REPORT NUMBER 202a-GTL-08-002

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 202aS HEAD RESTRAINTS – STATIC REQUIREMENTS

TOYOTA MOTOR CORPORATION
2008 SCION XD, PASSENGER CAR
NHTSA NO. C85107

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

DECEMBER 5, 2008

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
1200 NEW JERSEY AVE., SE
WASHINGTON, D.C. 20590

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15. Supplementary Notes		
16. Abstract Compliance tests were conducted on the subject, 2008 Scion XD, passenger car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-202aS-00 for the determination of FMVSS 202a compliance. Test failures identified were as follows: NONE		
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PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2008 Scion XD passenger car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 202a testing to determine if the vehicle was in compliance with the requirements of the standard. 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 2008 Scion XD passenger car. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: JTKKU10468J015848

B. NHTSA No.: C85107

C. Manufacturer: TOYOTA MOTOR CORPORATION

D. Manufacture Date: 11/07

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 202a testing during the time period November 13-17, 2008.

SECTION 2

COMPLIANCE TEST RESULTS

2.0 TEST RESULTS

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

Based on the test performed, the 2008 Scion XD passenger car appeared to meet the requirements of FMVSS 202a testing.

SECTION 3

COMPLIANCE TEST DATA

3.0 TEST DATA

The following data sheets document the results of testing on the 2008 Scion XD passenger car.

DATA SHEET 1 (1 of 2)
SUMMARY OF RESULTS

VEH. MOD YR/MAKE/MODEL/BODY STYLE: 2008 SCION XD PASSENGER CAR

VEH. NHTSA NO.: C85107 ; VIN: JTKKU10468J015848

VEH. BUILD DATE: 11/07 ; TEST DATE: November 13-17, 2008

TEST LABORATORY: GENERAL TESTING LABORATORIES

OBSERVERS: G. FARRAND, J. LATANE

A. VISUAL INSPECTION OF TEST VEHICLE

Upon receipt for completeness, function, and discrepancies or damage which might influence the testing.

RESULTS: OK for testing. Due to manufacture date of vehicle, rear DSP's are not required to meet 202a requirements.

B. DIMENSIONAL REQUIREMENTS	PASS	FAIL	N/A
Driver's Side	X		
Passenger's Side	X		
Rear Designated Seating Positions			X

C. OWNER'S MANUAL	PASS	FAIL
	X	

D. REMOVABILITY	PASS	FAIL	N/A
Driver's Side	X		
Passenger's Side	X		
Rear Designated Seating Positions			X

E. NON-USE POSITION	PASS	FAIL	N/A
Rear Designated Seating Positions			X

DATA SHEET 1 (2 of 2)
SUMMARY OF RESULTS

F.	**ENERGY ABSORPTION TEST**	**PASS**	**FAIL**	**N/A**
	Driver's Side			X
	Passenger's Side	X		
	Rear Designated Seating Positions			X
G.	**HEIGHT RETENTION TEST**	**PASS**	**FAIL**	**N/A**
	Driver's Side	X		
	Passenger's Side			X
	Rear Designated Seating Positions			X
H.	**BACKSET RETENTION TEST**	**PASS**	**FAIL**	**N/A**
	Driver's Side	X		
	Passenger's Side			X
	Rear Designated Seating Positions			X

RECORDED BY: G. FARRAND DATE: 11/17/08

APPROVED BY: D. MESSICK

DATA SHEET 2a (1 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C85107 TEST DATE: 11/13/08

Seat Location: DRIVER

Height Measurement

SAE J826 three-dimensional manikin torso angle: 19°

Striker to H-Point (mm): 89 mm (Ahead) Striker to H-Point angle: Down

Position the head restraint in the highest position of vertical adjustment.
Height, Hh (mm): 810 mm X **PASS** **FAIL**

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Position the head restraint in the lowest position of vertical adjustment.
Height, Hl (mm): 767 mm X **PASS** **FAIL**

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 745 mm

Width, W (mm): 207 mm X **PASS** **FAIL**

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm. N/A

DATA SHEET 2a (2 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: 19°

Striker to H-Point (mm): 90 mm Striker to H-Point angle: Down

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): 37 mm X PASS FAIL

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: None

Least dimension of each gap (measured with a steel tape): N/A

Size of each gap (as measured with the spherical head form):

Gap Size N/A X PASS FAIL

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: G. FARRAND DATE: 11/14/08

APPROVED BY: D. MESSICK

DATA SHEET 2b (1 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C85107 TEST DATE: 11/13/08

Seat Location: PASSENGER

Height Measurement

SAE J826 three-dimensional manikin torso angle: 19°

Striker to H-Point (mm): 87 mm (Ahead) Striker to H-Point angle: Down

Position the head restraint in the highest position of vertical adjustment.
Height, Hh (mm): 808 mm X **PASS** **FAIL**

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Position the head restraint in the lowest position of vertical adjustment.
Height, Hl (mm): 767 mm X **PASS** **FAIL**

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere. N/A

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 743 mm

Width, W (mm): 208 mm X **PASS** **FAIL**

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm. N/A

DATA SHEET 2b (2 of 2)
DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: 18.9°

Striker to H-Point (mm): 86 mm Striker to H-Point angle: Down

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): 36 mm X PASS FAIL

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: None

Least dimension of each gap (measured with a steel tape): N/A

Size of each gap (as measured with the spherical head form):

Gap Size N/A X PASS FAIL

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: G. FARRAND DATE: 11/14/08

APPROVED BY: D. MESSICK

DATA SHEET 3
OWNER'S MANUAL

VEH. NHTSA NO.: C85107 TEST DATE: 11/13/08

Emphasize that all occupants should place their head restraint in a proper position prior to operating the vehicle in order to prevent the risk of serious injury.

PASS X FAIL _____

Description of the head restraint system and identification of which seats are equipped.

PASS X FAIL _____

If the head restraint is removable, instructions on how to properly remove and reinstall using a deliberate action distinct from any act necessary for adjustment.

PASS X FAIL _____ N/A _____

Warning that all head restraints must be reinstalled properly to protect occupants.

PASS X FAIL _____

Describe the adjustment of the head restraints and/or seat back to achieve proper head restraint position relative the head. The description must include the following:

1) a presentation and explanation of the main components of the vehicle's head restraints

2) the basic requirements for proper head restraint operation, including an explanation of the actions that may affect the proper functioning of the head restraints.

3) the basic requirements for proper positioning of a head restraint in relation to an occupant's head position, including information regarding the proper positioning of the center of gravity of an occupant's head in relation to the head restraint.

PASS X FAIL _____

Include copies of relevant pages from the owner's manual in the final report.

REMARKS:

RECORDED BY: G. FARRAND DATE: 11/14/08

APPROVED BY: D. MESSICK

DATA SHEET 4
REMOVABILITY

VEH. NHTSA NO.: C85107 TEST DATE: 11/13/08

Are the head restraints removable? X **YES** **NO**

If removable, does removal REQUIRE an action distinct from actions to adjust the head restraint?
X **YES (PASS)** **NO (FAIL)**

Description of action(s) for head restraint adjustment:
Lift upward on head restraint to raise; Push in and hold release button on left side post while pushing down on headrest to lower.

Description of distinct action for removal: Push in on release button on right side post with key While lifting upward on head restraint to remove.

REMARKS:

RECORDED BY: G. FARRAND DATE: 11/14/08

APPROVED BY: D. MESSICK

DATA SHEET 5
ENERGY ABSORPTION TEST

VEH. NHTSA NO.: C85107 TEST DATE: 11/17/08

Seat Location: PASSENGER Type of head restraint: ADJUSTABLE

Test Number: 6117

635 mm Height Measurement for lower boundary of the impact zone

SAE J826 three-dimensional manikin torso angle: 19°

Striker to H-Point (mm): 87 mm Striker to H-Point angle: Down

Description of equipment or method used to rigidly fix the seat back: Telescoping steel tube brace from top of seat back frame to rear floor of vehicle.

Accelerometer identification: F209 Accelerometer type/brand: ENDEVCO

Last calibration date: 11/08

Head form vertical angle (-2° - +2°): 0.0

Distance between head form and target location (> or = 25 mm): 40 mm

Impact velocity (23.6 kph ± 0.5 kph): 23.2 KpH

Impact location: 100 mm down from top of headrest on left/right centerline of headrest.

Maximum deceleration (< or = 785 m/s² (80 g)): 37.2 **PASS** X **FAIL**

REMARKS:

RECORDED BY: G. FARRAND DATE: 11/17/08

APPROVED BY: D. MESSICK

DATA SHEET 6
HEIGHT RETENTION TEST
(ADJUSTABLE HEAD RESTRAINTS ONLY)

VEH. NHTSA NO.: C85107 TEST DATE: 11/14/08

Seat Location: DRIVER Test Number: 6111, 6112

Pre-test measurements

SAE J826 Manikin torso angle: 19° Top of Head Restraint Height (mm): 810 mm

Striker to H-Point (mm): 89 mm Striker to H-Point angle: Down

Description of height retention lock: Spring loaded catch on left side post with four locking positions.

Test measurements

Initial load (50 N ± 1 N): 55 N Initial Displacement, D1 (mm): 11.7 mm

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

Maximum load (495 N ± 5 N): 505 N Maximum Displacement, D2 (mm): 32.4 mm

Return load (50 N ± 1 N): 52 N Return Displacement, D3 (mm): 12.5 mm

Total displacement (D3-D1) < 13 mm: 0.8 mm **PASS** X **FAIL**

REMARKS:

RECORDED BY: G. FARRAND DATE: 11/17/08

APPROVED BY: D. MESSICK

DATA SHEET 7
BACKSET RETENTION TEST

VEH. NHTSA NO.: C85107 TEST DATE: 11/17/08

Seat Location: DRIVER Type of head restraint: ADJUSTABLE

Test Number: 6113, 6114, 6115, 6116

Pre-test measurements

SAE J826 Manikin torso angle: 19° Top of Head Restraint Height (mm): 810 mm

Striker to H-Point (mm): 89 mm Striker to H-Point angle: Down

Displacement torso reference line

Test device back pan angle: 19.4°

Distance from the H-point to the initial location of the load (0.290 ± 0.013 m): .29 m

Initial load (N): 1290 N Initial moment (373 ± 7.5 Nm): 374 Nm

Backset retention and strength

Distance from the H-point to the head form tangency point (m): .745 m

Head Restraint contact (mm) : -50.6 mm

Initial load (N): 50 N @ -40.6 mm Initial moment (37 ± 0.7 Nm): 37 Nm

Initial head form displacement, D1 (< or = 25 mm): 10 mm **PASS** X **FAIL**

Load range to generate a 373 ± 7.5 Nm rearward moment (N): 500.6 N

Actual load applied (N): 490N Resultant moment (Nm): 366 Nm

Maximum Head form displacement, D2 (< or = 102 mm): 39.2 mm **PASS** X **FAIL**

Final head form displacement, D3 (mm): -27.8 mm
measured at (37 ± 0.7 Nm)

Total displacement (D3-D1) < 13 mm : 12.8 mm **PASS** X **FAIL**

Maximum applied load (> or equal to 885 N): 885 N **PASS** X **FAIL**

REMARKS:

RECORDED BY: G. FARRAND DATE: 11/17/08
APPROVED BY: D. MESSICK

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		
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	90º, 45º	BEFORE USE	BEFORE USE
LEVEL, LASER	GAERTNER	2789-A	BEFORE USE	BEFORE USE
ACCELEROMETER	ENDEVCO	F209	11/08	11/09
LOAD CELL	SENSOTEC	257818	01/08	01/09
LOAD CELL	INTERFACE	27246	05/08	05/09
STRING POT	WALDALE	102	BEFORE USE	BEFORE USE
STRING POT	CELESCO	69	BEFORE USE	BEFORE USE

SECTION 5
PHOTOGRAPHS

2008 SCION XD
NHTSA NO. C85107
FMVSS NO. 202a

FIGURE 5.1
LEFT SIDE VIEW OF VEHICLE

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FMVSS NO. 202a

FIGURE 5.2
RIGHT SIDE VIEW OF VEHICLE

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FMVSS NO. 202a

FIGURE 5.3
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE

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FIGURE 5.4
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE

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FMVSS NO. 202a

FIGURE 5.5
VEHICLE CERTIFICATION LABEL

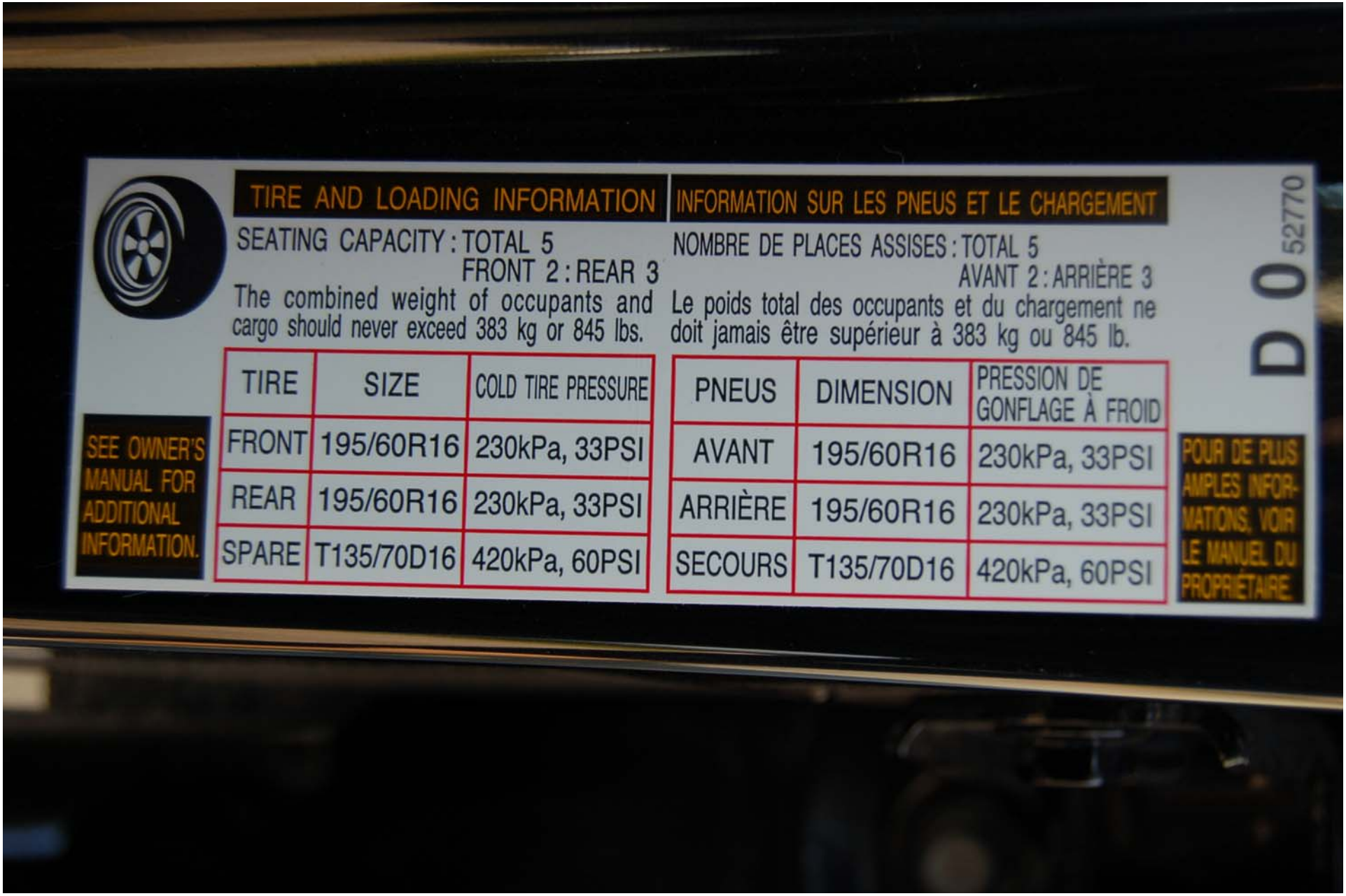

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FIGURE 5.6
VEHICLE TIRE INFORMATION LABEL

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FIGURE 5.7
DRIVER SEAT HEAD RESTRAINT

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FMVSS NO. 202a

FIGURE 5.8
PASSENGER SEAT HEAD RESTRAINT

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NHTSA NO. C85107
FMVSS NO. 202a

FIGURE 5.9
ROW 2, RIGHT SIDE HEAD RESTRAINT

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NHTSA NO. C85107
FMVSS NO. 202a

FIGURE 5.10
ROW 2, CENTER HEAD RESTRAINT

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FIGURE 5.11
ROW 2, LEFT SIDE HEAD RESTRAINT

