

Repair Instructions

for

Training Parachute RS - 4/4 T

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Training Parachute RS - 4/4 0

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1. General

Routine maintenance work and alterations may only be carried out by persons authorised to do so.

All sewing and resewing work must be done with

- thread of a contrasting colour on the parachute canopy,
- thread of the same colour for inner packing with static line and harness,
- the respectively same thread for darning.

Where something is re sewn, the new stitches are to be made on top of the stitches to be improved. All stitching must extend at least 50 mm beyond the area to be repaired on both sides. Polyamide belt tapes are to be hot-cut. Cotton belt tapes are to be soaked in wax (50% beeswax and 50 % paraffin).

Note: If the parachute canopy and the suspension lines are to be sewn/seamed with a flatbed sewing machine there should be 30 +/- 3 stitches per 100 mm, with a saddler machine 20 +/- 2 stitches per 100 mm.

Note: Due to the automatic production, the stitch patterns of some series do not match the diagrams shown here.

When structural units are replaced all the necessary device data must be transferred onto the new structural units so that it can be determined unequivocally that the new structural unit belongs to the set.

2. Description of the routine repair work

2.1. Inner packing with static line

2.1.1 Replace inner packing with static line

2.1.2 Replace static line

Separate damaged static line and sew with Nm 11/ 4 nylon thread.
(see Figure 1)

2.1.3 Replace snap hooks

Separate damaged snap hooks and sew according to pattern with Nm 11/ 4 nylon thread. (see Figure 2)

2.1.4 Resewing suspension line loops

Resew the damaged stitching on the suspension line loops with the thread used on the pattern. (see Figure 3)

2.1.5 Replace loop belt

Separate loop belt, manufacture according to pattern and sew on with Nm 20/3 nylon thread.

2.1.6 Replace protective sleeve

Remove damaged protective sleeve, tailor according to pattern 635x90 mm and sew with Nm 40/ 3 nylon thread.

2.1.7 Loop on covering flap

Remove damaged loop on the cover flap. Tailor new loops according to pattern and sew with Nm 40/ 3 nylon thread. (see Figure 4)

2.1.8 Repair edging tape

Darn damaged areas up to 15 mm on a zigzag machine with Nm 40/ 3 nylon thread. When larger areas of damage are repaired the repair should extend 25 mm beyond the damaged area on each side. Cut edging tape plus 20 mm, fold over edges 10 mm and sew with Nm 40/ 3 nylon thread. (see Figure 5)

2.2 Parachute canopy

2.2.1 Replace parachute canopy

Open separable rectangular ring and remove from intermediate harness. Do not remove the suspension lines from the separable rectangular ring. Affix new canopy to the intermediate harness with the separable rectangular ring.

2.2.2 Replace top loop

Separate damaged top loop. Cut according to pattern and sew with Nm 11/ 3 nylon thread.

Note: Ensure that all top lines are held in the loop and that the top loop is fed through the top insertion

.

2.2.3 Replace suspension line

Remove damaged suspension line. Hot-cut the suspension line RS – 4/4 T to 8430 mm with 1 daN pretension. Compare new suspension line with the next suspension line and integrate into the canopy in exactly the same manner. After the repair, the opened-up seams should be sewn zigzag again with Nm 40/ 3 nylon thread (see Figure 6).

Tie the suspension line into the separable rectangular ring on the intermediate harness and sew in zigzags (see Figure 7).

2.2.4 Replace top line

Remove damaged top line. Measure new line against pattern and hot-cut. Ensure that the top line is fed through the top loop in the correct place and sew in zigzags exactly as the neighbouring top line with Nm 40/ 3 nylon thread. (see Figure 8)

2.2.5 Patching the top tape

Cut top tape appropriately and impregnate on the corners. Sew it onto the damaged top tape from the inside with quadruple stitching and Nm 40/ 3 nylon thread in such a manner that it extends 15 mm beyond the 2 neighbouring longitudinal canopy seams. The rows of stitches are each to be sewn 0 mm beyond the patch tape ends. Only one patch is allowed.

