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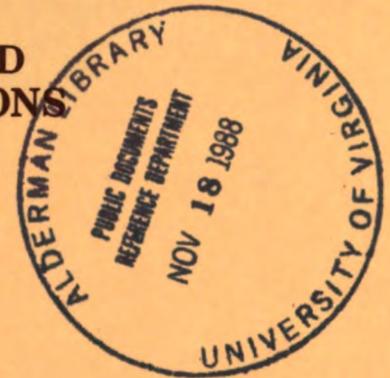
10-8475-202-13

TO 14P3-5-61  
TM 10-8475-202-13

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**TECHNICAL MANUAL**

**OPERATION, SERVICE, AND  
MAINTENANCE INSTRUCTION**



**QUICK DONNING  
ANTI-EXPOSURE FLYING COVERALL  
TYPE CWU-16/P**

**THIS TECHNICAL MANUAL IS A REPRINT OF AIR FORCE T.O. 14P3-5-61,  
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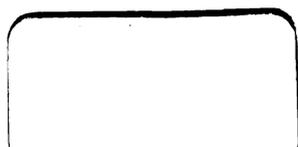
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WASHINGTON, D.C., 29 May 1987

Operation, Service, and  
Maintenance Instructions

QUICK DONNING  
ANTI-EXPOSURE FLYING COVERALL  
TYPE CWU-16/P

NOTE

THIS IS ARMY CHANGE 1  
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TO 14P3-5-61/TM 10-8475-202-13, 6 February 1984, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

Intro page  
4-1 and 4-2  
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Intro page  
4-1 and 4-2  
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4-4A/4-4B

2. Retain this sheet in front of manual for reference purposes.

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*Chief of Staff*

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**OPERATION, SERVICE, AND MAINTENANCE INSTRUCTIONS**

**QUICK DONNING  
ANTI-EXPOSURE FLYING COVERALL**

**TYPE CWU-16/P**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Aviation Systems Command, ATTN: AMSAV-MPSD, 4300 Goodfellow Boulevard, Saint Louis, MO 63120-1798. A reply will be furnished directly to you.

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## TABLE OF CONTENTS

<i>Section</i>		<i>Page</i>
I	INTRODUCTION.....	1-1/2-1
	1-1. Purpose .....	1-1/2-1
II	DESCRIPTION.....	1-1/2-1
	2-1. General.....	1-1/2-1
	2-3. Detailed Description.....	1-1/2-1
	2-5. Use.....	1-1/2-1
	2-7. Donning Instructions.....	1-1/2-1
III	INSPECTION .....	3-1
	3-1. Prior to Issue and Periodic.....	3-1
IV	MAINTENANCE.....	4-1
	4-1. Authorized Repairs .....	4-1
	4-3. Restricted Repairs .....	4-1
	4-5. Carrying Case Replacement.....	4-1
	4-7. Repair of Seams and Tapes .....	4-1
	4-9. Repair of Snags, Tears and Punctures .....	4-2
	4-11. Replacement of Waist Strap.....	4-4
	4-13. Replacement of Boot Strap .....	4-4
	4-15. Replacement of Wrist and Neck Seals.....	4-4
	4-17. Replacement of Entrance Slide Fastener .....	4-4
	4-20. Leak Test.....	4-8

## LIST OF ILLUSTRATIONS

<i>Number</i>	<i>Title</i>	<i>Page</i>
2-1.	CWU-16/P Coverall.....	2-3
2-2.	Opening Carrying Case.....	2-4
2-3.	Coverall Removal.....	2-5
2-4.	First Donning Step .....	2-6
2-5.	Inserting Arm in Coverall.....	2-7
2-6.	Inserting Head in Seal .....	2-8
2-7.	Closing Coverall .....	2-9
2-8.	Adjusting Waist Strap.....	2-10
2-9.	Adjusting Ankle Strap.....	2-11
2-10.	Inflating Hood .....	2-12
2-11.	Donning Gloves .....	2-13/2-14
3-1.	Folding Procedure .....	3-2
3-2.	Rolling Procedure .....	3-3/3-4
4-1.	Linear Tear .....	4-1
4-2.	Snag or Three Corner Tear .....	4-1
4-3.	Puncture or Hole .....	4-2
4-4.	Seam Separation .....	4-2
4-5.	Sealing Seam Separation .....	4-2
4-6.	Rectangular Patch .....	4-3
4-7.	Square Patch (Puncture).....	4-3
4-8.	Round Patch .....	4-3
4-9.	Neck Seal Pattern .....	4-5
4-10.	Wrist Seal Pattern.....	4-7

## SECTION I INTRODUCTION

### 1-1. PURPOSE

1-2. This technical manual provides basic information and instructions for emergency donning and use of the Type CWU-16/P Quick-Donning Anti-Exposure Coverall. This manual shall be used as a general reference by all

flying personnel making extended or sustained over-water flights.

1-3. The data contained herein is concerned with the use, inspection, maintenance, and repair of the equipment.

## SECTION II DESCRIPTION II

### 2-1. GENERAL.

2-2. The type CWU-16/P anti-exposure coverall (Figure 2-1.) has been designed for quick-donning (approximately one minute) by crew members of heavy bombers and cargo aircraft, prior to emergency ditching of such aircraft at sea. After ditching of the aircraft, the coverall will protect the wearer from exposure while swimming in cold water and from exposure to wind, spray, and rain when adrift on a life raft.

### 2-5. USE.

2-6. The coverall when utilized will be donned over regular flight clothing. The coverall is of sufficient fullness so that it can be worn over the usual flight gear. The gloves and hood are stowed in the pockets of the coverall and are normally worn after boarding the life raft.

### 2-7. DONNING INSTRUCTIONS.

#### CAUTION

Care should be exercised when donning to prevent damaging the coverall by snagging, tearing, or puncturing on projecting objects.

2-8. The procedure for donning the coverall is as follows:

- a. Unsnap the fasteners of carrying case (see Figure 2-2).
- b. Remove coverall from carrying case and unroll (see Figure 2-3).

#### Note

The coverall is stowed in carrying case with entrance slide fastener closed to a point approximately 3 to 4 inches from the seal block.

- c. Grasp coverall by the shoulders and insert feet well into the boot. Pull coverall up to waist (see Figure 2-4).
- d. Insert right arm into right sleeve with sufficient force to insert hand through the wrist seal (see Figure 2-5). Smooth out wrist seal.
- e. Pull coverall up over the head and insert head through the neck seal (see Figure 2-6). Smooth out seal around the neck. Repeat the procedure for left arm as outlined above for right arm.

#### Note

Hook Blade Knife, Part No. 60C6037, FSN 1670-779-1253, may be stowed in the left accessory glove pocket when required. The knife lanyard shall be tied to the pocket grommet, and the knife stowed beneath the gloves.

f. Close entrance slide fastener, making sure slider is in full closed position (see Figure 2-7).

**Note**

Excessive force is not required to close entrance slide fastener if proper alignment of scoops prior to slider movement is assured and fastener lips are lubricated. The slider shall be pulled in the direction of the long axis of the fastener and not at an angle. The tying of a square knot in end of slider pull tab provides a loop to enhance leverage when closing slide fastener.

