Sherry Laboratories
3100 North Hemlock Circle
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LABORATORY REPORT

Attn: Carl Strom
C Sert Mfg LLC
20422 Callon Dr.
Topanga, CA 90290

Report No.: **09030755-001-v1**
Date Received: **3/17/2009**
Date Reported: **4/30/2009**
P.O. No.: **VERBAL**

Sample Description: Pullout Test of Inserts

Background and Procedure

A total of 15 thread repair inserts from C-Sert Mfg. were submitted for load testing to failure. The C-Serts were installed by the client in 1018 carbon steel without any Loctite type adhesive. Three specimens of each submitted size were placed under an increasing tensile load until the repair insert or socket head bolt failed. The 6mm, 8mm, 10mm and 12mm inserts were tested using a MTS tensile testing machine, (Sherry Laboratory ID M232, calibration due date: 3/10/10), see Figure 1. The 16mm and 24mm inserts were tested using a SATEC tensile test machine, (Sherry Laboratory ID M347 calibration due date: 10-2-09), see Figure 2. The loads on the 6mm, 8mm, 10mm and 12mm inserts were applied at a rate of 0.050”/minute. The loads on the 16mm and 24mm inserts were applied at a rate of 0.50”/minute. The applied load and the displacement of the cross head was recorded for the duration of each test. The Load vs. Displacement curves were plotted for each test and are shown in Figures 3 through 8. A summary of the results is given in Table 1. The Certification of Calibration for the MTS and SATEC are shown in Figures 15 and 16.

Results

All tests conducted were terminated when the socket cap screw used to apply the load to the C-Sert inserts failed. None of the C-Sert inserts exhibited any slippage or damage to the inserts during or after the tests, as shown in Figures 9 through 14. The C-Sert internal threads remained undamaged as indicated by the easy removal by hand of the fractured ends of the screws.

Approved By: W. Don Bunn

W. Don Bunn, PE
Project Engineer

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Table 1
Summary of Loads at Failure

Test ID	6MM	8MM	10MM	12MM	16MM	24MMM
1	5678 lbs	10,922 lbs	17,031 lbs	23,335 lbs	47,559 lbs	104,772 lbs
2	5624 lbs	10,895 lbs	16,743 lbs	23,412 lbs	47,817 lbs	104,410 lbs
3	5631 lbs	10,874 lbs	16,923 lbs	23,420 lbs	46,518 lbs	105,151 lbs

Note: No Insert failed. The tests were terminated with the fracture of the socket cap screw used to apply the load. The 6MM, 8MM, 10MM and 12MM inserts were tested on a MTS tensile test machine. The 16MM and 24MM inserts were tested on SATEC tensile test machine.

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Figure 1, Insert under test in the MTS tensile testing machine

Figure 2, Insert under test in the SATEC tensile testing machine

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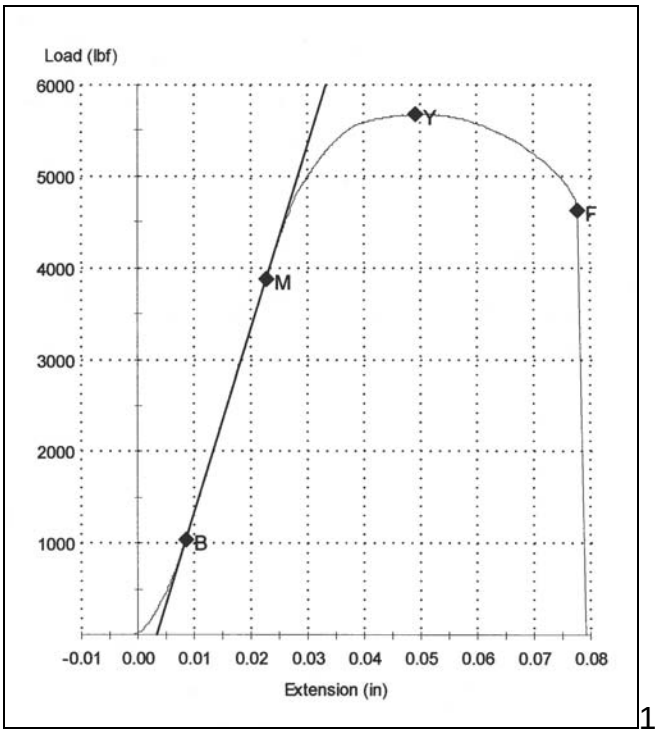

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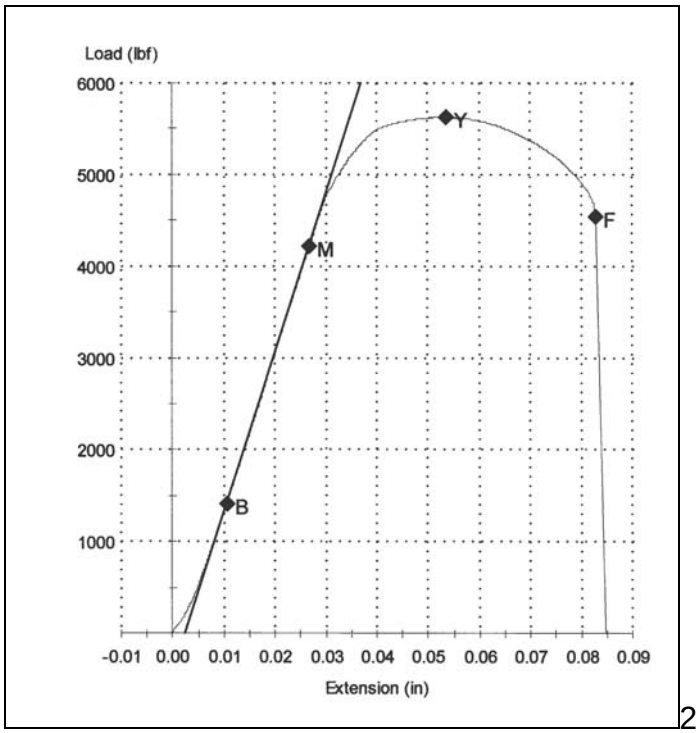

