

FINAL REPORT NUMBER 225-MGA-04-004

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

DAIMLERCHRYSLER CORPORATION
2004 JEEP LIBERTY
NHTSA No. C40300

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083



Test Date: July 28, 2004
Report Date: August 31, 2004

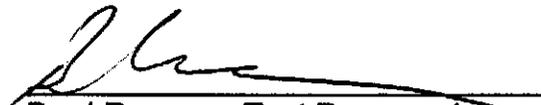
FINAL REPORT

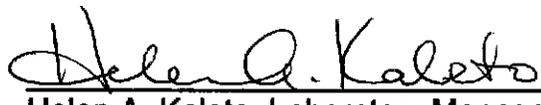
PREPARED FOR:

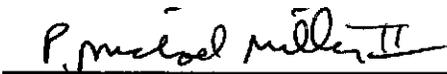
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 6111 (NVS-221)
WASHINGTON, D.C. 20590

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: 
Melanie Schick, Project Engineer

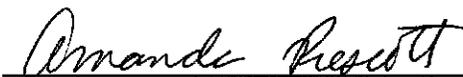

Brad Reaume, Test Personnel


Helen A. Kaleto, Laboratory Manager

Approved By: 

Approval Date: 9/14/04

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: 

Acceptance Date: 9/27/04

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	Full rear view	
6.2	¾ Front right view	
6.3	Test vehicle's certification label	
6.4	Test vehicle's tire information placard	
6.5	3/4 Front right side view of test vehicle with test apparatus in place	
6.6	Left side view of test vehicle with test apparatus in place	
6.7	Vehicle tie down at each tie down location	
6.7.1	front under vehicle	
6.7.2	left front	
6.7.3	left rear	
6.7.4	right front	
6.7.5	right rear	
6.8	Pre-test views of each child restraint anchorage system installed in the vehicle	
6.8.1	pre-test 1 of 3	
6.8.2	pre-test 2 of 3	
6.8.3	pre-test 3 of 3	
6.9	Post-test condition of each child restraint anchorage system	
6.9.1	post- test 1 of 5	
6.9.2	post- test 2 of 5	
6.9.3	post- test 3 of 5	
6.9.4	post- test 4 of 5	
6.9.5	post- test 5 of 5	
7.0	PLOTS	40
8.0	REPORT OF VEHICLE CONDITION	42
	APPENDIX A OWNERS MANUAL CHILD RESTRAINT SYSTEMS	44
	APPENDIX B MANUFACTURER'S DATA (OVSC Form 14)	50

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)	10
5.	Tether Location and Dimensional Measurements (Data Sheet 3)	12
6.	Tether Anchorage Static Loading and Displacement (Data Sheet 5) With Tether Strap	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 2004 Jeep Liberty, NHTSA No. C40300 meets the performance requirements of FMVSS No. 225, "Child Restraint Anchorage Systems."

PROCEDURE

This test was 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 60/40 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 rear outboard lower anchorage systems was approximately 760 mm. The child restraint anchorage system for the rear left outboard seating position was tested with the SFAD 2 fixture.

2.0 COMPLIANCE TEST AND DATA SUMMARY

TEST SUMMARY

The test was conducted at MGA, Troy, Michigan on July 28, 2004.

Based on the test results, the 2004 Jeep Liberty appears to comply the performance requirements of FMVSS No. 225 for this test.

The SFAD 2 at the rear left outboard seating position sustained a maximum force of 9,959 N and held the required load for 3 seconds.

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)
SD4259	SFAD II	Rear Left	9,959	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	2004 Jeep Liberty
VEH. NHTSA NO.	C40300
VIN	1J4GK48KX4W162401
COLOR	White
VEH. BUILD DATE	10/03
TEST DATE	July 28, 2004
TEST LABORATORY	MGA Research Corporation
OBSERVERS	Melanie Schick, Brad Reaume, Kenney Godfrey

GENERAL INFORMATION:

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: DaimlerChrysler Corporation

Date of Manufacture: 10/03; VIN: 1J4GK48KX4W162401

GVWR: 2427 kg; GAWR FRONT: 1248 kg

GAWR REAR: 1429 kg

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 215 kPa REAR: 215 kPa

Recommended Tire Size: P215/75R16 Load Range: 385 kg

Recommended Cold Tire Pressure:

FRONT: 227 kPa REAR: 227 kPa

Size of Tire on Test Vehicle: P215/75R16

Type of Spare Tire: Standard: P215/75R16

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
One (1) Load Cell 3,000 lb Capability	S/N 268 (10/26/04)
One (1) String Potentiometer (S/N 20763)	Calibrated at each use
Hydraulic Pump	N/A
MGA CRF Fixture	N/A
MGA SFAD2	N/A
MGA 2-Dimensional Template	N/A
Linear Scale	S/N 358 (12/17/04)
MGA Data Acquisition System	N/A
One (1) Hydraulic Cylinder	N/A
Digital Calipers	S/N MGA00053 (9/2/04)
Force Gauge	S/N MGA00058 (10/30/04)
Inclinometer (Digital)	S/N MGA00046 (8/12/04)

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.	N/A	N/A	N/A
	RH	N/A	N/A	N/A
Third Row	N/A	N/A	N/A	N/A

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

REMARKS: The 60% side was damaged in a previous FMVSS 208 test, and therefore was not able to be evaluated or tested.

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	N/A		N/A
	Ctr		N/A		
	RH		N/A		
Each of the bars is visible, without the compression of the seat cushion or seat back, when the bar is viewed, in a vertical longitudinal plane passing through the center of the bar, along a line marking an upward 30 degree angle with a horizontal plane.	LH	N/A	Yes		N/A
	Ctr		Yes		
	RH		Yes		
Diameter of the bar (mm)	LH	N/A	5.92	5.89	N/A
	Ctr		N/A		
	RH		N/A	N/A	
Inspect if the bars are straight, horizontal and transverse	LH	N/A	Yes		N/A
	Ctr		N/A		
	RH		N/A		
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	63		N/A
	Ctr		N/A		
	RH		N/A		
Measure the distance between the SRP to the center of the anchorage bar (mm)	LH	N/A	143		N/A
	Ctr		N/A		
	RH		N/A		

Table 4. Child Restraint Lower Anchorage Configuration (Data Sheet 2) (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		N/A		
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	33.29	39.85	N/A
	Ctr		N/A		
	RH		N/A	N/A	
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		N/A		
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
	Ctr		N/A		
	RH		N/A		
Inspect if the bars are an integral and permanent part of the vehicle.	LH	N/A	Yes		N/A
	Ctr		N/A		
	RH		N/A		
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		N/A		

PITCH, YAW, & ROLL INFORMATION

SEAT POSITION	PITCH (deg)	YAW (deg)	ROLL (deg)
Rear Left	19	No Data	0

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.	N/A
	RH	N/A
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) With Tether Strap

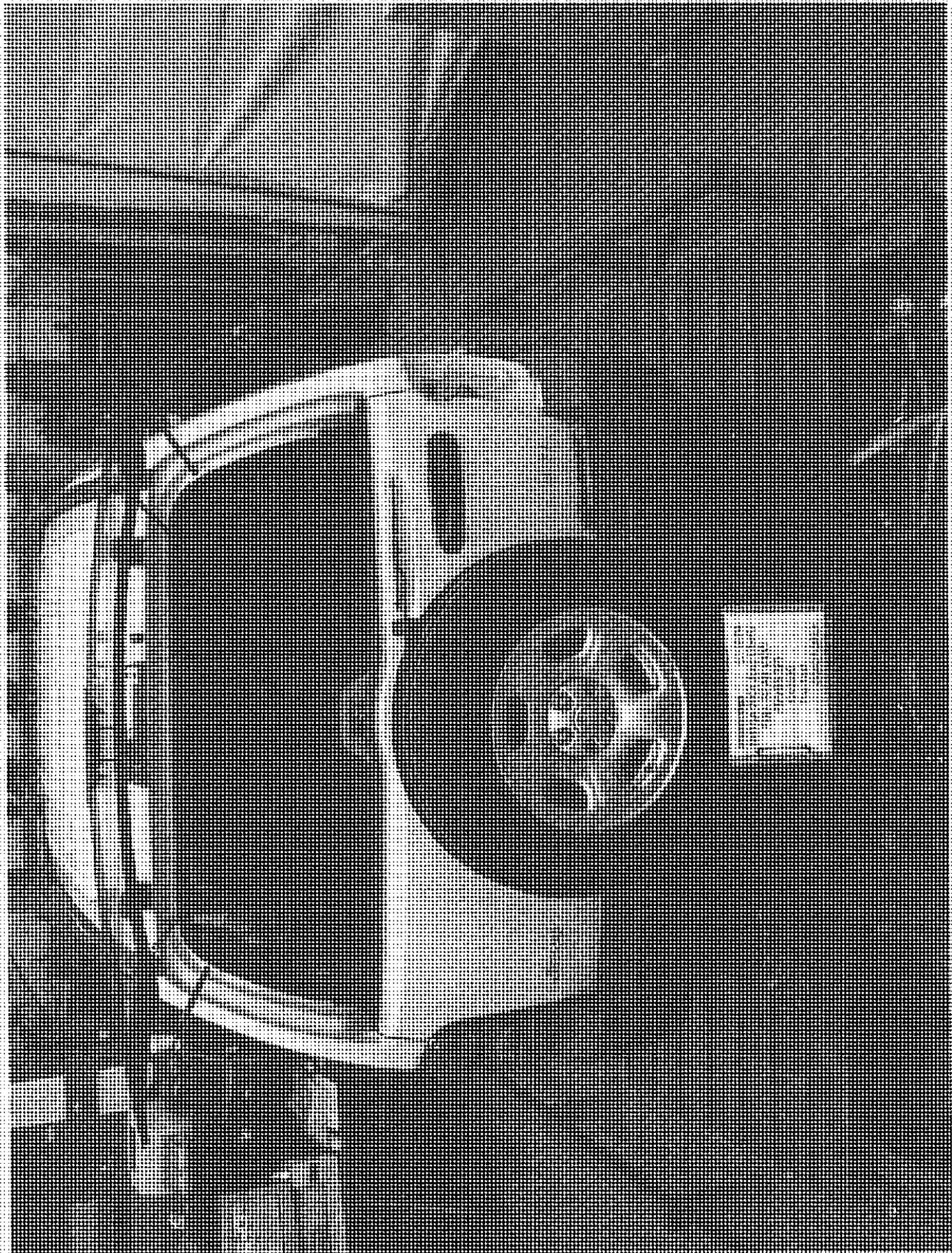
SEAT POSITION		Seat, Seat Back, & Head Restraint Positions			Angle (deg)	Initial Location (mm)	Onset Rate (N/sec.)	Force Applied (N)	Max. Load (N)	Final Location (mm)	Horizontal Displ. (mm)
		Seat	Seat Back	Is There a Head Restraint ?							
Front Row	LH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ctr.										
	RH										
Second Row	LH	Fixed	Fixed	No	5	N/A	350	9,950	9,959	N/A	N/A
	Ctr.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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.

