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SIGNATURE APPROVAL PAGE

Procedure Number: NHTSA FMVSS 213 Sled Test Procedure
Rev. 17, dated December 5, 2018

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Date: 03/25/2019

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Project Engineer

Date: 03/25/2019

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Instrumentation/Calibration: Brian Roach

Secretary: Pam Delaney

The results presented in this report relate only to the specified test items as received. MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

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TEST SUMMARY

The tests were conducted in accordance with 49 CFR Part 571.213 and Laboratory Test Procedure TP-213-10 at MGA Research Corporation, Virginia Operations in Manassas, Virginia USA on March 14, 2019.

DATA SHEET - TEST 2

Dynamic Impact Test Conditions <i>FMVSS 213: S6.1</i>	
Sled Test No.	V19182R
Test Date	03/14/2019
Test Bench	Bench 05
Dummy	Hybrid III 6 Year Old (Part 572N)
Serial Number	077
Temperature (°C)	21.4
Humidity (% RH)	31
Seat Setup	
Seat Model	ClypX SKB #2
Installation Direction	Forward-Facing
Belt Attachment	Type II
Tether	No
Shoulder Belt Position	Fixed
Crotch Belt Position	N/A
Recline Position	Fixed
Pre Back Angle (RF)	N/A
Pulse Results	
Peak Acceleration (g)	23.9
Velocity (kph)	48.1

Injury Criteria <i>FMVSS 213: S5.1.2</i>		
Criteria	Compliance Requirement	Test Result
Head Injury Criterion	HIC 36 \leq 1000	743
Chest Injury Criterion	3 ms Chest Clip \leq 60 g	51 g

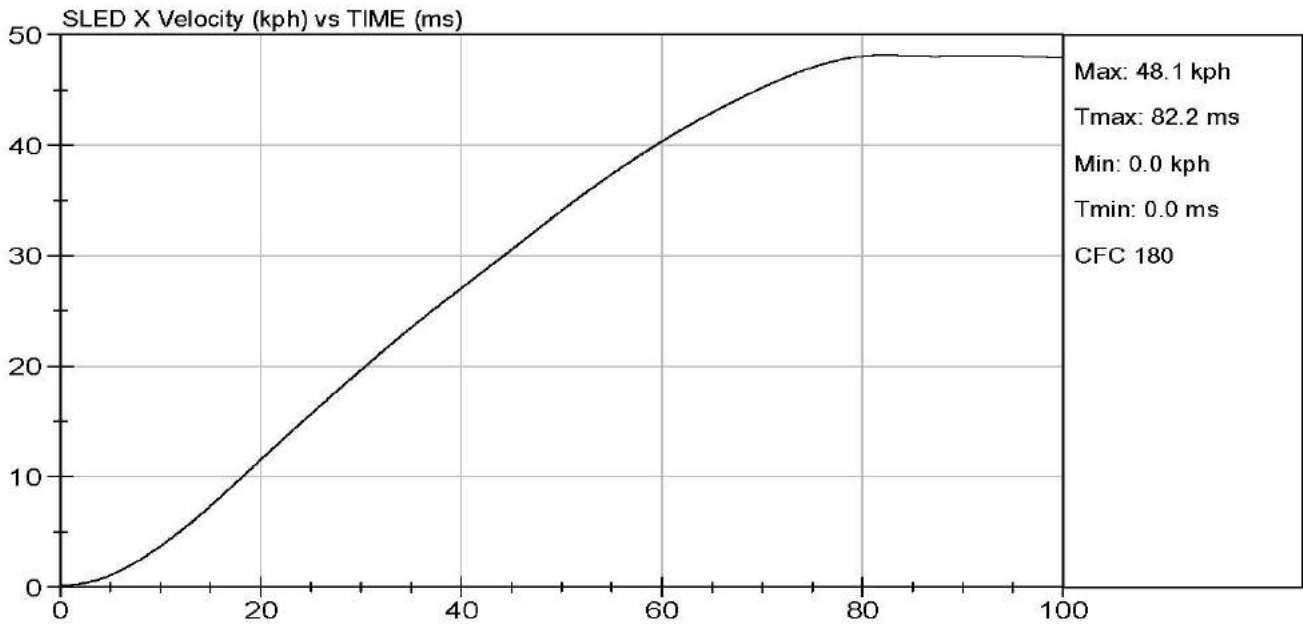
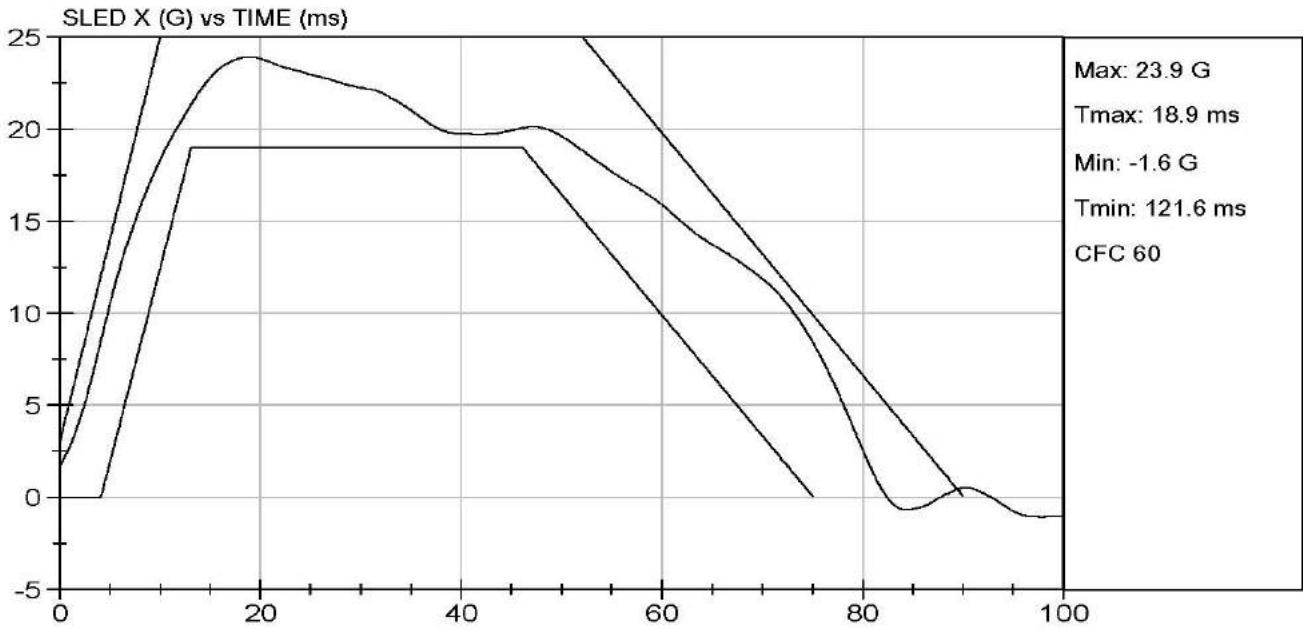
Buckle Release <i>FMVSS 213: S5.4.3.5, S6.2</i>		
Criteria	Compliance Requirement	Test Result
Pre-Impact Release Force	40 - 62 N	N/A
Post-Impact Release Force	\leq 71 N	N/A
Buckle Integrity	No Release	No Release