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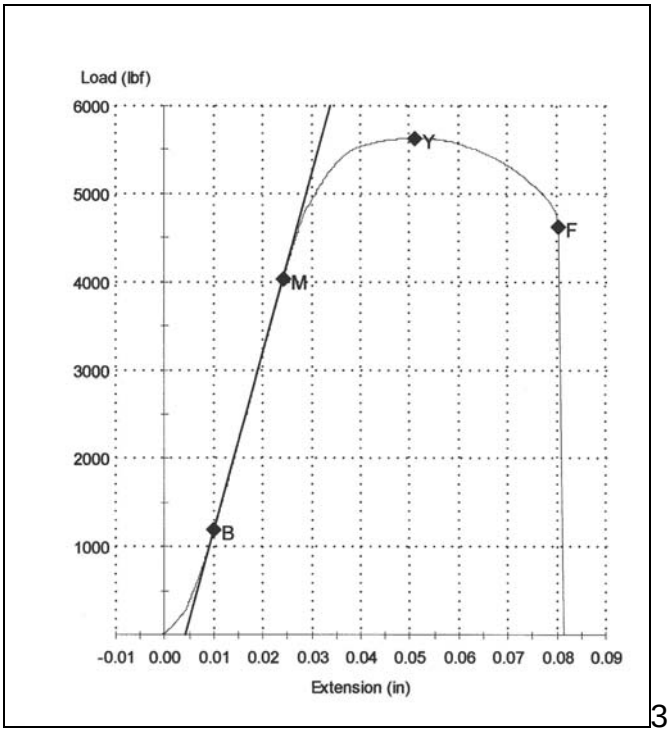

3

6MM	
ID	Failure Load
1	5678 lbs
2	5624 lbs
3	5631 lbs

Figure 3, Load curves for the 6MM inserts

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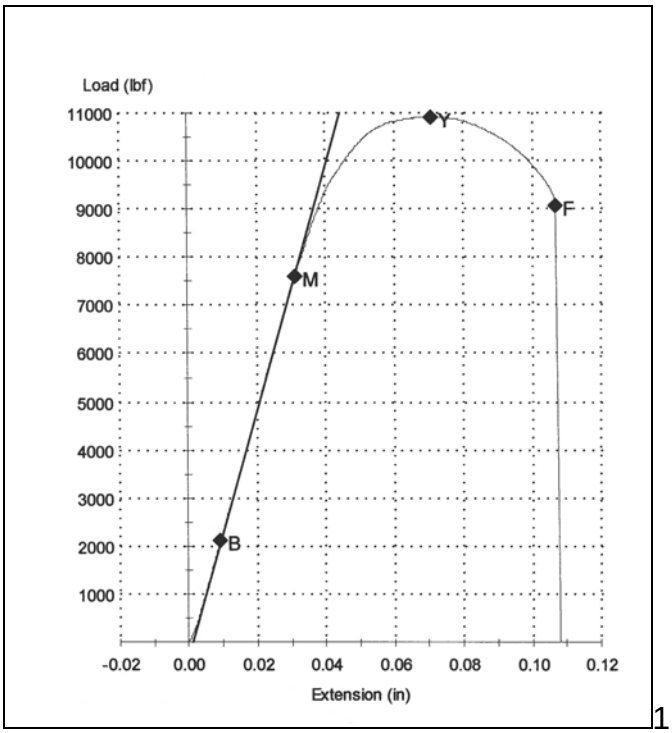

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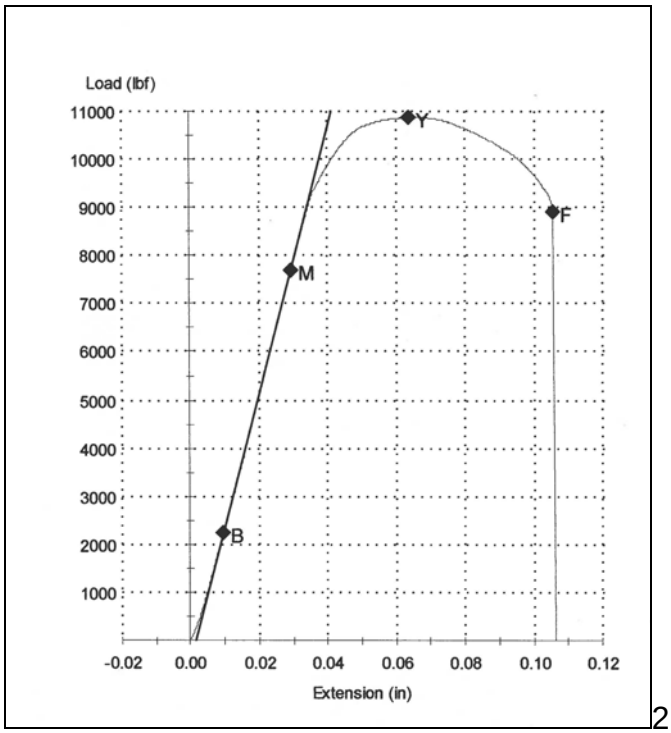