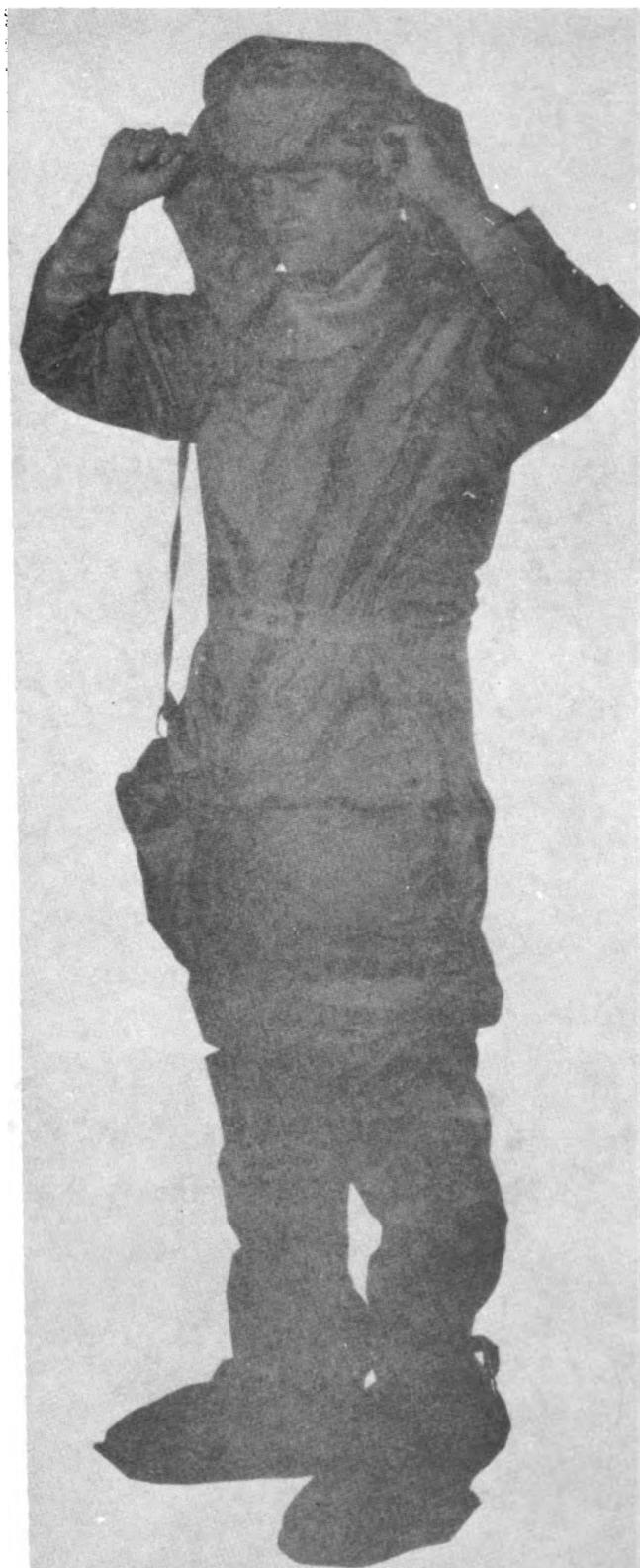
g. Adjust coverall waist band and boot ankle straps to take up coverall fullness (see Figures 2-8 and 2-9).

**Note**

Pulling neck seal away from the neck and crouching prior to jumping will aid in expelling excess air and reducing coverall bulkiness.

h. Jump into water feet first with arms close to the sides of the body or brought together over the head.

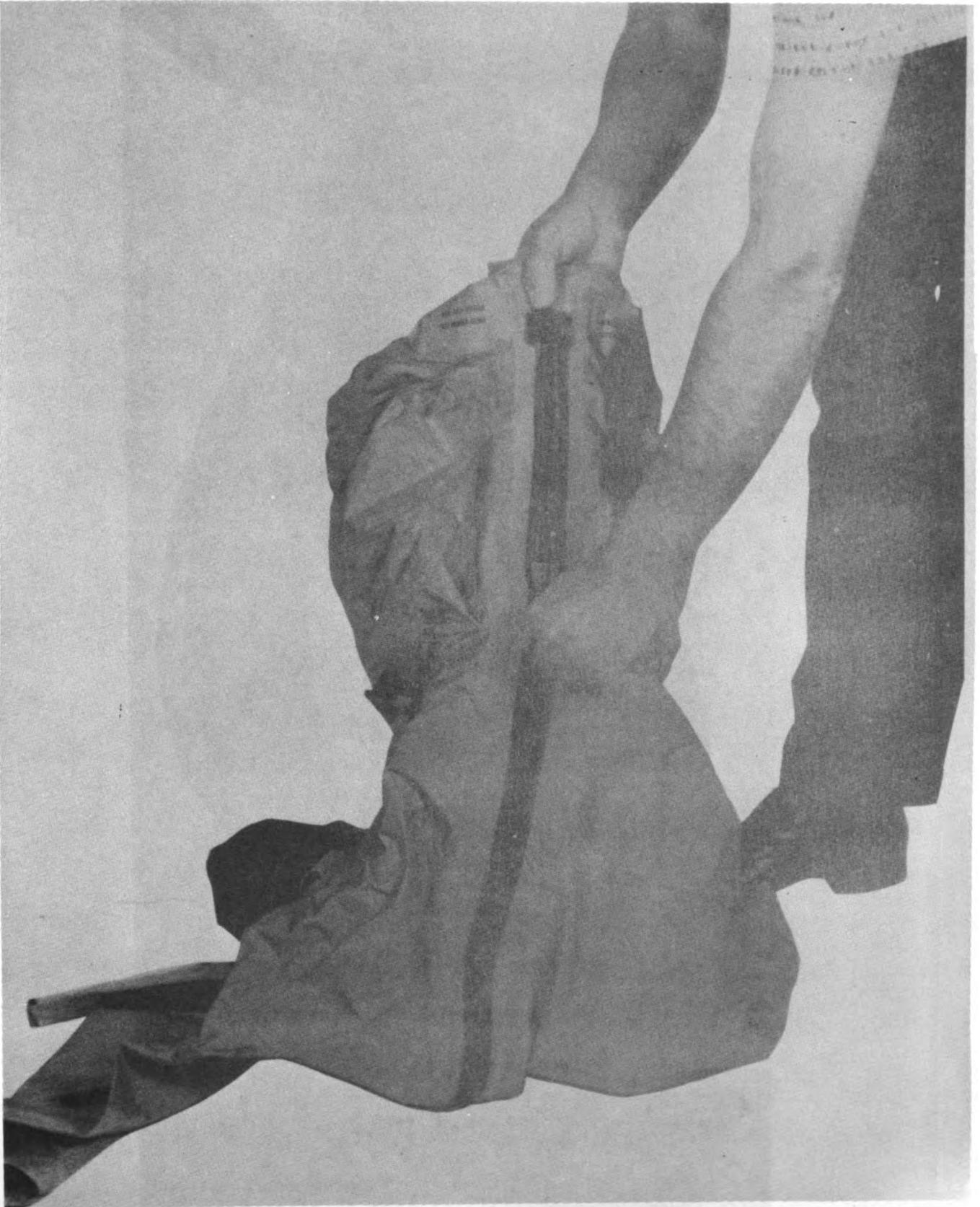
i. Gloves normally worn during flight should be used until after boarding the life raft to keep the hands dry and warm. The gloves and hood found in coverall pockets can then be readily donned (see Figures 2-10 and 2-11).



