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Trust of Czechoslovak Aeronautical Works Prague  
Czechoslovakia

## MANDATORY BULLETIN No. L 13/059

Page No. 1

Of: 2

Supplements: 8

Effectivity: Technical Manual of the L 13 Sailplane 4-th Edition

Reason: Unification of flight hours till general overhaul and service life.

Description: Abolish all till now issued information about flight hours till general overhaul and service life of L 13 sailplane i.e.:

- 1/ In technical manual L 13 sailplane Part II - Instructions for operation II - 3. "Periodical inspections, lubrications and checkings" and substitute it by new Clause 3, which is appended to this bulletin. Sheets, on which were made changes, have date April 1-st 1985. Note the alternation to the table "Survey of bulletins influencing this manual contents", introducing part of the manual.
- 2/ Abolish further data of flight hours till general overhaul and service life stated in bulletins L 13/030, L13/034, L 13/042, L 13/045.

To be accomplished not later than: Immediately after receiving of this bulletin.

To be accomplished by: User.

Cost covered by: User.

Material availability: We send with this bulletin the whole Clause 3, Chapter II. Part II /pages 108/1 - 108/15/.

Validity: July 1-st, 1985

Karásek

.....  
Manufacturer

Lukas

.....  
Customer's Representative

Olšan

.....  
State Aviation Inspection

Kaplan

.....  
Ministry of Foreign Trade

Add the following text on the page No. 4:

No.	No. of bulletin	Class of bulletin	Alteration effected in following Clauses	Alteration carried out by
1	L 13/059	M	Part II, Chapter II., Clause 3. Periodical inspections, lubrications and checkings are abolished and substituted by new Clause 3. It concerns 108 - 113 pages.	

### 3. Periodical Inspections, Lubrications and Checkings

For the purpose of reliable operation of the sailplane, it is necessary to carry out the periodical inspections, lubrications and checkings mentioned below with regard to the number of take-offs and flying hours. The exact number of the sailplane take-offs and flying hours are to be registered. To record these items a sailplane log-book is provided. All periodical inspections and the like are to be recorded in the Sailplane Log-book as well.

#### 3.1. Survey of periodical work

##### A. Periodical inspections

The periodical inspections consist of inspections A-type and inspections B-type.

##### A-type inspection

This inspection is performed every  $50 \pm 5$  flight hours or every  $350 \pm 30$  take-offs or every year since the start of operation or last periodical inspection, in accordance with the item 3.2.a.

##### B-type inspection

This inspection is performed every  $500 \pm 30$  flight hours or  $3000 \pm 180$  take offs after 5 years since the start of operation or last general overhaul in accordance with the item 3.2.b.

##### B. General overhaul

General overhaul is performed at intervals mentioned below or after any major damage of the sailplane.

- a/ The period for 1-st and further general overhauls is 1000 flight hours or 10 years or 5000 take-offs since the production of the sailplane or since the previous general overhaul.

##### C. Service life

- a/ The basic service life of the sailplane is 3750 flight hours, provided that the operating conditions, outlined below, are fulfilled:

- a.1/ 4.8 take-offs per 1 flight hour
- a.2/ the ratio winch launching: aerotow 5:1
- a.3/ crew: 35% two pilots, 65% solo
- a.4/ the ratio elementary training: advanced training and routine flying: 40% : 60%, while 0.26 % of total flight hours are aerobatic
- a.5/ the flaps are in UP position at every winch launching

- b/ Service life may be prolonged on the following assumptions:

- b.1/ replacement of critical parts L 13 glider in accordance with the bulletin L 13/050. Thereby is the life prolonged by 3750 flight hours to the value, which has the sailplane attained till the part replacement, or by more exact value, valid for average operating conditions, which will be supplied to the manufacturer by the user.
- b.2/ replacement of critical parts by parts of L 13 A glider in accordance with the bulletin L 13/057. Thereby is life prolonged by 6000 flight hours since the date of critical parts replacement.
- b.3/ after evaluation of supplied statistical operating conditions /supposed they are more favourable than listed above/, will the producer determine the conditions concerning the glider life.

b.3.1/ Statistical data, which must be supplied to the manufacturer for life prolongation:

- i - number of take-offs per 1 hour totally
- i<sub>1</sub> - number of winch launches per 1 hour
- k<sub>1</sub> - % of take-offs with two pilots from i<sub>1</sub> take-offs
- k<sub>2</sub> - % of take-offs with flaps extended to 10° from k<sub>1</sub> take-offs
- k<sub>3</sub> - % of take-offs with flaps 0° from k<sub>1</sub> take-offs
- k<sub>4</sub> - % of take-offs solo from i<sub>1</sub> take-offs
- k<sub>5</sub> - % of take-offs with flaps extended to 10° from k<sub>4</sub> take-offs
- k<sub>6</sub> - % of take-offs with flaps 0° from k<sub>4</sub> take-offs
- i<sub>2</sub> - number of aerotow take-offs per 1 flight hour
- k<sub>7</sub> - % of take-offs solo from i<sub>2</sub> take-offs
- k<sub>8</sub> - % of take-offs with two pilots from i<sub>2</sub> take-offs
- k<sub>9</sub> - % of routine flights with two pilots/circuits, thermic flying, cross-country flights, normal training, return aerotows/from total flight hours
- k<sub>10</sub> - % of routine flights solo/circuits, thermic flying, cross-country flights, normal training, return aerotows/from total flight hours
- k<sub>11</sub> - % of two pilot training flight hours from total flight hours
- k<sub>12</sub> - % of solo training flight hours from total flight hours
- k<sub>13</sub> - % of flight hours of aerobatic training and aerobatic/training of stalling, slips, spins, narrows curves/ divided on solo and two pilot flights.
- - load spectra/if they are available to the user/

On the basis of above mentioned data, approved by supervising office in user's country, it is possible to calculate more exactly the sailplane service life for average operating conditions of the whole sailplane fleet in respective country, using the load spectra of original calculation.

b.3.2/ On sailplanes with life prolongation it is necessary to extend the B-type inspection by following operation:

Inspect the critical spots on the lower wing flangeplates till the distance of 500 mm from the main wing hinge axis and the whole centre-section spar from fuselage inside, through openings in edge wing ribs and through openings in centresection spar web, for fatigue cracks detection.

### 3.2. Volume of prescribed work

#### a/ A-type inspection

##### Fuselage

The fuselage outside surface must be clean, in good condition, riveted joints must not be loosened; cockpit closure and ventilation must be sound. The locks of the mounting doors must be in order. Locks of back-rests and covers are to be tightened. The upholstery of the padded fabric is to be brushed and fuselage inside space cleaned.

