

REPORT NUMBER 202a-GTL-05-004

# FMVSS NO. 202a – HEAD RESTRAINTS INDICANT TEST

**DAIMLERCHRYSLER CORPORATION  
2005 DODGE GRAND CARAVAN, MPV  
NHTSA NO. C50303**

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MAY 9, 2006

FINAL REPORT

PREPARED FOR

**U. S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
ENFORCEMENT  
OFFICE OF VEHICLE SAFETY COMPLIANCE  
400 SEVENTH STREET, SW  
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15. Supplementary Notes		
16. Abstract Tests were conducted on the subject, 2005 Dodge Grand Caravan MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-202aS-00. This was an indicant test for FMVSS 202 compliance. The results indicate that the 2005 Dodge Grand Caravan meets the requirements of FMVSS 202.		
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## SECTION 1

### PURPOSE OF TEST

#### 1.0 PURPOSE OF TEST

A 2005 Dodge Grand Caravan MPV was subjected to Position Retention Tests in Federal Motor Vehicle Safety Standard (FMVSS) No. 202a to determine the effect of test procedure variations. The purpose of this standard is to establish requirements for head restraints to reduce the frequency and severity of neck injury in rear end and other collisions.

1.1 The test vehicle was a 2005 Dodge Grand Caravan MPV. Nomenclature applicable to the test vehicle are:

- A. Vehicle Identification Number: 2D4GP24R65R203599
- B. NHTSA No.: C50303
- C. Manufacturer: DAIMLERCHRYSLER CORPORATION
- D. Manufacture Date: 06/04

#### 1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 202a testing during the time period March 13-15, 2006.

## SECTION 2

### TEST PROCEDURE

#### 2.0 TEST PROCEDURE

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures, TP-202As-00 dated 22 December 2004.

NOTE:

1. The Backset Retention maximum loading to 885 newtons was not performed at this time.
2. The Head Impact Energy Absorption test was not performed at this time.

## SECTION 3

### RESULTS AND TEST DATA

#### 3.0 RESULTS AND TEST DATA

The following data sheets document the results of testing on the 2005 Dodge Grand Caravan.

**DATA SHEET 1  
HEIGHT RETENTION TEST  
(ADJUSTABLE HEAD RESTRAINTS ONLY)**

VEHICLE: 2005 DODGE GRAND CARAVAN MPV

VEH. NHTSA NO.: C50303 TEST DATE: 03/13/06

TEST #5421

Seat Location: Driver

Pre-test measurements

HEAD RESTRAINT IN POSITION 4 (0-5)

SAE J826 Manikin torso angle: Top of Head Restraint Height (mm): 815 mm

Striker to H-Point (mm): Striker to H-Point angle:

DESCRIPTION OF HEIGHT RETENTION LOCK: The head restraint has two mounting posts. The right side post has detents cut into it which engage into a lock mechanism which prevents downward movement of the head restraint in each position. Only the full up position locks in the upward direction to prevent headrest removal. The left side post has no locking detents.

Test measurements

Initial load (50 N ± 1 N): 50 N Initial Displacement, D1 (mm): 12.1 mm

Initial Displacement (D1) < 25 mm **PASS** X **FAIL** \_\_\_\_\_

Maximum load (495 N ± 5 N): 500 N Maximum Displacement, D2 (mm): 44.1 mm

Return load (50 N ± 1 N): 50 N Return Displacement, D3 (mm): 31.3 mm

Total displacement (D3-D1) < 13 mm: 19.2 mm **PASS** \_\_\_\_\_ **X** **FAIL** \_\_\_\_\_

REMARKS:

RECORDED BY: G. Farrand

DATE: 03/13/06

APPROVED BY: D. Messick



**DATA SHEET 2  
BACKSET RETENTION TEST**

VEHICLE: 2005 DODGE GRAND CARAVAN MPV  
VEH. NHTSA NO.: C50303 TEST DATE: 03/15/06

TEST #5435

Seat Location: Driver

Type of head restraint:

Pre-test measurements

SAE J826 Manikin torso angle: Top of Head Restraint Height (mm): 815 mm FULL UP  
800 mm IN POS.3

Striker to H-Point (mm):

Striker to H-Point angle:

Displacement torso reference line

Test device back pan angle: Pre-Test 21.4°; Full Load 42.2°

Distance from the H-point to the initial location of the load ( $0.290 \pm 0.013$  m): .290 m

Initial load (N): 1286 N Initial moment ( $373 \pm 7.5$  Nm): 373 Nm

Backset retention and strength

Zero Displacement set at torso reference line.

Distance from the H-point to the head form tangency point (m): .735 m

Zero Contact Ref. -139.6 mm

Initial load (N): 53 N Initial moment ( $37 \pm 0.7$  Nm): 39 Nm

Initial displacement: -124.9 mm

Initial head form displacement, D1 ( $< \text{ or } = 25$  mm): 14.7 mm **PASS** X **FAIL** \_\_\_\_\_

Load range to generate a  $373 \pm 7.5$  Nm rearward moment (N): 508 N

Actual load applied (N): 508 N Resultant moment (Nm): 373 Nm

Actual displacement: -63.0 mm

Maximum Head form displacement, D2 ( $< \text{ or } = 102$  mm): -63.0 mm **PASS** X **FAIL** \_\_\_\_\_

Final Load (N): 50 N

Final head form displacement, D3 (mm): -102.1 mm Measured at ( $37 \pm 0.7$  Nm) 37 Nm

Total displacement (D3-D1)  $< 13$  mm : 22.8 mm **PASS** \_\_\_\_\_ **FAIL** X

Maximum applied load ( $> \text{ or } \text{ equal to } 885$  N): N/A **PASS** \_\_\_\_\_ **FAIL** \_\_\_\_\_

REMARKS:

RECORDED BY: G. Farrand

DATE: 03/15/06

APPROVED BY: D. Messick

### DATA SHEET 3

<b>VEHICLE INFORMATION</b>	Year:	2005	Type:	
	Make:	Dodge	VIN:	2D4GP24R65R203599
	Model:	Grand Caravan	NHTSA No:	C50303

<b>SEAT SETUP</b>	<b>OCCUPANT LOCATION P1</b>	<b>GTL</b>		
	1. Seat Fore/Aft	Full Rear		
	2. Seat Raise/Lower	Full Down		
	3. Seat Tilt			
	4. Seat Cushion	Rear of cushion full up		
	5. Seat Back Adjustment with manikin installed (25 deg. target torso angle)	13.4	degree from vertical of head restraint post	
		694	distance (mm) from visor bolt to head restraint post center	
6. Seat Back Adjustment without manikin	13.4	degree from vertical of head restraint post		
	694	distance (mm) from visor bolt to head restraint post center		
		detents with full up locked being 0		

NOTE: LUMBAR SUPPORT SHOULD BE RETRACTED

H-POINT LOCATION (mm)*	X (forward of striker)	118	
	Z (below striker)	22	
TORSO ANGLE (deg)		22.0	
VEHICLE SILL ANGLE (deg) Curb weight plus SAE J826 manikin	LEFT		
	RIGHT		
HEAD RESTRAINT HEIGHT (mm) SAE J826 manikin head room probe (dimension has been offset 101.6 mm)	LOWEST	Position 0	765.0
		Position 1	782.0
		Position 2	800.0
		Position 3	815.0
		Position 4	N/A
		Position 5	N/A
		Position 6	N/A
HIGHEST			

\*SAE J826 H-POINT TARGET REFERENCED TO THE VEHICLE STRIKER

### DATA SHEET 4

<b>VEHICLE INFORMATION</b>	Year:	2005	Type:	
	Make:	Dodge	VIN:	2D4GP24R65R203599
	Model:	Grand Caravan	NHTSA No:	C50303

