55

STABILIZERS

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STABILIZERS

DESCRIPTION AND OPERATION

1. GENERAL

The stabilizers are the elements which enable the aircraft to be controlled around the pitch and yaw axes.

The main elements of the system are :

- the horizontal stabilizer,
- the vertical stabilizer,
- the rudder.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Horizontal stabilizer	1	330	/	55-20-00
Vertical stabilizer	1	330	/	55-30-00
Rudder	1	330	/	55-40-00

3. DESCRIPTION

A. Horizontal stabilizer

The horizontal stabilizer enables the aircraft to be controlled around the pitch axis.

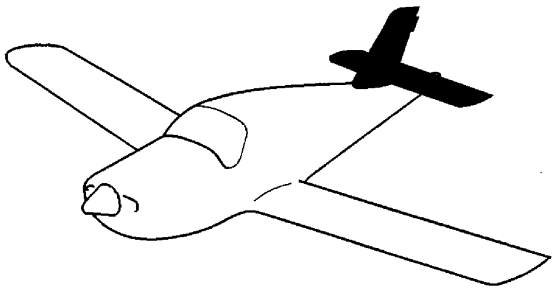
B. Vertical stabilizer

The vertical stabilizer supports the rudder.

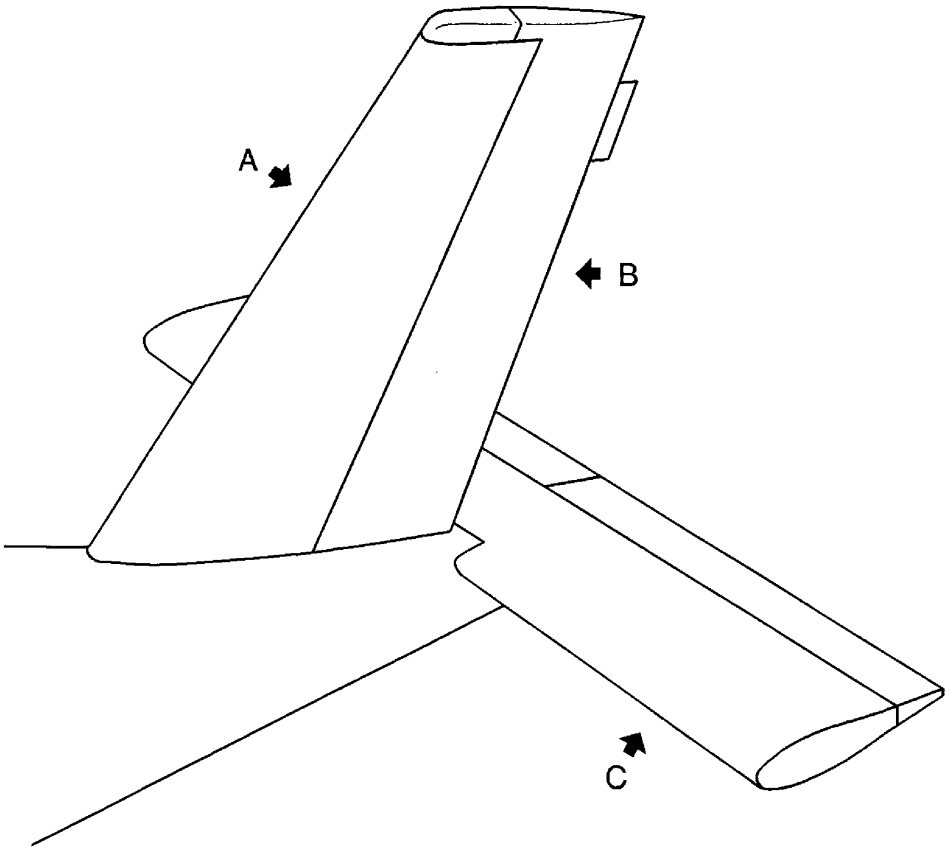
The vertical stabilizer is secured to the rear fuselage.

C. Rudder

The rudder enables the aircraft to be controlled around the yaw axis.



A - Vertical stabilizer
B - Rudder
C - Horizontal stabilizer



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Stabilizers - Identification and location of components
Figure 1

HORIZONTAL STABILIZER

DESCRIPTION AND OPERATION

1. GENERAL

The horizontal stabilizer is a single-piece, all-metal structure with an automatic tab.

It allows the pilot to maneuver the aircraft around the pitch axis.

The horizontal stabilizer is composed of two elements :

- the elevator,
- the elevator tab.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Elevator	1	330	/	55-20-01
Elevator tab	2	330	/	55-20-02

3. DESCRIPTION (Figure 2)

A. Elevator

The elevator is located at the rear of the fuselage. It is articulated on two fittings which are mounted aft of frame C9. It is controlled by the pilot via the control wheel and a pitch control linkage composed of rods and bellcranks.

The elevator travel is as follows :

- nose up - 17° ± 1°
- nose down + 2° ± 1°

It is fitted with a balancing weight of different values :

Balancing weight		Tolerance		Validity
kg	lbs	kg	lbs	
4.530	9.99	+ 0 ; + 0.100	+ 0 ; + 0.22	S / N 1-1029, 1034, 1035, 1041, 1043, 1044
4.580	10.10	+ 0 ; + 0.050	+ 0 ; + 0.11	S / N 1-1029, 1034, 1035, 1041, 1043, 1044
4.690	10.34	+ 0 ; + 0.050	+ 0 ; + 0.11	Pre-MOD. 183
4.690	10.34	+ 0 ; + 0.130	+ 0 ; + 0.28	Post-MOD. 183

B. Elevator tab

The elevator tab is located aft of the elevator. It is articulated on two hinges fixed to the upper surface of the elevator trailing edge.

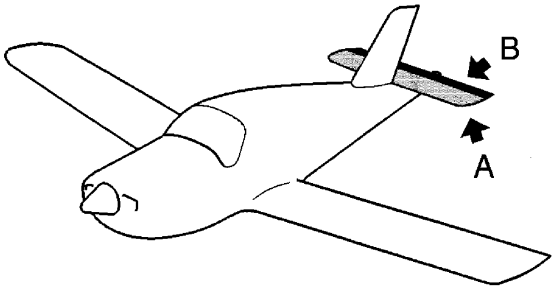
A static discharger is secured to the external trailing edge of each elevator tab.

The tab fulfills two functions :

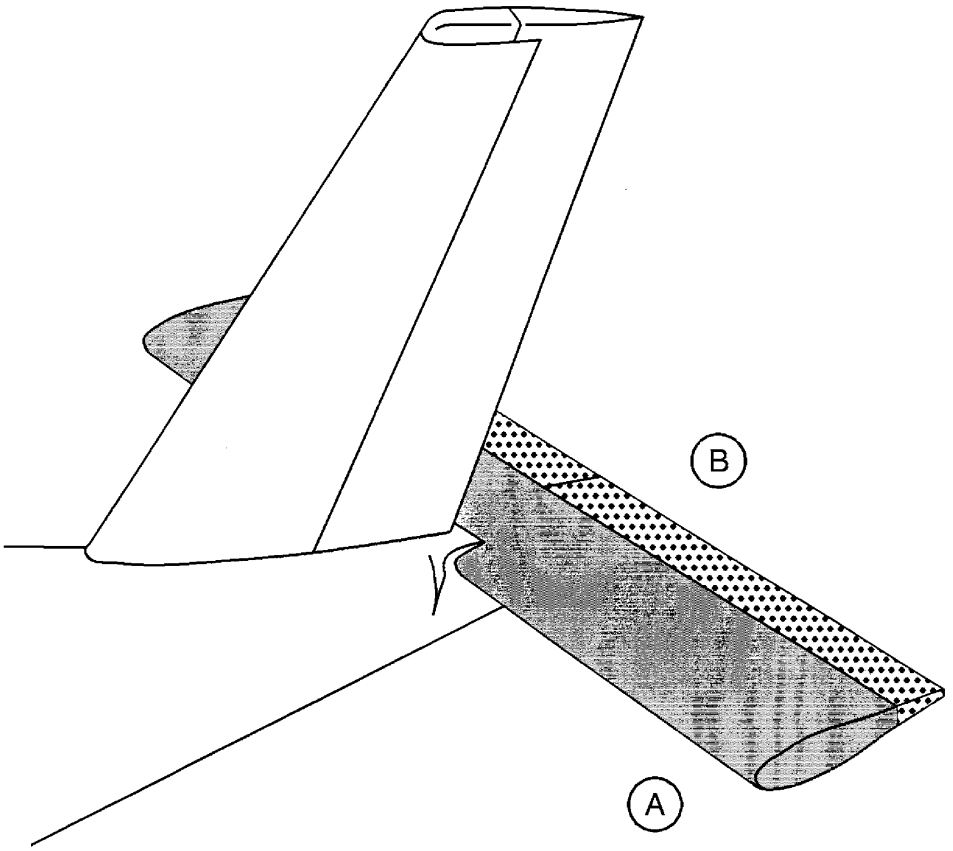
- Automatic anti-tab when linked to elevator operation,
- Elevator tab when controlled by the pilot via the control wheel, located on the L.H. side of the central pedestal, and a cable control.

