

### AIRWORTHINESS DIRECTIVE

Issue 2

TYPES AFFECTED:

ASTIR CS from Serial No. 1001 to 1536 inclusive
ASTIR CS77 from Serial No. 1601 to 1844 inclusive
ASTIR CS Jeans from Serial No. 2001 to 2248 inclusive
CLUB ASTIR 11 and STD ASTIR 11 from Serial No. 5001 to 5061 incl.

SUBJECT:

Inspection/replacement of divebrake system cast bellcranks

BACKGROUND:

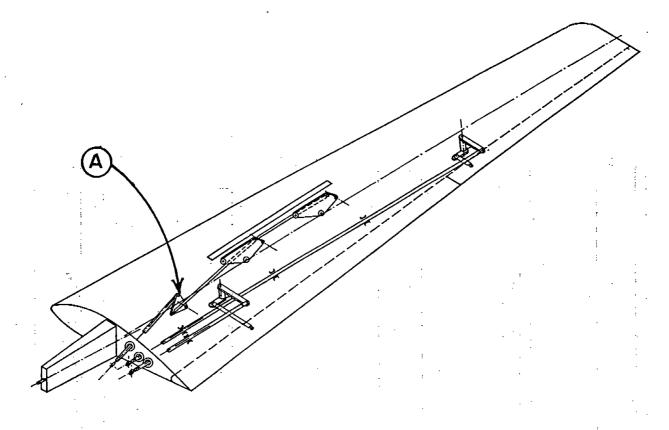
English & European experience has required the issue of:

- 1. AD-85-98 issued by the German LBA
- 2. Grob TM 306-26, TM 306-26/1 and TM 306-26/2. (Forming part of this A.D.).

These documents request the inspection and replacement of the cast bellcrank marked (a) in the sketch below.

To facilitate the introduction of these requirements, this AD has been published in two issues; the second issue prepared following satisfactory inspection of all applicable sailplanes and completion of several trial installations to check accuracy of the German documentation.

Anchor nuts have been added to the bellcrank pivots to allow inservice removal of the new bellcranks without the need for re-cutting access holes at a later date.



Issued by:

Chief Technical Officer, Airworthiness

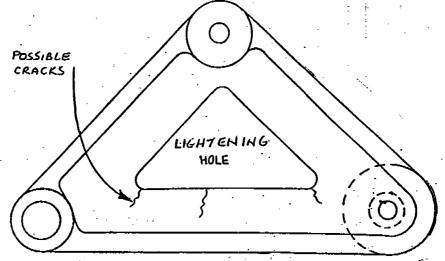
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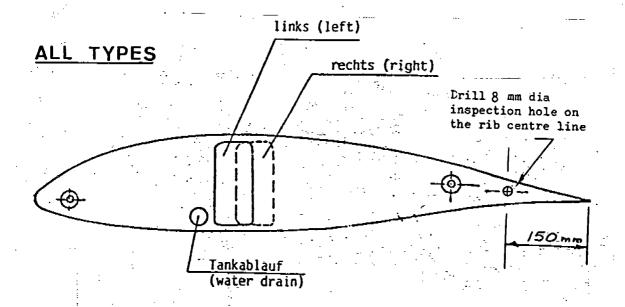
#### ACTION REQUIRED: (1)

#### 1. Before next flight

Cut an inspection hole in both wing root ribs and determine if the bellcrank looks like this:



Locate the inspection holes as shown in the following diagram.



#### RESULTS OF INSPECTION:

- (a) If the inspection shows no hole in the casting, then you are not required to replace the bellcrank until the 3000 hr life extension inspection.
- (b) If the inspection shows no hole, but the sailplane has passed 3000 hrs then replacement of the belicrank must be made on or before June 30th 1987.

Order both modification kits detailed on the attached order forms.

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- (c) If the bellcrank has a hole, then the following is required:
  - 1. Order both mod kits on the attached forms (Before 31st August 85)
  - 2. Cut a 40mm inspection hole as shown on the attached sheets (Dimensions supplied by Grob).
  - 3. Through the hole, determine whether or not the bellcrank is cracked.
  - 4. If the bellcrank is cracked it must be replaced before further operations. (The sailplane is grounded).
  - 5. If no cracks can be seen (they will show as a black line), the sailplane can return to service on the condition that the bellcrank is visually inspected for cracks at each Daily Inspection.

    This <u>must</u> be endorsed on both Parts 1 and 2 of the Maintenance Release.
  - 6. Bellcranks to be replaced on or before 30th June 1987.

IMPLEMENTATION:

Any GFA C. of A. inspector can complete the required inspection programme, recording details of the inspection in the sailplane's logbook.

#### ACTION REQUIRED (2)

Replacement of bellcranks at either the 3000 hour inspection or 30th June 1987, as required by (a) and (b) or (c) 6 of Action 1.

All bellcranks with lightening holes are to be removed and replaced with factory supplied bellcranks, manufactured from Duralumin plate.

This replacement is achieved by:-

(1) Cutting two access holes in the <u>underside</u> of both wings in accordance with:-

Astir CS, Astir CS77 - Drawing No. 1.

Club Astir 11
Standard Astir 2

Drawing No. 2.

Note! The drawings show the bottom of the fuselage and wings.

Note! Repair Instruction 306-26/1 and Repair Instruction 306-26/2 discuss fully locating and cutting the 4 access holes.