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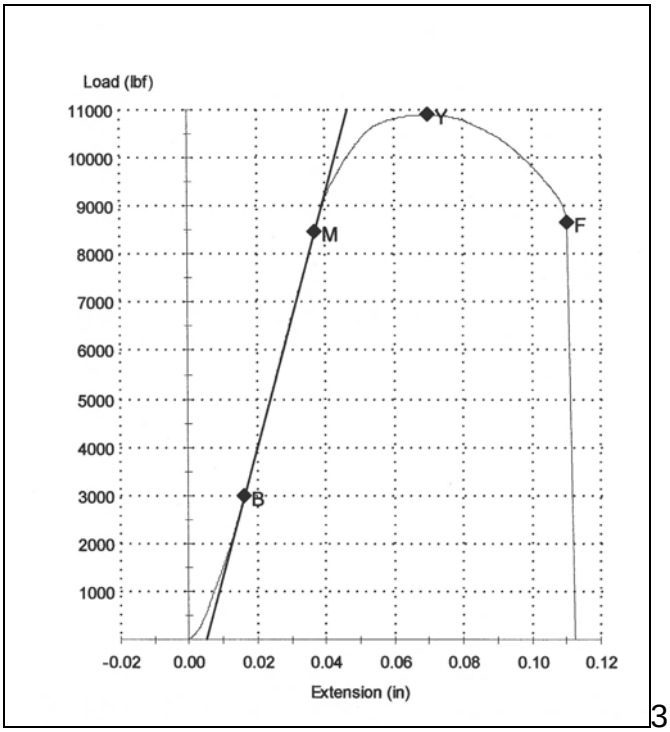

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8MM	
ID	Failure Load
1	10,922 lbs
2	10,895 lbs
3	10,874 lbs

Figure 4, Load curves for the 8MM inserts

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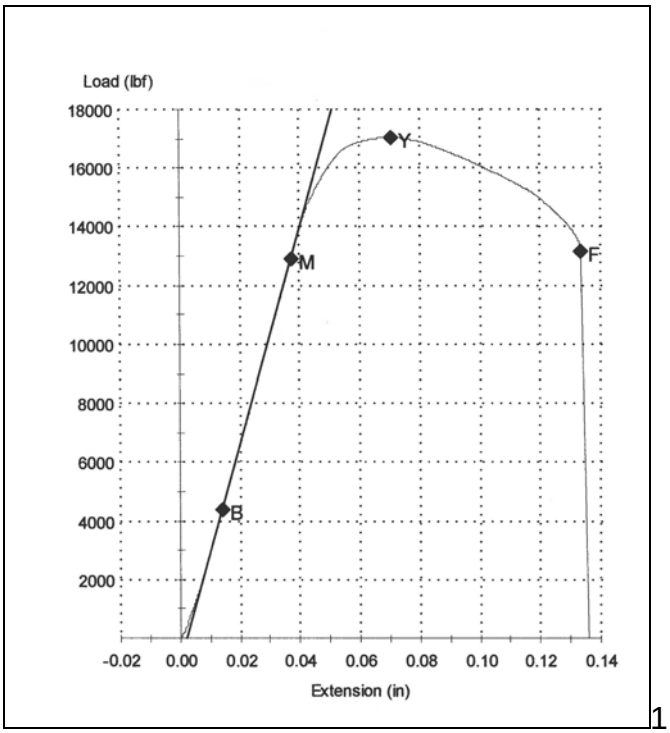

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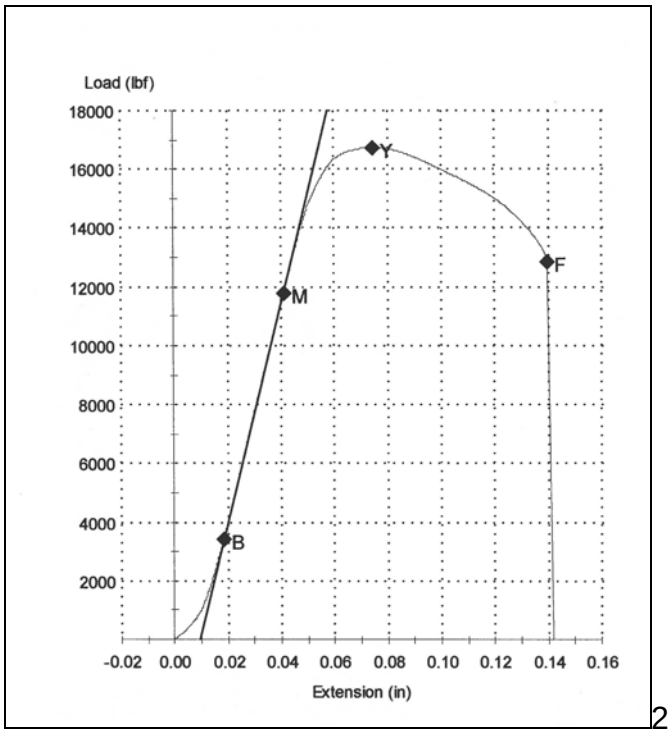

