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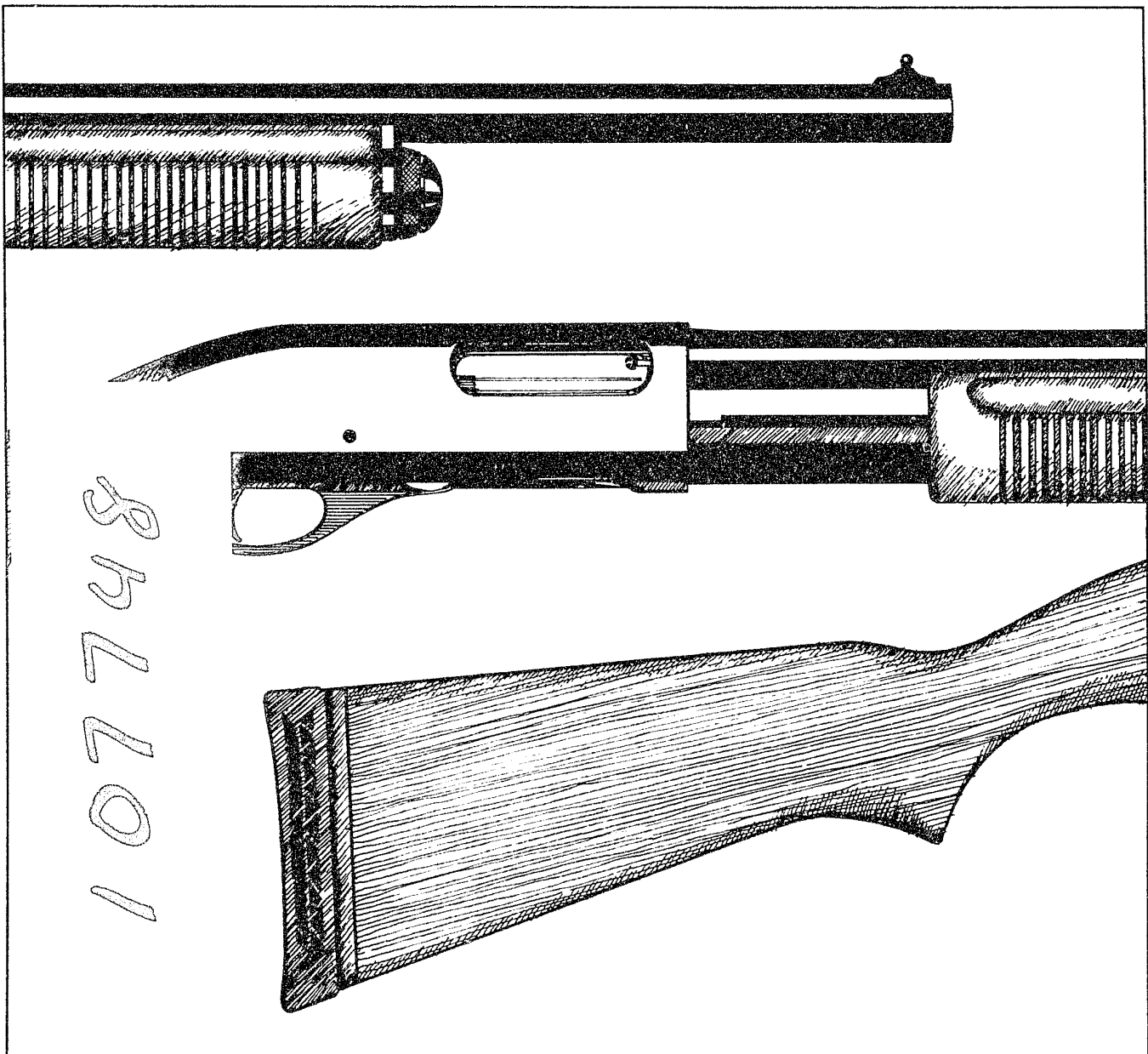


National Institute of Justice

*Technology
Assessment*

TECHNOLOGY ASSESSMENT PROGRAM

Equipment Performance Report: 12-Gauge Shotgun Test Results



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Equipment Performance Report: 12-Gauge Shotgun Test Results

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The Assistant Attorney General, Office of Justice Programs, coordinates the criminal and juvenile justice activities of the following program Offices and Bureaus: National Institute of Justice, Bureau of Justice Statistics, Bureau of Justice Assistance, Office of Juvenile Justice and Delinquency Prevention, and Office for Victims of Crime.

About the Technology Assessment Program

The Technology Assessment Program (TAP) is an applied research project of the National Institute of Justice (NIJ). TAP develops minimum performance standards for law enforcement equipment and tests equipment based on these standards.

To accomplish program tasks, NIJ coordinates the activities of two organizations: the TAP Information Center (TAPIC) and the Law Enforcement Standards Laboratory (LESL) of the National Bureau of Standards. LESL prepares equipment standards, reports, and guides; TAPIC coordinates testing of law enforcement equipment by independent laboratories and publishes the test results. LESL, TAPIC, and the National Institute support one another in accomplishing the program tasks and goals.

TAP's major tasks and goals are:

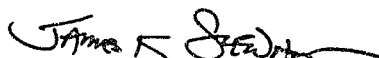
Coordination of the TAP Advisory Council. Composed of nationally recognized professionals from Federal, State, and local criminal justice agencies, the Advisory Council helps the National Institute set priorities for developing new equipment standards and for testing available products.

Coordination of equipment testing. TAPIC develops Requests for Proposals to select testing laboratories, evaluates proposals with assistance from LESL, selects laboratories, and monitors the testing activities.

Compilation and dissemination of test results. TAPIC compiles and analyzes the test results and, after review by NIJ and LESL, publishes the results in TAP Alerts (brief bulletins issued periodically) and Equipment Performance Reports such as this one.

Dissemination of information. TAP educates the criminal justice community about its resources and services in a number of ways. Staff prepare articles for criminal justice periodicals, develop exhibits, make presentations at major criminal justice conferences, and serve as a clearinghouse of information about equipment and technology.

