

MIL-B-44053A

31 DEC 1986

SUPERSEDING

MIL-B-44053

29 September 1981

MILITARY SPECIFICATION

BODY ARMOR, FRAGMENTATION PROTECTIVE VEST, GROUND TROOPS

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This document covers a body armor vest for protection against fragmentation munitions, consisting of an aramid ballistic filler inclosed in a nylon ballistic cloth shell.

1.2 Classification. The body armor vest shall be of one type and in the following sizes (see 6.2):

Sizes

Extra small

Small

Medium

Large

Extra large

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8470

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SPECIFICATIONS

FEDERAL

- A-A-203 - Paper, Kraft, Untreated
- V-T-285 - Thread, Polyester
- V-T-295 - Thread, Nylon
- DDD-L-20 - Label: For Clothing, Equipage and Tentage
(General Use)
- PPP-B-636 - Boxes, Shipping, Fiberboard

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- MIL-C-508 - Cloth, Oxford, Nylon, 3 Ounce
- MIL-W-4088 - Webbing, Textile, Woven Nylon
- MIL-T-5038 - Tape, Textile and Webbing, Textile, Reinforced
Nylon
- MIL-W-5664 - Webbing, Textile, Elastic
- MIL-F-10884 - Fasteners, Snap
- MIL-E-20652/1 - Eyelets, Metallic, Rolled Flange Type; and Eyelet
Washer
- MIL-F-21840 - Fastener Tapes, Hook and Pile, Synthetic
- MIL-L-35078 - Loads, Units: Preparation of Semiperishable
Subsistence Items; Clothing, Personal Equipment
and Equipage; General Specification For
- MIL-C-43128 - Cloth, Plain Weave, Nylon; Water Repellent; OG-106
- MIL-C-43191 - Cloth, Wind Resistant Sateen, Cotton and Nylon
- MIL-C-43734 - Cloth, Duck, Nylon, 9 Ounce
- MIL-C-44043 - Cloth, Ballistic, Nylon, Lightweight, Water-Repellent
Treated
- MIL-C-44050 - Cloth, Ballistic, Aramid

STANDARDS

FEDERAL

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

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- 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

(Copies of documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

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2.1.2 Other Government documents. The following other Government documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of solicitation.

JOINT COMMITTEE ON PRINTING (JPC) PUBLICATIONS

- JCP-A-60 - Government Paper Specification Standards
- JCP-L-50 - Government Paper Specification Standards

(Copies may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.2 Other 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 shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issues of the nongovernment documents which are current on the date of the solicitation.

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.)

(Technical society and technical association documents are generally available for reference from libraries. They also distributed among technical groups and using Federal agencies.)

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 shall take precedence. Nothing in this document however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Guide samples. Samples, when furnished, are solely for guidance and information to the contractor (see 6.3). Variation from this document may appear in the sample, in which case the document shall govern.

3.1.2 Standard sample for color. Unless otherwise specified, standard samples for color shall apply (see 6.3).

3.1.3 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3, 6.2 and 6.4).

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3.2 Materials and components (see 6.7).

3.2.1 Cloth, oxford, nylon, 3 ounce. The cloth for the collar shell shall be 3 ounce nylon oxford, quarpel treated, camouflage printed conforming to type I, class 3 of MIL-C-508.

3.2.2 Cloth, ballistic, nylon, lightweight, water-repellent. The cloth for the vest inner and outer shells, the shoulder pad inner and outer shells and the front flap shall be water-repellent treated ballistic nylon conforming to MIL-C-44043. The classes shall be as specified in 3.7.1.1 and 3.7.1.2.

3.2.3 Cloth, ballistic, aramid, water-repellent. The cloth for the collar ballistic inserts, the front and back ballistic filler components, and the shoulder pad ballistic inserts shall be water-repellent aramid ballistic cloth conforming to type II, class 2 of MIL-C-44050.

3.2.4 Cloth, duck, nylon, 9 ounce. The cloth for the rifle butt patches and shoulder pad outer cover shall be 9 ounce nylon duck, camouflage printed water repellent treated conforming to class 2 of MIL-C-43734, except that the warp breaking strength requirements shall be 400 pounds minimum.

3.2.5 Cloth, wind resistant sateen, cotton and nylon. The cloth for the pockets and pocket flaps shall be wind resistant sateen, camouflage printed, quarpel treated conforming to class 3 of MIL-C-43191, with the exception that the dimensional stability requirement be no greater than 3 percent.

3.2.6 Thread. The thread for all stitching throughout the body armor assembly shall be nylon, type I, class B, conforming to V-T-295 or polyester, type I, class 1, subclass B conforming to V-T-285. All threads visible on the exterior of the completed body armor shall be Olive Drab S-1, C. A. 66022. Color of thread not visible on the exterior of the body armor is optional. Thread size shall be as specified in table I.

3.2.6.1 Colorfastness. The dyed thread used on the exterior of the body armor shall show fastness to light, laundering, and perspiration equal to or better than the standard sample. If dyed thread is used where the color of thread is optional the colorfastness requirement shall not apply.

3.2.7 Webbing, nylon, 1-inch wide. The 1-inch wide nylon webbing for the grenade hangers shall conform to class 2 of MIL-W-17337, dyed Olive Drab 7.

3.2.8 Tape, nylon 1/2-inch and 1-1/2 inches wide. The 1/2-inch wide nylon tape for the shoulder pad edge finishing and for joining the back ballistic filler components and the 1-1/2 inches wide nylon tape for the side closure retainers and for joining the back ballistic filler components shall be dyed Olive Drab 7 and conform to type III, class 2 of MIL-T-5038, except that the requirements for the curvature of the nylon tape shall not apply.

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3.2.9 Fastener tape, hook and pile, nylon. The nylon fastener tape used for the intermediate front closure and to secure the front flap and pocket flaps shall conform to type II, class 1 of MIL-F-21840, dyed Olive Green 106, in the widths specified in table I or as indicated by patterns except the selvage edges shall be 1/8 to 3/16 inch in width and for the 2-inch tape an area 1/8 to 3/16-inch wide, located in the center of the tape, running the length of the tape, shall be free of hook or pile. When the roll contains more than one piece the pieces may be joined by overlapping the ends 3/8 to 1/2 inch and heat spliced using the fastener tape contractor's standard technique. The pile or hook material in the area of the splice shall be removed. In fabricating the body armor assembly, only one splice is allowed for any one individual length of fastener tape except no splices are allowed on the tape used for securing the breast pockets and for the intermediate front closing tapes.

3.2.10 Webbing, nylon, 3/4-inch wide. The 3/4-inch wide nylon webbing for the shoulder pad retainer strap reinforcements shall conform to type Ia, class 2, color optional of MIL-W-4088.

3.2.11 Webbing, elastic, 1-inch and 1-1/2-inches wide. The elastic webbing for the shoulder pad retainer straps and side closures shall conform to type II, class 1 of MIL-W-5664, 1-inch and 1-1/2-inches wide. The webbing shall be dyed Olive Green 106.

3.2.12 Fasteners, snap. The snap fasteners shall conform to style 2, finish 2, hard action, conforming to MIL-F-10884. The size of the button and eyelet components shall be determined by the contractor. The size selected shall effect a secure clinch of the assembled materials.

3.2.13 Eyelets and washers. The eyelets and washers shall conform to dash numbers BB114 and BBW101, respectively of MIL-E-20652/1.

3.2.14 Size, identification, and instruction label. The body armor shall have a combination size, identification, and instruction label conforming to type VI, class 14 of DDD-L-20 with the following exceptions and detailed requirements.

a. The size of characters for the instruction label, except capital letters, shall be 1/16 inch minimum. All capital letters shall be 3/32 inch minimum.

b. The label material shall be nylon conforming to MIL-C-43128, except it shall not be water-repellent treated. The label material shall be dyed Medium Green 614 matching the standard sample (see 6.3).

c. The required permanent coating shall not apply.

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d. The combination label shall be printed with the instruction label first and the size and identification label placed below the instruction label. The size and identification label shall be combined with the size label contents placed above the identification label.

e. The size of the label and method of attachment shall be as shown on figure 1 and operation 3 of table I.

f. The label shall show fastness to accelerated laundering.

g. The contents of the size label shall be as follows for the specific size:

X-Small

Chest: Up to 33 in.
Stock No.
NATO Size: 7080/7484

Small

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

Medium

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

Large

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

X-Large

Chest: From 45 in. and upward
Stock No.
NATO Size: 7080/1424

h. Format and contents of the instruction label shall be as follows:

READ, THEN KEEP THE "USE AND

CARE" BOOKLET IN THIS POCKET

THIS ARMOR MAY SAVE YOUR LIFE!!

When worn properly, this armor vest will protect YOUR vital areas against shell and grenade fragments which cause most combat casualties.

INSTRUCTIONS

1. Wear armor over shirt and under field jacket.
2. Be sure the snaps at the shoulders are fastened.
3. Close the vest by overlapping the right side over the left so that the full length of the edge meets the joining seam inside the flap. Fold the flap over making sure that the flap completely covers the pile tape of the closure. For maximum protection, wear the collar in upright position.

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INSTRUCTIONS (cont'd)4. Cleaning instructions

- a. Remove loose dirt from touch and close fastener and outer cover surface using a cloth or soft brush. NEVER USE A STIFF BRISTLE BRUSH.
- b. Wet the vest in the shower or immerse in water. Use warm, not hot water.
- c. Apply toilet soap or detergent to the soiled areas and scrub with a soft brush. Badly soiled areas may be scrubbed with GI soap. Scrub only long enough to remove soil.
- d. Grease and oil stains may be pre-spotted with a detergent mixture and scrubbed with a soft brush. If stubborn stain persists, repeat the above procedure.
- e. Rinse the vest with warm water until suds are completely gone.
- f. Hang the vest to dry, away from heat or open flame by placing a stick or pole through the armholes.

5. Turn in your vest to supply points for exchange

When:

- a. The outer cover is torn or damaged.
- b. The vest is "bunched" and lumps cannot be flattened.
- c. The front touch and close fastener will not close completely.
- d. The flap is damaged and will not function.
- e. The side elastic webbing is torn or frayed.
- f. You cannot clean the vest.
- g. Any shoulder strap is damaged or does not snap properly.
- h. Your vest is hit and damaged by fragments.

3.2.15 Size label for ballistic filler components. Each front ballistic filler and each component of the back ballistic filler shall have a stamped label showing the size. The label shall conform to type IV, class 9 of DDD-L-20. The fastness of the class 9 label shall be as specified for class 5 labels. The labels shall be printed in bold letters 1/4-inch in height and located in the approximate center of each ballistic filler or component on the outer surface.

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3.2.16 Use and care booklet. A "Use and Care" booklet shall be furnished by the contractor with each body armor assembly. The booklet shall be placed behind the instruction label which is attached to the back inner shell with the top open forming a pocket. The printing, collation, folding and stitching of the booklet shall be in accordance with the standard sample (see 6.3). The cover shall be a vellum finish cover of white paper conforming to JCP-L-50, 130 pound weight basis 20 x 26 inches per 1000 sheets (see 4.4.1.1). The text paper shall be white offset book paper conforming to JCP-A-60, 120 pound weight basis 25 x 38 inches per 1000 sheets (see 4.4.1.1).