Patches always inside, also in the event of damage to the outside. (see Figure 9)

2.2.6 Replacing fields

- Arrange parachute canopy on the table in such a manner that the inside of the parachute canopy is facing upwards.
- Affix damaged part of canopy to the table with drawing pins.
- Marked damaged field 12 mm inside each inner seam with contrasting colour.
- Cut out damaged field along the marking.
- Where necessary cut the suspension lines, top lines, longitudinal reinforcement, transverse reinforcement, reinforcement tapes, v-straps, base net to the necessary lengths.
- Fold up edges to the respective inner seam and pin in position.
- Cut replacement field out of the appropriate canopy material according to template.
- Position replacement field correctly in the cut out canopy part and fold it downwards along the transverse and longitudinal seam so that the fold of the fold of the transverse and longitudinal seam cover each other and then pin.
- Sew on replacement field with Nm 40/ 3 nylon thread. Where necessary resew/zigzag sew (separated) suspension lines, top lines , reinforcement tapes, v-straps.

2.2.7 Patching the parachute canopy

Holes in the canopy fabric up to a size of 250 x 250 mm and tears up to 400 mm in length will be repaired by affixing a patch.

The patch is cut 50 mm larger than the damaged area on each side. Thread direction of the patch should be the same as the thread direction of the fabric of the canopy gore. The patch is to be laid over the damaged part of the canopy on the outside, the edges of the patch are to be folded in 10 mm and sewn on with the sewing machine with short edges. On the other side of the canopy the damaged area is to be cut out, the edges of the hole will be folded over 10 mm and sewn with the sewing machine with short edges (Figure 10).

When the arrangements of the patches on the canopy is the same as the

arrangement of the reinforcement tapes, the tapes should first be removed, the patches sewn on and the separated tapes are then to be sewn on over the patches. If the damage is within 10 mm of the short seam this must then be removed approx. 100 – 130 mm on both sides of the damaged area and the damaged areas must be repaired as described. The separated seam is then returned into its original condition and then closed again with a one-needle machine. If the canopy fabric is damaged within the base tape without the base tape being destroyed a patch will be stuck onto the inner side of the canopy, folded around the base edge and sewed onto the outside of the canopy.

(see Figure 11)

If the canopy fabric is damaged directly next to the base edge, the base is opened up approx. 150 mm in both directions from the damaged area. The patch is affixed from the outside. The bases will then be restored to its original condition and machine-stitched with quilt stitches. The beginning and the end are sewn over 50 mm.

(see Figure 12)

Damaged areas on the reinforcement tapes are repaired by sewing on new tapes of the same kind on top of the original tapes with an added 110 mm on each side. The ends of the tapes are to be folded inwards 10 mm. The length of the damaged areas of the tapes may not exceed 150 mm. Broken machine stitches will be repaired with additional quilt-stitches directly on the old seam. All seam starts are to be oversewn by 50 mm.

Where the canopy fabric and the base tape is damaged near a suspension line, this must be cut off and the base must be opened up correspondingly wide. The damages of the base tape max. 150 mm. The base tape must overlap on both sides by 200 mm. The base will be restored to its original condition and secured with quilt-stitching whereby the start and end of the seam is oversewn by 50 mm. Suspension line and v-strap will be sewn or zigzag-sewn appropriately.

2.2.8 Replace v-strap

- Remove damaged v-strap
- Hot-cut the strap at an angle of 45°.
- Position replacement strap around the suspension line so tightly that the loop lies at the lower base edge.
- Sew and zigzag the v-strap.
- Zigzag stitch the suspension line on the longitudinal seam of the canopy.

2.2.9 Repair net

- Cut at least 50 mm more than damaged area.
- If the damage is closer than 25 mm to the net cross, the repair must be made at least over 25 mm over the cross.
- Where damage is close to the suspension line, skip over the suspension line at least 25 mm without sewing.
- In the event of damage to a vertical line on the upper horizontal line, separate the vertical lines on the horizontal line and sew the replacement part with horizontal line next to the old line.
- Sew with Nm 40/ 3 nylon thread using a zigzag sewing machine. (see Figure 13)

2.3 Harness

Note: Seams on the harness are to be sewn with Nm 11/ 4 nylon thread and the padding replaced, Nm 11/ 4 nylon thread.

