FINAL REPORT NUMBER 225-MGA-07-005

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

KIA MOTOR CORPORATION
2006 KIA SORENTO 4-DOOR
NHTSA No. C60520

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Date: July 1, 2008
Report Date: July 10, 2008

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 6111 (NVS-220)
WASHINGTON, D.C. 20590

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Approval Date: 7/22/08

FINAL REPORT ACCEPTANCE BY OVSC:

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DN: CN = Edward E. Chan, C = US, O = National Highway Traffic Safety Administration, OU = Office of Vehicle Safety Compliance
Date: 2008.07.23 14:34:21 -04'00'

Acceptance Date:

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 225-MGA-07-005	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 225 Compliance Testing of a 2006 KIA Sorento, NHTSA No. C60520		5. Report Date July 10, 2008 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-07-005	
9. Performing Organization Name and Address MGA Research Corporation 446 Executive Drive Troy, Michigan 48083		10. Work Unit No. 11. Contract or Grant No. DTNH22-06-C-00030/0003	
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 2006 KIA Sorento, NHTSA No. C60520, 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 July 1, 2008. Test failures identified were as follows: NONE The data recorded indicates that the 2006 KIA Sorento tested appears to meet the requirements of FMVSS 225.			
17. Key Words Compliance Testing Safety Engineering FMVSS 225 2006 KIA Sorento		18. Distribution Statement Copies of this report are available From: NHTSA Technical Reference Division, Mail Code: NPO-230 400 Seventh Street, SW, Room PL-403 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 70	22. Price

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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. DTNH22-06-C-00030/0003. The purpose of the testing was to determine if the subject vehicle, a 2006 KIA Sorento, NHTSA No. C60520 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-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). The center seating position was equipped with a tether anchorage only. The center-to-center spacing between the 2nd row outboard lower anchorages was approximately 740 mm. The 2nd row left and right outboard seating positions were tested with the SFADII fixture.

2.0 COMPLIANCE TEST AND DATA SUMMARY

TEST SUMMARY

The testing was conducted at MGA in Troy, Michigan on July 1, 2008.

Based on the test results, the 2006 KIA Sorento 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 5,184 N and held the required load for 3 seconds and the total displacement was 88 mm. The SFADII at the 2nd row right seating position sustained a maximum force of 5,203 N and held the required load for 3 seconds and the total displacement was 75 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)
SC8284	SFADII	Lateral Left	2nd Row Left	5,184	88
			2nd Row Right	5,203	75

N/A indicates that the displacement criteria does not apply to this test.

3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

VEH. MOD YR/MAKE/MODEL/BODY	2006 KIA Sorento
VEH. NHTSA NO.	C60520
VIN	KNDJD733565628204
COLOR	White
VEH. BUILD DATE	03/2006
TEST DATE	July 1, 2008
TEST LABORATORY	MGA Research Corporation
OBSERVERS	Fern Gatilao , Brad Reaume, Kenney Godfrey

GENERAL INFORMATION:

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: KIA Motor Corporation

Date of Manufacture: 03/06; VIN: KNDJD733565628204

GVWR: 5,467 lbs; GAWR FRONT: 2,822 lbs

GAWR REAR: 3,307 lbs

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 30 psi REAR: 30 psi

Recommended Tire Size: P245/70R16

Recommended Cold Tire Pressure:

FRONT: 30 psi REAR: 30 psi

Size of Tire on Test Vehicle: P245/70R16

Size of Spare Tire: P245/70R16

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	S/N 180s (12/3/08), 126 (12/03/08)
String Potentiometer	Calibrated at each use (S/N L1608959A & L11608956A)
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 TPM830 (3/1/09)
MGA Data Acquisition System	N/A
Digital Calipers	S/N MGA00676 (1/14/09)
Force Gauge	S/N MGA00118 (1/11/09)
Inclinometer (Digital)	S/N MGA00764 (1/10/09)

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	N/A		N/A
	Ctr		N/A		
	RH		N/A		
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	5.99	5.99	N/A
	Ctr		N/A		
	RH		5.96	5.91	
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	62		N/A
	Ctr		N/A		
	RH		64		
Measure the distance between the SRP to the front of the anchorage bar (mm)	LH	N/A	195	196	N/A
	Ctr		N/A		
	RH		193	193	

Table 4. Child Restraint Lower Anchorage Configuration (continued)

OBSERVED LOWER ANCHORAGE CONFIGURATION	SEAT POSITION					
			FRONT ROW	SECOND ROW I/B	SECOND ROW O/B	THIRD ROW
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	Req't>25	N/A	30	29	N/A
		Req't<60		33	34	
	Ctr	Req't>25		N/A		
		Req't<60		N/A		
	RH	Req't>25		29	29	
		Req't<60		33	34	
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	15.2	N/A	1.3
2nd Row Center	N/A	N/A	N/A
2nd Row Right	15.6	N/A	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	15	167	5,000	5,184*	88	73
	Ctr.			Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	RH			Yes	II	0	27	167	5,000	5,203*	75	48
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.

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

6.0 PHOTOGRAPHS

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6.2 Rear view

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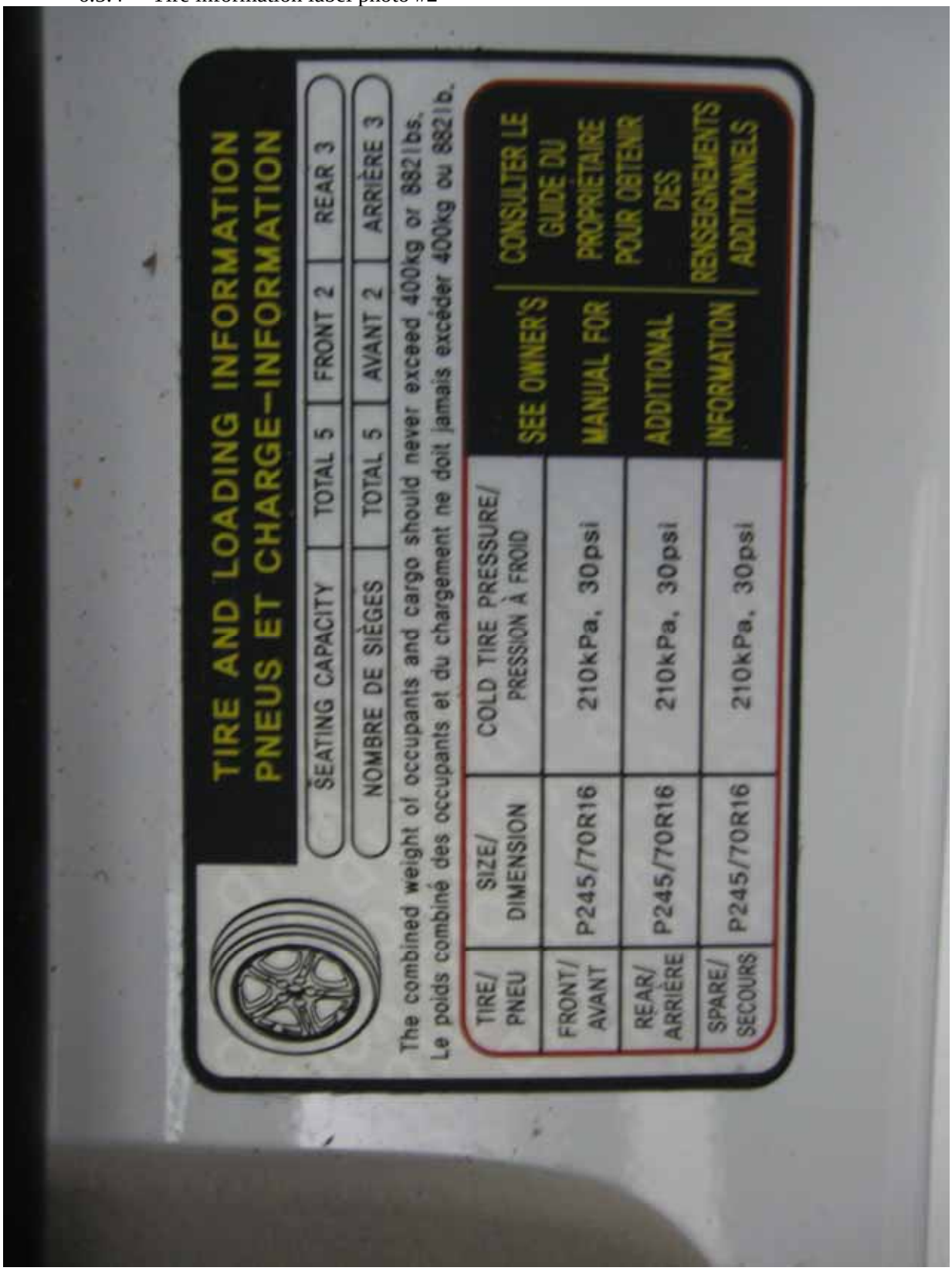
6.5.2 Certification label photo #2

