Report Number: TWG-TRC-04-001

New Car Assessment Program (NCAP)
Side Airbag Out-Of-Position Injury Testing

2004 Mazda RX-8

Hybrid III 6YO Static Air Bag Deploy

Procedure #3.3.5.1

TRC Inc. Test Number: S040622

Prepared By:

Transportation Research Center Inc.

10820 State Route 347

East Liberty, OH 43319

Test Date: June 22, 2004

Final Report: June 28, 2004

Prepared For:

U. S. Department of Transportation

National Highway Traffic Safety Administration

Office of Crashworthiness Standards

Mail Code: NVS-111

400 Seventh Street, S.W., Room 5313

Washington, DC 20590

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Test Performed By: Ronald D. Stoner, Test Technician

Report Approved By:

Date 6/28/04

Walter D. Dudek, Project Manager
Transportation Research Center Inc.

FINAL REPORT ACCEPTANCE BY OCS:

_____ Date _____

Manager, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

_____ Date _____

Contracting Officer's Technical Representative (COTR),
NHTSA, Office of Crashworthiness Standards

Technical Report Documentation Page

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TWG-TRC-04-001		

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9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319-0367	10. Work Unit No. (TRAIS)
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15. Supplemental Notes

16. Abstract

This side impact out-of-position test was performed in conjunction with a New Car Assessment Program (NCAP). This test was conducted at The Transportation Research Center Inc. in East Liberty, Ohio, on June 22, 2004.

Injury Summary

HIC15	HIC36	NIJ NTF	NIJ NTE	NIJ NCF	NIJ NCE
6	6	0.08	0.18	0.10	0.30

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Airbag Out-of-Position	Copies of this report are available from: National Highway Traffic Safety Admin. NHTSA Technical Reference Division Room 5111 (NAD-52) 400 Seventh Street, S. W. Washington, DC 20590 Attn: Robert Hornicle

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. Number of Pages	22. Price
Unclassified	Unclassified	49	

Table of Contents

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Table of Data Plots

Section 1.0

Purpose and Summary of Test

Purpose

The purpose of this test was to obtain data in a static out-of-position side impact. These data constitute part of the general consumer information collected by the New Car Assessment Program (NCAP) sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract No. DTNH22-01-D-22005.

Summary

The effects of a seat mounted side airbag deployment in a 2004 Mazda RX-8 with an out-of-position six-year-old child were evaluated. The test was performed by Transportation Research Center Inc. on June 22, 2004. Pre- and post-test photographs of the vehicle and dummy can be found in Appendix A.

Two high-speed digital cameras and one real-time camera were used to document the side torso airbag deployment event. One high-speed camera was placed in the left front occupant compartment in line with the centerline of the dummy. A second high-speed camera was placed to view the event through the vehicle windshield. The recorded image rate was 1000 frames per second.

One Part 572, Hybrid III six-year-old child anthropomorphic test device (ATD), was placed in the right front seat situated in the leftward facing position according to dummy placement instructions specified in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags as prepared by the Side Airbag Out-of-Position Injury Technical Working Group (TWG).

The child dummy was instrumented with head triaxial accelerometers and upper and lower six axial neck force and moment load cell sensors.

Sixteen channels of data were recorded using an onboard data acquisition system. Appendix A contains photographs. Appendix B contains dummy response data plots. Appendix C contains the Instrumentation Data Channel Reports.

The Hybrid III six-year-old child dummy's visible contact points were as follows: The airbag to the back of the right side of the torso of the dummy. The dummy's head to the headliner above the passenger door.

The six-year-old child dummy was placed on a booster block and oriented in the leftward facing position on the outboard portion of the seat cushion. The seat was placed in the highest height position with the seatback placed at the manufacturer's design position for a fiftieth percentile male. The seat track was positioned forward to minimize the vertical distance between the dummy's head and the roof rail module. The dummy's pelvis was slid outward until contact with the door trim panel and the head was adjusted to align its center of gravity with the edge of the roof header. The dummy's arms were bent at the elbow until the fingers touched the booster seat. This orientation complies with Section 3.3.5.1 of the TWG Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags as defined by Lund, et al and the Technical Working Group dated July 2003.

Data Acquisition Explanations

There were no anomalies recorded during this test.

Section 2.0

Data Sheet No. 1

Test Summary

Test Configuration Information

	Test Data	Description
Seating Position:	P2	Right front seating position
Test:	3.3.5.1*	Leftward facing Hybrid III 6-year-old child dummy on booster block
Airbag:	Seatback	Seatback side torso airbag
Booster Block	300 mm x 450 mm x 75 mm	Block consisted of HD36 foam with a density of 44.8 g/L
ATD Type/Serial No.:	P572N/182	Hybrid III six-year-old child dummy

* Procedure as defined by Lund, et al and the Technical Working Group dated July 2003.

Number of data channels: 16
Number of cameras: 1 Real-time
2 High-speed digital

Visible Dummy Contact Points

Head Contact:	Headliner
Upper Torso Contact:	Side torso airbag
Lower Torso Contact:	Side torso airbag
Left Knee Contact:	None
Right Knee Contact:	None

Data Sheet 2

General Test Vehicle Parameter Data

Test Vehicle Information:

Vehicle Year/Make/Model: 2004 Mazda RX8

Vehicle Body Style/Color: 4-door/Silver VIN: JM1FE17N740117759

Vehicle NHTSA No.: C45403 Build Date: 09/03

Engine Data: 4 Cylinders; ____ CID; 1.3 Liters; ____ cc

Placement: X Longitudinal; or - Lateral; or - Horizontal

Transmission: 4 Speed; - Manual; X Automatic; - Overdrive

Final Drive: X RWD; - FWD; - Four-Wheel Drive

Odometer Reading: 92 miles

Options: X A/C; X Power steering; X Pwr. brakes; X Power windows

Data From Vehicle's Tire Placard:

Tire Pressure (at capacity) 220 kPa Front; 220 kPa Rear

Recommended Tire Size: 225/55R16

Tires on Test Vehicle: 225/55R16 Manufacturer: Bridgestone, Potenza

Vehicle Capacity Data:

Number of Occupants: 2 Front; 2 Rear; N/A 3rd seat; 4 Total

Type of Front Seats: X Bucket; - Bench; - Split bench

Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob

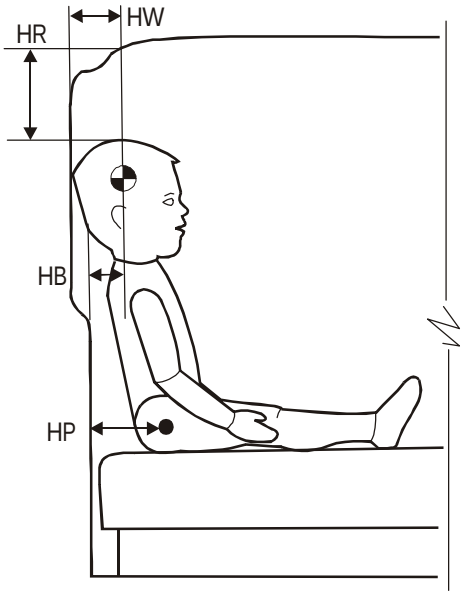
Vehicle Max. Capacity Loading = 308 kg

No. of Occupants x 68.04 kg. = 272 kg

Vehicle Cargo Capacity (A-B) = 36 kg

Data Sheet No. 3

Child Dummy Positioning in Vehicle



Measurements for Position #2 (Right Front)	
	Dimension (mm)
HR	174
HW	159
HB	276
HP	50
Airbag Module Length	155
Airbag Module Width	60
Toe to Toe	70
Top of the airbag module to the top of the head/neck junction	195
Foam Block Depth	300
Foam Block Width	450
Foam Block Thickness	75

Test Time	14:40
Test Temperature	70.2°F

Data Sheet No. 4

Child Dummy Injury Criteria Values

		Maximum Value			
		Position #2			
Description	Unit	Maximum	Time (ms)	Minimum	Time (ms)
Head X	g	5.0	15.6	-5.1	6.2
Head Y	g	9.4	6.4	-14.4	76.7
Head Z	g	3.7	71.4	-6.6	7.8
Head Resultant	g	14.6	76.7	0.0	-17.6
Upper Neck Fx	N	107.0	17.6	-38.0	214.6
Upper Neck Fy	N	195.2	12.4	-54.8	76.6
Upper Neck Fz	N	65.4	18.8	-253.0	80.6
Upper Neck Mx	N-m	15.4	23.2	-14.9	9.6
Upper Neck My	N-m	8.6	15.3	-8.1	85.1
Upper Neck Mz	N-m	3.6	164.6	-7.0	95.8
Lower Neck Fx	N	244.4	13.4	-71.0	88.3
Lower Neck Fy	N	452.1	8.2	-89.9	78.1
Lower Neck Fz	N	85.7	18.3	-224.3	7.6
Lower Neck Mx	N-m	32.7	28.1	-8.4	169.8
Lower Neck My	N-m	6.5	200.5	-16.6	17.4
Lower Neck Mz	N-m	19.9	10.6	-8.3	98.5

Data Sheet No. 4

Child Dummy Injury Criteria Values (Continued)

	Head Injury Criteria (HIC)							
	HIC15				HIC36			
	HIC	t_1 (msec)	t_2 (msec)	Average Acceleration t_1 to t_2	HIC	t_1 (msec)	t_2 (msec)	Average Acceleration t_1 to t_2
Position #2 - Right Front	6.0	69.36	82.64	76.0	6.0	69.36	82.64	76.0

Position 2 Neck Injury Summary (HIII 6 year old - Out of Position)

NIJ V10	NIJ	Time (ms)	Z Force (N)	X Force (N)	Y Moment (N-m)
NTF	0.08	23.2	37.7	66.7	2.7
NTE	0.18	166.1	12.9	-18.6	4.1
NCF	0.10	79.4	-248.1	15.6	-4.6
NCE	0.30	9.6	-156.5	39.2	6.9

Peak Tension (CFC1000) 65.4 N Peak Compression (CFC1000) 253.0 N

Critical Values

NIJ Intercepts				Peak Limits	
Tension (CVt)	2800 N	Extension (mCVe)	37 N-m	Tension	1490 N
Compression (CVc)	2800 N	Flexion (mCVf)	93 N-m	Compression	1820 N