- (2) Remove the cast bellcranks
- (3) Fit 2 8mm 2 legged anchor nut to each mounting channel using the existing bolt/bush assembly as locating jigs, utilising 2 1/8" dia Monel pop rivets per anchor nut.

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#### ALTERNATIVELY -

Replace the original 8mm pivot bolts with AN5 bolts (length to suit). Fit 2 AN 362-516 two legged anchor nuts with 1/8" Monel pop rivets to the mounting channels using the bolts and bushes as jigs to locate the anchor nuts.

- (4) Install the new Duralumin bellcranks, ensuring that all pivot bolts are tightened correctly and nuts in safety and parts function freely without interference. Refer to repair instruction No. 306-26/2 (included with this AD) for recommendations on removal and installation, particularly the built up of the overcentre stop pad which may be worn or damaged.
- (5) Repair the large access hole in accordance with Repair Instruction No. 306-26/1.
- (6) Repair the small access hole in accordance with Repair Instruction No. 306-26/2.
- (7) Renew gel coat, avoiding the use of excessive hardener or thinner to forestall gel coat cracking in the future.

#### (8) DIVEBRAKE PILOT EFFORT

The manufacturer has refused to provide pilot effort data, that is maximum forces to be exerted by the pilot while opening and closing the divebrake system. It is known that in some cases high pilot effort has resulted in system damage and cracking of the gel coat and GRP skins adjacent to the stop blocks in each wing.

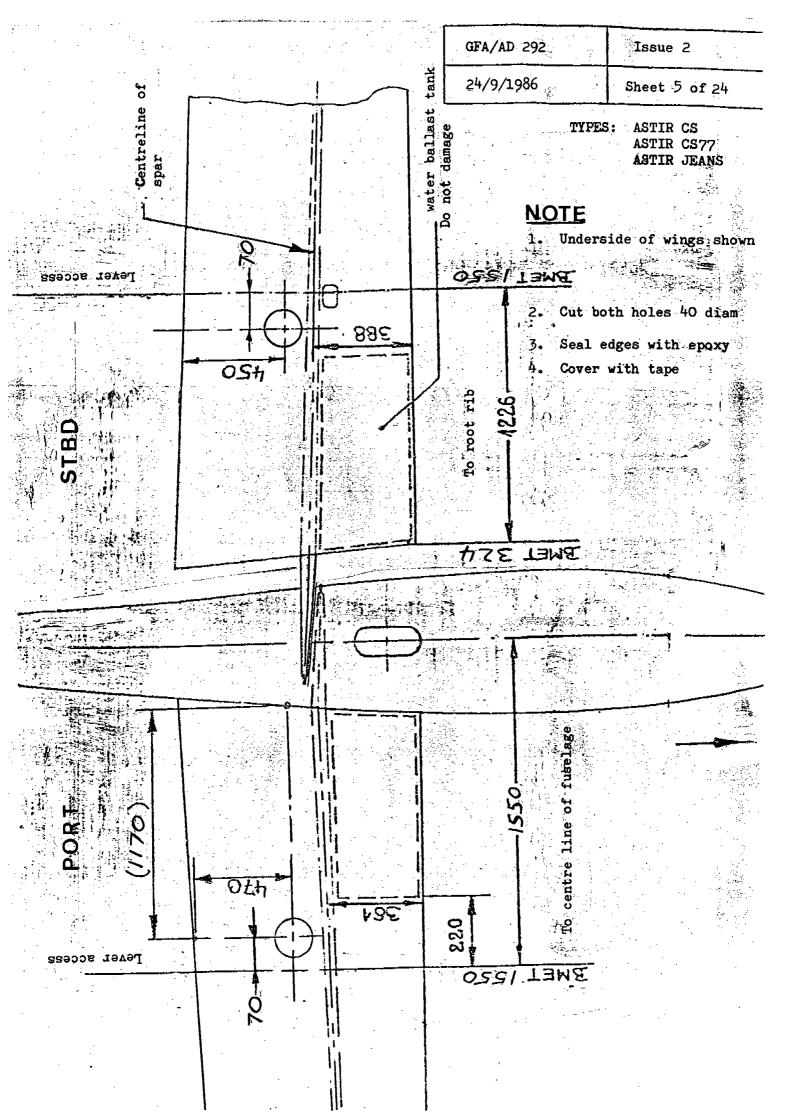
Careful overcentre adjustment should allow pilot effort, opening or closing to be kept below 10kg, but not less than 6kg.

