FINAL REPORT NUMBER 225-MGA-09-001

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

TOYOTA MOTOR COMPANY
2008 Toyota Avalon
NHTSA No. C85105

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Date: February 26, 2009
Report Date: May 19, 2009

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

Prepared By: _____
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Approval Date: 5/20/09

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: Edward E. Chan
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DN: CN = Edward E. Chan, C = US, O = National Highway Traffic Safety Administration, OU = Office of Vehicle Safety Compliance
Date: 2009.05.21 15:31:06 -04'00'

Acceptance Date: _____

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 225-MGA-09-001	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 225 Compliance Testing of a 2008 Toyota Avalon, NHTSA No. C85105		5. Report Date May 19, 2009 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-09-001	
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-00030/0006	
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 Toyota Avalon, NHTSA No. C85105, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-225-01 for the determination of FMVSS 225 compliance. The test was conducted at MGA Research Corporation in Troy, Michigan on February 26, 2009. Test failures identified were as follows: NONE The data recorded indicates that the 2008 Toyota Avalon tested appears to meet the requirements of FMVSS 225.			
17. Key Words Compliance Testing Safety Engineering FMVSS 225 2008 Toyota Avalon		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 81	22. Price

Form DOT F 1700.7 (8-70)

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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-00030/0006. The purpose of the testing was to determine if the subject vehicle, a 2008 Toyota Avalon, NHTSA No. C85105 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) and the center seating position was equipped with a tether anchorage. The center-to-center spacing between the 2nd row outboard lower anchorages was approximately 780 mm. The 2nd row left and right outboard seating positions were tested with the SFADII.

2.0 COMPLIANCE TEST AND DATA SUMMARY

TEST SUMMARY

The testing was conducted at MGA in Troy, Michigan on February 26, 2009.

Based on the test results, the 2008 Toyota Avalon appears to meet the requirements of FMVSS No. 225 for this testing.

The SFADII at the 2nd row left seating position sustained a maximum force of 4,984 N and held the required load for 3 seconds and the total displacement was 59 mm. The SFADII at the 2nd row right seating position sustained a maximum force of 4,965 N and held the required load for 3 seconds and the total displacement was 43 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)
SC9090	SFADII	Lateral Right	2nd Row Left	4,984	59
			2nd Row Right	4,965	43

3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

VEH. MOD YR/MAKE/MODEL/BODY	2008 Toyota Avalon
VEH. NHTSA NO.	C85105
VIN	4T1BK36B78U274891
COLOR	Black
VEH. BUILD DATE	11/07
TEST DATE	February 26, 2009
TEST LABORATORY	MGA Research Corporation
OBSERVERS	Fern Gatilao , Brad Reaume, Kenney Godfrey

GENERAL INFORMATION:

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Toyota Motor Manufacturing

Date of Manufacture: 11/07; VIN: 4T1BK36B78U274891

GVWR: 4565 lbs GAWR FRONT: 2665 lbs

GAWR REAR: 2505 lbs

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 29 psi REAR: 29 psi

Recommended Tire Size: P215/60R16

Recommended Cold Tire Pressure:

FRONT: 29 psi REAR: 29 psi

Size of Tire on Test Vehicle: P215/60R16

Size of Spare Tire: P215/60R16

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 629 & 635 (6/4/09)
String Potentiometer Calibrated at each use	S/N L1608956A/C1801426A
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	TPM848 (7/28/09)
MGA Data Acquisition System	N/A
Digital Calipers	04456455 (3/19/09)
Force Gauge	MGA00014 (6/4/09)
Inclinometer (Digital)	MGA0050 (8/22/09)

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	Yes		N/A
	Ctr		N/A		
	RH		Yes		
Each of the bars is visible, without the compression of the seat cushion or seat back, when the bar is viewed, in a vertical longitudinal plane passing through the center of the bar, along a line marking an upward 30 degree angle with a horizontal plane.	LH	N/A	N/A		N/A
	Ctr		N/A		
	RH		N/A		
Diameter of the bar (mm)	LH	N/A	5.95	5.96	N/A
	Ctr		N/A		
	RH		5.95	5.98	
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	65		N/A
	Ctr		N/A		
	RH		65		
Measure the distance between the SRP to the front of the anchorage bar (mm)	LH	N/A	190	190	N/A
	Ctr		N/A		
	RH		180	180	

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	35	35	N/A
		Req't<60		45	50	
	Ctr	Req't>25		N/A		
		Req't<60		N/A		
	RH	Req't>25		34	33	
		Req't<60		40	55	
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	16.2	N/A	0.9
2nd Row Center	N/A	N/A	N/A
2nd Row Right	16.2	N/A	0.7

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	II	0	14	167	5,000	4,984	73	59
	Ctr.			Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	RH			Yes	II	0	26	167	5,000	4,965	69	43
Third Row		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

6.0 PHOTOGRAPHS

6.1 Front view

6.2 Rear view


XL
AVALON
TOYOTA
NHTSA 2008 Toyota Avalon
Rear View
FMVSS 225
C85105

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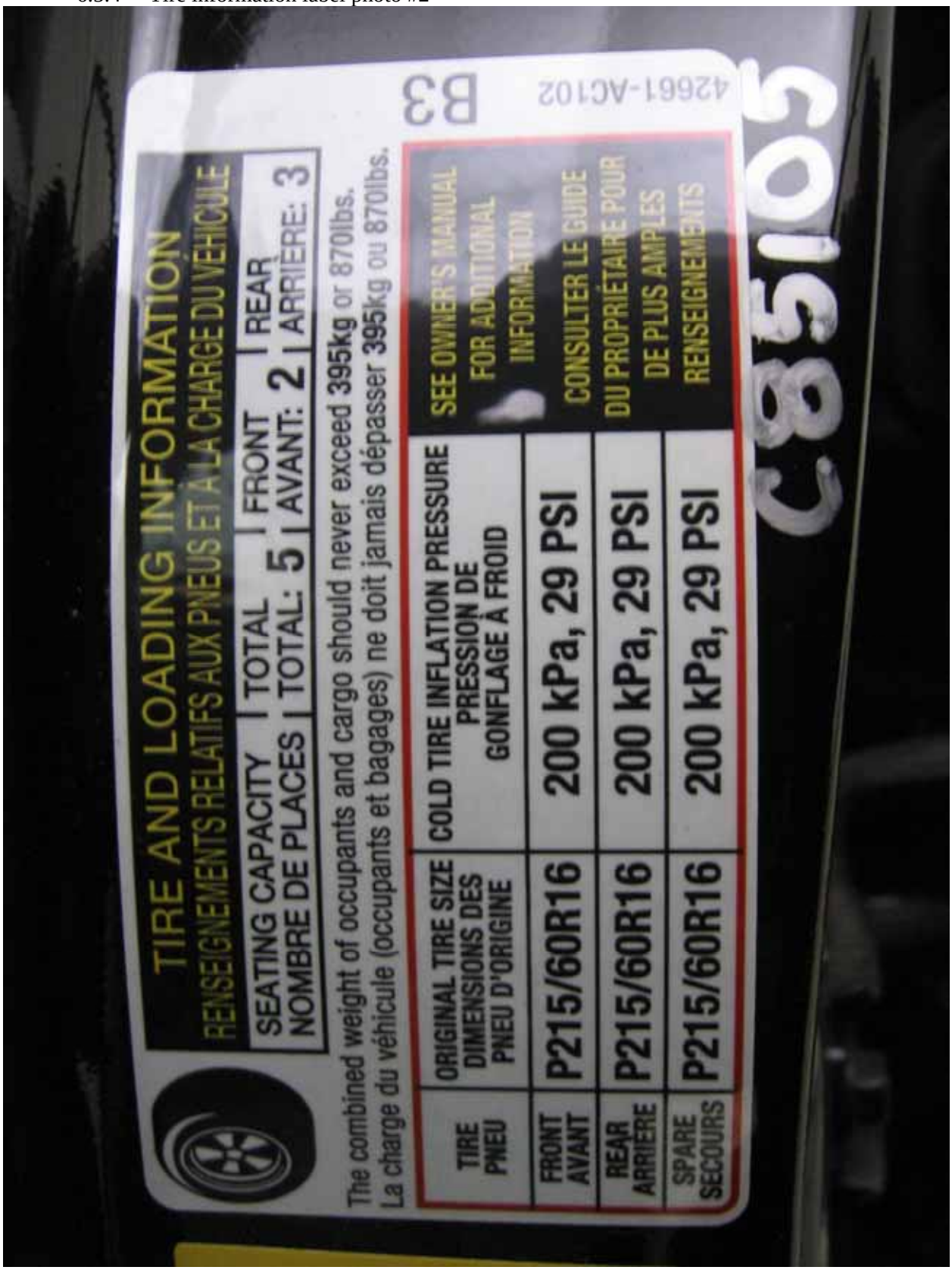
6.5 Test vehicle's certification label

