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FINAL REPORT NUMBER 225-MGA-03-001

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

GENERAL MOTORS COMPANY
2003 PONTIAC VIBE
NHTSA No. C30105

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083



Test Date: May 2, 2003
Report Date: August 29, 2003

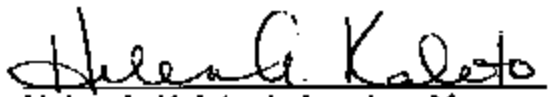
FINAL REPORT

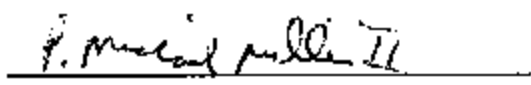
PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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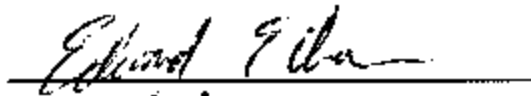
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Approved By: 

Approval Date: 2/5/04

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: 

Acceptance Date: 1/7/04

TABLE OF CONTENTS

<u>SECTION</u>		<u>PAGE</u>
1.0	PURPOSE AND PROCEDURE	5
2.0	COMPLIANCE TEST AND DATA SUMMARY	5
3.0	TEST VEHICLE INFORMATION	6
4.0	TEST EQUIPMENT LIST AND CALIBRATION INFORMATION	8
5.0	DATA	9
6.0	PHOTOGRAPHS	14
6.1	Vehicle Receiving	
6.1.1	full passenger side view	
6.1.2	full driver side view	
6.1.3	¼ passenger rear side view	
6.1.4	¼ driver front side view	
6.2	Test vehicle's certification label	
6.3	Test vehicle's tire information placard	
6.4	3/4 Frontal left side view of test vehicle with test apparatus in place	
6.5	3/4 Frontal right side view of test vehicle with test apparatus in place	
6.6	Vehicle tie down at each tie down location	
6.6.1	left front	
6.6.2	left rear	
6.6.3	right front	
6.6.4	right rear	
6.6.5	side view under vehicle	
6.6.6	full rear view	
6.7	Pre-test views of each child restraint anchorage system installed in the vehicle	
6.7.1	pre-forward SFAD II test 1 of 2	
6.7.2	pre-forward SFAD II test 2 of 2	
6.7.3	pre-forward SFAD I test 1 of 3	
6.7.4	pre-forward SFAD I test 2 of 3	
6.7.5	pre-forward SFAD I test 3 of 3	
6.8	Pre-test equipment set up at each designated seating position & loading device with load cell and the test fixture in test position	
6.8.1	pre-test & equipment 1 of 2	
6.8.2	pre-test & equipment 2 of 2	
6.9	Load system control and data recording device in test position	
6.9.1	forward SFAD II test 1 of 1	
6.9.2	forward SFAD I test 1 of 1	
6.10	Post-test condition of each child restraint anchorage system	
6.10.1	post-forward SFAD II test 1 of 3	
6.10.2	post-forward SFAD II test 2 of 3	
6.10.3	post-forward SFAD II test 3 of 3	
6.10.4	post-forward SFAD I test 1 of 5	
6.10.5	post-forward SFAD I test 2 of 5	
6.10.6	post-forward SFAD I test 3 of 5	
6.10.7	post-forward SFAD I test 4 of 5	
6.10.8	post-forward SFAD I test 5 of 5	
7.0	PLOTS	45
8.0	REPORT OF VEHICLE CONDITION	48
	APPENDIX A OWNERS MANUAL CHILD RESTRAINT SYSTEMS	50
	APPENDIX B MANUFACTURER'S DATA (OVSC Form 14)	61

LIST OF TABLES

<u>TABLE#</u>		<u>PAGE</u>
1.	Summary Data for Strength and Displacement	6
2.	General Test and Vehicle Parameter Data	6
3.	Child Restraint Tether Anchorage Configuration (Data Sheet 1)	9
4.	Child Restraint Lower Anchorage Configuration (Data Sheet 2)	11
5.	Tether Location and Dimensional Measurements (Data Sheet 3)	12
6.	Tether Anchorage Static Loading and Displacement (Data Sheet 5)	13
7.	Lower Anchorage Static Loading and Displacement (Data Sheet 6) With SFAD 2	13

1.0 PURPOSE AND PROCEDURE

PURPOSE

The child restraint anchorage test 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 2003 Pontiac Vibe, NHTSA No. C30105 meets the performance requirements of FMVSS No. 225, "Child Restraint Anchorage Systems."

PROCEDURE

These tests were conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedures, TP-225T (5/3/01) and TP-225L (6/11/01), and MGA's Laboratory Test Procedure, MGATP225GOV (3/20/03).

The front occupant compartment consisted of two (2) adjustable outboard bucket seats and the rear occupant compartment consisted of a three-passenger bench seat. Each rear outboard seating position was equipped with a child restraint anchorage system (one tether and two lower anchors). The rear center occupant position was equipped with a tether anchorage only. The center-to-center spacing between the two rear outboard lower anchorage systems was approximately 680 mm. The lower anchorages for both rear outboard seating positions were tested with SFAD 2 fixtures and the tether anchorage in the rear center seating position was tested with a SFAD 1 fixture.

2.0 COMPLIANCE TEST AND DATA SUMMARY

TEST SUMMARY

The tests were conducted at MGA, Troy, Michigan on May 2, 2003.

Based on the test results, the 2003 Pontiac Vibe appeared to meet the performance requirements of FMVSS No. 225 for these tests.

The SFAD 2 at the rear left outboard seating position sustained a maximum force of 8,230 N and held the required load for 2.0 seconds with a total displacement of 33 mm, measured at Point "x". The SFAD2 at the rear right outboard seating position sustained a maximum force of 8,598 N and held the required load for 2.1 seconds with a total displacement of 38 mm, measured at Point "x". The SFAD 1 at the rear row center seating position sustained a maximum force of 10,164 N and held the required load for 3 seconds. The applied maximum forces and the measured displacements are provided in Table 1.

DATA SUMMARY

Strength and displacement summary data are provided below, and 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	Seating Position	Max. Load (N)	Displacement (mm)
SB3229	SFAD II	Rear Left	8,230	33
		Rear Right	8,598	37
SB3230	SFAD I	Rear Center	10,164	N/A

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

3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

VEH. MOD YR/MAKE/MODEL/BODY	2003 Pontiac Vibe
VEH. NHTSA NO.	C30105
VIN	5Y2SL62833Z440235
COLOR	Red
VEH. BUILD DATE	September 2002
TEST DATE	May 2, 2003
TEST LABORATORY	MGA Research Corporation
OBSERVERS	Brad Reaume

GENERAL INFORMATION:

Date Received: October 30, 2002 Odometer Reading: 23 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: New United Motor Manufacturing, Inc.

Date of Manufacture: 9/02; VIN: 5Y2SL62833Z440235

GVWR: 1744kg; GAWR FRONT: 914kg

GAWR REAR: 839kg

DATA SUMMARY

Strength and displacement summary data are provided below, and 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.

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Date of Manufacture: 9/02; VIN: 5Y2SL62833Z440235

GVWR: 1744kg; GAWR FRONT: 914kg

GAWR REAR: 839kg

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 220kpa REAR: 220kpa

Recommended Tire Size: P205/55/R16

Recommended Cold Tire Pressure: Unknown

FRONT: 220kpa REAR: 220kpa

Size of Tire on Test Vehicle: P205/55/R16

Type of Spare Tire: Standard: T135/80/R16

VEHICLE CAPACITY DATA:

Type of Front Seats: Bench ___; Bucket X; Split Bench _____

Number of Occupants: Front 2; 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
Three (3) Load Cells 3,000 lb Capability	S/N 153 6/10/03, S/N 306 8/20/03, & S/N 147 6/10/03
Two (2) String Potentiometers (S/N 18385 & 18386)	Calibrated at each use
Hydraulic Pump	N/A
MGA CRF Fixture	N/A
MGA SFAD2	N/A
MGA H-point Machine	N/A
MGA 2-Dimensional Template	N/A
Linear Scale	7/24/03 (S/N 133)
MGA Data Acquisition System	N/A
Three (3) Hydraulic Cylinders	N/A
Calipers	2/14/04 (S/N DCL002)
Force Gauge	10/11/03 (S/N FRG001)
Inclinometer (Digital)	5/28/03 (S/N DGP002)

5.0 DATA

Table 3. Child Restraint Tether Anchorage Configuration (Data Sheet 1)

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
	Ctr.	Yes	Yes	Yes
	RH	Yes	Yes	Yes
Third Row	N/A	N/A	N/A	N/A

Note: AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225L & 225T.

REMARKS: NONE

Table 4. Child Restraint Lower Anchorage Configuration (Data Sheet 2)

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 75 mm above the bar, and in the vertical longitudinal plane that passes through the center of the bar.	LH	N/A	Yes (O/B only Marked)		N/A
	Ctr		N/A		
	RH		Yes (O/B only Marked)		
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	5.96	5.96	N/A
	Ctr		N/A		
	RH		5.97	5.96	
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 center of the anchorage bar (mm)	LH	N/A	47	47	N/A
	Ctr		N/A		
	RH		52	53	
Measure the distance between the SRP to the center of the anchorage bar (mm)	LH	N/A	190		N/A
	Ctr		N/A		
	RH		190		

Table 4. Child Restraint Lower Anchorage Configuration (Data Sheet 2) (continued)

OBSERVED LOWER ANCHORAGE CONFIGURATION	SEAT POSITION				
		FRONT ROW	SECOND ROW		THIRD ROW
Inspect if the centroidal longitudinal axes are collinear within 5 degrees	LH	N/A	Yes		N/A
	Cr		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 40 mm in length (mm).	LH	N/A	39	39	N/A
	Cr		N/A		
	RH		40	40	
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
	Cr		N/A		
	RH		Yes		
Measure the distance between the center of the length of one bar to the center of the length of the other bar. The requirement is 280 mm ± 1 mm (mm).	LH	N/A	280		N/A
	Cr		N/A		
	RH		280		
Inspect if the bars are an integral and permanent part of the vehicle.	LH	N/A	Yes		N/A
	Cr		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
	Cr		N/A		
	RH		Yes		

PITCH, YAW, & ROLL INFORMATION

SEAT POSITION	PITCH (deg)	YAW (deg)	ROLL (deg)
LH	16.3	No Data	0.0
Cr	N/A		N/A
RH	16.1		0.1 to 0/B

Note: AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225L & 225T.

REMARKS: NONE

Table 5. Tether Location and Dimensional Measurements (Data Sheet 3)

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

Note: AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225L & 225T.

REMARKS: NONE

Table 6. Tether Anchorage Static Loading and Displacement (Data Sheet 5)

SEAT POSITION		Seat, Seat Back, & Head Restraint Positions			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 Head Restraint?							
Front Row	LH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ctr.										
	RH										
Second Row	LH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ctr.	Fixed	Fixed	No	5	N/A	352	10,000	10,164*	N/A	N/A
	RH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Third Row	LH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ctr.										
	RH										

Note: (1) AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225L & 225T.

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

Table 7. Lower Anchorage Static Loading and Displacement (Data Sheet 6) With SFAD 2

SEAT POSITION		Seat, Seat Back, & Head Restraint Positions			Type of SFAD used	Measured Angles		Initial Location (mm)	Onset Rate (N/sec.)	Force Applied (N)	Max. Load (N)	Final Location (mm)	Displ. (mm)
		Seat	Seat Back	Is There a Head Restraint?		Vert. (deg.)	Horiz. (deg.)						
Front Row	LH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ctr.												
	RH												
Second Row	LH	Fixed	Fixed	Yes	2	N/A	10	14	3750	8,000	8,230*	47	33
	Ctr.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	RH	Fixed	Fixed	Yes	2	N/A	10	16	3750	8,000	8,598*	54	38
Third Row	LH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ctr.												
	RH												

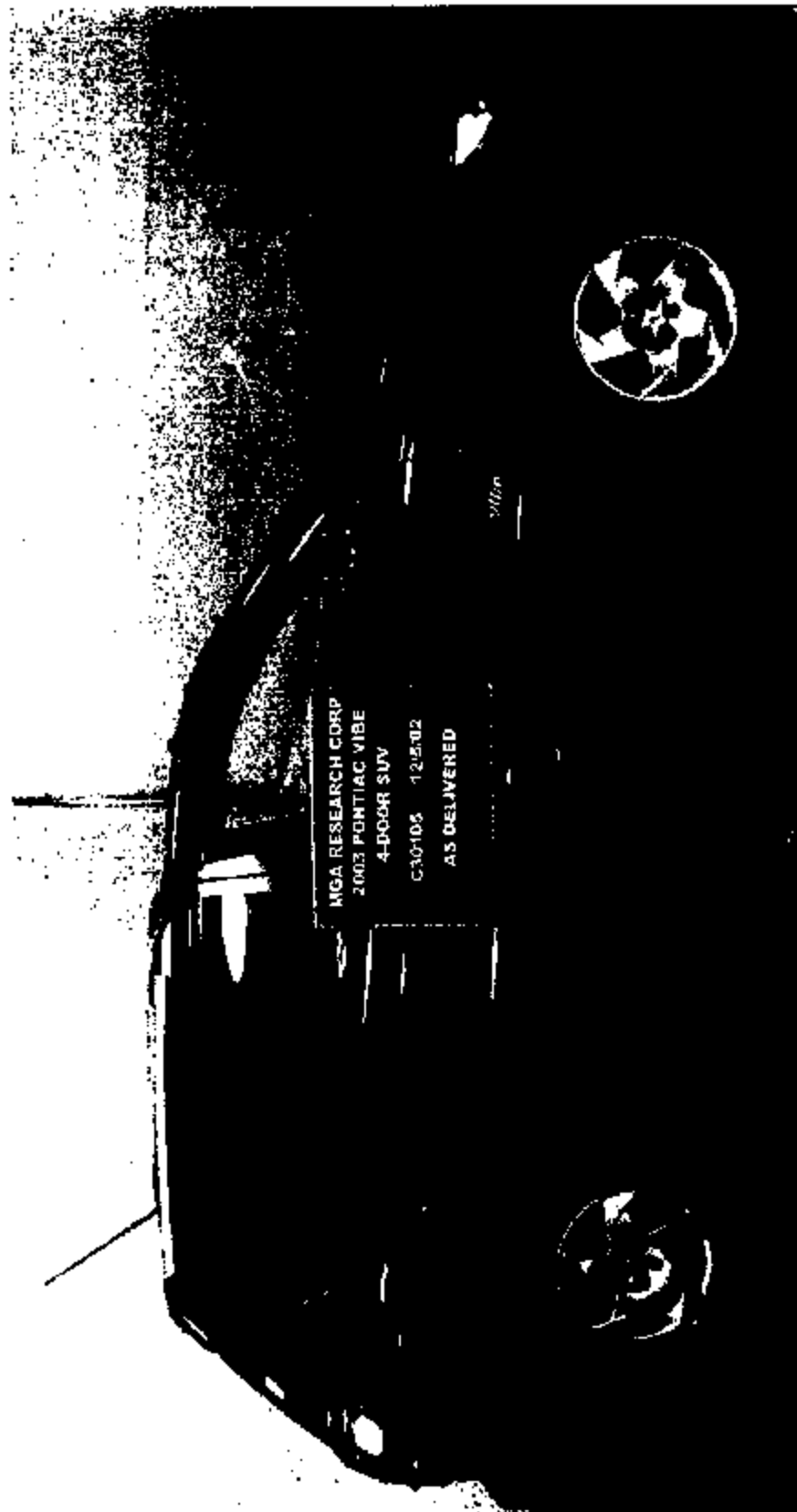
Note: (1) AS DETERMINED USING THE PROCEDURES SPECIFIED IN TP-225L.
 (2) FORWARD FORCE APPLICATION