For more information or to add your name to TAPIC's mailing list, call toll free 800-24-TAPIC. (In Maryland and the Metropolitan Washington, D.C., area call 301-251-5060.)



James K. Stewart
Director
National Institute of Justice

Executive Summary

Today's law enforcement executives face rising crime rates, increasing public demand for police services, and, at the same time, feel the pressure of dwindling resources. Just as research and experimentation have revealed better alternatives to traditional policing methods, National Institute of Justice (NIJ) research also has led to improved ways of selecting law enforcement equipment. Ineffective equipment hampers police operations and poses a threat to officer safety. In addition, the costs associated with maintenance and replacement of inferior equipment is sometimes astronomical.

Aside from the police officer's sidearm, the shotgun is one of the most important items of equipment a police officer carries. Although the shotgun, like the sidearm, is seldom needed, its proper function may be the difference between life and death. When confronted with an armed criminal the shotgun is a great equalizer. In many situations its mere presence helps de-escalate potentially violent encounters with criminals. Through the choice of ammunition the shotgun also is very versatile.

This report describes in detail the results of testing seven different models of shotguns against the minimum performance requirements established by NIJ Standard-0113.00 for 12-gauge shotguns for police use. The standard describes the parameters that are critical to the safe and reliable operation of the police shotgun.

None of the seven models of shotguns complied with every requirement of the standard. One model, however, did comply with all but the user information requirements. In no case did the manufacturers provide, with the user information, a certificate of compliance with the standard as required. (See Appendix A for commentary on NIJ Standard 0113.00.)

Table 1 presents an overall summary of the 12-gauge shotgun test results for seven of the primary requirements as well as the optional folding stock requirement where appropriate. Since none of the shotguns complied with the user information requirement, that requirement is not included in the table.

It should be noted that the requirements of the NIJ standard represent the minimum level of performance that should be demanded for a shotgun that is fully capable of service use in a law enforcement agency (i.e., a combat-ready shotgun).

No attempt has been made to rank shotguns according to their test results; rather, TAP recommends that law enforcement agencies base their purchase decisions on the extent that failure to comply with a specific requirement limits the shotgun's ability to meet an agency's individual needs. TAP further recommends that agencies closely scrutinize the results of the firing and drop safety requirements before purchasing shotguns for their officers.

The test results indicate that the majority of the shotguns were not ready for police use right out of the box. Purchasers who are interested in obtaining a combat-ready shotgun should stipulate in their purchase order that the weapon must comply with the requirements of NIJ Standard-0113.00, 12-gauge shotguns for police use, September 1985.

Even then, each shotgun should be examined by a qualified armorer and judged to be combat ready before it is issued to an officer.

We encourage you to take the time to read the entire report on shotgun testing and call the TAP Information Center if you have any questions concerning the test results.

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Introduction

Police officers today are facing criminals armed with more powerful and higher capacity handguns than just 10 years ago. While in the past the handgun of choice among armed criminals was the .22-caliber pistol and .38-caliber revolver, more and more criminals are carrying 9mm and .45-caliber pistols and .357 magnum revolvers. In fact 9mm, .45-caliber, and .357 magnum handguns were involved in twice as many police killings in 1986 than in 1977.

The sentiment among many police officers is that they are being "outgunned" in the streets. Many law enforcement agencies have considered switching from the standard .38-caliber revolver to the more powerful .357 magnum or higher capacity autoloading pistol. But the police arsenal already includes a powerful high capacity weapon--the police shotgun. The police shotgun, like the sidearm, though rarely used in defense of life, must be in perfect operating order.

The Technology Assessment Program Advisory Council, in recognition of the extraordinarily important role that shotguns play in law enforcement, recommended that NIJ establish performance standards for shotguns and that shotguns be tested against those standards. NIJ Standard-0113.00, 12-gauge shotguns for police use was issued as a voluntary national standard in September 1985 and shotguns were tested against the standard in the summer of 1987. This Equipment Performance Report presents the results of testing seven different models of shotguns according to the requirements of that standard.

NIJ standards establish minimum levels of performance that determine the safety and reliability of the shotgun and its suitability for service use.¹ A shotgun that

fully complies with the requirements of the standard is duty ready. Many large police departments have their weapons examined by an armorer and modified or adjusted to assure duty-ready performance. Regrettably many departments, particularly the smaller ones, do not possess or have access to this capability.

NIJ Standard-0113.00 establishes eight separate requirements each shotgun must comply with plus having proper user information. Each parameter is evaluated through visual inspection, dimensional measurements, and operational tests. One sample of each shotgun model is tested. However, Franchi's SPAS-12 included a dual firing system allowing the shooter to choose between slide and autoloading operations. Therefore, two different samples of this model were tested; one as a slide action and the other as an autoloader.

None of the shotguns that were tested complied with all of the minimum performance requirements of the standard. One, however, did comply with all but the user information requirements. An overall comparison of the performance of the seven different models of shotguns is presented in Table 1.

Readers should review the test results with an eye toward which requirements are most critical to their particular needs. A department may consider noncompliance with one or another of the functional requirements insignificant if the shotgun can be easily adjusted to conform to the standard and the department has the personnel to do so. Noncompliance with other parameters could, however, require major rework or modifications requiring either the service of a skilled gunsmith or the manufacturer to achieve an acceptable level of performance. Thus, one agency's critical need may be unnecessary to another agency. Some requirements of the NIJ standard, however, such as the drop safety or firing requirements, should

¹Appendix A, Commentary--NIJ Standard-0113.00, contains a discussion of the basis for the requirements included in the standard and the criticality of those requirements.

be scrutinized universally because they are essential to the basic performance and safety of the shotgun.

