



The American Society of
Mechanical Engineers

A N A M E R I C A N N A T I O N A L S T A N D A R D

PLIERS: MULTIPLE POSITION, ELECTRICAL CONNECTOR

ASME B107.27-2003
(Revision of ASME B107.27-1998)

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CONTENTS

| | |
|--------------------------------------------------------------|----------|
| Foreword | iv |
| Committee Roster | v |
| Correspondence With the B107 Committee | vi |
| 1 Scope | 1 |
| 2 Classifications | 1 |
| 3 References | 1 |
| 4 Definitions | 1 |
| 5 Requirements | 1 |
| 6 Tests | 3 |
| 7 Safety Requirements and Limitations of Use | 3 |
| Figures | |
| 1 Pliers, Multiple Position, Minimum Capacity Position | 2 |
| 2 Pliers, Multiple Position, Maximum Capacity Position | 2 |
| 3 Jaw Sleeve Insert Test | 3 |

FOREWORD

The American National Standards Committee B107, Socket Wrenches and Drives, under sponsorship of The American Society of Mechanical Engineers, was reorganized as an ASME Standards Committee and its title was changed to Hand Tools and Accessories. In 1996 its scope was expanded to address safety considerations.

Members of the Hand Tools Institute Pliers Standards Committee have been major contributors to the development of this Standard in their committee work, their knowledge of the products, and their active efforts in the promotion of the adoption of the Standard.

The purposes of this Standard are to define general and dimensional data and safety considerations specifically applicable to multiple position electrical connector pliers and to specify test methods to evaluate performance relating to the defined requirements.

This Standard is a revision of ASME B107.27-1996 Pliers, Multiple Position (Electrical Connector). Principal changes in this edition of the Standard are consolidation of Types and Classes, reference to performance test methods in B017.25M-1996, and updated references.

The format of this Standard is in accordance with *The ASME Codes & Standards Writing Guide 2000*. Requests for interpretations of the technical requirements of this Standard should be expressed in writing to the Secretary, B107 Committee, at the address below.

Suggestions for the improvement of this Standard are welcome. They should be addressed to the Secretary, B107 Main Committee, Three Park Avenue, New York, NY 10016-5990.

The requirements of this Standard become effective at the time of publication.

This revision was approved as an American National Standard on May 1, 2003.

ASME STANDARDS COMMITTEE B107

Hand Tools and Accessories

(The following is the roster of the Committee at the time of approval of this Standard.)

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General. ASME standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B107 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Interpretations. Upon request, the B107 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B107 Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

| | |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subject: | Cite the applicable paragraph number(s) and the topic of the inquiry. |
| Edition: | Cite the applicable edition of the Standard for which the interpretation is being requested. |
| Question: | Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings, which are necessary to explain the question; however, they should not contain proprietary names or information. |

Requests that are not in this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

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Attending Committee Meetings. The B107 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B107 Standards Committee.

PLIERS: MULTIPLE POSITION, ELECTRICAL CONNECTOR

1 SCOPE

This Standard provides performance and safety requirements for pliers (also known as Cannon Plug Pliers) that are used primarily for connecting or disconnecting threaded lock collars of electrical connectors. Inclusion of dimensional data in this Standard does not mean that all products described herein are stock production sizes. Consumers should consult with manufacturers concerning lists of stock production sizes.

This Standard may be used as a guide by state authorities or other regulatory bodies in the formulation of laws or regulations. It is also intended for voluntary use by establishments that use or manufacture the tools covered.

2 CLASSIFICATIONS

Pliers, Multiple Position, Electrical Connector

3 REFERENCES

The following is a list of publications referenced in this Standard.

ASME B107.25M-1996 Pliers — Performance Test Methods

Publisher: The American Society of Mechanical Engineers (ASME International), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300

ASTM D 2240-97, Test Method for Rubber Property — Durometer Hardness

Publisher: The American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959

Guide to Hand Tools — Selection, Safety Tips, Proper Use and Care

Publisher: The Hand Tools Institute (HTI), 25 North Broadway, Tarrytown, NY 10591

4 DEFINITIONS

Definitions of terms used within this Standard may be found in ASME B107.25M.

