

Revision No 1 to Supplement ref. 8.66 is approved
by the CAA under approval number UK.MAJ.00002 on 20 April 2021
Validated by EASA under approval number 10076595.

8.66 ULTRAMAGIC SOLO AND DUO 'BOTTOM ENDS' WITH CAMERON ENVELOPES

8.66.1 GENERAL

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 Maintenance Manual. For Limitations, Procedures, and Performance Data not contained in this supplement, consult the basic Hot Air Balloon Maintenance Manual.

All references to the Ultramagic Flight Manual refer to Flight Manual Ref FM04, Revision 26 and Supplement 9, Issue 6 or latest approved revisions.

Throughout this supplement the term "Cameron" refers to envelopes, burners and cylinders manufactured by Cameron, Lindstrand Hot Air Balloons Limited, Sky and Thunder & Colt.

Issue 1 of this supplement consists of 10 pages.

Supplement 7.66 to maintenance manual issue 10 is required to ensure continued Airworthiness.

This supplement details the instructions and limitations necessary to ensure the safe operation, maintenance and continued airworthiness of the Ultramagic SOLO / DUO.

The Ultramagic SOLO is capable of carrying a single pilot and consists of a seat and harness assembly, a special fuel cylinder and a burner designed specifically for use with the equipment. The Ultramagic DUO can carry the pilot plus one passenger. The seat and harness assembly and the fuel cylinder are mounted on to a main frame. The main frame is a welded stainless-steel tube construction. The burner is mounted in a welded stainless-steel tubular frame. The frame allows single axis burner gimbal and provides the interface to the envelope flying wires.

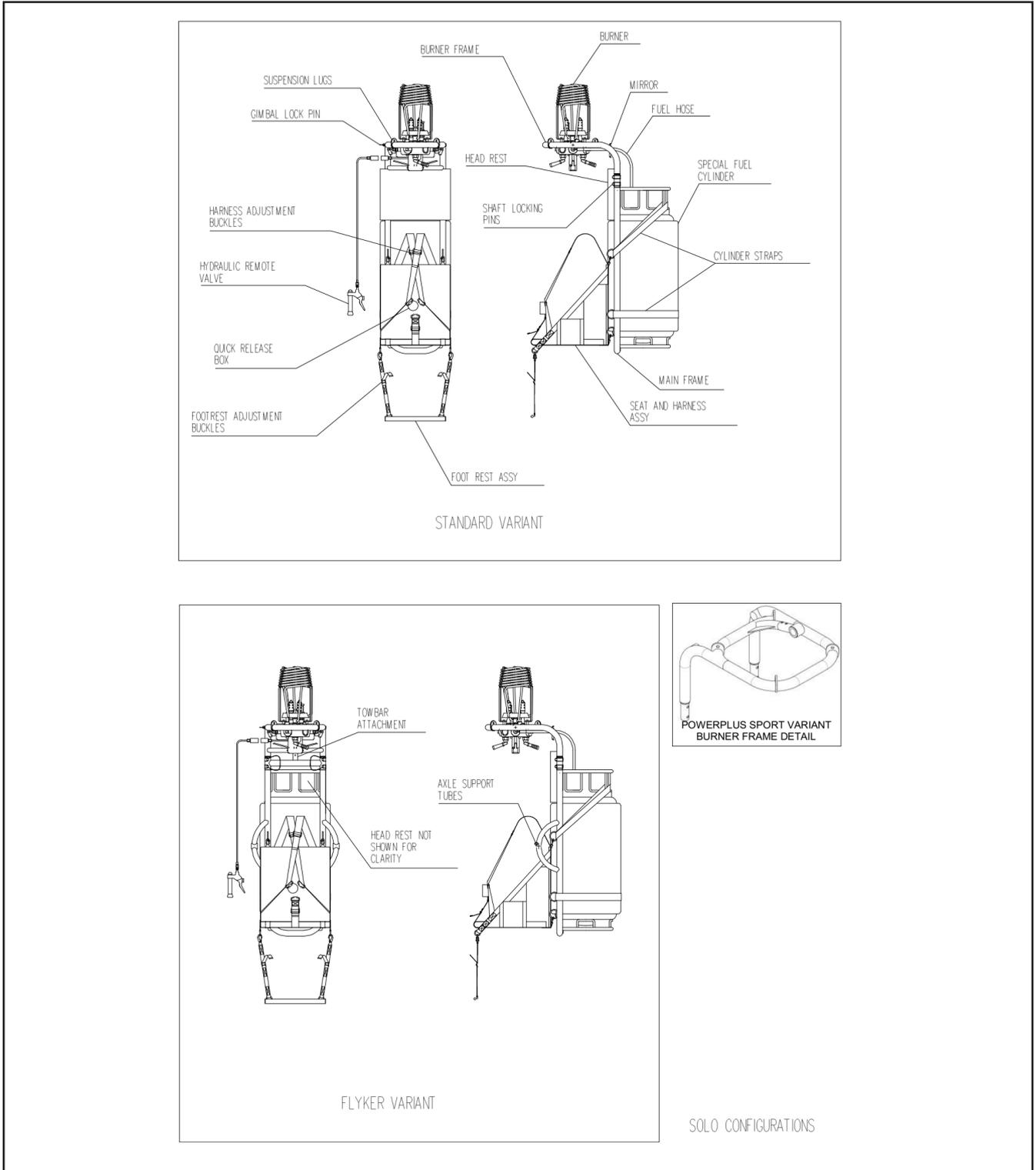
The burner and main frames may be detached from one another for the purposes of transportation. During flight, they are secured using four shaft-locking pins. The SOLO / DUO burner is essentially a variant of the Ultramagic Single and as such, independent duality of all functions is provided.