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

6.0 PHOTOGRAPHS

6.1 Vehicle Receiving

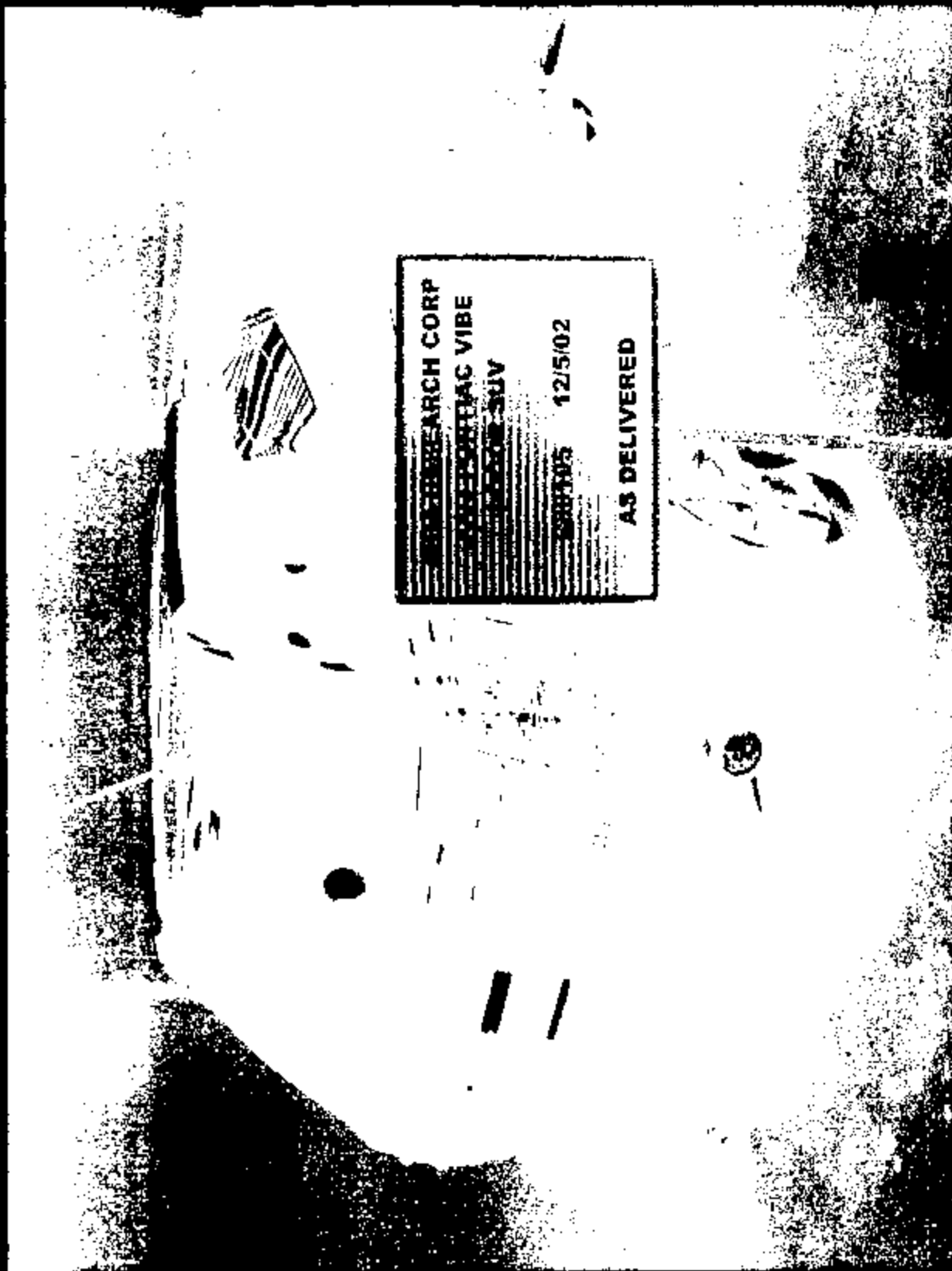
6.1.1 full passenger side view



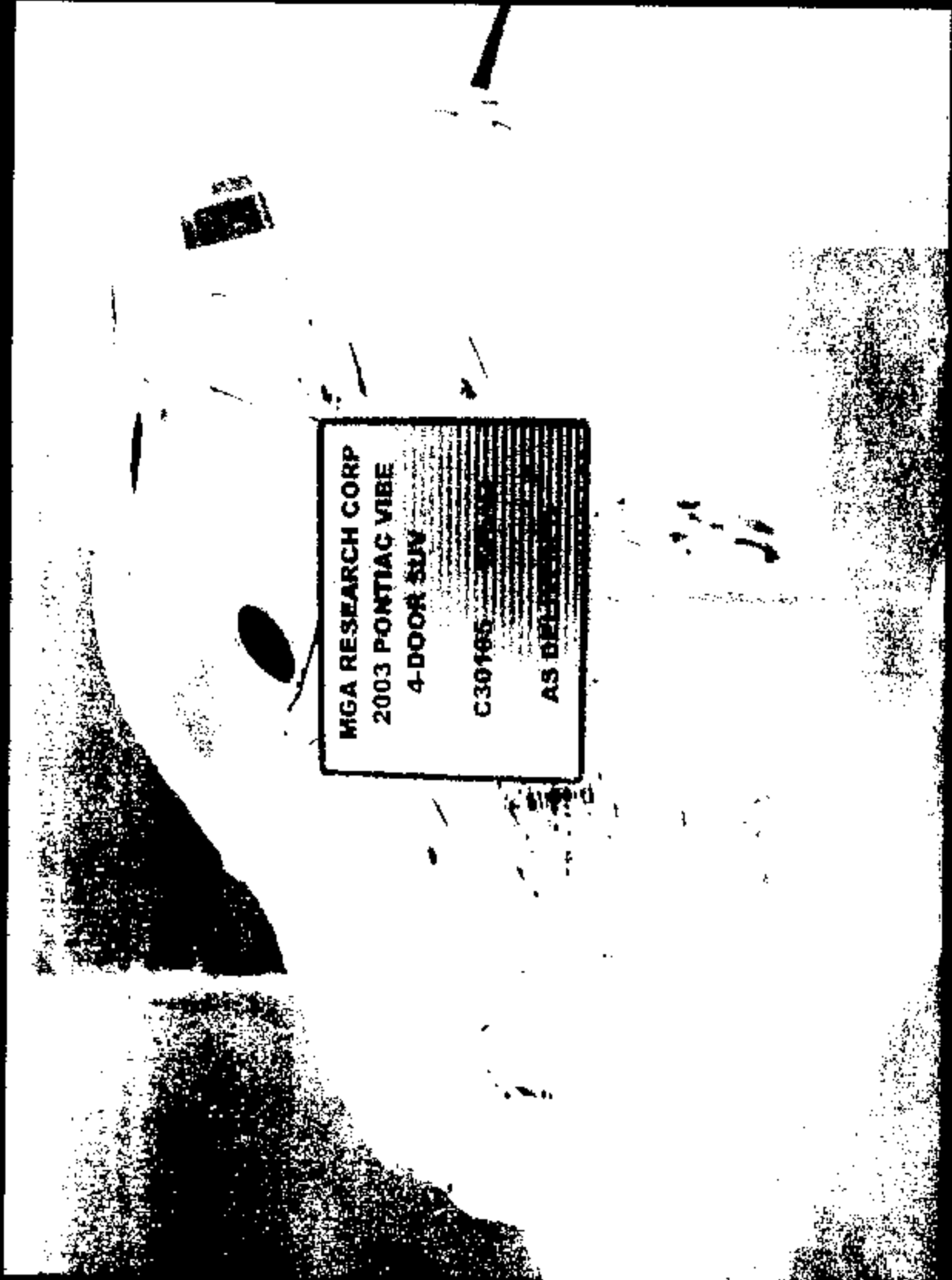
6.1.2 full driver side view



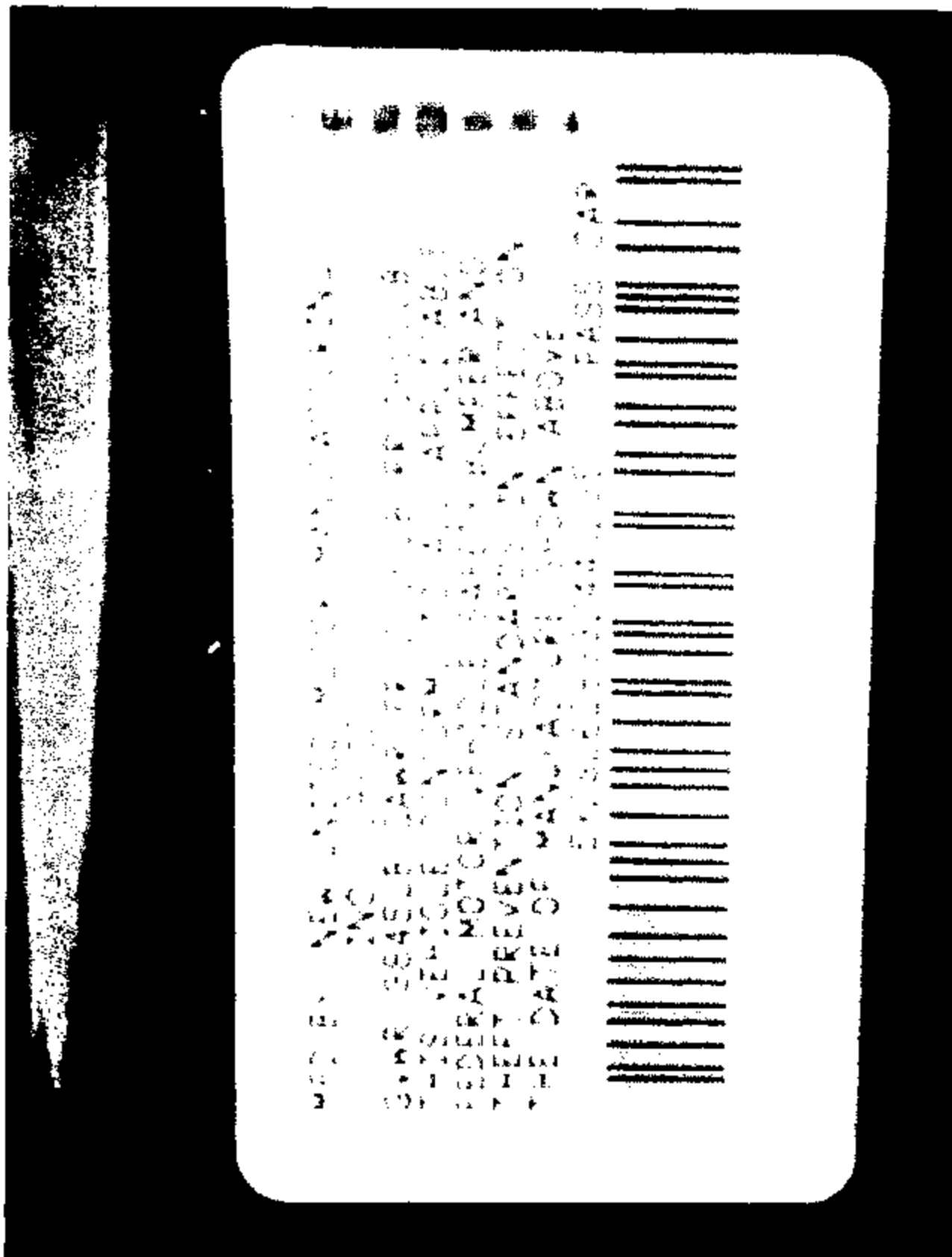
6.1.3 3/4 passenger rear side view



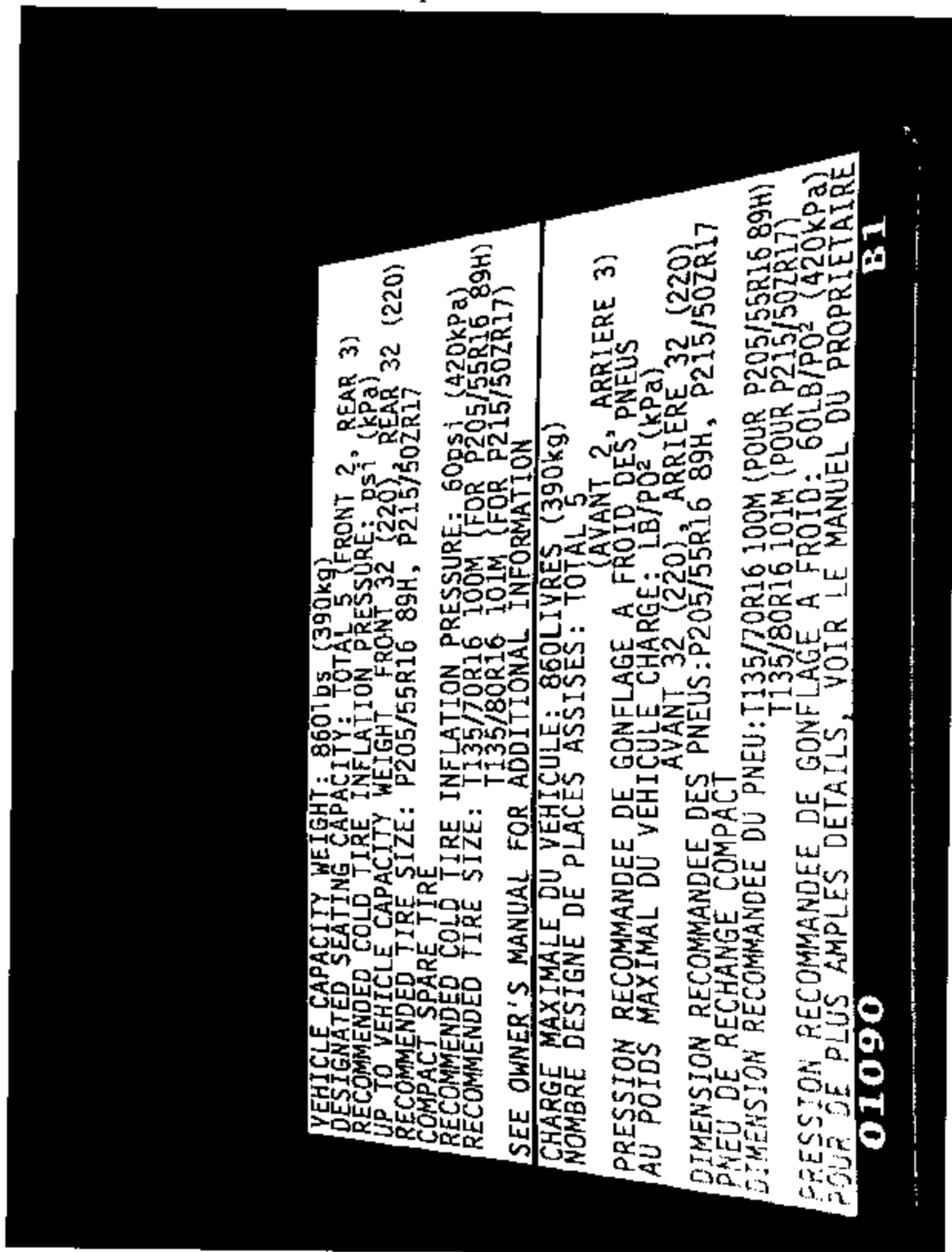
6.1.4 ¾ driver front side view



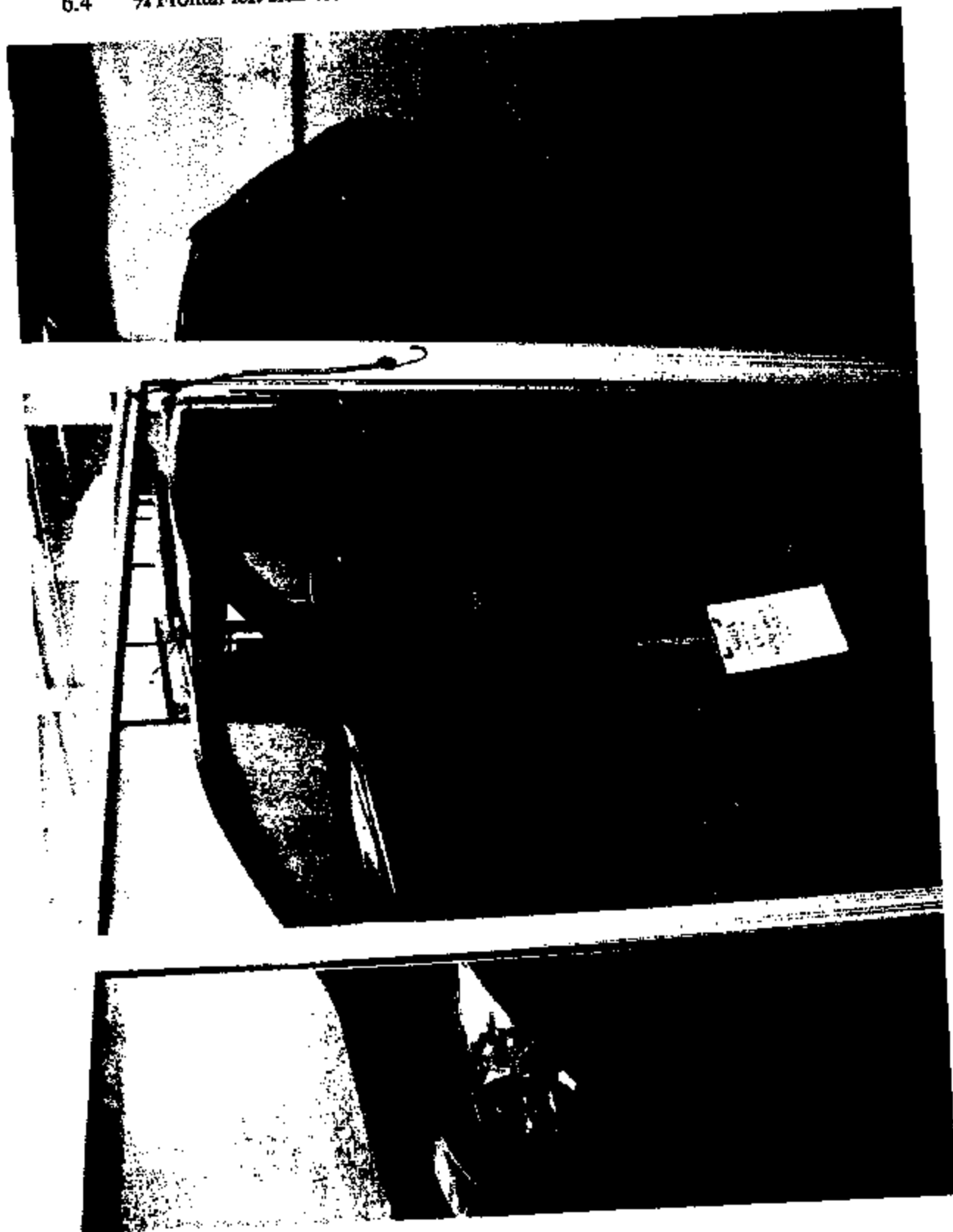
6.2 Test vehicle's certification label