6.0 PHOTOGRAPHS

6.1 Full rear view



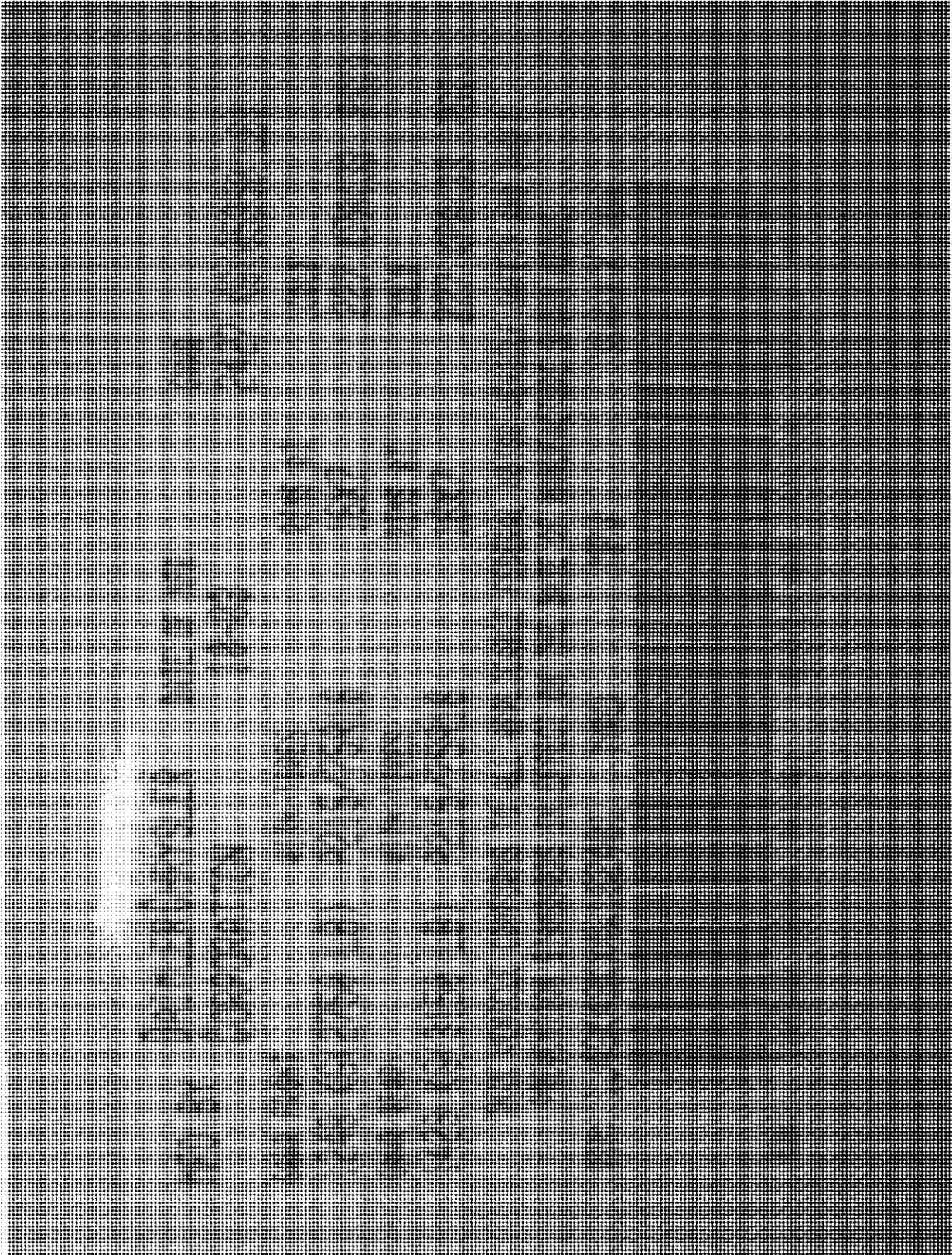
6.2 3/4 Front right view



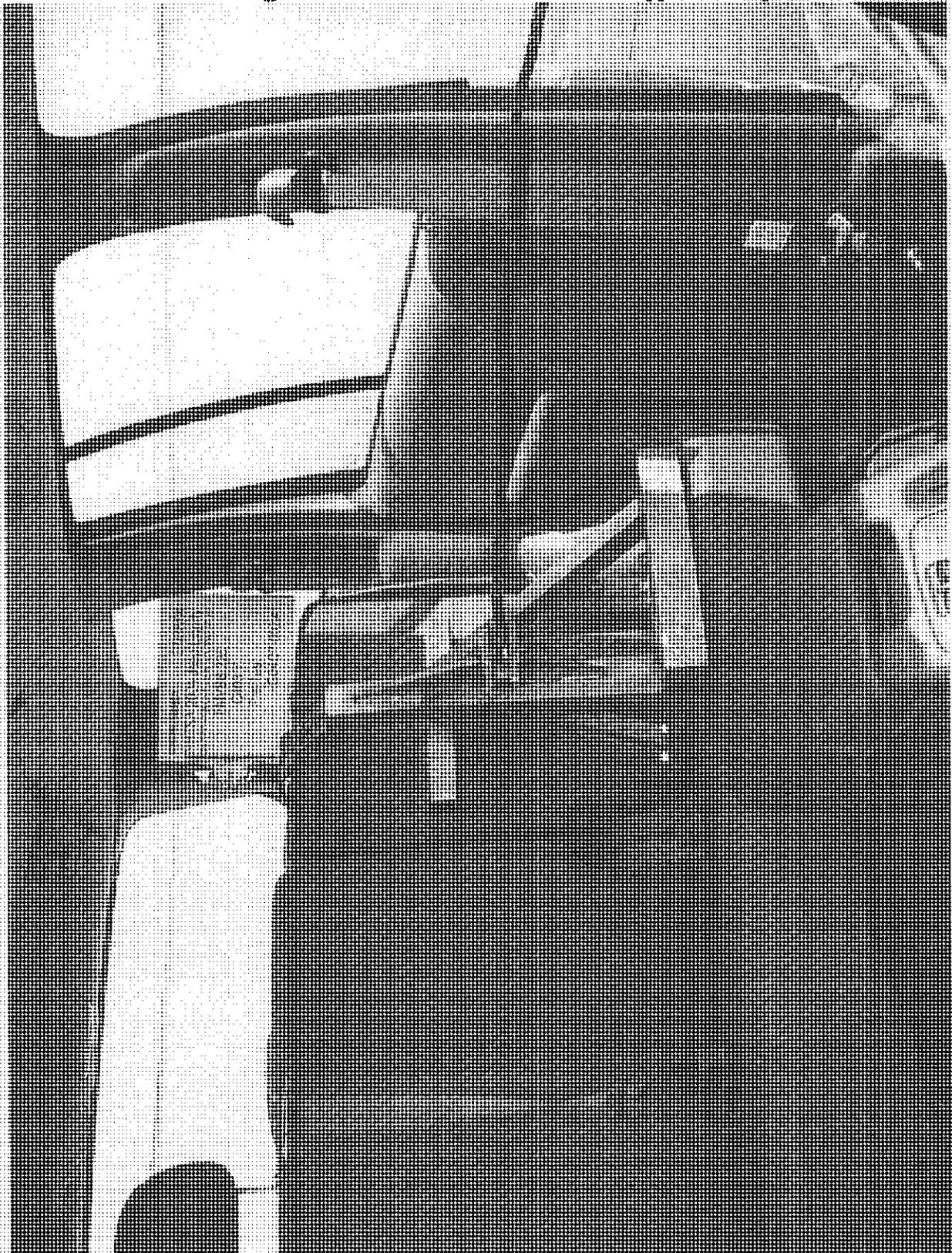
6.3 Test vehicle's certification label



6.4 Test vehicle's tire information placard



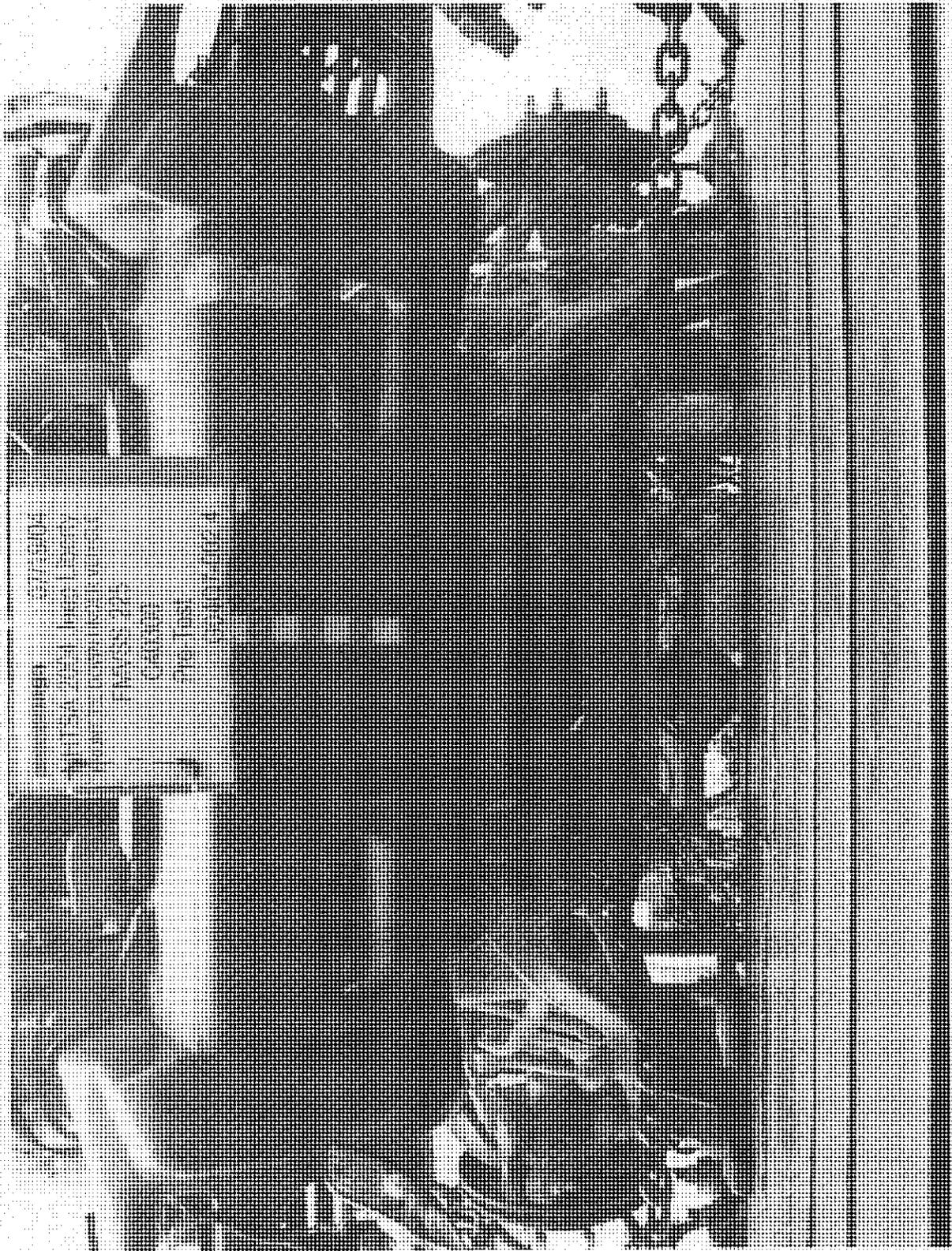
6.5 3/4 Front right side view of test vehicle with test apparatus in place



