



[Billing Code 6355-01-P]

## CONSUMER PRODUCT SAFETY COMMISSION

### 16 CFR Part 1211

[Docket No. CPSC-2015-0025]

### Safety Standard for Automatic Residential Garage Door Operators

**AGENCY:** U.S. Consumer Product Safety Commission.

**ACTION:** Final rule.

**SUMMARY:** The Consumer Product Safety Commission (“Commission” or “CPSC”) is issuing a final rule amending the regulations for the *Safety Standard for Automatic Residential Garage Door Operators* to reflect changes made by Underwriters Laboratories, Inc. (“UL”), in the entrapment protection provisions in UL’s standard UL 325, Sixth Edition, “Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems.”

**DATES:** The rule is effective on [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER.] The incorporations by reference of the publications listed in this rule are approved by the Director of the *Federal Register* as of [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**FOR FURTHER INFORMATION CONTACT:** Troy W. Whitfield, Lead Compliance Officer, Office of Compliance, Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD 20814-4408; Telephone (301) 504-7548 or e-mail: [twhitfield@cpsc.gov](mailto:twhitfield@cpsc.gov).

## **SUPPLEMENTARY INFORMATION:**

### **A. Background**

The Commission has regulations for residential garage door operators (“GDOs”) to protect consumers from the risk of entrapment. 16 CFR part 1211. The Commission first issued the GDO standard in 1991, at the direction of the Consumer Product Safety Improvement Act of 1990 (“Improvement Act”), Public Law No. 101–608. Section 203 of the Improvement Act mandated that the entrapment protection requirements of the 1988 version of UL’s 325, Third Edition, “Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems,” be considered a consumer product safety rule under the Consumer Product Safety Act. Section 203(c) of the Improvement Act established procedures for the Commission to revise the Commission’s GDO standard . When UL revises the entrapment protection requirements of UL 325, UL must notify the Commission of the revision, and that revision “shall be incorporated in the consumer product safety rule . . . unless, within 30 days of such notice, the Commission notifies [UL] that the Commission has determined that such revision does not carry out the purposes of subsection (b)” [of section 203 of the Improvement Act which mandated the UL 325 entrapment protection requirements initially]. As provided in the Improvement Act, several times in the past, after UL has notified the Commission of changes to UL 325’s entrapment protection requirements, the Commission has revised the GDO standard to reflect the UL updates.

The Commission last updated 16 CFR part 1211 in 2007 to reflect changes made to the entrapment protection provisions of UL 325 up to that time that previously had not been reflected in the regulation.

On September 2, 2015, the Commission published a notice of proposed rulemaking (“NPR”), proposing to update 16 CFR part 1211 to reflect recent changes made by UL to the entrapment protection requirements of UL 325. (*See* 80 FR 53036). After publication of the NPR, UL released an update to UL 325 (UL 325, Sixth Edition, February 24, 2016 Revision). The February 24, 2016 revisions to the UL 325 Sixth Edition are related to the entrapment protection provisions for residential GDOs and are minor and editorial in nature. The February 24, 2016 revisions were made by UL to improve the clarity of the standard and describe test conditions better. The final rule has been revised to incorporate these editorial changes, as described in Section C of the preamble, so that the rule is consistent with the most recent version of UL 325.

## **B. Responses to Comments**

Three comments were submitted on the NPR. Two commenters express support for the proposed rule and acknowledge the rule’s safety benefits.

Comment: One commenter expresses concern about the public availability and accessibility of documents that are incorporated by reference, by either congressional mandate or through rulemaking. The commenter asserts that it is unclear which version of UL 325 is mandatory law. The commenter also describes the difficulties encountered attempting to purchase UL 325, an attempt to request the standard under FOIA, as well as difficulty accessing UL 325 in government reading rooms or libraries. The commenter also asserts that the Fifth Edition of UL 325 is the current binding law, until the proposed rule is finalized.

The commenter also notes that the NPR proposed incorporating by reference five voluntary standards that are contained in UL 325. The commenter asserts that it is

unclear what version of UL 99, UL 1998, and UL 746C the Commission proposed to incorporate by reference in the NPR. The commenter notes that the UL link in the NPR for the proposed incorporation by reference for the voluntary standard ANSI/DASMA 102-2004 is inoperative. The commenter further states that the DASMA website has a new version ANSI/DASMA 201-2011 on their website, and ANSI/DASMA 102-2004 is no longer available. The commenter asserts there is no reason to incorporate ANSI/DASMA 102-2004 because it is not readily available on the DASMA or CPSC website.

The commenter contends that it is crucial that these five voluntary standards be made freely available. The commenter notes that the law must be available for all to read because ignorance of the law is no excuse.

Response: The commenter misunderstands the mandatory safety standard for automatic residential GDOs. The NPR did not propose incorporating by reference any part of UL 325, nor has any previous rulemaking under 16 CFR part 1211 incorporated by reference any part of UL 325. Therefore, no version of the voluntary standard UL 325 is currently mandatory, nor has it been mandatory in the past. Rather, using appropriate rulemaking procedures, the Commission has based the current and previous mandatory requirements of CPSC's safety standard for automatic residential GDOs in 16 CFR part 1211 on the entrapment protection provisions of UL 325. The NPR proposed revisions to 16 CFR part 1211 based upon revisions made to UL 325, but the NPR does not incorporate by reference any of the provisions of UL 325. All the requirements in the proposed rule are codified or incorporated in 16 CFR part 1211. Therefore, purchase of, or access, to any version UL 325 is not necessary to determine the legal requirements for

automatic residential GDOs; all of the requirements for GDOs are stated in 16 CFR part 1211, which is publicly available in the Code of Federal Regulations (“CFR”).

As correctly noted by the commenter, the Office of the Federal Register (“OFR”) requires reference to a specific version of a voluntary standard for the standard to be incorporated by reference in the CFR. The preamble and the codified text of the NPR clearly indicated what version of UL 99, UL 1998, and UL 746C was being proposed for incorporation by reference. (*See* 80 FR at 53039).

Regarding the incorporation by reference of the ANSI/DASMA 102-2004 voluntary standard in the NPR, the commenter is correct that the link on the DASMA website currently is inoperative. After publication of the NPR in the *Federal Register*, DASMA removed the ANSI/DASMA 102-2004 voluntary standard from its website and replaced it with the more recent version, ANSI/DASMA 102-2011. DASMA gave no indication on its website when the NPR was published that the standard was being updated with a newer version. As noted by the commenter, the revisions in ANSI/DASMA 102-2011 are not substantive in nature. Due to the public availability and the editorial nature of the changes reflected in ANSI/DASMA 102-2011, the final rule incorporates by reference ANSI/DASMA 102-2011, in lieu of the proposed incorporation of ANSI/DASMA 102-2004 in the NPR. The 2011 version of the ANSI/DASMA standard is available on DASMA’s website.

Regarding the commenter’s assertions about the incorporation by reference of five voluntary standards in the NPR, the OFR recently updated 1 CFR part 51, the regulation governing incorporation by reference in the CFR. (Final Rule, 79 FR 66267, November 7, 2014). Responding to comments regarding accessibility, the OFR noted that the final

rule for incorporation by reference balanced the standards' reasonable availability with U.S. copyright law, U.S. international trade obligations, and agencies' ability to substantively regulate under their authorizing statutes. The OFR noted that to achieve this balance, the incorporation by reference rule requires that agencies discuss how incorporated materials were made publicly available to the parties, where those materials are located, and provide a summary of those materials in the preambles of rulemaking documents. (*See* 79 FR at 66270). The preamble to the NPR for the safety standard for automatic residential garage door operators provided that information. (*See* 80 FR 53036, 53039). The OFR noted in the preamble to the final rule regarding incorporation by reference and the cost of standards: "while these materials may not be as easily accessible as the commenter would like, . . . they are described in the regulatory text in sufficient detail so that a member of the public can identify the standard IBR'd into the regulation." (79 FR at 66272). The Commission has met the requirements for 1 CFR part 51 regarding incorporation by reference.

### **C. Description of the Final Rule**

The final rule revises subpart A of the GDO standard and creates a new subpart D to consolidate all of the incorporations by reference in the rule. The final rule does not change the certification (subpart B) or recordkeeping (subpart C) provisions of the GDO standard. The text of the final rule is nearly identical to the NPR, with the few exceptions described below. As explained in the NPR, the Commission is revising several sections of the existing regulation. In addition, the rule adds three new sections (§§ 1211.14 (unattended operation requirements), 1211.15 (vertically moving combination rigid one-

piece overhead residential garage door and operator system) and 1211.40 (consolidating all of the incorporations by reference in one place).

Changes to the rule reflect changes that UL made to the entrapment protection provisions of UL 325. UL added requirements for certain types of GDOs that were not previously covered by the GDO standard. Most of the revisions to the GDO standard involve adding requirements for these types of GDOs and making changes related to these provisions. In addition, UL added requirements for unattended operation of GDOs and for wireless control and communications. Finally, UL made several editorial changes throughout the standard to provide better descriptions of the appropriate requirements and test conditions. UL also revised dimensional tolerances on test fixtures so that the fixtures can be manufactured using generally available machine tools. As discussed in more detail below, the Commission is incorporating these changes into the Commission's GDO standard at 16 CFR part 1211.

*GDOs that Open Horizontally.* Because UL added requirements for GDOs that open horizontally, the rule is revised to differentiate between requirements for horizontal- and vertical-opening GDOs (§ 1211.6(d)). Entrapment protection requirements are similar for vertically and horizontally opening GDOs. UL added and clarified test requirements to address entrapment protection for either vertical or horizontal movement. In addition, UL clarified wording throughout the standard, such as replacing “downward movement” with “closing movement,” and adding “vertically” or “horizontally” moving, where appropriate. Additionally, UL clarified secondary entrapment protection requirements for vertically and horizontally opening GDOs. The final rule incorporates these changes (§ 1211.8).

*Combination Sectional Overhead GDOs.* UL added requirements for combination sectional overhead GDOs, which are a door and operator combination, in which the door and hardware are an integral part of the operator, and in which the operator does not exert a driving force on the door in the closing direction. The final rule incorporates these changes (§ 1211.6(c)). Under UL's revised provisions, this type of GDO must comply with the common requirements for GDOs; plus, they must comply with the requirements found in the American National Standard/Door and Access Systems Manufacturers ANSI/DASMA 102-2011, *Specifications for Sectional Doors*, 2011 revision, dated May 19, 2011, which the rule incorporates by reference (§ 1211.6(c)). As noted in response to a comment in Section B of the preamble, the Commission is incorporating ANSI/DASMA 102-2011 instead of ANSI/DASMA 102-2004 as proposed in the NPR because ANSI/DASMA 102-2011 is the most recent version of the standard and the one publically available on the DASMA website. ANSI/DASMA 102-2011 does not differ from ANSI/DASMA 102-2004 substantively because the changes are merely editorial in nature.

ANSI/DASMA 102-2011 provides requirements for installation/operation, maintenance, durability, and identification of GDO systems with the name and address of the door system manufacturer, loads, in addition to general requirements. This ANSI/DASMA standard is available from ANSI/DASMA, or the standard may be examined at the offices of the *Federal Register*.

Additionally, the revised UL standard requires that the instructions for combination sectional overhead GDOs must specify: (1) the operator by manufacturer and model; (2) the doors by manufacturer, model, and maximum and minimum door



width and height required for compliance to the entrapment protection requirements; (3) the hardware required to meet the entrapment protection requirements (§ 1211.16(a)(13)); and (4) how to properly counterbalance the door (§ 1211.16(a)(14)). Finally, combination sectional overhead GDOs must be provided with permanent labels that contain specific warnings (§ 1211.17(k)) and markings (§ 1211.17 (m)). The rule includes these requirements in the sections indicated.

*Unattended Operation of GDOs.* UL added requirements for unattended operation of GDOs, which is permitted if additional safety features are provided. The final rule includes these requirements (new § 1211.14). Under UL’s revised provisions, unattended operation is allowable only if proper installation instructions and markings are provided. Unattended GDOs must require one or more intentional actions to function and must require an audible and visual alarm that must signal for 5 seconds before door movement. Unattended operation is not permitted on one-piece or swinging garage doors. The word “bulb” is changed to “light” to address newer technologies that may use LEDs that may not be considered “bulbs” and clarifies that the visual or audio alarm during unattended operation does not require monitoring.

*Combination Rigid One-Piece Overhead GDOs.* UL added requirements for combination rigid one-piece overhead GDOs, which are a door and operator combination in which the door is constructed of one rigid piece. The final rule includes these requirements (new § 1211.15). Under UL’s revised provisions, this type of GDO must comply with the common requirements for GDOs; plus, the speed of the door edge during movement must not exceed 6 inches per second. This type of GDO also must provide two additional independent secondary entrapment-protection devices, including a

minimum of two sensors. Additionally, these GDOs must provide a means of mechanically detaching both door operators from the door and must have an interlock to de-energize the operator when detached. Finally, the installation instructions for combination rigid one-piece GDOs must specify attachment points for installation. The rule includes these requirements for instructions (§ 1211.16(b)(2)(13)).

*Wireless Control and Communication.* UL added requirements for wireless control (§§ 1211.8(d) and 1211.10(f)), including additional tests for battery operation (§ 1211.10(g)) and wireless communication (§ 1211.10(h)). The rule includes these requirements at the sections indicated.

*Photoelectric Sensors.* UL added requirements for alternate sources of light for the photoelectric sensor ambient light test. The rule includes these requirements (§ 1211.11(e)(2)). The current test method specifies a specific DXC-RFL-2 flood lamp, which is becoming difficult to obtain in the marketplace. Instead, the requirement specifies the minimum required wattage (500W) and maximum color temperature (3600K) of the light, to allow for available light sources without affecting the test results.

