

REPORT NUMBER 202a-GTL-05-003

# FMVSS NO. 202a – HEAD RESTRAINTS INDICANT TEST

**NISSAN MOTOR CO., LTD.  
2005 NISSAN ALTIMA, PASSENGER CAR  
NHTSA NO. C55201**

**GENERAL TESTING LABORATORIES, INC.  
1623 LEEDSTOWN ROAD  
COLONIAL BEACH, VIRGINIA 22443**



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  
ROOM 6111 (NVS-220)  
WASHINGTON, D.C. 20590**

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Approved By: \_\_\_\_\_

Approval Date: \_\_\_\_\_

**FINAL REPORT ACCEPTANCE BY OVSC:**

Accepted By: \_\_\_\_\_

Acceptance Date: \_\_\_\_\_

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		6. Performing Organ. Code GTL
7. Author(s) Grant Farrand, Project Engineer Debbie Messick, Project Manager		8. Performing Organ. Rep# GTL-DOT-05-202a-003
9. Performing Organization Name and Address General Testing Laboratories, Inc. 1623 Leedstown Road Colonial Beach, Va 22443		10. Work Unit No. (TRAIS) N/A
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		14. Sponsoring Agency Code NVS-220
15. Supplementary Notes		
16. Abstract Tests were conducted on the subject, 2005 Nissan Altima passenger car 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 Nissan Altima meets the requirements of FMVSS 202.		
17. Key Words Safety Engineering FMVSS 202a Head Restraints		18. Distribution Statement
19. Security Classif. (of this report)  UNCLASSIFIED	21. No. of Pages 48	22. Price
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## SECTION 1

### PURPOSE OF TEST

#### 1.0 PURPOSE OF TEST

A 2005 Nissan Altima passenger car 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 Nissan Altima passenger car. Nomenclature applicable to the test vehicle are:

- A. Vehicle Identification Number: 1N4AL11D25C172044
- B. NHTSA No.: C55201
- C. Manufacturer: NISSAN MOTOR CO., LTD.
- D. Manufacture Date: 04/04

#### 1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 202a testing during the time period February 28 –March 1, 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 Nissan Altima.

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

VEHICLE: 2005 NISSAN ALTIMA, PASSENGER CAR

VEH. NHTSA NO.: C55201 TEST DATE: 02/28/06

TEST #5395

Seat Location: Driver

Pre-test measurements

HEAD RESTRAINT IN POSITION 5 (0-5)

SAE J826 Manikin torso angle: Top of Head Restraint Height (mm): 791 mm

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

DESCRIPTION OF HEIGHT RETENTION LOCK: The head restraint has two mounting posts. The left 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 right side post has no locking detents.

Test measurements

Initial load (50 N  $\pm$  1 N): 52 N Initial Displacement, D1 (mm): 12.5 mm

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

Maximum load (495 N  $\pm$  5 N): 500 N Maximum Displacement, D2 (mm): 40.0 mm

Return load (50 N  $\pm$  1 N): 52 N Return Displacement, D3 (mm): 27.0 mm

Total displacement (D3-D1) < 13 mm: 14.5 mm **PASS** \_\_\_\_\_ **X** **FAIL** \_\_\_\_\_

REMARKS:

RECORDED BY: G. Farrand DATE: 02/28/06

APPROVED BY: D. Messick



**DATA SHEET 2**  
**BACKSET RETENTION TEST**

VEHICLE: 2005 NISSAN ALTIMA, PASSENGER CAR  
VEH. NHTSA NO.: C55201 TEST DATE: 03/01/06

TEST #5409

Seat Location: Driver

Type of head restraint:

Pre-test measurements

SAE J826 Manikin torso angle: Top of Head Restraint Height (mm): 791 mm FULL UP

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

Displacement torso reference line

Test device back pan angle: Pre-Test 19.1°; Full Load 33.7°

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): .726 m

Zero Contact Ref. 63.3 mm

Initial load (N): 54 N Initial moment ( $37 \pm 0.7$  Nm): 39 Nm

Initial displacement: -40.7 mm

Initial head form displacement, D1 ( $< \text{or} = 25$  mm): -22.6 mm **PASS** X **FAIL** \_\_\_\_\_

Load range to generate a  $373 \pm 7.5$  Nm rearward moment (N): 375 N

Actual load applied (N): 516 N Resultant moment (Nm): 375 Nm

Actual displacement: 98.3 mm

Maximum Head form displacement, D2 ( $< \text{or} = 102$  mm): 98.3 mm **PASS** X **FAIL** \_\_\_\_\_

Final Load (N): 54 N

Final head form displacement, D3 (mm): 0.0 mm Measured at ( $37 \pm 0.7$  Nm) 39 Nm

Total displacement (D3-D1)  $< 13$  mm : 40.7 mm **PASS** \_\_\_\_\_ **FAIL** X

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

REMARKS:

RECORDED BY: G. Farrand

DATE: 03/02/06

APPROVED BY: D. Messick

### DATA SHEET 3

<b>VEHICLE INFORMATION</b>	Year:	2005	Type:	
	Make:	Nissan	VIN:	1N4AL11D25C172044
	Model:	Altima	NHTSA No:	C55201

<b>SEAT SETUP</b>	<b>OCCUPANT LOCATION P1</b>	<b>GTL</b>	
	1. Seat Fore/Aft		
	2. Seat Raise/Lower		
	3. Seat Tilt		
	4. Seat Cushion		
	5. Seat Back Adjustment with manikin installed (25 deg. target torso angle)	10.5	degree from vertical of head restraint post
	6. Seat Back Adjustment without manikin	728	distance (mm) from visor bolt to head restraint post center
10.6		degree from vertical of head restraint post	
726		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)	103	
	Z (below striker)	127	
TORSO ANGLE (deg)		21.0	
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	722.0
		Position 1	735.0
		Position 2	753.0
		Position 3	765.0
		Position 4	783.0
		Position 5	791.0
		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:	Nissan	VIN:	1N4AL11D25C172044
	Model:	Altima	NHTSA No:	C55201

<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			
	11. Seat Back Adjustment with manikin installed (25 deg. target torso angle)	15.6	degree from vertical of head restraint post	
		784	distance (mm) from visor bolt to head restraint post center	
12. Seat Back Adjustment without manikin	15.7	degree from vertical of head restraint post		
	782	distance (mm) from visor bolt to head restraint post center		
	5	detents with full up locked being 0		

NOTE: LUMBAR SUPPORT SHOULD BE RETRACTED

H-POINT LOCATION (mm)*	X (forward of striker)	101	
	Z (below striker)	149	
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	755.0
		Position 1	768.0
		Position 2	783.0
		Position 3	798.0
		Position 4	811.0
		Position 5	821.0
		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 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.1  
LEFT SIDE VIEW OF VEHICLE



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.2  
RIGHT SIDE VIEW OF VEHICLE





2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.3  
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.4  
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE

**MANUFACTURED BY NISSAN MOTOR CO., LTD.**

DATE 04/04 GVWR 4202 LB  
GAWR FR. 2249 LB GAWR RR. 1969 LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR  
VEHICLE SAFETY, BUMPER AND THEFT PREVENTION STANDARDS  
IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.  
SEE OWNERS MANUAL FOR ADDITIONAL INFORMATION.

