MANDATORY SERVICE BULLETIN

IS-29D2/IS-29D/EO-14

SUBJECT: GLIDER IS-29D2/IS-29D
Increase of the safe life until the first overhaul and between overhaul and between overhauls. Introduction of a maintenance schedule without limit of the calendaristic period until the first overhaul or between two overhauls.

Corresponds to modification: no subject

This Service Bulletin is based on :

- Increase of the safe life until the first overhaul and between the overhauls for the gliders IS-29D2/IS-29D owned by the Romanian Aeronautical Club Program, document code 701R.04.0025.
- Maintenance Exposition Manual program glider IS-29D2/IS-29D, document no. 77/15.04.2004
- Examination and Measurement of Skins Program, document code 701R.04.0020
- Maintenance and Operation on Condition of Skins Program, 701R.04.0021".
- The experience, gained by applying the Service Bulettins concerning safe life and gliders modification, particularly BS-IS-29D2/IS-29D/ER-13.

The technical content hereof has been approved under the authority of AACR, according to the Authorization Certificate no.AACR.JA.01 .

List of approved revision	Approved revision no.

List of effective pages			
Page.	Date		
1/3	06.04		
2/3	06.04		
3/3	06.04		

(1) APPLICATION INSTRUCTIONS

1A. Validity

To be applied to all the IS-29D2/IS-29D gliders.
This Service Bulletin replaces BS-IS-29D2/IS-29D/ER-13.

1B. Purpose

- Increase of safe life until the first overhaul and between overhauls from 750 flight hours to 1200 flight hours or 3000 landings.
- Introduction of a maintenance schedule based on the performed flight hours or on calendaristic time for gliders having a small number of flight hours/year.
- To specify the TBO for the board instruments mounted by manufacturer.

1C. Description

The overhaul (RG) will be performed after every 1200 flight hours or 3000 landings.
There isn't an imposed calendaristic time limit for the performance of RG.
The new safe life is valid only by applying a specific maintenance schedule based on the operation of the glider and on calendaristic time for the gliders with small number of yearly flight hours.
The maintenance schedule is presented in amendment no.21 of Flight and Maitenance Manual – issue 5, amendment no.10 of Flight and Maitenance Manual – issue 4 and amendment no 20 of Operation and Maintenance Manual IS-29D.

1D. Application

The application hereof (after the reception of this Service Bulletin) will be performed by the customer.

1E. Labor

No content.

1F. Material-Price-Availability

All costs required by the application hereof shall be borne by the customer.

1G. Tooling-Price-Availability

Special tools and equipments shall be ensured by the customer.

1H. Weight and balance

No content.

1I. Reference documents

- Flight and Maintenance Manual IS-29D2 issue 5 and 4.
- Operation and Maintenance Manual IS-29D
  - Appendix 1 – STRUCTURE SOUNDNESS CHECK.
  - Amendment 21 (issue 5)
  - Amendment 10 (issue 4)
  - Amendment 20 (IS-29D)

(2) EXECUTION INSTRUCTIONS

2.A. Work preparation

No content.

2B. Method of application

According to Flight and Maintenance Manual and Operation and Maintenance Manual.

2C. Identification

The appliance hereof will be registered in glider Log Book.

2D. Maintenance and operation indications

According to Flight and Maintenance Manual and Operation and Maintenance Manual.

(3) INSTRUCTIONS CONCERNING THE MATERIALS

3A. Basic elements

No content.

3B. List of materials

No content.

3C. List of tooling

No content.

3D. Provisioning instructions

No content.

3E. Appendix

- Appendix 1 – STRUCTURE SOUNDNESS CHECK.
- Amendment 21 (Flight and Maintenance Manual IS-29D2, issue 5).
- Amendment 10 (Flight and Maintenance Manual IS-29D2, issue 4).
- Amendment 20 (IS-29D). Maintenance Manual

Part No.	Amended page	Revision nature	Date		Signature
			Of aproval	Of insertion	
18	3.4.C	T.B.O. improvement (only for Romania)			
19	3.4.D; 3.4.1.A; 3.4.2; 3.4.3; APPENDIX 1/03.1998 APPENDIX 2/03.1998	Servicing of the gliders with the overhaul carried out after 20 years from the manufacturing date (S.B. IS-29D/ER-13).	18.03.98		
20	0.3.1.A.; 3.4.E; 3.4.B; 3.4.2.A; 3.4.4; 3.4.5; APPENDIX 1	Safe life and total and partial service life, maintenance schedule.	14.06.2004		

Table of Periodical Checks & Work

For gliders S/N 1 to 20 :

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- The safe life until the first overhaul and between overhauls is 500 flight hours (2000 landings) or 5 years.
- Total safe life – 1700 flight hours (9000 landings) or 10 years.

PERIODICAL INSPECTIONS AND REVISIONS SEQUENCE

A. Maintenance cycle

The inspections and revisions of the glider in flight hours and calendaristic periodicity, are as follows:

C – Inspection after 100±5 flight hours

During the 100 hours inspection, a thorough check of the glider shall be performed, as well as the greasing in the points indicated in the diagrams of this section.

R1 - Revision after 200±5 flight hours or one operation year (if there are less flight hours)

All the R1 revision works (page. 3.4.4, 3.4.5) shall be carried out and, in addition, the **C** inspection works
(as 100 flight hours multiple) and also the control surfaces deflections and controls clearances are to be measured.

R2 - Revision after 600±25 flight hours

All the R2 revision works (page. 3.4.4, 3.4.5) and, in addition, the C and R1 works shall be carried out.

R6 - Revision after 6 operation years (when the glider has not accomplished the conditions for RG)

20 All the R6 revision works shall be performed every year starting with the ninth year of operation, until RG.

Note 1: The counting of the operation years will start at the manufacturing date if there isn't a performed RG or at the last RG performing date.
During this revision, all the R2 revision works shall be performed and in addition:

- Clearance check in the control surfaces hinges (without dismounting)
- Clearance check to wing-to-fuselage junction and fin-to-stabilizer junction (no motion must be noticed in mounted condition)

- The condition and operation of the controls linkages shall be checked. The corrosion occurrence to the tubular rivets at the end of the control rods, to the end parts of the control rods and to axles fitting bushes shall be particularly checked. If any corrosion is noticed, the respective parts shall be dismounted, cleaned and greased with protection vaseline.
- The wings can show paint coating cracks in the skin bonding area (this is not an alarming sign). Paint shall be applied for preventing the moisture penetration.
- The glider shall be subjected to a local repair if 20 consecutive loosened wing rivets are detected (at a skin bonding) and if more than 10 consecutive loosened rivets are found out (in the cone bonding area and cone-to-fin attachment area of the rear fuselage).

For other defects detected , the manufacturer shall be consulted.

CSS – Structure soundness check

This check shall be performed every 3 years starting with the 12-th year of operation until RG (if the RG wasn't performed, the check shall be performed every two years starting from the 21-th year of operation). Years counting according to Note 1.