6.3 Test vehicle's tire information placard



6.4 3/4 Frontal left side view of test vehicle with test apparatus in place



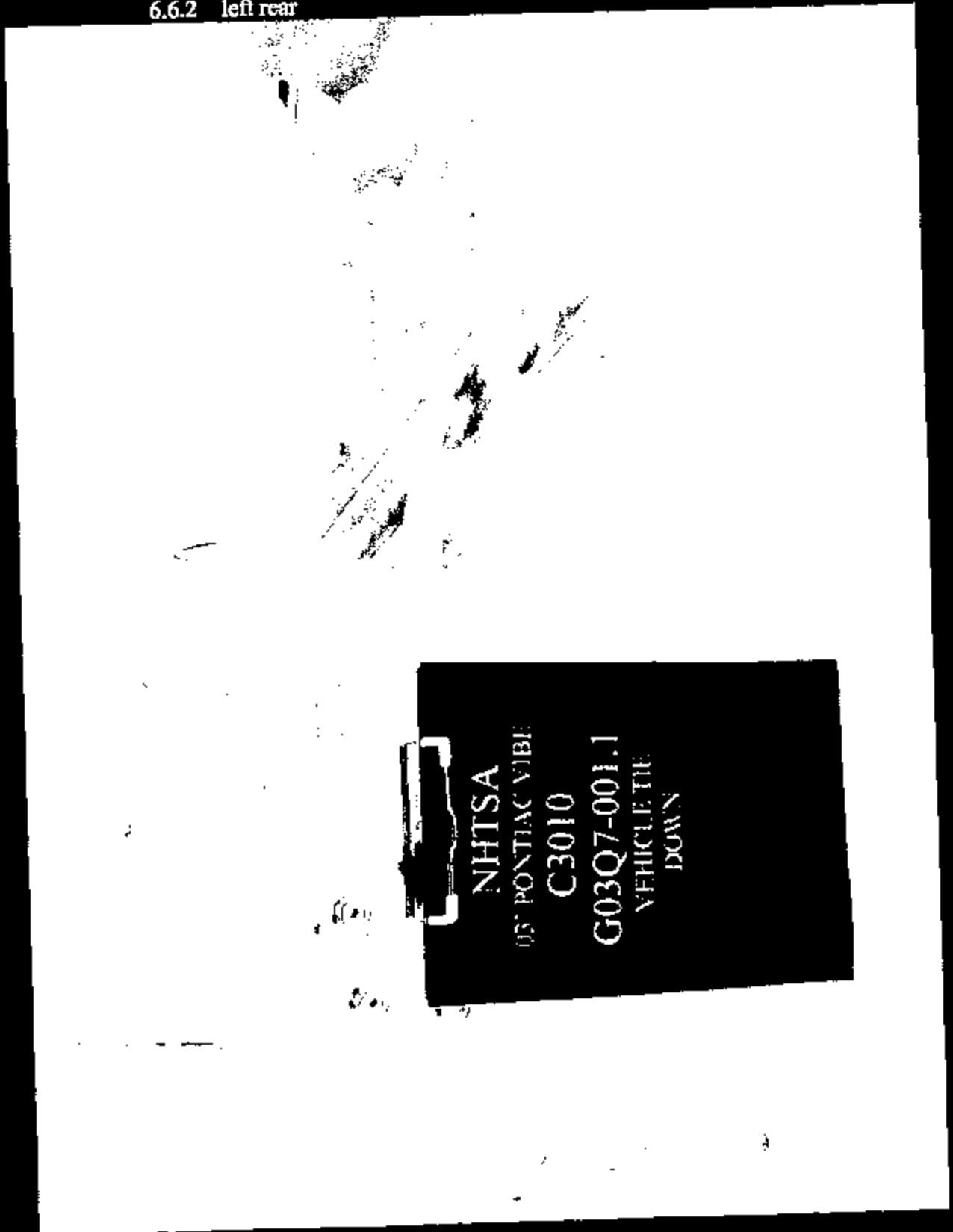
6.5 ¾ Frontal right side view of test vehicle with test apparatus in place



6.6 Vehicle tie down at each tie down location
6.6.1 left front

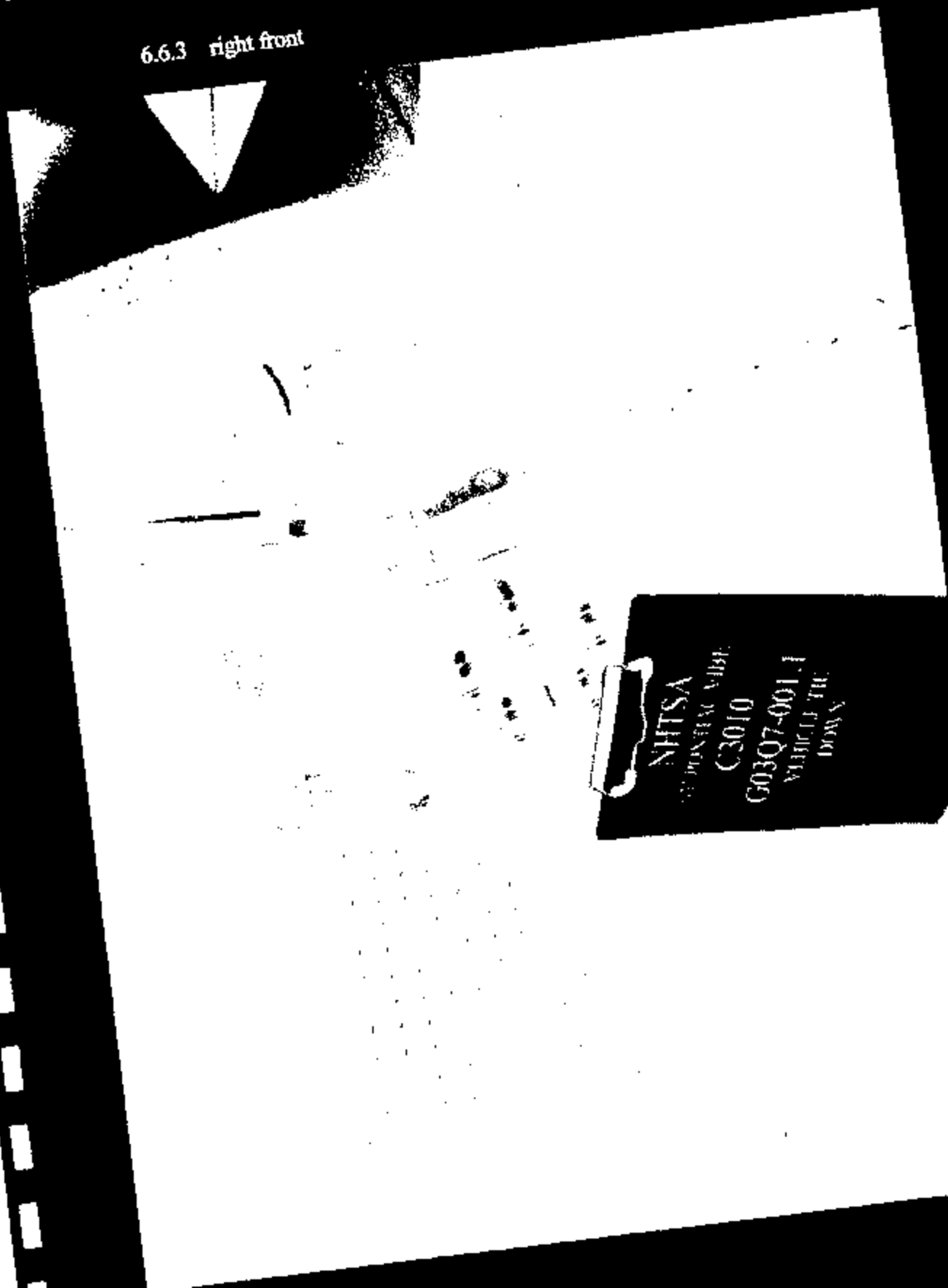


6.6.2 left rear



Safety Compliance Testing For FMVSS 225
"Child Restraint Anchorage Systems"