The elevator tab travel, with the elevator in the maximum up position is as follows :

- nose up 2.5° ± 0.5°
- nose down 17.5° ± 1.5°



A - Elevator
B - Elevator tab



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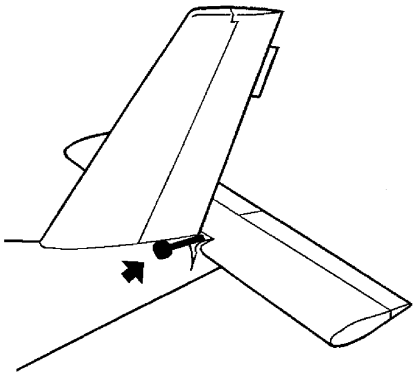
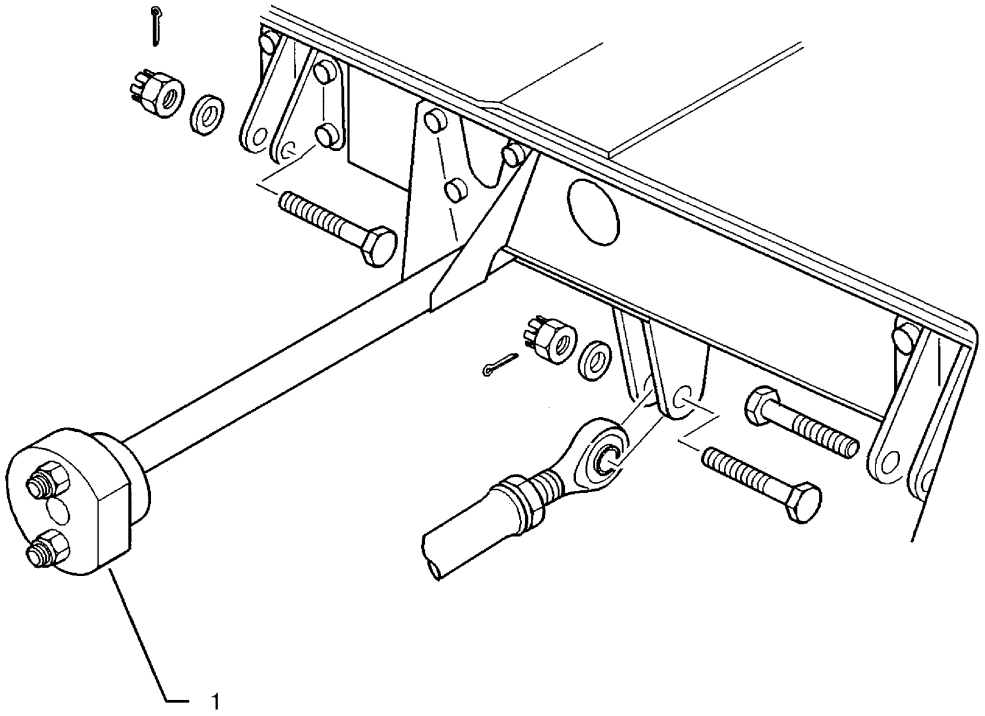
Horizontal stabilizer - Identification and location of components
Figure 1



1 - Balancing weight



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Horizontal stabilizer - Balancing weight
Figure 2

ELEVATOR

REMOVAL / INSTALLATION

1. REMOVAL OF THE ELEVATOR (Figure 401)

A. Tools and consumable materials

- Cleaning agent (TB 11-003)
- Lintfree clean cloths
- Padded supports
- Spatula

B. Procedure

1) Remove tail cone 222 - refer to 53-20-04.
2) Position elevator in nose-up attitude to disconnect tab rod (26).
3) Remove and discard cotter pin (20).
4) Remove nut (22), washer (23), bolt (25), spacer (27) and clear tab rod (26) from lever (24).
5) Remove and discard cotter pin (18).
6) Remove nut (17), washer (16), bolt (14) and clear input rod (19) from levers (15).
7) If installed, remove bonding strap attachment.
8) Remove and discard cotter pins (8).
9) Remove nuts (9) and recessed washers (10).
10) Hold the elevator and remove bolts (12).

CAUTION : WHEN REMOVING THE ELEVATOR, TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGING THE PITCH AND TAB CONTROLS, THEIR SUPPORTS AND FRAME C9 WITH BALANCING WEIGHT (4).

11) Disengage the elevator from both support assemblies (1) and (21) and place it on 2 padded supports.
12) If necessary, remove the elevator tab - refer to 55-20-02.
13) If necessary, remove hinge fittings (11) and (13) :
    a) Remove bolts (6) and washers (7).
    b) Remove hinge fittings (11) and (13).
    c) Remove sealant with a spatula and clean the surfaces with a lintfree clean cloth moistened with cleaning agent (TB 11-003).
14) If necessary, remove balancing weight (4) :
    a) Remove nuts (2), washers (3), bolts (5) and balancing weight (4).
    b) Discard nuts (2).
    c) Clean the surfaces with a lintfree clean cloth moistened with cleaning agent (TB 11-003).

2. INSTALLATION OF THE ELEVATOR (Figure 401)

A. Tools and consumable materials

- Cleaning agent (TB 11-003)
- Torque wrench 0 - 266 lbf.in. (0 - 30 N.m)
- Lintfree clean cloths
- Sealant (TB 09-916)
- Petrolatum (TB 04-012)
- Red paint
- Mastinox (TB 05-002A)
- Siccative oil (TB 05-914)

B. Procedure

NOTE : In case of repair, painting or addition of an option to the elevator, check elevator balancing - refer to 51-60-00.

1) Clean the following parts with a lintfree clean cloth moistened with cleaning agent (TB 11-003), then check the condition of :
   - the elevator,
   - the hinges,
   - the levers,
   - the elevator balancing boom and weight,
   - the control rods,
   - the supports and ball joints,
   - the bonding strap, if installed.
2) If removed, install the balancing weight (4) :
   a) Apply mastinox (TB 05-002A) to the end of balancing boom tube and to the seating face of balancing weight (4).
   b) Install balancing weight (4) with bolts (5), washers (3) and new nuts (2).
3) If removed, install hinge fittings (11) and (13) :
   a) Apply a very thin layer of petrolatum (TB 04-012) to the seating face of hinge fittings (11) and (13).
   b) Apply sealant (TB 09-916) to the seating face of hinge fittings (11) and (13) and bolts (6) - refer to 20-00-09.
   c) Position hinge fittings (11) and (13) on the elevator and secure them with washers (7) and bolts (6). Torque according to "Specific cases" tightening procedure - refer to 20-00-01.
   d) Wipe off excess sealant with a lintfree clean cloth moistened with cleaning agent (TB 11-003).
   e) Mark bolts (6) with a mark of red paint.
4) If removed, install the elevator tab - refer to 55-20-02.

