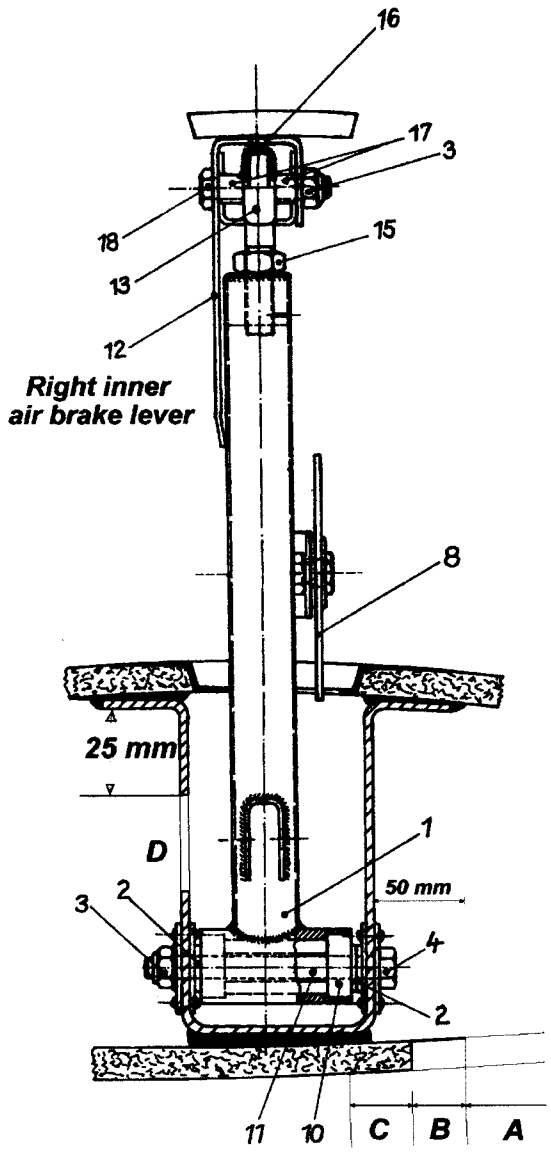
Overview:
1. Cross section through air bake box, lever extended
2. Cross section through air brake box in wing span direction
3. List with details of fabric, splicing width, resin/hardener and heat treating
4. Special hints for disassembly and assembly

Two possible procedures are provided:

(a) Opening **A** in wing underside behind air brake box, Opening **D** in air brake box:
Advantages: - uncomplicated disassembly of levers due to direct access to bolt using ratchet
- Holding tool 1 bent ring spanner
Disadvantages: - Splicing and paint job at under side outer shell

(b) Both Openings (**D** + **D** reversed) in air brake box
Advantages: - No outer shell work required
Disadvantages: - difficult disassembly of lower bolt
- 2 symmetrically identical tools made from ring spanners (welding required)

Picture 1 Section through air brake box:
(invalid for **LS6**, **LS6-a** and **LS6-b,** see picture 3)



Procedure (a)

A = Opening in lower shell behind air brake box
Edge A-B must be 50 mm <2 in> behind box
and aligned with lever axis

B = Splicing width for inner layers
C = Splicing width for outer layers
For splicing width, see type related table, page 4

D = Opening in air brake box
Upper edge 25 mm <1 in> below shell
Horizontal displacement: at edge
min. 50 mm <2 in>
See also picture 2

2 = Washers
3 = self-locking Nut M6 LN 9348 or DIN 6924 -**8**
4 = Bolt M6
10 = Ball bearing 626 2RS
11 = Bearing spacer

Procedure (b)

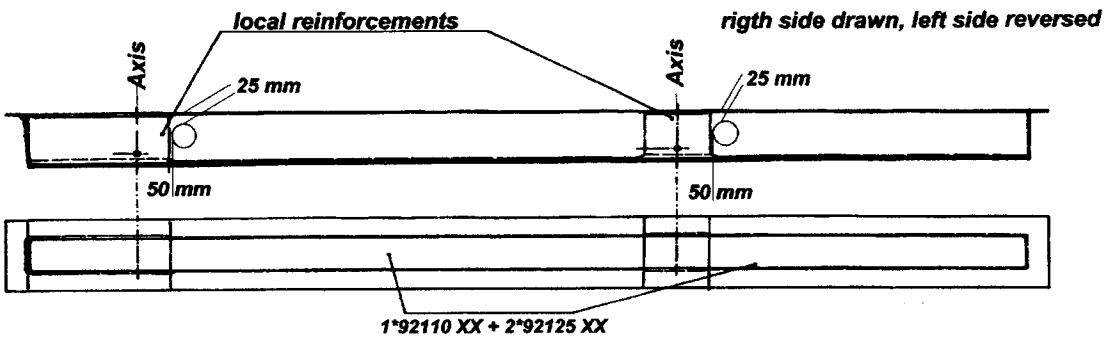
No Opening **A with B & C**

Opening **D** before and behind air brake lever
with identical values for horizontal displacement
upper edge distance from shell

Attention: For hints regarding disassembly and assembly of brake levers and exchange of ball bearings **10** see page 5.