##### Wing

The wing surface must be clean, not warped, the rivets-especially those at points where covering sheets contact one another - must not be loosened. The covering fabric of ailerons must not be worn out or torn. The hinges of the ailerons, flaps and divebrakes must move easily, too much play, however, is not allowed. The dust from the inside of wings must be exhausted by a vacuum cleaner.

## Tail unit

No damage or deformation to the covering sheets is allowed. The covering fabric on rudder and elevator must not be worn out or torn. The rivets must not be loose. The rudder, elevator and trimtab motion must be easy, no play, however, being allowed. The hinge pins must be secured properly.

The rudder and elevator deflections are to be measured /see Part I of this Manual, Chapter 1-2/. Check whether or not the tailplane is not located in the fuselage with too much clearance. The permissible clearance of the tail plane location in the fuselage is not more than  $\pm 2$  mm /measured on the extreme outside arch of the tail plane/. More clearance than allowed may be due to wear of ball joints in the tailplane hinges of the fuselage /See Fig. 17, item 17/. It must be remedied by replacing these ball joints.

## Controls

When the controls /control stick and rudder pedals/ are in a normal /i.e. central/ position, then the rudder, elevator and ailerons must be in their undeflected positions, too.

No, so called, lost motion of controls must occur /See Part I of this Manual, Chapter I-2/. Push rods must be neither bent nor otherwise deformed. Fairleads and control cables must not be damaged. The control push-rods of the flaps and divebrakes must not be damaged and must be easy to move, without of any play, in the guides. The carrier pin on the countershaft in the fuselage must not be jammed and the carrier channel /See Fig. 23, det. B/ must not be open. Damaged parts are to be replaced and the securings of all pins are to be checked.

Check the condition of the bonded junctions on inner push rods draw. No. L 13. 411-12 of flap control /See Fig. 23, item 15/. An eye is bonded to one end of this push-rod whilst a threaded tube for attachment of clevis is bonded to the other end.

## How to procede during the check

The check is effected by two men. One of them holds the flap control handle in the "ON" position, whilst the other one holds the flap by its leading and trailing edges /at that point where is the rib/ and by exerting force in the directions of the flap extension and retraction, will check whether the flap control push rods are not loosened /in bonded joints/.

The check is carried out on the left as well as on the right flap. If any defect at the bonded joints is ascertained, then it is necessary to replace the defective part and report it to the manufacturer.

## Landing gear

Check the pressure in the tyre air tube. This pressure can be checked by means of the normal pressure gauge which is used for motocars. The tyre air tube pressure should be 0.23 MPa /2.6 kg per sq. cm/. Check the spring mounting of the undercarriage shock absorber. If the shock absorber is pumped properly and the sailplane is loaded fully, the piston rod /tube/ will project to a length of 13 - 3 mm out of the cylinder /See Fig. 79, dimension figure x/. The check can be effected without removing the leather cover of the piston rod. The measurement is taken after the shock absorber has been depressed several times in order to eliminate the influence of the shock absorber inner friction.

For maintenance and defects of the shock absorber - see Cl. 4 of this Chapter. The operation of undercarriage control mechanism is to be tested on an elevated sailplane.

The brake lining must not be oil soaked and worn too much. The undercarriage wheel must not be damaged, its turning must be smooth. No play is allowed.

For maintenance of the wheel and brake - see Cl. 5 of this Chapter.

The suspension /hinge/ pins and control mechanism pins must not be jammed.

The stop on the suspension forging must not be bent.

Inspect the tail skid - to see if it is not damaged.

The undercarriage and surrounding area to be cleaned; worn parts replaced.

#### Outfit

Clean the cushions and upholstery. Inspect the first-aid kit contents and replenish, if necessary. Check the side-wall release hooks control mechanism and the front tow hook. Worn out parts are to be replaced. Once a year check the emergency jettisoning of the cockpit hood. Proceed in the following way:

1. Rotate through  $180^{\circ}$  in the direction marked by the arrow the emergency release lever installed on the right hand side of the cockpit hood towards the front. In the first segment of the travel of the release lever, the resistance due to cutting of the 0.5 mm locking wire fitted with a seal and an aluminium shear pin of 2.0 mm dia is to be overcome.
2. Holding the release lever at the end of its travel, force the right hand side of the cockpit hood upwards. To avoid damage of the hood, it is necessary that an assistant should support the hood from right outside before releasing it from the hinges.
3. After removal of the hood inspect all working parts for corrosion. Corrosion, if defected is to be removed with emery paper. In any case remove old grease, clean and lubricate.
4. Holding the release lever in its forward position, reassemble the cockpit hood by inserting the pins into the hinges. To end assembly seal the lever with locking wire and insert new aluminium shear pin.

#### Instruments and electrical outfit

Disconnect the Pitot and static pressure tubing from the instruments. Blow the tubing out by means of compressed air. After having blown the tubing out, effect the respective connections.

Check all units on instrument board and make certain that the glass of each is tight and in good condition and that no other damage has occurred to them.

Test all units without dismounting them from the instrument board. Specifications of all instruments are listed in Part I, Chapter VIII of this Manual.

In the turn-and-bank indicator LUN 1211.1 remove the carbon dust from the collector /see Cl. 8 of this Chapter/.

Carry out the compensation of the pilot compass /see Cl. 7 of this Chapter/.

If the converter PAG - 1FP is incorporated in the sailplane, the condition of the carbon brushes and commutator is to be checked in accordance with Part I, Chapter VIII.10 of this Manual.

## Lubrication

The sailplane is to be lubricated with an aircraft lubricating grease /see Part I, Chapter I.1/. Those points, which cannot be lubricated with grease in its normal condition, shall be lubricated with grease thinned with technical grade petrol. For better orientation, the lubrication points on the sailplane airframe are seen in the lubricating scheme /see Fig.78 /. Dust and rests of previous grease on these points are to be removed, prior to applying grease to them. Use technical grade petrol for this cleaning.

