

Section 2.0 Barrel Length and Overall Length Measurement of a Firearm.

History Page

Revision #	Effective date	History
0	1/12/07	This is an original procedure this procedure has been completely reformatted and updated from the previous procedure that was adopted from the Washington State Patrol.
1	1/16/13	Changes made to all sections for measurement uncertainty and traceability policy updates.
2	1/16/2014	Update to Uncertainty of Measurement reporting criteria, removal of converting fractional measurement to a decimal equivalent. Minor formatting changes

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2.0 BARREL AND OVERALL LENGTH MEASUREMENT OF A FIREARM

2.1 SCOPE AND BACKGROUND

This procedure is used for determining the barrel length and overall length of a firearm. 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 hiders, etc., if permanently affixed. Overall length of a firearm is defined as the dimension measured parallel to the axis of the bore from muzzle to a line at right angles to the axis and tangent at the rearmost point of the butt plate or grip. Removable barrel extensions, poly chokes, flash hiders, etc., are not part of the measured barrel length or overall length.

Measurements will be classified as “Descriptive” or “Reported.”

- Descriptive measurements are defined as routine firearm dimension measurements for general documentation. Descriptive measurements are recorded in case notes only.
- Reported measurements are defined as measurements which are relevant to the determinations of possession of a “Short Barrel Rifle” or “Short Barrel Shotgun.” Reported measurements require the use of a NIST-traceable measuring device. Reported measurements are recorded in the case notes and on the case report.
- For barrel length of a shotgun or rifle, if the descriptive measurement is less than 16 inches for a rifle or less than 18 inches for a shotgun, a reported measurement shall be taken.
- For overall length of a shotgun or rifle, if the descriptive measurement is less than 26 inches, a reported measurement shall be taken.
- If a reported measurement is requested by the customer, but cannot be made with a NIST traceable device because the barrel or overall length is too long, the laboratory will inform the customer that the analysis cannot be performed.

2.2 EQUIPMENT (refer to section 9 for maintenance and calibration procedures)

Measurements at or under 24 inches for barrel length or 36 inches for a overall length:

- A NIST-traceable or certified measuring device (e.g., ruler or barrel rod) capable of measurements to:
 - 1/16th of an inch for a barrel rod.
 - 1/32nd of an inch for a ruler.
- Measurements over 24 inches for barrel length or 36 inches for overall length: A standard tape measure may be used directly or against a non-marring dowel.

2.3 PROCEDURE or ANALYSIS

Care must be taken if any object is placed down the barrel for measurement purposes.

2.3.1 BARREL LENGTH:

2.3.1.1 REVOLVERS:

Measure the distance from the breech end of the barrel to the muzzle, excluding the cylinder. This measurement shall be done directly by using a barrel rod. The barrel rod shall be inspected for damage before use. When using a measuring device down the barrel, the rod shall be held parallel with the barrel and read with the barrel end at eye level. Be sure not to damage the barrel or breach when measuring barrel length.

This measurement will be recorded in the case notes rounded up to the nearest 16th of an inch.

2.3.1.2 FIREARMS OTHER THAN REVOLVERS:

Measure the distance from the breech face in a closed and locked position to the longest point of the muzzle. This measurement shall be done directly by using a barrel rod. The barrel rod shall be inspected for damage before use. When using a measuring device down the barrel, the rod shall be held parallel with the barrel and read with the barrel end at eye level. Be sure that the firing pin does not protrude past the breach. Be sure not to damage the barrel or breach when measuring barrel length.

This measurement will be recorded in the case notes rounded up to the nearest 1/16th of an inch.

For barrel length of a shotgun or rifle, if the descriptive measurement is less than 16 inches for a rifle or less than 18 inches for a shotgun, a reported measurement shall be taken and recorded in the case notes. The reported measurement shall be adjusted for any bias associated with the reference standard (e.g. butting) if the measurement is between 15 ¾ inches and 16 inches for rifles or 17 ¾ inches and 18 inches for shotguns.

If the barrel length of the shotgun or rifle exceeds the length of the 24 inch NIST-traceable barrel rod, a non-marring dowel rod may be used for a descriptive measurement. The non-marring dowel rod measurement will be compared to a standard tape measure for a descriptive measurement. The measurement will be rounded up to the nearest 1/16 inch on the standard tape measure. Descriptive measurements shall be recorded in the case notes.

2.3.2 OVERALL LENGTH:

Measure the distance from the butt to the muzzle. Measurement shall be made parallel to the bore using a ruler. The ruler shall be inspected for damage before use. This measurement will be recorded in the case notes rounded up to the nearest 1/32nd of an inch.

For overall length of a shotgun or rifle, if the descriptive measurement is less than 26 inches, a reported measurement shall be taken and recorded in the case notes.

If the overall length of the shotgun or rifle exceeds the length of the 36 inch NIST-traceable ruler, a standard tape measure may be used for a descriptive measurement. A descriptive measurement using a standard tape measure will be rounded up to the nearest 1/16 inch. Descriptive measurements shall be recorded in the case notes.

2.3.3 REPORTING AND INTERPRETATION OF RESULTS:

For reported measurements, the examiner shall document the serial number of the NIST-traceable or certified measuring device used (i.e. ruler or barrel rod).

“Reported measurements” shall be included in the case report.

“Descriptive measurements” shall not be reported in the case report.

At a minimum, the laboratory will report the measurement result and the estimated expanded uncertainty when it impacts evaluation of a statute, legal requirement, or upon customer request. When measurements are reported, the measurement uncertainty and a statement regarding the coverage probability of 99.73% shall be on the report. The measurement result shall include the measured quantity value (y) along with the associated expanded uncertainty (U), and this measurement shall be reported as $y \pm U$ where U is consistent with the units of Y (i.e. 18 1/2 inches \pm 3/32 inches). The current expanded uncertainty is published as a protected document on the ISPFPS shared network drive and is available to all analysts.

2.3.3.1 Measurement of Uncertainty Estimation

An expanded uncertainty of measurement was calculated for barrel length and overall length. Many factors (e.g. environmental and facility conditions, reference standards, analytical method factors) were evaluated for potential contribution to the expanded uncertainty of measurement. A reproducibility study was also performed as a part of the expanded uncertainty. An uncertainty budget is available for barrel length and overall length measurements. The final expanded uncertainty result is converted to a fraction consistent with the smallest division on the measuring device (1/32th for overall length and 1/16th for barrel length) rounded using the Microsoft Excel arithmetic rules of rounding where by the half way number (5) is rounded up. The expanded uncertainty in the firearms discipline is reported at $k=3$. Fraction may be simplified as needed (i.e. 4/32nd = 1/8th).

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At a minimum the uncertainty budget shall be reviewed annually, or upon recalibration of a reference standard, replacement of a reference standard, significant changes to the analytical method, or personnel change within the discipline.

2.4 SAFETY CONSIDERATIONS

This procedure involves hazardous materials, operations and equipment. This procedure does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this procedure to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Proper caution must be exercised and the use of personal protective equipment must be considered.

Appropriate hearing and eye protection must be worn when applicable.

2.5 REFERENCES

“The Proper Method for Measuring Weapons,” AFTE Journal, Vol.14, No. 3, p. 10

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