

Approved by EASA under Approval Number 10044755

## 8.8 SCHRÖDER 'BOTTOM ENDS' WITH CAMERON OR THUNDER & COLT ENVELOPES

### 8.8.1 GENERAL INFORMATION

This supplement shall be inserted in the Flight Manual, in Section 8: 'Supplements' with the revisions record sheet amended accordingly.

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

All references to the Schröder Flight Manual refers to Fire Balloons G, Issue dated November 2001, Amendment 2 (22.10.04) or later EASA approved revision.

Issue 5 of this supplement has eight pages.

There are no additional continued airworthiness instructions associated with this supplement.

### 8.8.2 LIMITATIONS

#### 8.8.2.1 INTRODUCTION

The use of Schröder baskets, burners and cylinders is only permitted with envelope volumes of between 42,000 to 300,000 cu.ft (1200 - 8500 m<sup>3</sup>).

**Note:** In some cases the original Fire Balloon limitations, where an envelope volume is given in cubic metres (m<sup>3</sup>), have been approximated to the nearest Cameron or Thunder & Colt standard envelope volume given in cubic feet (cu. ft). This does not affect airworthiness.

The following additional limitations apply when using all Schröder Fire Balloons baskets, burners and cylinders with Cameron or Thunder & Colt Envelopes;

#### 8.8.2.4 MINIMUM BURNER REQUIREMENTS

1. A single burner may only be used in balloons of less than 70,000 cu ft (1999 m<sup>3</sup>).
2. A double burner may only be used in balloons of 42,000 cu ft (1200 m<sup>3</sup>) to 160,000 cu ft (4500 m<sup>3</sup>).
3. The Optima IV triple burner may only be used in balloons of 140,000 cu ft (3970 m<sup>3</sup>) to 180,000 cu ft (5000 m<sup>3</sup>).

4. The FB5 and FB 6 triple burner may only be used in balloons of 140,000 cu ft (3970 m<sup>3</sup>) to 300,000 cu ft (8500 m<sup>3</sup>).
5. A quad burner may only be used in balloons of 210,000 cu ft (6000 m<sup>3</sup>) to 300,000 cu ft (8500 m<sup>3</sup>).

#### **8.8.2.9 WEIGHT RANGE**

4. The maximum payload (comprising of crew, passengers and cylinders) and the MTOM for each basket is given in Table 6. In cases of conflict, the basket payload is restricted to the MTOM.

#### **8.8.2.15 BASKETS**

6. The range of envelope volumes and applicable burner frames with which each basket can be used is given in Table 6.
7. The maximum number of occupants (passengers and crew) when using baskets with an internal height of less than 1.1 m is 6.
8. The maximum number of occupants is 13.
9. Where a partitioned basket is used, an approved pilot restraint harness must be fitted.

#### **8.8.2.18 EQUIPMENT INTERCHANGEABILITY**

1. The burners, baskets and cylinders manufactured by Schröder Fire Balloons which may be used in combination with Cameron and Thunder & Colt envelopes are listed in Section 8.8.9 of this supplement.
2. Approved Cameron and Thunder & Colt Burner systems may be used in combination with Schröder Fire Balloons baskets where the burner is fitted in a compatible frame. Limitations specific to each burner assembly should be used (refer to base manual Section 2.4 and Supplement 8.22.2.4). A list of compatible frames is given in Section 8.8.9.2 of this supplement.

**WARNING:** The length of basket cables, support rods and angle of mounting sockets must be checked when combining equipment from different manufacturers.

### **8.8.3 EMERGENCY PROCEDURES**

The more knowledge one has gathered about the fuel system, the easier it is to react correctly to a burner failure. The reaction should be quick but without panic. One has to distinguish between pilot light failure and main burner failure. The more critical situation is the main burner failure.

### 8.8.3.10 Main Burner Failure (additional)

A failure of the main flame is critical, it must be dealt with courageously.

There may be a number of causes for the blockage:

- a. Cylinder valves have been closed inadvertently.
- b. The fuel cylinder is empty although the contents gauge indicates otherwise.

Connect the hose to another fuel cylinder after closing the cylinder valve. If this fails with all cylinders and the other burner still works without problems, land as soon as possible.

Is the fuel cylinder connected to the failed burner not empty (detectable by opening of the strap buckles and lifting the cylinder), it is likely that the blockage is caused by a defective blast valve needle or a piece of ice in the blast valve.

- c. Ice can also develop because of the cold due to evaporation if the external or gas temperature is above 0° C. If the blockage caused by ice, there is a good chance it can be rectified if dealt with correctly.

Release the upper cylinder strap and tilt the fuel cylinder 45°. Only then open the cow burner or the take-off burner (FB 6 Burner). A further intake of water can be avoided by tilting. This situation rarely happens, but has been experienced by various pilots.

