FINAL REPORT NUMBER 225-MGA-08-003

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

NISSAN MOTOR CO., LTD.
2008 NISSAN ALTIMA SEDAN
NHTSA No. C85200

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Date: October 20, 2008
Report Date: December 30, 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: 1/14/09

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: Edward E. Chan

Digitally signed by Edward E. Chan
DN: CN = Edward E. Chan, C = US, O = National Highway Traffic Safety Administration, OU = Office of Vehicle Safety Compliance
Date: 2009.01.21 09:25:33 -05'00'

Acceptance Date:

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 225-MGA-08-003	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 225 Compliance Testing of a 2008 Nissan Altima Sedan, NHTSA No. C85200		5. Report Date December 30, 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-08-003	
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 2008 Nissan Altima Sedan, NHTSA No. C85200, 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 October 20, 2008. Test failures identified were as follows: NONE The data recorded indicates that the 2008 Nissan Altima Sedan tested appears to meet the requirements of FMVSS 225.			
17. Key Words Compliance Testing Safety Engineering FMVSS 225 2008 Nissan Altima Sedan		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	
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TABLE OF CONTENTS

TABLE OF CONTENTS (continued) PAGE

SECTION

LIST OF TABLES

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 2008 Nissan Altima, NHTSA No. C85200 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. The center-to-center spacing between the 2nd row outboard lower anchorages was approximately 700 mm. The 2nd row left and right outboard seating positions were tested with the SFADII fixture and the center seating position was tested with a SFADI fixture.

2.0 COMPLIANCE TEST AND DATA SUMMARY

TEST SUMMARY

The testing was conducted at MGA in Troy, Michigan on October 20, 2008.

Based on the test results, the 2008 Nissan Altima Sedan 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 11,191 N and held the required load for 3 seconds and the total displacement was 71 mm and the right seating position sustained a maximum force of 15,136 N and held the required load for 3 seconds. The SFADI at the 2nd row center seating position sustained a maximum force of 15,094 N and held the required load for 3 seconds.

DATA SUMMARY

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

Table 1. Summary Data for Strength and Displacement

MGA Test #	Fixture Type	Test Configuration	Seating Position	Max. Load (N)	Displacement (mm)
SB8395	SFADII	Lower Only	2nd Row Left	11,191*	71
		Lower w/Top Tether	2nd Row Right	15,136*	--
SB8396	SFADI	Lower w/Top Tether	2nd Row Center	15,094*	--

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

3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

VEH. MOD YR/MAKE/MODEL/BODY	2008 Nissan Altima Sedan
VEH. NHTSA NO.	C85200
VIN	1N4AL21E98C116413
COLOR	Grey
VEH. BUILD DATE	08/07
TEST DATE	October 20, 2008
TEST LABORATORY	MGA Research Corporation
OBSERVERS	Fern Gatilao , Brad Reaume, Kenney Godfrey

GENERAL INFORMATION:

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Nissan Motor Co., Ltd.

Date of Manufacture: 08/07; VIN: 1N4AL21E98C116413

GVWR: 4279 lbs GAWR FRONT: 2242 lbs

GAWR REAR: 2189 lbs

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 32 psi REAR: 32 psi

Recommended Tire Size: P215/60R1694T

Recommended Cold Tire Pressure:

FRONT: 32 psi REAR: 32 psi

Size of Tire on Test Vehicle: P215/60R1694T

Size of Spare Tire: T135/90R16

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 607 & 304 (5/27/09)
String Potentiometer Calibrated at each use	S/N F1603964A
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 TPM052 (12/3/08)
MGA Data Acquisition System	N/A
Digital Calipers	S/N 04456455 (3/19/09)
Force Gauge	S/N MGA00648 (7/8/09)
Inclinometer (Digital)	S/N MGA00725 (7/30/09)

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	5.97	6.00	N/A
	Ctr		N/A		
	RH		5.99	5.97	
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	48		N/A
	Ctr		N/A		
	RH		52		
Measure the distance between the SRP to the front of the anchorage bar (mm)	LH	N/A	169	169	N/A
	Ctr		N/A		
	RH		165	165	

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	32	32	N/A
		Req't<60		38	38	
	Ctr	Req't>25		N/A		
		Req't<60		N/A		
	RH	Req't>25		32	32	
		Req't<60		38	38	
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	14.4	N/A	0.1
2nd Row Center	N/A	N/A	N/A
2nd Row Right	14.5	N/A	0.3

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

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

REMARKS: NONE

Table 5. Tether Location and Dimensional Measurements

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

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

REMARKS: NONE

Table 6. Tether Anchorage Static Loading and Displacement

SEAT POSITION		Seat, Seat Back, & Head Restraint Positions			Type of SFAD Used	Angle (deg)	Initial Location (mm)	Onset Rate (N/sec.)	Force Applied (kN)	Max. Load (N)	Final Location (mm)	Horiz. Displ. (mm)
		Seat	Seat Back	Is There a H/R?								
Front Row		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Second Row	LH	Fixed	Fixed	Yes	2	10	26	389	11	11,191*	97	71
	Ctr.			No	1	10	N/A	537	15	15,094*	N/A	N/A
	RH			Yes	2	10	N/A	537	15	15,136*	N/A	N/A
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

