

EO 05-1-2L

A

ROYAL CANADIAN AIR FORCE



**SELF-SEALING FUEL & OIL
CELLS PACKING, STORAGE,
MAINTENANCE & SALVAGE**

(This EO replaces EO 05-1-2L dated 19 Jun 59)

ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF

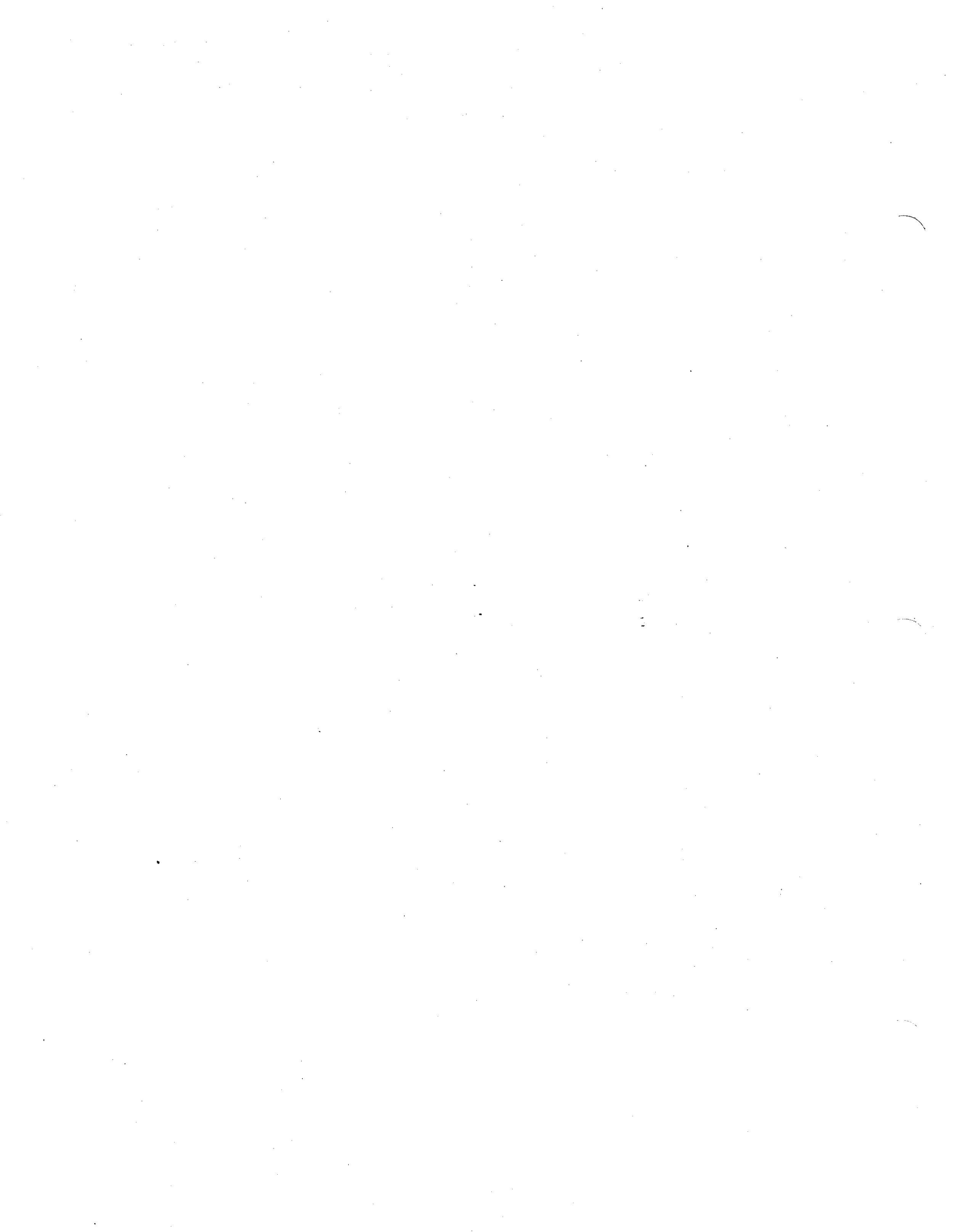
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LIST OF RCAF REVISIONS

DATE	PAGE NO	DATE	PAGE NO
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TABLE OF CONTENTS

PART	TITLE	PAGE
	GENERAL	1
	PACKING	1
	STORAGE AND HANDLING	1
	MAINTENANCE AND INSPECTION	2
	TYPES OF CELL FAILURES AND CAUSES	2
	GENERAL PRECAUTIONS FOR REMOVAL AND INSTALLATION OF CELLS	3
	SALVAGE	5
APPENDIX "A"		
	LISTS OF KNOWN FUEL CELL AND FITTING DEFECTS AND ACCEPTABLE LIMITATIONS	1



SELF-SEALING FUEL AND OIL CELLS PACKING, STORAGE, MAINTENANCE AND SALVAGE.

GENERAL

1 The following instructions apply specifically to self-sealing fuel and oil cells of American design, in which the flexible layer is immediately adjacent to the contents. However, certain of the precautions listed apply equally to the British type of self-sealing tanks, in which the sealant layer is applied to the outside of a metal tank.

PACKING

2 All cell openings are to be adequately covered with moisture-resistant adhesive tape or other suitable material to prevent entrance of foreign matter into the tank. The cell is to be supported in its crate with lint-free padded wooden supports which are to be arranged in a manner to ensure that no damage will result to the fittings or cell liner during shipment. Care is to be exercised when nailing the shipping crate together, to ensure that no nails protrude into the crate or the cell and that the fittings do not jam against or protrude through the crate. Instructions for correct handling and storage are to be clearly marked on the crate; e.g., USE NO HOOKS, THIS SIDE UP, and any other applicable instructions.

STORAGE AND HANDLING

3 Since cells deteriorate with exposure to light and heat and through improper handling, the following instructions are to be rigidly conformed to by all concerned:-

- (a) Store cells in a clean, dry, dark and cool place, away from operating electric motors, with sump drains open.
- (b) Always store cells in shipping crates. To ensure that these containers are available when required, they should be dismantled with care and stored after new or reconditioned cells have been removed from them for use. All personnel handling these crates are to exercise the degree of care consistent with contingent re-use.
- (c) Crated cells are not to be stored over three high. If cells are not crated, they must be stored on suitable padded racks, resting on the largest surface, i. e., in position in which it is installed in the aircraft. Care must be exercised to ensure that cells are not stored in any manner which may cause damage to protruding fittings.
- (d) Suitable supports, padded with lint-free material, are to be installed inside semi-flexible cells, while stored to prevent their distortion. Where cells are equipped for external support, these are also to be fitted during storage.

- (e) Cell fittings or openings are not to be used as hand grips during handling or installation.
- (f) When installing spare cells, always install first the cell which has been longest in storage.

MAINTENANCE AND INSPECTION

4 The following inspections are to be carried out on all aircraft equipped with self-sealing fuel cells:-

PRIMARY INSPECTION

(a) Through inspection doors or drain openings, where practical, visually inspect the adjacent tank structure and all cell fittings and connections for signs of leakage, indicated by swelling, softening, or by a soggy, swollen or delaminated appearance. Leakage only occurs in a very advanced stage of deterioration, in which sealing layers of the cell are completely deteriorated.

PERIODIC INSPECTION

- (b) Check the fuel strainers for the presence of rubber particles. Any accumulation of rubber particles will indicate advanced deterioration of the cells.
- (c) The interior of each cell is to be inspected with the aid of a mirror and safety light through the filler neck, inspection door, fuel contents gauge opening, or sump for the following:
 - (1) Diffusion of liquid through the synthetic liner, indicated in its initial stages by a swelling of the cell wall, with later stages recognized by a soggy, swollen or delaminated appearance.
 - (2) Loosening of the seams of the liner.
 - (3) Loosening of the fittings from the liner.

