FINAL REPORT NUMBER 225-MGA-05-008

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

DAIMLERCHRYSLER CORPORATION
2005 JEEP GRAND CHEROKEE
NHTSA No. C50307

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Date: September 2, 2005
Report Date: September 14, 2005

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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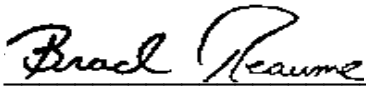
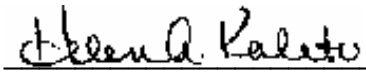
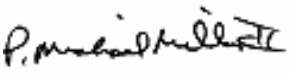
Melanie Schick, Project Engineer


Brad Reaume, Test Personnel


Helen A. Kaleto, Laboratory Manager

Approved By: 

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16. Abstract A compliance test was conducted on the subject 2005 Jeep Grand Cherokee, NHTSA No. C50307, 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 September 2, 2005. Test failures identified were as follows: NONE The data recorded indicates that the 2005 Jeep Grand Cherokee 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 Jeep Grand Cherokee, NHTSA No. C50307 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 800 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 September 2, 2005.

Based on the test results, the 2005 Jeep Grand Cherokee 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 11,172 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 63 mm. The SFADII at the 2nd row right seating position sustained a maximum force of 11,142 N and held the required load for 3 seconds. The total displacement from point "X" on the SFADII for the 2nd row right seating position was 60 mm. The SFADI at the 2nd row center seating position sustained a maximum force of 15,263 N and held the required load for 3 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)
SB5319	SFADII	Forward	2nd Row Left	11,172	63
			2nd Row Right	11,142	60
SB5320	SFADI	Forward	2nd Row Center	15,263	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 Jeep Grand Cherokee
VEH. NHTSA NO.	C50307
VIN	1J4GR48K35C539018
COLOR	Blue
VEH. BUILD DATE	11/04
TEST DATE	September 2, 2005
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: 11/04; VIN: 1J4GR48K35C539018

GVWR: 5900 lbs; GAWR FRONT: 2950 lbs

GAWR REAR: 3200 lbs

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 33 psi REAR: 33 psi

Recommended Tire Size: P235/65R17

Recommended Cold Tire Pressure:

FRONT: 33 psi REAR: 33 psi

Size of Tire on Test Vehicle: P235/65R17

Size of Spare Tire: P235/65R17

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 251 (02/10/06), S/N 258 (02/10/06)
String Potentiometer	Calibrated at each use (S/N 20763, 21809)
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 TPM543 (08/02/06)
MGA Data Acquisition System	N/A
Digital Calipers	S/N MGA00053 (09/20/06)
Force Gauge	S/N MGA00113 (05/25/06)
Inclinometer (Digital)	S/N MGA00517 (06/01/06)

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	64	53	N/A
	Ctr		N/A		
	RH		73	60	
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	6.00	5.98	N/A
	Ctr		N/A		
	RH		6.03	6.01	
Inspect if the bars are straight, horizontal and transverse	LH	N/A	Yes		N/A
	Ctr		N/A		
	RH		Yes		
Optional Marking: At least one anchorage bar (when deployed for use, if storable anchorages), one guidance fixture, or one seat marking is visible.	LH	N/A	N/A		N/A
	Ctr				
	RH				
Optional Marking: If guidance fixtures are used, the fixture(s) must be installed.	LH	N/A	N/A		N/A
	Ctr				
	RH				
Measure the distance between Point "Z" of the CRF and the front surface of the anchorage bar (mm)	LH	N/A	36		N/A
	Ctr		N/A		
	RH		35		
Measure the distance between the SRP to the center of the anchorage bar (mm)	LH	N/A	150		N/A
	Ctr		N/A		
	RH		167		

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	34	34	N/A
	Ctr		N/A		
	RH		35	35	
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		
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	279		N/A
	Ctr		N/A		
	RH		280		
Inspect if the bars are an integral and permanent part of the vehicle.	LH	N/A	Yes		N/A
	Ctr		N/A		
	RH		Yes		
Inspect if the bars are rigidly attached to the vehicle. If feasible, hold the bar firmly with two fingers and gently pull.	LH	N/A	Yes		N/A
	Ctr		N/A		
	RH		Yes		

PITCH, YAW, & ROLL INFORMATION

SEAT POSITION	PITCH (deg)	YAW (deg)	ROLL (deg)
2nd Row Left	11	No Data	0.1
2nd Row Center	N/A	N/A	N/A
2nd Row Right	11	No Data	0.1

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	9	21	387	11,000	11,172*	84	63
	Ctr.			No	I	8	N/A	535	15,000	15,263*	N/A	N/A
	RH			Yes	II	9	23	387	11,000	11,142*	83	60
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: (1) 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

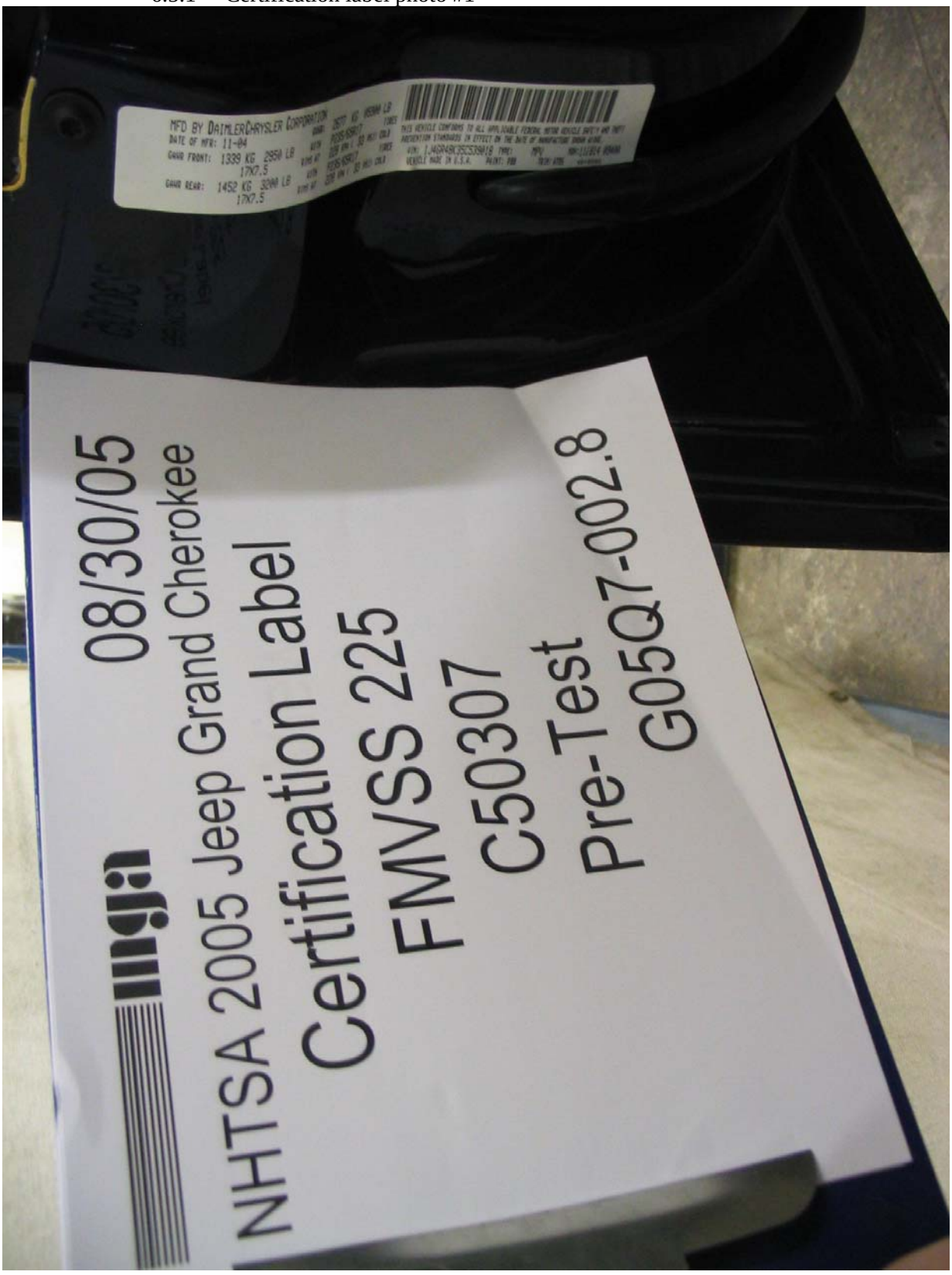

LAREDO
Jeep
Jeff Wyler
Wyler
.com
EASTGATE
4x4
NHTSA 2005 Jeep Grand Cherokee
Rear View
FMVSS 225
C50307
Pre-Test
G05Q7-002.8
08/30/05

