Project No.: Q053
Test Start Date: 5/23/12
Issue Date: 5/25/12

EVALUATION OF EXO-TEC STAND-OFF MPV BRACKET FOR TENSION, COMPRESSION AND BENDING

Prepared for:
EXO-TEC MANUFACTURING, INC.
22 Washington Street
Stoughton, MA 02072

By:
R. J. KENNEY ASSOCIATES, INC.
72 Washington Street
Plainville, MA 02762
Phone: (508) 695-1526
Fax: (508) 695-2898

Prepared by:

Todd E. Watson

Todd E. Watson P.E.
Director of Testing Services

Assisted by:

Abdullah Khaliqi,
Assistant Director of Testing Services

BACKGROUND

Twelve Stand-Off MPV Brackets, manufactured by EXO-TEC Manufacturing, Inc., were delivered to our office on May 9, 2012. The brackets were, reportedly, fabricated of AISI C1008/1010 CR Steel.

OBJECTIVE

To conduct bending, tension, and compression testing of the assembled Stand-Off MPV Bracket. Such testing was to be conducted to simulate the installed condition.

TEST SPECIMEN PREPARATION

Compression and tension samples where prepared by drilling two, quarter-inch diameter holes into the three-inch diameter flat plate. The holes where placed three-eighths inch from the perimeter of the plate and in line with the center. Bolts where placed in the holes to serve as contact points during testing.

Bending samples were prepared by setting the three-inch diameter flat plate such that a half-inch of threads were engaged with the threaded female collar, leaving one inch of threads exposed.

TEST PROCEDURE

Three brackets for each test were evaluated, for a total of nine tests. Testing was conducted using a floor-mount, Instron Universal Tester set at a feed rate of 0.3 inches per minute. Compression and tension testing were conducted with the instrument's cross head engaging the bolt heads that were inserted into the bracket plate. Bending testing was conducted with the instrument's cross head pushing down on the edge of the bracket plate. See Figures 1, 2, and 3 for each loading scenario.

Figure 1 - Bending Test

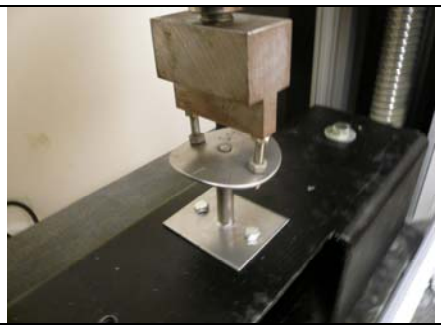

Figure 2 - Compression Test

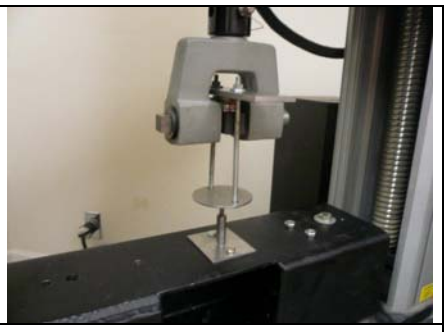

Figure 3 - Tension Test

TEST RESULTS

Load/Deflection curves were recorded during testing for each of the nine samples. The curves depicting the average of the three samples for each test are provided in Figures 4, 5, and 6 below.

