

FINAL REPORT NUMBER 225-MGA-05-012

SAFETY COMPLIANCE TESTING FOR FMVSS 225
“Child Restraint Anchorage Systems”

FORD MOTOR COMPANY
2005 FORD ESCAPE
NHTSA No. C50201

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083




Test Date: June 2, 2006
Report Date: July 14, 2006

FINAL REPORT

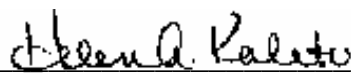
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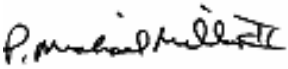
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
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WASHINGTON, D.C. 20590

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FINAL REPORT ACCEPTANCE BY OVSC:

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DN: CN = Edward Chan, C = US
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15. Supplementary Notes					
16. Abstract A compliance test was conducted on the subject 2005 Ford Escape, NHTSA No. C50201, 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 June 2, 2006. Test failures identified were as follows: NONE The data recorded indicates that the 2005 Ford Escape tested appears to meet the requirements of FMVSS 225.					
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1.0 PURPOSE AND PROCEDURE

PURPOSE

The child restraint anchorage testing results presented in this report are part of the Federal Motor Vehicle Safety Standard (FMVSS) No. 225 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by MGA Research Corporation (MGA) under Contract No. DTNH22-02-D-11043. The purpose of the testing was to determine if the subject vehicle, a 2005 Ford Escape, NHTSA No. C50201 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 (2/24/05).

The front occupant compartment consisted of two (2) adjustable outboard bucket seats and the rear occupant compartment consisted of a 2nd row three-passenger 60/40 split-back bench seat. Each 2nd row outboard seating position was equipped with a child restraint anchorage system (one tether and two lower anchorages). The 2nd row center seating position was equipped with a tether anchorage. The center-to-center spacing between the 2nd row outboard lower anchorages was approximately 680 mm. Each 2nd row outboard seating position was tested with the SFADII fixture and the 2nd row center seating position was tested with the SFADI fixture.

2.0 COMPLIANCE TEST AND DATA SUMMARY

TEST SUMMARY

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

Based on the test results, the 2005 Ford Escape 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 11,144 N and held the required load for 3 seconds. The total displacement from point "X" on the SFADII for the 2nd row left seating position was 64 mm. The SFADII at the 2nd row right seating position sustained a maximum force of 11,074 N and held the required load for 2 seconds. The total displacement from point "X" on the SFADII for the 2nd row right seating position was 53 mm. The SFADI at the 2nd row center seating position sustained a maximum force of 15,144 N and held the required load for 2 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)
SB6318	SFADII	Forward	2 nd Row Left	11,144	64
			2 nd Row Right	11,074	53
SB6319	SFADI	Forward	2 nd Row Center	15,144	N/A

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

3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

VEH. MOD YR/MAKE/MODEL/BODY	2005 Ford Escape
VEH. NHTSA NO.	C50201
VIN	1FMYU02Z25KB04029
COLOR	Black
VEH. BUILD DATE	06/04
TEST DATE	June 2, 2006
TEST LABORATORY	MGA Research Corporation
OBSERVERS	Melanie Schick, Brad Reaume, Kenney Godfrey

GENERAL INFORMATION:

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Ford Motor Co.

Date of Manufacture: 06/04; VIN: 1FMYU02Z25KB04029

GVWR: 4260 lbs; GAWR FRONT: 2320 lbs

GAWR REAR: 2115 lbs

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 32 psi REAR: 32 psi

Recommended Tire Size: P225/75R17

Recommended Cold Tire Pressure:

FRONT: 32 psi REAR: 32 psi

Size of Tire on Test Vehicle: P225/75R17

Size of Spare Tire: T145/90R17

VEHICLE CAPACITY DATA:

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

Number of Occupants: Front 2; Middle N/A; Rear 3; TOTAL 5.

4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

MGA Research Corporation 446 Executive Drive Troy, Michigan 48083	
Test Equipment Used for Testing	Calibration Due Date
MGA Hydraulic Test Frame	N/A
Two (2) Load Cell 10,000 lb Capability	S/N 258 (08/13/06), S/N 270 (08/10/06)
String Potentiometer	Calibrated at each use (S/N C1601440A, C1601445A)
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 TPM659 (04/25/07)
MGA Data Acquisition System	N/A
Digital Calipers	S/N MGA00571 (09/02/06)
Force Gauge	S/N MGA00647 (05/26/07)
Inclinometer (Digital)	S/N MGA00051 (02/09/07)

5.0 DATA

Table 3. Child Restraint Tether Anchorage Configuration

Seating Position		Permit the attachment of a tether hook	Accessible without the need for any tool other than a screwdriver or coin	Ready for use without the need for any tools	Sealed to prevent the entry of exhaust fumes
Front Row		N/A	N/A	N/A	N/A
Second Row	LH	Yes	Yes	Yes	Yes
	Ctr.	Yes	Yes	Yes	Yes
	RH	Yes	Yes	Yes	Yes
Third Row		N/A	N/A	N/A	N/A

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

REMARKS: NONE.

Table 4. Child Restraint Lower Anchorage Configuration

OBSERVED LOWER ANCHORAGE CONFIGURATION	SEAT POSITION				
		FRONT ROW	SECOND ROW		THIRD ROW
			I/B	O/B	
Above anchorage, permanently marked with a circle not less than 13 mm in Dia.; and whose color contrasts with its background; and its center is not less than 50 mm and not more than 100 mm above the bar, and in the vertical longitudinal plane that passes through the center of the bar.	LH	N/A	60	71	N/A
	Ctr		N/A		
	RH		75	83	
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	No		N/A
	Ctr		N/A		
	RH		No		
Diameter of the bar (mm)	LH	N/A	5.95	6.02	N/A
	Ctr		N/A		
	RH		6.04	6.02	
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		N/A		
	RH		N/A		
Optional Marking: If guidance fixtures are used, the fixture(s) must be installed.	LH	N/A	N/A		N/A
	Ctr		N/A		
	RH		N/A		
Measure the distance between Point “Z” of the CRF and the front surface of the anchorage bar (mm)	LH	N/A	43		N/A
	Ctr		N/A		
	RH		44		
Measure the distance between the SRP to the center of the anchorage bar (mm)	LH	N/A	147		N/A
	Ctr		N/A		
	RH		148		

Table 4. Child Restraint Lower Anchorage Configuration (continued)

OBSERVED LOWER ANCHORAGE CONFIGURATION	SEAT POSITION				
		FRONT ROW	SECOND ROW		THIRD ROW
			I/B	O/B	
Inspect if the centroidal longitudinal axes are collinear within 5 degrees	LH	N/A	Yes		N/A
	Ctr		N/A		
	RH		Yes		
Inspect if the inside surface of the bar that is straight and horizontal section of the bars, and determine they are not less than 25 mm, but not more than 60 mm in length (mm).	LH	N/A	31	32	N/A
	Ctr		N/A		
	RH		29	30	
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)
2 nd Row Left	15.8	No Data	0.5
2 nd Row Center	N/A	N/A	N/A
2 nd Row Right	16.5	No Data	0.0

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

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

REMARKS: NONE

Table 5. Tether Location and Dimensional Measurements

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

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

REMARKS: NONE

Table 6. Tether Anchorage Static Loading and Displacement

SEAT POSITION	Seat, Seat Back, & Head Restraint Positions			Type of SFAD Used	Angle (deg)	Initial Location (mm)	Onset Rate (N/sec.)	Force Applied (N)	Max. Load (N)	Final Location (mm)	Horiz. Displ. (mm)	
	Seat	Seat Back	Is There a H/R?									
Front Row	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Second Row	LH	Fixed	Fixed	Yes	II	10	33	387	11,000	11,144*	97	64
	Ctr.			No	I	9.5	N/A	535	15,000	15,144*	N/A	N/A
	RH			Yes	II	10	48	387	11,000	11,074*	101	53
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

6.1 Front view



6.2 Rear view



6.3 3/4 Front left view



6.4 3/4 Front right view



- 6.5 Test vehicle's certification label
- 6.5.1 Certification label photo #1



6.5.2 Certification label photo #2



MFD. BY FORD MOTOR CO.

DATE: 06/04
FRONT GAWR: 2320LB
1052KG
P225/75R15
15X6.5J
AT 220 kPa/32 PSI COLD

GAWR: 4260LB / 1932KG
REAR GAWR: 2115LB
959KG
WITH TIRES RIMS PSI COLD

WITH TIRES RIMS PSI COLD

WITH TIRES RIMS PSI COLD

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

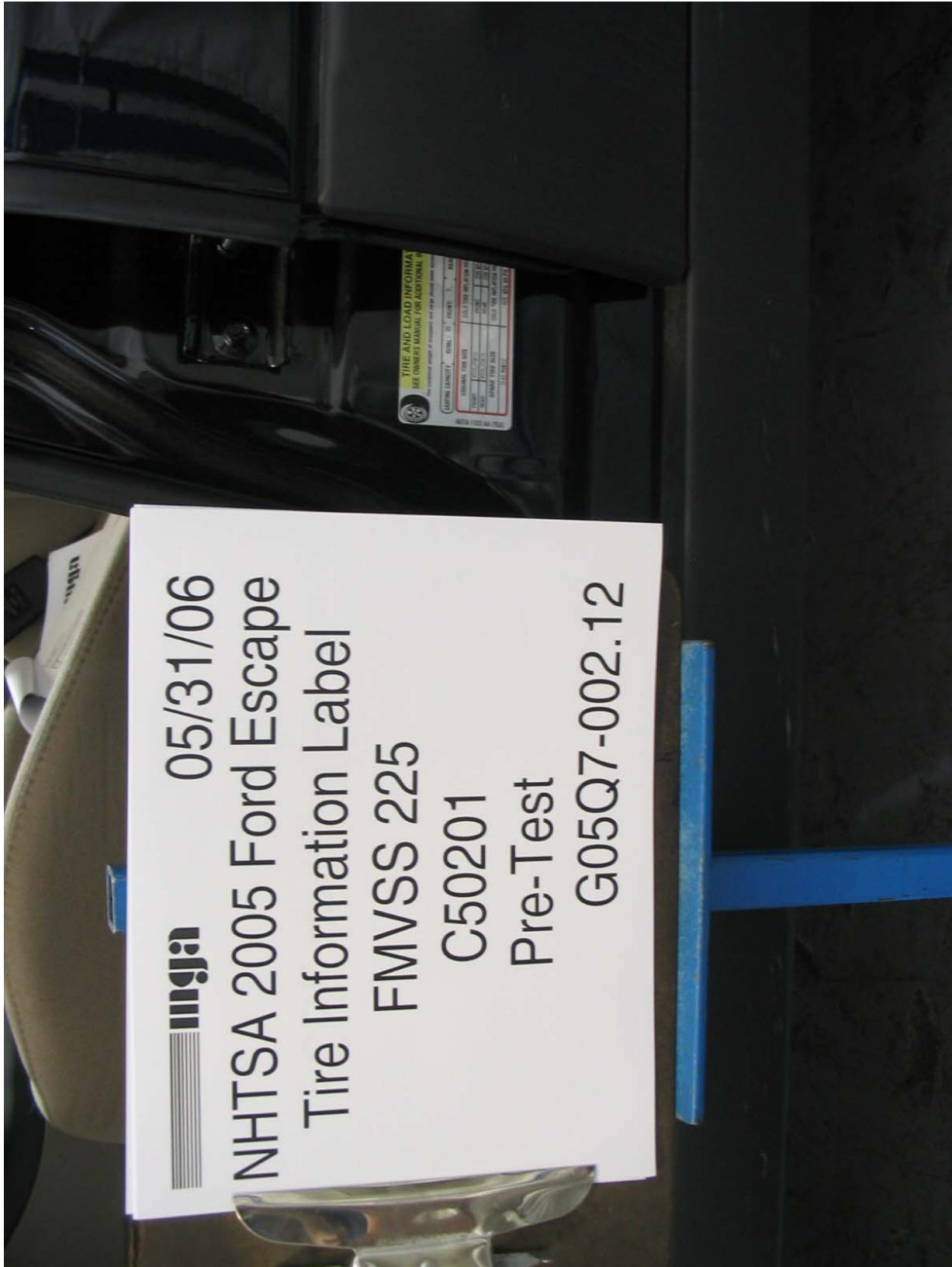
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F0129
T0083

