Remington Arms Company Inc.
RESEARCH & DEVELOPMENT TECHNICAL CENTER
315 WEST RING ROAD
ELIZABETHTOWN, KY 42701

M/710 Testing
"Holeless" Connector and Tempered Scope Mount Screw Test

Description:

Mayfield and E-town Firearm Design personnel proposed eliminating the hole in the connector for the M/710 since it serves no function in this model. This simplifies manufacture and results in a less expensive part. Mayfield and E-town Test jointly agreed on a 15 gun test where 8 rifles would be built in .30-06 caliber and 7 in .270 Win. Caliber. About this same time Mayfield had a need to test a heat treat change to the scope mount screws also used on the 710. It was decided to test both of these changes concurrently.

A test outline was agreed to that consisted of the following measurements and tests:

- **Measurements as Rec'd (All 15 guns)**
  - **Trigger Pull (spec. is 4.0 – 5.5 lbs.)**
  - **Engagement (spec. is .020 - .025 in.)**
  - **Over travel (spec. is .20 - .025 in.)**
  - **Headspace**
- **Proof and Re-measure Headspace (All 15 guns)**
- **SAAMI Jar-Off, Drop Rotation (6 guns: 3 of each cal. chosen at random)**
  - **Drop with scopes mounted (Use std. Screws)**
  - **Set fire controls to process minimums**
    TRIGGER PULL: 4.0 lbs.
    ENGAGEMENT: 0.020 in.
- **Extended SAAMI Jar-Off Only (same 6 guns) – <u>For Information Only</u>**
  - **Drop with scopes mounted (Use std. Screws)**
  - **Set fire controls to process minimums**
    TRIGGER PULL: 4.0 lbs.
    ENGAGEMENT: 0.020 in.
- **100 Rd. Jack Fcn. Test (9 guns)**
  - Shoot with scopes mounted on 8 guns, 9th gun has no scope mounted
    - Use special mount screws provided (tempered screws)
    - Use Loctite 222MS and torque screws to 15 – 20 in. lb.
  - Fire 100 rds/gun, heavy shooting jacks (any ammo-note what's used)
  - Track malfunctions
  - Pay special attention to fire control function and feel
  - Cycle Safety from Fire to Safe every feeding cycle
  - Check Scope mount screws for tightness after firing 100 rds
  - Remove and inspect screws for cracks after firing

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Test Summary:

All required phases of testing were completed successfully, with no issues or problems encountered. A summary of results follows for each measurement and test. These results are average or overall numbers for all guns combined. Individual gun results and measurements are available upon request. This data will be stored in the Test Lab Central Files under TLW 0822.

A number of individual gun measurements were measured as Out of Specification for Trigger Pull, Engagement and Over Travel. The actual values noted for these guns are included below for reference purposes. One gun was out on Trigger Pull (under 4.0 lbs.) as measured with E-town's Spring Scale. The value noted is within a range that can be considered measurement error or site to site variation as determined by a recent study on Trigger Pull done by Brian Rages. This further emphasizes the need to refine Trigger Pull measurement methods at the manufacturing sites. The two guns measured out for Engagement were less than .001" over the Max. specification, again arguably within the range of measurement error. This same comment holds for the guns just out for Over Travel.

After testing two guns fire controls were disassembled so that critical dimensions could be checked on the Connectors. All dimensions checked were within specification on these two parts except for the .075" +/- .025" characteristic on one part. This was measured as .118". The angle that corresponds to this surface (2° 30' +/-30') was within specification on both parts. This measurement was checked on E-towns MicroVu system. Since this is a difficult measurement to make and it is not consistent with Mayfield's inspection method E-town encourages Mayfield to check this operation for conformance to specification.

Test Results:

- **Measurements as Rec'd (All 15 guns)**
  - **Trigger Pull (spec. is 4.0 – 5.5 lbs.)**
    - **Avg. = 4.82 lbs.**
    - **Std. Dev. = .41 lbs.**
    - **One gun Measured out of Spec. – Was 3.67 lbs.**
  - **Engagement (spec. is .020 - .025 in.)**
    - **Avg. = .024 in.**
    - **Std. Dev. = .001 in.**
    - **2 guns Measured Out of Spec. – Both at .0258 in.**

- **Over travel (spec. is .20 - .025 in.)**
  - **Avg. = .021 in.**
  - **Std. Dev. = .002**
  - **6 Guns Measured Out of Spec. – All .001" or less under Min. Spec.**
- **Headspace**
  - **As Rec'd – Avg. = Min. +.002"**
  - **After 1 Proof Rd. – Avg. = Min. + .003"**
  - **Growth = .001"**

- **SAAMI Jar-Off, Drop Rotation (6 guns: 3 of each cal. chosen at random)**
  - **All 6 Guns Passed**
    - **Dropped with scopes mounted (Used std. Screws)**
    - **Set fire controls to process minimums**
      - TRIGGER PULL: 4.0 lbs.
      - ENGAGEMENT: 0.020 in.
- **Extended SAAMI Jar-Off (same 6 guns) – <u>For Information Only</u>**
  - **3 Guns Passed all Drops**
  - **3 guns fired at 48" – Bbl. horizontal with barrel down**
    - **Dropped with scopes mounted (Used std. Screws)**
    - **Set fire controls to process minimums**
      - TRIGGER PULL: 4.0 lbs.
      - ENGAGEMENT: 0.020 in.
- **100 Rd. Jack Fcn. Test (9 guns)**
  - Shot with scopes mounted on 8 guns, 9th gun had no scope mounted
    - Used special mount screws provided (tempered screws)
    - Used Loctite 222MS and torqued screws to 15 – 20 in. lb.
  - Fired 100 rds/gun, heavy shooting jacks (ammo types noted on sheets)
    - Fired five 30-06 Cal. and four .270 Win. Cal. guns
    - **No Malfunctions – 0 % in 900 rds. of shooting**
  - Paid special attention to fire control function and feel – **No Issues**
  - Cycled Safety from Fire to Safe every feeding cycle - **No Issues**
  - Checked Scope mount screws for tightness after firing 100 rds/gun
    - **No Loosening of screws**
  - Removed and inspected screws after firing
    - **No Issues**