

TENNESSEE BUREAU OF INVESTIGATION
Forensic Services Division

Firearms/Toolmarks Standard Operating Procedures Manual
Malfunctioning Firearm Procedure



10.0 MALFUNCTIONING FIREARM PROTOCOL

10.1 Scope: In some instances, it may be necessary to examine a firearm to determine if the firearm will malfunction. Many of these cases will deal with the question: "Will the firearm fire without pulling the trigger?" Examinations may include external and internal observations, or striking or dropping the firearm in attempts to duplicate the incident as reported. The firearm examiner should attempt to conduct the examinations in a manner so as not to alter the firearm. However, there may be occasions when damage may occur. Any change to the firearm shall be specifically documented in the examiner's notes.

10.2 Precautions/Limitations: The firearm examiner shall visually inspect the firearm to ensure that it is not loaded. If loaded, immediate steps should be taken to ensure that the firearm is safely unloaded. Care shall be exercised when the force to be used in testing could alter or damage internal parts and their working relationship(s). Damage caused by the examiner may prevent the examiner from determining the cause of the reported malfunction.

10.3 Related Information:

- 10.3.1 Physical Examination and Classification of Firearms Method 1
- 10.3.2 Safe Firearm Handling Method 2
- 10.3.3 Automatic Firing Method 7
- 10.3.4 Worksheet Appendix 1
- 10.3.5 Firearm Safety Appendix 3
- 10.3.6 Range of Conclusions Appendix 4

10.4. Instruments:

- 10.4.1 Rubber Mallet or other non-marring impact tool.
- 10.4.2 Primed Cartridge Case(s).
- 10.4.3 Dummy rounds.

10.5. Reagents/Materials: None

10.6. Hazards/Safety:

- 10.6.1 It is the responsibility of the firearm examiner to employ appropriate safety and health practices. Safe firearm handling procedures shall be strictly followed at all times.
- 10.6.2 Appropriate hearing and eye protection shall be worn when conducting tests with live ammunition, primed cartridge cases, or when applicable.

10.7 Reference Materials/Controls/Calibration Checks:

10.7.1 The firearm examiner should consult available manufacturer specification publications as



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well as disassembly/assembly and exploded diagram manuals.

10.7.2 TBI Firearms Reference Collection

10.8. Procedures/Instructions:

10.8.1 While not necessary to disassemble the firearm at this point in the examination, the firearm examiner or technician may disassemble a firearm when:

- The firearm is damaged upon receipt and incapable of being test fired as received.
- The firearm is rusted or corroded and disassembly is necessary for rendering the firearm functional for test firing.
- The firearm is suspected as having been altered for full automatic fire. If full automatic conversion is suspected, the examiner shall test fire the firearm in its original, "as received", condition before disassembly.

Extreme caution should be exercised if disassembly is required. Proper documentation must be made prior to disassembly and during the disassembly process.

10.8.2. As part of this method, an examiner may perform an "Impact" test on the firearm utilizing a primed cartridge case. An "Impact" test is used to determine if the firearm will discharge because of any type of impact. An "impact" test should consist of the following steps:

- Ensure that the firearm is unloaded.
- Load a primed cartridge case into the chamber of the firearm. A dummy round may also be used with sticky wax in the primer pocket to detect a firing pin strike.
- Holding the muzzle away, strike the firearm forcibly with a rubber mallet, or other non-marring impact tool, on the top, bottom, right side, left side, and back of the firearm.
- The examiner should repeat these strikes while the firearm is in various operating stages (single-action, double action, safety on, safety off, etc.).

10.8.3. No one procedure can sufficiently outline the steps necessary to examine all firearms for any malfunction. However, the following list of examinations should serve as a **guideline** for the examiner:

- Physical Examination of the Firearm as Received.