NOTE

If there is any indication of the above, cells are to be removed from the aircraft, properly crated and returned for repair or disposal action.

On completion of the above inspection, a capacity check is to be carried out by comparing the amount of fuel required to fill the tank with the amount specified adjacent to the filler cap.

TYPES OF CELL FAILURES AND CAUSES

5 The most common types of fuel cell failure associated with normal service are:-

- (a) Diffusion of liquid through the synthetic layer, causing swelling and subsequent deterioration.

- (b) Collapse of the cell.
- (c) Loosening of the fittings from the liner.
- (d) Leakage between cell and surrounding structure.

NOTE

These failures may generally be detected as follows: The diffusion of liquid through the synthetic liner, loosening of seams in the liner, and loosening of the fittings from the liner, found by visual and hand inspection of cell interior. Soft swollen area of cell surface, wrinkles in liner, or separation of the sealing layers from the liner, indicate leakage or diffusion of the fuel. The result of the capacity test noted in para. 4 (c) will indicate whether the cell has partially collapsed. Leakage of fuel between the cell and surrounding structure may be the result of improper attachment of fittings or partial failure of tank outlet connections. The first sign of failure of this nature in cells installed in a sealed structure will be collapse of these cells.

NOTE

In order to determine the serviceability of a cell, defects and acceptable limitations are included as Appendix "A" to this Engineering Order.

GENERAL PRECAUTIONS FOR REMOVAL AND INSTALLATION OF CELLS

6 The general precautions outlined below are to be adhered to in all cases:-

- (a) All inner supports and outside stiffeners are to be removed prior to collapsing the cells for installation or removal. These may be replaced by coating with soapy water. **DO NOT DRIVE THEM INTO PLACE OR USE OIL OR GREASE.**
- (b) Ensure that all fittings are disconnected from the cell before removing from aircraft.
- (c) When possible, cells are to be warmed to a temperature of 26.7°C (80 °F) before collapsing and are to be left in a collapsed condition only as long as necessary for installation.
- (d) Do not bend cells in the vicinity of fittings or inspection doors, or pry on rubber fittings with any tools.
- (e) Before entering cells, remove all sharp instruments from pockets, remove shoes and cover bottom of cell with a heavy lint-free cloth. Light bulbs must not be allowed to come in contact with the interior of the cell. Compliance with the provisions of EO 00-80-4/7 is required.

- (f) All openings must be covered when the cell is removed from the aircraft to prevent entrance of foreign matter.
- (g) The torque to be applied to all fitting connecting screws is not to exceed 25 inch-pounds, regardless of the manufacturer's instructions. This torque limit does not apply to spider type fitting attachments, in which case the manufacturer's instructions apply. The above torque loading should be applied with a torque wrench, if available. However, a four inch spanner may be used in lieu of the torque wrench. The following procedure for connecting rubber moulded fittings is recommended:-
- (1) Inspect fittings and threaded parts prior to installation to ensure freedom from foreign matter, damaged threads, or other defects.
 - (2) Align mating surfaces so that screws or bolts can be started with minimum torque.
 - (3) Distribute a sufficient number of bolts uniformly about the fitting to ensure an even seating of the mated surfaces.
 - (4) Install the remaining bolts, then torque all bolts to the specified value, using a diametrically opposite sequence.
 - (5) If torque drops after bolts have been torqued to a specified value, do not tighten bolts to regain torque value; this is normal and is due to "cold flow" of the rubber fitting surface. Instead, loosen all bolts and completely retorquer fitting.

NOTE

Excessive torques result in deformation of synthetic rubber, contributing to compound failure and fuel leakage. If after securing the fittings as directed, a leak is detected, the torque should be checked. If it has not fallen greatly below the initial torque, or below 20 inch-pounds, the mating surfaces should be examined for the cause of the leakage. Overtightening must not be resorted to, as it will definitely result in failure of the fitting and surrounding cell area. This may not be evident on surfaces which are dry and have not been exposed to fuel, but when synthetic rubber is subjected to extensive compressive forces and exposed to the action of fuel, it will crack or chunk off over the mating surfaces and delaminate on the edges.

(h) Seam sealing materials, such as Prestite or Sealube, are not to be used as rubber to rubber and metal to metal applications for self-sealing cells. These materials contain solvent detrimental to synthetic rubber, and also have a lubricating effect on synthetic rubber, causing increased "cold flow". Should some of the paste accidentally get into the screw threads, and into the bottom of the blind tapping, the increased friction results in rapid torque build-up without corresponding cramping pressure on the fitting stalk.

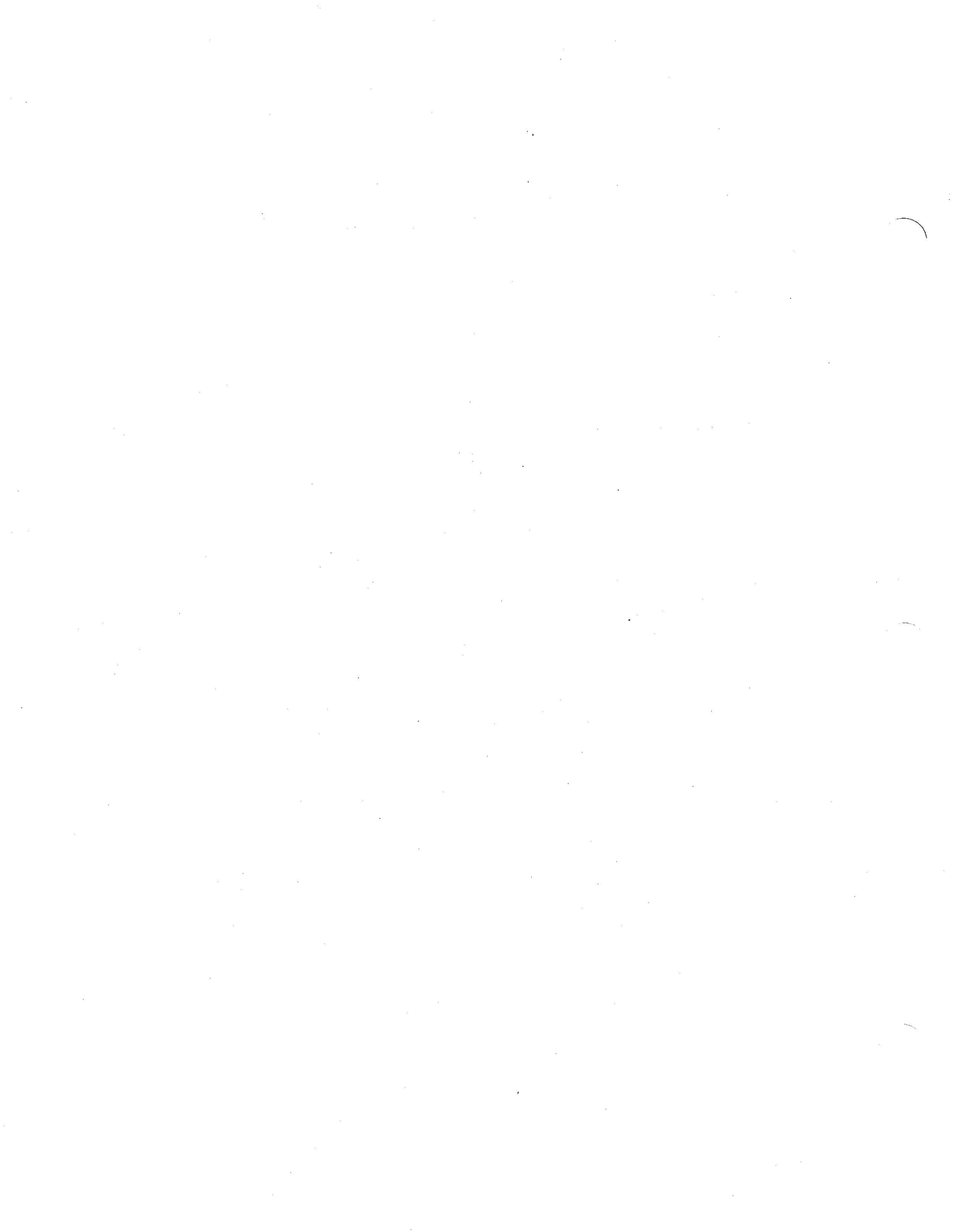
WARNING

Personnel working with their heads in these cells, must use smoke respirators, or gas masks having a breather connected by a tube to the outside air instead of to the usual gas mask cannister.

