

To: Mike Keeney
From: James Urbon
Date: January 28, 2002
Re: M/710 Bolt Stops

Some issues concerning the M/710 Bolt Stop have arisen in the past few months where a few of the bolt stops have chipped in assembly each month. The problem was communicated with the vendor, Sterling Sintered, and they suggested that the part be copper infiltrated. Samples of the copper infiltrated parts were received and upon initial evaluation they seemed to help. A sample of current production parts and copper infiltrated parts were sent to the R&D Technical Center in Elizabethtown, KY for material strength evaluation.

A test was designed for the Instron 8502 to overload the tip of the bolt stop where the bolt hits the bolt stop. Fixturing was made that held the bolt stop upright so that a punch could shear off the tip of the bolt stop. It was designed such that the samples could be changed without moving the fixture so that the engagement was constant sample to sample. Figures 1 and 2 show the setup on the Instron. The test was ran at a rate of 0.100"/min. 83

Figure 3 is a table of the individual peak load results for the samples tested. The current production part had an average peak load of 902 lbs. and the copper infiltrated parts had an average peak load of 1150 lbs. Figures 4 and 5 show the load vs. displacement curves for the samples tested.

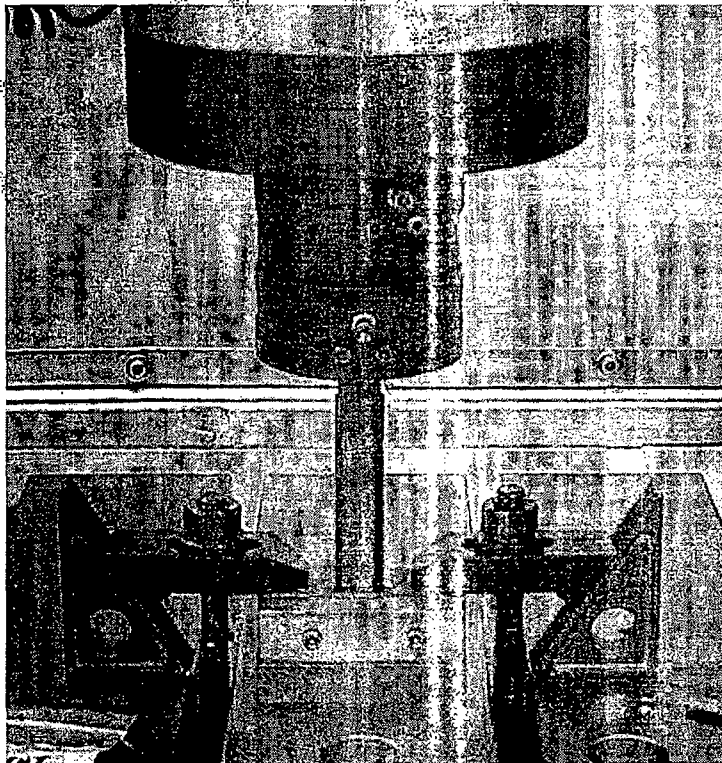


Figure 1: Fixture setup on the Instron.

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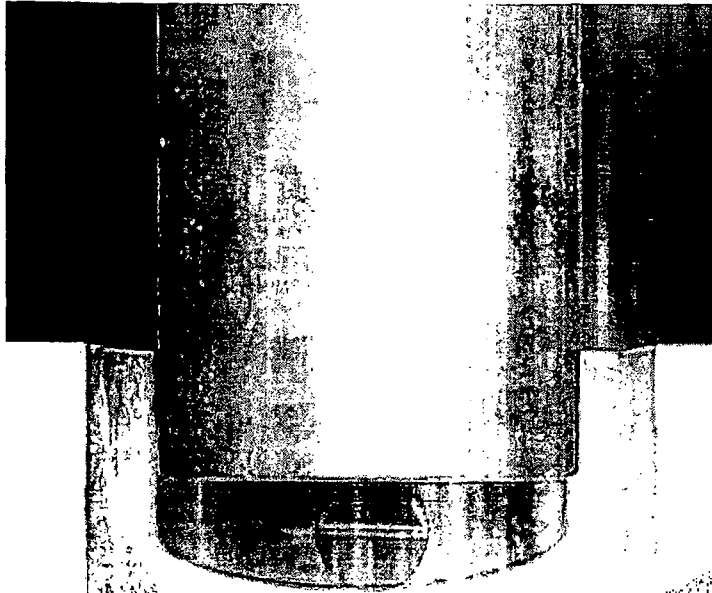


Figure 2: Close up of the punch to sample setup.

