

FINAL REPORT NUMBER 225-MGA-10-005

SAFETY COMPLIANCE TESTING FOR FMVSS 225
“Child Restraint Anchorage Systems”

MAZDA MOTOR CORPORATION
2010 MAZDA 3
NHTSA No. CA5401

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083



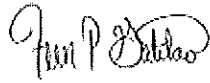
Test Date: July 30, 2010
Report Date: August 30, 2010

FINAL REPORT

Prepared For:

U.S DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance (Rm W45-304)
1200 New Jersey Avenue, SE
Washington, DC 20590

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Prepared By:

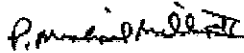
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Brad Reaume, Test Personnel



Helen A. Kaleto, Laboratory Manager



Approved By:

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9/9/2010

Approval Date:

FINAL REPORT ACCEPTANCE BY OVSC:

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Acceptance Date:

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 225-MGA-10-005	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 225 Compliance Testing of a 2010 Mazda 3, NHTSA No. CA5401		5. Report Date August 30, 2010	
		6. Performing Organization Code MGA	
7. Author(s) Helen A. Kaleto, Laboratory Manager Fern Gatilao, Project Engineer Brad Reaume, Test Personnel		8. Performing Organization Report No. 225-MGA-10-005	
9. Performing Organization Name and Address MGA Research Corporation 446 Executive Drive Troy, Michigan 48083		10. Work Unit No.	
		11. Contract or Grant No. DTNH22-02-D-11043	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 Seventh Street, SW Room 6111 Washington, DC 20590		13. Type of Report and Period Covered Final Test Report	
		14. Sponsoring Agency Code NVS-220	
15. Supplementary Notes			
16. Abstract A compliance test was conducted on the subject 2010 Mazda 3, NHTSA No. CA5401, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-225-01 for the determination of FMVSS 225 compliance. The test was conducted at MGA Research Corporation in Troy, Michigan on July 30, 2010. Test failures identified were as follows: <p style="text-align: center;">NONE</p> The data recorded indicates that the 2010 Mazda 3 tested appears to meet the requirements of FMVSS 225.			
17. Key Words Compliance Testing Safety Engineering FMVSS 225 2010 Mazda 3		18. Distribution Statement Copies of this report are available From: NHTSA Technical Reference Technical Information Services Division, NPO-411 1200 New Jersey Avenue, SE (Rm E12-100) Washington, D.C. 20590 Telephone No. (202) 366-4946	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 107	22. Price

Form DOT F 1700.7

(8-70)

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1.0 PURPOSE AND PROCEDURE

PURPOSE

The child restraint anchorage testing results presented in this report are part of the Federal Motor Vehicle Safety Standard (FMVSS) No. 225 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by MGA Research Corporation (MGA) under Contract No. DTNH22-02-D-11043. The purpose of the testing was to determine if the subject vehicle, a 2010 Mazda 3, NHTSA No. CA5401 meets the performance requirements of FMVSS No. 225, “Child Restraint Anchorage Systems.”

PROCEDURE

This testing was conducted in accordance with NHTSA’s Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure TP-225-01 (4/11/05) and MGA’s Laboratory Test Procedure, MGATP225GOV (6/23/06).

The rear occupant compartment consisted of a 2nd row three-passenger 60/40 split-back-bench seat. The 2nd row outboard left and right seating positions were equipped with a child restraint anchorage system (one tether and two lower anchorages) and the center seating positions was equipped with a tether anchorage. The center-to-center spacing between the 2nd row outboard lower anchorages was approximately 696 mm. The 2nd row right outboard and center seating positions were tested with the SFADII.

2.0 COMPLIANCE TEST AND DATA SUMMARY

TEST SUMMARY

The testing was conducted at MGA in Troy, Michigan on July 30, 2010.

Based on the test results, the 2010 Mazda 3 appears to meet the requirements of FMVSS No. 225 for this testing.

The SFADII at the 2nd row LH seating position sustained a maximum force of 11,102 N and held the required load for 3 seconds and the total displacement was 45 mm. The SFADII at the 2nd row right seating position sustained a maximum force of 11,071 N and held the required load for 3 seconds and the total displacement was 46 mm. The SFAD I at the 2nd Row center seating position sustained a maximum force of 15,131 N and held the required load for 3 seconds.

DATA SUMMARY

Strength and displacement summary data are provided below. Data for the configuration and the location of each child restraint anchorage system are provided in Section 5.0. Photographs are found in Section 6.0 and test plots are found in Section 7.0.

Table 1. Summary Data for Strength and Displacement

MGA Test #	Fixture Type	Test Configuration	Seating Position	Max. Load (N)	Displacement (mm)
A10241	SFADII	Forward	2 nd Row Left	11,102	45
		Forward	2 nd Row Right	11,071	46
A10242	SFADI	Forward w/ Top Tether	2 nd Row Center	15,131	--

3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

VEH. MOD YR/MAKE/MODEL/BODY	2010 Mazda 3
VEH. NHTSA NO.	CA5401
VIN	JM1BL1SG8A1232728
COLOR	Silver
VEH. BUILD DATE	10/09
TEST DATE	July 30, 2010
TEST LABORATORY	MGA Research Corporation
OBSERVERS	Fern Gatilao , Brad Reaume, Kenney Godfrey

GENERAL INFORMATION:

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Mazda Motor Corporation
 Date of Manufacture: 10/09; VIN: JM1BL1SG8A1232728
 GVWR: 3,898 lbs GAWR FRONT: 2,057 lbs
 GAWR REAR: 1,841 lbs

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 35 psi REAR: 35 psi

Recommended Tire Size: P205/55R16

Recommended Cold Tire Pressure:

FRONT: 35 psi REAR: 35 psi

Size of Tire on Test Vehicle: P205/55R16

Size of Spare Tire: T115/70D15

VEHICLE CAPACITY DATA:

Type of Front Seats: Bench ____; Bucket X; Split Bench ____

Number of Occupants: Front 2; Middle 0; Rear; 3 TOTAL 5.

4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

MGA Research Corporation 446 Executive Drive Troy, Michigan 48083	
Test Equipment Used for Testing	Calibration Due Date
MGA Hydraulic Test Frame	N/A
Two (2) Load Cell 10,000 lb Capability	251 & 253 (12/1/2010)
String Potentiometer (Calibrated per use)	L1608952A
Hydraulic Pump	N/A
MGA CRF Fixture	N/A
MGA SFADI	N/A
MGA SFADII	N/A
MGA 2-Dimensional Template	N/A
Linear Scale	TPM928 (5/26/2011)
MGA Data Acquisition System	N/A
Digital Calipers	MGA00572 (11/11/2010)
Force Gauge	MGA00801 (1/16/2011)
Inclinometer (Digital)	MGA00822 (1/27/2011)

5.0 DATA

Table 3. Child Restraint Tether Anchorage Configuration

Seating Position		Permit the attachment of a tether hook	Accessible without the need for any tool other than a screwdriver or coin	Ready for use without the need for any tools	Sealed to prevent the entry of exhaust fumes
Front Row		N/A	N/A	N/A	N/A
Second Row	LH	Yes	Yes	Yes	Yes
	Ctr.	Yes	Yes	Yes	Yes
	RH	Yes	Yes	Yes	Yes
Third Row		N/A	N/A	N/A	N/A

Note: AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225-01.

REMARKS: NONE.

Table 4. Child Restraint Lower Anchorage Configuration

OBSERVED LOWER ANCHORAGE CONFIGURATION	SEAT POSITION				
		FRONT ROW	SECOND ROW		THIRD ROW
			I/B	O/B	
Above anchorage, permanently marked with a circle not less than 13 mm in Dia.; and whose color contrasts with its background; and its center is not less than 50 mm and not more than 100 mm above the bar, and in the vertical longitudinal plane that passes through the center of the bar.	LH	N/A	Yes		N/A
	Ctr		Yes		
	RH		Yes		
Each of the bars is visible, without the compression of the seat cushion or seat back, when the bar is viewed, in a vertical longitudinal plane passing through the center of the bar, along a line marking an upward 30 degree angle with a horizontal plane.	LH	N/A	N/A		N/A
	Ctr		N/A		
	RH		N/A		
Diameter of the bar (mm)	LH	N/A	6.1	6.1	N/A
	Ctr		N/A		
	RH		6.1	6.1	
Inspect if the bars are straight, horizontal and transverse	LH	N/A	Yes		N/A
	Ctr		Yes		
	RH		Yes		
Optional Marking: At least one anchorage bar (when deployed for use, if storable anchorages), one guidance fixture, or one seat marking is visible.	LH	N/A	N/A		N/A
	Ctr		N/A		
	RH		N/A		
Optional Marking: If guidance fixtures are used, the fixture(s) must be installed.	LH	N/A	N/A		N/A
	Ctr		N/A		
	RH		N/A		
Measure the distance between Point “Z” of the CRF and the front surface of the anchorage bar (mm)	LH	N/A	51		N/A
	Ctr		N/A		
	RH		52		
Measure the distance between the SRP to the front of the anchorage bar (mm)	LH	N/A	157	157	N/A
	Ctr		N/A		
	RH		155	155	

Table 4. Child Restraint Lower Anchorage Configuration (continued)

OBSERVED LOWER ANCHORAGE CONFIGURATION	SEAT POSITION					
		FRONT ROW	SECOND ROW		THIRD ROW	
			I/B	O/B		
Inspect if the centroidal longitudinal axes are collinear within 5 degrees	LH	N/A	Yes		N/A	
	Ctr		Yes			
	RH		Yes			
Inspect if the inside surface of the bar that is straight and horizontal section of the bars, and determine they are not less than 25 mm, but not more than 60 mm in length (mm).	LH	N/A	Req't>25	39.2	38.4	N/A
			Req't<60	48.0	47.9	
	Ctr		Req't>25	N/A		
			Req't<60	N/A		
	RH		Req't>25	39.9	39.8	
			Req't<60	47.8	48.0	
Inspect if the bars can be connected to, over their entire inside length by the connectors of child restraint system.	LH	N/A	Yes		N/A	
	Ctr		Yes			
	RH		Yes			
Inspect if the bars are an integral and permanent part of the vehicle.	LH	N/A	Yes		N/A	
	Ctr		Yes			
	RH		Yes			
Inspect if the bars are rigidly attached to the vehicle. If feasible, hold the bar firmly with two fingers and gently pull.	LH	N/A	Yes		N/A	
	Ctr		Yes			
	RH		Yes			

PITCH, YAW, & ROLL INFORMATION

SEAT POSITION	PITCH (deg)	YAW (deg)	ROLL (deg)
2 nd Row Left	13	N/A	0
2 nd Row Center	N/A	N/A	N/A
2 nd Row Right	13	N/A	1

N/A indicates that there were no lower anchorages in the 2nd row center seating position.

Note: AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225-01.

REMARKS: NONE

Table 5. Tether Location and Dimensional Measurements

SEAT POSITION FOR TETHER		TETHER ANCHORAGE LOCATION Located in the required zone?
Front Row		N/A
Second Row	LH	Yes
	Ctr.	Yes
	RH	Yes
Third Row		N/A

Note: AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225-01.

REMARKS: NONE

Table 6. Tether Anchorage Static Loading and Displacement

SEAT POSITION	Seat, Seat Back, & Head Restraint Positions			Type of SFAD Used	Angle (deg)	Initial Location (mm)	Onset Rate (N/sec.)	Force Applied (kN)	Max. Load (N)	Final Location (mm)	Horiz. Displ. (mm)	
	Seat	Seat Back	Is There a H/R?									
Front Row	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Second Row	LH	Fixed	Full Up	Yes	II	9.6	25	389	11,000	11,102	70	45
	Ctr.	Fixed	Full Up	No	I	8.8	--	537	15,000	15,131	--	--
	RH	Fixed	Full Up	Yes	II	9.8	27	389	11,000	11,071	73	46
Third Row	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Note: AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225-01.