6.3 ¾ Front left view

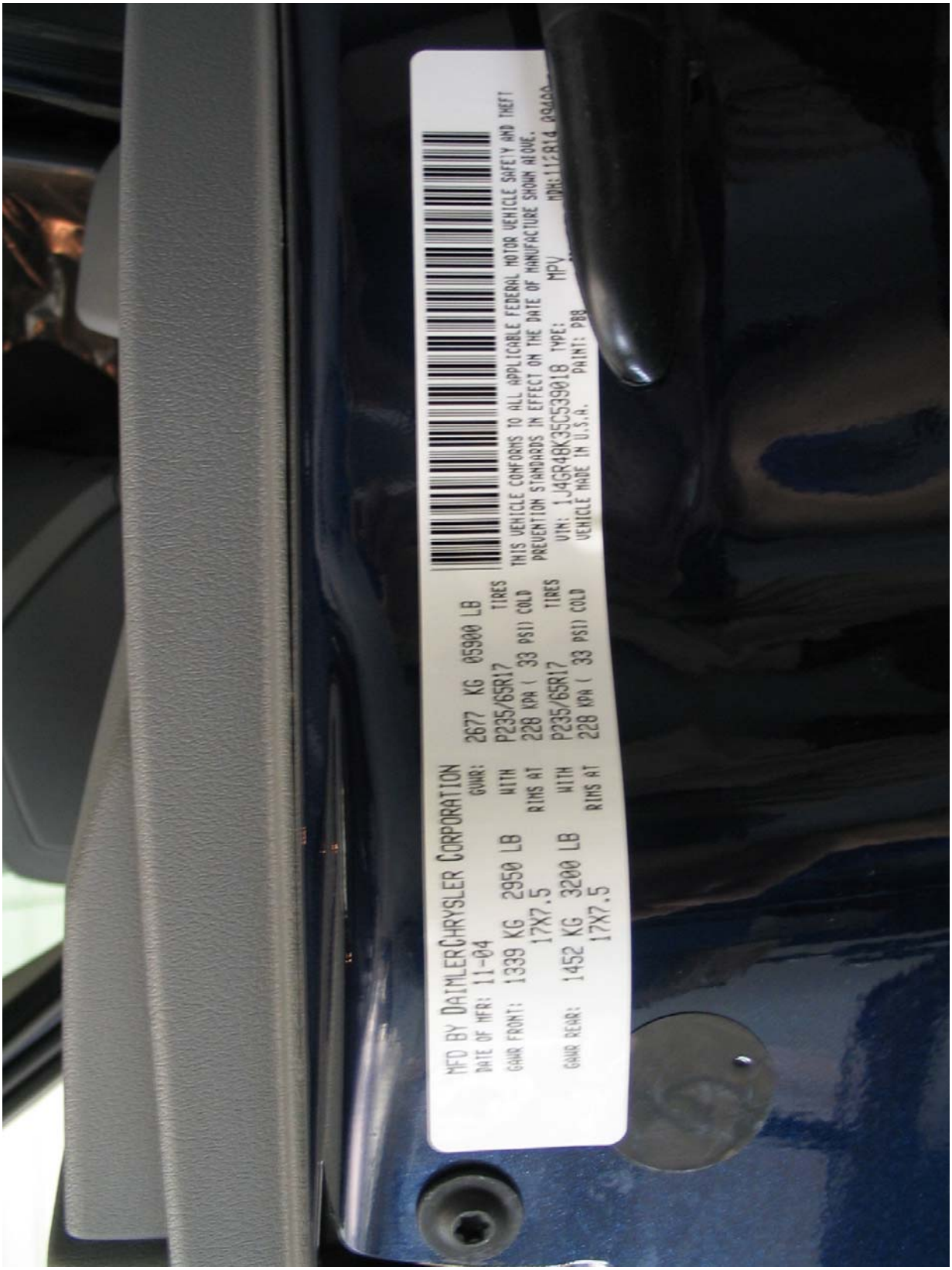
6.4 ¾ Front right view

6.5 Test vehicle's certification label

6.5.1 Certification label photo #1



6.5.2 Certification label photo #2



6.5.3 Tire information label photo #1

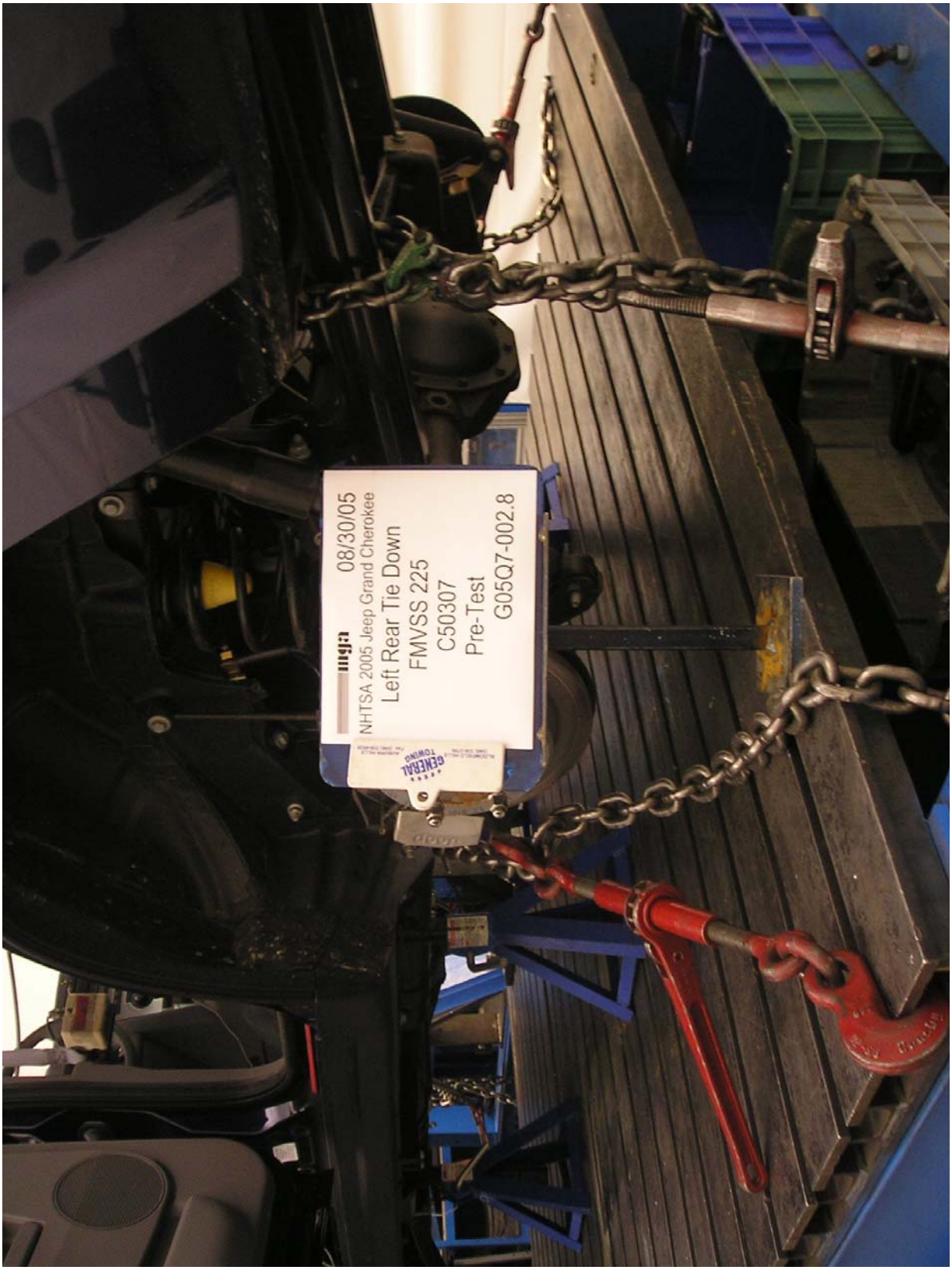
6.5.4 Tire information label photo #2

6.6 Vehicle tie down at each tie down location

6.6.1 Front under vehicle

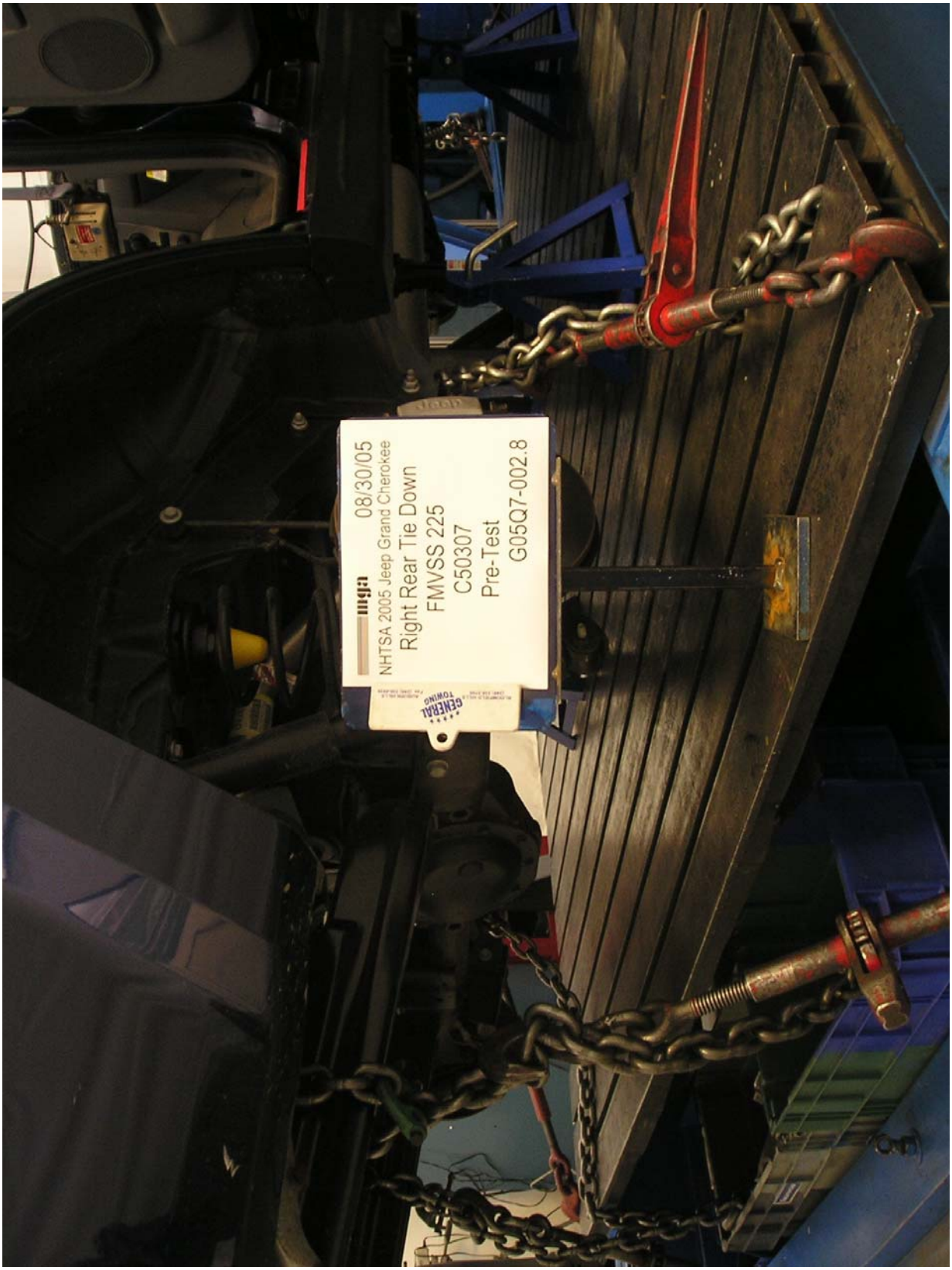
