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## **7.56 JETSTREAM SERIES 2 BURNER**

### **7.56.1 General**

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.

This data was originally approved as Lindstrand Maintenance Manual Issue 1.0 and Maintenance Manual Supplement 2, Issue 1.3.

### **7.56.2 ENVELOPE REPAIRS**

No Change

### **7.56.3 BASKET REPAIRS**

No change.

### **7.56.4 FUEL SYSTEM REPAIRS**

#### **7.56.4.1 Preventative Maintenance**

##### **7.56.4.1.1 Storage and Handling**

The burner is the engine of the hot air balloon, and consequently should be stored with care. Ideally it should be stored suspended within the basket so that it cannot hit other items. A padded burner bag which sits on the basket top frame stubs is available, and is recommended.

The burner may be placed on soft ground, resting on the burner coils, to assist in the insertion of the burner rods. Hard surfaces should be avoided wherever possible at this stage.

Care should be taken when dismantling the basket and burner assembly, to avoid dragging unprotected connectors on the ground. It is recommended that the connector cover is always fitted to the connector before the burner is taken down.

#### **7.56.4.1.2 General Cleaning**

During the operation of the burner, there is inevitably an accumulation of carbon deposits (soot) within the coil and can of the burner. These deposits may be removed by using a solvent soaked cloth.

#### **7.56.4.1.3 Jet Blockages**

In some instances, the main jets and/or pilot light jets may become blocked due to foreign particles contained within the fuel. These may be rectified as follows:

##### **a. Main Jets**

Blockages of main jets cannot normally be detected through a loss of performance, unless a substantial number of the main jets are blocked at the same time. Using a torch, shine light down onto the jet holes and look for any debris lodged in the jets. Remove the jets which are blocked and carefully insert a pin into the hole, forcing any debris out backwards. Replace the cleared jet. Do not use any gas sealant on the jet threads. Only tighten the jets by  $\frac{1}{4}$  of a turn, to avoid shearing the jet.

##### **b. Pilot Light Jets**

Blockage of pilot light jets will cause a complete malfunction or erratic performance. To gain access to the pilot light jet, first unscrew the pilot light cup and heat exchange tube as one unit. Remove the pilot light jet by unscrewing it and clean in the same way as the main jets.

The hole in the pilot jets is very small, but if held up to a light, the hole should appear round. A special pilot light jet cleaning tool is available from the factory. Alternatively, a jet cleaning tool for a tilley lamp or a gas camping stove may be used. Replacement is the reverse of removal.

### **7.56.4.2 TOGGLE VALVE ASSEMBLIES**

#### **7.56.4.2.1 General Description**

These instructions apply to all the toggle type valve assemblies which control the flow to either the main vaporising coil or to the commercial liquid fire (CLF), or the normal liquid fire unit. The only difference between the two types of valve assembly is the length of the valve stem.

#### **7.56.4.2.2 Dismantling the Valve Assembly**

All the numbers in brackets refer to the ballooned item numbers on Figure 7.56.1 Use a large wide jawed adjustable spanner (wrench) to unscrew the complete valve assembly from the burner. It is recommended that the faces of the spanner are covered with masking tape to prevent scratches on the valve assembly.

Move the valve handle (1) into a vertical position so that the valve is in an open position.

On the underside of the valve handle (1) are two grub screws (2).

Loosen these two grub screws but do not remove them.

Close the valve handle again and gently push the pivot pin (3) out to one side of the handle.

This will release the handle from the valve stem (4).

The pivot pin does not need to be completely removed from the handle.

Once the handle has been released, re-tighten one of the grub screws onto the pivot pin to retain the pivot pin in the correct alignment.

