

(INCH-POUNDS)

A-A-59530A

May 22, 2000

SUPERCEDING

A-A-59530

December 22, 1999

COMMERCIAL ITEM DESCRIPTION

BOOT, SAFETY, (8 INCH)

The General Services Administration has authorized the use of this commercial item description for all Federal agencies.

- 1 SCOPE. This commercial item description covers the requirements for an aircrew safety boot.
- 2 CLASSIFICATION. The boots shall be in the following whole and half sizes and widths.

<u>Sizes</u>	<u>Width</u>
3 through 16	N – Narrow
3 through 16	R – Regular
3 through 16	W – Wide
3 through 16	XW – Extra Wide

3 SALIENT CHARACTERISTICS

3.1 Description. The boot shall be a blucher style, black, eight inch high boot with a full lace eyelet, plain safety steel box toe, padded collar band, one piece vamp, combination tongue and gusset, backstay and leather lined vamp and quarters as shown in Figure 1.

3.1.1 Materials. The upper leather shall be full grain only and drum dyed black. The thickness shall be 4-1/2 to 6 ounces. The leather for the gusset-tongues and eyelet stays shall have a soft temper. The color shall be black. The thickness shall be 2-1/4 to 3-1/2 ounces.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: Defense Supply Center Philadelphia, Clothing and Textiles Directorate, Bldg. 6D, ATTN: DSCP-CRFD, 700 Robbins Avenue, Philadelphia, PA 19111-5096

AMSC N/A

FSC 8430

3.1.2 Lining, collar leather. The lining leather shall be soft, chrome tanned, unfinished, full grain cattlehide glove or pigskin leather of 2 to 3-1/2 ounces in thickness. The color of the lining shall be produced by the tanning agents. The collar leather shall be black, full grain, cowhide leather and shall have a soft temper. The thickness shall be 2 to 3 ounces. A certificate of compliance shall be submitted and will be acceptable for the stated requirements.

3.1.2.1 Inside Padded Collar. The inside padded collar shall have a length equal to the circumference of the boot top exclusive of the eyelet facing, gusset/tongue and a finished width of 3/4 inch (+/- 1/8). The foam for the padded collar shall be 3/8 inch (+/- 1/32), polyurethane open cell foam having a density of 2 lbs. per cubic foot. (see Figure 2). The exposed leather at the padded collar attachment seam shall be no greater than 1/8 inch away from the seam maximum. A certificate of compliance shall be submitted and will be acceptable for the stated requirements.

3.1.3 Insoles. The insole shall meet the requirements as specified in Table I. A certificate of compliance shall be submitted and will be acceptable for the stated requirements.

Table I. Insole Requirements

<u>CHARACTERISTICS</u>	<u>PHYSICAL REQUIREMENTS</u>	<u>TEST METHODS</u>
Thickness	0.090 min.	ASTM D-1777 1/
Fungal Resistance	Level 10	ASTM D-3273
Wet Tensile	70 kgf/cm/sq. min.	SATRA PM 2
Flexing Resistance	3.7 (5000 cycles) min.	SATRA PM 3
Abrasion Resistance:		
Cellulose Board	50 mm/cu. max.	SATRA PM 14
Non-Woven Board	25,600 revs dry/6400 wet	SATRA PM 31
Transverse Tensile-Dry	8 kgf/cm/sq. min.	SATRA PM 80
Dimensional Stability	0.7% max.	SATRA PM 98
Peel Strength	0.5 kgf/cm/sq. min.	SATRA PM 101

1/ A thickness gauge of the dead-weight type equipped with a dial graduated to read directly to .001 inches shall be used. The presser foot shall be circular, with a diameter of 1.129 (+/-0.001) inches and having moving parts weighted to apply a total load of 0.60 (+/- 0.03) pounds per square inch to the specimen. The anvil shall be not less than 1.129 inches in diameter. The presser foot and anvil surface shall be planed to within 0.001 inches and shall be parallel to each other to within 0.001 inches.

