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SUBJECT: MONTHLY REPORT - SEPT. '91

MODEL 522 VIPER:

Five new guns were built with the latest design modifications. The major changes were the firing pin retract system, a new extractor spring and the barrel projections to locate the magazine box central to the chamber. These guns had preliminary measurements taken and then had extensive field testing done on them. Highlights of this testing are listed below.

- o Trigger pulls on these five gun samples were in the 8-9 lb. range. Trigger pulls do come down as the gun breaks in. Coating the pins with Teflon and Sankstrom was tried to lower trigger pulls on new guns. The target is 7 lbs. +/- 1.5 lbs.. Teflon does lower trigger pull by approximately .6-.7 lbs. Sankstrom did not lower and in fact raised the trigger pull. The Sankstrom also wore off in about 15 cycles. Teflon will be pursued as a possible alternative.

- o Firing pin indent is lower with the plunger system in the gun. Indents went from approximately .016 in. with the plunger out to about .014 in. with the plunger in.

- o Over-all malfunction rate for all field cycle testing was about 3 %.

- o Some trap shells did occur at the beginning. Extractor hook space, plunger retraction distance, plunger material(mass) and plunger spring loads were changed to address this. Traps did improve after these changes. The current plunger system consists of an aluminum plunger with reduced firing pin retraction distance and a spring with lower loads. Trap shells do not seem to be a major issue with the plunger system installed in the gun.

- o Feeding seemed much improved on these five guns. The magazine guides on the barrel face does help. There does seem to be a long term trend of increasing feed type malfunctions with rounds shot. This trend is slight, an increase from about 1 % to 2.5 %. It is not known if this is statistically significant at this time. We will continue to monitor trends on all test guns in the future to determine if this is an issue.

o The wider sear spring seems to be working as expected. Only a couple of fail to engage the primary sear malfunctions occurred during this testing. When this happened the secondary sear system worked as designed. The frequency of this malfunction was extremely low as compared to the rate before the sear spring change.

Fifteen guns were built in production with the latest changes as determined by the latest five gun test. This was done to increase sample size and get some early processing feedback on the production process established to build these guns in the plant. Preliminary measurements and field tests were run to evaluate these guns.

o Trigger pull on these guns averaged 7.02 lbs. without any Teflon coating. The surface finishes on these guns were probably better than the last five gun sample. Teflon coating is still being considered to give more consistent trigger pulls.

o Firing pin indent with the plunger system in averaged .014 in..

o Live fire testing on these guns consisted of shooting 100 rds. in the plant gallery followed by two field cycle tests. The malfunction rate on the first 100 rds. was about 1 % over-all. There were no surprises during this part of the test. The first field test was 2.6 % over-all with no trap shells. The major malfunction was fail to fires due to poor indent. The second field test results jumped up to 5.5 % over-all. The fail to fires due to poor indent jumped up considerably. Investigation showed that the bolts were not closing up completely due to crud accumulation in the receiver up near the chamber. This results in light blows. This condition is currently being investigated. The most likely changes to improve the fail to fires is to give the bolt more clearance in the receiver by reducing the O.D. of the bolt and beefing up the bolt return spring energy. These changes are currently being tested.

Five new Marlin and five new Ruger rifles were purchased recently for evaluation purposes. These guns will be the M/522's major competition. The reason for purchasing these guns was to determine their current "Out of the Box" performance on a representative sample and then to compare these results to the M/522. Two complete field cycle tests were run on these guns. A total of 240 rds./gun of various ammo types was shot. Performance was as follows:

	<u>Marlin</u>	<u>Ruger</u>
Over-all Malf. Rate	3.25 %	0.58 %
Best Gun	1.7 %	0 %
Worst Gun	5.0 %	1.25 %

As this test shows the target as far as performance is concerned is the Ruger 10/22. If the fail to fire malfunction from light indents is solved by the latest modifications the M/522's expected performance should fall between the Ruger and Marlin, and probably closer to the Ruger.

REMINGTON O/U:

Nothing new to report here. We are still awaiting completion of prototype parts from the model shop to evaluate the fore-end latching system.

STRESSLAB ACTIVITY:

One intermittent problem experienced with the 522 is a fail to release the firing pin carrier when the trigger is pulled. There are a number of possible causes for this, all of which are currently being investigated. One of those causes could be due to disconnecter flexure when the trigger is pulled. This is an ideal Stresslab application and is currently being analyzed.