

MAINTENANCE  
AND  
STRUCTURAL REPAIR MANUAL

FOR ADAMS BALLOONS PRODUCED UNDER TYPE CERTIFICATE  
NUMBER A1550

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ATTENTION

\* SPECIAL NOTICE \*

THIS MANUAL CONTAINS ONLY A LIST OF REPAIR, INSPECTION AND MAINTENANCE PROCEDURES TO BE FOLLOWED BY QUALIFIED AND CERTAIN PERSONNEL. THIS MANUAL IS NOT TO BE USED BY UNQUALIFIED PERSONNEL IN PERFORMING ANY INSPECTIONS OR REPAIRS TO ANY ADAMS BALLOON. THIS MANUAL IN NO WAY UNDERTAKES TO PROVIDE INSTRUCTION IN THE REPAIR AND MAINTENANCE OF AN ADAMS BALLON, AND MIKE ADAMS BALLOON LOFT, INC. EXPRESSLY DISCLAIMS ANY LIABILITY WHATSOEVER ARISING OUT OF THE USE OF THIS MANUAL.

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## INTRODUCTION

Material which follows in this manual is a listing of approved inspection, maintenance and repair procedures for persons skilled in balloon repair, and is NOT INTENDED to teach basic skills.

Only materials and parts approved by TC # A15SO may be used in repair and maintenance of Adams Balloons. Use of other materials or techniques must be considered as a major alteration of the aircraft and should be done in compliance with the appropriate Federal Aviation Administration regulations.

Unless otherwise specified techniques approved in the "Airframe and Powerplant Mechanics Handbook" are acceptable.

Mike Adams Balloon Loft, Inc. expressly denies any liability for damage or any claim arising out of the use of this manual for the inspection or repair of any balloon performed by any person.

## INSPECTIONS

The following check lists should be followed for 100 HR. and/or ANNUAL INSPECTION and repairs conducted in accordance with approved Adams materials, parts and procedures listed herein before returning to service.

### A. Envelope – Inspection includes

1. General integrity of all fabric seams.
2. Each fabric panel for tears, melt holes, Abrasions and heat damage
3. Fabric tensile strength to 30 LBS minimum over a one inch area. Test area will be within 15 feet of the balloon apex with intent to find the weakest fabric.
4. Temperature recording tabs located on gore seam 1 in crown of balloon, if tabs have been activated replace and attach old tabs to the current page in the aircraft logbook
5. All webbing for proper attachment to envelope and possible wear or heat damage
6. All cable connections for possible wear or heat damage
7. Crown load plate and web connections on prevent and multi vent models
8. Control lines for heat or chafe damage
9. Control line guides (grommets) and junctions of web to cable or line
10. Deflation mechanism (pop top models) and crown safety lines
11. Suspension cables for frays kinks or damage
12. Envelope attachment caribeeners for wear, fatigue and swing gate function
13. Heat guards at web cable connections of envelope suspension cables
14. Inflate and check that all vents open and close properly and control lines are proper length (enough excess for 10% elongation of total assembly)

### B Gondola – Inspection includes

1. All suspension cables especially in the area where the cable passes through the flooring and between the flooring and skid assemblies Maximum allowable slack in cables with burner struts up is one inch excess in length
2. Nicopress fittings- thimble liner must be proper in position and sleeve is not damaged
3. Load plate in the center of the basket must be secure and undamaged
4. Plywood floor for possible cracks or rot
5. Oak Skids must be secure, check for general wear, possible cracks or splits
6. Stainless steel eye bolt where envelope attaches to gondola for any signs of wear or distortion

7. Burner load ring welds for cracks or possible distortion
8. All bolts and nuts (except skids) replace where corroded or otherwise damaged replace any worn fiber lock nuts
9. All leather straps for general integrity

C. Instruments-Inspection includes:

1. Altimeter and vertical speed instruments may be serviced only by a licensed repairman at an authorized repair facility. For calibration of either instrument send it to the factory or an approved facility.
2. WESTON temperature gauge should be calibrated to boiling water. Adjustment is made with an Allen screw located on the side of the face housing. Use a known accurate thermometer to calibrate with.
3. Breather ports, small holes located one inch up and over from the bottom back corners of the instrument box must be clear of all obstructions.
4. Compass is glued in with silicone glue and should not be removed except for replacement.
5. Instrument attachment screws should be checked for possible looseness
6. For other instrumentation see that manufacturer's maintenance instructions

D. BURNER AND FUEL SUPPLY SYSTEM-Inspection includes:

1. Check for any distortion or physical damage.
2. Pressurize entire system and check for leaks.
3. Light pilot lights and check function of each.
4. Fire burner and check flame pattern.
5. Service REGO T-50 valve cores.
6. Service PARKER Pilot valve.
7. Snug gimbal bolts to dampen gimbal swing of burners and replace safety wire
8. Inspect for any loose fittings
9. check that anti-swivel link between triggers allows free action of triggers
10. Inspect all fuel lines for wear, cuts or swelling.
11. Check all fuel line end fittings for security.
12. Service all tank valves\_ replace "O" rings and lubricate
13. Inspect external surface area of tanks for pitting or other physical damage

## MATERIALS DESCRIPTION

### A. FABRICS

1. 1.9 OZ. RIP STOP NYLON, RESIN IMPREGNATED, urethane coated, or silicone coated 70 X 70 DEN fabric
2. 6 OZ. FIRE RETARDANT NOMEX.