6.6.3 right front

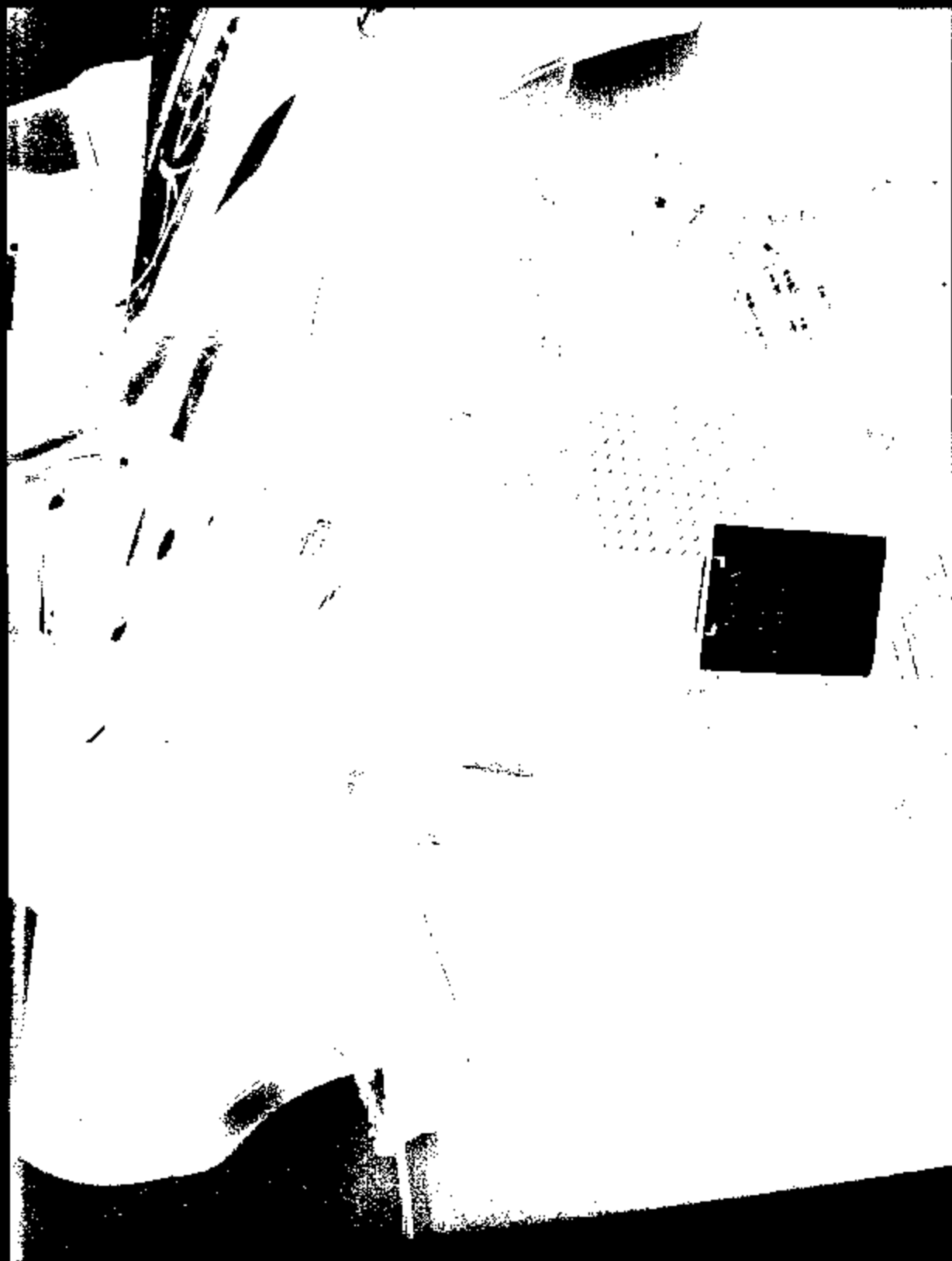


NHTSA
CONTRACT VIBE
C3010
G03Q7-001.1
VIBRATED
DOWN

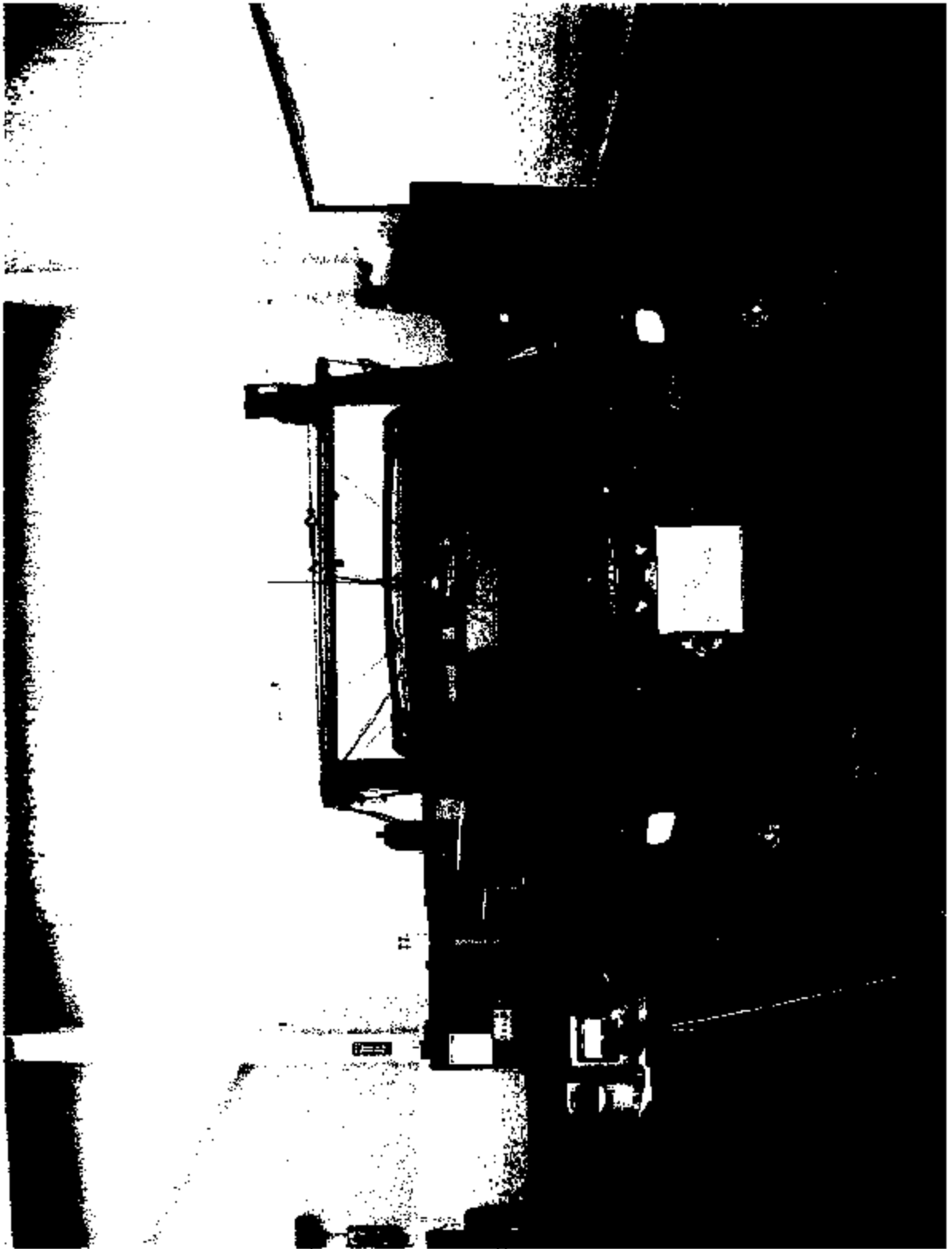
6.6.4 right rear



6.6.5 side view under vehicle

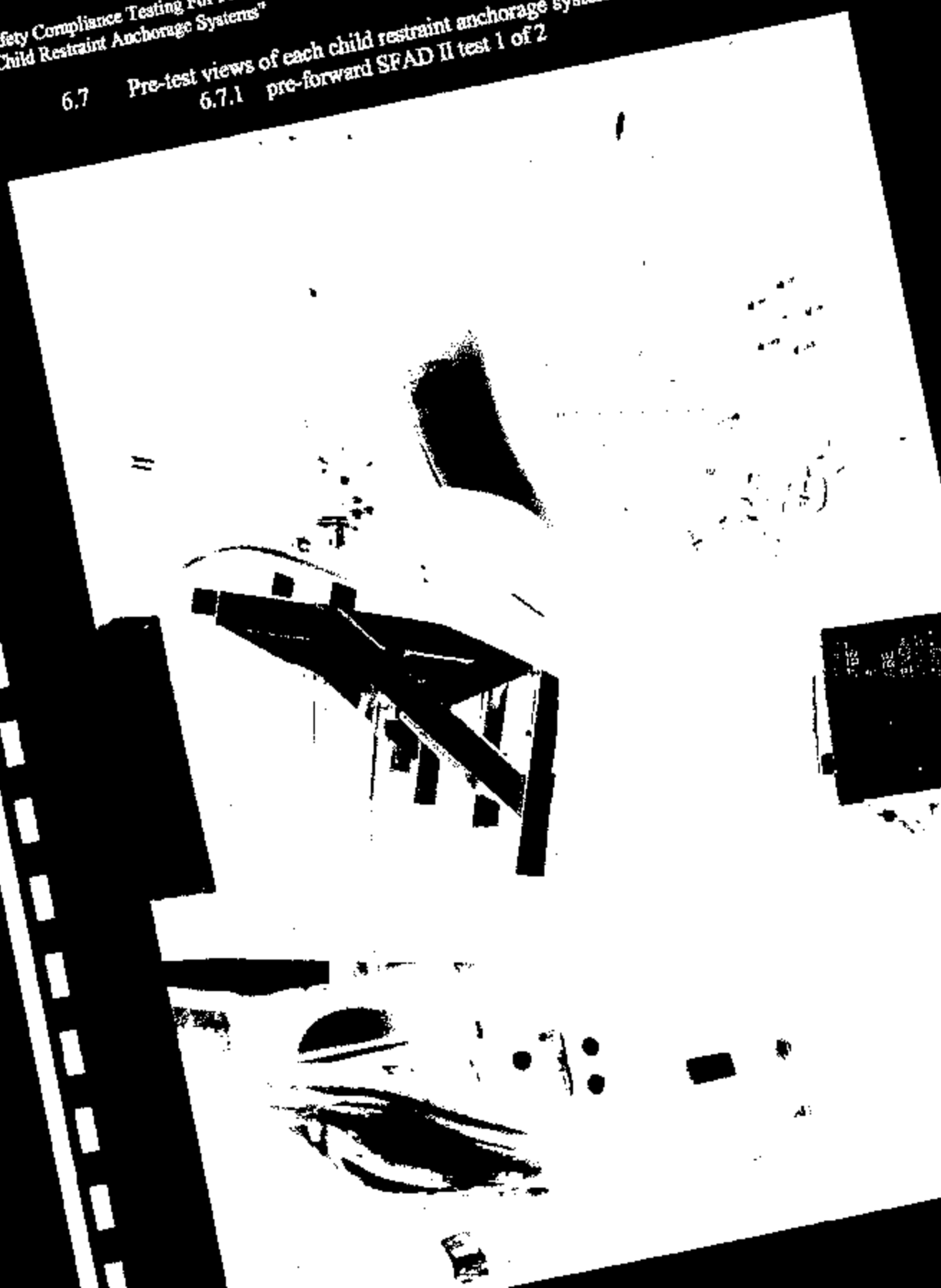


6.6.6 full rear view



Safety Compliance Testing For FMVSS 225
"Child Restraint Anchorage Systems"

- 6.7 Pre-test views of each child restraint anchorage system installed in the vehicle
 - 6.7.1 pre-forward SFAD II test 1 of 2



6.7.2 pre-forward SFAD II test 2 of 2

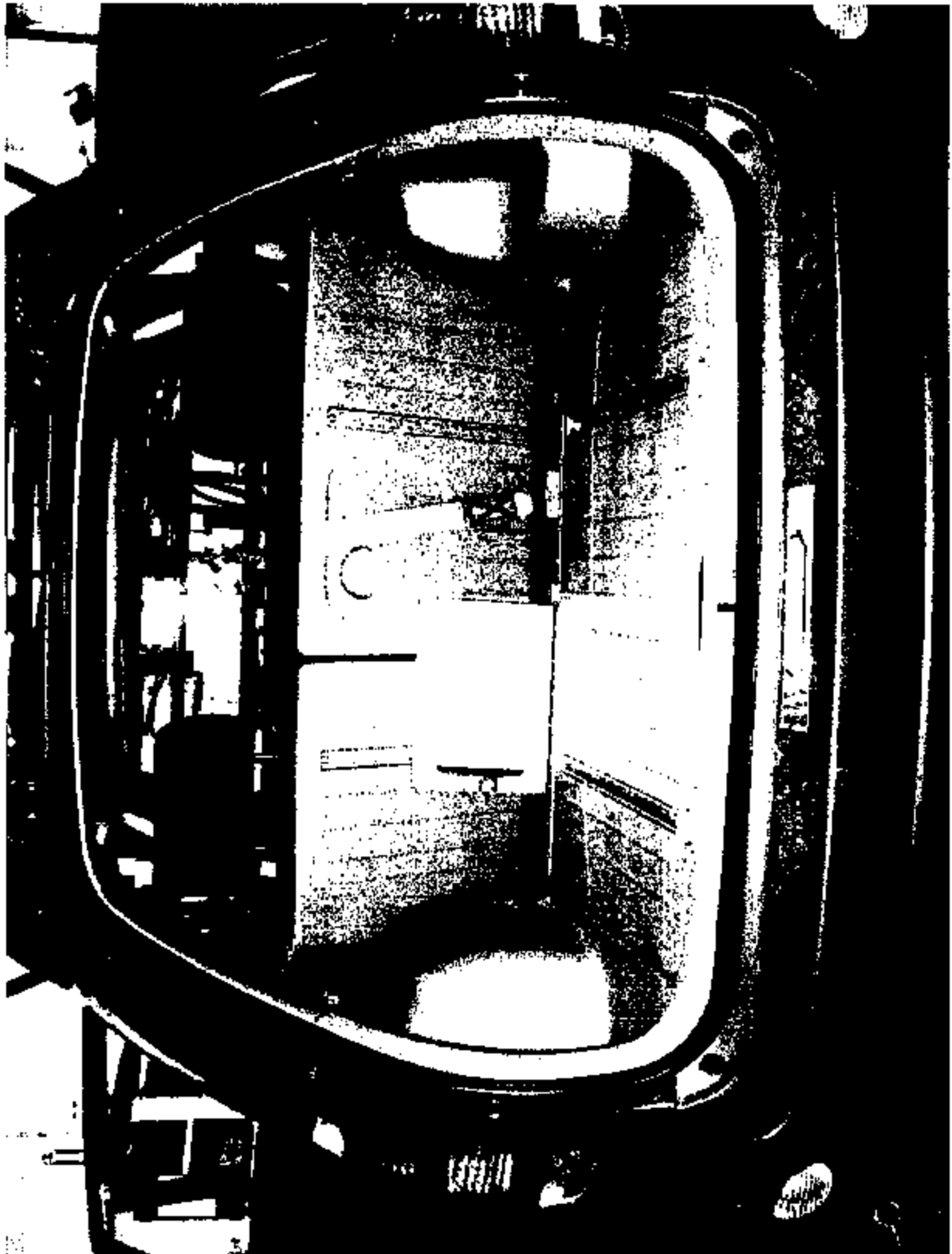


Safety Compliance Testing For FMVSS 225
"Child Restraint Anchorage Systems"