Erstellt: 8. Oktober 1999 Geprüft:

Picture 2 View at air brake box (not valid for LS6, LS6-a, LS6-b, see picture 4)



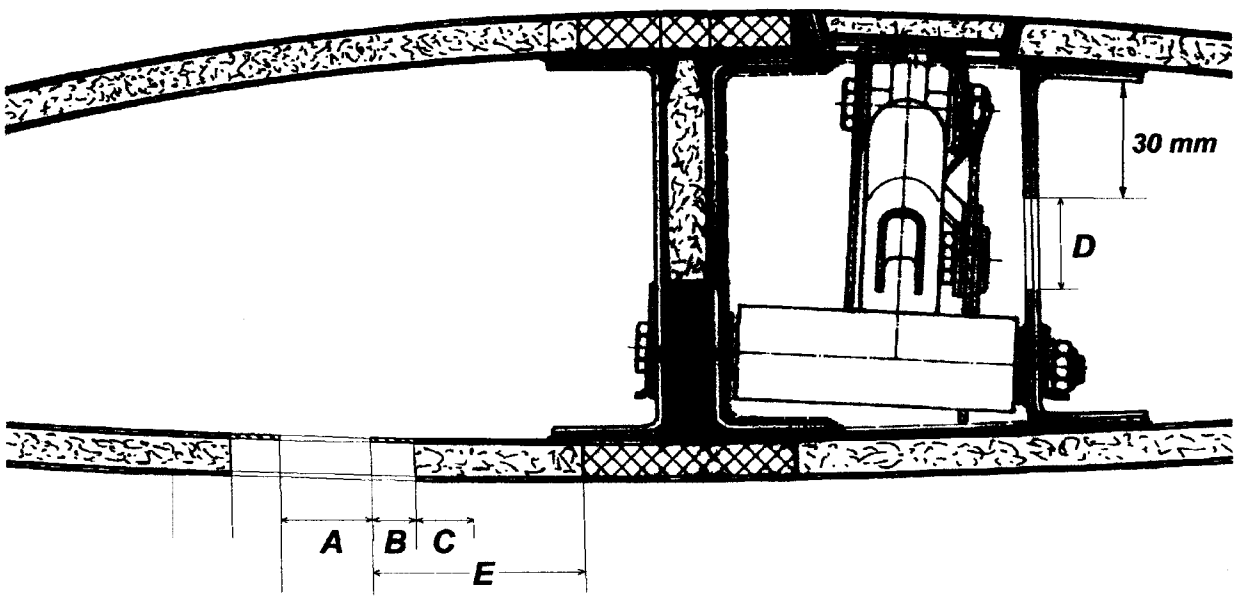
Picture 3 Cross section through air brake box (LS6, LS6-a, LS6-b):

A = Opening in lower shell in front of spar
Rear edge must be **E** = 70 mm <2.76 in> in front of spar leading edge (may be easily tapped off) and axial to lever axis