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

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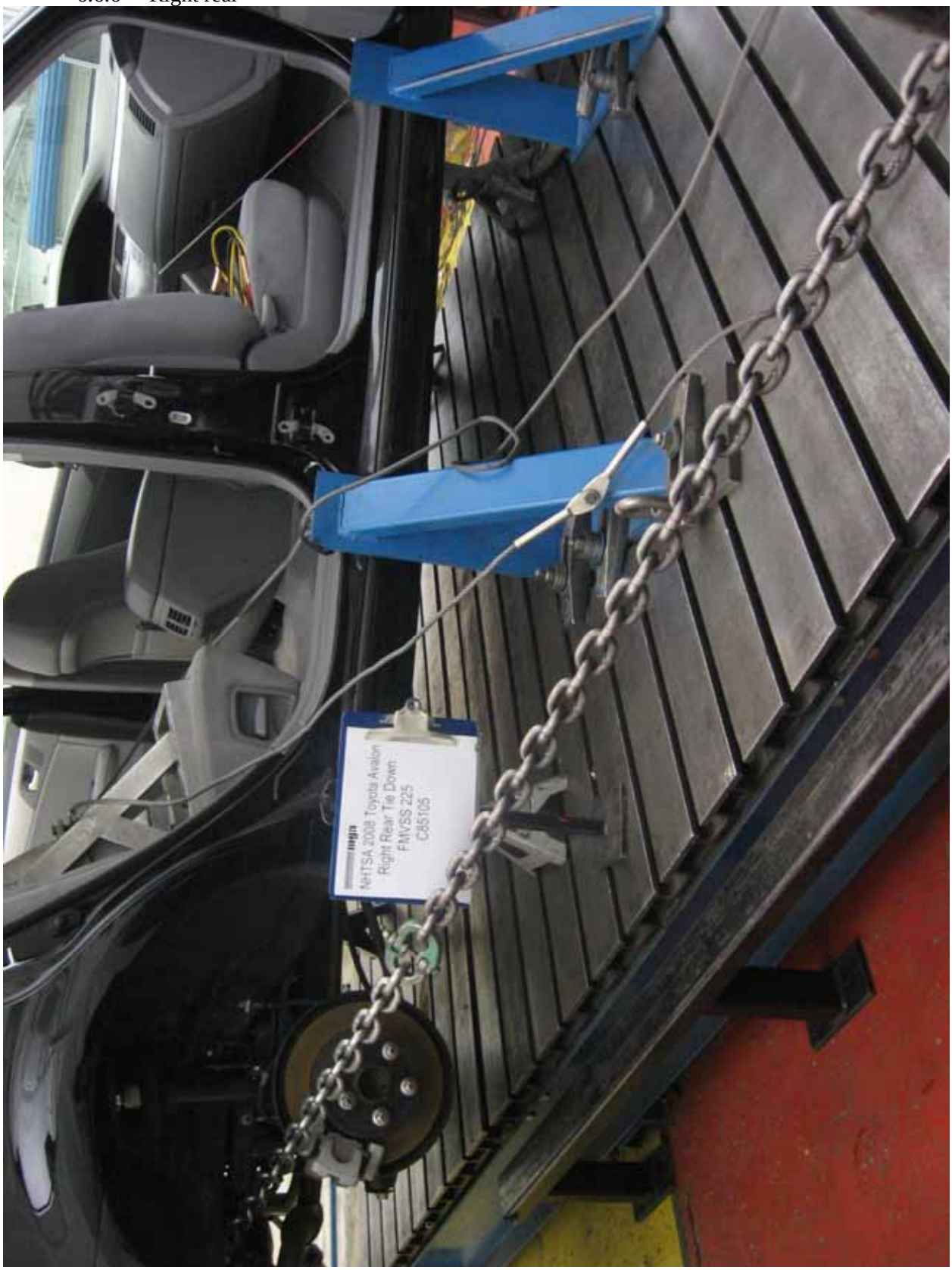

