FINAL REPORT NUMBER 225-MGA-06-002

SAFETY COMPLIANCE TESTING FOR FMVSS 225
"Child Restraint Anchorage Systems"

GENERAL MOTORS CORPORATION
2006 HUMMER H3
NHTSA No. C60102

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Date: August 2, 2006
Report Date: September 27, 2006

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
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Approval Date: 09/27/2006

FINAL REPORT ACCEPTANCE BY OVSC:

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4. Title and Subtitle Final Report of FMVSS 225 Compliance Testing of a 2006 Hummer H3, NHTSA No. C60102		5. Report Date September 27, 2006 6. Performing Organization Code MGA	
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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	
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15. Supplementary Notes			
16. Abstract A compliance test was conducted on the subject 2006 Hummer H3, NHTSA No. C60102, 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 tests were conducted at MGA Research Corporation in Troy, Michigan on August 2, 2006. Test failures identified were as follows: NONE The data recorded indicates that the 2006 Hummer H3 tested appears to meet the requirements of FMVSS 225.			
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TABLE OF CONTENTS

SECTION	PAGE
1.0 PURPOSE AND PROCEDURE	5
2.0 COMPLIANCE TEST AND DATA SUMMARY	5
3.0 TEST VEHICLE INFORMATION	6
4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION	8
5.0 DATA	9
6.0 PHOTOGRAPHS	14
6.1 Front view	
6.2 Rear view	
6.3 ¾ Front left view	
6.4 ¾ 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 Left front	
6.6.3 Left rear	
6.6.4 Right front	
6.6.5 Right rear	
6.7 2-dimensional template	
6.7.1 LH position photo #1	
6.7.2 LH position photo #2	
6.7.3 Center position photo #1	
6.7.4 Center position photo #2	
6.7.5 RH position photo #1	
6.7.6 RH position photo #2	
6.8 CRF verification	
6.8.1 LH position photo #1	
6.8.2 LH position photo #2	
6.8.3 RH position photo #1	
6.8.4 RH position photo #2	
6.9 ¾ Front view of test vehicle with test apparatus in place	
6.9.1 ¾ Front left view of SFADII	
6.9.2 ¾ Front right view of SFADII	
6.10 Pre-test views of each child restraint anchorage system installed in the vehicle	
6.10.1 Pre-test photo #1 of SFADII	
6.10.2 Pre-test photo #2 of SFADII	
6.10.3 Pre-test photo #3 of SFADII	
6.10.4 Pre-test photo #4 of SFADII	

TABLE OF CONTENTS (continued)

SECTION PAGE

6.11 Post-test views of each child restraint anchorage system installed in the vehicle 43
6.11.1 Post-test photo #1 of SFADII
6.11.2 Post-test photo #2 of SFADII
6.11.3 Post-test photo #3 of SFADII
6.11.4 Post-test photo #4 of SFADII
6.11.5 Post-test photo #5 of SFADII
6.11.6 Post-test photo #6 of SFADII
6.11.7 Post-test photo #7 of SFADII
7.0 PLOTS 50
8.0 REPORT OF VEHICLE CONDITION 52

SECTION
APPENDIX A OWNERS MANUAL CHILD RESTRAINT SYSTEMS 54
APPENDIX B MANUFACTURER'S DATA (OVSC Form 14) 67

LIST OF TABLES

TABLE#
1. Summary Data for Strength and Displacement 6
2. General Test and Vehicle Parameter Data 6
3. Child Restraint Tether Anchorage Configuration 9
4. Child Restraint Lower Anchorage Configuration 10
5. Tether Location and Dimensional Measurements 12
6. Tether Anchorage Static Loading and Displacement 13

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 2006 Hummer H3, NHTSA No. C60102 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 (06/23/06).

The front occupant compartment consisted of two (2) adjustable outboard bucket seats and the rear occupant compartment consisted of a 2nd row three-passenger 60/40 split-bench seat. Each 2nd row outboard seating position was equipped with a child restraint anchorage system (one tether and two lower anchorages). The 2nd row center seating position was equipped with a tether anchorage. The center-to-center spacing between the 2nd row outboard lower anchorages was approximately 705 mm. Each 2nd row outboard seating position was tested with the SFADII fixture.

2.0 COMPLIANCE TEST AND DATA SUMMARY

TEST SUMMARY

The testing was conducted at MGA in Troy, Michigan on August 2, 2006.

Based on the test results, the 2006 Hummer H3 appears to meet the requirements of FMVSS No. 225 for this testing.

The SFADII at the 2nd row left seating position sustained a maximum force of 4,979 N and held the required load for 3 seconds. The total displacement from point "X" on the SFADII for the 2nd row left seating position was 80 mm. The SFADII at the 2nd row right seating position sustained a maximum force of 5,044 N and held the required load for 3 seconds. The total displacement from point "X" on the SFADII for the 2nd row right seating position was 77 mm.

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)
SB6361	SFADII	Lateral Left	2nd Row Left	4,979	80
			2nd Row Right	5,044	77

3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

VEH. MOD YR/MAKE/MODEL/BODY	2006 Hummer H3
VEH. NHTSA NO.	C60102
VIN	5GTDN136368235357
COLOR	Gray
VEH. BUILD DATE	01/2006
TEST DATE	August 2, 2006
TEST LABORATORY	MGA Research Corporation
OBSERVERS	Melanie Schick, Brad Reaume, Kenney Godfrey

GENERAL INFORMATION:

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: General Motors Corporation.

Date of Manufacture: 01/06; VIN: 5GTDN136368235357

GVWR: 5850 lbs; GAWR FRONT: 3050 lbs

GAWR REAR: 3200 lbs

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 30 psi REAR: 30 psi

Recommended Tire Size: P265/75R16

Recommended Cold Tire Pressure:

FRONT: 30 psi REAR: 30 psi

Size of Tire on Test Vehicle: P265/75R16

Type of Spare Tire: P265/75R16

VEHICLE CAPACITY DATA:

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

Number of Occupants: Front _2_; Middle N/A; 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	S/N 600 (12/20/06), S/N 251 (08/13/06)
String Potentiometer	Calibrated at each use (S/N F1603960A, F1603959A)
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	S/N TPM517 (08/02/06)
MGA Data Acquisition System	N/A
Digital Calipers	S/N MGA00571 (09/02/06)
Force Gauge	S/N MGA00647 (05/26/07)
Inclinometer (Digital)	S/N MGA00051 (02/09/07)

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	No	No	N/A
	Ctr		N/A		
	RH		No	No	
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	Yes		N/A
	Ctr		N/A		
	RH		Yes		
Diameter of the bar (mm)	LH	N/A	5.94	5.95	N/A
	Ctr		N/A		
	RH		5.95	5.95	
Inspect if the bars are straight, horizontal and transverse	LH	N/A	Yes		N/A
	Ctr		N/A		
	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				
	RH				
Optional Marking: If guidance fixtures are used, the fixture(s) must be installed.	LH	N/A	N/A		N/A
	Ctr				
	RH				
Measure the distance between Point "Z" of the CRF and the front surface of the anchorage bar (mm)	LH	N/A	34		N/A
	Ctr		N/A		
	RH		43		
Measure the distance between the SRP to the center of the anchorage bar (mm)	LH	N/A	163	163	N/A
	Ctr		N/A		
	RH		141	141	

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		N/A		
	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	30	29	N/A
			41	41	
	Ctr		N/A		
	RH		30	30	
			40	41	
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		N/A		
	RH		Yes		
Inspect if the bars are an integral and permanent part of the vehicle.	LH	N/A	Yes		N/A
	Ctr		N/A		
	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		N/A		
	RH		Yes		

PITCH, YAW, & ROLL INFORMATION

SEAT POSITION	PITCH (deg)	YAW (deg)	ROLL (deg)
2nd Row Left	13.5	No Data	0.4
2nd Row Center	N/A	N/A	N/A
2nd Row Right	14.9	No Data	0.1

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 (N)	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	Fixed	Yes	II	0	25	167	5,000	4,979	105	80
	Ctr.			Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	RH			Yes	II	0	29	167	5,000	5,044*	106	77
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: (1) AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225-01.

REMARKS: * Applied force exceeded the force specified in the test procedure.

6.0 PHOTOGRAPHS

6.1 Front view

6.2 Rear view

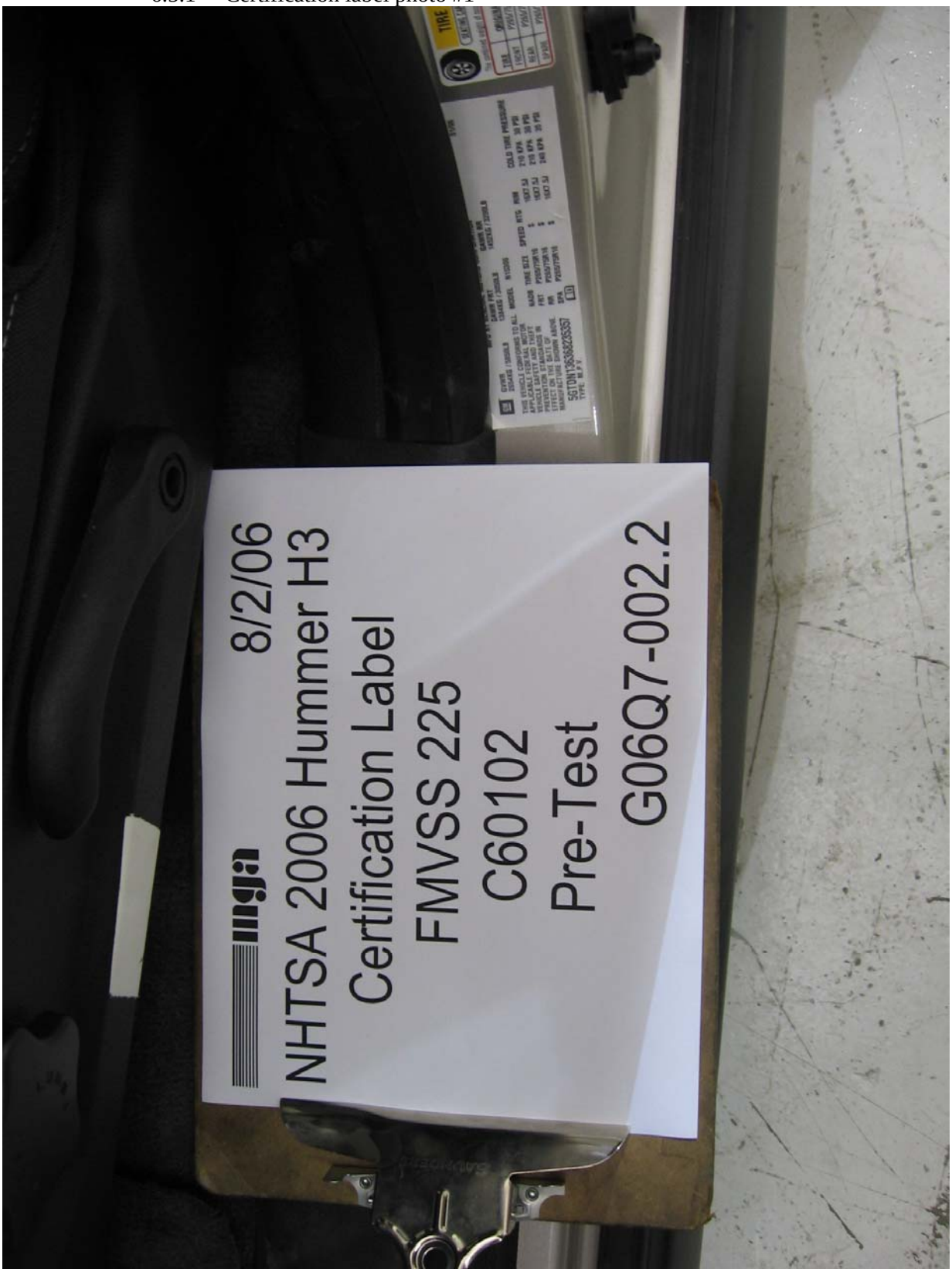

GOODYEAR
WRANGLER
SUBURBAN
NHTSA 2006 Hummer H3
Rear View
FMVSS 225
C60102
Pre-Test
G06Q7-002.2