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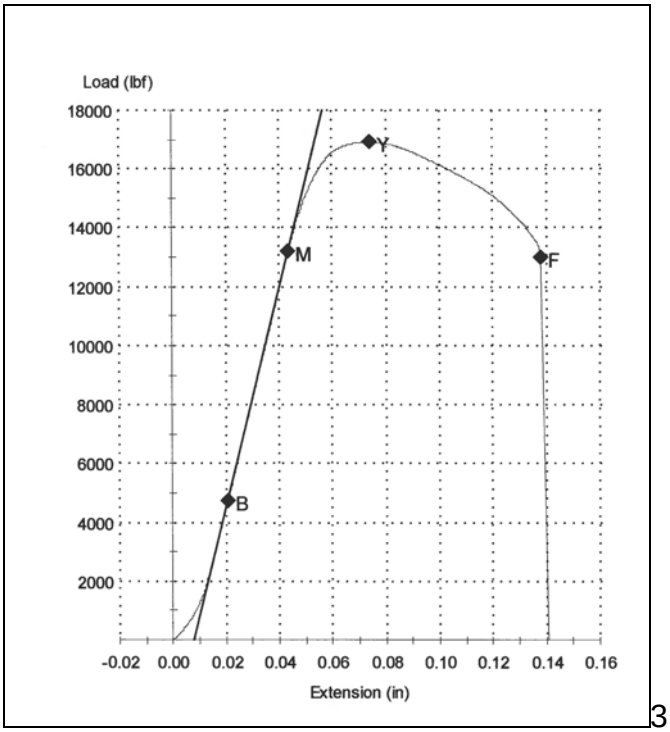

3

10MM	
ID	Failure Load
1	17,031 lbs
2	16,743 lbs
3	16,923 lbs

Figure 5, Load curves for the 10MM inserts

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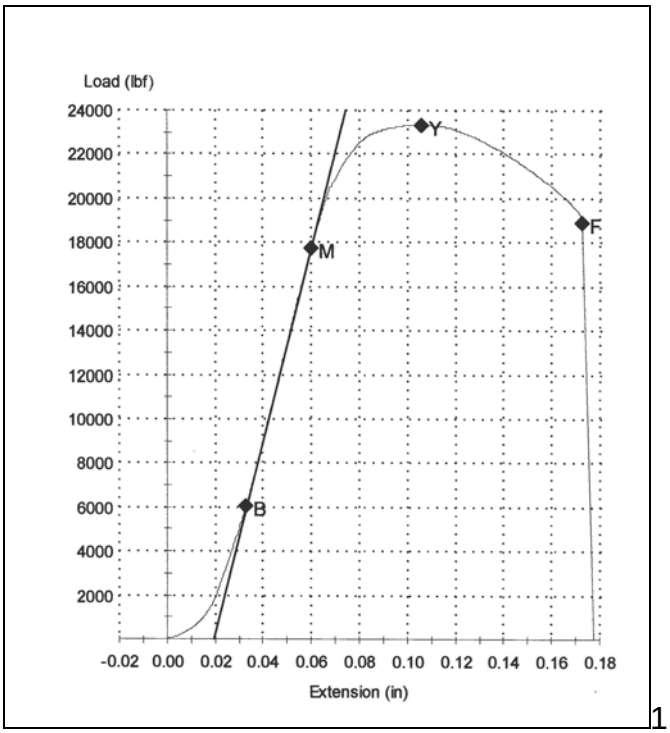

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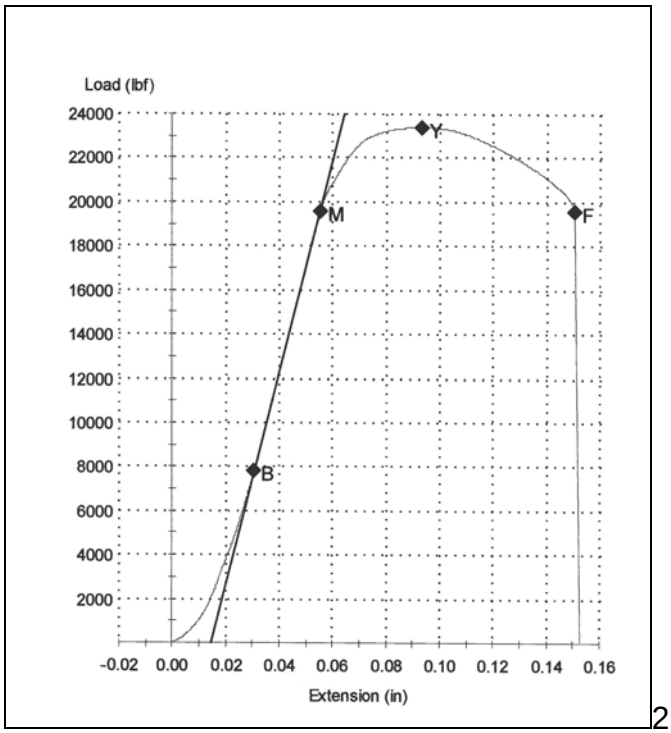

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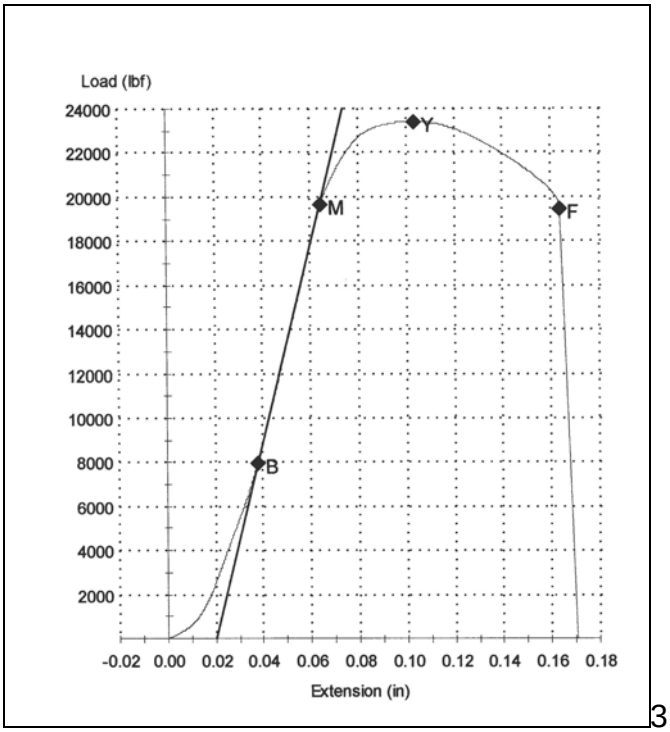

