



National Institute of Justice

Law Enforcement and Corrections Standards and Testing Program

Autoloading Pistols For Police Officers

NIJ Standard-0112.03

ABOUT THE LAW ENFORCEMENT AND CORRECTIONS STANDARDS AND TESTING PROGRAM

The Law Enforcement and Corrections Standards and Testing Program is sponsored by the Office of Science and Technology of the National Institute of Justice (NIJ), U.S. Department of Justice. The program responds to the mandate of the Justice System Improvement Act of 1979, which created NIJ and directed it to encourage research and development to improve the criminal justice system and to disseminate the results to Federal, State, and local agencies.

The Law Enforcement and Corrections Standards and Testing Program is an applied research effort that determines the technological needs of justice system agencies, sets minimum performance standards for specific devices, tests commercially available equipment against those standards, and disseminates the standards and the test results to criminal justice agencies nationally and internationally.

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The *Law Enforcement and Corrections Technology Advisory Council (LECTAC)* consisting of nationally recognized criminal justice practitioners from Federal, State, and local agencies, which assesses technological needs and sets priorities for research programs and items to be evaluated and tested.

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Autoloading Pistols for Police Officers

NIJ Standard-0112.03

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Jeremy Travis
Director

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This standard has been reviewed and approved by the Weapons and Protective Systems Subcommittee and the Executive Committee of the Law Enforcement and Corrections Technology Advisory Council.

FOREWORD

This document, *NIJ Standard-0112.03, Autoloading Pistols for Police Officers*, is an equipment standard developed by the Office of Law Enforcement Standards of the National Institute of Standards and Technology. It is produced as part of the Law Enforcement and Corrections Standards and Testing Program of the National Institute of Justice. A brief description of the program appears on the inside front cover.

This standard is a technical document that specifies performance and other requirements equipment should meet to satisfy the needs of criminal justice agencies for high quality service. Purchasers can use the test methods described in this standard to determine whether a particular piece of equipment meets the essential requirements, or they may have the tests conducted on their behalf by a qualified testing laboratory. Procurement officials may also refer to this standard in their purchasing documents and require that equipment offered for purchase meet the requirements. Compliance with the requirements of the standard may be attested to by an independent laboratory or guaranteed by the vendor.

Because this NIJ standard is designed as a procurement aid, it provides precise and detailed test methods. For those who seek general guidance concerning the selection and application of law enforcement equipment, user guides have also been published. The guides explain in nontechnical language how to select equipment capable of the performance required by an agency.

NIJ standards are subjected to continuing review. Technical comments and recommended revisions are welcome. Please send suggestions to the Director, Office of Science and Technology, National Institute of Justice, U.S. Department of Justice, 810 7th St., NW, Washington, DC 20531.

Before citing this or any other NIJ standard in a contract document, users should verify that the most recent edition of the standard is used. Write to: Director, Office of Law Enforcement Standards, National Institute of Standards and Technology, Gaithersburg, MD 20899.

David G. Boyd, Director
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National Institute of Justice

NIJ STANDARD FOR AUTOLOADING PISTOLS FOR POLICE OFFICERS

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COMMONLY USED SYMBOLS AND ABBREVIATIONS

A	ampere	H	henry	nm	nanometer
ac	alternating current	h	hour	No.	number
AM	amplitude modulation	hf	high frequency	o.d.	outside diameter
cd	candela	Hz	hertz (c/s)	Ω	ohm
cm	centimeter	i.d.	inside diameter	p.	page
CP	chemically pure	in	inch	Pa	pascal
c/s	cycle per second	ir	infrared	pe	probable error
d	day	J	joule	pp.	pages
dB	decibel	L	lambert	ppm	part per million
dc	direct current	L	liter	qt	quart
$^{\circ}\text{C}$	degree Celsius	lb	pound	rad	radian
$^{\circ}\text{F}$	degree Fahrenheit	lbf	pound-force	rf	radio frequency
dia	diameter	lbf·in	pound-force inch	rh	relative humidity
emf	electromotive force	lm	lumen	s	second
eq	equation	ln	logarithm (natural)	SD	standard deviation
F	farad	log	logarithm (common)	sec.	section
fc	footcandle	<i>M</i>	molar	SWR	standing wave ratio
fig.	figure	m	meter	uhf	ultrahigh frequency
FM	frequency modulation	min	minute	uv	ultraviolet
ft	foot	mm	millimeter	V	volt
ft/s	foot per second	mph	mile per hour	vhf	very high frequency
<i>g</i>	acceleration	m/s	meter per second	W	watt
g	gram	N	newton	λ	wavelength
gr	grain	N·m	newton meter	wt	weight

area=unit² (e.g., ft², in², etc.); volume=unit³ (e.g., ft³, m³, etc.)