6.6.2 Left front

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

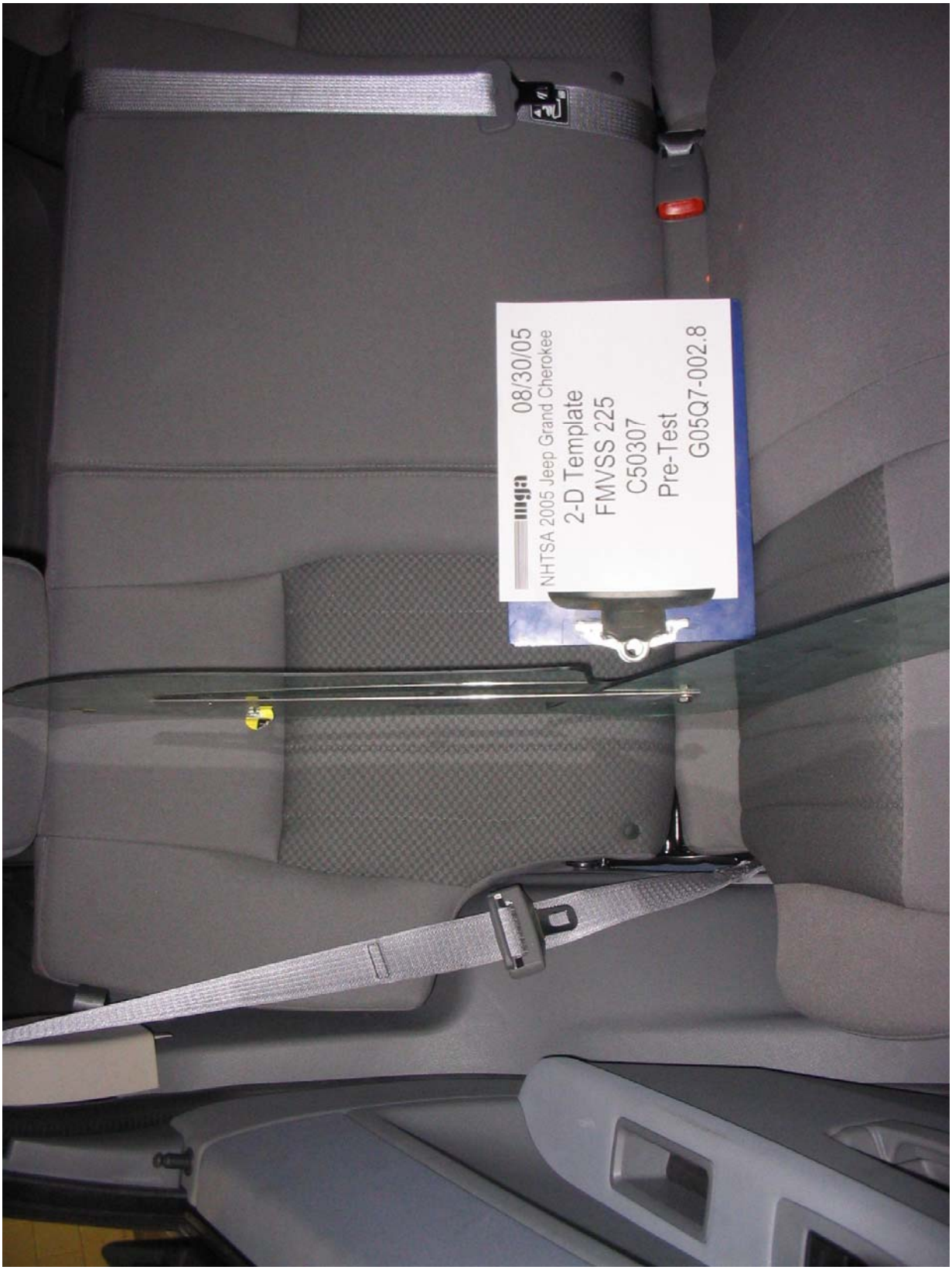
6.7.2 LH position photo #2

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

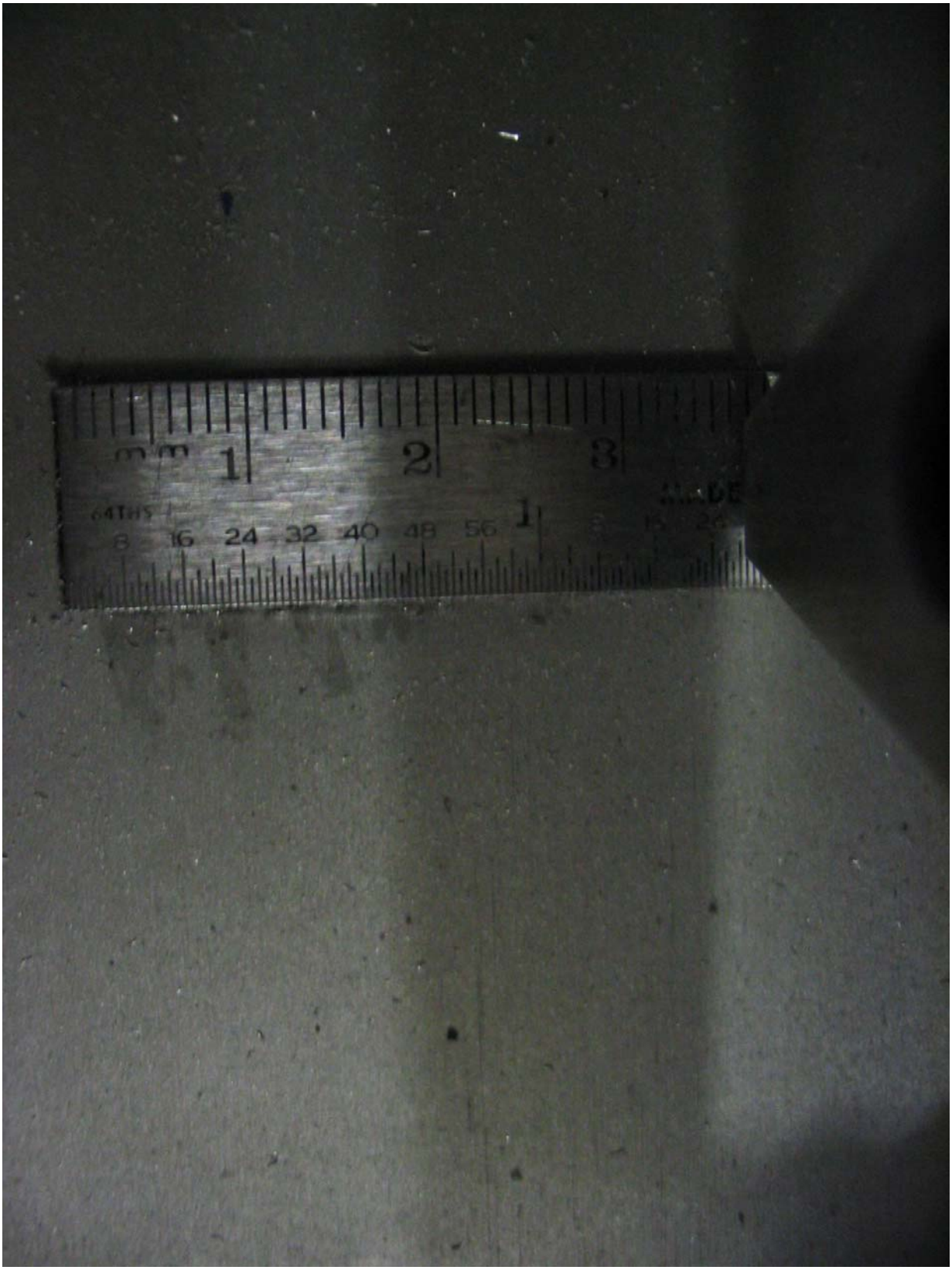


6.8 CRF verification

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

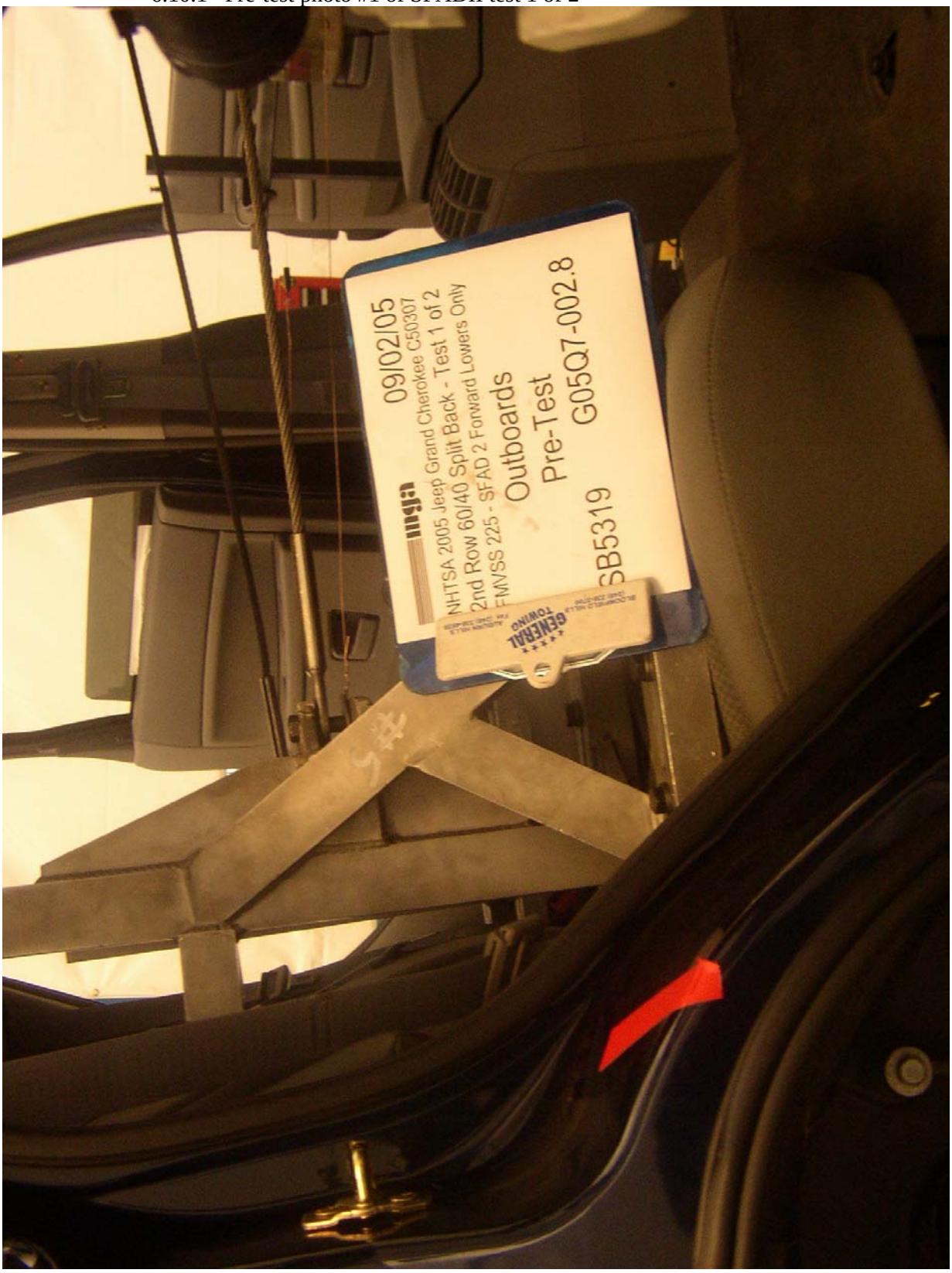
6.9 ¾ Front view of test vehicle with test apparatus in place

