

KAVANAGH MODEL

**C-56, C-65, C-77, D-77, D-84, D-90, D-105
E-120, E-140, E-160, E-180, E-200, E-210, E-240, E-260, E-300**

THIS PAGE INTENTIONALLY BLANK

**HOT AIR BALLOON
AUSTRALIAN APPROVED
FLIGHT MANUAL**

APPROVED:.....



DATE:..... 2 Sep 2010

For the Civil Aviation Safety Authority of Australia

**LOG OF EFFECTIVE PAGES
September 2010**

Page	Revision	Page	Revision
i	4	25	4
ii	Blank	26	0
iii	4	27	0
iv	Blank	28	0
1	1	29	0
2	2	30	0
3	0	31	0
4	Blank	32	0
5	0	33	0
6	Blank	34	0
7	Blank	35	0
8	Blank	36	0
9	0	37	0
10	0	38	0
11	0	39	0
12	0	40	0
13	1	41	0
14	0	42	0
15	1	42	0
16	2	44	0
17	0	45	3
18	0	46	3
19	0	47	3
20	0	48	3
21	0	49	3
22	0	50	3
23	4	51	3
24	0	52	Notes

THIS PAGE INTENTIONALLY BLANK

APPROVED..........DATE.....2 Sep 2010.....
 For Civil Aviation Safety Authority

SECTION 4 - EMERGENCY PROCEDURES**4.1 PILOT BURNER FAILURE**

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

Check that the vapour valve on the master tank is open and that the vapour shut-off valve at the base of the burner is open.

Check that the pilot burner hose is connected correctly to the regulator on the master tank and that the regulator is not on too low a setting, then attempt to relight the pilot burner. If unsuccessful, and a double burner is being used, continue the flight using the other burner and make a landing as soon as possible. If all pilot lights fail and cannot be relit, or if the burner is a single unit proceed as follows:

BURNERS FITTED WITH BALL VALVES: Open one blast valve partially and ignite the fuel coming directly out of the main jets. Adjust the valve to give a flame to act a pilot burner. Fly on, using the other blast valve and make a landing as soon as possible.

BURNERS FITTED WITH BALL VALVES: Open one blast valve partially and ignite the fuel coming directly out of the main jets. Adjust the valve to give a flame approximately 30cm. high and leave this flame to act as a pilot burner. Fly on, using the other blast valve and make a landing as soon as possible.

BURNERS FITTED WITH REGO VALVES: Shut off main fuel supply at tank valve and fully open the burner valve connected to that tank. Open the tank valve partially to allow a little fuel to reach the main jets so the burner can be relit using the spare striker or matches. Once the burner is alight the tank valve can be opened more fully to burn for the desired time, then closed down to the partial setting to maintain the emergency pilot flame. NOTE: The partial opening will cause refrigeration of the tank valve, so it is desirable to burn frequently in short bursts to avoid a complete ice-up of the valve. A landing should be made as soon as possible.

If liquid fire is fitted to the burner this may be used as the emergency pilot light until a landing can be made.

together. This procedure is repeated until the panel is fully sealed. The capewell safety locks are closed during the resealing procedure or during the inflation.

e. **PRE-INFLATION CHECKS** - Re-check all the points made in (a) to (d) of this section. Check that at least one extra source of ignition for the pilot burner is in the basket, i.e. striker of matches or both. Check that all equipment such as handling line and fire extinguisher is on board as well as any other equipment to be carried. Make a detailed check of the load to be carried against the instructions set out in SECTION 7.

f. **INFLATION - RECOMMENDED PROCEDURE** - One crew member should be appointed to the crown line and one other to each side of the mouth to hold it open for filling by fan. The fan is started and at this point the balloon pilot, after connection the end of the vent rope to the burner frame should walk into the balloon taking all the excess vent rope to above the lower pulley. As the balloon inflates the balloon pilot should visually inspect the condition of the envelope and ensure that the vent rope and the rigging is not in a position to tangle as the inflation progresses. If a combination parachute/rip is fitted, each of the capewell safety locks must be checked to ensure the rip line is running freely through the pulleys and that all the locks are secure.