3.3 Design. The body armor shall consist of an aramid ballistic filler with a nylon outer fabric shell.

3.4 Construction. The construction shall conform in all respects to the requirements specified in table I and herein.

3.4.1 Stitching, machine. All machine stitching, except bartacking, shall conform to FED-STD-751 as follows:

- a. For straight line stitching, type 301. Stitches per inch shall be as specified in table I.
- b. For overedge stitching, type 502, 503, 504 and 505. Stitches per inch shall be as specified in table I.
- c. For optional holding stitching, type 101 (See 3.4.1.4).

3.4.1.1 Type 301 stitching. Unless otherwise specified ends of all stitching shall be backstitched or overstitched not less than 1/2 inch except where ends are turned under in a hem or held down by stitching. Thread tension 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.

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

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

b. Any thread break or two or more consecutive skipped or run-off stitches noted during inspection of the item (in-process or end item) shall be repaired by overstitching. The stitching shall start a minimum of 1 inch in back of the defective area and continue over the defective area to a point 1 inch minimum beyond the defective area onto 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.

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3.4.1.2 Type 502, 503, 504, and 505 stitching. Thread tension shall be maintained so that there will be no loose stitching. All repairs shall be in accordance with 3.4.1.1.1a and b. except substitute 3/4 inch for 1 inch wherever 1 inch appears.

3.4.1.3 Bartacks. Unless otherwise specified, bartacks shall be as specified in table I and as follows:

<u>Length</u>	<u>Width</u>	<u>Stitches per bartack</u>
1/2 + 1/16 inch	1/8 + 1/32 inch	28
3/4 + 1/16 inch	1/8 + 1/32 inch	42

Bartacking shall be free from thread breaks and loose stitching.

3.4.1.4 Optional type 101 holding stitching. Any additional holding stitching to facilitate manufacture is permissible provided that during ballistic filler assembly the stay stitching is 1/4 + 1/16 inch from edge of ballistic filler. When attaching front ballistic fillers to front inner shells, typical left and right, and back ballistic filler assembly to back inner shell, no more than three stay tacks shall be used for each front and upper back and two tacks for lower back. The tacking shall be 4-6 stitches per tack using size B thread.

3.4.1.5 Automatic stitching. Automatic stitching machines may be used to perform any of the required stitch patterns provided the requirements for the stitch pattern, stitches per inch, size and type of thread are met, and at least three tying, overlapping, or back stitches are used to secure the ends of the stitching.

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

3.4.1.7 Lubrication of thread. Except for fabrication of the ballistic filler components (see 6.6), there shall be no lubrication of the thread by any means prior to or during sewing (see 4.4.1.1).

3.4.2 Setting of eyelets. A hole shall be prepunched before inserting the eyelet. The hole shall be smaller than the outside diameter of the eyelet barrel so that the barrel must be forced through the hole. The eyelet shall be securely clinched without splitting in a manner that will prevent detachment from or cutting of the adjacent material. Unless otherwise specified, the washer may be on either side of components on which installed.

3.4.3 Setting of snap fasteners. A hole shall be prepunched before inserting the male or female part of the snap fastener. The hole shall be smaller than the outside diameter of the fastener barrel so that the barrel must be forced through the hole. The hole shall not be punched in the setting operation with the button or eyelet barrel. The fasteners shall be securely clinched without cutting the adjacent material and no more than three splits shall occur in the button or eyelet barrels.

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3.4.4 Fusing of edges of nylon ballistic and oxford cloth. When specified in table I, the edges of the nylon ballistic and oxford cloth components shall be fused smooth and even. The apparatus used to fuse the cloth edges shall be capable of providing sufficient heat to provide a smooth edge with the cut ends of the cloth yarns all fused together. The fused edges shall be the same thickness as the cloth, i.e., there shall be no build up in thickness along the edge due to the fusing operation.

3.4.5 Fusing ends of webbing and tape. All ends of elastic webbing, nylon webbing, and tape shall be fused. The apparatus used to fuse the webbing and tape ends shall be capable of providing sufficient heat to provide a smooth edge with the cut ends of the webbing and tape yarns all fused together. Fusing of the webbing and tape ends shall be accomplished prior to being assembled for stitching.

3.4.6 Location marks. Marks for showing location of component parts on the outer shells may be done with marking ink or by use of drill holes. Ink marks or drill holes on the outer shell shall be located such that the marks or holes are completely and permanently covered by the component part.

3.4.7 Cutting of camouflage printed components. All components on the exterior of the vest required to be cut from camouflage printed material, as listed in 3.7.1.2, 3.7.1.4, 3.7.1.5 and 3.7.1.6 shall be cut so that the camouflaged printed surfaces are exposed to the outside of the vest.

3.5 Repairs. Repairs such as mends, darns, patches, or any piecing or splices are not permitted on the vest.

3.6 Replacement of defective components. During the spreading, cutting and manufacturing process, components having material defects or damages that are classified as defects in 4.4.2.4 and 4.4.3 shall be removed from production and replaced with non-defective and properly matched components.

3.7 Patterns. Standard patterns, which provide an allowance for all seams will be furnished by the Government and shall be used by the contractor as a guide for cutting working patterns only. The standard patterns shall not be altered in any way and working patterns shall be cut to conform with the standard patterns.

3.7.1 List of pattern parts and applicable materials.

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3.7.1.1 Material - cloth, ballistic, nylon, lightweight, water-repellent treated, color OG-106, class 2, MIL-C-44043.

<u>Item</u>	<u>Nomenclature</u>	<u>Cut</u>
1	Back shell-inner	1
2	Front shell-inner, left	1
3	Front shell-inner, right	1
4	Shell, shoulder pad, inner	1 pair
5	Shell, shoulder pad, outer	1 pair
6	Flap, front closure, inner	1

3.7.1.2 Material - cloth, ballistic, nylon, lightweight, water-repellent treated, camouflage printed, class 3, MIL-C-44043.

<u>Item</u>	<u>Nomenclature</u>	<u>Cut</u>
1	Back shell - outer	1
2	Front shell - outer, left	1
3	Front shell - outer, right	1
4	Flap, front closure, outer	1
5	Shell, shoulder pad, inner (alternate material)	1 pair
6	Shell, shoulder pad, outer (alternate material)	1 pair

3.7.1.3 Material - cloth, ballistic, aramid, water-repellent treated, type II, class 2, color natural, MIL-C-44050.

<u>Item</u>	<u>Nomenclature</u>	<u>Cut</u>
1	Insert, ballistic, collar, wide	4
2	Insert, ballistic, collar, narrow	8
3	Insert, ballistic, shoulder pad, long	14
4	Insert, ballistic, shoulder pad, short	12
5	Filler, ballistic, front, wide	12
6	Filler, ballistic, front, narrow	14
7	Filler, ballistic, lower back, wide	6
8	Filler, ballistic, lower back, narrow	7
9	Filler, ballistic, back, upper, wide	12
10	Filler, ballistic, back, upper, narrow	14
11	Filler, ballistic, back, upper center, narrow	7
12	Filler, ballistic, back, upper center, wide	6

3.7.1.4 Material - cloth, oxford, nylon, 3 ounce, quarpel treated, type I, class 3, camouflage printed, MIL-C-508.

<u>Item</u>	<u>Nomenclature</u>	<u>Cut</u>
1	Collar, shell	4

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3.7.1.5 Material - wind resistant sateen, cotton and nylon, quarpel treated, camouflage printed, class 3, MIL-C-43191.

<u>Item</u>	<u>Nomenclature</u>	<u>Cut</u>
1	Pocket, breast	1 pair
2	Flap, breast pocket	2 pair
3	Pocket, pencil	1

3.7.1.6 Material - cloth, duck, nylon, 9 ounce, water repellent treated, color camouflage printed, class 2, MIL-C-43734.

<u>Item</u>	<u>Nomenclature</u>	<u>Cut</u>
1	Patch, shoulder rifle butt, lower	1 pair
2	Shoulder pad, outer cover	1 pair

3.7.1.7 Material - webbing, elastic, nylon, type II, class 1 - MIL-W-5664.

<u>Item</u>	<u>Nomenclature</u>	<u>Cut</u>
1	Strap, retainer, shoulder pad, back	4
2	Strap, retainer, shoulder pad, front	4

3.7.1.8 Material - webbing, nylon, 1-inch wide, class 2 - MIL-W-17337.

<u>Item</u>	<u>Nomenclature</u>	<u>Cut</u>
1	Hanger, grenade	2

3.7.1.9 Material - fastener tape, 2 inch wide, type II, class 1, hook or pile as designated - MIL-F-21840.

<u>Item</u>	<u>Nomenclature</u>	<u>Cut</u>
1	Closure, hook, front flap	1
2	Closure, pile, front flap	1
3	Closure, pile, pocket	2

3.8 Manufacturing operations requirements. The body armor shall be manufactured by and with the use of all operations specified in table I: The contractor is not required to following the exact sequence of operations. Any additional holding stitching to facilitate manufacture is permissible provided that during ballistic filler assembly the stay stitching is $1/4 \pm 1/16$ inch from edge of ballistic filler. When attaching front ballistic fillers to front inner shells, typical left and right, and back ballistic filler assembly to back inner shell no more than three stay tacks shall be used for each front and upper back and two tacks for lower back. The tacking shall be 4-6 stitches per tack.

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NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	ROBBIN/ LOOPER COVER
1.	<p><u>Cutting.</u></p> <p>a. The body armor fabric components shall be cut in strict accordance with patterns furnished which show size, cutting directional lines, placement of components and notches for proper assembling of all parts (see 3.4.6 and 3.4.7).</p> <p>b. The fabric components visible on the exterior of the body armor shall not be drilled for positioning, any part except where a component part, when attached, will completely and permanently cover the drill hole. The ballistic fillers and inserts may be cut in any direction. All components shall be cut in strict accordance with patterns furnished.</p> <p>NOTE: Cutting of nylon cloth may cause fusing of several plies of material. Care should be taken to prevent fraying when separating these plies.</p> <p>c. Each webbing or fastener tape component shall be cut in the required length as specified or as indicated by patterns $\pm 1/8$ inch.</p>					
2.	<p><u>Make back inner shell.</u></p> <p>a. Overedge around the entire periphery of the back inner shell with the stitch gauge $3/16$ to $1/4$ inch wide.</p> <p>b. Install five eyelets and washers on back inner shell in locations shown on pattern, $\pm 1/4$ inch. Washer shall be on inside surface of shell.</p>	502, 503 504, or 505	EPd-1	6-10	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
3.	<p><u>Labels.</u></p> <p>The combined instruction, size and identification label shall serve as a pocket for the instruction booklet and shall be fabricated and attached to the outer surface of the back inner shell as shown on figure 1. The label shall be stitched to the back inner shell in location marked on pattern, + 1/4 inch. The row of horizontal stitching required to form the bottom of the pocket shall not pass through the printing. Seams and stitch margins shall be as shown on figure 1.</p>	301	As shown on figure 1	10-12	D	B	
4.	<p>Make front inner shells, <u>typical left and right.</u></p> <p>Overedge around entire periphery and install three eyelets with washers same as specified in operations 2.a. and 2.b.</p>						
5.	<p><u>Cut and stitch side closure retainers to front inner shell, typical left and right.</u></p> <p>a. Cut four side closure retainers from 1-1/2 inch wide nylon tape 3-1/4 + 1/8 inches long. (Two retainers required for each side.)</p> <p>b. Fold one end under 3/8 + 1/16 inch and position on outer surface of front inner shell in locations shown on pattern, + 1/8 inch, with opposite end toward side (underarm) edge of shell. Stitch to shell with a box stitch pattern 1/4 + 1/8 inch wide and 1-1/4 + 1/8 inches long, located 1/16 to 1/8 inch from folded edge of retainer and side edges of retainer. (Typical all four retainers.)</p>	301	SSb-2	8-10	E	E	