6.5.3 Tire information label photo #1

6.5.4 Tire information label photo #2



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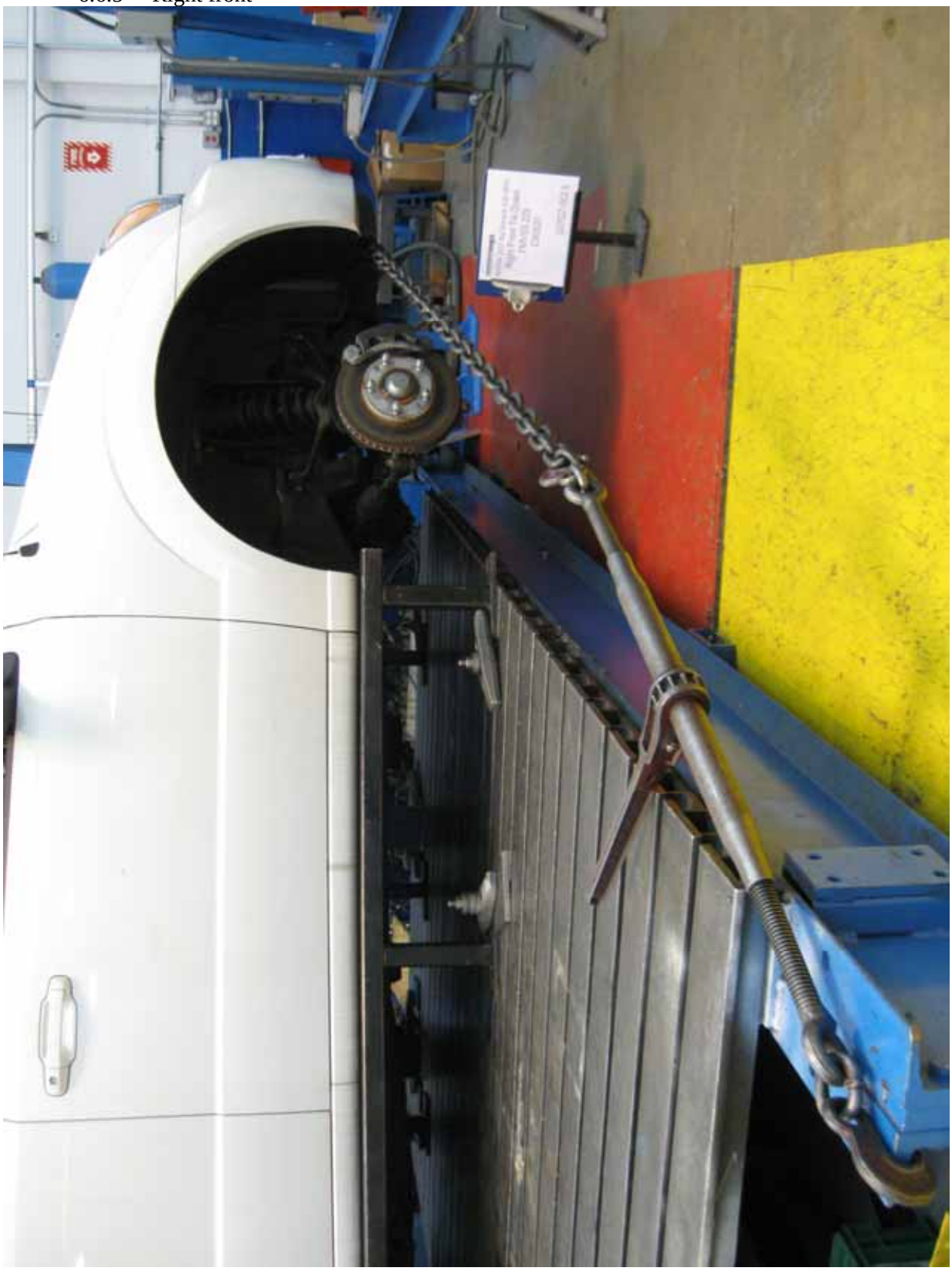

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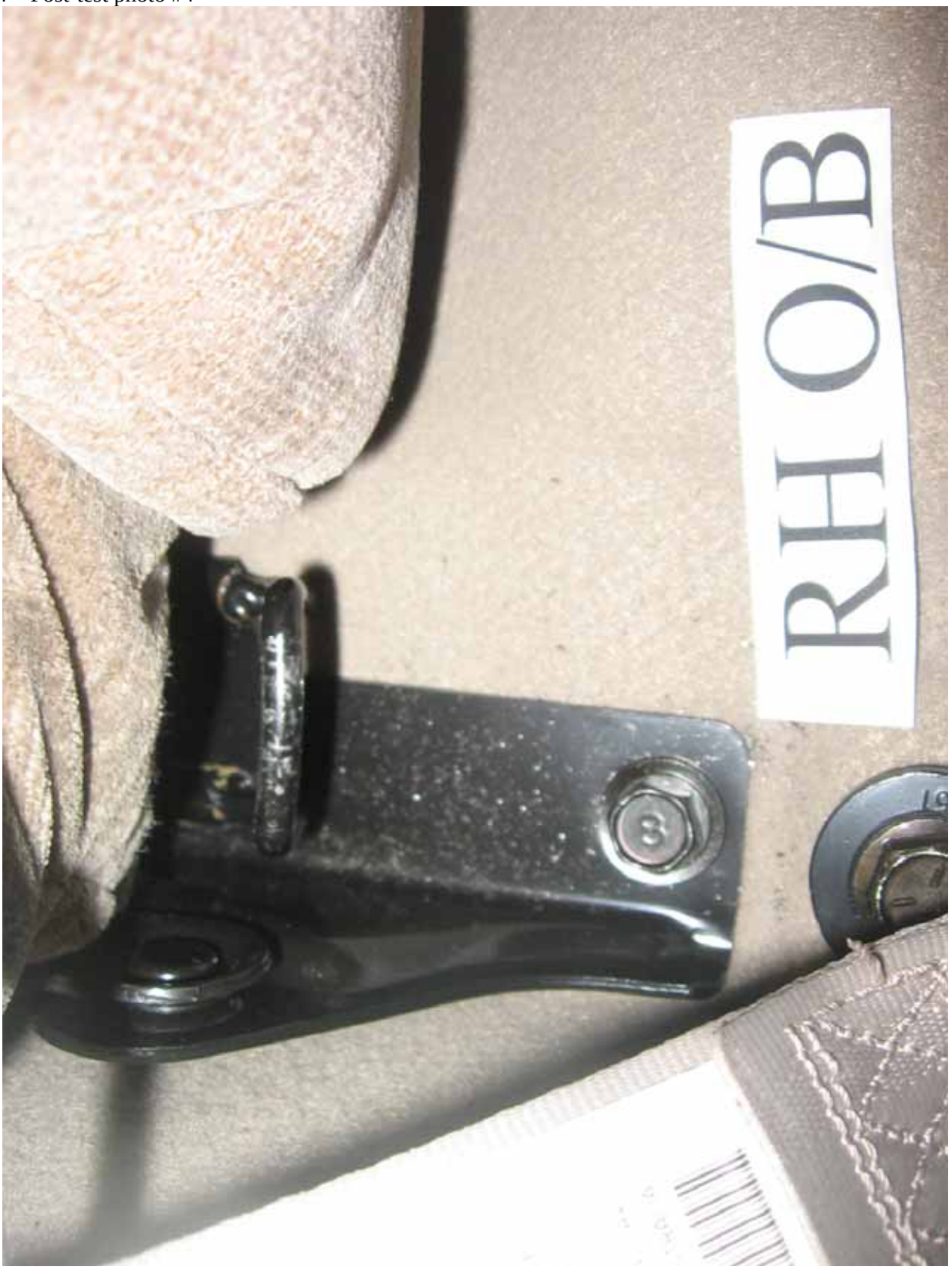
6.11.1 Post-test photo #1