Lubrication points in the sailplane /sequence numbers correspond items in Fig.78 /:

1. Connection of push rods actuating the release hook and countershaft on the bulkhead No. 1.
2. Connection of lever of front hook of towing cable and push-pull rod.
3. Front release hook for towing cable.
4. Connection of push rods and cables with double-arm lever of rudder control at front pedals.
5. Mounting of the lever for adjustment of front pedals in console on the cockpit floor.
6. Connection of front control lever of trimming tabs with connecting push-pull rod.
7. Mounting of the front control stick.
8. Front guides of push rods of flap and divebrake control.
9. Guide of tow cable release push rod in the rear cockpit.
10. Rear guide of flap and divebrake control push rods.
11. Bearing of rudder pedals pulleys.
12. Connection of rear lever of trim tabs control with connecting push rod and cables.
13. Ball joints of rear control column.
14. Side-wall hooks of towing cable /left and right/.
15. Lock of undercarriage control push rod.
16. Ball joint of undercarriage control push-rods.
17. Connection of undercarriage control push-rod with single-arm lever.
18. Bearings of undercarriage pivoted suspension.
- 19., 20. Grease cups on undercarriage shock absorber /to be lubricated by means of lubricating gun/.
21. Mounting of wheel fork on fuselage.
22. Connection of wheel brake lever with Bowden cable.
23. Wheel bearings. Lubrication grease in bearings of a correctly functioning wheel, is not allowed to be replaced before the full-range check of sailplane.
24. 25. Mounting of push-rods and fairleads of control of flaps and divebrakes.
26. Bearings of mounting of outer and inner shaft of flap and divebrake control.
27. Lower bearing of control vertical countershaft mounting.
28. Rudder pedals pulley.
29. Connection of control push-rod with vertical countershaft lever.
30. Upper bearing of vertical countershaft mounting and connecting push rods mounting.



31. Bearing on rocker lever of aileron control /on rib No.1/.
32. Ball joint of divebrake and flap control.
- 33., 34. Mounting of inner push rod of flap control.
35. Pulley of guide link of flaps on rib No. 1.
36. Bearings on rocker lever of aileron control.
37. Pulleys of slotted link of flaps on rib No. 7.
38. Bearings on rocker lever of aileron control.
39. 40. Mounting of outer push rod flaps control.
41. Bearings on double-arm lever of divebrake control.
42. Divebrake hinges.
43. Pulley of slotted link of flaps on rib No. 13.
44. Inner shaft bearing on rib No. 15.
45. Pulleys of slotted link of flap on rib No. 19.
46. Bearings on rocker lever of aileron control.
47. Mounting of push rod of aileron control.
48. Bearing of double-arm lever of elevator control.
49. Mounting of elevator control push rod.
50. Lower hinge of rudder.
51. Upper hinge of rudder.
52. Inner hinges of elevator.
53. Trimming tab hinges.
54. Outer hinges of elevator.

Sailplane equipped by tail-wheel /see Fig. 28a/

55. Replace grease in wheel bearing.
56. Remove the fork item 2 from the bracket item 4, clean and grease the friction points.

#### b/ B-type inspection

- Check for loose skin rivets on the main flangeplates of wing structure at a distance of approximately 200 mm from wing rib No. 1. If the number of loosened rivets has exceeded 6 pcs on top and bottom flangeplates, the sailplane has to be handed over to an overhaul facility for performing an overhaul.
- Check for loose rivets on the wing ribs No. 13, 19 and 25 both up and down within the main spar in a chordwise direction /towards the trailing edge/. Should the number of loosened rivets exceed 25 per cent of the total number of rivets within a given area of an individual rib or should there be four rivets loosened one after another it is necessary to repair the rib using new rivets of the subsequent larger diameter.
- Check for water leaks into the bottom flangeplate of the centresection spar /see Fig. 69/; remove all moisture, if any, check for signs of corrosion from attacked surfaces using an emery cloth. Apply a protective coating afterwards. A gap between the rib and attachment fitting on the side of fuselage to be covered by an aviation fabric attached by an adhesive.
- Check for proper state of the rudder pedal control cables, their proper tension and condition /cracks/ over pulleys at the rudder. There may be no more than 5 cracked wires in the cable, or otherwise the plane is not air worthy. The state of control cables to be checked within this area during every pre-flight inspection. The cables will be replaced if more than 5 wires of the cable failed. The loosened cables to be stretched by a 450 N /45 kp/ force, if not replaced. In case of the cables being replaced they have to be stretched to 650 N /65 kp/ due to reducing of the



