

REPORT NUMBER: 213-ABC-#

BUILT-IN RESTRAINT SYSTEM TESTS - FMVSS NO. 213

Manufacturer
Manufacturer Child Seat - Type
Automobile

Performing Organization
Address

Date

FINAL REPORT

PREPARED FOR:
U. S. Department of Transportation
National Highway Traffic Safety Administration
400 Seventh Street, S. W.
Washington, DC 20590

APPENDIX F....Continued:

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REPORT ACCEPTED BY:

Contract Officer's Technical
Representative (COTR)
Office of Vehicle Safety Compliance

Acceptance Date

APPENDIX F....Continued:

TECHNICAL REPORT STANDARD TITLE PAGE

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4. <i>Title and Subtitle</i> Child Restraint Systems Tests - FMVSS 213 Manufacturer Manufacturer Child Seat - Type		5. <i>Report Date</i> Date	6. <i>Performing Organization Code</i>
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16. Abstract

This report contains the results of tests performed in accordance with FMVSS 213, Child Restraint Systems, on the Manufacturer, Automobile, equipped with a Manufacturer Child Restraint. The child restraint appears to comply with the requirements of FMVSS 213. Final determination of compliance is made by the National Highway Traffic Safety Administration.

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APPENDIX F...Continued:

TABLE OF CONTENTS

Section 1 –	Purpose and Test Procedure
Section 2 –	Introduction and Summary
Section 3 –	Inspection and Test Data
Appendix A –	Equipment List and Calibration Schedules
Appendix B –	Photographs of Equipment

SECTION 1

PURPOSE AND TEST PROCEDURE

Purpose: The purpose of the test was to determine if the production built-in child restraint system(s) in the Manufacturer Automobile met the requirements of Federal Motor Vehicle Safety Standard (FMVSS) No. 213, Child Restraint Systems.

Test Procedure: The "Performing Organization Operating Test Procedure for FMVSS No. 213", submitted to and approved by the Office of Vehicle Safety Compliance, National Highway Traffic Safety Administration, contains the specific procedures used to conduct this test. This procedure shall not be interpreted to be in conflict with any portion of FMVSS No. 213 and amendments in effect as noted in the applicable contract.

SECTION 2

INTRODUCTION AND SUMMARY

This report presents all of the FMVSS 213 compliance inspection and test data obtained on the Manufacturer Child Seat - Type child restraint system. This test was performed in conjunction with a full-scale FMVSS 208 compliance test of a Automobile. The restraint was dynamically tested in the forward-facing upright configuration. The results from all inspections and tests indicate that the Manufacturer Child Seat - Type child restraint complied with all of the requirements of FMVSS 213.

Restraint system inspection and, full-scale dynamic testing were performed by the Performing Organization. Compliance test data sheets for all tests are found in Section 3 of this report.

APPENDIX F...Continued:

SECTION 3
INSPECTION AND TEST DATA
FMVSS 213 - BUILT-IN CHILD RESTRAINT SYSTEMS

Report No. 213-ABC-96-#

CHILD RESTRAINT SYSTEM IDENTIFICATION

Manufacturer:

Name _____

Address _____

Model No. _____

Group No. _____

1. Item Code _____
Date of Manufacture _____
Sled Test No. _____

2. Item Code _____
Date of Manufacture _____
Sled Test No. _____

3. Item Code _____
Date of Manufacture _____
Sled Test No. _____

4. Item Code _____
Date of Manufacture _____
Sled Test No. _____

5. Item Code _____
Date of Manufacture _____
Sled Test No. _____

6. Item Code _____
Date of Manufacture _____
Sled Test No. _____

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F....Continued:

**COMPLIANCE TEST DATA: FMVSS 213
LABELING (FMVSS 213, S5.5)**

Date of Test	Item Code
_____	_____

PASS / FAIL

S5.5.4 (a) Each built-in child restraint system other than a factory-installed built-in restraint shall be permanently labeled with the information specified in S5.5.5 (a) through (l). The information specified in S5.5.5 (a) through (j) and in S5.5.5(l) shall be visible when the system is activated for use. _____

(b) Each factory-installed built-in child restraint shall be permanently labeled with the information specified in S5.5.5 (f) through (j) and S5.5.5(l), so that the information is visible when the restraint is activated for use. The information shall also be included in the vehicle owner's manual. _____