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NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
6.	<p>Attach intermediate front closure pile fastener <u>tape on right inner front shell.</u></p> <p>Cut three each 2 + 1/8 inches long pieces of 2 inch wide pile fastener tape and position each one on outside surface of shell in location shown on pattern, + 1/4 inch, with selvage edge of tape running parallel with front opening edge of shell. Stitch to shell along all sides of each piece 1/8 + 1/16 inch from edge and down the center in the area of no pile.</p>	301	-	8-10	B	D
7.	<p><u>Make back outer shell.</u></p> <p>a. Overedge back outer shell around entire periphery same as specified in operation 2.a.</p> <p>b. Install four snap fasteners (male component) in location marked on pattern, + 1/16 inch with stud component on outer surface of shell. Under each eyelet, approximately centered, place a reinforcement cut from ballistic nylon cloth measuring approximately 1 inch square or in diameter. The reinforcements may be one piece approximately 2 inches long for positioning under both snap fasteners.</p>					
8.	<p><u>Make front outer shell, typical left and right.</u></p> <p>Overedge around entire periphery same as specified in operation 2.a.</p>					

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
9.	<p><u>Attach lower shoulder rifle butt patches to front outer shell, typical left and right.</u></p> <p>Attach lower shoulder rifle butt patch on front outer shell in location shown on pattern, + 1/8 inch. Fold straight edges under 3/8 + 1/16 inch and stitch to shell with single row of stitching located 1/16 to 1/8 inch from folded edges.</p> <p>NOTE: As an option, patch may be stitched to shell along the raw edge of the shell with stitching 1/8 to 1/4 inch from edges. Use 301 stitching with size B or E thread.</p>	301	LSD-1	8-10	E	E
10.	<p><u>Attach grenade hanger, typical left and right front outer shells.</u></p> <p>a. Cut a reinforcement piece from ballistic nylon material 4-3/4 + 1/8 inches by 2-1/4 + 1/8 inches. Position hanger webbing on the front outer shell in location indicated on pattern, + 1/8 inch, with cloth reinforcement positioned on underside of fronts approximately centered under the hanger webbing.</p> <p>b. Bartack hanger to shell with four vertical 7/8 to 1 inch long bartacks. The two inner bartacks shall be in the locations indicated by notches on pattern, + 1/8 inch. The two end bartacks shall be located 3/16 + 1/16 inch from the ends of the webbing.</p>	Bartack	-	42 per tack	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
10.	<p><u>Attach grenade hanger, typical left and right front outer shells. (cont'd)</u></p> <p>c. Between the second and third bartacks stitch along top and bottom edges of the webbing with stitching located $1/8 + 1/16$ inch from edge forming loops in each end of the webbing only. As an option the stitching may continue across the webbing forming box stitch pattern.</p> <p>d. Secure cloth reinforcement to front shell with stitch around all four sides, located $1/4 + 1/8$ inch from edges of grenade hanger. This operation to be performed with outer surface of shell facing up using the edges of the grenade hanger as a guide.</p>	301	-	8-10	E	E	
11.	<p><u>Install snap fasteners on front outer shells, typical left and right.</u></p> <p>Install two snap fasteners (male component) in locations marked on shoulder rifle butt patch pattern, $1/16$ inch, with stud on outer surface of shell.</p>	301	-	8-10	E	F	
12.	<p><u>Attach intermediate front closure hook fastener tape on left on left front outer shell.</u></p> <p>Cut three $1 + 1/8$ inch long pieces of 1 inch wide hook fastener tape and position each one on left front outer shell in locations shown on pattern $+ 1/8$ inch. Stitch to shell along all edges of each piece $1/8 + 1/16$ inch from edge.</p>	301	-	8-10	E	E	

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	ROBBIN/ LOOPER	COVER
13.	<p><u>Attach front flap closure pile fastener tape on right front outer shell.</u></p> <p>Position front flap closure pile fastener tape on the right front outer shell in the location shown on the pattern, + 1/8 inch. Stitch to shell along sides and ends and also down center of tape in area of no pile. Stitch 1/8 + 1/16 inch from edges of tape.</p>	301	-	8-10	E	E	
14.	<p><u>Item and attach pencil pocket to left front outer shell.</u></p> <p>a. Item top of pencil pocket with the raw edge turned under twice 3/8 + 1/8 inch. Stitch 1/8 + 1/16 inch from inner folded edges.</p> <p>b. With hemmed edge facing up turn side edges of pocket under 1/4 + 1/8 inch and seam to left outer front shell in location shown on pattern, + 3/16 inch. Stitch along sides and bottom 1/8 + 1/16 inch from folded edge.</p>	301	Efb-1	10-12	B	B	
15.	<p><u>Make two breast pockets, left and right.</u></p> <p>a. Breast pocket shall be outside, bellows patch type. Left and right pockets are similar except folds are made in opposite direction.</p>	301	Lsd-1	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
15.	<p>Make two breast pockets, left and right. (cont'd)</p> <p>b. Fold top edges of pocket twice as indicated by notches on patterns, $\pm 1/8$ inch, and single stitch $1/8 \pm 1/16$ inch from inner folded edge. (Folds shall be on inside when pockets are attached to shell.)</p> <p>c. Cut pile fastener tape closure in accordance with pattern and position on outside of pocket in location shown on pattern, $\pm 1/8$ inch. Stitch to pocket around all four sides $1/8 \pm 1/16$ inch from edges and also down center of tape in area of no pile.</p> <p>d. Seam corners of pockets with seam allowance as indicated on pattern, $\pm 1/16$ inch. Turn and raise stitch, $1/16$ to $1/8$ inch from folded edge with seam facing top edge of pocket.</p> <p>e. Form bellows by folding along marks indicated on pattern and stitch $1/16$ to $1/8$ inch from folds. Fold of first fold from edge shall be on inside of pocket and second fold shall be outside.</p> <p>f. Install eyelet with washer in corner of pocket at location shown on pattern, $\pm 1/4$ inch. A reinforcement piece cut from nylon oxford material, approximately 1 inch square or diameter shall be placed under the eyelet on inside of pocket and approximately centered.</p>	301	Efb-1	10-12	B	B	
		301	-	8-10	E	E	
		301	LSq-2	10-12	B	B	
		301	OSF-1	10-12	B	B	

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/LOOPER COVER
16.	<p><u>Attach breast pockets to front outer shell, typical left and right.</u></p> <p>a. Position pocket on outer front shell in location shown on pattern, + 3/16 inch with edges folded under 3/8 + 1/16 inch. Seam along back (short side) and bottom sides. With bellows along bottom edges folded inward stitch along front edge. Stitch margin shall be 1/16 + 1/8 inch.</p> <p>NOTE: As an option, before attaching pocket to shell, seam allowance for bottom and back edges of bellows may be turned under and stitched 1/16 to 1/8 inch from edge, using type 301 stitch, size B thread and 10 to 12 stitches per inch.</p> <p>b. The pocket, when folded and flat, shall cover the seaming of the bellows.</p> <p>c. Bartack each side of breast pocket opening at top with a 1/2 inch long vertical bartack and also at each bottom corner of pocket along bottom edge with a 1/2 inch long horizontal bartack. Bellows edge along back side and back bottom corner of pocket shall not be bartacked through. Locate bartacks on top of 301 stitching and with end of bartack even with edge of pocket, + 0, - 1/8 inch.</p>	301	Lsd-1	8-10	E	E
		1/2 inch bartack	-	28 per tack	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
17.	<p>Make two pocket flaps, left and right.</p> <p>a. With two plies of flap evenly superimposed on each other, stitch around edges $1/4 + 1/16$ inch from edge leaving upper edge (straight edge) open.</p> <p>b. Turn insides of flap out and work out edges and points. Stitch along edges $3/16 + 1/16$ inch from edge leaving upper edge open.</p> <p>c. Cut a $1-3/4 + 1/8$ inch length of 1 inch wide hook fastener tape and position on under side of flap in location shown on pattern, $+ 1/8$ inch. Stitch to flap around all four sides $1/8 + 1/16$ inch from edge.</p> <p>Attach pocket flap to front outer shell, typical left and right.</p> <p>a. Position pocket flap on outer front shell in location shown on pattern, $+ 1/8$ inch with fastener tape facing up. Seam flap to shell with row of stitching $3/16 + 1/16$ inch from edge.</p> <p>b. Turn flap down and raise stitch $3/8 + 1/16$ inch from folded edge.</p> <p>NOTE: As an option, use seam type LSba-2 for operations a. and b.</p> <p>c. Bartack each end of pocket flap with a $1/2$ inch bartack positioned on top and parallel with the 301 stitching securing flap to vest and with end of bartack even with edge of flap, $+ 0, - 1/8$ inch.</p>	301 301 301 301 301 Bartack	SSe-2 Step (a) SSe-2 Step (b) - Lss-2 Step (a) Lss-2 Step (b) -	10-12 10-12 10-12 8-10 8-10 28 per tack	B B B E E D	B B D E E D	
18.							

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	ROBBIN/ LOOPER	COVER
19.	<p><u>Make Flap for front closure.</u></p> <p>a. Overedge raw edge of flap outer ply along back edge using 3/16 to 1/4 inch gauge or as an option, fuse the edge (see 3.4.4).</p> <p>b. Position flap closure hook fastener tape on inner ply of flap in position shown on pattern, + 1/8 inch. Stitch along all four sides of the tape 1/8 + 1/16 inch from edge, and also down center of tape in area of no hooks.</p> <p>c. Position the outer ply for the flap evenly on inner ply with the fastener tape on the inside and with the curved edges even. Stitch 1/4 + 1/16 inch from edge leaving back (straight edge) open.</p> <p>d. Turn insides of flap out and work out edges and corners. Stitch along sides 1/16 to 1/8 inch from edge leaving back edge open.</p>	<p>502, 503, 504 or 505</p> <p>301</p> <p>301</p> <p>301</p> <p>301</p> <p>301</p>	<p>EFD-1</p> <p>-</p> <p>SSE-2 Step (a)</p> <p>SSE-2 Step (b)</p> <p>LSS-2 Step (a)</p> <p>LSS-2 Step (b)</p>	<p>6-10</p> <p>8-10</p> <p>8-10</p> <p>8-10</p> <p>8-10</p> <p>8-10</p>	<p>D</p> <p>E</p> <p>E</p> <p>E</p> <p>E</p> <p>E</p>	<p>B</p> <p>E</p> <p>E</p> <p>E</p> <p>E</p> <p>E</p>	
20.	<p><u>Attach front flap.</u></p> <p>a. Position front flap on left front outer shell with overedged edge of outer ply aligned with location shown on pattern, + 3/16 inch, with flap in open position and fastener tape facing up. Stitch to shell with stitching 1/4 + 1/16 -0 inch from edge of outer ply flap.</p> <p>b. Turn flap to the front and raise stitch 3/8 + 1/16 inch from folded edge enclosing the back edge of the outer ply.</p>	<p>301</p> <p>301</p>	<p>LSS-2 Step (a)</p> <p>LSS-2 Step (b)</p>	<p>8-10</p> <p>8-10</p>	<p>E</p> <p>E</p>	<p>E</p> <p>E</p>	