<b>SEAT SETUP</b>	<b>OCCUPANT LOCATION P1</b>	<b>GTL</b>		
	7. Seat Fore/Aft	Full Rear		
	8. Seat Raise/Lower			
	9. Seat Tilt			
	10. Seat Cushion	16.6	degrees above horizontal	
	11. Seat Back Adjustment with manikin installed (25 deg. target torso angle)	14.9	degree from vertical of head restraint post	
		736	distance (mm) from visor bolt to head restraint post center	
12. Seat Back Adjustment without manikin	13.8	degree from vertical of head restraint post		
	729	distance (mm) from visor bolt to head restraint post center		
	4	detents with full up locked being 0		

NOTE: LUMBAR SUPPORT SHOULD BE RETRACTED

H-POINT LOCATION (mm)*	X (forward of striker)	87	
	Z (below striker)	7	
TORSO ANGLE (deg)		23.0	
VEHICLE SILL ANGLE (deg) Curb weight plus SAE J826 manikin	LEFT		
	RIGHT		
HEAD RESTRAINT HEIGHT (mm) SAE J826 manikin head room probe (dimension has been offset 101.6 mm)	LOWEST	Position 0	750.0
		Position 1	767.0
		Position 2	783.0
		Position 3	799.0
		Position 4	N/A
		Position 5	N/A
		Position 6	N/A
HIGHEST			

\*SAE J826 H-POINT TARGET REFERENCED TO THE VEHICLE STRIKER

SECTION 4  
INSTRUMENTATION AND EQUIPMENT LIST

TABLE 1 – INSTRUMENTATION & EQUIPMENT LIST

EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
HRMD	RONA KINETICS & ASSOCIATES LTD.	HRMD 0-62	N/A	N/A
J826 MANIKIN	ALDERSON RESEARCH LABS	3 DM/92	N/A	N/A
DIGITAL PROTRACTOR	MITUTOYO	950-315 PRO 360	BEFORE USE	BEFORE USE
RULE/SCALE	STARRET	C331	05/05	05/06
TORPEDO LEVEL	SANDS	500	BEFORE USE	BEFORE USE
FORCE GAUGE	CHATILLON	DPPN-50 870	BEFORE USE	BEFORE USE
CALIPER	STARRET	N/A	BEFORE USE	BEFORE USE
LEVEL, LASER	BLACK & DECKER	360	BEFORE USE	BEFORE USE
LEVEL, LASER	SEAN & STEPHEN CORP	90°, 45°	BEFORE USE	BEFORE USE
LEVEL, LASER	GAERTNER	2789-A	BEFORE USE	BEFORE USE

SECTION 5  
PHOTOGRAPHS



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.1  
LEFT SIDE VIEW OF VEHICLE



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.2  
RIGHT SIDE VIEW OF VEHICLE



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.3  
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE





2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.4  
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE

MFD BY DAIMLERCHRYSLER CORPORATION

DATE OF MFR 6-04

GWR 2586 KG (5700 LB)

GAWR FRONT WITH TIRES 1293 KG (2850 LB) 215/70R15

RIMS AT 15X6.5

COLD 250 KPA (36 PSI)

GAWR REAR WITH TIRES 1339 KG (2950 LB) 215/70R15

RIMS AT 15X6.5

COLD 250 KPA (36 PSI)

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

VIN: 2D4GP24R65R203599

TYPE: MPV

SINGLE X DUAL



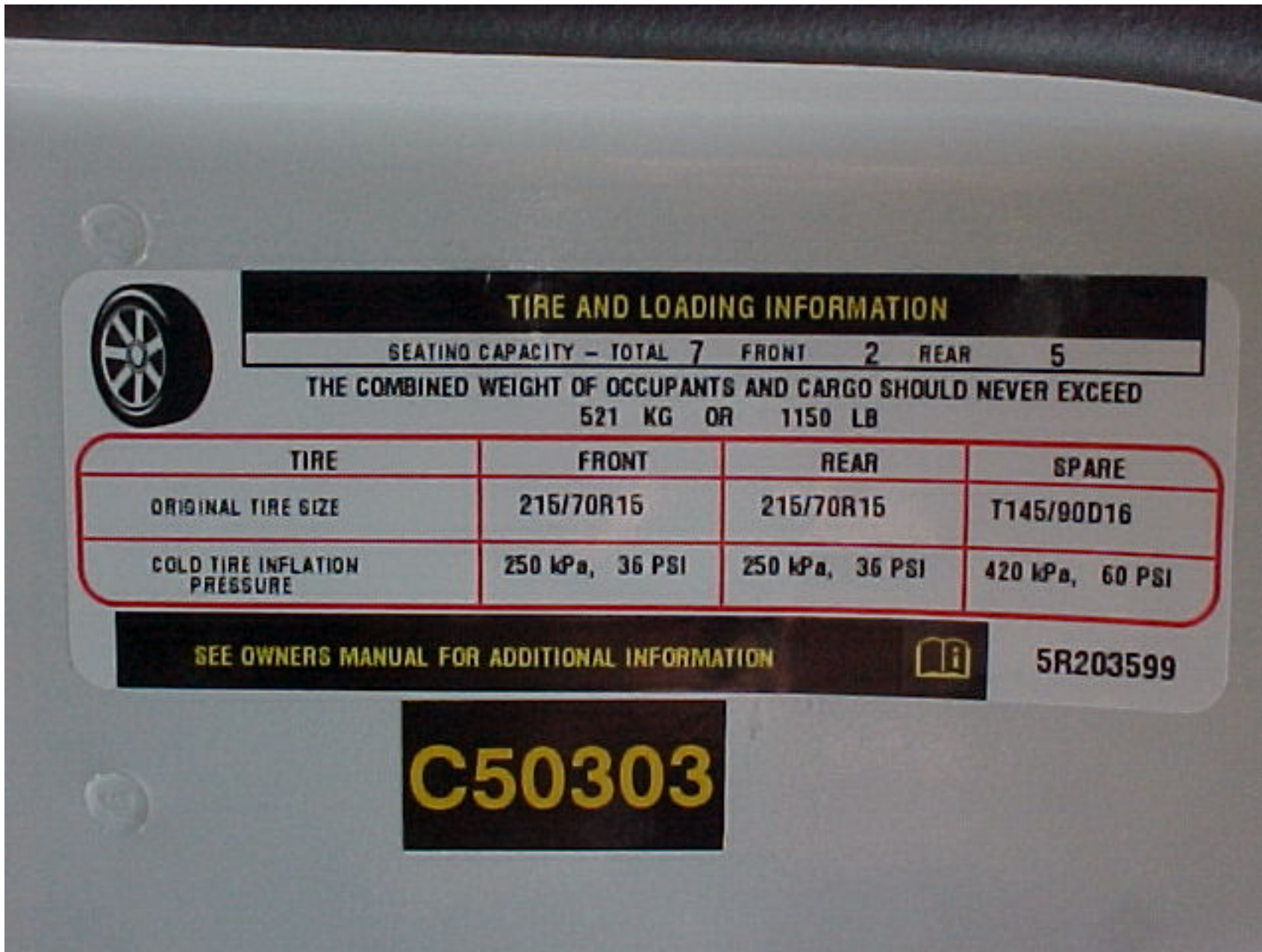
MDH: 060110 004AB PNT:PW1

VEHICLE MADE IN CANADA TRM: B7D5 4648505

**C50303**

2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.5  
VEHICLE CERTIFICATION LABEL



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.6  
VEHICLE TIRE INFORMATION LABEL



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.7  
VIEW OF OVERALL TEST SET-UP



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.8  
PRE-TEST, HEIGHT RETENTION, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.9  
PRE-TEST, HEIGHT RETENTION, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.10  
CONTACT, HEIGHT RETENTION, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.11  
FULL LOAD, HEIGHT RETENTION, DRIVER #1