S5.5.5 The information specified in paragraphs (a) through (l) of this section that is required by S5.5.4 shall be in English and lettered in letters and numbers using a not smaller than 10 point type. Unless specified otherwise, the information shall be labeled on a white background with black text. Unless written in all capitals, the information shall be stated in sentence capitalization. _____

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F....Continued:

LABELING (Continued)

PASS/FAIL

The following information is included:

- (a) The model name or number of the system. _____
- (b) The manufacturer's name. A distributor's or dealer's name may be used instead if the distributor or dealer assumes all responsibility for all duties and liabilities imposed on the manufacturer with respect to the system by the National Traffic and Motor Vehicle Safety Act, as amended. _____
- (c) The statement: "Manufactured in _____," inserting the month and year of manufacture. _____
- (d) The place of manufacture (city and State, or foreign country). However, if the manufacturer uses the name of the distributor or dealer, then it shall state the location (city and State, or foreign country) of the principle offices of the distributor or dealer. _____
- (e) The statement: "This child restraint system conforms to all applicable Federal Motor Vehicle Safety Standards." _____

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

LABELING (Continued)

PASS/FAIL

(f) One of the following statements, as appropriate, inserting the manufacturer's recommendations for the maximum mass of children who can safely occupy the system, except that booster seats shall not be recommended for children whose masses are less than 13.6 kg. For seats that can only be used as belt-positioning seats, manufacturers must include the maximum and minimum recommended height, but may delete the reference to weight:

(1) Use only with children who weigh _____ pounds (_____ kg) or less and whose height is (*insert values in English and metric units; use of word "mass" in label is optional*) or less; or _____

(2) Use only with children who weigh between _____ and _____ pounds (_____ and _____ kg) and whose height is (*insert appropriate values in English and metric units; use of word "mass" in label is optional*) or less and who are capable of sitting upright alone; or _____

(3) Use only with children who weigh between _____ and _____ pounds (_____ and _____ kg) and whose height is (*insert appropriate values in English and metric units; use of word "mass" in label is optional*) or less. _____

(4) Use only with children who weigh between _____ and _____ pounds (*insert appropriate English and metric values; use of word "mass" is optional*) and whose height is between _____ and _____ (*insert appropriate values in English and metric units*). _____

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

LABELING (Continued)

PASS/FAIL

(g) The heading and statement specified in paragraph (1), and if appropriate, the statements in paragraph (2) and (3). If used, the statements in paragraphs (2) and (3) shall be bulleted and precede the bulleted statement required by paragraph (1) after the heading.

(1) A heading as specified in S5.5.2(k)(3)(i), with the statement "WARNING! DEATH or SERIOUS INJURY can occur" capitalized as written and followed by the bulleted statement: Follow all instructions on this child restraint and in the vehicle's owner's manual. At the manufacturer's option the phrase "DEATH or SERIOUS INJURY can occur" in the heading can be on either a white or yellow background.

(2) In the case of each built-in child restraint system which is not intended for use in motor vehicles in certain adjustment positions or under certain circumstances, an appropriate statement of the manufacturers restrictions regarding those positions or circumstances.

(3) As appropriate, the statements required by the following sections will be bulleted and placed after the statement required by 5.5.5(g)(1) in the following order: 5.5.5(g)(2), 5.5.5(f), S5.5.5(h) and S5.5.5(i).

(h) In the case of each built-in child restraint system that has belts designed to restrain children using them and which do not adjust automatically to fit the child, the statement:

Snugly adjust the belts provided with this child restraint around your child.

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F....Continued:

LABELING (Continued)

PASS/FAIL

- (i) In the case of each built-in child restraint which can be used in a rear facing position, the following statement:

Place an infant in a rear-facing position in this child restraint.

- (j) A diagram or diagrams showing the fully activated child restraint system in infant and/or child configurations.

- (k) The following statement, inserting an address and telephone number:

“Child restraints could be recalled for safety reasons. You must register this restraint to be reached in a recall. Send your name, address and the restraint’s model number and manufacturing date to *(insert address)* or call *(insert telephone number)*. For recall information, call the U. S. Government’s Auto Safety Hotline at 1-800-424-9393 (202-366-0123 in D.C. area).”

