

UL 1028

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Hair Clipping and Shaving Appliances

Underwriters Laboratories Inc. (UL)
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UL Standard for Safety for Hair Clipping and Shaving Appliances, UL 1028

Fourth Edition, Dated October 26, 1995

Revisions: This Standard contains revisions through and including August 2, 2000.

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The following table lists the effective dates with the corresponding item.

Future Effective Date	References
August 2, 2002	Paragraphs 13.1.1.2, 13.1.1.3, 17.2, 18.2, 19.5, and 43.4 Figure 13.1 Table 13.1

The new/revised requirements are substantially in accordance with UL's Bulletin(s) on this subject dated July 30, 1999.

The revisions dated August 2, 2000 include a reprinted title page (page1) for this Standard.

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New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Listing and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

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The most recent approval of UL 1028 as an American National Standard (ANSI) occurred on April 25, 2000. Approval of UL 1028 as an American National Standard is maintained using the continuous maintenance process. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Written comments are to be sent to UL NBK Standards Department, 333 Pfingsten Road, Northbrook, IL 60062.

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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FOREWORD

A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.

D. A product employing materials or having forms of construction which conflict with specific requirements of the Standard cannot be judged to comply with the Standard. A product employing materials or having forms of construction not addressed by this Standard may be examined and tested according to the intent of the requirements and, if found to meet the intent of this Standard, may be judged to comply with the Standard.

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

INTRODUCTION

1 Scope

1.1 These requirements cover hair clippers and shaving appliances to be employed in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements cover appliances for household or commercial use on persons or animals, and appliances in which motion of an operating part is produced by electrical means.

1.3 An appliance that utilizes some other source of energy – such as gas or steam – in addition to electric energy is investigated under these requirements and under such additional requirements as are applicable to the appliance under consideration.

1.4 Motor-operated lather makers, lather makers incorporating heaters, barber shop vacuum cleaners for use on persons, and other types of hair clipping and shaving appliances not specifically mentioned are investigated under these requirements and under such additional requirements as are applicable to the appliance under consideration.

1.5 These requirements do not cover appliances rated more than 600 volts, nor do they cover appliances involving universal motors rated more than 250 volts.

1.6 These requirements do not cover manicure, pedicure, or personal grooming appliances used for similar purposes. However, hair clipping and shaving appliances provided with manicure, pedicure, or other similar attachments or accessories are investigated under these requirements and such additional requirements as are applicable to the appliance under consideration.

1.7 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

1.7 revised August 2, 2000

2 Glossary

2.1 For the purpose of this standard, the following definitions apply.

2.2 AUTOMATICALLY CONTROLLED APPLIANCE – An appliance is considered to be automatically controlled under any one or more of the following conditions if:

- a) The repeated starting of the appliance, beyond one complete predetermined cycle of operation to the point where some form of limit switch opens the circuit, is independent of any manual control.
- b) During any single predetermined cycle of operation, the motor is caused to stop and restart one or more times.
- c) Upon energizing the appliance, the initial starting of the motor may be intentionally delayed beyond normal, conventional starting.
- d) During any single predetermined cycle of operation, automatic changing of the mechanical load may reduce the motor speed sufficiently to reestablish starting-winding connections to the supply circuit.

2.3 REMOTELY CONTROLLED APPLIANCE – An appliance that is out of sight of the operator who is at the starting device.

3 Components

3.1 Except as indicated in 3.2, a component of a product covered by this standard shall comply with the requirements for that component. See Appendix A for a list of standards covering components generally used in the products covered by this standard.

3.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this standard.

3.2 revised August 2, 2000

3.3 A component shall be used in accordance with its rating established for the intended conditions of use.

3.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

4 Units of Measurement

4.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4.1 revised August 2, 2000

5 Undated References

5.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

6 Instructions Provided with the Appliance

6.1 A copy of the operating, user-maintenance, and other instructions intended to accompany an appliance as produced shall be used as a guide in the examination and test of the appliance. For this purpose, a final printed copy is not required.

6.2 The instructions shall include such directions and information as deemed by the organization responsible for the appliance to be necessary to cover the operation, intended use, and maintenance of the appliance, and shall comply with the requirements for instruction manuals in Sections 41 – 46.