6.5 Front view

6.5 Rear view

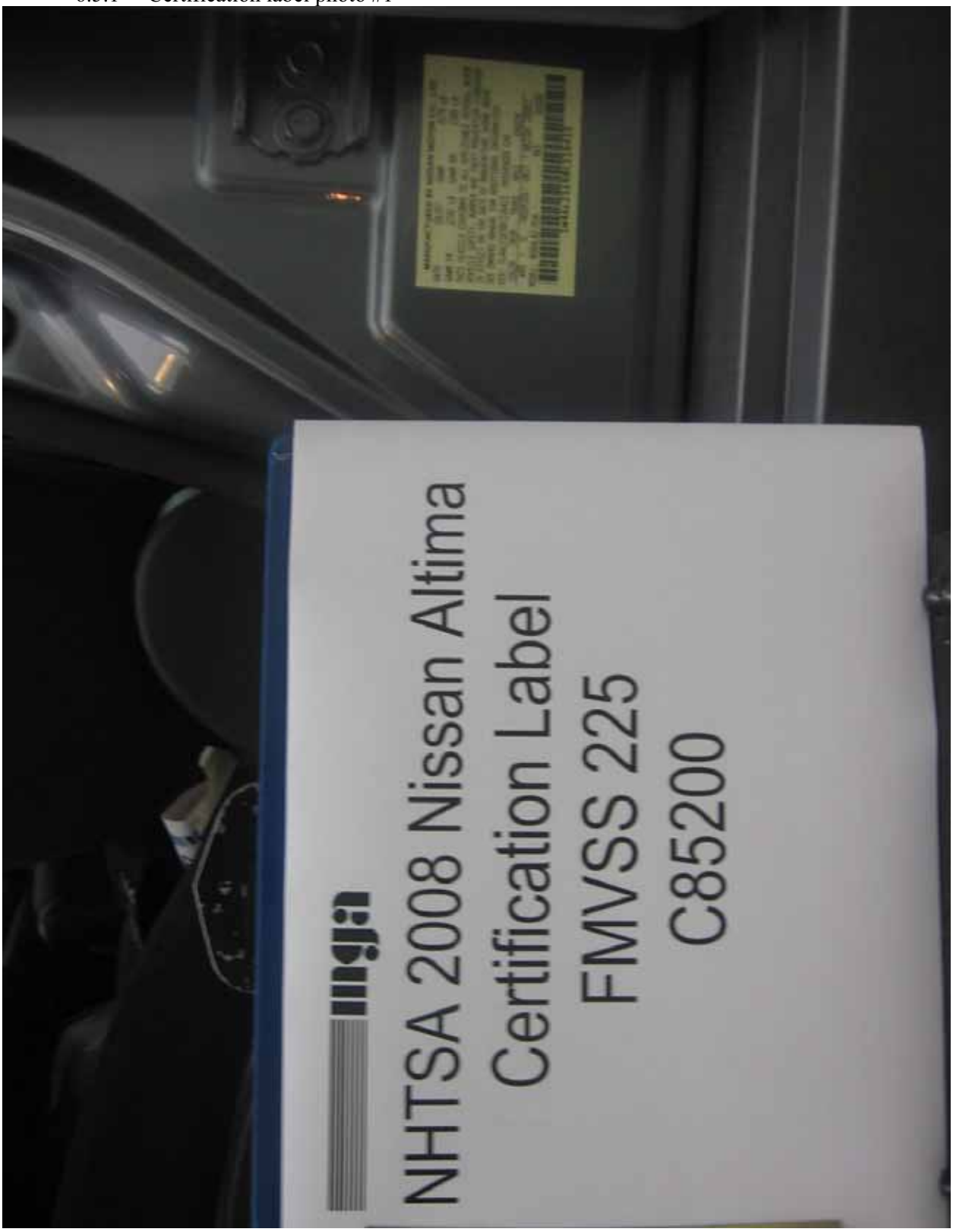

2.5 S
NISSAN
ALTIMA
NHTSA 2008 Nissan Altima
Rear View
FMVSS 225
C85200

6.5 ¾ Front left view

6.4 ¾ Front right view

6.5 Test vehicle's certification label

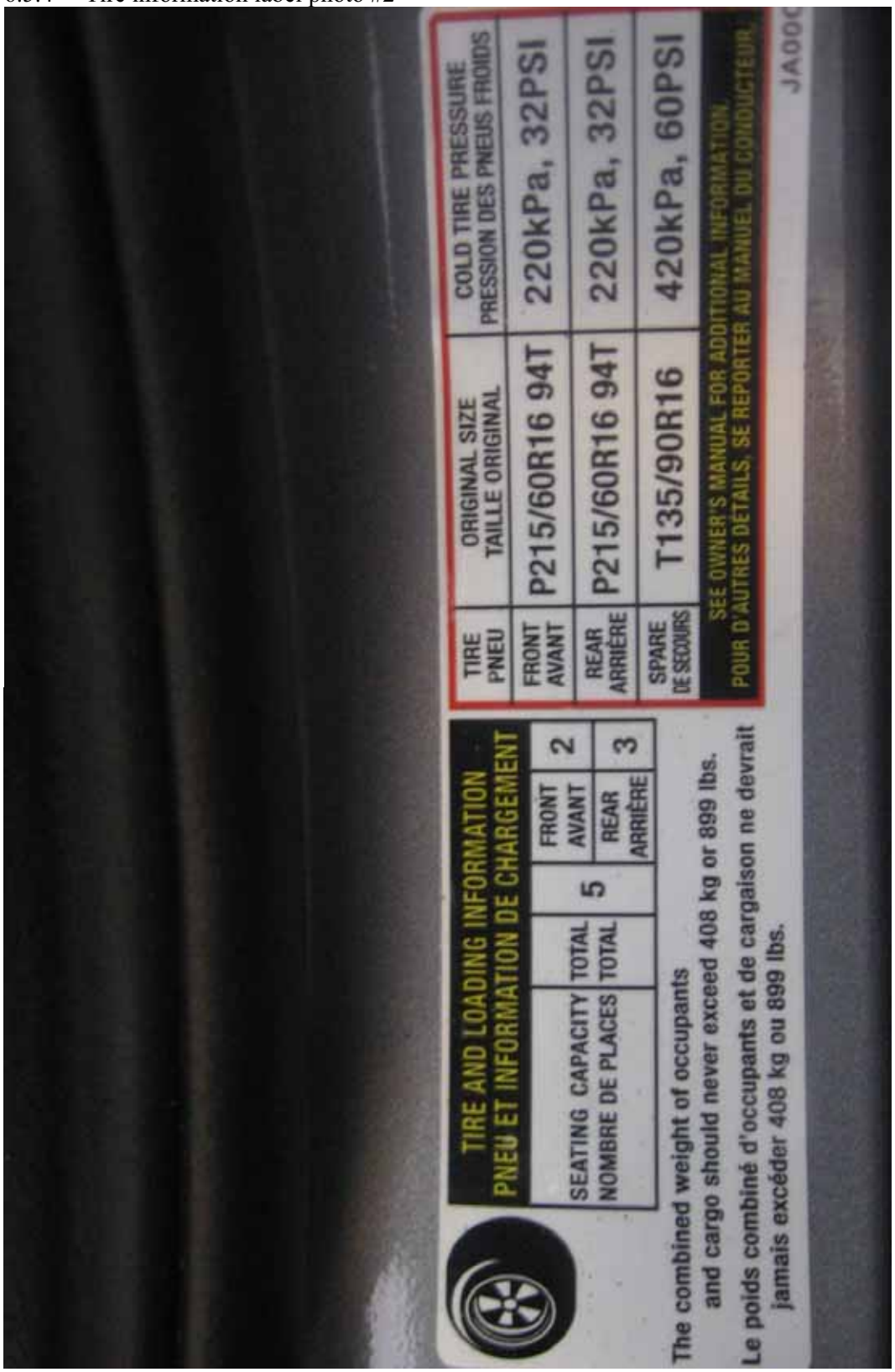
6.5.1 Certification label photo #1



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 Rear under vehicle

6.6.3 Left front

6.6.4 Left rear

6.6.5 Right front

6.6.6 Right rear

6.7 2-dimensional template

6.7.1 LH position photo #1

6.7.2 LH position photo #2

6.7.3 RH position photo #1

6.7.4 RH position photo #2

6.8 CRF verification

6.8.1 LH position photo #1

6.8.2 RH position photo #1

6.9 Front view of test vehicle with test apparatus in place

6.9.1 LH & RH

6.9.2 Center

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

6.10.1 Pre-test photo

6.10.2 Pre-test photo

