GROUP 3 AIRPLANE SYSTEMS

Chapters List

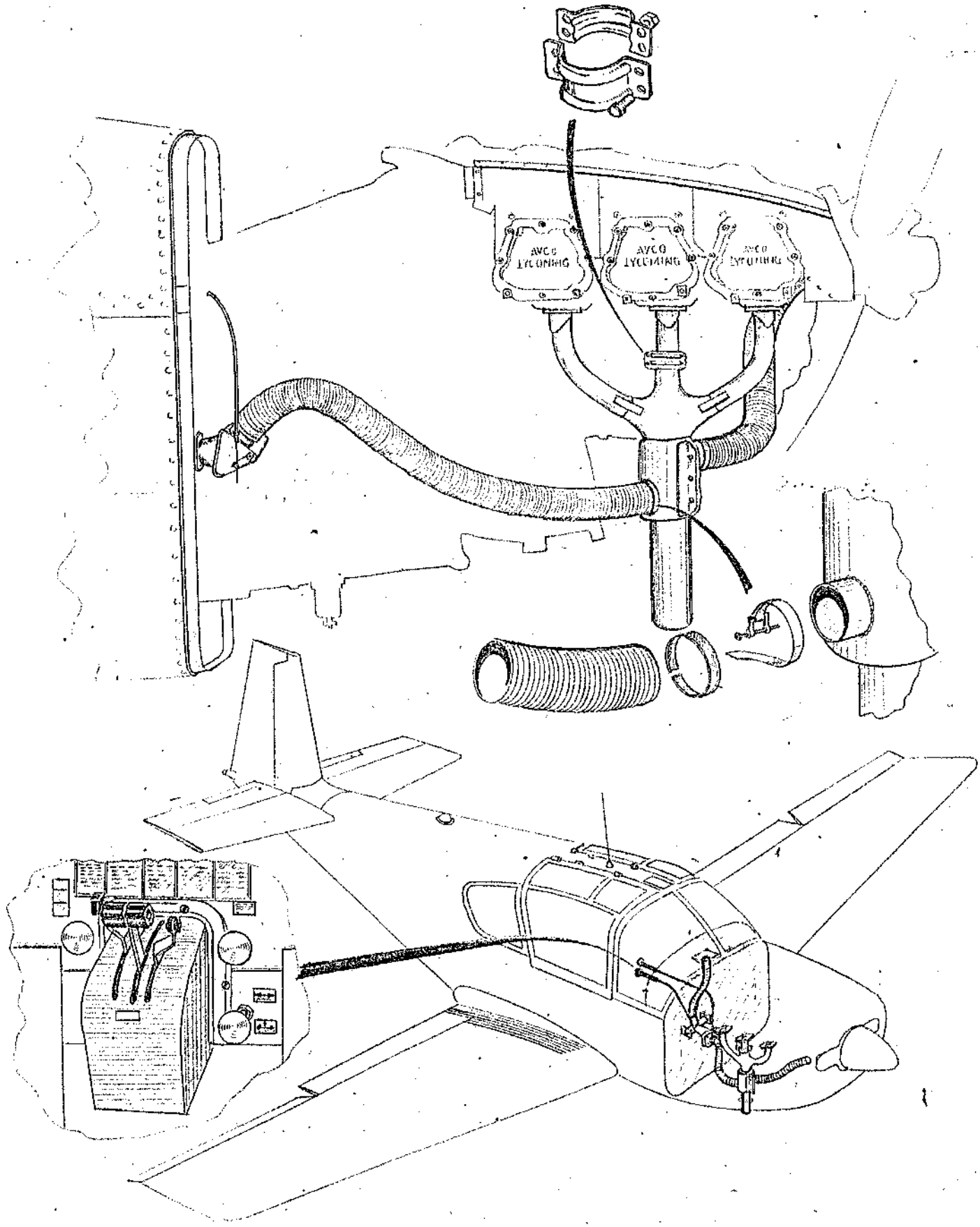
Chapter 3.1

AIR CONDITIONS

CONTENT Page

General

1. The heat system collects the cold air from the engine compartment front area, heats it inside exhaust heater and sends it to the cabin through the central plate of the board panel and a ramp below the windshield. The pipes are made of fireproofed, corrugated board: the first pipe leads air from the front tilted right diaphragm to the heater; the second pipe bend the air heater to the distribution frame; finally, the third pipe leads the air from the distribution frame to the ramp below the winshield. The distribution frame is an assy mounted on the firewall together with a 3 branches pipe, both being made of light allay. The distribution frame is provided with a valve whose role is to fully or partially obturate the air intake to the heater.



Heat System

Inside the 3 branches pipe there is also mounted an adjusting valve for the cold and warm airflow ratio.

Controls

2. The warm air distribution control button as well as that of the distribution pipe control are mounted (one above the other) on the control central pylon right side. Each control has intermediate adjustment positions.

Windshield De-icing

3. Beside the warm air distributed by the distribution frame, there is no other special de-icing facility included in the standard airplane.

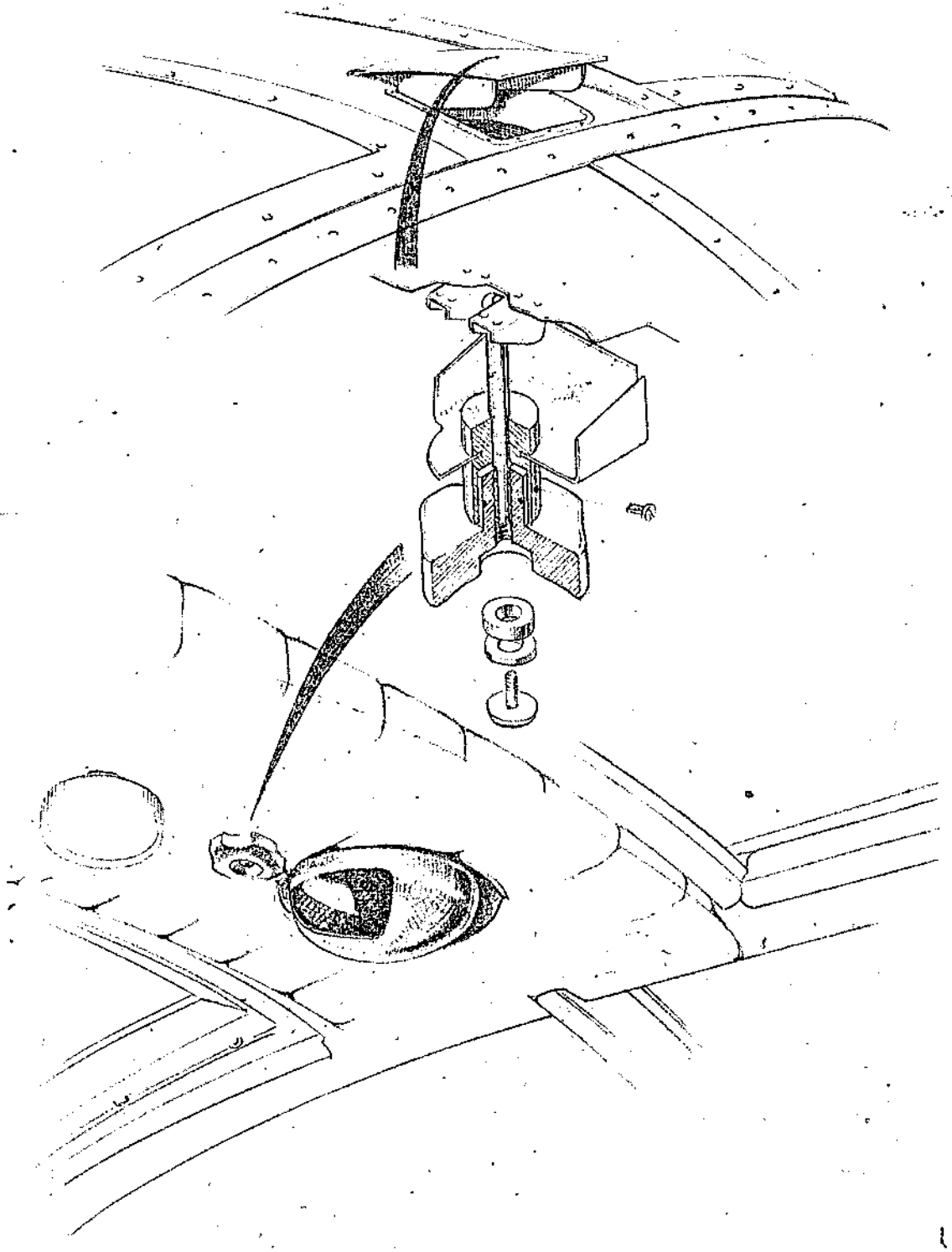
Ventilation System

4. The cabin ventillation is carried out by means of a vent system situated in the cabin ceiling and through the ventillation windows

MAINTENANCE

1. General
2. Pitot Head
3. Limit Speed Warning System

1. Some of the board instruments are described within separate chapters as an integrated part of the described system
Within this chapter there are prescribed the basic flight control instruments.



Vent System

CHAPTER 3.2

COMMUNICATIONS

CONTENTS

I. DESCRIPTION AND OPERATION OF THE INSTALLATION

1. The airplane is fitted with a radiocommunication unit. This unit consists of a transceiver RT 241 installed at the RH side of the instrument panel (See fig. 2), a power supply PS 243A located at the right side of the rear fuselage near the T1 relay box, an interconnection box situated behind the board panel and two pairs of jacks under the board panel on the "electrical installation and engine control panel" and "warning control panel" respectively paralellmounted through 4D strip.
The PTT buttons are located on the throttle levers.
The aerial is installed above the cabin in order to provide the necessary counter - weight (See figure 2).

2. Description of the components (See fig. 2)

Item	Designation	Symbol	Type	Qty
1.	VHF radiocom. unit	3R	RT241 Bendix	1
2.	VHF antenna	11R	CI 109 King	1
3.	Headsets		MRB 2400 Telex	2
4.	Jacks	17R,18R	JJ033 Telex	2
		19R,20R	JJ034 Telex	2
5.	Circuit breaker	7R	AZS10 - URSS	1
6.	PTT buttons	4R	204K URSS	1
		5 R	204K URSS	1

Item	Designation	Symbol	Type	Qty
7.	Power supply	2R	PS 243 A	1
8.	Interconnecting box	14R		1

3. Operation

The transceiver is put into operation by actuating the 7R circuit breaker and by turning the VOL button clock wise.

After selecting the desired frequency using the two rotary knobs, push the PTT button to transmit (Background noise should be heard in the headsets.

III. MAINTENANCE

The RT 241 transceiver shall be maintained according to its Maintenance manual.

To remove the unit from its support use a screwdriver to unlock the locking pawl, and pull forward untill disconnected To remove the power supply remove the four screws and disconnect the unit.

Warning

Before tilting the instrument panel: remove the RT 241 transceiver from its rack.

After each mounting/dismounting of the antenna, the following operations shall be carried out:

- checking and securing the electrical connections;
- measuring electrical bonding resistance (max. 1 mΩ).

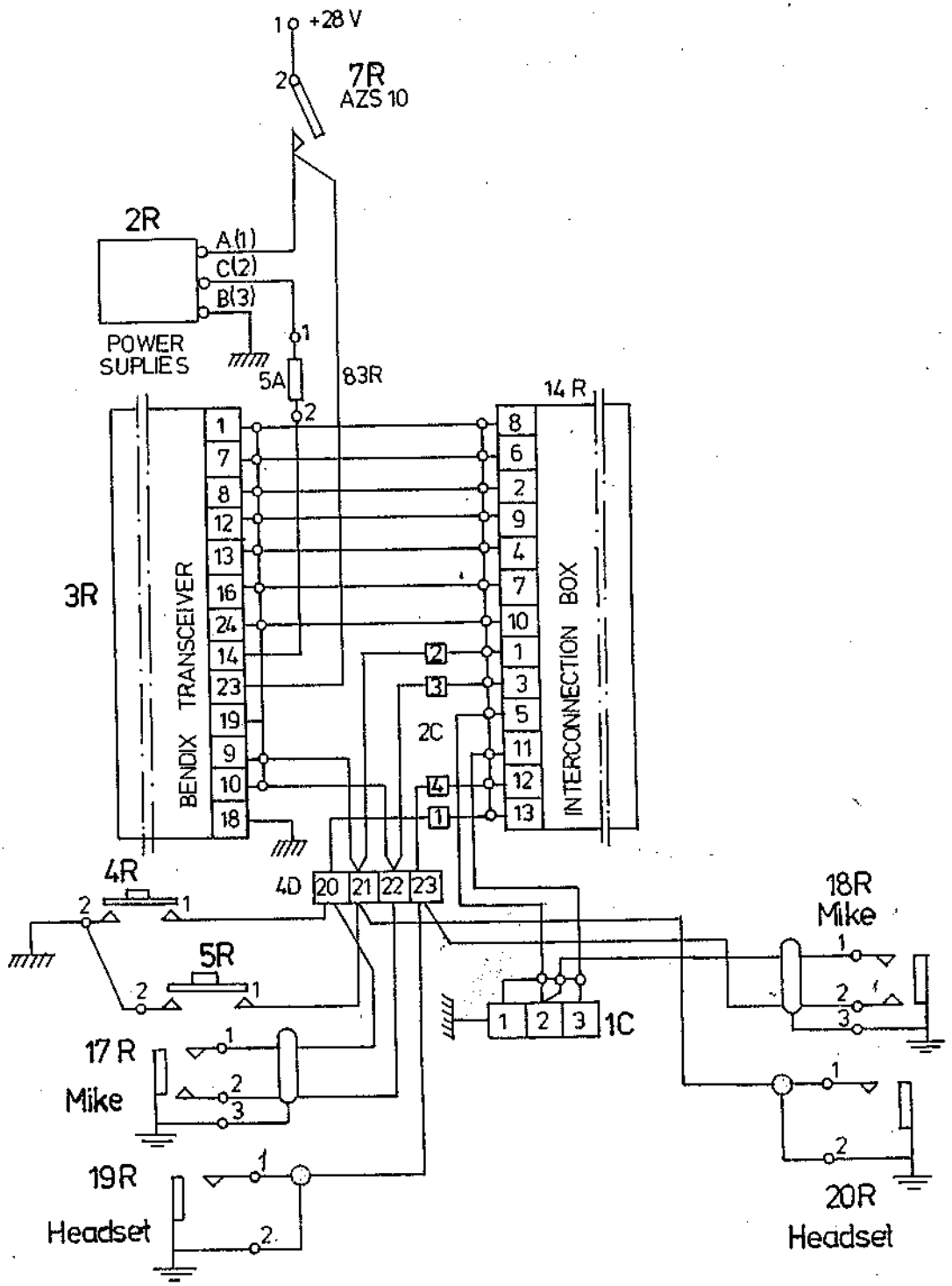
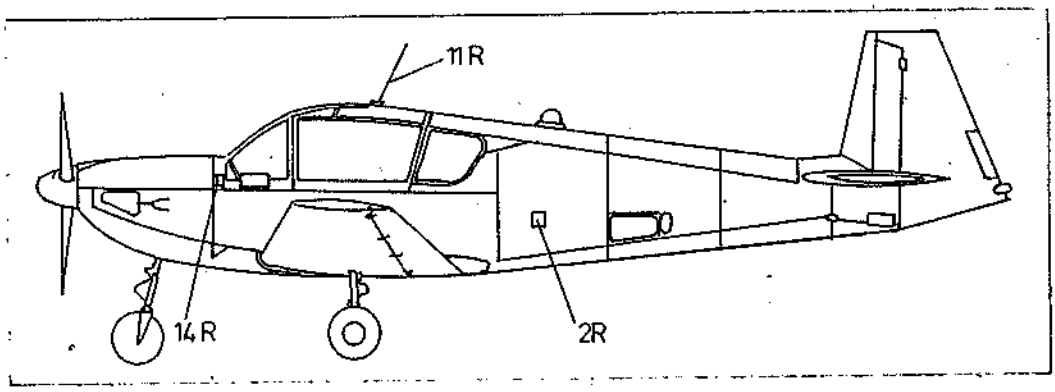


Figure 1 BENDIX INTERCONECTING DIAGRAM



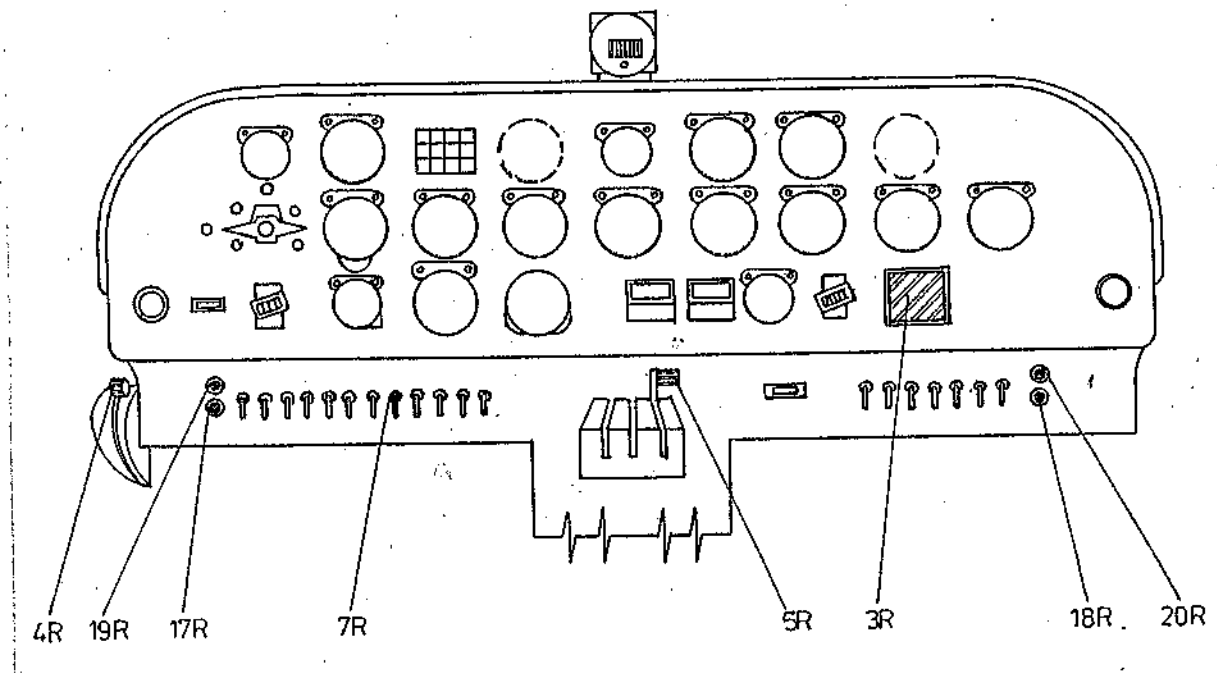


Figure 2 INSTALATION ARANGEMENT

CHAPTER 3.2.

COMMUNICATIONS

CONTENTS

I. DESCRIPTION AND OPERATION

1. The communication installation

Consists of a transceiver unit, mounted in a rack, installed at the RH side of the instrument panel, a power supply VR 14/4 located at the right side behind the instrument panel, two transmission buttons located on the throttle levers and the plugs for the headsets and microphones that are mounted under the board panel on the "electrical installation and engine control panel" and "warning control panel" respectively.
The aerial is installed above the cabin in order to provide the necessary counter - weight.

2. Description of the components (See figure 2)

Item	Designation	Symbol	Type	W	Qty
1.	VHF radiocommunication unit	3R	AR400A		1
2.	VHF antenna	11R			1
3.	Headsets		MRB 2400	Telex	2
4.	Jacks	17R18R	JJ033	Telex	2
		19R20R	JJ034	Telex	2
5.	Circuit breaker	7R	A2S 10	URSS	1
6.	PTT buttons	4R, 5R	204 K	URSS	2
7.	Power supply	2R	VR14/4	Becker	1

3. Operation

The transceiver is put into operation by actuating the 7R circuit breaker and by turning the VOL potentiometer clockwise.
After selecting the desired frequency using the two rotary knobs push, the PTT button to transmit, Back ground noise should be heard in the head sets.

III. MAINTENANCE

To remove the AR 400A transceiver from its support unlock with a screwdriver the four fasteners that are securing the unit to the instrument panel, and disconnect the connectors from the rear.

Warning
Before tilting the instrument panel, remove the AR 400A transceiver from its rack.
The AR 400A transceiver shall be maintained according to its Maintenance manual.
To remove the power supply, unlock the two fasteners and disconnect the unit.
After each mounting/dismounting of the antenna, the following operations shall be carried out.
- checking and securing the electrical connections
- measuring electrical bonding resistance (max. 1 mΩ).

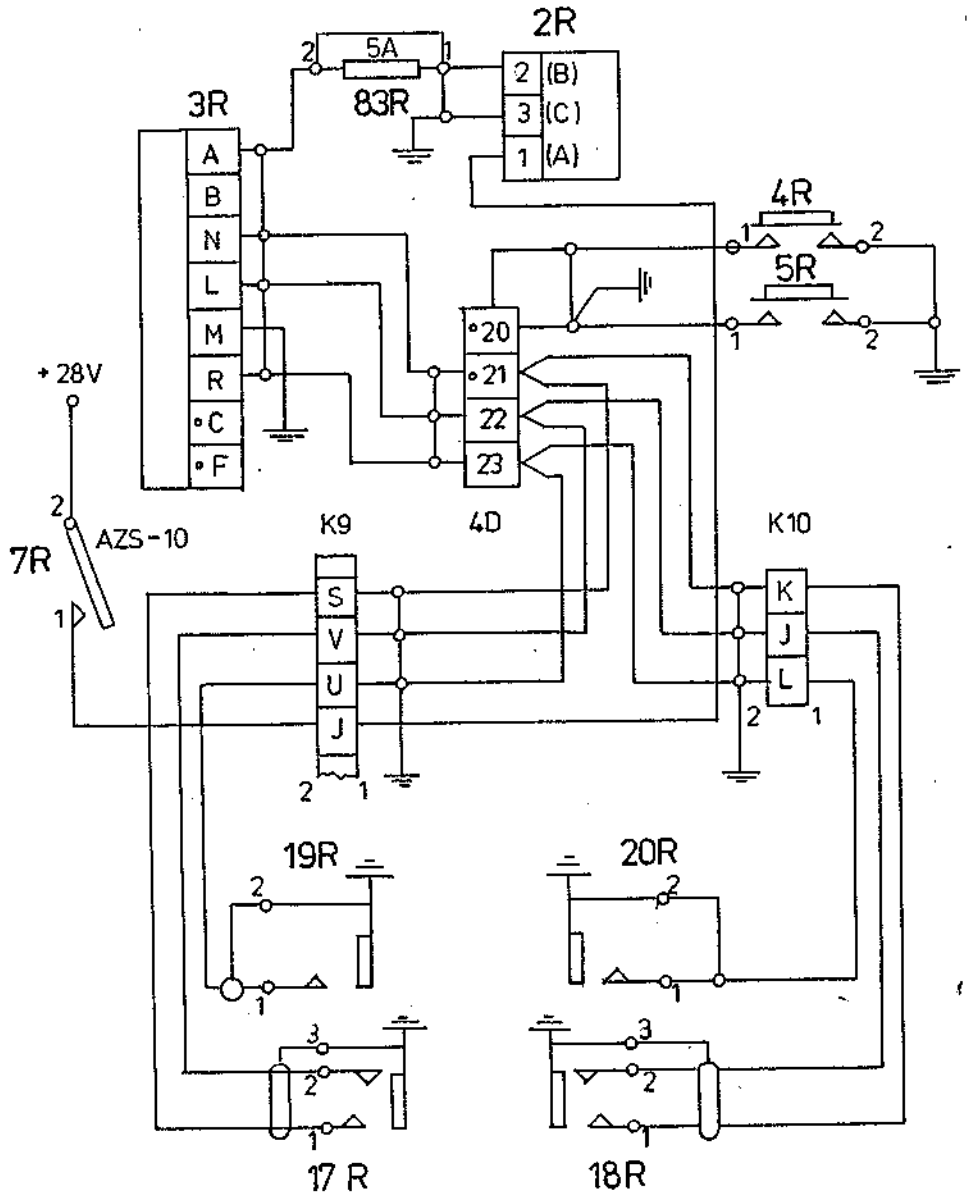
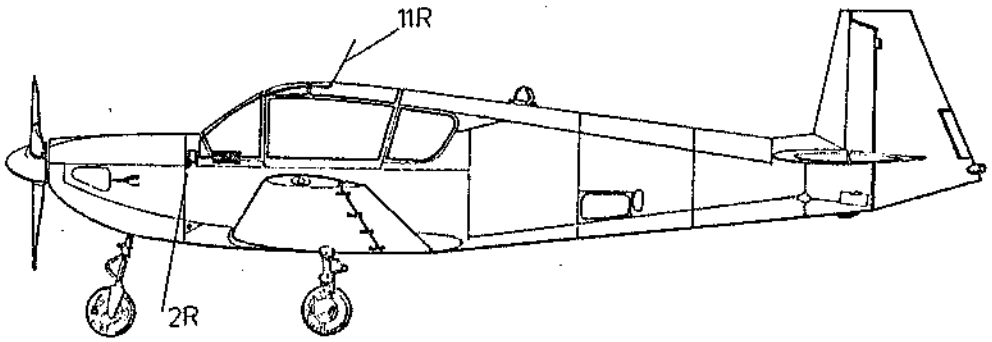


Figure 1 BECKER INTERCONECTING DIAGRAM



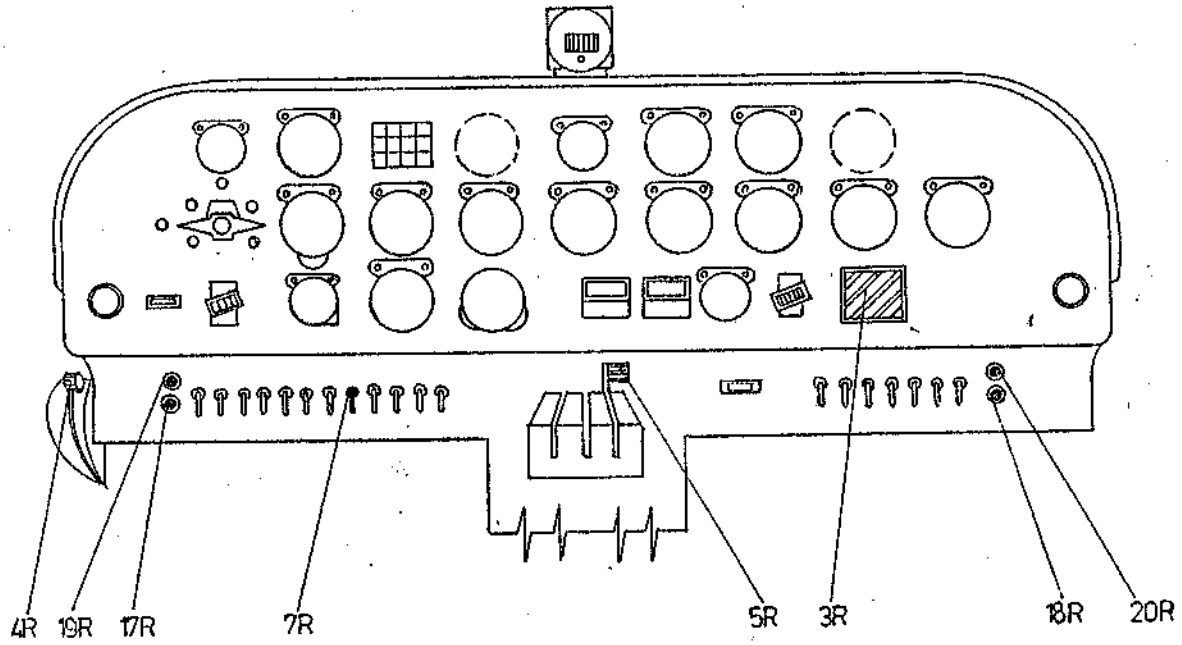


Figure 2 INSTALATION ARANGEMENT

RESERVED

Chapter 3.3.

POWER SUPPLIES AND DISTRIBUTION

CONTENTS Page

DESCRIPTION AND OPERATION

General

1. The electrical power is delivered by a 28 V d.c., 50 A engine - driven generator, which operates in parallel with a 24 V, 16 Ah Cd.Ni accumulator. The electrical diagram components are shown in the theoretical diagram, figure 1.
   Their location and the cable routes are given in fig. 2 and 3, and the components are these included in the appended list.
   There is installed an external power receptacle (fig.3) for engine starting or for usting electrical systems when thw engine is not operating, The supply cables are connected to the supply bass located in the circuit breakes. cabinet. Circuit breakers are used to protect the airplane circuits.

Generator

2. This is a rotary machine installed at the right side of the engine, driven by a belt. The voltage produced is rectified by six diodes. Cooling is provided by a flexible pipe.

Voltage regulator

3. The voltage is rectified at a value of 28.5 V in the speed range of 1200 - 2700 rpm. This voltage supplies a tranzistorized voltage regulator which controls the generator excitation. It varies the excitation voltage so that the voltage delivered by the generator is constant. The regulator is installed in the cabin, on the fire-wall, at left hand side

Battery (figure 2)

4. The CdNi type battery has a 16 Ah capacity at 24V; it is installed in the rear fuselage at the left hand side.

Power supplies manual control

5. The airplane electrical supply is manually controlled by means of 2 switches located on the switch board (a volt-ampermeter located on the instrument panel which indicates charging or discharging of battery). The external power receptacle is disconnected through contactor 4E located near the battery in the relay box (figure 2). If an external power supply is connected, by actuating BAT switch contactor 4E is switched in, if connecting the battery to the network. The generator can be connected to the airplane network using switch 19E.

Overvoltage signalling and protection (figure 3)

6. If generator voltage increases it is automatically disconnected. An overvoltage protection unit is connected in series with the generator excitation voltage regulator if generator voltage exceeds 32V, the overvoltage unit is activated and disconnects the regulators, the generator output voltage becomes zero and the airplane bus bar is supplied from the battery.

Distribution and connection

7. The electric power is distributed to different consumers through circuit breaker which include also a manual disconnection device. Switches are available on the switch board located below the instruments panel in front of the pilot.

Wirings

8. Cables used are of Filotex type and end in connectors or thimbles.
   The conductors are marked according to the codes applied to the units.

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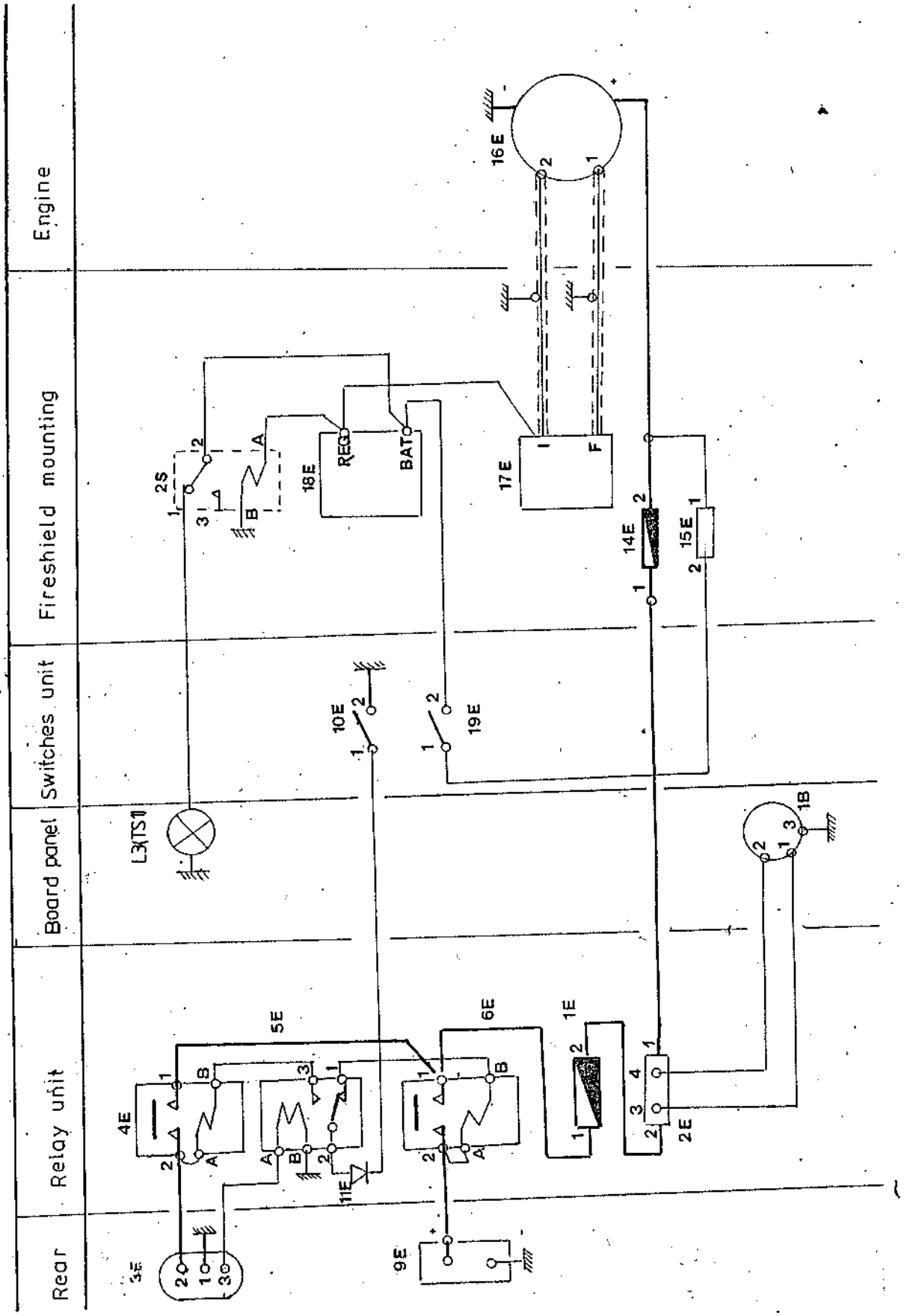


Figure 1 — Theoretical electrical diagram.

CAPTION TO FIGURE 1

Electrical System

1. Inertial fuse	1 E	IP-50
2. Shunt	2 E	SA-240
3. External power receptacle	3 E	-
4. Contactor	4 E	KM-50DV
5. Relay	5 E	TKE-21PD
6. Contactor	6 E	KM-50DV
7. Accumulator	9 E	SAFT 1600
8. Switch	10 E	V-45
9. Diode	11 E	EFR-136
10. Inertial fuse	14 E	IP-50
11. Fuse	15 E	PV-6
12. Generator	16 E	ALU-8403
13. Voltage regulator	17 E	VSF-7402
14. Overvoltage relay	18 E	X17620
15. Switch	19 E	V 45
16. Voltampermeter	1 S	VA-2
17. Light	L3(TSL)	
18. Relay	2 S	TKE 21 PD

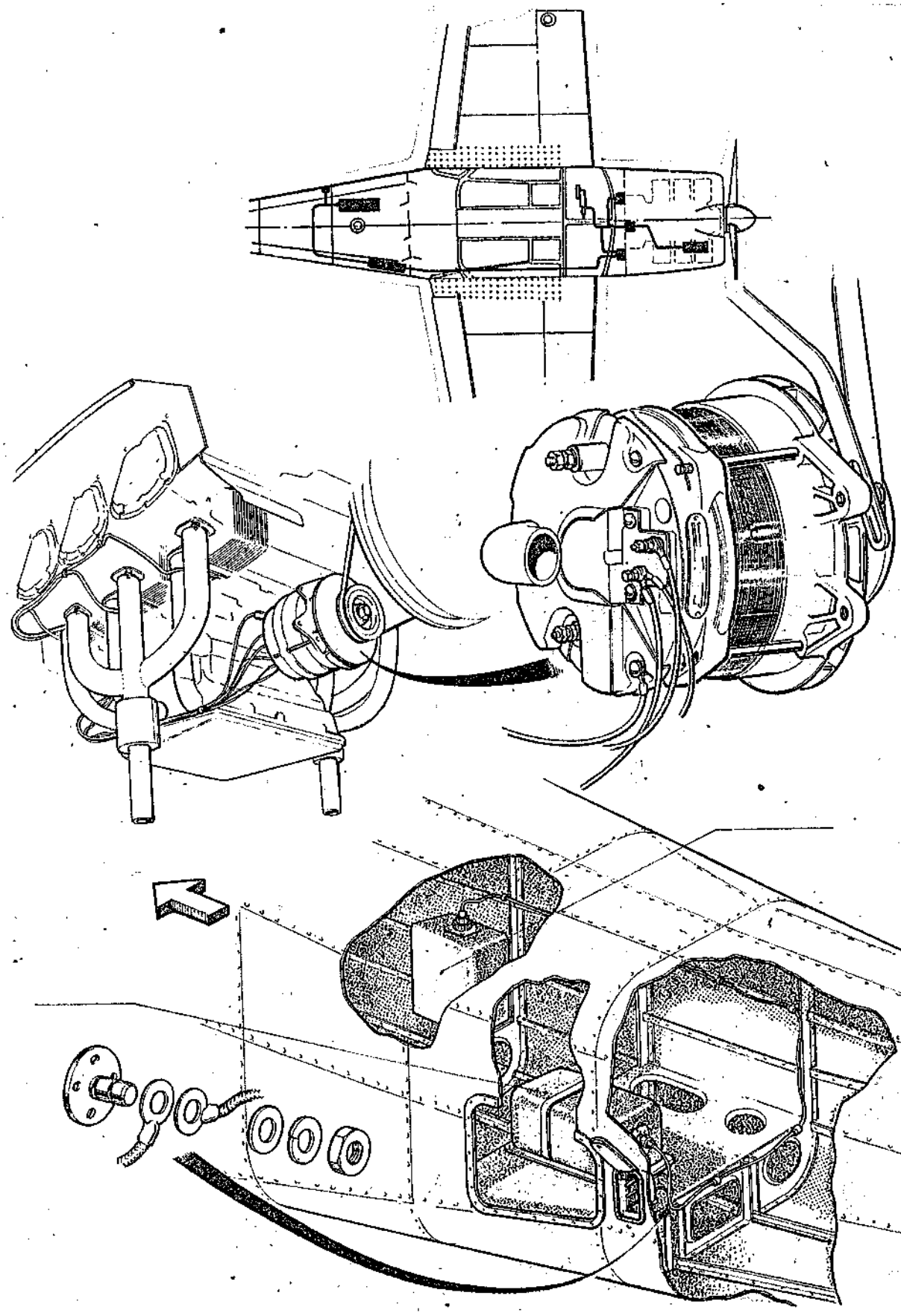


Figure 2– Wirings and location of main elements

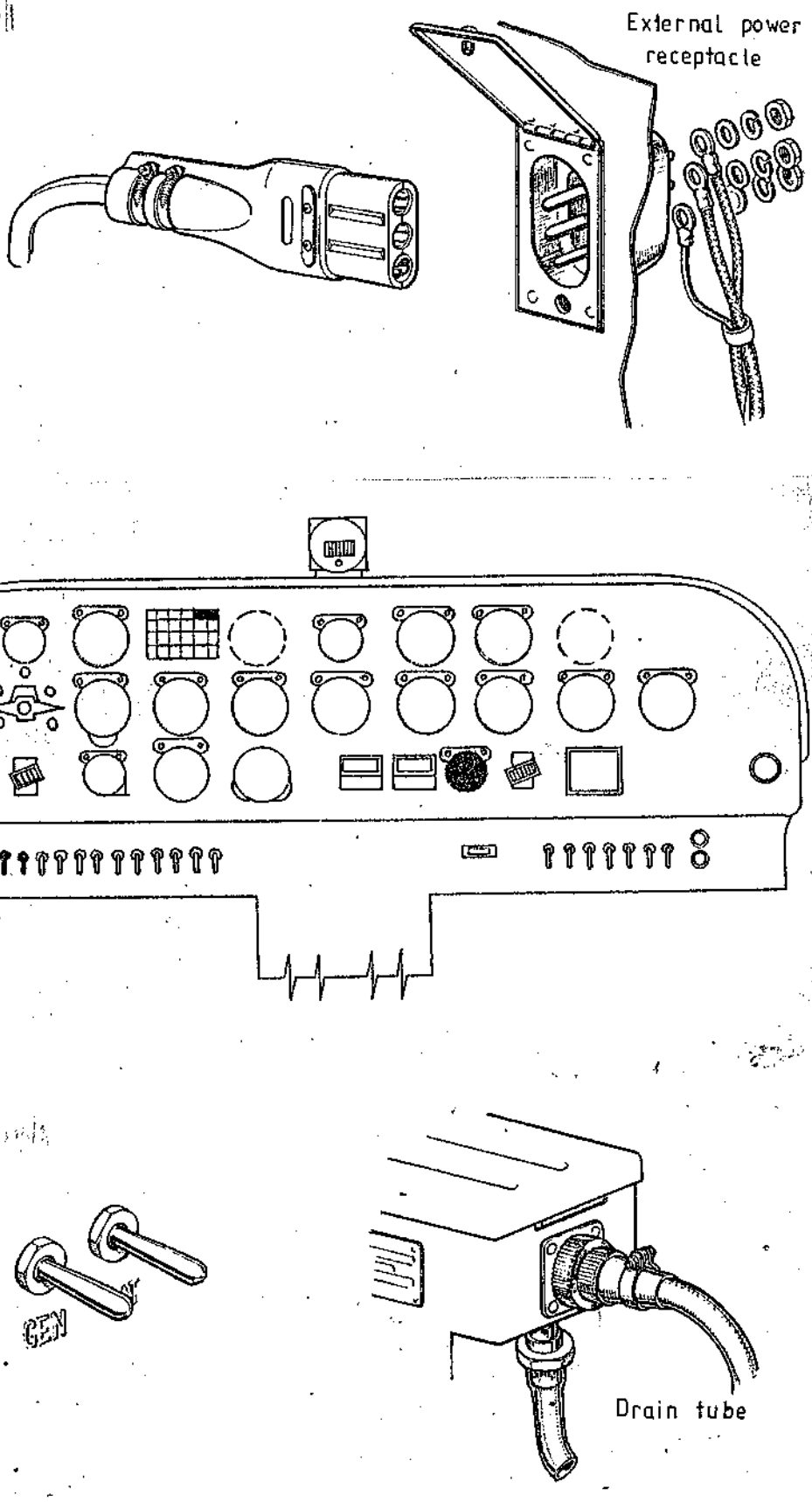


Figure 3— External power receptacle, accumulator, voltampermeter

Reserved

MAINTENANCE

General circuit tests

1. The airplane is ground tested using an external power supply. Connect external power supply and turn BAT switch ON.
   Ensure that battery is disconnected.
   (1) The circuits can be tested by actuating switches. Carry out repair and replacing if necessary, in keeping with the safety precautions.
   (2) Ensure that all switches are OFF, then disconnect external power supply

Generator tests

2. Before testing ensure that a fully loaded battery of a proper type is connected, to avoid wrong readings. Proceed as follows :
   (1) Start engine using an external power supply, then disconnect external power supply. Run engine at 1200 to 1400 rpm.
   (2) Ensure that all switches are in disconnect position except for BAT and GEN switches.
   (3) Allow for some minutes for temperature stabilization then increase engine rpm to 2100 rpm.
   (4) Check that the voltmeter reads 27.75 V $\pm$ 0.25 V at the main bus bar. Read battery load current with the ammeter; it should not exceed 2 to 5 A.
   (5) Turn on all switches. No significant change shall occur in voltage and load current.
   (6) Carry out tests described at § 4 and 5 with engine running at different speeds between 1200 and 2575 rpm.
   (7) Turn switches off, cut off engine and turn GEN and BAT switches off.
   (8) Voltage can be set to the required value by adjusting the voltage regulator. Instability with load variations and of the rpm are possibly due to unproper generator driving belt tensioning or to a faulty regulator.

