



## SECTION 0 - GENERAL

## 0.0 Flight Manual Approval

## Kavanagh Balloons Approved Hot Air Balloon Flight Manual

Models:

B-77, B-105, B-350, B-400

C-56, C-65, C-77

D-77, D-84, D-90, D-105

E-120, E-140, E-160, E-180, E-210, E-240, E-260, E-300

EX-65

G-450

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**Applicable to Serial Numbers as shown in Section 1.2**

**This manual is specific to the following balloon**

Model \_\_\_\_\_

Serial Number \_\_\_\_\_

Construction Date \_\_\_\_\_

Registration Mark \_\_\_\_\_

Approved By \_\_\_\_\_

For the Civil Aviation Safety Authority Australia

Approval Date \_\_\_\_\_



2 Sep 2010

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### 0.3 Log of Effective Pages

| Page | Revision | Page | Revision | Page | Revision |
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| 0-13 | 0        | 4-11 | 0        | 7-15 | 0        |
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| 0-15 | 0        | 4-13 | 0        | 7-17 | 0        |
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| 1-4  | 0        | 4-18 | 0        | 7-22 | 0        |
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fuel spraying from relief valves and a possibility of explosion from overheated fuel tanks.

4. If the balloon is inflated, the deflation system must be activated to prevent the balloon from climbing as crew and passengers exit the basket.

### 3.6 Fire in Flight

1. Turn off fuel at main tank valves and turn off pilot burners.
2. Put out the fire with the fire extinguisher.
3. If it is safe, relight pilot burner, proceed as normal and make a landing as soon as possible.
4. If it is unsafe to relight the burner, prepare to make an emergency/hard landing.

### 3.7 Envelope Over Temperature Indication

1. If an envelope over temperature is indicated - either by a continuous temperature indicator or warning signal such as a fusible link, descend to the minimum safe altitude.
2. If a continuous reading temperature gauge is available, the flight may be continued provided the envelope temperature is within limits.
3. If there is no further over temperature indicator available, a landing must be made as soon as possible.

### 3.8 Pilot Burner Failure

In the event of pilot burner failure, adopt the following course of action:

1. If multiple burners are fitted, continue the flight on another burner while troubleshooting the pilot burner failure.
2. Check the pilot burner valve has not been inadvertently turned off at the burner.



## SECTION 3 - EMERGENCY PROCEDURES

### 3.1 Introduction

This section provides procedures for emergency situations that may occur in flight or on the ground.

### 3.2 Avoidance of Low Level Objects

If a collision with an object on the ground appears possible, the pilot must quickly make the decision whether it is better to climb or descend.

**NOTE:** *From stable flight the balloon responds faster when a descent is initiated than when action is taken to begin a climb.*

#### 3.2.1 Emergency Climb

1. The situation must be assessed quickly, and if the decision to climb is made it must be made only if the pilot is certain that the obstacle can be cleared.
2. Activate as many available burners, including liquid fire as required, to initiate the climb.

#### 3.2.2 Emergency Descent

1. If the decision to descend is made, brief the crew and passengers and carry out an emergency landing using the parachute mode of the vent to increase the rate of descent if necessary.
2. Prepare for a hard landing as described in 3.4



### 3.3 Accidental Operation of the Rip Line

Accidental operation of the rip line in a Smart Vent or Lite Vent will be noticed by a different feel in the load on the control line as the vent starts to open.

In a balloon fitted with a Circular Velcro Rip Panel, the rip locks will provide a positive indication that the rip panel is being opened.

1. Release the rip line immediately.

**CAUTION: Unless the final deflation system is a Parachute Vent, the vent will not close automatically.**

2. For Smart Vent and Lite Vent, close the vent by use of the parachute line.
3. For Circular Velcro Rip Panels, assess the amount the panel has been opened. There is no way to re-close the panel from the basket.
4. Turn the burner(s) on to replace any lost lift and bring the balloon under control.
5. If it is obvious that control can not be regained before contact with the ground, prepare for a heavy landing.

### 3.3 Power Line Contact

If contact with power lines is unavoidable follow the following procedures.

1. Descend as fast as possible so that the contact is made with the envelope and not with the basket assembly.
2. Take care to ensure no one is holding any metallic parts of the basket, fuel tanks or burner.
3. If there is no risk of fire, remain in the basket until the power company is contacted and it has been confirmed that the power has been turned off.



4. If the basket must be evacuated, crew and passengers must avoid contact between their bodies and any part of the balloon at the same time.

### 3.4 Hard Landing Procedures

Hard landings may result from emergency manoeuvres or pilot error. The following procedures will reduce the risk to crew and passengers during a hard landing.

1. Crew and passengers must be briefed for the hard landing - holding onto rope handles or fuel tank rims, feet together and knees slightly bent. In partitioned baskets, passengers should have their back to the direction of landing with their back or hip firmly against the padded wall.

When a high horizontal landing speed is expected, passengers should be made aware that the basket will tip forward and they should take a lower than normal landing position to avoid being thrown forwards out of the basket.

2. Pilot lights and the main burner **must** be extinguished prior to contact with the ground.
3. If time permits, fuel should be shut down at the fuel tanks and fuel in the lines vented/burnt.
4. Emergency ballast such as surplus fuel tanks may be jettisoned provided there is no risk to people on the ground.
5. The rip line should be fully operated and held open just before contact to reduce rebound or drag if either is likely.