VIN: 1N4AL11D25C172044 PASSENGER CAR  
COLOR TRIM TRANS AXLE ENGINE  
KY2 G RE4F04B FT44 QR25DE 2488CC  
MODEL: BDBALBA-EUR 466 02000



1N4AL11D25C172044

**C55201**

2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.5  
VEHICLE CERTIFICATION LABEL

**C55201**

VEHICLE CAPACITY WEIGHT	860 lbs	SEATING CAPACITY	FRONT AVANT 2	TOTAL TOTAL	SPARE TIRE ROUE DE SECOURS	psi (kPa)
POIDS UTILE DU VEHICULE	390 kg	NOMBRE DE PLACES	REAR ARRIERE 3	5	T135/90R16	60 (420)
RECOMMENDED COLD TIRE INFLATION PRESSURE PRESSION DE GONFLAGE RECOMMANDEE DES PNEUS FROIDS.				DO NOT USE IN EXCESS OF 50 MPH. 80 km/h SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION. UTILISATION A UNE VITESSE MAX 50 MPH. 80 km/h POUR LES DETAILS SE REFERER AU MANUEL DU CONDUCTEUR.		
TIRE SIZE DIMENSIONS	FRONT psi AVANT (kPa)	REAR psi ARRIERE (kPa)				
P215/60R16 94T	29 (200)	29 (200)				

ZB100

2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.6  
VEHICLE TIRE INFORMATION LABEL



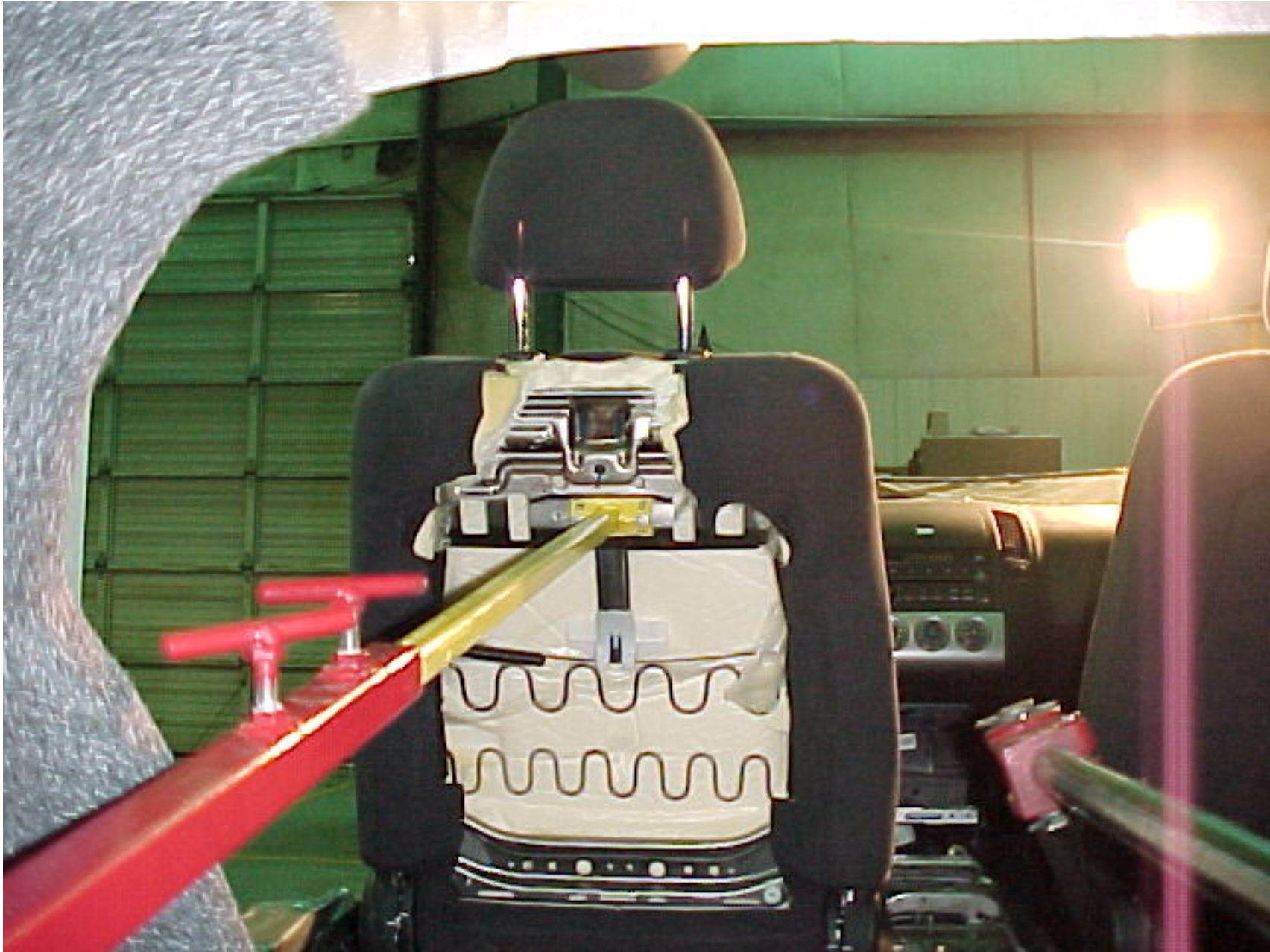
2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.7  
VEHICLE PRE-TEST SET-UP



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

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



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

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



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.10  
CONTACT, HEIGHT RETENTION, DRIVER #1





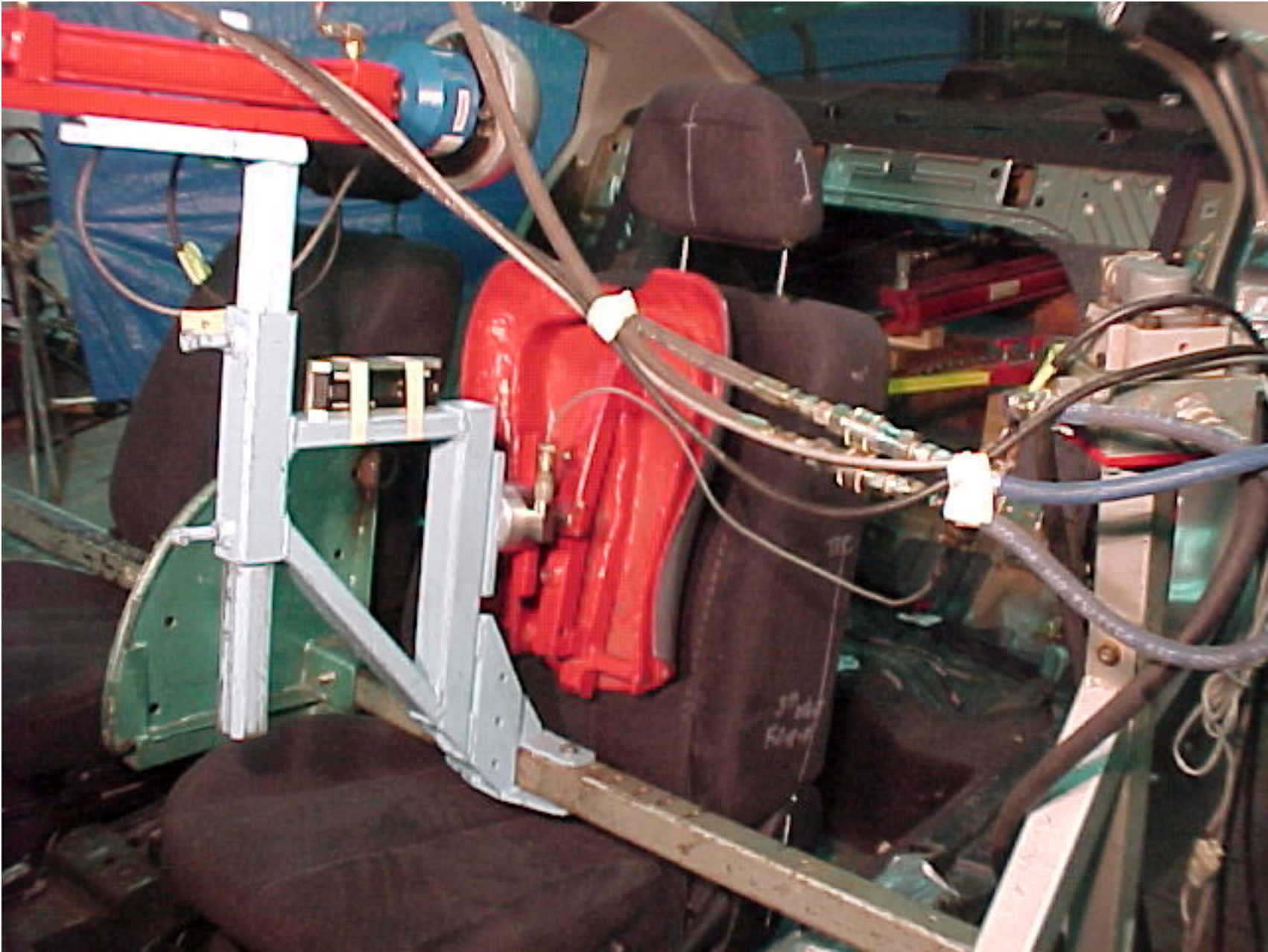
2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.11  
FULL LOAD, HEIGHT RETENTION, DRIVER #1



