



AIRCRAFT MAINTENANCE MANUAL – SYSTEM DESCRIPTION SECTION

**ON A/C ALL

55-00-00-001

STABILIZERS, GENERAL

Introduction

The stabilizers give stable attitude around the lateral (pitch) and vertical (yaw) axis of the aircraft.

General Description

Refer to Figure 1.

There are two stabilizers, a vertical and horizontal stabilizer. The vertical stabilizer is constructed as part of the aft/tail fuselage. The horizontal stabilizer is attached to the top of the vertical stabilizer. The joint between the vertical and horizontal stabilizer is covered by a removable, four piece composite construction aerodynamic fairing.

The fore rudder is attached to fittings on the aft edge of the vertical stabilizer. The elevators attach to fitting on the rear spar of the horizontal stabilizer.

Stabilizer components are made from high strength aluminum alloy.

The stabilizer has the sub-systems that follow:

- Horizontal Stabilizer (55-10-00)
- Elevator (55-20-00)
- Vertical Stabilizer (55-30-00)
- Rudder (55-40-00).

Detailed Description

The vertical and horizontal stabilizers are made of high-strength aluminum alloy. The structures use conventional spar and rib construction. The skins are stiffened with bonded stringers. The leading edges are constructed of composite material. Pneumatic deicing boots are attached to the stabilizer leading edges.

The vertical stabilizer is an airfoil that stabilizes movement of the aircraft around the vertical (yaw) axis. The rudder is a primary flight control surface that is attached to the rear spar of the vertical stabilizer.

Refer to Figures 2 and 3.

The rudder has a fore rudder and a trailing rudder. The fore rudder is attached to the vertical stabilizer rear spar, and the trailing rudder is attached to the trailing edge of the fore rudder.

Refer to Figures 4 and 5.

The horizontal stabilizer is an airfoil that stabilizes movement of the aircraft around the lateral (pitch) axis. The left and the right elevators are moveable surfaces that control the movement of the aircraft around the lateral axis.

Vertical Stabilizer

The vertical stabilizer is part of the aft/tail fuselage. The stabilizer has three vertical spars connected by horizontal ribs, and covered with skin panels. The vertical spar members are shaped at the lower end to form the integral main frames of the aft/tail fuselage. The leading edge has pneumatic deicer boots installed.



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Rudder

The rudder has a fore rudder and a trailing rudder. The fore rudder is attached to the vertical stabilizer rear spar, and the trailing rudder is attached to the trailing edge of the fore rudder. The fore rudder is moved directly by hydraulic power. Mechanical linkage transmits fore rudder movement to the trailing rudder. Both rudders are constructed of spars and profile ribs covered by skin panels.

Horizontal Stabilizer

The fixed incidence horizontal stabilizer has a front, mid and rear spar connected by profile ribs and covered with skin panels stiffened by riveted stringers. Each of the three spars has two fittings for attachment of the horizontal stabilizer at the upper end of the vertical stabilizer. Hinge arms for the elevators are attached to the rear spar and adjacent ribs. Leading edges are of a composite construction in two sections per side, installed with locators to prevent incorrect installation, and have pneumatic deicer boots installed.

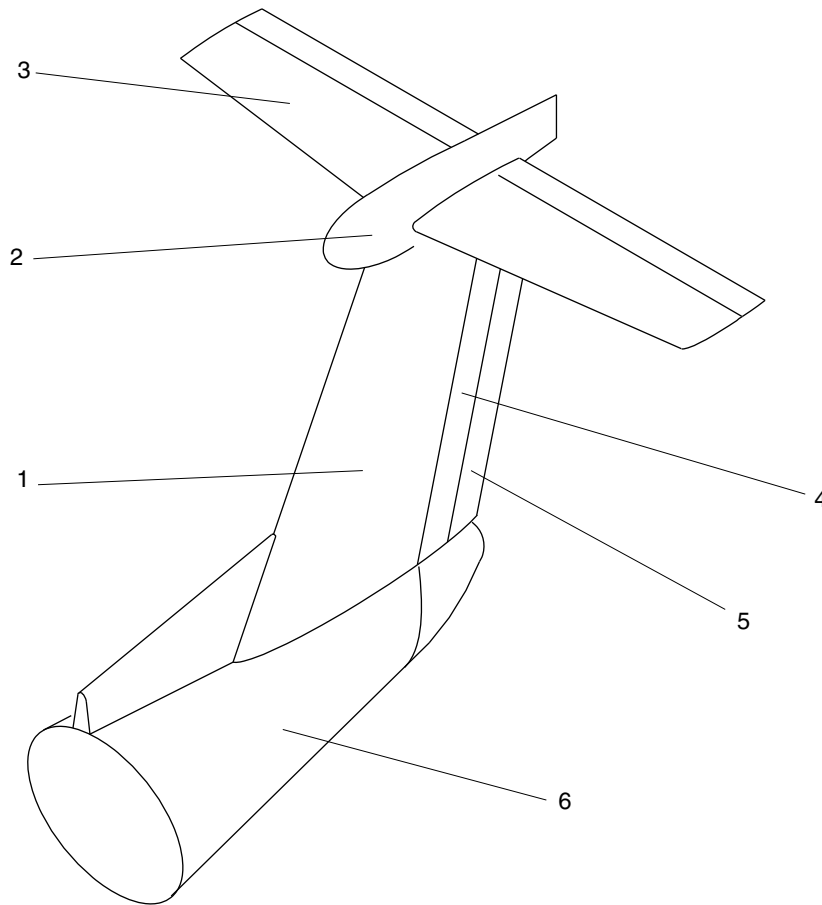
Elevators

The left and right elevators has a main and rear spar interconnected by profile ribs and covered by skin panels. The inboard half of the elevator also incorporates a front spar installed with a leading edge sealing strip. The elevators are moved directly by hydraulic power.



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LEGEND

- 1. Vertical Stabilizer.
- 2. Stabilizer Fin Fairing.
- 3. Horizontal Stabilizer.
- 4. Fore Rudder.
- 5. Trailing Rudder.
- 6. Rear Fuselage Section.

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STABILIZERS – GENERAL LAYOUT
Figure 1

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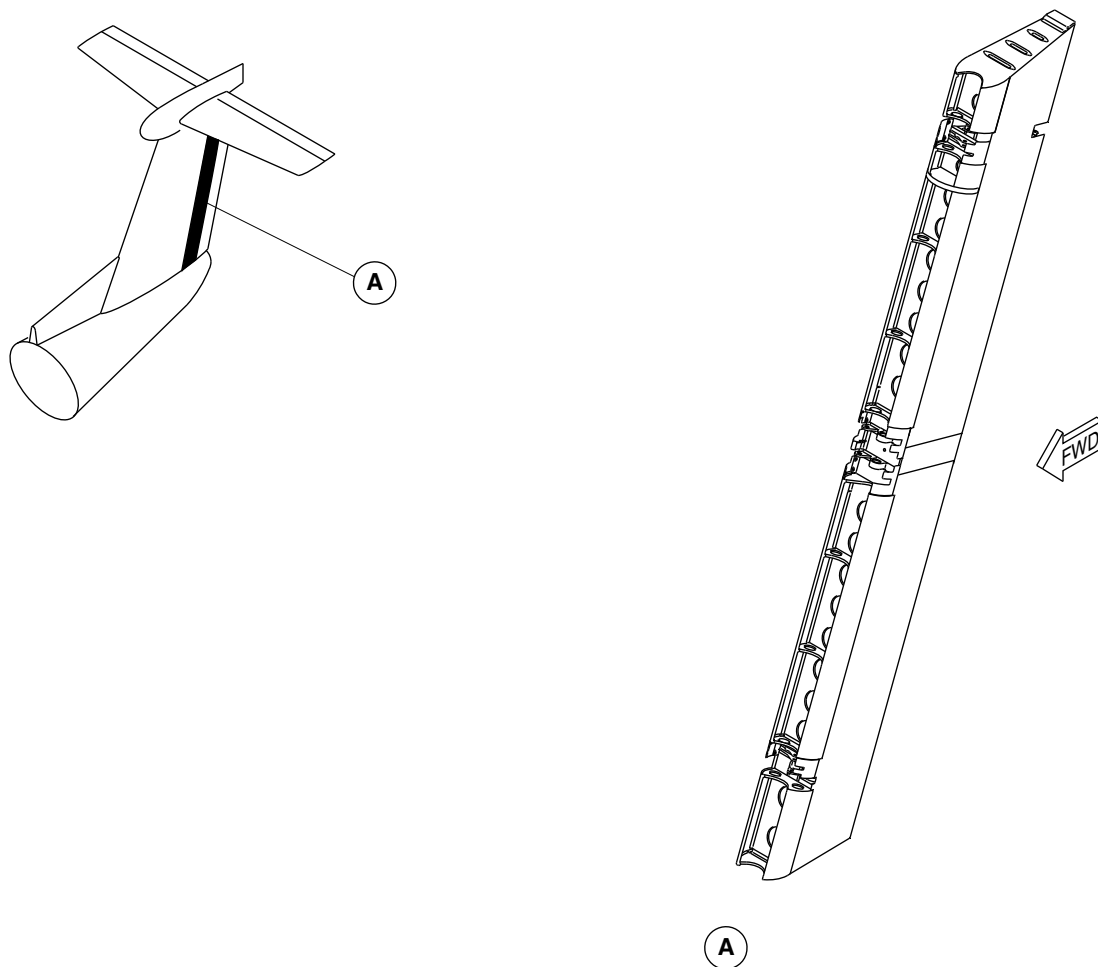
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FORE RUDDER LOCATOR
Figure 2

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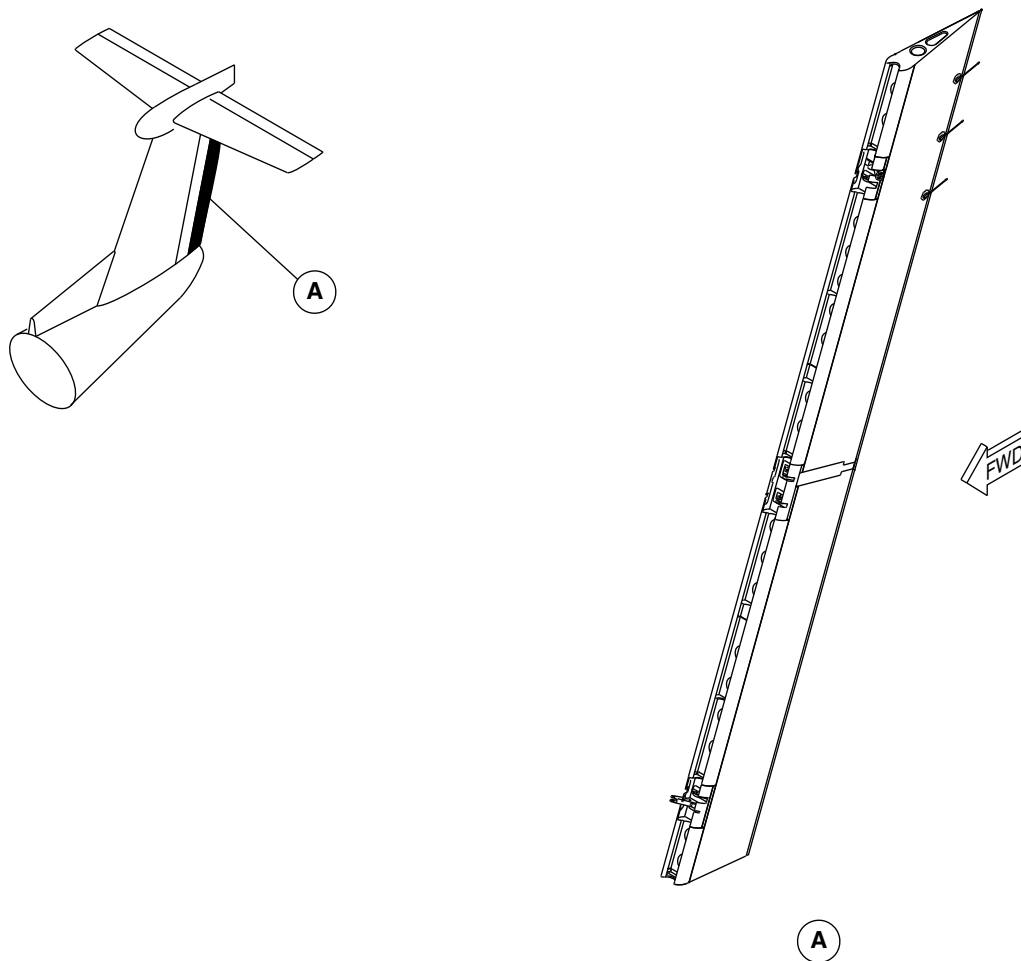
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TRAILING RUDDER LOCATOR
Figure 3