*Figure 2-1. CWU-16/P Coverall*



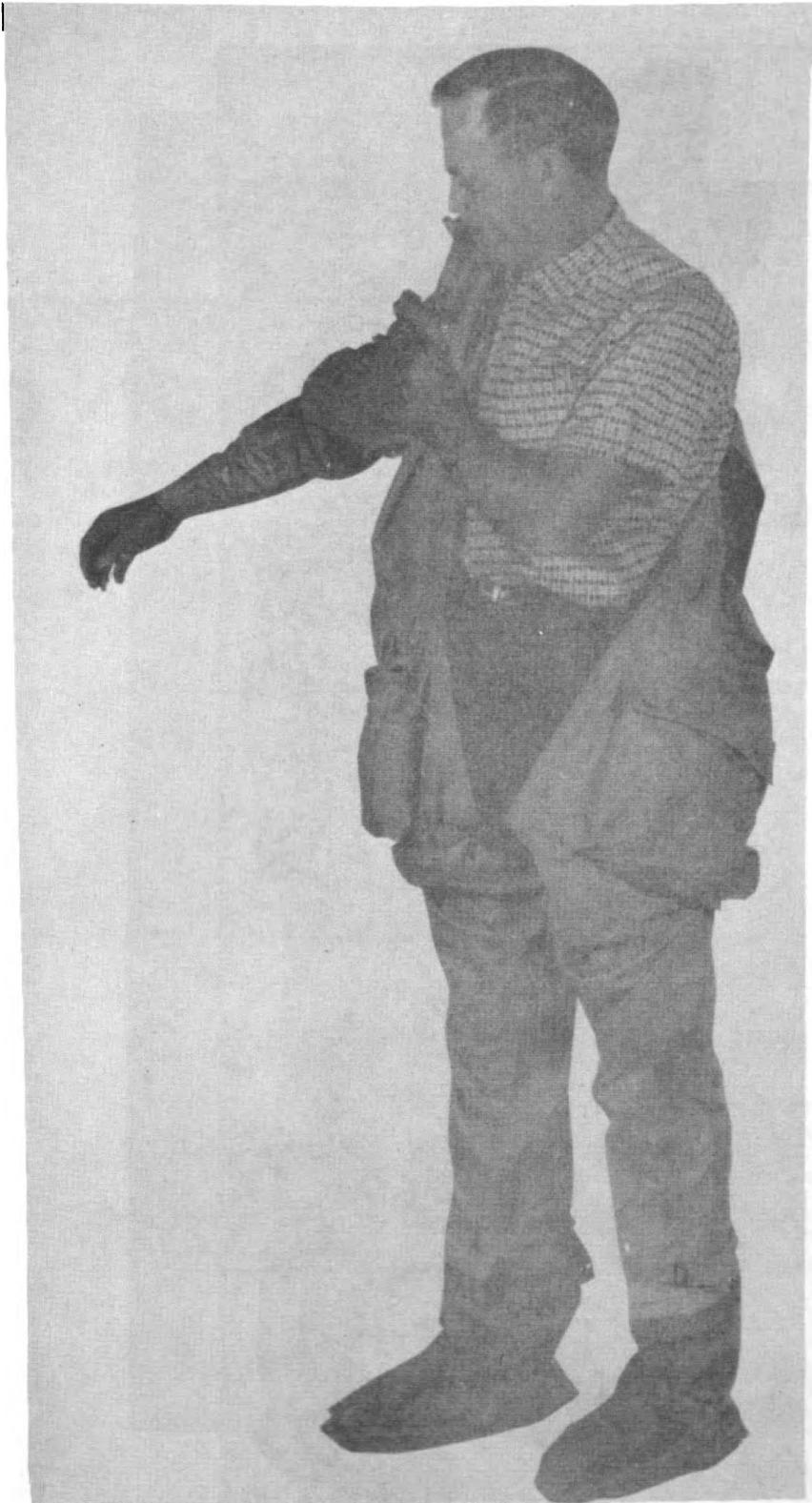
**Figure 2-2. Opening Carrying Case**



**Figure 2-3. Coverall Removal**



*Figure 2-4. First Donning Step*



*Figure 2-5. Inserting Arm In Coverall*



*Figure 2-6. Inserting Head In Seal*



**Figure 2-7. Closing Coverall**



*Figure 2-8. Adjusting Waist Strap*



*Figure 2-9. Adjusting Ankle Strap*



**Figure 2-10. Inflating Hood**



**Figure 2-11. Donning Gloves**



## SECTION III INSPECTION

### 3-1. PRIOR TO ISSUE AND PERIODIC.

3-2. To prolong service life and maintain the reliability of the coverall, the Fabrication Branch of field maintenance will inspect each garment prior to issue and every 140 ± 10 days thereafter in the following manner.

#### Note

Exposure suits prepositioned aboard cargo aircraft in A-3 bags, etc, will be inspected during periodic aircraft inspection cycle not to exceed 180 plus or minus 5 days.

a. Remove coverall from container or carrying case by opening snap fasteners.

b. Coveralls, gloves, and hood will be visually inspected for cracks, tears, holes, abraded areas and seam separation.

c. Inspect snap fasteners for proper clinch and operation. Check waist and ankle adjustment straps for proper attachment to coverall and for deterioration. Inspect neck and wrist seals for tears or loss of elasticity.

#### CAUTION

Coveralls will be inspected on a smooth-topped table or work bench that is free of objects or substances that would cause damage to the coverall.

d. Inspect entrance slide fastener for corrosion of chain and proper function of slider. Check rubber lips for nicks or cuts.

#### NOTE

The slide fastener lips should be inspected for cracks and splits as the fastener becomes visible when the suit is being unrolled.

e. Inspect gloves for holes and proper attachment of tie-cords. Visually inspect hood for tears, holes, or seam separation. Inflate oral valve to assure valve functions properly. Perform inflation test on hood as directed in paragraph 4-23, Section IV.

f. Inspect carrying case for tears, holes, or open seams, and the snap fasteners for corrosion and proper operation.

g. Repairs to coveralls, hood, gloves, and carrying case will be accomplished in accordance with Section IV of this technical manual.

h. Upon completion of inspection, serviceable coveralls will be dusted lightly on inner surface with talc. To facilitate ease of donning, the inside of wrist and neck seals should also be dusted.

#### Note

The slide fastener shall be closed to a point approximately 3 to 4 inches from the seal block prior to packaging the coverall in the carrying case. A light application of silicone compound (Dow Corning 4 Compound, manufactured by Dow-Corning Mfg. Co., Midland, Michigan) or a fluorinated silicone/teflon grease (manufactured by American Oil Co., Whiting, Indiana) to the rubber lips of slide fastener will ease slider operation. The talon slide fastener shall be lubricated by applying a light coating of paraffin wax to the chain halves.

3-3. Fold and position the coverall in the carrying case in accordance with Figures 3-1 and 3-2. Following closing of carrying case, the abbreviation "DUE INSP" will be stamped or stenciled in 1/4 inch letters on carrying case adjacent to instruction panel and the dates due inspection will be stamped immediately below. (Contrasting color will be used for inspection date markings.) Inspection record will also be annotated on AFTO Form 336.

#### Note

To facilitate recording inspection and to maintain legibility, a piece of cloth, airplane, cotton, 8 by 2 inches, may be sewn to back of carrying case for marking dates. To further increase legibility, a felt-point marking pen may be used in lieu of stenciling or stamping. Where a local numbering system is used to maintain coverall identify, the coverall and its carrying case should bear the same number. The number of the coverall shall appear on the exterior of the right pocket below the flap.

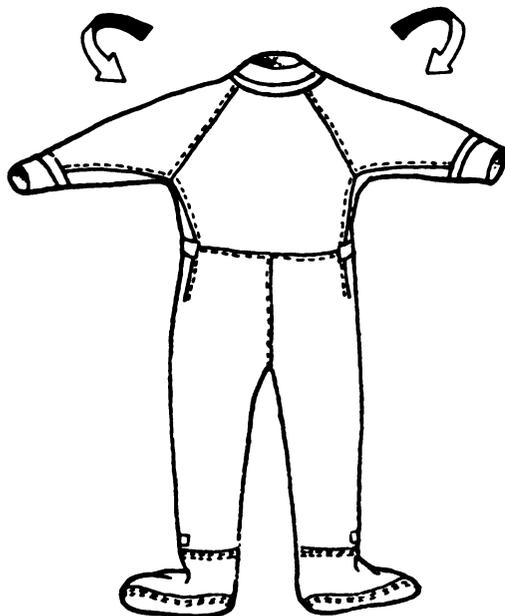
3-4. Deleted.

STEP NO. 1

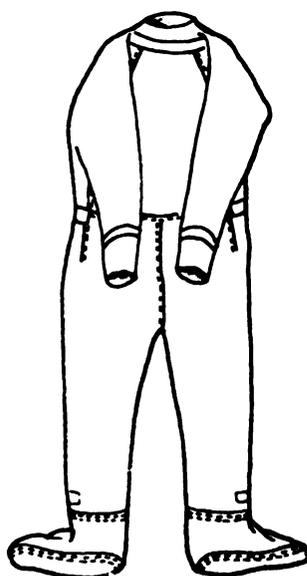
ALL THE PARTS OF THE COVERALL, HOOD, AND GLOVES SHALL BE COVERED WITH A MINIMUM AMOUNT OF ZINC STEARATE OR TALC TO PREVENT ADHERING OF THE ADJACENT CLOTH SURFACES, TAPES, AND CEMENTED AREAS DURING NORMAL STORAGE AND TRANSPORTATION CONDITIONS. CARE SHALL BE EXERCISED SO THAT NO ZINC STEARATE OR TALC SHALL CONTAMINATE THE COVERALL ENTRANCE SLIDE FASTENER. THE HOOD SHALL BE COMPLETELY EVACUATED OF AIR AND THE ORAL INFLATION VALVE SHALL BE LOCKED IN THE CLOSED POSITION BY THE KNURLED RING, ONE END OF THE TIE CORD SHALL BE SECURELY ATTACHED TO THE SEWN EYELET IN THE HOOD. THE OTHER END OF THE TIE CORD SHALL BE SECURELY ATTACHED TO THE SEWN EYELET IN THE HEM OF THE RIGHT-HAND COVERALL POCKET, THE HOOD SHALL BE FOLDED IN HALF AND THEN ROLLED. THE ORAL INFLATION TUBE AND VALVE SHALL BE ON THE INNER SIDE OF THE ROLL AND THE HOOD SHALL BE INSERTED INTO THE RIGHT-HAND POCKET. THE ADJUSTMENT STRAP AND TIE CORD SHALL BE SNAPPED TO THE GLOVES. THE FREE ENDS OF THE TIE CORDS ATTACHED TO THE GLOVES SHALL BE SECURELY ATTACHED TO THE PROPER SEWN EYELET IN THE HEM OF THE POCKETS. THE GLOVES SHALL BE FOLDED IN HALF AND PLACED IN THEIR RESPECTIVE POCKETS AND THE POCKET FLAPS SHALL BE SNAPPED CLOSED. SLIDE FASTENER SHALL BE CLOSED TO A POINT APPROXIMATELY 3 TO 4 INCHES FROM THE SEAL BLOCK.