6.10.3 Pre-test photo

6.10.4 Pre-test photo

6.10.5 Pre-test photo

6.10.6 Pre-test photo

6.11 Post-test condition of each child restraint anchorage system

6.11.1 Post-test photo

6.11.2 Post-test photo

6.11.3 Post-test photo

6.11.4 Post-test photo

6.11.5 Post-test photo

6.11.6 Post-test photo

6.11.7 Post-test photo

6.11.8 Post-test photo

6.11.9 Post-test photo

6.11.10 Post-test photo

6.11.11 Post-test photo

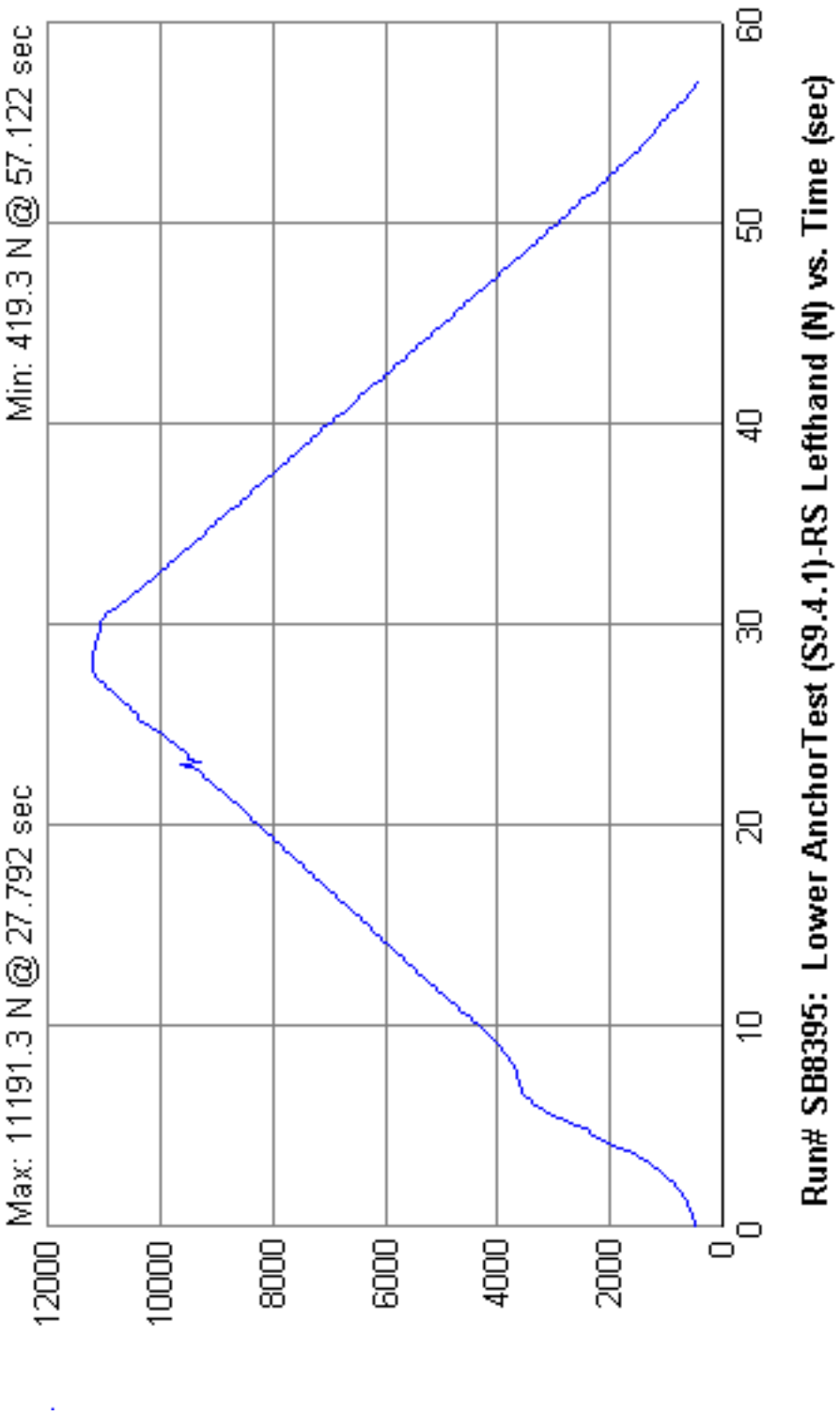
6.11.12 Post-test photo

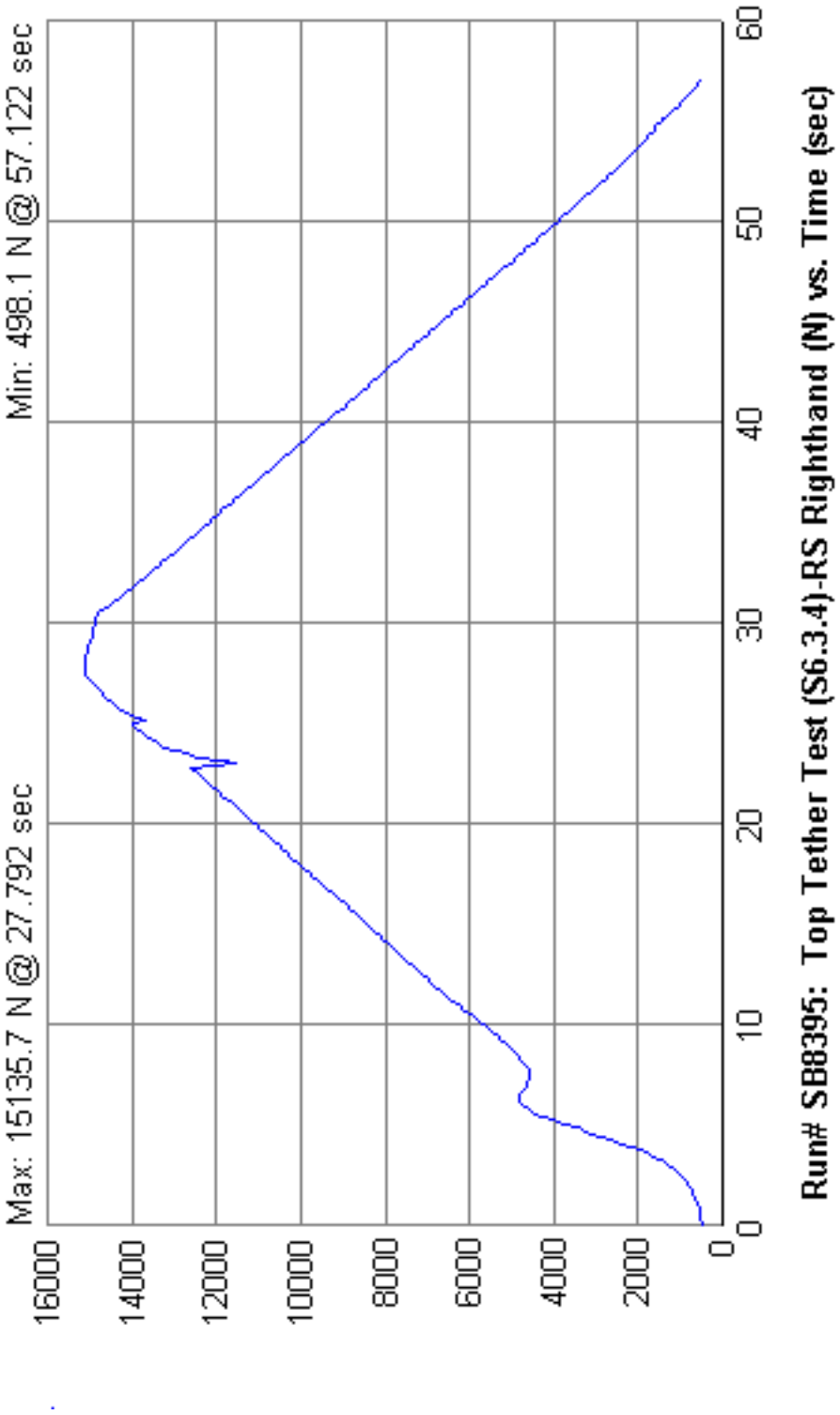
6.11.13 Post-test photo

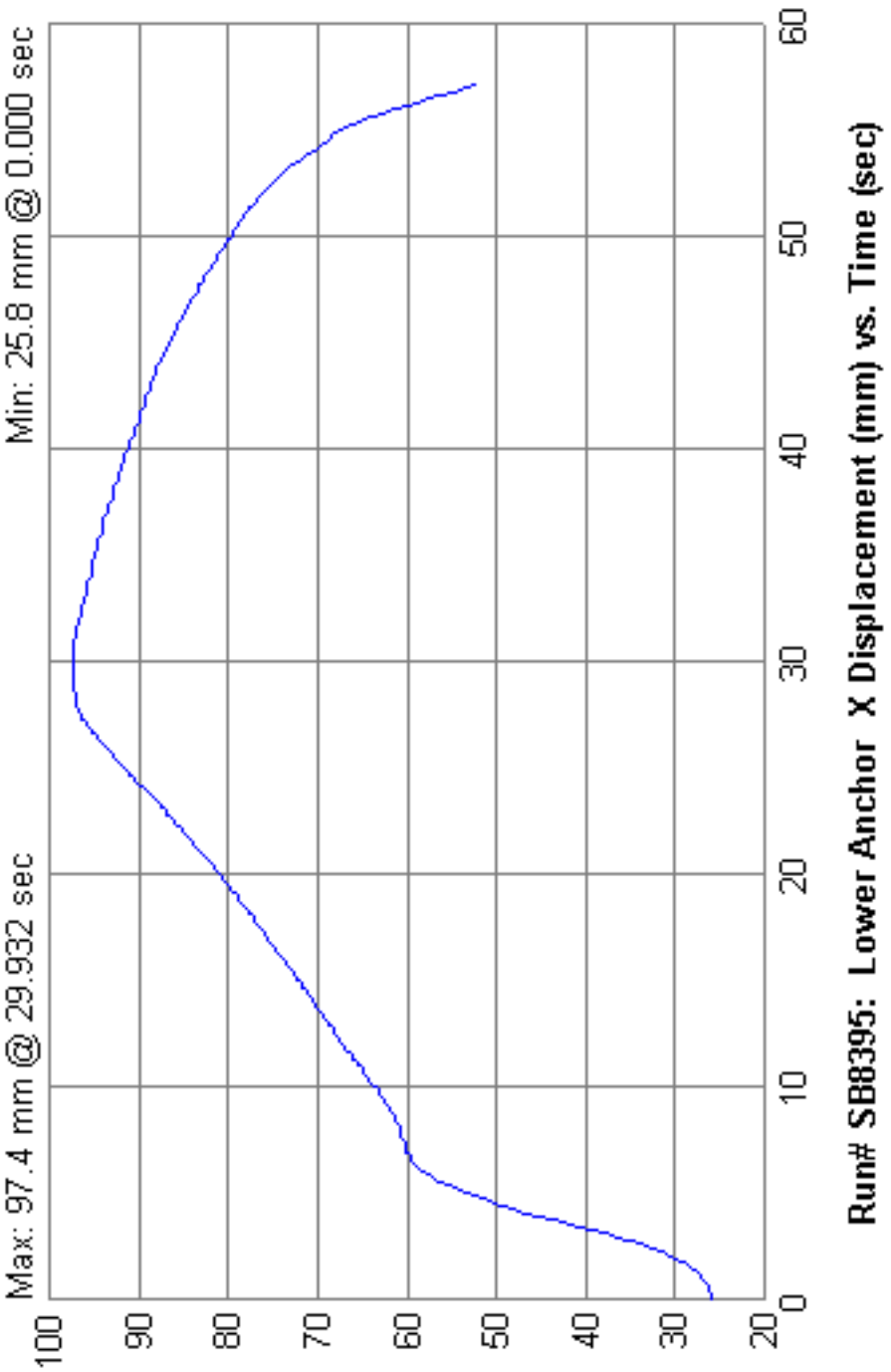
6.11.14 Post-test photo

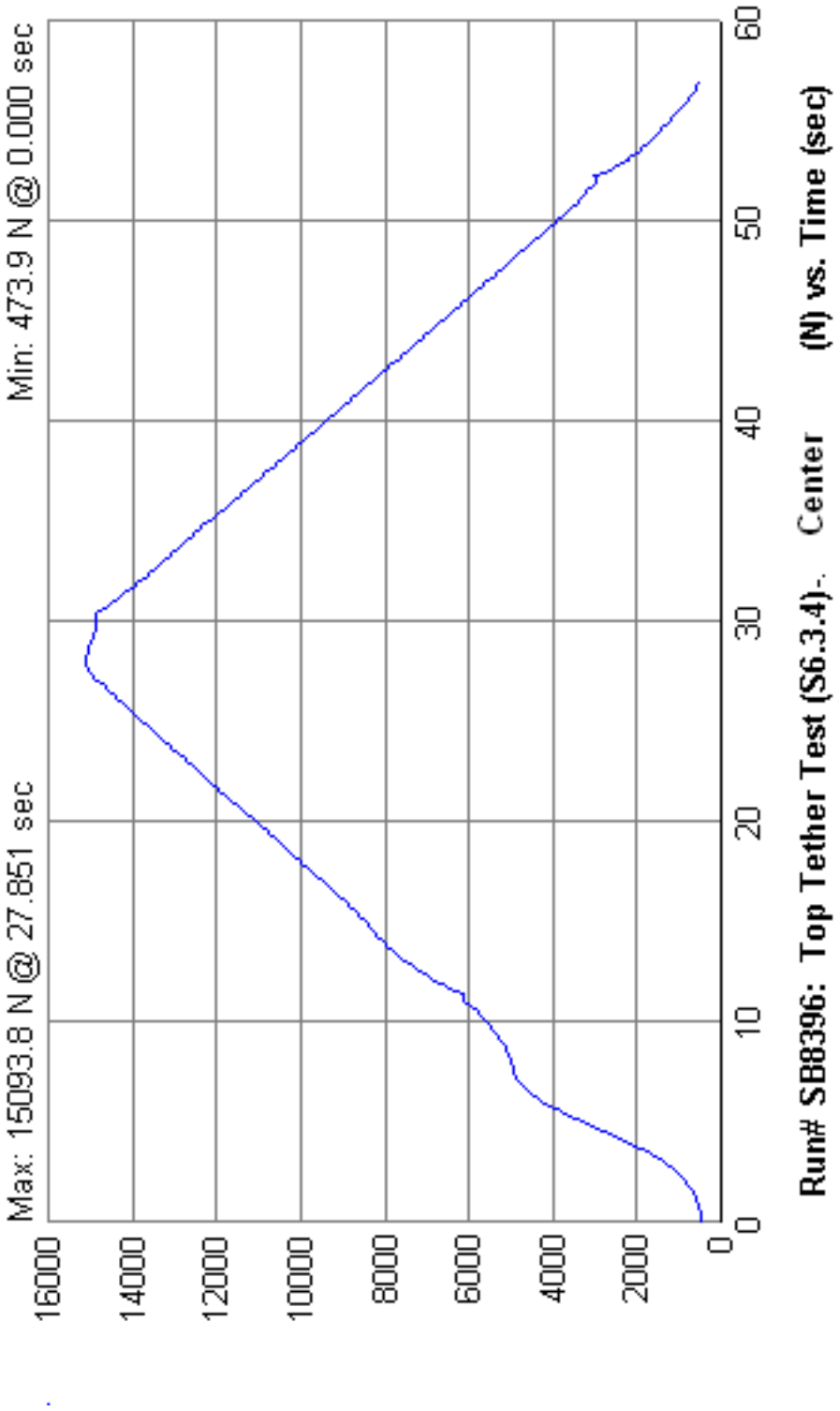
6.11.15 Post-test photo

7.0 PLOTS


Max: 11191.3 N @ 27.792 sec
Min: 419.3 N @ 57.122 sec
Run# SB8395: Lower AnchorTest (S9.4.1)-RS Lefthand (N) vs. Time (sec)
12000
10000
8000
6000
4000
2000
0
0
10
20
30
40
50
60