Condyle Offset -0.01778

Appendix A

Photographs

List of Photographs

Figure A-1 Pre-Test Vehicle Front View

Figure A-2 Post-Test Vehicle Front View

Figure A-3 Pre-Test Vehicle Right Side View

Figure A-4 Post-Test Vehicle Right Side View

Figure A-5 Pre-Test Left Side View of Dummy

Figure A-6 Post-Test Left Side View of Dummy

Figure A-7 Pre-Test Front View of Dummy

Figure A-8 Post-Test Front View of Dummy

Figure A-9 Pre-Test Rear View of Dummy

Figure A-10 Post-Test Rear View of Dummy

Figure A-11 Post-Test Side Torso Airbag - View 1

Figure A-12 Post-Test Side Torso Airbag - View 2

Figure A-13 Pre-Test Dummy Positioning - View 1

Figure A-14 Pre-Test Dummy Positioning - View 2

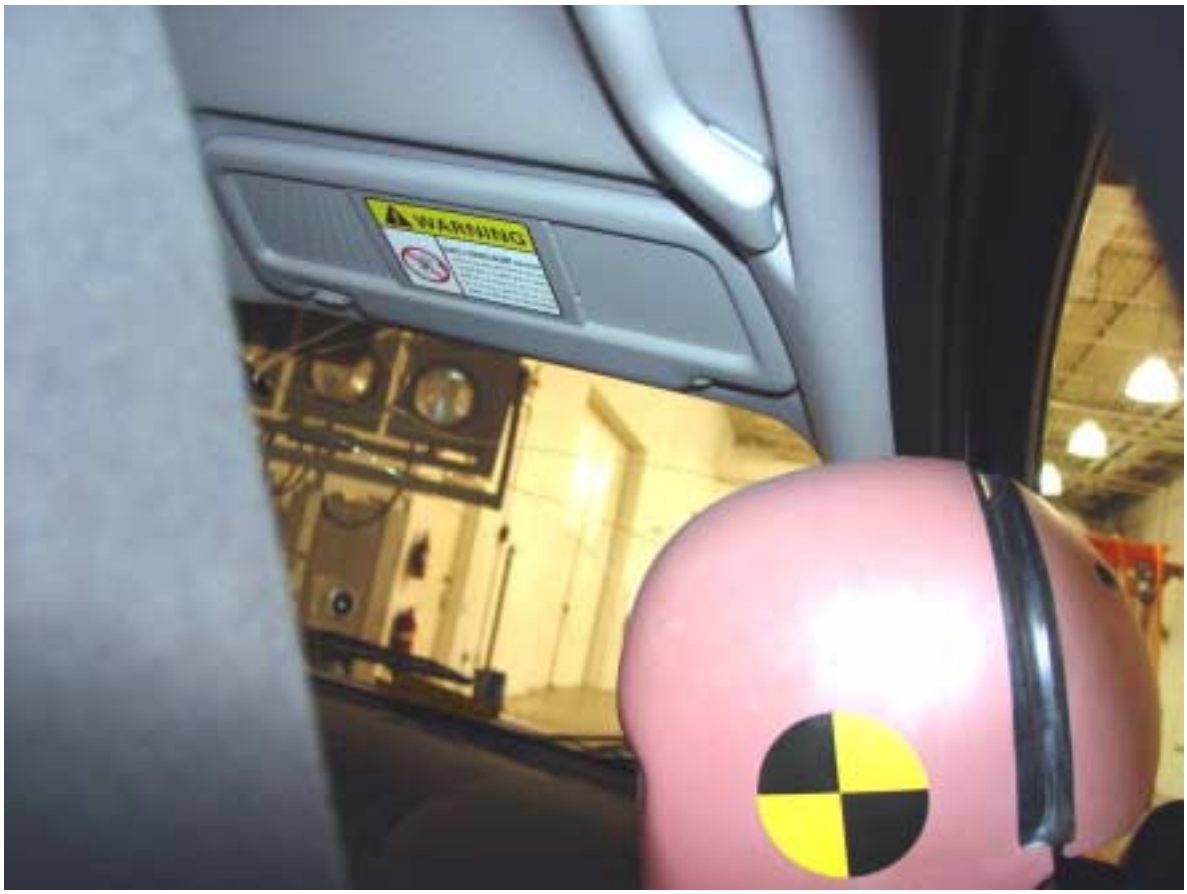


Figure A-15 Pre-Test Dummy Positioning - View 3

Figure A-16 Pre-Test Dummy Positioning - View 4

Figure A-17 Vehicle Certification Label View

Figure A-18 Vehicle Tire Load Label View

Appendix B

Child Dummy Response Data Plots

Table of Data Plots

Transportation Research Center, Inc.

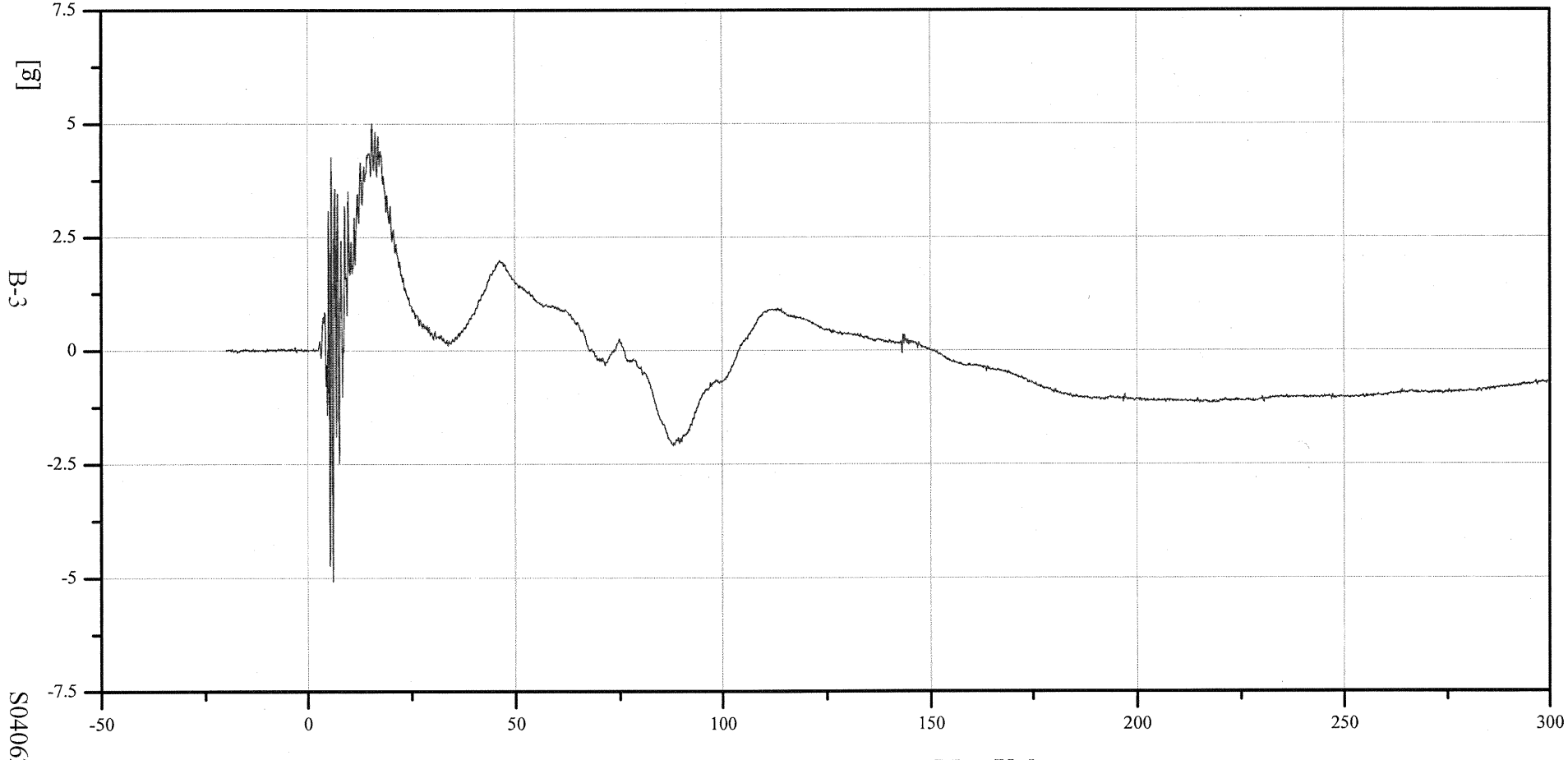
Head Accel X

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

HEDXG2



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-5.08 g at 6.16 ms

<Max Value>
5.01 g at 15.60 ms

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

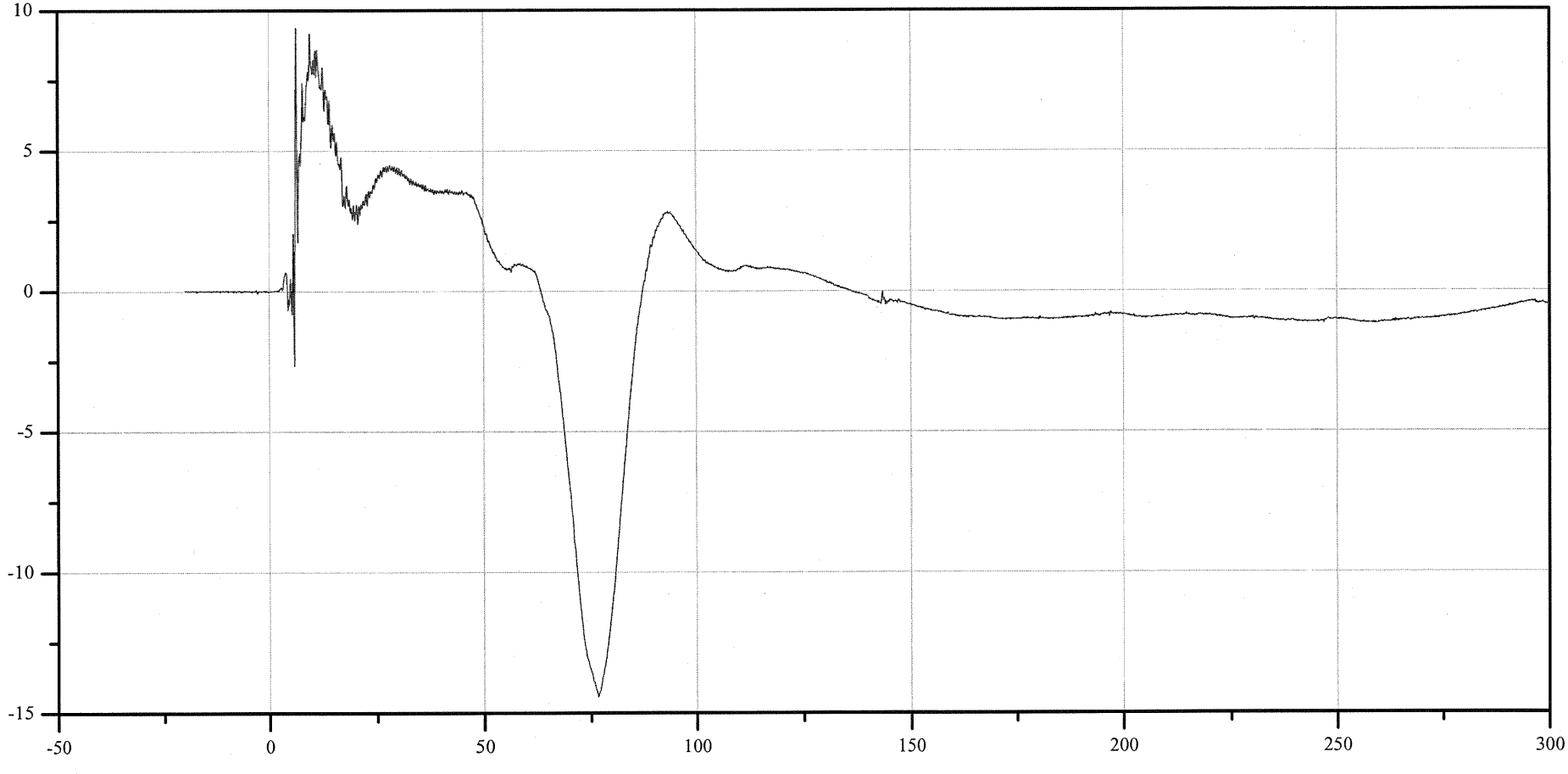
Head Accel Y

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

HEDYG2



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-14.42 g at 76.72 ms

<Max Value>
9.37 g at 6.40 ms

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Transportation Research Center, Inc.

