I. Introduction

A. Test concept: Utilizing three mass produced polymer framed striker-fired 9mm handguns conduct a 10,000 round (rd) reliability test in an attempt to determine what, if any, reliability differences exist.

B. Test subjects: At the time of writing, the Glock 19, Smith and Wesson M&P 9 Fullsize, and Springfield XDM-9 will be the subjects of testing, however this test can expand or be repeated to incorporate other firearms.

C. Purpose:

1. Compare production mass-produced striker-fired pistols in a *scientific, repeatable,* and *transparent* method.

2. It is the opinion of the author of this document that, while interesting to the reader, common individually done "torture" or reliability tests conducted on youtube or various firearms blogs are inadequate due to lack of basic standards, repeatability and lack of reality, along with bias, and budget constraints.

3. This test is not intended to be a "torture test" whereby extreme measures are taken to push the handgun needlessly to failure without concern for proper maintenance or realistic use. Each handgun will have parts replaced at its manufacturer's recommended intervals.

II. Testing Constraints and Methodology.

A. Each handgun is a sample of one. For this reason it is important that the test accurately reflect a well built in-spec example of the respective design.

B. The frequency of out-of spec or improperly build examples directly correlates to the overall reliability of a product line, however it is beyond the scope of this test to judge the entire line and thus should attempt to test the reliability of the design itself.

C. 10, 000 rounds far exceeds what most average users will put through their pistols. This test will attempt to accelerate and replicate a heavy firing schedule. However, this test will not speak to a platform's longevity under maintained conditions such has been done by resources such as Pistol-Training.com

III. Testing Plan

A. Initial and periodic measurements.

1. Accuracy:

(a) Pure mechanical accuracy over time.
(b) Initial, 5K rds, and 10K rds at 25m.
(c) Upon initial accuracy define sight picture and offset.

2. Headspace:

(a) Initial and during inspection periods.
(b) Ideally should be incremental to show acceleration how of wear over time.

3. Trigger Pull

(a) Subjective initial impressions from a variety of shooters.
(b) Conducted objectively using a trigger pull system using a 5-measurement average.
(c) Conducted at start of test, 5K rds, and 10K rds.

4. Muzzle velocity

(a) Barrel designs and construction can affect muzzle velocity and it should be noted if there is any measurable difference between the test subjects.
(b) Should be conducted at beginning and end of test.

B. Ammunition compatibility testing.

1. Purpose: Due to differences in ammunition types it establish that the gun will function with a variety of ammo.

2. Minimum of 10 ammo types, 250 rounds each. First ammunition type will be the reliability ammunition.

3. Ammunition should cover the grain weight from 115 to 147, be of various ball and hollow point designs and include +P and subsonic, and include a sample of frangible training ammunition.

4. Ammunition should primarily of reputable manufacture and consist foremost of popular duty, plinking, and target rounds.

5. Notoriously underpowered or inconsistent ammunition (foreign import and small manufacturers) should be avoided. However it may be added in addition to the minimum reputable ammunition types. If using these types of ammunition results should show significant difference between pistols in order to be considered of note.

C. Endurance

1. Ammunition compatibility should count towards the final total of rounds fired.

2. Recommend M882 Mil-Type or equivalent ammunition for testing.

(a) Ammunition is a standardized ball-type of a high chamber pressure.

(b) Alternatively, a similar round with an aggressive hollow-point might prove more valuable but at greater expense.

3. Firing Schedule.

(a) 250 round strings, air cool to ambient between strings.

(b) Every 500 rounds should consist of oiling of the rails.

(c) Every 1,000 rounds a full field strip and field cleaning should be conducted. No amorer level disassembly will be conducted. Full inspection should be conducted prior to reassembly.

(d) At 5,000 rounds a full strip, detail cleaning, and inspection should be conducted.

(e) Lube with CLP.

4. Targets vs No Targets.

(a) No Target: Due to lack of focus and attempt to have proper technique not having a target to focus on can reveal reliability issues. Firearms should function properly regardless of shooter's influence.

(b) Targets allow better use of ammunition *for the shooter*. However, proper firing stance and grip allows the pistol to cycle more cleanly and can mask minor problems.

5. Orientation Firing. 125 Rds/Ea orientation. This will comprise the first 500 rounds post-ammunition compatibility.

(a) Limp wrist induction: Firing with a light grip of only the thumb and trigger finger.

(b) On left side

(c) On right side

(d) Top down

6. Magazines

(a) Ideally enough magazines to fire 250 rounds non-stop should be provided.

(b) Each magazine will be numbered. Every failure will be traceable to a magazine regardless if the shooter feels the magazine may play a role in a malfunction or breakage.

(c) Every third magazine will be loaded on a full chamber from a partially loaded magazine. Every magazine loaded will be to capacity and fired until empty, exempting the last odds rounds of the 250 round cycle.

(d) Reloads will be conducted by slingshot and slide release evenly.

D. User evaluation testing.

1. Testing staff evaluation.

(a) Each member of the test group will be provided a questionnaire regarding subjective aspects of the test samples.

(b) Subjective aspects will include trigger feel, ergonomics, recoil, aesthetics, and overall impression.

2. Inexperienced shooter survey.

(a) Using a sample of 20-30 inexperienced shooters each test sample will be evaluated for ease of use.

(b) Objective testing: Each shooter will receive a scoreable target and a 15 round magazine for each pistol. Scores will be used to judge which pistol is the easiest for an inexperienced user to adapt to.

(1) Round count will count towards endurance/reliability portion

(2) Shooters will be observed by testing staff to strictly monitor for malfunctions, which need to be recorded with circumstances noted.

(3) Pistol order will be randomized.

(c) Subjective testing: After shooting each pistol users will be asked to provide opinion on their thoughts on each pistol.

IV. Reporting

A. Every round fired will be recorded. Round tracking sheets will be drafted and compiled in an excel sheet.

B. Every malfunction will be recorded

1. Pictures

(a) Each picture will be recorded with the exact round count number.

(b) Every picture should provide the best possible angle to show the malfunction.

2. Noted on round tracking sheets.

(a) Exact round in the magazine will be noted to watch for patterns.

(b) Detailed descriptions are necessary.

(c) Parts breakages will be noted with the exact round count.

V. Manufacturer Intervention

A. Acquiring test samples

1. If possible testing samples should not be acquired from the manufacturer in order to reduce company interference via modification or cherry picking parts.

2. Samples will be examined by a qualified armorer in order to inspect for any defects or parts discrepancies. Each sample must be ensured to be built to the latest model.

B. In case of consistent malfunctions

1. First course of action should be armorer intervention and parts replacement. Parts should be inspected to ensure conformity.

2. If manufacturer intervention is required, replaced or broken parts should be returned to testing staff. All parts should be witness marked to ensure manufacturer accountability of repair reports. Detailed explanations need to be provided to prove parts conformance.

3. ANY manufacturer intervention should be done with as much transparency as possible to reduce opportunity for undue manufacturer influence.

VI. Testing Equipment

-Handguns (Glock 19 Gen 4, S&W M&P9 Fullsize, Springfield XDM-9)
-Ammunition (7500 Reliability Ammo, 2500 Assorted Ammunition Compatibility)
-Magazines (Recommend enough magazines to fire 250 rounds)
-Chronograph
-3 Digital Cameras
-Replacement Parts (Scheduled replacement parts and extras for unforeseen breakages)
-Full body targets with scoreable target zones.
-Folding tables
-Maglula Pistol Loaders
-CLP

VII. Closing

This test will attempt to lay as equitable a playing field as possible. Data must be captured accurately and honestly without regard to advertiser, tester, and manufacturer bias.