MANDATORY SERVICE BULLETIN

IS-28B2/EO-26

SUBJECT: GLIDER IS-28B2 - LIMITATIONS

Increase of the safe life until the first 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-28B2 owned by the Romanian Aeronautical Club Program, document code 701R.04.0024
- Synthetic report concerning the development of the above mentioned program, document code 701R.04.0027
- Examination and Measurement of Skins Program, document code 701R.04.0020
- Maintenance and Operation on Condition of Skins Program, 701R.04.0021".
- Overhauls performed by the manufacturer and revisions performed to the test batch containing the following S/N gliders: 50, 252, 285, 286, 307, 316.
- The experience, gained by applying the Service Bulettins concerning safe life and gliders modification, particularly BS-IS-28B2/ER-24.

The technical content hereof has been approved under the authority of AACR, according to the Authorization Certificate no.AACR.JA.01. owned by IAR-SA for projection activity

List of approved revisions	Approved revision no.

List of effective pages			
Page	Date		
1/3	03.04		
2/3	03.04		
3/3	03.04		

(1) APPLICATION INSTRUCTIONS

1A. Validity

To be applied to all the IS-28B2 gliders.
This Service Bulletin replaces BS-IS-28B2/ER-24.

1B. Purpose

- Increase of safe life until the first overhaul and between overhauls from 1000 flight hours or 6000 landings to 1200 flight hours or 7500 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 7500 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.24 of Flight and Maitenance Manual – issue 2 and amendment no.38 of Flight and Maitenance Manual – issue 3.

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-28B2 issue 2 and 3.
  - Appendix 1 – STRUCTURE SOUNDNESS CHECK.
  - Amendment 24 (issue 2)
  - Amendment 38 (issue 3)

(2) EXECUTION INSTRUCTIONS

2A. Work preparation

No content

2B. Method of application

According to Flight and Maintenance Manual IS-28B2

2C. Identification

The appliance hereof will be registered in glider Log Book.

2D. Maintenance and operation indications

According to Flight and Maintenance Manual IS-28B2

(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

- Amendment 24 (Flight and Maintenance Manual IS-28B2, issue 2)
- Amendment 38 (Flight and Maintenance Manual IS-28B2, issue 3)
- Appendix 1 – STRUCTURE SOUNDNESS CHECK.

Part no.	Amended page	Revision nature	Date		Signature
			of approval	of insertion	
38	0.2.4; 0.3.Z.1;0.3.1.C; 6.9.F; 6.9.1.C; 6.10.E;6.14.F; 6.15.E; Appendix No.1	Safe life and total and partial service life, maintenance schedule.	19.03.2004		

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0.2.E	3rd E ISSUE: NOVEMBER 1979
0.2.1	3rd ISSUE: OCTOBER 1980
0.2.2	3rd ISSUE: OCTOBER 1989
0.2.3	3rd ISSUE: APRIL 1992
0.2.4	3rd ISSUE: FEBRUARY 2004
0.3.Z.1	3rd Z.1 ISSUE: FEBRUARY 2004
0.3.1.C	3rd C ISSUE: FEBRUARY 2004
1.0.B	3rd B ISSUE: MARCH 1988
1.1.A	3rd A ISSUE: MARCH 1988
1.2.A	3rd A ISSUE: MARCH 1988
1.3.- 1.4	3rd ISSUE: APRIL 1978
1.5.B	3rd B ISSUE: JULY 1991
1.5.1	3rd ISSUE: JULY 1994
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2.0.B	3rd B ISSUE: MARCH 1988
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2.2	3rd ISSUE: APRIL 1978
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2.4.A	3rd A ISSUE: OCTOBER 1980
2.5.B	3rd B ISSUE: MARCH 1988
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2.7.A	3rd A ISSUE: NOVEMBER 1979
2.8.A	3rd A ISSUE: MARCH 1988
2.9-2.10	3rd ISSUE: APRIL 1978
2.11.A	3rd A ISSUE: DECEMBER 1978
3.0	3rd ISSUE: APRIL 1978
3.1.A	3rd A ISSUE: JULY 1994
4.0 - 4.6	3rd ISSUE: APRIL 1978
4.7.A	3rd A ISSUE: FEBRUARY 1994
4.8 - 4.11	3rd ISSUE: APRIL 1978
4.12.A	3rd A ISSUE: NOVEMBER 1982
5.0 - 5.4	3rd ISSUE: APRIL 1978
5.5.A	3rd A ISSUE: MAY 1979
6./01 - 6./02	3rd ISSUE: APRIL 1978
6./03.B	3rd B ISSUE: MARCH 1988
6/04	3rd ISSUE: APRIL 1978
6.1 - 6.4	3rd ISSUE: APRIL 1978
6.4.1.A	3rd A ISSUE: DECEMBER 1978
6.5.A	3rd A ISSUE: NOVEMBER 1982
6.6	3rd ISSUE: APRIL 1978
6.6.1.A	3rd A ISSUE: NOVEMBER 1978
6.7.A	3rd A ISSUE: APRIL 1989
6.8	3rd ISSUE: APRIL 1978
6.9.F	3rd F ISSUE: FEBRUARY 2004
6.9.1.C	3rd C ISSUE: FEBRUARY 2004
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6.14.F	3rd F ISSUE: FEBRUARY 2004
6.15.E	3rd E ISSUE: FEBRUARY 2004
6.15.1	3rd ISSUE: NOVEMBER 1994
6.15.2	3rd ISSUE: NOVEMBER 1994
6.16 - 6.22	3rd ISSUE: APRIL 1978
6.23.A	3rd A ISSUE: FEBRUARY 1994
6.24	3rd ISSUE: APRIL 1978
6.25.B	3rd B ISSUE: APRIL 1989
6.26.A	3rd A ISSUE: FEBRUARY 1983

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6.26.1	3rd ISSUE: FEBRUARY 1992
6.27.A	3rd A ISSUE: NOVEMBER 1982
6.27.1	3rd ISSUE: FEBRUARY 1992
6.28.A	3rd A ISSUE: FEBRUARY 1983
6.28.1	3rd ISSUE: FEBRUARY 1992
6.29.B	3rd B ISSUEMARCH 1987
6.30	3rd ISSUE: APRIL 1978
6.31.B	3rd B ISSUE: NOVEMBER 1998
6.32.A	3rd A ISSUE: NOVEMBER 1998
6.33 – 6.44	3rd ISSUE: APRIL 1978
6.45.B	3rd B ISSUE: MAY 1992
6.46.D	3rd D ISSUE: APRIL 1995
6.46.1	3rd ISSUE: MAY 1992
6.47.A	3rd A ISSUE: MAY 1979
6.47.1 - 6.47.2	3rd ISSUE: MAY 1992
6.48.B	3rd B ISSUE: MAY 1992
6.49	3rd ISSUE: APRIL 1978
APPENDIX 1	FEBRUARY 2004

CAUTION

The stabilizer shall be folded after mounting the handling wheel.

6.3. MAINTENANCE SCHEDULE

6.3.1. NON-PERIODICAL INSPECTIONS

6.3.1.1. **Daily inspection** –to be carried out whenever the glider is ready to perform a flight activity.
This inspection shall be carried out as per paragraph 4.1.