Carry out the necessary adjustments, repairs and replacements, then repeat the above tests.

Diagram 1. Power supplies and distribution circuits checks and adjustments.

Voltage regulator checks

3. The voltage to which the generator is limited is determined by the regulator by means of the adjustment screw available on it's front side.
(1) In order to adjust voltage, remove protective cover and use a screwdriver to rotate adjustment screw in the required direction (+ or -);
(2) If the regulator can not be set to the required voltage value or shows other faults, it shall be replaced.

Adjusting the generator driving belt tensioning

4. If it is necessary to adjust the driving belt tensioning slack generator attachment screws and adjust position so that a belt deflection of about 2 mm for 14 lb load (new belt) or 16 lb load (used belt) is obtained. Tighten and lock attachment screws when obtaining the required tensioning, then carry out checks given in § 2.

Overvoltage protection

5. In case that this circuit is not operating properly, the overvoltage protective unit shall be removed and bench tested.
(1) Apply voltage between terminal B and Housing and notice voltage at which the relay is operating; this shall be about 32 V ± 1 V.
(2) If the unit is operating properly, inspect, clean and adjust contact if necessary, and install it on airplane.
(3) If the unit is not operating properly, it shall be replaced.

Chapter 3.4.

CABIN ARRANGMENT AND ADJOINT EQUIPMENT

CONTENT Page

DESCRIPTION AND OPERATION

General

1. Within this chapter there are presented the standard airplane equipment and furnishing.

Cabin Arrangement (fig.1)

General

2. The cabin inner structure is fully covered by uphostery panels .
The cabin furnishing (including sun-shades, door - locks mounting, electrical wiring fairings etc.) is presented in fig.1 and the accompaning caption.

Cabin Upholstery

3. The upholstery panels fully cover the cabin interior. They are made of polyurethanes foil and fire resistent upholstery material, Termovil type. Their attachment to the structure is carried out by sheet strips and scrws as well as Velcro fabric zippers.

Instrument Panel

4. Mounted by means of some flexible damping elements, the instrument panel is made of dural sheet. At the panels upper part there is a shield to facilitate the instrument readings.

Removable Floors

5. The cabin floors, whose attachment to the fuselage booms upper bases is fixed (riveted) or removable (by screws) belong to the fuselage and central plan strength structure.

Arrangement Dismounting

6. To dismount an inside item, remove the fastening screws and strips or pull the item covering panel from the fabric zipper.

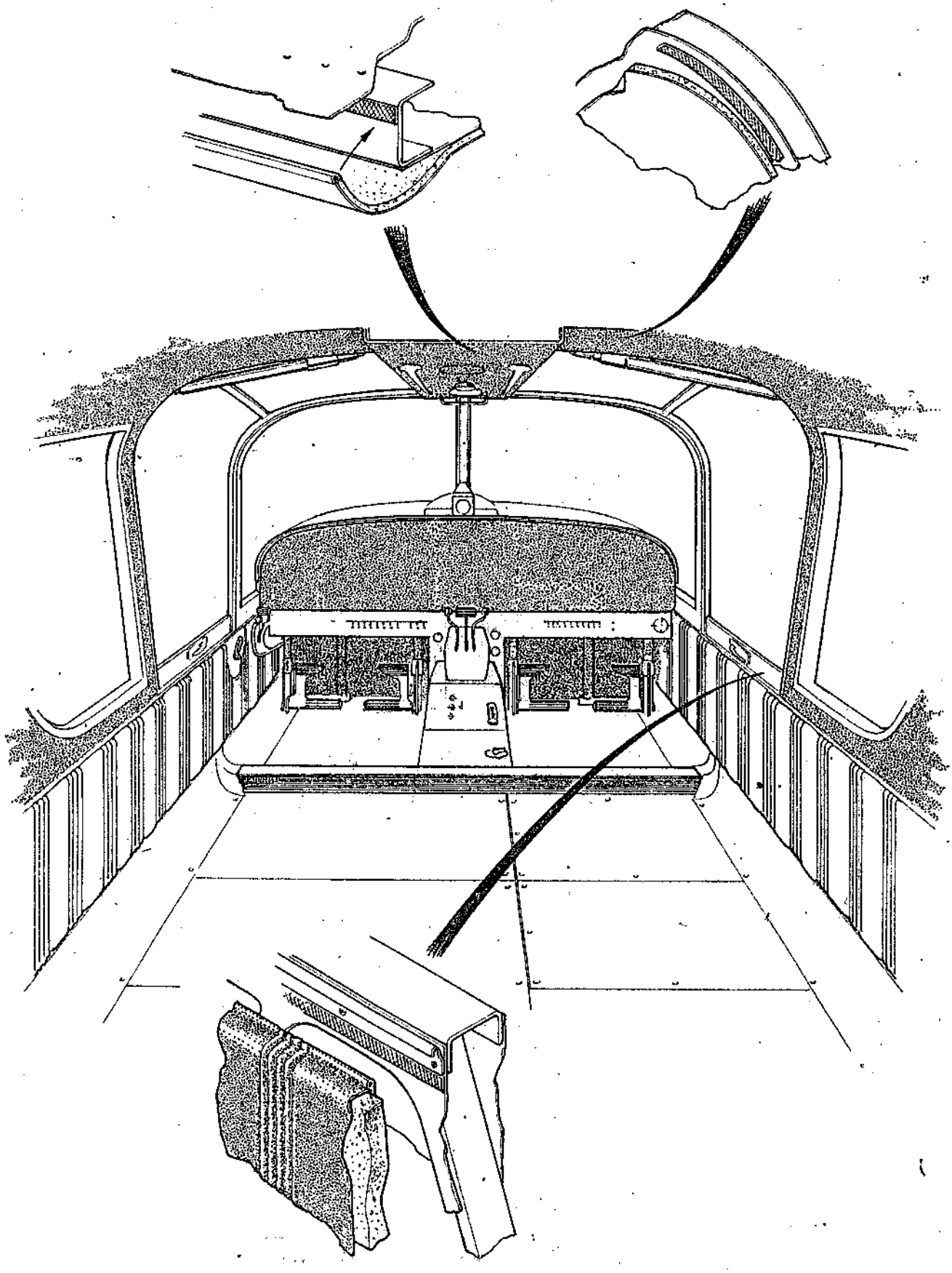


Fig. 2.– Cabin Arrangement

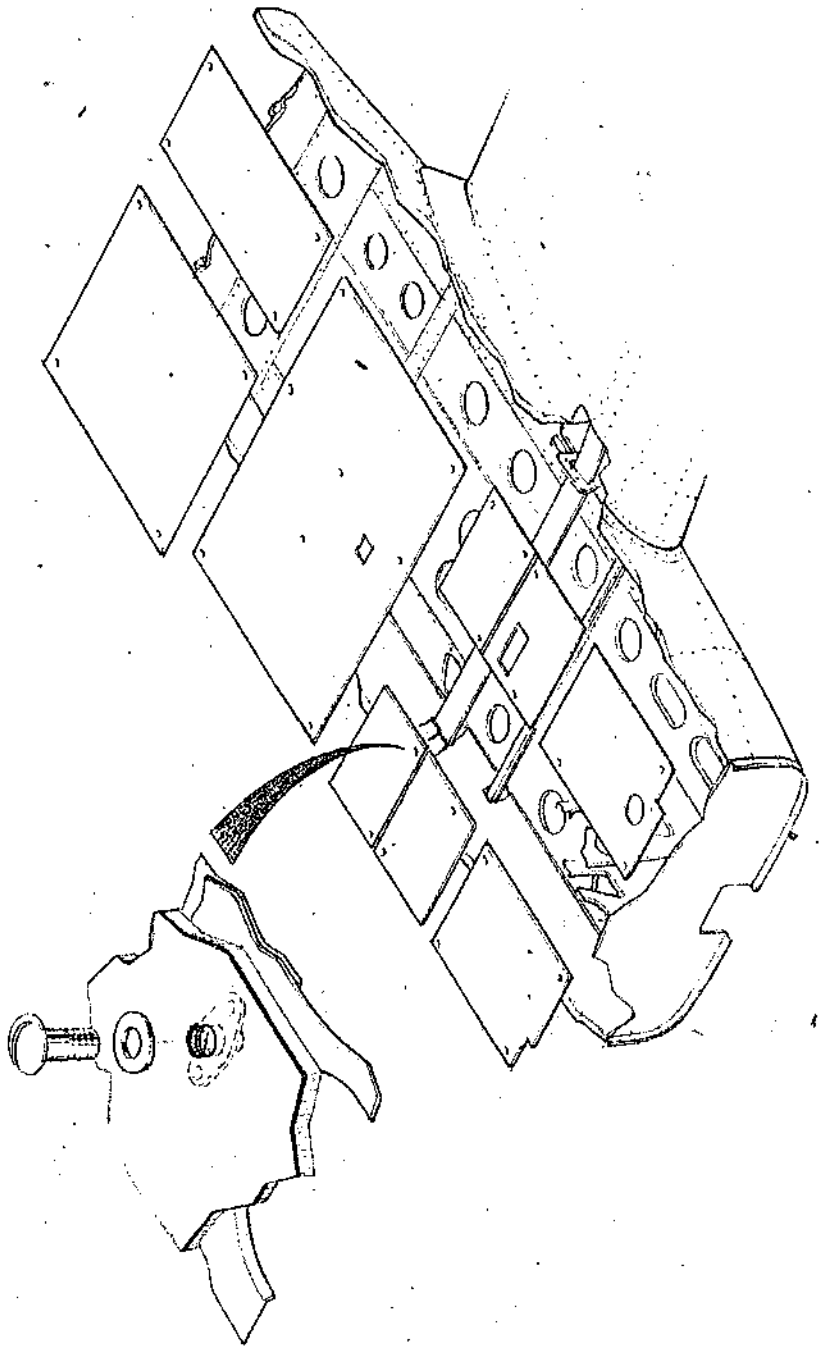


Fig. 3. Removable Floors

Seats (fig.4)

7. For pilot and co-pilot there are provided individual seats, with steel sheet and tubes structure. The seats are adjustable to and fro. The seat cushions are made of polyurethanes foames, upholstery wool, fabric, covered with upholstery material and dermateen. The seats are fastened by screws to the main spar base and to the floor.

Bench

8. Provided to accomodate 2 passagers there is an adjustable bench.

Seat - belts

9. They are made of relon fabric strips, catches and locks. The belts are attached to the anchors included in the side walls structure and floor and bench central anchors. The pilot seats are provided with five fastening point belts.

Maintenance

General

1. There shall be carried out periodical checks of seat-belts condition and fixing.

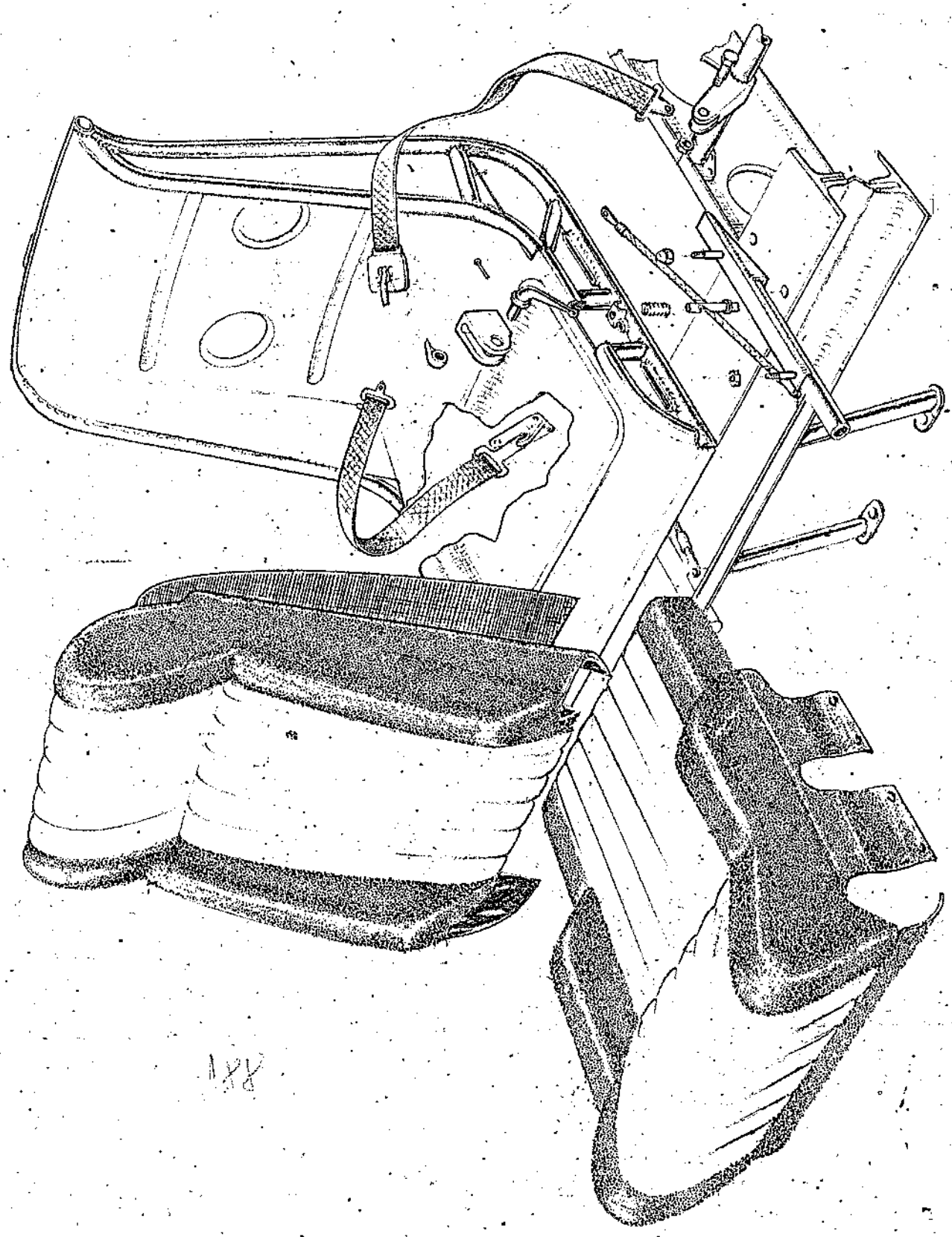


Fig. 4. — Seat

Chapter 3.5

ANTI-FIRE - EQUIPMENT

CONTENT

DESCRIPTION AND OPERATION

General

1. On the standard airplane it is installed a fire-protection system situated in the engine compartment, The system is automatically set into operation when a dangerous temperature is reached inside the respective compartment.

Fire Extinguisher

The fire extinguisher is made of chrome-molybdenum steel sheet. On one of its ends are mounted the ejection tubes, on the other is the filling cap union and compressed-air filling valve. The fire extinguisher is mounted on the firewall holder.
When mounted on the airplane, the fire extinguisher ejection tubes are directed towards the fuel filter and injector.
It is set into operations when a temperature of 95°C is reached in the engine compartment dangereus areas. At that moment the fusing caps from the tube ends, made of Pb 32%; Bi 52%; Sn 16% alloy and having a thickness established within special tests, melt and the insulating foam is ejected.

Installation Technical Data

(1) Extinguisher Capacity	2000 cm^3
(2) Operation Pressure	3.8 Kgf/cm^2
(3) Test Pressure	18 Kgf/cm^2
(4) Foaming Agent	Metylbromide
(5) Required agent volume	1200 $\pm$ 12 cm^3
(6) Compression Agent	Compressed-air

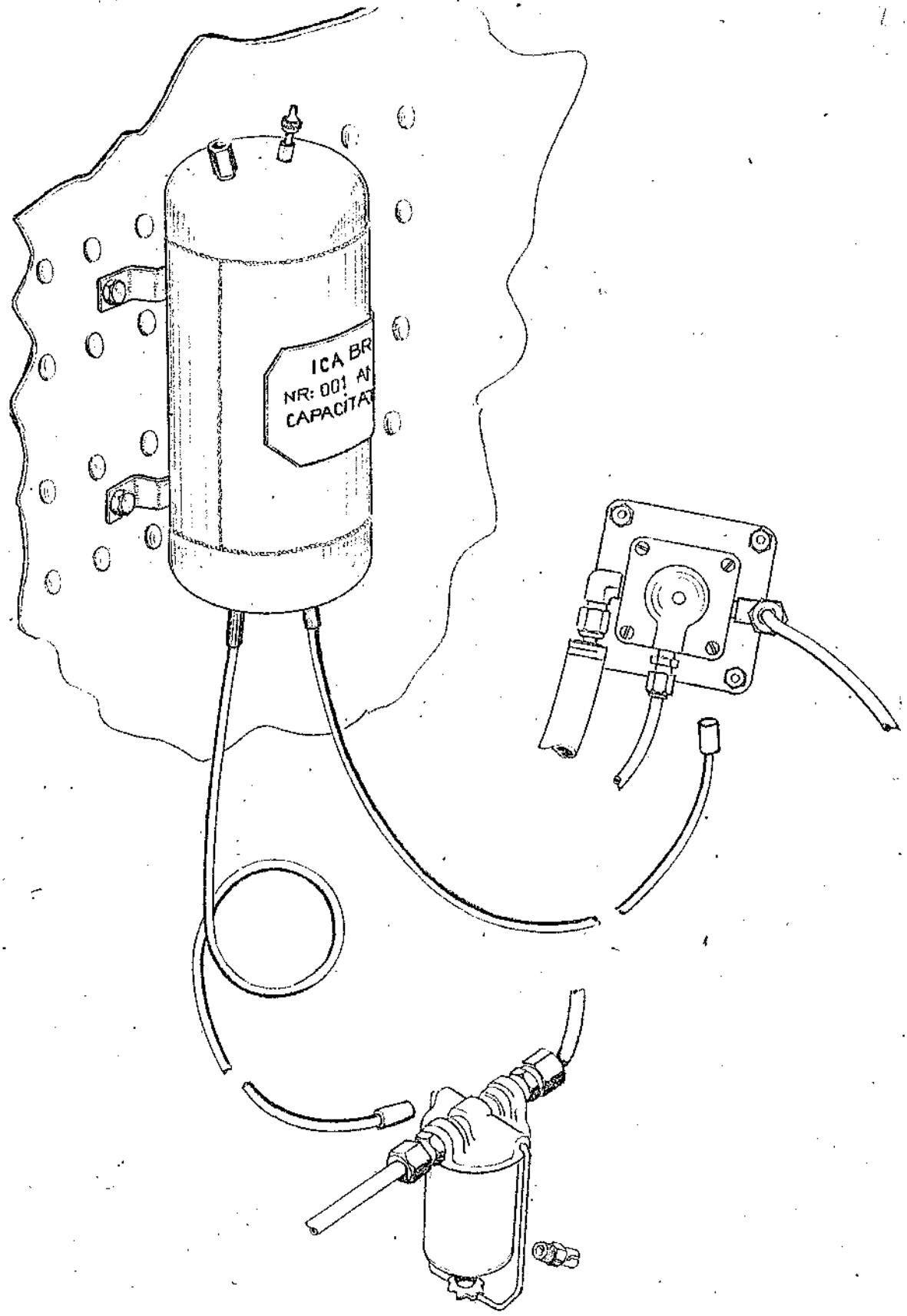


Fig.1 Antifire System

Chapter 3.6

FLIGHT CONTROLS

CONTENT Page

11. Elevator Control (Detail)
12. Elevator Control (Detail)
13. Elevator Trimmer Control
14. Electrical Diagram of Elevator Trimmer Actuating System
15. Flap Control
16. Location of Flap Control Transmitter and Electromechanism.
17. Location of Flap Control Lever; Flap Indicator and Control Electric Diagram

Diagram MAINTENANCE

1. Control Stick Mounting/Dismounting
2. Rudder Control Adjustment and Greasing
3. Aileron Control " " "
4. Elevator -"- -"- -"- -"-
5. Elevator Trimmer Control Adjustment and Greasing
6. Rudder Trimmer Control -"- -"-
7. Flap Control Adjustment and Greasing
8. Adjustment and Greasing of Flap Actuation Assy
9. Flap Control and Actuation
10. Elevator Trimmer Actuation.

DESCRIPTION AND OPERATION

General

1. The rudder, elevator and aileron controls are manually actuated.
The flap control is electro-mechanically actuated.
The aileron, elevator and rudder are actuated by mechanical systems consisting of connecting rods, levers, torque bars, cables and rods.
The flap actuating system consists of levers and rods.
The rudder trimmer is controlled by the hand wheel mounted in the cabin ceiling. The right elevator flettner (an automatic fletner is mounted in the left elevator) is controlled by a levers and rods system electromechanically controlled.

Aileron (fig.2 and 3)

Control Stick

2. The control stick consists of the upper lever with the handle itself and the stick hub made of cast light alloy.
To the control stick also belongs the torque tube hinged to the floor structure.
The stick hub is mounted on the hinge of the torque tub end.

Controls in Fuselage and wing (Fig.1,4,5 and6)

The control is transmitted by the stick control through rods, levers and cables to the control surfaces.

Rudder and Fletner

Rudder Pedals (fig.7)

4. The rudder pedals consist of arms and spindles (on which the pedals themselves are mounted). Each arm-spindle assy is welded on one of the two oscillating spindle parts of the rudder pedals. The spindles lay on ball bearings in the fuselage sides, and the sleeves lay on the central bearing.
On each spindle there is a gear fixed by two pins.
The gears have identical toothing and drive the right and left spindle.

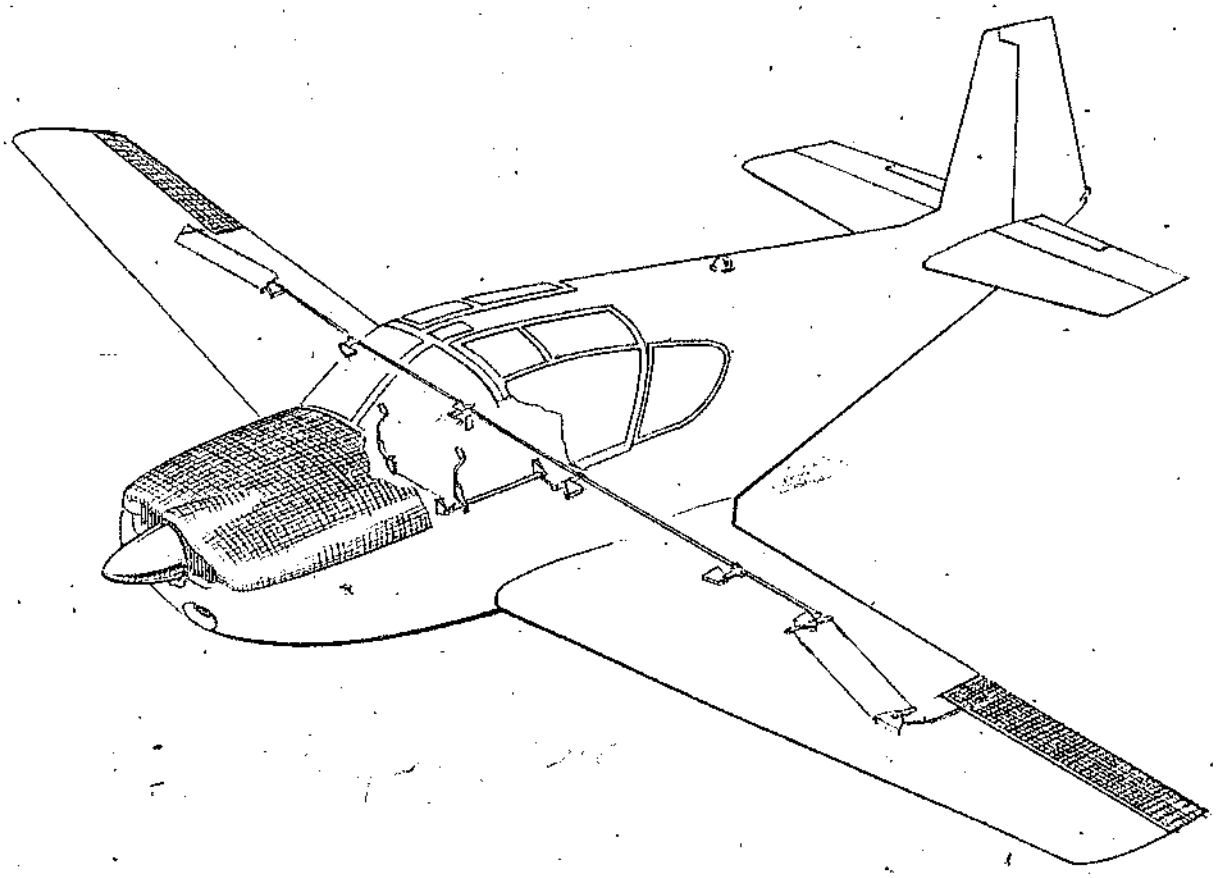


Fig.1 Aileron Control

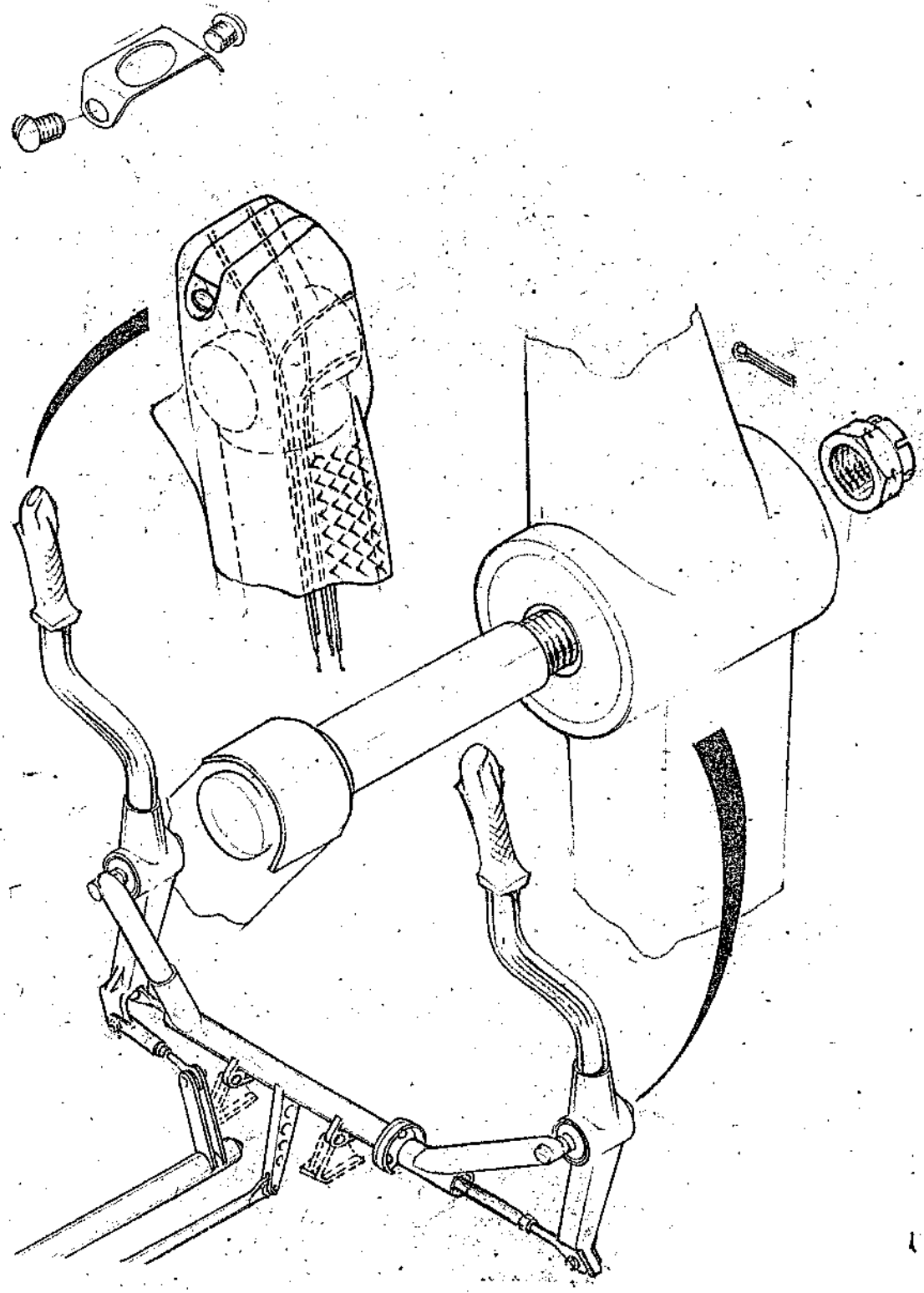


Fig.1 Control Stick Mounting

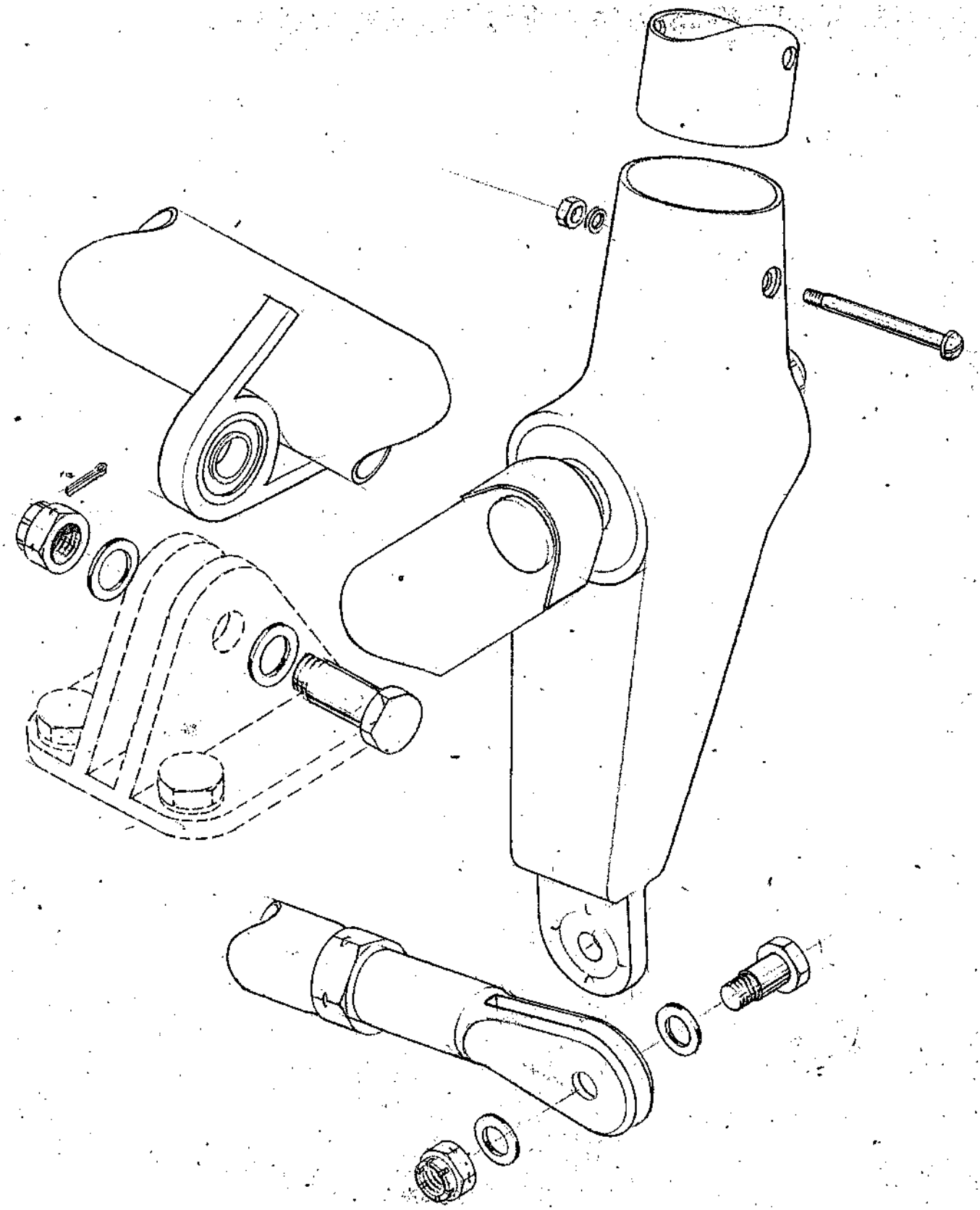


Fig.3 Control Stik Mounting

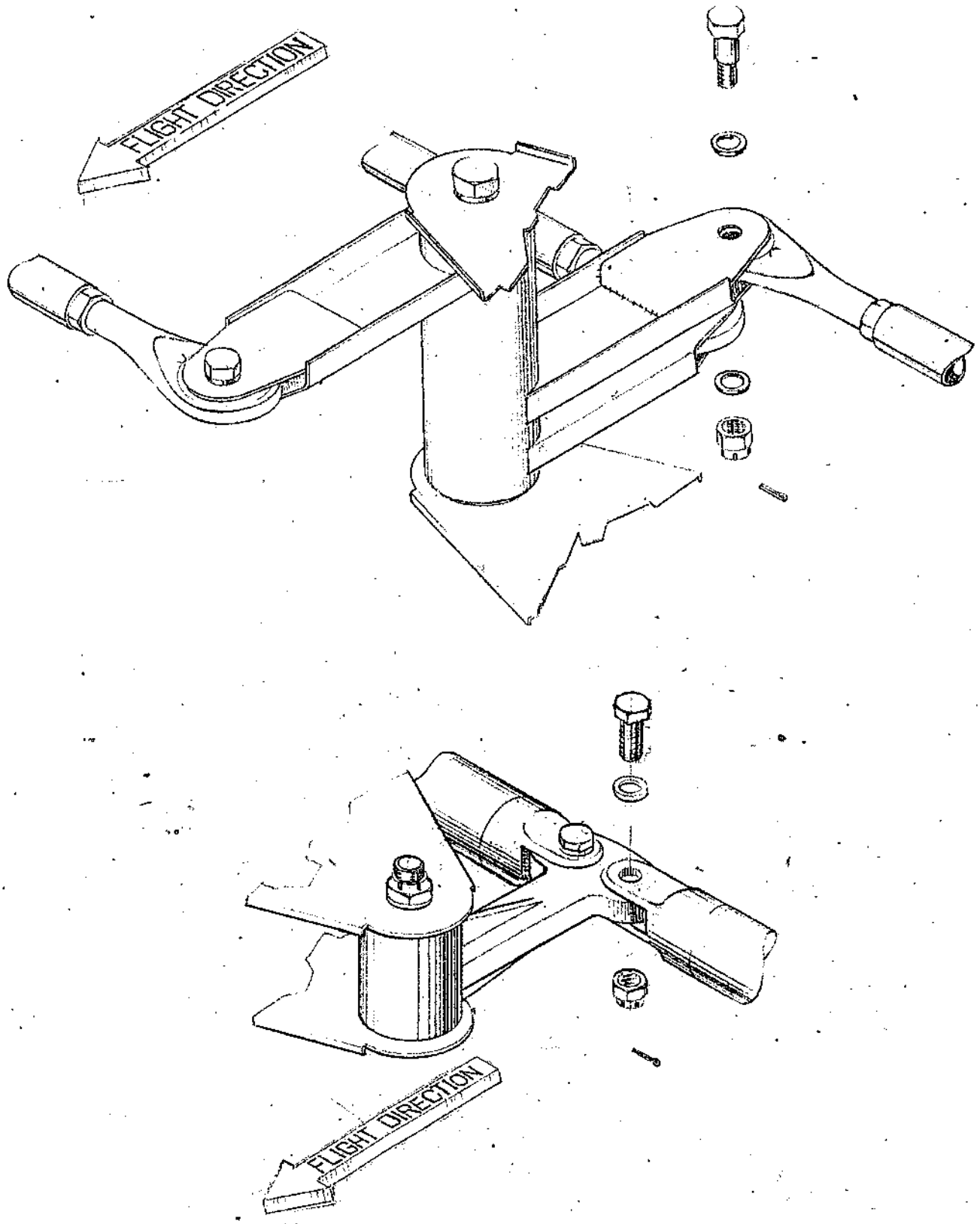


Fig. 4 Aileron Control-(Detail)

