

DEPARTMENT OF INDUSTRIAL RELATIONS

Occupational Safety and Health Standards Board

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OCCUPATIONAL SAFETY AND HEALTH
STANDARDS BOARD

BOARD STAFF'S REVIEW OF
PETITION FILE NO. 555

Petitioner: Mr. Colton Swingle

Submitted by: Michael Nelmidia
Title: Senior Engineer-Standards
Date: July 7, 2016

INTRODUCTION

On February 22, 2016, the Occupational Safety and Health Standards Board (Board) received a petition dated February 20, 2016 from Mr. Colton Swingle (Petitioner). The Petitioner requested that the Board amend Title 8, California Code of Regulations, Section 4307(b) of the General Industry Safety Orders, concerning the guarding of portable power driven circular hand saws.

Labor Code Section 142.2 permits interested persons to propose new or revised regulations concerning occupational safety and health and requires the Board to consider such proposals and to render its decision no later than six months following their receipt. In accordance with Board policy, the purpose of this evaluation is to provide the Board with relevant information upon which to base a reasonable decision.

Portable Power Driven Circular Hand Saws

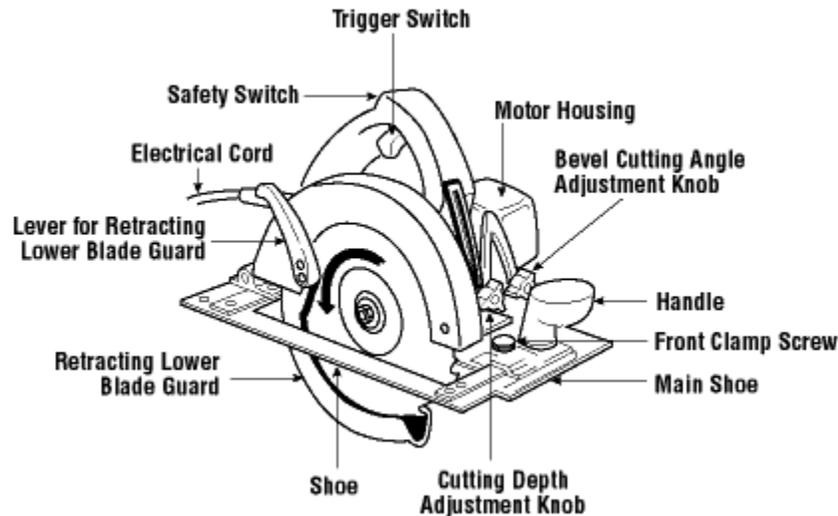


Figure 1. Circular Saw with a Telescopic Guard

Portable power driven circular hand saws (Figure 1) are mechanized saws that utilize a circular blade to cut wood and other materials. The portability of the saw allows saw operators to perform cuts at or near where the workpiece is to be installed.

Guarding for portable power driven circular hand saws consists of:

- a static upper guard,
- an articulating base plate, and
- a movable lower guard

The lower guard for a portable power driven circular hand saw is the movable guard that protects the saw operator from contact with the spinning circular blade. The lower guard, in the closed position, extends below a base plate to cover the exposed portions of the saw blade that protrudes

below the base plate. Modern lower guard configurations return the lower guard automatically when the saw operator withdraws the saw from the workpiece. The automatic return of the saw guard (required by State, Federal and ANSI standards¹) prevents the operator from inadvertently contacting the saw blade. Severe lacerations and amputations have resulted from contact with the spinning blade.

Lower Guard Configurations

There are 2 types of movable lower guards (named in Title 8, Section 4307):

- Telescopic guards (Figure 2 – right)
- Hinged guards (Figure 3 – below)

Petition 555 addresses proposed changes to Title 8 Section 4307 specific to lifting lug, levers and handles on portable power driven circular hand saws. The “lifting lugs and levers” on telescopic guards perform the same task as the “handle” on hinged guards for portable power driven circular hand saws. When the saw operator grasps the handle, lever, or lifting lug the saw operator is capable of sliding the lower guard to expose the saw blade. The purpose is to allow the saw operator a safe handhold to move the lower guard to remove the blade and perform maintenance on the saw (while the saw is “unplugged”). Additionally, under 4307(b)(1), the saw operator can use a lifting lug or lever on a telescopic guard saw (but not a hinged guards saw) to expose enough of the saw blade to initiate unusual cuts.

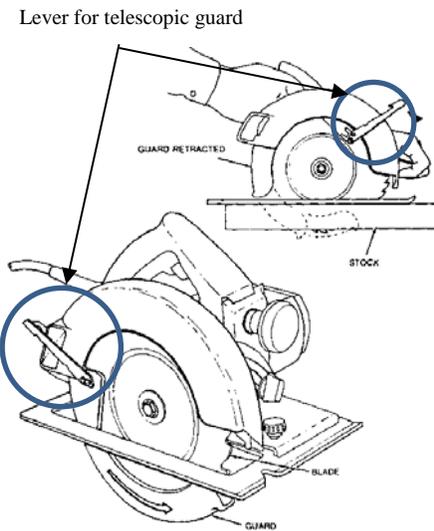


Figure 2 Saw with a telescopic guard.

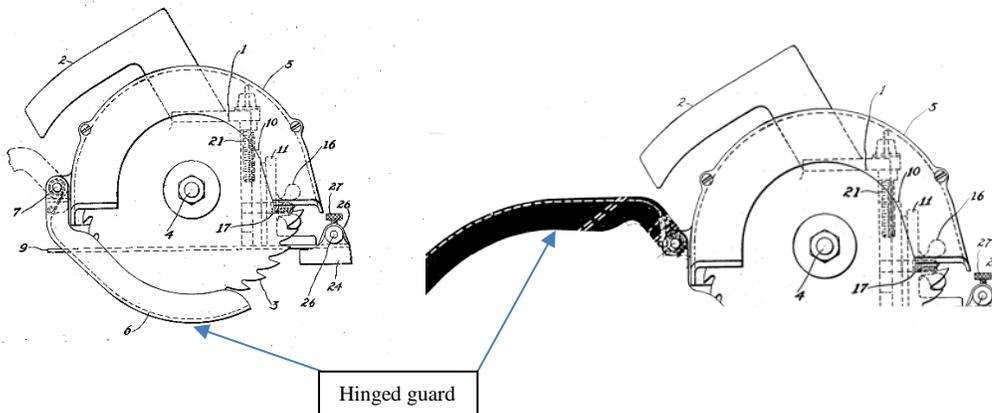


Figure 3 Saw with a hinged guard

¹ For discussion of Federal and Consensus standards, See Attachments 1 and 2

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HISTORY

The current standard governing portable power driven circular hand saws is Title 8 Section 4307. The Board relocated the original requirements of Title 8, Section 1680, Construction Safety Orders to the Title 8, Section 4307 of the General Industry Safety Orders in November 1985. The Standards Board updated provisions of Section 4307 to render the state standard commensurate with the requirements contained in the Federal OSHA Standards.

In relevant part, the recent change to 4307(b) requires:

... When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

The updated standard became effective on March 7, 2016 –14 days after the submission of the Petitioner’s request.

Title 8 Section 4307(b)(1) and (2) require:

(1) Telescopic guards shall be equipped with a lifting lug or lever, remote from the blade teeth, that will permit the operator to safely shift the guard for starting unusual cuts.

(2) Saws with hinged guards shall be equipped with 2 handles so arranged that neither hand is exposed to the hazard of the rotating blade. One handle shall be on the hinged guard, and of such design that its use will avoid exposure of the hand or fingers between the retracted guard and the blade.

Subsection (b) requires a lower guard on portable power driven circular hand saws and requires the lower guards to be either telescopic or hinged. Subsections (b)(1) and (b)(2) require that the lower guard is capable of being retracted, using lifting lugs for telescopic guards and handles for hinged guards.

PETITIONER’S REQUEST

The Petitioner proposes changes to Section 4307(b)(1) and (2).

The Petitioner’s first of two requests is to modify requirements within Section 4307(b)(1). The requested change, modifies requirements for lifting lugs and levers on portable power driven circular hand saws with a telescopic lower guard.

(1) Telescopic guards shall be equipped with a hands free safe lifting device, remote from the blade teeth, lifting lug or lever, remote from the blade teeth, that will permit the operator to safely shift the guard for starting unusual cuts without touching the lifting lug or lever.

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The second request is to repeal the requirement for two handles for portable power driven circular hand saws with hinged guards. The Petitioner's stated reason for the removal of subsection (b)(2) is that saw guards "are only equipped with a small lifting lug or lever on the outer guard that if used as prescribed places the operator's hand and fingers inches from the spinning blade."

~~(2) Saws with hinged guards shall be equipped with 2 handles so arranged that neither hand is exposed to the hazard of the rotating blade. One handle shall be on the hinged guard, and of such design that its use will avoid exposure of the hand or fingers between the retracted guard and the blade.~~

The Petitioner surmises that a danger arises to the user when releasing one of the two grips to lift the saw guard, which exposes their hands and fingers near the unprotected spinning saw blade culminating in the loss of saw control and possible harm.

The Petitioner reasons that saw operators circumvent the saw's guard by pinning the guard in the retracted position. The saw's guard is rendered inoperable using a nail or piece of wood wedged under the lifting lug or lever. The Petitioner believes that the changes he proposes, would dissuade saw operators from circumventing the saw guards.

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH EVALUATION

The Division submitted an evaluation to the Board on May 27, 2016. The Division recommended denial of the Petition.

STAFF EVALUATION

Portable power driven circular hand saws are mechanized saws that utilize a circular blade to cut wood and other materials. The portability of the saw allows saw operators to perform cuts at or near where the workpiece is to be installed. The saw operator guides the saw across the workpiece by resting the base plate upon the workpiece while the saw operator propels the saw forward. The exposed portion of the blade below the base plate performs the cutting action and is the source of the hazard associated with portable power driven circular hand saws.

The upper guard protects the saw operator from the hazards above the base plate. The lower guard protects the operator from the hazards of the saw below the base plate. The lower guard is designed to move exposing portions of the blade during cutting operations. The lower guard is supplied with a lifting lug or lever to allow the operator to grasp the lower guard to manipulate the guard to gain access to the blade during maintenance operations and to expose the blade to set up for "unusual cuts." Lower guards are required under ANSI and Title 8 standards "to automatically and instantly return to the covering position." The requirement for the guard to "automatically and instantly return" exists to protect operators in the event of a "kickback."

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“Kickbacks” are the sudden uncontrolled movement of the saw during cutting operations. Kickbacks are common in most wood sawing operations. The danger posed to employees by kickbacks of portable power driven circular hand saws compared to other types of saws is that the direction the saw blade rotates directs the saw back at the operator. The lower guard is designed to close rapidly to cover the blade before the blade can contact the operator. When the guard is prevented from retracting, there is no barrier between the saw operator and the spinning blade.

In 2013, eleven serious injuries were investigated by the Division involving portable power driven circular hand saws. Seven of those incidents were a result of kickbacks. The injuries included severe lacerations (which required hospitalization) and amputations.

The Petitioner’s suggested changes to Sections 4307(b)(1) and (2).

The Petitioner’s first proposed change:

(1) Telescopic guards shall be equipped with a hands free safe lifting device, remote from the blade teeth, lifting lug or lever, remote from the blade teeth, that will permit the operator to safely shift the guard for starting unusual cuts without touching the lifting lug or lever.

The terms “hands free” and “safe lifting device” are not clear, and serve to weaken the clarity of the existing standard. Board staff perceives that “hands-free” misstates the Petitioner’s aims in that even the Petitioner’s device also requires hand manipulation of the guard. The Petitioner seeks to replace the terms “lifting lug and lever” with an unclear term “safe lifting device.” The current standard clearly specifies a specific component to retract the lower guard. Current lifting lugs and levers do not place the operator’s hand at or near the exposed portions of the blade (Figure 1, see Lever for Retracting Lower Blade Guard). Current lifting lugs and levers are mounted and follow the “arc” of the upper guard.

Manufacturers design lifting lugs and levers to allow saw operators to shift (retract) the [lower] guard to expose the saw blade to perform cuts. When using the lifting lug or levers, the saw blade must not be in motion. The proper technique requires the saw operator to raise the guard while the blade is static, then position the saw on the workpiece, finally starting the cut. The lifting lugs mounted on the guard ensure that the operator has full control of how much of blade is exposed for the cut.

The Petitioner’s second proposed change is the deletion of Section (b)(2):

(2) Saws with hinged guards shall be equipped with 2 handles so arranged that neither hand is exposed to the hazard of the rotating blade. One handle shall be on the hinged guard, and of such design that its use will avoid exposure of the hand or fingers between the retracted guard and the blade.

Board staff believes the hinged guarded saws are rooted in the design under US Patent No. 1,848,330², one of the earliest designs for portable power driven circular hand saws. It is unclear whether portable power driven circular hand saws of this type are still in use. The hinged guard appears as a clamshell configuration, with the lower guard opening away from the saw.

While the hinged guard saws appear to be a design similar to plunge cut saws, it is unclear whether the original intent of Section 4307(b)(2) includes plunge cut saws³. Most plunge cut saws that Board staff identified meet the requirements of Section 4307(b)(2). For most modern portable power driven circular hand saw designs (with the exception of plunge cut saws), the guard rotates along the same axis as the circular saw blade. It would appear that the Petitioner confuses the hinged guard with telescopic guards. Board staff finds no basis to delete Section 4307(b)(2).

Saw Guard Dog

The Petitioner's device, the Saw Guard Dog (Figure 4), is an add-on that consists of a pushrod and linkages that connect to the frame of the saw and the lifting lug of circular saws with telescopic guard saws.

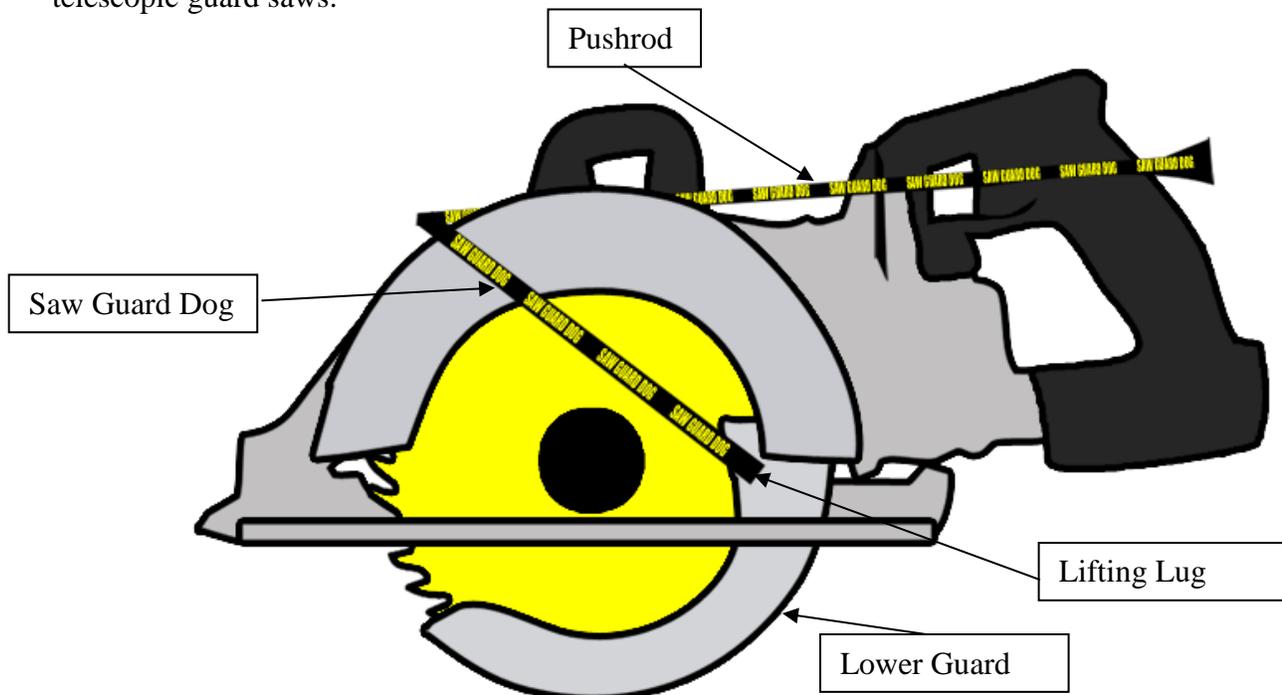


Figure 4. Saw Guard Dog installed on a Circular Saw with a Telescopic Guard

² US1848330 A, <https://www.google.com/patents/US1848330>

³ Plunge cut saws are portable power driven circular hand saws that are specifically designed to perform “plunge cuts”. Plunge cuts are initiated at the middle of a work piece to cut out a hole within the workpiece.

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The Saw Guard Dog can only be installed on specific models of saws and manufacturers. According to the website, The Saw Guard Dog currently fits the Skilsaw® 77, Skilsaw® Mag 77, Bosch® 1677MD, and Craftsman® 2761. The device operates by allowing the operator to push the push rod with the operator's thumb causing the linkage to move the lifting lug, retracting the lower guard. The operation can be performed with a single hand leaving the operator's second hand free to secure the saw during the cut.

The Saw Guard Dog prevents the “automatic and instantaneous return” feature of the saw while the operator's thumb holds the push rod forward. The Petitioner champions his device as a means to perform unconventional⁴ cuts and compares the relative ‘safety’ of his device to the dangerous measures (such as wedging the lower guard in the open position) saw operators sometimes use to perform unconventional cuts.

The Saw Guard Dog does not prevent an operator from using the device to maintain the lower guard open. The Petitioner was asked, “what tasks would benefit (made safer, faster or possible) from the changes you propose?” The Petitioner's response was ‘plunge cuts, thin slice cuts and angled cuts for form stakes.’ The Petitioner demonstrates these cuts on the product's website. After reviewing the Petitioner's web demonstration, Board staff has concerns over cutting wooden form stakes by holding the saw in one hand (unsecured) as the other hand passes the piece of lumber across the spinning, exposed blade.

To utilize the Petitioner's device, a saw owner would modify the guard without a means to validate the proper installation and would defy the manufacturer's recommendation. Board staff opines that the Petitioner's device may be subject to the requirements of Title 8 Section 3328(f) as a “modification.” The Petitioner's device adds additional complexity to the proper closing of the guard. The lower guard is required to return instantaneously after the saw operator withdraws the saw from work. Any damage or interference to the Petitioner's device, such as a bend in the pushrod, while installed on a saw could prevent the lower guard from closing, leaving the blade exposed and potentially endangering employees.

The Petitioner's device exposes the operators to a greater risk of injury resulting from kickbacks should the Petitioner's device fail to operate smoothly under field conditions. Since the Petitioner's device remains on the saw until the saw operator removes the device completely, the saw operator is exposed to the risks on otherwise legal sawing operations as well.

The product has not been tested through a nationally recognized testing laboratory in conjunction with any portable power driven circular hand saws.

⁴ The term “unconventional cuts” includes the “unusual cuts” such as plunge cuts and cuts that are not generally accepted such as single-handed unsupported workpiece cutting operations demonstrated by the petitioner.

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During the course of the evaluation, Board staff queried stakeholders such as Power Tool Institute, Inc. (PTI) and the Carpenters Training Committee for Northern California. Both organizations were provided a copy of Petition 555 for review. Both offered opposition to the use of the Petitioner's product and the Petitioner's request for changes to Title 8 Section 4307. PTI, a representative of manufacturers of power tools, opposed, pointing out the modifications to the standard were inconsistent with the ANSI/UL standard and the International standard, IEC 60745-2-5. Additionally, PTI cautioned that the Petitioner's product would "go against the manufacturer's recommendation." PTI reviewed the petition and provided the following conclusion:

...PTI does not support the adoption of the petition to change Title 8 of the California Code of Regulation, Section 4307 for circular saw lower guards. The proposal presented in the petition would not work in concert with the current safety requirements for circular saws established by ANSI and in fact could create a greater risk to the operator. In addition, acceptance of such a requirement in the California Code of Regulation would make most circular saws, if not all on the market illegal for use in California and would result in deviating from the consensus standard developed by ANSI and accepted as a Bi-National standard in the US and Canada...

Carpenters Training Committee for Northern California opined:

We believe that the current lifting lever, when used properly, is safe and gives the operator two handed control of the saw. The device shown (Saw Guard Dog) seems to stick out enough from the body of the saw that it would create a hazard, i.e. catching a sleeve on it. Saws take a lot of abuse in their normal operation on the jobsite, and the possibility of this device getting bent or malfunctioning seems pretty high. The argument that operators pin the guard back to use the saw implies that it is necessary – it is not, and is forbidden already by regulation.

RECOMMENDATION

Board staff has discussed the Petitioner's request with DOSH and evaluated the request in detail including a comprehensive review of relevant subject matter literature relevant to the request. For reasons described in the preceding evaluation, Board staff recommends that the Petitioner's request be DENIED.

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Attachment 1: NATIONAL CONSENSUS STANDARD

The current national consensus standard for portable circular saws is ANSI/UL 60745-2-5 adopted early in 2016. ANSI/UL 60745-2-5 specifies the design, operation and testing criteria for “hand held circular saws.” There are four types of lower guards described in ANSI/UL 60745-2-5:

1. circular saws with outer pendulum guard,
2. circular saws with inner pendulum guard,
3. circular saws with tow guard, and
4. plunge type saws.

ANSI/UL 60745-2-5 does not use the terms “hinged guard” and “telescopic guard” found in Title 8, Section 4307.

The current ANSI O1.1 2013 no longer includes requirements for portable circular saws. ANSI O1.1 2013 only applies to stationary woodworking equipment. However, federal OSHA still requires that woodworking machinery comply with ANSI O1.1 1961. Copies of ANSI O1.1 1961 are not available however, the 1971 “revision” of the 1961 edition reads as follows:

ANSI O1.1-1971 Safety Code for Woodworking Machinery

6.1.10 Portable Circular Saws. All portable, power-driven saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the blade to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the blade to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to covering position.

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Attachment 2: FEDERAL OSHA STANDARDS

The current Federal Standards 29 CFR 1926.304 and 1910.243 do not include requirements for the lifting lugs or handles specified in Title 8 Section 4307(b)(1) and (2).

29 CFR 1926.304(d)

Guarding. All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

29 CFR 1926.304(f)

Other requirements. All woodworking tools and machinery shall meet other applicable requirements of American National Standards Institute, O1.1-1961, Safety Code for Woodworking Machinery.

The requirements are nearly identical to the requirements within ANSI O1.1-1961⁵ Safety Code for Woodworking Machinery.

The current ANSI O1.1 2013 no longer includes guarding requirements for portable circular saws. ANSI O1.1 2013 only applies to stationary woodworking equipment.

⁵ ANSI O1.1-54(R1961) was superseded by ANSI O1.1-1971