2.3.1 Replace harness

Open canopy quick-release locks. Open press studs on the retaining belts on the container and remove harness. Lace new harness in container and close the press studs on the retaining belts. Join intermediate harness to harness.

2.3.2 Replace intermediate harness

Open canopy quick-release locks. Undo separable rectangular ring and affix to new intermediate harness.

2.3.3 Replace rubber loops

Replace rubber loops on back straps, leg straps and chest belt.

2.4 Container

2.4.1 Replace container

Open press studs on the retaining straps of the container and take out harness. Change container, replace harness and close the press studs on the retaining straps of the container.

2.4.2 Patching

There are no limitations with regard to external dimensions and number. Sew with Nm 40/ 3 nylon thread. (see Figure 14)

2.4.3 Replace frame

Undo base seam on container flap 4. Pull out frame and replace with new frame. Close base seam again using Nm 11/ 2 nylon thread.

2.4.4 Replace securing loop

Undo hand stitches on rubber band 50x70. Take out old securing loop. Hot-cut a new securing loop, tie both ends together and retract washer. Then push the securing loop under the rubber band and through the grommet, and then hand stitch on the rubber band with Nm 40/ 3 nylon thread.

2.4.5 Resew sew-on plate on the grommet

Stitches on the sew-on plate are to be resewn with Nm 40/ 3 nylon thread.