SALVAGE

7 For salvage action proceed as follows:-

- (a) The cells are to be removed from the aircraft as soon as possible.
- (b) Before commencing salvage or entering the cell, it is to be completely drained, flushed and aired in accordance with the procedure outlined in EO 00-80-4/7.
- (c) See procedure outlined in paras. 6(b), (d) and (e).
- (d) All serviceable parts, such as detachable fittings are to be salvaged and stored with the cell for re-issue.
- (e) After removal, the cells are to be immediately inspected by qualified personnel for evidence of damage or deterioration, then brushed or sprayed internally with engine oil, Ref. 34A/35. Serviceable cells are to have all apertures sealed in accordance with EO 05-1-2AV and tagged for re-issue. Damaged cells are to be returned to supply section for repair.
- (f) Cells which require repair will not be treated with oil. They are to be properly crated and returned for repair.



LISTS OF KNOWN FUEL CELL AND FITTING DEFECTS
AND ACCEPTABLE LIMITATIONS

1. SERVICEABLE SELF-SEALING CELLS.

a. Cell Interior:

CONDITION	LIMIT
(1) Loose liner at throat of fitting.	1/2-inch looseness in width around entire circumference at throat of fitting (see figure 2).
(2) Edge looseness at liner lap.	Acceptable up to 1/4-inch width maximum length of liner lap, provided 1-inch bond is maintained.
(3) Edge looseness on liner reinforcements, corner patches, and chafing patches.	1/2-inch maximum looseness, provided loose area does not exceed 15 percent of total area. Blisters or separations other than in the edge area allowable up to 15 percent of total area.
(4) Looseness under cemented components such as attaching straps, baffle shoes, etc.	15 percent of individual area provided 1/4-inch bond is maintained around the edge (see figure 3).
(5) Blisters between liner and fitting flange.	1/4-inch maximum dimension; maximum one per lineal foot and two per fitting provided 1-inch bond is maintained (see figure 2).
(6) Damaged grommets in accessories.	Acceptable provided serviceability is not affected.
(7) Damaged coating on accessories (metal, wood or rubber).	Acceptable provided rust, corrosion or other deterioration is not present.
(8) Checking due to weather, ozone, dry cracking or surface imperfections	Acceptable provided there is no indication of activation.
(9) Blisters in liner laps.	1/4-inch maximum dimension; average one per lineal foot of splice with a maximum of five in any one 5-foot length of splice (see figure 4).
(10) Blisters, delaminations, or ply separations.	1-inch maximum dimension provided there is a 6-inch bond between blisters and no more than one per square foot of total cell area.
(11) Channels in inner-liner laps.	1/8-inch by 3-inch maximum dimension with a maximum of one in any 5 lineal feet of splice (see figure 4).
(12) Channels around entire outer edge of fitting flange.	1/4-inch maximum width (see figure 2).
(13) Channels at tapered construction step-off area or edge of lap splices of any ply.	1/4-inch maximum width entire length of lap (see figure 5).
(14) Open end channels in three-ply liner overlaps or tailored corners.	1/8-inch by 3-inch maximum dimension provided 1-inch minimum bond is maintained between end of channel and sealant (see figure 4).

Cell Interior (continued)

CONDITION	LIMIT
(15) Cuts or holes in inner-liner.	Not acceptable.
(16) Buffing through inner-liner.	Not acceptable.

