

CHAPTER 55

STABILIZERS

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STABILIZERS - DESCRIPTION/OPERATION

1. General

The horizontal and vertical stabilizers are the fixed empennage structures to which the elevators and rudder are connected. In addition to providing attachment points for the control surfaces, the stabilizers assist in ensuring directional and longitudinal stability of the aircraft.

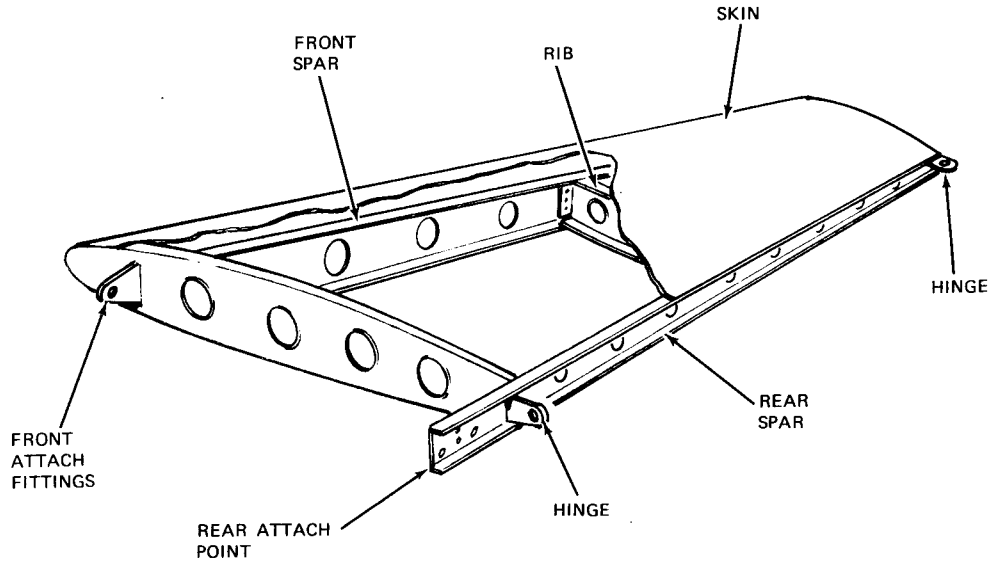
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HORIZONTAL STABILIZERS - DESCRIPTION/OPERATION

1. General (See Figure 1 and 2.)

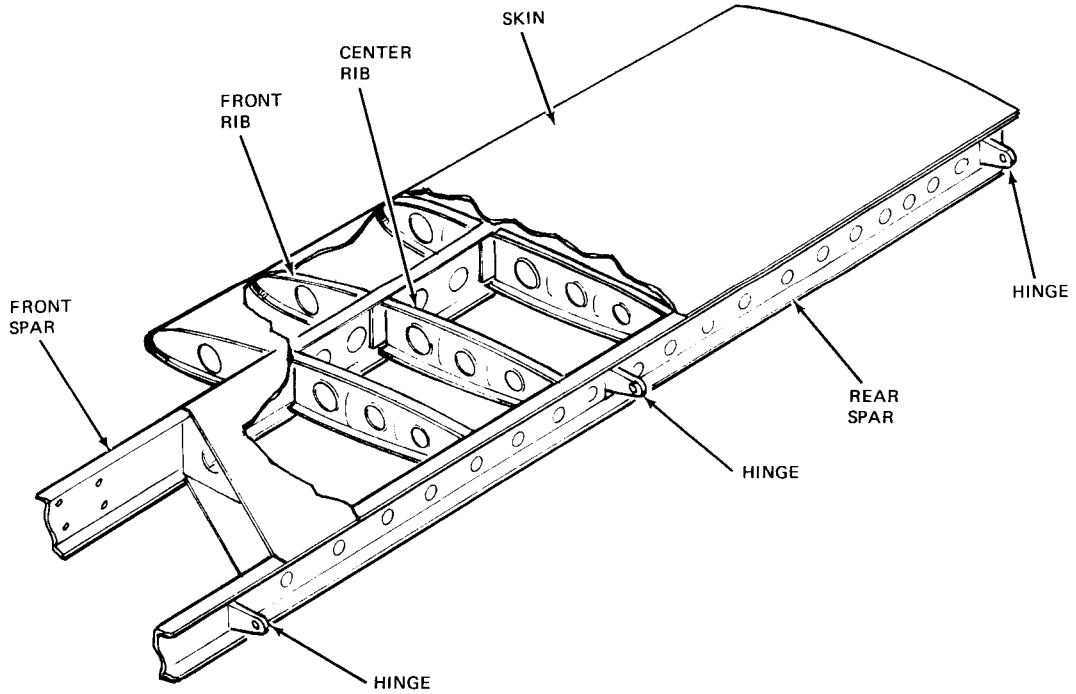
The horizontal stabilizers are of conventional dual spar and rib structure, with the skin bonded to the ribs and spars. On the AA-5 aircraft, the horizontal stabilizer has a tapered chord, wider at the root than the tip. On AA-5A and AA-5B aircraft the horizontal stabilizer is of constant chord configuration.

