

Supplement 8 – Center Gimbal Burner Frames

Section 1

1. Introduction

This supplement defines the maintenance and inspection requirements for the range of Ultramagic Burner Frames developed for use with the MK21 burner when fitted with the Centre Gimbal and also for the Mk21 Single Burner. Maintenance and inspection requirements covering the range of Ultramagic MK 21 burners when fitted with the Centre Gimbal Assembly are also provided. Centre gimbal assemblies are also common to the BMK-008 Double, BMK-050 and MK-32 families of burners, being this supplement applicable for this specific subassembly.

Sections 1 to 5 detail the maintenance procedures and the parts used. Section 6 details the annual / 100 hour inspection and test requirements.

The burner when fitted with the Centre Gimbal Assembly uses many common components to the standard MK21 burner already detailed in the Maintenance Manual. Only those areas which are different to those already detailed in the Maintenance Manual, are described in this supplement. All other limitations, instructions and safety information contained in the Maintenance Manual remain applicable.

A range of burner frames have been designed for use with the Centre Gimbal Assembly, accommodating the various basket styles and burner combinations. The frames use many common components and materials. Consequently, areas of commonality are dealt with on a generic basis.

The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

For US operations, only the items listed in 14 CFR Part 43, Appendix A may be accomplished as Preventative Maintenance items.

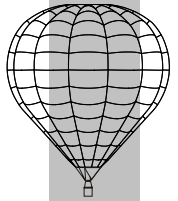
For U.S. operations, maintenance must be performed in accordance with the requirements of 14 CFR Part 43.3 Persons authorized to Perform Maintenance, Preventative Maintenance, Rebuilding, and Alterations.

For US operations please refer to Unit Conversion Table (Supplement 10), whenever necessary.

1.1 Applicability

The information contained in this supplement applies to the Ultramagic range of MK 21 burners, when fitted with the Centre Gimbal, as defined by the following drawing numbers:

Double Burner:	2022/0000
Triple Burner:	2023/0000



Quad Burner: 2024/0000
 Gimbal Block Assembly: 2022/2500

Note that the Single Burner does not use a Centre Gimbal Assembly.

The range of Burner Frames is as defined in Figure 1 below:

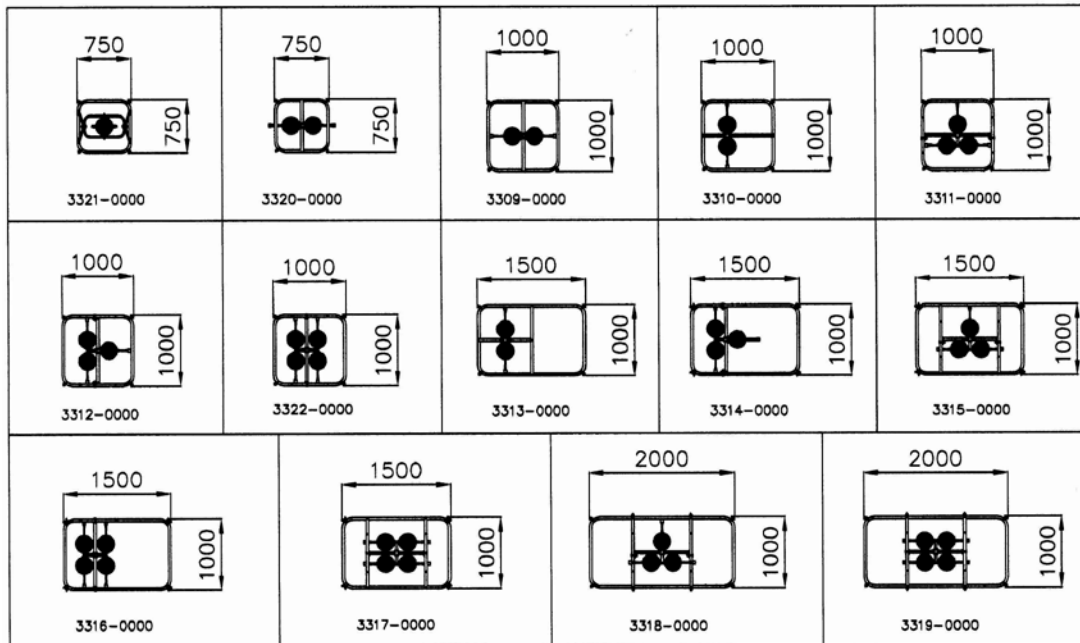


Figure 1
 Burner Frame Range

1.2 Replacement Parts and Procedures

See Maintenance Manual.

1.3 Approved Maintenance and Inspection Personnel

See Maintenance Manual.

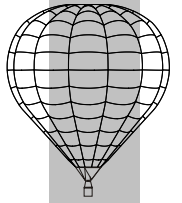
1.4 Welding and Welders

See Maintenance Manual.

1.5 Maintenance Records

See Maintenance Manual

1.6 Technical Support



See Maintenance Manual.

1.7 Safety

The following safety instructions are additional to those already contained in the Maintenance Manual:

- Before initiating any maintenance work, ensure that the burner is fully vented of fuel and that it is disconnected from any fuel supply.
- Do not carry out any maintenance work on the burner frames when the frame is assembled to the rest of the balloon equipment.

Section 2

2.0 Airworthiness Limitations

2.1 Approval Statement

This supplement provides the maintenance information for the range of Ultramagic burner frames developed for use with the MK21 burner fitted with a Centre Gimbal, as required by EASA CS 31 HB.82 and FAR 31 section 31.82.

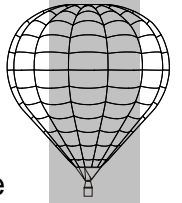
2.2 Mandatory Replacement Time

See Maintenance Manual.

2.3 Inspection Interval

See Maintenance Manual.

Additional inspection requirements for the Centre Gimbal and the burner frames are defined in Sections 4 and 6 of this Supplement.



Section 3

3.0 Technical Description

3.1 General

3.1.1 Centre Gimbal Assembly

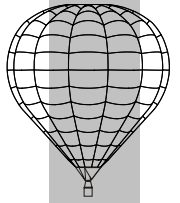
The Centre Gimbal has been introduced to the MK 21 range of double, triple and quad burners and replaces the previous method of achieving burner rotation which used an inner frame.

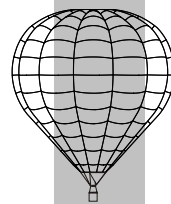
The Gimbal Block Assembly consists of three machined blocks assembled together using screw fixings. Large diameter holes are bored through the block allowing the block to be attached to a central tube on the burner frame and allowing the burner to be attached with the use of a special hanger assembly. There are three different hanger assemblies depending upon the burner combination.