### 3.5 Fire on the Ground

1. Turn off fuel at the main tank valves.
2. Use the fire extinguisher to put out fire.
3. If this action proves unsuccessful after 30 seconds or so, evacuate all personnel from the immediate area because of the danger from



**NOTE:** *In all cases, releasing the parachute line may allow the vent to close and will prolong or prevent the deflation of the balloon. In fast landings, this may greatly increase the distance the balloon drags across the ground before stopping.*

**CAUTION:** *Using the parachute mode for final landing with both Smart Vent and Lite Vent, the deflation time may be increased over the time expected with a standard parachute vent, therefore it is not recommended to use this technique with these deflation systems.*

**WARNING:** *In landings with a high rate of descent there is a possibility of rebound after contact with the ground. This rebound may be transferred to the parachute line and pilots must be holding on securely as there is a significant risk of being pulled from the basket by the parachute line in this situation.*

#### 4.14.2 Final Landing - Smart & Lite Vent

Deflation of the balloon during final landing with a Smart Vent or Lite Vent is generally very fast and will normally require a much smaller area to land the balloon than it does for a balloon fitted with other deflation systems.

1. The red centre pull rip line should be fully opened once the balloon is within six feet (2 metres) of ground level at the pilot's discretion during the landing operation.
2. A small amount of load should be held on the rip line to ensure the vent will stay fully open during the deflation.

**NOTE:** *Due to the rigging of these deflation systems, any rebound on landing will not be transferred to the red rip line. However, the pilot should still be hanging on securely during the landing.*

3. Once the balloon has stopped and is fully deflated, the pilot must check to ensure all the fuel valves are turned off and that fuel pressure is released from all parts of the fuel system.



#### 4.12 Approach to landing

1. A suitably large landing site should be selected, free of obstacles such as power lines, buildings and livestock. The overshoot area (down wind of the landing) should be free from high obstacles where possible in case the landing has to be aborted.
2. When horizontal landing speed is expected, passengers should be made aware that the basket may tip forward and they should take a lower than normal landing position to avoid being thrown forwards out of the basket
3. When a fast landing is anticipated extra space will be required for the potential drag and deflation of the balloon and a low approach should be favoured to minimise the vertical speed during landing.
4. Crew and passengers should be briefed for the landing and safe landing positions confirmed well in advance of the touchdown.
5. Particularly in partitioned baskets, rotation vents must be used to orient the basket so that the long side of the basket is across the direction of travel.
6. Just prior to touchdown, the vertical speed of the descent should be minimised with the use of the burner. The pilot lights and main burners **must** be extinguished before ground contact is made.

**NOTE:** *If an intermediate landing is to be carried out, the scoop should be positioned down wind during the landing.*

**WARNING:** *Landing a partitioned basket on a corner or short edge presents considerable risk to the occupants. Any landing where the basket is out of position should be aborted unless it is an emergency landing.*



### 4.13 Intermediate Landing

If the wind speed on the ground is slow enough and the landing site has adequate space for a re-launch, the balloon may be kept inflated to change passengers or to upload more fuel before continuing the flight.

The balloon may also be landed using the following technique to allow assistance from ground crew with deflation or moving of the balloon to a more suitable position for deflation.

**WARNING:** *Any time the balloon is on the ground and not secured with a launch restraint, there is considerable risk to personnel and equipment due to unexpected wind gusts or changes in loading. Care must be taken to minimise this risk.*

#### 4.13.1 Intermediate Landing - Parachute Vent.

The following procedure can be used with a standard parachute vent as well as the parachute action on a Smart Vent or Lite Vent.

1. Prior to ground contact, open the parachute vent sufficiently to stop the balloon from dragging.
2. When the balloon is safely on the ground and before too much lift is released from the balloon, release the parachute line to close the parachute vent.
3. If required, re-ignite the pilot light and re-fill the balloon using the burner until the envelope is stable without lifting off again.

#### 4.13.2 Intermediate Landing - Smart & Lite Vent

1. Just prior to ground contact and not more than 6 feet from the ground, fully open the Smart/Lite Vent using the red rip line.
2. After initial ground contact, and before too much lift is lost from the balloon, close the Smart/Lite Vent using the red and white parachute line.

A fast pull on the parachute line will enable the vent panel to re-



inflate with the out rushing air, and the parachute line can then be released to seal the vent.

3. If required, re-ignite the pilot light and re-fill the balloon using the burner until the envelope is stable without lifting off again.

**NOTE:** *To reduce rebound on landing and to assist in shortening the landing drag, the Smart/Lite Vent should be fully opened and should remain open until the initial rebound of air inside the balloon has reached the top of the balloon.*

#### 4.13.3 Intermediate Landing - Rip Panel

Intermediate landings using a rip panel are not recommended as the amount of lift that can be released with the rotation vents alone is not likely to be sufficient to make a safe intermediate landing. Exceptionally calm conditions would be the only conditions where an intermediate landing could be attempted.

### 4.14 Final Landing

A final landing generally includes the intention to fully deflate the envelope immediately after touchdown. A final landing ensures that the risks associated with an inflated but unrestrained balloon are minimised.

#### 4.14.1 Final Landing - Parachute Vent

The following procedure can be used with a standard parachute vent as well as the parachute action on a Smart Vent or Lite Vent.

1. Prior to ground contact, open the parachute vent sufficiently to ensure the balloon makes contact with the ground.
2. During the touchdown, continue pulling the parachute line to increase the opening and hold the vent open until full deflation of the envelope occurs.
3. Once the balloon has stopped and is fully deflated, the pilot must check to ensure all the fuel valves are turned off and that fuel pressure is released from all parts of the fuel system.