6.9.1 ¾ Front left view of SFADII

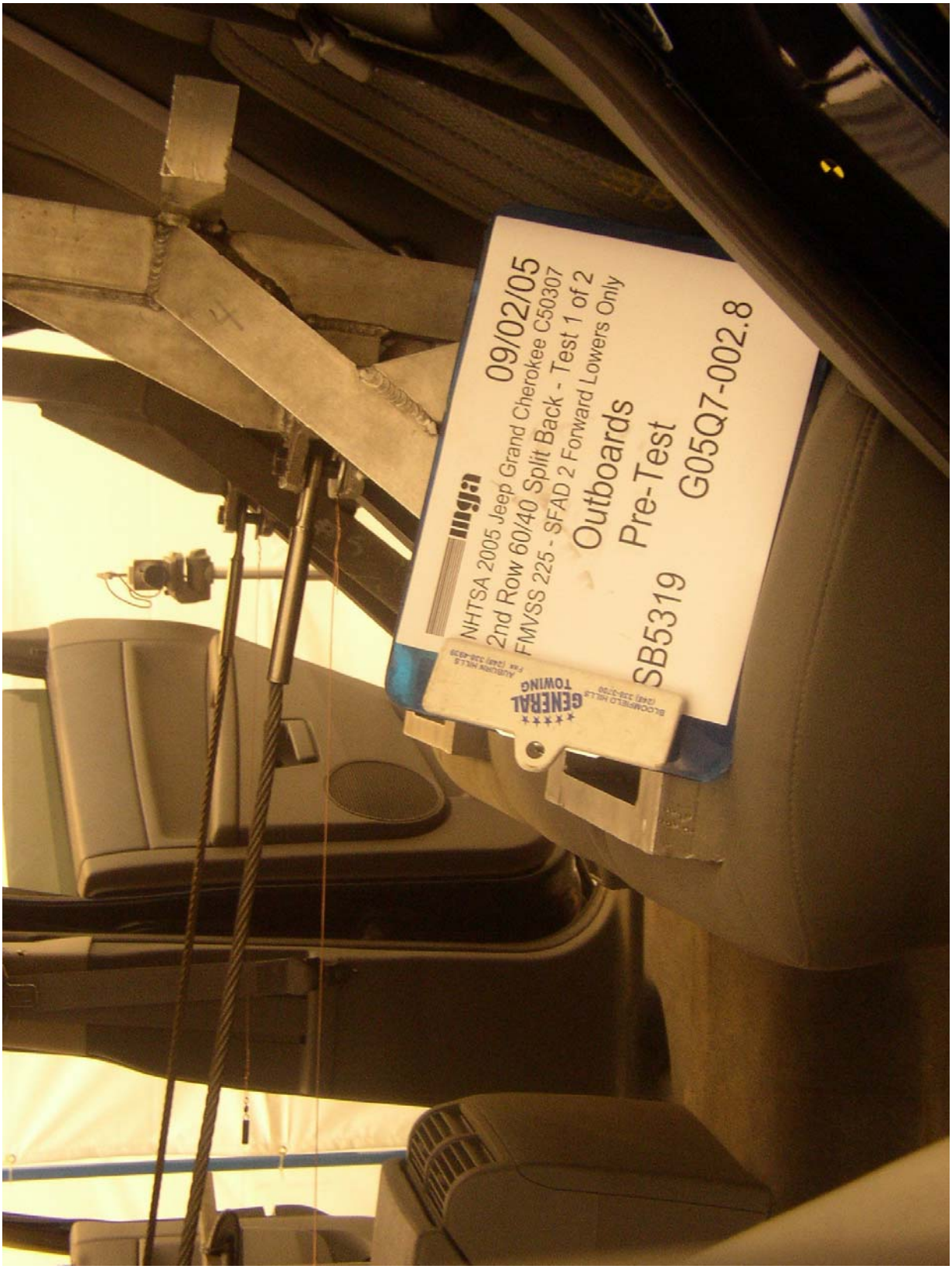
6.9.2 ¾ Front right view of SFADII

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



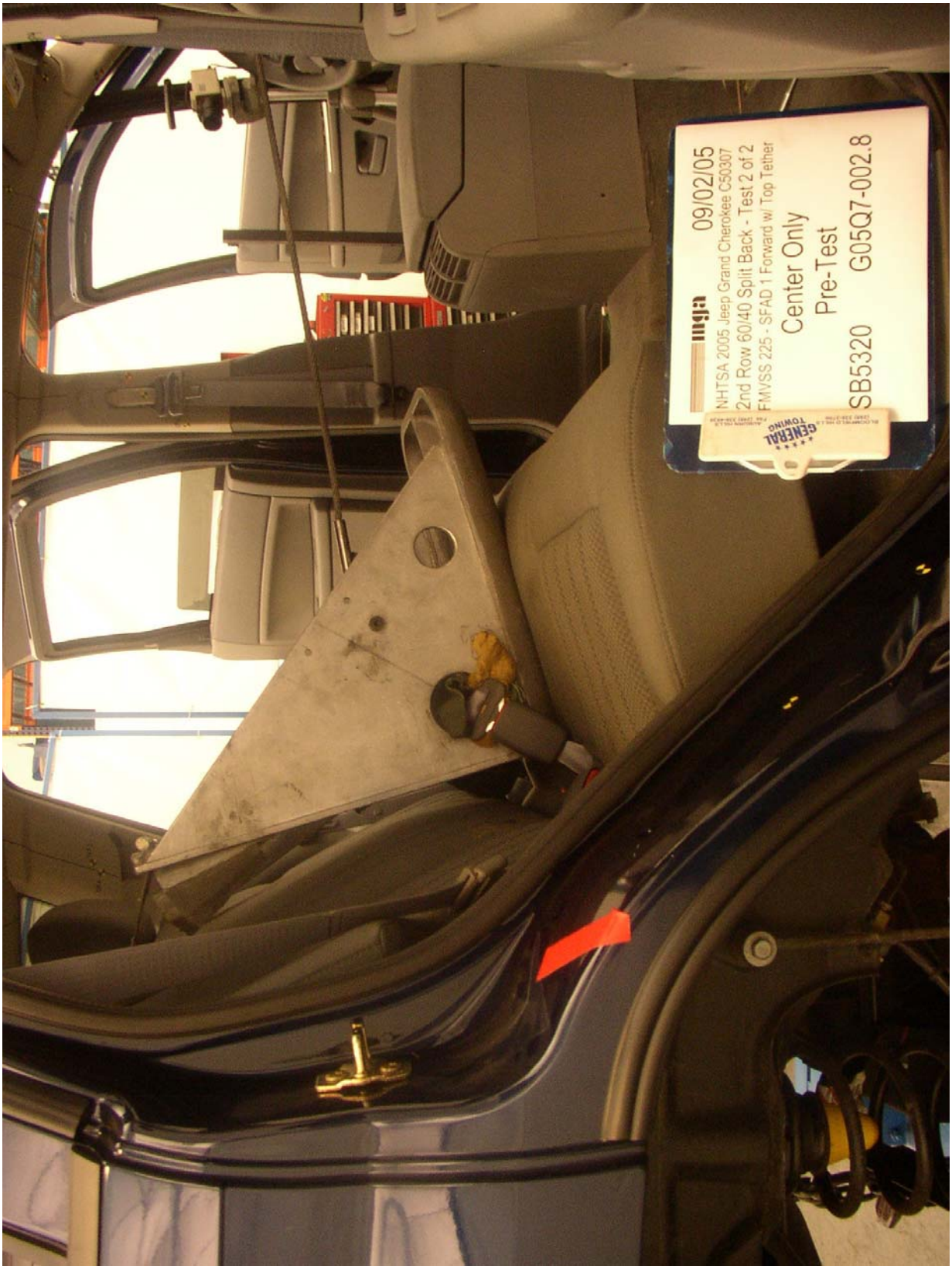
6.10.2 Pre-test photo #2 of SFADII test 1 of 2



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

6.11.8 Post-test photo #8 of SFADII test 1 of 2

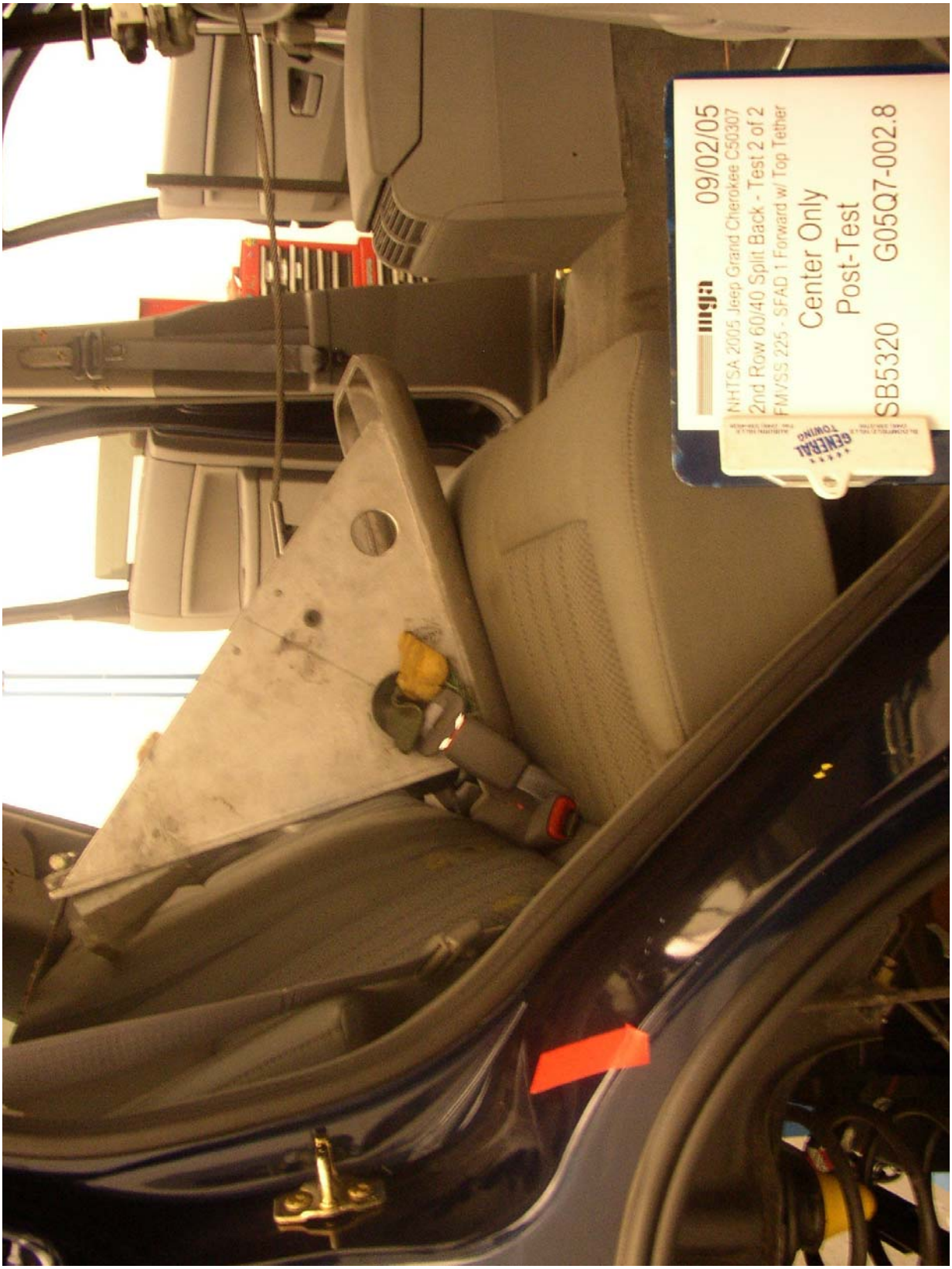
6.11.9 Post-test photo #9 of SFADII test 1 of 2