The Gimbal Block Assembly is provided with a mechanical detent mechanism. This provides a momentary change in the amount of rotational friction and provides an indication to the pilot that the burner is orientated vertically. For the double burner, the mechanical detent is provided in both axes. Due to the different balance requirements, the detent is only present in one axis on the triple and quad burners. However, tension gas springs fitted to the burner frame automatically return the triple and quad burners to the vertical in the other axis.

The Gimbal Block Assembly is fitted with internal friction bearings. These may be adjusted so that the rotational friction can be set to accommodate individual pilot preference.

The Centre Gimbal when fitted in the Double Burner may be seen in Figure 2.





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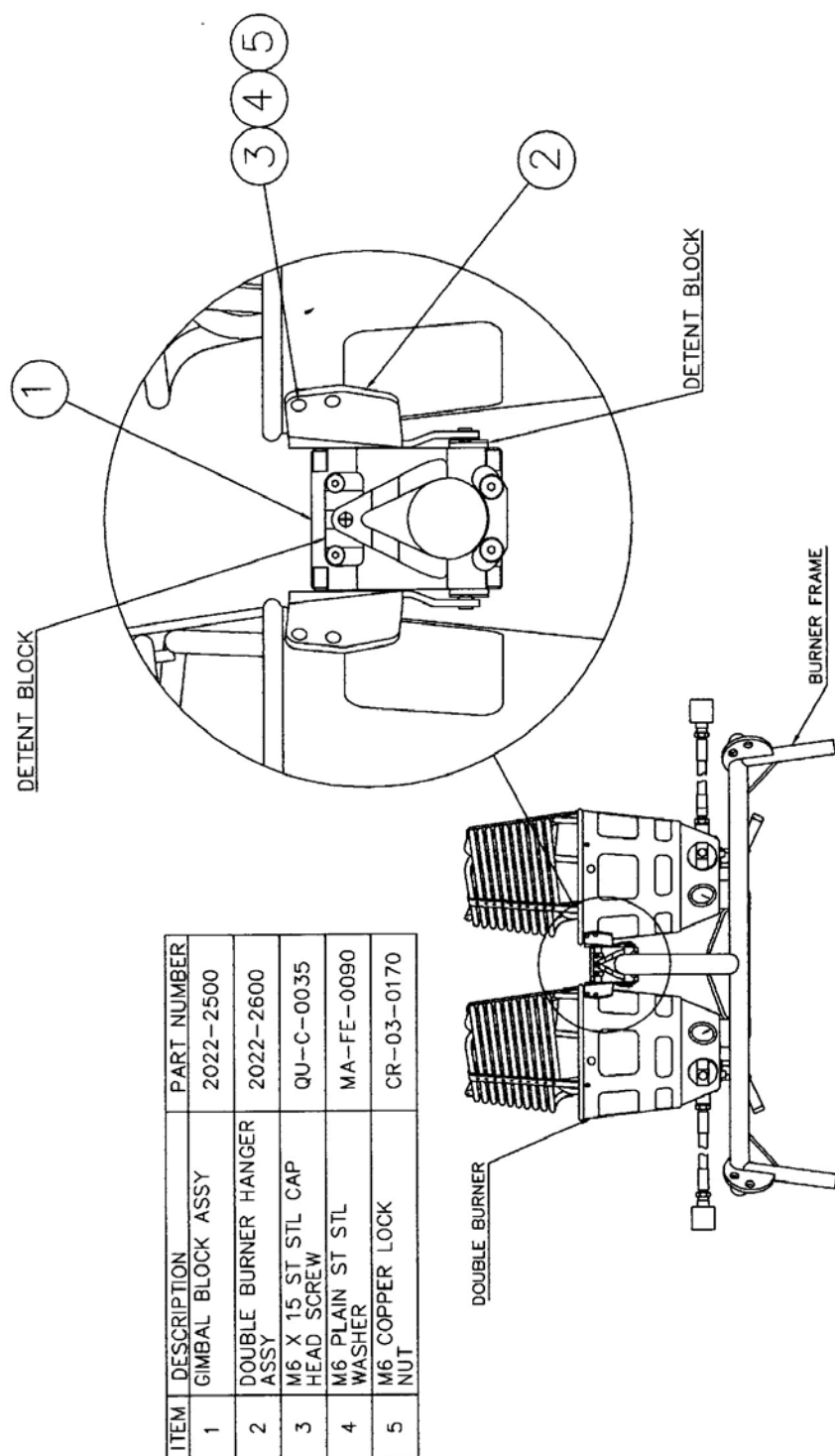
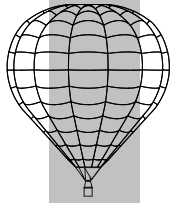


Figure 2
Gimbal Block Installation

The triple and quad burners utilise different hanger assemblies. These may be seen in Figure 3.