The crown crew member should attach all of the temporary vent tabs on the vent panel as the balloon inflates. When the balloon is about half full the tank mentioned in Part (d) Step 2. is turned on and the pilot burner is lit. The balloon pilot at this stage will give several short burns to cause the balloon envelope to lift of the ground a little so the fan can complete filling. The crown person should only apply enough weight on the crown line at this time to stop the crown from drifting back towards the basket in calm conditions and no weight at all if there is any wind. When the balloon is almost completely full on its side, the pilot will signal to the crown person to apply weight on the line by means of one continuous burn, the crown will rise rapidly if no weight is applied and the task of the crown person is to let it rise slowly to the upright position. In calm conditions the crown person's job is harder than during windy conditions when no pressure on the crown is needed as the wind is quite an effective anchor for the crown.

g. PRE-LAUNCH CHECKS

1. After the balloon is erect and before take-off check that the parachute vent rope, and/or the rip line and rotation vent control lines are not fouled and check the operation of the vent ensuring that all the touch tape tabs are released.
2. Check that both sides of the fuel system are operating satisfactorily.
3. Ensure that passengers are properly instructed.
4. Make sure that all points in (a) to (e) of this section have been satisfied.

3.2 FLIGHT

- a. PARACHUTE VENT - the parachute vent is an extremely effective control and should be used with caution until the pilot becomes familiar with its affect on manoeuvring. Prolonged opening of the vent causes partial deflation of the envelope and this can be seen by the inwards movement of the lower part of the envelope. Attention is drawn to SECTION 2 - limitations Para. 2.5
- b. ROTATION VENTS - if rotation vents are fitted they may be used in flight to orient the balloon as the pilot wishes.
- c. FUEL MANAGEMENT - A suggested procedure is to use the master tank used for inflation first. until the fuel gauge starts to indicate a decrease in quantity, thus ensuring operation of the gauge. The master cylinder should then be shut off and left to be used as an emergency reserve while the other tanks are used.
- d. BURNER - The burner is best used in short burns at short intervals for greater control of vertical movement. A point to remember is that better fuel consumption will be obtained if vertical speed is kept to a minimum.

3.3 LANDING

- a. The rotation vents should be used to orient the basket so that a long side is at a right angle to the direction of travel.
- b. 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
- c. Just prior to touchdown, the vertical speed of the descent should be minimized with the use of the burner. The pilot lights and main burners **must** be extinguished before ground contact is made.
- d. The parachute vent may be fully opened at the pilot's discretion during the landing operation. For deflation, tension should be maintained on the vent rope until the envelope is fully deflated. Note: Elongation of the envelope will occur during the deflation and the vent panel will reseal itself unless the pilot continues to hold the vent rope until the balloon is completely empty.
- e. On balloons fitted with a combination parachute/rip deflation system either system may be used during the landing at the pilots discretion. The breaking of the locks should be started before ground contact is made during a windy landing to ensure the balloon will not drag too far before emptying. It is recommended that the complete length of the touch tape closure is opened at least once during every twenty hours of flight. to ensure it does not become too firmly bound through constant pressure caused by folding and packing in the bag.
- f. Before the balloon is packed away, the touch tape rip panel should be resealed as described in 3.1 d. ASSEMBLY.
- g. Ensure all fuel tank valves are closed and that fuel pressure is released from all parts of the system.

SECTION 7 - WEIGHTS AND LOAD CALCULATION

7.1 WEIGHTS

BASKET WEIGHT

Includes: Burner, Model:

- BasketX.....
- 4 Flex-Frame poles
- 4 Pole covers
- Tank straps
- Fire Extinguisher
- Handling line
- Instrument pack

Sub-Total =

ENVELOPE WEIGHT

Includes: Envelope

- Carry bag
- Skirt

Sub-Total =

TOTAL WEIGHT =

FUEL TANKS

Weight when empty:	Kavanagh	16.5kg.
	Worthington	12.5kg.
Weight when full:	Kavanagh	42kg.
	Worthington	35kg.