The structure soundness check shall be performed by a technical staff authorized for inspection and maintenance works. The works shall be performed according to APPENDIX 1. The results of the performed works will be placed in " Glider IS 29D corrosion condition check questionnaire ". A copy of this questionnaire will be sent to manufacturer for information.

Note 2: In Romania , the authorized technical staff must be trained and certified by manufacturer. After this check, the authorized technical staff (the inspector) decides:

- Glider in flight condition, or
- Indicates the repairs to be performed in order to put the glider in flight condition, or
- Sending to perform the RG before the consumption of the 1200 flight hours (3000 landings) in case of improper technical condition of the glider.

RG – Overhaul after 1200 flight hours or 3000 landings

Note 3: There isn't a imposed calendaristic time limit for the performance of RG.

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The RG shall be performed by the manufacturer or by a workshop which is accepted by manufacturer to perform overhauls (RG).

Note 4:The maintenance schedule is structured depending on the performed flight hours and is mandatory.

This schedule, based on flight hours, is completed with works which are performed depending on the calendaristic period from the manufacturing date or from the last RG date for the gliders which cumulate less flight hours and therefore, with rarely performed maintenance works.

If the lapse between R2 and R6 happens to be very short (less than 50 flight hours), the more complex work (R6) will be performed.

B. Times between overhauls (TBO) and service lives for component parts

Instruments mounted by the manufacturer:

Part no.	Instrument	Type	TBO
1	Airspeed indicator	PZL-PR-250S	2000 hours
2	Altimeter	PZL-W10S	1500 hours
3	Variometer 30m/s	PZL-WRs – 30c	1000 hours
4	Variometer 5m/s	PZL-WRs – 5D	1000 hours
5	Total energy trim tab	PZL-KWEC-2	1000 hours
6	Compass	PZL-BS-1	2000 hours
7	Turn and bank indicator	PZL-EZS-2	1200 hours

The maintenance of instruments shall be performed by an authorized person according to the indications of the manufacturer.

The board instruments of the gliders with maintenance depending on time (large operation period until RG) have to be carefully watched and after 10 years, be subjected to a calibration (time might alter their sensitivity). The calibration shall be performed by an authorized organization.

TOST releases

According to TOST documentation , the releases E72G, E73G will be dismounted and sent for revision after 2000 starts or 3 operation years.
The revision shall be performed by an authorized organization.

Rubber parts

Operation on condition (canopy gasket, instrument panel shock-mounts, flight controls run limiter, etc)

External surfaces (Skins)

Operation on condition. For repair methods, see Repair Manual.
Depending on skin condition, the authorized technical staff decides the local repair or the complete replacement of the skin.
In Romania, this evaluation is in accordance with "Examination and Measurement of Skins Program 701R.04.0020". Maintenance according to "Maintenance and Operation on Condition of Control Surfaces Skins Program 701R.04.0021".

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C. Total safe life and service life of the glider

The total safe life of the glider is of 3750 flight hours or 15000 landings, its total service life is of 35 years.

Note:

- This total service life is ensured by the quality of the maintenance works and store conditions.
- The total service life of the glider depends on its technical condition, particularly on its structure corrosion condition (soundness). The periodical soundness checks establish the condition of the structure and decide if the glider is still in flight condition, if it is necessary to perform a RG (before the consumption of the safe life) or if the glider will be definitively kept from flight (before the limit of 35 years).
- After 35 years, only the owner of the Type Certificate of the glider can accept the aircraft to flight.

A 6 years revision shall be included in each overhaul.
This revision consists of :

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- Visual check of landing gear support and riveting to structure.
- Visual check of wheel fork (distortion, corrosion).
- Visual check of shock-absorber condition (greasing).
- Chec of main wheel, tail wheel, bearing, tyres.

SYSTEMS MAINTENANCE

MAINTENANCE WORKS PERIODICITY

20	According to the indications								
	*CSS-After 12 years and after every 3 years								
	*R6-After 6 years and yearly after 9 years								
	RG-After every 1200 hours								
	R2-After every 600 hours								
	R1-Yearly or after every 200 hours								1
	C-After every 100 hours							Structure soundness check –Maintenance Manual Appendix 1	
							(R2) + Works indicated in page 3.4.E		
1.LANDING GEAR									
1.1 Visual check of landing gear support and structure riveting.			X						2
1.2 Visual check of wheel fork (distortion, corrosion).			X						2
1.3 Visual check of shock-absorber condition (greasing).	X								
1.4 Inspection of wheels (main wheel and tail wheel), bearings tyres greasing.			X						
1.5 Wheel brake (greasing of control route and shoes driving cam shaft), shoes and drum surface check.			X						2
1.6 Inspection of wheel fork-to-landing gear support joint, by dismounting; wear evaluation and greasing..				X					
1.7 Inspection of wheel fork-to-shock absorber joint, shock absorber fork by dismounting (wear and greasing).				X					
2. AIRCRAFT									
2.1. Visual check of glider outside (after washing)	X								
2.2. Visual inspection of glider structure condition (by dismounting the inspection covers).		X							
2.3. Visual check of skin joint areas on fuselage and wing.				X					
2.4. Visual check of wing junction, washing and greasing.		X							5
2.5. Wear check to wing-to-fuselage jonction bolts.					X				5
2.6. Cleaning of wing junction fittings, measurement.					X				5
2.7. Visual check of tails junctions (washing, greasing).		X							
2.8. Check of horizontal tail pin wear.					X				
2.9. Control surfaces dismounting, check of hinge clearance.					X				
2.10. Visual check of plexiglass canopies.	X								
2.11. Check of canopy hinges greasing (no corrosion should be found).		X							
2.12. Check of seat, upholstery, safety belts attachment adjustment.		X							
2.13. Visual check of instrument panel shock-mounts, instruments.		X							
2.14. Instrument panel dismounting, shock-mounts replacement (according to their condition).					X				
2.15. Compass trim.					X				3
2.16. Visual check of air scoops, wiring sealing hose..					X				

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	According to the indications	*CSS-After 12 years and after every 3 years	*R6-After 6 years and yearly after 9 years	RG-After every 1200 hours	R2-After every 600 hours	R1-Yearly or after every 200 hours	C-After every 100 hours	(R2) + Works indicated in page 3.4.E	Structure soundness check –Maintenance Manual Appendix 1
2.17. Pipes replacement (rubber or plastic) depending on their condition.								X	
2.18. Water settler-drain, sealing (Braunschweig system).							X		
2.19. Rubber elements replacement at the Braunschweig system.								X	
2.20. Radio antenna, wirings (if they exists in the glider's endowment) following the equipment's instructions.							X		
2.21. Board instruments check in a specialized workshop.								X	6
3. CONTROLS									
3.1. Visual check of cables, bearing pulleys, greasing, sandow replacement (according to their condition).						X			
3.2. Visual check of sticks and under floor area, check of clearances within the elevator and aileron control, check of air brake control locking, check of cable tensions.						X		X	
3.3. Visual check of rudder pedal assy, sandow replacement (according to their condition) greasing.						X		X	
3.4. Visual check of trimmer condition and trimming spring..						X			
3.5. Dismounting of controls from structure, replacement of worn out items and greasing.								X	
3.6. Visual check of control surfaces skins and structure.						X			
3.7. Replacement of control surface fabric (rudder and elevator).								X	
3.8. Release check, greasing (including the control).							X		4

* Years since the manufacturing date if there isn't a performed RG or since the last RG performance date.

