

# 27 FLIGHT CONTROLS

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## 27-00 GENERAL

### 1. INTRODUCTION

This chapter describes operation and the adjustment of the flight controls. It also describes the assembly of the flight controls. Refer to the related chapter for the data on a specified system.

The aircraft is equipped with dual control systems for elevator, ailerons and rudder.

### 2. MAINTENANCE PRACTICES

#### A. General principles

##### WARNING

**FOR CONNECTING THE ROTARY-MOVABLE PARTS OF THE FLIGHT CONTROLS, THE SELF-LOCKING NUTS ARE PROHIBITED TO BE USED.**

**AT INSTALLATION USE ALWAYS NEW AND UNDAMAGED LOCKING ELEMENTS (COTTER PINS, LOCK WASHERS, SELF-LOCKING NUTS, etc.).**

At removals / installations adhere to general principles which are applicable to all flight controls:

All bearings, surfaces of bolts and other moving parts of the flight controls have to be greased. Friction surfaces of the ball joint bearings and sliding bearings have to be lubricated before installation.

Threaded parts of adjustable bearing ends and forks of all control push-pull rods have to be screwed-in so that they cover the check holes in control pull rods ends. So, the minimum length of bearing end or fork threaded parts screwing in the control pull rods, i.e. min. 10 mm (0.39 in), is ensured.

The ball joint bearings and the ball bearings must rotate freely without any jamming or excessive resistance.

Bolted joints, serving for connection of two each other movable parts of the aircraft flight controls, should be tightened carefully with the wrench or only with hand. The bolted joint is tightened only to eliminate axial plays of the connection.

Immediately after tightening of each bolted joint, secure it with the castellated nut, the cotter pin or the locking pin and check the joint for movability and its axial play.

After removal and installation of the flight control parts and prior to returning the aircraft to operation, check always all the flight control parts, which were subject of your handling, for proper safety.

Orientation of bolts, locking pins and cotter pins: Mount the bolts into joints according to the rule – from above downwards or from the front backwards (considering the flight direction). If this principle is observed, spontaneous dropping out the bolt from the joint is so precluded in case of unlocking, unscrewing and dropping out the nut during operation. Use the same principle also when securing the nuts with locking pins or cotter pins.

After installing control elements, always check them for free motion without any jamming and verify proper safety of all nuts and bolts.

Prior to installing new push-pull rods, adjust their lengths to correspond to their nominal sizes.

In the whole operating range of the flight controls there must be kept the specified play between the structure and those movable parts of the control, at which their motion could be blocked.

### **3. ADJUSTMENT / TEST**

#### **A. Values for deflection adjustment**

##### **WARNING**

**NON-OBSERVANCE OF CONTROL SURFACES AND WING FLAPS SPECIFIED DEFLECTIONS CAN NEGATIVELY INFLUENCE THE FLIGHT CHARACTERISTICS OF THE AIRCRAFT.**

The control systems have specified deflections that must be always kept in the course of the aircraft operation. After replacing the control system parts, after adjusting the cable tension and in other necessary cases, the deflections of control surfaces and wing flaps must be checked and adjusted as required. The procedures for adjusting the control surfaces and wing flaps are provided in the appropriate sections, which describe the individual flight control systems. The values for checks and adjusting of control surfaces and wing flaps deflections are given in appropriate chapters.

## 4. INSPECTION / CHECK

### A. Check of plays in flight controls

At the aircraft operation the flight control and elements become worn-out under the influence of loading, vibrations etc. This wear is shown by increase of plays. When the maximum allowable operating play is reached, the worn-out parts (bearings, bolts, pins, guides etc.) must be replaced.

SYSTEM	PROCEDURE TO FIND A PLAY	PROCEDURE TO REMEDY A PLAY	MAX. PRODUCT PLAY	MAX. OPERATION PLAY
Ailerons control system	Fix ailerons in neutral position. Move the control stick to the left and right to find possible plays. Move the control stick to the end stops. Move the ailerons to find possible plays.	Check condition of bearings and replace if necessary.	2 mm / 0.078 in	5 mm / 0.197 in
Elevator control system	Fix elevator in neutral position. Move the control stick forward and backward to find possible plays. Move the control stick to the end stops. Move the elevator to find possible plays	Check condition of bearings and replace if necessary.	2 mm / 0.078 in	5 mm / 0.197 in
Flaps control system	Extend the flaps and move the flap trailing edge in the root section up and down to find possible plays. Perform for each position of flaps.	Check condition of slots at the top of central tunnel. Check the condition of bearings and replace if necessary.	2 mm / 0.078 in	5 mm / 0.197 in
Ruder control system	Fix the nose wheel and move the pedals. Fix the pedals and move with rudder left/right) and forward/backward.	Check the rudder hinges play. Check the conditions of bearing eyes of push-pull rods. and tension of control cables.	1 mm / 0.039 in	2 mm / 0.078 in

*Tab. 27-1 Maximum Permissible Plays*

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## **27-10 AILERON**

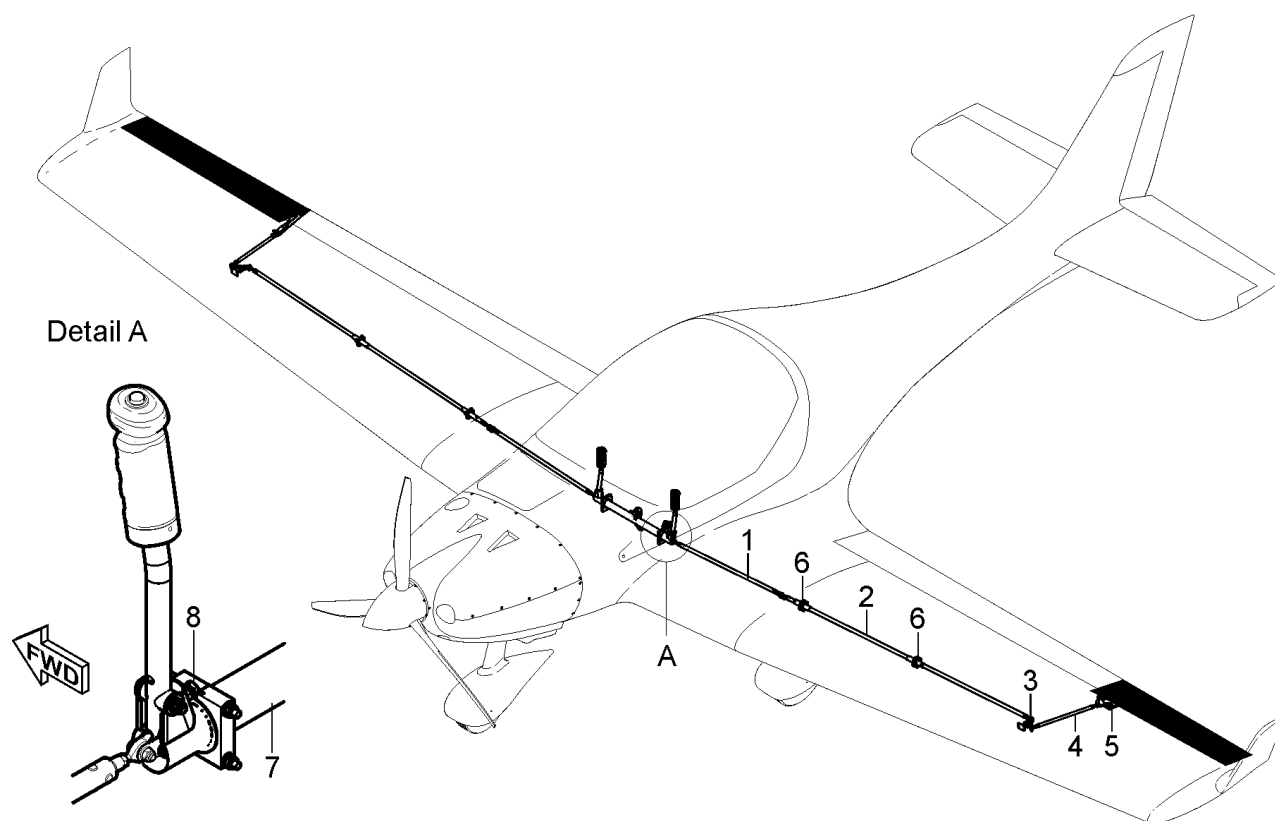
### **1. DESCRIPTION**

Ailerons are controlled through the control sticks, attached to the control stick's torsion tube (7, Fig. 27-1). Movement from control sticks is transferred to the ailerons through the push-pull rod 1 (1), push-pull rod 2 (2), bellcrank (3) and push-pull rod 3 (4).

Push-pull rods 1 are equipped with adjustable bearing eye at one end and revolving fork at the other end. Push-pull rods 2 are equipped with adjustable bearing eyes on both ends and are guided in two guide bearings (6) in the wing (in the root rib and support rib). Bellcranks are fitted with bearings and fixed in the consoles that are attached to the main wing spar. Bellcranks provide necessary differentiation of the aileron's deflections. The deflections of the ailerons are differentiated 1:1.6.

Push-pull rods 3 are equipped with adjustable bearing eyes on both ends and are connected to the aileron root ribs (5).

Range of aileron control movement is limited by stops (8) on the control stick's torsion tube (7).



- 1 – Push-pull rod 1
- 2 – Push-pull rod 2
- 3 – Bellcrank
- 4 – Push-pull rod 3

- 5 – Aileron root rib
- 6 – Guide bearing
- 7 – Torsion tube
- 8 – Stop

Fig. 27-1 Aileron Control System (illustrative figure)



## 2. MAINTENANCE PRACTICES

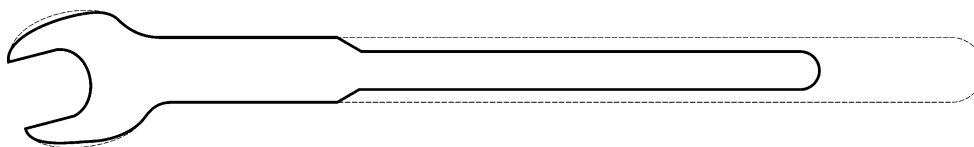
### A. Aileron control

Type of maintenance: Heavy

Recommended tools, materials, persons and documentation:

ITEM	QUANTITY
Wrench 10	2 pcs
Special wrench 10 (see Fig. 27-2)	1 pc
Wrench 9	1 pc
Socket set 10	1 pc
Ruler 20 cm	1 pc
Protractor with deflecting pointer	1 pc
Vaseline	1 pc
Serrated locking washer ø6.4	AR
Persons	2

*Tab. 27-2 Recommended tools, materials, persons and documentation*



*Fig. 27-2 Special Wrench*

#### (1) Aileron control removal:

- (a) Remove transparent cover (9, Chapter 06-00, Fig. 06-2) located on wing's bottom surface.
- (b) Remove laminated seats (Chapter 25-10).
- (c) Disconnect the push rod (3, Fig. 27-3) from the bellcrank (4), by removing nut (13), washers (15) and bolt (10).
- (d) Disconnect the push rod (3) from the aileron root rib (20) by removing nut (13), washers (15; 17) and bolt (27).

#### **NOTE**

Use special wrench (Fig. 27-2) for disconnecting push rod (3) from aileron.

- (e) Remove wing (Chapter 57-10).
- (f) Disconnect the push rod (2, Fig. 27-3) from the bellcrank (4), by removing nut (13), washers (15) and bolt (10).
- (g) Disconnect the push rod (1) from the control stick (21), by removing nut (13), washer (15) and bolt (8).
- (h) Remove the bellcrank (4) from bracket (26), by removing nut (13), washers (15) and bolt (11).

- (2) Aileron control installation:
- (a) Thoroughly clean and lubricate all the aileron movable points and other movable parts with Vaseline before each assembling (Chapter 12-20).
  - (b) Before assembling check push rods for cracks and condition of rivets. Check parallel alignment of swivel bearings (19, Fig. 27-3); on new push rods, release locking nuts (12) and use new washers (16).
  - (c) In maintenance hole on wing, attach bellcrank (4) to bracket, using bolt (11), washers (15) and nut (13); check free movement.
  - (d) Connect push rod (3) to bellcrank (4), using bolt (10), washers (15) and nut (13).
  - (e) Connect push rod (3) to aileron using bolt (27), washers (15; 17) and nut (13). If using a new push rod (3), adjust length of push rod (3) so that the lower deflection of the aileron trailing edge at the tip is 65 mm; at this point the aileron bellcrank (4) must be touching the spar web.

#### NOTE

Use special wrench (Fig. 27-2) to attach push rod (3) to aileron.

- (f) Slide the push rod (2) through the hole in the wing root. Connect push rod (2) to bellcrank (4) using bolt (10), washers (15) and nut (13).
- (g) Slide the push rod (1) through centre wing root hole. Connect push rod (1) to control stick using bolt (8), washer (15) and nut (13).
- (h) Attach the wing (Chapter 57-10); if using new push rod(s) (1; 2):
  - Align aileron trailing edge with wing trailing edge and fix them.
  - Set control sticks vertical.
  - Adjust lengths of push rods (1; 2) so it is possible to connect them with bolt (9).
  - Loosen aileron, leave control stick fixed.
- (i) Connect push rod (1) with push rod (2) using bolt (9), washer (15), nut (14) and safety pin (18).
- (j) Set control sticks vertical.
- (k) Adjust length of push rod (3), to align aileron upper trailing edge with wing bottom trailing edge.
- (l) Screw new push rods to distribute equal lengths of threads. Tighten every lock nut (12). Check parallel alignment of swivel bearings (19).
- (m) Install laminated seats (Chapter 25-10).
- (n) Install transparent cover (9, Chapter 06-00, Fig. 06-2) using silicone glue and white adhesive tape.

- (o) Carry out test and check:
- That the castle nuts are secured with cotter pins.
  - If all bolt connections are tight.
  - That all lock nuts are tight.
  - Free movement of aileron control system.
  - Alignment of the trailing edge of aileron and wing.
  - Neutral position and max. deflections.
  - Equal division of the threads on the push rods.
  - That no foreign objects remained in the aircraft.

(3) Adjustment / test - aileron deflections:

Both ailerons must be adjusted simultaneously. Described is adjusting of one side.

CONTROL SURFACE DEFLECTIONS			
Control surface	Up	Down	Distance measurement point from the point of rotation
Aileron	25 ±2°	15 ±2°	252 mm
	106 ±4 mm	65 ±4 mm	

*Tab. 27-3 Aileron Deflections*

- (a) Remove laminated seats (Chapter 25-10).
- (b) Put protractor on trailing edge of aileron root.
- (c) Set the aileron to neutral position.
- (d) Set the protractor to 0°- starting value for measuring.
- (e) Deflect aileron to the lower (possibly upper) extreme position and read the deflection value.
- (f) Check deflection values in accordance with Tab. 27-3.
- (g) If deflections are not within range listed in Tab. 27-3, screw stop bolts (7, Fig. 27-3) at torsion tube of control stick to adjust correct deflections.
- (h) Carry out test and check:
- Deflections of ailerons.
  - If all lock nuts are tight.
  - That no foreign objects remain in the aircraft.

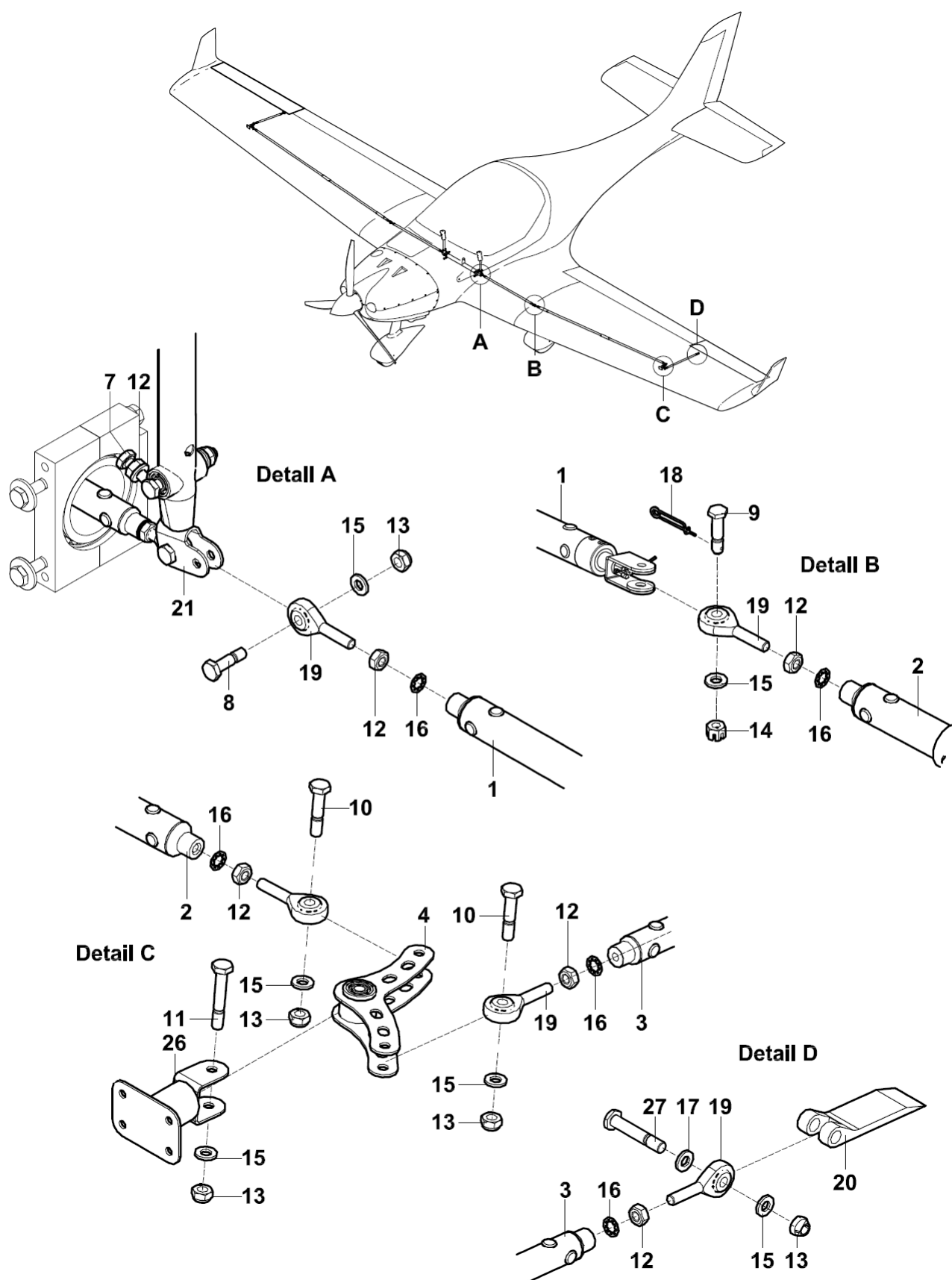


Fig. 27-3 Aileron Control Removal / Installation (page 1 of 2)

