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FAA APPROVED
BALLOON FLIGHT MANUAL
FOR

ADAMS BALLOON
MODEL A55.

Reg. No. _____

Ser. No. _____

This flight manual is required by Federal Aviation Regulations Part 31.81 to be carried on board the balloon during all free flight operations.

FAA APPROVED: John J. Vogel
CHIEF
ENGINEERING AND MANUFACTURING
BRANCH SOUTHERN REGION, FAA

DATE December 8, 1976

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LOG OF REVISIONS

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A. OPERATING LIMITATIONS - This balloon must be operated in accordance with the following limitations:

1. Daytime VFR conditions only.
2. Maximum gross weight shall not exceed 1500 pounds, including the weight of the envelope. Volume: 75,000 ft³
3. Maximum envelope temperature - 250°F - (see fig. 1 for estimating temperature limited gross weight)
4. Fuel - Propane - 1, 2, 3 or 4 Worthington model LE-43-U4 fuel cylinders.
5. Fuel cylinder connections will not be changed while in flight.
6. The deflation mechanism (red control line) shall not be activated when the basket is more than five feet above the landing surface.
7. Two or more flint strikers, in good operating condition, must be on board during each flight.
8. The maneuvering vent (white control line) shall not be activated while in descents of more than 600 feet per minute.
9. Maximum allowable rate of climb - 1000 feet per minute.
10. Fuel Pressure Regulator shall be set for maximum available fuel pressure for take off and landing, not less than 70 PSI.
11. Crown Safety Line must be around balloon envelope opposite the maneuvering vents and secured to the basket (no slack) while in flight.
12. Logbook must contain all inflated time - free flight and tether.

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- b. Check fuel system integrity and fuel quantity.
1. All fuel fittings must be free of all foreign matter prior to attachment.
 2. Check installation of fuel cylinders. Fuel tanks must be installed in such a manner that there is no tension on the fuel line and tank couplings will not provide an obstacle for the occupants.
 3. Check each fitting for possible leakage by sound and smell. If there is any doubt use a solution of soapy water and watch for bubbles.
 4. Check quantity of fuel in each tank. Fuel quantity may be determined by three methods:
 - a. 10% bleeder valve - if tank is full it will blow a white mist.
 - b. Gauge - will read the per cent of fuel remaining when the level drops to 32% or below.
 - c. Weight - quantities between 32% and full can only be determined by weighing the fuel tank. When full a Worthington model LE-43-U4 tank will weigh approximately 71 pounds and contain approximately 10 gallons of usable liquid. Propane weighs approximately 4.2 pounds per gallon.
 5. Verify flow from each fuel tank by opening the blast valve and then opening each tank valve, one at a time, for two seconds each.
 6. Set fuel pressure regulator to maximum available fuel pressure, not less than 70 PSI. (Note: Clockwise increases pressure)
 7. The balloon is equipped to operate with from one to four Worthington model LE-43-U4 fuel cylinders. (Manufacturer recommends a minimum of two fuel tanks) Normal operation of the main burner consumes the fuel in its liquid state by means of a withdrawal tube which feeds off the bottom of the tank. When the fuel supply is reduced to approximately 7% as indicated on the gauge a loss of fuel pressure may be noted and the balloon become less responsive. This is because the withdrawal tube does not extend all the way to the bottom of the fuel tank. The remaining fuel is unusable as a liquid, but can be consumed in the vapor form.

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CAUTION: THE FIRST SIGN OF "O" RING DETERIATION IN THE BLAST VALVE WILL BE STIFF OPENING AND CLOSING (WILL NOT SNAP TO OFF POSITION) DUE TO THE LACK OF LUBRICANT. LUBRICATION SHOULD BE DONE IN ACCORDANCE WITH AIRWORTHINESS DIRECTIVE NO. 75-12-08.

- c. Check attachment of instrument package. Set altimeter to field elevation and rate of climb to "0". Install envelope thermometer in crown - 6 inches down.
- d. Check flint ignitors. There must be at least two on board. Test each.
- e. Check deflation mechanism rigging and safety thread.
 - 1. Yellow deflation mechanism should be set with small loop inserted through the large loop so that the small loop points toward the center.
 - 2. The pin should be inserted in the small loop so that the line of pull is down toward the basket along the vertical axis of the envelope.
 - 3. Safety with 4 lb. thread through the two small holes in the deflation pin and around the yellow deflation mechanism so that the pin cannot move more than one inch without breaking the thread.
- f. Brief passengers and crew.