The SOLO is available in three options. The standard variant is designed for flight only. The PowerPlus variant is designed in order to allow the use of the PowerPlus Sport burner. The Flyker variant is provided with additional equipment allowing it to be attached to

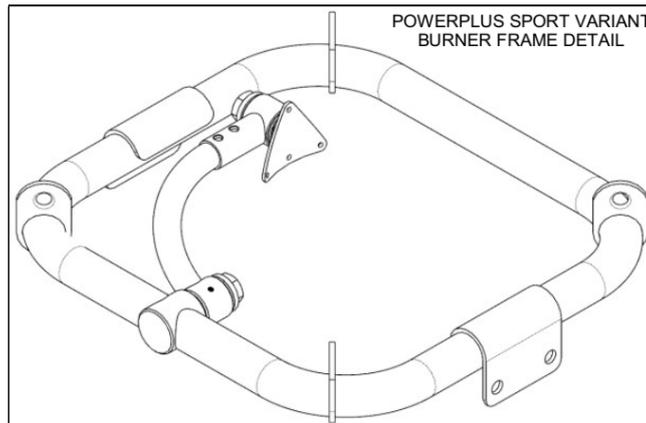
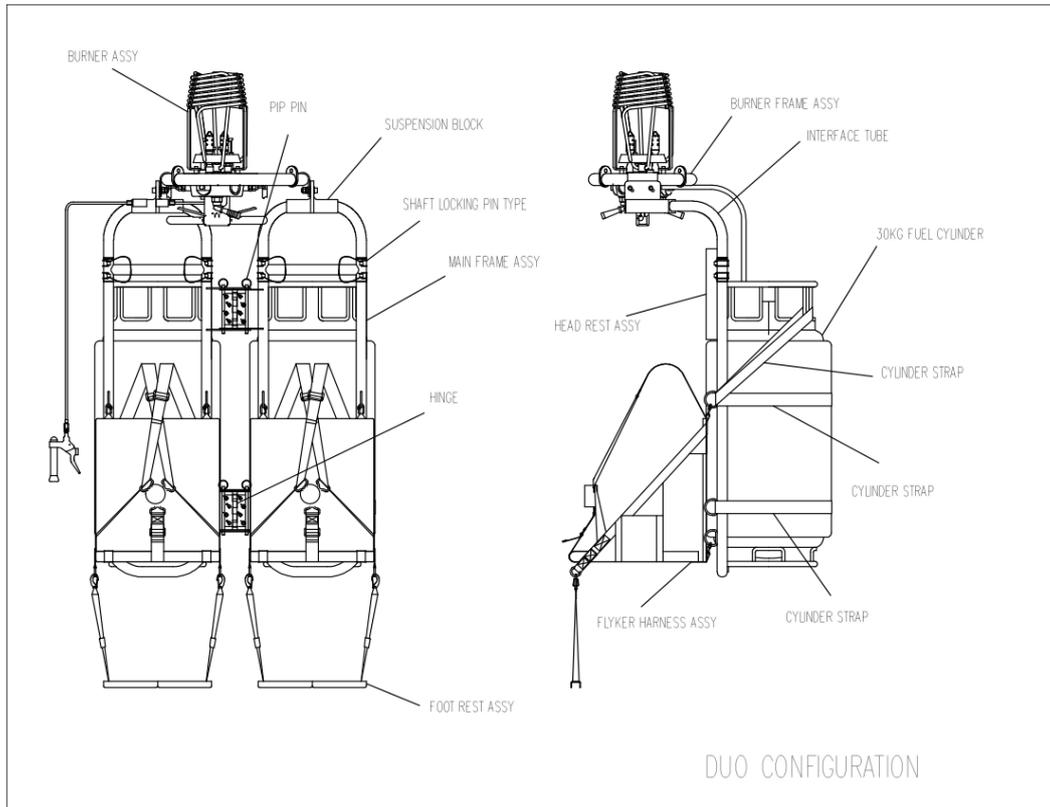
a special bicycle enabling it to be towed as a small trailer. The DUO is available in two options. The standard variant uses the SOLO / DUO burner whereas the PowerPlus variant is designed in order to allow the use of the PowerPlus Sport burner.

