

TEST OUTLINE:

Weight
Headspace
Firing Pin Indent
Firing Pin Protrusion
Trigger Pull (and Range)
Safety On/Off Force
Locktime

Blanked Primer Test
Proof Test
Live Load/Unload
Function
Accuracy
Endurance/Dry Cycle/Trick Test
Accuracy
Jar Off Test/Drop Test
Ultimate Strength Test

Test Outline

Weight: Weigh all test guns and record the weight. (Without scope mounts)

Headspace: Verify headspace of all rifles according to Research Manual in J.R. Snedeker's office

Firing Pin Indent: Std.

Firing Pin Protrusion: Std.

Trigger Pull: Measure trigger pull parallel to the axis of the bore. Take and record 5 readings from each rifle at the max. and min. ends of the trigger pull range. Cycle the bolt between each reading.

Safety On/Off Force: Measure safety forces at an angle as close to being parallel to the surface of the tang as possible. Take and record 5 safety on and 5 safety off readings from each rifle. Cycle the bolt between each reading.

Locktime: Measure and record the locktime of all rifles and explain method of measurement.

Blanked Primer Test: We want to determine how the action handles medium to high pressure gas.

Procedure:

- Proof rifle
- Determine load that will allow high pressure gas to escape through primer pocket.
- Shoot 5 shots in iron lung with witness paper to determine where gas is venting. Record pressures developed as well as avenue of gas escape. Note breakages, abnormalities, etc. Photograph results if necessary.

Proof Test: Proof test all 6 rifles.

Live Load/Unload: Cycle through each long action rifle 50 live rounds of the following bullet weights: 125PSP, 150BP, 180PSP, 220SP.

With the detachable box magazine, several magazines may be loaded and each successfully unloaded through a single rifles action.

Cycle through each short action rifle 50 live rounds of the following bullet weights:

Live Load/Unload: 150PSP, 180SP, Record all malfunctions.
(cont'd.) Also please note any bullet nose deformation resulting from this test. Test to be performed in the shooting jacks.

Function: Perform a full field cycle test at the Fish & Game Club with several shooters.

Accuracy: After sighting (and cooling if necessary) shoot 5-5 shot groups of each of the following ammo types: 150BP, 180SP, 180PSP. Cool and shoot one fouling shot between each group. Use Remington factory ammo and test each of the six rifles, (three 30-06 and three 308). (100 yard range)

Endurance: Live fire all rifles in the shooting jacks to 2,000 rounds each. Use all ammo types available and record any malfunctions. Take headspace, trigger pull and safety on-off force measurements every 500 rounds. Record all malfunctions.

Repeat Accuracy Test After Endurance

Dry Cycle:

- Cycle magazine latch 10,000 rounds, (latch to be deflected .100 and force to be applied thru mag release). Measure force required to deflect latch at start, at 5,000, and at 10,000 cycles.
- Dry fire rifle 10,000 rounds to determine wear of trigger, sear rotor and receiver. Measure trigger pull at 0, 5,000, and 10,000 cycles.
- Cycle extractor 10,000 times to determine fatigue life in bending. Fixture extractor in bolt. If extractor breaks, at what level does it fail?
- Using the dynamic pull test fixture, determine the strength relationship of the new extractor vs. the current. Does extractor pull through brass rim before it breaks?

Trick Test:

- Dry cycle trigger with "ear" broken to determine wear characteristics. Does it cause a safety problem?
- Try to trick rifle to fire off safe or to "hang" safe in the mid (or any other) position.
- An environmental test of the fire control should be performed. This should include cold box testing of the rifle with the fire control lubricated with oil.

Trick Test: • What force is necessary to pull the trigger and break it when the safe is on. Does the rifle fire?
(cont'd.)

Jar Off Test/Drop Test: Perform test to meet the attached proposed SAAMI specifications.

Ultimate Strength Test: Work up several progressively increasing high pressure loads to the point where the barreled action yields or the ultimate strength test is reached.

New Bolt Action Design Goals

Weight: 6 lbs. 10 oz. (no scope mounts)

Headspace: Min. +.005 (working Max.)
Min. +.007 (Final inspection Max.)
Min. +.009 (Field Max.)

Firing Pin Indent: .018 min-.026 max (copper crusher)

Firing Pin Protrusion: .045 min-.075 max

Trigger Pull: 3 lbs. min.
5 lbs. max.

Safety On/Off Force: 3 lbs. min.
6 lbs. max.

Locktime: better than 3.3 msec.

Blanked Primer Test: I expect high pressure gas to vent along the left rail as the Model 700 does. The gas venting through the bolt body, however, will be deflected downward and dispersed harmlessly as it impinges on the bolt plug.

Proof Test: The rifles must be proofed before they may be live fired.

Live Load/Unload: I expect the number of feeding malfunctions will be reduced because of the new magazine box. Also, extraction and ejection will be enhanced because of the new extractor. All bullet weights and configurations should be fed and extracted with little or no tip deformation.

Live Load/Unload: Allowable malfunction rates are:
(cont'd.)

First 10: 0%
First 100: 1%
Total Life: .5%

Function: The rifle function test results should be as good as or better than the live load/unload test.

Accuracy: Both the 308 and 30-06 group size at 100 yards for 5-shot group should be less than 3.5".

Endurance: I expect minimal wear on all critical components after 2,000 rounds. The malfunction rates should be as good as or better than the live load/unload test. A failure to the extractor after 1,000 rounds is acceptable. No other parts should fail within 2,000 rounds.

Dry Cycle: All components should complete the dry cycle test with minimal wear. The components chosen for this test may be susceptible to fatigue failure and the high cycle level was selected to ensure that they will not fail in any rifle under any circumstances.

Trick Test: If the trigger does fail, I expect it to do so in a safe manner. If an "ear" on the trigger should break and go undetected, we should verify that there are no adverse effects.

The safety should have two well defined positions. Any position between the two is unacceptable.

In the environmental test, I expect the fire control to perform as well at -20° as at room temperature.

Jar Off Test/Drop Test: The rifles should meet the proposed minimum SAAMI specifications.

Ultimate Strength: The NBAR must handle extremely high pressures as well as or better than the current Model 700.

sps
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