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FIGURE 5.12
J826 MANIKIN POSITIONED IN DRIVER SEAT

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FMVSS NO. 202a

FIGURE 5.13
DRIVER HEAD RESTRAINT IN LOWEST POSITION

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FMVSS NO. 202a

FIGURE 5.14
DRIVER HEAD RESTRAINT IN HIGHEST POSITION

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FIGURE 5.15
DRIVER HEAD RESTRAINT WIDTH MEASUREMENT

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FIGURE 5.16
DRIVER HEAD RESTRAINT HRMD BACKSET MEASUREMENT

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FIGURE 5.17
DRIVER HEAD RESTRAINT IMPACT ZONE AND GAPS

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FMVSS NO. 202a

FIGURE 5.18
TYPICAL HEAD RESTRAINT ADJUSTMENT BUTTON

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FIGURE 5.19
TYPICAL HEAD RESTRAINT REMOVAL BUTTON

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FMVSS NO. 202a

FIGURE 5.20
J826 MANIKIN POSITIONED IN PASSENGER SEAT

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FMVSS NO. 202a

FIGURE 5.21
PASSENGER HEAD RESTRAINT IN LOWEST POSITION

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FMVSS NO. 202a

FIGURE 5.22
PASSENGER HEAD RESTRAINT IN HIGHEST POSITION

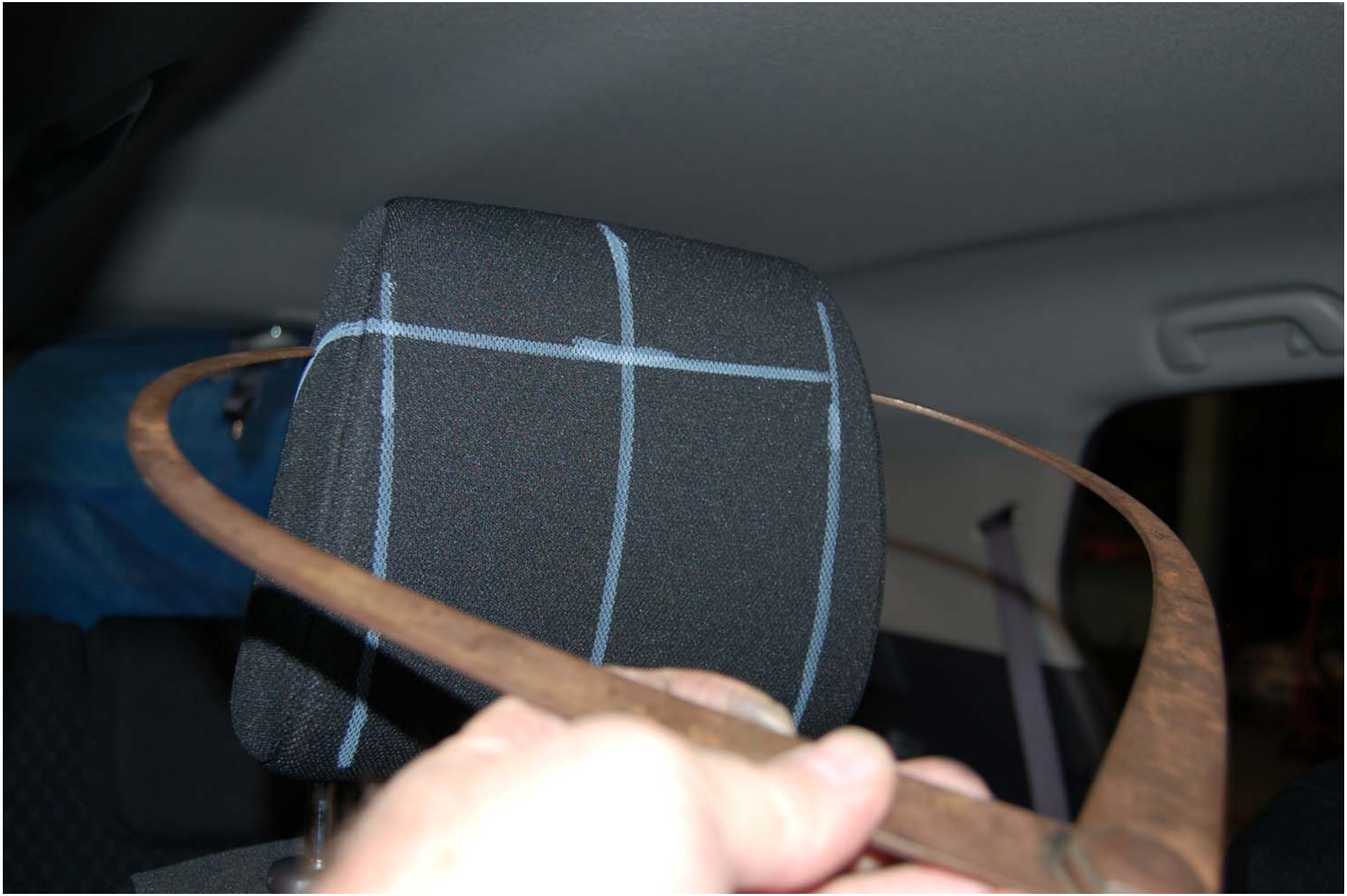

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FIGURE 5.23
PASSENGER HEAD RESTRAINT WIDTH MEASUREMENT

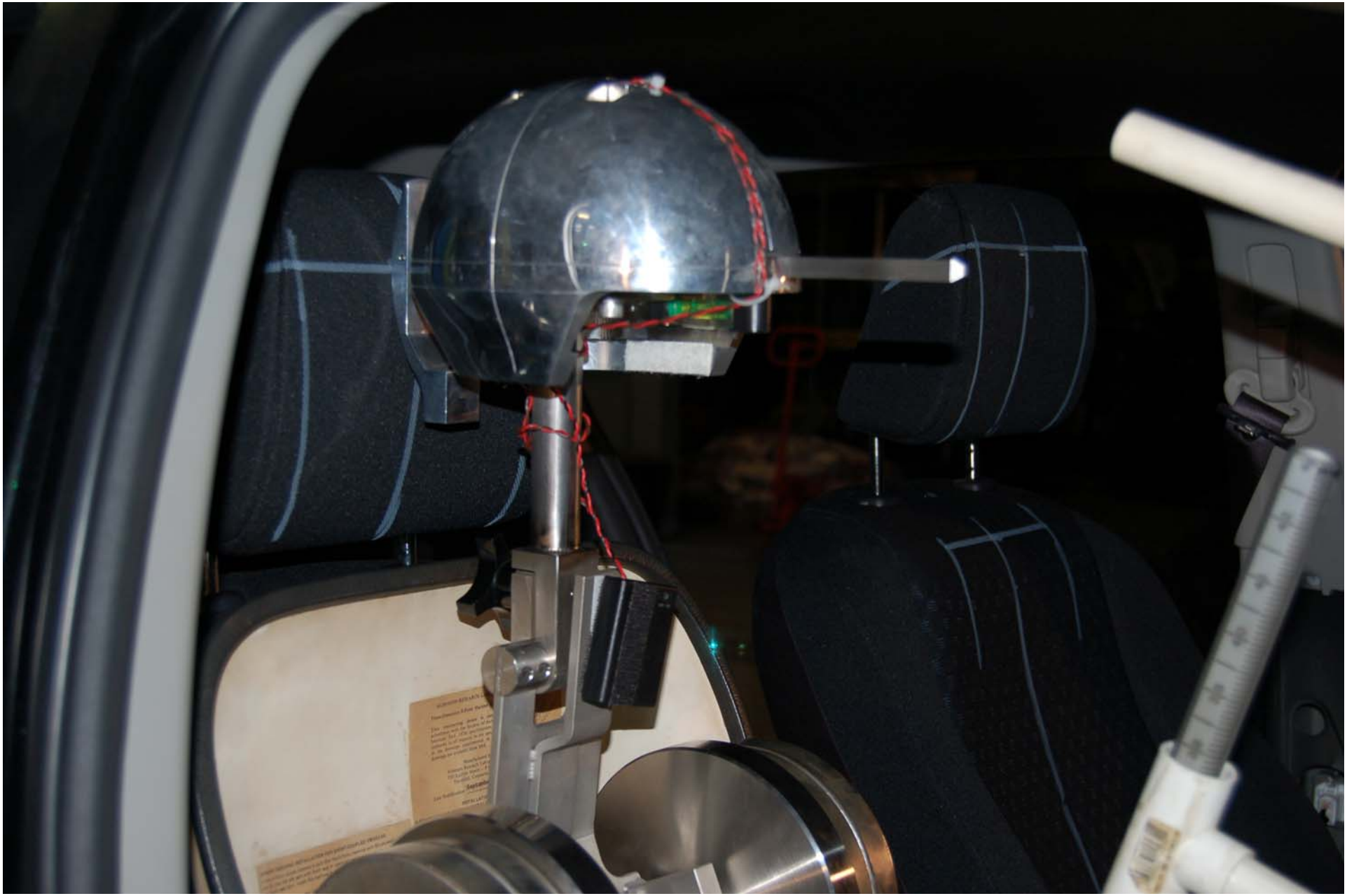

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FIGURE 5.24
PASSENGER HEAD RESTRAINT HRMD BACKSET MEASUREMENT

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FIGURE 5.25
PASSENGER HEAD RESTRAINT IMPACT ZONE AND GAPS

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FIGURE 5.26
PRE-TEST SET-UP FOR HEIGHT RETENTION

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FIGURE 5.27
HEAD RESTRAINT WITH 50 N LOAD FOR HEIGHT RETENTION

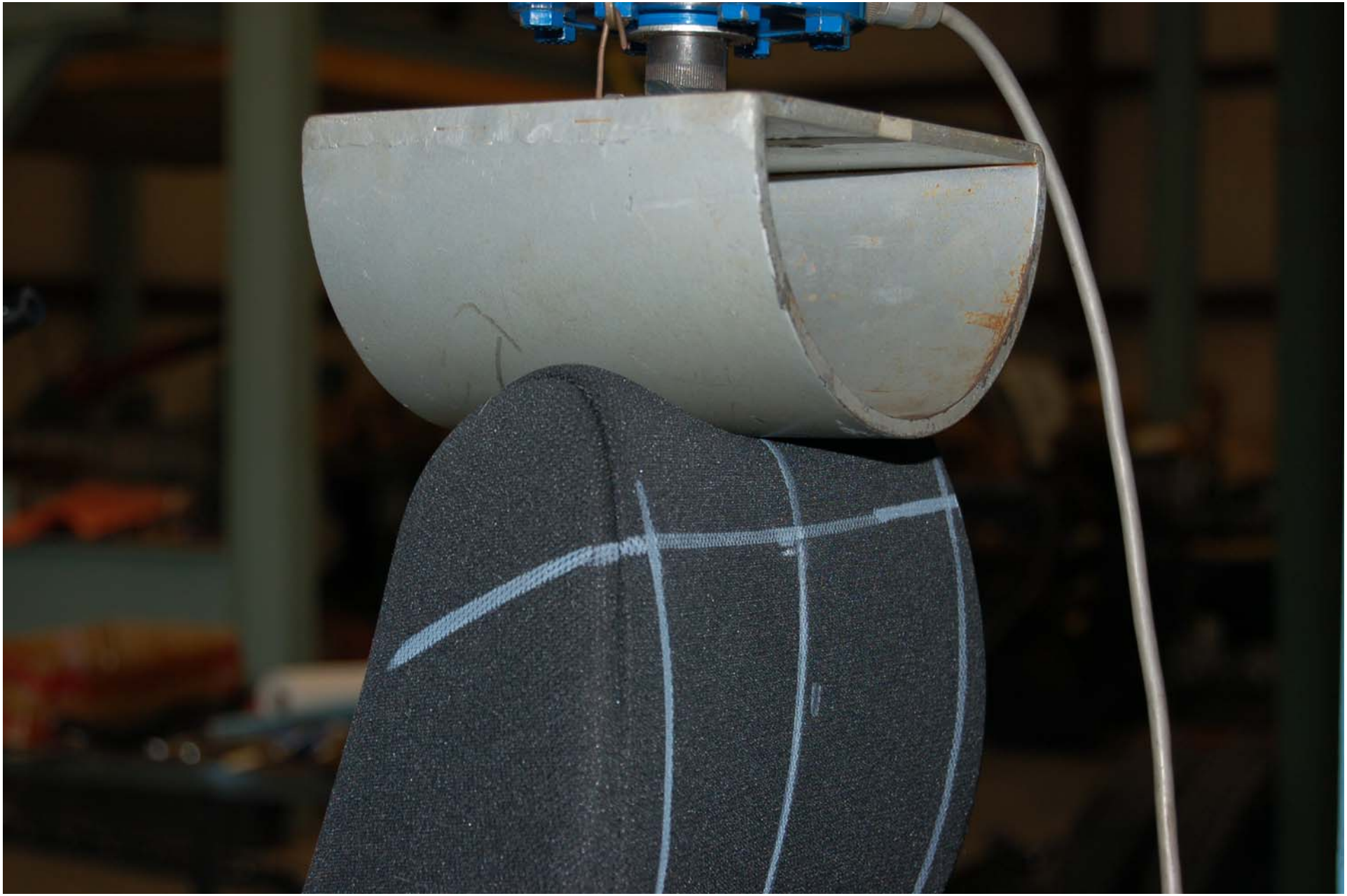

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FIGURE 5.28
HEAD RESTRAINT WITH FULL LOAD FOR HEIGHT RETENTION

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FIGURE 5.29
HEAD RESTRAINT POST TEST HEIGHT RETENTION TEST

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FIGURE 5.30
PRE-TEST SET-UP FOR BACKSET RETENTION TEST

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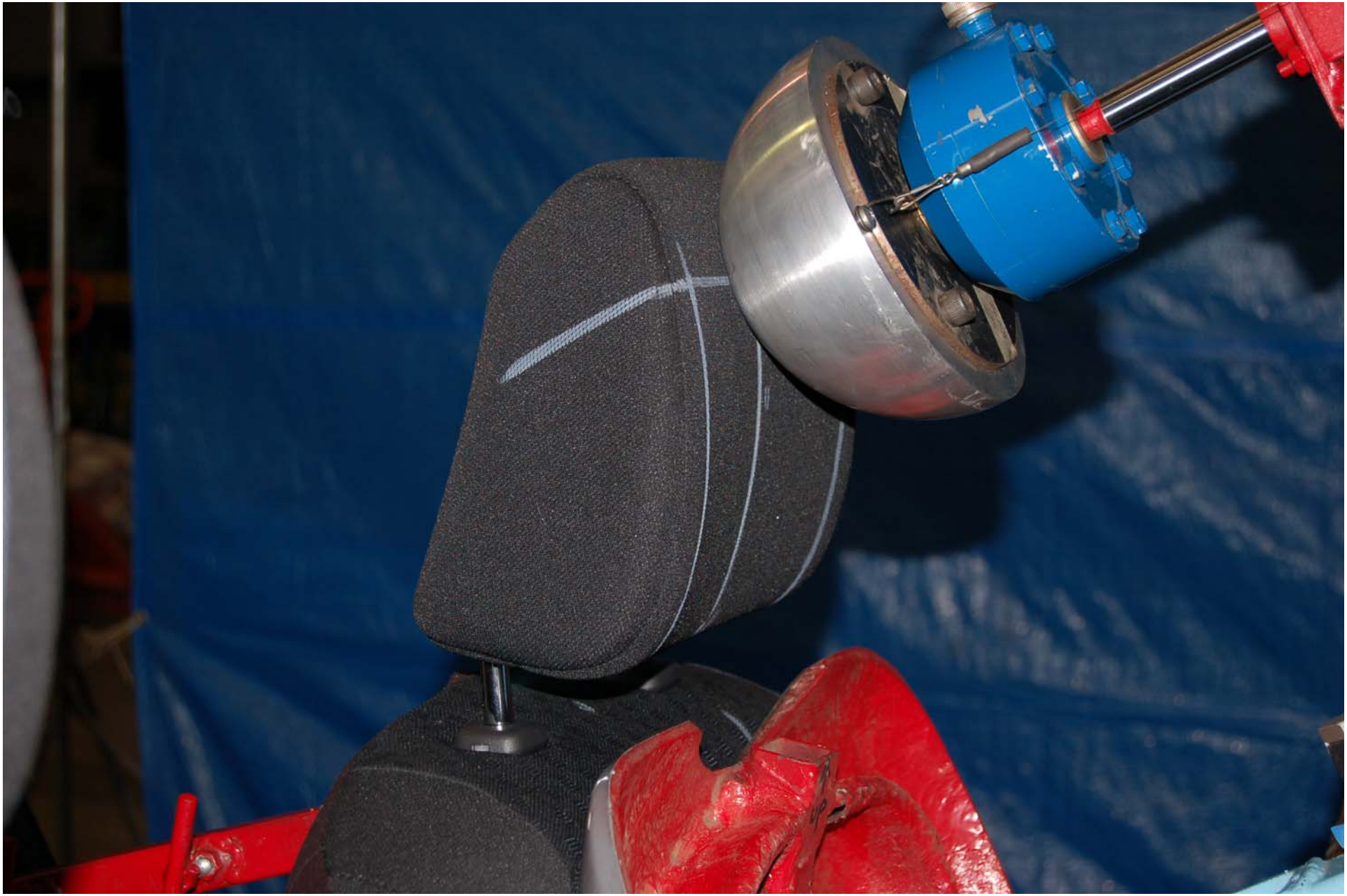
FIGURE 5.31
BACK PAN LOADING FOR DISPLACED TORSO LINE



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FMVSS NO. 202a

FIGURE 5.32
HEAD RESTRAINT WITH 37 Nm LOAD APPLIED

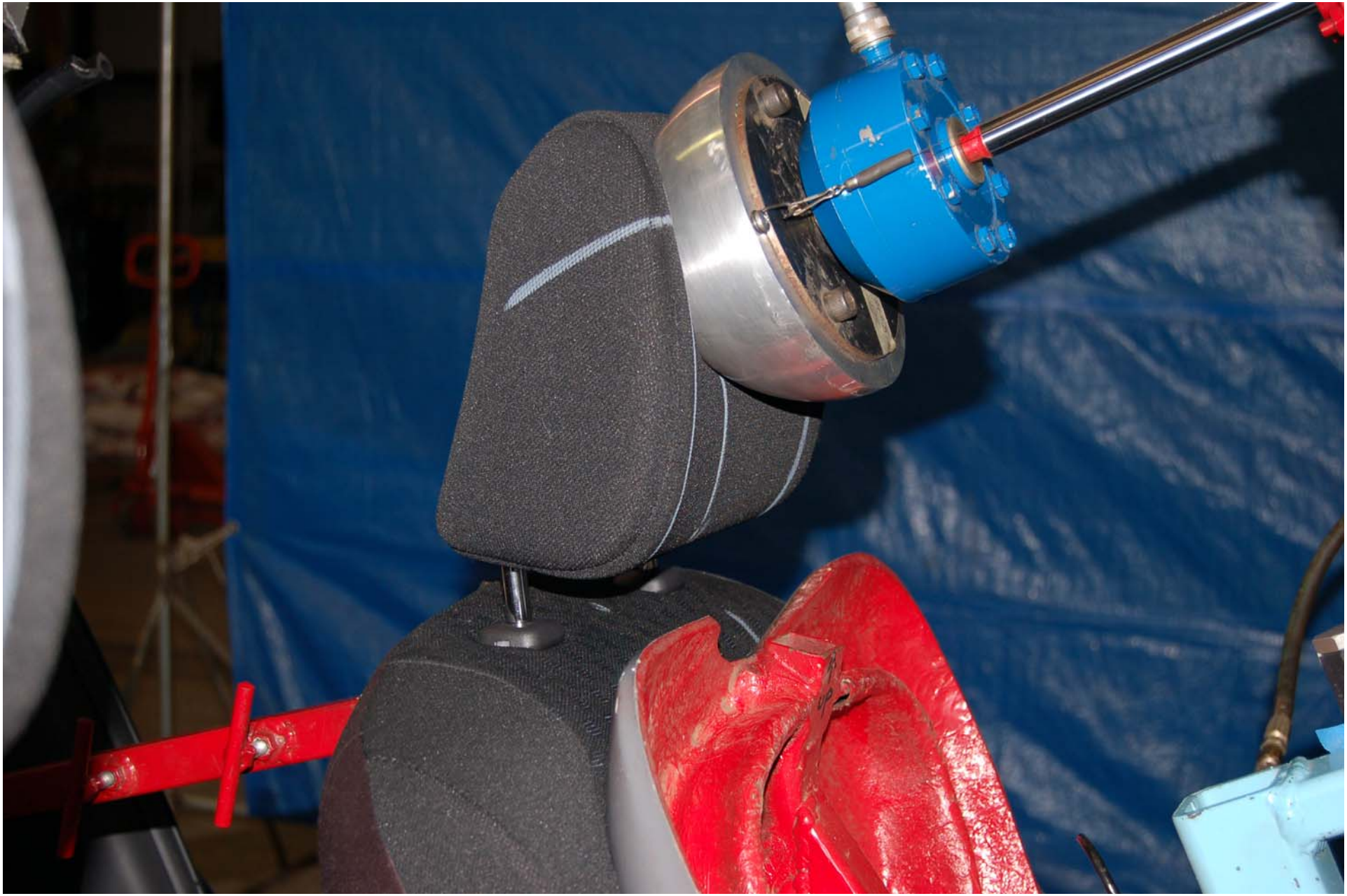

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FIGURE 5.33
HEAD RESTRAINT WITH 373 Nm LOAD APPLIED

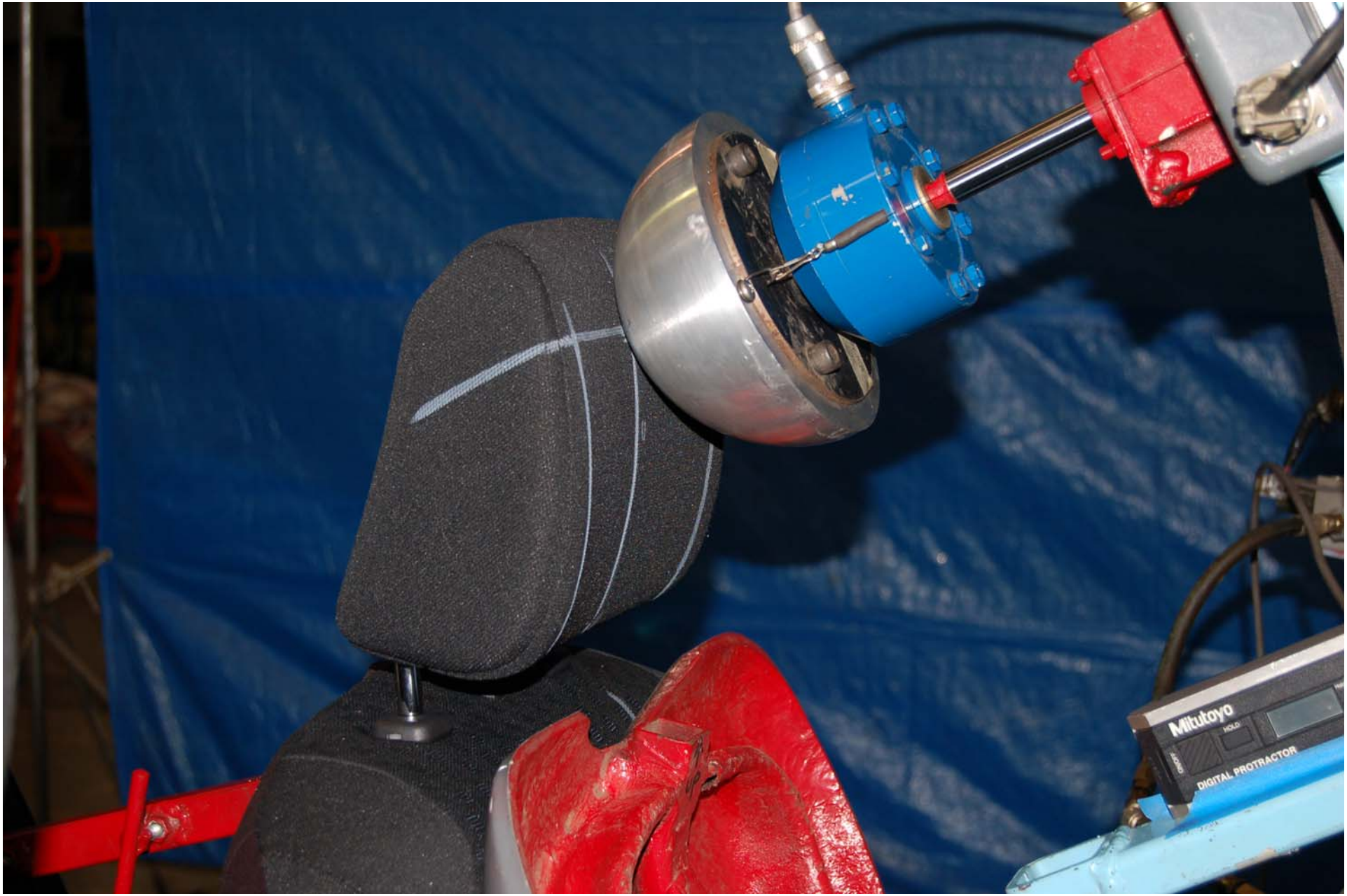

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FIGURE 5.34
HEAD RESTRAINT WITH 37Nm LOAD REAPPLIED