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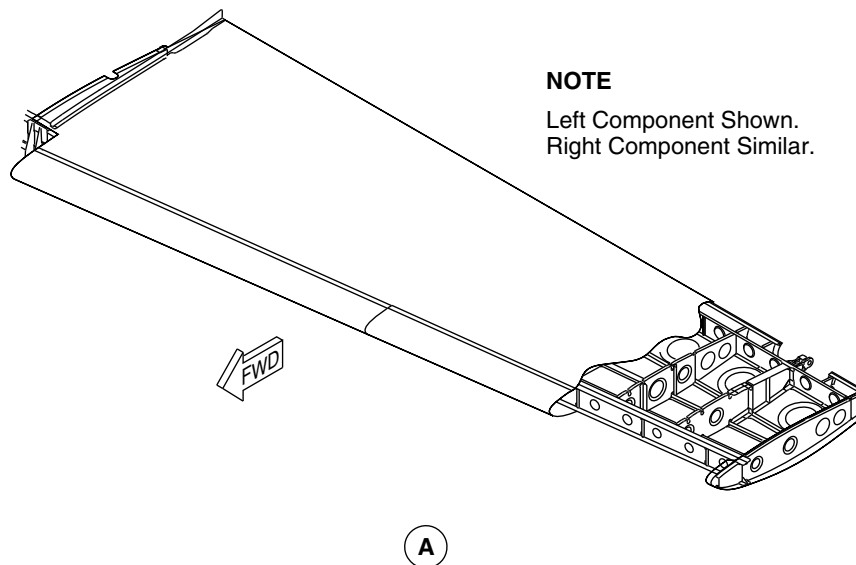
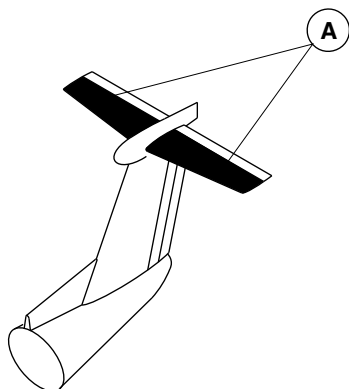
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HORIZONTAL STABILIZER LOCATOR
Figure 4

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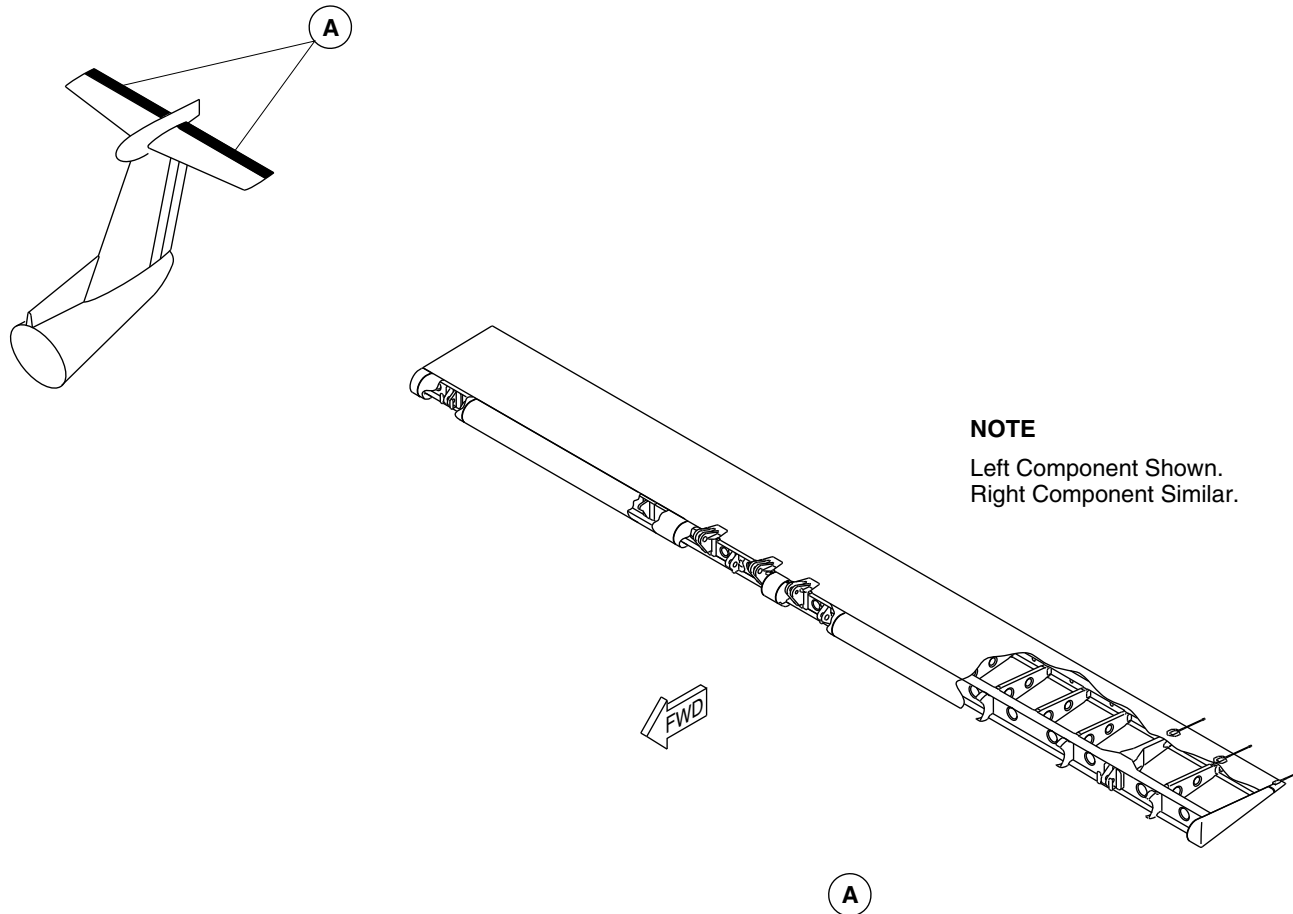
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ELEVATOR LOCATOR
Figure 5

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55–10–00–001

HORIZONTAL STABILIZER

Introduction

The horizontal stabilizer is an airfoil that stabilizes movement of the aircraft around the lateral (pitch) axis.

General Description

The horizontal stabilizer has the structures that follow:

- Box Structure
- Horizontal Stabilizer Leading Edge (55–13–00)
- Tip Fairing Structure
- Elevator Attachment
- Horizontal Stabilizer Access Panels (55–11–00).

Detailed Description

[Refer to Figures 1 and 2.](#)

The fixed incidence horizontal stabilizer has front, mid, rear and auxiliary spars. They are connected to each other by profile ribs and covered with skin panels stiffened by riveted stringers. Each front, mid and rear spar has two fittings for attachment of the horizontal stabilizer at the upper end of the vertical stabilizer. Hinge arms for the elevators are attached to the rear spar and adjacent ribs. Leading edges are of composite construction and have two sections

per side. The leading edges are fitted with locators to prevent incorrect installation and have pneumatic deicer boots installed.

Box Structure

The box structure is the primary structure of the horizontal stabilizer. It is formed by front and rear spars, and 16 ribs. The top and bottom skin panels are the covers for the box structure. Spanwise stringers give stiffness to the skin panels.

The box structure is made from machined and formed aluminum–alloy materials. The skin panels are made from aluminum alloy sheet, clad on the outer surface, and chem–milled on the bare inner surface. The front and rear spar caps are made from aluminum alloy extrusions. The spar webs and formed members such as some of the ribs and small parts are made from clad aluminum–alloy sheet. Machined fittings and some of the ribs are made from aluminum alloy forgings.

Horizontal Stabilizer Leading Edge

The horizontal stabilizer leading edges are of a composite construction in two sections per side, installed with locators to prevent incorrect installation, and have pneumatic deicer boots installed.

Tip Fairing Structure

The tip fairing structure is a cover for each end of the horizontal stabilizer. The tip fairing structure is attached to the box structure and to the leading edge assemblies with countersunk–head screws.

The tip fairing is also called as the wing tip. The discharger with discharger base is installed on the strap and the strap is bonded to



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the wing tip with the adhesive. The dischargers are installed one on each wing tip. The dischargers dissipate electrostatic charges from the aircraft structure to the surrounding air, to minimize radio interference caused by these charges. Each static discharger consists of a resistive coated fibre glass rod with a pellet of composite carbon-based material at the tip.

Elevator Attachment

Four attachment hinges for each elevator are installed on the auxiliary spar on each side of the horizontal stabilizer. The hinges are machined from aluminum alloy forgings.

Horizontal Stabilizer Access Panels

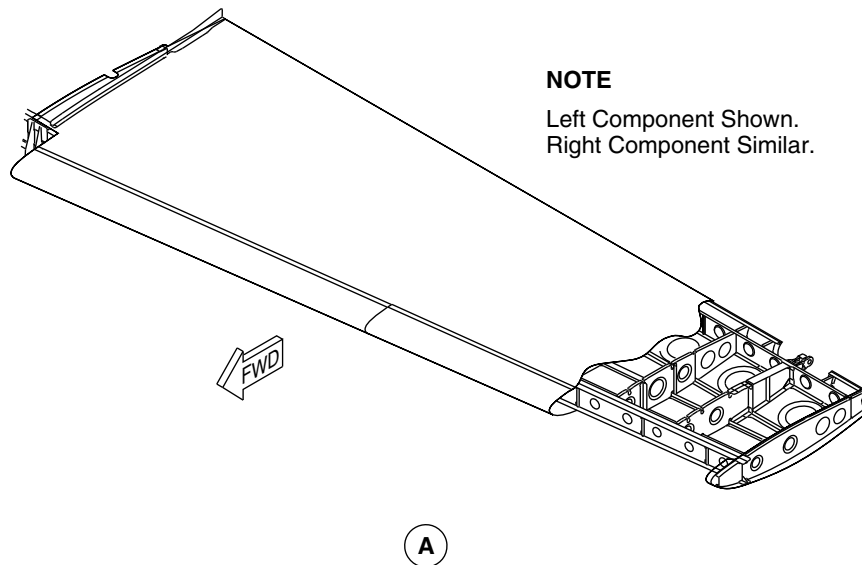
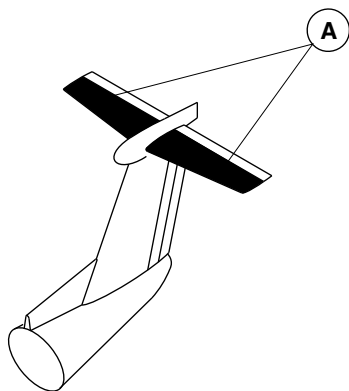
[Refer to Figures 3 and 4.](#)

Thirteen access panels are installed on the bottom skin on each side of the horizontal stabilizer. The access panels give access to the deice lines and the elevator control system.



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NOTE

Left Component Shown.
Right Component Similar.

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HORIZONTAL STABILIZER LOCATOR
Figure 1

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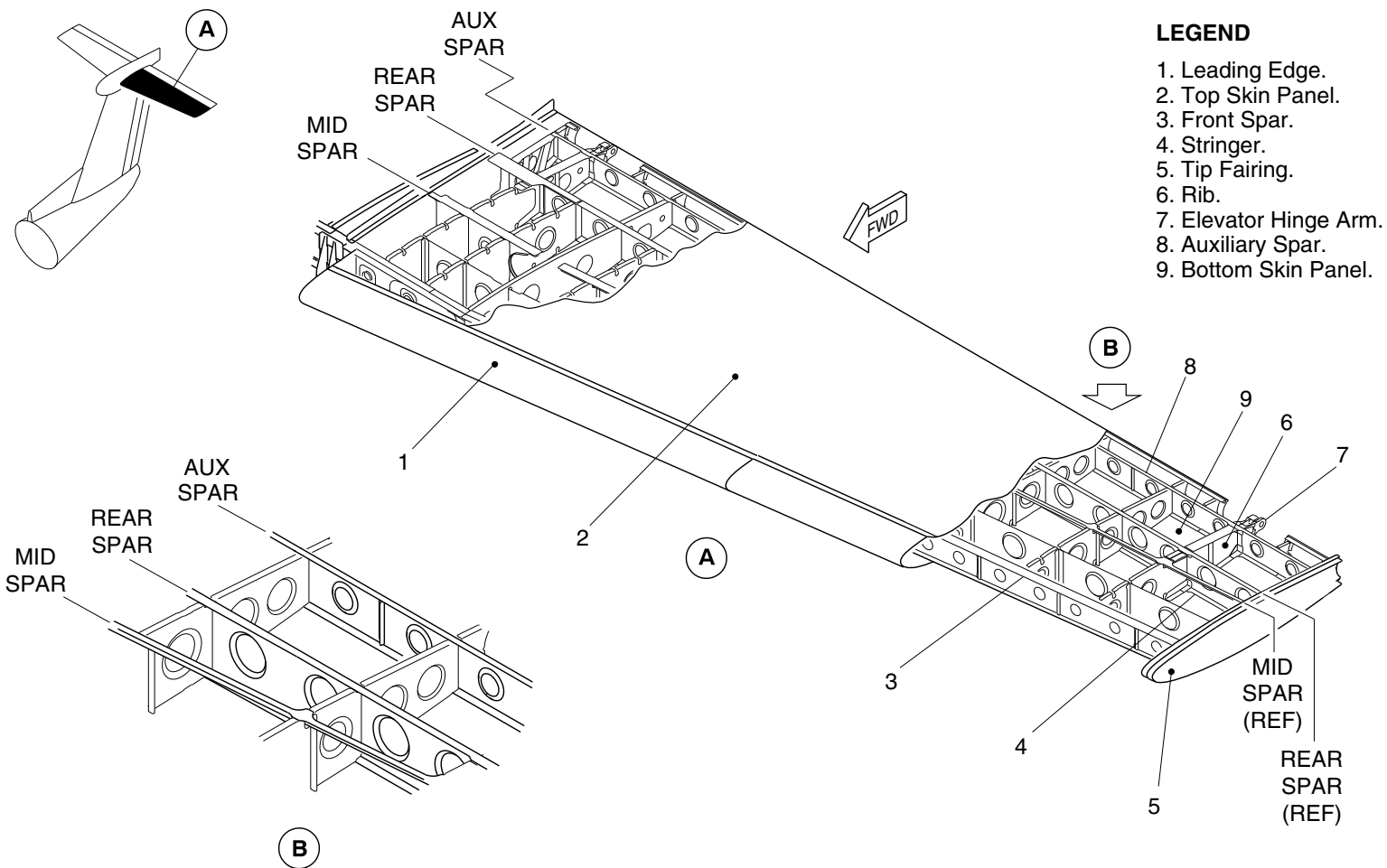
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Horizontal Stabilizer Detail
Figure 2 (Sheet 1 of 2)