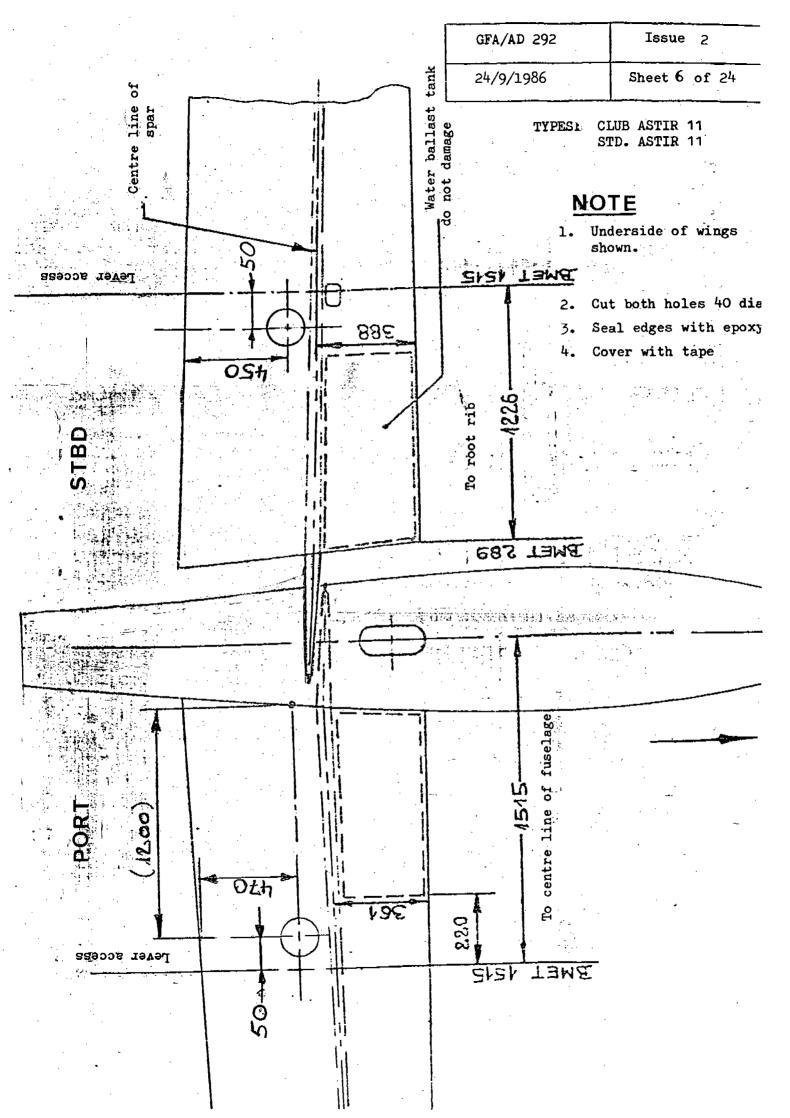
#### IMPLEMENTATION:

- (1) Repair of access holes and installation of reinforcement rings must be carried out by the holder of a DoA 1109 Glider Inspectors Certificate endorsed "Major repair FRP".
- (2) System installation and rigging may be completed by any 1109 holder endorsed "C. of A. Inspector" (any type).
- (3) On completion all work is to be certified by logbook entry, signed by the appropriate inspector/s.

#### COMPLIANCE:

The requirements of this Airworthiness Directive are mandatory. This Directive is issued pursuant to Air Navigation Regulations under the delegated authority of the Secretary of the Department of Aviation.





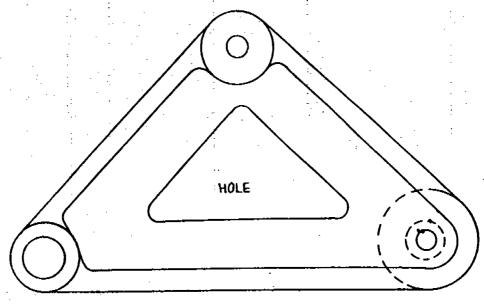
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Technical Information
TM 306-26

ASTIR CS 77
ASTIR CS Jeans
CLUB ASTIR II
STANDARD ASTIR II



- 1.4. If a solid constructed lever of aluminium casting without hole is found, further actions are not applicable until the 3000-hours-check (see instruction 4.4.)
- 1.5. If a lever of aluminium casting with facilitating hole is found, the following instructions have to be carried out.
- 2. <u>Instruction</u>: Installation of an inspection hole with sight-window into the wing underside in the region of the airbrake locking levers. (See repair instruction 306-26/1).
- 2.1. Temporarily, the control of the levers according to instruction 3 can be carried out through the opening in the root rib. In order to facilitate the control and especially to avoid the daily disassembly it is urgently recommended to install the inspection openings in the wing underside at short notice.
- 2.2. The instruction 2, however, has to be performed not later than 31.03.1986. The necessary material (see below) has to be ordered from the manufacturer with the attached order form.
- 2.3. Concerning the installation of the inspection holes it has to be proceeded according to repair instruction no. 306-26/1. This repair instruction is component part of this Technical Information and will be destributed with the material.
- 2.4. In Flight Manual from ASTIR CS, CS 77 and CS Jeans page 3 has to be exchanged and page 26a added. In Flight Manual from CLUB and STANDARD ASTIR II have to be exchanged page 1 and added page 14a. This pages will be delivered with the repair

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material.

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# Technical Information TM 306-26

ASTIR CS
ASTIR CS 77
ASTIR CS Jeans
CLUB ASTIR II
STANDARD ASTIR II

- 3. <u>Instruction</u>: Control of the airbrake locking levers with facilitating hole for cracks.
- 3.1. Before next start the right and the left locking lever have to be checked for cracks in one of the 3 legs. The control is made either through the openings in the root ribs or through the openings in the wing underside.
- 3.2. In case of the control through the root rib an endoscope or another doubtless method has to be used. In case of doubt instruction 2 has to be performed in advance.
- 3.3. In case of the control through the wing underside the plexiglass-pane can be removed for better access. The use of a magnifying glass is recommended.
- 3.4. If no cracks are found, instruction 3 has to be repeated daily before flight operation until realization of instruction 4.
- 3.5. If cracks are found, instruction 4 has to be performed before next start.
- 4. <u>Instruction</u>: Exchange of the locking levers left and right no. 102-4123/4124 of aluminium casting for such of aluminium sheet.
- 4.1. The instruction 4 requires accomplishment of instruction 2.
- 4.2. The exchange of the locking levers has to be carried out according to repair instruction no. 306-26/2. This repair instruction, too, is component part of this Technical Information and will be distributed with the material.
- 4.3. If the exchange is carried out as a precaution and the levers if aluminium sheet are installed, the daily check is inapplicable.
- 4.4. The exchange of the casting levers and, as a precaution, also of those without facilitating hole has to be performed, however, at the latest on the occasion of the 3000-hours-check.