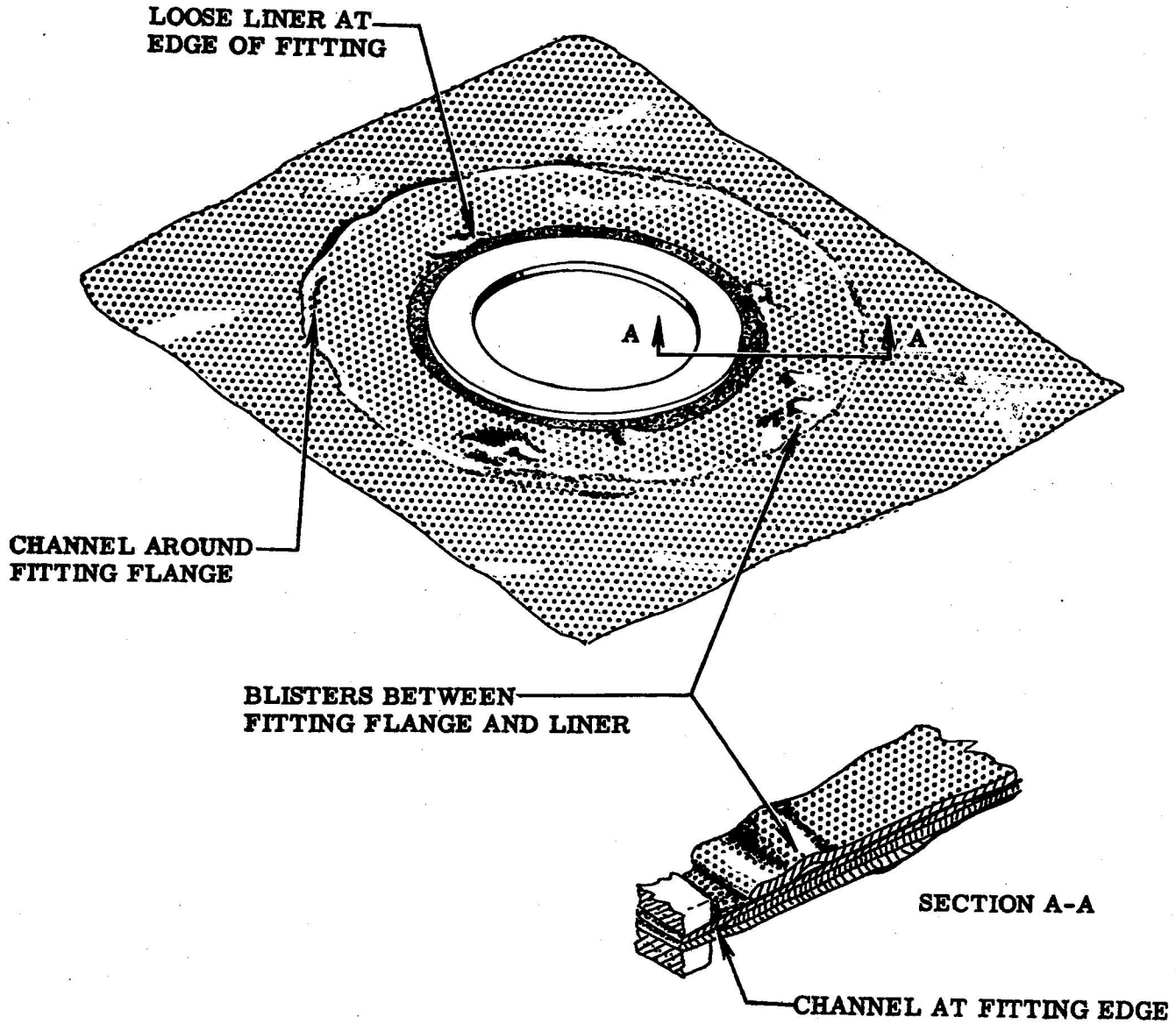


Figure 2

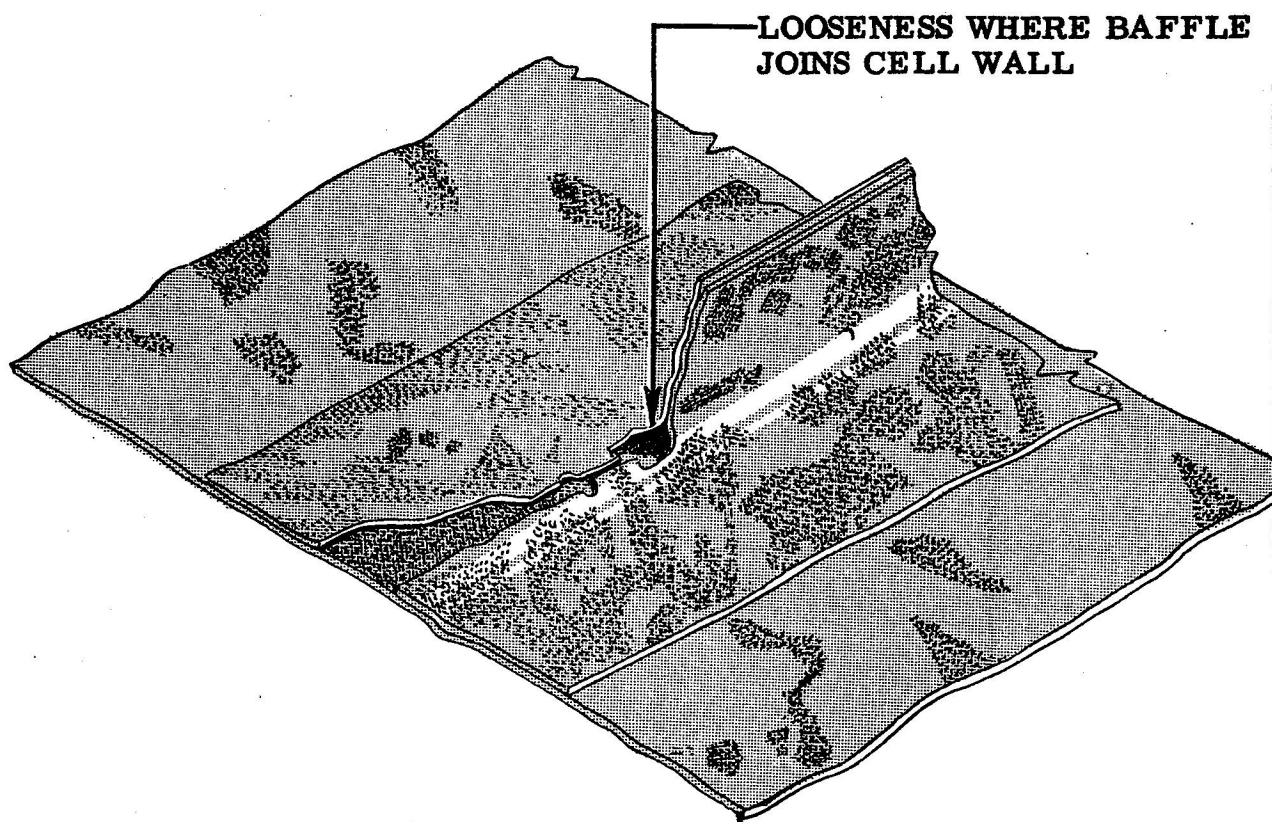


Figure 3

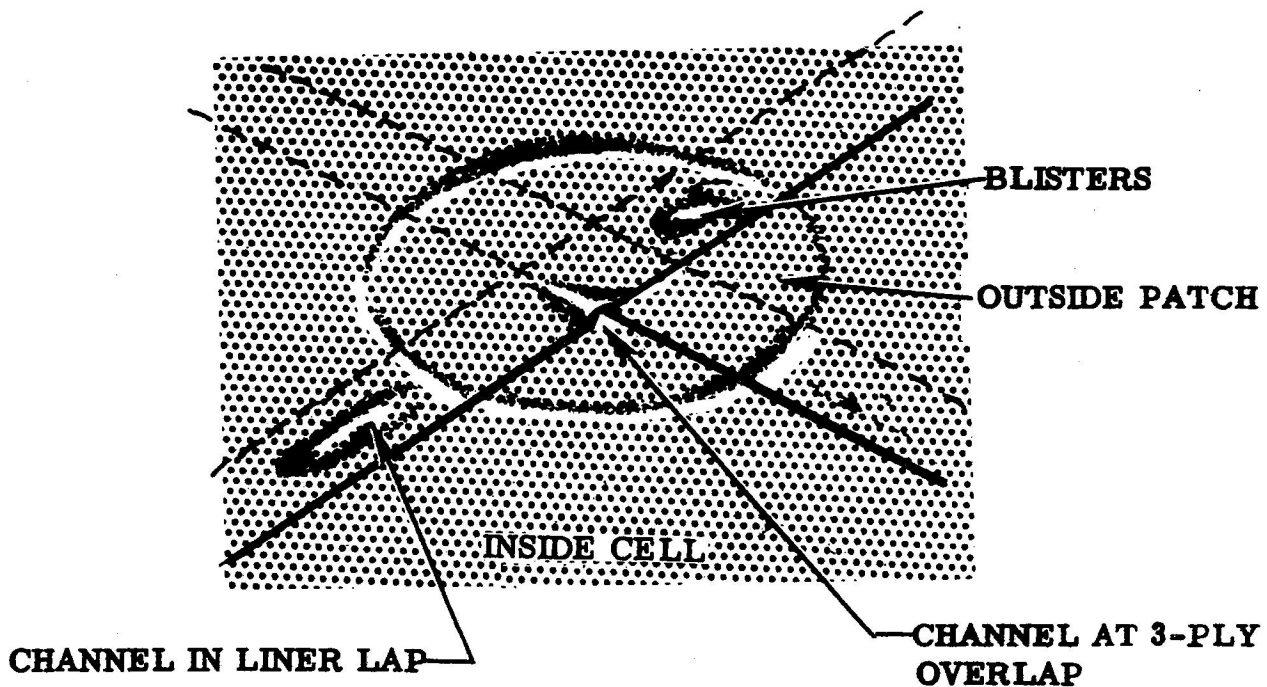


Figure 4

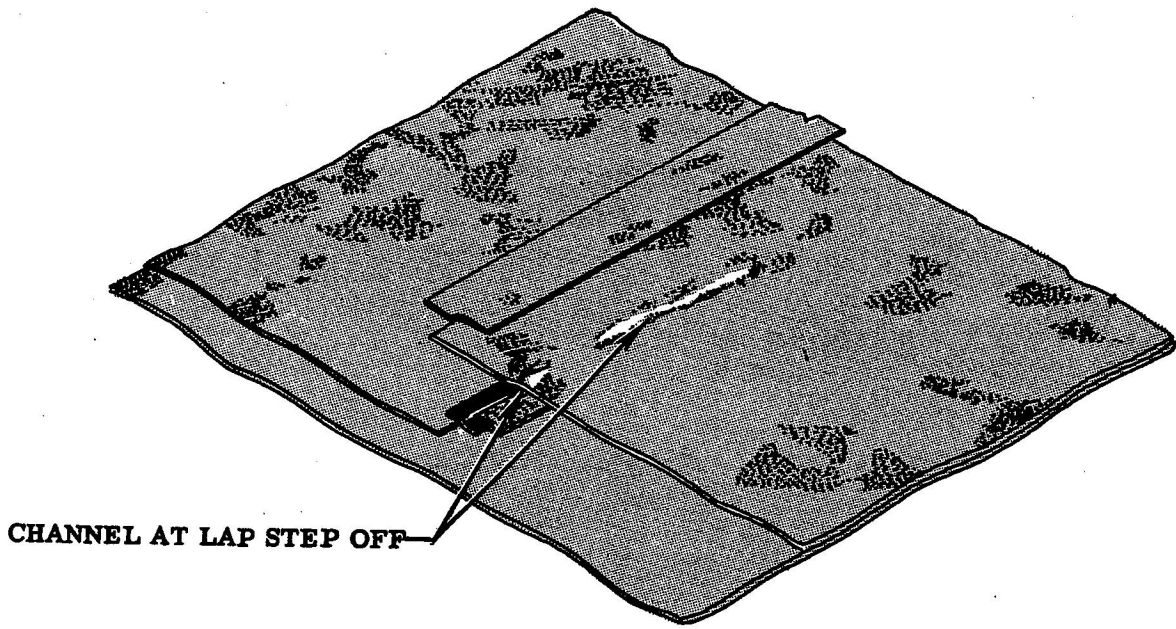


Figure 5

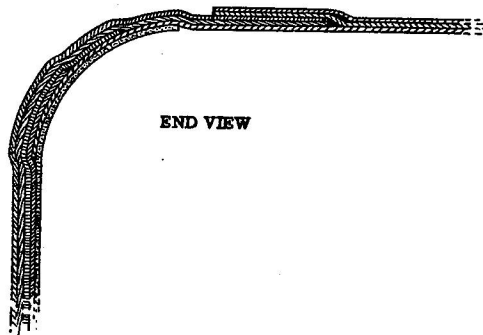
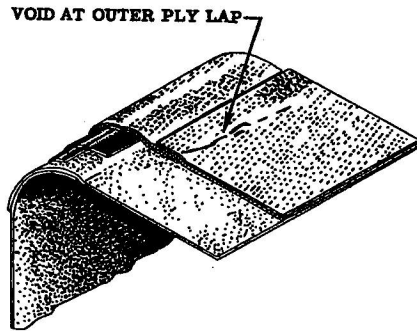


Figure 6

b. Cell Exterior:

CONDITION	LIMIT
(1) Blisters or ply separation between any plies except liner and sealant.	1-inch maximum dimension.
(2) Skim coat blisters.	Acceptable.
(3) Loose hanger straps or hanger attaching points.	Acceptable up to 15 percent of total area provided 1/4-inch bond is maintained around the edge.
(4) Loose or damaged tapes, corner patches, and other outside accessories.	1/2-inch maximum allowable looseness provided this looseness does not exceed 15 percent of the total area.
(5) Checking due to weather, ozone, dry cracking or surface imperfections	Acceptable.
(6) Damaged grommets in accessories.	Acceptable, provided serviceability is not affected.
(7) Damage through outer cord or fabric ply.	Not acceptable.
(8) Channels or bridging of outer plies at cord or fabric splice.	1/2-inch maximum width full length of splice (see figure 6).