### B. WEBS

1. 1" WIDE NYLON, 1000 LB. MIN TENSIL.
2. 3/8" WIDE NYLON OR POLYESTER, 200 LB. MIN. TENSIL.

### C. SEAMS

1. THREAD- FED. STD. VT 285 TYPE 1 CLASS 1 V-69 OR DB-69 BONDED POLYESTER
2. STITCH- FED. STD. 751a LOCK STITCH TYPE 301
3. GAUGE- 1/2 OR 3/8 INCH
4. NEEDLE SIZE 18.
5. STICH LENGTH- 7 PLUS OR MINUS 1 PER INCH.
6. SEAM TYPE- 3/4 INCH FELL, TYPE LSC2 OR LAP SEAM.

### D. LINES.

1. GONDOLA- 1/2 " POLYPROPELENE TWIST.
2. ENVELOPE  
1/2 "-5/8" NYLON YACHT BRAID.  
5/16" NYLON YACHT BRAID.  
1/4" NYLON DIAMOND BRAID.  
1/8" NYLON DIAMOND BRAID.

### E. STEEL CABLES

1. GONDOLA  
5/32" – 7 X 19 GALV. CARBON STEEL AIRCRAFT
2. ENVELOPE  
3/32"- 7 X 19 STAINLESS STEEL AIRCRAFT  
1/8" – 7 X 19 STAINLESS STEEL AIRCRAFT  
3/32" – 7 X 19 STAINLESS STEEL OR GALV. CARBON STEEL AIRCRAFT

NOTE: USE ONLY A.N. HARDWARE & SWEDGING SPECS.

### F. FUEL LINES

1. 1/4" I.D. POLYESTER CORD U.L. APPROVED

### G. BURNER

FACTORY PARTS ARE REQUIRED FOR ENTIRE BURNER ASSEMBLY AND FUEL SYSTEM.

### H. BURNER SUPPORT STRUT TUBES

6061-T6 1 1/4 " X .035"

## REPLACEMENT OF PARTS

The following is the basic criteria for replacement of damaged components and deals only with minimum acceptable standards. When In doubt contact the factory.

THIS SECTION IS NOT INTENDED TO BE A COMPLETE GUIDE FOR REPLACEMENT

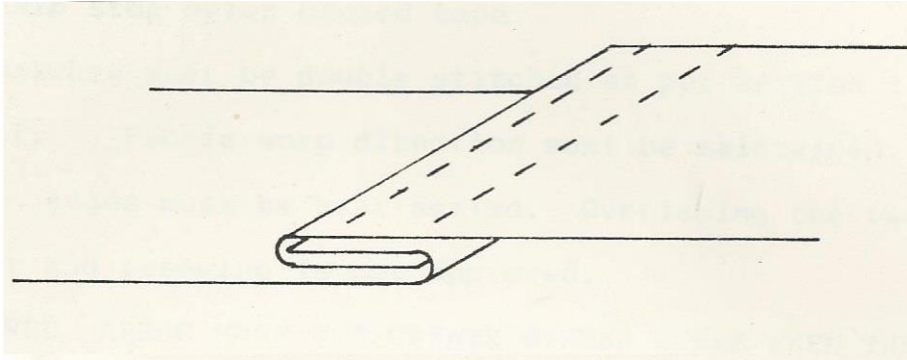
1. Replace any fabric which fails minimum strength test.
2. Replace any part which is specified or found faulty by the check list.
3. Replace any web or line which appears to have heat or other damage to 10% or more of its width
4. Replace any steel cable which has rust, broken fibers or shows loss of temper from annealing
5. Replace yellow deflation mechanism in POP-TOP models at 100 hours total service or if there is evidence that there has been enough wear in the area where the pin slides through to cause binding. Replace only with factory part.
6. Replace ant REGO-50 valve core bonnet in which the cylinder wall is scored in any way.
7. Replace deflation pin on POP-TOP models if pin is scarred sufficiently to cause friction binding in the mechanism.
8. It is possible to replace all fabric panels in the balloon if the repair station or mechanic feels it to be necessary