CONSTRUCTION

7 General

7.1 An appliance shall employ materials that are acceptable for the application.

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8 Adhesives Used to Secure Parts

8.1 An adhesive that is relied upon to reduce a risk of fire, electric shock, or injury to persons shall comply with the requirements for adhesives in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

8.2 The requirement in 8.1 also applies to an adhesive used to secure a part, including a nameplate, that may, if loosened or dislodged:

- a) Make a live part accessible,
- b) Reduce spacings below the minimum acceptable values, or
- c) Expose a normally enclosed moving part that may present a risk of injury to persons.

9 Frame and Enclosure

9.1 An appliance shall be formed and assembled so that it will have the strength and rigidity necessary to resist the abuses to which it is likely to be subjected, without resulting in a risk of fire, electric shock, or injury to persons due to total or partial collapse with resulting reduction of spacings, loosening or displacement of parts, or other serious defects.

9.2 Among the factors that shall be taken into consideration when judging the acceptability of a nonmetallic enclosure or an enclosure of magnesium are:

- a) Mechanical strength,
- b) Resistance to impact,
- c) Moisture-absorptive properties,
- d) Flammability, and
- e) Resistance to distortion at temperatures to which the material may be subjected under conditions of normal or abnormal usage.

9.3 For unreinforced, flat surfaces in general, cast metal shall not be less than 1/8 inch (3.2 mm) thick, except that malleable iron may be not less than 3/32 inch (2.4 mm) and die-cast metal may be not less than 5/64 inch (2.0 mm) thick. Corresponding thicknesses of not less than 3/32, 1/16 (1.6 mm), and 3/64 inch (1.2 mm), respectively, may be acceptable if the surface under consideration is curved, ribbed, or otherwise reinforced, or if the shape or size, or both, of the surface is such that the necessary mechanical strength is provided.

9.4 An enclosure of sheet metal is judged with respect to its size, shape, thickness of metal, and its acceptability for the application, considering the intended use of the complete appliance. The use of sheet steel having a thickness of less than 0.026 inch (0.66 mm) if uncoated or 0.029 inch (0.74 mm) if galvanized, or of nonferrous sheet metal having a thickness of less than 0.036 inch (0.91 mm) is not recommended, except for relatively small areas or for surfaces that are curved or otherwise reinforced.

9.5 Sheet metal to which a wiring system is to be connected in the field shall have a thickness not less than 0.032 inch (0.81 mm) if uncoated steel, not less than 0.034 inch (0.86 mm) if galvanized steel, and not less than 0.045 inch (1.14 mm) if nonferrous.

9.6 The enclosure of a remotely or automatically controlled appliance shall prevent molten metal, burning insulation, flaming particles, or the like from falling on combustible materials, including the surface upon which the appliance is supported.

9.7 The requirement in 9.6 will necessitate that a switch, a relay, a solenoid, or the like be individually and completely enclosed, except for terminals, unless it can be shown that breakdown or malfunction of the component would not result in a risk of fire, or there are no openings in the bottom of the appliance enclosure. It will also necessitate the use of a barrier of noncombustible material:

a) Under a motor unless:

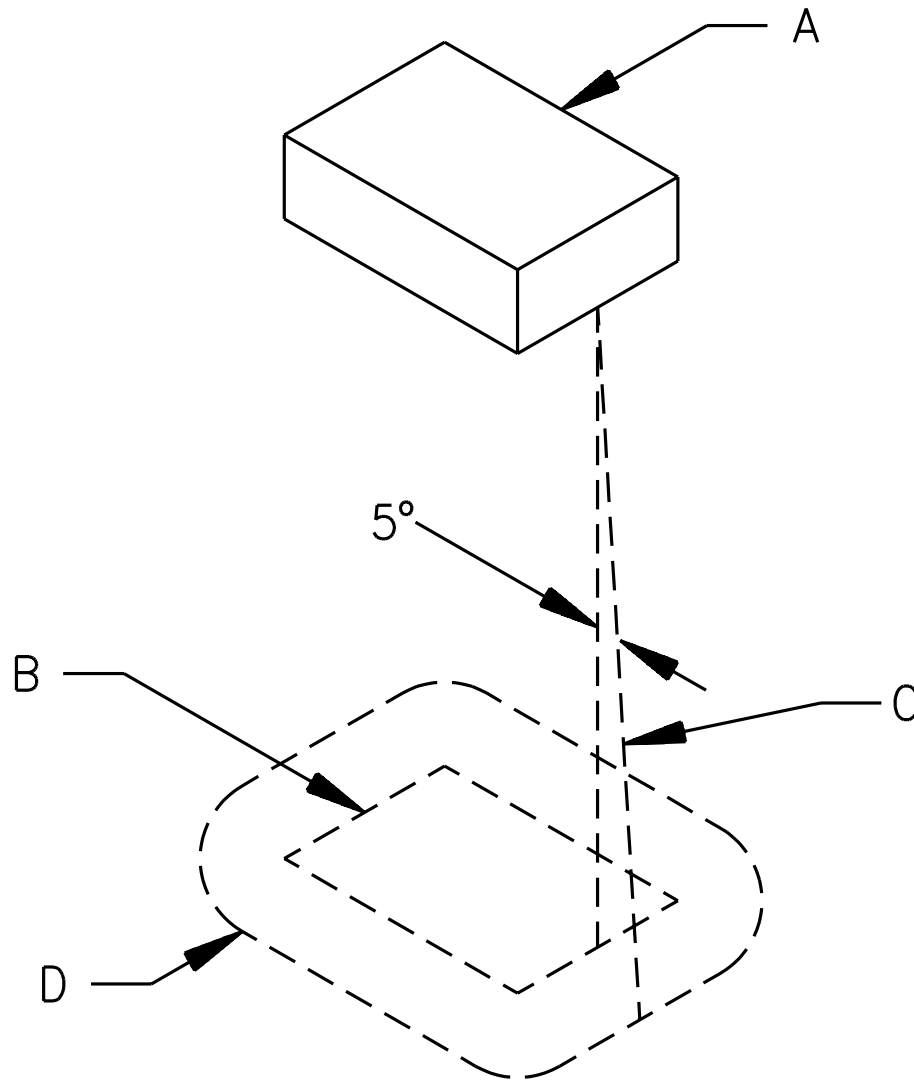
- 1) The structural parts of the motor or of the appliance provide the equivalent of such a barrier;
- 2) The protection provided with the motor is such that no burning insulation or molten material falls to the surface that supports the appliance when the motor is energized under each of the following fault conditions:
 - i) Open main winding,
 - ii) Open starting winding, and
 - iii) Starting switch short-circuited; or
- 3) The motor is provided with a thermal motor protector – a protective device that is sensitive to temperature and current – that will prevent the temperature of the motor windings from exceeding 125°C (257°F) under the maximum load under which the motor will run without causing the protector to cycle and from exceeding 150°C (302°F) with the rotor of the motor locked.

b) Under wiring, unless it is neoprene- or thermoplastic-insulated.

9.8 The barrier mentioned in 9.7 shall be horizontal, shall be located as illustrated in Figure 9.1, and shall not have an area less than that described in that illustration. Openings for drainage, ventilation, and the like may be employed in the barrier, provided that such openings would not permit molten metal, burning insulation, or the like to fall on combustible material.

9.9 A door or cover of an enclosure that gives access to any overload-protective device shall be hinged or attached in an equivalent manner if the functioning of the device requires renewal, or if it is necessary to open the cover in connection with the operation of the protective device.

Figure 9.1
Location and extent of barrier



SA0604-1

A – Region to be shielded by barrier. This will consist of the entire component if it is not otherwise shielded, and will consist of the unshielded portion of a component which is partially shielded by the component enclosure or equivalent.

B – Projection of outline of component on horizontal plane.

C – Inclined line which traces out minimum area of barrier. When moving, the line is always (1) tangent to the component, (2) 5 degrees from the vertical, and (3) so oriented that the area traced out on a horizontal plane is maximum.

D – Location (horizontal) and minimum area for barrier. The area is that included inside the line of intersection traced out by the inclined line C and the horizontal plane of the barrier.

9.10 Means shall be provided for holding the door or cover over a fuseholder in a closed position, and the door or cover shall be tight-fitting.