INDICATIONS:

1. The operations indicated in this column shall be carried out after every 200 flight hours or at least once a year, preferably at the beginning of the flying season.
2. The landing gear shall be also checked every time an abnormal landing occurred (forced or heavy landing).
3. The trim shall be carried out after every installation of new instruments on the instrument panel, particularly those creating electromagnetic fields.
4. The operations shall be carried out according to the maintenance and servicing instructions for TOST releases, type E72 and E73.
5. In case of corrosion traces, use very fine abrasive paper to remove them (by circular movement) and then grease.
6. The chek shall be also performed if wrong indication are notice.

APPENDIX 1

CHECK OF THE IS-29D GLIDERS CONDITION FOR CORROSION APPEARANCE

(STRUCTURE SOUNDNESS CONDITION)

The check of the IS-29D gliders for corrosion appearance shall be carried out, in principle, according to the recommendations of the ADVISORY CIRCULAR FAA-AC43-4A/25.07.1991, having for subject the "CORROSION CHECK FOR AIRCRAFT".

1. General

To prevent corrosion, a constant cycle of cleaning, inspection and greasing is required. The prompt detection and removal of corrosion will limit the damage extension to the aircraft and its components. The basic requirements of a corrosion prevention and inspection program shall include at least the following points:

(1) Adequate personnel, specialized in corrosion fighting, with solid knowledge of the corrosion appearance conditions, detection, identification, cleaning, treatment and prevention.

(2) Detailed knowledge of the corrosion identification techniques.

(3) Aircraft washing at scheduled intervals.

(4) Wiping or cleaning of all exposed surfaces.

(5) Keeping the drain and through holes in open and functional state.

(6) Immediate detection and restoration of the damaged protection coat.

(7) Complete cleaning, greasing and prevention at the prescribed intervals.

(8) Prompt corrosion treatment after detection.

2. The corrosion effects on the main metals used in the IS-29D construction are show in the table below.

(Table taken from AC43-4A)

ALLOY	TYPE OF ATTACK TO WHICH ALLOY IS SUSCEPTIBLE	APPEARANCE OF CORROSION PRODUCT
Magnesium	Highly susceptible to pitting.	White, powdery, snowlike mounds and white spots on surface.

ALLOY	TYPE OF ATTACK TO WHICH ALLOY IS SUSCEPTIBLE	APPEARANCE OF CORROSION PRODUCT
Low- alloy steel (4000 – 8000 series)	Surface oxidation, surface and intergranular pitting.	Reddish-brown oxide (rust).
Alluminium	Surface, intergranular pitting, exfoliation stress-corrosion and fatique cracking and fretting.	White-to-grey powder
Cadmium	Uniform surface corrosion used as sacrificial plating to protect steel.	From white powdery deposits to brown or black mottling of the surface.
Stainless steels (300-400 series)	Crevice corrosion; some pitting in marine environments; corrosion cracking; intergranular corrosion (300 series); surface corrosion (400 series).	Rough surface; sometimes a uniform red, brown stain.
Nickel-base (Inconel, Monel)	Generally has good corrosion resistant qualities; susceptible to pitting in sea water.	Green powdery deposit.
Copper-base Brass Bronze	Surface and intergranular corrosion.	Blue or blue-green powdery deposit.
Chromium (Plate)	Pitting (promotes rusting of steel where pits occur in plating).	No visible corrosion products; blistering of plating due to rusting and lifting.

3. Corrosion Check on wings

3.1. The external surfaces (skins) are protected by finish priming and painting. In the area of riveted wing skins, corrosion may occur around the rivets.
These defects may occur as shown in fig. 4-1.

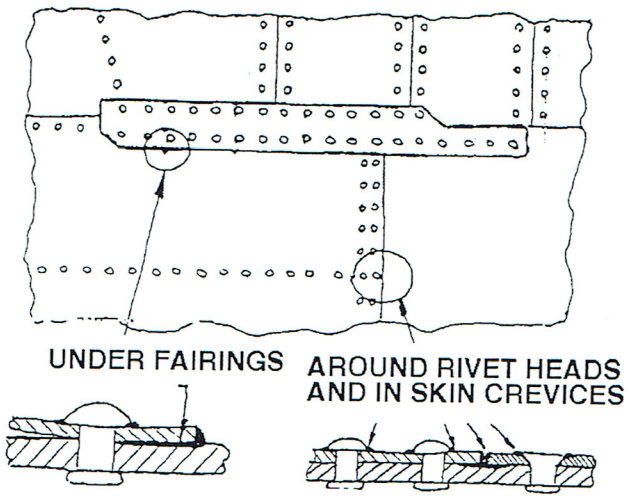


Fig. 4-1/Section 4/Para. 400 of AC 43-4A

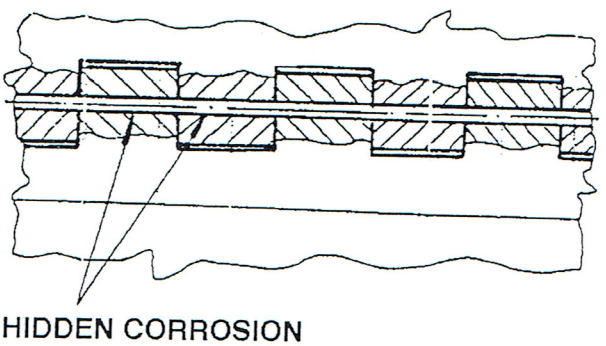


Fig. 4-7/Section.4/Para. 406 of AC-43-4A

The effect of the corrosion types described above may be noticed firstly by the cracking and blistering of the paint coat.

3.2. The hinges type piano-chord are particularly exposed to corrosion due to the contact between different metals (aluminium alloy and steel) as shown in fig. 4-7.

3.3. The corrosion check for the wing consists in :

(a) Skin and riveting area check according to the indications of point 3.1.
(b) Check of flaps attachment hinges as shown to point 3.2.
(c) Check of aileron supports and joint shaft.
(d) Check of junction fittings, link fittings and junction bolts.
(e) Check of flanges and relevant fittings.
(f) Check of air brake housing.
(g) Check of control rod supports.
(h) Check of areas near the inspection covers and draining holes.

NOTE : The points (a) to (h) are to be found on fig. 3.1.