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Horizontal Stabilizer (AA-5)
Figure 1



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Horizontal Stabilizer (AA-5A and AA-5B)
Figure 2

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HORIZONTAL STABILIZERS - MAINTENANCE PRACTICES

1. Removal/Installation

A. Horizontal Stabilizer Removal (AA-5 Aircraft). (See Figure 201.)

NOTE: The horizontal stabilizer can be removed as an assembly with trim tabs and elevator intact, or by a disassembly procedure, whichever is required. If the trim tabs or elevators are being replaced, this can be accomplished without removing the stabilizer. However, if the right or left stabilizer half is being replaced, it may be advantageous to remove the stabilizer as an assembly. For complete stabilizer assembly removal, the following procedure may be used:

- (1) Remove tailcone and aft fuselage inspection covers below vertical fin. Refer to Chapter 53.
- (2) Disconnect elevator control cables and trim lever. Refer to Chapter 27.
- (3) Remove nuts (1), washers (2), and bolts (3) securing bearing (4).
- (4) Loosen lock nuts (5) and remove elevator stop bolts (6).

NOTE: Before removing horizontal stabilizer mounting bolts place stands beneath horizontal stabilizer to prevent its falling.

- (5) Remove forward attachment bolt (7) and washer (8).
- (6) Remove rear attachment bolts (9) and washers (10).
- (7) Spread stabilizer assembly apart at forward edge, just enough to free forward attaching lugs from fuselage and remove assembly from rear of aircraft.
- (8) When stabilizer is removed note position of shim (11) and spacers (12), in relation to spar stiffener flange (13).

NOTE: If only one side of the horizontal stabilizer is to be removed, proceed as follows:

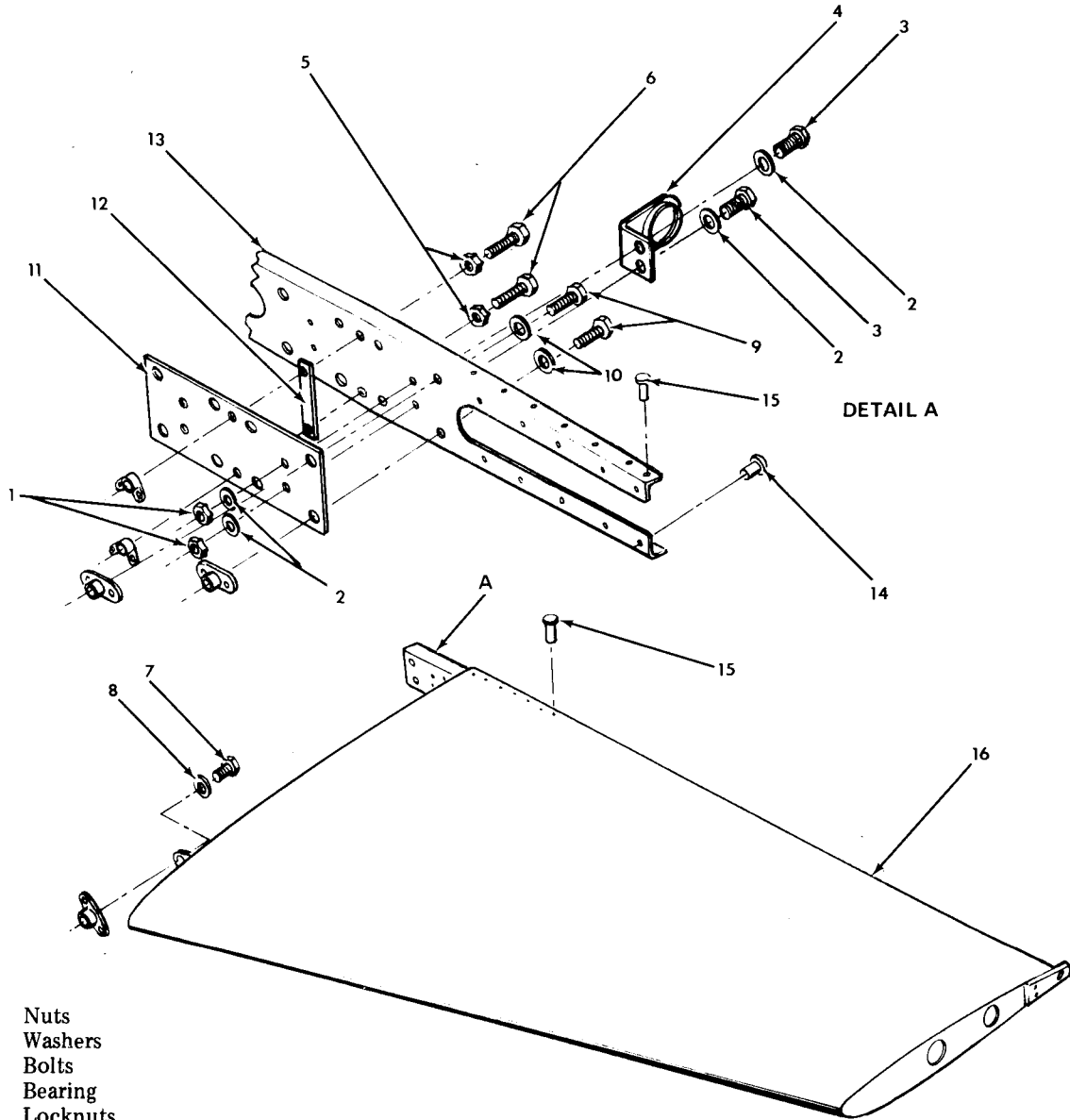
- (9) Remove appropriate elevator. Refer to Chapter 27.
- (10) Remove appropriate aft fuselage inspection cover below vertical fin. Refer to Chapter 53.
- (11) Remove forward attach bolt (7) and washer (8).
- (12) Use a number 30 drill to drill out the ten rivets (14) and fourteen rivets (15) securing spar stiffener flange (13) to horizontal stabilizer (16).
- (13) Pull stabilizer (16) from aircraft.

B. Horizontal Stabilizer Installation (AA-5 Aircraft). (See Figure 201.)

NOTE: The horizontal stabilizer can be installed as an assembly with trim tabs and elevator intact, or by build-up, whichever is required. If the right or left stabilizer half is being replaced it may be advantageous to install the stabilizer as an assembly. For complete stabilizer assembly installation, the following procedure may be used:

- (1) Position stabilizer in its installed location and spread assembly apart at forward edge enough to allow forward attaching lugs to enter access openings in fuselage.