PLACE SLEEVES ACROSS  
BACK AS SHOWN IN  
STEP NO. 3

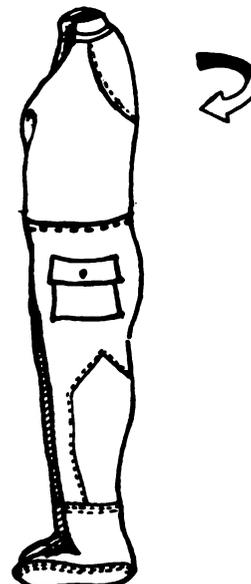
FOLD THE RIGHT SIDE OF  
THE COVERALL OVER THE  
LEFT AS SHOWN IN STEP  
NO. 4



STEP NO. 2



STEP NO. 3 COMPLETED



STEP NO. 4

Figure 3-1. Folding Procedure

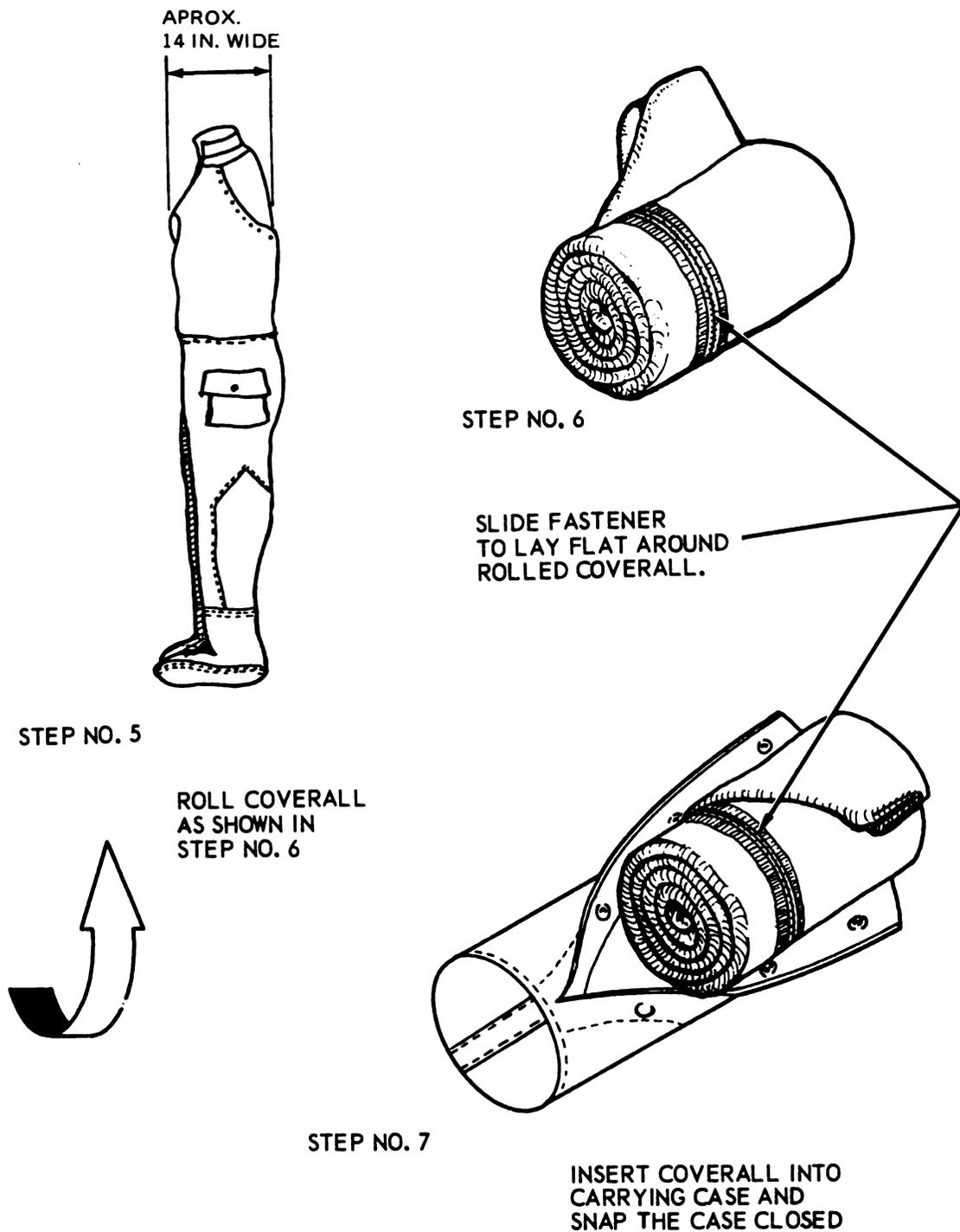


Figure 3-2. Rolling Procedure



## SECTION IV MAINTENANCE

### 4-1. AUTHORIZED REPAIRS.

4-2. The following repairs are authorized for the CWU-16/P coveralls:

- a. Patching linear (straight) tears 2 1/2 inches or less in length (see Figure 4-1).
- b. Patching snags or three corner tears 1-inch or less in length or less on the long leg of the tear (see Figure 4-2).
- c. Patching punctures or circular holes 1-inch or less in diameter (see Figure 4-3).
- d. Repairing seams and tape separations 2 1/2 inches or less in length (see Figure 4-4).

#### NOTE

Hood, gloves, seams and tape repairs are authorized up to 4 inches in length.

- e. Replacing of entrance slide fastener.
- f. Replacing waist belt and ankle adjustment straps.
- g. Replacing neck and wrist seals.
- h. Repairing minute holes.
- i. Patching hood and gloves.
- j. Serviceable hood and gloves may be retained locally from condemned coveralls to replace unserviceable hoods and gloves.

### 4-3. RESTRICTED REPAIRS.

4-4. Repairs other than those listed in paragraph 4-2 will not be made. Patches will be limited to five, and seam

separation repairs to three per coverall (excluding hood, gloves, and carrying case), and will not be located closer together than eight inches from center to center.

### 4-5. CARRYING CASE REPLACEMENT.

4-6. Replacement containers, if needed, will be fabricated locally, using the old container as a pattern and materials salvaged from condemned coveralls, if available; otherwise use fabric conforming to Specification MIL-C-19002, Type I.

### 4-7. REPAIR OF SEAMS AND TAPES.

4-8. Coveralls requiring repair due to seam separation and loose sealing tapes will be repaired as follows:

#### WARNING

Acetone is flammable and may affect skin, eyes and respiratory tract. Use in a well ventilated area. Avoid prolonged breathing of vapors. Chemical goggles and neoprene gloves are required. Keep away from sparks and flames.

- a. All overlapping seams or edges which are to be rebonded or sealed with tape will be cleaned thoroughly with acetone and allowed to dry.
- b. Buff overlapping surfaces lightly with fine abrasive cloth.
- c. Reclean the buffed surface with a cloth or soft-bristle brush dampened with acetone cleaning solution to remove cement residue.