6.3 ¾ Front left view

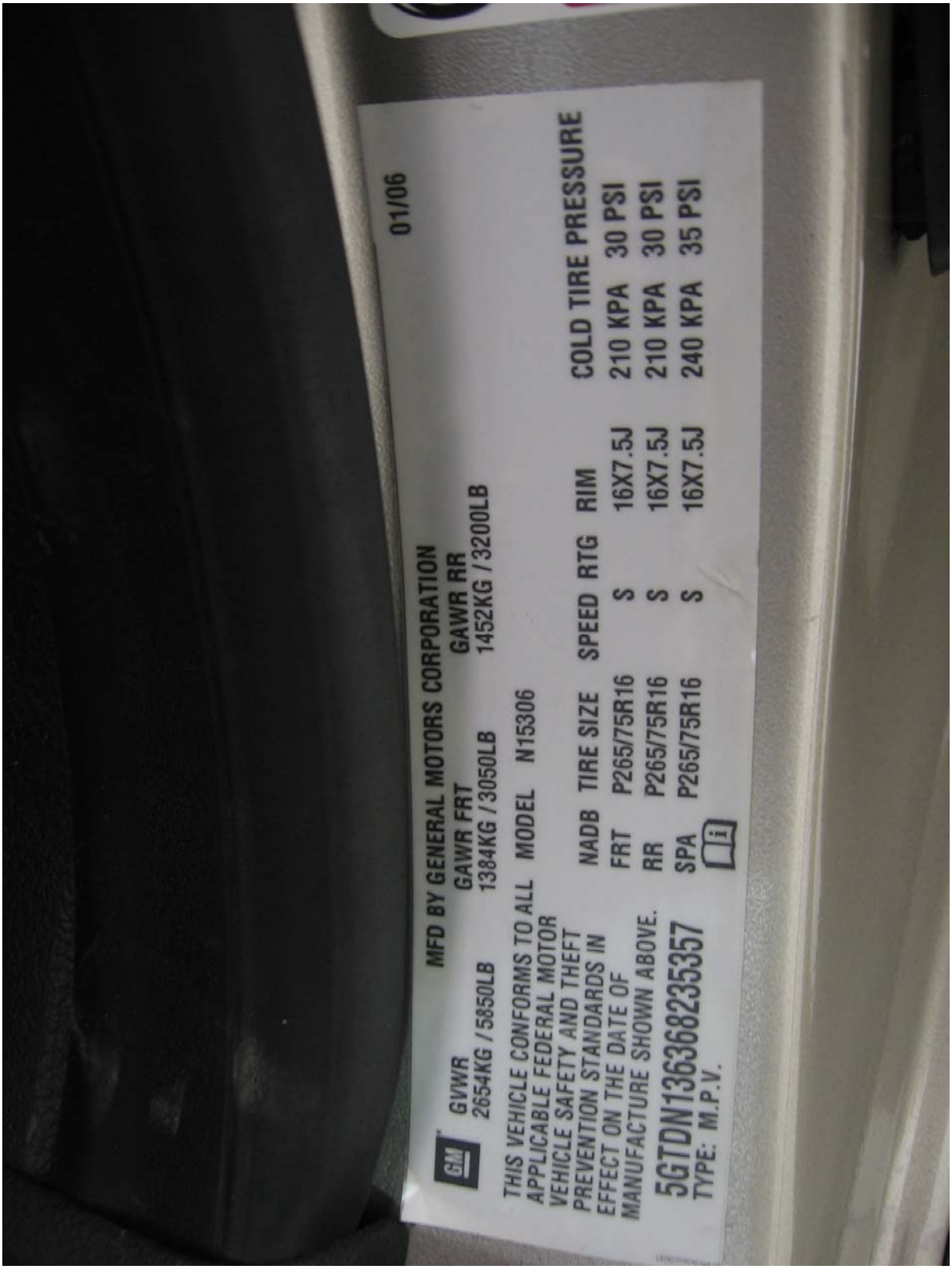
6.4 ¾ Front right view

6.5 Test vehicle's certification label

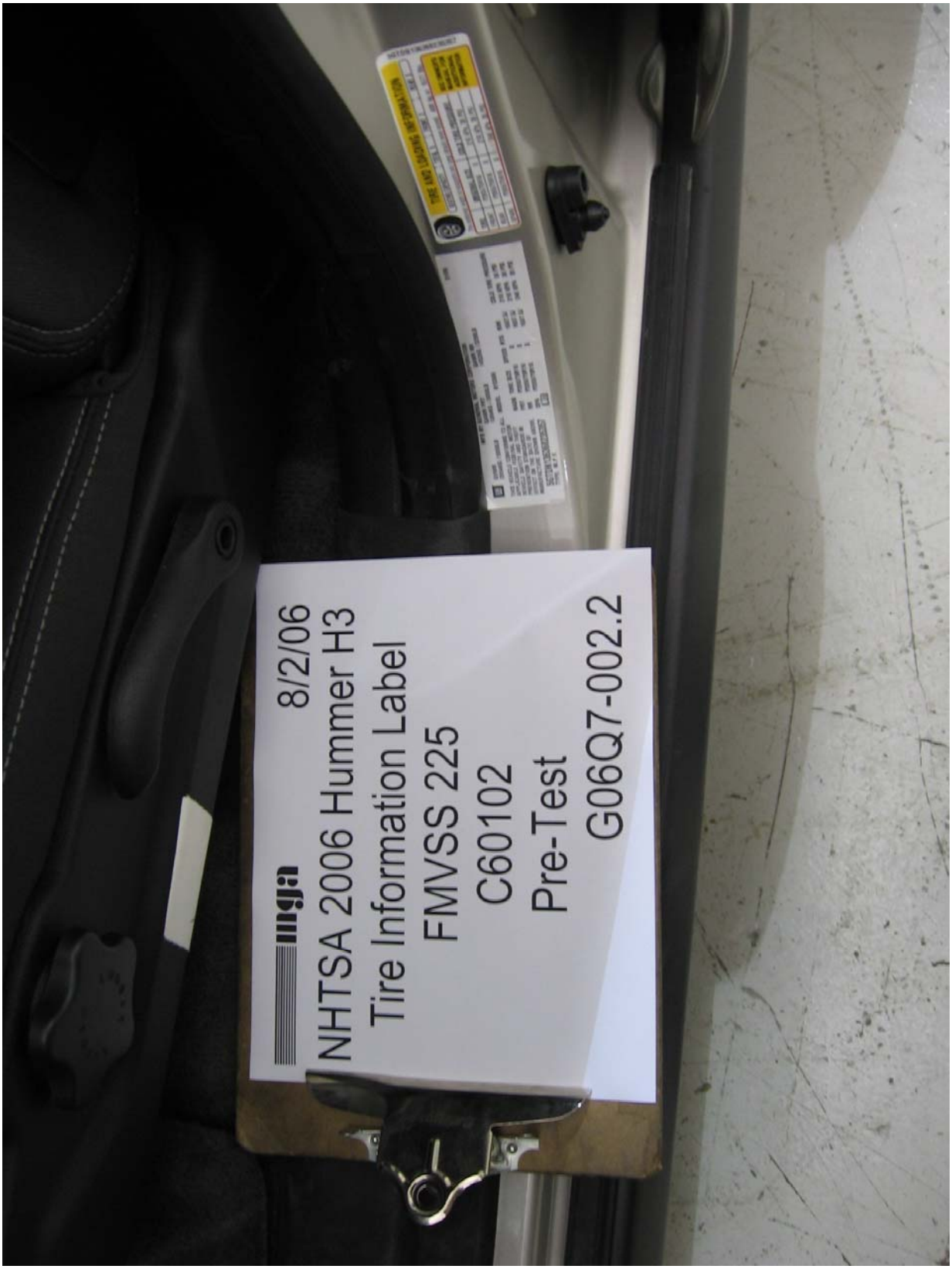
6.5.1 Certification label photo #1



6.5.2 Certification label photo #2



6.5.3 Tire information label photo #1



6.5.4 Tire information label photo #2

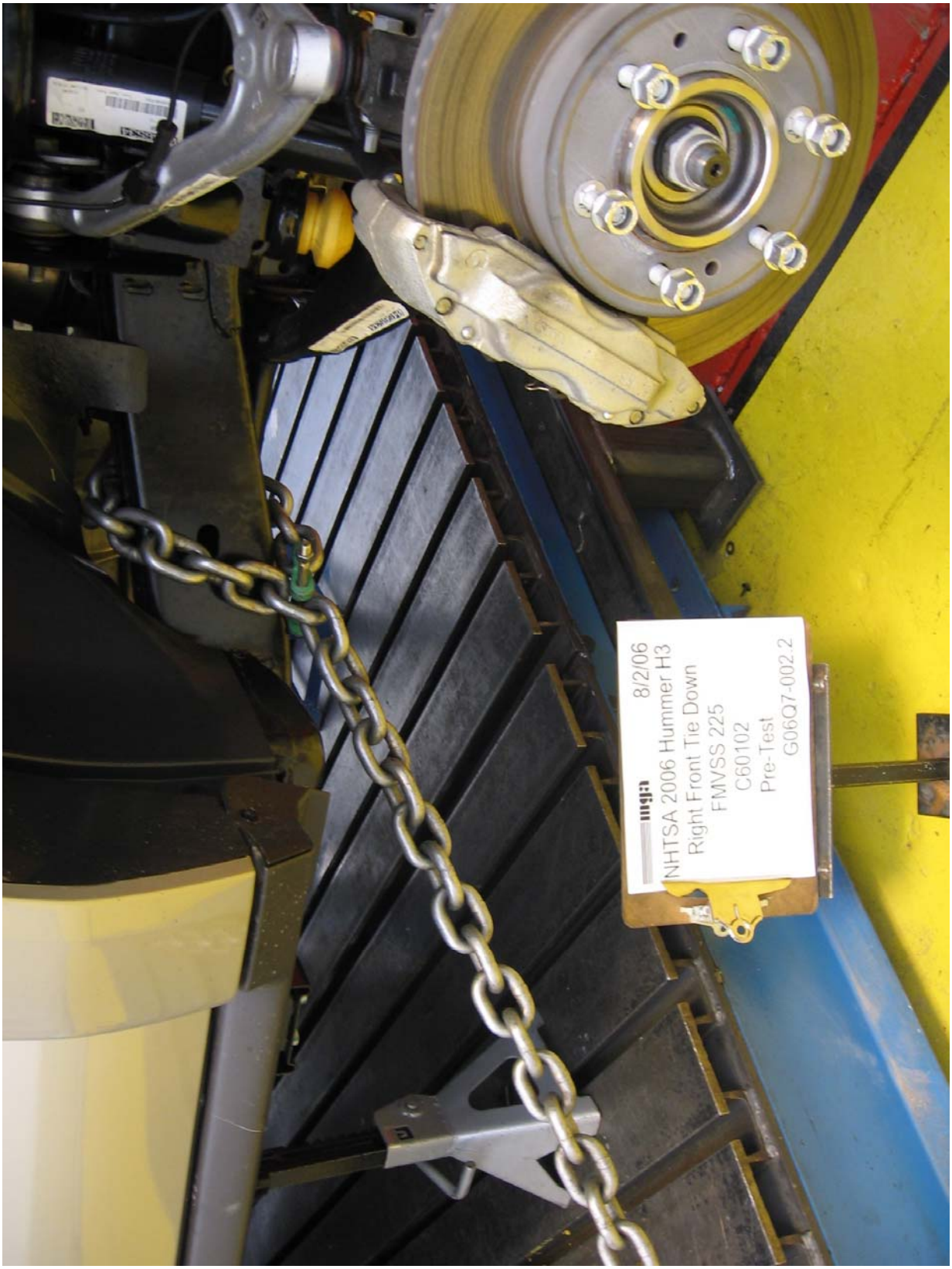
6.6 Vehicle tie down at each tie down location

