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## 7.46 LINDSTRAND ENVELOPES

### 7.46.1 GENERAL INFORMATION

This supplement shall be inserted in the Maintenance Manual, in Section 7: 'Supplements' with the revisions record sheet amended accordingly.

Information contained herein supplements, or in the case of conflict, supersedes that contained in the basic Maintenance Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult the basic Hot Air Balloon Maintenance Manual.

Issue 1 of this supplement consists of six pages.

NOTE: Throughout this document "Lindstrand" refers to Lindstrand Hot air Balloons Limited

#### 7.46.1.6 Identification of systems

All major components of Lindstrand hot air balloons are identified by a serial number and a description. These are located as follows:

Envelope - Engraved on the crown ring and on an identification plate, which is situated on the top side of the envelope mouth.

### 7.46.2 ENVELOPE REPAIRS

#### 7.46.2.3 LOAD TAPE REPAIRS

##### 7.46.2.3.1 GENERAL

Several of the load tapes used are common to all Lindstrand envelopes. The top rim tape is always 25.5 mm (1") wide, with a tensile strength of 2000 kg (4,400 lbs). The bottom rim tape is always 50 mm (2") wide tape. The tensile strength is greater than 2,000 kg, but this wider tape is used mainly to provide greater tolerance to burn damage in the mouth area. All other horizontal and vertical tapes are defined on Table 1.

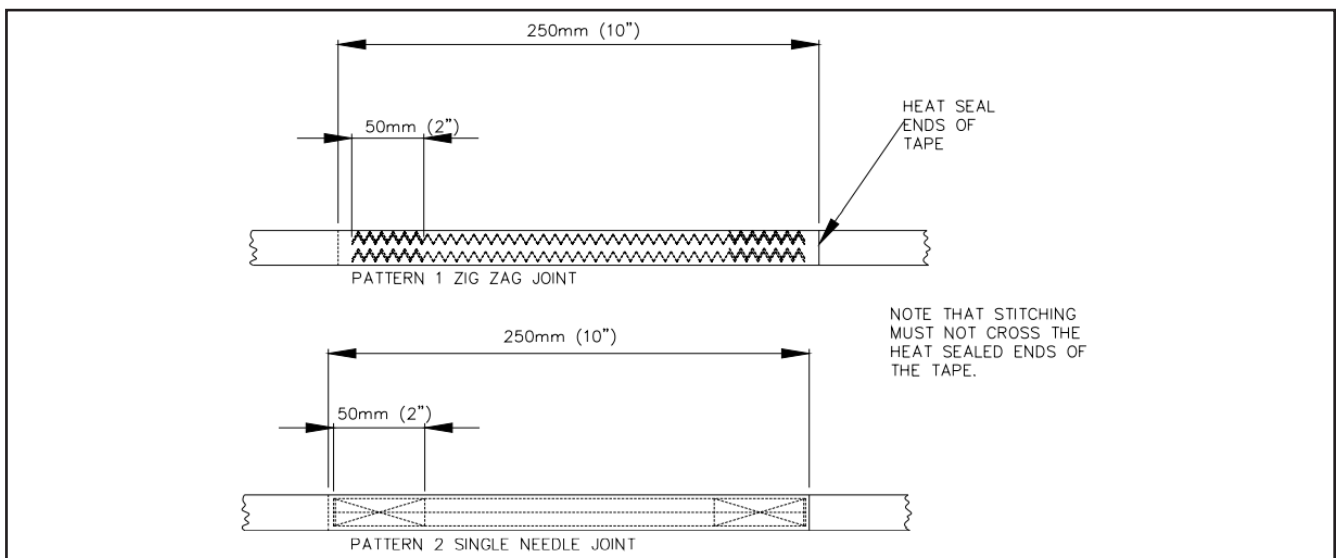
TABLE 1 - VERTICAL AND HORIZONTAL LOAD TAPE SPECIFICATIONS

Envelope Type	Vertical Tape					Horizontal Tape				
	Width		Name	Strength		Width		Name	Strength	
	mm	in		kg	lbs	mm	in		kg	lbs
42A	19	¾	58402	650	1430	19	¾	58402	650	1430
56A	19	¾	58402	650	1430	19	¾	58402	650	1430
69A	19	¾	58402	650	1430	19	¾	58402	650	1430
77A	19	¾	58402	650	1430	19	¾	58402	650	1430
90A	19	¾	59055	1000	2200	19	¾	58402	650	1430
105A	19	¾	59055	1000	2200	19	¾	58402	650	1430
120A	19	¾	59055	1000	2200	19	¾	58402	650	1430
150A	19	¾	59056	1400	3080	19	¾	58402	650	1430
180A	19	¾	59056	1400	3080	19	¾	58402	650	1430
210A	19	¾	59056	1400	3080	19	¾	58402	650	1430
240A	19	¾	59056	1400	3080	19	¾	58402	650	1430
310A	25	1	59056	1950	4290	19	¾	58402	650	1430

7.46.2.3.2 LOAD TAPE JOINTS

The maximum allowable damage to any load tape is a 5 mm (3/16”) reduction in load carrying width.