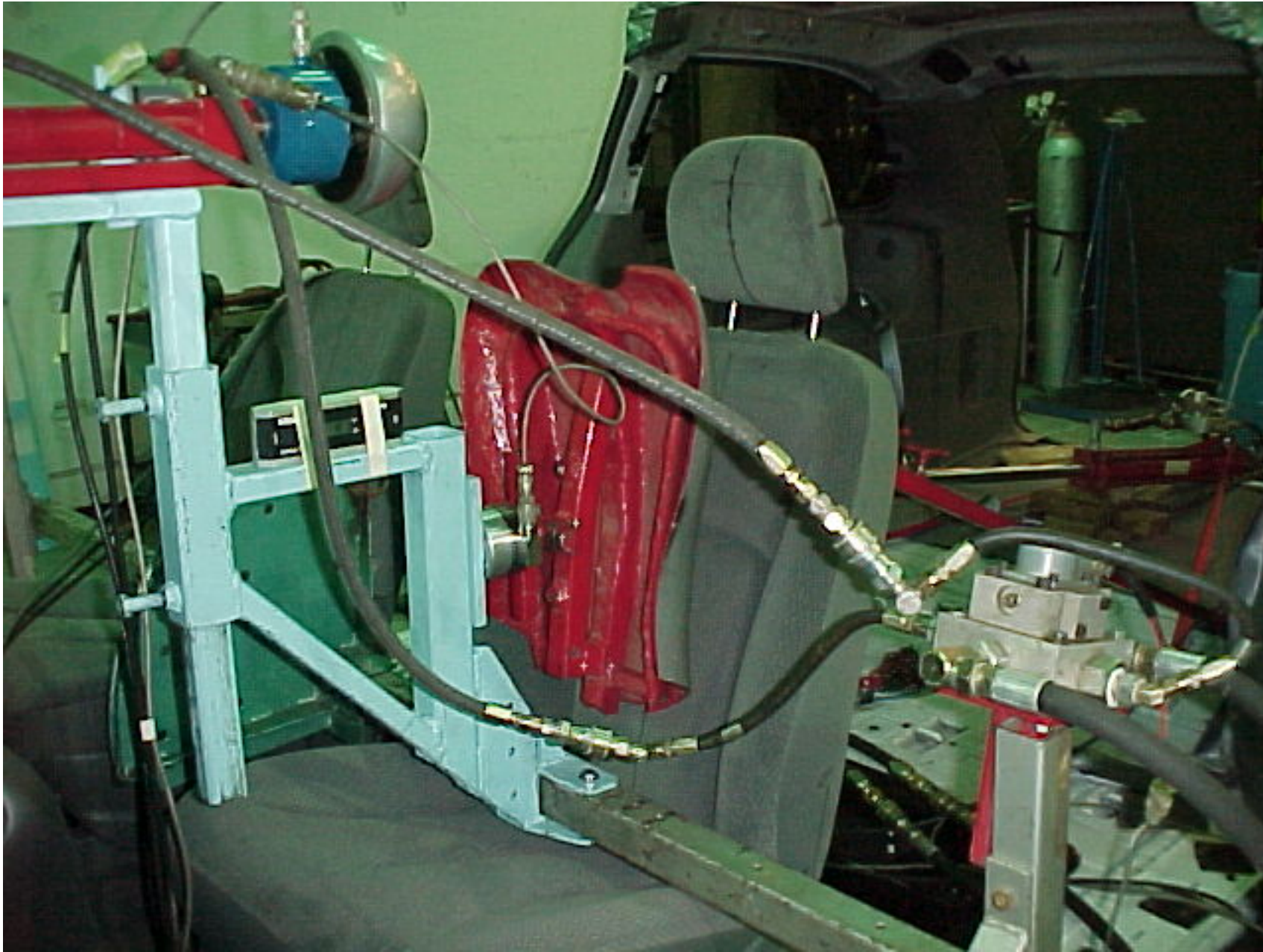
2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.12  
POST TEST, HEIGHT RETENTION, DRIVER #1



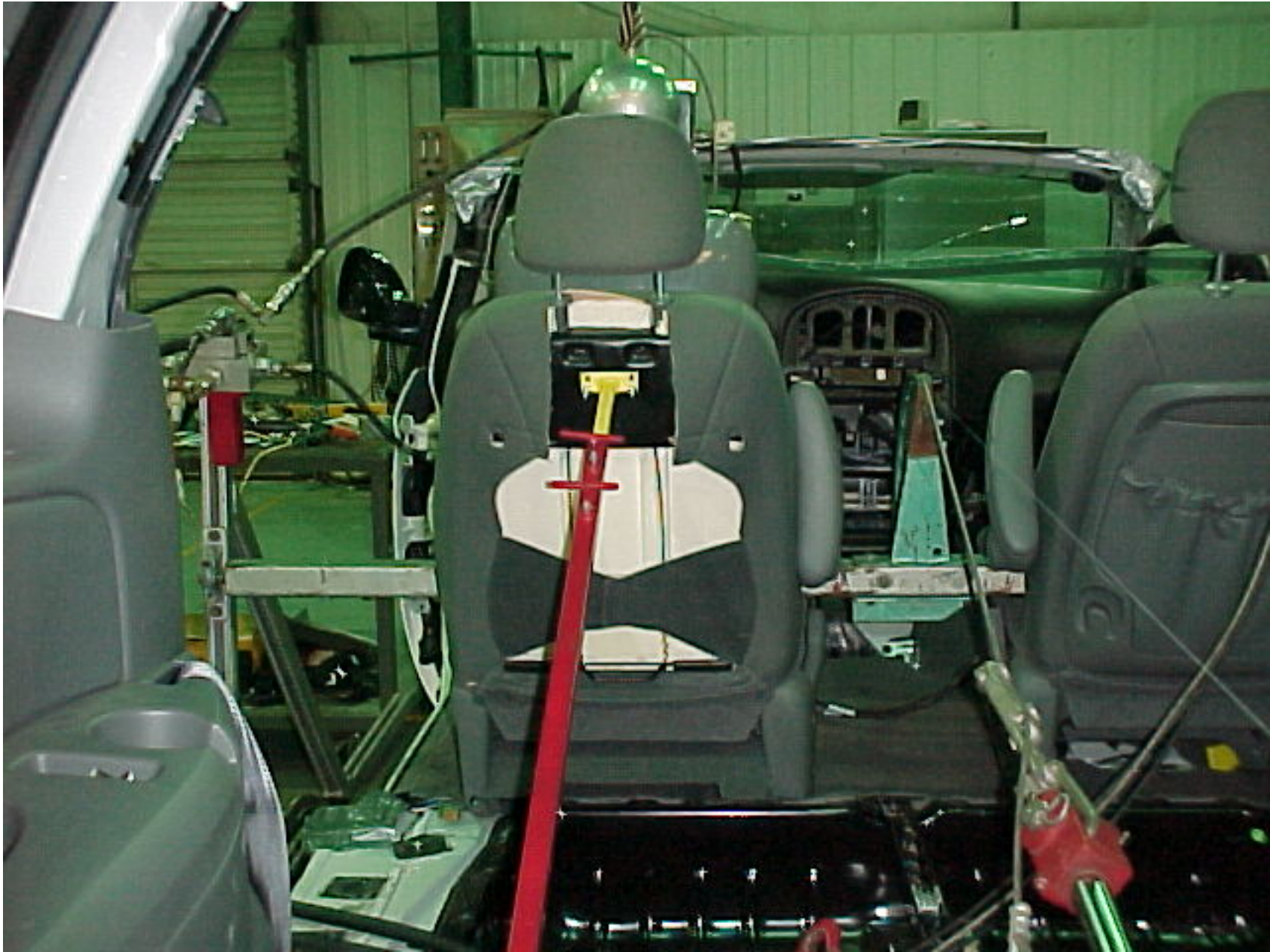
2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.13  
POST TEST, HEIGHT RETENTION, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.14  
PRE-TEST, BACK PAN, DRIVER #1



