

MIL-R-85188A
 14 November 1986
 SUPERSEDING
 MIL-R-85188(AS)
 30 September 1980

MILITARY SPECIFICATION
 RIVETER, POWER, PNEUMATIC-HYDRAULIC
 BLIND RIVET INSTALLATION

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

1. SCOPE

1.1 Scope. This specification covers pneumatic-hydraulic tools for use in the installation of type I blind rivets conforming to MIL-R-7885 (see 6.1).

1.2 Classification.

1.2.1 Types. The riveters furnished under this specification shall be of the following types:

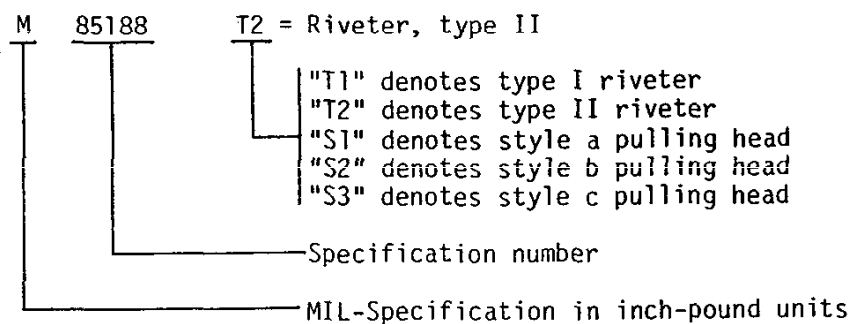
Type I - 1600 pound force pulling capacity (see figure 2).

Type II - 3000 pound force pulling capacity (see figure 3).

1.2.2 Pulling heads. The pulling heads furnished under this specification shall be of the following styles:

Style a - Straight
 Style b - Right Angle
 Style c - Offset

1.3 Military part number.



Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to the Naval Air Engineering Center, Systems Engineering and Standardization Department (Code 93), Lakehurst, NJ 08733-5100, 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 5130

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the 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.

SPECIFICATIONS

Federal

PPP-P-40 Packaging and Packing of Hand Tools.

Military

MIL-R-7885 Rivets; Blind, Structural, Locked and Friction Retained Spindle, General Specification for.

STANDARDS

Federal

FED-STD-H28 Screw-Thread Standards for Federal Services.

Military

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-129 Marking for Shipment and Storage.

MIL-STD-130 Identification Marking for U. S. Military Property.

(Copies of specifications, standards, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publication. The following document forms a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issues of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the nongovernment documents which are current on the date of the solicitation.

AMERICAN NATIONAL STANDARDS INSTITUTE

ANSI S5.1 Test Code For the Measurement of Sound From Pneumatic Equipment

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(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway, New York, NY 10018.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspections (see 4.3, 6.3 and table II).

3.2 Design and construction. The riveters shall operate at air pressure between 90-120 pounds per square inch (psi). The riveter equipped with a pulling head shall be capable of installing all styles and sizes of MIL-R-7885, type I rivets without adjustment of the riveter or pulling head. The pulling head and riveter shall be compatible with any spindle whose dimensions are in accordance with figure 1 and table I. The head assembly of the riveter shall be positioned parallel to the base of the riveter (see figures 2, 3 and 5). The head assembly shall be made of alloy steel (see figure 6a) having 150,000 psi minimum tensile strength or having a threaded insert made of alloy steel having 150,000 psi minimum tensile strength (see figure 6b and 6c). The nose fitting shall have an internal .750-20 UNEF-2B thread.

3.2.1 Riveter, type I. The type I riveter shall employ either a straight pulling head, a right angle pulling head, or an offset pulling head. The type I riveter (while operating at any air pressure between 90-120 psi), shall exert a pulling force of not less than 1600 pounds and shall consume approximately 2 cubic feet of air per minute at 20 cycles per minute, while not exceeding a maximum noise level of 79dBA according to ANSI S5.1.

3.2.2 Riveter, type II. The type II riveter shall employ either a straight pulling head, a right angle pulling head, or an offset pulling head. The type II riveter (while operating at any air pressure between 90-120 psi) shall exert a pulling force of not less than 3000 pounds and shall consume approximately 4 cubic feet of air per minute at 20 cycles per minute, while not exceeding a maximum noise level of 79dBA according to ANSI S5.1.

3.2.3 Pulling heads. Each pulling head (see figure 4) attached to the riveter shall install protruding head, flanged dome head, or flush head rivets of 1/8, 5/32 and 3/16 inch diameter conforming to MIL-R-7885, type I rivets without adjustment to the pulling head. Each pulling head shall be compatible with any spindle whose dimensions are in accordance with figure 1 and table I.

3.2.3.1 Style a, straight pulling head. Style a, straight pulling head shall conform to and not exceed the dimensions specified in figure 4.