6.6.1 Front under vehicle

6.6.2 Left front

6.6.3 Left rear

6.6.4 Right front



6.6.5 Right rear

6.7 2-dimensional template

6.7.1 LH position photo #1

6.7.2 LH position photo #2

6.7.3 Center position photo #1

6.7.4 Center position photo #2

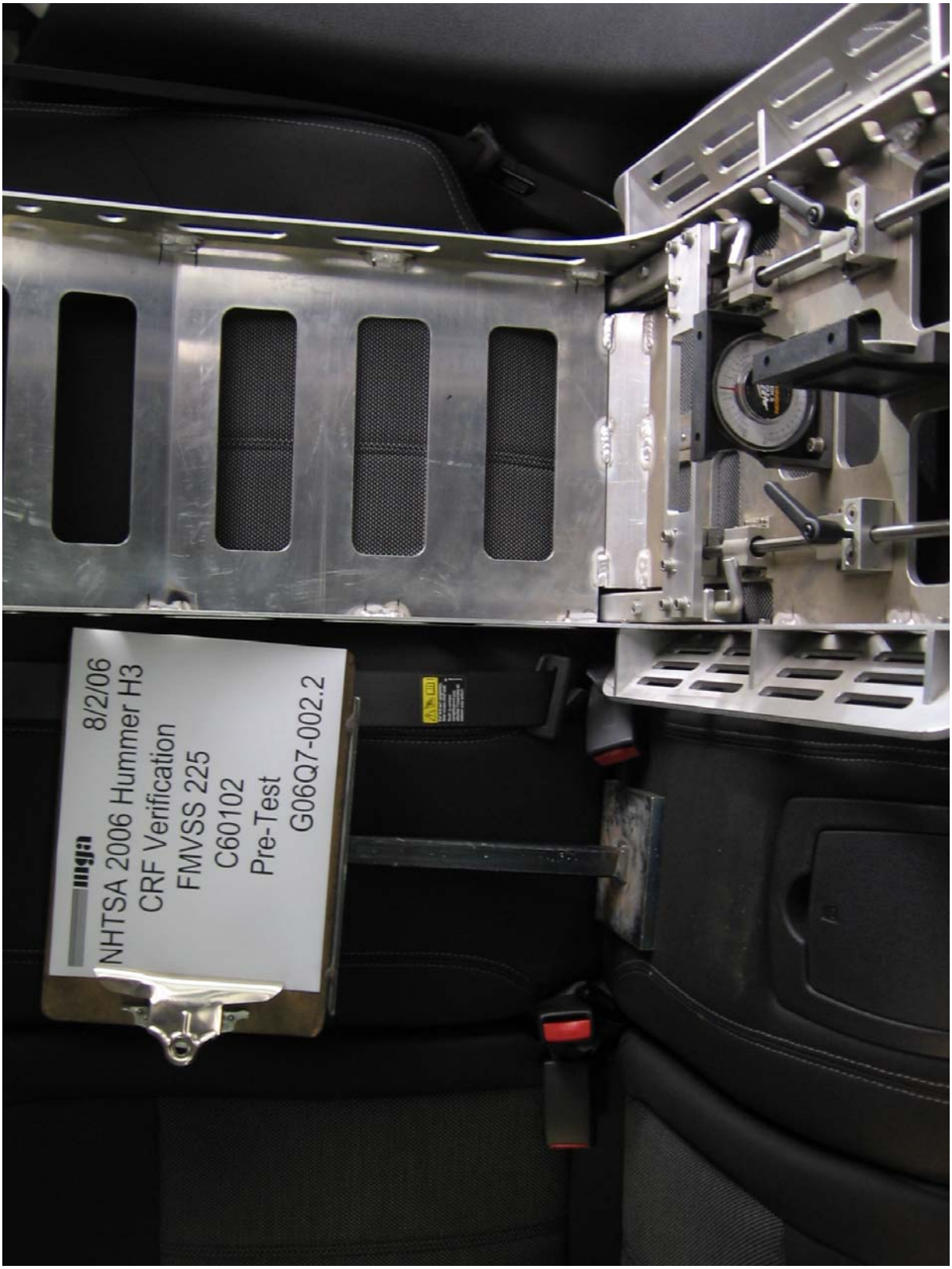
6.7.5 RH position photo #1

6.7.6 RH position photo #2

6.8 CRF verification

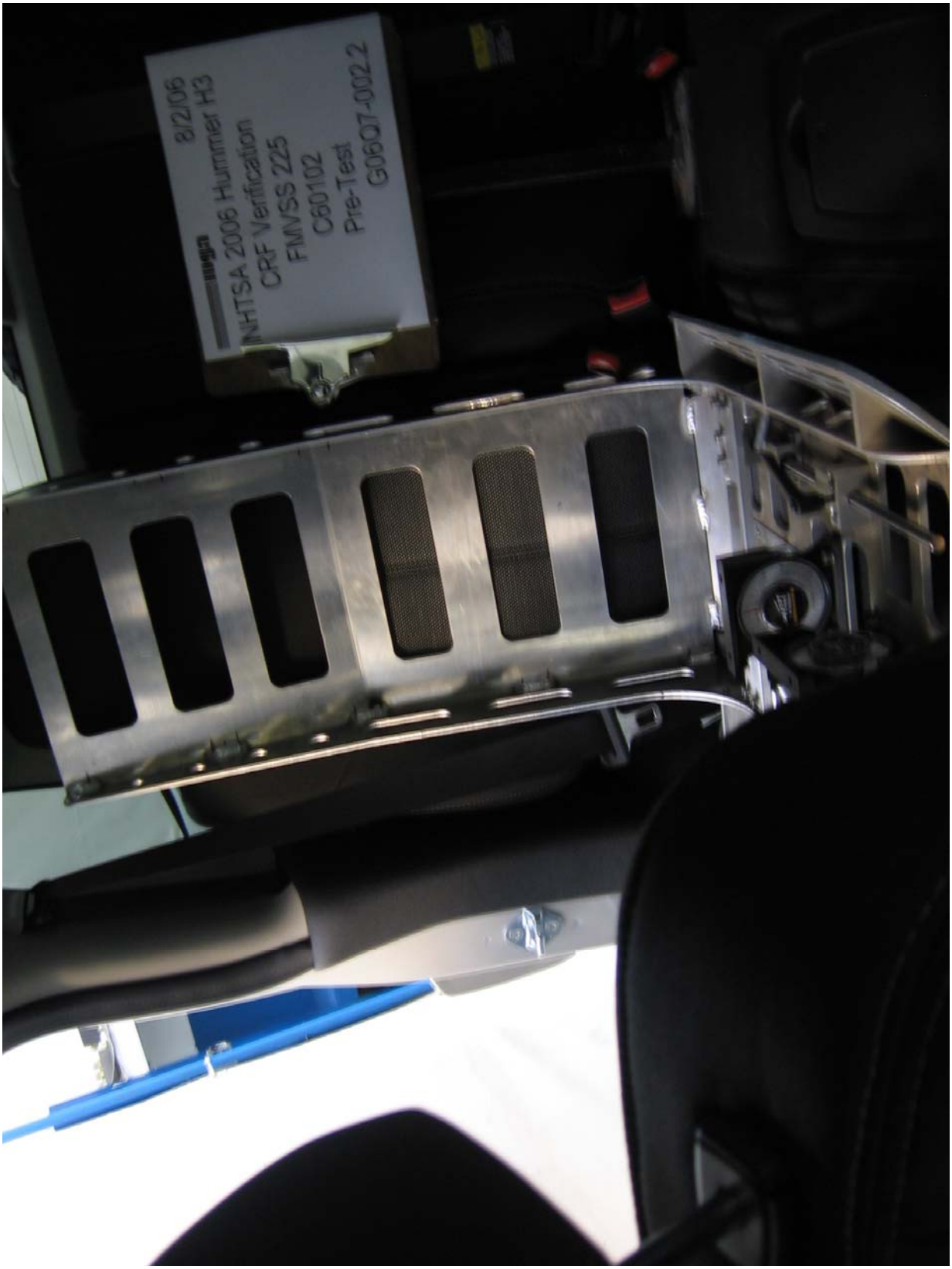
6.8.1 LH position photo #1

6.8.2 LH position photo #2



6.8.3 RH position photo #1

6.8.4 RH position photo #2



6.9 ¾ Front view of test vehicle with test apparatus in place

6.9.1 ¾ Front left view of SFADII

6.9.2 ¾ Front right view of SFADII

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

6.10.1 Pre-test photo #1 of SFADII

6.10.2 Pre-test photo #2 of SFADII

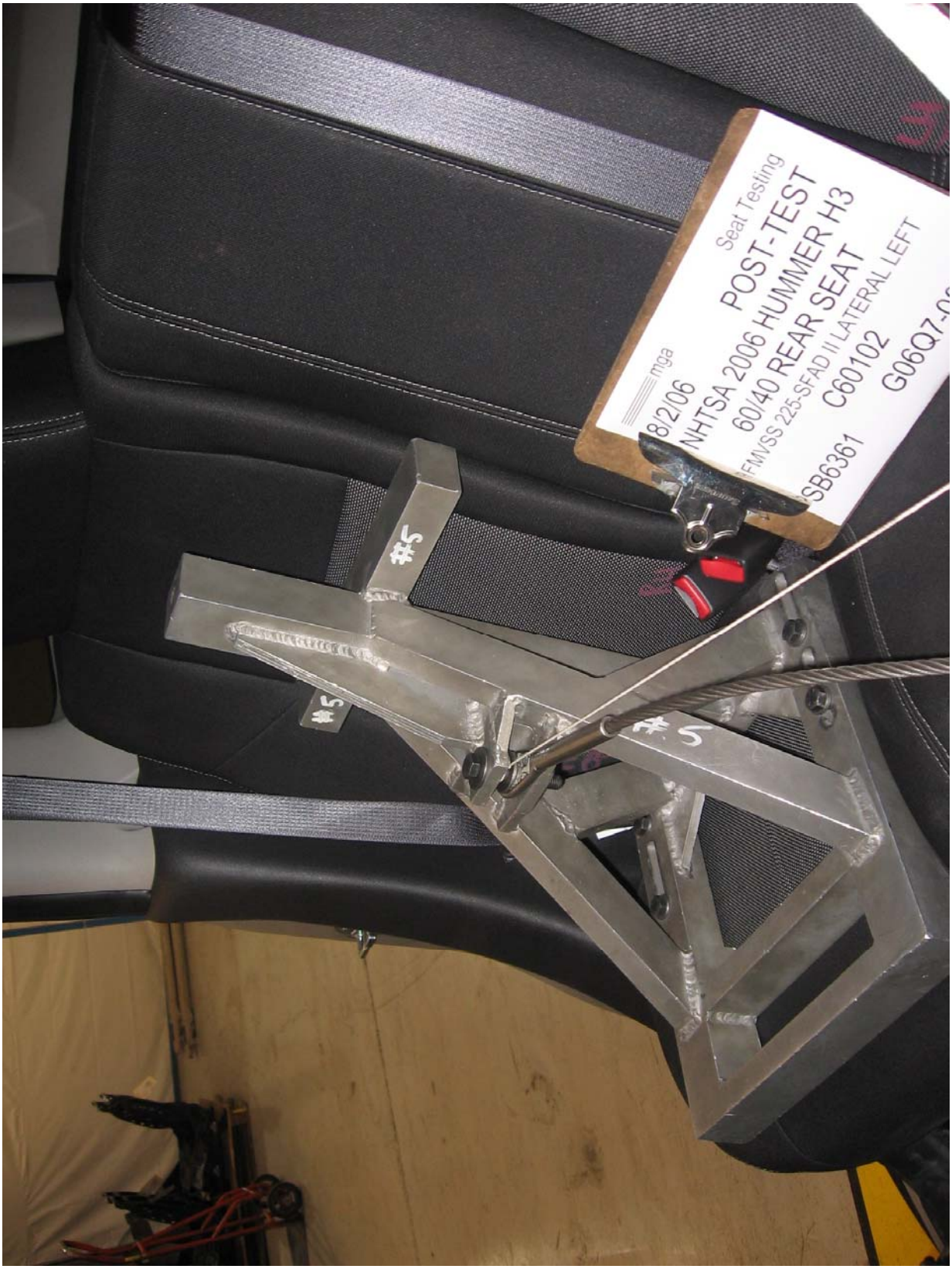
6.10.3 Pre-test photo #3 of SFADII

6.10.4 Pre-test photo #4 of SFADII

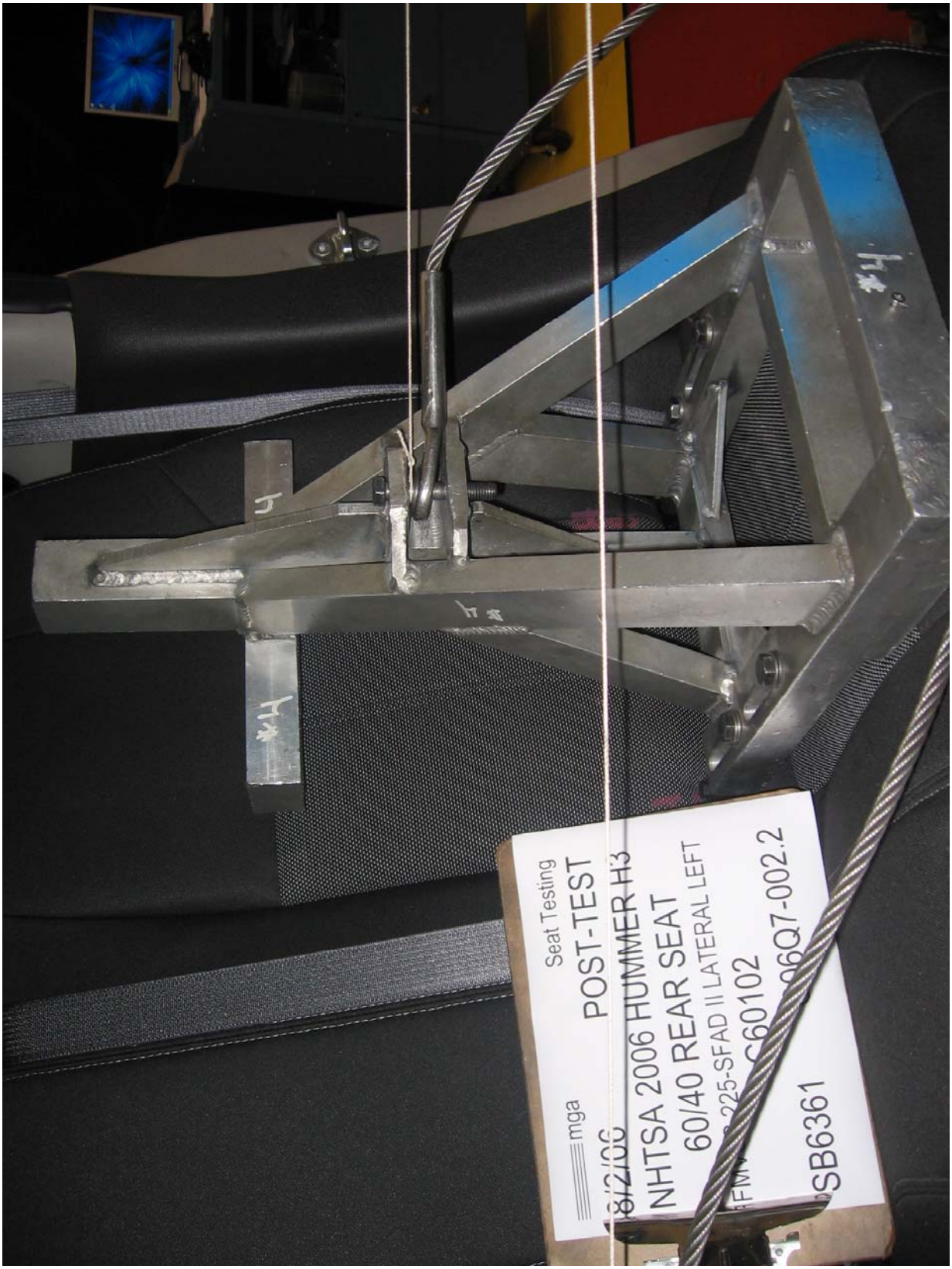
6.11 Post-test condition of each child restraint anchorage system