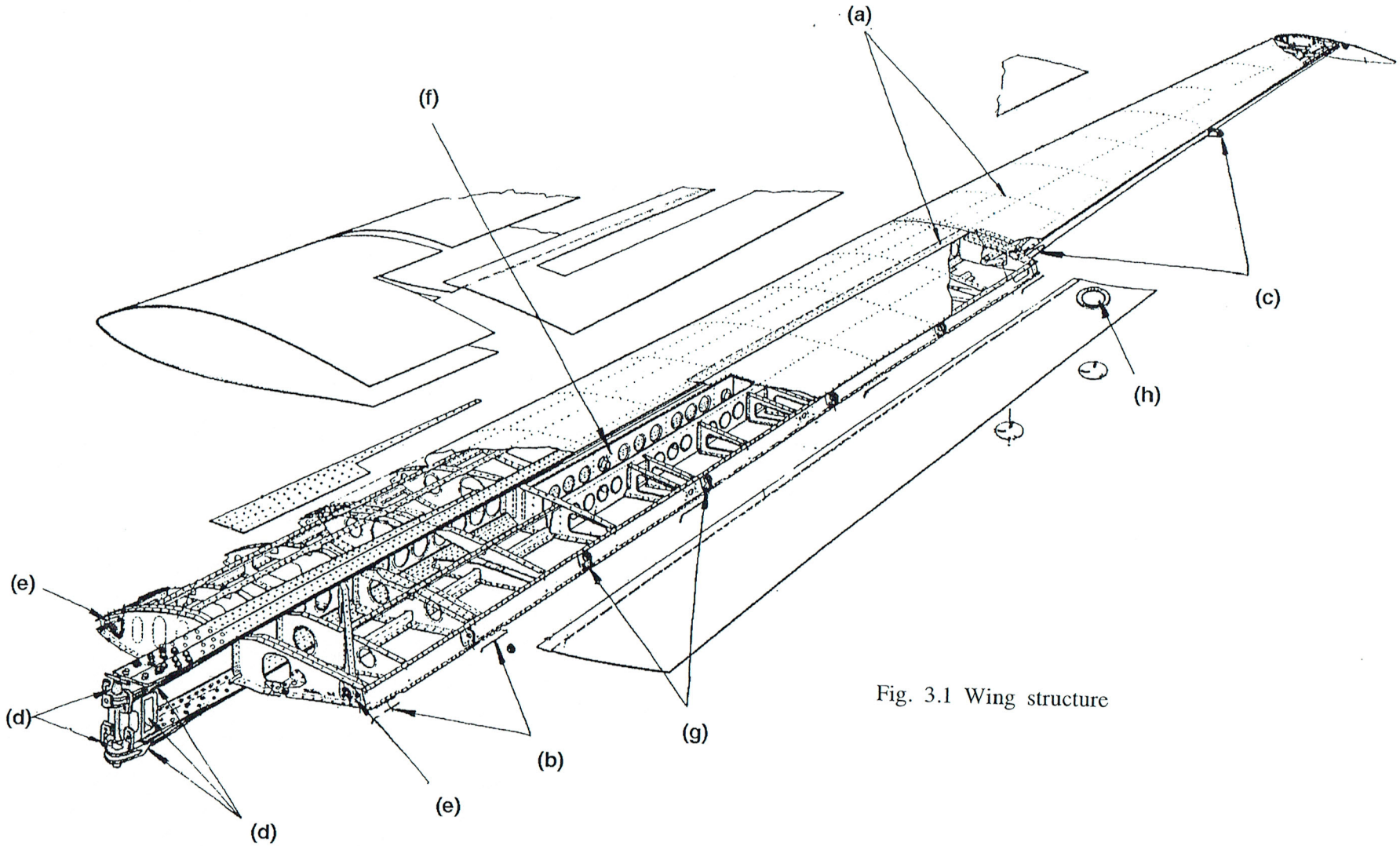
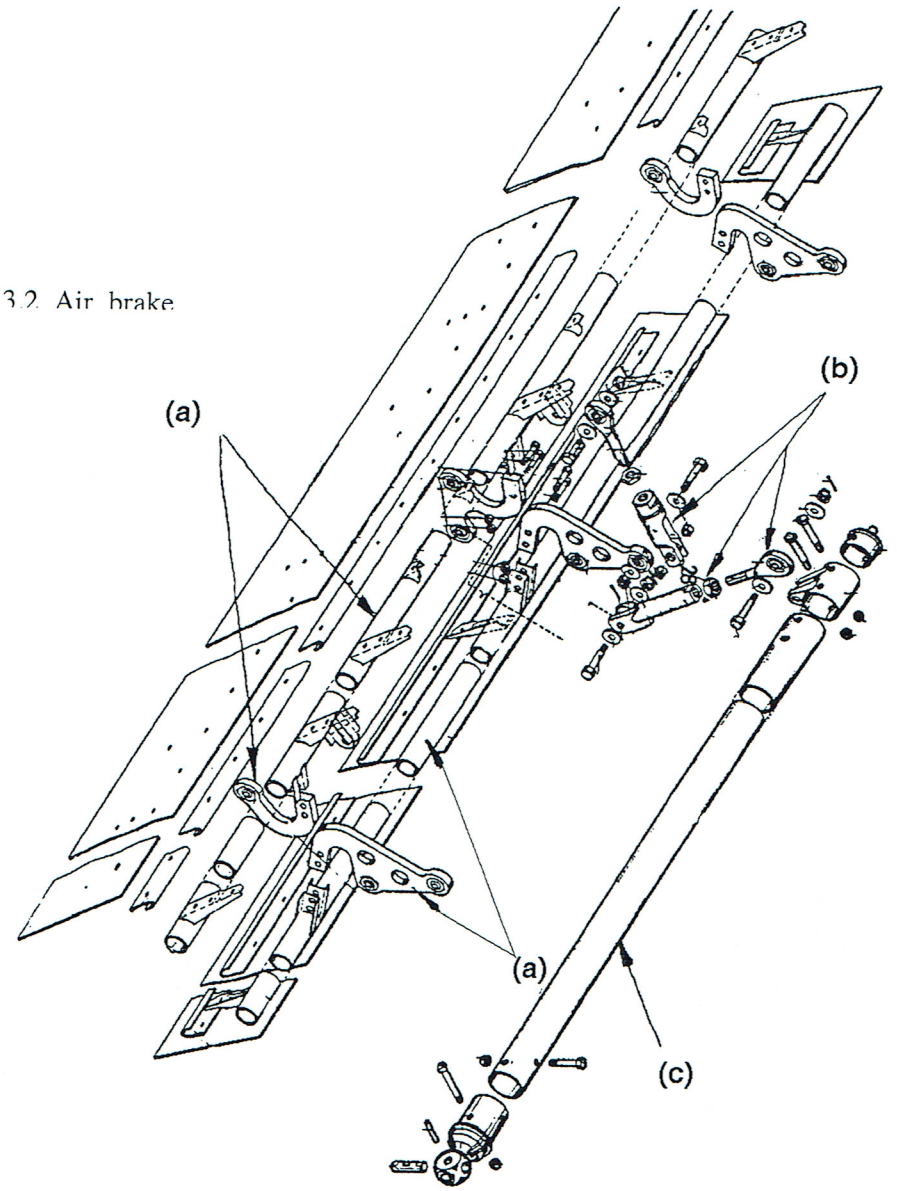


Fig. 3.1 Wing structure

3.4. Check of air brake components according to the points shown in fig. 3.2.

(a) Check of metal frame with upper/lower levers.
(b) Check of control items.
(c) Check of control rods.

