**Report No.**

**209-SGS-2012-13**

# SEAT BELT ASSEMBLY COMPLIANCE TESTING
# FMVSS 209

**2012 Buick Verano**
**MODEL NO. 22931563/13382776/13297071/22859927 (GM)**
**P/N 6150473T1G/623410500/617025200D/6216558T1C (Autoliv)**

**SGS NORTH AMERICA INC.**
**291 FAIRFIELD AVENUE**
**FAIRFIELD, NJ 07004**

**FINAL REPORT**

**2843009-13**

**August 16, 2012**

**PREPARED FOR**

**U.S. DEPARTMENT OF TRANSPORTATION**
**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**
**ENFORCEMENT**
**OFFICE OF VEHICLE SAFETY COMPLIANCE (Room W45-304)**
**1200 NEW JERSEY AVENUE, SE**
**WASHINGTON, D.C. 20590**

**Report No.:** 209-SGS-2012-13

**Prepared By:** SGS North America Inc.

**Approved by**: Frank Savino

Frank Savino

**Approval Date:** August 16, 2012

**FINAL REPORT ACCEPTANCE BY OVSC:**

**Accepted By:**

**Acceptance Date:** August 16, 2012

**TECHNICAL REPORT Title Page**

| | | | |
|---|---|---|---|
| 1. Report No.<br>209-SGS-2012-13 | 2. Govt. Accession No. | | 3. Recipient's Catalog No. |
| 4. Title and Sub-Title<br>Final report of FMVSS No. 209 Compliance Testing of Autoliv P/N 6150473T1G / 623410500 / 617025200D / 6216558T1C Type 2 seat belt assemblies being installed in 2012 Buick Verano, Front Left Seat | | | 5. Report Date:<br>August 16, 2012<br>6. Performing Organization Code<br>SGS |
| 7. Author<br>Frank Savino, Project Manager | | | 8. Performing Organization Report No.<br>SGS Report 2843009-13 |
| 9. Performing Organization Name and Address:<br>SGS North America Inc.<br>291 Fairfield Avenue<br>Fairfield, NJ 07004 | | | 10. Work Unit No.<br>11. Contracts or Grant No.<br>DTNH22-08-D-00107 |
| 12. Sponsoring Agency Name and Address:<br>U.S. Department of Transportation<br>National Highway Traffic Safety Administration, Enforcement<br>Office of Vehicle Safety Compliance (Room W45-304)<br>1200 New Jersey Avenue, SE<br>Washington, D.C. 20590 | | | 13. Type of Report and Period Covered: FINAL<br>June 27-August 8, 2012<br>14. Sponsoring Agency Code<br>NVS-220 |
| 15. Supplementary Notes | | | |
| 16. Abstract<br>Compliance tests were conducted on Autoliv Type 2 seat belt assemblies being installed in 2012 Buick Verano in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-209-08. Test failures identified were as follows: None. | | | |
| 17. Key Words<br>FMVSS No. 209<br>Compliance Testing<br>Safety Engineering | 18. Distribution Statement<br>Copies of this report are available from --<br>National Highway Traffic Safety Administration<br>Technical Information Services (NPO-411)<br>1200 New Jersey Avenue, SE (Room E12-100)<br>Washington, DC 20590<br>Email: tis@nhtsa.dot.gov<br>Fax: 202-493-2833 | | |
| 19. Security Classif. (Of This Report)<br>Unclassified | 20. Security Classif. (Of This Page)<br>Unclassified | 21. No of Pages: 45 | 22. Price |

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# PURPOSE

## SECTION 1

## PURPOSE

**Purpose:** The purpose of this test was to determine if the production seat belt assemblies supplied by the National Highway Traffic Safety Administration met the requirements specified in TP-209-08 as governed by the contract.

# SECTION 2

# COMPLIANCE TEST DATA SUMMARY

## SECTION 2

## SUMMARY OF RESULTS

RETRACTOR TYPE: ___-ALR;__X___-ELR; ____ -ELR w/ALR GROUP NO.: 013

ELR RETRACTOR SENSITIVITY: _____-WSI; _____-VSI; __X__-VWSI

BELT DATE CODES:____25W_____

BELT ASSY MFR.:_____Autoliv_____

BELT ASSY PART/MODEL NO.: 6150473T1G/623410500/617025200D/6216558T1C

SELLER/VEHICLE MFR.: _____General Motors Corp._____

SELLER/VEH. MFR. PART/MODEL NO.: 22931563/13382776/13297071/22859927

LABELING / MARKING REQUIREMENT: _____P_____

SUMMARY OF RESULTS: (P = Passed, F = Failed, NA = Not Applicable)

(Continued on next page)

| No. | Test Title: | Group Number<br>Specimen No. | C<br>7 | C<br>8 | C<br>9 |
|---|---|---|---|---|---|
| | | | | | |
| **09** | Hardware Corrosion Resistance | | **P** | **P** | **P** |
| **10** | Hardware Temperature Resistance | | **P** | **P** | **P** |
| **11** | Hardware Buckle Latch | | **P** | **P** | **P** |
| **12** | Loop Load | Pelvic Type 2 | **P** | **P** | **P** |
| | | Upper Torso | **P** | **P** | **P** |
| **13** | Elongation | Pelvic Type 2 | **P** | **P** | **P** |
| | | Upper Torso | **N/A** | **N/A** | **N/A** |
| **14** | Buckle Release Force | | **P** | **P** | **P** |
| **15** | Common Hardware Load | | **P** | **P** | **P** |
| **16** | Cut Webbing Strength | Pelvic Type 2 | **N/A** | **N/A** | **N/A** |
| | | Upper Torso | **N/A** | **N/A** | **N/A** |
| **17** | Retractor Load | Pelvic Type | **N/A** | **N/A** | **N/A** |
| | | Upper Torso | **P** | **P** | **P** |

**REMARKS:** Retractor contains a load-limiting device

**RECORDED BY:** Mark Ostrovsky and John Roycraft

**PREPARED BY:** Frank Savino

**APPROVED BY:** Frank Savino

| No. | Test Title: | Group Number / Specimen No. | D / 10 | D / 11 | D / 12 |
|---|---|---|---|---|---|
| | | | | | |
| **18** | Retractor Performance--Baseline Characteristics | | **P** | **P** | **P** |
| **19** | Post Corrosion Cycling (2,500 Cycles) | | **P** | **P** | **P** |
| **20** | Post Temperature Cycling (2,500 Cycles) | | **P** | **P** | **P** |
| **21** | Dust Test | | **P** | **P** | **P** |
| **22** | Additional Cycling (5,000 to 45,000 Cycles) | | **P** | **P** | **P** |
| **23** | Post Test Retractor Performance | | **P** | **P** | **P** |
| **24** | Minimum Retractor Strength | Pelvic Type | **N/A** | **N/A** | **N/A** |
| | | Upper Torso | **P** | **P** | **P** |

**REMARKS:**

**RECORDED BY:** Mark Ostrovsky and John Roycraft

**PREPARED BY:** Frank Savino

**APPROVED BY:** Frank Savino

## TEST RESULTS FOR SPECIMENS 7, 8 & 9

**GROUP NO.:** 013 **TEST DATE:** July 24-25, 2012

**CORROSION RESISTANCE**
(Spec=24 hr. exposure time)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 7 | 8 | 9 |
| **A** | Attachment Hardware Pass/Fail | **P** | **P** | **P** |
| **B** | Other Hardware Pass/Fail | **P** | **P** | **P** |

**REMARKS:**

**TEMPERATURE RESISTANCE** **TEST DATE:** July 31-August 2, 2012
(Spec=48 hrs. @ 80° ± 1°C)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 7 | 8 | 9 |
| **A** | Parts Deteriorated | **P** | **P** | **P** |

**REMARKS:**

**BUCKLE LATCH** **TEST DATE:** August 8, 2012

(Spec=200 Cycles @ 133 ± 13 N force; False Latching Spec=22 N max separation force)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 7 | 8 | 9 |
| **A** | Buckle Latch Pass/ Fail | **P** | **P** | **P** |
| **B** | False Latching Force, N | **N/A*** | **N/A*** | **N/A*** |
| **C** | False Latching Pass/Fail | **P** | **P** | **P** |

**REMARKS:** *These metal to metal buckles were examined and partial engagement was not observed by means of any technique representative of actual use, therefore, a false latching force could not be measured.

**ASSEMBLY PERFORMANCE - LOOP LOAD** **TEST DATE:** August 8, 2012

(Pelvic Belt Load Spec=22,241 N min.; Upper Torso Belt Load Spec=13,345 N min.)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 7 | 8 | 9 |
| **A** | Pelvic Belt (Type 2) Loop Load, N | **22,241** | **22,241** | **22,241** |
| **B** | Upper Torso Belt Loop Load, N | **13,345** | **13,345** | **13,345** |
| **C** | Pelvic Belt Pass/Fail | **P** | **P** | **P** |
| **D** | Upper Torso Belt Pass/Fail | **P** | **P** | **P** |

**REMARKS:**

**ASSY PERFORMANCE - MAX ELONGATION** **TEST DATE:** August 8, 2012
(Pelvic & Upper Torso 508 mm max between anchorages)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 7 | 8 | 9 |
| A | Pelvic Belt (Type 2) Elongation, mm | 145 | 142 | 147 |
| B | Upper Torso Belt Elongation, mm | * | * | * |
| C | Pelvic Belt Pass/Fail | P | P | P |
| D | Upper Torso Belt Pass/Fail | N/A | N/A | N/A |

**REMARKS:** Retractor contains a load-limiting device

*The load limiter went to full extension. This could not be achieved in a single pull. After the extension limit of the Instron was reached, the crosshead of the machine was re-positioned and the remaining webbing was pulled off the retractor spool.