6.11.1 Post-test photo #1 of SFADII

6.11.2 Post-test photo #2 of SFADII



6.11.3 Post-test photo #3 of SFADII



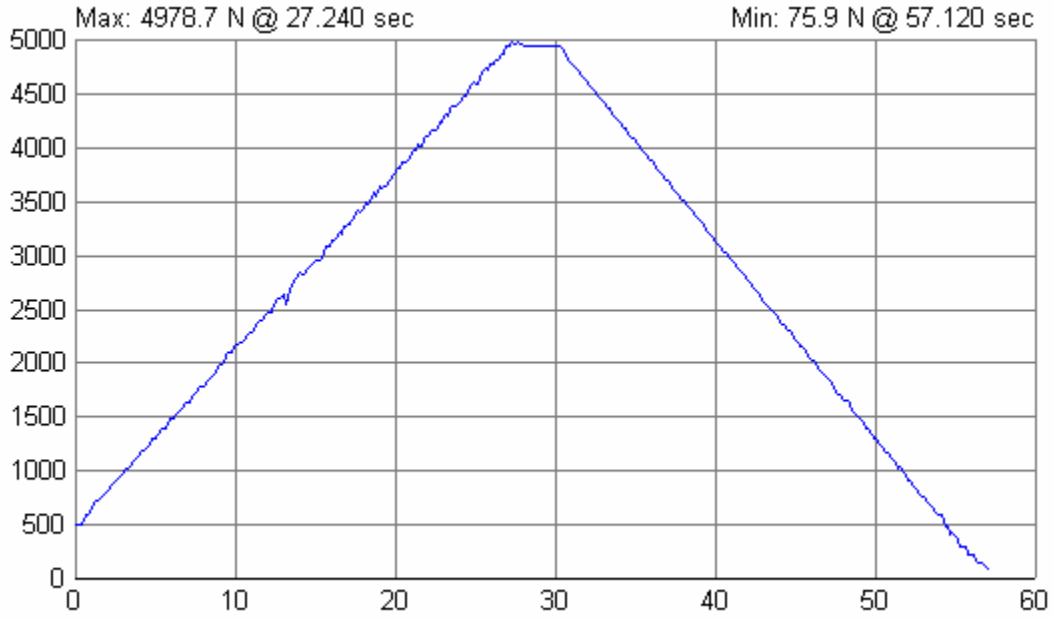
6.11.4 Post-test photo #4 of SFADII

6.11.5 Post-test photo #5 of SFADII

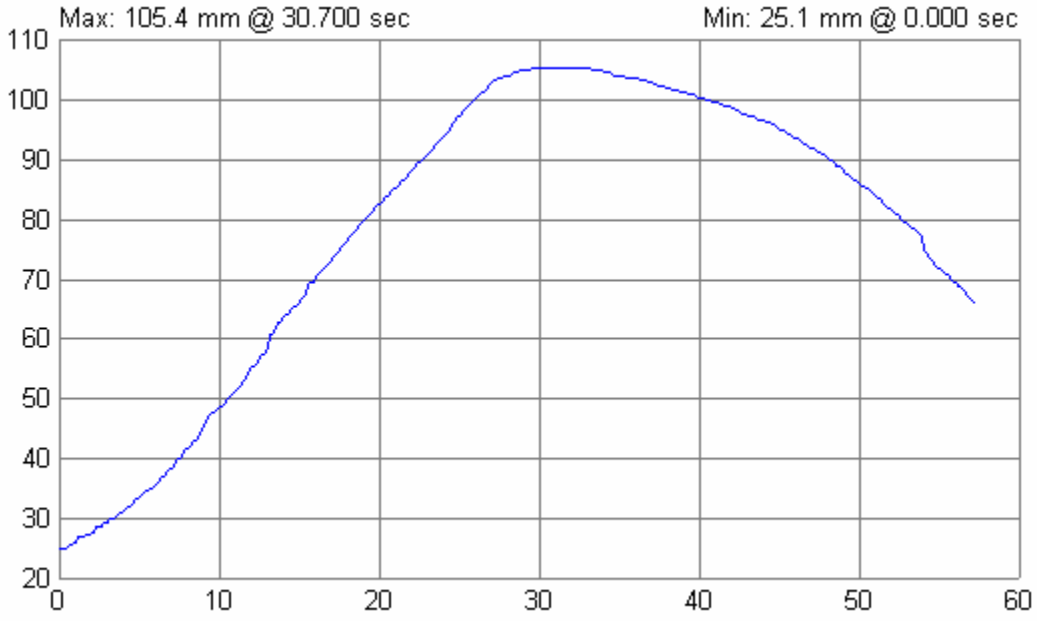
6.11.6 Post-test photo #6 of SFADII

6.11.7 Post-test photo #7 of SFADII

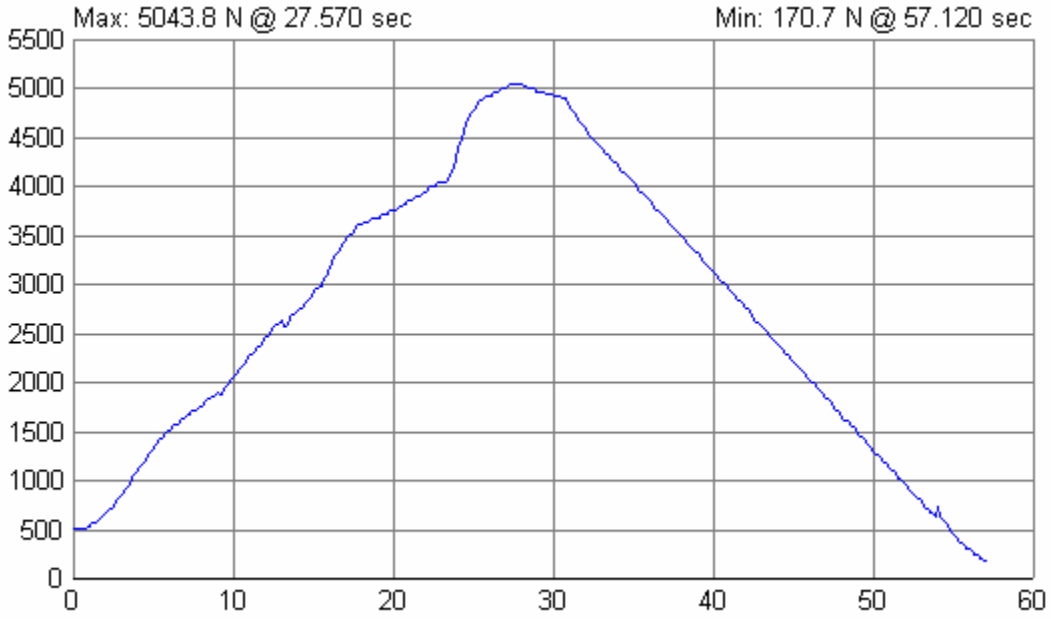
7.0 PLOTS



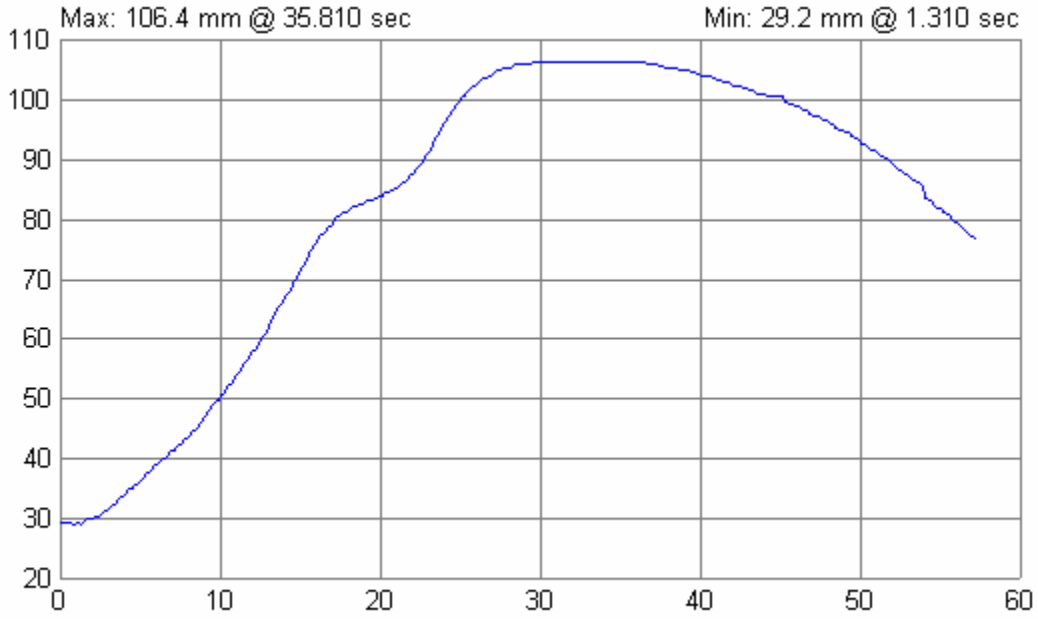
Run# SB6361: Lower Anchor Test (S9.4.1)-RS 60% O/B Load (N) vs. Time (sec)



Run# SB6361: 60% O/B SFAD X Displacement (mm) vs. Time (sec)



Run# SB6361: Lower Anchor Test (S9.4.1)-RS40% Load (N) vs. Time (sec)



Run# SB6361: 40% SFAD X Displacement (mm) vs. Time (sec)

8.0 REPORT of VEHICLE CONDITION

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT No.: DTNH22-02-D-11043 DATE: August 2, 2006

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. 201U and 225

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: 2006 Hummer H3

VEH. NHTSA NO.: C60102 VIN: 5GTDN136368235357

COLOR: Gray

ODOMETER READINGS: ARRIVAL 94 miles Date: 05/10/06

COMPLETION 95 miles Date: 08/02/06

PURCHASE PRICE: N/A DEALER'S NAME: Suburban Collection

ENGINE DATA: 5 Cylinders 3.5 Liters ____ Cubic Inches

TRANSMISSION DATA: ____Automatic X Manual No. of Speeds 5

FINAL DRIVE DATA: ____Rear Drive ____ Front Drive X 4 Wheel Drive

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Melanie Schick, Brad Reaume, Kenney Godfrey

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

REMARKS:

Good condition.

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:

Right rear door was removed before conducting the test.

Test Vehicle Condition:

Good condition. Vehicle can be driven.

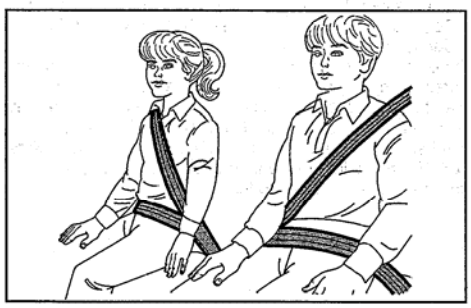
RECORDED BY: Melanie Schick, Kenney Godfrey DATE: August 2, 2005

APPROVED BY: Brad Reaume

APPENDIX A
OWNERS MANUAL CHILD RESTRAINT SYSTEMS

Child Restraints

Older Children



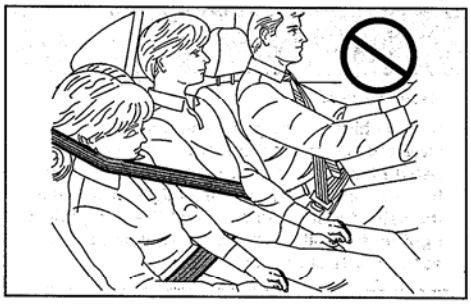
Older children who have outgrown booster seats should wear the vehicle's safety belts.

Q: What is the proper way to wear safety belts?

A: An older child should wear a lap-shoulder belt and get the additional restraint a shoulder belt can provide. The shoulder belt should not cross the face or neck. The lap belt should fit snugly below the hips, just touching the top of the thighs. It should never be worn over the abdomen, which could cause severe or even fatal internal injuries in a crash.

Accident statistics show that children are safer if they are restrained in the rear seat.

In a crash, children who are not buckled up can strike other people who are buckled up, or can be thrown out of the vehicle. Older children need to use safety belts properly.



⚠ CAUTION:

Never do this.

Here two children are wearing the same belt. The belt can not properly spread the impact forces. In a crash, the two children can be crushed together and seriously injured. A belt must be used by only one person at a time.

Q: What if a child is wearing a lap-shoulder belt, but the child is so small that the shoulder belt is very close to the child's face or neck?

A: If the child is sitting in a seat next to a window, move the child toward the center of the vehicle. Also see *Rear Safety Belt Comfort Guides on page 1-27.* If the child is sitting in the center rear seat passenger position, move the child toward the safety belt buckle. In either case, be sure that the shoulder belt still is on the child's shoulder, so that in a crash the child's upper body would have the restraint the belts provide.

⚠ CAUTION:

Never do this.

Here a child is sitting in a seat that has a lap-shoulder belt, but the shoulder part is behind the child. If the child wears the belt in this way, in a crash the child might slide under the belt. The belt's force would then be applied right on the child's abdomen. That could cause serious or fatal injuries.