Effective November 8, 2005:

One of the following statements, inserting an address and a U.S. telephone number. If manufacturer opts to provide a Web site on the registration card as permitted in Figure 9a of this section (FMVSS 213), the manufacturer must include the statement in part (ii):

(i) “Child restraints could be recalled for safety reasons. You must register this restraint to be reached in a recall. Send your name, address, e-mail address if available [preceding four words is optional] and the restraint’s model number and manufacturing date to *(insert address)* or call *(insert a U.S. telephone number)*. For recall information, call the U. S. Government’s Auto Safety Hotline at 1-800-424-9393.”

(ii) “Child restraints could be recalled for safety reasons. You must register this restraint to be reached in a recall. Send your name, address, e-mail address if available [preceding four words is optional] and the restraint’s model number and manufacturing date to *(insert address)* or call *(insert a U.S. telephone number)* or register online *(insert web site for electronic registration form)*. For recall information, call the U. S. Government’s Auto Safety Hotline at 1-800-424-9393.”

APPENDIX F...Continued:
LABELING (Continued)

PASS/FAIL

Effective June 21, 2006 (voluntary compliance is permitted before this time):

“Child restraints could be recalled for safety reasons. You must register this restraint to be reached in a recall. Send your name, address and the restraint’s model number and manufacturing date to *(insert address)* or call *(insert telephone number)*. For recall information, call the U. S. Government’s Vehicle Safety Hotline at 1-888-327-4236 (TTY:1-800-424-9153), or go to *http://www.NHTSA.gov*.”

- (I) In the case of a built-in belt-positioning seat that uses either the vehicles Type I or Type II belt systems or both, a statement describing the manufacturer's recommendations for the maximum height and weight of children who can safely occupy the system, and how the booster should be used (e.g.; with or without shield) with the different vehicle belt systems.

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F....Continued:

COMPLIANCE TEST DATA: FMVSS 213
INSTALLATION INSTRUCTIONS (FMVSS 213, S5.6)

Date of Test	Item Code
_____	_____

PASS/FAIL

S5.6 Any labels or written instructions provided in addition to those required by this section shall not obscure or confuse the meaning of the required information or be otherwise misleading to the customer. Any labels or written instructions other than in the English language shall be an accurate translation of English labels or written instructions. Unless written in all capitals, the information required by S5.6.2 and S5.6.3 shall be stated in sentence capitalization. _____

S5.6.2

(a) Each built-in child restraint system shall be accompanied by printed instructions in English that provide a step-by-step procedure, including diagrams, for activating the restraint system, positioning a child in the system, adjusting the restraint and, if provided, the restraint harness to fit the child. The instructions for each built-in car bed shall explain that the child should be positioned in the bed in such a way that the child's head is near the center of the vehicle. _____

(b) Each motor vehicle equipped with a factory-installed built-in child restraint shall have the information specified in paragraph (a) of this section included in it's vehicle owner's manual. _____

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F....Continued:

(Installation continued)

PASS/FAIL

S5.6.2.1

The instructions shall explain the primary consequences of not following the manufacturer's warnings for proper use of the child restraint system in accordance with S5.5.5 (f) through (i).

S5.6.2.2

The instructions for each built-in child restraint system, other than a factory-installed restraint, shall include the following statement, inserting an address and telephone number:

"Child restraints could be recalled for safety reasons. You must register this restraint to be reached in a recall. Send your name, address and the restraint's model number and manufacturing date to (*insert address*) or call (*insert telephone number*). For recall information, call the U. S. Government's Auto Safety Hotline at 1-800-424-9393 (202-366-0123 in D.C. area)."

Effective November 8, 2005:

The instructions for each built-in child restraint system other than a factory-installed restraint, shall include one of the following statements, inserting an address and a U.S. telephone number. If a manufacturer opts to provide a Web site on the registration card as permitted in Figure 9a of this section (FMVSS 213), the manufacturer must include the statement in part (ii):

(i) "Child restraints could be recalled for safety reasons. You must register this restraint to be reached in a recall. Send your name, address, e-mail address if available [preceding four words is optional] and the restraint's model number and manufacturing date to (*insert address*) or call (*insert a U.S. telephone number*). For recall information, call the U. S. Government's Auto Safety Hotline at 1-800-424-9393."

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F....Continued:

(Installation continued)

PASS/FAIL

(ii)“Child restraints could be recalled for safety reasons. You must register this restraint to be reached in a recall. Send your name, address, e-mail address if available [preceding four words is optional] and the restraint’s model number and manufacturing date to (*insert address*) or call (*insert a U.S. telephone number*) or register online (*insert web site for electronic registration form*). For recall information, call the U. S. Government’s Auto Safety Hotline at 1-800-424-9393.”