Fig. 3.2 Air brake



4. Check of fuselage structure/skin and fin.

The areas to be carefully checked are the following (see fig. 4.1) :

(a) Spars-integrity check.
(b) Junction bolts and pins.
(c) Fuselage frames and panels.
(d) Release mounting area.
(e) Landing gear mounting area.

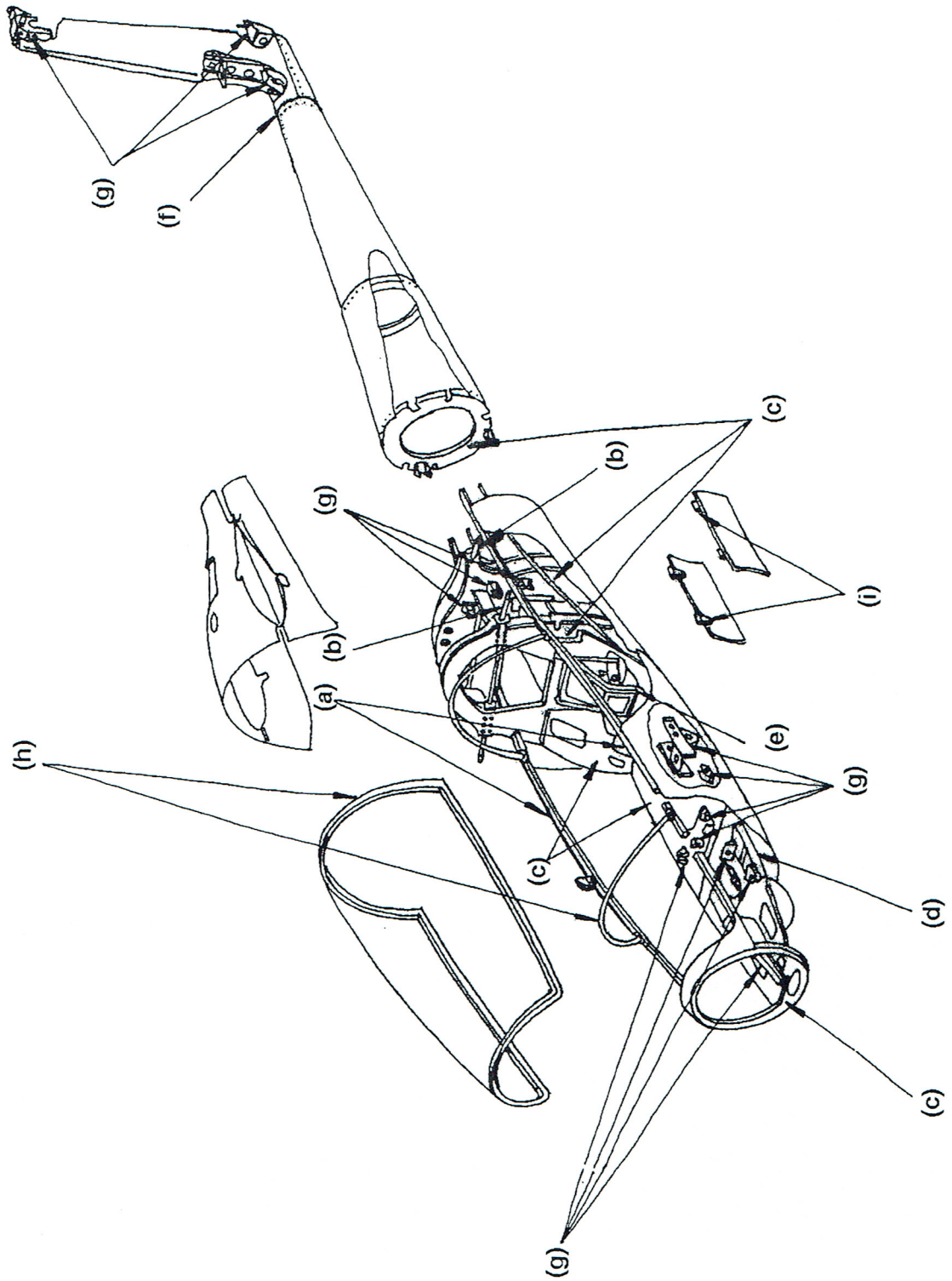


Fig. 4.1 Fuselage structure

(f) Fuselage-to-fin junction area.
(g) Fuselage and fin control supports.
(h) Fixed arcade and canopy structure.
(i) Landing gear trap hinges.

(j) NOTE : The skin/fin riveting areas are to be checked according to the indications of point 3.1.

4.1. Tail skid area check (Fig. 4.2.). For the tail skid version, the following components shall be checked:

(a) Skid components, as shown in fig. 4.2.a and tail wheel components, as shown in fig. 4.2.b.
(b) Skid support riveting.
(c) Wheel shaft with pins.

4.2. Check of fin-to-rudder, stabilizer-to-elevator joint area.

(a) Elevator-stabilizer hinge area.
(b) Fin-rudder hinge area.