10 Accessibility of Uninsulated Live Parts, Film-Coated Wire, and Moving Parts

10.1 To reduce the likelihood of unintentional contact that may involve a risk of electric shock from an uninsulated live part or film-coated wire or injury to persons from a moving part, an opening in an enclosure shall have a minor dimension less than 1 inch (25.4 mm) and such a part or wire shall not be contacted by the probe illustrated in Figure 10.1.

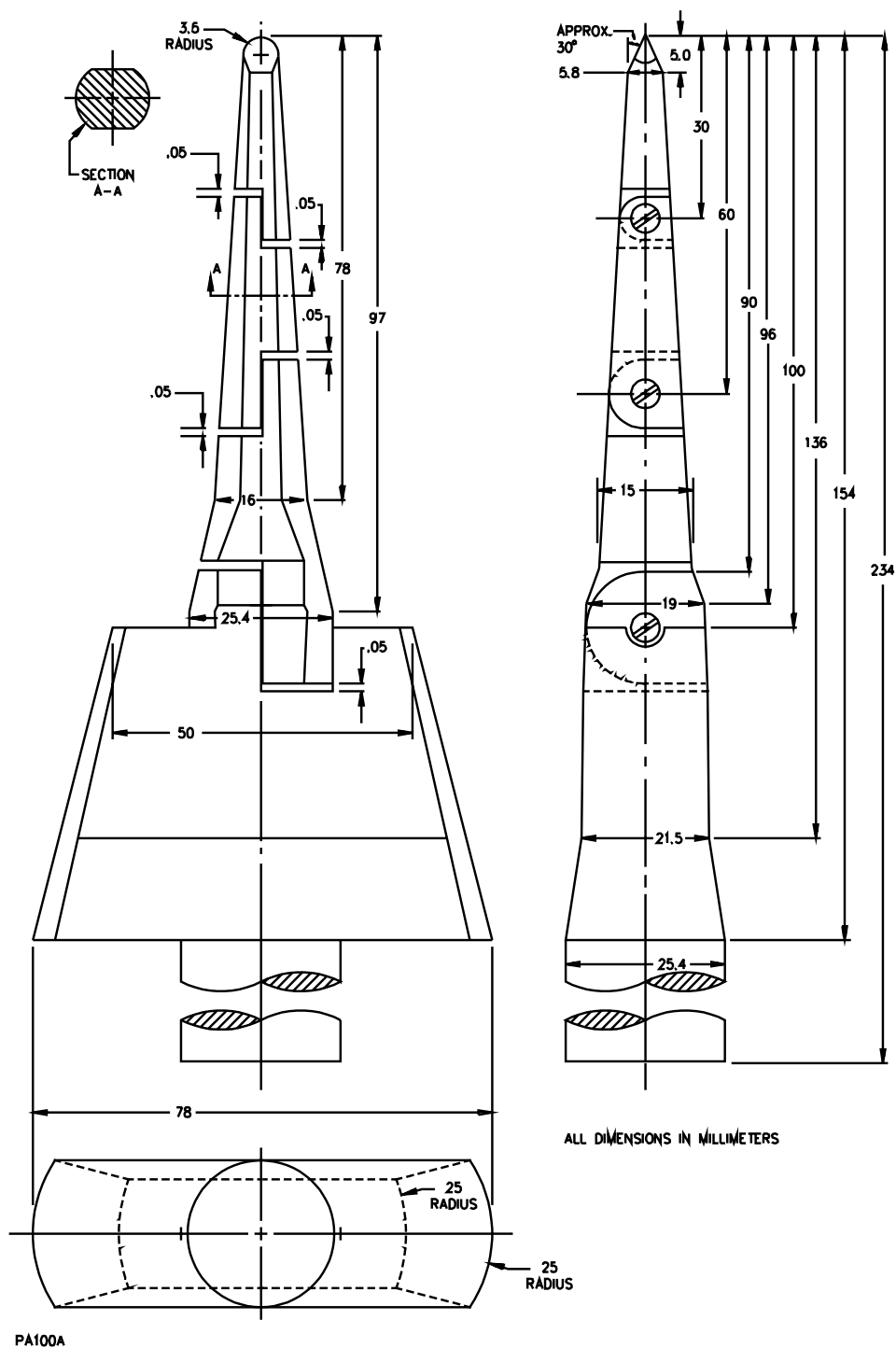
10.2 The probe shall be applied to any depth that the opening will permit, and shall be rotated or angled before, during, and after insertion through the opening to any position that is necessary to examine the enclosure. The probe shall be applied in any possible configuration; and, if necessary, the configuration shall be changed after insertion through the opening.