6.0 PHOTOGRAPHS

6.1 Front view



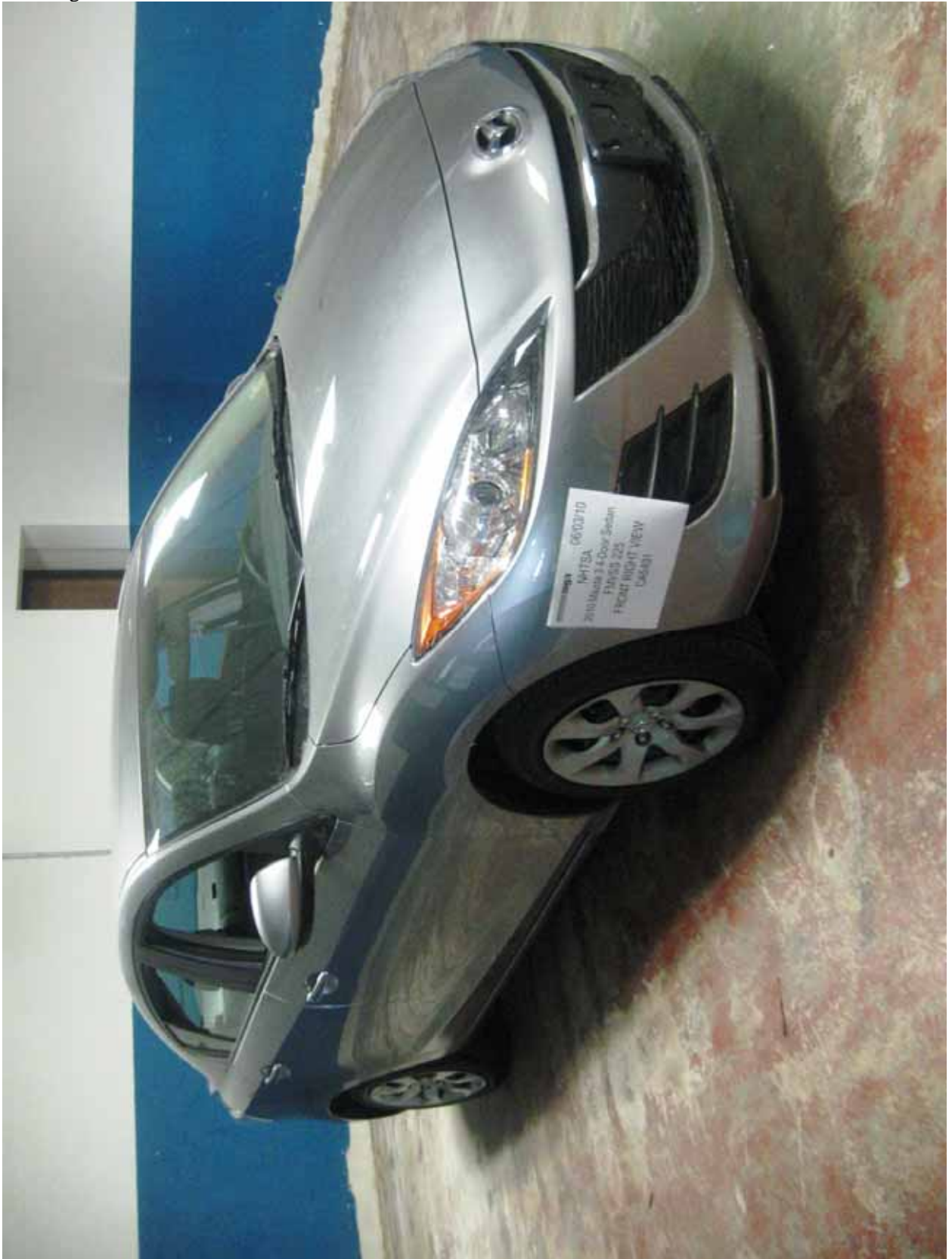
6.2 Rear view



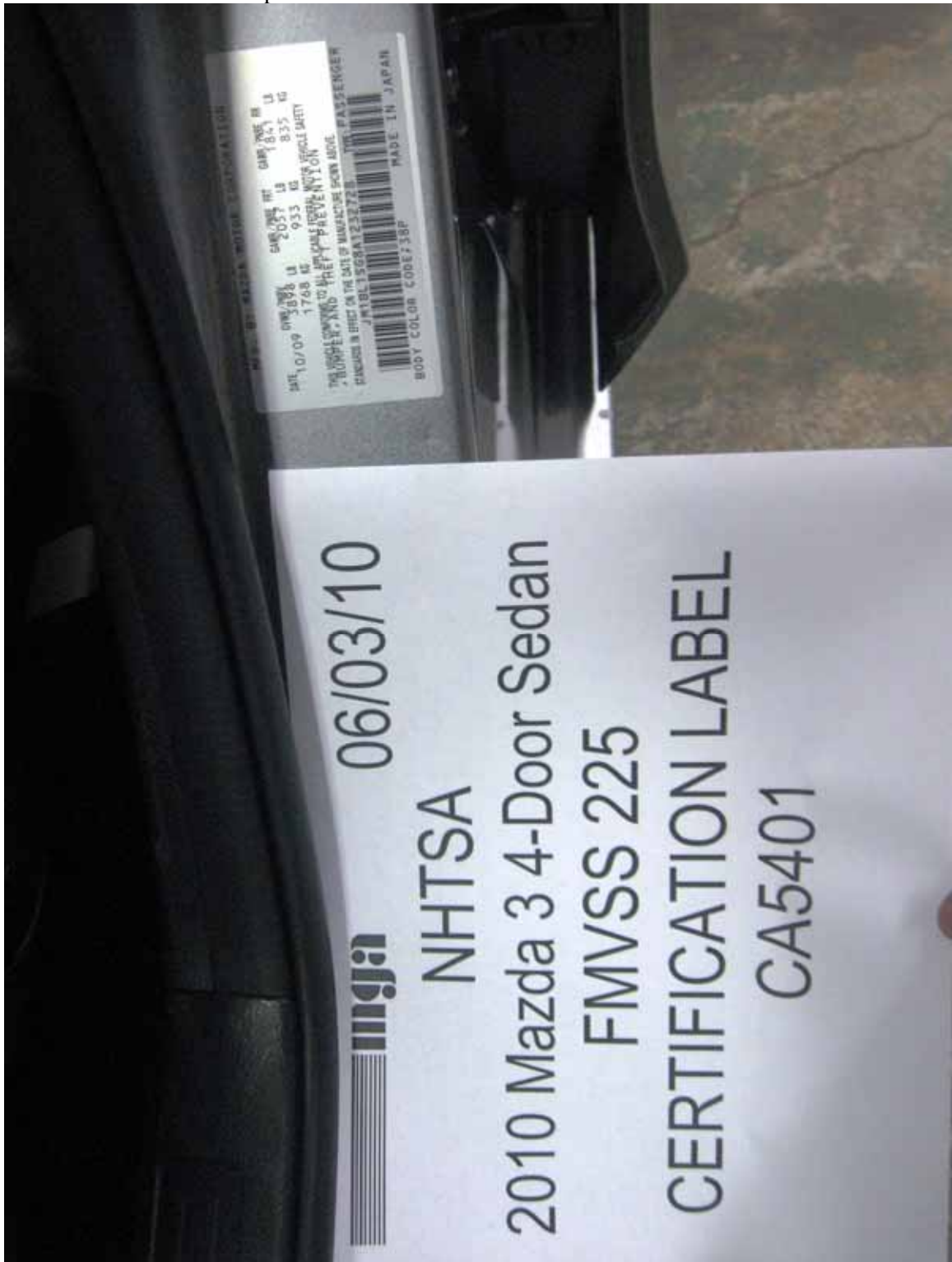
6.3 Front left view



6.4 Front right view



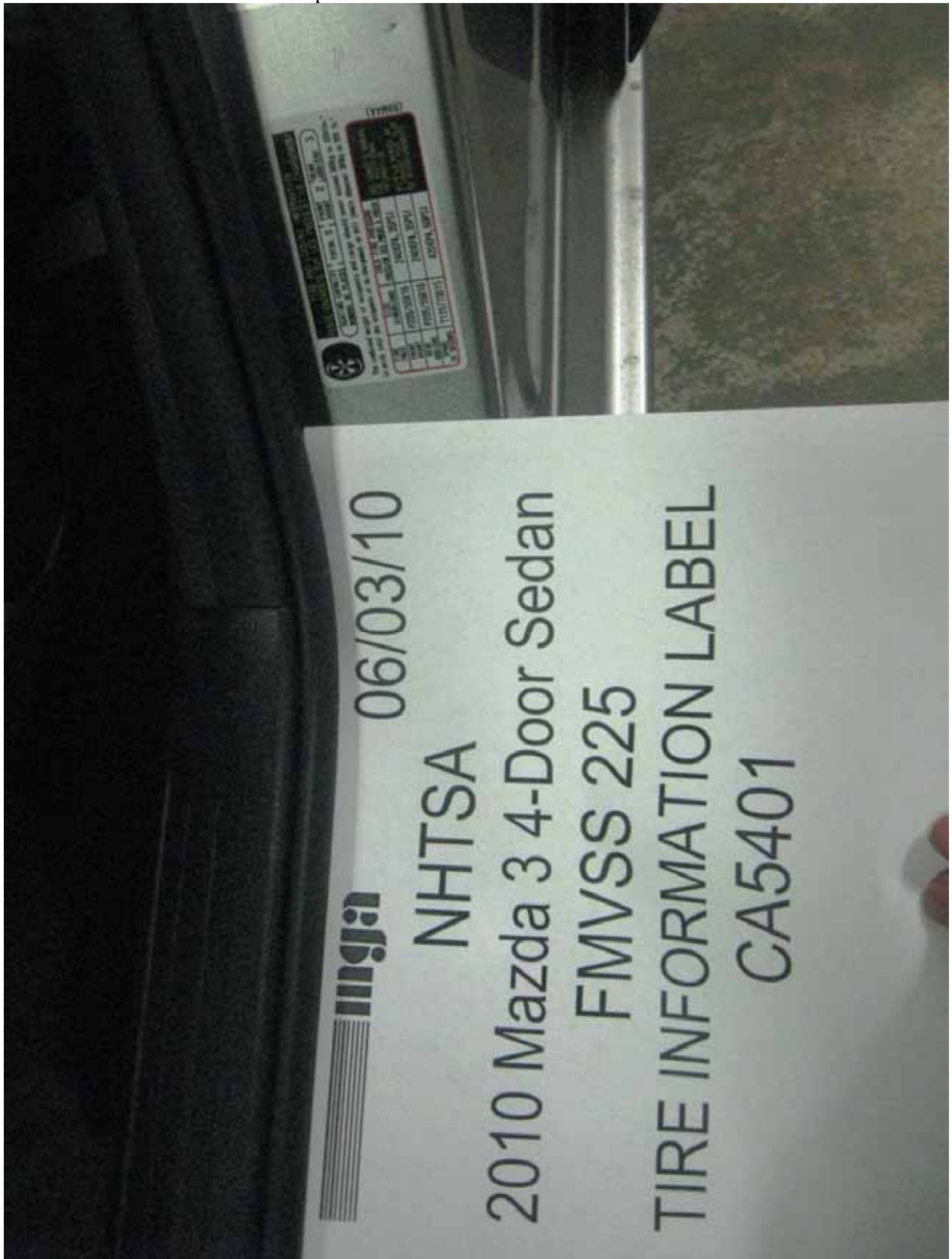
6.5 Test vehicle's certification label
6.5.1 Certification label photo 1