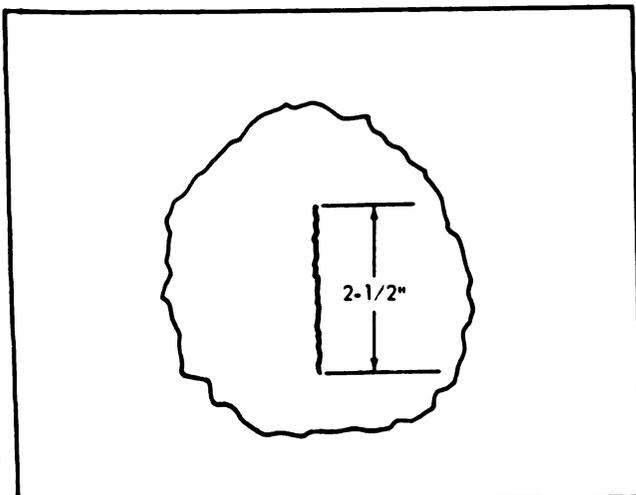


Figure 4-1. Linear Tear

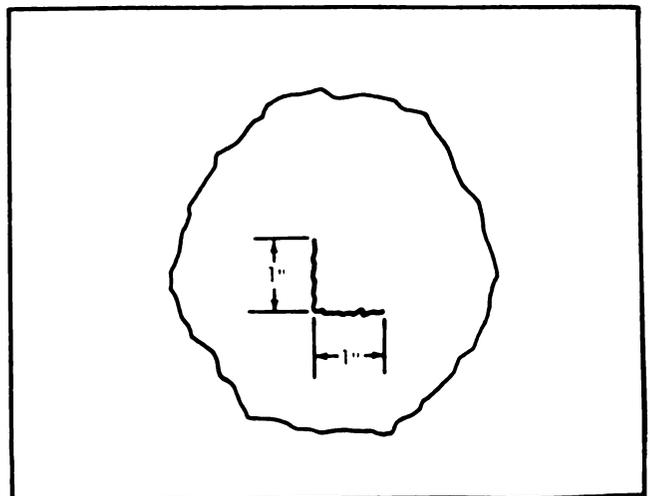


Figure 4-2. Snag or Three Corner Tear

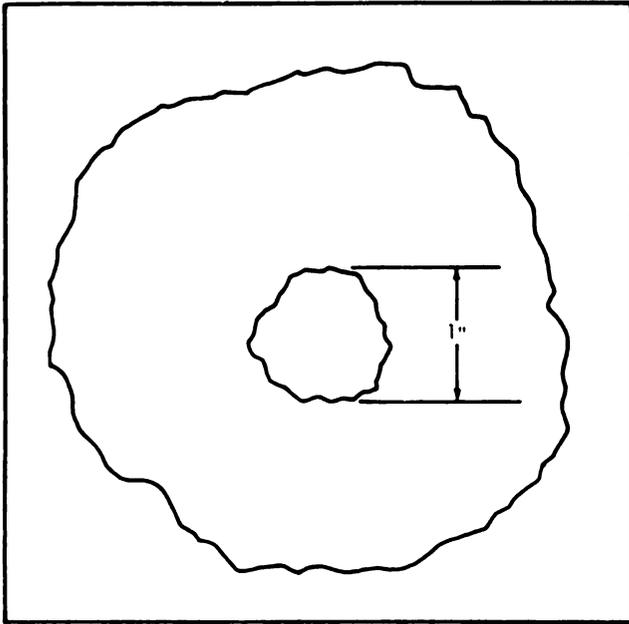


Figure 4-3. Puncture or Hole

**WARNING**

Perform all adhesive operations in a well ventilated area. Avoid prolonged breathing of vapors. Avoid repeated skin contact. Chemical goggles will be worn. Keep adhesives away from sparks and flames.

d. Apply three thin coats of neoprene adhesive conforming to Specification MIL-A-5540 to each surface. Each coat of adhesive shall be allowed one-half hour drying time before applying next coat. Start rebonding seams or applying seam tape when last coat of adhesive is tacky to touch.

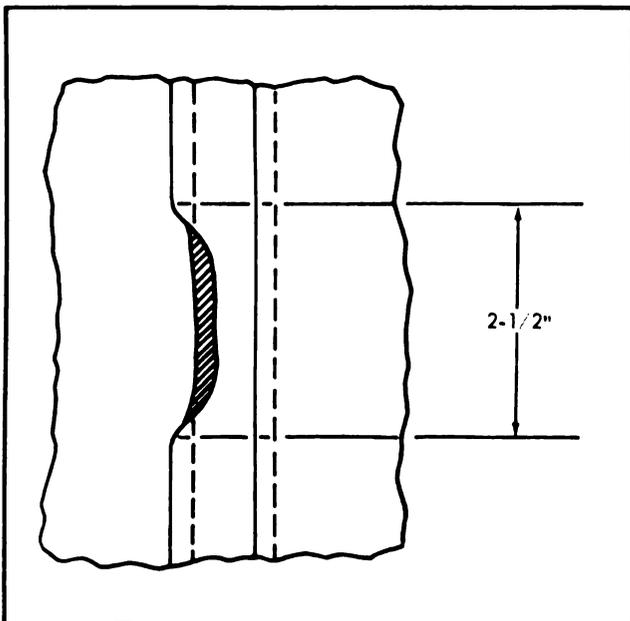


Figure 4-4. Seam Separation

Apply seam tape as shown in Figure 4-5. Roll cemented areas firmly to remove wrinkles and channels and to form proper adhesion. Dust repaired area with talc. Apply seam tape by centering the width over the seam. Width of adhesive application should be wider than tape width to prevent loose edges.

e. Stitched seams requiring repair will require removal of seam tape. Thoroughly clean area with acetone. Patch, using nylon thread, Specification V-T-295, Type I or II, Class 1 or 2, size E, color to match basic fabric, and back-stitch one-half inch, using same stitch pattern and type as original sewn seam. Retape sewn seam with seam tape, using above cementing procedure.

f. All patches used in repair of coveralls will be fabricated from nylon coated cloth conforming to Specification MIL-C-19002, Type I. Seam tape shall conform to Specification MIL-C-19002, Type III, one inch wide.

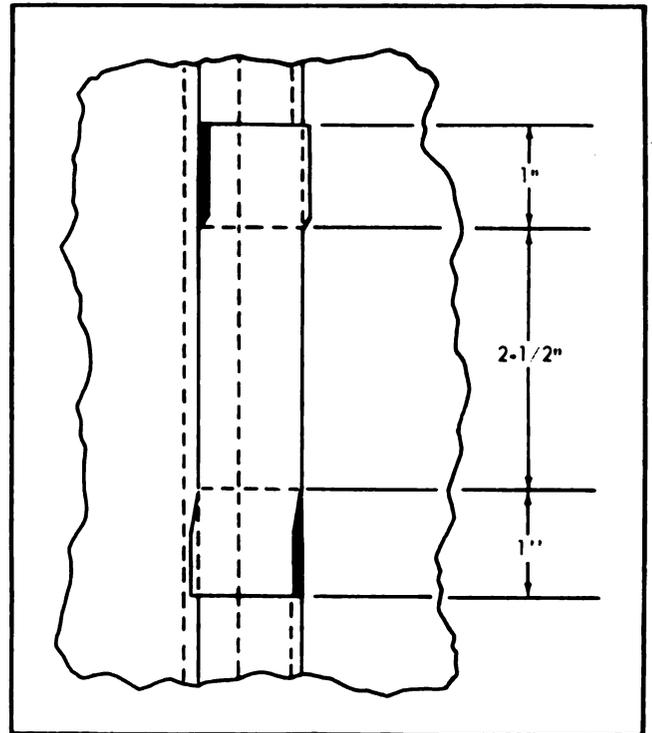


Figure 4-5. Sealing Seam Separation

**Note**

All patches and sealing tapes will be cemented to inside surface of garment.

**4-9. REPAIR OF SNAGS, TEARS, AND PUNCTURES.**

4-10. Coveralls requiring repair due to snags, tears, or punctures will be repaired as follows:

a. All surfaces to which cement is applied will be thoroughly cleaned with acetone and allowed to dry.

- b. Buff the damaged area lightly with fine crocus cloth. Buffing will be confined to area to be patched.

**WARNING**

Acetone is flammable and may affect skin, eyes and respiratory tract. Use in a well ventilated area. Avoid prolonged breathing of vapors. Chemical goggles and neoprene gloves are required. Keep away from sparks and flames.