NO.	TABLE I. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/LOOPER COVER
22.	<p>Make collars (two required).</p> <p>a. Each collar shall consist of a shell and a ballistic insert. The insert shall consist of two wide plies and four narrow plies.</p> <p>b. Overedge around the top (curved) edge of the two shell plies with the stitch gauge 3/16 to 1/4 inch wide. As an option, fuse the curved (top) edge of the shell plies (See 3.4.4).</p> <p>c. Overedge around the top (curved) edge of each of the wide plies of the insert with the stitch gauge 3/8 to 1/2 inch wide.</p> <p>d. Evenly position two narrow plies of the insert on top of each other and overedge the top (curved) edge with the stitch gauge 3/8 to 1/2 inch wide. Repeat this procedure with the remaining two narrow plies.</p> <p>e. Evenly position two halves of the collar shell with the camouflage sides facing each other. Stitch the shell plies together with a row of stitching along the top (curved) edge starting and stopping at the bottom edge at each end. Stitch $3/8 \pm 1/16$ inch in from the edge. Leave the bottom edge open. Turn collar right side out and work out edges.</p>	502, 503, 504 or 505	Efd-1	6-10	B	B
		502, 503, 504 or 505	Efd-1	6-10	B	B
		502, 503, 504 or 505	Ssa-1	6-10	B	B
		502, 503, 504 or 505	Ssa-1	6-10	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
22.	<p>Make collars (two required). (cont'd)</p> <p>f. Sandwich two of the overedged pairs of narrow, ballistic plies between two wide ballistic plies so that they are aliagned evenly at the top (curved) edges. Holding the total of six plies in this manner, insert them into the collar shell assembled in e. above until filler taightly meets the top of the shell assembly without buckling. Stitch all eight plies together with a row of stitching along the bottom edges of the shell plies $3/16 + 1/16$ inch from the bottom edge. The nararow ballistic material shall protrude $3/4 + 1/8$ inch and the wide ballistic material shall protrude $1 + 1/8$ inch from the open edge of the collar shell.</p> <p>g. Assemble and stitch the remaining one wide and two narrow plies of the insert to the other ply of the shell as specified in d. and e. above.</p> <p>h. Evenly position the two halves of the collar on top of each other with the shell plies facing each other. Stitch the shell plies together with a row of stitching along the top (curved) edge starting and stopping at the bottom edge at each end. Stitch $3/8 + 1/16$ inch in from the edge. Leave bottom edge open. Turn collar right side out and work out edges.</p>	301	-	8-10	E	E	
23.	<p>Attach collars to back and front outer shell assembly.</p> <p>With outside surface of outer shell facing up, position the first collar on the right side of the vest with the collar shell edge and outer shell edge</p>	301	SSa-1	8-10	E	E	E

NO.	TABLE I. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/LOOPER COVER
23.	<p><u>Attach collars to back and front outer shell assembly.</u> (cont'd)</p> <p>evenly aligned. The widest end of the collar is the front and is aligned with the mark 1 + 1/4 - 0 inches from the front edge of the vest collar. The narrowest end (back) should overlap the center of the back outer cover by 1/4 ± 1/16 inch. Stitch collar to outer shell with row of stitching along the edge, 3/8 + 1/16 inch from the overedged edges. Attach the other collar in the same manner as above. The back edges of the collars should overlap 1/2 to 5/8 inch.</p>					
24.	<p><u>Make shoulder pads, typical left and right.</u></p> <p>a. Overedge separately edges of inner shell around entire periphery except in the short reversed curved area which butts up against the collar at assembly. Width of stitch gage shall be 3/16 to 1/4 inch.</p> <p>b. Fuse separately the raw edge of the inner shell that was not overedged in operation a. above (see 3.4.4).</p> <p>c. Position the shoulder pad on the outer surface of the outer shell so that the edges of the two are evenly aligned. Overedge stitch the shoulder pad outer cover to the outer shell around the entire periphery with stitch gauge 3/16 to 1/4 inch.</p>	502, 503, 504 or 505	EFD-1	6-10	D	D
		502, 503, 504 or 505	SSa-1	6-10	D	D

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/LOOPER COVER
24.	<p>Make shoulder pads, typical left and right. (cont'd)</p> <p>d. On outer surface of the outer cover, at the edge that butts against the collar, when assembled, stitch a length of 1/2 inch wide nylon tape. Edge of tape shall be even with edges of shell and ends cut off even with edges of shell. Stitch tape to shell with a row of stitching along each edge.</p> <p>e. Make four shoulder pad retainer straps. Cut elastic straps from 1 inch elastic webbing in accordance with pattern. Cut reinforcement pieces 2-1/4 + 1/8 inch long from 3/4 inch wide nylon webbing. Position reinforcement centrally on top of retainer strap in location shown on pattern. Fold the long end of retainer strap over itself and reinforcement. Stitch around periphery of folded area with stitching 1/8 + 1/16 inch from edges. Install two female snap fasteners with the smooth bottom side on the same side as the interior edge of the strap. Fold over the single end of strap at the locations shown and stitch around the periphery of this folded area with stitching 1/8 + 1/16 inch from edges.</p> <p>f. With outer surface of inner shell facing up, position front and back retainer straps on top of shell in location shown on pattern and with button components of snap fasteners facing up. The strap shall be aligned within the alignment marks noted on the pattern + 1/8 inch. With center area of ends of straps even with edge of shell, stitch to shell with row of stitching located 1/4 + 1/16 inch from edge of shell.</p>	301	SSaa-2	8-10	E	E
		301	-	8-10	E	E
		301	-	8-10	E	E

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
24.	<p>Make shoulder pads, <u>typical left and right</u>. (cont'd)</p> <p>g. The ballistic insert for the shoulder pad shall consist of 13 plies, 7 long plies and 6 short plies. Group the 6 short plies into two groups of 3 each and the 7 long plies into two groups, one group of 3 plies and one group of 4 plies. Evenly align each group and overedge around the entire periphery of each group with the stitch gauge 3/8 to 1/2 inch wide.</p> <p>h. Superimpose the four groups on top of one another with the two long groups, evenly aligned with each other, on the bottom and the two short groups, evenly aligned with each other, on top. The side edges of the short groups shall be evenly aligned with the side edges of the long groups and the ends of the short groups shall be equidistant from the ends of the long groups or positioned as marked on patterns. With the inner surface of the inner shell facing up, position the ballistic insert centrally on top of the inner shell with the edges of the insert located as shown on the pattern, $\pm 1/16$ inch. Stitch inserts to shell along top and bottom edges with stitching located $1/2 + 1/8$ inch from edge. Start and stop stitching $1/2 + 1/8$ inch from side edges of inserts.</p>	502, 503, 504 or 505	SSa-1	6-10	B	B
		301	-	6-8	F	F

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER/ COVER
24.	<p>Make shoulder pads, typical left and right. (cont'd)</p> <p>i. With the elastic retainer straps folded to the inside, position the inner shell on top of the outer shell with the outer surfaces of each facing each other. Join the inner and outer shells together with row of stitching around entire periphery except the fused edge area of the shells shall be left open. Stitch $3/8 + 1/16$ inch from edge of shells. The outer shell is larger than the inner shell, therefore, it is necessary to feed the additional material into the joining seam when stitching. The material shall be fed into the seam evenly in such a manner that the notches indicated on the center of the pattern align within $1/8$ inch.</p>	301	-	8-10	E	E
25.	<p>j. Turn pad right side out and work out edges of pad along the seam line. Evenly align the edges of the inner and outer shells at the opening, and close the pad with a row of stitching $3/16 + 1/16$ inch from edge of shells.</p> <p>Make front ballistic filler, typical left and right.</p> <p>a. The front ballistic filler, typical left and right, shall consist of 13 plies, 6 wide and 7 narrow plies of the ballistic aramid cloth. The 6 wide plies shall be grouped into two groups of 3 plies each. The 7 narrow plies shall be grouped into two groups, one group of 3 plies and one group of 4 plies. Evenly align the plies of each</p>	301 502, 503, 504 or 505	- SSa-1	8-10 6-8	E E	E E

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D	
					NEEDLE	BOBBIN/ LOOPER COVER
25.	<p>Make front ballistic filler, typical left and front. (cont'd)</p> <p>group and overedge around the periphery of each group with the stitch gauge 3/8 to 1/2 inch wide (see 6.6). The outer ply of the group of 4 plies shall be marked with the number "4" in such a location that it will be visible by lifting one of the outer groups at the bottom, after assembly to the next shell.</p> <p>b. Superimpose the four groups on top of each other with the two narrow groups in the middle. Placement of the two narrow groups may be either way, i.e., the 4 ply groups may be on top with the 3 ply group on the bottom or vice versa. The two wide groups shall be evenly superimposed on each other. The two narrow groups shall be evenly superimposed on each other and their underarm and bottom edges evenly superimposed between the wide groups and the sides approximately equal distance from the side edges of the wide groups. Starting at the top or bottom edge stitch the four groups together along the front opening edge (longest straight edge). Stitching shall be located such that it is 1/2 to 3/4 inch inward from the edges of the middle narrow groups. On the opposite edge below the arm pit cut out area (straight edge) and stitch the four groups together the same as specified above for the front opening edges. During the above stitching operations the four groups shall be maintained in their original aligned positions.</p>	301	SSa-1	8-10	E	E

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
26.	<p>Make back ballistic filler lower component.</p> <p>a. The back ballistic filler lower component shall consist of 13 plies, 6 wide plies and 7 narrow plies of the ballistic aramid cloth. The 6 wide plies shall be grouped into two groups of 3 plies each. The 7 narrow plies shall be grouped into two groups, one group of 3 plies and one group of 4 plies. Evenly align the plies of each group and overedge around the periphery of each group with the stitch gauge 3/8 to 1/2 inch wide (see 6.6). The outer ply of group of 4 plies shall be marked with the number "4" in such a location that it will be visible by lifting one of the outer groups at the bottom, after assembly to the vest shell.</p> <p>b. Superimpose the four groups on top of each other with the two narrow groups in the middle. Placement of the narrow groups may be either way, i.e., the 4 ply group may be on top with the 3 ply group on the bottom or vice versa. The two wide groups shall be evenly superimposed on each other. The two narrow groups shall be evenly superimposed in each other and their top and bottom edges evenly superimposed between the wide groups and the sides approximately equal distance from the side edges of the wide groups. Along the top edge stitch the four groups together with a row of stitching located 1/2 + 1/8 inch from the edge. Along each side edge stitch the four groups together from top to bottom with a row of stitching located 1/2 to 3/4 inch from the edge of the narrow groups. During the stitching operation the four groups shall be maintained in their original aligned positions.</p>	502, 503, 504 or 505	SSa-1	6-8	E	E	
		301	SSa-1	8-10	E	E	

