

INCH-POUND

MIL-C-0044077C(GL)

27 November 1990

USED IN LIEU OF

MIL-C-44077B

3 November 1988

## MILITARY SPECIFICATION

## COVERALLS, COMBAT VEHICLE CREWMEN'S

This specification is approved for use by the Natick Research, Development, and Engineering Center, Department of the Army, based upon currently available technical information but it has not been approved for promulgation as a coordinated revision of MIL-C-44077B(GL). It is subject to modification. However, pending its promulgation as a coordinated military specification, it may be used in acquisition.

## 1. SCOPE

1.1 Scope. This specification covers coveralls made of fire-resistant material.

1.2 Classification. The coveralls shall be of the following classes and sizes as specified (see 6.2).

Class 1 - Olive Green 106

Class 2 - Tan 380

Schedule of sizes

<u>Short</u>	<u>Regular</u>	<u>Long</u>
X-Small	X-Small	X-Small
Small	Small	Small
Medium	Medium	Medium
Large	Large	Large
X-Large	X-Large	X-Large

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5019 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8415

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## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

## SPECIFICATIONS

## FEDERAL

- A-A-50083 - Bag, Plastic, Folded Garment
- A-A-50195 - Thread, Aramid
- A-A-50199 - Thread, Polyester Core, Cotton- or Polyester-Covered
- T-T-881 - Twine, Cotton, Seine
- V-F-106 - Fasteners, Slide, Interlocking
- JJ-W-155 - Webbing, Textile, (Cotton, Elastic)
- DDD-L-20 - Label: For Clothing, Equipage, and Tentage  
(General Use)
- PPP-B-636 - Boxes, Shipping, Fiberboard

## MILITARY

- MIL-F-10884 - Fasteners, Snap
- MIL-F-21840 - Fastener Tapes, Hook and Loop, Synthetic
- MIL-L-35078 - Loads, Unit: Preparation of Semiperishable  
Subsistence Items; Clothing, Personal Equipment  
and Equipage; General Specification For
- MIL-W-43685 - Webbing, Tape, Textile, Aramid Fiber
- MIL-T-43709 - Tape, Textile Aramid
- MIL-T-44100 - Thread, Para-Aramid, Spun, Intermediate Modulus
- MIL-C-83429 - Cloth, Plain and Basket Weave, Aramid

## STANDARDS

## FEDERAL

- FED-STD-751 - Stitches, Seams, and Stitchings

## MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection  
by Attributes
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-147 - Palletized Unit Loads
- MIL-STD-731 - Quality of Wood Members for Containers and Pallets

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(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3951 - Standard Practice for Commercial Packaging

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

COLOR ASSOCIATION OF THE UNITED STATES

Standard Color Card of America

Department of Defense Standard Shades for Sewing Threads

(Application for color cards should be addressed to the Color Association of the United States, 343 Lexington Avenue, New York, NY 10016-0927. If color cards are not available from the Color Association, individual color samples may be obtained from the contracting activity or as directed by the contracting activity.)

(Non-Government standards and other publications are normally available from organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes laws and regulations unless a specified exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3), in accordance with 4.3.

3.2 Guide samples. Guide samples, when furnished, are solely for guidance and information to the contractor (see 6.4). Variation from this specification may appear in the sample, in which case this specification shall govern.

3.3 Material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.

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3.3.1 Basic material. The basic cloth for the class 1 coveralls shall be plain weave Olive Green 106 conforming to type II, class 3 of MIL-C-83429. The basic cloth for the class 2 coveralls shall be plain weave Tan 380 conforming to type II, class 6 of MIL-C-83429.

3.3.2 Fastener tapes. The fastener tapes shall be 1 and 2 inch wide hook and loop tapes conforming to type I, class 2 of MIL-F-21840. The color for class 1 shall be Green 3421 and for class 2 shall be Tan 380.

3.3.3 Elastic webbing. The elastic webbing shall be bleached or unbleached and shall conform to type I of JJ-W-155 in the following classes (with exceptions as indicated):

Class 1 - (Except that the water repellent and mildew resistant treatments are not required) sleeve and leg bottoms

Class 6 - Waist tunnel

3.3.4 Cord. The cord beading used for welts of pocket openings and the front openings shall conform to type I, size 18 of T-T-881.

3.3.5 Webbing. The webbing for the retrieval strap tab, the retrieval strap, and holster loop shall conform to type II of MIL-W-43685 with the following exceptions:

a. The webbing for the retrieval strap shall be natural in color.

b. The webbing for the liner snap fastener tabs may be natural in color; however, the same color (Olive Green 106, Tan 380, or natural) must be used for all of the snap fastener tabs within a single garment.

3.3.6 Slide fasteners. The slide fasteners shall be brass with a black chemical finish and conform to size M of V-F-106 in the following types and styles (see operation 2 of table II for length requirements):

Type I, style 3 - Drop seat, and sleeve and leg side openings

Type I, style 7 - All pockets

Type I, style 15 - Front opening

3.3.6.1 Slide fastener tapes. The material for the slide fastener tapes shall be aramid. The color for class 1 shall be Olive Green 106 and for class 2 shall be Tan 380. The tapes shall be of sufficient lengths to comply with respective slide fastener attachment operations. Color matching of the fastener tape under incandescent lamplight at 2300  $\pm$  100K shall be exempt.

3.3.6.2 Colorfastness. The finished tape shall show fastness to light and laundering equal to or better than the standard sample. When no standard sample is available, the tape shall show "fair" fastness to light after 6 standard fading hours, and "good" fastness to laundering.

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3.3.6.3 Slide fastener thongs. The slide fastener thongs shall be 1/4-inch wide tape conforming to MIL-T-43709. The color for class 1 shall be Olive Green 106 and for class 2 shall be Tan 380. To prevent fraying, the thong tape ends shall be either seared or ultrasonically cut.

3.3.7 Thread, aramid and para-aramid. The thread shall be aramid, sizes B and E or T-35 and T-50 conforming to A-A-50195. All operations requiring the use of a LSc-2 seam type shall use either size B or T-35 thread. When the alternate LSq-2(b) seam type is used in place of the LSc-2 seam, only MIL-T-41000 thread size T-50 shall be used (excluding loopers and the 503 or 504 portion of stitching). Para-aramid spun staple thread, size T-35 conforming to MIL-T-44100, may be used as an alternate to aramid sizes B and E. The color of the thread for class 1 shall be Olive Drab 501, C.A. 66022 and for class 2 shall be Tan 380, and shall show fastness to laundering equal to or better than the standard sample. When no standard sample is available, the thread shall show "good" fastness to laundering.

3.3.7.1 Polyester thread. Cotton, covered polyester core thread, conforming to ticket No. 50, 2 ply of A-A-50199 may be used as an alternate thread for bartacking. The thread for class 1 shall be dyed Olive Drab S-1, C.A. 66022, for class 2 shall be Tan 380 and shall show fastness to laundering equal to or better than the standard sample. When no standard sample is available, the thread shall show "good" fastness to laundering.

3.3.8 Snap fasteners. The snap fasteners shall be brass, finish 2, male and female, consisting of stud and eyelet size 1 or 2 with button size 1 or 2 and socket, conforming to style 2A of MIL-F-10884, except an uncapped button may be used to attach the socket.

3.3.9 Labels. Each coverall shall have an identification label, a size label, and instruction label, conforming to type VI of DDD-L-20. The color of the label for class 1 shall be Medium Green, Cable No. 70034, 70130, or 70131, and the color for class 2 shall be Khaki, Cable No. 70188. The fastness to laundering requirements of DDD-L-20 shall apply.

3.3.9.1 Identification label. The identification label shall conform to class 1.

3.3.9.2 Size label. The size label shall conform to class 2 and shall contain the following information for each respective size. Descriptive information shall be printed in letters and numerals not less than 10-point and as follows:

X-Small - Short

Height: Below 67 in.  
Chest: Below 33 in.  
Stock No.  
NATO Size: 6070/7484

X-Small - Regular

Height: From 67 to 71 in.  
Chest: Below 33 in.  
Stock No.  
NATO Size: 7080/7484

X-Small - Long

Height: Over 71 in.  
Chest: Below 33 in.  
Stock No.  
NATO Size: 8090/7484

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Small - Short

Height: Below 67 in.  
 Chest: From 33 to  
 37 in.  
 Stock No.  
 NATO Size: 6070/8494

Small - Regular

Height: From 67 to 71 in.  
 Chest: From 33 to  
 37 in.  
 Stock No.  
 NATO Size: 7080/8494

Small - Long

Height: Over 71 in.  
 Chest: From 33 to  
 37 in.  
 Stock No.  
 NATO Size: 8090/8494

Medium - Short

Height: Below 67 in.  
 Chest: From 37 to  
 41 in.  
 Stock No.  
 NATO Size: 6070/9404

Medium - Regular

Height: From 67 to 71 in.  
 Chest: From 37 to  
 41 in.  
 Stock No.  
 NATO Size: 7080/9404

Medium - Long

Height: Over 71 in.  
 Chest: From 37 to  
 41 in.  
 Stock No.  
 NATO Size: 8090/9404

Large - Short

Height: Below 67 in.  
 Chest: From 41 to  
 45 in.  
 Stock No.  
 NATO Size: 6070/0414

Large - Regular

Height: From 67 to 71 in.  
 Chest: From 41 to  
 45 in.  
 Stock No.  
 NATO Size: 7080/0414

Large - Long

Height: Over 71 in.  
 Chest: From 41 to  
 45 in.  
 Stock No.  
 NATO Size: 8090/0414

X-Large - Short

Height: Below 67 in.  
 Chest: Over 45 in.  
 Stock No.  
 NATO Size: 6070/1424

X-Large - Regular

Height: From 67 to 71 in.  
 Chest: Over 45 in.  
 Stock No.  
 NATO Size: 7080/1424

X-Large - Long

Height: Over 71 in.  
 Chest: Over 45 in.  
 Stock No.  
 NATO Size: 8090/1424

3.3.9.3 Instruction label. The instruction label shall conform to class 3 and shall contain the following information:

## COVERALLS, COMBAT VEHICLE CREWMEN'S

These coveralls are of low-flammability.