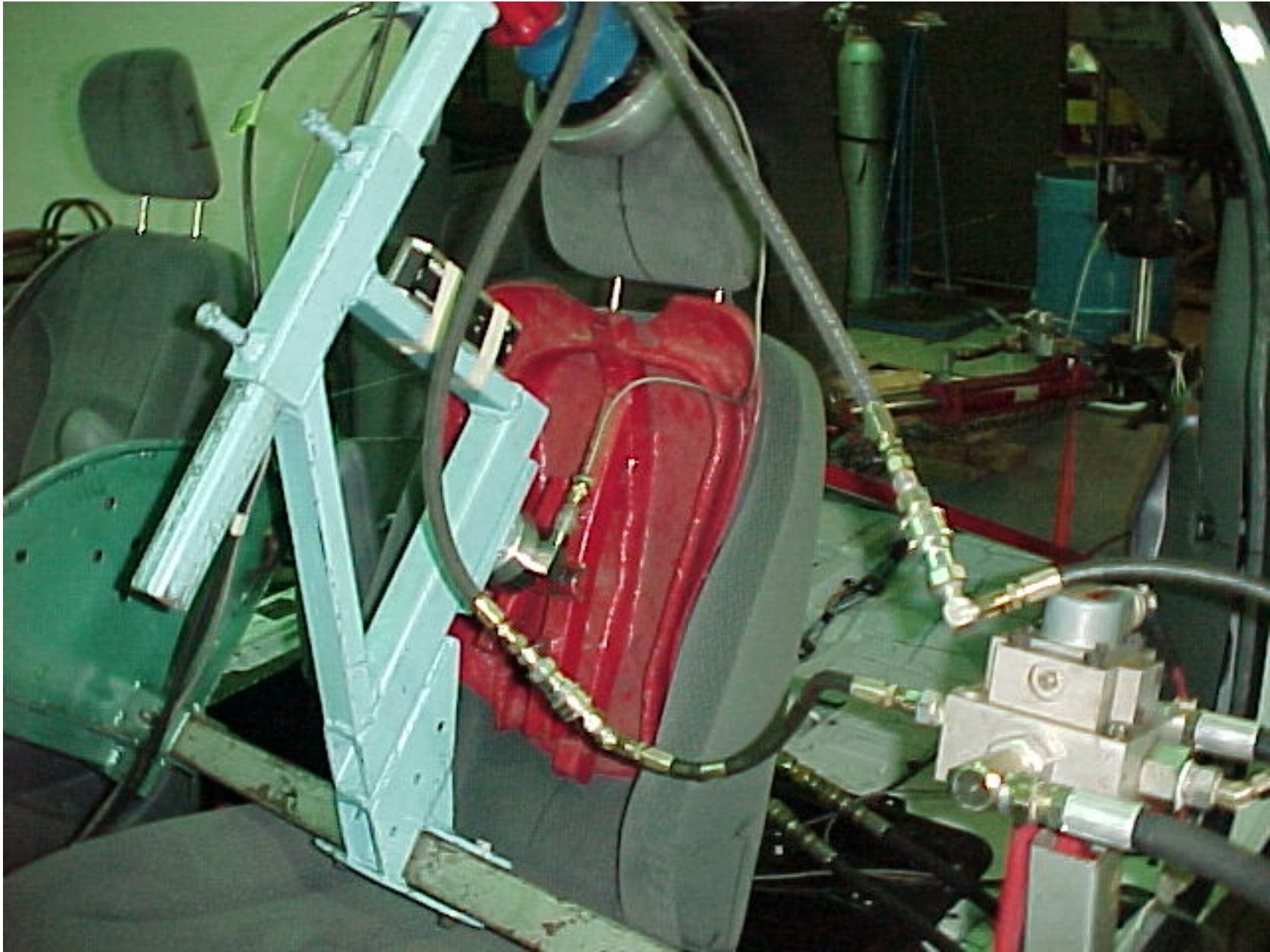
2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.15  
PRE-TEST, BACK PAN, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.16  
PRE-TEST, BACK PAN, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.17  
FULL LOAD, BACK PAN, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.18  
PRE-TEST, BACKSET RETENTION, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.19  
CONTACT, BACKSET RETENTION, DRIVER #1





2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.20  
FULL LOAD, BACKSET RETENTION, DRIVER #1



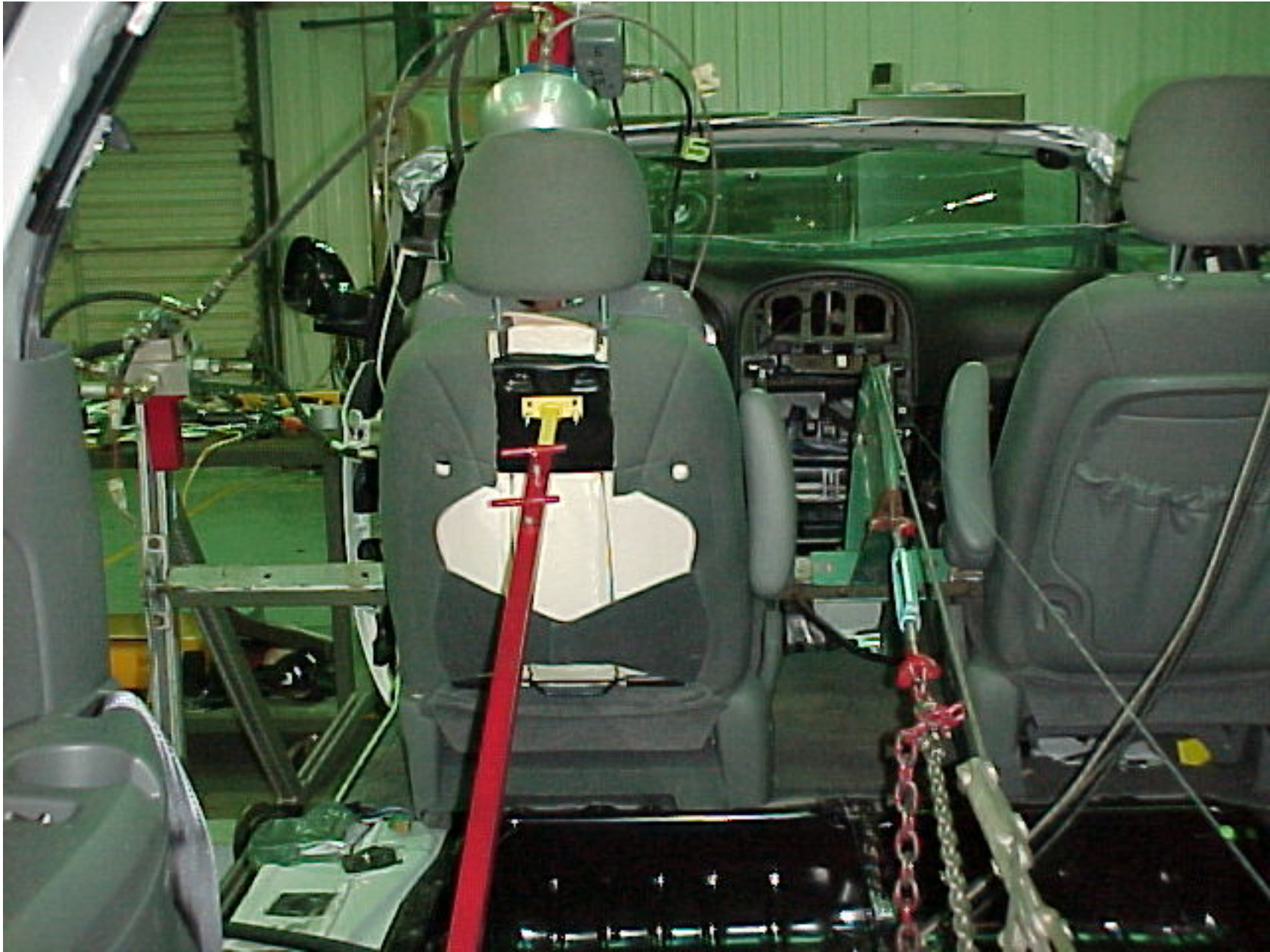
2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.21  
POST TEST, BACKSET RETENTION, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.22  
POST TEST, BACKSET RETENTION, DRIVER #1



