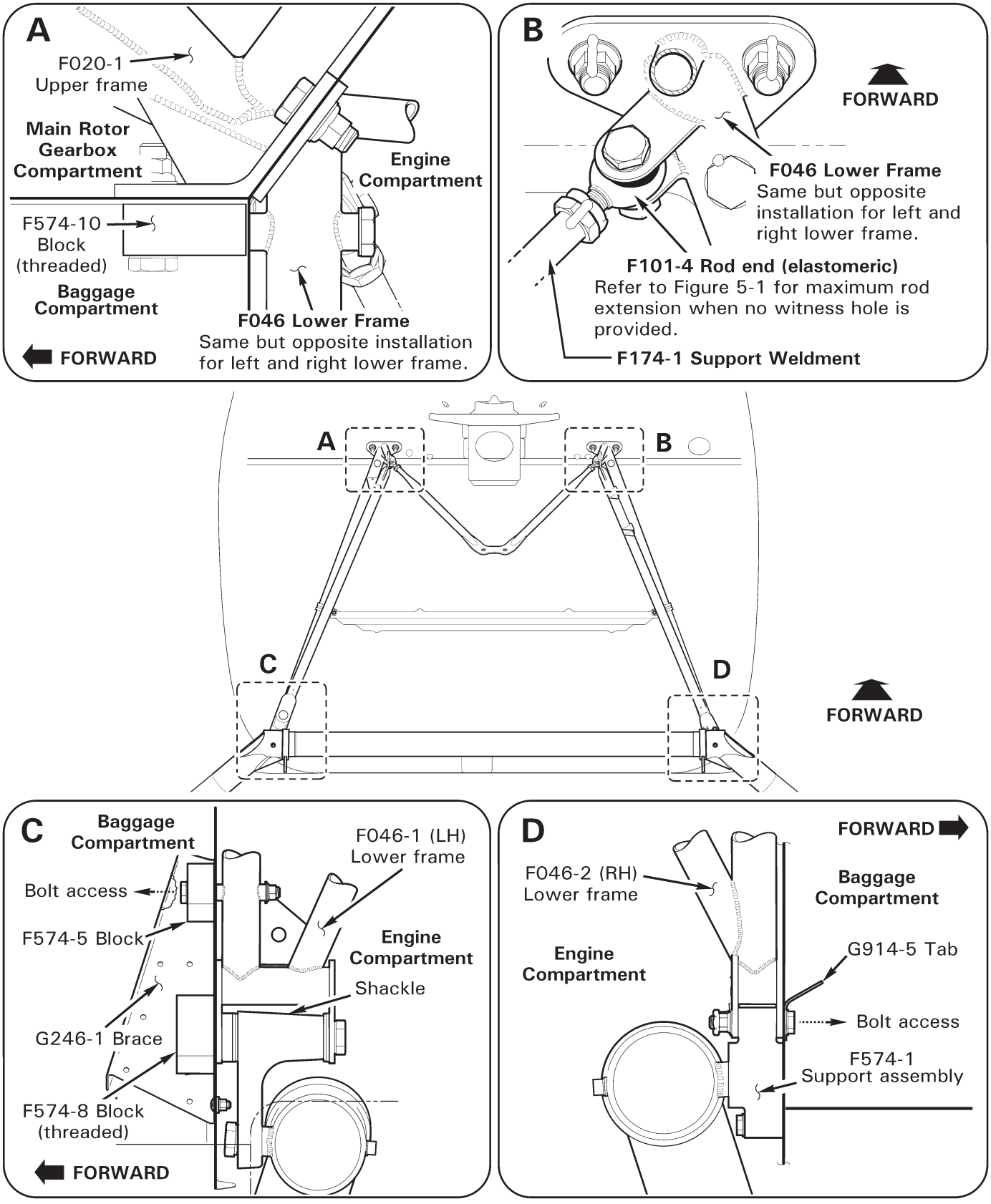


FIGURE 53-2 LOWER FRAMES

53-31 Lower Frames (continued)

B. Installation

1. Refer to Figure 53-2.

   a. F046-1 (LH) only: Install hardware securing shackle and frame to F574-8 block (threaded). Special torque bolt per § 20-33, and torque stripe per Figure 5-1. Install hardware securing frame to F574-5 block (insert bolt thru G246-1 brace, inside baggage compartment). Standard torque bolt per § 20-32, and torque stripe per Figure 5-1.

   b. F046-2 (RH) only: Install hardware, and G914-5 tab, securing frame to F574-1 support assembly (access bolts from inside baggage compartment). Remove finish from surface under braided wire terminal, if installed. Standard torque bolts per § 20-32, and torque stripe per Figure 5-1.

2. Install hardware securing F046 lower frame to F574-10 block assembly (threaded). Install hardware securing F020-1 frame weldment, firewall, and F046 lower frame. Standard torque bolts per § 20-32, and torque stripe per Figure 5-1.

3. Verify rod end engagement in F174-1 support weldment is approximately symmetrical with minimal preload. Adjust rod end extension on both sides as required per § 5-33, and Figures 5-1 & 5-2; ensure rod extension is no more than 1.10 inches. Install hardware securing weldment to lower frames, standard torque bolts per § 20-32, and torque stripe per Figure 5-1. Remove tailcone support.

4. Seal around frame weldment(s) at firewalls using B270-1 sealant.

5. Connect F049-03 harness assembly wires at plastic connectors, install hardware securing clamps to firewall, and install ty-raps as required. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.

6. a. F046-1 (LH) only: Install hardware securing power turbine governor control cable clamps, F723-3 line assembly clamp, and firewall clamp to F046-1 lower frame. Standard torque hardware per § 20-32, and torque stripe per Figure 5-1.

   b. F046-2 (RH) only: Install hardware securing battery cable harness clamp, external power block, and stiffener clamp to F046-2 lower frame. Standard torque hardware per § 20-32, and torque stripe per Figure 5-1.