Wherever the child sits, the lap portion of the belt should be worn low and snug on the hips, just touching the child's thighs. This applies belt force to the child's pelvic bones in a crash.

Infants and Young Children

Everyone in a vehicle needs protection! This includes infants and all other children. Neither the distance traveled nor the age and size of the traveler changes the need, for everyone, to use safety restraints. In fact, the law in every state in the United States and in every Canadian province says children up to some age must be restrained while in a vehicle.

1-32

⚠ CAUTION:

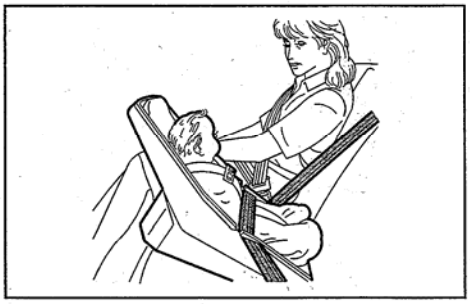
Children can be seriously injured or strangled if a shoulder belt is wrapped around their neck and the safety belt continues to tighten. Never leave children unattended in a vehicle and never allow children to play with the safety belts.

Every time infants and young children ride in vehicles, they should have the protection provided by appropriate restraints. Young children should not use the vehicle's adult safety belts alone, unless there is no other choice. Instead, they need to use a child restraint.

⚠ CAUTION:

People should never hold a baby in their arms while riding in a vehicle. A baby does not weigh much — until a crash. During a crash a baby will become so heavy it is not possible to hold it. For example, in a crash at only 25 mph (40 km/h), a 12 lb (5.5 kg) baby will suddenly become a 240 lb (110 kg) force on a person's arms. A baby should be secured in an appropriate restraint.

1-33



⚠ CAUTION:

Children who are up against, or very close to, any airbag when it inflates can be seriously injured or killed. Airbags plus lap-shoulder belts offer protection for adults and older children, but not for young children and infants. Neither the vehicle's safety belt system nor its airbag system is designed for them. Young children and infants need the protection that a child restraint system can provide.

Q: What are the different types of add-on child restraints?

A: Add-on child restraints, which are purchased by the vehicle's owner, are available in four basic types. Selection of a particular restraint should take into consideration not only the child's weight, height and age but also whether or not the restraint will be compatible with the motor vehicle in which it will be used.

For most basic types of child restraints, there are many different models available. When purchasing a child restraint, be sure it is designed to be used in a motor vehicle. If it is, the restraint will have a label saying that it meets federal motor vehicle safety standards.

The restraint manufacturer's instructions that come with the restraint, state the weight and height limitations for a particular child restraint. In addition, there are many kinds of restraints available for children with special needs.

1-34

⚠ CAUTION:

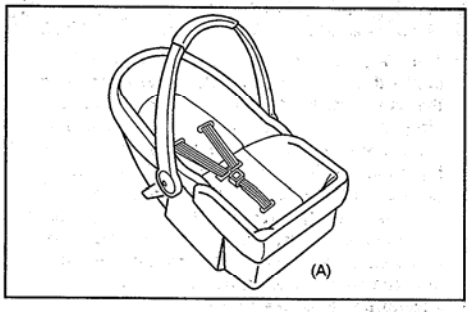
Newborn infants need complete support, including support for the head and neck. This is necessary because a newborn infant's neck is weak and its head weighs so much compared with the rest of its body. In a crash, an infant in a rear-facing seat settles into the restraint, so the crash forces can be distributed across the strongest part of an infant's body, the back and shoulders. Infants always should be secured in appropriate infant restraints.

⚠ CAUTION:

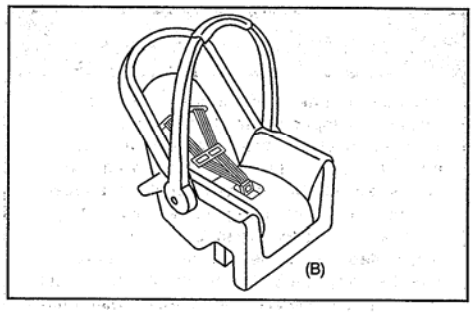
The body structure of a young child is quite unlike that of an adult or older child, for whom the safety belts are designed. A young child's hip bones are still so small that the vehicle's regular safety belt may not remain low on the hip bones, as it should. Instead, it may settle up around the child's abdomen. In a crash, the belt would apply force on a body area that is unprotected by any bony structure. This alone could cause serious or fatal injuries. Young children always should be secured in appropriate child restraints.