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3.2.3.2 Style b, right angle pulling head. Style b, right angle pulling head shall conform to and not exceed the dimensions specified in figure 4.

3.2.3.3 Style c, offset pulling head. Style c, offset pulling head shall conform to and not exceed the dimensions specified in figure 4.

3.3 Threaded parts. Threaded parts shall be in accordance with FED-STD-H28.

3.4 Fittings. The threaded fitting in the handle base (to connect the air supply fitting) shall be internal .250-18 National Pipe Thread form (see figures 2 and 3). The riveter shall be capable of being attached to and detached from standard fittings for industrial compressed air tools without the need for additional hardware, adapters or equipment.

3.5 Hydraulic system. The hydraulic system shall be protected against the entrance of dirt or other foreign materials.

3.6 Safety and human factors.

3.6.1 Safety. All moving parts that are of potential hazard to maintenance or operating personnel shall be fully enclosed or guarded. Protective devices shall not impair the operating functions of the riveter.

3.6.2 Human factors. The riveter must be capable of being operated in any position with one hand.

3.6.3 Ease of maintenance. All subassemblies shall be readily accessible for servicing, repair or replacement.

3.6.3.1 Operating and maintenance manual. An operating and maintenance manual shall be supplied with each riveter.

3.6.3.2 Replacement parts. All replacement parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable.

3.6.3.3 Service parts kit. The manufacturer shall make available to the purchaser upon request a service parts kit (see 6.2.1). Instruction and service manuals containing detailed illustrations, parts breakdown (assembly order) and part numbers shall be provided for each riveter.

3.7 Identification marking. The riveter, pulling heads and parts shall be marked for identification in accordance with MIL-STD-130. In addition, the following markings must be permanently attached to the riveter:

- a. Military part number (see 1.3).
- b. Manufacturer's name.
- c. Manufacturer's address.
- d. Manufacturer's service parts kit number.

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3.8 Dimensions. The riveter shall comply with the dimensions specified in figure 2 for type I riveter, in figure 3 for type II riveter, and in figure 4 for the pulling heads.

3.9 Weight. The weight of the type I riveter shall be 5-1/4 pounds maximum. The weight of the type II riveter shall be 6-1/2 pounds maximum.

3.10 Performance.

3.10.1 Endurance. There shall be no failure or malfunction of the riveter when subjected to 10,000 continuous cycles of operation (see 4.6.1).

3.10.2 Sustained load. The riveter shall withstand for 10 seconds a sustained load of 1600 pounds minimum for type I riveter and 3000 pounds minimum for type II riveter when tested as specified in 4.6.2 and in 4.6.3.

3.10.3 Stroke length. The riveter shall have a minimum stroke length of .469 inches when tested as specified in 4.6.4.

3.10.4 Rivet installation. The riveter shall show no damage that will affect the proper installation of the rivets when tested as specified in 4.6.5.

3.11 Workmanship. The riveter shall be free from blemishes, defects, burrs and sharp edges. Particular attention shall be given to the preciseness of welding, brazing, alignment of parts and tightness of assembly screws and bolts to insure proper operation and performance. The riveter shall be free from any metallic particles, dirt, or other extraneous materials in the hydraulic system which can affect riveter operation, performance and life expectancy. The same shall apply to all service parts and kits (specified herein). The riveter shall also be a new current production item for which maintenance, parts and service are readily available from the supplier.

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 the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. The riveters shall meet all requirements of Sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring the riveters submitted to the Government comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective riveters nor does it commit the Government to acceptance of defective riveters.

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4.1.2 Test equipment and inspection facilities. The manufacturer shall insure that test and inspection facilities of sufficient accuracy, quality and quantity are established and maintained to permit performance of required inspections.

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

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

4.3 First article. The contractor shall furnish, within the time limit specified in the contract (see 6.3), four riveters for first article inspection and approval. The inspection shall be conducted prior to the submission of the remainder of the riveters to be furnished under the contract. The riveters shall be identical with the production riveters the manufacturer proposes to furnish in fulfillment of the contract. The first article inspection shall be as specified in table II. Approval of the first article samples shall not relieve the contractor of the obligation to meet the quality conformance requirements of this specification (see 4.1 and 4.4).

4.3.1 Samples. The riveters shall be taken at random from a production run and shall be produced with equipment and procedures normally used in production.

4.4 Quality conformance inspections. Quality conformance inspections shall be as specified in table III and test samples shall be selected at random in accordance with MIL-STD-105.

4.5 Visual examination.

4.5.1 Identification markings. The identification marking on the riveter shall be visually examined to insure compliance with the requirements specified herein.