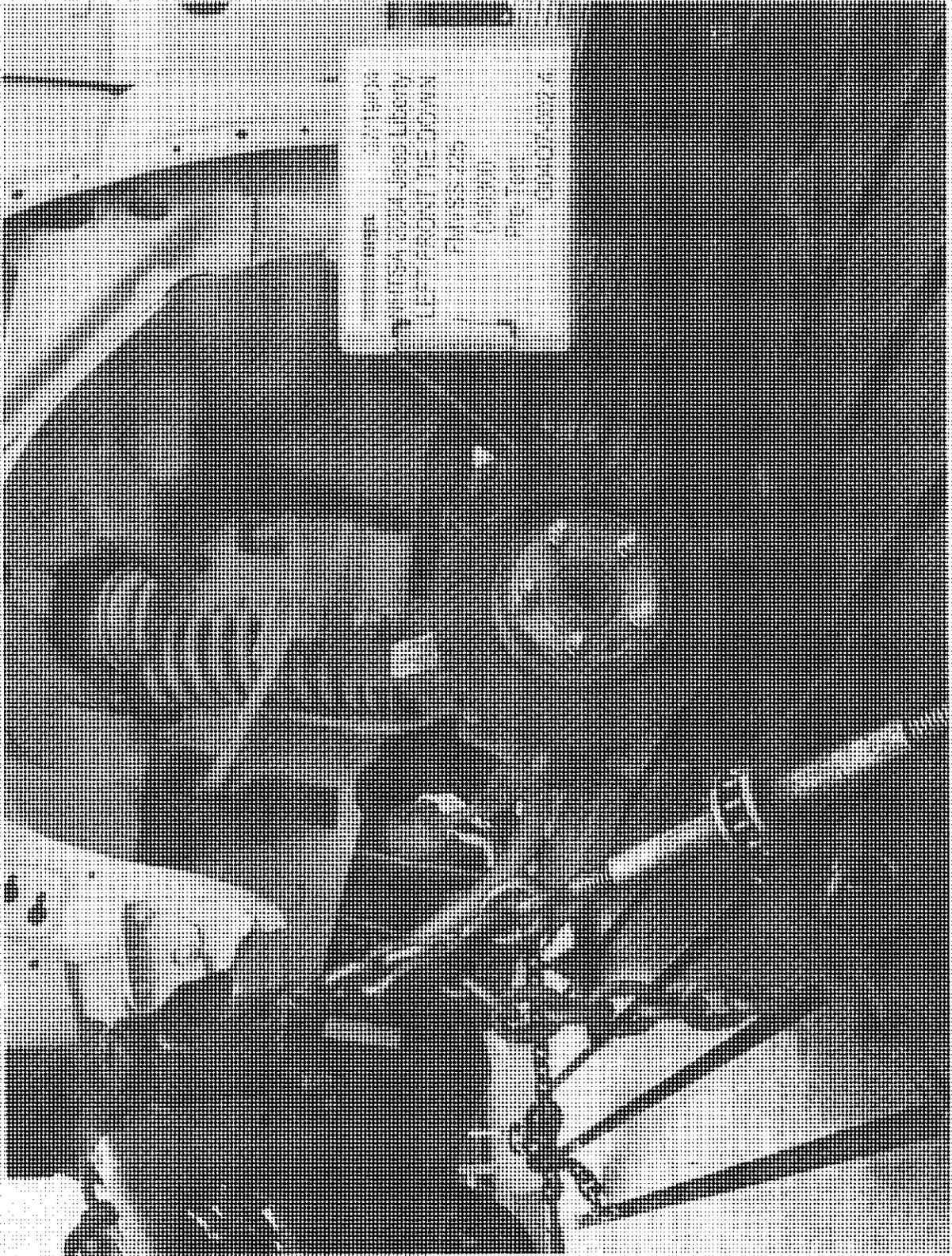
6.6 Left side view of test vehicle with test apparatus in place



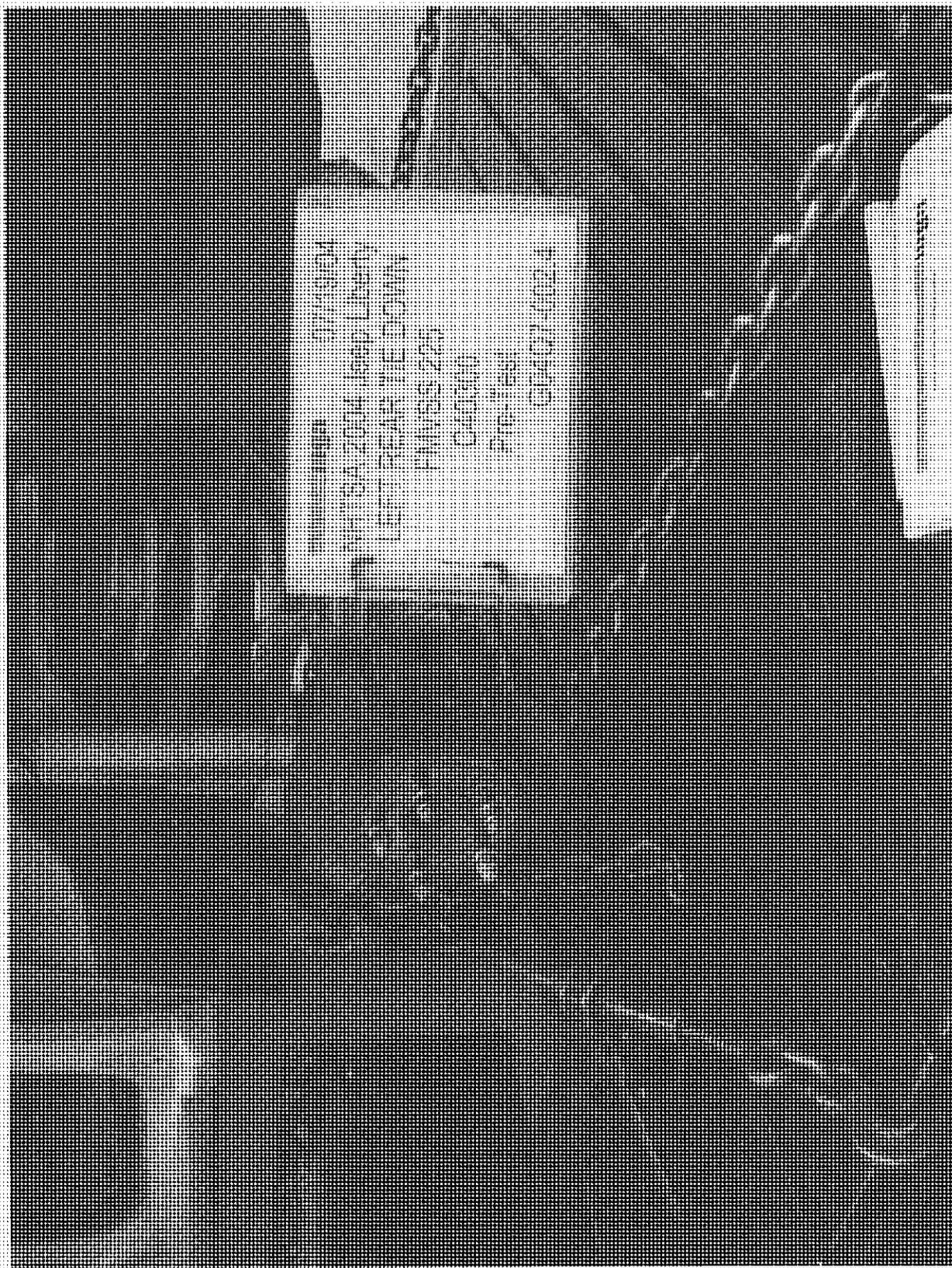
- 6.7 Vehicle tie down at each tie down location
- 6.7.1 front under vehicle