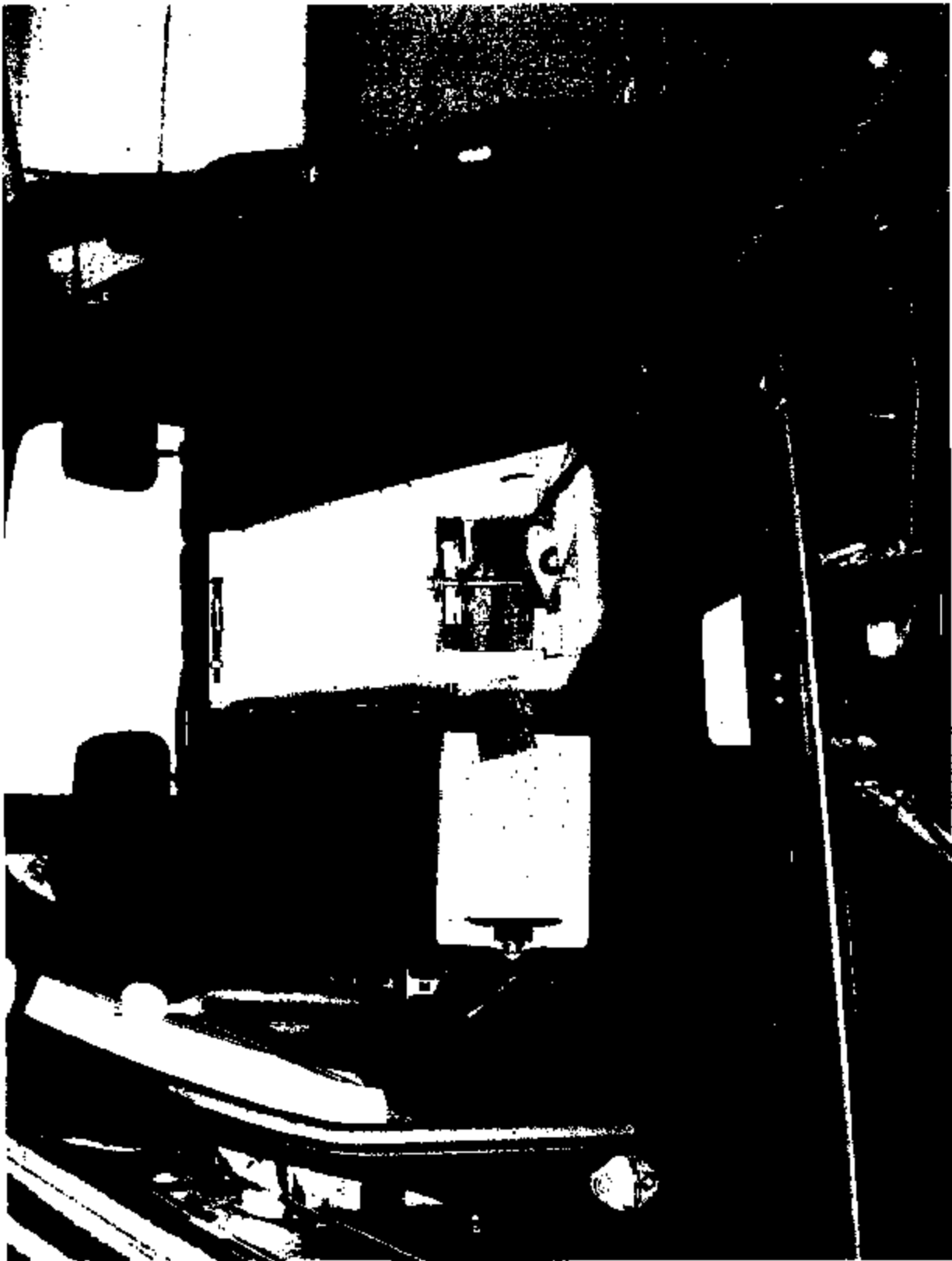
6.7.3 pre-forward SFAD I test 1 of 3



6.7.4 pre-forward SFAD I test 2 of 3

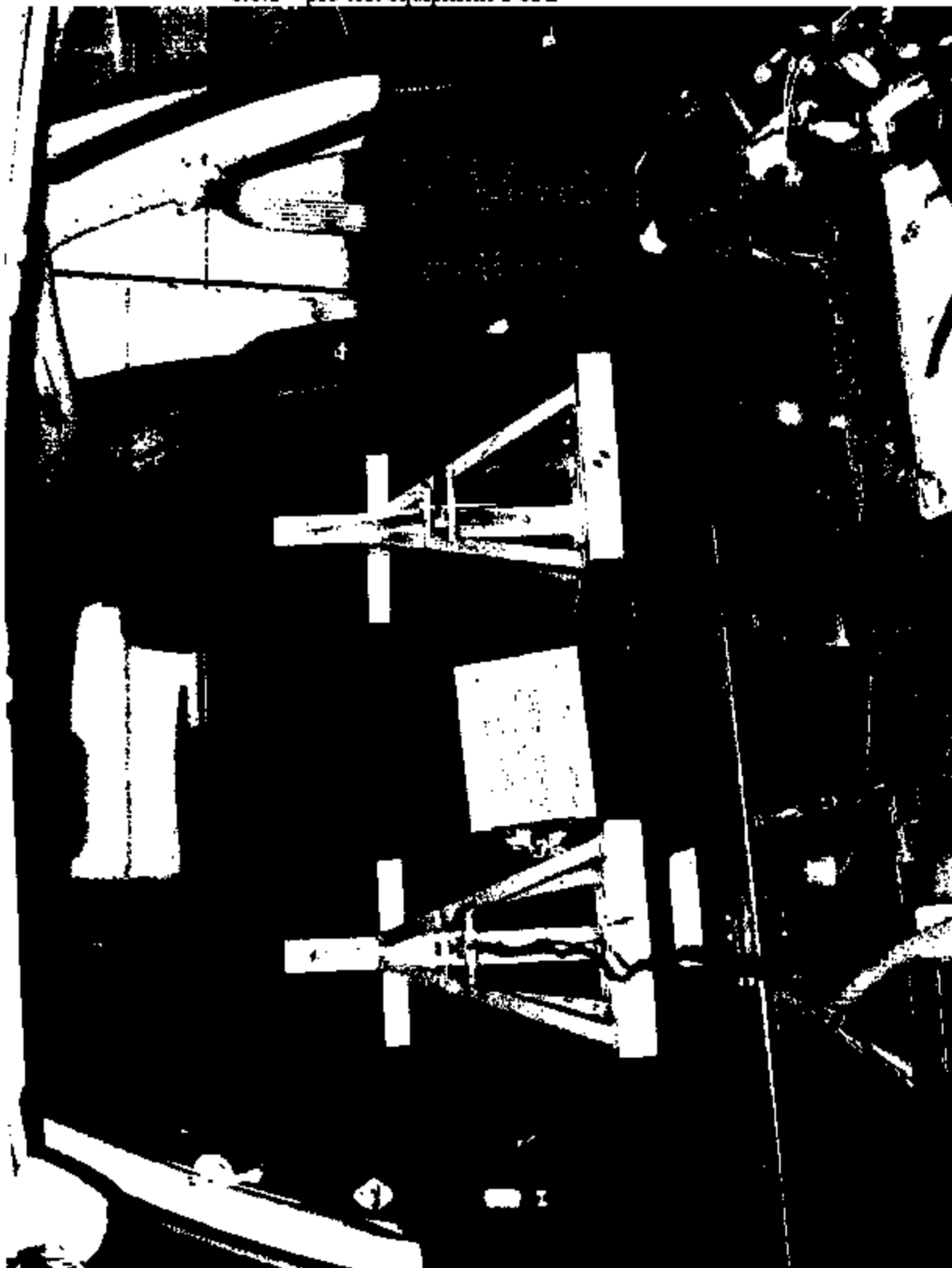


6.7.5 pre-forward SFAD I test 3 of 3



6.8 Pre-test equipment set up at each designated seating position & loading device with load cell and the test fixture in test position

6.8.1 pre-test equipment 1 of 2



6.8.2 pre-test equipment 2 of 2



6.9 Load system control and data recording device in test position
6.9.1 forward SFAD II test 1 of 1



Safety Compliance Testing For FMVSS 225
"Child Restraint Anchorage Systems"

6.9.2 forward SFAD I test 1 of 1

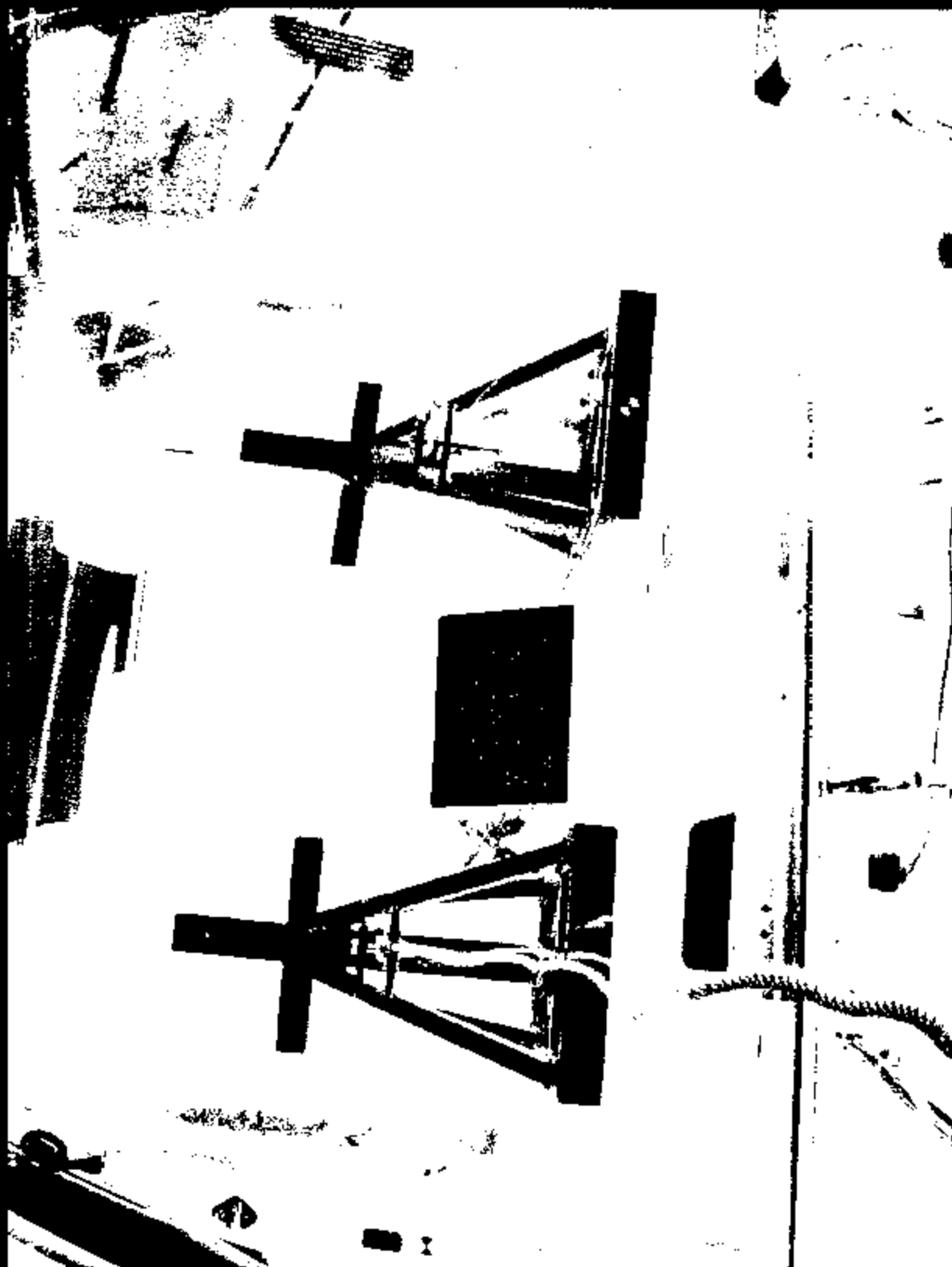


6.10 Post-test condition of each child restraint anchorage system
6.10.1 post-forward SFAD II test 1 of 3



5/2/03 POST-TEST
NHTSA/C30105
2003 PONTIAC VIBE
2ND ROW 60/40 BENCH
FMVSS 225-ISO RAMP RATE FWD
SB3229 G03Q7-001.1

6.10.2 post-forward SFAD II test 2 of 3



6.10.3 post-forward SFAD II test 3 of 3



Safety Compliance Testing For FMVSS 225
"Child Restraint Anchorage Systems"