Max: 15135.7 N @ 27.792 sec
Min: 498.1 N @ 57.122 sec
16000
14000
12000
10000
8000
6000
4000
2000
0
0
10
20
30
40
50
60
Run# SB8395: Top Tether Test (S6.3.4)-RS Righthand (N) vs. Time (sec)


Min: 25.8 mm @ 0.000 sec
Max: 97.4 mm @ 29.932 sec
Run# SB8395: Lower Anchor X Displacement (mm) vs. Time (sec)
100
90
80
70
60
50
40
30
20
0
10
20
30
40
50
60


Max: 15093.8 N @ 27.851 sec
Min: 473.9 N @ 0.000 sec
16000
14000
12000
10000
8000
6000
4000
2000
0
0
10
20
30
40
50
60
Run# SB8396: Top Tether Test (S6.3.4)-. Center (N) vs. Time (sec)

8.0 REPORT of VEHICLE CONDITION

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT No.: DTNH22-06-C-00030/0003 DATE: October 20, 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: 2008 Nissan Altima Sedan

VEH. NHTSA NO.: C85200 VIN: 1N4AL21E98C116413

COLOR: Grey

ODOMETER READINGS: ARRIVAL 578 miles Date: 7/9/08

COMPLETION 578 miles Date: 10/20/08

PURCHASE PRICE: $19,999 DEALER'S NAME: Jeff Wyler

ENGINE DATA: 4 Cylinders 2.5 Liters ___ Cubic Inches

TRANSMISSION DATA: X Automatic __ Manual No. of Speeds

FINAL DRIVE DATA: ____Rear Drive X Front Drive ____4 Wheel Drive

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Fern Gatilao, Brad Reaume, Kenney Godfrey

X	Air Conditioning		Traction Control	X	Clock
	Tinted Glass		All Wheel Drive		Roof Rack
X	Power Steering		Speed Control	X	Console
X	Power Windows		Rear Window Defroster	X	Driver Air Bag
X	Power Door Locks		Sun Roof or T-Top	X	Passenger Air Bag
	Power Seat(s)		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:

Windshield and front seats were removed before conducting the testing.

Test Vehicle Condition:

Salvage only.

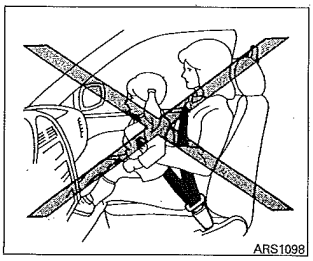
RECORDED BY: Fern Gatilao, Kenney Godfrey DATE: October 20, 2008

APPROVED BY: Brad Reaume

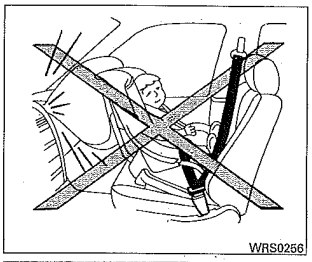
APPENDIX A
OWNERS MANUAL CHILD RESTRAINT SYSTEM

CHILD RESTRAINTS

- **Periodically check to see that the seat belt and the metal components,** such as buckles, tongues, retractors, flexible wires and anchors, work properly. If loose parts, deterioration, cuts or other damage on the webbing is found, the entire seat belt assembly should be replaced.



PRECAUTIONS ON CHILD RESTRAINTS



⚠WARNING

- **Infants and small children should always be placed in an appropriate child restraint while riding in the vehicle. Failure to use a child restraint can result in serious injury or death.**
- **Infants and small children should never be carried on your lap. It is not possible for even the strongest adult to resist the forces of a severe accident. The child could be crushed between the adult and parts of the vehicle. Also, do not put the same seat belt around both your child and yourself.**

- **Even with the NISSAN Advanced Air Bag System, never install a rear-facing child restraint in the front seat. An inflating supplemental front air bag could seriously injure or kill your child. A rear-facing child restraint must only be used in the rear seat.**
- **NISSAN recommends that the child restraint be installed in the rear seat. According to accident statistics, children are safer when properly restrained in the rear seat than in the front seat. If you must install a front facing child restraint in the front seat, see "Child restraint installation using the seat belts" later in this section.**
- **Improper use or improper installation of a child restraint can increase the risk or severity of injury for both the child and other occupants of the vehicle and can lead to serious injury or death in an accident.**
- **Follow all of the child restraint manufacturer's instructions for installation and use. When purchasing a child restraint, be sure to select one which will fit your child and vehicle. It may not be possible to properly install some types of child restraints in your vehicle.**
- **If the child restraint is not anchored properly, the risk of a child being injured in a collision or a sudden stop greatly increases.**
- **Child restraint anchor points 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.**
- **Adjustable seatbacks should be positioned to fit the child restraint, but as upright as possible.**
- **After attaching the child restraint, test it before you place the child in it. Push it from side to side while holding the seat near the LATCH attachment or by the seat belt path. Try to tug it forward and check to see if the belt holds the restraint in place. The child restraint should not move more than 1 inch (25 mm). If the restraint is not secure, tighten the belt as necessary, or put the restraint in another seat and test it again. You may need to try a different child restraint. Not all child restraints fit in all types of vehicles.**
- **When your child restraint is not in use, keep it secured with the LATCH System or a seat belt to prevent it from being thrown around in case of a sudden stop or accident.**

⚠CAUTION

Remember that a child restraint left in a closed vehicle can become very hot. Check the seating surface and buckles before placing your child in the child restraint.

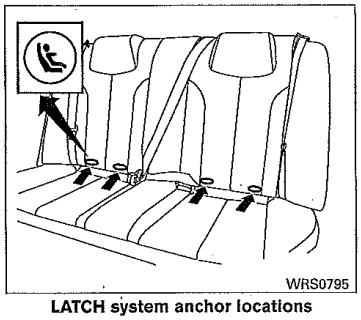
This vehicle is equipped with a universal child restraint lower anchor system, referred to as the Lower Anchors and Tethers for CHildren System or LATCH. Some child restraints include two rigid or webbing-mounted attachments that can be connected to these lower anchors. For details, see the "Lower Anchors and Tethers for CHildren System (LATCH)" later in this section.

If you do not have a LATCH compatible child restraint, the vehicle seat belts can be used. See "Child restraint installation using the seat belts" later in this section. In general, child restraints are also designed to be installed with the lap portion of a lap/shoulder seat belt.

Several manufacturers offer child restraints for infants and small children of various sizes. When selecting any child restraint, keep the following points in mind:

- Choose only a restraint with a label certifying that it complies with Federal Motor Vehicle Safety Standard 213 or Canadian Motor Vehicle Safety Standard 213.
- Check the child restraint in your vehicle to be sure it is compatible with the vehicle's seat and seat belt system.
- If the child restraint is compatible with your vehicle, place your child in the child restraint and check the various adjustments to be sure the child restraint is compatible with your child. Choose a child restraint that is designed for your child's height and weight. Always follow all recommended procedures.

All U.S. states and Canadian provinces or territories require that infants and small children be restrained in an approved child restraint at all times while the vehicle is being operated.

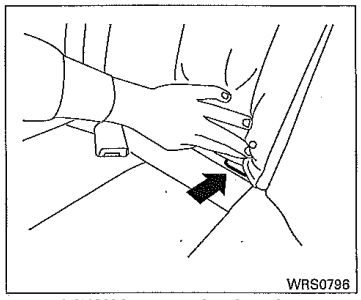


LATCH system anchor locations

LOWER ANCHORS AND TETHERS FOR CHILDREN SYSTEM (LATCH)

Your vehicle is equipped with special anchor points that are used with Lower Anchors and Tethers for CHildren System (LATCH) compatible child restraints. This system may also be referred to as the ISOFIX or ISOFIX compatible system. With this system, you do not have to use a vehicle seat belt to secure the child restraint.

The LATCH anchor points are provided to install child restraints in the rear outboard seating positions only. Do not attempt to install a child restraint in the center position using the LATCH anchors.



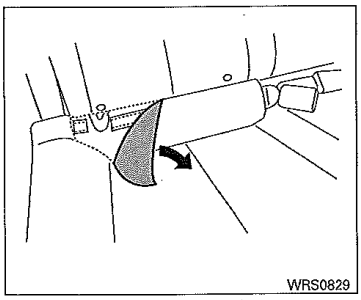
LATCH lower anchor location

LATCH lower anchor point locations

The LATCH anchors are located at the rear of the seat cushion near the seatback. A label is attached to the seatback to help you locate the LATCH anchors.

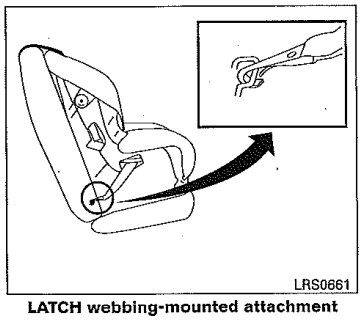
⚠WARNING

- **Attach LATCH compatible child restraints only at the locations shown in the illustration. If a child restraint is not secured properly, your child could be seriously injured or killed in an accident.**



(If so equipped)

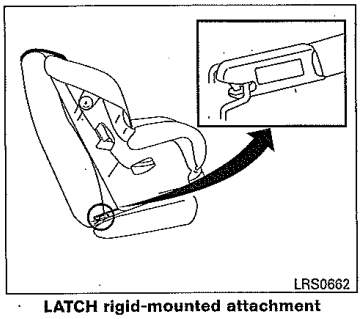
- **Do not secure a child restraint in the center rear seating position using the LATCH anchors. The child restraint will not be secured properly.**
- **Child restraint anchor points are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstance are they to be used for adult seat belts or harnesses.**



LATCH webbing-mounted attachment

Installing child restraint LATCH anchor attachments

LATCH compatible child restraints include two rigid or webbing-mounted attachments that can be connected to two anchors located at certain seating positions in your vehicle. With this system, you do not have to use a vehicle seat belt to secure the child restraint. Check your child restraint for a label stating that it is compatible with LATCH. This information may also be in the instructions provided by the child restraint manufacturer.