APPROVED BY WEIGHT CONTROL OFFICER APPROVAL NO.....

Signed:.....

Date:.....

4.2 MAIN BURNER FAILURE

a. In the event of a main burner failure, several options are available to the pilot. If a double unit is being used and one burner fails, fly on the alternative unit and land as soon as possible. If both burners malfunction, or if the burner is a single unit, use liquid fire. If this doesn't work, check that the tanks connected to the burner are not empty, make sure that they are properly connected and turned on. If there is still no fuel flow, try another tank. If the fault cannot be rectified, prepare for a heavy landing. Follow the emergency landing procedure.

b. When using a full flight skirt, under some conditions generally associated with low ambient air densities, (hot weather), a flame instability may develop after several seconds of continuous burner operation. This will first be noticed by a change in tone of the burner flame to a "swoosh" noise. If burning is continued, the flame may be extinguished completely, however this can generally be avoided by terminating the burn at the initial change of sound, leaving the blast valve closed for a second or so, and then continuing the burn. Further occurrence of this phenomenon can be avoided by using shorter burn periods.

4.3 EMERGENCY LANDING PROCEDURES

UNPREMEDITATED FAST DESCENTS - To arrest a fast descent, all burners can be used simultaneously and may, if necessary, be used continuously until the maximum envelope temperature is reached. During extreme circumstances, this course of action can be repeated, as the temperature may stabilise and show a lower reading after a short pause between burns. If the descent cannot be slowed to an acceptable rate before ground contact is made, prepare for an emergency landing.

EMERGENCY LANDING - All passengers should be briefed to brace themselves, face forward with knees slightly bent, watch the progress of the landing and hold onto the internal basket handles. Pilot lights and the main burner **must** be extinguished prior to contact with the ground. The pilot should alert passengers to imminent ground contact.

Prior to touch down, any emergency ballast can be removed from the basket if this can be done without injuring persons on the ground. Before ground contact is made the passengers should be reminded not to leave the basket until instructed to do so.

4.3 FIRE

ON THE GROUND - Turn off fuel at the main tanks valves, use fire extinguisher to put out fire. If this action proves unsuccessful after 30 seconds or so, evacuate the crew from the immediate area because of the danger from fuel spraying from relief valves and a possibility of explosion from overheated fuel tanks.

IN THE AIR - Turn off fuel at main tank valves. Put out the fire with fire extinguisher. If safe to relight pilot burner proceed as normal and make a landing as soon as possible. If unsafe to relight the pilot burner, prepare to make an emergency landing.

4.5 AVOIDANCE OF LOW LEVEL OBSTACLES

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

CLIMB - 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. NOTE: from stable flight the balloon responds faster when put into a descent than when put into a climb.

DESCENT - If the decision to descend is made, brief the crew and carry out an emergency landing using the parachute vent to increase the rate of descent if necessary. During the descent shut-off fuel as described in emergency landing procedures.

POWERLINES - If contact with powerlines is unavoidable, descend as fast as possible so that the contact is made with the envelope and not with the basket assembly. If time permits, disconnect the envelope temperature sensor wire before contact is made.

SECTION 5 - MANDATORY EQUIPMENT LIST

5.1 A serviceable instrument pack must be carried on each flight. This includes the altimeter, vertical speed indicator, envelope/ambient temperature gauge. If the envelope temperature gauge is not working, an acceptable alternative is a fusible link warning device in the envelope, providing that an ambient temperature sensor is carried as well.

5.2 One fire extinguisher and handling line.

5.3 Two master tanks must be carried as minimum fuel requirement on each flight if a double burner is used. For a balloon with a single burner the minimum fuel requirement is one master tank.

5.4 The flight manual must be carried in the basket on each flight.

5.5 Matches or a hand held igniter should be carried in the basket as a secondary means of pilot burner ignition

SECTION 6 - RADIO SYSTEMS

6.1 No radio system is fitted as standard, however approved handheld VHF radios may be used from time to time as the flight requirements dictate.