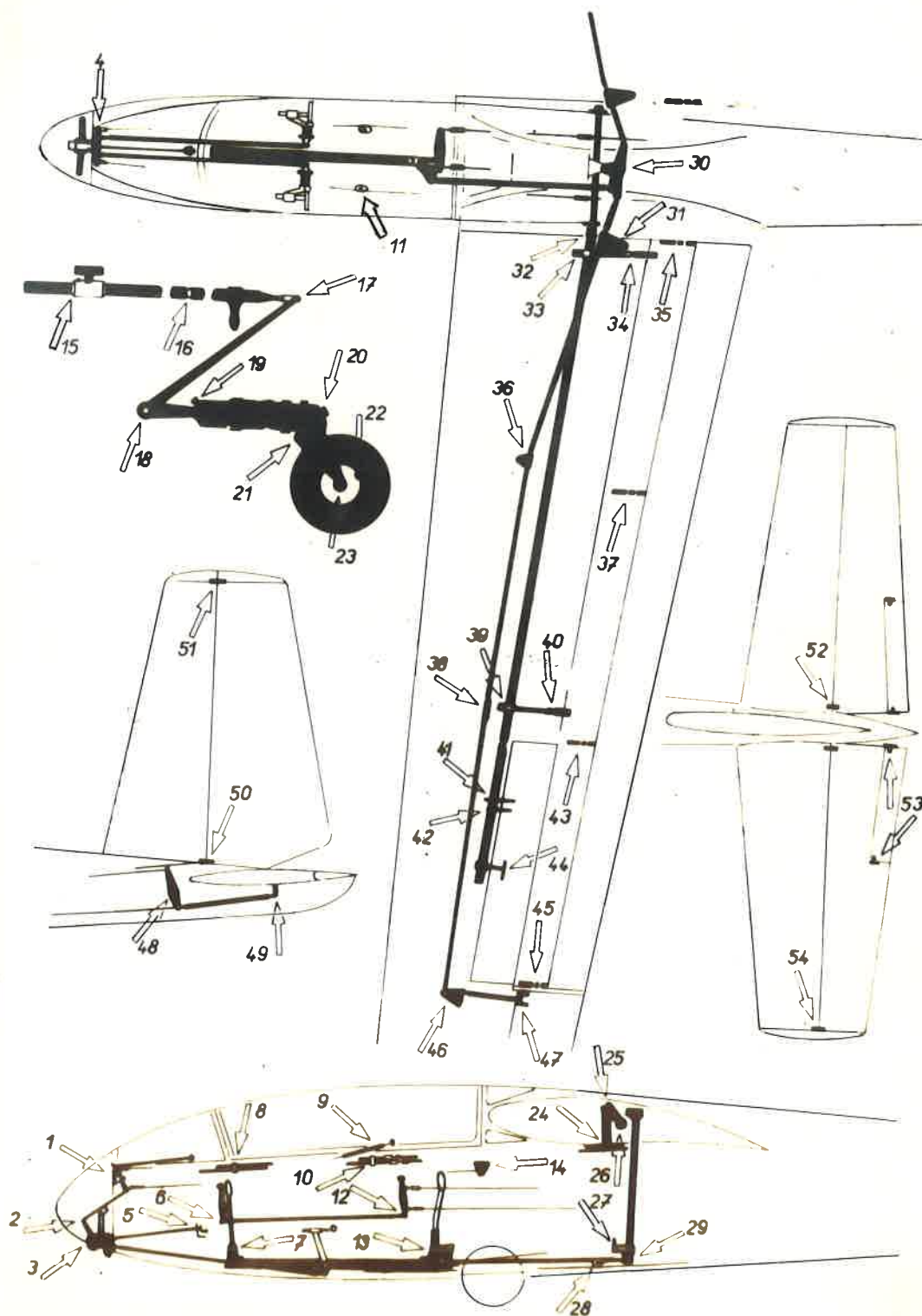


Fig. 78. Lubrication scheme

Check the fuselage frame No. 15 for possible cracking within the tail skid mounting structure /see Fig. 70/. The aircraft is air worthy even in case of two cracks of 10 mm lenght max. in the bottom frame structure where the tail skid is attached. Ends of such cracks must be drilled off using a drill of 2.1 mm dia. Should the lenght of these cracks exceeds the above limit, the frame is to be replaced. Replacement of the fuselage frame is required also in case there are more than two cracks found in the structure.

- Check the undercarriage silencer mounts and the undercarriage mounting structure /support refer to Fig. 71/ for cracks.

- Check for proper clearance of the undercarriage fork /Fig. 73 d/.

Refer to section A-A - the hole dia. in fork 14 H7  
dia. of bolt 14 f8

Should the sizes be different and the holes damaged, the following instructions are to be followed in case of repair:

1/ Reream the holes in fork and support to 14.1H7 or 14.2H7 dia. Install new bolts into the reamed holes. Refer to TP GO./013-058 /dia.14.1f8/ or to TP GO./013-059 /dia. 14.2f8/.

## II. Section B-B

- Check the front pedal controls rocker lever for cracks /Fig. 72/. Replace in case this check has revealed any crack. Check for clearance at the end of the foot pedal and use two extreme limit settings of the pedal travel only if the clearance exceeds 2 mm.
- Check for proper clearance of the rudder pedal controls. If the end clearance of pedal when forced sideways exceeds 1 mm, replace its support structure.
- Check the elevator drive for cracks /see Fig. 73/. Replace the drive in case any crack is found.
- Check the stiffeners according to Fig. 73a for cracks within the area designated by an arrow. Cracked stiffeners shall be replaced.

- Check for safety of the front tail skid attachment. Should the mount be damaged, replace it for a new one SK-L 13.165 and strengthen its attachment structure on either side of fuselage using a sheet panel of 0.8 mm thickness and about 60 x 100 mm size, made from a material designated D 16 T /see Fig. 73 b, detail view "T"/.
- Check for proper attachment of the top rudder mount on the topmost fin rib and its surrounding area for cracks. Reinforce the area by angle pieces if any cracks are found. Refer to angle piece No. L 13.304-03.02 /see Fig. 73b, view "S"/. -03.03
- Check of the elevator edge rib radii for cracks /see Fig. 73c/. In case any cracks are found, drill off their ends using a drill dia. 2.1 mm and stiffen the ribs by angle pieces SK-L 13.276-02 /see Fig. 73c; view "U"/. -01
- Check the fuselage structure skin panels for cracks, particularly around cut-outs for attachment joints. Any cracks are to be drilled off, using a drill of 2.1 mm dia. up to the crack length of 10 mm. Longer cracks must receive a special attention, the various parts being repaired or replaced as required.
- Check the aircraft skin panels and all surfaces for damage and security. All surface with damaged surface treatment /painting damaged by scratches or nicks/ are to be protected by a paint AK 113, which is applied as a prime layer and AS 82, which is a second cover layer.
- Check the clearances of a disconnect pin in the main wing joint fitting for damage and security, /disconnect pins used at sailplanes No. 170101 through 172530/. The same check to be carried out at continuous pins, used at the sailplanes P/N 172601 and up. Any damaged pins replace by new ones.
- Check for proper clearances at the front wing mount, principal wing mount and in tail surfaces. The sailplane may not be cleared for flying unless its pin and hole sizes correspond to the values in the following Table, column "0".

Should the actual sizes not correspond to the specified ones, these mounts may be repaired by reaming the holes to sizes given in the table, column I and II or in the extreme case according to values given in the column III. The reamed holes must be provided, however, by new pins corresponding to the limits of the repair type selected.

	"0"	I	II	III
Wing front pin dia.	12-0.016 -0.034	12.1-0.016 -0.034	12.2-0.016 -0.034	12.3-0.016 -0.034
Front wing attachment hole dia.	12+0.027 -0.00	12.1+0.027 -0.00	12.2+0.027 -0.00	12.3+0.027 -0.00
Wing main pin dia. top-bottom	22-0.020 20-0.033	22.1-0.020 20.1-0.033	22.2-0.020 22.2-0.033	22.3-0.020 20.3-0.033
Wing mount hole dia. top-bottom	22+0.033 20-0.00	22.1+0.033 20.1-0.00	22.2+0.033 20.2-0.00	22.3+0.033 20.3-0.00
Tail unit horizontal connecting pin dia.	10-0.005 -0.014	10.1-0.006 -0.017	10.2-0.006 -0.017	10.3-0.006 -0.017
Tail unit connecting pin hole dia.	10+0.015 -0.00	10.1+0.018 -0.00	10.2+0.018 -0.00	10.3+0.018 -0.00