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FIGURE 5.35
HEAD RESTRAINT POST TEST BACKSET TESTING

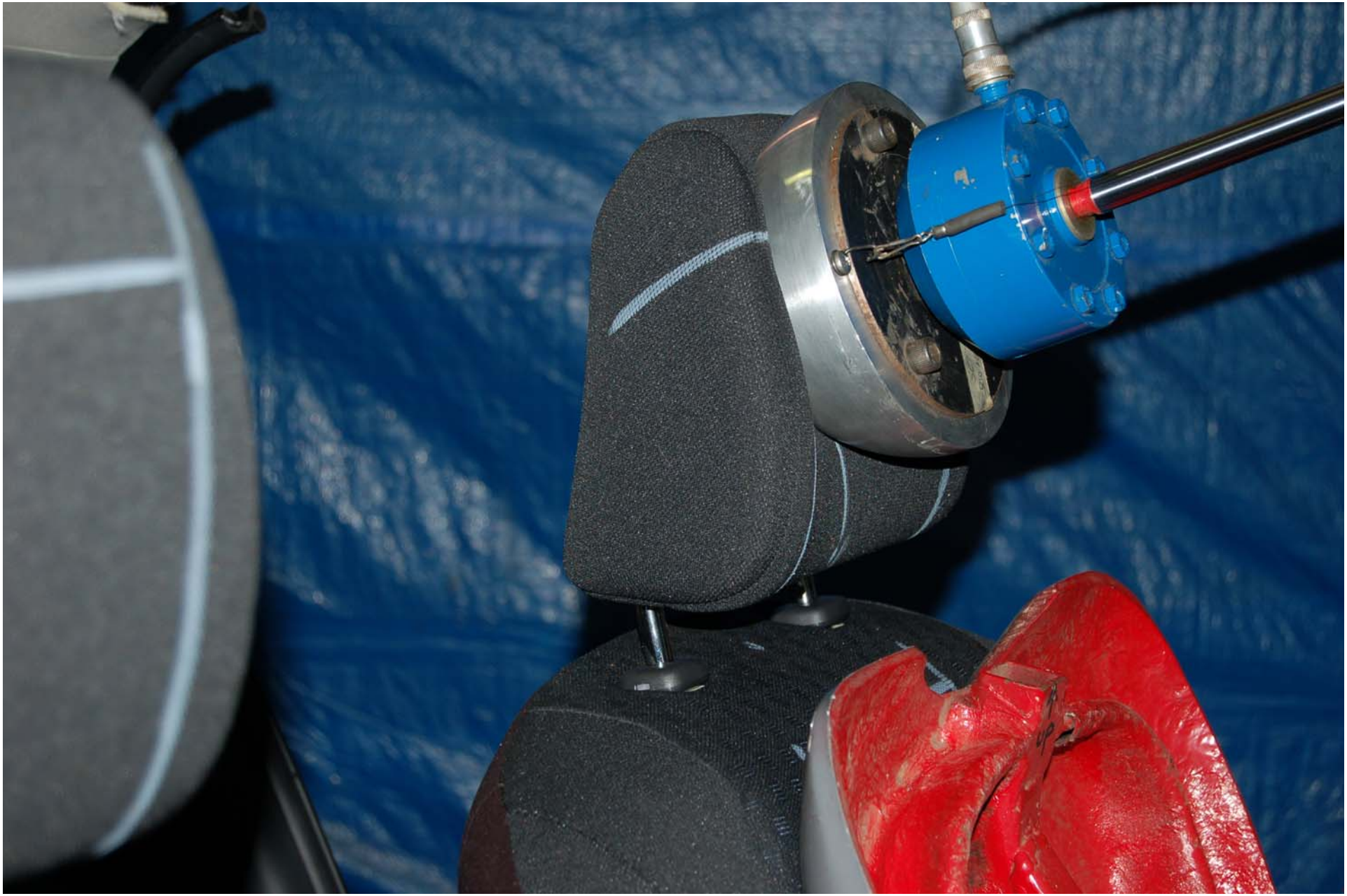

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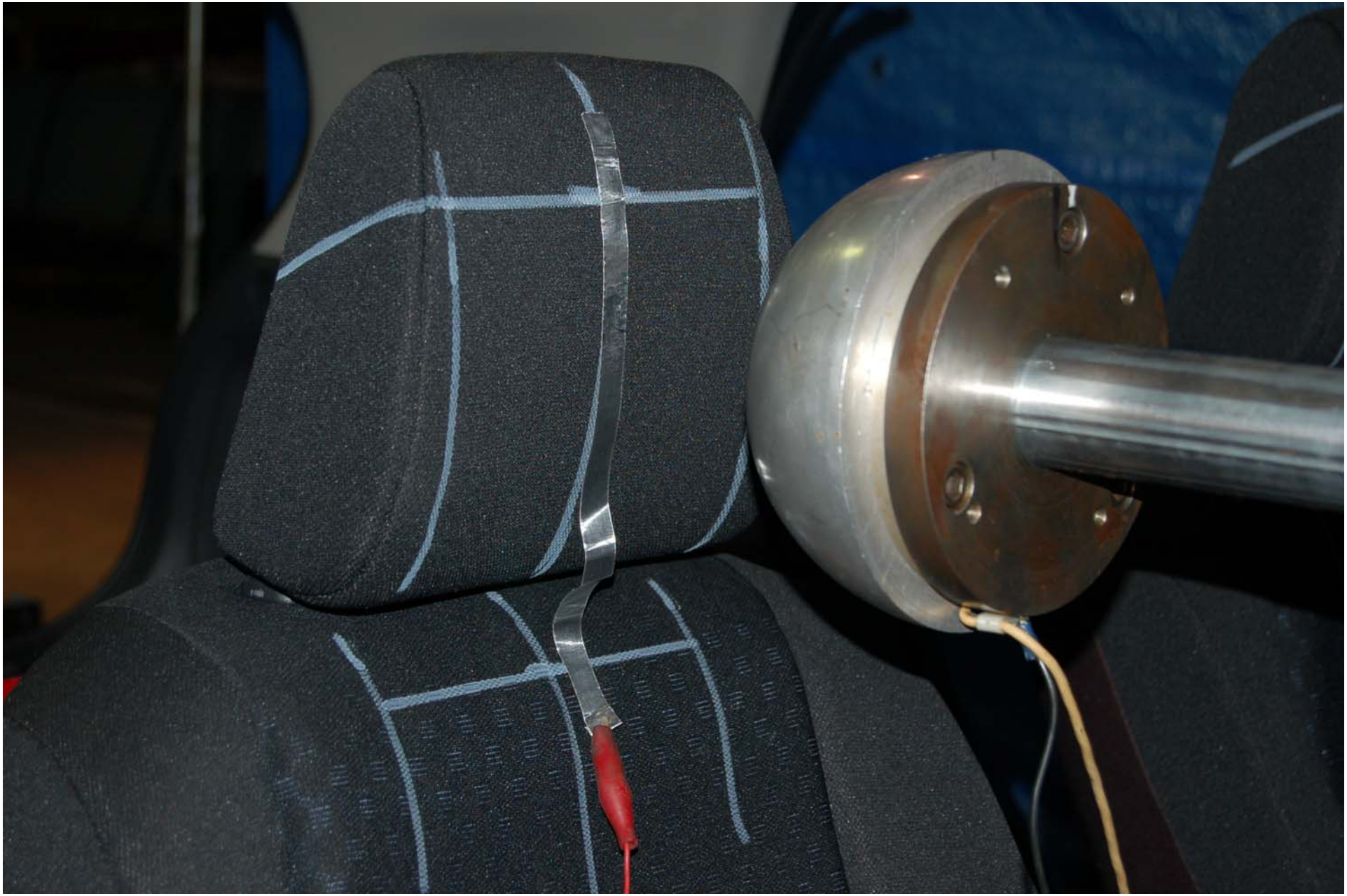
FIGURE 5.36
HEAD RESTRAINT WITH 895 N LOAD APPLIED



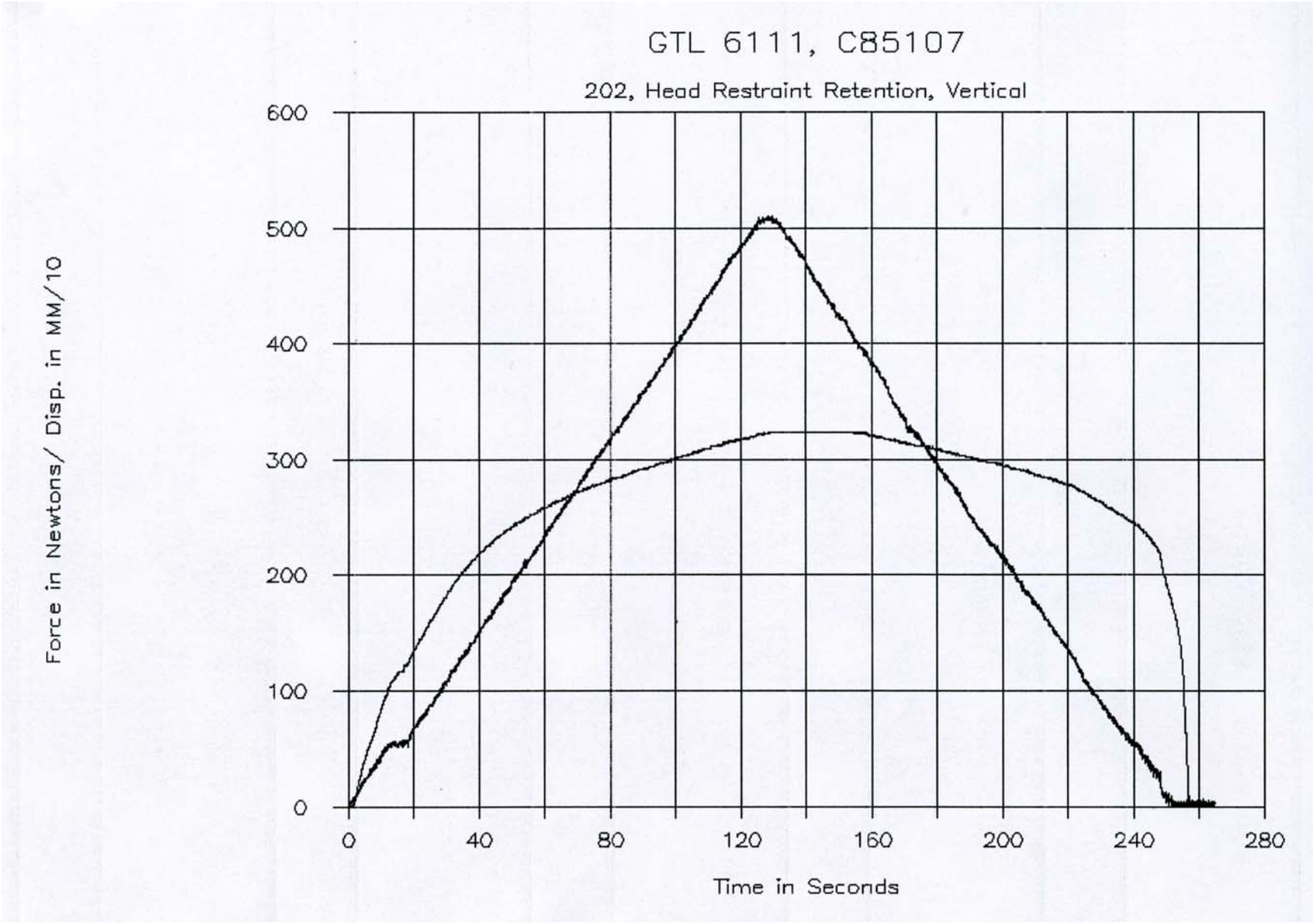
2008 SCION XD
NHTSA NO. C85107
FMVSS NO. 202a