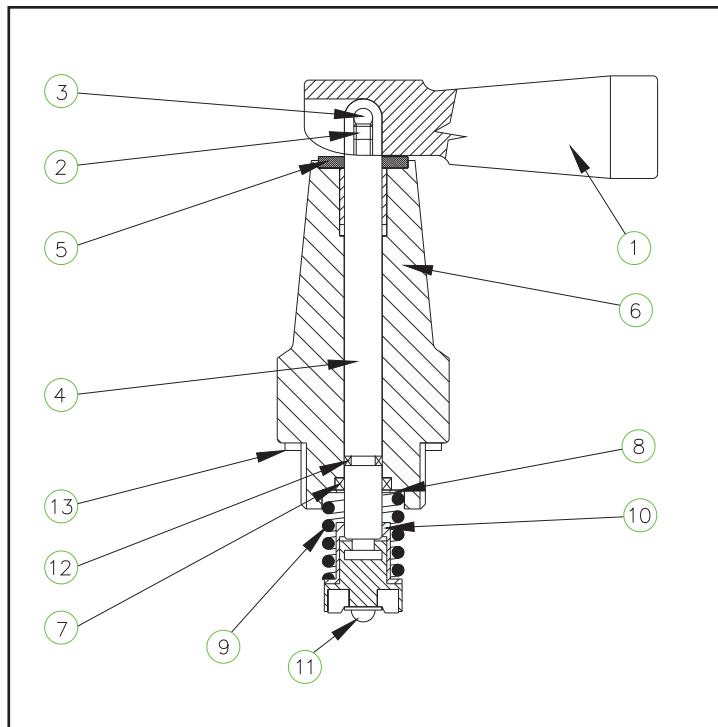


Fig 7.56.1 Toggle Valve Assembly ▲

Remove the plastic wear pad (5) from on top of the valve assembly and store safely. It should be noted that these wear pads (5) are not always interchangeable between valve assemblies. It is recommended that only one valve assembly is dismantled at any time.

#### 7.56.4.2.2 Replacing Valve Seals

Carefully withdraw the valve stem (4) and seals from the valve bonnet (6). Gently push the lip seal (7), washer (8), spring (9), and seat carrier sleeve (10), up the valve stem (4). This permits the removal of the seat carrier (11) from the valve stem (4). Inspect the sealing surface of the valve seat for any damage or foreign bodies.

Normally, there is a circular indentation where the seat rests on the main valve block. Inspect this area in particular, for any cuts or damage. If the sealing surface is damaged, the complete seat carrier (11) must be replaced.

Remove the lip seal (7), washer (8) and spring (9) from the valve stem (4), taking care not to scratch the valve stem. The quad ring seal (12) is removed by carefully sliding a piece of wire down the side of the seal and hooking it under the seal. Lift the seal out of the recess on the stem and slide it off the stem. Note that if this seal (12) is removed, it must not be re-used. A new seal must always be fitted on re-assembly.

Inspect the valve stem (4) for any signs of scratches or damage. Scratches are best detected by running a finger nail over any marks.

If the scratch can be felt, then the stem must be replaced. Frequently there are slight wear marks along the shaft where the lip seal (7) contacts the shaft.

These wear marks do not necessarily mean that the shaft or lip seal require replacement.

If a valve stem leak is experienced, then the valve stem (4), lip seal (7) and quad ring seal (12) must be replaced.

Re-assembly is generally the reversal of the dismantling process. Ensure that the lip seal (7) and the quad ring seal (12) are lubricated with grease prior to installation. There is no particular orientation for the quad ring seal, but the lip seal must be mounted upon the valve stem so that the helical spring, visible inside the seal, is facing towards the seat carrier end of the valve stem.

When replacing the valve assembly back into the block, smear a small amount of grease on to the valve assembly threads and ensure that the copper sealing washer (13) is present.

To refit the valve handle, remove the grub screws (2), clean off any existing Loctite and refit using Loctite 243 (Threadlock) or equivalent. Fully tighten the grub screws using a 2mm A/F Allen key ensuring that the grub screws are aligned with the machined flat on the pivot pin (3).

#### **7.56.4.2 SQUEEZE (MAIN) VALVE ASSEMBLIES**

To remove the main squeeze action valves, proceed as follows:

All the numbers in brackets refer to the ballooned item numbers on Figure 7.56.2

Ensure that the burner is fully vented.

Using a 4 mm AF Allen Key, undo and remove the four hex. cap head screws (14) and crinkle washers (16).

Using a 2 mm AF Allen Key, undo and remove the hex.c/sink screws (13).