#### Material:

#### Material for instruction 2:

- 1 Repair instruction no. 306-26/1 Two pages of Flight Manual
- ASTIR CS, CS 77 and CS Jeans: Page 3 and 26a
- CLUB and STANDARD ASTIR: Page 1 and 14a
- 2 Roving rings no. 103-1001.17
- 2 Plexiglass-panes no. 103-1001.48
- 12 Self-tapping screws B 2,9 x 6,5 DIN 7982 galvanized

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Technical Information TM 306-26

ASTIR CS ASTIR CS 77 ASTIR CS Jeans CLUB ASTIR II STANDARD ASTIR II

#### Material for instruction 4:

- Repair instruction no. 306-26/2
- Locking lever left no. 102-4123 (mark L)
- Locking lever right no. 102-4124 (mark R) in each case complete according to drawing no. 102-4123/4124
- Stop dogs (3 x 30 x 30 mm) of laminated fabric
- Hard foam pieces (Conticell C 60) 160 x 200 mm, 8 thick, one-sided diagonally coated with woven glass LN 8.4551.6 (Interglas 92125)

#### Material for instruction 2 and 4:

- Woven glass LN 8.4548.6 (Interglas 92 110) Woven glass LN 8.4551.6 (Interglas 92 125)
- Resin Glycidather 162 (BASF) 100 GT\*(previously Epikote 162, SHELL)
- Hardened Laromin C 260 (BASF) 38 GT\*
- Filler cotton flocks (type FL 1 f)
- PE-varnish, white, no. 03-69 066 (100 GT)
- UP-hardened no. 07-20510 (3 GT\*) quick-hardener

\* GT = parts

Weight and balance: No influence

Remarks:

Instruction 1 and instruction 3 have to be performed

by an experience person.

Instruction 2 and instruction 4 have to be performed

by an authorized aviation workshop.

The proper execution of the instructions has to be certified in the log-book by an authorized inspector,

class 3.

Mattsies, 25.03.85

signed Dipl.-Ing. H. Wilser

LBA-approved on:

**2** 5. *fatti* 1985.

In case you have sold your glider meanwhile, we ask you kindly to P.S. give this information immediately to the new owner and to let us know his address and the serial number.

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No. 306-26/1

Type Certificate 306

Installation of an inspections hole with sight-window into the wing underside in the region of the airbrake locking levers

(See also TM 306-26)

(All parts are made available by the manufacturer)

- Dismantle aircraft and lay-out wings upside down on tressles, unlock airbrakes.
- Pin-point the position of the overcentre lever according to drawing No. lor 2 Before cutting, reasure yourself by tapping to locate the position of the spar. It is pointed out here, that the position of the spar differs in Port and STBD. wings.
- 3. First cut the larger hole to replace the lever behind the spar for later on, by cutting a circle of 180 mm diam. through the outer skin and through the foam only. Stay clear of the inner skin. Remove the outer skin and foam from the inner skin (the outer 30 mm surface must be cleaned of all foam and roughened to take the supplied re-inforcing ring). Then cut out inner skin in circle after curing which is glued into place with Epoxy/Cotton mixture, arrows point to the L.E.
- 4. For the inspection ring, follow the instructions on drawing 4 picture D, and splice the outer laminate 20 mm wide.
- 5. The repaired area, as well as the foam block are cleaned:
  - Remove sanding dust (also out of the foam pores) by compressed air.
  - Remove protection fabric from laminated foam block.
  - In case of dirt or grease, wash splices with Acetons.

Check for tools and other foreign objects inside the openings. All further work should be dust-free and free of grease.

6. Resin and hardener is again mixed at the ratio of 100 : 38, but without the cotton flaks. With this mixture, the pores of the foam is filled.

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No. 306-26/1

Type Certificate 306

- 7. According to drawing 4 picture C, a first layer of 92 125 (thicker fabric, larger patch) is applied.

  After this, the thinner fabric 92 110 (smaller patch) is applied with a fabric parallel to the spar, and the resin is made to penetrate with a small brush.
- 8. At room temperature, the resin mix should be cured after approx. 8 hours. To speed up this process, the surrounding air can be heated slightly.

  Attention: To higher temperature will cause air bubbles.
- 9. Now follows the finishing work. As soon as the laminate has cured, sand with 80 wet and dry sand-paper and then with a 150, to an even surface. Before applying the Gelcoat, the repaired area should be thoroughly cleaned of dust etc. etc.
- 10. Follow instruction for application of Gelcoat and finish in Maintenance Manual (Repair instructions).
- 11. Now fix the perspex covers (2 mm thick; diameter 140 mm) at the rings with 6 self-tapping screws (shell end mill). See drawing 4 picture D.
- 12. The action of this work is to be entered into the Logbook.

