ASME B107.38M-1998

REAFFIRMED 2004

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ELECTRONIC PLIERS

AN AMERICAN NATIONAL STANDARD

The American Society of
Mechanical Engineers

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ELECTRONIC PLIERS

ASME B107.38M-1998

Date of Issuance: September 27, 1998

This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda or written interpretations of the requirements of this Standard issued to this edition.

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

FOREWORD

(This Foreword is not part of ASME B107.38M-1998.)

The American National Standards Committee B107, Socket Wrenches and Drives, under sponsorship of the American Society of Mechanical Engineers, held its organizational meeting on June 28, 1967. Subsequently, the Committee was recognized as an ASME Standards Committee and was changed to Hand Tools and Accessories.

Members of the Hand Tools Institute Plier 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.

This Standard on Electronic Pliers is the first standard covering the dimensional and functional characteristics of this type of pliers used in the electronic industry.

Suggestions for improvement of this Standard are welcome. They should be sent to: The American Society of Mechanical Engineers, Attn: Secretary, ASME B107 Main Committee, Three Park Avenue, New York, NY 10016-5990.

Following approval by the Standards Committee B107 and ASME, this Standard was approved by the American National Standards Institute on July 16, 1998.

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
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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 may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

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.

CONTENTS

ELECTRONIC PLIERS

1 SCOPE

This Standard covers the dimensional and functional characteristics of electronic pliers suitable for gripping, holding, and/or manipulating small objects. Some pliers may also have cutting edges suitable for cutting small diameter wire.

Inclusion of dimensional and functional data in this Standard is not intended to imply that all of the products described herein are stock production sizes. Consumers should consult with manufacturers concerning a list of stock production sizes.

2 CLASSIFICATION

Type I Flat Nose

Type II Chain Nose

Class 1 Long Nose Without Side Cutter
Class 2 Long Nose With Side Cutter
Class 3 Curved Nose
Class 4 Short Nose
Class 5 Subminiature

Type III Long Nose With Tip Cutter

Type IV Needle Nose

Type V Round Nose

NOTE: The above types and classes shall be available with one of the following jaw styles as specified in Section 6: Style A Smooth Jaw; Style B Serrated Jaw.

3 NORMATIVE REFERENCES

The following documents form a part of this Standard to the extent specified herein:

ASME B46.1-1995, Surface Texture (Surface Roughness, Waviness and Lay)

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

Publisher: The American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990

4 DEFINITIONS

4.1 Illustrations

The illustrations shown herein are descriptive and not restrictive, and are not intended to preclude the manufacture of pliers which are otherwise in accordance with this Standard. All figures are shown without comfort grips or spring.

4.2 Materials

The materials used in the manufacture of electronic pliers shall be such as to produce pliers conforming to the mechanical requirements hereafter specified.

4.3 Design

Pliers shall be similar to the figure to which reference is made and shall be properly proportioned in all parts so as to be strong, durable, and easy to operate.

4.4 Cutting Requirements

Pliers with cutting edges shall be so designed to cut wire as specified in para. 5.3.

4.5 Handles

4.5.1 Characteristics. Handles shall have a hardness of 30 to 60 HRC. Handles shall be shaped to provide a comfortable grip and shall be free from rough edges and sharp corners.

4.5.2 Comfort Grips. Comfort grips shall be made of rubber, plastic, or other material capable of withstanding long, hard usage, without deteriorating or rubbing off, and meeting the solvent resistance test as specified in para. 5.5. The comfort grips shall remain permanently attached under normal use of the tool. The ends of the handles shall not touch when the jaws are in the closed position.

WARNING: The comfort grips are not intended to give any degree of protection against electrical shock and shall not be used on live electrical circuits.

4.6 Joint

4.6.1 Construction. There shall be no excessive sideways movement, play, or other indication of looseness of the two halves of the pliers when opened or closed that will affect the function of the pliers. The fastener shall have a hardness of 30 to 50 HRC.

4.7 Jaws

4.7.1 Spring. All pliers shall have a spring. The spring shall be captive, durable, and capable of opening the pliers' jaws under normal use. The spring shall open the jaws to the minimum jaw opening, as indicated in the appropriate tables, for the normal life of the pliers.

4.7.2 Jaw Opening. Jaw opening shall be measured at the tips of the jaws. Beyond the minimum opening in the applicable tables, the jaws may open at increasing loads until the position stop is engaged.

4.7.3 Jaw Hardness. Cutting edges (within 0.063 in. [1.6 mm] of the cutting edge shoulder) shall have a hardness equivalent to 55 to 65 HRC and meet the cutting tests requirements specified in para. 5.3. The balance of the jaw shall have a minimum hardness of 35 HRC.

4.7.4 Smooth Jaws. Pliers with smooth jaws (Style A) shall have a minimum gripping surface length of 0.25 in. (6.4 mm) from the outermost end of the jaw and shall be chamfered or radiused to prevent marring or nicking of the material being held.

4.7.5 Serrated Jaws. Pliers with serrated jaws (Style B), except Type III, Long Nose With Tip Cutter, shall have 0.25 in. to 0.50 in. (6.4 mm to 12.7 mm) of the gripping surface serrated back from the outermost end of the jaw. Type III pliers shall have serrations within 0.032 in. (0.81 mm) of the cutting edge from the outermost edge.