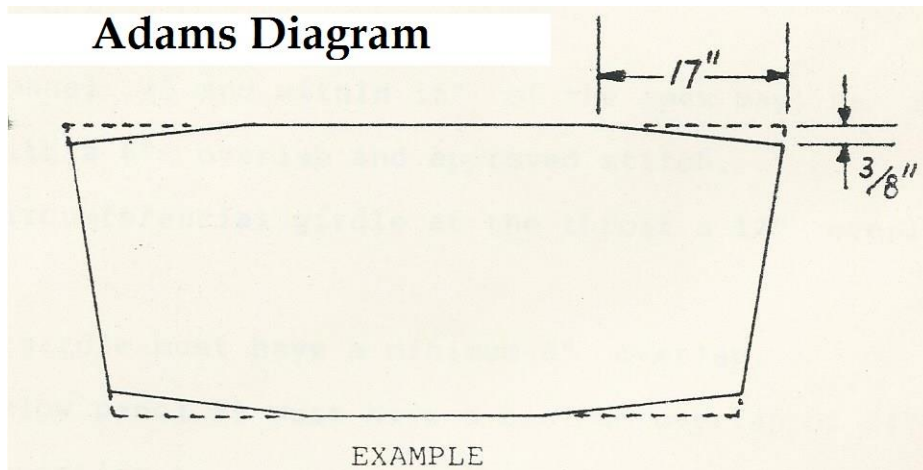
## REPAIR TECHNIQUES

### A. FABRIC REPAIRS

1. REPLACING COMPLETE PANELS- Use LSC2 fell seam for all panel replacements.



NOTE: Panels are cut with a  $\frac{3}{8}$ " taper on top and bottom. Edges extending 17" toward the center of each panel except deflation port panels and #1 NOMEX throat panels. All panels use between 42 and 60" fabric and all cuts are straight lines.



2. FABRIC PATCHES- The minimum allowable unpatched tear above panel #5 (panels are counted from bottom up beginning with the NOMEX throat panel as panel #1) is 1/2 in length or one square inch for melt hole or scorch area. Any time a tear or melt crosses a panel seam the panel seam must be reestablished by opening up the seam and patching the panels separately and the resewing that area of the panel seam. Fabric patches may be:

- LSC2 fell seam

- Flat lap with hot knife edges

- Rip stop nylon backed tape

All patches must be double stitched as per SECTION 3 C of this manual. Fabric warp direction must be maintained. All exposed edges must be heat sealed. Overlapping the two

Edges of a tear and resewing is not approved.

NOTE: REPAIRED AREA MUST NOT CREATE STRESS LINES WHEN THE BALLOON IS INFLATED.

B. WEBBING PATCHES OR SPLICES

1. NOT APPROVED FOR CONTROL LINES
2. BETWEEN PANEL #5 AND WITHIN 15" OF THE APEX MAY BE ACCOMPLISHED WITH A 6" OVERLAP AND APPROVED STITCH.
3. FOR THE CIRCUMFERENTIAL GIRDLE A at the throat a 12" overlap is required.
4. The crown girdle must have a minimum 6" overlap
5. Splices below panel # 5 must have a minimum overlap of 24"
6. If web connection to suspension cables is replaced a 3ft. splice must be made to the remaining web and then sewn to the envelope.
7. It is possible to replace an entire load tape from apex to mouth if the repair station or mechanic feels it to be necessary

C. STEEL CABLES – SPLICES ARE NOT APPROVED

1. Envelope suspension cables may be replaced with either:  
1/8" – 7 x 19 S.S. aircraft cable

3/32" – 7 x 19 S.S aircraft cable

3/32" – 7 x 19 galv. Cbn. Steel aircraft cable

2. Deflation control cables:

3/32" – 7 x 19 galv. Cbn. Steel aircraft cable

3. Gondola suspension cables:

5/32" – 7 x 19 galv. Cbn. Steel aircraft cable

D. WICKER AND WOOD REPAIRS

The woven sides of the gondola are considered secondary load bearing and may be patched, repaired or rewoven at the discretion of the repairman. The plywood floor is a primary load bearing component however and should be maintained in accordance with approved woodworking methods. (see "AIRFRAME AND POWERPLANTS MECHANICS HANDBOOK")

E. BURNER AND FUEL SYSTEM REPAIRS

1. Burner model PN5-2, standard equipment for all Adams Balloons S/N 072 and above, requires considerable experience to align. It is recommended that for alignment or replacement of parts other than valves or pilot light components the entire unit be returned to the factory.
2. Defective or clogged pilot orifices can not be recycled and the entire sub assembly should be replaced.
3. If during normal operation the burner manifold temperature goes above 125 degrees F. or below 50 degrees F the entire assembly should be returned to the factory for servicing and alignment.

4. When servicing REGO T-50 valve cores replace "O" ring and lubricate with unmedicated Vaseline. Use two wraps of TEFLON tape on hex bonnet threads and tighten to 60 ft. lbs.

5. Servicing of fuel tanks includes:

Removal of all valve cores, replacement and lubrication of "O" rings with unmedicated Vaseline. Clean and lubricate with WD40 or equivalent all REGO 7141 connectors. Replace worn "O" rings and flat washers. Add two ounces of methanol or equivalent to each fuel cylinder with at least one gal. of L.P.G DO NOT LEAVE METHANOL IN EMPTY TANKS. Observe D.O.T. standards for hydrostatic test of tanks 12 years after date of mfgr. Stamped on cylinder.