7. Install engine per § 71-10.

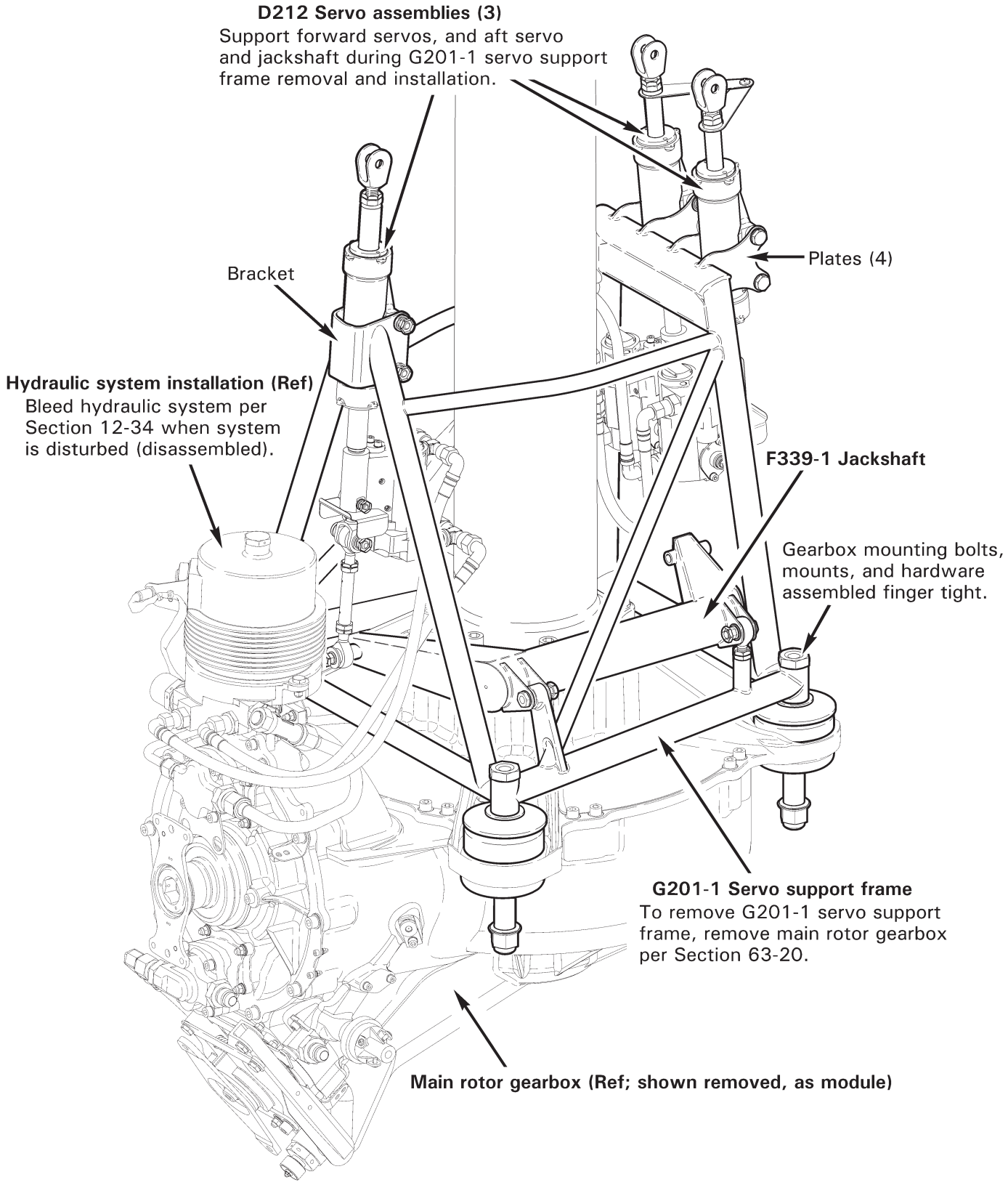


FIGURE 53-3 HYDRAULIC SERVO SUPPORT FRAME

53-32 Hydraulic Servo Support Frame

Refer to R66 Illustrated Parts Catalog (IPC) Figure 67-19.

A. Removal

1. Remove main rotor gearbox per Section 63-20.
2. Remove main rotor hub per Section 62-20.
3. Remove mast fairing per Section 53-22.
4. Remove swashplate assembly per Section 67-40.
5. Refer to Figure 53-3. Tag F121-3 push-pull tube assemblies with corresponding D212 servo assembly, and tag servos with location on G201-1 servo support frame. Remove hardware securing push-pull tubes to servos.
6. Remove hardware securing F339-1 jackshaft weldment to frame.
7. Remove hardware securing servos to frame forward plates and aft bracket. Support forward servos, and aft servo and jackshaft, during hardware removal.
8. Remove gearbox mounting bolts, mounts, and hardware. Lift frame off of gearbox, over mast assembly.

B. Installation

1. Refer to Figure 53-3. Lower G201-1 servo support frame over mast assembly, onto main rotor gearbox. Install gearbox mounting bolts, mounts, and hardware. Install nuts finger tight.
2. Remove tags and install hardware securing D212 servo assemblies to frame forward plates and aft bracket. Standard torque bolts per Section 20-32, and torque stripe per Figure 5-1.
3. Install hardware securing F339-1 jackshaft weldment to frame. Standard torque bolts per Section 20-32, and torque stripe per Figure 5-1.
4. Install F121-3 push-pull tube assemblies as removed. Standard torque bolts per Section 20-32, and torque stripe per Figure 5-1.
5. Install swashplate assembly per Section 67-40.
6. Install mast fairing per Section 53-22.
7. Install main rotor hub per Section 62-20.
8. Install main rotor gearbox per Section 63-20.

53-33 Upper Frame

Refer to R66 Illustrated Parts Catalog (IPC) Figure 53-11 and 53-11B.

A. Removal

1. Remove main rotor blades per Section 62-10.
2. Remove tailcone assembly per Section 53-40.
3. Remove tail rotor drive shaft weldment per Section 65-10.
4. Remove hardware securing F236-1 scroll assembly to F306-1 box assembly. Remove hardware securing box to firewall.
5. Remove hardware securing F252-1 strut to F020-1 upper frame and remove strut.
6. Remove air filter and cage assembly per Section 71-22. Disconnect air bypass switch assembly wiring at connector and remove hardware securing G258-4 strap to fuel bladder support assembly.
7. Remove engine shaft weldment per Section 63-10.
8. Remove engine per Section 71-10.
9. Remove main rotor gearbox per Section 63-20, steps 2 thru 12.
10. Cut and discard ty-raps securing wires and antenna cables to frame, as required.
11. Disconnect D205-19 hose assembly and F724-1 line assembly from F823-1 thermostat assembly. Plug hose and line and cap fittings. Remove hardware securing F651-1 oil filter assembly to frame.
12. Remove hardware securing F231-8 braces to fuel bladder support, and to frame.
13. Remove hardware securing rotor brake cable assembly to frame. Remove hardware securing B157-1 (pulley) mount to frame.
14. Remove ELT transmitter per Section 25-61, if installed. Remove hardware securing clamps to upper frame and remove clamps.
15. Remove palnut, nut, and spacer securing F316-1 bellcrank assembly to upper frame, and slide C494-2 shaft inboard until it clears frame. Remove fastener securing A331-4 bellcrank assembly to upper frame and swing bellcrank clear of frame.
16. Remove fasteners securing upper frame to horizontal firewall.
17. Using plastic scraper, remove sealant around frame weldment edges at firewalls, cabin bulkhead, and fuel bladder support.
18. Remove mounting hardware securing upper frame to firewalls, bulkhead, and support and remove frame.

53-33 Upper Frame (continued)

B. Installation

1. Position F020-1 upper frame inside helicopter. Install mounting hardware securing upper frame to firewalls, cabin bulkhead, and fuel bladder support assembly. Standard torque bolts per § 20-32, and torque stripe per Figure 5-1. Seal around frame weldment edges at firewalls, bulkhead, and support using B270-1 sealant.

2. Install fasteners securing upper frame to horizontal firewall. Standard torque hardware per § 20-32, and torque stripe per Figure 5-1.

3. Install hardware securing A331-4 bellcrank assembly to upper frame. Standard torque bolt per § 20-32, and torque stripe per Figure 5-1. Slide C494-2 shaft outboard thru F316-1 bellcrank assembly and upper frame and install spacer, nut, and palnut. Special torque nut per § 20-33, and torque stripe per Figure 5-1.

4. Install ELT transmitter per § 25-61, if installed. Install clamps and hardware securing clamps to upper frame.

5. Install B157-1 (pulley) mount and hardware securing mount to frame. Install hardware securing rotor brake cable assembly to frame.

6. Install F231-8 braces and hardware securing braces to fuel bladder support, and to frame.

7. Install hardware securing F651-1 oil filter assembly to frame. Standard torque hardware per § 20-32, and torque stripe per Figure 5-1. Remove caps and plugs and connect D205-19 hose assembly and F724-1 line assembly to F823-1 thermostat assembly. Standard torque hose assembly nuts per § 20-32, special torque line assembly nuts per § 20-33, & torque stripe per Figure 5-1.