4.8 Finish

4.8.1 Appearance. Pliers shall have finished heads. Finished surfaces shall have a maximum surface roughness of 63 microinches (1.6 micrometers) arithmetic average. Measurement of the finish shall be made with a measuring instrument using a 0.03 in. (0.8 mm) roughness width cutoff (see ASME B46.1). All other unfinished surfaces shall be free of pits, burrs, cracks, and other defects which may adversely affect the performance or appearance of the pliers.

4.8.2 Coating. All surfaces must be coated or treated to inhibit rust.

4.9 Marking

4.9.1 Requirements. 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 may be readily determined. The marking shall be as permanent as the normal life expectancy of the pliers to which it is applied (providing the surface has not been subjected to a fretting or abrading action) and be capable of withstanding cleaning normally experienced during its intended use.

4.10 Workmanship

4.10.1 Requirements. The requirements within this Standard are intended to describe the best commercial quality pliers available. The pliers shall conform to the requirements specified in this Standard.

5 TESTING PROCEDURES

5.1 Safety

Many tests required herein are inherently dangerous. Adequate safeguards for personnel and property shall be used when conducting such tests.

5.2 Handle Load Test

5.2.1 Procedure. Permanent set and deflection shall be tested in accordance with ASME B107.25M, para. 5.1. The load shall be applied at the point of maximum handle curvature. The pliers shall be tested with the comfort grips removed and a hardened jaw insert placed between the jaw tips.

5.2.1.1 Hardened Jaw Insert. Insert shall be approximately 0.06 in. (1.5 mm) thick and shall not extend in the jaw more than 0.13 in. (3.3 mm) from the outermost end of the jaw. The insert shall be hardened to not less than 40 HRC.

5.2.2 Permanent Set and Deflection. Permanent set on all pliers shall not exceed 0.04 in. (1.0 mm) when subjected to a major load of 100 in.-lb. (11 N·m). Deflection on all pliers less than 5 in. (127 mm) in nominal length shall not exceed 0.50 in. (12.7 mm). Deflection on all pliers 5 in. (12.7 mm) in nominal length or longer shall not exceed 0.75 in. (19.1 mm). If permanent set or deflection exceeds the maximum

value specified; if the handles or jaws break, crack, chip, or spread under load; or if the fastener shows signs of weakness, the pliers shall be considered unacceptable.

5.3 Cut Tests

5.3.1 Wire Cut Test. The wire cut test shall be performed per ASME B107.25M, para. 5.2.1, on all pliers with cutters except Type III Long Nose with Tip Cutter. Wire for the test shall be 0.032/0.036 in. (0.81/0.91 mm) in diameter and shall have a tensile strength of 120,000 psi (828 MPa) ± 10 percent. The handle load required to completely sever the wire shall not exceed 100 in.-lb. (11 N·m). The load shall be applied at a line of contact so that both handles directly oppose one another at the point of maximum handle curvature. Three cuts shall be made at the midpoint of the cutting edges. There shall be no visible deformation or damage to the cutting edge as a result of this test.

5.3.2 Wire Cut Test—Type III Long Nose With Tip Cutter. The wire cut test shall be performed per ASME B107.25M, para. 5.2.1. Wire type shall be single strand copper, 0.032/0.036 in. diameter (0.81/0.91 mm) and shall have a tensile strength of 33,381 psi. (230 MPa) ± 10 percent. The handle load required to completely sever the wire shall not exceed 100 in.-lb. (11 N·m). The load shall be applied at a line of contact so that both handles directly oppose one another at the point of maximum handle curvature. Three cuts shall be made at the midpoint of the cutting edges. There shall be no visible deformation or damage to the cutting edge as a result of this test.

5.3.3 Paper Cut Test. Following the wire cut test, the paper cut test shall be performed per ASME B107.25M, para. 5.2.2. Load shall be applied at a line of contact so that both handles directly oppose one another at the point of maximum handle curvature. The cutting edges shall completely and cleanly cut bond paper without exceeding the maximum load specified in ASME B107.25M, para. 5.2.2.3.

5.4 Hardness Tests

5.4.1 Procedure. The hardness ranges specified in paras. 4.5.1, 4.6.1, and 4.7.3 shall be tested in accordance with ASME B107.25M, para. 5.3. Hardness determination for handles shall be taken approximately midway between the joint fastener and the end of each handle.

5.5 Solvent Resistance Test

5.5.1 Procedure. Comfort grips shall be tested in accordance with ASME B107.25M, para. 5.5.1.

6 TYPE, CLASS, AND STYLE PROVISIONS

6.1 Type I, Style A and B, Flat Nose

Pliers shall be suitable for gripping and holding flat or square objects securely and for making angular bends and similar forming operations. Can be used for manipulating and pulling small objects and reaching into small openings. The jaws shall taper in thickness from near the joint to the outermost end. Jaws shall contact each other at the outermost end when the pliers are in a closed position. Pliers shall be similar to Fig. 1 and conform to dimensions shown in Table 1.