5) Lubricate the control and the elevator - refer to 12-21-02 and 12-21-03.

6) Protect the interior of the balancing boom tube with siccative oil (TB 05-914) - refer to 20-00-16.

CAUTION : WHEN INSTALLING THE ELEVATOR, TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGING THE PITCH AND TAB CONTROLS, THEIR SUPPORTS AND FRAME C9 WITH BALANCING WEIGHT (4).

7) Position the elevator into support assemblies (1) and (21).

8) Hold the elevator, install bolts (12), recessed washers (10) and nuts (9). Torque - refer to 20-00-01.

9) Lock with new cotter pins (8).

10) If installed, secure the bonding strap. Perform electrical bonding procedure - refer to 20-00-12.

11) Install spacer (27) in its housing.

12) Secure tab rod (26) to lever (24) with bolt (25), washer (23) and nut (22).

13) Lock with a new cotter pin (20).

14) Secure input rod (19) to levers (15) with bolt (14), washer (16) and nut (17).

15) Lock with a new cotter pin (18).

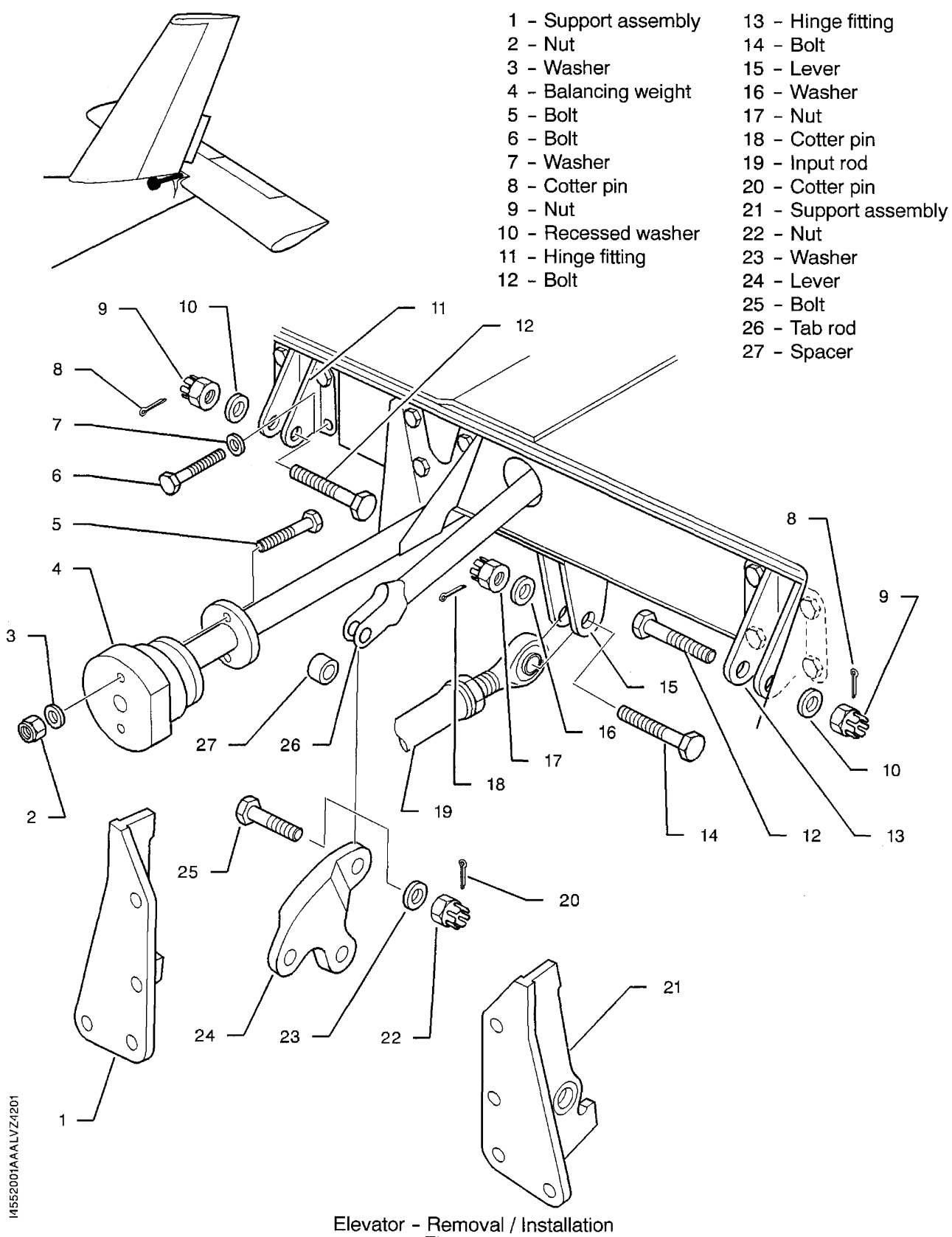
16) Make sure all the tools and materials are removed and the work area is clean and free from debris.

17) Install tail cone 222 - refer to 53-20-04.

18) Check the elevator travel - refer to 27-30-00.

19) Check the elevator tab travel - refer to 27-30-03.

20) Perform a test flight - refer to 05-30-00.



Elevator - Removal / Installation
Figure 401

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ELEVATOR

INSPECTION / CHECK

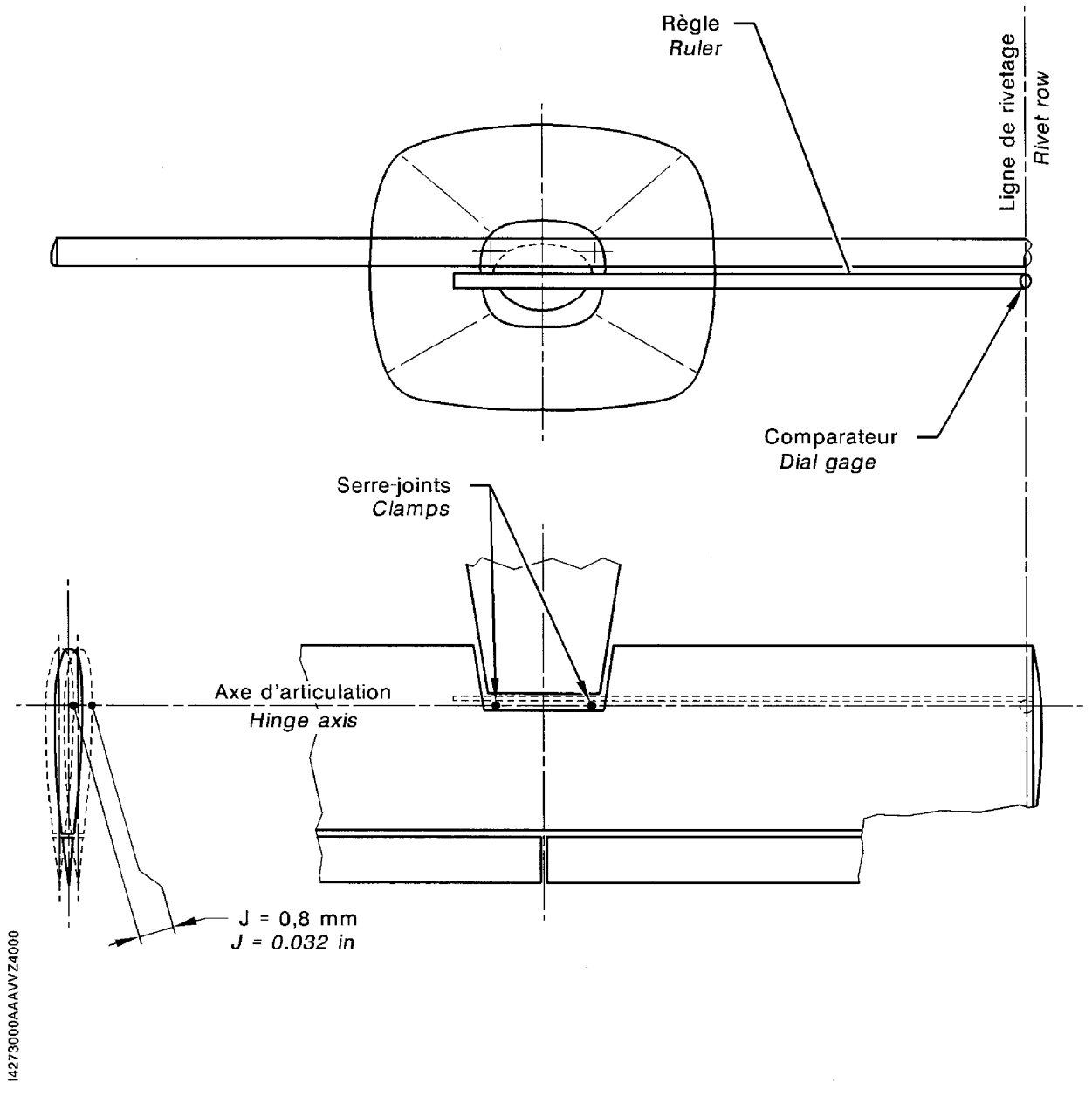
1. CHECK OF THE HINGE BALL JOINTS (Figure 601)