8. Install MS3367-4-9 or -5-9 ty-raps as required to secure wire harness & cables to frame. Cinch ty-raps until snug without over-tightening, & trim tips flush with heads.

9. Install main rotor gearbox per § 63-20, but do not install F252-1 strut until step 13.

10. Install engine per § 71-10.

11. Install engine shaft weldment per § 63-10.

12. Install air filter and cage assembly per § 71-22. Install hardware securing G258-4 strap to fuel bladder support and connect air bypass switch assembly wiring at connector.

13. Install hardware securing F252-1 strut to F020-1 upper frame. Standard torque bolts per § 20-32, and torque stripe per Figure 5-1.

14. Install F306-1 box assembly and hardware securing box to firewall. Install F236-1 scroll assembly and hardware securing scroll to box.

15. Install tail rotor drive shaft weldment per § 65-10.

16. Install tailcone assembly per § 53-40.

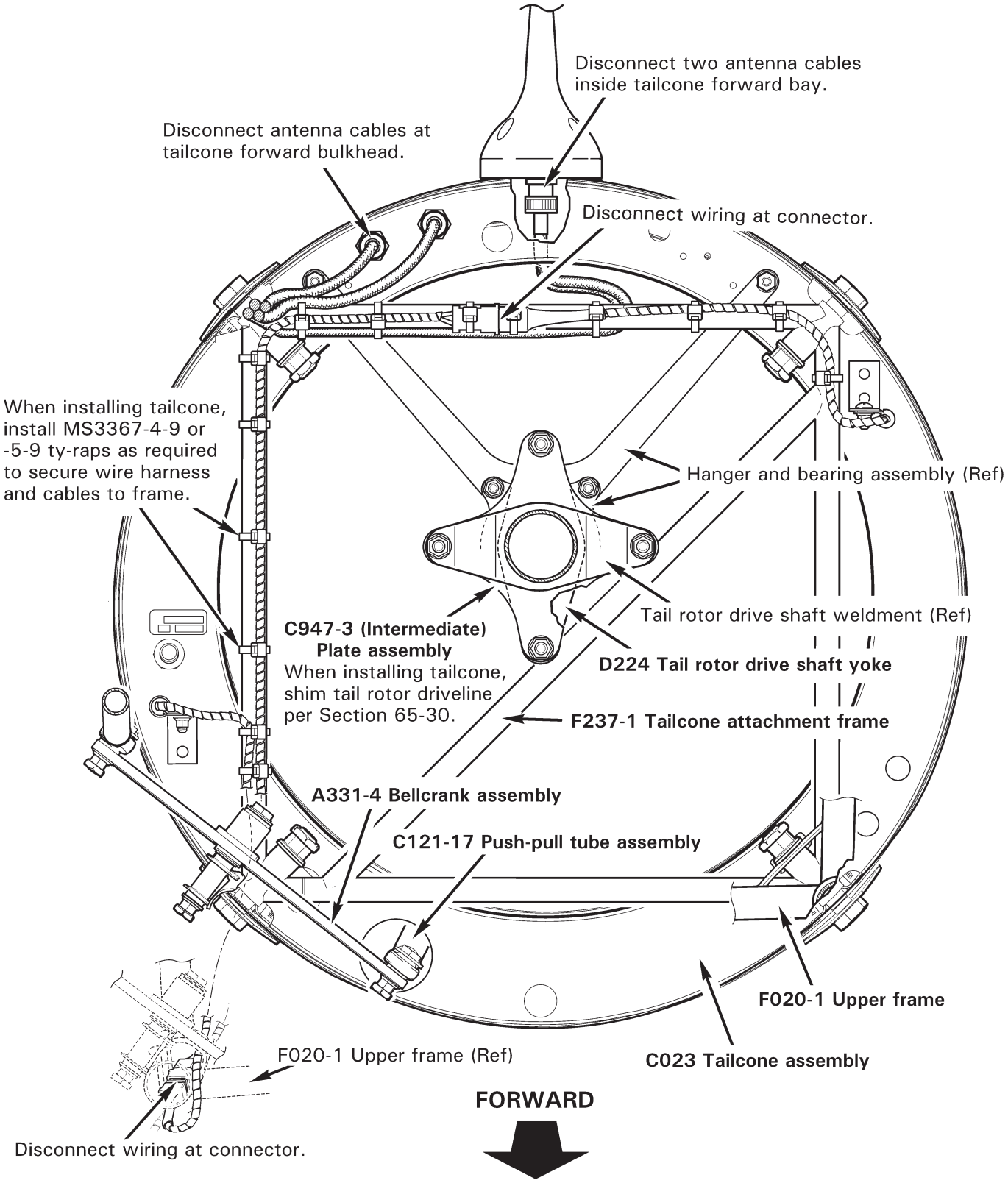


FIGURE 53-4 TAILCONE ASSEMBLY

53-40 Tailcone Assembly

CAUTION

If tailcone has an F955-1 or -6 bracket, then F050-2 horizontal stabilizer must be installed.

C044-1 or -2 horizontal stabilizer may not be installed on a tailcone that has an F955-1 or -6 bracket.

F044-1 vertical stabilizers mount assembly may only be installed on a tailcone that has an F955-1 or -6 bracket.

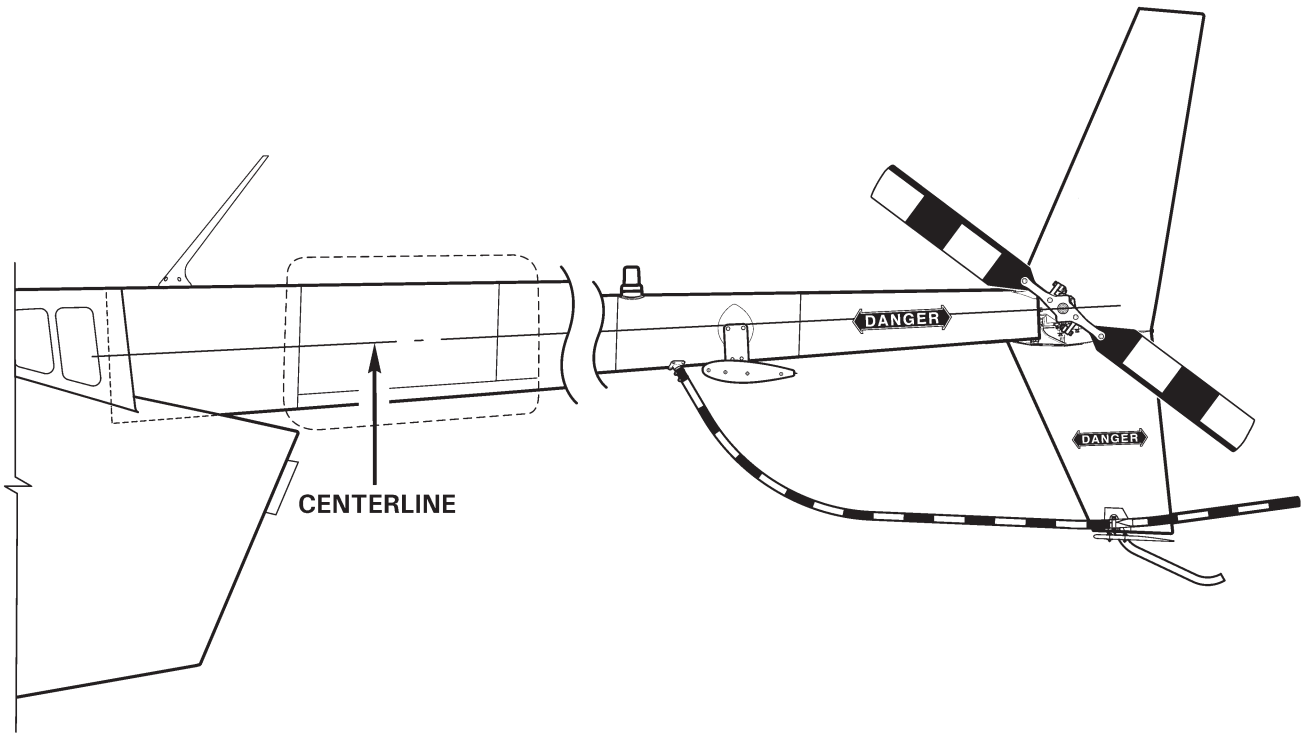
As applicable, C050-2 or G950-2 stabilizer must always be installed.