**ASSEMBLY PERF - MAX BUCKLE REL FORCE** **TEST DATE:** August 8, 2012
(Spec=133 N max. @ 667 N loop load)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 7 | 8 | 9 |
| A | Buckle Release Force, N | 36 | 45 | 40 |
| B | Buckle Release Force Pass/Fail | P | P | P |

**REMARKS:**

**ASSY PERFORMANCE - COMMON HARDWARE** **TEST DATE:** August 8, 2012
(Min. Spec=26,689 N Loop)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 7 | 8 | 9 |
| A | Common Hardware Load, N | 26,689 | 26,689 | 26,689 |
| B | Common Hardware Pass/Fail | P | P | P |

**REMARKS:**

**ASSY PERF - MINIMUM CUT WEBBING STRENGTH** **TEST DATE:** N/A
(Pelvic Belt Load Spec=15,569 N; Upper Torso Belt Load Spec=12,455 N)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 7 | 8 | 9 |
| A | Pelvic Belt (Type ___) Loop Load, N | N/A | N/A | N/A |
| B | Upper Torso Belt Loop Load, N | N/A | N/A | N/A |
| C | Pelvic Belt Pass/Fail | N/A | N/A | N/A |
| D | Upper Torso Belt Pass/Fail | N/A | N/A | N/A |

**REMARKS:**

**ASSY PERF – RETRACTOR STITCH LOAD** **TEST DATE:** August 8, 2012
(Continuous Webbing System Load Spec=6,672 N)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 7 | 8 | 9 |
| A | Pelvic Belt Load, N | N/A | N/A | N/A |
| B | Upper Torso Belt Load, N | P | P | P |

## TEST RESULTS FOR SPECIMENS 10, 11 & 12

**GROUP NO.:** 013 **TEST DATE:** June 27, 2012

RETRACTOR PERFORMANCE - BASELINE CHARACTERISTICS
(Pelvic & Upper Torso 1 to 7N; Webbing Travel Before Lockup Spec=25 mm max.)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | **10** | **11** | **12** |
| **A** | Avg. Force (ALR) Between 75% + 51 mm + 75% - 51 mm | **N/A** | **N/A** | **N/A** |
| **B** | Lowest Retraction Force (ELR), N | **3.2** | **3.0** | **2.9** |
| **C** | Webbing Travel Before Lockup (ALR), mm | **N/A** | **N/A** | **N/A** |
| **D** | Webbing Travel Before Lockup (Web Sensitive ELR) | | | |
| | Retractor Accel to 0.28G @ 0° Angle, mm. | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 0° Angle, mm | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 45° Angle, mm | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 90° Angle, mm | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 135° Angle, mm | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 180° Angle, mm | **N/A** | **N/A** | **N/A** |
| **E** | Webbing Travel Before Lockup (Veh Sensitive ELR)<br>Retractor Accel. Within 0.7g pulse corridor in 2 Directions<br>- Secure Webbing & Accelerate Retractor, mm | | | |
| | X (Parallel to Vehicle Centerline), mm | **22** | **23** | **23** |
| | Y (90° to Vehicle Centerline), mm | **21** | **22** | **22** |
| **F** | 15º Angle, No Lock Check | **P** | **P** | **P** |
| **G** | 45º Angle, Lock Check | **P** | **P** | **P** |
| | Pelvic Belt (Type ___) Retractor Pass/Fail | **N/A** | **N/A** | **N/A** |
| | Upper Torso Belt Retractor Pass/Fail | **P** | **P** | **P** |

**REMARKS:**

**RETR PERF-POST CORROSION CYCLING (2500)** **TEST DATE:** July 2, 2012
(Spec=24 hr. salt spray, 1 hr. dry, 4 wash cycles-38 ± 5°C water & 25 manual cycles)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 10 | 11 | 12 |
| **A** | Pre-cycling Retractor Performance Pass/Fail | **P** | **P** | **P** |
| **B** | 2,500 Automatic Cycles Pass/Fail | **P** | **P** | **P** |

**REMARKS:**

**RETR PERF-POST TEMPERATURE CYCLING (2,500)** **TEST DATE**: July 11, 2012
(Spec=48 hr. temp conditioning period of 24 hrs. @ 80 ± 1°C over water +
24 hrs. @ 80 ± 1°C dry oven)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 10 | 11 | 12 |
| **A** | 25 Manual Cycles Pass/Fail | **P** | **P** | **P** |
| **B** | 2,500 Automatic Cycles Pass/Fail | **P** | **P** | **P** |

**REMARKS:**

**RETRACTOR PERFORMANCE - DUST TEST** **TEST DATE:** July 19, 2012
(Spec=5 hr. conditioning period)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | 10 | 11 | 12 |
| **A** | Pass/Fail | **P** | **P** | **P** |

**REMARKS:**

**RETRACTOR PERFORMANCE - CYCLING** **TEST DATE:** July 30-August 3, 2012
(P= Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | **10** | **11** | **12** |
| **A** | Retractor Performance - 25 manual cycles - Pass/Fail | **P** | **P** | **P** |
| **B** | FOR ALR - 5,000 cycles @ 100% extension and 89 N load - Pass/Fail | **N/A** | **N/A** | **N/A** |
| **C** | FOR ELR - 35,000 Cycles @ 50% extension and 89 N load - Pass/Fail | **P** | **P** | **P** |
| **D** | FOR ELR - 10,000 lockup cycles @ 50% extension and 89 N load - Pass/Fail | **P** | **P** | **P** |

**RETR PERF - POST TEST CHARACTERISTICS** **TEST DATE:** August 5, 2012
(Actual Values) (P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | **10** | **11** | **12** |
| **A** | Avg Force (ALR) Between 75% + 51 mm + 75% - 51 mm | **N/A** | **N/A** | **N/A** |
| **B** | Lowest Retraction Force (ELR), N | **3.1** | **2.9** | **3.0** |
| **C** | Percent of BASELINE (minimum = 50%), percent | **97** | **97** | **100+** |
| **D** | Webbing Travel Before Lockup (ALR), mm | **N/A** | **N/A** | **N/A** |
| **E** | Webbing Travel Before Lockup (Web Sensitive ELR) | | | |
| | Retractor Accel to 0.28G @ 0° Angle, mm | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 0° Angle, mm | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 45° Angle, mm | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 90° Angle, mm | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 135° Angle, mm | **N/A** | **N/A** | **N/A** |
| | Retractor Accel within 0.7g pulse corridor @ 180° Angle, mm | **N/A** | **N/A** | **N/A** |
| **F** | Webbing Travel Before Lockup (Veh Sensitive ELR) Retractor Accel. Within 0.7g pulse corridor in 2 Directions - Secure Webbing & Accelerate Retractor, mm | | | |
| | X (Parallel to Vehicle Centerline), mm | **18** | **18** | **18** |
| | Y (90° to Vehicle Centerline), mm | **16** | **16** | **16** |
| **G** | 15º Angle, No Lock Check | **P** | **P** | **P** |
| **H** | 45º Angle, Lock Check | **P** | **P** | **P** |
| | Pelvic Belt (Type ___) Retractor Pass/Fail | **N/A** | **N/A** | **N/A** |
| | Upper Torso Belt Retractor Pass/Fail | **P** | **P** | **P** |

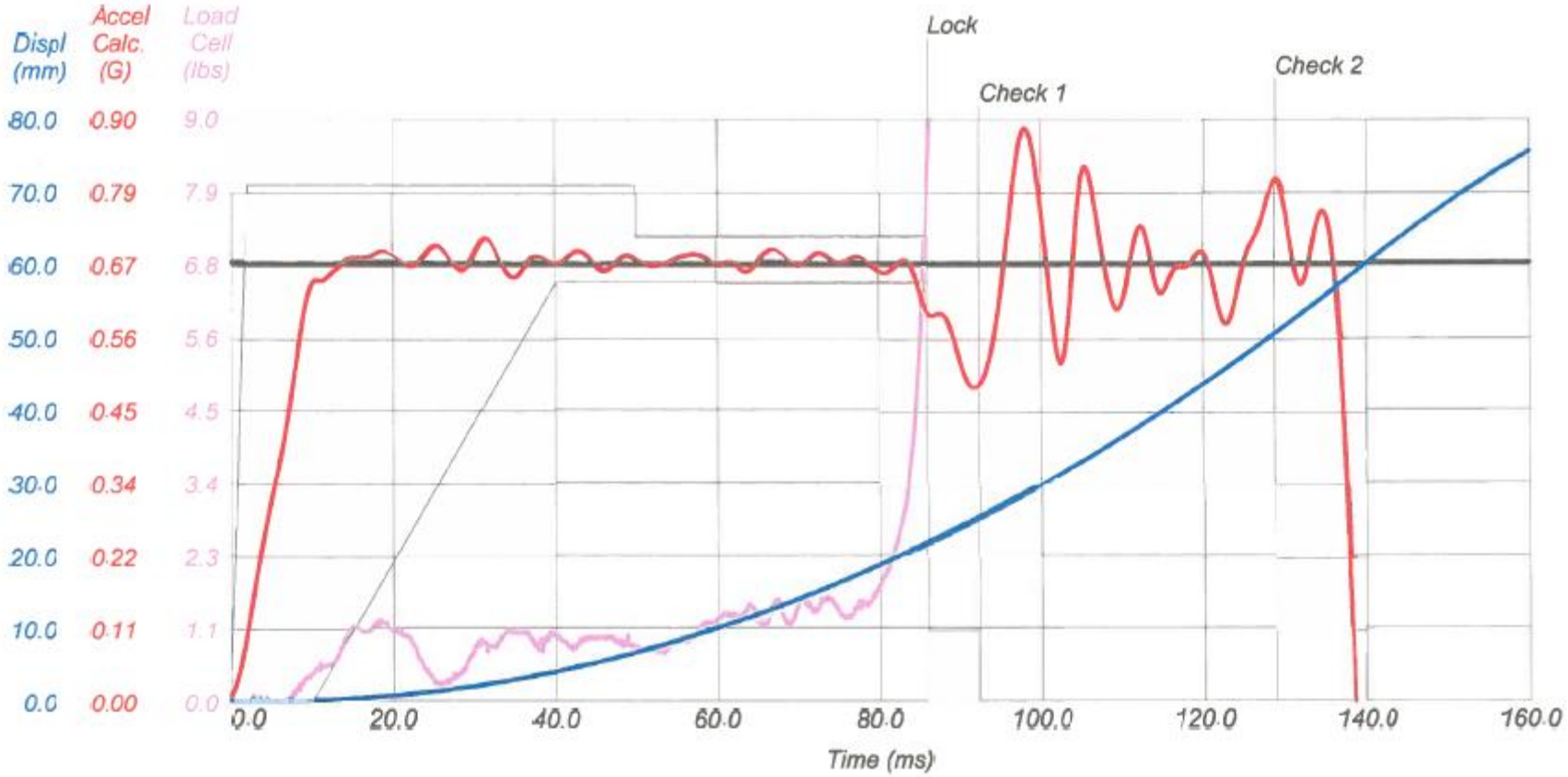
**RETR PERF - MIN STRENGTH** **TEST DATE:** August 6, 2012