ITEM	DESCRIPTION	PART NUMBER
1	TRIPLE BURNER HANGER ASSY	2023--0100
2	QUAD BURNER HANGER ASSY	2024--0100

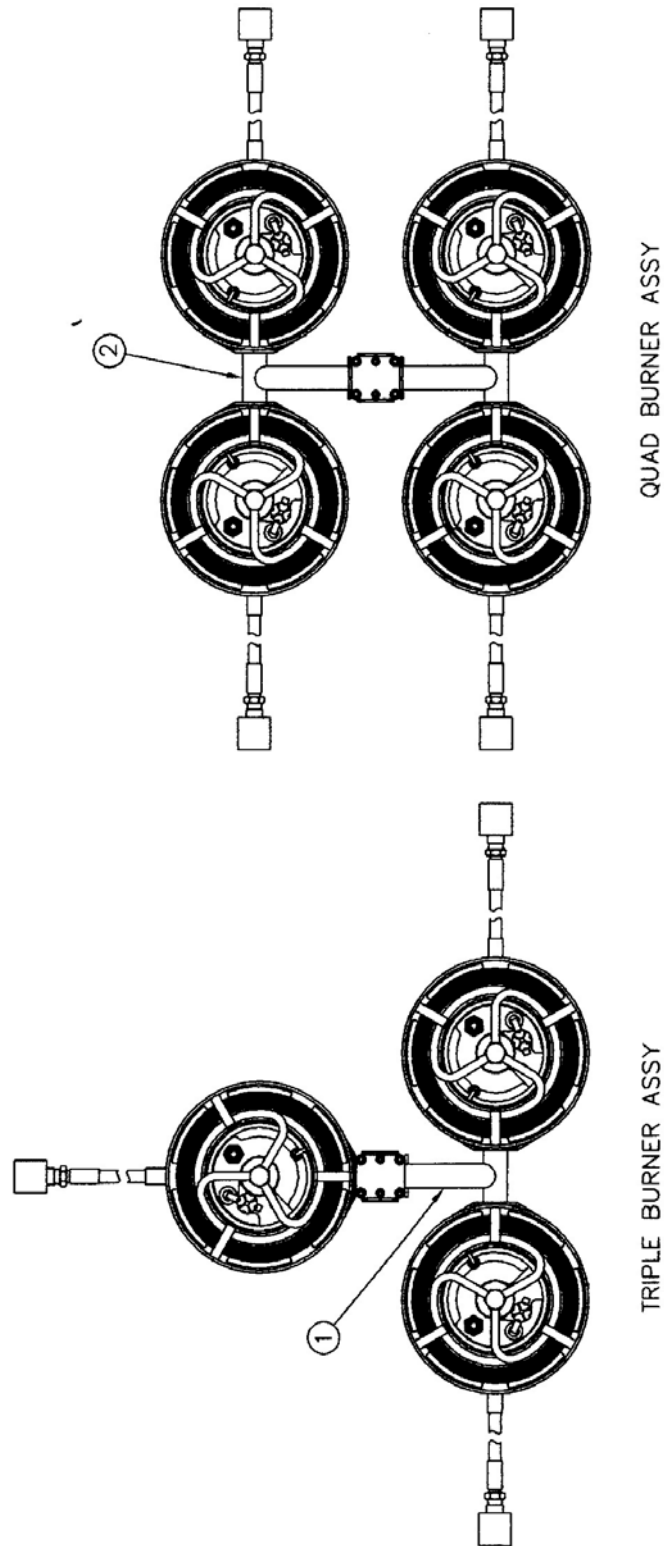


Figure 3
Gimbal Block Installation (Triple and Quad)

3.1.2 Burner Frames

The burner frames are welded tubular stainless steel assemblies designed to act as the interface between the basket suspension wires and the envelope flying

wires. The frames also provide the mounting for the range of Ultramagic MK21 burners.

For the double, triple and quad burners, provision is made to accommodate the centre gimbal block. In the case of the double burner, a fixed bar spanning the width of the frame provides the mounting for the gimbal block.

In the case of the triple burner, a separate tube with an offset pivot provides the gimbal mount and also the means of achieving burner rotation in one axis. The method of mounting employed for the quad burner is similar to that of the triple with the exception that the pivot is not offset. The triple and quad burner frames are also provided with tension gas springs to assist with the action of burner gimbal.

Although the MK21 Single Burner does not utilise a centre gimbal, a frame has been developed, similar in style, to accommodate its use. Two-axis gimbal is achieved with the use of an inner frame.

Section 4

4.0 Preventative Maintenance

It is recommended that the burner support assemblies are subject to periodic preventative maintenance check and preventative maintenance measures implemented if necessary. The annual/100h check is the maximum interval allowed, although this can be shortened based on the experience gained during the operation.

4.1 Centre Gimbal Assembly

All preventative maintenance is as described for the MK 21 Burner in the Maintenance Manual with the following additions:

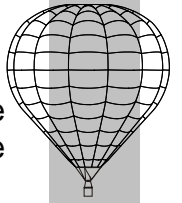
Apply a thin smear of temperature resistant silicon grease to the four Detent Blocks (see Figure 2) on the Gimbal Block Assembly.

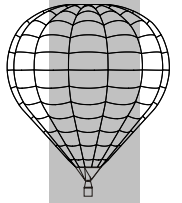
4.2 Burner Frames

4.2.1 Single Burner Frame

Refer to the safety instructions and:

- Check that the gimbal friction in both axes is satisfactory. Adjust if necessary by tightening the fixing screws and nuts.
- Check that the rotation stop fitted to the end of the inner frame prevents complete burner inversion. If it is found that the rotation stop does not prevent complete rotation, contact Ultramagic for advice.





4.2.2 Double Burner Frames

Refer to the safety instructions and:

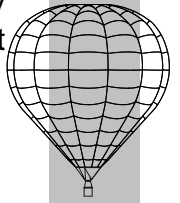
- Check that the two Spring Plates fitted to the cross tube are positioned such as to provide a good mechanical indication that the burner is in the vertical position. Adjust if necessary by tapping the Spring Plates gently with a soft hammer.
- Check that the eight fixings securing the Gimbal Block to the Burner Frame and Hanger Assembly are secure. Tighten if necessary.
- Check the gimbal friction in both axes. Adjust the friction if necessary by tightening the two screws positioned in the middle of the upper and lower Gimbal Block Caps (four total).

4.2.3 Triple and Quad Burner Frames

Refer to the safety instructions and:

- Check that the eight fixings securing the Gimbal Block to the Burner Frame and Hanger Assembly are secure. Tighten if necessary.
- Check the gimbal friction about the axis where the Hanger Assembly rotates inside the Gimbal Block. Adjust the friction by tightening the two screws positioned in the middle of the opposite Gimbal Block Cap.
- Check that the attachment of the Gimbal Block to the Cross Tube is secure. The Gimbal Block is locked to the Cross Tube and as such, the attachment should be solid and not loose. If the attachment is loose and cannot be rectified by tightening the Gimbal Block fixings and the friction adjustment screws, then it is likely that the locking pin or mating hole inside the Gimbal Block is worn. In this case, contact Ultramagic for advice.
- Check that the two fixings securing the Cross Tube Assembly to the frame are secure. Do not over-tighten as this will restrict the action of the two gas springs.
- Check the action of the gas springs. Fully operational gas springs should always return the burner to the central position. Faulty or damaged gas springs must be replaced (see Section 5.2.5.2).
- Check all fixings and attachments securing the gas springs. Tighten if necessary.

- Check that the rotation stops fitted at both ends of the Crossbar Assembly prevent complete burner inversion. If it is found that the rotation stops do not prevent complete rotation, contact Ultramagic for advice.



Section 5

5.0 Repair and Maintenance

5.1 Centre Gimbal Assembly

5.1.1 General

This section describes the procedures necessary to enable the removal, repair and replacement of the various assemblies and components used within the construction of the Gimbal Block Assembly and the Burner Hanger Assemblies.

Maintenance other than that detailed in Section 4, (Preventative Maintenance) and Section 6, (Annual / 100 Hour Inspection) should not be carried out unless it is clear that there is a fault or there is a noticeable deterioration in the performance of any part of the equipment functions.

Unless otherwise stated, maintenance specified in this section may only be carried out by Ultramagic or by a maintenance organisation approved by the airworthiness authority in the country of registration.

5.1.2 Gimbal Block Assembly

The Gimbal Block Assembly is used to mount the double, triple and quad burners to the various burner frames. The Gimbal Block Assembly when in double burner configuration may be seen in Figure 4.