2. Inflation

- a. Lay basket on side.
- b. Lay out envelope down wind, vents up.
- c. Connect suspension cables.
- d. Check general integrity of the envelope, suspension cables and attachments.
- e. Check that control lines are through guide grommets.
- f. Inflate balloon.

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3. Pre-Lift Off

- a. Check for any fouled control lines or suspension cables.
- b. Check that envelope temperature is reasonable for the load carried.
- c. Place the crown safety line along gore seam around balloon envelope opposite the maneuvering vents and secure to the basket - no slack. (Manufacturer recommends securing the crown safety line by first passing the end of the line from the inside of the basket out through the upper window of the weaving. The line is then tied to itself at the padded railing level with a half hitch and a half bow knot.)
- d. Check that the ends of the red deflation line and white maneuvering vent line are within the basket and within reach of the pilot.

4. Flight

- a. In the event of a pilot light flame out, the pilot light should be relighted immediately.
- b. Recommended fuel useage. Use fuel from one tank at a time beginning with the pilot light tank and working in a clockwise direction around the basket. Manufacturer recommends that the pilot light tank not be consumed to less than 20%. A loss of pressure in the pilot light tank may be experienced when high pilot light settings are used, thereby reducing the main burner pressure when operating from the pilot light tank.

5. Landing

- a. Reset fuel pressure regulator to maximum available fuel pressure.
- b. Landings at low ground speeds may be achieved by using the maneuvering vents to stabilize the balloon on the ground without deflating.
- c. Manufacturer recommends touch and go landings not be made when the operational tank has less than 25% fuel.
- d. Activation of the deflation system will provide a comfortable landing with minimum drag in windy situations. This system should not be activated more than five feet above the landing surface.

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- e. Activation of the deflation system is best accomplished by casting off the crown safety line, taking up all the slack in the red deflation line, pulling it taut and giving a brisk yank on the line.

CAUTION: IF THE CROWN SAFETY LINE IS NOT RELEASED THE TOP WILL ONLY OPEN SLIGHTLY WHEN THE DEFLATION SYSTEM IS ACTIVATED.

- f. Immediately upon landing extinguish the pilot light at the burner, shut off all tank valves and bleed all fuel from all lines.
- g. Always store aircraft with all fuel valves in the closed position.

C. EMERGENCY PROCEDURES

1. Relighting the pilot light - using a flint striker or matches, reach up inside the burner can or over the top of the coils and make a spark while the pilot light valve is at a low setting (just enough so that you can hear it hiss).
2. Pilot Light failure - if for any reason the pilot light system becomes inoperative during a flight the main burner system can be ignited without the pilot light and kept burning by slightly opening the main burner valve and using a flint striker or matches for relighting as described in IPC-1. After lighting, the main burner can be:
 - a. Throttled in short bursts to keep the fire going.
 - b. Throttled from the main tank valve while leaving the blast valve open.
 - c. Throttled by holding the blast valve opened slightly.If pilot light fails land as soon as practicable.
3. Main Burner failure - if for any reason a main burner becomes inoperative the pilot light may be used to provide an alternate heat source for a short period, after which time the vapor pressure will become inadequate to maintain level flight. If a main burner fails a landing should be made as soon as practicable.
4. Loss of Crown Safety Line - if for any reason during a flight the crown safety line is cast off out of reach a landing should be made as soon as practicable.

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5. Premature activation of deflation system - if for any reason the deflation mechanism is prematurely activated the crown safety line will hold the deflation port closed enough to permit a controlled landing, but the balloon should be landed as soon as practicable.
6. Fuel Leaks - if for any reason a fuel leak occurs in flight land as soon as practicable.

