

DATA

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REVISION

4-19-96

4

UL 1112

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18

**Underwriters Laboratories Inc.®**A not-for-profit organization dedicated to public safety
and committed to quality service**April 19, 1996****Revision pages for****Standard for****Marine Electric Motors and Generators (Cranking, Outdrive Tilt, Trim Tab, Generators, Alternators)****UL 1112, Second Edition**

Attached to this transmittal notice is a revision of the Second edition of UL 1112.

A CHANGE ON A PAGE DATED APRIL 19, 1996 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE NEW AND REVISED REQUIREMENTS IN THIS STANDARD ARE NOW IN EFFECT.

THE FOLLOWING REVISIONS ARE CONSIDERED NON-SUBSTANTIVE AND WERE ISSUED TO ELIMINATE THE OXYGEN BOMB TEST. THE OXYGEN BOMB TEST IS NO LONGER APPROPRIATE IN MOST CASES DUE TO THE ADDITION OF ANTIOXIDANTS TO RUBBER AND POLYMERIC COMPOUNDS. THEREFORE, UL IS ELIMINATING THE OXYGEN BOMB TEST AND REPLACING IT WITH AN AIR OVEN AGING TEST WHICH IS USED FOR THERMOPLASTIC COMPOUNDS.

Attention is directed to the note on the title page of this standard outlining the procedure to be followed to retain the approved text of ANSI/UL 1112-1988.

Revised and/or additional pages may be issued from time to time.

With the inclusion of the accompanying material, the standard consists of pages dated as shown in the following checklist:

Page	Date
1	November 25, 1988 (Reprinted April 19, 1996)
2	—
3 — 12	November 25, 1988
13	April 19, 1996
14	November 25, 1988

NOVEMBER 25, 1988
(Title Page Reprinted: April 19, 1996)



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UL 1112

Standard for

**Marine Electric Motors and Generators
(Cranking, Outdrive Tilt, Trim Tab,
Generators, Alternators)**

First Edition — July, 1977

Second Edition

November 25, 1988

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated November 25, 1988. These pages should not be discarded when revised or additional pages are issued if it is desired to retain the ANSI approved text.

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

Approved as ANSI/UL 1112-1988, August 4, 1988

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 published set of revision pages.

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Mechanical Strength Test

14.5 A generator, alternator, or cranking motor that may be used as a step after installation shall withstand a load of 250 pounds-force (1.11 kN) applied to the least-supported surface likely to be used. The load is not to be applied to collector ring covers, voltage regulators, or other small nonstructural enclosure extensions.

14.6 The product shall not deform to the extent that its intended operation is impaired, either during application of the load or following removal of the load.

15. Ignition Protection Test

15.1 A generator, diode-rectified alternator, cranking motor, trim-tab motor, tilt motor, or accessory part intended for use in an area requiring ignition protection shall be tested in accordance with the applicable requirements for ignition-protection test for marine products, UL 1500, and shall not ignite the specified surrounding mixture of propane and air.

16. Salt Spray Corrosion Test

16.1 A metallic part that is (1) necessary for the product to perform its intended function and (2) formed of material not known to be resistant to corrosion, shall not show visible evidence of corrosion sufficient to affect intended operation of the product when tested for 96 hours as described in paragraph 16.2.

16.2 The sample is to be supported vertically and exposed to salt spray in accordance with the Standard Method for Salt Spray (Fog) Testing, ASTM B117 — 73 (1979).

17. Nonmetallic Materials Tests

Immersion Test

17.1 A synthetic-rubber or elastomeric material (1) that forms part of an ignition-protected product, or (2) the deterioration of which would impair the intended operation of the product, shall not have a volume change of more than 50 percent swelling or a loss in tensile strength of more than 40 percent when tested as described in paragraphs 17.2 and 17.3.

17.2 Three sets of samples or specimens are to be immersed in test fuels at $23 \pm 2^\circ\text{C}$ ($73 \pm 4^\circ\text{F}$), for 5 hours; one set in ASTM Reference Oil No. 3, one set in ASTM Reference Fuel A, and one set in ASTM Reference Fuel C. The composition of the test liquids is to be as specified in the Standard Test Method for Rubber Property — Effect of Liquids, ANSI/ASTM D471 — 79.