6.11.2 Post-test photo #2

6.11.3 Post-test photo #3

6.11.4 Post-test photo #4

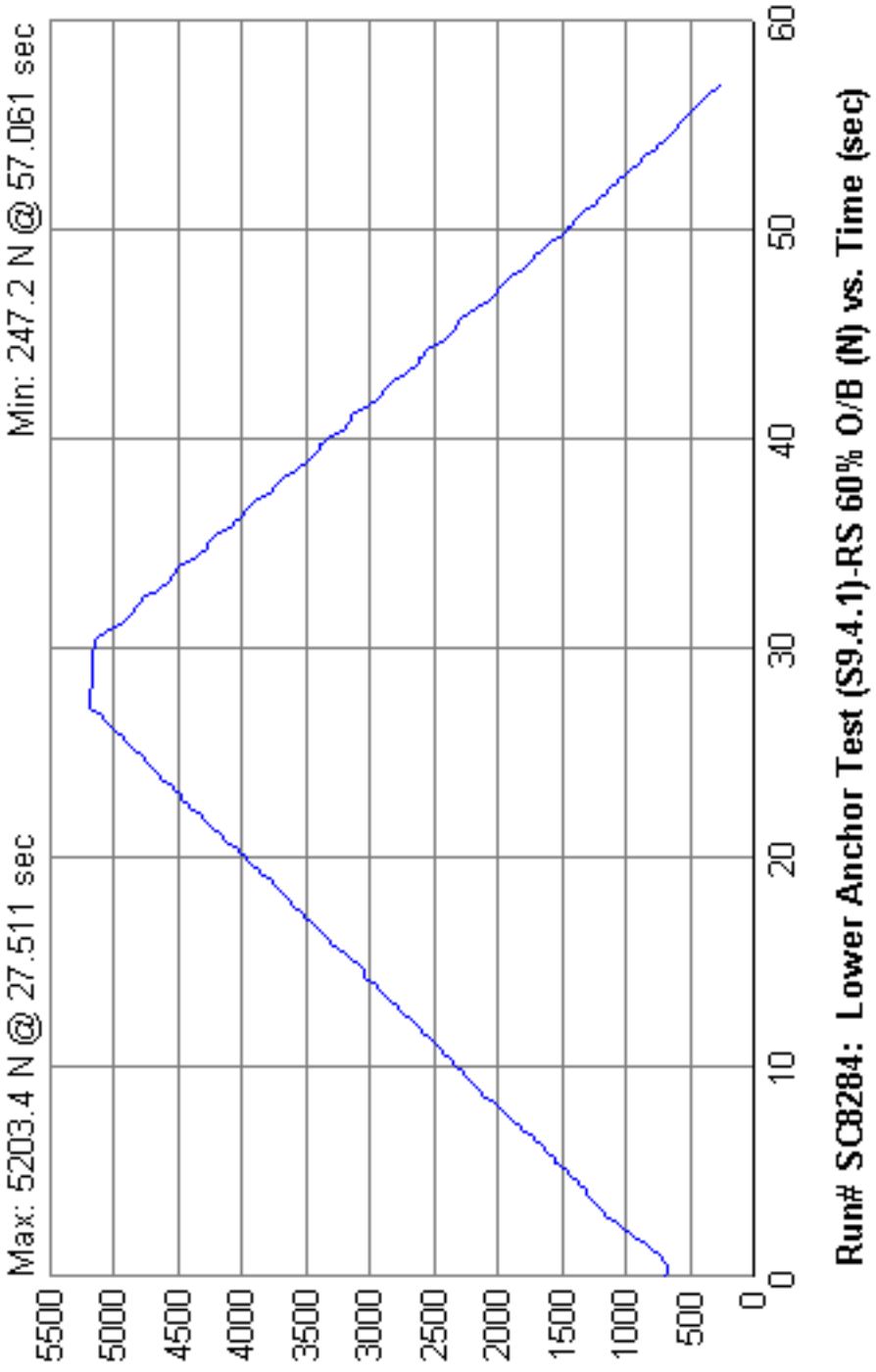


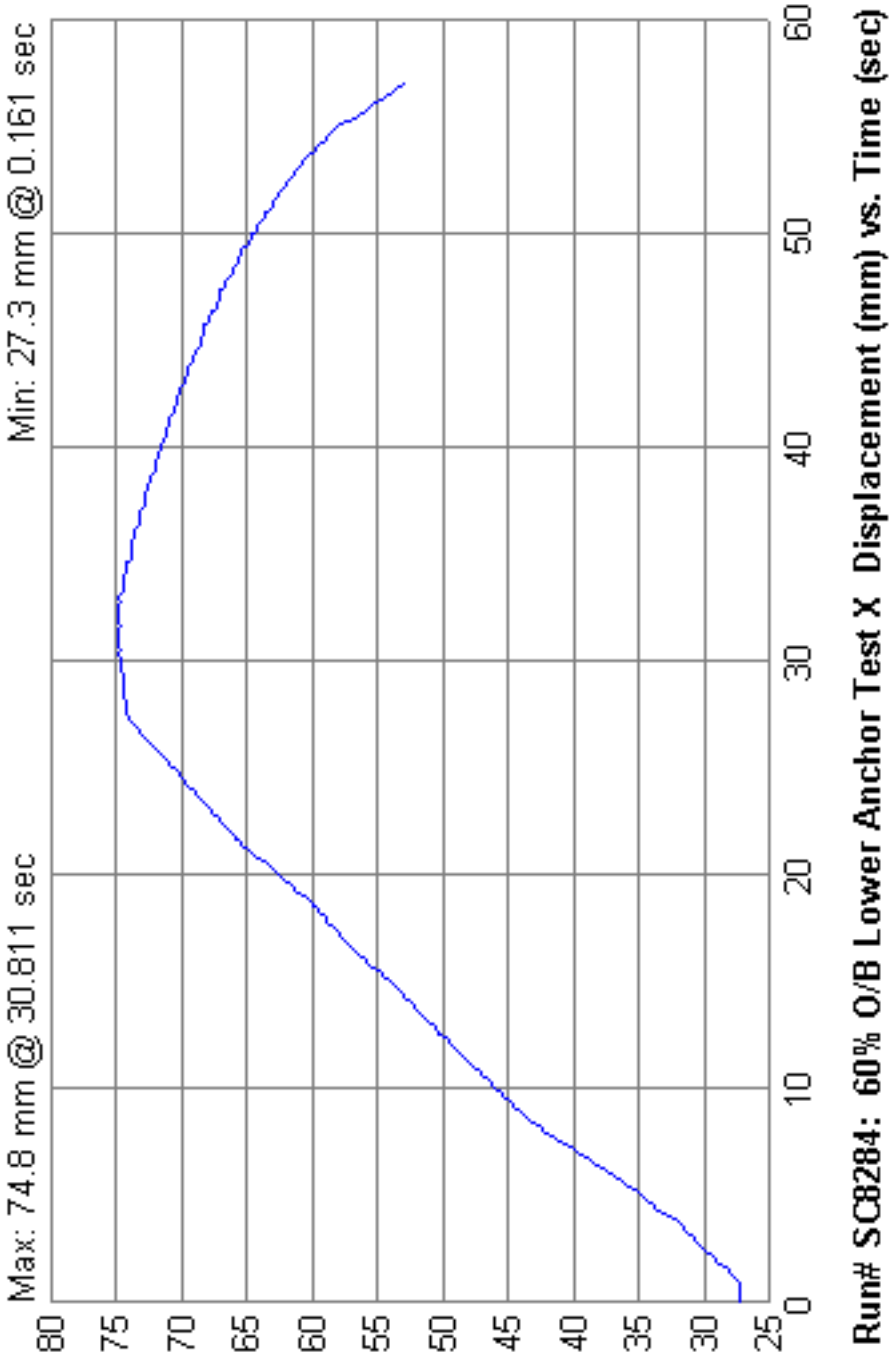
6.11.5 Post-test photo #5

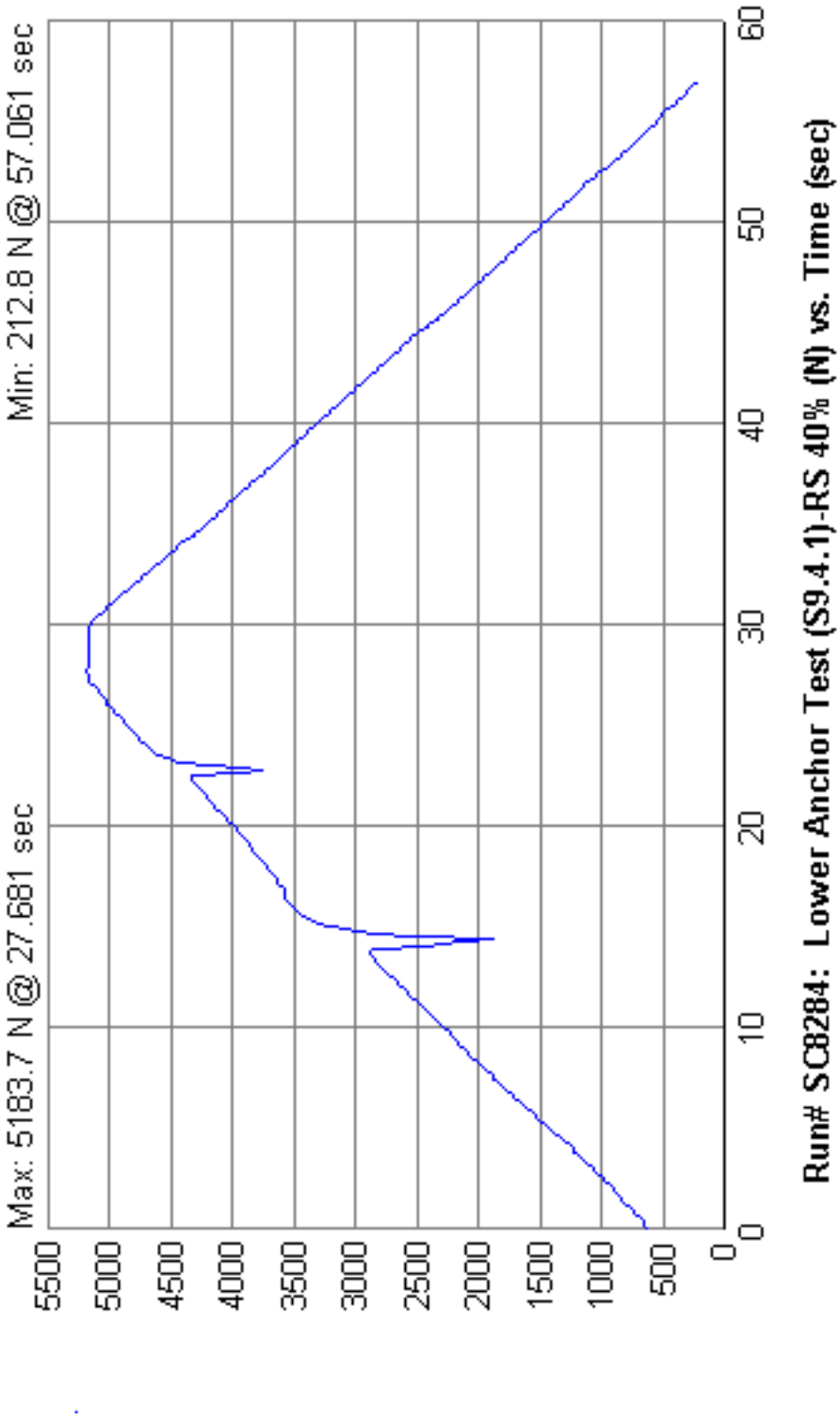
6.11.6 Post-test photo #6