6.3..1.2. **Circumstantial inspection** – to be carried out whenever abnormal events occur (e.g. transport knocks, outfield landings, malfunction, etc.).
During these inspections, the assemblies and items subjected to stresses or showing some defects or malfunctions shall be particularly and thoroughly examined.
After excessive stresses, the inspection shall be carefully carried out to all the vital items (wing junction fitting, tails and adjoining structures, link between controls and control surfaces), paying attention, at the same time, to the condition of painting and skins, which might indicate local overstresses.

6.3.2. 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. 6.14.F, 6.15.E) 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. 6.14.F, 6.15.E)) 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)
All the R6 revision works shall be performed every year starting with the ninth year of operation, until RG.

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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.
- Lever no.1. for elevator control and synchronizing shall be carefully examined, dismounted, washed and checked (it must not show any distortion, blows or corrosion)
- 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 28B2 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 (7500 landings) in case of improper technical condition of the glider.

RG – Overhaul after 1200 flight hours or 7500 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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D. Total safe life and service life of the glider

The total safe life of the glider is of 10000 flight hours or 30000 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.

CAUTION: When dismounting the control cables for rudder or elevator control, attention shall be paid during mounting to the cables crossing according to the diagrams in manual and Appendix 1 (figure 6.3. and 6.4.)

6.3.3. ADJUSTMENTS

The adjustments carried out by the manufacturer shall be checked during the yearly revisions (or after 200 flight hours).
The control surfaces deflections shall be measured for checking the values indicated in paragraph 6.5.1.
If these values are not within the tolerances, the adjustments shall be carried out again.
The total controls clearances shall be lesser than the following values:

- To stick (measured at the end) for:
  - elevator control: 4mm
  - aileron control: 4mm
- To rudder pedals: 5mm

To measure the clearances, the control surfaces shall be blocked and the control lever displacement shall be measured in the control movement direction.

6.4. SYSTEMS MAINTENANCE

6.4.1. MAINTENANCE WORKS PERIODICITY

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	C-After every 100 hours	R1-Yearly or after every 200 hours	R2-After every 600 hours	RG-After every 1200 hours	*R6-After 6 years and yearly after 9 years	*CSS-After 12 years and after every 3 years	According to the indications
							Structure soundness check – Flight and Maintenance Manual Appendix 1 (R2) + Works indicated in paragraph 6.3.2, indentation A, page 6.9.F
1. LANDING GEAR							
1.1 Visual check of landing gear support and structure riveting.	X						
1.2 Visual check of wheel fork (distortion, cracks, corrosion).	X						1
1.3 Visual check of shock-absorber condition (greasing).	X						
1.4 Inspection of main wheels and tail wheel (bearings, tires); greasing.	X						
1.5 Wheel brake: greasing of control route and shoes cam.	X						
1.6 Inspection of wheel fork-to-landing gear support joint, by dismounting.			X				
1.7 Inspection of wheel fork-to-shock absorber joint (shock absorber fork by dismounting); washing.			X				
1.8 Inspection of wheel drum braking surface.		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 wing junction, washing and greasing.			X				
2.4. Wear check to wing-to-fuselage junction bolts (by dismounting)				X			
2.5. Cleaning of wing attachment fittings with fine abrasive paper(400), washing, check . by using a magnifier, greasing with vaseline		X					
2.6. Visual check of tails junctions (washing, greasing).			X				
2.7. Wear check of horizontal tail attachment bolt (by dismounting).				X			
2.8. Cleaning and visual check of plexiglas canopy.	X						
2.9. Check of canopy hinges: jettisoning, washing, greasing.		X					
2.10. Check of upholstery, seats, safety belts, safety belts fittings; adjustment.		X					
2.11. Control surfaces dismounting; check of hinge clearances after mounting.				X			
2.12. Visual check of instrument panel shock-mounts, instruments, marking, placards.			X				
2.13. Replacement of instrument panel shock-mounts.				X			
2.14. Compass trim.				X			2

38	C-After every 100 hours	R1-Yearly or after every 200 hours	R2-After every 600 hours	RG-After every 1200 hours	*R6-After 6 years and yearly after 9 years	*CSS-After 12 years and after every 3 years	According to the indications	Structure soundness check – Flight and Maintenance Manual Appendix 1	(R2) + Works indicated in paragraph 6.3.2, indentation A, page 6.9.F	
2.15. Check of rubber or plastic ducts (replacement depending on their condition), including the Braunschweig system (tail static pressure intake).			X							
2.16. Air intakes: check, removal of foreign bodies.	X									
2.17. Check of pressure system settler and sealing; drain.	X									
2.18. Check of pressure system tightness.			X							
2.19. Board instruments check in a specialized workshop.				X						
3. CONTROLS										
3.1. Visual check of cables, pulleys, bearings. Check of air brake locking force, turnstiles locking and check of cables tensions; greasing.		X								
3.2. Visual check of sticks and controls route (rudder and elevator); greasing.		X								
3.3. Visual check of trimmer control route, greasing and trimmer condition check.		X								
3.4. Visual check of hinge joints, greasing.		X								
3.5. Visual check of rudder pedal assy, greasing.		X								
3.6. Visual check of control surfaces structure skins.	X									
3.7. Visual check of releases and their control, cleaning and greasing.	X									3
3.8. Controls dismounting from structure, replacement of worn out items; inspection and greasing.				X						4

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

INDICATIONS:

1. The landing gear and its surrounding structure shall be checked whenever an abnormal landing on a rough ground or a rough landing took place.
2. The compass trim shall be performed after every 1200 flight hours or when new instruments are mounted on instrument panel, especially when instruments creating magnetic fields are mounted.
3. The works shall be carried out according to TOST E72 and73 maintenance and servicing instructions.
4. When dismounting the control cables for rudder or elevator control, the cables crossing must be observed during mounting.
5. After 21 years, the structure soundness check will be performed every 2 years until the safe life of 1200 flight hours or 7500 landings will be consumed.

Part no.	Amended page	Revision nature	Date		Signature
			of approval	of insertion	
20	2.2; 26.1.A; 26.2	Increase of the number of landings until the first overhaul and between overhauls for the gliders owned by the Romanian Aeroclub.	21.04.1993		
21	11.A; 27.A	Additional indications concerning the schock-absorber mounting and completion of the landing procedure.	24.02.1994		
22	26.H; 26.1.B; 26.2.A; 36D; 37.C; 37.1; Appendix 1/10.1997 Appendix 2/10.1997	Gliders servicing after reaching 20 years from the manufacturing date.	05.12.1997		
23	22.1.A	Check of air brake control handles.	7.11.1998		
24	2.2A; 26I; 26.1.C; 26.2.B; 36.E; 37.D; Appendix No.1	Safe life and total and partial service life, maintenance schedule.	19.03.2004		

7.5. 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. 6.14.F, 6.15.E) 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. 6.14.F, 6.15.E)) 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)

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)

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- 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.

- Lever no.1. for elevator control and synchronizing shall be carefully examined, dismounted, washed and checked (it must not show any distortion, blows or corrosion)

- 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 28B2 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 (7500 landings) in case of improper technical condition of the glider.

RG – Overhaul after 1200 flight hours or 7500 landings

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

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

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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".

D. Total safe life and service life of the glider

The total safe life of the glider is of 10000 flight hours or 30000 landings, its total service life is of 35 years.