- |                          |                                   |
|--------------------------|-----------------------------------|
| 1 – Push-rod 1           | 15 – Washer ø6.4 x 12 x 1.6       |
| 2 – Push-rod 2           | 16 – Serrated locking washer ø6.4 |
| 3 – Push-rod 3           | 17 – Washer ø6.4 x 12 x 0.5       |
| 4 – Bellcrank            | 18 – Safety-pin ø1.4 x 20         |
| 5 – N/A                  | 19 – Swivel bearing               |
| 6 – N/A                  | 20 – Aileron root rib             |
| 7 – Bolt M6x16           | 21 – Control stick                |
| 8 – Bolt M6x22           | 22 – N/A                          |
| 9 – Bolt M6x25           | 23 – N/A                          |
| 10 – Bolt M6x30          | 24 – N/A                          |
| 11 – Bolt M6x38          | 25 – N/A                          |
| 12 – Nut M6              | 26 – Bracket                      |
| 13 – Self-locking nut M6 | 27 – Bolt M6x36                   |
| 14 – Castle nut M6       |                                   |

*Fig. 27-3 Aileron Control Removal / Installation (page 2 of 2)*

**B. Torsion tube with control sticks**

- (1) Torsion tube with control sticks removal:
  - (a) Remove laminated seats (Chapter 25-10).
  - (b) Remove pedestal panel (Chapter 27-50, 2.B.(1)).
  - (c) Disconnect ailerons push-pull rods (1, Fig. 27-3) from both control sticks (21) by removing nut (13), washer (15) and bolt (8).
  - (d) Disconnect elevator control push-pull rod 1 (1, Fig. 27-11) from torsion tube (21), by removing nut (16), washer (12) and bolt (11) (Chapter 27-30, 2.A.(1)).
  - (e) Disconnect trim push-rod (4, Fig. 27-12) from torsion tube (16), by removing nut (13), washers (11) and bolt (8) (Chapter 27-30, 2.C.(1)).
  - (f) On control sticks, pull out and unsolder wires from left and right handle PTT buttons (5, Fig. 27-4) (Chapter 27-10).
  - (g) Remove bushings (10) from left and right side of torsion tube (1), by unscrewing bolts (29, 14) and removing washers (20; 23; 28).
  - (h) Pull and remove torsion tube (1) with control sticks thought opening in central tunnel.

**NOTE**

Control stick assembly is composed from items No. 2; 3; 4; 5 for left stick and No. 3; 5; 7; 8; for right stick.

- (i) Remove left handle (4) and right handle (8), by unscrewing bolt (3). For foam handle the bolt (3) no exist.

**NOTE**

It may be necessary to use greater force.

- (j) Disconnect connecting push rod (11) from a control sticks (2; 7), by removing nuts (24), washers (21) and bolts (16).
- (k) Disconnect left control stick (2) from torsion tube (1) by unscrewing nut (24), washer (21) and bolt (15).
- (l) Disconnect right control stick (7) from torsion tube (1) by unscrewing nut (24), washer (21) and bolt (15).
- (m) If necessary, remove stop bolts by releasing nut (25) and unscrew bolt (17).

- (2) Torsion tube with control sticks installation:
- (a) Before assembling check push rods for cracks and condition of rivets. Check parallel alignment of swivel bearings; on new push rods, release lock nuts.
  - (b) Assemble connecting push rod (11, Fig. 27-4) with control sticks (2; 7) and torsion tube (1), using bolts (16; 15), washers (21) and nuts (24). Check free movement of control sticks. If using new connecting push rod:
    - Adjust the length by screwing bearings ending (27) so that the distance between tops of control sticks (2; 7), is the same as the distance between bolts (15) connecting control sticks (2; 7) with torsion tube (1) (575 mm).
    - Use new washers (23) and tighten nuts (25).
    - If using new torsion tube (1):
    - Screw aileron stop bolts (17) with nuts (25).
  - (c) Put torsion tube (1) through the hole on the central tunnel.
  - (d) If previously removed, install front part of bushing (10) on left and right side of main beam using washers (20; 23) and bolts (14). Apply the Loctite 243 on thread of bolts.
  - (e) Insert torsion tube (1) into front bushings, put aft part of bushing (10) using washers (23; 28) and bolts (29). Apply the Loctite 243 on thread of bolts.
  - (f) Put the PTT buttons (5) on the top of left handle (4) and right handle (8). Route wires through the control sticks and solder the wires to handles and to PTT buttons (5).
  - (g) Put the left (4) and right (5) handles on the control sticks and screw bolt (3). For foam handle the bolt (3) no exist.
  - (h) If necessary, install stop bolts:
    - Screw front stop bolt (19) with nut (25).
    - Slide the rear stop of elevator (12) into central tunnel, put washer (9), bolt (18), washer (22) and screw the nut (26).
    - Screw the rear stop bolt (13) on rear stop of elevator (12) with washer (21) and nut (25).
    - Adjust stop bolts (13; 19).
    - Install the pedestal panel (Chapter 27-50, 2.C.(2)).
  - (i) Carry out test and check:
    - That the castle nuts and pins are secured with cotter pins.
    - If all bolt connections are tight.
    - Plays.
    - Free movement of elevator control system.
    - Neutral position and max displacements.
    - Equal division of threads on push rods.
    - Operation of push button on stick.
    - No foreign objects remain in the aircraft.



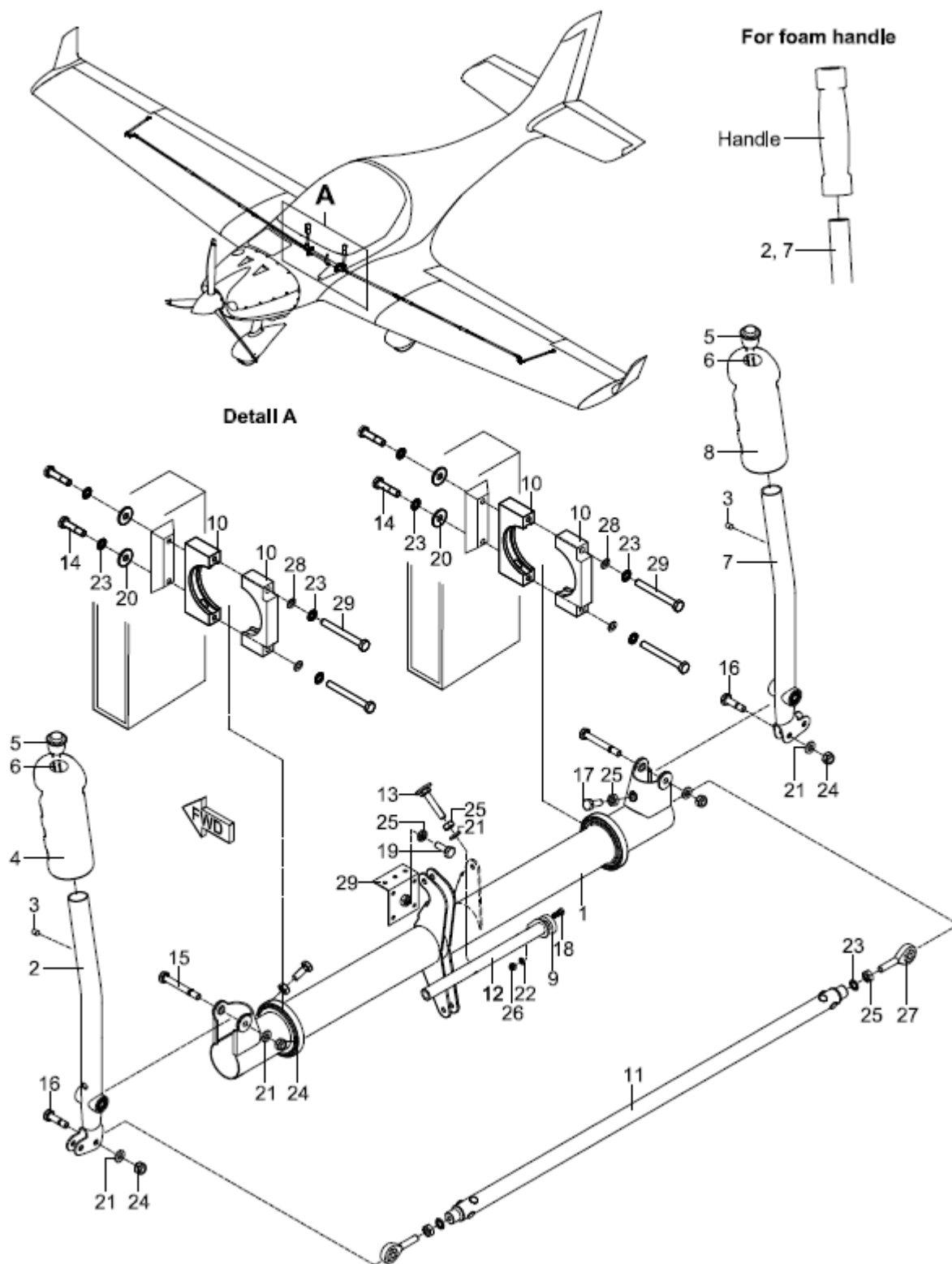


Fig. 27-4 Torsion Tube with Control Sticks Removal / Installation (page 1 of 2)



1 – Torsion tube	16 – Bolt M6x22
2 – Left control stick	17 – Bolt M6x16
3 – Bolt M5x8	18 – Bolt M4x 25
4 – Left handle	19 – Bolt M6x16
5 – Push-To-Talk (PTT) Button	20 – Washer 6x18x1.6
6 – Wires	21 – Washer 6x12x1.6
7 – Right control stick	22 – Washer 4x12x1
8 – Right handle	23 – Washer 6x11x0.7
9 – Carbon washer	24 – Self-locking nut M6
10 – Bushing	25 – Nut M6
12 – Elevator rear stop	26 – Self-locking nut M4
13 – Elevator rear stop bolt	27 – Bearing ending
14 – Bolt M6x26	28 – Washer 6x12x0.5
15 – Bolt M6x46	29 – Bolt M6x45

*Fig. 27-4 Torsion Tube with Control Sticks Removal / Installation (page 2 of 2)*

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## **27-20 RUDDER**

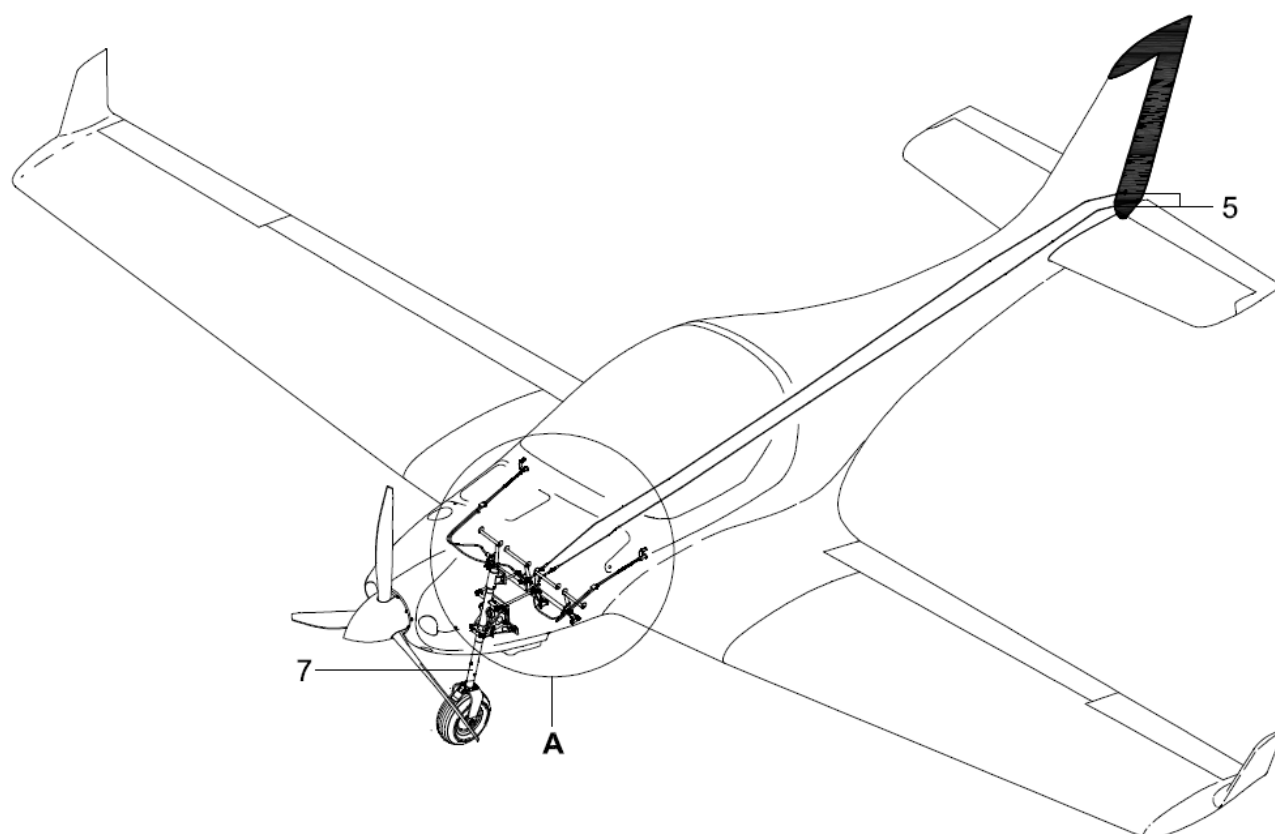
### **1. DESCRIPTION**

The rudder is controlled by foot control pedals. The position of pedals for pilot and co-pilot can be remotely adjustable. The rudder is controlled through steel cables. Nose gear steering is controlled through push-pull rods (FG version) or through control bowdens (RG version). The range of rudder deflections is limited by stops glued to the fin root.

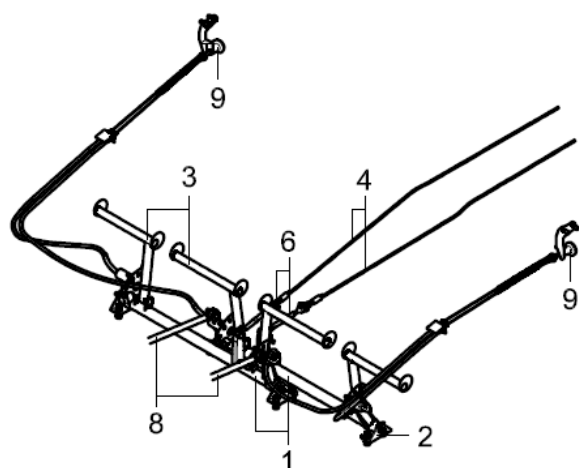
The rudder pedal's torsion tubes (1, Fig. 27-5) are attached to the floor (FG version) or to the rescue system board (RG version) in four holders (2). The motion of pedals (3) is transferred through torsion tubes arms and control cables (4) to the rudder root rib (5). The polyurethane casings are attached to the fuselage structure to guide the control cables. There are turnbuckles (6) for adjusting tension in control cables.

The rudder control pedals are connected to the nose landing gear leg (7) through two push-pull rods (8, FG version) or control bowdens (10, RG version).

Pedal positions can be adjusted manually or with control handles (9) that release locking pins. Three possible positions are available. Pedals are fitted with springs to return to the rearward position during adjusting.