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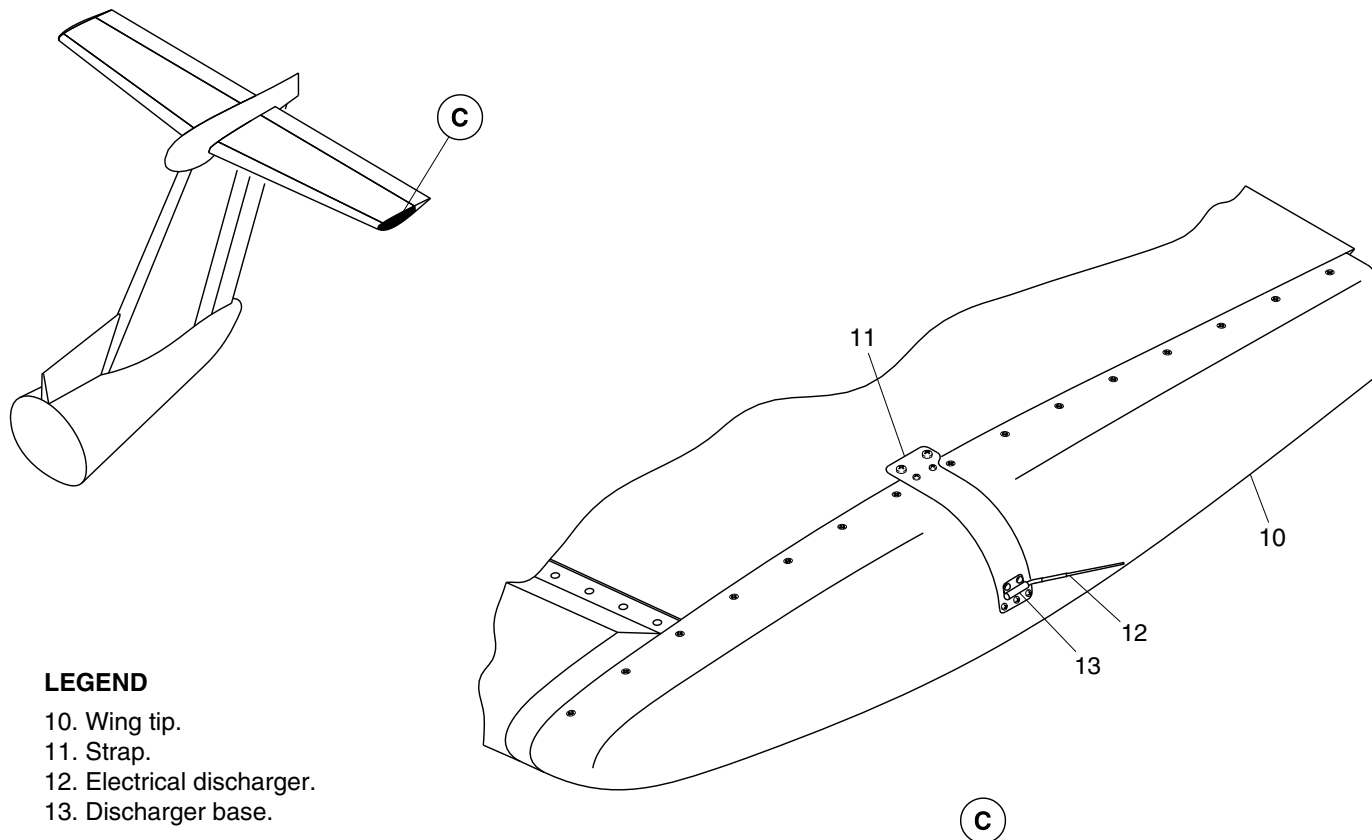
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Horizontal Stabilizer Detail
Figure 2 (Sheet 2 of 2)

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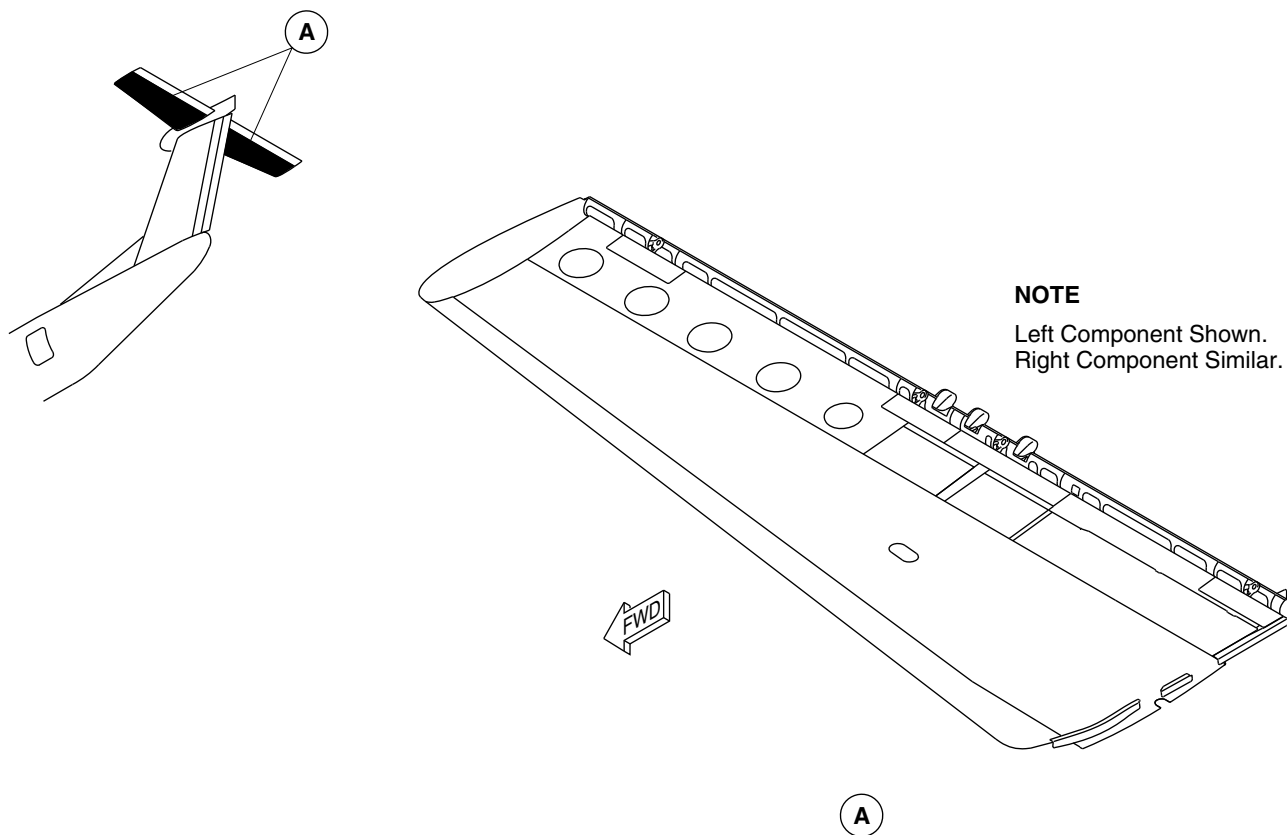
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HORIZONTAL STABILIZER ACCESS PANELS LOCATOR
Figure 3

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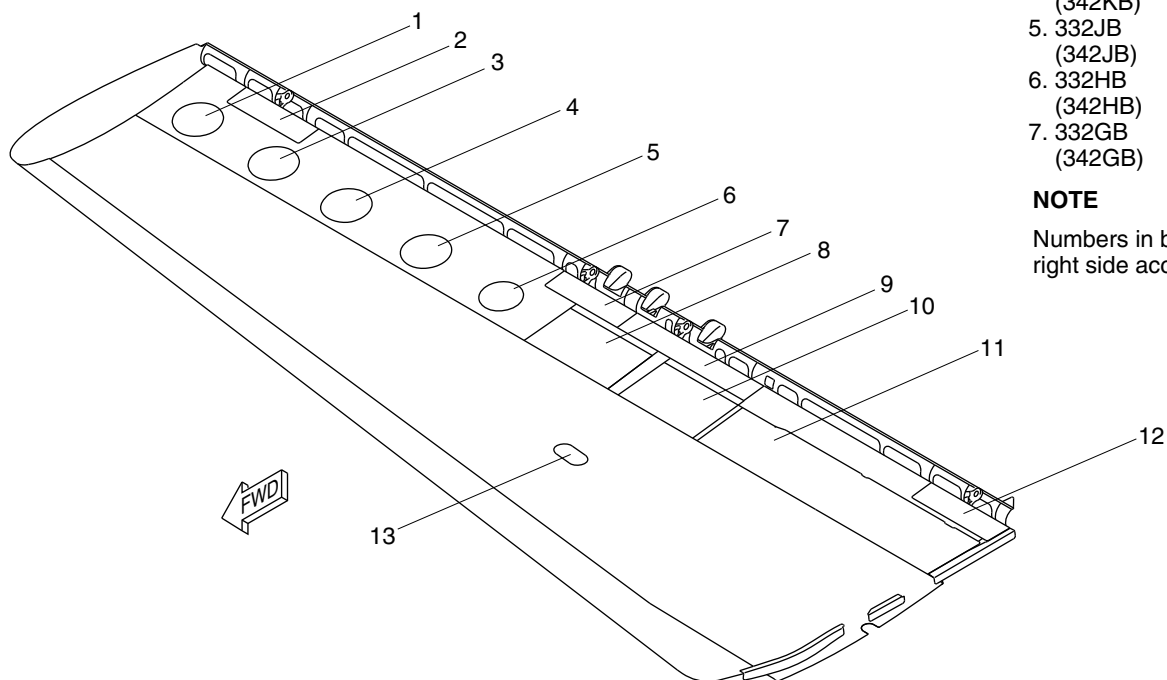
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LEGEND

- | | |
|---------------------|----------------------|
| 1. 332MB
(342MB) | 8. 332EB
(342EB) |
| 2. 332NB
(342NB) | 9. 332FB
(342FB) |
| 3. 332LB
(342LB) | 10. 332DB
(342DB) |
| 4. 332KB
(342KB) | 11. 332BB
(342BB) |
| 5. 332JB
(342JB) | 12. 332CB
(342CB) |
| 6. 332HB
(342HB) | 13. 332AB
(342AB) |
| 7. 332GB
(342GB) | |

NOTE

Numbers in brackets indicate
right side access panels.



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HORIZONTAL STABILIZER ACCESS PANELS DETAIL
Figure 4

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ELEVATOR

Introduction

The left and the right elevators are moveable flight control surfaces that control the movement of the aircraft around the lateral axis.

General Description

The left and the right elevators are installed on the trailing edge of each side of the horizontal stabilizer. The elevators are attached to the horizontal stabilizer by hinges.

The elevators include the structures that follow:

- Box Structure
- Elevator Attachment
- Elevator Power Control Unit (PCU) and Linear Variable Differential Transformer (LVDT) Attachment
- Elevator Access Panels (55–21–00).

Detailed Description

[Refer to Figures 1 and 2.](#)

The left and right elevators each have a main and rear spar connected by profile ribs and covered by skin panels. The inboard half of the elevator also has a front spar fitted with a leading edge sealing strip.

The elevator are attached to the horizontal stabilizer, by four hinges using low torque plain roller bearings. There is an inboard and an outboard hinge fitting and two more hinge fittings near the centre of the front spar. The three PCU attachment fittings are located near the centre hinge points. The LVDT attachment fitting is located near the inboard PCU attachment point (refer to SDS 27–34–00).

Box Structure

[Refer to Figures 1 and 2.](#)

Each elevator has 28 ribs installed between the front and rear spars to make a box structure. The top and bottom skin panels are covers for the box structure. The skin panels are joined together aft of the rear spar by a spanwise trailing edge member. Each skin panel extends forward of the front spar but not fully over the elevator nose area. Static dischargers are attached to the trailing edge, near the outboard end of each elevator.

The spars, ribs, skins and trailing edge member are made from clad aluminum alloy sheet. The aluminum used to make the skins is chem-milled.

Elevator Attachment

[Refer to Figures 3 and 4.](#)

Each elevator is attached to the horizontal stabilizer by four hinge fittings. Each hinge fitting is made from aluminum alloy forgings. The hinge fittings are installed on the forward face of the front spar. The hinge fittings have forked lugs and are located: one at the inboard end, two in the centre and one at the outboard end.



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Elevator PCU and LVDT Attachment

[Refer to Figure 5.](#)

Three PCU attachment fittings are located on the forward face of the front spar near the centre of the elevator. An LVDT attachment fitting is installed on the front spar just inboard of the PCU fittings. All the fittings are machined from aluminum alloy forgings.

Elevator Access Panels

[Refer to Figure 6.](#)

Five panels on the forward edge of each elevator give access to the hinge, actuator and LVDT attachment points. The access panels are made from clad aluminum alloy sheet.