5 REQUIREMENTS

The illustrations shown herein are descriptive and nonrestrictive, and are not intended to preclude the manufacture of pliers that otherwise comply with this Standard.

5.1 Design

Pliers shall be suitable for loosening and tightening threaded lock collars of electrical connectors and shall be properly proportioned in all parts so as to be strong, durable, and easy to operate. Jaw sleeves or inserts shall be used to prevent marring of the gripping surface of collars. Jaw capacity shall be adjustable through a range of 0.75 in. to 2.5 in.

Pliers shall meet the dimensional requirements as shown in Figs. 1 and 2, and shall be capable of passing all tests in para. 6.

5.2 Material

The materials used in the manufacture of the pliers shall be such as to produce pliers conforming to this Standard.

5.3 Finish

Surfaces shall have a rust preventive treatment and be essentially free from pits, nodules, burrs, cracks, and other conditions that would adversely affect the performance or safety of the tool. When provided, coatings shall be adherent, smooth, continuous, and free from any conditions that would interfere with their protective value, safety, and function.

5.4 Marking

Pliers shall be marked in a plain and permanent manner with the manufacturer's name or with a trademark of such known character that the source of manufacture and country of origin shall be readily determined. Marking shall be as permanent as the normal life expectancy of the pliers to which it is applied (providing the marked surface has not been subjected to a fretting or abrading action) and be capable of withstanding the cleaning procedures normally experienced during its intended use.

5.5 Handles

Handles shall be shaped to provide a comfortable handgrip, and shall be free from rough edges and sharp corners. Handles shall have a hardness of 38 to 48 HRC. When comfort grips are furnished, they shall be made