(9) Outer ply cuts or splits parallel to cords where cords are not damaged.	Not acceptable; may result in outside activation.

c. Fittings:

(1) Rubber Face Fittings.	
(a) Gouges, splits, or deep indentations on the sealing surfaces.	1/16-inch maximum depth by 1/16-inch maximum length.
(b) Weather checking of surfaces other than sealing surfaces.	Acceptable.
(2) "O" Ring Fittings.	
(a) Sealing face without groove:	
1. Scratches within the sealing area.	Not acceptable (see figure 7).
2. Burrs on mating surface.	Not acceptable (see figure 7).
3. Damage to protective coating.	Acceptable.
4. Corrosion or rust.	Not acceptable.

Fittings (continued)

CONDITION	LIMIT
(b) Sealing face with groove:	
1. Minor surface damage outside of "O" ring groove other than rust, corrosion or burrs.	Acceptable (see figure 7).
2. Physical damage to "O" ring groove.	Not acceptable.
3. Corrosion or rust.	Not acceptable.
4. Cement or other foreign material in "O" ring groove.	Not acceptable.
(3) Bent or broken fittings.	Not acceptable.
(4) Thread damaged fittings.	Acceptable provided serviceability is not affected.

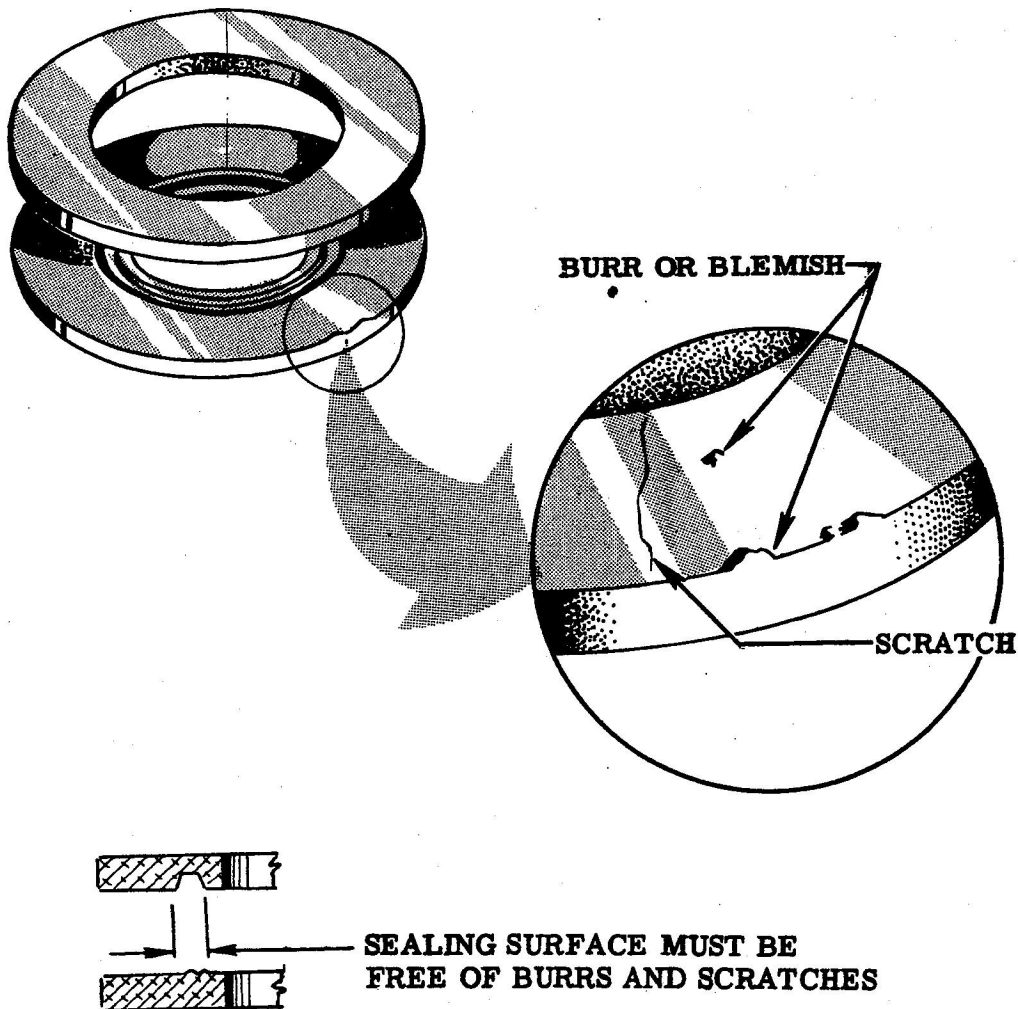


Figure 7

2. SERVICEABLE BLADDER TYPE CELLS.

a. Cell Interior:

CONDITION	LIMIT
(1) Loose liner at throat of fitting.	1/2-inch looseness in width around entire circumference at throat of fitting, except*Firestone 1052-6 construction on which 1/16-inch edge looseness will be allowable (see figure 2).
(2) Loose liner lap.	1/4-inch looseness maximum width in edge of liner lap and full length of lap provided 1-inch bond is maintained, except*Firestone 1052-6 construction on which 1/16-inch edge looseness will be acceptable.
(3) Edge looseness on liner reinforcements and chafing patches.	1/2-inch maximum allowable looseness provided this looseness does not exceed 15 percent of total area. Blisters or separations other than in the edge area allowable up to 15 percent of the total area.
(4) Looseness of cemented internal support components such as attaching straps, baffle supports, etc.	Acceptable up to 15 percent of component area provided 1/4-inch solid bond is maintained around the edge (see figure 3).
(5) Blisters between fitting flange and adjacent ply.	1/4-inch maximum dimension; maximum one per lineal foot and two per fitting provided 1-inch bond is maintained (see figure 2).
(6) Damaged grommets in accessories.	Acceptable provided serviceability is not affected.
(7) Damaged coating on accessories (rubber, metal or wood).	Acceptable provided no rust, corrosion or deterioration is apparent.
(8) Weather checking or minor surface imperfections in liner ply and reinforcement.	Acceptable provided serviceability is not affected.
(9) Blisters between liner laps.	1/4-inch maximum dimension; average one per 5 lineal feet of splice with a maximum of five in any one 5-foot length of splice (see figure 4).
(10) Blisters between plies (in cell panels).	1/4-inch maximum dimension; minimum of 6-inch bond between blisters and no more than one per square foot of cell area.
(11) Channels in liner laps.	1/8-inch by 3-inch maximum dimension with a maximum of one in any 5 lineal feet of lap (see figure 4).
(12) Channels around entire outer edge of fitting flange.	1/8-inch maximum width around entire fitting flange (see figure 2).
(13) Buffing through inner-liner.	Not acceptable.
(14) Exposed fabric.	Acceptable provided fabric is not damaged.
(15) Delamination between plies.	1-inch maximum dimension; average of one per 5 square feet of area with a maximum of five in any one 5 square feet of area. Minimum 6-inch solid bond between delaminations.
(16) Cuts or holes in inner-liners.	Not acceptable.

* TV 1/2 - T-33 aircraft only.

b. Cell Exterior:

CONDITION	LIMIT
(1) Skim coat blisters.	Acceptable.
(2) Lap Splice edge looseness.	1/4-by 3-inch maximum dimension provided there are no more than one per lineal foot.
(3) Loose or damaged hanger straps or hanger attaching points.	Acceptable up to 15 percent of component area provided 1/4-inch solid bond is maintained around the edge (see figure 8).
(4) Loose tapes, corner patches or other outside non-load carrying accessories.	1/2-inch maximum allowable looseness provided this looseness does not exceed 15 percent of the total area.
(5) Skim coat off outer ply.	Acceptable provided cords or fabrics are not cut or broken.
(6) Mislocated, blistered, split or weather checked tape.	Acceptable; missing tape to be replaced.
(7) Blisters or looseness between labels or decals and body of cell.	Acceptable.
(8) Weather checked or surface imperfections in outer ply or reinforcements.	Acceptable provided fabric is not damaged or broken.
(9) Blistered, loose or missing lacquer coating.	Acceptable.
(10) Blisters between fitting flange and adjacent ply.	1/4-inch maximum dimension; maximum of one per lineal foot and two per fitting provided 1-inch bond is maintained (see figure 2).
(11) Delamination between plies.	1-inch maximum dimension; average of one per 5 square feet of area with a maximum of five in any one 5 square foot area. Minimum 6-inch solid bond between delaminations.
(12) Damaged grommets in accessories.	Acceptable provided serviceability is not affected.
(13) Blisters between outer ply laps.	1/4-inch maximum dimension; average one per 5 lineal feet of splice with a maximum of five in any one 5-foot length of splice.
(14) Blisters between plies (in cell panels).	1/4-inch maximum dimension; minimum of 6-inch bond between blisters and no more than one per square feet of cell area.
(15) Channels in outer ply laps.	1/4-inch width entire length of lap.
(16) Channels around entire outer edge of fitting flange.	1/8-inch maximum around entire fitting flange (see figure 2).
(17) Damage through any cord or fabric ply.	Not acceptable.

c. Fittings:

CONDITION	LIMIT
(1) Rubber Face Fittings.	
(a) Gouges, splits or indentations on the sealing surface.	1/16-inch maximum depth by 1/16-inch maximum length.
(b) Weather checking of surfaces other than sealing surface	Acceptable.
(2) "O" Ring Fittings.	
(a) Sealing surface without groove:	
<u>1.</u> Scratches within the sealing area.	Not acceptable (see figure 7).
<u>2.</u> Burrs on mating surface.	Not acceptable (see figure 7).
<u>3.</u> Corrosion or rust.	Not acceptable.
(b) Sealing surface with groove:	
<u>1.</u> Minor surface damage outside "O" ring groove other than rust, corrosion or burrs.	Acceptable (see figure 7).
<u>2.</u> Physical damage to "O" ring groove.	Not acceptable.
<u>3.</u> Corrosion or rust.	Not acceptable.
<u>4.</u> Cement or other foreign matter in "O" ring groove.	Not acceptable.
(3) Bent or broken fittings and/or damaged dome nuts.	Not acceptable.
(4) Elongated or torn holes in fitting areas of cells using U. S. Rubber removable two-piece metal compression fittings.	Acceptable provided the elongation or tear does not extend beyond the outer or inner sealing groove of the inner ring, or over one-half the distance to the next hole.
(5) Thread damaged fittings.	Acceptable provided serviceability is not affected.

(After Installation)

3. SELF-SEALING CELLS.

a. Cell Interior:

- | | |
|---------------------------------------|--|
| (1) Loose liner at throat of fitting. | 1/2-inch looseness in width around entire circumference at throat of fitting (see figure 2). |
|---------------------------------------|--|

Cell Interior (continued)

CONDITION	LIMIT
(2) Edge looseness at liner lap.	1/2-inch maximum depth provided remainder of bond is good (see figure 4).
(3) Edge looseness on liner reinforcements, corner patches, and chafing patches.	1/2-inch maximum looseness provided loose area does not exceed 20 percent of total area. Blisters or separations other than in the edge area allowable up to 20 percent of total area.
(4) Looseness under cemented components such as attaching straps, baffle shoes, etc.	20 percent of individual area provided 1/4-inch bond is maintained around edge (see figure 3).
(5) Blisters between liner and fitting flange.	1/2-inch maximum dimension; maximum two per lineal feet and three per fitting, provided 1-inch bond is maintained (see figure 2).
(6) Damaged grommets in accessories.	Acceptable provided serviceability is not affected.
(7) Damaged coating on accessories (rubber, metal or wood).	Acceptable provided rust, corrosion, or other deterioration is not present.