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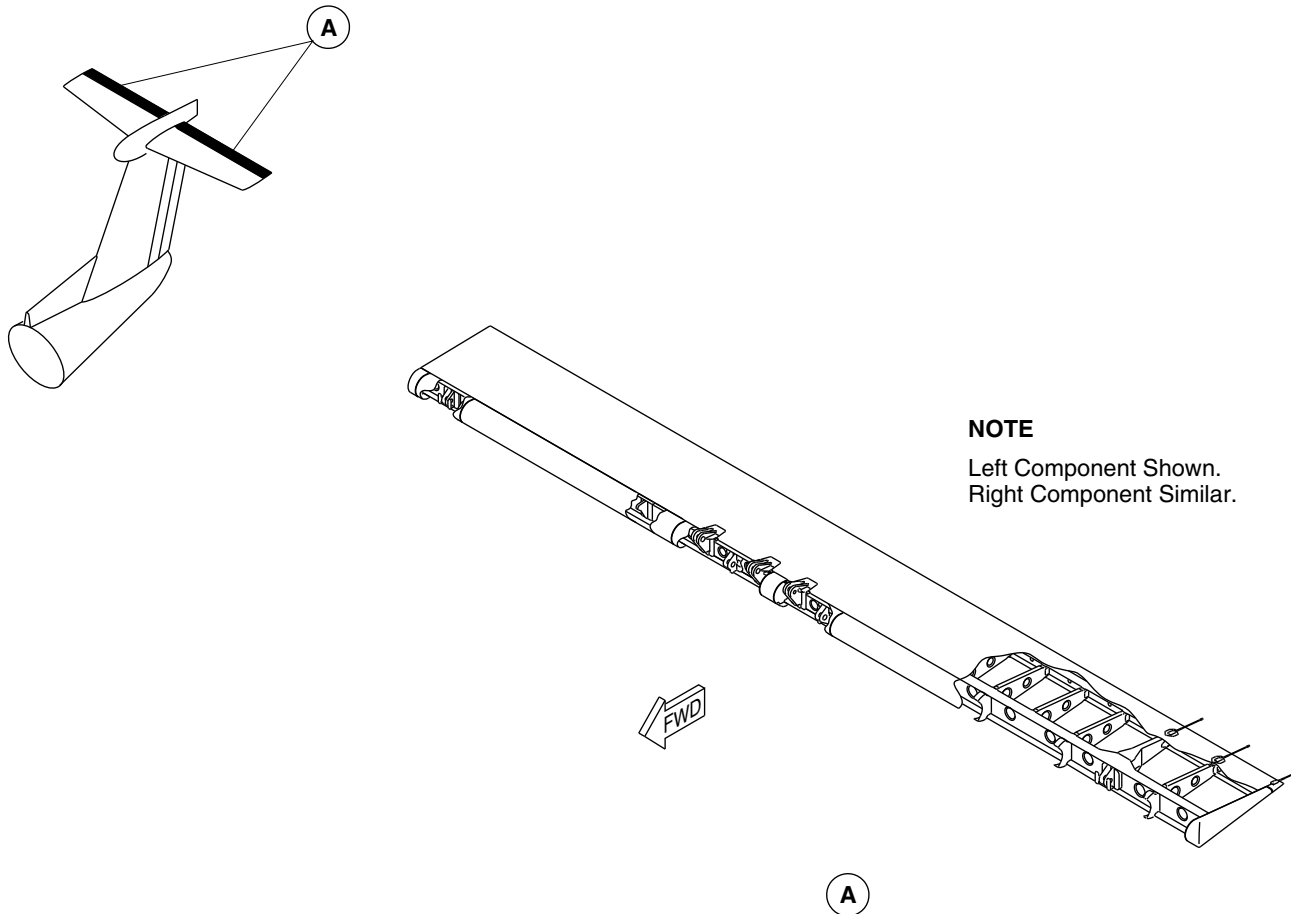
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ELEVATOR LOCATOR
Figure 1

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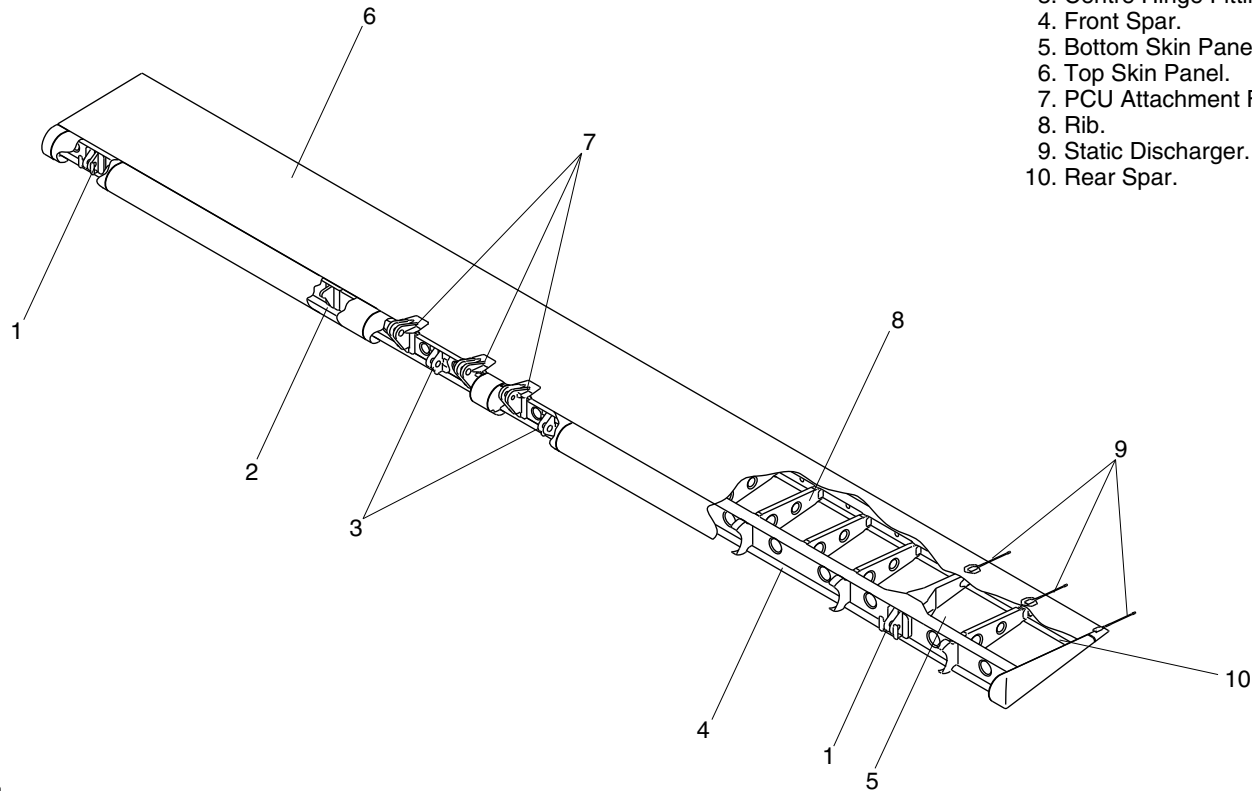


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LEGEND

1. Hinge Fitting.
2. LVDT Fitting.
3. Centre Hinge Fitting.
4. Front Spar.
5. Bottom Skin Panel.
6. Top Skin Panel.
7. PCU Attachment Fitting.
8. Rib.
9. Static Discharger.
10. Rear Spar.



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ELEVATOR DETAIL
Figure 2

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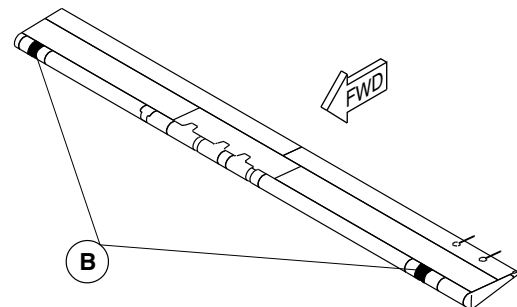
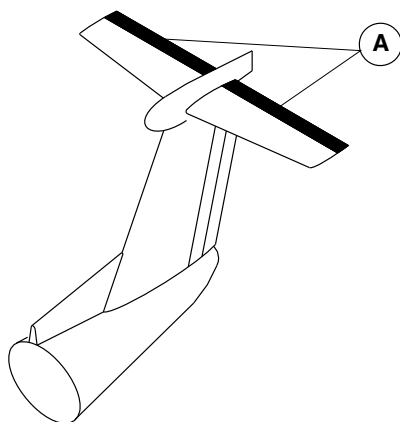
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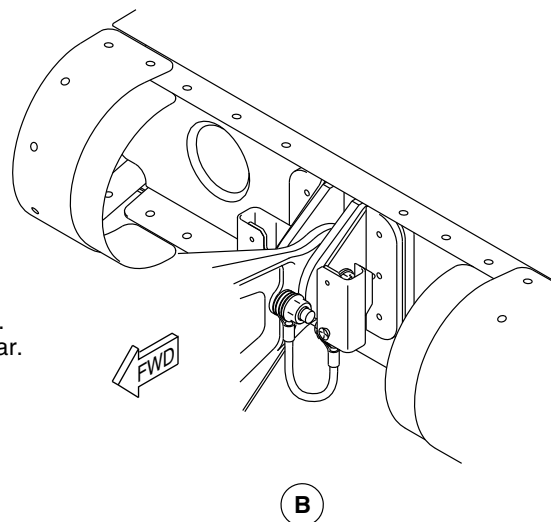
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A ELEVATOR SURFACE

- NOTE**
- 1 Inboard Component Shown.
Outboard Component Similar.
 - 2 Left Elevator Shown.
Right Elevator Similar.



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INBOARD / OUTBOARD ELEVATOR HINGES
Figure 3

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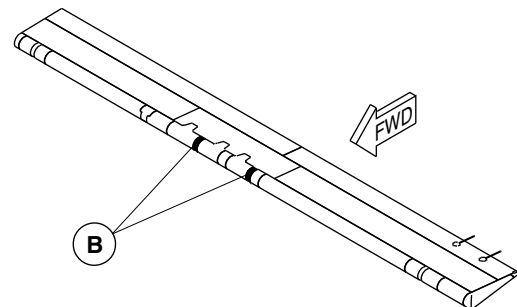
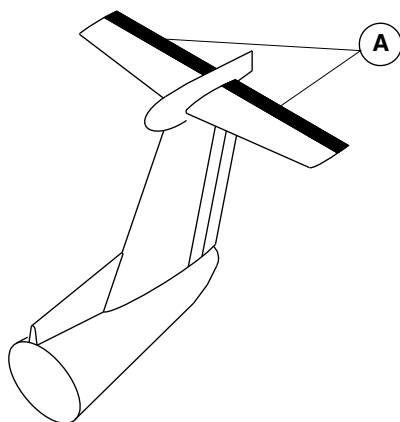
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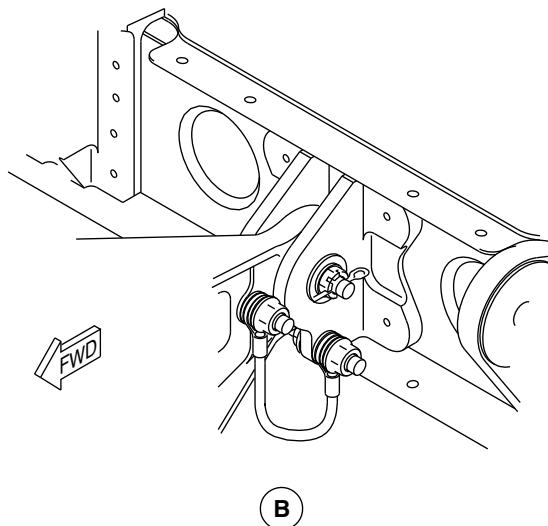
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A ELEVATOR SURFACE

NOTE

- 1 Inboard Component Shown.
Outboard Component Similar.
- 2 Left Elevator Shown.
Right Elevator Similar.



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ELEVATOR CENTRE HINGES
Figure 4

PSM 1-84-2A
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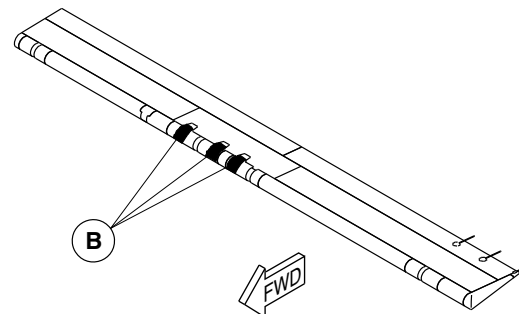
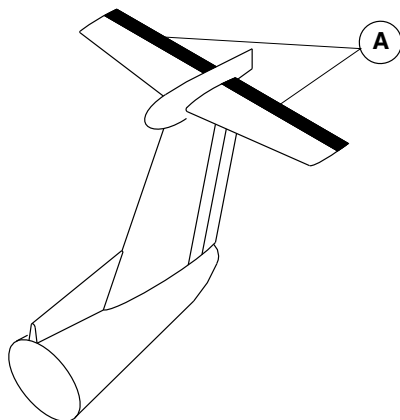
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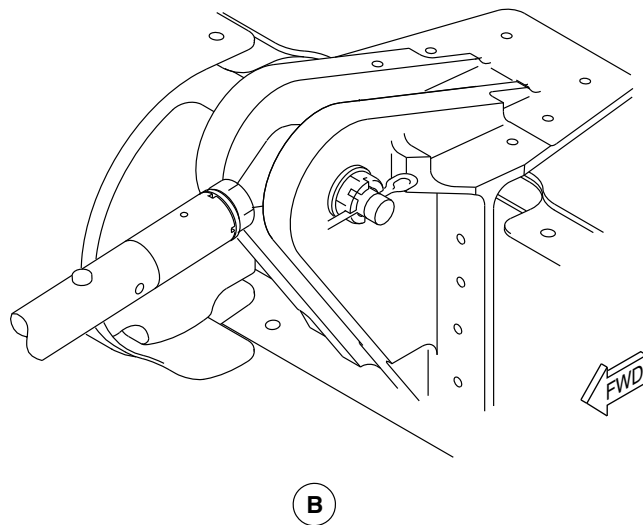


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A ELEVATOR SURFACE



- NOTE**
- 1 Inboard Component Shown.
Centre and Outboard
Components Similar.
 - 2 Left Elevator Shown.
Right Elevator Similar.