6.11.10 Post-test photo #10 of SFADII test 1 of 2

6.11.11 Post-test photo #11 of SFADII test 1 of 2

6.11.12 Post-test photo #12 of SFADI test 2 of 2

6.11.13 Post-test photo #13 of SFADI test 2 of 2

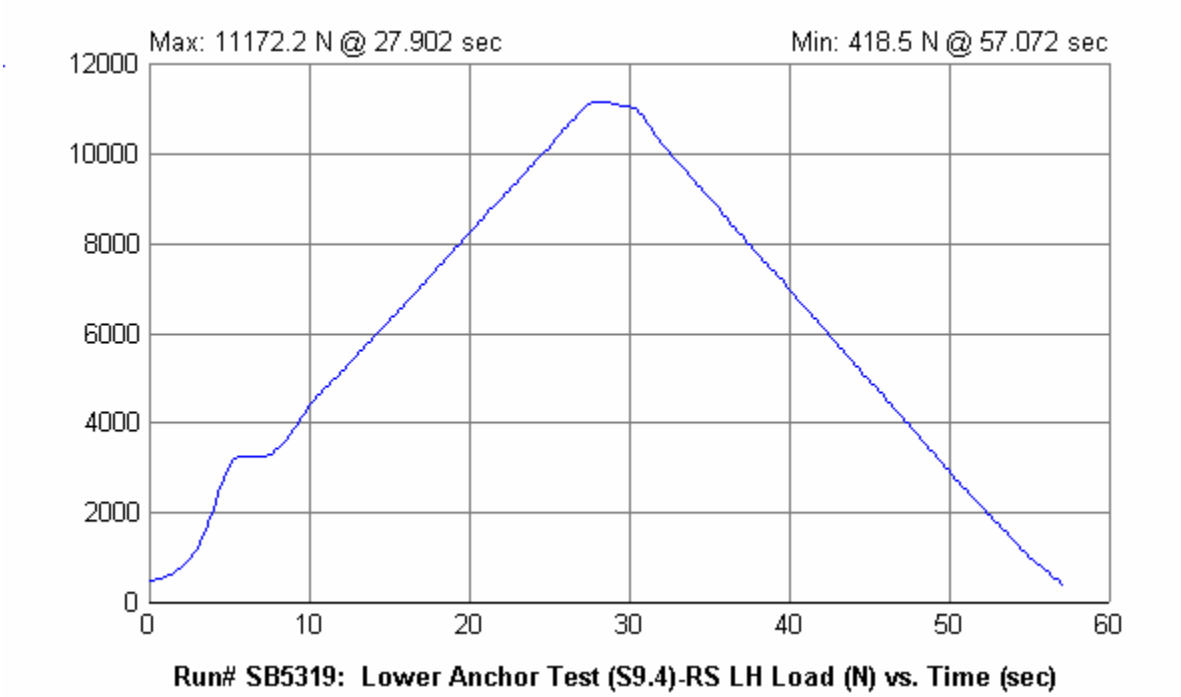


6.11.14 Post-test photo #14 of SFADI test 2 of 2

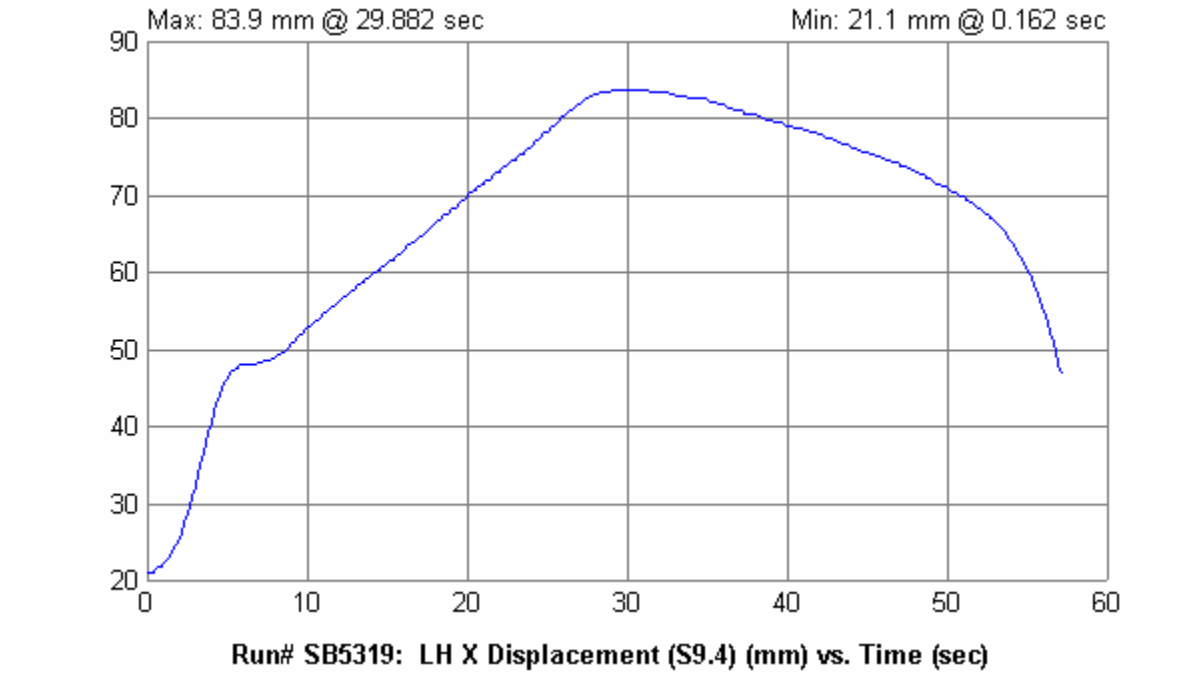
6.11.15 Post-test photo #15 of SFADI test 2 of 2

6.11.16 Post-test photo #16 of SFADI test 2 of 2

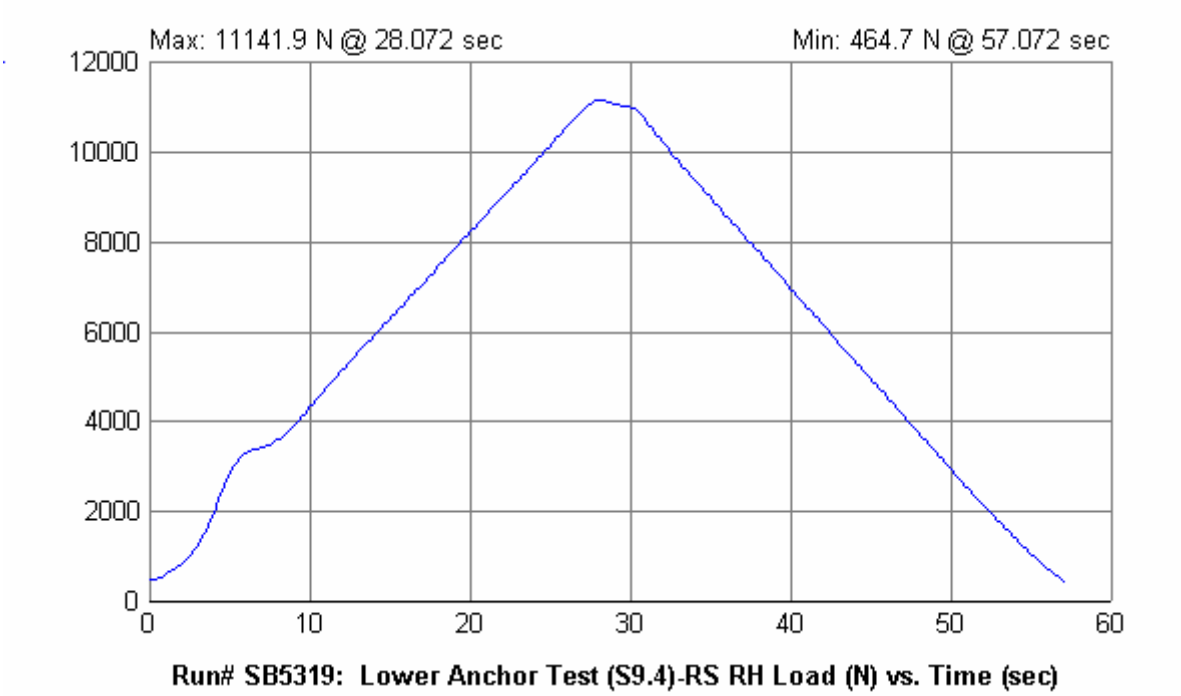
7.0 PLOTS



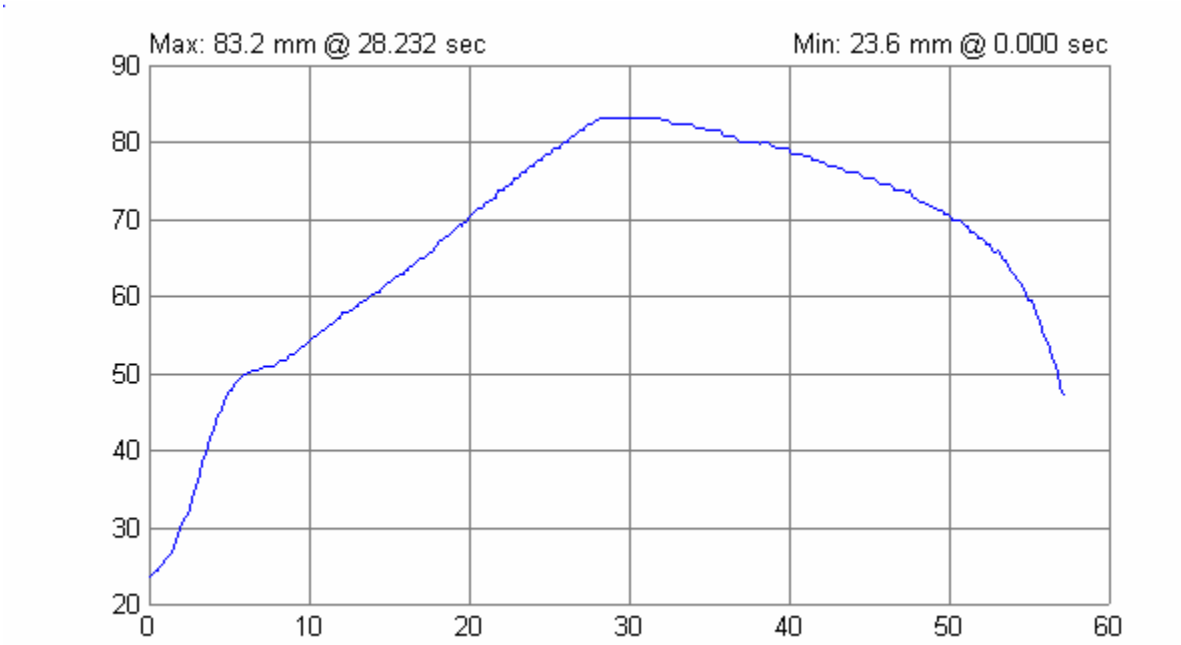
Run# SB5319: Lower Anchor Test (S9.4)-RS LH Load (N) vs. Time (sec)



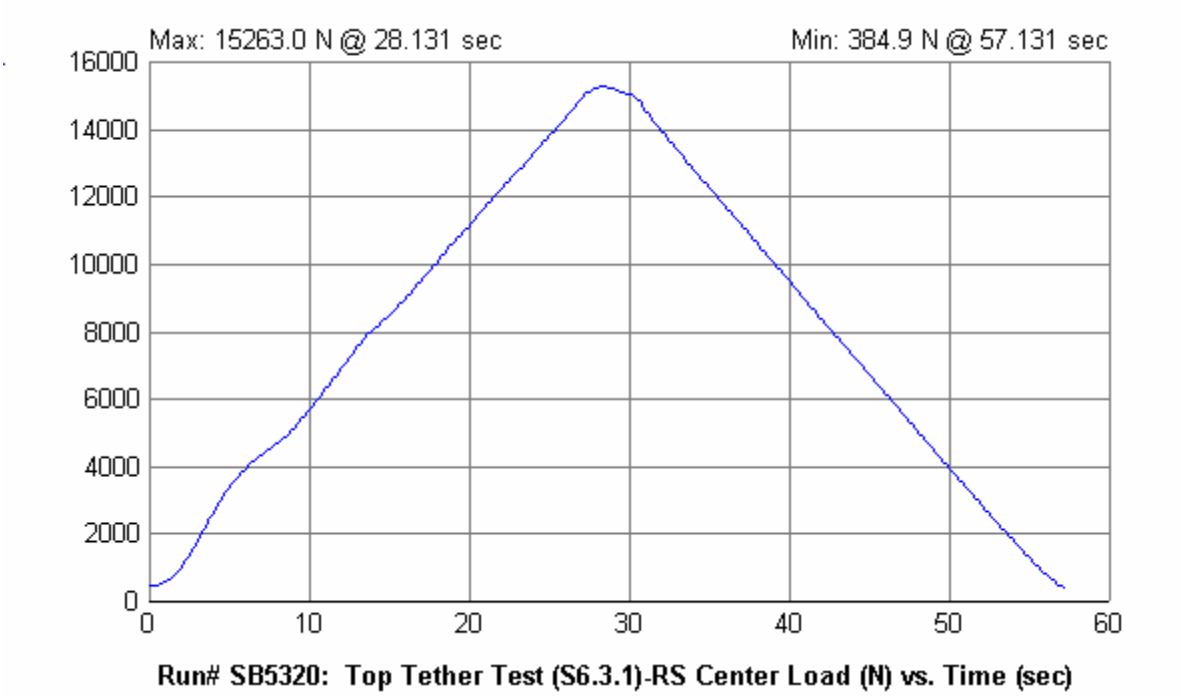
Run# SB5319: LH X Displacement (S9.4) (mm) vs. Time (sec)



Run# SB5319: Lower Anchor Test (S9.4)-RS RH Load (N) vs. Time (sec)



Run# SB5319: RH X Displacement (S9.4) (mm) vs. Time (sec)



Run# SB5320: Top Tether Test (S6.3.1)-RS Center Load (N) 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: September 2, 2005

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 Jeep Grand Cherokee

VEH. NHTSA NO.: C50307 VIN: 1J4GR48K35C539018

COLOR: Blue

ODOMETER READINGS: ARRIVAL 20 miles Date: 03/17/05

COMPLETION 21 miles Date: 09/02/05

PURCHASE PRICE: $24,588 DEALER'S NAME: Jeff Wyler Fleet Dealer Group

ENGINE DATA: 6 Cylinders 3.7 Liters ____ Cubic Inches

TRANSMISSION DATA: X Automatic ____ Manual No. of Speeds 5

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	X	Clock
X	Tinted Glass	X	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
X	Power Seat(s)		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 test.

Test Vehicle Condition:

Salvage only.

RECORDED BY: Melanie Schick, Kenney Godfrey DATE: September 2, 2005

APPROVED BY: Brad Reaume

APPENDIX A
OWNERS MANUAL CHILD RESTRAINT SYSTEMS

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.

There are different sizes and types of restraints for children from newborn size to the child almost large enough for an adult safety 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:

WARNING!

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.

2

Infants and Child Restraints

- 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 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. Both types of child restraints are held in the vehicle by the lap/shoulder belt or the LATCH child restraint anchorage system (Refer to LATCH — Child Seat Anchorage System in this section.)
- Rearward-facing child seats must **NEVER** be used in the front seat of a vehicle with the front passenger airbag unless the airbag is turned off. An airbag deployment could cause severe injury or death to infants in this position.

WARNING!

- **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 injury to the infant.**

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 also 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.
- Except for the second row center seating position, all passenger seat belts are equipped with cinching latch plates. The second row center position has an automatic locking retractor identified by a distinstive label.

Both types of seat belts 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). For the second row center seat belt with the automatic locking retractor, 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 fully 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. For additional information, refer to "Automatic Locking Mode" earlier in this section.