A. Tools and consumable materials

- Ruler 5.9 ft (180 cm)
- Clamps
- Dial gage

B. Procedure

1) Remove tail cone 222 - refer to 53-20-04.
2) Use two clamps to attach a ruler to the rear face of frame C9.
3) Attach a dial gage to the ruler end. The gage feeler must rest on the stabilizer lower surface between two elevator tip attachment rivets.
4) Lock the control wheel in neutral position.
5) Apply a load on the horizontal stabilizer end (side opposite to dial gage) and note the dial gage pointer deflections.
6) Ball joints must be replaced when max. slack equals 0.032 in. (0.8 mm).
7) Remove the dial gage, the clamps and the ruler.
8) Make sure all the tools and materials are removed and the work area is clean and free from debris.
9) Install tail cone 222 - refer to 53-20-04.



Elevator - Check of the slack value of the hinge ball joints
Figure 601

ELEVATOR TAB

REMOVAL / INSTALLATION

NOTE : This procedure is applicable to L.H. and R.H. installations. Information specific to R.H. installation are given in square brackets.

1. REMOVAL OF THE ELEVATOR TAB (Figure 401)

A. Tools and consumable materials

- Padded supports

B. Procedure

1) Move the elevator to nose-up position.
2) Remove and discard cotter pin (17).
3) Remove nut (16), bolt (6), spacer (8), washers (4) and (5) and clear tab rod (10) from levers (12).
4) Remove nut (15), washer (14), bolt (7) and spacer (11). Discard nut (15).
5) Hold tab (13) [9] and remove nuts (3), washers (2) and screws (1). Discard nuts (3).

   NOTE : Disengage the bonding strap, if installed.

6) Disengage tab (13) [9] and place it on two padded supports.

   NOTE : When removing tab (13) [9], disengage hinge pins (18) from holes (a) located in the elevator small spar.

2. INSTALLATION OF THE ELEVATOR TAB (Figure 401)

A. Tools and consumable materials

None

B. Procedure

NOTE : In case of repair, painting or addition of an option to the elevator tab, check elevator balancing - refer to 51-60-00.

Pre-MOD. 128 or Kit OPT10 921700

1) Lubricate hinge pins (18) and the hinges - refer to 12-21-03.

Post-MOD. 128 or Kit OPT10 921700

CAUTION : DO NOT LUBRICATE HINGE PINS WHICH ARE PROTECTED BY A TEFLON COAT.

1) Wipe hinge pins (18). Check the teflon coat for evenness. Replace the hinge pins if necessary.

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2) Position hinge pins (18) into the hinges.
3) Position tab (13) [9], insert the end of hinge pins (18) into holes (a) located in the elevator small spar.

4) Hold tab (13) [9], secure the hinges with screws (1), washers (2) and new nuts (3).

   NOTE : Secure the bonding strap, if installed. Perform electrical bonding procedure - refer to 20-00-12.

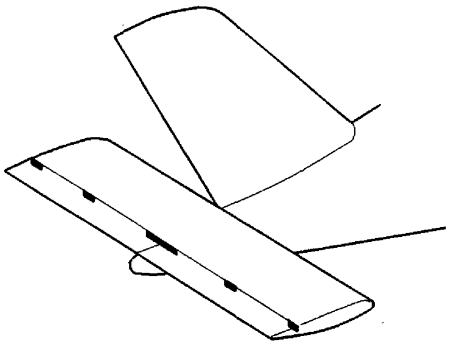
5) Secure the tabs with bolt (7), spacer (11), washer (14) and new nut (15).

6) Secure tab rod (10) to levers (12) with bolt (6), spacer (8), washers (4) and (5) and nut (16).

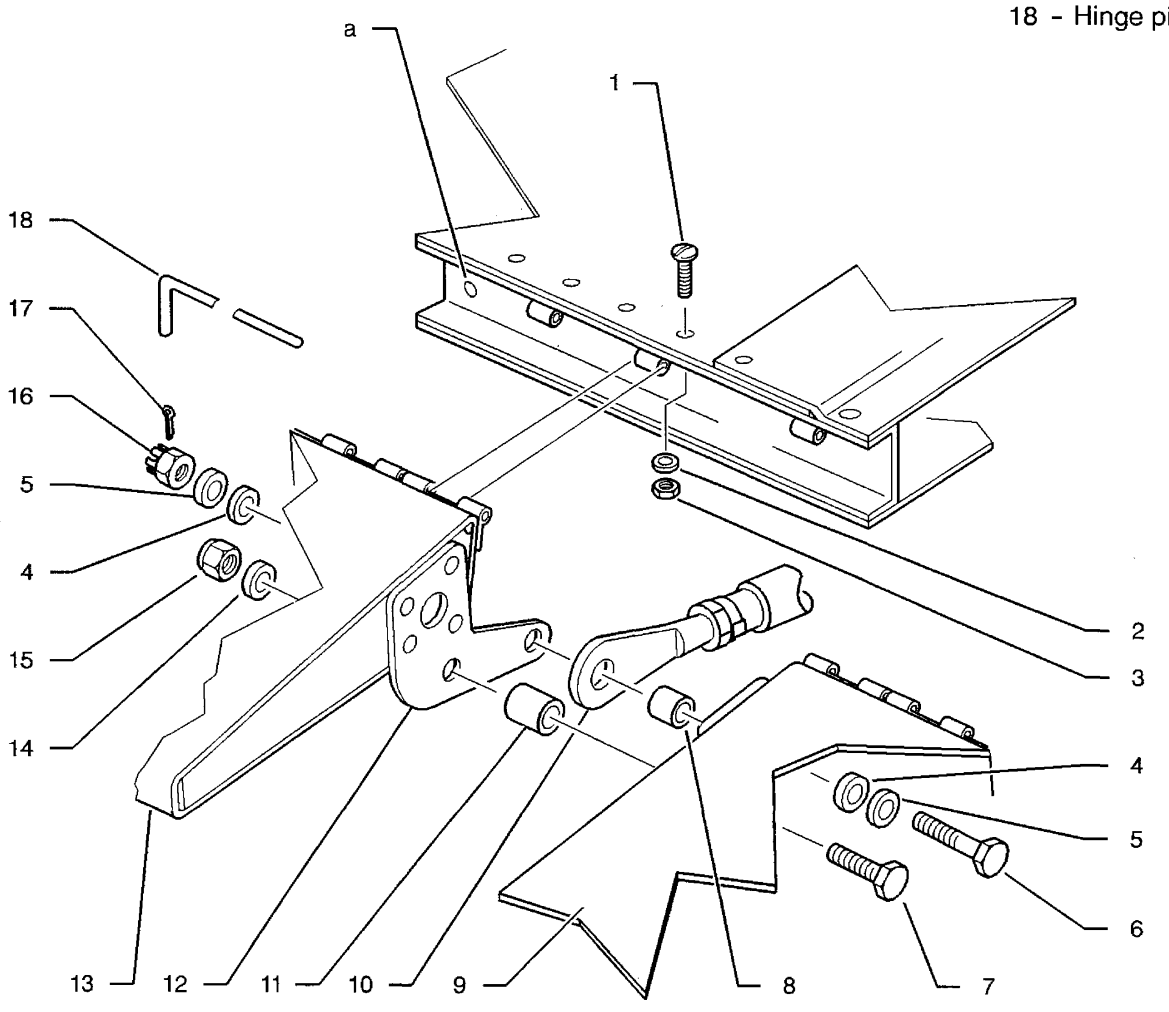
7) Lock with a new cotter pin (17).