The firearm examiner should examine the physical condition of the firearm as received, and document the following as necessary:

- Cocked/uncocked
- Safety position (i.e., off or on safe)
- Loaded/unloaded
- Cartridge position (for revolvers only)



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- Stuck cartridges and/or fired cartridge cases
- Presence and/or location of flare marks (revolvers only)

- Visual Abnormalities
The firearm examiner should look for the following abnormalities, and document as necessary.
 - Barrel (loose, etc.)
 - Receiver (cracked, etc)
 - Slide (condition)
 - Parts broken or missing
 - Screws (loose or missing)
 - Alterations
 - Sights (loose or missing)

- Action (External)
 - Relationships of the action parts
 - Correct assembly
 - The proper locking of the action on closing
 - Cylinder rotation (securely locks)
 - Hand relationship to the ratchet (worn)
 - Trigger (not returning to forward position, sticks, broken spring, etc.)
 - Trigger pull (single action, double action) and striking of hammer

- Action (Internal) – Dissassembly is required to check internal parts for condition and operability.
 - Hammer notch – check for burrs, dirt, wear, or other abnormalities
 - Check the sear to see if broken, worn, or altered
 - Make sure safeties are in correct alignment
 - Check to see if springs are broken, worn, or altered
 - Check for signs of any tampering or faulty assembly

- Safeties
The safeties should be individually checked for operability and inspected for damage to safety components.
 - ¼, ½, full cock, seating check (any false seating positions, push off, etc.)
 - Grip, magazine, disconnecter
 - Thumb/finger – note positions when firearm will fire
 - Rebound hammer or inertia firing pin
 - Firing pin relationship to primer
 - Firing pin condition
 - Drop hammer several times to check above safeties



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- Position of the slide or bolt in order to fire
- Condition of safeties

- Action Check
 - Check feeding (magazine, carrier or lifter, feed ramp, magazine lips, etc.)
 - Check for the possibility of slamfires
 - Check for unusual marks exhibited on the cartridges/fired cartridge cases submitted with the firearm

- Test Fire Firearm
 - Note any operational problems (misfires, failure to feed, failure to extract/eject, etc)
 - Check the integrity/condition of fired cartridge cases

10.9 Records: The firearm examiner shall document their findings in the form of handwritten notes, computer generated notes, or by utilizing a firearms worksheet. Any and all procedures used to disassemble and/or clean the firearm shall be detailed in the examiner's notes. The examiner shall strictly adhere to all note taking procedures as prescribed by laboratory policy.

10.10 Interpretations of Results: The firearm examiner should gather all aforementioned material and consult with manufacturers specifications to ascertain the operating condition of the firearm if in question.

10.11 Report Writing: Most firearm report writing can be found in the Range of Conclusions Appendix 4. However, it is noted that firearms occasionally are submitted inoperable or in very poor condition and these Range of Conclusions may not be pertinent.

10.12 References:

Association of Firearms and Toolmark Examiners Training Manual, March 3, 2001

Association of Firearms and Toolmark Examiners Procedures Manual, July 9, 2001

Association of Firearms and Toolmark Examiners Glossary, 5th Edition, 2007

Young, Joseph, "Magazine Malfunctions of a SWD Can Cause Double Feeding of Cartridges and Unintentional Discharge," AFTE Journal, Summer 2005 Vol. 37, No. 3, Pgs 201-205

Silverwater, Shoshani, Argman, Hocherman, Schecter, "Accidental Discharge of a FN Browning Hi-Power Pistol," AFTE Journal, October 1996 Vol. 28, No. 4, Pages 233-240.

Jaeger, Kendall, "Another Safety Issue With After-Market Parts," AFTE Journal, Summer 2005,

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“Forensic Examiners Firearms Recall/Safety Warning List”, FBI Laboratory

American National Standards Institute, Inc., “American National Standard Voluntary Industry Performance Standards Criteria for Evaluation of New Firearms Designs Under Conditions of Abusive Mishandling for the Commercial Manufacturers”. (ANSI/SAAMI Z299.5-1985), November, 1985.