2

- 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 cannot be tightened, or if pulling and pushing on the restraint loosens the belt, disconnect the latch plate from the buckle, turn the buckle around, and insert the latch plate into the buckle again. If you still cannot make the child restraint secure, try a different seating position.
- Buckle the child into the restraint exactly as the manufacturer's instructions tell you.
- 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.

NOTE: For additional information refer to www.seatcheck.org or call 1-866-SEATCHECK.

Older Children and Child Restraints

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 who are older than one year. These child seats are also held in the vehicle by the lap/shoulder belt or the LATCH child restraint anchorage system (Refer to LATCH — Child Seat Anchorage System in this section.)

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 vehicle's seat cushion while the child's back is against the seat back, they should use a belt-positioning booster seat. The child and belt-positioning booster seat are held in the vehicle by the lap/shoulder belt.

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 or behind their back.

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.

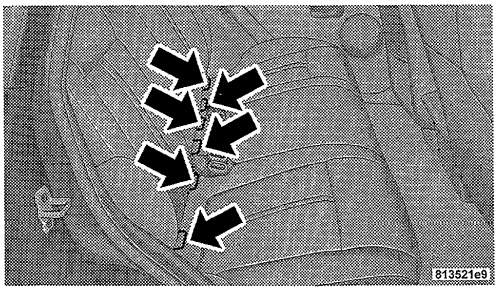
If you are installing LATCH-compatible child restraints in adjacent rear seating positions, you can use the LATCH anchors or the vehicle's seat belt for the outboard position, but you must use the vehicle's seat belt at the center position. If your child restraints are not LATCH-compatible, you can only install the child restraints using the vehicle's seat belts. Please refer to the next section for typical installation instructions.

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.

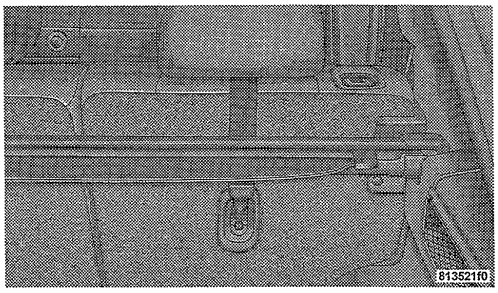
The rear seat lower anchorages are round bars, located at the rear of the seat cushion where it meets the seat back, and are just visible when you lean into the rear seat to

install the child restraint. You will easily feel them if you run your finger along the intersection of the seatback and seat cushion surfaces.



Latch Anchorages

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



Tether Strap Mounting

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.

WARNING!

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.

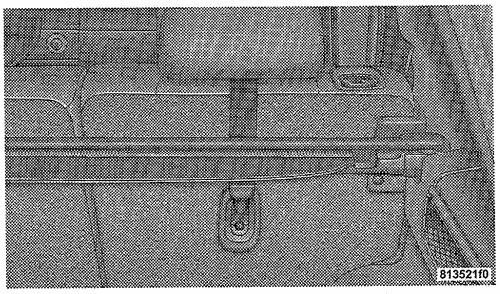
If the seat belt has a automatic locking retractor, it will have a distinctive label. Pull the belt from the retractor until there is enough to allow you to pass through the child restraint and slide the latch plate into the buckle. Then, pull the belt until it is all extracted from the retractor. Allow 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 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.



Tether Strap Mounting

WARNING!

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.

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)

2005 MY JEEP GRAND CHEROKEE FORM 14

SEAT REFERENCE POINT (SRP) AND TORSO ANGLE DATA
FOR FMVSS 225
(All dimensions in mm[1])

Model Year: 2005 Make: Jeep Model: Grand Cherokee Body Style: 4 DR

Seat Style: Front Row: Bucket Second Row: Folding Third Row: N/A

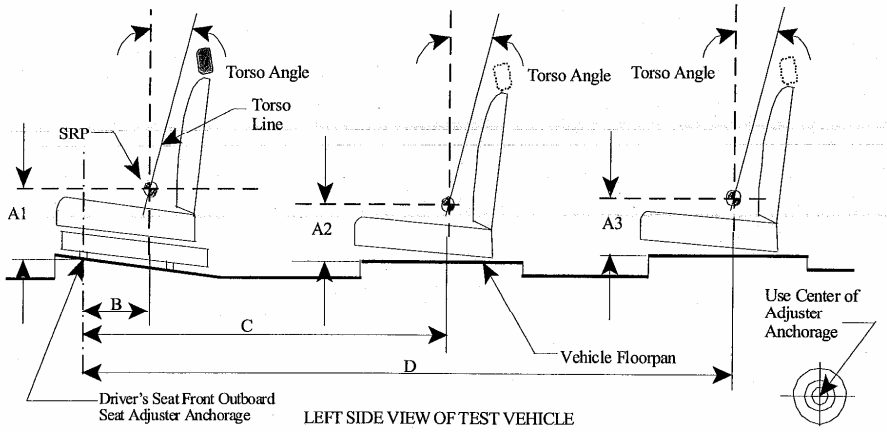


Table 1. Seating Positions[1] and Torso Angles

		Left (Driver Side)	Center (if any)	Right
A1		(Driver) 278.3	N/A	278.3
A2		314.5	240.2	327.8
A3		N/A	N/A	N/A
B		356.7	N/A	356.7
C		1195	1180	1195
D		N/A	N/A	N/A
Torso Angle (degree)	Front Row	24 Deg.	N/A	24 Deg.
	Second Row	24 Deg.	24 Deg.	24 Deg.
	Third Row	N/A	N/A	N/A

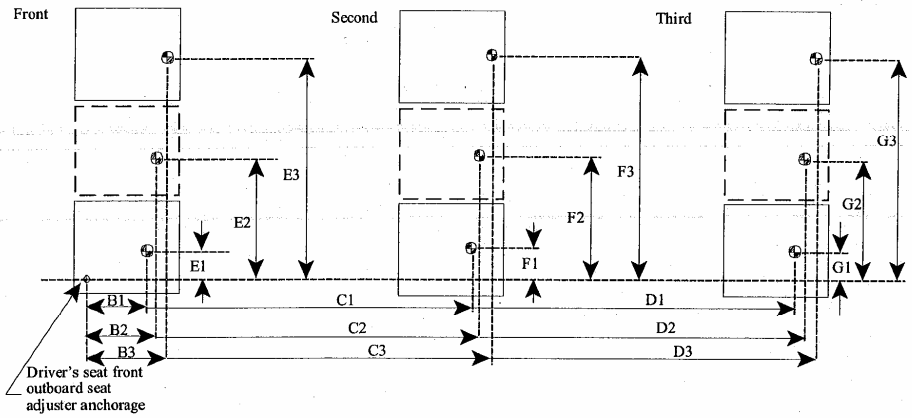
Note: 1. All dimensions are in mm. If not, provide the unit used.

2005 MY JEEP GRAND CHEROKEE FORM 14

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

Model Year: 2005 Make: Jeep Model: Grand Cherokee Body Style: 4 DR

Seat Style: Front Row: Bucket Second Row: Folding Third Row: N/A



2005 MY JEEP GRAND CHEROKEE 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	356.7
	E1	218
	B2	N/A
	E2	N/A
	B3	356.7
	E3	1036
Second Row	C1	1195
	F1	218
	C2	1180
	F2	627
	C3	1195
	F3	1036
Third Row	D1	N/A
	G1	N/A
	D2	N/A
	G2	N/A
	D3	N/A
	G3	N/A

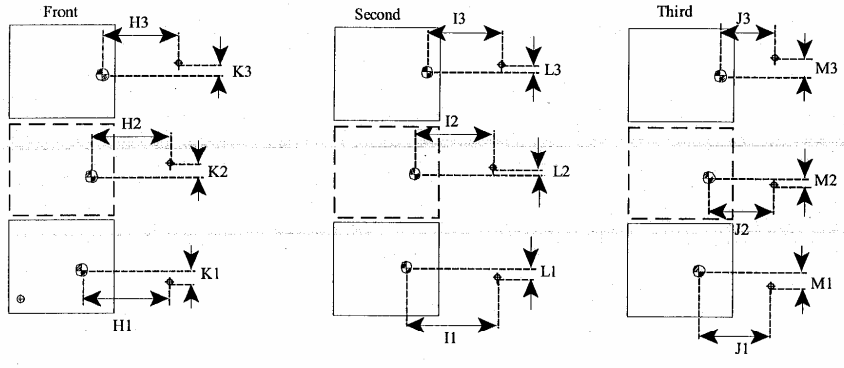
Note: 1. Use the center of anchorage.

2005 MY JEEP GRAND CHEROKEE FORM 14

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

Model Year: 2005 Make: Jeep Model: Grand Cherokee 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.

2005 MY JEEP GRAND CHEROKEE 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	351
	L1	0.0
	I2	336
	L2	0.0
	I3	351
	L3	0.0
Third Row	J1	N/A
	M1	N/A
	J2	N/A
	M2	N/A
	J3	N/A
	M3	N/A

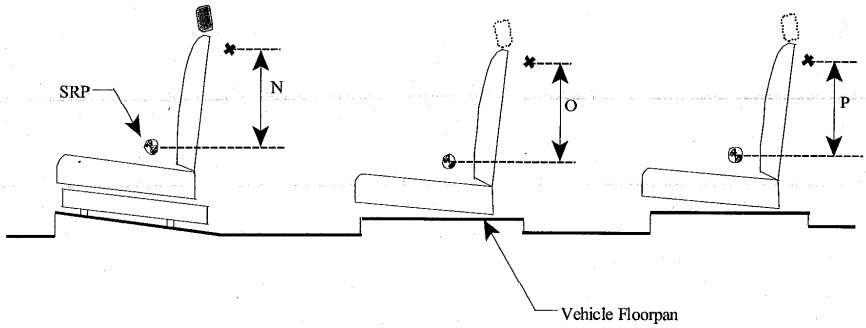
Note: 1. Use the center of anchorage.

2005 MY JEEP GRAND CHEROKEE FORM 14

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

Model Year: 2005 Make: Jeep Model: Grand Cherokee 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)	251
	O2 (Center)	237
	O3 (Right)	251
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.