PREFIXES

d	deci (10 ⁻¹)	da	deka (10)
c	centi (10 ⁻²)	h	hecto (10 ²)
m	milli (10 ⁻³)	k	kilo (10 ³)
μ	micro (10 ⁻⁶)	M	mega (10 ⁶)
n	nano (10 ⁻⁹)	G	giga (10 ⁹)
p	pico (10 ⁻¹²)	T	tera (10 ¹²)

COMMON CONVERSIONS

(See ASTM E380)

ft/s \times 0.3048000 = m/s	lb \times 0.4535924 = kg
ft \times 0.3048 = m	lbf \times 4.448222 = N
ft·lbf \times 1.355818 = J	lbf/ft \times 14.59390 = N/m
gr \times 0.06479891 = g	lbf·in \times 0.1129848 = N·m
in \times 2.54 = cm	lbf/in ² \times 6894.757 = Pa
kWh \times 3 600 000 = J	mph \times 1.609344 = km/h
	qt \times 0.9463529 = L

$$\text{Temperature: } (T_{\text{F}} - 32) \times 5/9 = T_{\text{C}}$$

$$\text{Temperature: } (T_{\text{C}} \times 9/5) + 32 = T_{\text{F}}$$

NIJ STANDARD FOR AUTOLOADING PISTOLS FOR POLICE OFFICERS

1. PURPOSE AND SCOPE

This standard establishes performance requirements and test methods for pistols to be used by law enforcement officers. This standard is a general revision of and supersedes NIJ Standard-0112.02 dated January 1995, and addresses new pistol designs, calibers, revised procedures for verifying headspace, and general revision of the testing procedures. NIJ Standard-0112.02 added the 10 mm and 40 S&W calibers. This revision of the standard deletes the 10 mm and adds the 357 SIG caliber. This standard is intended for use in assessing the acceptability of new or reissue¹ autoloading pistols. It does not address specific safety devices, full or partial magazine release, pistol shot group size, accuracy, or sights, nor does this standard address service life (endurance testing).

2. CLASSIFICATION

The pistols covered by this standard are considered to be those typically carried by law enforcement personnel as their duty weapon.

3. DEFINITIONS

3.1 Barrel Groove Diameter

The diameter of the largest inscribed circle that can be placed inside the barrel.

3.2 Barrel Land Diameter

The diameter of the largest round rod which will fit into the bore of the barrel.

3.3 Double Action

A mode of operation that permits a single pull of the trigger to cock and fire the pistol. (See also **3.16 Single Action** and **3.17 Striker Fire Action**.)

3.4 Firing Malfunction

Failure to feed, fire, or eject a round. This is a subset of a malfunction.

3.5 Grip Safety

A passive safety device that requires an applied force on the grip before the pistol can be fired.

¹ All pistols must be examined and reconditioned as necessary by a trained armorer or gunsmith prior to reissue.

3.6 Hammer Spur

Extension of the hammer used to cock the hammer manually.

3.7 Headspace

The distance between the closed breech face of the firearm and the surface of the chamber on which the cartridge case seats.

3.8 Headspace Gage

A device used to facilitate measurement of headspace.

3.9 Magazine Safety

A passive safety device that prevents firing of the pistol unless a magazine is in place.

3.10 Malfunction

Failure to feed, fire, or eject a round or failure to accept or eject a magazine; or failure of the slide to remain open after the last round has been fired.

3.11 Minimum Bore and Groove Area

The minimum allowable open or unrestricted area of the barrel bore as specified by SAAMI² Standards.

3.12 Misfire

Failure to fire a round. (See **3.4 Firing Malfunction** and **3.10 Malfunction**).

3.13 Model

The manufacturer's designation which uniquely identifies a specific design of autoloading pistol.

3.14 Model Change

Any change in the design or construction of a model previously tested and found to comply with the NIJ Standard requires a new model designation and testing of the new model to determine compliance with the standard. A **Change in Design or Construction** is defined as any alteration to the basic design or construction of the pistol submitted for testing which, in the concurrent opinion of NIJ, NLECTC, and OLES, has the potential to effect the performance of the pistol in the field or as it relates to the required testing specified in the NIJ Standard.

Examples which would require retesting under a new and separate model designation include, but are not specifically limited to: Changes in/to: materials of construction (with the exception of the items listed below, and excluding finish); overall size or shape of the weapon; the designated caliber or chambering; the mechanical operation and configuration of the weapon, including safety mechanisms (with the exception of those items listed below); and magazine size or capacity which requires alteration to the grip area.

Examples which would not require retesting under a new and separate model designation include, but are not specifically limited to: Changes in/to: the finish of the pistol; minor variations in materials of construction (i.e., carbon steel vs. stainless steel) or alloys thereof; sights (fixed vs. adjustable); and the location of the safety mechanism (to accommodate left vs. right-handed shooters), as long as the design, configuration and operation of the safety mechanism remains identical to the previously tested and approved model.

Issues not specifically listed above will be reviewed on a case-by-case basis by NIJ, OLES, and NLECTC to determine whether or not a new test will be required.

² Sporting Arms and Ammunition Manufacturers Institute, an organization dedicated to establishing and maintaining industry standards for firearms and ammunition.

3.15 Safe Action

Striker fire action. (See **3.17 Striker Fire Action**.)

3.16 Single Action

A mode of operation that uses the trigger to fire the pistol only. (See also **3.3 Double Action**.)

3.17 Striker Fire Action

A pistol design which employs an internal striker mechanism to detonate the primer. In operation, the pistol is normally in a partially cocked condition. Pulling the trigger completes cocking the action, and then releases the striker mechanism to fire the pistol.

3.18 Trigger Pull

The force that must be applied to the trigger to fire the pistol.

4. REQUIREMENTS

4.1 Acceptance Criteria

To satisfy the requirements of this standard, both sample pistols (see Sec. 5.1) must pass all of the requirements and tests specified in this standard.

To be suitable for issue or reissue, a pistol model that has previously met the requirements of this standard must be reconditioned by a trained armorer or gunsmith and as a minimum meet the visual inspection requirements (Sec. 4.3), the dimensional requirements (Sec. 4.4), the functional requirements (Sec. 4.5), and the reissue firing requirement (Sec. 4.6.2).