UL added a new test method for GDOs that use an array of “vertical” photoelectric sensors as a non-contact external entrapment protection device. The rule includes this new test method (§ 1211.11 (d)(4) and new paragraph (f)). The new method verifies that the “vertical” sensors function properly.

*Clarifications.* UL made several clarifications throughout the standard to improve clarity and describe test conditions better. The rule includes these clarifications:

- Electronic instructions (§ 1211.16(a)(10)) may be provided on alternate sources, such as CD-ROM, USB flash drive, or company website.
- For GDOs for one-piece doors that have an unattended operation function, certain markings are not required if the GDO automatically senses door operation (§§ 1211.16(b)(1)(ii), 1211.17(h), and 1211.18(m)),
- The requirements for UL markings for voltage, frequency, and input are clarified (§ 1211.18(b)(3) and (4)).
- UL marking requirements for risk of entrapment on GDOs that have user adjustments (§ 1211.18(i)) shall be located where visible to the user when making adjustments.
- Requirements for the external entrapment protection device (*i.e.*, photoelectric sensor and edge sensor) test criteria (§ 1211.10(b), (c), and (e) and § 1211.11(d)(4)) are clarified, and the requirements for determining whether the system is operating normally before and after each test are made consistent throughout the standard.
- The requirements for the switch or relay used in the entrapment protection circuit (§ 1211.6(f)) are clarified by stating that the switch or relay must be capable of operating at a minimum cycling of 100,000 cycles, as intended in the GDO without failing, *and* that when/if failure does occur in actual use (at any cycle count), failure shall result in preventing further operation of the door.

As mentioned above, the rule reflects a few minor and editorial changes in UL 325, Sixth Edition, February 24, 2016 Revision. In addition, the final rule is adding a new subpart D to consolidate the incorporations by reference in the proposed rule in one location. The rule reflects the revisions below:

- Update the incorporation by reference in § 1211.6(c) from ANSI/DASMA 102-2004 to the more recent and available ANSI/DASMA 102-2011 voluntary standard.
- Add a new subpart D titled Incorporation by Reference, with a new §1211.40 that centralizes the IBR paragraphs from the NPR in one location.
- Add a new cross reference in §1211.8 (f) to §1211.6(b)(3).
- Revise § 1211.16 (b)(1)(i)(3) to add the word “pull” before rope, and add two commas.
- Revise § 1211.16 (b)(1)(i)(6) to insert “above floors, landings, steps, or any other adjacent walking surface” between the words “feet” and “so.”
- Revise § 1211.16 (b)(1)(i)(9) by striking the proposed language and replacing with “For products having a manual release, instruct the end user on the operation of the manual release.”
- Create a new § 1211.16 (b)(1)(i)(10), and insert the language from proposed § 1211.16 (b)(1)(i)(9) in the new § 1211.16 (b)(1)(i)(10).

#### **D. Incorporation by Reference**

As noted above, a new subpart D titled Incorporation by Reference, with a new §1211.40 that centralizes the IBR paragraphs from the NPR in one location is being added to the final rule. In addition, the rule updates the existing incorporations by reference in the mandatory rule to the most recent version of the appropriate voluntary standard, as follows:

- NFPA 70 (The standard addresses the installation of electrical conductors, equipment, and raceways; signaling and communications conductors, equipment, and raceways; and optical fiber cables and raceways in commercial, residential, and industrial occupancies.)(§§ 1211.2(c) and 1211.40(c));
- UL 991 (The requirements apply to controls that employ solid-state devices and are intended for specified safety-related protective functions.)(§§ 1211.4(c), 1211.5(c) and 1211.40(d)(2));
- UL 1998 (These requirements apply to non-networked embedded microprocessor software whose failure is capable of resulting in a risk of fire, electric shock, or injury to persons.)(§§ 1211.8(f) and 1211.40(d)(3)); and
- UL 746C (These requirements cover parts made of polymeric materials that are used in electrical equipment and describe the various test procedures and their use in the testing of such parts and equipment.)(§§ 1211.10(d) and (e), 1211.12(c)(2), and 1211.40(d)(1)).

In addition, §§ 1211.6(c) and 1211.40(b) of the final rule adds a new incorporation by reference for ANSI/DASMA 102-2011. The NPR proposed incorporating ANSI/DASMA 102-2004 in § 1211.6(c) of the rule, but since publication

of the NPR, DASMA has released a more recent version of the standard ANSI/DASMA 102-2011, dated May 19, 2011, on its website. The Commission is incorporating ANSI/DASMA 102-2011 instead of the ANSI/DASMA 102-2004 as proposed in the NPR because it is the most recent version of the standard and the one available on the DASMA website.

The OFR has regulations concerning incorporation by reference. 1 CFR part 51. The OFR revised these regulations to require that, for a final rule, agencies must discuss in the preamble, the ways that the materials the agency incorporates by reference are reasonably available to interested persons and how interested parties can obtain the materials. In addition, the preamble to the final rule must summarize the material. 1 CFR 51.5(a).

In accordance with the OFR's requirements, this section and section C of this preamble summarize the provisions of the voluntary standards that the rule incorporates by reference:

- Specifications for Sectional Doors, ANSI/DASMA 102-2011, dated May 19, 2011. ANSI/DASMA 102-2011 is copyrighted. Copies may be obtained from the Door and Access Systems Manufacturers' Association, International, 1300 Sumner Avenue, Cleveland, OH 44115-2851, telephone (216) 241-7333, or online at:  
[http://www.dasma.com/PDF/Publications/Standards/ANSIDASMA102\\_2011.pdf](http://www.dasma.com/PDF/Publications/Standards/ANSIDASMA102_2011.pdf).
- National Electrical Code, NFPA 70, 2014 edition, effective August 21, 2013. NFPA 70 is copyrighted. Copies may be obtained from the National Fire

Protection Association, 1 Batterymarch Park, Quincy, MA 02269-9101,  
<http://www.nfpa.org/>; Telephone: (800) 344-3555.

- Standard for Safety for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991, Third Edition, dated October 22, 2004.
- Standard for Safety for Software in Programmable Components, UL 1998, Third Edition, dated December 18, 2013.
- Standard for Safety for Polymeric Materials—Use in Electrical Equipment Evaluations, UL 746C, Sixth Edition, dated September 10, 2004.

The UL standards listed above are copyrighted. The UL standards may be obtained from UL, 151 Eastern Avenue, Bensenville, IL 60106, Telephone: 1-888-853-3503 or online at: <http://ulstandards.ul.com/>. One may also inspect a copy of all of the above-referenced standards at CPSC's Office of the Secretary, U.S. Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814, Telephone: (301) 504-7923.

#### **E. Effective Date**

The NPR proposed a 30-day effective date from the date of publication of the final rule in the *Federal Register* because the requirements for residential GDOs in UL 325, Sixth Edition are currently in effect. No comments were received regarding the effective date. Therefore, the effective date for the rule is [INSERT DATE 30 DAYS AFTER PUBLICATION IN FEDERAL REGISTER].

## **F. Regulatory Flexibility Act**

The Regulatory Flexibility Act (“RFA”) generally requires that agencies review proposed and final rules for the rules’ potential economic impact on small entities, including small businesses, and prepare regulatory flexibility analyses. 5 U.S.C. 603 and 604. The Commission certified that this rule will not have a significant impact on a substantial number of small entities pursuant to section 605(b) of the RFA, 5 U.S.C. 605(b) in the NPR. 80 FR 53036, 53039. The Commission did not receive any comments that questioned or challenged this certification, nor has CPSC staff received any other information that would require a change or revision to the Commission’s previous analysis of the impact of the rule on small entities. Therefore, the certification of no significant impact on a substantial number of small entities is still appropriate.

## **G. Environmental Considerations**

The Commission’s regulations provide a categorical exclusion for Commission rules from any requirement to prepare an environmental assessment or an environmental impact statement because the rules “have little or no potential for affecting the human environment.” 16 CFR 1021.5(c)(2). This rule falls within the categorical exclusion, so no environmental assessment or environmental impact statement is required. The Commission’s regulations state that safety standards for products normally have little or no potential for affecting the human environment. 16 CFR 1021.5(c)(1). Nothing in this rule alters that expectation.



## **H. Preemption**

The Improvement Act contains a preemption provision that states: “those provisions of laws of States or political subdivisions which relate to the labeling of automatic residential garage door openers and those provisions which do not provide at least the equivalent degree of protection from the risk of injury associated with automatic residential garage door openers as the consumer product safety rule” are subject to preemption under 15 U.S.C. 2075. Public Law No. 101–608, section 203(f).

### **List of Subjects in 16 CFR Part 1211**

Consumer protection, Imports, Incorporation by reference, Labeling, Reporting and recordkeeping requirements.

For the reasons set forth in the preamble, the Commission amends 16 CFR part 1211 as follows:

### **PART 1211—SAFETY STANDARDS FOR AUTOMATIC RESIDENTIAL GARAGE DOOR OPERATORS**

1. The authority citation for part 1211 continues to read as follows:

**Authority:** Sec. 203 of Pub. L. 101–608, 104 Stat. 3110; 15 U.S.C. 2063 and 2065.

#### **SUBPART A – [Amended]**

2. Amend § 1211.2 by revising paragraph (c) to read as follows:

#### **§ 1211.2 Definition.**

\* \* \* \* \*

(c) Is intended to be employed in ordinary locations in accordance with NFPA 70 (incorporated by reference, see §1211.32).

3. Amend § 1211.4 by revising paragraph (c) to read as follows:

**§ 1211.4 General requirements for protection against risk of injury.**

\* \* \* \* \*

(c) An electronic or solid-state circuit that performs a back-up, limiting, or other function intended to reduce the risk of fire, electric shock, or injury to persons, including entrapment protection circuits, shall comply with the requirements in UL 991 (incorporated by reference, see § 1211.40), including environmental and stress tests appropriate to the intended usage of the end-product.

4. Amend § 1211.5 by revising paragraphs (a)(1) and (6), (b) introductory text, and (b)(3) to read as follows:

**§ 1211.5 General testing parameters.**

(a) \* \* \*

(1) With regard to electrical supervision of critical components, an operator being inoperative with respect to closing movement of the door meets the criteria for trouble indication.

\* \* \* \* \*

(6) When a Computational Investigation is conducted,  $\lambda_p$  shall not be greater than 6 failures/10<sup>6</sup> hours for the entire system. For external secondary entrapment protection devices or systems that are sold separately,  $\lambda_p$  shall not be greater than 0 failures/10<sup>6</sup> hours. For internal secondary entrapment protection devices or systems whether or not they are sold separately,  $\lambda_p$  shall not be greater than 0 failures/10<sup>6</sup> hours. The operational

test is conducted for 14 days. An external secondary entrapment protection device or system that is sold separately, and that has a  $\lambda_p$  greater than 0 failures/10<sup>6</sup> hours meets the intent of the requirement when for the combination of the operator and the specified external secondary entrapment protection device or system  $\lambda_p$  does not exceed 6 failures/10<sup>6</sup> hours. See § 1211.18(j) through (l).

\* \* \* \* \*

(b) In the evaluation of entrapment protection circuits used in residential garage door operators, the critical condition flow chart shown in Figure 1 to subpart A shall be used:

\* \* \* \* \*

(3) During the Power Cycling Safety for Tests in accordance with UL 991 (incorporated by reference, see §1211.40).

5. Revise § 1211.6 to read as follows:

**§ 1211.6 General entrapment protection requirements.**

(a) A residential garage door operator system shall be provided with inherent primary entrapment protection that complies with the requirements as specified in § 1211.7.

(b) In addition to the inherent primary entrapment protection as required by paragraph (a) of this section, a vertically moving residential garage door operator shall comply with one of the following:

(1) Shall be constructed to:

(i) Require constant pressure on a control intended to be installed and activated within line of sight of the door to lower the door;

(ii) Reverse direction and open the door to the upmost position when constant pressure on a control is removed prior to operator reaching its lower limit, and

(iii) Limit a portable transmitter, when supplied, to function only to cause the operator to open the door;

(2) Shall be provided with a means for connection of an external secondary entrapment protection device as described in §§ 1211.8, 1211.10, and 1211.11; or

(3)(i) Shall be provided with an inherent secondary entrapment protection device as described in §§ 1211.8(a), 1211.8(c), 1211.8(f), 1211.10, and 1211.12 and is:

(A) A combination sectional overhead garage door operator system as described in § 1211.6(c); and

(B) For use only with vertically moving garage doors.

(ii) With respect to § 1211.6(b)(3)(i)(A), trolley-driven operators do not meet the definition of a combination sectional overhead garage door operator system.

(c) In the case of a vertically moving combination sectional overhead garage door operator system, the door shall comply with the requirements in ANSI/DASMA 102 (incorporated by reference, see § 1211.40).

(d) In addition to the inherent primary entrapment protection as required by § 1211.6(a), a horizontally sliding residential garage door operator shall comply with one of the following:

(1) Shall be constructed to:

(i) Require constant pressure on a control to close the door;

(ii) Reverse direction and open the door a minimum of 2 in (50.8 mm) when constant pressure on a control is removed prior to operator reaching its position limit; and

(iii) Stop the door if a second obstruction is detected in the reverse direction.

(2) Shall be provided with a means for connection of an external secondary entrapment protection device for each leading edge as described in § 1211.8.

(e) A mechanical switch or a relay used in an entrapment protection circuit of an operator shall withstand 100,000 cycles of operation controlling a load no less severe (voltage, current, power factor, inrush and similar ratings) than it controls in the operator, and shall function normally upon completion of the test.