Head Accel Z

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

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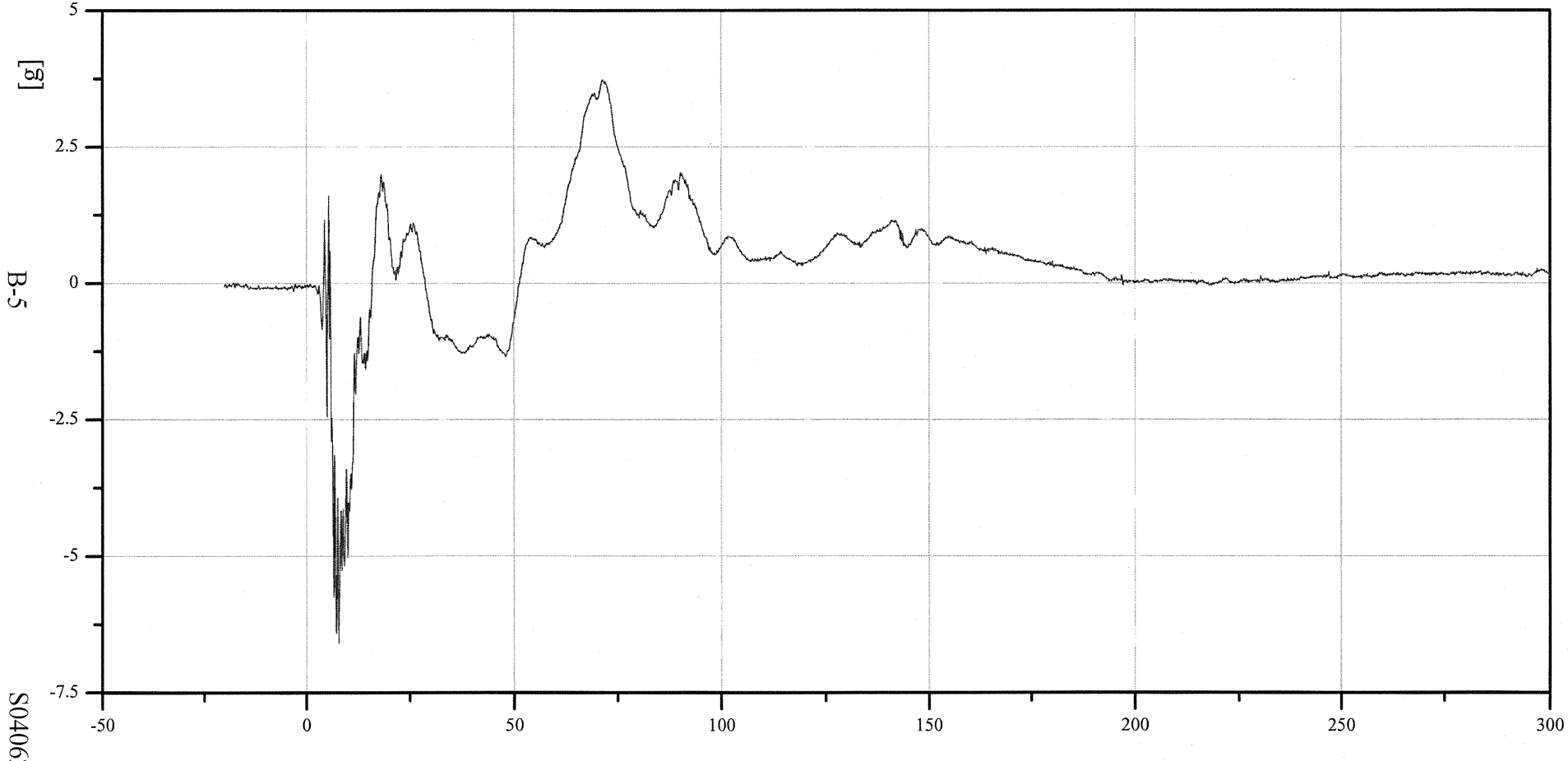

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<Max Value>
3.73 g at 71.44 ms

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

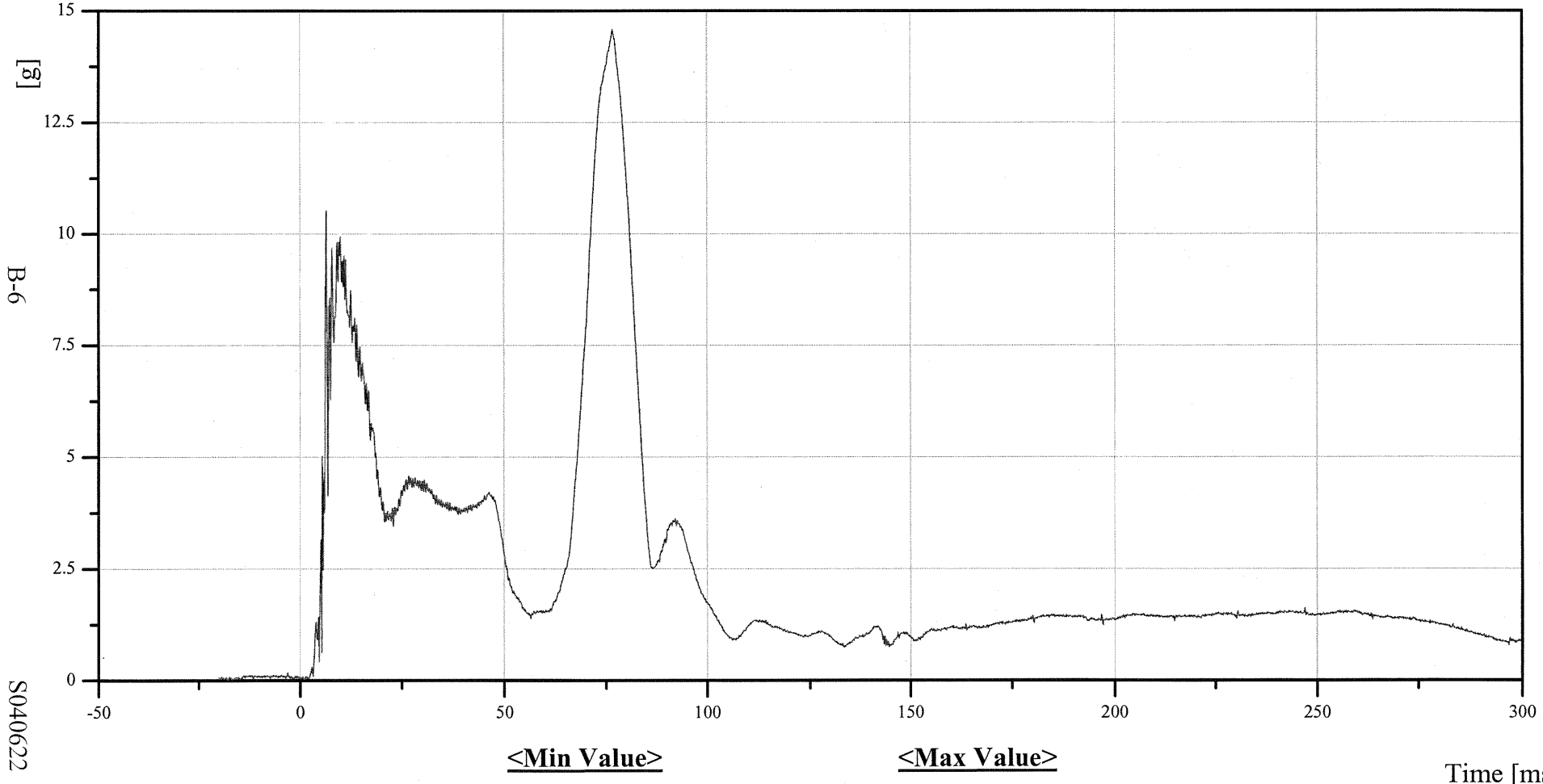
Head Resultant Acceleration

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

HEDRG2



<Min Value>
0.01 g at -17.60 ms

<Max Value>
14.58 g at 76.72 ms

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

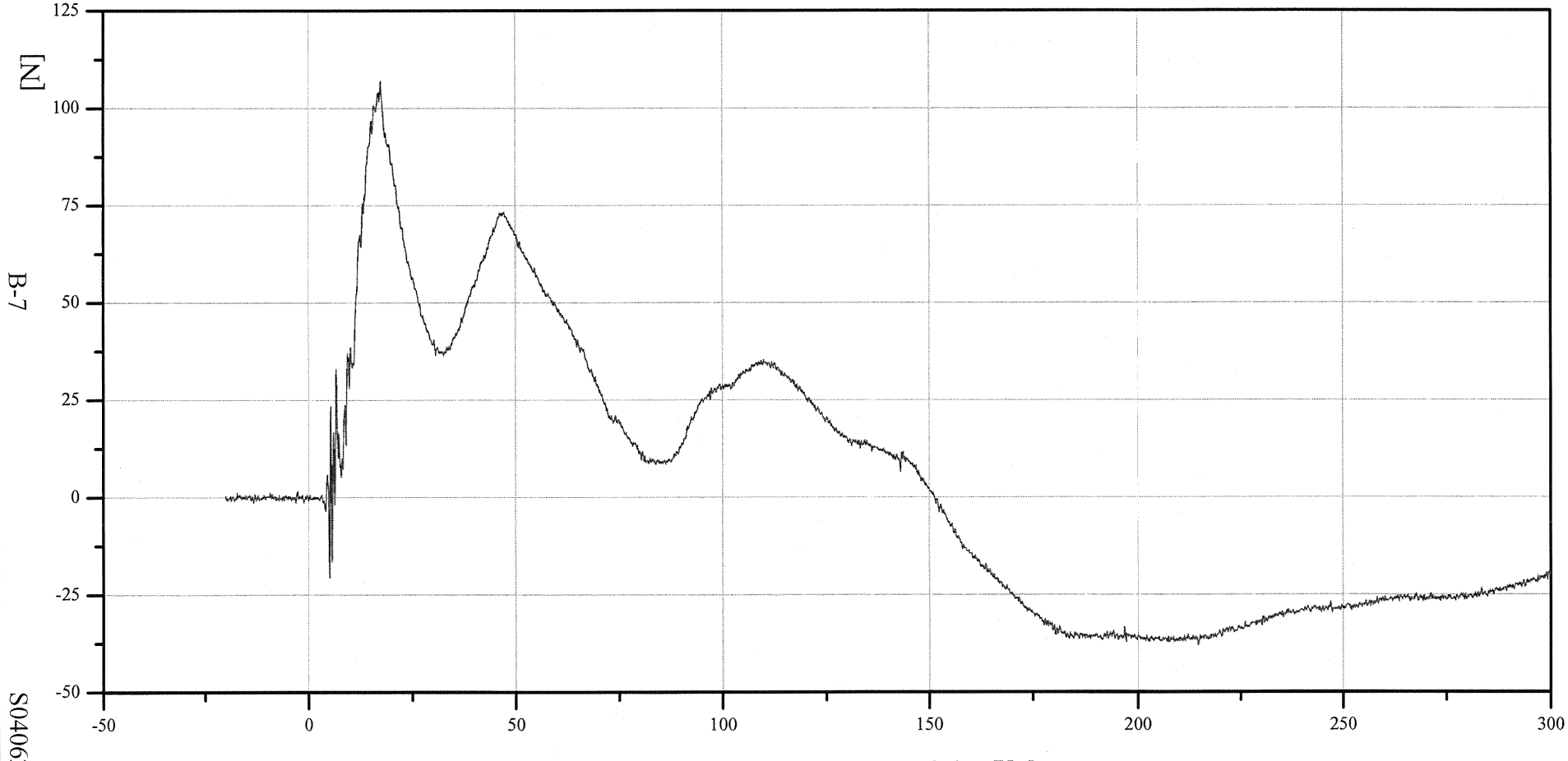
Neck Force X

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NEKXF2



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<Max Value>
107.01 N at 17.60 ms