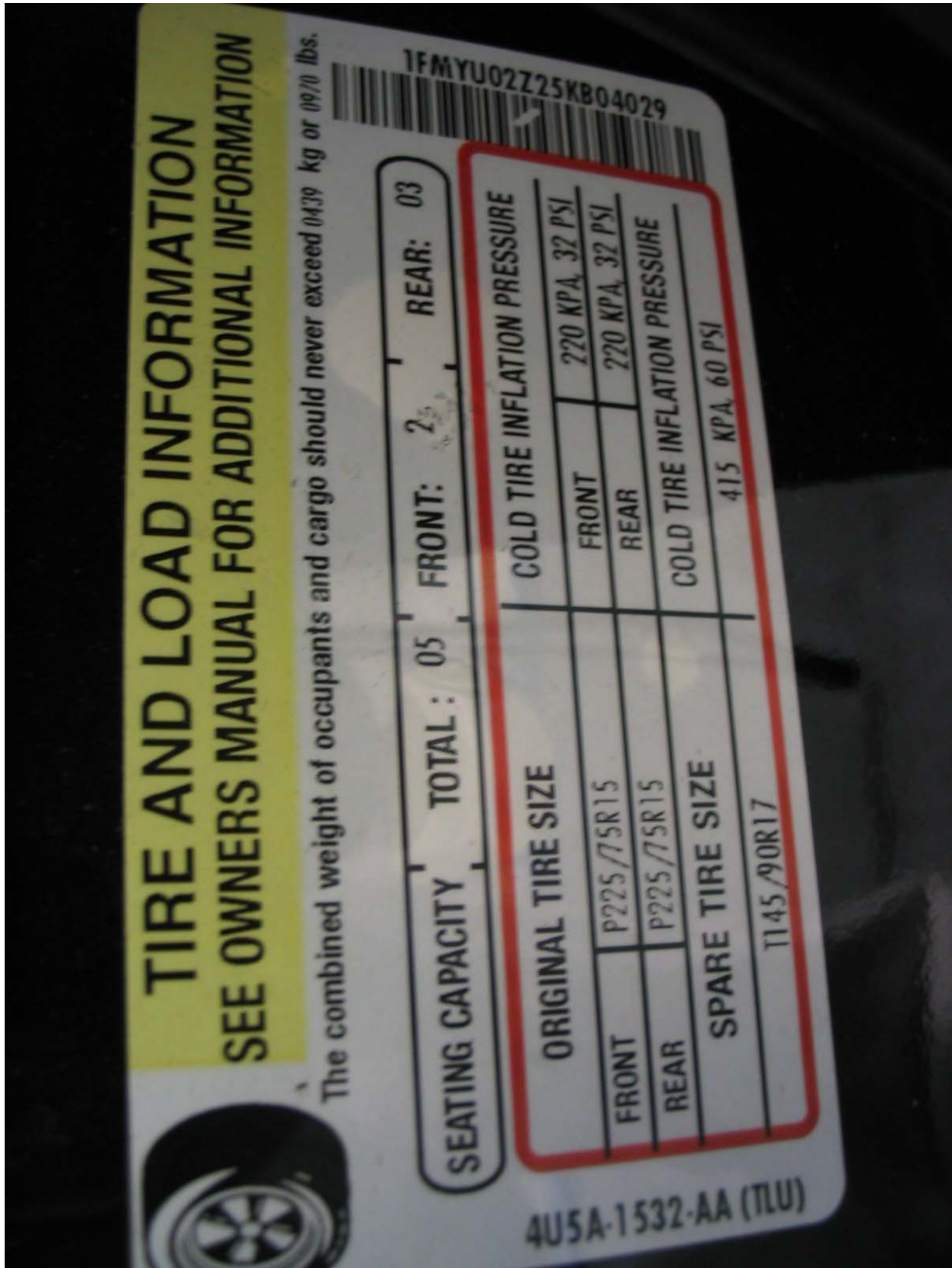


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WB	INT TR	AXLE	TR
103	WH	Z 96	SPR
		TP/PS	4 CCCC
		R	1200406234684 UTC
			2U5A-1520472-AA