2005 DODGE CARAVAN  
NHTSA NO. C50303  
FMVSS NO. 202a

FIGURE 5.23  
POST TEST, BACKSET RETENTION, DRIVER #1



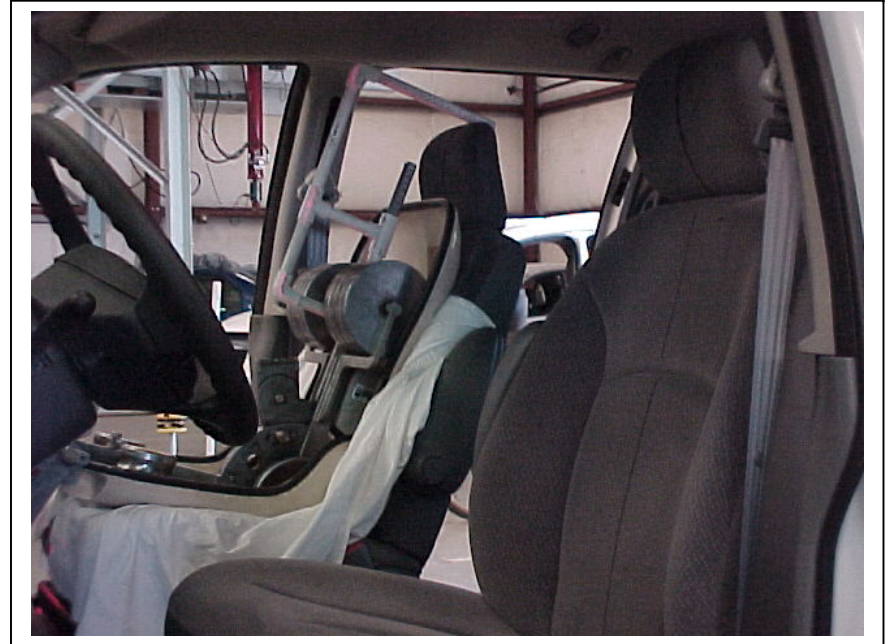
C50303 ¾ VIEW OF UNOCCUPIED DRIVER SEAT



¾ VIEW OF UNOCCUPIED PASSENGER SEAT



¾ VIEW OF MANIKIN IN PASSENGER SEAT, ITERATION 1



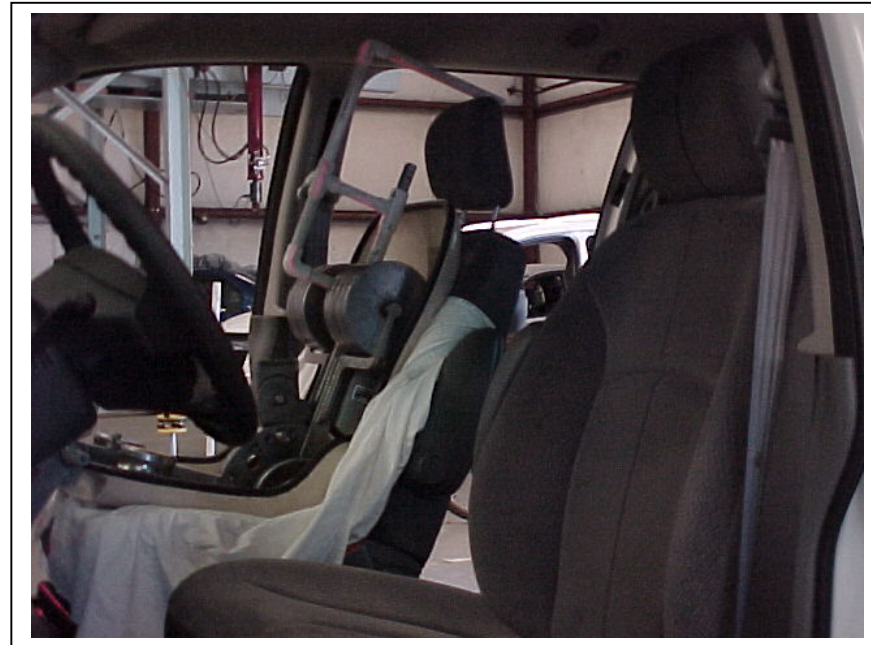
SIDE VIEW OF LOCATION P2, ITERATION 1, POSITION 0