Effective June 21, 2006 (voluntary compliance is permitted before this time):

“Child restraints could be recalled for safety reasons. You must register this restraint to be reached in a recall. Send your name, address and the restraint’s model number and manufacturing date to (*insert address*) or call (*insert telephone number*). For recall information, call the U. S. Government’s Vehicle Safety Hotline at 1-888-327-4236 (TTY:1-800-424-9153), or go to <http://www.NHTSA.gov>.”

S5.6.2.3

Each built-in child restraint system other than a factory-installed built-in restraint, shall have a location on the restraint for storing the instructions.

S5.6.2.4

Each built-in child restraint system, other than a system that has been installed in a vehicle or a factory installed built-in system that is designed for a specific vehicle model and seating position, shall be accompanied by instructions in English that provide a step-by-step procedure for installing the system in a motor vehicle. The instructions shall specify the types of vehicles and the seating positions into which the restraint can or cannot be installed. The instructions for each car bed shall explain that the bed should be installed so that the child’s head will be near the center of the vehicle.

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F....Continued:

(Installation continued)

PASS/FAIL

S5.6.2.5

In the case of a built-in belt-positioning seat that uses either the vehicle's Type I or Type II belt systems or both, the instructions shall include a statement describing the manufacturer's recommendations for the maximum height and weight of children who can safely occupy the system and how the booster must be used with the vehicle belt systems appropriate for the booster seat. The instructions shall explain the consequences of not following the directions. The instructions shall specify that, if the booster seat is recommended for use with only the lap-belt part of a Type II assembly, the shoulder belt portion of the assembly must be placed behind the child.

S5.6.3

In the case of each child restraint system that has belts designed to restrain children using them and which do not adjust automatically to fit the child, the printed instructions shall include the following statement:

A snug strap should not allow any slack. It lies in a relatively straight line without sagging. It does not press on the child's flesh or push the child's body into an unnatural position.

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

MINIMUM HEAD SUPPORT SURFACE (FMVSS 213, S5.2.1)

Date of Test _____ Item Code _____

S5.2.1.2 The child restraint system is too low to be exempt from this requirement.

 YES/NO

S5.2.1.1

BACK SUPPORT HEIGHT

Maximum Child Weight kg (lbs.)	Required Minimum Height cm (in.)	Measured Height cm (in.)	PASS/ FAIL

BACK SUPPORT WIDTH

Required Minimum Width cm (in.)	Measured Width cm (in.)	Side Wing Depth cm (in.)	PASS/ FAIL

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

TORSO IMPACT PROTECTION (FMVSS 213, S5.2.2)

Date of Test _____ Item Code _____

S5.2.2.1

Test	Compliance Requirement	Test Result	PASS/ FAIL
Back Support Surface	Flat or concave		
	Area \geq 548 sq. cm (85 sq. in.)	sq. cm (sq. in.)	
Side Support Surface	Flat or concave		
Max. weight \geq 9 kg (20 lb.)	Area \geq 155 sq. cm (24 sq. in.)	sq. cm (sq. in.)	
Max. weight < 9 kg (20 lb.)	Area \geq 310 sq. cm (48 sq. in.)	sq. cm (sq. in.)	
Forward Restraining Surface			
Horiz. Cross Section	Flat or concave		
Vertical Longitudinal Cross Section	Flat or convex		
	Radius of curvature \geq 5 cm (2 in.)		

YES/NO

PASS/DEFERRED

S5.2.2.2 Forward Fixed or Movable Surface

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

PROTRUSION LIMITATION (FMVSS 213, S5.2.4)

Date of Test _____ Item Code _____

Test	Compliance Requirement mm (in.)	Test Result mm (in.)	PASS/ FAIL
Height	≤ 9.53 mm (3/8 in.)		
Edge Radius	≥ 6.35 mm (1/4 in.)		

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

DYNAMIC IMPACT TEST CONDITIONS (FMVSS 213, S6.1)

Date of Test _____ Test No. _____

Item Code _____
Code _____

Laboratory Ambient Conditions During Testing

Temperature Range _____ to _____ Degrees C
(F)

Relative Humidity _____ % to _____ %
Range _____

Test Device

Nominal velocity (km/h) _____
[mph] _____ S/N: _____
Dummy Used _____

Child Restraint System _____

Location _____

Installation mode _____

Adjustment mode _____

"Misuse" mode _____

Test Results

Actual velocity _____ m/s (ft/s)
_____ km/h (mph)

Vehicle Seat Position

Vertical position _____

Horizontal position _____

Vehicle seat back position _____

Include pretest and post test photographs and acceleration-time history plot.

