

September 12, 2000

To: Mike Keeney
From: Marlin Jiranek

Cc: D. Danner, S. Franz, J. Snedeker, P. Reesor, D. Diaz

**RE: M/710 MAGAZINE BOX SPOT WELD STRENGTH TEST
COMPARISON OF DAT BOXES TO PRODUCTION BOXES**

HISTORY:

During the initial stages of DAT testing procedure, several of the magazine boxes were failed during the endurance function testing process. All of the failures occurred at the two spot welds which hold the magazine box together after the sheet metal forming. Visual examination of the welds show that the spot welded regions were not making a satisfactory metallurgical weld.

The production magazine boxes manufactured at the Hickory, KY manufacturing facility were welded using a higher weld current setting than the DAT boxes. The exact current specifications were not known at the time of the writing of this report. However, knowing that the production and the DAT magazine boxes were manufactured using different welding parameters, a comparison was done to measure the relative shear strength of the welds.

SUMMARY:

The results of the shear strength testing show a large discrepancy between the DAT boxes and the current production boxes. Figure 2 (procedure section) presents the weld shear strength and the magazine box breaking strength for each of the tested samples in graphical form.

Based on these findings, the results show at least a 3X strength difference in shear strength when comparing the DAT magazine boxes to the current production magazine boxes. It is recommended that the DAT magazine boxes in test be replaced with current production magazine boxes and the welding parameters of these replacement boxes be documented.

PROCEDURE:

A total of five magazine boxes were presented for testing. Three were current DAT samples and two were current production samples. The samples were labeled as DAT 1, DAT 2, DAT 3, PROD 1, and PROD 2. DAT 1 was destroyed during the test set-up and no usable data was recorded. The other boxes, however, were all tested successfully using the set-up described. The magazine boxes were fixtured into the Instron tensile testing machine using a small block and two pins. Figure 1 presents an illustration of the testing set-up.

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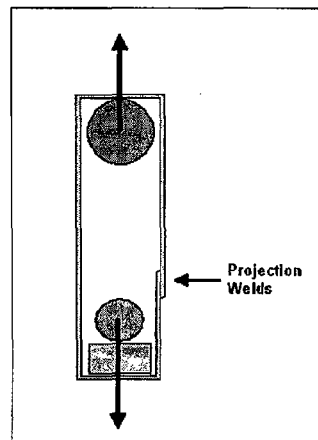


Figure 1. Illustration of the test set-up. Looking at the top of the magazine box cross-section.

The block was placed at the front of the magazine box to prevent the box from distorting during the tensile testing. The total force required to fail the box was reported from the Instron load cell. The shear strength per weld was calculated by dividing the total force by 4 (divide by 2 to determine the force per side, then divide by 2 again to determine the force per weld (2 welds on 1 side of the box)).

Figure 2 shows a graphical presentation of the data collected for all four of the tested samples. The testing results form the conclusion that the production boxes are much stronger than the DAT sample magazine boxes. The DAT boxes should be replaced with current production boxes as soon as they are available for test.

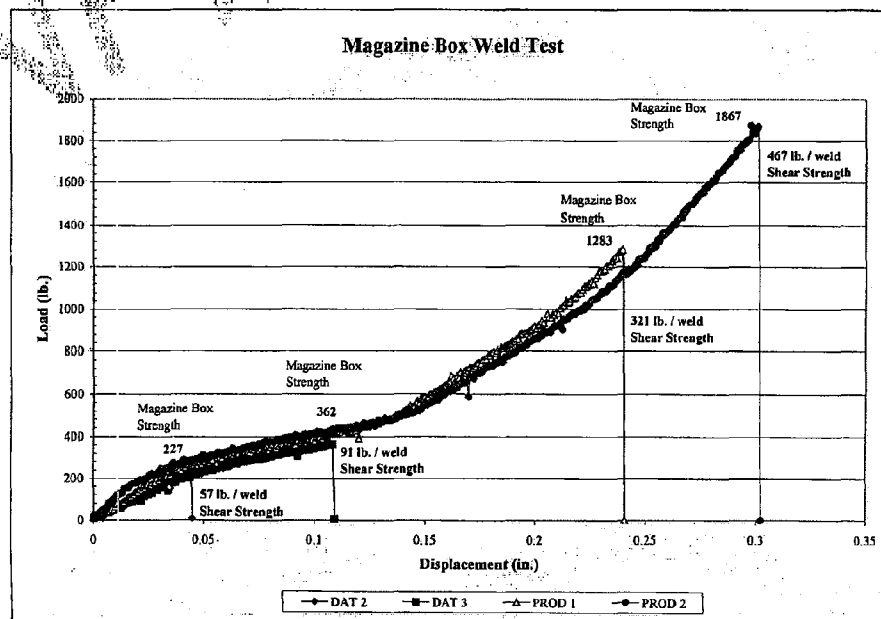


Figure 2. Chart of the testing results of the four tested magazine boxes.