3.1.4 RUBBER COMPOUNDS.

3.1.4.1 Solid Midsole. The midsole for welt construction shall be a 4 iron (+/- 1/2), black, oil resistant and conform to the requirements of Table III. For Process 82 construction, the midsole shall be 1/12 to 1/4 inch, black and oil resistant.

3.1.4.2 Cushion Midsole. The cushion midsole shall be 10 1/2 iron (+/- 1/2) black, oil resistant microcellular rubber and meet the requirements of Table II. Ethylene vinyl acetate shall not be used. A certificate of compliance shall be submitted and will be acceptable for the stated requirements.

3.1.4.3 Cushion Heel. The cushion heel thickness shall be chosen to properly fit the requirements of the outsole. The cushion heel shall be black, oil resistant microcellular rubber and meet the requirements of Table II. Ethylene Vinyl Acetate shall not be used.

TABLE II: Microcellular Rubber Requirements

<u>CHARACTERISTICS</u>	<u>REQUIREMENT</u>	<u>TEST METHOD</u>
Hardness, Shore A	54 (+/- 8)	ASTM D-2240
SplitTear	10 lbs. Min. @ 10.5 Iron min.	FIA 320
Shrinkage	5 % max.	FIA 321 1/

1/ 6 Hours @ 212 Deg. F.

3.1.4.4 Outersole. The full-length outersole shall be black rubber conforming to the requirements as specified in Table III. The sole shall have an anti-FOD (foreign objects and debris) chevron pattern as shown in figures 3 and 5. (see paragraph 7.3.1)

3.1.4.5 Rubber compound requirements. The requirements for the rubber shall be as specified in Table III below on testing performed on 1/4 inch test slabs according to the ASTM procedures cited in TABLE III. The specimens are not actual soles. There may be some deviation on actual outsoles or midsoles based on style thickness and curing parameters. The requirements are as follows:

TABLE III. Outsole and Midsole requirements

Characteristics	Outsole	Solid Midsole	Test method
NBS Abrasion	150 min.	N/A	ASTM-D-1630
Hardness before aging	60-80	N/A	ASTM-D-2240
Volume swell (fuel B)	30% max.	N/A	ASTM-D-471
Stitch tear dry	240 lb. min.	180 lb. min.	ASTM-D-4786

Stitch tear after immersion	160 lb. min.	50 lbs.min.	ASTM-D-4786
Tear strength DIE C	175 lb. min.	N/A	ASTM-D-624
Non-marking	Pass/Fail	Pass/Fail	(See 3.2.1)
Split Tear	55 lb. Min.	N/A	FIA 324

3.2 Toe reinforced stitching. The outsole and welt shall be stitched together extended around the toe area.

3.2.1 Non-marking test. The corner edge of the sole or heel shall be drawn across a sheet of white paper using moderate pressure. If only a light mark is made which is easily erased by rubbing with the fingers, the heels and soles shall be classified as non-marking.

3.3 Safety box toe. The finished boot shall meet or exceed requirements when tested in accordance with ANSI Z41, Class I75/C75 and the requirements specified in Table IV. Testing shall occur with the cushion insert in place. The steel toe shall be a medium round shape.

3.3.1. Fiberglass shank. The fiberglass shanks shall be bonded to the insole, and shall conform to the shape of the last. When fully cured, the shank (glass and resin area) shall be a minimum of 9/16 inch in width. A certificate of compliance shall be submitted and will be acceptable for the stated requirements.

3.3.2. Steel shank. As an alternate, steel shanks may be used. The steel shanks shall be of the proper size, length, width, and location. A certificate of compliance shall be submitted and will be acceptable for the stated requirements.

3.3.3 Eyelets. The boots shall have 9 eyelets per quarter for sizes 3 through 8-1/2 and 10 eyelets for sizes 9 through 14. The eyelets shall be size AA. The eyelets shall be of aluminum, 0.016 (+/- 0.0015) inch thick with a roll barrel setting. The eyelets shall be anodized or finished with a corrosive preventive treatment and the heads shall be roller or tumble coated with not less than two coats of black enamel. A certificate of compliance shall be submitted and will be acceptable for the stated requirements.

