



# **TECHNICAL DESCRIPTION**

**Directions for use and maintenance  
of the emergency parachute**

**ATL – 88/98 – S – 1**

**number P – 002 – 99**

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### List of changes

If the text of this handbook is to be changed or completed the holder will be informed about it by means of bulletins authorized by the Design organisation or EASA agency. The new (corrected) sheets became the supplement of these bulletins. The holder is obliged to inscribe the received change into the List of changes and carry out the exchange of the invalid sheets for the valid ones. The changed or completed text parts will be indicated with a perpendicular sideline. Further they will be indicated on the lower border with the change number and date of the change issue.

Serial No. of the change	Chapter	Sheet numbers concerned by the change	New sheets issue date	Bulletin number where the change issued	Authorization date of the bulletin	Execution date Signature





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# CHAPTER I

## Technical description of the emergency parachute ATL-88/98-S-1

### 1. Purpose

The emergency parachute ATL-88/98-S-1 (bellow only parachute) is designed personal parachute set to equipment aeroplanes, or so as so equipment crew, if need be traveller for use in emergency.

Parachute in compliance with the requirements Technical Standard Order ETSO C23d and Aerospace Standard SAE AS 8015B.

Parachute modification has the ETSO Authorization no. EASA.210.1011 Rev.A, issued by the EASA agency on the 14<sup>th</sup> May 2008.

### 2. Technical parameters

#### a) Basic parameters

- |                                                   |        |                   |
|---------------------------------------------------|--------|-------------------|
| - canopy's surface                                |        | 36 m <sup>2</sup> |
| - parachute's weight without portable bag:        |        | up to 8,4 kg      |
| - diemensions of packed parachute                 | length | 405 mm            |
|                                                   | Width  | 345 mm            |
|                                                   | Height | 120 mm            |
| - needful force to the pulling out of the ripcord |        | 23 to 97 N        |

#### b) Construction

The parachute is produced in a unified construction.

#### c) Functional parameters

- |                                                |                           |
|------------------------------------------------|---------------------------|
| - vertical sinking speed at the load G = 77 kg | up to 5 m.s <sup>-1</sup> |
| - swivelling through 360°                      | 8,6 s                     |

#### d) Product's restriction

Parachute is restricted to use:

- |                                                      |                                       |
|------------------------------------------------------|---------------------------------------|
| - the person's till the weight<br>( with equipment ) | 115 kg (254 lb)                       |
| - to the speed in a moment open parachute            | 277,8 km h <sup>-1</sup> (150 kt EAS) |
| - minimal allowable high of the use                  | 100 m                                 |
| at the aircraft's speed                              | 110 km h <sup>-1</sup>                |
| - temperatures imunity                               | from - 40 to + 93,3 °C                |

Note:

The parachute showed the reliable function at the tests with the load's weight 138 kg at the speed 333,4 km.h<sup>-1</sup>.

e) Guarantee period

The guarantee period is 5 years in the case of the timely carrying out of repair and change of the worn out parts, keeping the store and transport conditions and carrying out of the regular inspection and treatment that is linked with the parachute canopy's ventilation. The guarantee period comes in force from the parachute's dispatchment day for maximum 6 months from the date of production (marked on the canopy and on the label in the parachute's pack).

The manufacturer doesn't accept the reclamation in these following cases:

- if the parachute is damaged by forcible way or the instructions mentioned in Technical description and directions for use and maintenance are not observed
- if the parachute log book is not attached to the parachutes or if the operational records are not carried out correctly.

In case of logbook loss, visual check of the parachute will be carried out by an authorized person from producer. The check will be connected with a note about the parachute condition into Protocol of parachute inspection to issue parachute logbook copy. Record will be sent to producer and on the basis of satisfactory result of such record, producer issues a new parachute logbook with a sign „DUPLICATE“.

Visual inspection may be also carried out at the producer and in such a case; the note of parachute condition is stated in Check list.

In case that the parachutes are damaged, where the character of damage (stains of unknown origin, considerable burns, shifts of thread in fabric, damaged lines, worn out straps or other signs of great damage) supposes changes of mechanical-physical conditions of materials, the organization authorized for performing maintenance carries out tests of mechanical-physical conditions of parachute materials.

Provided that the parachute will require repair, the organization authorized for performing maintenance will do so on the basis of agreement with user.

f) Lifetime

The total parachute lifetime is specified for the maximum of 20 years from the production date providing the instruction specified in the Technical description and directions for use and maintenance are observed.

The total lifetime depends on the technical state of the parachute or its parts. The person authorized for performing the parachute packaging for use is obliged to check the parachute completeness and its technical state prior to its packaging for use.

If the parachute state is compliant, an authorized person will pack the parachute. The parachute eligibility for further operation is confirmed for the period of max. 365 days.

The person authorized can apply this procedure until using the total lifetime of the parachute.



In case of finding unsuitable technical state of individual parachute parts which is in breach of the regulations stated in the Technical description and directions for use and maintenance, the parachute must be eliminated from operation, and the incompliant part must be replaced, or the parachute must be sent to an organization authorized for performing maintenance. The organization authorized for performing maintenance will recommend the performance of potential repair work of the parachute or eliminate the parachute from operation and terminate its use.

- g) Temperatures imunity of parachute ATL-88/98-S-1 is interval temperature from - 40 to + 93,3 °C and at the relative humidity corresponding to this temperatures.

The parachute can be packed before its use at the longest 365 days.

It is necessary to examine the parachute in professional way after its every use and to send to the organization authorized for performing maintenance in the case of its damage.

The results from the examination are recorded into the parachute log- book.

### 3. Function of the parachute

After leaving of the plane the pilot puts the parachute into operation by means of the drawing out the release from the pocket positioned on the left side of the parachute harness at the pilot's breast height.

Drawing out of the ripcord upwards - from the waist to the pilot's chest - will cause an ecstasy of release's pins from the closing line's loops, the flaps of the parachute pack will release, a pilot parachute will bounce out to the air flow and it will draw out a canopy with the lines from the parachute pack. The lines will release from the rubber bands of the closing flap, will stress and the canopy will fill up with the air. The filled canopy secures a quiet descent and a safe landing.

### 4. The parachute construction (fig. 1)

The parachute contains these main parts:

I.	Pilot parachute	PV - 031 - 1	1 piece
II.	Connecting line	SS - 054	1 piece
III.	Canopy	V - 070 - 2	1 piece
IV.	Supporting harness	PS - 045 - 1	1 piece
V.	Parachute pack	OP - 098 - 2	1 piece
VI.	Seat cushion	SP - 012 - 2	1 piece
VII.	Release (ripcord)	U - 063	1 piece
VIII.	Back padding	P - 023 *	1 piece
IX.	Back padding	P - 029 *	1 piece
X.	Portable bag	G - 59	1 piece

\* The parachute assembly always contains at least one back padding according to the user's request. At the request of the user, it is also possible to deliver the further mentioned back padding.

### 5. List of interchangeable parts

5.1.	Pilot parachute	PV - 031 - 1
5.2.	Connecting line	SŠ - 054
5.3.	Seat cushion	SP - 012 - 2
5.4.	Release	U - 063
5.5.	Closing cord	$l = 400_{-15} \text{ mm}$ **
5.6.	Rubber band	$2 \times \frac{3}{8} \text{ "}$
5.7.	Back padding	P - 023
5.8.	Back padding	P - 029
5.9.	Portable bag	G - 59

\*\* The indicated length is measured at a load of 60 N.

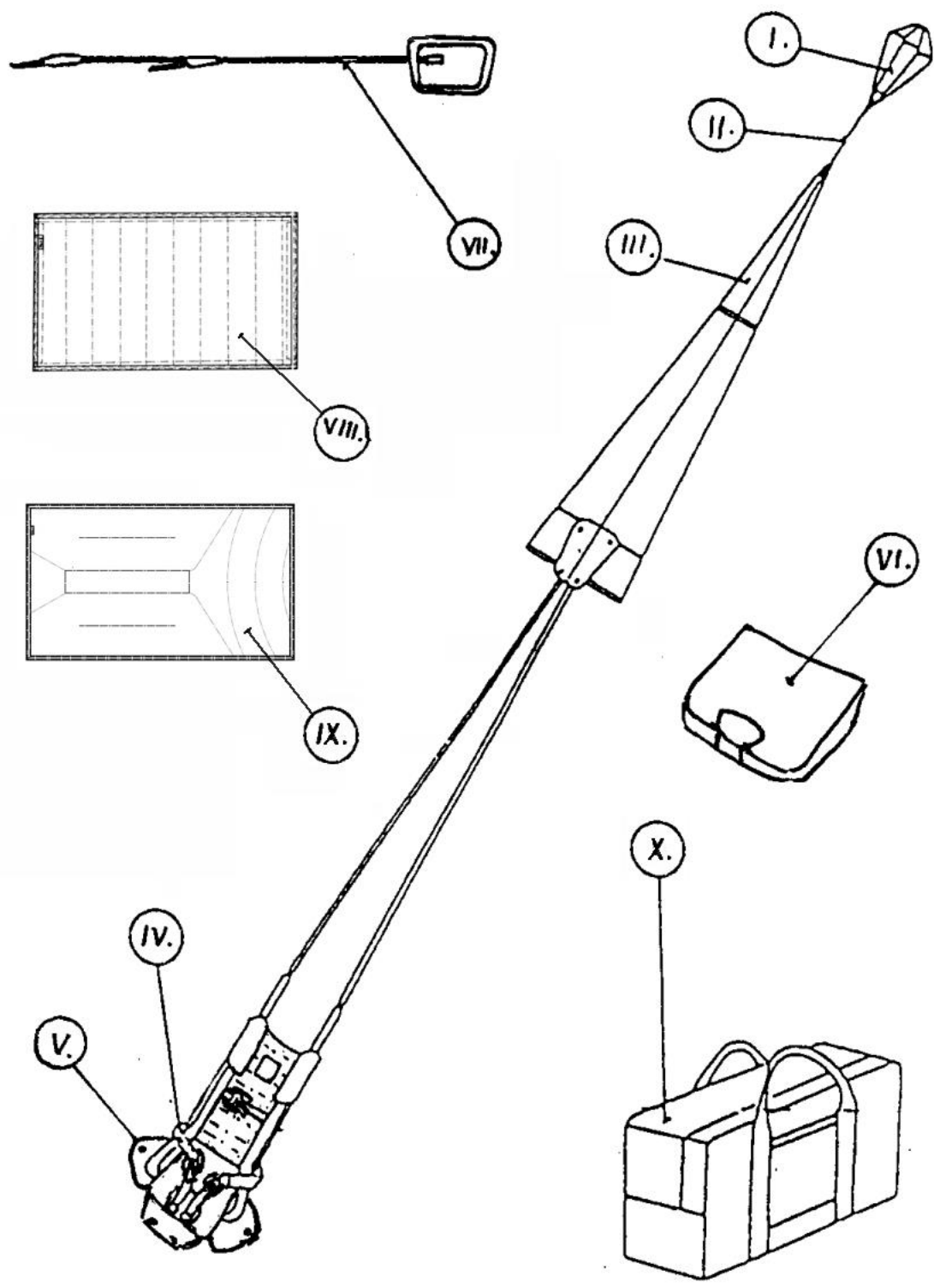


fig.1

## 6. Technical description of the parachute

### 6.1. Pilot parachute PV - 031 - 1 (fig. 2)

It is assigned for the canopy's drawing with the lines out of the parachute's pack. The canopy's base (1) of the pilot parachute is made from polyamide fabric UTT 38866.