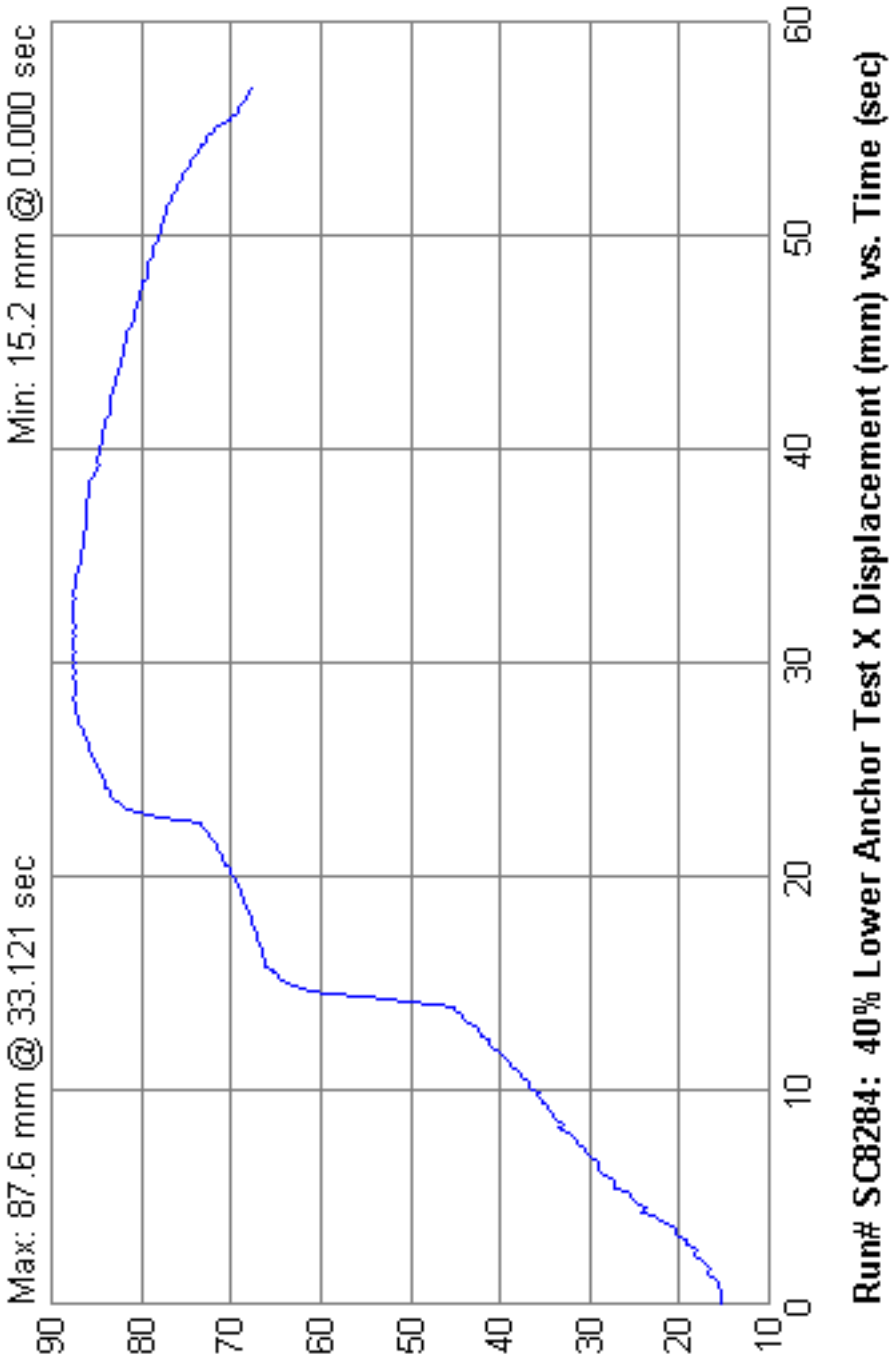
6.11.7 Post-test photo #7

7.0 PLOTS


Max: 5203.4 N @ 27.511 sec
Min: 247.2 N @ 57.061 sec
Run# SC8284: Lower Anchor Test (S9.4.1)-RS 60% O/B (N) vs. Time (sec)
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60