No other special flame resistant treatments are required.

1. Wear as outer garment or as under-layer in cold climates.
2. Pockets are designed to accommodate operational equipment and personal effects.
3. Wear liner for added insulation.
4. Brush snow or frost from garments before entering heated shelters.
5. Dry liner and coveralls separately when damp or wet.

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6. For thorough cleaning, return to laundry unit for machine washing in accordance with established procedures. Coveralls may be hand laundered; make sure that all soap is thoroughly rinsed out.
7. WARNING: Launder with slide fasteners and hook and pile fasteners engaged. Do not press hook and pile fasteners.
8. DO NOT STARCH. STARCH OR ANY OTHER TREATMENT THAT LEAVES A RESIDUE WILL DETERIORATE FLAME RESISTANCE.

## DO NOT REMOVE THIS LABEL

9. After 10 laundering cycles and thereafter, launder in accordance with Formula IX (no bleach) of TM 10-280, field laundry and Natick Formula X, fixed laundry for the treatment of anti-static agent.

3.3.9.4 Combination identification-instruction label. The identification label (class 1) and the instruction label (class 3) may be combined into one label. When combined, the item nomenclature shall not be repeated. The combination label shall conform to the requirements of the class 3 label.

3.4 Design. The coveralls feature a drop seat with slide fastener closure at sides and hook and loop tape at top edge, a retrieval strap (loop) located at a hook and loop tape closure at lower end of back yoke, and neck tab. There are nine pockets having slide fastener openings and welt pieces (two chest patch types, two front inside hanging, two thigh inside hanging, two shin inside hanging, and a left sleeve utility pocket, elastic at sleeve and leg bottoms, with slide fastener side opening, and an elastic waist tunnel).

3.5 Patterns. Standard patterns which provide an allowance of 1/2 inch for all double-lapped and double-stitched seams, and 3/8 inch for all other seams, unless otherwise specified, will be furnished by the Government. The Government patterns shall not be altered in any way and are to be used only as a guide for cutting the contractor's work patterns. The working patterns shall be identical to the Government patterns.

3.5.1 Pattern parts. The component parts shall be cut from the material specified below and in accordance with the pattern parts indicated.

TABLE I. List of pattern parts

Component	Pattern nomenclature	Cut parts
Basic material	Front	2
	Back yoke	1
	Upper back	1
	Lower back	2

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TABLE I. List of pattern parts (cont'd)

Component	Pattern nomenclature	Cut parts
Basic material (cont'd)	Front sleeve	2
	Back sleeve	2
	Collar <u>1/</u>	2
	Chest pocket	2
	Front pocket	2
	Shin pocket	2
	Ankle patch	2
	Front sleeve elbow patch	2
	Back sleeve elbow patch	2
	Knee patch	2
	Seat patch	2
	Waist tunnel	2
	Upper back facing	1
	Neck tab	2
	Thigh pocket	2
	Utility pocket	1
	Pencil pocket upper	1
	Pencil pocket lower	1
	Slide fastener cover	1
	Drop seat zipper facing	2
	Front zipper facing	1
	Sleeve zipper facing	2
	Retrieval strap marker, front	-
Retrieval strap marker, back	-	

1/ Collar may be cut in one piece with seam allowances along back edge deducted.

**3.6 Construction.** The construction shall conform in all respects to the requirements specified in table II and herein. Figure 1 is furnished solely for guidance and information. Should variation from this specification appear in figure 1, this specification shall govern.

**3.6.1 Stitches, seams, and stitching.** All stitches, seams, and stitching shall conform to FED-STD-751. The type of seam, stitching, and stitches per inch shall be as specified in table II. Seam allowances shall be maintained with seams sewn so that no raw edges, run-offs, pleats, puckers, or open seams occur. When two or more methods of seams or stitches are given for the same operation, any one may be used. Where stitch type 401 is used, the looper (underthread) shall be on the inside of the coverall.



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3.6.1.1 Type 301 stitching. Ends of all stitching shall be backstitched or overstitched not less than 1/2 inch, except where ends are turned under or caught in other seams or stitching. Ends of a continuous line of stitching shall be overlapped not less than 1/2 inch except on labels where a minimum of a three stitch overlap is required. Thread tensions shall be maintained so that there will be no loose stitching resulting in loose bobbin or top thread, or excessively tight stitching resulting in puckering of the materials sewn. The lock shall be embedded in the materials sewn.

3.6.1.1.1 Repairs of type 301 stitching. Repairs of type 301 stitching shall be as follows:

a. When thread breaks, skipped stitches, run-offs, or bobbin run-outs occur during stitching, the stitching shall be repaired by restarting the stitching a minimum of 1/2 inch back of the end of the stitching. 1/

b. Except for prestitching, thread breaks or two or more consecutive skipped or run-off stitches noted during inspection of the item shall be repaired by overstitching. The stitching shall start a minimum of 1/2 inch in back of the defective area, continue over the defective area and continue a minimum of 1/2 inch beyond the defective area on to the existing stitching. Loose or excessively tight stitching shall be repaired by removing the defective stitching, without damaging the materials, and restitching in the required manner. 1/

1/ When making the above repairs the ends of the stitching are not required to be backstitched.

3.6.1.2 Type 401, 502, and 503 stitching. Thread tension shall be maintained so that there will be no loose stitching. All repairs shall be in accordance with 3.6.1.1.1a and b. Thread tension shall be maintained so that there will be no loose or excessively tight stitching resulting in puckering of the materials sewn. Type 301 stitching may be used to repair 401 stitching.

3.6.2 Bartacking. The bartacks shall measure 1/4 to 1/2 inch in length.

3.6.3 Use of automated apparel equipment. Automated apparel equipment may be used to perform any of the operations specified in table II, providing that the seam and stitch type areas specified and the finished component conforms to the required configurations.

3.6.4 Thread ends. All thread ends that are visible on the finished item shall be trimmed to a length of not more than 1/4 inch.

3.7 Manufacturing operations requirements. The coveralls shall be made in accordance with operation requirements specified in table II or alternates listed below. The contractor is not required to follow the exact sequence of operations. Any additional basting or holding stitches used to facilitate manufacture are permissible provided that the thread is removed or does not show on the finished coveralls.

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3.7.1 Alternate LSc-2 seam. As an alternate for the LSc-2 seam in operations 11.c, 11.d, 16, 22, 23 and 27, the LSq-2(b) seam is allowed. The initial LSq-2(a) seam may be constructed using either the 515, 516, 517 or 518 stitch type using  $3/8 - 5/8$  inch (1/2 inch nominal) gage or distance from inside stitch (301 or 401) to outer edge of outside stitch (503 or 504). The LSq-2(b) seam shall be finished using a 301 top stitch sewn  $3/16 - 5/16$  inch (1/4 inch nominal) from edge of turn-back. Note: Deviation from these tolerances increase the potential for needle-cutting as the top stitch approaches the turn-back. Only T-50 thread sizes are required for the 301 and 401 needle portions of stitching. The 301 bobbin, 401 looper, and 503 or 504 can use T-35 thread size. Use of metric Size 90 sewing needle at 0.037 inch (max.) blade diameter at needle eye is necessary to prevent needle-cutting of the base fabric. Also, stitches per inch shall be reduced to 7-9.

NO.	TABLE II. MANUFACTURING OPERATIONS REQUIREMENTS.	STITCH TYPE.	SEAM AND STITCHING TYPE.	STITCHES PER INCH.	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
1.	<p><u>Cutting.</u></p> <p>a. Cut the coveralls in strict accordance with the patterns furnished which show size, shape, directional lines (warp), placement of pockets, reinforcement patches, fasteners, and retrieval strap, and marks for proper assembly.</p> <p>b. Cut all component parts of the coveralls out of one piece of material except waist tunnel pieces, pocket pieces, reinforcement piece at base of front closure, upper back facing, front zipper facing, drop seat zipper facings, and sleeve zipper facings, which may be cut from ends. Parts cut from ends shall approximate the shade of the coveralls.</p> <p>c. Cut the welt pieces for the slide fastener openings (excluding front closure) from the basic material on the bias, filling, or warp direction. The welt pieces shall be 1-1/2 to 1-5/8 inches in width and shall extend the same length as the respective slide fastener tapes.</p> <p>d. The cord pieces shall be cut of sufficient lengths to correspond to respective slide fastener welts.</p> <p>e. Cut the aramid webbing for the retrieval strap opening tab 3 inches + 1/4 inch in length. Cut six liner snap fastener tabs 3 inches + 1/4 inch from aramid webbing.</p>						