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1. Nuts
2. Washers
3. Bolts
4. Bearing
5. Locknuts
6. Stop Bolts
7. Bolt
8. Washer
9. Attach Bolts
10. Washers
11. Shim
12. Spacers
13. Flange
14. Rivets
15. Rivets
16. Stabilizer

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Horizontal Stabilizer Removal/Installation (AA-5 Aircraft)
Figure 201

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- (2) Secure forward attaching lugs to fuselage with bolts (7) and washers (8). Torque to standard value. (Refer to Chapter 91.)
- (3) Position shim (11) and spacers (12) between spar stiffener flange (13) and fuselage aft bulkhead.
- (4) Align bolt holes and secure with bolts (9) and washers (10). Torque to standard value. (Refer to Chapter 91.)
- (5) Screw lock nuts (5) on bolts (6) and install bolts (6). Do not tighten bolts.
- (6) Align bearing (4) mounting holes with holes in spar stiffener flange (13). Secure with bolts (3), washers (2), and nuts (1). Torque to standard value. (Refer to Chapter 91.)
- (7) Connect elevator controls and rig. (Refer to Chapter 27.)
- (8) Install aft fuselage inspection covers and tailcone. (Refer to Chapter 53.)

NOTE: If only one side of the horizontal stabilizer is to be removed, proceed as follows:

- (9) Position horizontal stabilizer on spar stiffener flange and secure with ten rivets (14) (Part Number MS-20470AD4-5) and fourteen rivets (15) (Part Number MS-20426AD4-5).
- (10) Secure attaching lug to fuselage with bolt (7) and washer (8). Torque to standard value. (Refer to Chapter 91.)
- (11) Connect elevator controls and rig. (Refer to Chapter 27.)
- (12) Install aft fuselage inspection covers and tailcone. (Refer to Chapter 53.)

C. Horizontal Stabilizer Removal (AA-5A and AA-5B Aircraft). (See Figure 202.)

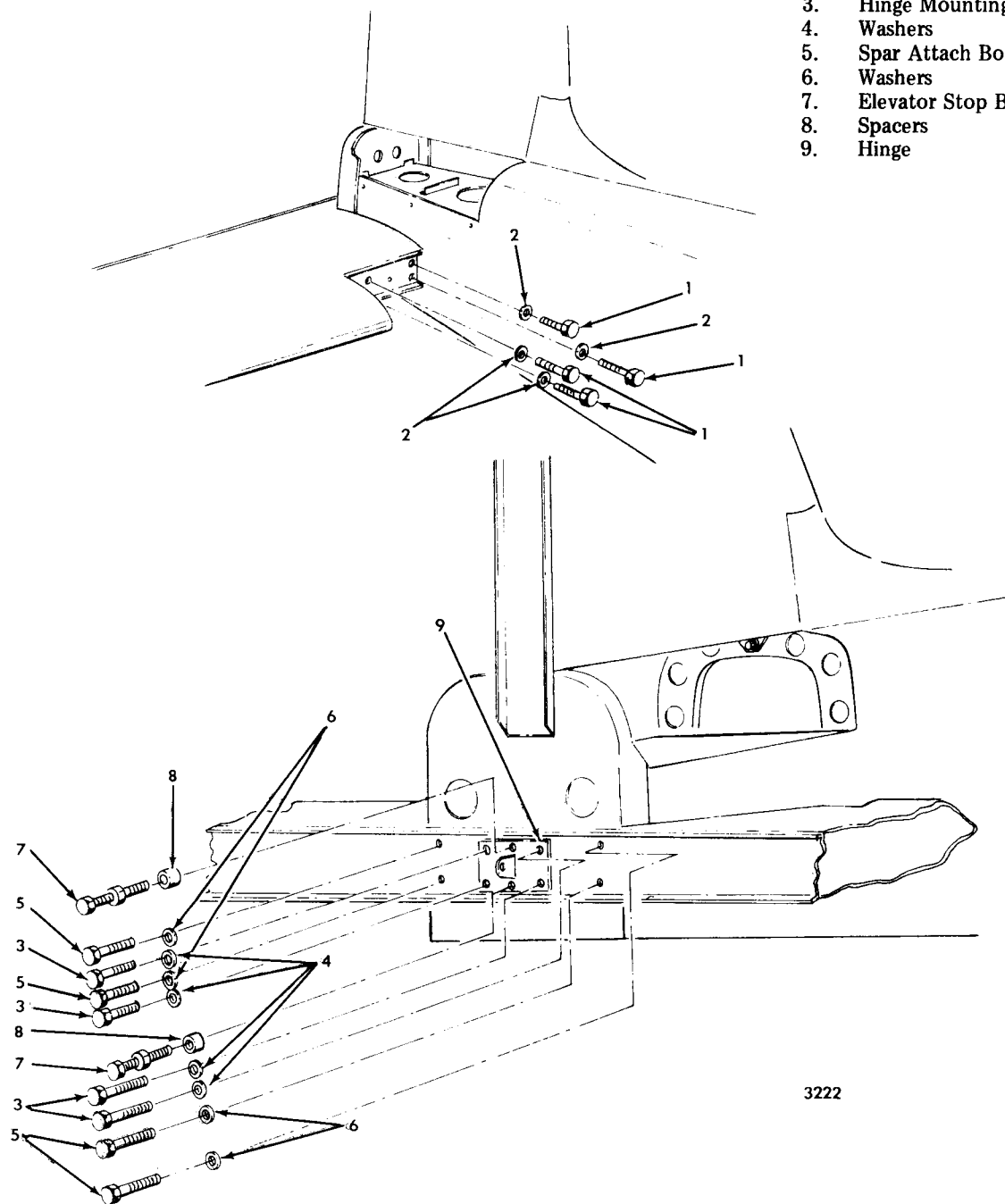
NOTE: The horizontal stabilizer can be removed as an assembly with trim tabs and elevator intact, or by a disassembly procedure, whichever is required. If the trim tabs or elevators are being replaced, this can be accomplished without removing the stabilizer, elevators, and trim tabs as an assembly. For complete stabilizer assembly removal, the following procedure may be used:

- (1) Remove tailcone and aft fuselage inspection covers below vertical fin. (Refer to Chapter 53.)
- (2) Disconnect elevator control cables and trim lever. (Refer to Chapter 27.)
- (3) Remove horizontal stabilizer fairings. (Refer to Chapter 53.)
- (4) Remove forward mounting bolts (1) and washers (2) on each side of fuselage.
- (5) Remove hinge mounting bolts (3) and washers (4).
- (6) Remove spar attach bolts (5) and washers (6).
- (7) Remove elevator stop bolts (7) and spacers (8).
- (8) Pull horizontal stabilizer aft and remove from aircraft.

D. Horizontal Stabilizer Installation (AA-5A and AA-5B Aircraft). (See Figure 202.)

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1. Forward Mounting Bolts
2. Washers
3. Hinge Mounting Bolts
4. Washers
5. Spar Attach Bolts
6. Washers
7. Elevator Stop Bolts
8. Spacers
9. Hinge



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Horizontal Stabilizer Removal/Installation (AA-5A and AA-5B Aircraft)
Figure 202

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- (1) Position horizontal stabilizer to its installed location and secure forward spar with bolts (1) and washers (2). Torque to standard value. (Refer to Chapter 91.)
- (2) Install aft spar mounting bolts (5) and washers (6). Torque to standard value. (Refer to Chapter 91.)
- (3) Position hinge (9) on aft spar and secure with bolts (3) and washers (4).
- (4) Install elevator stops (7) and spacers (8).
- (5) Connect elevator and trim linkages, and rig. (Refer to Chapter 27.)
- (6) Install tailcone, aft fuselage inspection covers and fairings. (Refer to Chapter 53.)