Note:

24

- 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.

CAUTION: When dismounting the control cables for rudder or elevator control, attention shall be paid during mounting to the cables crossing according to the diagrams in manual and Appendix 1 (figure 6.3. and 6.4.)

7.6. AIR SUPPLY THE SHOCK-ABSORBER

If shock absorber losses liquid it must be sent to a specialized workroom for revision.
When shock- absorber has located air and doesn't work right it could be air supplied as follows:

- Ensure shock-absorber full extension (suspended sail plane);
- Unscrew the cover located inside cockpit under yhe backsedt (wheel cover);

WARNING: Do not use oxygen supply.
When filling it may blow-up

7.11. SYSTEMS MAINTENANCE

7.11.1. MAINTENANCE WORKS PERIODICITY

24	C-After every 100 hours	R1-Yearly or after every 200 hours	R2-After every 600 hours	RG-After every 1200 hours	*R6-After 6 years and yearly after 9 years	*CSS-After 12 years and after every 3 years	According to the indications
					(R2) + Works indicated in paragraph 7.5, indentation A, page 26.1	Structure soundness check – Flight and Maintenance Manual Appendix 1	
1.LANDING GEAR							
1.1 Visual check of landing gear support and structure riveting.	X						1
1.2 Visual check of wheel fork (distortion, cracks, corrosion).	X						
1.3 Visual check of shock-absorber condition (greasing).	X						
1.4 Inspection of main wheels and tail wheel (bearings, tires); greasing.	X						
1.5 Wheel brake: greasing of control route and shoes cam.	X						
1.6 Inspection of wheel fork-to-landing gear support joint, by dismounting.			X				
1.7 Inspection of wheel fork-to-shock absorber joint (shock absorber fork by dismounting); washing.			X				
1.8 Inspection of wheel drum braking surface.		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 wing junction, washing and greasing.			X				
2.4. Wear check to wing-to-fuselage junction bolts (by dismounting)					X		
2.5. Cleaning of wing attachment fittings with fine abrasive paper(400), washing, check . by using a magnifier, greasing with vaseline		X					
2.6. Visual check of tails junctions (washing, greasing).			X				
2.7. Wear check of horizontal tail attachment bolt (by dismounting).					X		
2.8. Cleaning and visual check of plexiglas canopy.	X						
2.9. Check of canopy hinges: jettisoning, washing, greasing.		X					
2.10. Check of upholstery, seats, safety belts, safety belts fittings; adjustment.		X					
2.11. Control surfaces dismounting; check of hinge clearances after mounting.					X		
2.12. Visual check of instrument panel shock-mounts, instruments, marking, placards.			X				
2.13. Replacement of instrument panel shock-mounts.					X		
2.14. Compass trim.					X		2

	C-After every 100 hours	R1-Yearly or after every 200 hours	R2-After every 600 hours	RG-After every 1200 hours	*R6-After 6 years and yearly after 9 years	*CSS-After 12 years and after every 3 years	According to the indications: Structure soundness check – Flight and Maintenance Manual Annendix 1 (R2) + Works indicated in paragraph 7.5, indentation A, page 26.1	
24								
2.15. Check of rubber or plastic ducts (replacement depending on their condition), including the Braunschweig system (tail static pressure intake).			X					
2.16. Air intakes: check, removal of foreign bodies.	X							
2.17. Check of pressure system settler and sealing; drain.	X							
2.18. Check of pressure system tightness.			X					
2.19. Board instruments check in a specialized workshop.							X	
3. CONTROLS								
3.1. Visual check of cables, pulleys, bearings. Check of air brake locking force, turnstiles locking and check of cables tensions; greasing.		X						
3.2. Visual check of sticks and controls route (rudder and elevator); greasing.		X						
3.3. Visual check of trimmer control route, greasing and trimmer condition check.		X						
3.4. Visual check of hinge joints, greasing.		X						
3.5. Visual check of rudder pedal assy, greasing.		X						
3.6. Visual check of control surfaces structure skins.	X							
3.7. Visual check of releases and their control, cleaning and greasing.	X							3
3.8. Controls dismounting from structure, replacement of worn out items; inspection and greasing.							X	4

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

INDICATIONS:

1. The landing gear and its surrounding structure shall be checked whenever an abnormal landing on a rough ground or a rough landing took place.
2. The compass trim shall be performed after every 1200 flight hours or when new instruments are mounted on instrument panel, especially when instruments creating magnetic fields are mounted.
3. The works shall be carried out according to TOST E72 and73 maintenance and servicing instructions.
4. When dismounting the control cables for rudder or elevator control, the cables crossing must be observed during mounting.
5. After 21 years, the structure soundness check will be performed every 2 years until the safe life of 1200 flight hours or 7500 landings will be consumed.

APPENDIX 1

CHECK OF THE IS-28B2 GLIDERS CONDITION FOR CORROSION APPEARANCE
(STRUCTURE SOUNDNESS INSPECTION)

The check of the IS-28B2 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 sujbect 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.

3. The corrosion effects on the main metals used in the IS-28B2 construction are shown 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.
Low-alloy steel(4000-8000 series)	Surface oxidation, surface and intergranular pitting.	Reddish-brown oxide (rust).
Alluminium	Surface,intergranular pitting, exfoliation stress-corrosion and fatigue cracking and fretting.	White-to-gray 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.

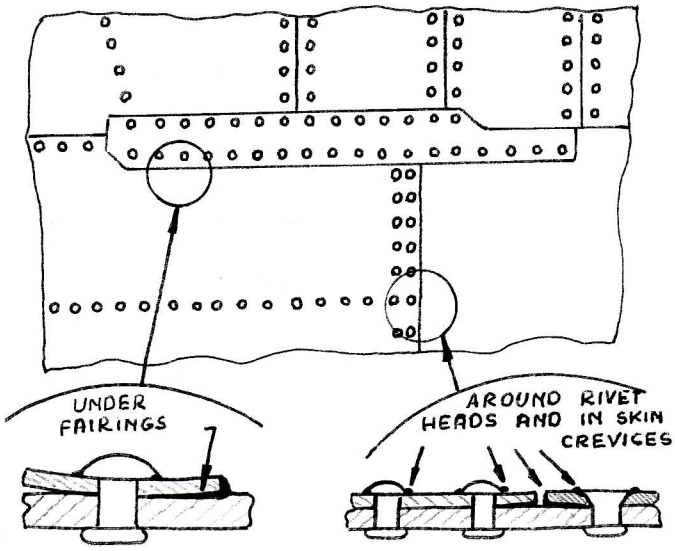


Fig.4-1/Section 4/Para.400 of AC43-4A

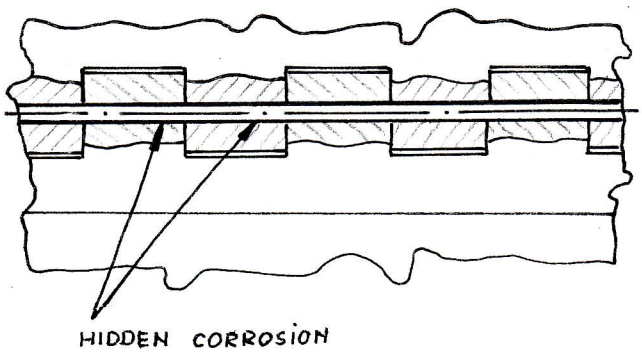


Fig.4-7/Section 4/Para.406 of AC43-4A

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 pianochord are particularly exposed to corrosion due to the contact between different metals (alluminium alloy and steel) as shown in fig. 4-7.