The most important warning that TAP can offer as a result of this test program is that agencies should not assume that a weapon is ready for police service until it has been inspected by an armorer. Even though each shotgun that was tested was donated directly by its manufacturer or distributor, only one was totally combat ready. TAP therefore encourages all departments that purchase shotguns for police use to stipulate in their purchase orders that the weapons must comply with the requirements of NIJ Standard-0113.00, 12-gauge shotguns for police use, September 1985.

TAP does not endorse particular products, and no attempt is made to compare the performance of one model of shotgun with another, or to rank the shotguns according to the test results. However, because Equipment Performance Reports are the product of carefully controlled tests and critical analysis of the data, we believe that the results will help law enforcement agencies identify those shotguns that most closely meet their needs.

Table 1

Summary of Shotgun Test Results

C = Complies with the requirements of the standard.

N = Does not comply with the requirements of the standard.

| Manufac- turer | Model ^a | Visual | Dimen- sional | Func- ^b tional | Safety Features | Firing | Drop Safety | Drop Function | Optional Folding Stock |
|-------------------|------------------------------|--------|------------------|------------------------------|--------------------|--------|----------------|------------------|---------------------------|
| Browning | BPS | C | C | N(1) | C | C | N | C | N/A |
| Franchi | LAW-12 | C | C | N(1) | N | C | C | N | N |
| Franchi | SAS-12 | C | N | N(1) | N | C | C | C | N |
| Franchi | SPAS-12 (Slide) ^c | C | C | N(1) | N | C | C | N | N/A |
| Franchi | SPAS-12 (Auto) ^c | C | C | N(2) | N | N | C | N | N/A |
| Remington | 870 | C | C | C | C | C | C | C | N/A |
| Remington | 11-87 | C | C | C | C | C | N | C | N/A |
| Savage | 69RXL | C | C | N(3) | C | N | N | N | N/A |

^aNone of the models tested complied with the User Information Requirement of NIJ Standard-0113.00.^bTests of four functional parameters were conducted; numbers in parenthesis are the number of characteristics of the functional requirement that did not comply with requirements.^cBecause the Franchi SPAS-12 is capable of both slide action and autoloading-gas operated action, two samples were tested, one in each mode.

The Test Program

According to the TAP equipment testing program procedures (discussed in Appendix B), TAPIC solicited bids to test shotguns from independent testing laboratories. One laboratory was selected based on its proposal score: H.P. White Laboratories in Street, Maryland.

One of the first steps in the testing procedure involved a review of all models of shotguns that were available to police. After LESL and TAPIC identified shotguns to be included in the testing, TAPIC contacted the manufacturers/distributors to invite their participation in the program. Four manufacturers/distributors sent TAPIC a total of seven models of shotguns for testing. The models are identified in Table 2. In addition, two shotguns were provided with optional folding stocks. The shotguns and stocks were then sent to the laboratory for testing.

Staff members from TAPIC, LESL, and the National Bureau of Standards Laboratory Accreditation Program attended preliminary testing to make sure the laboratory was staffed appropriately, had the correct equipment, and followed the procedures spelled out in NIJ Standard-0113.00. For the preliminary test, the laboratory tested one model. After TAP reviewed and approved the preliminary test, the laboratory began testing the remaining six models. Staff members from TAPIC and LESL also visited the lab periodically during parts of the remaining testing.

Once the testing was completed, LESL staff members assisted TAPIC in the analysis of the data and the compilation of results that are presented in this Equipment Performance Report.

Table 2

12-Gauge Shotguns Tested

| Manufacturer | Model | Action | Magazine Capacity ^a |
|--------------|----------------------|-------------|--------------------------------|
| Browning | BPS | Slide | 3 (3") |
| Franchi | LAW-12b | Autoloading | 8 (2 3/4") |
| Franchi | SAS-12b | Slide | 7 (3") |
| Franchi | SPAS-12 ^c | Slide/Auto | 8 (2 3/4") |
| Remington | 870 | Slide | 4 (3") |
| Remington | 11-87 | Autoloading | 4 (3") |
| Savage | 69RXL | Slide | 5 (3") |

^aNumber in parenthesis specifies shotshell size the shotgun is chambered for.

^bTested with optional folding stock.

^cBecause the Franchi SPAS-12 is capable of both slide action and autoloading-gas operated action, two samples were tested, one in each mode.

Minimum Performance Requirements and Methods of Testing

NIJ's 12-Gauge Shotguns for Police Use, Standard-0113.00 (September 1985)

established requirements and methods of testing for eight broad categories of shotgun performance including user information. The standard also established requirements and test methods for folding stocks. The discussion that follows summarizes the specific requirements and briefly describes the manner in which compliance is tested or determined. TAPIC will gladly provide a copy of the standard upon request.

1. User Information Requirements

The standard requires that the manufacturer provide six items of user information with each shotgun: (a) diagrams identifying all parts; (b) field assembly and disassembly instruction; (c) cleaning instructions; (d) a statement of ammunition known to be unacceptable; (e) a parts list and ordering instructions; (f) certification of compliance with NIJ Standard-0113.00.

Compliance is determined by examining the information provided with each shotgun to determine if all items are included and if the documentation is suitable for its intended purpose.

2. Visual Inspection Requirements

(a) There shall be no loose shavings or filings in the shotgun.

Compliance is determined through visual inspection.

(b) The shotgun shall have no scratches, burrs, or rust spots. The surface shall be corrosion resistant. There shall be no sharp edges or corners that could cut the shooter's hand, and the shotgun shall be inherently rust resistant.

Compliance is determined through visual inspection.

3. Dimensional Requirements

(a) The barrel bore diameter shall be not less than .725 inches nor more than .745 inches.

Compliance is determined by measuring the diameter of the barrel bore with a caliper/micrometer or other suitable method.

(b) The headspace shall be not less than .0575 inches nor more than .0717 inches.

Compliance is determined by inserting go and no-go headspace gauges into the chamber. The slide must close completely over the go gauge and must not close over the no-go gauge.

4. Functional Requirements

(a) The slide or bolt shall operate smoothly without binding or sticking when operated by hand, during the firing test, and after the drop function test.