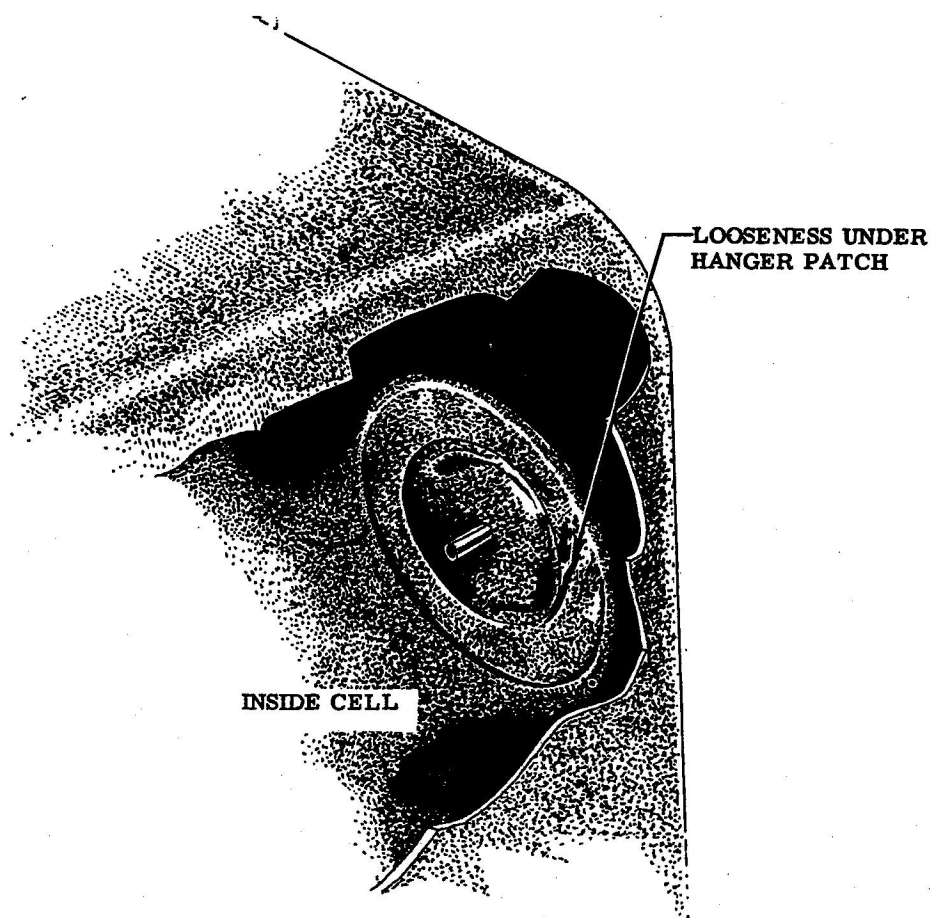


Figure 8

Cell Interior (continued)

CONDITION	LIMIT
(8) Checking due to weather, ozone, or dry cracking, or surface imperfections	Acceptable provided there is no indication of activation.
(9) Blisters in liner laps.	1/2-inch maximum dimension; maximum of five in any 5 lineal feet of splice with a minimum of 6-inch bond between blisters (see figure 4).
(10) Blisters, delaminations or ply separation.	1 1/2-inches maximum provided there is a 6-inch bond between blisters and no more than one per square foot of cell area.
(11) Channels in inner-liner laps.	1/4-inch by 3-inch maximum dimension with a maximum of one in any 5 lineal feet of splice (see figure 4).
(12) Channels around entire outer edge of fitting flange.	1/2-inch maximum width (see figure 2).
(13) Channels at tapered construction step-off area or edge of lap splices of any ply.	1/2-inch maximum width (see figure 5).
(14) Open end channels in three ply liner overlaps or tailored corners.	1/4-inch by 3-inch maximum dimension provided 1-inch minimum bond is maintained between end of channel and sealant (see figure 4).
(15) Cuts or holes in inner-liner.	Not acceptable.
(16) Buffing through inner-liner.	Not acceptable.
(17) Damaged anchor fittings.	Maximum cut or worn area 25 percent of total dimension.
(18) Activated areas.	Not acceptable.
(19) Broken stiffeners or supports.	Not acceptable.
b. Cell Exterior:	NOTE
	Only accessible portions of the cells will be inspected. Cells not to be removed from aircraft for inspection.
(1) Blisters or ply separations between any plies except liner and sealant.	1 1/2-inches maximum dimension.
(2) Skim coat blisters.	Acceptable.
(3) Loose hanger straps or hanger attaching points.	Acceptable up to 20 percent of total area provided 1/4-inch bond is maintained around the edge.
(4) Loose or damaged tapes, corner patches or other outside accessories.	Acceptable provided sealant is not activated.
(5) Checking due to ozone, weather, or dry cracking	Acceptable.

Cell Exterior (continued)

CONDITION	LIMIT
(6) Damaged grommets in accessories.	Acceptable provided serviceability is not affected.
(7) Damage through outer cord or one fabric ply.	1-inch maximum dimension.
(8) Channels or bridging of outer plies at cord or fabric splice.	1/2-inch width maximum full length of splice (see figure 6).
(9) Outer ply cuts or splits parallel to cords where cords are not damaged.	Acceptable provided activation of sealant is not evident.

c. Fittings:

NOTE

Fittings not to be disturbed for inspection unless leakage is suspected.

(1) Rubber Face Fittings.	
(a) Gouges, splits, or deep indentations on the sealing surface.	1/16-inch maximum depth by 1/16-inch maximum length.
(b) Weather checking of surfaces other than sealing surface.	Acceptable.
(2) "O" Ring Fittings.	
(a) Sealing face without groove:	
1. Scratches within the sealing area.	Not acceptable (see figure 7).
2. Burrs on mating surface.	Not acceptable (see figure 7).
3. Damage to protective coating.	Acceptable.
4. Corrosion or rust.	Not acceptable.
(b) Sealing face with groove:	
1. Minor surface damage outside of "O" ring groove other than rust, corrosion, or burrs.	Acceptable (see figure 7).
2. Physical damage to "O" ring groove.	Not acceptable.
3. Corrosion or rust.	Not acceptable.
4. Cement or other foreign material in "O" ring groove.	Not acceptable.
(3) Bent or broken fittings.	Not acceptable.
(4) Thread damaged fittings.	Acceptable provided serviceability is not affected.

4. BLADDER TYPE CELLS.

a. Cell Interior:

CONDITION	LIMIT
(1) Loose liner at throat of fitting, except sump type and three plane fittings.	1/2-inch looseness in width around entire circumference at throat of fitting except*Firestone 1052-6 construction on which 1/16-inch edge looseness will be allowable (see figure 2).
(2) Loose liner at throat of sump type and 3-plane fittings.	1/4-inch maximum looseness (see figures 9 and 10)
(3) Loose liner lap.	1/4-inch looseness maximum width in edge of liner lap and full length of lap provided 1-inch bond is maintained, except*Firestone 1052-6 construction on which 1/16-inch edge looseness will be acceptable.
(4) Edge looseness on liner reinforcements and chafing patches.	1/2-inch maximum looseness provided looseness does not exceed 25 percent of total area; blisters or separations other than in the edge area allowable up to 25 percent of the total area.
(5) Looseness of cemented internal support components such as attaching straps, baffle supports, etc.	Acceptable up to 25 percent of component area provided 1/4-inch solid bond is maintained around the edge (see figure 3).
(6) Blisters between fitting flange and adjacent ply.	1/2-inch maximum dimension, maximum two per lineal foot and three per fitting provided 1-inch bond is maintained (see figure 2).
(7) Damaged grommets in accessories.	Acceptable provided serviceability is not affected.

* TV 1/2 - T-33 aircraft only.