3.4 Bond Strength.

3.4.1 Bond Strength The rubber outsole shall be separated from the cushioned midsole or solid midsole and the resultant bond strength shall be a minimum of 80 pounds. The cushioned midsole shall be separated from the solid midsole and the resultant bond strength shall be a minimum of 80 pounds. The toe area of the boots shall be separated approximately 2 ½ inches prior to performing the bond strength evaluation. The components of the sole shall be layered in such a manner that the specified bond strengths must be achieved. If any test results are attained at values less than those specified due to material failure vs. the bond between the layers, the results shall be classified as a failure.

3.4.2 Specimen. The specimen shall be a combined-midsole-outsole unit which has aged at least 2 days. The outsole shall be separated from the midsole for a distance of approximately 2-1/2 inches from the toe end of the specimen.

3.4.3 Apparatus. A power-driven portable gage tongue adhesion machine or an approved testing device of equal performance shall be used. The rate of travel of the power-actuated grip shall be 2 inches per minute. The machine shall be operated with a device for maintaining maximum load indication.

3.4.4 Procedure. The separate toe ends of the specimen shall be clamped in the jaws of the machine, with the jaws 2 inches apart. The specimen shall extend outward at right angles to the direction of the application load. The machine shall be started and the outsole and midsole shall be pulled apart for a distance of 1 inch. At that instant, the load indicated on the machine shall be read and recorded.

3.5 Laces. The laces shall conform to Type II, class 3 of A-A-55093. The color shall be black and have a minimum length of 60 inches. A certificate of compliance shall be submitted and will be acceptable for the requirements stated.

3.6 Marking, permanent identification. The contractor shall provide the correct size, width, contract number (Example: 97-D-9999), and company name on the quarter boot lining by means of indelible ink. The marking shall be done in accordance with acceptable commercial practices without reduction to footwear functionality. The boot shall contain ANSI identification conforming to the requirements specified in ANSI Z41. Each boot unit pack shall be labeled to include a UPC symbol for each NSN.

3.7 Finished Boot Height. The height of the finished boot, measured on the outside from the top of the welt to the top of the back of the boot, (see A on figure 1) shall be 8 (+/-1/4) inches, for a size 9 and graduate up or down between whole sizes approximately 1/8 inch.

3.8 Testing.

3.8.1 End item testing. The finished boot shall be tested for the characteristics specified in Table IV. The sample unit size for end item testing shall be three boots. All test results shall contain individual values utilized in expressing the final averaged result. The lot shall be unacceptable if one or more sample units fail to meet any specified requirement.

TABLE IV. End Item Tests

	Requirement	Test method	Number of determinations per sample unit	Reported as pass or fail	Reported numerical to nearest
Impact test	3.3	ANSI Z41	1	X	--
Compression test	3.3	ANSI Z41	1	X	--
Bond strength test	3.4.1	ASTM-D-816	1	X	--

4 REGULATORY REQUIREMENTS.

4.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

5 QUALITY ASSURANCE PROVISIONS.

5.1 Product conformance. The products provided shall meet the salient characteristics of this commercial item description, and shall conform to the producer's own quality assurance practices. The Government reserves the right to require proof of such conformance.

5.2 End item visual examination. The end items shall be examined for the following defects: not properly mated, variation in color or appearance, cushioned inserts missing or wrong size, differences in outsole thickness, variation in height of more than 1/4 inch within a pair, any non-removable spot, stain, or foreign matter affecting appearance, color not as specified, finish streaky, chipped, or flaky on upper, any raw edges not stained to match upper leather, any cut, tear, hole, repair or damage, any component or assembly omitted or misplaced, open seam not repaired, Stitching omitted where required, number of eyelets not as specified in each row, not properly spaced or securely clinched, marking missing, incomplete, incorrect; lining torn, loose or wrinkled, not properly mated with upper; bar-code omitted or not readable by scanner; label/tag omitted or illegible.

6 PACKAGING.

6.1 Preservation, packing, and marking. The preservation, packing, and marking shall be as specified in the contract or purchase order.