A. Removal

1. Remove tailcone cowling assembly per § 53-23. Remove engine cowling assembly per § 53-21.
2. Refer to Figure 53-4. Cut and discard ty-raps as required and disconnect tailcone wiring at connectors. Disconnect two antenna cables inside tailcone forward bay, and cables at forward bulkhead, as required.
3. Remove hardware securing D224 tail rotor drive shaft yoke to C947-3 (intermediate) plate assembly, noting hardware removed.
4. Remove hardware securing C121-17 push-pull tube to A331-4 bellcrank assembly.
5. Remove hardware securing C023 tailcone assembly to frames and remove tailcone.
6. Cut and discard ty-raps as required and remove F237-1 tailcone attachment frame, as required.

B. Installation

1. Refer to Figure 53-4. Install F237-1 tailcone attachment frame, if not previously accomplished. Verify correct damper assembly orientation per Figure 65-3.
2. Position C023 tailcone assembly on F020-1 upper frame assembly; do not pinch wiring between tailcone bulkhead and frames. Install hardware securing tailcone to frames, standard torque bolts per § 20-32, and torque stripe per Figure 5-1.
3. Install hardware securing D224 tail rotor drive shaft yoke to C947-3 (intermediate) plate assembly. Shim tail rotor driveline per § 65-30. Standard torque bolts per § 20-32, and torque stripe per Figure 5-1.
4. Install hardware securing C121-17 push-pull tube to A331-4 bellcrank assembly. Standard torque bolt per § 20-32, and torque stripe per Figure 5-1.
5. Perform tail rotor drive shaft runout per § 65-21.



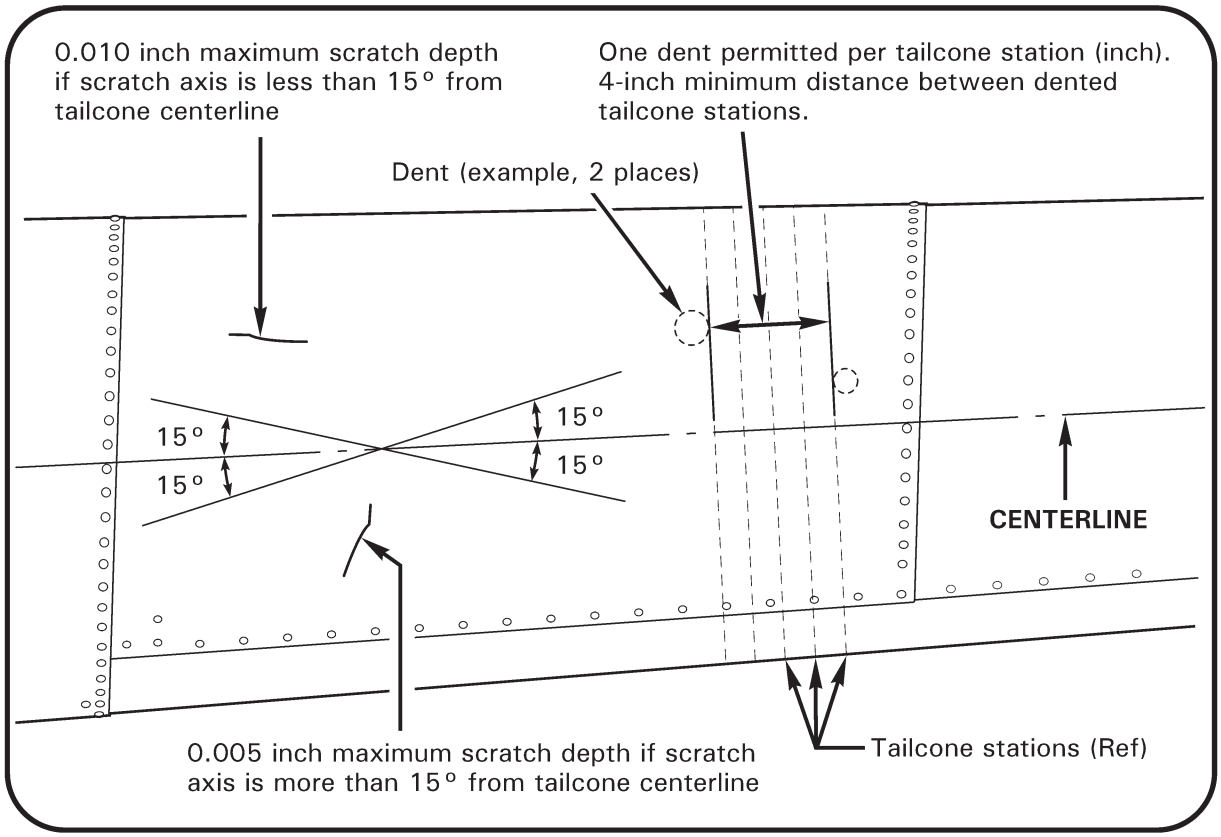


FIGURE 53-5 TAILCONE INSPECTION AND REPAIR

53-40 Tailcone Assembly (continued)

B. Installation (continued)

6. Connect tailcone wiring at connectors, connect two antenna cables inside tailcone forward bay, and connect antenna cables at forward bulkhead, as required. Individually test and verify correct function of tail position light, strobe, and TR chip light circuits.
7. Install MS3367-4-9 or -5-9 ty-raps as required to secure wire harness and cables to frame. Cinch ty-raps until snug without over-tightening, trim tips flush with heads.
8. Install tailcone cowling assembly per § 53-23. Install engine cowling assembly per § 53-21.

53-41 Inspection and Repair

This procedure outlines the inspection criteria and repair limits for the tailcone assembly. Repairs are limited to blending out scratches and refinishing skins. Contact RHC Technical Support if allowable damage is exceeded.

A. Scratches

1. Refer to Figure 53-5. Verify damage does not exceed the following limits:
   a. 0.005 inch maximum scratch depth if scratch axis is more than 15° from tailcone centerline.
   b. 0.010 inch maximum scratch depth if scratch axis is less than 15° from tailcone centerline.
2. If damage exceeds limits, return tailcone assembly to RHC for repair. If damage is within limits, blend out scratches with a 0.10 inch minimum blend radius. Refinish skins using approved materials per § 20-70.

B. Dents

> NOTE
>
> 0.125 inch minimum radius can be verified with using a 0.250 inch diameter bearing ball: Place bearing ball within dent and back light with lamp; if light is visible between skin & ball (i.e. ball not contacting dent bottom) then dent radius is less than 0.125 inch.

1. Refer to Figure 53-5. Smooth, round bottom dents with 0.125 inch minimum radius without sharp nicks or cracks are acceptable when damage does not exceed the following limits:
   a. 0.030 inch maximum dent depth.
   b. 1.250 inch maximum dent diameter.
   c. One dent permitted per tailcone station (inch).
   d. 4.000 inch minimum distance between dented tailcone stations.
2. If damage exceeds limits, replace tailcone or return to RHC for repair.