This supplement covers only those aspects related to flight.

The SOLO may be seen in Figure 1.1 in both configurations and the DUO in Figure 1.2



▲ Figure 1.1



▲ Figure 1.2 (Continued)

8.66.2 LIMITATIONS (additional)

8.66.2.2 WEATHER

The maximum surface wind speed for take-off and landing is 10 knots (5.1 m/sec).

8.66.2.3 FUEL

8.66.2.3.1 Pressures

In order to prevent heat damage to the envelope, the equipment must not be operated if the fuel pressure exceeds 8 Bar (120 psi).

8.66.2.4 MINIMUM BURNER REQUIREMENTS

The SOLO may only be operated with the Ultramagic SOLO Burner type 2025-0000 or the PowerPlus Sport burner type 2031-0000. The DUO may only be operated with the Ultramagic SOLO Burner with the standard coil of the Single burner MK-21 or with the PowerPlus Sport burner type 2031-0000.

8.66.2.7 CREW

No more than one person may occupy the seat at any one time with the SOLO and two persons for the DUO.

8.66.2.8 ENVELOPE TEMPERATURE AND LOADING

The MTOM for the SOLO is limited to a maximum of 300 kg or the envelope MTOM whichever is the lower.

The MTOM for the DUO is limited to a maximum of 450 kg or the envelope MTOM whichever is the lower.

8.66.2.16 FUEL CYLINDERS

The standard equipment is with the Ultramagic 20 kg or 30 kg SOLO Fuel Cylinder type 4004-0000, fitted with a padded jacket of minimum thickness 25 mm. One for the SOLO and 2 cylinders for the DUO.

The SOLO is allowed also to fly with a standard Fuel Cylinder with a T manifold. The DUO is permitted also to fly with 2 standard Fuel Cylinders (maximum fuel contents 40 kg each).

When a SOLO cylinder is used in a DUO or in a balloon basket the burner hoses must only be connected to the liquid outlet fitted with a RED handle. The outlet fitted with a BLUE handle should not be used.

8.66.2.18 HARNESS

The crew must wear the harness at all times during flight.

The harness quick release box must not be operated during flight. It may only be operated after landing, when the equipment has come to a complete stop and when the pilot judges it safe to vacate the seat.

8.66.2.19 ENVELOPE

The equipment may only be operated with envelopes fitted with rotation vents.