6.2 Type II, Class 1, Style A and B, Chain Nose, Long Nose Without Side Cutter

Pliers shall be suitable for making bends, loops, and similar forming operations on wire and sheet metal and for gripping, manipulating, pulling objects, and reaching into small openings. The inside and outside surfaces of the jaws shall taper uniformly from the joint area to the tips. Tips shall contact each other at the outermost end when the pliers are in a closed position. Jaw tips shall be elliptical and shaped so that the gripping surfaces are planar and straight. Pliers shall be similar to Fig. 2 and conform to dimensions shown in Table 2.

6.3 Type II, Class 2, Style A and B, Chain Nose, Long Nose With Side Cutter

In addition to the requirements of Type II, Class 1, the jaws of the pliers shall be provided with cutting edges on the jaws, adjacent to the joint. There shall be a recess behind the cutters to provide clearance for the cutting edges. With the pliers in the closed position, the cutting edges shall contact each other throughout their entire length. Pliers shall be similar to Fig. 3 and conform to dimensions shown in Table 3.

6.4 Type II, Class 3, Style A and B, Chain Nose, Curved Nose

Plier jaws are curved for easier access in confined places. Pliers shall be suitable for gripping, manipulating, pulling objects, and reaching into small openings. The inside and outside surfaces of the jaws shall taper

uniformly from the joint area to the tips. Tips shall contact each other at the outermost end when the pliers are in a closed position. Jaw tips shall be elliptical in shape so that the gripping surfaces are planar and straight. Pliers shall be similar to Fig. 4 and conform to dimensions shown in Table 4.

6.5 Type II, Class 4, Style A and B, Chain Nose, Short Nose

Pliers shall be suitable for fine, close work in making bends, loops, and similar forming operations on wire and sheet metal and for gripping, manipulating, pulling objects, and reaching into small openings. The inside and outside surfaces of the jaws shall taper uniformly from the joint area to the tips. Tips shall contact each other at the outermost end when the pliers are in a closed position. Jaw tips shall be half-elliptical in shape so that the gripping surfaces are planar and straight. Pliers shall be similar to Fig. 5 and conform to dimensions in Table 5.

6.6 Type II, Class 5, Style A, Chain Nose, Subminiature

Pliers shall have a fine point and be suitable for delicate work in making bends, loops, and similar forming operations on small wire and for gripping, manipulating, and pulling objects in very confined places. The inside and outside surfaces of the jaws shall taper uniformly from the joint area to the tips. Tips shall contact each other at the outermost end when the pliers are in a closed position. Jaw tips shall be elliptical in shape so that the gripping surfaces are planar and straight. Pliers shall be similar to Fig. 6 and conform to dimensions in Table 6.

6.7 Type III, Style A and B, Long Nose With Tip Cutter

Pliers shall have a cutting edge and be suitable for making some bends or loops on wire and for gripping, manipulating, or pulling small objects and reaching into small openings. The inside and outside surfaces of the jaws shall taper uniformly from the joint area to the tips. Tips shall contact each other at the outermost end when the pliers are in a closed position. Jaw tips shall be elliptical in shape so that the gripping surfaces are planar and straight. Pliers shall be similar to Fig. 7 and conform to dimensions in Table 7.

6.8 Type IV, Style A and B, Needle Nose

Pliers shall be suitable for assembly work in hard to reach areas. Outside surfaces of the jaws shall have a reduced cross sectional area immediately after the joint and taper uniformly to the jaw tips. Inside surfaces of the jaws shall taper uniformly from the joint area to the tips. Jaw edges shall be radiused to prevent nicking and marring. Tips shall be elliptical in shape so that the gripping surfaces are planar and straight. Pliers shall be similar to Fig. 8 and conform to dimensions in Table 8.

6.9 Type V, Style A, Round Nose

Pliers shall be suitable for bending and shaping wire. The jaws are round in cross section so that the gripping surfaces are circular. The inside and outside surfaces of the jaws shall taper uniformly from the joint area to the tips. Tips shall contact each other at the outermost end when the pliers are in a closed position and have a maximum gap of 0.03 in. (0.25 mm) at the joint. Pliers shall be similar to Fig. 9 and shall conform to dimensions shown in Table 9.

7 DESIGNATIONS

7.1 Procedure

Purchasers should select the preferred options permitted herein, and include the following information in procurement documents:

(a) Title, number, and date of this Standard.
(b) Type, class, and style of pliers required.
(c) Nominal size of pliers required.

TABLE 1 DIMENSIONS FOR TYPE I, STYLE A AND B, FLAT NOSE

Nominal Size in. (mm)	Overall Length *A* [Note (1)] in. (mm) ±.187 (4.75)	Jaw Length *B* in. (mm) ±.094 (2.38)	Joint Thickness *C* in (mm) ±.032 (0.81)	Jaw Width *D* in. (mm) ±.032 (0.81)	Handle Span *E* [Note (1)] in. (mm) ±.125 (3.17)	Tip Thickness *F* in. (mm) ±.015 (0.38)	Tip Width *G* in. (mm) ±.015 (0.38)	Minimum Jaw Opening in. (mm)
4½ (114)	4.875 (123.82)	1.187 (30.14)	0.250 (6.35)	0.437 (11.09)	1.875 (47.63)	0.140 (3.56)	0.078 (1.98)	0.500 (12.70)
5½ (140)	5.625 (142.87)	1.500 (38.10)	0.281 (7.14)	0.500 (12.70)	1.875 (47.63)	0.140 (3.56)	0.078 (1.98)	0.500 (12.70)

NOTE:
(1) *A* and *E* dimensions in the table are without comfort grips. Comfort grips shall not increase dimension *A* by more than .25 inch (6.4 mm) and *E* by more than .50 inch (12.7 mm).