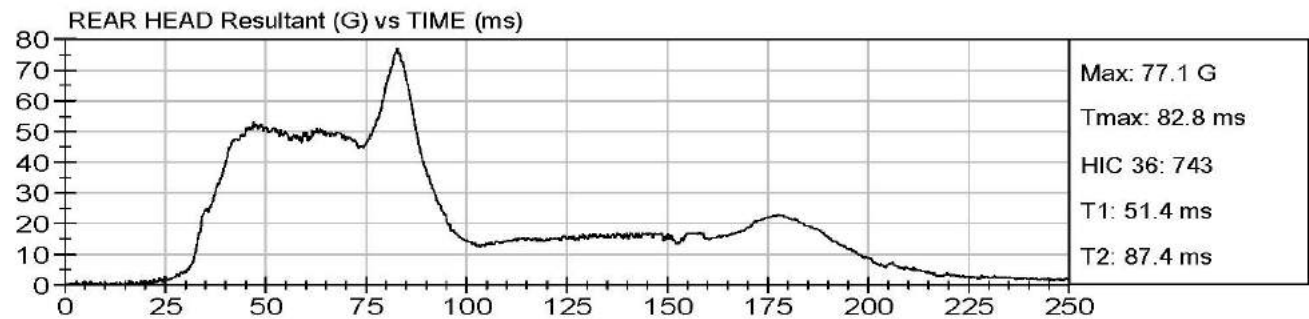
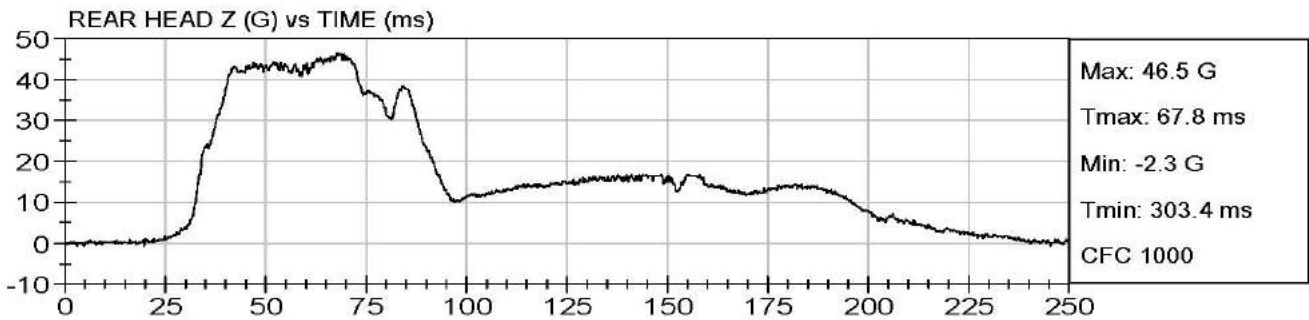
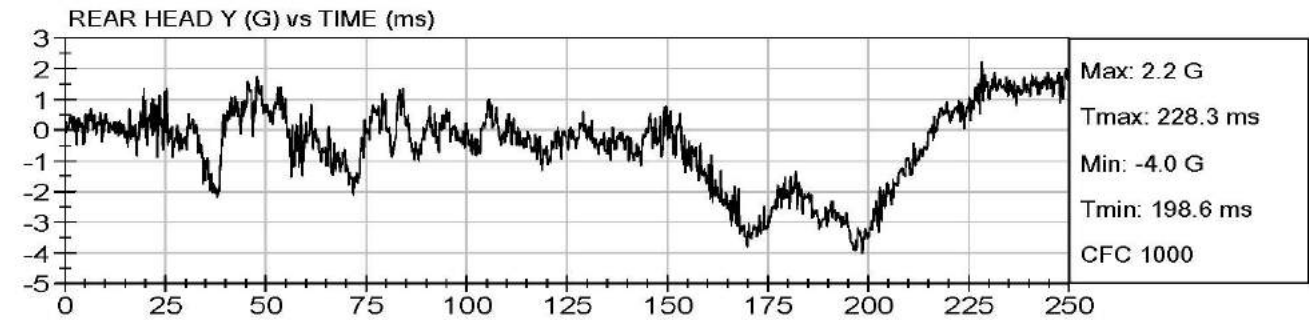
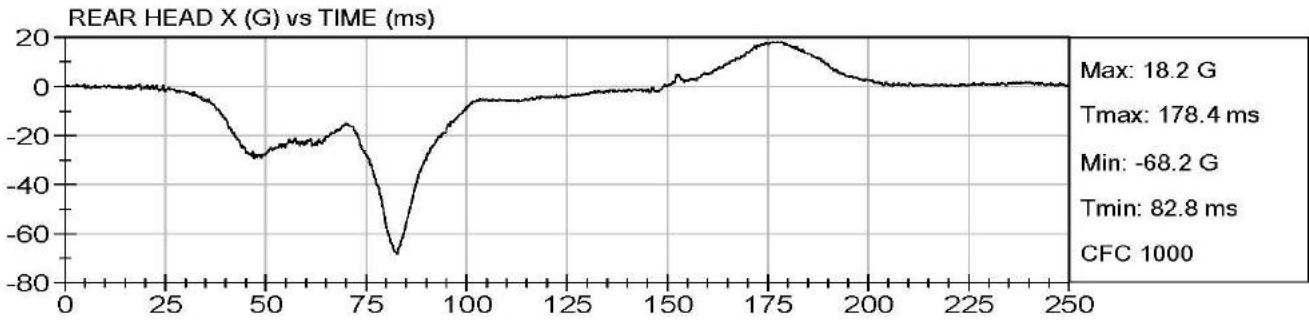
Restraint System Integrity <i>FMVSS 213: S5.1.1</i>		
Criteria	Compliance Requirement	Test Result
Structural Integrity	No Complete Separation	None
	No Partial Separation with Exposed Edge Radius $<$ ¼ in	None
	No Partial Separation with Protrusions with Height $>$ ³⁄₈ in	None
Adjustment Position	No Change	No Change
Back/Seating Surface Angle (FF)	\geq 45°	\geq 45°