8) Make sure all the tools and materials are removed and the work area is clean and free from debris.

9) Check the tab travel - refer to 27-30-03.



1 - Screw
2 - Washer
3 - Nut
4 - Washer
5 - Washer
6 - Bolt
7 - Bolt
8 - Spacer
9 - R.H. tab
10 - Tab rod
11 - Spacer
12 - Lever
13 - L.H. tab
14 - Washer
15 - Nut
16 - Nut
17 - Cotter pin
18 - Hinge pin



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Elevator tab - Removal / Installation
Figure 401

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VERTICAL STABILIZER

DESCRIPTION AND OPERATION

1. GENERAL

The vertical stabilizer has an entirely metal structure. It supports the rudder.

It is secured to the rear of the fuselage with :

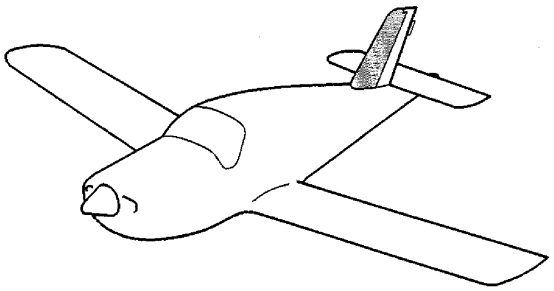
- the front fitting on frame C7,
- the lower bearing on frame C8.

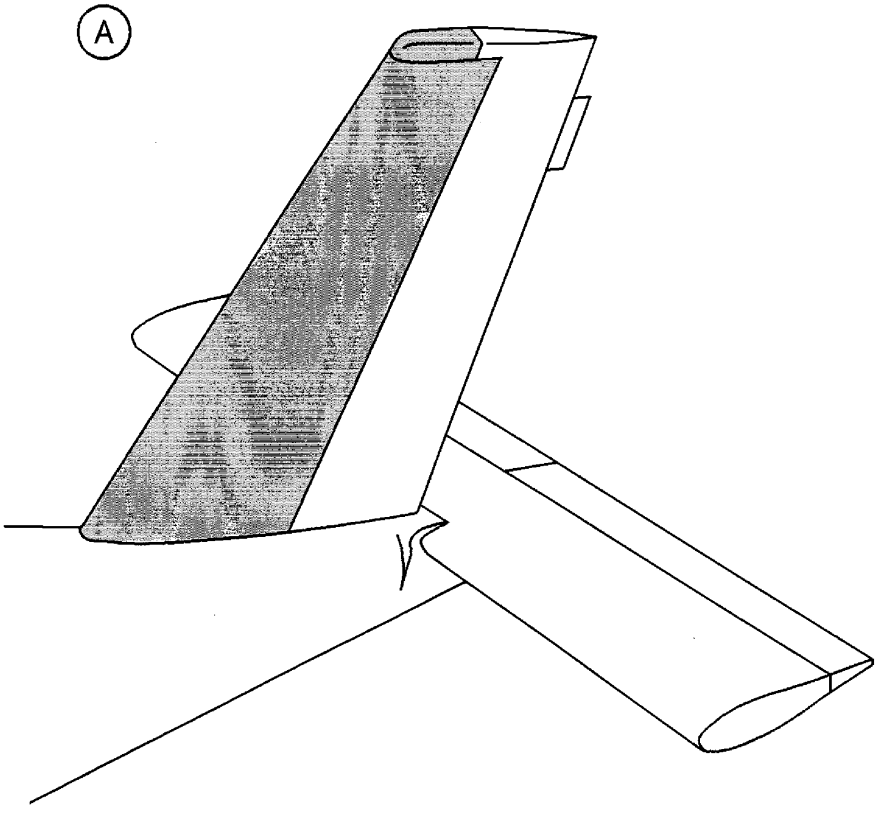
The lower bearing is also used as a support for rudder hinge ball joint.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Vertical stabilizer	1	310	/	55-30-00

A - Vertical stabilizer





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Vertical stabilizer - Identification and location of components
Figure 1

VERTICAL STABILIZER

REMOVAL / INSTALLATION

1. REMOVAL OF THE VERTICAL STABILIZER (Figure 401)

A. Tools and consumable materials

- Padded supports
- 1 padded support for frame C8

B. Procedure

1) Remove baggage compartment bottom door 242.

Post-MOD. 151

2) Remove dorsal fin 225.

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CAUTION : THE SUPPORT MUST FIT TO FUSELAGE PROFILE PERFECTLY AND BEARING FACES MUST BE PADDED TO AVOID DAMAGING THE STRUCTURE.

3) Put the padded support under rear fuselage at frame C8.

4) Protect the baggage compartment bottom area in order to gain access to the fuselage rear section, particularly to frames C7 (1) and C8 (2).

5) Remove the rudder - refer to 55-40-00.

6) If necessary, remove tail cone - refer to 53-20-04.

7) If installed, disconnect the anti-collision light connector and the GLIDE and VOR / LOC antennas.

8) Remove bolts (9) and washers (8) securing vertical stabilizer front attachment (7) to frame C7 (1).

9) Hold the vertical stabilizer, remove bolts (4) and washers (5) securing vertical stabilizer spar (6) to frame C8 (2).

10) Disengage the vertical stabilizer and place it on two padded supports.

2. INSTALLATION OF THE VERTICAL STABILIZER (Figure 401)

A. Tools and consumable materials

- Torque wrench (0 - 266 lbf.in) (0 - 30 N.m)
- Red paint

B. Procedure

1) If installed, inspect the anti-collision light electrical cable and connector for condition. Inspect the anti-collision light bulb and glass for condition and attachment.

2) If installed, inspect the antennas and coaxial cables for condition.

3) Position the vertical stabilizer.

4) Hold the vertical stabilizer and secure vertical stabilizer spar (6) to frame C8 (2) with bolts (4) and washers (5). Torque - refer to 20-00-01.

5) Secure vertical stabilizer front attachment (7) to frame C7 (1) with bolts (9) and washers (8). Torque - refer to 20-00-01.

6) Mark bolts (4) and (9) with a red paint line.

7) If installed, connect the anti-collision light connector and the GLIDE and VOR / LOC antennas.

8) Remove the protection from the baggage compartment bottom area.

9) Make sure all the tools and materials are removed and the work area is clean and free from debris.

10) Remove the padded support.

11) Install baggage compartment bottom door 242.

Post-MOD. 151

12) Install dorsal fin 225.