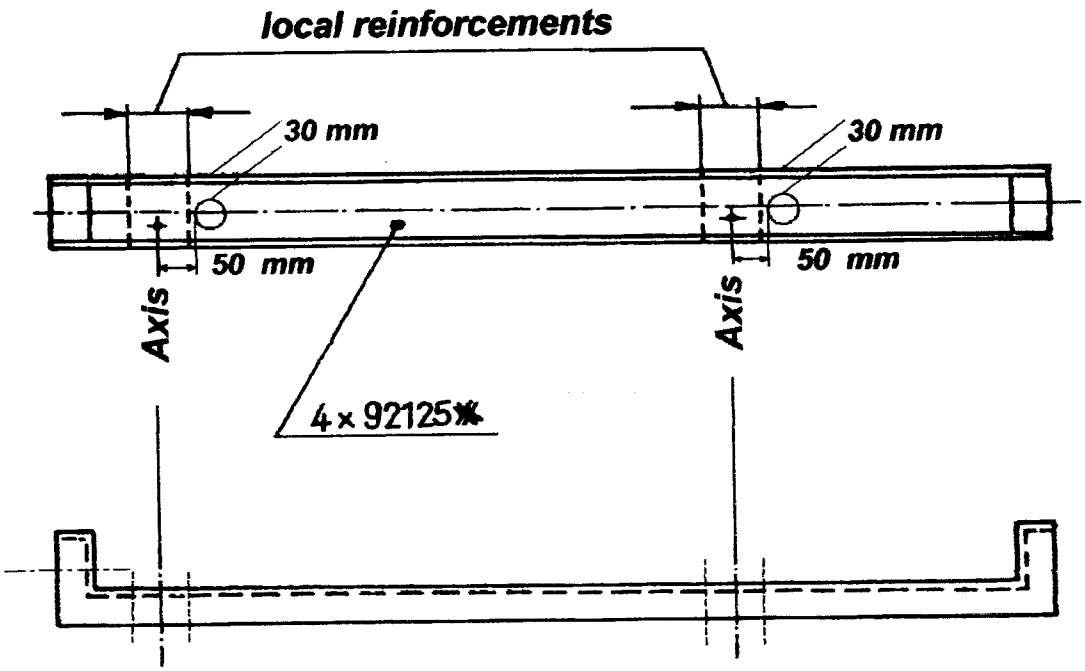
B = Splicing width for inner layers
C = Splicing width for outer layers
For splicing width see type related table, page 4

D = Opening in air brake box
Upper edge 30 mm <1.2 in> below shell
Horizontal displacement: at edge min. 50 mm <2 in>
See also picture 4

For basic arrangement of washers, nuts, ball bearings and bearing spacer see picture 1.



Picture 4 View at Air Brake Box (only models LS6, LS6-a, LS6-b)



Resin: Scheufler L285 **Hardener**: Scheufler 285 **Mixture ratio** 100:40 by weight

Foam: Divinycell H60 or Klegecell TR75

Heat treatment: Repair region at least 15 hours at 55° C <131°F >

Fabric cloth layout and splicing width for repair of:

a) Opening in lower wing shell behind air brake box and also in front of spar
Position see pictures 1 or 3 (For LS6, LS6-a and LS6-b 1 opening in front of spar *is required* !)

Model		Fabric weight XX means diagonally, == parallel to spar	Fabric denomination (Interglas)	Minimum total splicing width **B & C**
LS3	inside	1*Glas-285g/m² <0.058lb/ft²> XX	1*92125	**B** = 15 mm <0.591 in>
(1GF-1)	outside	2*Glas-220g/m² <0.045 lb/ft²> XX 1*Glas-220g/m² <0.045 lb/ft²> ==	2*92145 1*92145	**C** = 24 mm <0.945 in>, additionally 20mm <0.878 in> parallel to spar>
LS3-a; LS3-17	inside	2*Glas-160g/m² <0.033 lb/ft²> XX	2*92110	**B** = 15 mm <0.591 in>
(GF-5)	outside	2*Glas-220g/m² <0.045 lb/ft²> XX	2*92145	**C** = 24 mm <0.945 in>
LS4; LS4-a; LS4-b	inside	2*Glas-160g/m² <0.033 lb/ft²> XX	2*92110	**B** = 15 mm <0.591 in>
(1GF-30e)	outside	2*Glas-220g/m² <0.045 lb/ft²> XX	2*92145	**C** = 24 mm <0.945 in>
LS6; LS6-a;	inside	2*Glas-160g/m² <0.033 lb/ft²> XX	2*92110	**B** = 15 mm <0.591 in>
(1GF-44d)	outside	2*Glas-220g/m² <0.045 lb/ft²> XX	2*92145	**C** = 24 mm <0.945 in>
LS6-b	inside	2*Glas-160g/m² <0.033 lb/ft²> XX	2*92110	**B** = 15 mm <0.591 in>
(1GF-71a)	outside	2*Carbon-132g/m² <0.027 lb/ft²> XX	2*98320	**C** = 30 mm <1.181 in>
LS7; LS7-WL	Inside	2*Glas-160g/m² <0.033 lb/ft²> XX	2*92110	**B** = 15 mm <0.591 in>
(1GF-88b)	outside	2*Carbon-132g/m² <0.027 lb/ft²> XX	2*98320	**C** = 30 mm <1.181 in>
LS6-c; LS6-c18	inside	2*Carbon-132g/m² <0.027 lb/ft²> XX	2*98320	**B** = 30 mm <1.181 in>
LS6-18w (1GF-99c)	outside	2*Carbon-132g/m² <0.027 lb/ft²> XX	2*98320	**C** = 30 mm <1.181 in>
LS8	inside	2*Carbon-132g/m² <0.027 lb/ft²> XX	2*98320	**B** = 30 mm <1.181 in>
(1GF-152)	outside	2*Carbon-132g/m² <0.027 lb/ft²> XX	2*99320	**C** = 30 mm <1.181 in>
LS8-a; LS8-18	inside	2*Carbon-132g/m² <0.027 lb/ft²> XX	2*98320	**B** = 30 mm <1.181 in>
(1GF-167a; 1GF-179a)	outside	2*Carbon-132g/m² <0.027 lb/ft²> XX	2*98320	**C** = 30 mm <1.181 in>