6.5.2 Certification label photo #2



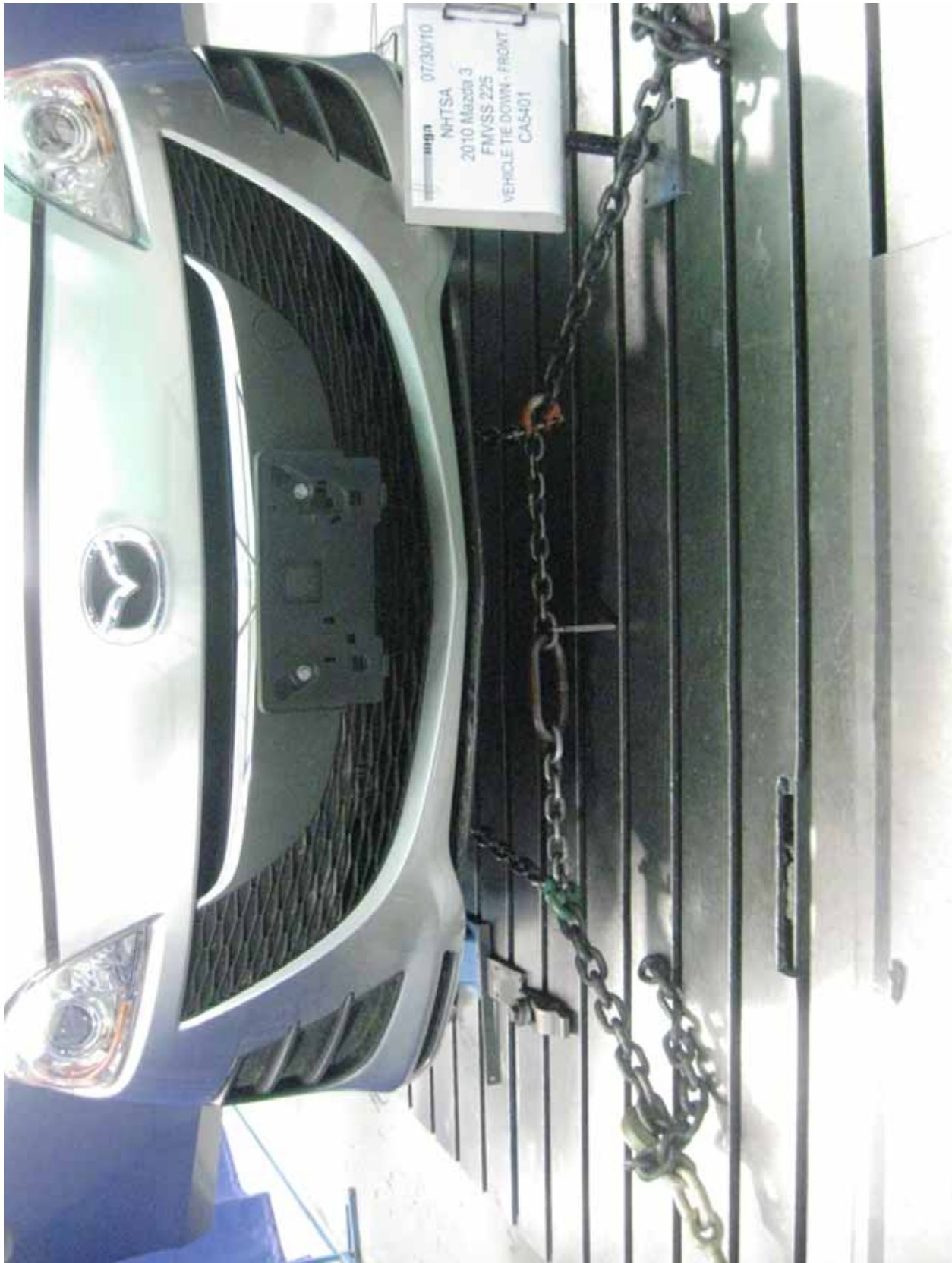
6.5.3 Tire information label photo #1



6.5.4 Tire information label photo #2



- 6.6 Vehicle tie down at each tie down location
 - 6.6.1 Front under vehicle



6.6.2 Rear under vehicle



6.6.3 Left front



6.6.4 Left rear



6.6.5 Right front



6.6.6 Right rear



- 6.7 2-dimensional template
 - 6.7.1 LH position photo #1



6.7.2 LH position photo #2



6.7.3 RH position photo #1



6.7.4 RH position photo #2



6.7.5 Center position photo #1



6.7.6 Center position photo #2



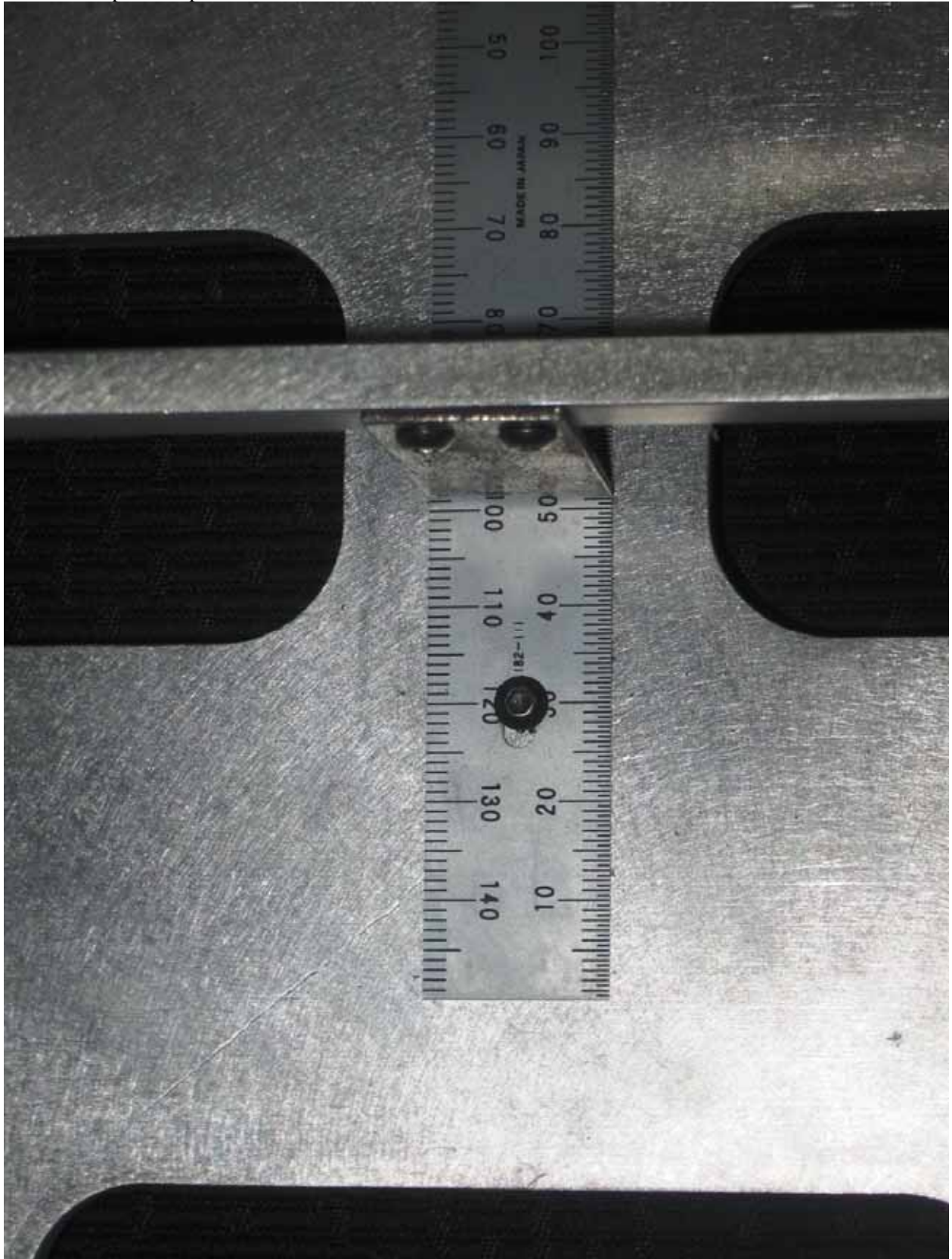
6.8 CRF verification
6.8.1 LH position photo



6.8.2 LH position photo



6.8.3 LH position photo



6.8.4 RH position photo



6.8.5 RH position photo



6.8.6 RH position photo



6.9 Front view of test vehicle with test apparatus in place
6.9.1 SFAD II LH & RH Photo # 1



6.9.2 SFAD II LH & RH Photo #2



6.9.3 SFAD I Center Photo #1



6.9.4 SFAD I Center Photo #2



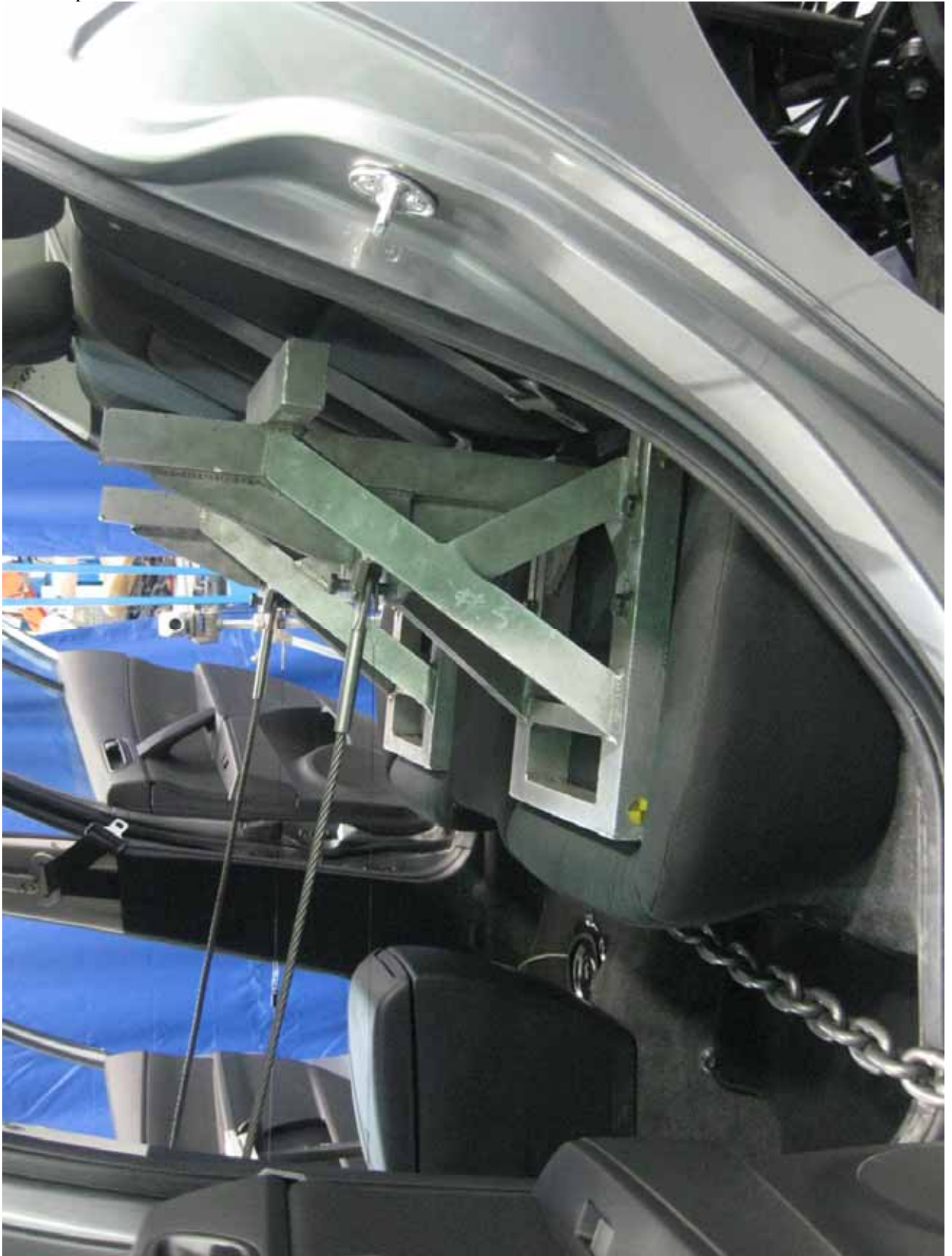
- 6.10 Pre-test views of each child restraint anchorage system installed in the vehicle
- 6.10.1 Pre-test photo



