



Why Do Table Saw Injuries Occur?

The Basics of Table Saw Guarding

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A table saw cuts wood with a circular blade whose teeth are moving, in the direction of the operator, at over one hundred miles per hour. These create several hazards: they can cut and sever fingers and hands, they can lift up and throw a workpiece back at the operator at high speeds (“kickbacks”), they can propel saw dust, splinters, chunks of wood and even broken saw blade teeth at the operator’s eyes. Designing out these hazards would render the saw unable to perform its basic cutting function. Accordingly, manufacturers equip their saws with guarding, instructions, warnings and recommendations for personal protection.

At least one manufacturer currently provides an additional safeguard known as flesh sensing technology or “sawstop”. These are discussed below.

Because of the speed of the blade, the contact with its hazards generally will occur so quickly as to be unavoidable. For this reason, skill and experience do not provide adequate protection. The use of guarding, in combination with personal protective equipment, such as

eye protection and hand protection in the form of push sticks, provides basic protection.

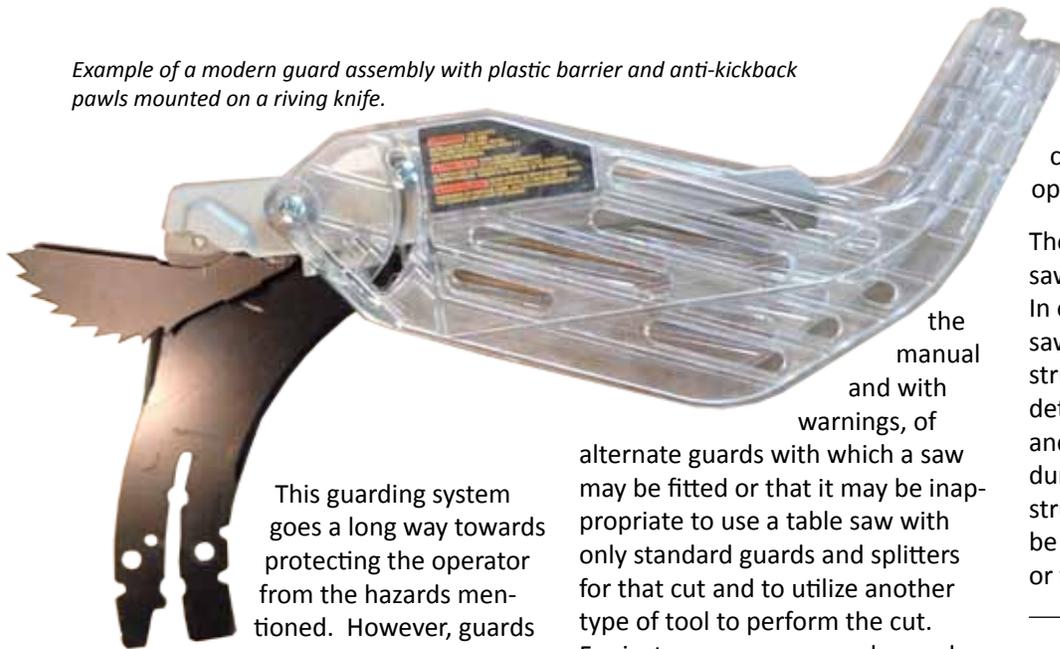
Safe table saw operation is dependent on a three-part guarding system. A plastic barrier guard is suspended over the blade to prevent inadvertent blade contact from above, the sides and the rear. The standard style guard is supported by a splitter or riving knife. A splitter/riving knife is a thin piece of steel, located behind the blade. Its purpose is to keep the kerf of the cut open or “split” to prevent the workpiece from pinching the blade, or contacting the rear, rising teeth of the blade and thereby causing the blade to throw the workpiece back at the operator.

This is known as “kicking back” the workpiece or simply a “kickback”.

Finally, anti-kickback pawls are suspended from the splitter/riving knife. These small plates have sharp teeth which ride on the top of the workpiece. If the workpiece moves backwards towards the operator, the teeth dig into its upper surface and restrain such motion. The barrier guard also helps contain saw dust, splinters, pieces of wood and broken saw teeth at their source.



Example of a modern guard assembly with plastic barrier and anti-kickback pawls mounted on a riving knife.



This guarding system goes a long way towards protecting the operator from the hazards mentioned. However, guards are not the complete solution to preventing contact with the blade, kickbacks and ejections.

While the guard is intended to shield the operator from accidental blade contact in four directions: from above, from the rear and from the sides, there is little if any protection against inadvertent contact from the front. This can occur when a hand inadvertently slides forward, on top of the table, and into the blade: a blade guard which admits wood from the forward direction will also, unfortunately, admit a hand.

Standard guards will not permit “non-through” cuts, such as slots made on the underside of workpieces, where the workpiece is intentionally not sawn in two. Narrow cuts can be problematic as well. It is widely known and documented in the literature, that for these reasons and others, many operators remove the guard and do not replace it. Once the guard is removed, the hazards posed by the rotating blade become fully exposed, and the danger level experienced by operators is greatly increased.

Two further options exist to provide enhanced saw safety:

Where guards interfere with the saw’s ability to make certain cuts, the operator should be instructed, in

the manual and with warnings, of alternate guards with which a saw may be fitted or that it may be inappropriate to use a table saw with only standard guards and splitters for that cut and to utilize another type of tool to perform the cut. For instance, grooves can be made with a router. Narrow cuts can be made with a hand held circular saw. By employing alternate methods, dangerously removing a guard can be avoided.

With the guard removed, certain types of injuries become more likely, such as:

While reaching behind the blade to steady a workpiece with his left hand, a kickback throws the workpiece towards the operator, drawing his hand backwards, along with the workpiece, through the unguarded blade.

With the guard removed, a kickback strikes the operator and causes him to twist to his right (clockwise as viewed from above) which results in his left hand sweeping across the unguarded blade

While cutting, the blade’s teeth strike an embedded nail, causing the nail or a tooth to chip. The tip is ejected, at high speed, toward the operator’s eye.

Flesh sensing technology/sawstop provides safety enhancement by almost immediately stopping the blade’s rotation, and causing the blade to drop down into the saw’s base upon blade/operator contact. These actions occur in milliseconds,

and reduce the level of a blade-contact event to a small nick, as opposed to an amputation.

The foregoing are the basics of table saw guarding as they presently exist. In order to fully investigate a table saw mishap, an accident reconstruction should be performed to determine what preceded the event and the dynamics of what occurred during the event. From this reconstruction, a determination can likely be made as to what conditions and/or failures are the causes.

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Les authored the safety introduction for a book concerning proper operation of table saws, he also wrote portions of a table saw operation manual for Wilke Machinery.

Les is actively involved in rebuilding and refurbishing woodworking tools, including a range of saw variations. Through this process, he has developed extensive experience in modifying and redesigning existing guards and designing custom guarding to improve safety.

Les is licensed as a Professional Engineer in multiple states and conducts woodworking tool-injury investigations nationally. Contact Les directly to discuss your case and how we can help.

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