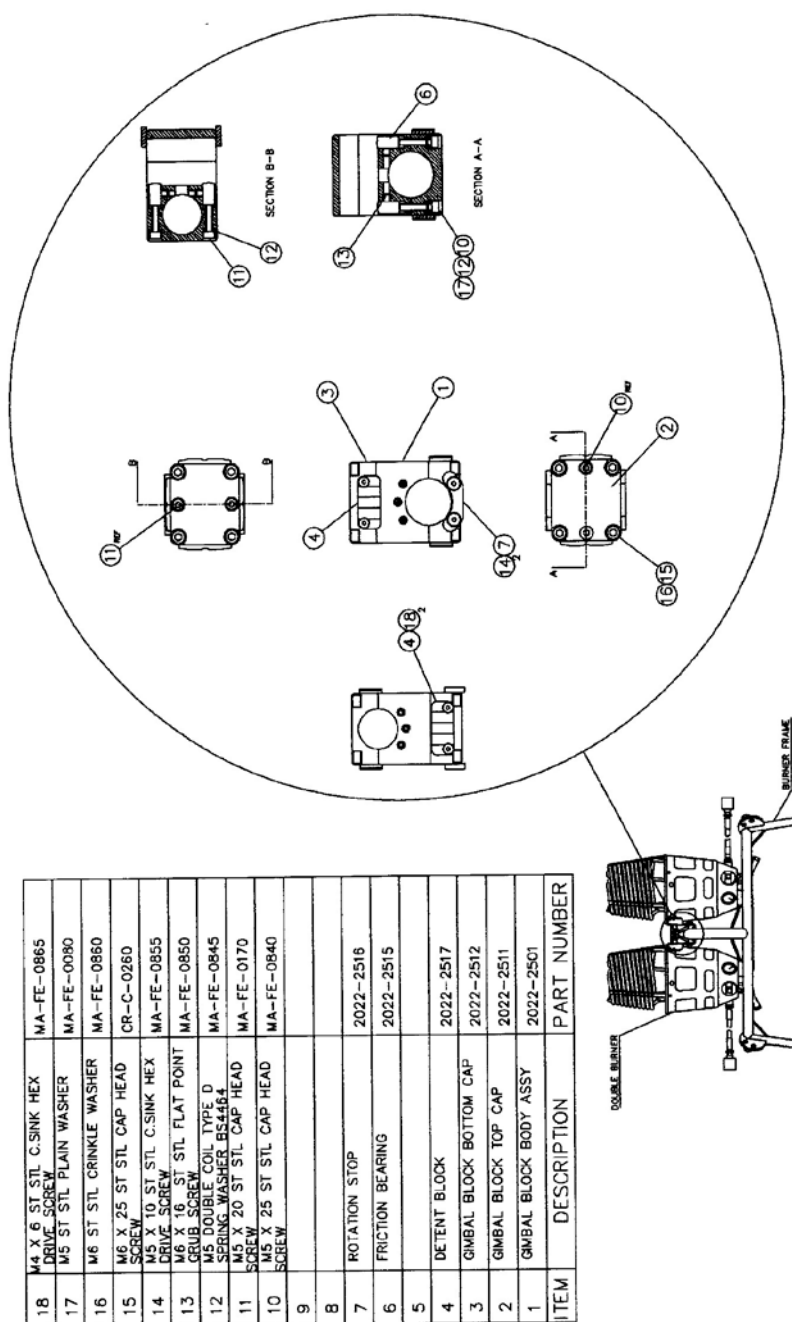
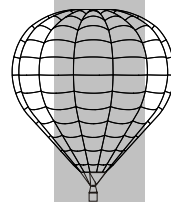
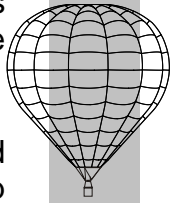


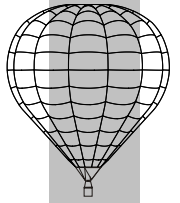
Figure 4
Gimbal Block Assembly

To remove and strip down the Gimbal Block Assembly, refer to Figure 4 and proceed as follows:

- Before removing any fixings from the Gimbal Block Assembly, ensure that the burner weight is fully supported and positioned so that it cannot fall. Removal of the Gimbal Block Assembly is best achieved with the burner upside down, on the floor and with the weight supported by the coils.

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- Using a 5mm across flats (AF) Allen key, undo and remove the fixings securing the burner handle to the burner valve blocks (refer to Maintenance Manual). Withdraw the handle and store carefully.
- Using a 5mm AF Allen key, undo and remove the four M6 x 25 cap head screws and crinkle washers (items 15 and 16) securing the Gimbal Top Cap (item 2) to the Gimbal Block Body Assembly (item 1). Note these fixings are positioned in the four corners. Remove the Gimbal Block Top Cap.
- Carefully lift off and remove the burner frame and store carefully.
- Using a 5mm AF Allen key, undo and remove the four M6 x 25 cap head screws and crinkle washers (items 15 and 16) securing the Gimbal Bottom Cap (item 3) to the Gimbal Block Body Assembly (item 1). Note these fixings are positioned in the four corners. Remove the Gimbal Block Bottom Cap and Gimbal Block Body Assembly
- Using a 4mm AF Allen key, undo and remove the two M5 x 20 fixings and double coil spring washers (items 11 and 12) from the gimbal Block Bottom Cap.
- Using a 4mm AF Allen key, undo and remove the two M5 x 25 fixings, double coil spring washers and plain washers (items 10, 12 and 17) from the Gimbal Block Top Cap.
- Using a 3mm AF Allen key, undo and remove the six M6 x 16 Grub Screws (item 13) from the Gimbal Block Body Assembly.
- Remove the four Friction Bearings (item 6) from the Gimbal Block Body Assembly.
- Using a 2.5mm AF Allen key, undo and remove the two M4 x 6 countersink screws (item 18) securing the Detent Block (item 4) to the top and bottom caps.
- Using a 3mm AF Allen key, undo and remove the two M5 x 10 countersink fixings (item 14) securing the Rotation Stop (item 7) to the cap. Repeat for the other rotation Stop.
- Replacement is generally the reverse procedure of removal. Prior to replacement, check and lubricate the inside of the circular bores and if necessary, lubricate using temperature resistant silicon grease. Make sure that the correct combination of M5 fixings, double coil spring washers and plain washers are fitted in the Top and Bottom Caps. Use Loctite 222 when replacing any fixings not provided with a mechanical locking method. Note, do not use Loctite on the main fixings securing the top and bottom caps to the Gimbal Block Body Assembly.
- Upon completion of re-assembly, adjust the four M5 screws (items 10 and 11) to achieve the desired level of gimbal friction.