(Continuous Webbing System Spec=13,344 ± 134 N Loop)
(P = Passed, F = Failed, NA = Not Applicable)

| | | SPECIMEN NUMBER | | |
|---|---|---|---|---|
| | | **10** | **11** | **12** |
| **A** | Pelvic Belt (Type ___) Retractor Performance, N | **N/A** | **N/A** | **N/A** |
| **B** | Upper Torso Belt/Contin. Web. Sys. Retr. Perf, N | **13,344** | **13,344** | **13,344** |
| **C** | Pelvic Belt Retractor Pass/Fail | **N/A** | **N/A** | **N/A** |
| **D** | Upper Torso Belt/Contin. Web. Sys. Retr. Pass/Fail | **P** | **P** | **P** |

**REMARKS:**

# Initial Test
## Retractor #1 - X Direction




| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.66 G* |
| Pos @ Lock | *21.8 mm* |
| Time To Lock | *85.9 ms* |
| Accel @ Chk 1 | *0.54 G* |
| Accel @ Chk 2 | *0.72 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.4 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *0.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
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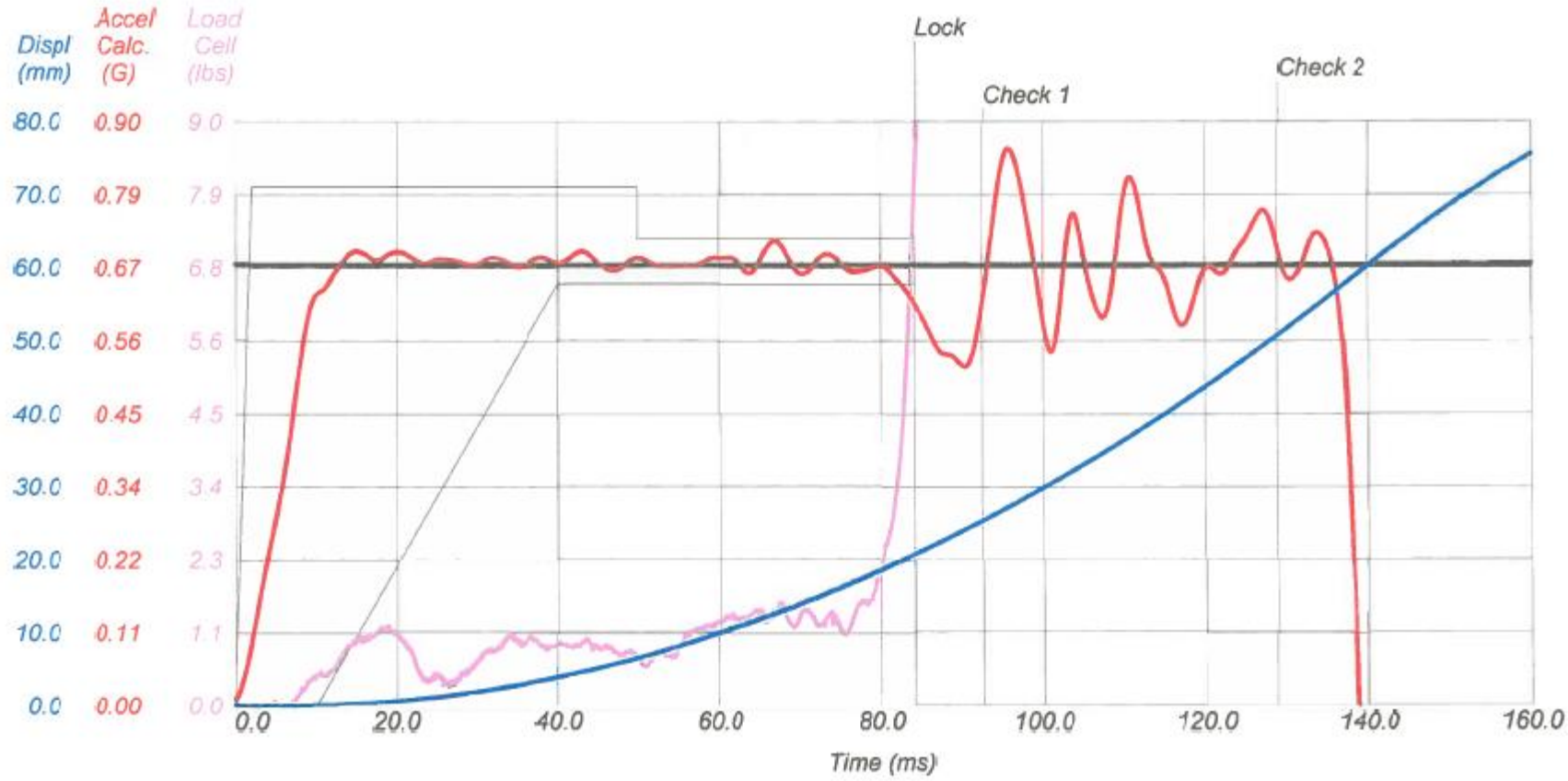
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Initial Test
# Retractor #1 – Y Direction




| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.66 G* |
| Pos @ Lock | *20.8 mm* |
| Time To Lock | *84.2 ms* |
| Accel @ Chk 1 | *0.54 G* |
| Accel @ Chk 2 | *0.74 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.3 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *90.0°* |

Test: *Test Comment*
Test: *Test Comment*
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Test: *Test Comment*
Test: *Test Comment*
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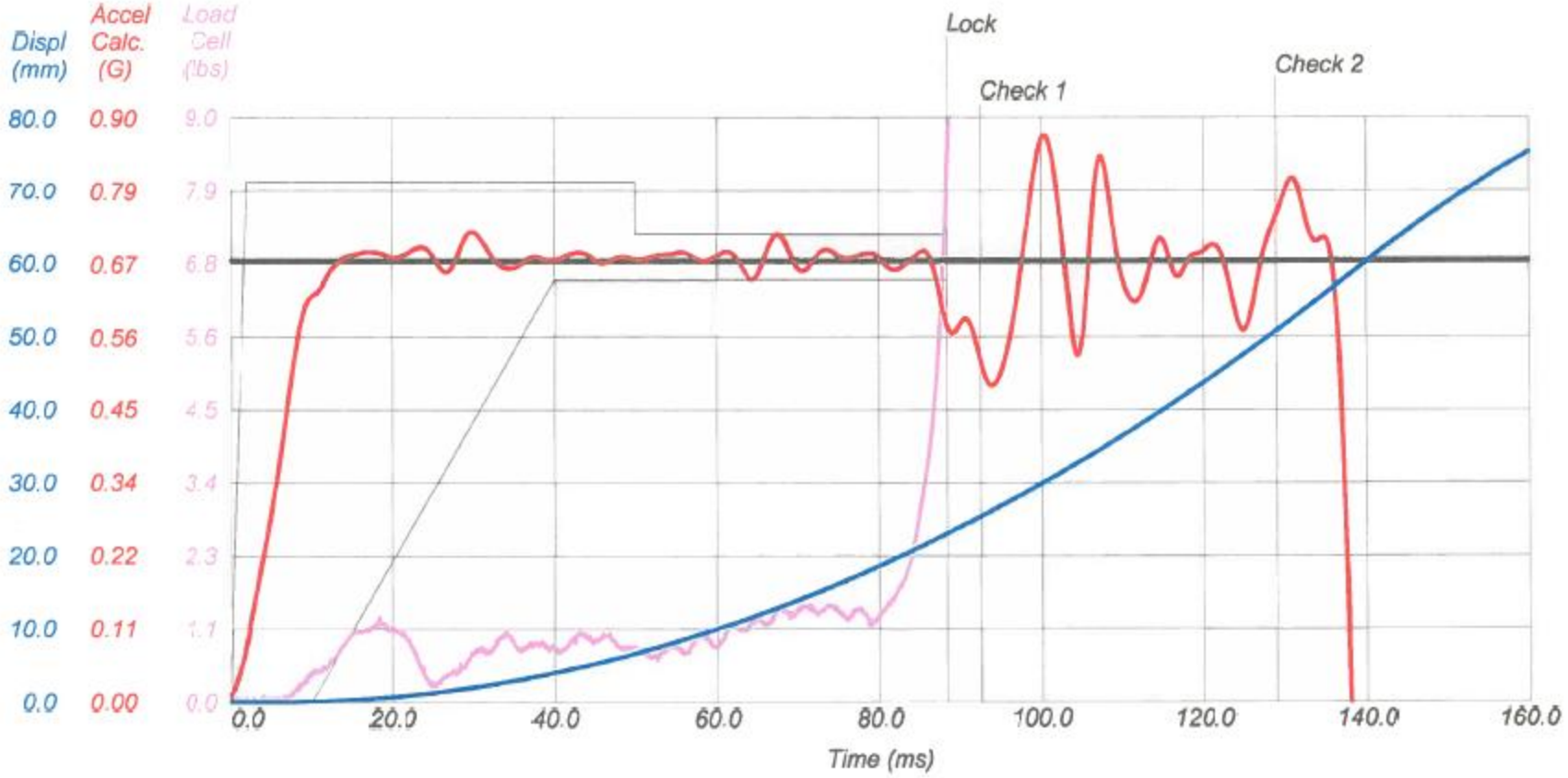
# Initial Test
# Retractor #2 – X Direction




| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.67 G* |
| Pos @ Lock | *23.0 mm* |
| Time To Lock | *88.4 ms* |
| Accel @ Chk 1 | *0.58 G* |
| Accel @ Chk 2 | *0.65 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.4 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *0.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
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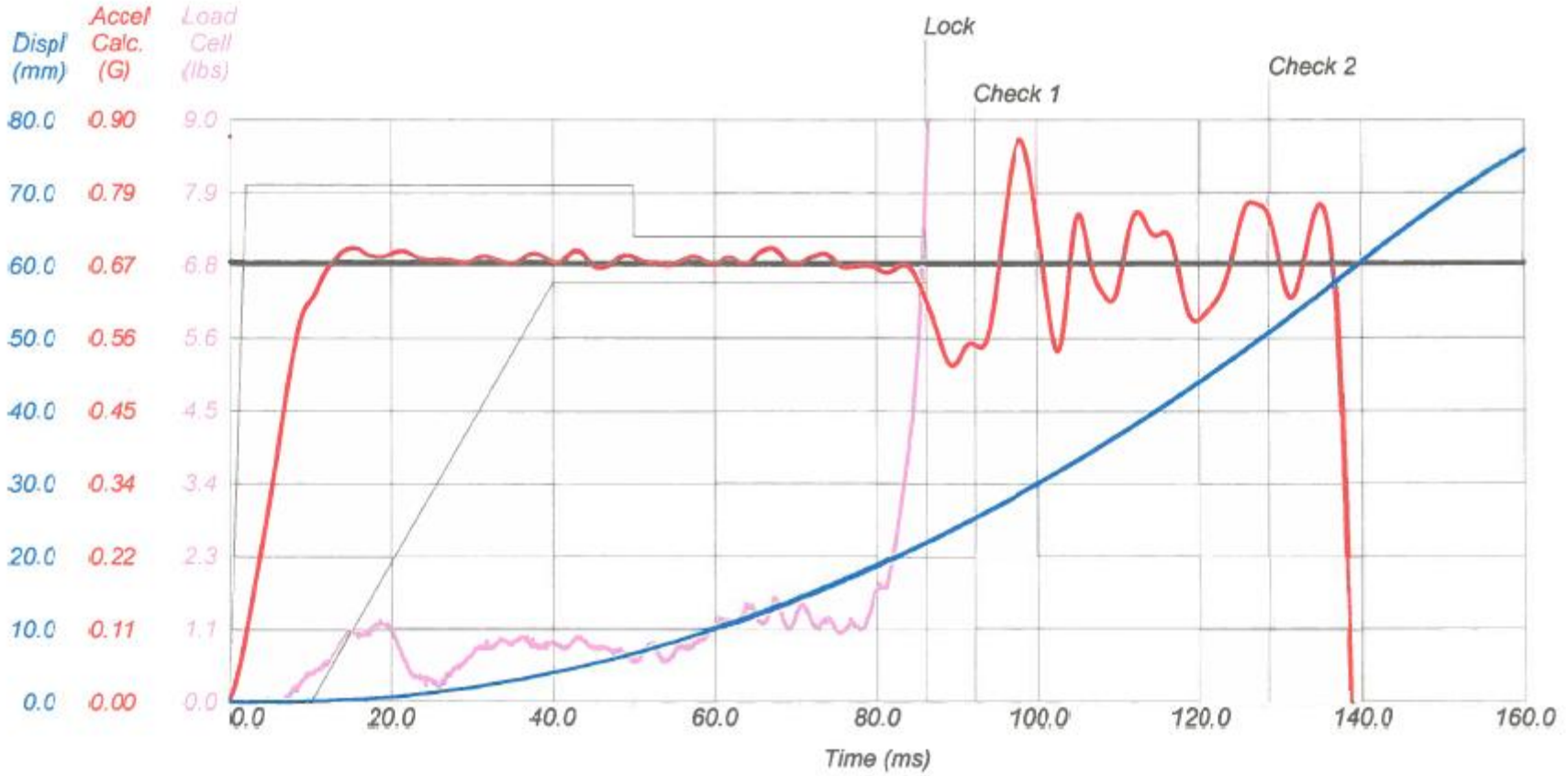
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Initial Test
# Retractor #2 – Y Direction




| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.66 G* |
| Pos @ Lock | *22.0 mm* |
| Time To Lock | *86.1 ms* |
| Accel @ Chk 1 | *0.54 G* |
| Accel @ Chk 2 | *0.74 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.4 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *90.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
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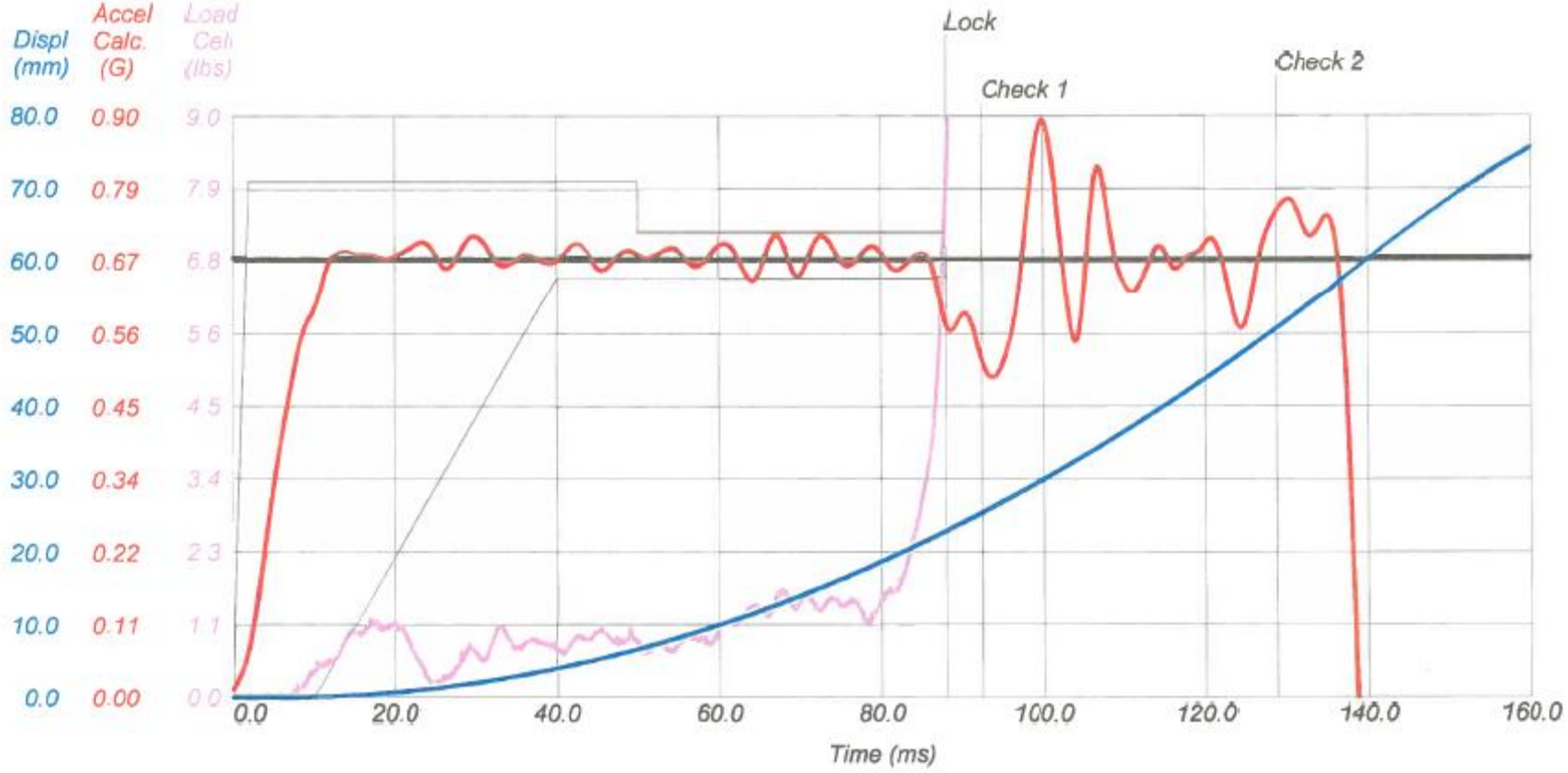
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Initial Test
# Retractor #3 – X Direction




| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.66 G* |
| Pos @ Lock | *22.9 mm* |
| Time To Lock | *88.0 ms* |
| Accel @ Chk 1 | *0.58 G* |
| Accel @ Chk 2 | *0.66 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.4 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *0.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
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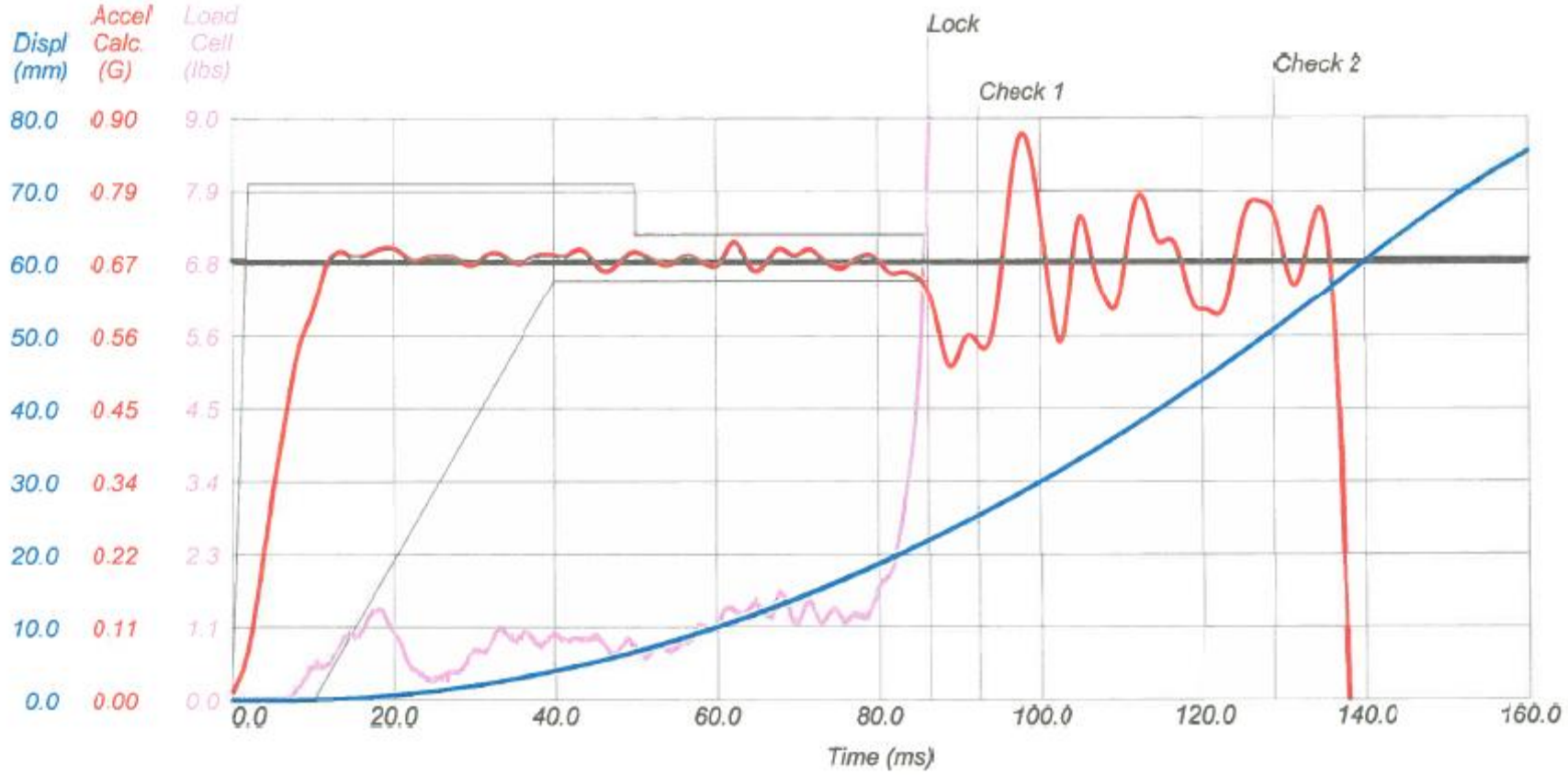
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Initial Test
# Retractor #3 – Y Direction

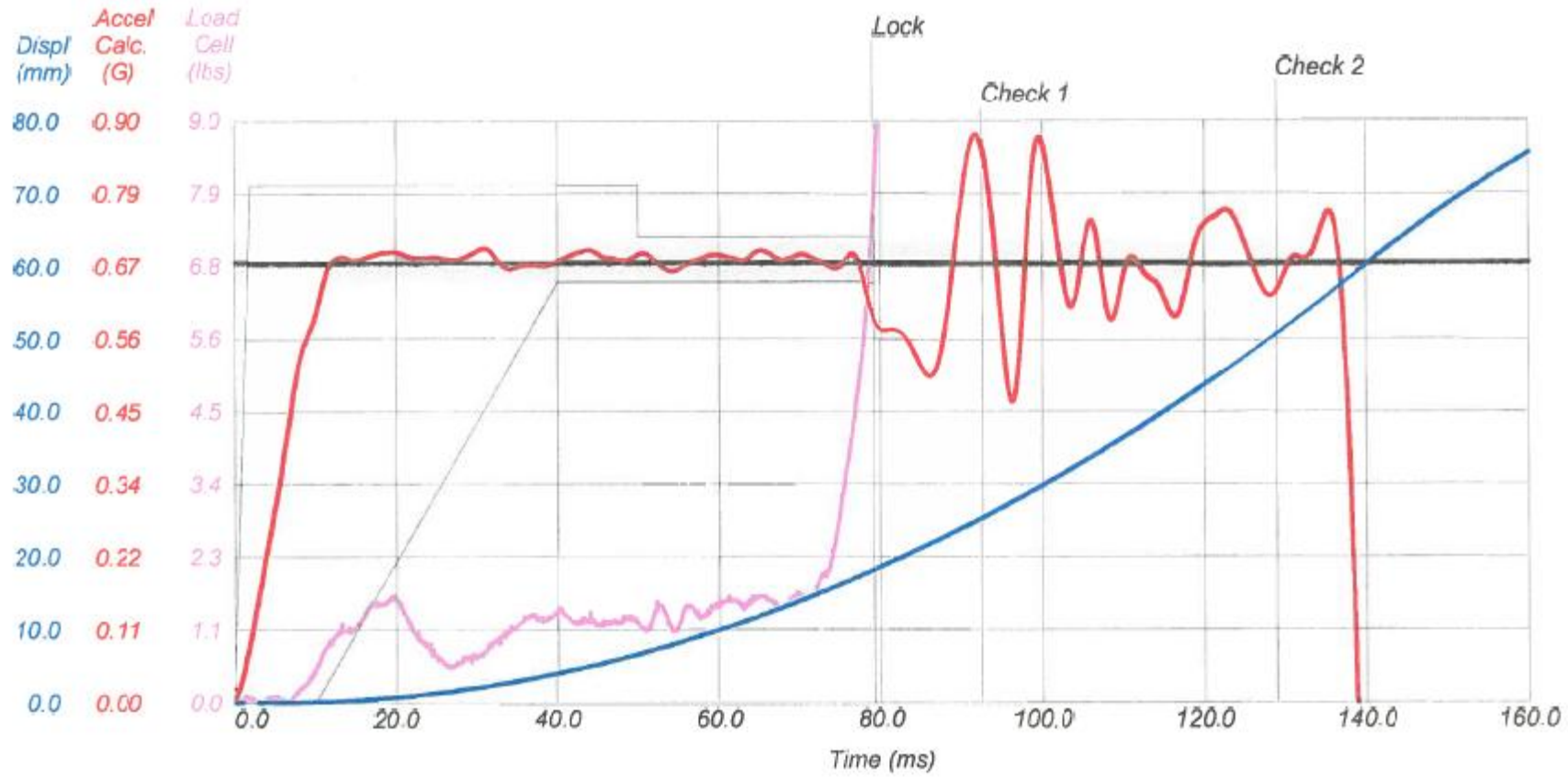



| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.66 G* |
| Pos @ Lock | *21.9 mm* |
| Time To Lock | *86.2 ms* |
| Accel @ Chk 1 | *0.54 G* |
| Accel @ Chk 2 | *0.75 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.4 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *90.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Final Test
# Retractor #1 – X Direction

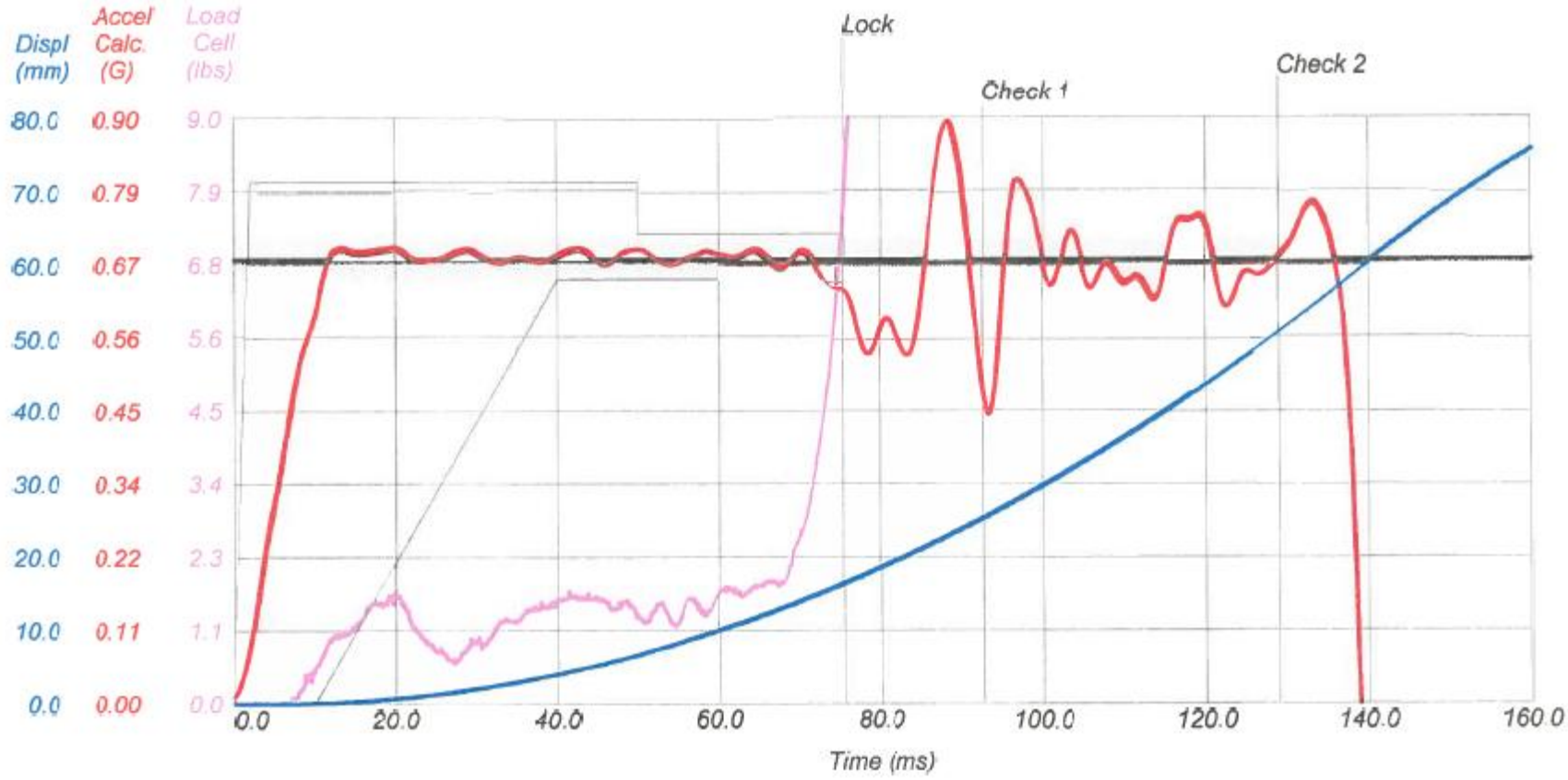



| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.66 G* |
| Pos @ Lock | *18.2 mm* |
| Time To Lock | *79.2 ms* |
| Accel @ Chk 1 | *0.76 G* |
| Accel @ Chk 2 | *0.67 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.4 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *0.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Final Test
# Retractor #1 – Y Direction