Run# SC8284: 60% O/B Lower Anchor Test X Displacement (mm) vs. Time (sec)
Max: 74.8 mm @ 30.811 sec
Min: 27.3 mm @ 0.161 sec
80
75
70
65
60
55
50
45
40
35
30
25
0
10
20
30
40
50
60


Max: 5183.7 N @ 27.681 sec
Min: 212.8 N @ 57.061 sec
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60
Run# SC8284: Lower Anchor Test (S9.4.1)-RS 40% (N) vs. Time (sec)


Run# SC8284: 40% Lower Anchor Test X Displacement (mm) vs. Time (sec)
Max: 87.6 mm @ 33.121 sec
Min: 15.2 mm @ 0.000 sec
90
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60

8.0 REPORT of VEHICLE CONDITION

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT No.: DTNH22-06-C-00030/0003 DATE: July 1, 2008

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 KIA Sorento

VEH. NHTSA NO.: C60520 VIN: KNDJD733565628204

COLOR: White

ODOMETER READINGS: ARRIVAL 455 miles Date: 07/20/07

COMPLETION 456 miles Date: 7/2/08

PURCHASE PRICE: $23,350 DEALER'S NAME: TRC

ENGINE DATA: 6 Cylinders 2.0 Liters ___ Cubic Inches

TRANSMISSION DATA: X Automatic __ Manual No. of Speeds ____

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

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Fern Gatilao, Brad Reaume, Kenney Godfrey

X	Air Conditioning		Traction Control	X	Clock
X	Tinted Glass	X	All Wheel Drive	X	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	X	Front Disc Brakes
X	Power Brakes	X	Tilt Steering Wheel	X	Rear Disc Brakes
X	Antilock Brake System	X	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:

Salvage only.

RECORDED BY: Fern Gatilao, Kenney Godfrey DATE: July 1, 2008

APPROVED BY: Brad Reaume

APPENDIX A
OWNERS MANUAL CHILD RESTRAINT SYSTEMS

⚠ WARNING

If the child restraint is not anchored properly, the risk of a child being seriously injured or killed in a collision greatly increases.

⚠ WARNING

- **Do not mount more than one child restraint to a single tether or to a child restraint lower anchorage point. The improper increased load may cause the anchorage points or tether anchor to break, causing serious injury or death.**

(Continued)

(Continued)

- **Do not install a child restraint seat at the rear center seating position using the vehicle's ISOFIX anchors. The ISOFIX anchors are only provided for the left and right outboard rear seating positions. Do not misuse the ISOFIX anchors by attempting to attach a child restraint seat in the middle rear seating position position to the ISOFIX anchors. In a crash, the child restraint seat ISOFIX attachments may not be strong enough to secure the child restraint seat properly in the rear center seating position and may break, causing serious injury or death.**
- **Attach the ISOFIX or ISOFIX-compatible child restraint seat only to the appropriate locations shown in the illustration.**
- **Always follow the installation and use instructions provided by the manufacturer of the child restraint.**

Restraint of Pregnant Women

Pregnant women should wear lap/shoulder belt assemblies whenever possible according to specific recommendations by their doctors. The lap portion of the belt should be worn AS SNUGLY AND AS LOW AS POSSIBLE.

⚠ WARNING - Pregnant Women

Pregnant women must never place the lap portion of the safety belt over the area of the abdomen where the fetus is located or above the abdomen.

Restraint of Infants and Small Children

To increase their safety, infants and young children should always be restrained by a restraint system approved for their age and size. For this reason, all states of The United States have laws governing the restraint of children.

⚠ WARNING - Children on Lap

Never hold a child on your lap or in your arms in a moving vehicle. Even a very strong person cannot hold onto a child in the event of even a minor collision.

Many companies manufacture child-restraint systems (often called child seats) for infants and small children. An acceptable child-restraint system must always satisfy U.S. Federal Motor Vehicle Safety Standards. Make sure that any child-restraint system you use in your vehicle is labelled as complying with those safety standards.

The child restraint system should be chosen to fit both the size of the child and the size of the vehicle seat. Be sure to follow any instructions provided by the child restraint system manufacturer when installing the child-restraint system.

⚠ WARNING - Hot Metal Parts

Since a safety belt or child restraint system can become very hot in a closed vehicle during warm sunny weather, be sure to check the seat cover and buckles before placing a child anywhere near them.

⚠ WARNING - Infants and Young Children

- **Infants and young children are at much greater risk of serious injury or death in an accident or sudden stop if they are unrestrained or restrained improperly. Follow all instructions in this section of your Kia manual and the instructions that came on and with an improved child safety restraint system. The child restraint must be correctly installed in the vehicle, and the child must be correctly installed in the child restraint.**
- **All children under 12 are safest in the back seat. The center rear position is best.**
- **Never install a rear-facing infant seat in the front passenger position. The baby will be injured or killed by the airbag if it deploys in an accident.**

(Continued)

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(Continued)

- **Never allow a child to stand or kneel on the seat of a moving vehicle. Insist the child sit down in an approved restraint system.**
- **Never allow a safety belt to be placed around both a child and an adult or around two children. In an accident they will not be properly restrained and may receive worse injuries from being thrown forward or crushed against one another.**
- **Never allow a child to be held on a lap or in anyone's arms while the vehicle is moving. Even a very strong person cannot hold onto a child in even a minor collision.**
- **A child too large for a child restraint but too small for the vehicle safety belts should use an approved belt-positioning booster seat. This is safer than allowing a child to ride with a shoulder belt that touches their face or neck.**

Restraint of Large Children

As children grow, they may need to use new child restraints, including larger child seats or booster seats, which are appropriate for their increased size.

A child who has outgrown available child restraint systems should use the belts provided in the vehicle. When seated, the child should be restrained by the lap/shoulder belt.

If the shoulder belt slightly touches the child's neck or face, try placing the child closer to the center of the vehicle. If the shoulder belt still touches their face or neck, they may need to be returned to a child restraint system. In addition, after-market devices are available from independent manufacturers which help pull the shoulder belt lower and away from the child's face or neck.

Child restraint system

For small children and babies, the use of a child seat or infant seat is strongly recommended and is required by law in almost all states. This child seat or infant seat should be of appropriate size for the child and should be installed in accordance with the manufacturer's instructions.

Children riding in the car should sit on the rear seat and must always be properly restrained to minimize the risk of injury in an accident, sudden stop or sudden maneuver. According to accident statistics, children are safer when properly restrained in the rear seats than in the front seat.

Children could be injured or killed in a crash if their restraints are not properly secured. For small children and babies, a child seat or infant seat must be used. Before buying a particular child restraint system, make sure it fits your car and seat belts, and fits your child. Follow all the instructions provided by the child seat manufacturer when installing the child restraint system.

⚠ WARNING

When a child restraint is not in use, make sure that it is secured by a safety belt. In a sudden stop or accident, a loose child restraint could be thrown forward and injure someone.

Installing a Child Restraint System in the Front Passenger Seat and Rear Seats

For safety reasons, we recommend that the child restraint system be used in the rear seat. **Never place a rear-facing child restraint in the front passenger seat, because of the danger that an inflating passenger side air bag could impact the rear-facing child restraint and kill the child.**

Since all four of passenger's safety belts move freely under normal conditions and only lock under extreme or emergency conditions (emergency lock mode), you must manually change these safety belts to the auto lock mode to secure a child restraint.

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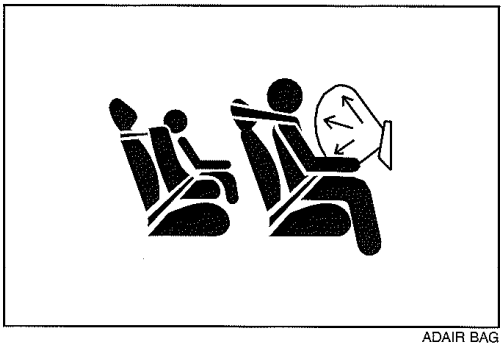
✻ NOTICE

The driver's safety belt incorporates the emergency lock mode only.