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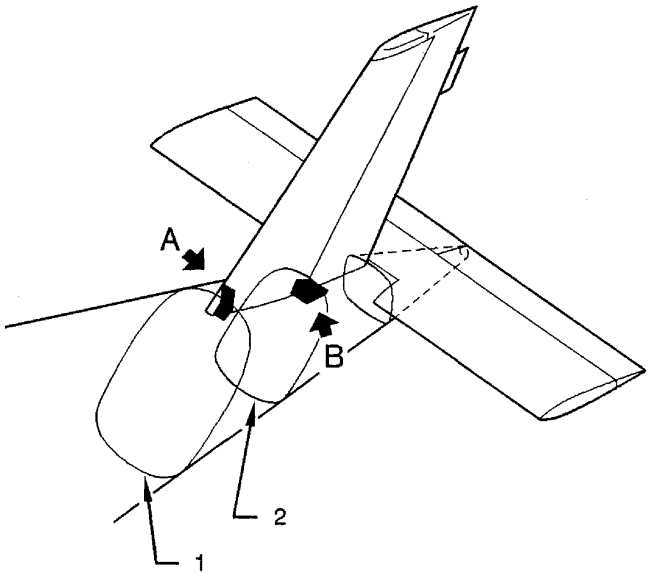
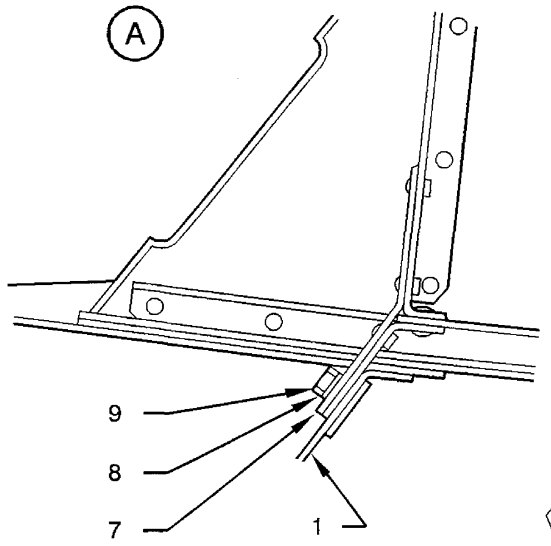
13) If removed, install tail cone - refer to 53-20-04.

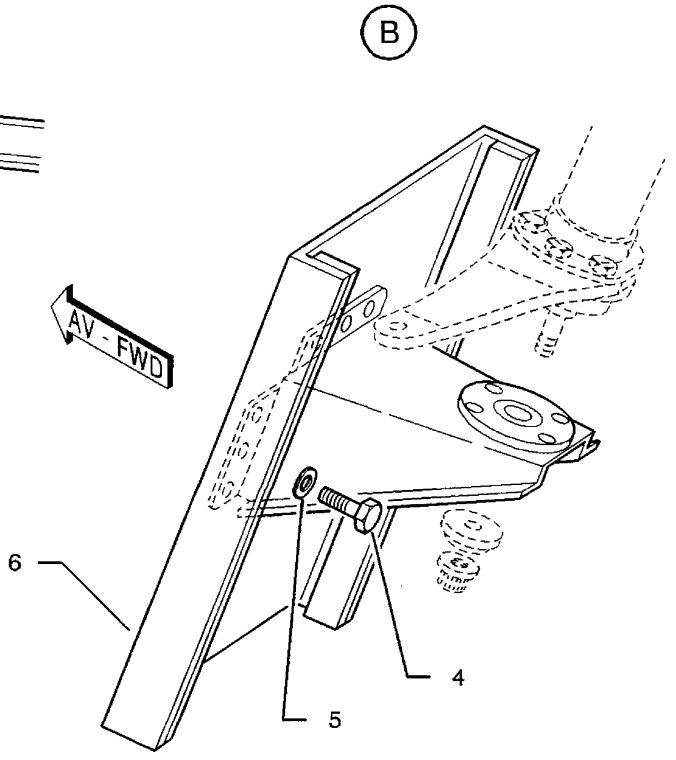
14) Install the rudder - refer to 55-40-00.

15) Perform a test flight - refer to 05-30-00.



1 - Frame C7
2 - Frame C8
4 - Bolt
5 - Washer
6 - Vertical stabilizer spar
7 - Vertical stabilizer front attachment
8 - Washer
9 - Bolt





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Vertical stabilizer - Removal / Installation
Figure 401

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RUDDER

DESCRIPTION AND OPERATION

1. GENERAL

The rudder has an entirely metal structure.

It enables the aircraft to be controlled around the yaw axis.

2. LOCATION (Figure 1)

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Rudder	1	320	/	55-40-00

3. DESCRIPTION (Figure 2)

The rudder is located aft the vertical stabilizer. It is articulated on two fittings which are secured to the spar of the vertical stabilizer.

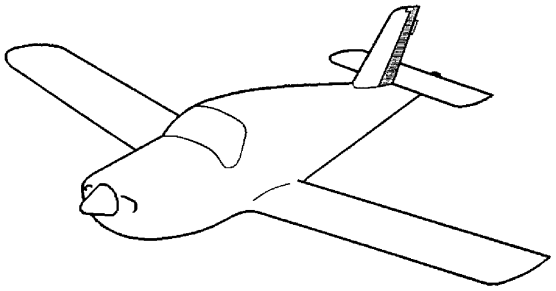
The pilot controls the rudder via the rudder pedals and a rudder control linkage composed of rods, bellcranks and a lever secured to the rudder hinge pin.

It is fitted with a balancing weight of 1.7 lbs (0.780 kg) and a compensator secured to the trailing edge.

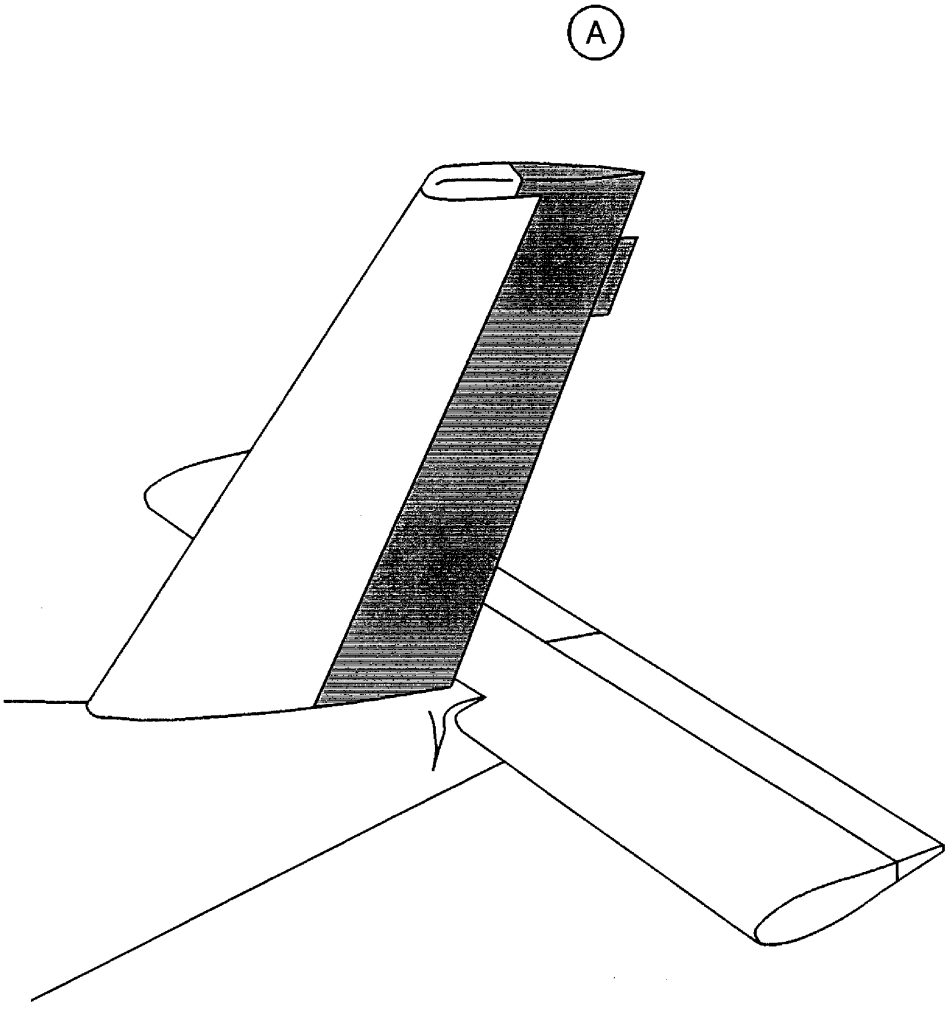
The top of the rudder is equipped with a composite material tip covering the balancing weight.