6.10.4 post-forward SFAD I test 1 of 5



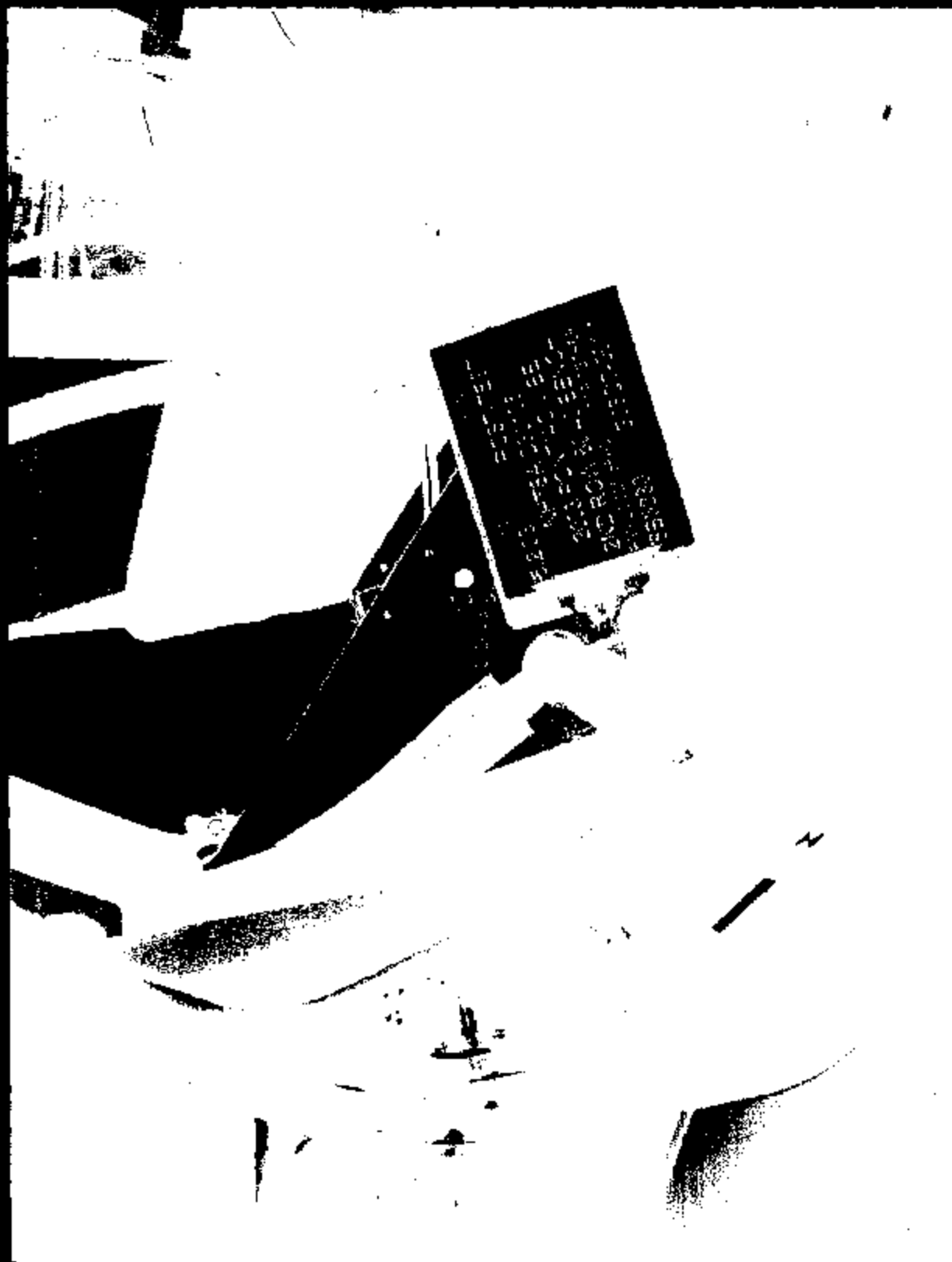
6.10.5 post-forward SFAD I test 2 of 5



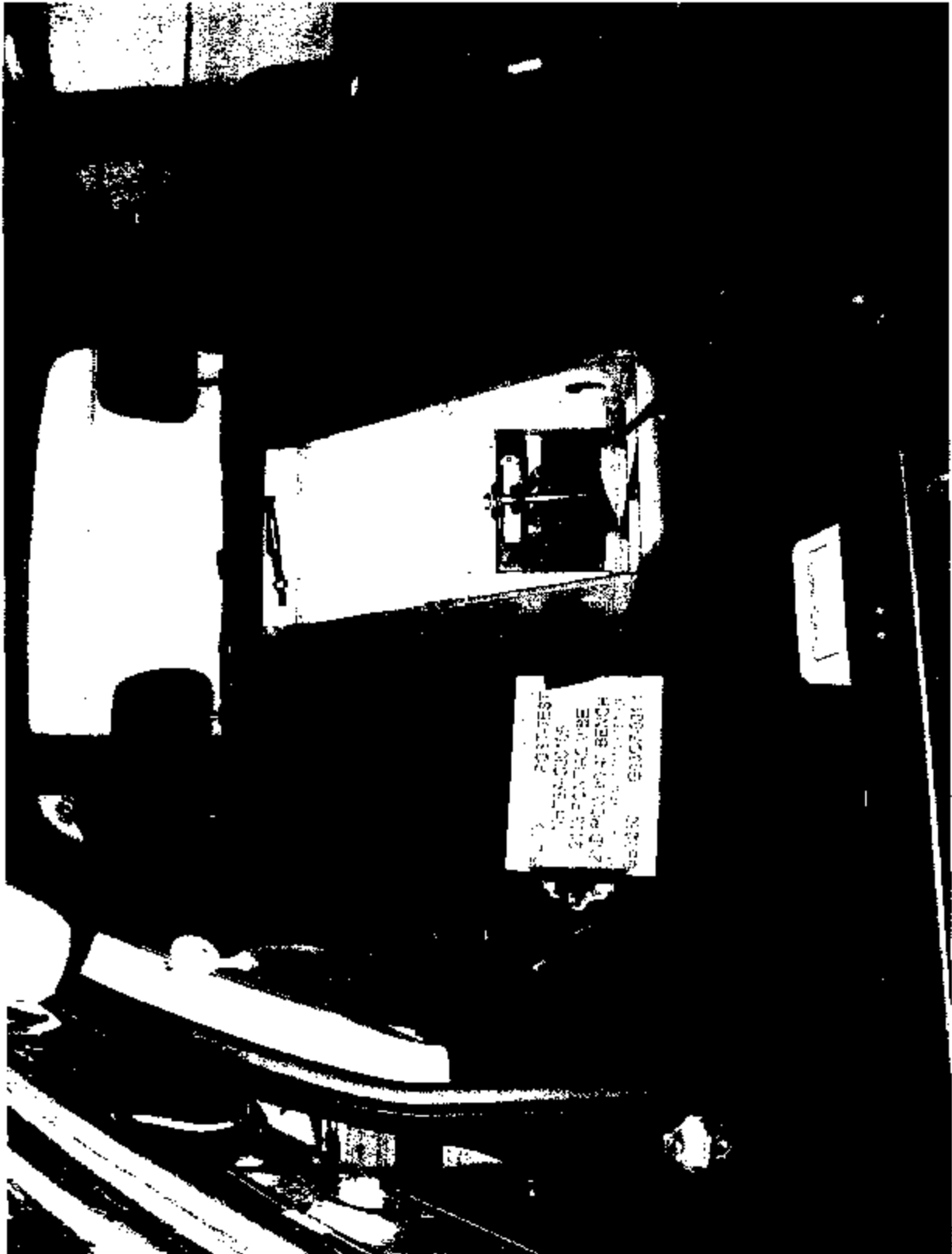
6.10.6 post-forward SFAD I test 3 of 5



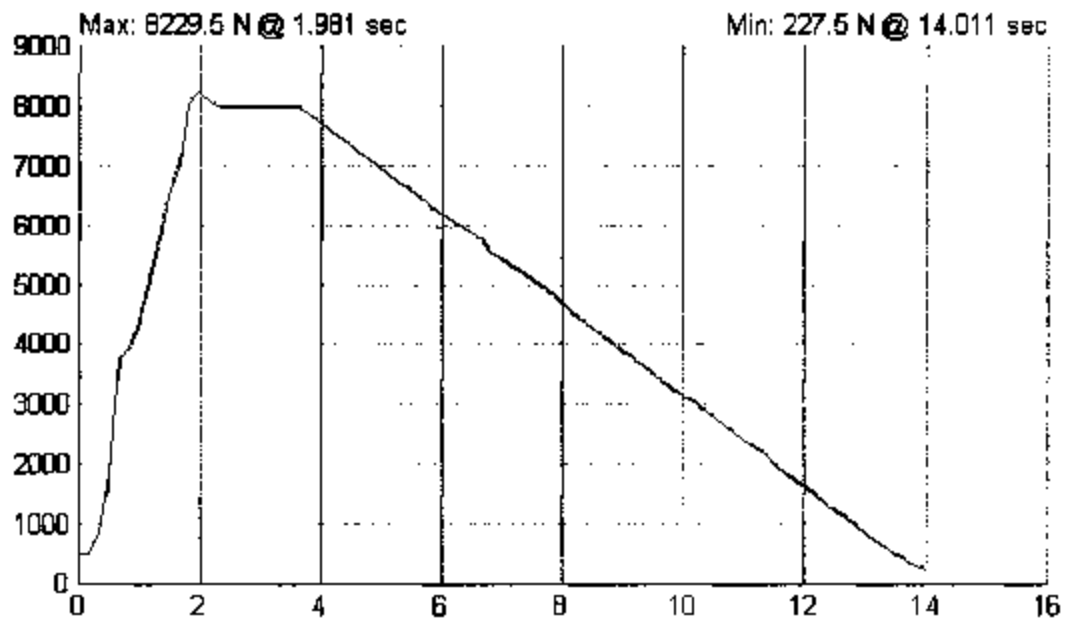
6.10.7 post-forward SFAD I test 4 of 5



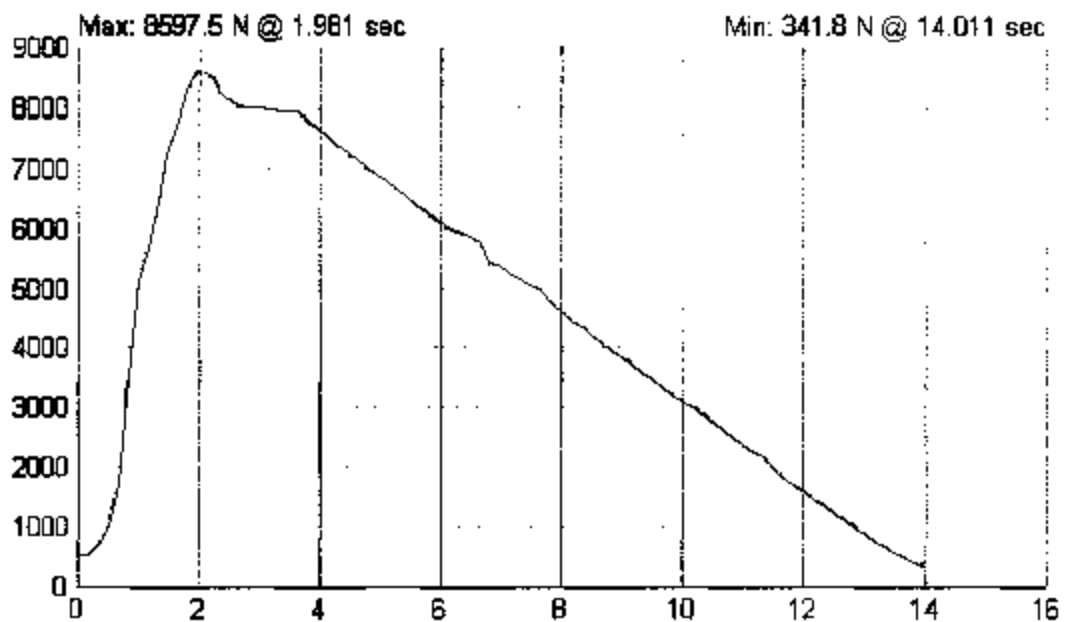
6.10.8 post-forward SFAD I test 5 of 5



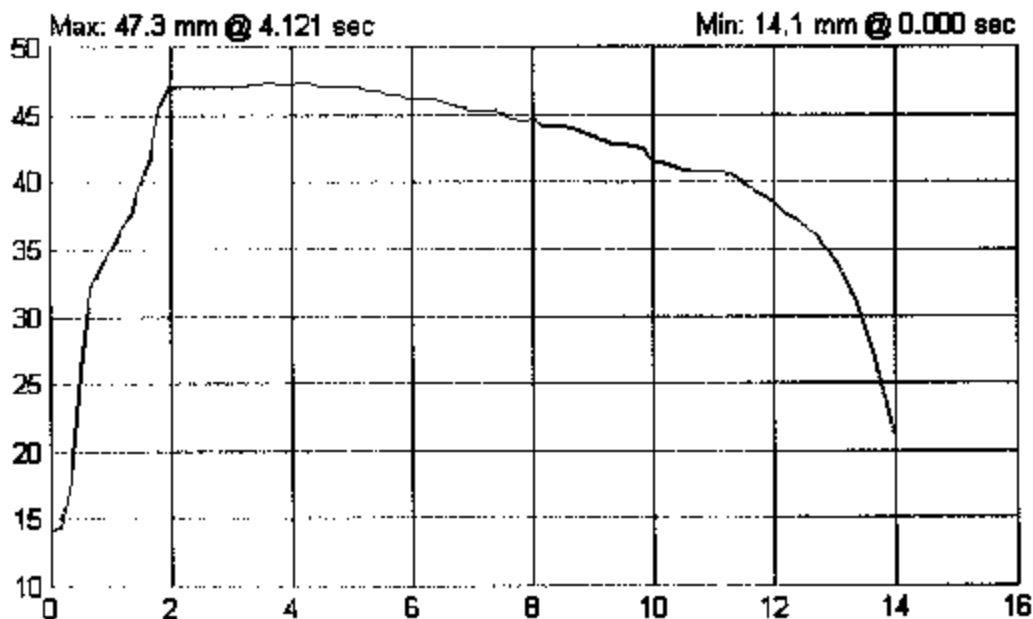
7.0 PLOTS



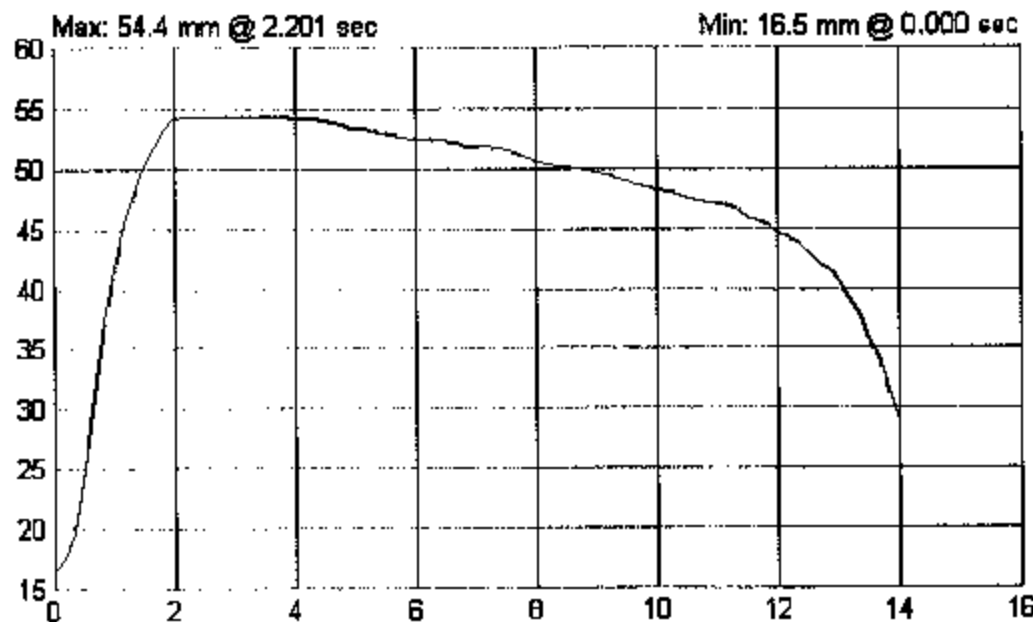
Run# SB3229: Lower Anchor Test (S15.3)-Rear LH Load (N) vs. Time (sec)



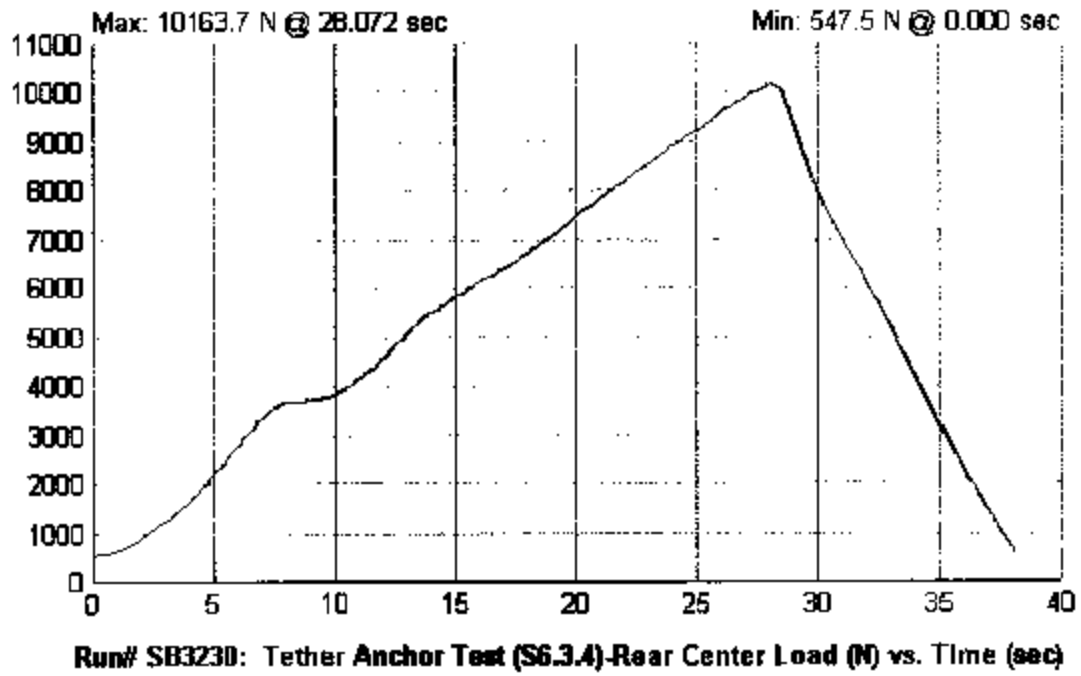
Run# SB3229: Lower Anchor Test (S15.3)-Rear RH Load (N) vs. Time (sec)



Run# SB3229: Lower Anchor Test (S15.3)-Rear LH SFAD2 X Displ. (mm) vs. Time (sec)



Run# SB3229: Lower Anchor Test (S15.3)-Rear RH SFAD2 X Displ. (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: 5/2/03

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

To: _____

The following vehicle has been subjected to compliance testing for FMVSS Nos. 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: 2003 Pontiac Vibe

VEH. NHTSA NO.: C30105 VIN: 5Y2SL62833 COLOR: Red

ODOMETER READINGS: ARRIVAL 23 miles Date: October 30, 2002
COMPLETION 23 miles Date: May 2, 2003

PURCHASE PRICE: \$16,991 DEALER'S NAME: Somerset Pontiac-GMC

ENGINE DATA: 4 Cylinders 2.7 Liters Cubic Inches

TRANSMISSION DATA: Automatic Manual No. of Speeds 5

FINAL DRIVE DATA: Rear Drive Front Drive 4 Wheel Drive

TIRE DATA: Size P205/55R16 Mfr. Goodyear

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Brad Reaume

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, IP, and steering column removed for test. All removed parts were placed in the trunk.

Test Vehicle Condition:

Salvage only.

RECORDED BY: Kevin Schimtzter

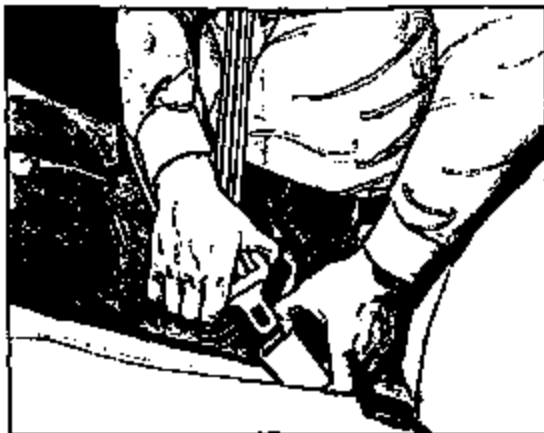
DATE: May 2, 2003

APPROVED BY: Brad Reaume

APPENDIX A
OWNERS MANUAL CHILD RESTRAINT SYSTEMS

⚠ CAUTION:

You can be seriously hurt if your shoulder belt is too loose. In a crash, you would move forward too much, which could increase injury. The shoulder belt should fit against your body.



To unfasten the belt, just push the button on the buckle.

Children

Everyone in a vehicle needs protection! This includes infants and all other children. Neither the distance traveled nor the age and size of the traveler changes the need, for everyone, to use safety restraints. In fact, the law in every state in the United States and in every Canadian province says children up to some age must be restrained while in a vehicle.

Infants and Young Children

Every time infants and young children ride in vehicles, they should have the protection provided by the appropriate restraint. Young children should not use the vehicle's safety belts, unless there is no other choice.

1-35



⚠ CAUTION:

People should never hold a baby in their arms while riding in a vehicle. A baby doesn't weigh much -- until a crash. During a crash a baby will become so heavy it is not possible to hold it. For example, in a crash at only 25 mph (40 km/h), a 12-lb. (5.5 kg) baby will suddenly become a 240-lb. (110 kg) force on a person's arms. A baby should be secured in an appropriate restraint.

1-36



⚠ CAUTION:

Children who are up against, or very close to, any air bag when it inflates can be seriously injured or killed. Air bags plus lap-shoulder belts offer outstanding protection for adults and older children, but not for young children and infants. Neither the vehicle's safety belt system nor its air bag system is designed for them. Young children and infants need the protection that a child restraint system can provide.

1-37

Q: What are the different types of add-on child restraints?

A: Add-on child restraints, which are purchased by the vehicle's owner, are available in four basic types. Selection of a particular restraint should take into consideration not only the child's weight, height and age but also whether or not the restraint will be compatible with the motor vehicle in which it will be used.

For most basic types of child restraints, there are many different models available. When purchasing a child restraint, be sure it is designed to be used in a motor vehicle. If it is, the restraint will have a label saying that it meets federal motor vehicle safety standards.

The restraint manufacturer's instructions that come with the restraint state the weight and height limitations for a particular child restraint. In addition, there are many kinds of restraints available for children with special needs.

⚠ CAUTION:

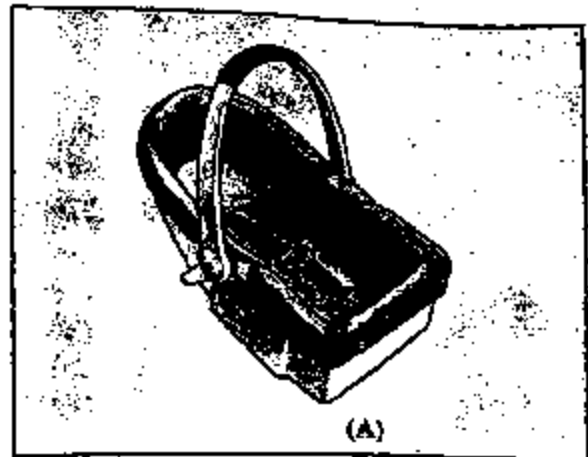
Newborn infants need complete support, including support for the head and neck. This is necessary because a newborn infant's neck is weak and its head weighs so much compared with the rest of its body. In a crash, an infant in a rear-facing seat settles into the restraint, so the crash forces can be distributed across the strongest part of an infant's body, the back and shoulders. Infants always should be secured in appropriate infant restraints.