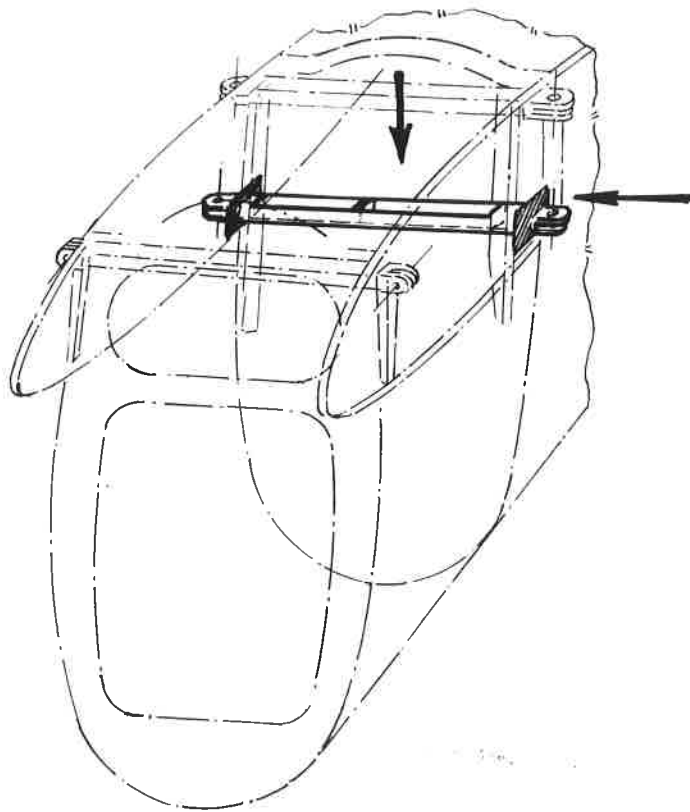


Fig. 69. Check for water leaks into the bottom flangeplate of the centresection spar.

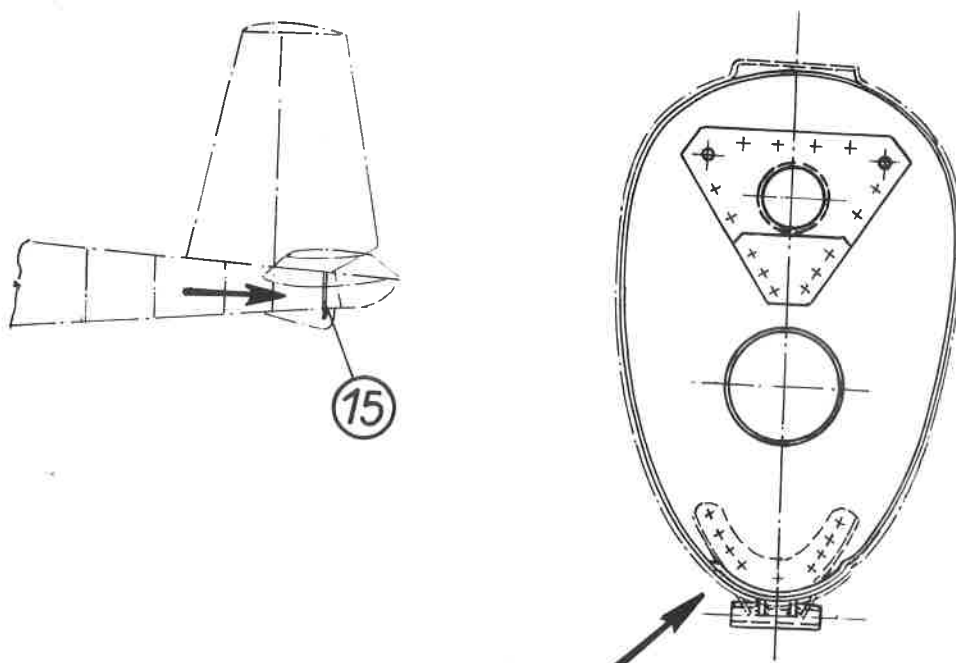


Fig. 70. Check of the fuselage frame No. 15 for possible cracks within the tail skid mounting structure.

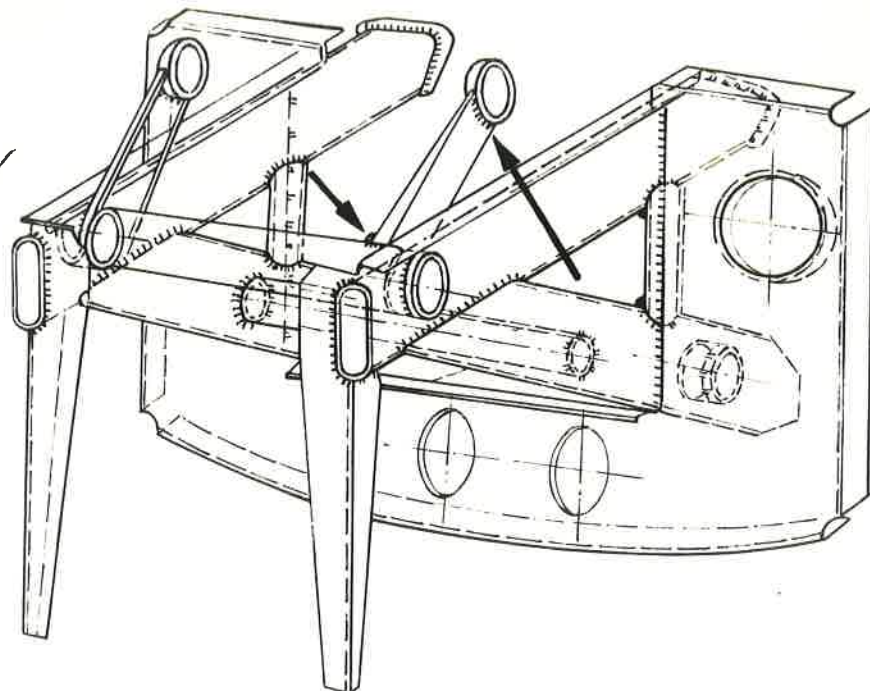


Fig. 71. Check of the undercarriage silencer mounts and the undercarriage mounting structure for cracks.