b) Opening in Air Brake box -all models **except** LS6, LS6-a, LS6-b.
>>> Position see picture 2

Fabric weight XX means diagonally	Fabric denomination (Interglas)	Minimum total splicing width
1*Glas-160g/m² <0.033 lb/ft²> XX 2*Glas-285g/m² <0.058lb/ft²> XX	1*92110 2*92125	25 mm <0.984 in>

c) Opening in Air Brake Box, only models LS6, LS6-a, LS6-b.
>>> Position see picture 4

Fabric weight XX means diagonally	Fabric denomination (Interglas)	Minimum total splicing width
4*Glas-285g/m² <0.058lb/ft²> XX	4*92125	30 mm <1.181 in>

Hints regarding disassembly and assembly of air brake levers and exchange of bearings

1) Disassemble upper and lower air brake blades.
Note size and distribution of bushes and washers to avoid unnecessary trying during assembly. The same applies to disassembly of levers.
2) With heavy corrosion **cautious** spraying of metal parts with corrosion solvent (for instance Caramba) may be required; prefer to apply solvent using pointed artists brush. Because oil and solvent may reduce bonding considerably, cover structure in case of spraying. In the end the repair opening must be closed again.
3) Check whether rod end bearing 13 at top of lever is still straight and pressed-in bearing outer ring fixed. Before removing rod end, measure distance between upper and lower bearing centres.
4) When exchanging lower bearings at levers, do not forget inner bearing spacer 11 (Principle see picture 1), to avoid bracing of ball bearings. Spacer length must be identical to inner bearing distance.
5) When new levers should be required, bushes and washers must be placed such, that upper air brake cover sits centrally in air brake cut-out. In span direction the cover must have at least 1 mm <0.04 in> of gap at the inner end and at least 2.5 mm <0.1 in> of gap at the outer end. With too small gaps or without these gaps the cover will touch ends and, depending on wing bending, protrude from section contour more or less.
6) Use new locknuts during assembly. Positively check tightening of bolt and nut connections.
7) During final functional check of system, covers of both left and right air brakes should lower simultaneously onto wing cut-out. Outer ends of covers must touch down about 5 mm <0.2 in> before inner ends.
8) Locking force of both air brakes measured at cockpit lever must not exceed 20 kg <44 lbs>.

For **LS6, LS6-a and LS6-b**, before cutting openings in front of spar, water ballast bags must be removed:

a. Water ballast bags are kept straight by nylon cord routed from bag end via caged pulley to root rib, tension about 10 kg <22 lbs>.
b. Open end knot at root rib and enlongate cord by about 15 m <42 ft> braided nylon cord. Heat seal ends, connect auxiliary cord to free end not by knot (this would not pass caged pulley), but by stitching for about 50 mm <2 in> in length.
c. When a bag is removed without auxiliary cord, then an opening must be cut near the pulley for installation of new cord.
d. Disassemble valve from root rib and pull bag through root rib opening. Open stitching and secure both auxiliary cord ends at root rib such, that they can not disappear into wing.

Assembly:

a. Connect nylon cord from bag end to auxiliary cord again by stitching.
b. Place bag with seam to leading edge, roll bag and insert into root rib cut-out, pull cautiously at only at auxiliary cord.
c. Disconnect auxiliary cord from nylon cord. Apply approximately 10 kg <22 lbs> tension and place end knot as shown. Do not cut surplus free end off, fix at root rib using tape.
d. When each wing has it's own valve, check play between fuselage lever and stem for about 2-3 mm <0.08 to 0.12 in>. Adjust at fuselage lever, when required. With existent tail fin tank, this must open before or at least simultaneously with wing tanks.
e. Fill bags according to details given in Flight Manual, check for tightness, proper discharge and equal discharge times.
f. When discharge time exceeds 4.5 minutes, the bag may possibly be twisted in wing. When not tight – water dripping from one of the drain holes, the fault must be searched and cleared, this necessitates disassembly again.

End knot for water ballast bag cord