The SOLO may be used on envelopes from 25,000 ft³ (708 m³) to 42,000 ft³ (1190 m³)

The DUO may be used on envelopes from 31,000 ft³ (890 m³) to 70,000 ft³ (1982 m³)

8.66.2.20 REFUELLING

Detach the cylinder prior refuelling to prevent the equipment from over-balancing.

8.66.2.21 BICYCLE

When used in FLYKER mode, the equipment may only be used with the bicycle supplied by Ultramagic.

8.66.3 EMERGENCY PROCEDURES

No Change

8.66.4 NORMAL PROCEDURES (additional)

8.66.4.2.2 Assembling the SOLO / DUO and Preparation for Flight

The SOLO / DUO consists of a series of major assemblies, which must be correctly assembled to ensure safe operation. From now on we will refer to the SOLO assembly, being for the DUO a very similar system. To assemble the SOLO, refer to Figure 1 and proceed as follows:

Attach to seat and harness assembly to the main frame by hooking the four quick links on the rear of the seat into the “D” lugs on the front of the main frame. Ensure the quick links are fully tightened.

Assemble the fuel cylinder to the rear of the main frame. Make sure that the cylinder base ring sits over the retaining bracket on the base of the main frame. Secure the cylinder to the main frame using the three cylinder straps. Note that it is important to position the straps as shown in order to ensure that the cylinder cannot move or rotate.

Make sure the straps are tight.

Fit the burner frame assembly into the two sockets on the top of the main frame.

Take care to prevent the equipment over-balancing at this stage. Ask for assistance if necessary.

Insert the four shaft locking pins through the holes in the sockets and rotate the spring clips into the locked position.

When using the PowerPlus Sport burner make sure that the two shaft-locking pins going through the holes in the burner's detachable arm are inserted and locked.
Fit the padded headrest to the front of the main frame and secure in position using the Velcro straps.

Check that the cylinder fuel valves are OFF. Attach the burner fuel hoses to the mating couplings on the fuel cylinder. Note that on the SOLO it is very important to ensure that the left burner fuel hose is assembled to the left cylinder fuel coupling (Blue) and that the right fuel hose is attached to the right cylinder fuel coupling (Red). When Solo fuel cylinders are used on the DUO the fuel hoses must be connected to the RED liquid offtake of each cylinder.

Fit the mirror into the two plastic bushes on the burner frame.

Attach the foot rest assembly to the two "D" lugs on the side of the seat and harness assembly using the two snap hooks on the ends of the foot rest tapes.

8.66.4.2.4 Envelope Rigging

Attach the envelope karabiners sequentially to the four rapid links fitted in the suspension lugs on the burner frame. Ensure that all karabiner and quick link gates are closed and tight. Make sure that the envelope orientation is such that all control lines may be easily reached from the seat.

8.66.4.2.3 INFLATION

When using the Ultramagic SOLO burner, withdraw the gimbal lock pin in the burner frame prior to inflation.

Inflate with the help of at least two assistants. The assistants must hold down and steady the equipment whilst the pilot secures himself into the seat.

Insert the two harness tangs in to the quick release box. Adjust the harness straps so that the pilot is fully secure and the harness and seat are comfortable.

Adjust the footrest tapes to suit

When using the Ultramagic SOLO burner, release the gimbal lock pin and lock the burner in the vertical position.

Set the mirror so that a reflection of the cylinder fuel contents gauge is clearly visible.

NOTE: It is strongly recommended that the pilot (and the passenger in the DUO version) wear a suitable hard protective hat for the duration of the flight.

Flyker only - If the equipment is to be used to carry the bicycle associated with the equipment, it must be carried in the supplied bag and suspended below the equipment by attaching the bag to one of the main frame "D" lugs.