4.2 User Information

The following minimum information must be supplied in the English language by the manufacturer:

- a. Instructions for field disassembly/assembly and diagram(s) identifying all parts.
- b. Cleaning instructions.
- c. A description of each safety feature designed into the pistol, how each safety feature is intended to function, and for those under shooter control, how the shooter should operate (activate/deactivate) each safety feature.
- d. A statement on ammunition known to be beyond the design limits of the pistol (e.g., +P ammunition in a pistol not designed to handle +P ammunition) and/or known not to function in the pistol.
- e. A statement identifying how a parts list may be obtained.
- f. Certification of compliance with this standard: Manufacturers are prohibited from placing any statement on the pistol itself, the labeling, or accompanying user information that in any way states, infers, or otherwise suggests that the model complies with the requirements of this standard until such time as the model has successfully completed testing at an NIJ-approved testing facility, and a letter of compliance for the model tested has been issued to the manufacturer by NLECTC. At that time, the manufacturer may place the following statement in the required user information:

“The manufacturer certifies that this model of autoloading pistol has been tested and found to comply with the requirements of NIJ Standard-0112.03, dated November, 1998.”

Manufacturers may supply any other information that they believe may be needed by the user for proper and safe operation of their handgun.

4.3 Visual Inspection

4.3.1 Hammer Travel

In the single action mode, if present, the hammer shall have sufficient over-travel to assure achievement of the full cocked position.

4.3.2 Particles

There shall be no loose chips, shavings or filings in the pistol.

4.3.3 Surface

The pistol shall have no chips, scratches, or burrs. There shall be no sharp edges or corners that could cut the shooter's hand while firing or during manual cycling of the pistol.

4.4 Dimensional Requirements

4.4.1 Barrel Bore Dimensions

The barrel bore diameter shall be in accordance with SAAMI Standards for the caliber for which the pistol is chambered (see App. A). The barrel shall meet the specifications for either bore and groove diameter or minimum bore and groove area.

4.4.2 Headspace

The headspace shall be in accordance with SAAMI Standards for the caliber for which the pistol is chambered (see App. A).

4.5 Functional Requirements

4.5.1 Action

The slide shall operate smoothly without binding or sticking when operated by hand or during firing tests (see Secs. 5.5.1 and 5.6).

4.5.2 Ejection

The ejection mechanism shall eject cases without hangup and without hitting the shooter during the ejection test (Sec. 5.5.2) or the firing tests (Sec. 5.6), except as provided in Sections 4.6 and 4.8.

4.5.3 Trigger

- a. The single action trigger pull force shall be not less than 13 N (3 lbf) nor more than 36 N (8 lbf) when tested in accordance with Section 5.5.3.³
- b. The double action trigger pull force shall be no more than 80 N (18 lbf) when tested in accordance with Section 5.5.3.³
- c. For a pistol employing a striker fire mechanism, the trigger pull force shall be not less than 22 N (5 lbf) nor more than 67 N (15 lbf) when tested in accordance with Section 5.5.3.³

4.5.4 Hammer

When tested in accordance with Section 5.5.4, the hammer shall operate smoothly without binding and shall not release under an applied load of $46 \text{ N} \pm 1 \text{ N}$ ($10 \frac{1}{4} \text{ lbf} \pm \frac{1}{4} \text{ lbf}$).

³ N, the metric unit of force, is equal to 0.2248 lbf. For the purpose of this standard all conversions from Newton to pound-force for required values and measurements have been rounded to the nearest 1/4 lbf.

4.5.5 Safety Features

The pistol shall have one or more design features to prevent inadvertent firing. Active (user activated) safety devices, if provided, shall be designed so that the pistol can be made fire-ready by releasing the safety(s) with the shooting hand.

The pistol shall not fire when tested in accordance with Section 5.5.5.

4.5.6 Magazine

The magazine shall have a capacity of six rounds, minimum, and shall be capable of being released without removing the shooting hand from the pistol.

4.6 Firing Requirement

4.6.1 Model Qualification Firing Requirement

When tested in accordance with Section 5.6.1, the pistol shall fire 600 rounds of ammunition with no structural or mechanical failures and no more than five malfunctions. Of the five allowable malfunctions no more than three shall be firing malfunctions not attributable to faulty ammunition (see Sec. 5.6).

4.6.2 Reissue Firing Requirement

The pistol shall function with the ammunition used by the issuing department when tested in accordance with Section 5.6.2. The department is free to increase the number of rounds to be fired. However, the minimum number of rounds that are required is equal to twice the maximum capacity of a magazine times the number of magazines issued with the pistol. For tests of 200 rounds or less, there shall be no more than one malfunction not attributable to faulty ammunition.

4.7 Drop Safety Requirement

The pistol shall not fire during the drop test described in Section 5.7.

4.8 Drop Function Requirement

The pistol shall exhibit no more than three malfunctions when tested as in Section 5.8.

5. TEST METHODS

All firing tests shall be performed with a shooter provided by the manufacturer. Mechanical rests, if desired by the manufacturer, may be used. In addition to the shooter, a manufacturer may have one additional representative present to witness the test. Should any test sample fail a specific test, the data for that test shall be recorded and testing continued, if possible, until all the tests required by this standard are completed.

In the event that a pistol model fails to comply with only one of the requirements of this standard, the manufacturer may elect to resubmit that model to NLECTC for retesting under the same model designation as previously tested. The manufacturer must include a written explanation with the samples submitted for retesting indicating why, in their opinion, the model failed this portion of testing and what steps they have taken to correct the cause of failure. Assuming that the steps taken do not fall under the definition of Model Change (Sec. 3.14), the model will be retested only for that portion of the test which it originally failed, with the exception of the Drop Function Test (Sec. 5.8), where the Drop Safety Test (Sec. 5.7) must also be performed.

