

Tool Marks

Tool mark identification techniques may be applied to many types of evidence in investigations (e.g., knife marks on bone, fractured knife blades, vise marks on homemade explosive devices, crimp marks on detonators, cut marks on wire, fractured radio antennas, etc.) including burglaries.

I. General

For the purposes of this chapter, a tool is any instrument or object capable of making a mark on another object.

A close examination of a tool mark may reveal the type of tool, contour of the cutting or prying edge, prying edge width or the presence of trace material.

II. Types of Tool Marks

Generally, tool marks encountered at a crime scene may be in the form of impressed markings, striated “drag” or “shear” marks created by tool movement during contact, or a combination of both (see Figures 17-1 and 17-2). For example, a drive punch will generally leave an impression tool mark, whereas a screwdriver or pry bar will frequently leave a striated mark as well as an impression of the tip of the tool.

III. Location of Tool Marks

Tool marks may be found at entry and exit points in buildings or vehicles and upon objects which have been attacked with a tool or other object.

IV. Recovery of Tool Marks

- A.** Always submit the object exhibiting tool mark(s) to the Laboratory.
- B.** If it is not practical to submit the object, remove the section of the object containing the tool mark and submit the section to the Laboratory.

- C. **Only as a last resort**, make a cast of the tool mark.
- D. Mark, protect and individually package item(s) containing tool mark(s) and submit to the Laboratory.

V. Casting of Tool Marks

Silicone based casting materials have been found to be satisfactory for casting tool marks although not all materials perform adequately. Brown “Mikrosil” possesses the best combination of casting and examination qualities. Directions for their use are contained in each kit.

Do not use Plasticine®, plaster of Paris, patch plaster and similar materials which have a tendency to shrink.

VI. Tools

Caution: Observe laws relating to the collection of evidence.

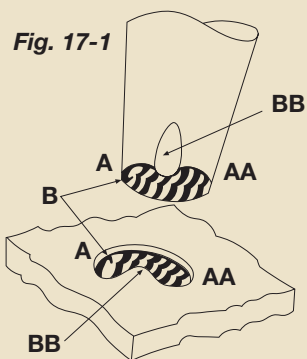
Recover and inventory all suspect tools observing the following precautions and submit them to the Laboratory for examination and comparison with tool marks.

- A. Never place a suspect tool in contact with a questioned tool mark or cast.
- B. Inscribe identification marks on tools for later identification. Exercise extreme care in handling and marking tool(s) if it is to be checked for fingerprints, DNA and/or trace evidence.
- C. Package each tool individually to prevent cross-contamination.

IMPRESSED TOOL MARK

A-AA – portion of the tool mark reveals the class characteristics (size and shape) of the tool.

B-BB – reveals individual characteristics of this particular tool. Marks on surface B are grinding or manufacturer’s marks; BB is a nick in the edge of the tool.



STRIATED TOOL MARK

- A.** Area A shows the entire prying edge width of the tool. The intervening lines, or striations, are the unique marks created by the tool's individual physical characteristics.
- B.** Area B, a partial tool mark, shows one side of the prying edge of the screwdriver and unique marking detail.
- C.** Area C, a partial tool mark, does not show either side of the prying edge, but does show individual markings.
- D.** Inset circle shows an enlarged view of the edge of the tool's prying edge showing individual physical characteristics acquired during manufacture, use, misuse, regrinding, or intentional alteration.

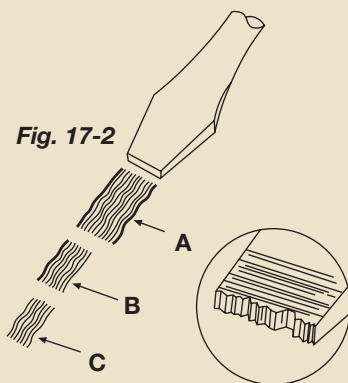


Fig. 17-3
Double-bladed tools such as bolt cutters are often used to cut padlock shackles. When recovered in the possession of a suspect, they may connect the offender with the crime.

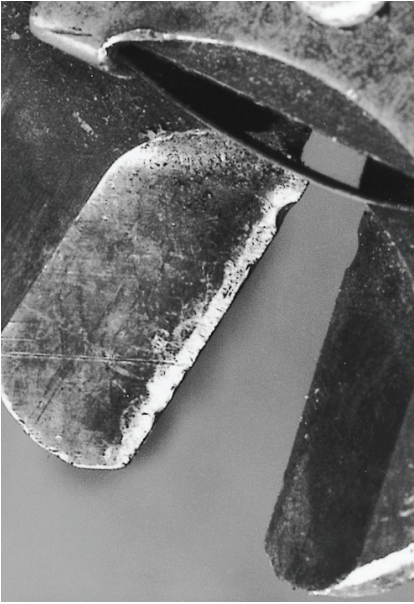


Fig. 17-4
Damage to the cutting edges of the blades creates individual markings on the materials cut by the bolt cutters.

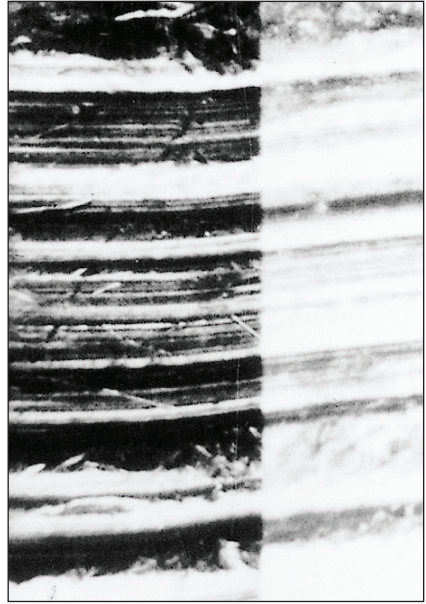


Fig. 17-5
This comparison microphotograph illustrates matching patterns of unique detail that result in an identification in a tool mark comparison.