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6.9.2 SFAD II LH & RH

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6.10.2 Pre-test photo

6.10.3 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

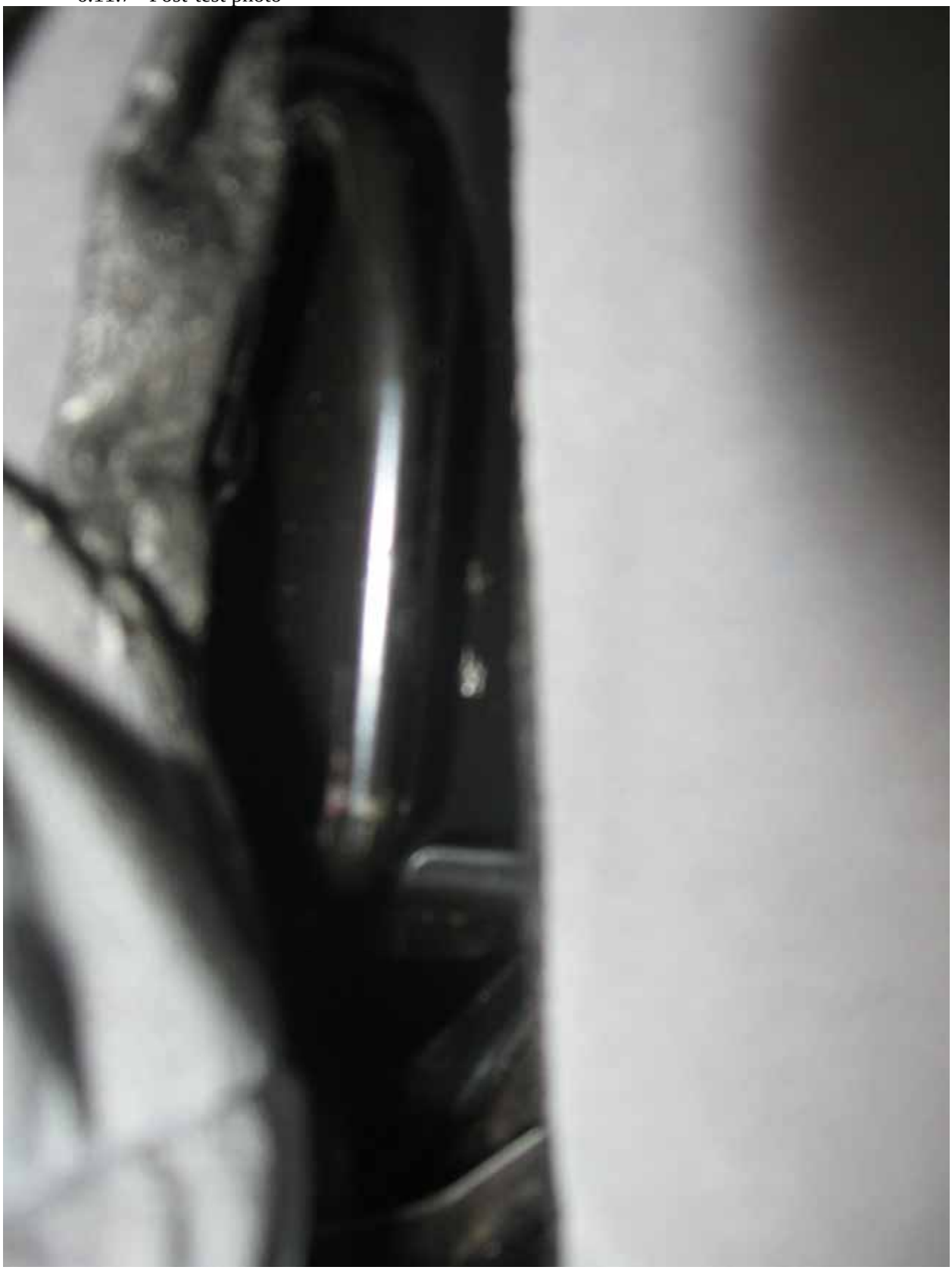
6.11.3 Post-test photo

6.11.4 Post-test photo

6.11.5 Post-test photo

6.11.6 Post-test photo

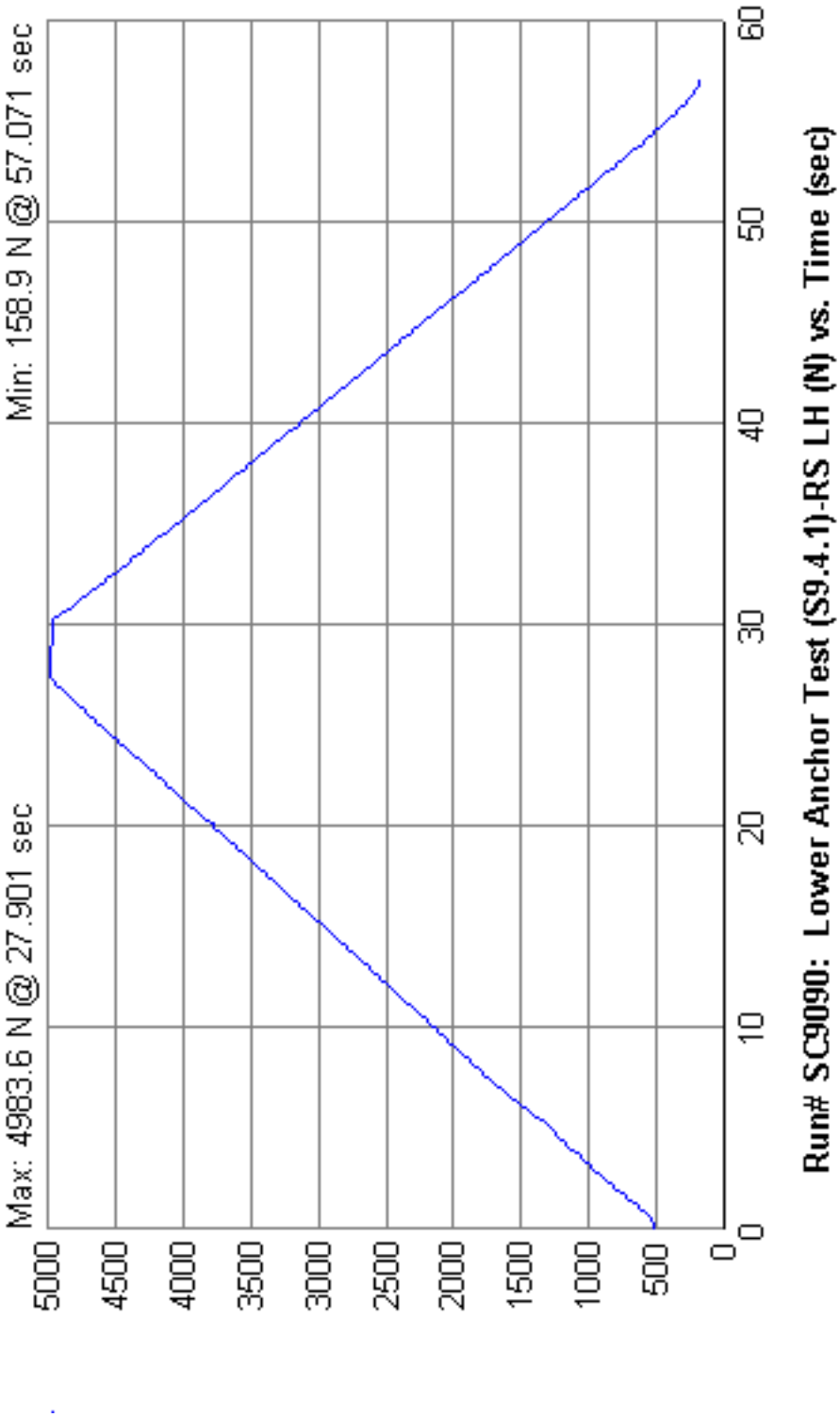
6.11.7 Post-test photo

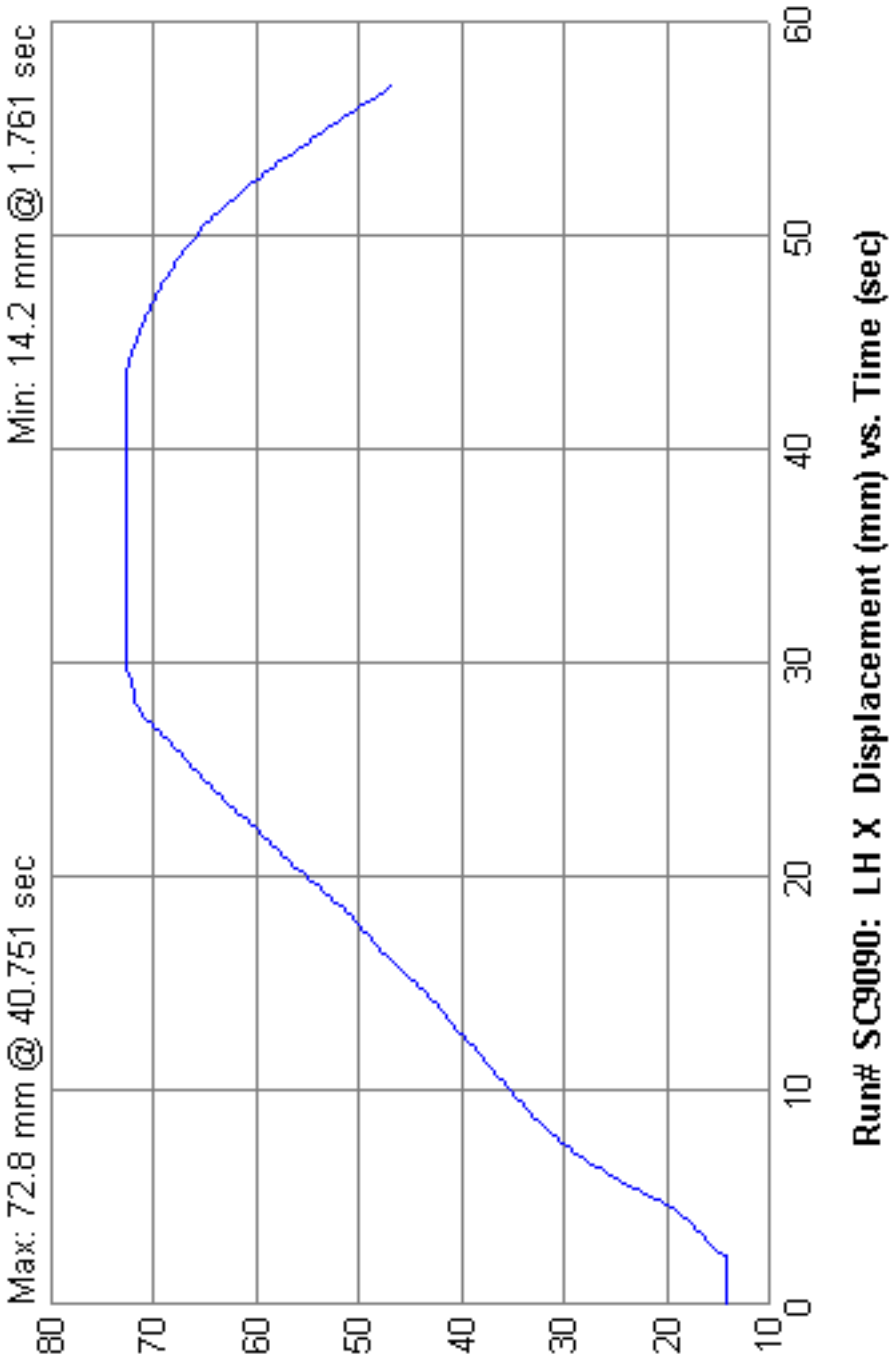


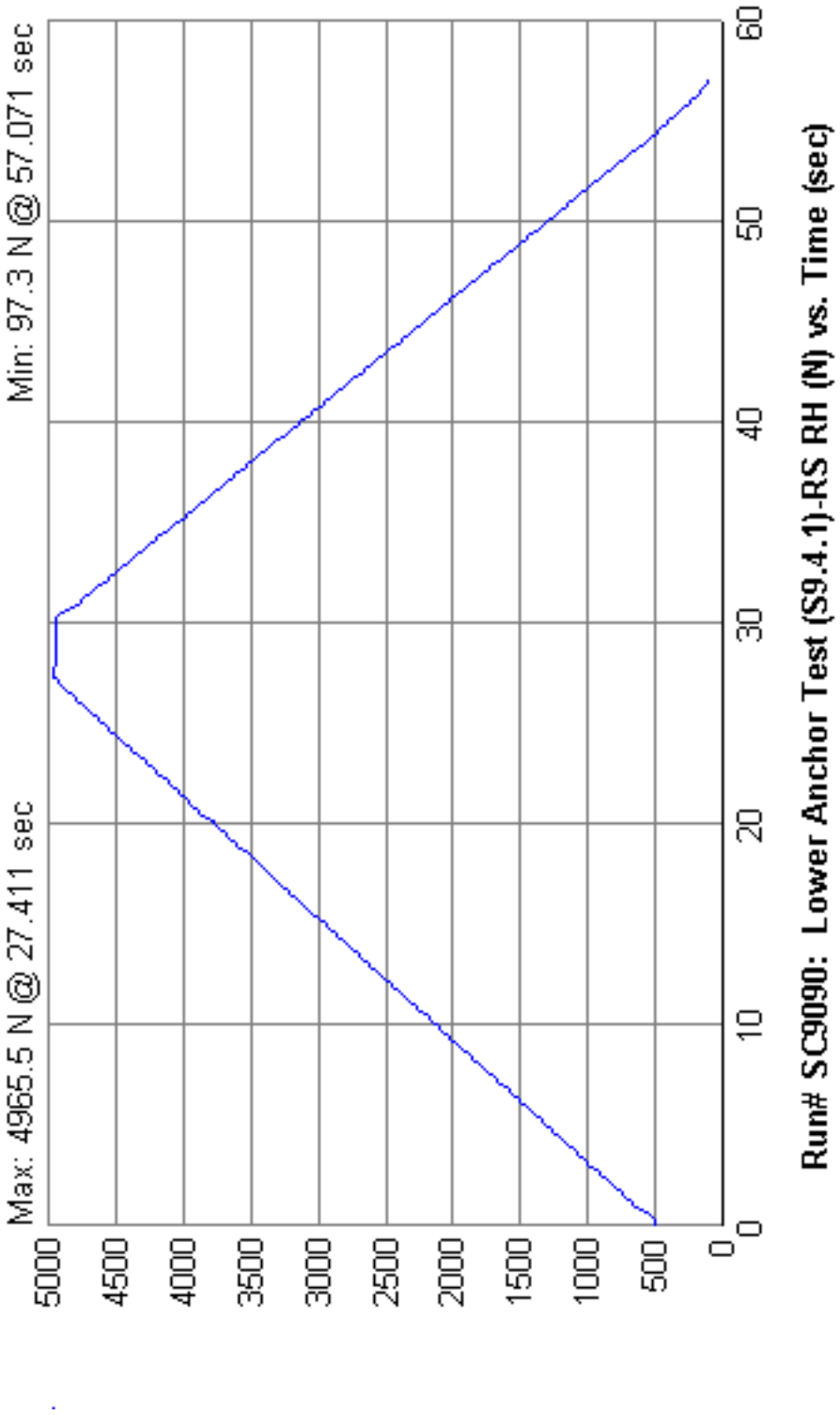
6.11.8 Post-test photo

6.11.9 Post-test photo

7.0 PLOTS


Run# SC9090: Lower Anchor Test (S9.4.1)-RS LH (N) vs. Time (sec)
Max: 4983.6 N @ 27.901 sec
Min: 158.9 N @ 57.071 sec
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60


Max: 72.8 mm @ 40.751 sec
Min: 14.2 mm @ 1.761 sec
Run# SC9090: LH X Displacement (mm) vs. Time (sec)
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60


Run# SC9090: Lower Anchor Test (S9.4.1)-RS RH (N) vs. Time (sec)
Max: 4965.5 N @ 27.411 sec
Min: 97.3 N @ 57.071 sec
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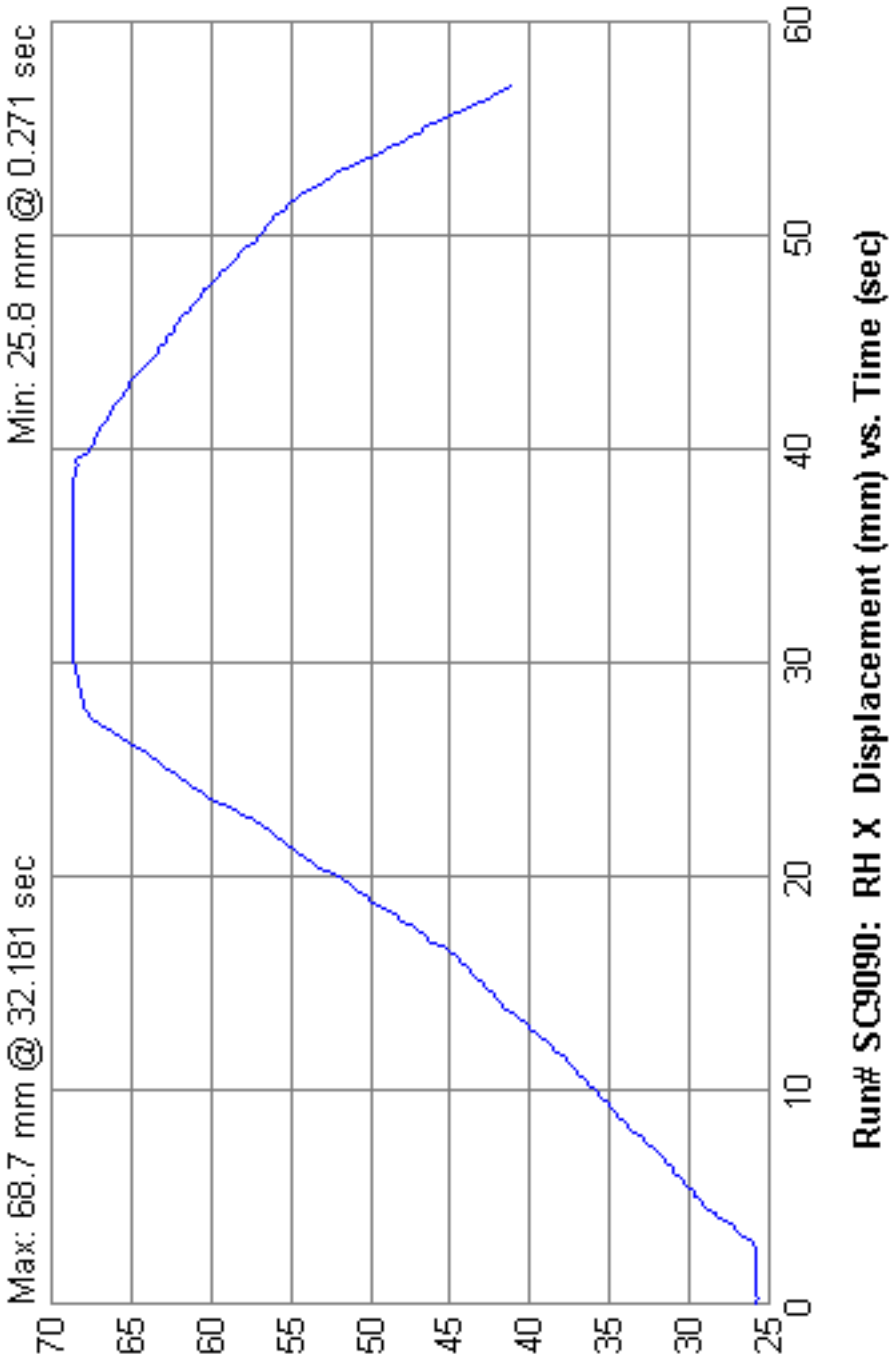
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60


Run# SC9090: RH X Displacement (mm) vs. Time (sec)
Max: 68.7 mm @ 32.181 sec
Min: 25.8 mm @ 0.271 sec
70
65
60
55
50
45
40
35
30
25
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-00030/0006 DATE: February 26, 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. 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 Toyota Avalon

VEH. NHTSA NO.: C85105 VIN: 4T1BK36B78U274891

COLOR: Black

ODOMETER READINGS: ARRIVAL 26 miles Date: 7/9/08

COMPLETION 26 miles Date: 2/26/09

PURCHASE PRICE: $Unknown DEALER'S NAME: Unknown

ENGINE DATA: 6 Cylinders 3.7 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	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
X	Power Seat(s)	X	Tachometer	X	Front Disc Brakes
X	Power Brakes	X	Tilt Steering Wheel	X	Rear Disc Brakes
	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: February 26, 2009

APPROVED BY: Brad Reaume

APPENDIX A
OWNERS MANUAL CHILD RESTRAINT SYSTEMS

1-7. Safety information

Child restraint systems

A child restraint system for a small child or baby must itself be properly restrained on the seat with the lap portion of the lap/shoulder belt.