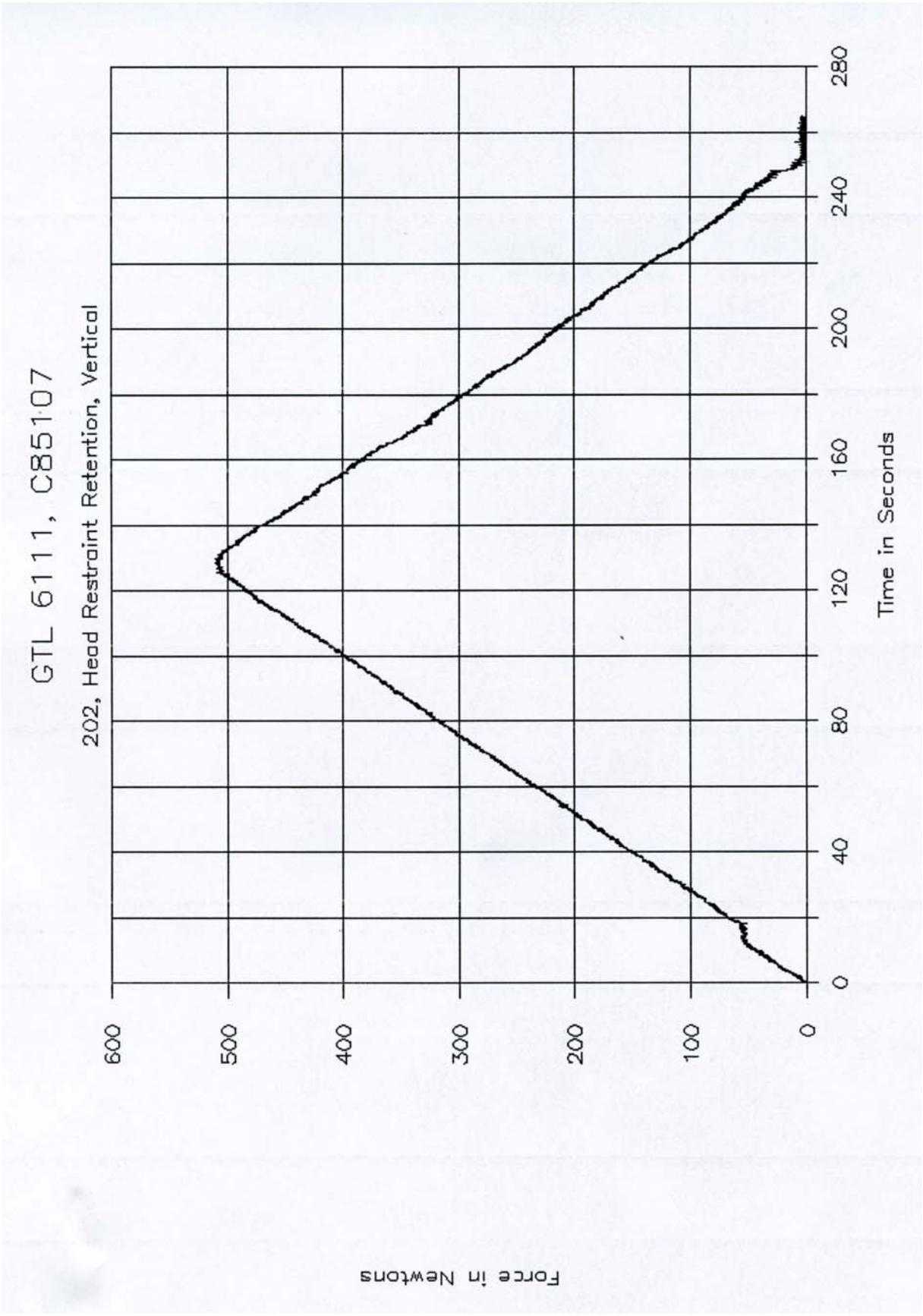
FIGURE 5.37
PRE-TEST SET-UP FOR ENERGY ABSORPTION TEST

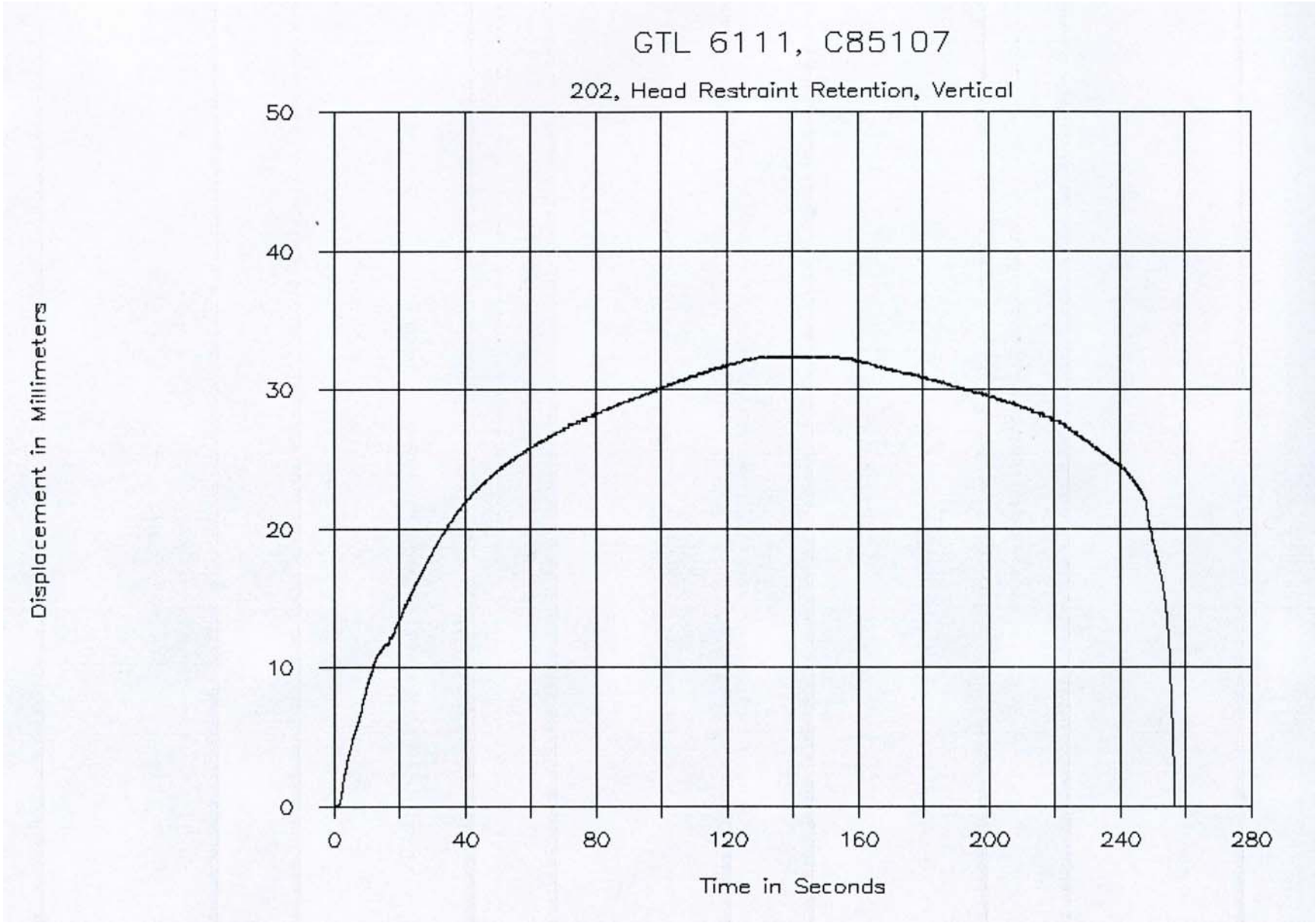
2008 SCION XD
NHTSA NO. C85107
FMVSS NO. 202a