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D												
					NEEDLE	BOBBIN/ LOOPER COVER											
1.	<p><u>Cutting.</u> (cont'd)</p> <p>f. Cut the slide fastener pull thongs of sufficient lengths to finish 3 inches + 1/4 inch when folded in half. To prevent fraying either ultrasonically cut or sear each fastener thong tape end.</p> <p>g. Cut the chest pocket loops of sufficient lengths to finish 1-1/4 to 1-1/2 inches when folded in half.</p> <p>h. Cut the elastic webbing in the following lengths:</p> <table border="0"> <tr> <td><u>Sleeves</u></td> <td><u>Legs</u></td> <td><u>Waist tunnel</u></td> </tr> <tr> <td>7 inches (all sizes)</td> <td>10-1/2 inches (all sizes)</td> <td>X-Small - 6 Small - 7 Medium - 8 Large - 9 X-Large - 10</td> </tr> </table> <p>i. Cut the reinforcement pieces for the base of front closure to finish 2-3/4 inches + 1/8 inch by 2-1/2 inches + 1/8 inch wide tapering to 2-1/4 inches + 1/8 inch.</p> <p>j. Cut the hook and loop fastener tape pieces in the following widths and lengths:</p> <table border="0"> <tr> <td><u>Use</u></td> <td><u>Width (inches)</u></td> <td><u>Length</u></td> </tr> <tr> <td>Hook and loop pieces for retrieval strap opening</td> <td>1</td> <td>To correspond with marks on pattern</td> </tr> </table>	<u>Sleeves</u>	<u>Legs</u>	<u>Waist tunnel</u>	7 inches (all sizes)	10-1/2 inches (all sizes)	X-Small - 6 Small - 7 Medium - 8 Large - 9 X-Large - 10	<u>Use</u>	<u>Width (inches)</u>	<u>Length</u>	Hook and loop pieces for retrieval strap opening	1	To correspond with marks on pattern				
<u>Sleeves</u>	<u>Legs</u>	<u>Waist tunnel</u>															
7 inches (all sizes)	10-1/2 inches (all sizes)	X-Small - 6 Small - 7 Medium - 8 Large - 9 X-Large - 10															
<u>Use</u>	<u>Width (inches)</u>	<u>Length</u>															
Hook and loop pieces for retrieval strap opening	1	To correspond with marks on pattern															

NO.	TABLE 11. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS			STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
	Use	Width (inches)	Length				NEEDLE	BOBBIN/LOOPER COVER
1.	<u>Cutting.</u> (cont'd)							
	Hook portion for top edge of drop seat panel	2	To correspond with marks on pattern					
	Loop piece for neck tab	1	To correspond with marks on pattern					
	Hook pieces for collar	1	To correspond with marks on pattern					
	Hook portion for top ends of lower back pieces	2	To correspond with marks on pattern					
	Loop portion for drop seat	2	To correspond with marks on pattern					
2.	<u>Lengths of slide fasteners (excluding tape).</u>							
	Breast pockets (2)	-	7-1/2 inches					
	Drop seats (2)	-	12-1/2 inches					
	Front pockets (2)	-	7-1/2 inches					
	Leg openings (2)	-	9-1/2 inches					
	Sleeve openings (2)	-	6-1/2 inches					
	Shin pockets (2)	-	8-1/2 inches					

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
2.	<p><u>Lengths of slide fasteners (excluding tape).</u> (cont'd)</p> <p>Front opening (1) - Of sufficient length so that the bottom stop finishes at the notch at base of opening, and the top stops 5/8 to 7/8 inch from neck edge extending to neck edge.</p> <p>Thigh pockets (2) - 8-1/2 inches</p> <p>Utility pocket (1) - 4-3/4 inches</p> <p><u>Marking.</u></p> <p>Mark, ticket, or bundle all components to ensure a uniform shade and size throughout the coverall.</p> <p><u>Replacement of damaged parts.</u></p> <p>a. Replace at time of cutting any part containing a hole, smash, multiple float, or loose slub.</p> <p>b. Replace any part damaged during the manufacturing process by a needle chew, cut, tear, or hole. (A darn or mend in seam allowance will be acceptable.)</p> <p><u>Attach thongs to slide fasteners (sixteen each coverall; see operation 1.f.).</u></p> <p>Thread thong through pull tab of slide fastener and with the ends even single stitch or bartack the plies together through the center (1/16 inch off center tolerance) in the lengthwise direction.</p>	301 or bartack	SSa-1	10-12 28 per bartack	B B	B B
3.						
4.						
5.						

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
5.	<p>Attach <u>thongs to slide fasteners (sixteen each overall; see operation 1.f.)</u>. (cont'd)</p> <p>The top end of the stitching shall finish 3/8 to 5/8 inch from the end of the metal pull tab. The bartack shall measure 1/4 to 3/8 inch in length.</p>	301 or 401 and 301	SSe-1(a) SSe-2(b)	10-12 10-12	B E B	
6.	<p><u>Make neck tab.</u></p> <p>a. Join plies of neck tab, leaving the end to be joined to collar, open. Turn tab and raise stitch 3/16 to 1/4 inch from folded edge.</p> <p>b. Join pile portion of fastener tape to each side of tab (as indicated by marks on pattern) with the stitching 1/16 to 1/8 inch from edges.</p>	301	LSbj-1	10-12	B	B
7.	<p><u>Make collar.</u></p> <p>a. Position the two hook pieces of the fastener tape to the under collar (as indicated by marks on pattern) and stitch on four sides.</p> <p>b. Position raw edge of neck tab to the under collar (as indicated by marks on pattern) and stitch 1/8 to 3/16 inch from edge. Turn and raise stitch tab with the stitching 1/8 to 3/16 inch from turned edge. The tab shall finish toward the back of collar.</p> <p>c. Join under collar and top collar pieces along top and side edges; turn, work out points and edges, and stitch 3/16 to 1/4 inch from side and top edges.</p> <p style="text-align: center;">or</p>	301 301 301 or 401 and 301	LSbj-1 LSbj-2 SSe-2(a) SSe-2(b)	10-12 10-12 10-12 10-12	B B B B	B B B

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
7.	<p><u>Make collar.</u> (cont'd)</p> <p>When collar is cut in one piece, fold collar in half lengthwise and stitch side edges, trim corners, turn, work out points and edges, and stitch 3/16 to 1/4 inch from side and top edges.</p>					
8.	<p><u>Make welt pieces</u> (see operation I.d.).</p> <p>a. Fold welt pieces in half widthwise; insert the cording at folded edges and single stitch 1/8 to 3/16 inch from folded edge.</p> <p>b. Overedge stitch back raw edges of welt pieces together.</p> <p>NOTE: Welt pieces including cording may be cut in strips and placed on rolls; however, there shall be no piecing visible on the finished coveralls.</p>	301  502 or 503	SSbf-3(a)  SSa-1	10-12  6-10	B  E	B  F
9.	<p><u>Attach welt pieces to fastener tapes</u> (see operation I.c.).</p> <p>Position welt pieces to the face side of respective fastener tapes with the back edges of tape extending 1/16 to 1/8 inch beyond raw edges of welt pieces and join plies together 1/4 to 5/16 inch from back edges of tapes.</p>	301 or 401		10-12	B	B
10.	<p><u>Make and attach utility and pencil pocket.</u></p> <p>a. Turn outer edge of slide fastener cover under 1/2 inch. Turn inner edge under 7/8 inch enclosing the cording and the other turned edge and stitch</p>	301	LSbj-2	10-12	E	E



NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
10	<p>Make and attach utility and pencil pocket. (cont'd)</p> <p>1/8 to 3/16 inch from folded edge. Position slide fastener on underside of cover, with edge of chain even with the folded edge of the 7/8-inch fold (inner edge) and stitch tape to cover with two rows of stitching 1/4 to 5/16 inch gage with the back row 1/16 to 1/8 inch from edge of fastener tape. Bridge of slide fastener shall finish toward top of sleeve.</p> <p>NOTE: Although only stitch type LSbj-1 is shown in FED-STD-751, LSbj-2 indicates requirements for two rows of stitching.</p> <p>b. Turn under top raw edge of upper pencil pocket 1/4 inch and hem. Turn under top raw edge of lower pencil pocket 1/4 inch and hem. Both hems shall measure <math>1/4 + 1/16</math> inch.</p> <p>c. Position top edge of lower pencil pocket to bottom of upper pencil pocket as indicated by marks on pattern. Turn under side and bottom edges of the combined pencil pocket and stitch to the utility pocket as indicated by marks on pattern 1/16 to 3/16 inch from folded edge.</p> <p>d. Place a vertical row of stitching through the center (1/8 inch off center tolerance) of upper and lower pencil pockets. Stitching shall be through all plies, forming two compartments in each pencil pocket.</p>	301	EFb-1	10-12	B	B
		301	LSd-1	10-12	E	E
		301	SSv-1	10-12	B	B

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
10.	<p><u>Make and attach utility and pencil pocket. (cont'd)</u></p> <p>e. Place vertical bartacks on ends of pencil pocket openings, superimposed on rows of side stitching, and center stitching of upper and lower pencil pockets and at bottom of lower pencil pocket, at sides and center making total of nine bartacks. The bartack shall measure 1/4 to 3/8 inch in length.</p> <p>f. Close bottom corners of utility pocket and stitch, forming a bellows bottom. Turn and work out edges and points.</p> <p>g. Turn back inner side edge of utility pocket 7/8 inch and insert cording at folded edge and stitch 1/8 to 3/16 inch from folded edge. Position free part of slide fastener tape on turned portion, with edge of slide fastener chain even with inner turned edge of pocket and stitch tape to pocket with two rows of stitching 1/4 to 5/16 inch gage with the back row 1/16 to 1/8 inch from edge of tape.</p> <p>h. Position pocket on left top sleeve on marks indicated on pattern. Turn under top, bottom, and side raw edges and stitch pocket to sleeve.</p> <p>i. Bartack each end of slide fastener opening with a horizontal bartack extending from slide fastener cover to pocket. Bartack shall be 1/4 + 1/8 inch from top and bottom edges of pocket.</p>	Bartack	-	28 per bartack	B	B
		301	SSa-1	10-12	F	E
		301	-	10-12	E	E
		301	LSD-1	10-12	E	E
		Bartack	-	28 per bartack	B	B