The laws of all 50 states of the U.S.A. and Canada now require the use of child restraint systems.

Points to remember

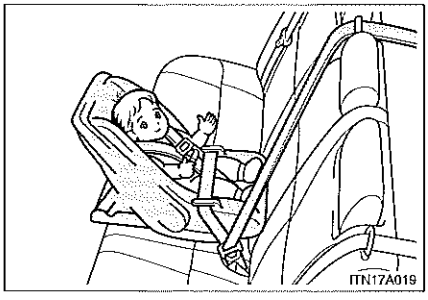
Studies have shown that installing a child restraint on a rear seat is much safer than installing one to the front passenger seat.

- Choose a child restraint system appropriate to the age and size of the child.
- For installation details, follow the instructions provided with the child restraint system.
  General installation instructions are provided in this manual.
  (→P. 102)

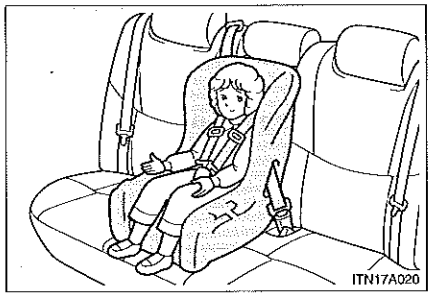
Types of child restraints

Child restraint systems are classified into the following 3 types according to the age and size of the child.

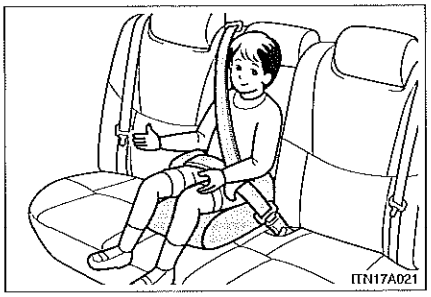
▶ Infant seat



▶ Convertible seat



▶ Booster seat



When the child restraint system is not in use

Leave the child restraint system properly secured on the seat. Do not store the restraint loosely on a passenger seat or in the trunk.

Selecting an appropriate child restraint system

Get an appropriate child restraint system for the child. If a child is too large for a child restraint system, sit the child on a rear seat and use the vehicle's seat belt. (→P. 54)

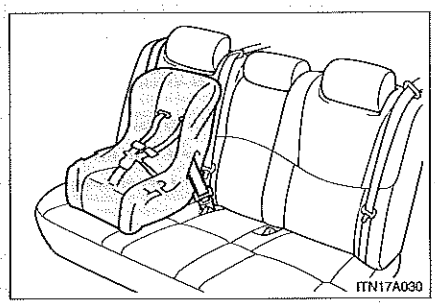
⚠ CAUTION

■ Child restraint precautions

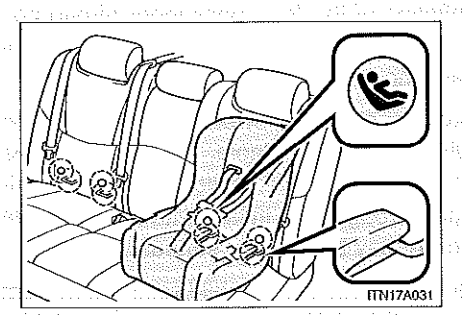
- For effective protection in automobile accidents and sudden stops, a child must be properly restrained, using a seat belt or child restraint system depending on the age and size of the child. Holding a child in your arms is not a substitute for a child restraint system. In an accident, the child can be crushed against the windshield, or between you and the vehicle's interior.
- Toyota strongly urges the use of a proper child restraint system that conforms to the size of the child, installed on the rear seat. According to accident statistics, the child is safer when properly restrained in the rear seat than in the front seat.
- Never install a rear-facing child restraint system on the front passenger seat even if "AIR BAG OFF" indicator light is illuminated. In the event of an accident, the force of the rapid inflation of the front passenger airbag can cause death or serious injury to the child if the rear-facing child restraint system is installed on the front passenger seat.
- A forward-facing child restraint system should allowed to be installed on the front passenger seat only when it is unavoidable. Always move the seat as far back as possible even if "AIR BAG OFF" indicator light is illuminated, because the front passenger airbag could inflate with considerable speed and force. Otherwise, the child may be killed or seriously injured.
- Do not use the seat belt extender when installing a child restraint system on the front or rear passenger seat. If installing a child restraint system with the seat belt extender connected to the seat belt, the seat belt will not securely hold the child restraint system, which could cause death or serious injury to the child or other passengers in the event of collision.
- Do not allow the child to lean his/her head or any part of his/her body against the door or the area of the seat, front pillar or roof side rail from which the side airbags or curtain shield airbags deploy even if the child is seated in the child restraint system. It is dangerous if the side airbags and curtain shield airbags inflate, and the impact could cause death or serious injury to the child.
- Make sure you have complied with all installation instructions provided by the child restraint manufacturer and that the system is properly secured. If it is not secured properly, it may cause death or serious injury to the child in the event of a sudden stop or accident.

1-7. Safety information
Installing child restraints

Follow the child restraint system manufacturer's instructions. Firmly secure child restraints to the outboard rear seats using a seat belt or a child restraint lower anchor belt. Attach the top strap when installing a child restraint.

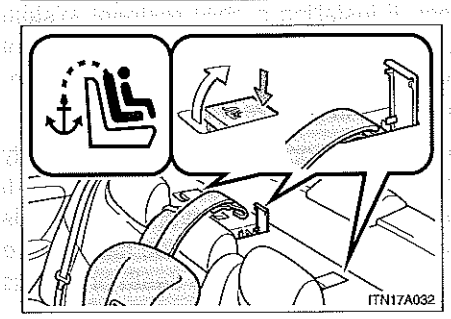


Seat belts equipped with a child restraint locking mechanism (ALR/ELR belts except driver's seat belt) (→P. 57)



Child restraint lower anchorages

Lower anchorages are provided for the outboard rear seats. (Buttons displaying the location of the anchorages are attached to the seats.)



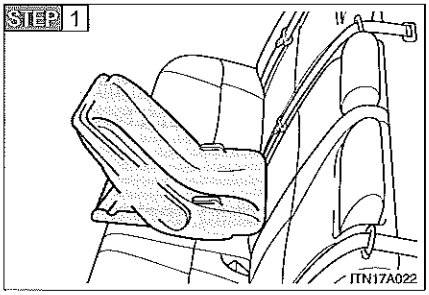
Anchor bracket (for top strap)

Anchor brackets are provided for all rear seats.

Installing child restraints using a seat belt (child restraint lock function belt)

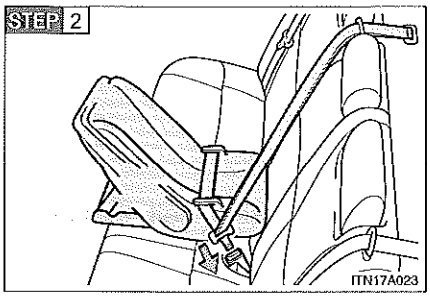
Rear-facing — Infant seat/convertible seat

STEP 1



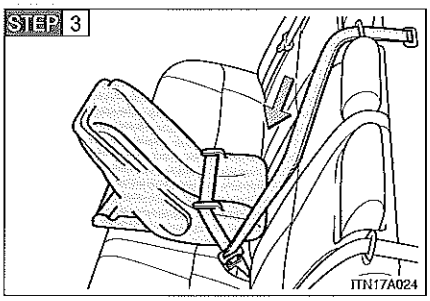
Place the child seat on the rear seat facing the rear of the vehicle.