53-50 Tail Rotor Guard Assembly

A. Removal

1. Refer to Figure 53-8. Loosen two (forward) fasteners securing D081-2 block and D079-1 guard assembly to C043-1 lower vertical stabilizer.
2. Remove hardware securing guard to D082-1 tube assembly. Slide guard off of tube, then forward through blocks. Remove D081-1 spacer from tube.

B. Installation

CAUTION

Do not install D079-1 revision U or prior tail rotor guard assembly on R66 helicopters.

1. Refer to Figure 53-8. Loosen two (forward) fasteners securing D081-2 block to C043-1 lower vertical stabilizer, if not previously accomplished. Insert D079-1 guard assembly aft through blocks.
2. Lightly coat retaining hardware and mating surfaces of D082-1 tube assembly and D079-1 guard assembly with § 20-70 approved primer, prior to installation.
3. Install D081-1 spacer inside tube. While wet with primer, slide guard onto tube and install hardware. Standard torque bolts per § 20-32, and torque stripe per Figure 5-1. Seal around end of guard with primer after assembly.
4. Verify D081 blocks clamp guard sleeve. For proper guard-to-stabilizer clamping, first standard torque (forward, top) NAS1351-4-53P screw and associate hardware per § 20-32, then special torque (forward, bottom) NAS1352-3-14P screw and associate hardware per § 20-33. Torque stripe fasteners per Figure 5-1.

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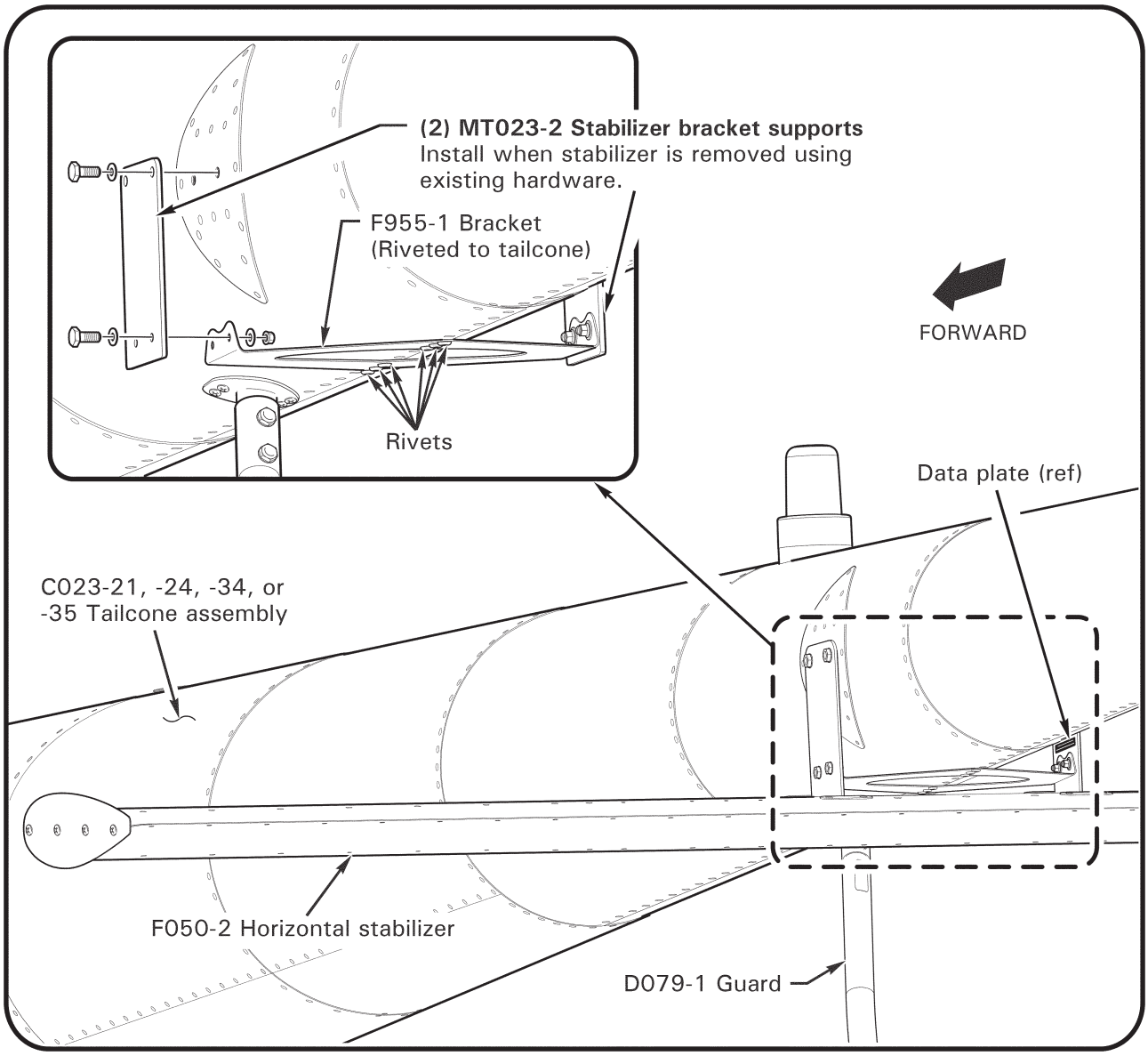


FIGURE 53-6 F050-2 HORIZONTAL STABILIZER ASSEMBLY

53-60 F050-2 Horizontal Stabilizer Assembly

CAUTION

If tailcone has an F955-1 or -6 bracket, then F050-2 horizontal stabilizer must be installed.

CAUTION

Support F050-2 horizontal stabilizer assembly during removal or installation when upper bolts are removed. F955-1 or -6 bracket is riveted to bottom of tailcone assembly.

A. Removal

1. Refer to Figure 53-6. Remove hardware securing F050-2 horizontal stabilizer assembly to F955-1 or -6 bracket.
2. Supporting stabilizer, remove hardware securing stabilizer to tailcone assembly and remove stabilizer.
3. As required, install MT023-2 stabilizer bracket supports using removed hardware (recommended when stabilizer is removed).

B. Installation

1. If installed, remove hardware securing MT023-2 stabilizer bracket supports to F955-1 or -6 bracket & tailcone assembly and remove supports.
2. Supporting F050-2 horizontal stabilizer assembly, install hardware securing stabilizer to tailcone and bracket. Special torque bolts per § 20-33 and torque stripe per Figure 5-1.