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
11	<p>Make sleeves.</p> <p>a. Position front sleeve elbow patch to front (as indicated on pattern) with the fronts, top and bottom edges of patch turned in, and single stitch 1/16 to 1/8 inch from turned edges.</p> <p>b. Position back sleeve elbow patch to back sleeve (as indicated on pattern) with the back top and bottom edges of patch turned in, and single stitch 1/16 to 1/8 inch from turned edges.</p> <p>c. Join sleeve pieces at underarm with a double-lapped and double-stitched seam. The front sleeve shall lap the back sleeve.</p> <p>d. Join sleeve pieces at back arm with a double-lapped and double-stitched seam, forming pleats positioned as indicated on pattern. The outside fold of pleats shall be toward bottom of sleeve and the front sleeve shall lap the back sleeve. The seam shall terminate at the sleeve opening (as indicated on pattern).</p> <p>e. Slash top of side sleeve opening (as indicated on pattern); turn seam allowances to inside and position slide fastener on the inside of sleeve with the back edges of lap 1/8 to 3/16 inch beyond the raw edges of the seam allowances.</p>	301	Lsd-1	10-12	B	B	
		301	Lsd-1	10-12	B	B	
		301 or 401 or 301 or 401/503 or 504 with 301 top stitch	LSc-2 or LSq-2(b)	10-12 7-9	B E T-50 (301 or and top stitch	B B T-35 (503 or 504)	T-35 All
		301 or 401 or 301 or 401/503 or 504 with 301 top stitch	LSc-2 or LSq-2(b)	10-12 7-9	B E T-50 (301 or 401 and Lop stitch	B B T-35 (503 or 504)	T-35 All

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
11.	<p><u>Make sleeves.</u> (cont'd)</p> <p>f. Join slide fastener to sleeve with two rows of stitching 1/4 to 5/16 inch gage. The first row of stitching shall be 1/16 to 1/8 inch from folded edges of sleeves, and the rows of stitching shall continue across the top of the opening with the raw edge turned in and caught in the stitching.</p> <p>g. Position elastic webbing on the inside of sleeve below hem line with the ends of webbing 3/8 to 1/2 inch from edges of side sleeve opening, and tack in position 1/4 to 3/8 inch from raw ends.</p> <p>h. Turn the bottom edge 1/4 inch toward the inside of the sleeve. Then turn in bottom of sleeve (as indicated on pattern) with the top side edges 1/8 to 3/16 inch in back of back edges of slide fastener scoops, and single stitch 1/16 to 1/8 inch from turned edge. The stitching shall continue along the width of hem at ends, and the elastic webbing shall not be caught in the stitching.</p> <p>i. Fold sleeve facings face to face and stitch top and bottom ends together. Turn right side, work out corners and edges, and edge stitch 1/16 to 1/8 inch from turned edge.</p> <p style="text-align: center;">or</p> <p>Fold sleeve facings in half lengthwise, turn in raw edges at ends of facings and edge stitch top, front, and bottom edges 1/16 to 1/8 inch from turned edges.</p>	301	LSb-2	10-12	B	B
		301 or tack	SSbd-1	10-12 14-28 per tack	B B	B
		301	EFb-1	10-12	B	B
		301	SSe-2 and OSF-1	10-12	B	B

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER/ COVER
11.	<p><u>Make sleeves.</u> (cont'd)</p> <p>j. Overedge back raw edges of facings.</p> <p>k. Position a facing behind each slide fastener on under sleeve side. Place a row of stitching through all plies, 5/8 to 11/16 inch from edge of cord. Stitching shall be through all plies and shall start from the cording of the slide fastener, go across to the edge of the facing, continue the full length of the facing, and across bottom edge.</p> <p>l. Secure a stud portion of snap fastener at each bottom end of side sleeve opening (as indicated on pattern) with the stud toward the inside of sleeve.</p>	<p>502 or 503</p> <p>301</p>	<p>SSa-1</p> <p>SSj-1</p>	<p>6-10</p> <p>10-12</p>	<p>F</p> <p>B</p>	
12.	<p><u>Make yoke, attach retrieval opening tab.</u></p> <p>a. Make tab by folding 3 inches + 1/4 inch length of aramid tape in half and stitch 1/16 to 1/8 inch from folded edge, or with a 3/8 to 1/2 inch bartack.</p> <p>b. Turn in bottom raw edge of yoke and stitch 3/16 to 1/4 inch from folded edge catching retrieval opening tab in stitching. One + 1/8 inch of the tab shall extend beyond the yoke and shall be centered + 1/2 inch on the yoke.</p> <p>c. Position 1 inch wide loop portion of tape to inside bottom edge, as indicated on pattern. Stitch tape to yoke with the lines of stitching 1/16 to 1/8 inch from top and bottom edges of tape.</p>	<p>301 Bartack</p> <p>301</p>	<p>OSf-1</p> <p>Efa-1</p> <p>LSbj-1</p>	<p>10-12 28 per bartack</p> <p>10-12</p> <p>10-12</p>	<p>B B</p> <p>B</p> <p>B</p>	

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
13.	<p><u>Make upper back.</u></p> <p>a. Position back facing to the outside bottom edge of upper back and stitch along step and side edges, turn and edge stitch 1/16 to 1/8 inch from edges.</p> <p>b. Fold the liner snap fastener tab in half so that they measure 1-1/2 inches + 1/8 inch. Turn in the top edge of facing and with the cut ends of the liner snap fastener tabs positioned between the facing and upper back in accordance with the pattern markings, stitch 1/16 to 1/8 inch from the turned edge. Fold the tab onto the facing and stitch with a row of stitches superimposed on the previous row. The tab shall finish 1 inch to 1-1/4 inches in length when measured from the folded edge of the facing.</p> <p>c. Turn top raw edge of upper back to outside and stitch 3/16 to 1/4 inch from turned edge.</p> <p>d. Position the 1 inch wide hook portion of tape to outside of top edge (as indicated on pattern) and single stitch with the lines of stitching 1/16 to 1/8 inch from top and bottom edges of tape.</p> <p>e. Position the 2-inch wide loop portion of fastener tape to inside bottom edge (as indicated on pattern) and single stitch 1/16 to 1/8 inch from all edges of tape.</p>	<p>301 or 401 and 301</p> <p>301</p> <p>301</p> <p>301</p> <p>301</p> <p>301</p>	<p>SSe-2(a) SSe-2(b) LSd-1</p> <p>EFa-1 LSbj-1</p> <p>SSb-1 and LSbj-1</p>	<p>10-12 10-12 10-12</p> <p>10-12 10-12 10-12</p>	<p>B E B</p> <p>B</p>	<p>B B B</p> <p>B</p> <p>B</p>	
14.	<p><u>Join yoke to upper back.</u></p> <p>Finished appearance. The retrieval strap opening shall finish in the following lengths:</p>						

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/LOOPER COVER
14.	<p>Join yoke to upper back. (cont'd)</p> <p>X-Small 11 (+ 1/4 to 1/2 inch)  Small 12 (+ 1/4 to 1/2 inch)  Medium 13 (+ 1/4 to 1/2 inch)  Large 14 (+ 1/4 to 1/2 inch)  X-Large 15 (+ 1/4 to 1/2 inch)</p> <p>Lap yoke on upper edge of back piece (as indicated on pattern) and double stitch. The rows of stitching shall be in line with and overlap the rows of stitching joining tape to yoke with one of the rows of stitching continued across width of double stitching at each end of strap opening.</p>	301	LSa-2	10-12	B	B
15.	<p>Attach seat reinforcement pieces.</p> <p>a. Position seat reinforcement pieces to each lower back piece with the raw edges of seam allowances even at seat and inseam area.</p> <p>b. Turn in rounded edges and the diagonal edges at the crotch areas of reinforcement pieces 1/2 inch, and stitch to the plies of lower back pieces with two rows of stitching. The first row of stitching shall be located 1/16 to 1/8 inch from the folded edge and the second row 5/16 to 3/8 inch from the edge.</p>	301	LSd-2	10-12	B	B

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
16.	<p><u>Join seat seam.</u></p> <p>Join seat seam from crotch to top edge of lower back with double-lapped and double-stitched seam catching seat reinforcement pieces in the stitching. The edges of the seat reinforcement pieces shall be aligned, and the seat seam may lap in either direction.</p>	<p>301 or 401 or 301 or 401/503 or 504 with 301 top stitch</p>	<p>LSc-2 or LSq-2(b)</p>	<p>10-12  7-9</p>	<p>B E T-50 (301 or 401 and top stitch</p>	<p>B B T-35 (503 or 504)</p>	<p>T 35 All</p>
17.	<p><u>Make drop seat.</u></p> <p>a. Slash lower back (as indicated on pattern) and tongue notch lower ends. Turn seam allowances and tongue notch end to inside; position slide fastener to underside of slash opening with the back edges of tapes extending 1/8 to 3/16 inch beyond raw edges of slashed seam allowance.</p> <p>b. Join slide fastener to lower back with 2 rows of stitching 5/16 to 3/8 inch gage. The first row of stitching shall be 1/16 to 1/8 inch from folded edges of lower back, and the rows of stitching shall continue across the bottom of opening catching the turned edge of tongue notch with the first row of stitching.</p> <p>c. Turn top raw edge of drop seat panel (include top ends of fastener tapes) to outside and stitch 1/4 to 5/16 inch from folded edge.</p>	<p>301</p>	<p>-</p>	<p>10-12</p>	<p>B</p>	<p>B</p>	



NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/LOOPER	COVER
17	<p>Make drop seat. (cont'd)</p> <p>d. Fold facings face to face and stitch top and bottom ends together. Turn to right side, work out corners and edges, and edge stitch 1/8 to 3/16 inch from turned edges.</p> <p>or</p> <p>Fold drop seat facings in half lengthwise, turn in raw edges at ends of facing and edge stitch top, front, and bottom edges 1/8 to 3/16 inch from turned edges.</p> <p>e. Overedge back raw edges of facings.</p> <p>f. Position one facing behind each slide fastener near side seam. Place a row of stitching, 5/8 to 1 1/16 inch from edge of cord. Stitching shall be through all plies and shall start from the cording of the slide fastener across to the edge of the facing, continue the full length of facing, and across bottom edge.</p> <p>g. Position the hook portion of 2 inch wide fastener tape to the outside top edge of lower back (as indicated on pattern) and stitch tapes 1/16 to 1/8 inch from all edges.</p> <p>h. Overedge stitch top raw ends of lower back catching the ends of slide fastener tapes.</p>	301	SSe-2	10-12	B	B	
		502 or 503	SSa-1	6-8	E	E	
		301	SSj-1	10-12	B	B	
		301	LSbj-1	10-12	B	B	
		502 or 503	SSa-1	6-10	E	E	