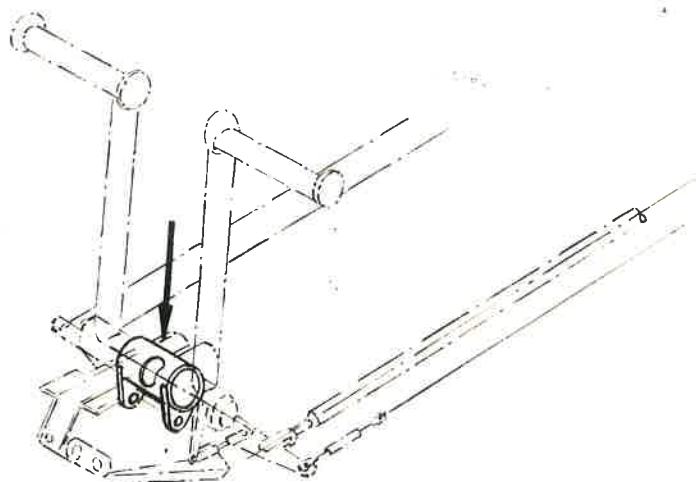


Fig. 72. Check of front pedal controls rocker lever for cracks

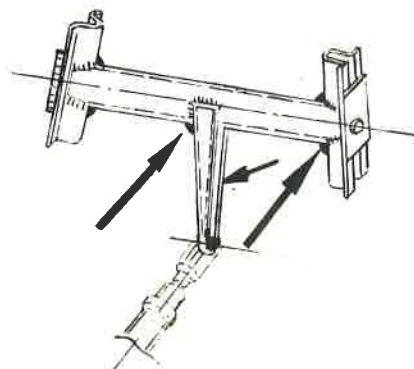


Fig. 73. Elevator drive check for possible cracks

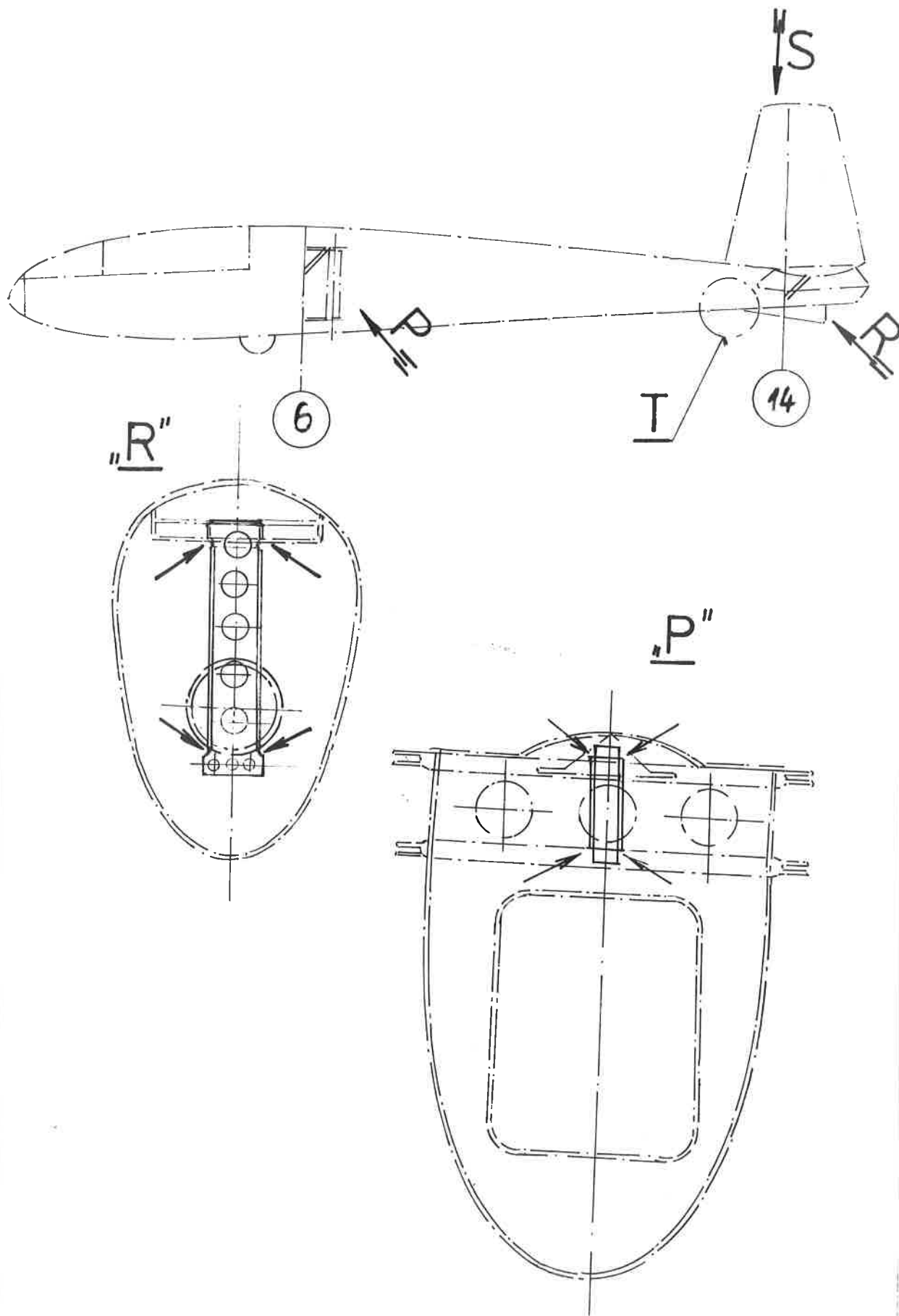
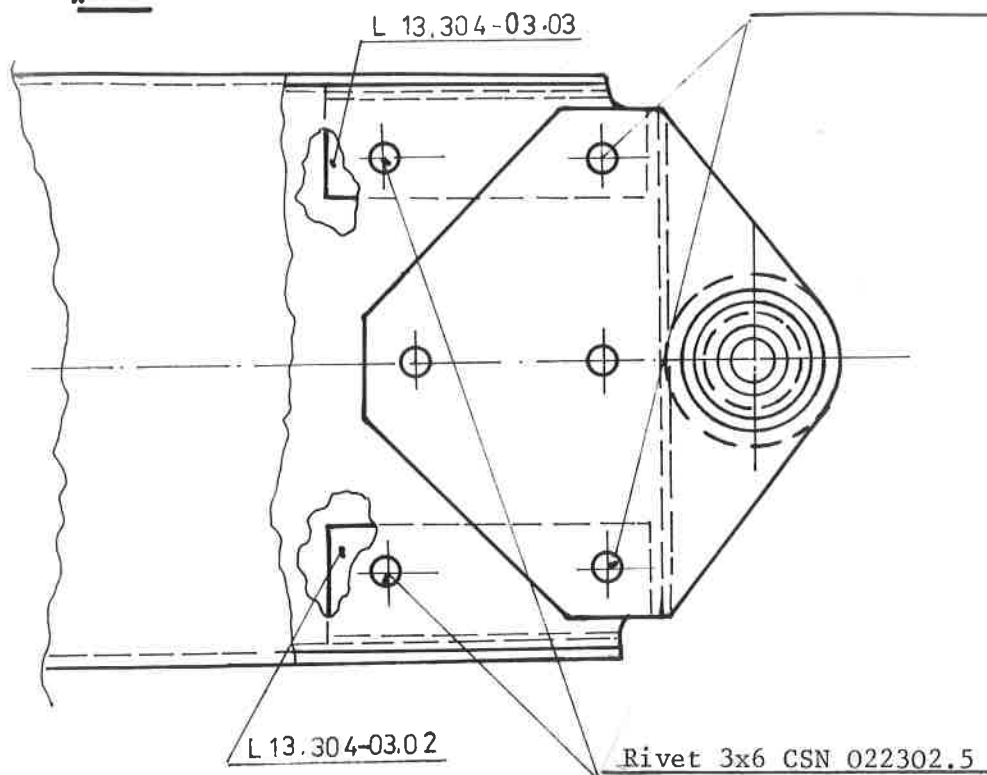