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ELEVATOR PCU FITTINGS
Figure 5

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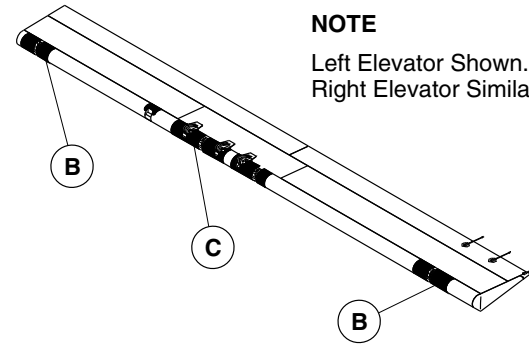
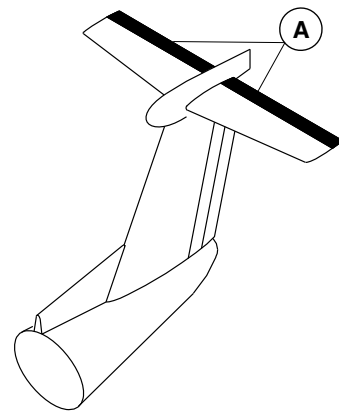
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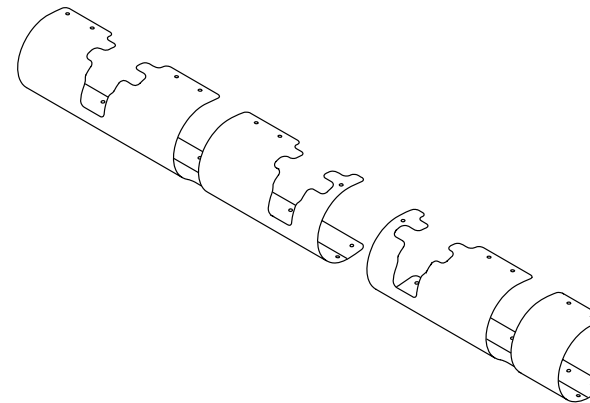
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NOTE

Left Elevator Shown.
Right Elevator Similar.

A LEFT ELEVATOR



NOTE

Left Panels Shown.
Right Panels Similar.

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ELEVATOR ACCESS PANELS
Figure 6

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AIRCRAFT MAINTENANCE MANUAL – SYSTEM DESCRIPTION SECTION

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VERTICAL STABILIZER

Introduction

The vertical stabilizer is an airfoil that stabilizes movement of the aircraft around the vertical (yaw) axis.

General Description

The vertical stabilizer has the components that follow:

- Vertical Stabilizer Access Panels (55-31-00)
- Vertical Stabilizer Fairing (55-32-00)
- Vertical Stabilizer Leading Edge (55-33-00).

Detailed Description

The vertical stabilizer is part of the aft/tail fuselage. The stabilizer has three vertical spars connected by horizontal ribs and covered with skin panels. The vertical spar members are shaped at the lower end to form the main frames of the aft/tail fuselage. The leading edge has pneumatic deicer boots installed (Refer to SDS 30-10-00).

Vertical Stabilizer Access Panels

Refer to Figure 1.

There are five access panels on each side of the vertical stabilizer. The panels give access to the rudder and elevator control systems.

Vertical Stabilizer Fairing

Refer to Figure 2.

The vertical stabilizer fairing is a combination of aerodynamic fairings. It starts at the top of the vertical stabilizer leading edge and continues aft to the rear of the horizontal stabilizer. The vertical stabilizer fairing is made from composite materials.

Vertical Stabilizer Leading Edge

Refer to Figure 3.

The vertical stabilizer leading edge is attached to the vertical stabilizer. It fairs with the aft dorsal fin at the lower end and with the vertical stabilizer fairing at the upper end. The vertical stabilizer leading edge also contains the H.F. antenna (Refer to SDS 23-12-00). The vertical stabilizer leading edge is made from composite materials.

The Horizontal/Vertical Stabilizer Joint

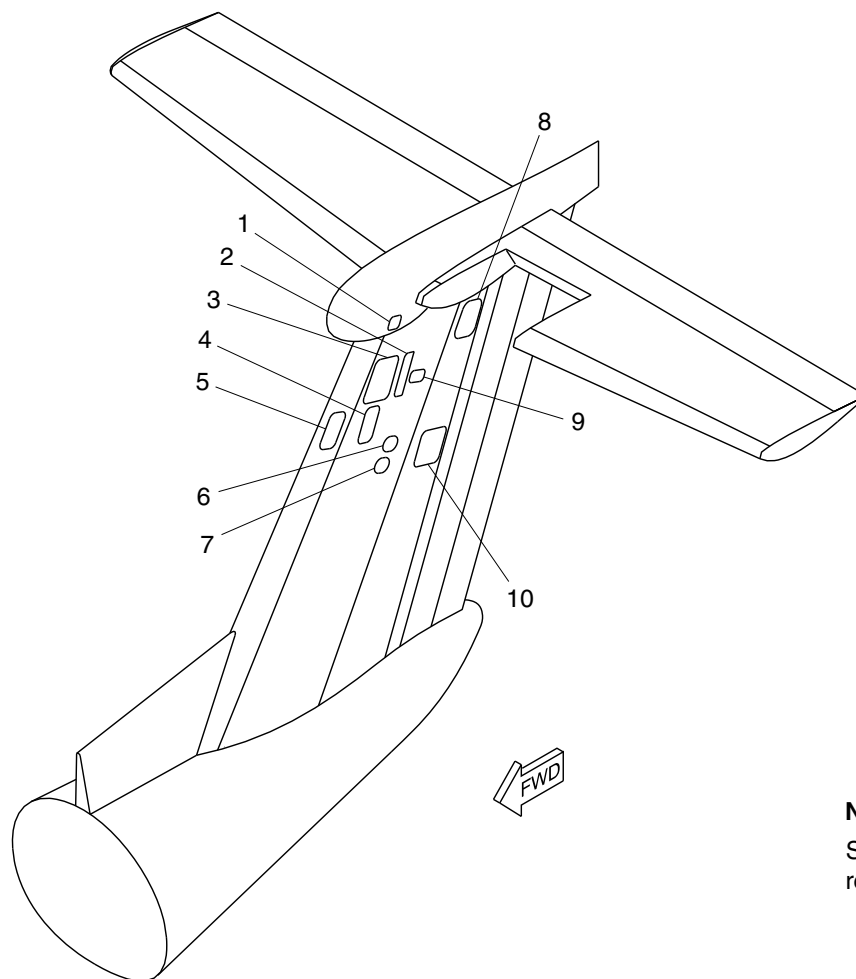
Refer to Refer to Figure 4.

The horizontal/vertical stabilizer joint is installed in the center box of the horizontal stabilizer and front spar of the vertical stabilizer. The joint between the vertical and horizontal stabilizer is covered by a removable composite construction aerodynamic fairing.



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LEGEND

- 1. 322ER.
- 2. 322GR.
- 3. 322FR.
- 4. 332DR.
- 5. 332AR.
- 6. 332BL.
- 7. 332AL.
- 8. 322EL.
- 9. 322CL.
- 10. 322DL.

NOTE

Section of left horizontal stabilizer
removed for clarity.

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Vertical Stabilizer Access Panels
Figure 1

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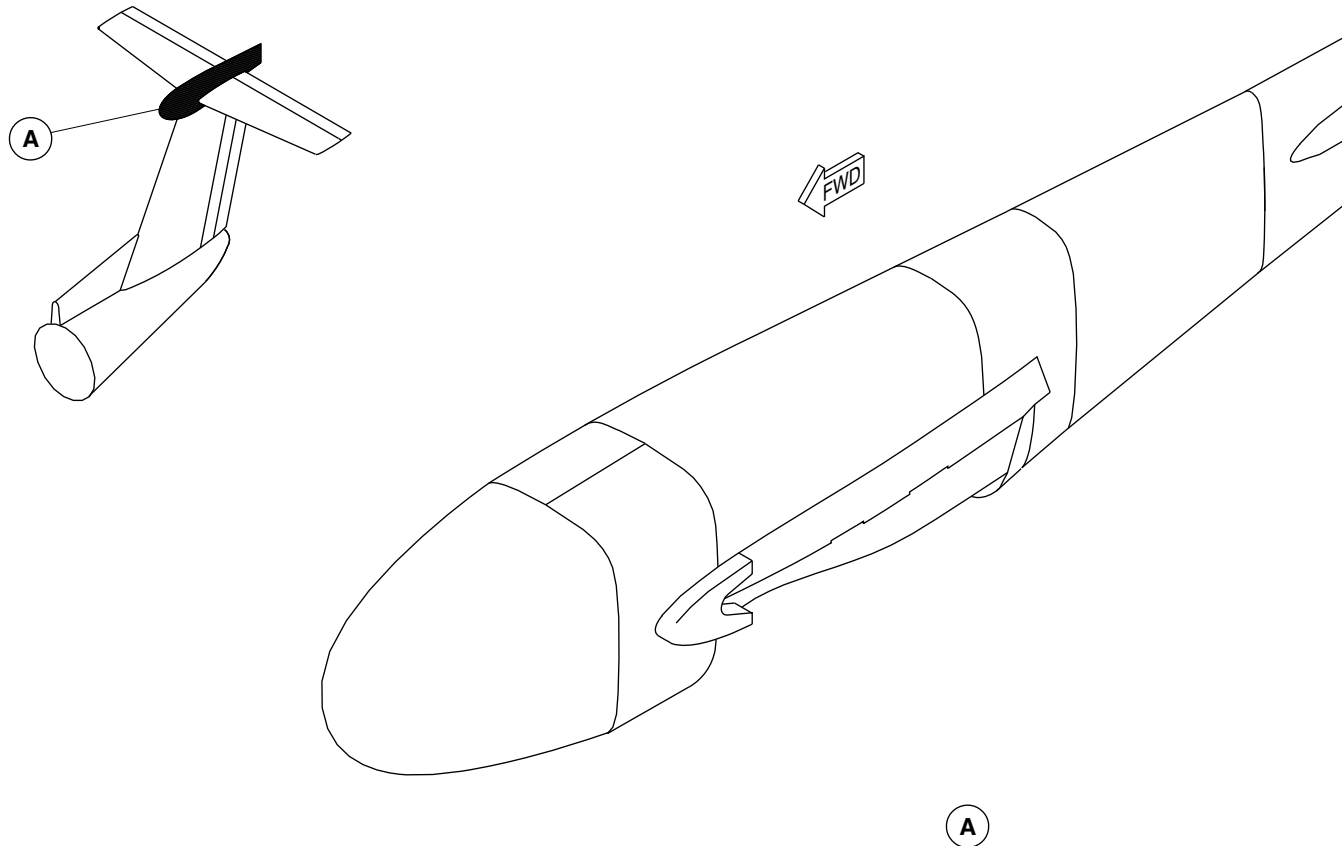
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VERTICAL STABILIZER FAIRING
Figure 2

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EFFECTIVITY:
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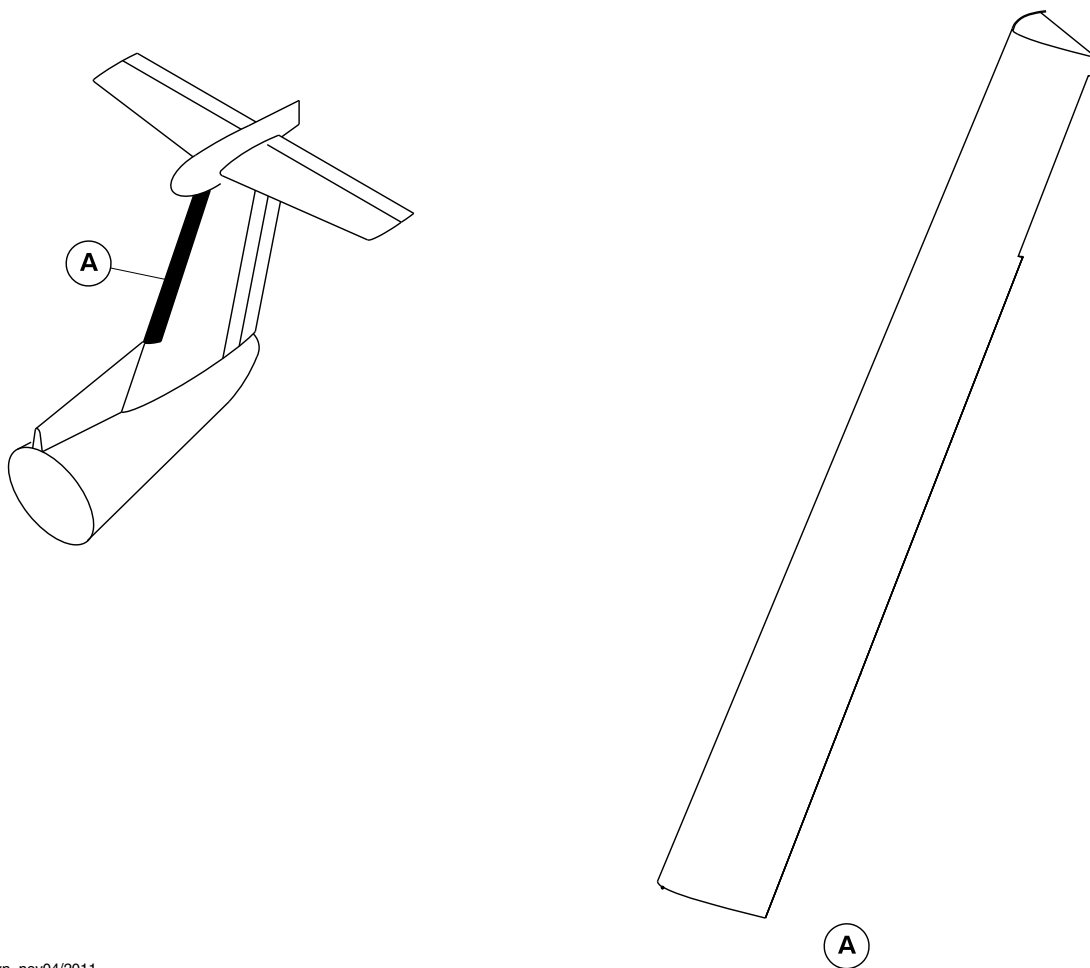
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Vertical Stabilizer Leading Edge
Figure 3