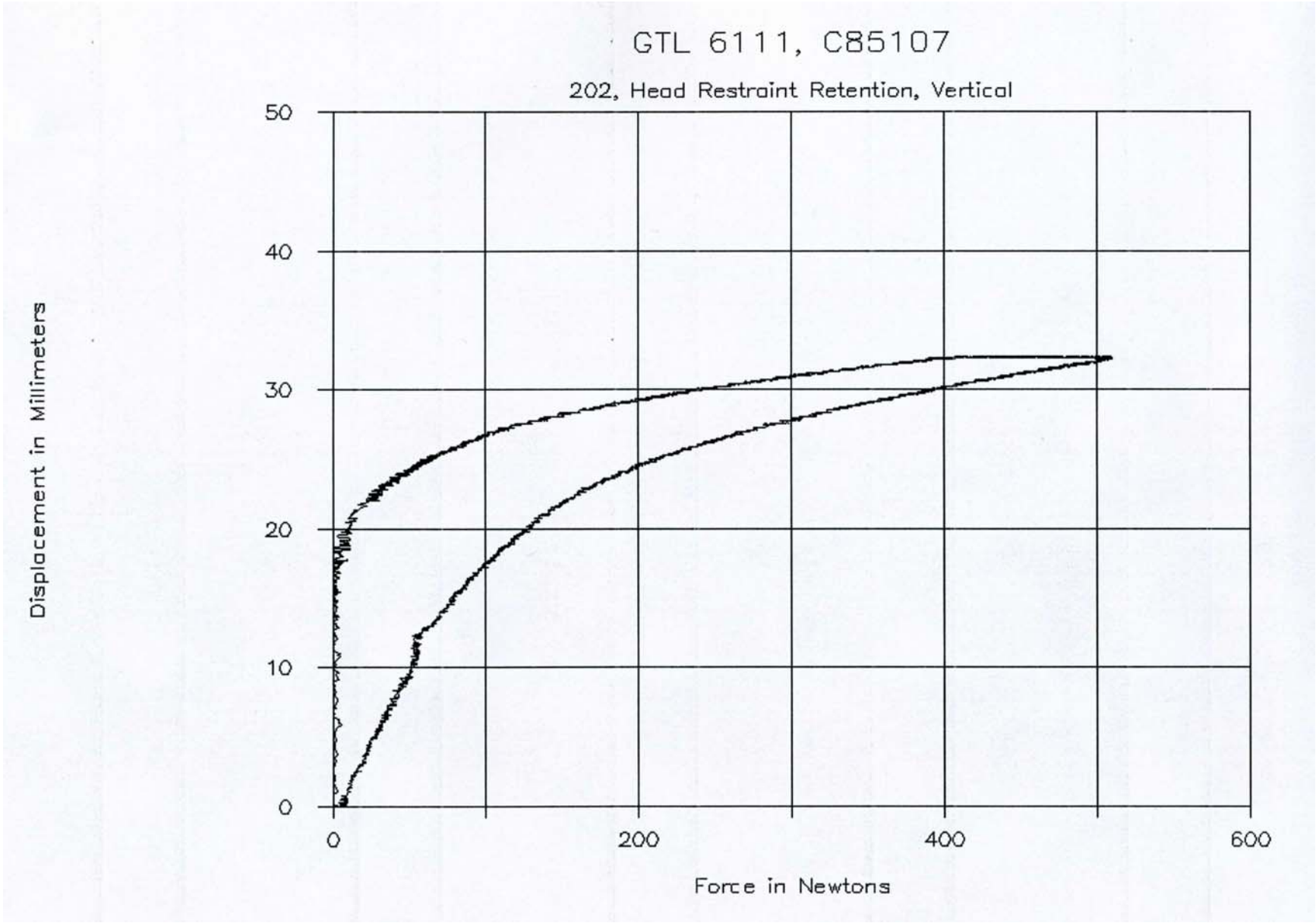
FIGURE 5.38
POST TEST ENERGY ABSORPTION TEST

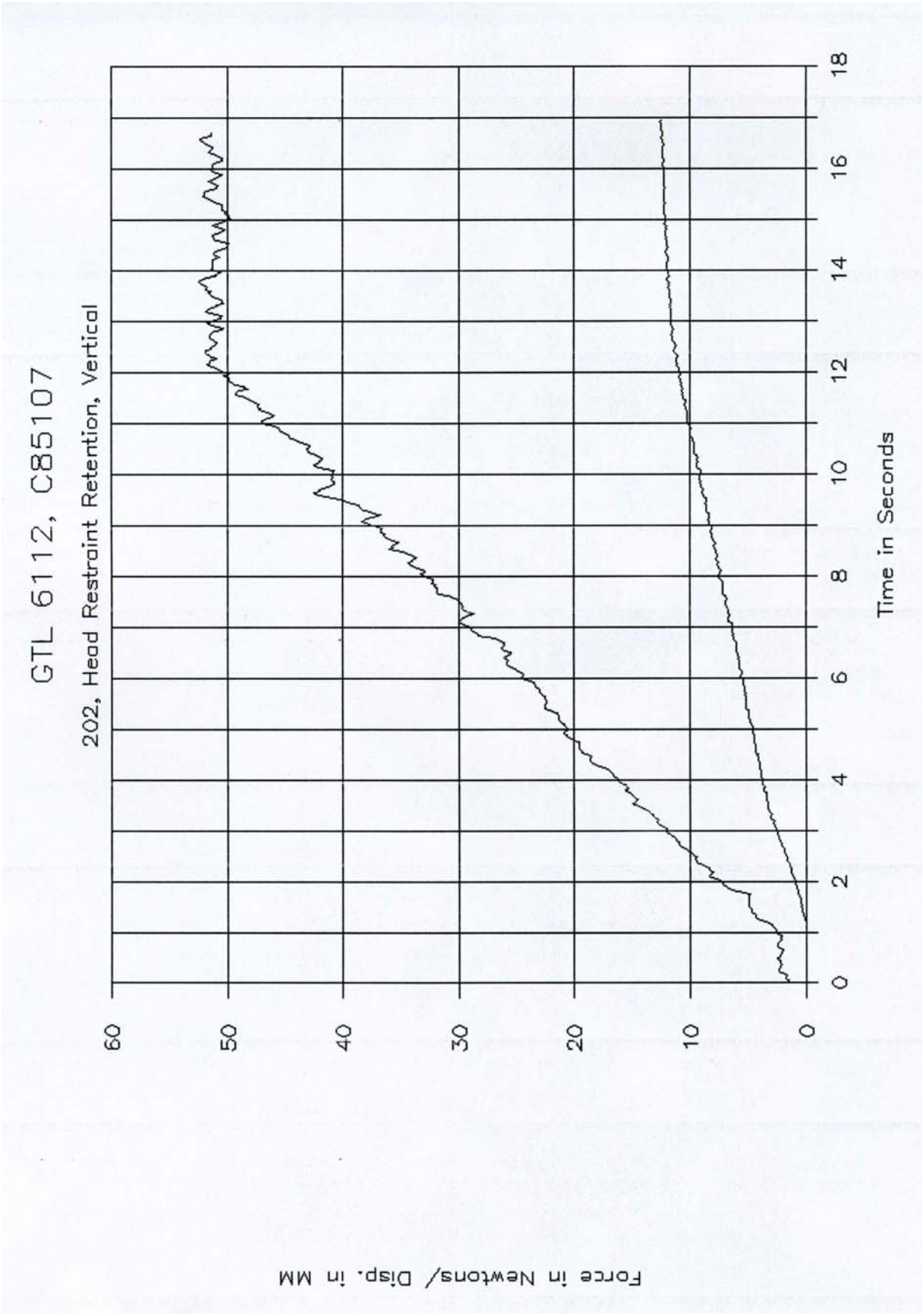
SECTION 6
TEST PLOTS

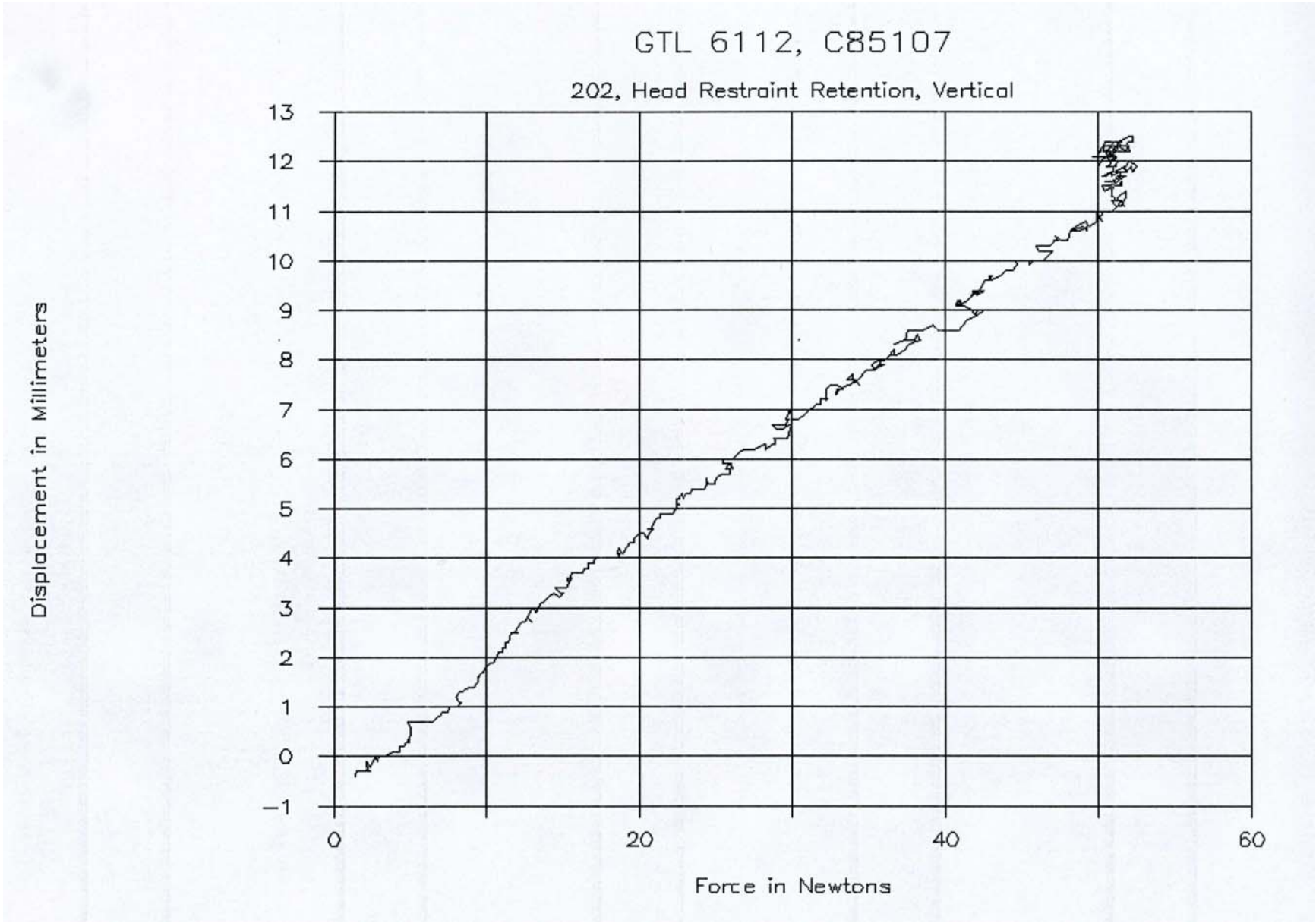

GTL 6111, C85107
202, Head Restraint Retention, Vertical
Force in Newtons/ Disp. in MM/10
600
500
400
300
200
100
0
0
40
80
120
160
200
240
280
Time in Seconds

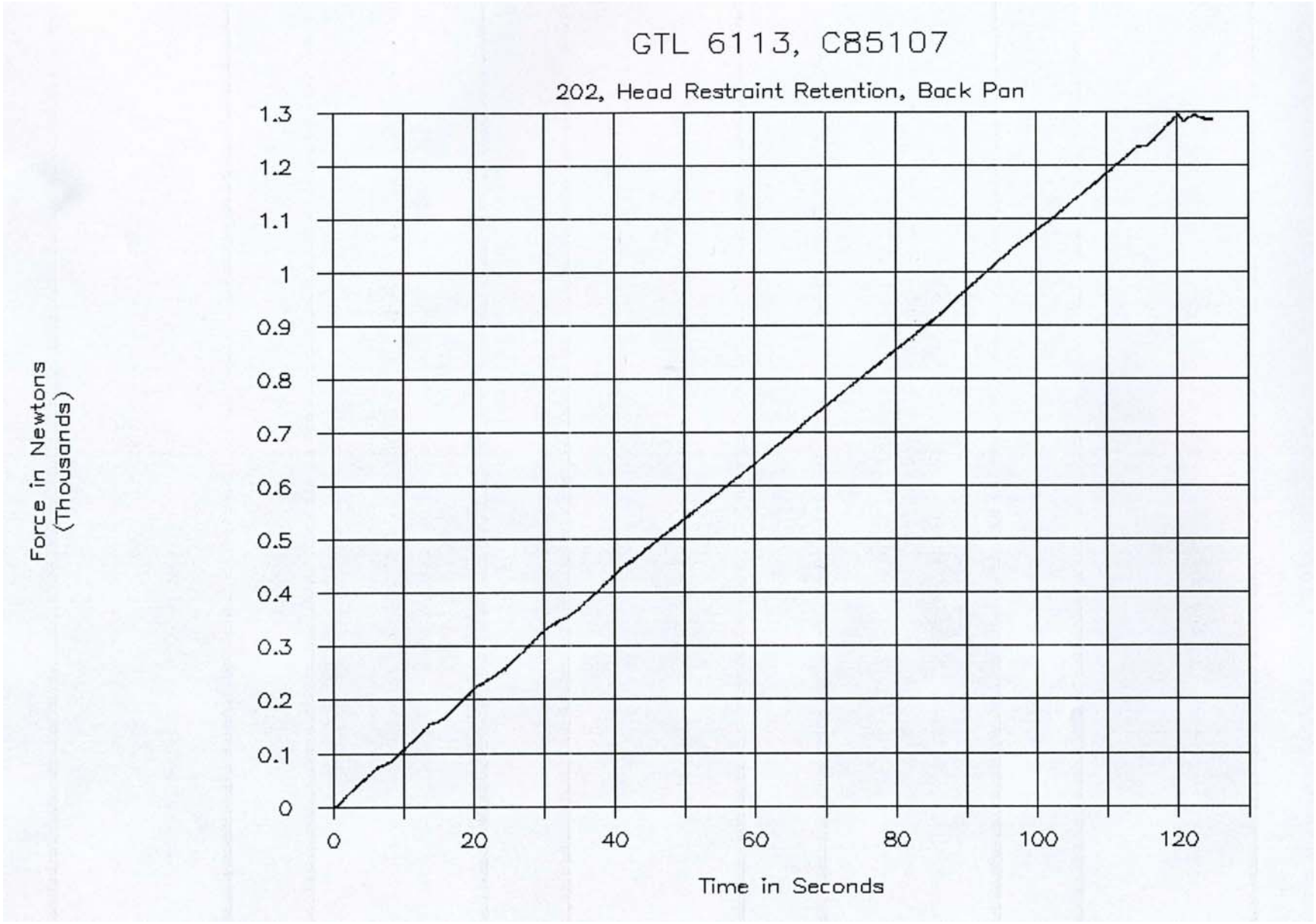

GTL 6111, C85107
202, Head Restraint Retention, Vertical
Force in Newtons
600
500
400
300
200
100
0
0
40
80
120
160
200
240
280
Time in Seconds

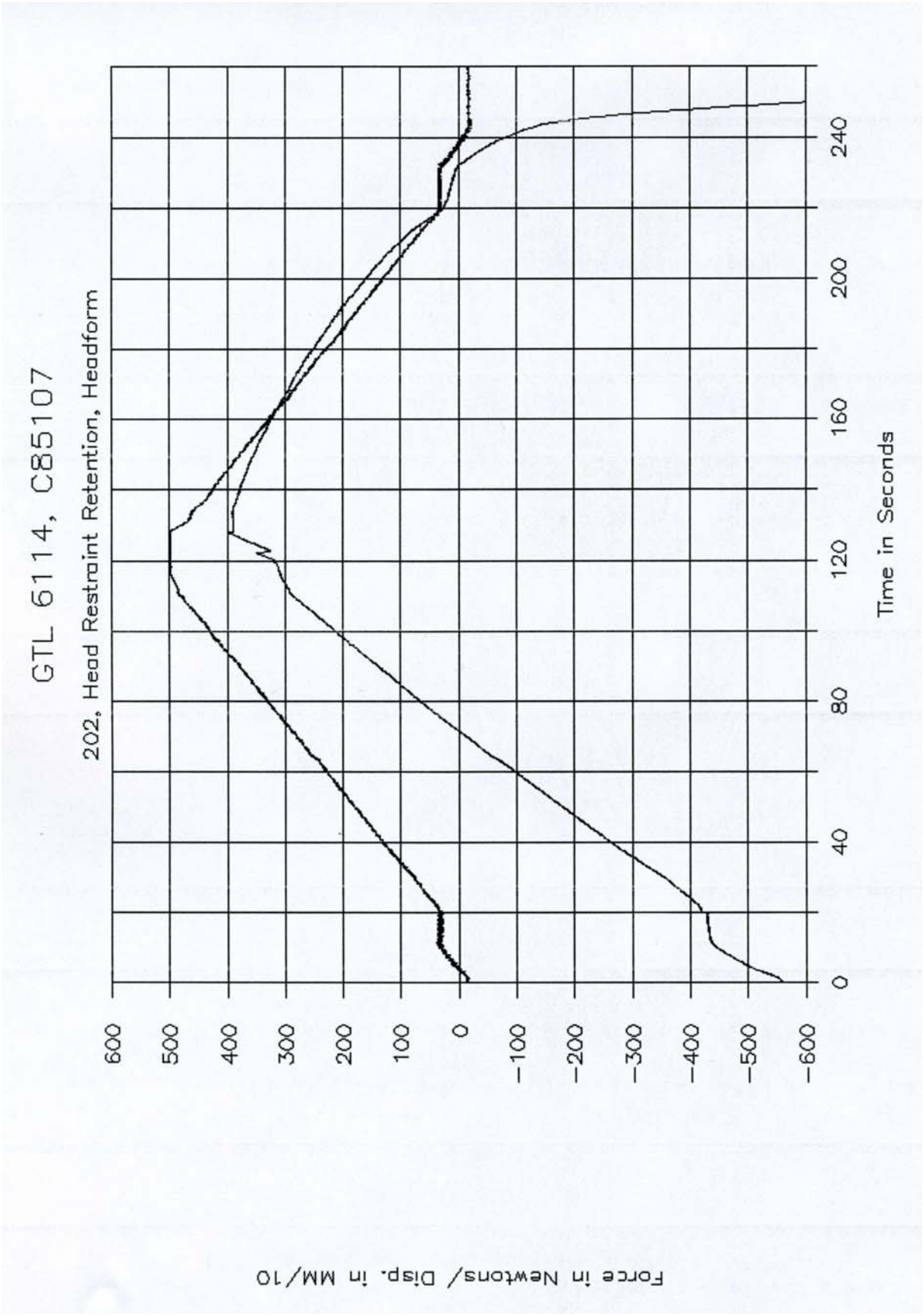

GTL 6111, C85107
202, Head Restraint Retention, Vertical
Displacement in Millimeters
50
40
30
20
10
0
0
40
80
120
160
200
240
280
Time in Seconds