Fig. 4.2 Tail skid assy

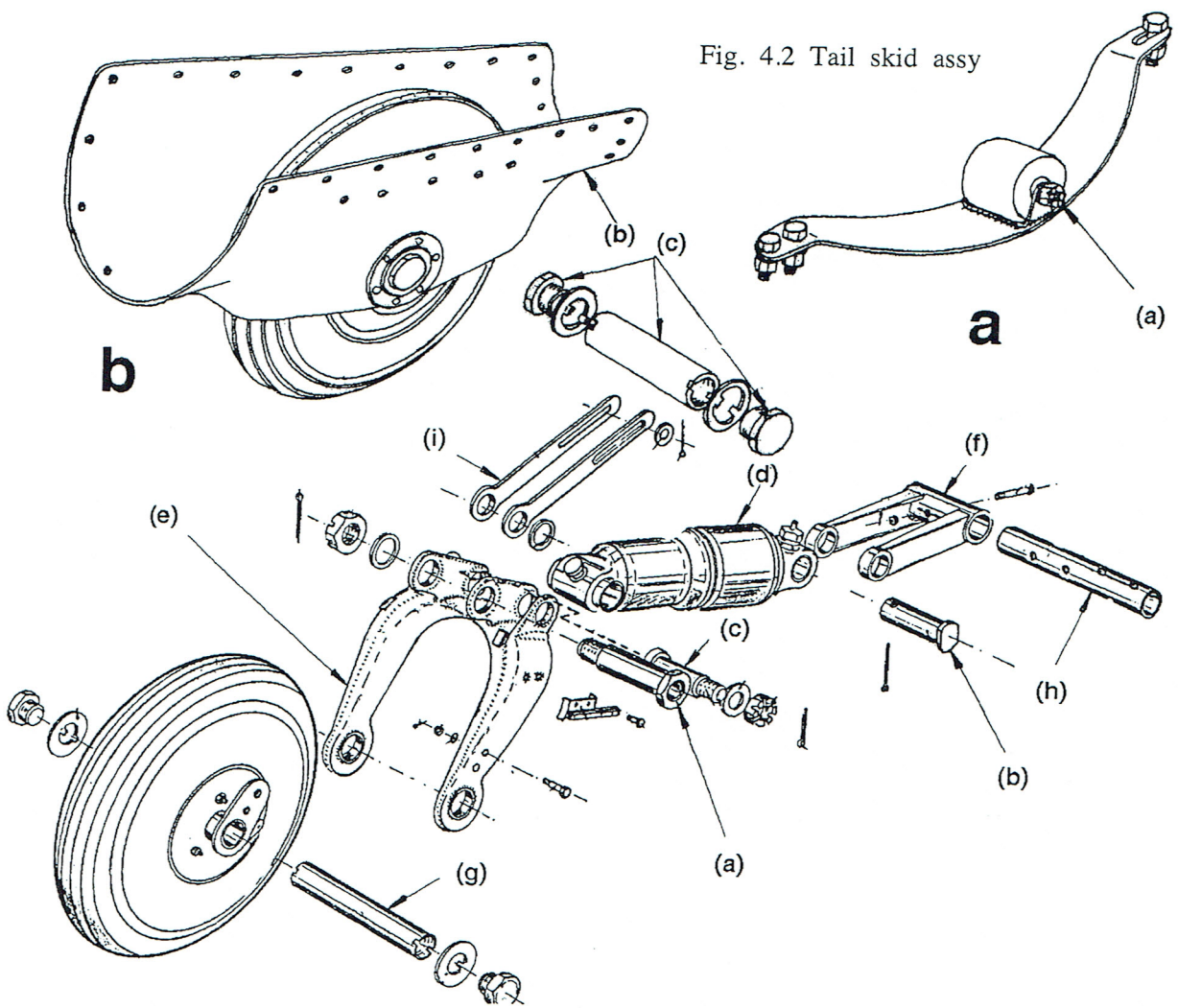


Fig. 5.1 Equipped landing gear

5. Landing gear components check (Fig. 5.1)

The following components shall be checked to the retractable landing gear: big shock-absorber shaft (a); small shock-absorber shaft (b); fork shafy (c); shock-absorber items (d); wheel fork (e); fork (f); wheel shaft (g); fork shaft (h); distance parts (i).

6. Controls check for corrosion occurrence

The control rods particularly exposed to corrosion due to the contact between different metals (aluminium alloy and steel) shall be checked to all the glider controls.

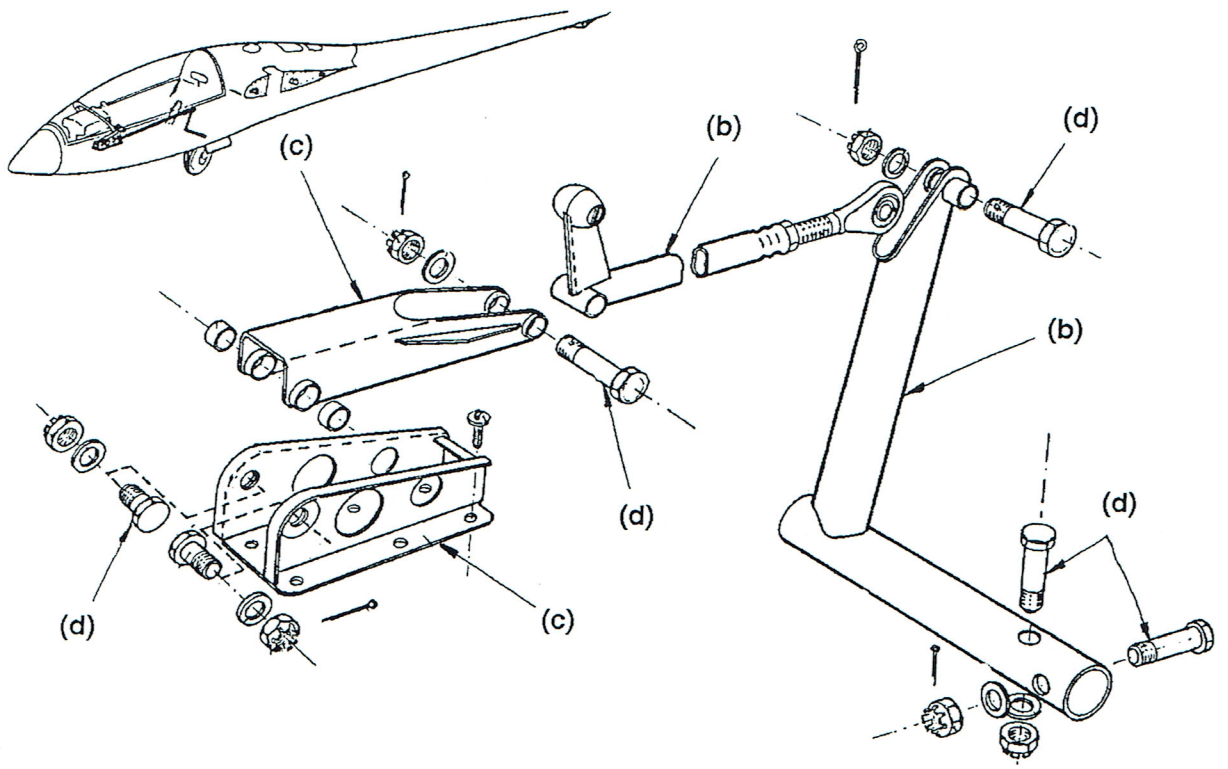


Fig. 6.1 Landing gear retracting control

Landing gear retracting control (Fig. 6.1); aileron control (Fig. 6.2); elevator control (Fig. 6.3); rudder control (Fig. 6.4); air brake and flap control (Fig.6.5); trimmer control (Fig. 6.6); release control, wheel brake control.