3.3. The corrosion check for the wing (Fig.3.1.) 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 hinges

d) check of junction fittings link fittings and junction bolts

e) check of flanges and fittings

f) check of air brake housing

g) check of control rod supports

h) check of areas near the inspection covers and draining holes.

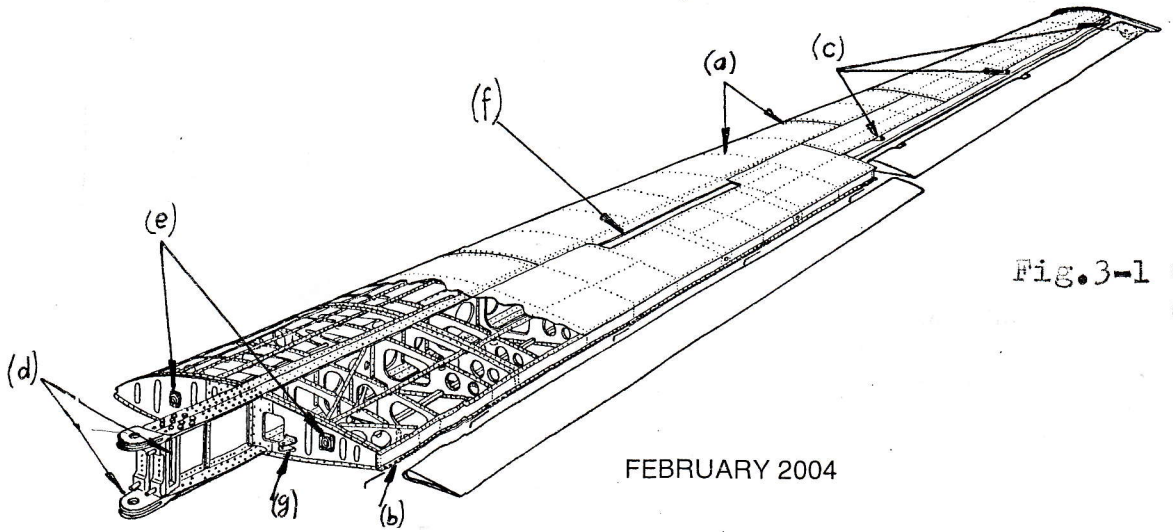


Fig.3-1 Wing structure

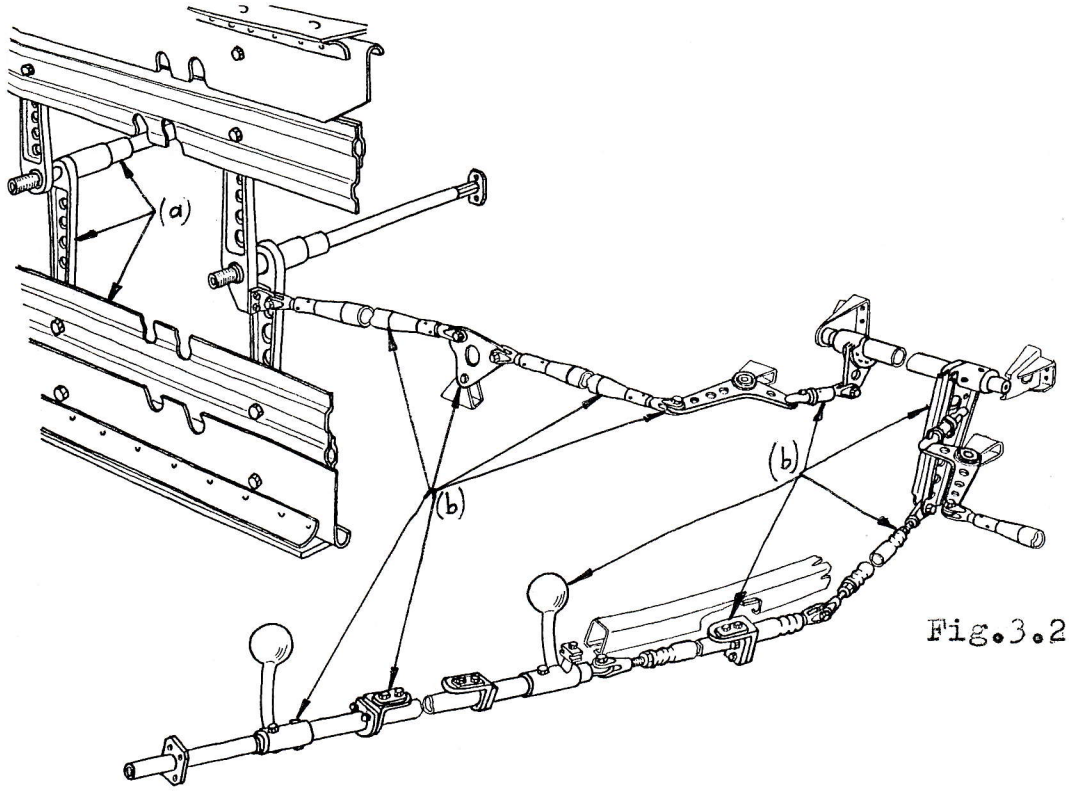


Fig.3.2. Air Brake with control

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 (rods, levers, guides, assembly items)