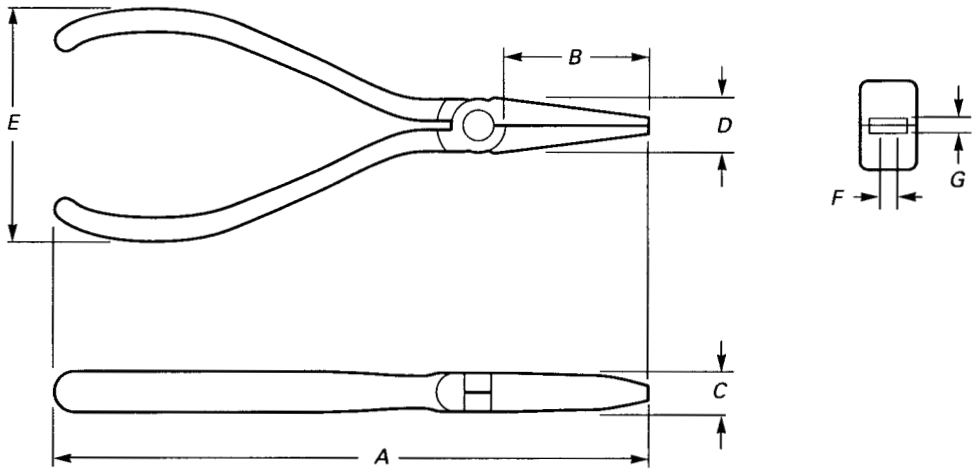

FIG. 1 TYPE 1, STYLE A AND B, FLAT NOSE

TABLE 2 DIMENSIONS FOR TYPE II, CLASS 1, STYLE A AND B, CHAIN NOSE, LONG NOSE WITHOUT SIDE CUTTER

Nominal Size	Overall Length *A* [Note (1)]	Jaw Length *B*	Joint Thickness *C*	Jaw Width *D*	Handle Span *E* [Note (1)]	Tip Thickness *F*	Tip Width *G*	Minimum Jaw Opening
in. (mm)	in. (mm) ±.187 (4.75)	in. (mm) ±.094 (2.38)	in (mm) +.032 (0.81) −.062 (1.57)	in. (mm) ±.032 (0.81)	in. (mm) ±.187 (4.75)	in. (mm) ±.015 (0.38)	in. (mm) ±.015 (0.38)	in. (mm)
4½ (114)	4.875 (123.82)	1.187 (30.14)	0.250 (6.35)	0.437 (11.09)	1.875 (47.63)	0.062 (1.57)	0.078 (1.98)	0.500 (12.70)
5½ (140)	5.625 (142.87)	1.687 (42.84)	0.281 (7.14)	0.500 (12.70)	1.875 (47.63)	0.062 (1.57)	0.078 (1.98)	0.500 (12.70)

NOTE:
(1) *A* and *E* dimensions in the table are without comfort grips. Comfort grips shall not increase dimension *A* by more than .25 inch (6.4 mm) and *E* by more than .50 inch (12.7 mm).