6.10.2 Pre-test photo



6.10.3 Pre-test photo



6.10.4 Pre-test photo



6.10.5 Pre-test photo



6.10.6 Pre-test photo



6.11 Post-test condition of each child restraint anchorage system
6.11.1 Post-test photo



6.11.2 Post-test photo



6.11.3 Post-test photo



6.11.4 Post-test photo



6.11.5 Post-test photo



6.11.6 Post-test photo



6.11.7 Post-test photo



6.11.8 Post-test photo



6.11.9 Post-test photo



6.11.10 Post-test photo



6.11.11 Post-test photo



6.11.12 Post-test photo



6.11.13 Post-test photo



6.11.14 Post-test photo



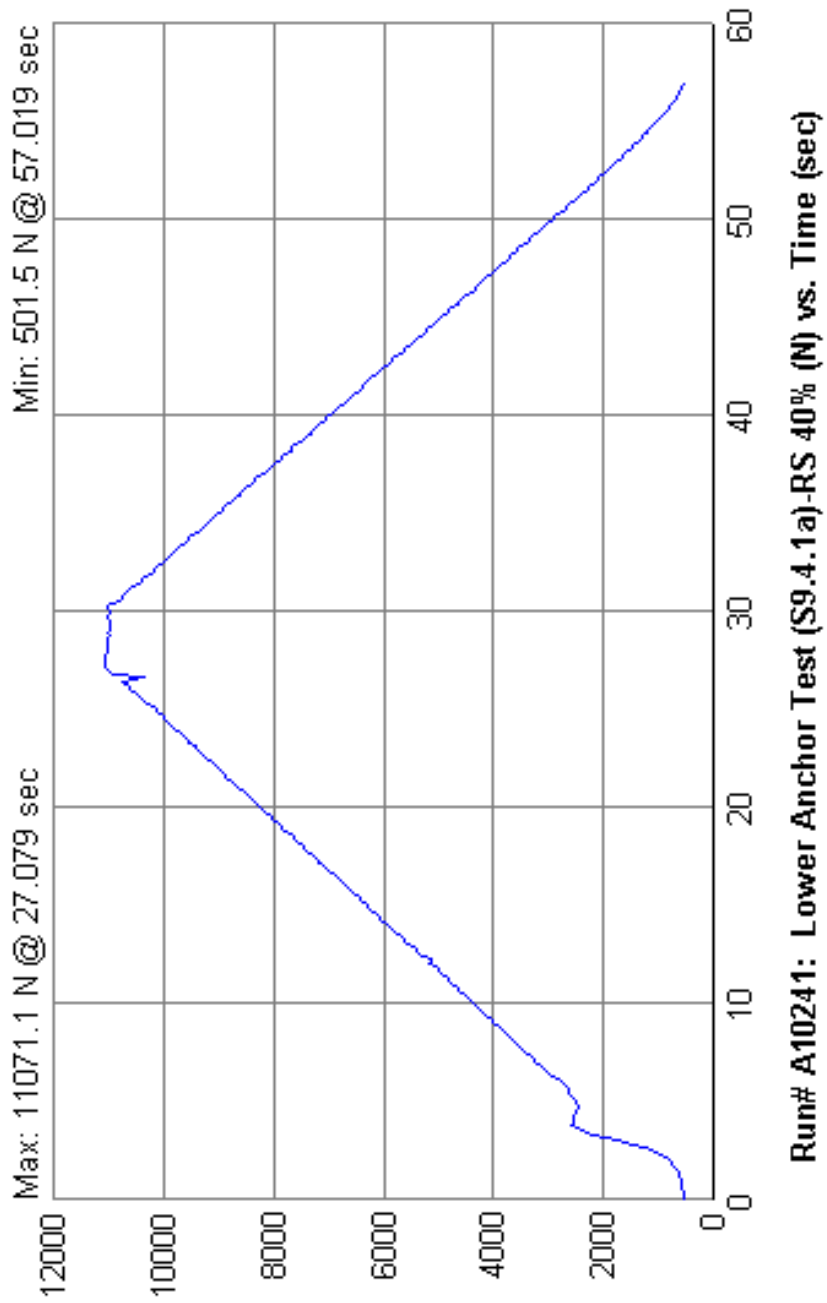
6.11.15 Post-test photo

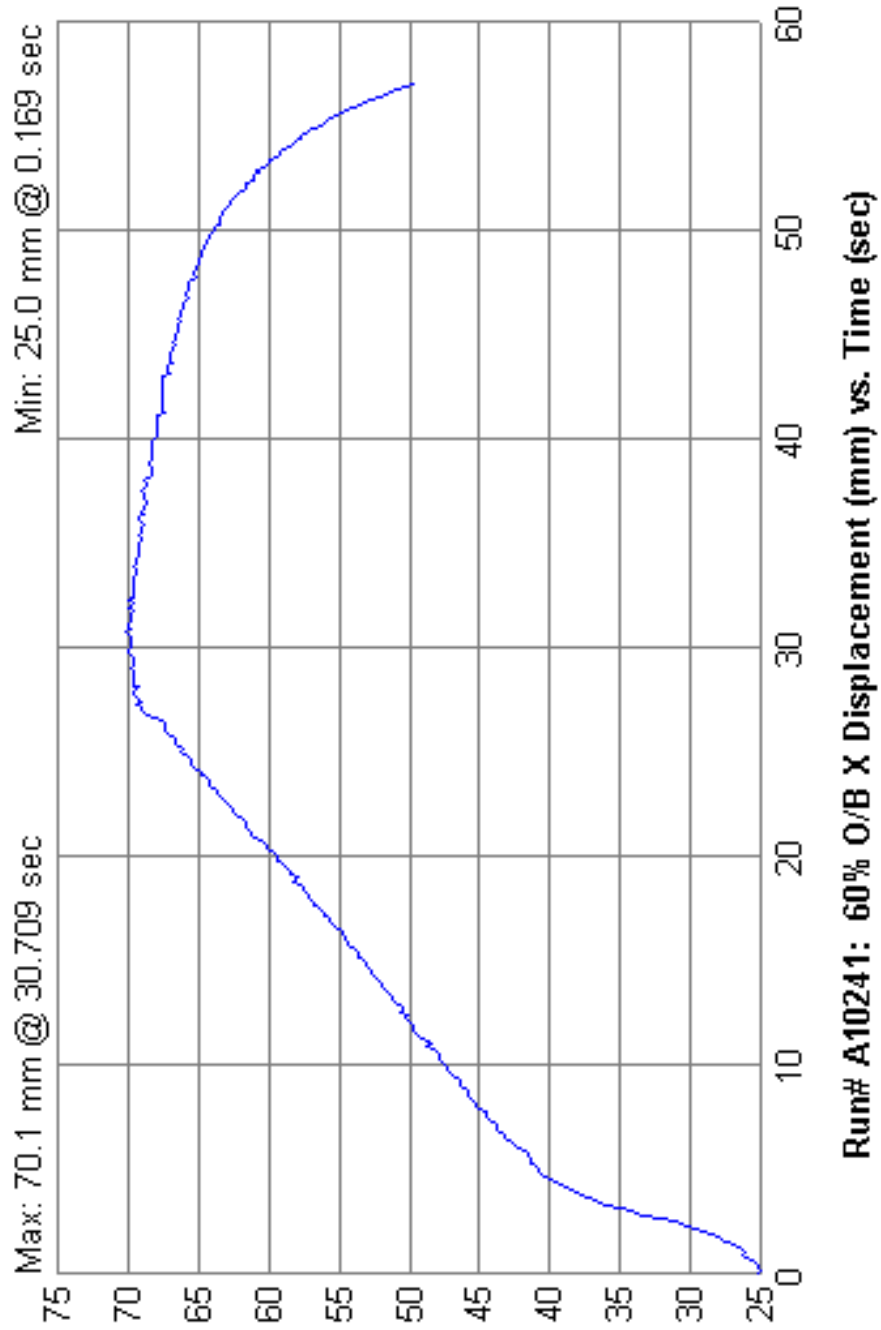


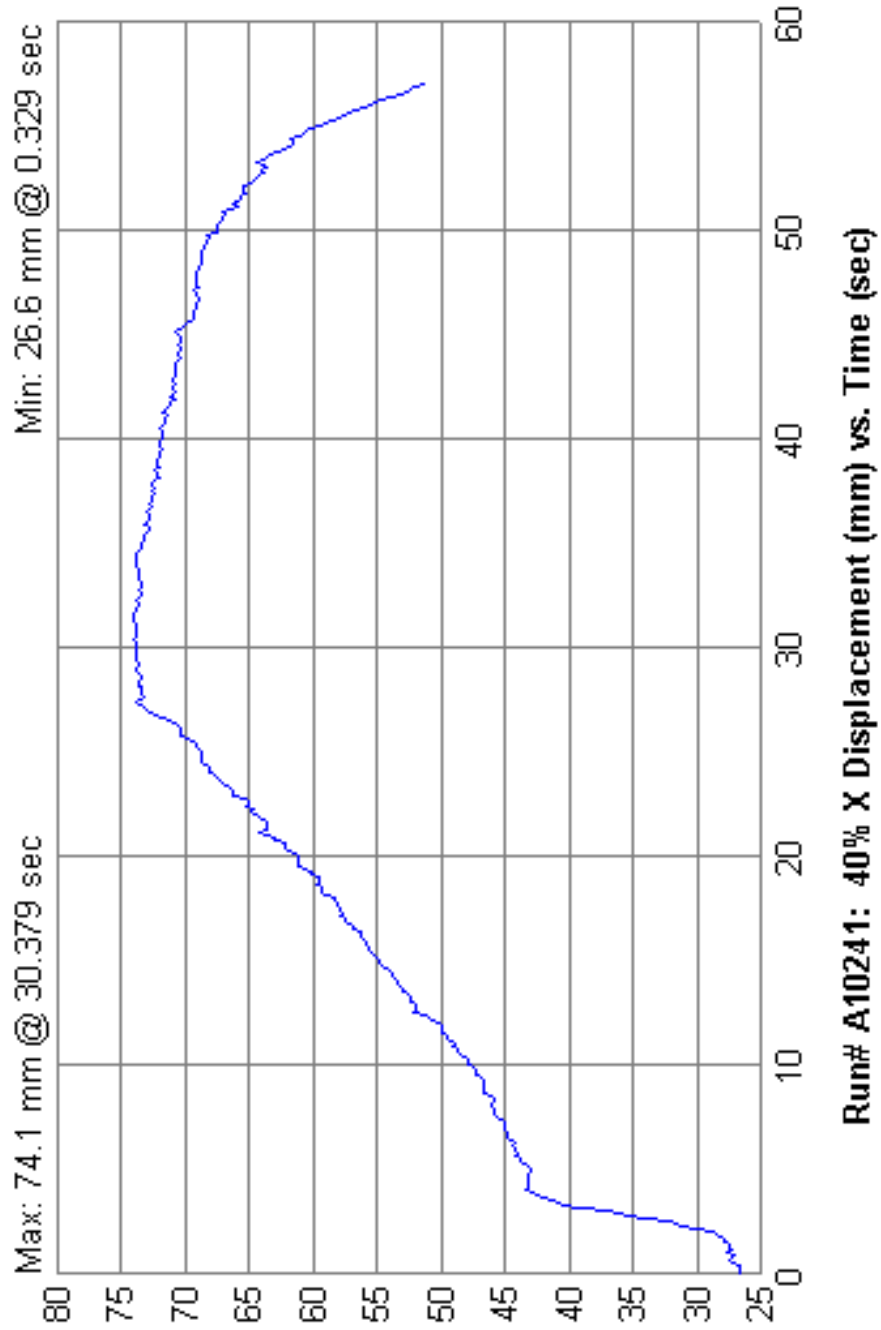
6.11.16 Post-test photo

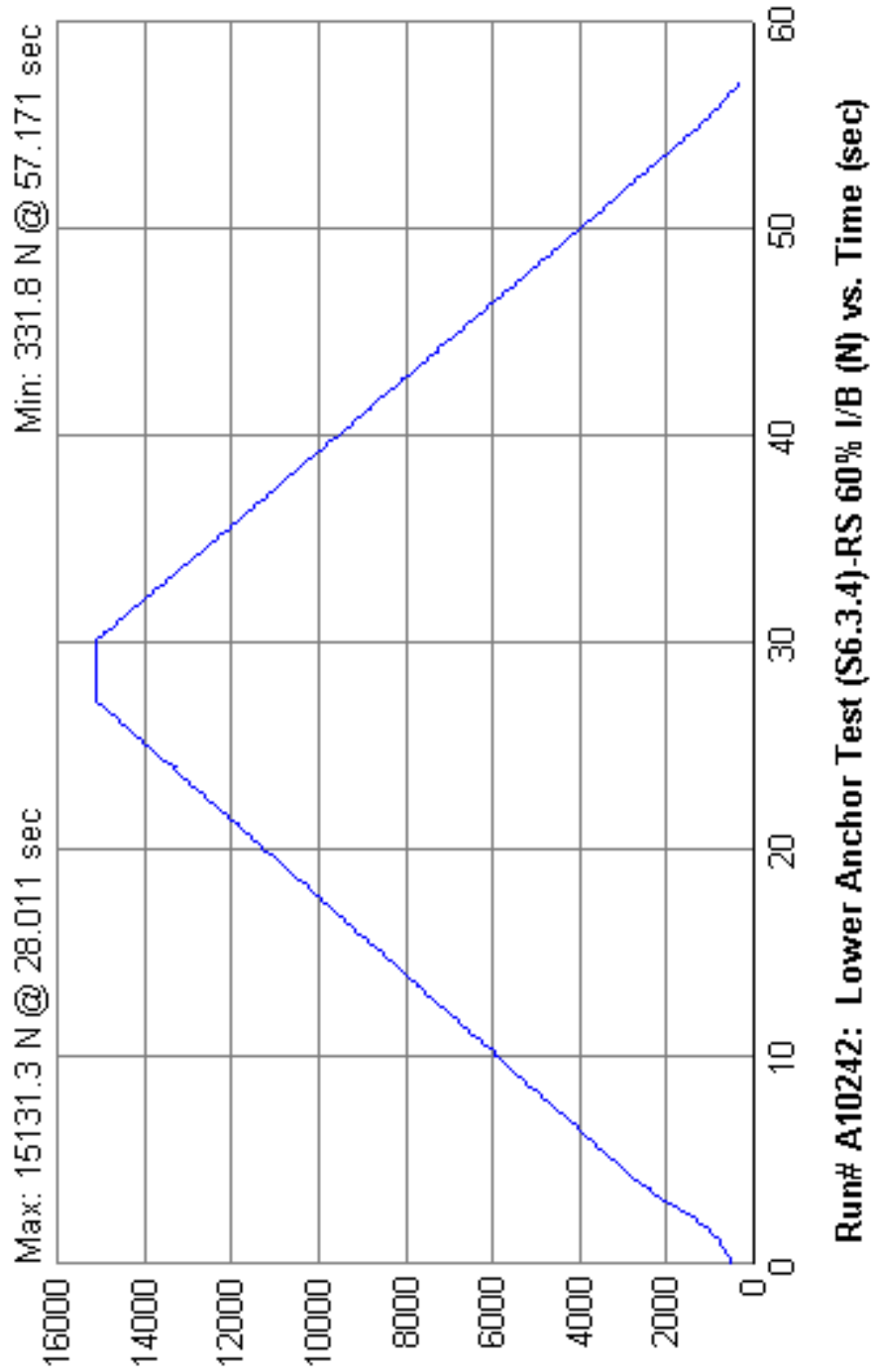


7.0 Plots









8.0 REPORT OF VEHICLE CONDITION

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT No.: DTNH22-02-D-11043

DATE: July 30, 2010

From: MGA Research Corporation, 446 Executive Drive, Troy, MI 48083

To: NHTSA, OVSC, NVS-220

The following vehicle has been subjected to compliance testing for FMVSS No. 225 & 201U

The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager (NAD0-30), with a copy to the OVSC COTR. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

VEH. MOD YR/MAKE/MODEL/BODY: 2010 Mazda 3

VEH. NHTSA NO.: CA5401

VIN: JM1BL1SG8A1232728

COLOR: White

ODOMETER READINGS: ARRIVAL 12 miles Date: 6/3/2010

COMPLETION 12 miles Date: 7/30/2010

PURCHASE PRICE: \$16,336

ENGINE DATA: Cylinders 2.0 Liters Cubic Inches

TRANSMISSION DATA: Automatic X Manual 5 No. of Speeds

FINAL DRIVE DATA: Rear Drive X Front Drive 4 Wheel Drive

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Fern Gatilao, Brad Reaume, Kenney Godfrey

<input checked="" type="checkbox"/>	Air Conditioning		Traction Control	<input checked="" type="checkbox"/>	Clock
	Tinted Glass		All Wheel Drive		Roof Rack
<input checked="" type="checkbox"/>	Power Steering		Speed Control	<input checked="" type="checkbox"/>	Console
<input checked="" type="checkbox"/>	Power Windows	<input checked="" type="checkbox"/>	Rear Window Defroster	<input checked="" type="checkbox"/>	Driver Air Bag
<input checked="" type="checkbox"/>	Power Door Locks		Sun Roof or T-Top	<input checked="" type="checkbox"/>	Passenger Air Bag
	Power Seat(s)	<input checked="" type="checkbox"/>	Tachometer	<input checked="" type="checkbox"/>	Front Disc Brakes
<input checked="" type="checkbox"/>	Power Brakes	<input checked="" type="checkbox"/>	Tilt Steering Wheel	<input checked="" type="checkbox"/>	Rear Disc Brakes
<input checked="" type="checkbox"/>	Antilock Brake System	<input checked="" type="checkbox"/>	AM/FM/Compact Disc		Other

REMARKS:

Salvage only.