Fig. 73 a/ Check of the stiffeners

"S"

Rivet 3x8 CSN 022302.5



"T"

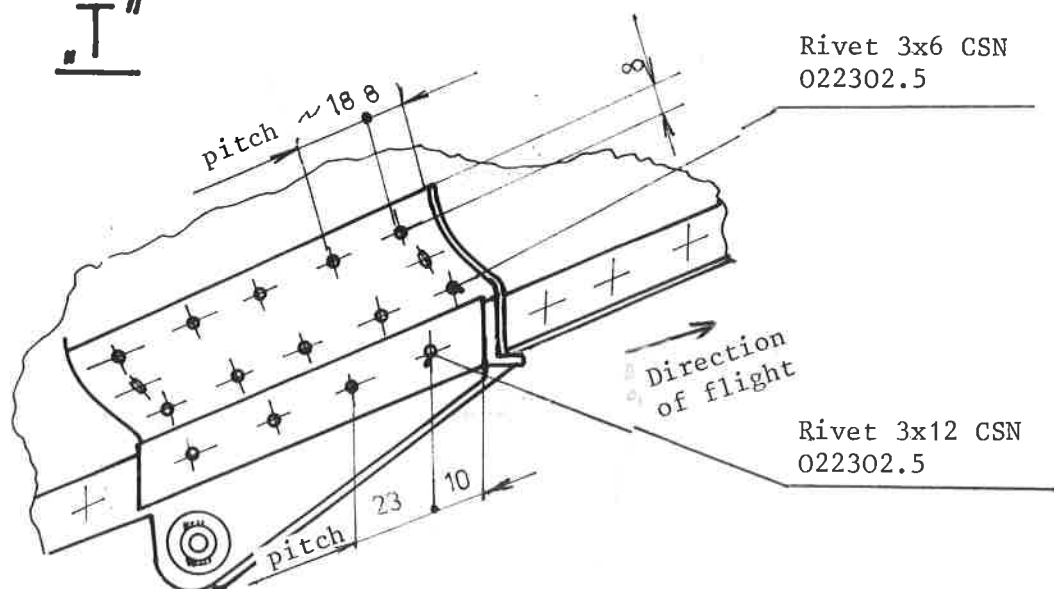
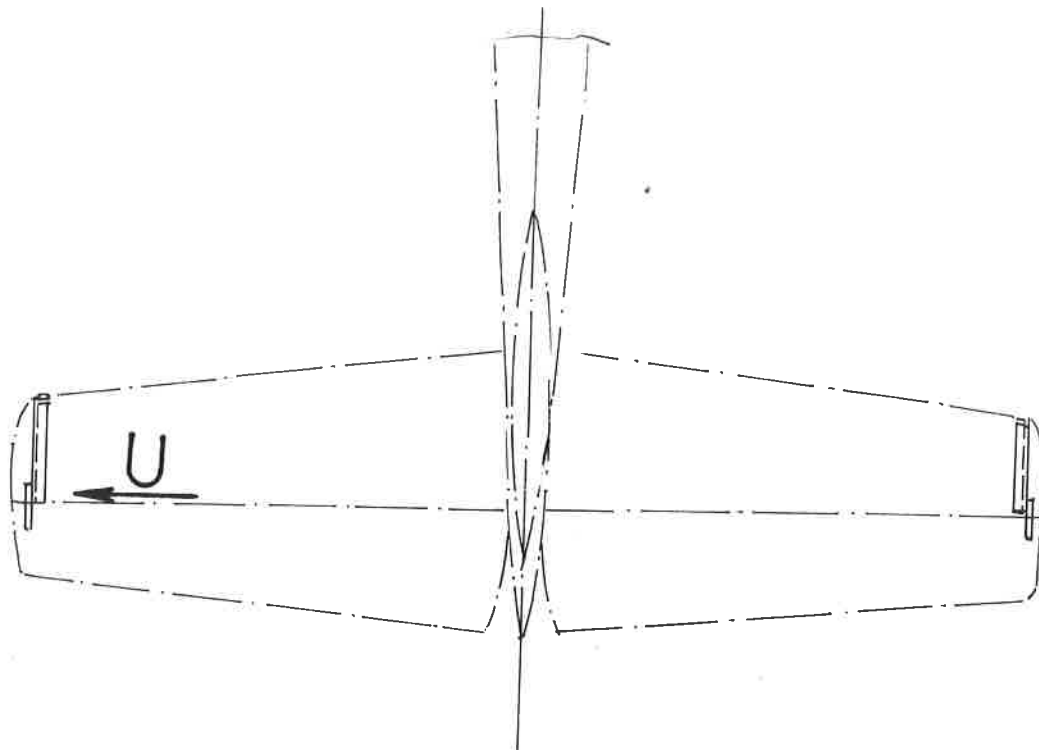


Fig. 73b/ View S and T from Fig. 73 a/

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"U"