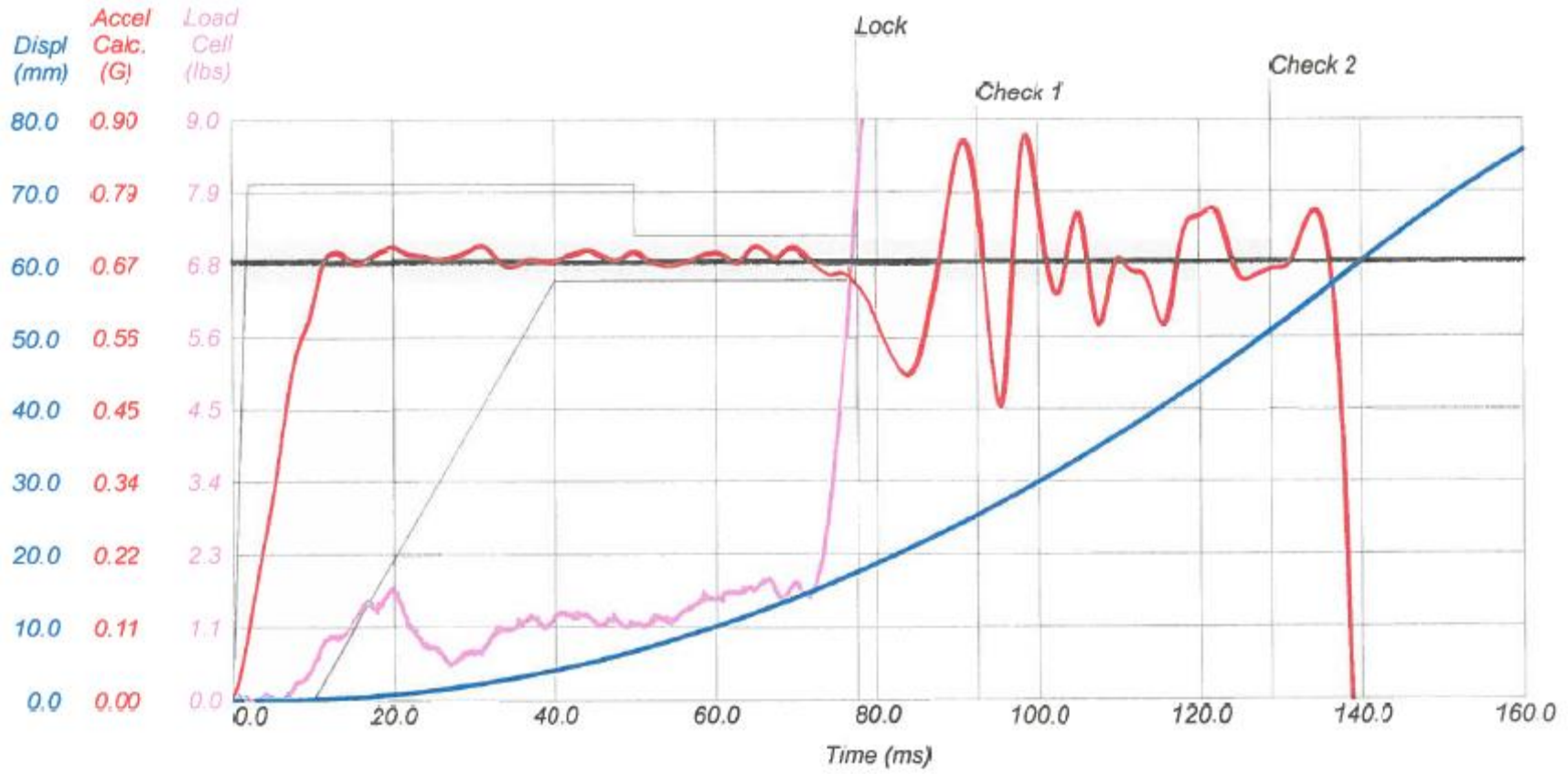



| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.66 G* |
| Pos @ Lock | *16.4 mm* |
| Time To Lock | *75.4 ms* |
| Accel @ Chk 1 | *0.75 G* |
| Accel @ Chk 2 | *0.67 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.3 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *90.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Final Test
# Retractor #2 – X Direction

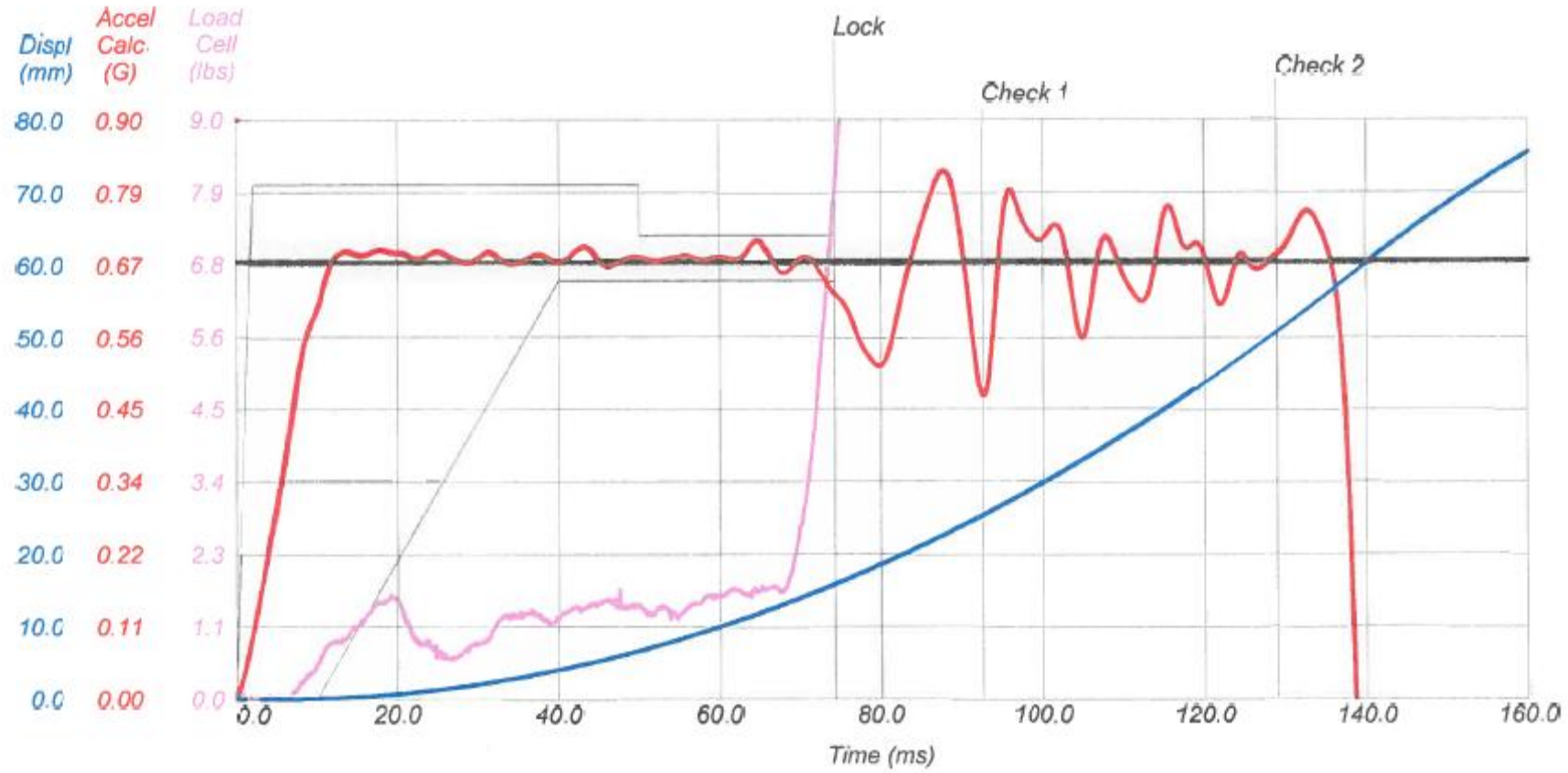



| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.66 G* |
| Pos @ Lock | *17.5 mm* |
| Time To Lock | *77.6 ms* |
| Accel @ Chk 1 | *0.80 G* |
| Accel @ Chk 2 | *0.66 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.4 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *0.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Final Test
# Retractor #2 – Y Direction