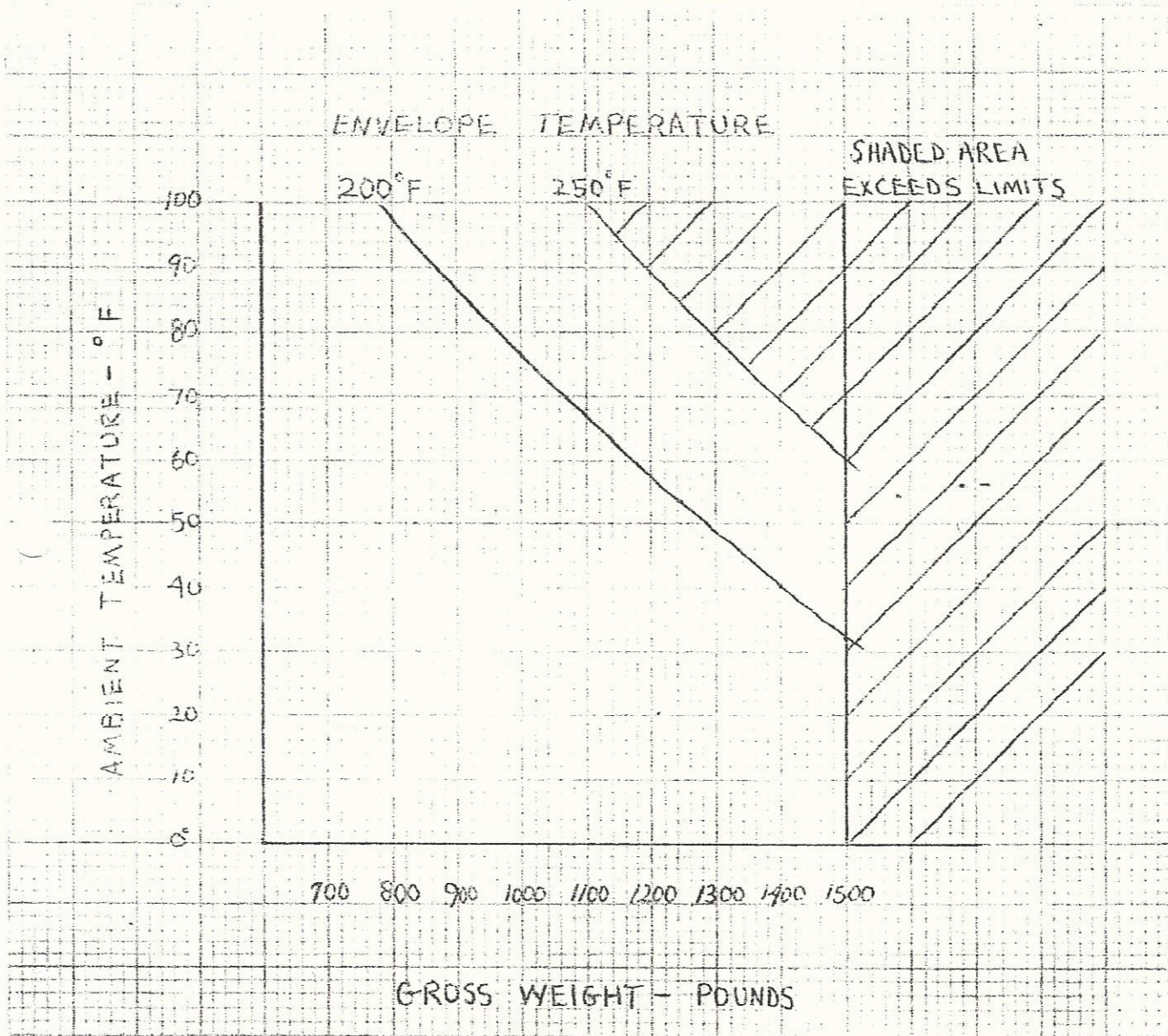
D. PERFORMANCE

1. Operating weights - see fig. 1 to estimate the envelope temperature necessary for ambient conditions for take off gross weight.
2. Burner off descent rate - see fig. 2 for maximum rate of descent vs. gross weight with the burner off or inoperative. Maximum rate of descent will develop after an altitude loss of approximately 1500 feet.
3. Altitude loss during recovery - recovery to level flight from a descent at maximum descent velocity using burner continuously at 70 PSI fuel pressure may incur as much as 1500 feet of altitude loss. The time to recover to level flight may exceed one and one half minutes.
4. Surface winds - the maximum demonstrated surface winds during certification tests were 7 knots.