To repair load tapes, unpick the damaged section and 300 mm (12”) beyond each end of the damaged section. Measure the length of the damaged load tape and cut with scissors. The ends of tape remaining on the envelope must be sealed with a hot knife or flame to prevent fraying. Cut a length of the correct type of tape, as shown in Table 1, Section 7.46.2.3.1, so that the total length is 500 mm (20”) longer than the damaged section. Heat seal the ends of the replacement tape. Pin the tape into position so that there is a 250 mm (10”) overlap at each end. Stitch the replacement tape to the original using either of the stitch patterns shown in Figure 1. Restitch the fabric onto the new section of tape using a double row of stitching.



▲ Fig 1. Load Tape Stitch Patterns

### 7.46.3 BASKET REPAIRS

No change.

### 7.46.4 FUEL SYSTEM REPAIRS

See Supplement 7.6

### 7.46.5 INSTRUMENT REPAIRS

No Change

### 7.46.6 MAINTENANCE SCHEDULE

No Change

### 7.46.8 REPAIR PARTS AND MATERIALS

See Lindstrand Illustrated Parts Catalogue, L\_IPC and section 7.6.8.1 below.

#### 7.46.8.1 Alternative repair materials

The tables below identify “Cameron” equivalent part numbers for Lindstrand parts.

##### 7.46.8.1.1 Envelope parts

##### 7.46.8.1.1.1 Load tapes

Cameron load tapes of similar specification may be used for repair of the envelope.

Table 2 Load tape alternatives

<b>Lindstrand Balloons Load Tape Name</b>	<b>Lindstrand Tape Description</b>	<b>Cameron Balloons Load Tape Part No</b>	<b>Cameron Tape Description</b>
58402	19 mm lightweight	CE-2020-5001 - White CE-2020-5011 - Black	20 mm flat tape
59055	19 mm medium weight	CE-2020-1101 - White CE-2020-2101 - Black	20 mm Load tape
59056	19 mm heavy weight	CE-2020-1101 - White CE-2020-2101 - Black	20 mm Load tape
59036	25 mm tape	CE-2025-1101 - White CE-2025-2103 - Black	25 mm Load tape
59157	25 mm heavyweight	CE-2025-3001 - White CE-2025-3002 - Black	25 mm heavyweight tape
10324	50 mm wide base tape	CE-2045-1001 - White CE-2045-1002 - Black	45 mm polyester Webbing

**7.46.8.1.1.2 Sewing Thread**

Polyester thread is the preferred thread for repair of Lindstrand balloons. Nylon sewing thread to the specification in Section 2.1.2 of the maintenance manual is an acceptable alternative for repair. Mixing Nylon and Polyester thread on needle and bobbin is not permitted.

The thread used on the needle is Metric 30 (V69), three strand continuous filament polyester, of plaited construction. The thread used on the bobbins is Metric 30 (V69), three strand continuous filament polyester, of twisted construction. Both threads should be treated to provide increased resistance to ultra-violet exposure. A comparable US specification is V-T-285, size E. Nomex thread is recommended for sewing the envelope components made in Nomex, but it must not be used elsewhere.

**7.46.8.1.3 Envelope Cordage**

Cameron load cords of similar specification may be used for repair of the envelope. The following table may be used to identify Cameron replacements for Lindstrand envelope cordage.

**Table 3 Envelope Cordage**

<b>Cord use</b>	<b>Lindstrand Cord description</b>	<b>Cameron Balloons Cord Part No</b>	<b>Cameron Cord description</b>
Parachute retaining lines	2 mm aramid plait cord.	CE-4103-0001	3 mm yellow kevlar
Parachute pull-down line	2 mm Polyester plait cord	CE-1504-0003	3 mm White Polyester
Parachute Operating line	8 mm aramid core with Polyester overbraiding. Red and white 50/50 spiral.	CE-4108-0005 - Red/White	8mm Kevlar Red/White
Rip and Superchute line	8 mm aramid core with Polyester overbraiding. Red	CE-4108-0001 - Red	8 mm Kevlar Red
Rotation Vent Lines	3.5 mm aramid core with Polyester overbraiding . Black or Green.	CE-4135-0002 - Green CE-4135-0001 - Black	3.5 mm TV line. Black or Green
Rotation Vent Lines	6 mm aramid core with Polyester overbraiding . Black or Green.	CE-4106-0002 - Green CE-4106-0001 - Black	6 mm TV line. Black or Green
Rotation Vent Lines	8 mm aramid core with Polyester overbraiding . Black or Green.	CE-4108-0009 - Green CE-4108-0008 - Black	8 mm TV line. Black or Green. 6mm TV line (above) may be used as an alternative.

**7.48.8.1.4 Flying Wires:**

Cameron balloons flying wires of identical wire diameter and length may be used. Part number CB1528-\*\*\*\* (the suffix “-\*\*\*\*” denotes length and heat-shrink colour).