(f) In addition to complying with paragraph (e) of this section, in the event of a malfunction of a switch or relay (open or short) described in paragraph (c) of this section results in loss of any entrapment protection required by §§ 1211.7(a), 1211.7(b)(7), 1211.7(c)(7), 1211.8(a), or 1211.8(b), the door operator shall become inoperative at the end of the opening or closing operation, the door operator shall move the door to, and stay within, 1 foot (305 mm) of the uppermost position.

6. Revise § 1211.7 to read as follows:

**§ 1211.7 Inherent primary entrapment protection requirements.**

(a) *General requirements.* A vertically moving residential garage door operator system shall be supplied with inherent primary entrapment protection that complies with the requirements as specified in paragraph (b) of this section. A horizontally sliding residential garage door operator system shall be supplied with inherent primary entrapment protection that complies with the requirements as specified in paragraph (c) of this section.

(b) *Inherent primary entrapment protection, vertically moving doors.* (1)(i) For a vertically moving residential garage door operator system, other than for the first 1 foot

(305mm) of door travel from the full upmost position both with and without any secondary external entrapment protection device functional, the operator of a downward moving residential garage door shall initiate reversal of the door within 2 seconds of contact with the obstruction as specified in subparagraph (b)(3) of this section. After reversing the door, the operator shall return the door to, and stop at, the full upmost position. Compliance shall be determined in accordance with paragraphs (b)(3) through (10) of this section.

(ii) The door operator is not required to return the door to, and stop the door at, the full upmost position when the operator senses a second obstruction during the upward travel.

(iii) The door operator is not required to return the door to, and stop the door at, the full upmost position when a control is actuated to stop the door during the upward travel—but the door can not be moved downward until the operator reverses the door a minimum of 2 inches (50.8 mm).

(2) The test shall be performed on a representative operating system installed in accordance with the manufacturer's installation instructions with the operator exerting a 25-lbf (111.21-N) pull or its rated pull, whichever is greater.

(3)(i) A solid object is to be placed on the floor of the test installation and at various heights under the edge of the door and located in line with the driving point of the operator. When tested on the floor, the object shall be 1 inch (25.4 mm) high. In the test installation, the bottom edge of the door under the driving force of the operator is to be against the floor when the door is fully closed.

(ii) For operators other than those attached to the door, a solid object is not required to be located in line with the driving point of the operator. The solid object is to be located at points at the center, and within 1 foot of each end of the door.

(iii) To test operators for compliance with requirements in paragraphs (b)(1)(iii), (b)(7)(iii), and (b)(8)(iii) of this section and § 1211.13(c), a solid rectangular object measuring 4 inches (102 mm) high by 6 inches (152 mm) wide by a minimum of 6 inches (152 mm) long is to be placed on the floor of the test installation to provide a 4-inch (102 mm) high obstruction when operated from a partially open position.

(4) An operator is to be tested for compliance with paragraph (b)(1) of this section for 50 open-and-close cycles of operation while the operator is connected to the type of residential garage door with which it is intended to be used or with the doors specified in paragraph (b)(6) of this section. For an operator having a force adjustment on the operator, the force is to be adjusted to the maximum setting or at the setting that represents the most severe operating condition. Any accessories having an effect on the intended operation of entrapment protection functions that are intended for use with the operator, are to be attached and the test is to be repeated for one additional cycle.

(5) For an operator that is to be adjusted (limit and force) according to instructions supplied with the operator, the operator is to be tested for 10 additional obstruction cycles using the solid object described in paragraph (b)(3) of this section at the maximum setting or at the setting that represents the most severe operating condition.

(6) For an operator that is intended to be used with more than one type of door, one sample of the operator is to be tested on a sectional door with a curved track and one sample is to be tested on a one-piece door with jamb hardware and no track. For an

operator that is not intended for use on either or both types of doors, a one-piece door with track hardware or a one-piece door with pivot hardware shall be used for the tests. For an operator that is intended for use with a specifically dedicated door or doors, a representative door or doors shall be used for the tests. See the marking requirements at § 1211.18.

(7)(i) An operator, employing an inherent entrapment protection system that measures or monitors the actual position of the door, shall initiate reversal of the door and shall return the door to, and stop the door at, the full upmost position in the event the inherent door operating “profile” of the door differs from the originally set parameters. The entrapment protection system shall measure or monitor the position of the door at increments not greater than 1 inch (25.4 mm).

(ii) The door operator is not required to return the door to, and stop the door at, the full upmost position when an inherent entrapment circuit senses an obstruction during the upward travel.

(iii) The door operator is not required to return the door to, and stop the door at, the full upmost position when a control is actuated to stop the door during the upward travel—but the door can not be moved downward until the operator reverses the door a minimum of 2 inches (50.8 mm).

(8)(i) An operator, using an inherent entrapment protection system that does not measure or monitor the actual position of the door, shall initiate reversal of the door and shall return the door, to and stop the door at the full upmost position, when the lower limiting device is not actuated in 30 seconds or less following the initiation of the close cycle.



(ii) The door operator is not required to return the door to, and stop the door at, the full upmost position when an inherent entrapment circuit senses an obstruction during the upward travel. When the door is stopped manually during its descent, the 30 seconds shall be measured from the resumption of the close cycle.

(iii) The door operator is not required to return the door to, and stop the door at, the full upmost position when a control is actuated to stop the door during the upward travel—but the door can not be moved downward until the operator reverses the door a minimum of 2 inches (50.8 mm). When the door is stopped manually during its descent, the 30 seconds shall be measured from the resumption of the close cycle.

(9) To determine compliance with paragraph (b)(7) or (8) of this section, an operator is to be subjected to 10 open-and-close cycles of operation while connected to the door or doors specified in paragraphs (b)(4) and (6) of this section. The cycles are not required to be consecutive. Motor cooling-off periods during the test meet the intent of the requirement. The means supplied to comply with the requirement in paragraph (b)(1) of this section and § 1211.8(a) or (b) are to be defeated during the test. An obstructing object is to be used so that the door is not capable of activating a lower limiting device.

(10) During the closing cycle referred to in paragraph (b)(9) of this section, the system providing compliance with paragraphs (b)(1) and (7) of this section or paragraphs (b)(1) and (8) of this section shall function regardless of a short- or open-circuit anywhere in any low-voltage external wiring, any external entrapment devices, or any other external component.

(c) *Inherent primary entrapment protection, horizontally sliding doors.* (1)(i) For a horizontally sliding residential garage door operator system, other than for the first 1 foot

(305mm) of door travel from the full closed position both with and without any external entrapment protection device functional, the operator of a closing residential garage door shall initiate reversal of the door within 2 seconds of contact with the obstruction as specified in paragraph (c)(3) of this section. After reversing the door, the operator shall open the door a minimum of 2 inches (50.8 mm) from the edge of the obstruction. Compliance shall be determined in accordance with paragraphs (c)(2) through (10) of this section.

(ii) The door operator is not required to open the door a minimum 2 inches (50.8 mm) when the operator senses a second obstruction during the closing direction of travel.

(iii) The door operator is not required to open the door a minimum 2 inches (50.8 mm) when a control is actuated to stop the door during movement towards the open position – but the door can not be moved towards the open position until the operator reverses the door a minimum of 2 inches (50.8 mm).

(2) The test shall be performed on a representative operating system installed in accordance with the manufacturer's installation instructions with the operator exerting a 25-lbf (111.21-N) pull or its rated pull, whichever is greater.

(3)(i) A solid object is to be placed on the floor of the test installation and rigidly supported within the bottom track and then repeated with the solid object placed on the floor and rigidly supported external to the track. The test shall then be repeated with the solid object rigidly supported at heights of 1 ft (305 mm), 3 ft (914 mm), 5 ft (1524 mm), and within 1 ft (305 mm) of the top edge. The object shall be 1 inch (25.4 mm) in width.

(ii) For operators other than those attached to the door, a solid object is not required to be located in line with the driving point of the operator. The solid object is to be located at points at the center and within 1 ft of each end of the door opening.

(iii) To test operators for compliance with paragraphs (c)(1)(iii), (c)(7)(iii), and (c)(8)(iii) of this section, and § 1211.13(c), a solid rectangular object measuring 4 inches (102 mm) high by 6 inches (152 mm) wide by a minimum of 6 in (152 mm) long is to be placed on the floor of the test installation to provide a 4 in (102 mm) high obstruction when operated from a partially open position with the test repeated with the bottom edge of the obstruction rigidly supported at heights of 1 ft (305 mm), 3ft (914 mm), 5ft (1524 mm), and within 1 ft (305 mm) of the top edge.

(4) An operator is to be tested for compliance with paragraph (c)(1) of this section for 50 open-and-close cycles of operation while the operator is connected to the type of residential garage door with which it is intended to be used or with the doors specified in paragraph (c)(6) of this section. For an operator having a force adjustment on the operator, the force is to be adjusted to the maximum setting or at the setting that represents the most severe operating condition. Any accessories having an effect on the intended operation of entrapment protection functions that are intended for use with the operator, are to be attached and the test is to be repeated for one additional cycle.

(5) For an operator that is to be adjusted (limit and force) according to instructions supplied with the operator, the operator is to be tested for 10 additional obstruction cycles using the solid object described in paragraph (c)(3) of this section at the maximum setting or at the setting that represents the most severe operating condition.

(6) For an operator that is intended to be used with more than one type of door, one sample of the operator is to be tested on a sectional door with a curved track and one sample is to be tested on a one-piece door with jamb hardware and no track. For an operator that is not intended for use on either or both of these types of doors, a one-piece door with track hardware or a one-piece door with pivot hardware shall be used for the tests. For an operator that is intended for use with a specifically dedicated door or doors, a representative door or doors shall be used for the tests. See the marking requirements in § 1211.18.

(7)(i) An operator, employing an inherent entrapment protection control that measures or monitors the actual position of the door, shall initiate reversal of the door and shall return the door to, and stop the door at, the fully closed position in the event the inherent door operation "profile" of the door differs from the originally set parameters. The system shall measure or monitor the position of the door at increments not greater than 1 inch (25.4 mm).

(ii) The door operator is not required to open the door a minimum 2 inches (50.8 mm) when an inherent entrapment circuit senses an obstruction during the reversing travel.

(iii) The door operator is not required to open the door a minimum 2 inches (50.8 mm) when a control is actuated to stop the door during the opening direction – but the door can not be moved in the closing direction until the operator reverses the door a minimum of 2 inches (50.8 mm).

(8)(i) An operator, using an inherent entrapment protection system that does not measure or monitor the actual position of the door, shall initiate reversal of the door and

shall open the door a minimum 2 inches (50.8 mm) when the closed position limit device is not actuated within 30 seconds or less following the initiation of the close cycle.

(ii) The door operator is not required to open the door a minimum 2 inches (50.8 mm) when an inherent entrapment circuit senses an obstruction during the reversing travel.

(iii) The door operator is not required to open the door a minimum 2 inches (50.8 mm) when a control is actuated to stop the door during the opening direction – but the door can not be moved in the closing direction until the operator has reversed the door a minimum of 2 inches (50.8 mm). When the door is stopped manually during its closing, the 30 seconds shall be measured from the resumption of the close cycle.

(9) To determine compliance with paragraph (c)(7) or (8) of this section, an operator is to be subjected to 10 open-and-close cycles of operation while connected to the door or doors specified in paragraphs (c)(4) and (6) of this section. The cycles are not required to be consecutive. Motor cooling-off periods during the test meet the intent of the requirement. The means supplied to comply with paragraph (c)(1) of this section and § 1211.8(b) are to be inoperative or defeated during the test. An obstructing object is to be used so that the door is not capable of activating a position limiting device.

(10) During the closing cycle referred to in paragraph (c)(9) of this section, the system providing compliance with paragraphs (c)(1) and (7) of this section or paragraphs (c)(1) and (8) of this section shall function regardless of a short- or open-circuit anywhere in any low-voltage external wiring, any external entrapment devices, or any other external component.

7. Revise § 1211.8 to read as follows:

**§ 1211.8 Secondary entrapment protection requirements.**

(a)(1) For a vertically moving door operator, a secondary entrapment protection device supplied with, or as an accessory to, an operator shall consist of:

(i) An external photoelectric sensor that when activated results in an operator that is closing a door to reverse direction of the door, returns the door to, and stops the door at the fully open position, and the sensor prevents an operator from closing an open door,

(ii) An external edge sensor installed on the edge of the door that, when activated results in an operator that is closing a door to reverse direction of the door, returns the door to, and stops the door at the fully open position, and the sensor prevents an operator from closing an open door,

(iii) An inherent door sensor independent of the system used to comply with § 1211.7 that, when activated, results in an operator that is closing a door to reverse direction of the door and the sensor prevents an operator from closing an open door, or

(iv) Any other external or internal device that provides entrapment protection equivalent to paragraph (a)(1)(i), (ii), or (iii) of this section.

(2) The door operator is not required to return the door to, and stop the door at, the fully open position when an inherent entrapment circuit senses an obstruction during the opening travel.

(3) The door operator is not required to return the door to, and stop the door at, the fully open position when a control is actuated to stop the door during the opening travel - but the door cannot be moved towards the closing direction until the operator has reversed the door a minimum of 2 inches (50.8 mm).

(b) For horizontal sliding garage door operators, a secondary entrapment protection device supplied with, or as an accessory to, an operator shall consist of:

(1) An external photoelectric sensor that, when activated, results in an operator that is closing or opening a door to reverse direction of the door for a minimum of 2 inches (50.8 mm); or

(2) An external edge sensor installed on the edge of the door that, when activated, results in an operator that is closing or opening a door to reverse direction of the door for a minimum of 2 inches (50.8 mm).