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FIG. 1
 SAMPLE LOADING GUIDE
 Std. Day, Sea Level



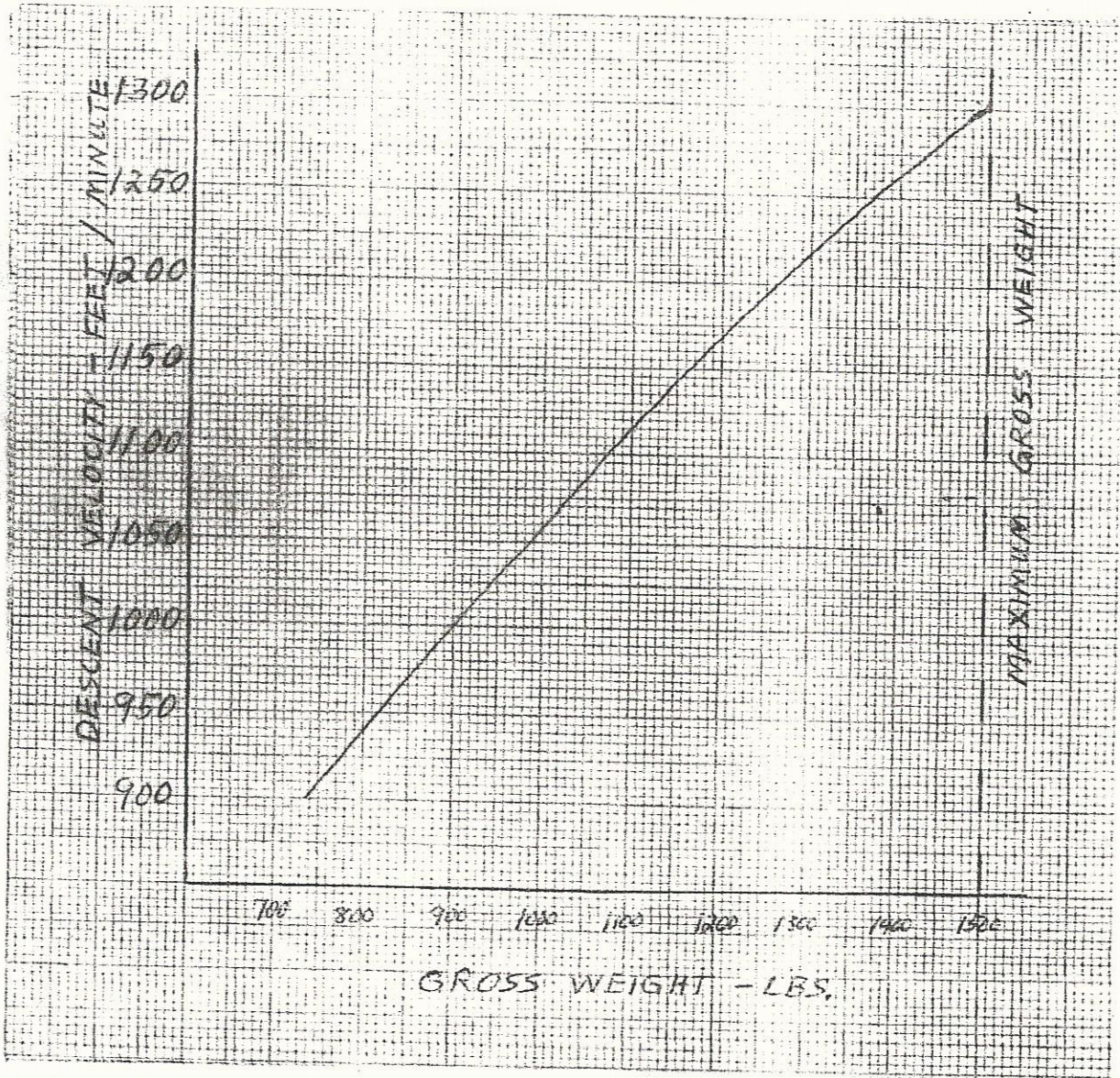
Slightly less lift will be generated at higher field elevations.
 Approximately 40 lbs. per thousand feet above sea level.