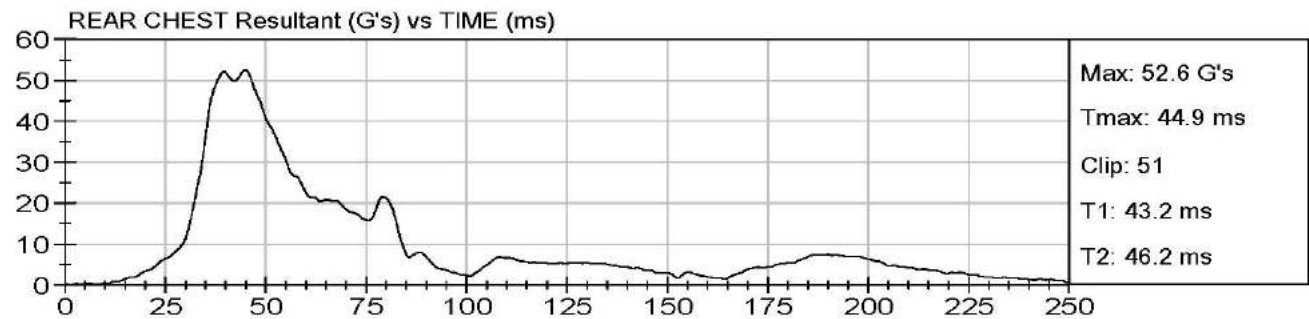
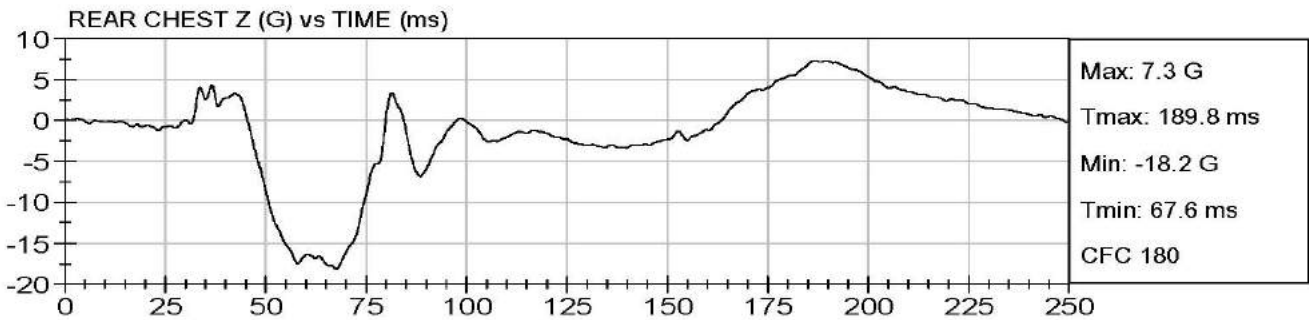
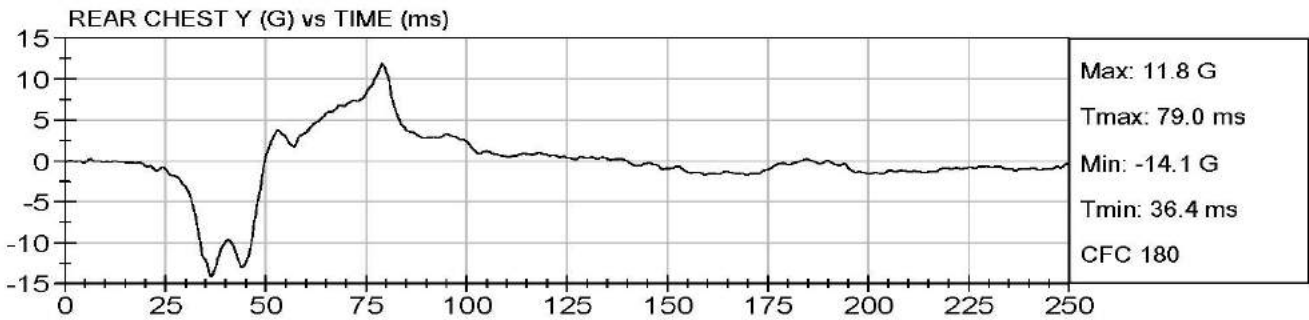
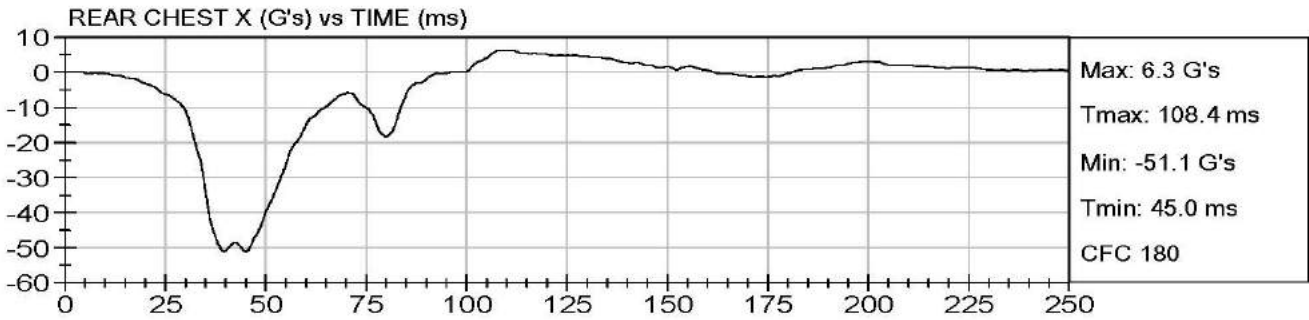
Occupant Excursion <i>FMVSS 213: S5.1.3, S5.1.4, S5.2.1.1(c)</i>		
Criteria	Compliance Requirement	Test Result
Torso Retention	Retain Within System	Retained
Head Excursion (FF)	\leq 720 mm (Tether) \leq 813 mm (No Tether)	441 mm (17.4 in)
Knee Target Excursion (FF)	\leq 915 mm	587 mm (23.1 in)
Seat Back Angle (RF)	\leq 70°	N/A
Head/Torso Angle	Rearward Change \leq 45°	\leq 45°

Remarks:

- 1) Belts tensioned prior to product installation





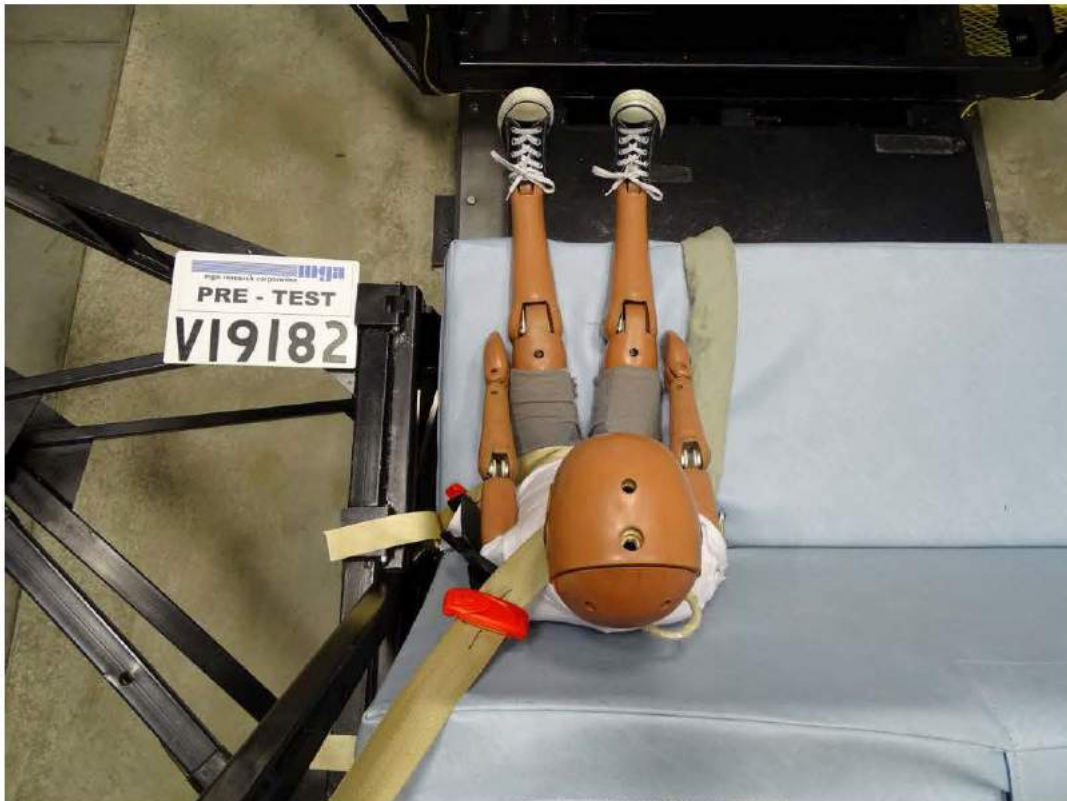




V19182R Pre-Test



V19182R Pre-Test



V19182R Post-Test



V19182R Post-Test



V19182R Post-Test



DATA SHEET - TEST 3

Dynamic Impact Test Conditions <i>FMVSS 213: S6.1</i>	
Sled Test No.	V19183F
Test Date	03/14/2019
Test Bench	Bench 04
Dummy	Hybrid III 6 Year Old (Part 572N)
Serial Number	111
Temperature (°C)	21.6
Humidity (% RH)	32
Seat Setup	
Seat Model	ClypX SKB #3
Installation Direction	Forward-Facing
Belt Attachment	Type II
Tether	No
Shoulder Belt Position	Fixed
Crotch Belt Position	N/A
Recline Position	Fixed
Pre Back Angle (RF)	N/A
Pulse Results	
Peak Acceleration (g)	23.6
Velocity (kph)	48.0

Injury Criteria <i>FMVSS 213: S5.1.2</i>		
Criteria	Compliance Requirement	Test Result
Head Injury Criterion	HIC 36 \leq 1000	550
Chest Injury Criterion	3 ms Chest Clip \leq 60 g	49 g

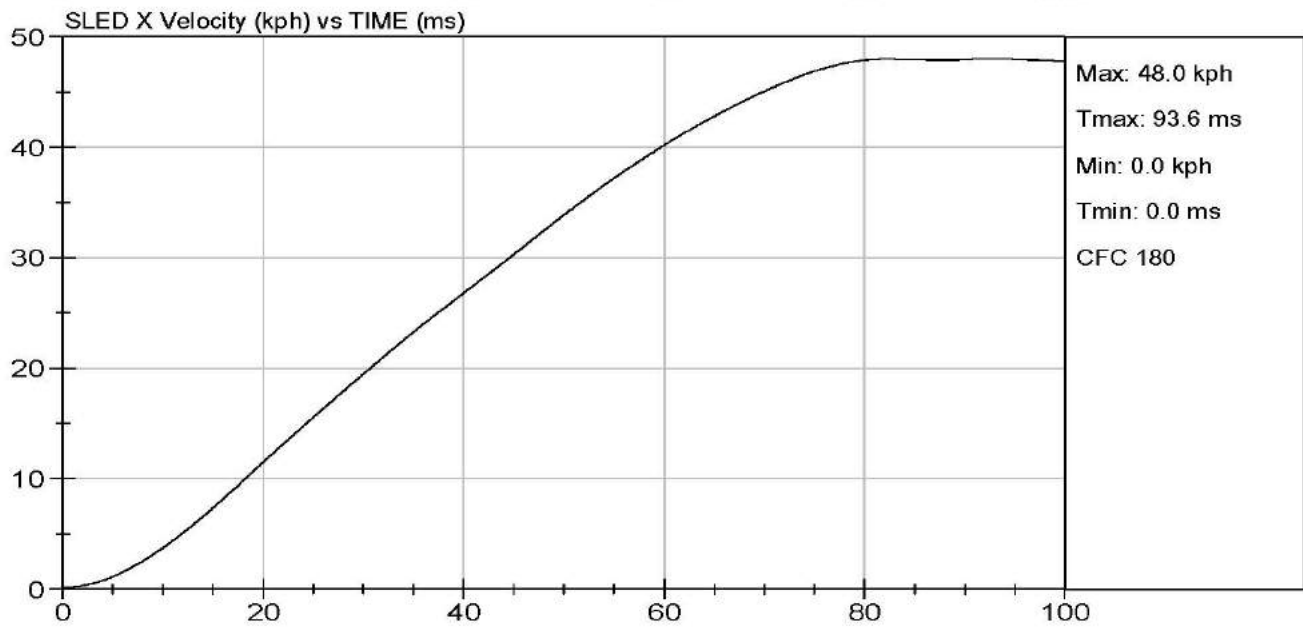
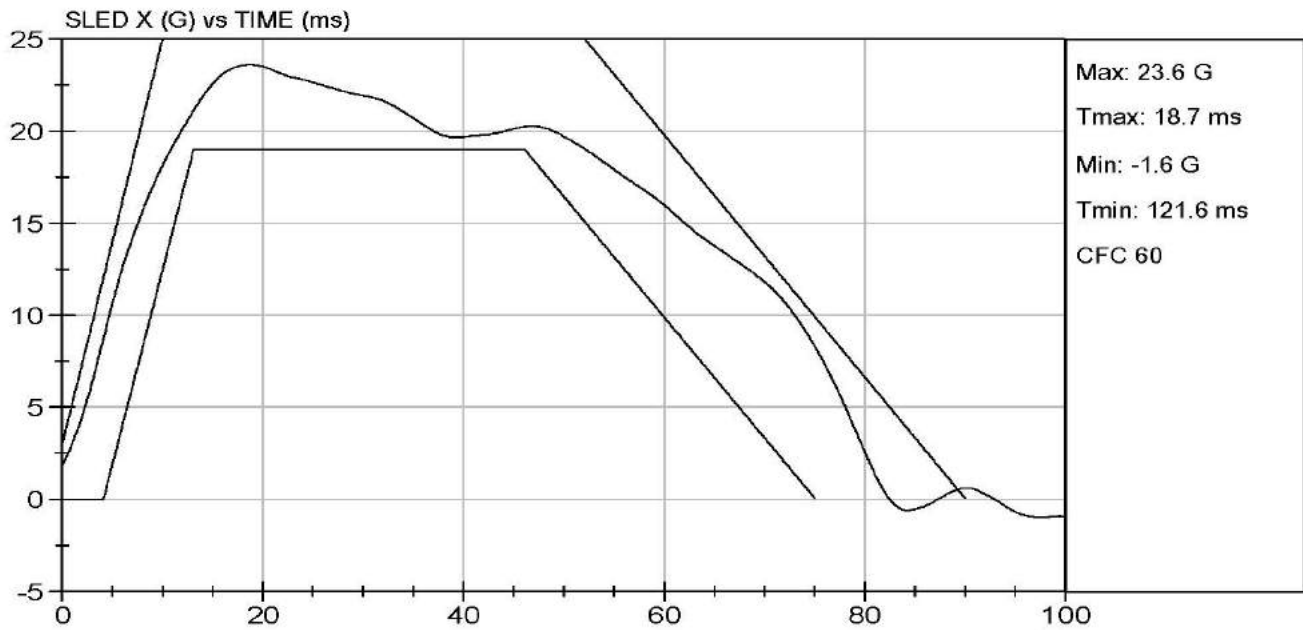
Buckle Release <i>FMVSS 213: S5.4.3.5, S6.2</i>		
Criteria	Compliance Requirement	Test Result
Pre-Impact Release Force	40 - 62 N	N/A
Post-Impact Release Force	\leq 71 N	N/A
Buckle Integrity	No Release	No Release