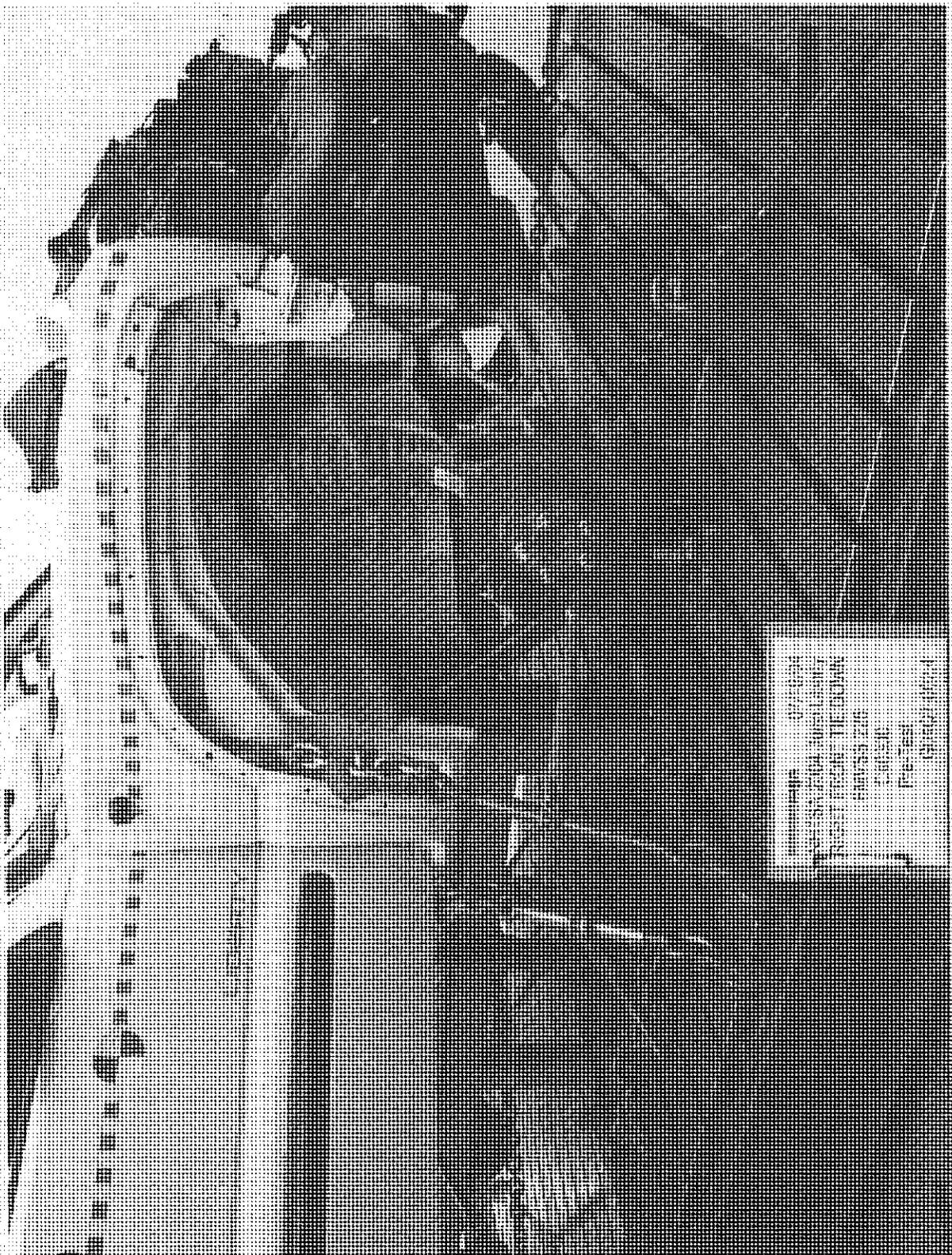
6.7.2 left front



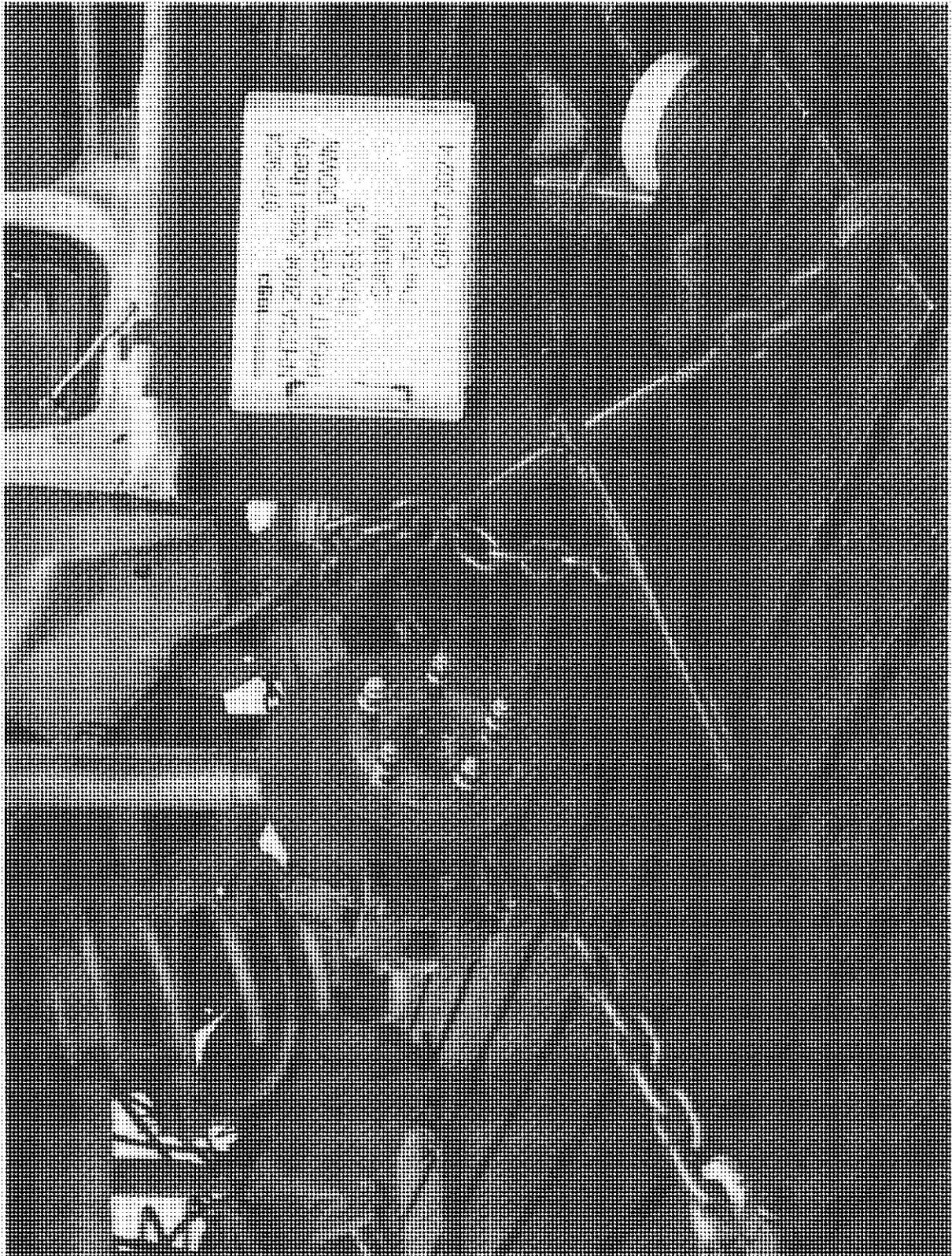
6.7.3 left rear



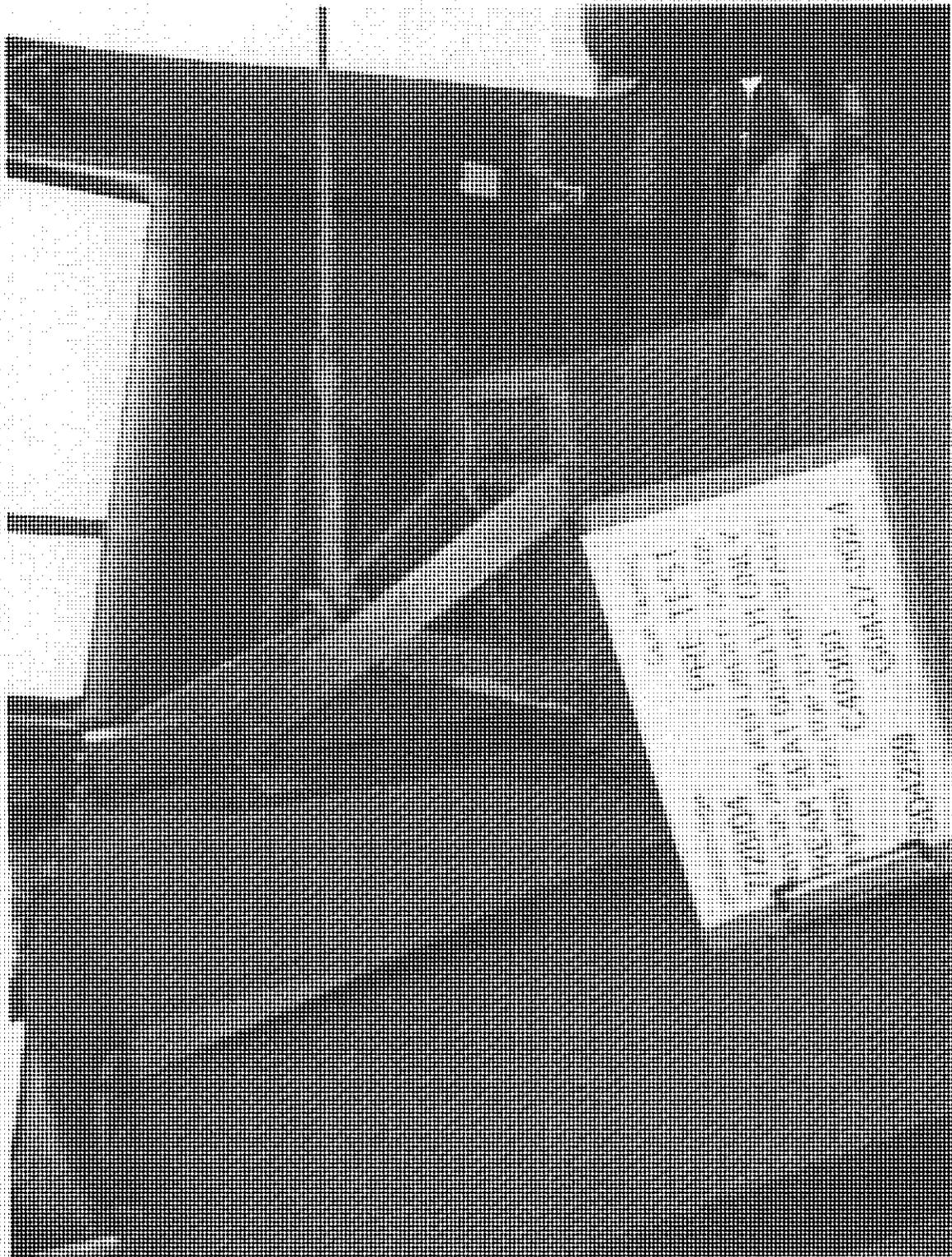
6.7.4 right front



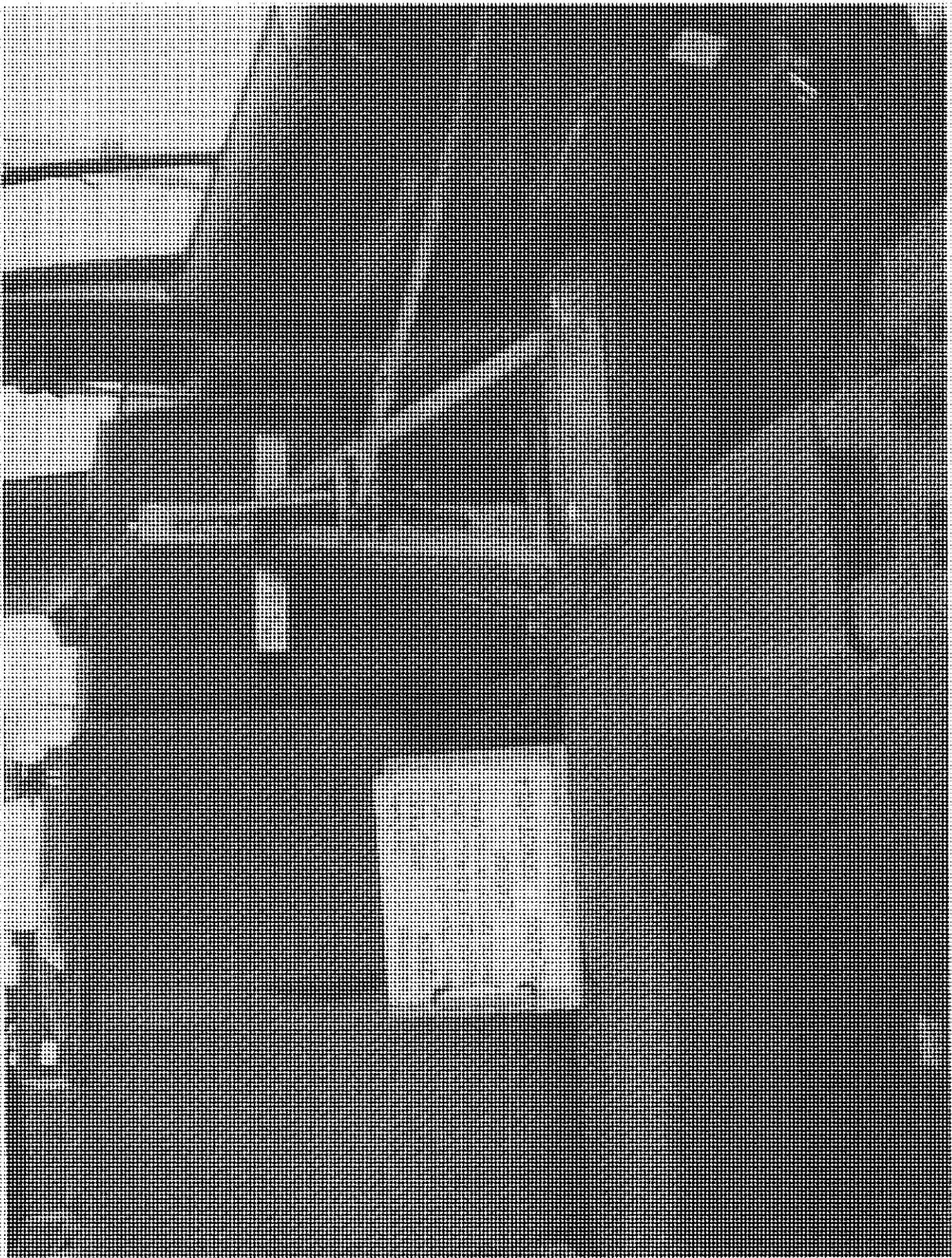
6.7.5 right rear



6.8 Pre-test views of the child restraint anchorage system installed in the vehicle