6.5.3 Tire information label photo #1



6.5.4 Tire information label photo #2



- 6.6 Vehicle tie down at each tie down location
 - 6.6.1 Front under vehicle



6.6.2 Left front



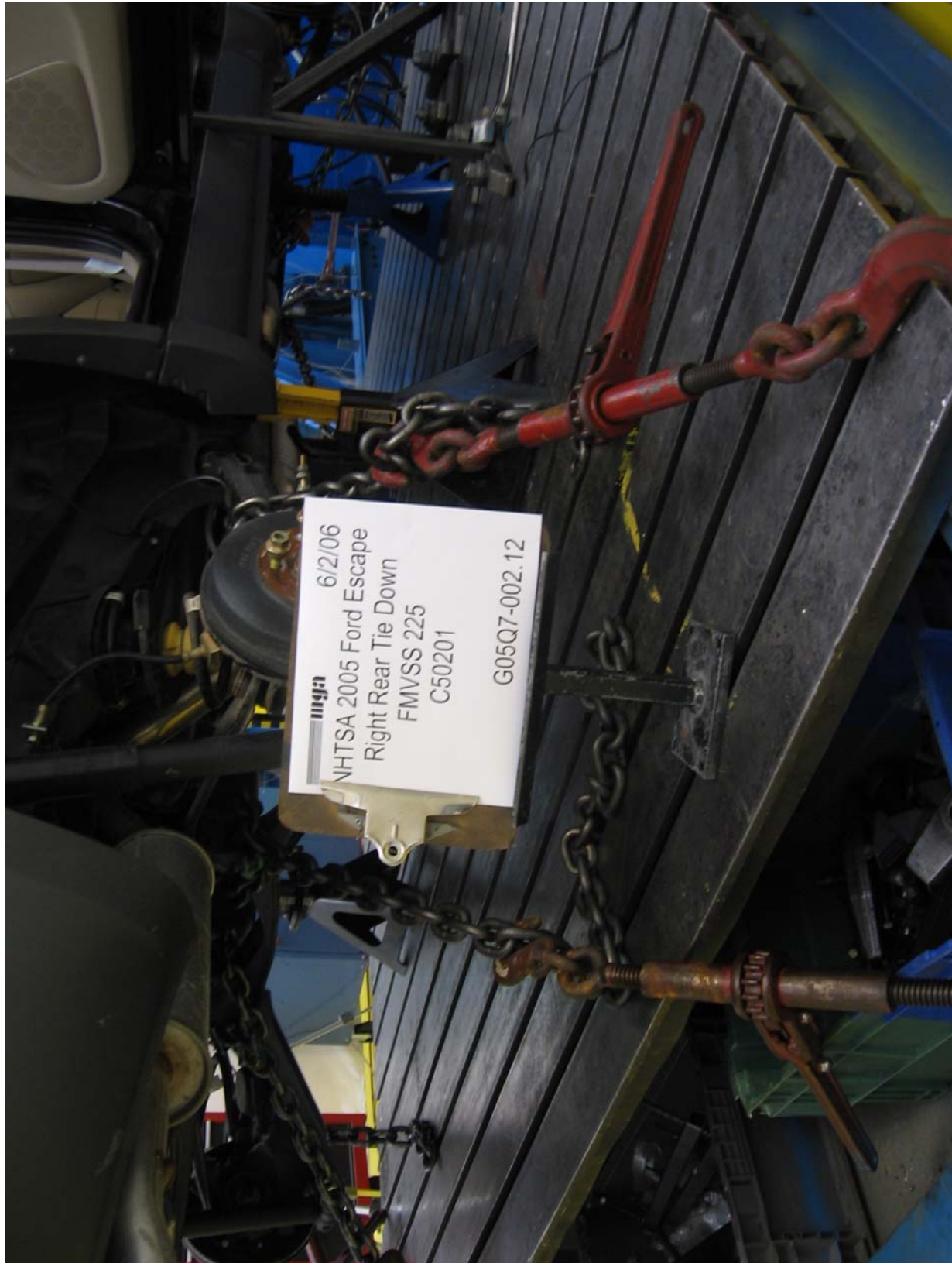
6.6.3 Left rear



6.6.4 Right front



6.6.5 Right rear



- 6.7 2-dimensional template
- 6.7.1 LH position photo #1



6.7.2 LH position photo #2



6.7.3 Center position photo #1



6.7.4 Center position photo #2



6.7.5 RH position photo #1



6.7.6 RH position photo #2



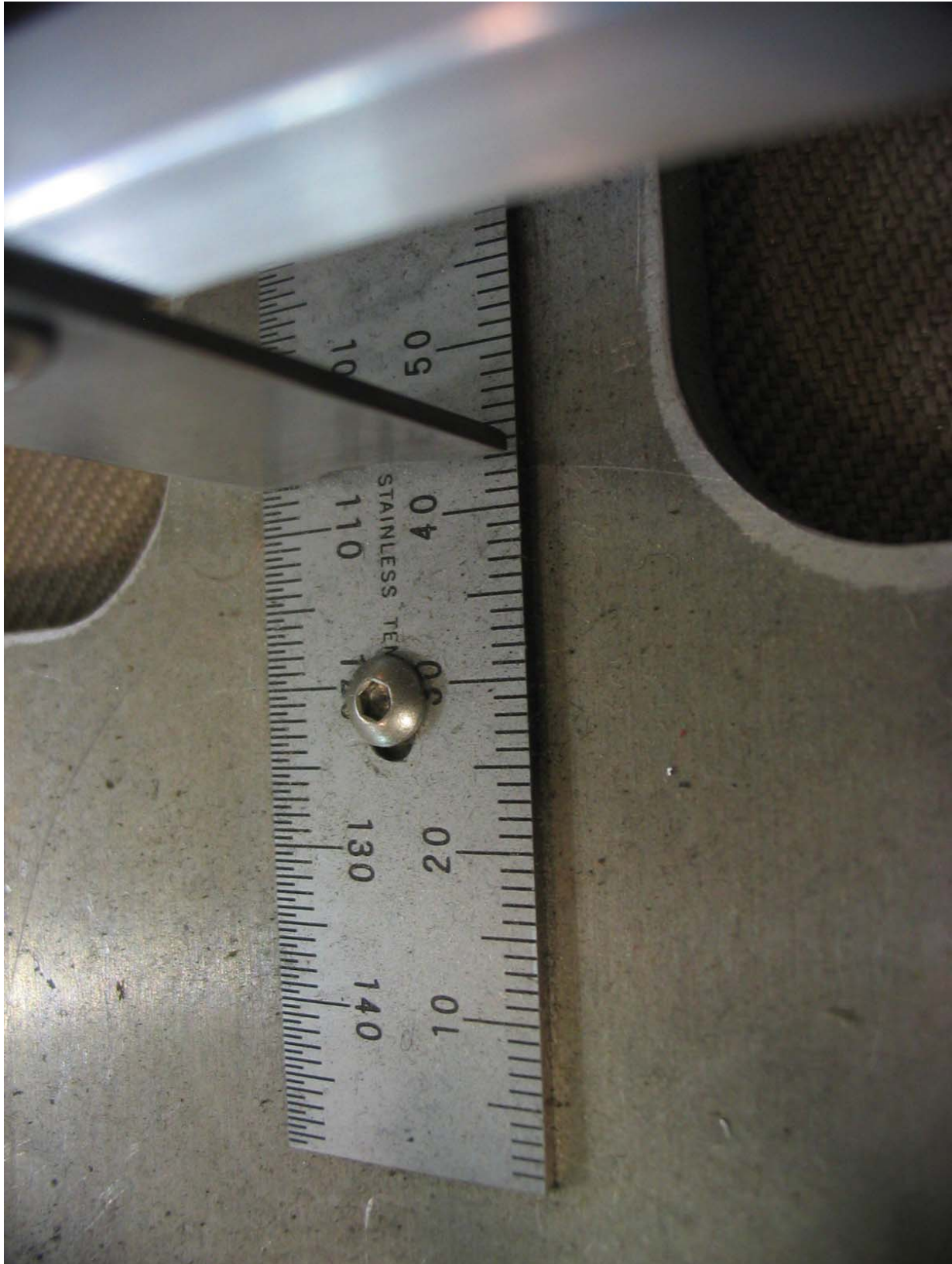
- 6.8 CRF verification
 - 6.8.1 LH position photo #1



6.8.2 LH position photo #2



6.8.3 LH position photo #3



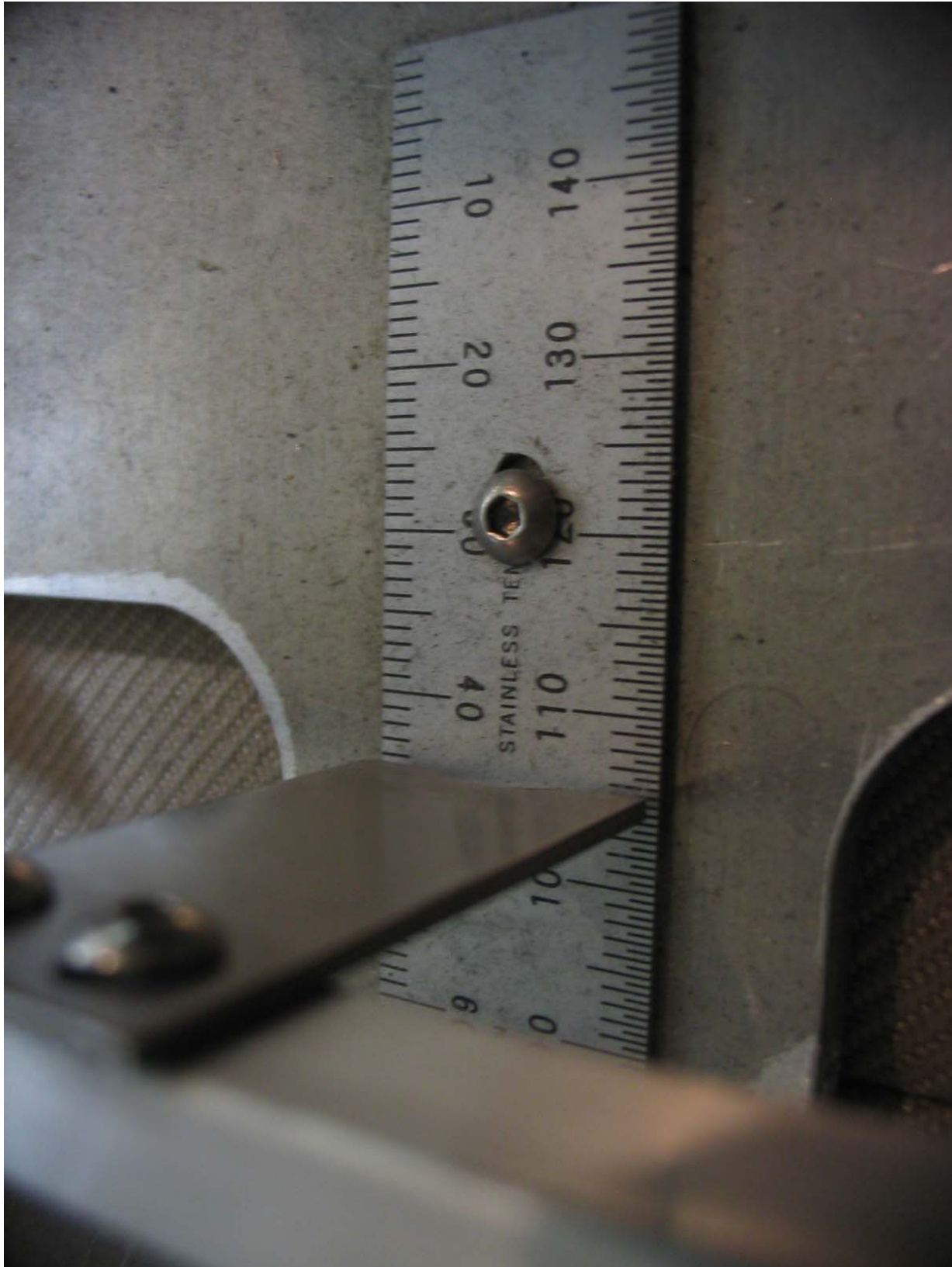
6.8.4 RH position photo #1



6.8.5 RH position photo #2



6.8.6 RH position photo #3



- 6.9 ¾ Front view of test vehicle with test apparatus in place
- 6.9.1 ¾ Front left view of SFADII test 1 of 2



6.9.2 3/4 Front right view of SFADII test 1 of 2



6.9.3 ¾ Front left view of SFADI test 2 of 2



6.9.4 3/4 Front right view of SFADI test 2 of 2



- 6.10 Pre-test views of each child restraint anchorage system installed in the vehicle
- 6.10.1 Pre-test photo #1 of SFADII test 1 of 2



6.10.2 Pre-test photo #2 of SFADII test 1 of 2



6.10.3 Pre-test photo #3 of SFADII test 1 of 2



6.10.4 Pre-test photo #4 of SFADI test 2 of 2



6.10.5 Pre-test photo #5 of SFADI test 2 of 2



6.10.6 Pre-test photo #6 of SFADI test 2 of 2



6.10.7 Pre-test photo #7 of SFADI test 2 of 2



- 6.11 Post-test condition of each child restraint anchorage system
 - 6.11.1 Post-test photo #1 of SFADII test 1 of 2