Compliance is determined by observation of evidence of sticking or binding.

(b) The shotgun shall have a minimum capacity of five rounds of the longest cartridges for which it is chambered.

Compliance is determined by loading the shotgun to capacity with dummy rounds.

(c) The ejection mechanism shall eject the dummy rounds from the capacity test and eject cases during the firing test and during the drop function test.

Compliance with this requirement is determined by ejecting the dummy rounds following the capacity test noting any binding, sticking, hesitation, or failures to eject. The same is noted during the firing and drop function test.

(d) The measured trigger pull force shall be not less than 3 lb nor more than 8.1 lb.

Compliance is determined by chambering a dummy round and incrementally increasing the load on the trigger until the shotgun fires.

5. Safety Features Requirements

The shotgun shall have design features to prevent inadvertent firing. As a minimum the shotgun shall be designed such that the trigger must be pulled for each shot, the shotgun shall not fire unless the action is fully closed, and there shall be at least one active safety device to prevent the firing of the shotgun even though it is loaded and locked. Active safety devices shall be designed so that the shotgun can be made ready-to-fire without removing either hand from the weapon.

Compliance is determined by operating the safety features and observing their operation.

6. Firing Requirements

The shotgun shall fire 400 rounds of ammunition with no structural or mechanical failures and no more than four malfunctions. Of the four allowable malfunctions, no more than one may be a misfire.

Compliance is determined by firing a total of 400 rounds of ammunition and noting any misfires, structural or mechanical failures, and malfunctions. Compliance for autoloading shotguns is also determined by noting whether the bolt remains open after the last round-per-magazine has been fired.

7. Drop Safety Requirements

The shotgun shall not fire when subjected to the drop test.

Compliance is determined by dropping the shotgun onto a solid slab of concrete from a height of 39.4 inches (1 meter). The shotgun is loaded with an empty case with a primer installed. The shotgun is

dropped from the normal firing position, on butt, on the muzzle, and on both sides. After each drop, it is noted if the primer fires. If the primer is indented a new primed case is used for the next drop.

8. Drop Function Requirements

After completing the drop safety test, the shotgun shall fire 20 rounds without slam firing and with not more than one malfunction of any other type.

Compliance is determined by firing the required number of rounds with no more than one malfunction. If there is more than one malfunction and it appears to be caused by the ammunition, the 20-round firing test is repeated. If there is no more than one malfunction during the repeat firing test, the shotgun meets the requirements.

9. Folding Stock Requirements (Optional)

There shall be no breaks, bends, or separation of the stock from the receiver. The stock shall lock in each position and move freely between the folded and extended positions.

Compliance is determined by extending the stock to the full open position and back to the folded position and noting any sticking or binding. Compliance is also determined by dropping the shotgun from a height of 39.4 inches and noting any breakage or separation of the stock and if the stock moves freely when folded and re-extended. The shotgun is dropped three times with barrel 45 degrees above horizontal: trigger down, trigger up, and on its side.

Test Results

To meet all the requirements of the NIJ Standard-0113.00 for 12-gauge shotguns for police use, one sample of a model must meet the user information, visual inspection, dimensional, functional, safety feature, firing, drop safety, and drop function requirements of the standard. In addition, shotguns provided with folding stocks must meet the folding stock requirement.

TAP's evaluation of the seven models submitted by manufacturers for testing according to NIJ Standard-0113.00 revealed that none of the models tested complied with all the requirements of the standard.

1. User Information Requirements

Of the seven models tested, none passed the user information requirement because the manufacturer did not provide certification of compliance with the standard. Also, several shotguns failed this requirement because the user information didn't include a diagram identifying all parts, a parts list, and ordering instructions.

2. Visual Inspection Requirements

All the shotguns passed the visual inspection requirements of the standard.

3. Dimensional Requirements

All but one shotgun model passed the dimensional requirements of the standard. The one shotgun model that failed this requirement did so because the slide would not close completely over the minimum headspace gauge, indicating that the headspace was too small.

4. Functional Requirements

Only two shotguns passed the functional requirements of the standard. The majority of the shotguns that failed this requirement failed because of light or excessive trigger pulls.

5. Safety Features Requirements

Four shotguns passed the safety features requirement of the standard. Those that failed this requirement failed because all the active safety devices could not be released without removing either hand from the shotgun.

6. Firing Requirements

Six of the shotguns tested were capable of firing the required 400 rounds of ammunition without failures described in the standard.

7. Drop Safety Requirements

Five shotguns passed the drop safety requirements of the standard. Those that failed this requirement failed because the primer fired during the drops.

8. Drop Function Requirements

Four shotguns passed the drop function requirements of the standard. Those that failed this requirement did so because of structural damage received during the drop safety test or because they could not fire 20 rounds without malfunctions.

The data sheets with detailed test results for each shotgun are presented in Appendix C.

The data sheets for each shotgun model include full manufacturer designation, the characteristics of the model including empty weight, an overall summary of the test results, and the data for each test performed. In those instances in which the shotgun did not comply with the requirement of the standard, the noncomplying parameter is identified by an asterisk (*). FEJ (failure to eject) and FFD (failure to feed) are the terms used to describe malfunctions during the firing test.

For completeness of result presentation, certain of the test results are footnoted and a detailed comment for that footnote is found at the bottom of the page.

For the trigger pull, numbers were rounded to the nearest tenth of a pound except when rounding caused ambiguities. The weight of the weapon was rounded to the nearest tenth of a pound.

Appendix A: Commentary—NIJ Standard-0113.00

NIJ Standard-0113.00, 12-gauge shotguns for police use, September 1986, establishes minimum performance standards for police shotguns. In this appendix, each of the requirements in NIJ Standard-0113.00 are discussed in terms of the purpose of the parameter and how the value limits were set. The firearms industry does have specifications covering some of the parameters of firearms and ammunition. These specifications are maintained by the Sporting Arms and Ammunition Manufacturer's Institute, Inc. (SAAMI, pronounced "Sammy"). Subject to laboratory verification, the SAAMI value for certain parameters was used if appropriate.