M710 Bolt Stop Shear Test Max Load		
Sample	Current Production	With Cu Infiltrate
1	934.5	1234.4
2	908.7	1087.4
3	922.8	1106.1
4	534.2	1220.9
5	972.3	1065.1
6	940.9	1095.9
7	909.6	1191.6
8	986.9	1151.8
9	947.4	1205.1
10	966.1	1142.1
Average	902.34	1150.04

Figure 3: Test Data

M/710 Bolt Stop - Current Production

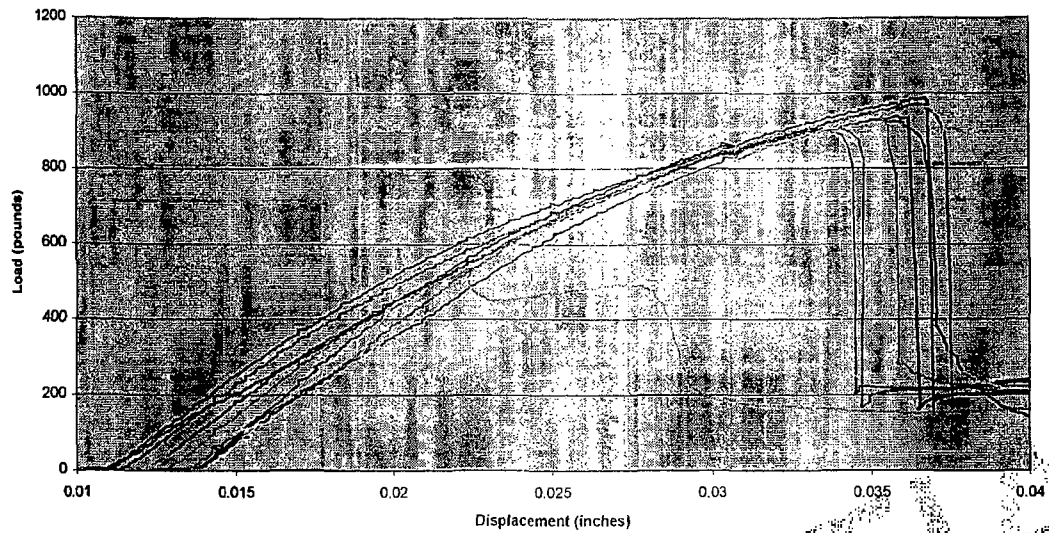


Figure 4: Load vs. Displacement curves for the current production samples.

M/710 Bolt Stop - With Copper Infiltrate

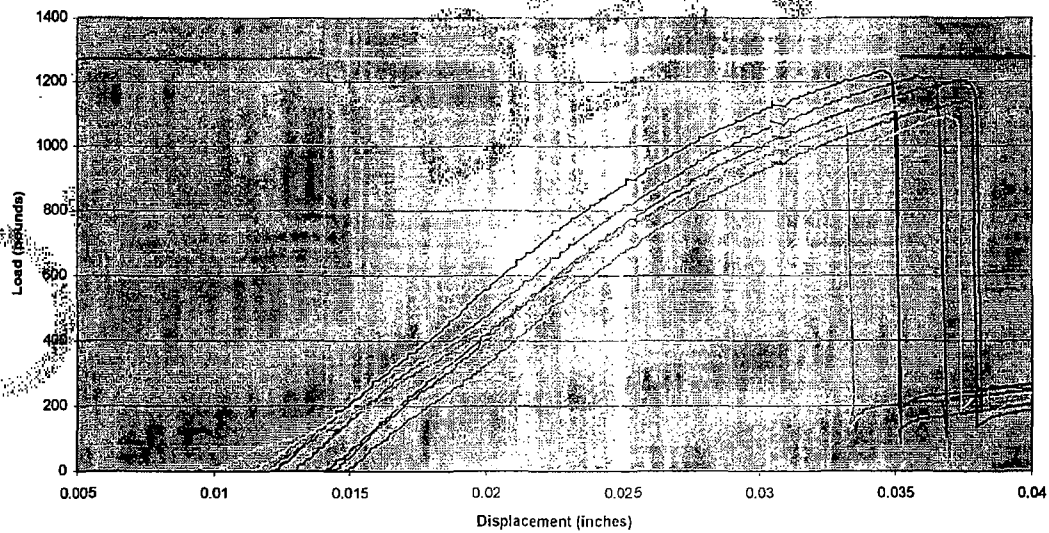


Figure 5: Load vs. Displacement curves for the copper infiltrated samples.