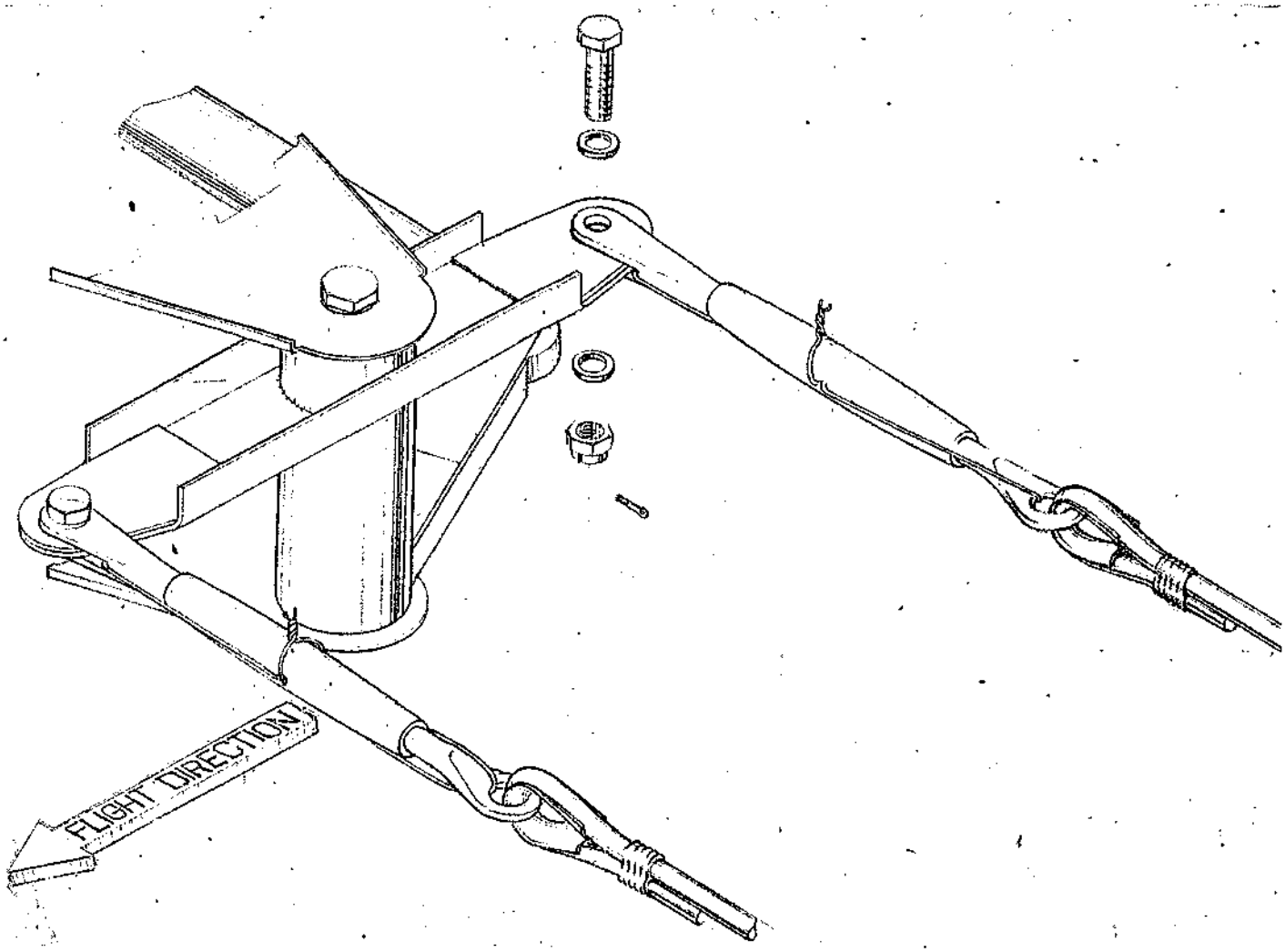


Fig. 5 Aileron Control (Detail)

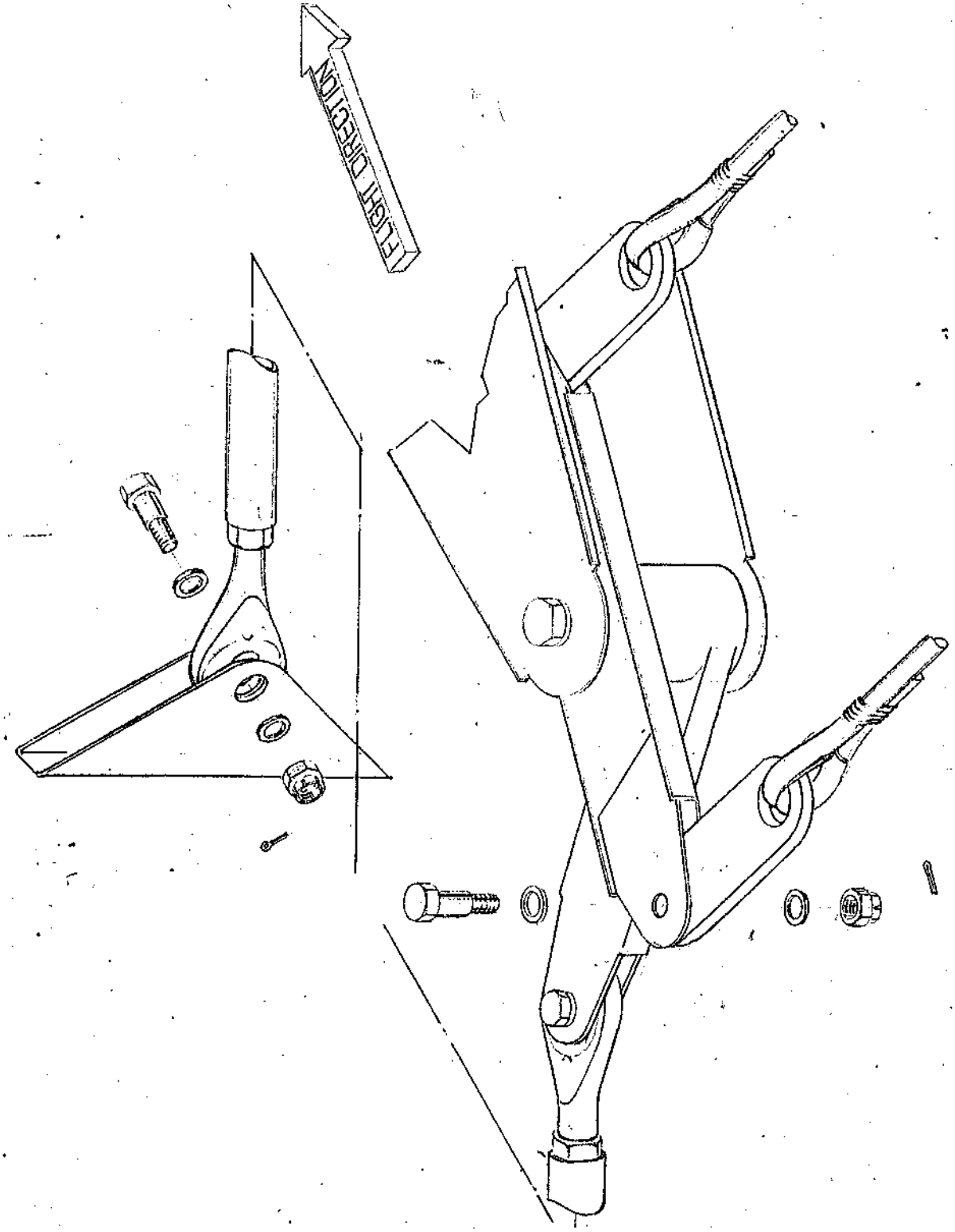


Fig.6 Aileron Control (Detail)

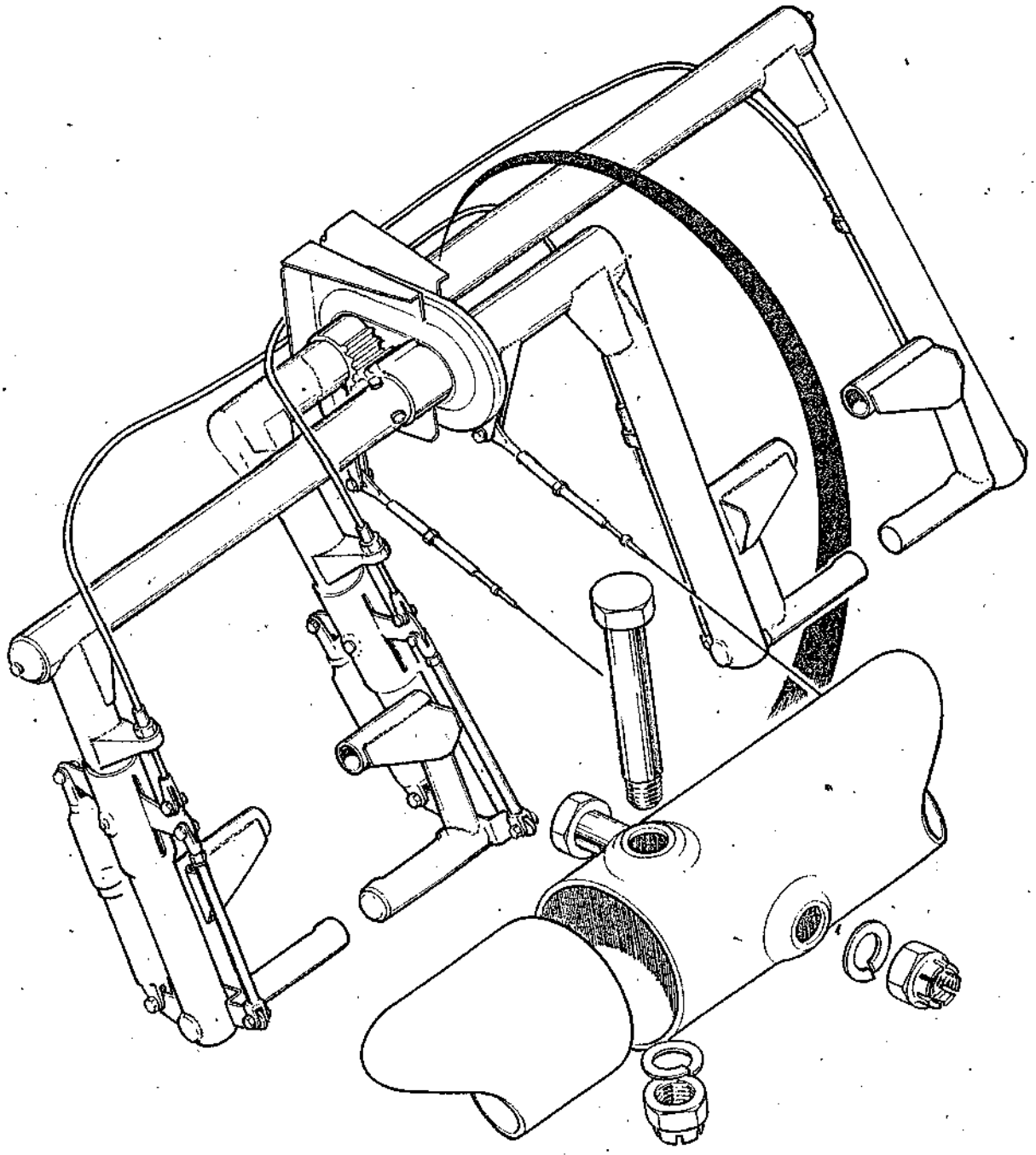


Fig. 7 Rudder Control

Rudder Controls in Fuselage (fig.8)

5. The two flexible cables are tightened and attached by pins to the pedals lever eyes. The cables are perpendicular to the lever eyes ridius when rudder is in neutral position.
The cable tighteners are adjusted for a 31 ± 2 Kgf tightening with rudder in neutral position and are locked.
The cables lay on two pair of roll bearings. The cable ends are set and provided with bushes and clips hinged to the lever. The lever rotation within the rudder deflection limits is carried out by two adjustable stoppers. The stoppers position is synchronized with the pedal stappers position.
The rudder control lever is hinged to the lever upper eye.

Trimmer Control (fig.9)

6. The rudder flettner is fitted with a flexible control whose actuation is made from the cabin ceiling hand wheel.
The flexible steel cable is wound on the reel from where it is guided towards aluminium tubes fixed on the structure.
Behind frame no.1 the control is continued by two strings.
In front of the fin, on the strings, there are the tighteners
The access to the tighteners is posible by dismounting the fuselage-empennage fairings.

Elevator and Flettner

Controls in fuselage (fig. 10, 11, and.12)

7. An adjustable length rod is hinged to the torque rod lever of the control stick system. This drives a similar rod by the oscillating lever situated on the holder in front of the rear spar. In its turn, this rod actuates upon the double mounted on a holder behind no.1 frame lower vault. At the lever ends there are the strings each, hinged by a tightening assy. The rear string ends are hinged to the oscillating three arms lever. To the 3-rd lever arm is hinged the control final rod that drives the control and synchronizing tubes levers of left and right elevators.
The three oscillating levers are mounted by bearings in a holder located on structure.

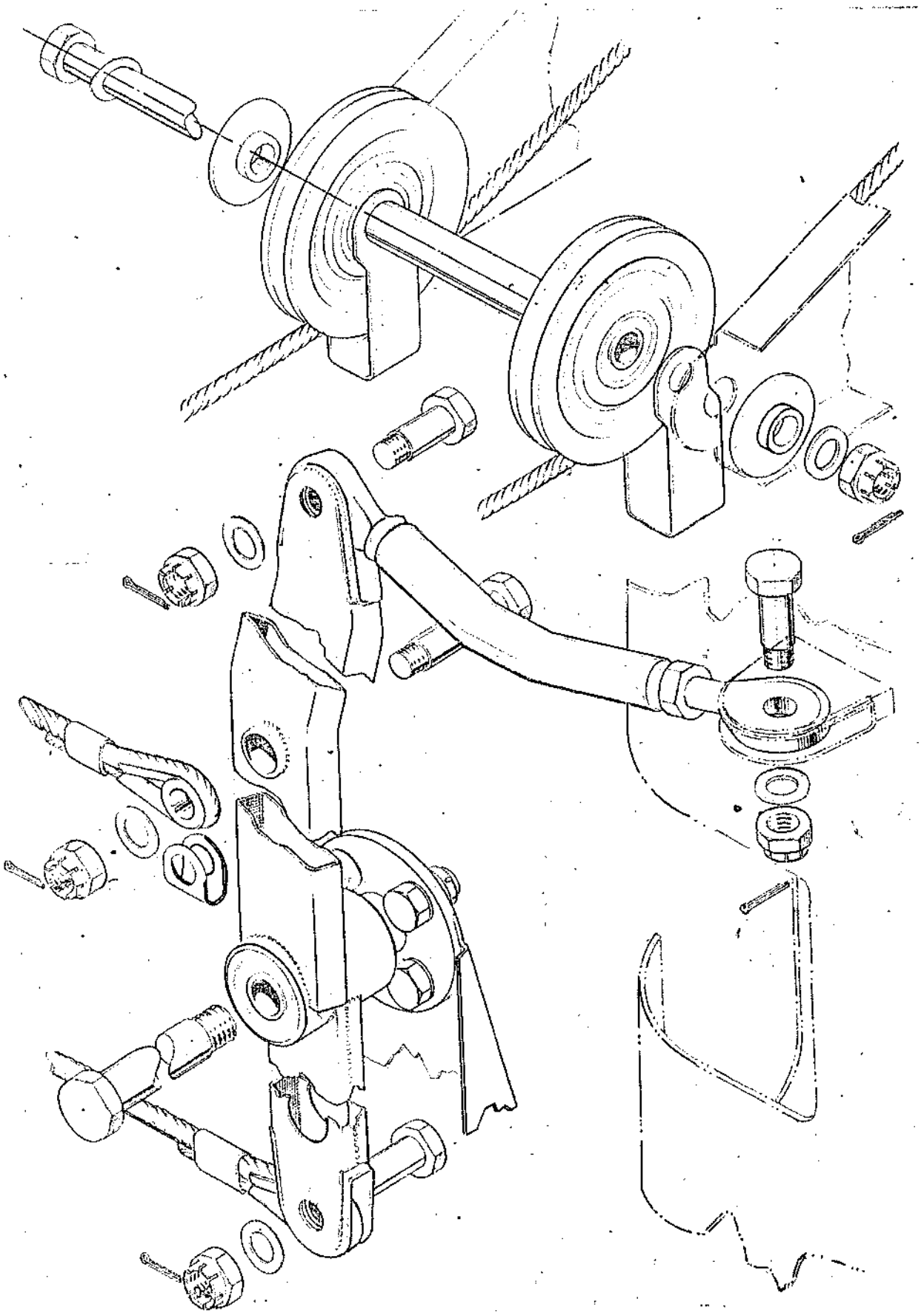


Fig. 8 Rudder Control (Detail)

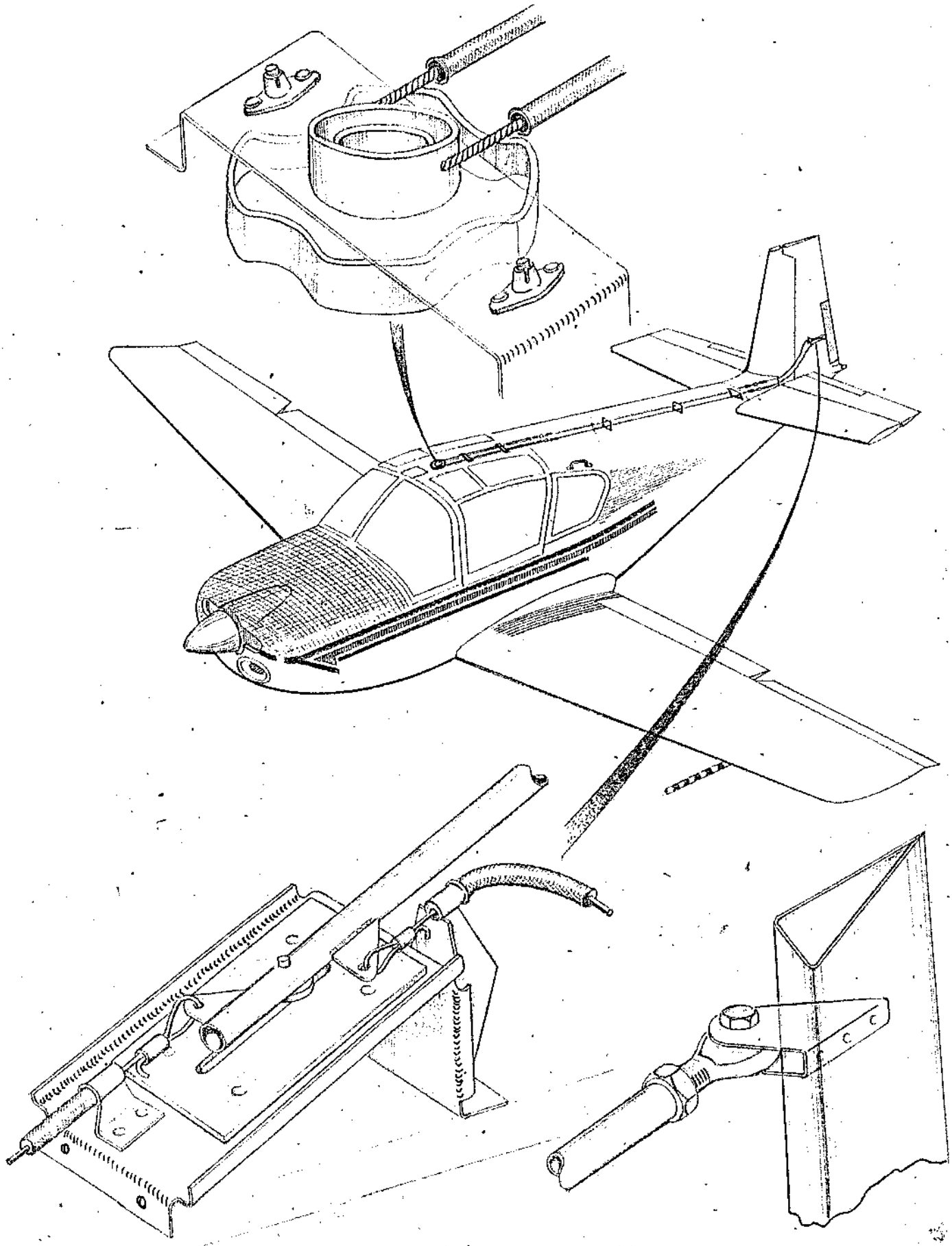


Fig. 9 Rudder Trimmer Control

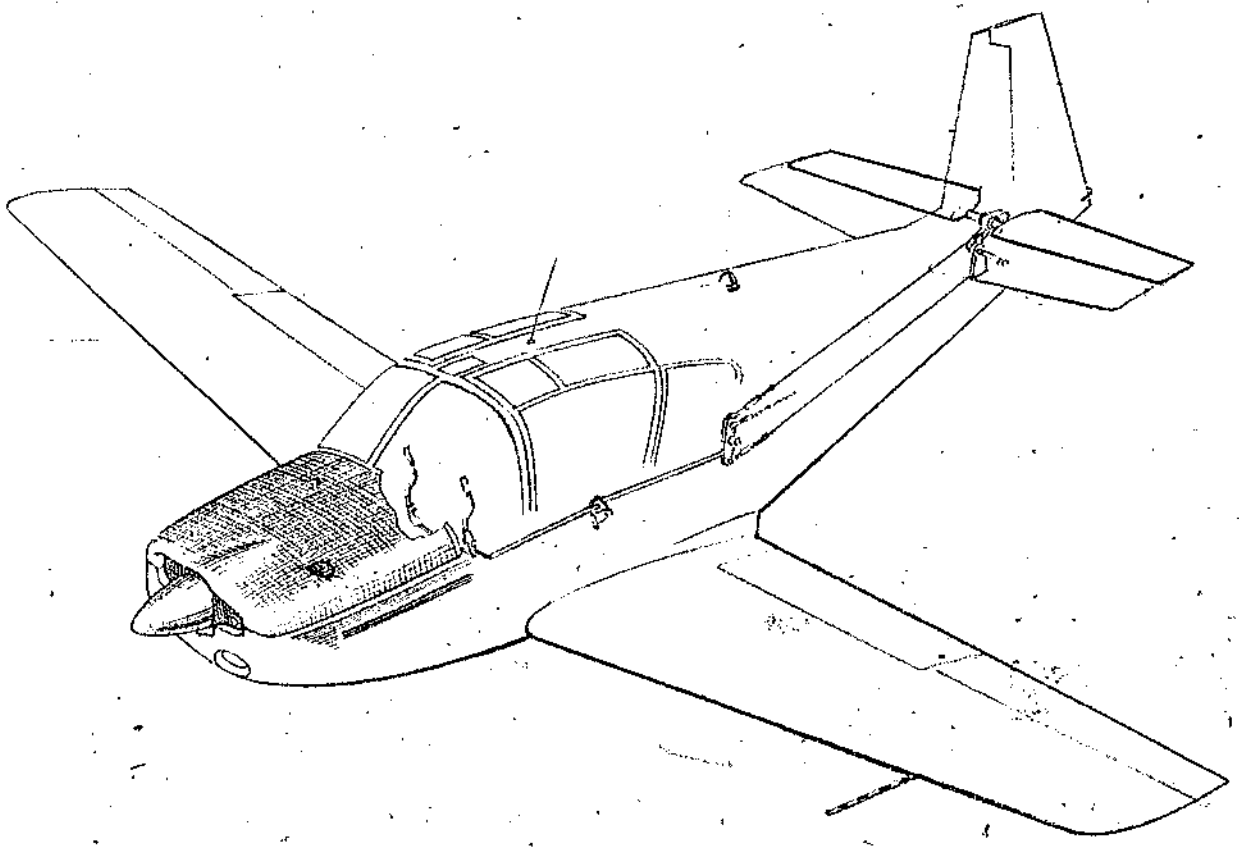


Fig. 10 Elevator Control

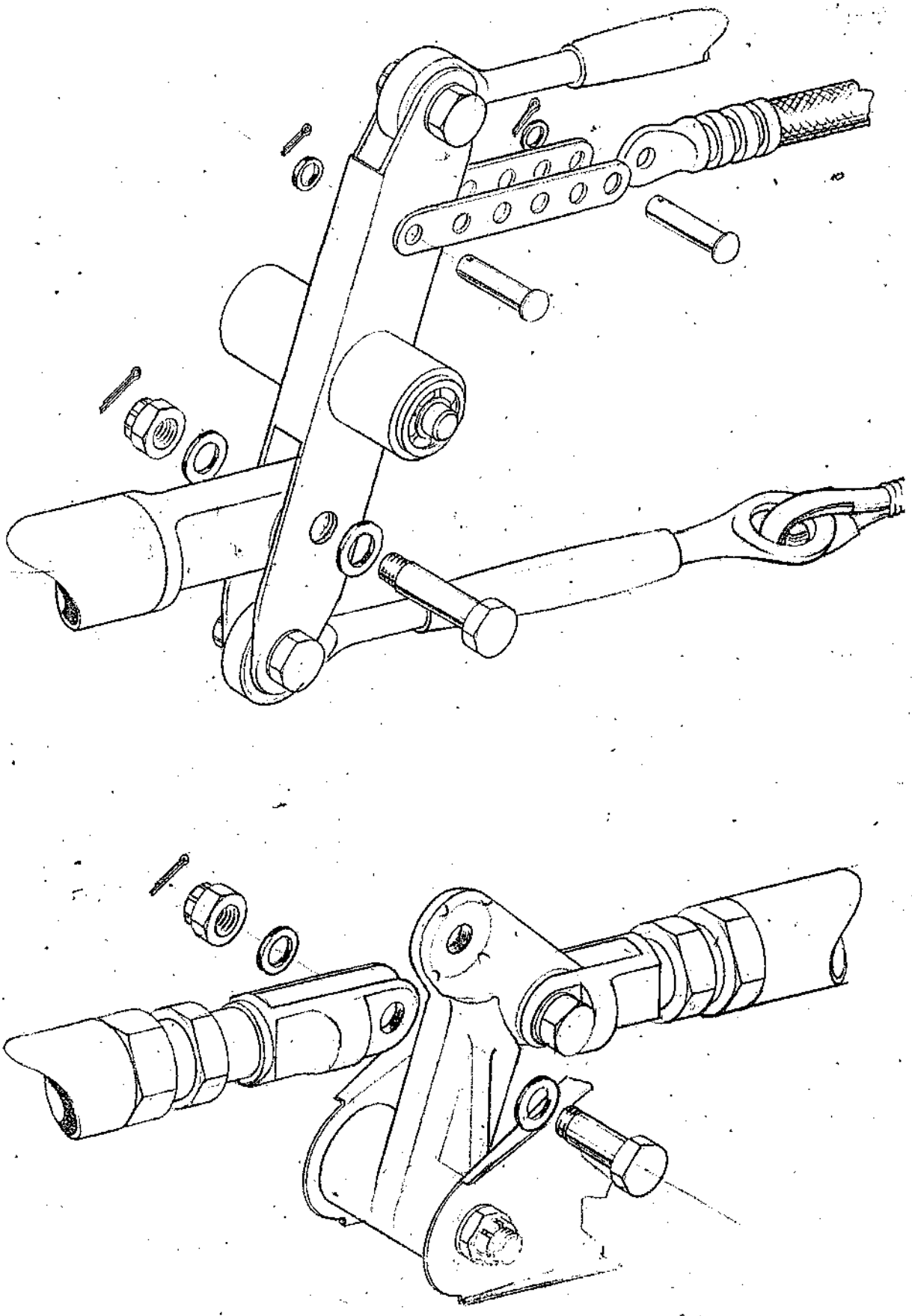


Fig. 11 Elevator Control (Detail)

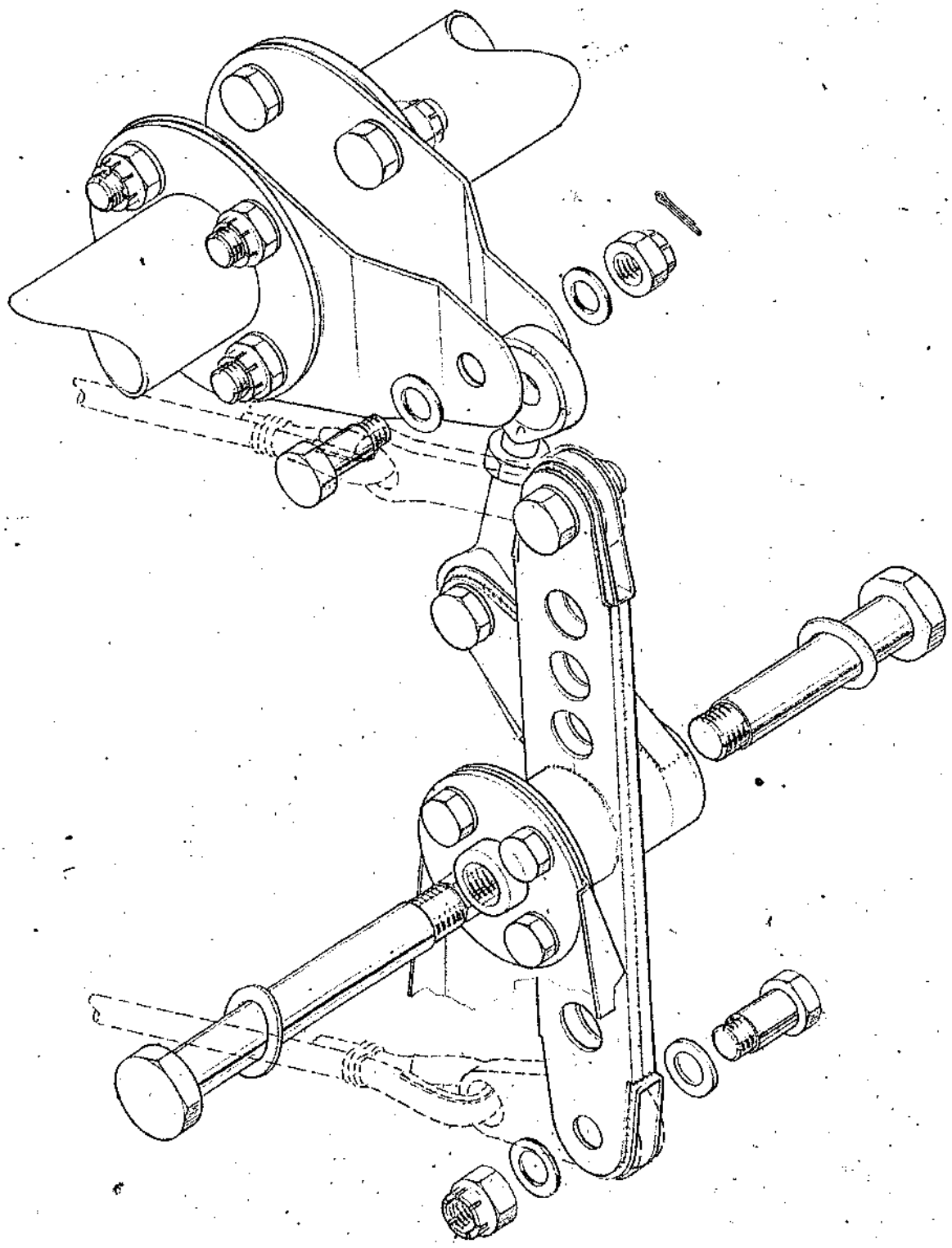


Fig. 12 Elevator Control (Detail)

Static trimmer (fig. 11)

8. To the upper arm of the oscillating lever behind no.1 frame there is hinged the static trimmer whose role is to get the control stick in neutral position when the elevator is un-deflected and out of operation.

Trimmer Control (fig. 13)

9. The right elevator flettner is driven by a UT-6D electromotor, mounted on the upper vault of no.7 frame, by means of a mechanical system. The rods are hinged to the crank and flettner lever by some oscillating bearings.

Trimmer Operating System (fig. 14)

10. Trimmer can be actuated with the button situated on the bracket between pilots. The electromechanism is mounted in the rear fuselage as previously mentionned and is fitted with travel end stoppers.

Caption - Fig. 14

1. Fuse	25 M	SP-2A
2. Switch	26 M	PN-45 M
3. Electromechanism	27 M	UT-6D
4. Warning light	28 M	SLP-51

11. Flap

Flap Controls (fig. 16 and 17)

11. The flap is actuated by a electromotor. The reduction gear assy rests with a cross-link on a diaphragm holder and by the other one is hinged to the left torque spindle upon which it actuated. Both right and left torque spindle rests on the teflon bearings, and their interlinking is made by a cross-link assy.
At the right and left torque spindle ends there are mounted with two pins the sleeve cranks which controll the flap.

