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Standard Guide for the Safe Use of Table Saws[1]

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1. Scope

1.1 This guide provides information promoting the safe use of table saws based on recommended practices in the United States, but may not reflect practices outside of the U.S. This guide includes the following activities:

1.1.1 Installation;

1.1.2 Setup;

1.1.3 Operation; and

1.1.4 Maintenance.

1.2 This guide is intended to be used by table saw operators as well as employers who utilize table saws in their operations.

1.3 This guide applies to the use of electric motor-operated, cord-connected, or permanently connected table saws intended for cutting wood and analogous materials, plastics, and non-ferrous metals except magnesium, used in the following applications:

1.3.1 Consumer;

1.3.2 Industrial; and

1.3.3 Commercial (for example, governmental, educational, or business).

1.4 This guide does not apply to:

1.4.1 Handheld tools;

1.4.2 Table saws with an automatic feeding device;

1.4.3 Table saws fitted with abrasive wheels for cutting or surface finishing;

1.4.4 Table saws intended to cut ferrous metals, magnesium, or both;

1.4.5 Table saws with more than one spindle such as for a scoring blade; and

1.4.6 Sawmills.

1.5 *Units*—The values stated in inch-pound units are to be regarded as the standard. No other units of measurement are included in this standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E1542 Terminology Relating to Occupational Health and Safety

2.2 *OSHA Standards:*[3]

29 CFR 1910.213 Woodworking Machinery Requirements

OSHA Publication No. 3157 A Guide for Protecting Workers from Woodworking Hazards

2.3 *ANSI Standards:*[4]

ANSI/ISEA Z87.1 American National Standard for Occupational and Educational Personal Eye and Face Protection Devices

ANSI/UL 62841-3-1 Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery—Safety—Part 3-1: Particular Requirements for Transportable Table Saws

ANSI/UL 987 Standard for Stationary and Fixed Electric Tools

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this guide, refer to Terminology E1542.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *anti-kickback device, n*—a device that allows the movement of the workpiece in the cutting direction but reduces

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from Occupational Safety and Health Administration (OSHA), 200 Constitution Ave., NW, Washington, DC 20210, http://www.osha.gov.

[4] For referenced ANSI standards, visit the ANSI website, https://webstore.ansi.org, and the UL Standards Sales Site https://www.shopulstandards.com.

the likelihood of the rapid movement of the workpiece in the direction opposite of feed.

Discussion—Definitions of specific types of anti-kickback devices are given in 3.2.1.1 – 3.2.1.8.

3.2.1.1 *featherboard, n*—spring-like fingers that are in contact with the workpiece.

Discussion—The fingers are designed to allow unobstructed movement of the workpiece in the feed direction and to provide a restraining force on the workpiece in the opposite direction.

3.2.1.2 *kickback pawls, n*—an anti-kickback device attached to a splitter/spreader or an extended riving knife.

3.2.1.3 *one-directional roller, n*—an anti-kickback device typically attached to a rip fence.

3.2.1.4 *riving knife, n*—a device located behind and in the plane of the saw blade, within the cutting capacity of the saw blade and in a fixed proximity to the saw blade through an entire depth of cut and bevel angle operating range of the saw blade, with an intended function to reduce the risk of saw blade pinching and binding.

Discussion—Definitions of specific types of riving knives are given in 3.2.1.5 – 3.2.1.7.

3.2.1.5 *adjustable extended riving knife, n*—a device designed to function at least in one position as an extended riving knife and in a second position as a riving knife.

3.2.1.6 *extended riving knife, n*—a device in all aspects identical to a riving knife, except it extends above the maximum cutting capacity of the saw blade to allow the mounting of a saw blade guard or an anti-kickback device, or both.

3.2.1.7 *fixed extended riving knife, n*—an extended riving knife that is fixed in position.

3.2.1.8 *splitter/spreader, n*—a device located behind and in the plane of the saw blade, extending above the cutting capacity of the saw blade through the entire depth of cut and bevel operating range of the saw blade.

Discussion—This device is also commonly known as a spreader.

3.2.2 *blade guarding system, n*—a system of safety devices that jointly function to provide barrier protection, as well as chip and other debris deflection at or near the saw blade area and kerf separation and help maintain workpiece alignment, and restraint in the event of kickback.

Discussion—Definitions of specific types of guarding systems are given in 3.2.2.1 – 3.2.2.4.

3.2.2.1 *3-in-1 blade guard, n*—an assembly that consists of a hood-type barrier which encloses the sides and top of the saw blade, a splitter/spreader, and an anti-kickback device.

3.2.2.2 *manually adjustable blade guard, n*—a blade guard that does not open in response to the advancing workpiece and requires manual adjustment for the material thickness being cut.

3.2.2.3 *modular blade guard*—consists of an extended riving knife, self-adjusting sides of the saw blade barriers, a fixed top of the saw blade barrier, and an anti-kickback device.

Discussion—The saw blade barriers and the anti-kickback device are independently secured (removable) to/from an adjustable extended riving knife. The extended riving knife can be adjusted to a non-through cutting position.

3.2.2.4 *overhead blade guard, n*—a hood-type barrier enclosing the saw blade.

Discussion—The hood barrier is not attached to a splitter/spreader or an extended riving knife, but can be suspended from the ceiling or held by a supporting arm or a stand-alone device.

Discussion—The riving knife and the anti-kickback devices are mounted to the table saw under the table top.

Discussion—An overhead blade guard is also known as an overarm blade guard.

3.2.3 *cutting capacity, n*—the height of the highest saw blade tooth tip above the table top for the particular depth setting of the saw blade at 0° bevel position.

3.2.4 *fence, n*—a device to locate/guide the workpiece during the cutting process.

Discussion—Definitions of specific types of fences are given in 3.2.4.1 – 3.2.4.6.

3.2.4.1 *auxiliary fence, n*—a stationary spacer used in conjunction with a rip fence to help avoid the interference between a blade guard and the rip fence.

3.2.4.2 *cross cutting fence, n*—a fence with the workpiece guiding surface perpendicular to the cutting device or set to a miter angle with respect to the cutting device and designed to move parallel with the plane of the saw blade during the cutting process or to position the workpiece for a table saw with sliding function.

3.2.4.3 *rip fence, n*—a fence that has the workpiece guiding face parallel with the plane of the saw blade and can be set to a desired distance from the saw blade.

3.2.4.4 *sacrificial fence, n*—any fence, except for the fence supplied with the table saw, that may be cut by the cutting device during the desired operation.

3.2.4.5 *tall auxiliary fence, n*—an additional guiding surface which is attached to the rip fence and provides additional guidance and stability to the workpiece standing on its edge during “resawing” and “raised panel” cutting operations.

3.2.4.6 *temporary fence, n*—a fence-like workpiece guiding device, typically used for cove cutting, that is temporarily fastened to the table top such that the workpiece guiding face of this fence is not parallel with the plane of the saw blade.

3.2.5 *fixture, n*—a fixed device to locate and hold the workpiece in the desired position so operations can be performed without guiding or supporting the workpiece by hand.

Discussion—The fixture’s design is typically dependent upon the shape of the workpiece, the operation being performed, or both.

3.2.6 *freehand cut, n*—any through cut or non-through cut performed where the workpiece is guided through the saw blade only by the operator’s hands, without any guiding devices (for example, a cross cutting fence, rip fence, fixture, or hold-down device) to keep the workpiece from twisting during the cut.

3.2.7 *jig, n*—a moveable device to locate, hold, and guide the workpiece in the desired position so operations can be

performed and to provide grasping area(s) that keep the operator's hands a safe distance from the cutting tool.

Discussion—Jigs can be referred to as templates or forms and can be used to guide or limit the relative positions of the workpiece and the cutting tool.

3.2.8 *kerf thickness, n*—a distance between two parallel planes that are touching the opposing sides of at least three saw blade tooth tips.

3.2.9 *kerf width, n*—a breadth of the channel cut out by the saw blade in the material being cut.

Discussion—Kerf width is typically a few thousands of an inch larger than the kerf thickness of the saw blade.

3.2.10 *kickback, n*—a sudden reaction to a pinched, jammed, or misaligned workpiece with respect to the saw blade, which causes the workpiece to be propelled by the saw blade.

3.2.11 *manual workpiece feeding device, n*—a handheld device designed to assist an operator in advancing the workpiece during the cut while providing a safe distance between the operator's hand(s) and the cutting tool.

Discussion—Definitions of specific types of manual workpiece feeding devices are given in 3.2.11.1 – 3.2.11.3.

3.2.11.1 *push block, n*—a handheld device with a handle on top to keep the workpiece against the table top and a heel or notch at the bottom rear end that transfers the feeding or control force, or both, of the operator to the trailing edge of the workpiece, mostly used in non-through cutting situations.

3.2.11.2 *push pad, n*—a handheld device with a handle on top to keep the workpiece against the table top and a friction pad on the bottom that transfers the feeding or control force, or both, of the operator to the workpiece, mostly used in non-through cutting situations.

3.2.11.3 *push stick, n*—a handheld, stick-like device with a handle on the back end and a heel and toe-type notch at the front end to feed the trailing edge of the workpiece, mostly used in through cutting ripping operations.

3.2.12 *maximum cutting capacity, n*—the cutting capacity at the maximum depth setting of the saw blade and, unless otherwise specified, at 0° bevel.