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
17.	<p><u>Make drop seat.</u> (cont'd)</p> <p>i. Position a hook portion of fastener tape to each top end of upper back piece in line with hook portion of tape on drop seat panel (slide fasteners at sides closed), and the front edge 1/2 to 5/8 inch from beaded edge of welt. Single stitch tape to back 1/16 to 1/8 inch from all edges.</p> <p>j. Secure three stud portions of snap fasteners to top of drop seat panel (as indicated on pattern) with the stud toward the inside of coverall.</p>	301	LSbj-1	10-12	B	B
18.	<p><u>Make chest pocket openings, attach pockets and labels</u> (see operation 31).</p> <p>Finished appearance. The slider portion of slide fastener shall be located on the back end of pocket opening when fastener is closed.</p> <p>a. Slash pocket opening and tongue notch ends, as indicated on pattern. Turn seam allowances and tongue notched end to inside; position slide fastener to the underside of slash opening with the back edges of tapes extending 1/8 to 3/16 inch beyond raw edges of slashed seam allowance.</p> <p>b. Join slide fastener to front with a row of stitching 1/16 to 1/8 inch from folded edge of front with the stitching continued across ends of opening catching the tongue notch. The loops for pockets shall be positioned as indicated on pattern, and caught in the line of stitching joining fastener tape to front at top of pocket opening.</p>	301	-	10-12	B	B

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
18.	<p>Make chest pocket openings, attach pockets and labels (see operation 31). (cont'd)</p> <p>c. Center identification label on left chest pocket (as worn) with top of label near top of pocket and stitch on all four sides.</p> <p>d. Position instruction label directly below the identification label with left side of labels lined up, and stitch on all four sides 1/16 to 1/8 inch from edge. The top edge of the instruction label may be caught in the bottom row of the identification label stitching. Stitching shall not be through the printing.</p> <p>e. Combination identification-instruction label, when used, shall be positioned as indicated for identification label. Stitching on labels shall not be through printing.</p> <p>f. Position chest pockets to inside of coveralls (as indicated on pattern) with the top and side edges turned in, and single stitch to fronts 1/16 to 1/8 inch from turned edges.</p>	301	LSbj-1	10-12	B	B	
		301	LSbj-1	10-12	B	B	
		301	LSbj-1	10-12	B	B	
		301	LSd-1	10-12	B	B	
19.	<p>Attach cording and slide fastener to front opening and join crotch seams.</p> <p>a. Turn in edges at front opening (as indicated on pattern); insert cording at folded edges with the top ends even with top edge of neck and extending to the notch at base of front opening, and single stitch 1/8 to 3/16 inch from folded edges.</p>	301	SSbf-3(a) (with cord)	10-12	B	B	

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
19.	<p>Attach cording and slide fastener to front opening and join crotch seams. (cont'd)</p> <p>b. Join crotch seams with the stitching terminating at notch at base of front opening. Spread seam allowance open.</p> <p>c. Position the slide fastener on the inside of coverall with the front edges of scoops even with the corded front edges and the front edge of chest pockets inserted between fastener tape and front.</p> <p>Join tapes to fronts 1/16 to 1/8 inch from back edges of tapes catching the chest pockets in the line of stitching. Place a second row of stitching through tape and front 7/16 to 1/2 inch from first row of stitching. Both rows of stitching shall extend the full length of fastener tape and the bottom edges of fastener tapes shall finish 1/2 to 3/8 inch from raw edge of crotch.</p> <p style="text-align: center;">or</p> <p>Fold facing face to face and stitch bottom ends together. Turn corner of bottom end, work out edges and corners, and edge stitch 1/8 to 3/16 inch across the bottom; then edge stitch up the folded edge; turn in raw edges of the top end, and continue stitching across the top end.</p> <p>d. Position bottom raw edge of reinforcement piece even with bottom edge of front slide fastener tape; turn in top and side edges of reinforcement piece, (turned edges of sides even with back edges of</p>	301	SSa-1	10-12	B	B
		301	SSt-2	10-12	B	B
		301	Lsd-1	10-12	B	B
		301				

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
19.	<p><u>Attach cording and slide fastener to front opening and join crotch seams.</u> (cont'd)</p> <p>fastener tapes), and stitch reinforcement piece to tape at front 1/16 to 1/8 inch from folded edges. The stitching may be continued across bottom edge.</p> <p>e. Fold facing face to face and stitch top ends together. Turn right side, work out edges and corners, and edge stitch 1/8 to 3/16 inch from turned edges.</p> <p style="text-align: center;">or</p> <p>Fold face to face and stitch bottom ends together. Turn corner of bottom end, work out edges and corners, and edge stitch 1/3 to 3/16 inch across the bottom; then, edge stitch up the folded edge; turn in raw edges of top end, and continue stitching across the top end.</p> <p>f. Overedge back raw edges of facing.</p> <p>g. Position the facing behind left side of slide fastener (as worn). Place a row of stitching, through all plies, 5/8 to 11/16 inch from edge of cord. Stitching shall be through all plies and shall continue the full length of the facing and along curve of bottom edge.</p>	301	SSe-2 and OSf-1	10-12	B	B	
		502 and 503	SSa-1	6-10	E	E	
		301	SSj-1	10-12	B	B	

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
20.	<p><u>Make side opening in leg.</u></p> <p>a. Slash side opening and tongue notch top end (as indicated on pattern); turn seam allowances and tongue notch to inside, and position slide fastener on the underside of back with the back edges of tapes 1/8 to 3/16 inch beyond the raw edges of seam allowances.</p> <p>b. Join the slide fastener to leg with two rows of stitching 1/4 to 5/16 inch gage. The first row of stitching shall be 1/16 to 1/8 inch from folded edges of leg, and the rows of stitching shall continue across the top of opening.</p>	301		10-12	B	B	
21.	<p><u>Attach knee patch.</u></p> <p>Turn in top and bottom edges of knee patch 3/8 inch (as indicated on pattern); position bottom edge to front (as indicated on pattern) and single stitch top and bottom edges 1/16 to 1/8 inch from turned edges. The stitching may be continued along outseam and inseam.</p>	301	LSc-1	10-12	B	B	
22.	<p><u>Join shoulder seam.</u></p> <p>Join shoulder seams with double-lapped and double-stitched seams. The back shall lap the fronts.</p>	301 or 401 or 301 or 401/503 or 504 with 301 top stitch	LSc-2 or LSq-2(b)	10-14 7-9	B E T-50 (301 or 401 and top stitch	B B T-35 (503 or 504)	T-35 A11

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
23.	<p><u>Join outseams.</u></p> <p>a. Lap step edge at bottom of upper back over upper ends of lower back (as indicated on pattern) and join outseams on one continuous operation with double-lapped and double-stitched seams forming leg pleats (as indicated on pattern) with the fronts lapping the back. The knee patches shall be caught in the stitching, and the outside fold of pleats shall be toward the bottom.</p> <p>b. A bartack, 3/8 to 1/2 inch in length, shall be placed at each side of the flap for the drop seat opening. It shall be located at the top of the opening formed by the side edge of the flap and the side seam and positioned diagonally across the flap and the seam. The bartack shall be slanted from the upper back to the front piece.</p>	<p>301 or 401 or 301 or 401/503 or 504 with 301 top stitch</p> <p>Bartack</p>	<p>1.Sc-2 or 1.Sq-2(b)</p>	<p>10-14  7-9</p>	<p>B E T-50 (301 or 401 and top stitch</p> <p>B</p>	<p>B B T-35 (503 or 504)</p>	<p>T-35 All</p>
24.	<p><u>Set sleeves.</u></p> <p>a. Join sleeve to armhole and overedge raw edges.</p> <p style="text-align: center;">or</p> <p>Join sleeve and overedge simultaneously.</p> <p>b. Turn sleeve seam toward body and raise stitch 3/16 to 1/4 inch from turned edge.</p>	<p>301 or 401 502 or 503 515 or 516</p> <p>301 or 401</p>	<p>LSq-2(a) EFD-1  LSq-2</p> <p>LSq-2(b)</p>	<p>10-14  6-8  10-14  10-14</p>	<p>B E E E E</p> <p>B E</p>	<p>B B E E</p> <p>B B</p>	

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
25.	<p><u>Make thigh pockets.</u></p> <p>Finished appearance. The slider portion of the slide fastener shall be located on the back part when fastener is closed.</p> <p>a. Position slide fastener to leg (face to face) with the pocket piece positioned on the inside of leg (slash marks matching) and stitch tape through all plies the length of the slash mark.</p> <p>b. Slash pocket opening through pocket and plies of leg (as indicated on pattern), tongue notch ends, turn fastener to inside, and join opposite edges of pocket opening to the respective tape on the inside of leg.</p> <p>c. Turn in tongue notched ends and raise stitch leg 1/16 to 1/8 inch from turned edge at bottom of opening with the stitching continued along tongue notched ends.</p> <p>d. Pull pocket piece through opening, fold pocket in half forming bottom pleat (as indicated on pattern), and join sides. Turn pocket through opening to finished position.</p> <p>e. Raise stitch leg at top of pocket opening through all plies including the pocket with the stitching 1/16 to 1/8 inch from turned edge and continuing along sides superimposed on the stitching.</p> <p>f. Overedge stitch top raw edges of pockets together.</p>	301	LSbj-1	10-12	B	B	
		301	SSa-1	10-12	B	B	
		301	LSq-2(b) and LSD-1	10-12	B	B	
		301	SSa-1	10-12	B	B	
		301	LSq-2(b)	10-12	B	B	
		502 or 503	SSa-2	6-10	E	F	



NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/LOOPER	COVER
26.	<p><u>Make shin pockets.</u></p> <p>Finished appearance. The slider portion of the slide fastener shall be located on the back part when fastener is closed.</p> <p>a. Position slide fastener to leg (face to face) with the pocket piece positioned on the inside of leg (slash marks matching) and stitch tape through all plies the length of the slash mark.</p> <p>b. Slash pocket opening through pocket and plies of leg (as indicated on pattern), tongue notch ends, turn fastener to inside, and join opposite edges of pocket opening to the respective tape on the inside of leg.</p> <p>c. Turn in tongue notched ends and raise stitch leg 1/16 to 1/8 inch from turned edge at bottom of opening with the stitching continued along tongue notched ends</p> <p>d. Pull pocket piece through opening, fold pocket in half forming bottom pleat (as indicated on pattern), and join sides. Turn pocket through opening to finished position.</p> <p>e. Raise stitch leg at top of pocket opening through all plies including the pocket with the stitching 1/16 to 1/8 inch from turned edge and continuing along the sides superimposed on the stitching.</p> <p>f. Overedge stitch top raw edges of pockets together.</p>	301	LSbj-1	10-12	B	B	
		301	SSa-1	10-12	B	B	
		301	LSq-2(b) and LSD-1	10-12	B	B	
		301	SSa-1	10-12	B	B	
		301	LSq-2(b)	10-12	B	B	
		502 or 503	SSa-2	6-10	E	E	

TABLE II. (cont'd)  
 MANUFACTURING OPERATIONS REQUIREMENTS

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/ LOOPER	COVER
27.	<p><u>Join inseams.</u></p> <p>Join inseams in one continuous operation with a double-lapped and double-stitched seam forming pleats as indicated on pattern. The knee patches shall be caught in the stitching and the fronts shall lap the backs. The outside fold of pleats shall finish toward the bottom and the crotch and seat seams shall not be staggered more than 3/8 inch (measurement taken from center of seam).</p>	<p>301 or            401 or            301 or            401/503            or 504            with 301            top stitch</p>	<p>LSc-2            or            LSq-2(b)</p>	<p>10-12            7-9</p>	<p>B            E            T-50            (301            or            401            and            top            stitch</p>	<p>B            B            T-35            (503            or            504)</p>	<p>T-35            All</p>
28.	<p><u>Attach retrieval strap.</u></p> <p>a. Position aramid webbing retrieval strap to inside of coverall (as indicated on patterns). Leave a free end of strap a minimum of 12 inches in length. Begin stitching strap to left front of coveralls (as worn) 1/16 to 1/8 inch from outer edge. Stitching shall not be through chest pocket. Continue stitching around armhole stopping at pattern marks on left upper back.</p> <p>Measure strap lengths as indicated per size:</p> <p>X-Small - 10 inches            Small - 11 inches            Medium - 12 inches            Large - 13 inches            X-Large - 14 inches</p> <p>Continue stitching outer edge of strap starting at pattern marks on right back and around armhole to right front leaving a 10-inch length of strap and c.t.</p>	<p>301</p>	<p>LSbj-1</p>	<p>10-12</p>	<p>B</p>	<p>B</p>	

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
28.	<p><u>Attach retrieval strap. (cont'd)</u></p> <p>b. Stitch inside edge of strap to coveralls 1/16 to 1/8 inch from edge easing in excess in the underarm areas. Stitching shall not be through chest pockets and shall not penetrate into armhole seam.</p> <p>c. Boxstitch strap on fronts and back as indicated on patterns. The stitching shall be superimposed on the stitching of strap at sides and top forming a pattern 2 to 2-1/4 inches in length with diagonal stitching from corner to corner crossing at center.</p> <p>d. Overlap free ends of strap such a distance that when centered and superimposed on the continuous loop there will be no excess in either loop when the retrieval strap is pulled taut. Turn under ends of straps so that overlap is a minimum of 6-1/4 inches. Trim off any turn under in excess of 1/4 inch. Stitch overlap to continuous loop with a 6 to 6-1/4 inch box stitch with stitching 1/16 to 1/8 inch.</p> <p style="text-align: center;">or</p> <p>Two box X stitch patterns will be allowed as an alternative to join the ends of the retrieval strap. When the alternative stitch pattern is utilized, the distance between the box patterns shall not be more than 1/2 inch and not less than 1/8 inch from edges and diagonal stitching from corner to corner crossing at center. There shall be no piecing of the aramid webbing and the raw ends shall be seared.</p>	301	LSbj-1	10-12	B	B	
		301	-	10-12	B	B	
		301		10-12	B	B	
		301		10-12	B	B	

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
29.	<p><u>Make front pockets.</u></p> <p>Finished appearance. The slider portion of slide fastener shall be located at the top end of opening when fastener is closed.</p> <p>a. Position the back edge of slide fastener tape to front (face to face) at slash mark, and join to front the length of the slash mark.</p> <p>b. Slash opening through pocket and front (as indicated on pattern), tongue notch ends, turn fastener to inside, and join opposite edge of pocket opening to the respective tape on the inside of front.</p> <p>c. Position the top pocket portion to inside of coveralls to the slide fastener tape at front of pocket opening (as indicated on pattern) and, with the slide fastener tape extending 1/16 to 1/8 inch beyond raw edge of pocket, single stitch, tape and welt pieces only, through pocket the length of slash opening.</p> <p>d. Turn in tongue notched ends; raise stitch fronts at sides of pocket opening with the stitching 1/16 to 1/8 inch from turned edges. The stitching shall continue across bottom and top ends of opening 1/16 to 1/8 inch from folded edges of tongue notches. The pocketing shall be turned toward the front of coveralls and caught in the raised stitching along front side of pocket opening.</p> <p>e. Turn pocket inside out at mark indicated on pattern, and join along back and bottom edges. Turn pocket, and edge stitch 3/16 to 1/4 inch.</p>	301  301  301  301  301 or 401 and 301	LSbj-1  LSq-2(a)	10-12  10-12  10-12  10-12	B  B  B  B	B  B  B  B  B B B	

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
29.	<p><u>Make front pockets.</u> (cont'd)</p> <p>f. Turn in raw edge of facing at inside back edge of underpocketing (as indicated on pattern), and stitch 1/16 to 1/8 inch from folded edge. The stitching shall continue across the width of facing at tongue notch at bottom of pocket opening.</p> <p>g. With the pocket in its finished position, tack across bottom and top ends of pocket opening through all plies with the stitching superimposed on the lines of stitching securing tongue notched ends.</p>	301 or tack		10-12 28 per tack	B B	B B
30.	<p><u>Finish leg bottoms.</u></p> <p>a. Position ankle patch to leg bottom with the notches positioned on inseam and the bottom edges even.</p> <p>b. Turn in curved raw edges of patch 3/8 inch and single stitch 1/16 to 1/8 inch from turned edge.</p> <p>c. Position elastic webbing on the inside of leg below hemline with the ends of webbing 3/8 to 1/2 inch from edges of side leg opening, and tack in position 1/4 to 3/8 inch from raw ends.</p> <p>d. Turn up the bottom edge of the leg cuff 1/4 inch toward the inside of the leg and then turn in bottom of leg (as indicated on pattern) with the top side edges 1/8 to 3/16 inch in back of back edges of slide fastener scoops, and single stitch 1/16 to 1/8 inch from turned edge. The stitching shall continue along the width of hem at ends, and the elastic webbing shall not be caught in the stitching.</p>	301  301 or tack  301	Lsd-1  SSbd-1  Efa-1	10-12  10-12 14-28 per tack  10-12	B  B  B	

NO.	TABLE II. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/LOOPER COVER
30	<p><u>Finish leg bottoms.</u> (cont'd)</p> <p>e. Secure a stud portion of snap fastener at each bottom end of leg opening (as indicated on pattern) with the stud toward the inside of leg.</p>					
31	<p><u>Attach collar and size label.</u> (see operation 18).</p> <p>a. With raw edge of undercollar and outside back edge even, stitch 3/8 inch from raw edges. The size label shall be centered on the inside back and caught in the joining seam.</p> <p>b. Turn in raw edge of top ply of collar and stitch to neck 1/16 to 1/8 inch from turned edge.</p> <p>c. Stitch the remaining three sides of the size label 1/16 to 1/8 inch from edge. Stitching shall not be through the printing.</p>	301 or 401	SSa-1	10-12	B E	B B
32	<p><u>Make and attach tunnel pieces.</u></p> <p>Finished appearance. The top ends of front pockets, the bottom of chest pockets, and the liner snap fastener tabs shall be caught in the stitching of tunnels to fronts. The webbing shall not be caught in the stitching along top and bottom edges of tunnel pieces.</p> <p>a. Fold the 1-3/4 inch piece of aramid tape for holster holder in half lengthwise and edge stitch 1/16 to 1/8 inch from edges.</p> <p>b. Turn under raw edges of holster holder 1/8 to 3/16 inch, position as indicated by marks on pattern, and bartack in place. The length of the bartack shall be 3/8 + 1/16 inch.</p>	301	LSb-1 LSbj-1	10-12	B B	B B
			SSa-1 and OSf-1	10-12	B	B
		Bartack	-	28 per bartack	B	B

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/LOOPER	COVER
32.	<p><u>Make and attach tunnel pieces.</u> (cont'd)</p> <p>c. Center the elastic webbing on waist tunnel with the raw ends even, and tuck in position the width of webbing 1/8 to 1/4 inch from ends. Turn pieces inside out.</p> <p>d. Position waist tunnel to the inside of fronts (as indicated on pattern) and with the top and bottom raw edges of tunnel turned in 3/8 inch and with liner snap fastener tabs positioned as indicated by marks on pattern, single stitch to fronts 1/16 to 1/8 inch from turned edge catching raw ends of fastener tabs in stitching.</p> <p>e. Fold the snap fastener tabs onto the tunnel and top stitch 1/16 to 1/8 inch from folded edge. The finished length of the tab shall be 1 inch to 1-1/4 inches.</p> <p>f. Secure the socket portion of snap fastener at each liner snap fastener tab. The snap fastener shall be centered on the tab and shall face the wearer when coveralls are worn.</p>	301	-	28 per tuck	B	B	
		301	Lsd-1	10-12	B	B	
33.	<p><u>Prepare for packing.</u></p> <p>a. Trim all thread ends and remove loose threads.</p> <p>b. Remove all spots, stains, and shade or size markings.</p> <p>c. Close all slide fasteners.</p>	301	OSf-1	10-12	B	B	

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3.8 Finished measurements. The coveralls shall conform to finished measurements shown in table III.