(c) With respect to paragraphs (a) and (b) of this section, the operator shall monitor for the presence and correct operation of the device at least once during each close cycle. Should the device not be present or a fault condition occurs which precludes the sensing of an obstruction, including an interruption of the wireless signal to the wireless device or an open or short circuit in the wiring that connects an external entrapment protection device to the operator and device's supply source, the operator shall be constructed such that:

(1) For a vertically moving door, the closing door shall open and an open door shall not close more than 1 foot (305 mm) below the upmost position;

(2) For a horizontally sliding door, the door shall not move in the opening or closing direction; or

(3) The operator shall function as required by § 1211.6(b)(1).

(d) An external entrapment protection device or system, when employing a wireless control, shall comply with paragraph (e) of this section when installed at its farthest distance from the operator as recommended in the installation instructions.

(e) An external entrapment protection device shall comply with the applicable requirements in §§ 1211.10, 1211.11, and 1211.12.

(f) An inherent secondary entrapment protection device described in §1211.6(b)(3) shall comply with the applicable requirements in § 1211.13. Software used in an inherent entrapment protection device shall comply with UL 1998 (incorporated by reference, see § 1211.40).

8. Amend § 1211.9 by revising paragraphs (a), (b)(2), and (c) to read as follows:

**§ 1211.9 Additional entrapment protection requirements.**

(a) A means to manually detach the door operator from the door shall be supplied. The gripping surface (handle) shall be colored red and shall be easily distinguishable from the rest of the operator. It shall be capable of being adjusted to a height of 6 feet (1.8 m) above the garage floor when the operator is installed according to the instructions specified in § 1211.16(a)(2). The means shall be constructed so that a hand firmly gripping it and applying a maximum of 50 pounds (223 N) of force shall detach the operator with the door obstructed in the down position. The obstructing object, as described in § 1211.7(b)(3)(i), is to be located in several different positions. A marking with instructions for detaching the operator shall be provided as required by § 1211.17(a), (b), and (j), as applicable.

(b) \* \* \*

(2) The door is capable of being moved to the 2-inch (50.8-mm) point from any position between closed and the 2-inch (50.8-mm) point.



(c) Actuation of a control that initiates movement of a door shall stop and may reverse the door on the closing cycle. On the opening cycle, actuation of a control shall stop the door but not reverse it.

\* \* \* \* \*

9. Revise § 1211.10 to read as follows:

**§ 1211.10 Requirements for all entrapment protection devices.**

(a) *General requirements.* (1) An external entrapment protection device shall perform its intended function when tested in accordance with paragraphs (a)(2) through (4) of this section.

(2) The device is to be installed in the intended manner and its terminals connected to circuits of the door operator as indicated by the installation instructions.

(3) The device is to be installed and tested at minimum and maximum heights and widths representative of recommended ranges specified in the installation instructions. For doors, if not specified, devices are to be tested on a minimum 7 foot (2.1 m) wide door and maximum 20 foot (6.1 m) wide door.

(4) If powered by a separate source of power, the power-input supply terminals are to be connected to supply circuits of rated voltage and frequency.

(5) An external entrapment protection device requiring alignment, such as a photoelectric sensor, shall be provided with a means, such as a visual indicator, to show proper alignment and operation of the device.

(b) *Current protection test.* (1) There shall be no damage to the entrapment protection circuitry if low voltage field-wiring terminals or leads are shortened or miswired to adjacent terminals.

(2) To determine compliance with paragraph (b)(1) of this section, an external entrapment protection device is to be connected to a door operator or other source of power in the intended manner, after which all connections to low voltage terminals or leads are to be reversed as pairs, reversed individually, or connected to any low voltage lead or adjacent terminal.

(3) After restoring the connections in the intended manner:

(i) A photoelectric sensor shall comply with the Normal Operation tests per § 1211.11(a) through (c); and

(ii) An edge sensor shall comply with the Normal Operation test, per § 1211.12(a).

(c) *Splash test.* (1) An external entrapment protection device intended to be installed inside a garage 3 feet or less above the floor shall withstand a water exposure as described in paragraph (c)(2) of this section without resulting in a risk of electric shock and shall function as intended, per paragraph (c)(3) of this section. After exposure, the external surface of the device may be dried before determining its functionality.

(2) External entrapment protection devices are to be indirectly sprayed using a hose having the free end fitted with a nozzle as illustrated in Figure 2 to subpart A and connected to a water supply capable of maintaining a flow rate of 5 gallons (19 liters) per minute as measured at the outlet orifice of the nozzle. The water from the hose is to be played, from all sides and at any angle against the floor under the device in such a manner most likely to cause water to splash the enclosure of electric components. However, the nozzle is not to be brought closer than 10 feet (3.05 m) horizontally to the device. The water is to be sprayed for 1 minute.

(3) After drying the external surface of the device:

(i) A photoelectric sensor shall comply with the Normal Operation Tests per § 1211.11(a) through (c); and

(ii) An edge sensor shall comply with the Normal Operation Test, per § 1211.12(a).

(iii) There shall be no water on uninsulated live parts of a line voltage circuit.

(d) *Ultraviolet light exposure test.* A polymeric material used as a functional part of a device that is exposed to outdoor weather conditions shall comply with the Ultraviolet Light Exposure Test described in UL 746C (incorporated by reference, see § 1211.40).

(e) *Resistance to impact test.* (1) An external entrapment protection device employing a polymeric or elastomeric material as a functional part shall be subjected to the impact test specified in paragraph (e)(2) of this section. As a result of the test:

(i) There shall be no cracking or breaking of the part; and

(ii) The part shall operate as intended, per paragraph (e)(4) of this section, or, if dislodged after the test, is capable of being restored to its original condition.

(2) Samples of the external entrapment protection device are to be subjected to the Resistance to Impact Test described in UL 746C (incorporated by reference, see § 1211.40). The external entrapment protection device is to be subjected to 5 foot-pound (6.8 J) impacts. Three samples are to be tested, each sample being subjected to three impacts at different points.

(3) In lieu of conducting the room temperature test described in paragraph (e)(2) of this section, each of three samples of a device exposed to outdoor weather when the door is the closed position are to be cooled to a temperature of minus  $31.0 \pm 3.6$  °F (minus  $35.0 \pm 2.0$  °C) and maintained at this temperature for 3 hours. Three samples of a device

employed inside the garage are to be cooled to a temperature of 32.0 °F (0.0 °C) and maintained at this temperature for 3 hours. While the sample is still cold, the samples are to be subjected to the impact test described in paragraph (e)(1) of this section.

(4) To determine compliance with paragraph (e)(1)(ii) of this section:

(i) A photoelectric sensor shall comply with the Normal Operation tests per § 1211.11(a) through (c); and

(ii) An edge sensor shall comply with the Normal Operation Test, per § 1211.12(a).

(f) *External entrapment protection devices with wireless control*—(1) *Initial test set-up.* (i) For a wireless device intended to be powered by a non-rechargeable battery, a fully charged battery shall be installed per the instructions or markings on the product. See § 1211.16 (a)(7).

(ii) An entrapment protection device or system employing a wireless control, or separately supplied for, shall be installed per the manufacturer's instructions.

(2) *Radiated immunity test.* (i) An external entrapment protection device when employing wireless control shall operate as specified in § 1211.8(a) through (e) as applicable; or is rendered inoperative (any case in which the operator will not complete a full cycle, open and close, of travel) when tested in accordance with paragraph (f)(2)(ii) of this section.

(ii) Compliance to paragraph (f)(2)(i) of this section is verified by simulating an obstruction during the period of the electric field strength test of § 1211.4(c).

(g) *Battery test for wireless devices.* (1) An external entrapment protection device when employing a battery powered wireless control shall operate as specified in § 1211.8(a) through (e) as applicable; or is rendered inoperative (any case in which the

operator will not complete a full cycle, open and close, of travel) when tested in accordance with paragraph (g)(2) of this section.

(2) Compliance with paragraph (g)(1) of this section shall be verified with battery charge at the following levels:

(i) Fully charged; and

(ii) Discharged per the manufacturer's recommendations to the wireless device's lowest operational voltage.

(3) An external entrapment protection device employing a battery powered wireless device operating under conditions with a fully discharged battery or when the battery is discharged sufficiently to cause the device or system to render the moving door inoperative, shall be considered a single point fault for complying with §§ 1211.5(b) and 1211.8(c).

(h) *Ambient light test for wireless device with IR communication.* (1) An external entrapment protection device, when employing an IR communication shall operate as specified in § 1211.8(a) through (e) as applicable; or is rendered inoperative (any case in which the operator will not complete a full cycle, open and close, of travel) when subjected to ambient light impinging at an angle of 15 to 20 degrees from the axis of the beam when tested in accordance with paragraph (h)(2) of this section.

(2) An external entrapment protection device when employing an IR communication shall be set up at maximum range per paragraph (h)(1) of this section. The ambient light test described in § 1211.11(e)(2) shall be conducted with the light source impinging on each IR receiver, one at a time that is part of the wireless control system between the external entrapment protection device and the operator.

10. Revise § 1211.11 to read as follows:

**§ 1211.11 Requirements for photoelectric sensors.**

(a) *Normal operation test.* When installed as described in § 1211.10(a)(1) through (4), a photoelectric sensor of a vertically moving door shall sense an obstruction as described in paragraph (c) of this section that is to be placed on the floor at three points over the width of the door opening, at distances of 1 foot (305 mm) from each end and the midpoint.

(b) *Normal operation test - Horizontally moving door.* When installed as described in § 1211.10(a)(1) through (4), a photoelectric sensor of a horizontally moving door shall be tested per paragraph (c) of this section that is to be placed on a level surface within the path of the moving door. The sensor is to be tested with the obstruction at a total of five different locations over the height of the door or gate opening. The locations shall include distances 1 in (25.4 mm) from each end, 1 ft (305 mm) from each end, and the midpoint.

(c) *Normal operation test – Obstruction.* The obstruction noted in paragraphs (a) and (b) of this section shall consist of a white vertical surface 6 inches (152 mm) high by 12 inches (305 mm) long. The obstruction is to be centered in the opening perpendicular to the plane of the door when in the closed position. See Figure 3 to subpart A.

(d) *Sensitivity test.* (1) When installed as described in § 1211.10(a)(1) through (4), a photoelectric sensor shall sense the presence of a moving object when tested according to paragraph (d)(2) of this section.

(2) The moving object is to consist of a  $1\frac{7}{8}$  inch (47.6 mm) diameter cylindrical rod,  $34\frac{1}{2}$  inches (876 mm) long, with the axis point being 34 inches (864 mm) from the end. The axis point is to be fixed at a point centered directly above the beam of the

photoelectric sensor 36 inches (914 mm) above the floor. The photoelectric sensor is to be mounted at the highest position as recommended by the manufacturer. The rod is to be swung as a pendulum through the photoelectric sensor's beam from a position 45 degrees from the plane of the door when in the closed position. See Figure 4 to subpart A.

(3) The test described in paragraph (d)(2) of this section is to be conducted at three points over the width of the door opening, at distances of 1 foot (305 mm) from each end and the midpoint.

(4) When the test fixture of Figure 4 to subpart A, prior to conduct of the test, interferes with the photoelectric sensor detection zone, the tests per paragraphs (d)(1) through (4) of this section may be conducted instead per paragraph (f)(4) of this section.

(e) *Ambient light test.* (1) A photoelectric sensor shall operate as specified in § 1211.8(a) and (c) when subjected to ambient light impinging at an angle of 15 to 20 degrees from the axis of the beam when tested according to paragraph (e)(2) of this section and, if appropriate, paragraph (e)(3) of this section.

(2) To determine compliance with paragraph (e)(1) of this section, a 500 watt incandescent or equivalent minimum rated, 3600K or lower color rated flood lamp is to be energized from a 120-volt, 60-hertz source. The lamp is to be positioned 5 feet from the front of the receiver and aimed directly at the sensor at an angle of 15 to 20 degrees from the axis of the beam. See Figure 5 to subpart A.

(3) If the photoelectric sensor uses a reflector, this test is to be repeated with the lamp aimed at the reflector.

(4) During the test conditions described in paragraphs (e)(2) and (e)(3) of this section, a photoelectric sensor shall comply with the normal operation test requirements described in paragraph (a) of this section, and

(i) A photoelectric sensor shall comply with sensitivity test requirements described in paragraph (d) of this section, and

(ii) An edge sensor shall comply with the normal operation test requirements described in § 1211.12.

(f) *Photoelectric sensor vertical arrays* (1) A vertical array shall be tested as required by paragraphs (a) through (e) of this section, except as noted in paragraphs (f)(2) through (5) of this section.

(2) The array shall comply with the Normal Operation tests specified in paragraphs (a) through (c) of this section, with the solid obstruction placed on the floor. In addition, the obstruction shall be placed at various locations over the height of the light curtain array in accordance with the light curtain coverage area per the manufacturer's instructions.

(3) In conducting the tests specified in paragraphs (a) through (c) of this section, when the product includes a blanking function whereby the light array is located directly in-line with the path of the door travel, and the door system is intended to detect any obstruction other than one in the "next" successive position that the door is programmed to travel, the obstruction is placed at any location other than the next successive door position expected by the system.

(4) The array shall comply with the Sensitivity Test specified in paragraph (d) of this section, except that the edge of the pendulum nearest to the array is to be located 2 in.



(50.8 mm) from one side of the plane of the array, rather than directly above one photoelectric sensor pair. For vertical arrays, this test need only be conducted with the test pendulum at the vertical height indicated in paragraph (d)(2) of this section.

(5) When conducting the Ambient Light Test specified in paragraph (e) of this section, the position of the light source shall be aligned per paragraph (e)(2) of this section based on the axis of the lowest beam or detection zone. This arrangement shall be used to determine compliance with the requirements specified in paragraph (f)(2) of this section (with the obstruction at the floor level) and paragraph (f)(4) of this section, which are the only conditions for which the ambient light is required to be applied.