3.2.13 *non-through cut, n*—any cutting operation where the cutting device does not extend (protrude, penetrate) through the thickness of the workpiece.

Discussion—Definitions of specific types of non-through cuts are given in 3.2.13.1 – 3.2.13.10.

3.2.13.1 *cove cut, n*—guiding a workpiece over an ordinary saw blade at an angle other than parallel to the cutting line of the saw blade, and in very small increments, increasing the depth of the cut after each pass to shave off large, arcing surface areas.

3.2.13.2 *dado cut, n*—a cut performed with a dado set or dado blade of a desired thickness to produce an essentially rectangular-sided notch or trough in the workpiece.

Discussion—A dado cut made parallel to the grain of the wood is also known as ploughing.

3.2.13.3 *dovetail cut, n*—a series of miter or bevel cuts, or both, to form an interlocking feature of fingers or channels to join two boards.

3.2.13.4 *kerfing cut, n*—a series of repeated cuts of same or different depth and spacing from each other, performed with an ordinary saw blade, to remove material for the purpose of shaping or bending the workpiece.

3.2.13.5 *molding head cut, n*—a cut performed with a specially shaped cutting device which produces a mirror image shape of the cutter on the cut surface of the workpiece, predominantly used for decoration.

3.2.13.6 *plunge cut, n*—starting the cut at a location other than at the edge of the workpiece. The cut is performed by first securing the workpiece over the stationary saw blade lowered below the table top and then slowly raising the rotating saw blade into the workpiece.

Discussion—The saw blade may be raised to fully cut through the thickness of the workpiece before the workpiece is advanced by guiding it with a rip fence.

3.2.13.7 *pocket cut, n*—a cut consisting of a sequence of intersecting plunge cuts to make an opening in the workpiece.

3.2.13.8 *rabbet cut, n*—a two-sided notch (typically rectangular) that is open to the edge or end of the surface into which it is cut.

3.2.13.9 *raised panel cut, n*—a beveled rip cut of a panel standing on its edge or a cove cut performed at the edge of the panel's surface situated on the table top.

Discussion—In either case, the saw blade intersects the panel's edge but not the entire panel's thickness dimension.

3.2.13.10 *resawing cut, n*—a combination of two cuts performed with an ordinary saw blade in the same plane but on opposite edges of a workpiece that results in reducing the thickness of the workpiece.

3.2.14 *reasonably foreseeable misuse, n*—the predictable use of facilities, equipment, or materials in a way not intended by the designer, but which may result from readily predictable human behavior.

3.2.15 *safe distance, n*—a distance that, under ordinary cutting where the workpiece is advanced by hand in accordance with the instructions provided with the table saw and safe working practices, reduces the likelihood of a saw blade contact accident.

Discussion—For a majority of table saw systems, a 6 in. or more hand to blade separation is considered to be a safe distance.

Discussion—When using jigs or other work helpers, a safe distance is dependent on the design of the device.

3.2.16 *saw blade, n*—a material-removing device that cuts through the workpiece.

Discussion—See Appendix X1 for more information on saw blades such as kerf thickness, tooth profile design, and selection criteria.

Discussion—Definitions of specific portions of the saw blade are given in 3.2.16.1 – 3.2.16.3.

3.2.16.1 *front quadrant, n*—saw blade quadrant where the blade teeth rotate down into the table top.

3.2.16.2 *quadrant, n*—a portion of the saw blade above the plane of the table top that is divided by an imaginary line extending up from the arbor and perpendicular to the table top.

3.2.16.3 *rear quadrant, n*—saw blade quadrant where the blade teeth rotate up and out of the table top.

3.2.17 *table insert, n*—a removable portion of the table top to facilitate the changing of the saw blade, adjustments of the riving knife, or both, and having a specific size slot opening to allow for a standard saw blade protruding through the insert.

Discussion—Definitions of specific types of table inserts are given in 3.2.17.1 and 3.2.17.2.

3.2.17.1 *dado table insert, n*—a table insert having a specific size slot opening to allow for a dado blade set or molding head protruding through the insert.

3.2.17.2 *zero-clearance table insert, n*—a table insert that is manufactured without any slot for the saw blade, with the intention that the slot in the table insert will be cut after installation in the table saw by the actual saw blade installed in the table saw.

3.2.18 *table top, n*—surface of the table saw supporting the workpiece.

Discussion—Definitions of specific table top portions are given in 3.2.18.1 and 3.2.18.2.

3.2.18.1 *infeed side, n*—the portion of the table top where the workpiece is approaching or is in contact with the front quadrant of the saw blade, where the saw blade rotates down into the table top.

3.2.18.2 *outfeed side, n*—the portion of the table top where the workpiece is exiting or is in contact with the rear quadrant of the saw blade, where the saw blade rotates up and out of the table top.

3.2.19 *through cut, n*—any cutting operation where the saw blade extends (protrudes, penetrates) through the thickness of the workpiece.

Discussion—Definitions of specific types of through cuts are given in 3.2.19.1 – 3.2.19.9.

3.2.19.1 *bevel cross cut, n*—a cross cutting operation with a saw blade at bevel angle other than 90° to the table top surface.

3.2.19.2 *bevel rip cut, n*—a rip-cutting operation with a saw blade at a bevel angle other than 90° to the table top surface.

3.2.19.3 *chamfering cut, n*—a beveled rip cut or beveled cross cut performed at the edge of the workpiece such that the saw blade intersects the edge of workpiece side dimension and the workpiece bottom surface that is situated on the table top.

3.2.19.4 *compound angle cross cut, n*—a cross cutting operation performed with a saw blade and a workpiece guiding surface of a miter gauge or of a cross cutting fence set to a bevel or miter angle other than 90°.

3.2.19.5 *cross cut, n*—a cutting operation performed utilizing a miter gauge or a cross cutting fence to guide the workpiece.

Discussion—For natural wood, a cut is performed predominantly in a perpendicular direction to the grain of the wood; for engineered materials, a cutting operation is performed perpendicular to the length of the workpiece.

3.2.19.6 *miter cross cut, n*—a cross cut performed with the workpiece guiding surface of a miter gauge or of a cross cutting fence set to a miter angle other than 90° to the saw blade line of cut.

3.2.19.7 *rip cut, n*—any cutting operation performed utilizing a rip fence to guide a workpiece.

Discussion—For natural wood, a cut is performed predominantly in a parallel direction with the grain of the wood; for engineered materials, a cutting operation is performed parallel with the length of the workpiece.

3.2.19.8 *simple (or square) cross cut, n*—a cross cutting operation performed with a saw blade and a workpiece guiding surface of a miter gauge or of a cross cutting fence set to 90°.

3.2.19.9 *tapered cut, n*—a cut performed utilizing a jig to hold the workpiece such that the straight edge of the workpiece is at tapered, non-parallel angle to the cutting line of the saw blade. The jig is guided by the rip fence or a miter gauge slot.

4. Significance and Use

4.1 This guide is intended to provide guidance on the safe operation of table saws.

4.2 This guide deals with hazards relevant to table saws when they are used as intended by the manufacturer and under conditions of reasonably foreseeable misuse.

4.3 Table saws are multi-purpose tools, configurable for multiple uses/operations. This document describes the accepted best practices for safe operation of the tool.

4.4 This guide does not and is not meant to supersede safety instructions provided in manufacturers' product use instructions or manuals.

5. Operator Qualifications and Training

5.1 It is highly recommended that a person who operates a table saw should be medically and physically capable to do so and have no impairment that prevents the safe use of table saws.

5.2 Appropriate safety training for any table saw operation is highly recommended for both occupational users and consumer users of table saws.

5.2.1 Training for occupational users is prescribed in OSHA 2254 Training Requirements in OSHA Standards; ANSI O1.1 Woodworking Machinery—Safety Requirements; and the manufacturer's user instruction manual for the table saw in use, which will include an evaluation by a qualified person and other requirements deemed necessary by the employer.

5.2.2 Training for consumer users of table saws should be based on a thorough understanding of the manufacturer's user instruction manual and mastering of the recommended table saw operating procedures of the instruction manual and of this guide.

5.2.3 Additional materials concerning the training of the table saw operator may be utilized from resources, including: ANSI (American National Standards Institute); the Association of General Contractors (agc.org); OSHA; and the National Safety Council (nsc.org).

6. Installation Requirements

6.1 *Work Area Requirements:*

6.1.1 Table saws shall be installed in an area that will be kept clean and free of unnecessary clutter.

6.1.2 Table saws shall be installed in an area with sufficient lighting to allow good operator visibility of the table saw, workpiece, and the surrounding area where the operator may be working.

6.1.3 Table saws shall be installed in an area where the surrounding floor or ground is level and will allow for good operator footing and balance.

6.1.4 Table saws shall be secured in a level and stable position so that it is unlikely that the saw will move or tip over during normal use, in accordance with the manufacturer's instructions. This may be achieved by mounting the table saw on a support, fixing it to a bench or the floor, or other means.

6.1.5 Table saws shall be installed in an area that provides enough room to easily handle the size of any anticipated workpiece, keeping in mind that the size of the workpiece shall not exceed the manufacturer's specifications.

6.1.6 Table saws shall not be permanently installed in an area that is exposed to rain.

6.1.7 Table saws shall be installed in an area where the ambient conditions (for example, temperature and humidity) are in accordance with the manufacturer's instructions for operating the saw.