5.1.3 Burner Hanger Assemblies

The Burner Hanger Assemblies secure the individual burner cans to each other and provide the mounting in to the Gimbal Block Assembly. To remove the Burner Hanger Assembly, refer to Figures 2, 3 and 4 and proceed as follows:

- Support the weight of the burner by resting the burner on the burner handle. Take care to make sure that the burner cannot over-balance. Place supports underneath the burner frame to make sure it remains stable and does not fall when the Gimbal Block fixings are removed.
- Using a 5mm AF Allen key, undo and remove the four M6 fixings securing the uppermost Gimbal Cap to the Gimbal Block Body Assembly.
- Take the weight of the burner frame, remove any supports and carefully lower the frame to the floor.
- Using a 5mm AF Allen key and a 10mm open-ended spanner, undo and remove the four M6 Cap Head Screws, plain washers and copper lock nuts (items 3, 4 and 5, Figure 2) securing the hanger brackets to the burner can. Repeat for all can positions.
- Further repair is by replacement only.
- Replacement is generally the reverse procedure of removal. Prior to re-assembly, check and grease the length of tube normally inside the Gimbal Block Assembly if necessary, using temperature resistant silicon grease.
- Upon completion of re-assembly, adjust the four M5 screws (items 10 and 11, Figure 4) to achieve the desired level of gimbal friction.

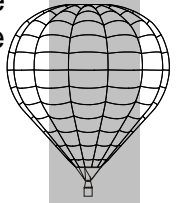
5.2 Burner Frames

5.2.1 General

This section describes the procedures necessary to enable the removal, repair and replacement of the various assemblies and components used in the burner frames.

Maintenance other than that detailed in Section 4, (Preventative Maintenance) and Section 6, (Annual / 100 Hour Inspection) should not be carried out unless it is clear that there is a fault or there is a noticeable deterioration in the performance of any part of the equipment functions.

Unless otherwise stated, maintenance specified in this section may only be carried out by Ultramagic or by a maintenance organisation approved by the airworthiness authority in the country of registration.



5.2.2 Indentation, bending and cracking (All Frame Types)

The burner frames form the interface between the basket suspension wires and the envelope flying wires. Since the envelope flying wires are at an angle to the vertical, significant mechanical loads are resisted by the burner frame. It is therefore of great importance to ensure that the structural integrity of the frame is not compromised.

In the event that any indentation, deformation or cracking is detected, do not attempt to carry out any repairs without first obtaining repair instructions from the Ultramagic Design Office.

Note that repairs to indentations and deformations may only be carried out by approved Ultramagic personnel, personnel approved by Ultramagic or by personnel approved to the appropriate standard by the Airworthiness Authority in the country of registration. Where welding is required, the limitations detailed in the Ultramagic Maintenance Manual apply.

5.2.3 Single Burner Frame

5.2.3.1 *Removal of Single Burner from Burner Frame*

To remove the Single Burner from the Burner Frame Assembly, refer to Figure 5 and the Safety Instructions and proceed as follows:

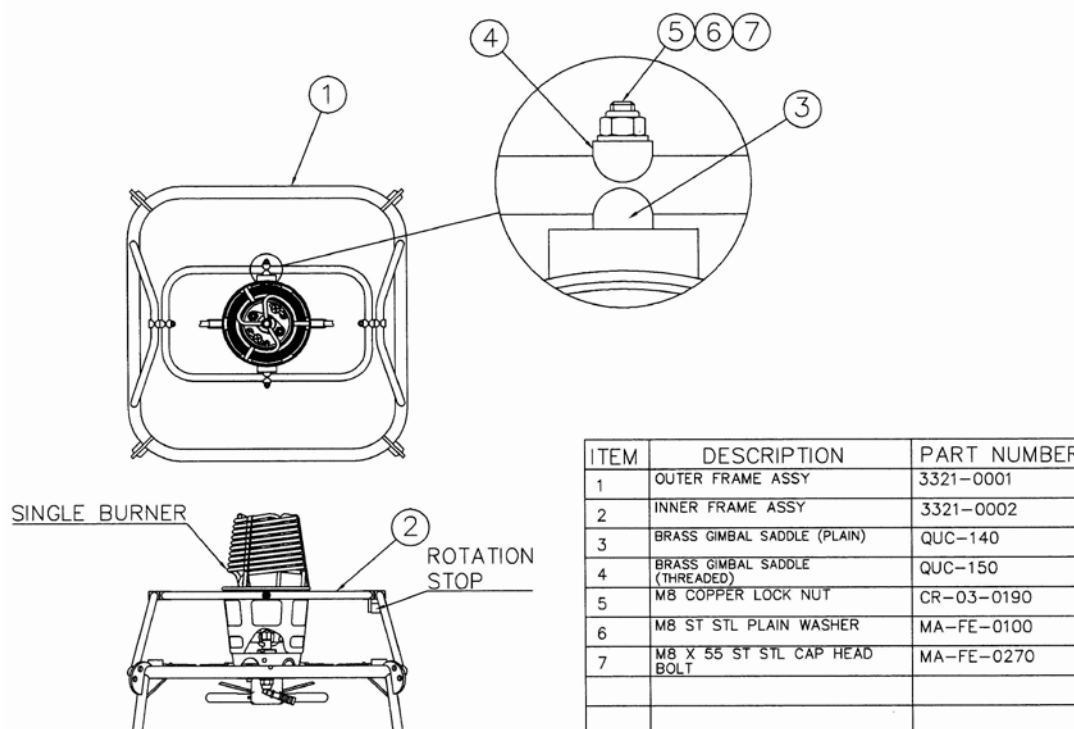


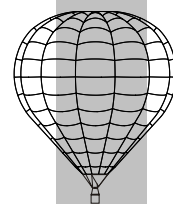
Figure 5
Single Burner Removal

Before removing any fixings, make sure that the burner weight is supported and that it cannot fall.

- Using a 6mm AF Allen key and a 13mm AF spanner undo and remove the two sets of fixings (items 5, 6 and 7).
- Withdraw the burner from the frame.
- Replacement is generally the reverse procedure of removal. Make sure that the Brass Gimbal Saddles (items 3 and 4) are fitted in the correct positions. Tighten the fixings to provide satisfactory levels of gimbal friction.
- Upon completion, rotate the burner in both directions to check that the rotation stop prevents burner inversion.