**CAUTION**

Buffing fabric beyond patch or tape area will damage overall fabric.

- c. Clean the buffed surface with a cloth dampened with acetone and allow to dry.

**WARNING**

Perform all adhesive operations in a well ventilated area. Avoid prolonged breathing of vapors. Avoid repeated skin contact. Chemical goggles will be worn. Keep adhesives away from sparks and flames.

- d. Apply three thin coats of neoprene adhesive, Specification MIL-A-5540, to damaged area and patch. Each coat of adhesive shall be allowed one-half hour drying time before applying next coat. Start bonding the patch to the garment surface when last coat of adhesive is tacky



to touch and place coated side of patch to coated side of garment.

e. Center patch over damaged area (Figures 4-6, 4-7, and 4-8). Roll firmly to eliminate wrinkles and channels. Dust repaired area with talc.

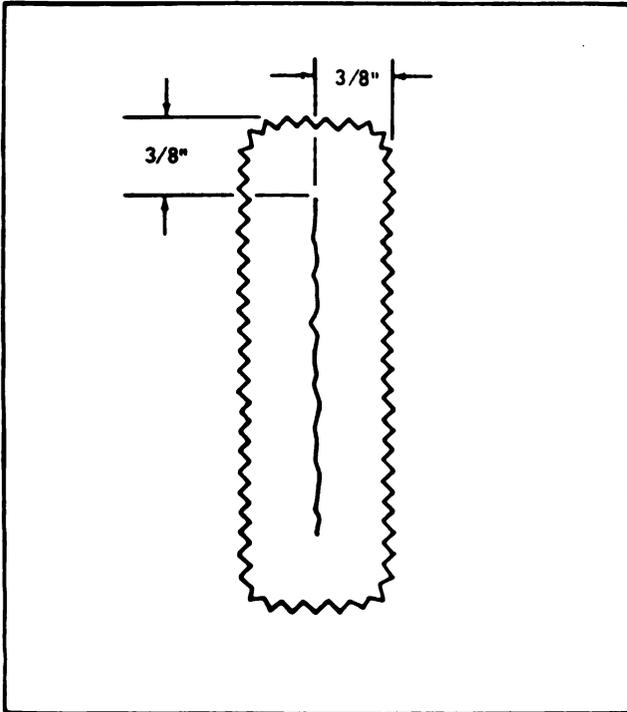


Figure 4-6. Rectangular Patch

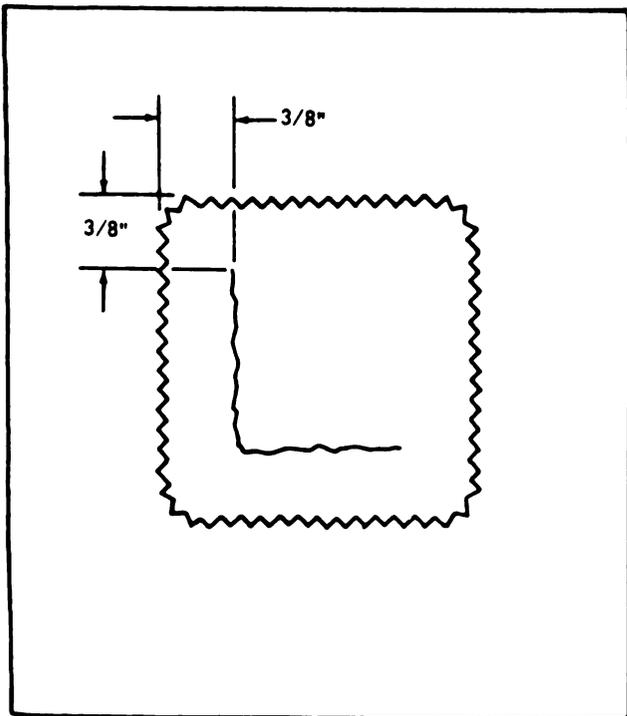


Figure 4-7. Square Patch (Puncture)

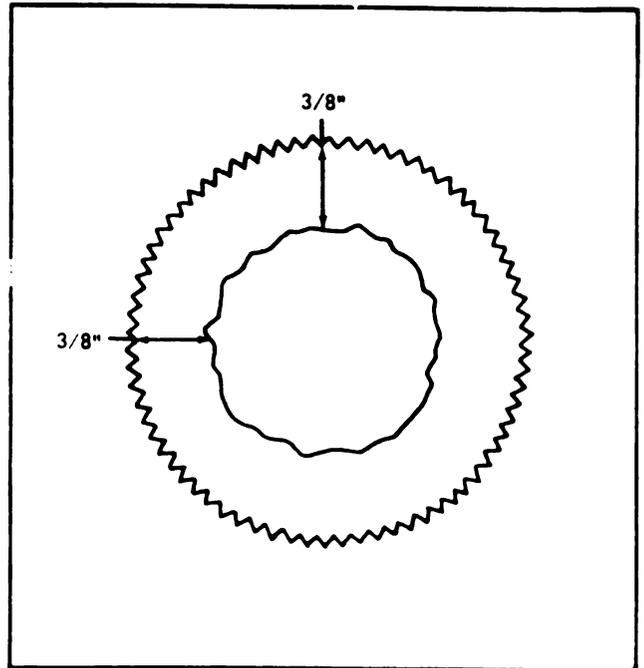


Figure 4-8. Round Patch

f. Patches will be square, circular, or rectangular in shape with rounded corners and cut large enough to extend 3/8-inch beyond the edge of defect as shown in Figures 4-6, 4-7, and 4-8. The cemented area shall be slightly larger than the patch to prevent loose edges.

g. Thin areas of coating and minute holes or punctures in coverall, especially in area of the slide fastener, may be repaired as follows:

(1) Wipe abraded area with acetone to insure area is free of foreign matter and dusting powder.

(2) Brush on two very light coats of MIL-A-5500, allowing coat to dry before applying second coat. Allow second coat to dry thoroughly and dust brushed area lightly with talc.

4-10A. Hood and gloves requiring repair due to snags, tears, or punctures will be repaired as outlined in paragraph 4-10. The number and size of patches on the gloves will be limited to not more than three patches per glove and each patch will not exceed 3 square inches in size.

#### NOTE

All patches will be cemented to the outside of hood and gloves.

**4-11. REPLACEMENT OF WAIST STRAP.**

4-12. Waist adjustment straps showing evidence of weakness or damage will be replaced as follows:

a. Remove defective straps from coverall. Care will be exercised when peeling sealing tape and removing stitched strap.

b. Fabric a new strap, using defective strap as pattern, from elastic webbing conforming to Specification JJ-W-155, Type I, Class 10, 11 or 12, 1-1/2 inches wide.

c. Stitch newly fabricated strap to coverall in original stitch holes with nylon thread, Specification V-T-295, Type I or II, Class 1 or 2, Size E.

d. Using same cementing procedures as outlined for patching, apply sealing tape to inside area of coverall.

**4-13. REPLACEMENT OF BOOT STRAP.**

4-14. Defective or damaged boot adjustment straps shall be replaced as follows:

**WARNING**

Acetone is flammable and may affect skin, eyes and respiratory tract. Use in a well ventilated area. Avoid prolonged breathing of vapors. Chemical goggles and neoprene gloves are required. Keep away from sparks and flames.

a. Remove defective straps from coverall, exercising care not to damage coverall fabric. Thoroughly clean areas with acetone.

b. Fabricate new straps of cotton webbing, conforming to Specification MIL-W-530, Type I, Class 3, 3/4-inch wide, using removed strap as a pattern. Attach to coverall in original position, using same cementing procedure outlined for patching.