1-35

Child Restraint Systems

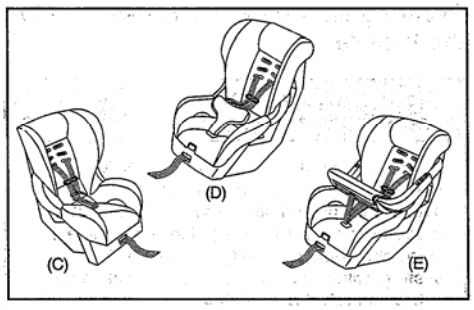


An infant car bed (A), a special bed made for use in a motor vehicle, is an infant restraint system designed to restrain or position a child on a continuous flat surface. Make sure that the infant's head rests toward the center of the vehicle.

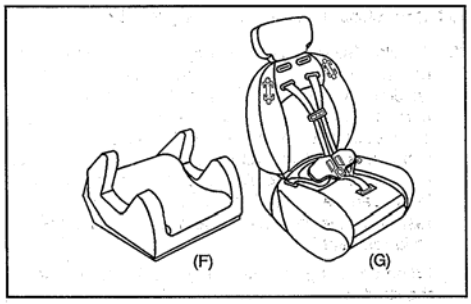


A rear-facing infant seat (B) provides restraint with the seating surface against the back of the infant. The harness system holds the infant in place and, in a crash, acts to keep the infant positioned in the restraint.

1-36



A forward-facing child seat (C-E) provides restraint for the child's body with the harness and also sometimes with surfaces such as T-shaped or shelf-like shields.



A booster seat (F-G) is a child restraint designed to improve the fit of the vehicle's safety belt system. Some booster seats have a shoulder belt positioner, and some high-back booster seats have a five-point harness. A booster seat can also help a child to see out the window.

1-37

Q: How Should I Use a Child Restraint?

A: A child restraint system is any device designed for use in a motor vehicle to restrain, seat, or position children. A built-in child restraint system is a permanent part of the motor vehicle. An add-on child restraint system is a portable one, which is purchased by the vehicle's owner. To help reduce injuries, an add-on child restraint must be secured in the vehicle. With built-in or add-on child restraints, the child has to be secured within the child restraint.

When choosing an add-on child restraint, be sure the child restraint is designed to be used in a vehicle. If it is, it will have a label saying that it meets federal motor vehicle safety standards. Then follow the instructions for the restraint. You may find these instructions on the restraint itself or in a booklet, or both.

Securing an Add-on Child Restraint in the Vehicle

⚠ CAUTION:

A child can be seriously injured or killed in a crash if the child restraint is not properly secured in the vehicle. Make sure the child restraint is properly installed in the vehicle using the vehicle's safety belt or LATCH system, following the instructions that came with that restraint, and also the instructions in this manual.

To help reduce the chance of injury, the child restraint must be secured in the vehicle. Child restraint systems must be secured in vehicle seats by lap belts or the lap belt portion of a lap-shoulder belt, or by the LATCH system. See *Lower Anchors and Tethers for Children (LATCH) on page 1-41* for more information. A child can be endangered in a crash if the child restraint is not properly secured in the vehicle.

When securing an add-on child restraint, refer to the instructions that come with the restraint which may be on the restraint itself or in a booklet, or both, and to this manual. The child restraint instructions are important, so if they are not available, obtain a replacement copy from the manufacturer.

Keep in mind that an unsecured child restraint can move around in a collision or sudden stop and injure people in the vehicle. Be sure to properly secure any child restraint in your vehicle — even when no child is in it.

Securing the Child Within the Child Restraint

There are several systems for securing the child within the child restraint. One system, the three-point harness, has straps that come down over each of the infant's shoulders and buckle together at the crotch. The five-point harness system has two shoulder straps, two hip straps, and a crotch strap. A shield may take the place of hip straps. A T-shaped shield has shoulder straps that are attached to a flat pad which rests low against the child's body. A shelf- or armrest-type shield has straps that are attached to a wide, shelf-like shield that swings up or to the side.

⚠ CAUTION:

A child can be seriously injured or killed in a crash if the child is not properly secured in the child restraint. Make sure the child is properly secured, following the instructions that came with that restraint.

Because there are different systems, it is important to refer to the instructions that come with the restraint. A child can be endangered in a crash if the child is not properly secured in the child restraint.

Where to Put the Restraint

Accident statistics show that children are safer if they are restrained in the rear rather than the front seat. We recommend that child restraints be secured in a rear seat, including an infant riding in a rear-facing infant seat, a child riding in a forward-facing child seat and an older child riding in a booster seat.

Your vehicle has a rear seat that will accommodate a rear-facing child restraint. A label on your sun visor says, "Never put a rear-facing child seat in the front." This is because the risk to the rear-facing child is so great, if the airbag deploys.

⚠ CAUTION:

A child in a rear-facing child restraint can be seriously injured or killed if the right front passenger's airbag inflates. This is because the back of the rear-facing child restraint would be very close to the inflating airbag.

CAUTION: (Continued)

CAUTION: (Continued)

Even though the passenger sensing system is designed to turn off the passenger's frontal airbag if the system detects a rear-facing child restraint, no system is fail-safe, and no one can guarantee that an airbag will not deploy under some unusual circumstance, even though it is turned off. We recommend that rear-facing child restraints be secured in the rear seat, even if the airbag is off.

If you need to secure a forward-facing child restraint in the right front seat, always move the front passenger seat as far back as it will go. It is better to secure the child restraint in a rear seat.

Wherever you install a child restraint, be sure to secure the child restraint properly.

Keep in mind that an unsecured child restraint can move around in a collision or sudden stop and injure people in the vehicle. Be sure to properly secure any child restraint in your vehicle — even when no child is in it.

Lower Anchors and Tethers for Children (LATCH)

Your vehicle has the LATCH system. The LATCH system holds a child restraint during driving or in a crash. This system is designed to make installation of a child restraint easier. The LATCH system uses anchors in the vehicle and attachments on the child restraint that are made for use with the LATCH system

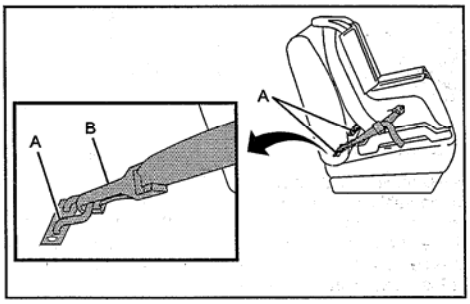
Make sure that a LATCH-compatible child restraint is properly installed using the anchors, or use the vehicle's safety belts to secure the restraint, following the instructions that came with that restraint, and also the instructions in this manual. When installing a child restraint with a top tether, you must also use either the lower anchors or the safety belts to properly secure the child restraint. A child restraint must never be installed using only the top tether and anchor.

In order to use the LATCH system in your vehicle, you need a child restraint equipped with LATCH attachments. The child restraint manufacturer will provide you with instructions on how to use the child restraint and its attachments. The following explains how to attach a child restraint with these attachments in your vehicle.

Your vehicle has lower anchors and top tether anchors. Your child restraint may have lower attachments and a top tether.

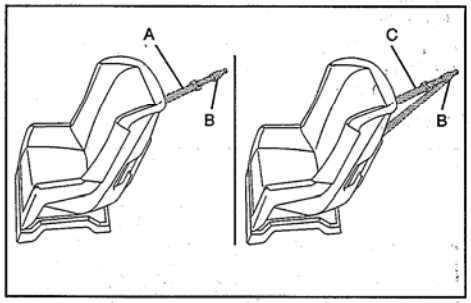
Not all vehicle seating positions or child restraints have lower anchors and attachments or top tether anchors and attachments.

Lower Anchors



Lower anchors (A) are metal bars built into the vehicle. There are two lower anchors for each LATCH seating position that will accommodate a child restraint with lower attachments (B).

Top Tether Anchor



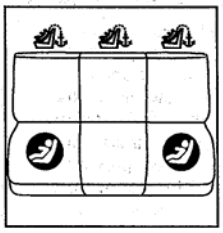
A top tether (A, C) anchors the top of the child restraint to the vehicle. A top tether anchor is built into the vehicle. The top tether attachment (B) on the child restraint connects to the top tether anchor in the vehicle in order to reduce the forward movement and rotation of the child restraint during driving or in a crash.

Your child restraint may have a single tether (A) or a dual tether (C). Either will have a single attachment (B) to secure the top tether to the anchor.

Some top tether-equipped child restraints are designed for use with or without the top tether being attached. Others require the top tether always to be attached. In Canada, the law requires that forward-facing child restraints have a top tether, and that the tether be attached. In the United States, some child restraints also have a top tether. Be sure to read and follow the instructions for your child restraint.

If the child restraint does not have a top tether, one can be obtained, in kit form, for many child restraints. Ask the child restraint manufacturer whether or not a kit is available.

Lower Anchor and Top Tether Anchor Locations



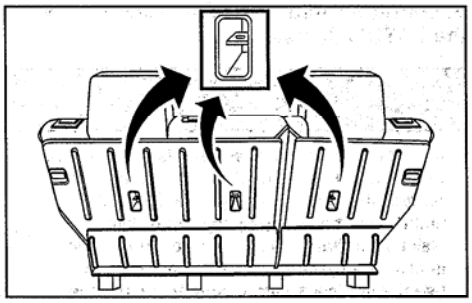
(Top Tether Anchor): Seating positions with top tether anchors.

(Lower Anchor): Seating positions with two lower anchors.

Rear Seat

Each outboard seating position in the rear seat has exposed metal lower anchors in the crease between the seatback and the seat cushion.

The top tether anchors are located on the back of the rear seatbacks. Be sure to use an anchor located on the same side of the vehicle as the seating position where the child restraint will be placed.



Do not secure a child restraint in the right front passenger's position if a national or local law requires that the top tether be attached, or if the instructions that come with the child restraint say that the top tether must be attached. There is no place to attach the top tether in this position.

Accident statistics show that children are safer if they are restrained in the rear rather than the front seat. See *Where to Put the Restraint on page 1-40* for additional information.

Securing a Child Restraint Designed for the LATCH System

⚠ CAUTION:

If a LATCH-type child restraint is not attached to anchors, the restraint will not be able to protect the child correctly. In a crash, the child could be seriously injured or killed. Make sure that a LATCH-type child restraint is properly installed using the anchors, or use the vehicle's safety belts to secure the restraint, following the instructions that came with that restraint, and also the instructions in this manual.

⚠ CAUTION:

Each top tether anchor and lower anchor in the vehicle is designed to hold only one child restraint. Attaching more than one child restraint to a single anchor could cause the anchor or attachment to come loose or even break during a crash. A child or others could be injured if this happens. To help prevent injury to people and damage to your vehicle, attach only one child restraint per anchor.

⚠ CAUTION:

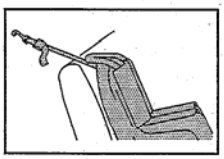
Children can be seriously injured or strangled if a shoulder belt is wrapped around their neck and the safety belt continues to tighten. Secure any unused safety belts behind the child restraint so children cannot reach them. Pull the shoulder belt all the way out of the retractor to set the lock, if your vehicle has one, after the child restraint has been installed. Be sure to follow the instructions of the child restraint manufacturer.