10.3 The probe shall be used as a measuring instrument to judge the accessibility provided by an opening, and not as an instrument to judge the strength of a material; it shall be applied with the minimum force necessary to determine accessibility.

10.4 With reference to the requirements in 10.1, the minor dimension of an opening is the diameter of the largest cylindrical probe having a hemispherical tip that can be inserted through the opening.

10.5 During the examination of a product to determine whether it complies with the requirements in 10.1, a part of the enclosure that may be opened or removed by the user without using a tool (to attach an accessory, to make an operating adjustment, or for other reasons) is to be opened or removed.

Figure 10.1
Articulate probe with web stop



10.6 With reference to the requirements in 10.1, insulated brush caps are not required to be additionally enclosed.

11 Mechanical Assembly

11.1 An appliance shall be assembled so that it will not be adversely affected by the vibration of normal operation. Brush caps shall be tightly threaded or otherwise designed to prevent loosening.

11.2 A switch – other than a through-cord switch – a lampholder, an attachment-plug receptacle, a motor-attachment plug, or similar component shall be mounted securely and shall be prevented from turning. See 11.4.

Exception No. 1: A switch need not be prevented from turning if all four of the following conditions are met:

- a) The switch is a plunger or other type that does not tend to rotate when operated. A toggle switch is considered to be subject to forces that tend to turn the switch during normal operation of the switch;*
- b) The means for mounting the switch make it unlikely that operation of the switch will loosen it;*
- c) The spacings are not reduced below the minimum required values if the switch rotates; and*
- d) The normal operation of the switch is by mechanical means rather than by direct contact by persons.*

Exception No. 2: A lampholder of the type in which the lamp cannot be replaced, such as a neon pilot or indicator light in which the lamp is sealed in a nonremovable jewel, need not be prevented from turning if rotation cannot reduce spacings below the minimum acceptable values.

11.3 Uninsulated live parts shall be secured to the base or mounting surface so that they will be prevented from turning or shifting in position, if such motion may result in a reduction of spacings below the minimum acceptable values.

11.4 The means for preventing the turning mentioned in 11.2 and 11.3 is to consist of more than friction between surfaces – for example, a lock washer, properly applied, is acceptable as the means for preventing a small stem-mounted switch or other device, having a single-hole mounting means, from turning.

12 Protection Against Corrosion

12.1 Iron and steel parts shall be protected against corrosion by enameling, galvanizing, plating, or other equivalent means, if corrosion of such unprotected parts would be likely to result in a risk of fire, electric shock, or injury to persons.

Exception No. 1: Surfaces of sheet steel or cast-iron parts within an enclosure may not need to be protected against corrosion if oxidation of the iron or steel due to the exposure of the metal to air and moisture is not likely to be appreciable – thickness of metal and temperature also being factors.

Exception No. 2: A bearing, laminations, or a minor part of iron or steel, such as a washer, a screw, and the like need not be protected against corrosion.

12.2 If the corrosion of a liquid container provided as a part of an appliance would result in a risk of fire, electric shock, or injury to persons, the container shall be of a material that is resistant to corrosion by the liquid intended to be used therein.

13 Supply Connections

13.1 Cord-connected appliances

13.1.1 Cords and plugs

13.1.1.1 An appliance intended to be connected to the power-supply circuit by means of a flexible cord shall be provided with a flexible cord and an attachment plug for connection to the supply circuit.