**4-15. REPLACEMENT OF WRIST AND NECK SEALS.**

4-16. Replacement of damaged wrist or neck seals will be accomplished as follows:

**WARNING**

Acetone is flammable and may affect skin, eyes and respiratory tract. Use in a well ventilated area. Avoid prolonged breathing of vapors. Chemical goggles and neoprene gloves are required. Keep away from sparks and flames.

a. Carefully remove wrist or neck seal from coverall by using acetone and a brush. Coat outer supported tape with solvent, start lifting end of outside tape carefully, brushing the newly exposed surface liberally with acetone and continue on around sleeve or neck.

b. Repeat above procedure on the inside tape circumscribing the wrist or neck seal.

c. After outside and inside sealing tapes are removed, remove the seal with liberal amounts of acetone applied between the coverall sleeve or neck and seal. Thoroughly clean coverall area with acetone to remove residual cement and allow to dry.

d. Fabricate a new wrist or neck seal as outlined below and attach to the coverall in same location as removed seal. Use same cementing procedure as outlined for patching. When seal is attached, apply sealing tape to inside of coverall neck or wrist seal area with tape centered over attaching point. Overlap end of seam tape 3/4-inch. Apply seam tape to outside area of coverall seal area with tape centered over attaching point. Overlap end of seam tape 3/4-inch. Dust inside and outside area with talc to prevent surfaces from adhering to each other.

**WARNING**

Perform all adhesive operations in a well ventilated area. Avoid prolonged breathing of vapors. Avoid repeated skin contact. Chemical goggles will be worn. Keep adhesives away from sparks and flames.

e. Fabricate seals from fabric conforming to Specification MIL-C-23926, Type I, using patterns shown in Figures 4-9 and 4-10. Cut the two parts of the neck seal. Position front and back sections, coated side up, with angled side butting. Apply a coat of cement to back and front sections along angled sides. Allow to dry; apply a second coat and allow to dry until tacky. Activate the cemented seam tape and apply over the butted edges. Tape should be equally divided over the joint. Join the balance of the seal to form a cone in the same manner. Cut the two parts of the wrist seal and join in the same manner as for the neck seal. Allow seals to dry a minimum of 24 hours before application to the coverall. Seals shall be applied to the coverall with coated side to the inside.

**4-17. REPLACEMENT OF ENTRANCE SLIDE FASTENER.**

4-18. Replacement of damaged or defective entrance slide fastener will be accomplished as follows:

**WARNING**

Acetone is flammable and may affect skin, eyes and respiratory tract. Use in a well ventilated area. Avoid prolonged breathing of vapors. Chemical goggles and neoprene gloves are required. Keep away from sparks and flames.

a. Remove reinforcing tape located at top and bottom of slide fastener on inside and outside of coverall, using acetone.

b. Remove supported sealing tape on inside of coverall, using acetone. Use sufficient solvent to loosen cemented area, but avoid excessive soaking of adjacent areas.

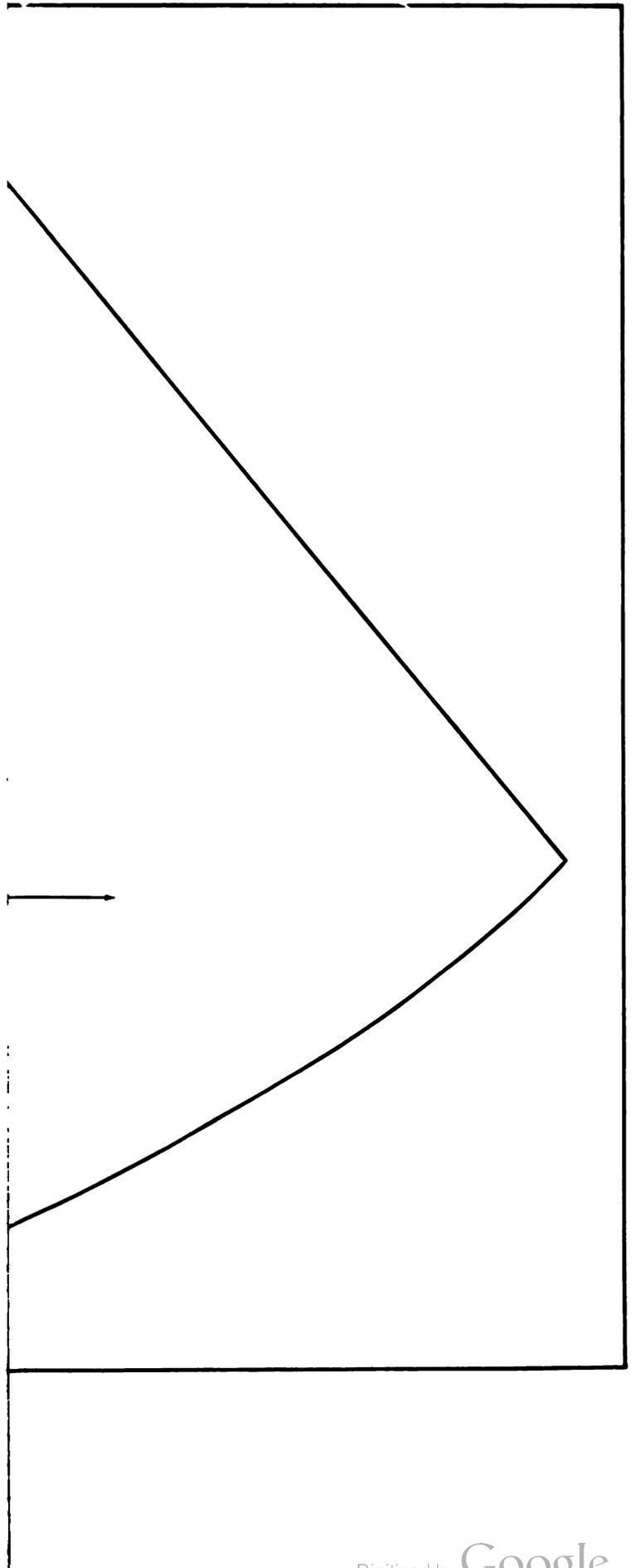
c. Carefully remove slide fastener from coverall, using acetone. Thoroughly clean coverall surface with a cloth dampened with acetone to remove residual cement.

**CAUTION**

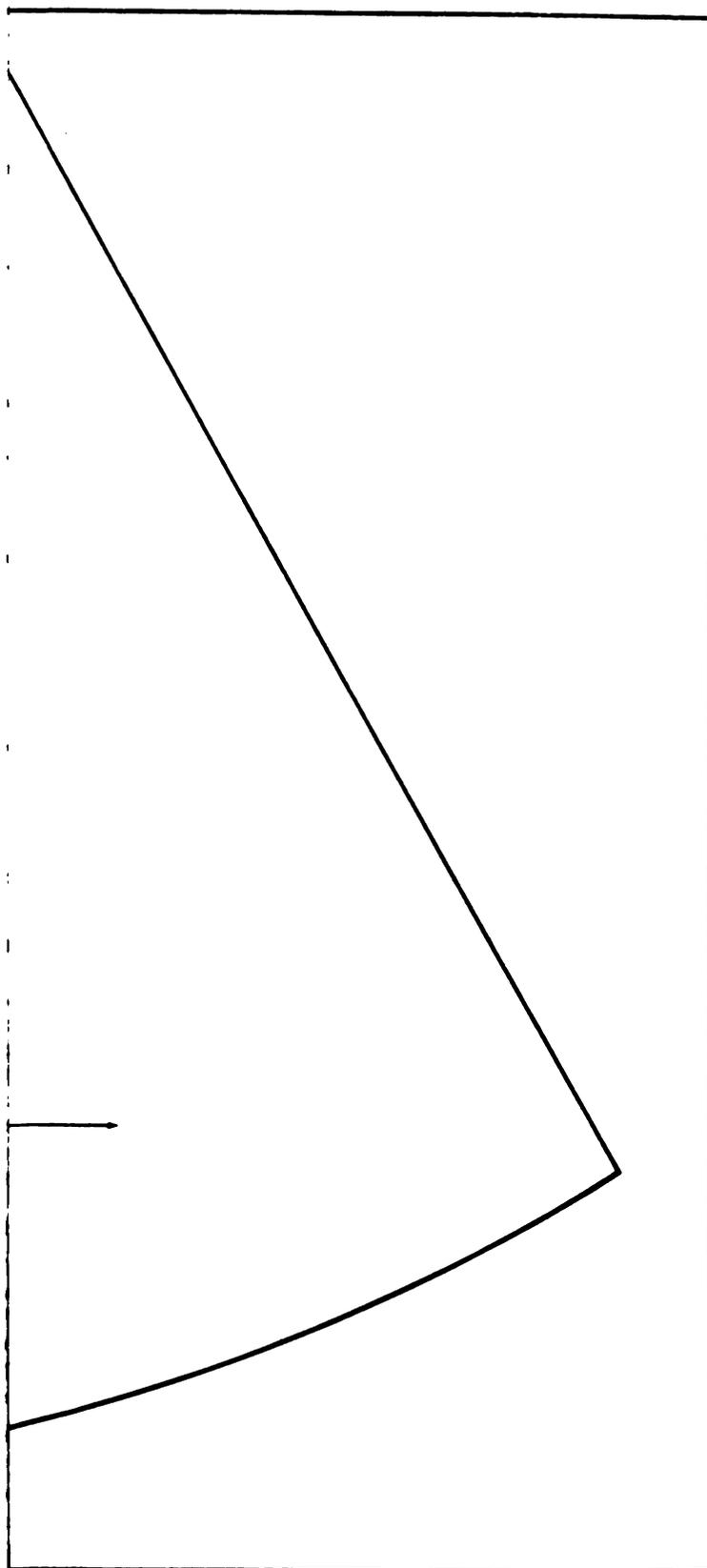
Exercise care in removal of slide fastener so as not to damage or stretch coverall fabric.

d. Obtain a new watertight slide fastener (B.F. Goodrich Co., Style 2430, or Talon, Inc., Number 84, Type I) of corresponding length.