The section 2 in the shape of triangular is made front polyamide clothing tulle - rough, business item 01200310300. The pilot parachute is reinforced with the edgings (3) that create a bridle (4) in the bottom part. A steel spring of the cylindrical shape (5) is sewn in the pilot parachute. In upper part of the pilot parachute and at the place of the spring's connection there are the edging loops sewn with brass rings (6) assigned for the passing through of the closing line and so for the folding and fastening of the pilot parachute in the parachute's pack.

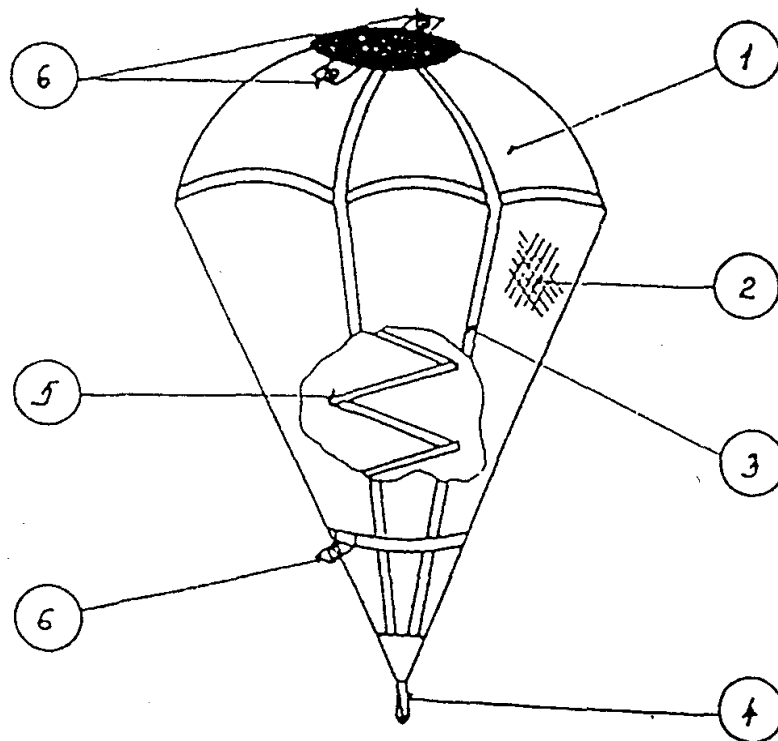


fig.2

### 6.2. The connecting line SŠ - 054 (fig. 3)

The connecting line connects the pilot parachute with the pole lines of the main parachute canopy. The connection line is made of polyamide stitchbounded fabric whose length is 2000 mm. Both ends of the connecting line are fitted with the loops for the connection of the pilot parachute with the canopy.

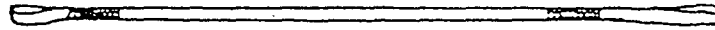


fig.3

### 6.3. The canopy V - 070 - 2 (fig. 4)

The canopy (1) with the surface  $36 \text{ m}^2$  is made of the polyamide fabric UTT 38866 and UTT 38960 and it consists of, 20 gores.

The canopy's construction is reinforced with 13 mm edgings - supporting (2) and circular (3), (4) and (5).

The bottom edge (6) and the pole whole's edge (7) are reinforced with the edgings 25 mm. The pole hole is stiffened with the pole lines (8).

In the back canopy's part two gores (9) are filled partly with the polyamide tulle – soft, business item 01200210300, securing stability, forward speed and parachute's controllability.

20 suspension lines (10) are attached to the canopy whose length is 5000 mm and minimal strength 2.600 N. In the bottom part the red control lines (11) are connected to the lines number 3 and 18. The suspension, lines are stowed during the packaging to the rubber bands  $2 \times \frac{3}{8}$  " of the closing flap (12) that is sewn on the bottom canopy's edge near the suspension line number 11. The suspension lines No. 1 and 20 are fitted with coloured marking (13) near the bottom edge and near the loose ends of the supporting harness for the easier canopy's pleating.

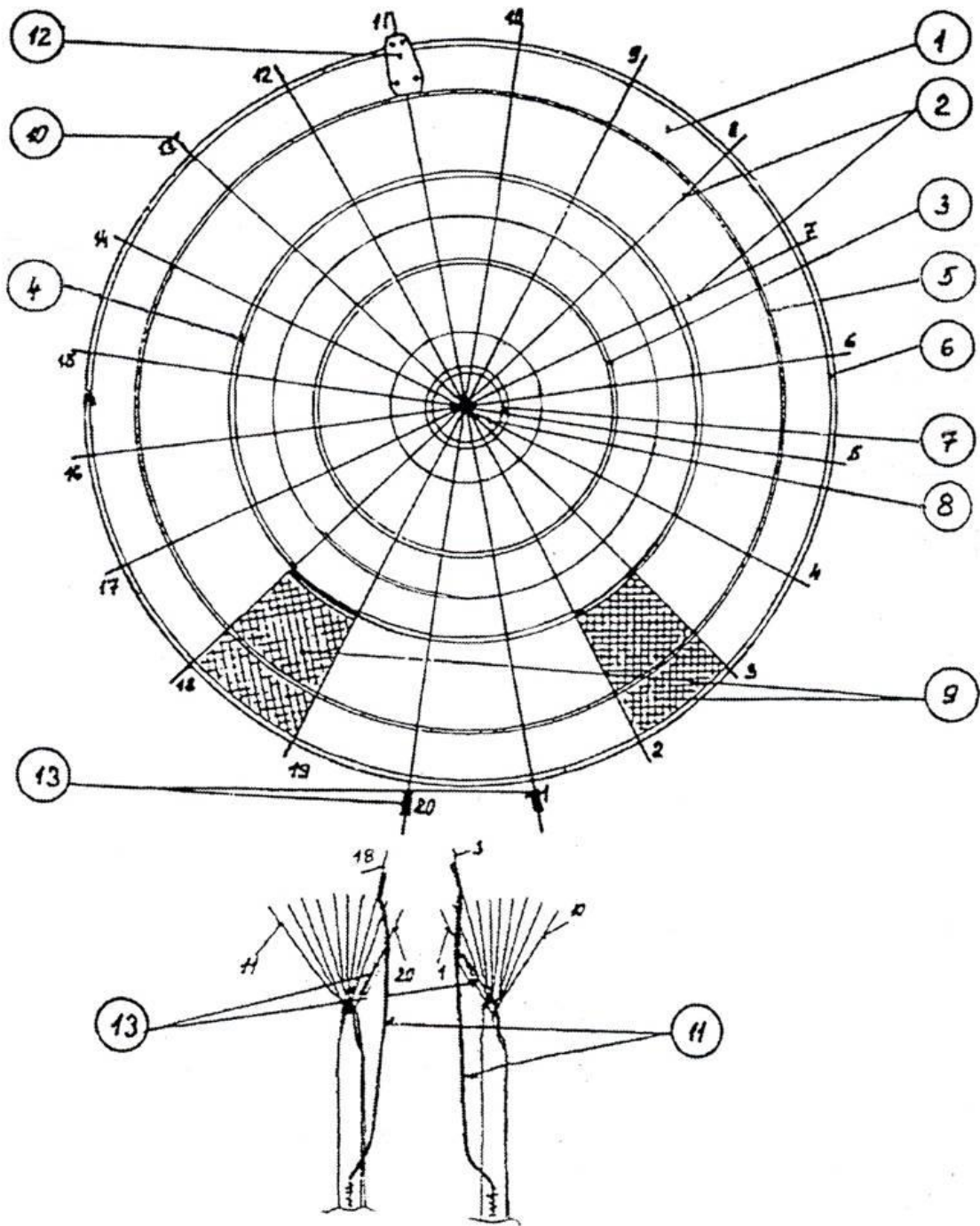


fig. 4

6.4. Supporting harness PS – 045 – 1

6.5. Parachute pack OP – 098 – 2

The parachute covering and supporting harness are one item (Fig. 5)

The supporting harness is to be tied to the body of a pilot to spread the dynamic impact. It is made of polyamide strap with minimal tensile strength 23000 N. It consists of two main straps –left one (1) and right one (2). The supporting harness is further made of chest strap (3), cross strap (4) and shoulder strap (5).

The main straps are strengthened with welts (6) 43 mm wide, in the shoulder part they have free ends (7) and from there they change into back straps (8). These are connected in the upper part with cross strap (4) and in the lower part they are folded back and stitched through the shoulder strap (5). Strength of the transition of main strap into the free end is ensured by oval metal eyes (9).

The chest part of the left main strap has sewn on chest strap (3) with additional clasp (10) that enables shortening of the chest strap. The rubber loop (11) is for storing the rest of the chest strap. There is a pocket (12) under the chest strap for placing of release handle. There is a welt-creating loop (13) under the pocket for placing of release hose (14). Further on there are two adjustable loops (15) threaded on left main strap, one above the shoulder strap, and one under it. These loops lead the release hose.

The right main strap has clevis sewn into the chest part (16), padded with wadding (17), designed for connection with clasp of the chest strap of left main strap, and therefore for tightening of supporting harness in the chest part, as well as for its quick release.

There are hook and loop fasteners (18) on both chest straps designed for length adjustment of supporting harness.

The shoulder strap has clevises on both ends (16), which – together with clasps (10) placed on main straps – serve to tie the pilot's legs and to tighten the supporting harness close to pilot's body. The clevises are padded (17).

Between two wrappings (19) on both ends of the shoulder strap is an opening for threading of main straps.

Both main straps are threaded through openings on the bottom part of parachute covering, so that when the ends of main straps are pulled, parachute covering is drawn to pilot's bottom. The rubber loops (11) serve for storing of remaining lengths of main straps.

The parachute covering is designed for placing of canopy with ropes, connecting cord and drogue parachute. It is made of polyamide fabric shaped as an envelope. The main parts include: back padding (20) changing into two shoulder paddings (21), middle part of parachute covering (22), side flaps – left (23) and right (24), upper flap (25) and bottom flap (26). The middle part of the parachute is divided in two sections and enables to thread closing rope (27) through rings (28) on parachute covering's underside. Closing rope serves for defining the movement of stored drogue parachute and to close the parachute covering. The bottom edge of middle part has two welts (29) with

threaded rubber bands  $2 \times \frac{3}{8}$  " (30) sewn into the sides, designed for attaching supporting ropes to parachute cover. The side flaps have one ring and upper and bottom flaps two rings (28) for threading of closing rope and consequent closure of parachute covering with help of the release pins. Every flap has a hook and loop fasteners (31) for flaps' connection and for correct shaping of parachute covering when packed. Left side flap has cover flap (32) sewn on to cover the end of release hose connected to parachute covering, as well as to rip cord.