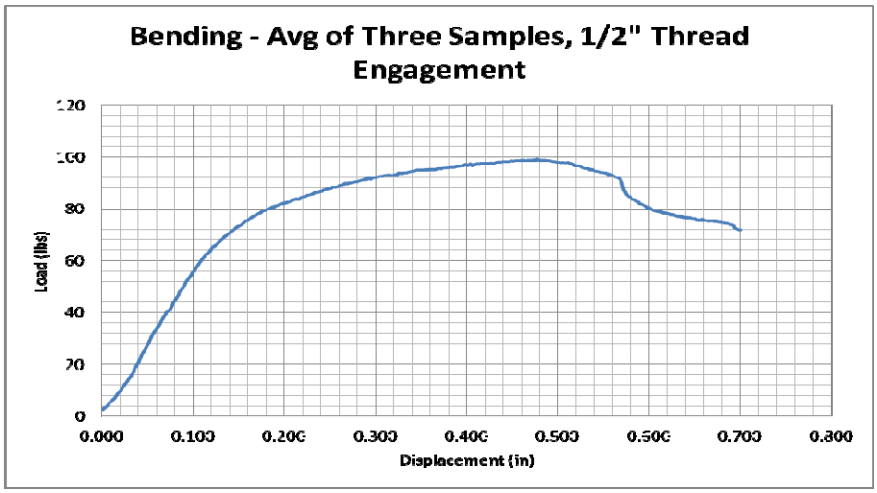

Figure 4 - Bending Test Results. Deformation of Pin at Base of Female Threaded Collar Occured in All Three Samples.

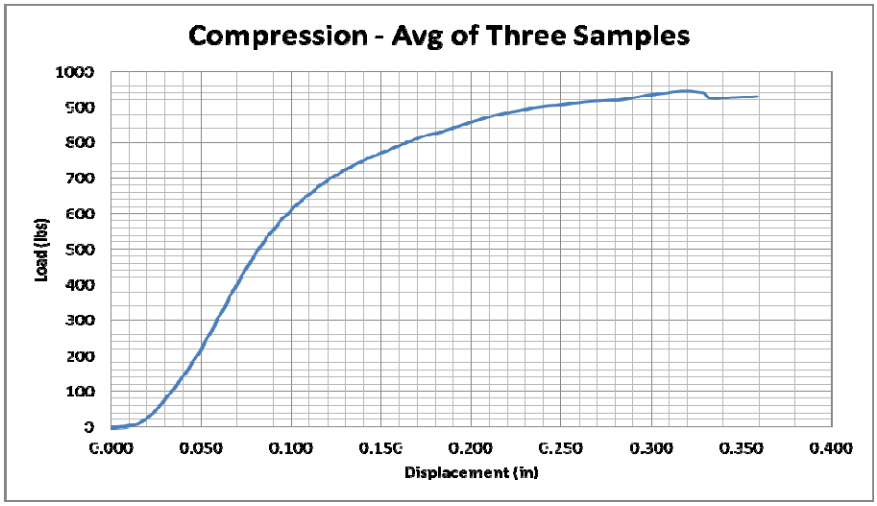

Figure 5 - Compression Test Results. Deformation of Round Plate Occured in All Three Samples.

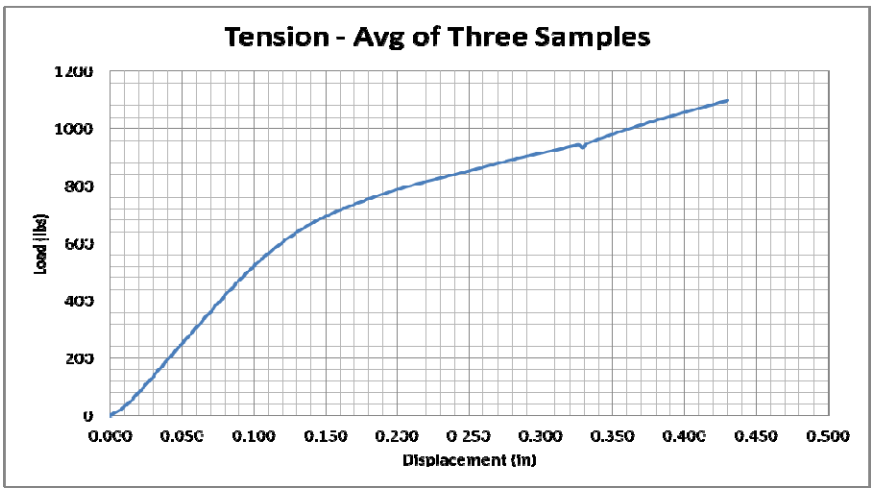

Figure 6 - Tension Test Results. Deformation of Round Plate Occured in

All Three Samples.

Test	Load at Elastic Limit (lbs)
Bending	60
Compression	550
Tension	550

Table 1 - Approximate Load at Elastic Limit
(No Permanent Deformation When Load is Released)