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/LOOPER	COVER
27.	<p>Make back ballistic filler upper center component.</p> <p>a. The back ballistic filler upper center component shall consist of 13 plies, 6 wide and 7 narrow. The plies shall be grouped into four groups and overedge stitched the same as specified in operation 26.a.</p> <p>b. Superimpose the four groups on top of each other in the same manner as specified in operation 26.b. with the top edges (narrowest) of the narrow groups even with the top edges (narrowest) of the wide groups. Stitch the groups together with a row of stitching along all four sides with the stitching located 1/2 + 1/8 inch from the edge. (The center narrow groups will be caught in the stitching along the top edge only.)</p> <p>c. Cut three anchor tabs 2-3/4 + 1/8 inches long, two from 1-1/2 inches wide nylon tape and one from 1/2 inch wide nylon tape. Turn one end of each tab under 3/8 + 1/16 inch and position each tab on the surface of the outer group (as viewed when worn) along the bottom edge in the location shown on the pattern, + 1/8 inch, with the free ends protruding beyond the bottom edge of the filler. The two 1-1/2 inches wide tabs shall be the left and right tabs and the 1/2 inch wide tab shall be the center tab. Bartack through the filler with a 3/4 inch vertical bartack extending across the width of the 1/2 inch wide tab and the ends of the bartack extending equally beyond the side edges of the tabs or onto the filler surface a maximum of 3/8 inch. The 1-1/2 inch wide tabs shall be either bartacked through the filler with one continuous or two 3/4 inch successive vertical bartacks or as an alternate method for the 1-1/2 inch</p>	301	SSa-1	8-10	E	E	
		Bartack or 301		42 per tack or 8-10	B	B	
					E	E	

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
27.	<p>Make back ballistic filler upper center component. (cont'd)</p> <p>tape only, stitch through the filler with two adjacent rows of stitching across each tab, located 1/8 + 1/16 inch from the folded edge.</p>						
28.	<p>Make back ballistic filler upper side component, typical left and right.</p> <p>a. The back ballistic filler upper side component shall consist of 13 plies, 6 wide and 7 narrow. The plies shall be grouped into four groups and overedge stitched the same as specified in operation 26.a.</p> <p>b. Superimpose the two narrow groups on top of one of the wide groups with the top edges (narrowest) of the narrow groups even with the top edge (narrowest) of the wide group and with the curved edge of all groups evenly aligned. Stitch the narrow groups to the wide group with a row of stitching along the bottom edge of the narrow groups located 1/4 to 3/8 inch from the edge. (Bottom edge is the straight edge approximately 2 inches long.)</p> <p>c. With the narrow groups of the three assembled groups facing up, position the remaining wide group on top and evenly align the edges. Stitch the groups together with a row of stitching along all sides except the curved side. Locate stitching 1/4 to 3/8 inch from edge. (The center narrow groups will be caught in the stitching along the top only.)</p>	301	-	8-10	E	E	
		301	SSa-1	8-10	E	E	

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER/ COVER
28.	<p>Make back ballistic filler upper side component, <u>typical left and right.</u> (cont'd)</p> <p>d. Cut two anchor tabs $2-3/4 + 1/8$ inches long, from $1/2$ inch wide nylon tape. Turn one end under $3/8 + 1/16$ inch and position on the surface of the outer group (as viewed when worn) in the location shown on pattern, $+ 1/8$ inch, with the free ends protruding beyond the edge of the filler. Bartack through the filler with a $3/4$ inch long vertical bartack extending equally beyond the edges of the tape onto the filler a maximum of $3/8$ inch.</p>	Bartack		42 per tack	B	B
29.	<p><u>Join back ballistic filler upper left and right side components to upper center components.</u></p> <p>a. With anchor tabs facing up, position left side component on left side of center component with the bottom edges of each even and the long straight edge (edge having anchor tabs attached) overlapping the side edge of the center component 1 to $1-1/4$ inch. Extend each anchor tab over onto center component, turn ends under $3/8 + 1/16$ inch and bartack through the filler with a $3/4$ inch vertical bartack across the tab, located $1/8 + 1/16$ inch from the folded edge of the tab. Carry bartack up to the side edges of the tab beyond the edges on to the filler surface up to $3/8$ inch maximum. After bartack, with anchor tabs under slight tension, the side and center filler components shall be overlapped the amount specified above and the bottom edges shall be even within $1/4$ inch.</p> <p>b. Attach right side component same as specified in operation 29.a.</p>	Bartack		42 per tack	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
30.	<p><u>Join back ballistic filler lower component to the assembled upper components.</u></p> <p>With the anchor tabs facing up, position the bottom edge of the assembled upper components over the top edge of the lower component forming an overlap of 1-1/2 + 1/4 inches. The side edges of the upper center component shall be located equal distance from the side edges of the lower component, \pm 3/16 inch. Extend each of the three anchor tabs attached to the center component over onto the lower component, turn ends under 3/8 + 1/16 inch and bartack with a 3/4 inch vertical bartack across the tab, located 1/8 + 1/16 inch from the folded edge of the tab. Carry bartack up to the side edges of the tab or beyond the edges onto the filler surface up to 3/8 inch maximum. After bartack, with anchor tabs under slight tension the upper center component shall overlap the lower component the amount specified above.</p>	Bartack	-	42 per tack	B	B
31.	<p><u>Attach front ballistic fillers to front inner shells, typical left and right.</u></p> <p>a. With the inner surface of the front inner shell facing up, position the first front ballistic filler to be attached on top of the inner shell with the neck edge of the filler located 5/8 + 1/8, -0 inch from the neck edge of the inner shell and with the side edges of the filler equal distance \pm 1/8 inch, from the side edges of the inner shell. Attach filler to shell with row of stitching along the edge of the front opening, neck, shoulder, armpit area and along the side in the location shown on the pattern, \pm 1/8 inch.</p>	301	-	6-8	F	F

NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	ROBBIN/ LOOPER COVER
31.	<p>Attach front ballistic fillers to front inner shells, <u>typical left and right.</u> (cont'd)</p> <p>b. Attach opposite side front filler same as specified above.</p> <p>NOTE: After accomplishing operations a. and b. above, the filler components and front inner shell shall lie flat with no puckering and all location tolerances shall be in accordance with those specified.</p>	301	-	6-8	F	F
32.	<p>Attach back ballistic filler assembly to back liner <u>shell.</u></p> <p>a. With inner surface of back inner shell facing up position the back ballistic filler assembly on top of the inner shell with the neck edge of the upper center component of the filler located $5/8 + 1/8$ inch from the neck edge of the inner shell. Stitch the center component of the filler to the inner shell with a row of stitching along the sides and top in the location shown on the pattern, $\pm 1/8$ inch.</p> <p>b. Extend the left and right upper side components of the filler the full length of the two anchor tabs and in a direction perpendicular to the side edges of the upper center component of the filler and with the top and bottom edges aligned with the top and bottom of the center component; $\pm 1/8$ inch. Stitch the side components of the filler to the inner shell with a row of stitching in the location shown on the pattern, $\pm 1/8$ inch.</p>	301	-	6-8	F	F

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NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD	
					NEEDLE	BOBBIN/ LOOPER COVER
32.	<p>Attach back ballistic filler assembly to back inner shell. (cont'd)</p> <p>c. Extend the lower component of the filler the full length of the three anchor tabs resulting in the side edges of the filler being equal distance from the edges of the inner shell, + 1/8 inch. Stitch filler to inner shell along each side edge in location shown on pattern, + 1/8 inch.</p> <p>NOTE: After accomplishing operations a., b. and c. above the filler components and back inner shell shall lie flat with no puckering and all location tolerances shall be in accordance with those specified.</p>	301	-	6-8	F	F
33.	<p>Join inner and outer shells and catch elastic side closures.</p> <p>a. Superimpose outer surface of inner shell on top of outer surface of outer shell. The outer shell is larger than the inner shell, therefore, the edges of the shells cannot be aligned prior to stitching. The applicable patterns are provided with match marks which shall be aligned during and after the stitching operation within 1/8 inch maximum. The extra material of the outer shell shall be evenly fed into the joining seam between the match marks with the edges of the inner and outer shells evenly aligned within 1/8 inch maximum.</p> <p>b. Cut four elastic side closure webs from 1-1/2 inches wide elastic webbing 1-3/4 + 1/8 inches long.</p>					

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NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/LOOPER	COVER
33.	<p><u>Join inner and outer shells and catch elastic side closures.</u> (cont'd)</p> <p>c. Position the four elastic side closures between the inner and outer shells in the location shown on the pattern, $\pm 1/8$ inch, with the ends even with the edges of the inner and outer shells $\pm 1/8$ inch. Join the inner and outer shells with two rows of stitching around entire periphery except the neck area and $3 + 1/4$ inches from top edge of fronts shall remain open. The elastic side closures shall be caught in both rows of stitching. The first row of stitching shall be $3/8 + 1/16$ inch from the edges of the inner and outer shells and the second row shall be $1/16$ to $1/8$ inch outside (towards edges of shell) of the first row.</p>	301	SSa-2	8-10	F	F	
34.	<p><u>Close neck area of vest and stitch through vest along front opening.</u></p> <p>a. Turn vest right side out and fully work out edges of inner and outer shells.</p> <p>b. Position neck edge of inner shell on top of collars (collars previously attached to outer shell) so that the folded edge corresponds with the folded edge of the outer shell. Close neck area with row of stitching through shells and collar, located $1/8$ to $3/16$ inch from the folded edges of the inner and outer shells.</p>	301	-	6-8	F	F	

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NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	THREAD		
					NEEDLE	BOBBIN/LOOPER	COVER
34.	<p><u>Close neck area of vest and stitch through vest along front opening. (cont'd)</u></p> <p>c. With the left and right ballistic fillers evenly positioned within the vest shell, stitch through the shell and ballistic filler with a row of stitching along both the left and right front openings of the vest. Locate stitching 1/2 to 5/8 inch from edge of front opening. Start stitching 3/4 + 1/4 inch from top edge of front opening and stop 2 + 1/4 inches from bottom edge. The stitching shall pass through the ballistic filler along the entire length of the stitching.</p>	301	-	6-8	F	F	
35.	<p><u>Attach shoulder pads, typical left and right.</u></p> <p>On the surface of the 1/2 inch nylon tape mark the center point of the length of the tape. Position shoulder pad on shoulder of vest with the peaked corner facing towards back of vest; with the center point of the pad, as marked above, aligned with the center, + 1/8 inch, of the vest front and back outer shells joining seam and with the edge of the pad even, + 1/16 inch, with the edge of the vest outer shell along the neck area. Stitch pad to vest with row of stitching located 1/8 to 3/16 inch from edge of pad. Carry stitching up to side edges of pad, +0, -1/8 inch. Backstitch ends of stitching 1 inch minimum. Stitching shall not run off pad at ends of stitching.</p>	301	-	6-8	F	F	

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NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH TYPE	SEAM AND STITCHING TYPE	STITCHES PER INCH	T H R E A D		
					NEEDLE	BOBBIN/ LOOPER	COVER
36.	<p>Attach ends of side closure retainers to back inner shell, typical four places.</p> <p>Fold ends of side closure retainer under $3/8 + 1/16$ inch and position on back inner shell in location marked on pattern, $+ 1/8$ inch. Stitch through vest with a box stitch pattern $1/4 + 1/8$ inch wide and $1-1/4 + 1/8$ inches long located $1/16$ to $1/8$ inch from folded edge of retainer and side edges of retainer. If the ballistic filler falls under the retainer, it shall be caught in the stitching. The ballistic filler shall not be folded under or pushed aside to avoid being caught in the stitching.</p>	301	-	6-8	F	F	
37.	<p>Attach side closure elastic webs to back of vest. Typical four places.</p> <p>Fold one end under $3/8 + 1/16$ inch and position on back outer shell in location shown on pattern, $+ 1/8$ inch with folded end facing down. Stitch to vest through inner and outer shells and ballistic filler with a box stitch pattern $1/4 + 1/8$ inch wide and $1-1/4 + 1/8$ inches long, located $1/16$ to $1/8$ inch from folded edge of side closure and side edges of closure.</p> <p>NOTE: As an option, folded end of web may be pre-stitched with single row of stitching using same stitching requirements as above.</p>	301	-	6-8	F	F	
38.	<p>Clean armor.</p> <p>Remove all spots, stains, and ends of threads.</p>						

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3.9 Finished measurements. The finished dimensions for the body armor vest shall conform to table II.