REMARKS:

Pretest and posttest photographs are presented in Appendix B.

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

Date of Test _____

Test No. _____
Item Code _____

"SLED PULSE"

FMVSS 213 30 MPH PULSE ENVELOPE

APPENDIX F....Continued:

BELT RESTRAINT (FMVSS 213, S5.4.3)

Date of Test _____

Test No. _____

Item Code _____

PASS/FAIL

S5.4.3.1 Snug Fit of Belts

EXTRA WEBBING

Dummy	Each Shoulder Belt cm (in.)	Each Lap Belt Side cm (in.)	Crotch Belt cm (in.)

S5.4.3.2 Direct Restraint Belts

YES/NO

- (1) Belt / dummy contact for _____
- (2) Rigid structure behind _____
- (3) Belt / child restraint slip _____

Note: If all "yes", restraint fails.

S5.4.3.3 Seating System Belts and/or Shields

- (1) Upper torso _____
- (2) Lower torso _____
- (3) Crotch restraint _____

S5.4.3.4 Child Harness Belts

- (1) Upper torso _____
- (2) Lower torso _____
- (3) Prevent standing _____

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F....Continued:

BUCKLE RELEASE (FMVSS 213, S5.4.3.5, S6.2)

Date of Test _____

Test No. _____

Item Code _____

Test	Compliance Requirement	Test Result	PASS/ FAIL
Buckle Minimum Surface Area	Area \geq 3.9 cm ² (0.6 in. ²)	cm ² (in. ²)	
Preimpact Release Force	Force range: 40 to 62 N (9 to 14 lbs.)	N (lbs.)	
Buckle Integrity	Not release during test		
Post Impact Release Force	Force range: \leq 71 N (16 lbs.)	N (lbs.)	

REMARKS:

The buckle is an integral part of the seat and, therefore, the buckle release test was performed on the entire seat assembly.

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

RESTRAINT SYSTEM INTEGRITY (FMVSS 213, S5.1.1)

Date of Test _____

Test No. _____

Item Code _____

Test	Compliance Requirement	Test Result	PASS/ FAIL
Structural Integrity	No complete separation		
	No partial separation with exposed edge radius < 9.53 mm (1/4")		
	No partial separation with protrusions > 6.35 mm (3/8")		
Adjustment Position	No change		
Back Surface / Seating Surface Angle	Not < 45 degrees	deg.	

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

INJURY CRITERIA (FMVSS 213, S5.1.2)

Date of Test _____

Test No. _____

Item Code _____

Test	Compliance Requirement	Test Result	PASS/ FAIL
Head Injury Criterion	≤ 1000		
Chest Injury Criterion	Cumulative duration over 60 g ≤ 3 ms	Peak g = Duration exceeding 60 g = _____	

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F...Continued:

OCCUPANT EXCURSION (FMVSS 213, S5.1.3, S5.1.4, S5.2.1.1 (C))

Date of Test _____

Test No. _____

Item Code _____

FORWARD-FACING RESTRAINTS

Test	Compliance Requirement	Test Result	PASS/ FAIL
Torso Retention (FMVSS 213, S5.1.3.1)	Retain within system		
Knee Target Excursion (FMVSS 213, S5.1.3.1)	≤ 305 mm (12 in.)	mm (in.)	
Head - Torso Angle (FMVSS 213, S5.2.1.1 (c))	Rearward change ≤ 45 degrees	deg.	

REAR-FACING RESTRAINTS

Test	Compliance Requirement	Test Result	PASS/ FAIL
Torso Retention (FMVSS 213, S5.1.3.2)	Retain within system		
Head Target Excursion (FMVSS 213, S5.1.3.2)	Not beyond restraint's top and forward edge		
Back Support Angle (FMVSS 213, S5.1.4)	≤ 70 degrees	deg.	
Head - Torso Angle (FMVSS 213 S5.2.1.1 (c))	Rearward change ≤ 45 degrees	deg.	

REMARKS:

Technician: _____

Date: _____

Program Manager: _____

APPENDIX F....Continued:

APPENDIX A
EQUIPMENT LIST AND CALIBRATION SCHEDULES

APPENDIX B
PHOTOGRAPHS OF EQUIPMENT