11. Amend § 1211.12 by revising paragraphs (a)(1), (c)(1) and (2), and (d) to read as follows:

**§ 1211.12 Requirements for edge sensors.**

(a) \* \* \*

(1) When installed on a representative residential door edge, an edge sensor shall actuate upon the application of a 15 pounds (66.7 N) or less force in the direction of the application. For an edge sensor intended to be used on a sectional door, the force is to be applied by the longitudinal edge of a 1<sup>7</sup>/<sub>8</sub> inch (47.6 mm) diameter cylinder placed across the switch so that the axis is perpendicular to the plane of the door. For an edge sensor intended to be used on a one piece door, the force is to be applied so that the axis is at an angle 30 degrees from the direction perpendicular to the plane of the door. See Figure 6 to subpart A.

\* \* \* \* \*

(c) \* \* \*

(1) An elastomeric material used as a functional part of an edge sensor shall function as intended when subjected to:

- (i) Accelerated Aging Test of Gaskets, stated in paragraph (c)(3) of this section,
- (ii) Compliance to the Standard for Gaskets and Seals, UL 157, fulfills this requirement (see paragraph (c)(2) of this section for UL contact information); and
- (iii) Puncture Resistance Test, stated in paragraph (d) of this section.

(2) An elastomeric material used for a functional part that is exposed to outdoor weather conditions when the door is in the closed position shall have physical properties as specified in the Table to subpart A after being conditioned in accordance with the Ultraviolet Light Exposure Test described in UL 746C (incorporated by reference, see § 1211.40).

\* \* \* \* \*

(d) *Puncture resistance test.* (1) After being subjected to the tests described in paragraph (d)(2) or (3) of this section, an elastomeric material that is a functional part of an edge sensor shall:

- (i) Not be damaged in a manner that would adversely affect the intended operation of the edge sensor, and
- (ii) Maintain enclosure integrity if it serves to reduce the likelihood of contamination of electrical contacts.

(2) For a vertically moving door, a sample of the edge sensor is to be installed in the intended manner on a representative door edge. The probe described in Figure 7 to subpart A is to be applied with a 20 pound-force (89N) to any point on the sensor that is 3 inches (76 mm) or less above the floor is to be applied in the direction specified in the

Edge Sensor Normal Operation Test, Figure 6 to subpart A. The test is to be repeated on three locations on each surface of the sensor being tested.

(3) For horizontally sliding doors, sample of the edge sensor is to be installed in the intended manner on a representative door edge. The probe described in Figure 7 to subpart A is to be applied with a 20 lbf (89 N) to any point on the sensor when the door is within 3 in (76 mm) of its fully open position and within 3 in (76 mm) of any stationary wall. For each type of door, the force is to be applied in the direction specified in the Edge Sensor Normal Operation Test, Figure 6 to subpart A. The test is to be repeated on three locations on each surface of the sensor being tested.

13. Revise § 1211.13 to read as follows:

**1211.13 Inherent force activated secondary door sensors.**

(a) *General.* (1) A force activated door sensor of a door system installed according to the installation instructions shall actuate in accordance with paragraphs (b) through (f) of this section, which are to be conducted in sequence on a single system sample, except for the separate test sequences of paragraph (a)(2) of this section.

(2) The system shall actuate with the maximum and minimum specifications of the door, operator, and hardware.

(3) Tests conducted per paragraphs (b) through (f) of this section shall be performed with the force exerted by a drive adjusted to its highest value if the force can be adjusted by the user during use or user maintenance.

(4) The test cylinder referred to in paragraph (b)(7) of this section shall be a 1-7/8 in (47.6 mm) diameter cylinder placed under the door so that the axis is perpendicular to the plane of the door. See Figure 6 to subpart A.

(5) The measuring device referred to in paragraph (b)(1) of this section shall:

(i) Have an accuracy of +/- 1%;

(ii) Have a rise and fall time not exceeding 5 ms;

(iii) Have the equivalence of a spring constant of 2855 lb/in +/- 285 lb/in (500 N/mm, +/- 50 N/mm);

(iv) Be placed on a rigid, level surface; and

(v) Have a rigid plate with a diameter of 3.1 in (80 mm).

(vi) See paragraph (a)(6) of this section for test equipment alternatives for force measurements at 1 ft (305 mm) or greater for the tests conducted per paragraphs (b) and (d) of this section.

(6) With regard to the alternative test equipment referred to in paragraph (a)(5)(vi) of this section, the test device described in paragraph (b)(5) of this section for force measurements at 1 foot (305 mm) or greater shall be:

(i) A spring constant means such as specified in paragraph (a)(5) of this section;

(ii) A gravity based weight displacing means that suspends a weight off its supporting surface upon exceeding 15 lbf (67 N) such as the example shown in figures 8 through 10 of this subpart if the equipment described in paragraph (a)(5) of this section is applied before the tests specified in paragraph (c) of this section and after the tests specified in paragraph (d) of this section at the 1 ft (305 mm) height specified in paragraph (b)(6) of this section; or

(iii) The equivalent requirements of paragraphs (a)(6)(i) or (ii) of this section.

(7) The cycles specified in paragraph (d) of this section are not required to be consecutive. Continuous operation of the motor without cooling is not required.

(b) *Closing force test.* (1) The door shall stop and reverse within 2 seconds after contacting the obstruction. The door shall apply the following forces at the locations noted in paragraph (b)(2) of this section:

(i) 90 lbf (400 N) or less average during the first 0.75 seconds after 15 lbf (67 N) is exceeded from initial impact; and

(ii) 15 lbf (67 N) or less from 0.75 seconds after 15 lbf (67 N) is exceeded from initial impact until the door reverses.

(2) The test referred to in paragraph (b)(1) of this section shall be conducted at the following test height and locations along the edge of the door:

(i) The center point, at a height of 2 in (50.8) from the floor;

(ii) Within 1 ft (305 mm) of the end of the door, at a height of 2 in (50.8) from the floor; and

(iii) Within 1 ft (305 mm) of the other end of the door, at a height of 2 in (50.8) from the floor.

(3) The maximum force specified in paragraph (b)(1) of this section shall be tested by the door applying a force against the longitudinal edge of the test cylinder described in paragraph (a)(4) of this section.

(4) The equipment used to measure force for the test described in paragraph (b)(1) of this section shall be in accordance with the requirements of paragraph (a)(5) of this section.

(5) The door shall stop and reverse within 2 seconds after contacting the obstruction. The door shall apply a load of 15 lbf (67 N) or less in the closing direction along the path of door travel at the locations noted in paragraph (b)(6) of this section.

(6) The test described in paragraph (b)(5) of this section shall be conducted at the following points along the edge of the door:

(i) At the center at heights of 1 ft, 3 ft, and 5 ft (305 mm, 914 mm and 1.52 m) from the floor;

(ii) Within 1 ft (305 mm) of the end of the door, at heights of 1 ft, 3 ft, and 5 ft from the floor; and

(iii) Within 1 ft of the other end of the door at heights of 1 ft, 3 ft, and 5 ft from the floor.

(7) The maximum force described in paragraph (b)(5) of this section shall be tested by the door applying a force against the longitudinal edge of the test cylinder as described in paragraph (a)(4) of this section.

(8) The equipment used to measure forces for the test described in paragraph (b)(1) of this section shall be in accordance with the requirements of paragraph (a)(5) or (6) of this section.

(c) *Opening force test.* (1) The door shall stop within 2 seconds after a weight of 44 lb (20 kg) is applied to the door.

(2) The test described in paragraph (c)(1) of this section shall be conducted with the door starting from the fully closed position and at heights of approximately 1 ft, 3 ft, and 5 ft (305 mm, 914 mm and 1.52 m) from the floor.

(3) Test weight(s) shall be applied to sections of the door that are vertical in the initial stopped position for each test height prior to operator activation.

(d) *Fifty cycle test.* (1) With the door(s) at the test point(s) determined by the tests described in paragraphs (b) and (c) of this section to be most severe with respect to both

reversal time and force, the door system shall function as intended after 50 cycles of operation. After the last cycle, the system shall complete one additional cycle of opening the door to its fully open condition and closing the door to its fully closed position.

(2) The tests described in paragraphs (b) and (c) of this section shall be repeated upon completion of cycling test.

(e) *Adjustment of door weight.* At the point determined by the test described in paragraph (b)(5) of this section to be the most severe, weight is to be added to the door in 5.0 pound (2.26 Kg) increments and the tests of paragraphs (b) and (c) of this section are to be repeated until a total of 15.0 pounds (66.72 N) has been added to the door. Before performing each test cycle, the door is to be cycled 2 times to update the profile. Similarly, starting from normal weight plus 15.0 pounds, the tests described in paragraphs (b) and (c) of this section are to be repeated by subtracting weight in 5.0 pound increments until a total of 15.0 pounds has been subtracted from the door.

(f) *Obstruction test.* For a door traveling in the downward direction, when an inherent secondary entrapment protection device senses an obstruction and initiates a reversal, any control activation shall not move the door downward until the operator reverses the door a minimum of 2 inches (50.8 mm). The test is to be performed as described in § 1211.7(b)(3)(iii). The system may be initially manually re-profiled for the purpose of this test.

**§§ 1211.14 through 1211.17 [Redesignated as §§ 1211.16 through 1211.19]**

13. Redesignate §§ 1211.14 through 1211.17 as §§ 1211.16 through 1211.19 respectively.

14. Add new § 1211.14 to read as follows:

**§ 1211.14 Unattended operation requirements.**

(a) *General requirements.* (1) A residential garage door operator or system may permit unattended operation to close a garage door, provided the operator system complies with the additional requirements of paragraphs (b) through (e) of this section.

(2) Unattended operation shall not be permitted on one-piece garage doors or swinging garage doors. An operator intended for use with both sectional doors and one-piece or swinging doors that have an unattended operation close feature shall identify that the unattended operation closing feature is only permitted to be enabled when installed with a sectional door by complying with:

(i) The installation instructions stated in § 1211.16(b)(1)(ii);

(ii) The markings specified in § 1211.17(h); and

(iii) The carton markings specified in § 1211.18(m) when the carton references the unattended operation close feature.

(b) *Operator system.* The operator system shall require one or more intentional actions to enable unattended operation, such as setting a power head switch or wall-control switch. For an accessory requiring installation and set-up in order to enable unattended operation, the installation and set-up may be considered satisfying this requirement.

(c) *Alarm signal.* (1) The operator system shall provide an audible and visual alarm signal.

(2) The alarm shall signal for a minimum of 5 seconds before any unattended closing door movement.



(3) The audible signal shall be heard within the confines of a garage. The audio alarm signals for the alarm specified in paragraph (c)(1) of this section shall be generated by devices such as bells, horns, sirens, or buzzers. The signal shall have a frequency in the range of 700 to 3400 Hz, either a cycle of the sound level pulsations of 4 to 5 per second or one continuous tone, a sound level at least 45 dB 10 ft (305 cm) in front of the device over the voltage range of operation.

(4) The visual alarm signal described in paragraph (c)(1) of this section shall be visible within the confines of a garage using a flashing light of at least 40 watt incandescent or 360 lumens.

(d) *Controls.* (1) During the pre-motion signaling period defined in paragraph (c)(2) of this section, activation of any user door control (*e.g.*, wall control, wireless remote, keypad) shall prevent the pending unattended door movement. Door movement resulting from activation of a user door control is not prohibited.

(2) Upon activation of a user door control during unattended door movement, the door shall stop, and may reverse the door on the closing cycle. On the opening cycle, activation of a user door control shall stop the door but not reverse it.

(3) If an unattended door travelling in the closing direction is stopped and reversed by an entrapment protection device, the operator system shall be permitted one additional unattended operation attempt to close the door.

(4) After two attempts per paragraph (d)(3) of this section, the operator system shall suspend unattended operation. The operator system shall require a renewed, intended input, via user door control (*e.g.*, wall control wireless remote, keypad) other than the unattended activation device, prior to re-enabling unattended operation.

(e) *Entrapment protection.* For a moving door, entrapment protection shall comply with §§ 1211.7 and 1211.8.

15. Add new § 1211.15 to read as follows:

**§ 1211.15 Vertically moving combination rigid one-piece overhead residential garage door and operator system.**

(a) A vertically moving combination rigid one-piece overhead residential garage door and operator system shall comply with the applicable residential garage door operator requirements in this standard and shall additionally comply with the following:

(1) The speed of the door edge during the opening or closing motion shall not exceed 6 in (152 mm) per second.

(2) The system shall be supplied with two additional independent secondary entrapment protection devices complying with Secondary Entrapment Protection, § 1211.8. When photoelectric sensors are used, a minimum of two sensors in addition to a third secondary device shall be supplied. The instructions shall state that one photoelectric sensor shall be positioned to comply with § 1211.11 and the other(s) shall be positioned on the left and right sides of the door to detect solid objects that would be within the space where the door moves as it opens or closes.

(3) A means to manually detach both door operators from the door shall be provided. For systems where the mechanical drive is located on a wall adjacent to the door, the manual detachment means is not required to comply with § 1211.9(a). Instead, the manual detachment means shall be located 5 ft (1.52 m) above the floor, shall not require a torque of more than 5 ft-lb (6.78 N-m) to initiate disconnection when the door is obstructed, and shall be clearly marked with operating instructions adjacent to the

mechanism. The gripping surface (handle) shall be colored red and shall be distinguishable from the rest of the operator. The marking which includes instructions for detaching the operator shall be provided in accordance with § 1211.17(a), (b), and (j) as applicable.

(4) A means (interlock) shall be supplied to de-energize the operator whenever the operator is manually detached from the door.

(5) A means (interlock) shall be supplied to de-energize the operator whenever an operable window or access (service) door that is mounted in the garage door is opened perpendicular to the surface of the garage door.