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

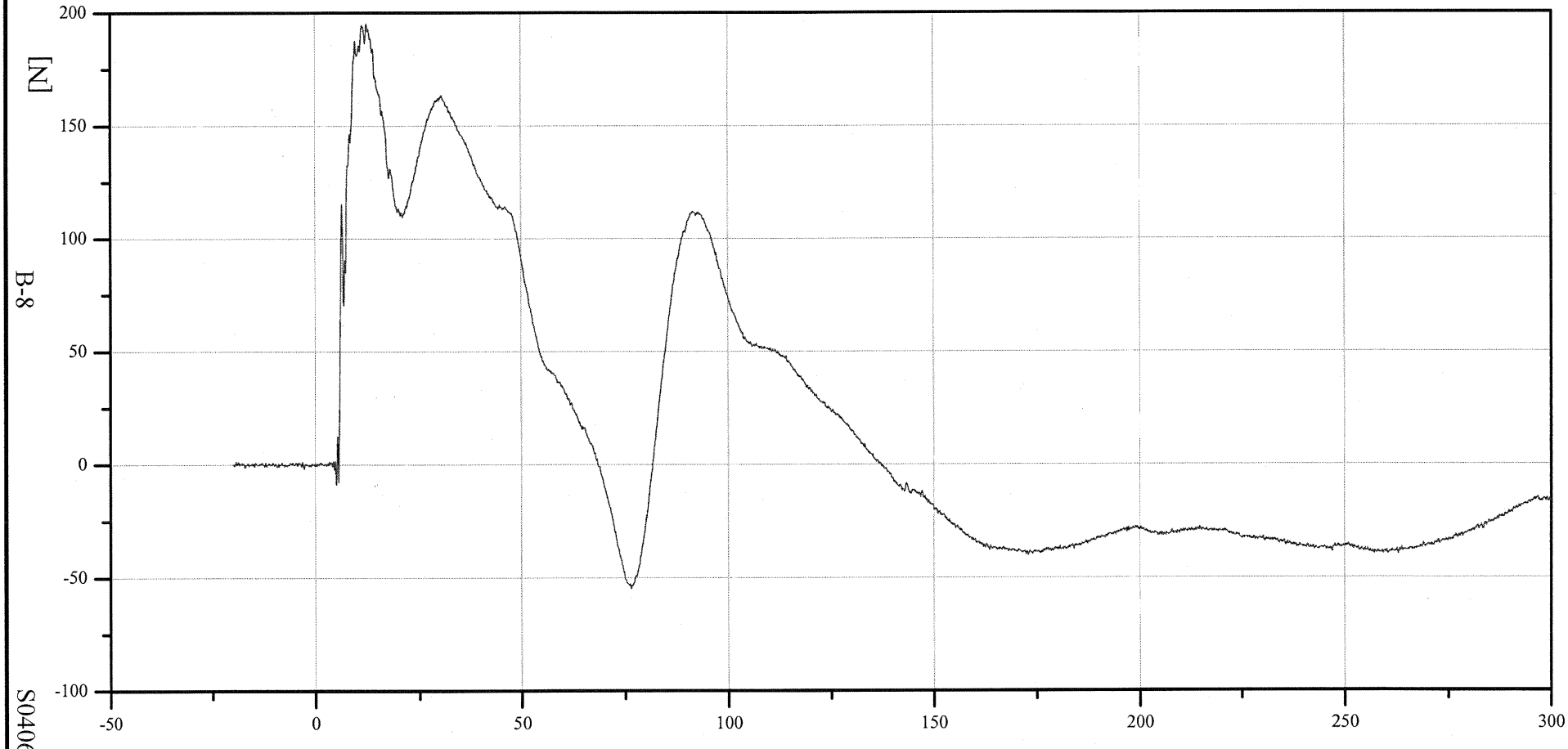
Neck Force Y

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NEKYF2



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-54.78 N at 76.64 ms

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195.20 N at 12.40 ms

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

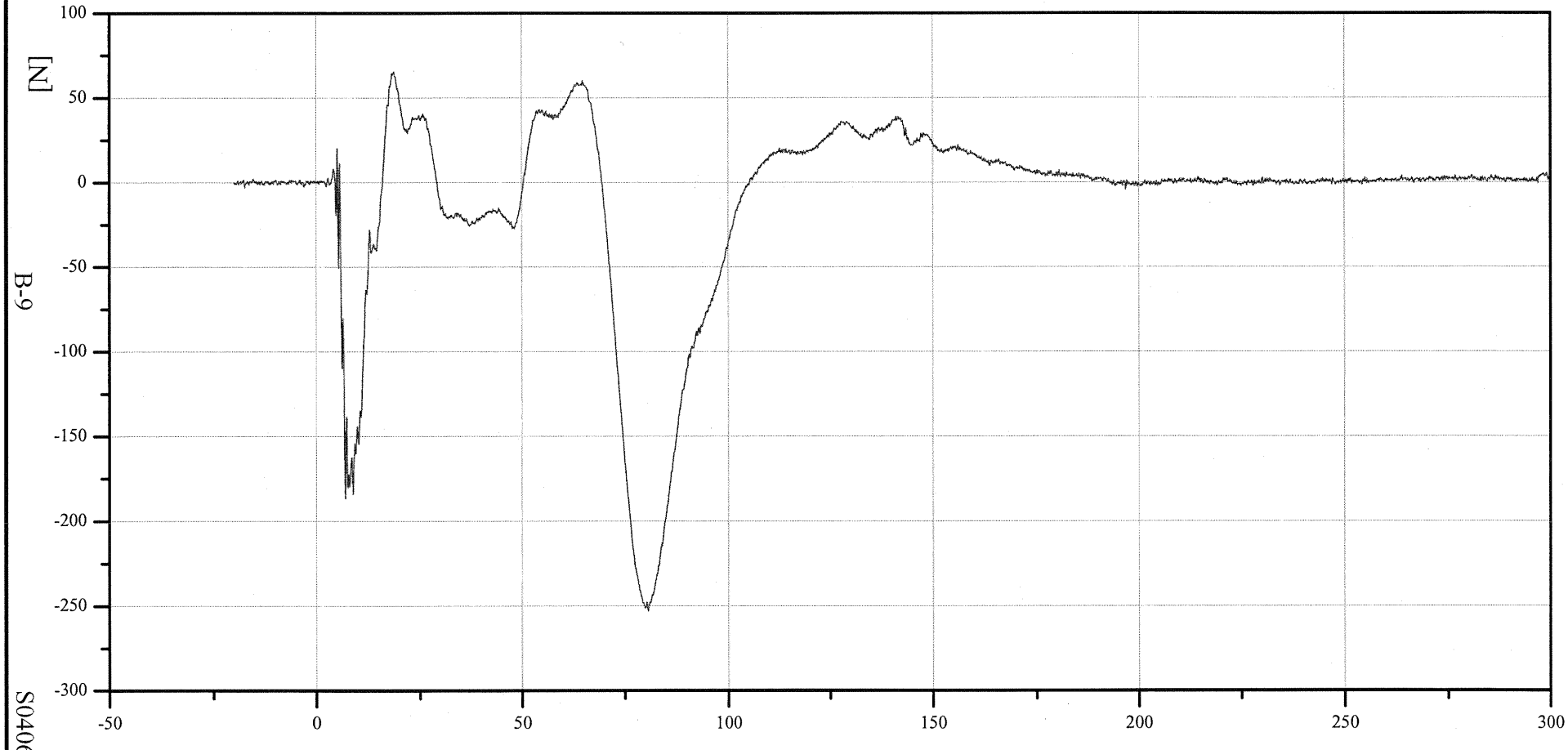
Neck Force Z

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NEKZF2



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-252.97 N at 80.56 ms

<Max Value>
65.40 N at 18.80 ms

Time [ms]

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

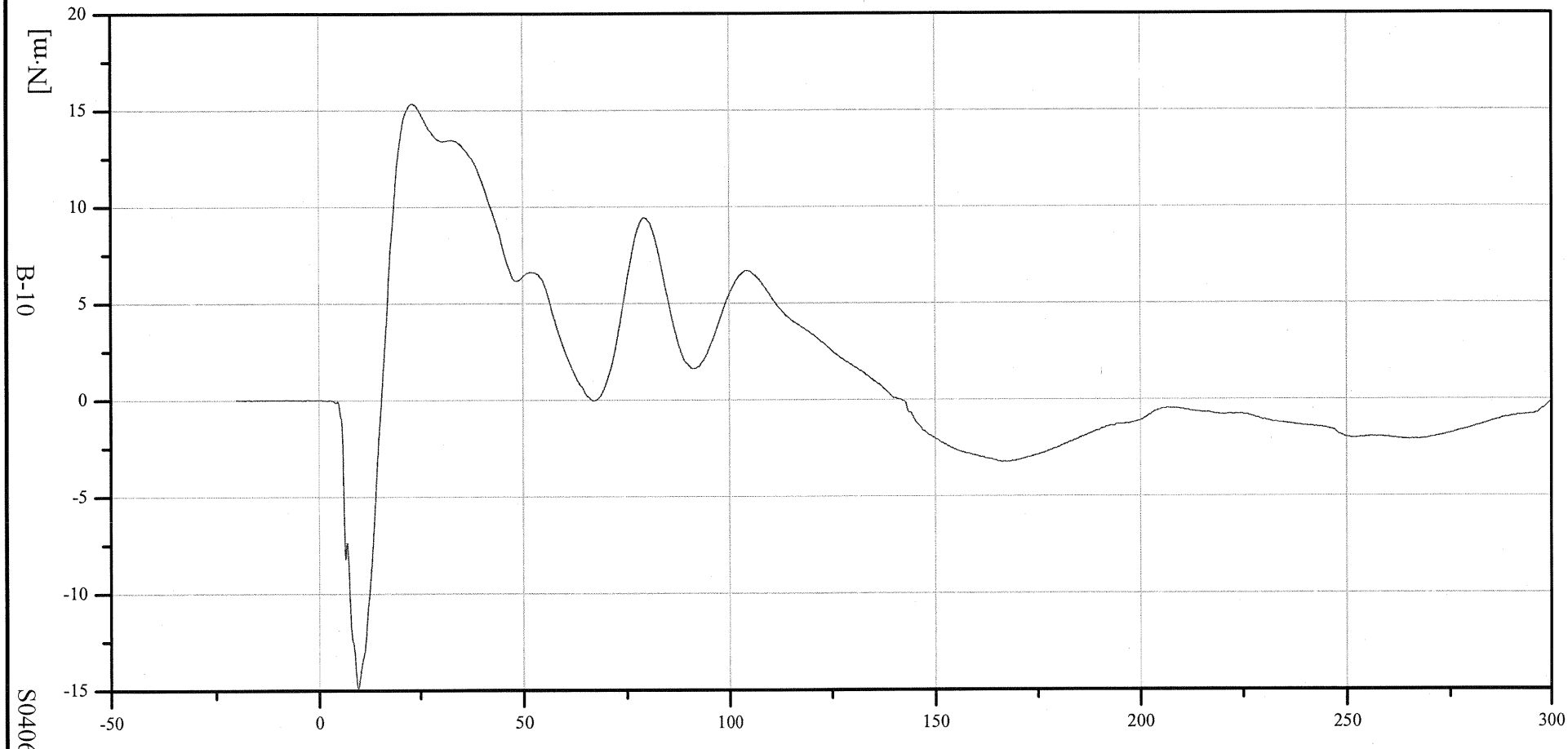
Neck Moment X

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NEKXM2



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-14.91 N·m at 9.60 ms

<Max Value>
15.35 N·m at 23.20 ms

Time [ms]