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12MM	
ID	Failure Load
1	23,335 lbs
2	23,412 lbs
3	23,420 lbs

Figure 6, Load curves for the 12MM inserts

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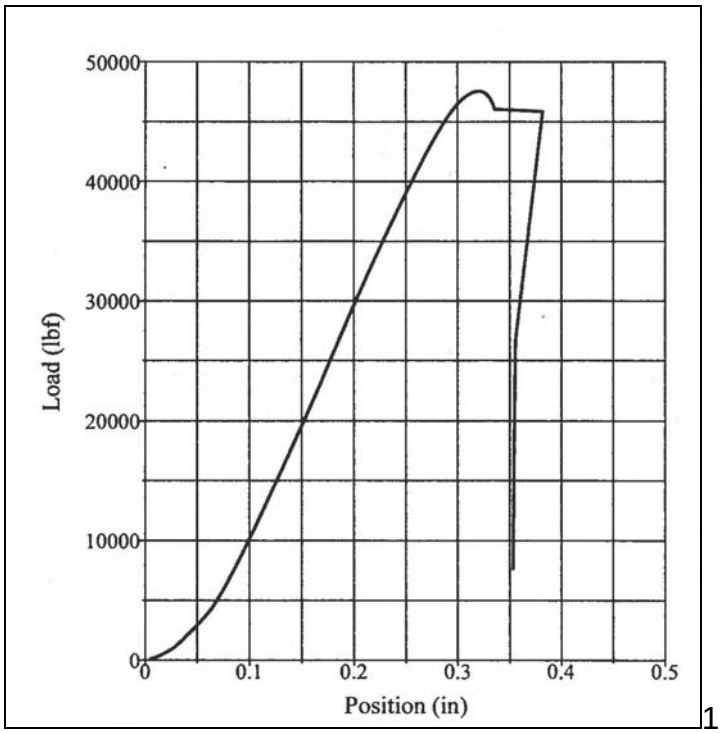

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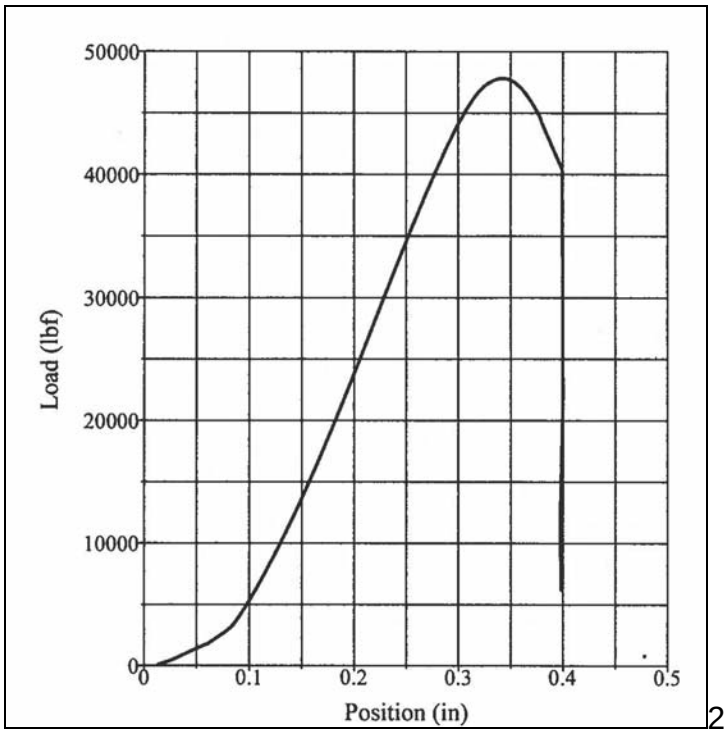

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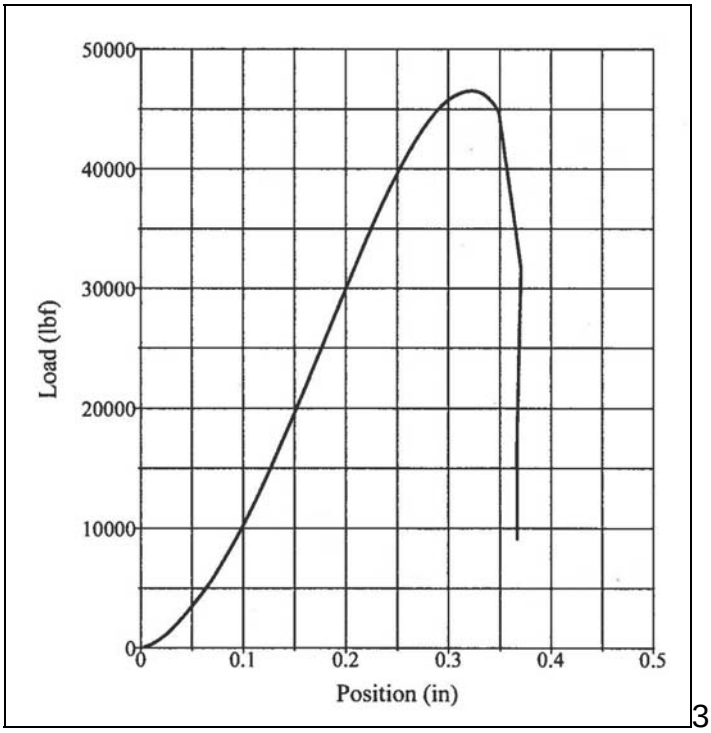

