

# Fuel system inspection

## 1. APPLICABILITY

All Kavanagh Balloons single, double triple and quad burners  
TCDS: Australian Certificate of Type Approval CTA148-2, Australian Type Certificates VL501, VL502, VL503, VL504, VL505. VL506, VL507 and EASA Type Certificate EASA.IM.BA.110

## 2. BACKGROUND

This service letter is in response to a recent inflight fire experienced on a KBS3-4 burner (Quad).

Initial indications are that there was a failure in a pressure gauge. This Service Bulletin is being distributed as a precautionary measure until more is known about the specific incident and exact cause.

## 3. COMPLIANCE

Highly recommended.

**Note: Inspection items may be completed by the pilot in command if approved to do so by the registered owner / operator. Any rectification must be accomplished by an approved maintenance authority holder or organisation.**

## 4. CONSEQUENCES OF NON COMPLIANCE

Risk of uncontrolled propane leak and fire

## 5. SERIES 3 & 4 BURNER PRESSURE GAUGE INSPECTION

Perform an external inspection of all burner pressure gauges for signs of external damage including deformed, cracked or damaged casing and missing or damaged lenses.

Check the operation of each pressure gauge as follows.

- i) Remove all pressure from the burner fuel line and check the gauge reads zero
- ii) Apply fuel pressure from a fuel cylinder and check the pressure reading at the gauge is in the expected and normal range.
- iii) Remove all pressure from the burner and check the gauge returns to zero.

Any defects are cause for rejection and the gauge must be replaced before further flight.

**NOTE: This inspection is not a calibration check of the gauge so a calibrated pressure source or comparison readings are not required unless a defect is suspected.**

**NOTE: If the pressure gauge reading appears abnormal, cross check it against other pressure gauges in the burner using the same fuel supply and reject if unsure.**

**NOTE: Older KBS3 burners may have a plastic body version of the KP4503 pressure gauge. These are safe to remain in service provided they pass inspection.**

**NOTE: Replacement KP4503 gauges for the KBS3 burner have a stainless steel body however the internal pressure sensing mechanism is the same as earlier gauges. The updated gauge has been in service since 2009**

**Note: the KBS4 Crossfire burner pressure gauge (KP6013) is housed in the valve block and does not need to be removed for this inspection. External inspection will be limited to the gauge lens and operation.**

**6. SERIES 3 BURNER STEM SEAL LEAKS AND ADJUSTMENT**

Operation of the main valve in the Series 3 burner will result in wear of the stem seals over time and regular adjustment will prevent leaks from developing.

Stem seal leaks will be evident during cycling of the valve from closed to open or open to closed. Applying a downward pressure or “hanging” on the valve handle during operation will increase the risk of a stem seal leak.

Inspect all main valves for stem seal leaks as follows;

- i) Connect each burner to a fuel supply and check that available pressure is in the normal operating range.
- ii) Open the main valve applying light pressure on the valve lever down and away from the burner.
- iii) Look and listen for any leaks at the valve stem.
- iv) A stem seal leak will manifest as a small leak of gas during movement of the valve.
- v) If there is any suspicion of a leak refer the burner to an approved maintenance person or organisation for further investigation and adjustment of the stem seal before further flight.

**Note: the use of commercial leak detector fluid is recommended for finding small leaks but is not required for this visual inspection.**

Stem seal leaks have been known to catch fire and that fire may impinge on the fuel pressure gauge if not extinguished immediately.

In the event of a stem seal fire, standard emergency procedures for a fire on the ground or a fire in the air must be followed. Refer to the Kavanagh Balloons flight manual section 3.6

Refer to the Kavanagh Balloons Maintenance Manual section 4.4.4.1 for details of stem seal adjustment.

**7. FUEL SYSTEM PRESSURISATION**

Review the limitations for system fuel pressure set out in section 2.7 of the Kavanagh Balloons Flight Manual.

If fuel pressure is artificially raised in your organisation by the use of Nitrogen or Co2, review the procedures set out in the Kavanagh Balloons AFM section 8.5.

If alternative methods of pressurisation such as heater pads are approved by other engineering instructions the process must be reviewed to ensure maximum operating pressure for the burner is not exceeded.

The maximum operating pressure for the KBS3 single, double, triple and quad burner is 218PSI.

The maximum operating pressure for the KBS4 Crossfire double, triple and quad burner is 180PSI.

**NOTE: While operation up to the maximum pressure is allowable, best burner performance is achieved around 120PSI for the KBS3 and nearer to 100PSI for the KBS4 burner. Above these pressures incomplete combustion, reduced fuel efficiency and excessive water production will result.**

**NOTE: Pressurisation of the fuel gauge beyond the maximum reading may result in damage leading to catastrophic failure of the pressure gauge.**

**8. QUICK SHUT OFF VALVES (QSOV) ON FUEL CYLINDERS**

The use of quick shut off valves are not mandatory but are highly recommended.

In an emergency or fire, the quick shut of valve allows much faster isolation of the fuel supply. Where fuel manifolds are in use a QSOV gives an immediate visual indication as to which fuel cylinder is in use and will improve the response time in an emergency.

All new Kavanagh Balloons fuel cylinders will have a QSOV fitted to the liquid outlet as standard from 2019

**9. REVIEW EMERGENCY PROCEDURES**

Pilots and organisations should conduct a review of all emergency procedures including in-flight fire and burner malfunctions as soon as possible.

Isolation of the fuel supply at the fuel cylinder is the number one priority. Both the liquid and vapour valves must be closed on any fuel cylinders connected to the burner with a leak or malfunction before any effective fire fighting methods can be performed.

Removal of residual fuel pressure from the burner will generally be achieved by the actual leak but can be accelerated by activation of the main or liquid valve on the affected burner if it is safe to do so. Refer to the Kavanagh Balloons Flight Manual section 3

Pilots and organisations are reminded that the minimum industry standard for protective clothing includes leather gloves and clothing made from fire resistant material such as a long sleeve cotton shirt.

The correct clothing and protective equipment will enable a pilot to immediately and effectively deal with any fire risk.

Additional fire fighting equipment such as a fire blanket are recommended.

**10. DOCUMENTATION**

Compliance with inspections performed in items 5 & 6 of this Service Bulletin should be recorded in the aircraft logbook and on the component card for the burner.

All defects must be reported to Kavanagh Balloons and the CASA defect reporting service.