CFC600 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

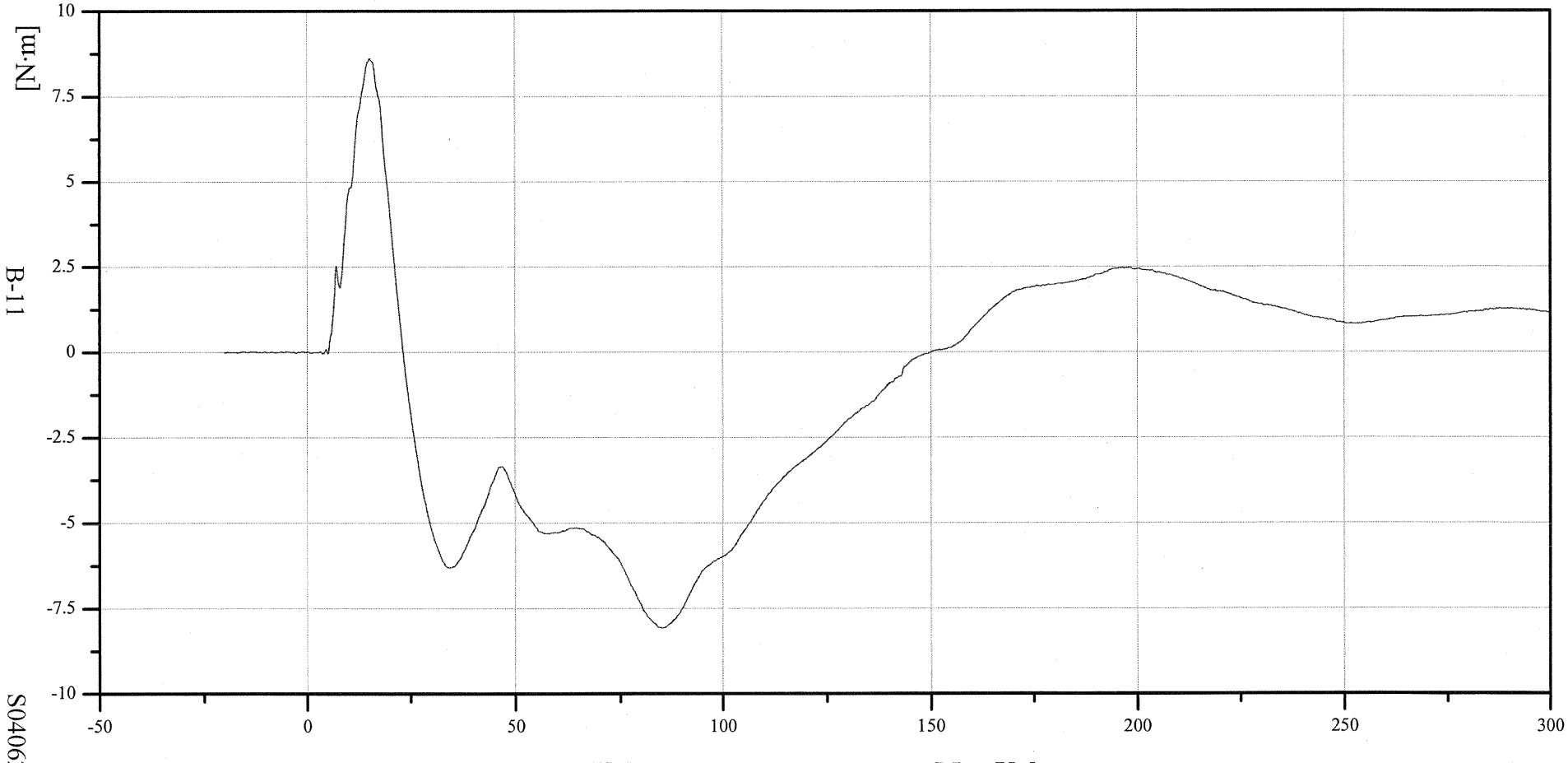
Neck Moment Y

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NEKYM2



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8.61 N·m at 15.28 ms

CFC600 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

Neck Moment Z

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

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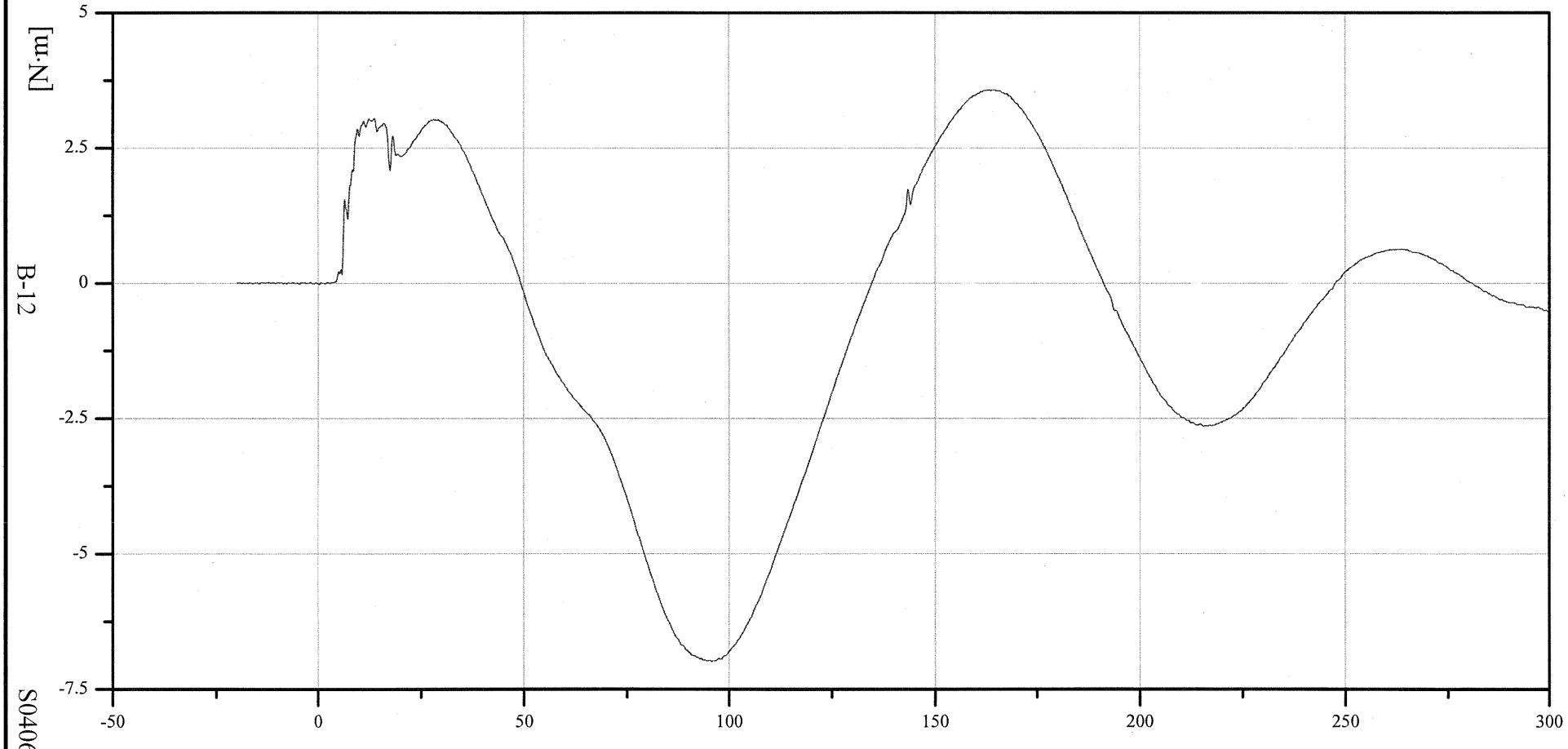

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3.57 N·m at 164.64 ms

CFC600 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

Lower Neck Force X

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

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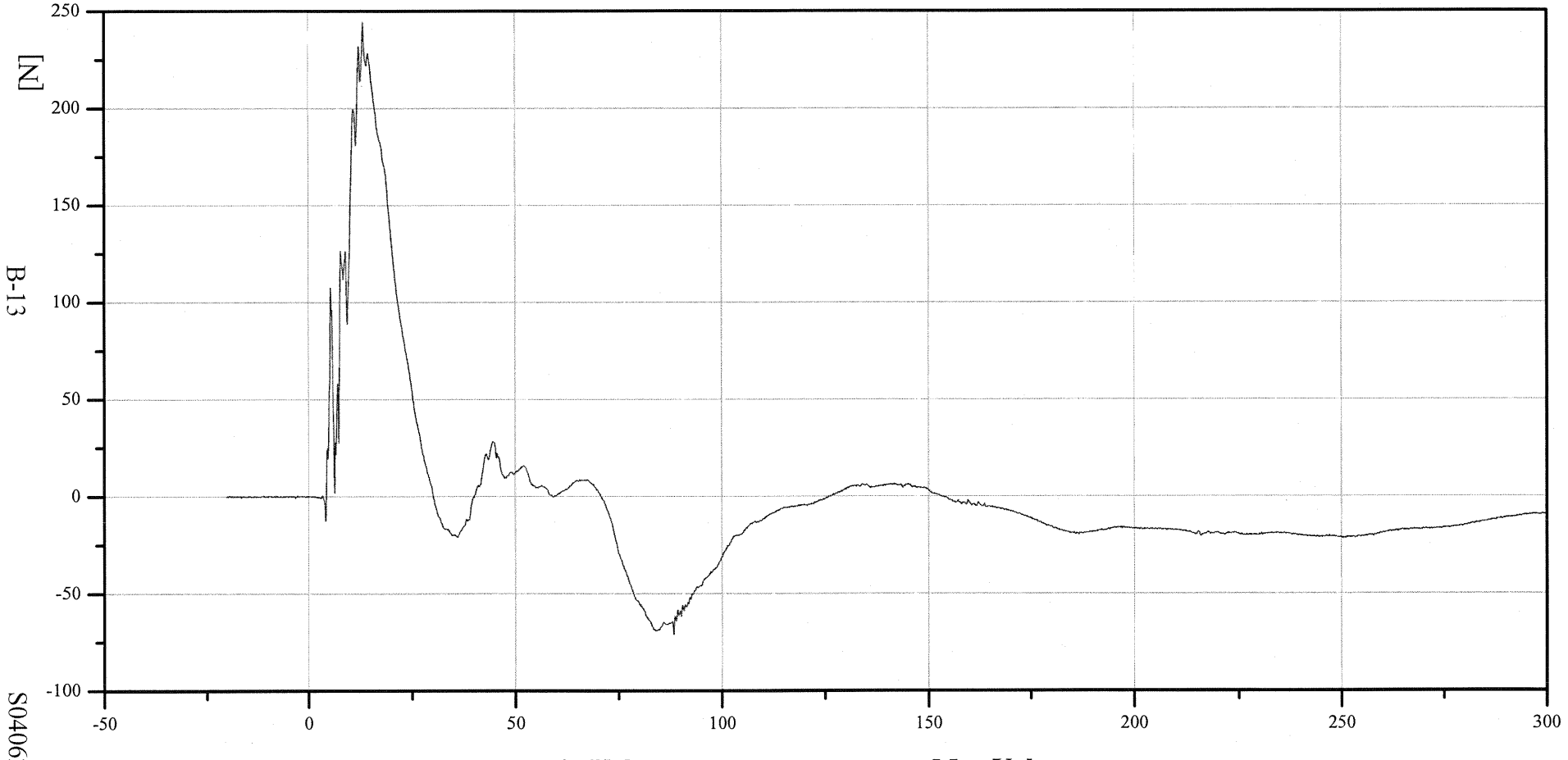

