

Report No.

209-SGS-2012-14

**SEAT BELT ASSEMBLY COMPLIANCE TESTING
FMVSS 209**

2012 Chevrolet Sonic

**MODEL NO. 95490333/95963886/95076531/95963888 (GM)
P/N 6161595T1D/6184273T1A/6162122T1C/616446536E (Autoliv)**

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



FINAL REPORT

2843009-14

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**

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Report No.: 209-SGS-2012-14

Prepared By: SGS North America Inc.

Approved by: 
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. 209-SGS-2012-14	2. Govt. Accession No.	3. Recipient's Catalog No.	
4. Title and Sub-Title Final report of FMVSS No. 209 Compliance Testing of Autoliv P/N 6161595T1D / 6184273T1A / 6162122T1C / 616446536E Type 2 seat belt assemblies being installed in 2012 Chevrolet Sonic, Front Left Seat		5. Report Date: August 16, 2012	
		6. Performing Organization <u>Code</u> SGS	
7. Author Frank Savino, Project Manager		8. Performing Organization Report No. SGS Report 2843009-14	
9. Performing Organization Name and Address: SGS North America Inc. 291 Fairfield Avenue Fairfield, NJ 07004		10. Work Unit No.	
		11. Contracts or Grant No. DTNH22-08-D-00107	
12. Sponsoring Agency Name and Address: 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		13. Type of Report and Period Covered: FINAL June 30-August 9, 2012	
		14. Sponsoring Agency Code NVS-220	
15. Supplementary Notes			
16. Abstract Compliance tests were conducted on Autoliv Type 2 seat belt assemblies being installed in 2012 Chevrolet Sonic 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 FMVSS No. 209 Compliance Testing Safety Engineering		18. Distribution Statement Copies of this report are available from -- National Highway Traffic Safety Administration Technical Information Services (NPO-411) 1200 New Jersey Avenue, SE (Room E12-100) Washington, DC 20590 Email: tis@nhtsa.dot.gov Fax: 202-493-2833	
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SECTION 1

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.: 014

ELR RETRACTOR SENSITIVITY: ___-WSI; ___-VSI; X-VWSI

BELT DATE CODES: 25N

BELT ASSY MFR.: Autoliv

BELT ASSY PART/MODEL NO.: 6161595T1D/6184273T1A/6162122T1C/616446536E

SELLER/VEHICLE MFR.: General Motors Corp.

SELLER/VEH. MFR. PART/MODEL NO.: 95490333/95963886/95076531/95963888

LABELING / MARKING REQUIREMENT: P

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

(Continued on next page)

No.	Test Title:	Group Number	C	C	C
		Specimen No.	7	8	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	D	D	D
		Specimen No.	10	11	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.: 014

TEST DATE: July 25-26, 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 9, 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 9, 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

(Pelvic & Upper Torso 508 mm max between anchorages)

(P = Passed, F = Failed, NA = Not Applicable)

TEST DATE: August 9, 2012

		SPECIMEN NUMBER		
		7	8	9
A	Pelvic Belt (Type 2) Elongation, mm	144	144	144
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

(Spec=133 N max. @ 667 N loop load)

(P = Passed, F = Failed, NA = Not Applicable)

TEST DATE: August 9, 2012

		SPECIMEN NUMBER		
		7	8	9
A	Buckle Release Force, N	45	49	45
B	Buckle Release Force Pass/Fail	P	P	P

REMARKS:

ASSY PERFORMANCE - COMMON HARDWARETEST DATE: August 9, 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 9, 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.: 014
TEST DATE: June 30, 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	3.4	3.5	3.4
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) Retractor Accel. Within 0.7g pulse corridor in 2 Directions - Secure Webbing & Accelerate Retractor, mm			
	X (Parallel to Vehicle Centerline), mm	23	23	14
	Y (90° to Vehicle Centerline), mm	23	22	22
F	15° Angle, No Lock Check	P	P	P
G	45° 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 5, 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 19, 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 26, 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
(P= Passed, F = Failed, NA = Not Applicable)

TEST DATE: July 31-August 3, 2012

		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
(Actual Values) (P = Passed, F = Failed, NA = Not Applicable)

TEST DATE: August 5, 2012

		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	3.1	2.8
C	Percent of BASELINE (minimum = 50%), percent	94	89	82
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	20	17	17
	Y (90° to Vehicle Centerline), mm	19	16	16
G	15° Angle, No Lock Check	P	P	P
H	45° 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:

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 Cyclor	1242-0204	1 Year	2/12	+/-% Ind.	Retractor Cycling
5	Retractor Endurance Test Stand	VSR	Large Drum Cyclor	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