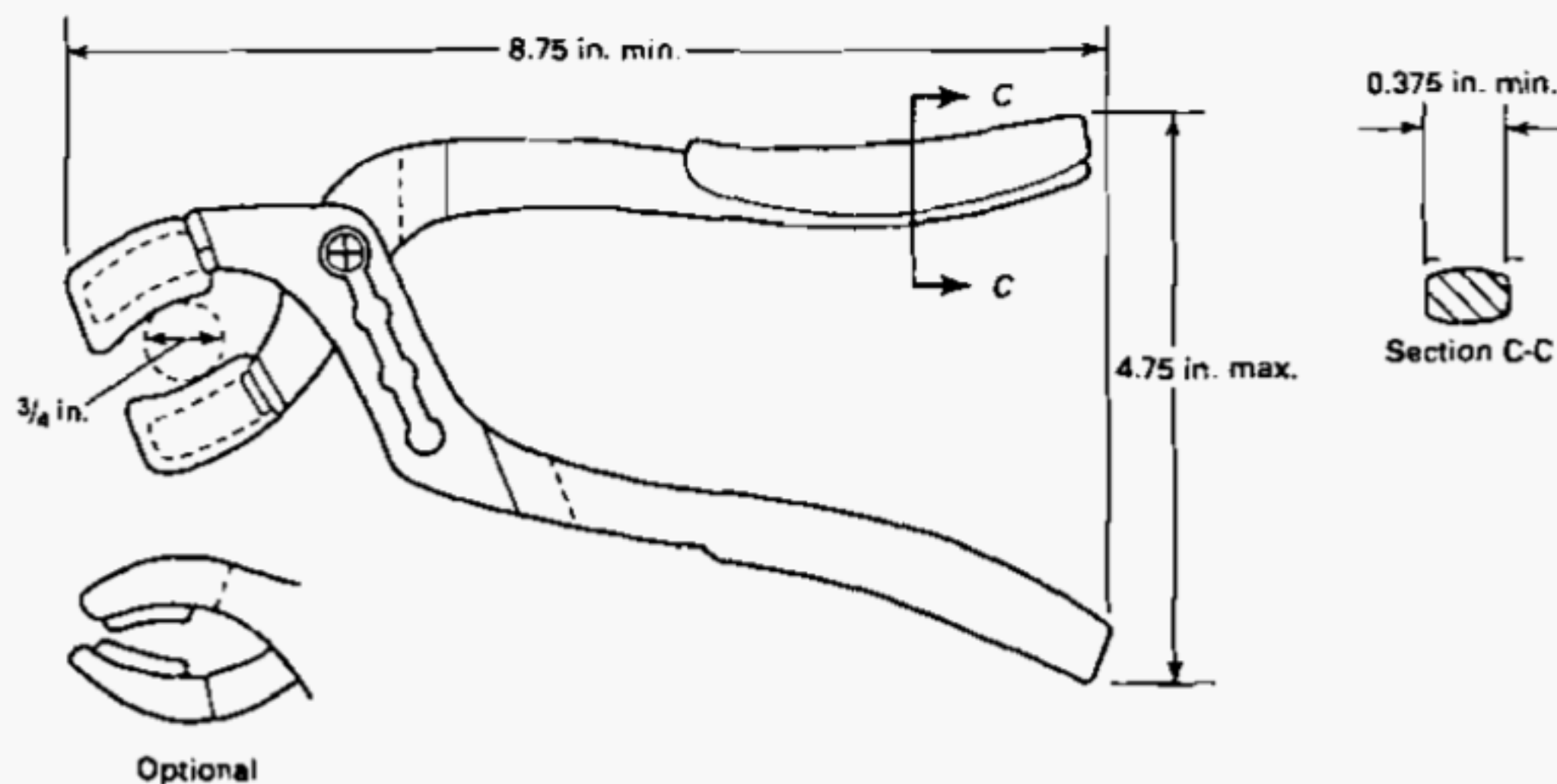


Fig. 1 Pliers, Multiple Position, Minimum Capacity Position

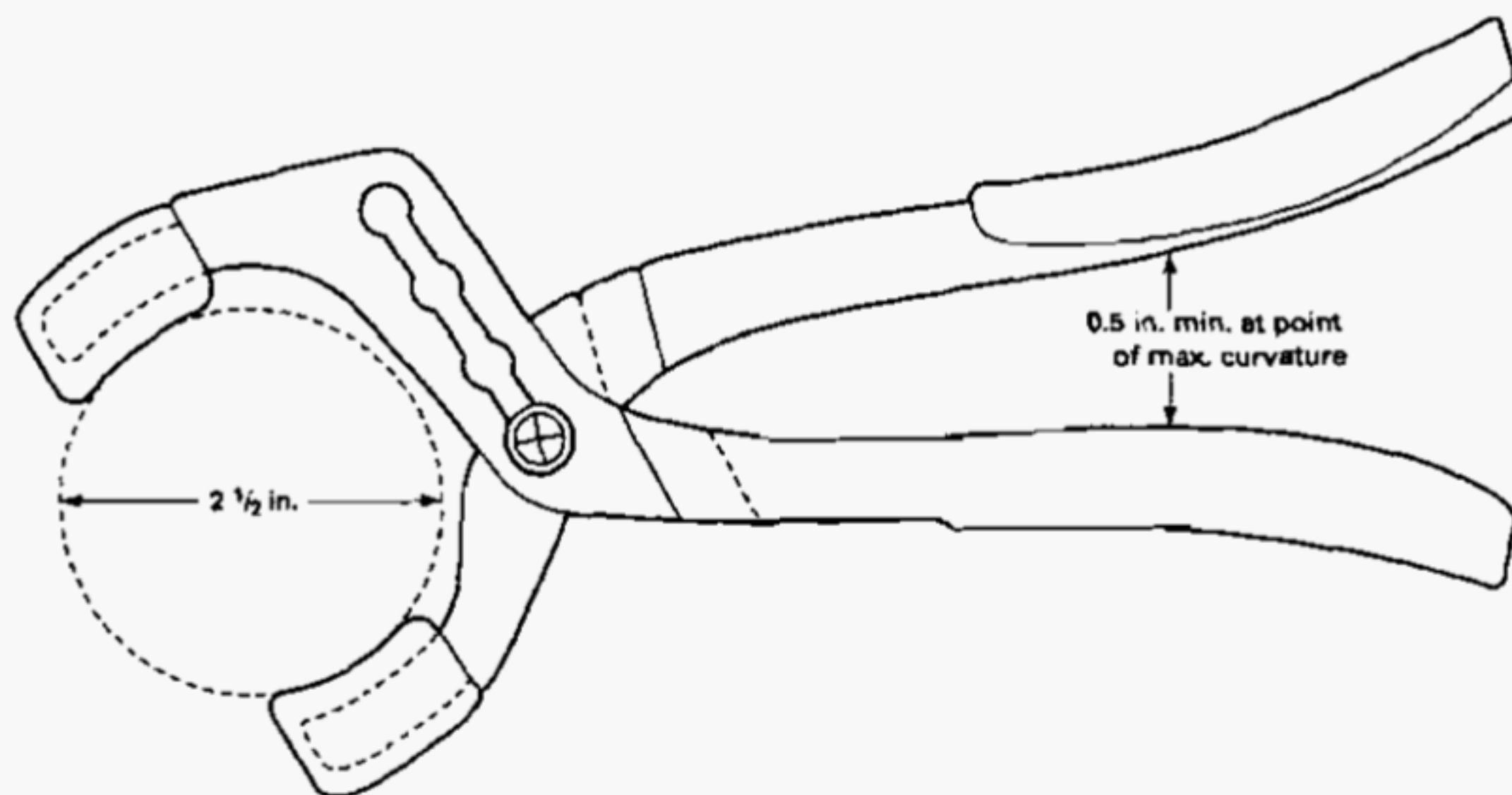


Fig. 2 Pliers, Multiple Position, Maximum Capacity Position

from a material capable of withstanding hard usage without deterioration, and shall pass the solvent test specified in para. 6.3. Comfort grips shall remain permanently attached under normal use of the tool.

WARNING: COMFORT GRIPS ARE NOT INTENDED TO GIVE ANY DEGREE OF PROTECTION AGAINST ELECTRIC SHOCK AND SHALL NOT BE USED ON OR NEAR LIVE ELECTRIC CIRCUITS.

5.6 Jaw Sleeve/insert

The jaw sleeve/insert shall be made from a polymer of vinyl, nylon, or other durable composition with a

durometer hardness of 73 to 95 on the Shore "A" scale per ASTM D 2240, and shall pass the tests per paras. 6.3 and 6.5.

5.7 Joint

Pliers shall be joined in a permanent manner through the use of a fastener. The joining method shall assure uniform smooth movement through respective number of adjustment positions. The fastener shall have a hardness of 25 to 38 HRC, except when case hardened when a maximum hardness equivalent to 60 HRC shall be permitted.

