SWGGUN SCIENTIFIC WORKING GROUP for FIREARMS and TOOLMARKS

GUIDELINES FOR TRIGGER PULL ANALYSIS

1.0 Objective/Introduction

The objective of the following guidelines is to identify the essential elements suggested for use in the measurements of firearm trigger pulls and review the established trigger pull protocols (methodology and instrumentation).

2.0 Definitions/Terminology

Standard terminology and methodologies from sources such as the National Rifle Association (NRA), Association of Firearm and Tool Mark Examiners (AFTE) Procedures Manual, the AFTE Glossary, firearm manufacturer manuals, and equipment manuals should be used in the measurement of trigger pulls.

3.0 Equipment/Supplies

Proper equipment will be used and checked for acceptable accuracy when appropriate.

3.1 Equipment and supplies may include:

3.1.1 Arsenal weights or dead weights

3.1.2 Spring Gauge

3.1.3 Automated trigger pull device, e.g. TriggerScan™

3.1.4 Force Gauge

3.2 Equipment utilized for trigger pull measuring should be initially calibrated, followed by periodic calibration, as defined by individual laboratory protocols and/or manufacturers documentation.

4.0 Concepts

4.1 Trigger pull examination is a tool in the assessment of a firearm's safety system, condition, and factory specifications.

4.2 Consistency in methodology is crucial in the evaluation of data.

4.3 Conducting the trigger pull test in accordance with written protocol is essential to accurate, reproducible results.

5.0 Safety Considerations

General laboratory safe firearm handling protocols should be followed.

6.0 Testing of Objective 1.0

Arsenal weights, spring and digital gauges of various designs and TriggerScanTM were tested employing various firearm types.

7.0 Testing Results of Objective 1.0

No significant variation between the various trigger pull measuring devices was observed.

8.0 Conclusions

8.1 Procedures to conduct trigger pull examinations should include, but are not limited to: manufacturer operating manuals, AFTE Procedures Manual, NRA guidelines, and laboratory protocols, etc.

8.2 Laboratory protocols should address:

8.2.1 calibration of instruments

8.2.2 methods – slow, consistent application of pressure

8.2.3 orientation of equipment – proper alignment of measuring device to firearm

9.0 References:

1. Cunningham, Jordan., "Accuracy Testing on Dvorak Instruments' Trigger-Scan™ System," AFTE Journal, Volume 32, Number 4, Fall 2000, pp. 364-366.
2. Association of Firearms and Toolmark Examiners Procedures Manual, Trigger Pull Examination – Standard Trigger Weights (FA-I-4), Version July 9, 2001
3. Association of Firearms and Toolmark Examiners Procedures Manual, Trigger Pull Examination – Spring Gauge (FA-I-5), Version July 9, 2001
4. Association of Firearms and Toolmark Examiners Procedures Manual, Trigger Pull Examination – Automated Systems (FA-I-6), Version July 9, 2001
5. AFTE Glossary, Fourth Edition (Trigger Pull Reference)
6. Dillon, John H., "The Trigger Scan™ System – Microprocessor Technology Applied to Precision Trigger Pull Analysis" AFTE Journal, Volume 31, Number 2, Spring 1999, pp. 123-130.
7. Koffman, Avi, Silverwater, Howard, Argaman, Uri, Hocherman, Gil, and Shoshani, Ezra, "TriggerScan™ Computerized Trigger Pull System," AFTE Journal, Volume 29, Number 4, Fall 1999, pp. 449 – 456.
8. Lomoro, Vincent, "A Statistical Analysis of Trigger Pulls" AFTE Journal, Volume 18, Number 1, Winter 1986, pp.

9. Rios, Ferdinand and Thorton, John, "Static vs. Dynamic Determination of Trigger Pull", AFTE Journal, Volume 16, Number 3, July 1984, pp. 84-86.
10. Thompson, Evan., "Preloaded vs. Normal Trigger Pull Weights" AFTE Journal, Volume 27, Number 1, Spring 1995, pp. 62 – 64.
11. Gamboe, Tom, "MAFS Firearms Workshop: Trigger Pull Methods" AFTE Journal, Volume 18, Number 3, July 1986, pp. 77 – 79.
12. Templin, Reginald, and Nielson, John., "Evaluation of the Effects of Cyanoacrylate Processing on Pistol and Revolver Trigger Pull" AFTE Journal, Volume 20, Number 4, Spring 1988, pp. 443 – 445.
13. Unpublished Empirical Trigger Pull Data conducted by the SWGGUN Trigger Pull sub committee in September 21 – 23, 2004 at the Federal Bureau of Investigation, Firearms and Toolmark Laboratory, Quantico, Virginia
14. Unpublished Empirical Trigger Pull Data conducted by the SWGGUN Trigger Pull sub committee in March 29 – 31, 2005 at the Federal Bureau of Investigation, Firearms and Toolmark Laboratory, Quantico, Virginia
15. Unpublished Empirical Trigger Pull Data conducted by the SWGGUN Trigger Pull sub committee in June 2005 at the Association of Firearm/Toolmark Examiner 2005 training conference, Indianapolis, Indiana.

Additional Reference Material

1. NRA trigger pull guidelines
2. AFTE Glossary
3. Imada Manual
4. TriggerScan™ Manual
5. Chatillion Manual
6. Static Weights (Brownells)