LATCH rigid-mounted attachment

LATCH child restraints generally require the use of a top tether strap. See "Top tether strap child restraint" later in this section for installation instructions.

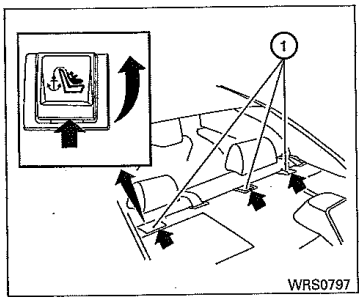
When installing a child restraint, carefully read and follow the instructions in this manual and those supplied with the child restraint. See "Child restraint installation using LATCH" in this section.

5TOP TETHER STRAP CHILD RESTRAINT

If the manufacturer of your child restraint requires the use of a top tether strap, it must be secured to the anchor point.

⚠WARNING

Child restraint anchor points 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.

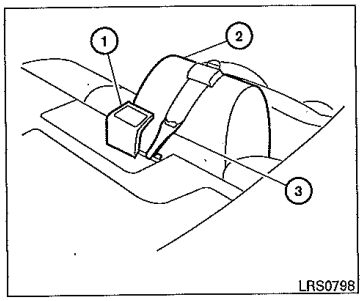


Coupe

Top Tether Anchor Point Locations

Anchor points ① are located on the rear parcel shelf.

Installing top tether strap



First, secure the child restraint with the seat belt or LATCH System (rear outboard seat positions only), as applicable.

① Flip up the anchor cover from the anchor point which is located directly behind the child seat.

② Position the top tether strap over the top of the seatback.

③ Secure the tether strap to the tether anchor bracket that provides the straightest installation.

4. Tighten the tether strap according to the manufacturer's instructions to remove any slack.

If you have any questions when installing a top tether strap child restraint on the rear seat, consult your NISSAN dealer for details.

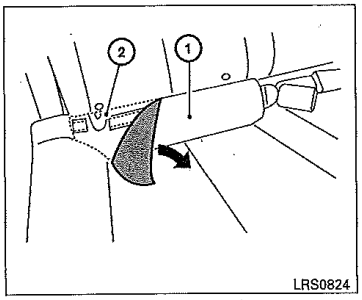
CHILD RESTRAINT INSTALLATION USING LATCH

⚠WARNING

- **Attach LATCH compatible child restraints only at the locations shown. For the LATCH lower anchor locations, see "Lower Anchors and Tethers for CHildren System (LATCH)" in this section. If a child restraint is not secured properly, your child could be seriously injured or killed in an accident.**
- **The LATCH anchors are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstance are they to be used for adult seat belts or harnesses.**
- **Inspect the lower anchors by inserting your fingers into the lower anchor area and feeling to make sure there are no obstructions over the LATCH anchors, such as seat belt webbing or seat cushion material. The child restraint will not be secured properly if the LATCH anchors are obstructed.**

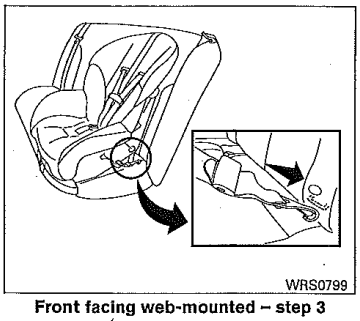
Front-facing

Follow these steps to install a front-facing child restraint using LATCH:



(if so equipped)

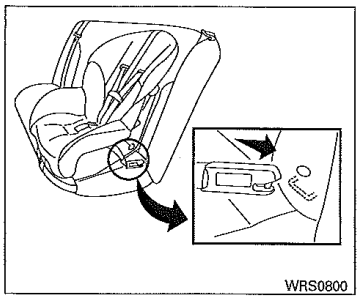
1. If the rear seat cushion has a flap ①, pull the flap down to allow access to the anchors ②.
2. Position the child restraint on the seat. Always follow the child restraint manufacturer's instructions.



Front facing web-mounted – step 3

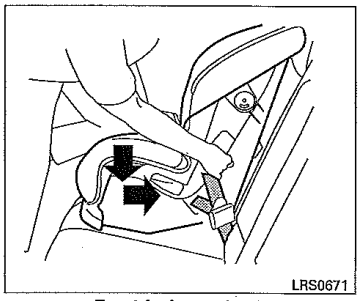
3. Secure the child restraint anchor attachments to the LATCH lower anchors. Check to make sure the LATCH attachment is properly attached to the lower anchors.
4. The back of the child restraint should be secured against the vehicle seatback.

If the seating position does not have an adjustable head restraint and it is interfering with the proper child restraint fit, try another seating position or a different child restraint.



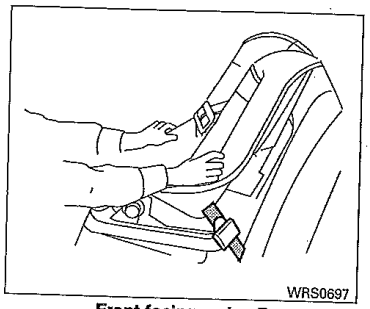
Front facing rigid-mounted – step 3

5. For child restraints that are equipped with webbing mounted attachments, remove any additional slack from the anchor attachments. Press downward and rearward firmly in the center of the child restraint with your knee to compress the vehicle seat cushion and seatback while tightening the webbing of the anchor attachments.
6. If the child restraint is equipped with a top tether strap, route the top tether strap and secure the tether strap to the tether anchor point. See "Top tether strap child restraint" in this section.



Front facing – step 5

7. Before placing the child in the child restraint, hold the child restraint near the LATCH attachment and use force to push the child restraint from side to side, and tug it forward to make sure that it is securely held in place. It should not move more than 1 in (25 mm). If it does move more than 1 in (25 mm), pull again on the anchor attachments to further tighten the child restraint. If you are unable to properly secure the restraint, move the restraint to another seating position and try again, or try a different child restraint. Not all child restraints fit in all types of vehicles.

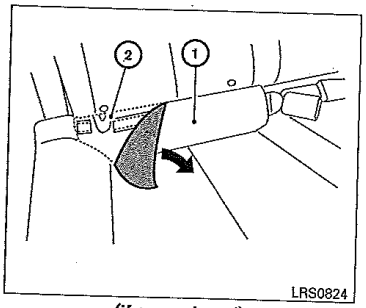


Front facing – step 7

8. Check to make sure the child restraint is properly secured prior to each use. If the child restraint is loose, repeat steps 4 through 7.

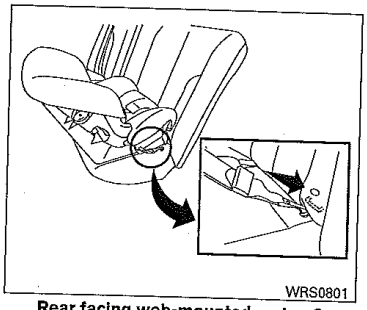
Rear-facing

Follow these steps to install a rear-facing child restraint using LATCH System:



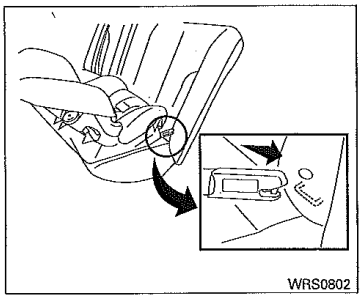
(if so equipped)

1. If the rear seat cushion has a flap ①, pull the flap down to allow access to the anchors ②.
2. Position the child restraint on the seat. Always follow the child restraint manufacturer's instructions.



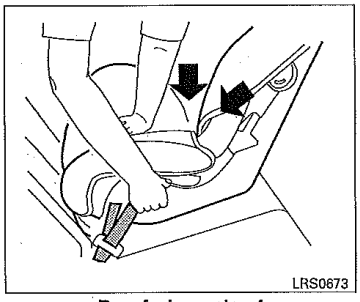
Rear facing web-mounted – step 3

3. Secure the child restraint anchor attachments to the LATCH lower anchors. Check to make sure the LATCH attachment is properly attached to the lower anchors.



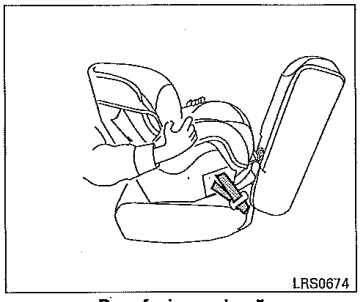
Rear facing rigid-mounted – step 3

4. For child restraints that are equipped with webbing mounted attachments, remove any additional slack from the anchor attachments. Press downward and rearward firmly in the center of the child restraint with your hand to compress the vehicle seat cushion and seatback while tightening the webbing of the anchor attachments.