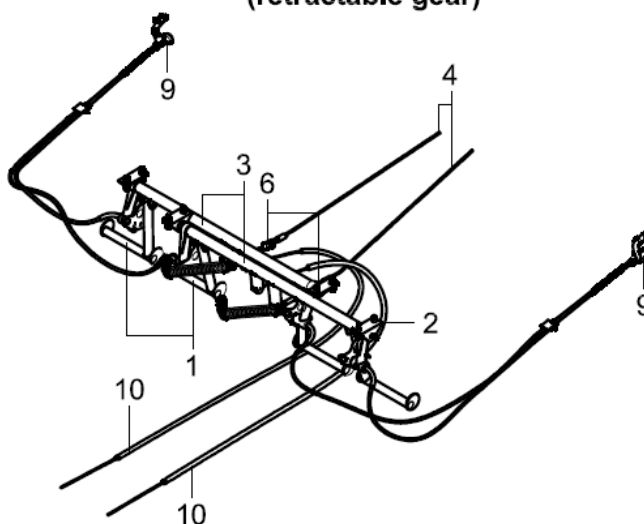


**Detail A**  
(fixed gear)



- 1 – Torsion tube
- 2 – Holder
- 3 – Pedal
- 4 – Control cables
- 5 – Rudder root lever

**Detail A**  
(retractable gear)



- 6 – Turnbuckle
- 7 – Nose landing gear leg
- 8 – Push-pull rod (FG only)
- 9 – Control handle
- 10 – Control bowdins (RG only)

*Fig. 27-5 Rudder Control System (Illustrative figure)*

## 2. MAINTENANCE PRACTICES

Type of maintenance: Heavy

Recommended tools, materials, persons and documentation:

ITEM	QUANTITY
Wrench 10	2 pcs
Wrench 9	1 pc
Hex key 5	1 pc
Nicopress tool	1 pc
Steel wire cutter	1 pc
Solder set	1 pc
Heat gun	1 pc
Pliers	1 pc
Combination pliers	2 pcs
Screwdriver	1 pc
Tensiometer	1 pc
Sleeve 3.0-3.2	4 pcs
Steel cable ø3.2	AR
Cotter pin ø1.6 x 25	2 pcs
Serrated locking washer ø6.4	6 pcs
Cable tie 3.2	4 pcs
Vaseline	AR
Lubrication oil	AR
Adhesive tape	AR
Loctite 243	AR
Loctite 270	AR
Contact adhesive	AR
Solder	AR
Safety wire ø0.8 mm	AR
Shrink tube ø12.4 mm	AR
Persons	2

*Tab. 27-4 Recommended tools, materials, persons and documentation*

**A. Control cables FG**

- (1) Control cables FG removal:
  - (a) On both ends of steel cable (1, Fig. 27-7), remove nuts (11; 12), washers (9; 10) bolts (6; 7) and distance tubes (15; 16); cut steel cable (1) and pull it out.
  - (b) Remove second steel cable (1).
  - (c) Remove turnbuckle assembly (4), by removing cotter pin (14), washers (8; 9) and pin (5).
  - (d) Remove second turnbuckle assembly (4).
- (2) Control cables FG installation:
  - (a) Connect turnbuckle assembly (4, Fig. 27-7) with foot control using pin (5), washers (8; 9) and cotter pin (14) so that the turnbuckle assembly (4) rotates easily.
    - Remove safety wire if it is present.
    - Connect turnbuckle barrel to turnbuckle fork and turnbuckle eye bolt with half a turn of thread.
  - (b) Connect second turnbuckle assembly (4).
  - (c) Make an eye on one end of new steel cable (1) with thimble (3), sleeve (2) and shrink tube. Press sleeve (2) closely to thimble (3) with Nicopress tool **at 3 points** and shrink the shrink tube on sleeve (2).
  - (d) Connect steel cable eye (1) with turnbuckle fork (4), by using distance tube (15), bolt (6), washer (10) and nut (11); tighten nut (11) so that the turnbuckle (4) assembly rotates easily.
  - (e) Lubricate steel cable (1) with oil on entire length.
  - (f) Slide free end of steel cable (1) through plastic tube to tail end.

**NOTE**

Plastic tube is located in the central tunnel.

- (g) Install second steel cable (1).
- (h) Put aircraft on lift jacks (Chapter 07-10), align foot control and set nose wheel and rudder to neutral position.
- (i) On rudder operating levers, put a temporary thimble (3), bolt (7) and screw a nut.
- (j) On free end of steel cable (1), slide shrink tube and sleeve (2).
- (k) Fold steel cable (1) around thimble (3) and strain cable to 61-65 N. Move sleeve (2) closely to the thimble (3) and fix them with combination pliers (Fig. 27-6).



*Fig. 27-6 Straighten of Steel Cable*

- (l) Disconnect steel cable (1, Fig. 27-7) with sleeve (2) and thimble (3) from rudder operating lever by removing bolt (7).

#### **NOTE**

Take care to not move positions of items (1; 2; 3) during removal of bolt (7).

- (m) Press sleeve (2) with Nicopress tool **at 3 points**, cut unnecessary end of steel cable (1) and shrink the shrink tube on sleeve (2).
- (n) Make eye on second steel cable (1).
- (o) Connect control cable eye with rudder operating lever, using distance tube (16), bolt (7), washer (9) and nut (12).
- (p) Connect second control cable eye.
- (q) Strain the control cable at value 70 N with turnbuckle barrel (4).
- (r) Swing the rudder few times.
- (s) Adjust the tension force in the steel cable (1), by turnbuckle barrel (4) at value 61-65 N.
- (t) Secure turnbuckle assembly (4) with safety wire.
- (u) Carry out test and check:
- That the castle nuts are secured with cotter pins.
  - If all bolt connections are tight.
  - Plays.
  - Alignment of rudder with nose gear
  - Equal division of threads on push rods and turnbuckle.
  - Tension of control cables.
  - That no foreign objects remain in the aircraft.

## (3) Adjustment / test - rudder deflections:

Deflections of rudder are mentioned in Tab. 27-5. These deflections are not adjustable. The neutral position of the rudder can be adjusted.

CONTROL SURFACE DEFLECTIONS			
Control surface	Left	Right	Distance measurement point from the point of rotation
Rudder	25 ±2°	25 ±2°	320 mm
	135 ±10 mm	135 ±10 mm	

*Tab. 27-5 Rudder Deflections*

- (a) Lift the aircraft on jacks (Chapter 07-10).
- (b) Set the pedals to middle position.
- (c) Align pedals and check if nose wheel and rudder is in neutral position.
- (d) If it isn't, align rudder screwing one turnbuckle barrel (4, Fig. 27-7) and simultaneously unscrewing second turnbuckle barrel (4).
- (e) Check if tension on steel cables (1) is between 61-65 N. If it's not, screw turnbuckle barrel(s) (4) to adjust to correct tension.
- (f) Secure turnbuckle assembly (4) with safety wire.
- (g) Carry out test and check:
  - Alignment of rudder with nose wheel and pedals in neutral positions.
  - Tension on control cables.
  - That no foreign objects remain in the aircraft.



**B. Control cables RG**

- (1) Control cables RG removal:
  - (a) Disconnect the both springs (20, Fig. 27-7) and steel cables (1) from the torsion tubes by removing nuts (12), washers (19) and distance tubes (16, 17).
  - (b) Remove the springs (20).
  - (c) Disconnect the steel cables (1) from the rudder by removing nuts (12), washers (9), bolts (7) and distance tubes (16).
  - (d) Cut the steel cables (1) and remove them.
- (2) Control cables RG installation:
  - (a) Make an eye on one end of new steel cable (1, Fig. 27-7) with thimble (3), sleeve (2) and shrink tube. Press sleeve (2) closely to thimble (3) with Nicopress tool **at 3 points** and shrink the shrink tube on sleeve (2).
  - (b) Connect steel cable eye (1) together with spring (20) to torsion tube lever using distance tubes (16, 17), bolt (18), washers (19) and nut (12).
  - (c) Lubricate entire length of steel cable (1) with oil.
  - (d) Slide free end of steel cable (1) through plastic tube to the tail end.

**NOTE**

Plastic tube is located in the central tunnel.

- (e) Install second steel cable (1) by the same method.
- (f) Attach the both springs (20) on spring anchoring eyes at the rescue system board.
- (g) Put aircraft on lift jacks (Chapter 07-10). Set the foot control pedals on pilot side to distance 220 mm from firewall and fixed them. Adjust the nose wheel and rudder to neutral position.
- (h) Put temporary thimble (3), bolt (7) and slightly screw the nut (12) on the rudder operating lever.
- (i) On free end of steel cable (1), slide shrink tube and sleeve (2).
- (j) Fold the steel cable (1) around thimble (3) and strain cable to 61-65 N. Move the sleeve (2) closely to the thimble (3) and fix it with combination pliers (Fig. 27-6).
- (k) Disconnect steel cable (1, Fig. 27-7) with sleeve (2) and thimble (3) from rudder operating lever by removing bolt (7).

**NOTE**

Take care to not move positions of items (1; 2; 3) during removal of bolt (7).

- (l) Press the sleeve (2) with Nicopress tool **at 3 points**, cut unnecessary end of steel cable (1) and shrink the shrink tube on the sleeve (2).
  - (m) Make the eye on the second steel cable (1) by the same method.
  - (n) Connect control cable eyes (1) to the rudder operating levers, using distance tubes (16), bolts (7), washers (9) and nuts (12).
  - (o) Release the pedals and swing the rudder few times.
  - (p) Carry out test and check:
    - If all bolt connections are tight.
    - Plays.
    - Alignment of rudder with nose gear
    - Tension of control cables.
    - That no foreign objects remain in the aircraft.
- (3) Adjustment / test - rudder deflections:  
Deflections of rudder are mentioned in Tab. 27-5. These deflections are not adjustable. The neutral position of the rudder can be adjusted.
- (a) Lift the aircraft on jacks (Chapter 07-10).
  - (b) Set the pedals to middle position.
  - (c) Align pedals and check if nose wheel and rudder is in neutral position.
  - (d) If it isn't, cut the both steel cables, set the rudder to correct position (neutral position) and install the new steel cables as described above.
  - (e) Carry out test and check:
    - Alignment of rudder with nose wheel and pedals in neutral positions.
    - Tension on control cables.
    - That no foreign objects remain in the aircraft.

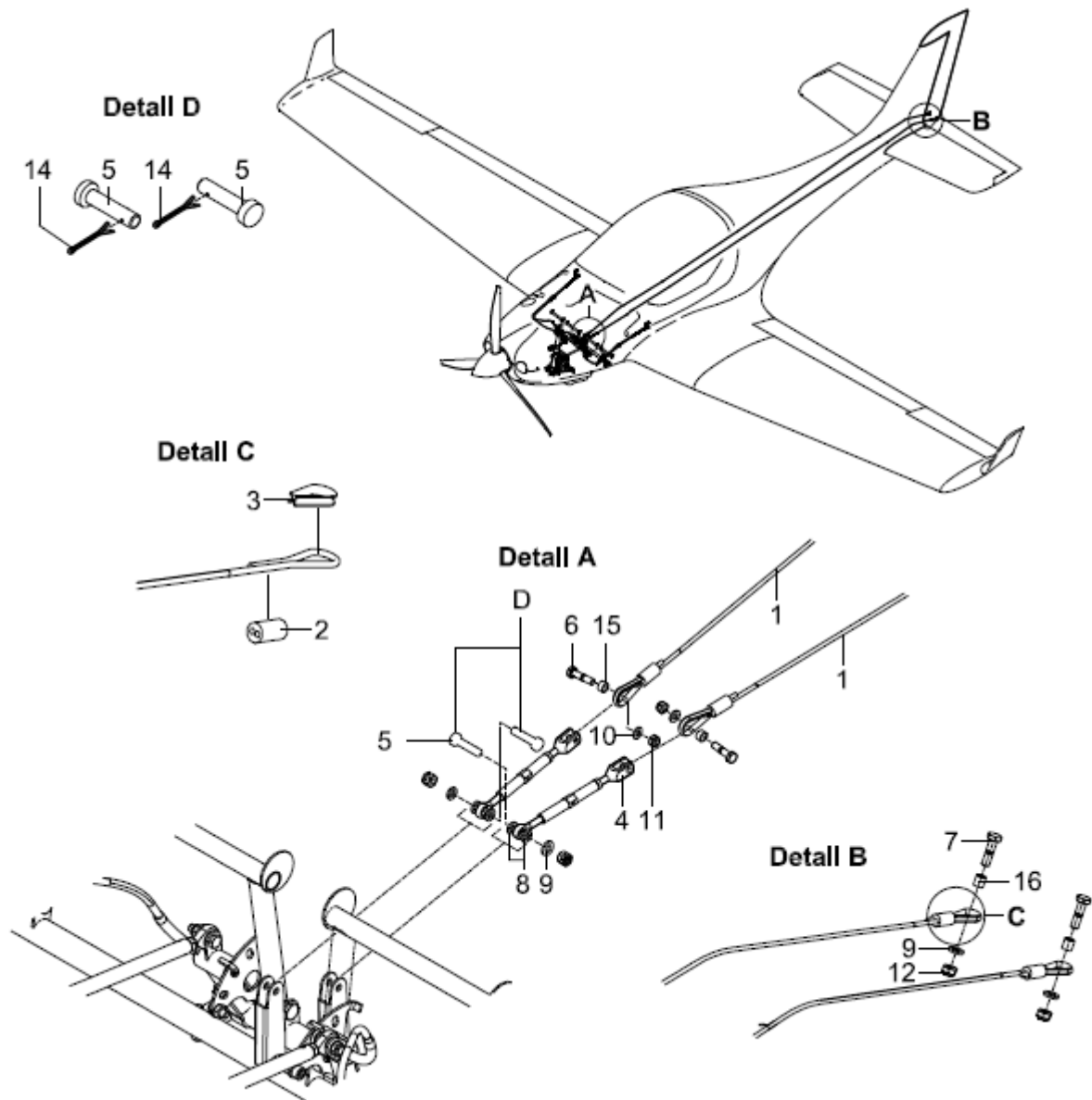
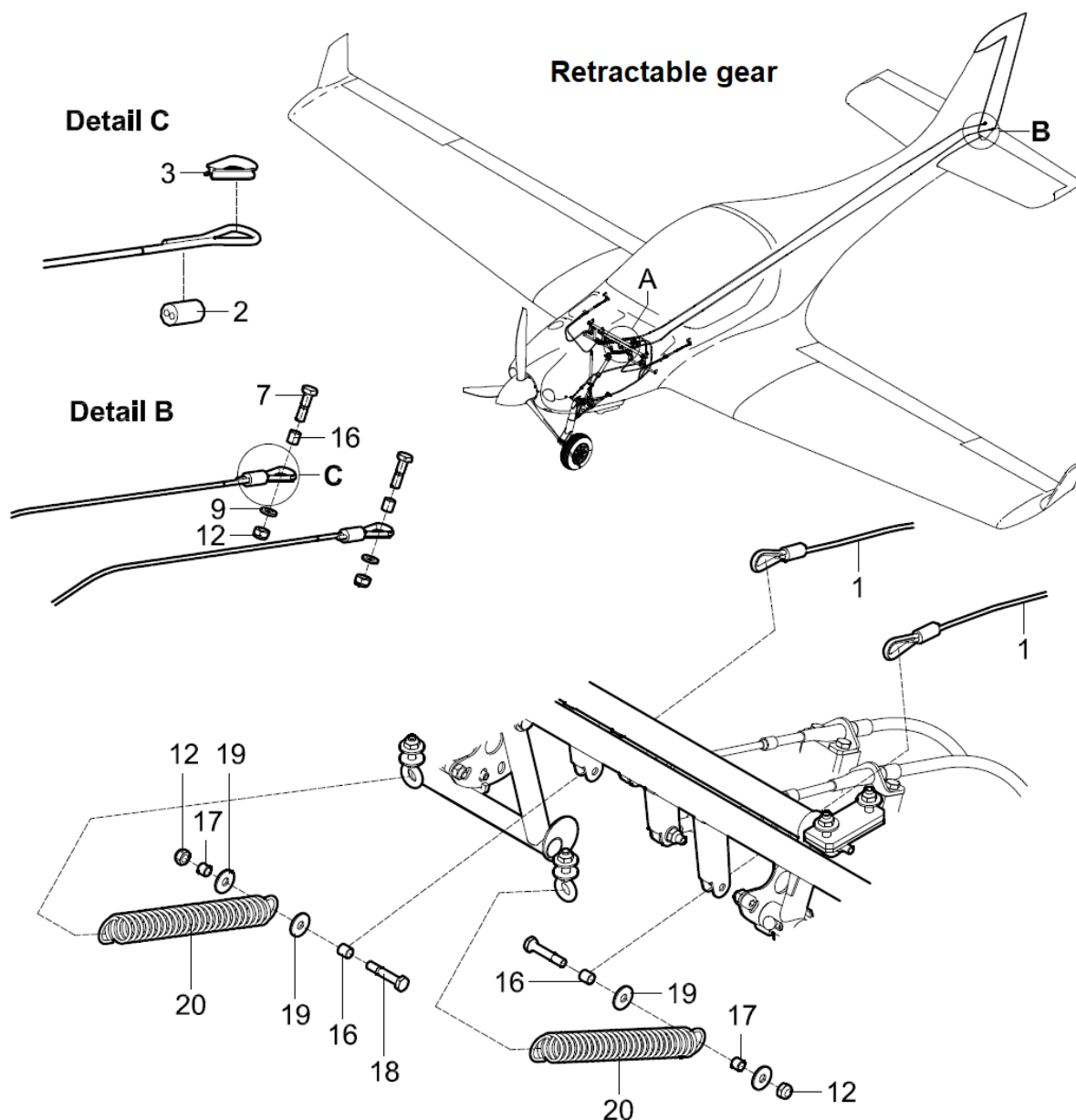


Fig. 27-7 Control Cable Removal / Installation (1 of 2)



- |   |  |
|---|--|
| 1 – Control cable $\varnothing 3.2$               | 12 – Self-locking nut M6                           |
| 2 – Sleeve 3.0-3.2                                | 13 – Castle nut M6                                 |
| 3 – Thimble 3.1-4.0                               | 14 – Cotter pin $\varnothing 1.6 \times 25$        |
| 4 – Turnbuckle assembly                           | 15 – Distance tube $\varnothing 8 \times 1 - 4.5$  |
| 5 – Pin $\varnothing 6 \times 18$                 | 16 – Distance tube $\varnothing 8 \times 1 - 8.5$  |
| 6 – Bolt M5 x 20                                  | 17 – Distance tube $\varnothing 8 \times 1 - 7$    |
| 7 – Bolt M6 x 22                                  | 18 – Bolt M6 x 32                                  |
| 8 – Washer $\varnothing 6.4 \times 10 \times 1.6$ | 19 – Washer $\varnothing 6.4 \times 18 \times 1.6$ |
| 9 – Washer $\varnothing 6.4 \times 12 \times 1.6$ | 20 – Spring 2.5 x 22 x 99 x 25                     |
| 10 – Washer $\varnothing 5.3 \times 10 \times 1$  |  |
| 11 – Self-locking nut M5                          |  |

Fig. 27-7 Control Cable Removal / Installation (2 of 2)

**C. Remote control of pedals FG / RG**

- (1) Remote control of pedals FG / RG removal:
  - (a) Remove spiral hoses (14, Fig. 27-8) and cable ties.
  - (b) Remove the nuts (8; 12), washers (6; 7), distance tube (13) and pull out thread rod (11) with handle (10).
  - (c) Pull out inner cables (2) and bowdens (1).
  - (d) Remove screw shackles (3), nuts (4), washers (5), by unscrewing nuts (4).
- (2) Remote control of pedals FG / RG installations:
  - (a) Install screw shackles (3, Fig. 27-8), washers (5) nuts (4) on holder (17) under instrument panel.
  - (b) Assembly the handle (10) with thread rod (11) secured with Loctite 270, distance tube (13) and nut (12), leaving 12 mm free end of thread rod (11). Let the Loctite 270 to harden.
  - (c) Unscrew the nut (12) and install assembled handle (10) with thread rod (11) and distance tube (13) on control anchor (16) using nut (12).
  - (d) Slide the bowdens (1) and inner cables (2) according table through bayonets (15) and screw shackles (3).