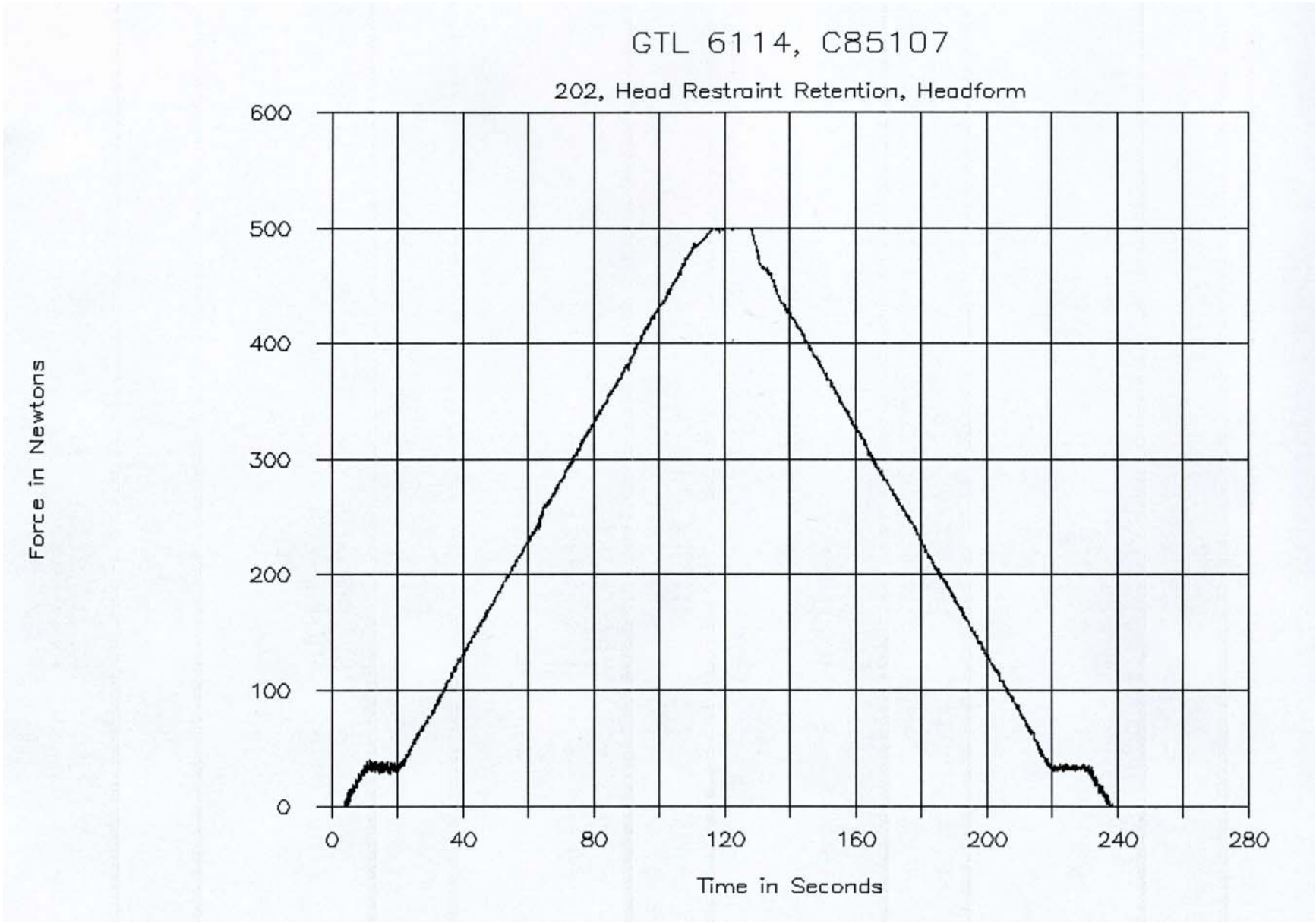

GTL 6111, C85107
202, Head Restraint Retention, Vertical
Displacement in Millimeters
50
40
30
20
10
0
0
200
400
600
Force in Newtons

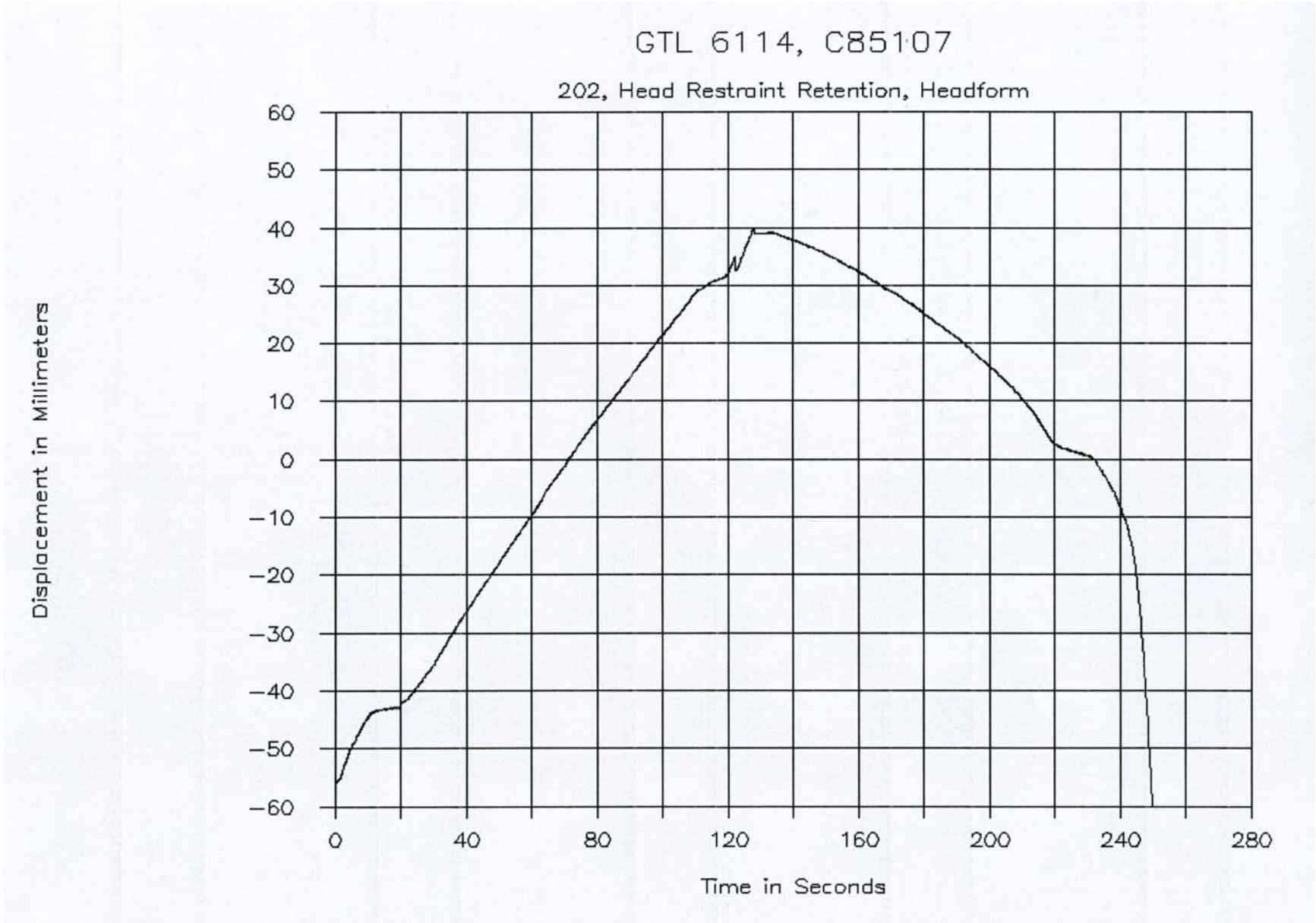

GTL 6112, C85107
202, Head Restraint Retention, Vertical
Force in Newtons/ Disp. in MM
Time in Seconds
0
10
20
30
40
50
60
0
2
4
6
8
10
12
14
16
18

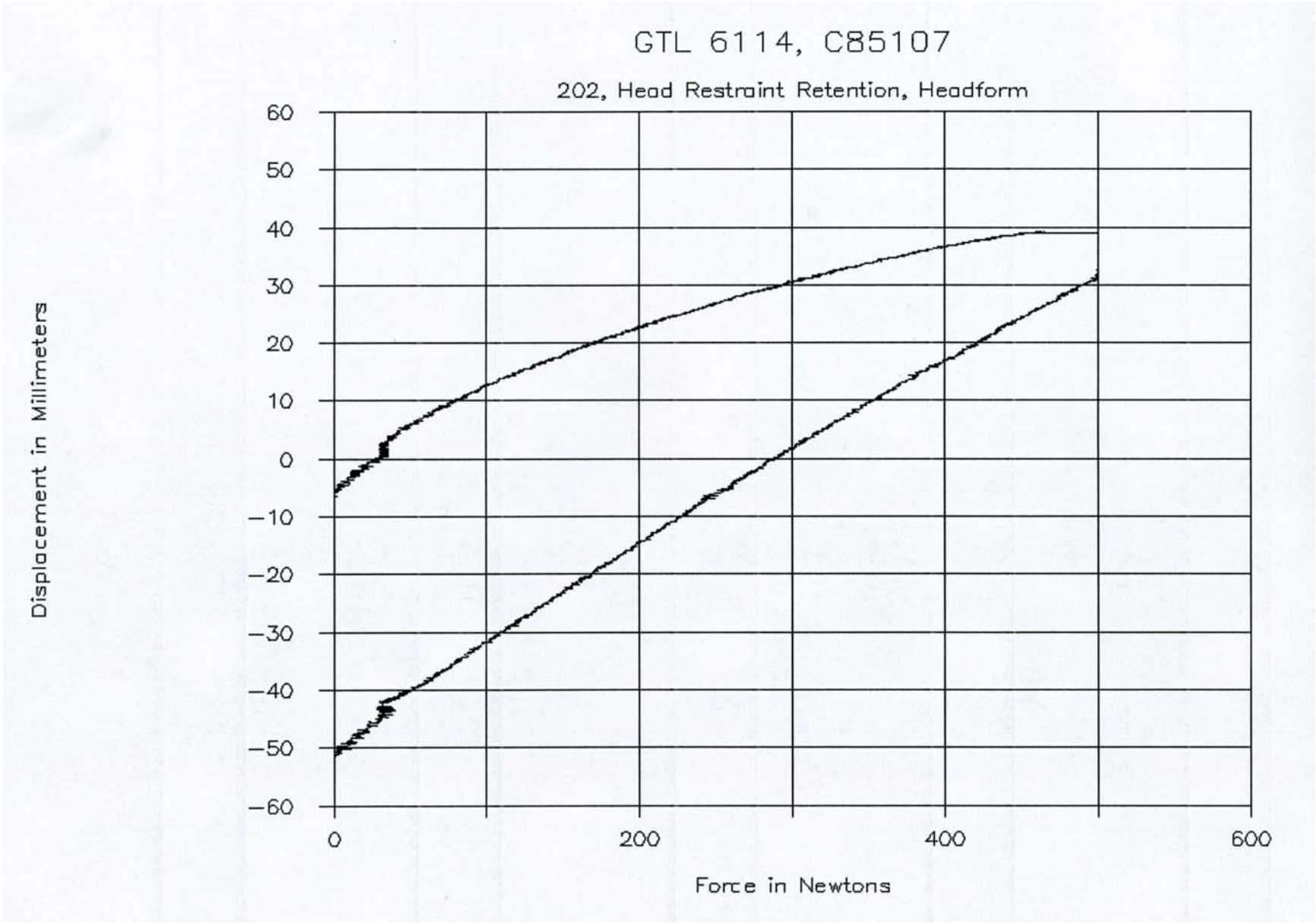

GTL 6112, C85107
202, Head Restraint Retention, Vertical
Displacement in Millimeters
13
12
11
10
9
8
7
6
5
4
3
2
1
0
−1
0
20
40
60
Force in Newtons