Upper flap consists of two parts: outside flap (33) and inside closable flap (34). Outside flap covers parachute covering's opening mechanism placed on inside flap. The opening mechanism has two rings (28) through which is threaded closing rope after packing the covering, secured by release pins.

Outside and inside flaps are connected on the sides by hook and loop fasteners and in the middle part covered by welt with sewn on hook and loop fasteners (35).

The other side of the parachute cover has reinforced (37) parachute covering's bottom (36), to keep the parachute covering's bottom flat when packed. The bottom has two sleeves (38) for threading of main straps of supporting harness. Hook and loop fasteners (39) for adding of sitting cushion are sewn around the bottom. Back padding is divided on the sides and creates tunnels for storing of supporting harness's free ends. Hook and loop fasteners (41) close the tunnels.

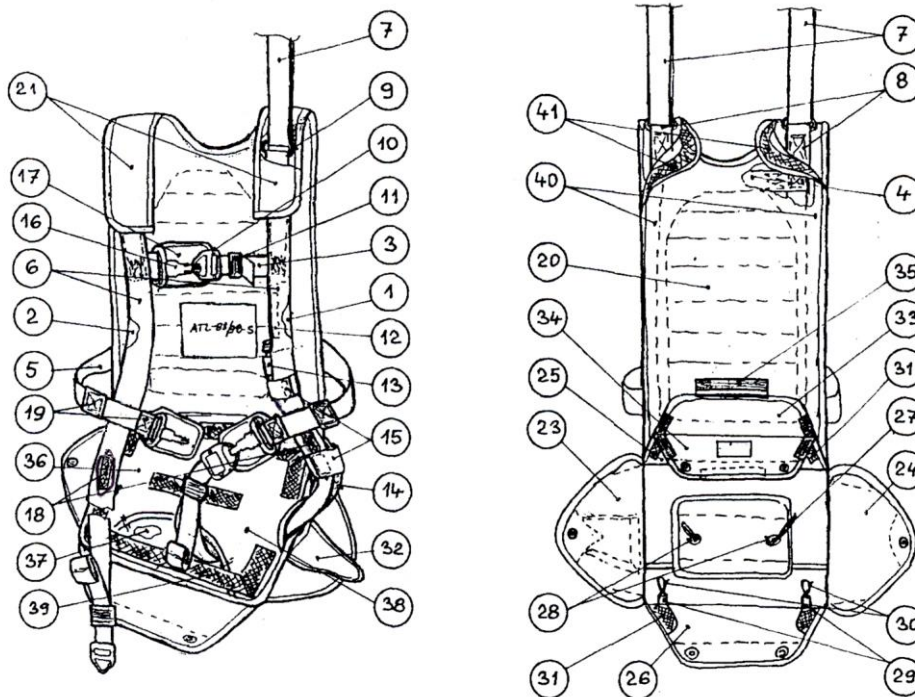


fig. 5



6.6. Seat cushion SP - 012 - 2 ( fig. 6)

The sitting cushion is designed for pilot's comfortable sitting on the plane. It has rectangular shape and consists of two parts – basic sitting cushion (1) and inserted segment (2). The insides of both parts are filled with foam rubber (3). The uppers are made of cotton textile, the sides and bottoms are made of polyamide textile. Parts (1) and (2) are interconnected with hook and loop fasteners (4). Hook fasteners (5) are sewn on to bottom parts and enable the attachment of a sitting cushion to parachute covering's bottom. The sitting cushion is divided into two parts for threading of main straps of supporting harness over the sitting cushion.

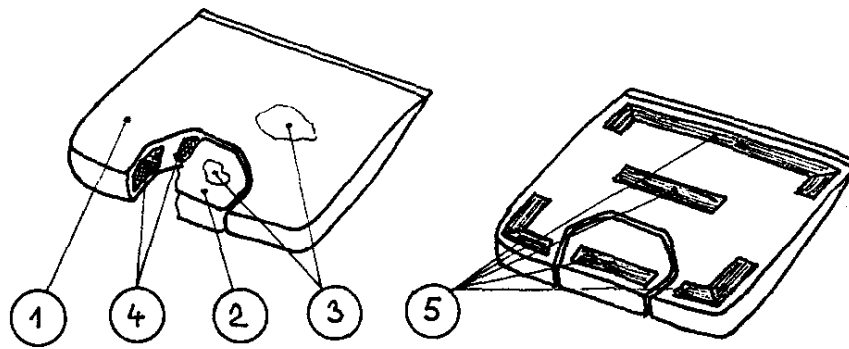


fig. 6

6.7. Release U – 063 (fig. 7)

The release is assigned for the closing and opening of the parachute pack. It consists of the handle (1), the steel cable (2), two pins (3), and a cable-atop (4).

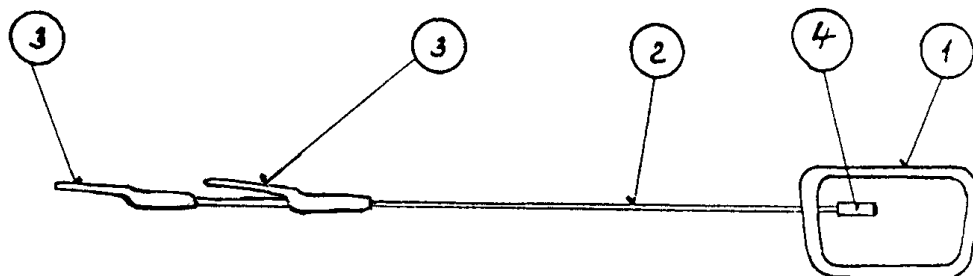


fig.7

6.8. Back padding P-023 (fig. 8), Back padding P-029 (fig. 8a)

The back padding is designed for comfortable pilot leaning in the aircraft seat.

The external parts of the back padding P-023 are made of cotton canvas (1) and airtight polyamide fabric (2), interior area is fitted with the padding from unwoven textile (3). On the reverse side of the back padding are sewn hook fasteners (4), designed for the connection back padding to the parachute pack.

On user request available back padding P-029 with progressive shape construction for increase user comfort. The external parts of the back padding are made of 3D fabric (1) and of cotton canvas (2). Interior area is fitted with the padding from unwoven textile (3) and from anatomical shape padding (4). On the reverse side of the back padding are sewn hook fasteners (5), designed for the connection back padding to the parachute pack.

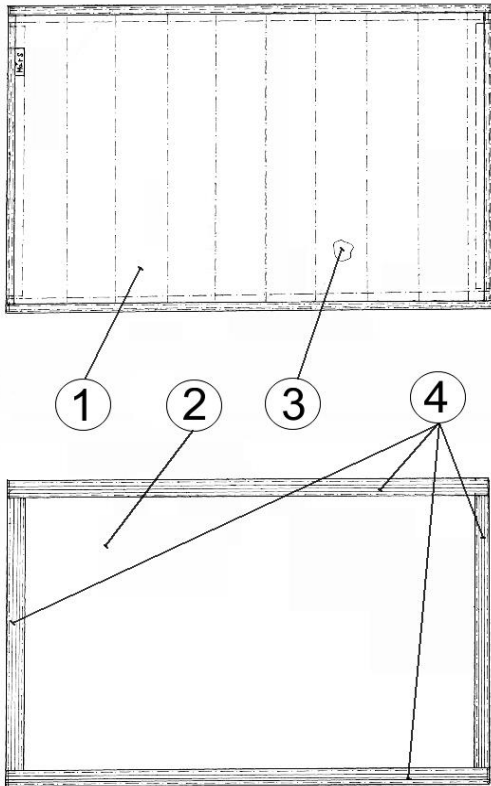


fig. 8

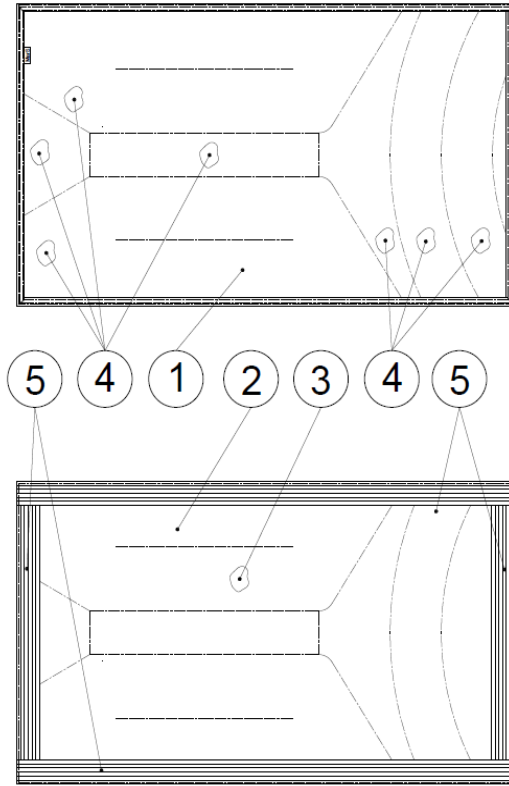


fig. 8a

6.9. Portable bag G - 59 (fig.9)

The portable bag is assigned for the parachute's placing at the storage and at the transport. It is made of the polyamide canvas it is in the shape of the right parallelepiped with dimensions 640 x 400 x 230 mm. In the upper part of the bag the zip fastener (1) is sewn in for the bag's closing. The portable bag has two handles (2) and on the lateral side the sewn-in pocket (3) that is closed with the help of hook and loop fasteners (4). The pocket serves for the placing of the parachute log-book and for the spare parts.

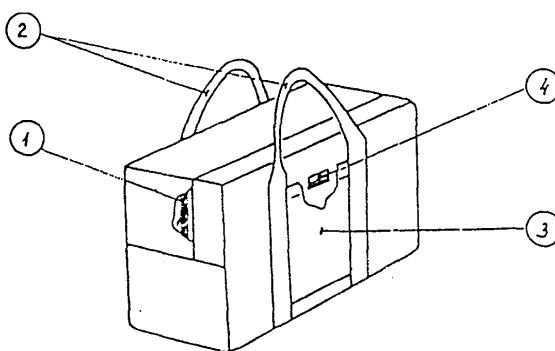


fig. 9

## CHAPTER II

### Instructions for the parachute's packaging

#### 1. General instructions

- 1.1. Only the person entitled to the parachutes' packaging carries out the parachute's packaging.
- 1.2. Before the packaging it is necessary to carry out the inspection of the technical state and entirety of the parachute.
- 1.3. The damaged functional parts are necessary to change or to repair.
- 1.4. The parachute's repair will be carried out according to the Technical conditions for the repair No. 0-2-99 of the parachute ATL-88/98-S-1.
- 1.5. The change of the parts and the repairs are written into the parachute log -book.
- 1.6. For the sealing of the ripcord's pins will be used green thread with the strength 4,5 to 7,5 N.
- 1.7. For the sealing of the portable bag's closing will be used red thread with the strength 49 to 68,8 N.
- 1.8. During the parachute's packaging we recommend not to expose the canopy to direct solar radiation.