4.5.2 Dimensions. The riveter and pulling heads shall be examined to insure dimensional compliance as specified herein.

4.5.3 Weight. The riveter shall be examined to ensure the weight compliance as specified herein.

4.6 Test methods.

4.6.1 Endurance. The riveter shall be subjected to the endurance test in the following order:

- a. Select a riveter from the sample lot and place in a chamber precooled to -20°F for a period of not less than 2 hours.
- b. Remove the cooled riveter from the chamber and install 5 rivets within 5 minutes after removal from the cooled chamber followed by 95 complete cycles in not more than 15 minutes after removal from the cooled chamber.

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- c. Allow the riveter to warm up to room temperature for a period of not less than 30 minutes.
- d. Place the same riveter in a chamber preheated to 100°F for a period of not less than 1 hour.
- e. Remove the heated riveter from the chamber and install 5 rivets within 5 minutes after removal from the heated chamber followed by 95 complete cycles in not more than 15 minutes after removal from the heated chamber.
- f. Allow the riveter to cool down to room temperature for a period of not less than 1 hour.
- g. Place the riveter in the test fixture similar to that illustrated in figure 5 and subject the riveter to 9800 continuous cycles using its full stroke with a minimum of 90 psi air pressure at the air inlet.
- h. Inspect the riveter for any signs of distortion, cracks, leaks, or breakage.

4.6.1.1 Failure. Failure of the riveter at any part of this test shall be considered as reason to discontinue the completion of the test specified herein. Failure is when the riveter is unable to install rivets properly as specified in MIL-R-7885 or has developed any degree of leakage, or has not conformed to the minimum stroke length as specified in 3.10.3. Upon completion of the endurance test, any part found distorted, worn, cracked, or broken shall be cause for rejection of the entire lot represented by the sample.

4.6.2 Sustained load (maximum air pressure). At the maximum recommended air pressure (120 ± 2 psi), and with the nose assembly removed, the drawbolt portion of the riveter shall be connected to a load testing machine and the load values specified in 3.10.2 shall be sustained for a period of not less than 10 seconds. Failure of the riveter to sustain the load for 10 seconds shall be cause for rejection.

4.6.3 Sustained load (minimum air pressure). At the minimum air pressure ($90 \pm 4, -0$ psi), and with the nose assembly removed, the drawbolt portion of the riveter shall be connected to a load testing machine and the load values specified in 3.10.2 shall be sustained for a period of not less than 10 seconds. Failure of the riveter to sustain the load for 10 seconds shall be cause for rejection.

4.6.4 Stroke length. A stroke gage shall be installed on the riveter collet to measure the proper stroke length for riveters. Failure of the riveter to reach the stroke length requirement shall be cause for rejection.

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4.6.5 Rivet installation. With a style a, b or c pulling head threaded to the riveter, the riveter shall install blind rivets specified in table IV. The air pressure supplied to the riveter shall be between 90 psi and 120 psi. Upon completion of the test, the riveter and pulling head shall be disengaged and inspected for damage. Damage to the riveter that affects the proper installation of the rivets shall be cause for rejection.

5. PACKAGING

5.1 Preservation, packaging and packing. Preservation, packaging and packing shall be in accordance with PPP-P-40. Preservation, packaging and packing shall be Level A or C, as specified (see 6.2).

5.2 Marking. All individual packages and shipping containers shall be marked for shipment in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The riveter is to be used with a straight, right angle, or offset pulling head.

6.2 Ordering data. Purchasers should select the preferred options offered herein and include the following in procurement documents:

- a. Military part number of riveter required (see 1.3).
- b. Quantity required.
- c. Military part number of pulling head (if required; see 1.2.2 and figure 4) and quantity.
- d. Level of preservation, packaging and packing requirements (see 5.1).

6.2.1 When ordering service parts kits, specify the following:

- a. The manufacturer's name.
- b. Manufacturer's address.
- c. Manufacturer's service parts kit number for the riveter.
- d. Quantity of kits required.
- e. Level of preservation, packaging and packing requirements (see 5.1).

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6.3 First article. When a first article inspection is required, the riveters should be a first article sample. The first article should consist of four units. The contracting officer shall include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitation for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Subject term (key word) listing.

Blind rivet installation
Riveter

6.5 Example of a part number.

M85188T1 = Riveter, type I; 1600 pound force pulling capacity.
M85188S3 = Pulling head, style c; offset.

6.6 Marginal indication. The margins of this specification are marked to indicate where changes, deletions or additions to the previous issue have been made. This is done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content as written, irrespective of the marginal notations and relationship to the previous issue.

Custodians:
Air Force - 11
Navy - AS

Preparing activity:
Navy - AS
(Project No. 5130-N305)

Review activities:
Air Force - 99, 84
DLA - IS
Army - GL

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TABLE I. Spindle Dimensions.

Diameter "S" (a)		Serration Pitch "p"		Serration Length "Q"	Spindle Length "Z"	
Max	Min	Max	Min	Minimum	Max	Min
.119	.069	.032	.030	.625	1.00	.87

(a) Serration depth shall be 0.003 to 0.005 inches.

