

# LINDSTRAND BALLOONS

## MAINTENANCE MANUAL SUPPLEMENT NO. 6

### ALTERNATIVE REPAIR MATERIALS

Approved under the authority of EASA.21J.140 (C671 and C701)

Issue 3 of this supplement consists of five pages

Add the following:

#### **5.1. Envelopes**

##### **5.1.1.1 Envelope Fabric**

Cameron fabrics of equivalent specification may be used for repair of the envelope.

Cameron “Ripstop” fabric part No CE-5120, CE-5131, CE-5181, CE-5186, CE-5193 & CE-5197 may be used in place of Lindstrand standard fabric N1053.

Cameron “Hyperlast” fabric part No CE-3500, CE-3391, CE-3392 & CE-3393 may be used in place of Lindstrand high strength fabric N2268

##### **5.1.1.2 Load tapes.**

Cameron load tapes of similar specification may be used for repair of the envelope. Use the table below to identify the appropriate replacement tape.

<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	19mm lightweight	CE-2020-5001 - White CE-2020-5011 - Black	20mm flat tape
59055	19mm medium weight	CE-2020-1101 - White CE-2020-2101 - Black	20mm tubular tape
59056	19mm medium weight	CE-2020-1101 - White CE-2020-2101 - Black	20mm tubular tape
59036	25mm tape	CE-2025-1101 - White CE-2025-2103 - Black	25 mm tubular tape
59157	25 mm heavyweight	CE-2025-3001 - White	25mm heavyweight tape
10324	50mm wide base tape	CE-2045-1001 - White CE-2045-1002 - Black	45mm polyester Webbing

##### **5.1.1.3 Sewing Thread**

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

Nylon bonded three-strand metric 40 thread (Tkt No. 40 M) may be used, ideally of a contrasting colour to the fabric. Comparable specifications are VT-295E size E, Dtex 233/3 or Type 69E, T-70.

Nylon thread is available as ‘Universally Bonded’, ‘Usual’ (S or left-twist) wound and ‘Reverse’ (Z or right twist) wound. These thread types are interchangeable although certain types of sewing machine may require specific threads (refer to sewing machine manual).

Note: If ‘Usual’ and ‘Reverse’ wound thread is used on twin needle sewing machines, the ‘Usual’ thread should be used on the outermost needle.

#### 5.1.1.4 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.

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

#### 5.1.1.5 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).

#### 5.1.1.6 Fibre Joint Fabric (Velcro)

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

#### 5.1.2.4 Flying Wires

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

#### Other part substitutions:

Temperature link: The Fusible link AC1162 may be replaced by Cameron temperature link CE-4620-1002.

Pulleys: See the table below:

<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-4000-0005	10mm XL Pulley with Becket
EN1773	SS Sheave Pulley	CB-1504-0001	RDS Pulley
EN1899	16mm HT block S/S sheave (Q-Vent)	CB-1504-0001	RDS Pulley

5.1.2.5

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

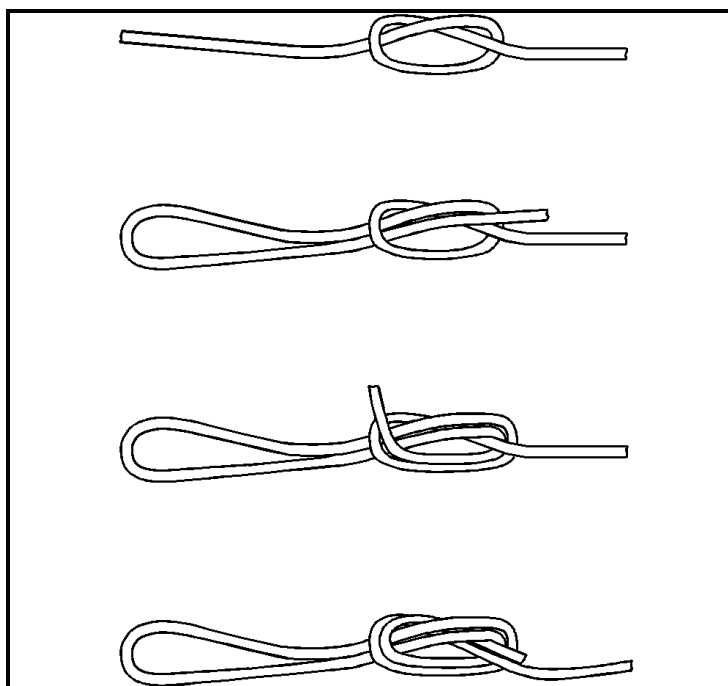


Fig 5.1.2.5b the "Cameron Knot"