5.2.3.2 Removal of Inner Frame Assembly

To remove the Inner Frame Assembly from the Outer Frame Assembly, refer to Figure 6 and proceed as follows:



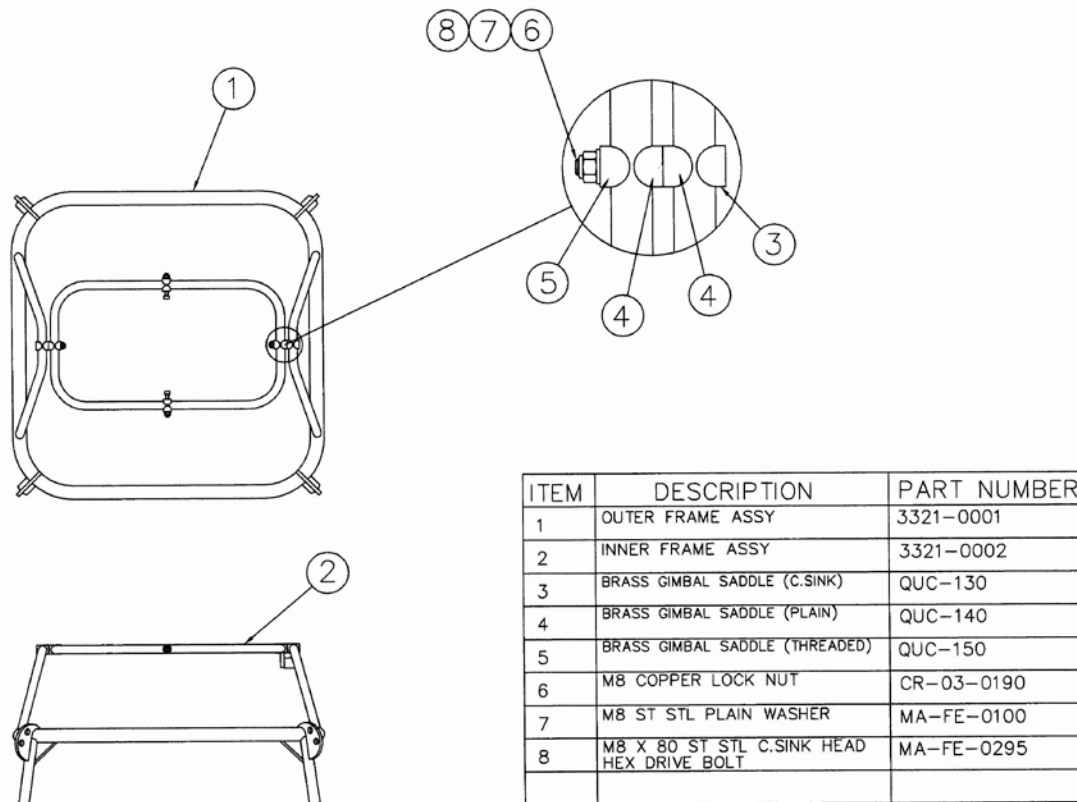
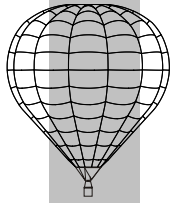


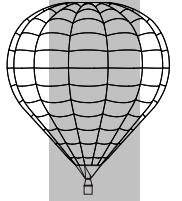
Figure 6
Inner Frame Assembly Removal

- Remove the burner from the Inner Frame Assembly as described in Section 5.2.3.1.
- Using a 6mm AF Allen key and a 13mm AF spanner, undo and remove the copper lock nut (item 6) from both sides.
- Using a 6mm AF Allen key, undo and remove the countersink bolt (item 8) from both sides.
- Withdraw the frame.
- Replacement is generally the reverse procedure of removal. Note the correct orientation of the Brass Gimbal Saddles (items 3, 4 and 5). Tighten the fixings to provide satisfactory levels of gimbal friction.
- Upon completion, rotate the burner in both directions to check that the rotation stop prevents burner inversion.

5.2.4 Double Burner Frame

The double burner frame is a complete welded assembly and as such, there are no removable parts. Repair work is therefore limited to that described in Section 5.2.2.





5.2.5 Triple and Quad Burner Frames

5.2.5.1 Crossbar Assembly Types

The triple and quad burner frames make use of a rotating Crossbar Assembly to achieve burner gimbal in one of the two axes. The Crossbar Assembly rotation is resisted by two tension gas springs. To accommodate the range of frame sizes and configurations, several Crossbar Assemblies are required. These are shown in Figure 7 below.

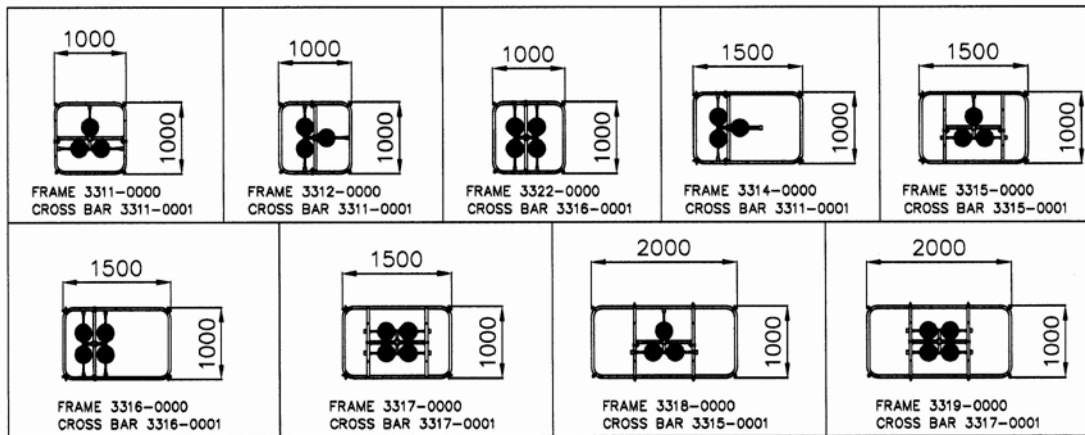


Figure 7
Burner Frame and Crossbar Assembly Combinations

5.2.5.2 Removal of Tension Gas Springs

Note that in their operational positions, the gas springs are partially extended and therefore exert considerable force. Care must be taken when removing the gas springs to avoid damage or injury. Follow the procedure below.

To remove the gas springs, refer to Figure 8 and proceed as follows:

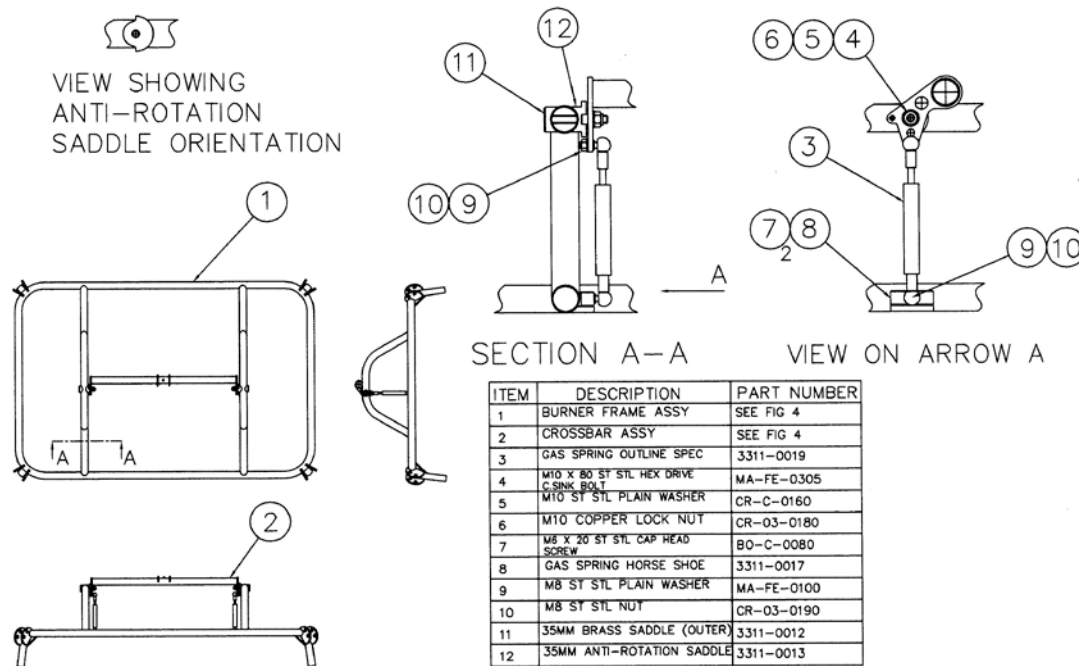
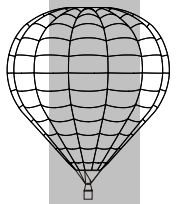
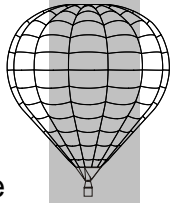


Figure 8
Gas Spring and Crossbar Removal

- Remove the Burner Assembly. Instructions covering the safe removal of the burner from the Burner Frame are provided in Section 5.1.2.
- Using a 5mm AF Allen key, carefully loosen the two cap head screws (item 7) securing the Gas Spring Horseshoe (item 8) to the burner frame. Loosen each screw, one turn at a time so that the horseshoe remains level until the Gas Spring has completely retracted. Leave the Horseshoe fixed to the frame.
- Using an 11mm and 13mm AF open-ended spanner, undo and remove the M8 nuts and plain washers at the top and bottom of the Gas Spring securing the ball joints to the Horseshoe and the Crossbar.
- Using an 11mm open-ended spanner, undo the ball joints at the top and bottom of the Gas Spring. Undo each ball joint one turn at a time. Remove the Gas Spring.
- The Gas Spring is a sealed unit containing pressurised gas. **Do not attempt to open the spring.** Repair of the Gas Spring is by replacement only.
- Replacement is generally the reverse procedure to removal. Apply Loctite 222 to the ball joint threads and nuts prior to re-assembly.
- After re-assembly, check that the Anti-Rotation Saddles (item 12) are fitted correctly and that they prevent complete burner inversion.
- Check that the Crossbar Assembly (item 2) is free to rotate smoothly.





5.2.5.3 Removal of Crossbar Assembly

To remove the Crossbar Assembly, refer to Figure 8 and proceed as follows:

- Remove the Burner Assembly. Instructions covering the safe removal of the burner from the Burner Frame are provided in Section 5.1.2.
- Remove the Gas Springs from each end of the Crossbar as described in Section 5.2.5.2.
- Using a 17mm AF open-ended spanner, undo and remove the M10 copper lock nuts and washers (items 6 and 5) from each end of the Crossbar.
- Using a 6mm AF Allen key, undo and remove the two M10 Countersink bolts from each end of the Crossbar.
- Withdraw the Crossbar from the burner frame.
- Replacement is generally the reverse procedure of removal. Note the correct positions of the Brass Saddle and Anti-Rotation Saddle (items 11 and 12 respectively). Anti-Rotation Saddles are fitted at each end of the Crossbar Assembly.
- When re-fitting the Crossbar Assembly, make sure that the Gimbal Block locking-pin located in the middle of the Crossbar is positioned uppermost.
- When replacing the two M10 copper lock nuts (item 6) do not over-tighten. Adjust so that the Crossbar is secure but free to rotate against the action of the Gas Springs.
- Check that the two Anti-Rotation Saddles (item 12) prevent complete burner inversion. Note that both saddles must be functional and that both the stops welded to the Crossbar end plates must engage with the Anti-Rotation Saddles.

5.2.5.4 Brass Saddle and Anti-Rotation Saddle Removal

See section 5.2.5.3.

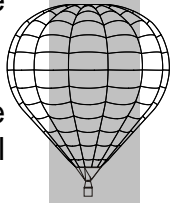
5.2.6 Gas Spring Horseshoe Removal

The Horseshoe may be replaced as part of the Gas Spring removal process or in isolation. To remove in isolation, refer to Figure 8 and proceed as follows:

- Using a 5mm AF Allen key, carefully loosen the two cap head screws (item 7) securing the Gas Spring Horseshoe (item 8) to the burner frame. Loosen each screw, one turn at a time so that the horseshoe remains level until the

Gas Spring has completely retracted. Continue to undo and remove the screws.

- Using an 11mm and 13mm AF open-ended spanner, undo and remove the M8 nuts and plain washers at the bottom of the Gas Spring securing the ball joint to the Horseshoe.
- Remove the Horseshoe.
- Replacement is generally the reverse procedure to removal. Apply Loctite 222 to the ball joint threads and nuts and to the two Horseshoe fixings (item 7) prior to re-assembly. Tighten the two Horseshoe fixings (item 7) one turn at a time in sequence until fully secure.



Section 6

6.0 Annual / 100 Hour Inspection Requirements

6.1 Centre Gimbal Assembly

6.1.1 General

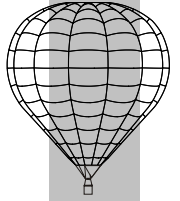
The burner must be subjected to an inspection by an inspector approved by the national airworthiness authority in the state of registration. The inspection must be carried out every 12 months or 100 hours use, whichever is the sooner.

The inspection requirements detailed below are additional to those already specified in the Maintenance Manual.

6.1.2 Inspection Requirements

Carry out all functional tests as specified in the Maintenance Manual. In addition, check the following:

- Check for the smooth and unrestricted rotation of the burner in both axes. Adjust the friction as necessary.
- Check that the rotation stops are fitted, their fixings are secure and that the stops prevent excessive burner rotation.
- Check for excessive wear on the Detent Blocks. Replace if necessary.
- Check that the eight fixings securing the top and bottom caps to the Gimbal Block Body Assembly are all present and secure.
- Check that the fixings securing the Burner Hanger Assemblies to the burner cans are all present and secure.



- Check the welds securing the Hanger Assembly brackets to the tubing.

6.2 Burner Frames

6.2.1 General

The burner frames must be subjected to an inspection by an inspector approved by the national airworthiness authority in the state of registration. The inspection must be carried out every 12 months or 100 hours use, whichever is the sooner.

