

BULLETIN No BE-111/97 SWIFT S-1**Concerns :**

Extension of glider service life to 1500 flying hours.

Way of introducing this Bulletin:

Mandatory - on reaching the total flying time of 500 hours.

Prepared:

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Agreed with
Civil Aircraft Inspection Board

On: *1997. 05. 16*
On:

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1. Grounds for introducing this Bulletin:

For the certified in Aerobatic category „SWIFT S-1” glider, as well as for the certified in Aerobatic category MDM-1 "FOX" two-seat, and for Utility category SZD 51-1 "JUNIOR" monoplace training glider (aimed also for primary schooling in aerobatics), the analysis of design details, stress level in structures and operational loads spectrum has been made. Basing on this, as well as taking into account the results of fatigue tests of MDM-1 "FOX" and SZD 51-1 "JUNIOR", the followings can be stated:

- a) service life of MDM-1 "FOX" aerobatic glider is 3000 flying hours
- b) potential service life (i.e. one which can be proved on the way of fatigue testing) of "SWIFT S-1" aerobatics glider is higher, most probably exceeding 6000 flying hours

Due to the compliance method employed (accepted abroad, but in Poland used for the first time), based on comparison of design characteristics, stress level in structures as well as operational load spectrum between "SWIFT S-1" on one side, and MOM-1 "FOX" and SAD-51-1 "JUNIOR" on the other, for conservative reasons the preliminary service life of "SWIFT S-1" glider has been settled at 1500 flying hours.

2. List of Factory Noose covered with this Bulletin:

- Fact. Nos - from P-05 to P-08
Fact. Nos - from 101 to 125
Fact. Nos - from 126 up

3. List of enclosures:

- "Appendix No 1"- program of 500-hours overhaul
- page No 3 of Technical Service Manual

4. Description of modifications involved

FOR FACT. NOS: FROM P-05 TO p-08, AND FROM 101 TO 125

- 4.1. "Appendix No 1" , should be attached to Technical Service Manual.
- 4.2. The mandatory overhaul, every 500 flying hours, is imposed herewith.
- 4.3. On completing the 500-hours overhaul, pages 3 and 38 should be introduced into the Technical Service Manual. These pages contain records changing the service life from 500 to 1500 flying hours.

FOR FACT. NOS FROM 126 UP

- 4.4. "Appendix No 1" and pages 3, 38 of TSM - are introduced by producer.

5. Final statements.

- 5.1 For Fact. Nos: from P-05 to P-08, as well as for these from 101 to 125, the service life will be extended from 500 to 1500 flying hours by a company performing a 500-hours overhaul.
- 5.2 For Fact. Nos from 126 up, service life extension will be made by a producer.

THE END

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APPENDIX No 1

to

TECHNICAL SERVICE MANUAL
of
S W I F T S - 1
glider**Concerns:**

Program of 500-hours overhaul of SWIFT S-1 glider.

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1. INTRODUCTION

- 1.1. The 500-hours overhaul can be performed only by the producer authorised workshops, approved by the responsible airworthiness Authority.
- 1.2. Verify the glider documentation.
- 1.3. Check measurements are to be performed at room temperature, employing the measuring instruments of $\pm 0,01$ mm accuracy.

2. PRELIMINARY OPERATIONS

- 2.1. Get acquainted with the content of glider documentation, pay attention to: number of landings, glider repairs, check if mandatory Bulletins have been introduced.
- 2.2. Verify completeness of glider and its equipment, as well as validity of instruments and towing hooks.
- 2.3. Wash and clean the glider sets, next complete the glider rigging.

3. GENERAL INSPECTION - on assembled glider.

- 3.1. Verify the deflections of all control surfaces (ailerons, elevator, rudder, air brake), compare the results found with data in Technical Service Manual [Fig. 1].
- 3.2. Verify the control circuits against possible plays:
 - check if these do not exceed the values specified in paragraph 2.2.5 of TSM.
- 3.3. Verify the level of friction forces in control circuits:
 - check if these do not exceed the values specified in paragraph 2.2.6 of TSM.
- 3.4. Verify the gaps size in wing / fuselage connection, as well as these on tailplanes.
- 3.5. Check if the radial clearance along the axis of stabiliser connecting bolt does not exceed 0,18 mm.

4. DETAILED VERIFICATION

4.1. DISASSEMBLE AND CLEAN ALL SETS AND ELEMENTS OF A GLIDER.

- 4.1.1. All markings must be removed from the glider, and all lacquered surfaces (except for fabric covered ones) grinded with abrasive paper of 1200 grade, and checked against visible cracks or scratches which could indicate the structure failure.
- 4.1.2. Verify the condition of anticorrosive protection on all glider elements.
- 4.1.3. Verify the condition and functioning of all bearings on a glider.