6.8.1 pre-test 1 of 3



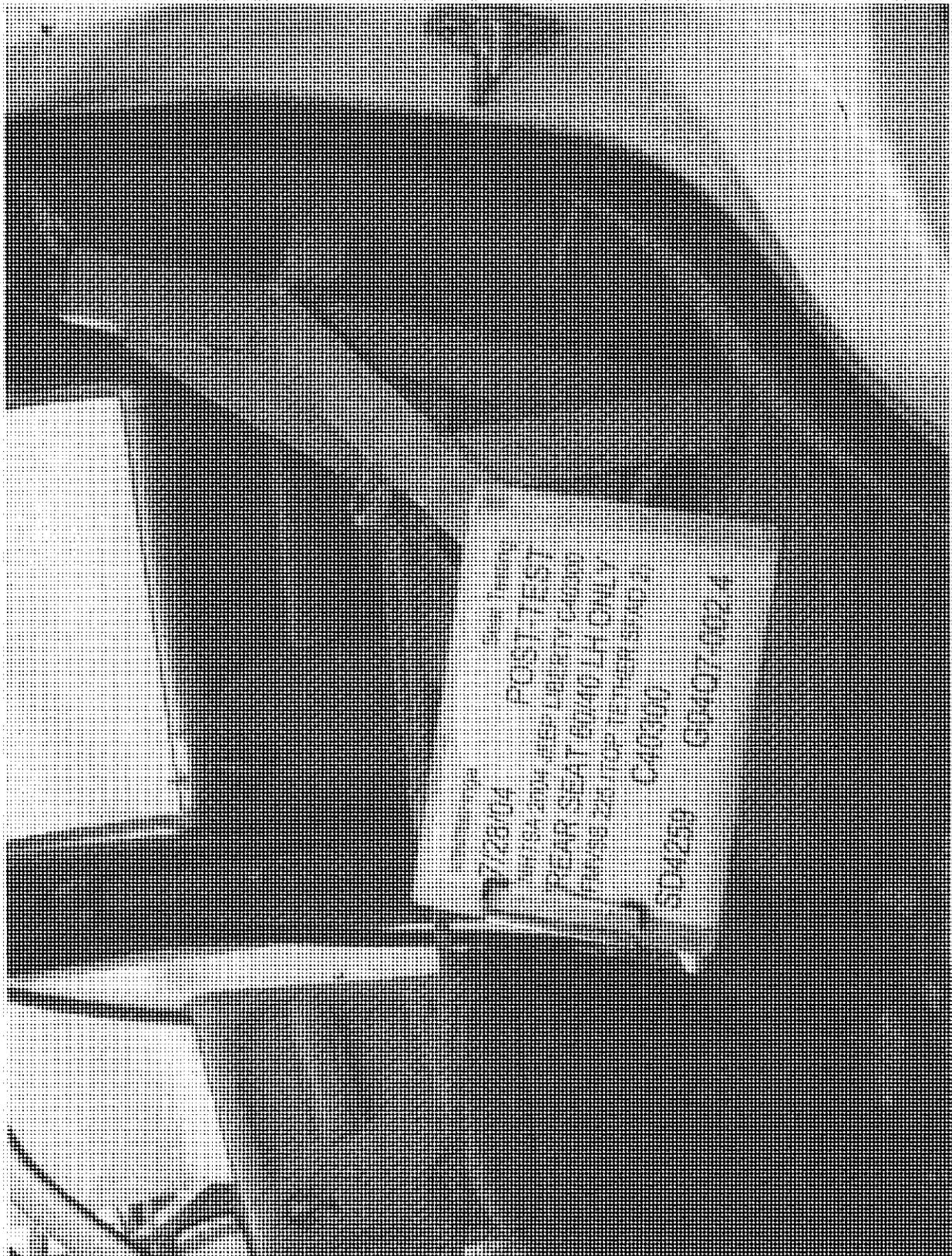
6.8.2 pre-test 2 of 3



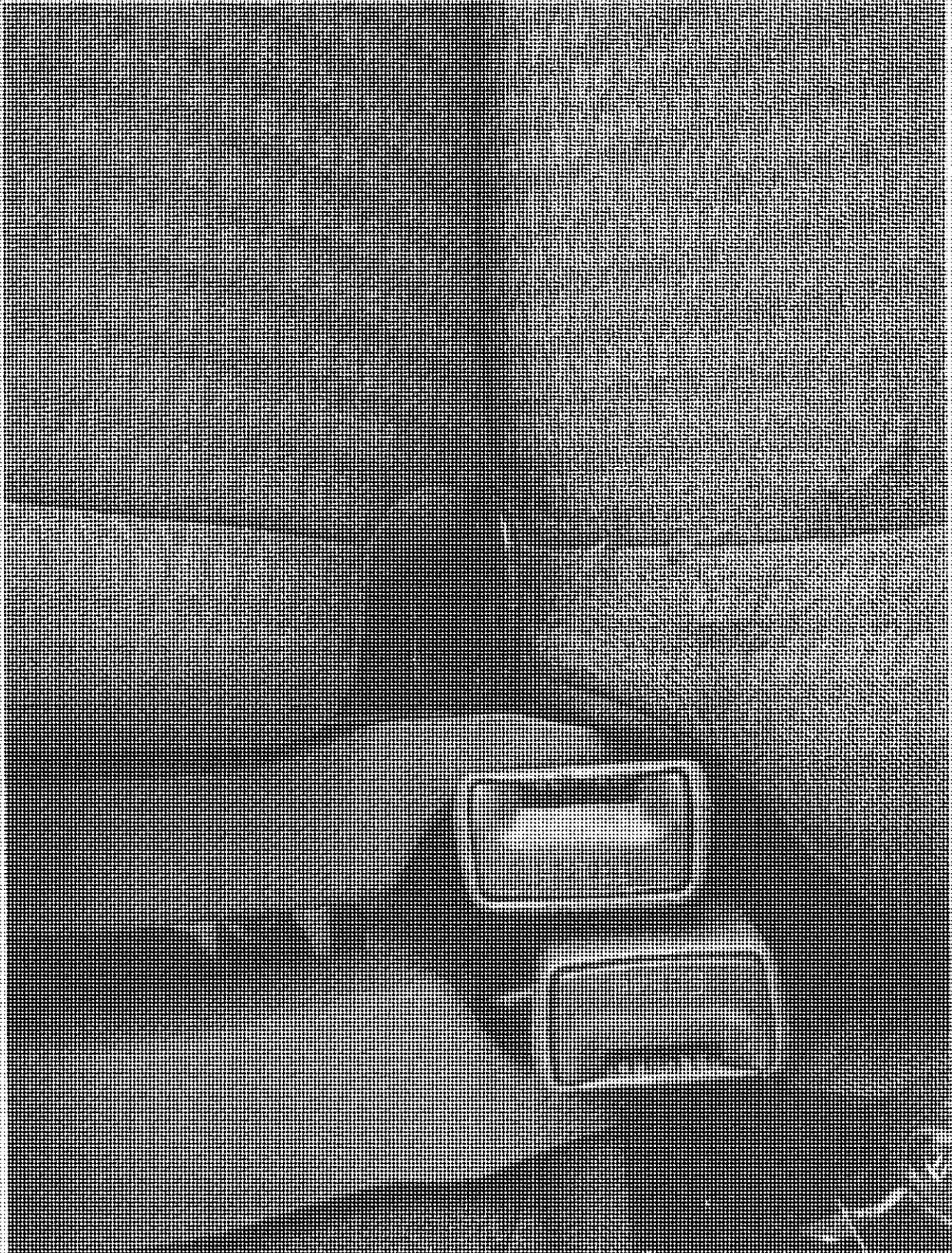
6.6.3 pre-test 3 of 3



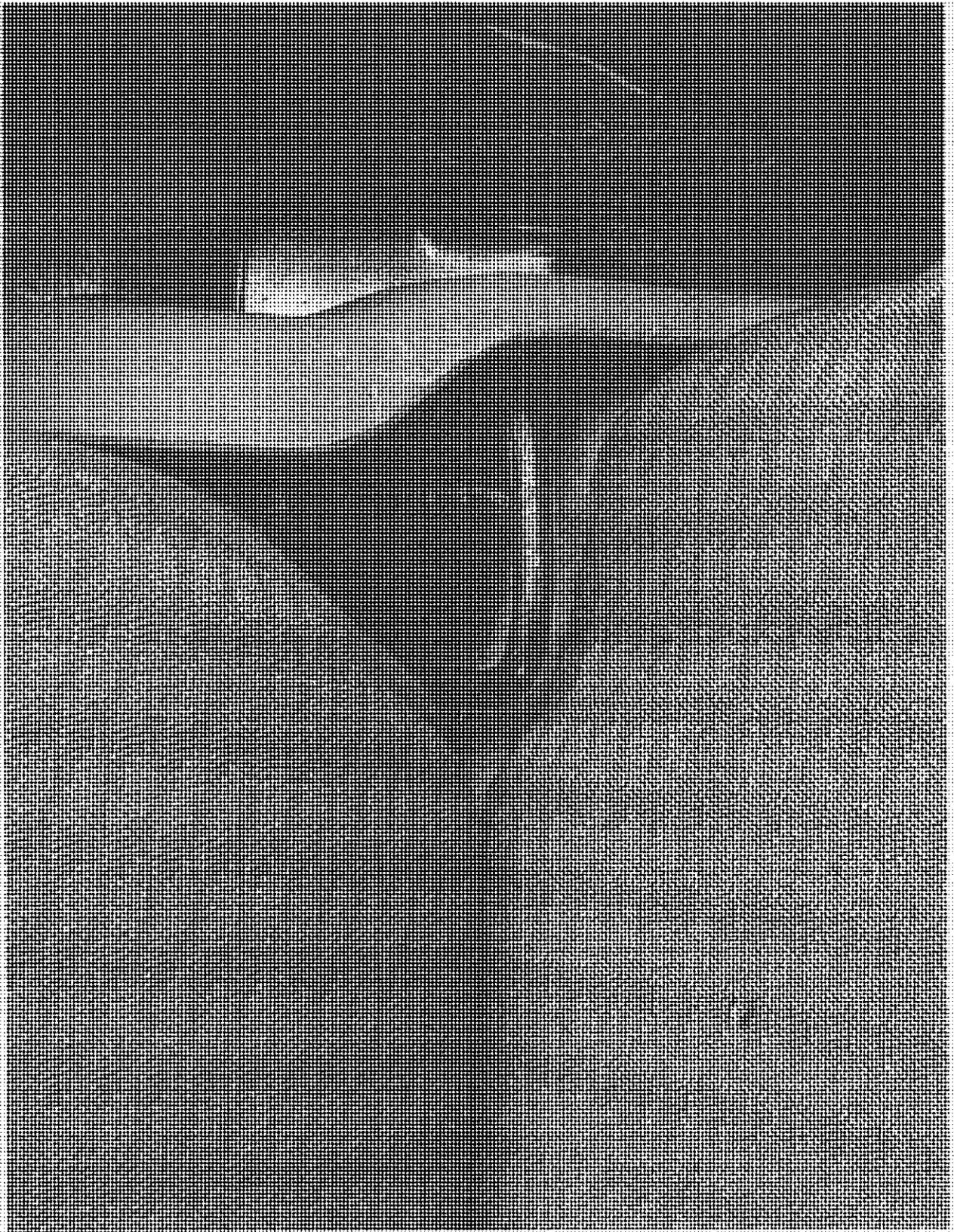
6.9 Post-test condition of the child restraint anchorage system
6.9.1 post-test 1 of 5



