



TENNESSEE BUREAU OF INVESTIGATION

Forensic Services Division

Firearms/Toolmarks Standard Operating Procedures Manual

Barrel and Overall Length Measuring Procedure

7.0 BARREL AND OVERALL LENGTH MEASURING PROCEDURE

7.1 Scope: One of the routine procedures conducted in a firearm examination is determining the barrel length and overall length of the firearm.

7.2 Precautions/Limitations: Accuracy is imperative to this examination. It is vitally important that the firearm examiner use calibrated measuring devices, or instruments checked against calibrated measuring devices. These measuring devices will be checked against a NIST traceable ruler prior to being placed into service. Also, care shall be taken if any object is placed down the barrel to help expedite the barrel length measurement. Only a non-marring item should be placed down the barrel. Test firing of the firearm should be performed prior to placing any item down the barrel if possible.

TCA Section 39-17-1301 defines a short-barreled rifle and shotgun as having a barrel length of less than sixteen inches (16") for a rifle and eighteen inches (18") for a shotgun, or an overall firearm length of less than twenty-six inches (26"). TCA Section 39-17-1302 classifies those as prohibited weapons. This information is also included in the federal National Firearms Act, and may be located at www.atf.gov.

7.3 Related Information:

- 7.3.1** Firearm Examination and Classification Procedure 5
- 7.3.2** Safe Firearm Handling Procedure 4
- 7.3.3** Worksheet Appendix 1
- 7.3.4** Firearm Safety Appendix 3
- 7.3.5** Range of Conclusions Appendix 4
- 7.3.6** Measurement of Uncertainty Appendix 10

7.4. Instruments:

- 7.4.1.** NIST Traceable Rulers
- 7.4.2.** Non-marring Dowel (Hott-Rod)
- 7.4.3.** Overall Length and Barrel Measuring Device (Monturo Device)

7.5. Reagents/Materials: None

7.6. Hazards/Safety:

7.6.1 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.

7.7 Reference Materials/Controls/Calibration Checks:

7.7.1 If the overall length or barrel length is within ½" of the state guidelines, the firearm examiner shall document in their notes which NIST traceable measuring device was used in this procedure, and the serial number or other unique identifier of that device. The calibration/

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certification must be current when this device is used.

7.7.2 A list of state laws (Tennessee Code Annotated) can be found at www.lexis.com. A list of federal firearm laws and guidelines (National Firearms Act) can be found at www.atf.gov.

7.8 Procedures/Instructions:

7.8.1 Barrel Length

Barrel length is defined as the distance between the end of the barrel and the face of the closed breechblock or bolt for firearms other than revolvers. On revolvers, it is the overall length of the barrel including the threaded portion within the frame. Barrel length normally should include compensators, flash hidere, etc., if affixed.

Federal and state laws define a short-barreled shotgun (SBS) as a shotgun having one or more barrels less than 18 inches (18") in length, or with an overall length of less than twenty-six inches (26"). A short-barreled rifle (SBR) is defined as a rifle having one or more barrels less than sixteen inches (16") in length, or with an overall length of less than twenty-six inches (26").

7.8.1.1 Barrel Length – Revolvers

- Measure the barrel length in inches.
 - For revolvers, measure from the breech end of the barrel to the muzzle of the revolver. Do not include the cylinder. This measurement is performed externally on the firearm.
 - This is an approximate measurement and does not require the use of a certified measuring device.

7.8.1.2 Barrel Length – Firearms Other than Revolvers

- Measure the barrel length in inches. This measurement should be recorded to the nearest sixteenth of an inch (1/16").
- For all firearms except revolvers, measure from the end of the chamber (closed breech) to the farthest point at the muzzle.
 - This measurement may be directly performed externally on the firearm, or can be done by placing a non-marring item down the barrel, marking the distance from the breech end of the barrel to the muzzle, and then measuring this item. If a Hott-Rod or other dowel system is used, this measurement must be performed with the firearm in a cocked position to ensure that the firing pin is not protruding into the breech.
- When the barrel length is within one half inch (1/2") of the barrel length dictated by state or federal guidelines (18" for shotguns, 16" for rifles), the barrel must be measured by a certified/calibrated NIST traceable ruler or other NIST traceable measuring device (E.g., Hott- Rod, Monturo Device Rods). Note: This only applies



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- when the barrel is shorter than the mandated length of 18" for SBS's or 16" for SBR's.
- When the barrel length is within one half inch (1/2") of the length dictated by state or federal guidelines, a measurement uncertainty shall be included in the report and case notes. The confidence interval of the measurement must also be included in the report.
 - When the barrel length is not within one half inch (1/2") of the length dictated by state or federal guidelines, a ruler, measuring tape, measuring rod, or other measuring device may be used to measure the barrel. These measurements are approximate. These measuring devices will be checked against a NIST traceable ruler prior to being placed into service.