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-71.02 N at 88.32 ms

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244.40 N at 13.36 ms

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

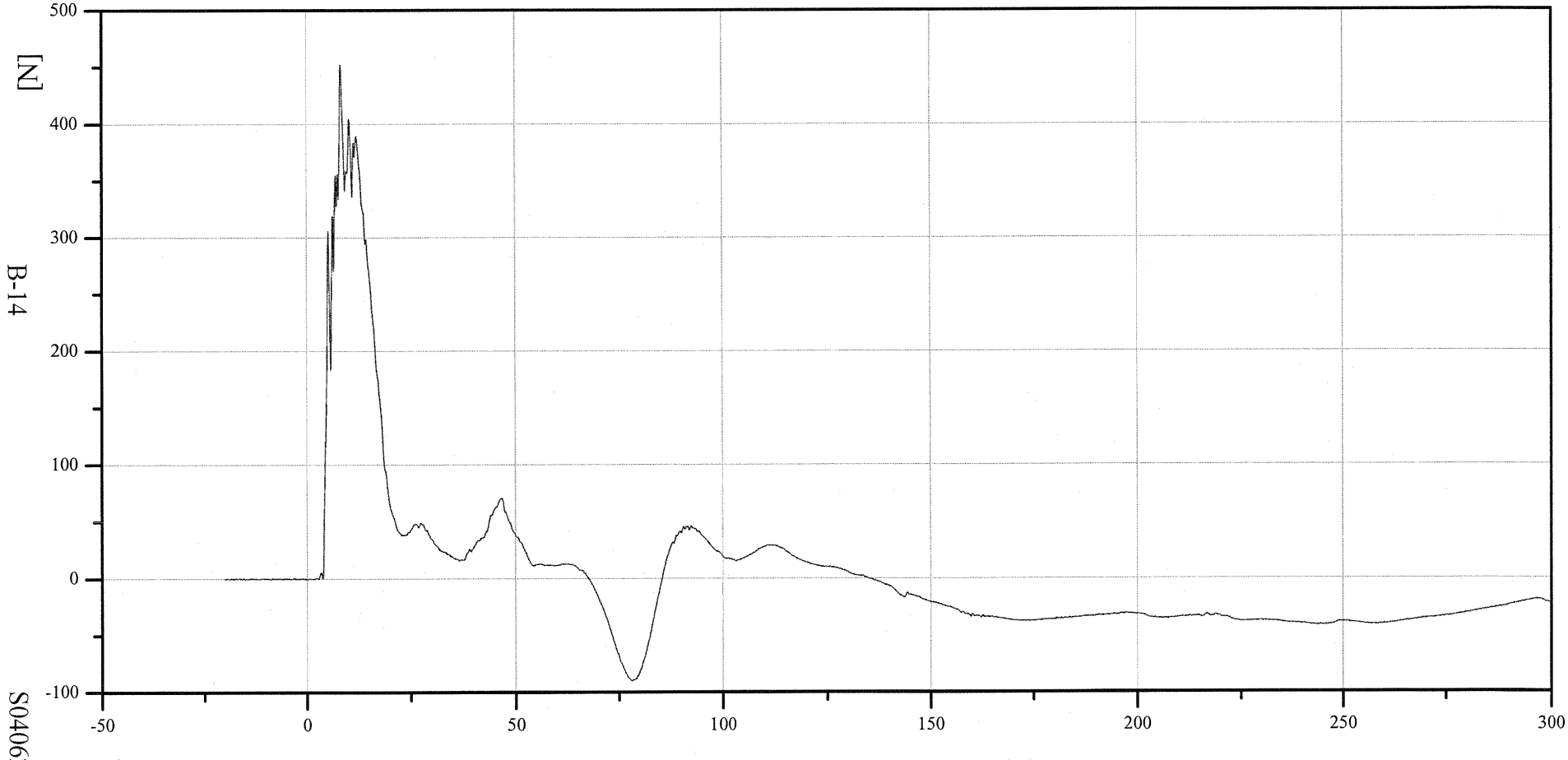
Lower Neck Force Y

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NKLYF2



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-89.85 N at 78.08 ms

<Max Value>
452.05 N at 8.24 ms

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

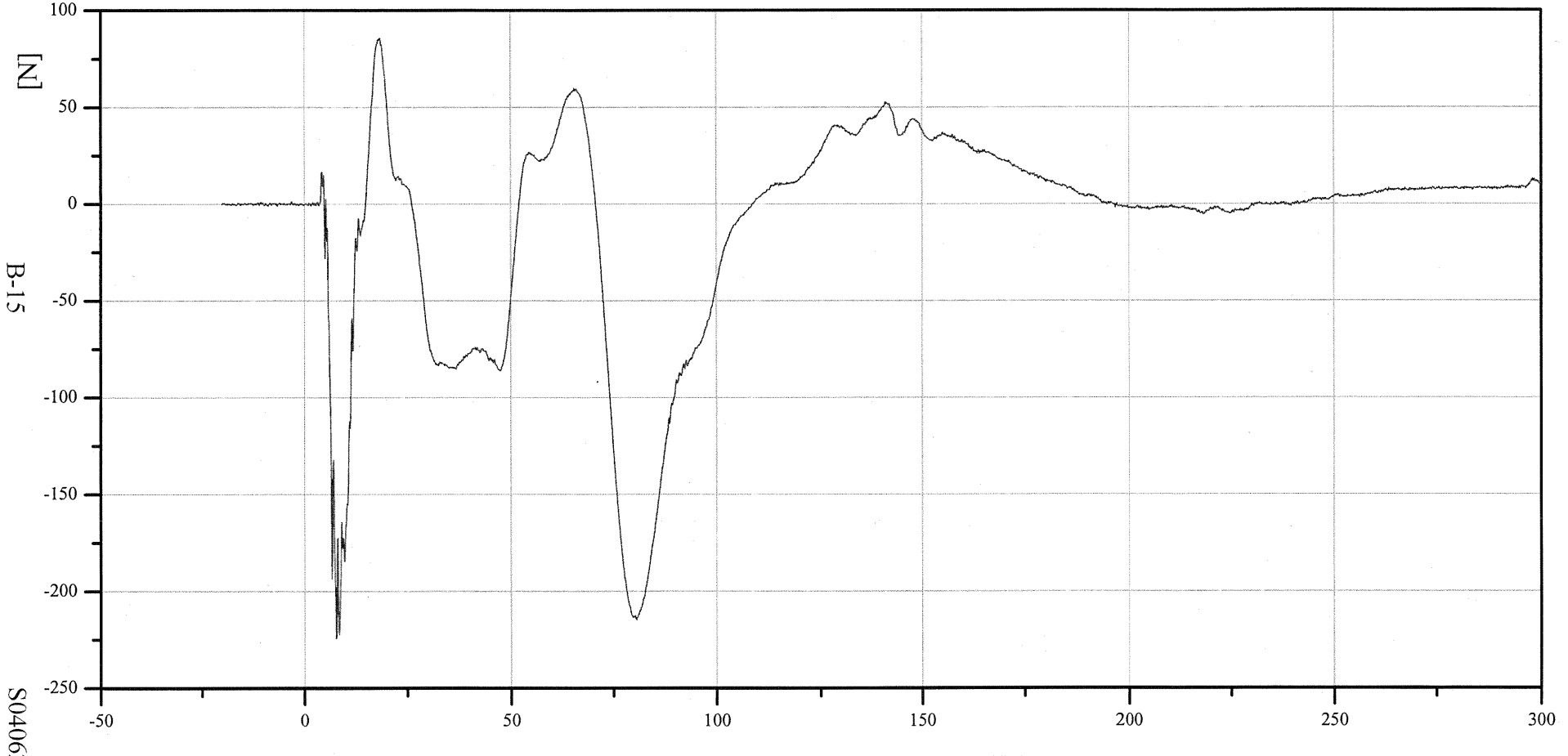
Lower Neck Force Z

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NKLZF2



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-224.25 N at 7.60 ms

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85.67 N at 18.32 ms

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

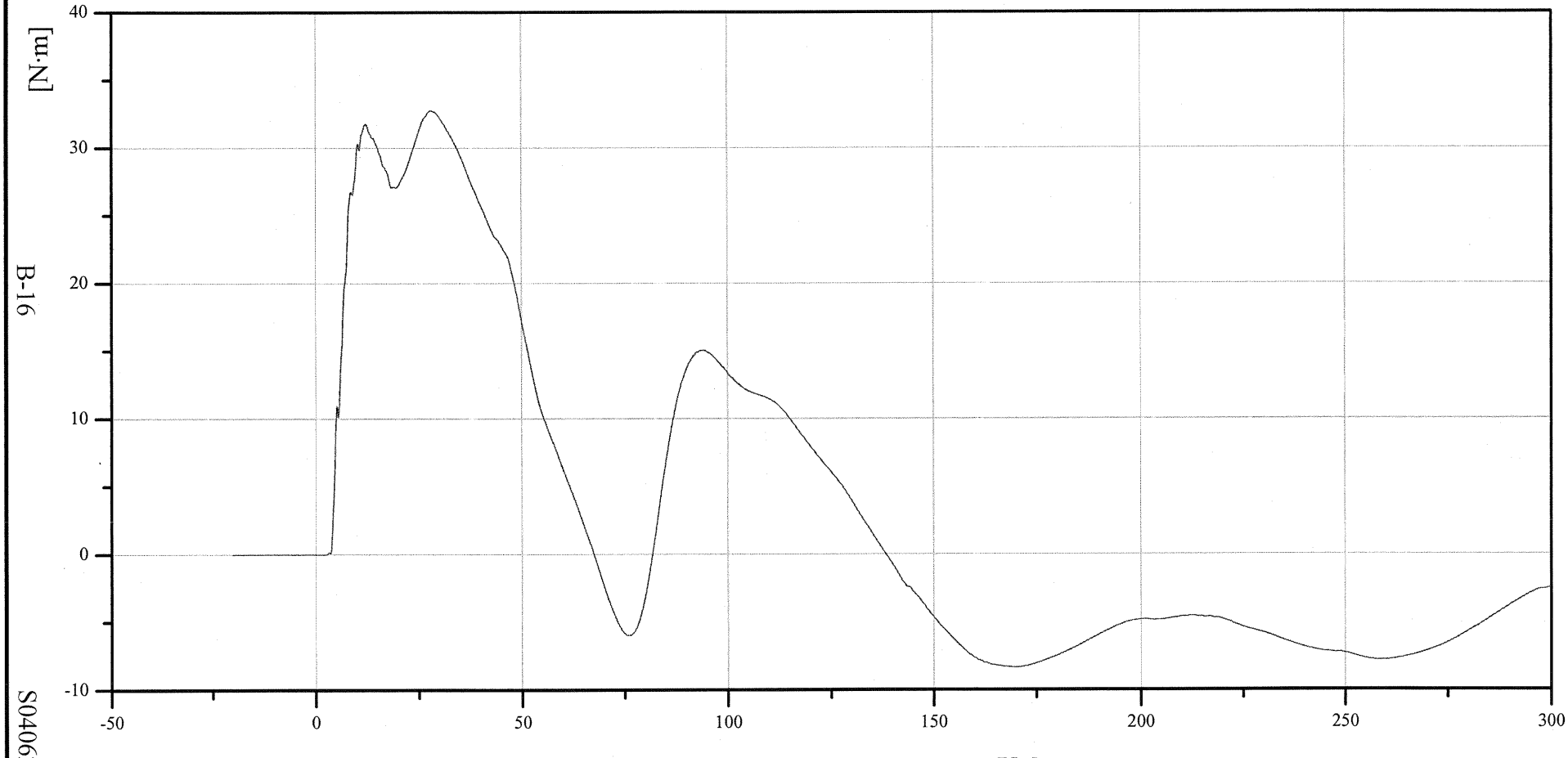
Lower Neck Moment X

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NKLXM2



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32.74 N·m at 28.08 ms

Time [ms]