1-38

⚠ CAUTION:

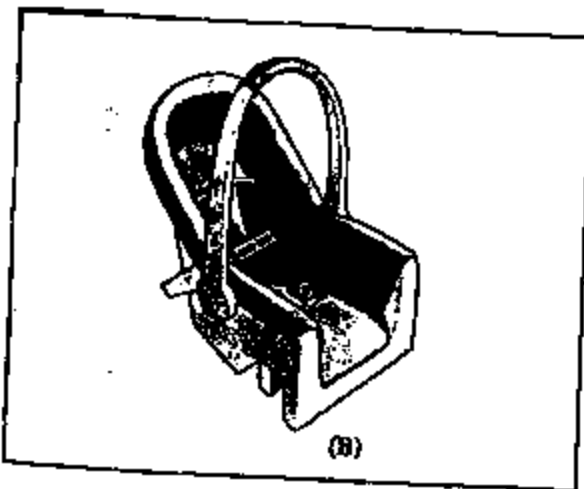
The body structure of a young child is quite unlike that of an adult or older child, for whom the safety belts are designed. A young child's hip bones are still so small that the vehicle's regular safety belt may not remain low on the hip bones, as it should. Instead, it may settle up around the child's abdomen. In a crash, the belt would apply force on a body area that's unprotected by any bony structure. This alone could cause serious or fatal injuries. Young children always should be secured in appropriate child restraints.

Restraint Systems for Children

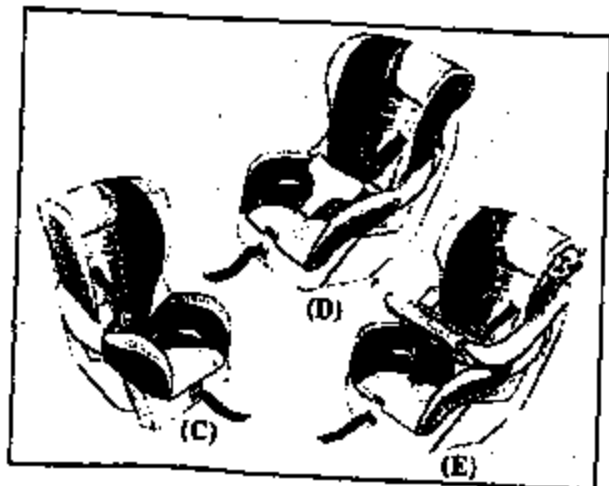


An infant car bed (A), a special bed made for use in a motor vehicle, is an infant restraint system designed to restrain or position a child on a continuous flat surface. Make sure that the infant's head rests toward the center of the vehicle.

1-39

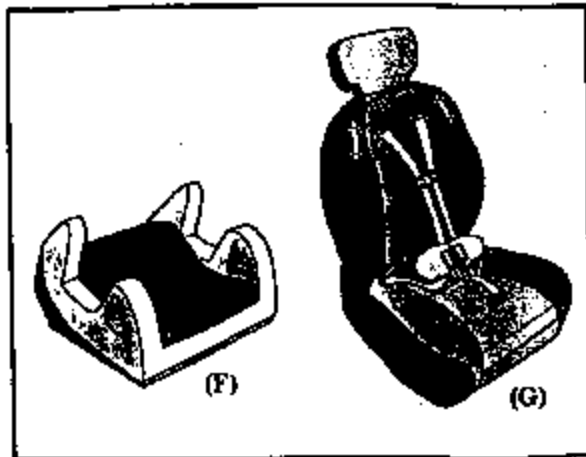


A rear-facing infant seat (B) provides restraint with the seating surface against the back of the infant. The harness system holds the infant in place and, in a crash, acts to keep the infant positioned in the restraint.



A forward-facing child seat (C-E) provides restraint for the child's body with the harness and also sometimes with surfaces such as T-shaped or shelf-like shields.

1-40



A booster seat (F-G) is a child restraint designed to improve the fit of the vehicle's safety belt system. Some booster seats have a shoulder belt positioner, and some high-back booster seats have a five-point harness. A booster seat can also help a child to see out the window.

Q: How do child restraints work?

A: A child restraint system is any device designed for use in a motor vehicle to restrain, seat, or position children. A built-in child restraint system is a permanent part of the motor vehicle. An add-on child restraint system is a portable one, which is purchased by the vehicle's owner.

For many years, add-on child restraints have used the adult belt system in the vehicle. To help reduce the chance of injury, the child also has to be secured within the restraint. The vehicle's belt system secures the add-on child restraint in the vehicle, and the add-on child restraint's harness system holds the child in place within the restraint.

One system, the three-point harness, has straps that come down over each of the infant's shoulders and buckle together at the crotch. The five-point harness system has two shoulder straps, two hip straps and a crotch strap. A shield may take the place of hip straps. A T-shaped shield has shoulder straps that are attached to a flat pad which rests low against the child's body. A shelf- or armrest-type shield has straps that are attached to a wide, shelf-like shield that swings up or to the side.

1-41

When choosing a child restraint, be sure the child restraint is designed to be used in a vehicle. If it is, it will have a label saying that it meets federal motor vehicle safety standards.

Then follow the instructions for the restraint. You may find these instructions on the restraint itself or in a booklet, or both. These restraints use the belt system in your vehicle, but the child also has to be secured within the restraint to help reduce the chance of personal injury. When securing an add-on child restraint, refer to the instructions that come with the restraint which may be on the restraint itself or in a booklet, or both, and to this manual. The child restraint instructions are important, so if they are not available, obtain a replacement copy from the manufacturer.

Where to Put the Restraint

Accident statistics show that children are safer if they are restrained in the rear rather than the front seat. General Motors, therefore, recommends that child restraints be secured in the rear seat including an infant riding in a rear-facing infant seat, a child riding in a forward-facing child seat and an older child riding in a booster seat. *Never* put a rear-facing child restraint in the front passenger seat. Here's why:

⚠ CAUTION:

A child in a rear-facing child restraint can be seriously injured or killed if the right front passenger's air bag inflates. This is because the back of the rear-facing child restraint would be very close to the inflating air bag. Always secure a rear-facing child restraint in a rear seat.

You may secure a forward-facing child restraint in the right front seat, but before you do, always move the front passenger seat as far back as it will go. It's better to secure the child restraint in a rear seat.

Wherever you install it, be sure to secure the child restraint properly.

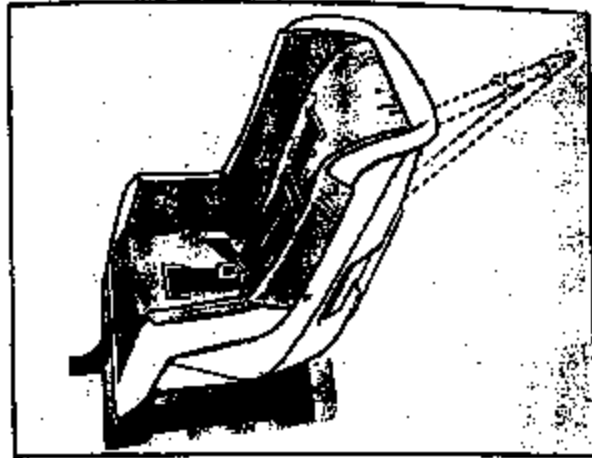
Keep in mind that an unsecured child restraint can move around in a collision or sudden stop and injure people in the vehicle. Be sure to properly secure any child restraint in your vehicle -- even when no child is in it.

1-42

Top Strap

Some child restraints have a top strap, or "top tether." It can help restrain the child restraint during a collision. For it to work, a top strap must be properly anchored to the vehicle. Some top strap-equipped child restraints are designed for use with or without the top strap being anchored. Others require the top strap always to be anchored. Be sure to read and follow the instructions for your child restraint. If yours requires that the top strap be anchored, don't use the restraint unless it is anchored properly.

If the child restraint does not have a top strap, one can be obtained, in kit form, for many child restraints. Ask the child restraint manufacturer whether or not a kit is available.



In Canada, the law requires that forward-facing child restraints have a top strap, and that the strap be anchored. In the United States, some child restraints also have a top strap. If your child restraint has a top strap, it should be anchored.

1-43



Anchor the top strap to one of the top strap anchors. Your vehicle has top strap anchors for the rear seating positions. You will find three top strap anchors in a covered compartment on the floor of the rear cargo area. To access the anchors, open the compartment doors marked with the child restraint anchor symbol. Choose the anchor that corresponds to the seating position where the child restraint will be placed. Raise the head restraint and route the top strap under it.

Once you have the top strap anchored, you'll be ready to secure the child restraint itself. Tighten the top strap when and as the child restraint manufacturer's instructions say.

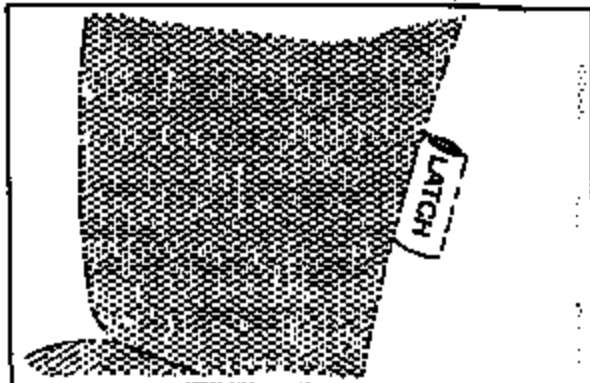
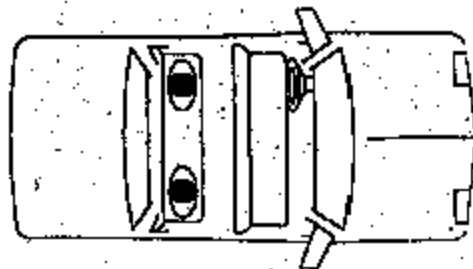


1-44

Lower Anchorages and Top Tethers for Children (LATCH System)

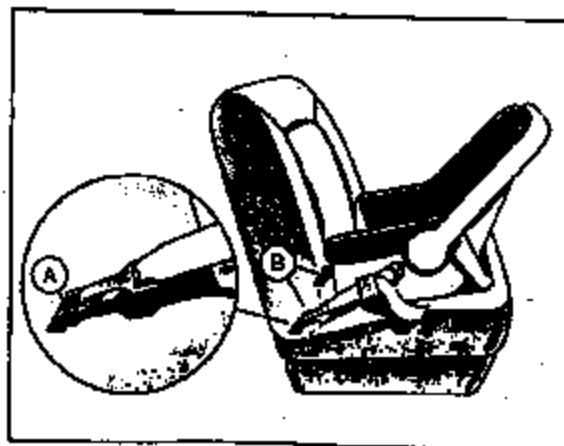
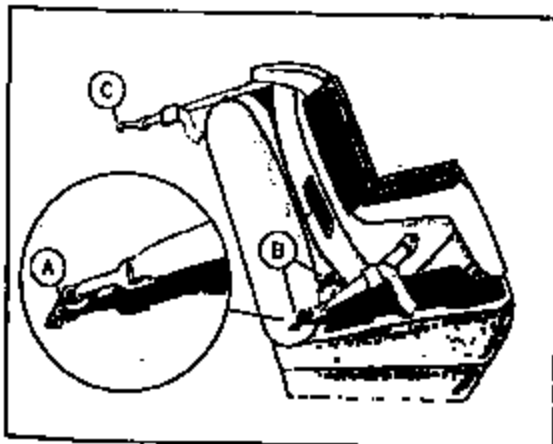
Your vehicle has the LATCH system. You'll find anchors (A) in both outside rear seat positions.

Each seating position with the LATCH system will have a label sewn to the seatback with the letters "LATCH" on it. To assist you in locating the anchors for this child restraint system, place your hand in a palm-up position and reach up between the seat cushion and the seatback, just under the LATCH label.



1-45

In order to use the system, you need either a forward-facing child restraint that has attaching points (B) at its base and a top tether anchor (C), or a rear-facing child restraint that has attaching points (B), as shown here.



With this system, use the LATCH system instead of the vehicle's safety belts to secure a child restraint.

1-46

⚠ CAUTION:

If a LATCH-type child restraint isn't attached to its anchorage points, the restraint won't be able to protect a child sitting there. In a crash, the child could be seriously injured or killed. Make sure that a LATCH-type child restraint is properly installed using the anchorage points, or use the vehicle's safety belts to secure the restraint. See "Securing a Child Restraint in a Rear Seat Position" in the Index for information on how to secure a child restraint in your vehicle using the vehicle's safety belts.

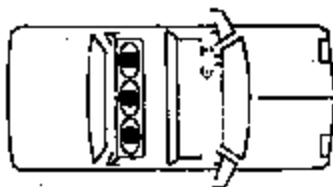
Securing a Child Restraint Designed for the LATCH System

1. Find the anchors for the seating position you want to use, where the bottom of the seatback meets the back of the seat cushion.
2. Put the child restraint on the seat.
3. Attach the anchor points on the child restraint to the anchors in the vehicle. The child restraint instructions will show you how.
4. If the child restraint is forward-facing, attach the top strap to the top strap anchor. See "Top Strap" in the Index. Tighten the top strap according to the child restraint instructions.
5. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, simply unhook the top strap from the top tether anchor and then disconnect the anchor points.

1-47

Securing a Child Restraint in a Rear Seat Position



If your child restraint is equipped with the LATCH system, see "Lower Anchorages and Top Tethers for Children (LATCH)" in the Index.

You'll be using the lap-shoulder belt. See the earlier part about the top strap if the child restraint has one. Be sure to follow the instructions that came with the child restraint. Secure the child in the child restraint when and as the instructions say.

1. Put the restraint on the seat.
2. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.

If the shoulder belt goes in front of the child's face or neck, put it behind the child restraint.

1-48



3. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.



4. Pull the rest of the shoulder belt all the way out of the retractor to set the lock.

1-49



5. To tighten the belt, feed the shoulder belt back into the retractor while you push down on the child restraint. If you're using a forward-facing child restraint, you may find it helpful to use your knee to push down on the child restraint as you tighten the belt.
6. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.

1-50

Securing a Child Restraint in the Right Front Seat Position



Your vehicle has a right front passenger air bag. *Never* put a rear-facing child restraint in this seat. Here's why:

CAUTION:

A child in a rear-facing child restraint can be seriously injured or killed if the right front passenger's air bag inflates. This is because the back of the rear-facing child restraint would be very close to the inflating air bag. Always secure a rear-facing child restraint in the rear seat.

Although a rear seat is a safer place, you can secure a forward-facing child restraint in the right front seat.

You'll be using the lap-shoulder belt. See the earlier part about the top strap if the child restraint has one. Be sure to follow the instructions that came with the child restraint. Secure the child in the child restraint when and as the instructions say.

1. Because your vehicle has a right front passenger air bag, always move the seat as far back as it will go before securing a forward-facing child restraint. See "Seats" in the index.
2. Put the restraint on the seat.
3. Pick up the latch plate, and run the lap and shoulder portions of the vehicle's safety belt through or around the restraint. The child restraint instructions will show you how.

If the shoulder belt goes in front of the child's face or neck, put it behind the child restraint.