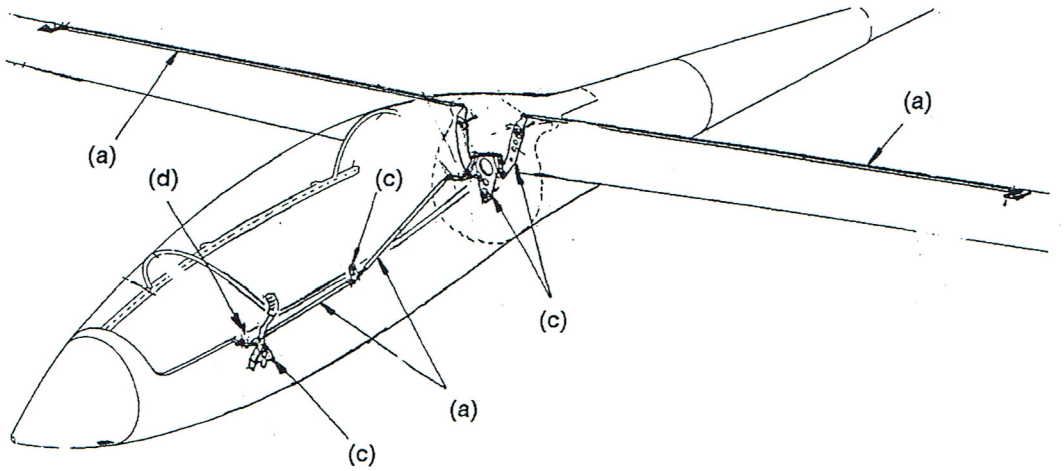


Fig. 6.2 Aileron control

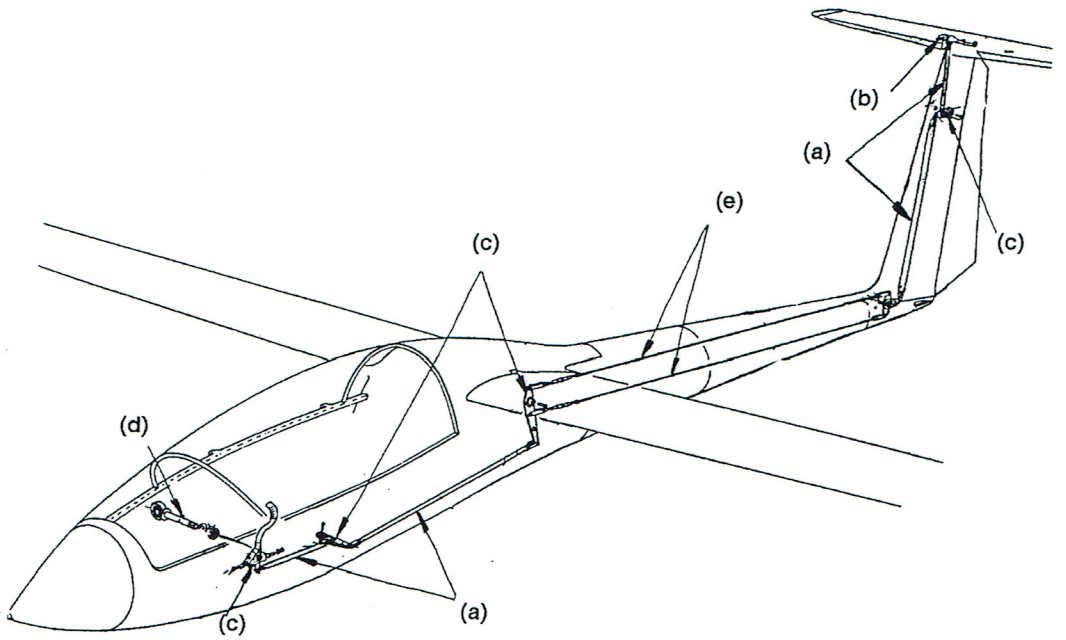


Fig. 6.3 Elevator control

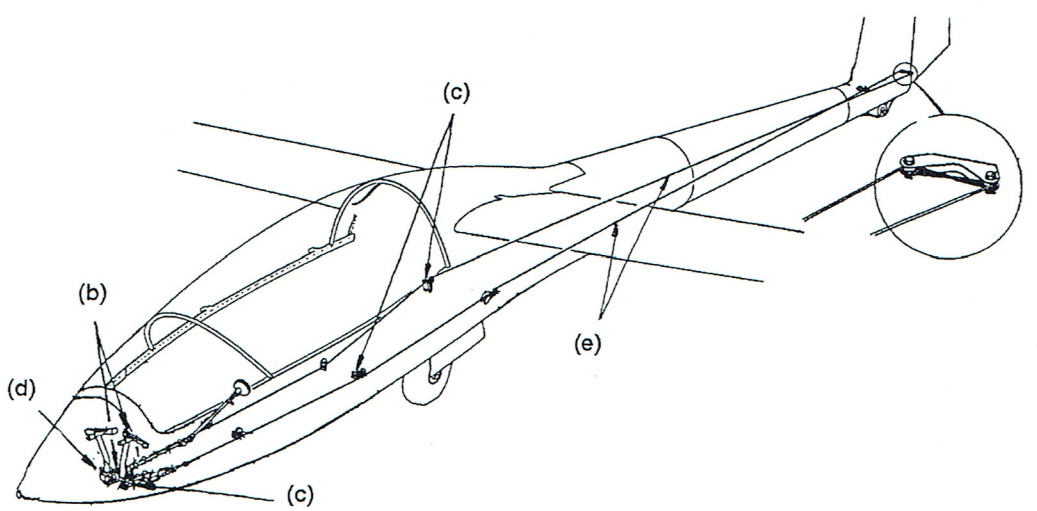


Fig. 6.4. Rudder control

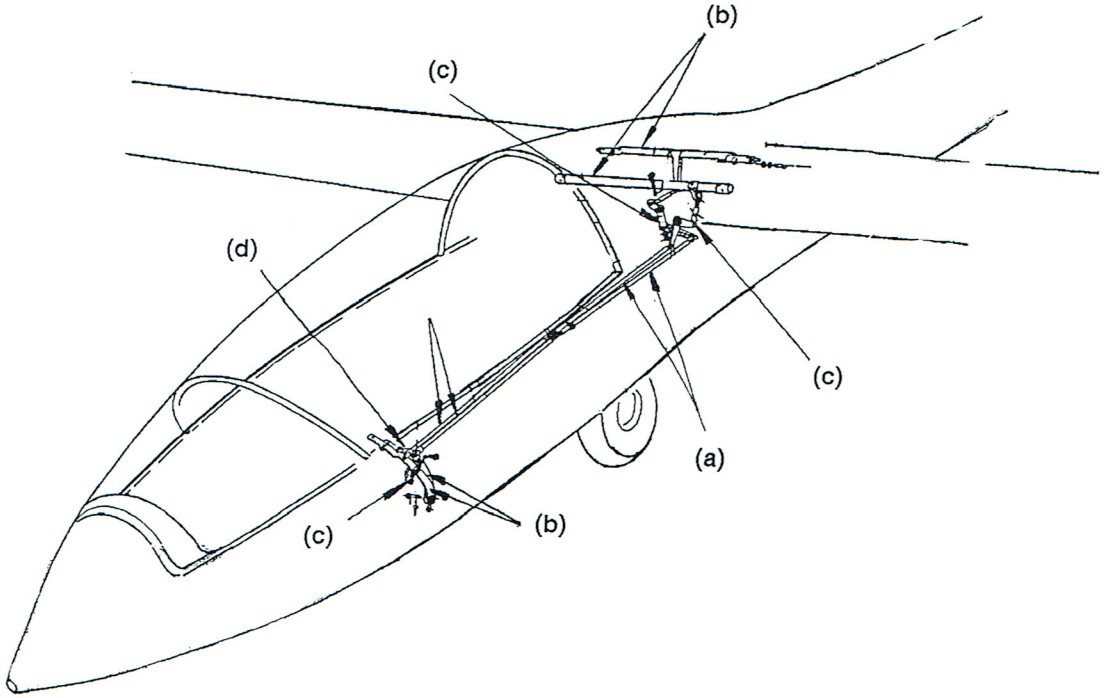


Fig. 6.5 Air brake and flap control

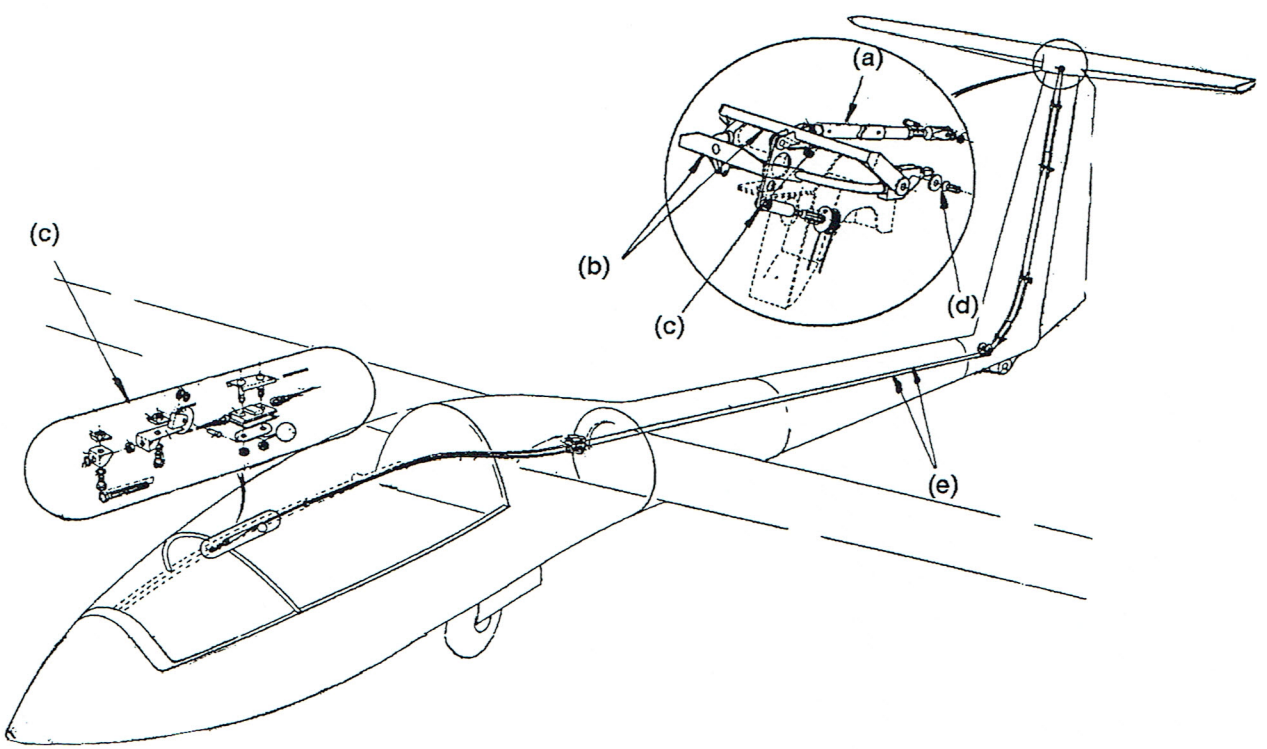


Fig. 6.6 Trimmer control

The priority areas to be checked within the control linkage shall be (Fig. 6.1 to 6.6) :

(a) Riveting area of control rod ends.
(b) Control rods and arms with welded/machined items.
(c) Structure attachment supports (guides).
(d) Areas including removable assembly units.
(e) Steel cables within the controls linkage.

NOTE : The steel cables can be considered critical areas and shall be thouroughly checked after dismounting and cleaning because corrosion may occur also inside the cable (on the cable wires). The cable end attachment areas shall be thouroughly checked. The cables showing even minor corrosion marks shall be replaced and then protected accordingly in the same way as the new mounted cables, without corrosion areas.

The soundness inspection shall be performed according to section 5/AC43-4A/25.07.1991, in matters of requirements and inspection methods.

To remove corrosion, the techniques described in section 6/AC43-4A/25.07.1991 shall be applied adapted and possibly completed with the local means.