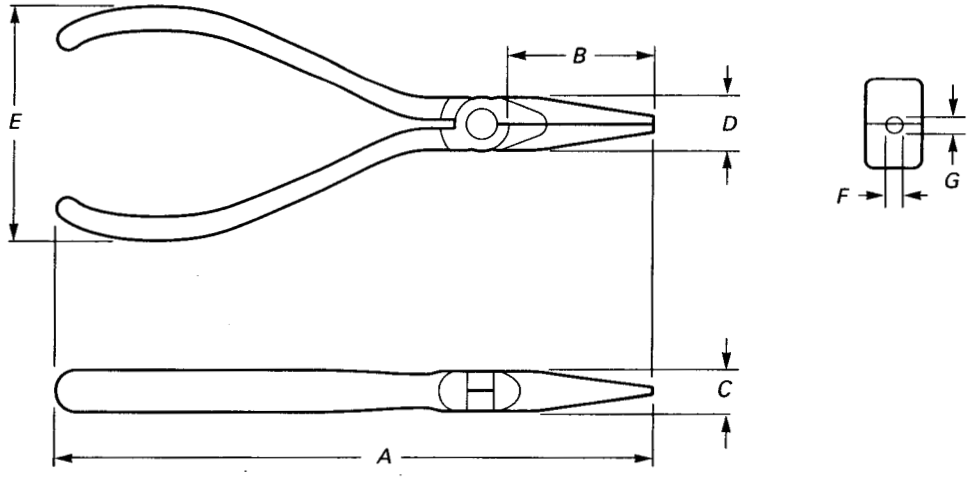

FIG. 2 TYPE II, CLASS 1, STYLE A AND B, CHAIN NOSE, LONG NOSE WITHOUT SIDE CUTTER

TABLE 3 DIMENSIONS FOR TYPE II, CLASS 2, STYLE A AND B, CHAIN NOSE, LONG NOSE WITH SIDE CUTTER

Nominal Size	Overall Length *A* [Note (1)]	Jaw Length *B*	Joint Thickness *C*	Jaw Width *D*	Handle Span *E* [Note (1)]	Tip Thickness *F*	Tip Width *G*	Cutter Length *H*	Minimum Jaw Opening
in. (mm)	in. (mm) ±.187 (4.75)	in. (mm) ±.062 (1.57)	in (mm) ±.032 (0.81)	in. (mm) ±.032 (0.81)	in. (mm) ±.187 (4.75)	in. (mm) ±.015 (0.38)	in. (mm) ±.015 (0.38)	in. (mm) ±.050 (1.27)	in. (mm)
4-½ (114)	4.875 (123.82)	1.187 (30.14)	0.250 (6.35)	0.437 (11.09)	1.875 (47.63)	0.062 (1.57)	0.078 (1.98)	0.234 (5.94)	0.375 (9.53)
5½ (140)	5.625 (142.87)	1.687 (42.84)	0.281 (7.14)	0.500 (12.70)	1.875 (47.63)	0.062 (1.57)	0.078 (1.98)	0.360 (9.14)	0.500 (12.70)

NOTE:
(1) *A* and *E* dimensions in the table are without comfort grips. Comfort grips shall not increase dimension *A* by more than .25 inch (6.4 mm) and *E* by more than .50 inch (12.7 mm).

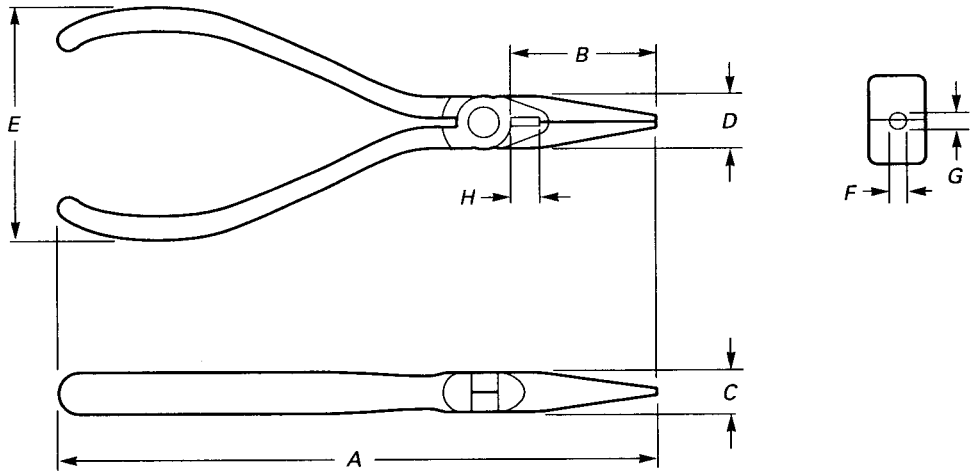

FIG. 3 TYPE II, CLASS 2, STYLE A AND B, CHAIN NOSE, LONG NOSE WITH SIDE CUTTER

TABLE 4 DIMENSIONS FOR TYPE II, CLASS 3, STYLE A AND B, CHAIN NOSE, CURVED NOSE

Nominal Size	Overall Length *A* [Note (1)]	Jaw Length *B*	Joint Thickness *C*	Jaw Width *D*	Handle Span *E* [Note (1)]	Tip Thickness *F*	Tip Width *G*	Bend Height *H*	Jaw Angle *I*	Minimum Jaw Opening
in. (mm)	in. (mm) ±.187 (4.75)	in. (mm) ±.062 (1.57)	in (mm) ±.032 (0.81)	in. (mm) ±.032 (0.81)	in. (mm) ±.125 (3.18)	in. (mm) ±.015 (0.38)	in. (mm) ±.015 (0.38)	in. (mm) ±.062 (1.57)	in. (mm) ±20 degrees	in. (mm)
4½ (114)	4.625 (117.48)	0.937 (23.80)	0.250 (6.35)	0.437 (11.09)	1.875 (47.63)	0.062 (1.57)	0.078 (1.98)	0.500 (12.70)	40 (40)	0.375 (9.53)
5½ (140)	5.687 (144.45)	1.562 (39.67)	0.281 (7.14)	0.500 (12.70)	1.875 (47.63)	0.062 (1.57)	0.078 (1.98)	0.312 (7.92)	45 (45)	0.500 (12.70)

NOTE:
(1) *A* and *E* dimensions in the table are without comfort grips. Comfort grips shall not increase dimension *A* by more than .25 inch (6.4 mm) and *E* by more than .50 inch (12.7 mm).