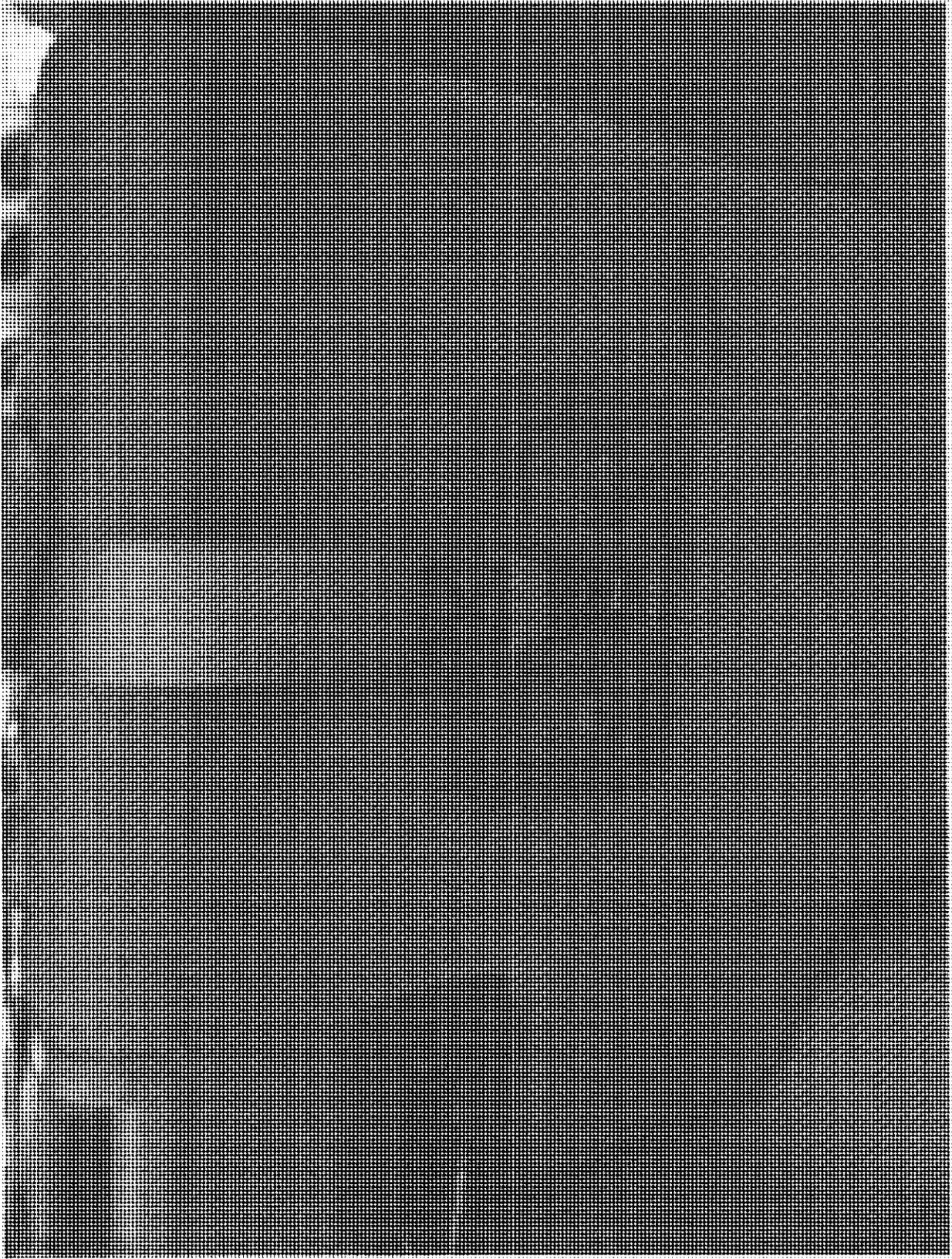
6.9.3 post-test 3 of 5



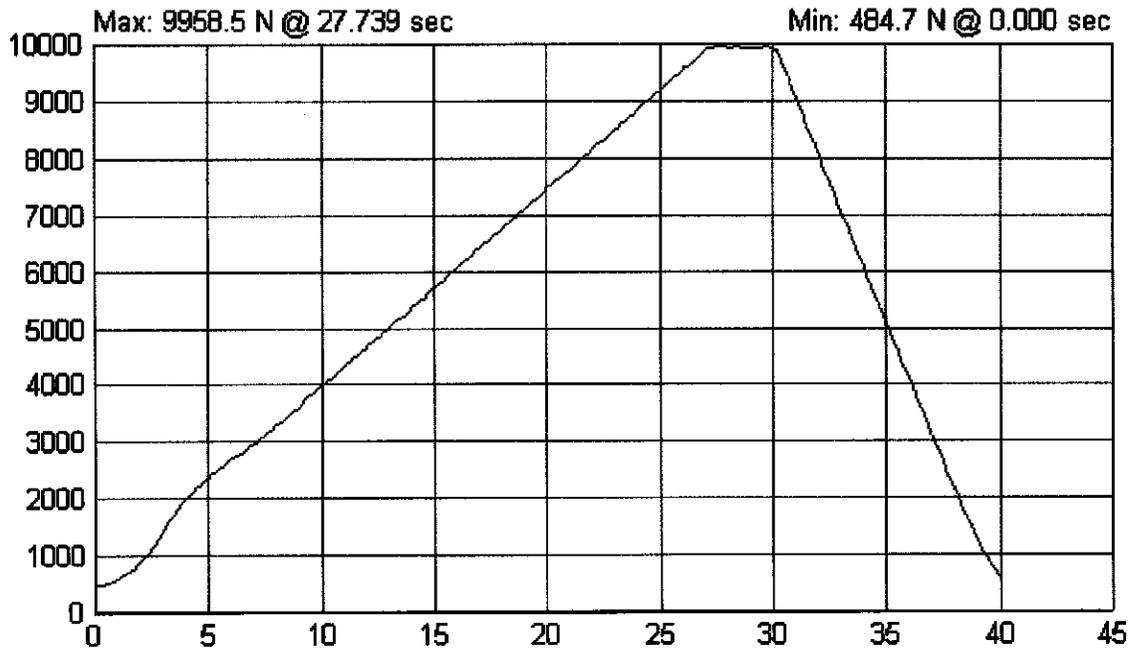
6.9.4 post-test 4 of 5



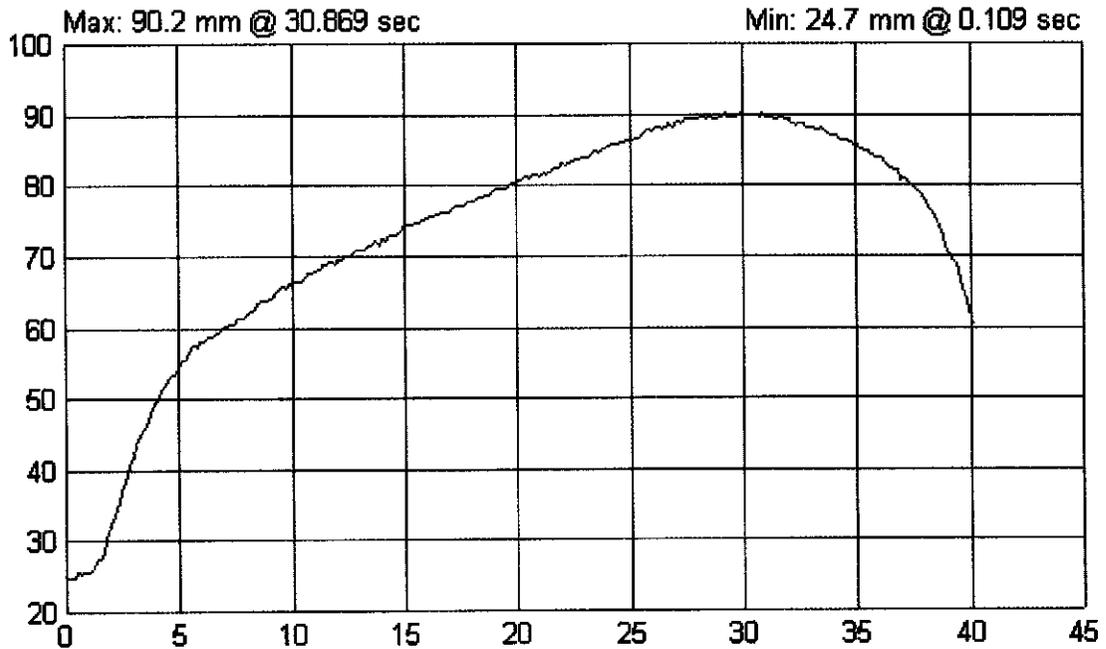
6.9.5 post-test 5 of 5



7.0 PLOTS



Run# SD4259: Top Tether Anchor Test (S6.3.4) - 2R LH Load (N) vs. Time (sec)



Run# SD4259: Top Tether Anchor Test (S6.3.4)-2R LH SFAD 2 X Disp. (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: July 28, 2004

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

To: NHTSA, OVSC, NVS-221

The following vehicle has been subjected to compliance testing for FMVSS No. 208 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: 2004 Jeep Liberty

VEH. NHTSA NO.: C40300 VIN: 1J4GK48KX4W162401

COLOR: White

ODOMETER READINGS: ARRIVAL N/A miles Date: 5/14/04

COMPLETION N/A miles Date: 7/28/04

PURCHASE PRICE: N/A DEALER'S NAME: #1 Ricart

ENGINE DATA: 6 cylinder, 3.7 Liter

TRANSMISSION DATA: X Automatic Manual No. of Speeds 4

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

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Melanie Schick, Brad Reaume, Kenney Godfrey

X	Air Conditioning		Traction Control		Clock
	Tinted Glass		All Wheel Drive	X	Roof Rack
X	Power Steering	X	Speed Control	X	Console
X	Power Windows	X	Rear Window Defroster	X	Driver Air Bag
X	Power Door Locks		Sun Roof or T-Top	X	Passenger Air Bag
	Power Seat(s)	X	Tachometer	X	Front Disc Brakes
X	Power Brakes	X	Tilt Steering Wheel	X	Rear Disc Brakes
X	Antilock Brake System	X	AM/FM/Compact Disc		Other

REMARKS:

Salvage only.