TABLE II. First article inspection.

Inspection	Requirement paragraph	Test method paragraph
Identification marking	3.7	4.5.1
Dimensions	3.8	4.5.2
Weight	3.9	4.5.3
Endurance	3.10.1	4.6.1
Sustained load	3.10.2	4.6.2 & 4.6.3
Stroke length	3.10.3	4.6.4
Rivet installation	3.10.4	4.6.5

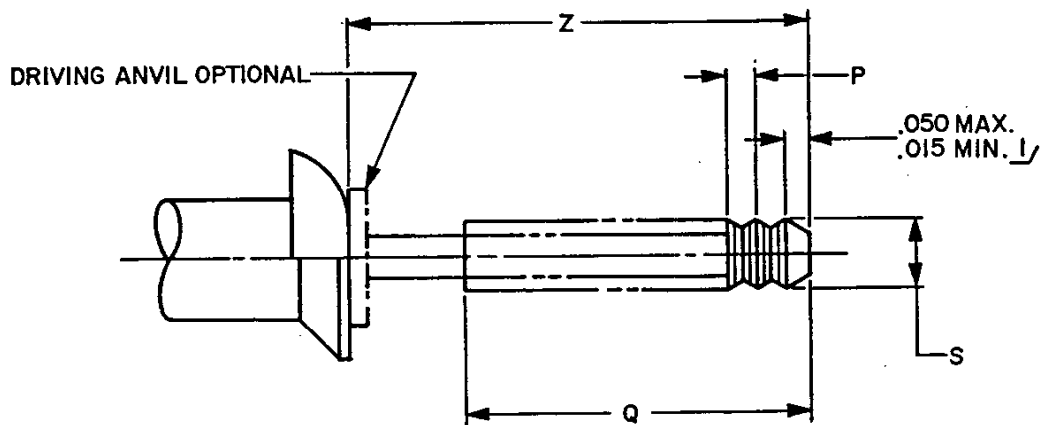
TABLE III. Quality conformance inspection.

Inspection	Sample size	AQL	Requirement paragraph	Test method paragraph
Identification marking	I	1.0	3.7	4.5.1
Sustained load	S-2	.15	3.10.2	4.6.2 & 4.6.3
Rivet installation	S-4	.65	3.10.4	4.6.5

TABLE IV. Rivets for installation test.

Part Number	Minimum Quantity to Install			
	Type I Riveter		Type II Riveter	
	First Article	Quality Conformance	First Article	Quality Conformance
M7885/4-4-03	3	1	3	1
M7885/4-5-03	3	1	3	1
M7885/4-6-03	0	0	3	1
M7885/5-4-03	3	1	3	1
M7885/5-5-03	3	1	3	1
M7885/5-6-03	0	0	3	1
M7885/14-4-03	3	1	3	1
M7885/14-5-03	3	1	3	1
M7885/14-6-03	0	0	3	1

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1/ Shape of lead is optional within .050 - .015 limit.

FIGURE 1. Rivet spindle.