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16MM	
ID	Failure Load
1	47,559 lbs
2	47,817 lbs
3	46,518 lbs

Figure 7, Load curves for the 16MM inserts

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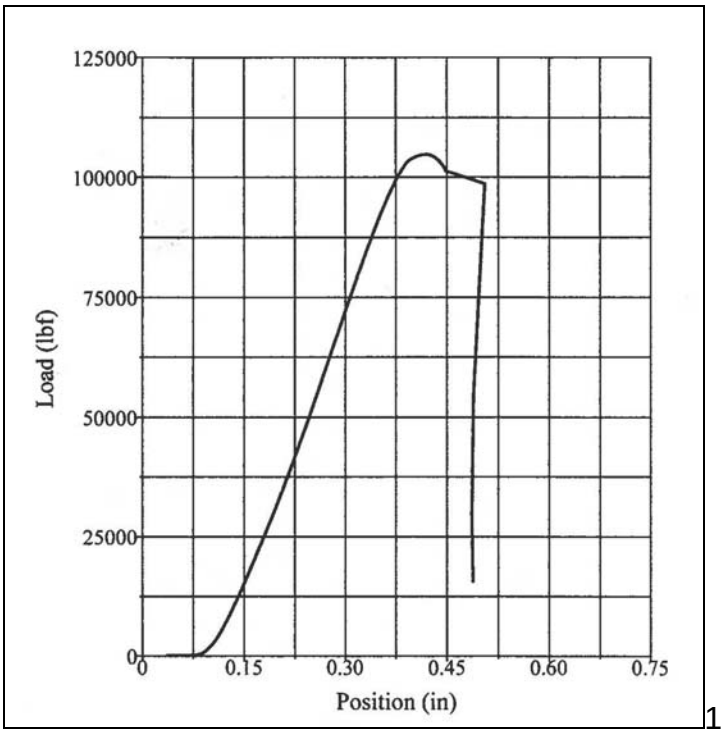

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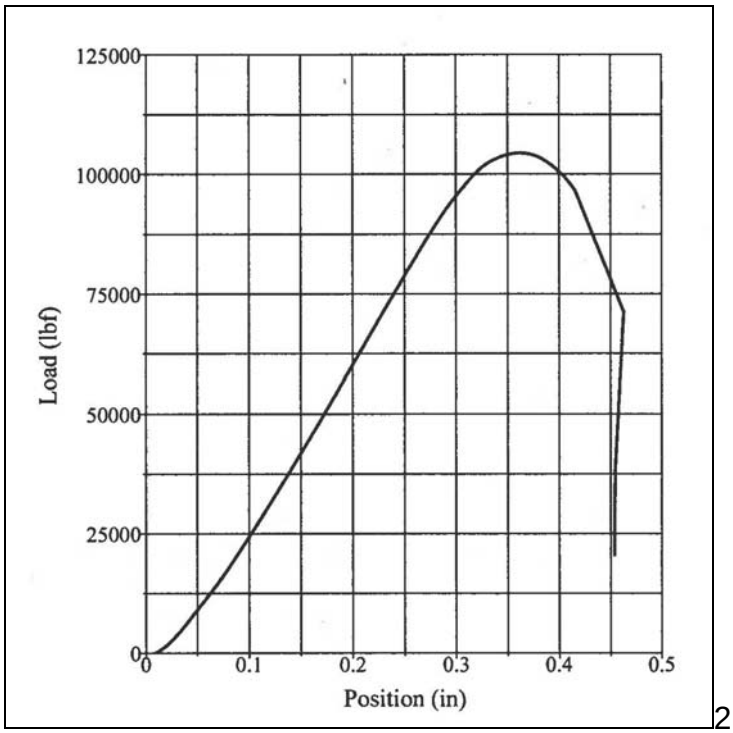

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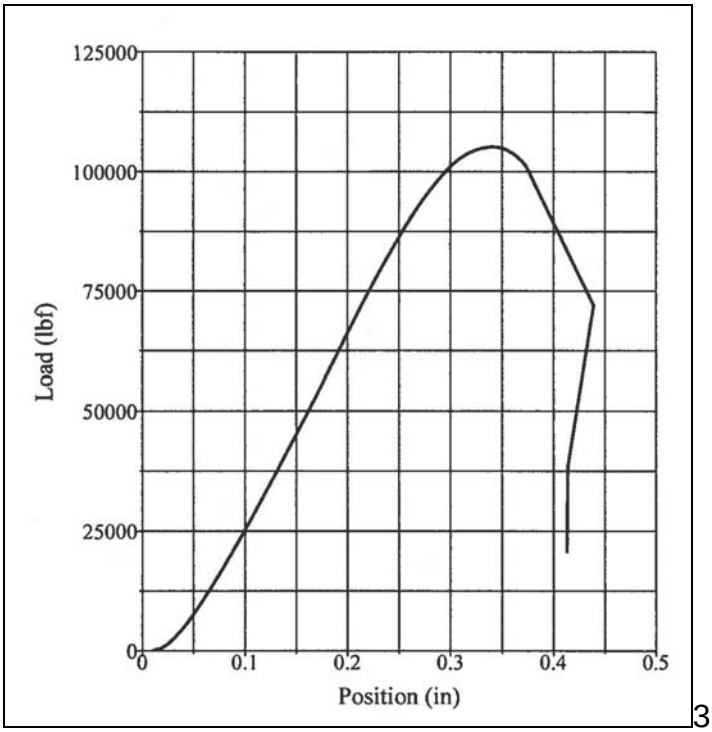