#### 2. Inspection of the parachute before the packaging

2.1. The inspection will be carried out in this sequence:

- pilot parachute
- connection line
- canopy with the lines
- supporting harness
- parachute pack
- seat cushion
- release
- portable bag

##### 2.1.1. Inspection of the pilot parachute

Check the damage of the fabric, webbings, seams and metal rings on the webbings. If the spring is enough deformed or broken the pilot chute will be replaced.

It is checked a stitching of webbings with sleeves to spring and their location in the middle of spring basis.

##### 2.1.2. Inspection of the connection line

The damage of the webbing and the sewing is inspected.

##### 2.1.3. Inspection of the canopy

The canopy is inspected at the stretching state, the best against light. The damage of the fabric, webbings and seams is inspected. After the inspection even the suspension and control lines are rechecked.

- 2.1.4. Inspection of the supporting harness  
At the supporting harness an entirety of the straps and sewing, the ripcord's pocket, state and function of the buckles is inspected.
- 2.1.5. Inspection of the parachute pack  
The damage of the fabric, webbings and reinforced bands, state of the metal ring's are inspected. The special attention must be givers to the closing line - if it is damaged it is necessary exchange it.
- 2.1.6. Inspection of the seat cushion  
The damage of the fabric and hook and loop fasteners.
- 2.1.7. Inspection of the release  
The state of the release - release's cable, lock and the pins (pressing, rust, notches) are inspected.  
The damaged release will be replaced.
- 2.1.8. Inspection of the portable bag  
Check the damage of the fabric (stains), handles' webbings and zip fastener's state.
- 2.2. The replacement of the damaged parts  
In operation it is allowed to exchange the parts mentioned in Chapter I., par.5.

### **3. Packing aids**

- 3.1. The parachute's packaging carries out on the packing table or on the army packing table.
- 3.2. For the parachute's packaging it is necessary to use two accessory packaging lines of the length aprox. 1 m and several weights.

## **4. Packaging of the parachute**

The parachute's packaging is carried out by one person.  
After the packaging of the parachute the man will write records into the parachute log-book.

Process of packaging:

- 4.1. Preparation for packaging
- 4.2. Canopy pleating
- 4.3. Inspection of the canopy and lines
- 4.4. The lines' stowing into the locking flap
- 4.5. Inspection of the lines' stowing
- 4.6. Canopy pleating into the parachute pack
- 4.7. Pilot chute's pleating and closing of the parachute pack
- 4.8. Inspection of the packed parachute

### **4.1. Preparation for packing**

The parachute will be spreaded on the packing table. The lines of the pole vent will be fixed at the packing table's end, canopy and suspension lines will be straighten along the whole length. The pilot chute will be put along the canopy. The supporting harness with the parachute pack will be put upwards with the parachute pack, the canopy will be divided in two so that the lines No. 1 ÷ 10 laid to the right and the lines No.11 ÷ 20 to the left (fig. 10). Thread the wire of the release device with needles through the tube connecting the supporting harness and the parachute packing then thread the wire through the border trimming on the inside flap of the parachute packing.

The release's handle will put in to the pocket on the supporting harness and will secured by means of the hook and loop fasteners.

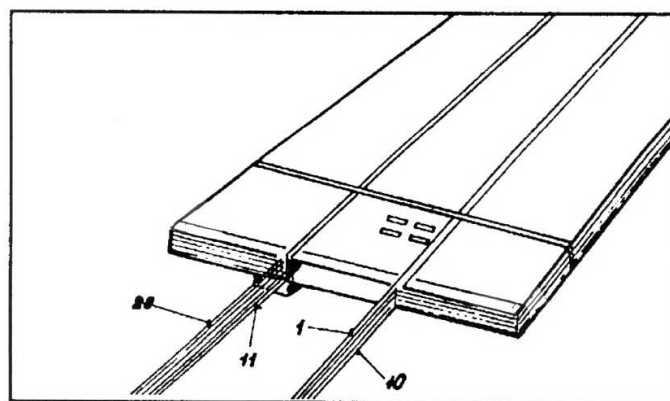


fig. 10

**4.2. Canopy pleating**

The left half of the canopy is folded on the right side (fig. 11). The line No. 12 will put on the line No. 11, the gore along these lines will pleat in two and along the whole length will levelled (fig. 12).

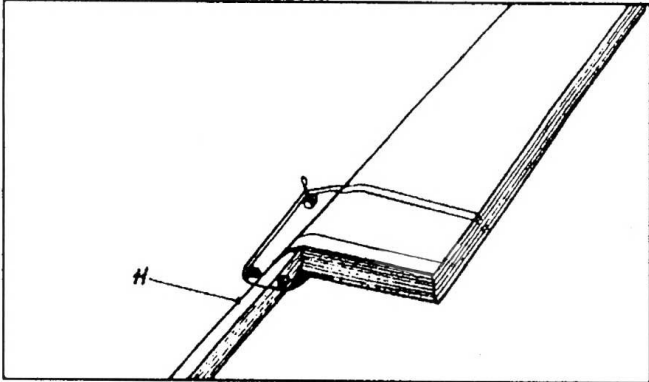


fig. 11

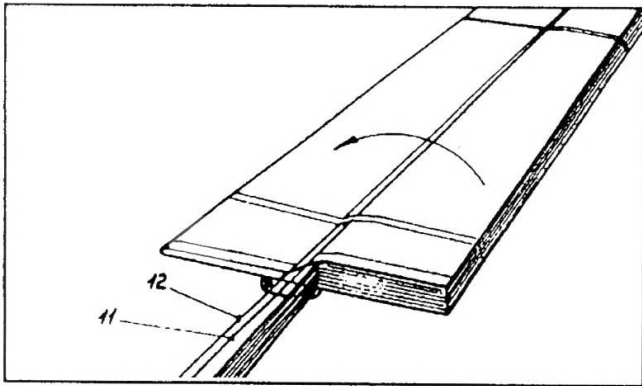


fig. 12

In this way the whole left canopy's half up to line No.20 will be pleated (fig. 13).

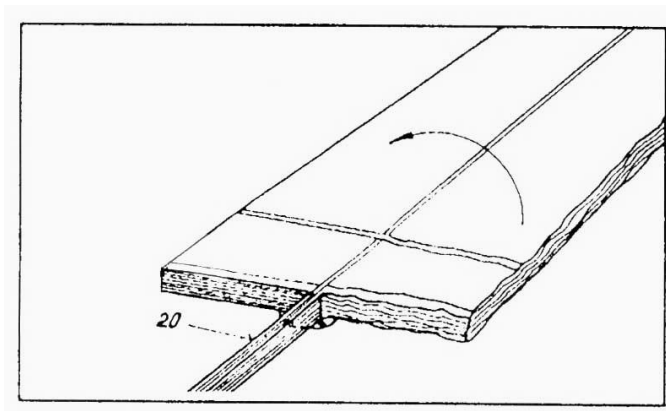


fig. 13

The unfolded right half of the canopy is placed on the left pleated half and is levelled in the same way as the left half (fig. 14). The gore between lines No.1 and 20 is placed on the left side (fig. 15).

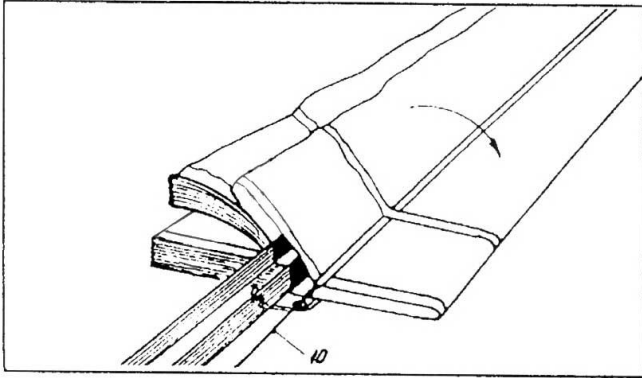


fig. 14

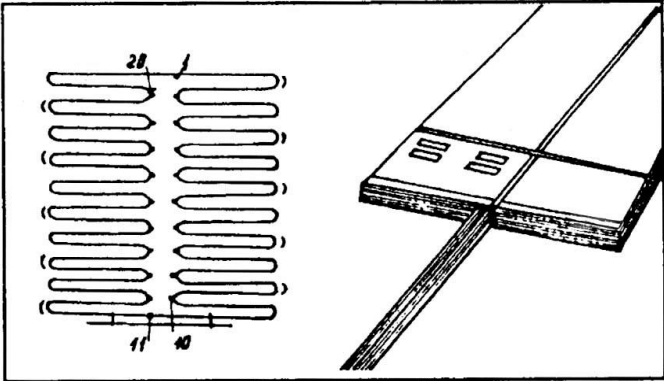


fig. 15



The canopy is folded at the bottom end from lines at a 45° angle (fig. 16a), the left and the right half of the canopy is folded in two (fig. 16b).

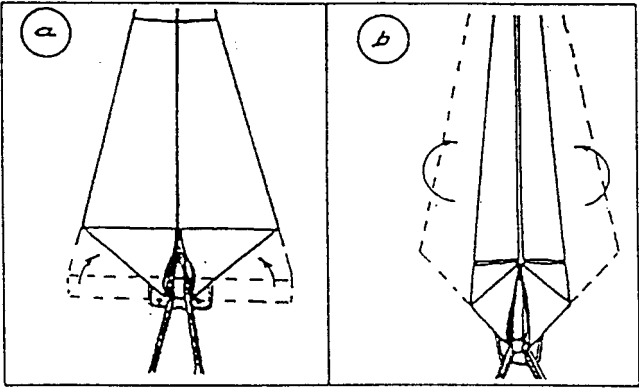


fig. 16

In this way packed canopy is folder into thirds so that first the right side of the canopy is put and on it then the left side of the canopy, the canopy is loader with the weights (fig. 17).

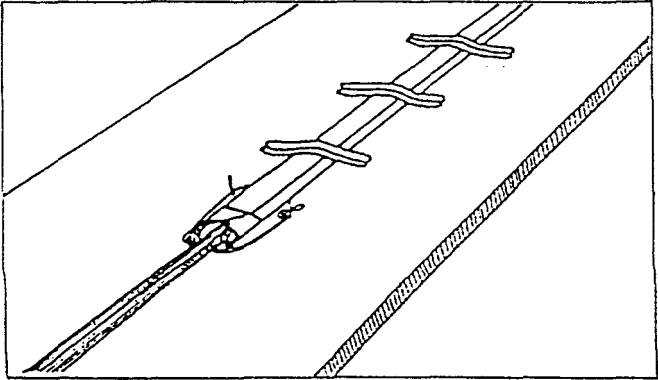


fig. 17

### 4.3. Inspection of canopy and lines

The packer grasps the lines No.1 and 20 (at the canopy and at the loose ends with red mark), lifts up them and goes from the canopy to the loose ends of, the supporting harness. In this way he checks the looseness of the lines from the canopy's edge up to free ends of the supporting harness (fig. 18).