7 NOTES

7.1 Source of Government documents. Copies of military and Federal documents are available from:

Standardization Documents Order Desk, Bldg. 4D
700 Robbins Avenue
Philadelphia, PA 19111-5094

7.2 Source of non-Government documents.

ASTM Test Methods

ASTM D-471	- Rubber property- Effects of liquids
ASTM D-624	- Tear Strength of conventional vulcanized rubber and elastomers
ASTM D-792	- Specific Gravity Evaluation
ASTM D-816	- Rubber Cements
ASTM D-1630	- Rubber Property, Abrasion Resistance- NBS Abraded
ASTM D-2240	- Rubber Property, Durometer Hardness
ASTM D-4786	- Stitch Tear Strength, Single Hole

(Applications for copies should be addressed to American Society for Testing and Materials, 100 Bar Harbor Drive, West Conshohocken, PA 19428.)

ANSI Z41 - American National Standard for Personal Protection –Protective Footwear

ANSI Z41 - Impact/Compression Testing

(Applications for copies should be addressed to the National Safety Council, P.O. Box 558, Itasca, IL 60143-0558.)

ASTM Test Methods

(Applications for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, Pa. 19428)

SATRA test Methods

(Applications for copies should be addressed to the Satra technology Centre, Satra House, Rockingham Road, Kettering, Northamptonshire, NN, 16 9 JH, England)

FIA Test Methods

- FIA 321 - Shrinkage Evaluation
FIA 324 - Split Tear Testing

(Applications for copies should be addressed to: The Footwear Industries of America, 1420 K Street, NW, Suite 600, Washington, DC. 20005)

7.3 Suggested Sources. In a limited Market Survey for Boots, Safety, 8 Inch, which meet the salient characteristics of this commercial item description, the following manufactures are listed. It should be noted that this list is not all-inclusive and there may be other manufactures in Industry with a suitable product.

Addison Shoe Company, Wynne, Ark. 72396
American West Company, Waverly, Tenn. 37185
Belleville Shoe Manufacturing, Belleville, Ill. 62222
Cove Shoe Company, Martinsburg, Pa. 16662
Iron Age Manufacturing, Pittsburg, Pa. 15205
Wellco Enterprises, Waynesville, N.C. 28786
Wolverine Footwear, Rockford, MI. 49351

7.3.1 Outersole. An outersole that meets the requirements of paragraph 3.1.4.4 is Part number S0507 available from the Biltrite Corporation, Two University Office Park, 51 Sawyer Road, P.O. Box 9045, Waltham, Mass, 02454-9045.

Custodians:

Navy - NU
Air Force - 99

Preparing Activity:

DLA - CT
(Project 8430-0464)

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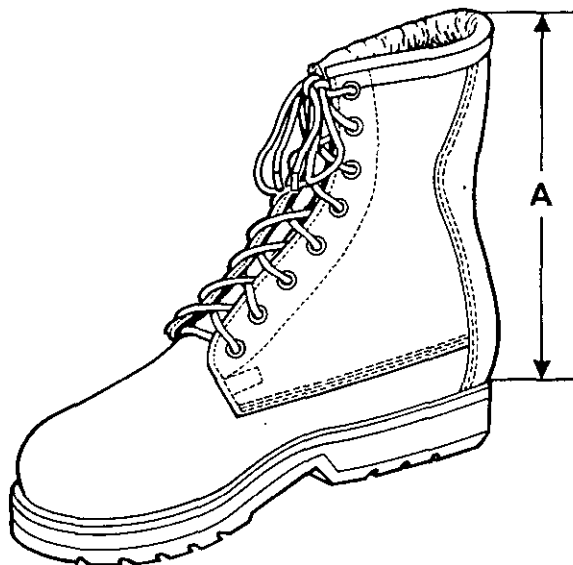