STEP 2



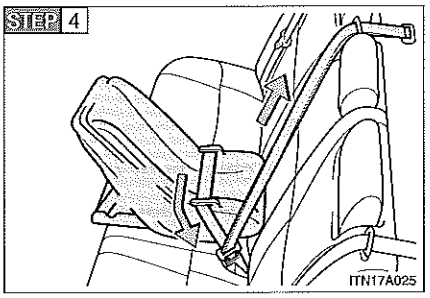
Run the seat belt through the child seat and insert the plate into the buckle. Make sure that the belt is not twisted.

STEP 3



Fully extend the shoulder belt and then allow it to retract slightly in order to activate the ALR lock mode.

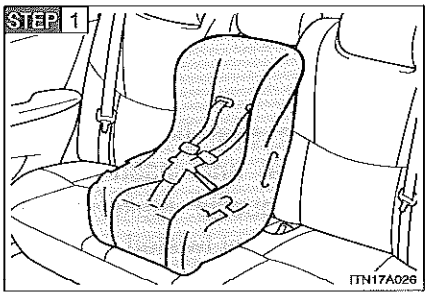
Lock mode allows the seat belt to retract only.



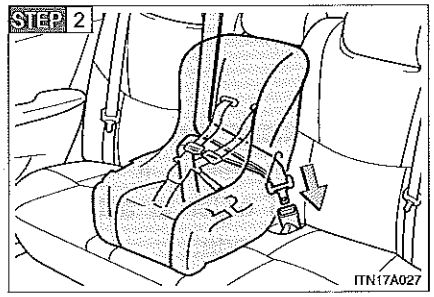
While pushing the child seat down into the rear seat, allow the shoulder belt to retract until the child seat is securely in place.

After the shoulder belt has retracted to a point where there is no slack in the belt, pull the belt to check that it cannot be extended.

Forward-facing — Convertible seat



Place the child seat on the seat facing the front of the vehicle.



Run the seat belt through the child seat and insert the plate into the buckle. Make sure that the belt is not twisted.

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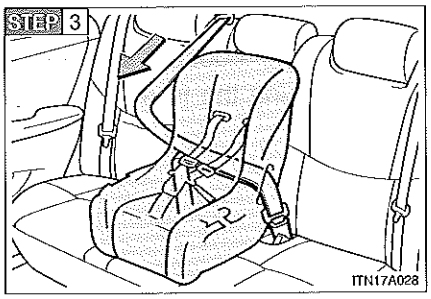
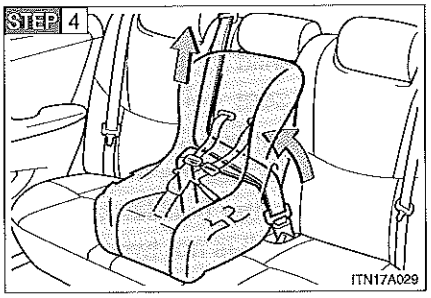


Fully extend the shoulder strap and then allow it to retract slightly into the ALR lock mode.

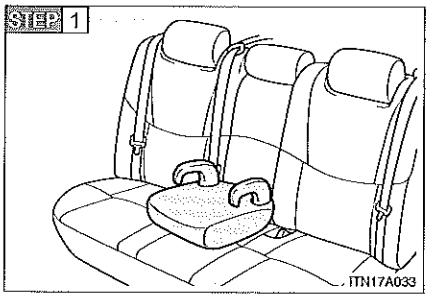
Lock mode allows the seat belt to retract only.



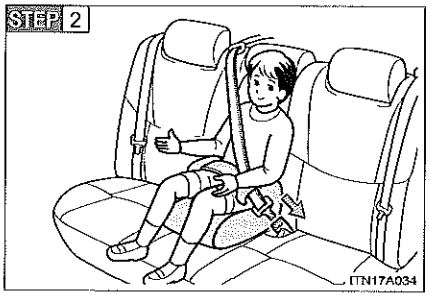
While pushing the child seat into the rear seat, allow the shoulder belt to retract until the child seat is securely in place.

After the shoulder belt has retracted to a point where there is no slack in the belt, pull the belt to check that it cannot be extended.

Booster seat



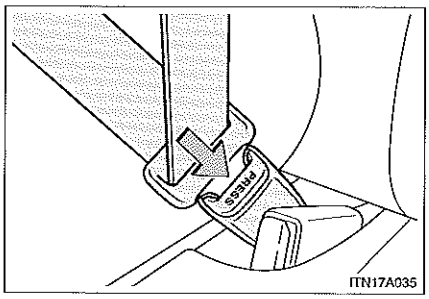
Place the booster seat on the seat facing the front of the vehicle.



Sit the child in the booster seat. Fit the seat belt to the booster seat according to the manufacturer's instructions and insert the plate into the buckle. Make sure that the belt is not twisted.

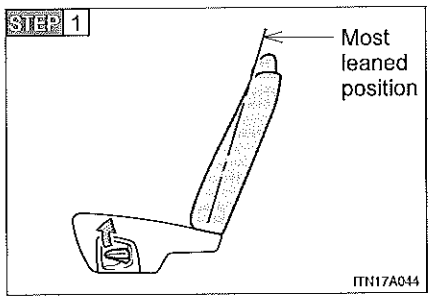
Check that the shoulder belt is correctly positioned over the child's shoulder, and that the lap belt is as low as possible.
(→P. 54)

Removing a child restraint installed with a seat belt



Push the buckle release button and fully retract the seat belt.

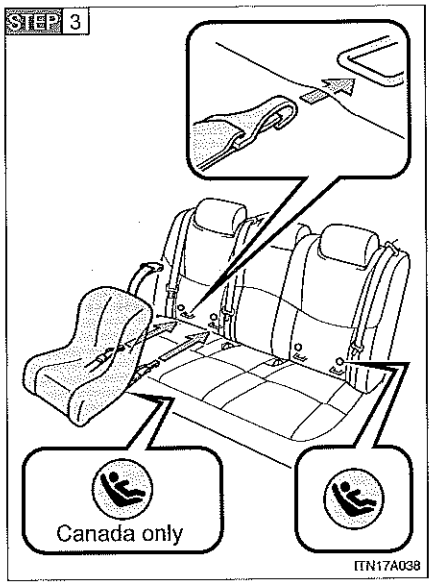
Installation with child restraint lower anchorages



Adjust the seatback to the most leaned position.

STEP 2 Widen the gap between the seat cushion and seatback slightly.

▶ Type A

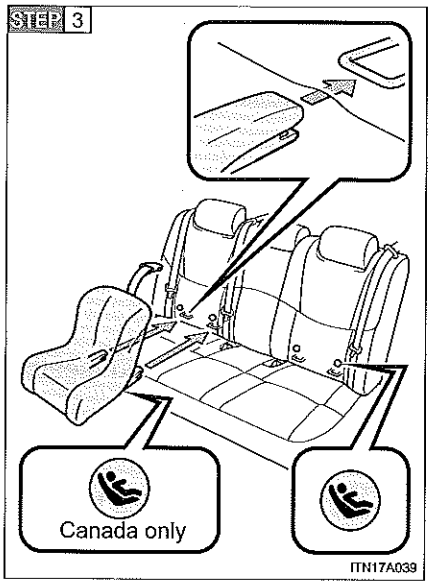


Latch the hooks of the lower straps onto the anchorages.

If the child restraint has a top strap, the top strap should be latched onto the anchorage.

For owners in Canada:
The symbol on a child restraint system indicates the presence of a lower anchorage system.