**NOTE**

Install correct length of bowdens (1) on correct positions:

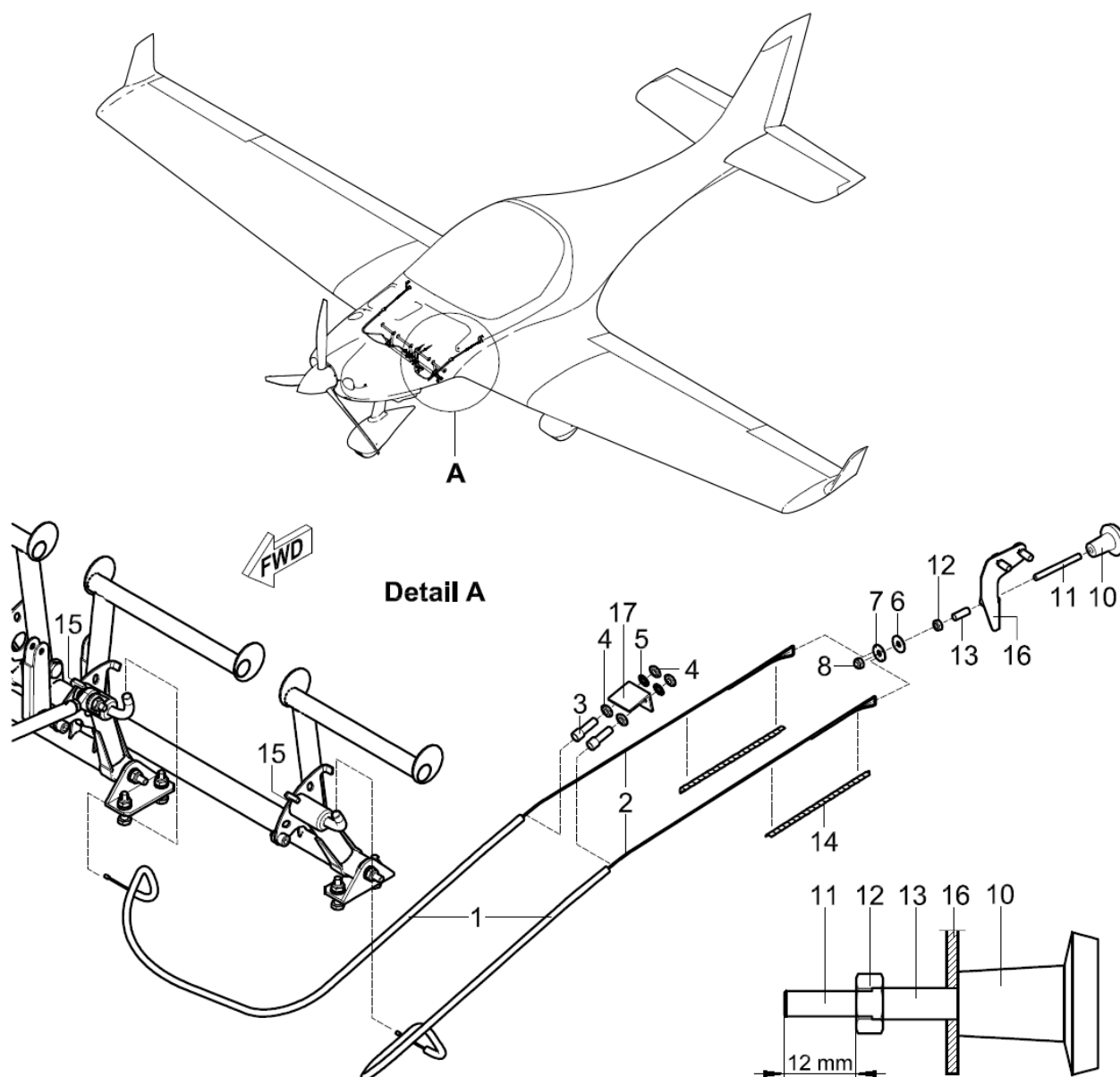
LENGTHS OF BOWDENS (FG / RG)			
Left side, left pedal	500 / 480 mm	Right side, left pedal	660 / 750 mm
Left side, right pedal	660 / 730 mm	Right side, right pedal	500 / 510 mm

- (e) Push the control handle (10) forward to the control anchor (16). Insert the pair of inner cables (2) diagonally through the holes in washer (7). Put the washer (6) and washer (7) with inner cables (2) on thread rod (11) and tighten nut (8).

**NOTE**

Control handle must have 3 mm backlash.

- (f) Cut ends of inner cables (2) to 150 mm length from washer (7) and solder the cable ends.
- (g) Wrap spiral hoses (14) and secure bowdens (1) with 2 cable ties (3.2 mm) to rescue system board.
- (h) Check operating of pedals remote control.
- (i) Carry out test and check:
  - If all bolt connections are tight.
  - That pedals lock in all three positions.
  - That no foreign objects remain in the aircraft.



- |   |                                  |
|---|----------------------------------|
| 1 – Bowden  | 10 – Black handle                |
| 2 – Inner cable $\varnothing 1.2$                     | 11 – Thread rod M5 x 42          |
| 3 – Screw shackle                                     | 12 – Nut M5                      |
| 4 – Nut M6 Low  | 13 – Distance tube               |
| 5 – Serrated locking washer $\varnothing 6.4$         | 14 – Spiral hose $\varnothing 1$ |
| 6 – Washer $\varnothing 5.3 \times 15 \times 1$       | 15 – Bayonet socket              |
| 7 – Plain washer $\varnothing 5.3 \times 15 \times 1$ | 16 – Control anchor              |
| 8 – Self-locking nut M5                               | 17 – Holder                      |

Fig. 27-8 Control of Pedals Removal / Installation (Illustrative figure)

**D. Foot control FG**

- (1) Foot control FG removal:
  - (a) Remove control cables (see 2.A.(1)).
  - (b) Remove remote control of pedals (see 2.C.(1)).
  - (c) Remove steering push rods (Chapter 32-50).
  - (d) Remove foot control, by unscrewing the nuts (13, Fig. 27-9) and removing the washers (15).
  - (e) Pull out consoles (3; 4) with bronze bushings (5).
  - (f) Disassemble bronze bushing (5), by unscrewing the nut (13), removing washer (15) and bolt (11).
  - (g) Disassemble pedal, by removing cotter pin (14), washer (16) and pin (10).
  - (h) Unscrew the bolt (12) from pedal.
  - (i) In case pedals without remote control:
    - Unscrew control grip M4 (21)
- (2) Foot control FG installation:
  - (a) Before assembling check foot controls for cracks and deformations. Check bolts laminated in floor.

**NOTE**

Described is installation of one pedal (6; 7; 8; 9, Fig. 27-9) to a torsion tube (1; 2). Take care to install correct pedals to correct positions on torsion tubes (1; 2).

- (b) Before assembling clean holes in torsion tubes (1; 2, Fig. 27-9) and pedals (6; 7; 8; 9).
- (c) Attach lever spring (17 or 18) to pedal and connect to torsion tube, by using pin (10), washer (16) and cotter pin (14).

**NOTE**

Attach it so that the pedal rotates easily.

- (d) Put spring (19) and bayonet (20) into socket on torsion tube.
- (e) Push down bayonet (20) and turn pedal to fit bayonet (20) into pedal's groove. In case pedals without pedals remote control: screw control grips M4 (21) to bayonets (20).
- (f) Check operation of adjustment in all three positions.
- (g) Screw bolt (12) on pedal and secure with Loctite 243.
- (h) Assemble other pedals.
- (i) Slide bronze bushings (5) with consoles (3; 4) on ends of torsion tubes (1; 2).

**NOTE**

The inner consoles (4) have elliptical holes and have direction out. Outer consoles (3) have direction in.

- (j) Connect bronze bushing (5) with console (4), by using bolt (11), washer (15) and nut (13).
- (k) Put foot control on screws laminated in floor; put washers (15) and tighten nuts (13).
- (l) Install steering push rods (Chapter 32-50).
- (m) Install remote control of pedals (see 2.B.(2)).
- (n) Install control cables (see 2.A.(2)).
- (o) Carry out test and check:
  - If all bolt connections are tight.
  - Alignment of rudder with nose gear.
  - Plays.
  - Free movement of rudder control system (nose wheel must be off the ground).
  - That no foreign objects remain in the aircraft.



**E. Foot control RG**

- (1) Foot control RG removal:
  - (a) Remove control cables (see 2.B.(1)).
  - (b) Remove remote control of pedals (see 2.C.(1)).
  - (c) Remove foot control bowdens (Chapter 32-50).
  - (d) Remove foot control, by unscrewing the nuts (13, Fig. 27-9) and removing the washers (22, 23), bolts (25) and pads (24).
  - (e) Pull out consoles (3; 4) with bronze bushings (5).
  - (f) Disassemble bronze bushing (5), by unscrewing the nut (13), removing washer (15) and bolt (11).
  - (g) Disassemble pedal, by removing cotter pin (14), washer (16) pin (10).
  - (h) Unscrew the bolt (12) from pedal.
  - (i) In case pedals without remote control:
    - Unscrew control grip M4 (21)
- (2) Foot control RG installation:
  - (a) Before assembling check foot controls for cracks and deformations. Check bolts laminated in floor.

**NOTE**

Described is installation of one pedal (6; 7; 8; 9, Fig. 27-9) to a torsion tube (1; 2). Take care to install correct pedals to correct positions on torsion tubes (1; 2).

- (b) Before assembling clean holes in torsion tubes (1; 2, Fig. 27-9) and pedals (6; 7; 8; 9).
- (c) Attach lever spring (17 or 18) to pedal and connect to torsion tube, by using pin (10), washer (16) and cotter pin (14).

**NOTE**

Attach it so that the pedal rotates easily.

- (d) Put spring (19) and bayonet (20) into socket on torsion tube.
- (e) Push down bayonet (20) and turn pedal to fit bayonet (20) into pedal's groove. In case pedals without pedals remote control: screw control grips M4 (21) to bayonets (20).
- (f) Check operation of adjustment in all three positions.
- (g) Screw bolt (12) on pedal and secure with Loctite 243.
- (h) Assemble other pedals.
- (i) Slide bronze bushings (5) with consoles (3; 4) on ends of torsion tubes (1; 2).

**NOTE**

The inner consoles (4) have elliptical holes and have direction out. Outer consoles (3) have direction in.

- (j) Connect bronze bushing (5) with console (4), by using bolt (11), washer (15) and nut (13).
- (k) Put foot control with pads (24) on holes in floor; insert bolts (25) with washers (23, 22) and tighten it with nuts (13).
- (l) Install foot control bowdens (Chapter 32-50).
- (m) Install remote control of pedals (see 2.C.(2)).
- (n) Install control cables (see 2.B.(2)).
- (o) Carry out test and check:
  - If all bolt connections are tight.
  - Alignment of rudder with nose gear.
  - Plays.
  - Free movement of rudder control system (nose wheel must be off the ground).
  - That no foreign objects remain in the aircraft.

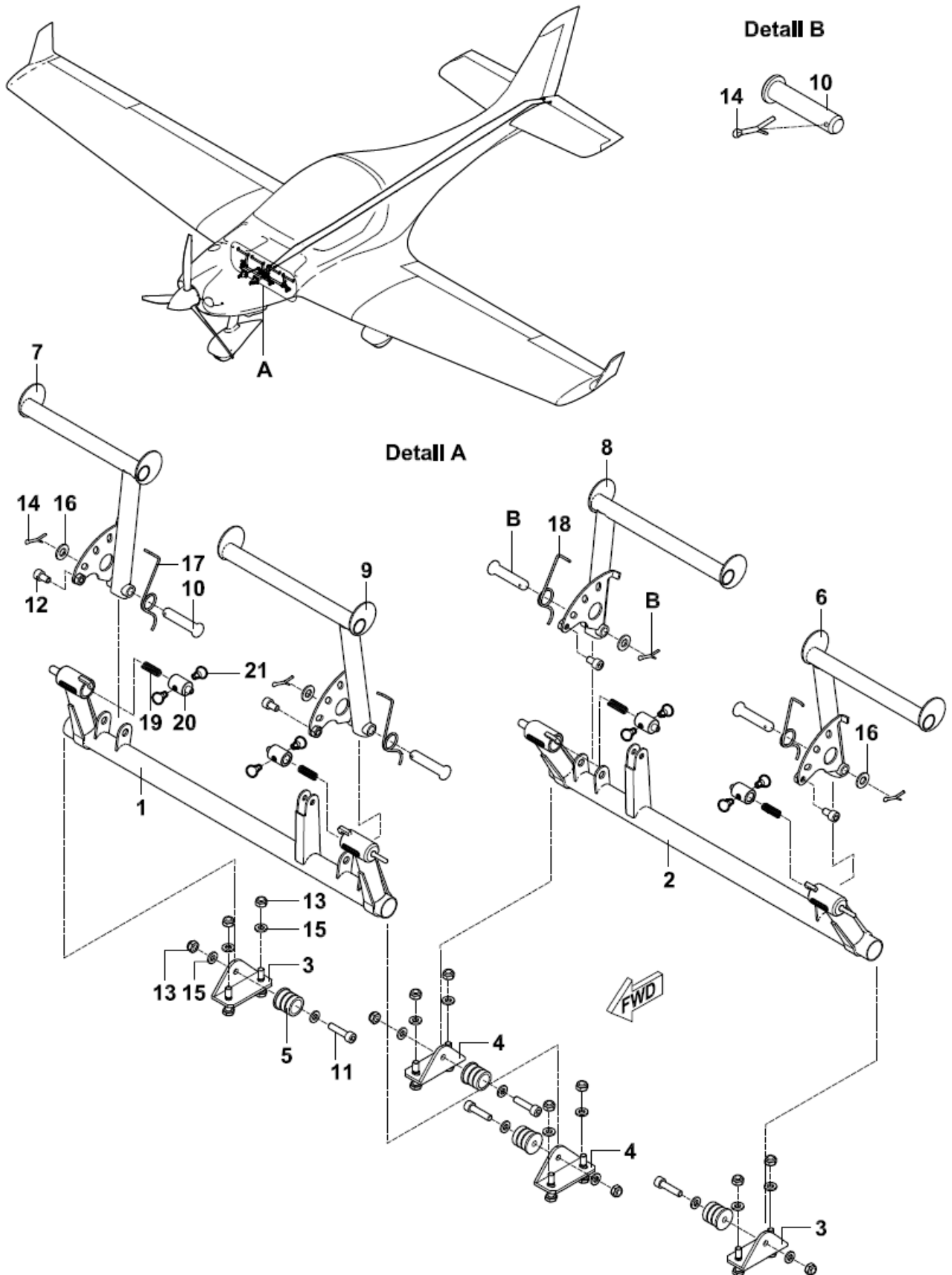


Fig. 27-9 Foot Control Removal / Installation (page 1 of 3)

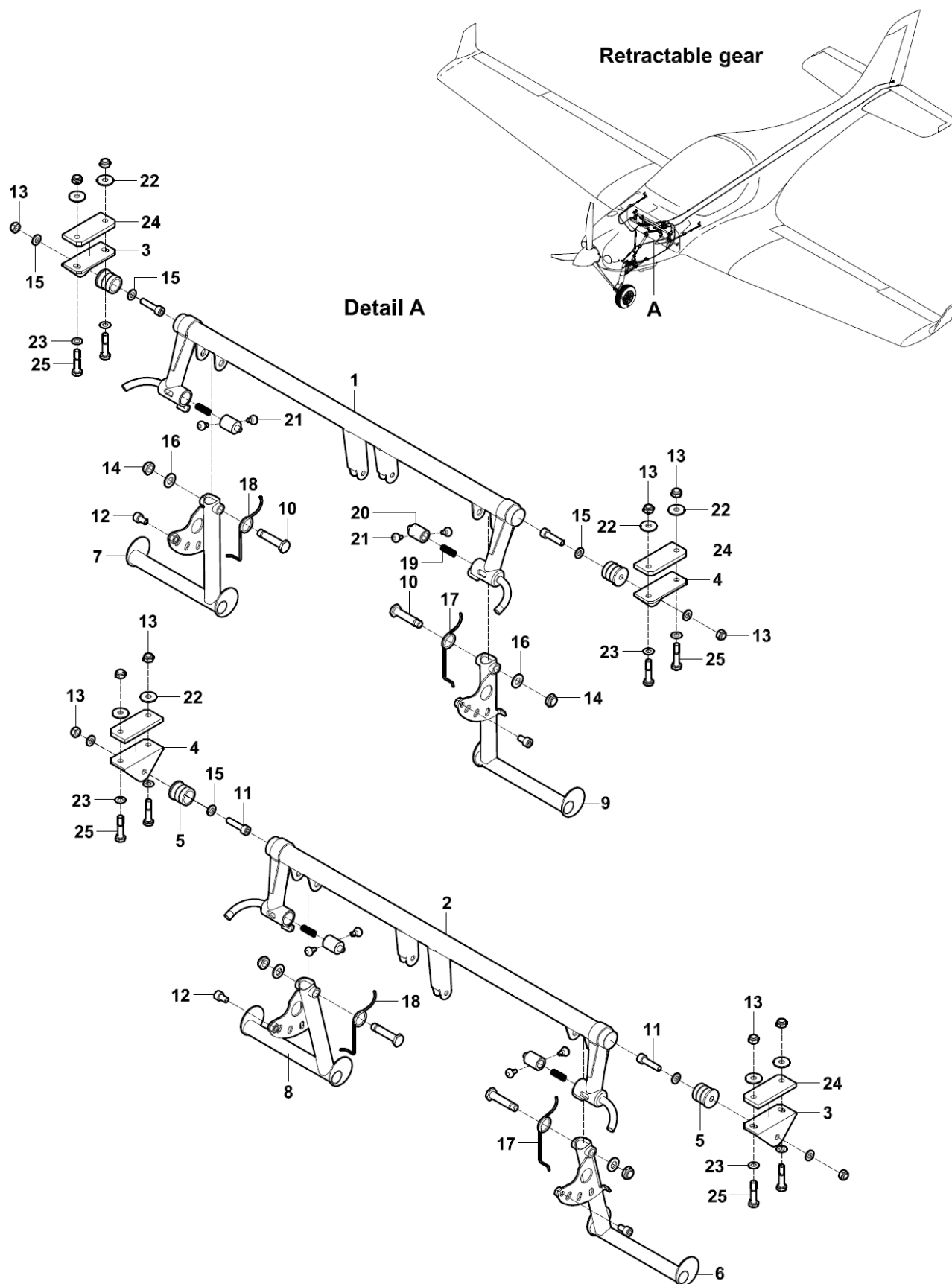


Fig. 27-9 Foot Control Removal / Installation (page 2 of 3)