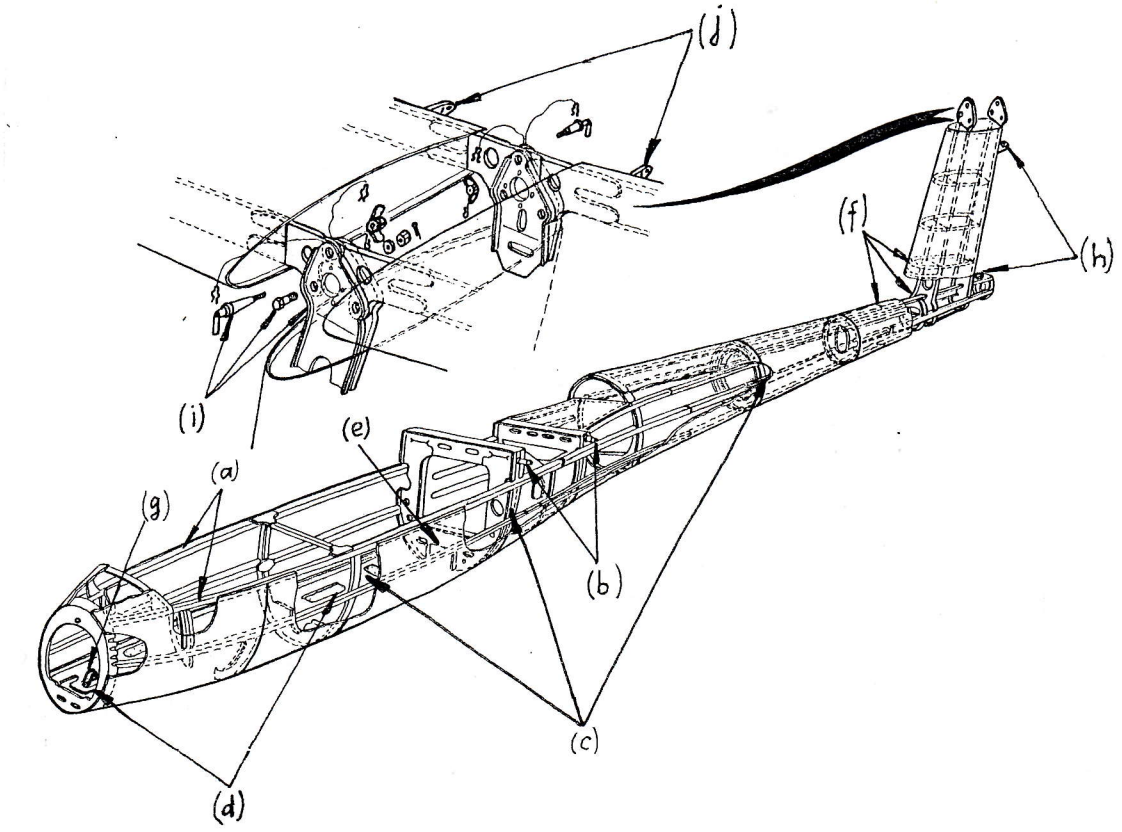


Fig.4.1. Fuselage structure/skin with fin and tails

4. Check of fuselage structure/skin with fin and tails

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 areas
(e) landing gear mounting area
(f) fuselage-to-fin junction area
(g) fuselage and fin control supports
(h) rudder attachment hinges
(i) stabilizer fittings and mounting items
(j) elevator attachment fittings