A-1 OF 2

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	+/-2°F +/-5% RH	Monitor Room Conditioning
12	Temperature/ Humidity Recorder	Dickson	TH 800	07150221	1 Year	4/12	+/-2°F +/-5% RH	Monitor Room Conditioning

CORROSION TESTING - TEMPERATURE/HUMIDITY

<u>No.</u>	<u>Item</u>	<u>Mfr.</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cal. Period</u>	<u>Date of Last Cal.</u>	<u>Accuracy</u>	<u>Remarks</u>
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	+/-5°F	Monitor Salt Spray Temperature
15	Temperature Humidity Chamber	Blue-M	FR-386PC	AA-221	1 Year	4/12	+/-2°C +/-5% RH	Temperature- Humidity Exposure
16	Dust Chamber	VSR	---	1140-1001	1 Year	2/12	---	Timer, Pressure Gauge & Orifice

SECTION 5
PHOTOGRAPHS

IDENTIFICATION LABEL

15903263



95490333 S25N04251



AUTOLIV, AMS, MADE IN MEXICO
INSTALL ONLY WITH AN AIR BAG
INSTALLER UNIQUEMENT AVEC UN SAC GONFLABLE

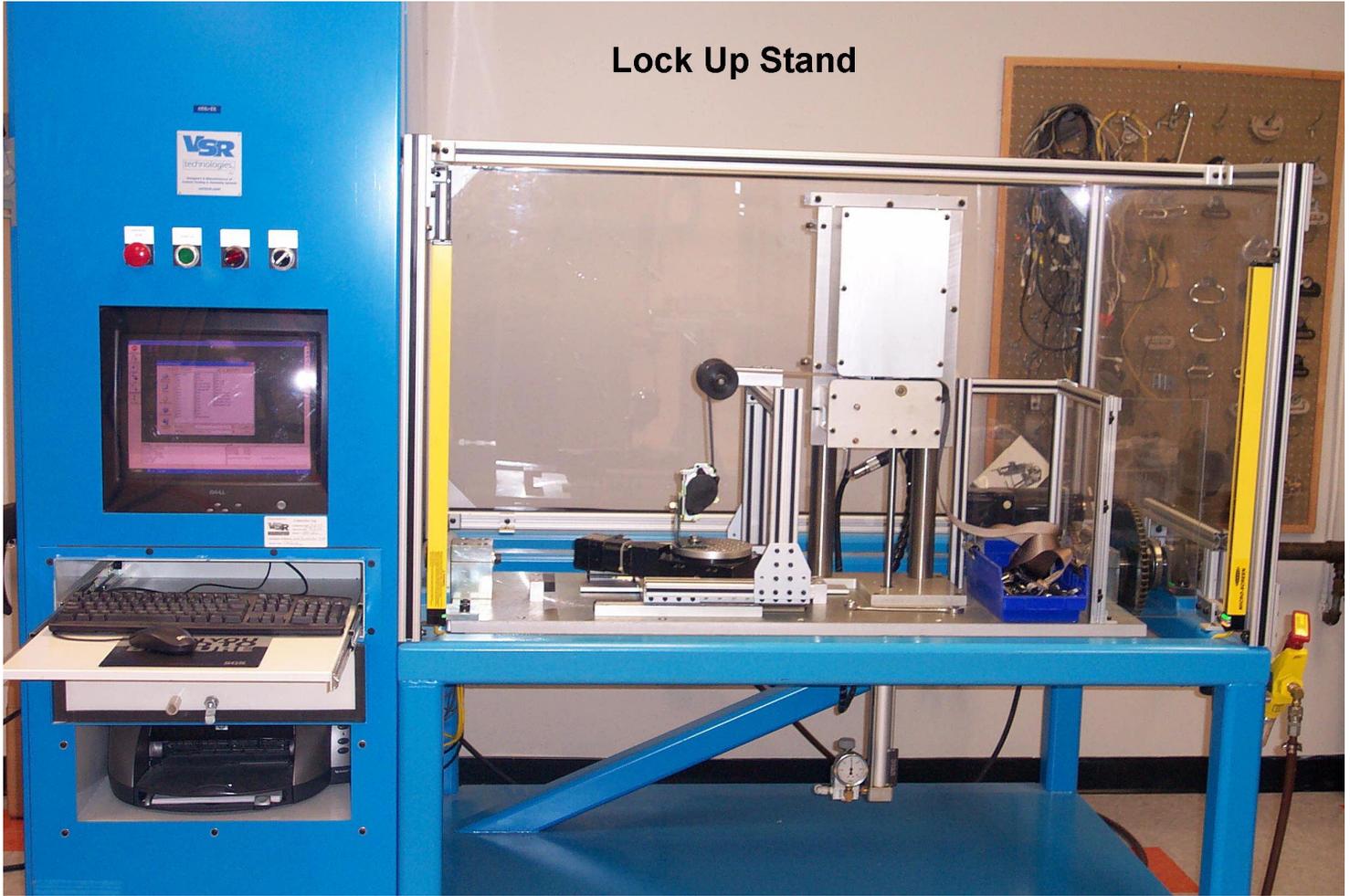


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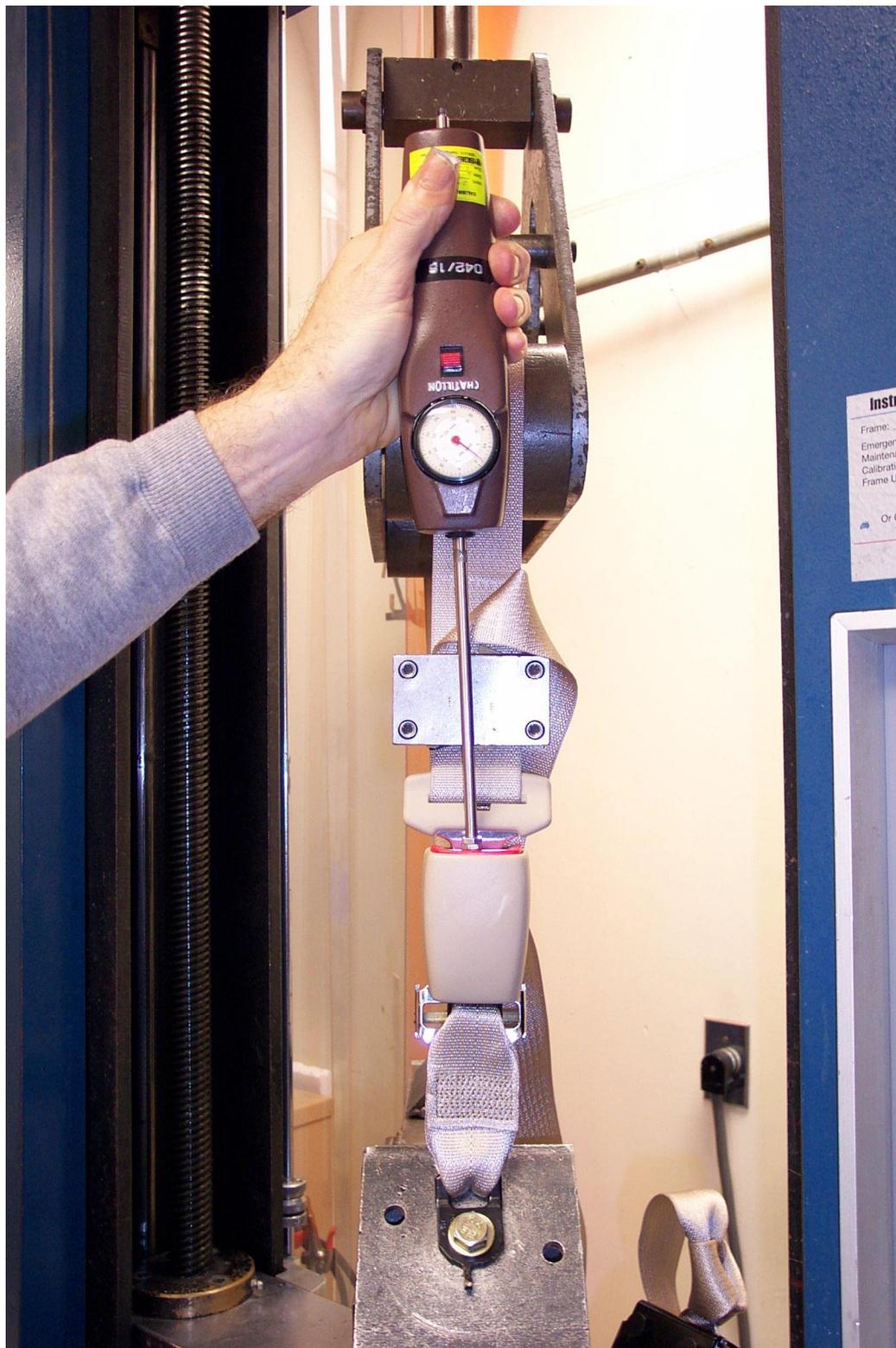
Lock Up Stand



Retraction Force Tester



Retractor Cycling Stand



Buckle Release Force



Loop Load Test





Temperature Humidity Chamber



Dust Chambers