CFC600 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

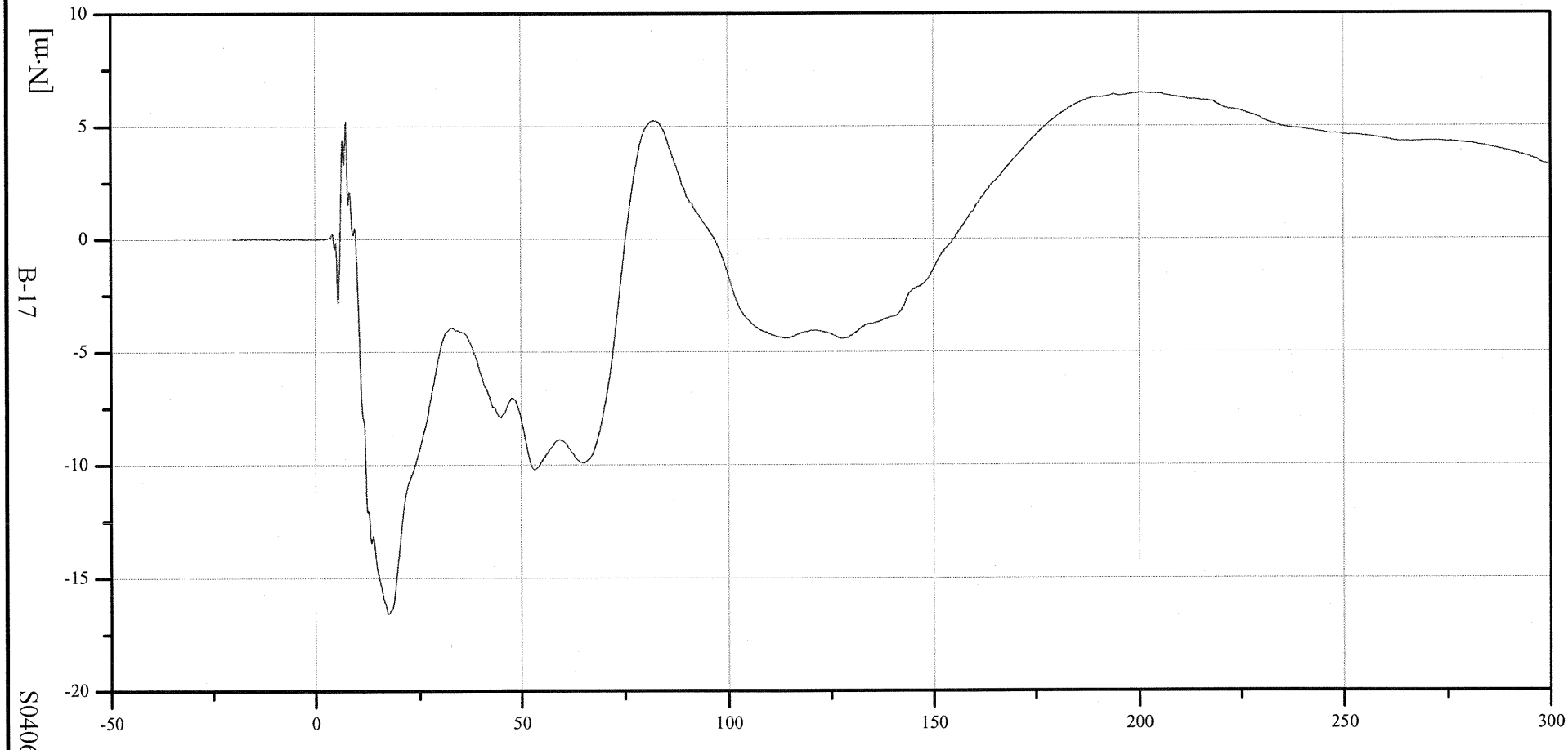
Lower Neck Moment Y

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NKLYM2



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6.48 N·m at 200.48 ms

CFC600 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

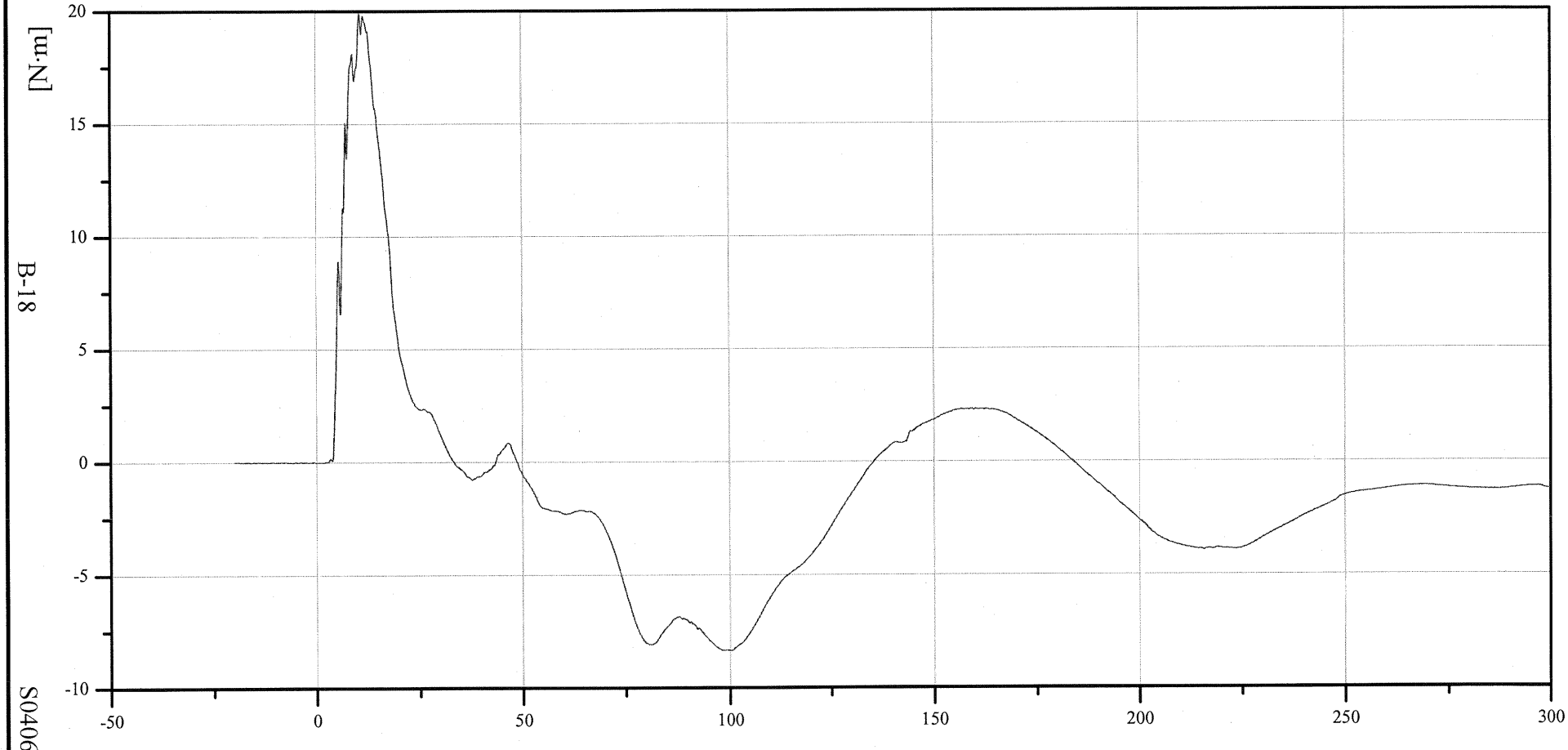
Lower Neck Moment Z

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

NKLZM2



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19.90 N·m at 10.56 ms

Time [ms]

CFC600 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

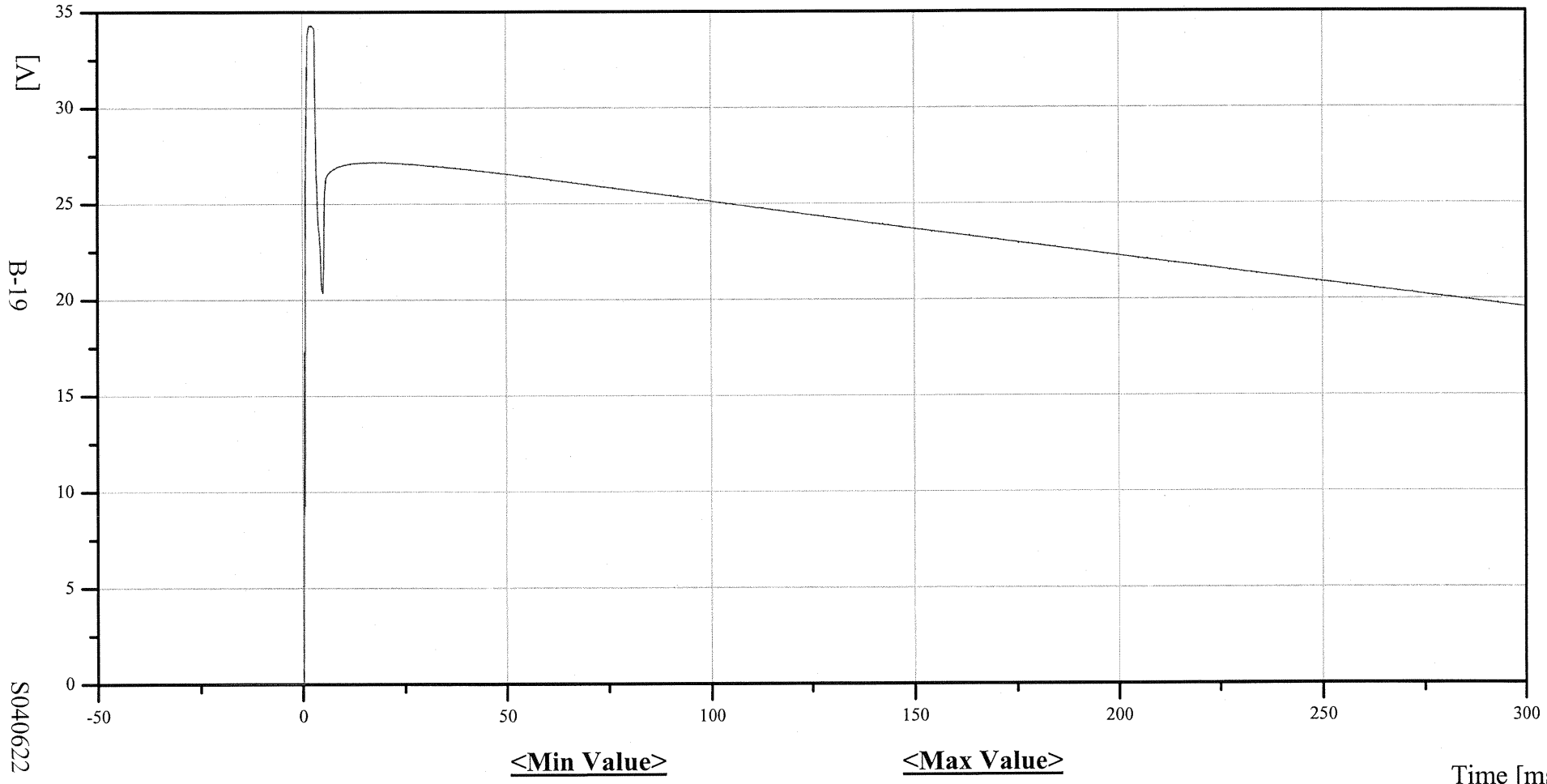
Passenger Side Torso Airbag

Date: 06/22/2004
Time: 14:42:38

Position #2 - HIII 6YO (186)

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

ABEVT1



<Min Value>
0.00 V at -20.00 ms

<Max Value>
34.30 V at 1.84 ms

CFC1000 [SAE J211 Polarity, Biased Removed and Filtered]

Transportation Research Center, Inc.

Neck Moment about the Occipital Condyle (NECK OM)

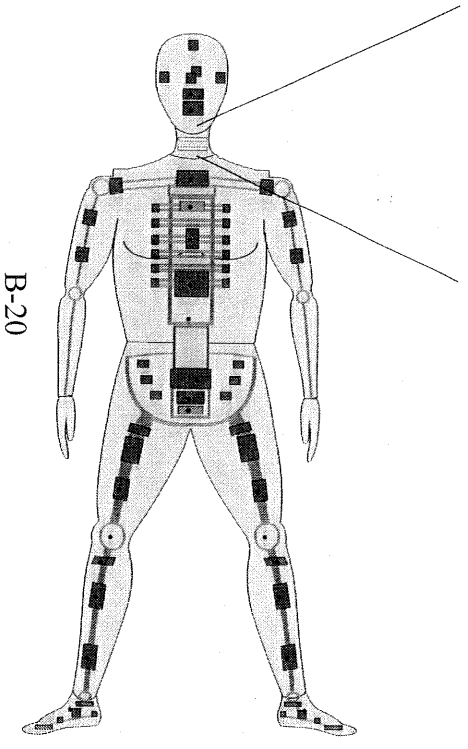
Date: 06/22/2004
Time: 14:42:38

Test Lab: SLED

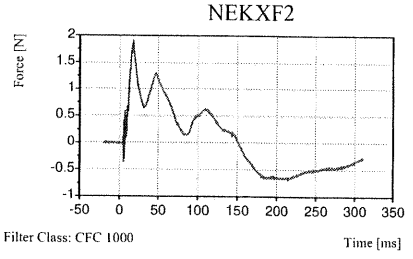
Test Orientation = Frontal

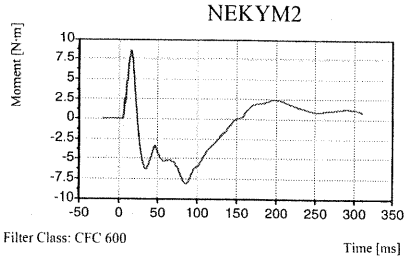
Customer: NHTSA

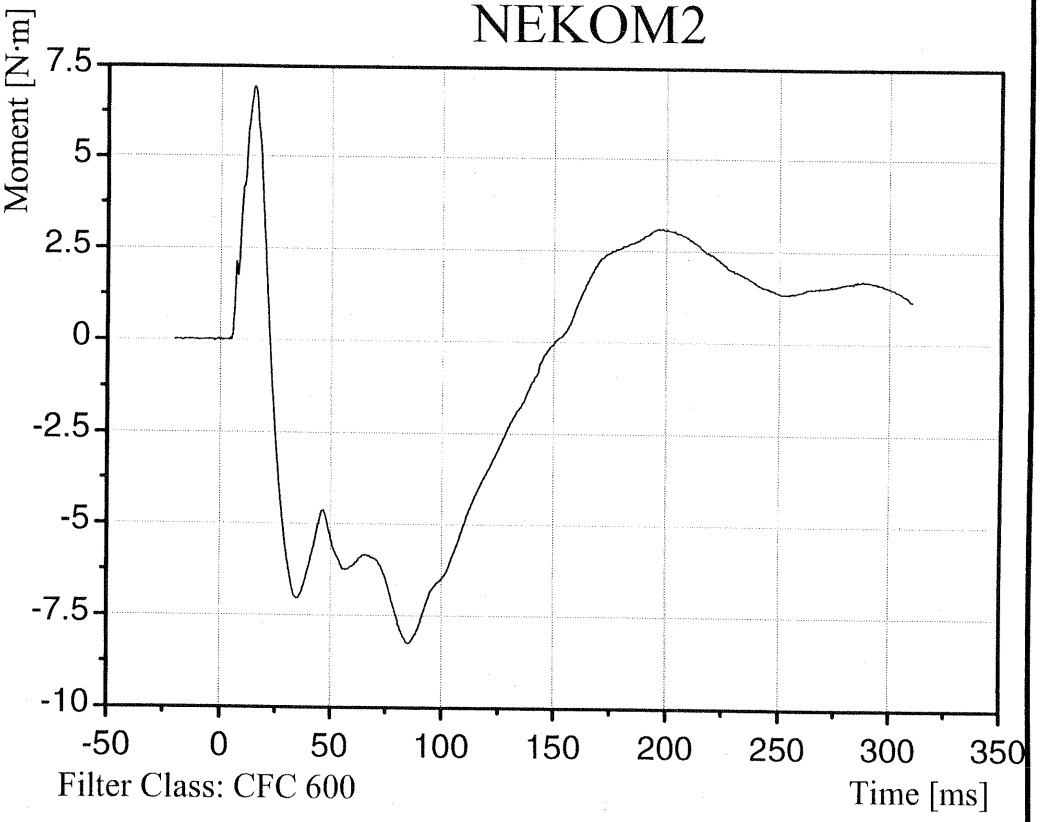
Test Number: S040622-1



B-20







Dummy: HIII 6YO

Seating Position: 2

S040622

Max [Flexion] = **6.92 N·m at 15.20 ms**

Min [Extension] = **-8.23 N·m at 85.20 ms**

Neck OM Source Code: My - (D*Fx)