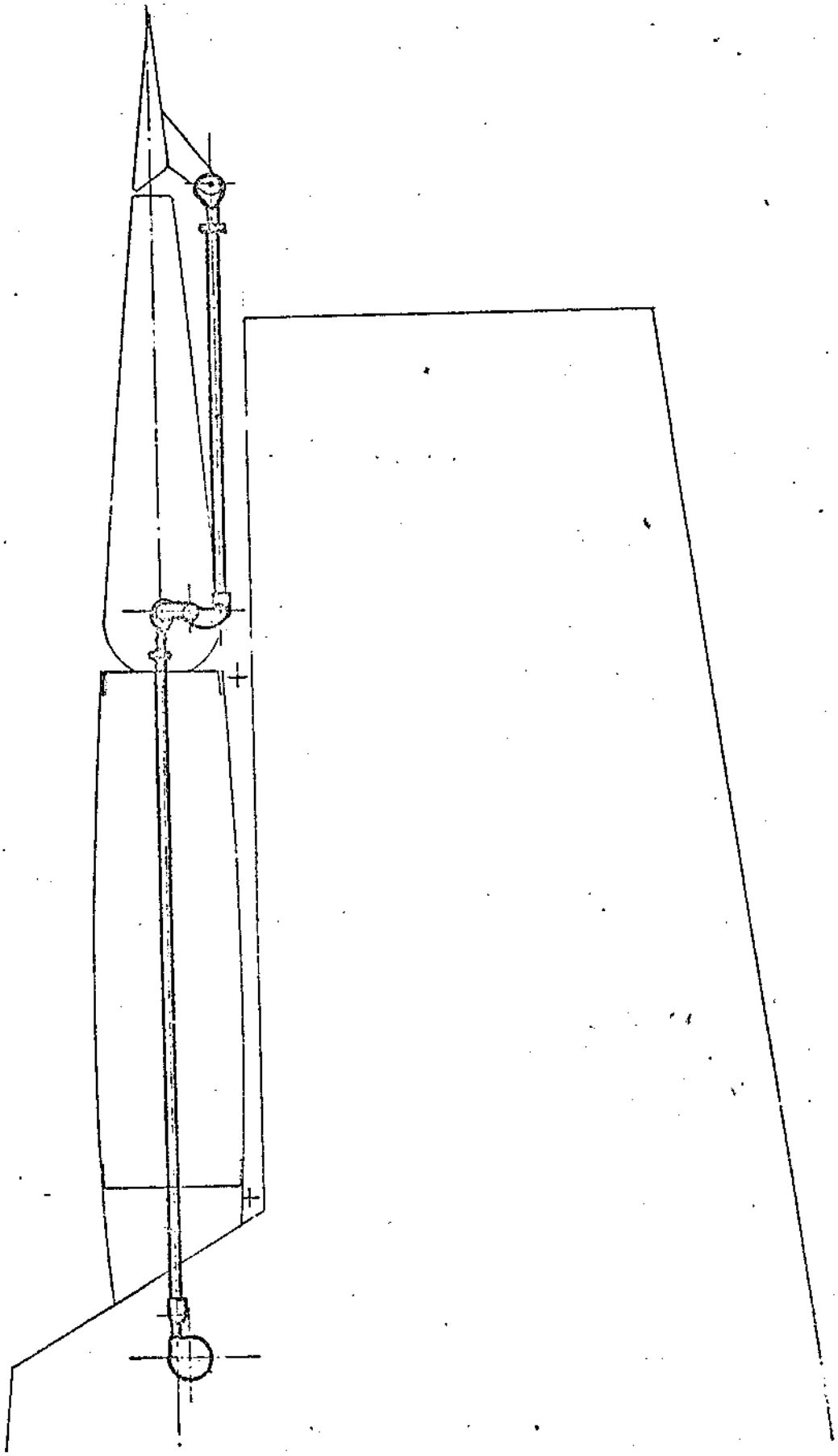


Fig. 13 Elevator-Trimmer Control

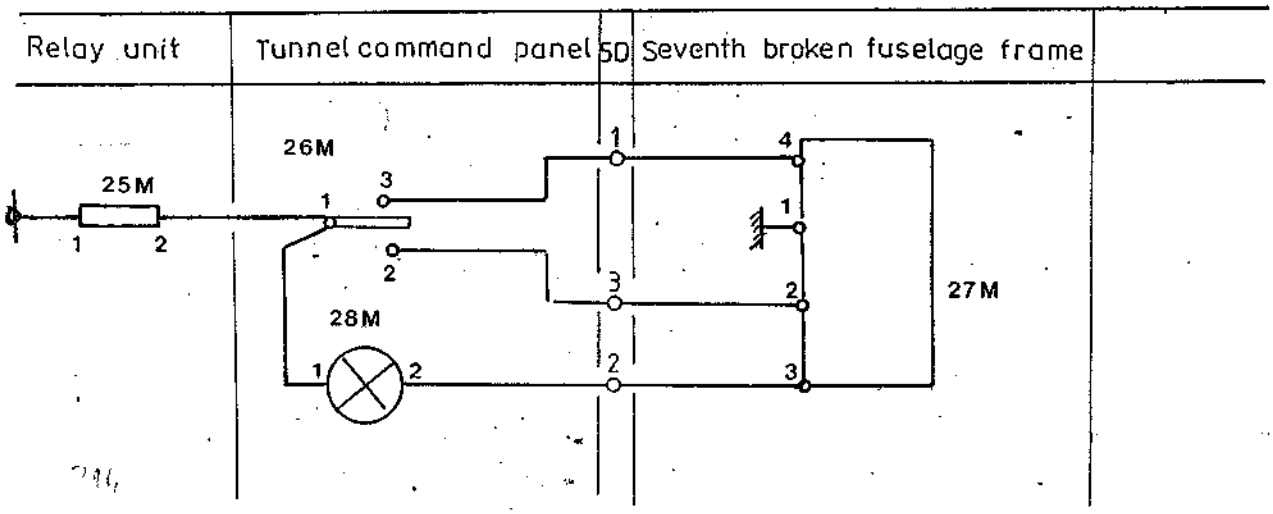


Fig. 14 Electric diagram of Elevator Trimmer System

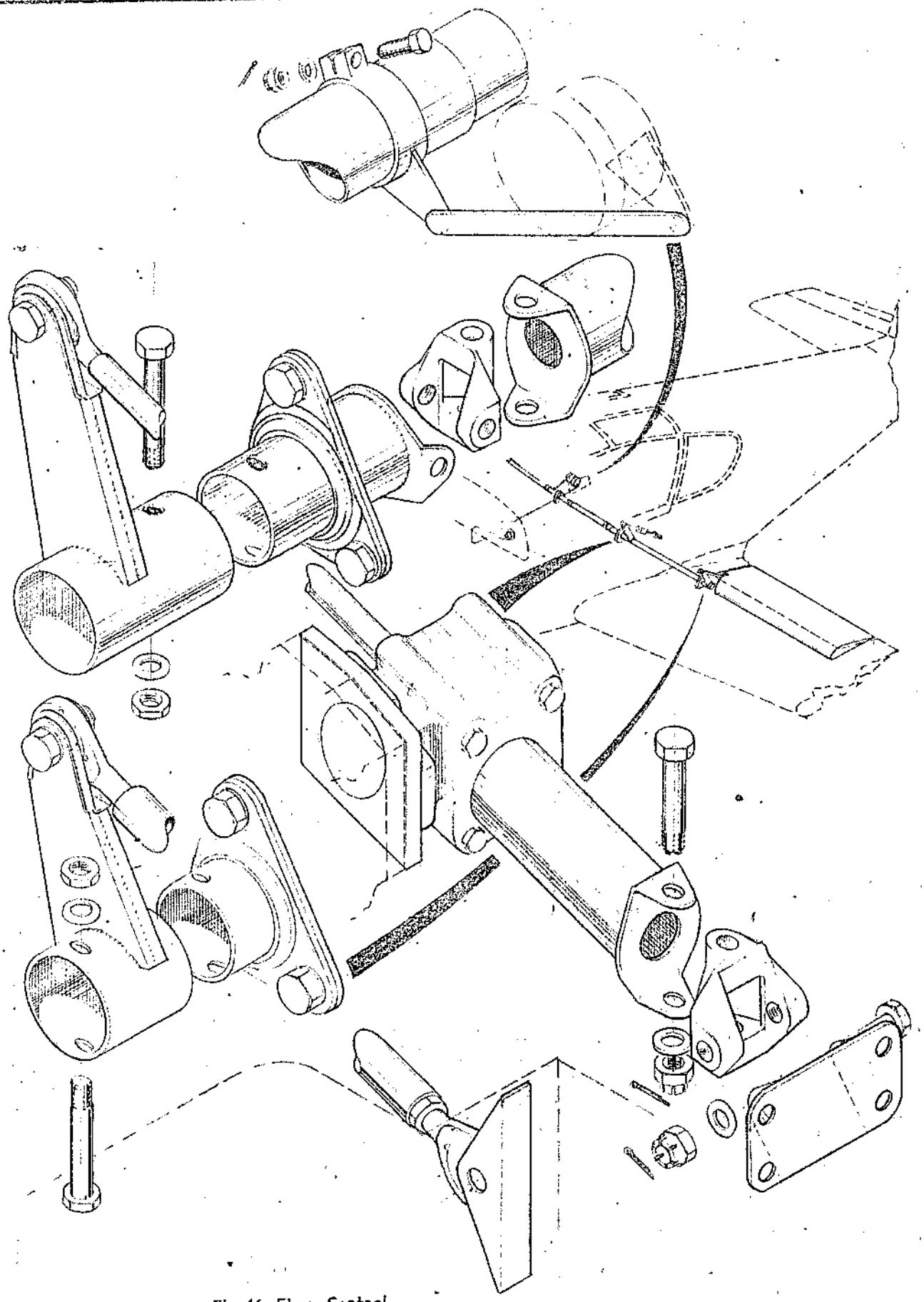


Fig. 16 Flap Control

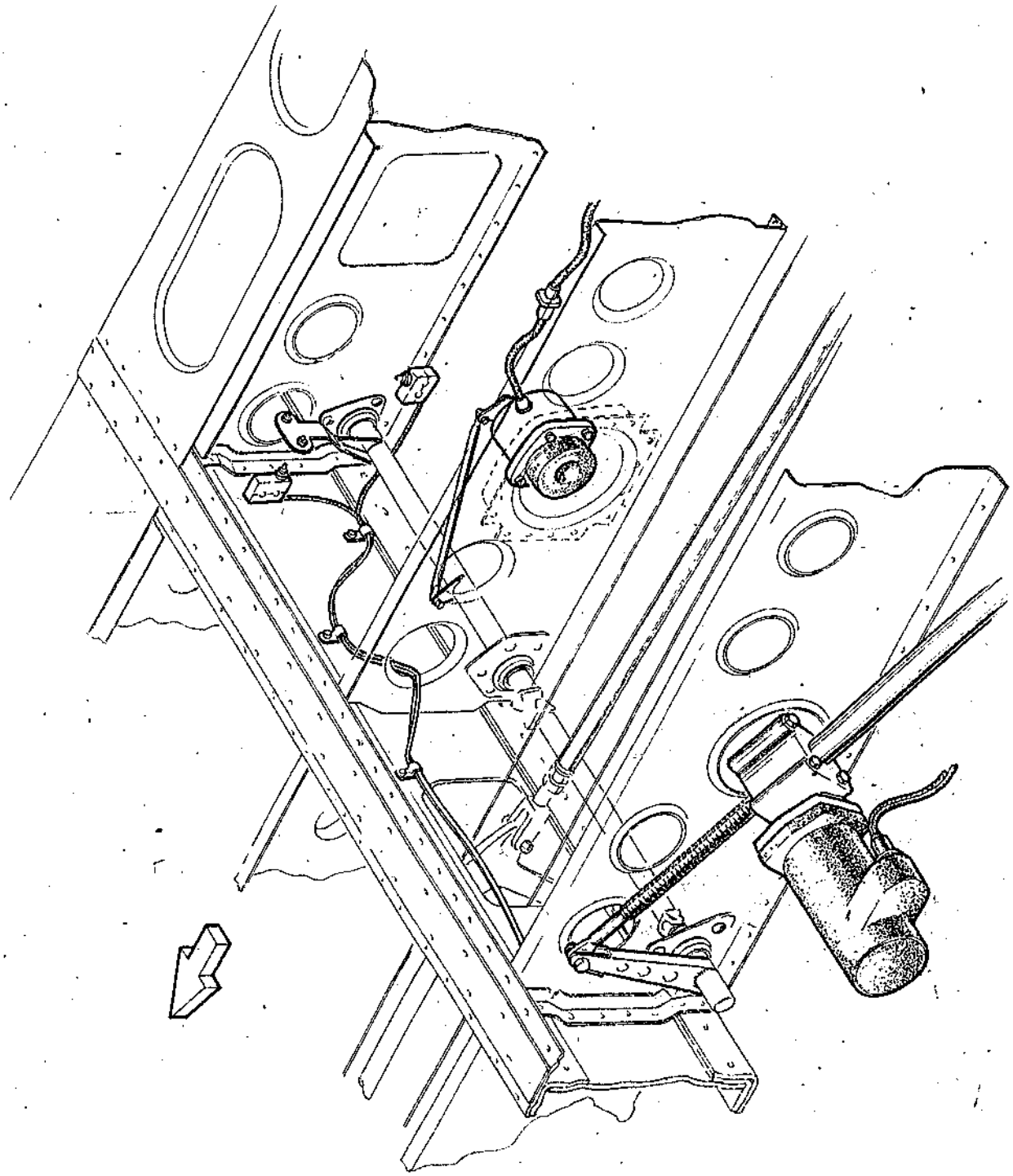
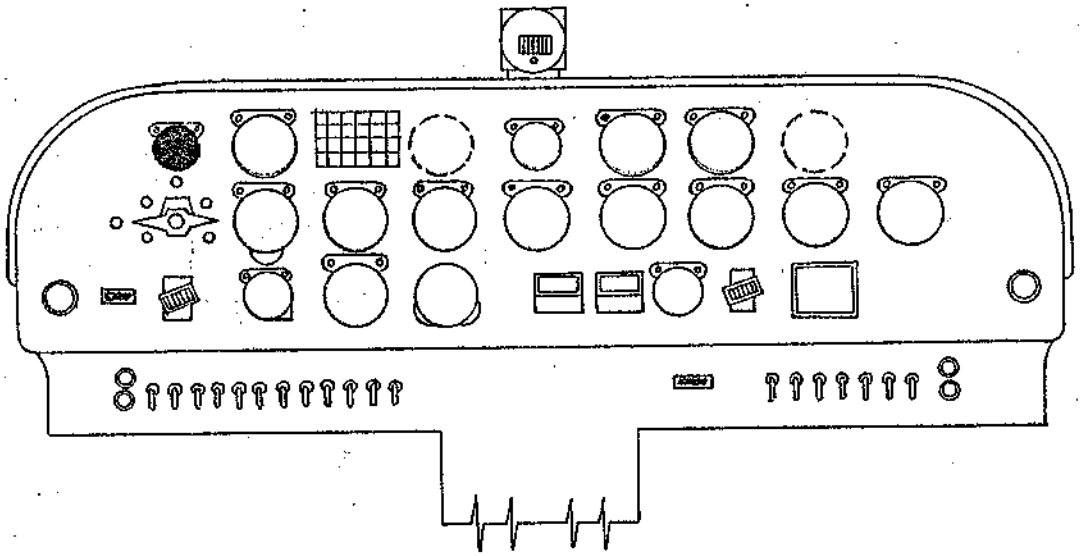


Fig. 17 Location of Flap electromechanism and Control Transmitter

Flap Position Indicator (fig. 18)

12. The flap is controlled by the control lever situated on the switch panel. Between the floor right booms, on the right torque rod there are two microswitches acting as travel limiters. Within the same compartment, on the rod, there is the crank that actuates the flap position transmitter.
The flap position is indicated on the instrument panel.



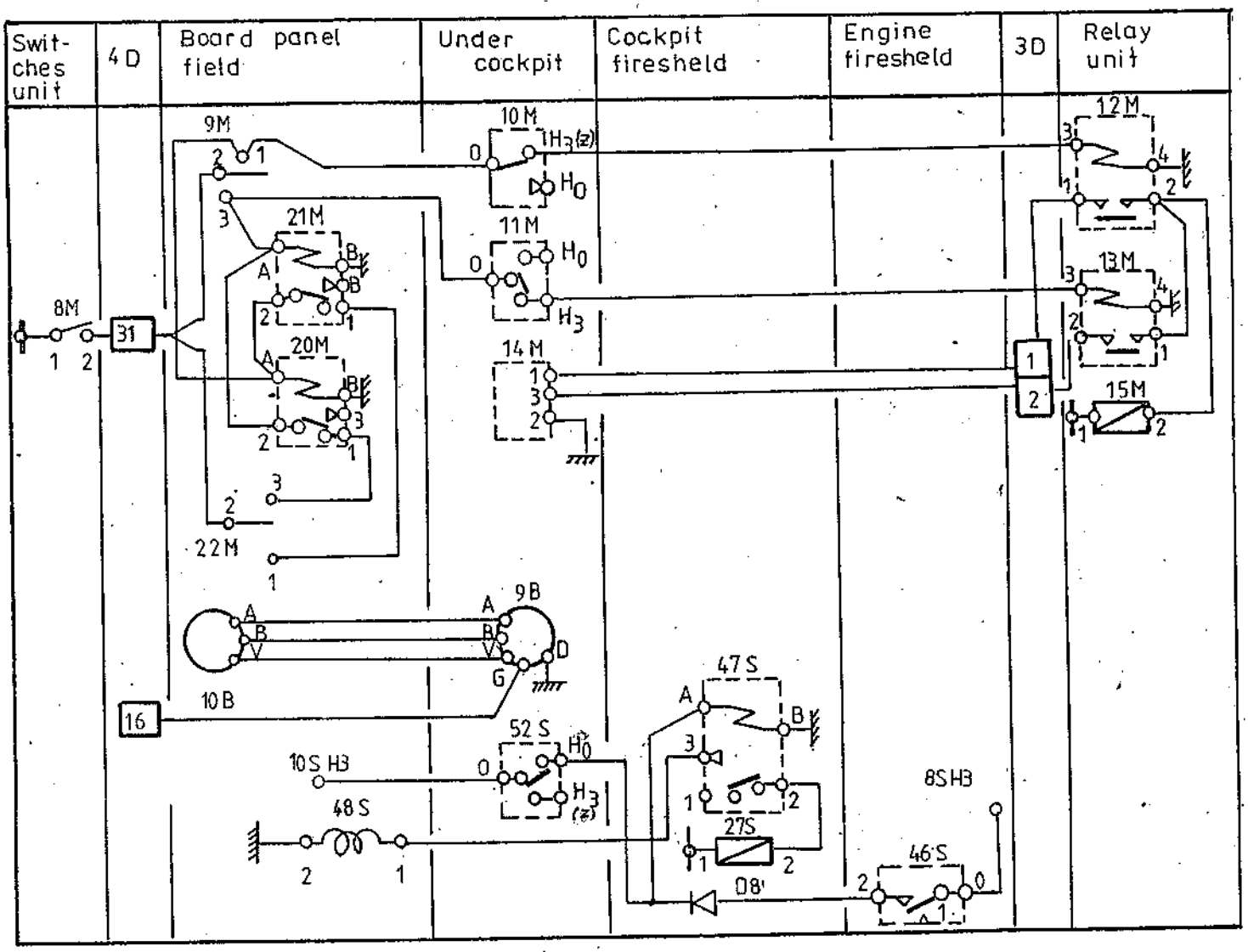


Fig.18 Location of Control Lever, Indicator and Flap Control Electric Diagram

Caption of the Electric Diagram Fig. 18

	Designation		Type
1.	Thermic Automate	8M	ASZ-2
2.	Switch	9M	PN-45M
3.	Microswitch	10M	VK-2-140K
4.	- " -	11M	VK-2-140K
5.	Switch	12M	KM-25D(V)
6.	Switch	13M	KM-25D(V)
7.	Electromechanism	14M	LUN 230201
8.	Fuse	15M	IP-10
9.	Relay	20M	TKE-21PD
10.	Relay	21M	TKE-21PD
11.	Switch	22M	PN-45M
12.	Position Transmitter	9B	UZPD
13.	Flap Position Indicator	10B	UZP 47
14.	Fuse	27S	SP-2A
15.	Microswitch	46S	OH-12
16.	Relay	47S	TKE-21PD
17.	Bell	48S	MORRA
18.	Microswitch	52S	VK-2-140K

RESERVED

DISMOUTING

Control stick dismounting is made according to the following sequence.

1. Switch off the electrical power unit
2. Remove the link between control stick and aileron control first rod.
3. Remove the hinge between control stick and aileron control first rod.
4. Remove the synchronizing rod.
5. Dismount the control stick hub hinge.

Inspection and Greasing

Remove the old vaseline from inside the ball bearings, as well as from pins, washers, nuts etc. Check the parts condition and clearances.

Grease again.

Re- mounting

Mounting shall be carried out by repeating dismounting operations in reversed order. Finally check the securings and for forgotten tods or other objects inside the structure.

MAINTENANCE

DISMOUTING

The rudder control assy, dimounting takes place in the following sequence :

1. Disconnect the power supply
2. Dismount instrument panel
3. Dismount seats, engine controls box, fuel tap handle, controls central tunnel cover, bench, floor panels between spars and those behind the rear spar, lower panel behind the cabin, so that the access to the airplane central part is free.
4. The access to the airplane tail is made by dismouting the left rear side fairing between fuselage and tail unit as well as the fuselage control access door.
5. Dismount brake pumps as indicated in Chapter 3.9.
6. Dismount the metallic links between cables and pedals levers.
7. Undo the lock wires and dismount the tighteners.
8. Dismount the assembling pin pair of pedals and toothed parts.
9. Dismount the bearing holders of pedals spindles frome the cabin side walls.
10. Twist and remove the central halves of front and rear pedals assy.
11. Dismount the roll pin from behind the main spar and keep the parts.
12. Dismount the roll pin behind no.1 frame and keep the parts.
13. Dismount the pin of the tail lever hinge with the control final rod and also dismount its link to the rudder lever.
14. Dismount the holding hinge of the tail lever.

15. The tail lever together with the two cables shall be removed from the airplane; the rest of dismountings shall be carried out if required.
16. Clean the inside structure.

INSPECTION AND GREASING

Clean the old vaseline from the ball bearings, pins, washers, nuts etc. Check the parts condition and clearence, Check the cable condition. Grease and check the re-mounting.

Re-mounting

The re-mounting of parts is carried out by repeating the dismounting operations in reversed order.

Adjustment

1. Pedals are kept in neutral position. For this position the rudder must be in neutral position as well.
2. Tighten the cables observing the previous indication up to a cable tightening force of 31 $\pm$ 2 Kgf.
3. Adjust the tail lever stoppers within the prescribed limits for rudder deflection (see Chapter 2.3($\pm$ 25°))
4. Adjust the rudder stoppers so that the rudder deflection take place within the prescribed limits. Wire lock the pedals stoppers.
5. Check the control hinges securing
6. Re-mount the metallic links.
7. Check if there are no fogotten tools or foreign objects inside the structure.

NOTE :

At the rods ar adjustable connecting rods, check if after adjustment, the threaded heads are not protruded in the check holes and if the counter-nut are well fastened.

MAINTENANCE

DISMOUNTING

The ailerons control dismounting is carried out in the

following sequence :

1. Dismount left seat
2. Remove control stick sheath
3. Dismount left front floor
4. Dismount floors between spars.
5. Dismount access doors of the wing aileron control
6. After the access is free, dismount the metallic links and the control component hinges.

   Remove rods and connecting rods. For greasing it's not necessary to dismount the oscillating levers from the airframe if there are less than 500 flight hours/ 2 years.

Inspection and Greasing

Clean ball bearings, pins, washers, nuts etc. Check the parts condition and clearance. Check cables condition. Grease.

Mounting

The aileron control maounting is carried out by re-peating the dismounting operations in reversed arder. Adjust control.

Adjustment

Aileron Deflection

The aileron max. deflection angles are:

1	Left aileron, UPWARDS and simultaneously Right aileron, DOWNWARDS	$25^{o} \pm 1^{o}$ $15^{o} \pm 1^{o}$
2	Left aileron, DOWNWARDS and simultaneously Right aileron UPWARDS	$15^{o} \pm 1^{o}$ $25^{o} \pm 1^{o}$

Adjustment

1. Ensure that the control stick is correctly assembled The stoppers shall permit the free travel of the control stick
2. Both ailerons are in neutral position.
3. Manually fasten the cables tighteners up to a 20 ± 1 Kgf tension.
4. Adjust the lenght of connecting rods and rods to obtain the following position :
   (1) First connecting rod perpendicular to the torque bar front rod.
   (2) Second connecting rod, perpendicular to the torque bar rear rod.
   (3) Three arms lever rods parallele with the airplane axis.
   (4) Simple levers axis, the bisector of rods angle.
   (5) The cable pairs of left and right wing have equal lengths and are perpendicular to the end rods.

NOTE
The aileron fixing in neutral position can be carried out using the trailing edge lockings. In this case, ensure that both flaps are in neutral position.

5. Without moving the control stick out of its neutral position settle the final rods length and attach ailerons to their rods.
6. Remove ailerons trailing edge lockings.
7. Check the operation of control assy throughout its travel:
   (1) Move control stick from its neutral position towards left. At about 60 mm max. travel, the aileron max. deflection shall be :

Left aileron, UP WARDS	$25^{o} \pm 1^{o}$
Right aileron, DOWNWARDS	$15^{o} \pm 1^{o}$

   (2) Move control stick from its neutral position towards right. At about 60 mm max. travel, the ailerons max. deflection shall be :

Left aileron, DOWNWARDS	$15^{o} \pm 1^{o}$
Right aileron, UPWARDS	$25^{o} \pm 1^{o}$

8. Adjust control stick stoppers and lock them by fastening their counter nuts, according to the ailerons UPWARDS and DOWNWARDS max. deflection.

<u>After Control Adjustment</u>

1. Check the re-mounting of metallic links
2. Re-lock. Use new cotter pins and lock wire.

NOTE ...
At the adjustable connecting rods or rods, check if the threaded ends are not proturding in the control hole area and if their locking counter-nuts are fastened.

3. Check the control stick stoppers locking.
4. Remount the dismounted parts.

MAINTENANCE

DISMOUNTING

The elevator control dismounting takes place as it follows:

1. Disconnect the airplane electrical supply.
2. Dismount the engine controls box.
3. Dismount the fuel top handle.
4. Dismount the floor central tunnel cover.
5. Dismount seats and bench.
6. Dismount the floor between spars, the floor behind the rear spar and that in front ot the main spar.
7. Dismount the lower panel behind cabin.
8. Dismount empennage - fuselage - fairings.
9. Dismount controls access doors situated at the rear fuselage.
10. Disconnect the electrical connection of the transceiver button.
11. Dismount the control metallic links.
12. Dismount control stick assy.
13. Dismount tightener cables.
14. Remove from the airplane the stick - torque bar - synchronizing bar assy and continue the dismounting if necessary.
15. Dismount elevator trimmer.
16. Dismount the rods below the cabin floors.
17. Dismount the connecting plates from the tail three arms lever, dismount front lever cables and remove parts from the airplane.
18. Dismount the oscillating levers from the airframe holders, if they are to be greased (500 flight hours/ 2 years).
19. Dismount the final rod of elevator control and remove it from the airplane.
20. Dismount the right pin of the three arms lever hub and remove the lever from the airplane (see the remark, position 18).

INSPECTION AND GREASING

Remove the old vaseline. Grease again using new vaseline.

MOUNTING

The mounting is carried out by repeating the dismounting operations in reversed order.

ADJUSTMENT

1. Set control stick in neutral position.
2. Adjust rods lenght in order to fix parallely on structure the shafts of the three oscillating levers.
3. Check the correct cable tightening (40 $\pm$ 1 Kgf)
4. Adjust the control final rod in neutral position (undeflected) observing position 1, 2 and 3.
5. Adjust the elvator stoppers to limitate the prescribed deflection ($25^{o} \pm 1^{o}$) and lock them.
6. Adjust the control stick stoppers so that to be pressed to the stick travels, corresponding to the elevator max. deflection. Lock them.
7. Check if the adjustable rod ends remain in front of the check holes.
8. Secure the tighteners, hinge etc.
9. Re-mount the metallic links.
10. Re-mount the access doors covering parts.

MAINTENANCE

DISMOUNTING

The elevator trimmer control is dismounted as it follows :

1. Disconnect the airplane electrical supply
2. Install the tail jack
3. Dismount the fuselage - fin fairing
4. Dismount the fuselage - rear empennage fairings
5. Dismount the lower panel behind cabin.
6. Disconnect the control electromotor connection and its fixing collars.
7. Dismount the control hinge pins.
8. If the stabilizer lever shaft is damaged or presents clearance inside the bearings or lever holes, dismount it by removing the central bearing.

INSPECTION AND GREASING

Remove the old vaseline. Grease again.

MOUNTING AND ADJUSTMENT

1. Re-set the contra components links.
2. Adjust the front rod lenght so that the shaft cranks are perpendicular to the rod.
3. Adjust the final rod length so that the flettner comes to neutral position.
4. Check the positionning of rod ends in front of check holes.
5. Secure hinges.
6. Re-connect the airplane electrical supply.
7. Check the operation and adjustment of control electromotor travels ($\pm$ 11.5 mm).
8. Check flettner deflection ($\pm 15^{0} \pm 3^{0}$) according to the electromotor max. travels.
9. Disconnect the airplane electrical supply.
10. Re-mount the access doors parts.

MAINTENANCE

DISMOUNTING

Carry out the dismounting operations in the following sequence :

1. Disconnect the aisplane electrical supply
2. Dismount the ceiling leather handle.
3. Dismount the rosette-handle of the control and the fairing - flange below it.
4. Dismount cold air installation, inner part.
5. Dismount the central upholstery from cabin ceiling.
6. Dismount fuselage - fin fairing.
7. Dismount tighteners.
8. Dismount the links between the reel cable and strings.
9. Remove strings out of the airplane.
10. Dismount the reel holder pins and remove the cable reel.
11. Dismount the controls access doors of the rear fuselage.
12. Dismount the electrical connection and rudder according to the diagram given in Chapter 2.3.
13. Dismount the rudder access cover.
14. Dismount the sliding rod of the flettner lever hinge.
15. Dismount the pins from the cable hinges and sliding rod.
16. Dismount the sliding lever by removing the cotter pin.

INSPECTION AND GREASING

Remove the old vaseline. Check the parts conditions. Grease the cable to decrease its friction inside the guiding tubes. Repeat operation for the strings to be mounted inside Bowden Sleeve.
Grease the sliding rod guides.

MOUNTING AND ADJUSTMENT

1. Mount the rudder control components and test its operation for max. flettner deflection ($\pm$ 15° $\pm$ 3°) before mounting rudder on airplane.
2. If the Bowden sleeves inside was sufficiently greased, mount rudder and rudder control on airplane.
3. Adjust tighteners fastening, moving the control throughout its travel.
4. Secure tighteners and control himges.
5. Re-mount covers, upholstery and all the other components.
6. Finally check the control operation throughout its travel.

DISMOUNTING

1. Deflect flap at 45°.
2. Disconnect the airplane electrical supply
3. Dismount the rear bench.
4. Dismount the lower panel behind cabin.
5. Dismount the floors behind rear spar.
6. Dismount the driving assy electrical connections.
7. Dismount the metallic links.
8. Dismount the driving assy of the two hinges and remove it from the airplane.
9. Dismount the cross-links of torque shafts.
10. Dismount the control final rod. Remove it from the airplane.
11. Dismount the position transmitter connecting plates.
12. Dismount the microswitches driving lever.
13. Dismount the torque shafts ends, right and left.
14. Dismount the oscillating bearings.
15. Remove torque shafts from the airplane.

INSPECTION AND GREASING

Remove the old vaseline. Check the parts condition and grease again.

MOUNTING

Mounting is carried out by repeating the dismounting operations in reversed order. Before securing parts, carry out the adjustment operations.

ADJUSTMENT

WARNING

Before connecting the airplane to its power supply, check if the microswitches driving lever is adjusted so that the flap acts within the deflection limits (0^{o} and 45^{o}), otherwise the airframe and the flap could be severely damaged.

1. Adjust microswitch till flaps reach the neutral position
2. Adjust final rods to synchronize flaps neutral position
3. Check if the board indicator reading at 0^{o}, 30^{o} and 45^{o} corresponds to the flap deflaction angles.
4. Adjust at 45^{o} the flap max. deflection switch.
5. Check the positionning of adjustable rod ends in fron of the check holes.
6. Adjust the flaps neutral position stoppers.

DISMOUNTING

Dismount the flap actuating assy in the following sequence:

1. Disconnect airplane electric power supply
2. Dismount bench
3. Dismount the lower wall behind the cabin
4. Dismount the floors behind the rear spar
5. Dismount the electromotor electrical connection
6. Dismount metallic link of the flap actuating assy

7. Dismount the actuating assy and remove it from the airplane.
8. Dismount the electromotor assembling pins. Remove electromotor
9. Dismount guiding system
10. Dismount the reduction gear housing and carefully remove it
11. Remove screw and hellical wheel.

INSPECTION AND GREASING

Clean the reduction gear parts. Check the gears condition. Replace worn-out parts. Grease.

MOUNTING

Mounting takes place by repeating the dismounting operations. in reversed order.

MAINTENANCE

1. Take into account the warnings and indications given in diagram 7
2. Connect the electromechanism to the power supply and check its operation that of travel microswitches as well. Get the flap in the travel limit position and adjust the microswitches screws. If the microswitch was not actuated, stop the electromechanism from the switch panel and adjust the microswitch to stop in this position. Push control lever to midd position and stop the electromechanism at the prescribe position. Adjust switchs system so that they actuate in this position.
3. Actuate flap from 10^{o} to 10^{o}, checking the correspondance between indicator readings and flap real position. Adjust transmitter system to obtain a precise indication of the 3 fixed position and the most accurate transmission.
4. If the electrical connection was made and the flap is still not moving, check the electromechanism supply. If the supply connection is right, replace the electromechanism as being defect. If flap moves but the indication is not according to its position, either the indicator or the transmitter is

defect. Dismount and check them. Replace the defect components.

MAINTENANCE

1. Refer to the indication in diagram 5.
2. Check the good operation of the electromechanism and the accordance of actuating position of travel and microswitches as well as the fletner deflection prescribed limits. Adjust the actuating rods of the control system till obtaining such an accordance. If when connecting the electrical supply the flettner doesn't move, check if the electromechanism is under voltage.
   If there is voltage at the terminals it means that the electromechanism is defect. Replace it.

Chapter 3.7.

FUEL SYSTEM

CONTENTS:

Page

DESCRIPTION AND OPERATION

General (figure 1)

1. LH and RH tank groups include compartments formed by the main spar and the leading edge skin between ribs 620 and 1380 and ribs 1480 and 2600.
Tank groups are filled through the extreme tank filling cap: From the reverse flight tank fuel is conducted through ducts provided with one-way valves to the three-way cock.
Then fuel passes through ducts to the decantation filter, reaching finally the fuel pump through a flexible pipe.
Normal supply is from both tanks, simultaneously.
The cock for supplying from only one group of tanks is used whenever indicators read unequal consumption. The system pump acts as auxilliary (booster) pump for take-off, climbing and landing procedures and as emergency stand-by tank in case of engine pump failure.

Fuel tanks (figure 1)

General

2. Construction of tanks and details concerning sealing are described in chapter 2.1, 2.2.
Details concerning mounting and access panels location are given in chapter 1.4.

Inertia valve

3. Central plane and wing tanks communicate through 2 flexible pipes, an upper and a lower one assembled to the flanges mounted on ribs.
In the central plane tanks there are inertial valves installed at the lower pipe mouth to prevent fuel run over.

Reverse flight tank

4. The reverse flight tanks are installed in the central plane tanks and are provided for retaining a certain quantity of fuel at ducts suction hole.
Filters are fitted to the pipes connection, unside the reverse flight tank.

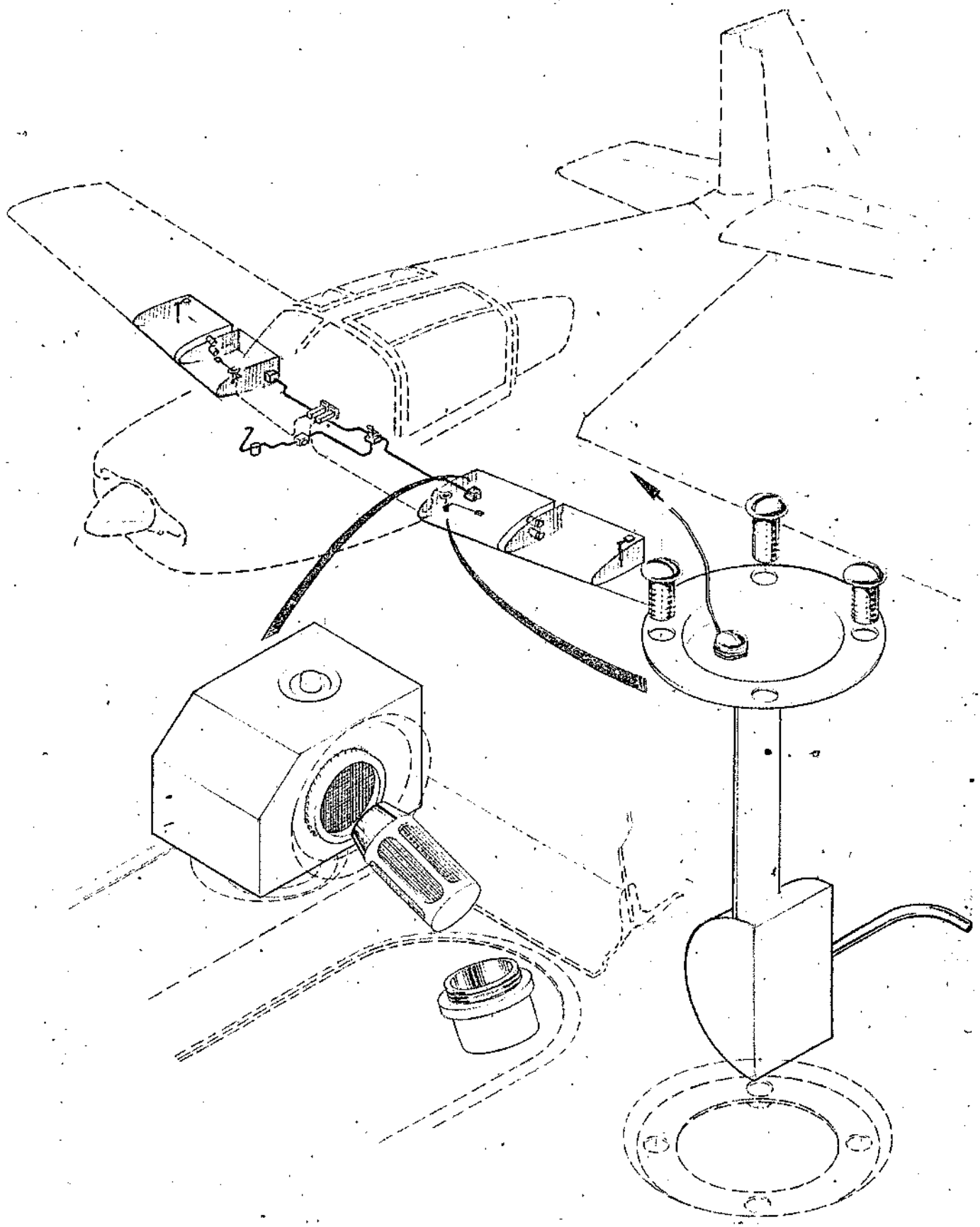


Fig. 1 Fuel system arrangement

Venting

5. Each group of tanks is provided with an individual venting system made of a float valve, venting pipe and connection nozzle which protrudes the inner lower wing in front of the main spar.

Draining

6. A squeezed drain hole is provided for each tank at their lowest areas.

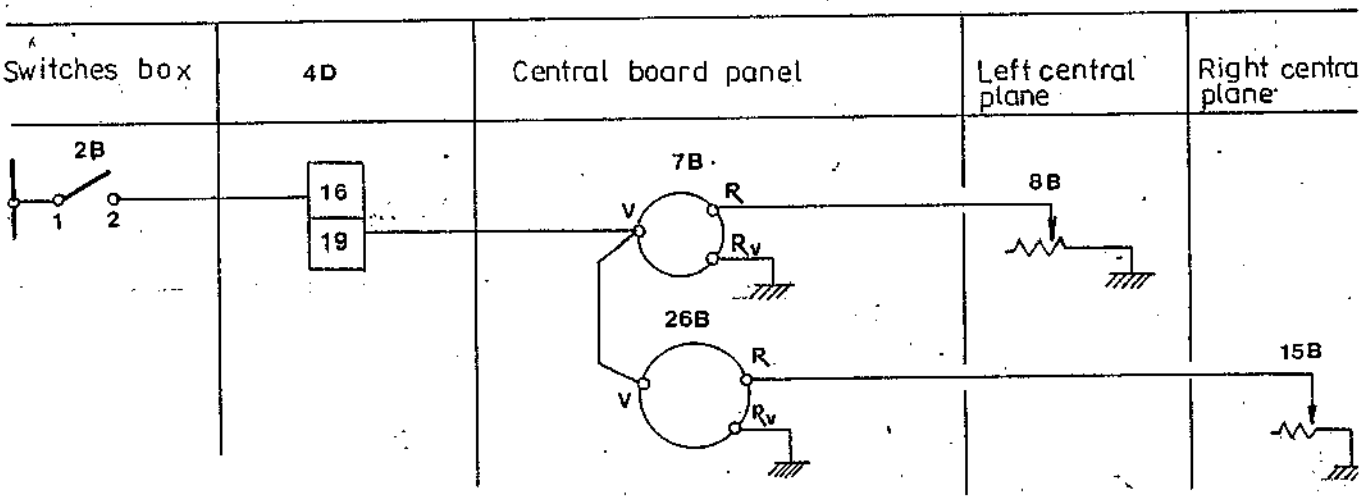


Figure 2 – Fuel gangues elèctric diagram

CAPTION TO FIGURE 2

Item	Component		Type
1.	Circuit breaker	2B	AZS-5
2.	LH fuel gauge	7B	01832-1-8048
3.	LH fudl transmitter	8B	823-12-411M
4.	RH fuel gauge	26B	01832-1-8048
5.	RH fuel transmitter	15B	823-12-411M

Transmitter

7. Close to the fuselage side, on the outer lower wing of the central plane the fuel transmitter supporting flanges are installed. Transmitters include a float, a lever and an electric circuit which transmits a signal to the aircraft indicator.
As the central plane is below the extreme wing tank, the transmitter does not read the maximum quantity of the group, but only when it has dropped from the maximum usable quantity of 170 liters to 110 liters.

Fuel cock

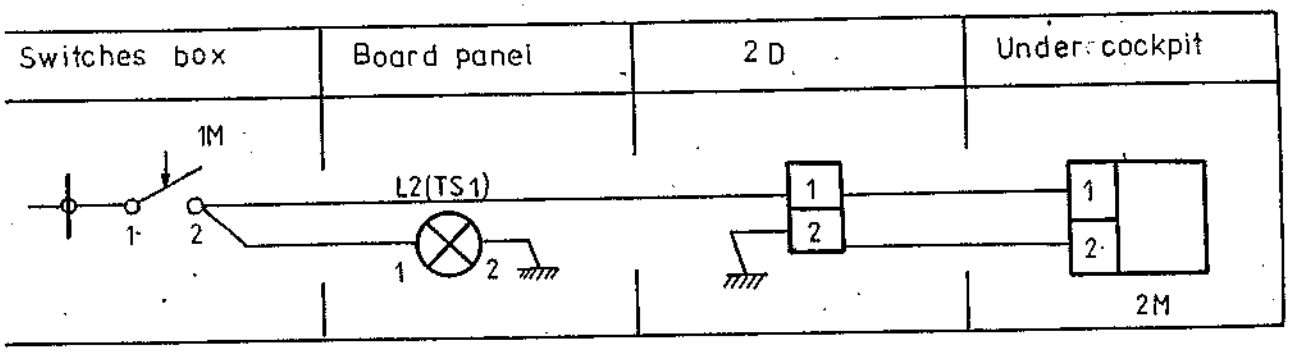
8. The fuel cock assy is attached by means of hexagonal head screws to the support sheet riveted to the LH central boom, under the floor, in front of the main spar.
Concentrically to the cock axis a dial crown is positioned which indicates cock positions according to the direction towards which the handle is directed.

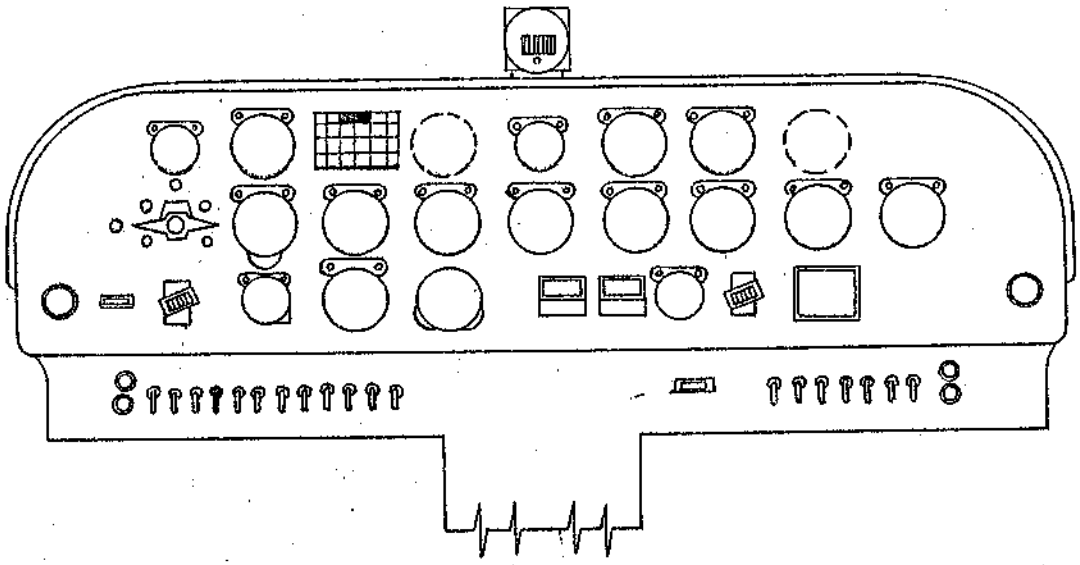
Auxilliary fuel pump (figure 4)
General

9. The electrically actuated pump acts as booster pump and is used to develop pressure required for the fuel to enter the engine until engine pump reaches a smooth operation rating or when it is damaged.
It is installed under the floor on the lateral RH boom.
A connection wiring between pump and the network ensures switching-in by means of a switch located on the switchboard.