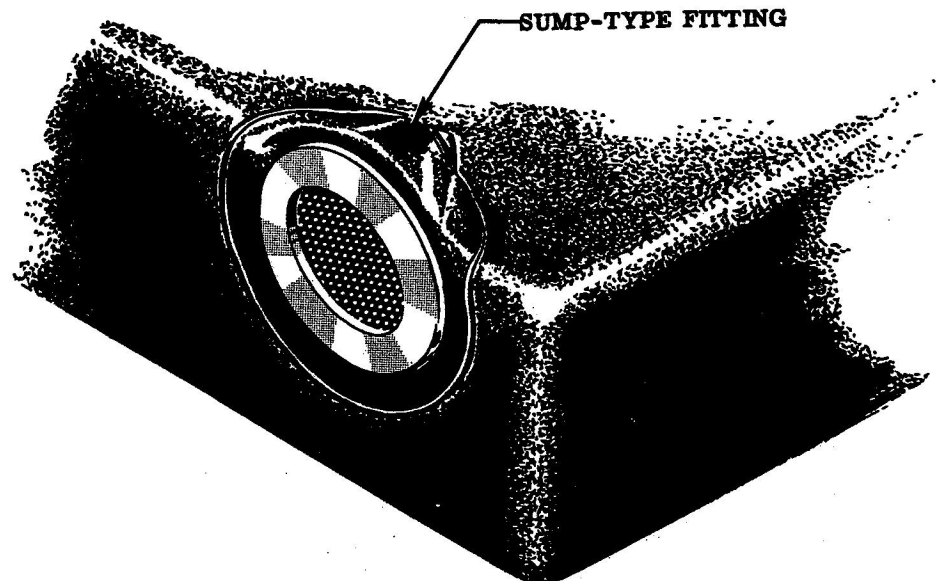


Figure 9

Cell Interior (continued)

CONDITION	LIMIT
(8) Weather checking or minor surface imperfections in liner ply and reinforcements	Acceptable provided serviceability is not affected.
(9) Blisters between liner laps.	1/2-inch maximum dimension; maximum of five in any 5 lineal feet of splice with a minimum of 6-inch bond between blisters (see figure 4).
(10) Blisters between plies (in cell panels).	1-inch maximum dimension; minimum of 6-inch bond between blisters and no more than one per square foot of cell area.
(11) Channels in inner-liner laps.	1/4-inch by 3-inch maximum dimension with a maximum of one in any 5 lineal feet of splice (see figure 4).
(12) Channels around entire outer edge of fitting flange.	1/4-inch maximum width around entire fitting flange (see figure 2).
(13) Damaged coating on accessories (rubber, metal or wood).	Acceptable provided rust, corrosion, or other deterioration is not apparent.
(14) Exposed fabric.	Acceptable provided cords are not cut or broken.
(15) Split or damaged corner reinforcements.	Acceptable.
(16) Cuts or holes in inner-liners.	Not acceptable.
(17) Delamination between plies.	1 1/2-inches maximum dimension; average one per 5 square feet of area with a maximum of five in any 5 square feet of area, minimum of 6-inches between delaminations.
(18) Broken stiffeners or supports.	Not acceptable.

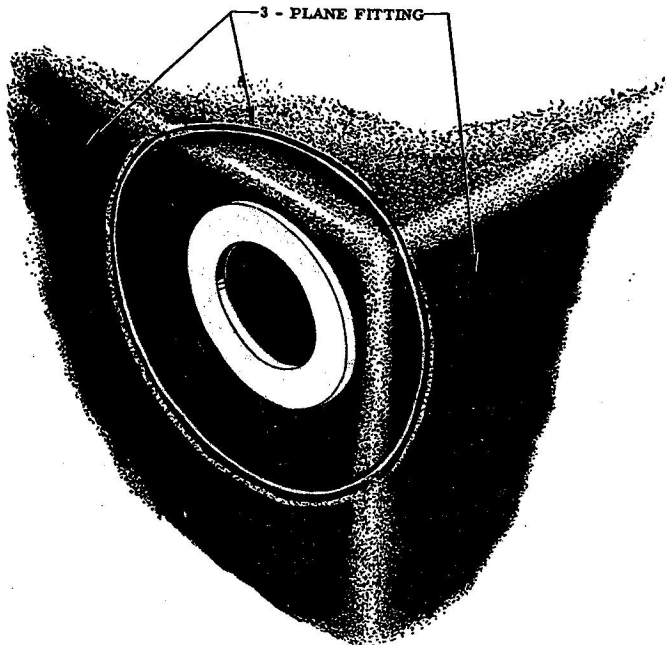


Figure 10

b. Cell Exterior:

NOTE

Only accessible portions of the cells will be inspected.
Cells not to be removed from aircraft for inspection.

CONDITION	LIMIT
(1) Skim coat blisters.	Acceptable.
(2) Loose or damaged hanger straps or hanger attaching points.	Acceptable up to 20 percent of component area provided 1/4-inch solid bond is maintained around the edge (see figure 8).
(3) Loose tapes, corner patches, or other outside non-load carrying accessories.	1/2-inch allowable looseness provided this looseness does not exceed 20 percent of the total area.
(4) Lap splice edge looseness.	3/8-inch by 3-inch maximum dimension provided there are no more than one per lineal foot.
(5) Skim coat off outer ply.	Acceptable provided cords or fabric are not broken.
(6) Mislocated, blistered, split or weather checked tape.	Acceptable.
(7) Blisters or looseness between labels or decals and body of cell.	Acceptable.
(8) Weather checked or surface imperfections in outer ply or reinforcements.	Acceptable.
(9) Blistered, loose or missing lacquer coating.	Acceptable.
(10) Damaged grommets in accessories.	Acceptable provided serviceability is not affected.
(11) Damage through any cord or fabric ply.	Not acceptable.
(12) Delamination between plies.	1 1/2-inches maximum dimension; average one per 5 square feet of area with a maximum of five in any 5 square feet. Minimum of 6-inches between delaminations.
(13) Blisters between fitting flange and adjacent ply.	1/2-inch maximum dimension with a maximum of two per lineal foot and three per fitting, provided 1-inch bond is maintained (see figure 2).
(14) Blisters between outer ply laps.	1/2-inch maximum dimension; average two per 5 lineal feet of splice with a maximum of five in any one 5-foot length of splice.
(15) Blisters between plies (in cell panels).	1-inch maximum dimension with a minimum of 6 inches between blisters and no more than one per square foot of cell area.
(16) Channels in outer ply laps.	1/4-inch by 3-inch maximum dimension with a maximum of one in any 5 lineal feet of splice.
(17) Channels around entire edge of fitting flange.	1/4-inch maximum width around entire fitting flange (see figure 2).

c. Fittings:

NOTE

Fittings not to be disturbed for inspection unless leakage is suspected.

CONDITION	LIMIT
(1) Rubber Face Fittings.	
(a) Gouges, splits or indentations on the sealing surface.	1/16-inch maximum depth by 1/16-inch maximum length.
(b) Weather checking of surfaces other than sealing surface	Acceptable.
(2) "O" Ring Fittings.	
(a) Sealing surface without groove:	
1. Scratches within the sealing area.	Not acceptable (see figure 7).
2. Burrs on mating surface.	Not acceptable (see figure 7).
3. Corrosion or rust.	Not acceptable.
(b) Sealing surface with groove:	
1. Minor surface damage outside "O" ring groove other than rust, corrosion or burrs.	Acceptable (see figure 7).
2. Physical damage to "O" ring groove.	Not acceptable.
3. Corrosion or rust.	Not acceptable.
4. Cement or other foreign matter in "O" ring groove.	Not acceptable.
(3) Bent or broken fittings and/or damaged dome nuts.	Not acceptable.
(4) Elongated or torn holes in fitting areas of cells using U. S. Rubber removable two-piece metal compression fittings.	Acceptable provided the elongation or tear does not extend beyond the outer or inner sealing groove of the inner ring, or over one-half the distance to the next hole.
(5) Thread damaged fittings.	Acceptable provided serviceability is not affected.