Notice: **Contact between the child restraint or the LATCH attachment parts and the vehicle's safety belt assembly may cause damage to these parts. Make sure when securing unused safety belts behind the child restraint that there is no contact between the child restraint or the LATCH attachment parts and the vehicle's safety belt assembly.**

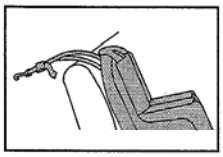
Folding an empty rear seat with the safety belts secured, may cause damage to the safety belt or the seat. When removing the child restraint, always remember to return the safety belts to their normal position before folding the rear seat.

1. Find the lower anchors, if equipped, for the desired seating position.
2. If the desired seating position does not have lower anchors, see *Securing a Child Restraint in a Rear Seat Position on page 1-47* for instructions on installing the child restraint using the safety belts.
3. Put the child restraint on the seat.
4. Attach and tighten the lower attachments on the child restraint to the lower anchors, if equipped, in the vehicle. The child restraint instructions will show you how.

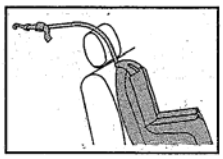
5. If the child restraint is forward-facing, attach and tighten the top tether to the top tether anchor. Refer to the child restraint instructions and the following steps:
   5.1. Find the top tether anchor.
   5.2. Route and tighten the top tether according to your child restraint instructions and the following instructions:



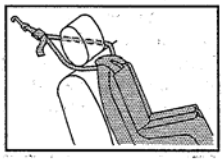
If the position you are using does not have a head restraint and you are using a single tether, route the tether over the seatback.



If the position you are using does not have a head restraint and you are using a dual tether, route the tether over the seatback.



If the position you are using has a fixed head restraint and you are using a single tether, route the tether over the head restraint.



If the position you are using has a fixed head restraint and you are using a dual tether, route the tether around the head restraint.

6. Push and pull the child restraint in different directions to be sure it is secure.

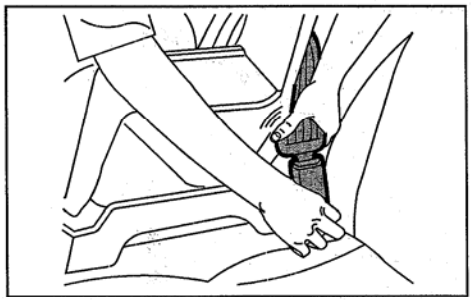
1-46

Securing a Child Restraint in a Rear Seat Position

If your child restraint is equipped with the LATCH system, see *Lower Anchors and Tethers for Children (LATCH) on page 1-41.*

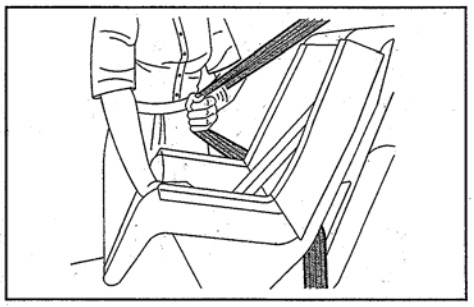
If your child restraint does not have the LATCH system, you will be using the lap-shoulder belt to secure the child restraint in this position. Be sure to follow the instructions that came with the child restraint. Secure the child in the child restraint when and as the instructions say.

1. Put the child restraint on the seat.
2. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.

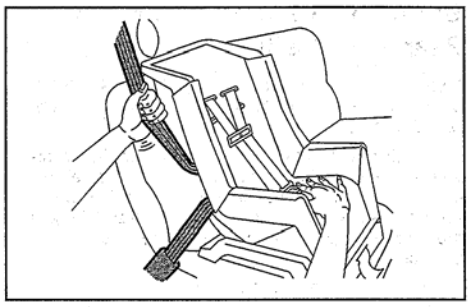


3. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.

1-47



4. Pull the rest of the shoulder belt all the way out of the retractor to set the lock.



5. To tighten the belt, push down on the child restraint, pull the shoulder portion of the belt to tighten the lap portion of the belt and feed the shoulder belt back into the retractor. If you are using a forward-facing child restraint, you may find it helpful to use your knee to push down on the child restraint as you tighten the belt.

6. If your child restraint manufacturer recommends using a top tether, attach and tighten the top tether to the top tether anchor. Refer to the instructions that came with the child restraint and see *Lower Anchors and Tethers for Children (LATCH) on page 1-41.*
7. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, if the top tether is attached to the top tether anchor, disconnect it. Unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.

Securing a Child Restraint in the Right Front Seat Position

Your vehicle has a right front passenger's airbag. A rear seat is a safer place to secure a forward-facing child restraint. See *Where to Put the Restraint on page 1-40.*

In addition, your vehicle has a passenger sensing system. The passenger sensing system is designed to turn off the right front passenger's frontal airbag when an infant in a rear-facing infant seat or a small child in a forward-facing child restraint or booster seat is detected. See *Passenger Sensing System on page 1-63* and *Passenger Airbag Status Indicator on page 3-29* for more information on this including important safety information.

A label on your sun visor says, "Never put a rear-facing child seat in the front." This is because the risk to the rear-facing child is so great, if the airbag deploys.

⚠ CAUTION:

A child in a rear-facing child restraint can be seriously injured or killed if the right front passenger's airbag inflates. This is because the back of the rear-facing child restraint would be very close to the inflating airbag.

Even though the passenger sensing system is designed to turn off the passenger's frontal airbag if the system detects a rear-facing child restraint, no system is fail-safe, and no one can guarantee that an airbag will not deploy under some unusual circumstance, even though it is turned off. We recommend that rear-facing child restraints be secured in the rear seat, even if the airbag is off.

If you need to secure a forward-facing child restraint in the right front seat position, move the seat as far back as it will go before securing the forward-facing child restraint. See *Six-Way Power Seats on page 1-3*.

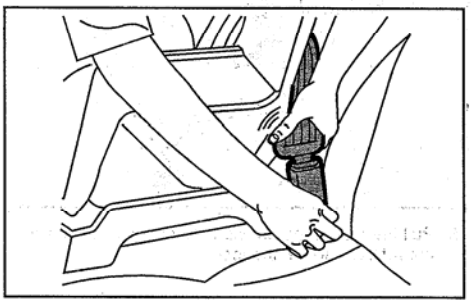
If your child restraint is equipped with the LATCH system, see *Lower Anchors and Tethers for Children (LATCH) on page 1-41*.

There is no top tether anchor in the right front passenger's position. Do not secure a child restraint in this position if a national or local law requires that the top tether be anchored or if the instructions that come with the child restraint say that the top tether must be anchored. See *Lower Anchors and Tethers for Children (LATCH) on page 1-41* if the child restraint has a top tether.

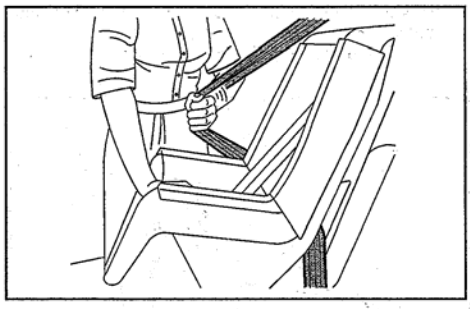
You will be using the lap-shoulder belt to secure the child restraint in this position. Be sure to follow the instructions that came with the child restraint. Secure the child in the child restraint when and as the instructions say.

1. Your vehicle has a right front passenger's frontal airbag. See *Passenger Sensing System on page 1-63*. General Motors recommends that rear-facing child restraints be secured in a rear seat, even if the airbag is off. If your child restraint is forward-facing, move the seat as far back as it will go before securing the child restraint in this seat. See *Six-Way Power Seats on page 1-3*.

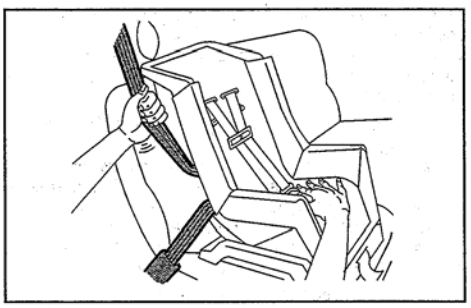
   When the passenger sensing system has turned off the right front passenger's frontal airbag, the off indicator in the passenger airbag status indicator should light and stay lit when you turn the ignition to ON or START. See *Passenger Airbag Status Indicator on page 3-29*.
2. Put the child restraint on the seat.
3. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.



4. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.



5. Pull the rest of the shoulder belt all the way out of the retractor to set the lock.



6. To tighten the belt, push down on the child restraint, pull the shoulder portion of the belt to tighten the lap portion of the belt and feed the shoulder belt back into the retractor. If you are using a forward-facing child restraint, you may find it helpful to use your knee to push down on the child restraint as you tighten the belt. You should not be able to pull more of the belt from the retractor once the lock has been set.
7. Push and pull the child restraint in different directions to be sure it is secure.
8. If the airbag is off, the off indicator on the instrument panel will be lit and stay lit when the key is turned to ON or START.

1-52

If a child restraint has been installed and the on indicator is lit, turn the vehicle off. Remove the child restraint from the vehicle and reinstall the child restraint.

If after reinstalling the child restraint and restarting the vehicle, the on indicator is still lit, check to make sure that the vehicle's seatback is not pressing the child restraint into the seat cushion. If this happens, slightly recline the vehicle's seatback and adjust the seat cushion if possible. Also make sure the child restraint is not trapped under the vehicle head restraint. If this happens, adjust the head restraint.

If the on indicator is still lit, secure the child in the child restraint in a rear seat position in the vehicle and check with your dealer.

To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger. When the safety belt is not in use, slide the latch plate up the safety belt webbing. The latch plate should rest on the stitching on the safety belt, near the guide loop on the side wall.

Airbag System

Your vehicle has a frontal airbag for the driver and a frontal airbag for the right front passenger. Your vehicle may also have roof-mounted side impact airbags designed for either side impact or rollover deployment. Roof-mounted side impact airbags are available for the driver and the passenger seated directly behind the driver and for the right front passenger and the passenger seated directly behind that passenger.

If your vehicle has roof-mounted side impact airbags, the words AIR BAG will appear on the airbag covering on the sidewall trim near the driver's and right front passenger's window.

Frontal airbags are designed to help reduce the risk of injury from the force of an inflating frontal airbag. But these airbags must inflate very quickly to do their job and comply with federal regulations.