Control and actuating system

10. On the switchboard besides this switch for plugging electric pump to the network there is also a test light from TS1 warning panel whose function is to signal the presence of voltage at the pump terminals and to warn the pilot that this shall be disconnected after the engine reaches maximum power.
Pressure indicator system is described in Engine indications (chapter 5.4.)





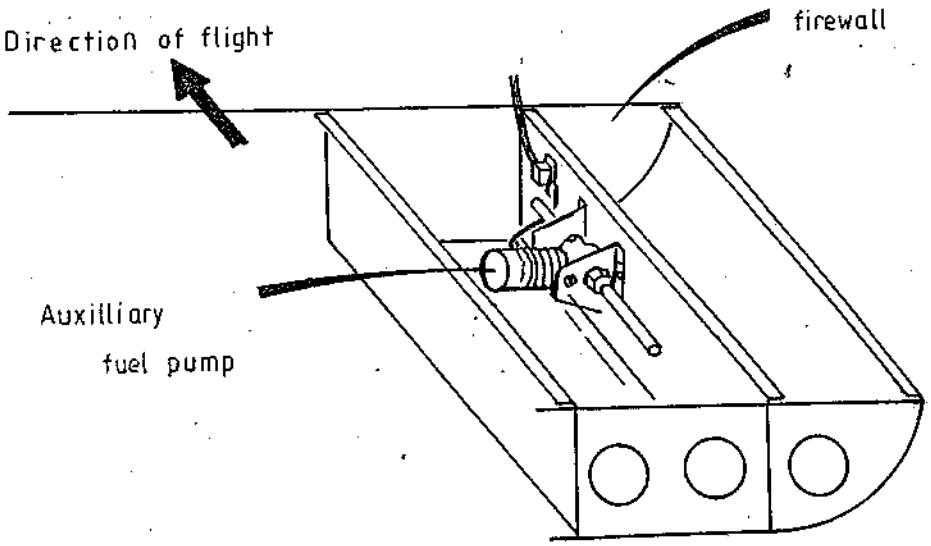


Fig. 4 Auxilliary fuel pump

Fuel filter (figure 3)

11. The filter is fitted by means of a support onto the engine mount, on the right.

Ducts and fittings

12. Fuel ducts system and their connections are made of standardized parts.
Ducts themselves are dural tubes. The fuel ducst rests on support sheets riveted to the structure by means of rubbered collars secured to it using screws and nuts.

Control switches and indicators

13. Items mentioned in § 9 and 10 are located as follows: fuel quantity indicators in the central part of the instrument panel; fuel pump signal light and fuel pump switch on the warning panel TS1 and switchboard, respectively.

Fuel tank leakages

14. If wing inner lower surface show signs of leakages in the tanks area, investigate immediately to determine the cause of leakages.

MAINTENANCE (see diagram 1)

1. Cut off airplane voltage
2. Empty fuel tanks completely
3. Disconnect pipe from the engine
4. Put a drain plug at the pipe free end
5. Set fuel cock to LH TANK + RH TANK position
6. Connect to the tanks drain plugs 2 proper pressure gauges and an air pressure system adjusted to a loading overpressure of 0.15 (kgf/cm^2) 2 psi.
7. Close pressure system cock after ascertaining that the fuel system overpressure reading has established.
8. Follow the installed pressure gauge. The system is considered satisfactory if the 0.15 kgf/cm^2 overpressure is maintained for 2 hours.
9. If there are not available 2 pressure gauges and 2 connections to connect the loading system, carry out test in turn for each group of tanks, setting the cock to the corresponding position.
10. If pressure loss is found, detect air leakage locations using soap suds applied by means of a brush. If leakage is established, apply sealant to the respective locations. If leakages are found along the system, tighten the respective connection and lock it, restore or replace wrong parts.
11. Carry out again pressure test until the result is satisfactory.

MAINTENANCE (see diagram 2)

Before proceeding to flow test, carry out, the following preliminary operations:

(a) set fuel cock to STOP position;
(b) introduce 20 liters in each group of tanks;
(c) ensure that auxilliary fuel pump is OFF;
(d) make sure that the fuel pump electric circuit is supplied;
(e) have a stop watch at hand

The sequence of operations is the following:

(1) Set fuel cock to LH TANK position and connect the auxilliary fuel pump, then go on to operation (2) with the temporary fuel cock.

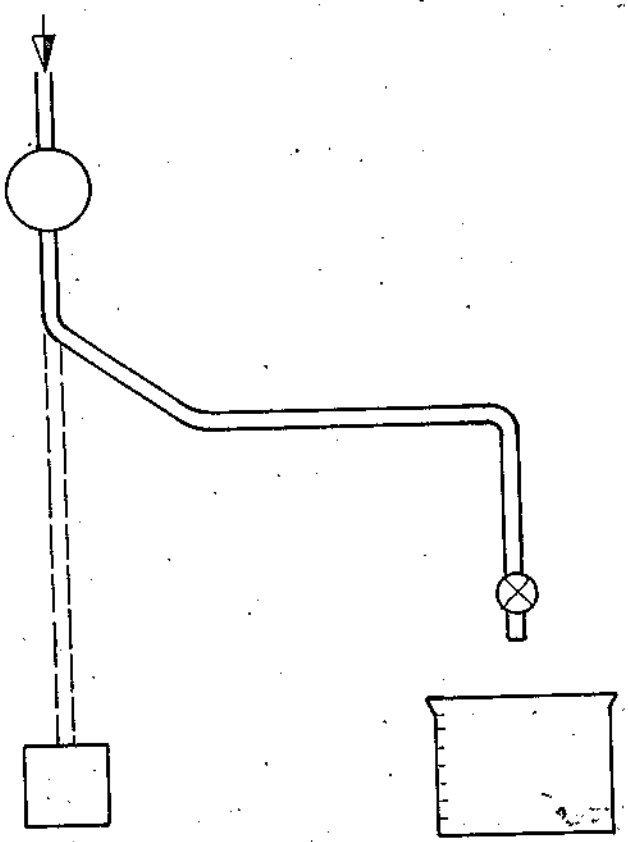


Diagram 2.

(2) Open temporary fuel cock so to enable fluid free run. Close the cock and discharge collected fuel . Open again fuel cock and then using a stop watch check that the flow time of 5 l of fuel does not exceed 2 min. 13 sec. This time value represents an 135 liters/hour flow, which is its minimum allowable value.

(3) Set fuel cock to RH TANK position and repeat operation 2.

(4) Set fuel cock to LH + RH TANKS and repeat operation 2.

(5) Disconnect auxilliary fuel pump and set cock to STOP after completing tests.

Before starting calibrations the following preliminary operations shall be carried out:

(a) Make sure the airplane is levelled;
(b) Remove fuel from the 4 tanks using the auxilliary fuel pump and an auxilliary cock as in diagram 1. Take into account that in each group of tanks there are 142 l of unusable fuel; these quantities will not be evacuated by opening drain cocks. Disconnect auxilliary fuel pump after it ceases to deliver into the collecting vessel.
(c) Set fuel cock to STOP position.

The operations given below aim at checking calibration it fuel quantity transmitters and/or indicators are replaced.

(1) Make sure that fuel quantity indicators are power supplied. Carry out operations simultaneously or in turn for the two groups of tanks.

(2) Make sure that the float floats on the fluid surface and the float arm moves freely.

(3) Slowly fill with fuel LH group of tanks, through the extreme tank filling cap. Transitter float shall be lifted immediately and the pointer shall read correctly the fuel quantity introduced.
After filling in 110 liters, the transmitter - indicator assy stops at this reading.

(4) Repeat operations for the second group of tanks if not carried out simultaneously with the first group of tanks.

(4') Follow pointer when emptying tanks.

(5) If operations 2 and 3 were not satisfactory, evacuate fuel from tanks, dismantle removable covers, check and adjust float and its lever, then install access panel and repeat operations .

(6) Ensure that fuel pump is supplied and check its operation.

MAINTENANCE

DISMANTLING

Generally it is not necessary to dismount the whole fuel system before an overhaul.
Though it is considered that it is useful to know the sequence of dismantling of components.

1. Cut off airplane voltage
2. Check fuel cock STOP position
3. Thoroughly evacuate fuel from tanks
4. Remove central plane to wing fairings
5. Undo tank filling caps
6. Remove tank access covers
7. Remove venting system float vent
8. Remove seats
9. Remove floors in front of the front spar;
   both floors on the right and only the adiacent floor on the left.
10. Remove fuel cock handle
11. Remove engine control levers and the central console cover
12. Remove booster pump and its electrical connection
13. Remove ducts and pipes from between the filter and engine
14. Remove one-way valves
15. Remove fuel cock
16. Remove filter
17. Remove connection hoses from between tanks compartments
18. Remove fuel gauge cover electrical connection and the fuel gauge itself.
19. Remove reverse flight tank cover, filter and the reverse flight tank itself.

INSPECTION

1. Check float valves for lack of sealing and check movement along the whole travel of
2. Check condition flexible pipes and their attaching collars
3. Check float condition
4. Check one-way vents for proper operation
5. Check condition of reverse flight tank filter
6. Check condition of reverse flight tank assy
7. Check cover fittings
8. Check cock for proper operation
9. Check booster pump
10. Clean decantation filter if necessary
11. Ensure that flexible pipes are not expired
12. Check condition of cap nuts and check ducts general condition.

MOUNTING

Mounting is carried out by repeating dismantling operations in reverse order.
Pay attention to connect correctly the one-way vent, fuel cock, pump and filter.
After installing the fuel system on the aircraft, carry out pressure test and fill fuel tanks subsequently, check its operation in each of the fuel cock positions, with booster pump connected and disconnected, i.e apply succesively diagrams 1, 2 and. 3.

Chapter 3.8.

INSTRUMENTS

CONTENTS

DESCRIPTION AND OPERATION

General

1. Some of the instruments located on the instrument panel are described within separate chapters as integrant part of the systems the chapters refer to.
   Basically, in this chapter the main flight control instruments are included.

Pitot head system (figures 3 and 4)

General

3. This system is used in the operation of the airspeed indicator, altimeter and rate-of-climb indicator. A Pitot head is installed in the left plane and static and total pressure is transmitted through 2 ducts along the plane and through the fuselage structure to the instrument panel. There are two decantation filters included.
Pitot head is provided with a heating capability controlled by a switch located on the switchboard. Pitot head heating is indicated by a signal light on the warning panel (TS1).

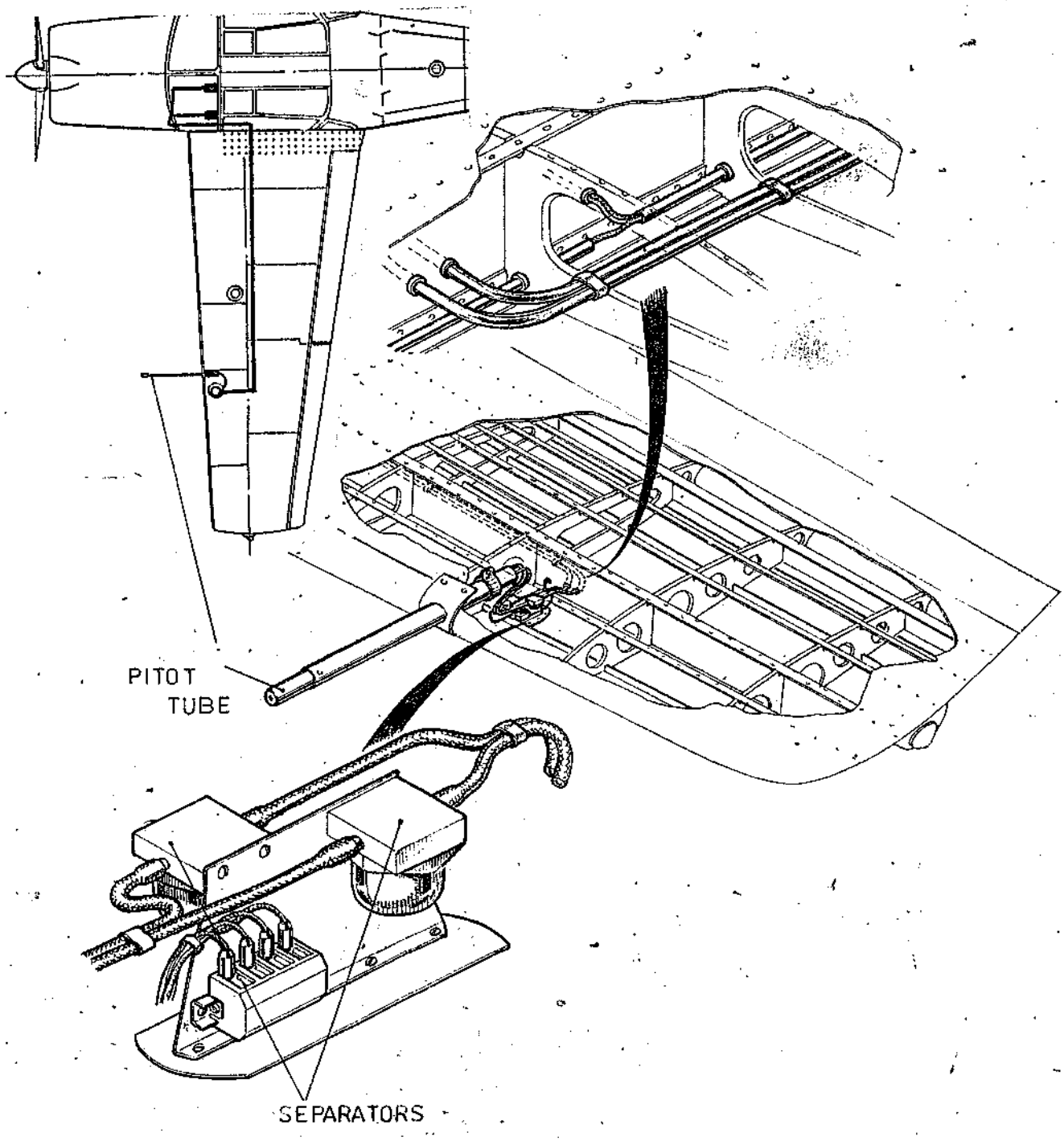
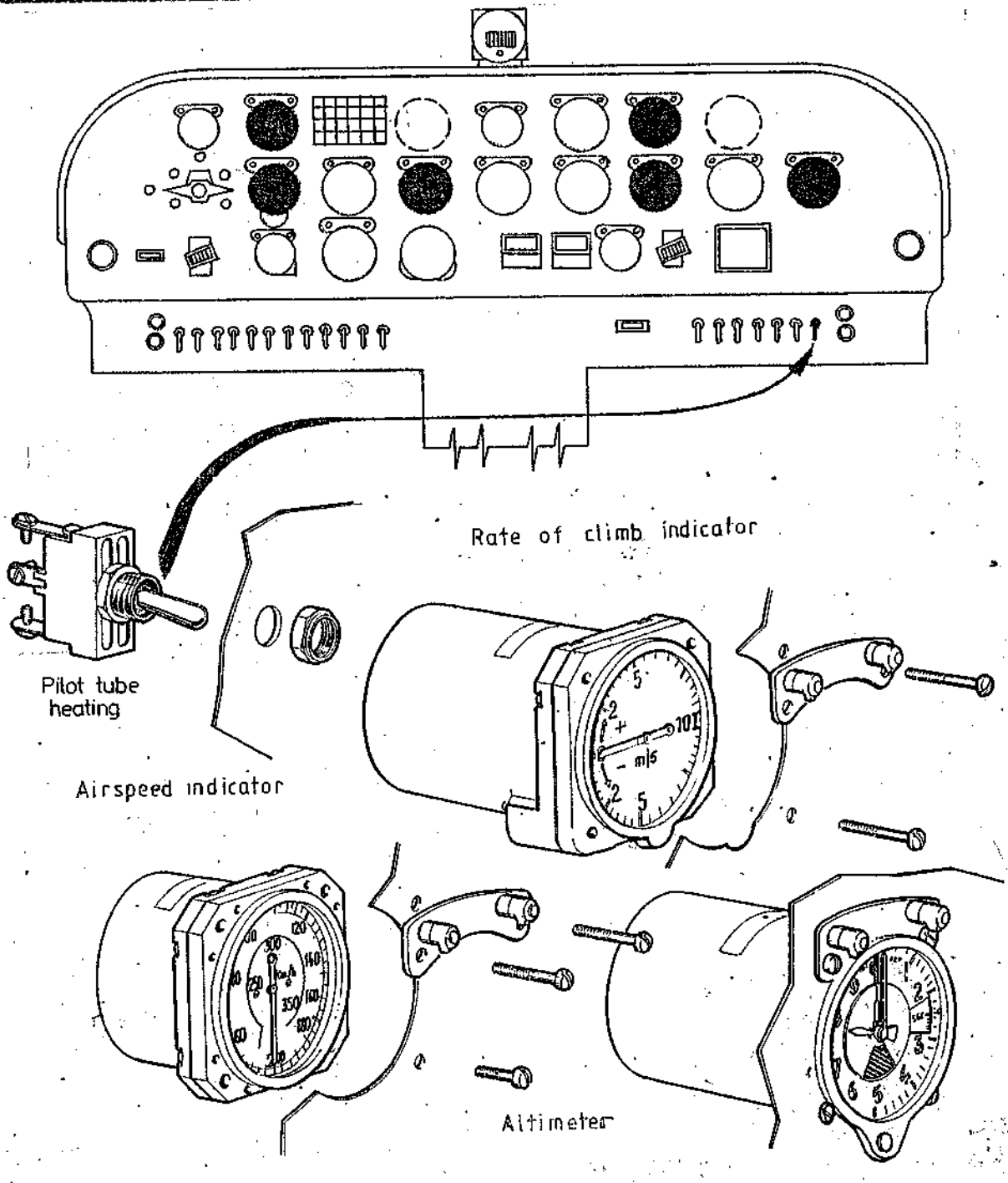


Fig 3 – Pitot tube installation



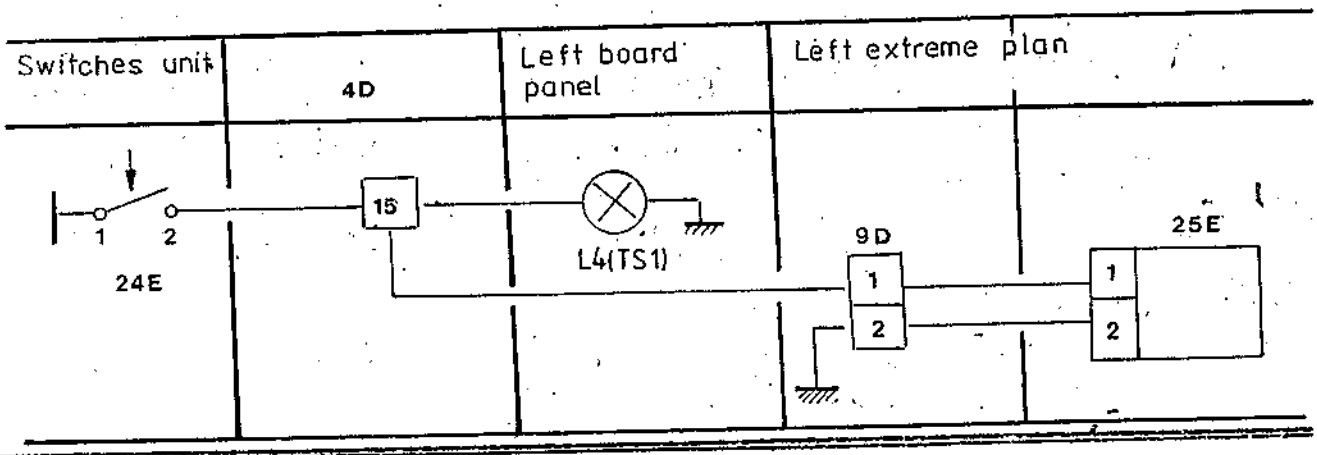


Figure 4 – Pitot head system

CAPTION TO THE THEORETICAL ELECTRICAL DIAGRAM (figure 4)

Item	Component		Type
1.	Circuit breaker	24 E	AZS10
2.	Signalling light	L4(TSL)	
3.	Pitot head (de-icing probe)	25 E	PVD-6M

Airspeed indicator

4. This is calibrated in km/h, connected to the dynamic and static pressure ducts. Its installation is shown in figure 4. The airplane is provided with 2 airspeed indicators.

Altimeter

5. It is an indicator with a capsule connected to the static pressure duct. It is calibrated in meters. The airplane is fitted with 2 altimeters.

Rate-of-climb indicator

6. It is an aircraft instrument connected to the static pressure duct, graduated in m/s.
There are 2 such indicators installed on the airplane.

Watch (fig. 5)

7. This instrument is located at the instrument panel left side. It is provided with an ON/OFF button.

Slide-and-turn indicator (fig. 6)

8. The airplane is provided with 2 slide-and-turn indicators.

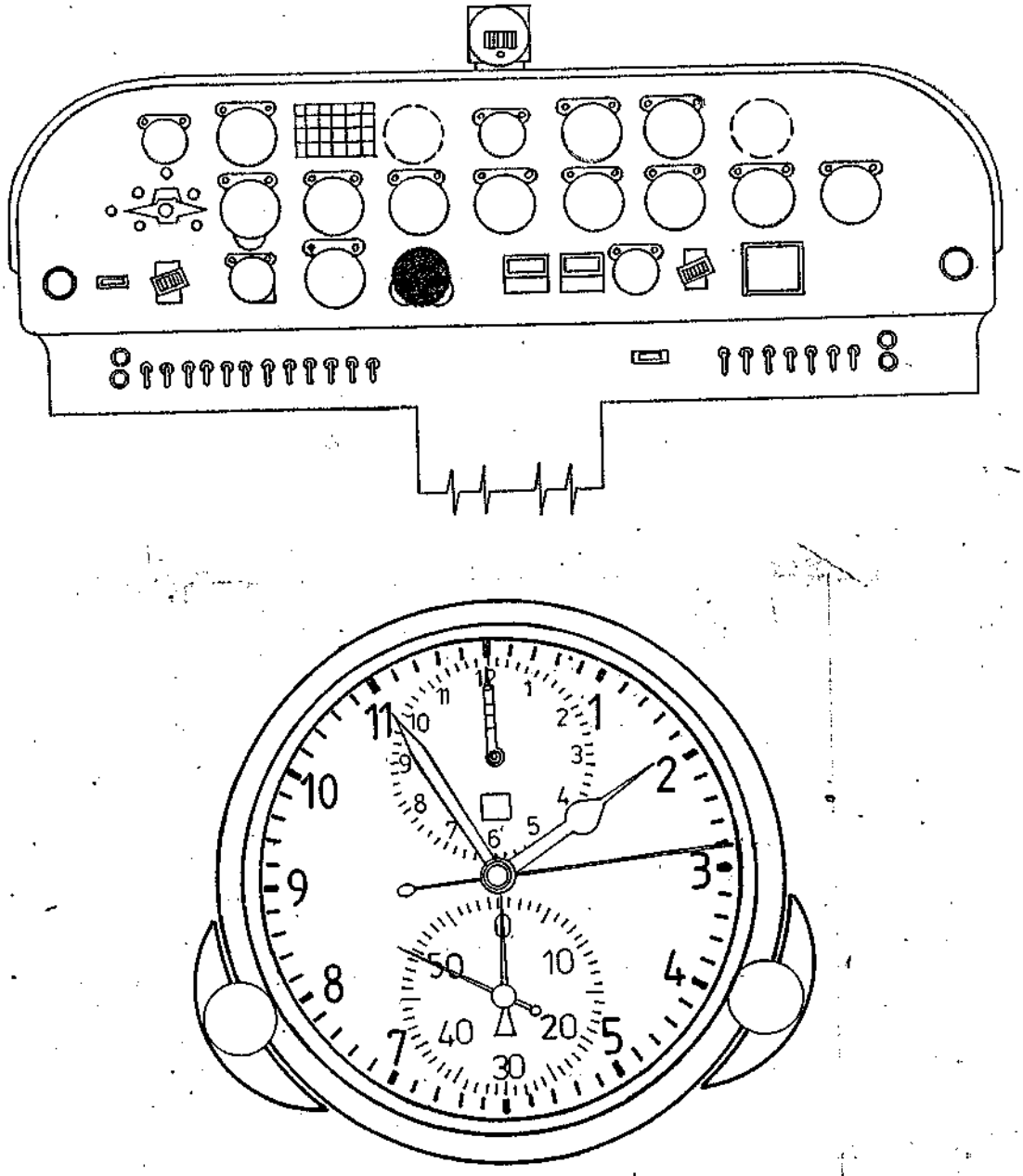
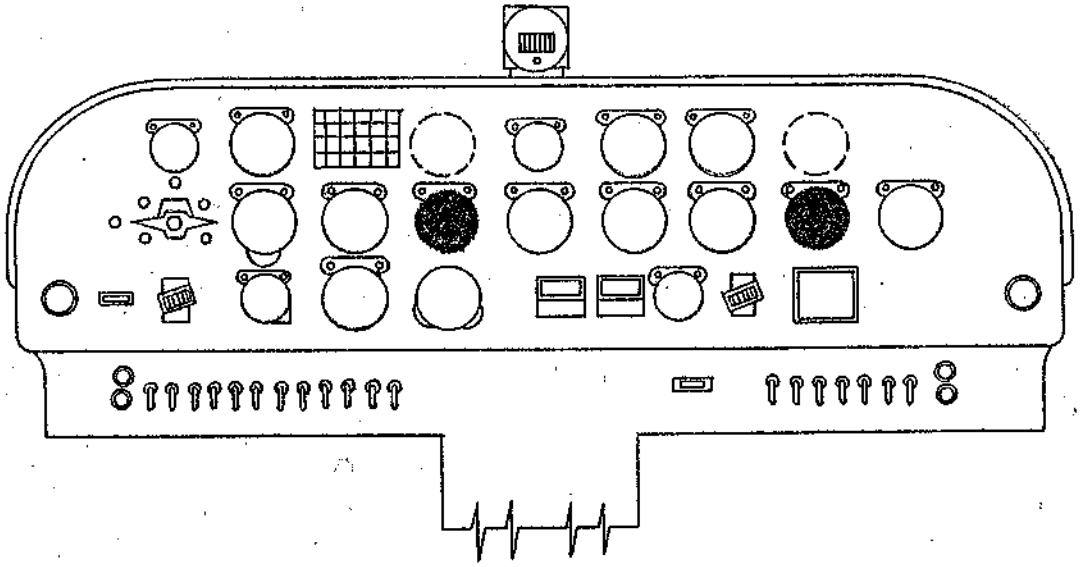
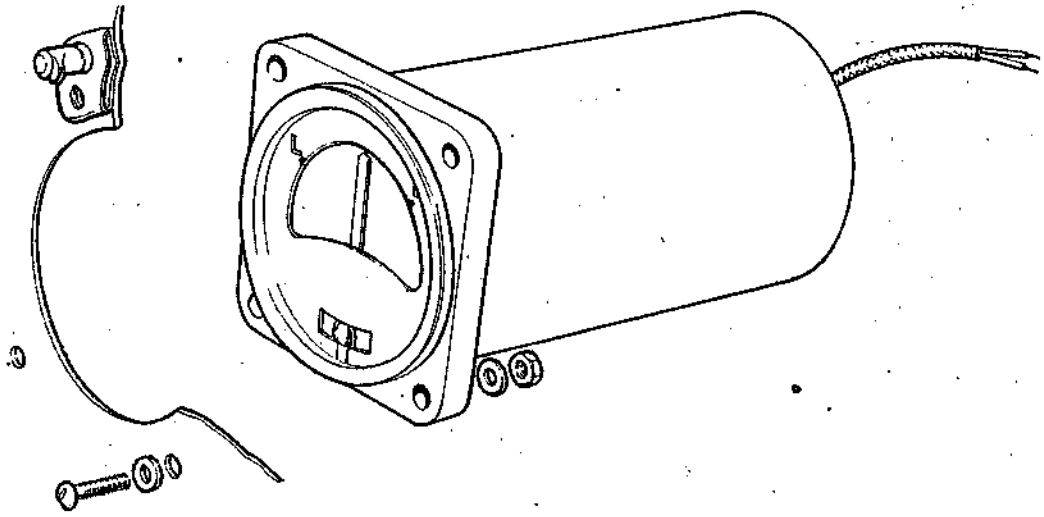


Fig. 5 – Watch system





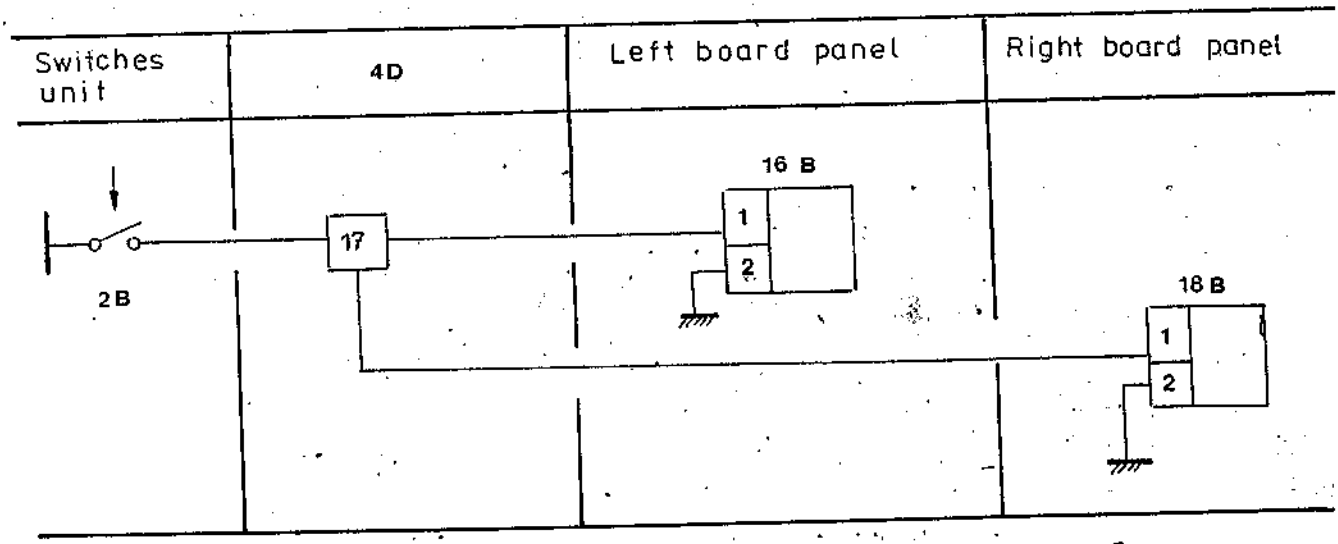


Fig. 6- Slide and turn indicator

CAPTION TO THEORETICAL ELECTRIC DIAGRAM (Figure 6)

Item	Component		Type
1.	Circuit breaker	2B	AZS-5
2.	Slide turn indicator	16B	LUN 1213-8
3.	Slide turn indicator	18B	LUN 1213-8

Magnetic compass (figure 7)

9. The magnetic compass is a simple indicator of magnetic north, installed above the instrument panel on the aircraft center line.
   The electric diagram refers to the magnetic compass illumination.

CAPTION TO THEORETICAL ELECTRIC DIAGRAM (Figure 7)

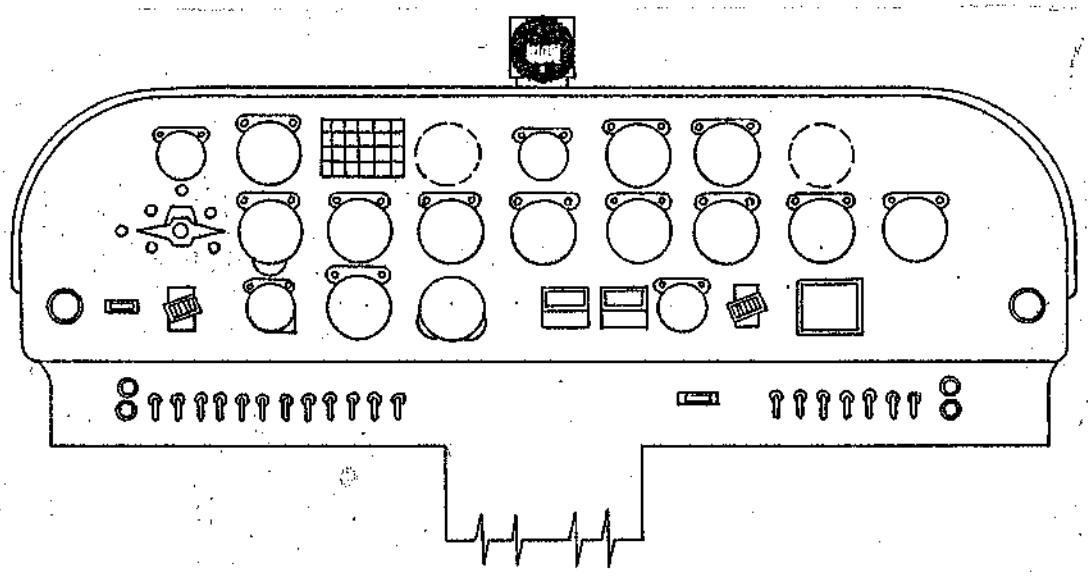
Item	Component		Type
1.	Circuit breaker	2B	AZS-5
2.	Magnetic compass	17B	KI-12
3.			

Gyro-horizon (figure 8)

10. The gyro-horizon is installed in the center of the instrument panel. It is supplied at 26V/400Hz three-phase a.c. current from the own inverter installed on the board table left side.

CAPTION TO THEORETICAL ELECTRIC DIAGRAM (Figure 8)

Item	Component		Type
1.	Circuit breaker	7R	AZS-10
2.	Static inverter	10R	TSG 420-101
3.	Gyro-horizon	9R	SFENA 705-1
4.			



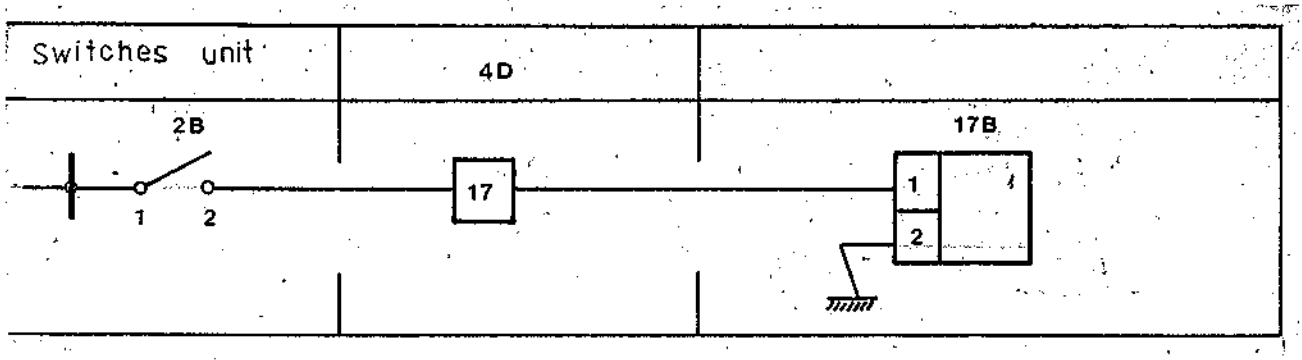
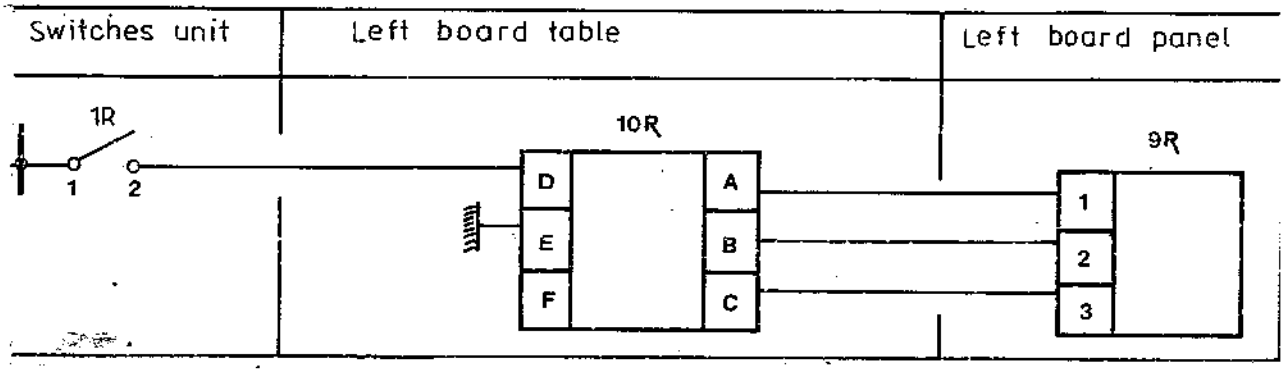
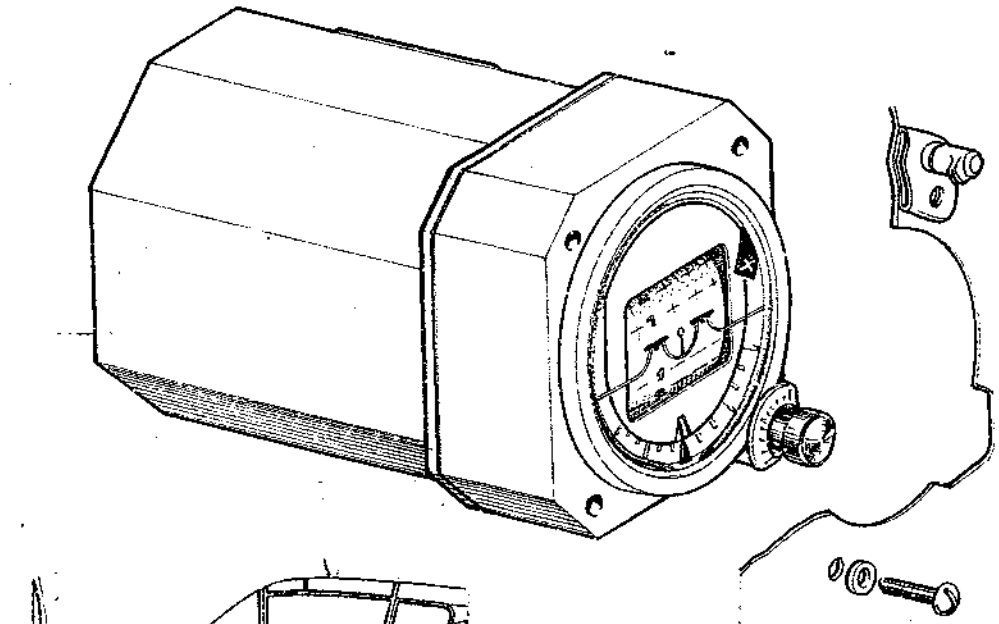
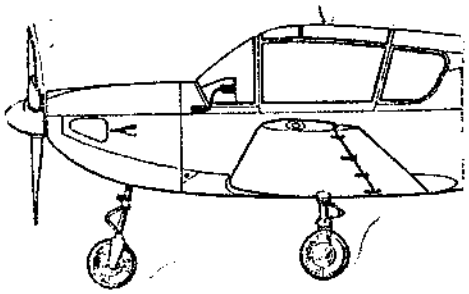
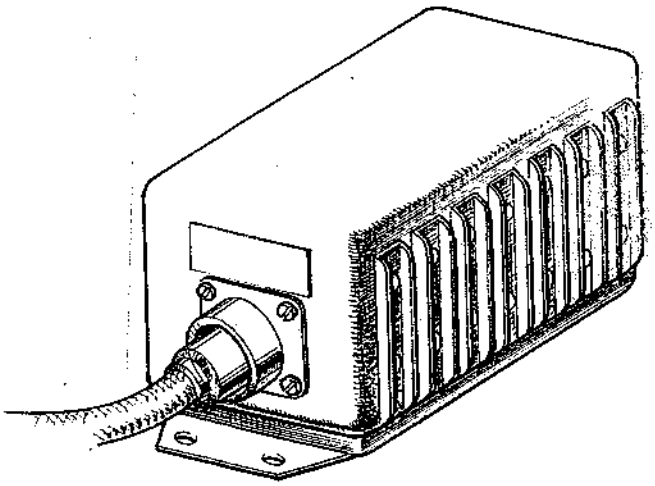


Figure 7 – Magnetic compass installation









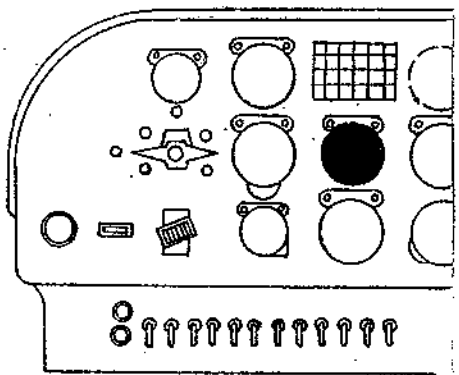


Fig 8 – Gyiro-horizon system

Limit speed warning system (fig.9)

11. The limit speed warning system includes a warning device and a light.
The light is located at the TS1 warning panel left side in a highly visible place.
The detector, with lamination is installed in the left plane, in the vecinity of the Pitot head, in the leading edge.
Inside this detector there is a microswitch in normally open position. When limit speed occurs the microswitch is actuated and the circuit which supplies the indicator is closed.