TABLE II. Finished measurements (inches)

	X-Small	Small	Medium	Large	X-Large	Tolerance
1/2 Chest <u>1/</u>	18-1/2	19-1/2	21-1/2	23-1/2	25-1/2	+ 1
Length	20-1/2	23-1/4	23-3/4	24-1/4	24-3/4	+ 1

1/ With the front completely closed, the vest shall be laid flat on a table. The measurements shall be taken as described below:

1/2 Chest. Measure from the folded edge to folded edge of the vest in line with bottom of armhole.

Length. Taken on a straight line along center of back from top edge of neck (center back) to bottom edge of shell.

3.10 Workmanship. The finished body armor vest shall conform to the quality of product established by this document 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 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 document where such inspections are deemed necessary to assure 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 document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirement in the document shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

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4.1.2 Certificate 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 inspection. 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 6.2 and 6.4), it shall be examined for the defects specified in 4.4.3 and 4.4.4. The presence of any defect shall be cause for rejection of the first article.

4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be 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 document or applicable purchase document.

4.4.1.1 Certification. The contractor shall furnish a certificate of compliance for the instruction booklet paper requirements specified in 3.2.16 and the thread lubrication restriction requirement specified in 3.4.1.7.

4.4.2 In-process inspection.

4.4.2.1 In-process visual examination of cut parts, fillers, and patterns. The cut parts for the vest shell assembly, the ballistic filler components, and the shoulder pad and collar inserts shall be 100 percent inspected during the cutting process to determine that parts are cut properly with respect to size and material directional requirements and that parts containing defects such as a hole, cut, smash, float, loose slub, hard crease or wrinkles are removed from production. Ballistic fillers shall be 100 percent inspected during assembly of the individual groups to assure that they contain the correct amount of plies, that no individual ply is pieced, and they are marked correctly as to the size and the number of plies. In addition to the above, inspection shall be made of the working patterns to assure that they conform to the Government patterns in all respects. Whenever nonconformance is noted, correction shall be made to the item or items affected. Parts which cannot be corrected shall be removed from production. Inspection shall also be made to assure that holes are prepunched for eyelets and snap fasteners as specified in 3.4.2 and 3.4.3 and the raw edge of the shoulder pad inner shell is fused as specified.

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4.4.2.2 In-process visual examination of front and back ballistic filler assemblies for size. The front and back ballistic filler assemblies shall be examined for the defects listed below. The lot shall be expressed in units of left fronts, right fronts, or back ballistic fillers. The sample unit shall be one left front, right fronts or ballistic filler, as applicable. The inspection level shall be II and the acceptable quality levels (AQLs), expressed in terms of defects per hundred units, shall be as follows:

For front ballistic filler, left or right - 1.0 major
4.0 total (major and minor combined)

For back ballistic filler assembly - 2.5 major
10.0 total (major and minor combined)

Examine	Defect	Classification	
		Major	Minor
Size of individual ballistic filler assembly (on back filler applicable to each component)	a. Smaller than cutting pattern:		
	(1) 3/16 inch to 3/8 inch at any point around the periphery <u>1/</u> <u>2/</u>		X
	(2) More than 3/8 inch at any point around the periphery <u>1/</u> <u>2/</u>	X	
	(3) 1/8 inch up to 3/16 inch around entire periphery <u>2/</u>		X
	(4) More than 3/16 inch around entire periphery <u>2/</u>	X	
	b. Larger than cutting pattern by 3/8 inch or more at any point <u>1/</u> <u>2/</u>		X

1/ To be scored when condition exists for a length of more than 2 inches or if condition exists in several areas with an accumulated distance of 4 inches or more.

2/ The front filler or back filler individual components, as applicable, shall be examined with the applicable cutting pattern centered on the filler components.

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4.4.2.3 In-process dimensional examination of vest inner and outer shells.

The vest inner and outer shell after attachment of all components and joining at shoulder seam shall be examined for the defects listed below. The lot shall be expressed in units of inner shells or outer shells, as applicable. The sample unit shall be one inner shell or outer shell, as applicable. The inspection level shall be S-3. The AQL, expressed in terms of defects per hundred units, for the inner shell shall be 1.0 major and 4.0 total (major and minor combined). The AQL, expressed in terms of defects per hundred units, for the outer shell shall be 2.5 major and 6.5 total (major and minor combined).

Examine	Defect	Classification	
		Major	Minor
Front flap (outer shell)	a. Hook fastener tape not located on flap within $\pm 1/8$ inch tolerance		X
	b. Not attached to shell in location specified:		
	(1) Exceeding $\pm 3/16$ inch tolerance up to $1/8$ inch		X
	(2) Exceeding $\pm 3/16$ inch tolerance by more than $1/8$ inch	X	
Intermediate fastener tape closure on shell fronts (inner and outer shells)	Any piece not located as specified:		
	(1) Exceeding tolerance up to $1/8$ inch $\frac{1}{2}$		X
	(2) Exceeding tolerance by more than $1/8$ inch $\frac{1}{2}$	X	
$\frac{1}{2}$ For pile tape $\pm 1/4$ inch tolerance and for hook tape $\pm 1/8$ inch tolerance.			
Front flap closure fastener tape on shell right front (outer shell)	Not located as specified:		
	(1) Exceeding $\pm 1/8$ inch tolerance up to $1/8$ inch		X
	(2) Exceeding $\pm 1/8$ inch tolerance by more than $1/8$ inch	X	

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Examine	Defect	Classification	
		Major	Minor
Breast pockets and flats (outer shell)	a. Not located on shell as specified, exceeding tolerance $(+ 3/16$ inch tolerance on pockets, $+ 1/2$ inch tolerance on flap)		X
	b. Fastener tape not located as specified, exceeding $+ 1/8$ inch tolerance		X
Grenade hangers (outer shell)	a. Not attached to shell in location specified, exceeding $+ 1/8$ inch tolerance		X
	b. Opening between bartacks: (1) $7/8$ inch to $3/4$ inch (2) Less than $3/4$ inch	X	X
Stitch margin or gage (inner and outer shells)	Not within specified tolerance (to be scored only when condition exists on major portion of the seam)		X
Bartacks (outer shell)	Length or width not within speci- fied tolerance. $(+ 1/16$ inch tolerance for length, $+ 1/32$ inch for width)		X
Snap fasteners (outer shell)	Any not located on shell as specified, exceeding $+ 1/16$ inch tolerance		X
Label (outer shell)	Not located on shell as specified, exceeding $+ 1/4$ inch tolerance		X

4.4.2.4 In-process dimensional examination of ballistic filler assemblies, collars, and vest shells prior to turning vest shell right side out. The ballistic filler assembly, collars, and vest shell shall be examined for the defects listed below prior to turning vest shell right side out. The lot shall be expressed in units of vest shells with filler assembly and collars attached. The sample unit shall be one vest shell with ballistic filler assembly and collars attached. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 1.5 major and 10.0 total (major and minor combined). One hundred percent inspection shall be performed for critical defects. Any ballistic filler found to contain a critical defect, during the 100 percent inspection shall be rejected.

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Examine	Defect	Classification		
		Critical	Major	Minor
Assembly - general	a. Overlap of back filler upper left and right components over upper center component <u>1/</u>			
	(1) Less than 1 inch	X		
	(2) More than 1-1/4 inch but not more than 1-3/8 inch			X
	(3) More than 1-3/8 inch but not more than 1-1/2 inch		X	
	(4) More than 1-1/2 inch	X		
	b. Overlap of back filler upper components over lower component <u>1/</u>			
	(1) Less than 1-1/4 inches but not less than 1 inch			X
	(2) Less than 1 inch but not less than 3/8 inch		X	
	(3) Less than 3/8 inch	X		
	(4) More than 1-3/4 inches but not more than 2 inches			X
	(5) More than 2 inches		X	
	c. Groups of ballistic filler components not evenly superimposed in areas where stitched through all groups:			
	(1) 1/8 inch up to 1/4 inch			X
	(2) More than 1/4 inch		X	
	d. Any ballistic filler component not positioned on inner shell in location specified, i.e., edges not located correctly with respect to edge of vest shell exceeding tolerance:			
	(1) Up to 1/8 inch			X
	(2) More than 1/8 inch		X	

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Examine	Defect	Classification		
		Critical	Major	Minor
Collars	Ballistic material not positioned properly in collar shell or edges not positioned properly in relation to edge of inner shell, exceeding tolerance			
Anchor tabs	a. Not located as specified exceeding tolerance:			
	(1) Up to 1/8 inch			X
	(2) By more than 1/8 inch		X	
	b. Fold unders not as specified exceeding tolerance			X
	c. Bartack length and width not as specified			X
Seam allowance, stitch margin or gage	a. Not within specified tolerance (To be scored only when condition exists on major portion of the seam)			X
	b. Optional holding stitching on ballistic filler(s) misplaced exceeding specified tolerance			X

1/ When measuring amount of overlap, sufficient tension shall be applied onto the filler components to remove all slack from the anchor tabs.

4.4.2.5 In-process visual examination of ballistic filler assemblies, collars and vest shells before turning vest shell right side out. The ballistic filler assembly, collars, and vest shall be visually examined for the defects listed below prior to turning vest shell right side out. The lot shall be expressed in terms of vest shells with filler assemblies and collars attached. The sample unit shall be one vest shell with ballistic filler assembly and collars attached. The inspection level shall be II and the AQL, expressed in terms of defects per hundred units, shall be 2.5 major and 15.0 total (major and minor combined).

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Examine	Defect	Classification	
		Major	Minor
Seams and stitching:			
Open seam (type 301 stitching)	a. Up to 1/2 inch		X
	b. More than 1/2 inch	X	
Open seams (over-edge stitching)	a. More than 1 inch but not more than 2 inches		X
	b. More than 2 inches	X	
NOTE: A seam shall be classified as an open seam when one or more stitches joining a seam are broken, or when two or more consecutive skipped or runoff stitches occur.			
Seam and stitch type	Wrong seam or stitch type	X	
Stitch tension	Loose, resulting in loose bobbin or top thread or excessively tight resulting in puckering of material <u>1/</u>		X
Stitches per inch (type 301 stitching)	a. One to two stitches less than minimum specified <u>1/</u>		X
	b. Three or more stitches less than minimum specified <u>1/</u>	X	
	c. Two or more stitches in excess of maximum specified <u>1/</u>		X
Overedge stitching	Stitches per inch:		
	(1) One less than minimum specified <u>1/</u>		X
	(2) Two or more less than minimum specified <u>1/</u>	X	
	(3) Two or more in excess of maximum specified <u>1/</u>		X

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Examine	Defect	Classification	
		Major	Minor
Rows of stitching	Any row missing	X	
Thread breaks, skipped or runoff stitches (on type 301 stitching)	Overstitched less than 1 inch in each direction beyond defective stitching area		X
Thread breaks, skipped or runoff stitches (on over-edge stitching)	Overstitched less than 3/4 inch in each direction beyond the defective stitching area		X
	NOTE: On all types of stitching, any thread break or two or more consecutive skipped or runoff stitches not overstitched shall be classified as open seam.		
Stitching end (on type 301 stitching)	End of stitching not secured as specified (except when caught in other stitching or turned under in a hem)		X
Raw edge (except where required)	More than 1/2 inch when securely caught in stitching		X
	NOTE: Raw edges not securely caught in stitching shall be classified as open seams		
Assembly - general	a. Front filler or back filler components improperly assembled, i.e., narrow ply groups not between wide ply groups or not evenly aligned around the edges	X	
	b. Back filler upper left and right components not positioned on top of upper center component or top edge of lower component not positioned under upper components		X

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Examine	Defect	Classification	
		Major	Minor
Assembly - general (cont'd)	c. Any filler component puckered or will not lie flat	X	
	d. Any anchor tab omitted or width less than specified	X	
	e. End of anchor tab not folded under		X
	f. Reinforcement for snap fasteners or grenade hangers omitted		X
Material defects (textile com- ponents)	Hole, cut, tear, or other weakening defect such as smash, float, loose slub, or thin area	X	
Cleanness	Excessively soiled or stained		X

1/ Defects shall be scored only when the condition exists for 3 inches or more or in several areas with an acalulated distance of 5 inches or more.
Applicable to individual seams.