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

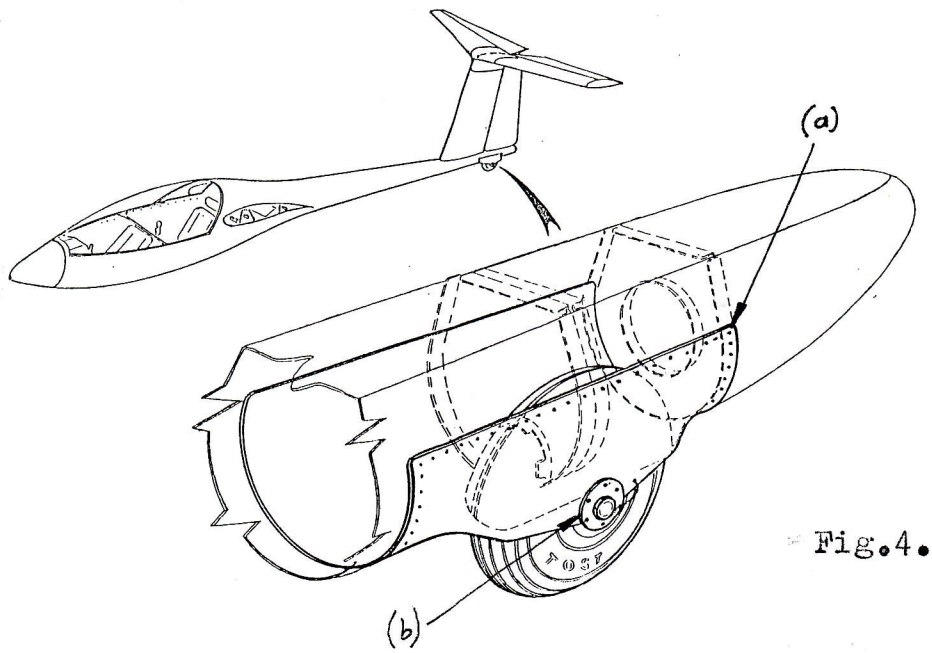


Fig.4.2. Tail skid assy

4.1. Tail skid area check (Fig. 4.2.)

(a) tail skid support riveting
(b) wheel shaft with pins

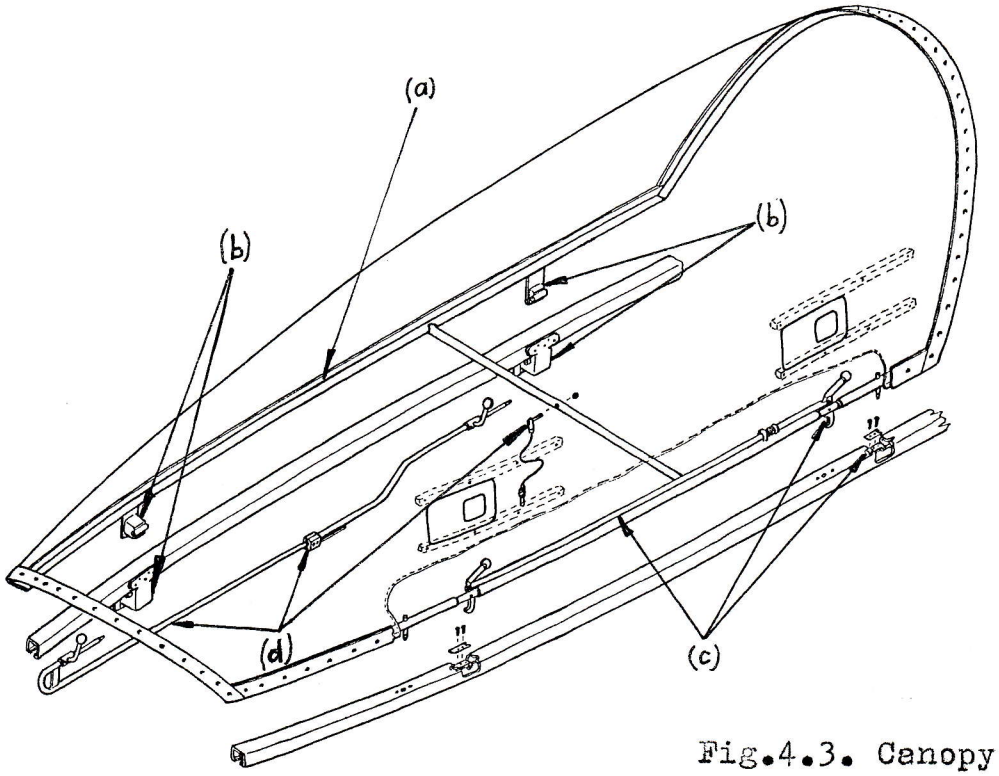


Fig.4.3. Canopy structure

4.2. Check of structure and canopy attachment and closing items (Fig. 4.3.)

(a) tube frame
(b) hinges
(c) closing system items
(d) jettisoning system items

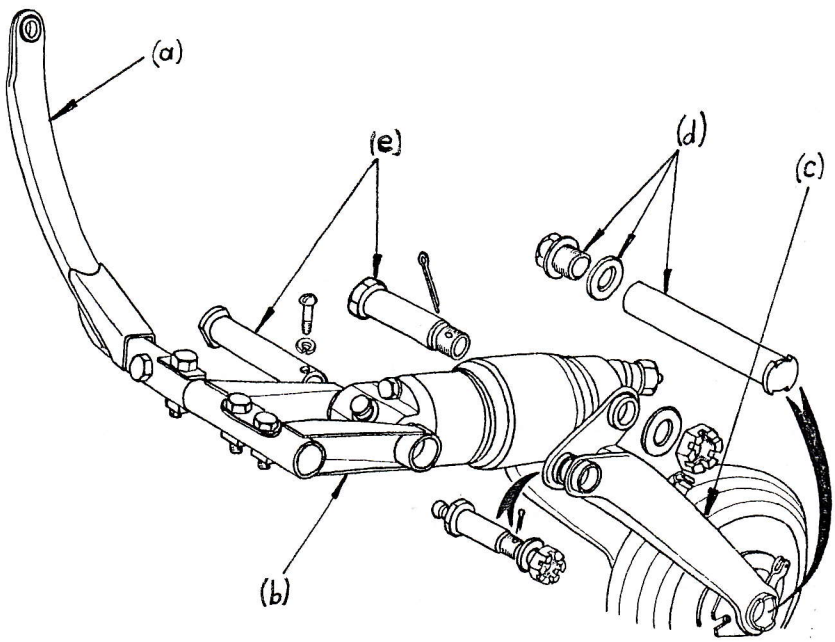


Fig.5.1.) Equipped landing gear

5. Landing gear components check (Fig. 5.1.)

The following components shall be checked to the retractable landing gear :

(a) control arm
(b) control fork
(c) wheel fork
(d) wheel shaft
(e) shock-absorber mounting axles

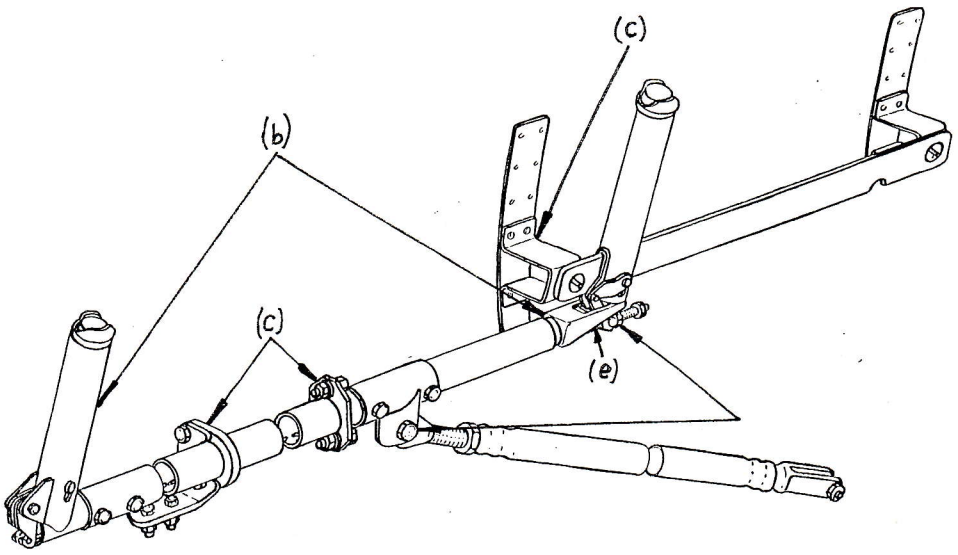


Fig.6.1.
Landing gear retracting control

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.

All the guide and support assembling items of all the control linkage existing in the glider shall be also checked, i.e. : landing gear retracting control (Fig.6.1.); aileron control (Fig.6.2.); elevator control (Fig.6.3.), rudder control (Fig.6.4.); flap control (Fig. 6.5.); trimmer control (Fig.6.6.); release control (Fig.6.7) wheel brake control (Fig.6.8.).

NOTE The air brake control is checked according to point 3.4. (See fig.3.2.).