### 8.8.3.11 Pilot Light Failure

Pilot light failure can have the following causes-

- a. The hose connector has become loose although it still appears connected to the socket.
  1. Pull on the hose and check the connection, if necessary reconnect properly.
  2. Re-light the pilot light using the piezo-ignitor or open the other burner, which still has a working pilot light, and at the same time open the main burner for a short period of time. The fire jumps over to the extinguished pilot flame.
- b. Both hose connections came loose at the same time as the connection was not properly locked.
  1. Lock the plug in the connection and relight the pilot light with the piezo on the burner. If unsuccessful, ignite with storm matches or spare piezo.
- c. Dirt particles blocking the jet of the pilot light. There is the possibility that the flame extinguishes or burns weaker.

If only one pilot light fails, try to relight the pilot light by short, partly opening of both main burners.

**Note:** It is unlikely that both flames fail at the same time because of dirt particles. If one pilot light burns weaker than during take-off, a higher pressure can then be set using the knurled screw of the vapour regulator (tighten counter nut!) The cause must be rectified before the next flight.

- d. Maybe the vapour phase valve of the fuel cylinder or burner has been closed inadvertently.
- e. Has the supplying fuel cylinder been pressurised with nitrogen? In this case the flame may have burnt in the beginning but extinguishes later. Connect to another fuel cylinder, if available, if the other checks A to D have already been unsuccessful and there is still enough altitude for safety.
- f. The pressure regulator is iced up because liquid fuel has got into it during inflation or because two cylinders connected via a fuel hose manifold have been opened at the same time and hence the master cylinder is now completely filled.

Continue flight with the other still functioning pilot light and connect to other fuel cylinder, if available. If not, ask passengers to warm the iced regulator by hand.

These checks are done in a few seconds if they are known to the pilot.

If it is even then not possible to reignite a pilot light and another one works without problems, land at the next opportunity.

If all pilot lights cannot be relit, a main burner must be lit. The following method shall be used:

1. Using storm matches. It is best to open the cow burner and to partly open the connected fuel cylinder valve. Light the match and place it close to the burner coil directly above the burner can entering from the side.

The cow burner can now be used as a pilot light for the other burner. Land as soon as practicable.

**CAUTION:** Partial opening of valves causes a strong cooling of the seals and a danger of leakage exists.

8.8.4 NORMAL PROCEDURES

8.8.4.3.3.5 Schröder Fire Balloons Burner Frames

The burner frames used with baskets I/2, II/3, III/4, IV/5, V/5, V-A and VI/6 are rigged using 2.5 or 3 tonne karabiners in accordance with the Schröder Flight Manual.

The burner frames used with baskets VII/7, VIII/8, VIII/9 and IX/11 are rigged using 4 tonne karabiners (in accordance with the Schröder Flight Manual. - Wire Lug Type B). Where they are to be used with envelopes with more than 16 flying cables an additional forged ring should be fitted to each karabiner to accommodate the additional flying cables.

The burner frame used with basket X/13 is rigged using the screw shackle (in accordance with the Schröder Flight Manual - Wire Lug Type C) and a forged tether ring (in place of the 5 tonne karabiner) as above.

8.8.4.3.5.1 Envelope Preparation

Where envelopes with more than 16 flying cables are used, the cables are to be distributed as evenly as possible among the four suspension points using additional 2.5 tonne karabiners as required. Refer to Figure 8.8.1.

The maximum number of flying cables attached to each envelope karabiner is four.

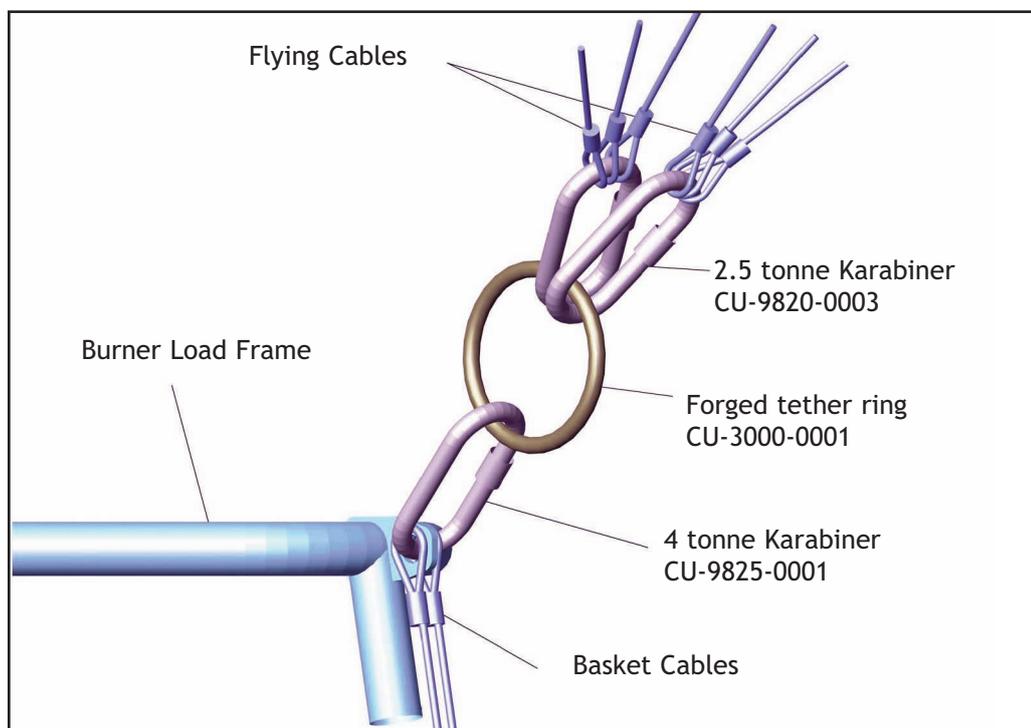


Fig. 8.8.1: Envelope Rigging ▲

### 8.8.5 WEIGHT CALCULATIONS

No change.