TABLE III. Finished measurements (in inches)

	Short	Regular	Long	Tolerance
Half chest <u>1/</u>				
X-Small	20-1/2	20-1/2	20-1/2	$\pm 1/2$
Small	22-1/2	22-1/2	22-1/2	
Medium	24-1/2	24-1/2	24-1/2	
Large	26-1/2	26-1/2	26-1/2	
X-Large	28-1/2	28-1/2	28-1/2	
Sleeve length <u>2/</u>				
X-Small	18-1/2	19-1/2	20-1/2	$\pm 1/2$
Small	18-1/2	19-1/2	20-1/2	
Medium	18-1/2	19-1/2	20-1/2	
Large	18-1/2	19-1/2	20-1/2	
X-Large	18-1/2	19-1/2	20-1/2	
1/2 Waist (relaxed) <u>3/</u>				
X-Small	16	16	16	$\pm 3/4$
Small	18	18	18	
Medium	20	20	20	
Large	22	22	22	
X-Large	24	24	24	
Inseam <u>4/</u>				
X-Small	28	30	32	$\pm 1/2$
Small	28	30	32	
Medium	28	30	32	
Large	28	30	32	
X-Large	28	30	32	

1/ Measure from folded edge to folded edge at bottom of armhole.

2/ Measure from base of armhole to bottom edge of sleeve. Individual coverall sleeves shall not differ in length by more than 1/2 inch.

3/ Measure from side edge to side edge between rows of waist tunnel stitching.

4/ Measure from seam line at base of crotch to bottom of leg. Individual coveralls inseams shall not differ in length by more than 1/2 inch.



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3.9 Workmanship. The finished coveralls shall conform to the quality of product established by this specification and the occurrence of defects shall not exceed the applicable acceptable quality levels.

## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for ensuring that all specified dimensions have been met. When dimensions cannot be examined on the end item, inspection shall be made at any point or at all points in the manufacturing process necessary to ensure compliance with all dimensional requirements.

4.1.3 Certificates of compliance. When certificates of compliance are submitted, the Government reserves the right to inspect such items to determine the validity of the certification.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).

4.3 First article inspection. When a first article is required (see 3.1 and 6.2), it shall be examined for the defects specified in 4.4.2 and 4.4.3. The presence of any defect shall be cause for rejection of the first article.

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4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.4.2 End item visual examination. The end items shall be examined for the defects listed in table III. The lot size shall be expressed in units of coveralls. The sample unit shall be one of the coveralls. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5 for major defects, 15.0 for major and minor A defects combined, and 40.0 for total (major, minor A, and minor B combined) defects.

TABLE IV. End item visual defects

Examine	Defect	Classification	
		Major	Minor A B
Material defects.	Hole, cut, tear, or needle chew:		
	On outside:		
	-up to 1/8 inch in diameter or length		301
	-more than 1/8 inch up to 1/4 inch inclusive		201
	-more than 1/4 inch	101	
	On inside:		
	-up to 1/4 inch in diameter or length		302
	-more than 1/4 inch up to 1/2 inch inclusive		202
	-more than 1/2 inch	102	
	Mend, darn, or patch:		
	On outside:		
-any	103		
On inside (except on seam allowance):			
-1/4 inch up to 1/2 inch in diameter or length		303	
-more than 1/2 inch		203	
Friction burn:			
-when fibers are broken use "hole, cut, tear, or needle chew" classification			
Drill hole exposed on outside		304	

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TABLE IV. End item visual defects (cont'd)

Examine	Defect	Classification	
		Major	Minor A B
Material defects (cont'd)	Weakening defects:	104	
	Smash		
	Multiple float or loose slub:		
	-on outside		204
	-on inside		305
	Slub or shade bar:		
-on outside		205	
-on inside		306	
	NOTE: Only knots and slubs that exceed the limits specified in the basic cloth document and are clearly visible when examined at a distance of 3 feet shall be scored as defects in evaluating the quality of the coveralls.		
Shaded parts	Any outside part shaded (except those cut from ends)		206
Cleanness	Any spot or stain on outside		307
	One or more shade or size markings not removed		308
	Thread ends not trimmed to 1/4 inch or less		207
Component and assembly	Any component or required operation omitted (unless otherwise classified herein)	105	
	Any operation not performed as specified (unless otherwise classified herein)		309
Cutting	Any component part not cut in conformance with directional lines indicated on patterns or not in accordance with specification requirements	106	

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TABLE IV. End item visual defects (cont'd)

Examine	Defect	Classification	
		Major	Minor A B
Seams and stitching	Accuracy of seaming:		
	Seam twisted, puckered, or pleated		208
	Part of garment caught in unrelated operation or stitching	107	
	Ends of stitching, when not caught in other seams or stitching, back-stitched less than 1/2 inch		209
	Stitching overlapping end(s) of thread break less than 1/2 inch		310
	Ends of a continuous line of stitching overlapped less than 1/2 inch (except label stitching)		311
	Ends of stitching on label overlapped with less than three stitches		312
	Gage of stitching:		
	Irregular, i.e., unevenly gaged or corresponding stitchings not uniform (to be scored only when condition exists along major portion of seam)		210
	Not within range of gage specified or varies more than 1/16 inch when no range is specified		313
	Stitches broken or missing:		
	-up to 1/4 inch inclusive		314
	-more than 1/4 inch to 1/2 inclusive		211
	-more than 1/2 inch	108	
	Raw edges (except ends of exposed welts and slide fasteners):		
	-more than 1/4 inch long		315
	Seam or stitch type not as specified		316
	Stitches per inch more than maximum or less than minimum specified		317
Stitch tension:			
Loose tension, resulting in a loose seam	109		
Loose tension (exposed loops of top or bottom threads):			
-on outside		212	
-on inside		318	

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TABLE IV. End item visual defects (cont'd)

Examine	Defect	Classification	
		Major	Minor A B
Seams and stitching (cont'd)	Tight tension (stitches break when strain is applied in the direction of the seam or stitching)	110	
	Run-offs (on edge or raised stitching): -1/4 inch up to 1/2 inch inclusive -more than 1/2 inch		319 213
Slide fasteners	One or more defective, affecting function	111	
	Not type, size, or style specified		214
	Slider on reverse side	112	
	Pocket slider not closing in direction specified		215
Slide fastener thongs	Any other slider not closing in direction specified	113	
	One or more omitted		216
	Less than 2-3/4 inches or more than 3-1/4 inches long		320
Waist tunnel	Line of stitching or bartack joining ends, off-center by more than 1/16 inch, or the top end of the stitching finishing less than 3/8 inch or more than 5/8 inch from end of metal pull tab		321
	Elastic webbing caught in the stitching of top and bottom edges		217
Front opening	Top ends of slide fastener or cord- ing not caught in collar joining seams		218
	Top ends of slide fastener or cording stops less than 1/4 inch or more than 1/2 inch from collar joining seam		219
	Cord edges of fronts not abutted or overlapping 1/16 inch or more when fastener is closed		220

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TABLE IV. End item visual defects (cont'd)

Examine	Defect	Classification	
		Major	Minor A B
WELTS at slide fastener openings	Piecing of welt pieces visible at one or more slide fastener openings (when applicable)		322
	Cording at folded edges not extending the full length of slide fastener opening		221
	Ends of tapes and welts not caught in the line of stitching at tongue notched ends of openings		222
	Corded edges not abutted or overlapping 1/16 inch or more when fastener is closed		223
Retrieval strap	Length of continuous loop not as specified		224
	Dimensions and locations of box stitches of retrieval strap not as specified		225
Collar	Twisted or puckered	114	
	Points not of uniform shape, affecting appearance		226
	Points uneven in length by more than 1/4 inch		227
	Ends insecurely stitched at edges of front opening		228
Back yoke	Not lapped on upper back	115	
	Yoke not overlapped to cover entire fastener tape on upper back		229
	Retrieval strap opening not as specified in operation 14 (finished appearance)		230
	Hook and loop portions of fastener tapes not positioned as specified (i.e., hook portion positioned at the inside bottom edge of yoke and the loop portion positioned at the outside top edge of upper back)		231

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TABLE IV. End item visual defects (cont'd)

Examine	Defect	Classification	
		Major	Minor A B
Back yoke (cont'd)	Rows of stitching joining yoke and upper back not in line with overlapping the stitching joining loop portion of tape to yoke		323
Drop seat	Hook portion positioned at the lower inside edge of upper back and the loop portion positioned at the outside of top edge of lower back Hook portions of fastener tape at ends of upper back out of alignment with hook portion on drop seat panel by more than 1/4 inch or positioned less than 1/2 inch or more than 5/8 inch from front edge of welts		232 324
Shoulder and side seams	Backs not lapping fronts		325
Neck tab	Not finishing toward the back of collar		326
Inseams and outseams	Fronts not lapping backs Outside fold of pleats not toward bottom		327 328
Thigh and shin pockets	Bottom pleat missing in one or both pockets		329
Sleeve and leg openings	Elastic webbing caught in the hemming operation Hem less than 7/8 inch or more than 1-1/8 inches wide		233 234
Labels	Missing, incorrect, or illegible: -size -identification, instruction, or combination identification-instruction (where applicable)	116	235

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TABLE IV. End item visual defects (cont'd)

Examine	Defect	Classification	
		Major	Minor A B
Labels (cont'd)	Not stitched on all four sides		236
	Stitching through printing		237
	Size label off center by more than 1/2 inch, or any other label not positioned as specified		238
Elbow and seat patches	Uneven at top by 1/8 to 1/4 inch inclusive		330
	Uneven at top by more than 1/4 inch		239
Snap fasteners	Any part of assembly missing, mismatched, broken, cracked, bent, not securely clinched, affecting function: -two or more snap fasteners -one snap fastener	117	240
		One or more clinched too tightly cutting surrounding fabric	118
	Loose (i.e., socket or stud spins freely or wobbles in connection portions)		241
	One or more having rough or sharp edge	119	
	More than three splits in eyelet or button barrel		242

4.4.3 End item dimensional examination. The end items shall be examined for conformance to the measurements specified in table III. Any dimension not within the specified tolerance shall be classified as a defect. The lot size shall be expressed in units of coveralls. The sample unit shall be one coveralls. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 4.0.