User Information Requirements

The majority of the requirement is self-explanatory; however, the last item does require some expansion.

The certification by the shotgun manufacturer that the shotgun model complies with the standard is to assure that the purchasing entity and the manufacturer agree that the standard does indeed apply to the item purchased and forms the basis for rejecting a particular shotgun or the entire purchase lot if the shotguns are found to not meet the standard.

Visual Inspection Requirements

There shall be no loose shavings or filings in the shotguns. The shotguns shall have no scratches, burrs, or rust spots. The surface shall be corrosion resistant. These requirements are indications of the workmanship quality.

Dimensional Requirements

Barrel Bore. The barrel bore diameter shall not be less than 1.842 cm (0.725 in) nor more than 1.892 cm (0.745 in). This requirement is the SAAMI specification. It assures that the correct barrel has been fitted to the shotgun.

Headspace. The headspace shall be not less than 0.146 cm (0.0575 in) nor more than 0.182 cm (0.0717 in). Laboratory measurements on shotguns that performed satisfactorily demonstrated that the dimensions were appropriate.

Functional Requirements

Action. The slide or bolt shall operate without binding or sticking. Also, during firing tests and after the drop function tests the action shall remain smooth. A police shotgun is generally going to be used when the officer is in a stressful situation; therefore, the action should be smooth so as to add no additional problems to the situation.

Capacity. The shotgun shall have a capacity of five rounds, minimum (one in the chamber plus four or more in the magazine), of the longest cartridge for which the shotgun is chambered (3 or 2-3/4 in).

Ejection. The ejection mechanism shall eject cases without hangup, before and during the firing tests and during the drop function test. This requirement simply states that the shotgun must function new, while it is firing and after it has been dropped.

Trigger. The trigger pull shall be not less than 13.5 N (3 lb) nor more than 36 N (8.1 lb). Laboratory tests established that a trigger pull of 3 lb was the minimum for safety and that 8.1 lb was a reasonable maximum that did not adversely affect accuracy.

Safety Features Requirements

Shotgun manufacturers include in their design features parts that give some degree of safety to the shotgun. Without passing judgment on the effectiveness of the safety features, this requirement stipulates that the safety features shall

be present. In other words, all of the parts intended in the design must be in the shotgun and they must work in the way the manufacturer says they work. Further, since the shotgun is a two-hand weapon the standard requires that those safety features under shooter control shall be designed so that the shotgun can be made ready to fire without removing either hand from the weapon.

Firing Requirements

The shotgun shall fire factory ammunition reliably. In advance of laboratory research, discussions were held with numerous gunsmiths/armorers about how many rounds represent a reasonable amount of ammunition. It was not expected that any two people would agree on a single number but there was general agreement that most problems resulting from firing tended to become apparent during the first 200 or so rounds. This was verified through laboratory tests, and the final 400-round firing test was established to ensure identification of all firing problems.

Drop Safety Requirements

Police service weapons will be dropped from time to time and when they are it is necessary that they not discharge. Also, in general, police officers are standing on hard surfaces such as roads, walkways, and inside buildings when a weapon falls. Therefore the shotgun is dropped from a 1-meter height to a solid concrete floor or slab in five different attitudes (e.g., normal firing attitude, barrel horizontal, trigger down; on butt, barrel vertical; etc.).

Drop Function Requirements

The shotgun shall fire 20 rounds of ammunition without slam firing and with not more than one malfunction of any other type after being subjected to the drop safety test.

Police service shotguns can be expected to receive rough handling and it is reasonable to expect them to be designed so that they continue to function even after being dropped.

Folding Stock Requirements (Optional)

There shall be no breaks, bends, or separation of the stock from the receiver after being dropped on the stock. Three drops are required. The stock shall lock in each position and move freely between the folded and extended positions after being dropped in accordance with the test.

Some police shotguns are supplied with folding stocks as an option. This requirement examines if the stocks will continue to work after rough handling.

Criticality of Requirements

A requirement that may be critical to one police department may not be as important to another department. Police service shotguns generally do not have a large number of parts that need adjustment; either the parts are there and work or a part is broken and needs to be removed and replaced by a nonbroken part. Therefore, a department should consider breakage or inability to complete the firing tests as critical failures. Failure to meet requirements such as headspace and trigger pull are not necessarily critical, for these parameters can be adjusted.

Appendix B: Testing Program Procedures

The National Institute of Justice (NIJ) Technology Assessment Program Advisory Council was originally established to recommend research priorities consistent with the "real time" needs of the law enforcement community. Based on the recommendations of the Advisory Council, NIJ subsequently established an equipment testing program to evaluate equipment in accordance with the performance standards that NIJ issues for voluntary national use and to publish the test results as Equipment Performance Reports.

Each year, the Advisory Council gives NIJ its recommendations for testing equipment. The recommendations are given in priority order according to overall interest and importance to State and local law enforcement agencies. Funding considerations normally limit the scope of testing programs to two items of equipment, which NIJ selects from the Advisory Council recommendations.

The testing program is complex, involving NIJ, the Technology Assessment Program Information Center (TAPIC), two organizations of the Department of Commerce, National Bureau of Standards (NBS), and independent testing laboratories. The result of the testing program is the availability of valid, unbiased test results that assist law enforcement agencies in selecting and procuring equipment suitable for their needs. Moreover, the program is structured so that manufacturers can continue to have their products tested according to the NIJ standard and the results disseminated to users as new products are tested.

Following the decision to test an item of equipment, TAPIC and the NBS Law Enforcement Standards Laboratory (LESL) identify manufacturers and the specific models that are available. The TAPIC staff then contact the manufacturers to invite them to participate in the program. When TAPIC knows the number of models to be tested, LESL and NIJ assist TAPIC in

developing a Request for Proposal (RFP) to solicit bids from independent testing laboratories. The NBS Laboratory Accreditation Program staff develop a laboratory questionnaire to assist in the initial evaluation of the testing laboratory capabilities, which is used as part of the RFP. A laboratory that is captive to a manufacturer or derives a major portion of its income from such a manufacturer is prohibited from bidding on the testing effort.