2. Cleaning/Painting

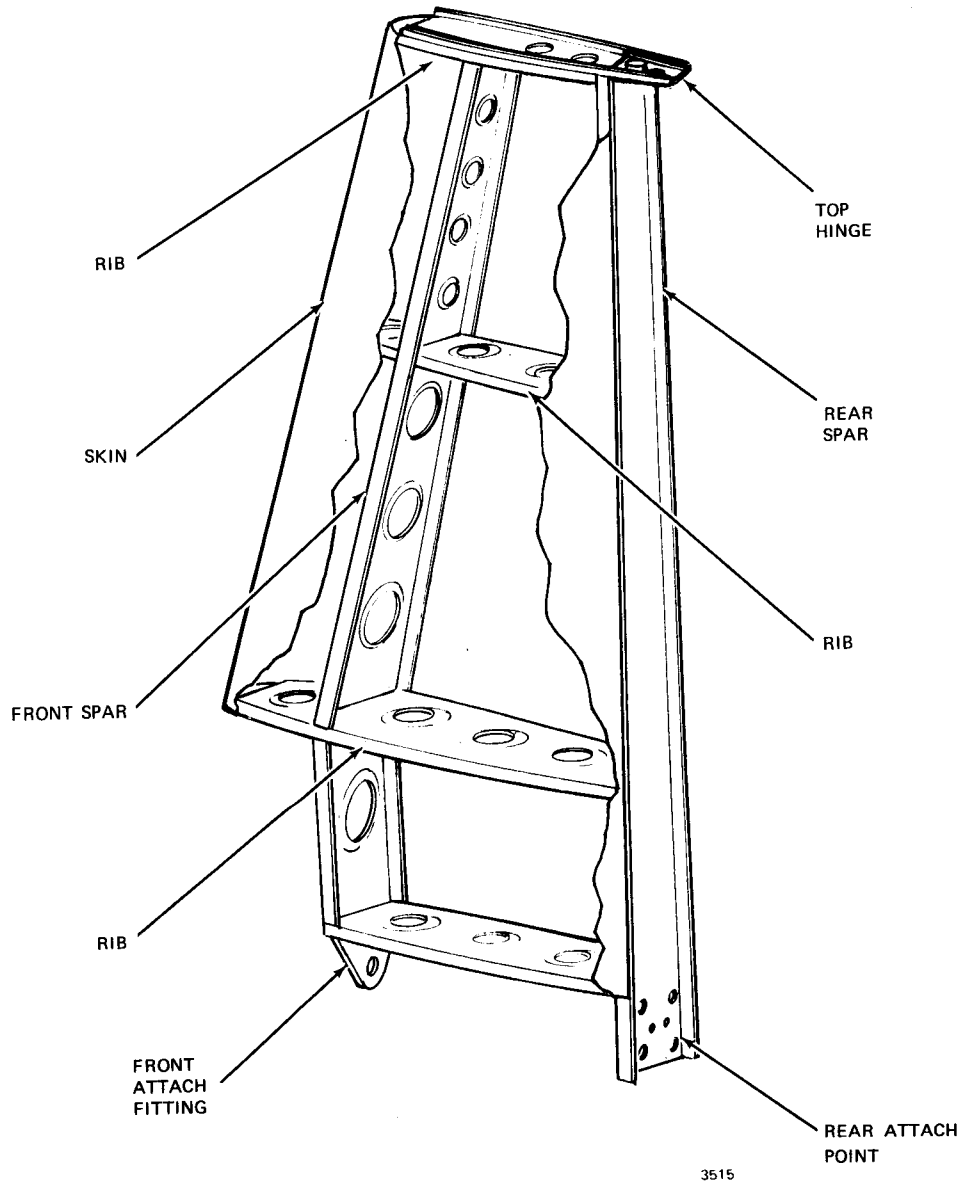
Clean and paint horizontal stabilizer. (Refer to Chapter 20.)

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VERTICAL STABILIZER - DESCRIPTION/OPERATION

1. General (See Figure 1.)

The vertical stabilizer is of conventional dual spar and rib construction, with its skin bonded to the ribs and spars. It has a tapered chord, with its maximum chord at the root, and its minimum chord at the tip.