C50303 SIDE VIEW OF LOCATION P2, ITERATION 1, POSITION 1



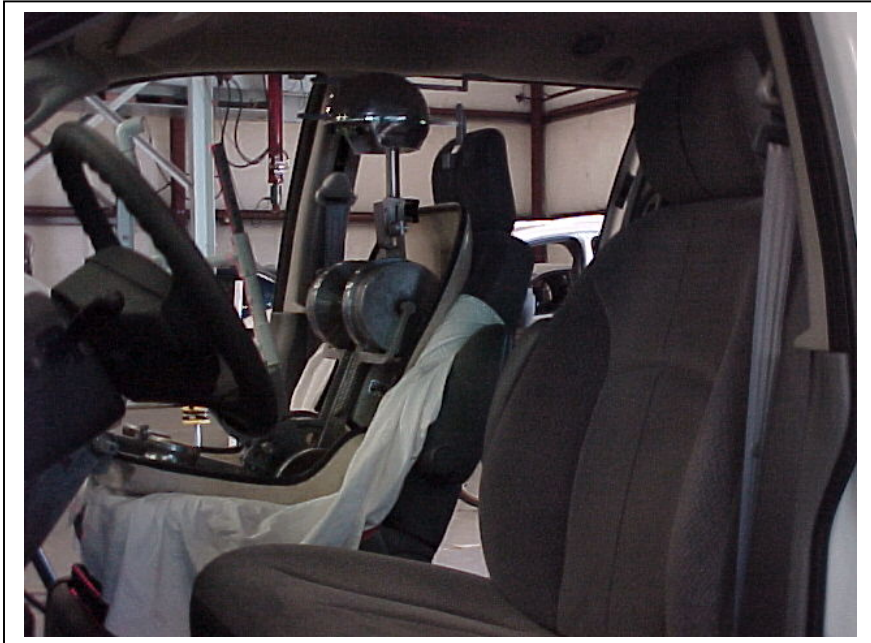
SIDE VIEW OF LOCATION P2, ITERATION 1, POSITION 2



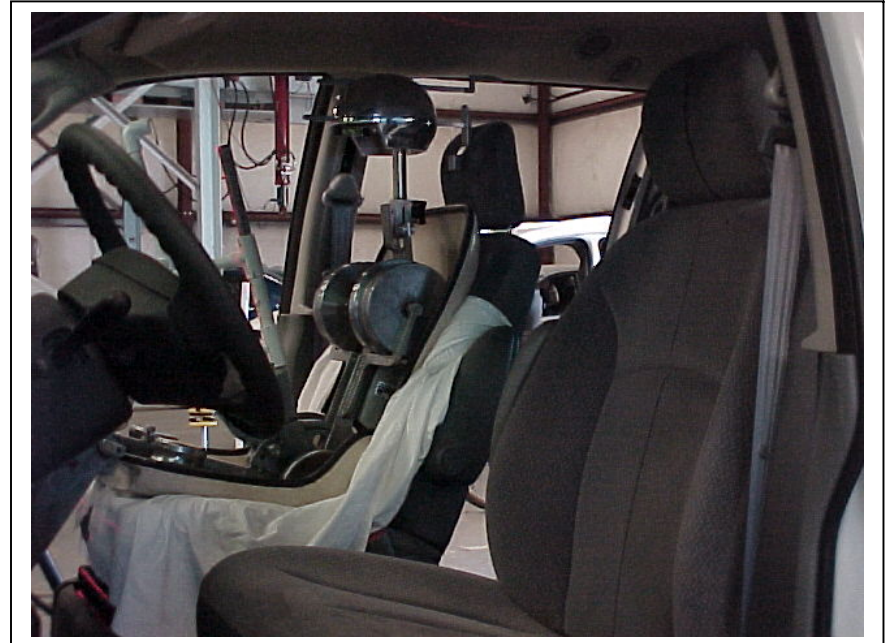
SIDE VIEW OF LOCATION P2, ITERATION 1, POSITION 3



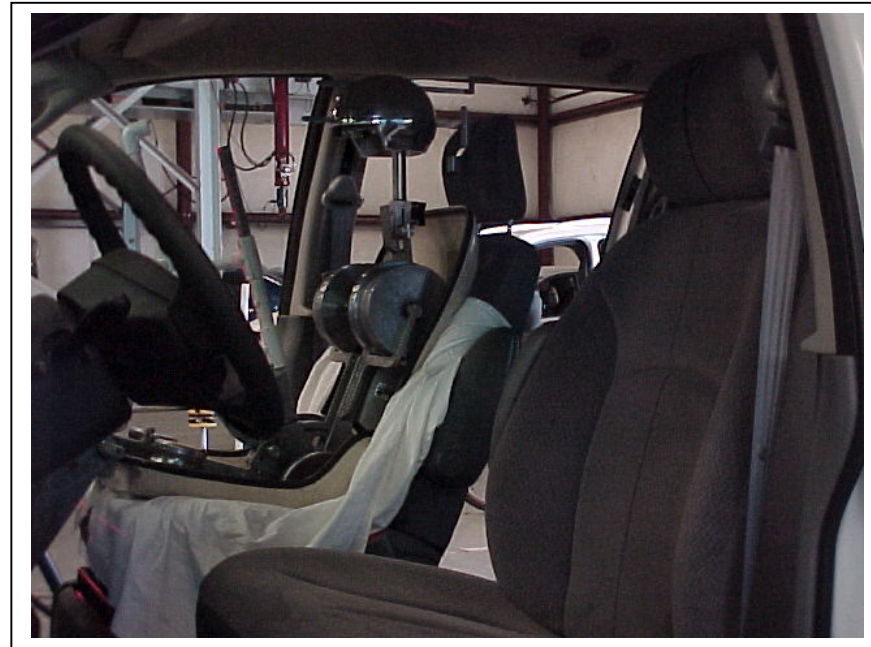
SIDE VIEW OF MANIKIN WITH HRMD IN PASSENGER SEAT



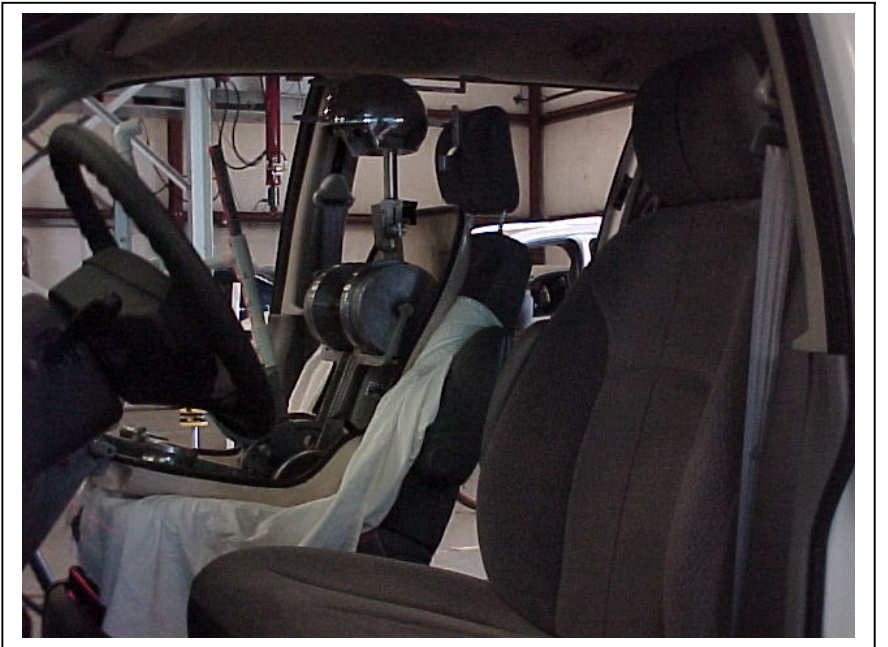
C50303 SIDE VIEW OF LOC P2, ITERATION 1, POS 0 WITH HRMD



