Report No.
3151176-43

CHILD RESTRAINT SYSTEM COMPONENT TESTS FMVSS 213

Model No.
Evenflo Maestro

SGS North America Inc.
Consumer Testing Services
291 Fairfield Avenue
Fairfield, NJ 07004

August 27, 2013

FINAL REPORT

213-SGS-13-43

PREPARED FOR

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

Report No.: 3151176-43

Prepared by: SGS North America Inc.

Approved by: Frank Savino

Frank Savino

Date: August 27, 2013

Report Accepted by:

Contract Technical Manager, O.V.S.C.
Office of Vehicle Safety Compliance

Accepted By:

Acceptance Date: August 27, 2013

1. Report No. 213-SGS-13-43	2. Govt. Accession No.	3. Recipient's Catalog No.	
4. Title and Sub-Title CHILD RESTRAINT SYSTEM, COMPONENT PARTS, Model No.: Evenflo Maestro		5. Report Date: August 27, 2013	
6. Performing Organization Code SGS-213-13-43		7. Author: Frank Savino, Project Manager	
8. Performing Organization Report No. SGS-DOT-213-13-43		9. Performing Organization Name and Address: SGS North America Inc. 291 Fairfield Avenue Fairfield, NJ 07004	
10. Work Unit No.		11. Order Number DTNH22-12-D-00263	
12. Sponsoring Agency Name and Address: U.S. DEPARTMENT OF TRANSPORTATION NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION ENFORCEMENT OFFICE OF VEHICLE SAFETY COMPLIANCE 1200 NEW JERSEY AVE, SE (ROOM W45-304) WASHINGTON, D.C. 20590		13. Type of report and Period Covered FINAL TEST REPORT August 9-26, 2013	
14. Sponsoring Agency Code: NVS-220		15.	

16. Abstract

THIS REPORT PRESENTS THE RESULTS OF TESTS PERFORMED IN ACCORDANCE WITH FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213 ON CHILD RESTRAINT SYSTEM COMPONENT PARTS.

MODEL NUMBER: Evenflo Maestro
ALL TESTS WERE SATISFACTORILY COMPLETED.

17. Key Words FMVSS No. 213 Child Restraint System Safety Engineering	18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services, Room 5111 (NPO-411) 1200 New Jersey Avenue, SE (Room E12-100) Washington, DC 20590 email: tis@nhtsa.dot.gov Telephone No. 202-493-2833		
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this Page) Unclassified	21. No. of Pages 41	22. Price

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SECTION 1

PURPOSE AND TEST PROCEDURES

PURPOSE AND TEST PROCEDURES

Purpose: The purpose of this report was to determine if the production child restraint components parts supplied by the National Highway Traffic Safety Administration met the requirements of Federal Motor Vehicle Safety Standard Number 213 - "Child Restraint System".

Test Procedures: The "SGS North America Inc. Laboratories Test Procedure for FMVSS No. 213" dated July 2012 submitted and approved by the office of Vehicle Safety Compliance National Highway Traffic Safety Administration contains the specific procedures used to conduct this test. This procedure shall not be interpreted to be in conflict with any portion of FMVSS No. 213 and amendments in effect as noted in the applicable order.

SECTION 2

INSPECTION DATA AND TEST DATA

INSPECTION AND TEST DATA
FMVSS NO. 213 - CHILD RESTRAINT SYSTEMS

Report No.: 3151176-43

Child Restraint System Identification

Manufacturer:

Name: Evenflo Co.

Address: 1801 Commerce Dr.
Piqua, OH 45356

Model: Maestro

Technicians: Mark Ostrovsky and John Roycraft

Project Manager: Frank Savino

WEBBING PERFORMANCE TESTS (a213-5.4.1)

Report No.: 3151176-43

Test Date: August 26, 2013

Laboratory Ambient Conditions During Testing

Temperature: 73 ° F

Relative Humidity: 50 %

Webbing Usage on Restraint: Harness

Test	Compliance Requirement	Test Result	Pass/Fail
Non-Degraded Webbing (FMVSS 209, S5.1 (b))	New webbing breaking strength, 15,000 N (webbing used to secure CRS to vehicle) or 11,000 N (webbing used to secure child within CRS)	1. 18,900 2. 19,200 3. 19,100 Median: 19,100	Pass
Resistance to Abrasion (FMVSS 209, S4.2(d) & S5.1(d)) Abrasion Cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. 19,500 2. 18,900 3. 19,000 Median: 19,000 Strength Retained: 99.5%	Pass
Resistance to Buckle Abrasion (FMVSS 209, S5.3(c)) Abrasion cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A