6.11.2 Post-test photo #2 of SFADII test 1 of 2



6.11.3 Post-test photo #3 of SFADII test 1 of 2



6.11.4 Post-test photo #4 of SFADII test 1 of 2



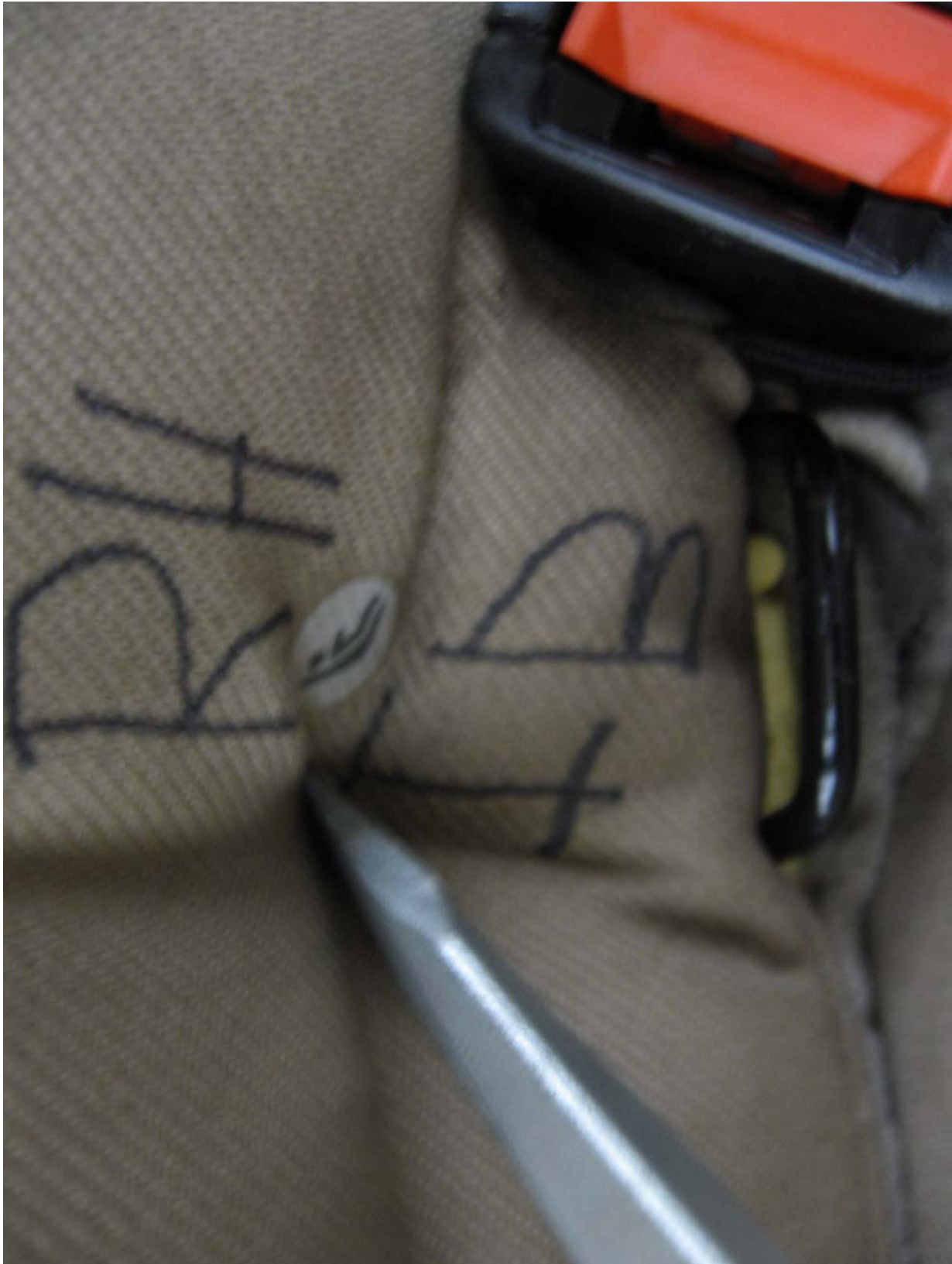
6.11.5 Post-test photo #5 of SFADII test 1 of 2



6.11.6 Post-test photo #6 of SFADII test 1 of 2



6.11.7 Post-test photo #7 of SFADII test 1 of 2



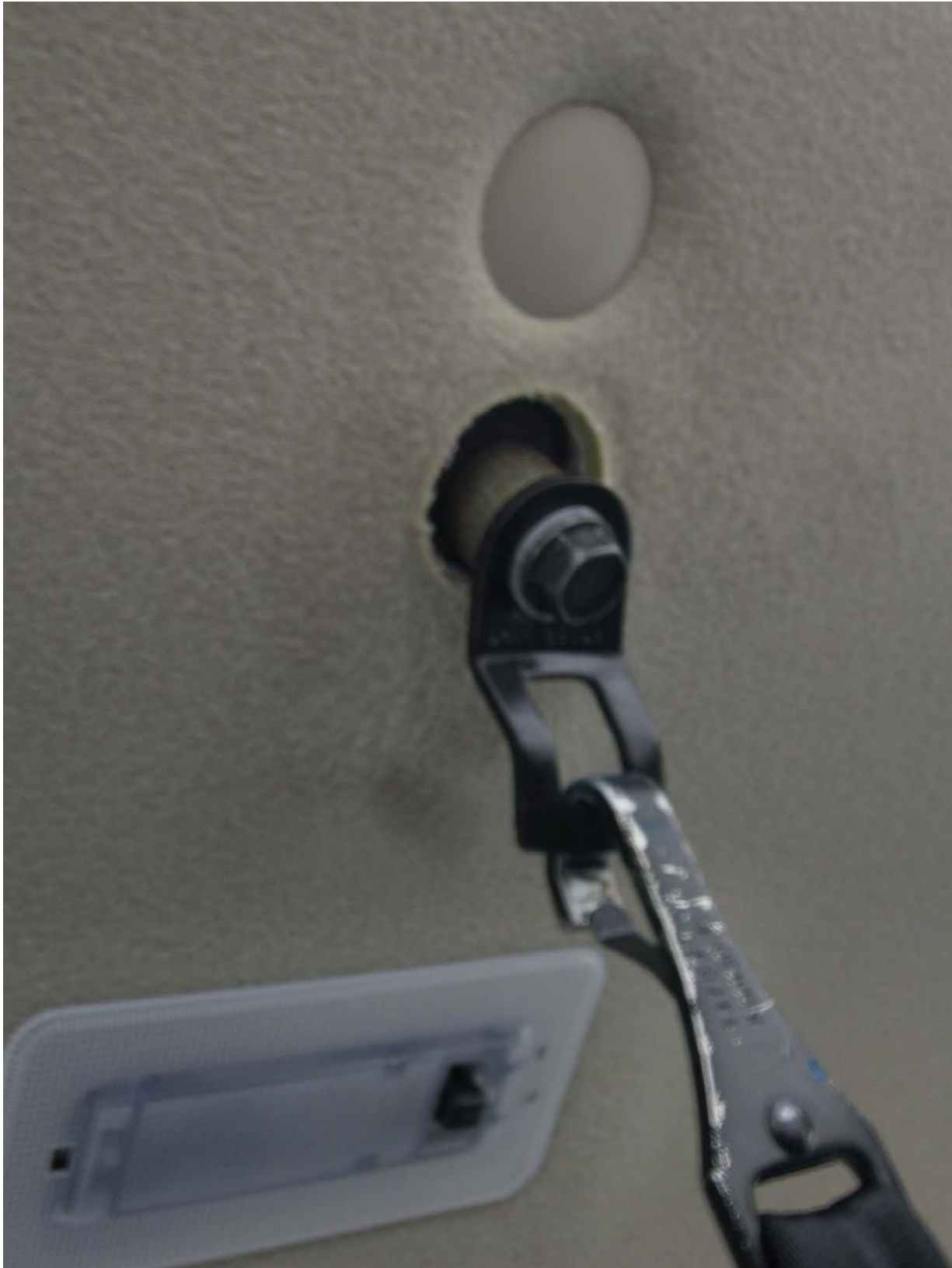
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6.11.9 Post-test photo #9 of SFADI test 2 of 2



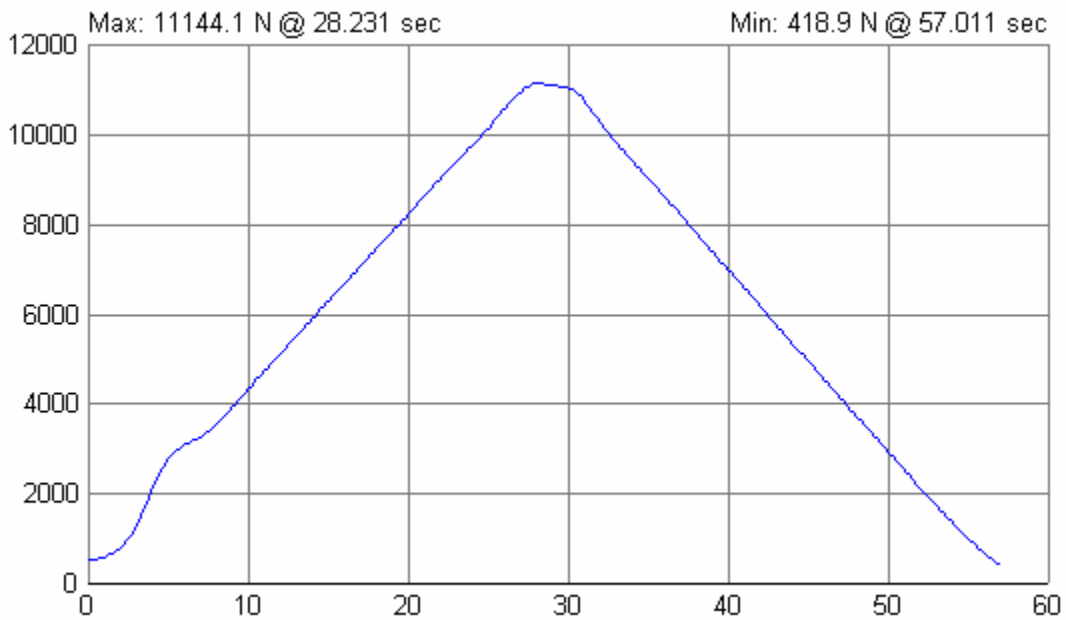
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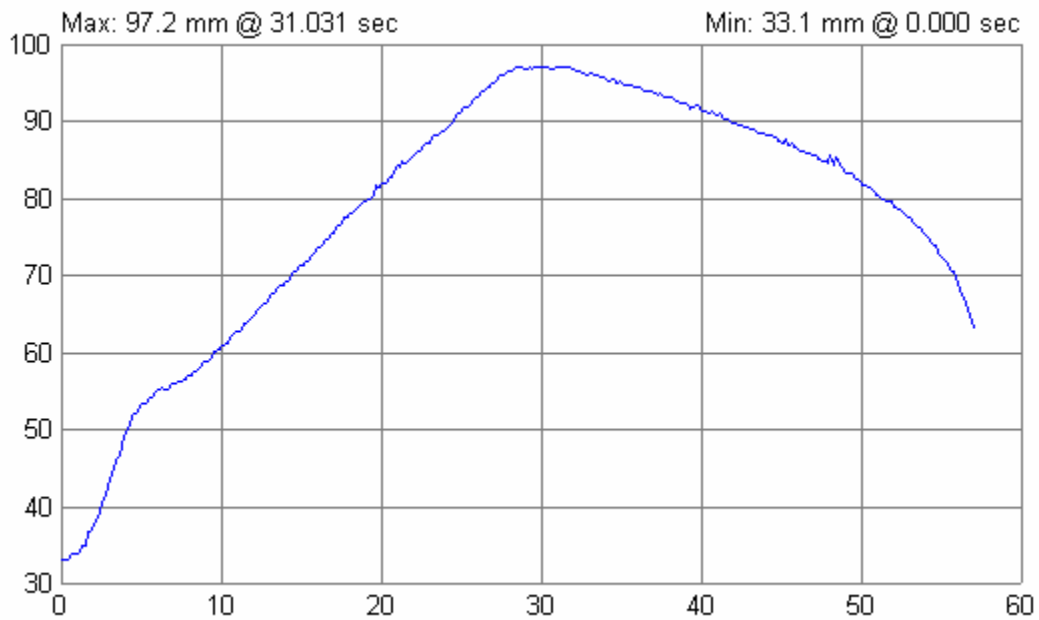
6.11.11 Post-test photo #11 of SFADI test 2 of 2