The inspection requirements detailed below are additional to those already specified in the Maintenance Manual.

6.2.2 Inspection Requirements

6.2.2.1 *Single Burner Frame*

Visually inspect the inner and outer frames for indentation, deformation or signs of cracking particularly in the areas of welded joints. If any indentation, deformation or cracking is detected, contact Ultramagic for advice.

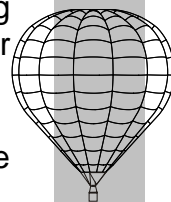
Check that the gimbal friction in both axes is satisfactory. Adjust if necessary by tightening the fixing screws and nuts (see section 5.2.3).

Check that the rotation stop fitted to the end of the inner frame prevents complete burner inversion. If it is found that the rotation stop does not prevent complete rotation, contact Ultramagic for advice.

6.2.2.2 *Double Burner Frame*

- Visually inspect the frame for indentation, deformation or signs of cracking particularly in the areas of welded joints. If any indentation, deformation or cracking is detected, contact Ultramagic for advice.
- Check that the eight fixings securing the Gimbal Block to the Burner Frame and Hanger Assembly are secure. Tighten if necessary.
- Check the gimbal friction in both axes. Adjust the friction if necessary by tightening the two screws positioned in the middle of the upper and lower Gimbal Block Caps (four total).

6.2.2.3 *Triple and Quad Burner Frames*

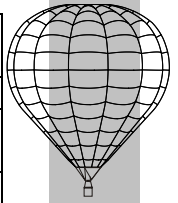


- Visually inspect the frame for indentation, deformation or signs of cracking particularly in the areas of welded joints. If any indentation, deformation or cracking is detected, contact Ultramagic for advice.
- Check that the eight fixings securing the Gimbal Block to the Burner Frame and Hanger Assembly are secure. Tighten if necessary.
- Check the gimbal friction about the axis where the Hanger Assembly rotates inside the Gimbal Block. Adjust the friction by tightening the two screws positioned in the middle of the opposite Gimbal Block Cap.
- Check that the attachment of the Gimbal Block to the Cross Tube is secure. The Gimbal Block is locked to the Cross Tube and as such, the attachment should be solid and not loose. If the attachment is loose and cannot be rectified by tightening the Gimbal Block fixings and the friction adjustment screws, then it is likely that the locking pin or mating hole inside the Gimbal Block is worn. In this case, contact Ultramagic for advice.
- Check that the two fixings securing the Cross Tube Assembly to the frame are secure. Do not over-tighten as this will restrict the action of the two gas springs.
- Check the action of the gas springs. Fully operational gas springs should always return the burner to the central position. Faulty or damaged gas springs must be replaced (see Section 5.5.5.2).
- Check all fixings and attachments securing the gas springs. Tighten if necessary.
- Check that the rotation stops fitted at both ends of the Crossbar Assembly prevent complete burner inversion. If it is found that the rotation stops do not prevent complete rotation, contact Ultramagic for advice.
- Remove the Gimbal Block Cap (Ref. 5.1.2) securing the Gimbal block to the Cross Tube of the frame. Visually inspect the tube and its welding, making sure that there are no cracks or signs of damage. Use magnifying lenses if necessary.

Section 7

7.0 Troubleshooting

Symptom	Possible Cause	Corrective Action
Single Burner Frame		
Gimbal Action too loose or too stiff.	Fixings too loose or too tight	<i>Adjust fixings</i>
	Inner or Outer Frame bent	<i>Contact Ultramagic</i>
Burner capable of turning upside down	Anti-Rotation Stop damaged or broken. Inner or outer frame bent	<i>Contact Ultramagic</i>



Double Burner Frame		
Gimbal Action too loose or too stiff.	Gimbal Block friction settings incorrect	<i>Adjust friction bearing settings.</i>
	Cross tube bent or deformed	<i>Contact Ultramagic</i>
	Hanger Assembly tube bent or deformed	<i>Contact Ultramagic</i>
	No grease inside Gimbal Block	<i>Add grease.</i>
	Contamination inside Gimbal Block	<i>Strip down and clean.</i>
	Spring Plates Incorrectly set	<i>Adjust and grease Spring Plates</i>
Burner capable of turning upside down	Anti-Rotation Stops not fitted or broken.	<i>Fit Anti-Rotation Stops</i>

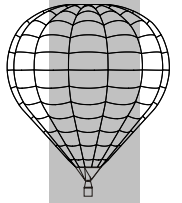
Triple and Quad Burner Frames		
Gimbal action too loose or too tight.	Crossbar fixings too tight	<i>Adjust fixings</i>
	Gas Spring Faulty	<i>Replace Gas Spring</i>
	Hanger Assembly tube bent or deformed	<i>Contact Ultramagic</i>
	Crossbar bent	<i>Replace Crossbar</i>
	Gimbal Block friction settings incorrect	<i>Adjust friction bearing settings</i>
	No grease inside Gimbal Block	<i>Add grease.</i>
	Contamination inside Gimbal Block	<i>Strip down and clean.</i>
	Spring Plates Incorrectly set	<i>Adjust and grease Spring Plates</i>
Burner capable of turning upside down	Anti-Rotation Saddles and stops not fitted or broken	<i>Fit Anti-Rotation Saddles and Stops</i>
	Crossbar bent	<i>Contact Ultramagic</i>

Section 8

8.0 Post Hard Landing Inspection Requirements

If the equipment has been subjected to a hard landing, inspect the burner frame and check that:

- The frame is not dented, deformed or cracked.
- The burner is incapable of complete inversion.
- All fixings are secure.
- The gimbal action is satisfactory in both axes.
- The Gimbal Block mounting fixings are secure and tight.
- All fixings securing the Burner Hanger Assembly to the burner cans are secure and tight.



APPENDIX 1

Centre Gimbal Assembly and Burner Frames

Annual / 100 Hour Burner Inspection Checklist

REQUIREMENT	REFERENCE	OKAY	COMMENTS
Rotation Action Okay	6.1.2		
Rotation Stops	6.1.2		
Wear on Detent Blocks	6.1.2		
Main Fixings	6.1.2		
Hanger Fixings	6.1.2		
Hanger Assembly Welds	6.1.2		
Indentation, deformation or cracking	6.2.2.1 6.2.2.2 6.2.2.3		
Gimbal Friction Setting	6.2.2.1 6.2.2.2 6.2.2.3		
Burner Inversion	6.2.2.1 6.2.2.2 6.2.2.3		
Gimbal Block Fixings (Double, Triple and Quad only)	6.2.2.2 6.2.2.3		
Cross bar cracks (Triple and Quad only)	6.2.2.3		

S 8 - C E N T E R G I M B A L A S S E M B L Y