

# Test Lab Work Request Form

Date Submitted: 10 March, 2000

Tracking #: TLW 0010AC

Project #: 241095

Engineer: J.R.SNEDEKER

## Test Objective:

### TLW0010AC - Extended Function & Endurance:

This Endurance Test will be shot to accomplish two purposes. The first purpose is to determine an estimate of the product's expected malfunction rate over an extended period of shooting. The second is to determine both the estimated life of individual components as well as the expected life (in rounds) of the product before system failure occurs. For purposes of definition, a component failure will be one that prevents (or could prevent) the firearm from functioning as intended. These are failures that can be fixed relatively easily by the simple replacement of a part such as could be done by the gun owner using only simple household tools. System failures are defined as failures of a major nature, the extent of which would require specialized tooling or methods to repair not normally available to the average gun owner. Such a repair would be most likely made by a qualified gunsmith or by return to the factory.

This Endurance Test will be shot in the test jacks and the testers will use gloves for protection. The covers on the "belly-protectors" will be down and in-place for each test shot. Careful monitoring of each test gun is essential to evaluate the malfunction rate for each firearm.

The standard Remington test jacks will be used for all jack-related testing.

Each rifle will be shot, using a variety of Centerfire ammunition comprised of light, medium and heavy bullets. In addition, ammunition from the three major manufacturers (Remington, Winchester and Federal) of Centerfire ammunition shall be included in the mix.

Each rifle will be shot no more than 20 rounds before being put aside for cooling. Compressed air applied to the inside of the chamber will be an acceptable method to assist in the cool-down process.

The S.A.A.M.I. recommendation for the minimum acceptable malfunction rate for a bolt action rifle is a malfunction rate of  $< 2\%$ . In this case, if the overall malfunction rate average for the test samples is  $> 2\%$ , the DAT test will be stopped and the guns returned to Design for modification and improvement before being re-submitted for DAT. If the overall average malfunction rate is  $< 2\%$  but one of the firearms is significantly greater than  $2\%$  malfunction rate, the test may continue with the other nine test samples while Design attempts to fix the problem with malfunctioning gun. After repair, this gun will again be required to pass the 200 round jack function test at  $< 2\%$  malfunction rate. If the gun passes these criteria it will then be re-introduced into the Endurance test. It is important that total endurance rounds on the gun include any rounds that are put through the gun for re-test purposes.

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The test will be performed according to Remington's standard endurance test procedures for centerfire rifle. Pyramid for this test will be ten rifles to 1,000 rounds, six rifles to 2,000 rounds, three rifles to 5,000 rounds and one rifle to 10,000 rounds.

Record all instances of malfunctions and failures, and replace parts when they become unserviceable noting the round level when they were replaced.

After every 100 rounds one live round will be extracted and ejected from the chamber to check on live round ejection. The ejected round will then be re-inserted into the chamber and fired to help keep the endurance round count accurate.

### **Test Description:**

#### Method:

- Disassemble, thoroughly clean, lubricate per the design team's instructions, and reassemble. Record headspace for each.
- Fire each test firearm in accordance with the firing procedure (number of rounds, firing cycle) specified by engineering and the test plan.
- Ammunition will be used that comprises at least five types of bullets, change ammunition type every 100 rounds.
- Before commencing design acceptance testing, calibrate, adjust, or re-build the shooting jacks, if necessary.
- Allow the firearm to completely recover in the shooting jack between each shot and do not lean or "stiff arm" the firearm while shooting the gun.
- All ammunition is to be functioned through the magazine - no "single shot" hand feeding permitted.
- Allow the rifle to cool between cycles. One cycle is 20 rounds fired. The use of forced air to accelerate cooling of the barrels between firing trials is permitted. The air should be directed from the chamber toward the muzzle to prevent it from washing the lubricant from the firearm's action.
- Cycle the safety from fire to safe every 5 rounds, from Safe to Fire at the start of the five round cycle and from Fire to Safe at the end of the 5 round cycle.
- After every 1000 rounds, disassemble, inspect, clean and lubricate the entire mechanism and take all required measurements.
- At the initial 1000, initial 5000 and at the 10,000 round level, Magna-Flux the bolt heads.
- The Standard Remington Jacks are to be used for this test.

#### Data Required:

- Rifle serial number
- Tester's name
- The Test Jack Identification
- TLW#
- Date of actual testing
- Headspace every 1000 round interval.
- Malfunctions per ammo type, breakage, and replacement parts used.
- Any failure that requires the gun to be removed from testing completely.

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- Notify management of any unusual events or malfunctions immediately.
- Any firing of the firearm without the trigger being pulled.
- Record ammunition lot code information as it is used throughout the test.
- Bullet type used for each 100 rounds of the test.
- The results and photographs, if any, of the Magna-Flux testing.

**Resource Usage:**

**Manpower Requirements -**

**Facility Requirements -**

**Test Results Required:**

**Formal Report:                      Data Only: X**

**REQUESTED Completion Date:**

**Required Materials/Parts/Equipment (include quantities):**

**Test Parts Availability Date:**

**Start Date:** 4-6-00

**Completion Date:** 5-8-00

**Report Date:** 4-7-00

**Test Assigned To:**

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