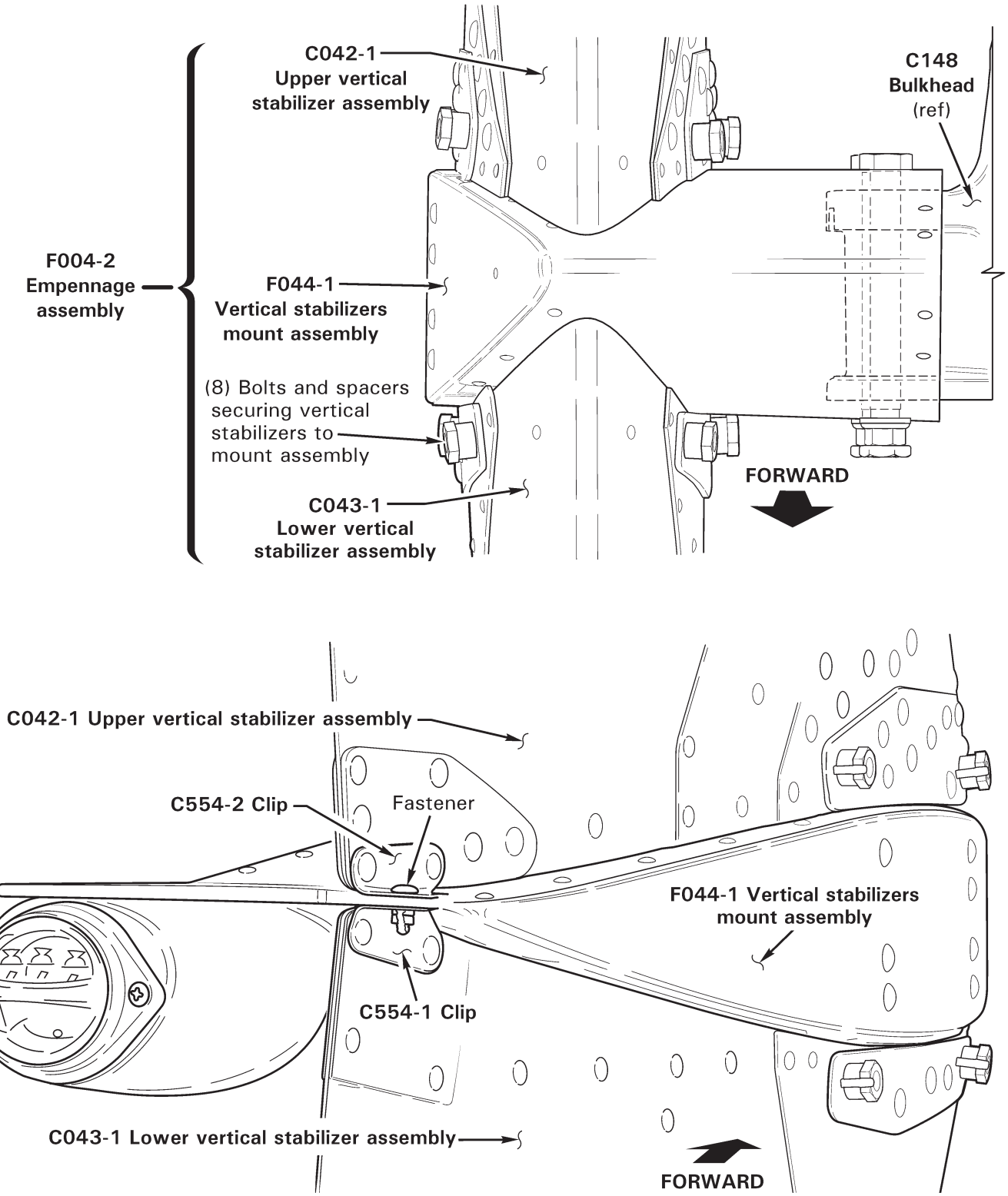


FIGURE 53-7 F004-2 EMPENNAGE ASSEMBLY

53-70 Empennage Assembly

CAUTION

If tailcone has an F955-1 or -6 bracket, then F050-2 horizontal stabilizer must be installed.

C044-1 or -2 horizontal stabilizer may not be installed on a tailcone that has an F955-1 or -6 bracket.

F044-1 vertical stabilizers mount assembly may only be installed on a tailcone that has an F955-1 or -6 bracket.

As applicable, C050-2 or G950-2 stabilizer must always be installed.

A. Removal

1. Remove tail rotor guard assembly per § 53-50.
2. Remove hardware securing forward MS21919WDG3 clamp to F044-1 vertical stabilizers mount assembly (or C044-1 or -2 horizontal stabilizer, if installed). Cut and discard ty-raps securing position light and gearbox chip detector wires and connectors together. Disconnect position light at connectors.
3. Refer to Figure 53-7 or 53-7A. Supporting empennage assembly, remove hardware securing empennage to C148 bulkhead, and remove empennage.

B. Installation

1. Refer to Figure 53-7 or 53-7A. Position empennage assembly on C148 bulkhead.
   a. **If D301 (empennage ballast; ref § 8-32) weights <u>will not</u> be installed:** Install (2) NAS6606-47 (or -48) bolts & associated hardware securing empennage to C148 bulkhead. Use as many NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
   b. **If D301 (empennage ballast; ref § 8-32) weights <u>will</u> be installed:** Install (2) NAS6606-78 bolts & associated hardware securing empennage to C148 bulkhead. Use (1) or (2) NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5; 1–4 threads may be exposed beyond primary nut. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
2. Connect position light wire connectors. Secure wires and install hardware securing forward MS21919WDG3 clamp to F044-1 vertical stabilizers mount assembly (or C044-1 or -2 horizontal stabilizer, if installed). Install MS3367-4-9 or -5-9 ty-raps as required to secure wires and connectors together. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.
3. Test and verify correct function of position and TR chip light circuits.
4. Install tail rotor guard assembly per § 53-50.