⚠ WARNING - Restraint Instructions

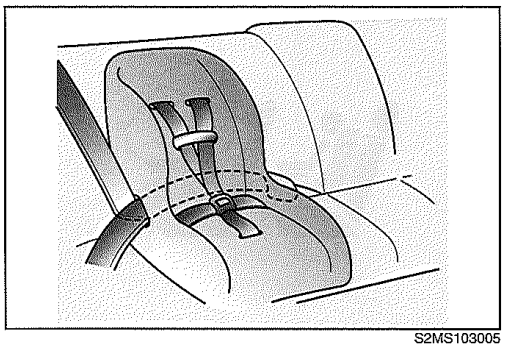
Failure to observe this manuals instructions regarding child restraint systems and the instructions provided with the child restraint system could increase the chance and/or severity of injury in an accident.



ADAIR BAG

⚠ WARNING - Child Restraint Placement

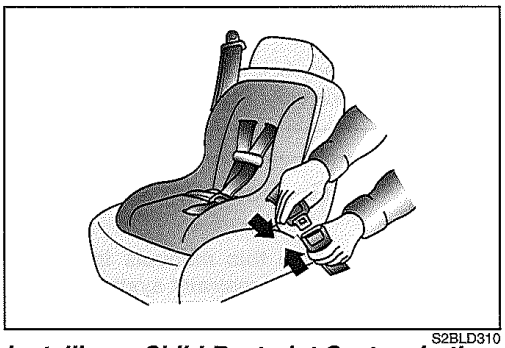
Never use a rear-facing child restraint in the front passenger seat. In a collision the air bag inflates with great force. A child in a rear-facing restraint in the front passenger seat can be severely or fatally injured by the power of the air bag.



S2MS103005

Placing a Passenger Safety Belt Into The Auto Lock Mode

The use of the auto lock mode will ensure that the normal movement of the child in the vehicle does not cause the safety belt to be pulled out and loosen the firmness of its hold on the child restraint system. To secure a child restraint system in the front passenger seat or rear seats, use the following procedure.



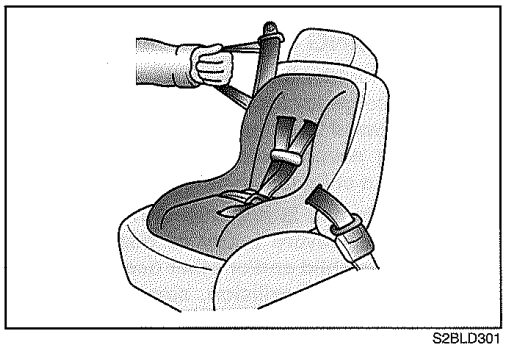
S2BLD310

Installing a Child Restraint System in the Front Seat and Rear Outboard Seats

1. Place the child restraint system in the seat and route the lap/shoulder belt around or through the restraint, following the restraint manufacturer's instructions. Be sure the safety belt webbing is not twisted.
2. Fasten the lap/shoulder belt latch into the buckle. Listen for the distinct "click" sound.

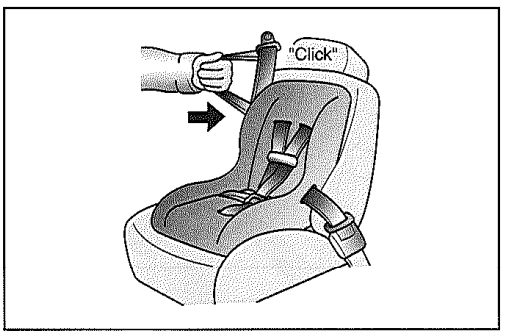
Position the release button so that it is easy to access in case of an emergency.

3-54



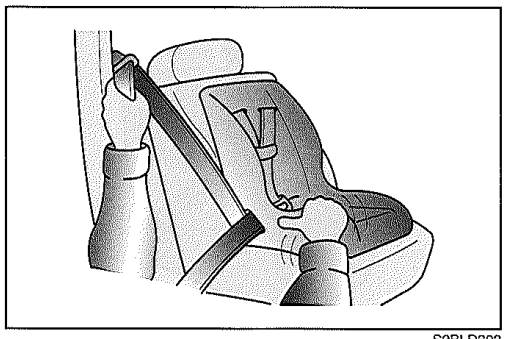
S2BLD301

3. Pull the shoulder portion of the safety belt all the way out. When the shoulder portion of the safety belt is fully extended, it will shift the retractor to the "Auto Lock" (child restraint) mode.



S2BLD302

4. Slowly allow the belt to retract. Pull up on the shoulder webbing. A "clicking" or "ratcheting" sound will be heard as the belt retracts. This indicates the retractor is now in the automatic locking mode. Push down on the child restraint while you pull up on the belt in order to remove any slack in the belt.


S2BLQ303

5. Before placing the child in the child restraint, forcibly try to push the seat from side to side and forward to make sure that the seat is securely held in place.
6. Double check that the retractor is in the automatic locking mode by trying to pull the shoulder portion of the safety belt out of the retractor. If you cannot pull the belt out of the retractor, it is in the automatic locking mode. If you can, repeat step 4.

To remove the child restraint, press the release button on the buckle and then pull the lap/shoulder belt out of the restraint and allow the safety belt to retract fully.

3-56

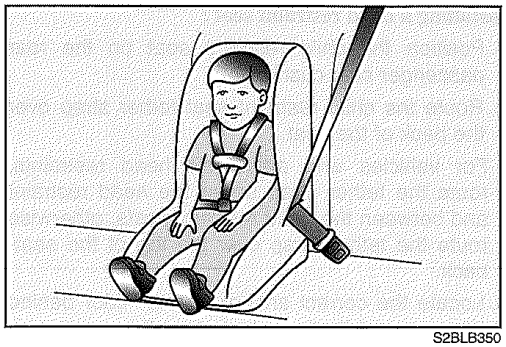
⚠ WARNING - Auto Lock Mode

The lap/shoulder belt automatically returns to the "emergency lock mode" whenever the belt is allowed to retract fully. Therefore, the preceding seven steps must be followed each time a child restraint is installed.

If the safety belt is not placed in the "auto lock" mode, severe injury or death could occur to the child and/or other occupants in the vehicle in a collision, since the child restraint will not be effectively held in place.

✻ NOTICE

When the safety belt is allowed to retract to its fully stowed position, the retractor will automatically switch from the "Auto Lock" mode to the emergency lock mode for normal adult usage.


S2BLB350

Installing a Child Restraint System in the Rear Center Seat

To install a child restraint system in the rear center seat, do the following:

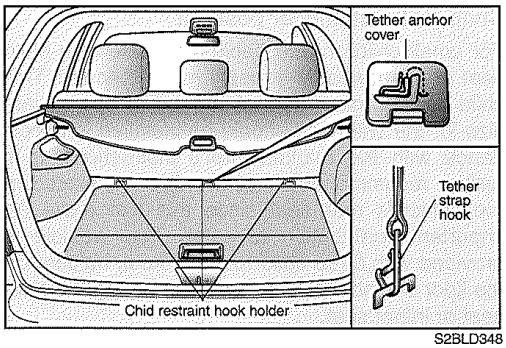
1. Pull the safety belt webbing and insert the tongue plate into the buckle.
2. Do the same procedure in the front seat and rear outboard seat on page 3-54.

Child restraint anchor position

For small children and babies, the use of a child seat or infant seat is strongly recommended. This child seat or infant seat should be of appropriate size for the child and should be installed in accordance with the manufacturer's instructions. It is further recommended that the seat be placed in the vehicle's rear seat since this can make an important contribution to safety. Your vehicle is provided with three child restraint hook holders on the floor behind the rear seat for installing the child seat or infant seat.

