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January 5, 1953

TO: W. A. Best  
FROM: G. J. Theriault  
SUBJECT: MODEL 721 - 30-06 -  
QUALITY & ENDURANCE TEST FOR 1952

On May 7th a quality and endurance test for Model 721 - 30-06 rifles was initiated. Due to this work having to be accomplished between other important jobs, the test was not completed until October 2, 1952. Preliminary results of the ten (10) samples tested through 320 rounds each are as follows:

| Gun No. | Round | Malfunction                                                                                     |
|---------|-------|-------------------------------------------------------------------------------------------------|
| 237007  | 6     | Stem Chamber (Win. S.P.) - 6                                                                    |
| 205406  | None  |                                                                                                 |
| 238323  | None  |                                                                                                 |
| 205366  | None  |                                                                                                 |
| 205587  | None  |                                                                                                 |
| 214332  | 1     | Stem Chamber (Win.) - 1                                                                         |
| 238076  | None  |                                                                                                 |
| 237412  | 17    | Stem Chamber - Win. 14<br>Western 2<br>Failure to eject (Western) 1<br>Failure to eject ( " ) 1 |
| 199805  | 1     |                                                                                                 |
| 238483  | None  |                                                                                                 |

In all of the above guns, hard opening of the bolt was caused by shaving the nose of the bullet in feeding and these shavings lodged between the breech and bolt locking lugs.

Guns Nos. 237412, 199805, and 238483 were then selected and fired an additional 600 rounds, for a total of 1,000 rounds, with results as follows:

|        |      |                                                                                                |
|--------|------|------------------------------------------------------------------------------------------------|
| 237412 | 14   | Stem Chamber - Win. 8<br>Western 5<br>Failure to eject (West.) 1<br>Failure to Eject (West.) 3 |
| 199805 | 3    |                                                                                                |
| 238483 | None |                                                                                                |

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Gun #199805 was then selected as the "mean" endurance gun and was subjected to an additional 5,000 rounds of firing. The results of the total 6,000 rounds are as follows:

| Gun No.      | Rounds | Malfunctions |                         |
|--------------|--------|--------------|-------------------------|
|              |        | Rate         | Time                    |
| 199805       | 129    | 2.15%        | Failure to Extract - 33 |
| (6,000 Rds.) |        |              | " " Eject - 36          |
|              |        |              | " " Fire - 4            |
|              |        |              | Stem Chamber - 1        |

In the above testing, 3 failures to eject and 1 failure to fire were encountered in the adverse conditions test of rain and dust which normally reduces the rate to 2.5%. The Extractor began to fail actually at 1,500 rounds, and the failures to eject are believed to be caused by this weak extractor. This gun was subjected to 10,000 dry cycles with no breakages occurring.

#### Conclusions

Since there were no breakages in all of the above testing and the malfunction rate appears to meet requirements, it can be concluded that the quality and endurance of the Model 721 in 30-06 Cal. can be accepted as satisfactory. There was no testing for accuracy due to lack of facilities.

Further investigation of the Extractor is recommended in order to determine if this weakness is inherent in the Model 721. This could probably be done in regular quality audit testing.

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