Pre-Inflation Checklist (additional)

Shaft Locking Pins	All four pins fitted and secure
Harness and seat	All load tapes are in good condition All four quick links are attached to the main frame and their gates are closed.
Fuel Cylinder(s)	Full and hoses connected correctly Fully secured to the main frame

8.66.4.4 TAKE-OFF

Pre-Inflation Checklist (additional)

Harness	Tangs secure within the quick release box Straps correctly adjusted
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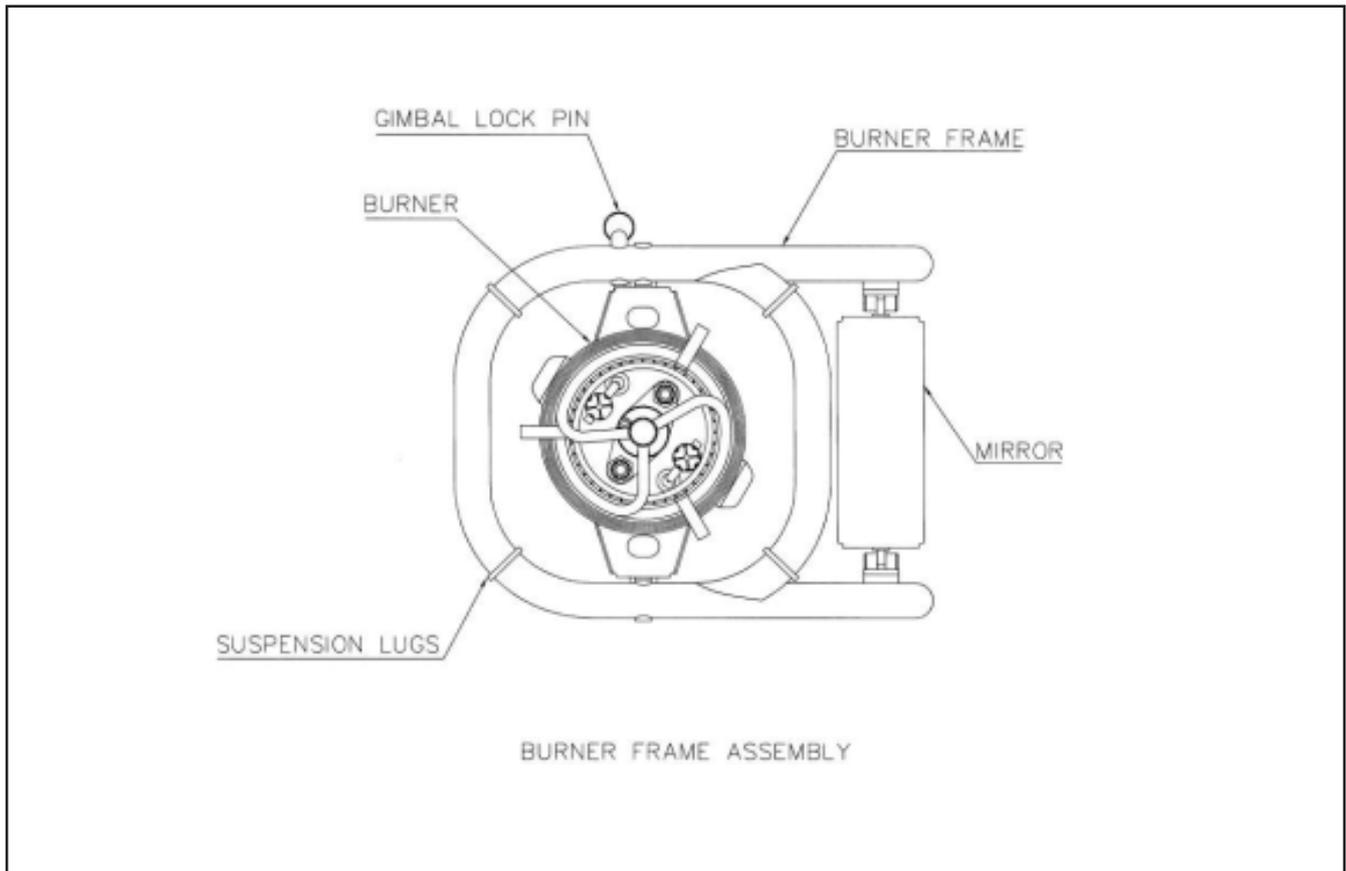
8.66.4.5.3 Fuel Management

The SOLO fuel cylinder is provided with two fuel feeds. As an additional safety feature, the right-hand (Blue) fuel feed is fitted with a dip tube which provides access to the first eighty percent of the total fuel contents in the cylinder. By using only the right-hand main and liquid burner valves until the right-hand fuel supply is exhausted, the pilot is provided with an effective warning that the fuel remaining is only twenty percent.