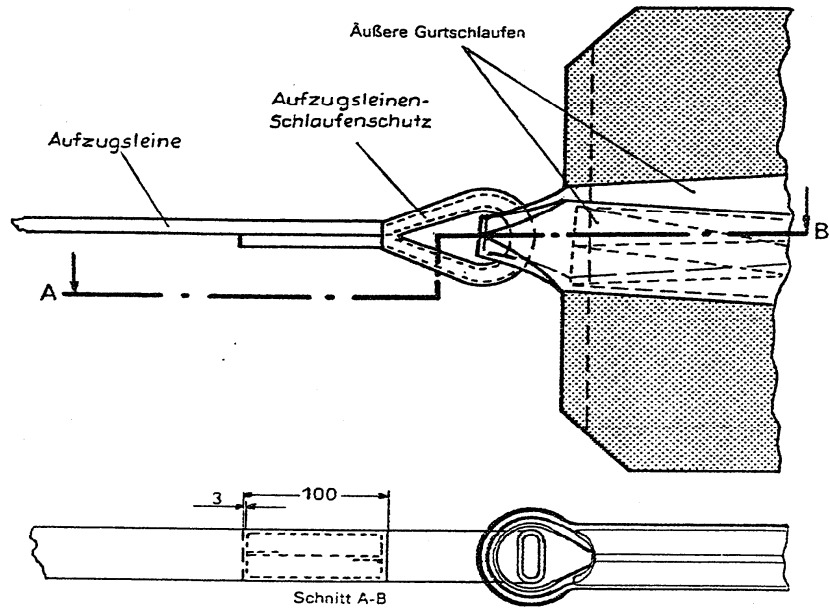


Figure 1 Replace static line

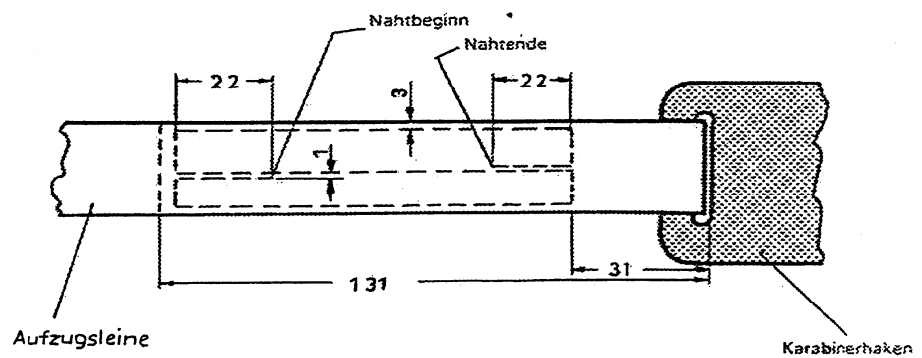


Figure 2 Replace snap hooks

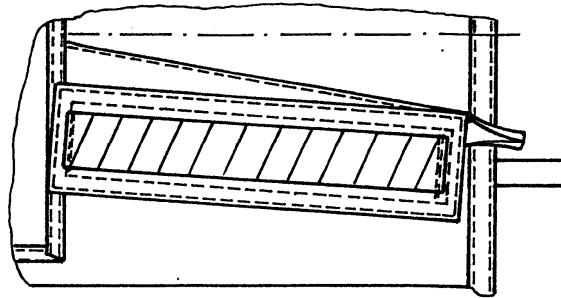


Figure 3 Resew suspension line loops