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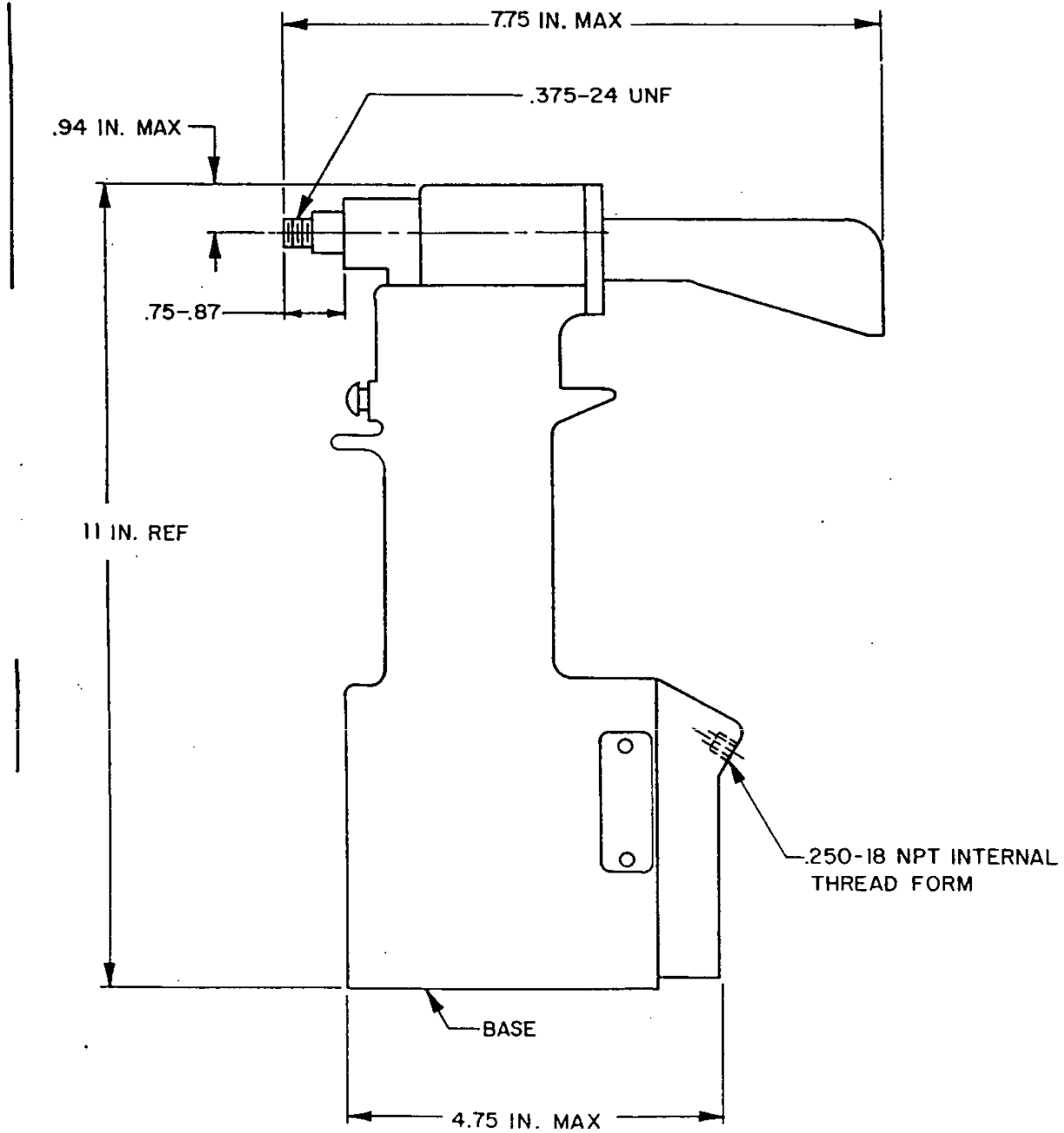


FIGURE 2. Riveter, Type 1.