NOTE : ALL THE PARTS THAT CANNOT BE REVITALIZED AS PER SECTION 6/AC-43-4A/25.07.1991 SHALL BE REPLACED AT THE USER'S FACILITIES, IF THIS HAS THE NECESSARY ENDOWMENT AND IS AUTHORIZED TO PERFORM MAINTENANCE AND REPAIR WORKS; IF NOT, AN AUTHORIZED REPAIR WORKSHOP SHALL BE FOUND.

QUESTIONNAIRE

CONCERNING THE CORROSION CHECK TO THE IS-29D GLIDER

Glider S/N : Manufacturing date :

Registered in the country :

Current owner : Address :

NOTE: The questionnaire wil be filled in a copy and wil be returned to the manufacturer. The corrosion presence shall be marked by "+" and its absence by "-".

No.	Item checked	Checked areas	Remarks
1	2	3	4
1	Wing Fig. 3.1/Appendix 1	a b c d e f g h	
2	Air brake Fig. 3.2/Appendix 1	a b c	
3	Fuselage structure/skin Fig. 4.1/Appendix 1	a b c d e f g h i Skin riveting	
4	Tail skid Fig. 4.2/Appendix 1	a b c	
5	Fin-to rudder, stabilizer-to-elevator junction areas (without drawing)	a b	
6	Landing gear Fig. 5.1/Appendix 1	a b c d e f g h i	
7	Controls check		
7.1	Landing gear retracting control Fig. 6.1/Appendix 1	b c d	
7.2	Aileron control Fig. 6.2/Appendix 1	a c d	
7.3	Elevator control Fig. 6.3/Appendix 1	a b c d e	
7.4	Rudder control Fig. 6.4/Appendix 1	b c d e	
7.5	Air brake and flap control Fig. 6.5/Appendix 1	a b c d	
7.6	Trimmer control Fig. 6.6/Appendix 1	a b c d e	
7.7	Release control (without drawing)	b c d e	
7.8	Wheel brake control (without drawing)	b c d e	

Inspector's :