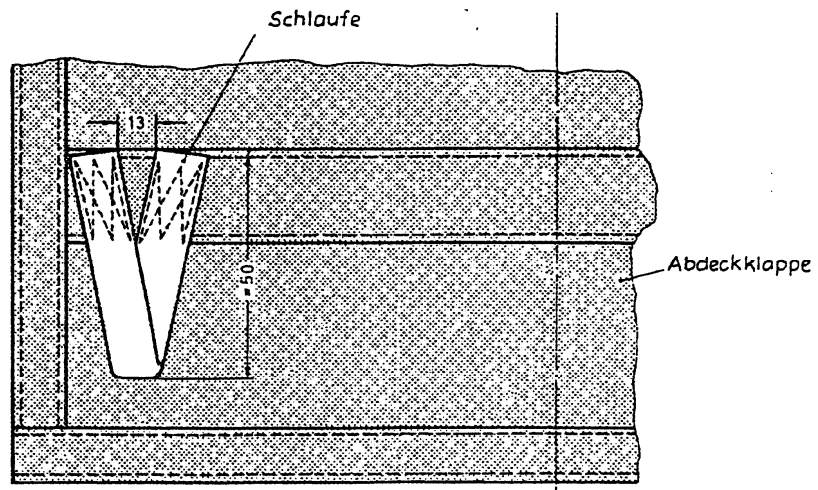


Figure 4 Loop on cover flap

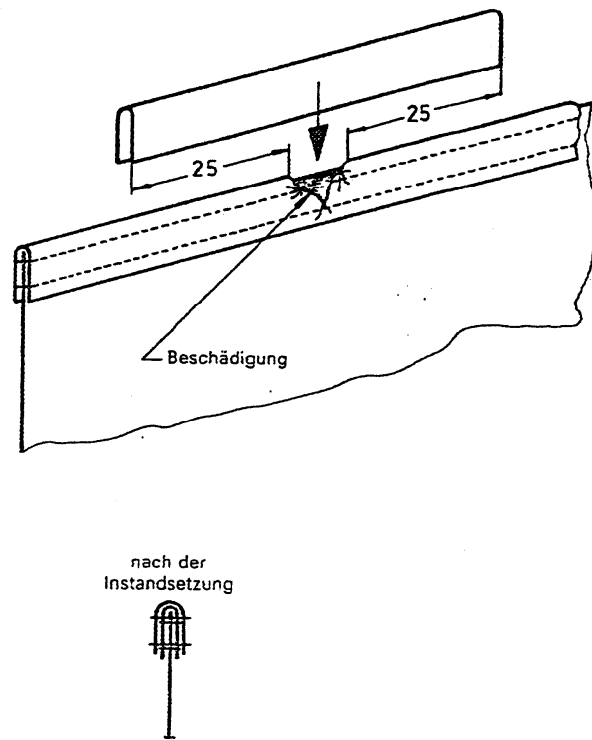


Figure 5 Repair edging tape

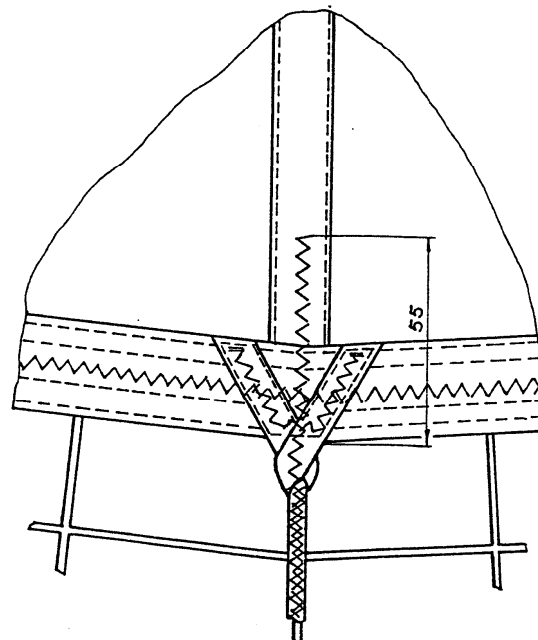


Figure 6 Integrate suspension line in canopy