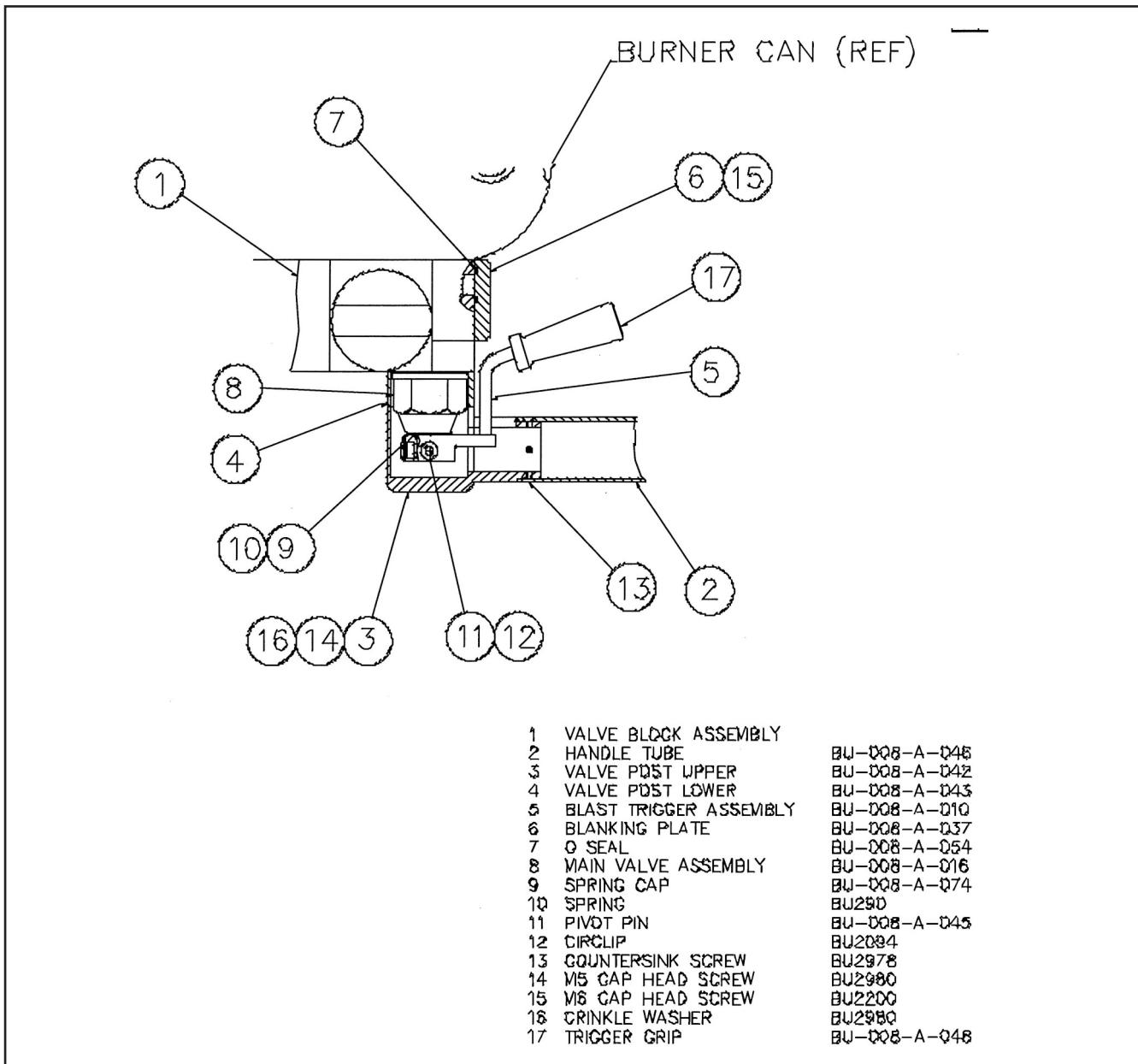
Remove the handle tube (2) from the upper valve posts (3). Remove the upper and lower valve posts.

Using a pair of circlip pliers, remove the circlip (12). Remove the pivot pin (11), from the blast trigger cam. The blast trigger can now be removed.

Take care to retain the spring (10) and spring cap (9) within the blast trigger cam.

Remove the main valve assembly (8) from the valve block using a wide jawed adjustable spanner. It is recommended that the jaws are covered with masking tape to prevent scratch damage to the valve bonnet.

Remove the plastic wear pad from the recess in the top of the valve bonnet.



▲ Fig 7.56.2 Squeeze (Main) Valve

**Note:** Wear pads are not always interchangeable between valve assemblies. It is recommended that only one valve assembly is dismantled at any time.

Further valve maintenance is as described in Section 7.56.4.1.

Re-assembly is generally the reversal of the dismantling process.

Always re-new the circlip. Apply Loctite 222 to the c/sink screws (13), prior to assembly.

Upon completion of re-assembly, pressure test the associated burner and test fire.

## 7.56.4.3 PILOT LIGHT

The pilot light is supplied with vapour from the pilot light regulator. It is situated within the burner can. If a pilot light failure is experienced, it is usually due to a blocked pilot light jet. To prevent this happening, a small filter is inserted into the feed to the jet.

The numbers in brackets refer to the ballooned item numbers on Figure 7.56.3.

The pilot light is removed by first withdrawing the igniter assembly (1) down into the burner block.

Unscrew the igniter retaining grub screw (2) which is located in the side face of the main burner block (3). Push the complete igniter assembly (1) out through the bottom of the burner block (3). Insert a screwdriver which has a thin shaft, through two opposite holes in the pilot light cup (4).