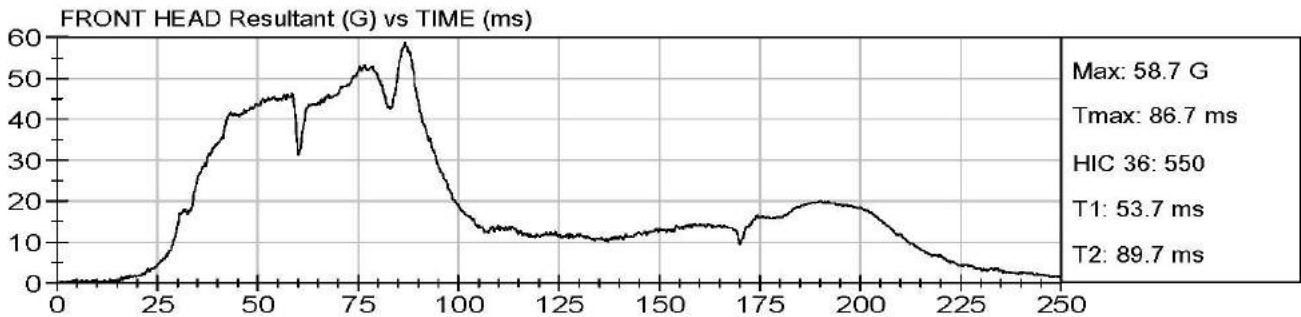
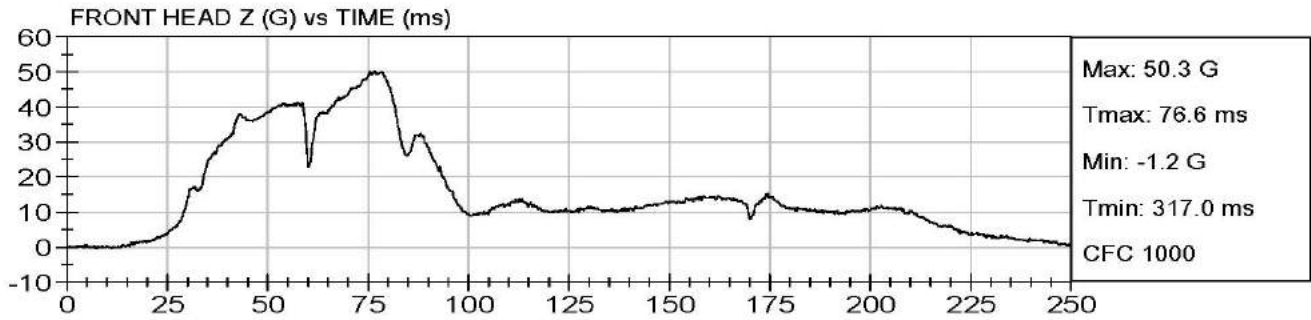
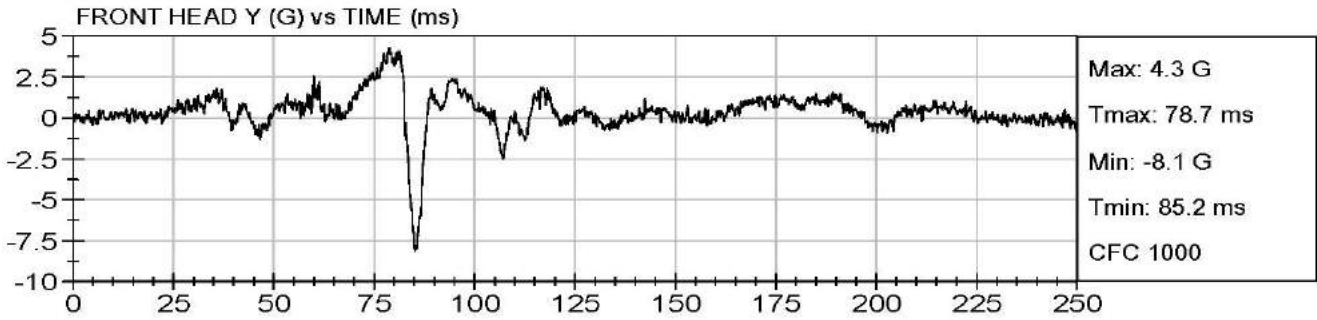
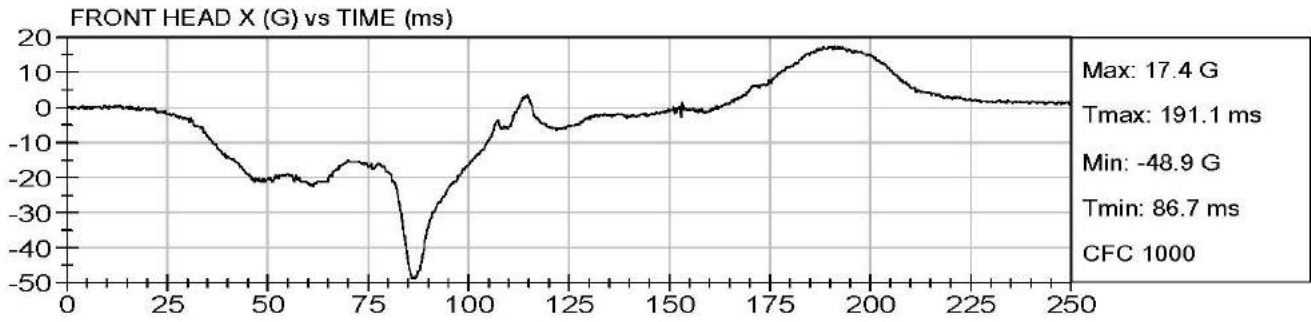
Restraint System Integrity <i>FMVSS 213: S5.1.1</i>		
Criteria	Compliance Requirement	Test Result
Structural Integrity	No Complete Separation	None
	No Partial Separation with Exposed Edge Radius $<$ ¼ in	None
	No Partial Separation with Protrusions with Height $>$ ⅜ in	None
Adjustment Position	No Change	No Change
Back/Seating Surface Angle (FF)	\geq 45°	\geq 45°