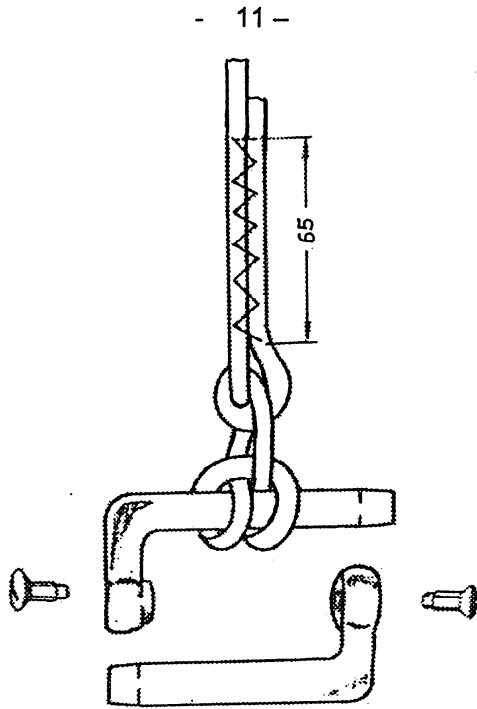


Figure 7 Tie suspension lines into separable rectangular ring

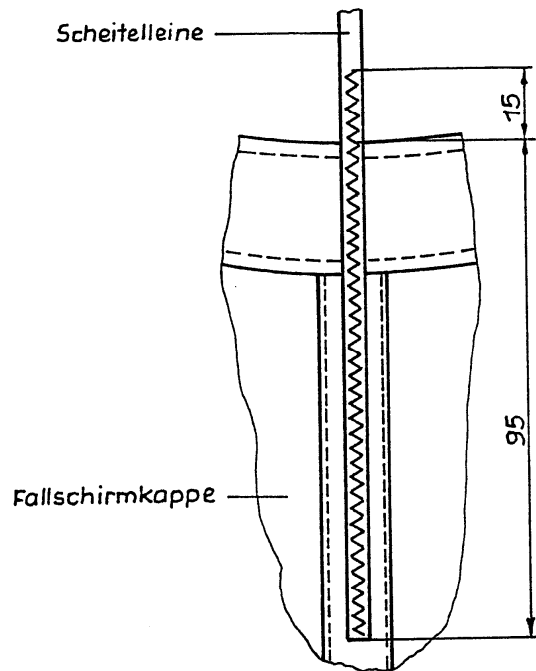
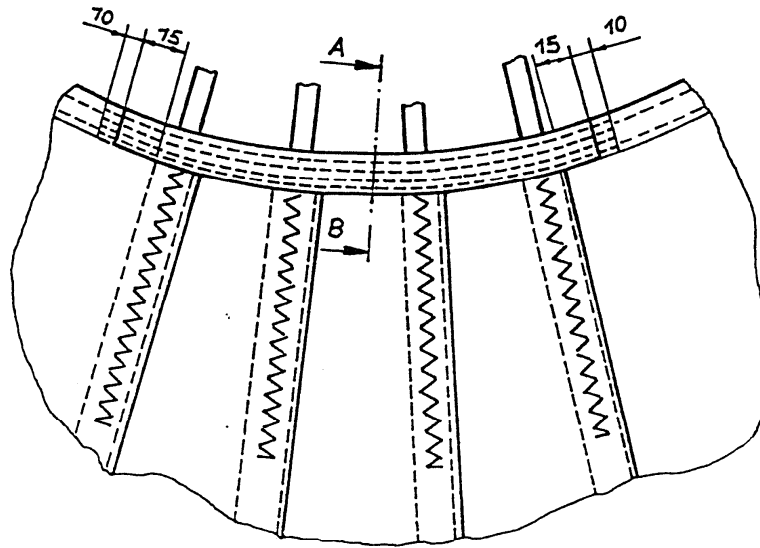
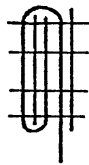