SIDE VIEW OF LOCATION P2, ITERATION 1, POSITION 1 WITH HRMD



SIDE VIEW OF LOCATION P2, ITERATION 1, POSITION 2 WITH HRMD

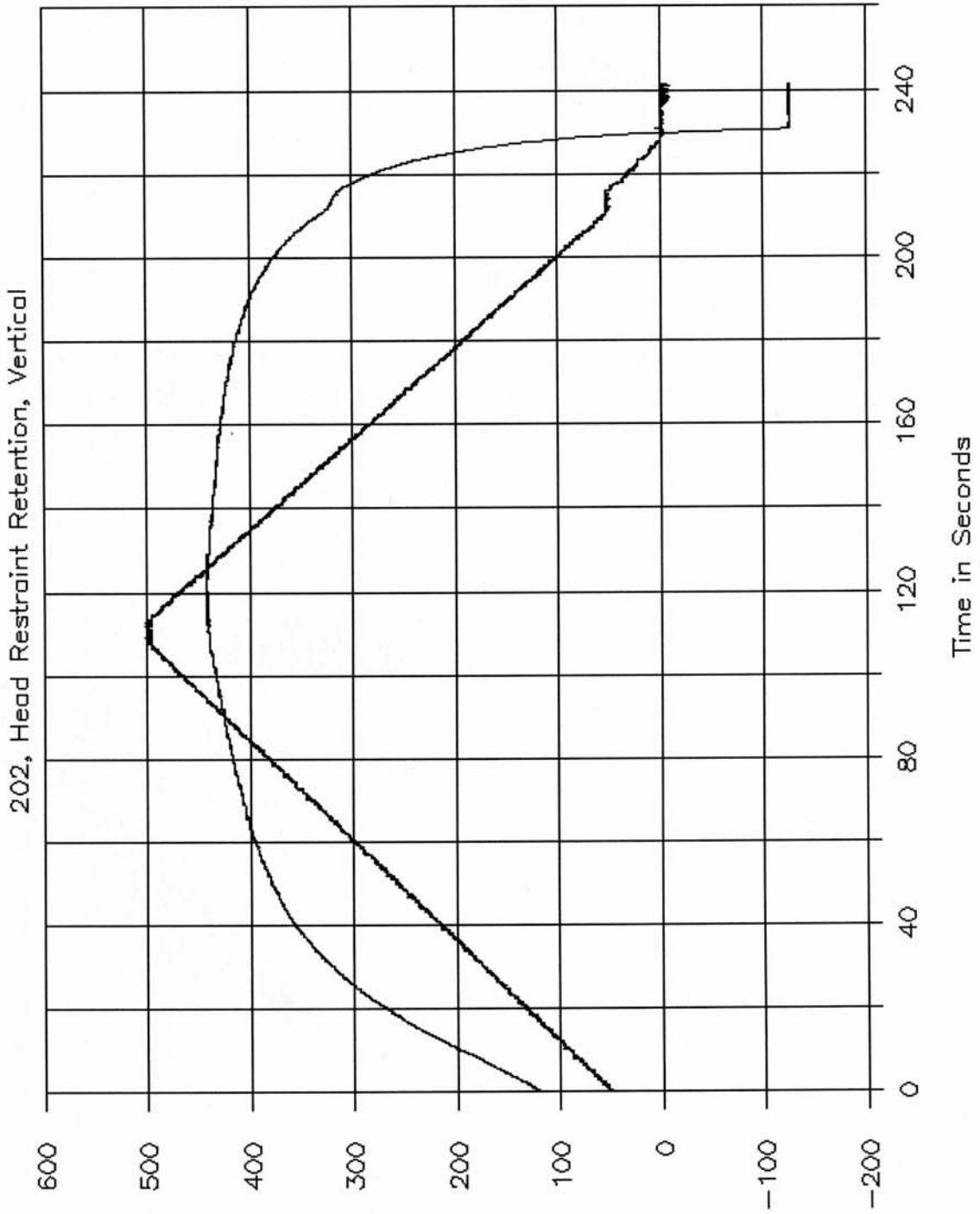


SIDE VIEW OF LOCATION P2, ITERATION 1, POSITION 3 WITH HRMD

SECTION 6  
TEST PLOTS

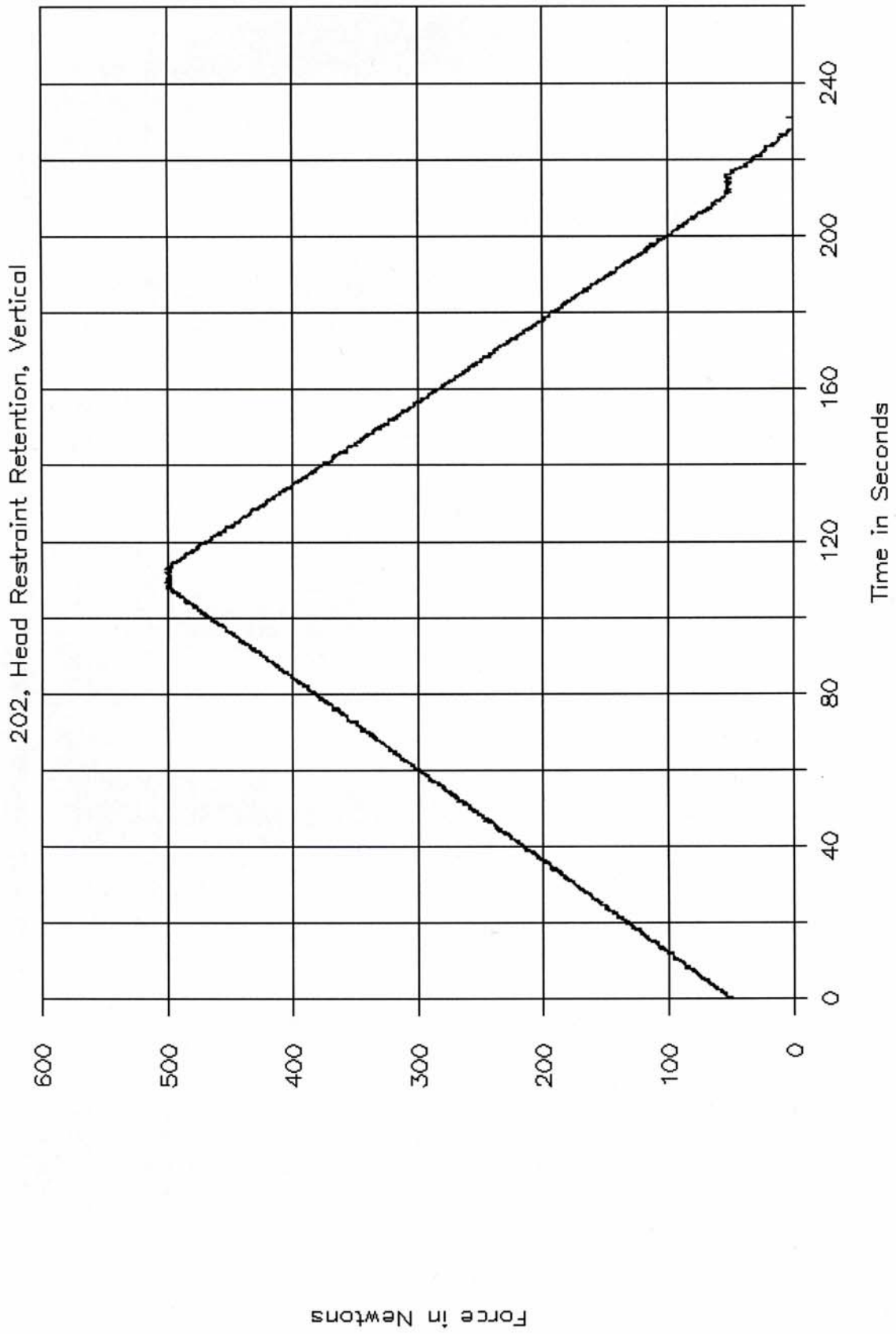


# GTL 5421

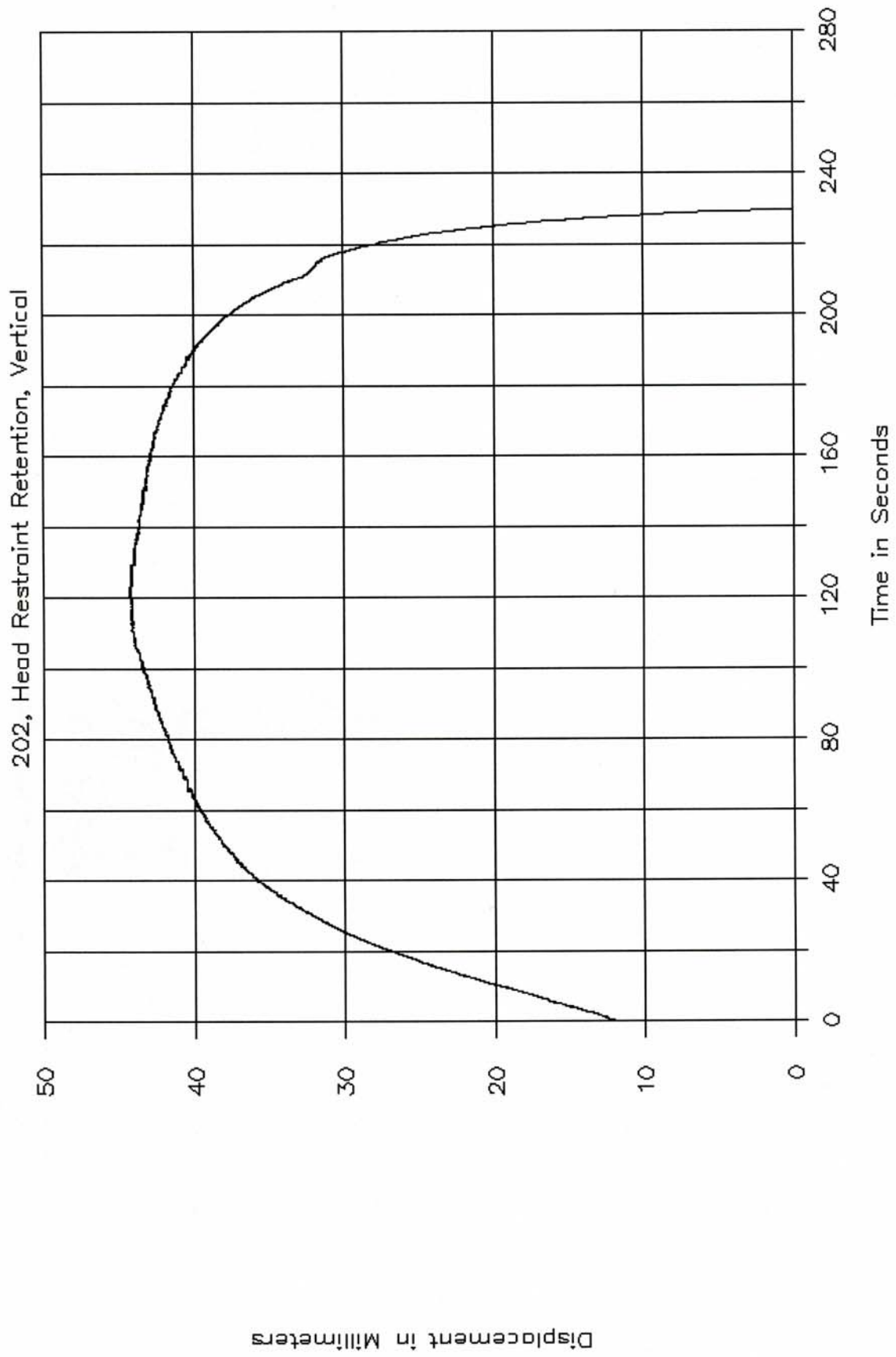


