
From: Franz, Scott
Sent: Tuesday, February 13, 2007 4:17 PM
To: Trull, John; Vicars, Gerald; Norton, Vince; James, Will; Lasley, Brian
Cc: Millner, Tommy; Campbell, Don H.; Lance, Kevin D.; Diaz, Danny; Cook, Todd D.; Reesor, Phillip K.
Subject: M770 Conditional Release in 7mm Rem. Mag. and 7mm-08
Importance: High
Sensitivity: Confidential

We've completed our 40 rd./rifle function test on 10 M/770's (5-.308's and 5-270's) and this completes all of our planned testing of this new product offering. No early grip cap failures and function was acceptable on both calibers. We did have 1 magazine latch break on one of the .308's. This was noticed after the testing so I'm not sure if this was broken prior to our test or if it broke during the test. The latch broke off on one side where the pin goes through the part. As far as we can tell this is not related to the M/770 stock.

Gerald, could you investigate to determine if this is unique to the M/770 from your end? This could have been a defective part possibility related to a short shot or an assembly issue.

Based on our testing and Mayfield's comparative data between 710 and recent 770 production on the grip cap issue the E-town Test Lab supports a position to ship product in the two calibers listed (7mm-08 and 7mm Rem Mag) with the following conditions:

- A formal design transmittal takes place where the transmitted design is reflective of T&P product.
- Mayfield should monitor grip cap failure rate and take corrective action with PAR4 if failures increase from current levels.
- Mayfield should supply E-town with initial accuracy data on the remaining calibers (.300 Win. Mag, .243 Win., .270 Win., .308 Win. and .30-06 Sprg). E-town will analyze this data and report findings relative to gallery specifications.
- Mayfield should publish their proposed accuracy sampling process for review.

As always, please give us a call if you have any questions or if additional review of this product is required.

Regards,

Scott R. Franz
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From: Vicars, Gerald
Sent: Tuesday, February 13, 2007 9:32 AM

To: Franz, Scott; Trull, John; Norton, Vince; James, Will; Lasley, Brian; Roudabush, Kathy
Cc: Lance, Kevin D.; Diaz, Danny; Cook, Todd D.; Reesor, Phillip K.
Subject: RE: M770 Accuracy Analysis-7mm Rem Mag & 7mm-08

Scott,

After talking with the second and third shifts it appears that we have only had a total of 7 or 8 caps come off across all shifts. We have proofed and functioned approximately 700 guns with this latest iteration of M770 stock.

Gerald

From: Vicars, Gerald
Sent: Monday, February 12, 2007 10:56 AM
To: Franz, Scott; Trull, John; Norton, Vince; James, Will; Lasley, Brian; Roudabush, Kathy
Cc: Lance, Kevin D.; Diaz, Danny; Cook, Todd D.; Reesor, Phillip K.
Subject: RE: M770 Accuracy Analysis-7mm Rem Mag & 7mm-08

Scott,

I have talked with the first shift supervisor and both of the first shift gallery people in an attempt to quantify grip cap failures. Since the latest iteration of the textured stock which we began to use with the last samples submitted to E-town. Mayfield has proofed & functioned approximately 700 guns. Of this 700 we have lost at total of 6 caps on the first shift. Our gallery people indicated that this tracked consistently with what they had experienced on the M710. I will follow up with the second and third shift and give you an update tomorrow.

Gerald

From: Franz, Scott
Sent: Monday, February 12, 2007 9:38 AM
To: Trull, John; Vicars, Gerald; Norton, Vince; James, Will; Lasley, Brian; Roudabush, Kathy
Cc: Lance, Kevin D.; Diaz, Danny; Cook, Todd D.; Reesor, Phillip K.
Subject: RE: M770 Accuracy Analysis-7mm Rem Mag & 7mm-08

Todd has run some recent experiments studying glue type and joint geometry. He and Marlin devised a method to quantify joint strength in the Instron machine so we should have quantifiable data to make some decisions around. This test used a specially made plate machine to duplicate stock geometry where grip caps were glued and then pushed out after curing. The actual force curve was recorded. He's in the data analysis phase so we should have published results shortly. He also has received a sample of new process stocks where he'll do a push out test on actual stocks for comparison. This data coupled with limited live fire data on .270 Win. and .308 Win. M770's should be available early to mid week.

Gerald – Have you seen any issues with caps falling off with these new stocks in your gallery testing??

Scott

From: Trull, John
Sent: Monday, February 12, 2007 9:46 AM
To: Franz, Scott; Vicars, Gerald; Norton, Vince; James, Will; Lasley, Brian; Roudabush, Kathy
Cc: Lance, Kevin D.; Diaz, Danny; Cook, Todd D.; Reesor, Phillip K.
Subject: RE: M770 Accuracy Analysis-7mm Rem Mag & 7mm-08

I am ok with the results. I do want to have a solid understanding of what the issues are and the corrective actions for them are on the grip cap. I furthermore agree with Scott on the 3-shot, 4-shot, 5-shot max test criteria that Ilion uses. There does need to be a limit on the number of shots. 5-shots is the accepted norm throughout the industry. Again, help me understand our exposure on the grip cap. Beyond that, lets ship guns.