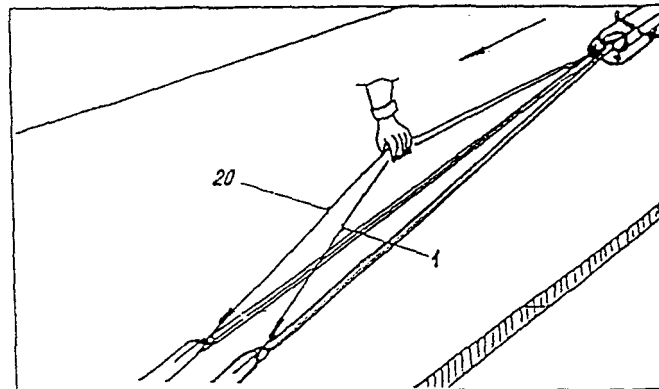


fig 18

### 4.4. Lines' stowing to closing flap

The suspension, lines will be grasped near the bottom edge of the canopy and the bottom part of the canopy is folded so that the closing flap was folded in a half. The rubber bands connected in the bottom part of the closing flap on all sides of the folded canopy will pass through metal rings in the upper part of the closing flap and the suspension lines are stowed step by step into all rubber bands placed in the bottom part of the closing flap (fig. 19a, b and 20).

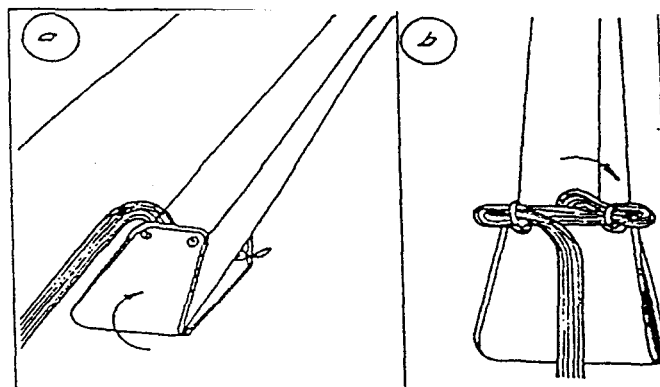


fig. 19

The loops' length behind the rubber bands is 30 - 50 mm.  
The lines should not be twisted.  
During the lines' stowing the parachute pack is drawn towards the canopy.

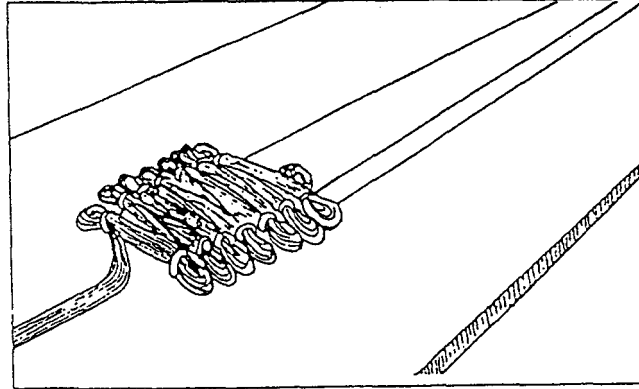


fig. 20

#### 4.5. Checking of stowed lines

The packer visually checks the lines for proper stowing.

#### 4.6. Canopy's stowing into parachute Pack

The loose ends of the supporting harness are folded into the parachute pack and the lines at free ends are passed through the rubber bands on the bottom of the parachute pack. The auxiliary packing lines will be passed through the loops of the closing line (fig. 21).

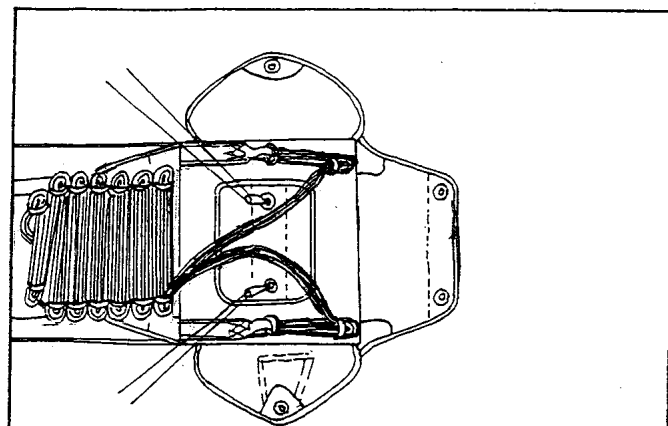


fig. 21

The bottom brim of the canopy with stored ropes is to be moved toward the bottom flap of the parachute cover, so that the canopy goes through the centre of cover, and the bottom brim of the canopy coincides with bottom edge of the parachute covering and the bottom flap (Fig. 22).

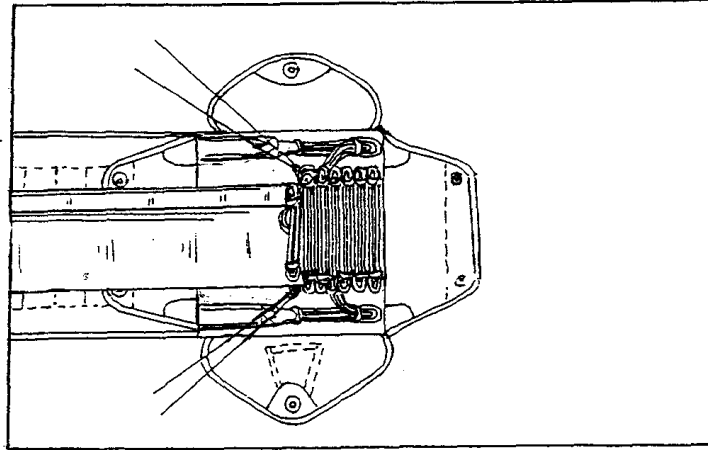


fig. 22

Next packing step includes folding of packed canopy in the place of transition of parachute covering's bottom and upper flap, and folding of canopy on the side of the parachute cover close to the left flap (Fig. 23).

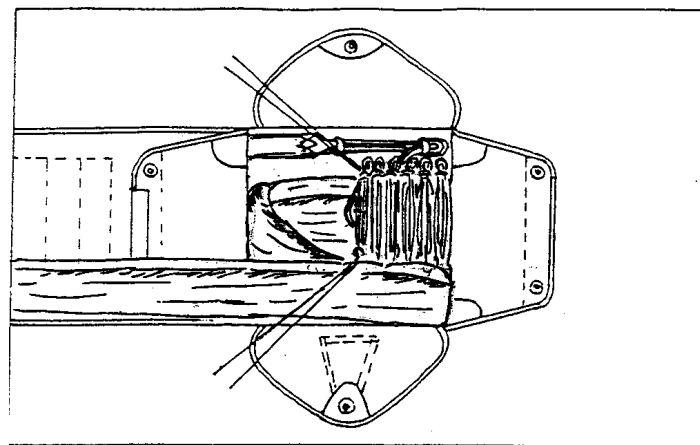


fig. 23

It is necessary to bear in mind that auxiliary packing ropes threaded through eyelets of closure rope must always be kept free during placing of canopy into parachute covering.

Next we fold the canopy on the left side of the parachute cover close to upper flap and place the canopy along the bottom edge of the parachute cover close to upper flap. Then we fold the canopy at right flap of the parachute covering and place it along the bottom edge at right flap towards the bottom flap, close to the bottom flap we fold it again and put the canopy back alongside the right flap (Fig. 24).

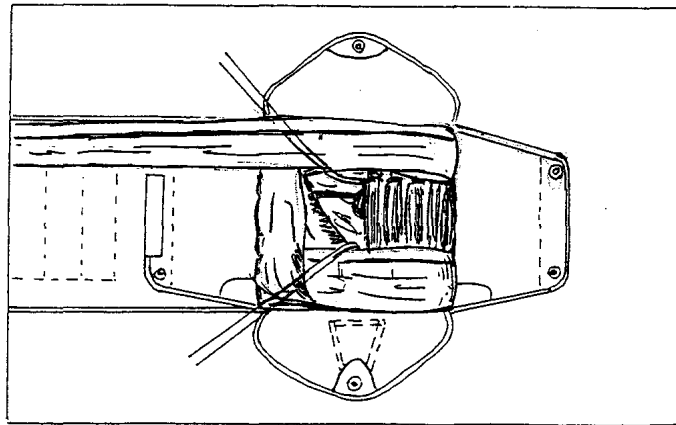


fig. 24

In the corner close to the upper flap we fold the canopy again and the remaining part of the canopy is placed in the centre of parachute covering, so that the upper rim of the canopy with pole ropes is folded down towards the placed canopy, and connection cord runs freely behind it (Fig. 25).

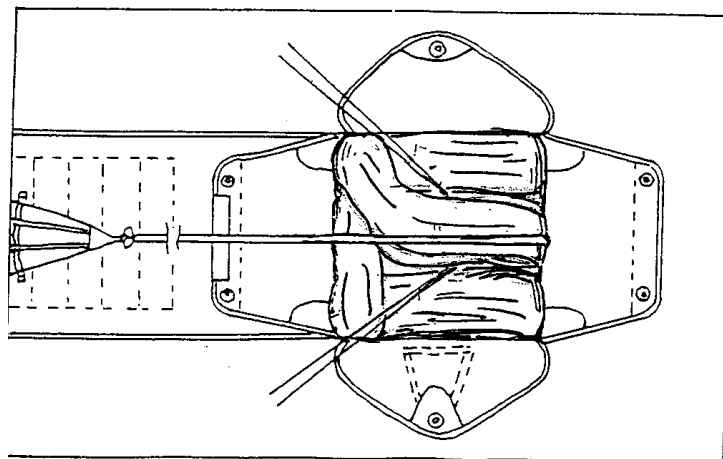


fig. 25

In the next step is connection cord placed in folds on packed canopy between auxiliary packing ropes (Fig. 26).

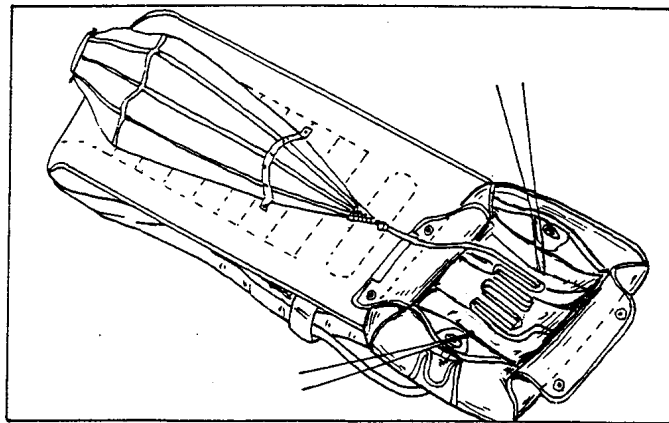


fig.26

#### 4.7. Stowing of pilot parachute and closing of parachute pack

The pilot parachute with gore in the shape of triangular is put on the folded connection line and the auxiliary packing lines are passed through the edgings and rings. The pilot parachute's spring is pressed down and fabric of its canopy is stowed in the direction of in along the individual spring coils (it should not be stowed below or above the pressed down spring), (fig. 27).

