

Memorandum

Date: September 24, 2026

To: Millicent Robinette, Executive Officer
Kevin Goddard, Principal Safety Engineer
Occupational Safety and Health Standards Board

From: Victor Copelan, Senior Safety Engineer
Jason Denning, Principal Safety Engineer
Eric Berg, Deputy Chief of Health
Division of Occupational Safety and Health

Subject: Evaluation of Petition No. 614 to Amend California Code of Regulations title 8 section 3563

1.0 INTRODUCTION

On April 20, 2026, the Division of Occupational Safety and Health (Cal/OSHA) received a petition from Mr. Daniel Mustico, representing the Outdoor Power Equipment Institute, Inc. The petitioner requests that title 8, California Code of Regulations, Section 3563, Power Lawn Mowers, be amended to require power lawn mowers manufactured after April 15, 1999, to meet newer consensus standards than those currently referenced in section 3563. Currently, title 8 section 3563, requires power lawn mowers manufactured after April 15, 1999, to meet the requirements of the 2003 edition of ANSI B71.1 for pedestrian-controlled and riding lawn mowers or the 2004 edition of ANSI B71.4 for commercial turf care equipment.

2.0 PETITIONER'S PROPOSAL AND BASIS FOR AMENDMENT OF TITLE 8 REGULATIONS

The petitioner proposes to incorporate by reference the 2012 and 2017 editions of ANSI/OPEI B71, the 2012 and 2017 edition of ANSI/OPEI B71.4, and the 2024 editions of ANSI/OPEI 5395-2 and 5395-3. To address battery powered lawn mowers, the petitioner also proposes to incorporate by reference the 2017 edition of UL 1447, the 2018 edition of UL 2753, and the 2023 edition of UL 62841-4-3. Additionally, the petitioner proposes to remove the labeling requirements for power lawn mowers manufactured after September 2, 2010, required by subsection 3563(b)(3). The following are the changes to title 8 section 3563 as proposed by the petitioner.

Subchapter 7. General Industry Safety Orders
Group 3. General Plant Equipment and Special Operations
Article 20. Hand and Portable Powered Tools and Equipment

§3563. Power Lawn Mowers.

(a) Scope. These regulations apply to power lawn mowers and cover walk-behind reel and rotary power lawn mowers, riding reel and rotary power lawn mowers,

lawn riding tractors with mower attachments, and lawn and garden riding tractors with mower attachments. They are intended to provide safety requirements and to help ensure uniform operator environments. These regulations do not apply to sulky-type units, flail mowers, sickle bar mowers, or tractors as defined in Article 25 of these Orders unless the tractor is designed primarily for mowing lawns and manufactured in conformance with the applicable standards in clause (b) below. ~~ANSI B71.1 or B71.4 national consensus standards for power lawn mowers. Requirements for tractors and attachments used in mowing operations that are manufactured in conformance with the ANSI B71.1 and B71.4 standards are provided in this Section.~~

(b) General.

(1) Power lawn mowers placed in service after March 29, 1975 through April 15, 1999, shall meet the requirements of ANSI B71.1-1972 and B71.1a-1974 or ANSI B71.1-1980, Safety Specifications for Power Lawn Mowers, Lawn and Garden Tractors and Lawn Tractors, or shall meet the requirements of the applicable ANSI B71.1 or B71.4 standard in effect at the time the mower was manufactured.

(2) Power lawn mowers manufactured after April 15, 1999, shall meet the requirements of one of the following ANSI/OPEI B71.1 or B71.4 standards, or ANSI/OPEI 5395-2, 5395-3, or UL 62841-4-3, 1447, 2753, as applicable, based on the mower design and date of manufacture. These ~~ANSI~~ standards are hereby incorporated by reference:

ANSI/OPEI B71.1-1998 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications,

ANSI/OPEI B71.1-2003 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications,

ANSI/OPEI B71.1-2012 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications,

ANSI/OPEI B71.1-2017 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications,

ANSI/OPEI B71.4-1999 standard for Commercial Turf Care Equipment-Safety Specifications,

ANSI/OPEI B71.4-2004 standard for Commercial Turf Care Equipment-Safety Specifications.

ANSI/OPEI B71.4-2012 standard for Commercial Turf Care Equipment-Safety Specifications.

ANSI/OPEI B71.4-2017 standard for Commercial Turf Care Equipment-Safety Specifications.

ANSI/OPEI 5395-2-2024 standard for Combustion-Engine-Powered Lawnmowers - Part 2: Pedestrian-Controlled Lawnmowers

ANSI/OPEI 5395-3-2024 standard for Combustion-Engine-Powered Lawnmowers - Part 3: Ride-On Lawnmowers

UL 62841-4-3-2023 standard for Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery - Safety - Part 4-3: Particular Requirements for Pedestrian Controlled Walk-Behind Lawnmowers

UL 1447-2017 standard for Electric Lawn Mowers

UL 2753-2018 Outline of Investigation for Battery Operated Ride-On Lawn Mowers

~~(3) Power lawn mowers manufactured after September 2, 2010, shall be affixed~~

~~with a durable label stating that the power lawn mower is manufactured in accordance with the applicable ANSI B71.1 or B71.4 standard.~~

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The petitioner asserts that the ANSI B71.1 and B71.4 standards currently referenced in title 8 section 3563, have been revised by more recent editions. More importantly, the petitioner asserts that the 2017 editions of ANSI/OPEI B71.1 and B71.4 have been replaced by the 2024 editions of ANSI/OPEI 5395-2 and 5395-3. ANSI/OPEI 5395-2 and 5395-3 have also been harmonized with ISO standards. In addition, the petitioner opines that UL 1447-2017, UL 2753-2018, and UL 62841-4-3-2023 should be incorporated by reference to address the use of battery-powered lawn mowers. Finally, the petitioner argues that subsection 3563(b)(3) should be removed because the reference to the ANSI B71.1 and B71.4 standards is outdated, does not provide a safety benefit, and creates an undue burden on California employers.

3.0 APPLICABLE TITLE 8 REGULATIONS

California Code of Regulations, title 8, section 3563, of the General Industry Safety Orders addresses power lawn mowers and covers walk-behind reel and rotary lawn mowers, riding reel and rotary power lawn mowers, lawn riding tractors with mower attachments, and lawn and garden riding tractors with mower attachments.

Subchapter 7. General Industry Safety Orders
Group 3. General Plant Equipment and Special Operations
Article 20. Hand and Portable Powered Tools and Equipment

Section 3563. Power Lawn Mowers

(a) Scope. These regulations apply to power lawn mowers and cover walk-behind reel and rotary power lawn mowers, riding reel and rotary power lawn mowers, lawn riding tractors with mower attachments, and lawn and garden riding tractors with mower attachments. They are intended to provide safety requirements and to help ensure uniform operator environments. These regulations do not apply to sulky-type units, flail mowers, sickle bar mowers, or tractors as defined in Article 25 of these Orders unless the tractor is designed primarily for mowing lawns and manufactured in conformance with the ANSI B71.1 or B71.4 national consensus standards for power lawn mowers. Requirements for tractors and attachments used in mowing operations that are manufactured in conformance with the ANSI B71.1 and B71.4 standards are provided in this Section.

(b) General.

(1) Power lawn mowers placed in service after March 29, 1975 through April 15, 1999, shall meet the requirements of ANSI B71.1-1972 and B71.1a-1974 or ANSI B71.1-1980, Safety Specifications for Power Lawn Mowers, Lawn and Garden Tractors and Lawn Tractors, or shall meet the requirements of the applicable ANSI B71.1 or B71.4 standard in effect at the time the mower was manufactured.

(2) Power lawn mowers manufactured after April 15, 1999, shall meet the requirements of one of the following ANSI B71.1 or B71.4 standards, as

applicable, based on the mower design and date of manufacture. These ANSI standards are hereby incorporated by reference:

ANSI/OPEI B71.1-1998 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications,

ANSI B71.1-2003 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications,

ANSI/OPEI B71.4-1999 standard for Commercial Turf Care Equipment-Safety Specifications,

ANSI B71.4-2004 standard for Commercial Turf Care Equipment-Safety Specifications.

(3) Power lawn mowers manufactured after September 2, 2010, shall be affixed with a durable label stating that the power lawn mower is manufactured in accordance with the applicable ANSI B71.1 or B71.4 standard

(c) Roll-Over Protective Structures (ROPS) and Seat Belts. Effective March 1, 2011, when visual inspection or technical information from the manufacturer indicates that a riding lawn mower is designed by the manufacturer to be equipped with ROPS, or to accept ROPS as an option, ROPS engineered and approved for the mower shall be provided and used. Approved seat belt assemblies shall be provided and used on all riding lawn mowers where ROPS are installed.

Exception: The use of ROPS and seat belts may be temporarily suspended only when operating in areas where the vertical clearance is insufficient to allow a ROPS equipped mower to operate.

NOTE: The requirements for ROPS on agricultural and industrial tractors are provided in Article 25 of the General Industry Safety Orders.

(d) Prohibited use of Ride-on, Sit-down Lawn Mowers.

(1) Ride-on, sit-down lawn mowers shall not be used on slopes that exceed the angle limitation when specified by the manufacturer.

(2) When the manufacturer's instructions are not obtainable or do not specify the angle limits for operating ride-on, sit-down lawn mowers on sloped surfaces, a qualified person shall evaluate the terrain and slope conditions to ensure the mower is operated in a safe manner.

(3) Ride-on, sit-down lawn mowers shall not be operated in areas where the traction drive wheels, as measured from the outside wheel edge, are within 5 feet of the unprotected edges of retaining walls, embankments, levees, ditches, culverts, excavations or similar locations that present an overturn hazard.

(4) When it is necessary to operate a ride-on, sit-down mower near ponds, creeks, reservoirs, canals, sloughs, lakes, golf course water hazards and similar bodies of water, a qualified person shall evaluate the terrain and

any slope conditions to ensure the mower is operated at safe speeds and at safe distances from such hazards.

(e) Powered Lawn Mower Operator Training.

(1) Safe operation.

The employer shall ensure that each power lawn mower operator is competent to operate the mower safely, as demonstrated by the successful completion of the training and evaluation specified in this subsection. Prior to permitting an employee to operate a power lawn mower (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this subsection, except as permitted in subsection (e)(5).

(2) Training program implementation.

(A) All operator training and evaluation shall be conducted by qualified persons who have the knowledge, training and experience to train power lawn mower operators and evaluate their competence.

(B) Trainees may operate a power lawn mower only under the direct supervision of qualified persons provided that such operation does not endanger the trainee or other employees.

(C) Training shall consist of a combination of formal instruction (e.g., lecture, discussion, written material, audio visual material) and also include demonstrations by the trainer and practical exercises performed by the trainee and evaluation of the operator's performance.

(3) Training program content. Operators shall receive initial training to ensure that each employee who operates a power lawn mower has been provided training in the hazards associated with the operation of mowers and other topics necessary for the safe operation of mowers. Training shall include at least the following:

(A) Review of the manufacturer's operator's manual including operating instructions, warnings and precautions for the types of power lawn mowers the operator will be authorized to operate.

(B) Review of the operator controls and instrumentation for safe operation of the equipment.

(C) Review all safety devices to ensure guards and shields are kept securely in place.

(D) The importance of surveying the terrain for hazards prior to mowing to identify obstacles in the mowing path, such as large rocks, tree stumps, soft or wet spots, and the prohibited use areas for ride-on, sit-down mowers provided in subsection (d) of this section.

(E) Speed control, steering and maneuvering the mower.

(F) Review of stability and rollover hazards associated with operating riding lawn mowers on surfaces, terrains or areas such as, but not limited to loading ramps, wet surfaces, slopes, and areas near drop offs, retaining walls/embankments, water or ponds, unprotected ditches, culverts, or excavations.

(G) The use of ROPS and seatbelts for riding mowers that are equipped with ROPS.

(4) Refresher training and evaluation. Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by this subsection to ensure that the operator has the knowledge and skills needed to operate the power lawn mower safely.

Refresher training in relevant topics shall be provided to the operator when:

- (A) The operator has been observed to operate a mower in an unsafe manner;
- (B) The operator has been involved in an accident or near-miss incident;
- (C) The operator has received an evaluation that reveals that the operator is not operating a mower safely; or

- (D) The operator receives a new job assignment that includes operating a mower or machinery that the operator is unfamiliar with or includes mowing lawns on terrain or surfaces that present hazards unfamiliar to the operator in their current or past work assignments.

(5) Avoidance of duplicative training. If an operator has previously received training in a topic specified in subsection (e)(3) of this section, and such training is appropriate for the type of power lawn mower authorized for use and the working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the mower safely.

(6) Recordkeeping. All safety instruction and training shall be documented in accordance with Section 3203 of the General Industry Safety Orders.

Subchapter 7. General Industry Safety Orders

Group 8. Point of Operation and Other Hazardous Parts of Machinery

Article 54. Scope and General Definitions

Title 8 section 4184 in Group 8 of the General Industry Safety Orders addresses guarding of hazardous points of operation for machinery. Subsection 4184(b) requires guarding of points of operation not specifically covered under the Group 8 guarding orders which would include power mowers.

Group 8. Points of Operation and Other Hazardous Parts of Machinery

Article 54. Scope and General Definitions

Section 4184. Guarding Required

(b) All machines or parts of machines, used in any industry or type of work not specifically covered in Group 8, which present similar hazards as the machines covered under these point of operation orders, shall be guarded at their point of operation as required by the regulations contained in Group 8.

Article 4 of the title 8 Group 1 Low-Voltage Safety Orders includes multiple requirements for electrical installations operating from 50 to 600 volts. The following sections include requirements for conductors to be insulated, guarding of energized parts, protection from mechanical damage, and maintaining electrical equipment to be free of recognized hazards.

Subchapter 5. Electrical Safety Orders

Group 1. Low-Voltage Electrical Safety Orders

Article 4. Requirements for Electrical Installations

Section 2340.2. Examination, Installation, and Use of Equipment.

- (a) Examination. Electric equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:
- (1) Suitability for installation and use in conformity with the provisions of these Orders; NOTE to subsection (a)(1): Suitability of equipment for an identified purpose may be evidenced by listing or labeling for that identified purpose.
 - (2) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided;
 - (3) Wire-bending and connection space;
 - (4) Electrical insulation;
 - (5) Heating effects under all conditions of use;
 - (6) Arcing effects;
 - (7) Classification by type, size, voltage, current capacity, and specific use; and
 - (8) Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment.
- (b) Installation and use. Listed or labeled equipment shall be installed and used in accordance with any instructions included in the listing or labeling.

Section 2340.5. Conductors.

- (a) Insulation. All conductors used for general wiring shall be insulated unless otherwise permitted in these safety orders.
- (b) Type. The conductor insulation shall be of a type that is approved for the voltage, operating temperature, and location of use.
- (c) Distinguishable. Insulated conductors shall be distinguishable by appropriate color or other suitable means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

§2340.17. Guarding of Energized Parts.

- (a) Except as elsewhere required or permitted by these orders, energized parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by use of approved cabinets or other forms of approved enclosures or by any of the following means:
- (1) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.
 - (2) By suitable permanent, substantial partitions or screens so arranged that only qualified persons will have access to the space within reach of the energized parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the energized parts or to bring conducting objects into contact with them.
 - (3) By location on a suitable balcony, gallery, or platform so elevated and otherwise located as to prevent access by unqualified persons; or
 - (4) By elevation of 8.0 feet (2.44 m) or more above the floor or other working surface.

Section 2340.26. Mechanical Protection.

In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.

Article 11 of the title 8 Group 1 Low-Voltage Safety Orders addresses proper grounding of electrical equipment. Section 2395.59 includes the requirements for the noncurrent-carrying parts of cord-and-plug-connected equipment to be grounded.

Subchapter 5. Electrical Safety Orders

Group 1. Low-Voltage Electrical Safety Orders

Article 11. Grounding

Section 2395.59. Cord- and Plug-Connected Equipment.

Noncurrent-carrying metal parts of cord-and-plug-connected equipment, where required to be grounded, shall be grounded by one of the methods indicated in (a), (b), or (c) below:

(a) By means of the metal enclosure of the conductors supplying such equipment if grounding-type attachment plug with one fixed grounding contact is used for grounding the metal enclosure, and if the metal enclosure of the conductors is secured to the attachment plug and to equipment by connectors approved for the purpose.

(b) By means of a grounding conductor run with the power supply conductors in a cable assembly or flexible cord properly terminated in grounding-type attachment plug with one fixed grounding contact. An uninsulated grounding conductor shall be permitted but, if individually covered, the covering shall have a continuous outer finish that is either green or green with one or more yellow stripes.

(c) By means of a separate flexible wire or strap, insulated or bare, protected as well as practicable against physical damage, where part of an approved portable equipment.

Section 2395.45. Equipment Connected by Cord and Plug.

(a) The exposed noncurrent-carrying metal parts of cord- and plug-connected equipment that may become energized shall be grounded under any of the following conditions:

(1) Utilization equipment used in hazardous (classified) locations (See Article 59).

(2) Any electric equipment which is operated at over 150 volts to ground.

(3) If the equipment is of the following types:

(A) Refrigerators, freezers, and air conditioners.

(B) Clothes-washing, clothes-drying and dishwashing machines, sump pumps, and electrical aquarium equipment.

(C) Hand-held motor-operated tools, stationary and fixed motor-operated tools, and light industrial motor-operated tools.

(D) Motor-operated tools and utilization equipment of the following types: drills, hedge clippers, lawn mowers, snow blowers, wet scrubbers, sanders and saws.

- (E) Cord- and plug-connected appliances used in damp or wet locations or by persons standing on the ground or on metal or exposed concrete floors or working inside of metal tanks or boilers.
- (F) Portable and mobile x-ray and associated equipment.
- (G) Portable hand lamps.
- (H) Tools likely to be used in wet and conductive locations.

Article 58.1 of the title 8 Group 1 Low-Voltage Safety Orders addresses safety of storage batteries. Section 2535.1 includes requirements for the diffusion and ventilation of storage batteries to prevent accumulation of explosive mixtures.

Subchapter 5. Electrical Safety Orders
Group 1. Low-Voltage Electrical Safety Orders
Article 58.1 Storage Batteries

Section 2535.1 Storage Batteries

Provisions shall be made for sufficient diffusion and ventilation of gases from storage batteries to prevent the accumulation of explosive mixtures. See General Industry Safety Orders, Section 5185 for additional requirements.

4.0 APPLICABLE FEDERAL OSHA REGULATIONS

The federal OSHA regulation 29 CFR 1910.243 has specific requirements for powered lawn mowers used by employees. 29 CFR 1910.212 has general machine guarding requirements applicable to all machines including powered lawn mowers.

Occupational Health and Safety Standards
1910 Subpart P
Hand and Portable Power Tools and Other Hand-Held Equipment
Standard Number 1910.243
Guarding of portable power tools

1910.243(e)

Power Lawnmowers

1910.243(e)(1)

General requirements.

1910.243(e)(1)(i)

Power lawnmowers of the walk-behind, riding-rotary, and reel power lawnmowers shall be guarded in accordance with the machine guarding requirements in 29 CFR 1910.212, General requirements for all machines.

1910.243(e)(1)(ii)

All power-driven chains, belts, and gears shall be so positioned or otherwise guarded to prevent the operator's accidental contact therewith, during normal starting, mounting, and operation of the machine.

1910.243(e)(1)(iii)

A shutoff device shall be provided to stop operation of the motor or engine. This device shall require manual and intentional reactivation to restart the motor or engine.

1910.243(e)(1)(iv)

All positions of the operating controls shall be clearly identified.

1910.243(e)(1)(v)

The words, "Caution. Be sure the operating control(s) is in neutral before starting the engine," or similar wording shall be clearly visible at an engine starting control point on self-propelled mowers.

1910.243(e)(2)

Walk-behind and riding rotary mowers.

1910.243(e)(2)(i)

The mower blade shall be enclosed except on the bottom and the enclosure shall extend to or below the lowest cutting point of the blade in the lowest blade position.

1910.243(e)(2)(ii)

Guards which must be removed to install a catcher assembly shall comply with the following:

1910.243(e)(2)(ii)(a)

Warning instructions shall be affixed to the mower near the opening stating that the mower shall not be used without either the catcher assembly or the guard in place.

1910.243(e)(2)(ii)(b)

The catcher assembly or the guard shall be shipped and sold as part of the mower.

1910.243(e)(2)(ii)(c)

The instruction manual shall state that the mower shall not be used without either the catcher assembly or the guard in place.

1910.243(e)(2)(ii)(d)

The catcher assembly, when properly and completely installed, shall not create a condition which violates the limits given for the guarded opening.

1910.243(e)(2)(iii)

Openings in the blade enclosure, intended for the discharge of grass, shall be limited to a maximum vertical angle of the opening of 30°. Measurements shall be taken from the lowest blade position.

1910.243(e)(2)(iv)

The total effective opening area of the grass discharge opening(s) shall not exceed 1,000 square degrees on units having a width of cut less than 27 1/2 inches, or 2,000 square degrees on units having a width of cut 27 1/2 inches or over.

1910.243(e)(2)(v)

The word "Caution." or stronger wording, shall be placed on the mower at or near each discharge opening.

1910.243(e)(2)(vi)

[Reserved]

1910.243(e)(2)(vii)

Blade(s) shall stop rotating from the manufacturer's specified maximum speed within 15 seconds after declutching, or shutting off power.

1910.243(e)(2)(viii)

In a multipiece blade, the means of fastening the cutting members to the body of the blade or disc shall be so designed that they will not become worn to a hazardous condition before the cutting members themselves are worn beyond use.

1910.243(e)(2)(ix)

The maximum tip speed of any blade shall be 19,000 feet per minute.

1910.243(e)(3)

Walk-behind rotary mowers.

1910.243(e)(3)(i)

The horizontal angle of the opening(s) in the blade enclosure, intended for the discharge of grass, shall not contact the operator area.

1910.243(e)(3)(ii)

There shall be one of the following at all openings in the blade enclosure intended for the discharge of grass:

1910.243(e)(3)(ii)(a)

A minimum unobstructed horizontal distance of 3 inches from the end of the discharge chute to the blade tip circle.

1910.243(e)(3)(ii)(b)

A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar shall be no higher than the bottom edge of the blade enclosure.

1910.243(e)(3)(iii)

The highest point(s) of the front of the blade enclosure, except discharge openings, shall be such that any line extending a maximum of 15° downward from the horizontal toward the blade shaft axis (axes) shall not intersect the horizontal plane within the blade tip circle. The highest point(s) on the blade enclosure front, except discharge-openings, shall not exceed 1 1/4 inches above the lowest cutting point of the blade in the lowest blade position. Mowers with a swingover handle are to be considered as having no front in the blade enclosure and therefore shall comply with paragraph (e)(2)(i) of this section.

1910.243(e)(3)(iv)

The mower handle shall be fastened to the mower so as to prevent loss of control by unintentional uncoupling while in operation.

1910.243(e)(3)(v)

A positive upstop or latch shall be provided for the mower handle in the normal operating position(s). The upstop shall not be subject to unintentional disengagement during normal operation of the mower. The upstop or latch shall not allow the center or the handle grips to come closer than 17 inches horizontally behind the closest path of the mower blade(s) unless manually disengaged.

1910.243(e)(3)(vi)

A swing-over handle, which complies with the above requirements, will be permitted.

1910.243(e)(3)(vii)

Wheel drive disengaging controls, except deadman controls, shall move opposite to the direction of the vehicle motion in order to disengage the drive. Deadman controls shall automatically interrupt power to a drive when the operator's actuating force is removed, and may operate in any direction to disengage the drive.

1910.243(e)(4)

Riding rotary mowers.

1910.243(e)(4)(i)

The highest point(s) of all openings in the blade enclosure, front shall be limited by a vertical angle of opening of 15° and a maximum distance of 1 1/4 inches above the lowest cutting point of the blade in the lowest blade position.

1910.243(e)(4)(ii)

Opening(s) shall be placed so that grass or debris will not discharge directly toward any part of an operator seated in a normal operator position.

1910.243(e)(4)(iii)

There shall be one of the following at all openings in the blade enclosure intended for the discharge of grass:

1910.243(e)(4)(iii)(a)

A minimum unobstructed horizontal distance of 6 inches from the end of the discharge chute to the blade tip circle.

1910.243(e)(4)(iii)(b)

A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar shall be no higher than the bottom edge of the blade enclosure.

1910.243(e)(4)(iv)

Mowers shall be provided with stops to prevent jackknifing or locking of the steering mechanism.

1910.243(e)(4)(v)

Vehicle stopping means shall be provided.

1910.243(e)(4)(vi)

Hand-operated wheel drive disengaging controls shall move opposite to the direction of vehicle motion in order to disengage the drive. Foot-operated wheel drive disengaging controls shall be depressed to disengage the drive. Deadman controls, both hand and foot operated, shall automatically interrupt power to a drive when the operator's actuating force is removed, and may operate in any direction to disengage the drive.

Federal OSHA regulations address guarding of machinery and equipment in 29 CFR Subpart O of the General Industry Safety Orders. Section 1910.212 includes requirements for point-of-operation guarding.

Occupational Health and Safety Standards

1910 Subpart O

Machinery and Machine Guarding

Standard Number 1910.243

General requirements for all machines.

1910.212(a)

Machine guarding -

1910.212(a)(1)

Types of guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are - barrier guards, two-hand tripping devices, electronic safety devices, etc.

1910.212(a)(3)(ii)

The point of operation of machines whose operation exposes an employee to injury, shall be guarded. The guarding device shall be in conformity with any appropriate standards therefor, or, in the absence of applicable specific standards, shall be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.

Federal OSHA addresses requirements for electrical conductor and equipment in 29 CFR Subpart S of the General Industry Safety Orders. Section 1910.303 includes requirements for conductors to be insulated, guarding of energized parts, protection from mechanical damage, and maintaining electrical equipment to be free of recognized hazards among other requirements.

Occupational Health and Safety Standards

1910 Subpart S

Electrical

Standard Number 1910.303

General

1910.303(a)

Approval. The conductors and equipment required or permitted by this subpart shall be acceptable only if approved, as defined in § 1910.399.

1910.303(b)

Examination, installation, and use of equipment -

1910.303(b)(1)

Examination. Electric equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

1910.303(b)(1)(i)

Suitability for installation and use in conformity with the provisions of this subpart;

Note to paragraph (b)(1)(i) of this section: Suitability of equipment for an identified purpose may be evidenced by listing or labeling for that identified purpose.

1910.303(b)(1)(ii)

Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided;

1910.303(b)(1)(iii)

Wire-bending and connection space;

1910.303(b)(1)(iv)

Electrical insulation;

1910.303(b)(1)(v)

Heating effects under all conditions of use;

1910.303(b)(1)(vi)

Arcing effects;

1910.303(b)(1)(vii)

Classification by type, size, voltage, current capacity, and specific use; and

1910.303(b)(1)(viii)

Other factors that contribute to the practical safeguarding of persons using or likely to come in contact with the equipment.

1910.303(b)(2)

Installation and use. Listed or labeled equipment shall be installed and used in accordance with any instructions included in the listing or labeling.

1910.303(b)(3)

Insulation integrity. Completed wiring installations shall be free from short circuits and from grounds other than those required or permitted by this subpart.

1910.303(b)(4)

Interrupting rating. Equipment intended to interrupt current at fault levels shall have an interrupting rating sufficient for the nominal circuit voltage and the current that is available at the line terminals of the equipment. Equipment intended to interrupt current at other than fault levels shall have an interrupting rating at nominal circuit voltage sufficient for the current that must be interrupted.

1910.303(b)(5)

Circuit impedance and other characteristics. The overcurrent protective devices, the total impedance, the component short-circuit current ratings, and other characteristics of the circuit to be protected shall be selected and coordinated to permit the circuit protective devices used to clear a fault to do so without the occurrence of extensive damage to the electrical components of the circuit. This fault shall be assumed to be either between two or more of the circuit conductors, or between any circuit conductor and the grounding conductor or enclosing metal raceway.

1910.303(b)(6)

Deteriorating agents. Unless identified for use in the operating environment, no conductors or equipment shall be located in damp or wet locations; where exposed to gases, fumes, vapors, liquids, or other agents that have a

deteriorating effect on the conductors or equipment; or where exposed to excessive temperatures.

Federal OSHA regulations address use of electrical equipment in 29 CFR Subsection S of the General Industry Safety Orders. Subsection 1910.334(a) includes requirements for the use of portable equipment including the attachment, grounding, and inspection among other requirements for portable electric equipment including cord-and-plug connected equipment.

Occupational Health and Safety Standards
1910 Subpart S
Electrical
Standard Number 1910.334
Use of Equipment

1910.334(a)

Portable electric equipment. This paragraph applies to the use of cord- and plug-connected equipment, including flexible cord sets (extension cords).

1910.334(a)(1)

Handling. Portable equipment shall be handled in a manner which will not cause damage. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment. Flexible cords may not be fastened with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.

[1910.334\(a\)\(2\)](#)

Visual inspection.

1910.334(a)(2)(i)

Portable cord- and plug-connected equipment and flexible cord sets (extension cords) shall be visually inspected before use on any shift for external defects (such as loose parts, deformed and missing pins, or damage to outer jacket or insulation) and for evidence of possible internal damage (such as pinched or crushed outer jacket). Cord- and plug-connected equipment and flexible cord sets (extension cords) which remain connected once they are put in place and are not exposed to damage need not be visually inspected until they are relocated.

1910.334(a)(2)(ii)

If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made.

1910.334(a)(2)(iii)

When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts shall first be checked to ensure that they are of proper mating configurations.

1910.334(a)(3)

Grounding-type equipment.

1910.334(a)(3)(i)

A flexible cord used with grounding-type equipment shall contain an equipment grounding conductor.

1910.334(a)(3)(ii)

Attachment plugs and receptacles may not be connected or altered in a manner which would prevent proper continuity of the equipment grounding conductor at the point where plugs are attached to receptacles. Additionally, these devices may not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors.

1910.334(a)(3)(iii)

Adapters which interrupt the continuity of the equipment grounding connection may not be used.

1910.334(a)(4)

Conductive work locations. Portable electric equipment and flexible cords used in highly conductive work locations (such as those inundated with water or other conductive liquids), or in job locations where employees are likely to contact water or conductive liquids, shall be approved for those locations.

1910.334(a)(5)

Connecting attachment plugs.

1910.334(a)(5)(i)

Employees' hands may not be wet when plugging and unplugging flexible cords and cord- and plug-connected equipment, if energized equipment is involved.

1910.334(a)(5)(ii)

Energized plug and receptacle connections may be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand (if, for example, a cord connector is wet from being immersed in water).

1910.334(a)(5)(iii)

Locking-type connectors shall be properly secured after connection.

1910.334(b)

Electric power and lighting circuits -

1910.334(b)(1)

Routine opening and closing of circuits. Load rated switches, circuit breakers, or other devices specifically designed as disconnecting means shall be used for the opening, reversing, or closing of circuits under load conditions. Cable connectors not of the load-break type, fuses, terminal lugs, and cable splice connections may not be used for such purposes, except in an emergency.

1910.334(b)(2)

Reclosing circuits after protective device operation. After a circuit is deenergized by a circuit protective device, the circuit may not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. The repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited.

Note: When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault condition, no examination of the circuit or connected equipment is needed before the circuit is reenergized. 1910.334(b)(3)

Overcurrent protection modification. Overcurrent protection of circuits and conductors may not be modified, even on a temporary basis, beyond that allowed by § 1910.304(e), the installation safety requirements for overcurrent protection.

1910.334(c)

Test instruments and equipment -

1910.334(c)(1)

Use. Only qualified persons may perform testing work on electric circuits or equipment.

1910.334(c)(2)

Visual inspection. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made.

1910.334(c)(3)

Rating of equipment. Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.

1910.334(d)

Occasional use of flammable or ignitable materials. Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used, unless measures are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to: flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings.

Note: Electrical installation requirements for locations where flammable materials are present on a regular basis are contained in § 1910.307.

5.0 APPLICABLE CONSENSUS STANDARDS

5.1 ANSI AND ANSI/OPEI STANDARDS

Numerous ANSI standards apply to lawn mowers. The ANSI B71.1 and B71.4 standards incorporated by title 8 section 3563 provide safety requirements for consumer and commercial turf care equipment. The ANSI/OPEI standard editions from 1998 to 2017 are listed below and are included in Attachments 1-6 of this evaluation.

- ANSI B71.1-1998 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications,
- ANSI B71.1-2003 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications

- ANSI B71.1-2012 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications,
- ANSI/OPEI B71.1-2017 standard for Consumer Turf Care Equipment-Walk-Behind Mowers and Ride-On Machines with Mowers-Safety Specifications,
- ANSI B71.4-1999 standard for Commercial Turf Care Equipment-Safety Specifications,
- ANSI B71.4-2004 standard for Commercial Turf Care Equipment-Safety Specifications.
- ANSI/OPEI B71.4-2012 standard for Commercial Turf Care Equipment Safety Specifications
- ANSI/OPEI B71.4-2017 standard for Commercial Turf Care Equipment-Safety Specifications.

The ANSI/OPEI 5395 standards proposed by the petitioner include safety requirements for pedestrian-controlled and ride-on combustion-engine-powered lawnmowers. The 2024 editions of the 5395-1, 5395-2, and 5395-3 standards are listed below and are included in Attachments 7-9 of this evaluation.

- ANSI/OPEI 5395-1-2024 safety requirements for Combustion-Engine-Powered Lawnmowers- Part 1 Terminology and Common Tests
- ANSI/OPEI 5395-2-2024 standard for Combustion-Engine-Powered Lawnmowers – Part 2: Pedestrian-Controlled Lawnmowers
- ANSI/OPEI 5395-3-2024 standard for Combustion-Engine-Powered Lawnmowers – Part 3: Ride-On Lawnmowers

5.2 ANSI/OPEI B71.1/B71.4 STANDARDS vs. ANSI/OPEI 5395 STANDARDS

The ANSI/OPEI B71.1 and B71.4 differ from the later ANSI/OPEI 5395-2024 standards in that the 2024 standard applies to both consumer (residential) and commercial equipment whereas ANSI/OPEI B71.1 (consumer) and ANSI/OPEI B71.4 (commercial) treated these separately.

ANSI/OPEI 5395 and its two companion standards provide requirements separately as Part 1, terminology and common tests; Part 2, pedestrian-controlled lawnmowers; and Part 3, ride-on lawnmowers, whereas ANSI/OPEI B71.1 and B71.4 cover these requirements together. The ANSI/OPEI 5395-2024 standards are also harmonized with international ISO standards. As such, the testing requirements for lawnmowers conform to ISO testing procedures. Additionally, electrically powered and battery-powered lawnmowers are excluded from the scope of ANSI/OPEI 5395-2-2024 and ANSI/OPEI 5395-3-2024, whereas such equipment is included in the ANSI/OPEI B71.1 and B71.4 standards.

5.3 UNDERWRITERS LABORATORIES (UL) STANDARDS

Underwriters Laboratories (UL) standards address safety for electric lawn mowers in the 1447, 2753 and 62841 standards. The standards germane to this petition evaluation are as follows and are included as Attachments 10-12 of this evaluation:

- UL 1447-2006 Electric Lawn Mowers
- UL 2753 Issue No. 2-2018 Battery Powered Ride-On Lawn
- UL 62841-4-3-2023 Particular Requirements for Pedestrian Controlled Walk-Behind Lawn Mowers

6.0 Cal/OSHA ANALYSIS

6.1 ANSI/OPEI 5395-2024 STANDARDS PROPOSED BY THE PETITIONER ARE LESS PROTECTIVE THAN ANSI/OPEI B71.1-2017 AND ANSI/OPEI B71.4-2017

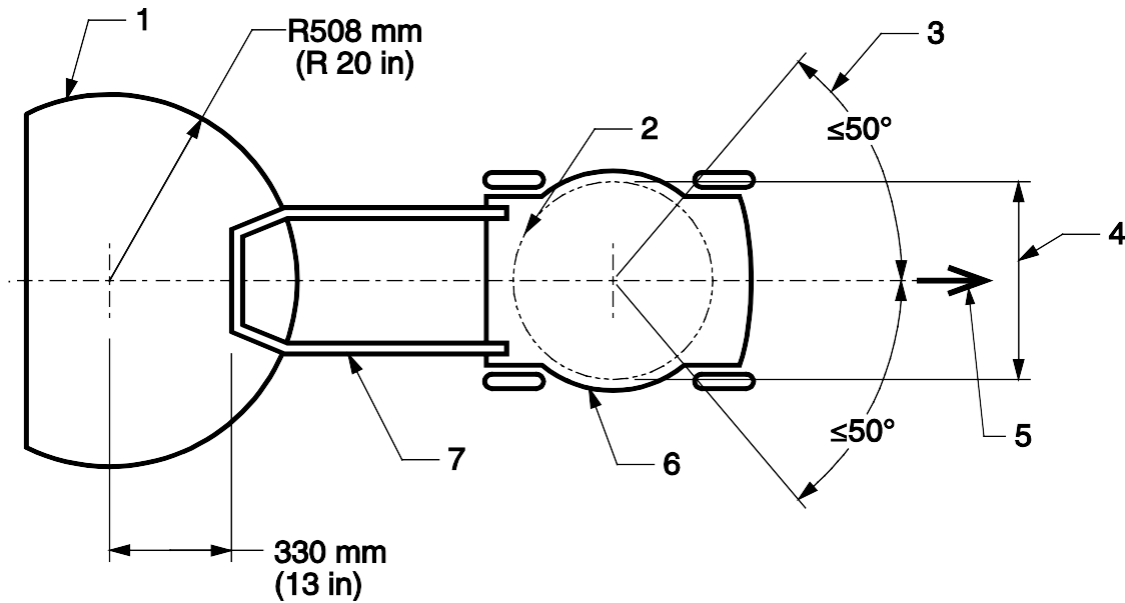
There are multiple requirements in the ANSI/OPEI 5395-2024 standards that are less protective than the ANSI/OPEI B71.1-2017 and ANSI/OPEI B71.4-2017 standards currently referenced in title 8. The following are discrepancies identified between the standards.

Section 4.2 of ANSI/OPEI B71.1-2017 requires a shutoff control device to stop the engine and explicitly requires manual and intentional activation in order to restart it. In contrast, Section 4.2.4 of ANSI/OPEI 5395-2 allows the engine-stopping device to be integrated into the operator presence control (OPC) and does not explicitly mandate a separate intentional activation to restart the engine. This integration could allow the mower to be restarted without a distinct, deliberate safety step, making it less protective than the current title 8 reference.

Section 6.1 of ANSI/OPEI B71.1-2017 requires specific written instructions recommended by the manufacturer to be provided with the equipment for servicing operations that shall be performed with the engine running. Additionally, section 6.2 requires that access doors, shields, or guards be provided to prevent inadvertent operator contact with hazardous servicing points. ANSI/OPEI 5395-2 does not require specific instructions for servicing operations when the engine is running or equivalent guarding as ANSI/OPEI B71.1-2017.

Section 6.3 of ANSI/OPEI B71.1-2017 provides a guideline that stored-energy devices, such as pressurized fluid systems and spring-loaded mechanisms that can be disconnected or disassembled in a manner that may release energy or material in a hazardous manner, have an appropriate safety sign on or near the device. Additionally, Section 6.3 requires that the sign include instructions for de-energizing and for proper disassembly, or include a reference to instructions provided in the operator's manual. Such safety signage is not required for stored-energy devices under ANSI/OPEI 5395-2. An identical signage guideline is included in Section 17.2 of ANSI/OPEI B71.4-2017 but is not included in ANSI/OPEI 5395-3.

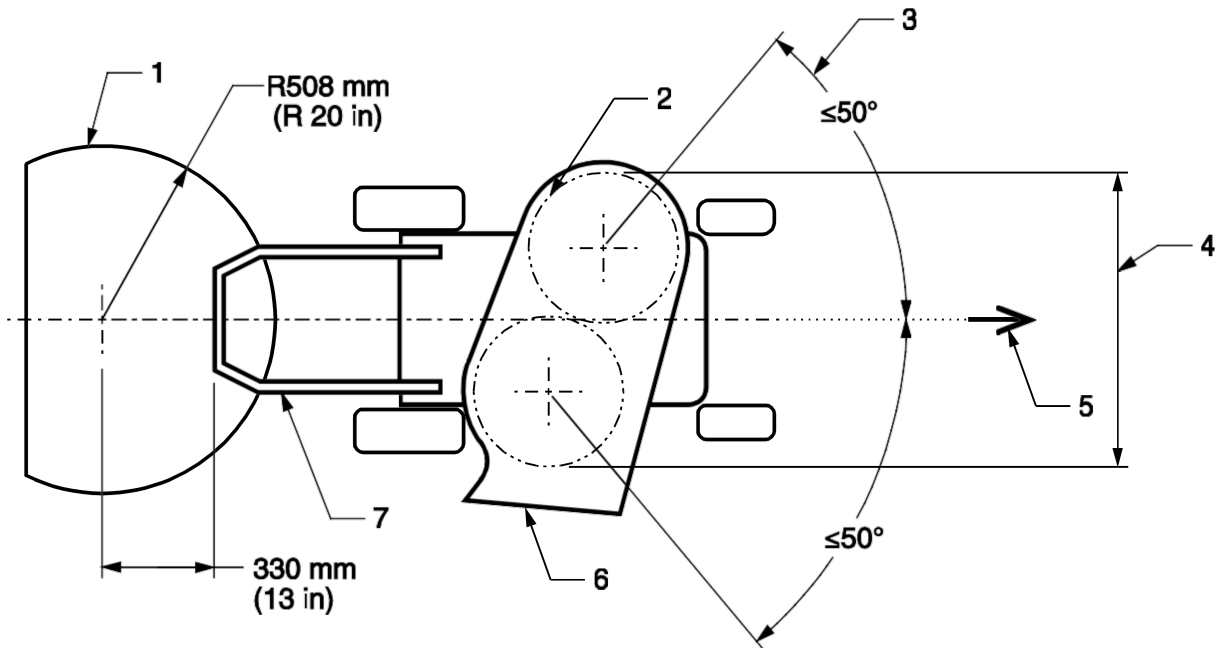
Section 10.1.3 of ANSI/OPEI B71.1-2017 requires discharge openings be so placed or guarded that grass, or debris will not discharge directly into the operator zone, as shown in Figures 2 and 3 below. Additionally, this section requires that the tangential extension of the walls of the discharge chute not intersect the operator zone when the mower is set at any height of cut and that no tangential line in the plane of the blade tip circle shall intersect the operator zone without first contacting the blade enclosure or guard. These discharge requirements are not present in ANSI/OPEI 5395.



Key:

- | | |
|------------------------------------|--------------------------|
| 1 Operator zone | 5 Direction of travel |
| 2 Blade tip circle | 6 Blade enclosure |
| 3 Limits of blade enclosure, front | 7 Handle, against upstop |
| 4 Width of cut | |

Figure 2 – Single-spindle pedestrian-controlled mower



Key:

- | | |
|------------------------------------|--------------------------|
| 1 Operator zone | 5 Direction of travel |
| 2 Blade tip circle | 6 Blade enclosure |
| 3 Limits of blade enclosure, front | 7 Handle, against upstop |
| 4 Width of cut | |

Figure 3 – Multi-spindle pedestrian-controlled mower

The ANSI/OPEI B71.1-2017 standard also provides a greater degree of safety for objects thrown from mowers. Pursuant to Table 3 of Section 10.3.7.5.3 below, non-discharge mowers shall allow no more than an average of 30 total hits between the base and the 450 mm (18 in) line.

ANSI/OPEI B71.1-2017

10.3 Performance Tests

10.3.7.5.3 All other mowers

For all other mowers, there shall be no more than an average of 30 hits between

the base and the 450 mm (18 in) line (lower and middle elevation zones) of which

not more than six may hit the target above the 300 mm (12 in) line (middle elevation zone). There shall be no hits above the 450 mm (18 in) line (top elevation zone). There shall be not more than two hits in the operator target zone

between the base and the 450 mm (18 in) line in accordance with Table 3. The average hits in any zone shall not exceed the number noted.

Table 3 - Average hits in any zone

Target Zone	Discharge Mowers	All Other Mowers
Total 0 - 450 mm (0 - 18 in)	45	30
300 > 450 mm (12 > 18 in)	6	6
450 > 900 mm (18 > 35.4 in)	0	0
Operator Target Area (above 450 mm (18 in))	0	0
Operator Target Area (0 - 450 mm (0 - 18 in))	2	2

ANSI/OPEI 5395-2-2024 permits 40 total hits between 0 and 450 mm in the target zone, as indicated in Table 2 of Section 5.5.

ANSI/OPEI 5395-2-2024

5.5 Thrown objects

The cutting-means enclosure, guards and grass catchers shall be designed and constructed in such a way as to minimize the risk of thrown objects in normal use. *Compliance shall be verified according to the test of ANSI/OPEI 5395-1:2024, Annex E.* The number of hits in any zone shall not exceed the value shown in Table 2. On multi-spindle lawnmowers, the total hits for each spindle shall be added together and divided by the number of spindles to obtain an average number of hits which is used for test acceptance. Only balls passing completely through all the layers of the panel material shall be considered as hits.

Table 2 – Permissible hits from thrown object test

Target zone as defined in ANSI/OPEI 5395-1:2024, Annex E	Maximum number of hits allowed with width of cut less than 1,200 mm (47.2 in) and with no discharge opening	Maximum number of hits allowed with width of cut greater than 1,200 mm (47.2 in) and with no discharge opening	Maximum number of hits allowed with any width of cut and with discharge opening
From 0 mm to 450 mm (0 in to 18.0 in)	30	40	45
of which from 300 mm to 450 mm (12.0 in to 18.0 in)	6	6	6
From 450 mm to 900 mm (18.0 in to 36.0 in)	0	0	0

This same discrepancy also exists between Table 3 of Section 11.4.6.6 of ANSI/OPEI B71.4-2017 and Table 2 of Section 5.5 of ANSI/OPEI 5395-3-2024, which allow 30 and 40 total hits, respectively, in the 0-450 mm thrown-object target zone.

ANSI/OPEI B71.4-2017

11.4 Tests for mowers except those with a blade tip circle diameter of 775 mm (30.5 in) or greater and blade thickness of 8 mm (0.312 in) or greater, for one or more blades

11.4.6.6.1 On multi-spindle mowers, a test (500 projectiles) shall be run for each spindle. The total hits for each spindle shall be added together and divided by the number of spindles to obtain an average number of hits that is used for test acceptance.

For discharge mowers, there shall be an average of no more than 45 hits between the base and the 450 mm (17.7 in) line (lower and middle elevation zones) of which not more than six (6) may be above the 300 mm (11.8 in) line (middle elevation zone). There shall be no hits above the 450 mm (17.7 in) line (top elevation zone).

There shall be not more than two hits in the operator target zone between the base and the 450 mm (17.7 in) line.

For all other mowers, there shall be an average of no more than 30 hits between the base and the 450 mm (17.7 in) line (lower and middle elevation zones) of which not more than six (6) may hit the target above the 300 mm

(11.8 in) line (middle elevation zone). There shall be no hits above the 450 mm (17.7 in) line (top elevation zone).

The average hits in any zone shall not exceed the number in Table 3.

Table 3 - Average allowable number of hits

Target Zone	Discharge Mowers	All other Mowers
Total 0 - 450 mm (0 - 17.7 in)	45	30
300 > 450 mm (11.8 > 17.7 in)	6	6
450 > 900 mm (17.7 > 35.4 in)	0	0
Operator Target Area for Mowers below 450 mm (17.7 in)	2	2
Operator Target Area for Mowers above 450 mm (17.7 in)	0	0

ANSI/OPEI B71.1-2017 also includes more protective requirements for safety warnings for mowers. Sections 13.3 and 24.1.5 require safety labels to comply with section 1205 of the Consumer Product Safety Commission (CPSC) requirements. Subsection 1205.6 requires warning labels to be at least 3.25 in (82.5 mm) in height and 4 in (102 mm) in width.

Section 24.1.5 also requires a safety pictorial warning of blade contact to be placed on the mower at or near each discharge opening, or on the discharge chute extension or deflector if it automatically returns to the guarded position after any movement from that position. The ANSI/OPEI 5395-2024 standards, however, do not specify the location of the pictorial safety warning at the discharge opening or chute. Section 24.1.5 as well as section 13.3 also require the signal word to read DANGER and that the warning conform to the requirements of ANSI Z535.4, ISO 11684, or the Consumer Product Safety Commission CPSC requirements of section 1205. Subsection 1205.6 requires warning labels to be at least 3.25 in. (82.5 mm) in height and 4 in. (102 mm) in width. However, section 7.2.2 allows for warning labels 0.01 in. (0.3 mm) in height.

Replacing the currently referenced standards with the ANSI/OPEI 5395 series would create a significant regulatory gap for non-combustion equipment. ANSI/OPEI 5395-2-2024 and ANSI/OPEI 5395-3-2024 explicitly exclude electrically powered and battery-powered lawnmowers from their scope. In contrast, the ANSI/OPEI B71.1 and B71.4 standards currently required by title 8 section 3563 include both electric and battery-powered mowers within their safety requirements.

Because the ANSI/OPEI 5395 standards do not cover battery or electric mowers, adopting them would strip existing consensus standard protections from an increasingly common class of equipment. While the petitioner proposed incorporating separate Underwriters Laboratories (UL) standards to cover battery-powered mowers, those UL standards are less protective than existing title 8 Electrical Safety Orders. Consequently, substituting the comprehensive B71 series with the narrower 5395 series would

leave non-combustion mowers without adequate safety specifications and reduce overall worker protection.

6.2 Incorporating The ANSI/OPEI 5395 Standards Would Require Referencing Two Different Standards and Would Not Provide a Significant Benefit for Safety

Certain provisions of the ANSI/OPEI 5395 standards provide additional or more stringent requirements than those in the ANSI B71.1 and B71.4 standards. These provisions include, but are not limited to, a faster stopping time for mower blades, requirements for sulky attachments¹, and testing protocols for noise attachments. However, these requirements would not significantly increase worker safety, are addressed by current title 8 regulations, and would require references to two different standards that apply to the same equipment. This would create confusion and an added layer of complexity for employers and Cal/OSHA staff in determining compliance with title 8 regulations.

6.3 Referencing UL Standards Would Be Less Protective Than Title 8 Regulations

The incorporation of Underwriters Laboratories (UL) standards proposed by the petitioner (UL 1447-2017, UL 2753-2018, and UL 62841-4-3-2023) would reduce worker safety because the requirements are less effective than current title 8 regulations. Electric lawn mowers operate at electric potentials between 40 and 80 volts, with the most common voltage being 60 volts. Title 8 Low-Voltage Safety Orders apply to electrical equipment operating between 50 and 600 volts. Therefore, most electric lawn mowers would fall within the scope of the title 8 Group 1 Low-Voltage Safety Orders in addition to the General Industry Safety Orders. The UL standards proposed by the petitioner include requirements to reduce risks rather than eliminate hazards, whereas the applicable title 8 regulations (such as section 2340.2) requires hazards likely to cause death or serious physical harm to be eliminated. Below are instances where the UL 1447, UL 2753 and UL 6284-4-3 standards are less protective than the existing title 8 regulations.

Underwriters Laboratories 1447, Electric Lawn Mowers–2017

5.17 Polymeric materials and enclosures

5.19.7 Portions of a circuit comprised of a microcontroller or other programmable device that performs a back-up, limiting, or other safety function intended to reduce the risk of fire, electric shock, or injury to persons shall comply with Controls Using Software requirements in UL 60730-1.

7 Accessibility of Live Parts

7.1 Electrical parts of a lawn mower shall be located or enclosed to reduce the likelihood of unintentional contact with uninsulated live parts. Insulated brush caps do not require additional enclosure.

¹ Sulky attachments are platforms or wheeled carts that attach to a commercial walk-behind lawn mower, turning it into a stand-on riding machine.

8 Accessibility of Moving Parts

8.1 Moving parts shall be guarded or enclosed to reduce the risk of injury to persons.

8.2 Among the factors to be considered when judging the acceptability of an exposed moving part are:

- a) Degree of exposure;
- b) Sharpness of the moving part;
- c) The likelihood of unintentional contact therewith;
- d) The speed of the moving part; and
- e) The likelihood that fingers, arms, or feet would be exposed to a risk of injury to persons by the moving part or that clothing would be caught by the part.

11 Rotating Parts

11.1 A rotating part shall be formed and assembled so that it has the strength and rigidity necessary to reduce the risk of its release or loosening in a manner that may cause injury to persons.

18.4 Protective controls (limiting controls)

18.4.1 An electronic control that performs a protective function shall comply with the requirements in Controls, Section 5.6, while tested using the parameters in this section. Examples of protective controls include:

- a) A control used to sense abnormal temperatures of components within the appliance;
- b) An interlock function to de-energize a motor;
- c) Temperature protection of the motor due to locked rotor, running overload, or loss of phase; or
- d) Other function intended to reduce the risk of electric shock, fire, or injuries to persons.

20 Capacitors

20.1 A capacitor provided as a part of a capacitor motor, and a capacitor connected across the line, such as a capacitor for radio-interference suppression, shall be housed within a suitable enclosure or container that protects the plates against mechanical damage and that reduces the risk of the emission of flame or molten material resulting from breakdown or malfunction of the capacitor. The enclosure shall be made of metal providing strength and protection not less than that of sheet steel having a thickness of 0.020 inch (0.51 mm).

54 Cautionary Markings

54.3 If complete guarding of a moving part capable of causing injury to persons would defeat the intended function of the lawn mower, cautionary markings shall be provided to instruct the user how to reduce the risk of injury unless the risk is apparent to the user.

54.4 If the intended operation of a lawn mower contemplates cleaning or servicing by the user, such as the replacement of a pilot lamp, and if such cleaning or servicing would expose an otherwise enclosed or guarded live part to unintentional contact, the lawn mower shall be marked to indicate that such servicing or cleaning is to be done with the lawn mower disconnected from the supply circuit to reduce the risk of electric shock.

55 Instruction Manual

55.2.1 The instruction manual shall include a safety instruction Section A or Section B, whichever is appropriate, and the applicable items of Section C of the following warning instructions, or the equivalent. The phrases "Read All Instructions" and "SAVE THESE INSTRUCTIONS" shall appear and shall be the first and last items, respectively. The phrase "Read All Instructions" shall be preceded by the statement "WARNING: When using electric lawn mowers, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and personal injury, including the following:" Equivalent wordings in equally definitive terminology are not prohibited from being used when they meet the intent of the instruction, except for the signal word. The instructions shall be legible, and shall contrast with the background.

SUPPLEMENT SA - BATTERY-OPERATED LAWN MOWERS

SA2 Construction and Performance

SA2.4 An integral battery shall be completely enclosed in order to reduce the likelihood of accidental contact. The cover of the integral battery compartment shall be securely fastened so that it remains closed during intended use.

SA2.5 The integral battery of a battery-powered lawn mower shall be encased or enclosed to reduce the likelihood of breakage of the battery case and the risk of an explosion. See Integral Battery Enclosure Test,

SA3 Integral Battery Enclosure Test

SA3.1 The surface of an integral battery enclosure shall have such strength and rigidity that, in conjunction with an air spacing provided between it and the battery terminals, the battery terminals will not be short-circuited and no part will be exposed that might result in a short circuit when 250 pounds-force (112 N) is applied to the surface. In lieu of the spacing, insulation that reduces the likelihood of short circuiting of the battery terminals may be used, provided the insulation is secured to the inner surface of a battery enclosure.

Underwriters Laboratory 2753 Issue No. 2 - 2018

5 Components

5.9 Overcurrent protection

5.9.5 Overcurrent protection of the size necessary to reduce the likelihood of overheating of the smallest conductor in the circuit. A fuse shall comply with UL 248 series of standards, UL 275 and UL 275A and shall be found suitable for the intended application:

6 General

6.2 All current-carrying parts of a ride-on lawn mower shall be constructed and enclosed so as to reduce the likelihood of mechanical damage and to resist the abuses to which they may be subjected.

7 Electric Controls

7.1 An arcing part in a power circuit shall be enclosed or installed so as to reduce the possibility of flame or molten metal reaching surrounding combustible material on the ride-on lawn mower.

10 Battery Compartment or Enclosure

10.3 A metal cover for a compartment or separate enclosure that houses a battery shall have:

a) Such strength and rigidity that, in conjunction with an air spacing provided between it and

the battery terminals, the battery terminals are not short-circuited when a 250-pound (1110-N) force is applied to any 1-square-foot (930-cm²) area of the cover; or
b) Insulation secured to the inner surface of a metal enclosure over the terminals to reduce the likelihood of short-circuiting of the battery terminals.

11 Battery

11.3 Battery Connectors

11.3.3 Live parts shall be recessed from the face of the connector to reduce the possibility of shorting.

Underwriters Laboratory 62841-4-3 – 2023

8 Marking and instructions

8.2 *Addition:*

Lawnmowers shall be marked with the following safety warnings:

– “WARNING – Beware of thrown objects – keep bystanders away” or one of the safety signs specified in Figure AA.1;

8.2DV.1 Lawnmowers shall be marked with a safety warning in one of the following versions:

– “WARNING – To reduce the risk of injury, user must read instruction manual”, or symbol M002 of ISO 7010.

If used, the word “WARNING” shall be in capital letters not less than 2,4 mm high and shall not be separated from either the cautionary statement or the symbol ISO 7000-0434A or ISO 7000-0434B (2004-01).

In contrast to the UL standards, which incorporate language to “reduce the risk, likelihood, or possibility” of a hazard, title 8 regulations, such as those included in Section 3.0 of this evaluation, prescribe requirements to eliminate hazards rather than merely reduce them. Including the UL standards proposed by the petitioner would, therefore, reduce the effectiveness of title 8 regulations and worker safety. Additionally, the UL 62841-4-3–2023 allows for warning labels for pedestrian controlled mowers of only 2.4 mm in height in contrast to the 3.25 in (82.5 mm) minimum height required by ANSI/OPEI B71.1-2017.

7.0 CONCLUSION

Cal/OSHA recommends that Petition 614 be DENIED.

- ANSI/OPEI 5395 standards are less-protective than current requirements.
- The ANSI/OPEI standards recommended to be incorporated would create overlapping requirements without safety benefit.
- The proposed UL standards are less protective than the title 8 Electrical Safety Orders.

If the Board decides to proceed with rulemaking on the proposed petition, Cal/OSHA recommends convening an advisory committee comprised of representatives from labor, lawn mower manufacturers, and ANSI/OPEI and UL standards committee members to properly reconcile the differing requirements between the consensus standards and title 8 regulations.

cc: Debra Lee, Cal/OSHA Chief