Equipment that is no longer on the test vehicle as noted on previous pages:

All equipment inventoried and placed in vehicle.

Explanation for equipment removal:

Test Vehicle Condition:

Winshield was removed for testing.

Salvage only.

RECORDED BY: Fern Gatilao, Kenney Godfrey

DATE: July 30, 2010

APPROVED BY: Brad Reaume

APPENDIX A
OWNERS MANUAL CHILD RESTRAINT SYSTEMS

Essential Safety Equipment

Child Restraint

Child Restraint Precautions

Mazda strongly urges the use of child-restraint systems for children small enough to use them.

You are required by law to use a child-restraint system for children in the U.S. and Canada. Check your local and state or provincial laws for specific requirements regarding the safety of children riding in your vehicle.

Whatever child-restraint system you consider, please pick the appropriate one for the age and size of the child, obey the law and follow the instructions that come with the individual child-restraint system.

A child who has outgrown child-restraint systems should sit in the rear and use seat belts, both lap and shoulder. If the shoulder belt crosses the neck or face, move the child closer to the center of the vehicle in the outboard seats, and towards the buckle on the right if the child is seated on the center seat.

Statistics confirm that the rear seat is the best place for all children up to 12 years of age, and more so with a supplemental restraint system (air bags).

A rear-facing child-restraint system should **NEVER** be used on the front seat with the air bag system activated. The front passenger's seat is also the least preferred seat for other child-restraint systems.

To reduce the chance of injuries caused by deployment of the front passenger air bag, the front passenger seat weight sensors work as a part of the supplemental restraint system. This system deactivates the front passenger front and side air bags and also the front passenger seat belt pretensioner system when the total seated weight on the front passenger seat is less than approximately 30 kg (66 lb).

When an infant or small child sits on the front passenger seat, the system shuts off the front passenger front and side air bags and seat belt pretensioner system, so make sure the front passenger air bag deactivation indicator light illuminates.

Even if the front passenger air bag is shut off, Mazda strongly recommends that children be properly restrained and child-restraint systems of all kinds are properly secured on the rear seats which are the best place for children.

For more details, refer to “Front passenger seat weight sensors” (page 2-55).

Essential Safety Equipment
Child Restraint

⚠ WARNING

Use the correct size child-restraint system:

For effective protection in vehicle accidents and sudden stops, a child must be properly restrained using a seat belt or child-restraint system depending on age and size. If not, the child could be seriously injured or even killed in an accident.

Follow the manufacturer's instructions and always keep the child-restraint system buckled down:

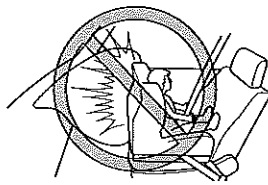
An unsecured child-restraint system is dangerous. In a sudden stop or a collision it could move causing serious injury or death to the child or other occupants. Make sure any child-restraint system is properly secured in place according to the child-restraint system manufacturer's instructions. When not in use, remove it from the vehicle or fasten it with a seat belt, or latch it down to BOTH LATCH lower anchors for LATCH child-restraint systems and the corresponding tether anchor.

Always secure a child in a proper child-restraint system:

Holding a child in your arms while the vehicle is moving is extremely dangerous. No matter how strong the person may be, he or she cannot hold onto a child in a sudden stop or collision and it could result in serious injury or death to the child or other occupants. Even in a moderate accident, the child may be exposed to air bag forces that could result in serious injury or death to the child, or the child may be slammed into an adult, causing injury to both child and adult.

Never use a rear-facing child-restraint system in the front seat with an air bag that could deploy:

Rear-facing child-restraint systems on the front seat are particularly dangerous even though you may feel assured that a front passenger air bag will not deploy based on the fact that the front passenger air bag deactivation indicator light illuminates. The child-restraint system can be hit by a deploying air bag and moved violently backward resulting in serious injury or death to the child.

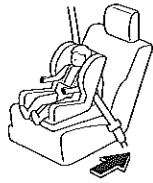


Essential Safety Equipment

Child Restraint

Do not install a front-facing child-restraint system on the front passenger seat unless it is unavoidable:

In a collision, the force of a deploying air bag could cause serious injury or death to the child. If installing a front-facing child-restraint system on the front passenger seat is unavoidable, move the front passenger seat as far back as possible.



Seating a child in a child-restraint system on the front passenger seat is dangerous:

Your vehicle is equipped with front passenger seat weight sensors. Even with the front passenger seat weight sensors, if you must use the front passenger seat to seat a child, using a child in a child-restraint system on the front passenger seat under the following conditions increases the danger of the front passenger air bag deploying and could result in serious injury or death to the child.

- *The total seated weight of the child with the child-restraint system on the front passenger seat is approximately 30 kg (66 lb) or more with a child in the child-restraint system.*
- *Luggage or other items are placed on the seat with the child in the child-restraint system.*
- *A rear passenger or luggage pushing or pulling down on the front passenger seatback.*
- *A rear passenger puts their feet on the front seat rails.*
- *Luggage or other items are placed on the seatback or hung on the head restraint.*
- *Heavy items are placed in the seatback map pocket.*
- *The seat is washed.*
- *Liquids are spilled on the seat.*
- *The front passenger seat is moved backward, pushing into luggage or other items placed behind it.*
- *The front passenger seatback contacts the rear seat.*
- *Luggage or other items are placed between the front passenger seat and driver seat.*
- *Any accessories, which might increase the total seated weight on the front passenger seat, are attached to the front passenger seat.*

The designated positions with seat belts on the rear seats are the safest places for children. Always use seat belts and child restraints.

Essential Safety Equipment
Child Restraint

Do not allow a child or anyone to lean over or against the side window of a vehicle with side and curtain air bags:

It is dangerous to allow anyone to lean over or against the side window, the area of the front passenger seat, the front and rear window pillars and the roof edge along both sides from which the side and curtain air bags deploy, even if a child-restraint system is used. The impact of inflation from a side or curtain air bag could cause serious injury or death to an out of position child. Furthermore, leaning over or against the front door could block the side and curtain air bags and eliminate the advantages of supplemental protection. With the front air bag and the additional side air bag that comes out of the front seat, the rear seat is always a better location for children. Take special care not to allow a child to lean over or against the side window, even if the child is seated in a child-restraint system.

Never use one seat belt on more than one person at a time:

Using one seat belt for more than one person at a time is dangerous. A seat belt used in this way cannot spread the impact forces properly and the two passengers could be crushed together and seriously injured or even killed. Never use one belt for more than one person at a time and always operate the vehicle with each occupant properly restrained.

 **CAUTION**

A seat belt or child-restraint system can become very hot in a closed vehicle during warm weather. To avoid burning yourself or a child, check them before you or your child touches them.

NOTE

Your Mazda is equipped with LATCH lower anchors for attachment of specially designed LATCH child-restraint systems in the rear seat. When using these anchors to secure a child-restraint system, refer to "LATCH Child-Restraint Systems" (page 2-38).

Essential Safety Equipment

Child Restraint

Installing Child-Restraint Systems

Accident statistics reveal that a child is safer in the rear seat. The front passenger's seat is clearly the worst choice for any child under 12, and with rear-facing child-restraint systems it is clearly unsafe due to air bags.

Some child-restraint systems now come with tethers and therefore must be installed on the seats that take tethers to be effective. In your Mazda, tethered child-restraint systems can only be accommodated in the three positions on the rear seat.

Even if your vehicle is equipped with front passenger seat weight sensors (page 2-55), which automatically deactivates the front passenger air bag, a rear seat is the safest place for a child of any age or size.

Some child-restraint systems also employ specially designed LATCH attachments; refer to "LATCH Child-Restraint Systems" (page 2-38).

WARNING

Tethered Child-Restraint Systems Work Only on Tether-Equipped Rear Seats:
Installation of a tether equipped child-restraint system in the front passenger's seat defeats the safety design of the system and will result in an increased chance of serious injury if the child-restraint system goes forward without benefit of being tethered.
Place tether equipped child-restraint systems where there are tether anchors.

▼ Rear Seat Child-Restraint System Installation

Follow these instructions when using a child-restraint system, unless you are attaching a LATCH-equipped child-restraint system to the rear LATCH lower anchors. Refer to "LATCH Child-Restraint Systems" (page 2-38).

NOTE

Follow the child-restraint system manufacturer's instructions carefully. If you are not sure whether you have a LATCH system or tether, check in the child-restraint system manufacturer's instructions and follow them accordingly. Depending on the type of child-restraint system, it may use LATCH system instead of seat belts or if the belt goes across the child's chest, may recommend against using automatic locking mode.

1. Make sure the seatback is securely latched by pushing it back until it is fully locked.
2. Raise the head restraint to the top locked position (except center seat position).
Refer to Head Restraints on page 2-12.
3. Secure the child-restraint system with the lap portion of the lap/shoulder belt. See the manufacturer's instructions on the child-restraint system for belt routing instructions.

Essential Safety Equipment
Child Restraint

Do not allow a child or anyone to lean over or against the side window of a vehicle with side and curtain air bags:

It is dangerous to allow anyone to lean over or against the side window, the area of the front passenger seat, the front and rear window pillars and the roof edge along both sides from which the side and curtain air bags deploy, even if a child-restraint system is used. The impact of inflation from a side or curtain air bag could cause serious injury or death to an out of position child. Furthermore, leaning over or against the front door could block the side and curtain air bags and eliminate the advantages of supplemental protection. With the front air bag and the additional side air bag that comes out of the front seat, the rear seat is always a better location for children. Take special care not to allow a child to lean over or against the side window, even if the child is seated in a child-restraint system.

Never use one seat belt on more than one person at a time:

Using one seat belt for more than one person at a time is dangerous. A seat belt used in this way cannot spread the impact forces properly and the two passengers could be crushed together and seriously injured or even killed. Never use one belt for more than one person at a time and always operate the vehicle with each occupant properly restrained.

 **CAUTION**

A seat belt or child-restraint system can become very hot in a closed vehicle during warm weather. To avoid burning yourself or a child, check them before you or your child touches them.

NOTE

Your Mazda is equipped with LATCH lower anchors for attachment of specially designed LATCH child-restraint systems in the rear seat. When using these anchors to secure a child-restraint system, refer to "LATCH Child-Restraint Systems" (page 2-38).

Essential Safety Equipment

Child Restraint

Installing Child-Restraint Systems

Accident statistics reveal that a child is safer in the rear seat. The front passenger's seat is clearly the worst choice for any child under 12, and with rear-facing child-restraint systems it is clearly unsafe due to air bags.

Some child-restraint systems now come with tethers and therefore must be installed on the seats that take tethers to be effective. In your Mazda, tethered child-restraint systems can only be accommodated in the three positions on the rear seat.

Even if your vehicle is equipped with front passenger seat weight sensors (page 2-55), which automatically deactivates the front passenger air bag, a rear seat is the safest place for a child of any age or size.

Some child-restraint systems also employ specially designed LATCH attachments; refer to "LATCH Child-Restraint Systems" (page 2-38).

WARNING

Tethered Child-Restraint Systems Work Only on Tether-Equipped Rear Seats:

Installation of a tether equipped child-restraint system in the front passenger's seat defeats the safety design of the system and will result in an increased chance of serious injury if the child-restraint system goes forward without benefit of being tethered.

Place tether equipped child-restraint systems where there are tether anchors.

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▼ Rear Seat Child-Restraint System Installation

Follow these instructions when using a child-restraint system, unless you are attaching a LATCH-equipped child-restraint system to the rear LATCH lower anchors. Refer to "LATCH Child-Restraint Systems" (page 2-38).

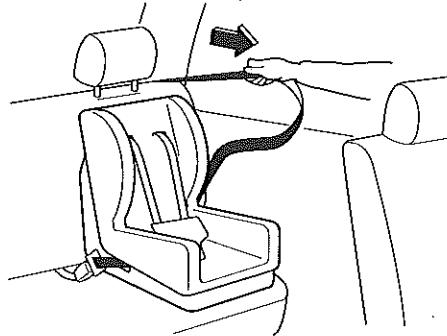
NOTE

Follow the child-restraint system manufacturer's instructions carefully. If you are not sure whether you have a LATCH system or tether, check in the child-restraint system manufacturer's instructions and follow them accordingly. Depending on the type of child-restraint system, it may use LATCH system instead of seat belts or if the belt goes across the child's chest, may recommend against using automatic locking mode.