### 8.8.6 BALLOON AND SYSTEMS DESCRIPTION

#### 8.8.6.3 BURNER

Refer to applicable Schröder Fire Balloons Flight Manual.

#### 8.8.6.4 FUEL CYLINDERS

Refer to applicable Schröder Fire Balloons Flight Manual.

#### 8.8.6.5 BASKET

Refer to applicable Schröder fire balloons Flight Manual.

### 8.8.7 BALLOON MAINTENANCE, HANDLING AND CARE

**Note:** The use - including handling, transportation and filling - of transportable gas cylinders manufactured prior to 2004 could be prohibited by legislation (e.g. ADR, RID, ADN) in many countries unless the cylinder has been reassessed for conformity against accepted design/manufacturing standards (e.g. pi-marked).

The owner/operator of the cylinder is responsible for establishing if compliance is required and ensuring that compliance is maintained. Cameron Balloons Ltd. is unable to provide advice on this matter and local guidance should be sought in the country of operation.

### 8.8.9 EQUIPMENT LIST

Tables 6, 7 and 8 list the Schröder fire baskets, burners and fuel cylinders which may be used with Cameron and Thunder & Colt envelopes.

**Table 7: Schröder Fire Balloons Fuel Cylinders (additional)**

Cylinder Category	Cylinder Material	Cylinder Model
2	Stainless Steel	VA 50
2	Stainless Steel	VA 70

**Table 6: Schröder Fire Balloons Baskets (additional)**

Basket Type	Basket Description	Applicable Cylinders	Applicable Burners	Applicable Burner Frames	Additional Limitations		
					Max. Payload (kg)	MTOM (kg)	Envelope Volume (,000 cu. ft)
I/2 <sup>1</sup>	107X95 O	1,1a, 2	a, b	201.2, 201.6, 201.7	316	378	42-70
II/3 <sup>1</sup>	125X100 O	1,1a, 2	a, b	201.2, 201.6, 201.7	406	690	56-70
III/4 <sup>1</sup>	130x115 O	1,1a, 2	a, b	201.2, 201.6, 201.7	474	910	56-105
IV/5 <sup>1</sup>	145X115 O	1,1a, 2, 3	a, b	201.2, 201.6, 201.7	530	1040	60-120
V/5 <sup>1</sup>	155 x 120 O	1,1a, 2, 3	b	201.2, 201.6, 201.7	598	1040	84-140
V-A <sup>1</sup>	155 x 120 O	1,1a, 2, 3	b	201.2, 201.6, 201.7	598	1040	84-140
VI/6 <sup>1</sup>	175 x 125	1,1a, 2, 3	b, c	201.2*, 201.6, 201.7	700	1410	100-160
VII/7	180 x140 T, 215 x 145T	1,1a, 2, 3	b**, c***, d	201.1, 201.5	815	1890	140-250
VIII/8	215 x140 T, 245 x145T	1,1a, 2, 3	b**, c***, d	201.1, 201.5	975	1890	140-250
VIII/9	235 x 140 TT, 260 x 145 TT	1,1a, 2, 3	b**, c***, d	201.1, 201.5	1065	2205	140-250
IX/11	250 x 170 TT, 275 x 150 TT	1,1a, 2, 3	c****, d	201.1, 201.5	1200	2205	210-300
X/13	275 x175 TT, 300 x 170 TT	1,1a, 2, 3	c****, d	201.1, 201.5	1430	2205	210-300

**Key**

- \* Load frame 201.2 must only be used with envelopes up to a volume of 120,000 cu.ft,
- \*\* Category ‘b’ burners must only be used with envelopes up to a volume of 160,000 cu.ft,
- \*\*\* Optima IV Triple burners must only be used with envelopes up to a volume of 180,000 cu.ft,
- \*\*\*\* FB5 and FB6 Triple burners only.

<sup>1</sup> These baskets are compatible, subject to an assembly check, with the following Cameron and Thunder & Colt burner frames : A0/BFS/500A Series, CB871, CB925, CB2598, CB2224, CB2203, CB2231, CB2309, CB2874, CB2226, CB8810, B8811, CB8820, CB8821, CB8864, CB8894, CB8902, CB8903.

**Table 8: Schröder Fire Balloons Burners (additional)**

<b>Burner Category</b>	<b>Burner Model</b>
A	Optima I Single
B	II
B	Optima IV Double
B	FB V Double
B	FB 6 Double
C	FB V Triple
C	FB 6 Triple
D	FB V Quad
D	FB 6 Quad