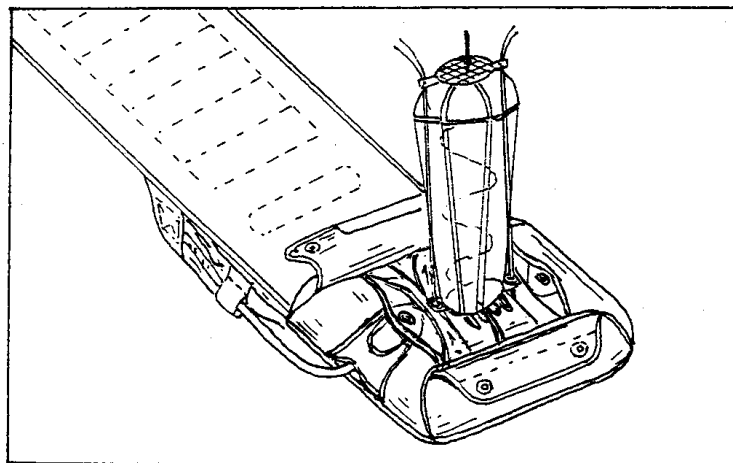


fig. 27

The packer holds by the left hand the pressed-down pilot parachute and by the right hand he puts the right side flap over the pilot parachute and passes the auxiliary packing line through the rings. In the same way he goes on with the left side flap (fig. 28).

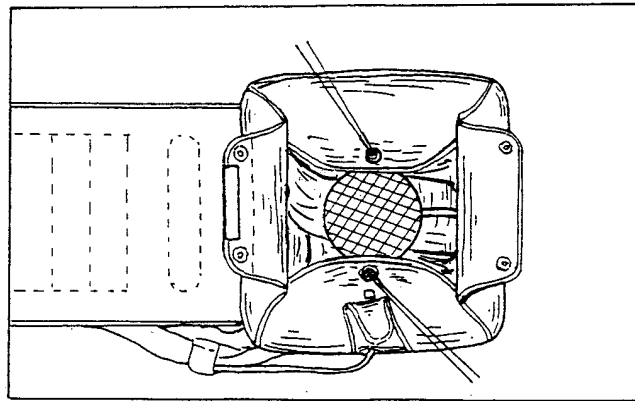


fig. 28

Auxiliary packing ropes are further threaded through rings in the bottom flap and then through rings in the upper flap (Fig. 29).

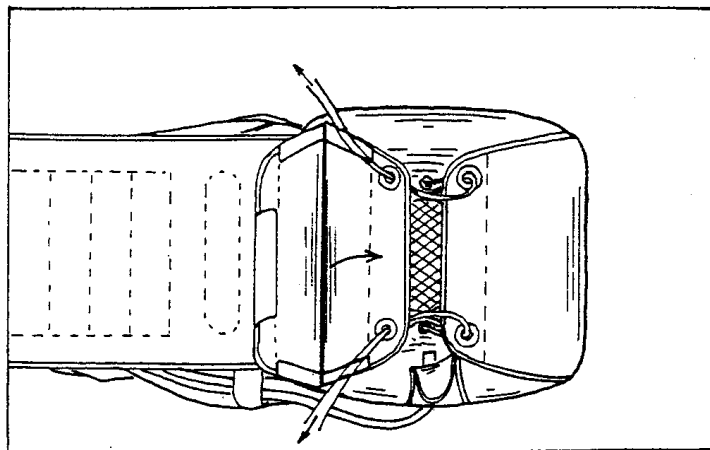


fig. 29

By pulling out of the auxiliary packing lines the loops of the closing line in that the ripcord's pins are inserted, are drawn out and so the parachute pack is closed. The auxiliary packing lines are pulled down below the ripcord's pins and they are pulled out from below of pins (closing lines should not be damaged) (fig. 30)

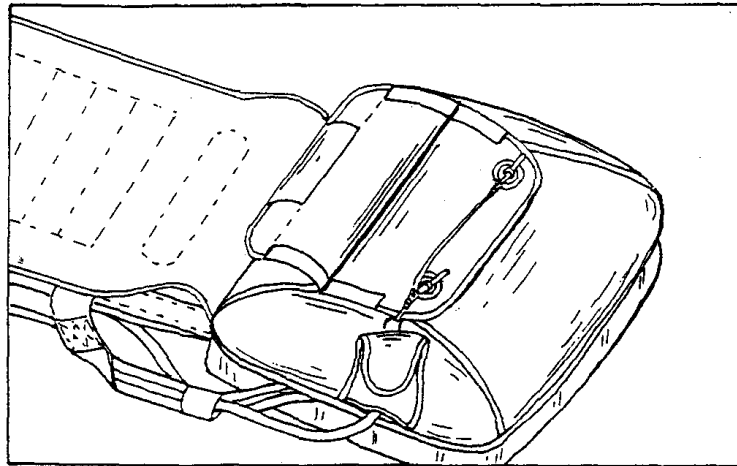


fig. 30

#### 4.8. Inspection of packed parachute

The packer checks the packed parachute and secures with green sealed thread of up 4,5 to 7,5 N tensile strength both pins of ripcord.

String the thread through the eyelet of the locking rope and beyond the needle part forcing. Bind the string ends with three knots (det. fig. 31).

At a distance 20 to 30 mm from the: knots the threads' ends are knotted together and the knot is secured with paper sticky tape (fig. 31).

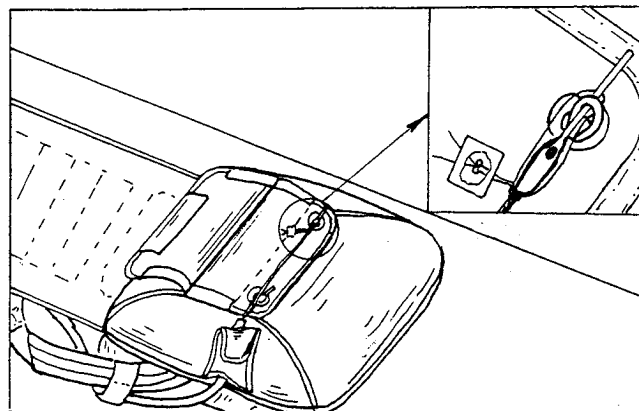


fig. 31



The sticky tape is marked with the date of the packaging and signature of the packer.

The closing mechanism is overlapped with the covering flap by means of the hook and loop fasteners and the divided upper flaps closed with hook and loop fasteners from three sides.

The parachute's packaging is finished (fig. 32).

The packer makes a record about the packaging into the parachute log-book and signs it.

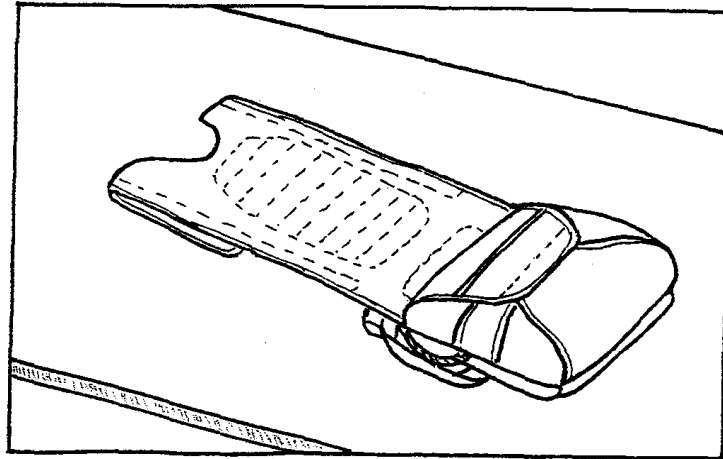


fig.32

## **CHAPTER III**

### **Instructions for use of parachute.**

#### **1. Preparation of parachute before flight**

The pilot checks the position of release ripcord pins in the loops of closing line, date of parachute packaging and makes sure that the seal thread is intact. Then he checks the state and functionality of metal parts of the parachute. The pilot puts on the parachute and adjusts the straps' length using the harness buckles.

#### **2. Opening of parachute**

Refer to Chapter I, par. 3 - Parachute's function.

After using (opening) of the parachute must be carried out the professional inspect of the parachute.

The damaged parachute is sent to the organization authorized for performing maintenance for repair.

# CHAPTER IV

## Storage and transportation of parachute

### 1. Preparation of parachute for storage

Prior to storage the parachute should be ventilated, inspected, repaired and faulty components replaced. The parachute is stored packed in portable bag (for 365 days from last packing) or unpacked.

The unwrapped canopy is assembled by gores, the left half is foiled over the right half and the canopy is rolled up from the apex to the lower edge. The suspension lines are chain-braided. The parachute is stowed in portable bag so that the back pad of the parachute pack with registration number faced up. The parachute log-book is stored into the pocket on the portable bag.

### 2. Storage of parachute

The parachute is stored in shelves in dry, dark and air-conditioned room. The distance of the bottom shelf from the floor should be at least 0,15 m, distance of the shelf from wall at least 0,5 m and min. 1m from a heater. If the parachute is stored for a long time, it should be ventilated for min. 24 hours at least once in 365 days. The parachute is ventilated in a shaded place. It should not be exposed to strong sun light.

The date of ventilation should be entered in the parachute log-book.

Rooms for storing of the parachutes should be free from oils, acids, diluents and other chemicals and metal objects not pertaining to the parachute. The following conditions should be observed in the storing room:

daily temperature	+ 14 to + 24°C
daily relative humidity	35 to 73 %

### 3. Transportation of parachute

3.1. The parachutes in operational conditions are transported in portable bags aboard the plane or in covered (canvassed) trucks.

3.2. In other cases the parachutes are transported unpacked in portable bags stowed in cardboards, boxes, transport cases or containers. The containers should have smooth and clean interior. Wall should be lined with wrapping paper.

3.3. The parachute stowed in cardboards, boxes or containers should be transported in covered transportation means.

3.4. The special conditions of parachutes' transportation should be specified in special order.

# CHAPTER V

## Parachute's repair at the user

### **1. The authorized person from producer can carry out the following repairs:**

- 1.1. Sewing of the patches on the fabric, edgings, webbings
- 1.2. Complementary stitches on the damaged sewing
- 1.3. Replacement of hooks and loop fasteners and rings

#### 1.1. Sewing of the patches on the fabric, edgings, webbings

##### a) sewing of the patches on fabric (referring to all parts of the parachute):

- repair of the damaged fabric (fracture, burn) is carried out with the sewing of one-sided or two-sided patch on the injured place from the same kind of material as the damaged material is
- the patches can be in the shape of square or rectangular and after sewing the minimal dimensions 30 x 30 mm or 30 x 60 mm, max. allowable dimension after sewing 250 x 250 mm
- stitched patch mustn't deform the basic fabric
- stitched patch must overlap the twice greater surface than the damaged part is. The warp and weft direction of the patch must agree with the warp and weft direction of the basic material
- if the damage is in the direction that is shorter than 20 mm from the stitch the patch for the repair must be sewn into the stitch (scheme No. 1)
- sewing of the patch with cutting out (scheme No. 2)
- the ending of patch's sewing must overlap min. 20 mm over the begin of the patch's sewing at the patch sewn-in stitch (scheme 1) the stitch's interruption must be reinforced with the stitching in length min. 75 mm in every side
- by sewing the two-sided patch (scheme 3) at first the patch from the inner side is sewn with the folding of the patch's edges' min 10 mm
- after sewing from the inner side the patch is sewn from outside. The patch's edges are folded min 10 mm. The outside patch should be have the dimensions about 15 mm greater than the inside patch
- the patches are sewn with sewing threads BONDED/VENUS No. 40
- the number of patches is not limited; Decision on number of patches is left to the body carrying out repairs and to the body carrying out the use certification
- if there are too much patches in one place or if the damage is greater than 1/3 of gore's surface it is necessary to send the parachute for the repair
- the one-sided patch can be sewn by hand
- only the patches from outsider are sewn on the parachute pack

##### b) stitching of the patch on the webbings and edgings (referring to all parts of parachute) scheme No. 4:

- repair of the damaged edgings (fracture, burn, etc.) is carried out with stitching of the patch from the same kind of material
- min. length of the patch after stitching must be 100 mm, its max. length 250 mm
- the sewn-in patch must overlap min 50 mm into every side of damaged part
- the sewn-in patch must not deform stitched basic edgings
- the patch is sewn in the face, if it is not possible to sew the patch at allowable dimensions, the parachute will send to the repair
- the patch's sewing will carry out by stitching with the single- or double - needle sewing machine. The edgings' ends are folded 10 ÷ 20 mm. The ending of patch's sewing must overlap 75 mm over the patch:
- it is permitted to sew the patch by hand
- the number of patches is not limited; Decision on number of patches is left to the body carrying out repairs and to the body carrying out the use certification
- if there are greater number of the patches it is necessary to change the damaged parachute. The parachute will send to the repair,
- the patches stitching is carried out with sewing threads BONDED/VENUS No. 40.