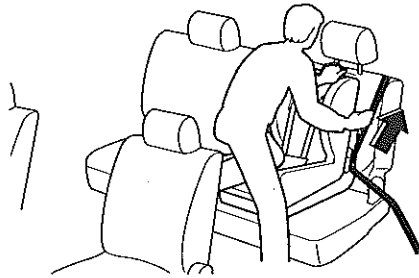
1. Make sure the seatback is securely latched by pushing it back until it is fully locked.
2. Raise the head restraint to the top locked position (except center seat position).
Refer to Head Restraints on page 2-12.
3. Secure the child-restraint system with the lap portion of the lap/shoulder belt. See the manufacturer's instructions on the child-restraint system for belt routing instructions.

Essential Safety Equipment
Child Restraint

4. To get the retractor into the automatic locking mode, pull the shoulder belt portion of the seat belt until the entire length of the belt is out of the retractor.



5. Push the child-restraint system firmly into the vehicle seat. Be sure the belt retracts as snugly as possible. A clicking noise from the retractor will be heard during retraction if the system is in the automatic locking mode. If the belt does not lock the seat down tight, repeat this step.

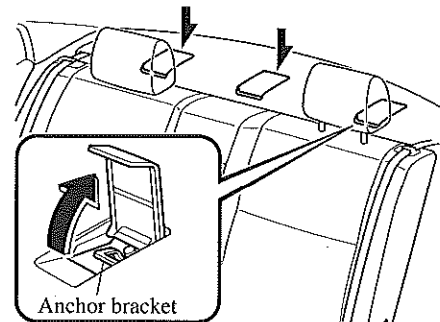


NOTE

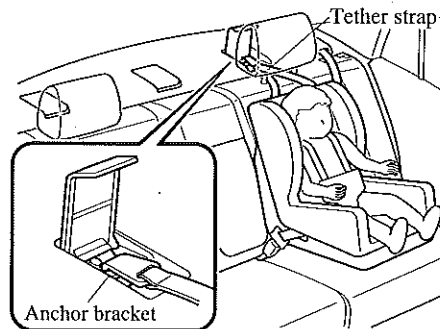
Inspect this function before each use of the child-restraint system. You should not be able to pull the shoulder belt out of the retractor while the system is in the automatic locking mode. When you remove the child-restraint system, be sure the belt fully retracts to return the system to emergency locking mode before occupants use the seat belts.

6. If your child-restraint system requires the use of a tether strap, refer to the manufacturer's instructions to hook and tighten the tether strap.

Anchor bracket location (4 Door)

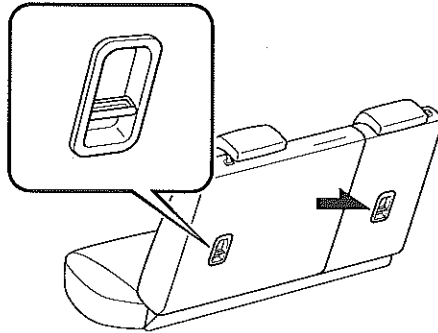


Tether strap position (4 Door)

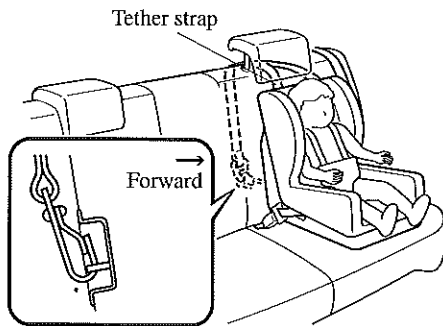


Essential Safety Equipment
Child Restraint

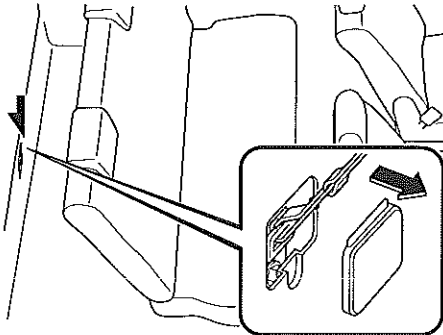
Anchor bracket location (5 Door outboard position)



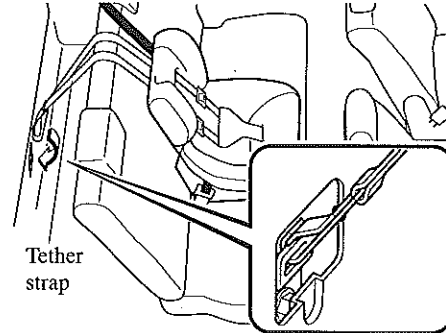
Tether strap position (5 Door outboard position)



Anchor bracket location (5 Door center position)



Tether strap position (5 Door center position)



⚠ WARNING

Use the tether and tether anchor only for a child-restraint system:

Using the tether or tether anchor to secure anything but a child-restraint system is dangerous. This could weaken or damage the tether or tether anchor and result in injury.

Always route the tether strap between the head restraint and the seatback (Except center position):

Routing the tether strap on top of the head restraint is dangerous. In a collision the tether strap could slide off the head restraint and loosen the child-restraint system. The child-restraint system could move which may result in death or injury to the child.

Always attach the tether strap to the correct tether anchor position:

Attaching the tether strap to the incorrect tether anchor position is dangerous. In a collision, the tether strap could come off and loosen the child-restraint system. If the child-restraint system moves it could result in death or injury to the child.

Essential Safety Equipment
Child Restraint

▼ **If You Must Use the Front Seat
for Children**

If you cannot put all children in the rear seat, at least put the smallest children in the rear and be sure the largest child up front uses the shoulder belt over the shoulder.

NEVER put a rear-facing child-restraint system on the front passenger seat, even with a seat weight sensor equipped vehicle.

This seat is also not set up for tethered child-restraint systems, put them in one of the rear seat positions set up with tether anchors.

Likewise the LATCH child-restraint system cannot be secured in the front passenger's seat and should be used in the rear seat.

Do not allow anyone to sleep against the side window if you have an optional side and curtain air bag, it could cause serious injuries to an out of position occupant. As children more often sleep in cars, it is better to put them in the rear seat. If installing the child-restraint system on the front seat is unavoidable, follow these instructions when using a front-facing child-restraint system in the front passenger's seat.

NOTE

- *To check if your front seats have side air bags:
Mazda vehicles equipped with side air bag will have a "SRS AIRBAG" tag on the outboard shoulder of the front seats.*
- *To check if your vehicle has curtain air bags:
Mazda vehicles equipped with curtain air bag will have an "SRS AIRBAG" marking on the window pillars along the roof edge.*

⚠ WARNING

Always move the front passenger seat as far back as possible if installing a front-facing child-restraint system on it is unavoidable:

As your vehicle has front air bags and doubly so because your vehicle has side air bags, a front-facing child-restraint system should be put on the front passenger seat only when it is unavoidable.

Even if the front passenger air bag deactivation indicator light illuminates, always move the seat as far back as possible, because the force of a deploying air bag could cause serious injury or death to the child.

Never use a rear-facing child-restraint system in the front seat with an air bag that could deploy:

Rear-facing child-restraint systems on the front seat are particularly dangerous.

Even in a moderate collision, the child-restraint system can be hit by a deploying air bag and moved violently backward resulting in serious injury or death to the child.

Even though you may feel assured that the front passenger air bag will not deploy based on the fact that the front passenger air bag deactivation indicator light illuminates.

Essential Safety Equipment

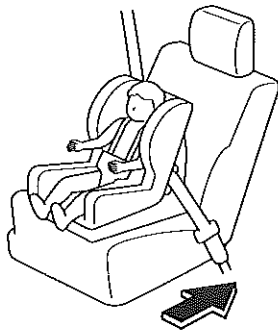
Child Restraint

Do not allow a child or anyone to lean over or against the side window of a vehicle with side and curtain air bags:

It is dangerous to allow anyone to lean over or against the side window, the area of the front passenger seat, the front and rear window pillars and the roof edge along both sides from which the side and curtain air bags deploy, even if a child-restraint system is used. The impact of inflation from a side or curtain air bag could cause serious injury or death to an out of position child. Furthermore, leaning over or against the front door could block the side and curtain air bags and eliminate the advantages of supplemental protection. With the front air bag and the additional side air bag that comes out of the front seat, the rear seat is always a better location for children. Take special care not to allow a child to lean over or against the side window, even if the child is seated in a child-restraint system.

▼ Front Passenger's Seat Child-Restraint System Installation

1. Slide the seat as far back as possible.



2-36

2. Secure the child-restraint system with the lap portion of the lap/shoulder belt. See the manufacturer's instructions on the child-restraint system for belt routing instructions.
3. To get the retractor into the automatic locking mode, pull the shoulder belt portion of the seat belt until the entire length of the belt is out of the retractor.
4. Push the child-restraint system firmly into the vehicle seat. Be sure the belt retracts as snugly as possible. A clicking noise from the retractor will be heard during retraction if the system is in automatic locking mode. If the belt does not lock the seat down tight, repeat the previous step and also this one.

NOTE

- *Inspect this function before each use of the child-restraint system. You should not be able to pull the shoulder belt out of the retractor while the system is in the automatic locking mode. When you remove the child-restraint system, be sure the belt fully retracts to return the system to emergency locking mode before occupants use the seat belts.*
- *Follow the child-restraint system manufacturer's instructions carefully. Depending on the type of child-restraint system, it may not employ seat belts which are in automatic locking mode.*

Essential Safety Equipment
Child Restraint

5. Make sure the front passenger air bag deactivation indicator light illuminates after installing a child-restraint system on the front passenger seat. Refer to Front passenger air bag deactivation indicator light on page 2-55.



⚠ WARNING

Do not seat a child in a child-restraint system on the front passenger seat if the front passenger air bag deactivation indicator light does not illuminate:

While it is always better to install any child-restraint system on the rear seat, it is imperative that a child-restraint system **ONLY** be used on the front passenger seat if the deactivation indicator light illuminates when the child is seated in the child-restraint system (page 2-55). Seating a child in a child-restraint system installed on the front passenger seat with the front passenger air bag deactivation indicator light not illuminated is dangerous. If this indicator light does not illuminate even when the total seated weight is less than approximately 30 kg (66 lb), this means that the front passenger front and side air bags, and seat belt pretensioner are ready for deployment. If an accident were to deploy an air bag, a child in a child-restraint system sitting in the front passenger seat could be seriously injured or killed. If the indicator light does not illuminate after seating a child in a child-restraint system on the front passenger seat, seat a child in a child-restraint system on the rear seat and consult an Authorized Mazda Dealer as soon as possible.

Essential Safety Equipment

Child Restraint

LATCH Child-Restraint Systems

Your Mazda is equipped with LATCH lower anchors for attachment of specially designed LATCH child-restraint systems in the rear seat. Both anchors must be used, otherwise the seat will bounce around and put the child in danger. Most LATCH child-restraint systems must also be used in conjunction with a tether to be effective. If they have a tether you must use it to better assure your child's safety.

WARNING

Follow the manufacturer's instructions for the use of the child-restraint system:

An unsecured child-restraint system is dangerous. In a sudden stop or a collision it could move causing serious injury or death to the child or other occupants. Make sure the child-restraint system is properly secured in place according to the child-restraint system manufacturer's instructions.

Never attach two child-restraint systems to the same LATCH lower anchor:

Attaching two child-restraint systems to the same LATCH lower anchor is dangerous. In a collision, one anchor may not be strong enough to hold two child-restraint system attachments, and it may break, causing serious injury or death. If you use the seat position for another child-restraint system when an outboard LATCH position is occupied, use the center seat belts instead, and the tether if tether-equipped.

Make sure the child-restraint system is properly secured:

An unsecured child-restraint system is dangerous. In a sudden stop or a collision it could move causing serious injury or death to the child or other occupants. Follow the child-restraint system manufacturer's instructions on belt routing to secure the seat just as you would with a child in it so that nobody is tempted to put a child in an improperly secured seat later on. When not in use, remove it from the vehicle or fasten it with a seat belt, or latch it down to BOTH LATCH lower anchors for LATCH child-restraint systems.

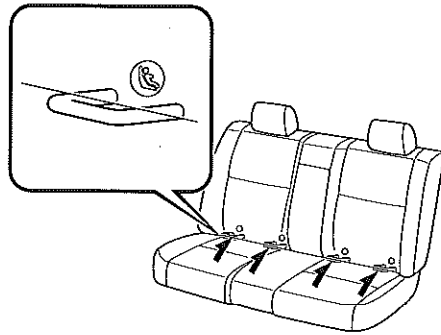
Make sure there are no seat belts or foreign objects near or around the LATCH child-restraint system:

Not following the child-restraint system manufacturer's instructions when installing the child-restraint system is dangerous. If seat belts or a foreign object prevent the child-restraint system from being securely attached to the LATCH lower anchors and the child-restraint system is installed improperly, the child-restraint system could move in a sudden stop or collision causing serious injury or death to the child or other occupants. When installing the child-restraint system, make sure there are no seat belts or foreign objects near or around the LATCH lower anchors. Always follow the child-restraint system manufacturer's instructions.