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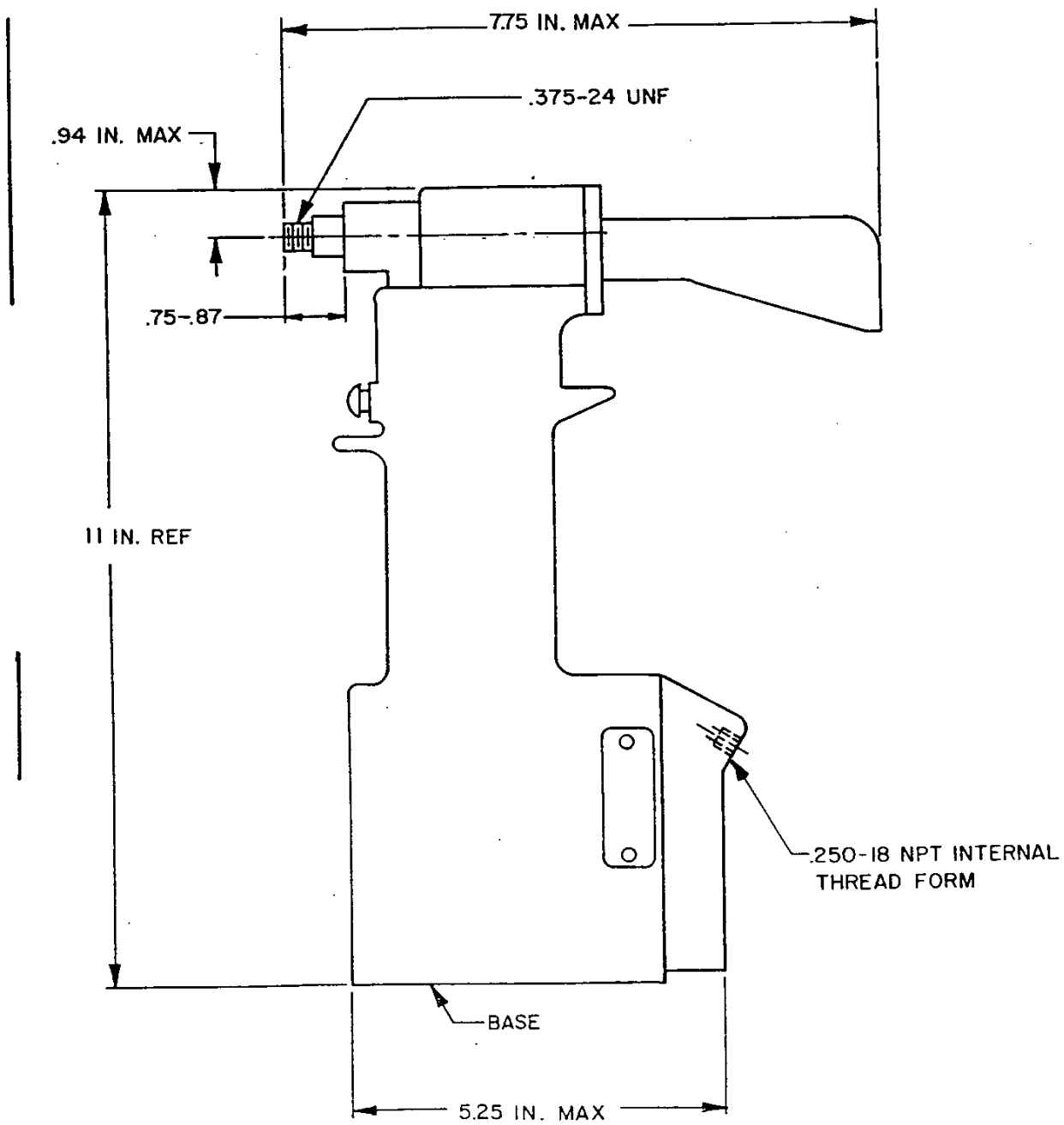
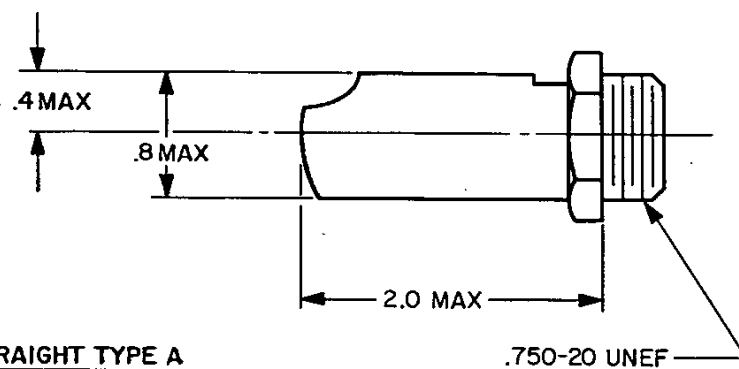
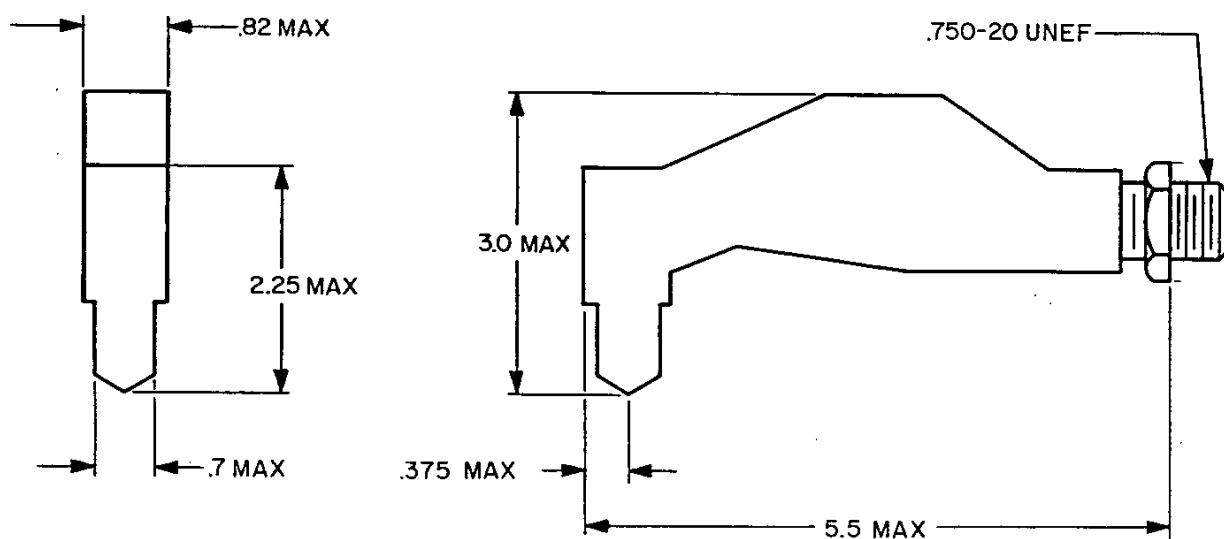


FIGURE 3. Riveter, Type 2.