A model which passes retesting under this criteria will be considered to be in compliance with the requirements of this standard. A model which fails retesting will have to be submitted under a new model designation.

Samples that fail more than one of the performance tests required by the standard shall be considered as having failed the compliance testing, and may not be resubmitted under the same model designation.

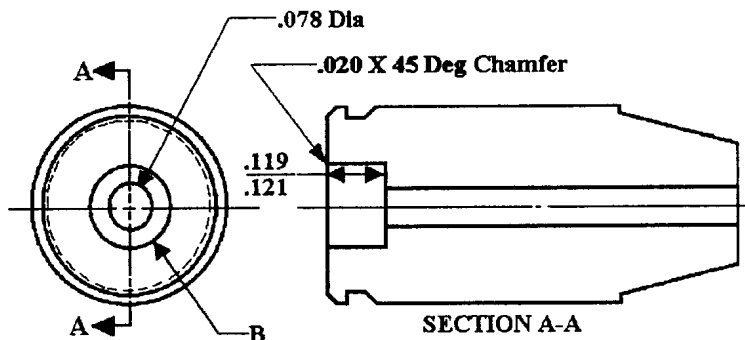
5.1 Sampling

Two representative samples of each pistol model to be tested are required. The samples can be selected at random from the current purchase lot for acceptance testing, recognizing that the two tested pistols probably will not be suitable for field issue after testing. NOTE: The pistols must be examined by a trained armorer or gunsmith after testing and reconditioned as necessary if issue of these two pistols is contemplated. Alternatively, two test pistols can be supplied by the manufacturer for qualification compliance testing separately from the purchase lot, in which case they shall be selected randomly from the current production.

5.2 Special Test Equipment

5.2.1 “Go,” “No-Go” Headspace Gages

These headspace gages are commercially available hardened steel gages used to verify the headspace of pistols firing from a locked breech condition. The “Go” gage verifies that the headspace of the pistol is equal to or greater than the SAAMI minimum headspace for the caliber for which the pistol is chambered. The “No-Go” gage verifies that the headspace of the pistol is not greater than the SAAMI maximum headspace for the caliber for which the pistol is chambered. The headspace gages to be used in this testing shall be standard commercial headspace gages, except that they shall be modified to permit the installation of a standard primer (of the appropriate size for the caliber of the gage), as well as a vent of 0.2 cm (0.078 in) dia located on the longitudinal axis of each gage (Fig. 1). Unfired primers will be in place in each headspace gage during the testing, and will be used to verify whether the hammer struck the firing pin with sufficient force to cause the pistol to fire during the headspace testing.



B = 0.4406 cm \pm .0013 cm (0.1735 in \pm .0005 in) Dia for 9 mm, 357 Sig & 40 S&W; 0.5308 cm \pm .0013 cm (0.2090 in \pm .0005 in) Dia for 45 ACP.

FIGURE 1. “Go,” “No-Go” headspace gages, modified for NIJ Standard-0112.03 tests.

5.3 Visual Inspection

Verify that the pistol is unloaded.

5.3.1 Hammer

Cock the external hammer, if one is present, to the single action full-cock position if the weapon will fire single action. Verify that there is perceptible travel past this position.

5.3.2 Particles

Examine the pistol. Note any shavings or filings that should not be inside the pistol.

5.3.3 Surface

Examine the pistol's surfaces. Note any chips, scratches, sharp edges, burrs, or rust spots.

5.4 Dimensional Tests

5.4.1 Barrel Bore Dimensions

The Barrel Bore dimensions shall be verified by either Sec. 5.4.1.1 or 5.4.1.2.

5.4.1.1 Groove and Land Diameters

Measure the diameter of the largest circle that can be inscribed in the bore of the barrel at the muzzle. This shall be the **“Groove Diameter,”** and shall be within the limits defined by SAAMI for the caliber of the pistol (see App. A).

Determine the largest diameter round rod which will fit into the bore of the barrel. This shall be the **“Land Diameter,”** and shall be within the limits defined by SAAMI for the caliber of the pistol (see App. A).

5.4.1.2 Minimum Bore and Groove Area

The **“Minimum Bore and Groove Area”** shall be determined in accordance with the SAAMI Standards, and shall meet or exceed the value specified for that specific caliber (see App. A).

5.4.2 Headspace

CAUTION: In all tests involving a headspace gage, do not force the gages or allow the mechanism to slam shut on a gage, since one or the other may be damaged.

NOTE: In all tests involving a headspace gage, verify that the extractor does not prevent the slide from reaching its forwardmost position—if the extractor does catch on the gage, manipulate the slide until the extractor slides over the rim of the gage, permitting the slide to move to its forwardmost position.

NOTE: In all tests involving a headspace gage with a live primer installed, the primer shall be seated flush with or 0.020 cm (0.008 in) below the base of the gage.

Examine the firing mechanism of the pistol to determine if the slide is physically restrained in a fixed position relative to the barrel when the weapon is ready to fire but without a cartridge in the chamber.

For pistols designed to physically lock the slide to the barrel in the firing position, verify that the headspace of the pistol meets the headspace requirements of this Standard in the following manner:

- a) Insert a “Go” headspace gage, with a live primer installed, into the chamber. Release the slide slowly until the slide stops and verify that the slide reached its mechanically locked position, and that the hammer will fall and strike the firing pin with sufficient force to cause the primer to detonate when all safeties are disengaged and the trigger is pulled.
- b) Remove the “Go” headspace gage, and install a “No-Go” headspace gage, with a live primer installed, into the chamber. Release the slide slowly until the slide stops and verify that the slide did not reach its mechanically locked position, and that the hammer is restricted from striking the firing pin (either will not fall or is blocked from striking the firing pin) with sufficient force to cause the primer to detonate when all safeties are disengaged and the trigger is pulled.

