



Investigation Guideline

Product: Brushcutters
Appendix #: 89
Date amended: July 2004

I. Introduction

NOTE: This guideline is to be used for string trimmers, edgers, and trimmer/brushcutters when the trimmer/brushcutters are being used in the *brushcutter* mode. If the trimmer/brushcutter is being used in the *trimmer* mode, see Investigation Guideline - Appendix No. 88, "Grass (string) Trimmers and Edgers".

A. Background Information

Brushcutters were associated with an estimated 550 emergency room treated injuries in 2002.

The major hazards associated with brushcutters are summarized as follows:

Blade thrust - The blade kicking or ricocheting off a sapling, post or other object and injuring a bystander or the operator. Blade thrust may occur when the spinning blade contacts an object that it does not immediately cut.

Inadvertent contact with exposed blade - Other blade contact with bystander or operator while the blade is spinning.

Blade breakage or dislodgement - A piece of the blade, blade retainer or the entire blade flying off.

Thrown objects - Dirt, stones, or wood chips propelled by the spinning blade hitting the operator or bystander.

In some cases, fire can also result from use of brushcutters.

Based on the special study of string trimmers, edgers, and brushcutters related to incidents between May 1, 2002 and August 1, 2002, the main body parts injured in a brushcutter-related incident were to the finger and hand. The primary diagnoses for injuries to operators were contusions/abrasions or lacerations.

Investigations are needed to determine the effectiveness of the voluntary American National Standard (ANSI-B175.3) for Grass Trimmers and Brushcutters. The purpose is

to reduce the hazards, especially thrown objects, associated with the use of string trimmers, edgers and brushcutters.

B. Product Description

Brushcutters are usually gasoline-powered and are designed for cutting heavy stands of brush and thicket as well as saplings. They may be equipped with a monofilament line for cutting grass and weeds, or with rigid metal or plastic blades for cutting brush or thin saplings (Figure 1). This guideline pertains to trimmer/brushcutters being used in the *brushcutter* mode, equipped with a rigid metal or plastic blade.

Figure 1. Gas-powered brushcutter with a metal cutting blade



C. Specific Items of Interest

- Of particular interest are details about the **shield around the blade assembly**. Indicate the position of the shield relative to the operator of the blade, the size of the shield and whether the shield was on the brushcutter at the time of the incident.
- Specify the type of vegetation being cut and thickness (i.e. ½” diameter) at the time of the incident.
- Obtain product safety instructions, if available, and describe the information included on product labels: list warnings, date codes, product certification, ratings.
- Details on cutting attachment are important. Features like dimensions, material (i.e. metal or plastic), number of teeth, and manufacturer.

D. Headquarters Contacts

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II. Instructions for Collecting Specific Information

A. Free Text Summary

- 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 brushcutter, and a detailed description of the parts of the brushcutter involved in the injury.
- Describe the nature of the injuries (did they result from a rotating blade, thrown object, snagging of clothing on the machine, or failure of the product).
- Describe whether the victim is the operator or bystander. Where the incident occurred (home, school, work, etc.).

B. Description of Incident Environment

- Outline the general conditions (i.e., sunny, cloudy, any adverse weather conditions, temperature, wind speed and direction, rain, snow, etc).
- Lighting conditions at the time of the accident.
- Size of the area being cut and type of material being cut.
- Condition of the material surface being cut and vegetation density (i.e., wet, dry, thick, long, etc.) and vegetation thickness (i.e. ½" diameter). Include the height of the grass or brush being trimmed.
- Ground surface conditions (wet, uneven, rough, slippery, etc.) and slope of terrain.
- Preparation of area being cut (e.g., removing objects that could be thrown by the brushcutter.

C. Description of Victim

1. Indicate victim's age, sex, height, weight and whether the victim was the operator, an assistant, or a bystander.
2. Indicate if operator was tired, rested, distracted, etc. at the time of the incident.
3. Indicate any medication or alcohol consumed by the operator and whether the operator had any physical or competence reducing handicaps or disabilities.
4. Provide a complete description of clothing and safety equipment used by the operator (e.g., gloves, safety shoes, goggles, hard hat, hearing protection).

5. Determine operator's awareness of possible dangers in the cutting activity and any precautions taken to prevent accidents.
6. Describe the accident sequence in detail, indicating the body part injured, the nature of the injury and its severity.
7. Indicate:
 - (a) The victim's knowledge of operating instructions - whether self-taught (by owner's manual) or by an instructor.
 - (b) Previous experience in operating, repair, or adjustment of the brushcutter.
 - (c) Previous injuries in using brushcutters.
 - (d) Position of operator's hands and feet relative to the brushcutter.
 - (e) Operator's awareness of the victim's presence.
 - (f) Victim's awareness of operator's presence.
 - (g) Victim's location in relation to trimming operation.