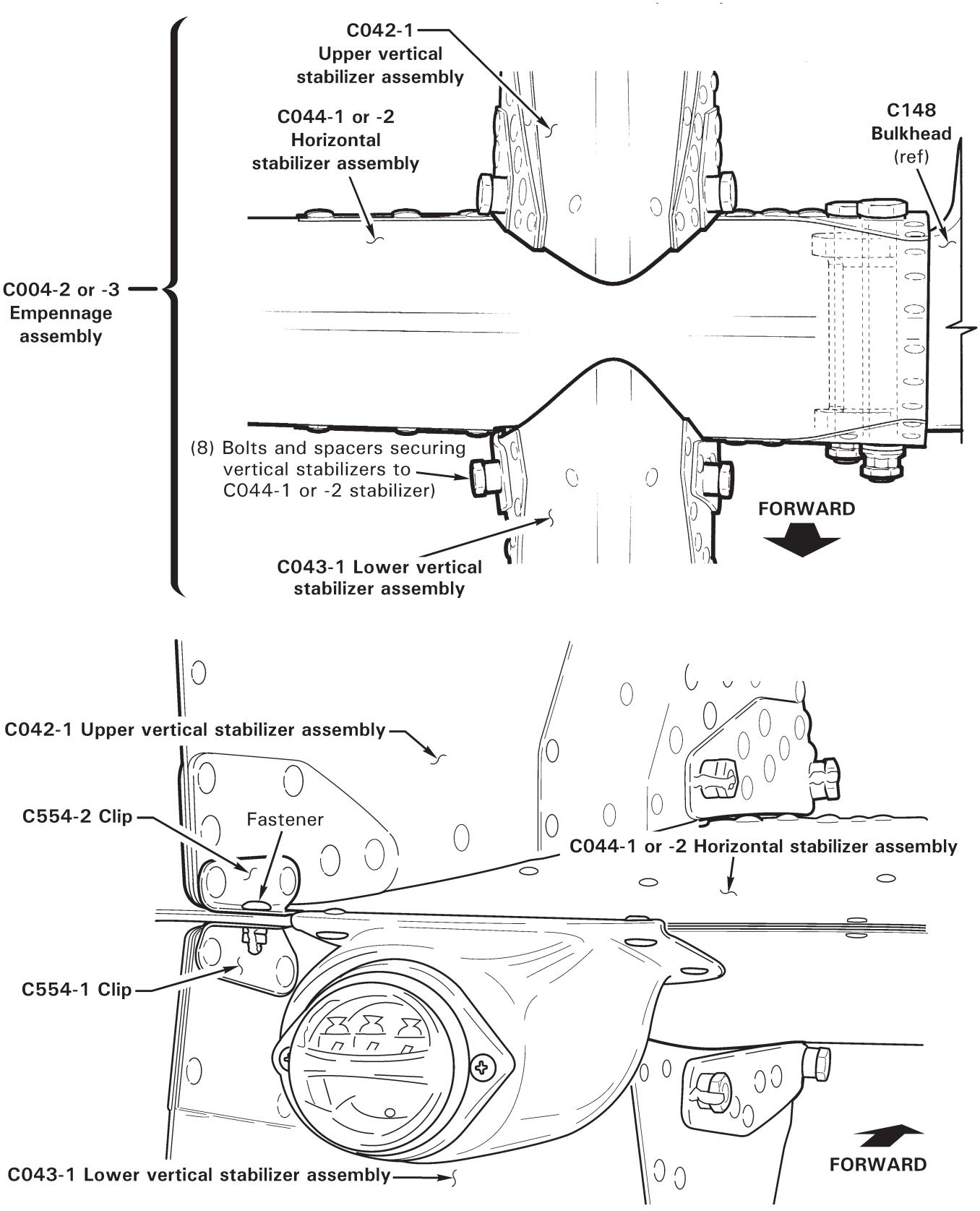


FIGURE 53-7A C004-2 OR C004-3 EMPENNAGE ASSEMBLY

53-71 Upper Vertical Stabilizer Assembly

A. Removal

1. Refer to Figure 53-7 or 53-7A. Remove fastener securing C554-1 & -2 clips to F044-1 vertical stabilizers mount assembly (or C044-1 or -2 horizontal stabilizer, if installed).
2. Supporting C042-1 upper vertical stabilizer assembly, remove bolts & spacers securing C042-1 stabilizer to mount (or C044-1 or -2 stabilizer), and remove C042-1 stabilizer.
3. If replacing C042-1 stabilizer, C554-2 clip may be reused. Drill out two rivets securing clip to C042-1 stabilizer and remove clip.

B. Installation

1. Refer to Figure 53-7 or 53-7A. Position C042-1 upper vertical stabilizer assembly on empennage assembly. Verify 0.030–0.120 inch gap between vertical stabilizer skin edges and F044-1 vertical stabilizers mount assembly (or C044-1 or -2 horizontal stabilizer, if installed) upper skin. File vertical stabilizer skin edge(s) as required. Conversion coat & prime bare aluminum edges per §§ 20-51 & 20-60.
2. Install bolts & spacers securing vertical stabilizer to mount (or C044-1 or -2 stabilizer). Special torque bolts per § 20-33 and torque stripe per Figure 5-1.
3. Install fastener securing C554-1 & -2 clips to mount (or C044-1 or -2 stabilizer). If reusing C554-2 clip, install clip and fastener, and match drill clip to vertical stabilizer with #30 drill. Deburr holes and install rivets. Torque stripe fastener per Figure 5-1.

53-72 Lower Vertical Stabilizer Assembly

A. Removal

1. Remove tail rotor guard assembly per § 53-50.
2. As required, remove C050-2 or G950-2 horizontal stabilizer assembly per § 53-80, and tail skid per § 53-90.
3. Refer to Figure 53-7 or 53-7A. Remove fastener securing C554-1 & -2 clips to F044-1 vertical stabilizers mount assembly (or C044-1 or -2 horizontal stabilizer, if installed).
4. Supporting C043-1 lower vertical stabilizer assembly, remove bolts & spacers securing C043-1 stabilizer to mount assembly (or C044-1 or -2 stabilizer), and remove C043-1 stabilizer.
5. If replacing C043-1 stabilizer, C554-1 clip may be reused. Drill out two rivets securing clip to C043-1 stabilizer and remove clip.

B. Installation

1. Refer to Figure 53-7 or 53-7A. Position C043-1 lower vertical stabilizer assembly on empennage assembly. Verify 0.030–0.120 inch gap between vertical stabilizer skin edges and F044-1 vertical stabilizers mount assembly (or C044-1 or -2 horizontal stabilizer, if installed) lower skin. File vertical stabilizer skin edge(s) as required. Conversion coat & prime bare aluminum edges per §§ 20-51 & 20-60.
2. Install bolts & spacers securing vertical stabilizer to mount (or C044-1 or -2 stabilizer). Special torque bolts per § 20-33 and torque stripe per Figure 5-1.
3. Install fastener securing C554-1 & -2 clips to mount (or C044-1 or -2 stabilizer). If reusing C554-1 clip, install clip and fastener, and match drill clip to vertical stabilizer with #30 drill. Deburr holes and install rivets. Torque stripe fastener per Figure 5-1.
4. Install C050-2 or G950-2 horizontal stabilizer assembly per § 53-80, and tail skid per § 53-90, as required.
5. Install tail rotor guard assembly per § 53-50.

53-73 F044-1 Vertical Stabilizers Mount Assembly

A. Removal

1. Remove C042-1 & C043-1 vertical stabilizer assemblies per §§ 53-71 & 53-72.
2. Remove hardware securing forward clamp to F044-1 vertical stabilizers mount assembly. Cut and discard ty-raps securing position light and gearbox chip detector wires and connectors together. Disconnect position light at connectors.
3. Support the mount assembly, remove hardware securing mount to C148 bulkhead and remove mount.

B. Installation

CAUTION

F044-1 vertical stabilizers mount assembly may only be installed on a tailcone that has an F955-1 or -6 bracket.

1. Position F044-1 vertical stabilizers mount assembly on C148 bulkhead.
   a. **If D301 (empennage ballast; ref § 8-32) weights will not be installed:** Install (2) NAS6606-47 (or -48) bolts & associated hardware securing empennage to C148 bulkhead. Use as many NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
   b. **If D301 (empennage ballast; ref § 8-32) weights will be installed:** Install (2) NAS6606-78 bolts & associated hardware securing empennage to C148 bulkhead. Use (1) or (2) NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5; 1–4 threads may be exposed beyond primary nut. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
2. Install C042-1 & C043-1 vertical stabilizer assemblies per §§ 53-71 & 53-72.
3. If mount assembly was replaced, match drill C554-1 & -2 clips 0.144-inch diameter hole through mount. Deburr hole and install fastener.
4. Connect position light at connectors. Install hardware securing forward clamp to mount assembly. Install MS3367-4-9 or -5-9 ty-raps as required to secure position light and gearbox chip detector wires and connectors together. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.
5. Test and verify correct function of position and TR chip light circuits.

53-74 C044-1 or -2 Horizontal Stabilizer Assembly

A. Removal

1. Remove C042-1 & C043-1 vertical stabilizer assemblies per §§ 53-71 & 53-72.
2. Remove hardware securing forward clamp to C044-1 or -2 horizontal stabilizer assembly. Cut and discard ty-raps securing position light and gearbox chip detector wires and connectors together. Disconnect position light at connectors.
3. Support the stabilizer, remove hardware securing stabilizer to C148 bulkhead and remove stabilizer.

B. Installation

CAUTION

C044-1 or -2 horizontal stabilizer may not be installed on a tailcone that has an F955-1 or -6 bracket.