2005 MY JEEP GRAND CHEROKEE FORM 14

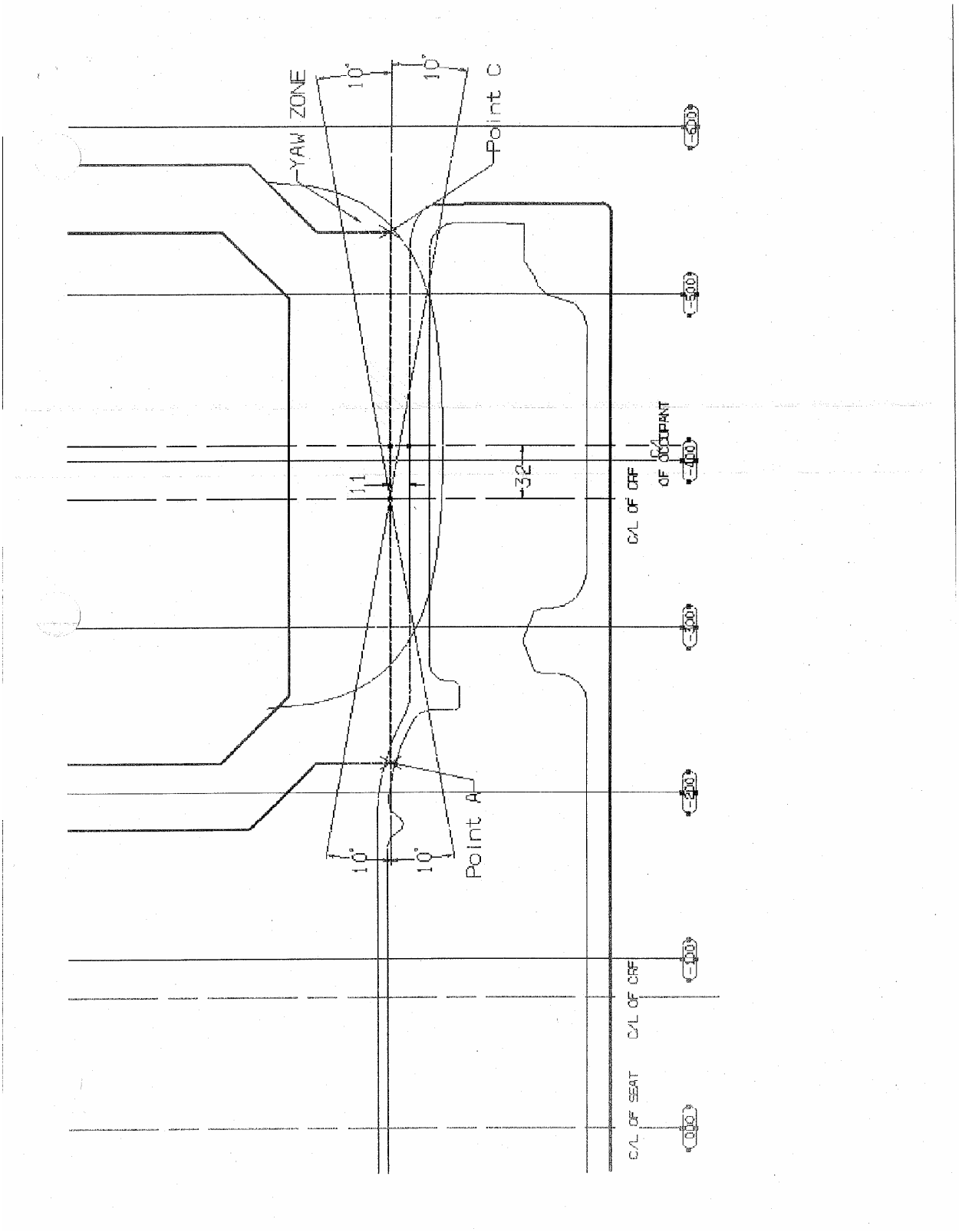
Test Procedures Used for Compliance Tests

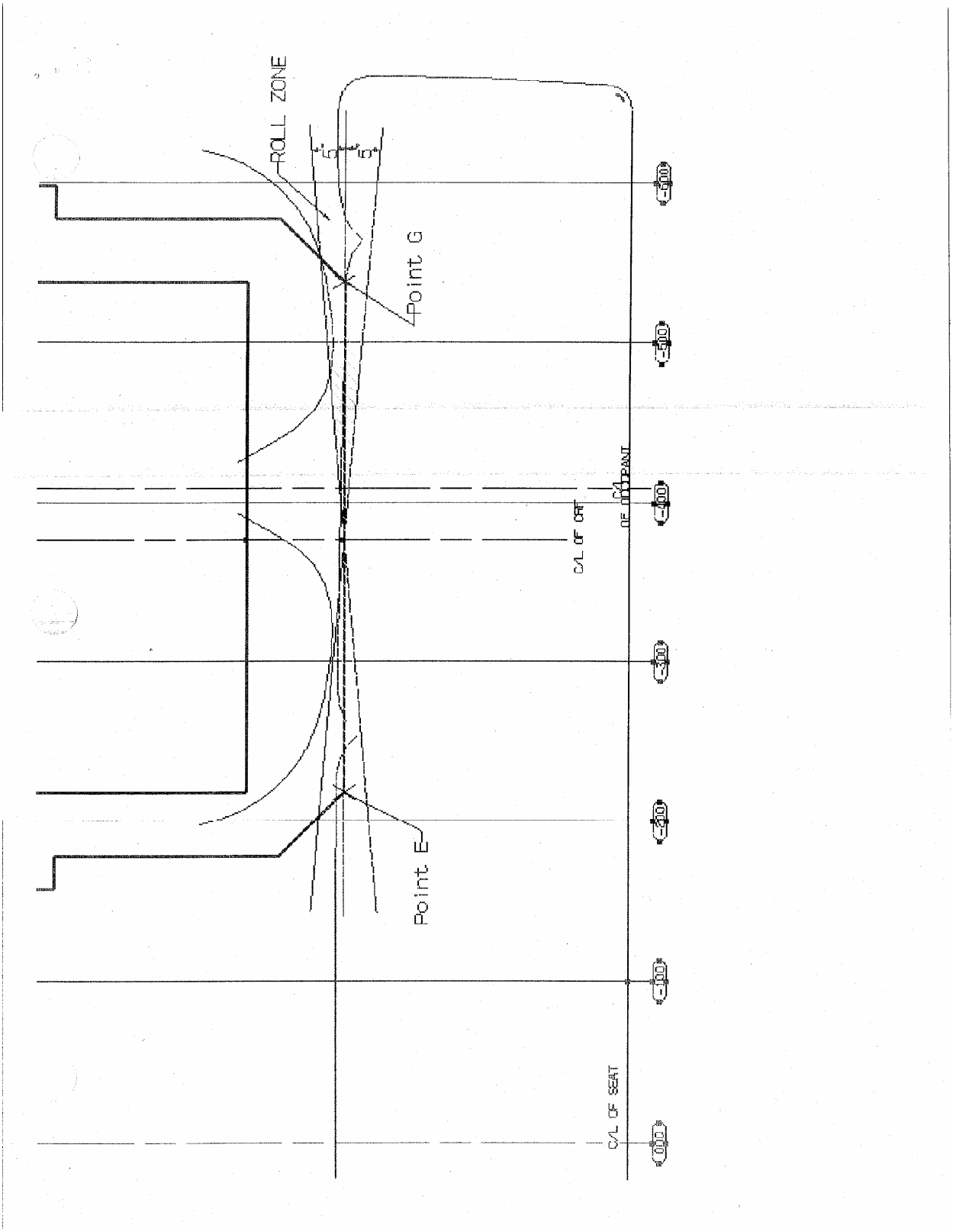
Tether Anchorages

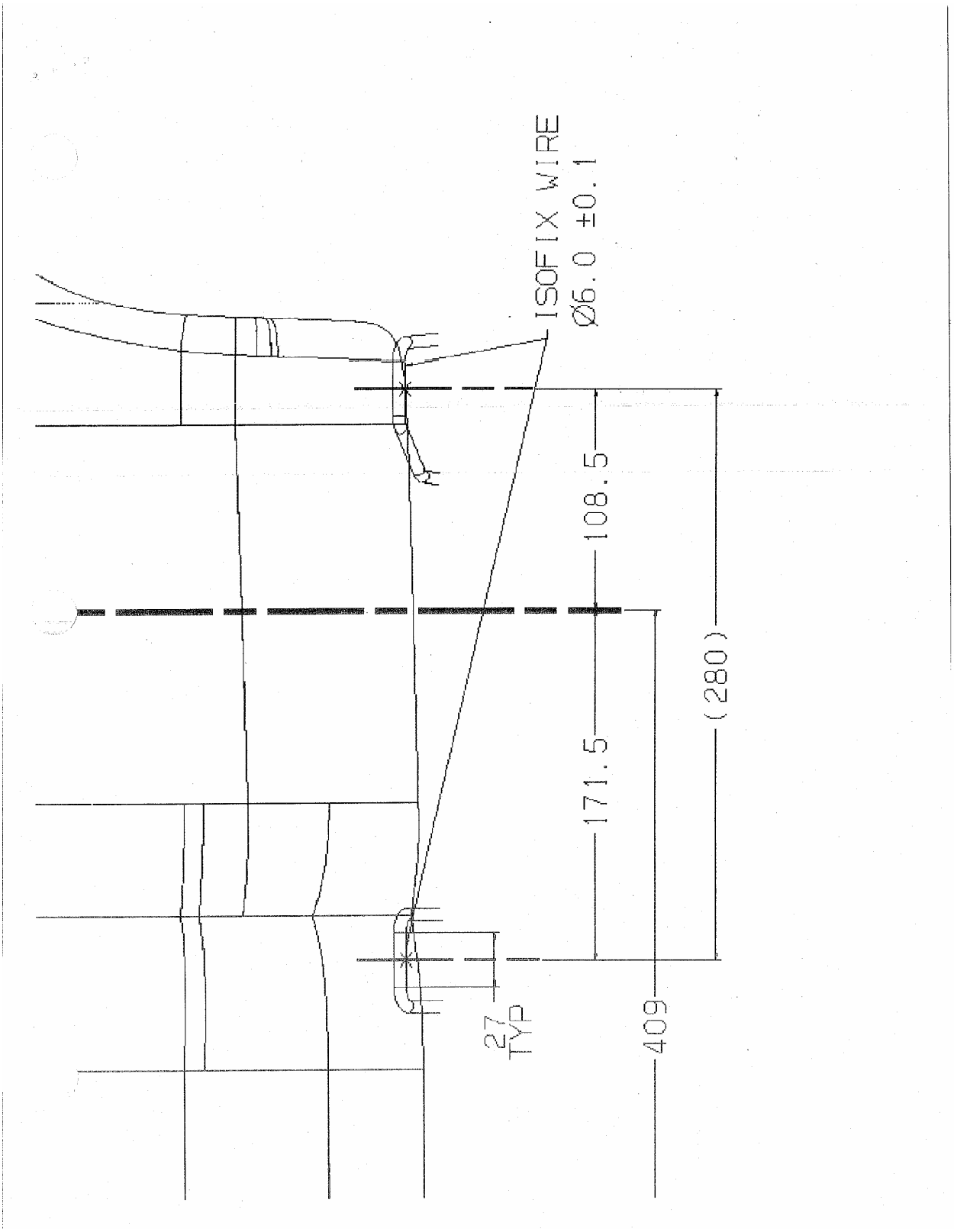
Seating Location		FMVSS Section(s) - Req.		
		Allowed until 9/1/04		Required after 9/1/04
		S6.3.4 (10 kN)	S6.3.4.1 (5.3 kN)	S6.3.1 (15 kN)
Front	Driver	N/A	N/A	N/A
	Center (if any)	N/A	N/A	N/A
	Right (if any)	N/A	N/A	N/A
Second	Left			X
	Center			X
	Right (if any)			X
Third	Left	N/A	N/A	N/A
	Center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