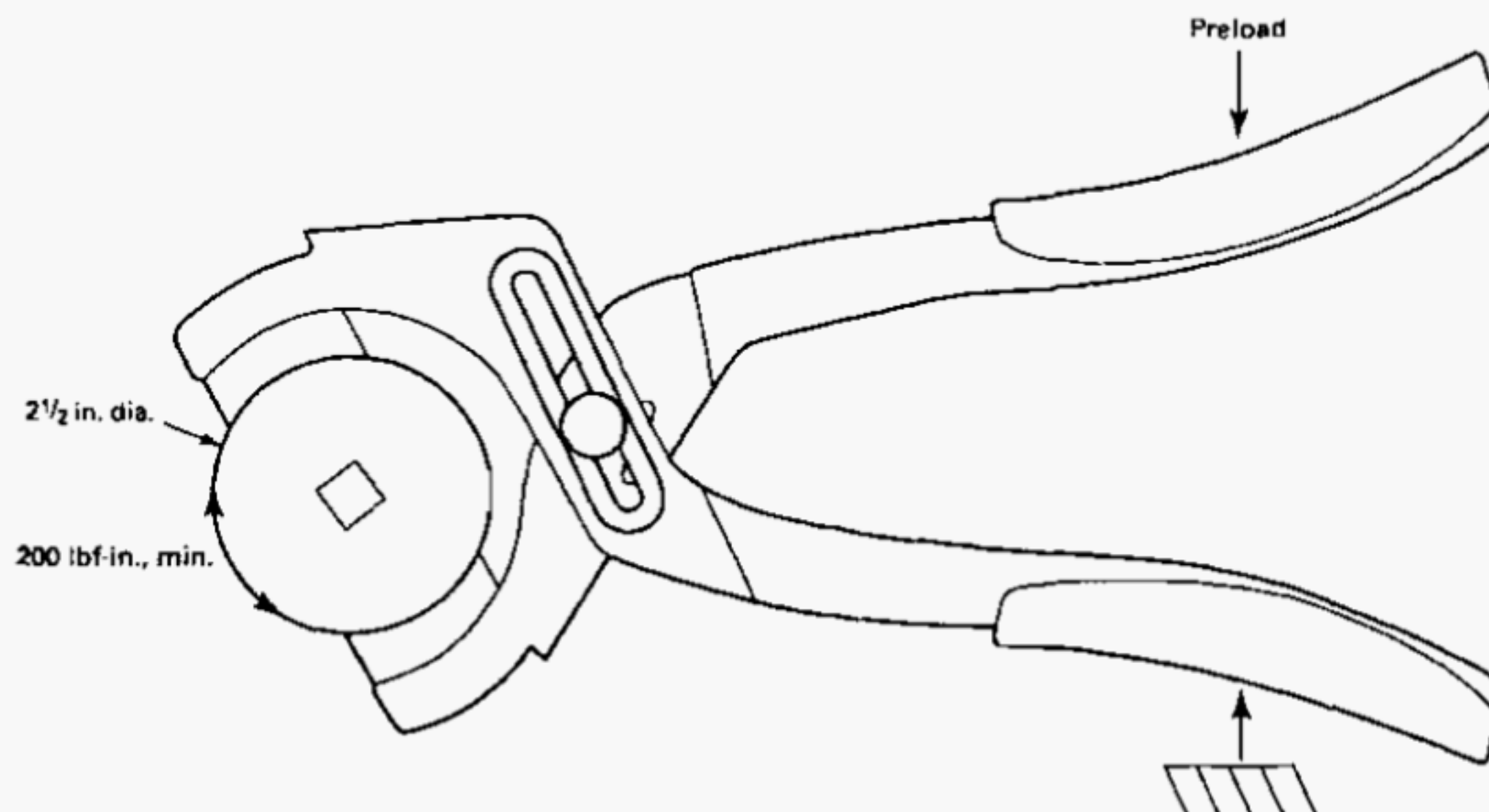


Fig. 3 Jaw Sleeve Insert Test

5.8 Jaws

Jaws shall open to the required gripping range of 0.75 in. diameter through 2.5 in. diameter, through which distance the tool shall operate in a smooth and uniform manner. Jaws shall have a hardness of 38 to 48 HRC.

6 TESTS

SAFETY WARNING: MANY OF THE TESTS REQUIRED HEREIN ARE INHERENTLY HAZARDOUS AND ADEQUATE SAFEGUARDS FOR PERSONNEL AND PROPERTY SHALL BE EMPLOYED IN CONDUCTING THESE TESTS.

6.1 Equipment

Equipment required for performing handle load requirement shall be of sufficient size as to test pliers through a gripping range of 0.75 in. through 2.5 in. diameter.

6.2 Handle Load Test

Pliers shall be tested per para. 5.1 of B107.25M. A cylindrical mandrel from 0.75 in. to 2.5 in. diameter shall be used. After application of the initial load, the load to create a moment of 500 in.-lb shall be applied to the handle grip area for 10 sec. Permanent set of the handles shall not exceed 0.062 in.

6.3 Solvent Resistant Test

Non-metallic components shall be tested per para. 5.5.1 of B107.25M.

6.4 Hardness Test

Rockwell hardness specified herein shall be tested per para. 5.3 of B107.25M.

6.5 Jaw Sleeve/Insert Test

Preload handles to prevent the 2 1/2 in. diameter mandrel from slipping on the sleeve/insert during the following test. Apply a torque of 200 lbf-in., minimum, to the mandrel (see Fig. 3). Maintain torque for 5 sec. Pliers shall not show any evidence of sleeve/insert slippage from its assembled position on the pliers.

7 SAFETY REQUIREMENTS AND LIMITATIONS OF USE

Instructors and employers shall stress proper use and safety in the use of pliers, information about which can be found in the HTI publication, *Guide to Hand Tools — Selection Safety Tips, Proper Use and Care*.