- |                          |   |
|--------------------------|---|
| 1 - Torsion tube R       | 15 - Washer ø6.4 x 12 x 1.6   |
| 2 - Torsion tube L       | 16 - Washer ø8.4 x 16 x 1.6   |
| 3 - Outer console        | 17 - Left lever spring  |
| 4 - Inner console        | 18 - Right lever spring   |
| 5 - Bronze bushing       | 19 - Spring   |
| 6 - Pedal LL             | 20 - Bayonet  |
| 7 - Pedal RR             | 21 - Control grip M4 (in case without<br>pedal's remote controller) |
| 8 - Pedal LR             | 22 - Washer ø6.4 x 18 x 1.6   |
| 9 - Pedal RL             | 23 - Washer ø6.4 x 12 x 0.5   |
| 10a - Pin ø8 x 36        | 24 - Console pad  |
| 11 - Allen bolt M6 x 20  | 25 - Bolt M6 x 28   |
| 12 - Allen bolt M6 x 10  |   |
| 13 - Self-locking nut M6 |   |
| 14 - Cotter pin 2 x 16   |   |

*Fig. 27-9 Foot Control Removal / Installation (page 3 of 3)*

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## **27-30 ELEVATOR AND PITCH TRIM**

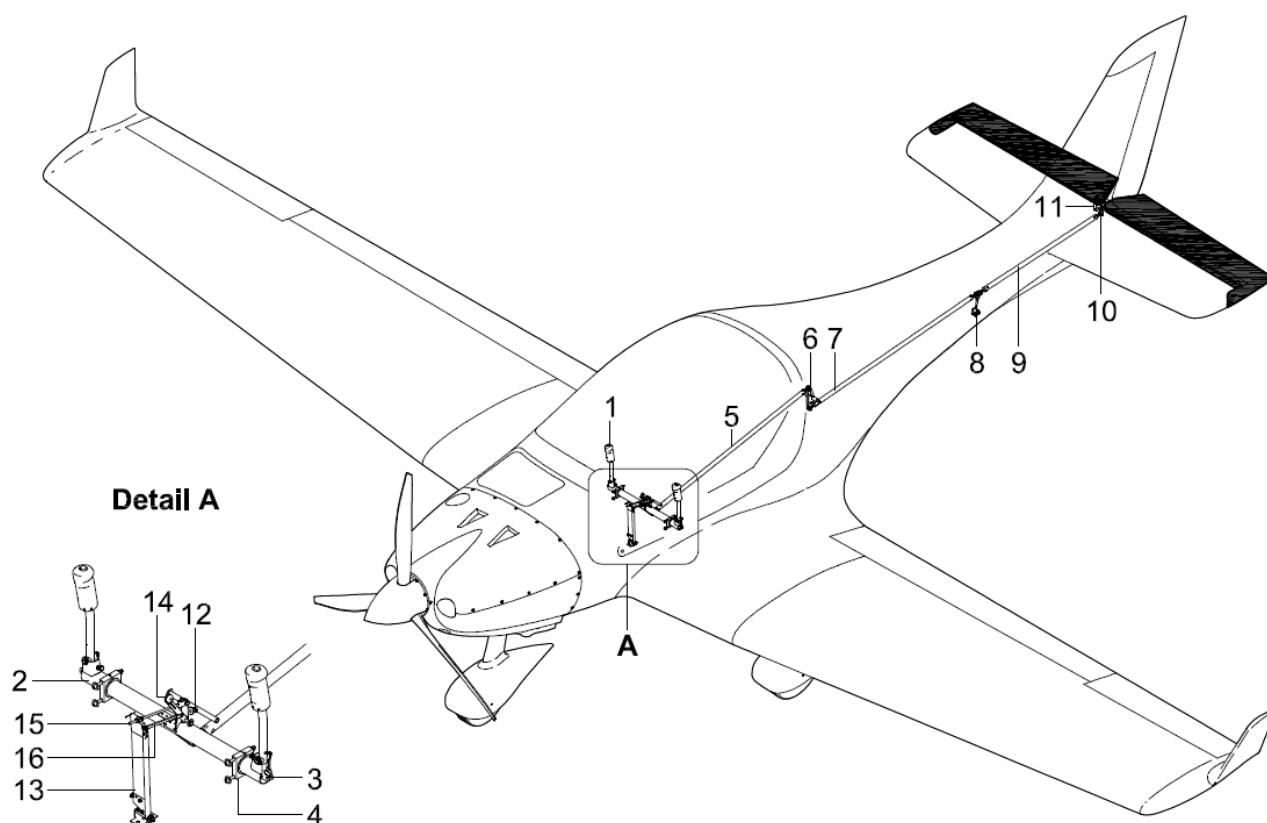
### **1. DESCRIPTION**

Both control sticks (1, Fig. 27-10) are fitted with bearings, attached to the control stick's torsion tube (2) and linked inside of torsion tube with connecting push-pull rod (3). Torsion tube turns in balling bearings (4) which are attached to the central section main spar.

Elevator is controlled through 3 push-pull rods that are equipped with adjustable bearing eyes. Push-pull rods are located in the central tunnel. Movement from control sticks is transferred to the elevator through the push-pull rod 1 (5), two-armed lever (6), push-pull rod 2 (7), support lever (8) and push-pull rod 3 (9) to the elevator lever (10). Elevator lever is fixed to the both halves of elevator and hinged through the bearing to the elevator root hinge (11). Elevator root hinge is attached to the horizontal stabilizer aft web.

Range of elevator control movement is limited by the front stop installed on the central section main spar and the aft stop (tube with a bolt installed inside of the central tunnel).

Control stick's torsion tube is connected with a trim spring (13) (attached in holder in front of central section main spar) and trim lever (14) (attached to the central tunnel) by means of adjustable pull-push rod (15) and connecting pull-push rod (16). For adjusting of required trim effect of the spring are used slots in the pedestal panel on the top of central tunnel.



- |                     |                               |
|---------------------|-------------------------------|
| 1 - Control stick   | 9 - Push-pull rod 3           |
| 2 - Torsion tube    | 10 - Elevator lever           |
| 3 - Push-pull rod   | 11 - Elevator root hinge      |
| 4 - Sliding bearing | 12 - Aft stop                 |
| 5 - Push-pull rod 1 | 13 - Trim spring              |
| 6 - Two-armed lever | 14 - Trim lever               |
| 7 - Push-pull rod 2 | 15 - Adjustable push-pull rod |
| 8 - Support lever   | 16 - Connecting push-pull rod |

*Fig. 27-10 Elevator Control System (illustrative figure)*



## 2. MAINTENANCE PRACTICES

Type of maintenance: Heavy

Recommended tools, materials, persons and documentation:

ITEM	QUANTITY
Wrench 10	2 pcs
Wrench 9	1 pc
Wrench 8	2 pcs
Wrench 7	2 pcs
Hex key 5	1 pc
Hex key 2.5	1 pc
Solder set	1 pc
Heat gun	1 pc
Shrink tube $\varnothing 3.2 \times 1.6$ mm	AR
Serrated locking washer $\varnothing 6.4$	AR
Cotter pin $\varnothing 1.6 \times 25$	AR
Cotter pin $\varnothing 1.6 \times 16$	1 pc
Protractor with deflecting pointer	1 pc
Ruler	2 pcs
Adhesive tape	AR
Persons	2

*Tab. 27-6 Recommended tools, materials, persons and documentation*

### A. Push rods and levers

- (1) Push rods and levers removal:
  - (a) Remove rudder (Chapter 55-40).
  - (b) Remove elevators (Chapter 55-20).
  - (c) Disconnect push rod (3, Fig. 27-11) from root hinge (4), by removing nut (16), washer (12) and bolt (9).
  - (d) Remove cover on baggage bulkhead (13, Chapter 06-00, Fig. 06-3).
  - (e) Disconnect push rod (3) from support lever (5), by removing nut (16), washer (12) and bolt (11).
  - (f) Disconnect push rod (2) from support lever (5), by removing nut (16), washer (12) and bolt (11).
  - (g) Disconnect push rod (2) from bellcrank (6), by removing nut (16), washer (12) and bolt (9).
  - (h) Remove the pedestal panel (Chapter 27-50, 2.C.(1)).
  - (i) Disconnect push rod (1, Fig. 27-11) from bellcrank (6), by removing nut (16), washer (12) and bolt (9).
  - (j) Disconnect push rod (1) from torsion tube (21), by removing nut (16), washer (12) and bolt (11).

- (k) Remove the root hinge (4), by removing nut (16), washers (12; 13) and bolt (10).
  - (l) Remove support lever (5), by removing nut (16), washer (12) and bolt (8).
  - (m) Remove bellcrank (6), by removing nut (16), washers (15) and bolt (7).
  - (n) If necessary, remove front elevator stop by releasing nut and removing bolt. Rear elevator stop could be removed similar way, by releasing nut and removing bolt and washer.
- (2) Push rods and levers installation:
- (a) Before assembling check push rods for cracks and condition of rivets. Check parallel alignment of bearing ends; on new push rods, release lock nuts.
  - (b) Install bellcrank (6, Fig. 27-11) behind baggage bulkhead, by using bolt (7), washers (15), nut (16).

**WARNING****ENSURE BELLCRANK (6) IS PUT IN CORRECT ORIENTATION!**

- (c) In tail, install support lever (5), by using bolt (8), washer (12), nut (16).
- (d) Install root lever (4) to bracket, by using bolt (10), washers (12; 13), nut (16).
- (e) Connect push rod (3) to root hinge (4), by using bolt (9), washer (12) and nut (16).
- (f) Connect push rod (3) to support lever (5), by using bolt (11), washer (12) and nut (16). If using a new push rod (3):
  - Replace washer (14) and fully screw bearing end (20) and tighten locking nuts (17).
  - Pay attention to parallel alignment of bearing ends (20).
- (g) Connect push rod (2) to support lever (5), by using bolt (11), washer (12) and nut (16).
- (h) Connect push rod (2) to bellcrank (6), by using bolt (9), washer (12) and nut (16). If using new push rod (2):
  - Replace washer (14) and fully screw bearing ends (20) and tighten locking nuts (17).
  - Pay attention to parallel alignment of bearing ends (20).
- (i) Connect push rod (1) to bellcrank (6), using bolt (9), washer (12) and nut (16).
- (j) Connect push rod (1) to torsion tube (21), using bolt (11), washer (12) and nut (16). If using new push rod (1):
  - Replace washer (14) and fully screw bearing ends (20) and tighten locking nuts (17).
  - Pay attention to parallel alignment of bearing ends (20).

- Perform adjustment of elevator control system (see par. D) (elevators have to be installed).
- (k) Carry out test and check:
  - That the castle nuts and pins are secured with cotter pins.
  - If all bolt connections are tight.
  - Plays.
  - Free movement of elevator control system.
  - Neutral position and max displacements.
  - Equal division of threads on push rods.
  - That trim spring isn't broken.
  - Operation of push button on stick.
  - If trimming lever operates in all positions.
  - That no foreign objects remain in the aircraft.

(3) Adjustment / Test – elevator deflections

CONTROL SURFACE DEFLECTIONS			
Control surface	Up	Down	Distance measurement point from the point of rotation
Elevator	28 ±2°	18 ±2°	240 mm
	112 ±8 mm	74 ±8 mm	

*Tab. 27-7 Elevator Deflections*

- (a) Fix the elevator in neutral position.
- (b) Check if distance between PTT button and instrument panel is 245 mm; if it isn't, adjust length of push rod (1, Fig. 27-11) so that the distance between PTT button and instrument panel is correct.

**NOTE**

If it is not possible reach correct distance, screw swivel bearings (20) at push rod (1). It is necessary to adjust the length of push rod (2) too.

- (c) Unfix elevator and keep in neutral position.
- (d) Put protractor on the trailing edge of elevator.
- (e) Set the protractor to 0° - starting value of measuring.
- (f) Check deflection values according to the Tab. 27-7.
- (g) If deflections are not within range listed in Tab. 27-7, screw stop bolts (25; 26, Fig. 27-11) to adjust the correct deflections.
- (h) Carry out test and check:
  - If all lock nuts are tight.
  - Free plays.
  - Free movement of elevator control system.
  - Neutral position and max. deflections.
  - Equal division of threads on push rods.
  - If trim control operates in all positions
  - That no foreign objects remain in the aircraft.

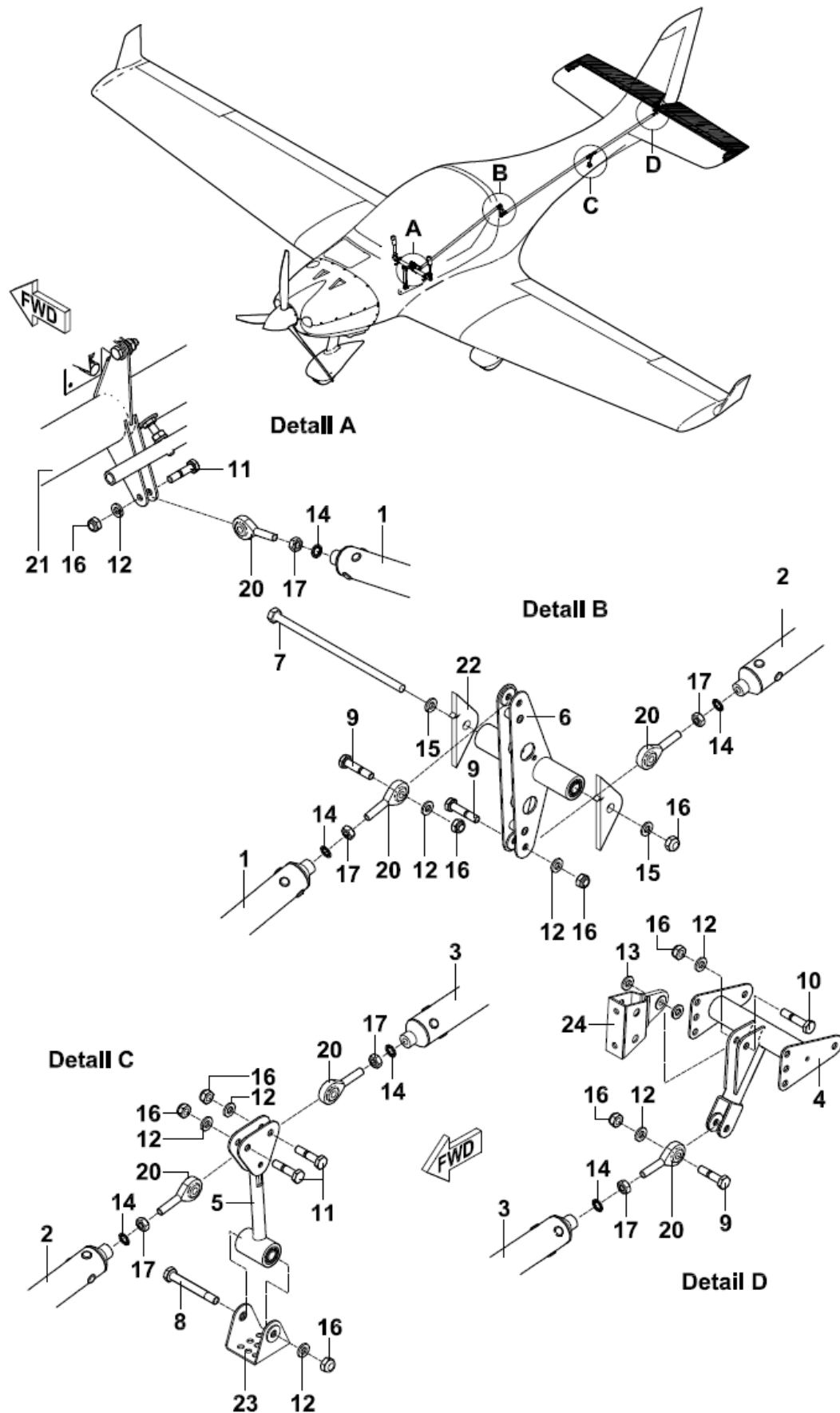


Fig. 27-11 Push Rods and Levers Removal / Installation (page 1 of 2)

- |                             |                                   |
|-----------------------------|-----------------------------------|
| 1 – Push rod                | 14 – Serrated locking washer ø6.4 |
| 2 – Push rod                | 15 – Washer ø6.4 x 18 x 1.6       |
| 3 – Push rod                | 16 – Self-locking nut M6          |
| 4 – Root hinge              | 17 – Nut M6                       |
| 5 – Support lever           | 18 – N/A                          |
| 6 – Bellcrank               | 19 – N/A                          |
| 7 – Bolt M6x135             | 20 – Bearing end                  |
| 8 – Bolt M6 x 48            | 21 – Torsion tube                 |
| 9 – Bolt M6 x 28            | 22 – Central tunnel               |
| 10 – Bolt M6 x 25           | 23 – Bracket                      |
| 11 – Bolt M6 x 25           | 24 – Elevator root hinge          |
| 12 – Washer ø6.4 x 12 x 1.6 | 25 – Front stop bolt              |
| 13 – Washer ø6.4 x 10 x 2   | 26 – Aft stop bolt                |

*Fig. 27-11 Push Rods and Levers Removal / Installation (page 2 of 2)*

**B. Manual pitch trim system**

- (1) Pitch trim system removal:
  - (a) Remove pedestal panel (Chapter 27-50, 2.C.(1)).
  - (b) Disconnect trim system from torsion tube (16, Fig. 27-12), by removing split pin (15), nut (13), washers (11) and bolt (8).
  - (c) Disconnect trim control (3) from central tunnel, by removing split pin (15), nut (13), washers (10) and bolt (7).
  - (d) Remove trim system from central tunnel, by removing split pin (15), nut (13), washer (11) and bolt (6).
  - (e) Disconnect trim control (3) from connecting push rod (2) by removing split pin (15), washers (12) and pin (9).
  - (f) Disconnect connecting push rod (2) from trim spring (1) by removing split pin (15), washers (12) and pin (9).
  - (g) Remove the push rod of trim (4), by removing nut (14).
  - (h) Remove the trim spring head pin (5), by removing split pin (15) with washer (12).
  - (i) If necessary remove the handle (7) by unscrew screw (18).
- (2) Pitch trim system installation:
  - (a) Clean and lubricate all the movable points and other movable parts with vaseline before each assembling (Chapter 12-20).
  - (b) Slide the trim spring head pin (5, Fig. 27-12) to the trim spring (1), put washer (12) and secure with split pin (15).
  - (c) Connect the connecting push rod (2) to the trim spring (1), by using pin (9), washers (12) and split pin (15).
  - (d) Connect trim control (3) to the connecting push rod (2), by using the pin (9), washer (12) and the split pin (15).
  - (e) Slide the push rod of trim (4) in to trim spring head pin (5) and screw the nut (14).