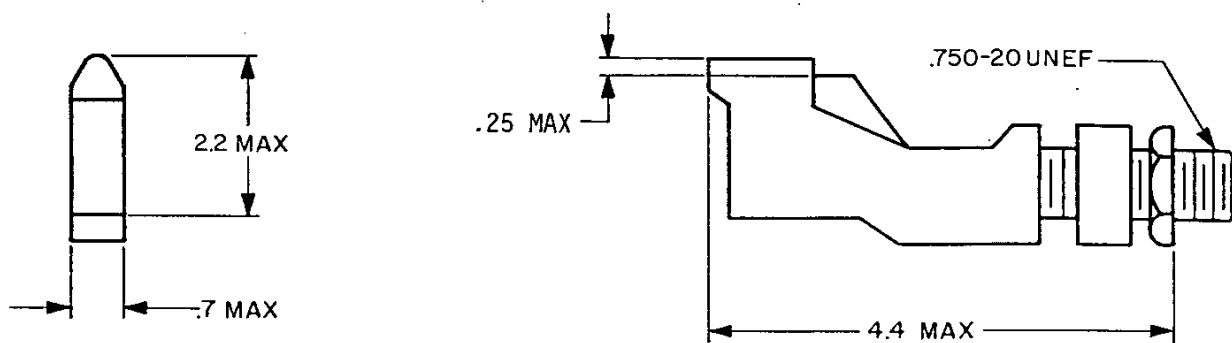
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STYLE 1 - STRAIGHT TYPE A



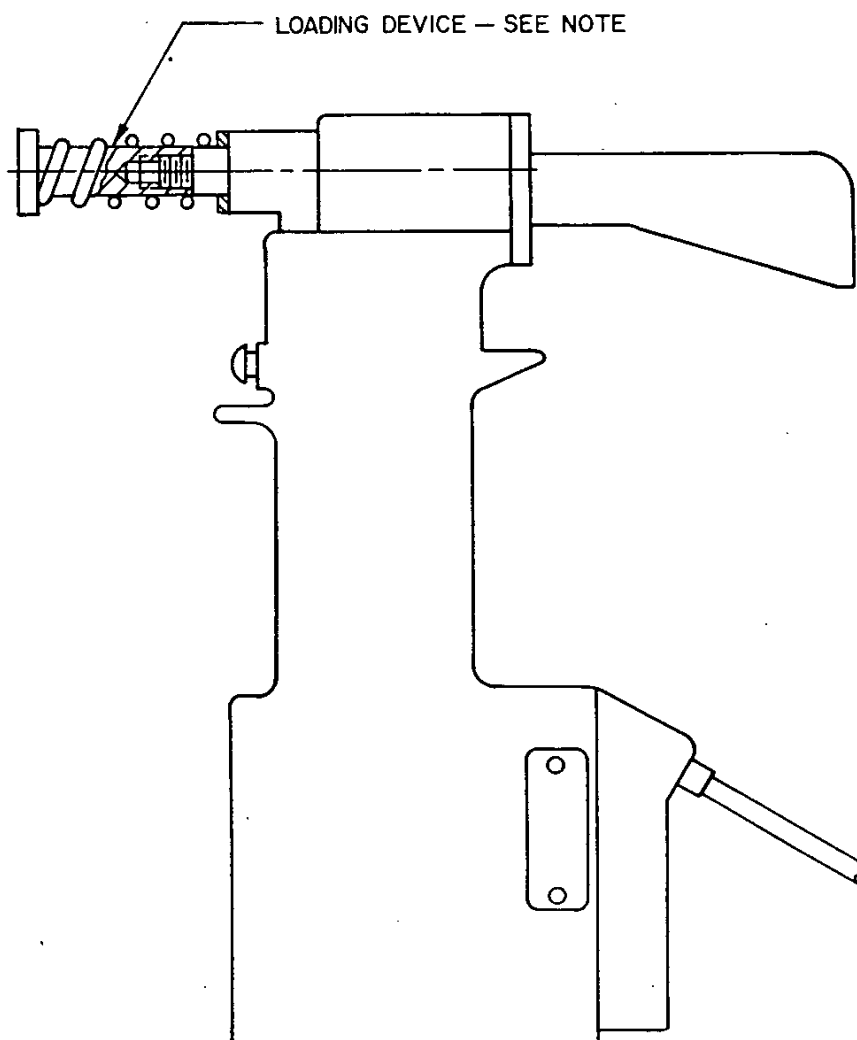
STYLE 2 - RIGHT ANGLE



STYLE 3 - OFFSET

FIGURE 4. Pulling head.

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NOTE: Remove pulling head and install mechanical or hydraulic device to simulate rivet load 1600 pounds for Type 1 or 3000 pounds for Type 2 at full stroke.

FIGURE 5. Riveter with loading device.