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24MM	
ID	Failure Load
1	104,772 lbs
2	104,410 lbs
3	105,151 lbs

Figure 8, Load curves for the 24MM inserts

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Figure 9, Fractured 6MM socket cap screws and inserts after the load tests.

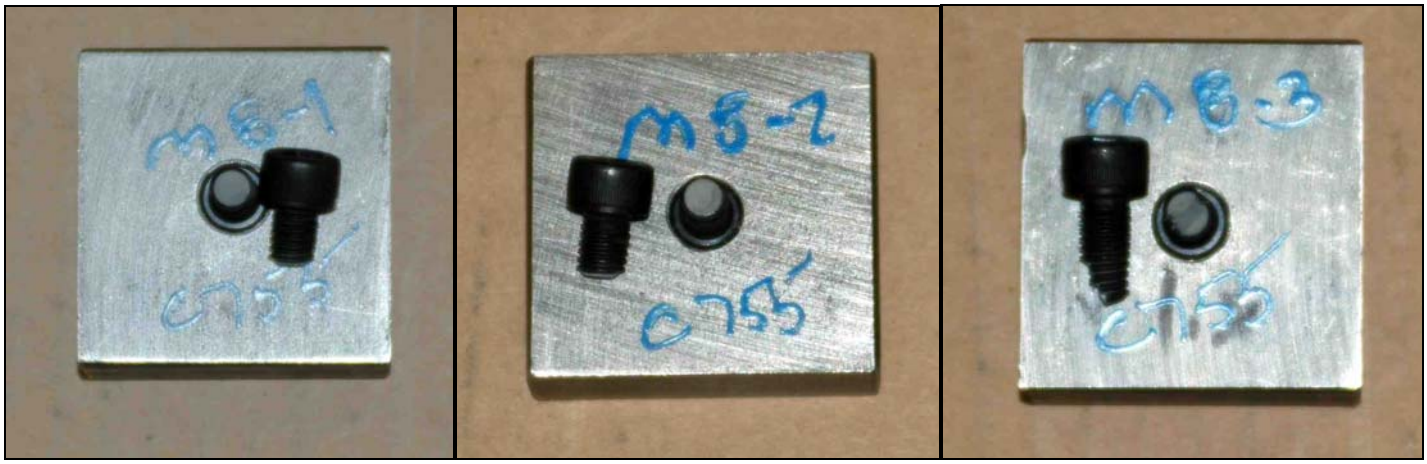

Figure 10, Fractured 8MM socket cap screws and inserts after the load tests.

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Figure 11, Fractured 10MM socket cap screws and inserts after the load tests.

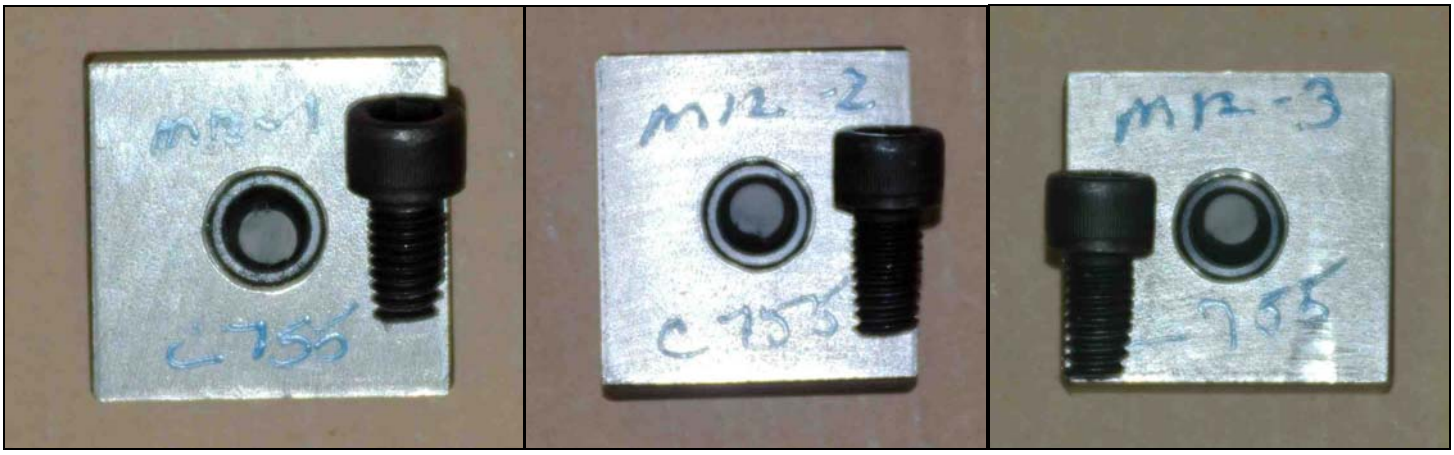

Figure 12, Fractured 12MM socket cap screws and inserts after the load tests.