Force in Newtons/Disp. in MM/10

# GTL 5421

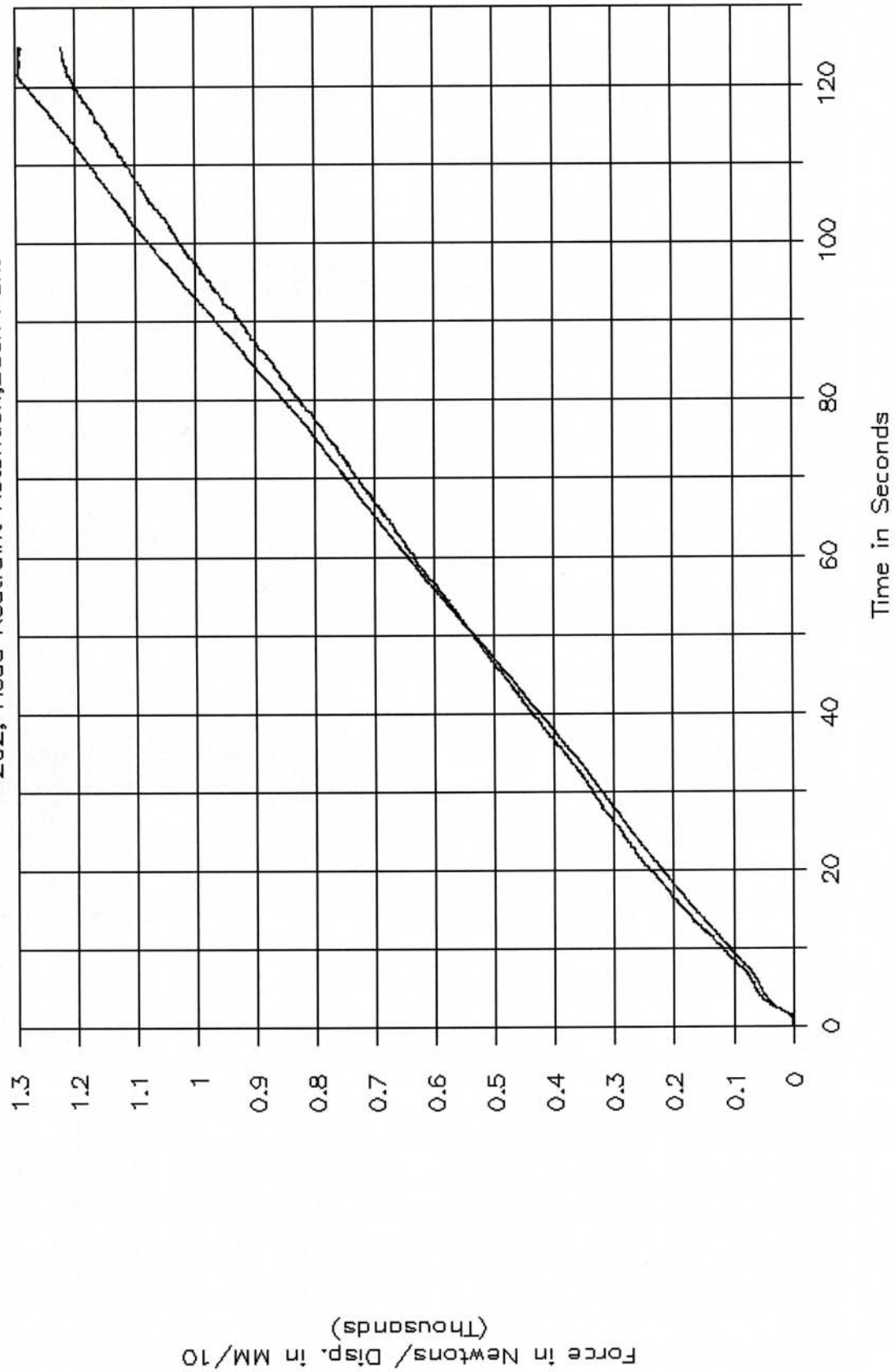


GTL 5421



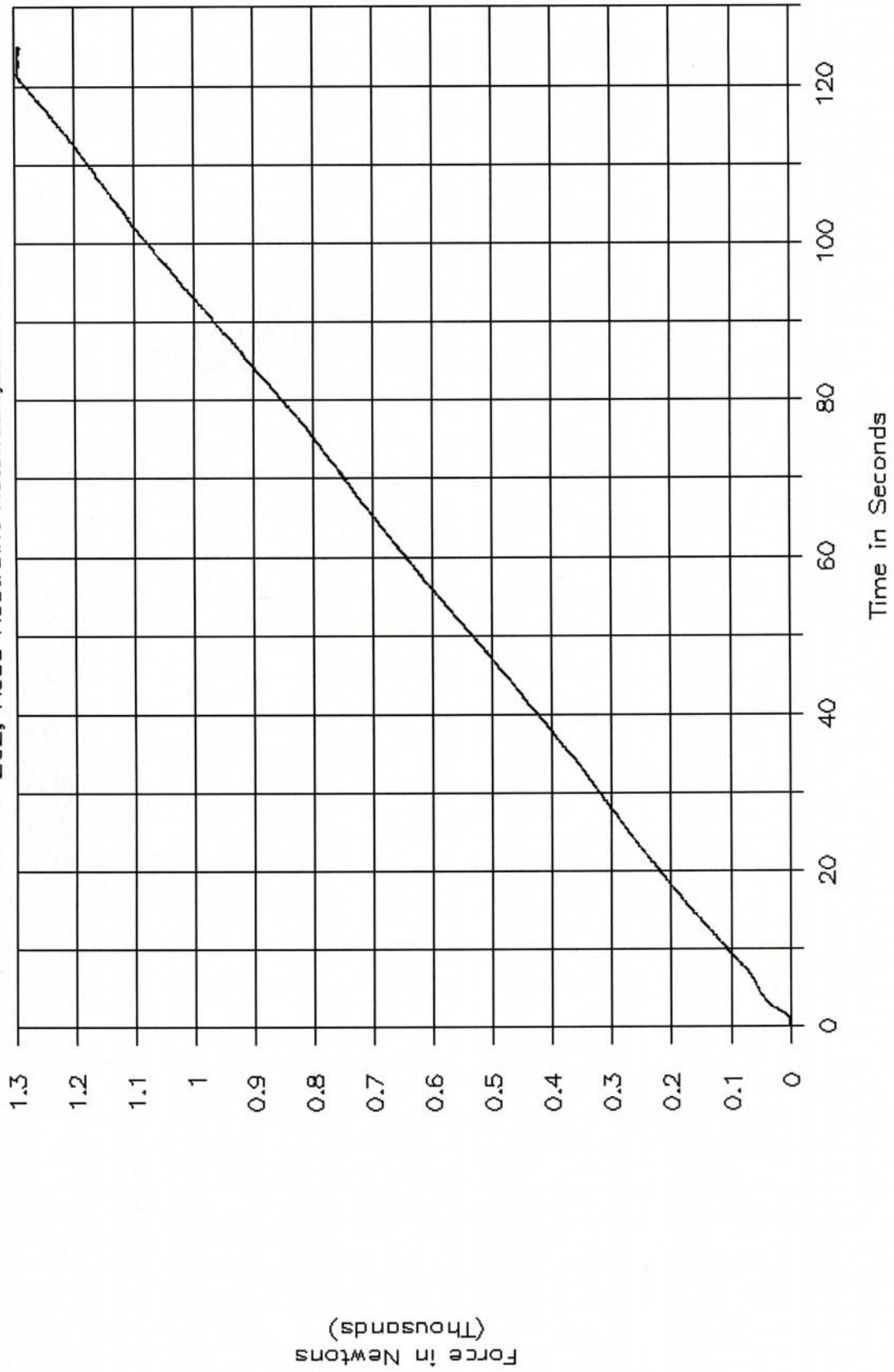
# GTL 5435

202, Head Restraint Retention, Back Pan.



GTL 5435

202, Head Restraint Retention, Back Pan.



GTL 5435

202, Head Restraint Retention, Back Pan.