For pistols designed with slides that are not locked to the barrel in the firing position, verify that the headspace of the pistol meets the headspace requirements of this Standard in the following manner:

- a) Determine the location of the slide relative to the barrel at which the hammer will fall when all safeties are disengaged and the trigger is pulled without a round in the chamber.
- b) Insert a “Go” headspace gage, with a live primer installed, into the chamber. Release the slide slowly until the slide stops and verify that the slide travelled at least to the location noted in step a) above, and that the hammer will fall and strike the firing pin with sufficient force to cause the primer to detonate when all safeties are disengaged and the trigger is pulled.
- c) Insert a “No-Go” headspace gage, with a live primer installed, into the chamber. Release the slide slowly until the slide stops and verify that the slide will not travel to the location noted in step a) above, and that the hammer will not fall and strike the firing pin with sufficient force to cause the primer to detonate when all safeties are disengaged and the trigger is pulled.

5.5 Function Tests

5.5.1 Action

- a. Operate the unloaded pistol in all of its action modes.
- b. Pull the slide fully to the rear and release it to battery position. In each case note any sticking, binding, grittiness, or hesitation.

5.5.2 Ejection Test

Load the pistol with a full magazine of ammunition and then fire the full load into a bullet trap or other suitable device. Note any failure to eject, if any ejected cases hit the shooter, and whether the slide remains open after the last round.

5.5.3 Trigger Pull Test

With the pistol empty, apply a load to the rearmost part of the front surface of the trigger so that the load is parallel to the barrel to within 5° (Fig. 2). Weights or spring gages may be used to apply the specified load. If weights are used (which is the recommended method), the pistol shall be mounted in a fixture with the barrel vertical, and the muzzle up.

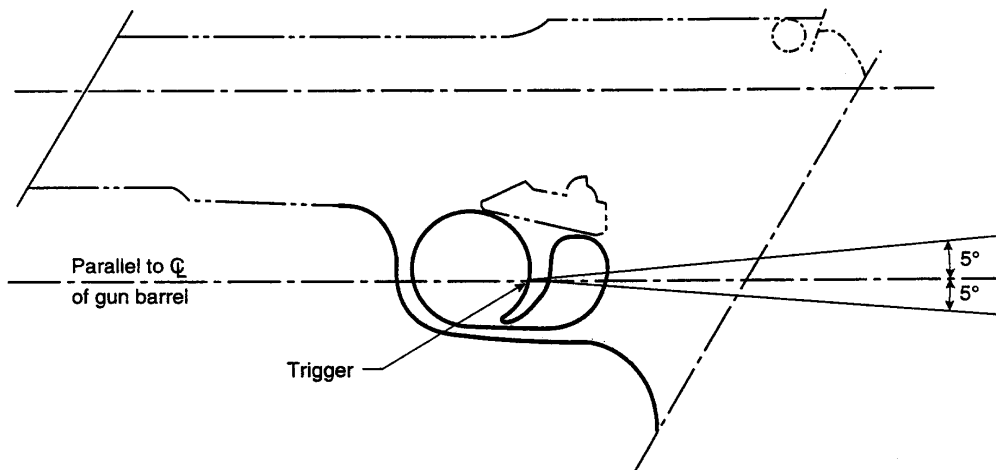


FIGURE 2. Trigger pull test setup.

- a. Single action. Cock the hammer or striker. Apply a 12 N (2 3/4 lbf) load to the trigger and uniformly increase it in 1 N (1/4 lbf) increments until the load of 36 N (8 lbf) has been applied or until the hammer releases. Record the load.
- b. Double action and Striker Fire Action. With the hammer or striker in the normal carry position, apply a 12 N (2 3/4 lbf) load to the trigger and uniformly increase it in 1 N (1/4 lbf) increments until a load of 80 N (18 lbf) has been applied or until the pistol cocks and fires on the empty chamber. Record the load.

5.5.4 Hammer “Push-Off” Test

With the pistol empty, cock the hammer if the weapon will fire single action and release it by pulling the trigger several times to check for smoothness of operation. Fully cock the hammer and load it with a $46 \text{ N} \pm 1 \text{ N}$ (10 1/4 lbf \pm 1/4 lbf) force applied to the rearmost part of the hammer spur and tangential to hammer’s arc (Fig. 3).

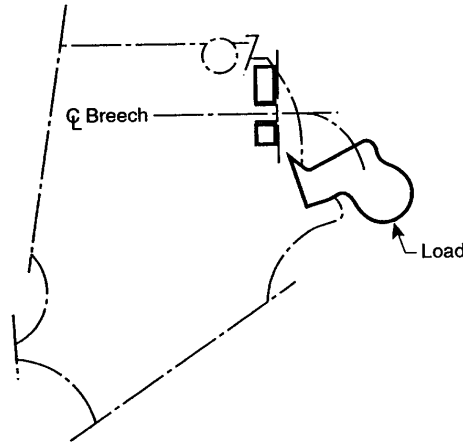


FIGURE 3. Hammer test setup.