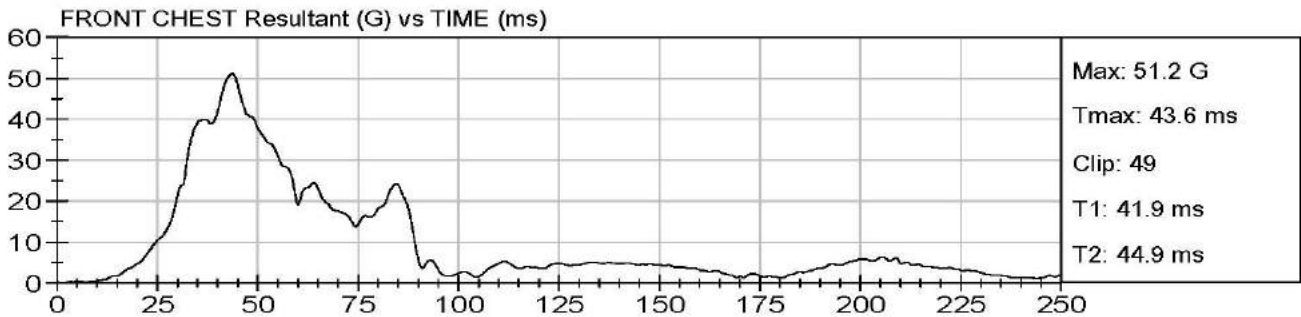
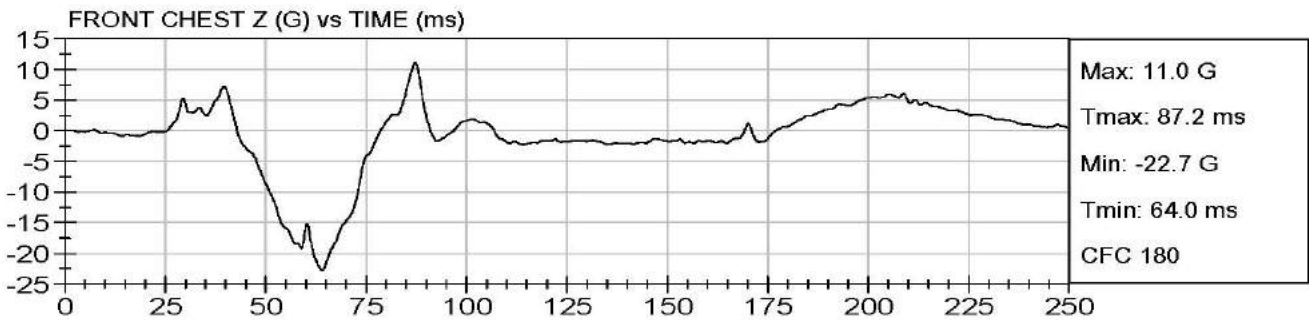
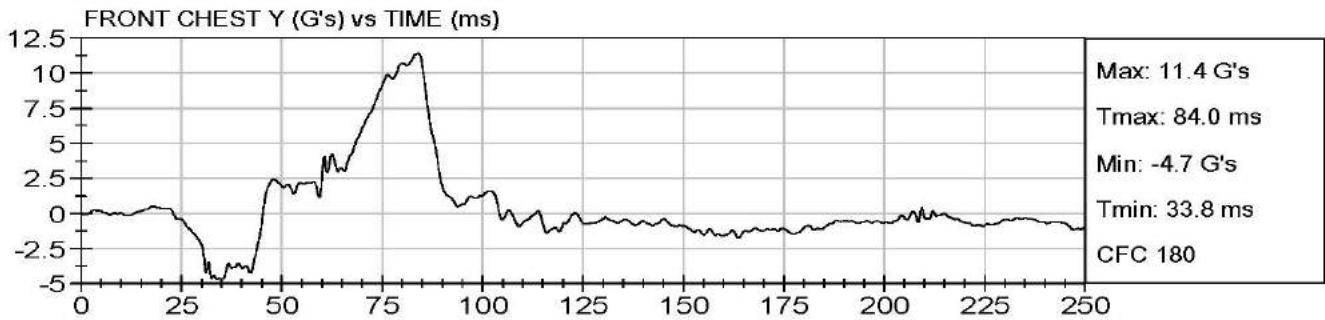
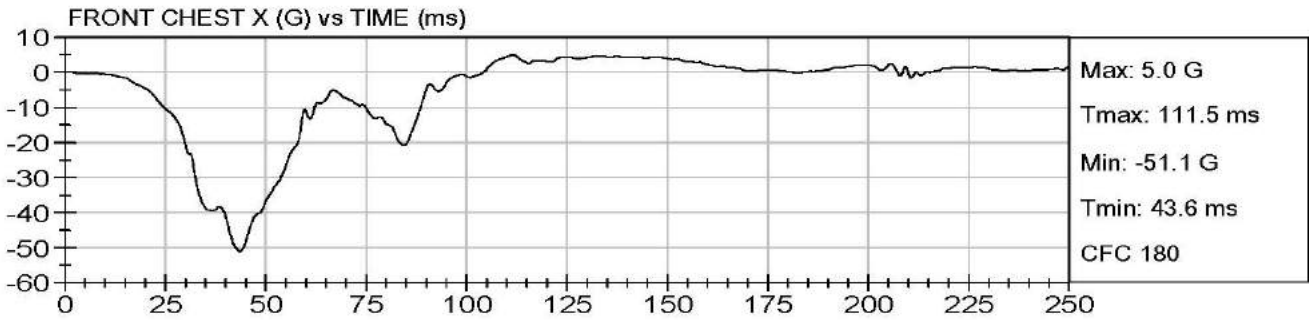
Occupant Excursion <i>FMVSS 213: S5.1.3, S5.1.4, S5.2.1.1(c)</i>		
Criteria	Compliance Requirement	Test Result
Torso Retention	Retain Within System	Retained
Head Excursion (FF)	\leq 720 mm (Tether) \leq 813 mm (No Tether)	443mm (17.4 in)
Knee Target Excursion (FF)	\leq 915 mm	534mm (21.0 in)
Seat Back Angle (RF)	\leq 70°	N/A
Head/Torso Angle	Rearward Change \leq 45°	\leq 45°

Remarks:

- 1) Belts tensioned prior to product installation

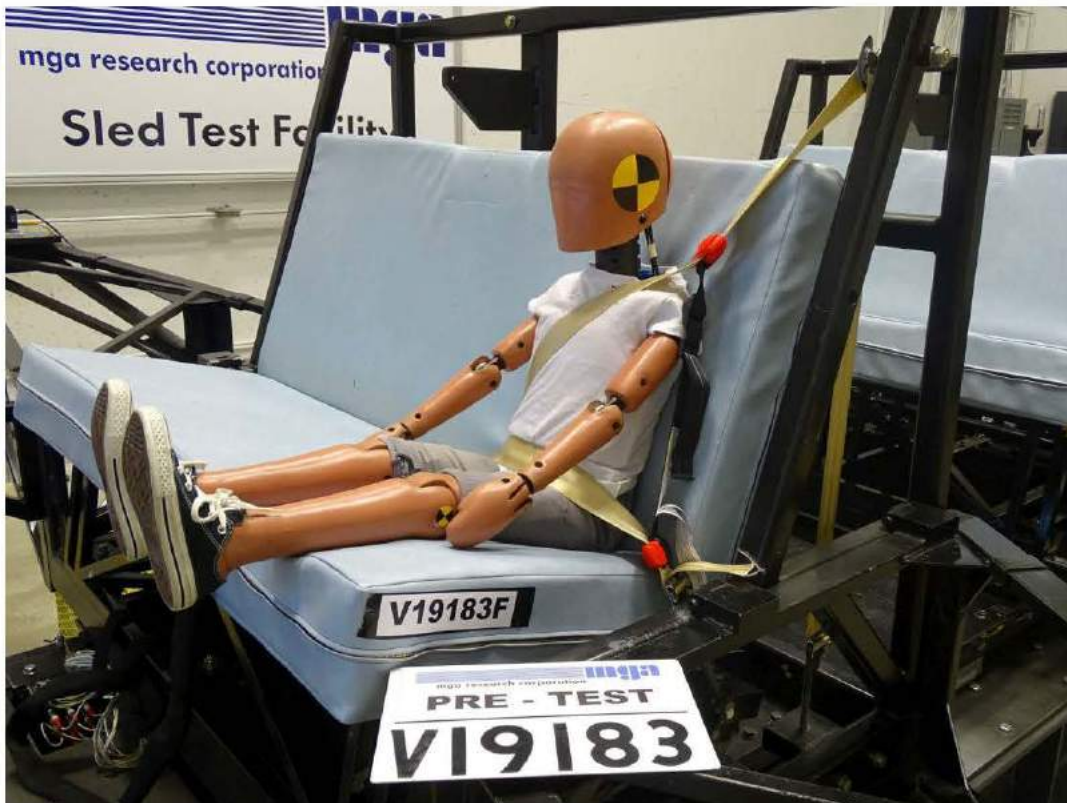




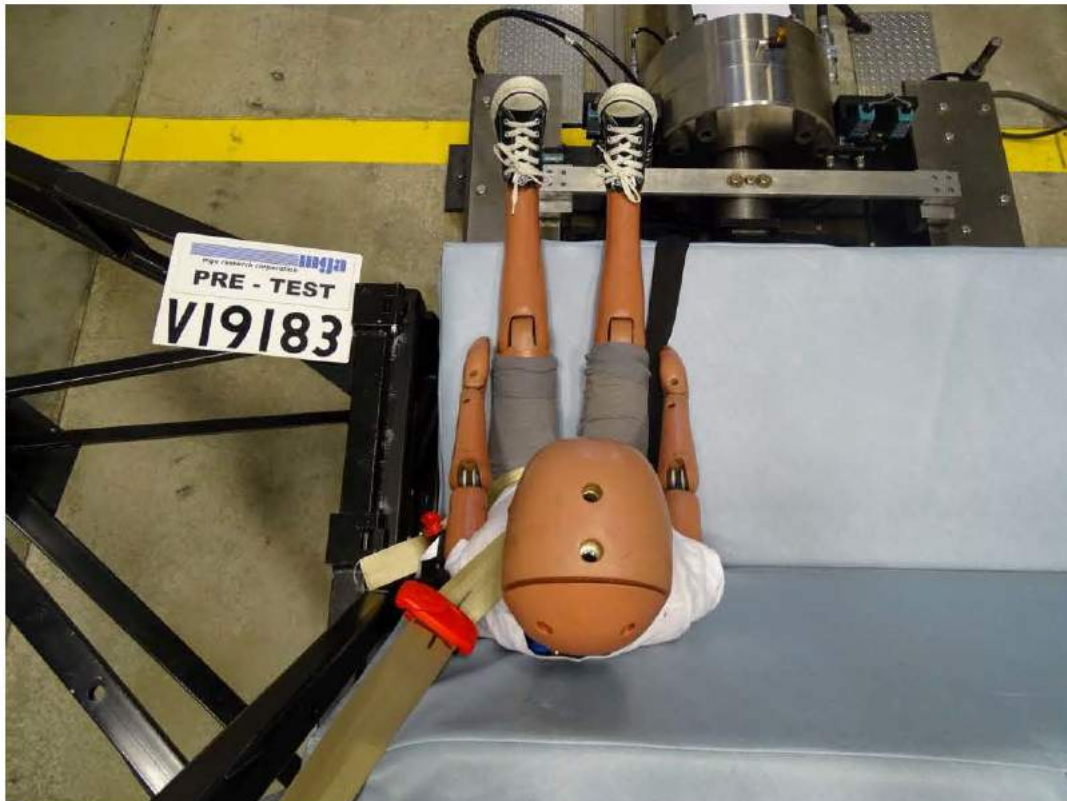
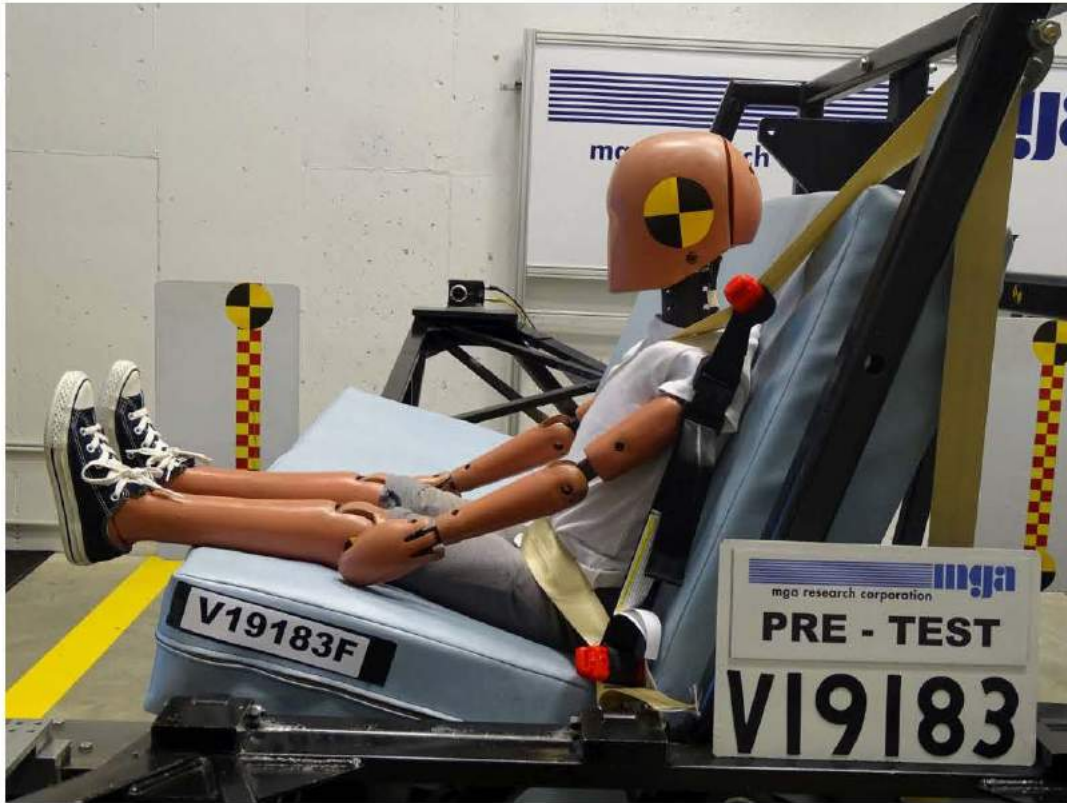