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.12  
POST TEST, HEIGHT RETENTION, DRIVER #1



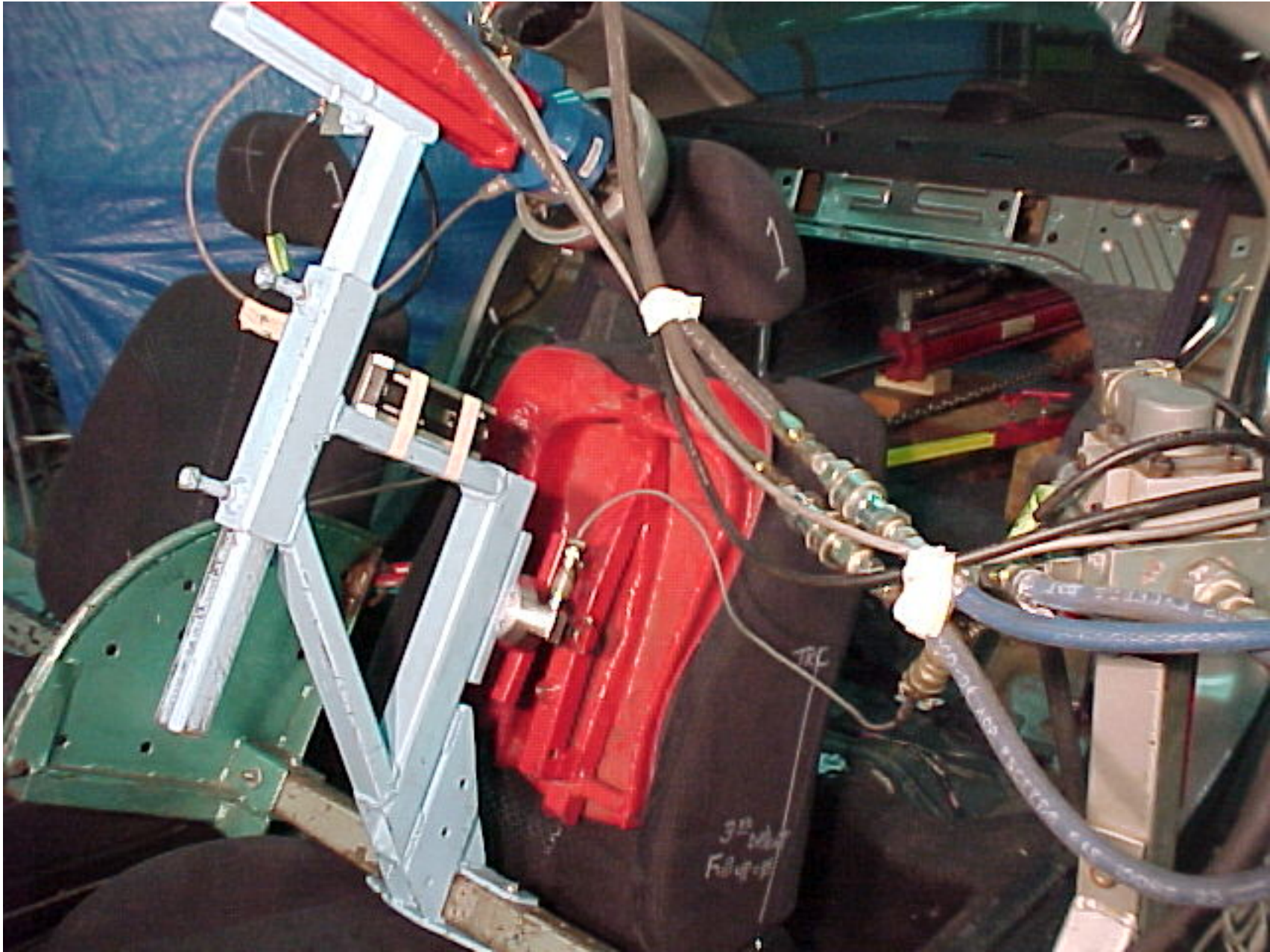
2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.13  
PRE-TEST, 10% POST LOAD, DRIVER #1



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.14  
PRE-TEST BACK PAN, DRIVER #1



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.15  
FULL LOAD, BACK PAN, DRIVER #1



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.16  
PRE-TEST, BACKSET RETENTION, DRIVER #1



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

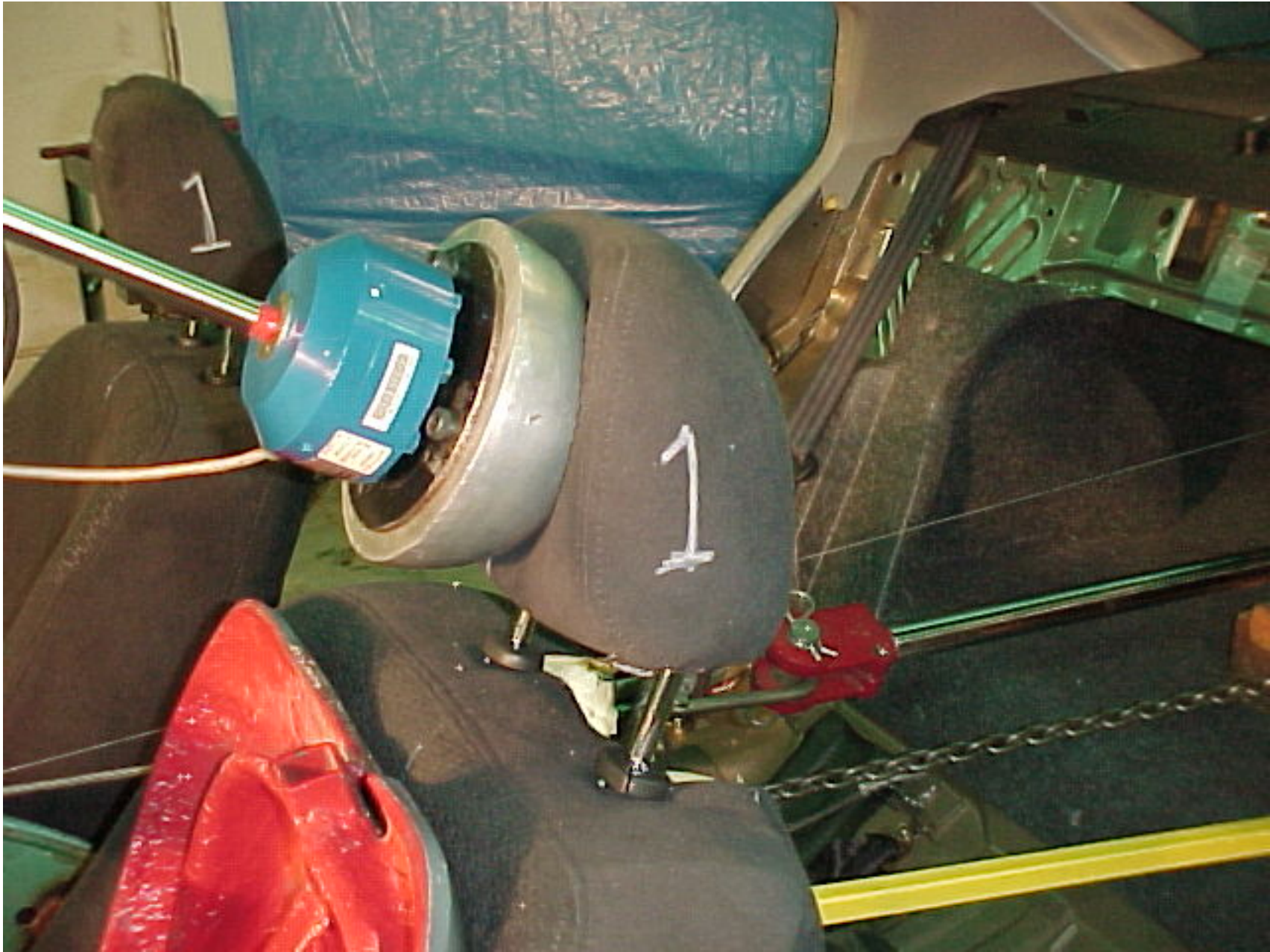
FIGURE 5.17  
CONTACT, BACKSET RETENTION, DRIVER #1



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.18  
ACTIVE HEAD RESTRAINT SPRING AT CONTACT