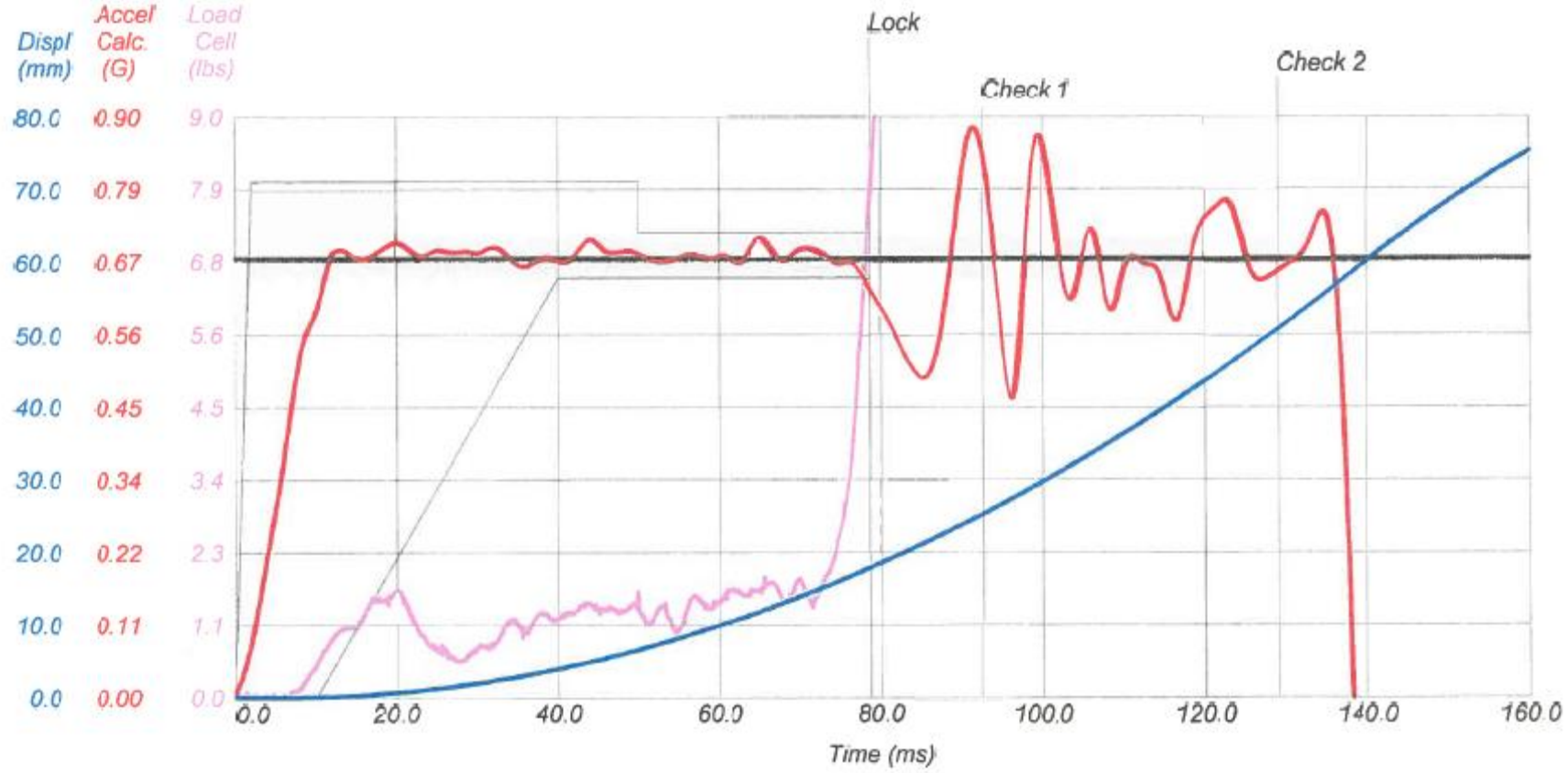



| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.67 G* |
| Pos @ Lock | *15.9 mm* |
| Time To Lock | *74.3 ms* |
| Accel @ Chk 1 | *0.67 G* |
| Accel @ Chk 2 | *0.68 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.3 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *90.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Final Test
# Retractor #3 – X Direction

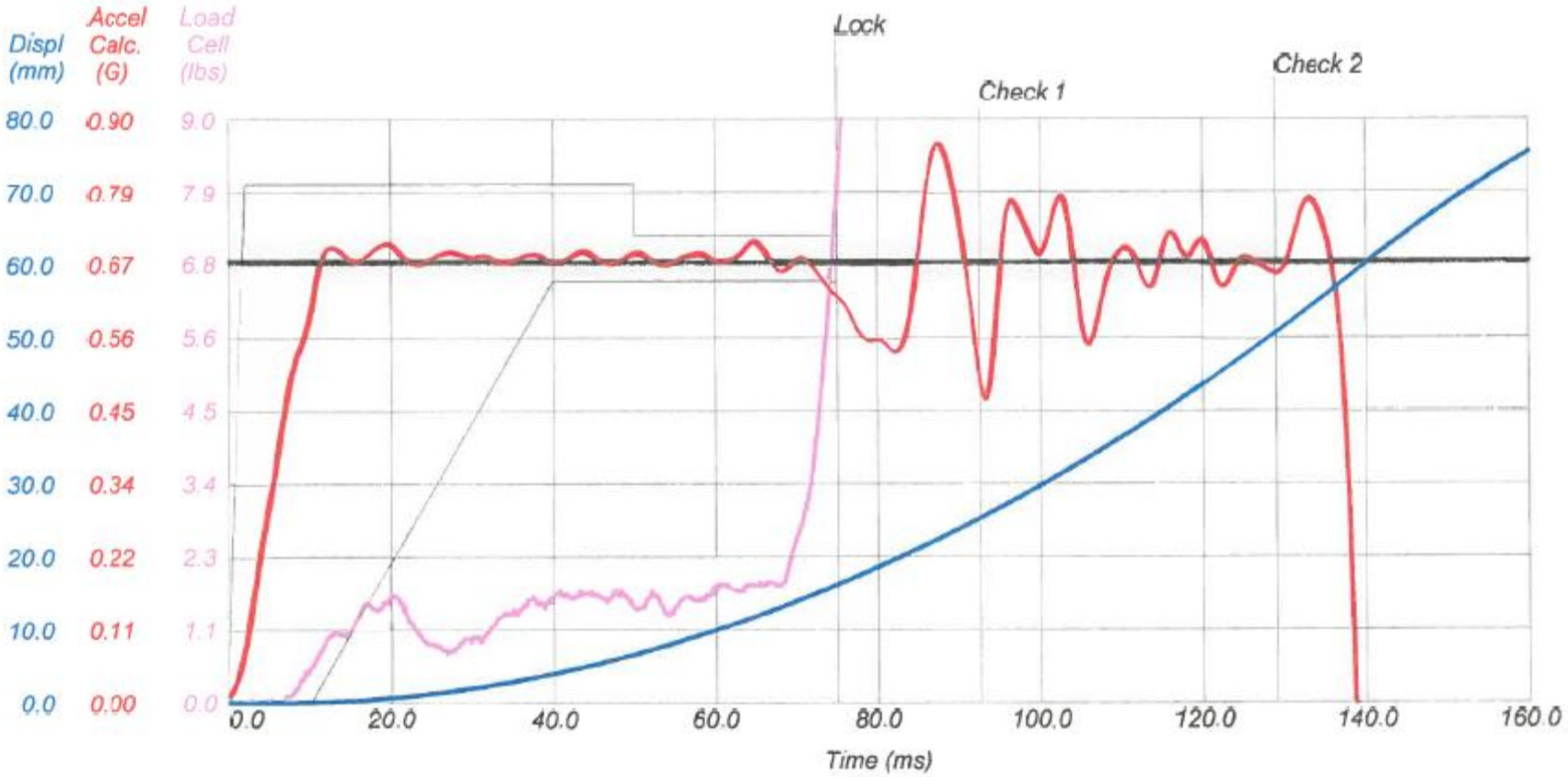



| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.67 G* |
| Pos @ Lock | *18.0 mm* |
| Time To Lock | *78.7 ms* |
| Accel @ Chk 1 | *0.78 G* |
| Accel @ Chk 2 | *0.67 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.4 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *0.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# Final Test
# Retractor #3 – Y Direction




| Results | |
|---|---|
| Lock Condition | *Locked* |
| Accel @ Lock | *0.66 G* |
| Pos @ Lock | *16.2 mm* |
| Time To Lock | *75.0 ms* |
| Accel @ Chk 1 | *0.72 G* |
| Accel @ Chk 2 | *0.68 G* |

| Parameters | |
|---|---|
| Stowed Webbing | *463.4 mm* |
| Accel Command | *0.68 G* |
| Onset | *68 G/s* |
| Check Pos 1 | *25.4 mm* |
| Check Pos 2 | *50.8 mm* |
| Accel Type | *Sled* |
| Filter | *CFC 60* |
| Rotation | *90.0°* |

Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*
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Test: *Test Comment*
Test: *Test Comment*
Test: *Test Comment*

# SECTION 4

# TEST EQUIPMENT LISTS

**SGS North America Inc.**

**TEST EQUIPMENT**
**RETRACTOR TESTING**

| No. | Item | Mfr. | Model | Serial No. | Cal. Period | Date of Last Cal. | Accuracy | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | Steel Tape | Stanley | W310 | --- | --- | --- | +/-1/16 in. | Webbing Length |
| 2 | Push-Pull Scale | Chatillon | DFIS 2 | 25258 | 1 Year | 5/12 | +/- 1% | Retractor Performance |
| 3 | Retractor Lock-Up Stand | VSR | Acceleration Sled | 1189-1202 | 1 Year | 2/12 | +/-% Ind. | Retractor Performance |
| 4 | Retractor Endurance Test Stand | VSR | Large Drum Cycler | 1242-0204 | 1 Year | 2/12 | +/-% Ind. | Retractor Cycling |
| 5 | Retractor Endurance Test Stand | VSR | Large Drum Cycler | 1243-0204 | 1 Year | 2/12 | +/-% Ind. | Retractor Cycling |
| 6 | Retractor Endurance Stand | VSR | 620 | 1090-1000 | 1 Year | 2/12 | +/-% Ind. | Retractor Cycling |
| 7 | Retractor Endurance Stand | VSR | 660 | 1388-1106 | 1 Year | 2/12 | +/-% Ind. | Retractor Cycling |
| 8 | Tensile Tester | Instron | 1115 | 3289 | 1 Year | 6/12 | +/-1% | Retractor Performance (Strength) |
| 9 | Tensile Tester | Instron | TTC | 4344 | 1 Year | 6/12 | +/- 1% | Retractor Performance (Strength) |
| 10 | Push-Pull Scale | Chatillon | DPP-50 | — | 1 Year | 1/12 | +/- 1% | Buckle Release |