AMERICAN NATIONAL STANDARDS FOR HAND TOOLS

| | |
|---------------------------------------------------------------------------------------------------------------|---------------------|
| Socket Wrenches, Hand (Inch Series) | B107.1-2002 |
| Socket Wrenches, Extensions, Adaptors, and Universal Joints, Power Drive (Impact) (Inch Series) | B107.2-2002 |
| Driving and Spindle Ends for Portable Hand, Impact, Air, and Electric Tools (Percussion Tools Excluded) | B107.4M-1995 |
| Socket Wrenches, Hand (Metric Series) | B107.5M-2002 |
| Adjustable Wrenches | B107.8-2003 |
| Handles and Attachments for Hand Socket Wrenches — Inch and Metric Series | B107.10M-1996 |
| Pliers: Diagonal Cutting and End Cutting | B107.11-2002 |
| Nut Drivers (Spin Type, Screwdriver Grip) (Inch Series) | B107.12-1997 |
| Pliers: Long Nose, Long Reach | B107.13-2003 |
| Hand Torque Tools | B107.14M-1994 |
| Flat Tip Screwdrivers | B107.15-2002 |
| Shears (Metal Cutting, Hand) | B107.16M-1998 |
| Gages, Wrench Openings, Reference | B107.17M-1997 |
| Pliers: Wire Twister | B107.18-2003 |
| Pliers, Retaining Ring | B107.19-1993(R1998) |
| Pliers (Lineman's, Iron Worker's, Gas, Glass, Fence, and Battery) | B107.20M-1998 |
| Wrench, Crowfoot Attachments | B107.21-1998 |
| Electronic Cutters | B107.22M-1998 |
| Pliers, Multiple Position, Adjustable | B107.23M-1997 |
| Locking Pliers | B107.24-2002 |
| Pliers: Performance Test Methods | B107.25-2002 |
| Pliers: Multiple Position, Electrical Connector | B107.27-2003 |
| Electronic Torque Instruments | B107.28M-1997 |
| Electronic Tester, Hand Torque Tools | B107.29M-1998 |
| Cross Tip Screwdrivers | B107.30-2002 |
| Screwdrivers, Cross Tip Gaging | B107.31M-1997 |
| Socket Wrenches, Impact (Metric Series) | B107.33M-2002 |
| Socket Wrenches for Spark Plugs | B107.34-2003 |
| Nut Drivers (Spin Type, Screwdriver Grip) (Metric Series) | B107.35M-1997 |
| Pliers: Locking, Clamp, and Tubing Pinch-Off | B107.36-2002 |
| Pliers: Wire Cutters/Strippers | B107.37-2003 |
| Electronic Pliers | B107.38M-1998 |
| Nail Hammers — Safety Requirements | B107.41M-1997 |
| Hatchets: Safety Requirements | B107.42M-1997 |
| Wood-Splitting Wedges | B107.43-2002 |
| Glaziers' Chisels and Wood Chisels | B107.44-2002 |
| Ripping Chisels and Flooring/Electricians' Chisels | B107.45-2002 |
| Stud, Screw, and Pipe Extractors: Safety Requirements | B107.46M-1998 |
| Metal Chisels: Safety Requirements | B107.47M-1998 |
| Metal Punches and Drift Pins: Safety Requirements | B107.48M-1998 |
| Nail Sets: Safety Requirements | B107.49M-1998 |
| Brick Chisels and Brick Sets: Safety Requirements | B107.50M-1998 |
| Star Drills: Safety Requirements | B107.51-2001 |
| Nail-Puller Bars: Safety Requirements | B107.52M-1998 |
| Ball Peen Hammers: Safety Requirements | B107.53M-1998 |
| Heavy Striking Tools: Safety Requirements | B107.54-2001 |
| Axes: Safety Requirements | B107.55M-2002 |
| Body Repair Hammers and Dolly Blocks: Safety Requirements | B107.56-1999 |
| Bricklayers' Hammers and Prospecting Picks: Safety Requirements | B107.57-2001 |
| Riveting, Scaling, and Tinner's Setting Hammers: Safety Requirements | B107.58M-1998 |
| Slugging and Striking Wrenches | B107.59-2002 |
| Wrenches | B107.100-2002 |

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