▶ Type B

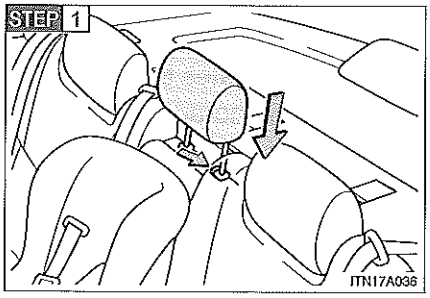


Latch the buckles onto the anchorages.

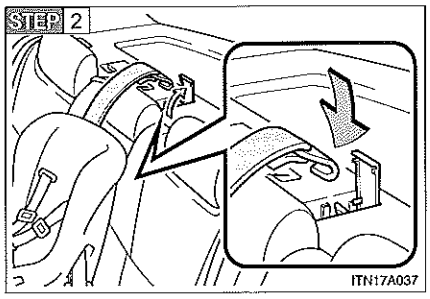
If the child restraint has a top strap, the top strap should be latched onto the anchorage.

For owners in Canada:
The symbol on a child restraint system indicates the presence of a lower anchorage system.

Child restraint systems with a top strap



Secure the child restraint using a seat belt or lower anchors, and lock the head restraint in place at the lowest position.



Open the anchor bracket cover, latch the hook onto the anchor bracket and tighten the top strap.

Make sure the top strap is securely latched.

Laws and regulations pertaining to anchorages

Anchorages conform to FMVSS225 or CMVSS210.2.
Child restraint systems conforming to FMVSS213 or CMVSS213 specifications can be used.
This vehicle is designed to conform to the SAE J1819.

⚠ CAUTION

When installing a booster seat

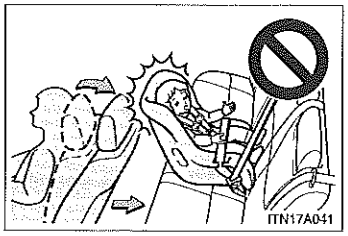
Do not fully extend the shoulder belt to prevent the belt from going to ALR lock mode: (→P. 57)

- ALR mode causes the belt to tighten only which could cause injury or discomfort to the child.
- Do not allow the child to play with the seat belt or the child could be killed or serious injured.

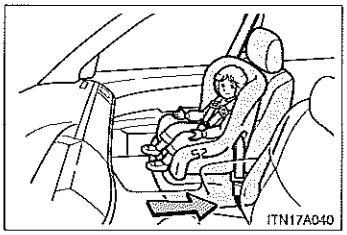
⚠ CAUTION

■When installing a child restraint system

Follow the directions given in the child restraint system installation manual and fix the child restraint system securely in place.
If the child restraint system is not correctly fixed in place, the child may be injured or even killed in the event of sudden braking or an accident.



- If the driver's seat interferes with the child restraint system and prevents it from being attached correctly, attach the child restraint system to the right-hand rear seat.



- Only put a forward-facing child seat on the front seat when unavoidable. When installing a forward-facing child restraint on the front passenger seat, move the seat as far back as possible even if "AIR BAG OFF" indicator light is illuminated. Failing to do so may result in death or serious injury if the airbags deploy (inflate).

- When a booster seat is installed, always ensure that the shoulder belt is positioned across the center of the child's shoulder. The belt should be kept away from the child's neck, but not so that it could fall off the child's shoulder. Failing to do so may result in death or serious injury in the event of an accident or sudden braking.
- Ensure that the belt and tab are securely locked and the seat belt is not twisted.
- Push and pull the child restraint system in different directions to be sure it is secure.
- Follow all installation instructions provided by the child restraint system manufacturer.

⚠ CAUTION

■ Do not use a seat belt extender

If a seat belt extender is used when installing a child restraint system, the seat belt will not securely hold the child restraint system, which could cause death or serious injury to the child or other passengers in the event of a collision.

■ To correctly attach a child restraint system to the anchorages

When using the lower anchorages, be sure that there are no foreign objects around the anchorages and that the seat belt is not caught behind the child seat. Make sure the child restraint system is securely attached, or it may cause death or serious injury to the child in the event of a sudden stop or accident.

APPENDIX B
MANUFACTURER'S DATA (OVSC FORM 14)

C85105

Attachment 24

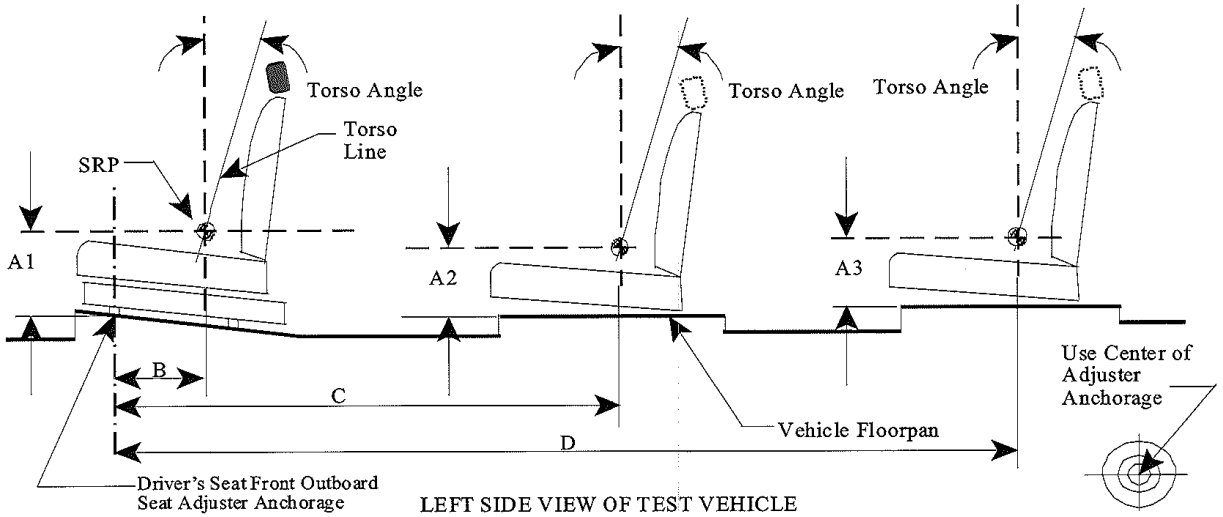
FORM – 225
Rev. 03/20/07

SEAT REFERENCE POINT (SRP) AND TORSO ANGLE DATA

FMVSS No. 225
(All dimensions in mm[1])

MODEL YEAR: 2008 / MAKE: Toyota / MODEL: Avalon / BODY STYLE: 4Door Sedan

SEAT STYLE: FRONT ROW: Separate / SECOND ROW: 40/60 Split Bench / THIRD ROW: N/A



LEFT SIDE VIEW OF TEST VEHICLE

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Table 1. Seating Positions[1] and Torso Angles

		Left (Driver Side)	Center (if any)	Right
A1		244.5	N/A	244.5
A2		245.6	270.3	245.6
A3		N/A	N/A	N/A
B		382.4	N/A	382.4
C		1290.7	1257.3	1290.7
D		N/A	N/A	N/A
Torso Angle (degree)	Front Row	21	N/A	21
	Second Row	25	25	25
	Third Row	N/A	N/A	N/A

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

FORM – 225

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SEATING REFERENCE POINT

FMVSS No. 225

(All dimensions in mm)