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## REPAIR INSTRUCTION No. 306-26/1

Type Certificate 306

#### Material for installation of inspection hole:

- Poam inserts (Conticell C 60) 160 x 200 mm, 8 thick, one side with 1 glass lager 92 125 diagonal
- Glass fibre 92 110
- Glass fibre 92 125
- Resin Glycidather 162 (BASF) 100 parts
- Hardener Laromin (BASF) 38 parts
- Cotton flocks Type FL 1 f
- Color: PE-Schwabbellack, white, No. 03-69066 (100 parts)
- Colorhardener: UP-Härter No. 07-20510 (3 parts)
- 2 Insert roving rings No. 103-1001.17
- 2 Perspex Nr. 103-1001.48
- 12 Self-tapping screws B 2,9 x 6,5 DIN 7982 verz.

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## REPAIR INSTRUCTION No. 306-26/2

Type Certificate 306

Exchange of the locking levers left and right No. 102-4123/4124 of aluminium casting for such of aluminium sheet.

(All parts are made available by the manufacturer.)

Repair instruction No. 306-26/1 must have be done.

- Dismantle aircraft and lay-out wings upside down on tressles, unlock airbrakes.
- 2. Pin-noint the position of the overcentre lever according to drawing No. 1 or 2 Before cutting, reassure yourself by tapping to locate the position of the spar. It is pointed out here, that the position of the spar differs in Port and STBD. wings.
  - 3. The position of the smaller hole must now be fixed according to drawing 1. Please note: that the lever accress is not in the centre of the hole to ensure that the water tank is not damaged. It is important to adhere to the distance 60 mm from the spar centre line (drawing 2) so as not to damage the spar area. This opening must be 120 mm x 80 mm right through outer and inner skin, so that the supplied foam blocks will fit. It is adviseable to first cut a smaller hole within the marked-out hole to carefully break through, to check the location. Care must be taken as the ballast jettison tube is located under this shell to avoid it's damage. Do not penetrate the inner skin, too far.
    For further work, the ballast tube my have to be pushed aside.
  - 4. Now the cast over-centre lever can be removed. Memorize the position of pushrods to ensure correct installation of the new levers, which are marked L = left and R = right wing (remember the wings are lying up-side down). The hinge bolt is removed and the spacer tube is removed through the leading edge hole (see sketch 2).
  - 5. The lever is removed from the bearing and the bolts for the two pushrods dismantled. The pushrod ends and the counter nut on the pushrods must not be interferred with.

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No. 306-26/2

Type Certificate 306

- 6- Because of the smaller outside contour of the new lever, the stop (drawing 3) must be built-up by a 3 mm material, and laminated with epoxy/cotton flake mixture to the correct position. A small strip of glass fibre is glued over the stop onto the skin. All gluing area's should be carefully prepared and sanded.
- Now the new sheet aluminium over-centre lever is installed. (Assembly part see drawing 102-4123/4124). Ensure that the left and right levers are not mixed up. Use new bolts and nuts.
- 8. First the control rods are attached. According to drawings 2 and 3 the pushrod leading to the root-rib is attached to the smaller lever arm, while the pushrod from the airbrake is attached to the longer lever arm.

  Takecare to add the spacer cones (2 on Stbd. lever and 1 on Port lever only), to avoid contact of the pushrods with the lever.
- 9. The lever is placed into it's bearer, the distance tube inserted through the leading edge opening, and the hexogen bolt M 8 x 90 fed-in through the round hole.
- 10. A function test is now carried out by operating the pushrod at the root rib. Pulling the pushrod is locking the system over-centre, pushing it unlocks it. The pushrod should have no contact with the lever while rotating.

  The over-centre action must be pronounced. (Drawing no. 3 shows detail).

  If necessary the stop may have to be adjusted by filing. It is urged to do a function test also on the rigged aircraft. Under unforeseen circumstances, correction can still be carried out through the openings.

  After correct installation to drawings 3 & 5 there should be no problems.
- 11. Before closing the opening, forward of the spar, the edge has to be prepared according to drawing 4. So that the inner layer overlaps, a 20 mm edge is cut away all round, allowing for a foam block to be 160 x 120 mm.
- 12. The foam block' which are supplied oversized, are made to fit with the laminated side touching the inner skin.

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No. 306-26/2

Type Certificate 306

- 13. With a sanding block, the outer layer is now spliced all round 20 mm wide. The inner lamination is cleaned of all foam and sanded, as well as the edge on the lamination of the foam block (drawing 4, picture A).
- 14. The repaired area, as well as the foam block are cleaned:
  - Remove sanding dust (also out of the foam pores) by compressed air.
  - Remove protection fabric from laminated foam block.
  - In case of dirt or grease, wash splices with Acetons.

Check for tools and other foreign objects inside the openings. All further work should be dust-free and free of grease.

- 15. Resin and hardener are mixed at a ratio of 100 to 38 by weight, and after thorough stirring, cotton flakes are added until a doughy, dripping, sticky mixture is achieved.
- 16. This mixture is now applied to the rim of the inner laminate, the glueing area of the foam block, as well as the edges of the foam block, and the foam block pressed into the opening (with the laminated part touching the inner skin). To follow the contours of the wing, the foam block is ballasted down (see drawing 4, picture 8). The gap between the foam block and the cut-out is filled with the mixture.
- 17. At room temperature, the resin mix should be cured after approx. 8 hours. To speed up this process, the surrounding air can be heated slightly.

  Attention: To higher temperature will cause air bubbles.
- 18. After curing, the foam block is sanded to the contour of the wing surface, allowing for 1 mm of glass and gelcoat.
- 19. The repair area is again cleaned as under point 14.
- 20. Resin and hardener is again mixed at the ratio of 100 : 38, but without the cotton flaks. With this mixture, the pores of the foam is filled.