Equipment that is no longer on the test vehicle as noted on previous pages:

All equipment inventoried and placed in vehicle.

Explanation for equipment removal:

Windshield and front seats were removed before conducting the testing.

Test Vehicle Condition:

Salvage only.

RECORDED BY: Melanie Schick, Kenney Godfrey

DATE: July 28, 2004

APPROVED BY: Brad Reaume

APPENDIX A
OWNERS MANUAL CHILD RESTRAINT SYSTEMS

THINGS TO KNOW BEFORE STARTING YOUR VEHICLE 55

Airbag Warning Light

You will want to have the airbag system ready to inflate for your protection in an impact. The airbag system is designed to be maintenance free. If any of the following occurs, have an authorized dealer service the system promptly:

- Does not come on during the 6 to 8 seconds after the ignition switch is first turned on.
- Remains on after the 6 to 8 second interval.
- Comes on for any period of time while driving.

Child Restraint

Everyone in your vehicle needs to be buckled up all the time — babies and children, too. Every state in the United States and all Canadian provinces require that small children ride in proper restraint systems. This is the law, and you can be prosecuted for ignoring it.

Children 12 years and under should ride properly buckled up in a rear seat, if available. According to crash statistics, children are safer when properly restrained in the rear seats rather than in the front.

In a collision, an unrestrained child, even a tiny baby, can become a missile inside the vehicle. The force required to hold even an infant on your lap can become so great that you could not hold the child, no matter how strong you are. The child and others could be badly injured. Any child riding in your vehicle should be in a proper restraint for the child's size.

56 THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

Infants and Small Children

There are different sizes and types of restraints for children from newborn size to the child almost large enough for an adult seat belt. Always check the child seat owner's manual to ensure you have the right seat for your child. Use the restraint that is correct for your child:

- This vehicle is not capable of accommodating the installation of a car bed used for carrying newborn babies at the right front passenger seat position. If a car bed must be used to transport a newborn baby, the car bed must be installed in the second seating row only.
- Safety experts recommend that children ride rearward-facing in the vehicle until they are at least one year old and weigh at least 20 lbs (9 kg). Two types of child restraints can be used rearward facing: infant carriers and "convertible" child seats.
- The infant carrier is only used rearward-facing in the vehicle. It is recommended for children who weigh up

to about 20 lbs (9 kg). "Convertible" child seats can be used either rearward-facing or forward-facing in the vehicle. Convertible child seats often have a higher weight limit in the rearward-facing direction than infant carriers do, so they can be used rearward-facing by children who weigh more than 20 lbs (9 kg) but are less than one year old.

- Rearward-facing child seats must NEVER be used in the front seat of a vehicle with a front passenger airbag. An airbag deployment could cause severe injury or death to infants in this position.
- Children who weigh more than 20 lbs (9 kg) and who are older than one year can ride forward-facing in the vehicle. Forward-facing child seats and convertible child seats used in the forward-facing direction are for children who weigh 20 to 40 lbs (9 to 18 kg), and are older than one year old. These child seats are also held in the vehicle by the lap/shoulder belt.

THINGS TO KNOW BEFORE STARTING YOUR VEHICLE 57

- The belt-positioning booster seat is for children weighing more than 40 lbs (18 kg), but who are still too small to fit the vehicle's seat belts properly. If the child cannot sit with knees bent over the seat cushion while the child's back is against the seatback, they need a belt-positioning booster seat. The child and booster seat are held in the vehicle by the lap/shoulder belt. (Some booster seats are equipped with a front shield and are held in the vehicle by the lap portion.)
- For additional information, refer to www.seatcheck.org.

- 2**
- Improper installation can lead to failure of an infant or child restraint. It could come loose in a collision. The child could be badly injured or killed. Follow the manufacturer's directions exactly when installing an infant or child restraint.
 - A rearward facing infant restraint should only be used in a rear seat. A rearward facing infant restraint in the front seat may be struck by a deploying passenger airbag which may cause severe or fatal to the infant.

58 THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

Here are some tips for getting the most out of your child restraint:

- Before buying any restraint system, make sure that it has a label certifying that it meets all applicable Safety Standards. The manufacturer recommends that you try a child restraint in the vehicle seats where you will use it before you buy it.
- The restraint must be appropriate for your child's weight and height. Check the label on the restraint for weight and height limits.
- Carefully follow the instructions that come with the restraint. If you install the restraint improperly, it may not work when you need it.
- The passenger seat belts are equipped with either cinching latch plates or automatic locking retractors, which are designed to keep the lap portion tight around the child restraint so that it is not necessary to

use a locking clip. If the seat belt has a cinching latch plate, pulling up on the shoulder portion of the lap/shoulder belt will tighten the belt. The cinching latch plate will keep the belt tight, however, any seat belt system will loosen with time, so check the belt occasionally and pull it tight if necessary.

If the seat belt has an automatic locking retractor, it will have a distinctive label. Pull the belt from the retractor until there is enough to allow you to pass through the child restraint and slide the latch plate into the buckle. Then, pull the belt until it is all extracted from the retractor. Allow the belt to return to the retractor, pulling on the excess webbing to tighten the lap portion about the child restraint. Refer to "Automatic Locking Mode" earlier in this section.

- Buckle the child into the restraint exactly as the manufacturer's instructions tell you.

THINGS TO KNOW BEFORE STARTING YOUR VEHICLE 59

- When your child restraint is not in use, secure it in the vehicle with the seat belt or remove it from the vehicle. Do not leave it loose in the vehicle. In a sudden stop or collision, it could strike the occupants or seat backs and cause serious personal injury.

LATCH — Child Seat Anchorage System (Lower Anchors and Tether for Children)

Your vehicle's rear seat is equipped with the child restraint anchorage system called LATCH. The LATCH system provides for the installation of the child restraint without using the vehicle's seat belts, instead securing the child restraint using lower anchorages and upper tether straps from the child restraint to the vehicle structure.

LATCH-compatible child restraint systems are now available. However, because the lower anchorages are to be introduced over a period of years, child restraint systems having attachments for those anchorages will continue to

also have features for installation using the vehicle's seat belts. Child restraints having tether straps and hooks for connection to the top tether anchorages have been available for some time. For some older child restraints, many child restraint manufacturers offer add-on tether strap kits or retro-fit kits. You are urged to take advantage of all the available attachments provided with your child restraint in any vehicle.

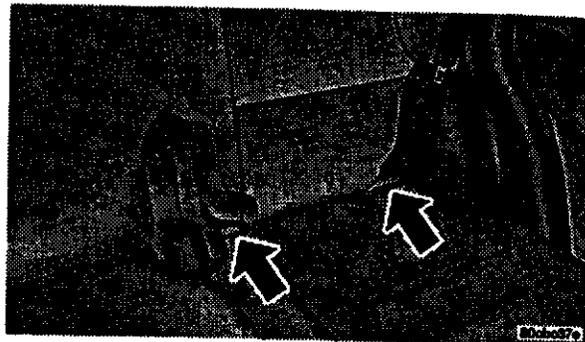
All three rear seating positions have lower anchorages that are capable of accommodating LATCH-compatible child seats having flexible, webbing-mounted lower attachments. Child seats with fixed lower attachments must be installed in the outboard positions only. Regardless of the specific type of lower attachment, NEVER install LATCH-compatible child seats such that two seats share a common lower anchorage. If installing child seats in adjacent rear-seating positions or if your child restraints are not LATCH-compatible, install the restraints using the vehicle's seat belts.

60 THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

Installing the LATCH-Compatible Child Restraint System

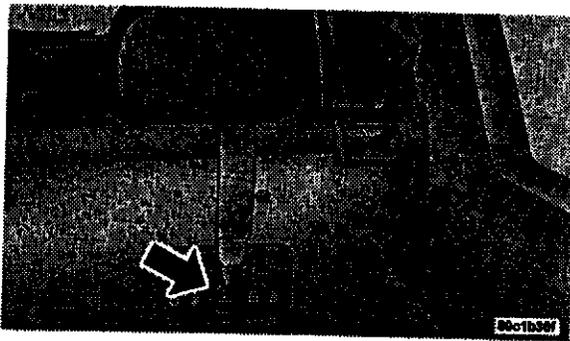
We urge that you carefully follow the directions of the manufacturer when installing your child restraint. Not all child restraint systems will be installed as described here. Again, carefully follow the installation instructions that were provided with the child restraint system.

The rear seat lower anchorages are round bars, located at the rear of the seat cushion where it meets the seat back, and are just visible when you lean into the rear seat to install the child restraint. You will easily feel them if you run your finger along the intersection of the seatback and seat cushion surfaces.



In addition, there are tether strap anchorages behind each rear seating position located on the back of the seat.

THINGS TO KNOW BEFORE STARTING YOUR VEHICLE 61



Many, but not all restraint systems will be equipped with separate straps on each side, with each having a hook or connector for attachment to the lower anchorage and a means of adjusting the tension in the strap. Forward-facing toddler restraints and some rear-facing infant restraints will also be equipped with a tether strap, a

hook for attachment to the tether strap anchorage and a means of adjusting the tension of the strap.

You will first loosen the adjusters on the lower straps and on the tether strap so that you can more easily attach the hooks or connectors to the vehicle anchorages. Next attach the lower hooks or connectors over the top of the anchorage bars, pushing aside the seat cover material. Then lift the tether anchorage cover directly behind the seat where you are placing the child restraint and attach the tether strap to the anchorage, being careful to route the tether strap to provide the most direct path between the anchor and the child restraint. If your vehicle is equipped with adjustable rear head restraints; raise the head restraint and, route the tether strap under the head restraint and between the two posts. Finally, tighten all three straps as you push the child restraint rearward and downward into the seat, removing slack in the straps according to the child restraint manufacturer's instructions.

62 THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

Improper installation of a child restraint to the LATCH anchorages can lead to failure of an infant or child restraint. The child could be badly injured or killed. Follow the manufacturer's directions exactly when installing an infant or child restraint.

Installing Child Restraints Using the Vehicle Seat Belt

The passenger seat belts are equipped with either cinching latch plates or automatic locking retractors, which are designed to keep the lap portion tight around the child restraint so that it is not necessary to use a locking clip. If the seat belt has a cinching latch plate, pulling up on the shoulder portion of the lap/shoulder belt will tighten the belt. The cinching latch plate will keep the belt tight, however, any seat belt system will loosen with time, so check the belt occasionally and pull it tight if necessary.