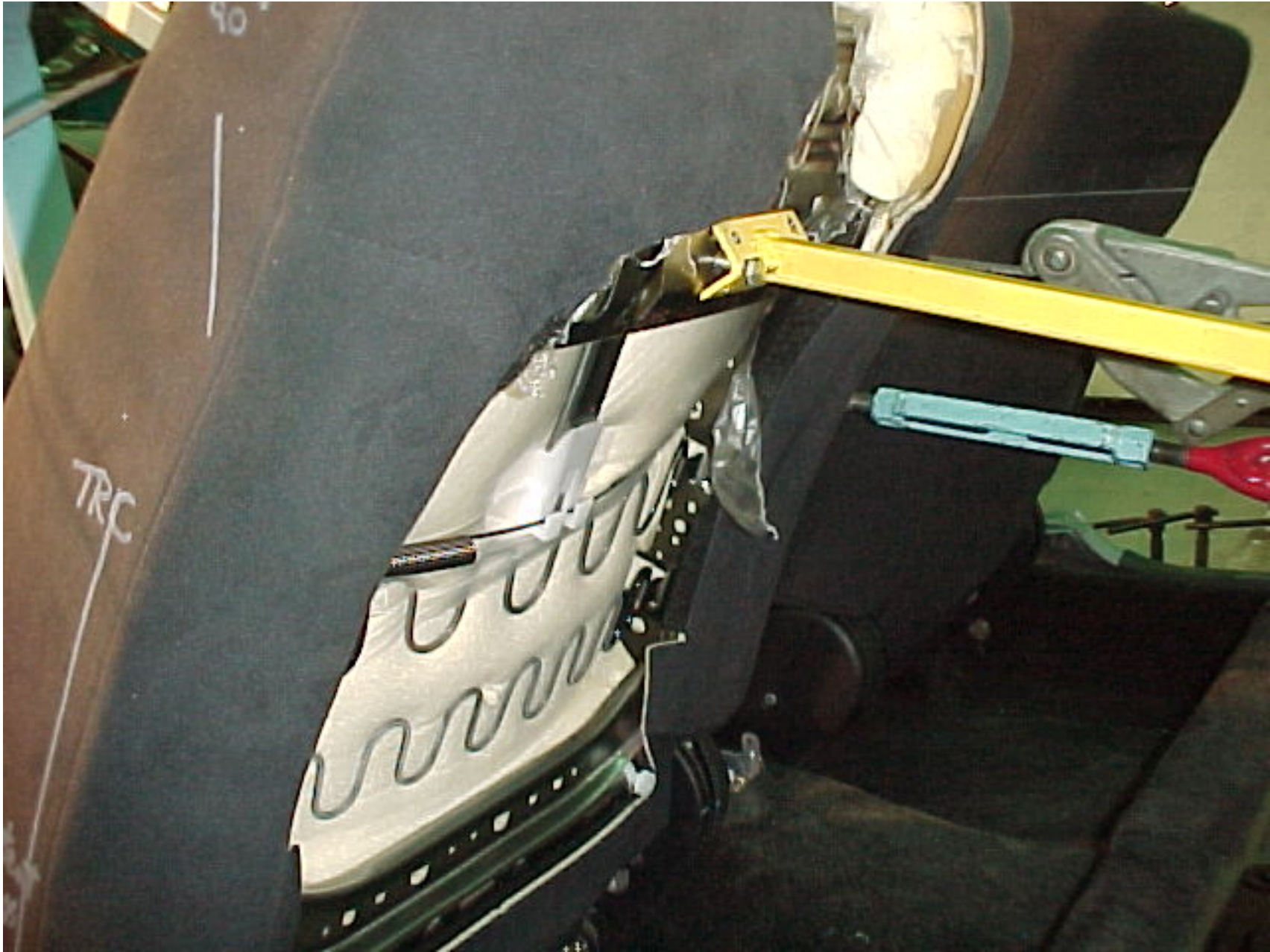
2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.19  
FULL LOAD BACKSET RETENTION, DRIVER #1



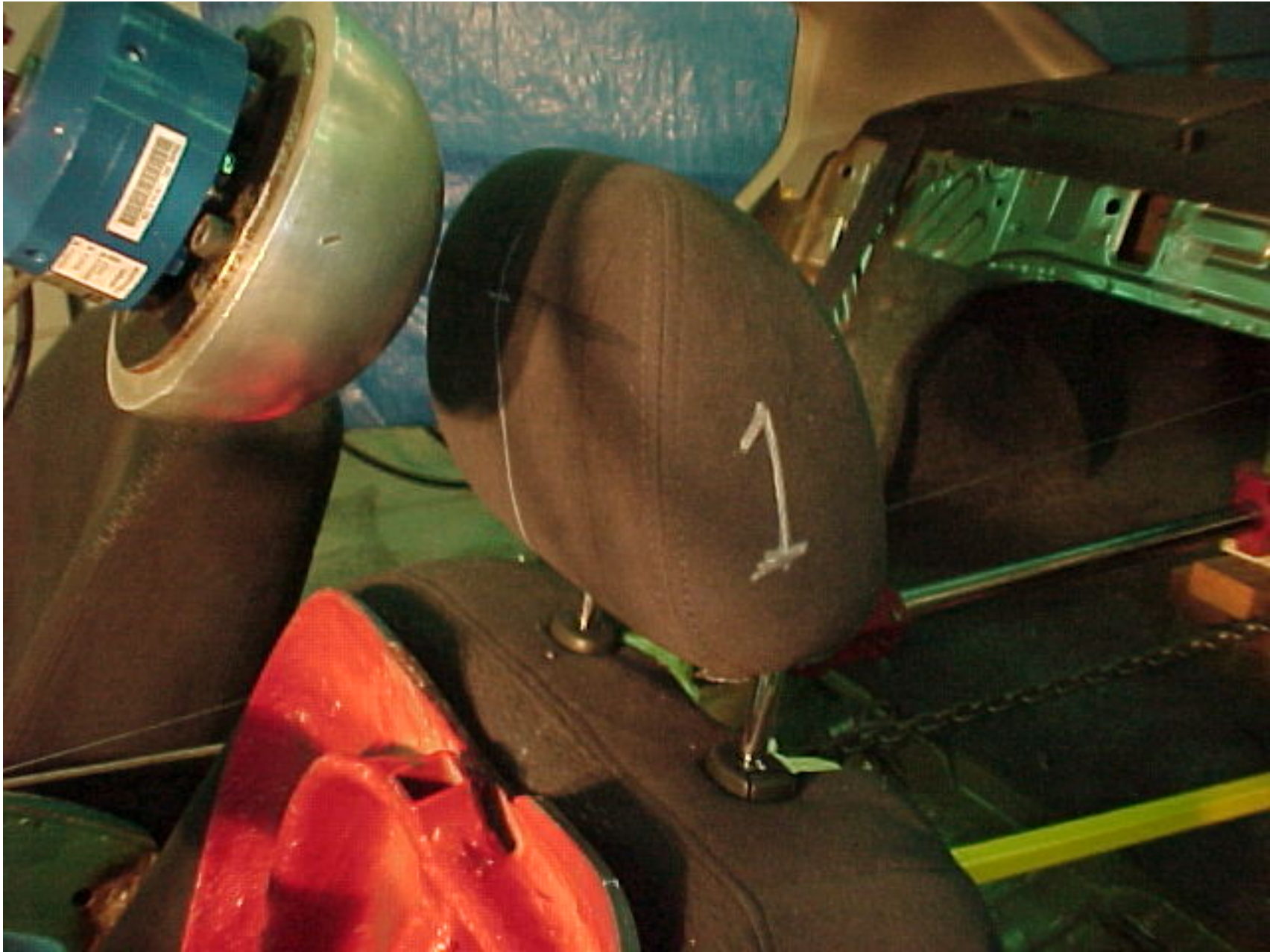
2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.20  
FULL LOAD, BACKSET RETENTION, DRIVER #1



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.21  
ACTIVE HEAD RESTRAINT SPRING AT FULL LOAD



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.22  
POST TEST BACKSET RETENTION, DRIVER #1