### 1.2. Complementary stitches on damaged sewing, scheme No.5

- the interrupted stitch (breakage) is corrected with the complementary stitch
- the complementary stitch must overlap min 75 mm into every side from the damaged place
- the complementary stitches are carried out with sewing threads BONDED/VENUS No. 40

### 1.3. Replacement of the book and loop fastener and rings

- the damaged, teared or separated hook and loop fasteners will be replaced, the new one must be of the same length as the origin, The stitching is carried out with sewing threads BONDED/VENUS No. 40
- the damaged, feared out or absented rings will replace with stringing of the new ring of the same kind, If the fabric is teared in the position of the ring the two-sided patch is stitched before the striking,
- the damaged or broken rubber bands will replace with new bands of the same size.

## **2. Number of stitches by the sewing at individual kinds of threads**

- sewing threads BONDED/VENUS No. 60    30 - 35 stitches in 100 mm
- sewing threads BONDED/VENUS No. 40    25 - 30 stitches in 100 mm
- at lattice stitch 30 - 35 steps in 100 mm

List of material for the parachute's repair, mechanical – physical properties of materials

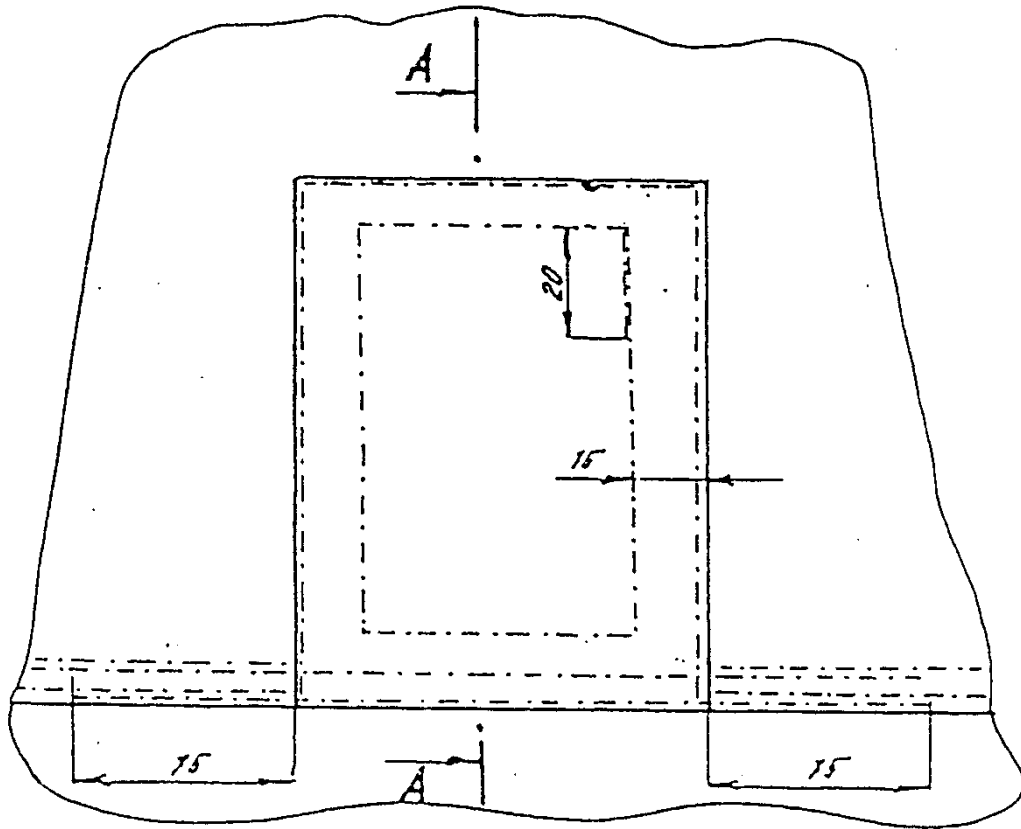
		Manufacturer business item	Standard	Strength (N) warp/weft	Elong (%) warp/weft	Air. perm. (l)	
						aver.	max.
1.	<b>Upper material</b>						
	UTT 38866	05100410160	Instruction QS 03/02, PIA-C-44378	400/325	20till40/20till40	-	15
	UTT 38960	05100710120	Instruction QS 03/02, MIL-C-7020	370/370	20till30/20till30	200 till 300	-
	UZARON UNI ZA1 PRINT	01300100140	PN 012823/051/80/80	1800/1750	44till63/37till54	-	-
2.	<b>Lining and trimming</b>						
	Harness PAD 45 mm	02200370045	PN 99301	23.000	45		
	Harness PAD 9886-1	06200800044	Instruction QS 03/02, MIL-W-4088	27.500	65		
	Webbing PAD 13 mm	02100210013	PN45192162-037/80/92	700	30		
	Webbing PAD 15 mm	02100410015	PN45192162-037/80/92	1.100	30		
	Webbing PAD 20 mm	02100870020	PN45192162-037/80/92	500	30		
	Webbing PAD 25 mm	02100310025	PN45192162-037/80/92	2.000	40		
	Webbing PAD 43 mm	02100669043	PN45192162-037/80/92	5.000	40		
	Hook and loop lower	02400270020	PN44569599-028/80/04				
	Hook and loop upper	02400170020	PN44569599-028/80/04				
	Support harness – vesicle	02201410015	PN 45192162/037/80/92	6.500	30		
	Sew.threads BONDED No. 10	02600400010	-	195	22 till 30		
	Sew.threads BONDED/VENUS No.60	02600400060	-	30	14 till 26		
	Sew.threads BONDED/VENUS No.40	02600400040	-	44	14 till 28		
	Sew.threads PES-SYNTON No.40	02600770040	-	42	16,5 till 21		
3.	<b>Metal</b>						
	Bushing stainless S 7690 SS 0L	07320200000	-				

Note for table: PAD = polyamid

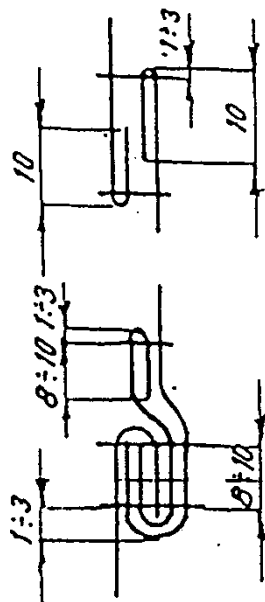
For repair of parachute can be used similar material whose mechanical – physical values corresponding with in table mentioned materials

Scheme No. 1

### THE PATCH IN SEAM



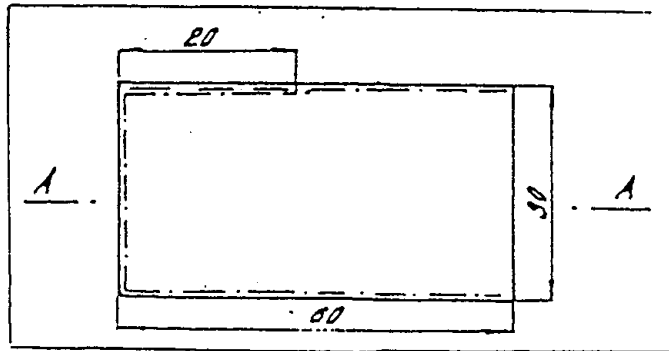
Cut A - A



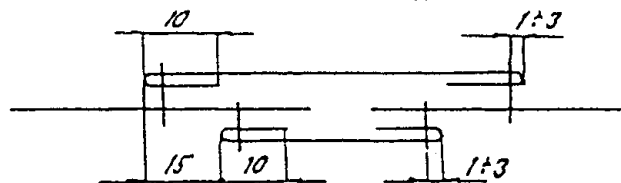
Scheme No. 2

### DOUBLE PATCH WITHOUT FABRIC'S CUTTING OUT

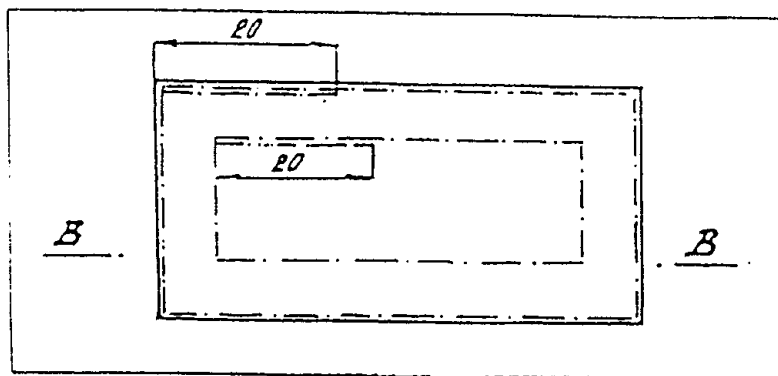
DOUBLE PATCH WITHOUT FABRIC'S CUTTING OUT



