



Centre of Forensic Sciences Investigators & Submitters Technical Information Sheets

Trigger Pull & Accidental Discharge

Introduction

Most firearms are designed by manufacturers to contain safeties, which are devices on a firearm intended to provide protection against accidental discharge under normal usage when properly engaged. The trigger pull of a firearm is set by the manufacturer and indicates the average force that needs to be applied to the trigger to cause it to discharge. Firearms safety tests are performed to determine whether or not the firearm will accidentally discharge despite safety designs and when not pulling the trigger and to report on the trigger pull for the firearm.

Accidental discharge testing involves testing a firearm under conditions of abusive mishandling to determine whether or not it exhibits tendencies to accidentally discharge. The testing performed is modelled on the SAAMI (Sporting Arms and Ammunition Manufacturers' Institute) voluntary performance standards for test procedures to evaluate new designs of rifles, shotguns and handguns. The SAAMI standard does not apply to muzzle loading and black powder firearms of any type, nor is the standard appropriate for firearms intended for formal target shooting and whose trigger pull is designed to be less than 3 pounds (1.36 kg). All accidental discharge testing is conducted with the firearm chambered with an empty primed case of its designated cartridge. The testing includes dropping a firearm in one or two conditions, safe carrying and maximum readiness, from various heights and in different attitudes

- i. Barrel vertical, muzzle down
- ii. Barrel vertical, muzzle up
- iii. Barrel horizontal, bottom up
- iv. Barrel horizontal, bottom down
- v. Barrel horizontal, left side up
- vi. Barrel horizontal, right side up

Depending on the specific design of the firearm or the case history additional testing not referenced in the SAAMI standard may be conducted.

During testing parts breakage or other damage resulting from testing does not constitute failure as long as the empty primed case does not fire and the firearm can be unloaded safely after each drop.

Examination

A trigger pull examination includes the following steps:

- Possible use of a wheel-operated test stand to secure the firearm
- Measuring a series of peak trigger pull using a digital force gauge or armourer's weights

The examination of a submitted firearm for accidental discharge may include the following steps:

- Mechanical evaluation of all design safeties
- Drop testing – simulates the abusive dropping of the firearm when in the safe carrying condition
- Jar-off testing – simulates the abusive bumping of the firearm against a hard surface with the firearm in a condition of maximum readiness

- Exposed hammer testing – simulates the dropping of the handgun on its exposed hammer or striker when in the safe carrying condition
- Rotation testing – simulates the abusive fall of a firearm left leaning against a vertical surface when in the safe carrying condition

Interpretation

Trigger Pull

- Provide the low, high and mean measurements

Accidental Discharge

- The item did not exhibit any tendencies to accidentally discharge during testing
- The item exhibited tendencies to accidentally discharge during testing
- Describe the conditions for the accidental discharge

Glossary

Accidental discharge

Is the unintentional discharge of a firearm by a mechanism other than the correct operation of the trigger by design

Maximum readiness

The firearm is in a condition to be fired when the trigger is pulled

Safe carrying position

Depends on the design of a firearm but is in a condition where the safeties of the firearm are engaged when the firearm is in a condition to be fired

Trigger pull

The amount of force which must be applied to the trigger of a firearm to cause sear release

Unintentional discharge

Is when a firearm is unintentionally discharged by the manipulation of the trigger by the operator