PSM 1-84-2A
EFFECTIVITY:
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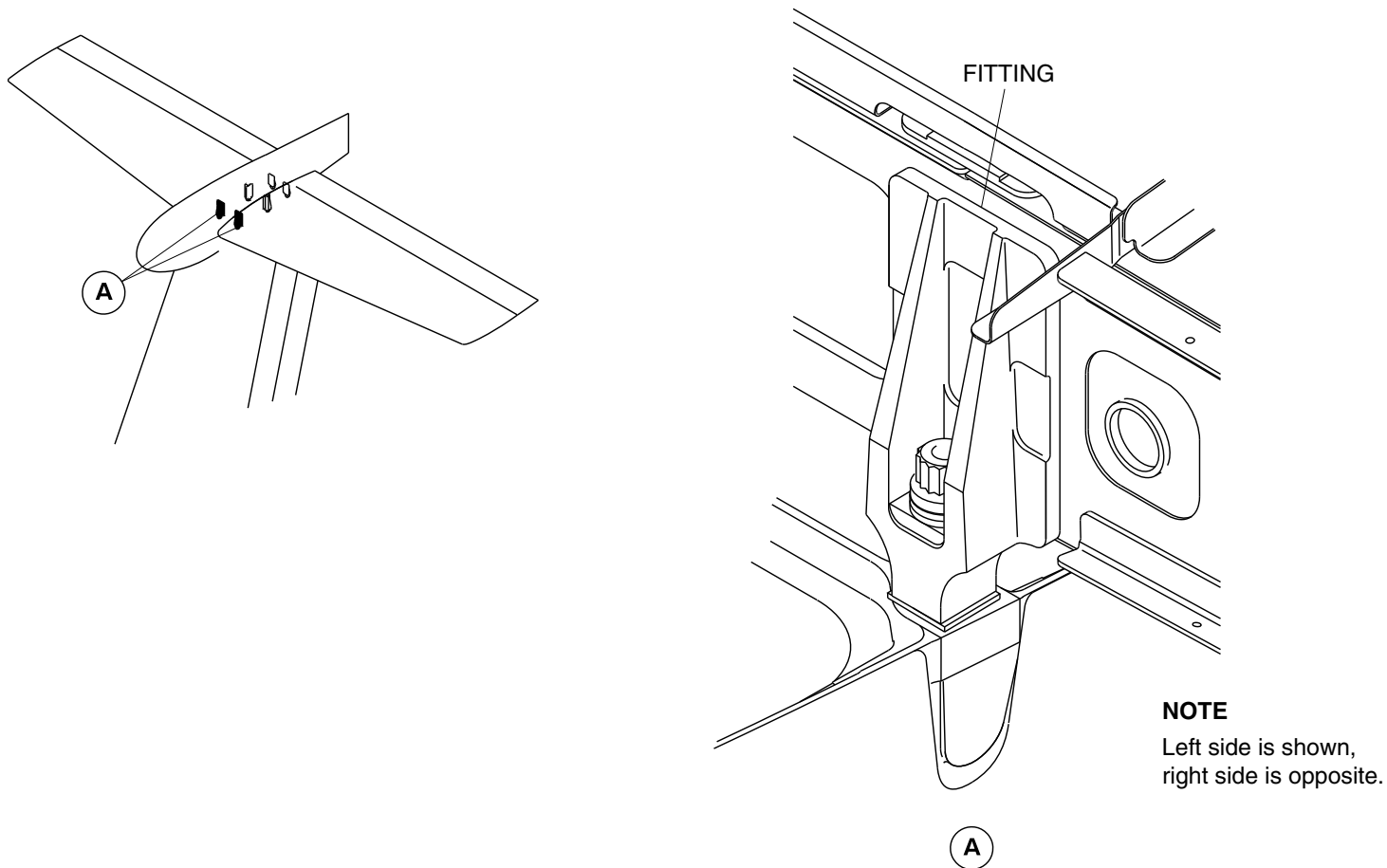
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cg1767a01.dg, vn/gv, nov11/2011

Horizontal/Vertical Stabilizer, Front Spar
Figure 4

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RUDDER

Introduction

The rudder is a moveable flight control surface that controls movement of the aircraft around the vertical axis.

General Description

The rudder is a primary flight control surface that is attached to the rear spar of the vertical stabilizer.

The rudder has the components that follow:

- Leading Edge
- Box Structure
- Rudder Attachment
- Rudder Access Panels (55-41-00).

Detailed Description

[Refer to Figures 1 and 2.](#)

The rudder has a fore rudder and a trailing rudder. The fore rudder is attached to the vertical stabilizer rear spar, and the trailing rudder is attached to the trailing edge of the fore rudder. The fore rudder is moved directly by hydraulic power. Mechanical linkage transmits fore rudder movement to the trailing rudder. Both rudders are constructed of spars and profile ribs covered with skin panels.

Leading Edge

[Refer to Figures 3 and 4.](#)

The fore rudder leading edge section has 11 nose ribs attached to the forward face of the front spar. The trailing rudder leading edge section has 10 nose ribs attached to the forward face of the front spar. Upper and lower skin panels cover the leading edge section. The leading-edge skin panels do not fully close the nose area, they are cut away to give access to the attachment points.

The leading edge parts are made from clad aluminum-alloy sheet.

Box Structure

The fore rudder box structure has 26 ribs attached to the front and rear spar assemblies. The trailing rudder box structure has 30 ribs attached to the front and rear spar assemblies. The top and bottom closing ribs are canted to align with the profile of the vertical stabilizer fairings and the tail cone. Left and right skin panels cover the box structure. Three static dischargers are installed near the top of the trailing rudder trailing edge.

The front and rear spar assemblies are made from clad aluminum-alloy sheet and machined aluminum-alloy extrusions.

The ribs are made from clad aluminum-alloy sheet. The rib at the hinge locations are also reinforced with machined aluminum alloy members. The skin panels are made from clad aluminum-alloy sheet.



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Rudder Attachment

Refer to Figures 5 and 6.

Six fittings on the fore rudder front spar form attachment points for the vertical stabilizer. Four of the fittings are hinges that are attached at the top and bottom of the spar. The fittings are machined from aluminum alloy forgings. The remaining fittings are combined hinge and actuator attachment fittings, and are attached to the center of the spar. The fittings are machined from aluminum alloy forgings.

Six fittings on the fore rudder rear spar have attachment points for the trailing rudder. The fittings are hinges that are attached at the top, center and bottom of the spar. These fittings are machined from aluminum alloy forgings.

Refer to Figures 7 and 8.

Six fittings on the trailing rudder front spar have attachment points for the fore rudder. Four of the fittings are hinges that are attached at the top, center and bottom of the spar. The fittings are machined from aluminum alloy forgings. The remaining fittings are combined hinge and radius rod attachment fittings, and are attached at the top and bottom of the spar. The fittings are machined from aluminum alloy forgings.

Rudder Access Panels

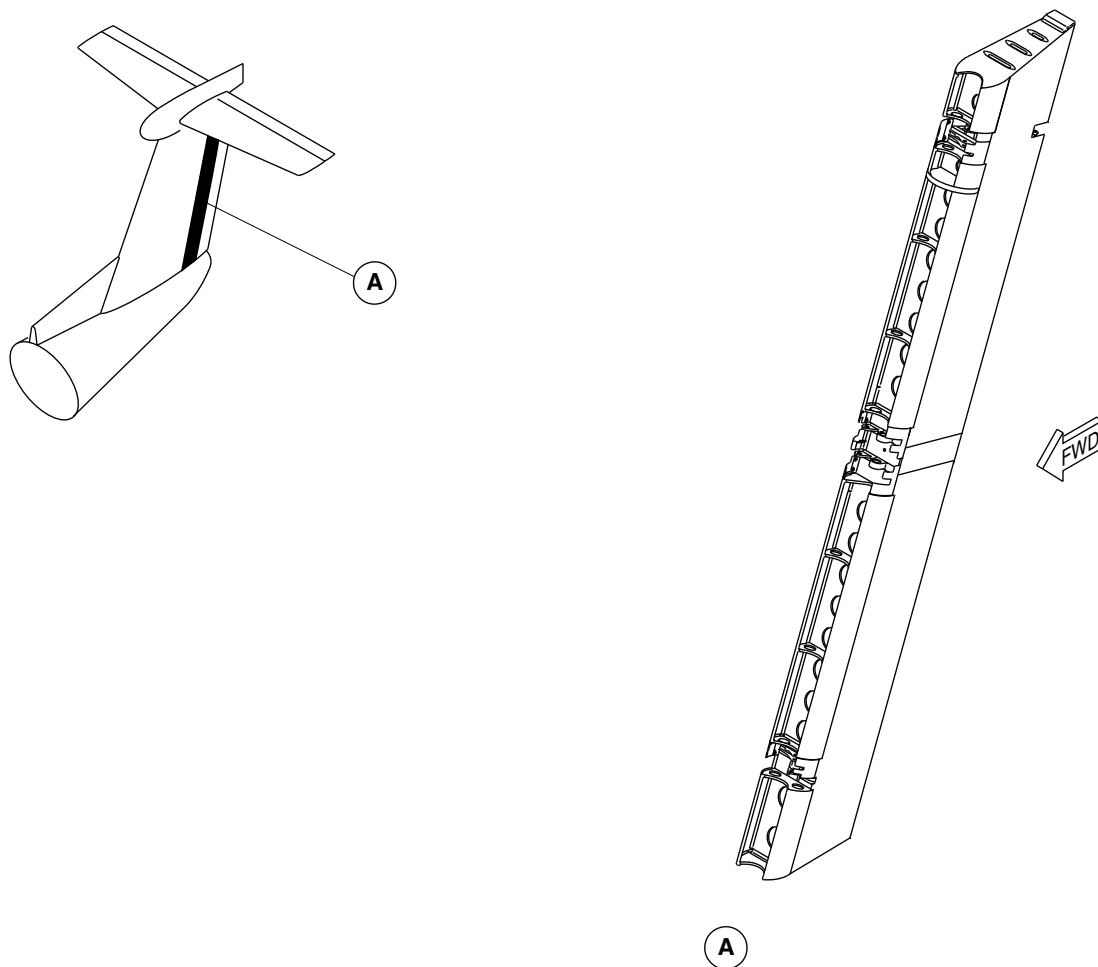
Refer to Figures 9 , 10 , 11 and 12.

There are four access panels on the left and right side of each rudder leading edge. The panels give access to the rudder hinge and PCU attachments.



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FORE RUDDER LOCATOR
Figure 1

PSM 1-84-2A
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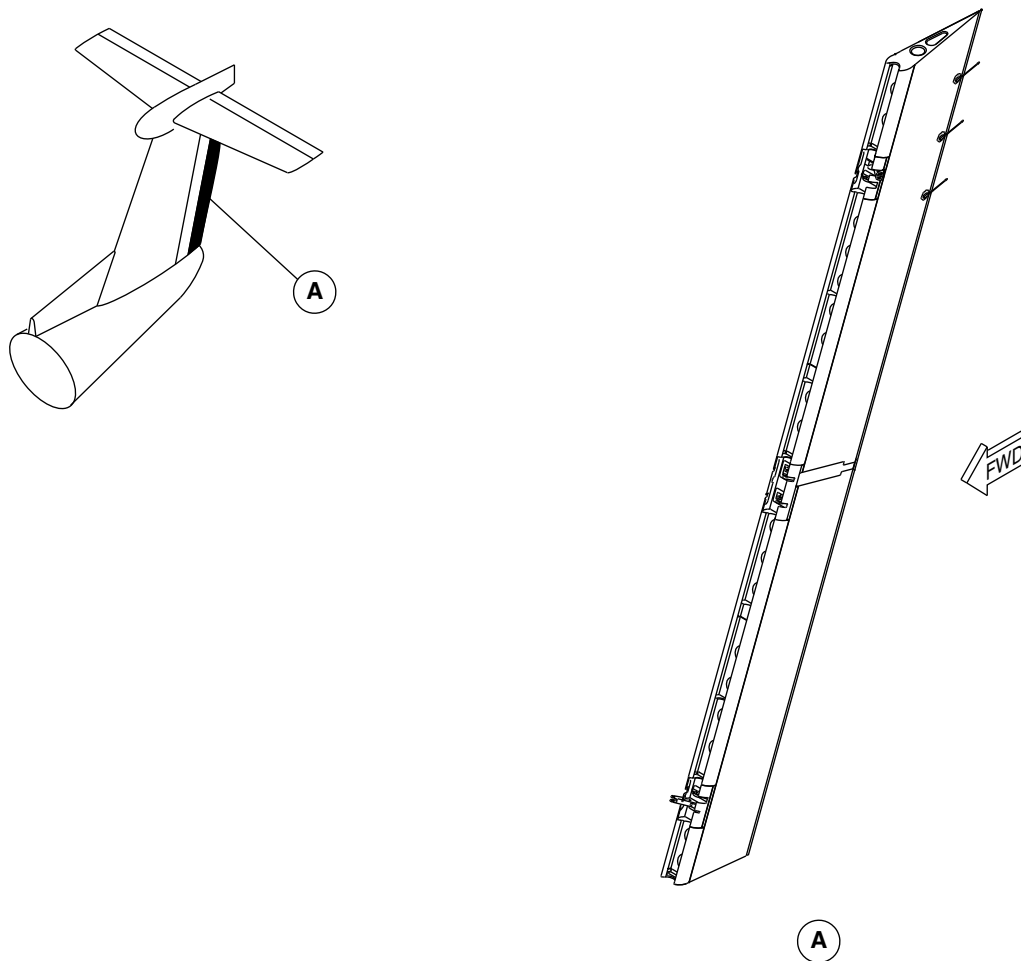
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TRAILING RUDDER LOCATOR
Figure 2