A static discharger is secured to the tip trailing edge.

With the rudder pedals pushed fully forward, the rudder travel is 25° ± 2° to the left or to the right.



A - Rudder



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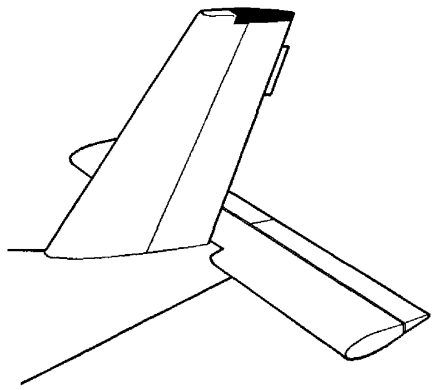
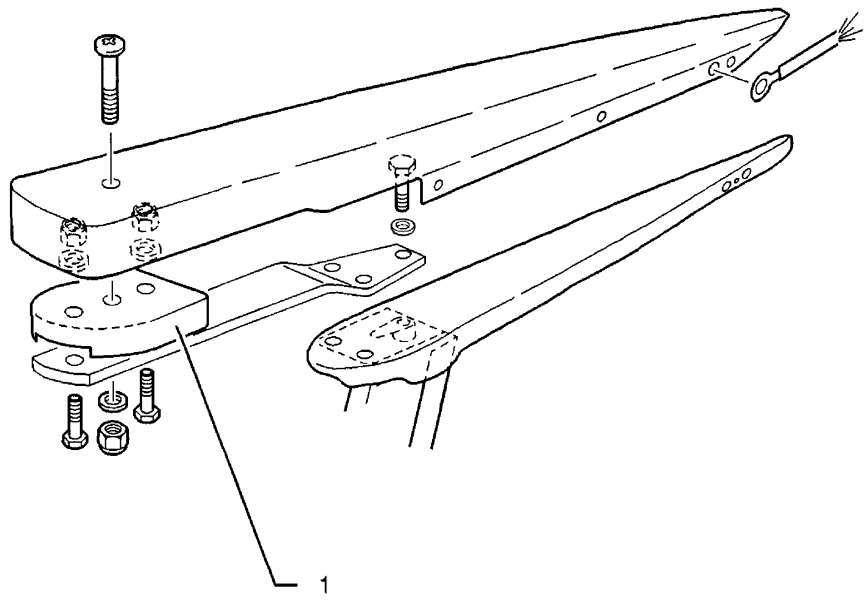
Rudder - Identification and location of components
Figure 1



1 - Balancing weight



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Rudder - Balancing weight
Figure 2

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RUDDER

REMOVAL / INSTALLATION

1. REMOVAL OF THE RUDDER (Figure 401)

A. Tools and consumable materials

- Padded supports
- 1 padded support for frame C8

B. Procedure

1) Remove baggage compartment bottom door 242.

CAUTION : THE SUPPORT MUST FIT TO FUSELAGE PROFILE PERFECTLY AND BEARING FACES MUST BE PADDED TO AVOID DAMAGING THE STRUCTURE.

2) Put the padded support under rear fuselage at frame C8.

3) Protect the baggage compartment bottom area to gain access to the rear fuselage section, particularly to frame C8.

4) Remove tail cone 222 - refer to 53-20-04.

5) Remove blank 221 - refer to 06-30-00.

6) Disconnect bonding strap (15).

7) Remove and discard cotter pin (8).

8) Remove nut (9), washer (10), bolt (14), shouldered washers (13) and disengage input rod (12) from lever (11).

9) Remove and discard cotter pin (7).

10) Remove nut (6) and special washer (5).

CAUTION : GLIDE AND VOR/LOC ANTENNAS (IF INSTALLED) ARE FRAGILE. WHEN REMOVING THE RUDDER, HANDLE THEM VERY CAREFULLY.

CAUTION : WHEN REMOVING THE RUDDER, AVOID ANY CONTACT WITH THE DIFFERENT PARTS OF THE AIRCRAFT.

11) Lift the rudder to clear it from the vertical stabilizer and place it on two padded supports.

12) If necessary, remove ball joint (4) support.

2. INSTALLATION OF THE RUDDER (Figure 401)

A. Tools and consumable materials

None

B. Procedure

NOTE : In case of repair, painting or addition of an option to the rudder, check the rudder balancing - refer to 51-60-00.

CAUTION : THE SIDE-RESTS OF BALL JOINT (4) SUPPORT MUST BE POSITIONED DOWNWARDS.

1) If removed, install ball joint (4) support.
2) Lubricate the rudder - refer to 12-21-03.
3) Inspect bonding strap (15) for condition. Replace it if necessary.

CAUTION : GLIDE AND VOR/LOC ANTENNAS (IF INSTALLED) ARE FRAGILE. WHEN INSTALLING THE RUDDER, HANDLE THEM VERY CAREFULLY.

CAUTION : WHEN INSTALLING THE RUDDER, AVOID ANY CONTACT WITH THE DIFFERENT PARTS OF THE AIRCRAFT.

4) Position the rudder, insert hinge pins (3) and (1) in ball joints (4) and (2) supports.
5) Secure the rudder with special washer (5) and nut (6).
6) Safety with a new cotter pin (7).

CAUTION : IT IS MANDATORY TO OBSERVE THE MOUNTING DIRECTION OF INPUT ROD (12) ON LEVER (11).

7) Secure input rod (12) to lever (11) with bolt (14), shouldered washers (13), washer (10) and nut (9).
8) Lock with a new cotter pin (8).
9) Connect bonding strap (15).
10) Remove the protection from the baggage compartment bottom area.
11) Make sure all the tools and materials are removed and the work area is clean and free from debris.
12) Remove the padded support.
13) Install baggage compartment bottom door 242.
14) Install blank 221.
15) Install tail cone 222 - refer to 53-20-04.
16) Check the rudder travel - refer to 27-20-00.
17) Perform a test flight - refer to 05-30-00.

3. REMOVAL OF THE BALANCING WEIGHT (Figure 402)

A. Tools and consumable materials

- Drill, dia. 1/8" (3.2 mm)
- Cleaning agent (TB 11-003)
- Lintfree clean cloths

B. Procedure

1) Remove the rudder - refer to Paragraph 1.
2) Remove screw (2) and static discharger (1).
3) Remove nut (5), washer (4) and screw (12). Discard nut (5).
4) Remove rivets (3) with a drill dia. 1/8" (3.2 mm) - refer to 51-40-02.
5) Remove tip (11).
6) Clean drilling chips from the area.
7) Remove nuts (10), washers (9), bolts (6) and balancing weight (8). Discard nuts (10).
8) Clean the parts with a lintfree clean cloth moistened with cleaning agent (TB 11-003).