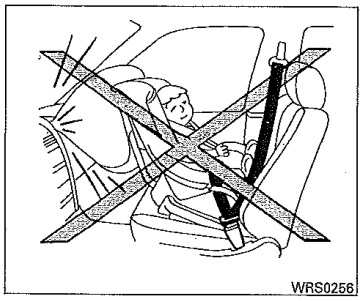
Rear facing – step 4

5. Before placing the child in the child restraint, hold the child restraint near the LATCH attachment and use force to push the child restraint from side to side, and tug it forward to make sure that it is securely held in place. It should not move more than 1 in (25 mm). If it does move more than 1 in (25 mm), pull again on the anchor attachments to further tighten the child restraint. If you are unable to properly secure the restraint, move the restraint to another seating position and try again, or try a different child restraint. Not all child restraints fit in all types of vehicles.



Rear facing – step 5

6. Check to make sure the child restraint is properly secured prior to each use. If the child restraint is loose, repeat steps 3 through 5.

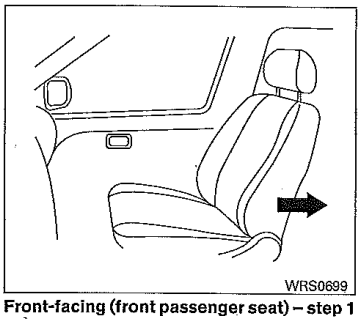


CHILD RESTRAINT INSTALLATION USING THE SEAT BELTS

⚠WARNING

- **Even with the NISSAN Advanced Air Bag System, never install a rear-facing child restraint in the front passenger seat. Supplemental front air bags inflate with great force. A rear-facing child restraint could be struck by the supplemental front air bag in a crash and could seriously injure or kill your child.**
- **NISSAN recommends that child restraints be installed in the rear seat. However, if you must install a forward facing child restraint in the front passenger seat, move the passenger seat to the rearmost position. Also, be sure the front passenger air bag status light is illuminated to indicate the passenger air bag is OFF. See "Front passenger air bag and status light" later in this section for details.**
- **The three-point seat belt in your vehicle is equipped with an Automatic Locking Retractor (ALR) which must be used when installing a child restraint.**
- **Failure to use the retractor's locking mode will result in the child restraint not being properly secured. The restraint could tip over or otherwise be unsecured and cause injury to the child in a sudden stop or collision.**
- **A child restraint with a top tether strap should not be used in the front passenger seat.**

The instructions in this section apply to child restraint installation using the vehicle seat belts in the rear seat or the front passenger seat.



Front-facing (front passenger seat) – step 1

Front-facing

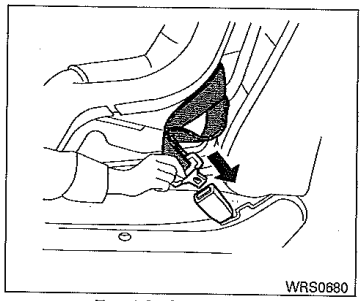
Follow these steps to install a front-facing child restraint using the vehicle seat belt in the rear seats or in the front passenger seat:

1. **If you must install a child restraint in the front seat, it should be placed in a front-facing direction only. Move the seat to the rearmost position. Child restraints for infants must be used in the rear-facing direction and therefore must not be used in the front seat.**

2. Position the child restraint on the seat. Always follow the child restraint manufacturer's instructions

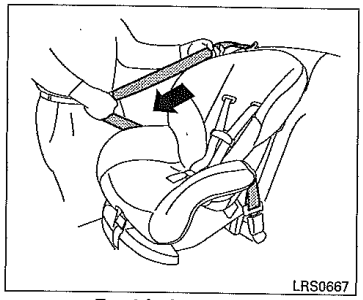
The back of the child restraint should be secured against the vehicle seatback. If necessary, adjust or remove the head restraint to obtain the correct child restraint fit. See "Head restraint adjustment" in this section.

If the head restraint is removed, store it in a secure place. Be sure to install the head restraint when the child restraint is removed. If the seating position does not have an adjustable head restraint and it is interfering with the proper child restraint fit, try another seating position or a different child restraint.



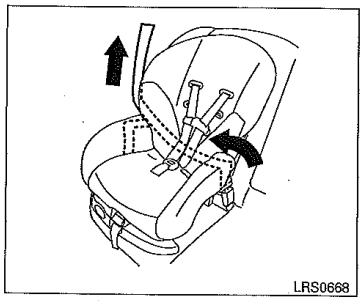
Front facing – step 3

3. Route the seat belt tongue through the child restraint and insert it into the buckle until you hear and feel the latch engage. Be sure to follow the child restraint manufacturer's instructions for belt routing.



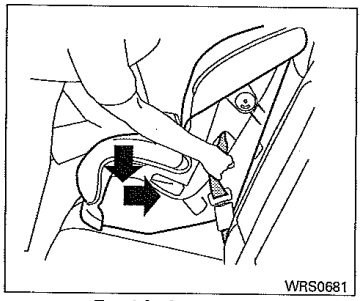
Front facing – step 4

4. Pull the shoulder belt until the belt is fully extended. At this time, the seat belt retractor is in the Automatic Locking Retractor mode (child restraint mode). It reverts to Emergency Locking Retractor mode when the seat belt is fully retracted.



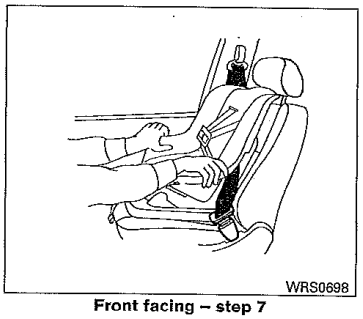
Front facing – step 5

5. Allow the seat belt to retract. Pull up on the shoulder belt to remove any slack in the belt.



Front facing – step 6

6. Remove any additional slack from the seat belt; press downward and rearward firmly in the center of the child restraint with your knee to compress the vehicle seat cushion and seatback while pulling up on the seat belt.



Front facing – step 7

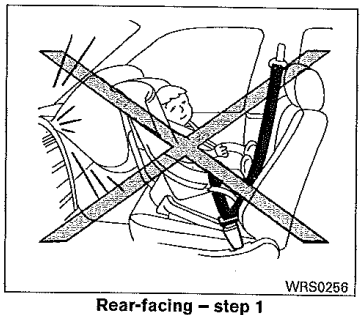
7. If the child restraint is equipped with a top tether strap, route the top tether strap and secure the tether strap to the tether anchor point (rear seat installation only). See "Top tether strap child restraint" in this section. Do not install child restraints that require the use of a top tether strap to seating positions that do not have a top tether anchor.

8. Before placing the child in the child restraint, hold the child restraint near the seat belt path and use force to push the child restraint from side to side, and tug it forward to make sure that it is securely held in place. It should not move more than 1 in (25 mm). If it does move more than 1 in (25 mm), pull again on the shoulder belt to further tighten the child restraint. If you are unable to properly secure the restraint, move the restraint to another seating position and try again, or try a different child restraint. Not all child restraints fit in all types of vehicles.
9. Check that the retractor is in the Automatic Locking Retractor mode by trying to pull more seat belt out of the retractor. If you cannot pull any more belt webbing out of the retractor, the retractor is in the Automatic Locking Retractor mode.
10. Check to make sure the child restraint is properly secured prior to each use. If the seat belt is not locked, repeat steps 3 through 9.

Front facing – step 11

11. If the child restraint is installed in the front passenger seat, push the ignition switch to the ON position. The front passenger air bag status light should illuminate. If this light is not illuminated see "Front passenger air bag and status light" in this section. **Move the child restraint to another seating position.** Have the system checked by a NISSAN dealer.

After the child restraint is removed and the seat belt is fully retracted, the Automatic Locking Retractor mode (child restraint mode) is canceled.

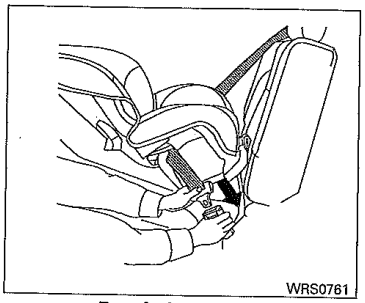


Rear-facing – step 1

Rear-facing

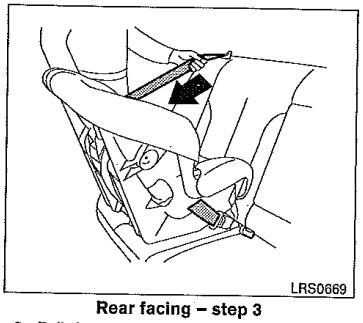
Follow these steps to install a rear-facing child restraint using the vehicle seat belt in the rear seats:

1. **Child restraints for infants must be used in the rear-facing direction and therefore must not be used in the front seat.** Position the child restraint on the seat. Always follow the restraint manufacturer's instructions.



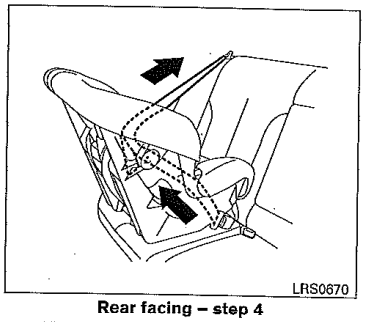
Rear facing – step 2

2. Route the seat belt tongue through the child restraint and insert it into the buckle until you hear and feel the latch engage. Be sure to follow the child restraint manufacturer's instructions for belt routing.



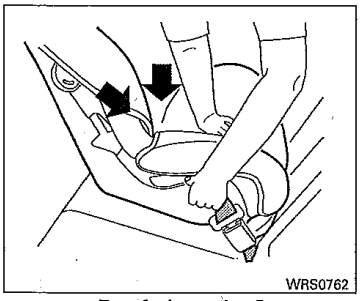
Rear facing – step 3

3. Pull the shoulder belt until the belt is fully extended. At this time, the seat belt retractor is in the Automatic Locking Retractor mode (child restraint mode). It reverts to Emergency Locking Retractor mode when the seat belt is fully retracted.