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Nc. 306-26/2

Type Certificate 306

- 21. According to drawing 4 picture C, a first layer of 92 125 (thicker fabric, larger patch) is applied.

  After this, the thinner fabric 92 110 (smaller patch) is applied with a fabric parallel to the spar, and the resin is made to penetrate with a small brush.
- 22. Curing as to Point 17.
- 23. Now follows the finishing work.
  As soon as the laminate has cured, sand with 80 wet and dry sandpaper and then with a 150, to an even surface.
  Before applying the Gelcoat, the repaired area should be thoroughly
  cleaned of dust etc. etc.
- 24. Follow instruction for application of Gelcoat and finish in Maintenance Manual (Repair instructions).
- 25. Now fixe the perspex covers (2 mm thick; diameter 140 mm) at the rings with 6 self-tapping screws (shell end mill). See drawing 4 picture D.
- 26. The repairs are now completed and should take approx. 6 to 8 work hours (for repair instruction 306-26/1 and 306-26/2). The aircraft is now rigged and another function test carried out.
- 27. The action of this work is to be entered into the Logbook.

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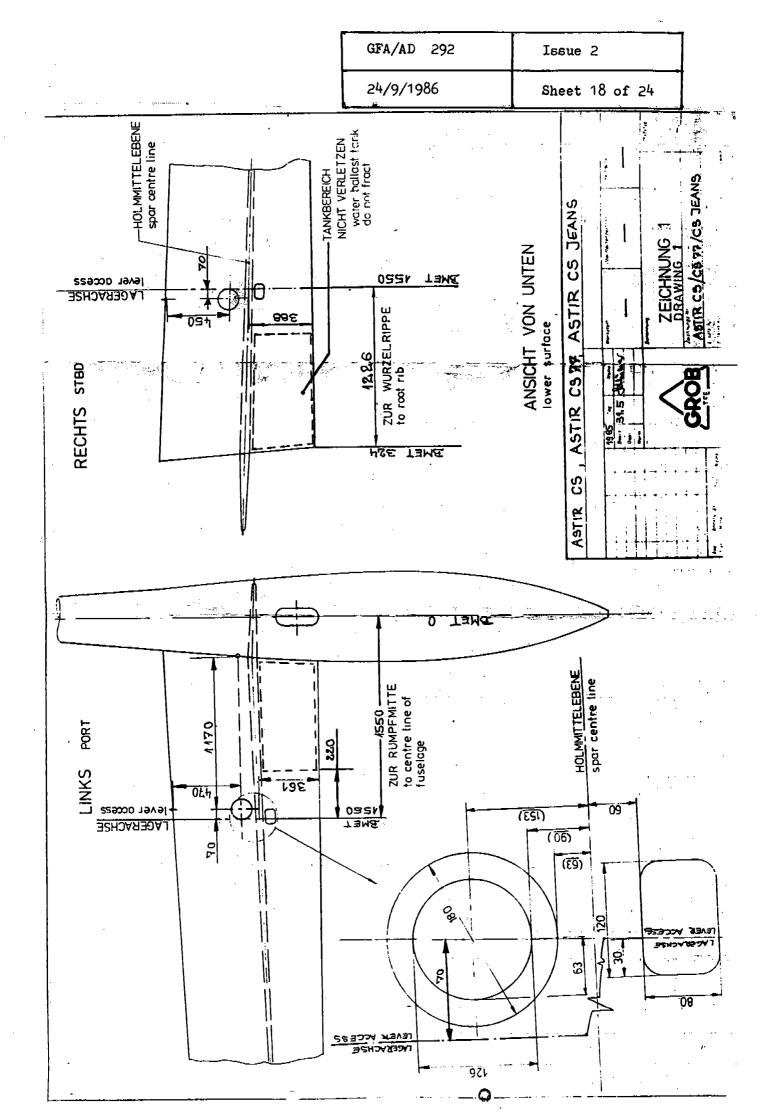
### REPAIR INSTRUCTION No. 306-26/2

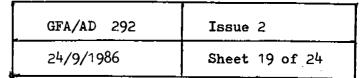
Type Certificate 306

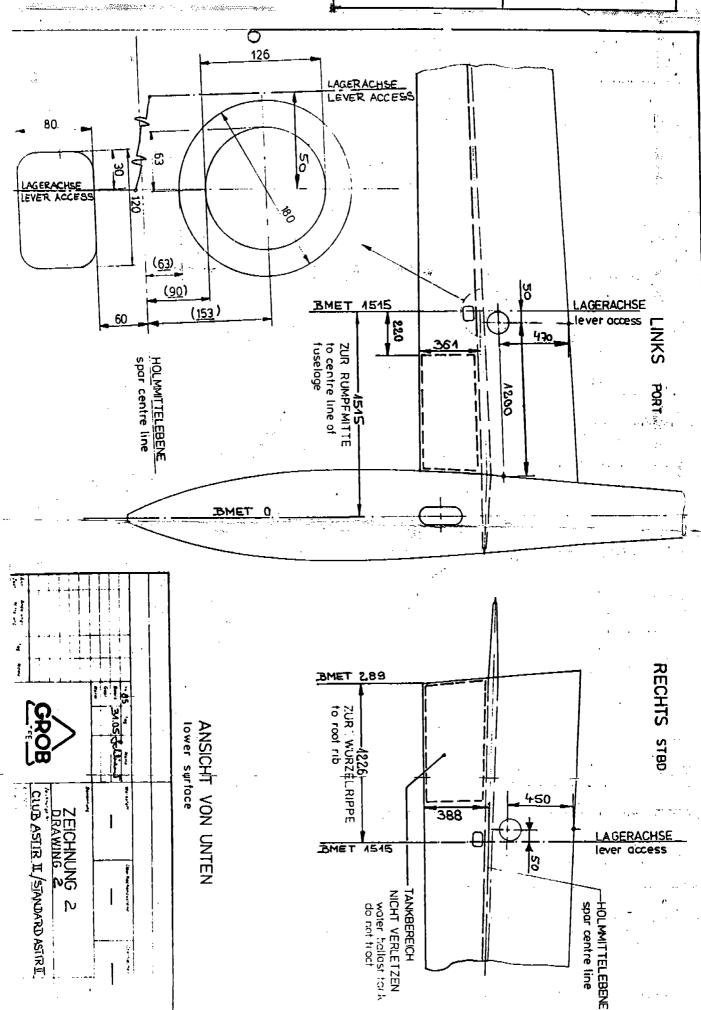
#### Material for replacement of airbrake overcentre lever:

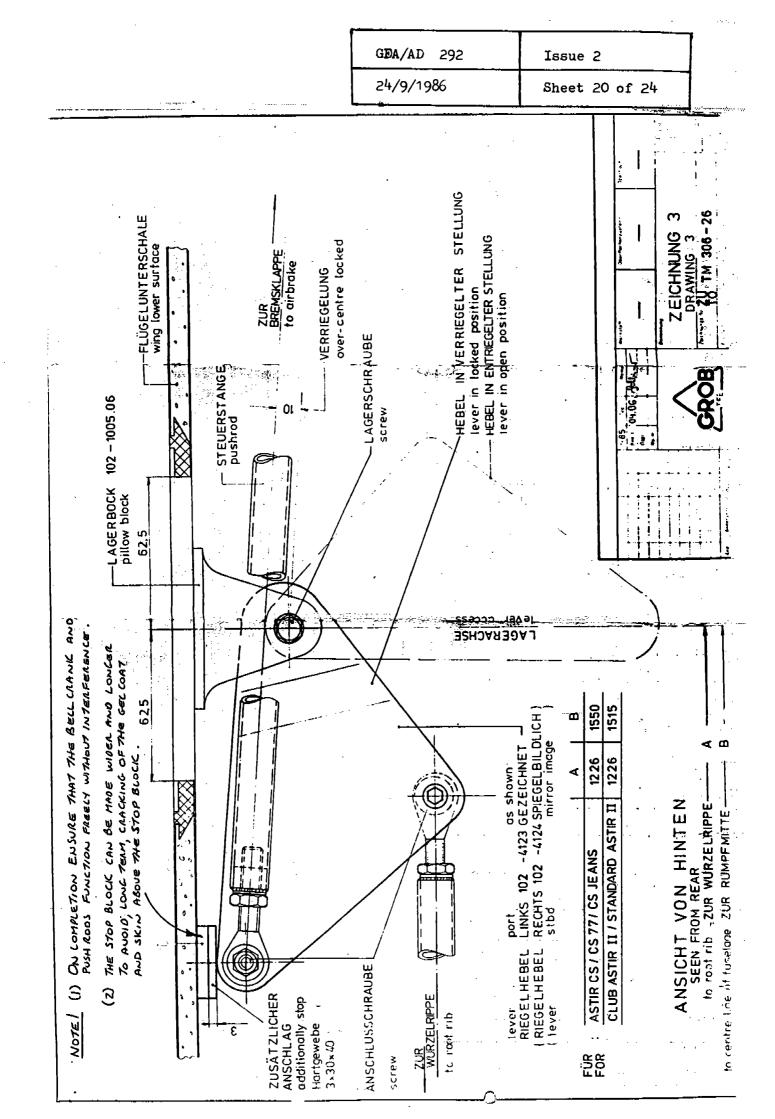
- 1 Airbrake overcentre lever left 102-4123 (KIT)
- 1 Airbrake overcentre lever right 102-4124 (KIT)
- Foam inserts (Conticell C 60) 160 x 200 mm, 8 thick, one side with 1 glass lager 92 125 diagonal
- 2 Stops 3 x 30 x 40 mm (Hartgewebe)
- Glass fibre 92 110
- Glass fibre 92 125
- Resin Glycidäther 162 (BASF) 100 parts
- Hardener Laromin (BASF) 38 parts
- Cotton flocks Type FL 1 f
- Color: PE-Schwabbellack, white, No. 03-69066 (100 parts)
- Colorhardener: UP-Härter No. 07-20510 (3 parts)

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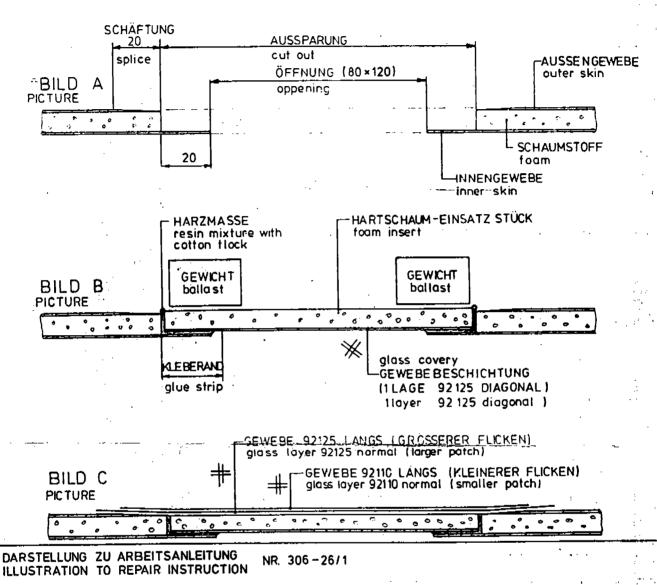