Figure 8 Replace top line



Fallschirmkappen-Innenseite



Schnitt A-B

Figure 9 Patch top tape

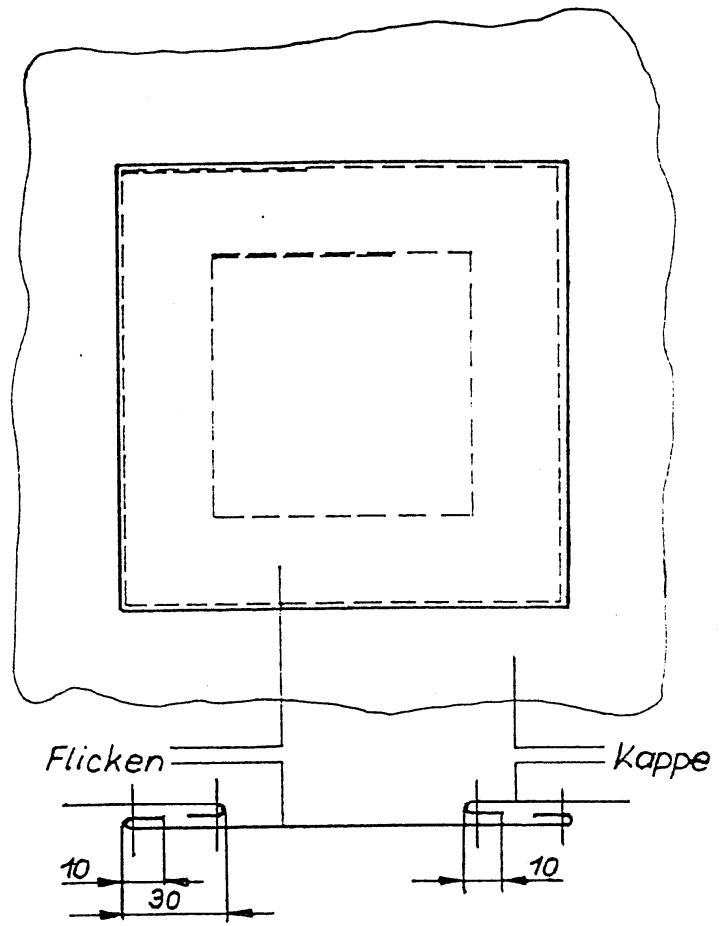
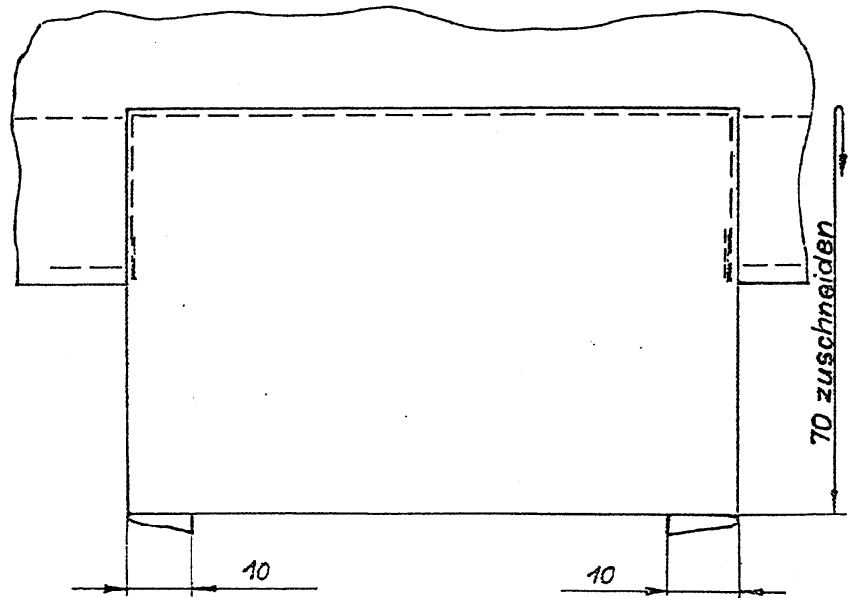
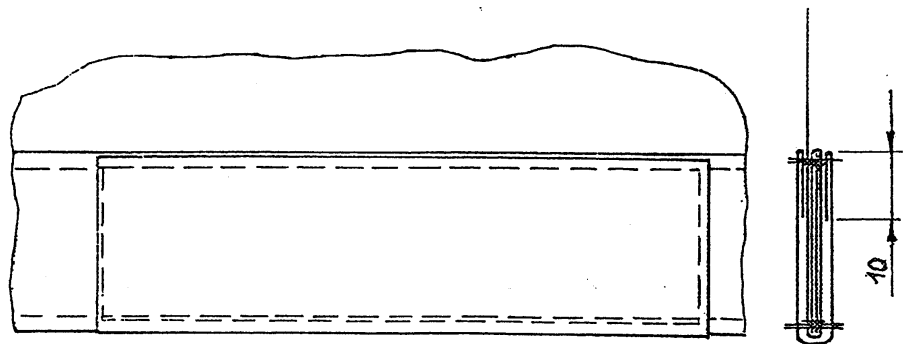