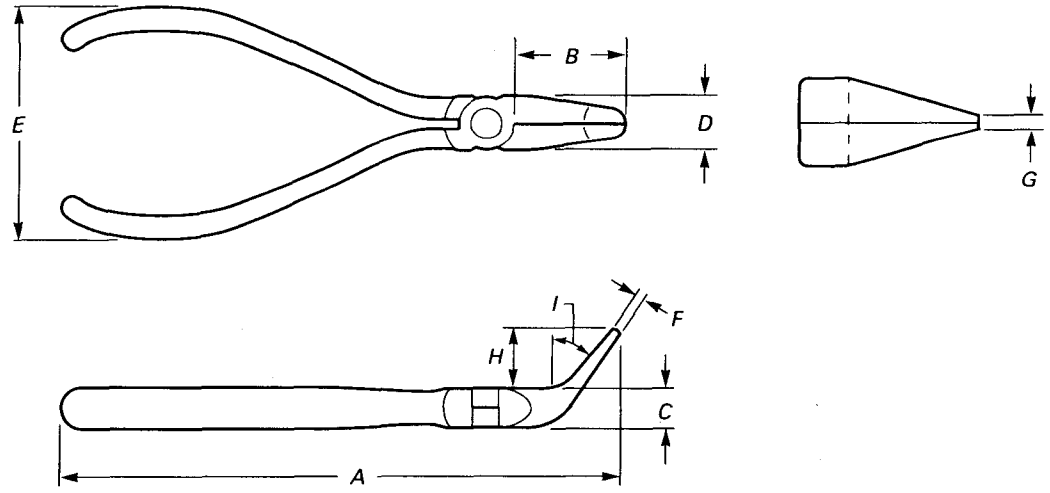

FIG. 4 TYPE II, CLASS 3, STYLE A AND B, CHAIN NOSE, CURVED NOSE

TABLE 5 DIMENSIONS FOR TYPE II, CLASS 4, STYLE A AND B, CHAIN NOSE, SHORT NOSE

Nominal Size in. (mm)	Overall Length *A* [Note (1)] in. (mm) ±.187 (4.75)	Jaw Length *B* in. (mm) ±.125 (3.18)	Joint Thickness *C* in. (mm) ±.032 (0.81)	Jaw Width *D* in. (mm) ±.032 (0.81)	Handle Span *E* [Note (1)] in. (mm) ±.187 (4.75)	Tip Thickness *F* in. (mm) ±.015 (0.38)	Tip Width *G* in. (mm) +.032 (0.81) −.015 (0.38)	Minimum Jaw Opening in. (mm)
4½ (114)	4.625 (117.48)	0.937 (23.80)	0.250 (6.35)	0.437 (11.09)	1.875 (47.63)	0.047 (1.19)	0.047 (1.19)	0.375 (9.53)
5 (127)	5.187 (131.75)	1.250 (31.75)	0.281 (7.14)	0.500 (12.70)	1.875 (47.63)	0.062 (1.57)	0.062 (1.57)	0.500 (12.70)

NOTE:
(1) *A* and *E* dimensions in the table are without comfort grips. Comfort grips shall not increase dimension *A* by more than .25 inch (6.4 mm) and *E* by more than .50 inch (12.7 mm).

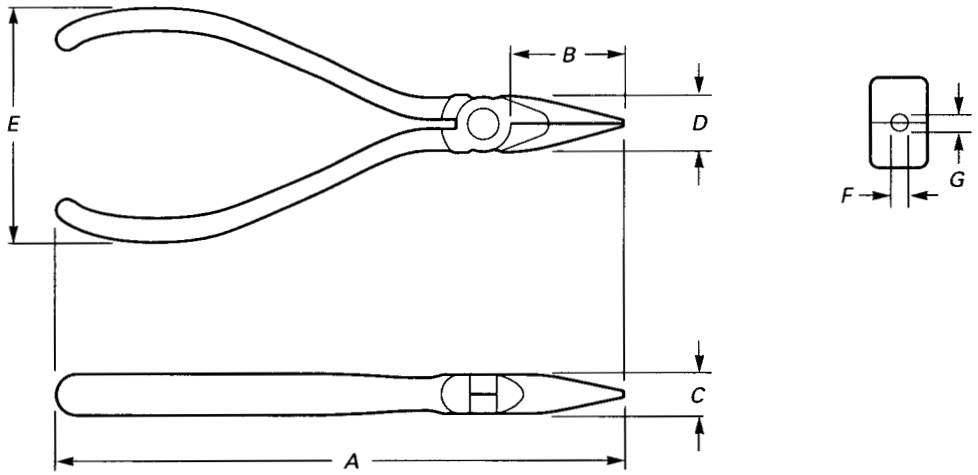

FIG. 5 TYPE II, CLASS 4, STYLE A AND B, CHAIN NOSE, SHORT NOSE

TABLE 6 DIMENSIONS FOR TYPE II, CLASS 5, STYLE A, CHAIN NOSE, SUBMINIATURE

Nominal Size	Overall Length *A* [Note (1)]	Jaw Length *B*	Joint Thickness *C*	Jaw Width *D*	Handle Span *E* [Note (1)]	Tip Thickness *F*	Tip Width *G*	Minimum Jaw Opening
in. (mm)	in. (mm) ±.187 (4.75)	in. (mm) ±.062 (1.57)	in. (mm) ±.032 (0.81)	in. (mm) ±.032 (0.81)	in. (mm) ±.125 (3.18)	in. (mm) ±.015 (0.38)	in. (mm) ±.015 (0.38)	in. (mm)
4 (102)	4.00 (101.60)	0.812 (20.62)	0.250 (6.35)	0.375 (9.53)	1.750 (44.45)	0.032 (0.81)	0.047 (1.19)	0.375 (9.53)

NOTE:
(1) *A* and *E* dimensions in the table are without comfort grips. Comfort grips shall not increase dimension *A* by more than .25 inch (6.4 mm) and *E* by more than .50 inch (12.7 mm).