TAPIC normally seeks to award contracts to two independent testing laboratories, one east and one west of the Mississippi. In this instance, the limited number of shotgun models designed for police use made it impractical to split the testing between two laboratories. Therefore, only a single testing contract was awarded--to H.P. White Laboratories in Street, Maryland.

When the responses to the RFP are received, LESL, TAPIC, and the NBS Laboratory Accreditation Program staff evaluate each proposal independently and rate it according to the scoring criteria specified in the RFP. A final rank is then established, and TAPIC recommends to NIJ the laboratory for contract award.

The laboratory awarded a contract is required to demonstrate its competence and ability to properly conduct tests in accordance with the NIJ standard. This is accomplished through an onsite inspection by representatives of TAPIC, LESL, and the NBS Laboratory Accreditation Program staff. During the inspection, a single item of equipment is tested, and the staff evaluate all the factors associated with laboratory competence. Once the laboratory has been found fully capable to conduct tests in accordance with the NIJ standard and its test report found adequate, it becomes a TAPIC approved independent laboratory for future tests of that item of equipment. Should the laboratory not be competent, it is eliminated

from the program and another laboratory is awarded a contract and also subjected to full evaluation.

The approved laboratory is authorized to proceed with the remaining or "main quantity" testing. Representatives of TAPIC and LESL periodically visit the laboratory during the final testing.

After TAPIC has received the final test reports, LESL and TAPIC staff analyze and interpret the results to ensure accuracy and validity. Data are reviewed with the laboratories to resolve any ambiguities prior to preparation of the Equipment Performance Report.

Manufacturers are encouraged to test additional items of equipment after the NIJ Equipment Performance Report is published. Such testing must be accomplished according to NIJ standards, by a TAPIC-approved laboratory, and subject to TAPIC administrative controls. TAPIC issues supplements to the Equipment Performance Report as new equipment is found to conform to NIJ standards.

Appendix C: Shotgun Data Sheets

Browning, BPS
Action: Slide - Weight: 7.0 lb (unloaded)
Serial Number 51306PV152

Results: The shotgun complied with all the requirements except for the User Information, Functional and Drop Safety Requirements.

User Information: Did not include certification of compliance with NIJ Standard 0113.00.*

Visual Inspection: Complied with the standard.

Dimensional Requirements: Barrel Bore Diameter 0.729 in; Headspace: Complied with the standard.

Functional Requirements:

Action: Operated smoothly during the initial test, during the firing test, and after the drop function test.

Capacity: 4 rounds.*

Ejection: Ejected cases without hangup during the initial test, during the firing test, and during the drop function test.

Trigger: 5.3 lb.

Safety Features: Present and functioned properly. Active safety device could be released without removing either hand from the shotgun.

Firing Requirement:

| <u>Shot Sequence</u> | <u>No. Structural/ Mechanical Failures</u> | <u>No. Malfunctions</u> |
|----------------------|--|-------------------------|
| 100 | None | None |
| 200 | None | None |
| 300 | None | None |
| 400 | None | None |

Drop Safety Requirement: (5 drops from a height of 39.4 in, 5 cardinal orientations): Did not comply with the standard; 2 primers fired.*

Drop Function Requirement: Complied with the standard.

Optional Folding Stock Requirement: Test sample not provided with folding stock.

* Not in compliance with requirements of NIJ Standard-0113.00.

Franchi, Law 12, F.I.E. Corporation (U.S. Distributor)
Action: Autoloading-Gas Operated - Weight: 7.3 lb (unloaded)
Serial Number S75115

Results: The shotgun complied with all the requirements except for the User Information, Functional, Safety Features, Drop Function and Optional Folding Stock Requirements.

User Information: Did not include ordering instructions and certification of compliance with NIJ Standard-0113.00.*

Visual Inspection: Complied with the standard.

Dimensional Requirements: Barrel Bore Diameter 0.725 in; Headspace: Complied with the standard.

Functional Requirements:

Action: Operated smoothly during the initial test, during the firing test, and after the drop function test.

Capacity: 9 rounds.

Ejection: Ejected cases without hangup during the initial test, during the firing test, and during the drop function test.

Trigger: 11.1 lb.*

Safety Features:¹ Present and functioned properly. Only one of two active safety devices could be released without removing either hand from the shotgun.*

Firing Requirement:

| <u>Shot Sequence</u> | <u>No. Structural/ Mechanical Failures</u> | <u>No. Malfunctions</u> |
|----------------------|--|---------------------------|
| 100 | None | Rd. 14 - FFD [†] |
| 200 | None | Rd. 157 - FFD |
| 300 | None | None |
| 400 | None | None |

Drop Safety Requirement:² (5 drops from a height of 39.4 in, 5 cardinal orientations): Complied with the standard.

Drop Function Requirement:³ Did not comply with the standard.*

Optional Folding Stock Requirement:⁴ Stock extended and retracted smoothly and locked in position. Drop test resulted in several structural failures.*

* Not in compliance with requirements of NIJ Standard-0113.00.

[†] FFD - Failure to Feed.

FOOTNOTES:

- ¹ There are two active safety devices on the LAW-12; a carry safety and a quick employment safety. The carry safety could not be released without removing either hand from the shotgun. The quick employment safety could be released without removing either hand from the shotgun.
- ² During the drop safety test, after drop number 2 (on butt, barrel vertical), the shotshell could not be ejected. The shotgun was disassembled and it was discovered that the trigger lever had become disengaged from the auto safety lever. The trigger lever was re-engaged to the auto safety lever and the test was completed.
- ³ Following completion of the drop safety test 20 rounds were fired with no malfunctions. The shotgun failed to comply with the drop function test as a consequence of the fact that when dropped on the butt with the barrel vertical it became inoperable, requiring disassembly and adjustment to restore operation.
- ⁴ After the first drop the butt plate split at the pivot point. After the third drop a small crack (3/16") on top, right corner of butt plate appeared. Folding stock was still operable.