6.1.8 It is recommended that table saws be installed in an area not subject to wet or damp conditions. If operating a table saw in a wet or damp location is unavoidable and is allowed in accordance with the manufacturer's instructions, either the AC power supply or the table saw shall incorporate a listed ground-fault circuit interrupter for operator protection.

6.1.9 Table saws shall not be installed in an area with an explosive atmosphere, such as in the presence of flammable liquids, gases, or dust.

6.1.10 Table saws shall be installed in an area that is properly ventilated to control the airborne dust generated by the sawing process.

6.1.11 If a dust extraction system is used, it shall be connected to the table saw in accordance with the manufacturer's instructions.

6.1.12 AC power supply table saws shall be installed in an area with an appropriate electrical outlet that has a socket type and rating in accordance with the manufacturer's instructions.

6.1.13 AC power supply table saws shall be connected to the AC power supply in accordance with the manufacturer's instructions, including cabling, fusing, socket type, and grounding requirements.

6.1.14 AC power supply table saws that are mostly used to cut metal shall incorporate a listed ground-fault circuit interrupter protection for personnel in either the AC power supply or the saw.

6.1.15 AC power supply table saws shall not be installed in an area where the power cord may be subjected to excessive heat, oil, sharp edges, or moving parts.

6.2 *Table Saw Guard and Saw Blade Fitting Requirements:*

6.2.1 All table saw guards shall be mounted and adjusted in accordance with the manufacturer's instructions.

6.2.2 Some table saws may have a manually adjustable blade guard, that is, the blade guard does not open in response to the advancing workpiece. Such blade guards shall be manually adjusted for the material thickness being cut to be no more than $\frac{1}{16}$ in. above the workpiece thickness. Follow the manufacturer's instructions for setting and locking the blade guard.

Warning—Do not set a manually adjustable blade guard higher than recommended. A larger gap above the workpiece may allow the fingers to reach the saw blade. A manually adjustable blade guard may be designed to reduce the magnitude of a kickback by restraining the workpiece from being lifted by the saw blade.

6.2.3 Table saw riving knives shall always be mounted and adjusted in accordance with the manufacturer's instructions.

6.3 *Saw Blade Fitting Requirements:*

6.3.1 Refer to Appendix X1 for guidance on selection of the saw blade to be used.

6.3.2 Table saws shall always be used with saw blades that are appropriate for the riving knife. For the riving knife to function properly, the saw blade diameter must match the appropriate riving knife, the body of the saw blade must be thinner than the thickness of the riving knife, and the kerf thickness of the saw blade must be wider than the thickness of the riving knife.

6.3.3 Table saws shall always be fitted with saw blades having the correct diameter of arbor holes, in accordance with the manufacturer's instructions.

6.3.4 Table saws shall always be fitted with saw blades having a saw blade diameter in accordance with the markings on the saw.

6.3.5 Table saws shall always be fitted with saw blades that are marked with a speed equal to or higher than the speed marked on the saw.

6.3.6 Saw blades shall always be installed on table saws to rotate in the proper direction.

6.3.7 Saw blades shall be mounted on table saws using the correct saw blade mounting means (for example, flanges or washers) in accordance with the manufacturer's instructions.

6.4 Table saws shall not be fitted with bonded grinding or cutting wheels, wire brushes, or abrasive diamond wheels.

7. Workpiece and Work Aids/Helpers

7.1 *General:*

7.1.1 **Warning—**Before any table saw operation, examine the workpiece for imperfections such as workpiece being warped/bowed/twisted or workpiece with embedded foreign objects and workpiece lacking a structural integrity to withstand the cutting process. Do not cut workpieces with these imperfections.

7.1.2 Workpiece aids/helpers such as push sticks, push blocks, push pads, featherboards, jigs, and fixtures should provide a substantial amount of safe distance between the hand and the saw blade in order to facilitate safe cutting conditions. When properly matched to the sawing operation, they can provide enhanced control of the workpiece.

7.2 *Push Sticks:*

7.2.1 A push stick can be shop made, purchased, or provided by the table saw manufacturer. Many shapes/designs are commercially available.

7.2.2 The general requirements for a push stick are as follows:

(1) It shall be made of a nonmetallic material, for example, wood or plastic;

(2) It shall provide a grasping area at the end opposite the notch end;

(3) It shall be long enough (typically at least three times the table saw maximum cutting capacity from the notch to the nearest point of the grasping area) to keep the hand at a safe distance from the saw blade during use; and

(4) It shall be strong enough to withstand breakage during use.

NOTE 1—For typical table saws having a saw blade diameter of 8 in. to 12 in., the strength of the push stick should be commensurate to the saw blade diameter, that is, 90 to 140 lb of force.

7.2.3 For the purposes of this guide, devices used to push the top or side edge, or both, of a workpiece against a rip fence are not considered push sticks. See 7.4.

7.2.4 The use of push sticks is required by OSHA when cutting small workpieces and pushing stock past the blade (see 29 CFR 1910.213(s)(9)).

7.2.5 OSHA does not specify push stick requirements. Specific, quantitative requirements can be found in ANSI/UL 987 and ANSI/UL 62841-3-1.

7.2.6 The operator shall use push sticks provided by a table saw manufacturer or push sticks that meet any specific requirements provided in the operator/owner's manual for the tool to be used.

7.3 *Push Pads/Push Blocks:*

7.3.1 A push pad or push block should not be utilized in a manner that causes the operator's hand holding it to travel directly over the saw blade when making a cut, unless it is specifically designed for such an operation and provides an equivalent guarding function from the hazard of the rotating saw blade. It is recommended that push pads or push blocks be used only on areas of the workpiece that cover (that is, are supported by) the saw's table top.

7.3.2 A push pad or push block can be shop made or purchased. Many shapes/designs are commercially available.

7.3.3 General requirements for a push pad or push block, except for the shoe-type work aid/helper described in 7.3.4, are as follows: (*1*) it shall provide a handle above the work-holding block with sufficient grasping area for an entire hand, and (*2*) any fasteners used to secure the handle to the block shall be recessed above the bottom surface of the block. Rubber-like bottom coverings for enhanced gripping of the workpiece are recommended.

7.3.4 A shoe-type push block is a type of work aid/helper that incorporates a long sole that pushes down on the workpiece and a heel that engages the rear edge of the workpiece. This type of device usually includes a handle to provide control and clearance between the operator's hand and the saw blade. A shoe-type push block may not provide as much hand clearance as a push stick when pushing the workpiece past the cutting tool.

7.3.4.1 One variation of the shoe-type work aid/helper is a block with an upright handle that straddles and slides along the rip fence (see Figure 10 of OSHA Publication No. 3157). This type of push block functions like a push stick.

7.4 *Featherboards and One-Directional Rollers:*

7.4.1 A featherboard (also known as a comb) is a work-guiding and hold-down device incorporating a series of spring-like fingers along one end. The device is held securely against the table or rip fence during any ripping operation, with the spring-like fingers guiding and holding the workpiece down on the table top or against the rip fence, or both. Featherboards are used with push sticks or push pads/push blocks, or combinations thereof, to help control the workpiece, maintain a guided cut, reduce the potential for kickback, and to allow the tool user to keep his/her hands a safe distance from the cutting tool.

7.4.2 Featherboards are especially useful when ripping small or narrow workpieces and for completing non-through cuts.

7.4.3 The use of featherboards or suitable jigs is required by OSHA when a standard guard cannot be used, as in dadoing, grooving, jointing, molding, and rabbeting (see 29 CFR 1910.213(a)(15)).

7.4.4 Featherboards can be shop made or purchased. Many shapes/designs are commercially available.

7.4.5 The ends of all fingers of a featherboard shall be linearly aligned and mitered. All fingers can be the same length or the fingers can be of varying lengths.

7.4.6 Featherboards are set at the mitered featherboard angle to the workpiece and provide an anti-kickback type action.

7.4.7 A one-directional roller is typically attached to a rip fence and a high-friction rolling component is adjusted to press on the workpiece. The one-directional roller allows the workpiece to move in the cutting direction, but will provide a resistance to a motion of the workpiece in the opposite direction.

7.5 *Cross Cutting Sleds:*

7.5.1 A cross cutting sled is a jig-type workpiece holding and guiding device that is typically guided by rails that fit in miter gauge slots, generally employed to accurately cross cut material of a size or configuration that is not easily cut with a standard miter gauge. These devices may vary in size and configuration, and can be purchased commercially or, more commonly, fabricated in a workshop. See Fig. 11.

7.5.2 A workshop-fabricated cross cutting sled is generally constructed of a flat panel (the workpiece support surface) that is fitted with a set of bottom rails and two parallel vertical rails, one at the front and one at the rear. The bottom rails are installed in line with the table saw miter gauge slots and serve to guide the flat panel from the infeed side of the saw table top to the outfeed side during the cutting operation. The rear vertical rail, the rail closest to the operator, is referred to as the fence and functions to support the workpiece during the cut. The front or outfeed side rail stabilizes the flat panel and provides rigidity to the assembly. The width of the sled must be designed to accommodate a minimum of 6 in. hand clearance

from the saw blade cut line. Both the front and rear rails shall have a height that is greater than the maximum cutting capacity of the table saw. To limit saw blade exposure during use, the sled assembly shall be fitted with a clear, impact-resistant (for example, polymeric) saw blade cover that spans the front and rear rail at least 2 in. to both the left and right of the saw blade and a box-style wood exit guard at the surface of the rear rail, which is closest to the operator, which effectively shields the protruding portion of the blade as it passes through the rear rail at the completion of the cut.