John C. Trull

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From: Franz, Scott
Sent: Sunday, February 11, 2007 11:04 AM
To: Trull, John; Vicars, Gerald; Norton, Vince; James, Will
Cc: Lance, Kevin D.; Diaz, Danny; Cook, Todd D.; Reesor, Phillip K.
Subject: M770 Accuracy Analysis-7mm Rem Mag & 7mm-08

The purpose of this e-mail is to convey results of Mayfield generated accuracy data for the calibers listed above. **If Marketing is satisfied with the results from this testing as presented here along with acceptance of a previously mentioned grip cap retention issue then E-town will issue a T&P Exit Letter conditionally agreeing to formal release of this product for shipment in these two calibers.** The only remaining work for E-town to complete before an Exit Letter can be issued on remaining product is a 40 round/rifle function test and grip cap retention assessment on .270 Win. and .308 Win. rifles which are already at E-town. Grip cap assembly processing has been improved as reported on by Mayfield and their stock supplier. Visual indications after review of the 10 guns just received confirm this. Grip cap fit looks better and does not exhibit open gaps as earlier samples did. E-town will focus on this during the 40 rd/rifle test on the .270 and .308 Win.. E-town will also need accuracy data from Mayfield on remaining calibers at the start of each initial production run for them to assess the accuracy potential of these products.

I have reviewed the accuracy data generated by Mayfield for the 7mm Rem. Mag. and 7mm-08 calibers. As part of the final T&P activity on the Model 770 it was agreed to that E-town would rely on Mayfield generated accuracy data as part of their T&P test protocol of this product.

Accuracy data was generated on a total of 92 guns for the 7mm Rem. Mag. and 100 for the 7mm-08. **Ilion 3-Shot maximum group limits of 2.5" and 1.7" respectively were used to calculate yields.** These were obtained from Ilion process records for these calibers.

Statistics follow for each caliber: (NOTE: 3 shots/group at 100 yds. out of Mayfields accuracy fixture)

	<u>7mm Rem. Mag</u>	<u>7mm-08</u>
Avg. Group Size (in.)	1.57	1.30
Std. Dev. (in.)	.36	.35
Max. Group (in.)	2.50	1.75
Min. Group (in.)	.75	.50

For the 7mm Rem. Mag. using a maximum acceptable group of 2.5 inches you can expect .5% (or 1 in 200 guns) to fall outside this limit. Interesting to note that of the 92 guns, none were over 2.5 inches but one gun was right at the limit. i.e. Observed data agrees very closely with the predicted statistics.

For the 7mm-08 using a maximum acceptable group of 1.7 inches you can expect approx. 12.7 % (approx. 13 in 100 guns) to fall outside this limit. Again; interesting to note that of the 100 guns tested, 13 were above the 1.7 inch threshold. This is perfect agreement between observation and prediction. In the case of these 13 guns Mayfield increased the number of shots per group which gives them additional chance to pass the gun and they passed all guns. As the # of shots/group goes up the limit also increases. I would encourage Mayfield to put an upper limit to this testing. For instance, Ilion has a 3-Shot, 4-Shot, and 5-Shot group specification. A gun is failed if it doesn't meet the 5-Shot group limit, as far as I know they do not keep testing that gun.

An ANOVA was run comparing the two data sets and the 7mm-08 did statistically outperform the 7mm Rem. Mag. as you would expect. Results from this ANOVA are shown below. As you can see the data sets are statistically significant at the 95% Confidence Level.

BOTTOM LINE – If you use the limits published here and shoot all product for accuracy you can expect 99.5 % yield on the 7mm Rem. Mag. and 87% yield on the 7mm-08. If a sampling plan is used as is normally done then there is a high probability that some 7mm-08's that shoot beyond the limit will be passed. One thing to note is that no really bad performing guns were found in the sample, therefore guns that don't meet this spec. will only miss it by a small amount.

Scott

One-way Analysis of Variance

Analysis of Variance

Source	DF	SS	MS	F	P
Factor	1	3.242	3.242	25.52	0.000
Error	177	22.483	0.127		
Total	178	25.725			

Individual 95% CIs For Mean
Based on Pooled StDev

Level	N	Mean	StDev	
7mm RM	92	1.5699	0.3635	(-----+-----+-----+-----)
7mm-08	87	1.3006	0.3488	(-----*-----)
Pooled StDev =		0.3564		1.32 1.44 1.56

From: Vicars, Gerald
Sent: Thursday, February 08, 2007 2:34 PM
To: Franz, Scott
Cc: Lance, Kevin D.
Subject: M770 first100.xls

Scott,
I am attaching a spreadsheet that details the accuracy data for the first 100 **M770 7mm-08 Rem.** The second sheet lists 92 **M770 7mm Rem. Mag.** We are currently not running 7mm Rem. Mag. and it will probably be sometime next month before we get back into this caliber. Will 92 guns suffice or do we need to hold out for the remaining 8 guns?
Gerald