17.3 The samples then are to be removed, blotted dry, and judged with respect to unconditioned samples.

Aging Test

17.4 A part made of synthetic rubber that is able to be affected by aging shall not crack or show visible evidence of deterioration such as cracking, discoloration, shrinking, swelling, melting, or warping following exposure in an air oven for 70 hours at $100 \pm 2^\circ\text{C}$ ($212 \pm 3.6^\circ\text{F}$).

Paragraph 17.4 revised April 19, 1996

MARKING

18. General

18.1 Each product or separate subassembly shall be plainly and permanently marked, where it will be readily visible after installation, with the following information:

- A. Manufacturer's or private labeler's name or identifying symbol.
- B. Model number or equivalent.
- C. Date of manufacture (month and year). May be in code.
- D. For a product or component that complies with the requirement in Section 15, the words "Ignition Protected."
- E. For a component that does not comply with the requirement in Section 15, the word "DANGER" and the following or equivalent: "Possible Ignition Source. Mount Outside Area Requiring Ignition Protection."

18.2 In addition to the requirements in paragraph 18.1, a generator or diode-rectified alternator shall be permanently marked to indicate: (1) rated voltage, (2) polarity, and (3) if applicable, direction of rotation.

18.3 A continuously energized terminal shall be marked with a tag pressed over the terminal, a decal adjacent to the terminal, or other equivalent means, with the word "DANGER" and the following or equivalent: "Risk of Fire If Shorted. Use Electrical Insulating Boot."

18.4 A product having a band or other cover that forms part of an ignition-protected electrical enclosure shall be permanently and visibly marked with the word "DANGER" and the following or equivalent: "Vapor Ignition Source. Cover or Band Must be Secured in Place When Operating." If a loose gasket is used in conjunction with the cover, specific reference is to be made to it in the statement.

INSTALLATION AND OPERATING INSTRUCTIONS

19. General

19.1 A generator or diode rectified alternator shall be provided with, or have available, installation and operating instructions that include the following:

- A. Electrical installation instructions, including a wiring diagram, the wire sizes required, and recommended overcurrent protection.
- B. Operating information, including a graph or chart showing voltage and current output versus rotational speeds.
- C. Information relative to direction of rotation (if applicable), maximum rotational speed, and cut-in speed.
- D. Identification, by part number, of any required separate voltage regulator or reverse current cut-out relay.

UL 1112

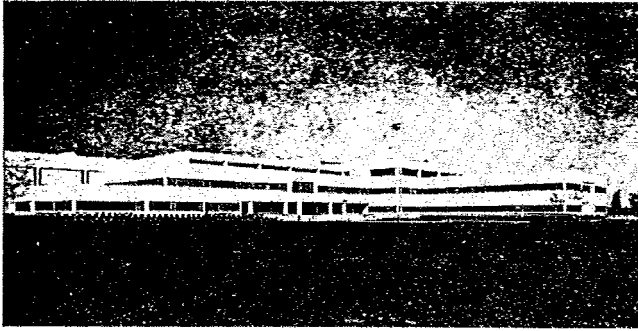
STANDARDS *for* SAFETY

MARINE ELECTRIC MOTORS AND GENERATORS

**(CRANKING, OUTDRIVE TILT,
TRIM TAB, GENERATORS,
ALTERNATORS)**



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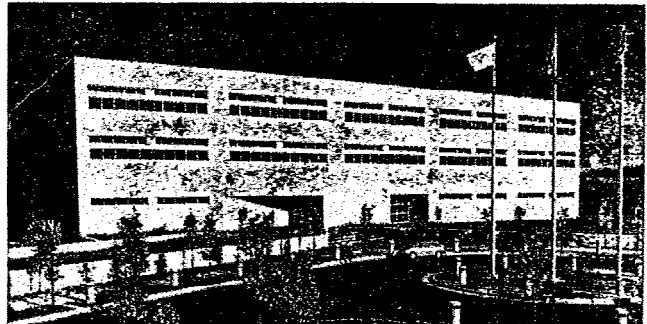
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