WEBBING PERFORMANCE TESTS (a213-5.4.1) (Continued)

Report No.: 3151176-43

Test Date: August 26, 2013

Test	Compliance Requirement	Test Result	Pass/Fail
Resistance to Light (FMVSS 209, S4.2 (e) & S5.1(e)) Exposure Time 100 Hr. (100 Hours Required)	Median breaking strength, Newtons (60% of median baseline strength)	1. 18,800 2. 18,600 3. 19,000 Median: 18,800 Strength Retained: 98.4%	Pass
	Color Retention >/= No. 2 on the Geometric Gray Scale	1. 5 2. 5 3. 5	Pass
Resistance to Micro-Organisms (FMVSS 209, S4.2 (f), S5.1 (f))	Median breaking strength, Newtons (85% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A
Width Requirement (FMVSS 213, S5.4.1.3)	Width >/= 38 mm) If webbing contacts the test dummy torso	1. 39.0 2. 39.0 3. 39.0	Pass

Remarks:

Technicians: John Roycraft

Project Manager: Frank Savino

WEBBING PERFORMANCE TESTS (a213-5.4.1)

Report No.: 3151176-43

Test Date: August 26, 2013

Laboratory Ambient Conditions During Testing

Temperature: 73 ° F

Relative Humidity: 50 %

Webbing Usage on Restraint: Adjuster

Test	Compliance Requirement	Test Result	Pass/Fail
Non-Degraded Webbing (FMVSS 209, S5.1 (b))	New webbing breaking strength, 15,000 N (webbing used to secure CRS to vehicle) or 11,000 N (webbing used to secure child within CRS)	1. 16,100 2. 16,300 3. 16,200 Median: 16,200	Pass
Resistance to Abrasion (FMVSS 209, S4.2(d) & S5.1(d)) Abrasion Cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. 16,000 2. 16,200 3. 15,800 Median: 16,000 Strength Retained: 98.8%	Pass
Resistance to Buckle Abrasion (FMVSS 209, S5.3(c)) Abrasion cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A

WEBBING PERFORMANCE TESTS (a213-5.4.1) (Continued)

Report No.: 3151176-43

Test Date: August 26, 2013

Test	Compliance Requirement	Test Result	Pass/Fail
Resistance to Light (FMVSS 209, S4.2 (e) & S5.1(e)) Exposure Time 100 Hr. (100 Hours Required)	Median breaking strength, Newtons (60% of median baseline strength)	1. 15,700 2. 16,000 3. 16,200 Median: 16,000 Strength Retained: 98.8%	Pass
	Color Retention >/= No. 2 on the Geometric Gray Scale	1. 5 2. 5 3. 5	Pass
Resistance to Micro-Organisms (FMVSS 209, S4.2 (f), S5.1 (f))	Median breaking strength, Newtons (85% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A
Width Requirement (FMVSS 213, S5.4.1.3)	Width >/= 38 mm) If webbing contacts the test dummy torso	1. 26.0 2. 26.0 3. 26.0	N/A

Remarks:

Technicians: John Roycraft

Project Manager: Frank Savino

WEBBING PERFORMANCE TESTS (a213-5.4.1)

Report No.: 3151176-43

Test Date: August 23, 2013

Laboratory Ambient Conditions During Testing

Temperature: 73 ° F

Relative Humidity: 50 %

Webbing Usage on Restraint: Latch

Test	Compliance Requirement	Test Result	Pass/Fail
Non-Degraded Webbing (FMVSS 209, S5.1 (b))	New webbing breaking strength, 15,000 N (webbing used to secure CRS to vehicle) or 11,000 N (webbing used to secure child within CRS)	1. 19,500 2. 19,300 3. 18,800 Median: 19,300	Pass
Resistance to Abrasion (FMVSS 209, S4.2(d) & S5.1(d)) Abrasion Cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. 19,300 2. 19,300 3. 19,300 Median: 19,300 Strength Retained: 100%	Pass
Resistance to Buckle Abrasion (FMVSS 209, S5.3(c)) Abrasion cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A