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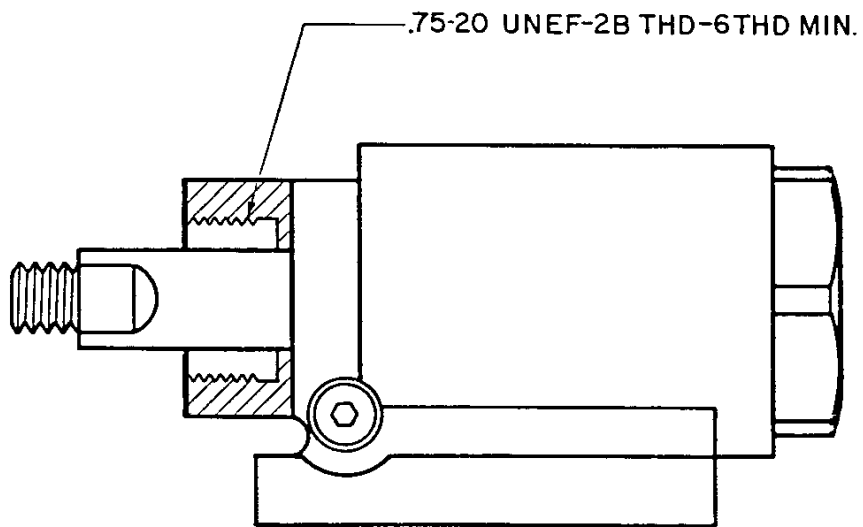


FIGURE 6a. Head assembly without threaded insert,
side view cutaway.

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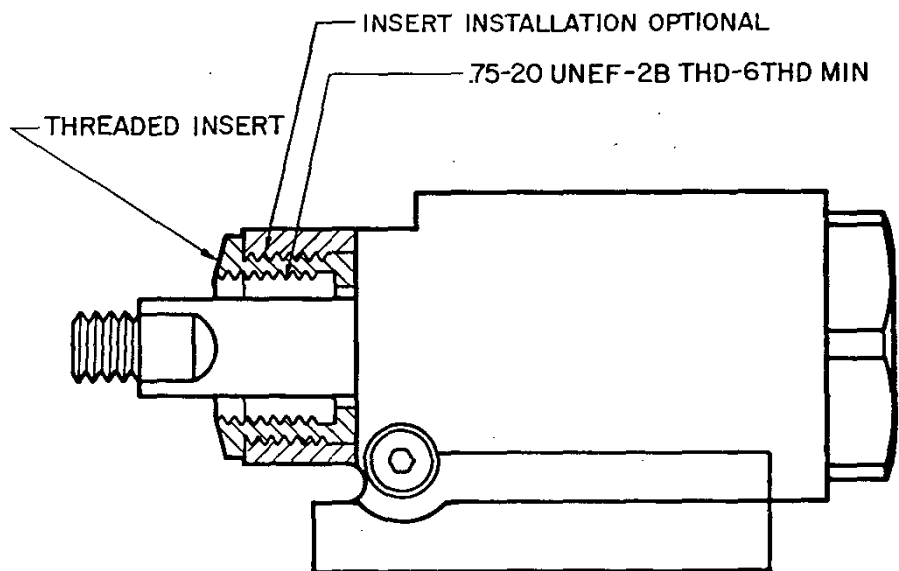


FIGURE 6b. Head assembly with threaded insert, side view cutaway.

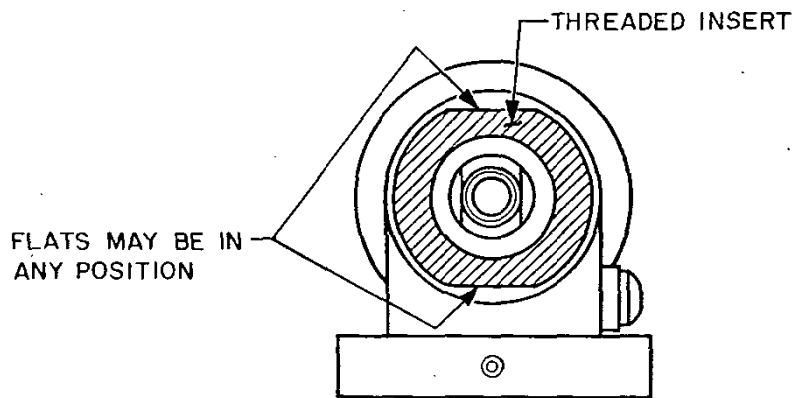


FIGURE 6c. Head assembly with threaded insert, front view.

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-R-85188A		2. DOCUMENT TITLE Riveter, Power, Pneumatic-Hydraulic Blind Rivet Installation	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION <i>(Mark one)</i> <input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER <i>(Specify):</i> _____	
b. ADDRESS <i>(Street, City, State, ZIP Code)</i>			
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER <i>(Last, First, MI) - Optional</i>		b. WORK TELEPHONE NUMBER <i>(Include Area Code) - Optional</i>	
c. MAILING ADDRESS <i>(Street, City, State, ZIP Code) - Optional</i>		8. DATE OF SUBMISSION (YYMMDD)	