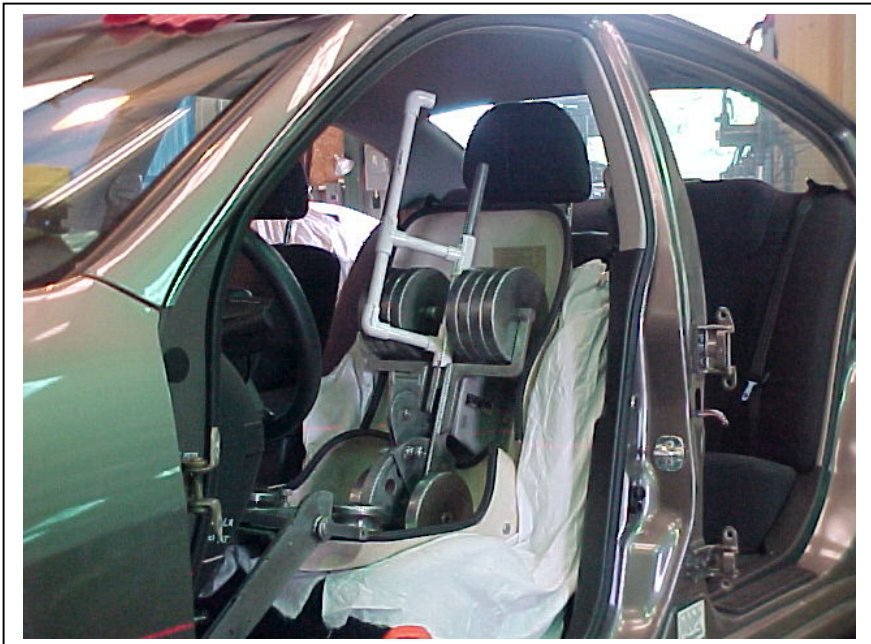
2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

FIGURE 5.23  
POST TEST, BACKSET RETENTION, DRIVER #1



2005 NISSAN ALTIMA  
NHTSA NO. C55201  
FMVSS NO. 202a

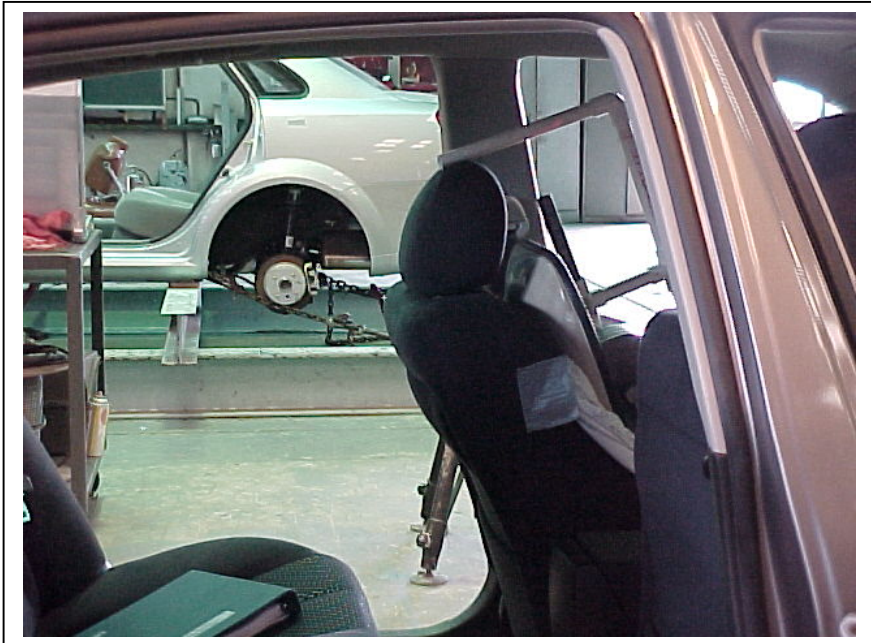
FIGURE 5.24  
POST TEST ACTIVE HEAD RESTRAINT SPRING



C55201 ¼ VIEW OF MANIKIN IN DRIVER SEAT, ITERATION 1



¼ VIEW OF UNOCCUPIED PASSENGER SEAT



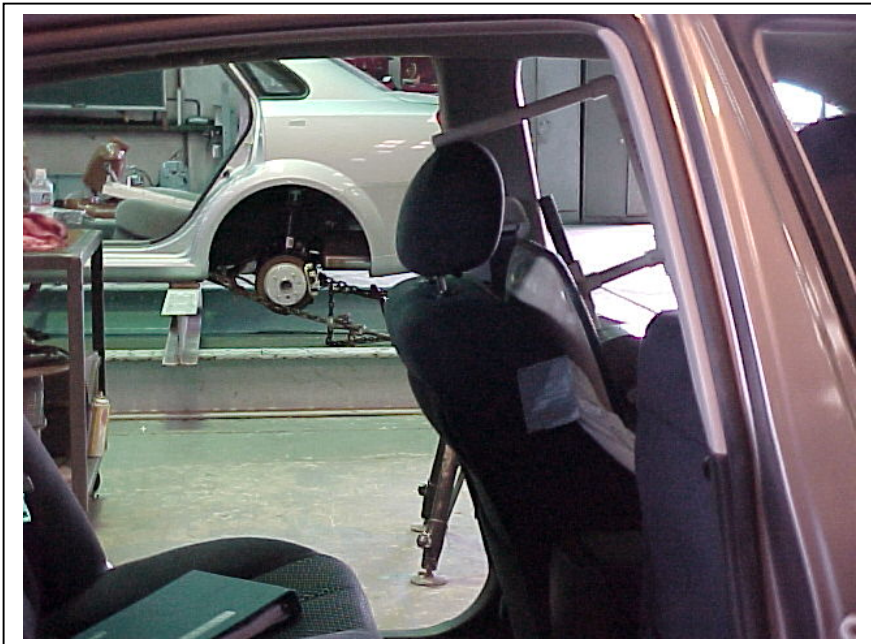
SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 0



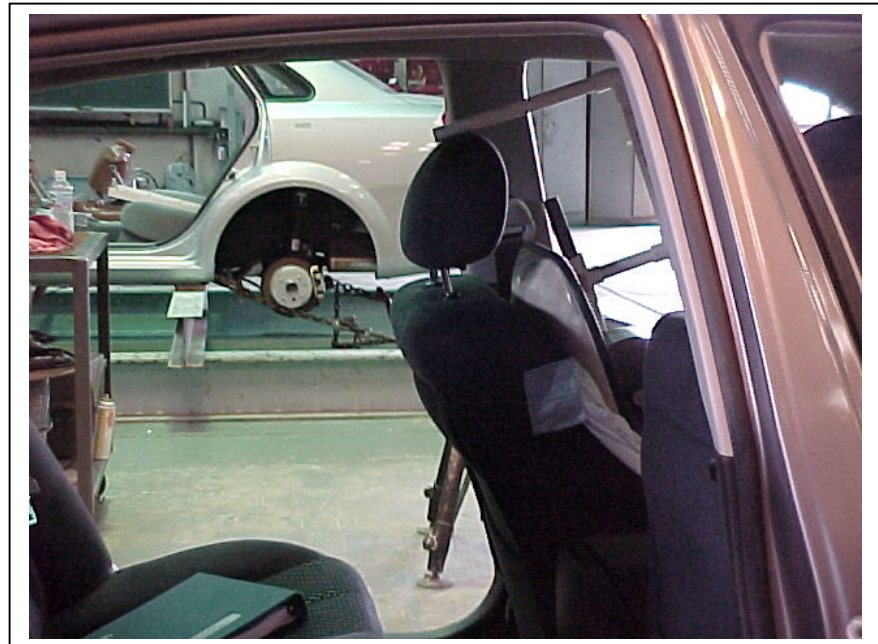
SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 1