5.5.5 Safety Features Test

Obtain from the manufacturer a description of the design feature(s) included in the pistol to ensure that the pistol will discharge only through the proper operation of the trigger mechanism, the list of parts that implement the design feature(s), and the manner in which the safety feature(s) operate. Verify that all of the safety parts are present, that they operate in the manufacturer’s intended manner, and that the feature(s) perform their intended function. Note: This description should be in the user information supplied by the manufacturer (see Sec. 4.2).

Chamber a primed case (no propellant or projectile) and attempt to fire the pistol, with the safety device engaged, into a bullet trap or other suitable device to determine whether the round discharges. If a pistol has more than one safety device, disengage all but one to conduct the test. Repeat, using the second safety device. Continue in this manner until all safety devices have been tested. In some designs the removal of parts to disable one safety feature may affect the performance of another safety feature. If assistance is needed to test each safety feature independently, consult with the manufacturer.

5.5.6 Magazine Test

Check the ease of insertion and removal of the magazine(s) by inserting each unloaded magazine into the pistol and releasing it in accordance with the manufacturer’s instructions. Note any binding or sticking during insertion and release.

5.6 Firing Test

5.6.1 Model Qualification Firing Test

Fire a total of 600 rounds of ammunition as shown by cartridge type in Appendix B. For pistols with both a single and double action mode, fire the first round of each magazine in double action mode. Before firing, examine the pistol for defects such as loose screws, cracks, etc. After every 200 rounds tighten any loose screws, measure trigger pull

(Sec. 5.5.3) and headspace (Sec. 5.4.2), and clean the pistol according to the manufacturer's recommendations in the provided user information. Also, determine from the manufacturer how, without firing the pistol, to lower the hammer when there is a live round in the pistol's chamber. It is necessary for safety reasons to be sure of the correct procedure. Place an empty magazine in the pistol, pull the slide all the way to the rear, and verify that the slide hold-open mechanism operates. Remove the magazine from the pistol and verify that the slide remains open. Load the magazine to maximum capacity, point the pistol at a suitable bullet trap, and insert the loaded magazine into the pistol. Release the slide hold-open mechanism to chamber a round. For double action pistols, lower the hammer so that the first shot can be fired in double action mode. Fire into a bullet trap or other suitable device until the magazine is empty. Fire the first six rounds in 5 s. The firing rate for the remainder of the test must be at least one round every 2 s and no greater than two rounds per second. Increments of 100 rounds must be fired with no delays except to reload or to determine causes of malfunctions. Note all misfires and whether the pistol ejects and feeds properly. Also observe whether the slide remains in the open position after the last round in the magazine has been fired.

After each magazine has been emptied, check the release mechanism for easy removal of the magazine. Check for smooth easy insertion of the reloaded magazine.

If feed or release problems are experienced during the first 50 rounds, replace the magazine with a different one and continue testing to determine whether the problems were caused by a faulty magazine. If a faulty magazine is suspected, note that the magazine was suspect and begin testing again at round zero with the new magazine.

Should three or more misfires occur during the 600 round test sequence, examine the primers in the misfired cartridges. If it is obvious that the misfires are the fault of the pistol (e.g., very shallow or no indentation of the primer), the pistol has failed to meet the requirements of the standard. If it is not obvious that the misfires are the fault of the pistol, repeat the entire firing test as stated above, except that the dimensional measurements (headspace, trigger pull) need not be made. If the pistol passes the second 600 round test, it meets the requirements. If three or more misfires occur during the second 600 rounds, and again it is not clearly the fault of the pistol, the ammunition manufacturer should be consulted to determine the condition of the misfired ammunition.

5.6.2 Reissue Firing Requirement

Perform the firing test of Section 5.6.1 using the department's standard issue ammunition and the magazine(s) that will be issued with the pistol. If there is more than one magazine, each magazine is to be used an equal number of times. The dimensional measurements (headspace, trigger pull) need not be made. Should there be too many malfunctions proceed as in Section 5.6.1 to determine if the ammunition is at fault.

5.7 Drop Safety Test

Pull the slide fully rearward and lock it in the rear position. Insert a primed case (no powder or projectile) into the chamber. Release the slide, allowing it to move forward under the impetus of the recoil spring. Insert a magazine loaded to capacity with dummy ammunition (a standard round with projectile in place, but no primer and no propellant), and place the pistol in a drop fixture capable of dropping the pistol from a drop height of 1.22 m (4 ft) onto a 85 ± 5 Durometer (Shore A) rubber mat, 2.54 cm (1 in) thick, backed by concrete. The mat and concrete shall be large enough so that when the pistol is dropped it will fall and come to rest without interference within the perimeter of the mat. The drop height shall be measured from the surface of the rubber mat to the center of gravity of the firearm. The center of gravity shall be determined to an accuracy of ± 2.54 cm (1 in) by any recognized method for finding the center of gravity of an irregular object. The pistol shall be cycled and returned to the specified testing condition after each drop, or a separate pistol may be used for each drop.

The pistol shall not be dropped from a hand; a fixture is required. However, the pistol shall be dropped in the condition (i.e., cocked, no manual safety applied, etc.) that the pistol would be in if it were dropped from a hand. If the design of the pistol is such that upon leaving the hand a "safety" is automatically applied by the pistol, this feature shall not be defeated. One fixture found to be suitable consists of a short piece of string with the pistol attached at one end and the other end held in an air vise until the drop is initiated.

The following six drops are required:

1. Normal firing position; barrel horizontal.
2. Upside down; barrel horizontal.
3. On grip; barrel vertical.
4. On muzzle; barrel vertical.
5. On either side; barrel horizontal.
6. If there is an exposed hammer or striker, on the rearmost point of that device; otherwise on the rearmost point of the pistol.