**SGS North America Inc.**

## TEST EQUIPMENT
## STANDARD LABORATORY CONDITIONING

| No. | Item | Mfr. | Model | Serial No. | Cal. Period | Date of Last Cal. | Accuracy | Remarks |
|---|---|---|---|---|---|---|---|---|
| 11 | Temperature/ Humidity Recorder | Dickson | TH 800 | 07150222 | 1 Year | 4/12 | +/-2ºF +/-5% RH | Monitor Room Conditioning |
| 12 | Temperature/ Humidity Recorder | Dickson | TH 800 | 07150221 | 1 Year | 4/12 | +/-2ºF +/-5% RH | Monitor Room Conditioning |

## CORROSION TESTING - TEMPERATURE/HUMIDITY

| No. | Item | Mfr. | Model | Serial No. | Cal. Period | Date of Last Cal. | Accuracy | Remarks |
|---|---|---|---|---|---|---|---|---|
| 13 | Salt Spray Chamber | Singleton Corp. | SCCH22 | SCCH22-21947 | --- | --- | --- | Checked daily in accordance with ASTM B-117 |
| 14 | Temperature Recorder | Honeywell | DR4300 | 0318Y359 016800003 | 1 Year | 4/12 | +/-5ºF | Monitor Salt Spray Temperature |
| 15 | Temperature Humidity Chamber | Blue-M | FR-386PC | AA-221 | 1 Year | 4/12 | +/-2ºC +/-5% RH | Temperature-Humidity Exposure |
| 16 | Dust Chamber | VSR | --- | 1140-1001 | 1 Year | 2/12 | --- | Timer, Pressure Gauge & Orifice |

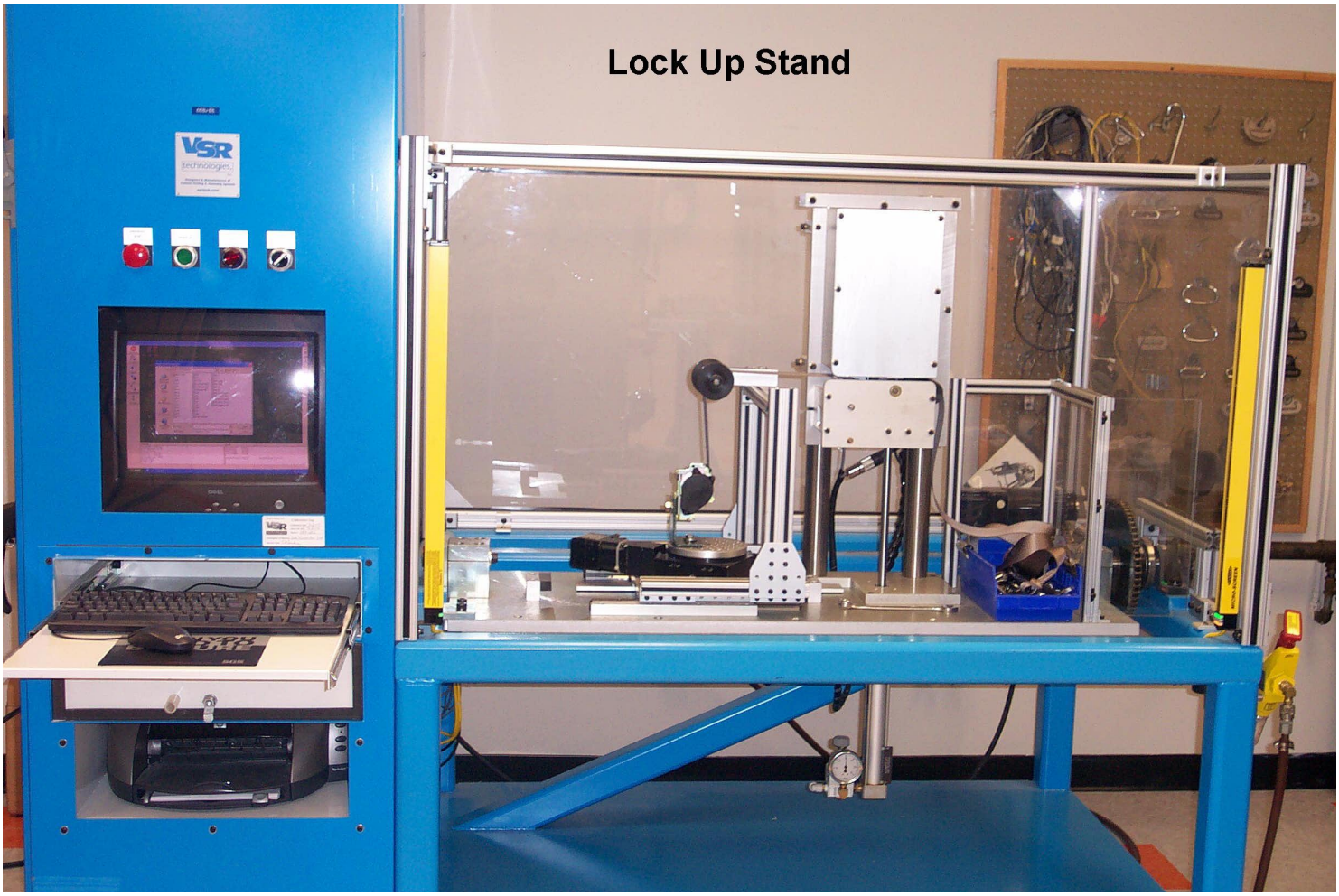
## SECTION 5

## PHOTOGRAPHS

## IDENTIFICATION LABEL


SGS DOT#13 2012
DANGER
DANGER
Autoliv

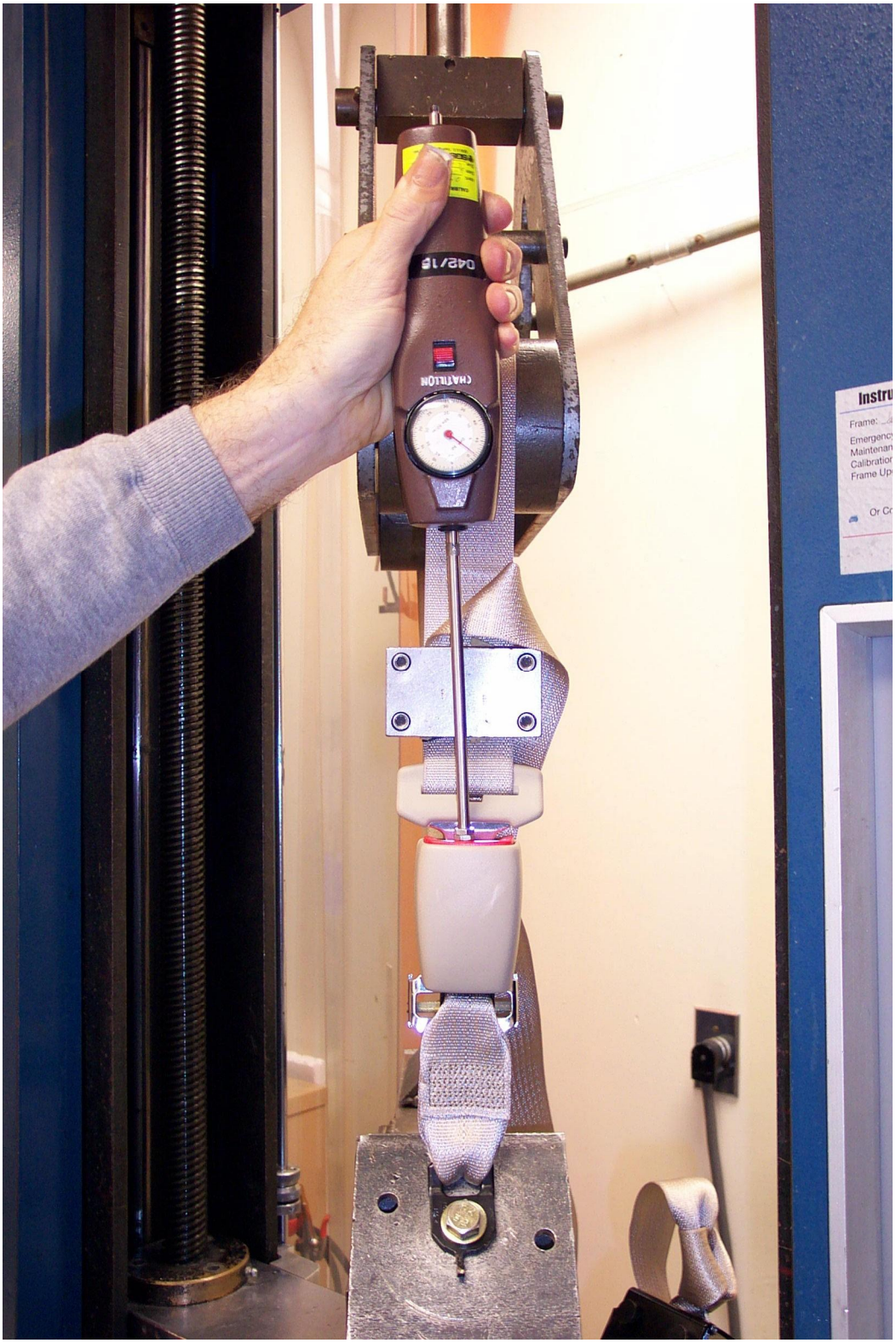

SGS DOT#13 2012
Autoliv




**Lock Up Stand**


**Retraction Force Tester**


**Retractor Cycling Stand**




**Buckle Release Force**

**Loop Load Test**


**Salt Spray Chamber**

**Temperature Humidity Chamber**

**Dust Chambers**