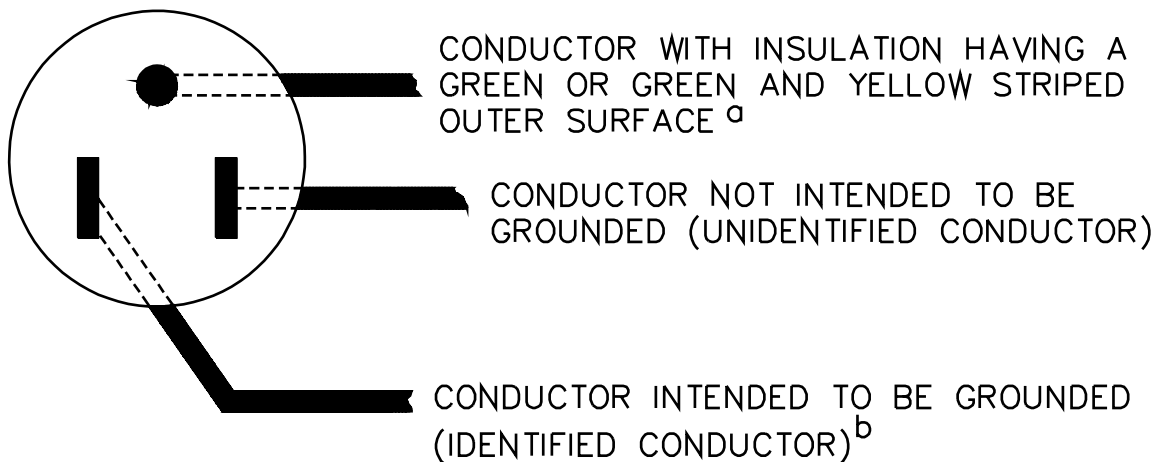
13.1.1.2 The attachment plug of a cord-connected appliance intended to be connected to a nominal 120-volt circuit, and employing devices required to be connected to a specific supply conductor as specified in 17.2, 18.2, and 19.5 shall be a polarized type. The connections to the attachment plug shall be in accordance with Figure 13.1. The polarity identification of the supply cord shall be in accordance with Table 13.1. See 43.4.

Added 13.1.1.2 effective August 2, 2002

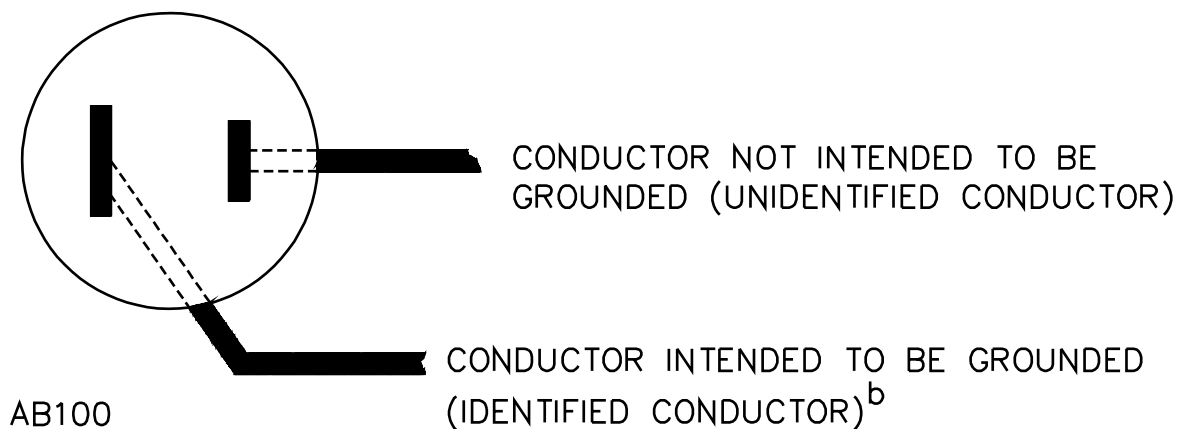
Figure 13.1
Connections to attachment plugs

Added Figure 13.1 effective August 2, 2002

CONNECTIONS OF CORD CONDUCTORS TO GROUNDING – TYPE
ATTACHMENT PLUG (FACE OF PLUG REPRESENTED)



CONNECTIONS OF CORD CONDUCTORS TO POLARIZED
ATTACHMENT PLUG (FACE OF PLUG REPRESENTED)



NOTES –

^a A U-shape blade instead of a circular cross section blade is not prohibited for the blade to which the green conductor is connected.

^b Signifies a conductor identified in accordance with Table 13.1.