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FIG. 2
MAXIMUM DESCENT RATES
Std. Day, Sea Level



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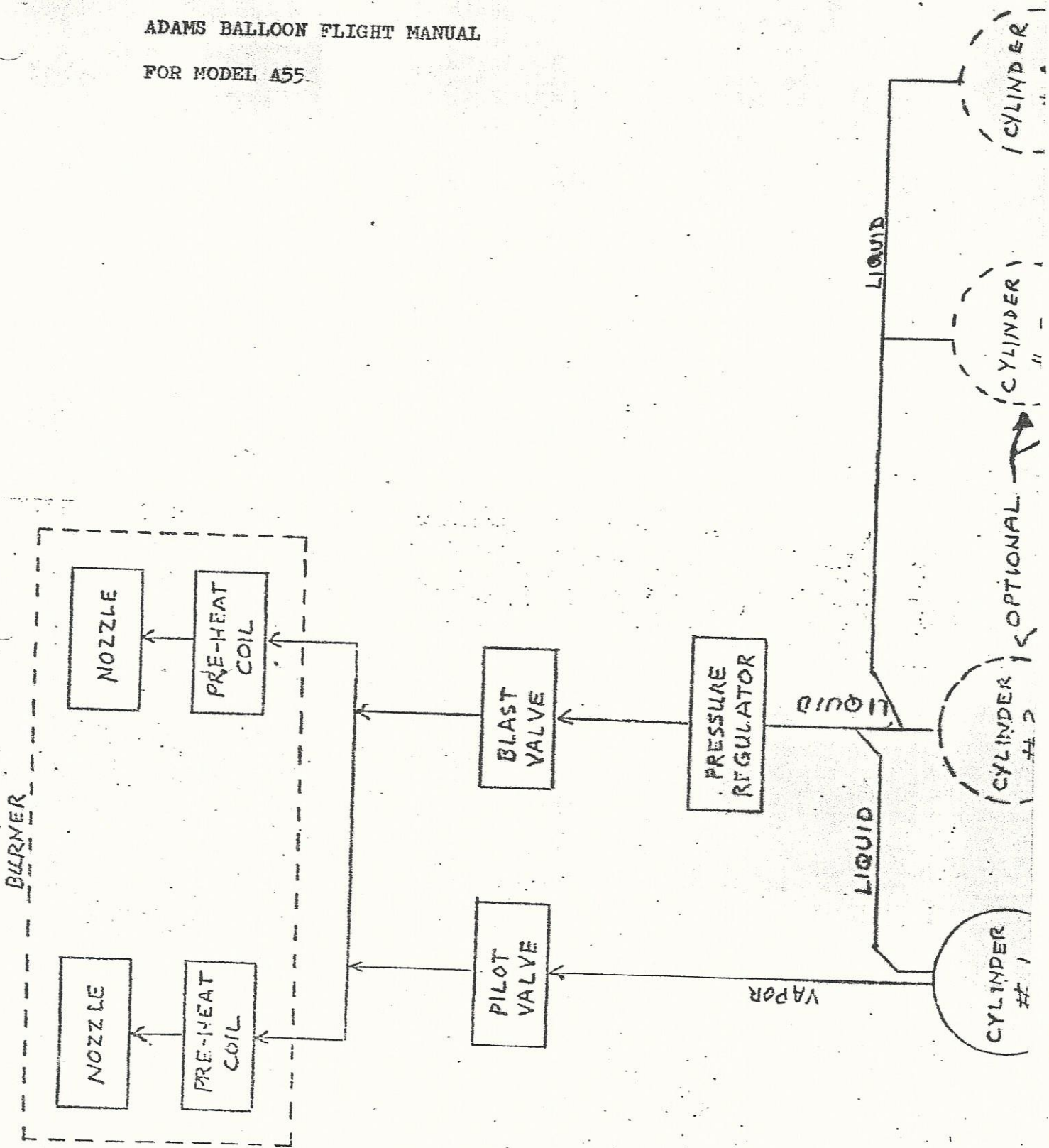
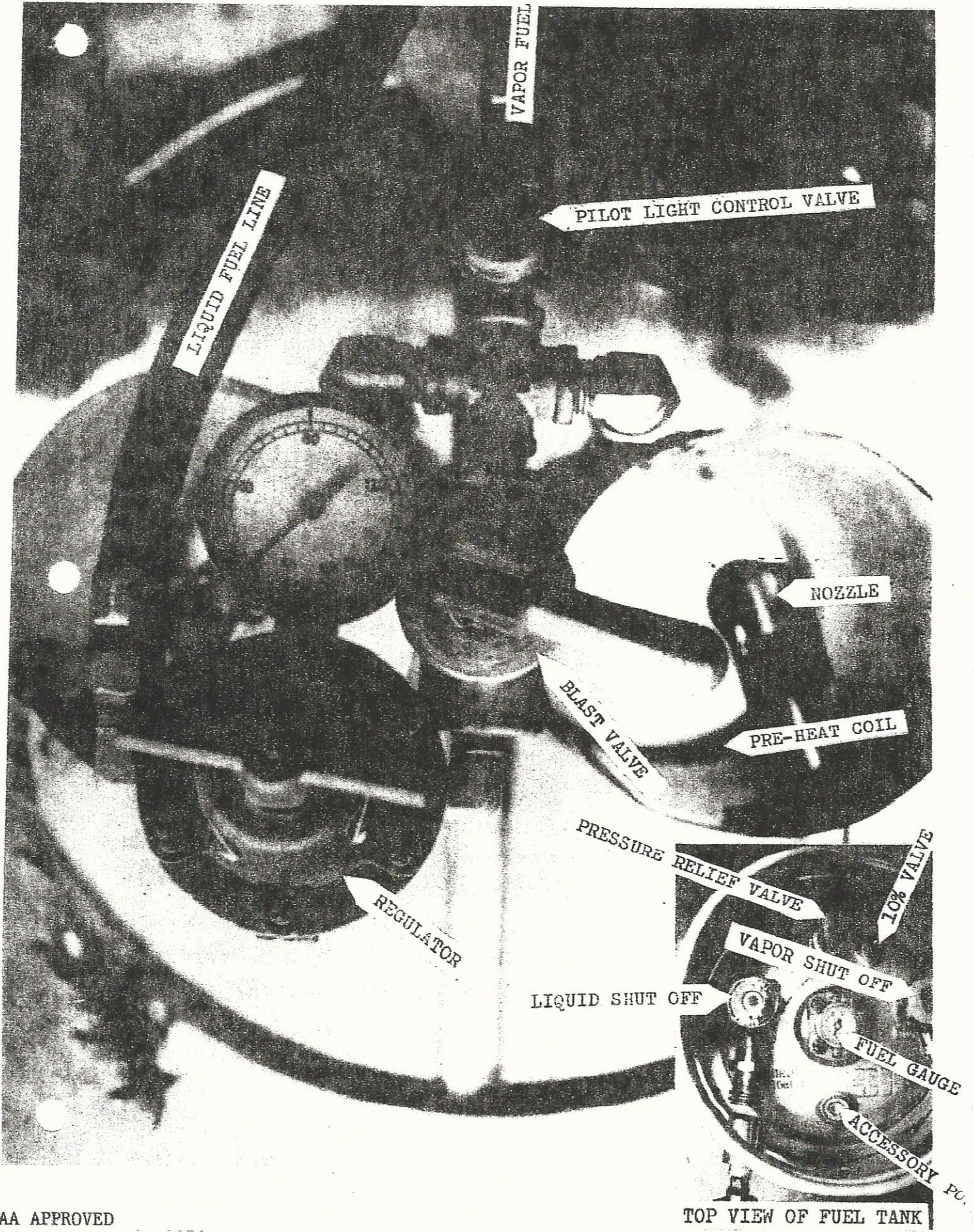


FIG 3

FUEL SCHEMATIC

FIG 4
FUEL CONTROLS

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NOTE: It is the responsibility of the balloon owner and the pilot to ensure that the balloon is loaded properly. The empty weight for this balloon as delivered from the factory is noted below.

LOADING INFORMATION

Actual Weights	<u>weight</u>
Basket (including instruments)	_____
Ser. No. _____	
Envelope	_____
Ser. No. _____	
Fuel Tanks - up to 4 Worthington model LE-43-U4 allowed.	
Empty fuel tank	28 lbs.
Full Fuel Tank	71 lbs.

SAMPLE LOADING

Example Loading - approximate weights

Basket (including instruments)	<u>140 lbs.</u>
Envelope	<u>210 lbs.</u>
Empty weight not including fuel tanks	350 lbs.
Assume 2 full fuel tanks	142 lbs.
Pilot	170 lbs.
Passenger	210 lbs.
Take off gross weight	<u>872 lbs.</u>

(maximum allowable gross weight - 1500 lbs.)