Vertical Stabilizer
Figure 1

VERTICAL STABILIZER - MAINTENANCE PRACTICES

1. Removal/Installation

A. Vertical Stabilizer Removal (See Figure 201.)

NOTE: The vertical stabilizer can be removed as an assembly with rudder intact, or by a disassembly procedure, whichever is required. If the rudder is being replaced this can be accomplished without removing the vertical stabilizer. (Refer to Chapter 27 for rudder removal.) for stabilizer and rudder removal as an assembly, proceed as follows:

- (1) Remove tailcone and aft fuselage inspection covers. (Refer to Chapter 53.)
- (2) Disconnect rudder cables. (Refer to Chapter 27.)
- (3) Remove front attachment bolt (1) and washer (2).
- (4) Remove aft attachment bolts (3) and washers (4).
- (5) Disconnect antenna and rotating beacon wiring. (Refer to Chapter 27.)
- (6) Remove vertical stabilizer and rudder from aircraft.

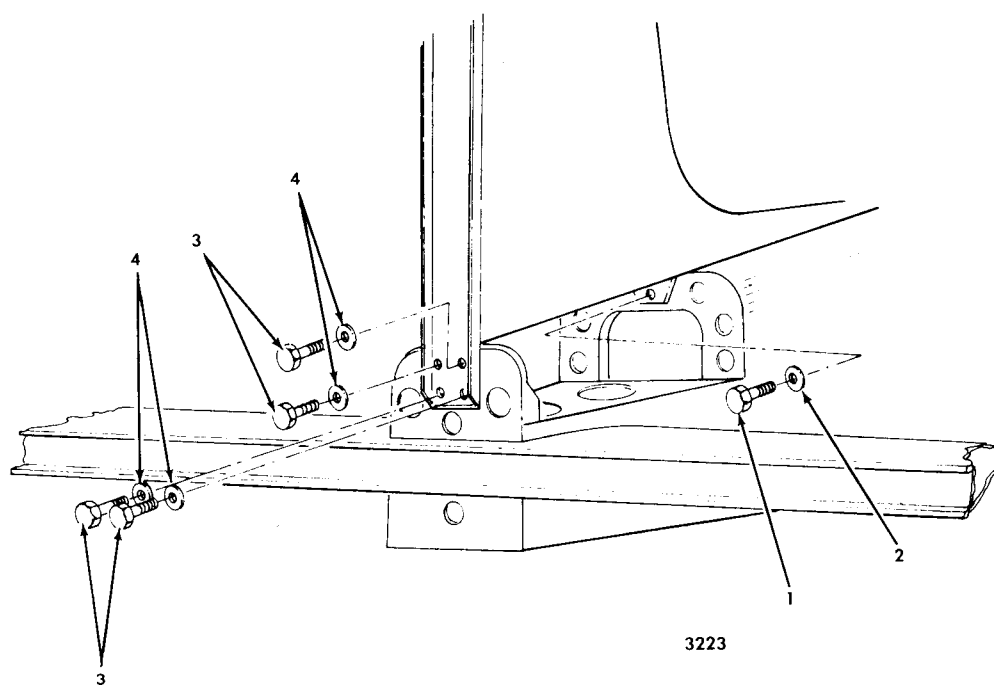
B. Vertical Stabilizer Installation (See Figure 201.)

- (1) Position vertical stabilizer and rudder on aircraft so that its rear mounting holes are aligned with those in fuselage. Secure with rear mounting bolts (3) and washers (4). Torque to standard value. (Refer to Chapter 91.)
- (2) Align hole in forward mount with hole in fuselage. Secure with bolt (1) and washer (2). Torque to standard value. (Refer to Chapter 91.)
- (3) Connect antenna and rotating beacon wiring. (Refer to Chapter 27.)
- (4) Connect rudder cables and rig rudder. (Refer to Chapter 27.)
- (5) Install tailcone, and aft inspection covers. (Refer to Chapter 53.)

2. Cleaning/Painting

Clean and paint vertical stabilizer. (Refer to Chapter 20.)

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1. Front Attach Bolt
2. Washer
3. Aft Attachment Bolts
4. Washers

**Vertical Stabilizer Removal/Installation
Figure 201**