⚠ WARNING - Child Restraint Placement

Never use a child restraint in the front passenger seat. A child in a child restraint installed in the front passenger seat can be severely or fatally injured by an air bag which could impact the child restraint with great force when the air bag inflates.



S2BLD348

Tether anchor installation

Your vehicle is equipped with an anchor for securing the tether strap of a child restraint system (child seat). The child restraint anchor fittings are installed on the floor behind the rear seat.

⚠ WARNING

If the tether strap is clipped incorrectly, the child restraint seat may not be restrained properly in the event of a collision.

Installing a child restraint seat ;

1. Position the child restraint seat on the rear passenger seat cushion.
2. Route the child restraint seat tether strap over the back of the seat.

   For vehicles with adjustable head restraints, route the tether strap under the head restraint and between the head restraint posts, otherwise route the tether strap over the top of the seat-back.
3. Locate the correct anchor on the floor behind the rear seat for the selected seating position.
4. Open the tether anchor cover.
5. Clip the tether strap hook to the tether strap hook holder.
6. Tighten the tether strap to secure the seat.

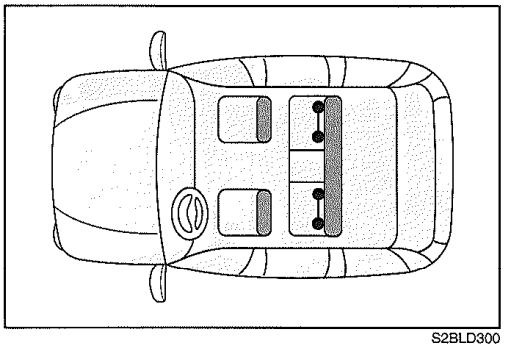
3-58

⚠ WARNING - Child Restraint

Check that the child restraint system is secure by pushing and pulling it in different directions. Incorrectly fitted child restraints may swing, twist, tip or come away causing death or injury.

⚠ WARNING - Child Restraint Anchorage

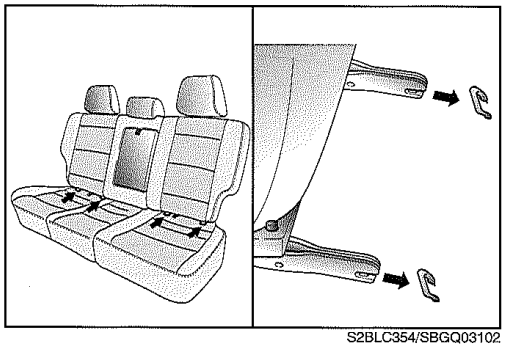
- **Child restraint anchorages are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seat belts or harnesses or for attaching other items or equipment to the vehicle.**
- **The tether strap may not work properly if attached somewhere other than the correct tether anchor.**



S2BLD300

Child seat lower anchors

Some child seat manufacturers make child restraint seats that are labeled as ISOFIX or ISOFIX-compatible child restraint seats. These seats include two rigid or webbing mounted attachments that connect to two ISOFIX anchors at specific seating positions in your vehicle. This type of child restraint seat eliminates the need to use seat belts to attach the child seat for forward-facing child restraint seats.



S2BLC354/SBGQ03102

ISOFIX anchors have been provided in your vehicle. The ISOFIX anchors are located in the left and right outboard rear seating positions. Their locations are shown in the illustration. There is no ISOFIX anchor provided for the center rear seating position.

The ISOFIX anchors are located between the seatback and the seat cushion of the rear seat left and right outboard seating positions.

Follow the child seat manufacturer's instructions to properly install child restraint seats with ISOFIX or ISOFIX-compatible attachments. Once you have installed the ISOFIX child restraint, assure that the seat is properly attached to the ISOFIX and tether anchors. Also, test the child restraint seat before you place the child in it. Tilt the seat from side to side. Also try to tug the seat forward. Check to see if the anchors hold the seat in place.

⚠ WARNING

When using the vehicle's "ISOFIX" system to install a child restraint system in the rear seat, all unused vehicle rear seat belt metal latch plates or tabs must be latched securely in their seat belt buckles and the seat belt webbing must be retracted behind the child restraint to prevent the child from reaching and taking hold of unretracted seat belts. Unlatched metal latch plates or tabs may allow the child to reach the unretracted seat belts which may result in strangulation and a serious injury or death to the child in the child restraint.

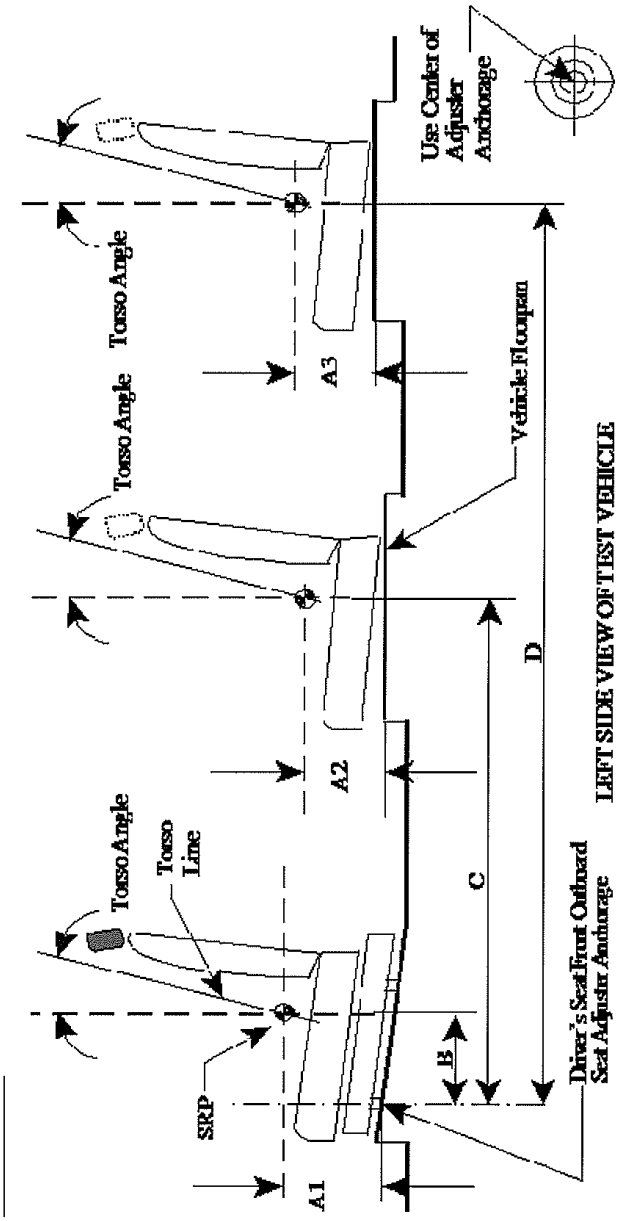
3-60

APPENDIX B
MANUFACTURER'S DATA (OVSC FORM 14)

07MY Kia Sorento FMVSS 225

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

Model Year: 2007 ; Make: KIA ; Model: SORENTO ; Body Style: SUV
Seat Style: Front row: BUCKET SEAT ; Second row: BENCH SEAT ; Third row:



FORM 225
Last Updated 12/12/2005

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07MY Kia Sorento FMVSS 225

Table 1. Seating Positions[1] and Torso Angles

		Left (Driver Side)	Center (if any)	Right
A1		(Driver) 283.2	-	(Front Passenger)283.2
A2		179.2	189.2	179.2
A3		-	-	-
B		338.8	-	338.8
C		1148.8	1103.8	1148.8
D		-	-	-
Torso Angle (degree)	Front Row	23	-	23
	Second Row	25	28	25
	Third Row	-	-	-