4. INSTALLATION OF THE BALANCING WEIGHT (Figure 402)

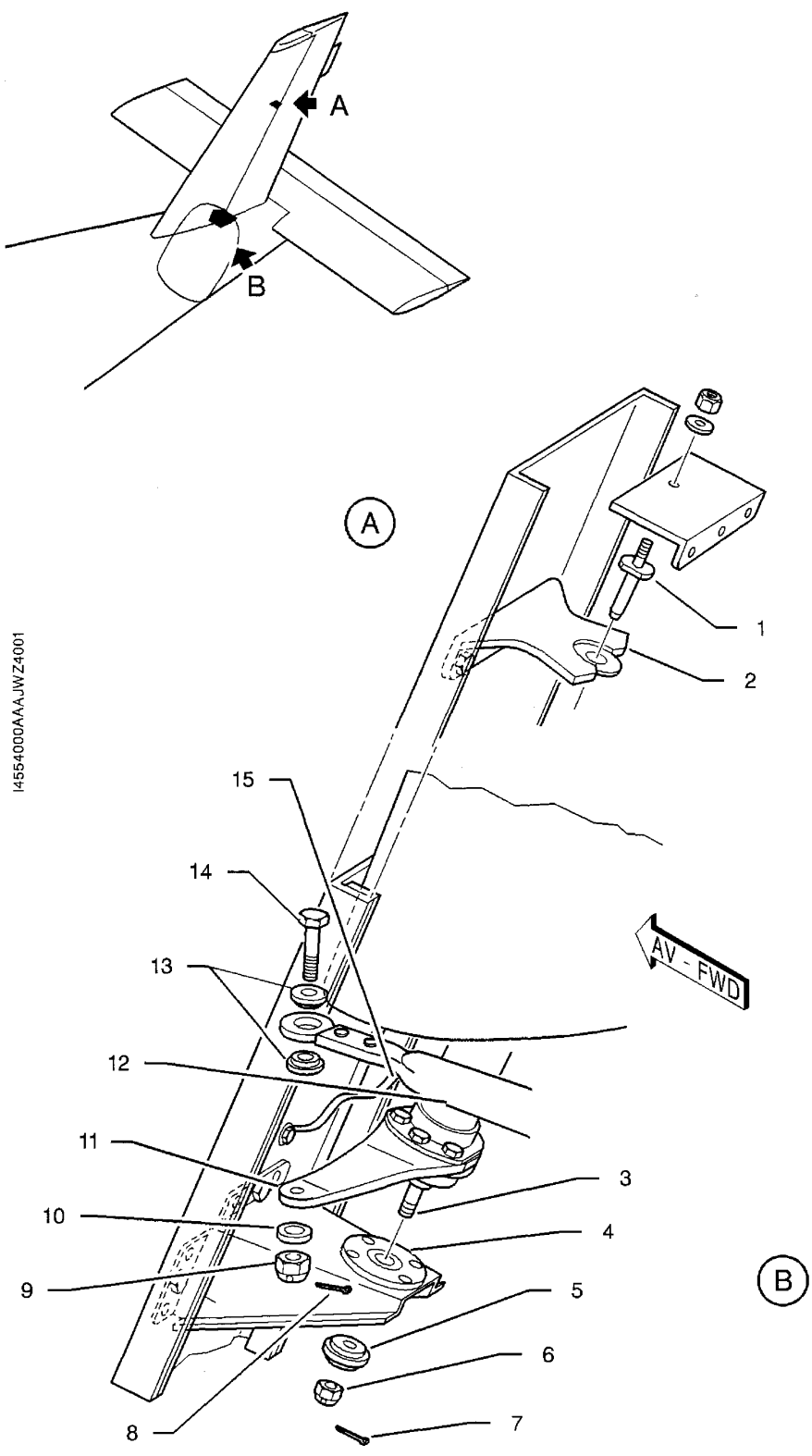
A. Tools and consumable materials

- Mastinox (TB 05-002A)
- Varnish (TB 07-907)

B. Procedure

CAUTION : APPLY A COAT OF MASTINOX (TB 05-002A) BETWEEN BALANCING WEIGHT (8) AND SUPPORT ARM (7).

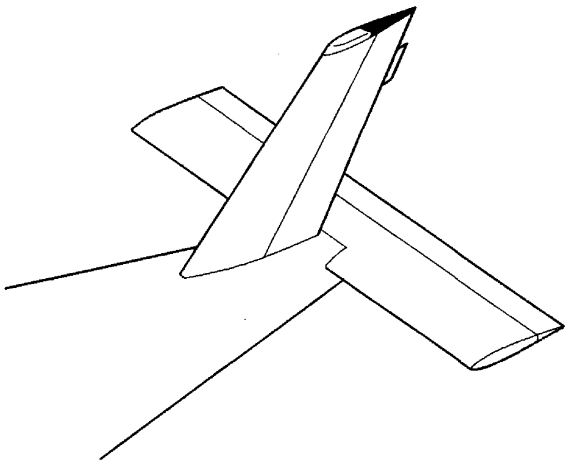
1) Apply a coat of mastinox (TB 05-002A) to balancing weight (8).
2) Position and secure balancing weight (8) onto support arm (7) with bolts (6), washers (9) and new nuts (10).
3) Make sure all the tools and materials are removed and the work area is clean and free from debris.
4) Secure the tip with rivets - refer to 51-40-02.
5) Install screw (12), washer (4) and a new nut (5).
6) Secure static discharger (1) with screw (2). Apply some varnish (TB 07-907).
7) Install the rudder - refer to Paragraph 2.

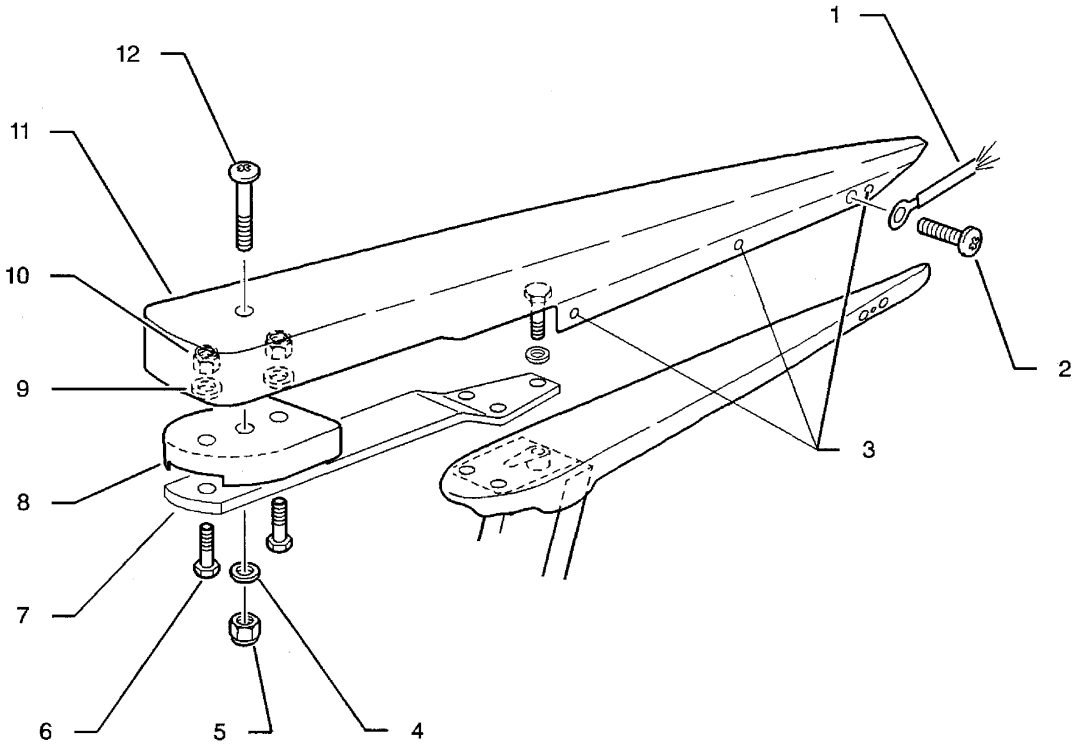


1 - Hinge pin
2 - Ball joint
3 - Hinge pin
4 - Ball joint
5 - Special washer
6 - Nut
7 - Cotter pin
8 - Cotter pin
9 - Nut
10 - Washer
11 - Lever
12 - Input rod
13 - Shouldered washer
14 - Bolt
15 - Bonding strap

Rudder - Removal / Installation
Figure 401

1 - Static discharger
2 - Screw
3 - Rivet
4 - Washer
5 - Nut
6 - Bolt
7 - Support arm
8 - Balancing weight
9 - Washer
10 - Nut
11 - Tip
12 - Screw





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Balancing weight - Removal / Installation
Figure 402

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