## **5.5. Burner and fuel system alternative repair materials**

### **5.5.1. Fuel System**

Cameron parts can be used for repair, servicing and replacement of a number of fuel system and burner components. The following tables describe these substitutions:

<b>Lindstrand Part No.</b>	<b>Lindstrand Part Description</b>	<b>Cameron Balloons Part No</b>	<b>Cameron Part Description</b>
BU-999-A-029	1/4" NPT to 3/8" BSP Hose Assembly	CB-76XX-1400 *	1/4" NPT to 3/8" BSP Hose Assembly Liquid Propane
BU-999-A-030	3/8" BSP to 3/8" BSP Hose Assembly	CB-76XX-4400 *	3/8" BSP to 3/8" BSP Hose Assembly Liquid Propane
BU1825 (CY5114)	Worcester Valve Repair Kit (WO 05 RK A44T)	CB-0392-0018	Worcester Valve Seal Kit
BU2026 (CY5129)	3/8" Dowty Seal	CH-3800-0003	3/8" BSP Dowty Seal
BU2041	Valve Spindle Long BU-002-A-041	CQ2041	Jetstream – Failsafe Valve Spindle Long
BU2046	Seat Carrier Sleeve BU-002-A046(1)	CQ2039	Jetstream – Failsafe Seat Carrier Sleeve
BU2050	Valve Spindle Short BU-002-A-050(2)	CQ2040	Jetstream – Failsafe Valve Spindle Short
BU2203	Post Block Seal BS113(Nitrile)	CT-8180-7188	Self Seal O-Ring
BU2217	M/Nitrile Gauge O-Ring Seal Small (BS008)	CU-7553-0012	Stem O-Ring

\* XX defines burner hose length. Lindstrand BU-999-A- hose drawings have no specific length so the replacement hose length must be defined by measuring the hose to be replaced.

<b>Lindstrand Part No.</b>	<b>Lindstrand Part Description</b>	<b>Cameron Balloons Part No</b>	<b>Cameron Part Description</b>
CY5121	Tema Male Nipple (P/N.3820)	CB-0671-0007	Tema 3800 Series Male Coupling
CY5122	1/4" BSP Dowty Seal pp45-a	CT-1300-0002	Dowty Seal Tema SOC/ADPT
CY5130	BMV 344 Liquid Valve	CB-0824-0001	BM Liquid Valve
CY5138	Rego Seals Inner (BS114)	CB-2621-0000	Liquid Valve O-Ring Set
CY5139	Rochester Gauge Seals	CB-2561-0000	Contents Gauge Gasket
CY5149	Contents Gauge Bolt	CY-006-3025	Contents Gauge Bolt T&C
CY1507	Rochester Gauge V20 / Worthington	CB2551-0000	Contents Gauge Worthington
CY1508	Rochester Gauge V30	CB2552-0000	Contents Gauge 44/60 ltr
CY1509	Rochester Gauge V40	CB2552-0000	Contents Gauge 56/80
CY5156	5/8" BSP Dowty Seal pp45-e	CB-0671-0004	5/8" Dowty Seal
CY5175	BM Vapor Valve with PRN	CB-2883-0000	Vapor Valve with PRV T&C

Lindstrand Part No.	Lindstrand Part Description	Cameron Balloons Part No	Cameron Part Description
HS6116	Tema Seal Inner (P/N.N617)	CB-2631-0000	Tema O-Ring Pack
HS6117	Tema Seal Outer (P/N.BS812)		
HS6113	Tema Female Coupling Body (P/N.3810)	CH-3800-0001	Tema 3800 Female
HS6139	Rego M7141F & S/S Backnut	CB-7900-0000	High Flow Hose Coupling
HS6150	Refuelling Bayonet Filler Valve	CH-6000-0023	Cargas Bayonet Filler Valve
HS6196	3/8" BSP Dynaquip Valve	CA-0000-8147	3/8" BSP Dynaquip Valve

### 5.5.2 Greases:

KSP125 grease (CBL Part Number CU-000-0010) may be used in place of molybdenum disulphide grease for applications where the components are immersed in liquid propane.