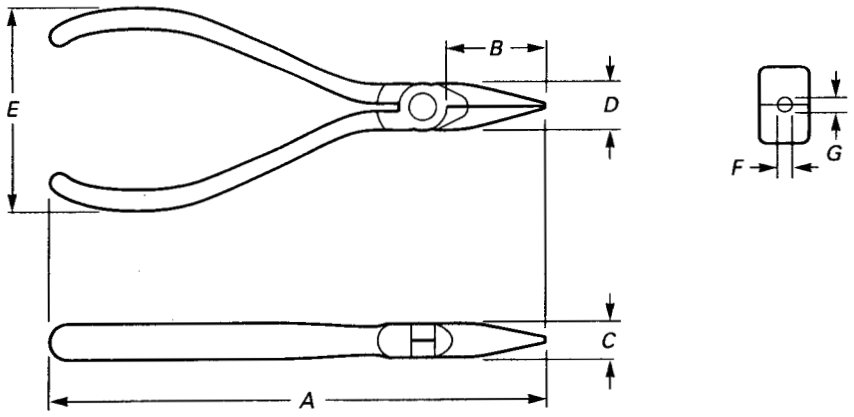

FIG. 6 TYPE II, CLASS 5, STYLE A, CHAIN NOSE, SUBMINIATURE

TABLE 7 DIMENSIONS FOR TYPE III, STYLE A AND B, LONG NOSE WITH TIP CUTTER

Nominal Size	Overall Length *A* [Note (1)]	Jaw Length *B*	Joint Thickness *C*	Jaw Width *D*	Handle Span *E* [Note (1)]	Tip Thickness *F*	Tip Width *G*	Cutter Length *H*	Minimum Jaw Opening
in. (mm)	in. (mm) ±.250 (6.35)	in. (mm) ±.062 (1.57)	in (mm) ±.094 (2.39)	in. (mm) ±.032 (0.81)	in. (mm) ±.187 (4.75)	in. (mm) ±.015 (0.38)	in. (mm) ±.015 (0.38)	in. (mm) ±.032 (0.81)	in. (mm)
4½ (114)	4.875 (123.82)	1.187 (30.14)	0.250 (6.35)	0.437 (11.09)	1.875 (47.63)	0.062 (1.57)	0.078 (1.98)	0.187 (4.75)	0.500 (12.70)
5 (127)	5.250 (133.35)	1.250 (31.75)	0.281 (7.14)	0.500 (12.70)	1.875 (47.63)	0.062 (1.57)	0.094 (2.39)	0.250 (6.35)	0.500 (12.70)

NOTE:
(1) *A* and *E* dimensions in the table are without comfort grips. Comfort grips shall not increase dimension *A* by more than .25 inch (6.4 mm) and *E* by more than .50 inch (12.7 mm).

