

REPORT NUMBER TR-P23106-07-NC

**SIDE AIRBAG OCCUPANT RISK PROGRAM
OCCUPANT OUT-OF-POSITION TESTS**

**FORD MOTOR COMPANY
2004 LINCOLN LS
4 DOOR SEDAN**

NHTSA NUMBER: M40205TWG2

**PREPARED BY:
KARCO ENGINEERING, LLC
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301**



MAY 27, 2004

FINAL REPORT

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Prepared by: _____
Mr. Biren J. Patel, Project Engineer
KARCO Engineering, LLC

Date: 6/21/2004

Reviewed by: _____
Mr. Jerry L. Kratzke, Director of Operations
KARCO Engineering, LLC

Date: 6/21/2004

Approved by: _____
Mr. Frank D. Richardson, Program Manager
KARCO Engineering, LLC

Date: 6/21/2004

FINAL REPORT ACCEPTED BY:

Manager, New Car Assessment Program

Date of Acceptance

COTR, NCAP Frontal Impact Program

Date of Acceptance

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16. Abstract					
A static side airbag deployment was conducted on a 2004 Lincoln LS 4 Door Sedan at KARCO Engineering, LLC on 5/27/2004. This test was conducted to obtain data indicant of TWG Side Airbag Out-of-Position Injury criteria.					
Measurement Description		Units	Threshold	Hybrid III 3 Year Old ATD	
Head Injury Criteria (HIC)		N/A	570	103.3	
Max. Thorax Accel. (3 msec clip)		G's	55	47.5	
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SECTION 1

PURPOSE AND SUMMARY OF TEST M40205TWG2

1.1 PURPOSE

This occupant out-of-position injury test is part of the Occupant Injury Risk from Deploying Side Airbags Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-01-D-02005. The purpose of this test was to obtain occupant injury data for a side airbag deployment.

The occupant out-of-position side airbag test was conducted in accordance with the Technical Working Group Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags.

1.2 SUMMARY

The effects of a seat-mounted combination torso/head airbag deployment in a 2004 Lincoln LS 4DR sedan with an out-of-position Hybrid III 3 Year-Old Child dummy were evaluated. The test was performed at Karco Engineering, LLC on May 27, 2004. Pre- and post-test photographs of the vehicle and dummy can be found in Appendix A.

Two high-speed film cameras were used to document the side airbag deployment event. Camera locations and other pertinent camera information can be found on Data Sheet No.1 and Data Sheet No.6.

One Part 572P, Hybrid III 3 Year-Old child anthropomorphic test device (ATD), was placed in the front passenger seat, facing rearward according to the dummy placement instructions in the July 2003 Revision of the Technical Working Group's 'Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags'.

The ATD was instrumented with head, chest and pelvis triaxial accelerometers, a chest displacement potentiometer, and a six-axis upper and lower neck transducer.

Twenty-two (22) channels of data were recorded using an on-board data acquisition system. Appendix A contains Photographs. Appendix B contains dummy response data traces. Appendix C contains the Instrumentation Data Channel assignments.

The passenger side doors remained closed during side air bag deployment and were operable after the deployment.

The Hybrid III 3 Year-Old Child Dummy's visible contact points were as follows: The ATD's head and chest contacted the airbag. This contact point can be observed dynamically on the high-speed video recording of the event.

Out of Position Occupant injury data is contained in table below.

OUT OF POSITION OCCUPANT DATA SUMMARY

ATD Position	HIC	Clip (g)	Chest Disp (mm)
Passenger	103.3	47.5	-27.6

Orientation of the Hybrid III 3 Year-old Child Dummy was in the rear facing position leaning against door. The dummy was positioned on its knees with head placed between the seat back and B-pillar. This orientation complies with section 3.3.3.2 of the Technical Working Group (TWG) recommendation in the Recommended Procedures for Evaluating Occupant Injury Risk from Deploying Side Airbags.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2004 Lincoln LS 4 Door Sedan

NHTSA No.: M40205TWG2

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

Test Date: 5/27/04

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressures	lbf/in ²	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	$=(tf - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

* Based on the Recommended Practice in SAE J916, May 85

DATA SHEET NO. 1

TEST SUMMARY

Test Vehicle: 2004 Lincoln LS 4 Door Sedan

NHTSA No.: M40205TWG2

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

Test Date: 5/27/04

TEST DUMMY INFORMATION

Description	Driver Seat Inboard Facing
Dummy Type / Serial No.	082
Head Contact	Yes
Chest Contact	Yes
Abdomen Contact	No
Pelvis	No
Left Knee Contact	No
Right Knee Contact	No