7.5.3 A cross cutting operation employing the sled is accomplished by first adjusting the saw into a non-through cutting configuration (in accordance with the operator's manual) and then placing the sled on the saw's table top with the bottom rails engaged in the miter gauge slots. The workpiece is placed on the sled table against the interior surface of the rear rail with the intended cut line aligned with the saw blade. The workpiece is then secured against the interior surface of the rear rail, either by some accessory clamping means or by employing one or both hands either to the left or right side of saw blade.

NOTE 2—Securement of the workpiece against the fence is dependent upon workpiece positioning on the sled and the cutting operation to be performed. It is recommended that a minimum 6 in. hand clearance from the rotating saw blade be maintained throughout the cut. After starting the saw blade motor, the sled is advanced by the steady application of hand force toward the outfeed side of the saw's table top through the completion of the cut. It is recommended that the saw blade motor be shut down and the saw blade rotation stopped before clearing cut material from the sled table.

7.5.4 The rear rail may be fitted with clamps, end stops, and angle fixtures for supplemental workpiece support, repetitive cutting, and cutting miters and joints.

8. Instructional Guidelines for Safe Table Saw Cutting Operations

8.1 **Rip Cuts:**

8.1.1 *Scope:*

8.1.1.1 A rip cut is any through-cutting operation performed utilizing a rip fence to guide a workpiece. For natural wood, a cut is performed predominantly in a parallel direction with the grain of the wood; for engineered materials, a cutting operation is performed parallel with the length of the workpiece.

8.1.1.2 A bevel rip cut is a rip-cutting operation with a saw blade at a bevel angle other than 90° to the table top surface.

8.1.1.3 The described procedure is applicable to table saws fitted with a standard saw blade.

8.1.1.4 Operators performing non-through rip cuts, that is, operations utilizing a rip fence to guide the workpiece, such as cuts made during rabbeting, resawing, or kerfing operations, will benefit from reading this subsection. However, the instructions in this subsection concerning the implementation of blade guards, auxiliary fences, and push blocks, as well as depth of cut settings, do not apply to non-through rip cuts.

8.1.1.5 The procedure described below applies to pull-type table saws, provided that the saw blade sliding mechanism is locked in the rip-cutting position; it also applies to sliding cross cutting table saws, provided that the sliding table mechanism is locked.

NOTE 3—Pull-type saws are also known as "push-pull saws."

8.1.1.6 For table saws with a sliding cross cutting table and for pull-type table saws, it is recommended that the mechanical operations of the sliding table and/or the setup of the cross cutting fence (as applicable) be performed in accordance with the instructional guidelines contained in the owner's manual for the table saw.

8.1.2 *PPE Requirements and Dust Control Systems:*

8.1.2.1 Eye/face and hearing protection shall be used during the sawing operation.

8.1.2.2 Respiratory protection or a dust extraction system attached to the table saw, or a combination thereof, is highly recommended for indoor installations.

8.1.3 *Work Aids/Helpers, Tools, and Fixture Requirements:*

8.1.3.1 Push stick, Fig. 1, or a push pad that is suitable for the particular operation.

8.1.3.2 Clamps and featherboard, Fig. 2.

8.1.3.3 Narrow strip cutting auxiliary fence and narrow strip cutting push block, see Figs. 3 and 4, for cutting strips less than 2 in. wide. In this subsection, these two work helpers will be simply referred to as an auxiliary fence and as a push block.

8.1.3.4 Outfeed, infeed, or side workpiece support or combinations thereof, required for a long and/or a large panel workpiece where the mass of the overhanging portion of the workpiece is greater than the mass resting on the table top at any time during the cutting process.

8.1.3.5 Straightedge rule or carpenter/machinist square.

8.1.3.6 Carpenter's pencil or marker.

8.1.3.7 Featherboard or a one-directional roller.

NOTE 4—The push block construction illustrated in Fig. 4 is for a fence positioned on the right-hand side of the saw blade.

NOTE 5—The horizontal base of the auxiliary fence and of the push block is made out of ⅜ in. thick plywood and the vertical portion of these

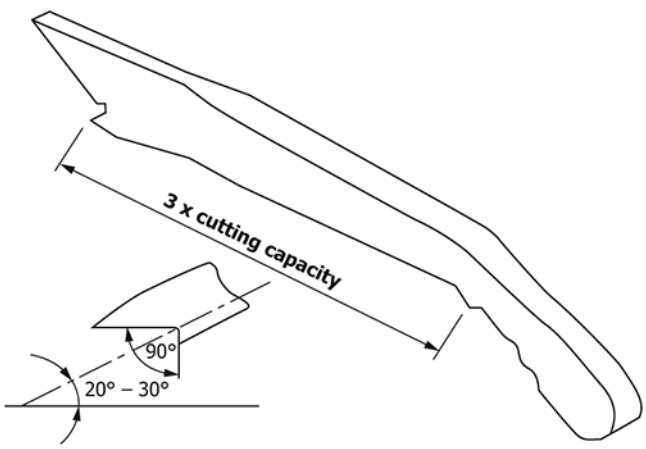

FIG. 1

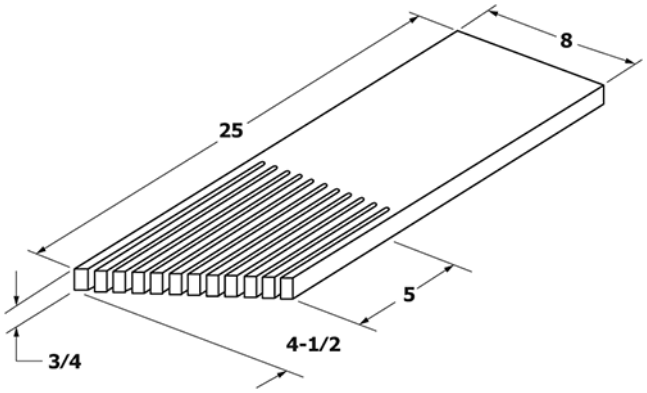

FIG. 2

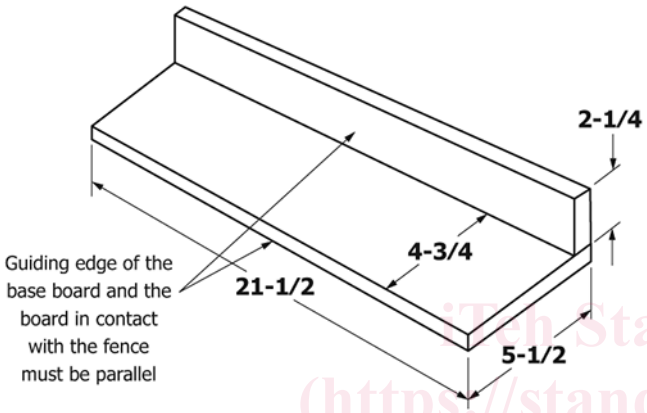

FIG. 3

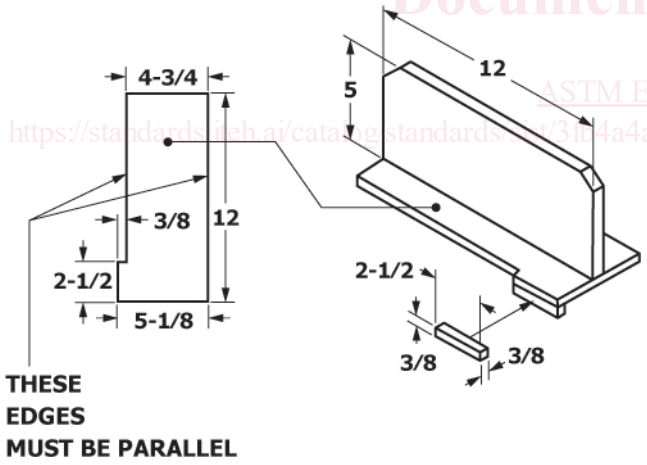

FIG. 4

devices is made from ¾ in. hardwood.

8.1.4 *Saw Blade Selection:*

8.1.4.1 Install a sharp rip-cutting saw blade with a medium tooth count.

8.1.4.2 The saw blade body thickness must be less than the thickness of the riving knife (or thickness of the 3-in-1 blade guard spreader) while the kerf thickness of the saw blade is wider than the riving knife (or thickness of the 3-in-1 blade guard spreader).

8.1.5 *Use of Guard, Riving Knife, and Anti-Kickback Device:*

8.1.5.1 The riving knife, barrier guard(s), and anti-kickback device(s) or a 3-in-1 blade guard shall be used when performing rip-cutting operations.

8.1.5.2 Table saws with a manually adjustable blade guard shall be used in accordance with the manufacturer's instructions. Also, see 6.2.2.

8.1.5.3 For table saws with an overhead blade guard, the guarding system shall be used in accordance with the manufacturer's instructions.

8.1.6 *Measurements and Layout for Rip Cuts:*

8.1.6.1 A rip cut is predominantly a sizing operation; that is, the workpiece is cut to the required width dimension when the rip fence is set to the desired distance from the rip fence side saw blade tooth tip.

8.1.6.2 In order to perform a rip cut safely, it is essential that the table saw and its components are set up properly.

8.1.6.3 The saw blade shall be parallel with the miter gauge slots of the table top. Adjust the saw blade if any measurable discrepancy of 1/32 in. or greater is detected.

8.1.6.4 The rip fence shall be parallel with the saw blade. With the saw blade elevated to the maximum cutting capacity, the distances between the fence side of the saw blade tooth tip and the workpiece guiding surface of the rip fence at the front and at the rear of the saw blade shall be identical. Adjust the rip fence if any measurable discrepancy of 1/32 in. or greater is detected.

NOTE 6—The fence parallelism should be checked at a few rip fence to saw blade settings.

NOTE 7—The fence parallelism is likely to be influenced by how the fence was moved to the desired position. If the fence is moved by holding the workpiece supporting arm over the table top, then the arm of the fence may be biased in the direction of the fence adjusting movement. Therefore, whenever adjusting the rip fence, always move the rip fence only by holding the T-square head and either pushing toward or pulling away from the table top (depending on your fence construction) while sliding the rip fence to the right or to the left. Lock the fence before making the saw blade to fence measurements.

8.1.6.5 The table saw blade guarding system shall be installed. The riving knife or the spreader shall be aligned within the kerf thickness of the saw blade. The saw blade barrier guard(s) shall move (open) by advancing the workpiece and the blade guard(s) shall not bind and shall return to be in contact with the table top, once the workpiece is removed (except for manually adjustable blade guards).

8.1.6.6 Whenever possible, the desired finished workpiece dimension shall be situated and advanced (pushed) between the rip fence and the saw blade and the cut-off portion of the workpiece is on the non-fence side of the saw blade:

(1) When the rip fence to the saw blade dimension is greater than 6 in., the workpiece may be advanced (pushed) by hand; see Fig. 5. The hand that corresponds to the rip fence side of the saw blade and is advancing the workpiece by applying the push force between the fence and the saw blade will be referred to as a "feeding hand." The other hand, which is guiding the cut-off side of the workpiece and keeping the workpiece in full contact with the rip fence, will be referred to

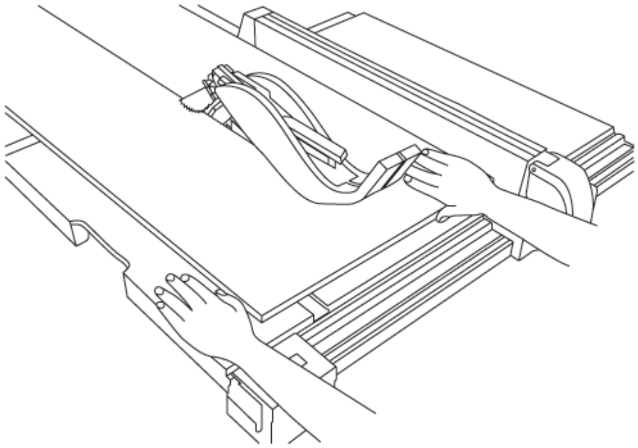

FIG. 5

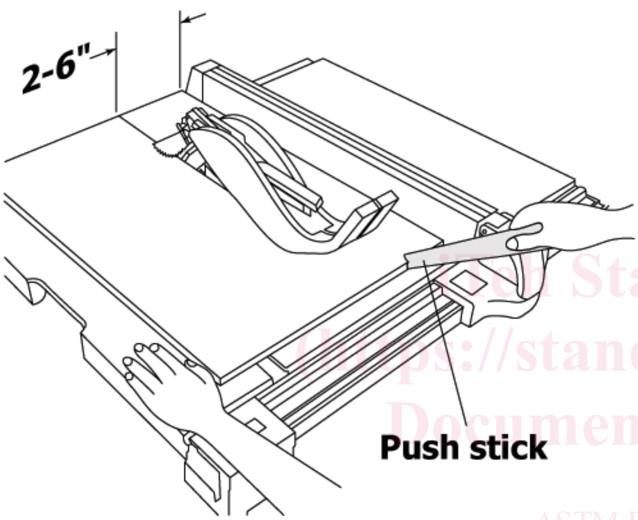

FIG. 6

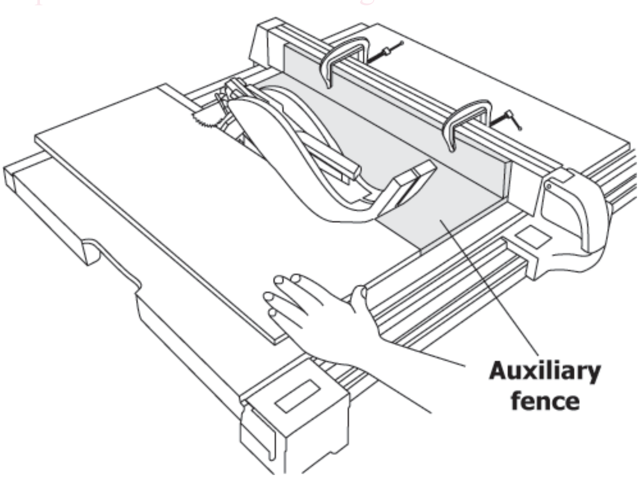

FIG. 7

as a "guiding hand." The guiding hand shall contact only the workpiece in front of the saw blade and shall never be positioned to the side or behind the saw blade!

(2) When the rip fence to the saw blade dimension is less than 6 in. but more than 2 in., the workpiece shall initially be advanced (pushed) by hand until the trailing end of the workpiece is even with the front edge of the table top; see Fig. 5. At this point, a suitable push stick, see Fig. 6, is engaged to finish the cut. The feeding hand that is corresponding to the rip fence side of the saw blade is holding the push stick and is advancing the workpiece by applying the push force between the rip fence and the saw blade. The guiding hand is guiding the cut-off side of the workpiece on the side of the saw blade that is opposite of the rip fence location, and keeping the workpiece in full contact with the rip fence. The guiding hand shall contact only the workpiece in front of the saw blade and shall never be positioned to the side or behind the saw blade! The push stick shall have a minimum separating distance from the closest portion of the hand grip to the workpiece notch of at least three times the maximum cutting capacity of your table saw and shall be strong enough for the size of the workpiece being cut.

(3) When the rip fence to the saw blade dimension is less than 2 in., the push stick may interfere with the blade guarding system. For this narrow strip cutting situation an auxiliary fence, see Fig. 7, is fastened to the rip fence and a push block, see Fig. 8, is used to advance (push) the workpiece.

(a) Fasten the auxiliary fence to the rip fence and adjust the distance between the workpiece guiding surface of the auxiliary fence and the fence side of the saw blade tooth tip at the front and at the rear of the saw blade to be identical and equal to the desired finished workpiece strip width.

(b) Pushing by hand, advance the workpiece until the trailing end of the workpiece is even with the front edge of the table top. At this point, engage the push block with the workpiece to complete the narrow strip cut; see Figs. 7 and 8.

(4) The placement of the feeding hand or of a push stick (or a push pad) to advance (push) the workpiece should always be a safe distance from the blade guarding system, but in most safe situations the force should be applied approximately at the midpoint between the rip fence and the saw blade. If the force is applied close to the rip fence, the workpiece may be "steered" away from the rip fence possibly increasing the jamming side load on the rear quadrant of the saw blade, thus increasing the likelihood of kickback.

8.1.6.7 For rip cuts, featherboards should be used whenever reasonably possible. Featherboards provide more consistent

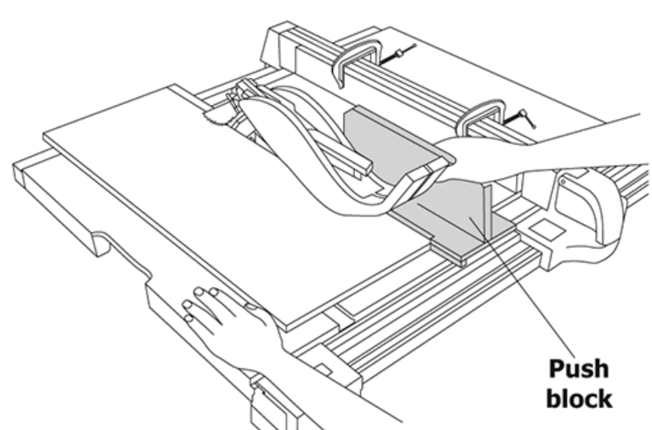

FIG. 8

guiding and biasing force to keep the workpiece in contact with the rip fence. Featherboards are essential when the cut-off portion of the workpiece is only a few inches wide and the guiding hand would have to be in unsafe proximity of the spinning saw blade. Featherboards shall be applied only to the workpiece in front of the saw blade and shall never be positioned to the side or behind the saw blade!

8.1.6.8 When the rip fence to saw blade distance is between 2 in. to 6 in., or at any time when a hand or push pad cannot comfortably hold down the workpiece, a vertical featherboard attached to the rip fence or other suitable structure is recommended. A vertical featherboard shall be located between the rip fence and the saw blade and at the rear quadrant side of the saw blade.

8.1.6.9 A straight rip cut can be performed on either side of the saw blade, whichever feels most comfortable. Most operators will perform a rip cut on the dominant hand side. However, some table saw designs will only allow performing a rip cut on one side of the saw blade.

8.1.6.10 Bevel rip cuts shall be performed only on the non-beveling side of the saw blade. A beveled saw blade may interfere with or cut the rip fence, or interfere with the blade guarding system. In addition, the cut-off portion of the workpiece will be trapped and jammed between a beveled saw blade and the rip fence, thus increasing the likelihood of kickback.

8.1.7 *Performing Rip-Cutting Operations:*

8.1.7.1 If the dimension or the mass of the workpiece overhanging the side of the table top or the workpiece length is such that during the rip cut the workpiece mass past the outfeed end of the table top is greater than the length or mass of the workpiece resting on the table top, an auxiliary workpiece side support or an outfeed workpiece support, or a combination thereof, shall be used.

8.1.7.2 For thinner or tapered thickness workpieces that may slide under the rip fence and get jammed, fasten an auxiliary facing to the rip fence such that the thinnest part of the workpiece cannot fit under the auxiliary facing, but at the same time, the attached auxiliary facing is not dragging on the table top and interfering with the free adjustment of the rip fence.

8.1.7.3 Adjust the saw blade cutting capacity to no more than ¼ in. above the workpiece thickness.

8.1.7.4 After adjusting the saw blade, lock the saw blade depth and bevel adjusting mechanism so it cannot "creep" or "drift" during the cut.

8.1.7.5 For the most accurate finished workpiece width dimension, adjust the rip fence such that the distance between the rip fence side of the saw blade tooth tips and the workpiece guiding surface of the rip fence is equal to the desired finished workpiece width. This dimension must be identical at the front and at the rear of the saw blade.

8.1.7.6 A reasonable rip cut width dimension accuracy can be achieved by scribing a pencil cut line designating the finished workpiece width. Then, place the workpiece against the rip fence and advance the workpiece to a point adjacent to the saw blade. While maintaining full contact of the workpiece with the rip fence, adjust the rip fence such that the pencil line is aligned with the saw blade. The saw blade thickness must be considered when aligning the workpiece with the pencil cut line to the saw blade. Align the workpiece such that the saw blade cuts through the unfinished or cut-off portion of the workpiece, while the saw blade is "shaving" the pencil cut line. Pull the workpiece away from the saw blade to create an adequate clearance between the workpiece and the saw blade prior to starting the motor.

8.1.7.7 If appropriate, set a featherboard to guide and maintain the biasing force to keep the workpiece in full contact with the rip fence.

8.1.7.8 Whether the rip fence is to the left or right of the saw blade, always position your body on the same side as the rip fence and utilize the hand positions described in 8.1.6.6 to feed and guide the workpiece during the cut. Since the push force to advance the workpiece through the cut has to be applied between the rip fence and the saw blade, it is dangerous to stand on the saw blade side opposite of the rip fence, since in such a case, during the final phase of the rip cut, the hand would have to cross over the saw blade and its blade guarding system.

8.1.7.9 Prior to starting the motor, ensure that the saw blade guard is in its protective position. Start the saw blade motor and slowly advance the workpiece toward the rotating saw blade.

8.1.7.10 Once the rip fence to saw blade dimension is set and the rip fence is locked down, the operator's visual focus should be on ensuring that the workpiece is always in full contact with the rip fence (this will ensure an accurate finished rip cut width dimension) and not be concerned with the saw blade following a pencil line. With your body and hands positioned as instructed in 8.1.7.8, apply a steady cutting feed rate.

8.1.7.11 At the completion of the rip cut, stop the saw blade motor and allow the saw blade rotation to come to a complete stop before removing the workpiece or the waste piece from the saw blade area.

8.1.8 *Alternative Power Tools:*

8.1.8.1 A radial arm saw, handheld circular saw, or a band saw are potential alternative power tools for making rip cuts.

8.2 **Cross Cutting Operations, Including Miter Cutting, Bevel Cross Cutting, and Compound Angle Cutting:**

8.2.1 *Scope:*

8.2.1.1 A cross cut is produced by passing the narrow dimension of a workpiece into and past a rotating saw blade elevated to a position above the thickness of the workpiece.

8.2.1.2 The described procedure is applicable to table saws fitted with a standard saw blade.

8.2.1.3 These instructions are applicable to table saws with a sliding cross cutting table, as well as to pull-type table saws.

8.2.1.4 In these instructions whenever the term "miter gauge" is used, it will also apply to the cross cutting fence of pull-type table saws and to the cross cutting fence on table saws with a sliding cross cutting table.

8.2.1.5 For table saws with a sliding cross cutting table and for pull-type table saws, the mechanical operations of the sliding table and/or the setup of the cross cutting fence (as applicable) should be performed in accordance with the instructional guidelines contained in the owner's manual for the table saw.

8.2.1.6 For table saws with a sliding cross cutting table:

(1) Reversing the miter gauge, as discussed in 8.2.6 and 8.2.7, depends on the design of your particular sliding cross cutting table.

(2) Only the saw blade side having the sliding table can be utilized to perform a cross cut. Disregard any text and pictorial references in 8.2.6 and 8.2.7 referring to the side of the saw blade opposite of the sliding table. Use only the text and pictorial references for the cross cutting options on the saw blade side of your sliding table.

8.2.1.7 For pull-type table saws:

(1) Only the saw blade side designed to accommodate the cross cutting fence can be utilized to perform a cross cut. Disregard any text and pictorial references in 8.2.6 and 8.2.7 referring to the side of the saw blade opposite of the cross cutting fence. Use only the text and pictorial references for the cross cutting options on the cross cutting fence side of the saw blade.

NOTE 8—Pull-type saws are also known as "push-pull saws."

8.2.2 *PPE Requirements and Dust Control Systems:*

8.2.2.1 Eye/face and hearing protection shall be used during the sawing operation.

8.2.2.2 Respiratory protection or a dust extraction system attached to the table saw, or a combination thereof, is highly recommended for indoor installations.

8.2.3 *Work Aids/Helpers, Tools, and Fixture Requirements:*

8.2.3.1 Miter gauge (supplied with table saw; see Fig. 9).

8.2.3.2 Tape measure.

8.2.3.3 Straightedge rule or carpenter/machinist square.

8.2.3.4 Carpenter's pencil or marker.

8.2.3.5 Cross cut workpiece supporting devices such as a miter gauge auxiliary fence. An example of such a device is shown in Fig. 10. This device must not interfere with the operation of table saw blade guards.

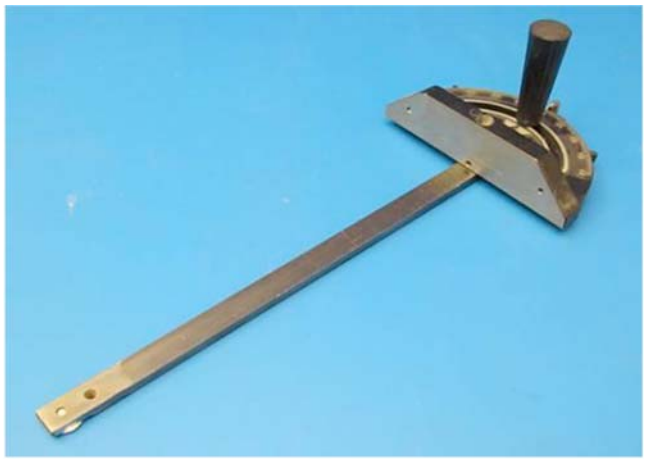

FIG. 9

FIG. 10

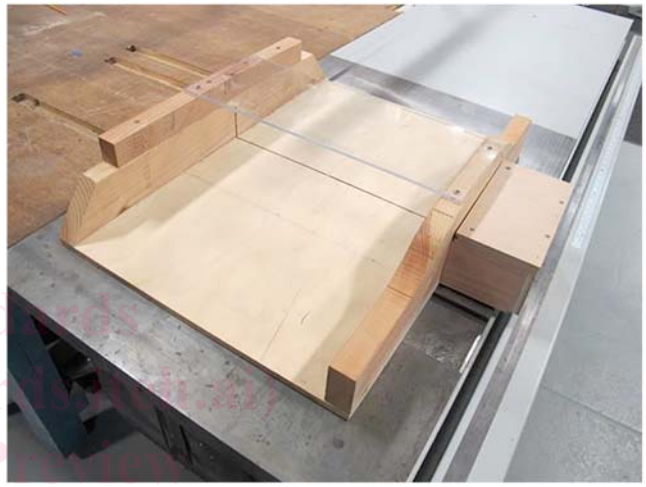

FIG. 11

8.2.3.6 Optional side workpiece support, required for a long workpiece where the mass of the overhanging portion of the workpiece is greater than the mass resting on the table top at any time during the cutting process.

8.2.3.7 Optional protractor or other angle measuring device.

8.2.3.8 Optional cross cutting sled (see Fig. 11).

8.2.4 *Saw Blade Selection:*

8.2.4.1 Install a sharp saw blade intended for cross cutting applications for the material being cut.

8.2.4.2 A higher tooth count (for example, 80 count) saw blade having an alternate-top bevel (ATB) tooth profile will generally produce a smoother finish with little or no workpiece tear-out.

8.2.4.3 The saw blade body thickness must be less than the thickness of the riving knife (or thickness of the 3-in-1 blade guard spreader) while the kerf thickness of the saw blade is wider than the riving knife (or thickness of the 3-in-1 blade guard spreader).

FIG. 12

FIG. 13

8.2.5 *Use of Guard, Riving Knife, and Anti-Kickback Device:*

8.2.5.1 The riving knife, barrier guard(s), and anti-kickback device(s) or the 3-in-1 blade guard shall be used when performing cross cutting operations.

8.2.5.2 Table saws with a manually adjustable blade guard shall be used in accordance with the manufacturer's instructions. Also, see 6.2.2.

8.2.5.3 For table saws with an overhead blade guarding system, the overhead guarding system shall be used in accordance with the manufacturer's instructions.

8.2.5.4 When performing a cross cut with a cross cutting sled as described in 7.5, the barrier guard of the modular guarding system or the manually adjustable blade guards as well as the anti-kickback device are removed. The riving knife is adjusted to a non-through cutting position.

8.2.6 *Measurements and Layout for Cross Cuts:*

8.2.6.1 Employing a tape measure and carpenter or machinist square, measure the desired finished cut length of the workpiece and scribe a pencil cut line in the surface of the workpiece. (See Figs. 12-16.) The pencil cut line shown in Fig. 16 designates the end of the desired (keeper) workpiece length after cutting.

8.2.6.2 It may also be helpful to scribe an "X" on the unfinished or unused portion of the cut workpiece as shown in Fig. 16. Note that Fig. 16 illustrates the case where the unfinished or unused portion of the cut workpiece is on the right side of the pencil cut line. It is also possible that the unfinished or unused portion of the cut workpiece may be on the left side of the pencil cut line.

8.2.6.3 Consider and evaluate the numerous options on how your particular cross cut can and should be performed. The options for particular cross cuts are covered in Table 1.

TABLE 1 Options for Particular Cross Cuts

Subsections	Type of Cut	Description
8.2.6.11 – 8.2.6.14	Simple (square) cross cut	Saw blade at 0°, miter gauge at 0°
8.2.6.15 – 8.2.6.18	Bevel cross cut	Saw blade at bevel angle, miter gauge at 0°
8.2.6.19 – 8.2.6.25	Miter cross cut	Saw blade at 0°, miter gauge at angle other than 0°
8.2.6.26 – 8.2.6.30	Compound angle cut	Saw blade and miter gauge at angle other than 0°

8.2.6.4 Irrespective of: (*1*) the type of the cross cut being made, (*2*) which side of the saw blade the miter gauge is situated, and (*3*) the miter angle setting, in order to perform the cross cut safely, the head of the miter gauge must be positioned over and supported by the table top surface.

8.2.6.5 Certain factors may cause the head of the miter gauge to be located off the table top surface at the start or at the completion of the cross cut, such as when the operator desires to make a cross cut:

(1) Of a wide workpiece;

(2) At a severe miter angle setting;

(3) On a smaller table top surface; or

(4) A combination of these factors.

FIG. 14

FIG. 15

FIG. 16

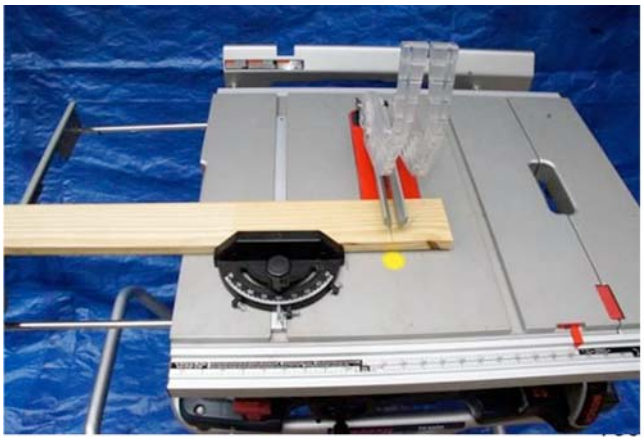

FIG. 17

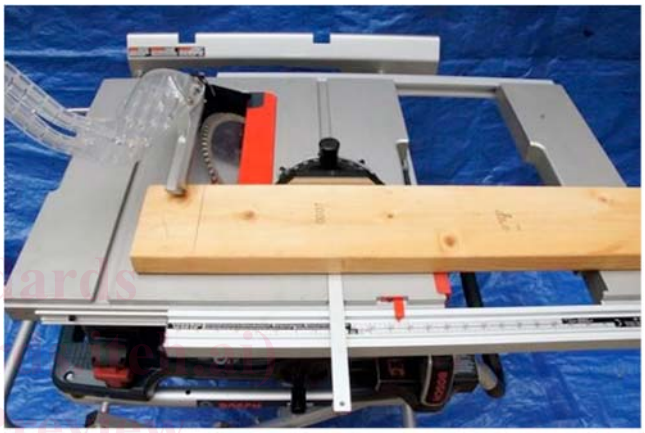

FIG. 18

8.2.6.6 Examples of safe miter gauge positions are illustrated in Figs. 17, 18, 21, 22, 24, 27, and 30–33.

8.2.6.7 Examples of unsafe miter gauge positions are illustrated in Fig. 20 and Fig. 23. Also, Figs. 25 and 26 are unsafe miter gauge positions, since by the completion of the cross cut the head of the miter gauge will be past the outfeed side of the table top.

8.2.6.8 The majority of cross cutting of any type should be accomplished by placing the miter gauge behind the workpiece; see Fig. 17. But in situations that force the miter gauge head off the table top surface as described above or as a matter of preference, the miter gauge may be placed in front of the workpiece; see Fig. 18.

8.2.6.9 In the case of a simple (square) cross cut and a bevel cross cut, with the miter gauge behind the workpiece with a large width dimension on a smaller table top, the head of the miter gauge may be forced off the table top surface at the start of the cross cut and thus not be stabilized and supported. With the alternative miter gauge position in front of the workpiece, the head of the miter gauge may travel past the outfeed side of the table top at the conclusion of the cross cut, leading to an unsafe unsupported miter gauge position.

8.2.6.10 In the case of miter cross cuts and compound angle cross cuts, in addition to a smaller table top surface and wide workpiece, more severe miter angles may also force the head of the miter gauge to be short of the table top surface at the start of the cut or to travel past the outfeed side of the table top at the conclusion of the cross cut and thus not be stabilized and supported by the table top surface. Instructions on the placement of the miter gauge, that is, before or after the workpiece during a miter cross cut and a compound angle cross cut, are covered in 8.2.6.19 – 8.2.6.25.

NOTE 9—The cross cutting fence of table saws with a sliding cross cutting table or pull-type table saws are considered to always be in the safe position if attached according to the manufacturer's instructions.

8.2.6.11 *Simple Cross Cutting:*

8.2.6.12 A simple cross cut can be performed on either side of the saw blade.

8.2.6.13 Set the saw blade bevel angle to 0° and the miter gauge to 0°.

8.2.6.14 Follow the cutting instructions in 8.2.7.

8.2.6.15 *Bevel Cross Cutting:*

8.2.6.16 If the top and bottom surfaces of the workpiece are reversible and do not "rock" on the table top, then any desired bevel angle, leaning left or right, can be cut on either side of the saw blade merely by "flipping" the top and bottom surface. But in the case of workpieces that cannot be "flipped," such as half

round or banister railing, a right-leaning bevel angle can be cut only on one side of the saw blade and a left-leaning bevel angle only on the opposite side of the saw blade. If a bevel cross cut must be performed on the saw blade beveling side, take extra precautions by lowering the saw blade to a bare minimum exposure above the workpiece thickness.

8.2.6.17 Set the miter gauge to 0° and tilt and lock the saw blade tilt mechanism into the desired bevel position. (See Fig. 19.)

8.2.6.18 Follow the cutting instructions in 8.2.7.

8.2.6.19 *Miter Cross Cutting:*

8.2.6.20 If the top and bottom surfaces of the workpiece are reversible and do not "rock" on the table top, then there are four different ways the desired miter cross cut can be made with the miter gauge positioned behind the workpiece; see Figs. 20-23. The options involve moving the miter gauge from one side of the saw blade to the other side or "flipping" the top and bottom surface of the workpiece and reversing the miter angle setting. But in the case of workpieces that cannot be "flipped," such as half round or banister railing, the desired miter angle can be cut only two ways: with a counterclockwise setting of the miter gauge as shown in Figs. 20 and 21 or with a clockwise setting of the miter gauge as shown in Figs. 22 and 23.

NOTE 10—For illustration purposes, the two opposite sides of the workpiece cut-off portion on the photographs are painted white or black.

NOTE 11—For illustration purposes, the side barriers of the saw blade guard are in the up position to improve visibility of the workpiece and saw blade alignment.

8.2.6.21 Depending on the size of your table saw and the width of the workpiece, the more severe miter angle settings may force the head of the miter gauge to be positioned off from the table top at the start of the cut as shown in Fig. 20 and Fig. 23. This situation is not safe and it is recommended that the alternative options shown in Figs. 21 and 22 or Fig. 24 and Fig. 27 be used.

8.2.6.22 If the top and bottom surfaces of the workpiece are reversible and do not "rock" on the table top, then there are four different ways the desired miter cross cut can be made with the miter gauge positioned in front of the workpiece; see Figs. 24-27. The options involve moving the miter gauge from one side of the saw blade to the other side or "flipping" the top and bottom surface of the workpiece and reversing the miter angle setting. But in the case of workpieces that cannot be "flipped," such as half round or banister railing, the desired miter angle can be cut only two ways: with a counterclockwise setting of the miter gauge shown in Figs. 24 and 25 or with a clockwise setting of the miter gauge shown in Figs. 26 and 27.

NOTE 12—For illustration purposes, the two opposite sides of the

FIG. 19

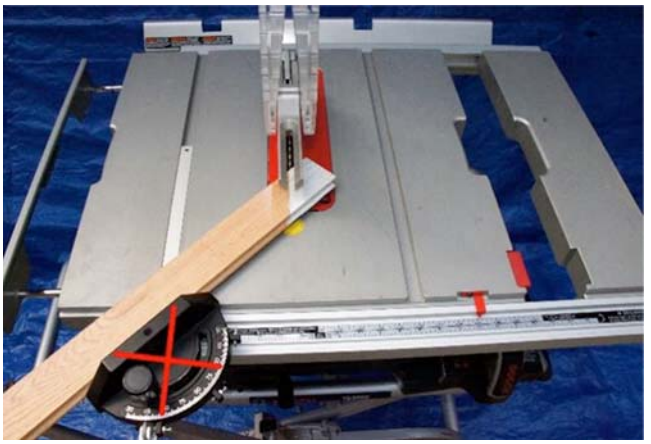

FIG. 20 (unsafe)

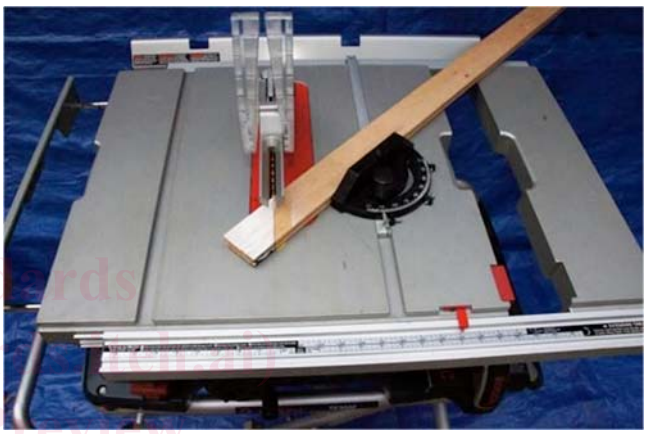

FIG. 21

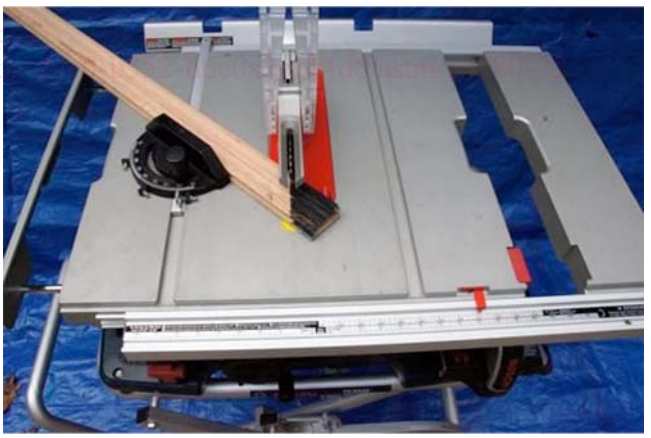

FIG. 22

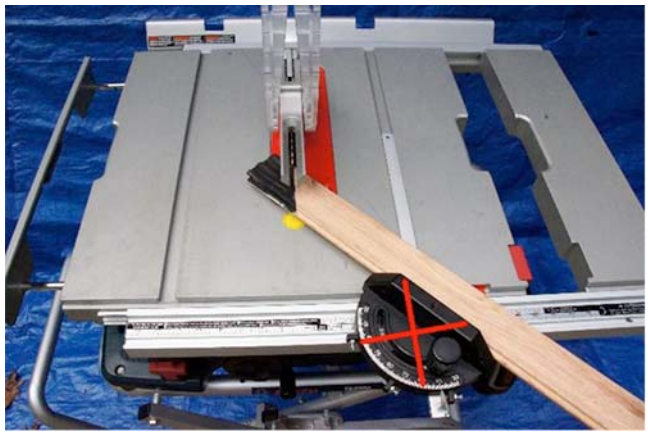

FIG. 23 (unsafe)

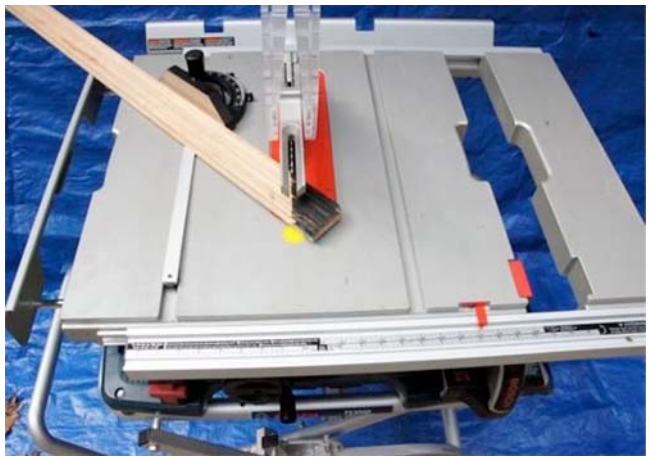

FIG. 26 (may be unsafe—see 8.2.6.23)

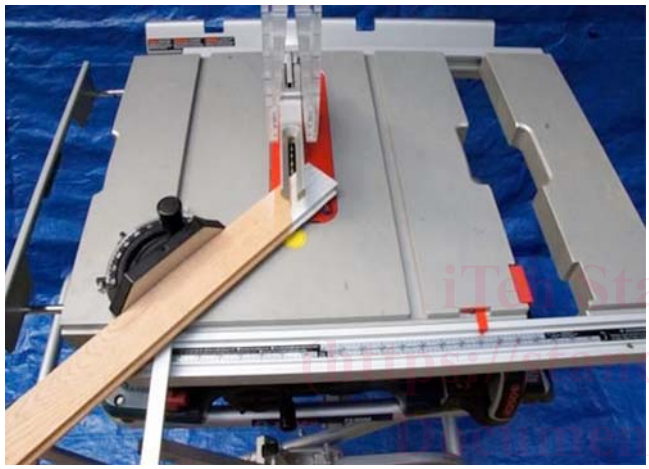

FIG. 24

FIG. 27

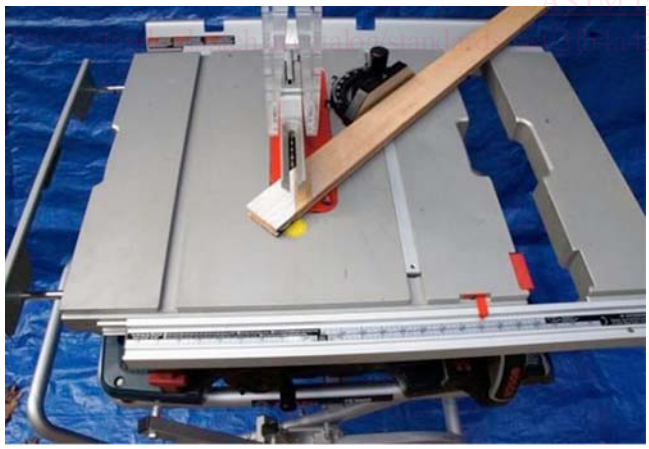

FIG. 25 (may be unsafe—see 8.2.6.23)

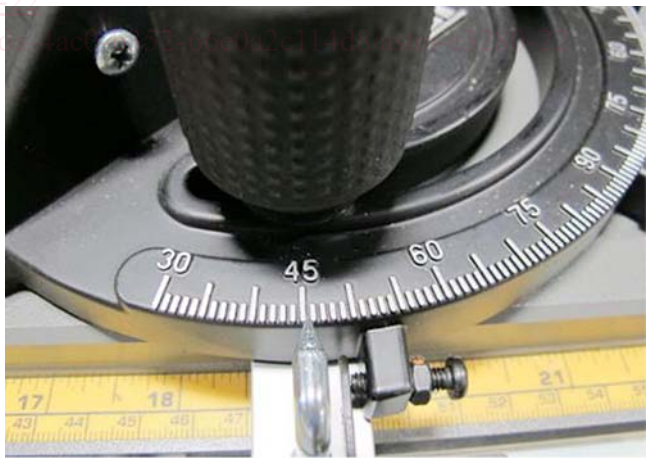

FIG. 28

workpiece cut-off portion on the photographs are painted white or black.

NOTE 13—For illustration purposes, the side barriers of the saw blade guard are in the up position to improve visibility of the workpiece and saw blade alignment.

8.2.6.23 For the options shown in Figs. 25 and 26, depending on the size of your table saw and the width of the workpiece, more severe miter angle settings may force the head of the miter gauge to be positioned off from the table top at the completion of the cut. In addition, the operator's hands would have to hold the miter gauge and the workpiece past the outfeed end of the table top. This situation is not safe and it is recommended that the alternative options shown in Fig. 24 and Fig. 27 or Figs. 21 and 22 be used.

8.2.6.24 Set the saw blade bevel angle to 0° and the miter gauge head to the desired angle and securely lock down the miter gauge head. (See Fig. 28.)