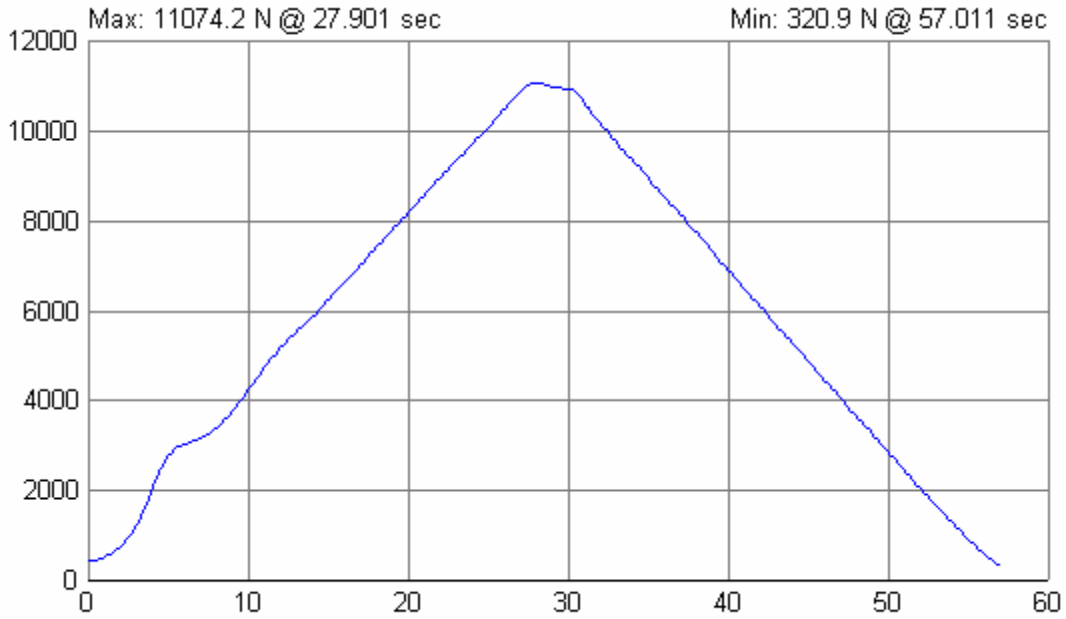
7.0 PLOTS



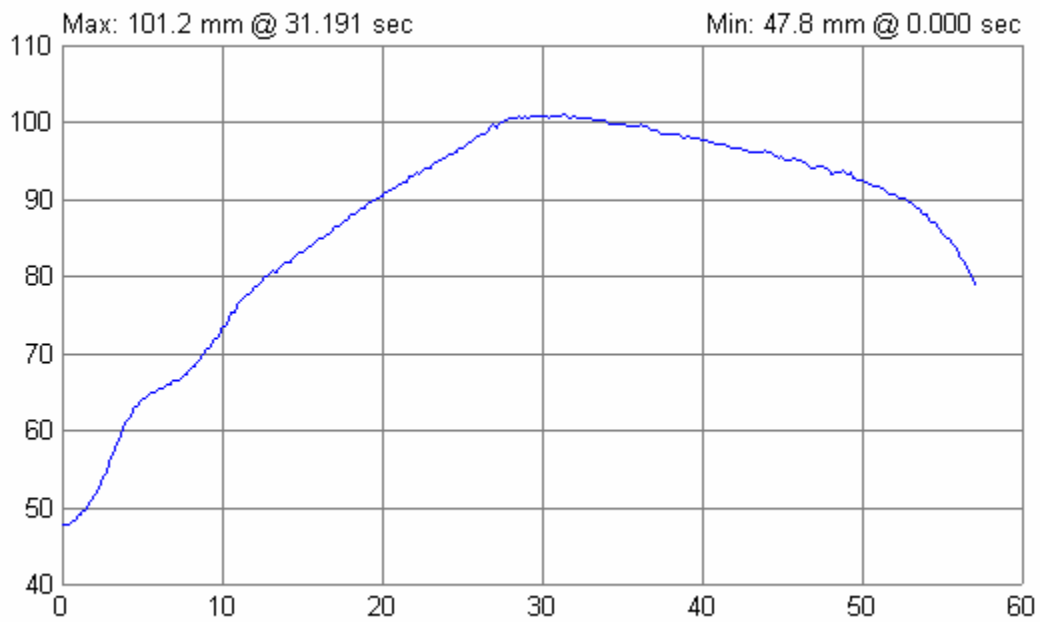
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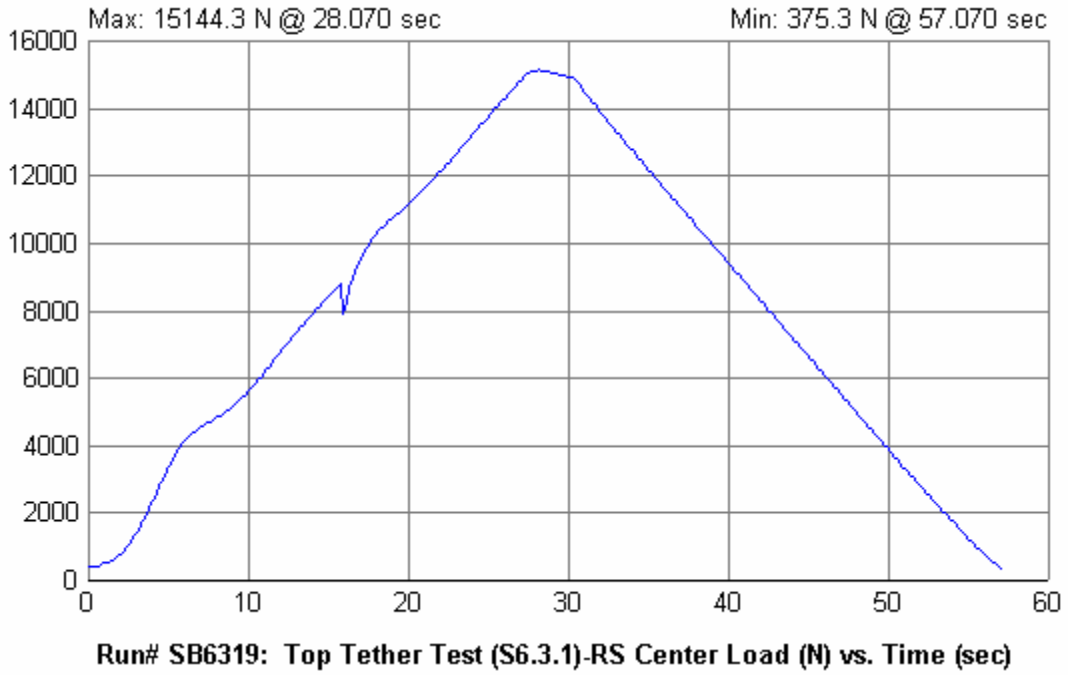
Run# SB6318: 60% O/B SFAD X Displacement (mm) vs. Time (sec)



Run# SB6318: Lower Anchor Test (S9.4.1)-RS 40% Load (N) vs. Time (sec)



Run# SB6318: 40% SFAD X Displacement (mm) vs. Time (sec)



8.0 REPORT of VEHICLE CONDITION

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT No.: DTNH22-02-D-11043

DATE: June 2, 2006

From: MGA Research Corporation, 446 Executive Drive, Troy, MI 48083

To: NHTSA, OVSC, NVS-220

The following vehicle has been subjected to compliance testing for FMVSS No. 201U and 225

The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager (NAD0-30), with a copy to the OVSC COTR. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

VEH. MOD YR/MAKE/MODEL/BODY: 2005 Ford Escape

VEH. NHTSA NO.: C50201

VIN: 1FMYU02Z25KB04029

COLOR: Blue

ODOMETER READINGS: ARRIVAL 30 miles Date: 05/03/06

COMPLETION 32 miles Date: 06/02/06

PURCHASE PRICE: \$17,391 DEALER'S NAME: West-Herr Ford

ENGINE DATA: 4 Cylinders 2.3 Liters Cubic Inches

TRANSMISSION DATA: X Automatic Manual No. of Speeds 5

FINAL DRIVE DATA: Rear Drive X Front Drive 4 Wheel Drive

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Melanie Schick, Brad Reaume, Kenney Godfrey

<input checked="" type="checkbox"/>	Air Conditioning		Traction Control	<input checked="" type="checkbox"/>	Clock
<input checked="" type="checkbox"/>	Tinted Glass		All Wheel Drive		Roof Rack
<input checked="" type="checkbox"/>	Power Steering	<input checked="" type="checkbox"/>	Speed Control	<input checked="" type="checkbox"/>	Console
<input checked="" type="checkbox"/>	Power Windows	<input checked="" type="checkbox"/>	Rear Window Defroster	<input checked="" type="checkbox"/>	Driver Air Bag
<input checked="" type="checkbox"/>	Power Door Locks		Sun Roof or T-Top	<input checked="" type="checkbox"/>	Passenger Air Bag
	Power Seat(s)		Tachometer	<input checked="" type="checkbox"/>	Front Disc Brakes
<input checked="" type="checkbox"/>	Power Brakes	<input checked="" type="checkbox"/>	Tilt Steering Wheel		Rear Disc Brakes
	Antilock Brake System	<input checked="" type="checkbox"/>	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: Melanie Schick, Kenney Godfrey

DATE: June 2, 2006

APPROVED BY: Brad Reaume

APPENDIX A
OWNERS MANUAL CHILD RESTRAINT SYSTEMS

Seating and Safety Restraints

- A series of five beeps will be heard. The tone pattern will repeat periodically until the problem and/or light are repaired.

If any of these things happen, even intermittently, have the SRS serviced at your dealership or by a qualified technician immediately. Unless serviced, the system may not function properly in the event of a collision.