4.4.3 End item visual examination (see 6.8). The completed body armor vest assembly shall be examined for the defects listed below. The lot size shall be expressed in terms of complete body armor vest assemblies. The sample unit shall be one complete body armor vest assembly. The inspection level shall be II and the AQL, expressed in terms of defects per hundred units, shall be 2.5 for major defects and 15.0 for total (major and minor combined).

Examine	Defect	Classification	
		Major	Minor
Cloth	a. Any hole (except drill hole), cut, or tear.	X	
	b. Any exposed drill hole.		X
	c. Any abrasion marks, broken or missing yarns, or multiple floats.	X	
	d. Any mend, darn, or patch.	X	

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Examine	Defect	Classification	
		Major	Minor
Cloth (cont'd)	e. Parts not cut correctly with respect to material lines:		
	(1) On vest inner and outer, shell components	X	
	(2) On collar, shoulder pad, pockets and pocket flaps and front closure flap		X
	f. Needle chews.	X	
Webbing	a. Any hole, cut, or frayed edge	X	
	b. Needle chews:		
	(1) Up to 1/8 inch in length		X
	(2) 1/8 inch or more in length	X	
	c. Not continuous, i.e., spliced	X	
	d. End not fused as required		X
Fastener tape	Hook tape crushed affecting closure	X	
Eyelets	a. Broken or malformed, corroded areas, burrs, or sharp edge	X	
	b. Finish omitted or not as specified		X
	c. Clinched excessively tight, cutting surrounding material	X	
	d. Insecurely clinched to a degree that eyelet may be detached from material		X
	e. Any omitted	X	
Snap fasteners	a. Any fastener not functioning properly, i.e., fails to snap closed, provide a secure closure or to open freely		X
	b. Clinched excessively tight, cutting material	X	

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Examine	Defect	Classification	
		Major	Minor
Snap fasteners (cont'd)	c. Clinched loosely, permitting either component to rotate freely or to separate	X	
	d. Not specified style or not hard action type	X	
	e. Finish omitted or not as specified		X
	f. Improper or insecure clinching	X	
	NOTE: The fasteners shall be snapped and unsnapped twice to determine whether parts of fasteners separate freely and also effect a secure closure.		
	NOTE: Incomplete roll of button or eyelet tube is evidence of insecure clinching. Fasteners evidencing incomplete roll will separate in use.		
Seams and stitchings:			
Open seams	a. Up to and including 1/2 inch.		X
	b. More than 1/2 inch.	X	
	NOTE: A seam shall be classified as an open seam when one or more stitches joining a seam are broken or when two or more consecutive skipped or runoff stitches occur.		
Raw edges (except where required or otherwise classified herein)	More than 1/2 inch when securely caught in stitching.		X
	NOTE: Raw edges not securely caught in stitching shall be classified as open seams.		

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Examine	Defect	Classification	
		Major	Minor
Seam and stitch type	a. Wrong seam or stitch type.	X	
	b. Seam pleated or badly puckered clearly noticeable.		X
Stitch tension	a. Tension loose, resulting in loose bobbin or top thread.		X
	b. Tension tight, resulting in puckering of material.		X
Stitches per inch	a. One to two stitches less than minimum specified. <u>1</u> /		X
	b. Three or more stitches less than minimum specified. <u>1</u> /	X	
	c. One or more stitches in excess of maximum specified. <u>1</u> /		X

1/ Defects to be scored only when condition exists for a length of 3 inches or more or in several areas with an accumulated distance of 5 inches or more. Applicable to individual seams.

NOTE: Variation in the number of stitches per inch caused by operator speeding up the machine and pulling the material in order to sew over heavy places, or in turning corners shall be classified as follows:

- (a) With the minor defect classification - No defect
- (b) With the major defect classification - Minor defect

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Examine	Defect	Classification	
		Major	Minor
Thread break, or skipped stitches (on type 301 stitching)	Overstitched less than 1 inch in each direction beyond defective stitching area.		X
	NOTE: On all types of stitching, thread breaks or two or more consecutive skipped stitches not overstitched shall be classified as open seam.		
Stitching ends (on type 301 stitching)	Ends of stitching not secured as specified (except when caught in other stitching or turned under in a hem).		X
Runoffs	a. On joining or closing seams - use open seam classification.		
	b. Edge or raise stitching, not resulting in any open seam, more than 1/2 inch in length (when resulting in an open seam use open seam classification.)		X
Rows of stitching	Any row missing (unless otherwise classified herein).	X	
Bartacks	a. Stitching loose, incomplete, or broken		X
	b. Any bartack omitted	X	
Front flap	a. Pile tape used for fasteners in lieu of hook tape	X	
	b. Raised stitching around sides of flap omitted		X
	c. Raised stitching omitted that stitches flap to shell	X	
	d. Stitched to right front shell in lieu of left	X	

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Examine	Defect	Classification	
		Major	Minor
Pocket flaps	a. Fastener tape on pocket flap and pocket body reversed, i.e., pile tape attached to flap in lieu of pocket body		X
	NOTE: If pile tape or hook tape is used on both pocket flap and pocket body, defect shall be classified as a major defect.		
	b. Raised stitching omitted around flap or that which stitches flap to shell		X
	c. Flaps reversed, i.e., left flap attached to right front shell	X	
Breast pockets	a. Pockets reversed, i.e., left pocket attached to right front shell	X	
	b. Stitching required to form bellows omitted		X
	c. Raised stitching on lower corner of pocket omitted		X
	d. Eyelet reinforcement omitted		X
	e. Bartack on top back corner or lower back corner passes through bellows edge of pocket		X
Side closure retainer	Ends not folded under		X
Elastic side closures	a. Ends not turned under		X
	b. Ends not fused		X
	c. Not stitched through entire vest where attached to back of vest	X	

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Examine	Defect	Classification	
		Major	Minor
Pencil pocket	a. Omitted		X
	b. Raw edge on hem, or sides not turned under		X
Grenade hangers	a. Reinforcement pieces on underside of shell omitted or mislocated causing bartack stitching on hangers not to pass entirely through reinforcements (check by feel)	X	
Shoulder pads	a. Reinforcement in end of elastic retainer strap omitted		X
	b. 1/2 inch tape along neck edge omitted		X
	c. Attached in reverse direction	X	
Intermediate fastener tape closures on shell fronts	Type of tape used for right front and left front reversed, i.e., pile tape used for 1 inch piece on left front and hook tape used for 2 inch piece on right front		X
Assembly - general	a. Any area of ballistic filler bunched (i.e., filler does not lie flat)		X

NOTE: Inspection for this defect shall be performed with the body armor vest properly positioned on a torso and with front closure secured. The vest shall be inspected for bunching of the ballistic filler by the inspector running his/her hand over the entire surface area of the vest, including the collar, to determine if the filler lies flat in all areas.

The following torso sizes shall be used to inspect the size of body armor vest indicated.

<u>Torso size</u>	<u>Vest size</u>
38	- Extra Small
38	- Small
42	- Medium
42	- Large
42	- Extra Large

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Examine	Defect	Classification	
		Major	Minor
Assembly - general (cont'd)	b. Any row of stitching securing ballistic filler to inner shell omitted	X	
	c. Any row of stitching through entire vest omitted or not passing through ballistic filler the entire length of the stitching	X	
	d. Any component caught in any unrelated operations of stitching, affecting appearance or function (not otherwise classified herein)	X	
	e. Any component part omitted (not otherwise classified herein) or not attached as specified	X	
	f. Any fabric component assembled with camouflage printed surface facing wrong direction	X	
	g. Any operation not performed as specified		X
	Label	a. Missing, incorrect, or illegible.	X
	b. Misplaced, not attached in the form of a pocket		X
	c. Color not green		X
Use and care pamphlet	Omitted, printing or figures illegible, any page missing		X
Cleanness	a. Any spot or stain clearly noticeable.		X
	b. Thread ends not trimmed as specified.		X
Color of components	Color of any component not olive drab, olive green, or camouflage as specified		X

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Examine	Defect	Classification	
		Major	Minor
Assembly - general (cont'd)	b. Any row of stitching securing ballistic filler to inner shell omitted	X	
	c. Any row of stitching through entire vest omitted or not passing through ballistic filler the entire length of the stitching	X	
	d. Any component caught in any unrelated operations of stitching, affecting appearance or function (not otherwise classified herein)	X	
	e. Any component part omitted (not otherwise classified herein) or not attached as specified	X	
	f. Any fabric component assembled with camouflage printed surface facing wrong direction	X	
	g. Any operation not performed as specified		X
	Label	a. Missing, incorrect, or illegible.	X
b. Misplaced, not attached in the form of a pocket			X
c. Color not green			X
Use and care pamphlet	Omitted, printing or figures illegible, any page missing		X
Cleanness	a. Any spot or stain clearly noticeable.		X
	b. Thread ends not trimmed as specified.		X
Color of components	Color of any component not olive drab, olive green, or camouflage as specified		X

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4.4.4 End item dimensional examination (see 6.8). Examination of the complete body armor vest assembly shall be made for the defects listed below. The lot size shall be expressed in units of complete body armor assemblies. The sample unit shall be one completed body armor vest assembly. The inspection level shall be S-3 and the AQL, expressed in terms of defects per hundred units, shall be 1.5 major and 4.0 total (major and minor combined).