Figure 1

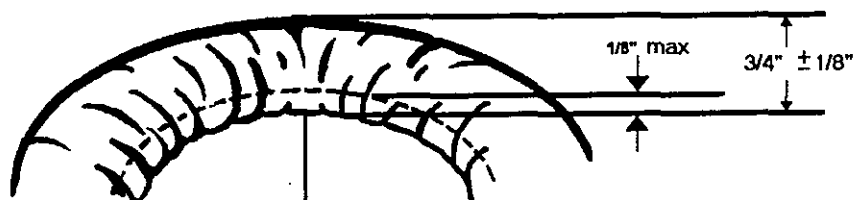
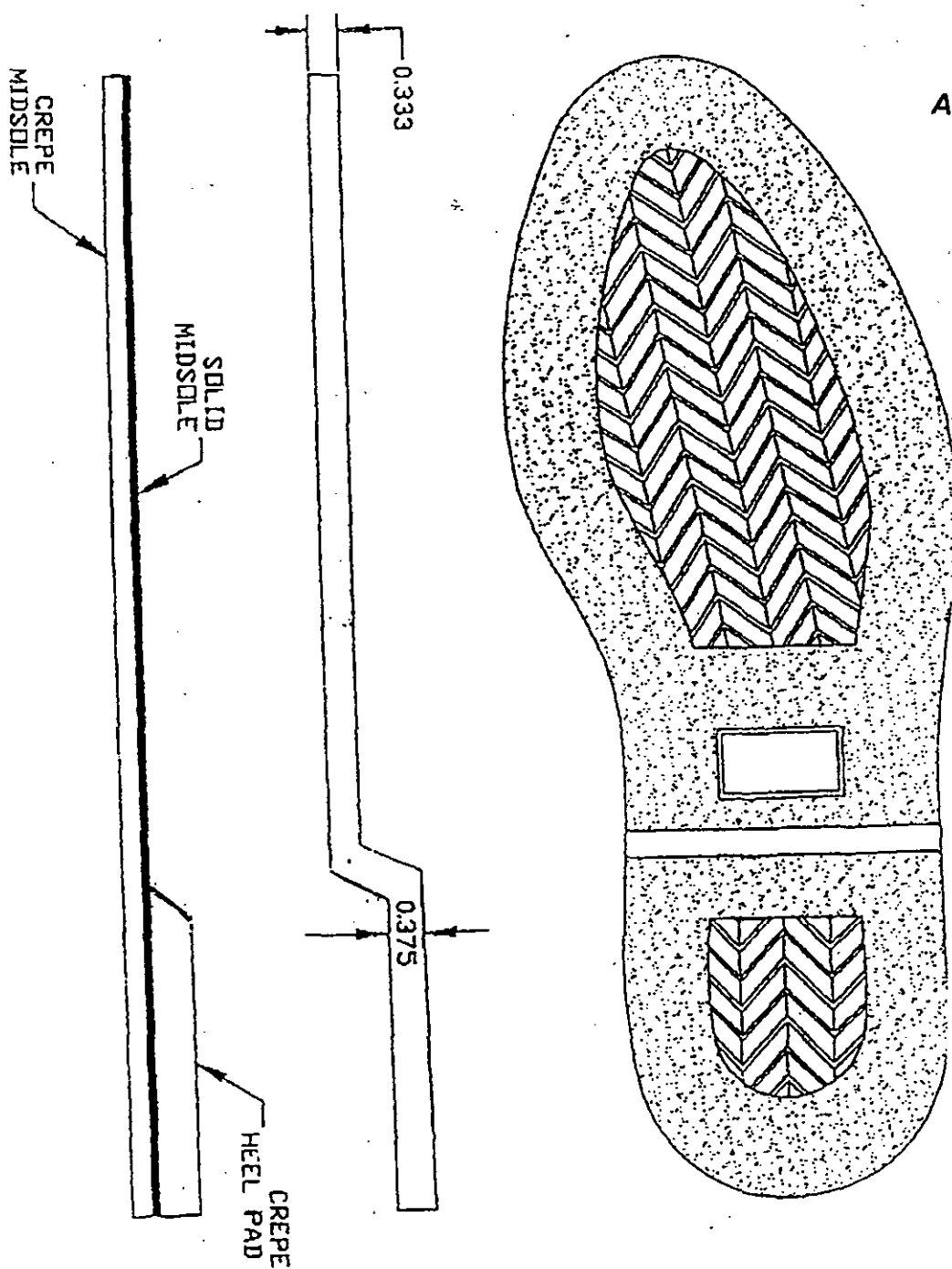