If using new push rod of trim (4) perform basic adjustment:

    - Adjust distance between trim spring head pin (5) and bolt (8) at 165 mm, by screwing nuts (14).
    - After the test flight length will be corrected.
  - (f) Install the assembled trim system into central tunnel on the floor, by using the bolt (6), washer (11), nut (13) and split pin (15).
  - (g) Attach the trim control (3) on left side of central tunnel, by using the bolt (7), washers (10), nut (13) and split pin (15).
  - (h) Connect the rod of trim (4) to torsion tube (16) using bolt (8), washers (11), nut (13) and split pin (15).
  - (i) Carry out test and check:
    - That the pin is secured with cotter pin.
    - If all bolt connections are tight.
    - That no foreign objects remain in the aircraft.
  - (j) Install pedestal panel (Chapter 27-50, 2.C.(2)).





- |                          |  |              |
|--------------------------|--|--------------|
| 2 – Connecting push rod  | 11 - Washer $\varnothing 6.4 \times 12 \times 1.6$ | 20 - Bracket |
| 3 – Trim control         | 12 - Washer $\varnothing 4.3 \times 9 \times 0.8$  |              |
| 4 – Push rod of trim     | 13 - Castle nut M6                                 |              |
| 5 – Trim spring head pin | 14 - Self-locking nut M5                           |              |
| 6 – Bolt M6 x 57         | 15 - Split pin $\varnothing 1.6 \times 25$         |              |
| 7 – Bolt M6 x 32         | 16 - Torsion tube                                  |              |
| 8 - Bolt M6 x 20         | 17 - Handle  |              |
| 9 - Pin                  | 18 - Screw M5 x 10                                 |              |

*Fig. 27-12 Manual Trim System Removal / Installation (page 2 of 2)*

**C. Electrical pitch trim system with electrical indicating**

- (1) Pitch trim system removal:
  - (a) Remove pedestal panel (Chapter 27-50, 2.C.(1)).
  - (b) Disconnect the adjustment trim push rod (2) from torsion tube (1, Fig. 27-13), by removing nut (29), washer (33) and bolt (23).
  - (c) Remove the adjustment trim push rod (2) from trim spring (10), by removing nuts (28).
  - (d) Remove the microswitches (40) and switch holders (5) from central tunnel, by removing nuts (26), washers (31) and bolts (21).
  - (e) Remove the switch holders (11; 14) from central tunnel and plywood (12), by removing nuts (26) and washers (31).
  - (f) Remove the bolt M3 (18) with forks M3 (39) from potentiometer and position indicating.
  - (g) Remove the electromotor bracket (4), by removing nuts (27), washers (34; 35) and bolts (24, 7).
  - (h) Disconnect the trim spring (10) from bracket in fuselage (see 2.B.(1)).
  - (i) Remove the electromotor with trim spring from central tunnel.
  - (j) Remove the potentiometer (38), holder (16) and cover (17) from electromotor, by removing nuts (26), washers (31) and bolts (19, 20).
  - (k) Disconnect the position indicator (3) from trim spring, by removing cotter pin (37), washers (32) and trim pin (6).
  - (l) Disconnect the position indicator (3) from electromotor bolt (15), by removing spring pin (36).
  - (m) Remove the wire (8) from electromotor (41), by removing nuts (26) and washer (9; 32).
- (2) Pitch trim system installation:
  - (a) Clean and lubricate all the movable points and other movable parts with vaseline before each assembling (Chapter 12-20).
  - (b) Connect the position indicator (3, Fig. 27-13) to electromotor bolt (15), by using the spring pin (36).
  - (c) Connect the position indicator (3) to trim spring (10), by using the trim pin (6), washers (32) and cotter pin (37).
  - (d) Install the assembled trim spring into central tunnel on the floor (see 2.B.(2)).
  - (e) Lock the electromotor (41), by using the wire (8), washers (9, 32) and nuts (26).
  - (f) Mount the electromotor bracket (4) on electromotor (41), by using bolts (7) and washers (35).
  - (g) Put the potentiometer holder (16) on electromotor (41) and fix them by electromotor screw.
  - (h) Assembly the potentiometer (38) with potentiometer cover (17), by using bolts (19).

- (i) Install the assembled potentiometer on potentiometer holder (16), by using bolts (20), washers (31) and nuts (26).
- (j) Attach the assembled electromotor on plywood (12) into central tunnel, by using the bolts (24), washers (34) and nuts (27).
- (k) Mount the bolt M3 (18) with forks M3 (39) to potentiometer and position indicating.
- (l) Assembly the microswitches (40), switch holders (5, 11, 14) and plywood brackets (13), by using the bolts (21), washers (31) and nuts (26).
- (m) Put and stick the assembled microswitches to central tunnel.
- (n) Connect the adjustment trim push rod (2) to torsion tube (1) by using the bolt (23), washer (33), nut (29).
- (o) Connect the adjustment trim push rod (2) to trim spring (10), by using the nuts (28).
- (p) Carry out test and check:
  - That the pin is secured with cotter pin.
  - If all bolt connections are tight.
  - Free plays.
  - Free movement of trim system parts.
  - End positions and indicating.
  - That no foreign objects remain in the aircraft.
- (q) Install pedestal panel (Chapter 27-50, 2.C.(2)).

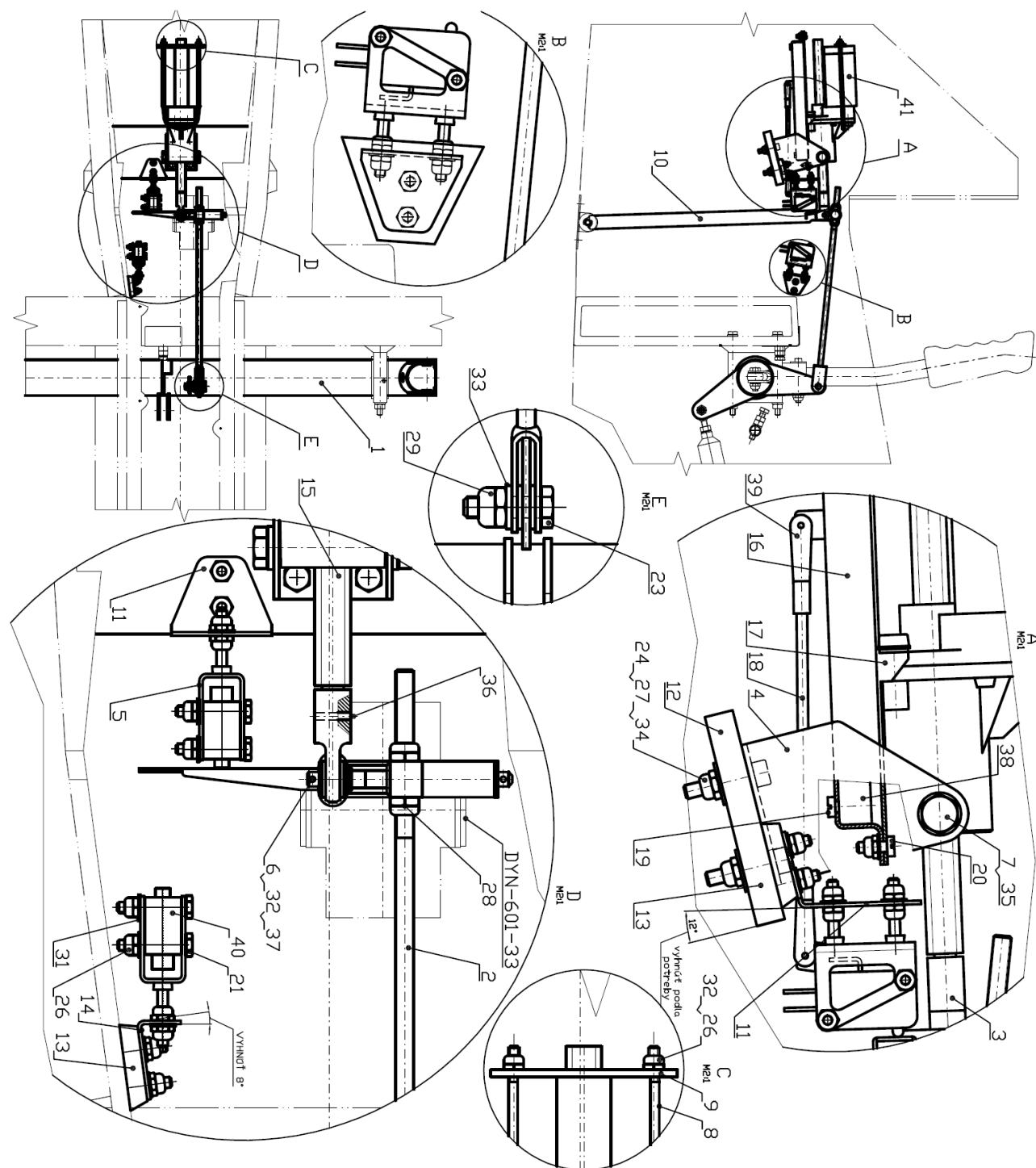


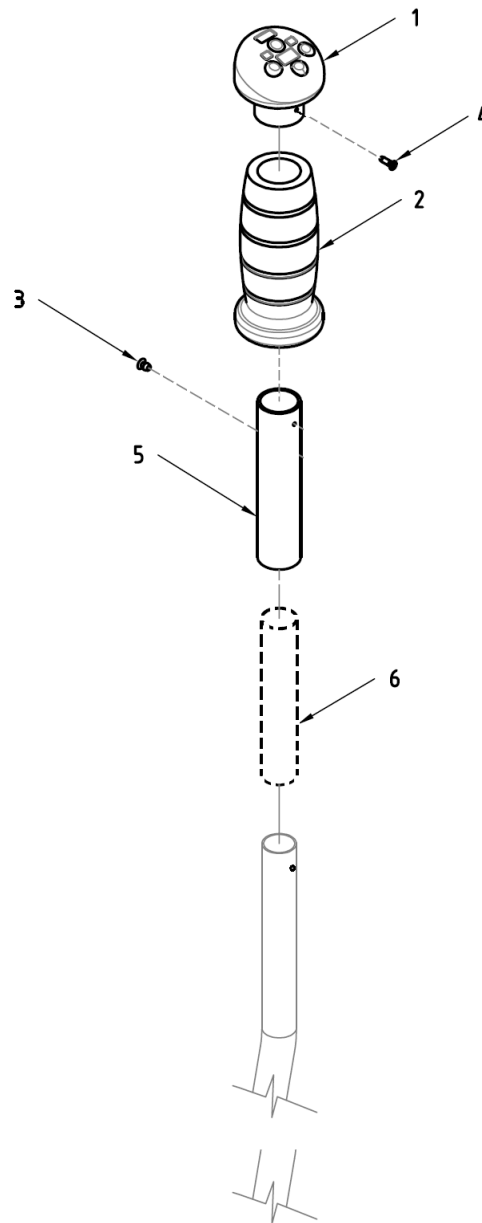
Fig. 27-13 Electrical Trim System Removal / Installation (page 1 of 2)

1 - Torsion tube	14 - Limit switch holder 3	28 - Self-locking nut M5
2 - Adjustment trim push rod	15 - Electromotor bolt	29 - Self-locking nut M6
3 - Position indicator	16 - Potentiometer holder	31 - Washer ø3.2 x 7 x 0.5
4 - Electromotor bracket	17 - Potent. holder cover	32 - Washer ø4.3 x 9 x 0.8
5 - Limit switch holder 1	18 - Bolt M3	33 - Washer ø6.4 x 12 x 1.6
6 - Trim pin	19 - Bolt M3 x 6	34 - Washer ø4.3 x 12 x 1
7 - Bolt M6 x 15	20 - Bolt M3 x 10	35 - Washer ø6.4 x 12 x 0.5
8 - Wire	21 - Bolt M3 x 20	36 - Spring pin 2 x 12
9 - Washer	22 - Bolt M4 x 20	37 - N/A
10 - Trim spring	23 - Bolt M6 x 20	38 - Linear potentiometer
11 - Limit switch holder 2	24 - Bolt M4 x 20	39 - Fork M3
12 - Plywood	26 - Self-locking nut M3	40 - Microswitch
13 - Plywood bracket	27 - Self-locking nut M4	41 - Electromotor

*Fig. 27-13 Electrical Trim System Removal / Installation (page 2 of 2)*

**D. Electrical pitch trim control**

- (1) Pitch trim control removal:
  - (a) Remove the upper handle (1, Fig. 27-14) from control stick by removing the handle (2), rivets (3), screw (4), plastic tube (5) and shrink tubes (6).
- (2) Pitch trim control installation:
  - (a) Install the upper handle (1, Fig. 27-14) on control stick, by using the handle (2), rivets (3), screw (4), plastic tube (5) and shrink tubes (6).
  - (b) Carry out test and check:
    - If all bolt connections are tight.
    - That no foreign objects remain in the control stick



1 – Upper handle  
2 – Handle

3 – Rivet 3x6  
4 – Screw M3x10

5 – Plastic tube  
6 – Shrink tube

*Fig. 27-14 Electrical Trim Control Removal / Installation*

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## 27-50 FLAPS

### 1. DESCRIPTION

The aircraft (with fixed gear – FG; or retractable gear – RG) may be equipped with manually or electrically operated wing flaps.

The manually operated wing flaps are controlled by a lever (1, Fig. 27-15) on the pedestal panel between pilot and co-pilot. Wing flaps lever moves in the slotted link (2) that determinates four positions:

**FLAPS 0** - Retracted (0°),

**FLAPS 1** - Take-off position (15°),

**FLAPS 2** - Mid-position (24°),

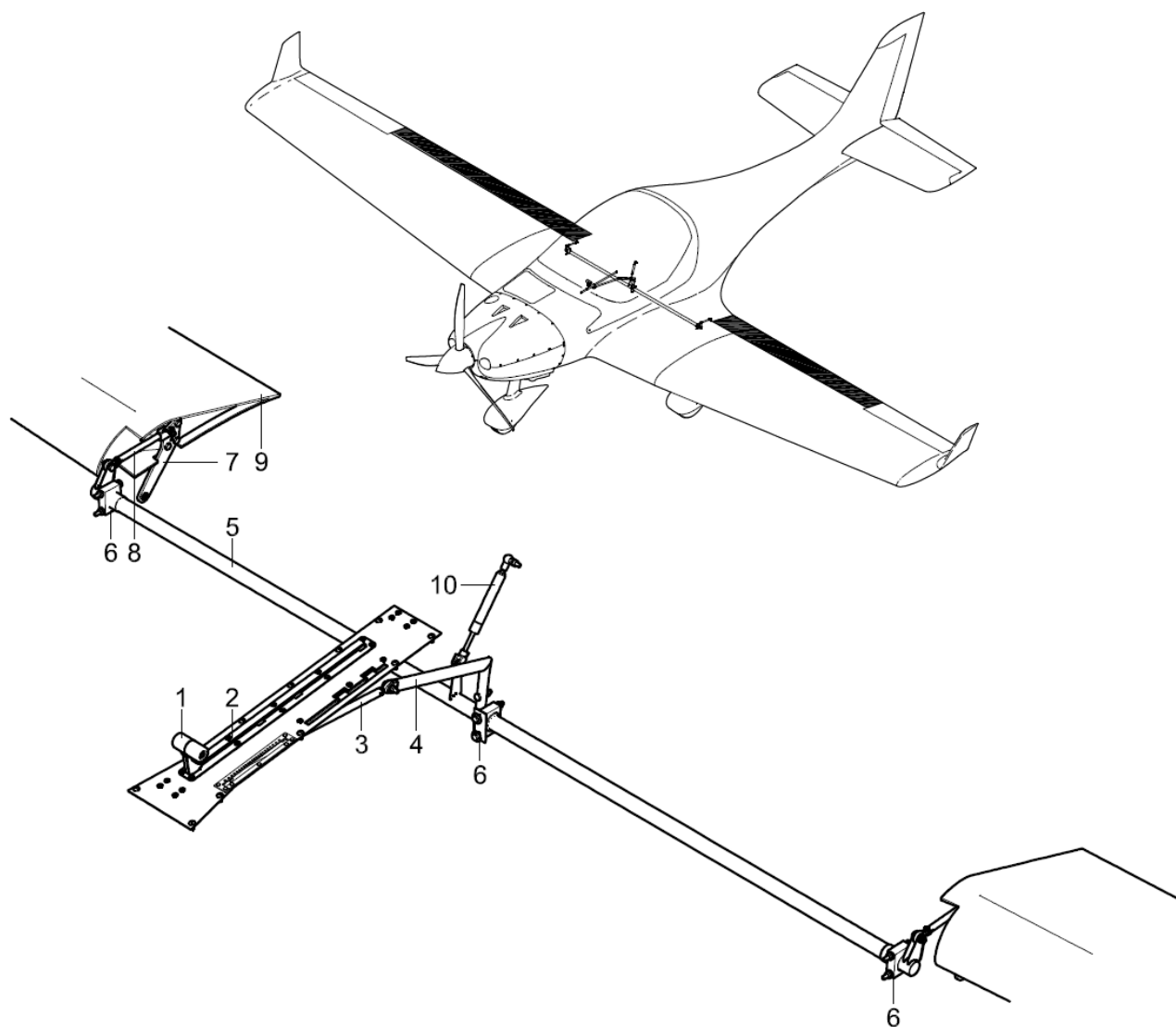
**FLAPS 3** - Fully extended position (35°).