4.4.4 Packaging examination. The fully packaged end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container fully packaged. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.



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<u>Examine</u>	<u>Defect</u>
Workmanship	Inadequate application of components, such as incomplete sealing or closure of flap, improper taping, loose strapping, or inadequate stapling Bulged or distorted container Incorrectly fabricated bag
Content	Number of unit packs per shipping container is more or less than specified

4.4.5 Palletization examination. The fully packaged and palletized end items shall be examined for the defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

<u>Examine</u>	<u>Defect</u>
Finished dimensions	Length, width, or height exceeds specified maximum requirements
Palletization	Pallet pattern not as specified Load not bonded as specified
Weight	Exceeds maximum load limits
Marking	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application

## 5. PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial as specified (see 6.2).

5.1.1 Level A. Each pair of coveralls with sleeves and legs fully extended and with slide fasteners closed, shall be laid flat, front down. Fold the leg bottoms up approximately 15 inches. Next bring the leg portion up even with the lower edge of the collar and fold the sleeve one on top of the other across the back. The length shall then be folded in half. Each of the completely folded coveralls shall measure approximately 21 inches by 15 inches. Each of the folded coveralls shall be unit packed in a close-fitting clear polyethylene film bag conforming to A-A-50083.

5.1.2 Commercial. Coveralls shall be preserved in accordance with ASTM D 3951.

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5.2 Packing. Packing shall be level A, B, or Commercial as specified (see 6.2).

5.2.1 Level A packing. Ten coveralls of one size only, preserved as specified in 5.1, shall be packed in a fiberboard shipping container conforming to style RSC-L, grade V2s of PPP-B-636. The inside of each container shall be fitted with a box liner conforming to type CF, class weather-resistant, variety DW, grade V15c of PPP-B-636. Level A unit packs shall be packed flat, alternated end for end, one in length, one in width and ten in depth. Inside dimensions of each container shall be approximately 21-1/2 inches in length, 15-1/2 inches in width, and 15 inches in depth. Approximate dimensions are furnished as a guide only. Each shipping container shall be closed in accordance with method III, waterproofed in accordance with method V, and reinforced as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.4. Shipping containers shall be arranged in unit loads in accordance with MIL-L-35078 for the type and class of load specified (see 6.2). When unit loads are strapped, strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

5.2.2 Level B packing. Ten coveralls of one size only, preserved as specified in 5.1; shall be packed in a fiberboard shipping container conforming to style RSC-L, type CF (variety SW) or SF, class domestic, grade 275 of PPP-B-636. The inside of each container shall be fitted with a box liner conforming to type CF, class domestic, variety DW, grade 275 of PPP-B-636. Level A unit packs shall be packed flat, alternated end for end, one in length, one in width, and ten in depth within a container. Inside dimensions of each container shall be approximately 21-1/2 inches in length, 15-1/2 inches in width, and 15 inches in depth. Approximate dimensions are furnished as a guide only. Each container shall be closed in accordance with method II as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.4.

5.2.2.1 Weather-resistant fiberboard container. When specified (see 6.2), the shipping container shall be a grade V3c, V3s, or V4s fiberboard box fabricated in accordance with PPP-B-636 and closed in accordance with method III as specified in the appendix of PPP-B-636, except that the inspection shall be in accordance with 4.4.4.

5.2.3 Commercial packing. Coveralls, preserved as specified in 5.1, shall be packed in accordance with ASTM D 3951.

5.3 Palletization. When specified (see 6.2), coveralls packed as specified in 5.2.2 or 5.2.3, shall be palletized on a 4-way entry pallet in accordance with load type Ia of MIL-STD-147. Pallet types shall be type I (4-way entry), type IV, or type V in accordance with MIL-STD-147. Pallets shall be fabricated from groups I, II, III, or IV of MIL-STD-731. Each prepared load shall be bonded with primary and secondary straps in accordance with bonding means C and D or film bonding means F or G. Pallet pattern shall be number 3 in accordance with appendix of MIL-STD-147.

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5.4 Marking. In addition to any special marking required by the contract or purchase order, unit packs, shipping containers, and palletized unit loads shall be marked in accordance with MIL-STD-129 or ASTM D 3951, as applicable.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The coveralls are intended for wear by combat vehicle crewmen of the Department of Defense.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Class and size required (see 1.2).
- c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- d. When a first article is required (see 3.2, 4.3, and 6.3).
- e. Levels of preservation and packing (see 5.1 and 5.2).
- f. Type and class of unit load required (see 5.2.1).
- g. When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.2.2.1).
- h. When palletization is required (see 5.3).

6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.4 Sample. For access to samples, address the contracting activity issuing the invitation for bids or request for proposal.

6.5 Subject term (key word) listing.

CVC  
Fire-resistant

6.6 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:

Army - GL

Preparing activity:

Army - GL

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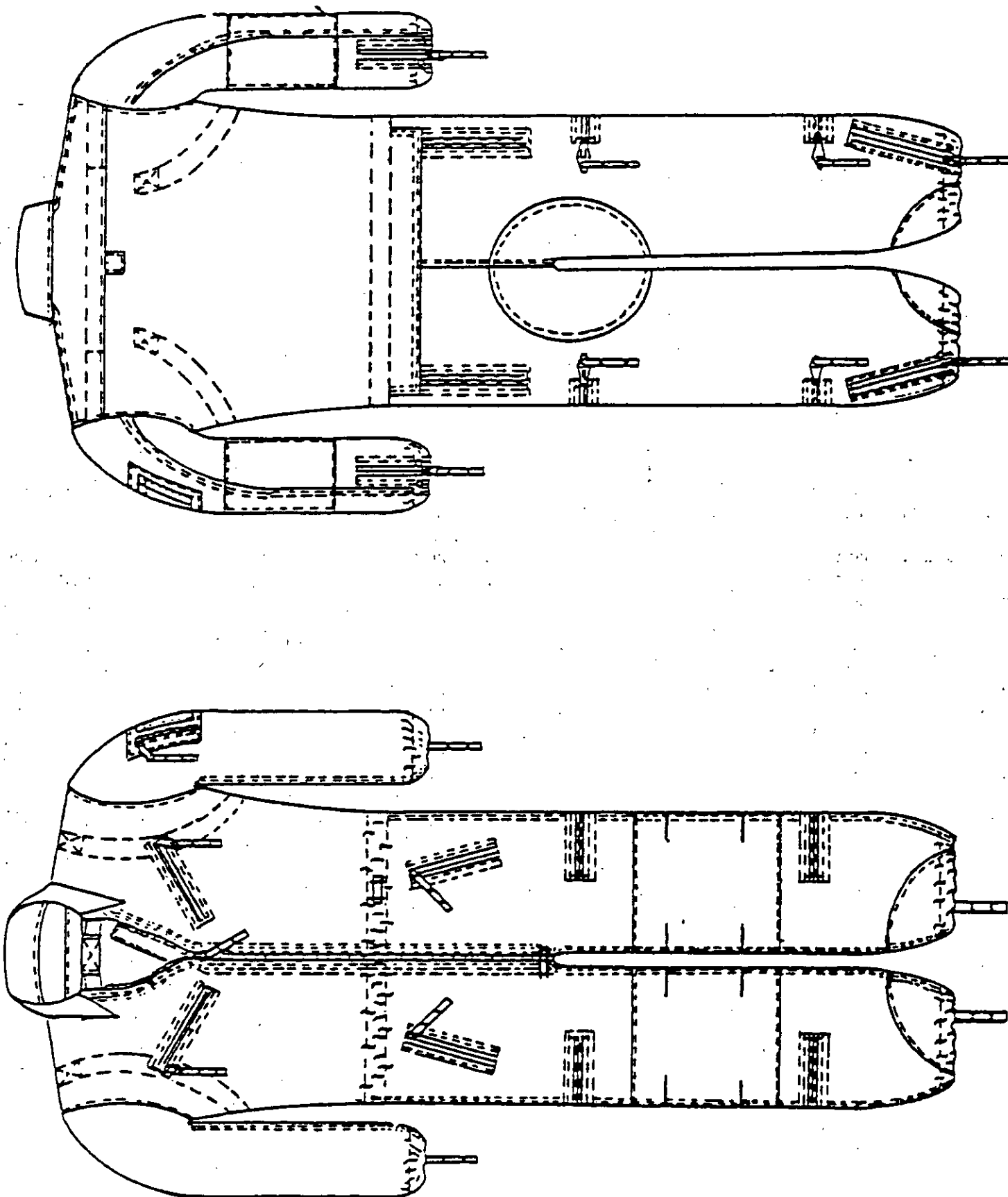


FIGURE 1. Coveralls, combat vehicle crewmen's.