Quicklink (Lindstrand part number AC1166) may be replaced by a 5mm Maillon link part Number CE-4103-0005

**7.46.8.1.5 Fibre Joint Fabric (Velcro)**

Cameron Balloons part number CE-3050-0002 may be used to replace 50mm Velcro.

**7.46.8.1.6 Other part substitutions:**

Temperature link: The Fusible link AC1162 may be replaced by Cameron temperature link CE-4260-1002.

Karabiners: The Cameron 4-tonne karabiner part No CU-9825-0001 is approved as a replacement for the Lindstrand 5-tonne karabiner part No EN1907

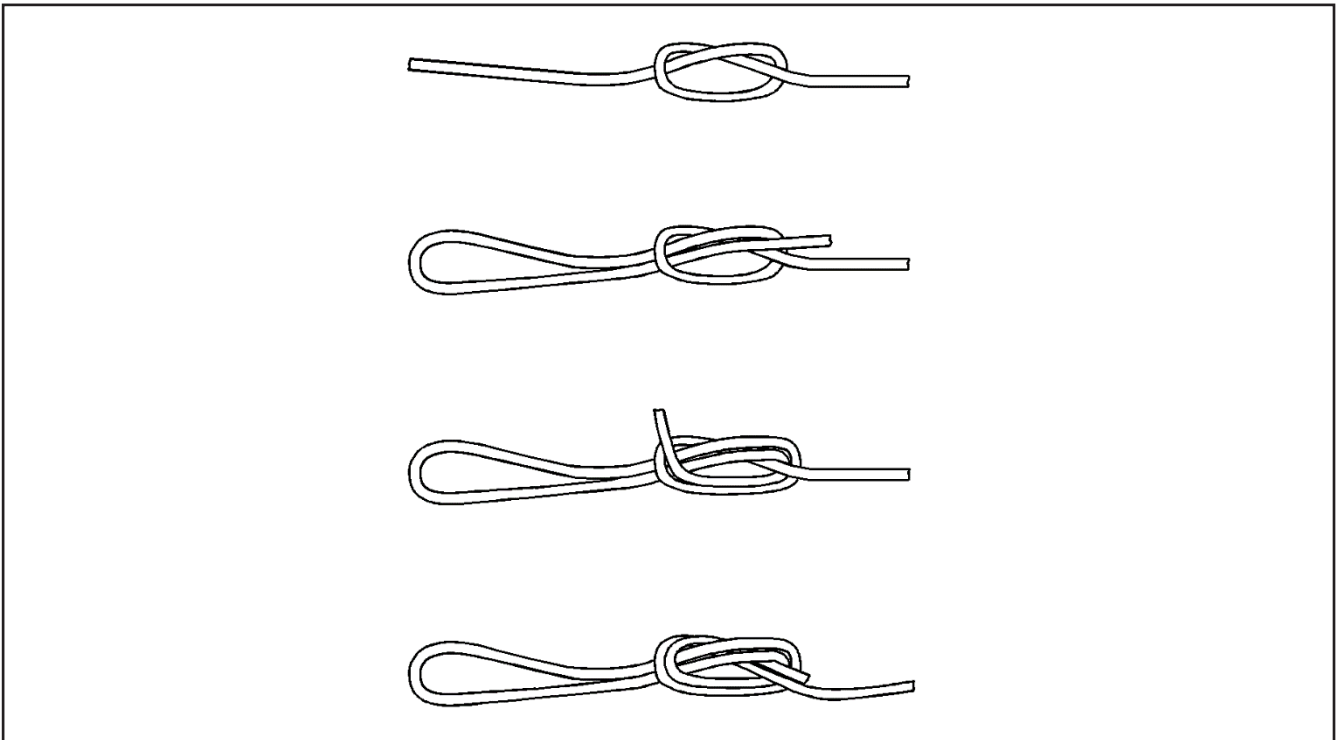
Pulleys: See Table 4:

**Table 4. Pulley alternatives**

<b>Lindstrand Part No.</b>	<b>Lindstrand Pulley Description</b>	<b>Cameron Balloons Part No</b>	<b>Cameron Pulley Description</b>
EN1838	300.12 Pulley single Block/ Internally bound	CE-4000-0002	Small Pulley
		CE-4000-0005	10mm XL Pulley
EN1839	Pulley 4BSH	CE-4000-0003	Pulley with Becket
		CE-4000-0006	10mm XL Pulley with Becket
EN1773	SS Sheave Pulley	CB-1504-0001	RDS Pulley
EN1899	16 mm HT block S/S sheave (Q-Vent)	CB-1504-0001	RDS Pulley

**7.46.8.1.7 The Cameron Knot**

The “Cameron Knot” (fig 5.1.2.5b) may be used as an alternative to the bowline knot on any envelope rigging line.



▲ Fig 5.1.2.5b the “Cameron Knot”