Figure 2

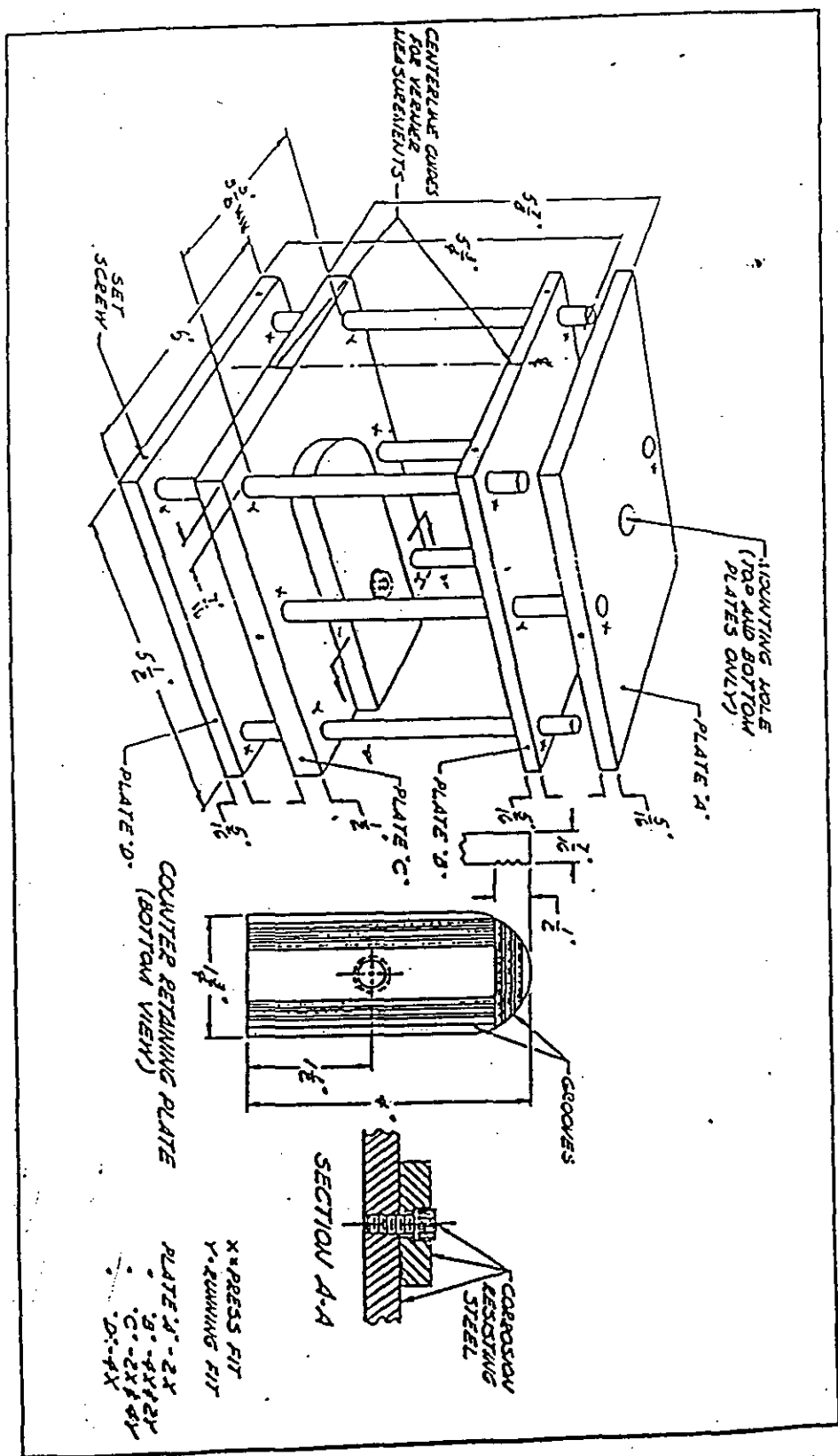
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Placement of the solid midsole between the outersole and the cushioned midsole is for illustration purposes to show the layers that comprise the sole. The order of the layers may vary based upon manufacturing processes.