1. Position C044-1 or -2 horizontal stabilizer assembly on C148 bulkhead.
   a. **If D301 (empennage ballast; ref § 8-32) weights will not be installed:** Install (2) NAS6606-47 (or -48) bolts & associated hardware securing empennage to C148 bulkhead. Use as many NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
   b. **If D301 (empennage ballast; ref § 8-32) weights will be installed:** Install (2) NAS6606-78 bolts & associated hardware securing empennage to C148 bulkhead. Use (1) or (2) NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5; 1–4 threads may be exposed beyond primary nut. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
2. Install C042-1 & C043-1 vertical stabilizer assemblies per §§ 53-71 & 53-72.
3. If horizontal stabilizer was replaced, match drill C554-1 & -2 clips 0.144-inch diameter hole through horizontal stabilizer. Deburr hole and install fastener.
4. Connect position light at connectors. Install hardware securing forward clamp to horizontal stabilizer. Install MS3367-4-9 or -5-9 ty-raps as required to secure position light and gearbox chip detector wires and connectors together. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.
5. Test and verify correct function of position and TR chip light circuits.

53-74 C044-1 or -2 Horizontal Stabilizer Assembly (continued)

C. Repair

A single dent on C044-1 or -2 horizontal stabilizer leading edge outboard of vertical stabilizers is permitted provided:

1. Dent is no more than 0.050 inch deep.
2. Dent must have a smooth bottom, with minimum 0.125-inch radius, and no sharp nicks or cracks.
3. Dent must be less than 1.25 inches spanwise.
4. It is permissible to remove above dent via metalworking.

Depending on the damage, U.S. FAA AC (Advisory Circular) 43.13-1B may be used to repair some horizontal stabilizer minor skin damage; refer to the AC's Title Page for limitations. Use only 0.020-inch thick 2024T3 aluminum sheet for repairs; do not use thicker sheet. Skin replacement, damage to spars, and either forward or middle attachment for vertical stabilizers, is not field repairable.

To inspect spars, remove NAS1919B04S01 rivets securing D292-3 outboard rib. Only the inboard D292-2 nose rib or D292-3 outboard tip rib may be field replaced; all other parts require use of the factory jig.

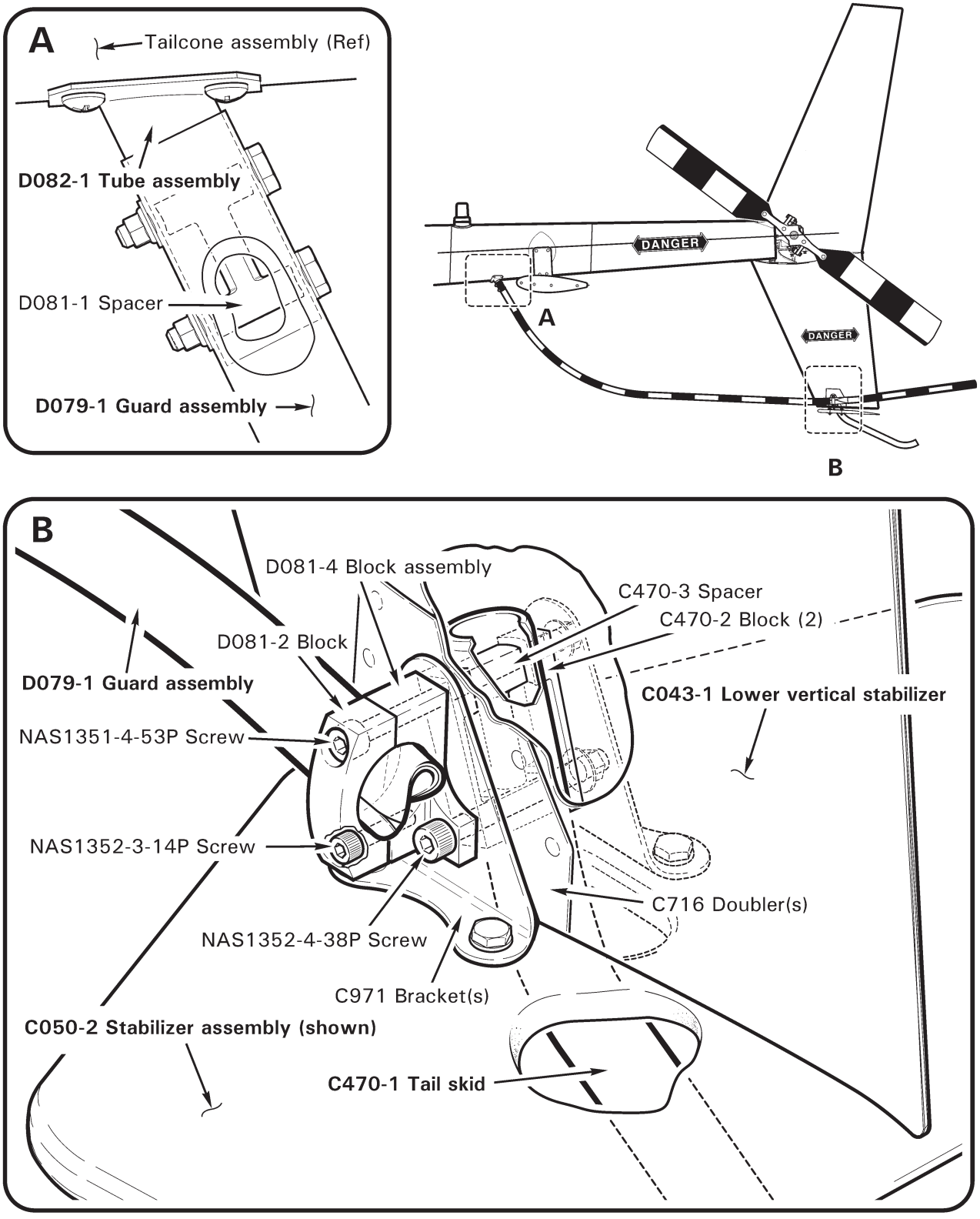


FIGURE 53-8 EMPENNAGE – TAIL ROTOR GUARD

53-80 C050-2 or G950-2 Horizontal Stabilizer Assembly

CAUTION

As applicable, C050-2 or G950-2 stabilizer must always be installed.

A. Removal

1. Remove tail skid per § 53-90.
2. Refer to Figure 53-8. Using plastic scraper, remove sealant around edges where C050-2 or G950-2 horizontal stabilizer assembly brackets attach to C043-1 lower vertical stabilizer assembly doublers. Remove horizontal stabilizer assembly.

B. Installation

1. Refer to Figure 53-8. Position C050-2 or G950-2 horizontal stabilizer assembly on C043-1 lower vertical stabilizer assembly and install tail skid per § 53-90.
2. Seal horizontal stabilizer bracket edges to lower vertical stabilizer doublers using B270-1 sealant.

53-90 Tail Skid

A. Removal

1. Refer to Figure 53-8. Support D079-1 guard assembly. Remove hardware securing D081-2 block to C043-1 lower vertical stabilizer assembly and remove block.
2. Support C050-2 or G950-2 horizontal stabilizer assembly and C470-1 tail skid. Remove hardware securing D081-4 block assembly to C043-1 stabilizer and remove block.
3. Remove C470-1 tail skid from C043-1 stabilizer. Remove C470-3 spacer from skid, as required. Support guard and C050-2 or G950-2 stabilizer while hardware is removed.

B. Installation

1. Refer to Figure 53-8. As required, install C470-3 spacer inside C470-1 tail skid wet with epoxy primer. Position tail skid inside C043-1 lower vertical stabilizer, position D081-4 block assembly and install hardware securing block assembly to stabilizer but do not torque at this time.
2. Position D079-1 guard assembly and D081-2 block, install hardware securing block to stabilizer. Verify D081-2 & -4 blocks clamp guard sleeve. For proper guard-to-stabilizer clamping, first standard torque hardware securing tail skid per § 20-32, then special torque screw securing D081-2 block to D081-4 block per § 20-33. Torque stripe fasteners per Figure 5-1.

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