V19183F Pre-Test



V19183F Pre-Test



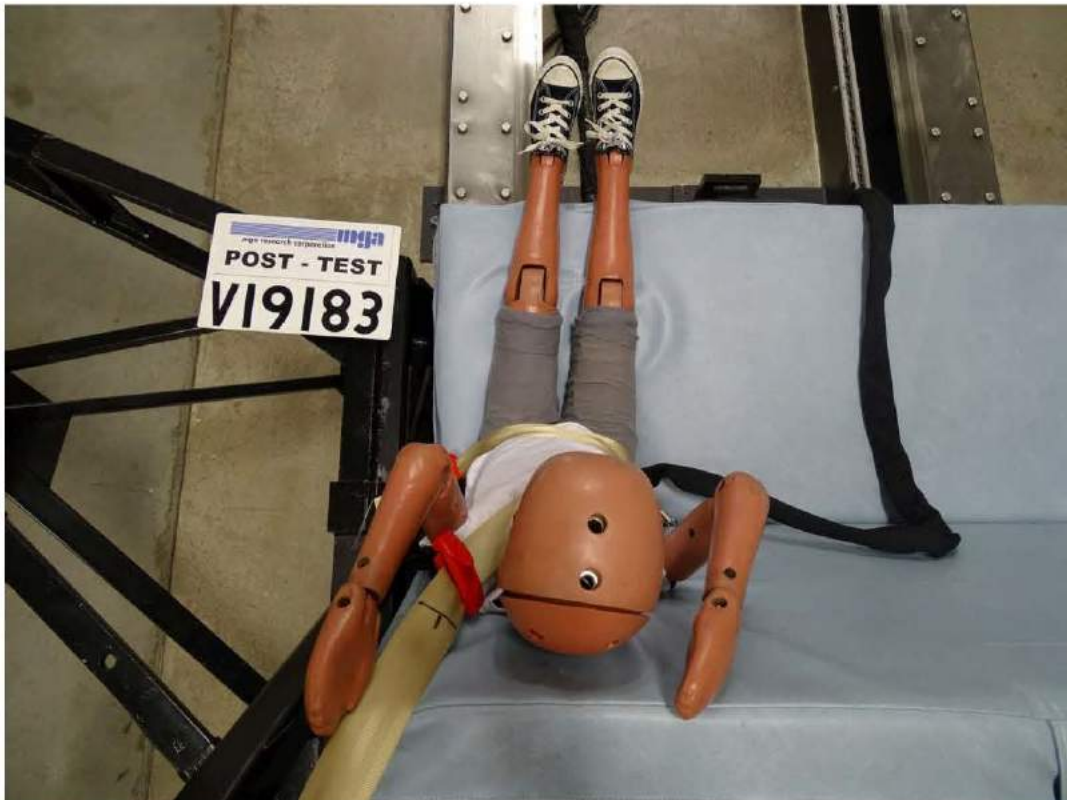
V19183F Post-Test



V19183F Post-Test



V19183F Post-Test





INSTRUMENTATION
CERTIFICATION INSTRUMENTATION

Sled Accelerometers	S/N	Manufacturer	Model Number	Calibration Date
Primary	1452975	Honeywell	JTF 060-F482-05	11/16/18
Redundant	1452976	Honeywell	JTF 060-F482-05	11/16/18

Temperature/Humidity Logger	S/N	Manufacturer	Model Number	Calibration Date
Accuracy 0.5°F, 2% RH	17092102	Vaisala	SP-2000-20R	5/10/2018

Force Gauge	S/N	Manufacturer	Model Number	Calibration Date
100 lb, Accuracy \pm 0.1 lb	213343	Wagner	FDIX 100	11/14/18

Inclinometer	S/N	Manufacturer	Model Number	Calibration Date
Accuracy \pm 0.1°	00002590	Mitutoyo	Pro 360	11/15/2018

Tape Measurers	S/N	Manufacturer	Model Number	Calibration Date
8 m/26 ft	00010	Stanley	Powerlock	11/19/18

DAS	S/N	Manufacturer	Model Number	Calibration Date
Rack	5M0464	DTS	TDAS G5	4/25/18
SIM	G5DS0268	DTS	TDAS G5 VDS	4/25/18

INSTRUMENTATION

TEST DUMMY INSTRUMENTATION

SERIAL NUMBER 111

Sensor		S/N	Manufacturer	Model Number	Calibration Date
Head Accelerometers	X	P88174	Endevco	7264C-2KTZ-360M17	1/14/19
	Y	P88175	Endevco	7264C-2KTZ-360M17	1/14/19
	Z	P88176	Endevco	7264C-2KTZ-360M17	1/14/19
Chest Accelerometers	X	P96362	Endevco	7264C-2KTZ-360M17	1/14/19
	Y	P83227	Endevco	7264C-2KTZ-2-360M17	1/14/19
	Z	P96869	Endevco	7264C-2KTZ-360M17	1/14/19

SERIAL NUMBER 077

Sensor		S/N	Manufacturer	Model Number	Calibration Date
Head Accelerometers	X	T12049	Endevco	7264C-2KTZ-2-360M17	1/22/19
	Y	T12055	Endevco	7264C-2KTZ-2-360M17	1/22/19
	Z	T12057	Endevco	7264C-2KTZ-2-360M17	1/22/19
Chest Accelerometers	X	P79620	Endevco	7264C-2KTZ-2-360M17	1/22/19
	Y	P86946	Endevco	7264C-2KTZ-2-360M17	1/22/19
	Z	P86942	Endevco	7264C-2KTZ-2-360M17	1/22/19