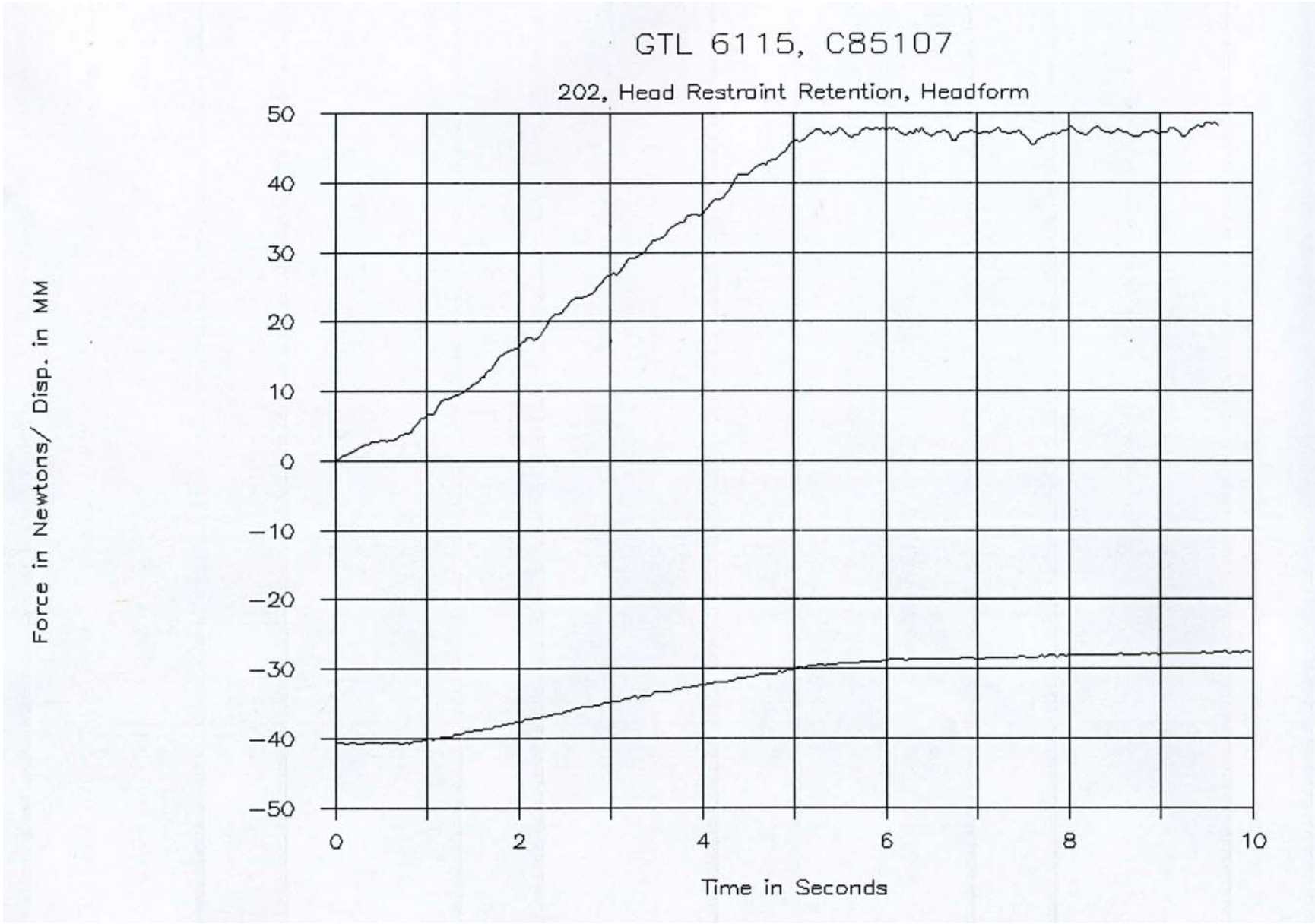

GTL 6113, C85107
202, Head Restraint Retention, Back Pan
Force in Newtons
(Thousands)
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
20
40
60
80
100
120
Time in Seconds

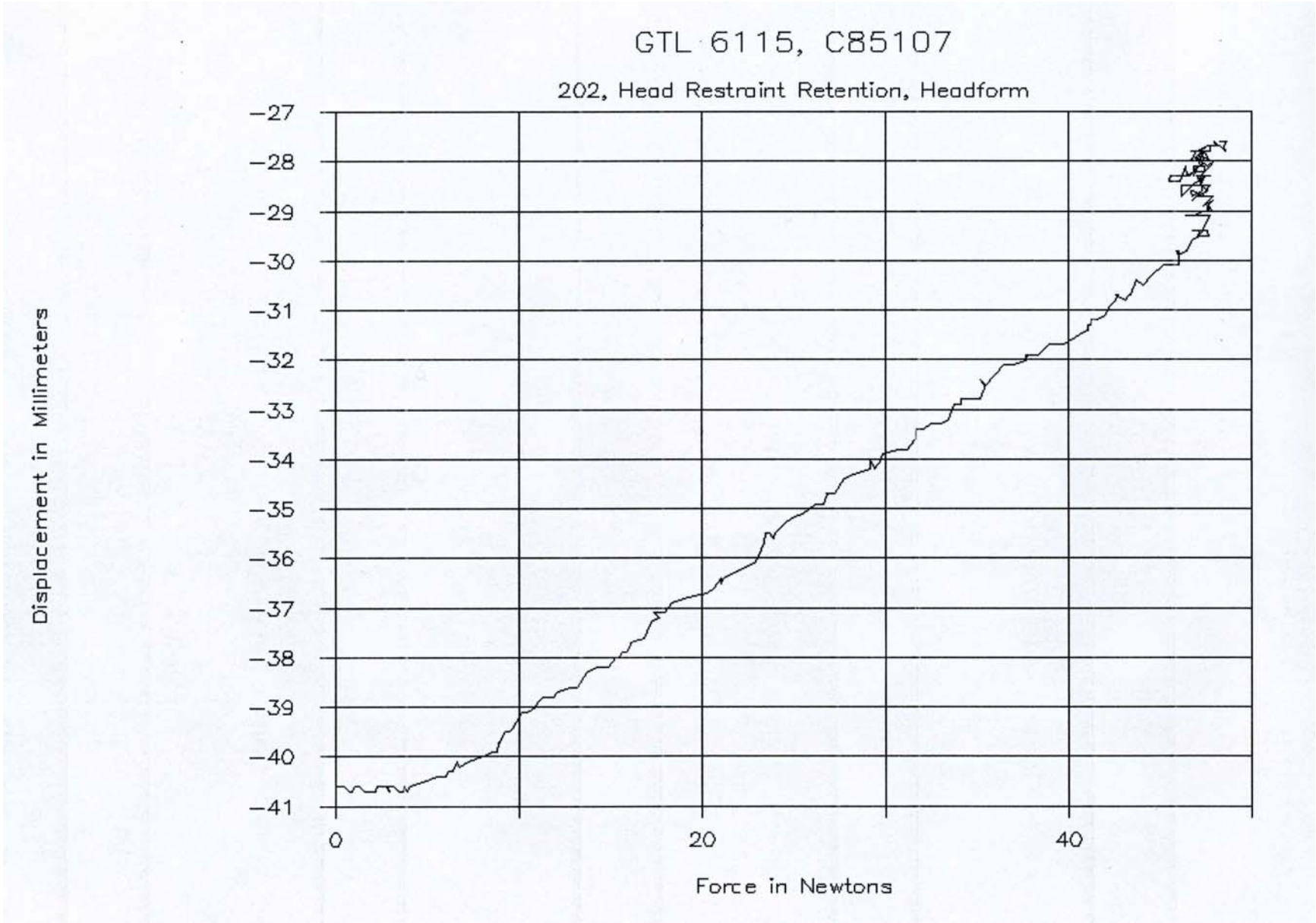

GTL 6114, C85107
202, Head Restraint Retention, Headform
Force in Newtons/ Disp. in MM/10
Time in Seconds
600
500
400
300
200
100
0
-100
-200
-300
-400
-500
-600
0
40
80
120
160
200
240

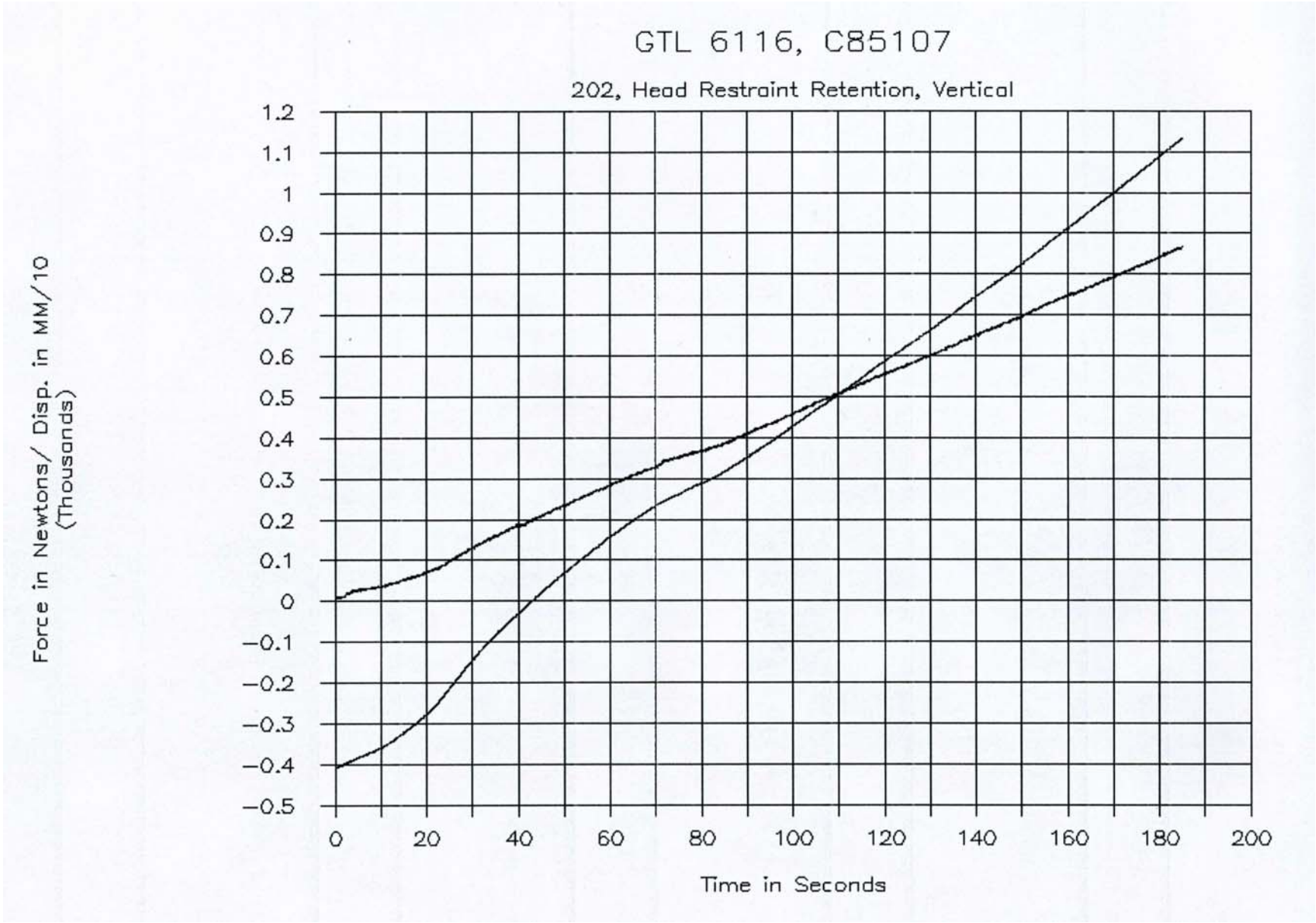

GTL 6114, C85107
202, Head Restraint Retention, Headform
Force in Newtons
600
500
400
300
200
100
0
0
40
80
120
160
200
240
280
Time in Seconds


GTL 6114, C85107
202, Head Restraint Retention, Headform
Displacement in Millimeters
60
50
40
30
20
10
0
−10
−20
−30
−40
−50
−60
0
40
80
120
160
200
240
280
Time in Seconds


GTL 6114, C85107
202, Head Restraint Retention, Headform
Displacement in Millimeters
60
50
40
30
20
10
0
−10
−20
−30
−40
−50
−60
0
200
400
600
Force in Newtons


GTL 6115, C85107
202, Head Restraint Retention, Headform
Force in Newtons/ Disp. in MM
50
40
30
20
10
0
−10
−20
−30
−40
−50
0
2
4
6
8
10
Time in Seconds

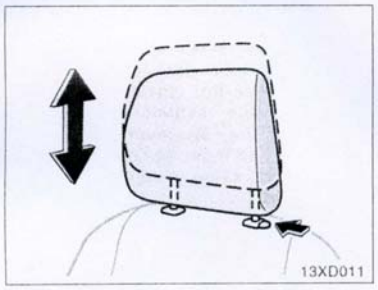

GTL 6115, C85107
202, Head Restraint Retention, Headform
Displacement in Millimeters
-27
-28
-29
-30
-31
-32
-33
-34
-35
-36
-37
-38
-39
-40
-41
0
20
40
Force in Newtons


GTL 6116, C85107
202, Head Restraint Retention, Vertical
Force in Newtons/ Disp. in MM/10
(Thousands)
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
−0.1
−0.2
−0.3
−0.4
−0.5
0
20
40
60
80
100
120
140
160
180
200
Time in Seconds

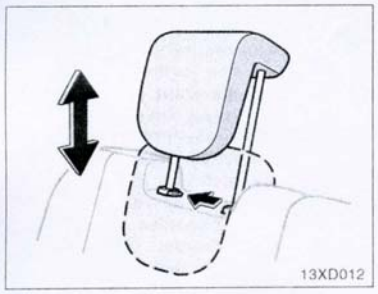

GTL 6117, C85107
201, Head Restraint Energy Absorption.
50
40
30
20
10
0
G's
0
20
40
60
milliseconds

SECTION 7
OWNER'S MANUAL INFORMATION

Head restraints



Front seat



Rear seat

For your safety and comfort, adjust the head restraint before driving.

Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top your ears.

To raise: Pull it up.
To lower: Push it down while pressing the lock release button.

Rear center head restraint—When an occupant sits on the rear center seat, always pull up the rear center head restraint to the lock position.

The head restraint is most effective when it is close to your head. Therefore, using a cushion on the seatback is not recommended.

The head restraints are specially designed for the seats on which they are installed.

Removing the front head restraints

1. Pull the head restraint up.
2. Insert a flathead screwdriver into the head restraint installation hole with red marking. (The other installation hole has the lock release button.)
3. While pushing in the screwdriver, pull up the head restraint.

⚠ CAUTION

The head restraints are designed to help reduce risk of whiplash injury by restraining the movement of the occupant's head in the event of a rear collision.

Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- **Adjust the center of the head restraint so that it is closest to the top of your ears.**
- **After adjusting the head restraint, make sure it is locked in position.**
- **Do not drive with the head restraints removed.**