Disposal of air bags and air bag equipped vehicles (including pretensioners)


See your local dealership or qualified technician. Air bags **MUST BE** disposed of by qualified personnel.

SAFETY RESTRAINTS FOR CHILDREN

See the following sections for directions on how to properly use safety restraints for children. Also see *Air bag supplemental restraint system (SRS)* in this chapter for special instructions about using air bags.

Important child restraint precautions

You are required by law to use safety restraints for children in the U.S. and Canada. If small children (generally children who are four years old or younger and who weigh 18 kg [40 lbs] or less) ride in your vehicle, you must put them in safety seats made especially for children. Many states require that children use approved booster seats until they are eight years old. Check your local and state or provincial laws for specific requirements regarding the safety of children in your vehicle. When possible, always place children under age 12 in the rear seat of your vehicle. Accident statistics suggest that children are safer when properly restrained in the rear seating positions than in the front seating position.

 Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

Always follow the instructions and warnings that come with any infant or child restraint you might use.

Children and safety belts

If the child is the proper size, restrain the child in a safety seat. Children who are too large for child safety seats (as specified by your child safety seat manufacturer) should always wear safety belts.

Follow all the important safety restraint and air bag precautions that apply to adult passengers in your vehicle.

Seating and Safety Restraints

If the shoulder belt portion of a combination lap and shoulder belt can be positioned so it does not cross or rest in front of the child's face or neck, the child should wear the lap and shoulder belt. Moving the child closer to the center of the vehicle may help provide a good shoulder belt fit.



Do not leave children, unreliable adults, or pets unattended in your vehicle.

Child booster seats

Children outgrow a typical convertible or toddler seat when they weigh 40 pounds and are around 4 years of age. Although the lap/shoulder belt will provide some protection, these children are still too small for lap/shoulder belts to fit properly, which could increase the risk of serious injury.

To improve the fit of both the lap and shoulder belt on children who have outgrown child safety seats, Ford Motor Company recommends use of a belt-positioning booster.

Booster seats position a child so that safety belts fit better. They lift the child up so that the lap belt rests low across the hips and the knees bend comfortably. Booster seats also make the shoulder belt fit better and more comfortably for growing children.

When children should use booster seats

Children need to use booster seats from the time they outgrow the toddler seat until they are big enough for the vehicle seat and lap/shoulder belt to fit properly. Generally this is when they weigh about 80 lbs (about 8 to 12 years old).

Booster seats should be used until you can answer YES to ALL of these questions:

- Can the child sit all the way back against the vehicle seat back with knees bent comfortably at the edge of the seat without slouching?



- Does the lap belt rest low across the hips?
- Is the shoulder belt centered on the shoulder and chest?
- Can the child stay seated like this for the whole trip?

Seating and Safety Restraints

Types of booster seats

There are two types of belt-positioning booster seats:

- Those that are backless.

If your backless booster seat has a removable shield, remove the shield and use the lap/shoulder belt. If a seating position has a low seat back and no head restraint, a backless booster seat may place your child's head (top of ear level) above the top of the seat. In this case, move the backless booster to another seating position with a higher seat back and lap/shoulder belts.



- Those with a high back.

If, with a backless booster seat, you cannot find a seating position that adequately supports your child's head, a high back booster seat would be a better choice.



Both can be used in any vehicle in a seating position equipped with lap/shoulder belts if your child is over 40 lbs.

The shoulder belt should cross the chest, resting snugly on the center of the shoulder. The lap belt should rest low and snug across the hips, never up high across the stomach.

If the booster seat slides on the vehicle seat, placing a rubberized mesh sold as shelf or carpet liner under the booster seat may improve this condition.

The importance of shoulder belts

Using a booster without a shoulder belt increases the risk of a child's head hitting a hard surface in a collision. For this reason, you should never use a booster seat with a lap belt only. It is best to use a booster seat with lap/shoulder belts in the back seat- the safest place for children to ride.

Seating and Safety Restraints



Follow all instructions provided by the manufacturer of the booster seat.



Never put the shoulder belt under a child's arm or behind the back because it eliminates the protection for the upper part of the body and may increase the risk of injury or death in a collision.



Never use pillows, books, or towels to boost a child. They can slide around and increase the likelihood of injury or death in a collision.

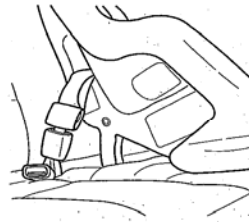
SAFETY SEATS FOR CHILDREN

Child and infant or child safety seats

Use a safety seat that is recommended for the size and weight of the child. Carefully follow all of the manufacturer's instructions with the safety seat you put in your vehicle. If you do not install and use the safety seat properly, the child may be injured in a sudden stop or collision.

When installing a child safety seat:

- Review and follow the information presented in the *Air bag supplemental restraint system (SRS)* section in this chapter.
- Use the correct safety belt buckle for that seating position (the buckle closest to the direction the tongue is coming from).
- Insert the belt tongue into the proper buckle until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.
- Keep the buckle release button pointing up and away from the safety seat, with the tongue between the child seat and the release button, to prevent accidental unbuckling.
- Place seat back in upright position.
- Put the safety belt in the automatic locking mode. Refer to *Automatic locking mode* (passenger side front and outboard rear seating positions) (if equipped) section in this chapter.



Seating and Safety Restraints

- LATCH lower anchors are recommended for use by children up to 22 kg (48 pounds) in a child restraint. Top tether anchors can be used for children up to 27 kg (60 pounds) in a child restraint, and to provide upper torso restraint for children up to 36 kg (80 pounds) using an upper torso harness and a belt-positioning booster.

Ford recommends the use of a child safety seat having a top tether strap. Install the child safety seat in a seating position with LATCH and tether anchors. For more information on top tether straps and anchors, refer to *Attaching safety seats with tether straps* in this chapter. For more information of LATCH anchors refer to *Attaching safety seats with LATCH (Lower Anchors and Tethers for Children) attachments* in this chapter.

⚠ Carefully follow all of the manufacturer's instructions included with the safety seat you put in your vehicle. If you do not install and use the safety seat properly, the child may be injured in a sudden stop or collision.

⚠ Rear-facing child seats or infant carriers should never be placed in the front seats.

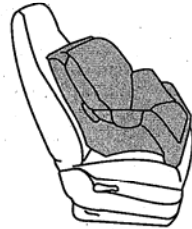
Installing child safety seats with combination lap and shoulder belts

The rear seat head restraints must be removed when using a child seat.

⚠ Air bags can kill or injure a child in a child seat. **NEVER** place a rear-facing child seat in front of an active air bag. If you must use a forward-facing child seat in the front seat, move the seat all the way back.

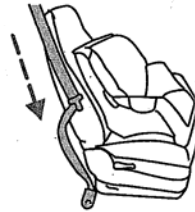
Seating and Safety Restraints

1. Position the child safety seat in a seat with a combination lap and shoulder belt.

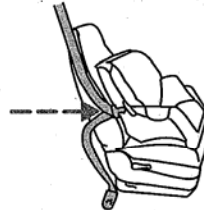


 Children 12 and under should be properly restrained in the rear seat whenever possible.

2. Pull down on the shoulder belt and then grasp the shoulder belt and lap belt together.

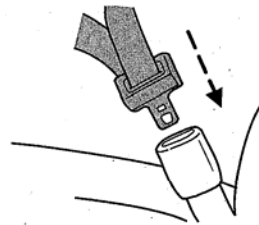


3. While holding the shoulder and lap belt portions together, route the tongue through the child seat manufacturer's instructions. Be sure the belt webbing is not twisted.

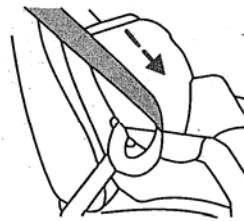


Seating and Safety Restraints

4. Insert the belt tongue into the proper buckle (the buckle closest to the direction the tongue is coming from) for that seating position until you hear a snap and feel the latch engage. Make sure the tongue is latched securely by pulling on it.



5. To put the retractor in the automatic locking mode, grasp the shoulder portion of the belt and pull downward until all of the belt is extracted and a click is heard.



6. Allow the belt to retract. The belt will click as it retracts to indicate it is in the automatic locking mode.

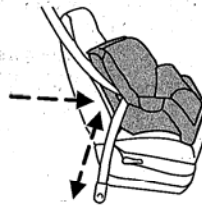
7. Pull the lap belt portion across the child seat toward the buckle and pull up on the shoulder belt while pushing down with your knee on the child seat.



Seating and Safety Restraints

8. Allow the safety belt to retract to remove any slack in the belt.

9. Before placing the child in the seat, forcibly tilt the seat forward and back to make sure the seat is securely held in place. To check this, grab the seat at the belt path and attempt to move it side to side and forward and back. There should be no more than one inch of movement for proper installation.



10. Try to pull the belt out of the retractor to make sure the retractor is in the automatic locking mode (you should not be able to pull more belt out). If the retractor is not locked, unbuckle the belt and repeat steps two through nine.

Check to make sure the child seat is properly secured before each use.

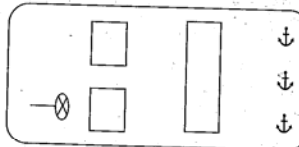
Attaching child safety seats with tether straps

Most new forward-facing child safety seats include a tether strap which goes over the back of the seat and hooks to an anchoring point. Tether straps are available as an accessory for many older safety seats. Contact the manufacturer of your child seat for information about ordering a tether strap.

The rear seating positions of your vehicle are equipped with built-in tether strap anchors located behind the seats on the roof panel in the cargo area.

The tether strap anchors in your vehicle are in the following positions:

⚠ Attach the tether strap only to the appropriate tether anchor as shown. The tether strap may not work properly if attached somewhere other than the correct tether anchor.

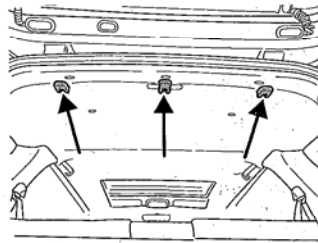


1. Position the child safety seat on the seat cushion.
2. Route the child safety seat tether strap over the back of the seat. For vehicles with adjustable head restraints, remove the head restraint first, place under the front seat for storage, and then route the tether strap over the top of the seatback.

Seating and Safety Restraints

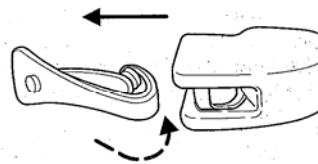
3. Locate the correct anchor for the selected seating position.