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

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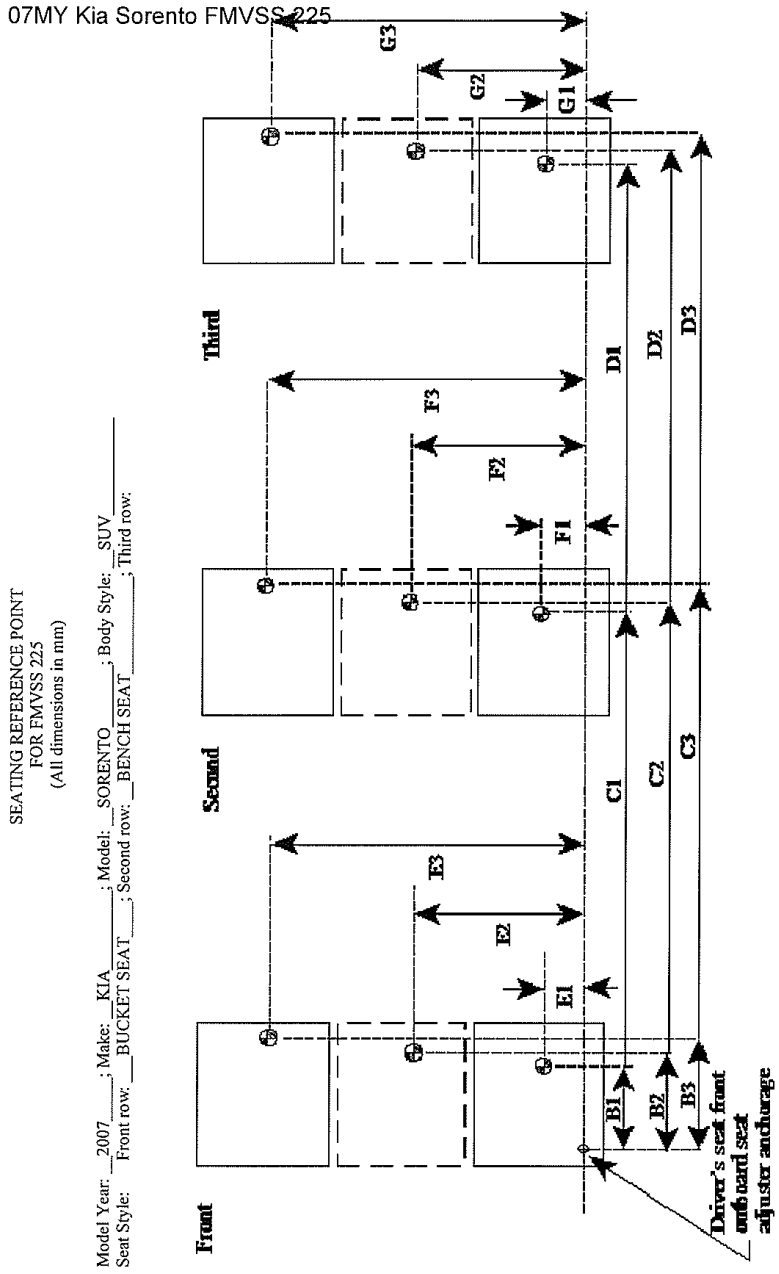

Table 2. Seating Reference Point and Tether Anchorage Locations

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07MY Kia Sorento FMVSS 225

Seating Reference Point (SRP)		Distance from Driver's front outboard seat adjuster anchorage[1]
Front Row	B1	338.8
	E1	238
	B2	-
	E2	-
	B3	338.8
	E3	1038
Second Row	C1	1148.8
	F1	268
	C2	1103.8
	F2	638
	C3	1148.8
	F3	1008
Third Row	D1	-
	G1	-
	D2	-
	G2	-
	D3	-
	G3	-

Note: 1. Use the center of anchorage.

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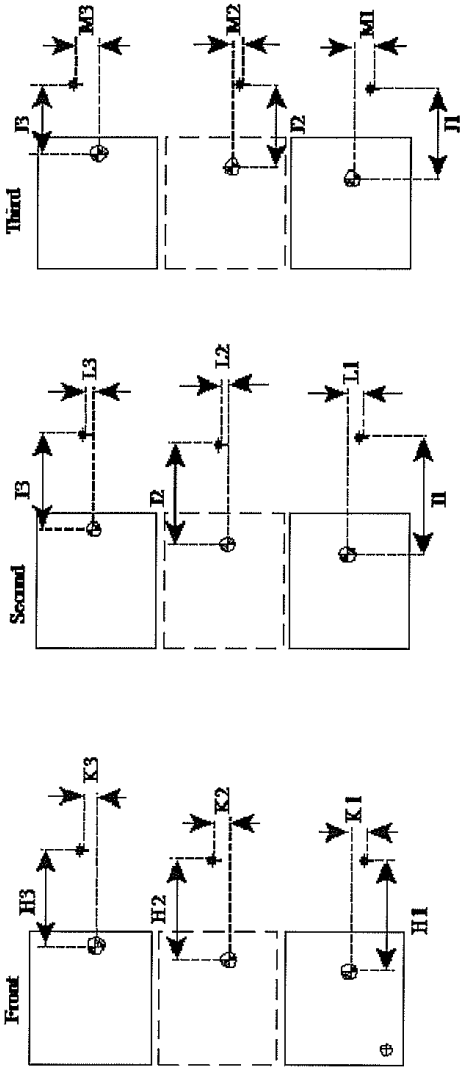
07MY Kia Sorento FMVSS 225

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

Model Year: 2007 ; Make: KIA ; Model: SORENTO ; Body Style: SUV
Seat Style: Front row: BUCKET SEAT ; Second row: BENCH SEAT ; Third row:



⊕: SRP
+: Tether anchorage

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

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07MY Kia Sorento FMVSS 225

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	272
	L1	40
	I2	317
	L2	35
	I3	272
	L3	40
Third Row	J1	-
	M1	-
	J2	-
	M2	-
	J3	-
	M3	-

Note: 1. Use the center of anchorage.

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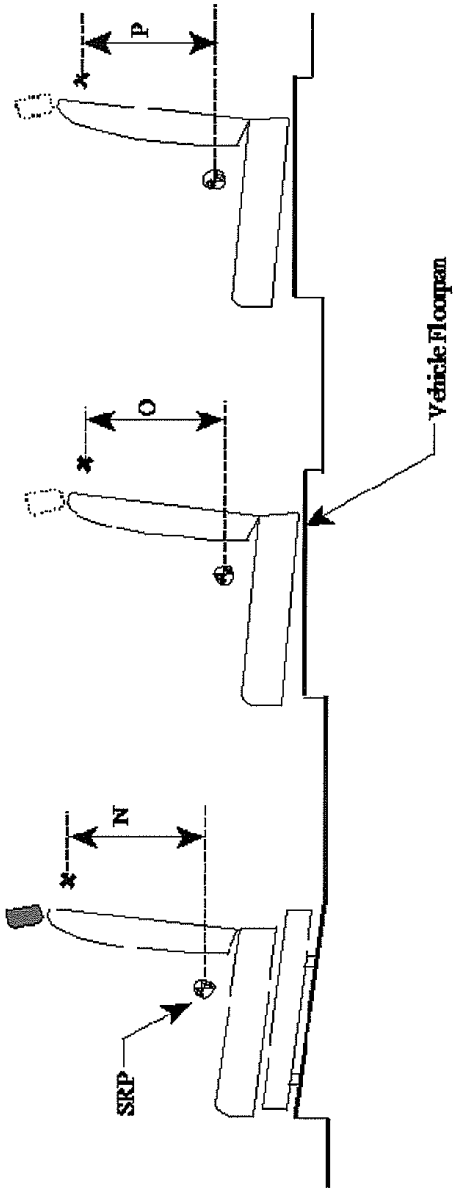
07MY Kia Sorento FMVSS 225

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

Model Year: 2007 ; Make: KIA ; Model: SORENTO ; Body Style: SUV
Seat Style: Front row: BUCKET SEAT ; Second row: BENCH SEAT ; Third row:



LEFT SIDE VIEW OF TEST VEHICLE

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07MY Kia Sorento FMVSS 225

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)	41
	O2 (Center)	51
	O3 (Right)	41
Third Row	P1 (Left)	-
	P2 (Center)	-
	P3 (Right)	-

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 (Front- 2, Second- 3)

2. **How many designated seating positions are equipped with lower anchorages and tether anchorages? Specify which position(s).**

   - 2 (Second row right and left seating positions)

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

   - 3 (Second row right and left seating positions)

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

   - S9.5(b)

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