CAPTION TO THEORETICAL ELECTRIC DIAGRAM (figure 9)

Item	Component		Type
1.	Fuse	29S	SP2A
2.	Warning light	L11(TS1)	
3.	Limit speed detector	55S	237
4.	Electric bell	72S	RS 704.75C

Relay 27S is described in chapter refering to the landing gear.

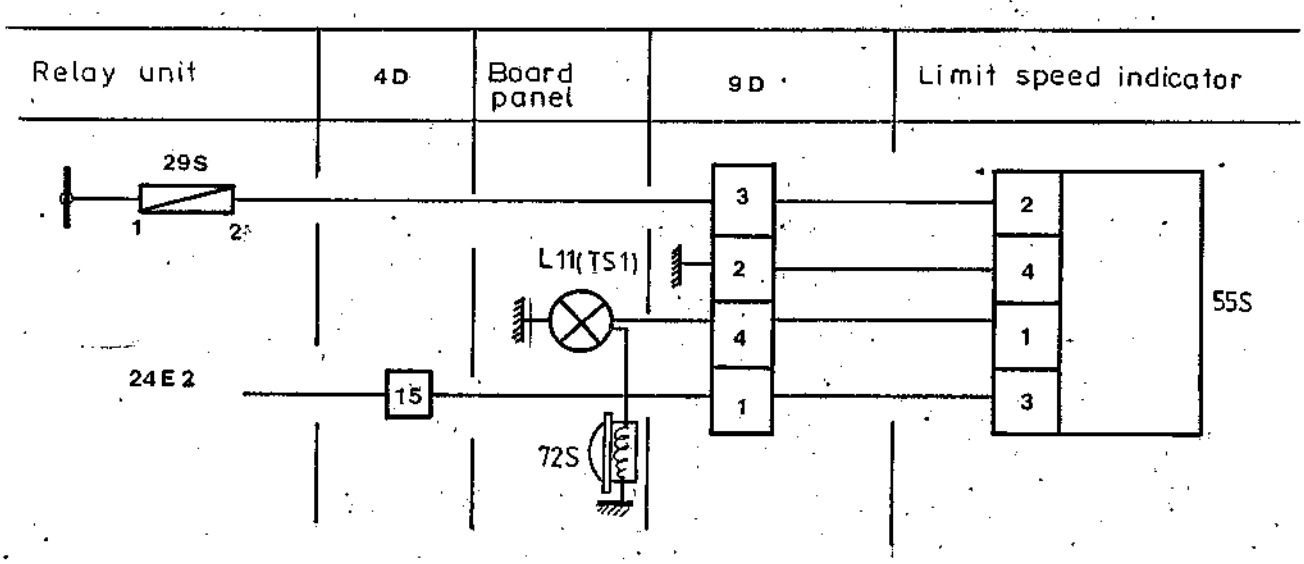
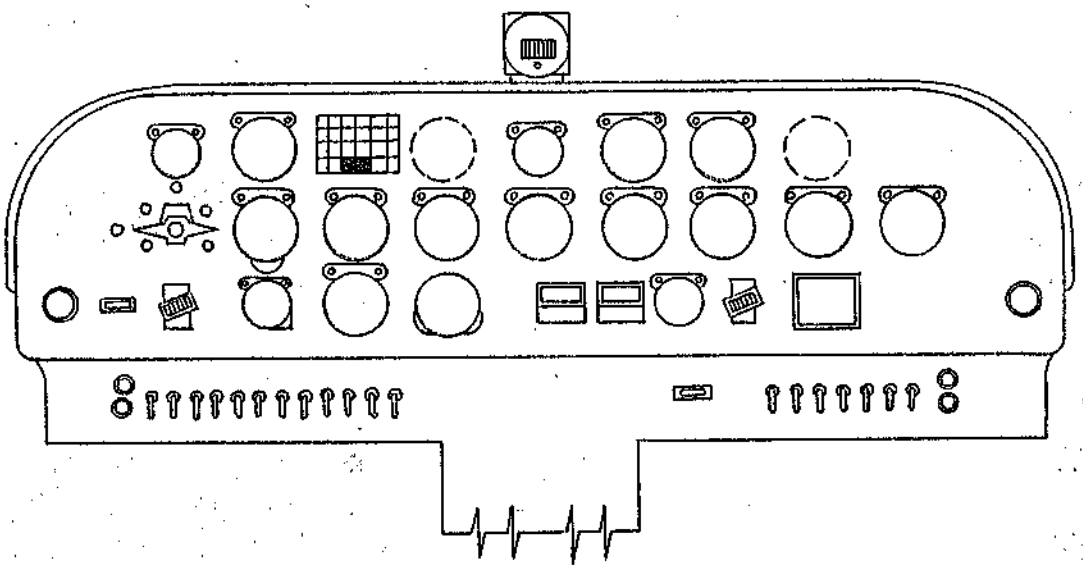

Relay unit
4D
Board panel
9D
Limit speed indicator
29S
1
2
L11(TS1)
24E2
15
72S
3
2
4
1
2
4
1
3
55S

Figure 9



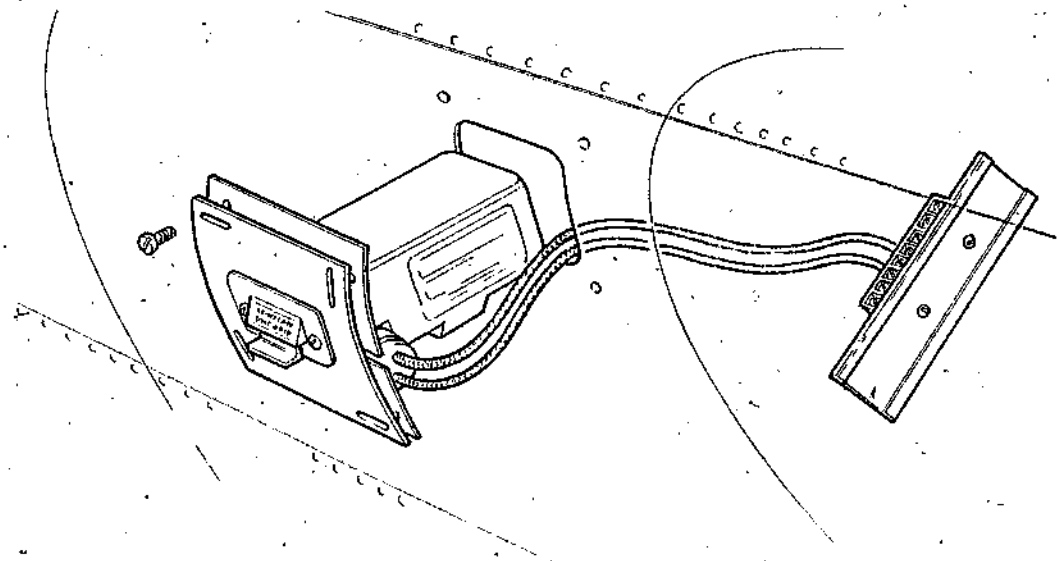


Figure 9. a. Limit speed warning system

Fire warning system.

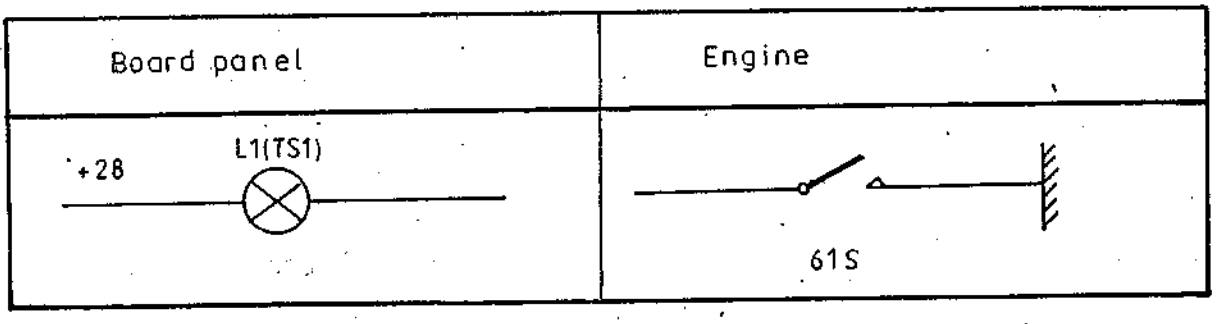
12. The system includes a TS-76 type fire warning device adjusted to a switching-in temperature of about 92°C, installed in the engine compartment, and a warning light located on the warning panel TS1.

CAPTION TO THEORETICAL ELECTRIC DIAGRAM (Fig. 10)

1. Fire detector	61S	TS-76
2. Warning light	L1 (TS1)	

Instrument panel

Engine



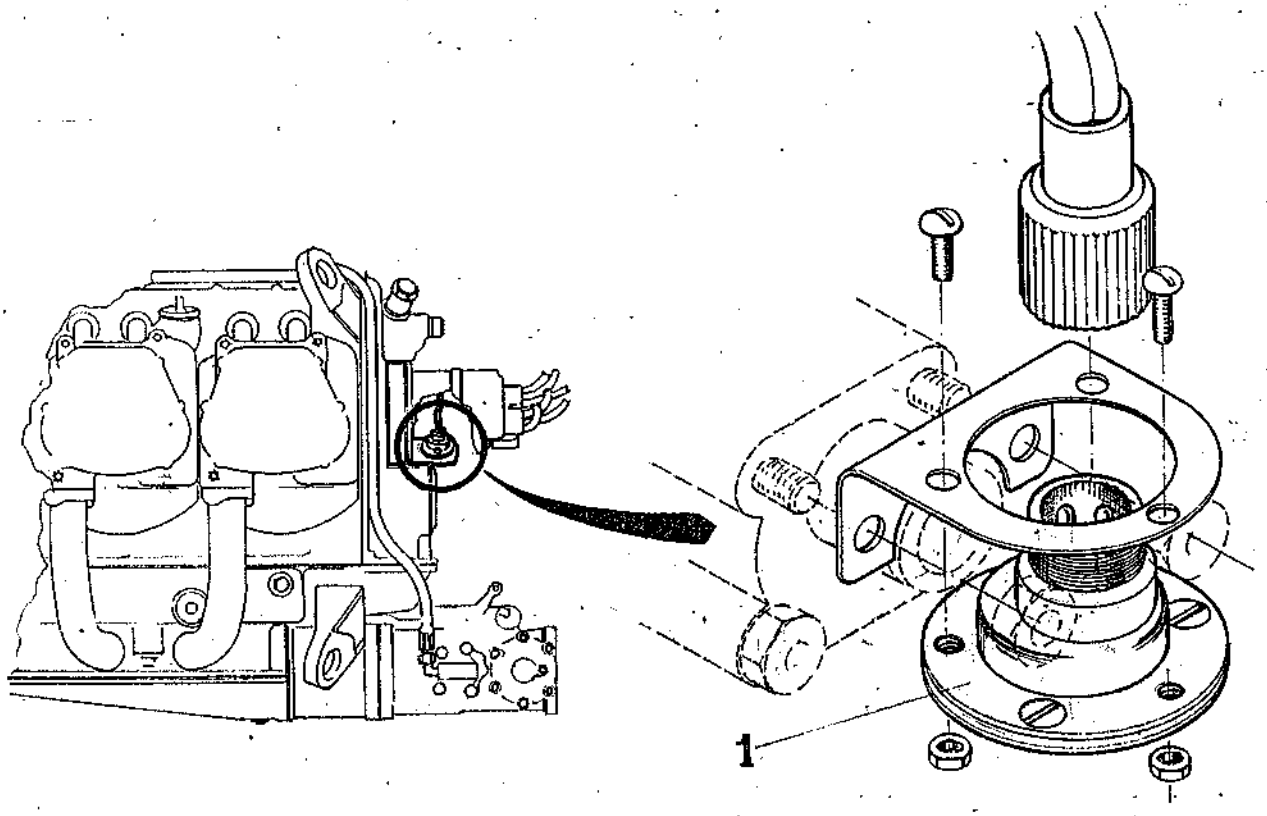


Fig. 10. Fire warning system

13. Accelerometer

The LUN 1722 type accelerometer is installed at the instrument panel extreme left side.

MAINTENANCE

General

1. Mainly the instruments and instrument systems maintenance practice includes checking that all electrical connections are in good operating condition. Faulty instruments shall be replaced. Care should be taken to replace instruments with instruments of proper type.

Pitot head system

2. The whole system shall be periodically checked and the water accumulated in the decantation devices drained. Special care should be given to the Pitot head and it must be ensured that it is not obstructed by foreign objects.

Limit speed warning system

3. Special attention shall be given that the detector in the leading edge be clean and free from foreign objects.

Chapter 3.9.

LANDING GEAR AND CONTROL

CONTENTS

Page

ILLUSTRATIONS

MAINTENANCE

DESCRIPTION AND OPERATION

General

1. The IAR 823 airplane landing gear is tri-cycle type, with nose wheel and oleo-pneumatic shock absorbers incorporated in retractable legs with electro-mechanical actuation.

Main technical characteristics

Item	Designation	Main leg	Front leg
1.	Type of shock absorber	Oleo pneumatic with separator piston	Oleo pneumatic with separator piston
2.	Fluid	AMG 10	AMG 10
3.	Shock absorber overall travel	155±2 mmq	170±2 mm
4.	Shock absorber static travel, at 1400 kg airplane weight	90±5 mm	60±2 mm
5.	Initial pressure of nitrogen in shock absorbers	14.5±0,5 daN/cm^2	15±0.5 daN/cm^2
6.	Dimensions and type of envelope	445x160 452x165 Goodyear	355x150 370x159 OH Kleber Colombes
7.	Inflating pressure of envelopes, at 1400 kg airplane weight	2.8 ± 0.1 daN/cm^2	2.5 ± 0.2 daN/cm^2
8.	Envelope flattening at 1400 kg airplane weight	38±3 mm	15±2 mm
9.	Type of brake	30 - 32A Cleveland	

NOTE

Operating the airplane at temperatures exceeding 30°C results in a pressure increase in the envelopes and thus pressure shall be decreased in such conditions according top item 8 in the table.

Front leg assy (figure 1)

Front leg

2. The front leg consists of a shock absorber provided with a clevis into which the wheel is fitted; the anti-shimmy transversal shock absorber and the folded strut on the leg body maintain leg in extended or retracted position, respectively.
   The front leg wheel is freely orientable at 45° in any direction. Details concerning the shock-absorber maintenance are given in the MAINTENANCE diagram.

Fittings

3. The fittings comprise 2 bushings welded onto the engine cowl, drilled in correspondence with the leg joining shaft, as well as 2 fittings riveted onto the firewall. The front leg fitting is accessible by removing the engine lower cowl.

Wheel assy

4. The front leg wheel includes 2 semi-hubs, each provided with a ball bearing, assembled by means of 3 screws. The wheel is secured to the clevis by means of 2 spacing bushings and a tubular pin with nut.
   Instructions concerning wheel greasing, adjustment, dismantling and mounting are given in the MAINTENANCE diagram.

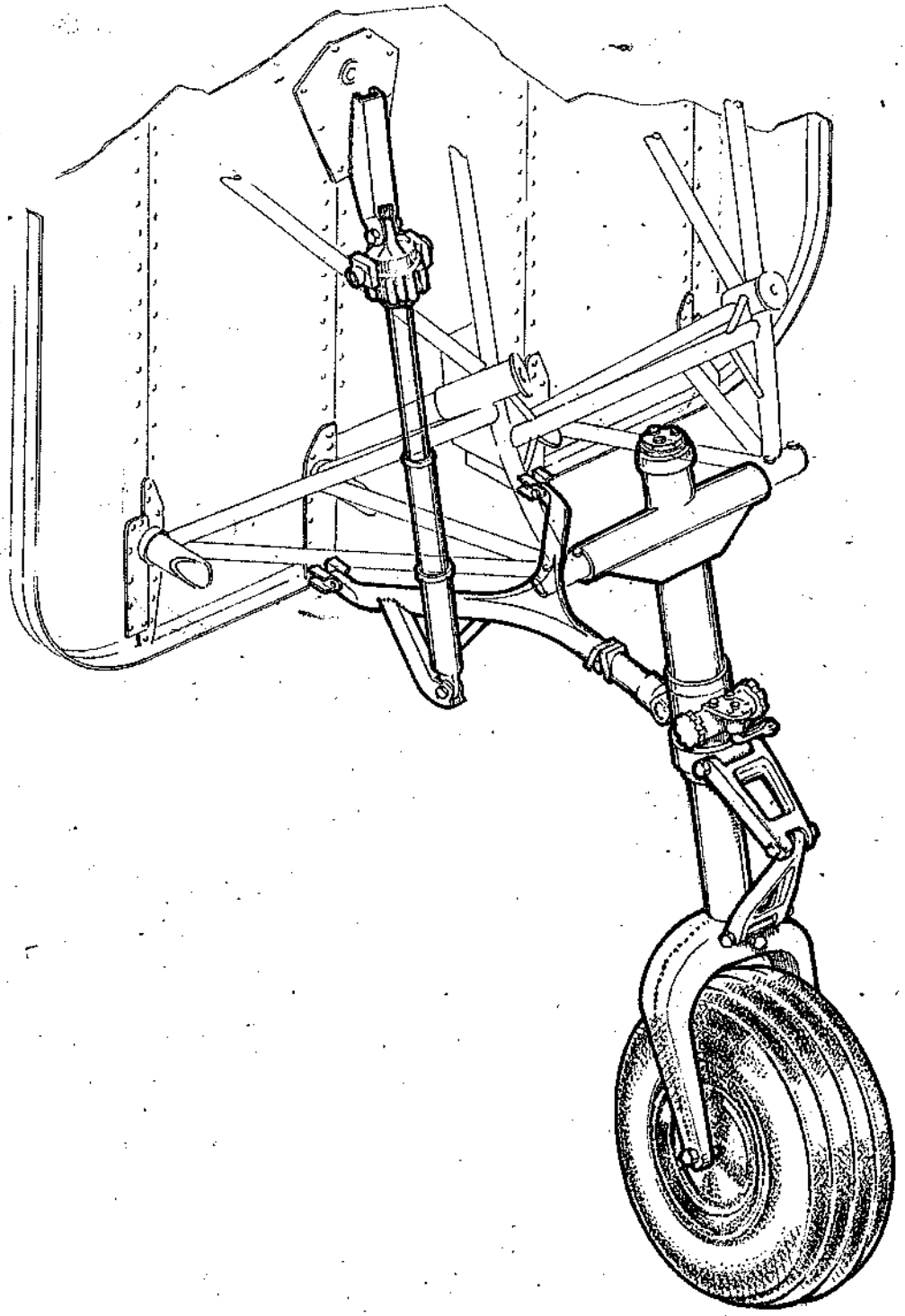


Figure 1 – Front leg assy.

Anti-shimmy damper

5. The anti-shimmy hydraulic damper is made of a cylinder containing AMG10 fluid, a double piston which moves in the fluid to and fro according to the direction of the front wheel oscillations and a lever driver which transmits oscillations during airplane taxiing on ground.
The oscillation damper is secured horizontally to the front leg body.
Details concerning the anti-shimmy damper maintenance are given in the MAINTENANCE diagram.

Main landing gear assy (figure 3)

Main leg

6. The main leg (2 offs on the airplane) consists of a shock-absorber assy, provided with a semi-clevis into which the wheel is fitted; on the leg body there is a subassy provided for locking purposes on retracting the landing gear if the shock absorber remains compressed after the airplane got airborne; and a foldable strut to maintain leg in extended or retracted position, respectively.
Details concerning the shock absorber filling and maintenance are given in the MAINTENANCE DIAGRAM.

Fittings

7. Fittings mounting each main leg onto the structure comprise 2 semi-bearings.

Wheel assy

8. From a constructive point of view the airplane 2 main wheels are similar to the front wheel, but bigger and having conical roll bearings on a single hub - the main hub of the wheel, assembled with an adjusting bushing.
Instructions concerning greasing, adjustment, dismantling and mounting of wheels are given in the MAINTENANCE DIAGRAM.

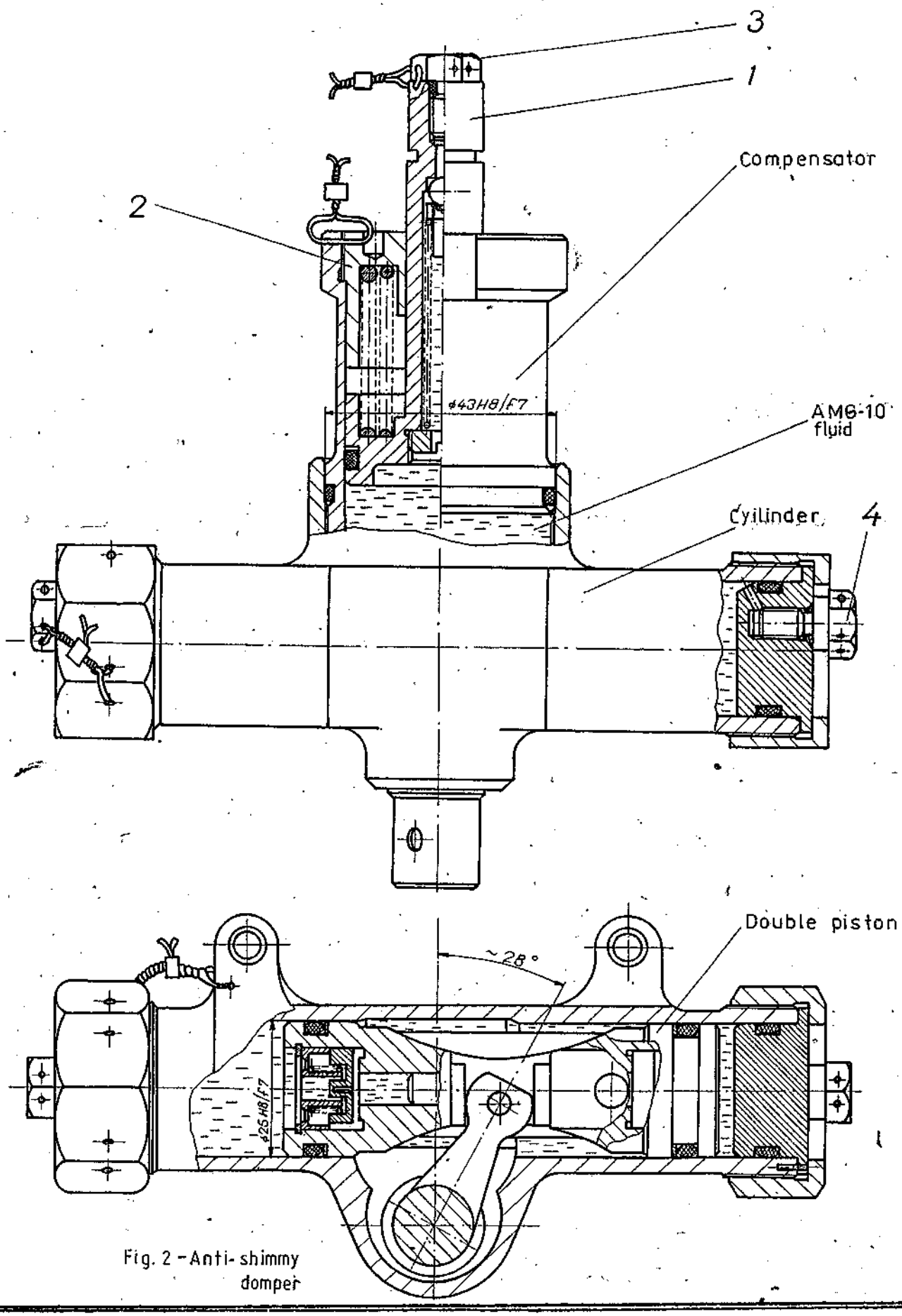


Fig. 2 - Anti-shimmy damper

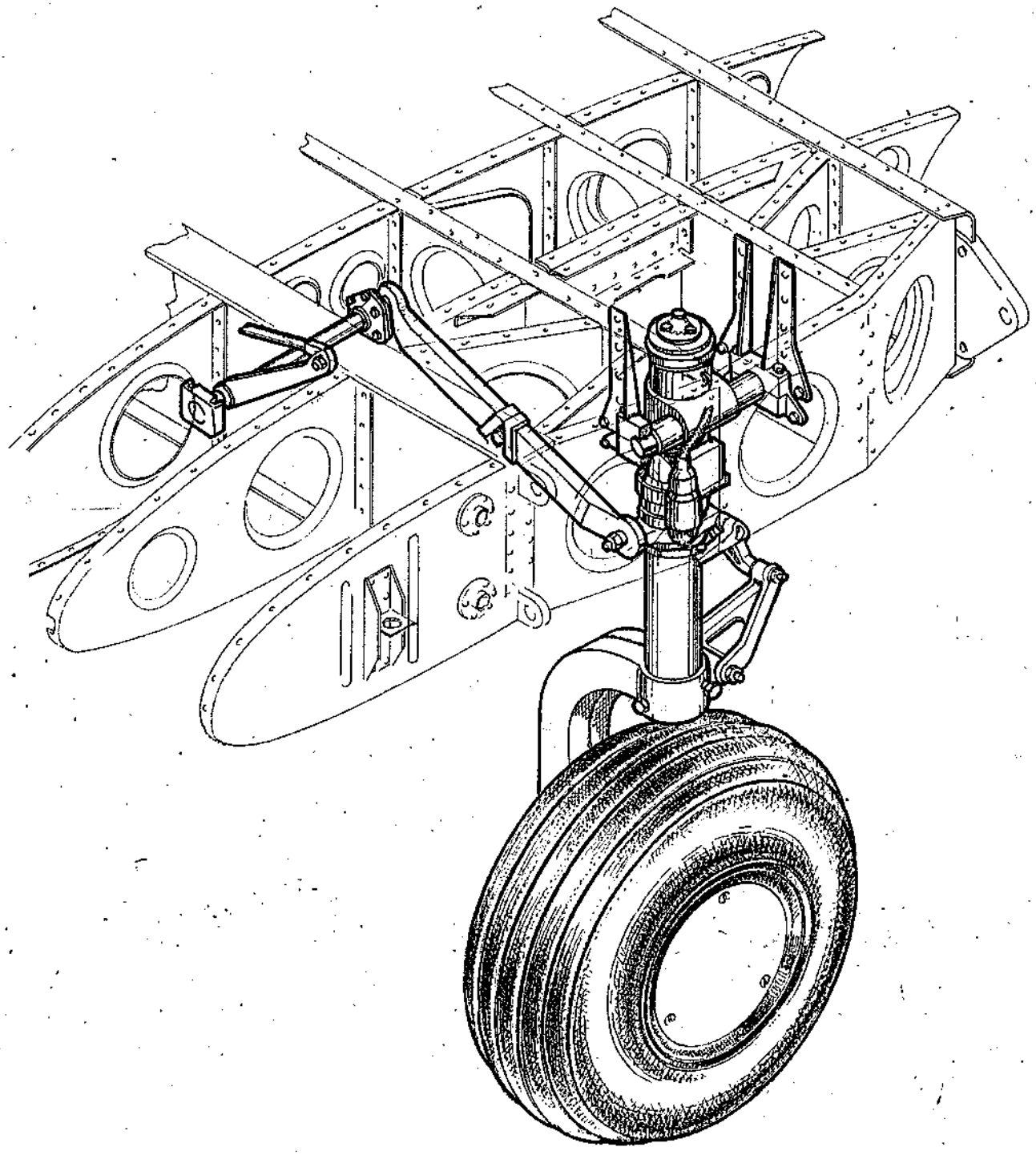


Figure 3– Main landing gear assy

Retracting system (figure 4)

Technical description

9. The landing gear retraction system is a LABINAL type electro-mechanism. Actuating is carried out by means of a 26V dc electric motor, rated at 0.32 KW, at a rated speed of 9000 rpm. The motor is fitted with a clutching-braking unit and an rpm reducer with 1/4, 44 ratio. The rotational movement is transmitted by means of 8 mm dia. flexible torque cables and different L and T shaped unions, to 3 mechanical jacks.

The travel of the three jacks are identical and equal to approx. 200 mm . During retraction the current varies from 94A on starting to 39A at the end of the travel, having a mean value of 18A. Time of retraction is 12 seconds and time of extending the gear is 7.6 seconds. For cases of emergency with the motor or power supply failure the system is provided with a switch box with crack to extend landing gear by manual actuation. The mean effort at the crank is 1.3 daN and 117 turns are necessary. The motor-reducer group has an operating life of about 30.000 startings, the jacks a 10000 cycles operating life (extension + retraction) the flexible transmissions an operating life of 15000 cycles and the L and T unions 30000 cycles .
Both motor - reducer and unions and flexible transmissions are capsulated and need no periodical greasing.

Operation

10. The operation of the retraction system is described in this paragraph only from an electrical point of view.

(1) Motor control and actuating (fig. 5, 6 and 9)

The LABINAL electromechanism is located under the cabin floor. There is a switch on the switchboard, which turns supply ON. There are two landing gear retraction - extension control levers.
In order to avoid incidental actuating of the control levers on ground, this is provided with a locking system which allows operation only when main legs are

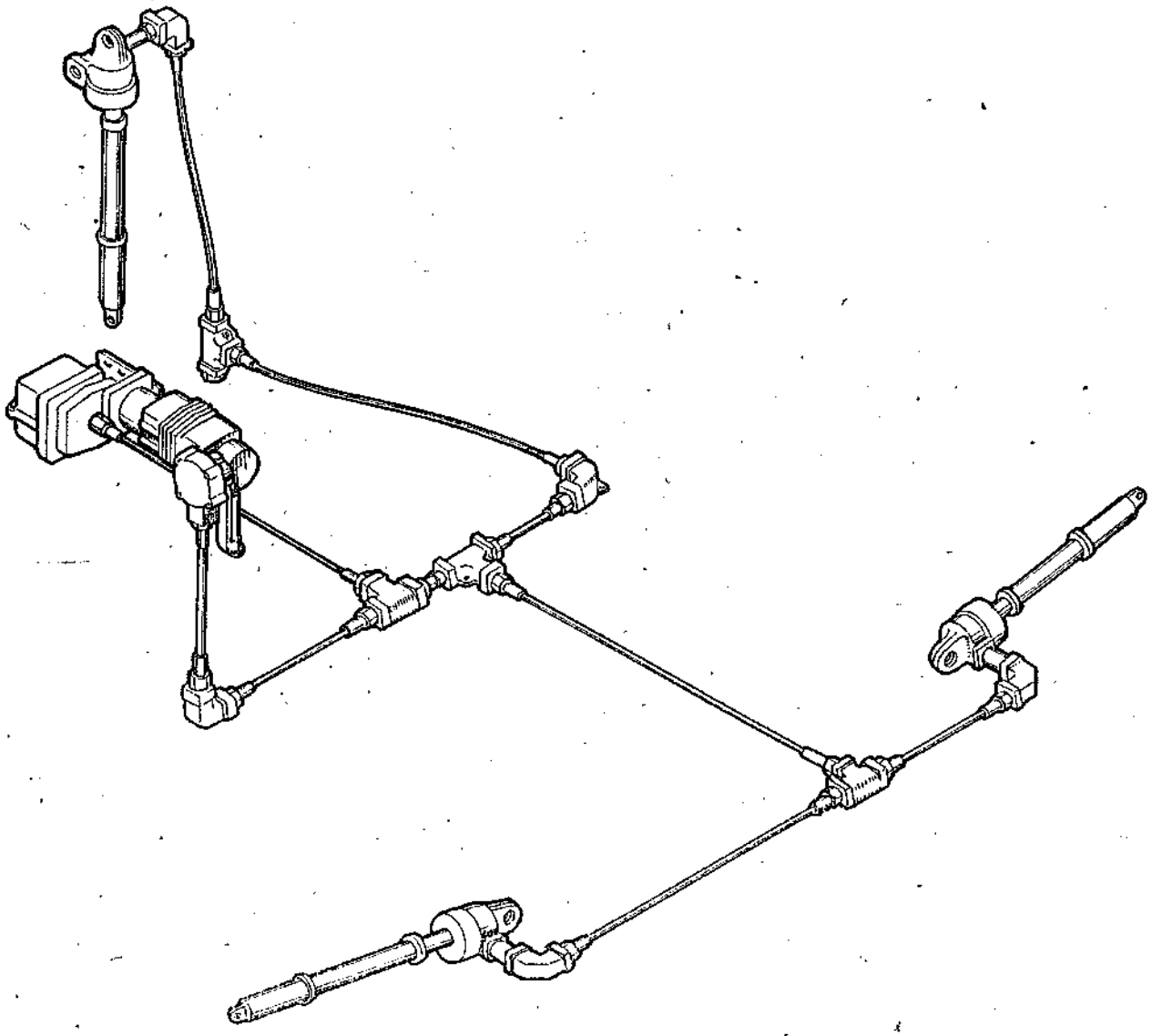


Fig. 4 – Retraction system

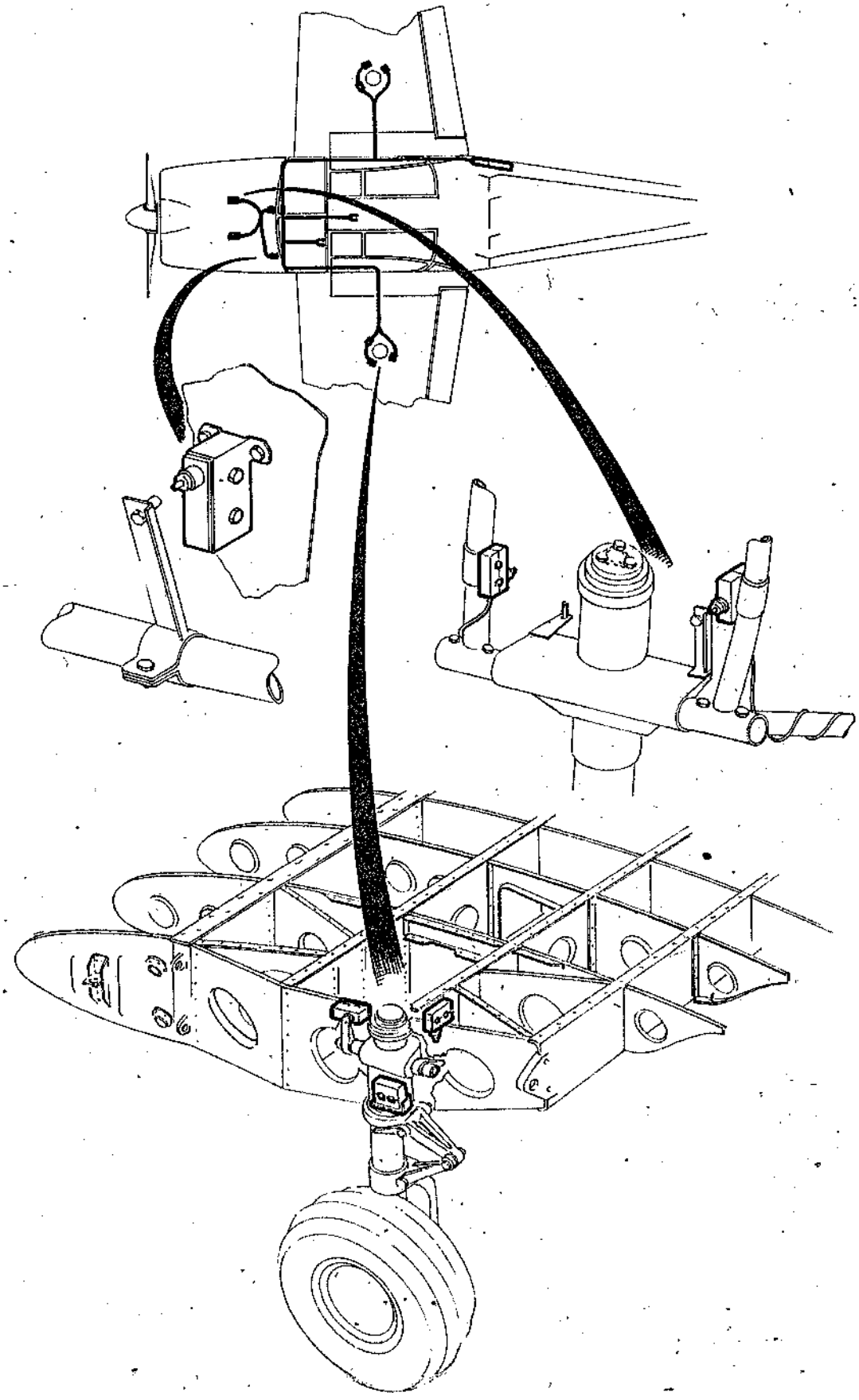


Fig. 5 – Gear actuating limiters.