Franchi, SAS 12, F.I.E. Corporation (U.S. Distributor)

Action: Slide - Weight: 7.0 lb (unloaded)

Serial Number P17335

Results: The shotgun complied with all the requirements except for the User Information, Dimensional, Functional, Safety Features and Optional Folding Stock Requirements.

User Information:¹ Did not include a diagram identifying all parts, a parts list, and certification of compliance with NIJ Standard-0113.00.*

Visual Inspection: Complied with the standard.

Dimensional Requirements: Barrel Bore Diameter: 0.725 in; Headspace: Go gauge would not go.*

Functional Requirements:

Action: Operated smoothly during the initial test, during the firing test, and after the drop function test.

Capacity: 8 rounds.

Ejection: Ejected cases without hangup during the initial test, during the firing test, and during the drop function test.

Trigger: 9.6 lb.*

Safety Features:² Present and functioned properly. Only one of two active safety devices could be released without removing either hand from the shotgun.*

Firing Requirement:

| <u>Shot Sequence</u> | <u>No. Structural/ Mechanical Failures</u> | <u>No. Malfunctions</u> |
|----------------------|--|-------------------------|
| 100 | None | None |
| 200 | None | None |
| 300 | None | None |
| 400 | None | None |

Drop Safety Requirement:³ (5 drops from a height of 39.4 in, 5 cardinal orientations): Complied with the standard.

Drop Function Requirement: Complied with the standard.

Optional Folding Stock Requirement:⁴ Stock extended and retracted smoothly and locked in position. Drop test resulted in a structural failure.*

* Not in compliance with requirements of NIJ Standard-0113.00.

FOOTNOTES:

- 1 The user information provided with the shotgun specified 2-3/4" shotshells but the gun is chambered for and marked 3" shotshells. The shotgun was tested using 3" shotshells.
- 2 There are two active safety devices on the SAS-12; a carry safety and a quick employment safety. The carry safety could not be released without removing either hand from the shotgun. The quick employment safety could be released without removing either hand from the shotgun.

Since the quick employment safety also serves as the slide/lock release, when the safety is applied, the slide is unlocked and, in the muzzle up orientation, the slide will open with no more impetus than the force of gravity.

- 3 During the drop safety test, on drop 2 (on butt, barrel vertical), the bolt opened and ejected the chambered shotshell even though the action was locked.
- 4 On the second drop (trigger up) the butt plate was cracked and distorted. Folding stock was still operable.

Franchi, SPAS-12, F.I.E. Corporation (U.S. Distributor)

Action: Slide - Weight: 9.4 lb (unloaded)

Serial Number AB3173

Results: The shotgun complied with all the requirements except for the User Information, Functional, Safety Features and Drop Function Requirements.

User Information: Did not include a diagram identifying all parts, a parts list and ordering instructions, and certification of compliance with NIJ Standard-0113.00.*

Visual Inspection: Complied with the standard.

Dimensional Requirements: Barrel Bore Diameter: 0.725 in; Headspace: Complied with the standard.

Functional Requirements:

Action: Operated smoothly during the initial test, during the firing test, and after the drop function test.

Capacity: 9 rounds.

Ejection: Ejected cases without hangup during the initial test, during the firing test, and during the drop function test.

Trigger: 14.1 lb.*

Safety Features:¹ Present and functioned properly. Only one of two active safety devices could be released without removing either hand from the shotgun.*

Firing Requirement:

| <u>Shot Sequence</u> | <u>No. Structural/ Mechanical Failures</u> | <u>No. Malfunctions</u> |
|----------------------|--|-------------------------|
| 100 | None | None |
| 200 | None | None |
| 300 | None | None |
| 400 | None | None |

Drop Safety Requirement:² (5 drops from a height of 39.4 in, 5 cardinal orientations): Complied with the standard.

Drop Function Requirement:³ Did not comply with the standard.*

Optional Folding Stock Requirement: See data sheet for LAW-12. Folding stock provided with this test sample was not tested since it was identical to the folding stock for LAW-12.

* Not in compliance with requirements of NIJ Standard-0113.00.

FOOTNOTES:

- 1 There are two active safety devices on the SPAS-12; a carry safety and a quick employment safety. The carry safety could not be released without removing either hand from the shotgun. The quick employment safety could be released without removing either hand from the shotgun.
- 2 During the drop safety test, after drop number 2 (on butt, barrel vertical), the shotshell could not be ejected. The shotgun was disassembled and it was discovered that the trigger lever had become disengaged from the auto safety lever. The trigger lever was re-engaged to the auto safety lever and the test was completed.
- 3 Following completion of the drop safety test 20 rounds were fired with no malfunctions. The shotgun failed to comply with the drop function test as a consequence of the fact that when dropped on the butt with the barrel vertical it became inoperable, requiring disassembly and adjustment to restore operation.

Franchi, SPAS-12, F.I.E. Corporation (U.S. Distributor)
Action: Autoloading-Gas Operated - Weight: 9.8 lb (unloaded)
Serial Number AB2847

Results: The shotgun complied with all the requirements except for the User Information, Functional, Safety Features, Firing and Drop Function Requirements.

User Information: Did not include ordering instructions and certification of compliance with NIJ Standard-0113.00.*

Visual Inspection: Complied with the standard.

Dimensional Requirements: Barrel Bore Diameter: 0.725 in; Headspace: Complied with the standard.

Functional Requirements:

Action: Operated smoothly during the initial test, during the firing test, and after the drop function test.

Capacity: 9 rounds.