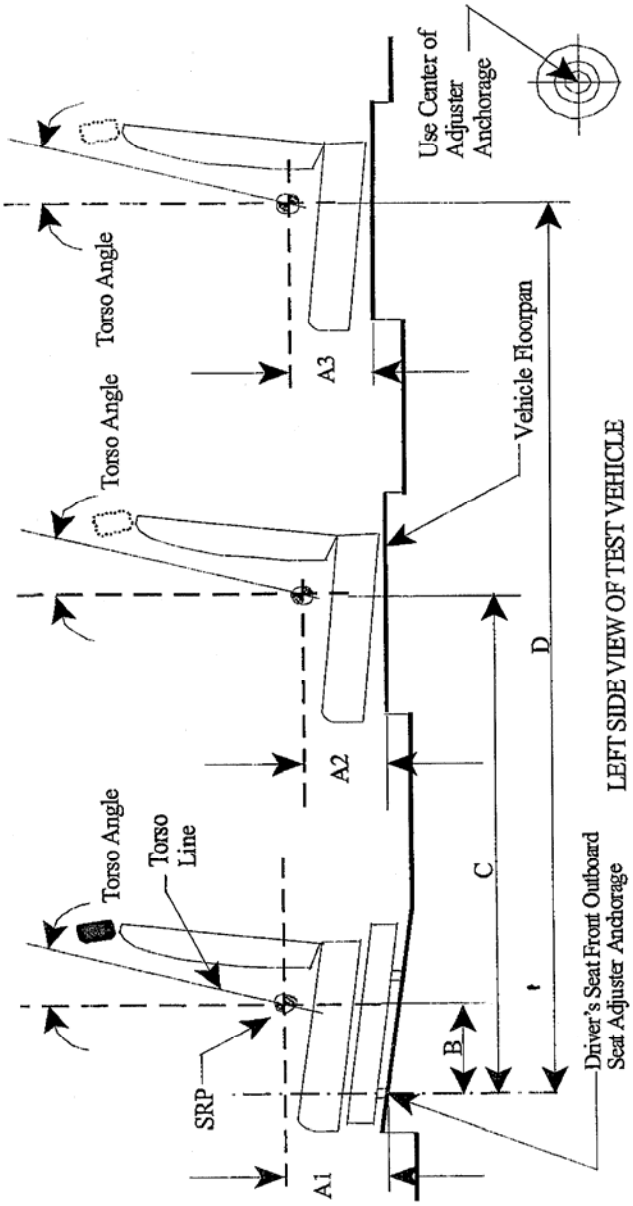
1-53

APPENDIX B
MANUFACTURER'S DATA (OVSC FORM 14)

Fi .25 for the 2006 Hummer H3
Page 1 of 9
Last Updated: 12/12/2005

SEAT REFERENCE POINT (SRP) AND TORSO ANGLE DATA
FOR FMVSS 225
(All dimensions in mm[1])

Model Year: 2006 Make: ; Model: H3 (345) ; Body Style:
Seat Style: Front row: ; Second row: 60/40 ; Third row: N/A



LEFT SIDE VIEW OF TEST VEHICLE

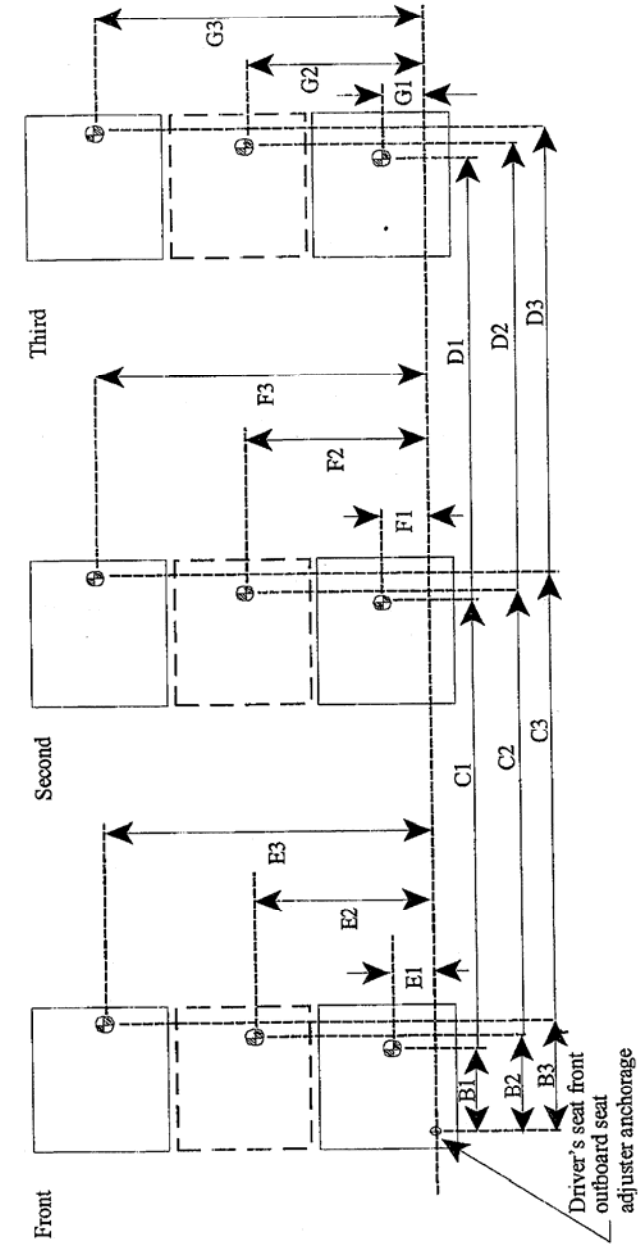
Table 1. Seating Positions[1] and Torso Angles

	Left (Driver Side)	Center (if any)	Right
A1	(Driver) 214.0	N/A	(Front Passenger) 214.0
A2	250.65	270.65	250.65
A3	N/A	N/A	N/A
B	350.0	N/A	350.0
C	1203.55	1183.55	1203.55
D	N/A	N/A	N/A
Torso Angle (degree) Front Row	23	N/A	23
Torso Angle (degree) Second Row	24	24	24
Torso Angle (degree) Third Row	N/A	N/A	N/A

Note: 1. All dimensions are in mm. If not, provide the unit used.

SEATING REFERENCE POINT
FOR FMVSS 225
(All dimensions in mm)

Model Year: 2006 ; Make: ; Model: H3 (345) ; Body Style:
Seat Style: Front row: ; Second row: 60/40 ; Third row: N/A



FC .25 for the 2006 Hummer H3
Page 3 of 9
Last Updated: 12/12/2005

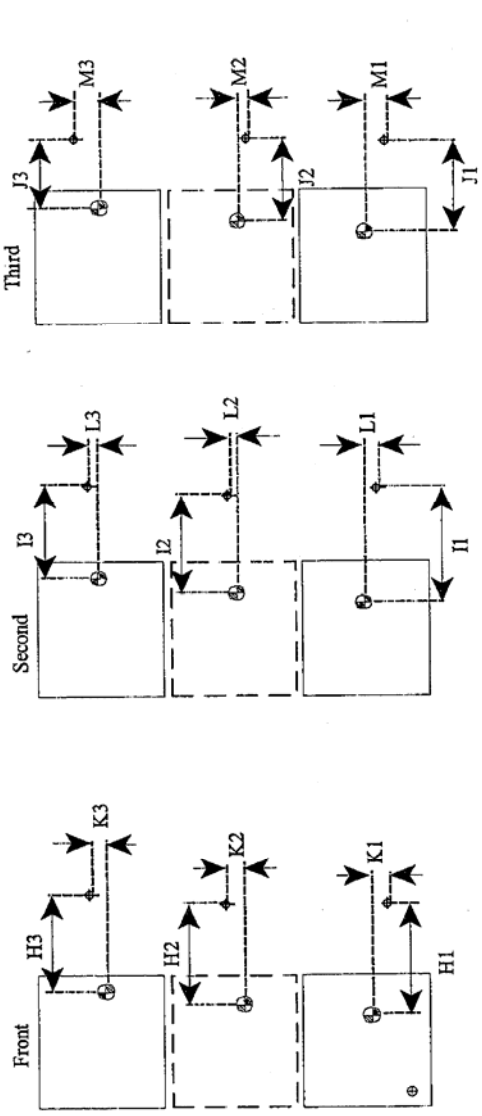
Table 2. Seating Reference Point and Tether Anchorage Locations

Seating Reference Point (SRP)		Distance from Driver's front outboard seat adjuster anchorage[1]
Front Row	B1	350.0
	E1	165.5
	B2	N/A
	E2	N/A
	B3	350.0
	E3	895.5
Second Row	C1	1203.55
	F1	187.5
	C2	1183.5
	F2	530.5
	C3	1203.55
	F3	873.5
Third Row	D1	N/A
	G1	N/A
	D2	N/A
	G2	N/A
	D3	N/A
	G3	N/A

Note: 1. Use the center of anchorage.

TETHER ANCHORAGE LOCATIONS
FOR FMVSS 225
(All dimensions in mm)

Model Year: 2006 ; Make: ; Model: H3 (345) ; Body Style:
Seat Style: Front row: N/A ; Second row: 60/40 ; Third row: N/A



⊕: SRP
⊕: Tether anchorage

Note: 1. The location shall be measured at the center of the bar.

Table 3. Seating Reference Point and Tether Anchorage Locations

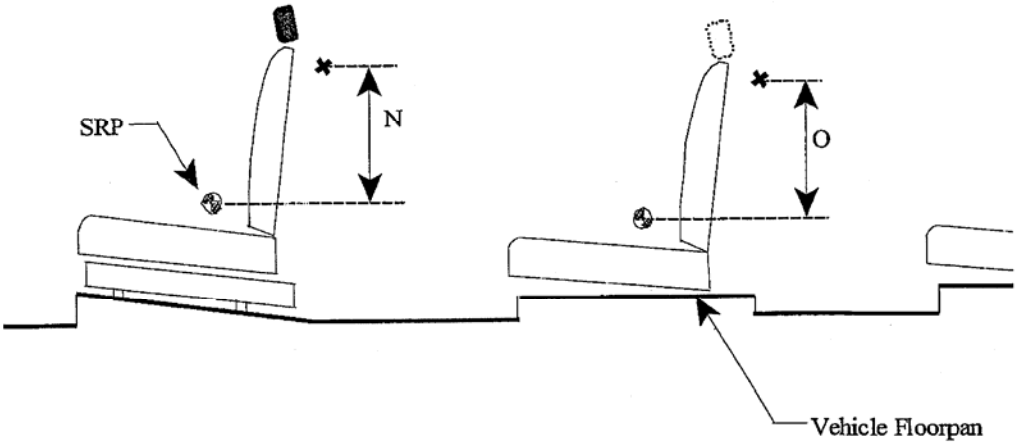
Seating Reference Point (SRP)	Distance from SRP	
Front Row	H1	N/A
	K1	N/A
	H2	N/A
	K2	N/A
	H3	N/A
	K3	N/A
Second Row	I1	348.45
	L1	0.13
	I2	368.44
	L2	0.71
	I3	348.61
	L3	0.12
Third Row	J1	N/A
	M1	N/A
	J2	N/A
	M2	N/A
	J3	N/A
	M3	N/A

Note: 1. Use the center of anchorage.

FORM 225 for the 2006 Hummer H3
Page 7 of 9
Last Updated: 12/12/2005

TETHER ANCHORAGE LOCATIONS - VERTICAL
FOR FMVSS 225
(All dimensions in mm)

Model Year: _2006__; Make: _____; Model: H2 (345) _; Body Style: _____
Seat Style: Front row: _____; Second row: 60/40__; Third row __N/A____



LEFT SIDE VIEW OF TEST VEHICLE

Table 4. Vertical Dimension For The Tether Anchorage

Seating Row	Vertical Distance from Seating Reference Point	
Front Row	N1 (Driver)	N/A
	N2 (Center)	N/A
	N3 (Right)	N/A
Second Row	O1 (Left)	247.39
	O2 (Center)	227.36
	O3 (Right)	246.59
Third Row	P1 (Left)	N/A
	P2 (Center)	N/A
	P3 (Right)	N/A

Note: 1. All dimensions are in mm. If not, provide the unit used.

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).**
   2; rear outboard

3. **How many designated seating positions are equipped with tether anchorages? Specify which position(s).**
   3; each rear position

4. **Lower Anchorage Marking and Conspicuity: Whether the anchorages are certified to S9.5(a) or S9.5(b) of FMVSS 225.**
   Certified as visible per S9.5(b)