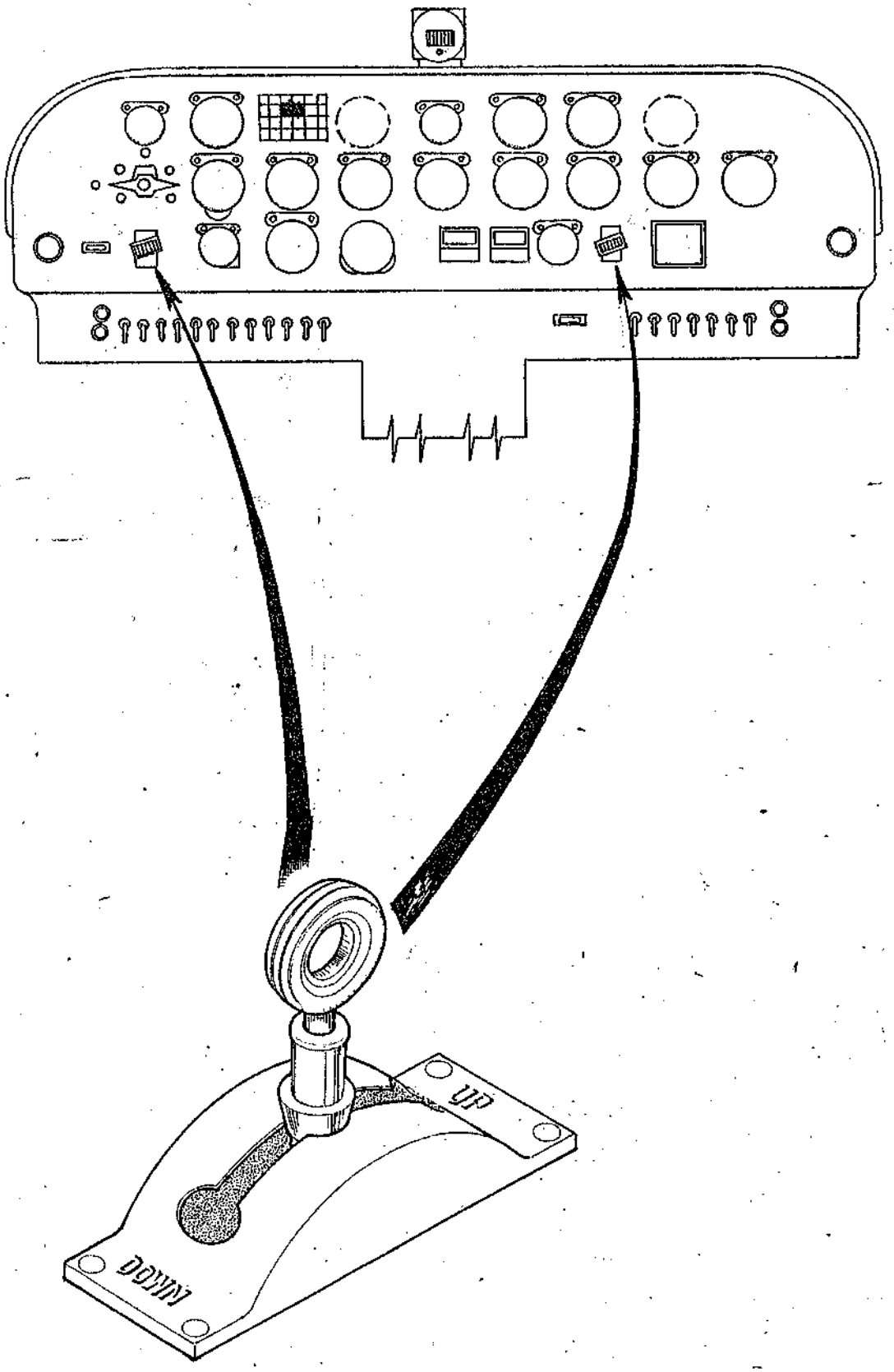


Fig. 6 – Landing gear control and actuating installation

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fully extended.
This is possible by means of 2 microswitches installed on the 2 main legs.

(2) Signalling the landing gear position (fig. 5, 6 and 9
The position of the landing gear is displayed by a light indicator installed on the instrument panel.

In order to signal the position of each leg 6 micro-switches are used which transmit electric signals to the indicator.
These are installed 2 by 2 for each leg signalling limit positions on retracting and extending, respectively.

(3) REDUCED ENGINE WARNING (fig. 5 and 9)
In order to avoid landing with retracted gear, an acoustic warning system has been provided for cases when the gear is not extended and the airplane engine rpm has reduced, or when flap are deflected.

Tail skid (fig . 8)

11. In order to avoid damage at the airplane rear fuselage when landing with tail boom down, a tail skid has been provided as shown in figure 8. The tail skid is made of a high hardness rubber protected with stainles steel sheet at the outside.

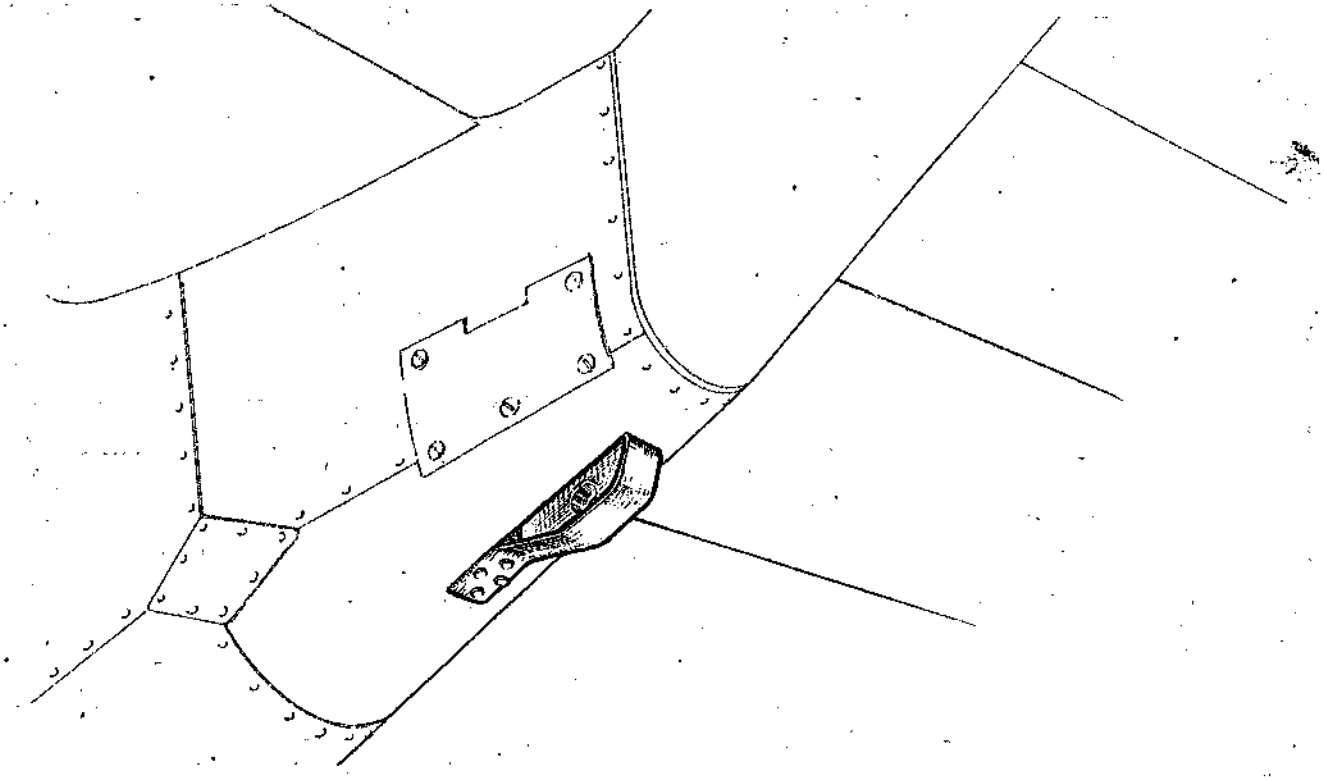


Figure 8 – Tail skid

Landing gear

1.	Circuit breaker	3M	AZS-2
2.	Switch	4M	PPN-45
3.	Switch	19M	PPN-45
4.	Relay	18M	TKE-21 PD
5.	Relay	17M	TKE-21 PD
6.	Switch	55M	VK 2-200R
7.	Switch	56M	VK 2-200R
8.	Electro-mechanism	5M	LABINAL MR1-DT
9.	Fuse	16M	IP-30
10.	Contactor	6M	KM-25 DV
11.	Contactor	7M	KM-25 DV
12.	Circuit breaker	4S	AZS-5
13.	Micro-switch	5S	VK-2-200R
14.	Micro-switch	6S	VK2-200R
15.	Micro-switch	7S	VK2-200R
16.	Micro-switch	8S	VK2-200R
17.	Micro-switch	9S	VK2-140K
18.	Micro-switch	10S	VK2-140K
19.	Button	50S	204K
20.	Light	11S	SLT 51
21.	Light	12S	SLT 51
22.	Light	13S	SLT 51
23.	Light	19S	SLT 51
24.	Light	26S	SLT 51
25.	Light	44S	SLT 51

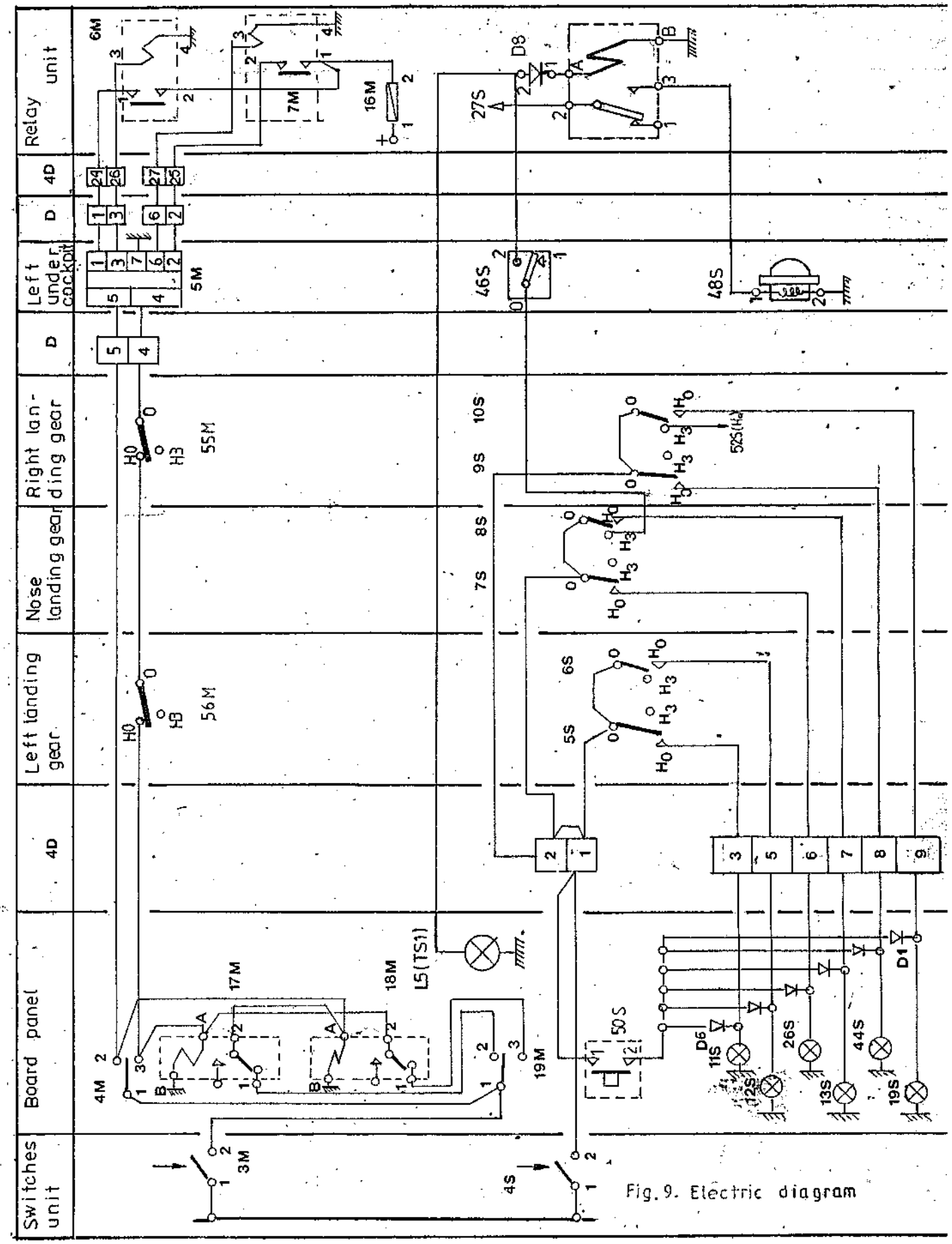


Fig. 9. Electric diagram

Braking System (fig. 9)

General

12. The braking system is presented in the schematic diagram. Each main wheel is provided with a CLEVELAND 30 - 23 A type, single-disc brake assy, hydraulically actuated by means of the main cylinders from the pedals. The maintenance instructions, the liquid supplying and the ventillation system are given in the MAINTENANCE diagram.

Main Cylinders Mounting (fig. 10)

13. On each pedal there are braking pumps actuating the wheels braking blocks.

Wheel Brakes Mounting (fig. 11)

14. Each braking block is fixed on the wheel drum flange, by means of four Ø 1/4 - screws and two Ø 11 mm sliding pins. The screws have to be evenly fastened when mounting them.

MAINTENANCE

Greasing. Periodically grease the front leg assy as shown in the diagram.

Shock Absorber Filling. The front leg shock absorber can be filled, if necessary, with nitrogen and AMG-10 liquid. It is easier to perform this operation when the leg is dismounted from the airplane. The following equipment is required:

(a) Nitrogen supplying installation (including a 0-60 daN/cm^2 pressure indicator.
(b) A flask of nitrogen (compression above daN/cm^2)
(c) Liquid supplying assy, consisting of AMG-10 liquid tank and hand pump, including an adaptor for connection to one of the M8x1 filling orifices and another adaptor for connection to a drain pipe.

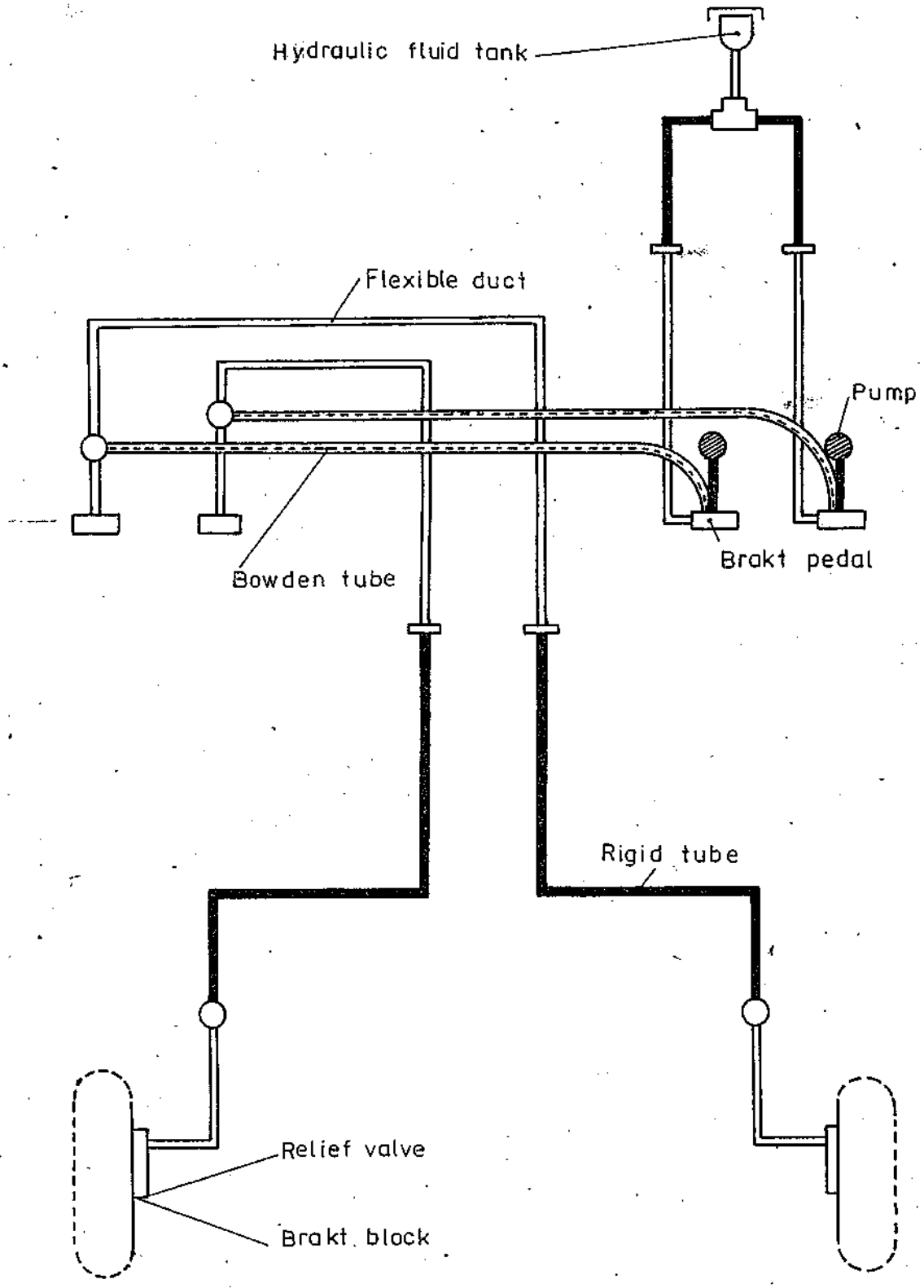


Fig. 9 Hydraulic bracking system

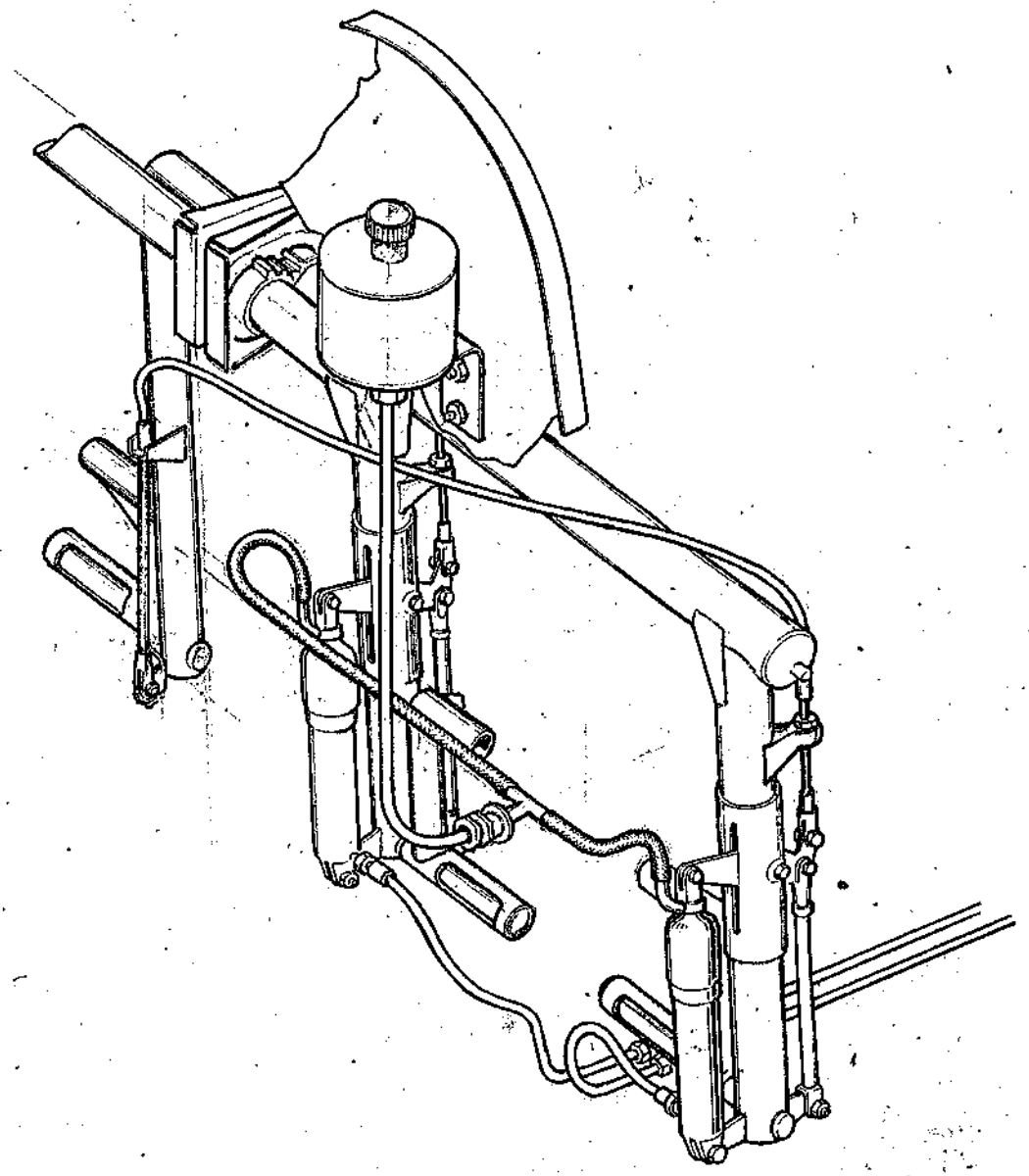
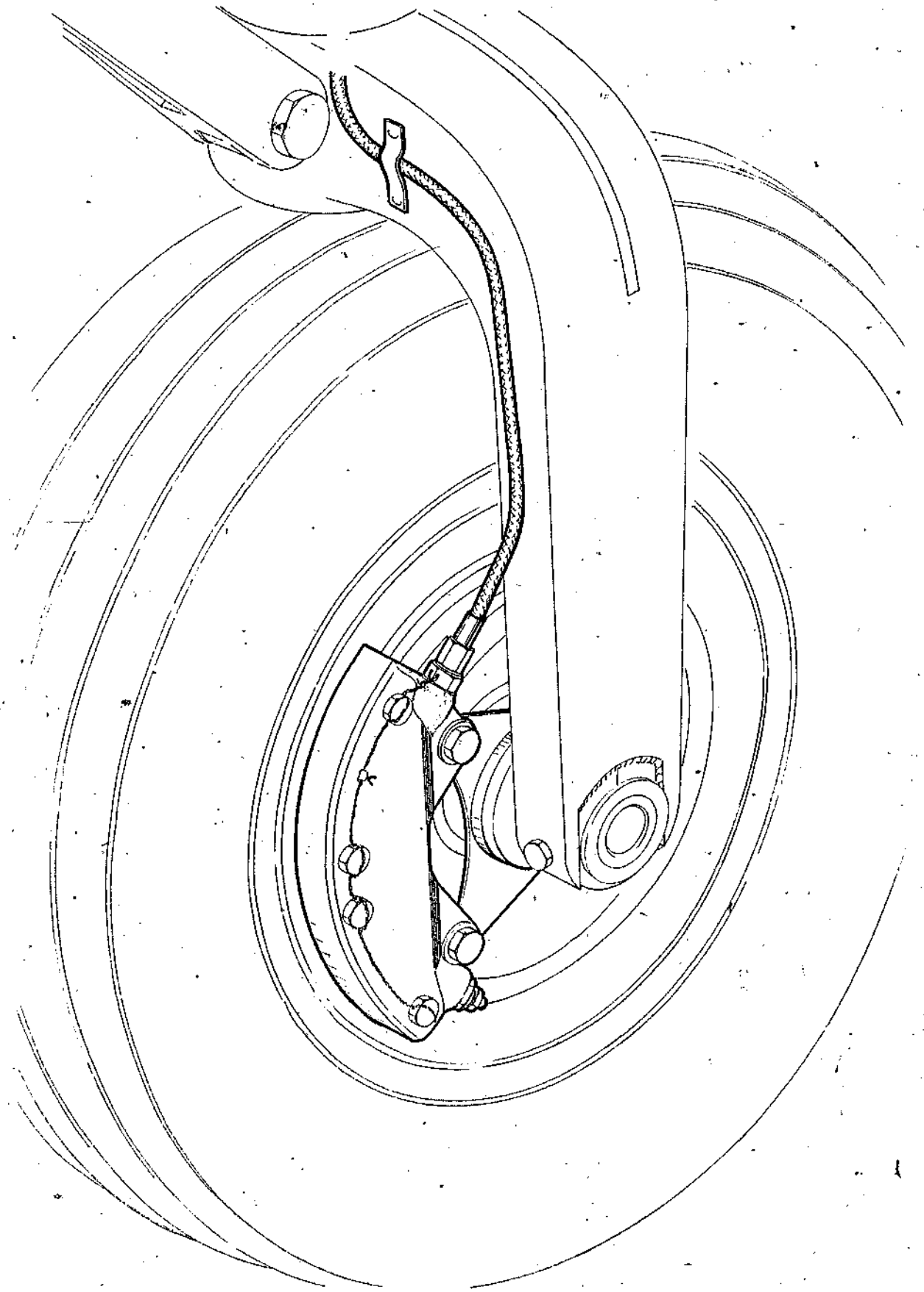


Fig. 10 – Brakes Main Cylinders



Mounting of wheel Brake assy

1. Left airplane on jacks, the shock absorber being completely detented.
2. Dismount the supply valve cover of the nitrogen supply and completely evacuate the nitrogen from the shock absorber.
3. Dismount the two filling hole caps and connect one filling hole to the hand pump assy and the orher one to a pipe that enters a clear liquid container.
4. Dismount the nitrogen supply valve and slowly compress the shock absorber to its complete travel.
5. Using the filling pump link mentionned at operation (3), pump AMG-10 fluid inside the shock absorber till reaching a 10 - 15 daN/cm^2 pressure to ensure that the shock absorber floating piston is pressed at the lower part of the damper rod and the leg is full extended and full filled with fluid.

   NOTE :
   The shock absorber capacity is about 820 cm^3, and the filling pressure shall not exceed 15 DaN/cm^2.
7. Dismount the filling pump connection and re-mount instead the drain pipe (as given in operation 3).
8. Fully compress the shock absorber, slowly and progressively eliminating the excess of liquid.
   When the leg is fully compressed, remove the drain pipe and adaptor and re-mount instead the M 8x1 cap.
   Fasten and secure it.
9. Re-mount the supply valve, fasten and secure it.
10. Connect to the valve the supply device and fill the shock absorber till reaching a 15$\pm$0.5 daN/cm^2. Dismount the supply device, mount instead the valve cap, fasten and secure it.
11. After finishing this operation (10) the leg should be fully extended. Check it by measuring the existent sizes given in diagram. The sliding part length should be 170$\pm$2 mm.

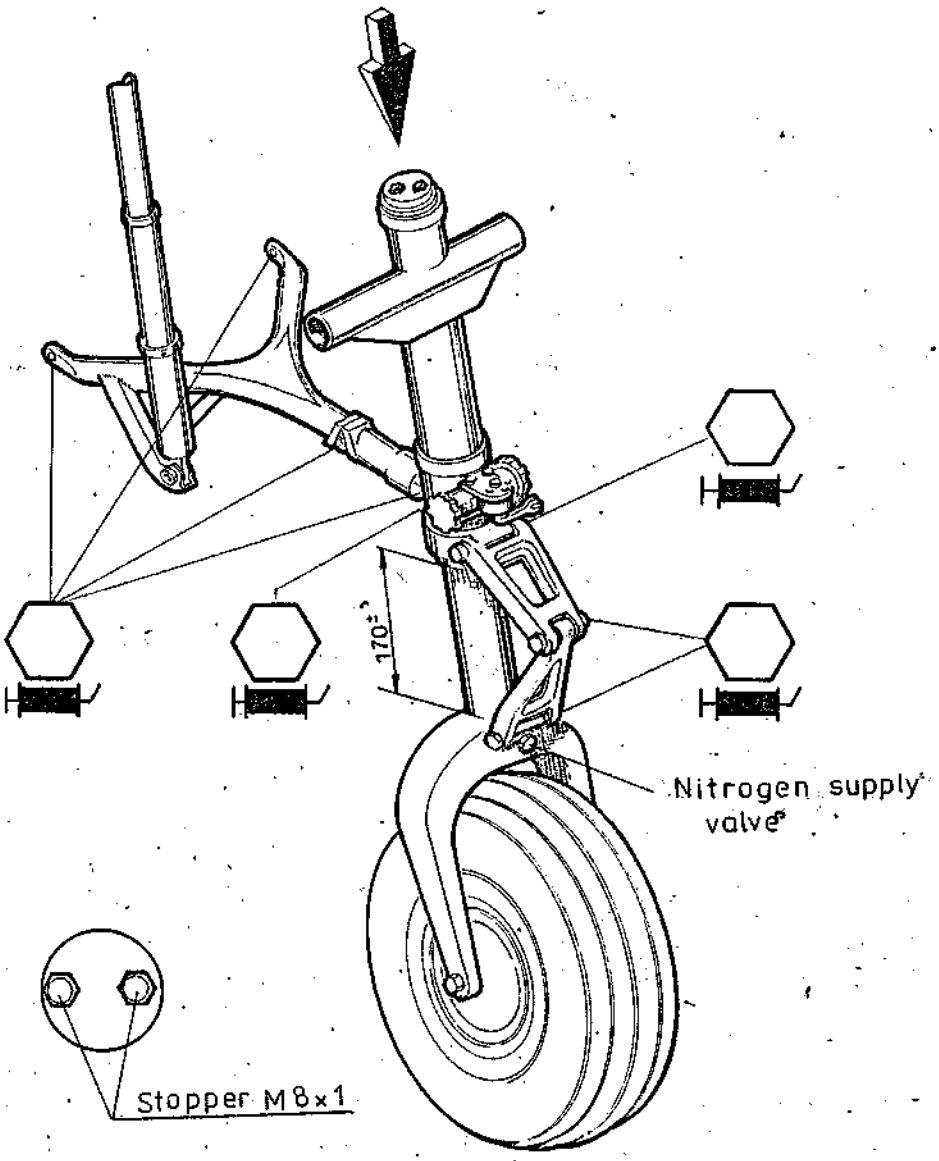


Diagram 1.- Front Leg Greasing and Filling

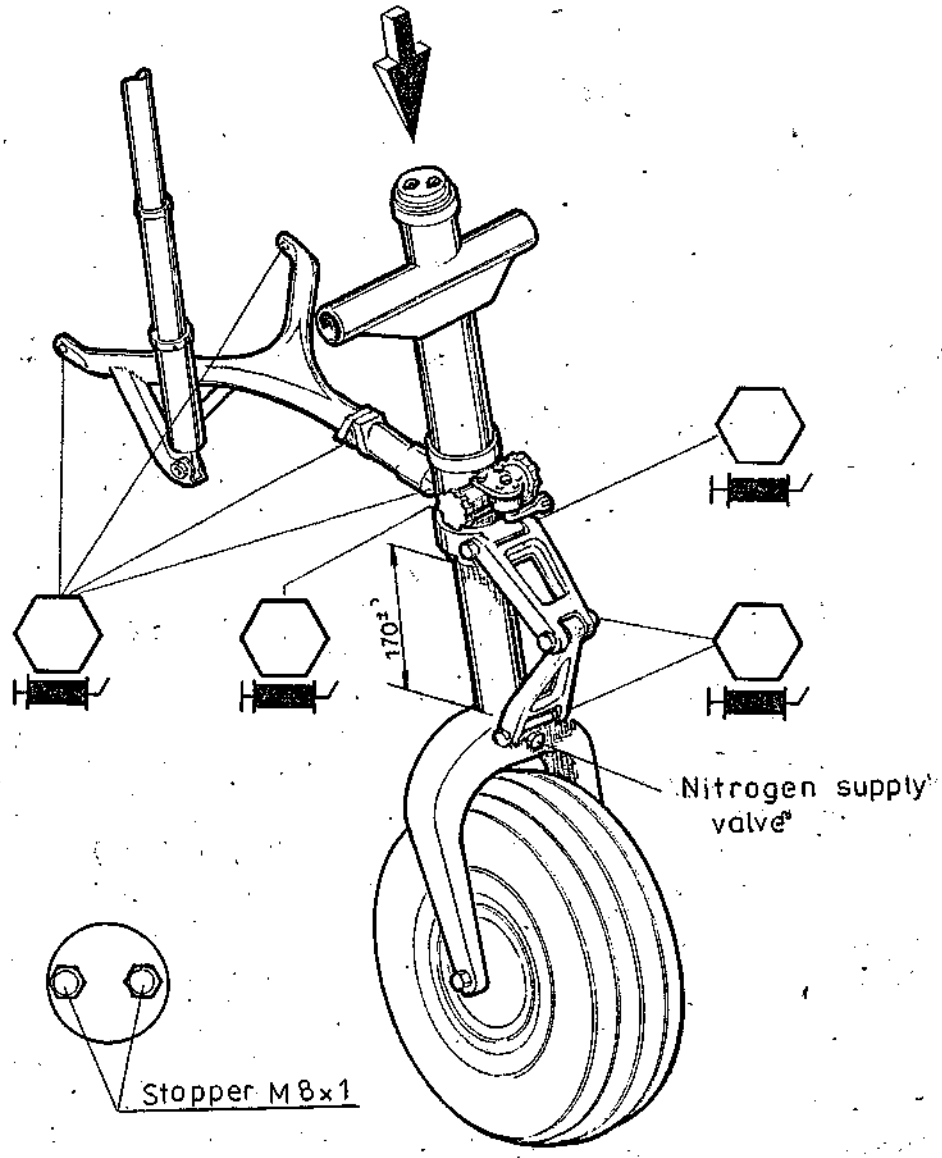


Diagram 1.- Front Leg Greasing and Filling

If everything is correct, take off jacks and with the wheels on ground carry out the shock absorber static compression.

12. If there is any difference between the measured sizes and those required, repeat the operations from (2) to (11) paying attention to the damper filling with liquid.

MAINTENANCE

Dismounting

1. Lift airplane on jacks till wheels are above ground.
2. Dismount nut no. 1 that fastens the wheel.
3. Remove wheel shaft 2 and take the wheel out of the fork.
4. Clean shaft and spacers.

Mounting

If a new wheel is to be mounted, check:

(a) Ball bearings greasing
(b) The condition of the two sealing bushes
(c) The wheel general condition

Mounting takes place in the following sequence:

1. Carefully insert the wheel shaft through fork and wheel.
2. Check the correct setting of the milled end of wheel shaft into its location.
3. Fix the wheel shaft by means of nut 1
4. Unscrew nut 1 - at about 0.1 - 0.2 mm and lock it.
5. When mounting is over, remove airplane from the jacks.

Dismounting

1. Lift airplane on jacks, so that the nose wheel is 200 mm above ground and dismount engine lower cowling.
2. Dismount screw 1, removing the link between leg and folding cross-bar
3. Get the free leg in vertical position and lift it on a holder.
4. Dismount the four screws item 2, that fix the leg shaft 3 to the engine holder.

5. Remove the hinge shaft 3
6. Remove the holder under the front wheel, by carefully releasing the wheel downwards.

Mounting

The front leg assy mounting is carried out by repeating the dismounting operations in reversed order.
When a new front leg assy is to be mounted, the following parts of the previous assy must be dismounted to use them for the new assy.

(a) Nose wheel, wheel shaft and the two lateral bushes - according to diagram 2
(b) The screws (4 pcs) item 2, that fasten the front leg shaft
(c) The front leg attaching shaft (3).

MAINTENANCE

Shock Absorber Filling (see fig. 2)

The sealing gaskets of the shock absorber have a warranted life time equal to the front leg T.B.O.
It is recommended to replace the shock absorber liquid each 36 month. It is necessary to month. It is necessary to complete the liquid level each time the rod mark 1 reaches the compensator 2 cover level. This method is the follbwing:

1. Dismount caps 3 and 4
2. Connect to the first free orifice the adaptor and the hand pump to supply AMG-10 liquid; connect to each orifice made free by the removal of cover 4, one adaptor with Ø6 polyethilene pipes; one free end of each pipe shall enter a container with clear liquid.
3. Pump AMG-10 liquid inside the shock absorber till the lower marking on compensator rod appears, taking care that the liquid is free of air bubbles.
4. Dismount the filling device, re-mount the caps, fasten and secure them.