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

- Indicate the degree of user familiarity with product operation, repair, and adjustment.
- For accidents involving blade thrust, determine the nature of the object causing the blade thrust and if the brushcutter blade was established in the cut or being placed in the cut when the bounce occurred.
- For accidents involving contact with a blade, describe the part of the body injured and how it contacted the blade. Indicate the manner in which product shielding may have been a factor in the accident.
- For accidents involving thrown objects, describe: the object and how it came into contact with the brushcutter (whether it ricocheted off another object or came directly off the cutting head); how high and far the object was thrown; how far the victim was standing from the machine, and where the victim was struck.
- For accidents involving fires, indicate: the sequence of events, the source of fuel and the manner of ignition.

E. Description of Product (Involved in the injury)

Safety Warning: When examining a gasoline-powered brushcutter, remove the spark plug wire from the spark plug and ground it to the chassis before manual inspection. The act of rotating the blade by hand may cause the engine to start if this is not done. Electrical units should be unplugged before examination.

Provide the following detailed information on the brushcutter:

- Describe the type of machine (brushcutter or trimmer/brushcutter combination). Indicate the manufacturer, brand, model name and/or number and serial number. Indicate age and whether purchased new/used or rented.
 - (a) If gasoline powered, indicate the following:
 - (1) Horsepower rating, cubic inch displacement
 - (2) Capacity of fuel tank.
 - (3) Location of fuel tank.
 - (4) Leakage in fuel tank, fuel liner, etc., if any.
- Describe if the unit has been modified or changed. Ask who made the modifications or changes.
- The blade
 - (1) Type of blade (material, design)
 - (2) Type of cutting edge (e.g. smooth, serrated)
 - (3) Dimensions (length, width, thickness)
 - (4) Clearance between blade tip and housing
- Determine if the manufacturer of the brushcutter provided the cutting head. If not, what company manufactured the cutting head?
- Machine adjustment
 - (1) Method of adjustment
 - (2) Number of positions
- Describe the machine shielding including deflectors
- If the device has wheels, describe the wheel construction
 - (1) Material (plastic, steel, etc.)
 - (2) Tires (material, tread width, diameter).
- Indicate the type of handle (Bar, T-style, wheel) and the presence of handgrips. Does the handle act as a barrier? A barrier is a device intended to restrain the operator from moving toward the cutting attachment and vice versa, and intended to prevent inadvertent operator contact with the cutting attachment.

- Determine if a harness was supplied with the unit when purchased and if it was being used by the operator at the time of incident.
- Weight and length of brushcutter
- Certification labels (OPEI, UL, ANSI)

III. Photographs/ Diagrams of Incident Scene

- Take a series of good, clear photographs of the incident scene and the product, simulating the incident sequence.
- Photograph the unit (front, side, rear), the manufacturers' name plate, OPEI certification, UL listings, warning signs, and safety features such as shielding.
- 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 in relation to the trimmer at the time of the incident (with power to the unit "off").
- Lay out, in diagram form, the distances between the operator, any objects with which the brushcutter made contact, and the victim (if not the operator).

IV. Obtaining samples and documents related to the investigation

- Photocopy the owners' manual and attach it to the report.
- Collect any official records associated with this incident that may be available.
- Document the victim's contacts with the retailer and manufacturer regarding the incident and obtain copies of all correspondence.



DATA RECORD SHEET for Brushcutters

1. Task Number _____
2. Incident Date (MM/DD/YYYY) _____
3. What type of product was involved in the accident?
____ Brushcutter
____ Trimmer/Brushcutter combination

DESCRIPTION OF INCIDENT ENVIRONMENT

4. Describe the general weather conditions at the time of the incident.

5. What was the operator trimming at the time of the accident?
(Select as many as applicable)

____ Grass
____ Weed
____ Brush
____ Small tree
____ Other (Specified: _____)

6. What was the condition of the material surface being cut and vegetation density
(i.e., wet, dry, thick, long)?

7. Describe whether there were any environmental conditions such as wet grass,
uneven surfaces (holes, bumps, rocks, or obstacles), a steep embankment or
anything else that may have contributed to the incident?