WEBBING PERFORMANCE TESTS (a213-5.4.1) (Continued)

Report No.: 3151176-43

Test Date: August 23, 2013

Test	Compliance Requirement	Test Result	Pass/Fail
Resistance to Light (FMVSS 209, S4.2 (e) & S5.1(e)) Exposure Time 100 Hr. (100 Hours Required)	Median breaking strength, Newtons (60% of median baseline strength)	1. 18,400 2. 18,400 3. 17,900 Median: 18,400 Strength Retained: 95.3%	Pass
	Color Retention >/= No. 2 on the Geometric Gray Scale	1. 5 2. 5 3. 5	Pass
Resistance to Micro-Organisms (FMVSS 209, S4.2 (f), S5.1 (f))	Median breaking strength, Newtons (85% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A
Width Requirement (FMVSS 213, S5.4.1.3)	Width >/= 38 mm) If webbing contacts the test dummy torso	1. 39.0 2. 39.0 3. 39.0	N/A

Remarks:

Technicians: John Roycraft

Project Manager: Frank Savino

WEBBING PERFORMANCE TESTS (a213-5.4.1)

Report No.: 3151176-43

Test Date: August 23, 2013

Laboratory Ambient Conditions During Testing

Temperature: 73 ° F

Relative Humidity: 50 %

Webbing Usage on Restraint: Tether

Test	Compliance Requirement	Test Result	Pass/Fail
Non-Degraded Webbing (FMVSS 209, S5.1 (b))	New webbing breaking strength, 15,000 N (webbing used to secure CRS to vehicle) or 11,000 N (webbing used to secure child within CRS)	1. 19,900 2. 18,900 3. 19,900 Median: 19,900	Pass
Resistance to Abrasion (FMVSS 209, S4.2(d) & S5.1(d)) Abrasion Cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. 18,700 2. 18,800 3. 17,600 Median: 18,700 Strength Retained: %	Pass
Resistance to Buckle Abrasion (FMVSS 209, S5.3(c)) Abrasion cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A

WEBBING PERFORMANCE TESTS (a213-5.4.1) (Continued)

Report No.: 3151176-43

Test Date: August 23, 2013

Test	Compliance Requirement	Test Result	Pass/Fail
Resistance to Light (FMVSS 209, S4.2 (e) & S5.1(e)) Exposure Time 100 Hr. (100 Hours Required)	Median breaking strength, Newtons (60% of median baseline strength)	1. 19,000 2. 19,400 3. 18,500 Median: 19,000 Strength Retained: 95.5%	Pass
	Color Retention >/= No. 2 on the Geometric Gray Scale	1. 5 2. 5 3. 5	Pass
Resistance to Micro-Organisms (FMVSS 209, S4.2 (f), S5.1 (f))	Median breaking strength, Newtons (85% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A
Width Requirement (FMVSS 213, S5.4.1.3)	Width >/= 38 mm) If webbing contacts the test dummy torso	1. 39.0 2. 39.0 3. 39.0	N/A

Remarks:

Technicians: John Roycraft

Project Manager: Frank Savino

BELT BUCKLE AND ADJUSTMENT HARDWARE
PERFORMANCE TESTS (S213-S5.4.2/S209-S4.3)

Report No.: 3151176-43

Test Date: August 21, 2013 **Item Code:** Maestro

Laboratory Ambient Conditions During Testing

Temperature: 73 °F

Relative Humidity: 50 %

Test	Compliance Requirement	Test Result	Pass/Fail
Corrosion Resistance (FMVSS 209), (S4.3.(a) (2)) Exposure Time 24 Hours (24 Hours Required) Drying Time 1 Hour (1 Hour Required)	No Corrosion (NC)	1. NC 2. NC 3. NC	Pass Pass Pass
Push Buttons S213; S5.4.3.5 (c)	Area ≥ 0.6 sq. in.)	0.84	Pass
	Dimensions	0.91 x 1.18	N/A
Lever Release	Cylinder Insertion	N/A	N/A
Other	Two-finger Access	N/A	N/A