4.2. WING & AILERONS

- 4.2.1. Verify a condition of wing and aileron structure, pay attention to: condition of glue joint in a area of root rib and spar, leading and trailing edges as well as at air brake housing.
- 4.2.2. Verify a condition of sleeves, and installation of these in spar root (white spots, etc.). Check the spar root against damages to spar caps and webs.
- 4.2.3. Check a condition of, and plays at air brake control couplings - allowed play value 0.1 mm.
- 4.2.4. Check a condition, and operation of wing controls of ailerons and air brake (check locking).
- 4.2.5. Check play values, condition of air brake arms, plates and caps.
- 4.2.6. Measure assembly plays between main bolts and bushings of spar and these of sleeve, as well as plays at aileron hinges. Compare the values measured with paragraph 2.5 of TSM.
- 4.2.7. Check a condition and installation of guides and connections with push rods.
- 4.2.8. Disassemble the long push rod of aileron control (make the access cut out in a skin), check the width of push rod wear area at guides, this value may not exceed 2.5 mm.
- 4.2.8. Check the mass and mass balance of ailerons, in accordance with paragraph 2.8, and Fig. 14 of TSM.

4.3. FUSELAGE

- 4.3.1. Check mating in assembly, and next disassemble as follows: cockpit canopy (emergency jettison test), instrument panel, pilot safety harness, baggage compartment, remaining elements and access panels.
- 4.3.2. Verify the structure of fuselage. Pay attention to glue joints and joint between both halves of fuselage shell, fin, frames, and housing of front towing hook.
- 4.3.3. Check a condition, and fuselage installation of fittings for pilot safety harness.
- 4.3.4. Verify a condition of: cockpit canopy, fittings installation, glue joint of glassing, sealings, side windows and locks, make an emergency jettison test.
- 4.3.5. Verify a condition of control systems of: rudder, ailerons, air brake, wheel brake, towing hooks, trimming device.
- 4.3.6. Replace all cables in control systems (after 500 hours), i.e. these of rudder, towing hook, emergency jettison of canopy, main wheel brake.
- 4.3.7. Dismount a towing hook, complete the maintenance procedure in accordance with hook producer instructions.
- 4.3.8. Dismount the main wheel together with control system, disassemble the wheel and clean the elements - check and replace, if necessary, friction lining of wheel brake and tyre, as well as springs of landing gear leg and these of brake lever. Assemble the wheel and adjust the wheel brake system.
- 4.3.9. Verify a condition of bearings and tyre of tail wheel, pay attention to mud guard and installation of wheel axle seats.
- 4.3.10. Verify a condition of board instruments, pressure pipes and tightness of instrument pressure system.
- 4.3.11. Assemble fuselage, make sure on correct assembly, securing and operation of all devices and accessories.

4.4. HORIZONTAL TAILPLANE

- 4.4.1. Make sure on a complete tailplane, that elevator does not rub against a skin apron.
- 4.4.2. Disassemble elevator halves from stabiliser, and verify a condition of elevator fabric coverings, glue joints, possible lacquer cracks, as well as installation of hinges and nests.
- 4.4.3. Measure plays at hinges, as well as at fittings connecting stabiliser with fin, compare these with data in paragraph 2.5 of TSM.
- 4.4.4. Check an inner dimension of elevator lever driver, this may not exceed $19^{+0.02}$ mm.
- 4.4.4. Check a mass and mass balance of control surfaces - see paragraph 2.8 and Fig. 14 of TSM.
- 4.4.5. Assemble elevator halves on stabiliser.

4.5. RUDDER

- 4.5.1. Verify a condition of fabric covering, glue joints, possible lacquer cracks and installation of hinges and nests.
- 4.5.2. Verify mass and mass balance of a rudder - see paragraph 2.8 and Fig. 14 of TSM.
- 4.5.3. Measure the plays at rudder hinges, and check a condition of lower fitting and stops.

4.5. FINAL INSPECTION

- 4.5.1. Make sure the venting and drainage holes are clear.
- 4.5.2. Rig the glider and connect all controls.
- 4.5.3. Make sure on correct operation and unrestricted deflections of control surfaces and air brake (make an appropriate protocol). Adjust, if necessary, in accordance with data given in TSM.
- 4.5.3. Weigh a glider, and find a location of glider CG (following instructions in TSM).
- 4.5.4. Check functioning and correct operation of board instruments.
- 4.5.5. Make a test flight - check and adjust the stall warning indicator.

THE END