To ensure that this system operates correctly it is very important that the connection of the fuel hoses to the cylinder is correct (see section 9.9.4.5) and that only the right-hand (blue) main and liquid burner valves are used until the first eighty percent of the fuel is exhausted. When the right-hand fuel supply is exhausted, the pilot must continue flight using the left-hand (Red) main and liquid burner valves. Upon switching to the left-hand fuel supply, the pilot should begin making preparations for landing. Note that both pilot lights must be lit throughout the duration of the flight.

Irrespective of the use of the above system, the pilot must continually monitor fuel contents by checking the fuel cylinder gauge in the mirror.

When used with a standard cylinder, the pilot must control continually the fuel contents with the mirror. In all cases pilot should land with at least 20% fuel remaining in the cylinder.



▲ Figure 2

8.66.4.6 LANDING (additional)

Prior to any landing, select the envelope parachute line and keep it in the hand ready for use.

If the wind conditions are light, use the legs to absorb some of the downward velocity.

If a fast landing is anticipated, use the envelope rotation vents to orientate the equipment such that the pilot's back faces the direction of motion. Do not use the legs to absorb the landing impact. Rather, allow the bottom of the cylinder and the seat to absorb the landing loads and prepare for the resulting drag to be on the side.

8.66.4.6.3 Action after Landing

Store the equipment in such a way as to prevent it from overbalancing. To prevent damage, the equipment should be stored in the protective bags provided.

8.66.6 BALLOON AND SYSTEMS DESCRIPTION (additional)

8.66.6.3 BURNER

8.66.6.3.14 Hydraulic burner Valve

The hydraulically operated main valve is an optional fit on the RIGHT HAND burner control. This enables the burner valve to be operated without touching the burner. It does not interfere with the manual operation of the valve.

Note that the use of the right and left main and liquid burner controls is of great importance for the correct fuel management of the equipment when used with a SOLO cylinder (see section 8.66.4.5.3).

8.66.6.3.15 Burner Frame Gimbal Lock Pin

The standard and the Flyker variants are provided with a single axis burner gimbal for the purposes of envelope inflation. During flight, the gimbal action must be locked using the lock pin fitted in the side of the burner frame.

Withdrawing the pin enables burner gimbal action. The pin may be held in the withdrawn position by rotating it through 90 degrees. Returning the pin to the retracted position prevents further gimbal action after the burner has been returned to the vertical position. The pin may be seen in Figure 2.

8.66.6.3.16 Harness Quick Release Box

The pilot harness is fitted with a rotary action quick release box. Prior to flight, the harness tangs are inserted into the quick release box thus securing the pilot into the seat. Rotating the outer knob releases the two tangs fitted to the harness shoulder straps allowing the pilot to vacate the seat.

8.66.6.3.17 Harness Adjustment Buckles

Three adjustment buckles are provided on the pilot harness. The buckles are self-locking and retain their position when released. Adjustment of the harness is achieved by pulling on the webbing to shorten and by pulling on the buckle to lengthen.

8.66.7 BALLOON MAINTENANCE, HANDLING AND CARE

No change

8.66.9 EQUIPMENT LIST
Table 6: Baskets (additional)

Basket Category	Basket Description	Applicable Cylinders	Applicable Burner Frames
A	Solo	Listed in Table 7	Integral with Solo
B	Duo	Listed in Table 7	Integral with Duo

Table 7: Ultramagic Fuel Cylinders (additional)

Cylinder Category	Cylinder Material	Cylinder model	Mass Empty (kg)	Mass Full (kg)
2	Stainless Steel	M 20 / M-20D	15	35
2	Stainless Steel	M 30 / M-30D	20	50
3	Stainless Steel	M 40 / M-40D	24	64
2	Stainless Steel	Solo 20 kg	15	35
2	Stainless Steel	Solo 30 kg	20	50