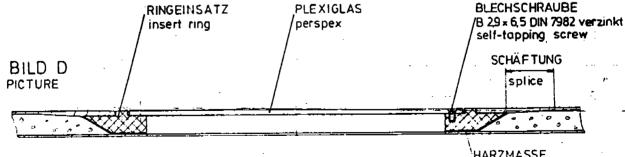




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DARSTELLUNG ZU ARBEITSANLEITUNG NR. 306-26/2 ILLUSTRATION TO REPAIR INSTRUCTION





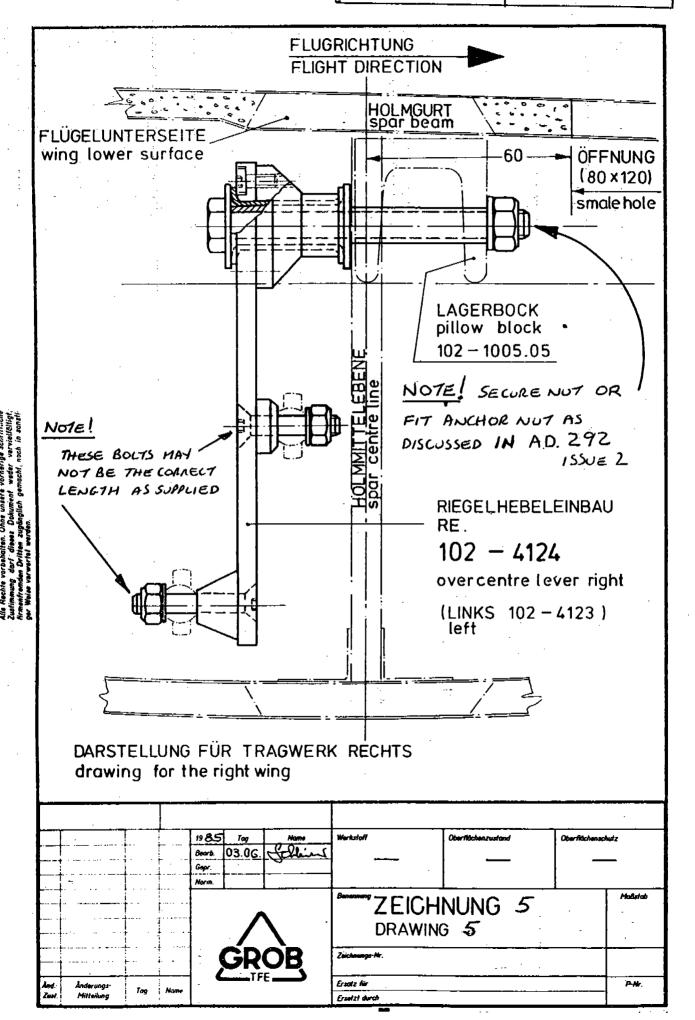
NOTE | AS SUPPLIED THIS RING DOES NOT FIT THE WING CONTOUR REQUILING IT TO BE CAREFULLY SHADED TO FIT.

> ARROW TOWARD LEADING EDGE!

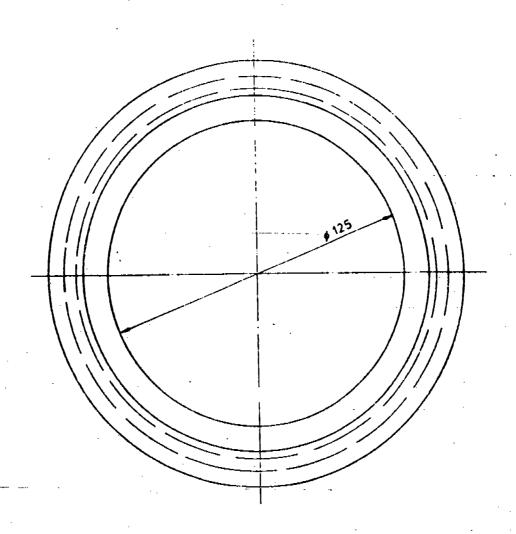
HARZMASSE resin mixture with cotton flock

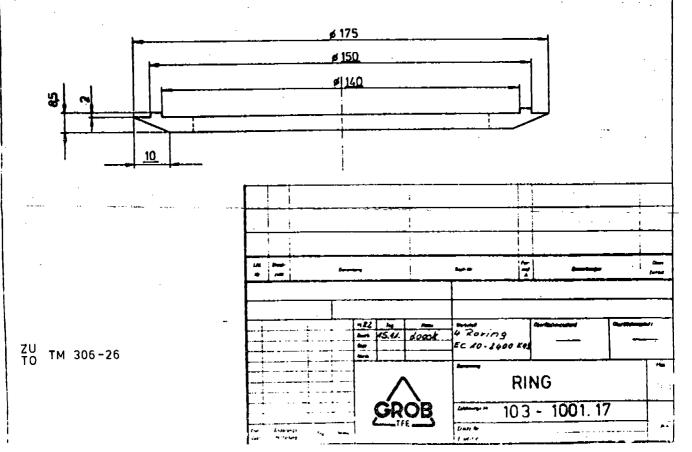
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