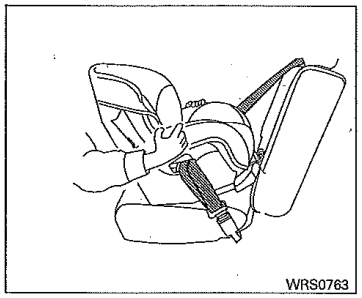
Rear facing – step 4

4. Allow the seat belt to retract. Pull up on the shoulder belt to remove any slack in the belt.



Rear facing – step 5

5. Remove any additional slack from the child restraint; press downward and rearward firmly in the center of the child restraint to compress the vehicle seat cushion and seatback while pulling up on the seat belt.

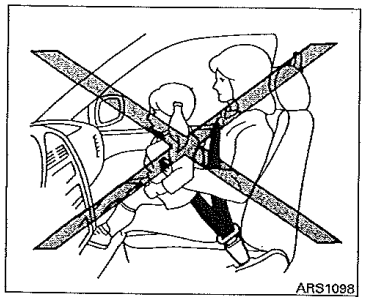


Rear facing – step 6

6. Before placing the child in the child restraint, hold the child restraint near the seat belt path and use force to push the child restraint from side to side, and tug it forward to make sure that it is securely held in place. It should not move more than 1 in (25 mm). If it does move more than 1 in (25 mm), pull again on the shoulder belt to further tighten the child restraint. If you are unable to properly secure the restraint, move the restraint to another rear seating position and try again, or try a different child restraint. Not all child restraints fit in all types of vehicles.
7. Check that the retractor is in the Automatic Locking Retractor mode by trying to pull more seat belt out of the retractor. If you cannot pull any more seat belt webbing out of the retractor, the retractor is in the Automatic Locking Retractor mode
8. Check to make sure that the child restraint is properly secured prior to each use. If the belt is not locked, repeat steps 3 through 7.

After the child restraint is removed and the seat belt fully retracted, the Automatic Locking Retractor mode (child restraint mode) is canceled.

BOOSTER SEATS



PRECAUTIONS ON BOOSTER SEATS

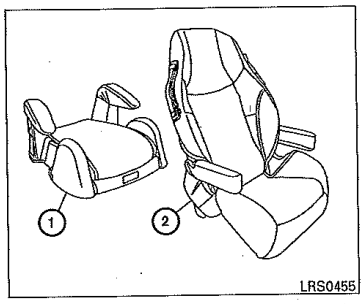
⚠WARNING

- Infants and small children should always be placed in an appropriate child restraint while riding in the vehicle. Failure to use a child restraint or booster seat can result in serious injury or death.
- Infants and small children should never be carried on your lap. It is not possible for even the strongest adult to resist the forces of a severe accident. The child could be crushed between the adult and parts of the vehicle. Also, do not put the same seat belt around both your child and yourself.
- NISSAN recommends that the booster seat be installed in the rear seat. According to accident statistics, children are safer when properly restrained in the rear seat than in the front seat. If you must install a booster seat in the front seat, see "Booster seat installation" in this section.
- A booster seat must only be installed in a seating position that has a lap/shoulder belt. Failure to use a three-point type seat belt with a booster seat can result in a serious injury in sudden stop or collision.
- Improper use or improper installation of a booster seat can increase the risk or severity of injury for both the child and other occupants of the vehicle and can lead to serious injury or death in an accident.
- Do not use towels, books, pillows or other items in place of a booster seat. Items such as these may move during normal driving or a collision and result in serious injury or death. Booster seats are designed to be used with a lap/shoulder belt. Booster seats are designed to properly route the lap and shoulder portions of the seat belt over the strongest portions of a child's body to provide the maximum protection during a collision.
- Follow all of the booster seat manufacturer's instructions for installation and use. When purchasing a booster seat, be sure to select one which will fit your child and vehicle. It may not be possible to properly install some types of booster seats in your vehicle.
- If the booster seat and seat belt is not used properly, the risk of a child being injured in a collision or a sudden stop greatly increases.
- Adjustable seatbacks should be positioned to fit the booster seat, but as upright as possible.

- **After placing the child in the booster seat and fastening the seat belt, make sure the shoulder portion of the belt is away from the child's face and neck and the lap portion of the belt does not cross the abdomen.**
- **Do not put the shoulder belt behind the child or under the child's arm. If you must install a booster seat in the front seat, see "Booster seat installation" later in this section.**
- **When your booster seat is not in use, keep it secured with a seat belt to prevent it from being thrown around in case of a sudden stop or accident.**

⚠CAUTION

Remember that a booster seat left in a closed vehicle can become very hot. Check the seating surface and buckles before placing your child in the booster seat.



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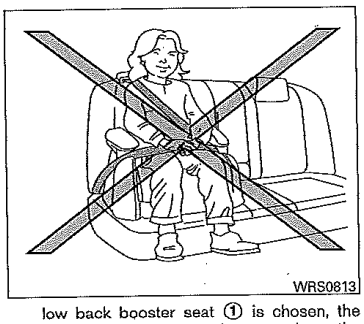
Booster seats of various sizes are offered by several manufacturers. When selecting any booster seat, keep the following points in mind:

- Choose only a booster seat with a label certifying that it complies with Federal Motor Vehicle Safety Standard 213 or Canadian Motor Vehicle Safety Standard 213.
- Check the booster seat in your vehicle to be sure it is compatible with the vehicle's seat and seat belt system.
- Make sure the child's head will be properly supported by the booster seat or vehicle seat. The seat back must be at or above the center of the child's ears. For example, if a low back booster seat ① is chosen, the vehicle seat back must be at or above the center of the child's ears. If the seat back is lower than the center of the child's ears, a high back booster seat ② should be used.


WRS0813

- If the booster seat is compatible with your vehicle, place your child in the booster seat and check the various adjustments to be sure the booster seat is compatible with your child. Always follow all recommended procedures.


WRS0811

All U.S. states and Canadian provinces or territories require that infants and small children be restrained in an approved child restraint at all times while the vehicle is being operated.

The instructions in this section apply to booster seat installation in the rear seats or the front passenger seat.

BOOSTER SEAT INSTALLATION

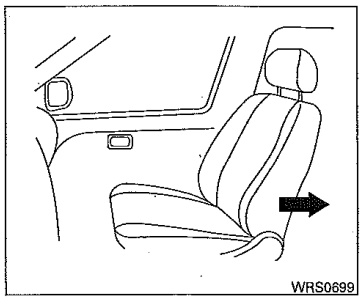
⚠WARNING

NISSAN recommends that booster seats be installed in the rear seat. However, if you must install a booster seat in the front passenger seat, move the passenger's seat to the rearmost position.

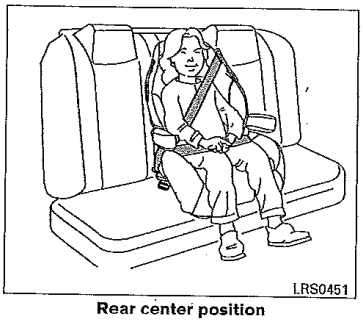
⚠CAUTION

Do not use the lap/shoulder belt Automatic Locking Retractor mode when using a booster seat with the seat belts.

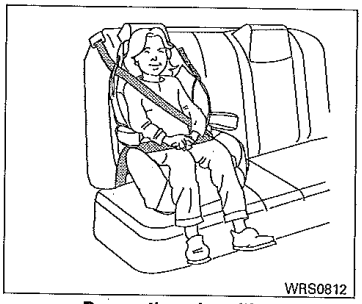
Follow these steps to install a booster seat in the rear seat or in the front passenger seat:


WRS0699

1. **If you must install a booster seat in the front seat, move the seat to the rearmost position.**
2. Position the booster seat on the seat. Only place it in a front facing direction. Always follow the booster seat manufacturer's instructions.

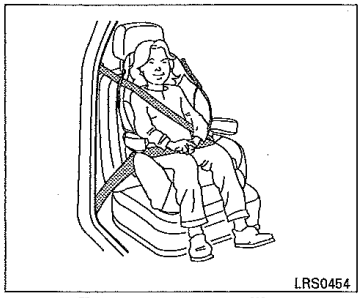


Rear center position



Rear outboard position

3. The booster seat should be positioned on the vehicle seat so that it is stable. If necessary, adjust or remove the head restraint to obtain the correct booster seat fit. See "Head restraint adjustment" earlier in this section. If the head restraint is removed, store it in a secure place. Be sure to install the head restraint when the booster seat is removed. If the seating position does not have an adjustable head restraint and it is interfering with the proper booster seat fit, try another seating position or a different booster seat.
4. Position the lap portion of the seat belt low and snug on the child's hips. Be sure to follow the booster seat manufacturer's instructions for adjusting the belt routing.
5. Pull the shoulder belt portion of the seat belt toward the retractor to take up extra slack. Be sure the shoulder belt is positioned across the top, middle portion of the child's shoulder. Be sure to follow the booster seat manufacturer's instructions for adjusting the belt routing.



Front passenger position

6. Follow the warnings, cautions and instructions for properly fastening a seat belt shown in the "Three-point seat belt with retractor" earlier in this section.

7. If the booster seat is installed in the front passenger seat, push the ignition switch to the ON position. The front passenger air bag status light may or may not illuminate, depending on the size of the child and the type of booster seat being used. See "Front passenger air bag and status light" later in this section.

SUPPLEMENTAL RESTRAINT SYSTEM

PRECAUTIONS ON SUPPLEMENTAL RESTRAINT SYSTEM

This Supplemental Restraint System (SRS) section contains important information concerning the driver and passenger supplemental front air bags (NISSAN Advanced Air Bag System), front seat-mounted side-impact supplemental air bags, roof-mounted curtain side-impact supplemental air bags and seat belt pretensionerss.

Supplemental front impact air bag system: The NISSAN Advanced Air Bag System can help cushion the impact force to the head and chest of the driver and front passenger in certain frontal collisions.