(6) The door shall not move outward from the exterior wall surface during the opening or closing cycle.

(7) The moving parts of the door or door system (mounting hardware, track assembly, and components that make up the door) shall be guarded.

(8) A horizontal track assembly, including installation hardware, shall support a dead load equal to the door weight when the door is in the horizontal position.

(9) Instructions for the installation of operable windows and access (service) doors and the interlocks specified in paragraph (a)(5) of this section shall be supplied with the operator.

(b) [Reserved]

16. Revise newly redesignated § 1211.16 to read as follows:

**§ 1211.16 Instruction manual.**

(a) *General.* (1) A residential garage door operator shall be provided with an instruction manual. The instruction manual shall give complete instructions for the installation, operation, and user maintenance of the operator.

(2) Instructions that clearly detail installation and adjustment procedures required to effect proper operation of the safety means provided shall be provided with each door operator.

(3) A residential garage door or door operator shall be provided with complete and specific instructions for the correct adjustment of the control mechanism and the need for periodic checking and, if needed, adjustment of the control mechanism so as to maintain satisfactory operation of the door.

(4) The instruction manual shall include the important instructions specified in paragraphs (b)(1) and (2) of this section. All required text shall be legible and contrast with the background. Upper case letters of required text shall be no less than  $\frac{5}{64}$  inch (2.0 mm) high and lower case letters shall be no less than  $\frac{1}{16}$  inch (1.6 mm) high. Heading such as “Important Installation Instructions,” “Important Safety Instructions,” “Save These Instructions” and the words “Warning—To reduce the risk of severe injury or death to persons:” shall be in letters no less than  $\frac{3}{16}$  inch (4.8 mm) high.

(5) The instructions listed in paragraphs (b)(1) and (2) of this section shall be in the exact words specified or shall be in equally definitive terminology to those specified. No substitutes shall be used for the word “Warning.” The items may be numbered. The first and last items specified in paragraph (b)(2) of this section shall be first and last respectively. Other important and precautionary items considered appropriate by the manufacturer may be inserted.

(6) The instructions listed in paragraph (b)(1) of this section shall be located immediately prior to the installation instructions. The instructions listed in paragraph (b)(2) of this section shall be located immediately prior to user operation and maintenance instructions. In each case, the instructions shall be separate in format from other detailed instructions related to installation, operation and maintenance of the operator. All instructions, except installation instructions, shall be a permanent part of the manual(s).

(7) For an operator or system provided with an external entrapment protection device requiring a non-rechargeable battery, instructions shall be provided with the operator and/or the device for:

- (i) The rating, size, number, and type of battery(s) to be used; and
- (ii) The proper insertion, polarity, orientation, and replacement of the battery(s).

(8) For an operator or system provided with an external entrapment protection device or system utilizing wireless control, instructions shall be provided with the operator and/or the device for:

- (i) The proper method of configuring and initializing the wireless communication link between device and operator;
- (ii) The proper orientation, antenna positioning, and mounting location with regard to maintaining communication link between device and operator;
- (iii) The maximum range at which the wireless device will operate; and
- (iv) The proper location of the device where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction.

(9) When provided with a detachable supply cord, the operator instructions shall contain complete details concerning proper selection of the power supply cord replacement.

(10) The installation, operation, and maintenance instructions may be provided in electronic read-only media format only, such as CD-ROM, USB flash drive, or company website, if the following instructions are additionally provided with the operator in an instruction sheet, manual, booklet, or similar printed material:

(i) Residential garage doors and door operators, instructions of this section, as applicable.

(ii) [Reserved]

(11) The printed instruction material referenced in this section shall contain detailed instructions of how to obtain a printed copy of the material contained in electronic format.

(12) All printed instruction material referenced in this section shall also be provided in the electronic read-only media format.

(13) Instructions of a combination sectional overhead garage door operator system shall specify:

(i) The operator by manufacturer and model;

(ii) The door(s) by manufacturer(s), model(s), and maximum and minimum door width and height required for compliance to § 1211.6(a) and (c); and

(iii) Hardware required for compliance to § 1211.6(a) and (c).

(14) Installation and maintenance instructions of a combination sectional overhead garage door operator system shall indicate how to properly counter-balance the door.

(b) *Specific required instructions for residential garage door operators and systems.*

(1)(i) The Installation Instructions shall include the following instructions:

Important Installation Instructions

Warning—To reduce the risk of severe injury or death:

1. Read and follow all Installation Instructions.
2. Install only a properly balanced garage door. An improperly balanced door could cause severe injury. Have a qualified service person make repairs to cables, spring assemblies and other hardware before installing opener.
3. Remove all pull ropes and remove, or make inoperative, all locks connected to the garage door before installing opener.
4. Where possible, install door opener 7 feet or more above the floor. For products requiring an emergency release, mount the emergency release within reach, but at least 6 feet above the floor and avoiding contact with vehicles to avoid accidental release.
5. Do not connect opener to source of power until instructed to do so.
6. Locate control button: (a) within sight of door, (b) at a minimum height of 5 feet above floors, landings, steps, or any other adjacent walking surface so small children cannot reach it, and (c) away from all moving parts of the door.
7. Install Entrapment Warning Label next to the control button in a prominent location. Install the Emergency Release Marking. Attach the marking on or next to the emergency release.
8. After installing opener, the door must reverse when it contacts a 1½ inch high object (or a 2 by 4 board laid flat) on the floor.
9. For products having a manual release, instruct the end user on the operation of the manual release.
10. For horizontally sliding doors, Item 2 shall be replaced with “Have a qualified service person make repairs and hardware adjustments before installing the opener.”

(ii) In accordance with § 1211.14(a)(2), the installation instructions in paragraph (b)(1) of this section for a residential garage door operator intended for use with both sectional and one-piece door that has an unattended operation close feature shall comply with paragraph (b)(1) of this section and include:

“WARNING: To reduce the risk of injury to persons – Only enable [+] feature when installed with a sectional door,” where + is the unattended operation function.

(iii) Exception: For operators that automatically sense one piece door operation, the warning in paragraph (b)(1)(ii) of this section is not required.

(iv) For residential garage door operators that do not have permanent connection of the wiring system, the installation instructions shall include the following or equivalent text: "This operator not equipped for permanent wiring. Contact licensed electrician to install a suitable receptacle if one is not available."

(2) The User Instructions shall include the following instructions:

#### IMPORTANT SAFETY INSTRUCTIONS

Warning—To reduce the risk of severe injury or death:

1. READ AND FOLLOW ALL INSTRUCTIONS.
2. Never let children operate, or play with door controls. Keep the remote control away from children.
3. Always keep the moving door in sight and away from people and objects until it is completely closed. No one should cross the path of the moving door.
4. NEVER GO UNDER A STOPPED PARTIALLY OPEN DOOR.
5. Test door opener monthly. The garage door MUST reverse on contact with a 1½ inch object (or a 2 by 4 board laid flat) on the floor. After adjusting either the force or the limit of travel, retest the door opener. Failure to adjust the opener properly may cause severe injury or death.



6. For products requiring an emergency release, if possible, use the emergency release only when the door is closed. Use caution when using this release with the door open. Weak or broken springs may allow the door to fall rapidly, causing injury or death.

7. KEEP GARAGE DOOR PROPERLY BALANCE. See user's manual. An improperly balanced door could cause severe injury or death. Have a qualified service person make repairs to cables, spring assemblies and other hardware.

8. For operator systems equipped with an unattended operation feature, the following statement shall be included: "This operator system is equipped with an unattended operation feature. The door could move unexpectedly. NO ONE SHOULD CROSS THE PATH OF THE MOVING DOOR."

9. SAVE THESE INSTRUCTIONS.

10. For horizontally moving doors, Item 4 shall be replaced with "NEVER GO THROUGH A STOPPED, PARTIALLY OPEN DOOR".

11. For horizontally moving doors, Item 6 is not required.

12. For horizontally moving doors, Item 7 shall be replaced with "Have a qualified service person make repairs and hardware adjustments before installing the opener."

13. The installation instructions provided with a combination rigid one-piece overhead residential garage door and operator system shall specify the locations where attachments to the horizontal track shall be made for the purpose of supporting the track.

17. Amend newly redesignated § 1211.17 by:

- a. Adding paragraph (g)(2)(v);
- b. Redesignating paragraphs (h) and (i) as paragraphs (i) and (j) respectively;
- c. Adding new paragraph (h); and
- d. Adding paragraphs (k) through (m).

The revisions and additions read as follows:

**§ 1211.17 Field-installed labels.**

\* \* \* \* \*

(g) \* \* \*

(2) \* \* \*

(v) For products equipped with an unattended operation feature, the instructions shall include the following: "This operator system is equipped with an unattended operation feature. The door could move unexpectedly."

\* \* \* \* \*

(h)(1) In accordance with § 1211.14(a)(2), the instructions of a residential garage door operator intended for use with both sectional doors and either one-piece or swinging doors and are provided with an unattended operation feature shall comply with paragraph (g) of this section and include the following under the avoidance statements of paragraph (g)(2) of this section:

“Only enable [+] feature when installed with a sectional door.”, or equivalent, where + is the unattended operation closing function.

(2) For operators that automatically sense one piece door operation, this warning is not required.

\* \* \* \* \*

(k) Both the operator and the door that comprise a combination sectional overhead garage door operator system shall be provided with permanent labels. The labels shall contain the following statement or the equivalent: “WARNING: THIS OPERATOR AND DOOR FUNCTION AS A SYSTEM. IF EITHER THE DOOR OR THE HARDWARE MUST BE REPLACED, THE REPLACEMENT DOOR OR HARDWARE MUST BE IDENTICAL TO THE ORIGINAL EQUIPMENT WITH RESPECT TO MANUFACTURER AND MODEL TO MAINTAIN THE SAFETY OF

THE SYSTEM. SEE INSTRUCTION MANUAL.” The marking shall be visible to the user after installation without the need to remove any covers.

(l) A label specified in paragraph (m) of this section when intended to be affixed during installation shall:

(1) Be provided with the operator or door assembly; and

(2) Have installation instructions of how and where to install the label so that it is visible to the user after installation.

(m) The operator of a combination sectional overhead garage door operator system shall be provided with a permanent marking that contains the following statement or the equivalent: "NO USER SERVICEABLE PARTS INSIDE."

18. Amend newly redesignated § 1211.18 by:

a. Revising paragraphs (b)(3) and (c);

b. Redesignating paragraphs (f) through (k) as paragraphs (g) through (l);

c. Adding new paragraph (f);

d. Revise newly redesignated paragraphs (i), (j), and (k); and

e. Adding paragraphs (m) and (n).

The revisions and additions read as follows:

**§ 1211.18 UL marking requirements.**

\* \* \* \* \*

(b) \* \* \*

(3) The voltage, frequency, and input in amperes, VA, or watts. The ampere or VA rating shall be included unless the full-load power factor is 80 percent or more, or, for a

cord-connected appliance, unless the rating is 50 W or less. The number of phases shall be indicated when an appliance is for use on a polyphase circuit; and

\* \* \* \* \*

(c) The date code repetition cycle shall not be less than 20 years.

\* \* \* \* \*

(f) Exception No 3: The input in amperes or watts may be shown as part of the motor nameplate, if the appliance employs a single motor, the nameplate is readily visible after the appliance has been installed.

\* \* \* \* \*

(i) For products with user adjustments, a residential garage door operator shall be marked with the word “WARNING” and the following or equivalent, “Risk of entrapment. After adjusting either the force or limits of travel adjustments, insure that the door reverses on a 1½ inch (or a 2 by 4 board laid flat) high obstruction on the floor.” This marking shall be located where visible to the user when making the adjustments.

(j) For a separately supplied accessory, including external entrapment protection device, the instructions, packaging, or marking on the product shall indicate the accessory manufacturer's name and or model number and the type of appliance or appliances with which it is intended to be used—such as a residential garage door operator. Additionally, installation instructions, accompanying specifications sheet, or packaging of the accessory shall identify the appliance or appliances with which it is intended to be used by specifying the manufacturer's name and catalog or model number or by any other positive means to serve the identification purpose.

(k) An appliance provided with terminals or connectors for connection of a separately supplied accessory, such as an external entrapment protection device or system, shall be marked to identify the accessory intended to be connected to the terminals or connectors. The accessory identification shall be by manufacturer's name and catalog or model number or other means to allow for the identification of accessories intended for use with the appliance.

\* \* \* \* \*

(m)(1) In accordance with § 1211.14(a)(2), a residential garage door operator intended for use with both sectional and one-piece or swinging door that has an unattended operation close feature indicating the function in the carton markings shall include the following carton marking:

“WARNING: To reduce the risk of injury to persons – Only enable [+] feature when installed with sectional door,” where + is the unattended operation closing function.

(2) Exception: For operators that automatically sense one piece door operation, this warning is not required.

(n) A residential garage door operator is not required to be provided with permanent wiring systems when marked with the following or equivalent text: “This operator not equipped for permanent wiring. Contact licensed electrician to install a suitable receptacle if one is not available.” This marking is to be placed adjacent to the power cord entry.