PSM 1-84-2A
EFFECTIVITY:
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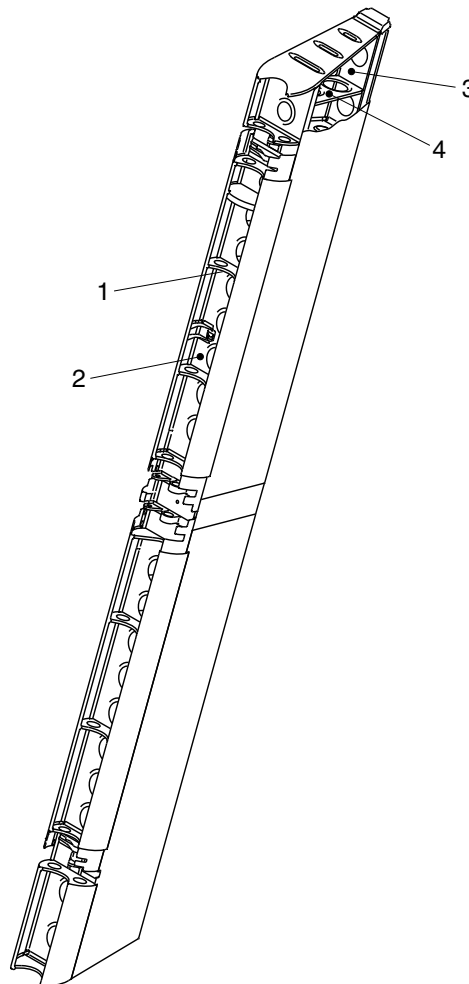
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LEGEND

- 1. Nose rib.
- 2. Front spar.
- 3. Rear spar.
- 4. Rib.

fsd49a01.dg, vn, nov04/2011

Fore Rudder Detail
Figure 3

PSM 1-84-2A
EFFECTIVITY:
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Config 001

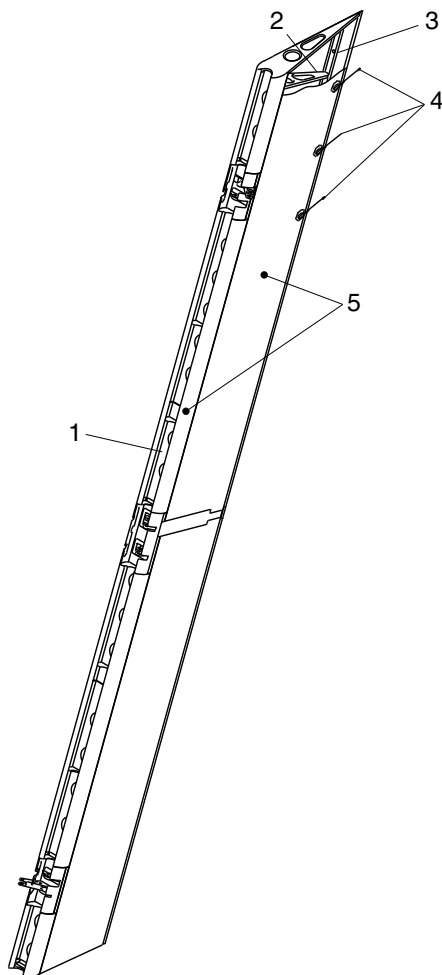
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LEGEND

- 1. Front spar.
- 2. Rib.
- 3. Rear spar.
- 4. Static discharger.
- 5. Skin panel.

fsd40a01.dg, vn, nov04/2011

Trailing Rudder Detail
Figure 4

PSM 1-84-2A
EFFECTIVITY:
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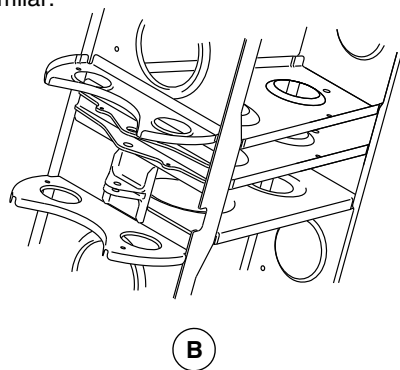
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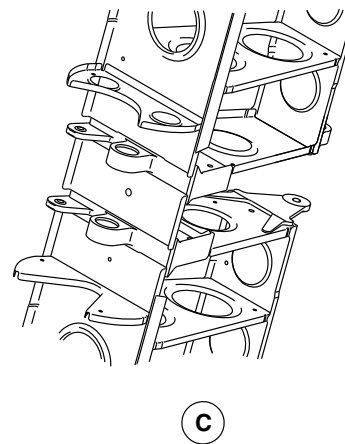


NOTE

Upper Hinge Shown.
Lower Hinge Similar.



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FORE RUDDER HINGES LOCATOR
Figure 5

PSM 1-84-2A
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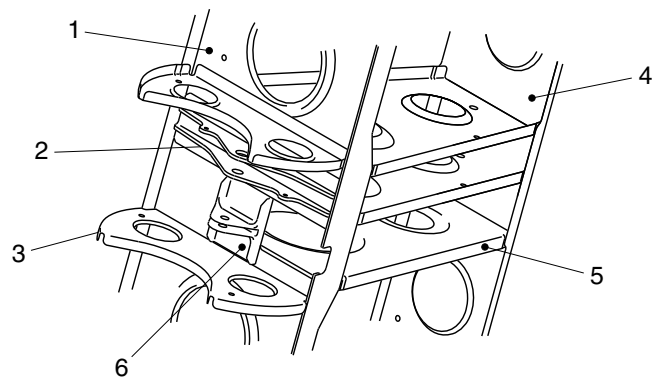
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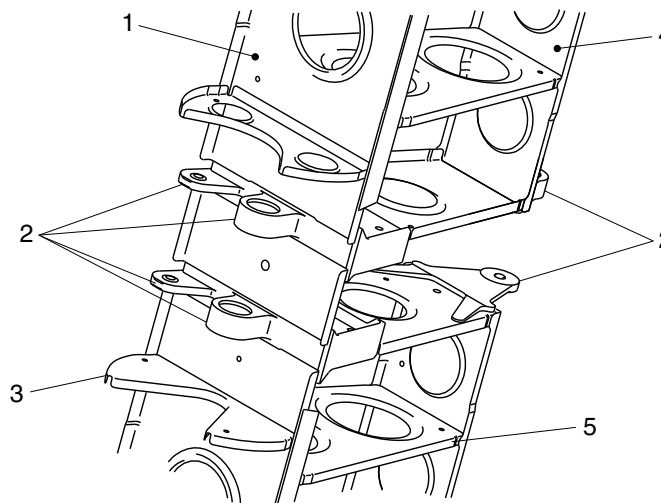
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B

LEGEND

- 1. Front spar.
- 2. Hinges.
- 3. Nose rib.
- 4. Rear spar.
- 5. Rib.
- 6. Safety hinge.



C

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Fore Rudder Hinges Detail
Figure 6

PSM 1-84-2A
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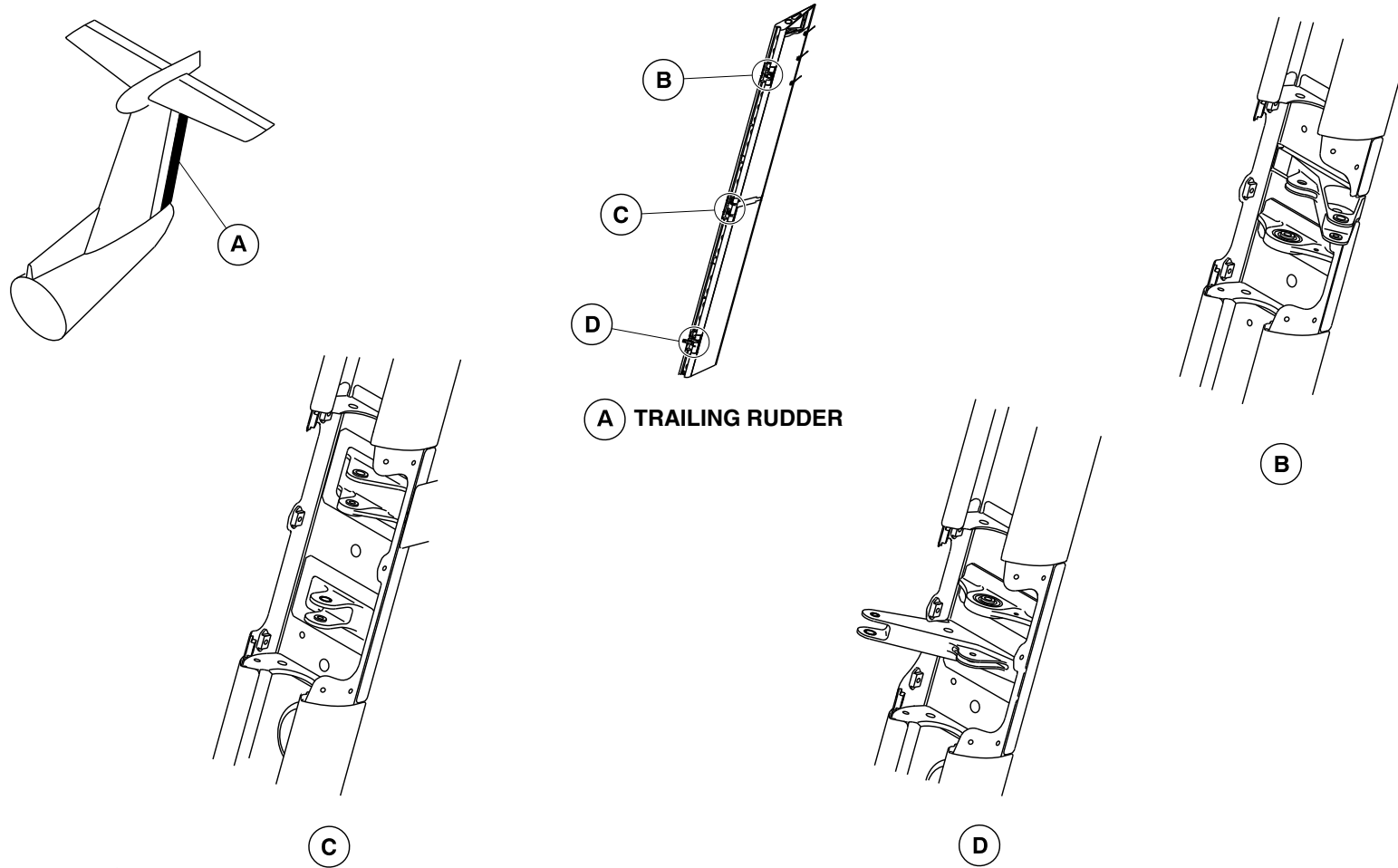
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Trailing Rudder Hinges Locator
Figure 7

PSM 1-84-2A
EFFECTIVITY:
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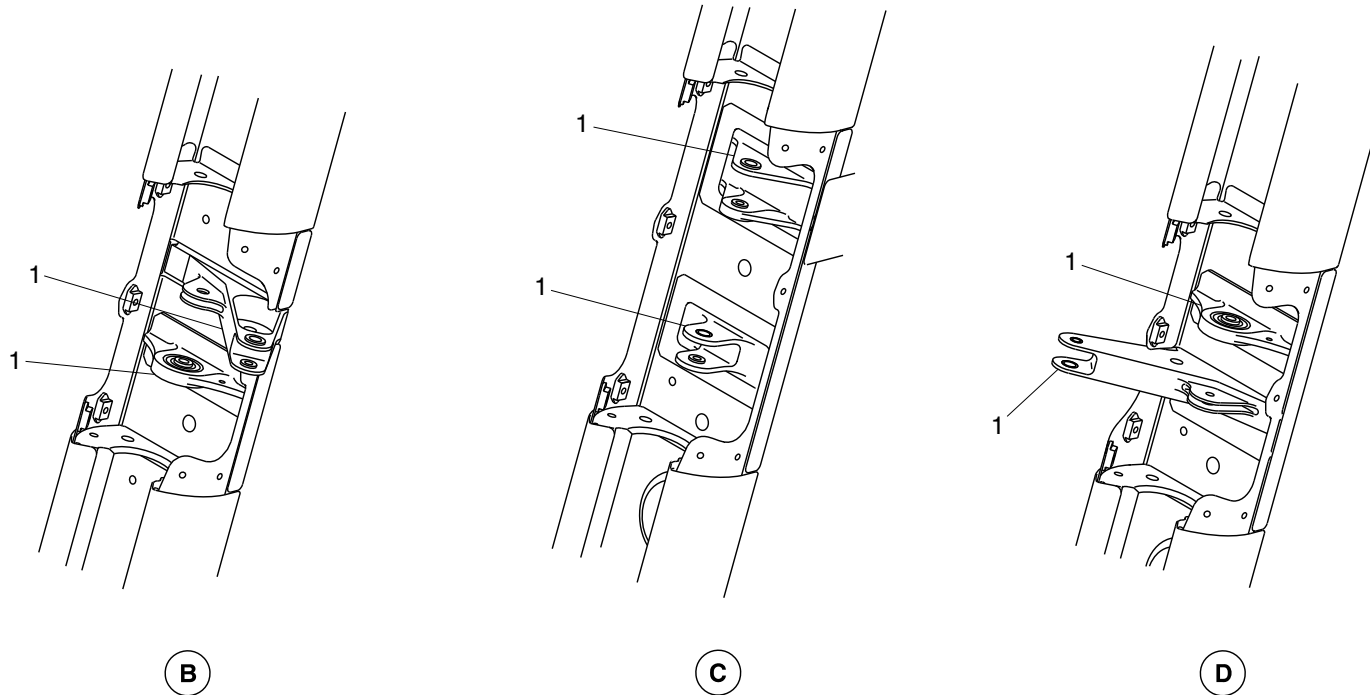
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LEGEND