C55201 SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 2



SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 3



SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 4



SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 5



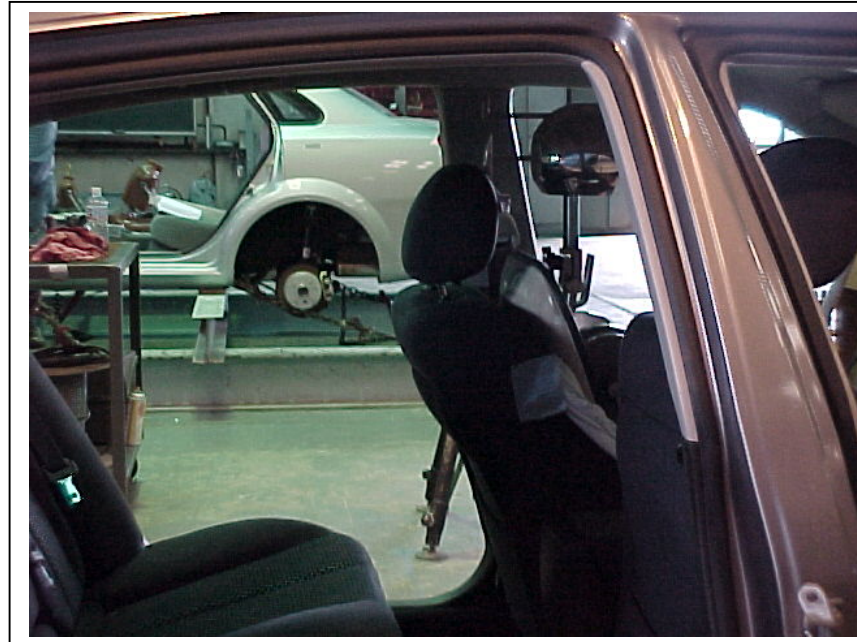
C55201 ¾ VIEW OF MANIKIN WITH HRMD IN DRIVER SEAT, ITERATION 1



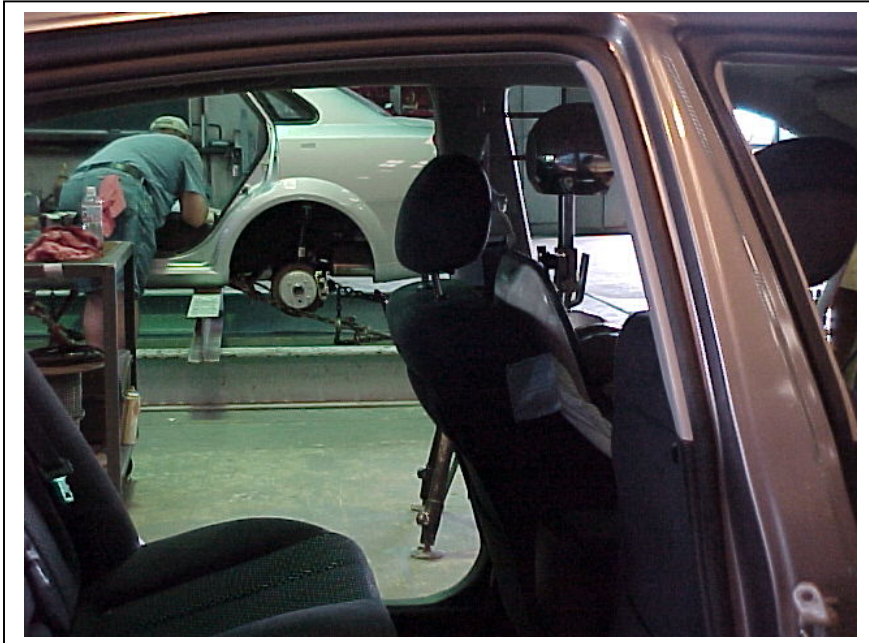
SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 0 WITH HRMD



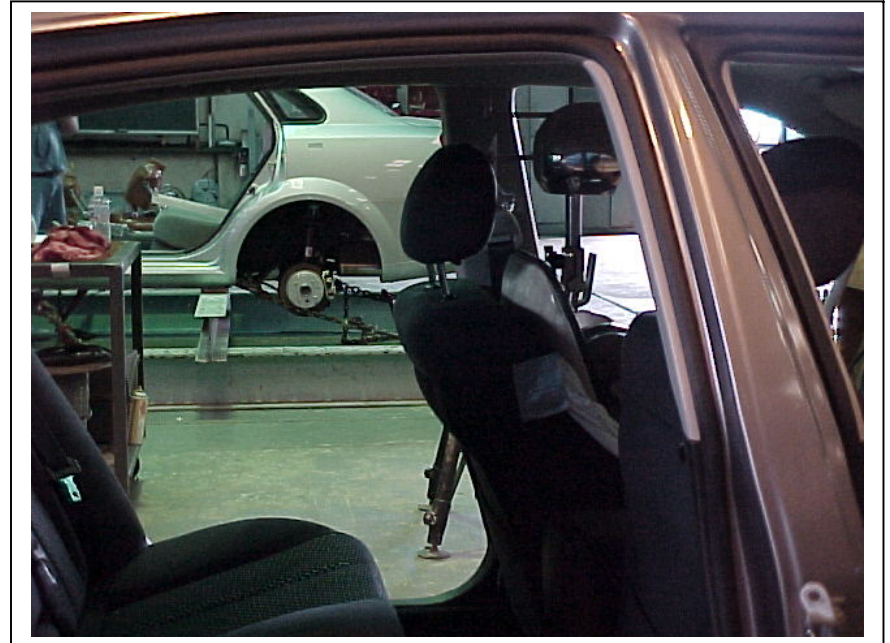
SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 1 WITH HRMD



SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 2 WITH HRMD



C55201 SIDE VIEW OF LOC P1, ITERATION 1, POS 3 WITH HRMD



SIDE VIEW OF LOCATION P1, ITERATION 1, POSITION 4 WITH HRMD

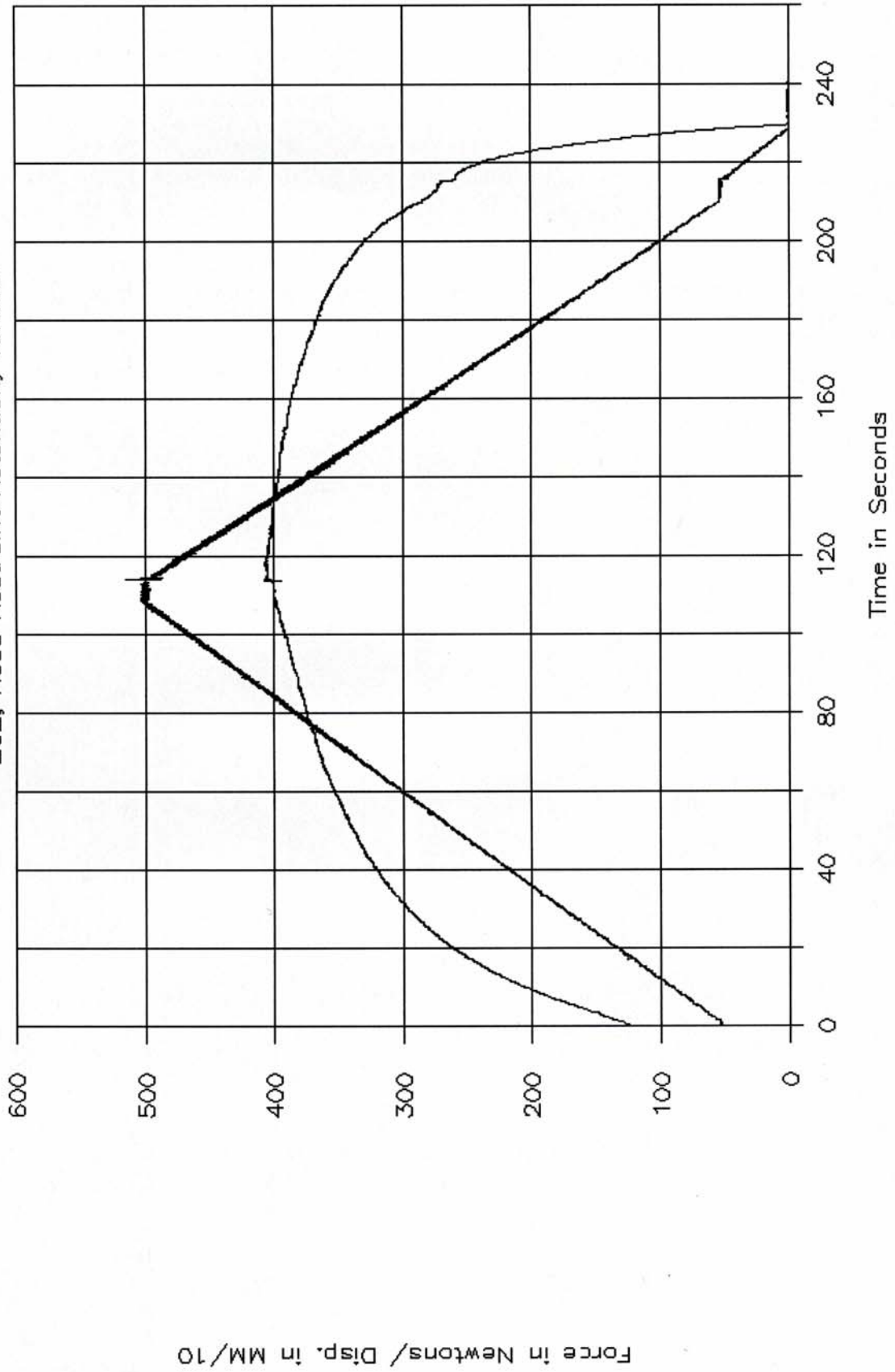


¾ VIEW OF UNOCCUPIED DRIVER SEAT, ITERATION 1

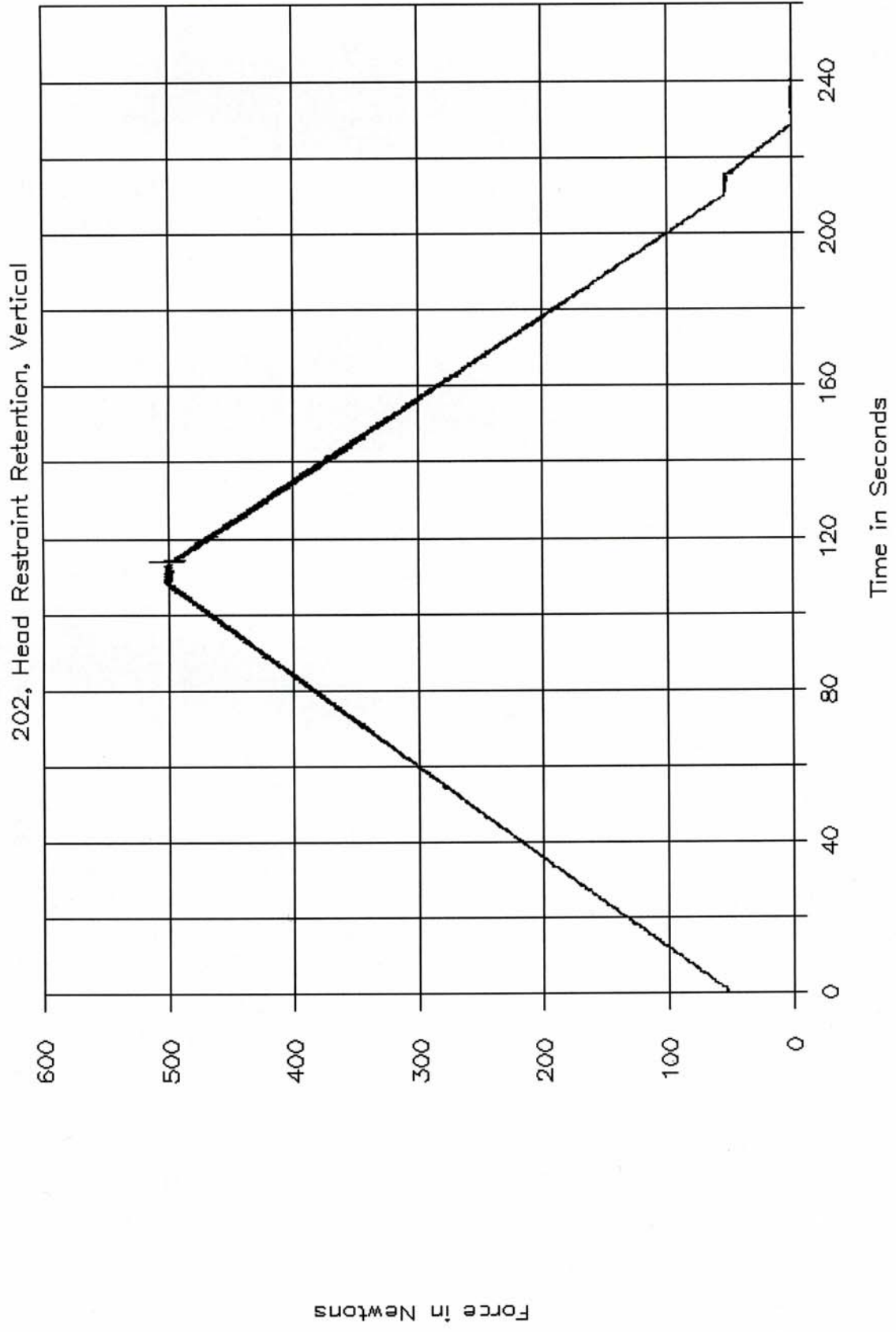
SECTION 6  