19. Amend newly redesignated § 1211.19 by revising paragraph (b) to read as follows:

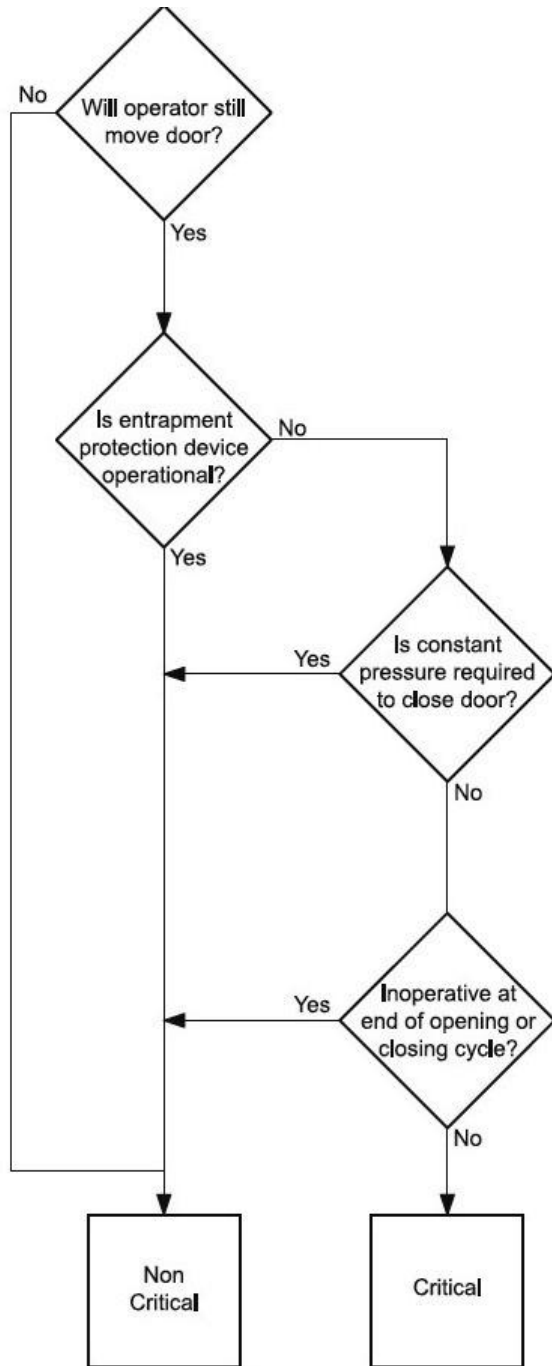
**§ 1211.19 Statutory labeling requirement.**

\* \* \* \* \*

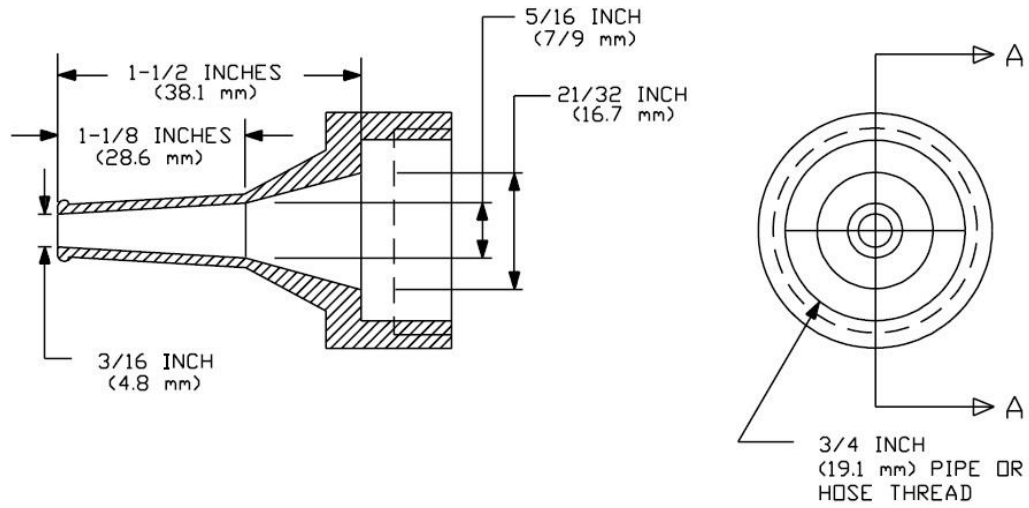
(b) The display of the UL logo or listing mark, and compliance with the date marking requirements stated in § 1211.18 of this subpart, on both the container and the system, shall satisfy the requirements of this subpart.

20. Add figures 1 through 10 to subpart A and the table to subpart A to the end of subpart A to part 1211 to read as follows:

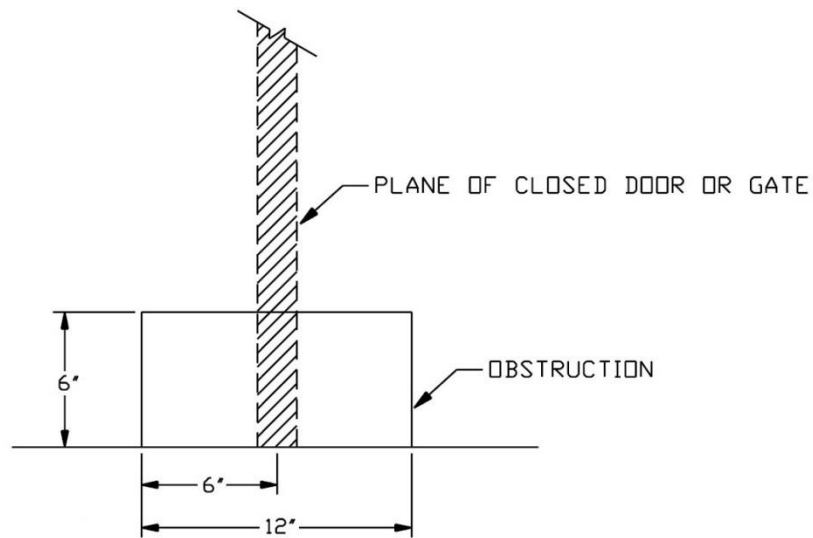
**Figure 1 to Subpart A of Part 1211 –Critical Condition Flow Chart for Residential Garage Door Operator Entrapment Protection Devices and Functions**



**Figure 2 to Subpart A of Part 1211—Nozzle SECTION A-A**

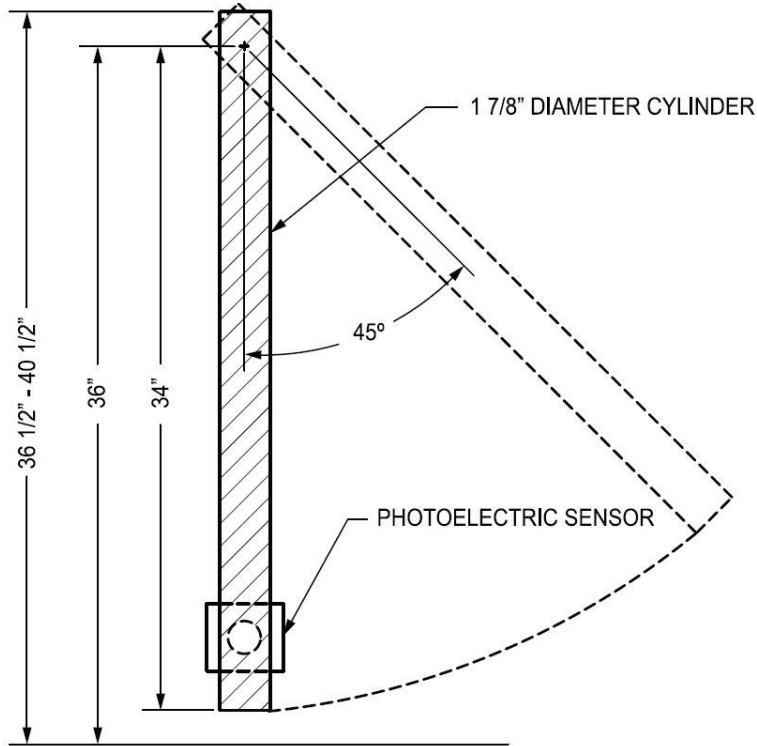


**Figure 3 to Subpart A of Part 1211—Stationary Obstruction**

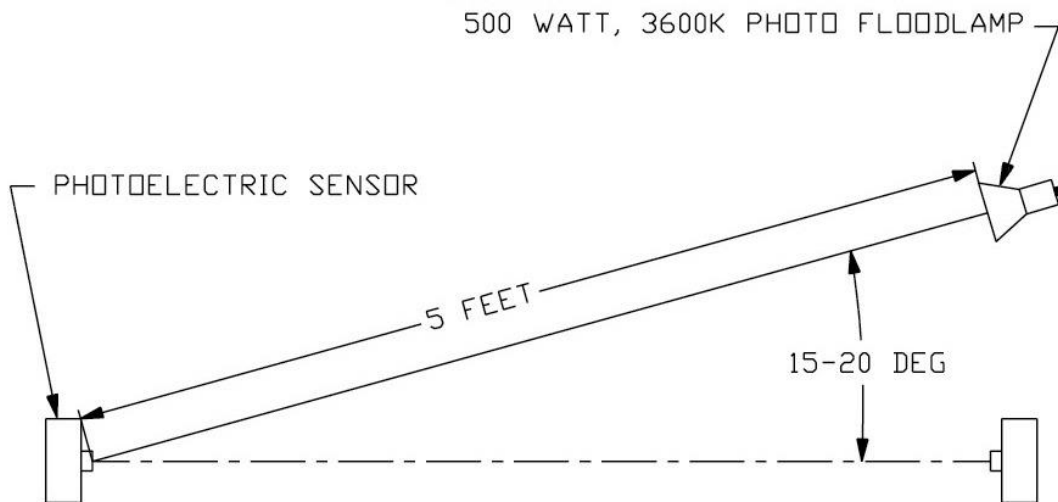




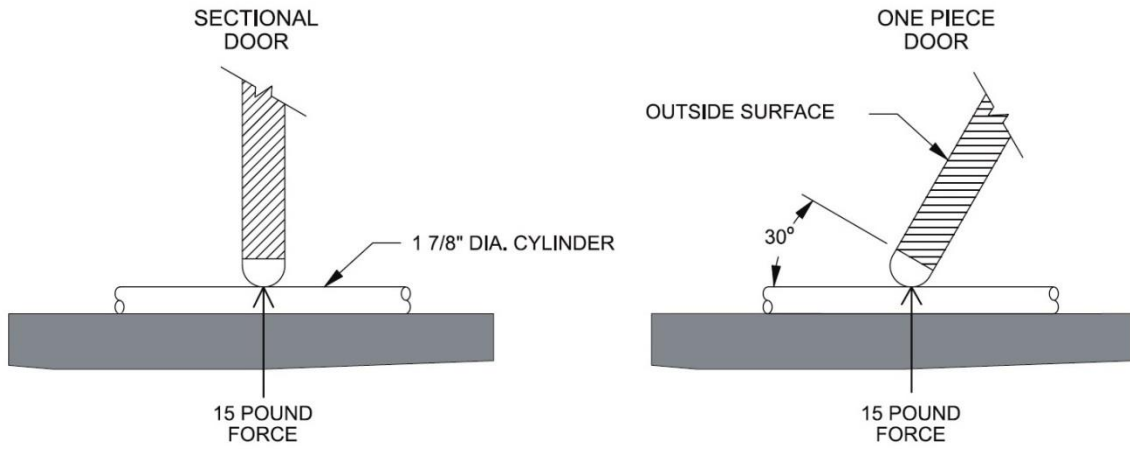
**Figure 4 to Subpart A of Part 1211—Moving Obstruction**



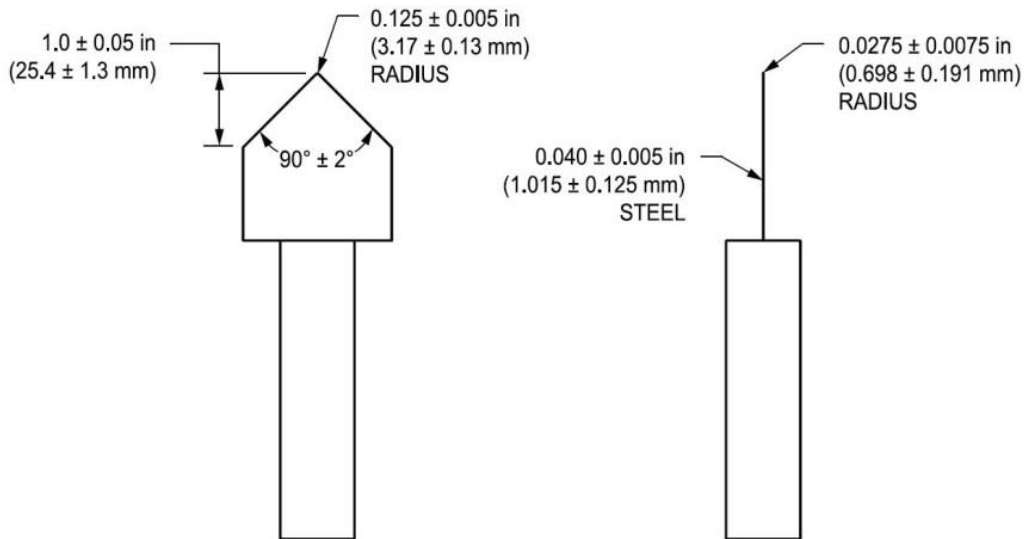
**Figure 5 to Subpart A of Part 1211—Ambient Light Test**



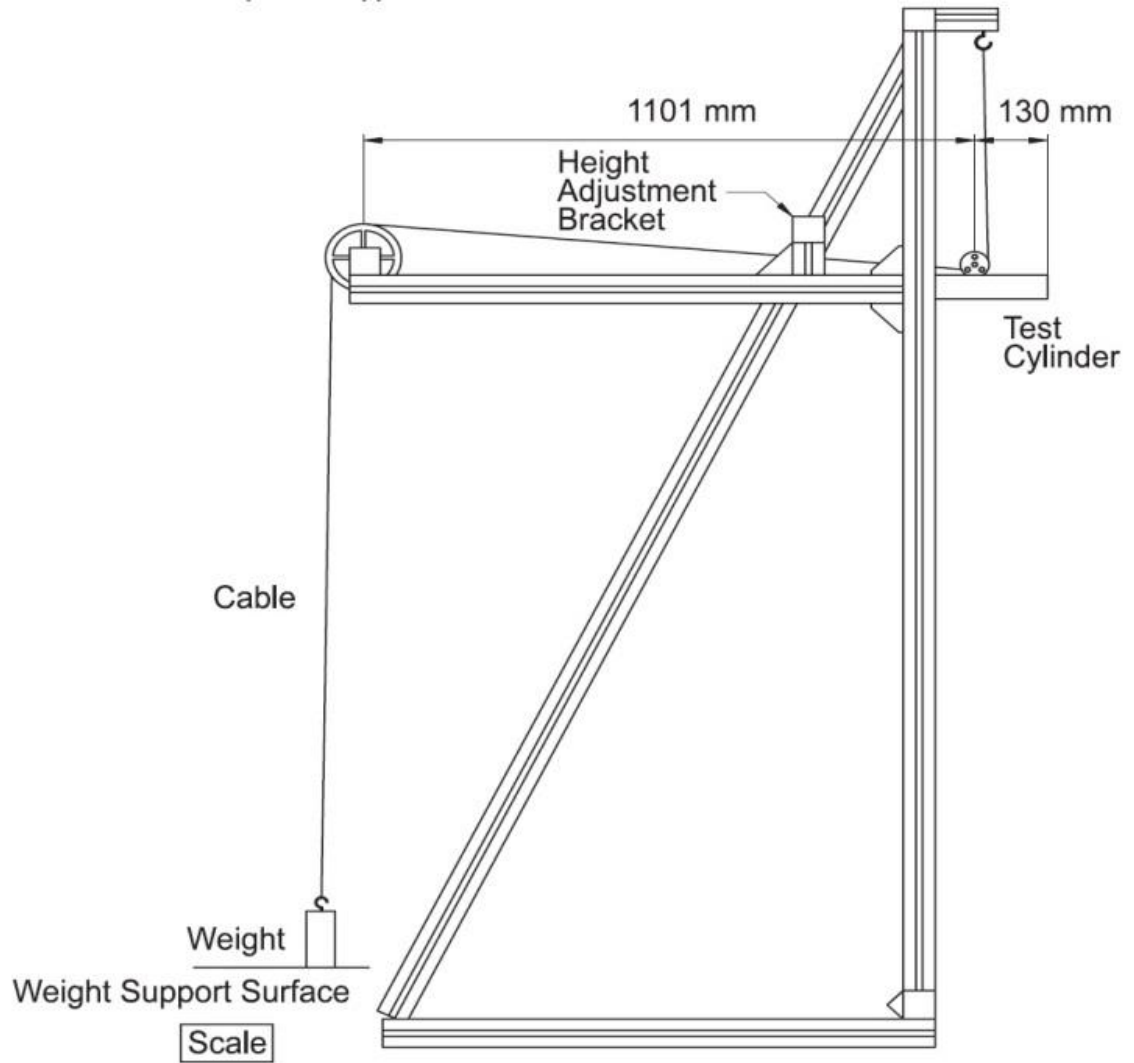
**Figure 6 to Subpart A of Part 1211—Edge Sensor Normal Operation Test**



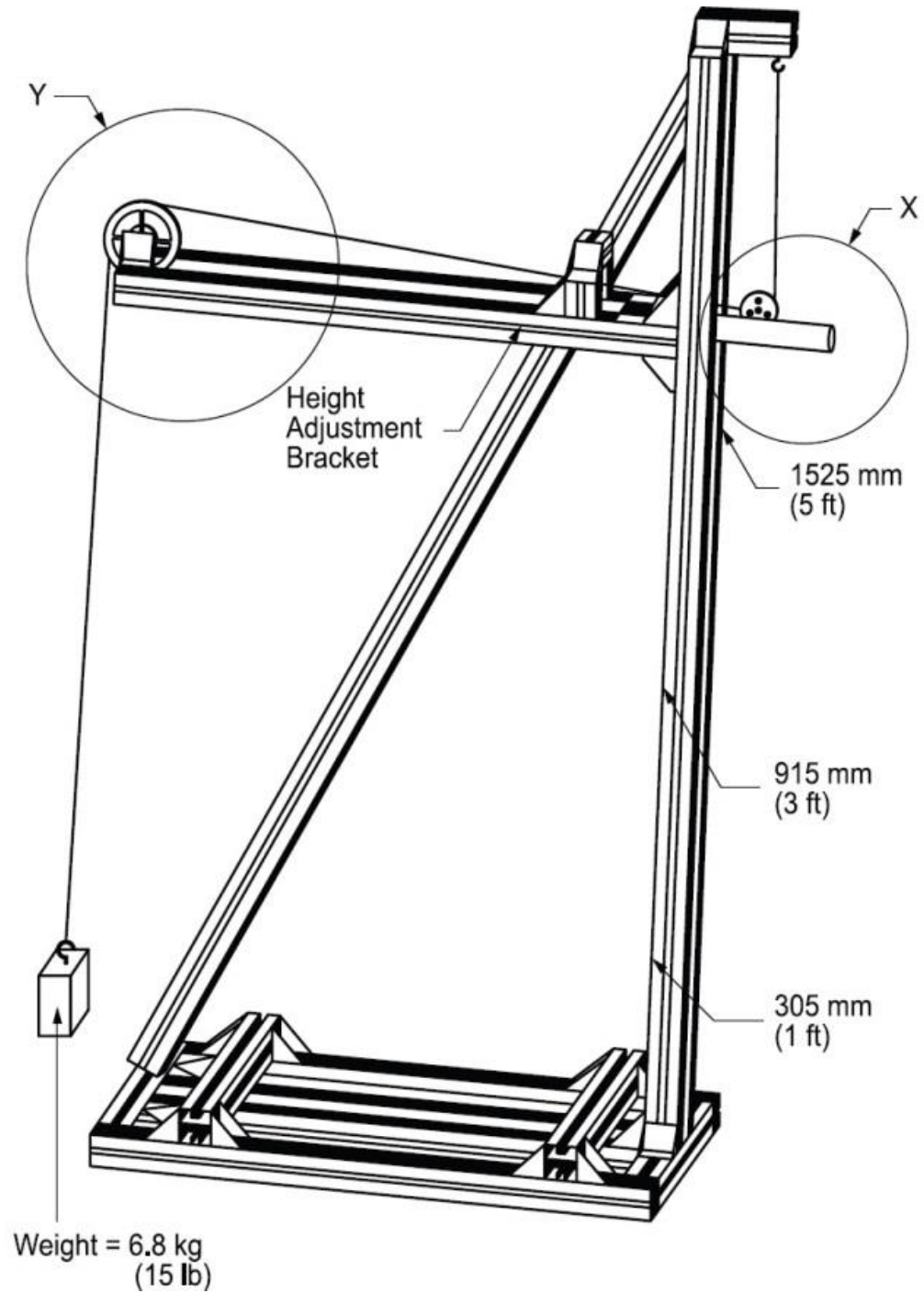
**Figure 7 to Subpart A of Part 1211—PUNCTURE PROBE**



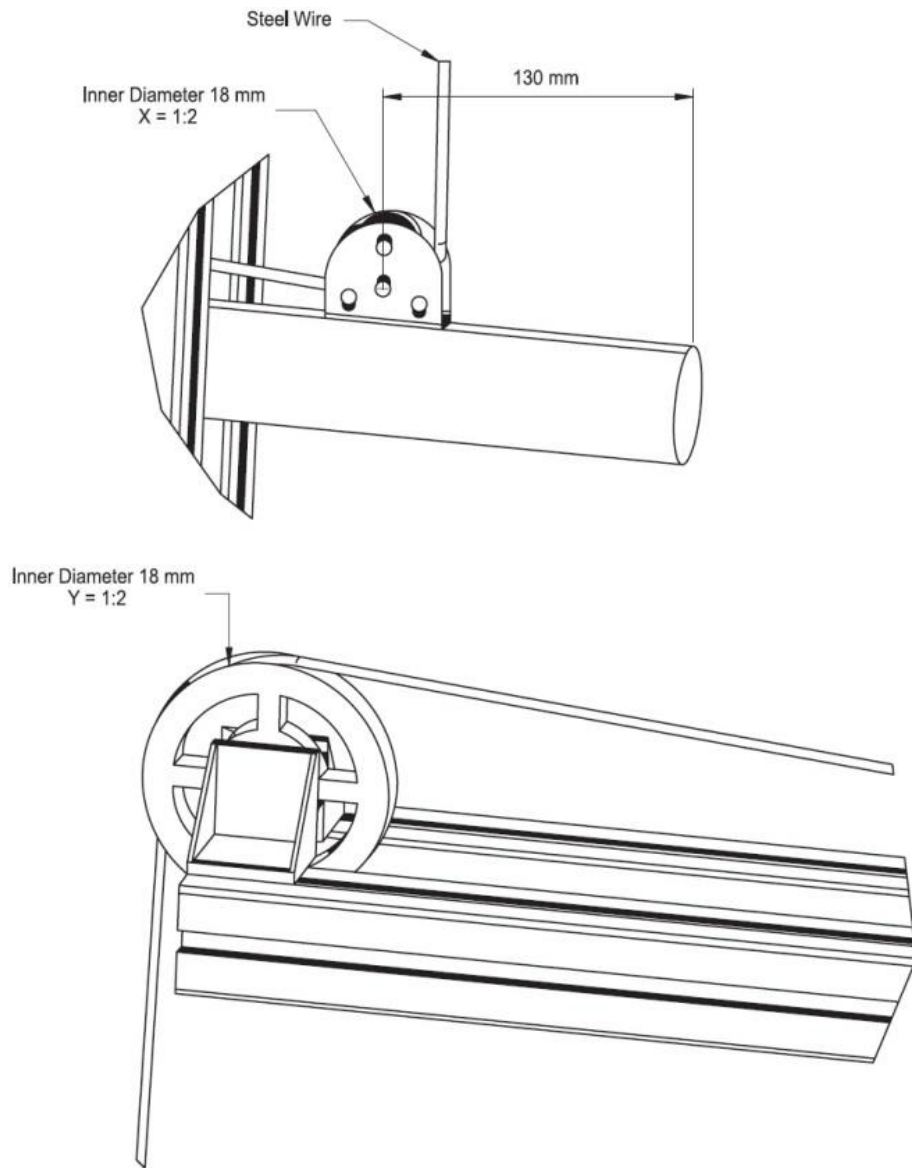
**Figure 8 to Subpart A of Part 1211—Example Test Apparatus for Measurements At 12 Inches or Greater**



**Figure 9 to Subpart A of Part 1211—Example Test Apparatus for Measurements  
At 12 Inches or Greater**



**Figure 10 to Subpart A of Part 1211—Example Test Apparatus for Measurements  
At 12 Inches or Greater**



**Table to Subpart A of Part 1211—Physical Properties of Gasket-Accelerated Aging Test**

Table 1

**PHYSICAL PROPERTIES OF GASKET-ACCELERATED AGING TEST**

	<b>Before Accelerated Aging</b>	<b>After Accelerated Aging</b>
<b>Recovery -- Maximum set when 2-inch (50.8-mm) gauge marks are stretched to 5 inches (127 mm), held for 2 minutes, and measured 2 minutes after release</b>	<b>1/2 inch (12.7 mm)</b>	<b>--</b>
<b>Elongation -- Minimum increase in distance between 2-inch gauge marks at break</b>	<b>250 percent [2 to 7 inches (50.8–178.8 mm)]</b>	<b>65 percent of original</b>
<b>Tensile Strength -- Minimum force at breaking point</b>	<b>850 pounds per square inch (59 mPa)</b>	<b>75 percent of original</b>

21. Add subpart D, consisting of § 1211.40, to read as follows:

**Subpart D—Incorporation by Reference**

**§ 1211.40 Incorporation by reference.**

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51.

All approved material is available for inspection at Consumer Product Safety Commission, Office of the Secretary, 4330 East West Highway, Bethesda, MD 20814, telephone 302-504-7923 and is available from the sources listed below. It is also

available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030 or go to [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(b) Door and Access Systems Manufacturers' Association, International (DASMA), 1300 Sumner Avenue, Cleveland, OH 44115-2851, Telephone: (216) 241-7333, <http://www.dasma.com/dasma-pages/D-AS-standards.asp>.

(1) ANSI/DASMA 102, Specifications for Sectional Doors, 2011 revision, dated May 19, 2011, into § 1211.6(c).

(2) [Reserved].

(c) National Fire Prevention Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269-9101, Telephone: (800) 344-3555, <http://www.nfpa.org/>.

(1) NFPA 70, National Electrical Code, 2014 edition, effective August 21, 2013, into § 1211.2(c).

(2) [Reserved].

(d) UL, formerly Underwriters Laboratories, International, 151 Eastern Avenue, Bensenville, IL 60106, Telephone: 1-888-853-3503, <http://ulstandards.ul.com/>

(1) UL 746C, Standard for Safety: Polymeric Materials—Use in Electrical Equipment Evaluations, Sixth Edition, dated September 10, 2004, into §§ 1211.10(d) and (e) and 1211.12(c).

(2) UL 991, Standard for Safety: Tests for Safety-Related Controls Employing Solid-State Devices, Third Edition, dated October 22, 2004, into §§ 1211.4(c) and 1211.5(b)(3).

(3) UL 1998, Standard for Safety: Software in Programmable Components, Third Edition, December 18, 2013, into § 1211.8(f).

Dated: March 30, 2016.

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Todd A. Stevenson,  
Secretary,  
Consumer Product Safety Commission

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