MODEL YEAR: 2008 / MAKE: Toyota / MODEL: Avalon / BODY STYLE: 4Door Sedan

SEAT STYLE: FRONT ROW: Separate / SECOND ROW: 40/60 Split Bench / THIRD ROW: N/A

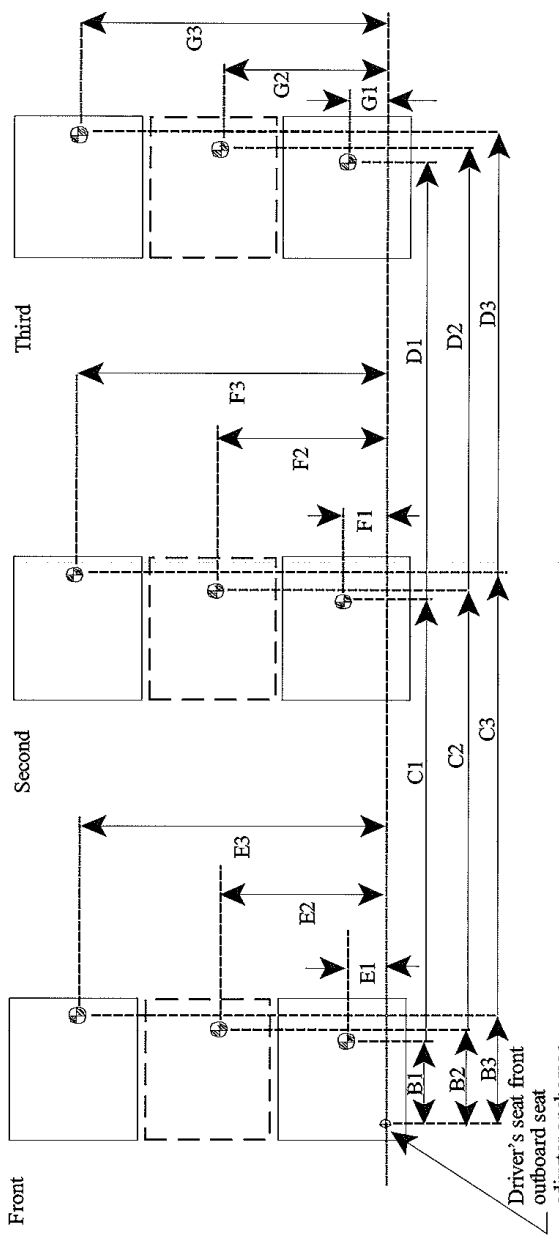

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Table 2. Seating Reference Point and Tether Anchorage Locations

Seating Reference Point (SRP)		Distance from Driver's front outboard seat adjuster anchorage[1]
Front Row	B1	382.4
	E1	212.0
	B2	N/A
	E2	N/A
	B3	382.4
	E3	972.0
Second Row	C1	1290.7
	F1	212.0
	C2	1257.3
	F2	592.0
	C3	1290.7
	F3	972.0
Third Row	D1	N/A
	G1	N/A
	D2	N/A
	G2	N/A
	D3	N/A
	G3	N/A

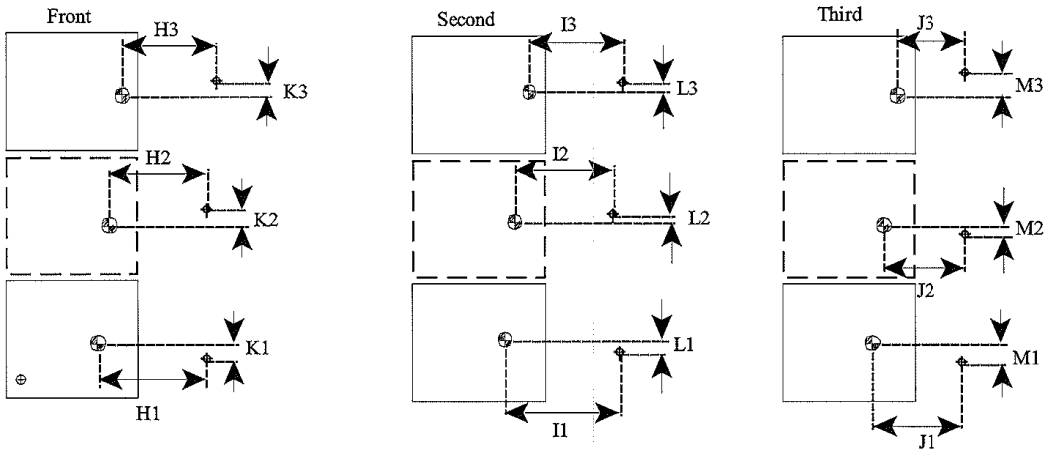
Note: Use the center of anchorage.

TETHER ANCHORAGE LOCATIONS

FMVSS No. 225
(All dimensions in mm)

MODEL YEAR: 2008 / MAKE: Toyota / MODEL: Avalon / BODY STYLE: 4Door Sedan

SEAT STYLE: FRONT ROW: Separate / SECOND ROW: 40/60 Split Bench / THIRD ROW: N/A



⊕: SRP
⊕: Tether anchorage

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

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Table 3. Seating Reference Point and Tether Anchorage Locations

Seating Reference Point (SRP)	Distance from SRP	
Front Row	H1	N/A
	K1	N/A
	H2	N/A
	K2	N/A
	H3	N/A
	K3	N/A
Second Row	I1	658.1
	L1	0
	I2	684.8
	L2	0
	I3	658.1
	L3	0
Third Row	J1	N/A
	M1	N/A
	J2	N/A
	M2	N/A
	J3	N/A
	M3	N/A

Note: Use the center of anchorage.

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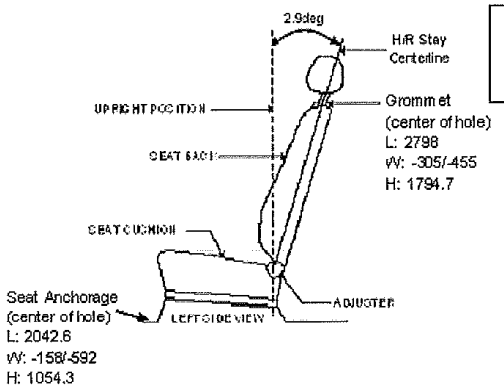
NOMINAL DESIGN RIDING POSITION

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

Seat back angle for driver's seat = 2.9 degrees (from vertical).



Use for the following seats:
1. 8Way PWR LH
2. 8Way PWR LH w/ CLA

Measurement Instructions:

Put seat into full rearward and mid lift. Use grommet and seat adjuster anchor coordinates to position seat accordingly. Recline until headrest stay angle reaches 2.9 degrees from vertical.

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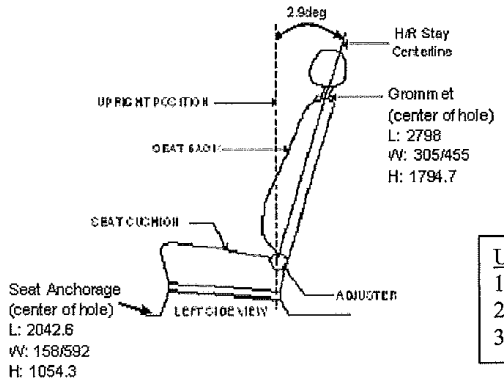
Seat back angle for passenger's seat = 2.9 degrees (from vertical).



Use for the following seats:
1. 8Way PWR RH
2. 4Way PWR RH
3. 4Way MNL RH

Measurement Instructions:

8Way PWR RH: Put seat to full rearward and lift lowermost. Recline until headrest stay angle reaches 2.9 degrees from vertical.

4Way PWR RH: Put seat to full rearward. Recline until headrest stay angle reaches 2.9 degrees from vertical.

4Way MNL RH: Put seat full rearward and recline 4 notches rearward from full forward.

Seat back angle for 2nd row seat = 25 degrees (torso line).

Measurement Instructions:

Bring seatback to full forward.

Seat back angle for 3rd row seat = N/A degrees.

Measurement Instructions:

N/A

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TETHER ANCHORAGE LOCATIONS - VERTICAL

FMVSS No. 225
(All dimensions in mm)

MODEL YEAR: 2008 / MAKE: Toyota / MODEL: Avalon / BODY STYLE: 4Door Sedan

SEAT STYLE: FRONT ROW: Separate / SECOND ROW: 40/60 Split Bench / THIRD ROW: N/A

LEFT SIDE VIEW OF TEST VEHICLE

FORM – 225

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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)	509.1
	O2 (Center)	484.4
	O3 (Right)	509.1
Third Row	P1 (Left)	N/A
	P2 (Center)	N/A
	P3 (Right)	N/A

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

FORM – 225

For each vehicle, provide the following information:

1. How many designated seating positions exist in the vehicle?

Response1:

The 2008 Toyota Avalon has five DSPs.

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

Response2:

The two outboard DSPs in the second row are equipped with lower anchorages and tether anchorages.

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

Response3:

The three DSPs in the second row are equipped with tether anchorages.

4. Lower Anchorages Marking and Conspicuity: Whether the anchorages are certified to S9.5(a) or S9.5(b) of FMVSS No. 225.

Response4:

All anchorages installed in the 2008 Toyota Avalon are certified to S9.5(a) of FMVSS225.