Movements from wing flap lever are transferred through the push-pull rod 1 (3) and bellcrank (4) to the flap's torsion tube (5). Flap's torsion tube is fixed in three sliding bearings (6) which are attached to the central section auxiliary spar (middle bearing) and outer ribs (left and right bearing). It makes mechanical interconnection between left and right wing flap. Torsion tube is connected with the wing flap lever (7) by means of push-pull rods (8) with fork at the one end and adjustable bearing at the other end. Wing flap lever is fixed at the wing flap (9).

Only for versions with flaps booster: Gas strut (10) installed in the flap control system reduces pilot's operating force during extending/retracting of wing flaps. The gas strut is located in the baggage compartment and attached to the central tunnel and flap's torsion tube. It is protected by laminate cover (Chapter 06-00, Fig. 06-3).

The pedestal panel (2, Fig. 27-15) is attached on top of central tunnel between seats. On the pedestal panel are located: brake lever, wing flap lever and trim control. Under the cover in the central tunnel are the elevator and wing flap push rods, rudder control cables, brake system, electrical wires, etc.

Only for versions with electrically operated flaps (Fig. 27-18): Flaps are controlled by actuator and flaps position is sensed by a potentiometer (38) installed in the baggage compartment and attached to the backrest and flap's torsion tube. The flaps actuator is controlled by flaps controller on the instrument panel.



- 1 - Lever
- 2 - Pedestal panel
- 3 - Push-pull rod 1
- 4 - Bellcrank
- 5 - Torsion tube

- 6 - Bearing
- 7 - Wing flap lever
- 8 - Push-pull rod
- 9 - Wing flap
- 10 - Gas strut

*Fig. 27-15 Wing Flap Control System*

## 2. MAINTENANCE PRACTICES

Type of maintenance: Heavy

Recommended tools, materials, persons and documentation:

ITEM	QUANTITY
Wrench 10	2 pcs
Wrench 8	1 pc
Screwdriver	1 pc
Puller on small pins M4	1 pc
Pliers	1 pc
Serrated locking washer ø6.4	2 pcs
Cotter pin ø1.6 x 25	2 pcs
Knife	1 pc
Vaseline	AR
Silicone	AR
Protractor with deflecting pointer	1 pc
Adhesive tape	AR
Ruler 50 cm	1 pc
Persons	2

*Tab. 27-8 Recommended tools, materials, persons and documentation*

### A. Flap control system FG / RG (manually)

- (1) Flap control system FG / RG removal:
  - (a) Remove wings (Chapter 57-10)
  - (b) Disconnect push rod (3, Fig. 27-17) from torsion tube (1), by removing nut (12), washer (13) and bolt (7).
  - (c) Remove second push rod (3).
  - (d) Remove pedestal panel (Chapter 27-50, 2.C.(1)).
  - (e) Disconnect bellcrank (2) from torsion tube (1), by removing nut (11), washer (13), sensor console (21) and bolt (8).
  - (f) In baggage compartments, remove covers of torsion tube (with knife, Velcro attachment) and gas strut cover.
  - (g) Remove gas strut (18).
  - (h) Remove cover on wing root central section with knife.
  - (i) Disassemble all sliding bearings (6), by removing nuts (11), washers (13; 14; 15), sensor holder (20) and bolts (5; 9).
  - (j) On right side of centre section, carefully pull out torsion tube (1) through access hole.

- (2) Flap control system FG / RG installation:
- (a) Before installation check main parts for cracks and condition.
  - (b) Carefully rotate and slide torsion tube (1, Fig. 27-17) from right side of centre section wing root through all holes to other side (wings have to be removed).
  - (c) Put all sliding bearings (6) on torsion tube (1) and attach them (1; 6) to middle insert and sides carbon holders by using bolts (5; 9), washers (13; 14; 15), sensor holder (20) (RG only) and nuts (11).

#### NOTE

Tighten nuts (11) so that the torsion tube (1) rotates easily.

- (d) Stick the cover on centre section roots with silicone (remove old silicone).
- (e) Connect bellcrank (2) to torsion tube (1), by using bolt (8), sensor console (21) (RG only), washer (13) and nut (11).
- (f) Install push rod and pedestal panel (Chapter 27-50, 2.C.(2)).
- (g) In right baggage compartment attach gas strut (18) to torsion tube lever and ball joint.

#### CAUTION

GAS STRUT HAS TO BE ORIENTED WITH VALVE SIDE UP AND PISTON ROD DOWN. GAS STRUT IS INSTALLED FOR VERSIONS WITH FLAPS BOOSTER.

- (h) Install gas strut cover.
- (i) Attach covers of torsion tube.
- (j) Install wings (Chapter 57-10).
- (k) Connect push rod (3) to torsion tube (1), by using bolt (7), washer (13) and nut (12).
- (l) Connect push rod (3) to wing flap hinge, by using pin (4) and cotter pin (17). If using new push rod(s) (3):
  - Set wing flap lever to position 0 (flaps retracted).
  - Flap trailing edges must be aligned with centre section trailing edge (a preload is created in the wing flap control system).
  - If previous point isn't fulfilled, disconnect pin (4), release lock nut (10) and screw push rod (3) to adjust to correct length. Replace washer (16) and tighten lock nut (10); check rod end in safety.
  - Secure pin (4) with cotter pin (17).
- (m) Connect second push rod (3).

- (n) Carry out test and check:
- That the pins are secured with cotter pins.
  - If all bolt connections are tight.
  - Free plays.
  - Free movement of flap control system.
  - If deflections of wing flaps are symmetrical.
  - Deflections (Tab. 27-9).
  - Push rod swivel motion in both wing flap positions for binding (retracted and fully extended) (Fig. 27-16); if binding occurs, realign rod end bearing.
  - That no foreign objects remain in the aircraft.

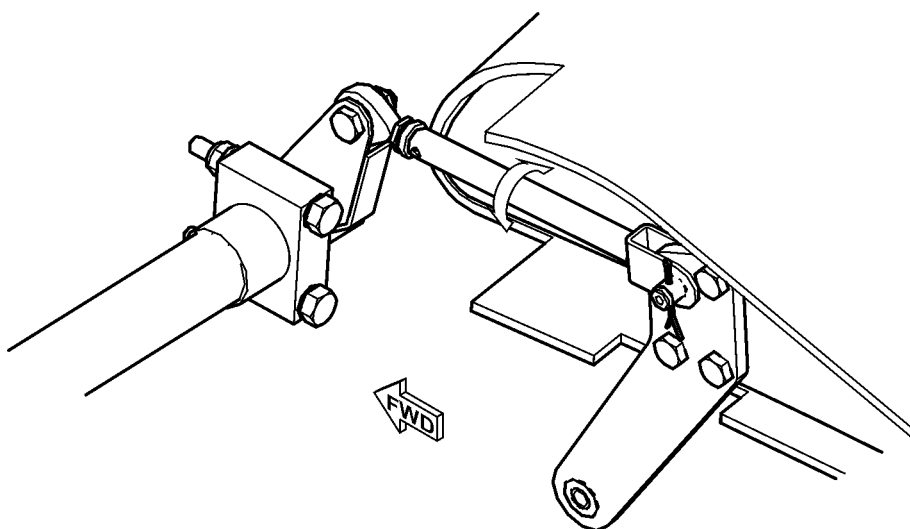


Fig. 27-16 Swivel Motion of Push Rod

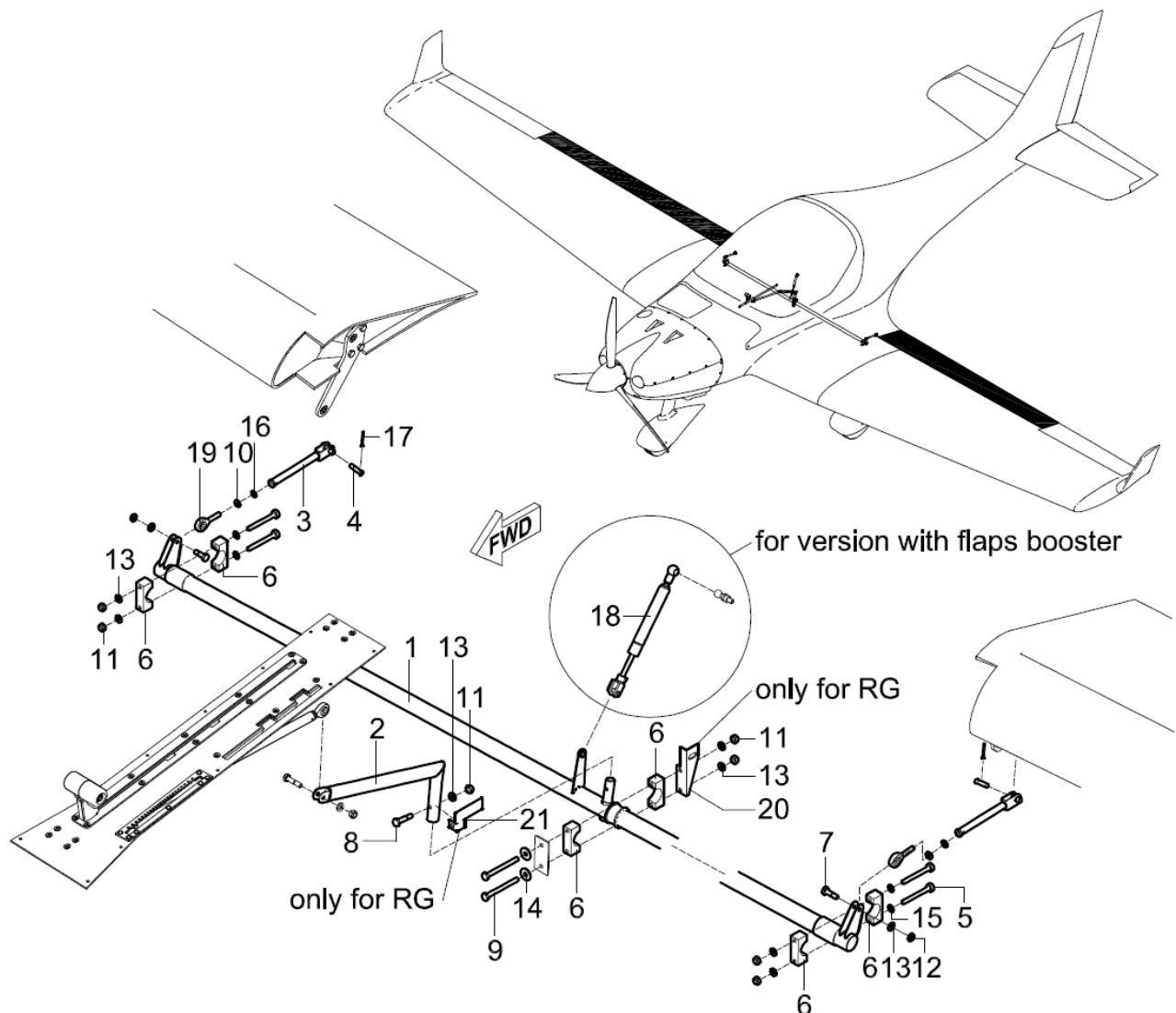
- (3) Adjustment / test - flaps deflections:

Both wing flaps have to be adjusted simultaneously. Described is adjusting of the right side. The process for the left side is mirrored.

CONTROL SURFACE DEFLECTIONS			
Control surface	Up	Deflection	Distance measurement point from the point of rotation
Wing flaps	FLAPS 1	15 ±2° 76 ±6 mm	295 mm (Root rib of the outer wing)
	FLAPS 2	24 ±2° 120 ±6 mm	
	FLAPS 3	35 ±2° 181 ±6 mm	
Maximum deflection difference between both flaps: ±2°/±6 mm			

Tab. 27-9 Wing Flap Deflections

- (a) Set protractor on trailing edge of wing flap root.
- (b) Set wing flaps to fully retracted position.
- (c) Set the protractor to 0° - starting value for measurement.
- (d) Check deflections at first position 15°, second position 24° and third position 35°, see Tab. 27-9.
- (e) Check if deflections are symmetrical on both wing flaps.
- (f) If deflections are not within range listed in Tab. 27-9, remove cotter pin (17, Fig. 27-18) and pin (4), release lock nut (10), use new washer (16) and screw push rod (3) to set correct length.
- (g) Check if push rod fork (3) is parallel with swivel bearing (19).
- (h) Tighten lock nut (10).
- (i) Connect push rod (3) to wing flap with pin (4) and secure with cotter pin (17).
- (j) Carry out test and check:
  - That the pins are secured with cotter pins.
  - Free movement of flap control system.
  - Deflections.
  - Push rod swivel motion in both wing flap positions for binding (retracted and fully extended) (Fig. 27-16); if binding occurs, realign rod end bearing.
  - That no foreign objects remained in the aircraft.



- |                          |  |
|--------------------------|--|
| 1 – Torsion tube         | 12 – Nut M6  |
| 2 – Bellcrank            | 13 – Washer $\varnothing 6.4 \times 12 \times 1.6$ |
| 3 – Push-pull rod        | 14 – Washer $\varnothing 6.4 \times 18 \times 1.6$ |
| 4 – Pin                  | 15 – Washer $\varnothing 6.4 \times 12 \times 0.5$ |
| 5 – Bolt M6 x 52         | 16 – Serrated locking washer $\varnothing 6.4$     |
| 6 – Sliding bearing      | 17 – Cotter pin $\varnothing 1.6 \times 25$        |
| 7 – Bolt M6 x 19         | 18 – Booster                                       |
| 8 – Bolt M6 x 28         | 19 – Swivel bearing                                |
| 9 – Bolt M6 x 60         | 20 – Flap sensor holder (RG only)                  |
| 10 – Nut M6              | 21 – Horn sensor console (RG only)                 |
| 11 – Self-locking nut M6 |  |

*Fig. 27-17 Flap Control System Removal / Installation*

**B. Flap control system (electrical)**

- (1) Flap control system removal:
  - (a) Remove wings (Chapter 57-10)
  - (b) Disconnect push rod (13, Fig. 27-18) from torsion tube (5), by removing nut (23), washer (29) and bolt (16).
  - (c) Remove second push rod (13).
  - (d) Remove pedestal panel (Chapter 27-50, 2.C.(1)).
  - (e) In baggage compartments, remove flaps actuator cover (10) by removing screws (22).
  - (f) Disconnect potentiometer (38) from flaps torsion tube (5), by removing fork joint (35).
  - (g) Disassemble the potentiometer (38) with holder (1) by removing cotter pin (34), nut (28), washer (31) and axle (6)
  - (h) Unscrew the screw from potentiometer head and disconnect the electrical wiring from potentiometer.
  - (i) Remove the potentiometer console (4) by removing the nut (25), washer (32) and bolt (20).
  - (j) Disconnect the flaps actuator (37) from flaps lever (2) by removing the nut (25), washer (31), bolt (18) and bushing (7).
  - (k) Remove shrink tube from flaps actuator cable, disconnect the electrical wiring from flaps actuator and remove flaps actuator.
  - (l) Remove the flaps lever (2) from torsion tube (5) by removing nuts (25), washers (29) and bolts (17).
  - (m) Disassemble the upper hinge (3) and flaps actuator (37) by removing nut (25), washer (31), bolt (18) and bushings (7).
  - (n) Remove the upper hinge (3) from backrest by removing bearing assembly (11), washers (32, 33), nuts (25, 26) and bolts (19).
  - (o) Disassemble all bearings (15), by removing nuts (25), washers (29; 31) and bolts (14; 21).
  - (p) On right side of centre section, carefully pull out torsion tube (5) through access hole.
- (2) Flap control system installation:
  - (a) Before installation check main parts for cracks and condition.
  - (b) Carefully rotate and slide torsion tube (5, Fig. 27-18) from right side of centre section wing root through all holes to other side (wings have to be removed).
  - (c) Put all bearings (15) on torsion tube (5) and attach them on middle insert and sides carbon holders, by using bolts (14; 21), washers (29; 31) and nuts (25).

**NOTE**

Tighten nuts (25) so that the torsion tube (5) rotates easily.



- (d) Stick cover on centre section roots with silicone (remove old silicone).
- (e) Install pedestal panel (Chapter 27-50, 2.C.(2)).
- (f) Install wings (Chapter 57-10).
- (g) Install the flaps lever (2) to torsion tube (5) by using bolt (17), washer (29) and nut (25).
- (h) In baggage compartment install the upper hinge (3) and flaps actuator (37) by using the bearing end (11), bushings (7), bolt (18), washers (31, 33) and nuts (25, 27).
- (i) Connect flaps actuator (37) to flaps lever (2), by using bushings (7), washer (31), bolt (18) and nut (25).
- (j) Attach the upper hinge with flaps actuator to the backrest by using bolts (19), washers (31) and nuts (25).
- (k) Slide the shrink tube and connect the electrical wiring of flaps actuator. Pay attention for electrical polarity and correct motion direction of flaps actuator! Install the shrink tube.
- (l) Install the potentiometer head with electrical wiring to the potentiometer.
- (m) Install the potentiometer (38), potentiometer holder (1) and potentiometer console (4) by using axle (6), washer (31), nut (28) and cotter pin (34).
- (n) Connect the potentiometer to torsion tube (5) by using spring fork (35).
- (o) Attach the potentiometer with potentiometer console (4) to the backrest by using bolts (20), washers (32) and nuts (26).
- (p) Connect push rod (13) to torsion tube (5), by using bolts (16), washers (29) and nuts (25).
- (q) Connect push rod (13) to wing flap hinge, by using pin and cotter pin (34). If using new push rod(s) (13):
  - Set wing flap lever to position 0 (flaps retracted).
  - Flap trailing edges must be aligned with centre section trailing edge (a preload is created in the wing flap control system).
  - If previous point isn't fulfilled, disconnect pin, release lock nut (23) and screw push rod (13) to adjust to correct length. Replace washer (30) and tighten lock nut (23); check rod end in safety.
  - Secure pin with cotter pin (34).
- (r) Connect second push rod (13).