There are three tether anchors located on the headliner at the rear of the vehicle.

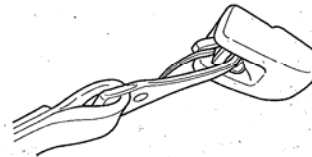


4. Clip the tether strap to the anchor as shown.

The arrow in the above graphic points toward the front of the vehicle.



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



5. Install the child safety seat tightly using the LATCH anchors or safety belts. Follow the instructions in this chapter.

6. Tighten the child safety seat tether strap according to the manufacturer's instructions.

! If the safety seat is not anchored properly, the risk of a child being injured in a collision greatly increases.

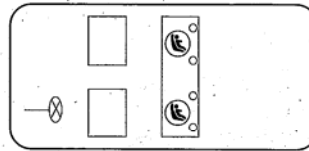
Seating and Safety Restraints

Attaching safety seats with LATCH (Lower Anchors and Tethers for Children) attachments for child seat anchors

Some child safety seats have two rigid or webbing mounted attachments that connect to two anchors at certain seating positions in your vehicle. This type of child seat eliminates the need to use seat belts to attach the child seat. For forward-facing child seats, the tether strap must also be attached to the proper tether anchor. See *Attaching safety seats with tether straps* in this chapter.

Your vehicle has LATCH anchors for child seat installation at the following locations:

The anchors on both sides of the center of the rear seat are provided primarily for child seats at the outboard seats, and are further apart than the pairs of lower anchors for child seat installation at other seats. A child seat with rigid LATCH attachments cannot be installed at the center rear seat. A

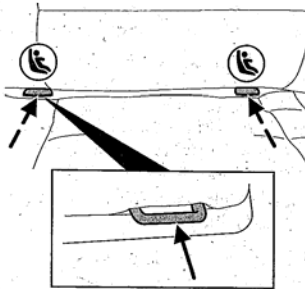


child seat with LATCH attachments on belt webbing can be used at the center rear seat unless a child seat at an outboard rear seat is attached to one of these lower anchors. Install a child seat onto the lower anchors at the center rear seat **ONLY IF** the child restraint manufacturer recommends that the child seat can be installed to anchors that are spaced up to 500 mm (20 in) apart.

! Never attach two LATCH child safety seats to the same anchor. In a crash, one anchor may not be strong enough to hold two child safety seat attachments and may break, causing serious injury or death.

Seating and Safety Restraints

The lower anchors for child seat installation are located at the rear section of the second row seat between the cushion and seat back. The LATCH anchors are below the locator symbols on the seat back.



Follow the child seat manufacturer's instructions to properly install a child seat with LATCH attachments.

⚠ Attach LATCH lower attachments of the child seat only to the anchors shown.

If you install a child seat with rigid LATCH attachments, do not tighten the tether strap enough to lift the child seat off the vehicle seat cushion when the child is seated in it. Keep the tether strap just snug without lifting the front of the child seat. Keeping the child seat just touching the vehicle seat gives the best protection in a severe crash.

Each time you use the safety seat, check that the seat is properly attached to the lower anchors and tether anchor. Try to tilt the child seat from side to side. Also try to tug the seat forward. Check to see if the anchors hold the seat in place.

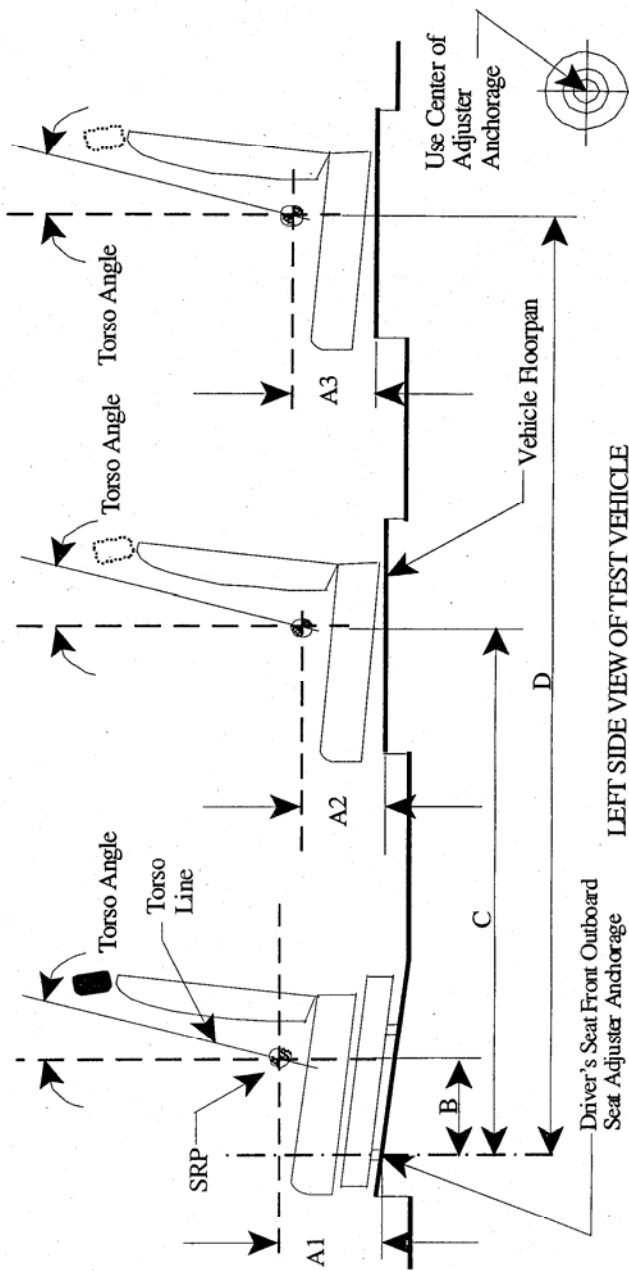
⚠ If the safety seat is not anchored properly, the risk of a child being injured in a crash greatly increases.

APPENDIX B
MANUFACTURER’S DATA (OVSC FORM 14)

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SEAT REFERENCE POINT (SRP) AND TORSO ANGLE DATA
 FOR FMVSS 225
 (All dimensions in mm¹)

Model Year: 2005; Make: Ford, Mazda, Mercury; Model: Escape/Escape HEV, Tribute, Mariner/Mariner HEV;
 Body Style: Light Truck; Seat Style: Front row: Bucket; Second row: 60/40; Third row: None;



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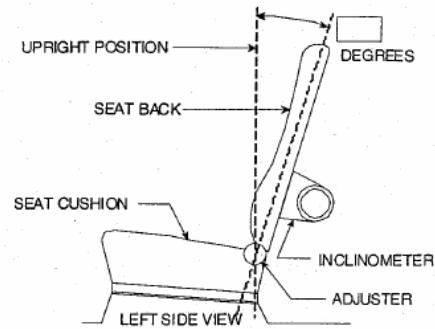
Table 1. Seating Positions¹ and Torso Angles

	Left (Driver Side)	Center (if any)	Right
A1	(Driver) 820	n/a	(Front Passenger) 820
A2	855	864	855
A3	n/a	n/a	n/a
B	2349	n/a	2349
C	3165	3165	3165
D	n/a	n/a	n/a
Torso Angle (degree)	Front Row	n/a	21 deg
	Second Row	24 deg	24 deg
	Third Row	n/a	n/a

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

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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 description of the location of the 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, driver's seat = 17.4 degrees
Measurement Instructions:

In order to correctly measure or set the SEATBACK (frame) angle (not torso angle, 21deg.), the trim and foam on the upper-seatback must be removed. Place the inclinometer on the upper frame and use the recliner to set the seatback at the correct design position. Option: The latch detent is "8" clicks from front to design position.

Seat back angle for passenger's seat = 17.4 degrees
Measurement Instructions:

In order to correctly measure or set the SEATBACK (frame) angle (not torso angle, 21deg.), the trim and foam on the upper-seatback must be removed. Place the inclinometer on the upper frame and use the recliner to set the seatback at the correct design position. Option: The latch detent is "8" clicks from front to design position.

Seat back angle for 2nd row seat = 23.5 degrees
Measurement Instructions:

In order to correctly measure the 2nd row SEATBACK (frame) angle (not torso angle, 24deg), Place the inclinometer on the flat area of the back side of the frame. _____

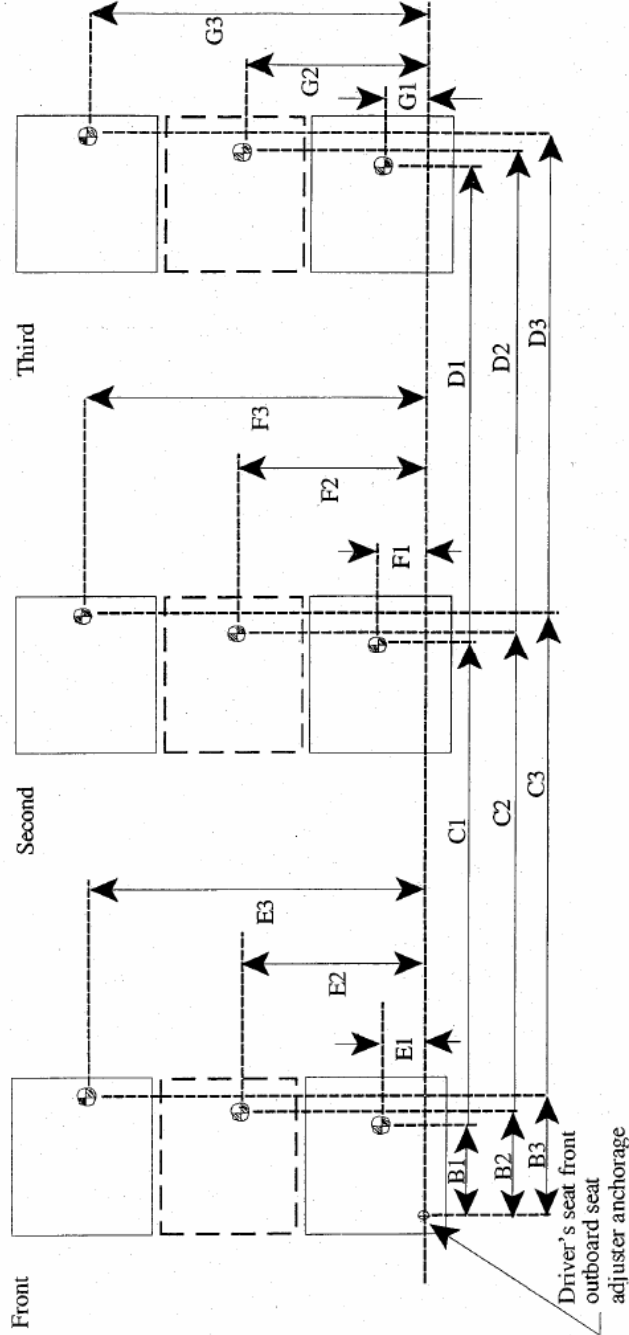
Seat back angle for 3rd row seat = na degrees
Measurement Instructions:

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

(Note: The Child Restraint Anchorage Location determines the 225 SRP locations)

Model Year: 2005; Make: Ford, Mazda, Mercury; Model: Escape/Escape HEV, Tribute, Mariner/Mariner HEV;
Body Style: Light Truck; Seat Style: Front row: Bucket; Second row: 60/40; Third row: None;



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Table 2. Seating Reference Point and Tether Anchorage Locations

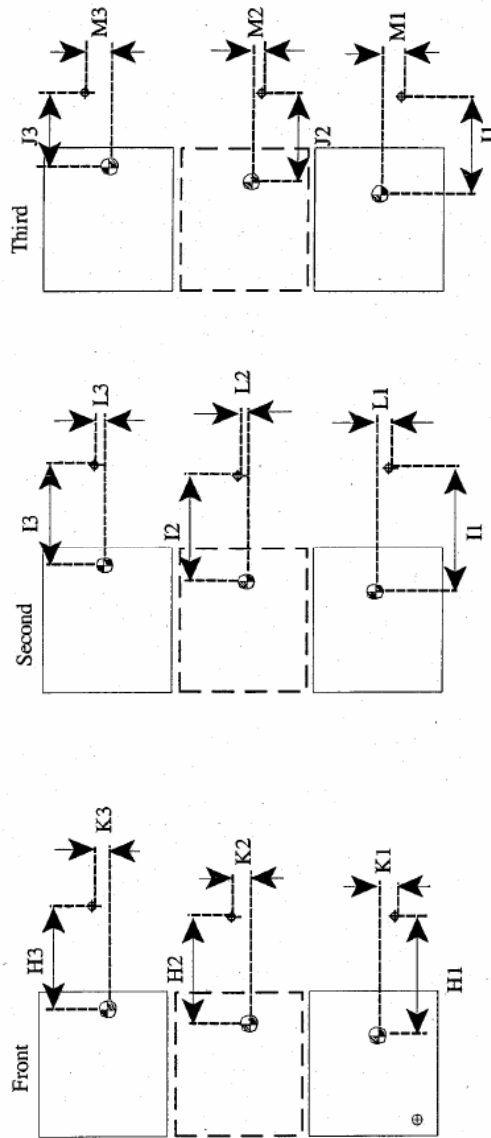
Seating Reference Point (SRP)	Distance from Driver's front outboard seat adjuster anchorage ¹	
Front Row	B1	307.3
	E1	198
	B2	n/a
	E2	n/a
	B3	307.3
	E3	938
Second Row	C1	1147.4
	F1	198
	C2	1147.4
	F2	566
	C3	1147.4
	F3	938
Third Row	D1	n/a
	G1	n/a
	D2	n/a
	G2	n/a
	D3	n/a
	G3	n/a

Note: 1. Use the center of anchorage.

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

Model Year: 2005; Make: Ford, Mazda, Mercury; Model: Escape/Escape HEV, Tribute, Mariner/Mariner HEV;
 Body Style: Light Truck; Seat Style: Bucket; Front row: None; Second row: 60/40; Third row: None;



⊙: SRP
 ⊕: Tether anchorage

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

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Table 3. Seating Reference Point and Tether Anchorage Locations

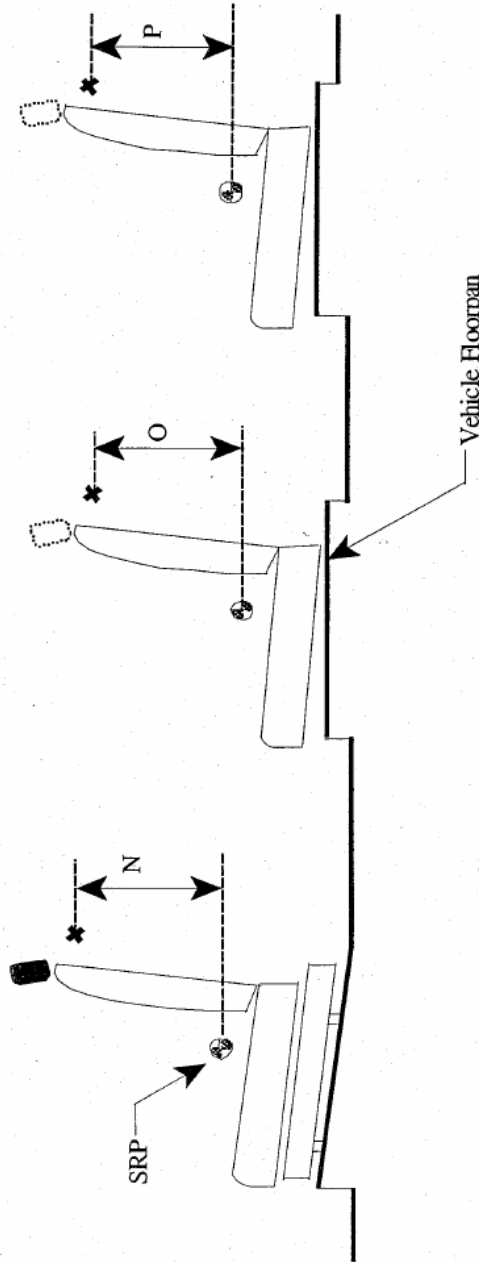
Seating Reference Point (SRP)	Distance from SRP	
	Front Row	H1
	K1	n/a
	H2	n/a
	K2	n/a
	H3	n/a
	K3	n/a
Second Row	I1	807
	L1	0
	I2	818
	L2	0
	I3	807
	L3	0
Third Row	J1	n/a
	M1	n/a
	J2	n/a
	M2	n/a
	J3	n/a
	M3	n/a

Note: 1. Use the center of anchorage.

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

Model Year: 2005; Make: Ford, Mazda, Mercury; Model: Escape/Escape HEV, Tribute, Mariner/Mariner HEV;
Body Style: Light Truck; Seat Style: Front row: Bucket; Second row: 60/40; Third row: None;



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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) 810
	O2 (Center) 803
	O3 (Right) 810
Third Row	P1 (Left) n/a
	P2 (Center) n/a
	P3 (Right) n/a

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

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Test Procedures Used for Compliance Tests

Lower Anchorages (ON SEAT)

For each seating location in each row record applicable FMVSS Section		FMVSS 225 Section(s)			
Block 1		Lower anchorage location certification method used (Enter applicable section used in block 1 of each position by circling A or B) A) 9.2.1 or B) 15.1.2.2			
Block 2		Lower anchorage dimension (Enter applicable section used in block 2 by circling A or B) (also provide roll and yaw angles) A) 9.1.1 or B) 15.1.2.2 pitch _____° roll _____° yaw _____°			
Block 3		Lower anchorage marking (Enter applicable section used in block 3 by circling A or B) A) 9.5 or B) 15.4			
Block 4		Strength requirement (Enter applicable section used in block 4 by circling A or B) A) Section 9 or B) Section 15			
Front	Driver	N/A			
	Center (if any)	Block 1 A — B	Block 2 A — B Pitch _____° Roll _____° Yaw _____°	Block 3 A — B	Block 4 A — B
N/A	Right (if any)	Block 1 A — B	Block 2 A — B Pitch _____° Roll _____° Yaw _____°	Block 3 A — B	Block 4 A — B
Second	Left	Block 1 A B	Block 2 A B Pitch 17°, Roll 0°, Yaw 0°	Block 3 A B	Block 4 A B
	Center N/A	Block 1 A — B	Block 2 A — B Pitch _____° Roll _____° Yaw _____°	Block 3 A — B	Block 4 A — B
	Right	Block 1 A B	Block 2 A B Pitch 17°, Roll 0°, Yaw 0°	Block 3 A B	Block 4 A B
Third	Left	Block 1 A — B	Block 2 A — B Pitch _____° Roll _____° Yaw _____°	Block 3 A — B	Block 4 A — B
	Center	Block 1 A — B	Block 2 A — B Pitch _____° Roll _____° Yaw _____°	Block 3 A — B	Block 4 A — B
	N/A	Right	Block 1 A — B Pitch _____° Roll _____° Yaw _____°	Block 3 A — B	Block 4 A — B
Fourth	Left	Block 1 A — B	Block 2 A — B Pitch _____° Roll _____° Yaw _____°	Block 3 A — B	Block 4 A — B
	Center	Block 1 A — B	Block 2 A — B Pitch _____° Roll _____° Yaw _____°	Block 3 A — B	Block 4 A — B
	N/A	Right	Block 1 A — B Pitch _____° Roll _____° Yaw _____°	Block 3 A — B	Block 4 A — B

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Test Procedures Used for Compliance Tests

Tether Anchorages

For each seating location in each row record applicable FMVSS Section		FMVSS Section(s) - Req.		
Block 1		Tether anchorage location certification method used (Enter applicable section used in block 1 by circling A, B, C, D, E or F) A) 6.2.1 B) 6.2.1.1 C) 6.2.1.2 D) 6.2.2 E) 6.2.2.1 F) 6.2.2.2		
Block 2		Number or tether anchorages based upon the applicable section (Enter applicable section used in block 2 by circling A or B) A) 4.4 B) 4.5		
Block 3		Tether anchorage strength requirement (Enter applicable section used in block 3 by circling A, B, or C) A) 6.3.1 B) 6.3.2 C) 6.3.4		
Front	Driver	N/A		
	Center (if any)	N/A	N/A	N/A
	Right (if any)	N/A	N/A	N/A
Second	Left	Block 1 A	Block 2 A	Block 3 A
	Center	Block 1 A	Block 2 A	Block 3 A
	Right	Block 1 A	Block 2 A	Block 3 A
Third	Left	N/A	N/A	N/A
	Center	N/A	N/A	N/A
	Right	N/A	N/A	N/A
Fourth	Left	N/A	N/A	N/A
	Center	N/A	N/A	N/A
	Right	N/A	N/A	N/A