7.8.2 Overall Length Measurement of Firearms

Overall length of a firearm is defined as the dimension (length) measured from the farthest point of the muzzle of the firearm to the rearmost point of the butt plate or grip of the firearm. This measurement must be made parallel to the bore of the firearm to lines at right angles to the axis of the bore and at the farthest forward and rearmost points on the firearm.

- Measure the overall length in inches. This measurement should be recorded to the nearest sixteenth of an inch (1/16").
- For all types of firearms, measure the overall length of the firearm parallel to the axis of the bore, from the muzzle of the barrel to the rearmost portion of the firearm.
- When the overall length is within one half inch (1/2") of the overall length dictated by state or federal guidelines (26 inches for shotguns and rifles), the overall length must be measured by a certified/calibrated NIST traceable ruler or other NIST traceable measuring device (E.g., Monturo device). Note: This only applies when the overall length is shorter than the mandated length.
- When the overall length is within one half inch (1/2") of the length dictated by state or federal guidelines, a measurement uncertainty shall be included in the report and case notes. The confidence interval of the measurement must also be included in the report.
- When the overall length is not within one half inch (1/2") of the length dictated by state or federal guidelines, a ruler, measuring tape, measuring rod, or other measuring device may be used to measure the length. This measurement is approximate. These measuring devices will be checked against a NIST traceable ruler prior to being placed into service.

7.8.3 Use of Overall Length and Barrel Measuring Device (Monturo Device) for Barrel Measurements

- The firearm should be cocked to ensure that the firing pin is not protruding into the breech.
- Place appropriate size rod into the barrel until it rests against the breechface.
- Lock the collar in place at the end of the muzzle.



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- Remove the rod from the firearm and measure from the appropriate end to the collar by utilizing the ruler affixed to the measuring device. Record the measurement to the nearest eighth of an inch (1/8"), or sixteenth of an inch if discernible.

7.8.4 Use of Overall Length and Barrel Measuring Device (Monturo Device) for Overall Length Measurements

- Place the firearm in the device so that the barrel is parallel to the NIST traceable ruler.
- Using the sliding end of the device close it until it comes to rest against the muzzle or the butt of the firearm.
- Record the measurement directly under the sliding end to the nearest sixteenth of an inch (1/16").

7.9 Records: The firearm examiner shall document their findings in the form of handwritten notes, computer generated notes, photography, or by utilizing a firearms worksheet.

7.10 Interpretations of Results:

7.10.1 When necessary, the examiner shall always "round up" to the nearest sixteenth of an inch.

7.10.2 When reporting "critical measurements", the firearm examiner shall refer to the TBI FTIU "Estimation of Uncertainty of Measurement" policy, and record their measurement and uncertainty in their notes as required by this document.

7.11 Report Writing: Most firearm report writing can be found in the Range of Conclusions Appendix 4. When the barrel length or overall length of a firearm is within one half inch of the length mandated by state or federal guidelines, a measurement uncertainty is required, and must be reported along with the confidence interval. Note: This only applies when the overall length or barrel length is shorter than the mandated length.

7.12 References:

Association of Firearm and Tool Mark Examiners Training Manual, March 3, 2001

Association of Firearm and Tool Mark Examiners Procedures Manual, July 9, 2001

Association of Firearm and Tool Mark Examiners Glossary, 5th Edition, 2007

Hamby & Shem, "The Proper Method for Measuring Weapons", AFTE Journal, July 1982, Vol.14, No. 3, pg. 10.

"Technical Protocols for the Handling of Firearms and Ammunition", FBI, June 1992.

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“Federal Firearms Regulations Reference Guide”, ATF, 2005 (www.atf.gov).