FIGURE 3. OUTSOLE DESIGN

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SHOE COUNTER CRUSHING APPARATUS

FIGURE 4

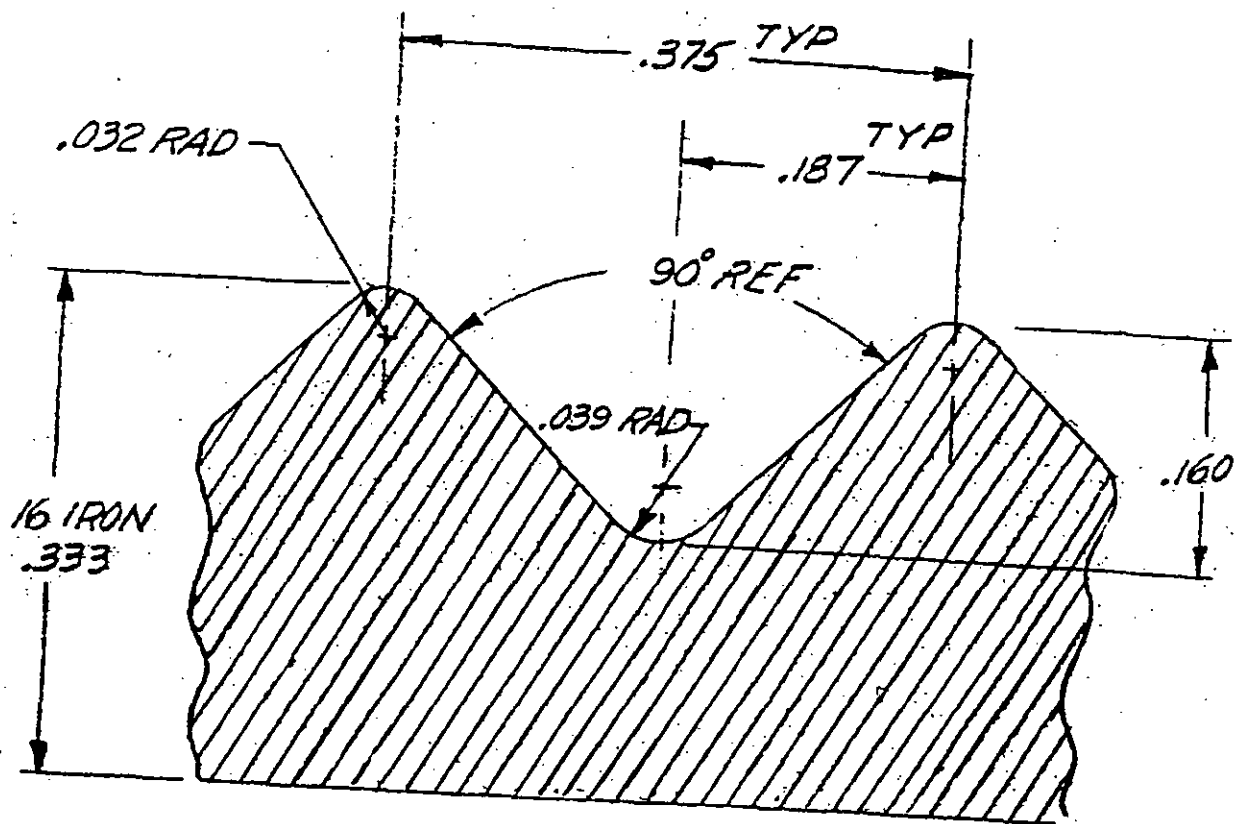


Figure 5. Outsole Chevron Detail