BELT BUCKLE AND ADJUSTMENT HARDWARE
PERFORMANCE TESTS (S213-S5.4.2/S209-S4.3) (Continued)

Report No.: 3151176-43

Test	Compliance Requirement	Test Result	Pass/Fail
Buckle Latch (FMVSS 209 S4.3(g)) Follows ***Corrosion Resistance*** Cycles 200 (200 Required)	No Functional Deterioration (NFD)	1. NFD 2. NFD 3. NFD	1. Pass 2. Pass 3. Pass

Test	Compliance Requirement	Test Result As Received (Results in Pounds)		Test Result After ***Corrosion Resistance***	
		Front	Reverse	Front	Reverse
Buckle Latch (FMVSS 209 S4.3(g)) ***Corrosion Resistance*** metal to metal buckles Note: Cycle Button; Perform manual latching and unlatching prior to partial engagement test. Measurements truncated to one decimal place.	Partial Engagement Separation Force <5 lb.	Sample 1 1) * 2) * 3) *	Sample 1 1) N/A 2) N/A 3) N/A	Sample 1 1) * 2) * 3) *	Sample 1 1) N/A 2) N/A 3) N/A
		Sample 2 1) * 2) * 3) *	Sample 2 1) N/A 2) N/A 3) N/A	Sample 2 1) * 2) * 3) *	Sample 2 1) N/A 2) N/A 3) N/A
		Sample 3 1) * 2) * 3) *	Sample 3 1) N/A 2) N/A 3) N/A	Sample 3 1) * 2) * 3) *	Sample 3 1) N/A 2) N/A 3) N/A

Remarks: *There is no partial latch – the buckles are self-ejecting
N/A = Not Applicable

Technicians: Mark Ostrovsky and John Roycraft

Project Manager: Frank Savino

BELT BUCKLE AND ADJUSTMENT HARDWARE PERFORMANCE TESTS (S213-S5.4.2/S209-S4.3)

Report No.: 3151176-43

Test Date: August 21, 2013 **Item Code:** Maestro

Laboratory Ambient Conditions During Testing

Temperature: 73 °F

Relative Humidity: 50 %

Test	Compliance Requirement	Test Result	Pass/Fail
Temperature Resistance (FMVSS 209), (S4.3.(b)) Exposure Time 24 Hours (24 Hours Required) Drying Time 1 Hour (1 Hour Required)	No Functional Deterioration (NFD)	1. NFD 2. NFD 3. NFD	Pass Pass Pass
Push Buttons S213; S5.4.3.5 (c)	Area ≥ 0.6 sq. in.)	0.84	Pass
	Dimensions	0.91 x 1.18	N/A
Lever Release	Cylinder Insertion	N/A	N/A
Other	Two-finger Access	N/A	N/A

BELT BUCKLE AND ADJUSTMENT HARDWARE
PERFORMANCE TESTS (S213-S5.4.2/S209-S4.3) (Continued)

Report No.: 3151176-43

Test	Compliance Requirement	Test Result	Pass/Fail
Buckle Latch (FMVSS 209 S4.3(g)) Follows ***Temperature Resistance*** Cycles 200 (200 Required))	No Functional Deterioration (NFD)	1. NFD 2. NFD 3. NFD	1. Pass 2. Pass 3. Pass

Buckle Latch (FMVSS 209 S4.3(g)) ***Temperature Resistance*** metal to metal buckles Note: Cycle Button; Perform manual latching and unlatching prior to partial engagement test. Measurements truncated to one decimal place.	Partial Engagement Separation Force <5 lb.	Test Result As Received (Results in Pounds)		Test Result After ***Temperature Resistance***	
		Front	Reverse	Front	Reverse
		Sample 1 1) * 2) * 3) *	Sample 1 1) N/A 2) N/A 3) N/A	Sample 1 1) * 2) * 3) *	Sample 1 1) N/A 2) N/A 3) N/A
		Sample 2 1) * 2) * 3) *	Sample 2 1) N/A 2) N/A 3) N/A	Sample 2 1) * 2) * 3) *	Sample 2 1) N/A 2) N/A 3) N/A
		Sample 3 1) * 2) * 3) *	Sample 3 1) N/A 2) N/A 3) N/A	Sample 3 1) * 2) * 3) *	Sample 3 1) N/A 2) N/A 3) N/A

