

To: Scott Franz
From: Vince Norton
Subject: Model 710 Bolt Body Deviation
Date: 04 November 2004
Cc: At the Discretion of the Primary Recipient

Background:

Mayfield purchasing had requested a temporary deviation to the Model 710 bolt body outside diameter. Current OD is .693 +/- .001". It was requested to be able to accept bolt bodies with an OD of .688" min.

Evaluation:

To determine if the bolt diameter is acceptable the following evaluations were performed.

First three recent production Model 710's, with plastic receiver inserts, were measured for bolt body diameter and firing pin head to sear engagement. Then the bolt bodies were replaced with bolt bodies at .688 OD and the measurement was repeated. The following table shows the result of the measurements

	Last 3 of SN	880	Last 3 of SN	696	Last 3 of SN	676
	Factory Bolt	Small Bolt	Factory Bolt	Small Bolt	Factory Bolt	Small Bolt
Bolt Body Diameter	0.6929	0.6883	0.6929	0.6883	0.6929	0.6883
Bolt Body Form	0.0005	0.0002	0.0005	0.0002	0.0003	0.0001
Sear to Rear Tang Slot Bottom	0.079		0.084		0.079	
Firing Pin Head to bottom of						
Rear Tang	0.020	0.024	0.019	0.023	0.023	0.023
Engagement	0.059	0.055	0.065	0.061	0.056	0.056
Difference	0.0040		0.0040		0.0000	

The result is that the reduction in engagement is proportional to the reduction in the bolt body diameter but not more.

Secondly, a 20 round live fire function test was performed on each gun with the small bolts. Results were that the guns functioned without any malfunctions and felt comparable to the correct factory bolt.

Lastly the bolt handle braze joint was evaluated to make sure that the undersized bolt did not compromise the strength of the braze. The CAD layout of the bolt body and bolt handle revealed that the gap between the bolt body and the bolt handle for the braze would be reduced from .0034" to .0027". It is not believed that this reduction in gap would be enough to cause an issue with the braze. Next, a bolt handle was broken off of one of the samples to look at the braze joint. The brazed joint looked fine and no issues were detected. Finally 5

samples were tested on the Instron machine. The amount of force necessary to break the bolt handle was determined and then compared to previous test data. The following forces were required to break the bolt handle from the bolt body.

Sample No.	Force to break handle
1	254 lbs.
2	243 lbs.
3	244 lbs.
4	251 lbs.
5	240 lbs.

These results are in line with previous analysis and demonstrate that the brazed joint is not compromised by the smaller bolt body.

Conclusions:

Based on the analysis I would recommend approving a temporary deviation for Mayfield to accept bolts at the .688" minimum outside diameter.

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