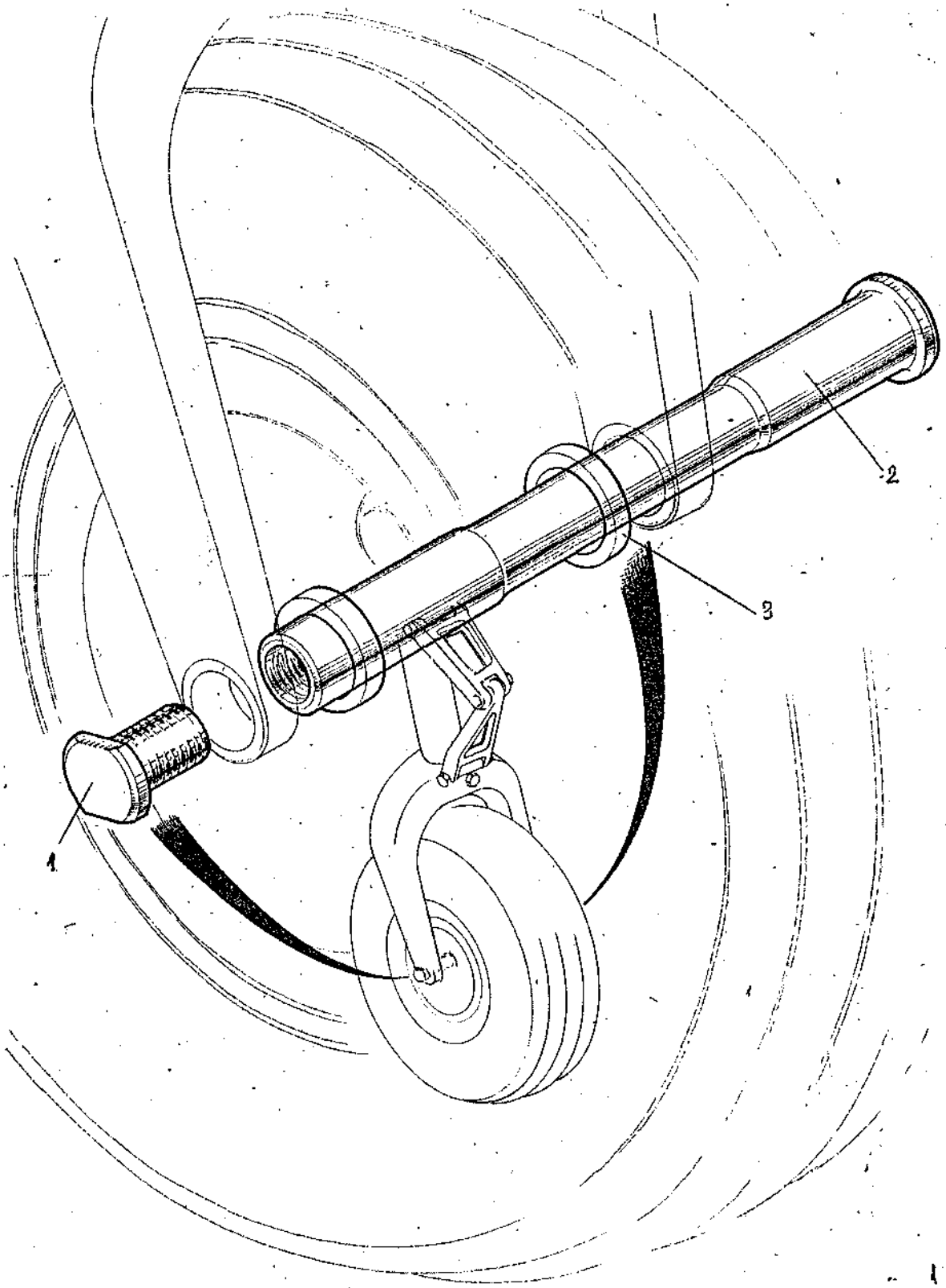


Diagram 2— Nose whell mounting / dismounting

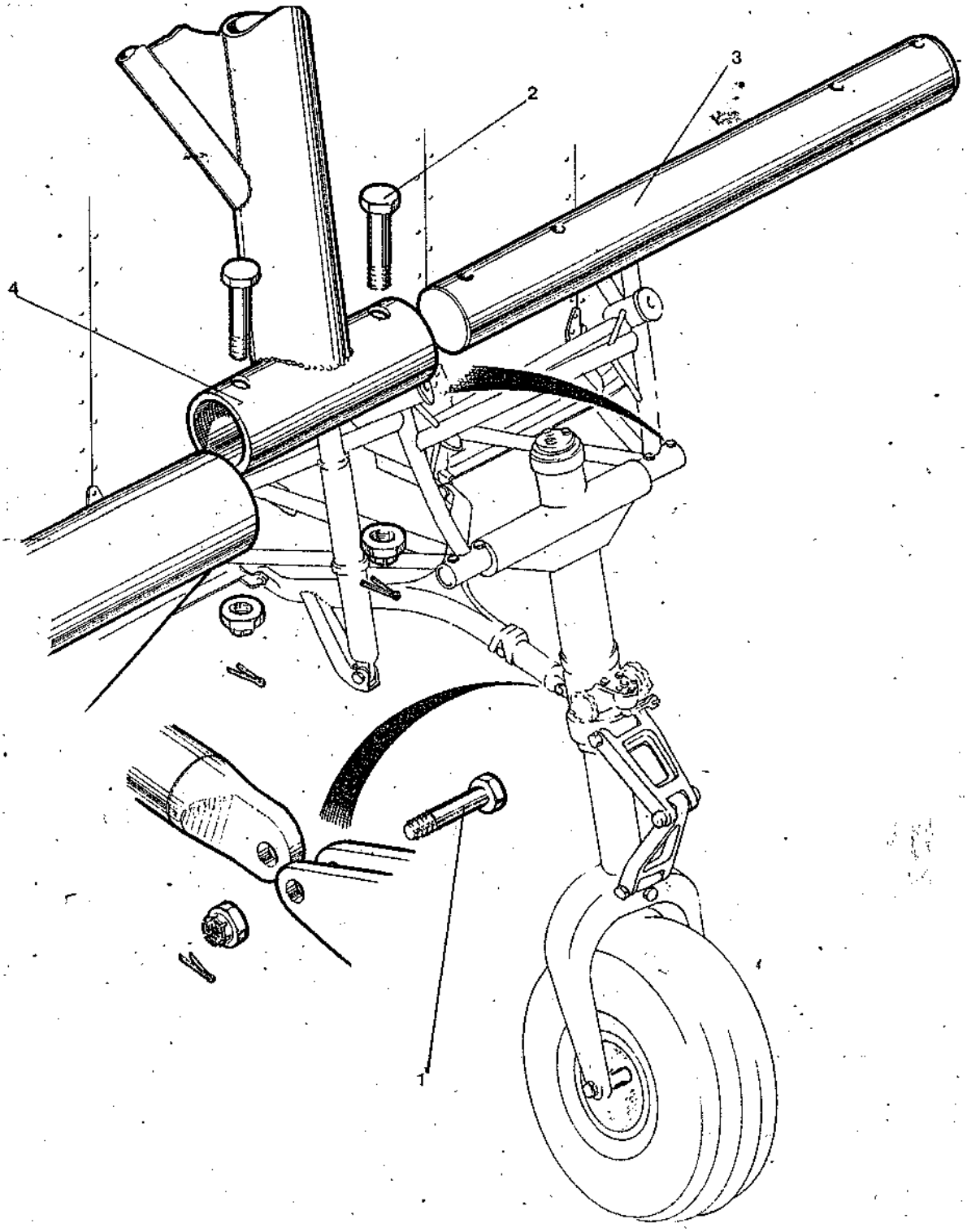


Diagram 3 – Front leg mounting / dismounting

NOTE

If no supply assy with hand pump is available, use any other filling supply under pressure. The hydraulic pressure during the filling operation should not exceed 10 - 15 daN/cm^2.

DISMOUNTING

1. Lift airplane on jacks till its wheels are above ground.
2. Remove nut lock wire (1) and (2) that fasten the main wheel.
3. Remove pressure bush (3) of the wheel shaft
4. Dismount the four screws fixing the small friction plates of the braking block
5. Remove wheel from its shaft.

Mounting

It is carried out by repeating the dismounting operations in reversed order.
Check:
(a) The wheel shaft condition
(b) The friction plates condition
(c) The braking drum flange condition. The braking drum becomes useless if the flange thickness is below 6.5 mm.
If a new wheel is to be mounted check its condition.

Ball bearings Adjustment

Set the wheel on a holder.
Remove the flexible lock and fasten the nut till a certain resistence is encountered when rotating the wheel. Release the nut axially by 0.1 - 0.2 mm and lock it in this position.

NOTE
Ball bearings can be adjusted with the wheel installed on its normal shaft.

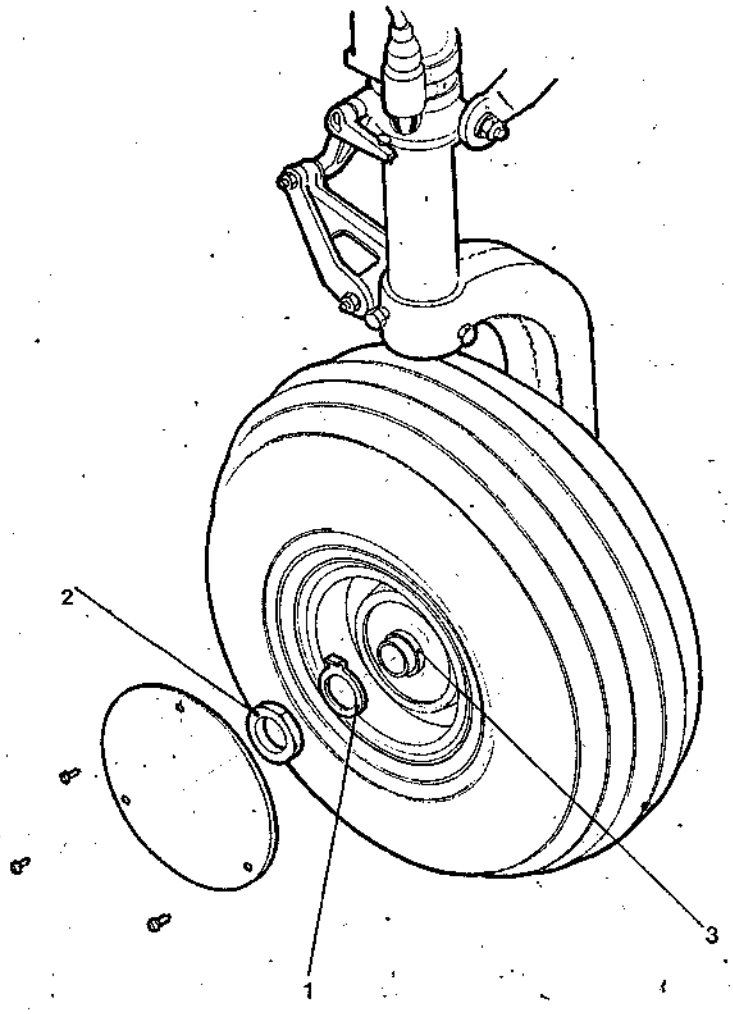


Diagram 5 – Main. whell mounting/dismounting

MAINTENANCE

This maintenance diagram presents two methods of filling and venting the braking system. To carry out this operation, the following equipment is necessary.

1. A hydropneumatic vent and supply assy, or a hand pump
2. Two Ø6 mm and 900 mm length polyethylene tubes.
3. A Ø3 link adaptor to match the drain orificies of each brake assy
4. Two clean bottles for the brake liquid
5. A brake liquid container

METHOD I

1. 2/3 of the hydropneumatic assy tank is filled with brake liquid. Using a compressed air supply, fill the assy till a 1 - 2 daN/cm^2 pressure.
2. Dismount the drain valve of the brake assy and mount instead of it the adaptor and connect it to the hydropneumatic assy.
3. Dismount the flexible tube valve of the central pump intake and mount instead of it one of the polyethylene tube, its other side being introduced in a clean liquid bottle.
4. Open the pressure control valve of the supply hydropneumati assy and vent the brake system.

   NOTE
   If the supply assy is provided with hand pump, the filling and vent operations are identical.

5. Dismount the vent system from the adaptor, remove adaptor and re-mount the drain assy of the brake system.
6. Dismount the polyethylene tube from the central pump and re-mount the pump normal connection to the supply tank.
7. Vent the second part of the brake system, repeating operations (1) - (5).
8. Mount one polyethylene tube at the drain valve of each brake assy. Open the vents and introduce the free ends of tubes inside a clean bottle containing brake liquid.

9. Push firmly and repeatedly on the brake pedals till through the polyethylene tubes passes a continuous, airless liquid flow.
   While pumping, the supply tank liquid level shall not decrease below 2/3 of its full capacity.
   With the pedals in their lower positions, close both valves and fasten them.
10. Complete the liquid of the system tank, if necessary.
11. Check the brakes correct operation.
12. If the brakes operate unsatisfactory, it is necessary to repeat operation (9).

METHOD II

The brake system shall be supplied and vent by carrying out the operations (8) to (12_ only.
To obtain a satisfactory result by the second method, repeat several times the operation (9), which is the basic operation of the procedure.

MAINTENANCE

Dismounting

The brake assy is presented in details in fig. 1.
The dismounting procedure of the brake assy is the following:

1. Check if brakesare out of operation (disconnected)
2. Dismount the four screws of the brake assy., that fix the friction plates
3. Dismount the supply flexible pipes and seal the pipes by caps.
4. Remove the brake assy

NOTE
The mounting of an existent brake assy or of a new one is carried out by repeating the dismounting operations in reversed order.
When finishing the mounting, the brake system must be well ventillated.

MAINTENANCE

Greasing (see diagram 8)

Periodically grease the main leg assy as shown in the diagram.

Shock Absorber Filling

The main leg shock absorber is filled with nitrogen, using the equipment and procedures given in diagram 1. The AMG-10 liquid quantity must be of about 980 cm^3 and the sliding part length shall be 155 ± 1 mm from the main leg shock absorber.

MAINTENANCE

Dismounting

The main landing gear is represented in details in fig. 3.

1. Lift the airplane on jacks so that the main wheels are at 200 mm above ground and dismount the flexible pipe of the main leg upper part. Put caps on the flexible pipes free ends.
2. By means of the emergency crank, partially retract the leg. Dismount nut 1 and pin 2 of the hinge. Detach the leg fixed cross bar part and get in vertical position the free part of the leg.
3. Slowly lift the leg and set it on the holder under the wheel.
4. Dismount the 4 screws that fix covers 5.
5. Remove the holder under the main spar and release wheel downwards.

NOTE

If a new shock absorber assy is to be mounted, dismount the wheel of the old leg (diagram 5) and the brake installation (diagram 6) which will be mounted on the new assy.

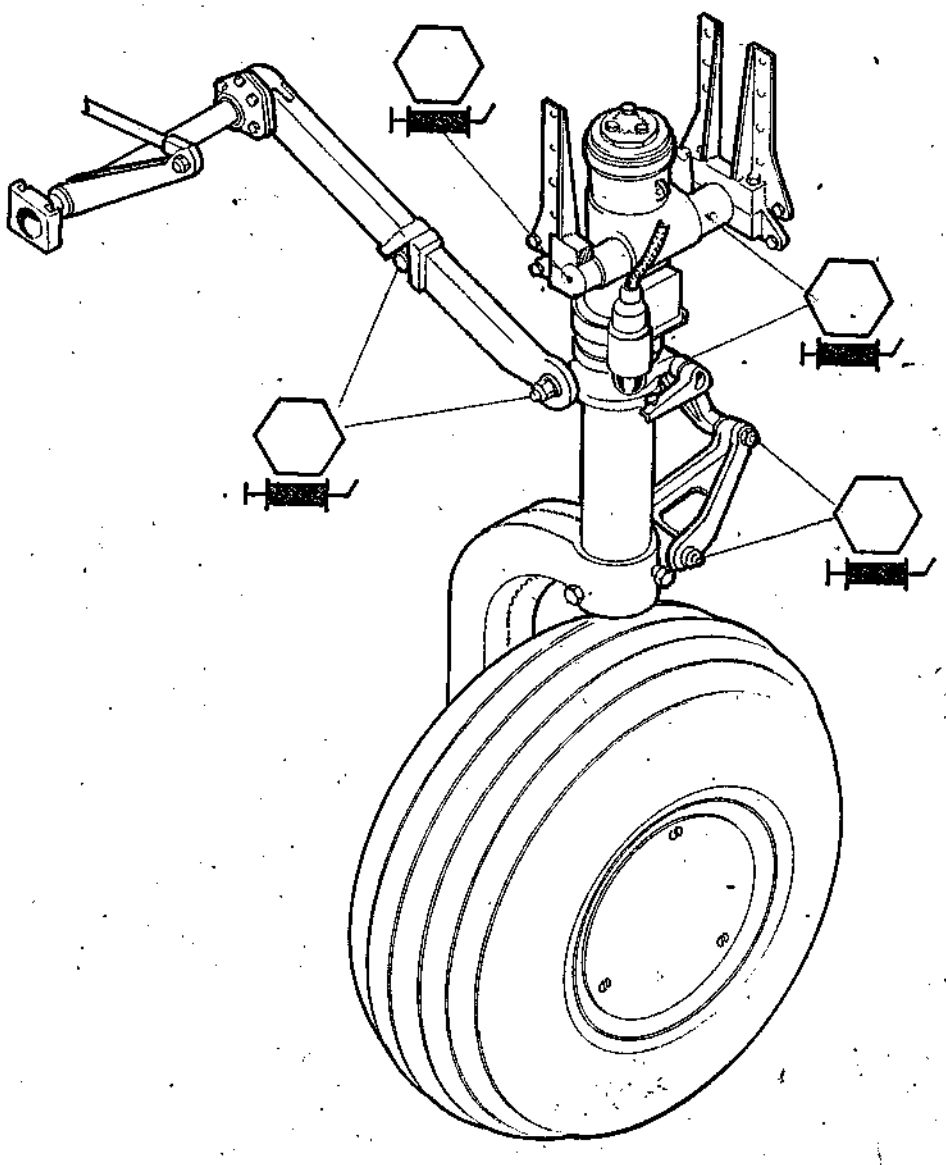


Diagram 8– Maintenance greasing and filling of the main leg assy

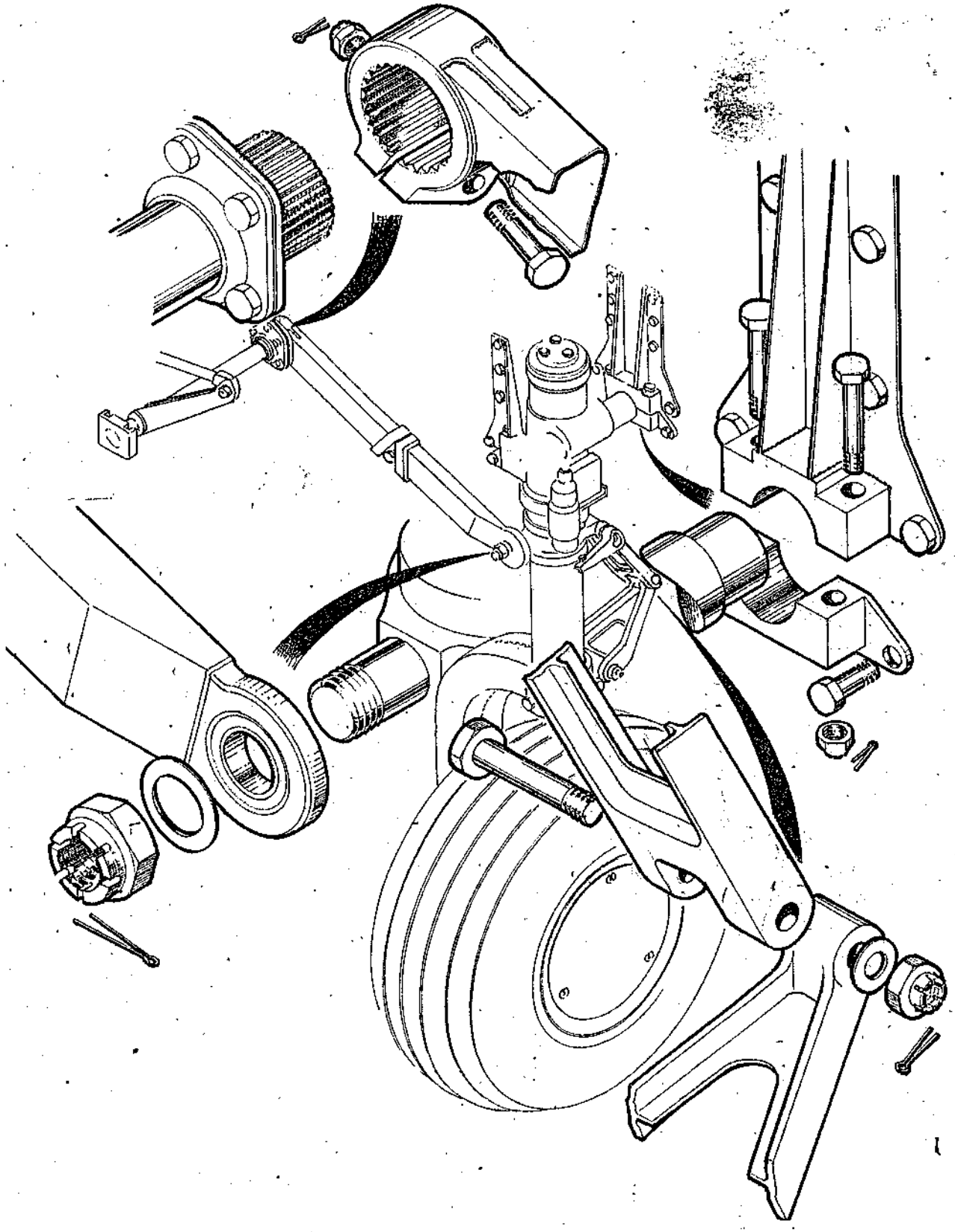


Diagram 8. a.

Mounting

The mounting takes place by repeating the dismounting operations in reversed order (see Note).

MAINTENANCE

Dismounting

Mounting and dismounting of the retracting electromechanism system is carried out only at the manufacturer's factory.

Electrical Installation

The maintenance of this installation is presented in fig. 7. If there is any damage within the installation parts, they have to be replaced by new ones of the same type. When microswitches are to be replaced, adjust the detectors travel, as it follows:

(a) Lift airplane on jacks till the wheels are above ground
(b) After the full extension of main legs, adjust the detectors
(c) With the landing gear extended adjust the microswitch detectors
(d) Retract landing gear and adjust the microswitch detectors
(e) With the landing gear retracted, start the engine and carry out the adjustment of the microswitch detector.

Front Leg Cross-bar

Periodically check the weldings condition.
Wash with gasoline and check the spherical bearing Ø10, its pin and the Ø6 pin connecting the cross-bar to the jack rod of the front leg. Grease with vaseline.
The M8x1.25 pin of the cross-bar hinge must have an axial clearance of 0.2 mm. Grease hinge with vaseline .
The cross-bar arm hinge mounted on the firewall shall be greased with vaseline.

Chapter 3.10

ILLUMINATION

Page

DESCRIPTION AND OPERATION

General

1. The external and internal illumination elements are applied at 28 V d.c., from the aircraft generator or battery.
   The external lights include landing lights, navigation lights, landing gear extended lights.
   The internal lights comprise the instrument panel and the cabin illumination circuits.
   Every circuit is protected by a circuit breaker located at the circuit breakers panel.
   The afferent switches are available on the pilot's switchboard.
   Magnetic compass and the watch is illuminated by separate circuits described in the Instruments chapter.

Navigation lights (fig. 1 and 2)

2. Navigation lights are installed at each wing tip and the most rear position of rudder. They are controlled by a single switch.
   These three lights are easily accessible as they are installed externally.

Anti-collision lights (fig. 1 and 2)

3. The airplane has an anti-collision light located on the fuselage.

Landing light (fig. 1 and 2)

4. This includes a landing light mounted on the engine cowl. It is of 100 W and is controlled by an individual switch.

Landing gear extended lights (fig. 2)

5. These include 3 white lights installed on each leg. They turn on when extending landing gear and the position lights are on as well.

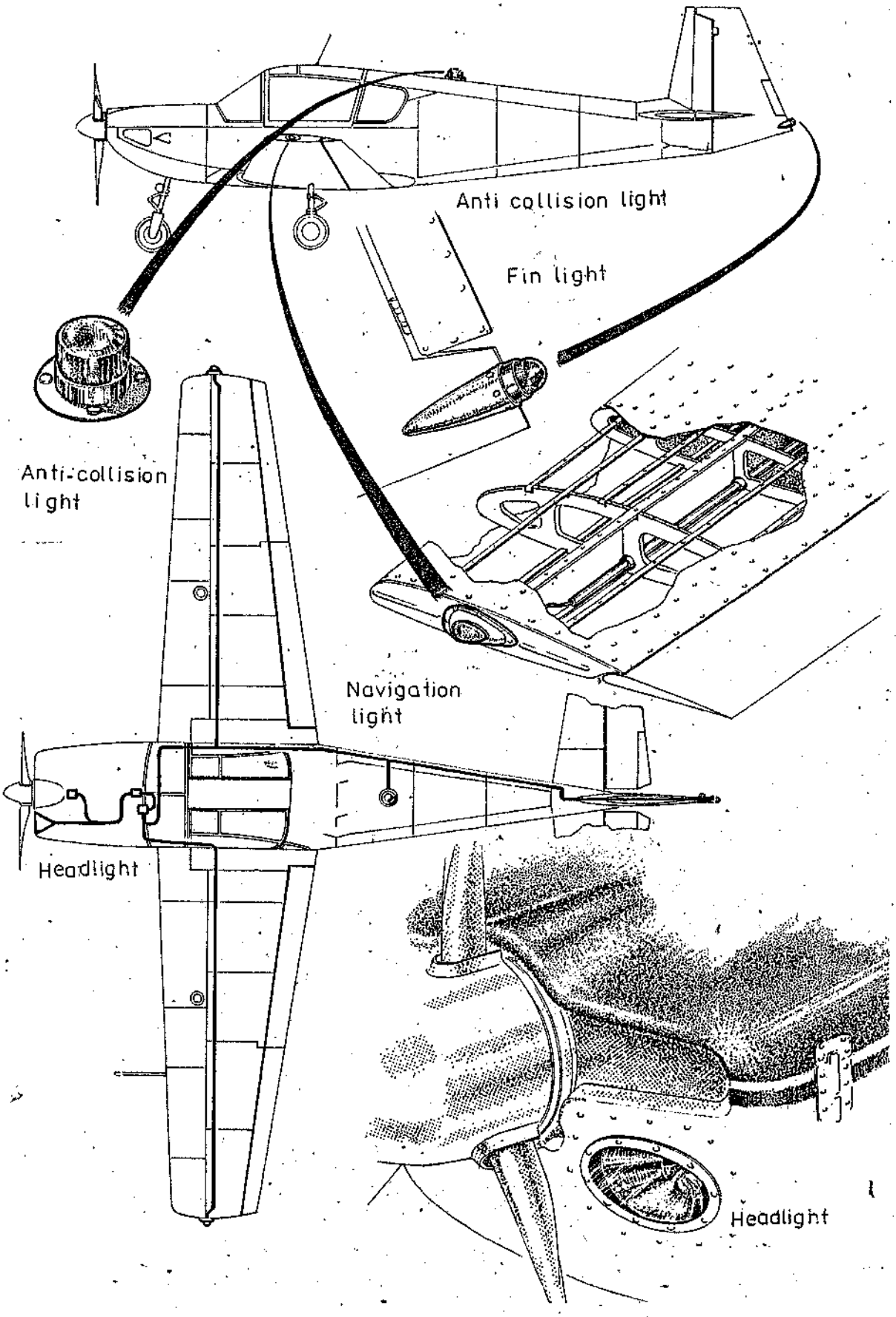


Fig. 1 External illumination navigation light and and anti-collision light

CAPTION TO THEORETICAL ELECTRIC DIAGRAM (figure 2)

Item	Component		Type
1.	Circuit breaker	28S	AZS 10
2.	Landing light	30S	FS 155
3.	Circuit breaker	20S	AZS 5
4.	Position Light	23S	BANO - 45
5.	Position Light	24S	HS 39
6.	Position light	25S	BANO - 45
7.	Relay	14S	TKE 53PD
8.	Light	15S	HS 39
9.	Light	16S	HS 39
10.	Light	17S	HS 39
11.	Circuit breaker	21S	AZS 5
12.	Anti-collision light	22S	WRM-24

Instrument panel illumination (fig.3)

6. Lights and double bridges are installed at the instrument panel.
   Supply voltage and ground are provided by a distribution bus bar.
   There are 2 separate illumination circuits for LH and RH lights with respect to the instruments.
   They are controlled by a double switch, but have two fuses.
   Conductors from switches pass through 2 rheostats to adjust illumination for nighttime.

Cabin illumination (fig. 3 and 4)

7. Cabin illumination is provided by a dome light controlled by a switch located at the switchboard.

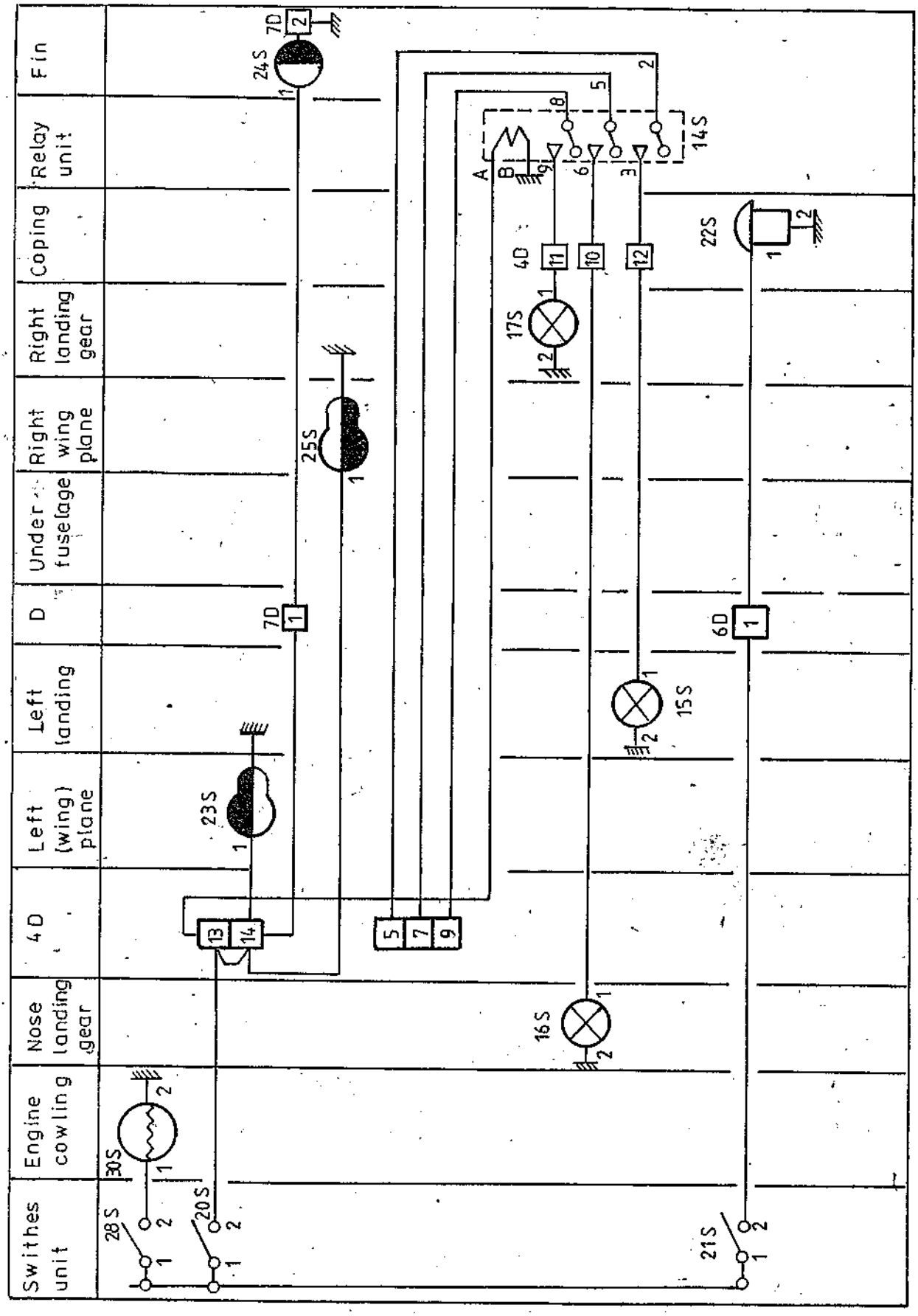


Figure 2.-External illumination electric diagram

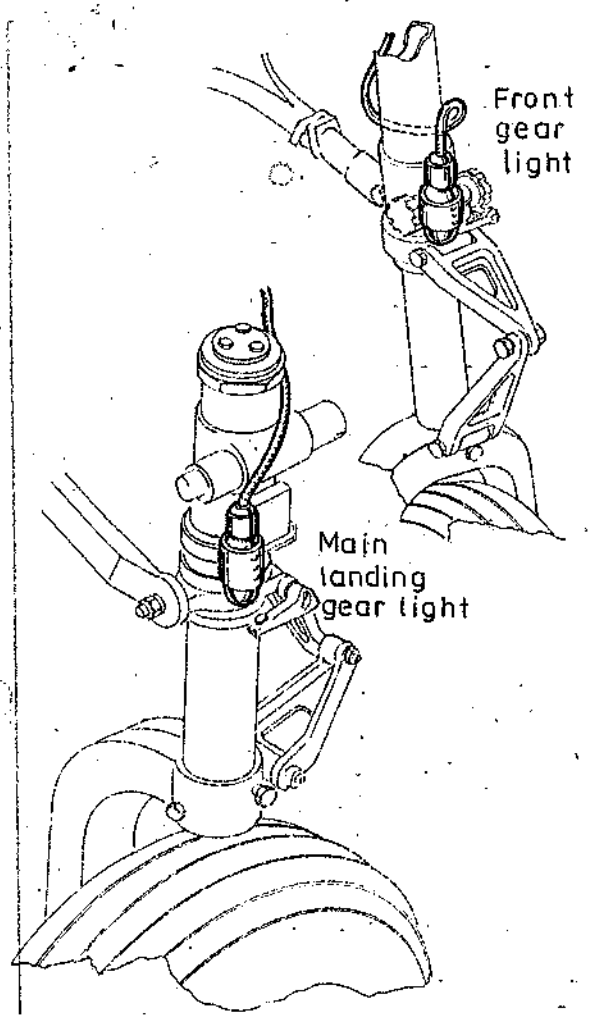


Figure 2.a. External illumination electric diagram and landing gear extended light.

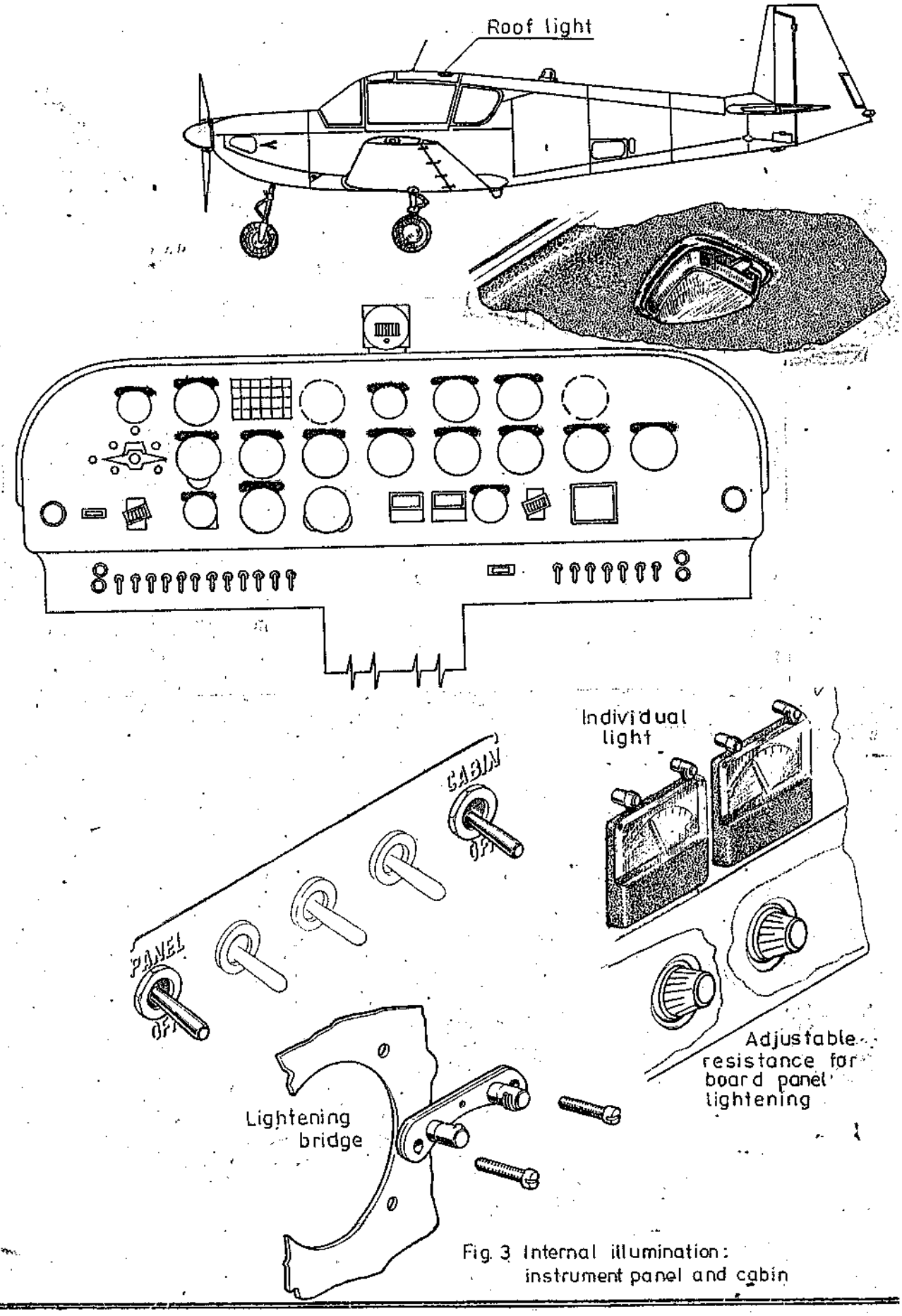


Fig. 3 Internal illumination: instrument panel and cabin

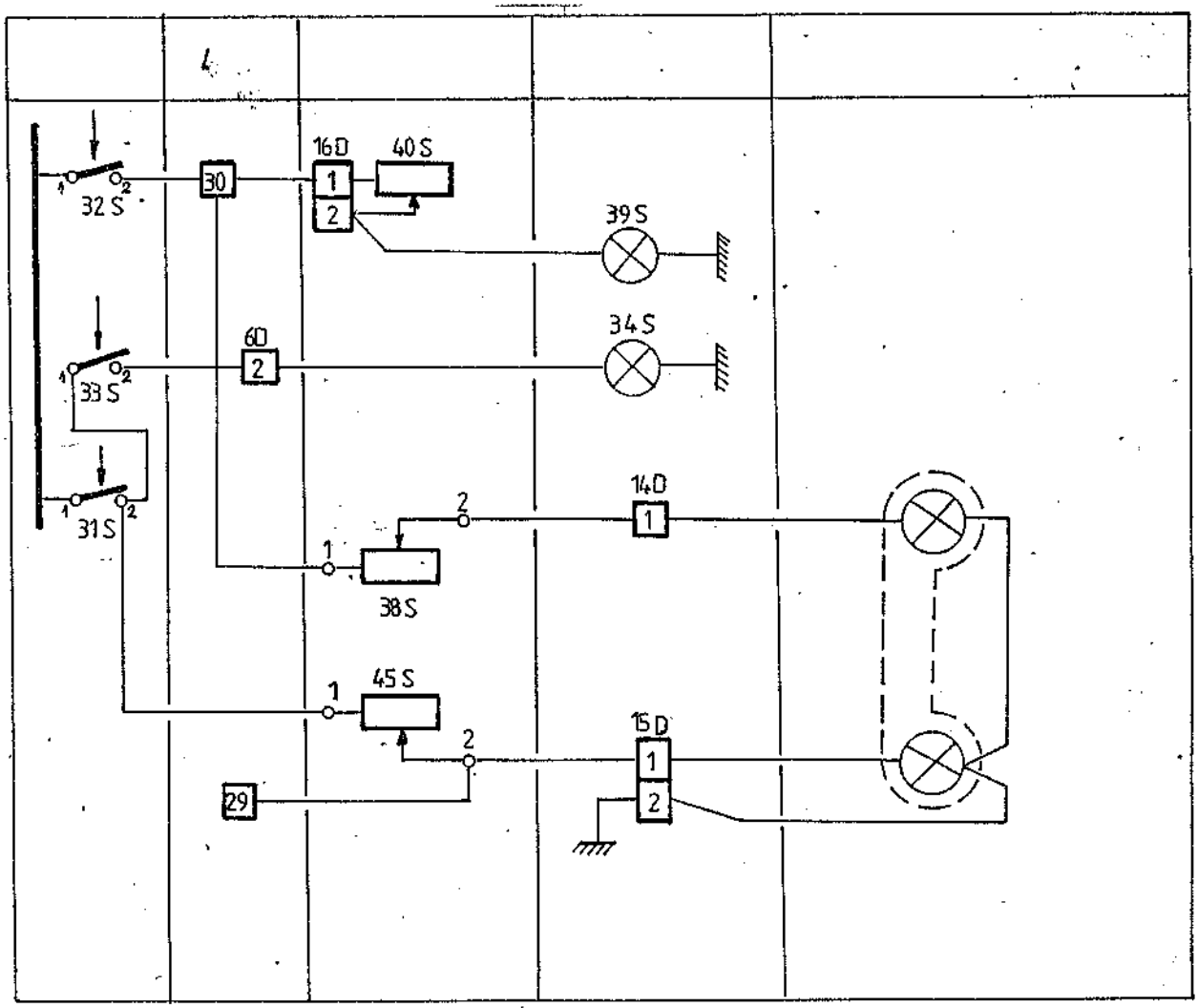


Figure 3.a. Instrument panel light - theoretical electric diagram

CAPTION TO THE THEORETICAL ELECTRIC DIAGRAM

Item	Component		Type
1.	Circuit breaker	31S	AZS-5
2.	Circuit breaker	32S	AZS-5
3.	Switch	33S	V-45
4.	Rheostat	38S	RKL-45
5.	Instrument panel illumination light	39S 34S	ARUFOS-45M
6.	Rheostat	40S	RUFO-45
7.	Rheostat	45S	RKL-45

RESERVED

MAINTENANCE

As regarding the illumination electric system maintenance, it shall be ensured that electric connections are in good operating condition. If lamps are burnt, they shall be replaced.