Ejection: Ejected cases without hangup during the initial test. Did not eject all cases without hangup during the firing test, and during the drop function test.*

Trigger: 12.3 lb.*

Safety Features:¹ Present and functioned properly. Only one of two active safety devices could be released without removing either hand from the shotgun.*

Firing Requirement:

| <u>Shot Sequence</u> | <u>No. Structural/ Mechanical Failures</u> | <u>No. Malfunctions*</u> |
|----------------------|--|-----------------------------|
| 100 | None | Rnd 57, 58-FEJ [‡] |
| 200 | None | None |
| 300 | None | Rnd 281-FFD [†] |
| 400 | None | Rnd 296, 297-FEJ None |

Drop Safety Requirement: (5 drops from a height of 39.4 in, 5 cardinal orientations): Complied with the standard.

Drop Function Requirement: Failed to comply with the standard; 6 failures to eject during the firing of 20 rounds.*

Optional Folding Stock Requirement: See data sheet for LAW-12. Folding stock provided with this test sample was not tested since it was identical to the folding stock for LAW-12.

* Not in compliance with requirements of NIJ Standard-0113.00.

[‡] FEJ - Failure to Eject.

[†] FFD - Failure to Feed.

FOOTNOTE:

- ¹ There are two active safety devices on the SPAS-12; a carry safety and a quick employment safety. The carry safety could not be released without removing either hand from the shotgun. The quick employment safety could be released without removing either hand from the shotgun.

Remington, 870
Action: Slide - Weight: 6.9 lb (unloaded)
Serial Number W586213M

Results: The shotgun complied with all the requirements except for the User Information Requirement.

User Information: Did not include certification of compliance with NIJ Standard-0113.00.*

Visual Inspection: Complied with the standard.

Dimensional Requirements: Barrel Bore Diameter: 0.735 in; Headspace: Complied with the standard.

Functional Requirements:

Action: Operated smoothly during the initial test, during the firing test, and after the drop function test.

Capacity: 5 rounds.

Ejection: Ejected cases without hangup during the initial test, during the firing test, and during the drop function test.

Trigger: 3.7 lb.

Safety Features: Present and functioned properly. Active safety device could be released without removing either hand from the shotgun.

Firing Requirement:

| <u>Shot Sequence</u> | <u>No. Structural/ Mechanical Failures</u> | <u>No. Malfunctions</u> |
|----------------------|--|-------------------------|
| 100 | None | None |
| 200 | None | None |
| 300 | None | None |
| 400 | None | None |

Drop Safety Requirement: (5 drops from a height of 39.4 in, 5 cardinal orientations): Complied with the standard.

Drop Function Requirement: Complied with the standard.

Optional Folding Stock Requirement: Test sample not provided with folding stock.

* Not in compliance with requirements of NIJ Standard-0113.00.

Remington, 11-87

Action: Autoloading-Gas Operated - Weight: 7.7 lb (unloaded)
Serial Number PC019931

Results: The shotgun complied with all the requirements except for the User Information and Drop Safety Requirement.

User Information: Did not include certification of compliance with NIJ Standard-0113.00.*

Visual Inspection: Complied with the standard.

Dimensional Requirements: Barrel Bore Diameter: 0.735 in; Headspace:
Complied with the standard.

Functional Requirements:

Action: Operated smoothly during the initial test, during the firing test, and after the drop function test.

Capacity: 5 rounds.

Ejection: Ejected cases without hangup during the initial test, during the firing test, and during the drop function test.

Trigger: 4.0 lb.

Safety Features: Present and functioned properly. Active safety device could be released without removing either hand from the shotgun.

Firing Requirement:

| <u>Shot Sequence</u> | <u>No. Structural/ Mechanical Failures</u> | <u>No. Malfunctions</u> |
|----------------------|--|-------------------------|
| 100 | None | None |
| 200 | None | None |
| 300 | None | None |
| 400 | None | None |

Drop Safety Requirement: (5 drops from a height of 39.4 in, 5 cardinal orientations): Did not comply with the standard; 1 primer fired.*

Drop Function Requirement: Complied with the standard.

Optional Folding Stock Requirement: Test sample not provided with folding stock.

* Not in compliance with requirements of NIJ Standard-0113.00.

Savage, 69RXL
Action: Slide - Weight: 7.3 lb (unloaded)
Serial Number E730717

Results: The shotgun complied with all the requirements except for the User Information, Functional, Firing, Drop Safety, and Drop Function Requirements.

User Information: Did not include field assembly and disassembly instructions and certification of compliance with NIJ Standard-0113.00.*

Visual Inspection: Complied with the standard.

Dimensional Requirements: Barrel Bore Diameter: 0.726 in; Headspace: Complied with the standard.

Functional Requirements:

Action: Did not operate smoothly during the initial test, during the firing test, and after the drop function test.*

Capacity: 6 rounds.

Ejection: Ejected cases without hangup during the initial test and during the drop function test. Did not eject cases without hangup during the firing test.*

Trigger: 8.3 lb.*

Safety Features: Present and functioned properly. Active safety device could be released without removing either hand from the shotgun. (See Firing Requirement.)

Firing Requirement:

| <u>Shot Sequence</u> | <u>No. Structural/¹ Mechanical Failures</u> | <u>No. Malfunctions*</u> |
|----------------------|--|-------------------------------------|
| 100 | None | Rnd 23,30,42,48,60-FEJ [‡] |
| 200 | None | Rnd 120,136,152,158,165-FEJ |
| 300 | Structural failure* | Rnd 227,234,256,273-FEJ |
| 400 | None | Rnd 308,314,337,364-FEJ |

Drop Safety Requirement: (5 drops from a height of 39.4 in, 5 cardinal orientations): Did not comply with the standard; 1 primer fired.*

Drop Function Requirement: Did not comply with the standard. Safety had to be manually held in fire position to fire.*

Optional Folding Stock Requirement: Test sample not provided with folding stock.

* Not in compliance with requirements of NIJ Standard-0113.00.

[‡] FEJ - Failure to Eject.

FOOTNOTE:

- ¹ The safety leaf spring lost tension. In order to fire the safety had to be held manually in the fire position.

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