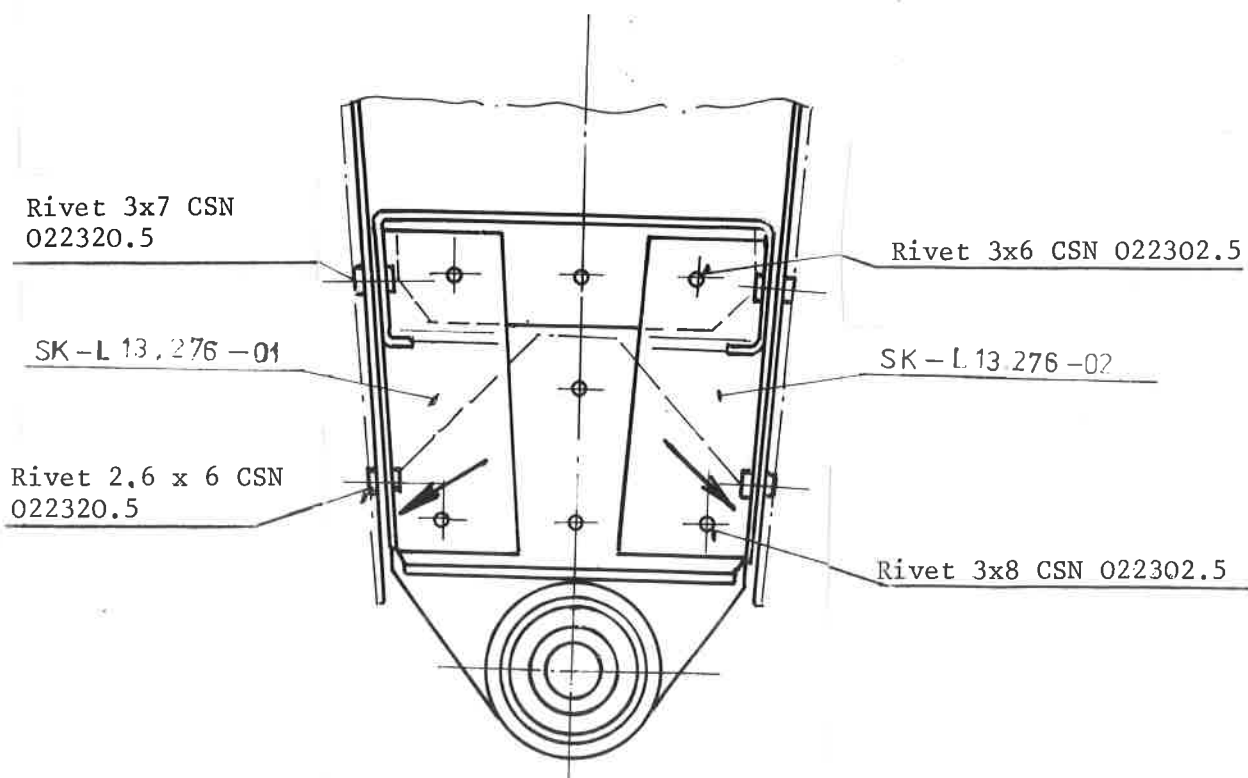
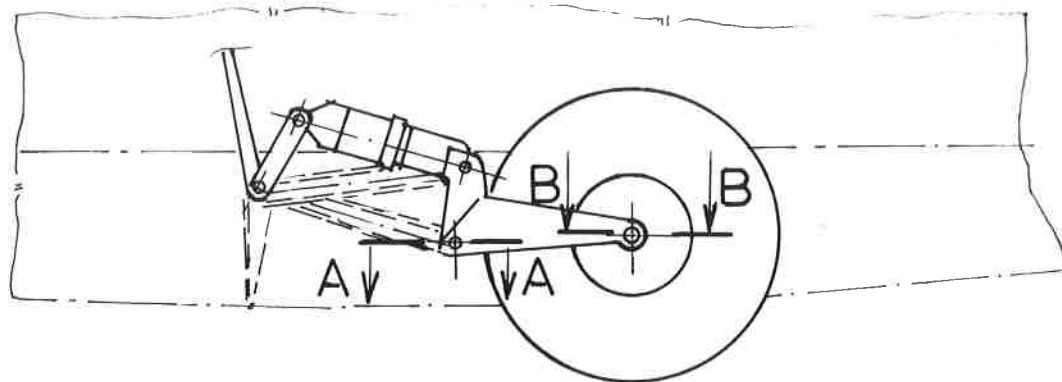
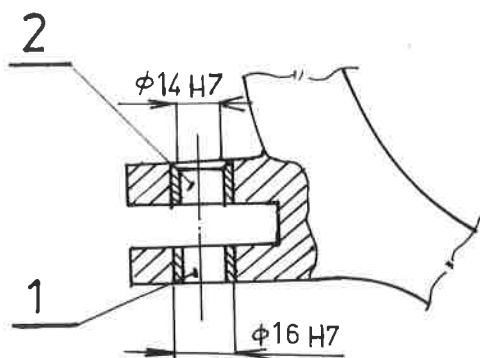


Fig. 73c/ Check of elevator edge rib radii for cracks



A-A



B-B

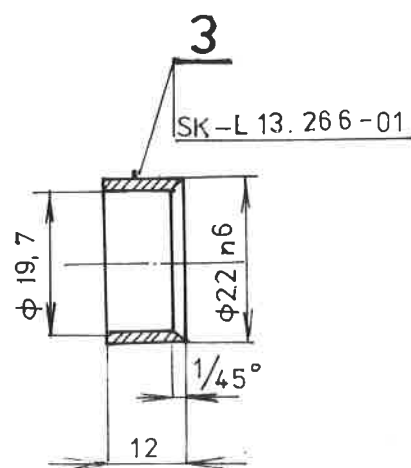
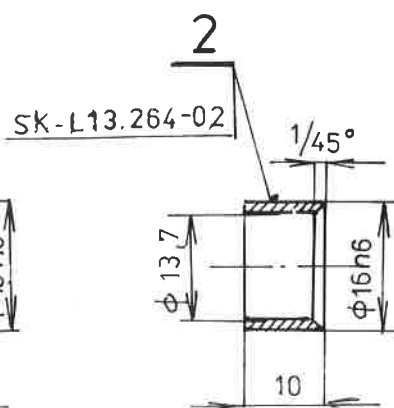
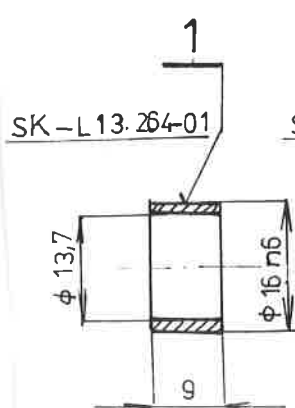
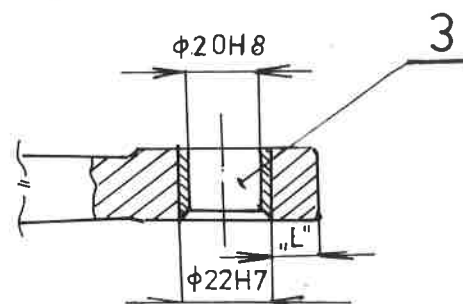


Fig. 73 d/ Check for clearances of the undercarriage fork