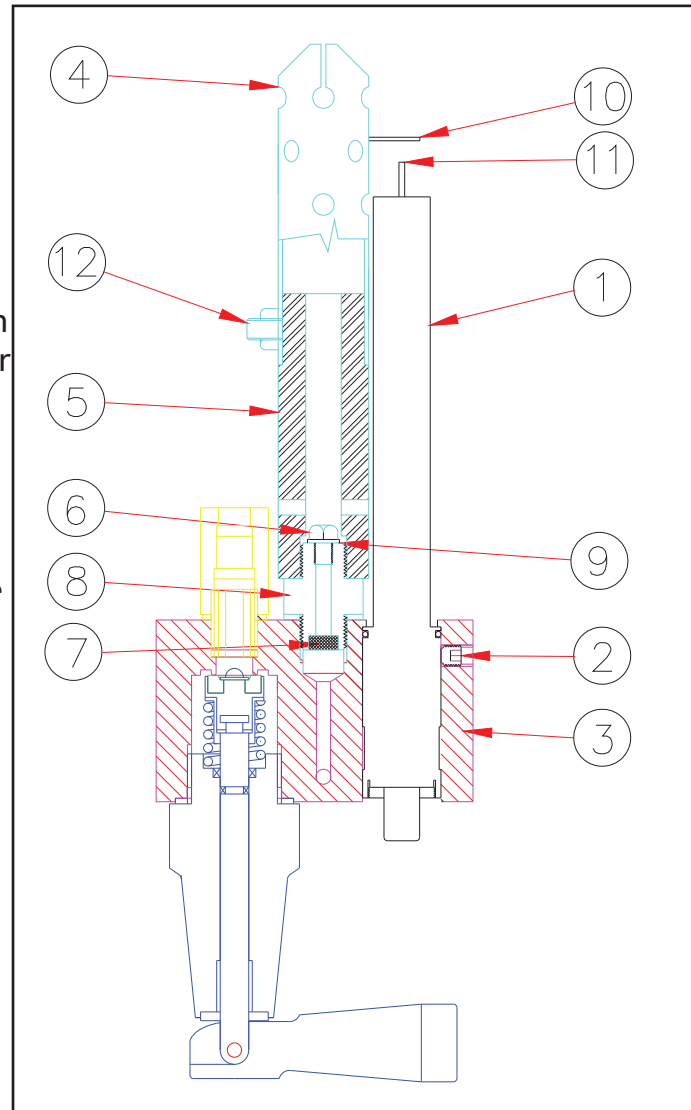
A special tool is available from the factory to achieve this task. Unscrew the complete pilot light cup assembly (4, 5) to reveal the pilot light jet (6). Unscrew the pilot light jet (6) using a ¼" AF socket.

If the pilot jet is held up to a bright light, the hole should appear round. If not, clean the jet in kerosene and use an airline to clear the jet of any blockage. If this procedure does not dislodge the blockage, then insert a fine piece of wire from the top of the jet into the hole and push any obstruction out. Jet cleaners which are used for tilley lamps or camping stoves are suitable.

A jet cleaning tool is available from the factory.

The pilot light filter (7) is accessible by unscrewing the jet adaptor (8) from the burner block, using a ¾" (19 mm) socket. The filter is situated in the upstream end of the adaptor and is a sintered bronze filter. It is possible to clean this filter by soaking the complete adaptor in kerosene and then blowing back through the filter with an airline.

However, if the filter is heavily blocked, it is recommended that this filter is replaced. Re-assembly of the pilot light system is the reverse of the dismantling process.



▲ Fig 7.56.3 Jetstream Pilot Light

Ensure that there is a copper washer (9) under the pilot light jet (6) when it is screwed into the jet adaptor. Once the complete pilot light assembly has been fitted, replace the igniter unit (1).

The pilot light cup (4) may need repositioning so that the earthing tag (10) for the igniter is positioned directly above the igniter electrode (11). This is achieved by loosening the grub screw (2) on the side of the pilot light cup and rotating the cup until the earthing tag is in the correct position.

The gap between the electrode and the earthing tag should be 3/16" (4 mm).

#### 7.56.4.4 CROSSFLOW

##### 7.56.4.4.1 Crossflow Blanking Plate Seal

When the burner is configured in the squeeze action mode, the crossflow ports are blanked off using a specially machined aluminium plate and O-ring. To replace the O-ring, proceed as follows:

The numbers in brackets refer to the ballooned item numbers on Figure 7.56.2.

Ensure that the burner is completely vented.

Remove the four cap head screws (15) using a 5 mm Allen Key. The blanking plate can now be removed.

Carefully remove the O-ring (7) from the blanking plate seal groove.