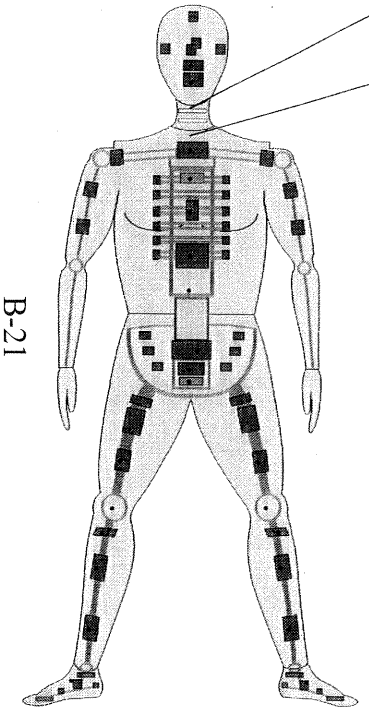
Transportation Research Center, Inc.

Neck Injury Predictor (NIJ)

Date: 06/22/2004
Time: 14:42:38

Test Lab: SLED
Customer: NHTSA
Test Number: S040622-1

Test Orientation = Frontal
Fzc(Tension) = 2800 N
Fzc(Compression) = 2800 N
Myc(Flexion) = 93 N·m
Myc(Extension) = 37 N·m



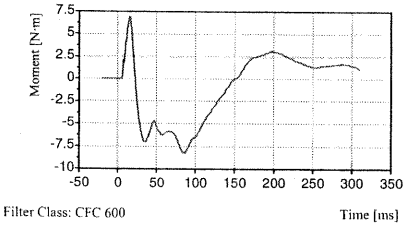
B-21

Dummy: HIII 6YO

Seating Position: 2

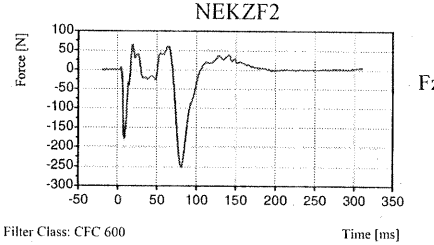
S040622

NEKOM2



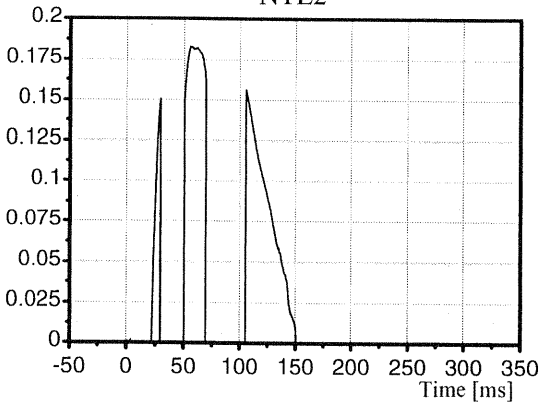
Filter Class: CFC 600

NEKZF2



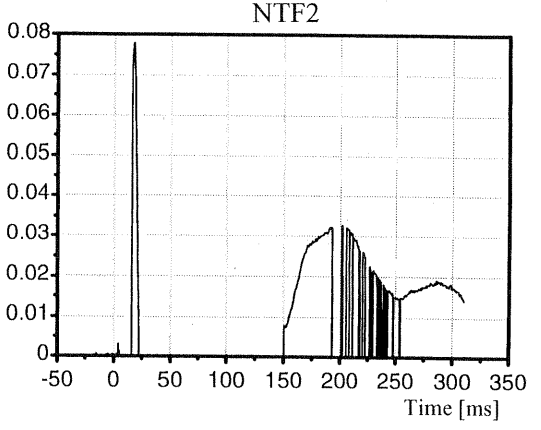
Filter Class: CFC 600

NTE2



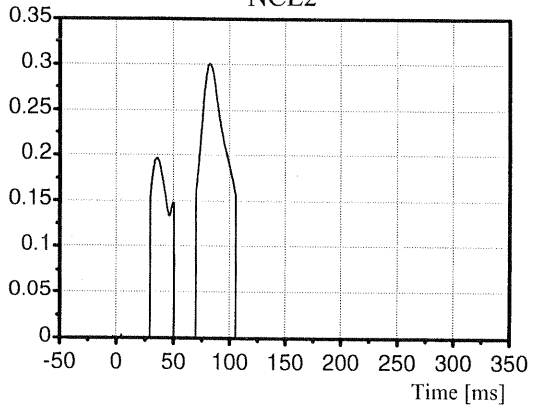
Max [NTE2] = 0.18 at 55.68 ms

NTF2



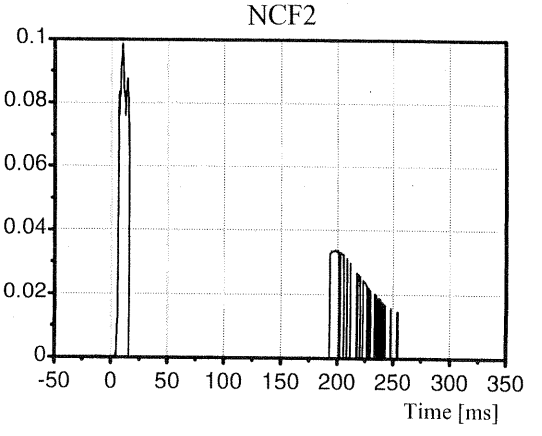
Max [NTF2] = 0.08 at 17.68 ms

NCE2



Max [NCE2] = 0.30 at 81.76 ms

NCF2



Max [NCF2] = 0.10 at 10.16 ms

NIJ Source Code: (Fz/Fzc) + (My/Myc)

Appendix C

Test Equipment and Instrumentation Calibration Information

Channel Report

06/22/2004 8:29:10 AM

Name of Test 040622-1 **System** MINIDAU **Name of DAU** DAU8

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range		Pol.	Cal.		Group	Mfg.	Model
8001	EVENT	EVENT	EVENT		5.12	V	+	04/19/2004	OK	-1	TRC	Event
8002	03D03D16-F03	HEDXG2	Head Accel X	Fwd	398.69641	g	+	05/21/2004	OK	186v	Entran	EGE-73B6Q-200
8003	99H30-Z09	HEDYG2	Head Accel Y	Rgt	401.28159	g	+	05/21/2004	OK	186v	Entran	EGE-73BQE0-20
8004	01J02-F08	HEDZG2	Head Accel Z	Up	398.39583	g	-	05/21/2004	OK	186v	Entran	EGE-73B6Q-200
8005	1716A-1632-FX	NEKXF2	Neck Force X	Hd	8896.5839	N	-	08/11/2003	OK	186v	Denton	1716A
8006	1716A-1632-FY	NEKYF2	Neck Force Y	Hd	8903.5850	N	+	08/11/2003	OK	186v	Denton	1716A
8007	1716A-1632-FZ	NEKZF2	Neck Force Z	Hd	13340.552	N	+	08/11/2003	OK	186v	Denton	1716A
8008	1716A-1632-MX	NEKXM2	Neck Moment X	Rt Ear	282.63576	N·m	-	08/11/2003	OK	186v	Denton	1716A
8009	1716A-1632-MY	NEKYM2	Neck Moment Y	Chn	282.28356	N·m	+	08/11/2003	OK	186v	Denton	1716A
8010	1716A-1632-MZ	NEKZM2	Neck Moment Z	Chn	282.90508	N·m	+	08/11/2003	OK	186v	Denton	1716A
8011	2430D-138-FX	NKLXF2	Lower Neck Force X	Hd	4445.3907	N	-	04/16/2003	---	186v	Denton	2430D
8012	2430D-138-FY	NKLYF2	Lower Neck Force Y	Hd	4449.2841	N	+	04/16/2003	---	186v	Denton	2430D
8013	2430D-138-FZ	NKLZF2	Lower Neck Force Z	Hd	7121.6422	N	+	04/16/2003	---	186v	Denton	2430D
8014	2430D-138-MX	NKLXM2	Lower Neck Moment X	Rt Ear	225.91588	N·m	-	04/16/2003	---	186v	Denton	2430D
8015	2430D-138-MY	NKLYM2	Lower Neck Moment Y	Chn	225.66014	N·m	+	04/16/2003	---	186v	Denton	2430D
8016	2430D-138-MZ	NKLZM2	Lower Neck Moment Z	Chn	141.14325	N·m	+	04/16/2003	---	186v	Denton	2430D

Dummy 186v **Type** HIII-6 Y.O. **Descriptio** VRTC - 186v HIII 6 YR OLD ICAL'd 4-16-03 (DKS 6-11-04)J211

Chsnam	Location	Model	Name	Manufacturer	Sens./mV/V/		Fullscal	Caldat	Pos Output	Flip
HEDXG	Head Accel X	EGE-73B6Q-20	03D03D16-F03	Entran	0.0251801	g	2000	5/21/2004	Fwd	0
HEDYG	Head Accel Y	EGE-73BQE0-	99H30-Z09	Entran	0.019332	g	2000	5/21/2004	Rgt	0
HEDZG	Head Accel Z	EGE-73B6Q-20	01J02-F08	Entran	0.0197716	g	2000	5/21/2004	Up	1
NEKXF	Neck Force X	1716A	1716A-1632-FX	Denton	0.000189309	N	8896	8/11/2003	Hd Fd,Cst Rr	1
NEKYF	Neck Force Y	1716A	1716A-1632-FY	Denton	0.000184903	N	8896	8/11/2003	Hd Lt,Cst Rt	0
NEKZF	Neck Force Z	1716A	1716A-1632-FZ	Denton	0.000095233	N	13344.6	8/11/2003	Hd Up,Cst Dn	0
NEKXM	Neck Moment X	1716A	1716A-1632-MX	Denton	0.0057876	N·	282.5	8/11/2003	Rt Ear to Rt Shld	1
NEKYM	Neck Moment Y	1716A	1716A-1632-MY	Denton	0.0058509	N·	282.5	8/11/2003	Chn to Strnm	0
NEKZM	Neck Moment Z	1716A	1716A-1632-MZ	Denton	0.00804353	N·	282.5	8/11/2003	Chn to Lt Shld	0
NKLXF	Lower Neck Force X	2430D	2430D-138-FX	Denton (Suffix D	0.000521156	N	4448.2	4/16/2003	Hd Fd,Cst Rr	1
NKLYF	Lower Neck Force Y	2430D	2430D-138-FY	Denton (Suffix D	0.00051603	N	4448.2	4/16/2003	Hd Lt,Cst Rt	0
NKLZF	Lower Neck Force Z	2430D	2430D-138-FZ	Denton (Suffix D	0.000210215	N	7117.2	4/16/2003	Hd Up,Cst Dn	0
NKLXM	Lower Neck Moment X	2430D	2430D-138-MX	Denton (Suffix D	0.009029204	N·	225.9	4/16/2003	Rt Ear to Rt Shld	1
NKLYM	Lower Neck Moment Y	2430D	2430D-138-MY	Denton (Suffix D	0.008626991	N·	225.9	4/16/2003	Chn to Sternum	0
NKLZM	Lower Neck Moment Z	2430D	2430D-138-MZ	Denton (Suffix D	0.014060156	N·	141.2	4/16/2003	Chn to Lt Shld	0
CSTXD	Chest Deflection X	08C1-3179	08C1-3179-CST186	Servo	2.20714	m	100	5/19/2004	Strnm Away Frm Spn	0