Essential Safety Equipment
Child Restraint

▼ **LATCH Child-Restraint System
Installation Procedure (Rear
Outboard Seats)**

1. Make sure the seatback is securely latched by pushing it back until it is fully locked.
2. Expand the area between the seat bottom and the seatback slightly to verify the locations of the LATCH lower anchors.



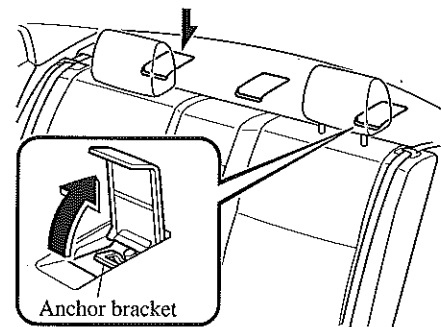
NOTE

The markings above the LATCH lower anchors indicate the locations of LATCH lower anchors for the attachment of a child-restraint system.

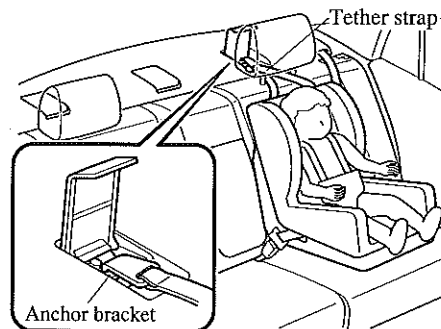
3. Raise the head restraint to the top locked position. Refer to Head Restraints on page 2-12.
4. Secure the child-restraint system using BOTH LATCH lower anchors, following the child-restraint system manufacturer's instruction. Pull on the child-restraint to be sure both anchors are engaged.

5. If your child-restraint system came equipped with a tether, that means it is very important to properly secure the tether for child safety. Please carefully follow the child-restraint system manufacturer's instructions when installing tethers.

Anchor bracket location (4 Door)

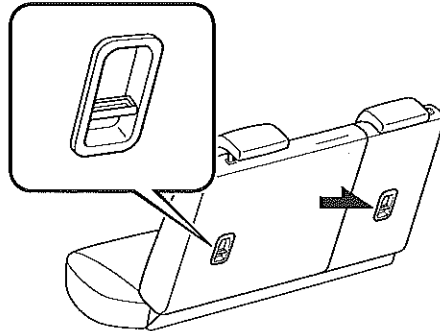


Tether strap position (4 Door)

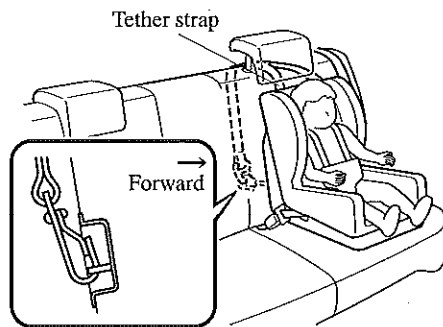


Essential Safety Equipment
Child Restraint

Anchor bracket location (5 Door)



Tether strap position (5 Door)



⚠ WARNING

Use the tether and tether anchor only for a child-restraint system:

Using the tether or tether anchor to secure anything but a child-restraint system is dangerous. This could weaken or damage the tether or tether anchor and result in injury.

Always route the tether strap between the head restraint and the seatback:

Routing the tether strap on top of the head restraint is dangerous. In a collision the tether strap could slide off the head restraint and loosen the child-restraint system. The child-restraint system could move which may result in death or injury to the child.

Always attach the tether strap to the correct tether anchor position:

Attaching the tether strap to the incorrect tether anchor position is dangerous. In a collision, the tether strap could come off and loosen the child-restraint system. If the child-restraint system moves it could result in death or injury to the child.

Essential Safety Equipment
Child Restraint

▼ **LATCH Child-Restraint System
Installation Procedure (Rear
Center Seat)**

The LATCH lower anchors at the center of the rear seat are much further apart than the sets of LATCH lower anchors for child-restraint system installation at other seating positions. Child-restraint systems with rigid LATCH attachments cannot be installed on the center seating position. Some LATCH equipped child-restraint systems can be placed in the center position and will reach the nearest LATCH lower anchors which are 400 mm (15.75 in) apart. LATCH compatible child-restraint systems (with attachments on belt webbing) can be used at this seating position only if the child-restraint system manufacturer's instructions state that the child-restraint system can be installed to LATCH lower anchors that are 400 mm (15.75 in) apart. Do not attach two child-restraint systems to the same LATCH lower anchor. If your child-restraint system has a tether, it must also be used for your child's optimum safety.

⚠ WARNING

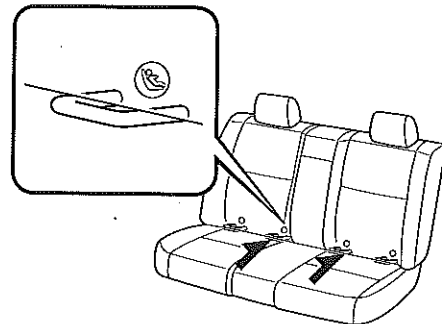
Use the tether and tether anchor only for a child-restraint system:

Using the tether or tether anchor to secure anything but a child-restraint system is dangerous. This could weaken or damage the tether or tether anchor and result in injury.

Always attach the tether strap to the correct tether anchor position:

Attaching the tether strap to the incorrect tether anchor position is dangerous. In a collision, the tether strap could come off and loosen the child-restraint system. If the child-restraint system moves it could result in death or injury to the child.

1. Make sure the seatback is securely latched by pushing it back until it is fully locked.
2. Expand the area between the seat bottom and the seatback slightly to verify the locations of the LATCH lower anchors.



NOTE

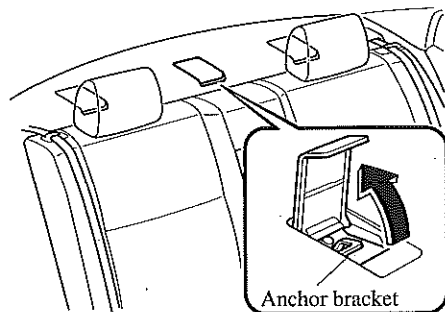
The markings above the LATCH lower anchors indicate the locations of LATCH lower anchors for the attachment of a child-restraint system.

Essential Safety Equipment

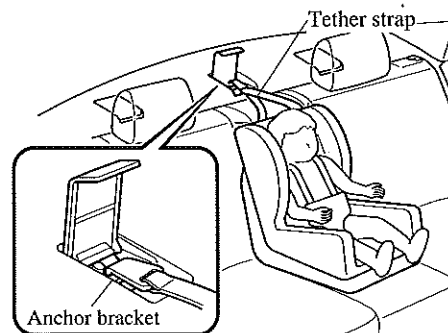
Child Restraint

3. Secure the child-restraint system using BOTH LATCH lower anchors, following the child-restraint system manufacturer's instructions. Pull on the child-restraint to be sure both anchors are engaged.
4. If your child-restraint system came equipped with a tether, that means it is very important to properly secure the tether for child safety. Please carefully follow the child-restraint system manufacturer's instructions when installing tethers.

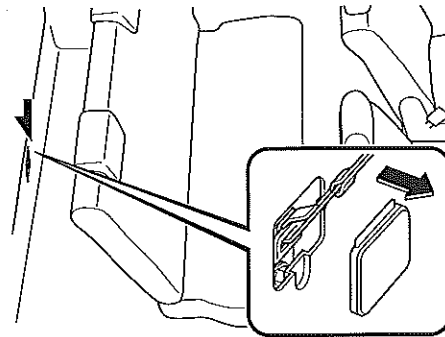
Anchor bracket location (4 Door)



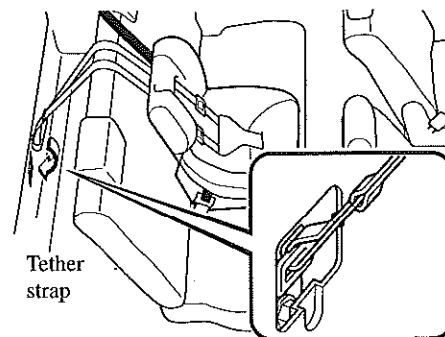
Tether strap position (4 Door)



Anchor bracket position (5 Door)



Tether strap position (5 Door)



APPENDIX B
MANUFACTURER’S DATA (OVSC FORM 225)

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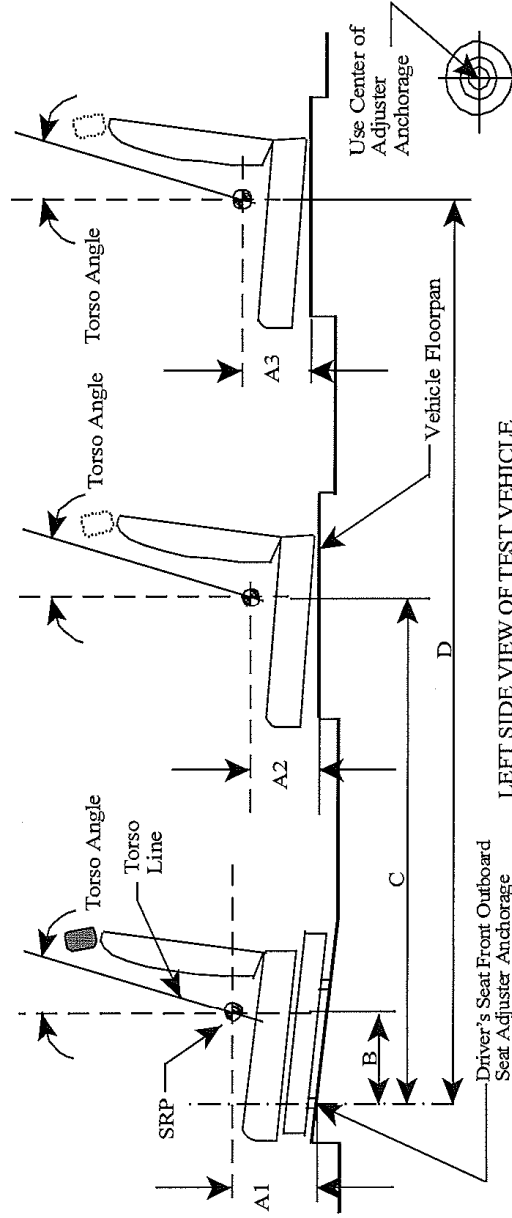
FORM - 225
Rev. 10/10/08

SEAT REFERENCE POINT (SRP) AND TORSO ANGLE DATA

FMVSS No. 225
(All dimensions in mm¹)

MODEL YEAR: 2010 / MAKE: CHEVY / MODEL: EQUINOX / BODY STYLE: SUV

SEAT STYLE: FRONT ROW: Free Standing Buckets / SECOND ROW: Full Bench W/Split Seat Back / THIRD ROW: N/A



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Table 1. Seating Positions¹ and Torso Angles

	Left (Driver Side)	Center (if any)	Right
A1	268.15 (Driver)	N/A	268.15 (Front Passenger)
A2	265.77	285.77	265.77
A3	N/A	N/A	N/A
B	304.8	N/A	304.8
C	1187.0	1167.0	1187.0
D	N/A	N/A	N/A
Torso Angle (degree)	Front Row	N/A	20
	Second Row	22	22
	Third Row	N/A	N/A

Note: All dimensions are in mm. If not, provide the unit used.