Examine	Defect	Classification	
		Major	Minor
Side elastic closure pieces	Not attached on back outer shell in location specified:		
	(1) Exceeding tolerance up to 1/8 inch		X
	(2) Exceeding tolerance by more than 1/8 inch	X	
Side closure retainers	Not attached to outer shell in location specified:		
	(1) Exceeding tolerance up to 1/8 inch		X
	(2) Exceeding tolerance by more than 1/8 inch	X	
Collars:	a. Ends of collars at back not overlapped exceeding tolerance		
	b. Location of front edge of collar(s) from edge of shell:		
	(1) More than 1-1/4 inch but not more than 1-3/8 inch		X
	(2) More than 1-3/8 inch	X	
	(3) Less than 3/4 inch but not less than 5/8 inch		X
	(4) Less than 5/8 inch	X	
Shoulder pads	a. Not attached with edge even with neck edge of vest shell:		
	(1) By more than 1/16 inch up to 1/8 inch		X
	(2) By more than 1/8 inch	X	

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Examine	Defect	Classification	
		Major	Minor
Shoulder pads (cont'd)	b. Not attached with center of shoulder pad aligned with center of front and back outer shell joining seam:		
	(1) By more than 1/8 inch up to 1/4 inch		X
	(2) By more than 1/4 inch	X	
Overall length or width	More or less than specified exceeding tolerance: <u>1/</u>		
	(1) Up to 1/4 inch but not more than 3/4 inch		X
	(2) By more than 3/4 inch	X	
<u>1/</u> For the applicable dimensions and tolerances see table II.			
Bartacks	Length or width not within specified tolerance (<u>±</u> 1/16 inch tolerance for length, <u>±</u> 1/32 inch for width)		
Stitch margin or gage	Not within specified tolerance (to be scored only when condition exists on major portion of the seam)		X

4.4.5 Packaging examination. The fully packaged end item 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.

<u>Examine</u>	<u>Defect</u>
Marking (exterior and interior)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application.
Materials	Any component missing, damaged, or not as specified.

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<u>Examine</u>	<u>Defect</u>
Workmanship	Inadequate application of components, such as: cushioning or padding material (when applicable) not properly secured, incomplete closure of box flap, improper taping or tying, or inadequate stapling. Inadequate nailing of shipping container; loose strapping. Bulged or distorted container.
Content	Number of items per shipping container is more or less than required.

4.4.6 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. Interlocking of loads not as specified. Load not bonded with required straps as specified.
Weight	Exceeds maximum load limits.
Marking	Omitted; incorrect; illegible; of improper size location, sequence, or method of application.

5. PACKAGING

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

5.1.1 Level A. Ten body armor vests, of one size only, shall be packed in a fiberboard shipping container conforming to style RSC-L, grade V2s of PPP-B-636. The weight limitation requirement shall be waived when applicable. The inside of each fiberboard container shall be fitted with a fiberboard box liner conforming to type CF, class weather-resistant, variety DW, grade V15c of PPP-B-636. Body armor shall be packed flat ten in depth, each alternately reversed top to bottom, within a shipping container. Inside dimensions of shipping containers shall be as specified in table III. Each shipping container shall have the contents completely covered on the top and bottom with a sheet of 40-pound minimum basis weight kraft paper conforming to A-A-203. 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 4.4.5. Toward the end of the contract or when there are less than the required amount per container of the same size, mixed sizes may be packed within the same shipping container.

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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). Strapping shall be limited to nonmetallic strapping, except for type III, class F loads.

TABLE III. Shipping container dimensions

Sizes	Inside dimensions of shipping containers in inches (+ 1/8 inch)		
	Length	Width	Depth
X-Small, Small and Medium	23	20	12
Large and X-Large	25	24	13

5.1.2 Level B. Ten body armor vests of one size only, shall be packed in a fiberboard shipping container conforming to style RSC-L, type CF (variety SW) or SF, class domestic, grade 350 of PPP-B-636. The weight limitation requirement shall be waived when applicable. The inside of each shipping container shall be fitted with a fiberboard box liner conforming to type CF, class domestic, variety SW or DW, grade 275 of PPP-B-636. Body armor shall be packed flat ten in depth, each alternately reversed top to bottom, within a shipping container. Inside dimensions of shipping containers shall be as specified in table III. Each shipping container shall have the contents completely covered on the top and bottom with a sheet of 40-pound minimum basis weight kraft paper conforming to A-A-203. Each shipping 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 4.4.5. Toward the end of the contract or when there are less than the required amount per container of the same size, mixed sizes may be packed within the same shipping container.

5.1.2.1 Weather-resistant fiberboard container. When specified (see 6.2), the fiberboard 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 4.4.5.

5.1.3 Commercial packing. Body armor vests shall be packed in accordance with ASTM D 3951.

5.2 Palletization. When specified (see 6.2), vests packed as specified in 5.1.2 and 5.1.3, shall be palletized on a 4-way entry pallet in accordance with load type Ia of MIL-STD-147. Pallet type shall be type I (4-way entry), type IV, or type V in accordance with MIL-STD-147. Pallets shall be fabricated from wood 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 K and L. Pallet patterns shall be number 3 in accordance with the appendix of MIL-STD-147. Interlocking of loads shall be effected by reversing the pattern of each course.

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

5.3.1 Labels, mixed sizes. Each shipping container packed with mixed sizes shall have securely attached to the end and side directly under the printing or stenciling a white paper label 5 by 4 inches, with the words "MIXED NSN's" plainly stamped or printed thereon and under these words shall be legibly stamped or printed the correct quantity and NSN's contained therein.

6. NOTES

6.1 Intended use. The body armor vest is intended for use by ground troops for protection against low velocity projectiles and grenade fragments.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this document.
- b. Size required (see 1.2).
- c. When a first article sample is required (see 3.1.3, 4.3, and 6.4).
- d. Selection of the applicable level of packing (see 5.1).
- e. Type and class of unit load required (see 5.1.1).
- f. When weather-resistant grade fiberboard shipping containers are required for level B packing (see 5.1.2.1).
- g. When palletization is required (see 5.2).

6.3 Samples. For access to samples, address the contracting activity issuing the invitation for bids.

6.4 First article. When a first article sample 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 include specific instructions in all acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.5 Marking ink. Marking ink meeting the requirements of MIL-I-43639 has been found to meet the fastness of printing requirements for the label specified in 3.2.14.

6.6 Cooling of needle. In order to keep the needle cool when overedging the ballistic fillers, it is recommended that either the machines be equipped with a compressed air blower directed at the needle or by affixing a felt pad saturated with silicone oil in a position so that the thread will rub against it during sewing. The use of chromium plated needles have been found to be advantageous in that they do not generate as much heat or deflect as much during use as regular needles. Recommended maximum speed for the overedge machine is 1000 RPM.

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6.7 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this document (see 3.2).

6.8 Inspection aid. The use of a torso may be beneficial in determining if some of the defects listed in 4.4.3 and 4.4.4 are present.

6.9 Subject term (key word) listing.

Body armor
Clothing protective
Troops ground
Vest

6.10 Changes from previous issue. Asterisks are not used in this revision due to the extensiveness of changes.

Custodians:

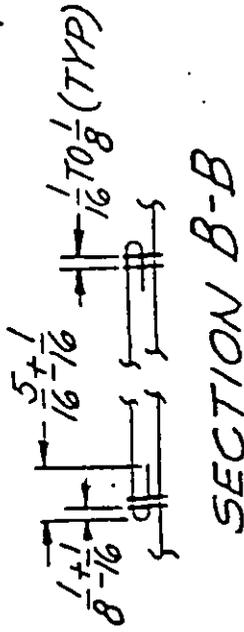
Army - GL
Navy - NU
Air Force - 99

Preparing activity:

Army - GL
Project No. 8470-0113

Review activities:

Army - MD
Navy - MC
DLA - CT



NOTES:

1. LENGTH OF LABEL SHALL BE GOVERNED BY THE LABEL CONTENTS BUT SHALL BE AT LEAST 7" TO FORM POCKET FOR INSTRUCTION BOOKLET.
2. ALLOW 1/8" MIN BLANK MARGIN BETWEEN STITCHING AND PRINTING ALL AROUND LABEL.
3. ATTACH LABEL TO BACK VEST INNER SHELL WITH OPEN END OF POCKET FACING TOWARDS TOP OF VEST IN LOCATION MARKED ON PATTERN.

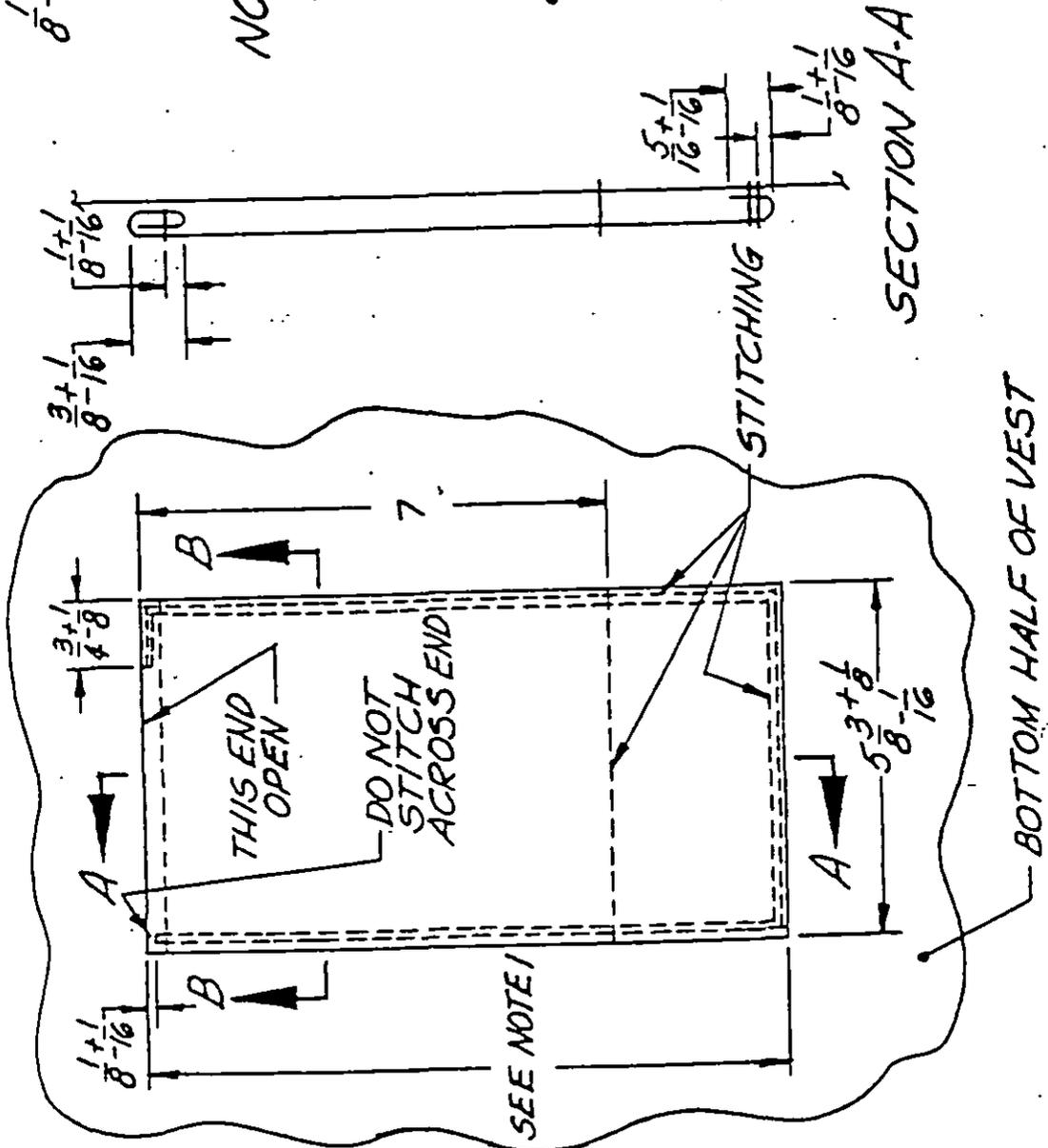


FIG. 1 BODY ARMOR, LABEL DETAILS AND METHOD OF ATTACHMENT