Remarks: *There is no partial latch – the buckles are self-ejecting
N/A = Not Applicable

Technicians: Mark Ostrovsky and John Roycraft

Project Manager: Frank Savino

APPENDIX A

EQUIPMENT LIST AND CALIBRATION

SGS NORTH AMERICA INC.
TEST EQUIPMENT

NO.	ITEM	MANUFACTURER	MODEL	SERIAL NO.	CAL. PERIOD	DATE OF LAST CAL.	ACCURACY	REMARKS
WEBBING TESTING								
1	Steel Ruler	Mitutoyo	182-125	---	1 Year	7/13	+/-0.01 inch	Webbing Width
2	Hex-Bar Abrader	U.S. Testing	---	---	1Year*	6/13	---	*Timer-Counter Assembly and Weights
3	Weatherometer	Atlas Electric Co.	CXW	CB-12295	1 Year*	5/13	+/-1%	*Temp. and Voltage Meters
4	Weatherometer	Atlas Electric Co.	CXW	CB-1214	1 Year*	5/13	+/-1%	*Temp. and Voltage Meters
5	Weatherometer	Atlas Electric Co.	XW-WT	W0-3009	1 Year*	5/13	+/-1%	*Temp. and Voltage Meters
6	Color Change - Gray Scale	AATCC	---	---	---	---	---	Visual Comparison
7	Universal Testing Machine	Instron	1115	3289	1 Year	6/13	+/-1%	Webbing Strength
8	Universal Testing Machine	Instron	TTC	4344	1 Year	6/13	+/-1%	Webbing Strength
9	2” Split Drum Grips	U.S. Testing Co.	---	---	---	---	---	Instron Fixture

SGS NORTH AMERICA INC.
TEST EQUIPMENT

NO.	ITEM	MANUFACTURER	MODEL	SERIAL NO.	CAL. PERIOD	DATE OF LAST CAL.	ACCURACY	REMARKS
			BUCKLE TESTING					
10	Salt Spray Chamber	Singleton Corp.	SCCH22	SCCH22-21947	---	---	---	Checked daily in accordance with ASTM B-117
11	Temperature Recorder	Honeywell	DR4300	0318Y359 016800003	1 Year	4/13	+/- 5°F	Monitor Salt Spray Temperature
12	Temperature Humidity Chamber	Blue-M	FR-386PC	AA221	1Year	4/13	+/-2°C +/-5% R.H	Temperature-Humidity Exposure
13	Temperature Humidity Chamber	Blue-M	FR-386PBX	AA278	1Year	4/13	+/-2°C +/-5% R.H	Temperature-Humidity Exposure
14	Temperature Humidity Chamber	Blue-M	LR-386B-MP1	L3-122	1 Year	1/13	+/-2°C +/-5% R.H	Temperature-Humidity Exposure
15	Temperature Chamber	Despatch	52392 V29	037-15	1 Year	4/13	+/-2°C +/-5% R.H	Temperature Exposure
16	Temperature Recorder	Bristol	N15-T25	736652	1 Year	4/13	+/-1%	Temperature Measurement
17	Pushbutton Latch Fixture	U.S. Testing	---	---	1 Year*	6/13	---	Force checked prior to use. *Timer Counter
			STANDARD LABORATORY CONDITIONING					
18	Temperature / Humidity Recorder	Dickson	TH800	07150222	1Year	4/13	+/-2°F +/-5% R.H.	Monitor Room Conditioning

APPENDIX B

INTERPRETATION AND/OR DEVIATIONS FROM FMVSS NO. 213

NO INTERPRETATIONS OR DEVIATIONS FROM FMVSS NO. 213

APPENDIX C

PHOTOGRAPHS

LISTS OF PHOTOGRAPHS

The following section identifies photographed testing equipment.

The following section identifies photographs of the seat.