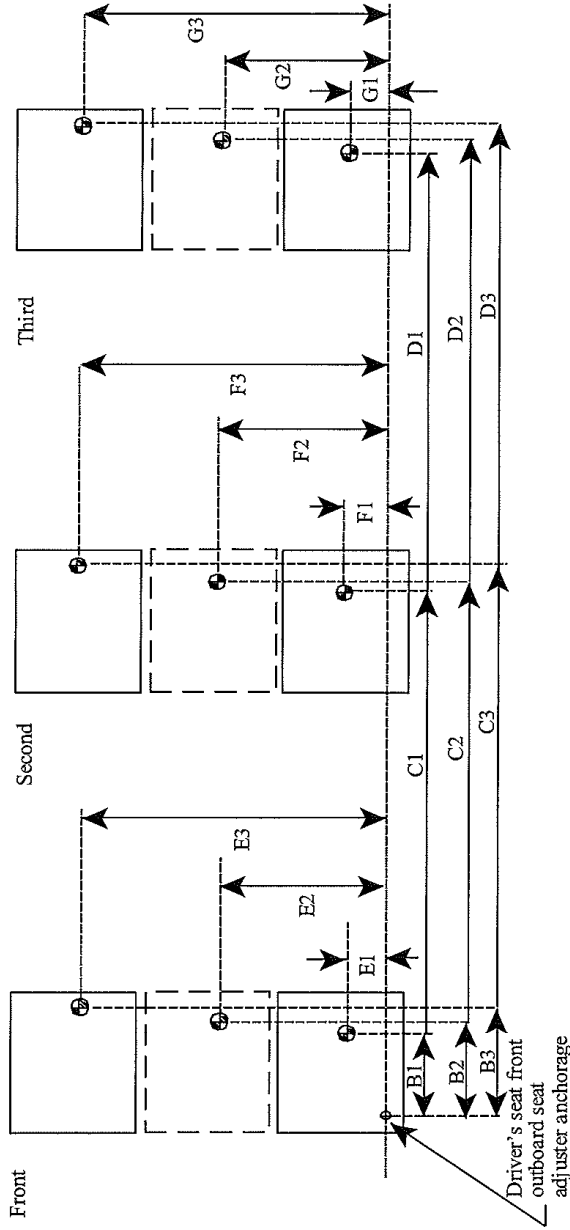
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SEATING REFERENCE POINT

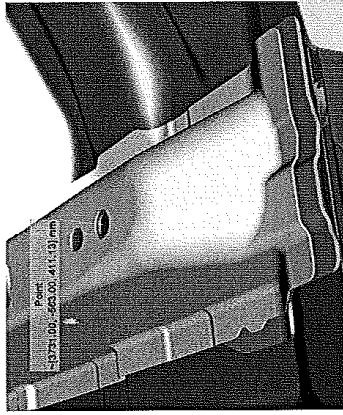
FMVSS No. 225
(All dimensions in mm)

MODEL YEAR: 2010 / MAKE: CHEVY / MODEL: EQUINOX / BODY STYLE: SUV
SEAT STYLE: FRONT ROW: Free Standing Buckets / SECOND ROW: Full Bench W/Split Seat Back / THIRD ROW: N/A

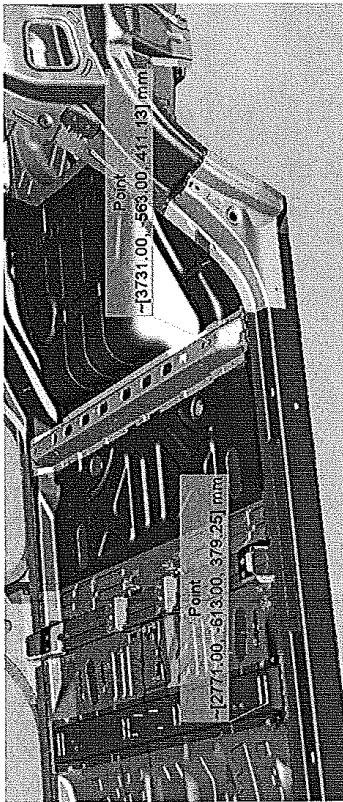


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Point selected for the 2nd row
"Vehicle Floor-pan" reference point.



Point selected as the "Driver's seat front outboard
seat adjuster anchorage" reference point.

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Table 2. Seating Reference Point and Tether Anchorage Locations

Seating Reference Point (SRP)		Distance from Driver's front outboard seat adjuster anchorage ¹
Front Row	B1	300.51
	E1	222.75
	B2	N/A
	E2	N/A
	B3	300.51
	E3	962.75
Second Row	C1	1182.71
	F1	232.75
	C2	1162.71
	F2	592.75
	C3	1182.71
	F3	952.75
Third Row	D1	N/A
	G1	N/A
	D2	N/A
	G2	N/A
	D3	N/A
	G3	N/A

Note: Use the center of anchorage.

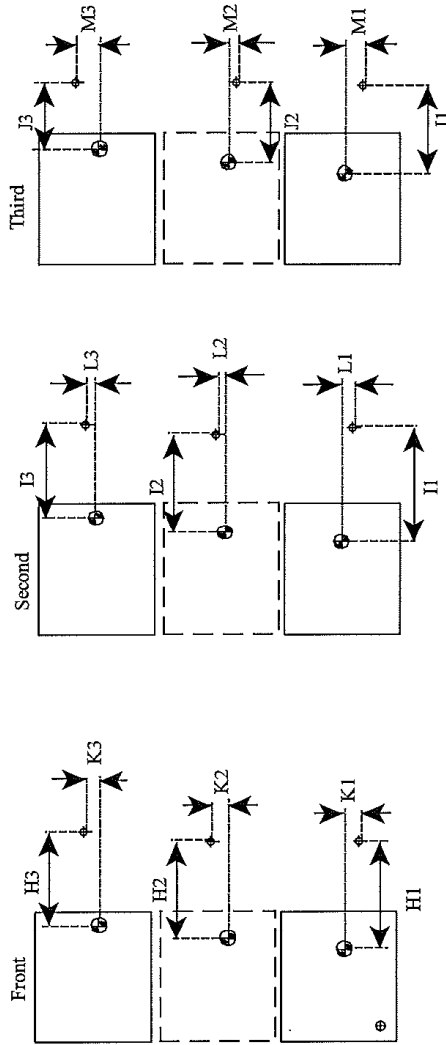
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TETHER ANCHORAGE LOCATIONS

FMVSS No. 225
 (All dimensions in mm)

MODEL YEAR: 2010 / MAKE: CHEVY / MODEL: EQUINOX / BODY STYLE: SUV

SEAT STYLE: FRONT ROW: Free Standing Buckets / SECOND ROW: Full Bench W/Split Seat Back / THIRD ROW: N/A



⊙: SRP
 ⊕: Tether anchorage

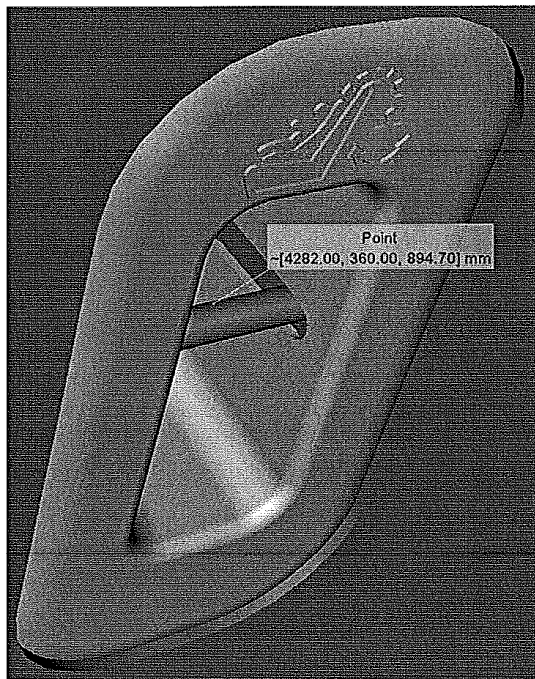
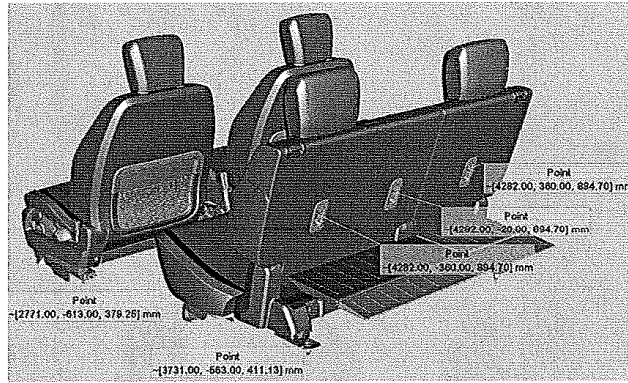
Note: The location shall be measured at the center of anchorage.

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Table 3. Seating Reference Point and Tether Anchorage Locations

Seating Reference Point (SRP)	Distance from SRP	
Front Row	H1	N/A
	K1	N/A
	H2	N/A
	K2	N/A
	H3	N/A
	K3	N/A
Second Row	I1	324.0
	L1	0.0
	I2	344.0
	L2	20.0
	I3	324.0
	L3	0.0
Third Row	J1	N/A
	M1	N/A
	J2	N/A
	M2	N/A
	J3	N/A
	M3	N/A

Note: Use the center of anchorage.

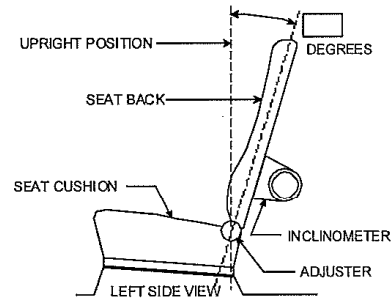


Point measured is on the top and centered on the anchor

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NOMINAL DESIGN RIDING POSITION

For adjustable driver, passenger, 2nd row and 3rd row seat backs, describe how to position the inclinometer to measure the seat back angle. Include a description of the location of the seat back adjustment latch detent if applicable. Indicate if applicable, how the detents are numbered (Is the first detent "0" or "1"?). Indicate if the seat back angle is measured with the dummy in the seat.



Seat back angle for driver's seat = 20 degrees.

Measurement Instructions:

To get to the 20 degree back angle move the head restraint to the highest position and fit an electronic inclinometer against the back of the head restraint post and recline the seat back until it reads 2.8 degrees. The driver torso angle is 20 degrees.

Seat back angle for passenger's seat = 20 degrees.

Measurement Instructions:

Measurement instructions same as driver seat. The passenger torso same as driver.

Seat back angle for 2nd row seat = 18.3 SIDES_18.3 MIDDLE_degrees.

Measurement Instructions:

To get to the 18.3 degree back angle measure 18.3 degrees off the hard back panel. This is the first locking position you get to when you rotate the seat up from fold flat position. It has two recline positions. Each position is 3.5 degrees rearward. The torso angle is 22 degrees for sides and middle.

Seat back angle for 3rd row seat = __N/A__ degrees.

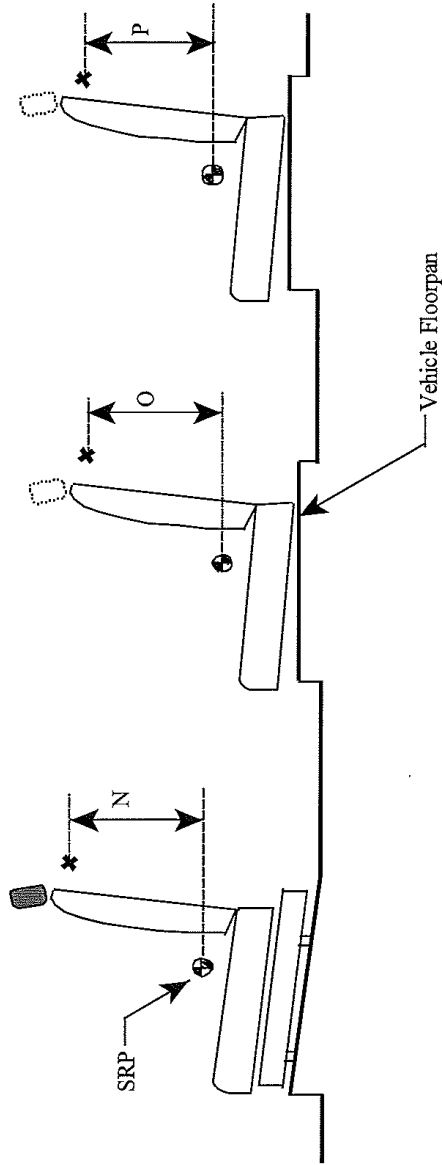
Measurement Instructions:

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TETHER ANCHORAGE LOCATIONS - VERTICAL

FMVSS No. 225
(All dimensions in mm)

MODEL YEAR: 2010 / MAKE: CHEVY / MODEL: EQUINOX / BODY STYLE: SUV
SEAT STYLE: FRONT ROW: Free Standing Buckets / SECOND ROW: Full Bench W/Split Seat Back / THIRD ROW: N/A



LEFT SIDE VIEW OF TEST VEHICLE

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Table 4. Vertical Dimension For The Tether Anchorage

Seating Row	Vertical Distance from Seating Reference Point
Front Row	N1 (Driver)
	N2 (Center)
	N3 (Right)
Second Row	O1 (Left)
	O2 (Center)
	O3 (Right)
Third Row	P1 (Left)
	P2 (Center)
	P3 (Right)

Note: All dimensions are in mm. If not, provide the unit anchorage.

For each vehicle, provide the following information:

1. How many designated seating positions exist in the vehicle? 5
2. How many designated seating positions are equipped with lower anchorages and tether anchorages? Specify which position(s). 3 positions: 2nd row, LH, Ctr and RH. Only 2 Child Seats can be used in the 2nd row at one time. Options are: 1) The two outboard positions or 2) Ctr position.
3. How many designated seating positions are equipped with tether anchorages? Specify which positions(s). 3 positions; 2nd row, LH, Ctr and RH

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4. Lower Anchorages Marking and Conspicuity: Whether the anchorages are certified to S9.5(a) or S9.5(b) of FMVSS No. 225. Vehicle rear seats have exposed latch wires, S9.5(b).

SgRP's:

Front Seat: LH RH
 X = 2771.0 X = 2771.0
 Y = -613.0 Y = 613.0
 Z = 379.25 Z = 379.25

2nd Row Seat: LH CTR RH
 X = 3958.0 X = 3938.0 X = 3958.0
 Y = -360.0 Y = 0.0 Y = 360.0
 Z = 676.9 Z = 696.9 Z = 676.9

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