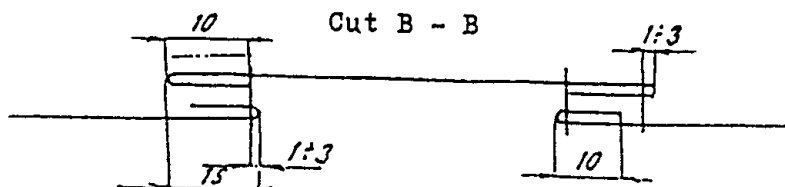
Cut A - A



PATCH WITH CUTTING OUT OF DAMAGED FABRIC



Cut B - B



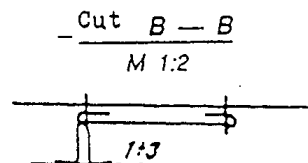
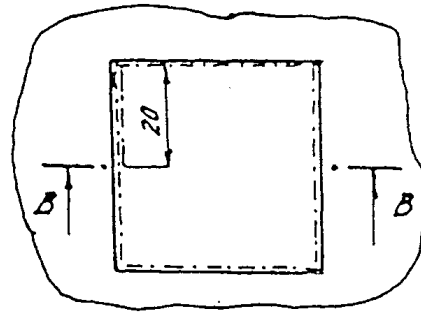
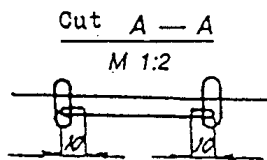
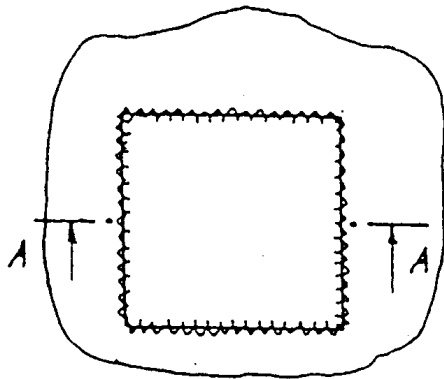


Scheme No. 3

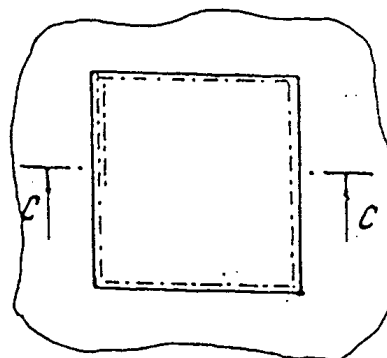
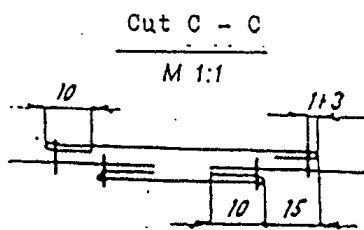
PATCH SEWN-IN BY HAND

PATCH SEWN-IN BY MACHINE

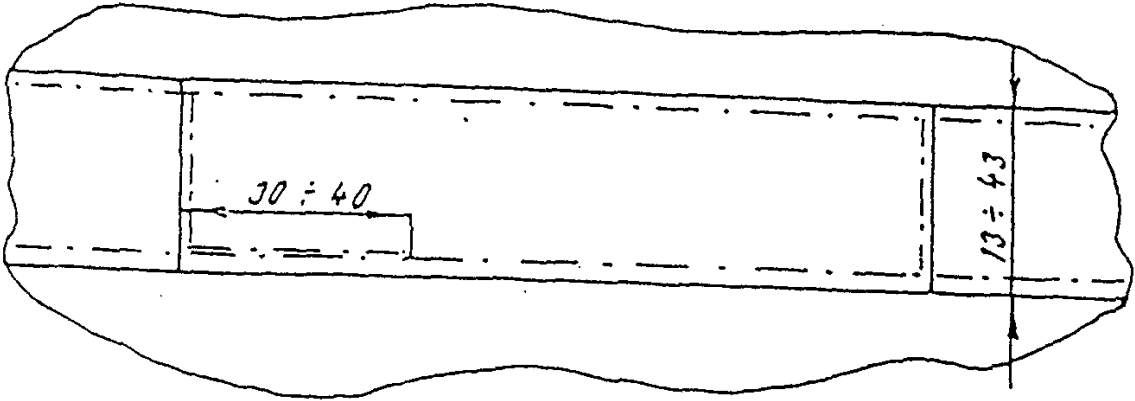
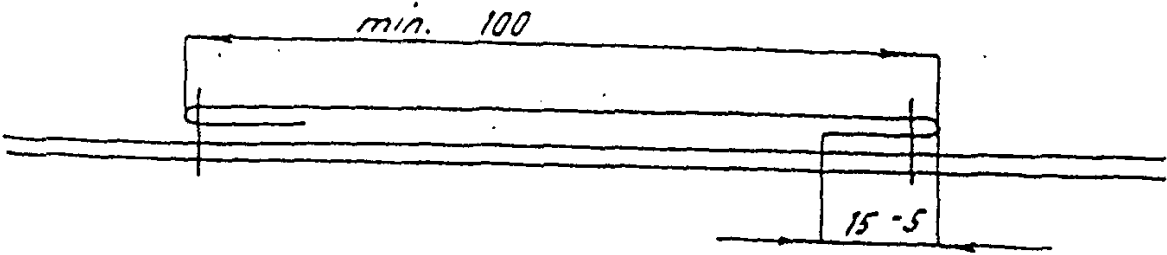
one-sided patches



two-sided patches

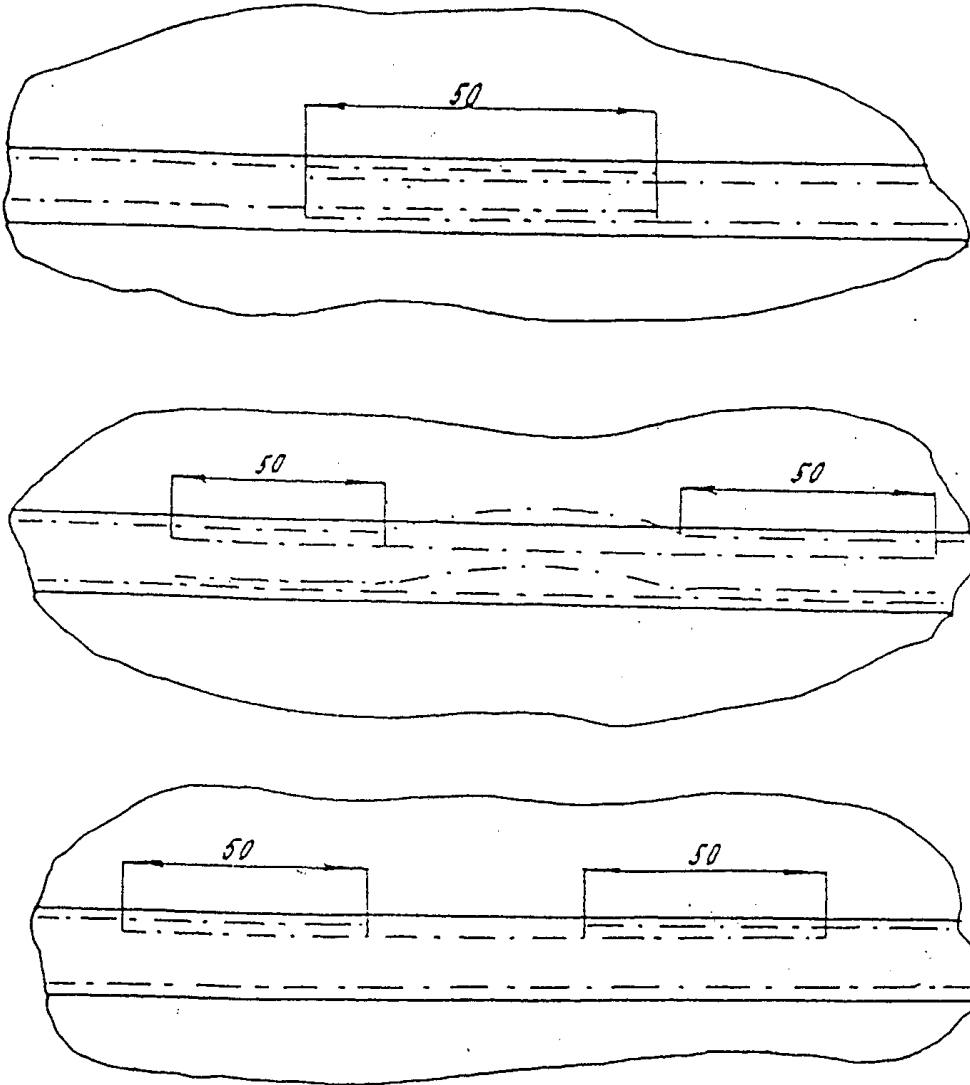


PATCH ON WEBBING

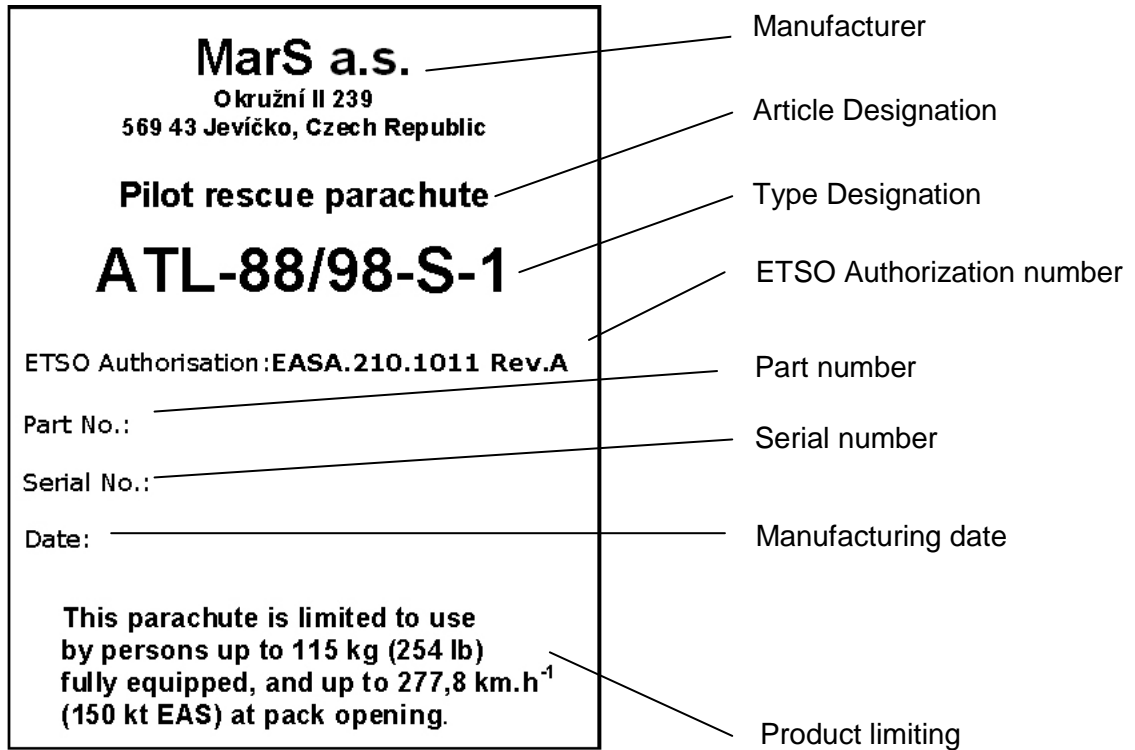


Scheme No. 5

STITCHING WITH COMPLEMENTARY STITCHES IN THE CASE  
OF BREAKING AND WRONG STITCHES



**Performance of the label with emergency parachute  
ATL-88/98-S-1**











**2018**

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