16mm MOVIE COVERAGE

High Speed Film	2
High Speed Digital	1
Total	3

DATA CHANNELS

Child ATD Sensors	22
Belt Assessment Sensors	0
Vehicle Structure Accelerometers	0
Total	22

DATA SHEET NO. 2**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2004 Lincoln LS 4 Door SedanNHTSA No.: M40205TWG2Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)Test Date: 5/27/04**TEST VEHICLE INFORMATION**

Make	Lincoln
Model	LS
Body Style	4-Door
NHTSA No.	M40205
VIN	1LNHM86S64Y616447
Color	Light Brown
Delivery Date	12/19/03
Odometer Reading (mile)	20.1
Dealer	Sunland Ford
Transmission	5 Speed Automatic
Final Drive	Rear
Type/Number Cylinders	V6
Engine Displacement (L)	3
Engine Placement	Longitudinal

TEST VEHICLE OPTIONS

Driver Front Airbag	Yes
Driver Side Torso Airbag	Yes
Driver Side Head Airbag	No
Rear Pass. Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Head Airbag	No
Power Brakes	Yes
Power Steering	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	Yes
Anti-lock Brakes	Yes
Tilt Steering Wheel	Yes
Power Windows	Yes
Power Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company	GVWR (kg)	2195
Date of Manufacture	September-03	GAWR Front (kg)	1181
		GAWR Rear (kg)	1181

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	308	308
Cold Pressure (kPa)	205	205
Recommend Tire Size	P225/55R16	P225/55R16
Tire Size on Vehicle	P225/55R16	P225/55R16
Tire Manufacturer	Continental	Continental

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket	None	
Number of Occupants	2	3	0	5
Capacity Wt. (VCW) (kg)				408
Cargo Weight (RCLW) (kg)				68

* Vehicle had undergone New Car Assessment Program Side Impact Test on November 14, 2004

DATA SHEET NO. 3

TEST VEHICLE INFORMATION

Test Vehicle: 2004 Lincoln LS 4 Door Sedan

NHTSA No.: M40205TWG2

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

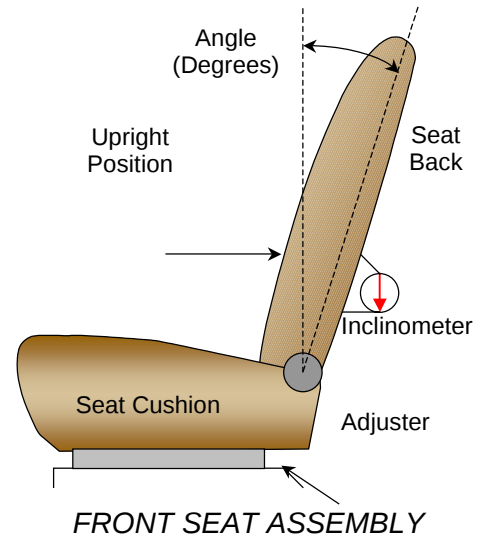
Test Date: 5/27/04

NOMINAL DESIGN RIDING POSITION

The passenger seat back is positioned to the manufacturers designated angle. The procedure is as follows: A special application tool with pointed probes is inserted through the fabric to make contact with the rigid portion of the lower seat frame assembly, approximately 13 inches above the pivot point of the seat back. An inclinometer is placed against the flat surface of the tool and the seat back angle is measured directly from the dial face.

SEAT BACK ANGLES

Position	Deg.
Passenger w/ Dummy	22.8



SEAT FORE/AFT POSITIONS

The first or forward most position is counted as number one (1). The fore/aft position is set aft of the middle position for the driver seat.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Passenger Seat	240 mm	120 mm

DATA SHEET NO. 4

DUMMY POSITIONING INFORMATION

Test Vehicle: 2004 Lincoln LS 4 Door Sedan

NHTSA No.: M40205TWG2

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

Test Date: 5/27/04

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Hybrid III 3-Year-Old Child Dummy	
		Length (mm)	Angle (°)
SA	Seat Back Angle		22.8
AMW	Airbag Module Width	85	
ABW	Airbag Width	315	
AML	Airbag Module Length	220	
ABL	Airbag Length	645	
HD	Head CG to Door Panel/ Window	150	
HSC	Head to Seat Back Centerline	5	
HB	Head to B-Pillar	41	
HZ	Head to Roof (Z)		
HHD	Head to Header	360	
CD	Chest to Dash	630	
CS	Chest to Seatback	80	
RACL	Right Arm to Seatback Centerline		
RA	Right Arm to Door Panel		
KK	Kne to Knee	120	
TT	Toe to Toe	115	
KSCR	Right Knee to Seat Cuhion Centerline		
TSCR	Right Toe to Seat Cushion Centerline		