1. Hinge.

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Trailing Rudder Hinges Detail
Figure 8

PSM 1-84-2A
EFFECTIVITY:
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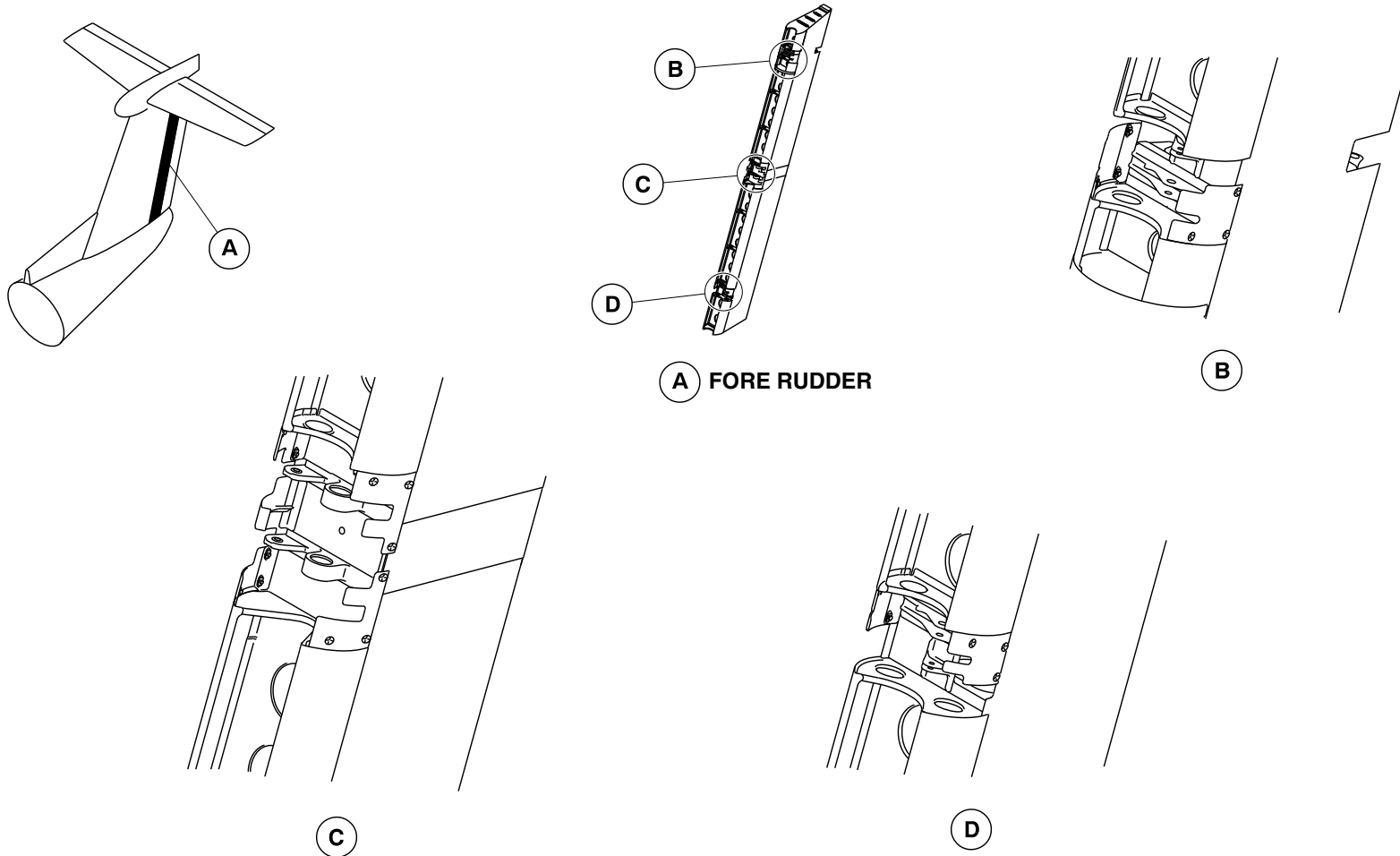
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Fore Rudder Access Panels Locator
Figure 9

PSM 1-84-2A
EFFECTIVITY:
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Config 001

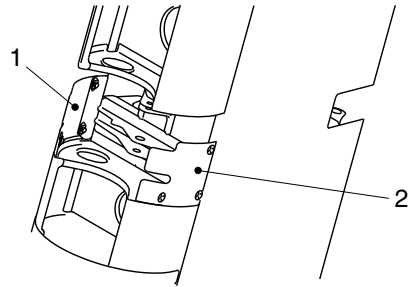
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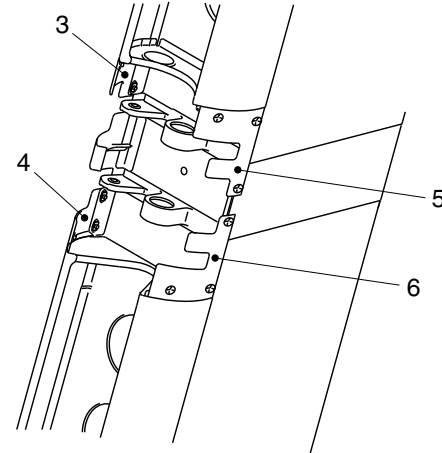


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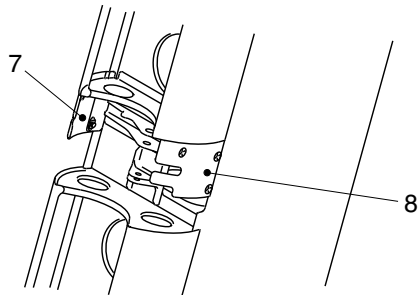
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B



C



D

LEGEND

- 1. 323DR.
- 2. 323DL.
- 3. 323CR.
- 4. 323BR.
- 5. 323CL.
- 6. 323BL.
- 7. 323AR.
- 8. 323AL.

fsd44a01.dg, vn, nov04/2011

Fore Rudder Access Panels Detail
Figure 10

PSM 1-84-2A
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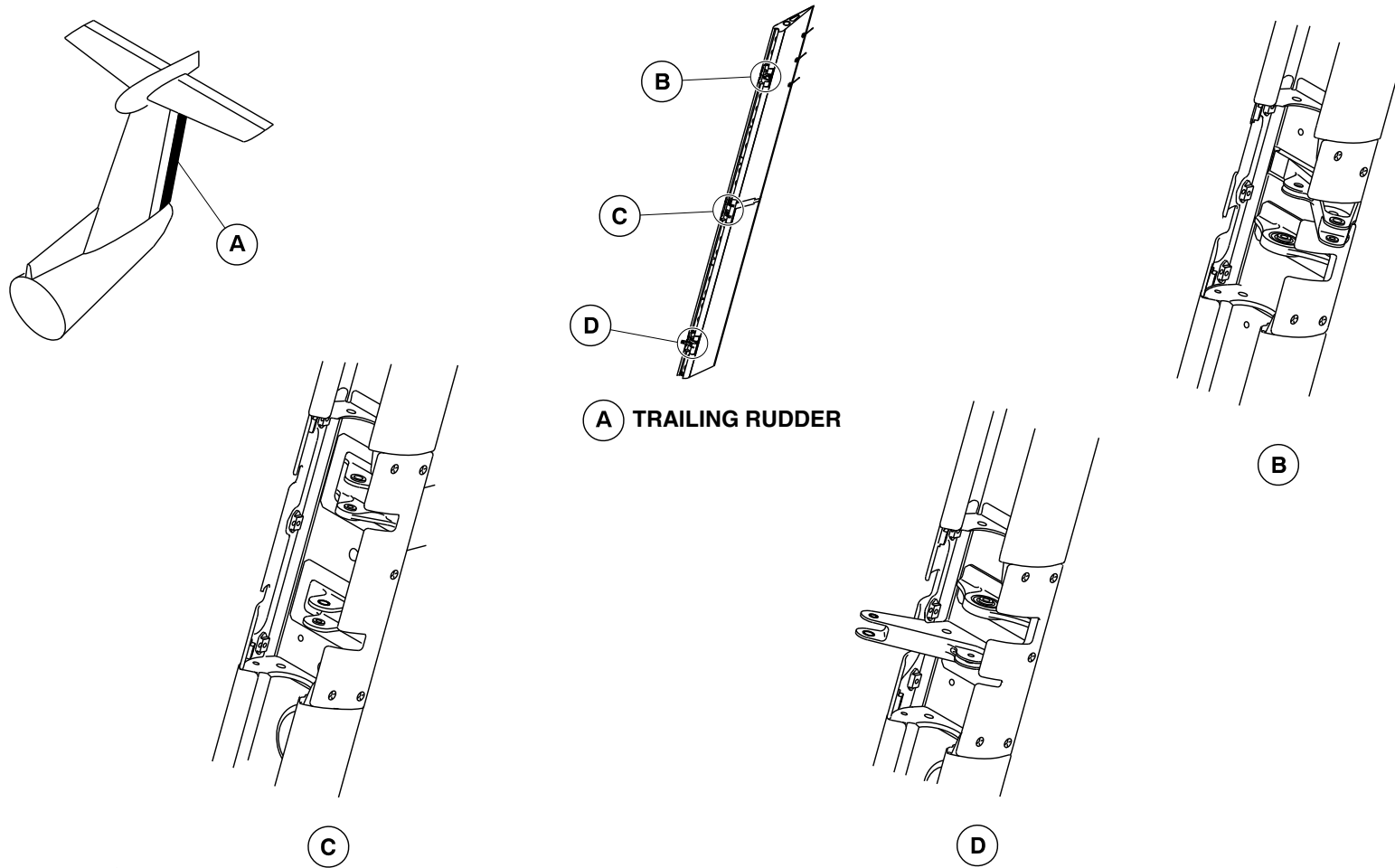
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Trailing Rudder Access Panels Locator
Figure 11

PSM 1-84-2A
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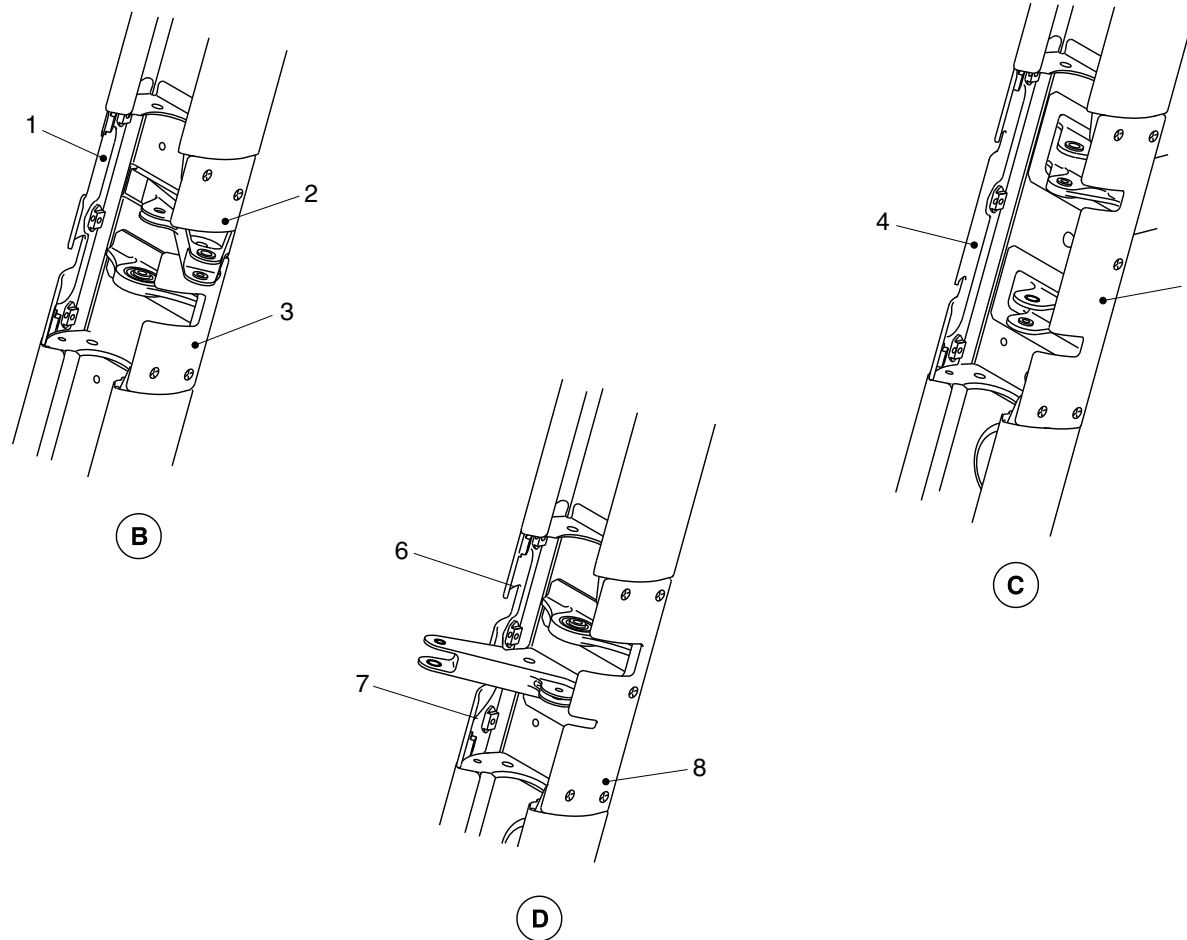
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LEGEND

- 1. 324DR.
- 2. 324EL.
- 3. 324DL.
- 4. 324CR.
- 5. 324CL.
- 6. 324BR.
- 7. 324AR.
- 8. 324AL.

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Trailing Rudder Access Panels Detail
Figure 12

PSM 1-84-2A
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