If the seat belt has an automatic locking retractor, it will have a distinctive label. Pull the belt from the retractor until there is enough to allow you to pass through the child restraint and slide the latch plate into the buckle. Then, pull the belt until it is all extracted from the retractor. Allow the belt to return to the retractor, pulling on the excess webbing to tighten the lap portion about the child restraint. Refer to "Automatic Locking Mode" earlier in this section.

In the rear seat, you may have trouble tightening the lap/shoulder belt on the child restraint because the buckle or latch plate is too close to the belt path opening on the restraint. Disconnect the latch plate from the buckle and twist the short buckle-end belt several times to shorten it. Insert the latch plate into the buckle with the release button facing out.

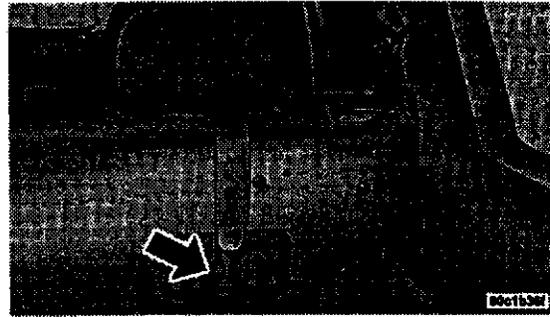
If the belt still can't be tightened, or if by pulling and pushing on the restraint loosens the belt, you may need

THINGS TO KNOW BEFORE STARTING YOUR VEHICLE 63

to do something more. Disconnect the latch plate from the buckle, turn the buckle around, and insert the latch plate into the buckle again. If you still can't make the child restraint secure, try a different seating position.

To attach a child restraint tether strap:

Route the tether strap over the seat back and attach the hook to the tether anchor located on the back of the seat. For the outboard seating positions, route the tether under the head restraint between the head restraint posts.



64 THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

An incorrectly anchored tether strap could lead to increased head motion and possible injury to the child. Use only the anchor positions directly behind the child seat to secure a child restraint top tether strap.

Children Too Large for Booster Seats

Children who are large enough to wear the shoulder belt comfortably, and whose legs are long enough to bend over the front of the seat when their back is against the seat back should use the lap/shoulder belt in a rear seat.

- Make sure that the child is upright in the seat.
- The lap portion should be low on the hips and as snug as possible.

- Check belt fit periodically. A child's squirming or slouching can move the belt out of position.
- If the shoulder belt contacts the face or neck, move the child closer to the center of the vehicle. Never allow a child to put the shoulder belt under an arm.

Transporting Pets

Airbags deploying in the front seat could harm your pet. An unrestrained pet will be thrown about and possibly injured, or injure a passenger during panic braking or in a collision.

Pets should be restrained in the rear seat in pet harnesses or pet carriers that are secured by seat belts.

APPENDIX B
MANUFACTURER'S DATA (OVSC FORM 14)

07/16/2004 10:09 FAX 202 336 3061

DOT OVSC 221

+ MGA TROY

0002

FORM 14

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

Model Year: 2004 Make: JEEP Model: Liberty Body Style: 4 DR
 Seat Style: Front Row: Bucket Second Row: Folding Third Row: N/A

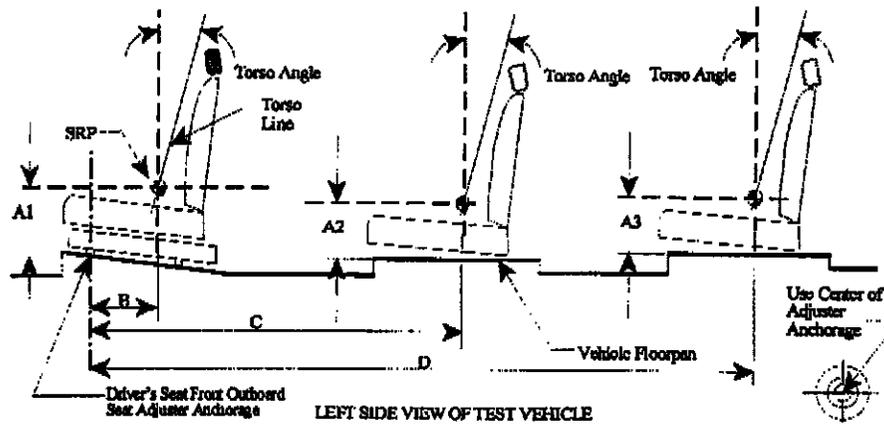


Table 1. Seating Positions¹ and Torso Angles

	Left (Driver Side)	Center (if any)	Right
A1	(Driver)323.0	N/A	323.0
A2	232.0	255.2	232.0
A3	N/A	N/A	N/A
B	328.1	N/A	328.1
C	1124.0	1109.0	1124.0
D	N/A	N/A	N/A
Torso Angle (degree)	Front Row	23.5 Deg.	23.5 Deg.
	Second Row	23.5 Deg.	23.5 Deg.
	Third Row	N/A	N/A

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

07/16/2004 10:09 FAX 202 336 3081

DOT OVSC 221

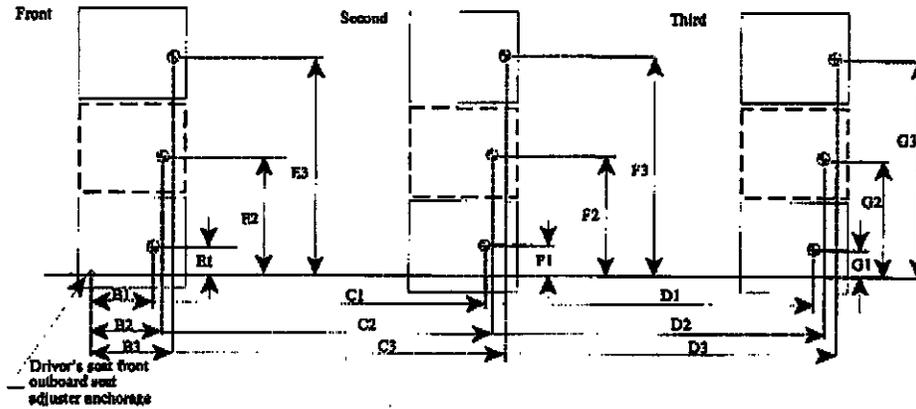
- MGA TROY

0003

FORM 14

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

Model Year: 2004 Make: Jeep Model: Liberty Body Style: 4 DR
Seat Style: Front Row: Bucket Second Row: Folding Third Row: N/A



07/16/2004 10:10 FAX 202 336 3081

DOT OVSC 221

+ MGA TROY

004

FORM 14

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

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	328.1
	E1	176.1
	B2	N/A
	E2	N/A
	B3	328.1
	E3	956.1
Second Row	C1	1124.0
	F1	195.1
	C2	1109.0
	F2	566.1
	C3	1124.0
	F3	937.1
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.

07/16/2004 10:10 FAX 202 336 3081

DOT OVSC 221

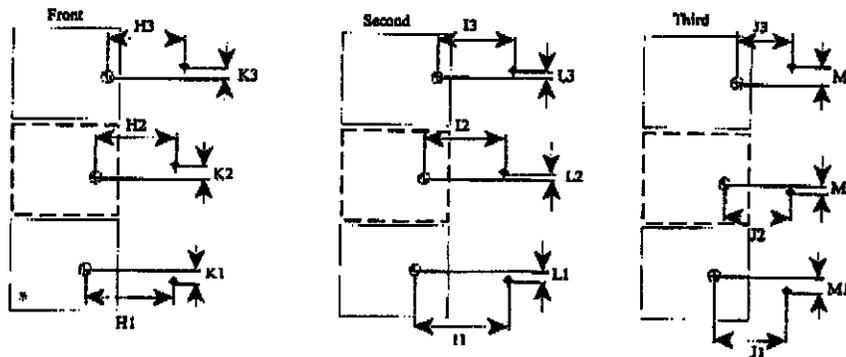
→ MGA TROY

005

FORM 14

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

Model Year: 2004 Make: JEEP Model: Liberty Body Style: 4 DR
Seat Style: Front Row: Bucket Second Row: Folding Third Row: N/A



⊕: SRP

⊕: Tether anchorage

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

07/16/2004 10:10 FAX 202 336 3081

DOT OVSC 221

→ MGA TROY

006

FORM 14

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

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	381.3
	L1	16.0
	I2	381.3
	L2	0.0
	I3	381.3
	L3	16.0
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.

07/16/2004 10:11 FAX 202 336 3081

DOT OVSC 221

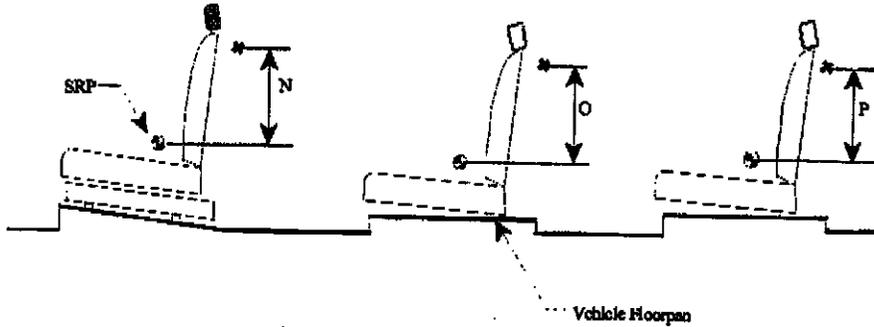
+ MGA TROY

007

FORM 14

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

Model Year: 2004 Make: JEEP Model: Liberty Body Style: 4 DR
 Seat Style: Front Row: Bucket Second Row: Folding Third Row: N/A



LEFT SIDE VIEW OF TEST VEHICLE

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)	268
	O2 (Center)	249
	O3 (Right)	268
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 used.

07/16/2004 10:11 FAX 202 336 3061

DOT OVSC 221

+ MGA TROY

0008

FORM 14

Test Procedures Used for Compliance Tests

Tether Anchorages

Seating Location		FMVSS Section(s) - Req.		
		Allowed until 9/1/04		Required after 9/1/04
		S6.3.4 (10 kN)	S6.3.4.1 (5.3 kN)	S6.3.1 (15 kN)
Front	Driver	N/A	N/A	N/A
	Center (if any)	N/A	N/A	N/A
	Right (if any)	N/A	N/A	N/A
Second	Left	X		
	Center	X		
	Right (if any)	X		
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

Lower Anchorages

Seating Location		FMVSS Section(s) - Req.	
		Allowed until 9/1/04	Required after 9/1/04
		S15.3 (8 kN / 5 kN)	S9.4 (11 kN / 5 kN)
Front	Driver	N/A	N/A
	Center (if any)	N/A	N/A
	Right (if any)	N/A	N/A
Second	Left	X	N/A
	Center	N/A	N/A
	Right (if any)	X	N/A
Third	Left	N/A	N/A
	Center	N/A	N/A
	Right	N/A	N/A
Fourth	Left	N/A	N/A
	Center	N/A	N/A
	Right	N/A	N/A