Figure 10 Patching the canopy



1. Arbeitsgang (Kappe von innen)



Fertig vernäht (Kappe von außen)

Figure 11 Patching the canopy

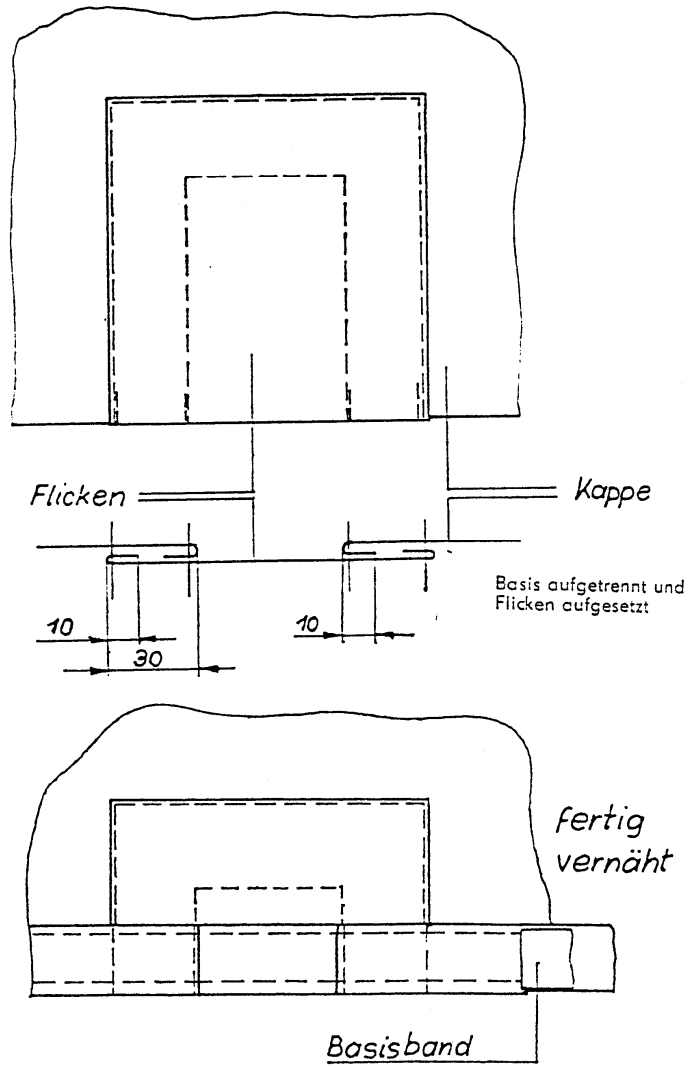


Figure 12 patching the canopy

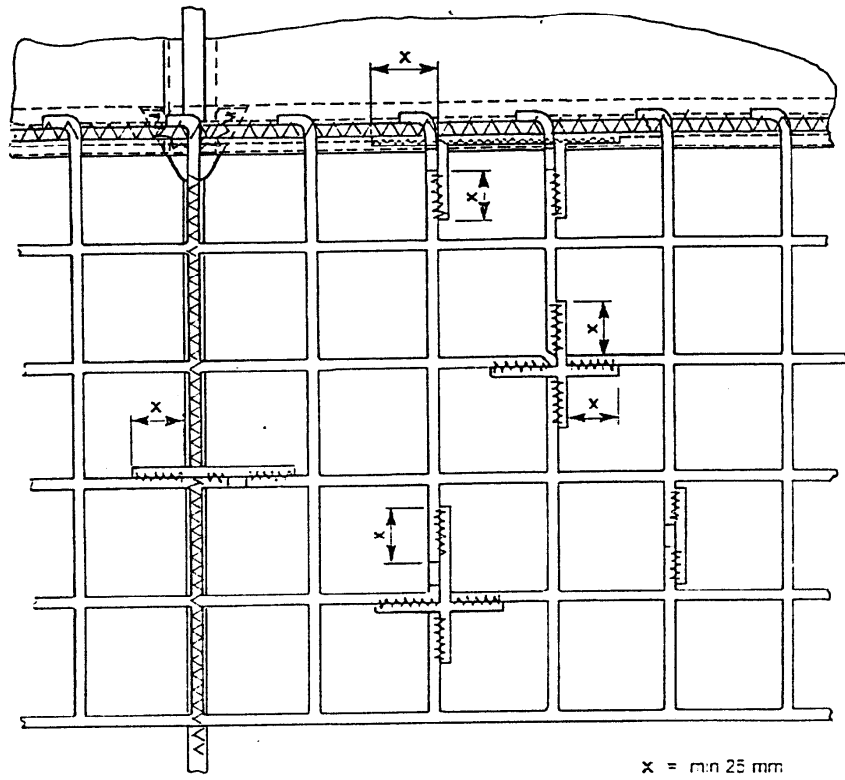


Figure 13 Repair net

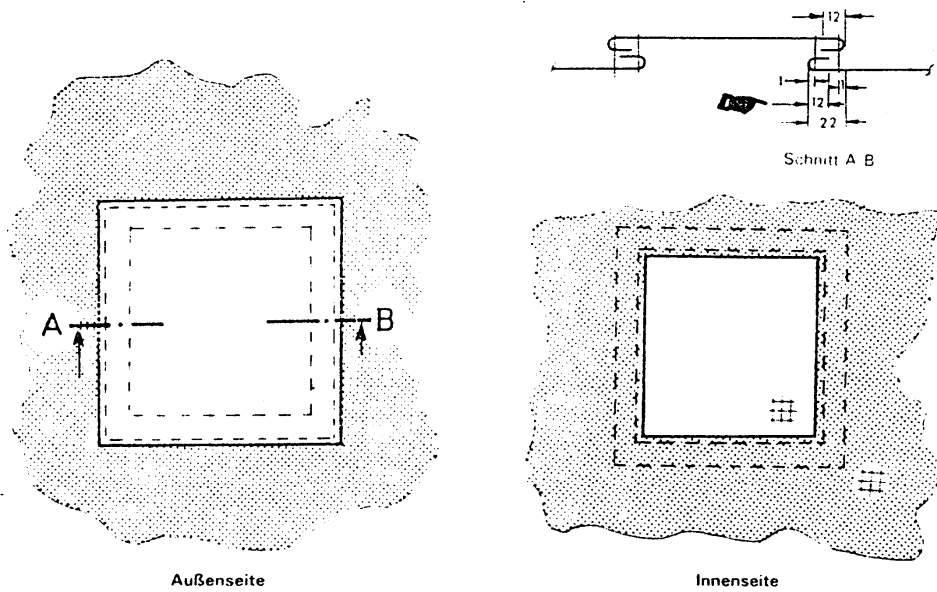


Figure 14 Putting on patches