- (s) Carry out test and check:
  - That the pins are secured with cotter pins.
  - If all bolt connections are tight.
  - Free plays.
  - Free movement of flap control system.
  - If deflections of wing flaps are symmetrical.
  - Deflections (Tab. 27-9).
  - Push rod swivel motion in both wing flap positions for binding (retracted and fully extended) (Fig. 27-16); if binding occurs, realign rod end bearing.
  - That no foreign objects remain in the aircraft.
  
- (3) Adjustment / test - flaps deflections:  
See the chapter 27-50, 2.A.(3).

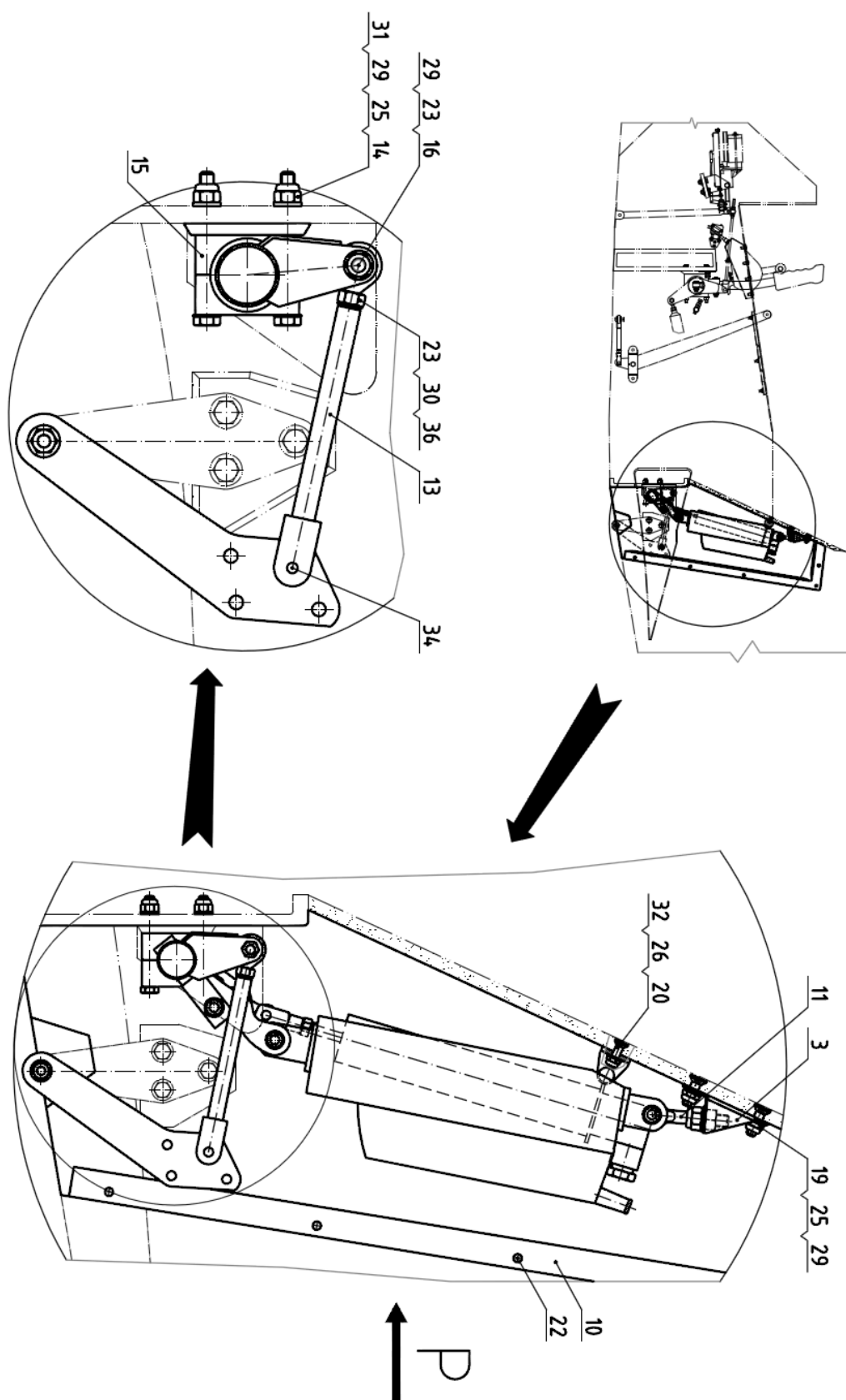


Fig. 27-18 Electrical Flap Control System Removal / Installation (page 1 of 3)

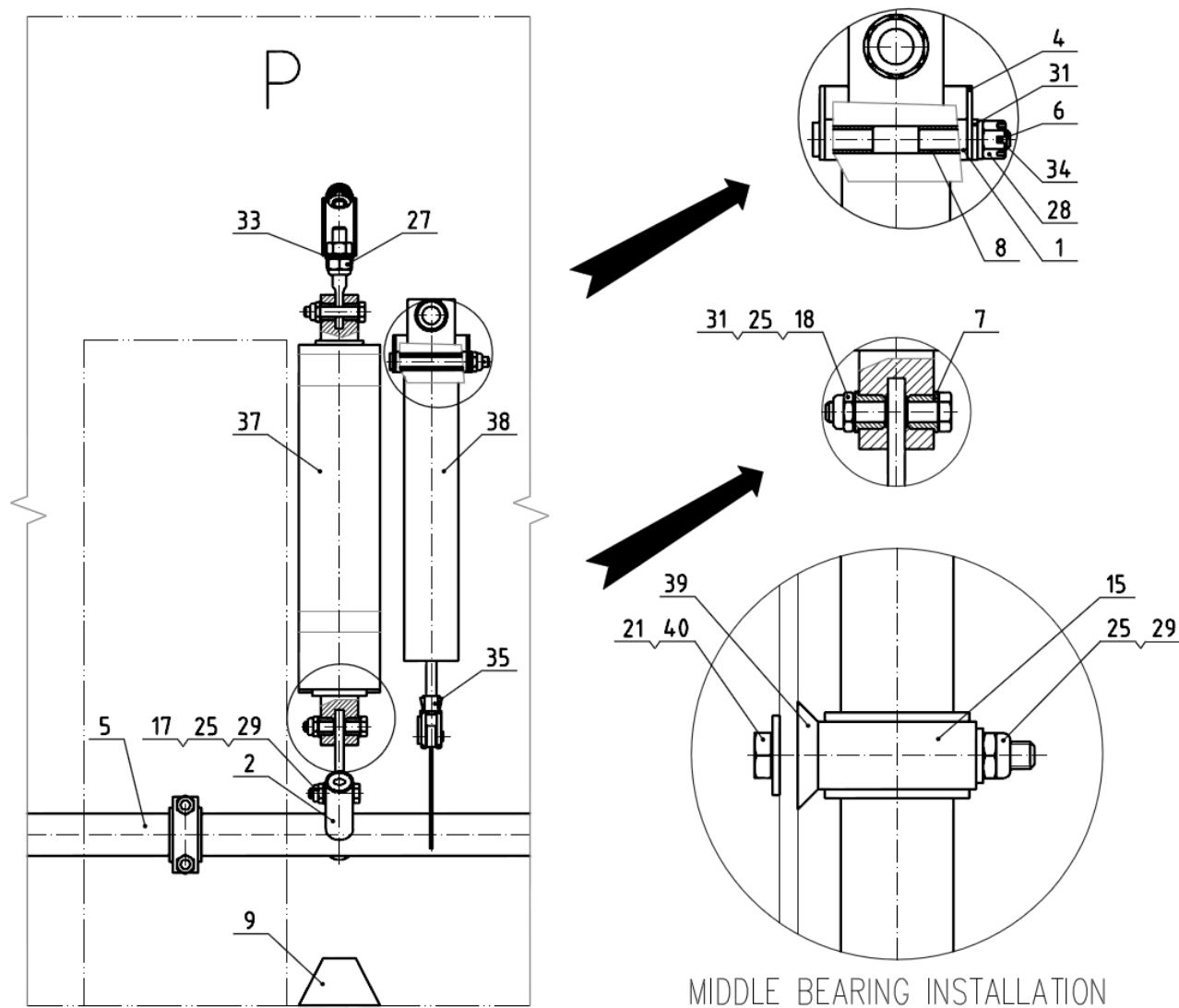


Fig. 27-18 Electrical Flap Control System Removal / Installation (page 2 of 3)

- |                                     |  |
|-------------------------------------|--|
| 1 - Potentiometer holder            | 21 - Bolt M6 x 60                                  |
| 2 - Flaps lever assembly            | 22 - Screw M4 x 12                                 |
| 3 - Upper hinge assembly            | 23 - Nut M6 lower                                  |
| 4 - Potentiometer console           | 24 - Nut M6  |
| 5 - Flaps torsion tube              | 25 - Self locking nut M6                           |
| 6 - Potentiometer assembly axle     | 26 - Self locking nut M5                           |
| 7 - Flaps actuator bushing          | 27 - Self locking nut M8                           |
| 8 - Potentiometer bushing           | 28 - Castle nut M6                                 |
| 9 - Bottom flaps stop               | 29 - Washer $\varnothing 6.4 \times 12 \times 1.6$ |
| 10 - Flaps drive cover              | 30 - Serrated locking washer $\varnothing 6.4$     |
| 11 - Bearing ends assembly          | 31 - Washer $\varnothing 6.4 \times 12 \times 0.5$ |
| 12 - Washer $\varnothing 6$ adapted | 32 - Washer $\varnothing 5.3 \times 10 \times 1$   |
| 13 - Push rod flaps                 | 33 - Washer $\varnothing 8.4 \times 16 \times 1.6$ |
| 14 - Bolt M6 x 52                   | 34 - Cotter pin $\varnothing 1.6 \times 25$        |
| 15 - Bearing                        | 35 - Spring fork joint                             |
| 16 - Bolt M6 x 19                   | 36 - Bearing end                                   |
| 17 - Bolt M6 x 28                   | 37 - Flaps actuator                                |
| 18 - Bolt M6 x 32                   | 38 - Potentiometer                                 |
| 19 - Bolt M6 x 25                   | 39 - Wood washer                                   |
| 20 - Bolt M5 x 20                   | 40 - Washer $\varnothing 6.4 \times 18 \times 1.6$ |

*Fig. 27-18 Electrical Flap Control System Removal / Installation (page 3 of 3)*

**C. Pedestal panel**

Type of maintenance: Line

Recommended tools, materials, persons and documentation:

ITEM	QUANTITY
Wrench 10	2 pcs
Wrench 8	1 pc
Screwdriver 10	1 pc
Philips screwdriver	1 pc
Vaseline	AR
Persons	1

*Tab. 27-10 Recommended tools, materials, persons and documentation*

## (1) Pedestal panel removal:

- (a) Remove upholstery (3, Fig. 27-19).
- (b) Remove arm rest (2) by unscrewing the bolts (7).
- (c) Unscrew the nut (16), remove washer (14), bolt (9) and the brake handle (5).
- (d) Unscrew the bolt (20) and remove the trim lever handle (19) (only manual trim control).
- (e) Disconnect the push rod (4) from bellcrank (17) by unscrewing nut (15) and removing bolt (11) with washer (12).
- (f) Unscrew the bolts (7) and carefully lift the pedestal panel (1).
- (g) Disconnect the trim rocker switches (18) (if installed).
- (h) Disconnect push rod (4) from main cover (1), by unscrewing nut (15) and removing washers (12; 13) with bolt (10).
- (i) Remove pedestal panel (1).

## (2) Pedestal panel installation:

- (a) Thoroughly clean and lubricate bearings on push rods with Vaseline before each assembling (Chapter 12-20).

**NOTE**

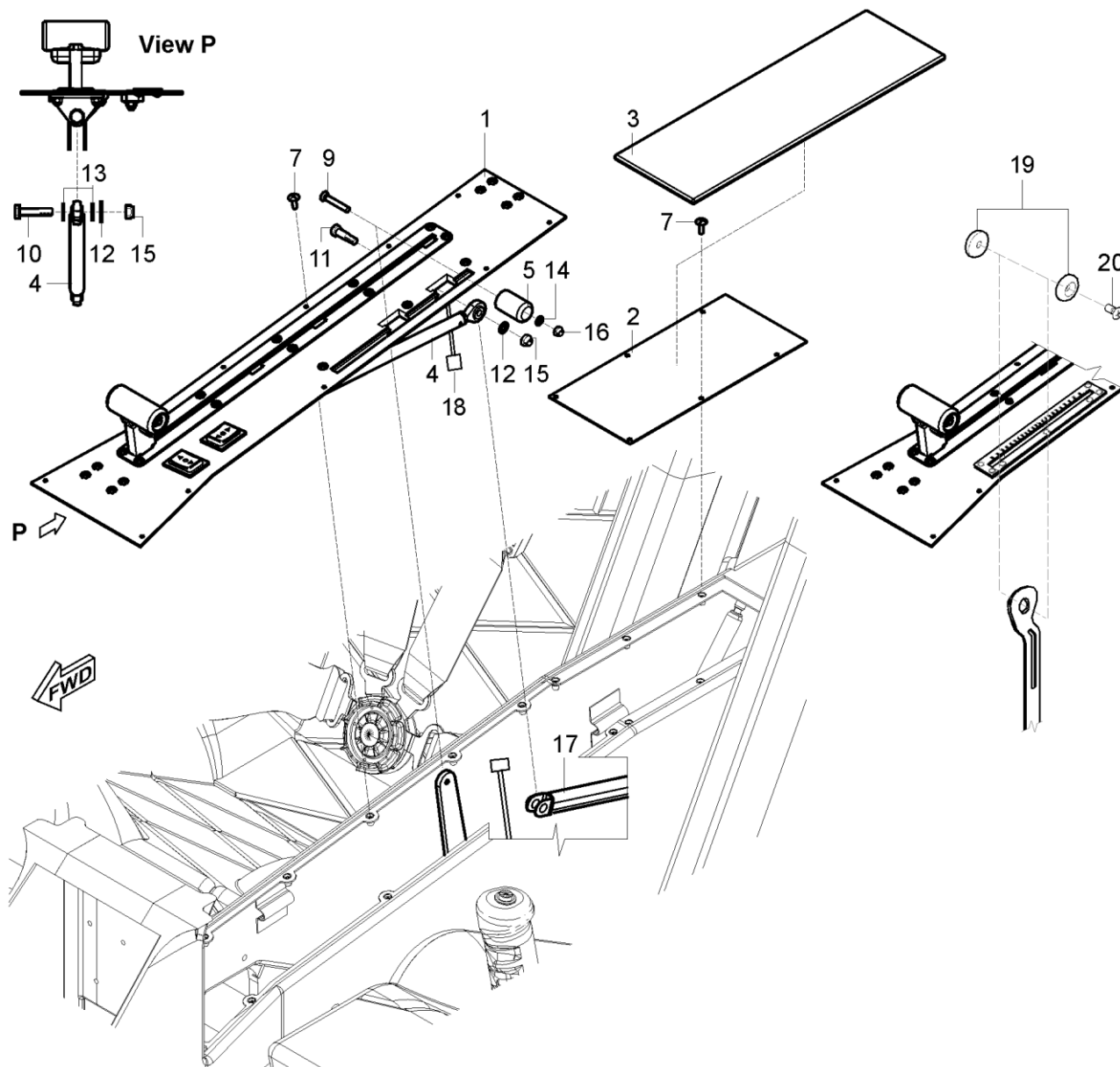
If using new push rod (4, Fig. 27-19), fully screw swivel bearings and tighten counter nuts. Check parallelism of swivel bearings.

- (b) Connect push rod (4) to pedestal panel (1), using bolt (10), washers (12; 13) and nut (15).
- (c) Connect push rod (4) to bellcrank (17), using bolt (11), washer (12) and nut (15).

**WARNING**

**CHECK CONTROL TUNNEL VERY CAREFULLY FOR  
FOREIGN OBJECTS AND TOOLS AFTER  
REASSEMBLY!**

- (d) Connect the trim rocker switches (18) (if installed).
- (e) Place the pedestal panel (1) on the central tunnel and install attaching bolts (7).
- (f) Install the trim lever handle (19) by using bolt (20) (only manual trim control).
- (g) Install the brake handle (5) by using bolt (9), nut (16) and washer (14).
- (h) Place the arm rest (2) to the tunnel and install attaching bolts (7).
- (i) Install upholstery (3).
- (j) Carry out test and check:
  - If all bolt connections are tight.
  - Free movement of control levers.
  - That no foreign objects remain in the aircraft.



- |                              |  |
|------------------------------|--|
| 1 – Slotted link             | 11 – Bolt M6 x 25                                  |
| 2 – Arm rest                 | 12 – Washer $\varnothing 6.4 \times 12 \times 1.6$ |
| 3 – Upholstery               | 13 – Washer $\varnothing 6.4 \times 10 \times 1.6$ |
| 4 – Push rod                 | 14 – Washer $\varnothing 5.3 \times 10 \times 1$   |
| 5 – Brake handle             | 15 – Self-locking nut M6                           |
| 6 – Intentionally left blank | 16 – Self-locking nut M5                           |
| 7 – Bolt M4 x 12             | 17 – Bellcrank                                     |
| 8 – Intentionally left blank | 18 – Electrical connector                          |
| 9 – Bolt M5 x 30             | 19 – Trim lever handle                             |
| 10 – Bolt M6 x 28            | 20 – Bolt M5 x 10                                  |

Fig. 27-19 Pedestal panel Removal / Installation