8. Were objects that could be thrown by the brushcutter removed from the area to be cut prior to using the brushcutter?

DESCRIPTION OF VICTIM

9. Was the victim/injured person an operator, bystander, or helper?

Operator
 Bystander
 Helper

10. Indicate the victim's age, sex, height, and weight.

Age
 Sex
 Height
 Weight

11. Indicate the operator's level of alertness at the time of the injury (i.e., tired, rested, distracted, etc).

12. Determine whether the operator was ill or under any medication, drug, or alcohol at the time of the accident?

Yes → (Specify: _____)
 No

13. Was the operator wearing protective gear at the time of the accident?
(Select as many as applicable)

Eyeglasses
 Safety goggles
 Gloves
 Steel toe shoes

- Heavy pants
 Other special clothing (Specify: _____)

PRODUCT SHIELDING

14. Was the shield attached to the brushcutter at the time of the accident?

- Yes
 No

15. If the shield was attached to the brushcutter, ask whether it was damaged, broken, or in good condition?

- Damaged
 Broken
 In good condition

16. If the shield was NOT attached, ask why was it not attached?

- Had broken off
 Had been removed
 Never had one
 Other (Specify: _____)

FOR INCIDENTS INVOLVING BLADE THRUST:

17. Determine the nature of the object causing the blade thrust and if the brushcutter blade was established in the cut or being placed in the cut when the bounce occurred.

FOR INCIDENTS INVOLVING THROWN OBJECTS:

18. Describe the thrown object and how it came into contact with the brushcutter.

19. Determine whether the object ricocheted off another object or was it thrown directly (in a straight line) from the cutting head?

- Ricochet off another object
 Directly from the cutting head

20. Indicate whether the thrown object was a part of the machine or was it a piece of grass, twig, pebble, etc?

_____ A part of the machine (Specify: _____)
_____ A piece of grass, twig, or pebble, etc.
_____ Other (Specify: _____)

21. How high and far was the object thrown?

22. How far away from the machine was the victim standing?

23. Where was the victim struck?

FOR INCIDENTS INVOLVING FIRE,

24. Indicate the sequence of events, source of the fuel and the manner of ignition.

DESCRIPTION OF PRODUCT

25. Was the brushcutter involved in the incident gas or electric?

_____ Gas (What was the engine size? _____)

_____ Electric (Was the product corded or did it use a battery?)

_____ Corded (Please describe the type, length, and gauge of the cord and extension cord. _____).

____ Battery (Describe voltage, if recharging involved,
describe the recharger).

26. About how old is the brushcutter?
(Write down the number of years, months, or days)
- ____ Years
____ Months
____ Days
____ Don't know
27. What is the brand name (manufacturer) and model name/number of the
brushcutter?
- Mfr. _____
- Model # _____
- Serial # _____
- Horsepower/Displacement _____
- Don't know _____
28. How was the brushcutter acquired?
- ____ Rented (from a rental store)
____ Purchased, new
____ Purchased, used
____ Borrowed, from a friend, relative or _____
____ Other - _____
29. What was the frequency of use of the brushcutter?
- ____ Very frequent use (several times every week)
____ About once per week
____ About once per month
____ About once per year
____ Very infrequent use (once per ____ years)
30. What was involved in the periodic maintenance or periodic inspection of the
brushcutter?

31. What was the scheduled frequency of maintenance or inspection of the brushcutter?
32. Had the brushcutter been changed or modified in any way since you got it?
____ Yes
____ No
33. If changed or modified, ASK:
- How was the brushcutter changed or modified?

 - Who did the modifications?
____ Victim
____ Friend
____ Relative
____ Other (Specify: _____)
34. Was the engine running at the time of the accident? (Determine if the brushcutter had just been turned “on” or “off”).
- ____ Motor/engine was running.
____ Motor/engine was not running.
____ Motor/engine was just turned “on”.
____ Motor/engine was just turned “off”.
35. What type of cutting head was being used at the time of the accident?
____ Non-metallic head
____ Metallic cutting blade
____ Other (Specify: _____)
36. Determine the manufacturer of the cutting head being used at the time of the accident.
37. Determine how long the operator had been working with the brushcutter that day before the accident occurred? (Write down the number of hours and/or minutes)
- ____ Hours ____ Minutes

38. Determine how often and for what length of time the operator used the brushcutter?

39. Determine if the operator remembers any warnings or safety precautions about the operation of the brushcutter that were printed in the owner's manual?

40. Describe whether the operator remembers seeing any warnings or safety precautions printed on a label on the brushcutter?