Front seat-mounted side-impact supplemental air bag system: This system can help cushion the impact force to the chest and pelvic area of the driver and front passenger in certain side impact collisions. The supplemental side air bag is designed to inflate on the side where the vehicle is impacted.

Roof-mounted curtain side-impact supplemental air bag system: This system can help cushion the impact force to the head of occupants in front and rear outboard seating positions in certain side impact collisions. The curtain side-

APPENDIX B
MANUFACTURER'S DATA (OVSC FORM 14)

FORM – 225
Rev. 03/20/07

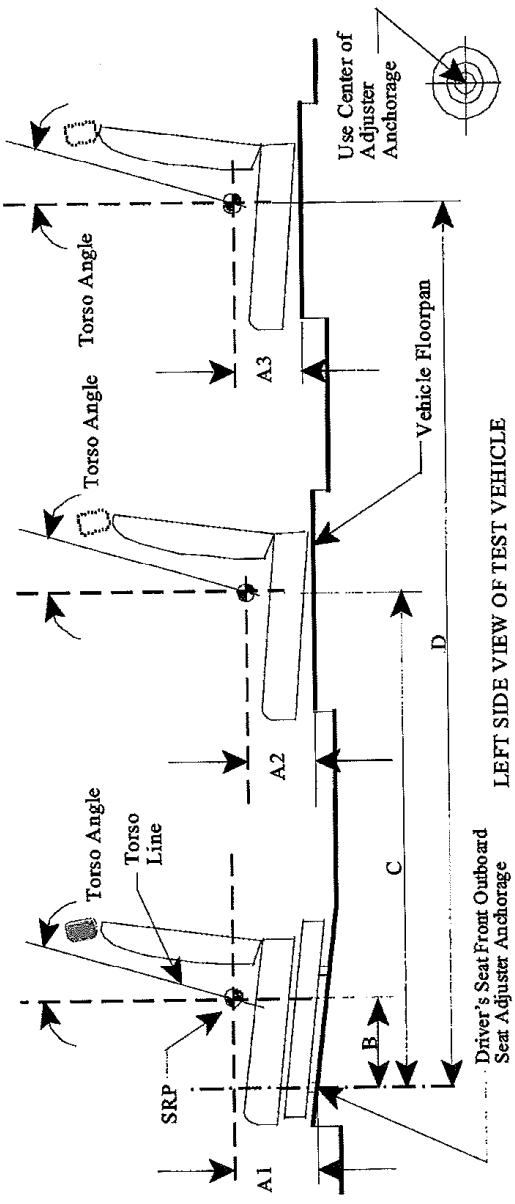
SEAT REFERENCE POINT (SRP) AND TORSO ANGLE DATA

FMVSS No. 225

(All dimensions in mm[1])

MODEL YEAR: 2008 / MAKE: Nissan / MODEL: Altima / BODY STYLE: Sedan

SEAT STYLE: FRONT ROW: Bucket / SECOND ROW: 60/40 Folding/Fixed Back / THIRD ROW: N/A



LEFT SIDE VIEW OF TEST VEHICLE

W-1411-Y
Attachment I
Page 1 of 10

Table 1. Seating Positions[1] and Torso Angles

		Left (Driver Side)	Center (if any)	Right
A1		210		210
A2		254	263	254
A3				
B		349		349
C		1221	1178	1221
D				
Torso Angle (degree)	Front Row	21		21
	Second Row	27	27	27
	Third Row			

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

W-1411-Y
Attachment I
Page 2 of 10

FORM - 225

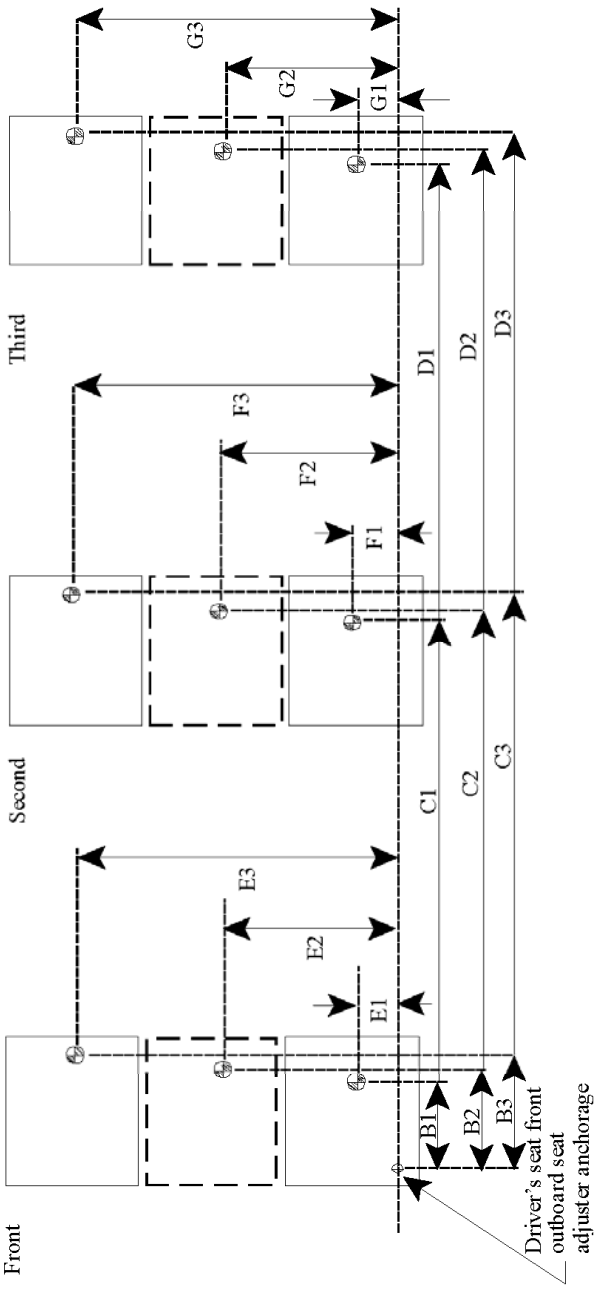
3

SEATING REFERENCE POINT

FMVSS No. 225
(All dimensions in mm)

MODEL YEAR: 2008 / MAKE: Mazda / MODEL: CX-7 / BODY STYLE: 5-Dr SUV

SEAT STYLE: FRONT ROW: Bucket / SECOND ROW: Split Bench / THIRD ROW: N/A



FORM – 225

4

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	*364.5*
	E1	*197*
	B2	*N/A*
	E2	*N/A*
	B3	*364.5*
	E3	*937*
Second Row	C1	*1191.5*
	F1	*227*
	C2	*1171.5*
	F2	*567*
	C3	*1191.5*
	F3	*907*
Third Row	D1	*N/A*
	G1	*N/A*
	D2	*N/A*
	G2	*N/A*
	D3	*N/A*
	G3	*N/A*

Note: Use the center of anchorage.

TETHER ANCHORAGE LOCATIONS

FMVSS No. 225

(All dimensions in mm)

MODEL YEAR: 2008 / MAKE: Nissan / MODEL: Altima / BODY STYLE: Sedan

SEAT STYLE: FRONT ROW: Bucket / SECOND ROW: 60/40 Folding/Fixed Back / THIRD ROW: N/A

●: SRP

✦: Tether anchorage

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

FORM – 225

W-1411-Y
Attachment I
Page 5 of 10

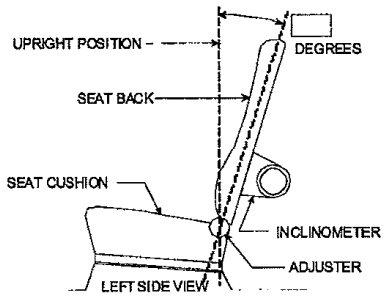
Table 3. Seating Reference Point and Tether Anchorage Locations

Seating Reference Point (SRP)	Distance from SRP	
Front Row	H1	
	K1	
	H2	
	K2	
	H3	
	K3	
Second Row	I1	537
	L1	0
	I2	580
	L2	0
	I3	537
	L3	0
Third Row	J1	
	M1	
	J2	
	M2	
	J3	
	M3	

Note: Use the center of anchorage.

NOMINAL DESIGN RIDING POSITION

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



Seat back angle for driver's seat = 21 degrees.

Measurement Instructions:

For manual seat, 7 clicks from the most upright position or 14 degrees off H/R post from the most upright position. For power seat, (1) Put the seat in full rear position, (2) Adjust the lift to get torsion tube center 54.5 mm above top edge of pivot bracket and (3) Rotate the back by 28 degrees.

Seat back angle for passenger's seat = 21 degrees.

Measurement Instructions:

7 clicks from the most upright position.

Seat back angle for 2nd row seat = 27 degrees.

Measurement Instructions:

Fixed for both folding and bench seat.

Seat back angle for 3rd row seat = _____ degrees.

Measurement Instructions:

N/A.

TETHER ANCHORAGE LOCATIONS - VERTICAL

FMVSS No. 225

(All dimensions in mm)

MODEL YEAR: 2008 / MAKE: Nissan / MODEL: Altima / BODY STYLE: Sedan

SEAT STYLE: FRONT ROW: Bucket / SECOND ROW: 60/40 Folding/Fixed Back / THIRD ROW: N/A

LEFT SIDE VIEW OF TEST VEHICLE

FORM – 225

W-1411-Y
Attachment I
Page 8 of 10

Table 4. Vertical Dimension For The Tether Anchorage

Seating Row	Vertical Distance from Seating Reference Point	
Front Row	N1 (Driver)	
	N2 (Center)	
	N3 (Right)	
Second Row	O1 (Left)	535
	O2 (Center)	526
	O3 (Right)	535
Third Row	P1 (Left)	
	P2 (Center)	
	P3 (Right)	

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

W-1411-Y
Attachment I
Page 9 of 10

FORM – 225