C-2

C-3

Temperature/Humidity Chamber

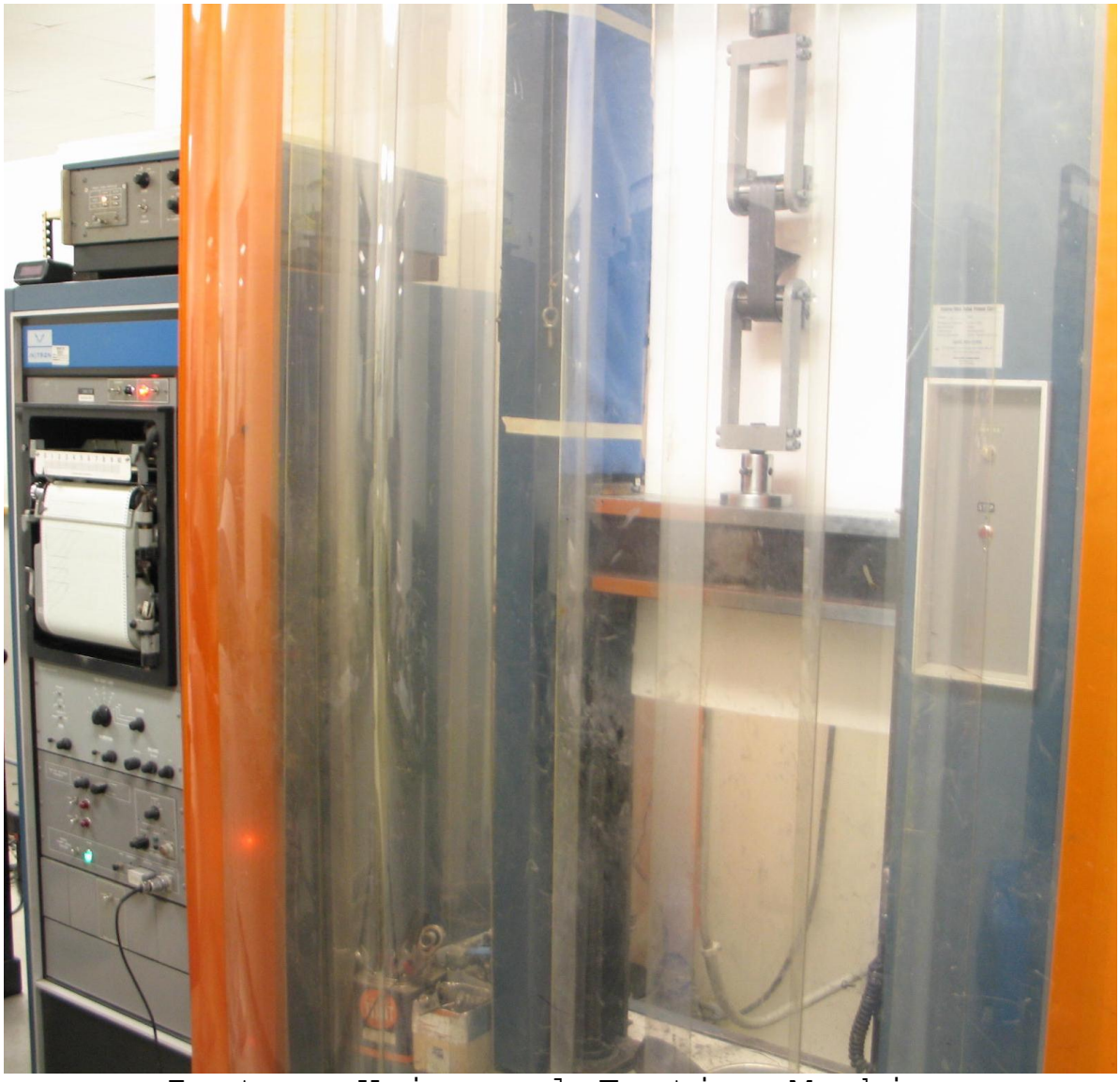
C-4

Temperature Chamber

C-5

Button Cycling Apparatus

C-6

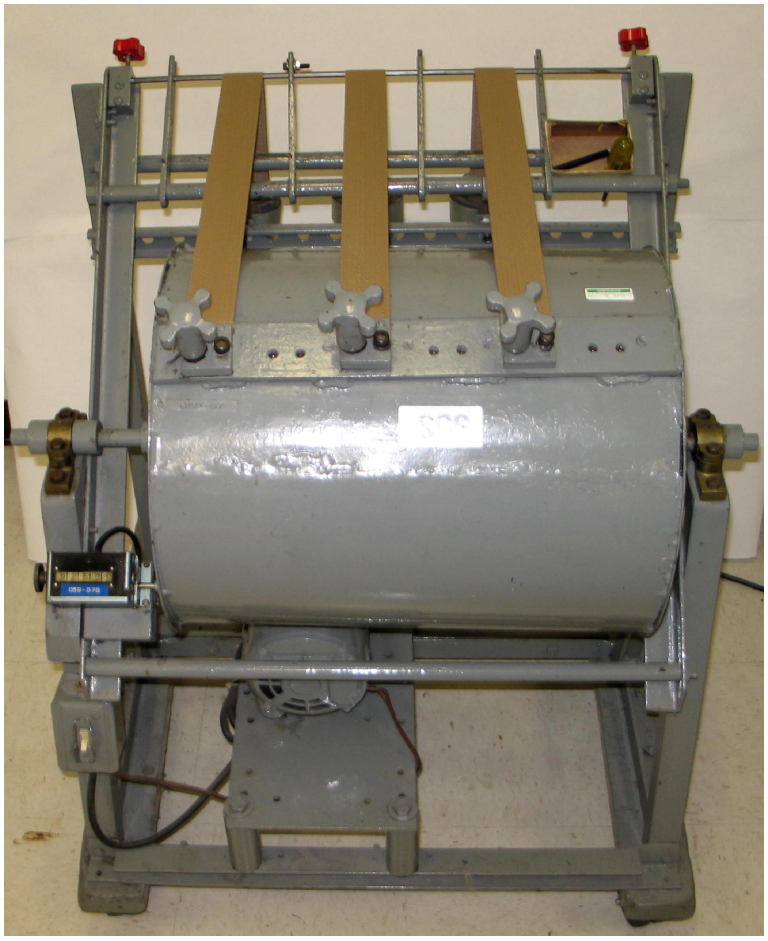


Instron Universal Testing Machine

C-7

Weatherometer

C-8



Hex Bar Abrasion Apparatus

C-9


evenflo
BOOSTER CAR SEATS
SIÈGES D' APPOINT D'AUTO
ASIENTOS DE NIÑO PARA EL AUTOMÓVIL
#43 EVENFLO MAESTRO C9

C-10


evenflo
#43
#43 EVENFLO MAESTRO C10
BOOSTER CAR SEATS
SIÈGES D' APPOINT D'AUTO
ASIENTOS DE NIÑO PARA EL AUTOMÓVIL
Contains 2 car seats • Contient 2 sièges auto • Contenido 2 asientos para el automóvil
0003
DEPT./DIV.
M1014
237750
03-01-13
Old Dominion Freight Lines
3102198

C-10A (Box label showing actual contents near bottom edge)

C-11

C-12

C-13

C-14

FOR YOUR CHILD'S CONTINUED SAFETY

Please take a few moments to promptly fill out and return the attached card (or register online using the direct link to the manufacturer's registration website provided).

Although child restraint systems undergo testing and evaluation, it is possible that a child restraint could be recalled.

In case of a recall, we can reach you only if we have your name and address, so please send in the card (or register online) to be on our recall list.

Please fill this card out and mail it NOW,
(or register online at: *www.evenflo.com/registercarseat)*
while you are thinking about it.

The card is already addressed and we've paid the postage.

Tear off and mail this part

Consumer: Just fill in your name and address and e-mail address.

Your Name # 43

Your Street Address

City State Zip Code

E-mail Address

CHILD RESTRAINT REGISTRATION CARD

Made in/Fabriqué en 2013 | 02 | 20
(year | month | day)/(année | mois | jour)
Name/Nom Maestro
Model/Modèle 3102198 PO 2
Manufactured in / Fabriqué en US
Expires on / Expire le 2019 | 02 | 19