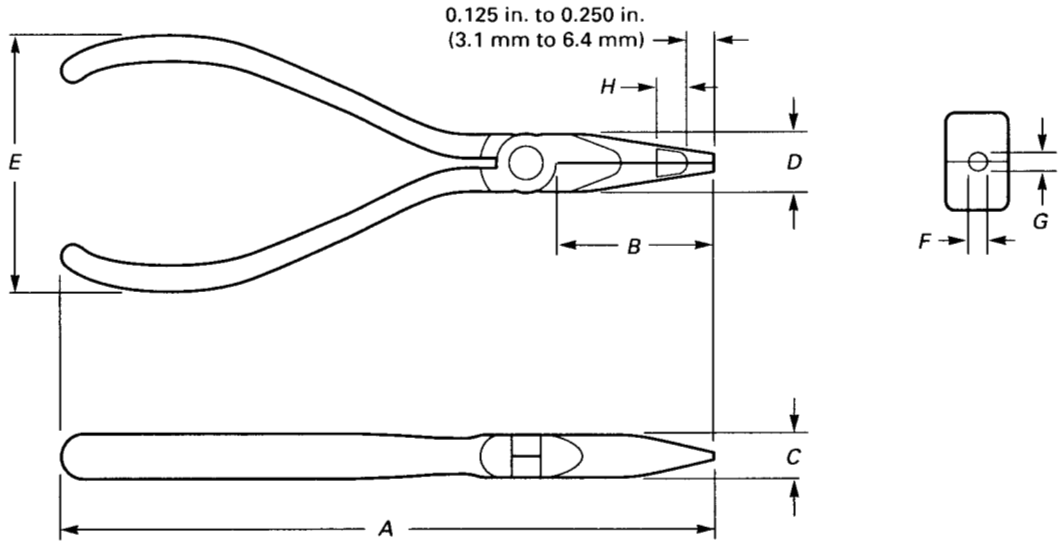

FIG. 7 TYPE III, STYLE A AND B, LONG NOSE WITH TIP CUTTER

TABLE 8 DIMENSIONS FOR TYPE IV, STYLE A AND B, NEEDLE NOSE

Nominal Size	Overall Length *A* [Note (1)]	Jaw Length *B*	Joint Thickness *C*	Jaw Width *D*	Handle Span *E* [Note (1)]	Tip Thickness *F*	Tip Width *G*	Minimum Jaw Opening
in. (mm)	in. (mm) ±.187 (4.74)	in. (mm) ±.062 (1.57)	in (mm) ±.032 (0.81)	in. (mm) +.032 (0.81) −.047 (1.19)	in. (mm) ±.187 (4.75)	in. (mm) ±.015 (0.38)	in. (mm) ±.015 (0.38)	in. (mm)
4½ (114)	4.625 (117.48)	1.187 (30.14)	0.250 (6.35)	0.437 (11.09)	1.875 (47.63)	0.062 (1.57)	0.078 (1.98)	0.500 (12.70)
5½ (140)	5.625 (142.87)	1.687 (42.84)	0.281 (7.14)	0.500 (12.70)	1.875 (47.63)	0.062 (1.57)	0.078 (1.98)	0.500 (12.70)

NOTE:
(1) *A* and *E* dimensions in the table are without comfort grips. Comfort grips shall not increase dimension *A* by more than .25 inch (6.4 mm) and *E* by more than .50 inch (12.7 mm).

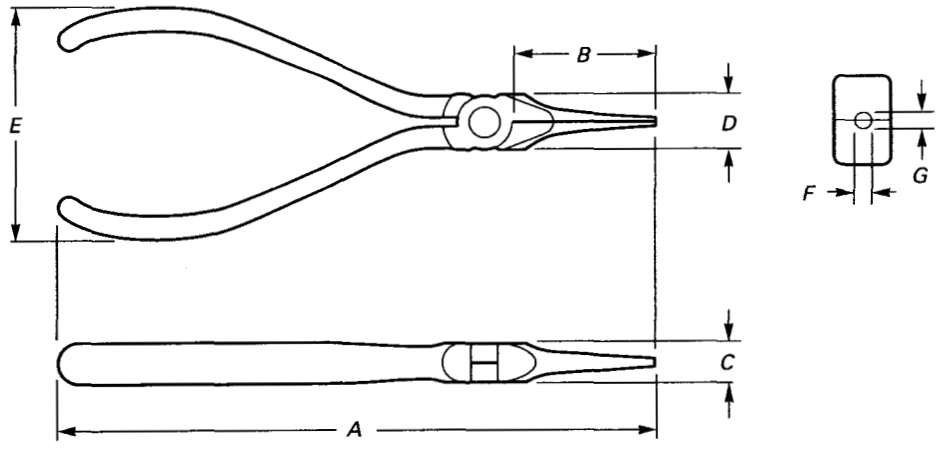

FIG. 8 TYPE IV, STYLE A AND B, NEEDLE NOSE

TABLE 9 DIMENSIONS FOR TYPE V, STYLE A, ROUND NOSE

Nominal Size in. (mm)	Overall Length *A* [Note (1)] in. (mm) ±.187 (4.75)	Jaw Length *B* in. (mm) ±.062 (1.57)	Joint Thickness *C* in (mm) ±.032 (0.81)	Jaw Width *D* in. (mm) ±.032 (0.81)	Handle Span *E* [Note (1)] in. (mm) ±.187 (4.75)	Tip Thickness *F* in. (mm) +.015 (0.38) −.032 (0.81)	Tip Width *G* in. (mm) +.032 (0.81) −.062 (1.57)	Minimum Jaw Opening in. (mm)
4½ (114)	4.562 (115.88)	0.875 (22.23)	0.25 (6.35)	0.437 (11.09)	1.875 (47.63)	0.062 (1.57)	0.125 (3.18)	0.375 (9.53)

NOTE:
(1) *A* and *E* dimensions in the table are without comfort grips. Comfort grips shall not increase dimension *A* by more than .25 inch (6.4 mm) and *E* by more than .50 inch (12.7 mm).

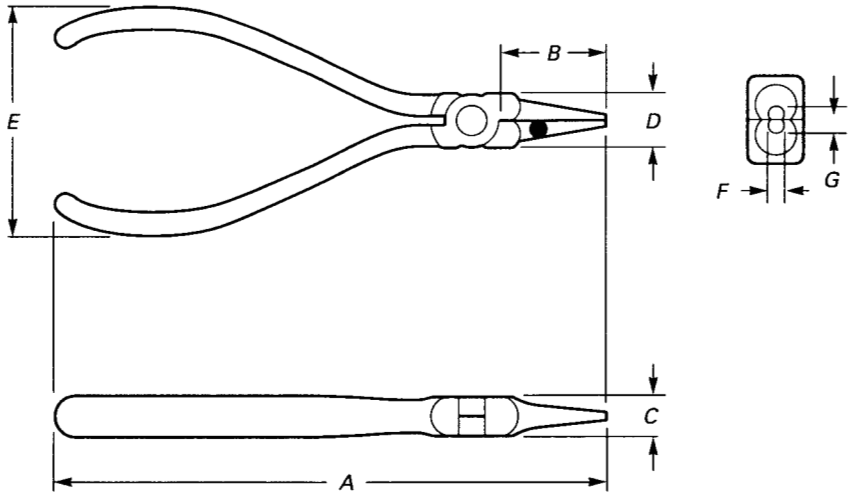

FIG. 9 TYPE V, STYLE A, ROUND NOSE

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