TEST PLOTS

# GTL 5395

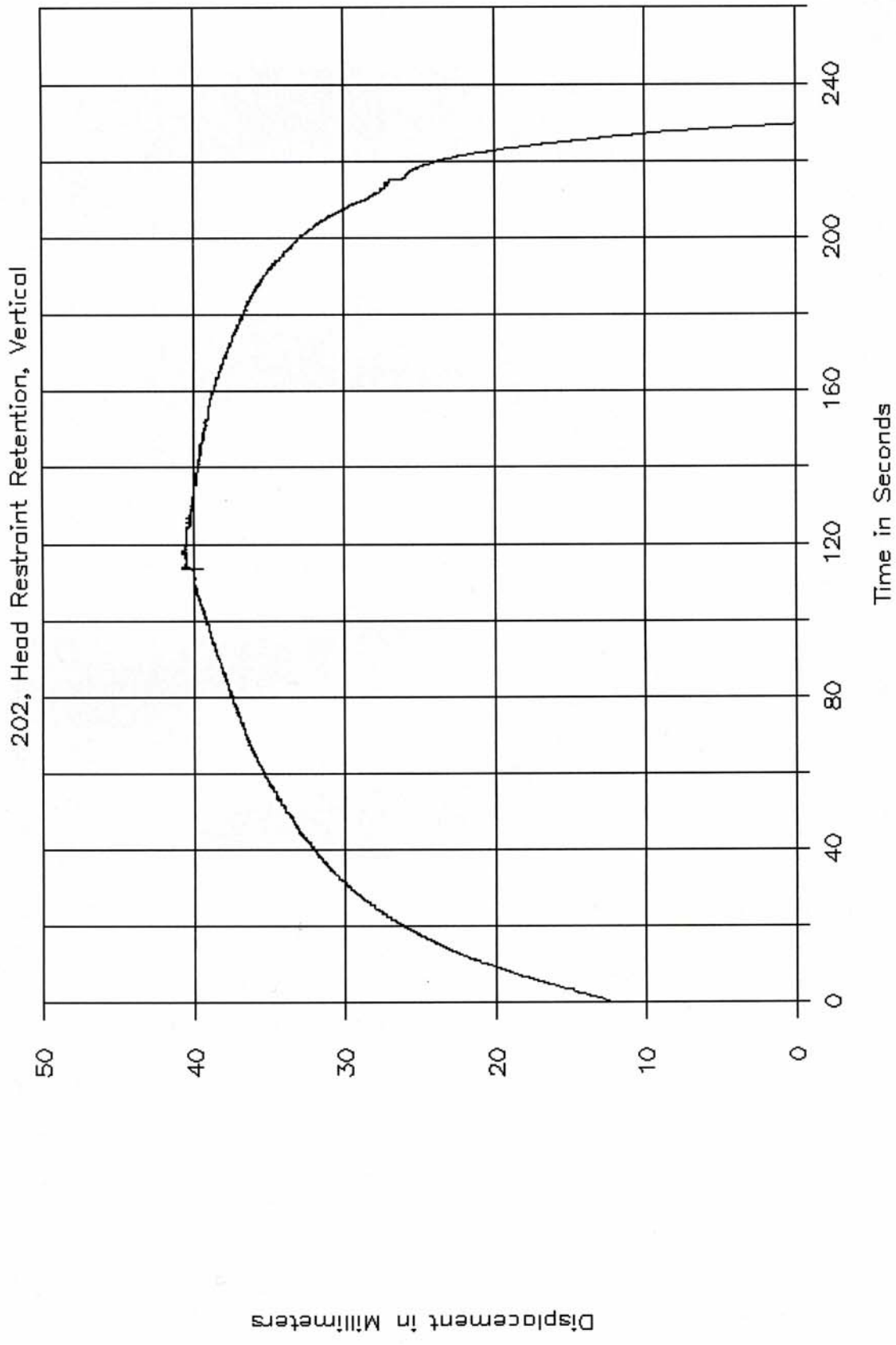
202, Head Restraint Retention, Vertical



# GTL 5395

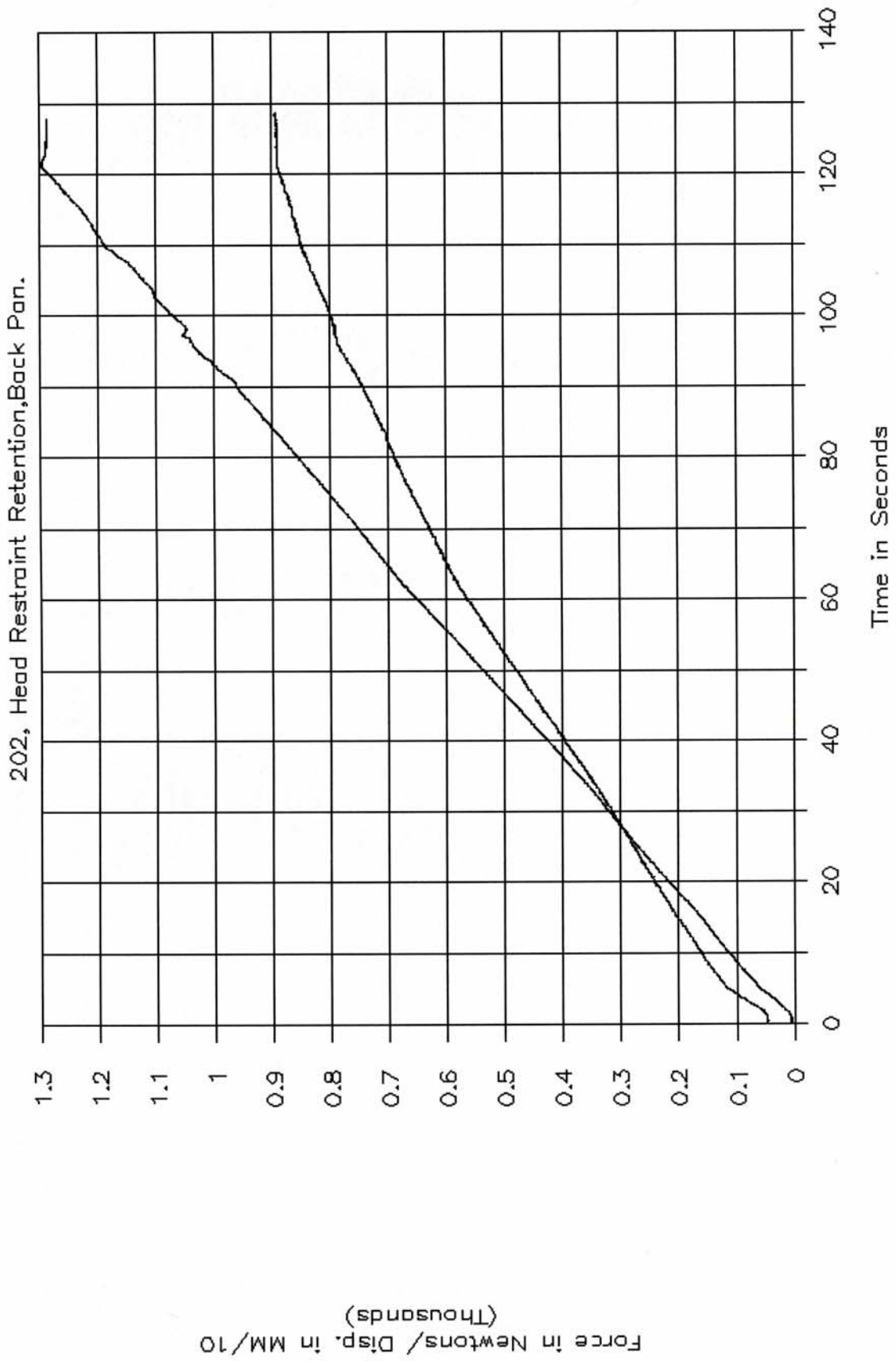


GTL 5395



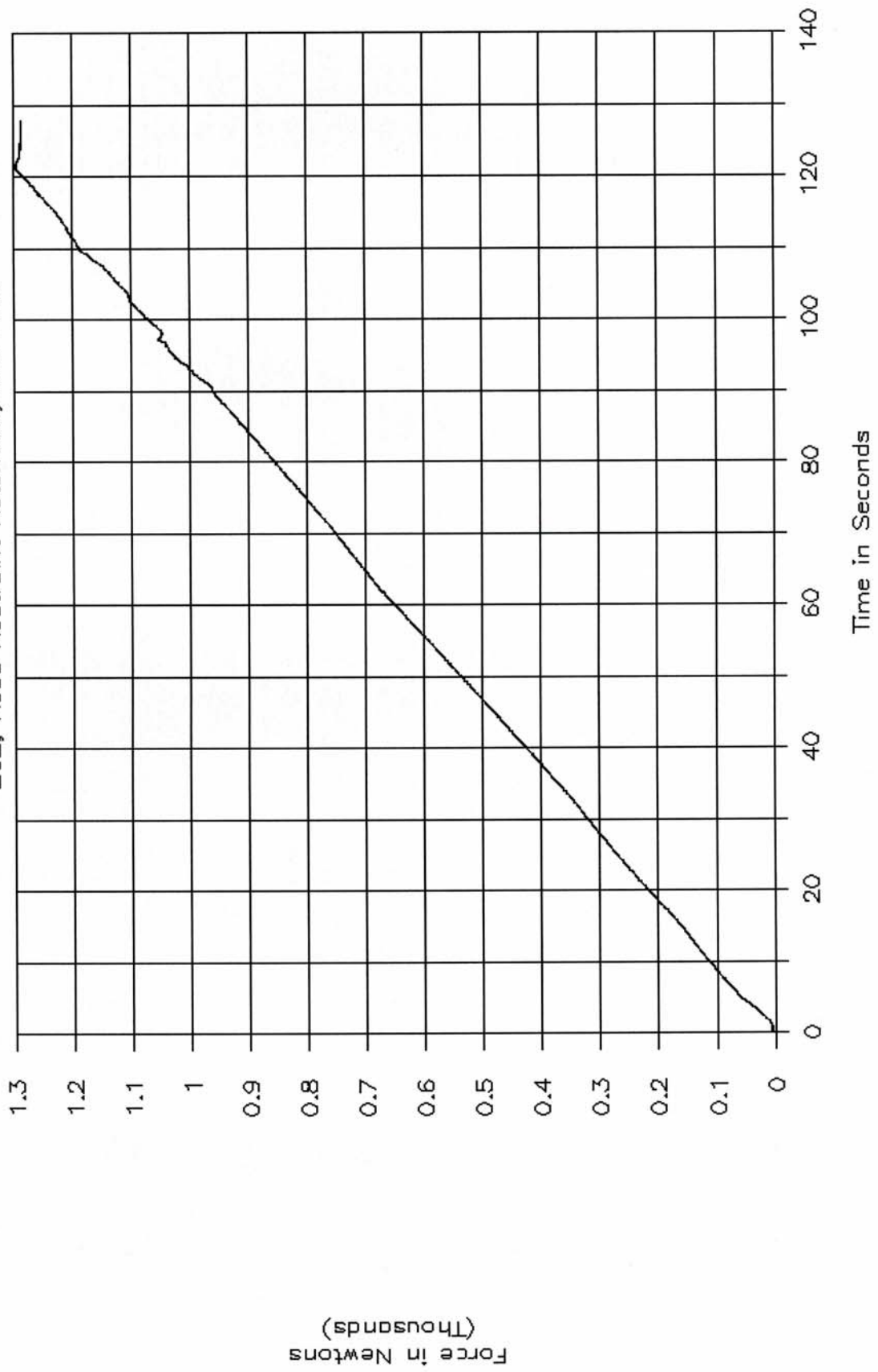


# GTL 5409



# GTL 5409

202, Head Restraint Retention, Back Pan.



GTL 5409

202, Head Restraint Retention, Back Pan.