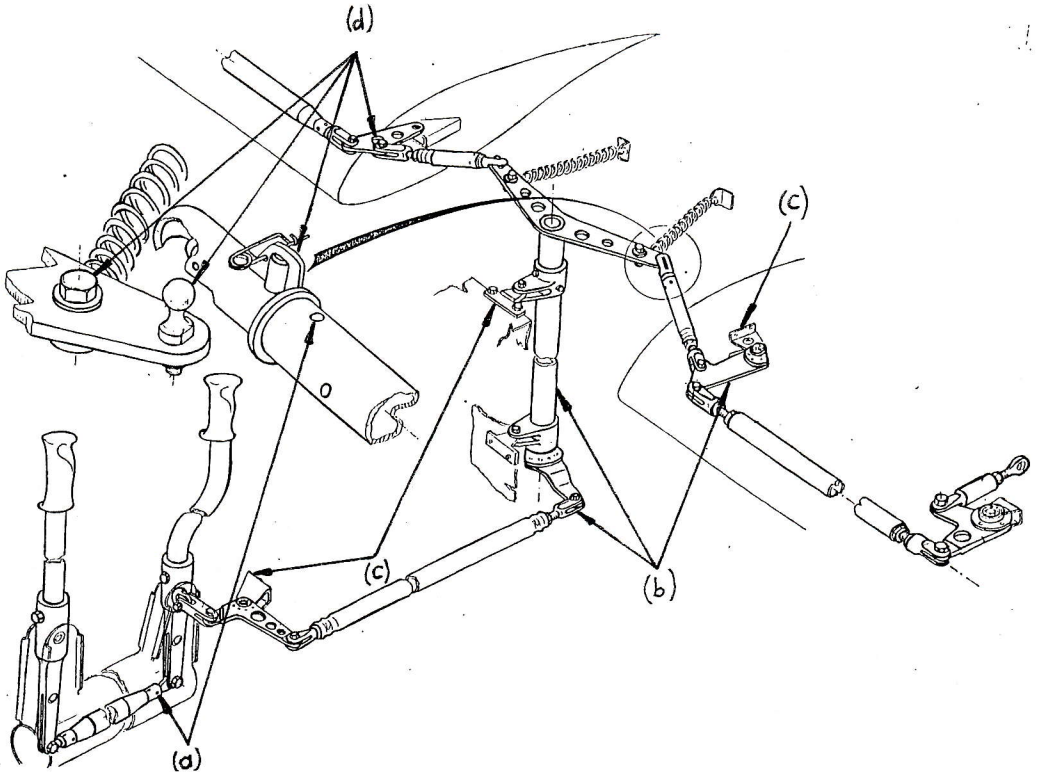


Fig.6.2. Aileron control

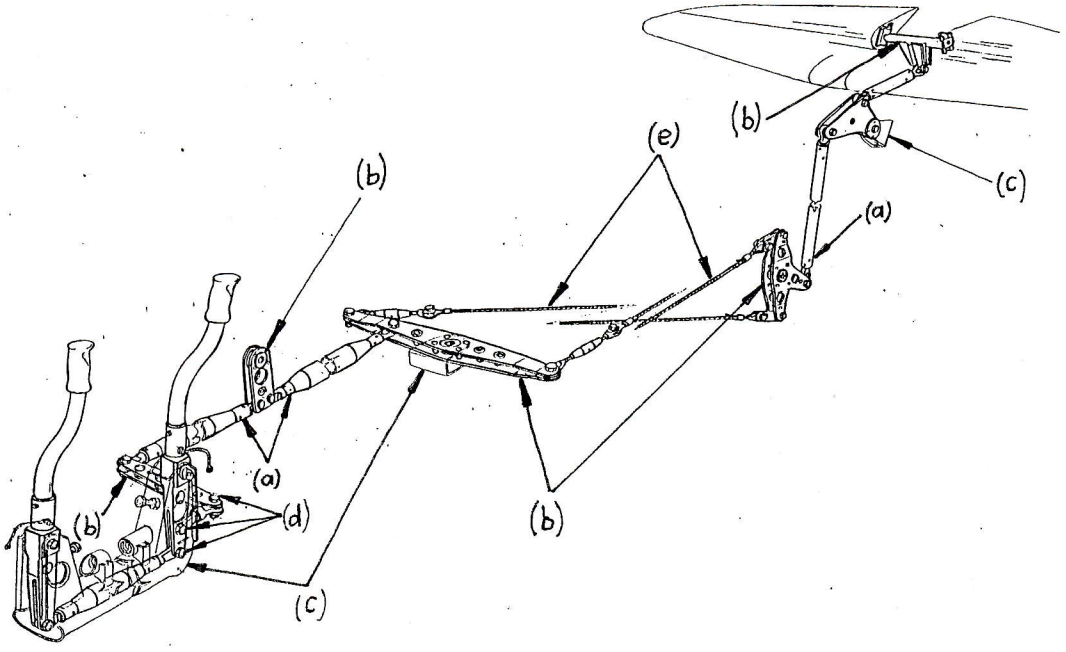


Fig.6.3. Elevator control

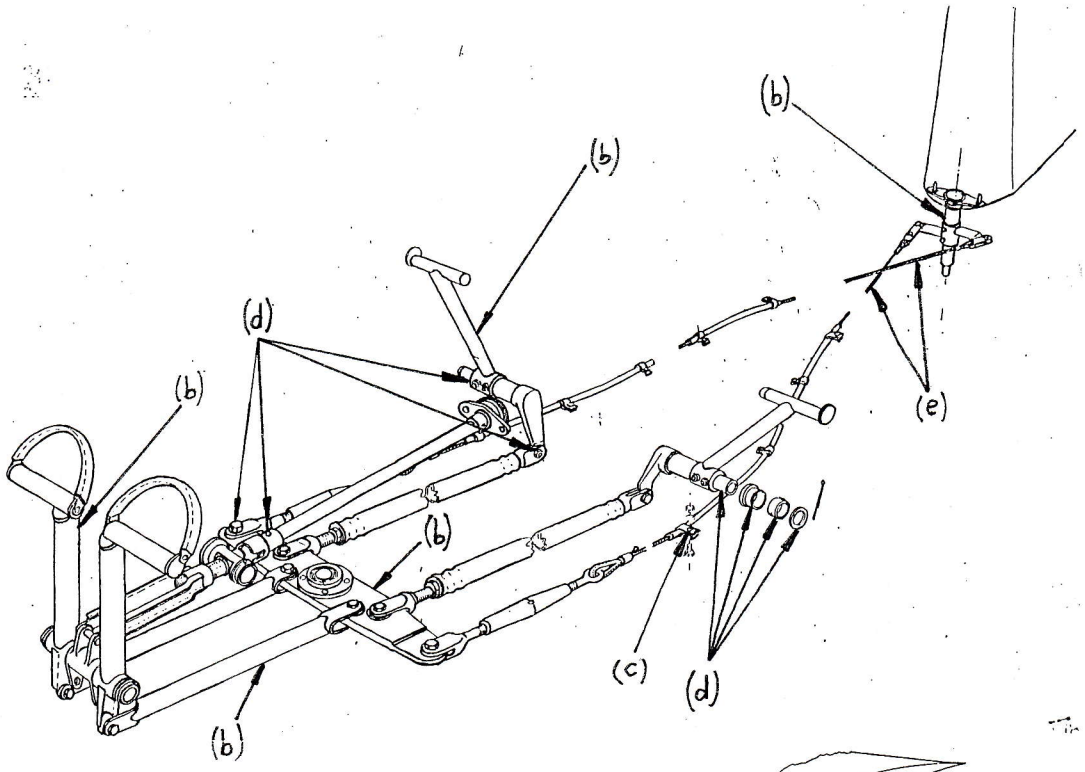


Fig.6.4.
Rudder control

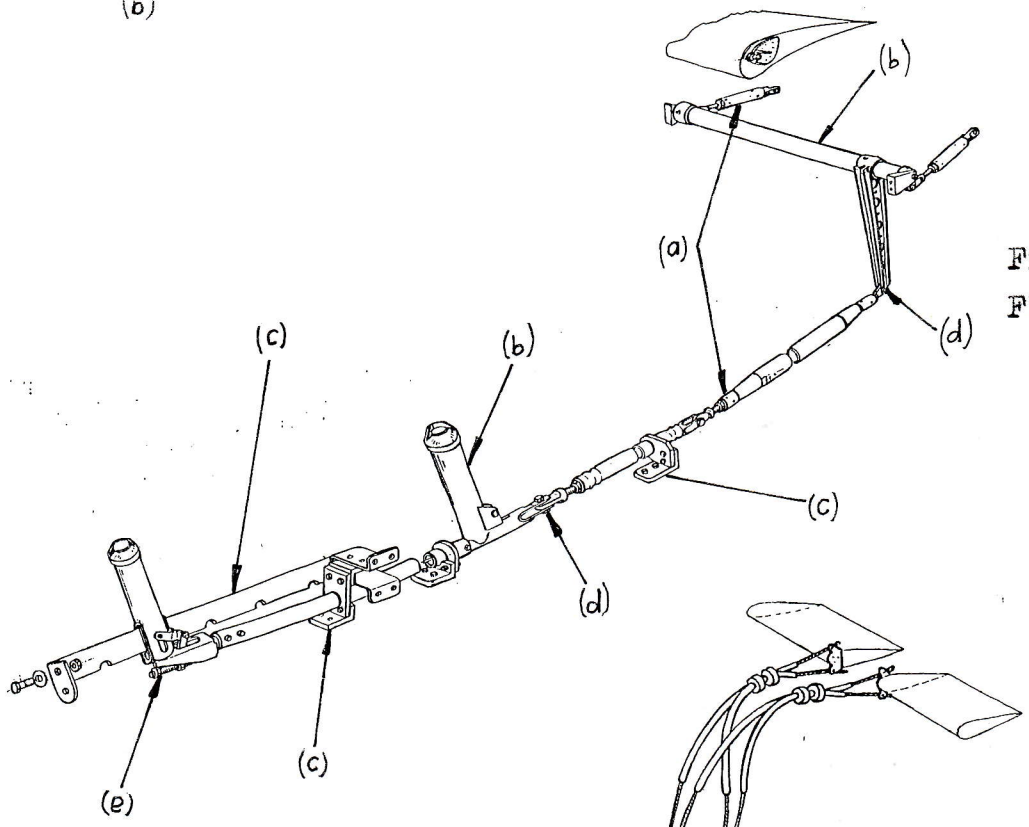


Fig.6.5.
Flap control

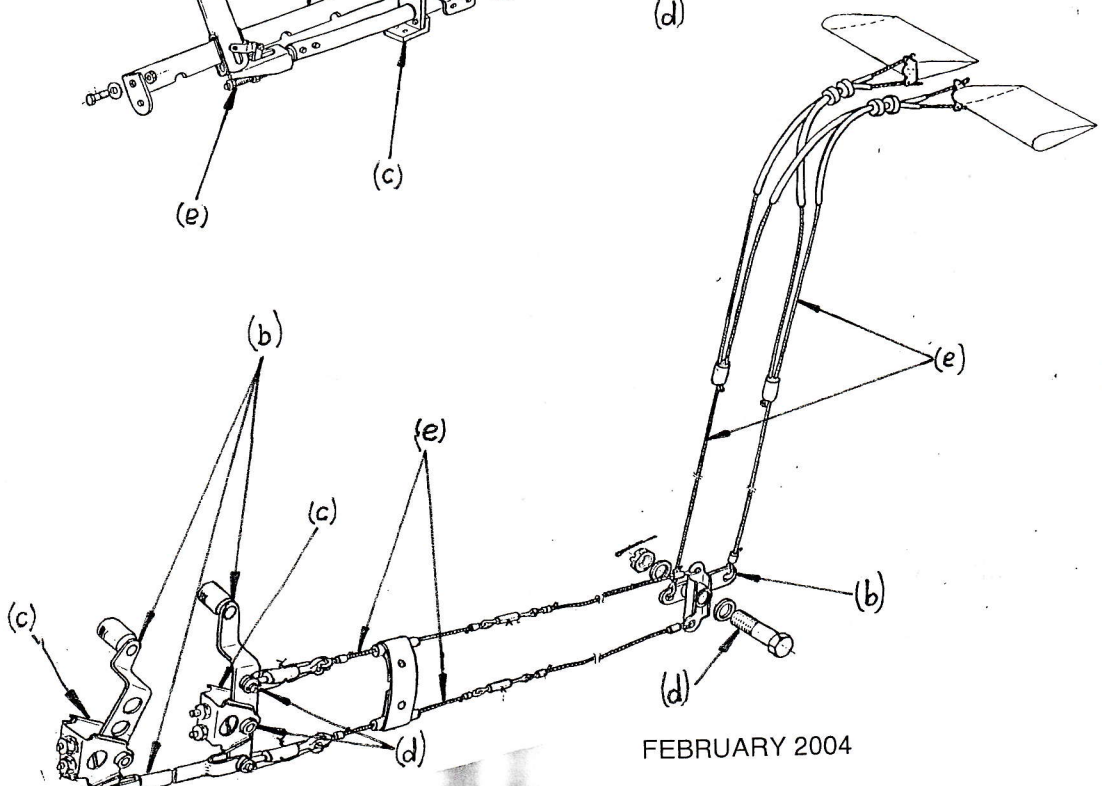


Fig.6.6.
Trimmer control

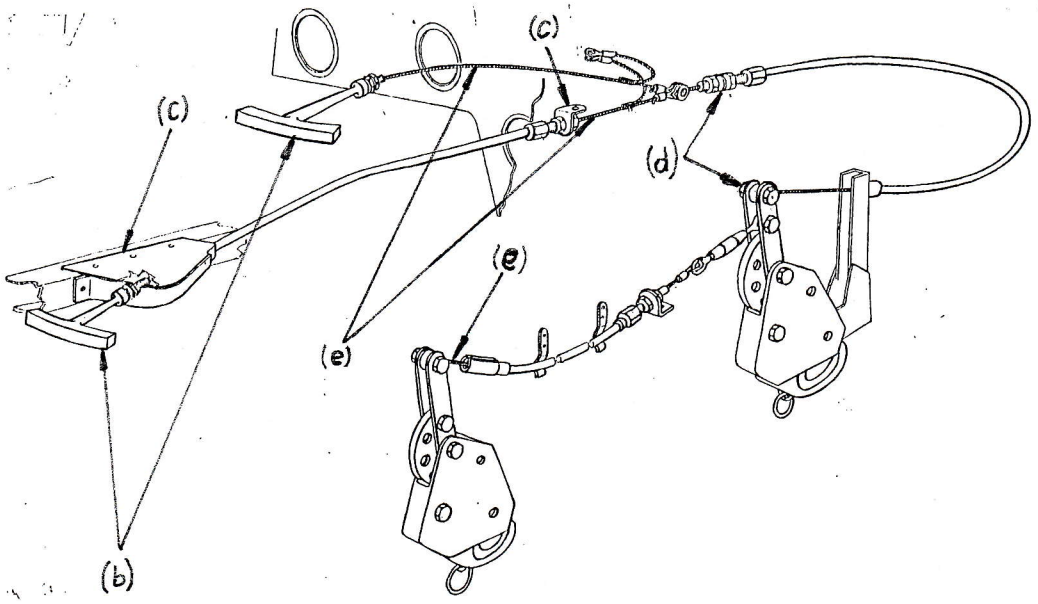


Fig. 6.7.
Release control

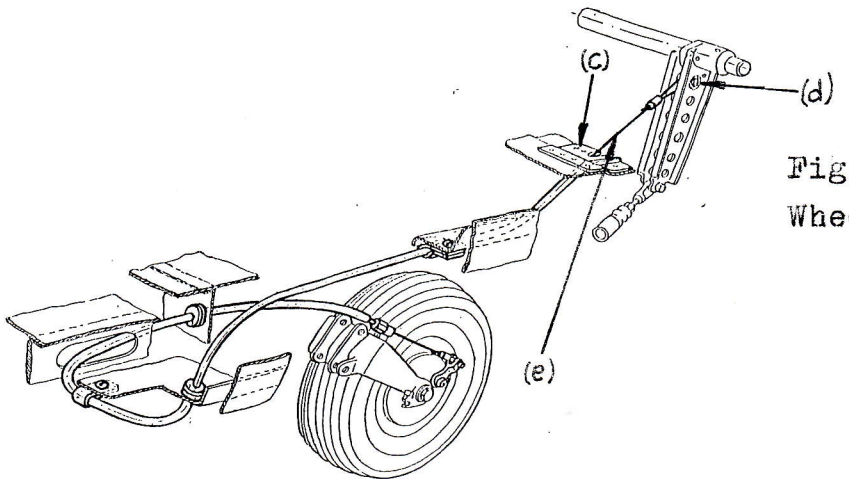


Fig. 6.8.
Wheel brake control

The priority areas to be checked within the control linkage shall be (Fig. 6.1. to 6.8.).

(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/A43-4A/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

FOR CHECKING THE CORROSION CONDITION OF THE IS-28B2 GLIDER

Glider S/N :

Manufacturing date:

Registered in :

Present 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	Areas checked										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						
3	Fuselage structure/skin with fin and tails Fig. 4.1/Appendix 1	a	b	c	d	e	f	g	h	i	j	
4	Tail skid Fig. 4.2/Appendix 1	a				b						
5	Cockpit canopy structure Fig. 4.3/Appendix 1	a		b		c		d				
6	Landing gear Fig. 5.1/Appendix 1	a		b		c		d		e		
7	Control check											
7.1	Landing gear retraction control Fig. 6.1/Appendix 1	b		c		d		e				
7.2	Aileron control Fig. 6.2/Appendix1	a		b		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	Flap control Fig. 6.5/Appendix 1	a		b		c		d		e		
7.6	Trimmer control Fig. 6.6/Appendix 1	b		c		d		e				
7.7	Release control Fig. 6.7/Appendix 1	b		c		d		e				
7.8	Wheel brake control Fig. 6.8/Appendix 1	c		d		e						

Inspector's signature: