Investigation Guideline

Product: Table/Bench Saws
Appendix # : 76
Date amended: July 2004

1. Introduction

A. Background Information

Based on the follow-up investigations of the incidents occurred between October 1, 2001 and December 31, 2001, the Directorate for Epidemiology estimated that about 38,000 people were treated in U.S. hospital emergency rooms for injuries associated with table/bench saws in calendar year 2001. Almost all of the victims (98%) were the operators of the saws. Most of the injuries were to fingers (87%). The rate of hospitalization was about six percent compared to the average rate of four percent associated with all consumer products reported through the NEISS system. The major hazard patterns for table/bench saws are blade-contact incidents, being hit by stock/cutting material, and being hit by flying debris.

Contact with the operating blade occurred most often in different scenarios. The operator used a hand to guide the stock/cutting material; lacerations and sometimes amputations resulted when he failed to move his/her hand as it came into the path of the blade. In some incidents, the operator was pushing the stock/cutting material and got too close to the blade and his/her gloved hand was caught in the blade. Sometimes the operator's hand which was holding the stock/cutting material was drawn into the blade when the blade jammed in the material.

Injuries as a result of "kickback" was reported with some frequency. Kickback occurs when contact with the side of the blade is made due to misalign guiding of stock/cutting material, pinching of the blade by stock/cutting material, over aggressive feeding of stock/cutting material (beyond the blade's cutting capacity), or blade contact with knots or nails in the cutting material. If the stock/cutting material is held securely, the saw blade of a circular saw will kick back. However, if the saw blade is securely held as in table saw case, stock/cutting material will kick back with enough force to cause serious injury to the operator.

Being hit by flying debris occurred when stock/cutting material broke during the operation or the cut off piece caught in the saw teeth and was flung back onto the operator.

CPSC staff is evaluating the current voluntary standard for table/bench saws to determine if performance requirements can be improved to reduce injuries. Additional investigations are required to provide detailed information on consumer behavior and product configuration/characteristics that contributed to incident.

B. Product Descriptions

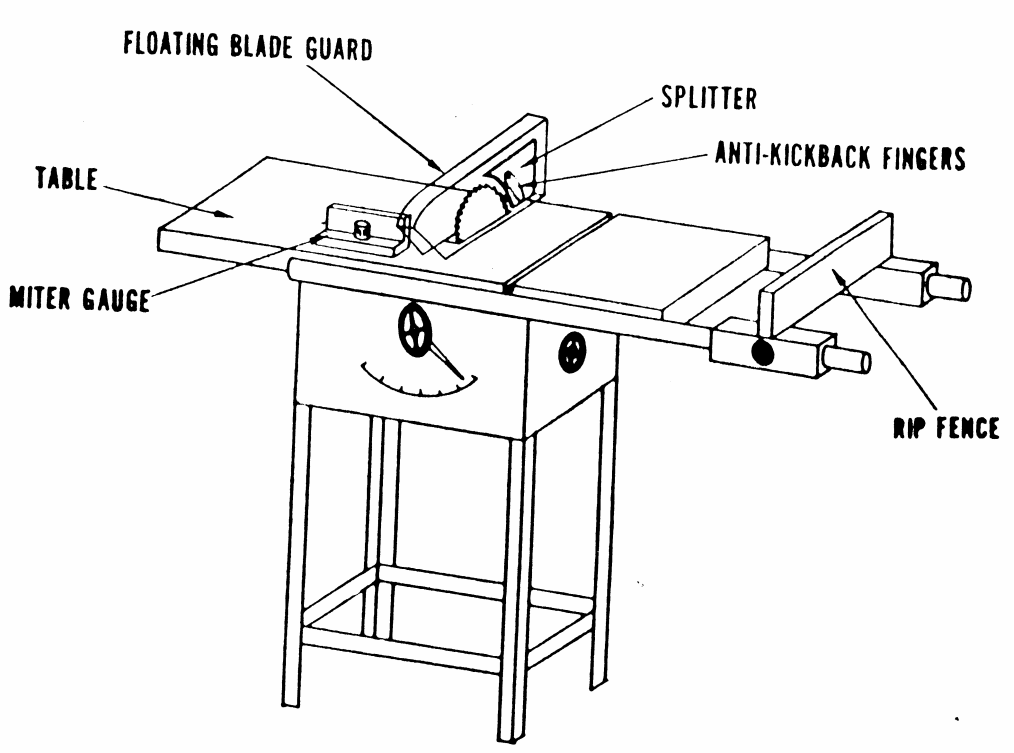
Table and bench saws are stationary cutting tools consisting of a fixed power driven circular blade positioned below a table (Figure 1). Table saws stand alone whereas bench saw typically rests on counter, table, stand, or bench. A bench saw that is fixed to a stand is essentially a table saw. The difference between table and bench saws has become subjective and both products are commonly sold as table saws.

A table/bench saw has a rotating handle for raising or lowering the blade. Guides on the tabletop help to hold stock/cutting material while making cuts. The saw table has a laterally adjustable rip fence to prevent side movement in the stock/cutting material (that could lead to side contact with blade and kick back) during cuts and is slotted to equip wood rest/miter gauge. The rip fence is used in the procedure described as being a cut made parallel to/with the grain of the wood. A basic rip cut is done by placing the stock on the front edge of the table, flat down and snugly against the fence. The wood rest/miter gauge also prevents side movement of the wood during cuts made across the grain of the stock (crosscut). The wood rest/miter gauge angle is adjustable in order to keep the stock at the proper angle during a cut. The simple crosscut is performed by holding the stock against the wood rest/miter gauge and advances both the gauge and the stock past the blade to make a cut.

Certain cuts use the saw blade to produce a channel in the stock/cutting material. These cuts are called dado cuts when the channel is somewhere in the middle of the cutting material. They are called rabbet cuts when the channel is on the edge of the cutting material. Dado and rabbet cuts require removal of the blade guard because the top surface of the saw blade is required to make the cut.

Most power tools, especially stationary ones, are equipped with **tool guards or safety devices**. Standard safety devices for a table saw are a **spreader** (prevents cut/split or kerf (channel) in wood from pinching blade), **anti-kick back** device, and **blade guard**. The most common blade guard on a table/bench saw is a long rectangular transparent plastic channel that is hinged at one end. The blade guard that covers the circular blade should be maintained so it slides easily over the advancing stock/cutting material while still remain resting on the stock to maintain blade coverage for the remainder of the cut. Past data showed that the operators usually removed the guards when they did special cuts such as dado or rabbet cuts.

Figure 1
Table/Bench Saw



C. Specific Items of Interest

Incidents involving table saws require information on product, brand, model, serial number, motor horsepower, age of product, as well as detailed information on saw operation, the location of the blade guard, and the operator's activities prior to and at the time of the incident.

D. Headquarters Contacts

Natalie Marcy (301) 504-7329
Caroleene Paul (301) 504-7540

11. Instructions for Collecting Specific Information

A. Synopsis

It is important to describe clearly the sequence of events. Describe what happened immediately before, during, and after the incident. Include location of the victim relative to the saw, and a detailed description of the parts of the saw involved in the injury. Describe whether the victim is the operator, helper, or bystander. Where the incident occurred (home, school, at work, etc.). What the injury was and how severe was the injury. Include the following important information:

- Explain in a step by step manner the tasks required to set up and use the saw (i.e. plug in wall, turn on saw switch, set guards, adjust the blade, etc.).
- Describe in detail the exact task being performed by the victim such as types of cuts (crosscutting, ripping, dadoing, beveling, or mitering), sizes and types of stock (rectangular, square, block, stick, molding, metal, wet, dry, hard, soft, etc.).
- Provide details of the victim's hands, feet, and body in relation to the stock being cut. Did the victim reach behind the blade for any reason? Be sure about the location of the victim's hand because lacerations and sometimes amputations resulted when the victim failed to move the hand as it came into the path of the blade.
- Describe whether the victim used a push stick or a hand to guide the stock into the blade. Hand or finger contact with the operating blade occurred frequently because the victim was using a hand to guide the stock.
- Use **ATTACHED DATA RECORD SHEET** to obtain specific information associated with table saw related incidents.

B. Description of Incident Environment

Describe all relevant information on environmental factors such as lighting, its location and intensity, slippery floor/debris on the floor, or debris on work surface. Make note on the areas around the table saw, considering free movement for the saw operator. **Visually** examine **(DO NOT PERFORM AN OPERATIONAL CHECK OF THE SAW)** signs for abuse, broken, missing saw teeth, bending, damage, misalignment, or other problems on the saw.

Inspect the saw mechanism, owner manual, or other available material for UL labeling or other listings of certification. Report presence or absence of the UL labeling or listings of certification. Photograph these indications and transcribe information on them. If none of these indications are found, include a statement indicating this in the investigation report.

C. Description of Interaction between Injured Person(s) and Product

- Determine the incident sequence and the exact position where the saw, stock, or flying debris contacted the victim (lower arm, wrist, hand, finger, lower trunk, lower leg, head, face, eyeball, or neck).
- Describe the position of the victim's left and right hands with respect to the saw and the stock, just before the incident, and right at the time of the incident.
- Indicate how stock was fed into the saw.
- Specify if the victim was reaching.
- Specify whether the victim was holding stock firmly or loosely.
- Describe whether the victim is right-handed or left-handed or he/she uses both hands interchangeably.
- Indicate whether the victim was wearing safety goggles, gloves, or other special clothing at the time of the incident.
- In the victim's opinion what caused the accident?

D. Description of Product (Involved in the injury)

Provide the following detailed information on the saw:

- Saw classification (provide front, rear, and side photograph) manufacturer, model number, and serial number or any other identification number.
- Manner in which the saw was acquired: new, used, rented, or borrowed.
- Age of the saw (if acquired used, state number of years owned and total age, if known).
- Condition of the saw, maintenance level, or previous repairs or modifications (**pay special attention to repairs made shortly before the incident).**
- The condition of blade at the time of the incident (sharp, dull, missing teeth, or something else).
- The height of the blade above the saw table (write down the number) at the time of the incident and indicate how this height was measured (saw gauge, ruler, eyeball it, etc.)

- The presence or absence of blade guard and anti-kick back on the saw.
- If any safety devices (especially the blade guard) were absent, ask why they were removed or missing.

111. Photographs/ Diagrams of Incident Scene

- Photograph the table saw front, side, and top views and how the stock was supported.
- Provide close-up photos of labels, controls, safety devices or guards, and off-on switches.
- Have victim pose for photo that depicts his/her position (**WITHOUT POWER ON THE SAW)**, as well as the position of the stock/material being cut, at the time of the incident.
- Include close-up photo of the blade involved, that shows the type and size of the teeth.

IV. Obtaining samples and documents related to the investigation

- Photocopy the owners' manual and attached it to the report.
- Collect any official records associated with this incident that may be available.

(DATA RECORD SHEET – Attached)

DATA RECORD SHEET
Investigation Guideline

PRODUCT:_Table/Bench Saw_____

TASK NUMBER _____ INCIDENT DATE _____

1. Describe the saw involved in the incident. Was the saw mounted on a table or a bench or was it portable?

_____ Mounted on a table or bench

_____ Portable

_____ Other, Specify:_____

_____ Don't Know

2. About how old is the saw?

3.What is the brand name (manufacturer), model name/number, and horsepower of the saw?

4. Had the saw been changed or modified in anyway since you got it? How was the saw changed or modified? Who did it?

5. Was the motor running at the time of the accident? (**Determine if the saw had just been turned "on" or "off"**).

6. Does the blade have a safety switch (removable or stationary) such as a key lock that must be activated, in addition to the start switch, before the saw can be turned on?

7. Is the saw blade belt driven or direct drive?

8. Was the operator actually cutting, about to start cutting, at the end of a cutting operation, pausing during a cutting operation, at the time of the incident?

9. How long had the operator been working with the saw that day before the accident occurred?

10. What was the operator cutting at the time of the incident?

11. What type of cutting was the operator performing at the time of the incident? Had the operator been cutting the length of the stock, cutting the width of the stock, or cutting the stock at an angle, or cutting the stock in some other way?

12. Does the operator use a different type of blade for different types of cutting operations?

13. What type of blade was being used at the time of the incident? Was it a crosscut blade, rip blade, combination blade, dado blade, plywood/paneling blade, metal cutting blade or other (**please specify**)?

14. What was the diameter of the saw blade (in inches)?

15. What was the condition of the blade at the time of the incident? Was it sharp, dull, had teeth missing or something else?

16. Was the blade guard attached to the saw at the time of the accident?

17. At the time of the incident, did the blade guard function properly? (**Whether the guard returned quickly to its normal position or was slow to return and hung up)**.

18. What was the shape of stock/material being cut? (e.g. rectangular, square, molding, stick…).

19. What was the length, width, and thickness of stock/material being cut?

20.What was the condition of stock/material?

21. Describe how stock/material was supported.

22. Did the whole surface of stock/material fit on table or did it extend beyond?

23. Was stock/material or the support firmly anchored?

24. Was the operator pulling, pushing, or holding stock/material at the time of incident?

25. Was the fence (Figure 1) used to guide stock/material?

26. Was stock/material held securely against the fence during the cutting operation or was it wobbling or shifting?

27. What was the height of the blade above the table? How was this height measured (saw gauge, ruler, other)?

28. Was there an anti-kickback and spreader assembly (Figure 1) attached to the saw at the time of the incident?

29. Is the operator right-handed or left-handed or does he/she use both hands interchangeably?

30. Was the operator wearing eyeglasses, safety goggles, gloves, or any other special clothing at the time of the incident?

31. How many times during the last year has the operator used the saw?

32. Was the saw assembled when purchased or did the operator have to assemble it him/herself?