

Damage Recovery of Bullets and Cartridges Version 1.0 April 14, 2022

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OBJECTIVES

- Confirm that a Laser Marked Signakey will survive high energy impact.
- Mark on cartridge and bullet for 9 mm weapon.
- Load the bullet under controlled, documented conditions.
- Used both full metal jacket and hollow point bullets.
- Input from the Michigan State Police on safe confinement & practices.
- Design and construct the confinement box.
- Conduct the tests in a Licensed & Safe location.
- Fire fixed number of each bullet & clean confinement before the next.



DETAILS OF THE CONFINEMENT BOX

ALL SURFACES ARE 1 INCH PLYWOOD

TARGET - ¼ INCH THICK STEEL PLATE



REMOVABALE LID WITH 6 WING NUTS

VENT HOLES EACH SIDE - OUT GASING

TARGET END



CONFINEMENT BOX WITHOUT LID







MARKING BULLETS AND CARTRIDGES

- BULLETS AND CARTRIDGES WERE MARKED WITH 20-WATT FIBRE LASER.
- BULLETS AND CARTIDGES EACH MARKED WITH A UNIQUE SIGNAKEY.
- EACH WAS DECODED AND ENTERED INTO A DATABASE.



BULLET WAS NESTED IN PLASTIC BLOCK FOR MARKING



CARTRIDGE RESTED IN V-BLOCK FOR MARKING

LASER MARKING THE BACK OF BULLET

HOLLOW-POINT BULLET IN LASER CABINET READY FOR MARKING



ACTUAL LASER MARKING SIGNAKEY ONTO THE BACK OF HOLLOW-POINT BULLET



BULLET AND CARTRIDGE MARKING

- THE BASE OF THE BULLET WAS LASER MARKED BEFORE LOADING.
- THE CARTRIDGES WERE LASER MARKED ON THE SIDE.







BULLETS AND CARTRIDGES COLLECTED FROM TESTS

- ALL CARTRIDGES WERE RECOVERED AFTER TESTS.
- ONE FULL METAL JACKET BULLET LOST AFTER MISSING TARGET.
- ONE FULL METAL JACKET BULLET SPLIT BY TARGET.







DAMAGED BULLET FORESNIC DECODE



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EFFECTS OF BULLET IMPACTS & MISSES



SAMPLE DECODES HOLLOW POINT

BASE ALONE 1-3-33-110



BASE AND CARTRIDGE 1-3-33-134



SIGNAKEY

BASE ALONE 1-3-33-172



EMBEDDED BASE 1-3-33-33



SAMPLE DECODES FULL METAL JACKET

BASE ALONE 1-3-33-28



BASE ALONE 1-3-33-145



BASE ALONE 1-3-33-114



BASE ALONE 1-3-33-88