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Figure 13, Fractured 16MM socket cap screws and inserts after the load tests.

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Date Reported: 4/30/2009

Figure 14, Fractured 24MM socket cap screws and inserts after the load tests.

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C Sert Mfg LLC
Report No.: 09030755-001-v1
Date Reported: 4/30/2009

CERTIFICATE OF CALIBRATION

ISSUED BY: INSTRON CALIBRATION LABORATORY

DATE OF ISSUE: 11-Mar-09 CERTIFICATE NUMBER: SV0903090078-11

NVLAP
Lab code: 200301-0

INSTRON

Instron
825 University Avenue
Norwood, MA 02062-2643
Telephone: (800) 473-7838
Fax: (781) 575-5750
Email: service_requests@instron.com

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APPROVED SIGNATORY

Dick Hesselgesser

Digitally signed by Dick Hesselgesser
DN: cn=Dick Hesselgesser, c=US, o=Instron Corp., ou=Central Service
Date: 2009.03.11 12:12:38 -04'00'

Type of Calibration: Force
Relevant Standard: ASTM E4 - 07
Date of Calibration: 11-Mar-09

Customer

Name: SHERRY LABS. OF OKLAHOMA, LLC
Address: 3100 NORTH HEMLOCK CIRCLE
BROKEN ARROW OK 74012
P.O./Contract No.:
Contact: JEFF SIMMONS

Machine

Manufacturer: MTS
Serial Number: 342-31(M232)
System ID: 50KMTS/342-31M232
Range Type: Single

Transducer

Manufacturer: MTS
Transducer ID: 50KLB /403
Capacity: 50000 lbf
Type: Tension/Compression

Classification

1. Digital Readout - PASSED

Certification Statement

This certifies that the forces verified with machine indicator(s) (listed above) that passed are WITHIN ± 1 % accuracy, 1 % repeatability, and zero return tolerance.
All machine indicators were verified on-site at customer location by Instron in accordance with ASTM E4.
The verification and equipment used conform to a controlled Quality Assurance program which meets the specifications outlined in ANSI/NCSL Z540-1, ISO 10012, ISO 9001:2000 and ISO/IEC 17025:2005.
The certification is based on runs 1 and 2 only. A third run is taken to satisfy uncertainty requirements according to ISO 17025 specifications.

Method

The testing machine was verified in the 'as found' condition with no adjustments carried out.

CERTIFICATE
☑ Accepted
☐ Rejected
Date 3/11/09 Int.

Instron CalproCR Version 3.7

The results indicated on this certificate and the following report relate only to the items verified. If there are methods or data included that are not covered by the NVLAP accreditation it will be identified in the comments. Any limitations of use as a result of this verification will be indicated in the comments. This report must not be used to claim product endorsement by NVLAP or the United States government. This report shall not be reproduced, except in full, without the approval of the issuing laboratory.

Figure 15, Certification of Calibration of MTS Tensile Testing Machine.

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C Sert Mfg LLC
Report No.: 09030755-001-v1
Date Reported: 4/30/2009

CERTIFICATE OF CALIBRATION

ISSUED BY: INSTRON CALIBRATION LABORATORY

DATE OF ISSUE: 02-Oct-08 CERTIFICATE NUMBER: 837656-1

NVLAP
Lab code: 200301-0

INSTRON

Instron
825 University Avenue
Norwood, MA 02062-2643
Telephone: (800) 473-7838
Fax: (781) 575-5750
Email: service_requests@instron.com

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Type of Calibration: Force **Date of Calibration:** 02-Oct-08
Relevant Standard: ASTM E4 **Customer Requested Due Date:** NA

Customer

Name: SHERRY LABS. OF OKLAHOM, LLC
Address: 3100 NORTH HEMLOCK CIRCLE
BROKEN ARROW OK 74012
P.O./Contract No.:
Contact: JEFF SIMMONS

Machine

Manufacturer: BALDWIN (M347)
System ID: 120BTEC523645
Range Type: Multi

Transducer

Manufacturer: SENSOTEC
Transducer ID: 120K PRESSURE TRANSDUCER
Capacity: 120000 lbf
Type: Compression

Classification

1. Digital Readout - PASSED

Certification Statement

This certifies that the forces verified with machine indicator(s) (listed above) that passed are WITHIN ± 1 % accuracy, 1 % repeatability, and zero return tolerance.
All machine indicators were verified on-site at customer location by Instron in accordance with ASTM E4.
The verification and equipment used conform to a controlled Quality Assurance program which meets the specifications outlined in ANSI/NCSL Z540-1, ISO 10012-1, ISO 9001, and ISO/IEC 17025 (formerly ISO/IEC Guide 25).
The certification is based on runs 1 and 2 only. A third run is taken to satisfy uncertainty requirements according to ISO 17025 specifications.

Adjustments

The testing machine was verified in the 'as found' condition with no adjustments carried out.

Summary of Results

Temperature at start of verification: 72.40 °F.

Indicator 1. - Digital Readout (lbf)

Range Full Scale (%)	Tested Force Range (lbf)	Mode	ASTM E4 Max Error (%)	ASTM E4 Max Repeat Error (%)	Zero Return	Resolution (lbf)	ASTM E4 Lower Limit (lbf)
100	-24000 to -120000	C	0.28	0.08	Pass	100	20000
40	-4800 to -48000	C	0.58	0.17	Pass	10	2000

Instron CalproCR Version 3.6

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Figure 16, Certification of Calibration of SATEC Tensile Testing Machine.

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