4-10. Wrist Seal Pattern

**TO 14P3-5-61**  
**TM 10-8475-202-13**

e. Roughen the smooth part of rubber side of the entrance slide fastener tapes. Do not attempt to roughen the pebbled area. Clean roughened area with a cloth dampened with MEK and allow to dry. Cement to the coated side of the coverall. This will place the rubber lips on the exterior of the coverall. Apply three thin coats of neoprene adhesive, Specification MIL-A-5540, to coverall and slide fastener surfaces, and allow one-half hour drying time between coats. When last coat is tacky to touch, attach slide fastener to the coverall (in closed position). Roll firmly to assure proper bonding. Edges of the coverall opening should cover the smooth area only and should not project onto the pebbled area.

**Note**

Slide fastener shall close downward and the slide pull shall be to the outside of the coverall.

f. Apply supported seam tape over joined area on both sides of slide fastener to the inside of the coverall. Assure tape is centered and runs full length of slide fastener tape. Use same cementing procedures as for patching.

g. Apply reinforcing strips of supported tape at top and bottom of slide fastener on both inside and outside of the coverall. Dust all cemented areas with talc. Allow a minimum of 24 hours curing time before using.

**Note**

An application of silicone compound, Dow-Corning 4 Compound (manufactured by Dow-Corning Mfg. Co., Midland, Michigan) or fluorinated silicone/teflon grease (manufactured by American Oil Co., Whiting, Indiana) should be applied with a small brush to the outside and inside of rubber lips and to pebbled surface of the closure slide fastener in order to provide easy slider operation.

h. Installation of Talon, Inc., Number 84, Type 1 slide fastener will be accomplished in accordance with instructions contained in paragraph 4-18e. The addition of a slide fastener protective flap is required when installing the Talon slide fastener. The protective flap shall be installed as follows:

(1) The protective flap shall be installed on the outside of the coverall over the slide fastener closure.

(2) The flap shall be fabricated from a section of coverall fabric that is cut  $37\frac{1}{2} \pm 1/4$  inches long by 6 inches wide. The fabric shall be folded lengthwise at the center, coated side to coated side, and stitched with a continuous single row of stitching around the sides and ends (seam type SSa-1). The stitching shall be  $1/4 \pm 1/16$  inch from the folded and raw edges. A zig-zag type of stitching with the points 3 inches apart

shall complete the flap. The stitching shall start at one end corner and continue the length of the flap, ending at the corner in the opposite end.

(3) The flap shall be installed on the coverall by folding under the raw edges on the length of the flap  $1/4$  inch  $\pm 1/16$  inch and placing the flap over the entrance fastener with the turned-under portion parallel to the length of the cutout on the left side of the coverall. The flap shall be fastened to the coverall with a single row of stitching the full length of the flap (seam type SSn-1). The row of stitching shall be not less than  $5/8$  inch nor more than  $3/4$  inch from the edge of the coverall cutout and  $1/8 \pm 1/16$  inch from the folded edge of the turn-under on the flap. The stitching shall not catch the fastener tape. The flap length shall be equally spaced over the cutout length. The ends of the flap shall not be stitched to the coverall but the lengthwise stitching shall be backstitched a minimum of  $1/2$  inch at each end. Seam tape shall be centered over stitching and fastener tape and cemented on inside of coverall.



Repaired coveralls shall not be used or repacked for 24 hours to permit correct curing time.

4-19. Deleted.

**4-20. LEAK TEST.**

4-21. Each repaired coverall will be inflated and leak tested in the following manner:

a. Block the neck opening by a locally manufactured plug. The plug shall be slightly tapered (approximately  $5\frac{1}{2}$  inches diameter) and may be wood, metal or plastic. Plug shall be of such dimensions so as to provide a smooth fit with no wrinkles or excessive tension on the neck seal. The outer side of the plug shall contain two connectors, one for the air supply and one for the manometer or pressure gage. (An alternate method is to fabricate a plug to block off the wrist seal and install the two connectors for hook-up to air source and gage. The neck seal may then be tapered or clamped to prevent leakage.)

b. Turn the coveralls inside out and install plug into the neck seal. Seal neck opening using elastic cord (FSN 8305-276-7575 (an endless ring will suffice) or other effective means to prevent leakage.

c. Tape or clamp wrist seals tightly to prevent leakage.

d. Inflate the coverall with air to a pressure of 5 inches (water column). Shut off the air supply securely and after 3 minutes observe the pressure in coverall. Coveralls which retain a pressure of 4 inches (water column) should be considered serviceable. Coveralls which do not retain the above pressure shall be checked with a liquid soap and water solution ( $1/3$  soap to  $2/3$  water) to determine leaks.

e. All leaks, including thin areas of the coating detected during inflation shall be returned for repair.

**NOTE**

For determining pressure in coveralls, manometer or magnehelic gage, FSN 6685-526-8629 or FSN 6685-087-6331 may be utilized.

4-21A. Alternate Leak Test. Following procedures outlined in paragraphs 4-21a, b, and c, introduce and maintain a minimum of 1/8 PSI pressure inside the coverall. Apply a soap and water solution to the seams and cemented areas and observe for bubbles which are evidence of leakage.

4-22. After inflation test the coverall shall be thoroughly dried, dusted lightly with talc, and folded and positioned in carrying case (refer to Figures 3-1 and 3-2).

4-23. Inflation test of the hood will be as follows:

a. Inflate the hood to a pressure of 2 to 4 inches (water column) with oil free and water free air.

b. The oil-free and water-free air shall be introduced into the hood through the oral inflation valve and tube.

c. The air supply shall be securely shut off. Immerse a portion of hood in water and check for leaks. Continue procedure until entire hood has been checked for leaks, or use a soap and water solution to detect leaks.

d. The air will be discharged through the oral inflation assembly upon completion of test.



By Order of the Secretary of the Army:

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*General, United States Army*  
*Chief of Staff*

Official:

**ROBERT M. JOYCE**  
*Major General, United States Army*  
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# The Metric System and Equivalents

## Linear Measure

1 centimeter = 10 millimeters = .39 inch  
 1 decimeter = 10 centimeters = 3.94 inches  
 1 meter = 10 decimeters = 39.37 inches  
 1 dekameter = 10 meters = 32.8 feet  
 1 hectometer = 10 dekameters = 328.08 feet  
 1 kilometer = 10 hectometers = 3,280.8 feet

## Weights

1 centigram = 10 milligrams = .15 grain  
 1 decigram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 dekagram = 10 grams = .35 ounce  
 1 hectogram = 10 dekagrams = 3.52 ounces  
 1 kilogram = 10 hectograms = 2.2 pounds  
 1 quintal = 100 kilograms = 220.46 pounds  
 1 metric ton = 10 quintals = 1.1 short tons

## Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce  
 1 deciliter = 10 centiliters = 3.38 fl. ounces  
 1 liter = 10 deciliters = 33.81 fl. ounces  
 1 dekaliter = 10 liters = 2.64 gallons  
 1 hectoliter = 10 dekaliters = 26.42 gallons  
 1 kiloliter = 10 hectoliters = 264.18 gallons

## Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

## Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch  
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

## Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square meters	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

## Temperature (Exact)

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