Do not use hard or sharp implements to remove the O-ring, as this may damage the seal interface.

Check the O-ring groove for any signs of damage or scratching. If any damage or scratching is detected, then the blanking plate must be replaced.

A new O-ring must always be fitted on re-assembly. Prior to fitting the seal in the groove, lightly smear the seal with grease.

Re-assembly is generally the reversal of the dismantling process. Apply Loctite 222 to the four cap head screws prior to re-assembly.

Upon completion of re-assembly, air pressure test the associated burner and test fire.

#### 7.56.4.4.1 Crossflow Assembly Interface Seal

When the burner is configured in the toggle action mode, a crossflow assembly is fitted between the two valve blocks (see Fig 7.56.4).

The numbers in brackets refer to the ballooned item numbers on Figure 7.56.4.

The crossflow assembly forms a pressure tight fuel link between the left hand and right hand burners. The seal is achieved ,with the use of an O-ring (7), at each end of the cross flow assembly. To replace the seal, proceed as follows:

Ensure that the burner is completely vented.

Remove the four cap head screws (3), securing the handle assembly (2) to the crossflow assembly, using a 4 mm Allen Key.

**Note:** The handle assembly is not fitted on the Triple and Quad versions.

Remove the hex. c/sink screw (4), securing each of the eight cover blocks (5) using a 2 mm Allen key. Remove the cover blocks.

Remove the eight cap head screws (6), using a 5 mm Allen Key.

Carefully withdraw the crossflow assembly. Keep the crossflow assembly level as it is being withdrawn, to prevent it from jamming between the two valve blocks.

Carefully remove the O-rings from each end of the crossflow assembly.

**Warning:** Do not use hard or sharp implements to remove the seals, as this may damage the seal interface.

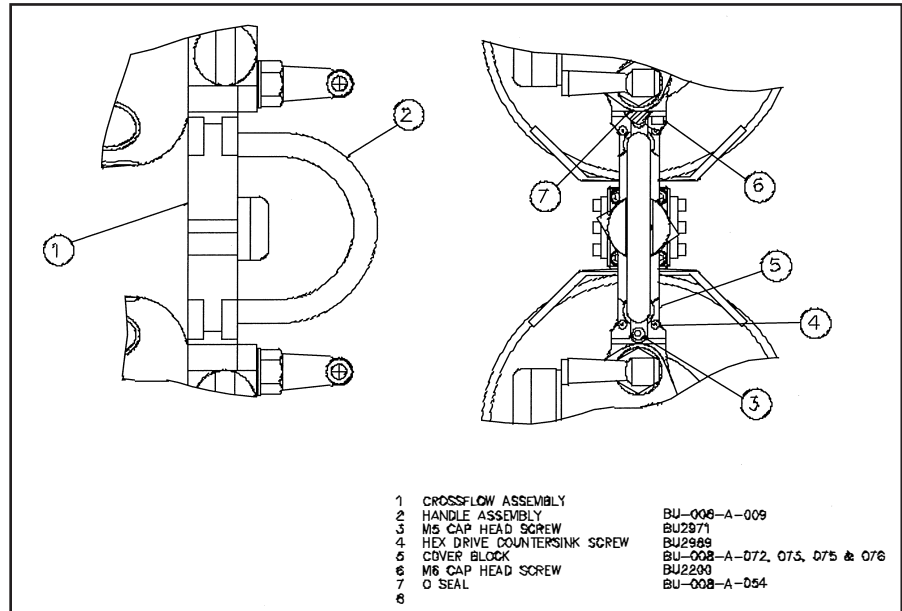
Check the O-ring grooves and the valve block faces for any signs of damage. If any of the grooves or faces are damaged, the components will need to be replaced.

New O-rings must always be fitted on re-assembly. Prior to fitting the seals in the groove, lightly smear the seals with grease.

Re-assembly is generally the reversal of the dismantling process. Apply Loctite 222 to the eight cap head screws prior to re-assembly.

Upon completion of re-assembly, air pressure test the complete burner assembly and test fire.





▲ Fig 7.56.4 Jetstream Crossflow

### 7.56.5 INSTRUMENT REPAIRS

No change.

### 7.56.6 MAINTENANCE SCHEDULE

No change.

### 7.56.8 REPAIR PARTS AND MATERIALS

#### 7.56.8.4.12 Jetstream Burner

Part Number	Description
BU2037	Pilot Light Jet
BU2094	Circlip
BU2222	Quad Ring Seal
BU2223	Stem Seal
BU2298	Copper Washer
BU2980	Crinkle Washer
BU-008-A-045	Igniter Electrode
BU-008-A-054	O-ring

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