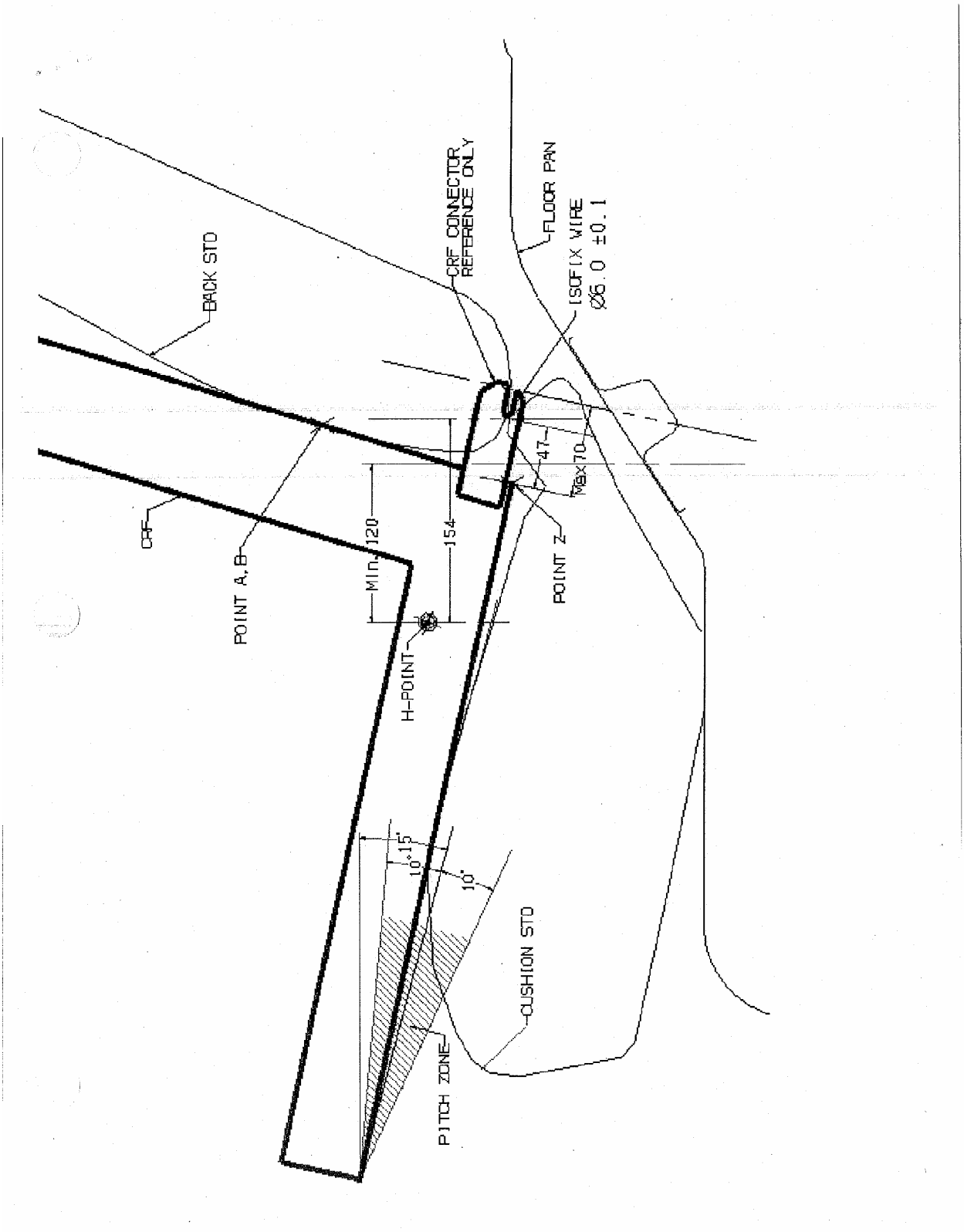
Lower Anchorages

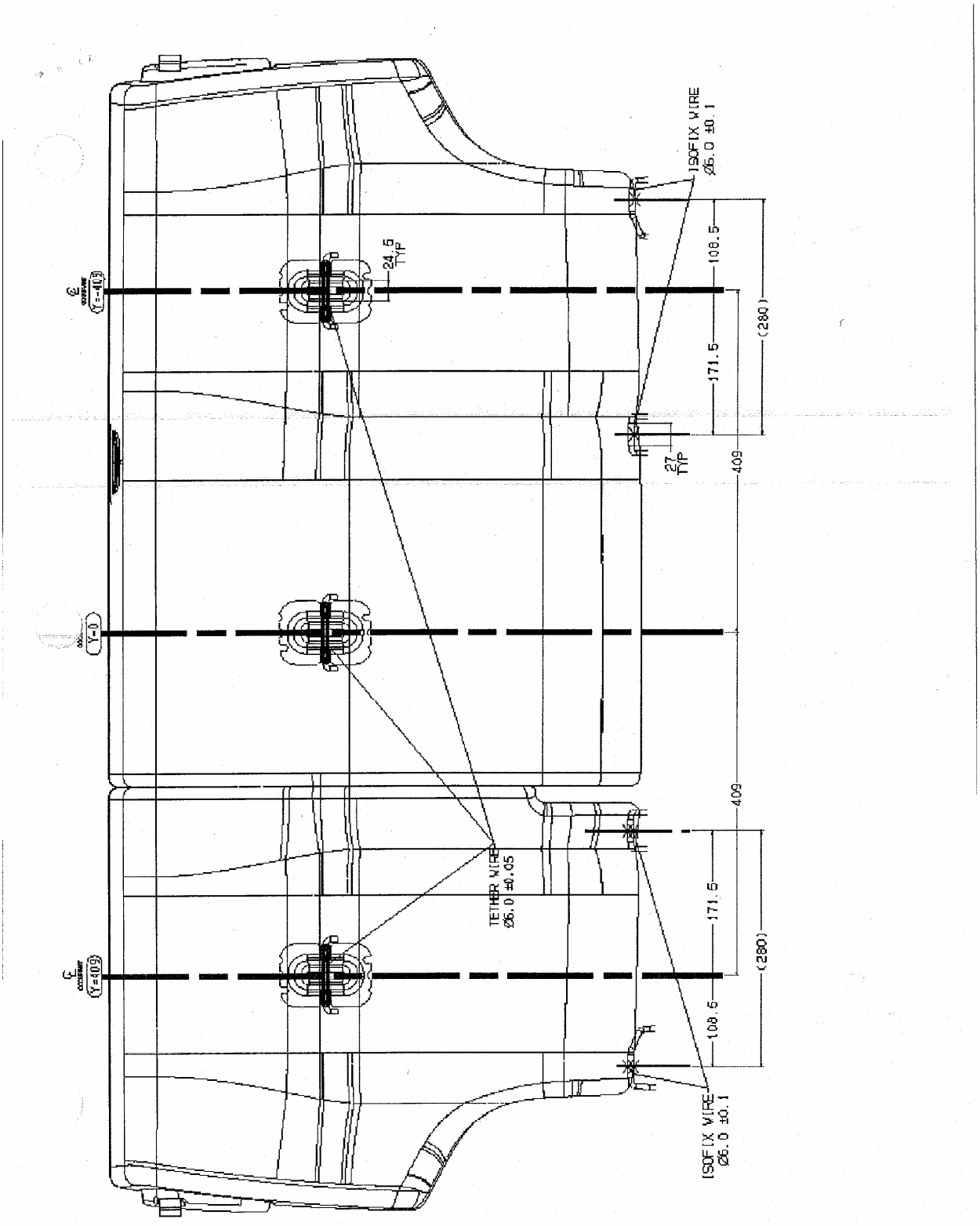
Seating Location		FMVSS Section(s) - Req.	
		Allowed until 9/1/04	Required after 9/1/04
		S15.3 (8 kN / 5 kN)	S9.4 (11 kN / 5 kN)
Front	Driver	N/A	N/A
	Center (if any)	N/A	N/A
	Right (if any)	N/A	N/A
Second	Left		X
	Center		N/A
	Right (if any)		X
Third	Left	N/A	N/A
	Center	N/A	N/A
	Right	N/A	N/A
Fourth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


YAW ZONE
10°
10°
Point C
Point A
10°
10°
11
32
C/L OF OCCUPANT
C/L OF SEAT
C/L OF CRF
C/L OF CRF
600
500
400
300
200
100
000


ROLL ZONE
5"
5"
Point G
Point E
C/L OF SEAT


ISOFIX WIRE
Ø6.0 ±0.1
108.5
171.5
(280)
409
27
TYP


BACK STD
CRF CONNECTOR
REFERENCE ONLY
FLOOR PAN
ISOFIX WIRE
Ø6.0 ±0.1
47
Max 70
CRF
POINT A, B
Min. 120
154
POINT Z
H-POINT
15°
10°
10°
CUSHION STD
PITCH ZONE


ISOFIX WIRE
Ø6.0 ±0.1
108.5
(280)
171.5
409
24.5
TYP
27
TYP
Y=-409
Y=0
Y=409
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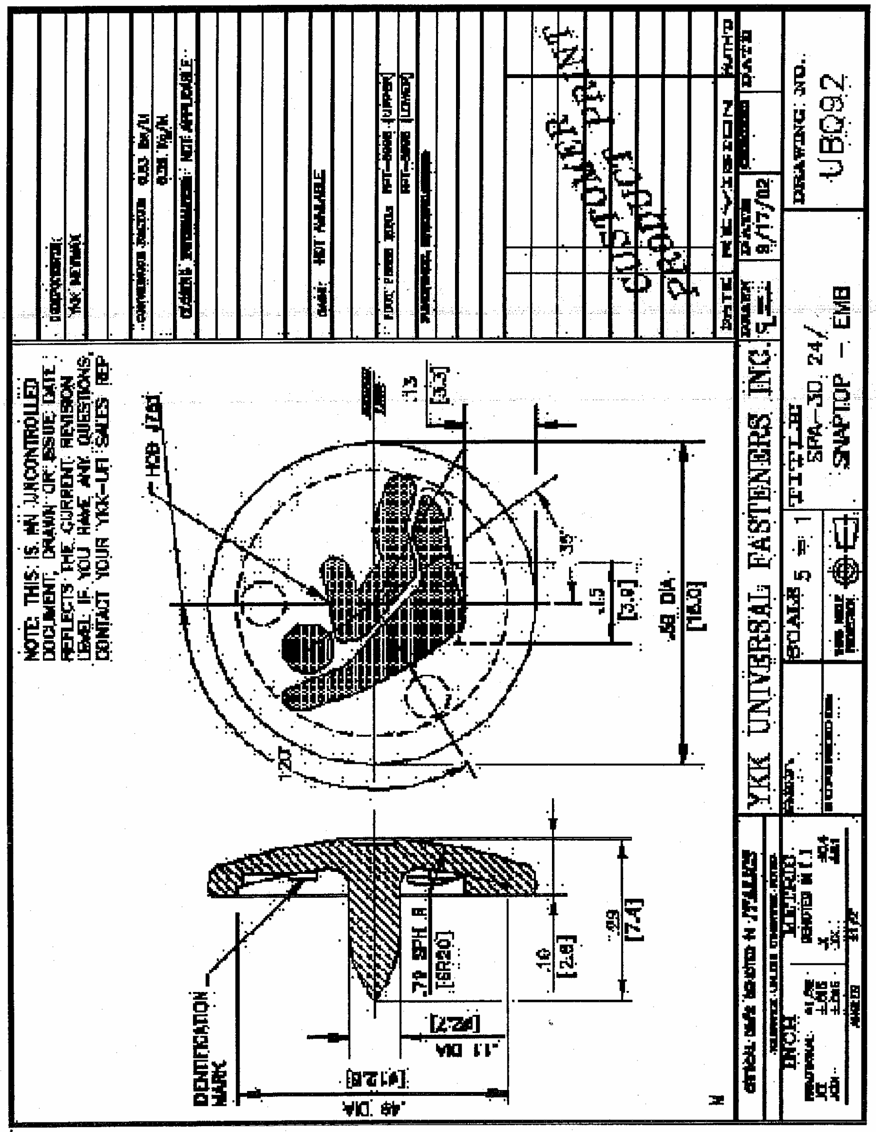
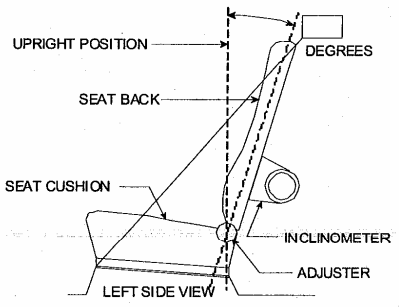
Ø6.0 ±0.05
171.5
(280)
409
108.5
ISOFIX WIRE
Ø6.0 ±0.1


NOTE: THIS IS AN UNCONTROLLED DOCUMENT, DRAWN OR ISSUE DATE REFLECTS THE CURRENT REVISION LEVEL. IF YOU HAVE ANY QUESTIONS, CONTACT YOUR YKK-UFI SALES REP
YKK UNIVERSAL FASTENERS INC.
SFA-3D 24/
SNAPTOP - EMB
DRAWING NO.
UB092
9/17/02
.58 DIA
[14.8]
IDENTIFICATION MARK
.48 DIA
[Ø12.6]
.11 DIA
[Ø2.7]
.79 SPH R
[SR20]
.10
[2.6]
.29
[7.4]
.13
[3.3]
.15
[3.8]
35°
120°

2005 MY Jeep Grand Cherokee

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 for driver's seat = 14 degrees
Measurement Instructions:

Ensure vehicle is level. Extend head rest to full up position. Place inclinometer on exposed head rest post and position seat back to 14 degrees.

Seat back angle for passenger's seat = 14 degrees
Measurement Instructions:

Same as driver

Seat back angle for 2nd row seat = N/A degrees
Measurement Instructions:

Second row seat back angle is fixed by ensuring seat back latches are fully engaged.