Examine the primer for indentations after each drop. If indentations are present, a fresh primed case must be used for the next drop. Firing of the primer constitutes failure of the test.

5.8 Drop Function Test

After completing the drops specified in the drop safety test (Sec. 5.7), examine the pistols for damage and note any cracks, chips, or other visible damage. For those pistols that passed the drop safety test without structural damage, insert a fully loaded magazine, chamber a round, point the pistol into a bullet trap or other suitable device. Fire until the ammunition has been expended. Release the magazine (note any sticking or binding), reload and repeat until 20 rounds have been fired. Note any misfires or malfunctions. If there are more than three malfunctions, repeat the 20 round firing test. If there are no more than three malfunctions during the repeat firing test, the pistol meets the requirements of this test.

APPENDIX A—REFERENCE DIMENSIONS

TABLE A—Bore Dimensions*
(dimensions in millimeters (inches))

<i>Caliber</i>	<i>Land Dia. (min)</i>	<i>Groove Dia. (max)</i>	<i>Min. Bore & Groove Area, mm² (in²)</i>
9 mm Luger	8.8 (.346)	9.0 (.355)	2.46 (.0967)
357 Sig	8.8 (.346)	9.0 (.355)	2.46 (.0969)
40 S & W	10.0 (.390)	10.2 (.4005)	3.13 (.1233)
45 ACP	11.2 (.442)	11.4 (.450)	4.0 (.1570)

(dimensions in millimeters)

<i>Caliber</i>	<i>Land Dia. (min)</i>	<i>Groove Dia. (max)</i>	<i>Min. Bore & Groove Area, cm²</i>
9 mm Luger	8.788	9.017	.6239
357 Sig	8.788	9.017	.6252
40 S & W	9.906	10.173	.7955
45 ACP	11.227	11.430	1.0129

TABLE B—Headspace Dimensions*
(dimensions in millimeters (inches))

<i>Caliber</i>	<i>Minimum Headspace</i>	<i>Maximum Headspace</i>
9 mm Luger	19.20 (.754)	19.71 (.776)
357 Sig	21.97 (.865)	22.28 (.877)
40 S & W	21.59 (.850)	21.90 (.862)
45 ACP	22.81 (.898)	23.37 (.920)

(dimensions in millimeters)

<i>Caliber</i>	<i>Minimum Headspace</i>	<i>Maximum Headspace</i>
9 mm Luger	19.152	19.710
357 Sig	21.971	22.276
40 S & W	21.590	21.895
45 ACP	22.809	23.368

* Presented for reference only—refer to SAAMI Standards.

APPENDIX B—AMMUNITION FOR FIRING TESTS

(Commercial Manufacturer, supplied by Pistol Manufacturer)

<i>Caliber</i>	<i>200 Rounds</i>	<i>400 Rounds</i>
9 mm Luger	115 g FMJ	124 g JHP
357 Sig	125 g FMJ	125 g JHP
40 S & W	155 g FMJ	180 g JHP
45 ACP	230 g FMJ	185 g JHP

APPENDIX C—TEST REPORT FORM

This Compliance Test Report form shall be used in conjunction with NIJ Standard-0112.03, Autoloading Pistols for Police Officers, and shall become a part of the official records of the compliance testing of pistols submitted. All sections of the form shall be completed.

Verification of the information recorded on the Compliance Test Report form shall be documented by the initials and date in the QA blocks provided of unbiased personnel assigned by NIJ (i.e., not a representative of either the test facility or pistol manufacturer), who will monitor the testing and verify information on this form.

COMPLIANCE TEST REPORT

Autoloading Pistols for Police Officers

Test Number: _____

5.1 Pistols Submitted for Testing:

Date submitted: _____

Manufacturer: _____

Address: _____

City, State, Zip: _____

Country: _____

This test is for (check one) **Compliance Testing:** _____ **Reissue:** _____

Pistol #1:

Brand Name: _____ Model: _____

Serial Number: _____ Caliber: _____

Action type (check one):

Single Action: ___ Double Action: ___ Double Action Only: ___ Striker Fire Action: ___

Magazine Capacity: _____ # Magazines provided with pistol: _____

Pistol Finish: _____

Safeties: Active: _____

Passive: _____

User Information Provided with Pistol Acceptable (see Sec. 4.2): (Y or N) _____

QA _____

Pistol #2:

Brand Name: _____ Model: _____

Serial Number: _____ Caliber: _____

Action type (check one):

Single Action: ___ Double Action: ___ Double Action Only: ___ Striker Fire Action: ___

Magazine Capacity: _____ # Magazines provided with pistol: _____

Pistol Finish: _____

Safeties: Active: _____

Passive: _____

User Information Provided with Pistol Acceptable (see Sec. 4.2): (Y or N) _____

QA _____

Compliance Test Report—Continued

5.3 Visual Inspection: Verify that the pistol is unloaded. **QA**_____

5.3.1 Hammer

Cock the external hammer, if one is present, to the single action full-cock position if the weapon will fire single action. Verify that there is perceptible travel past this position.

QA_____

5.3.2 Particles

Examine the pistol. Verify that there are no shavings or filings that should not be inside the pistol.

QA_____

5.3.3 Surface

Examine the pistol's surfaces. Note and record any chips, scratches, sharp edges, burrs, or rust spots.

 _____ **QA**_____

5.4 Dimensional Tests:

5.4.1 Barrel Bore Dimensions

The Barrel Bore dimensions shall be verified by either 5.4.1.1 or 5.4.1.2.