1-51

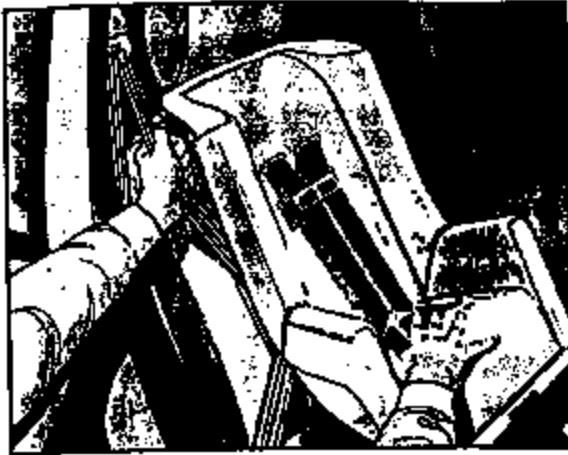


4. Buckle the belt. Make sure the release button is positioned so you would be able to unbuckle the safety belt quickly if you ever had to.



5. Pull the rest of the shoulder belt all the way out of the retractor to set the lock.

1-52



6. To tighten the belt, feed the shoulder belt back into the retractor while you push down on the child restraint. You may find it helpful to use your knee to push down on the child restraint as you tighten the belt.
7. Push and pull the child restraint in different directions to be sure it is secure.

To remove the child restraint, just unbuckle the vehicle's safety belt and let it go back all the way. The safety belt will move freely again and be ready to work for an adult or larger child passenger.

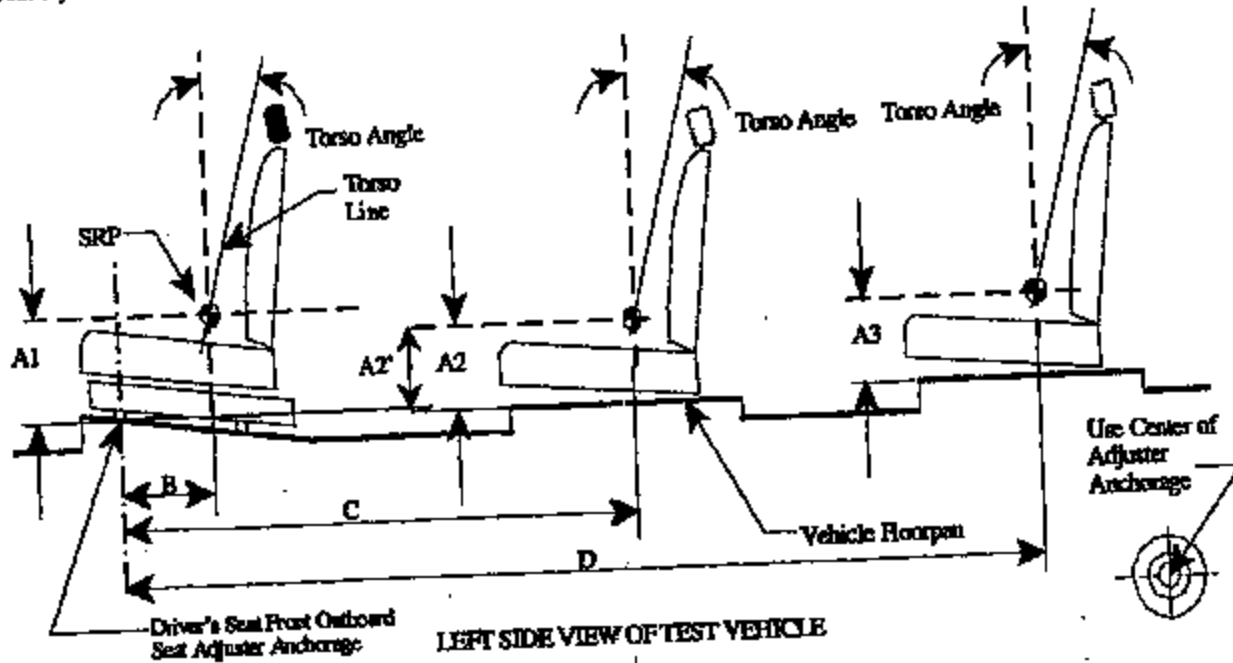
APPENDIX B
MANUFACTURER'S DATA (OVSC FORM 14)

C 30105

FORM 14
Page 1 of 10

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

Model Year: 2003 ; Make: Pontiac ; Model: Vibe ; Body Style: 4Door
Seat Style: Front row: Separate ; Second row: 6:4 Split Bench ; Third row: N/A



LEFT SIDE VIEW OF TEST VEHICLE

Safety Compliance Testing For FMVSS 225
"Child Restraint Anchorage Systems"

04/23/2003 11:55 FAX 202 336 3031

OVSC/NBS/221

MCA TR07

IG002

C30105 / DTHN22-02-D-11043

Page 62 of 71

MCA File #: C0307-001.1

04/23/2003 11:58 AM FAX 202 336 1061

DIVC/NTR/231

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Q003

FORM 14
 Page 2 of 10

Table 1. Seating Partitions¹ and Torsio Angles

		Left (Driver Side)	Center (if any)	Right
A1		(Driver) 254.1	N/A	(Front Passenger) 254.1
A2(*)		264.6	294.6	264.6
A3		N/A	N/A	N/A
B		338.7	N/A	338.7
C		1114.3	1099.3	1114.3
D		N/A	N/A	N/A
Torsio Angle (degree)	Front Row	19	N/A	19
	Second Row	25	23	25
	Third Row	N/A	N/A	N/A

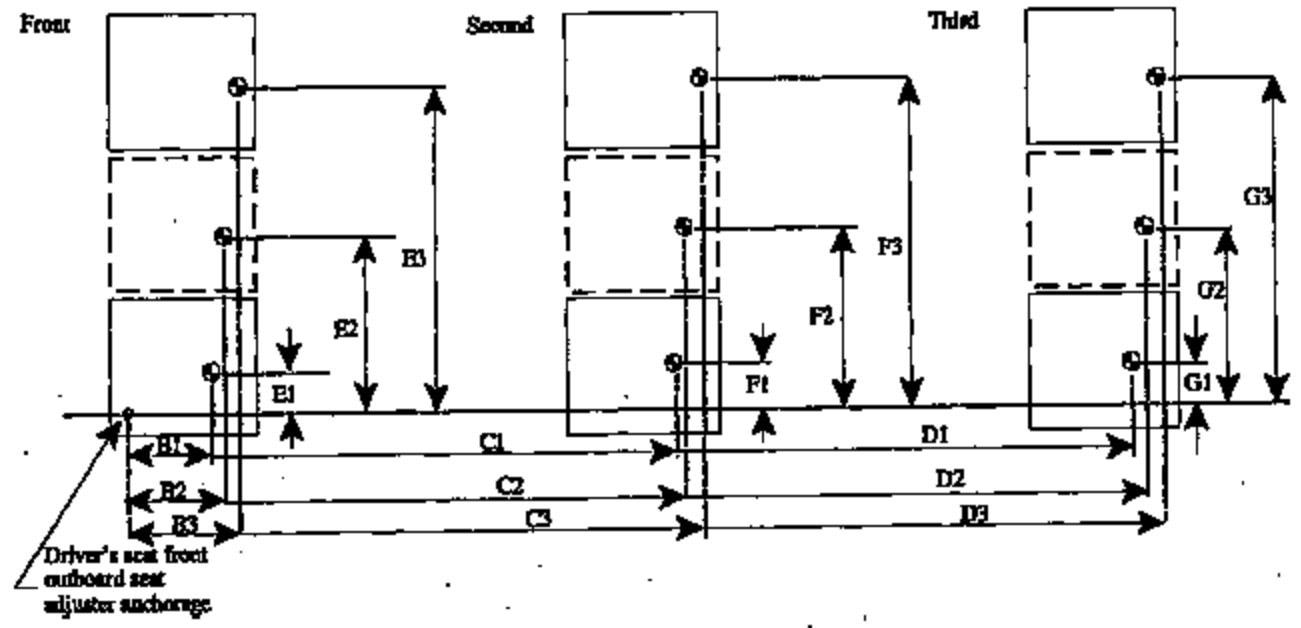
Notes: 1. All dimensions are in mm. If otherwise, the unit is provided.

(*): A2' are the dimensions from the driver's seat front outboard seat adjuster anchorage.

FORM 14
 Page 3 of 10

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

Model Year: 2003 ; Make: Pontiac ; Model: Vibe ; Body Style: 4Door
 Seat Style: Front row: Separate ; Second row: 6/4 Split Bench ; Third row: N/A



04/25/2003 11:58 FAX 202 336 3081

DVSC/NVS/221

→ MGA TROY

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FORM 14
 Page 4 of 10

Table 2. Seating Reference Point and Tether Anchorage Locations

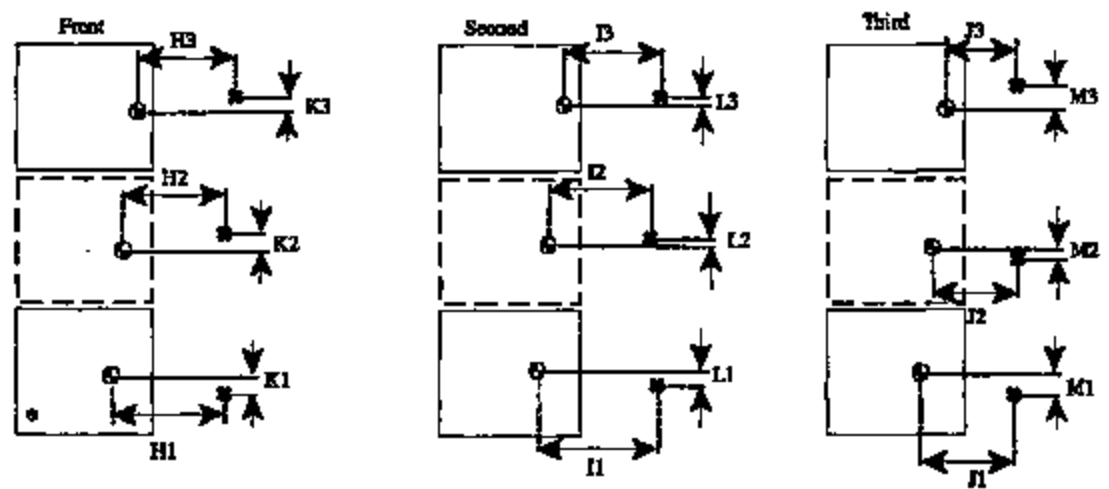
Seating Reference Point (SRP)	Distance from Driver's front outboard seat adjuster anchorage ¹	
Front Row	B1	338.7
	E1	217.0
	B2	N/A
	E2	N/A
	B3	338.7
	E3	922.0
Second Row	C1	1114.3
	F1	224.5
	C2	1099.3
	F2	569.5
	C3	1114.3
	F3	914.5
Third Row	D1	N/A
	G1	N/A
	D2	N/A
	G2	N/A
	D3	N/A
	G3	N/A

Note: 1. Use the center of anchorage.

FORM 14
 Page 5 of 10

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

Model Year: 2003 ; Make: Pontiac ; Model: Vibe ; Body Style: 4Door
 Seat Style: Front row: Separate ; Second row: 6:4 Split Bench ; Third row: N/A



G: SRP

*: Tether anchorage

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

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- MGA TROY

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FORM 14
Page 6 of 10

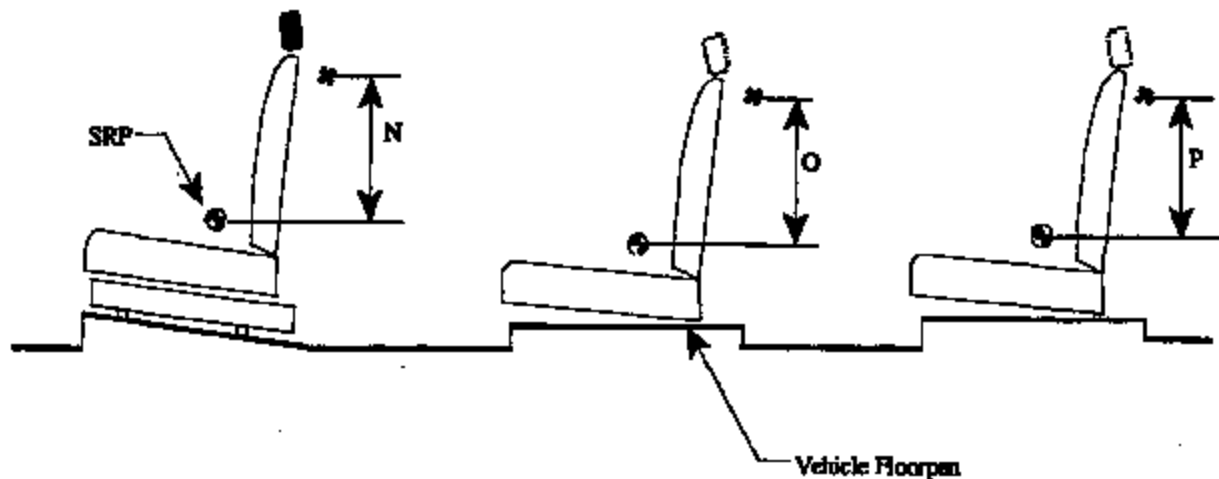
Table 3. Seating Reference Point and Tether Anchorage Locations

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	423.5
	L1	0.0
	I2	438.5
	L2	170.0
	I3	423.5
	L3	0.0
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.

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

Model Year: 2003 ; Make: Pontiac ; Model: Vibe ; Body Style: 4Door
Seat Style: Front row: Separate ; Second row: 6:4 Split Bench ; Third row: N/A



LEFT SIDE VIEW OF TEST VEHICLE

FORM 14
 Page 8 of 10

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)	31.4
	O2 (Center)	61.4
	O3 (Right)	31.4
Third Row	P1 (Left)	N/A
	P2 (Center)	N/A
	P3 (Right)	N/A

Note: 1. All dimensions are in mm. If otherwise, the unit is provided.

04/29/2005 11:58 FAX 802 338 2031

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W010

Test Procedures Used for Compliance Tests

Tether Anchorages

Seating Location	FMVSS Section(s) - Req.	
Front	Driver	N/A
	Center (if any)	N/A
	Right (if any)	N/A
Second	Left	S6.3.4
	Center	S6.3.4
	Right (if any)	S6.3.4
Third	Left	N/A
	Center	N/A
	Right	N/A
Fourth	Left	N/A
	Center	N/A
	Right	N/A

Lower Anchorages

Seating Location	FMVSS Section(s) - Req.	
Front	Driver	N/A
	Center (if any)	N/A
	Right (if any)	N/A
Second	Left	S15.2
	Center	N/A
	Right	S15.2
Third	Left	N/A
	Center	N/A
	Right	N/A
Fourth	Left	N/A
	Center	N/A
	Right	N/A

04/23/2008 11:59 FAX 202 336 3081

CVSC/RVS/231

• MGA TROY

0011

FORM 14
Page 10 of 10

For each anchorage systems, provide the following information:

1. **Lower Anchorage Dimensions:** Whether the anchorages are certified with S15.1.2.1 of FMVSS No. 225.

Response: The anchorages are certified with S15.1.2.1.

2. **Lower Anchorage Location:** Whether the anchorages are certified with S15.1.2.2 of FMVSS No. 225. If the anchorages are certified with S15.1.2.2, provide the pitch, roll and yaw angles.

Response: The anchorages are certified with S15.1.2.2.

The pitch, roll and yaw design angles (degree)

Pitch angles	17
Roll angles	0
Yaw angles	0

3. **Lower Anchorage Marking and Conspicuity:** Whether the anchorages are certified with S15.4 of FMVSS No. 225. If guidance fixtures are used, provide the location of the seating systems that are equipped with the guidance fixture.

Response: The anchorages are certified with S15.4.
Guidance fixture are not used.

4. **Location of Tether Anchorages:** Applicable section of FMVSS No. 225 for the option used for its certification.

Response: S6.2.1

5. **Number of Tether Anchorages:** Applicable section of FMVSS No. 225 for the option used for its certification

Response: S4.3 (b)