5.4.1.1 Groove and Land Diameter

Measured Groove Diameter: _____

Measured Land Diameter: _____

5.4.1.2 Minimum Bore and Groove Area

Minimum Bore and Groove Area: _____

Pistol #1 meets the SAAMI Standards for Bore Dimensions (Y or N): **QA**_____

Pistol #2 meets the SAAMI Standards for Bore Dimensions (Y or N): **QA**_____

5.4.2 Headspace

Pistol #1 meets the SAAMI Standards for Headspace (Y or N): **QA**_____

Pistol #2 meets the SAAMI Standards for Headspace (Y or N): **QA**_____

5.5 Function Tests

5.5.1 Action

Pistol #1 Action Function (Pass or Fail): _____ **QA**_____

comments: _____

Pistol #2 Action Function (Pass or Fail): _____ **QA**_____

comments: _____

Compliance Test Report—Continued

5.5.2 Ejection Test

Pistol #1 Ejection Test (Pass or Fail):_____ **QA**_____

Pistol #2 Ejection Test (Pass or Fail):_____ **QA**_____

5.5.3 Trigger Pull Test

Pistol #1 Measured Trigger Pull:_____ **QA**_____

Pistol #2 Measured Trigger Pull:_____ **QA**_____

5.5.4 Hammer “Push-Off” Test

Pistol #1 “Push-Off” (Pass or Fail):_____ **QA**_____

Pistol #2 “Push-Off” (Pass or Fail):_____ **QA**_____

5.5.5 Safety Features Test

Pistol #1 Safety Features (Pass or Fail):_____ **QA**_____

Pistol #2 Safety Features (Pass or Fail):_____ **QA**_____

5.5.6 Magazine Test

Pistol #1 Magazine Test (Pass or Fail):_____ **QA**_____

Pistol #2 Magazine Test (Pass or Fail):_____ **QA**_____

5.6 Firing Test

5.6.1 Model Qualification Firing Test (see Sec. 4.6.1 for number and types of malfunctions allowed)

Pistol #1 Firing Test: # pistol-caused malfunctions:_____

types of malfunction(s):_____

Pistol #1 Firing Retest: # pistol-caused malfunctions: _____

types of malfunction(s):_____

Pistol #1 Firing Test (Pass or Fail):_____ **QA**_____

Pistol #2 Firing Test: # pistol-caused malfunctions:_____

types of malfunction(s):_____

Pistol #2 Firing Retest: # pistol-caused malfunctions: _____

types of malfunction(s):_____

Pistol #2 Firing Test (Pass or Fail):_____ **QA**_____

Compliance Test Report—Continued

5.6.2 Reissue Firing Requirement (if applicable):

Pistol Serial Number _____ (Pass or Fail): _____ **QA** _____

5.7 Drop Safety Test:

Pistol #1:

Drop #1: Normal firing position; barrel horizontal. (Pass or Fail): _____ **QA** _____

Drop #2: Upside down; barrel horizontal. (Pass or Fail): _____ **QA** _____

Drop #3: On grip; barrel vertical. (Pass or Fail): _____ **QA** _____

Drop #4: On muzzle; barrel vertical. (Pass or Fail): _____ **QA** _____

Drop #5: On either side; barrel horizontal. (Pass or Fail): _____ **QA** _____

Drop #6: If there is an exposed hammer or striker, on the rearmost point of that device; otherwise on the rearmost point of the pistol. (Pass or Fail): _____ **QA** _____

Pistol #2:

Drop #1: Normal firing position; barrel horizontal. (Pass or Fail): _____ **QA** _____

Drop #2: Upside down; barrel horizontal. (Pass or Fail): _____ **QA** _____

Drop #3: On grip; barrel vertical. (Pass or Fail): _____ **QA** _____

Drop #4: On muzzle; barrel vertical. (Pass or Fail): _____ **QA** _____

Drop #5: On either side; barrel horizontal. (Pass or Fail): _____ **QA** _____

Drop #6: If there is an exposed hammer or striker, on the rearmost point of that device; otherwise on the rearmost point of the pistol. (Pass or Fail): _____ **QA** _____

5.8 Drop Function Test

Pistol #1 after Drop Safety Test:

Cracks, chips, or other visible damage: _____

Structural damage (Yes or No): _____ **QA** _____

Drop Function test: # malfunctions: _____

Drop Function retest: # malfunctions: _____

Pistol #1 Drop Function Test (Pass or Fail): _____ **QA** _____

Pistol #2 after Drop Safety Test:

Cracks, chips, or other visible damage: _____

Structural damage (Yes or No): _____ **QA** _____

Drop Function test: # malfunctions: _____

Drop Function retest: # malfunctions: _____

Pistol #2 Drop Function Test (Pass or Fail): _____ **QA** _____

Compliance Test Report—Continued

Test Results

Test Number: _____

Date of Test: _____

Type of Test: Compliance _____ **Reissue** _____

Make: _____ **Model:** _____ **Caliber:** _____

Pistol #1 serial number: _____

Pistol #2 serial number: _____

Compliance Test (Pass or Fail): _____

Reissue Test (Pass or Fail): _____

Test Laboratory _____

Test Conductor: _____ signature: _____

Manufacturer: _____

Mfg. Representative: _____ signature: _____

Shooter (from Mfg.): _____ signature: _____

Quality Assurance: _____ signature: _____

This completed Compliance Test Report Form shall be submitted to:

NLECTC
ATTN: Testing Coordinator
2277 Research Blvd.
Rockville, MD 20850

for review and subsequent issuance of official NIJ Certificate of Compliance (if applicable).