DATA SHEET NO. 5 - 3 YEAR OLD HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2004 Lincoln LS 4 Door Sedan

NHTSA No.: M40205TWG2

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

Test Date: 5/27/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Head CG	X	G's	23.7	262.3	-53.4	6.7
Head CG	Y	G's	25.9	8.0	-26.8	264.2
Head CG	Z	G's	29.0	11.9	-7.9	18.4
Head CG Resultant	N/A	G's	58.2	7.4		

PRIMARY HEAD INJURY CRITERIAS (HIC)

Location	Pass.			
	HIC	T ¹	T ²	Avg G
Head CG Primary (HIC15)	103.3	5.6	14.4	42.3

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Chest CG	X	G's	17.6	12.1	-71.7	8.4
Chest CG	Y	G's	18.4	264.3	-30.1	11.8
Chest CG	Z	G's	17.5	264.5	-16.0	9.2
Chest CG Resultant	N/A	G's	72.6	8.4		

PRIMARY CHEST CLIP (3MSEC)

Location	Pass.		
	CLIP	T ¹	T ²
Chest CG Primary	47.5	7.3	10.3

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Chest CG	X	MM	2.2	21.0	-27.6	9.8

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Pelvis	X	G's	10.7	11.5	-9.4	29.1
Pelvis	Y	G's	13.7	18.7	-9.9	29.6
Pelvis	Z	G's	19.8	266.7	-31.2	8.4
Pelvis Resultant	N/A	G's	31.4	8.4		

DATA SHEET NO. 5...(continued)Test Vehicle: 2004 Lincoln LS 4 Door SedanNHTSA No.: M40205TWG2Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)Test Date: 5/27/04**UPPER NECK PEAK FORCES AND MOMENTS**

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Neck Force	X	Newtons	537.5	6.7	-235.7	275.9
Neck Force	Y	Newtons	319.7	273.0	-320.4	15.8
Neck Force	Z	Newtons	1422.4	10.4	-1138.1	270.0
Neck Force Resultant	N/A	Newtons	1458.1	7.9		
Neck Moment	X	Nm	17.8	266.5	-21.5	19.6
Neck Moment	Y	Nm	17.8	6.7	-8.9	280.3
Neck Moment	Z	Nm	4.9	299.9	-5.0	14.8
Neck Moment Resultant	N/A	Nm	23.1	19.6		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Neck Force	X	Newtons	434.5	6.1	-207.1	12.3
Neck Force	Y	Newtons	151.1	282.4	-437.0	13.5
Neck Force	Z	Newtons	1219.2	7.5	-1012.7	270.8
Neck Force Resultant	N/A	Newtons	1257.7	8.2		
Neck Moment	X	Nm	33.4	273.1	-44.9	15.4
Neck Moment	Y	Nm	16.8	12.4	-11.0	89.5
Neck Moment	Z	Nm	9.7	8.2	-15.8	13.9
Neck Moment Resultant	N/A	Nm	47.8	15.4		

DATA SHEET NO. 6**CAMERA LOCATIONS**Test Vehicle: 2004 Lincoln LS 4 Door SedanNHTSA No.: M40205TWG2Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)Test Date: 5/27/04

No.	Camera View	Location (mm)			Angle (Deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	High Speed Film Side View	270	3100	120	2.0	24	900
2	High Speed Film Front View	2270	300	886	21.0	24	1020
3	High Speed Digital Side View	350	3320	175	1.0	25	1000

* Cameras aligned to center of seat back as reference.

APPENDIX A

PHOTOGRAPHS



Figure A-1: Right Front $\frac{3}{4}$ View, As Received

MFD. BY FORD MOTOR CO. IN U.S.A.

DATE: 09/03

GVWR: 2195KG/4840LB

FRONT GAWR: 1181KG/2604LB

REAR GAWR: 1181KG/2604LB

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

VIN: 1LNHM86S64Y616447 TYPE: PASSENGER

MAXIMUM LOAD = OCCUPANTS + LUGGAGE = 408KG/0900LB

OCCUPANTS = 5 TOTAL;

2 FR, 3 RR

TIRE: P225/55R16

PRESSURE(FR): 205 kPa/30 PSI COLD

PRESSURE(RR): 205 kPa/30 PSI COLD



1LNHM86S64Y616447

TRAILER TOWING - SEE OWNER GUIDE

EXT PNT: G3

BRK
4

INT TR
4U

TP/PS

R
6

AXLE
53

IRC: 54

TR
A

SPR

HH6

DSO:

F0196
R0036

UBC

▽2U5A-5420472-AA

Figure A-2: Vehicle Certification Label



Figure A-3: Post-Test Right Front $\frac{3}{4}$ View of Prior Test



Figure A-4: Post-Test Right Side View of Prior Test



Figure A-5: Pre-Test Dummy Position, Left Side View



Figure A-6: Pre-Test Dummy Position, $\frac{3}{4}$ View



Figure A-7: Pre-Test Dummy Position, Full Front View



Figure A-8: Post-Test Dummy Position and Airbag, Full Front View



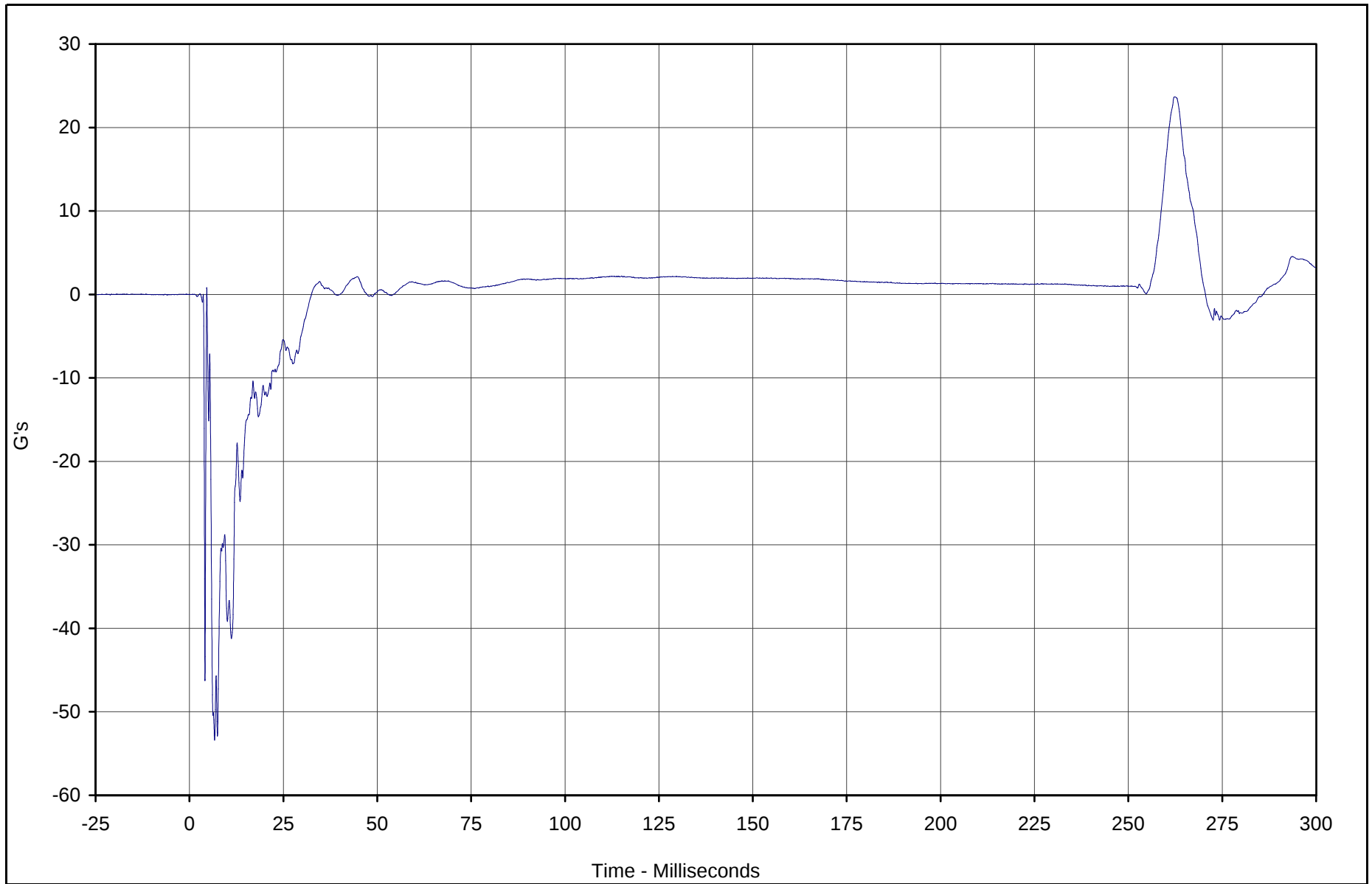
Figure A-9: Post-Test Dummy Position and Airbag, Left View



Figure A-10: Post-Test Airbag, Left Side View

APPENDIX B

DATA PLOTS



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Head X	001	FIL	G's	23.7	262.3	-53.4	6.7	1000

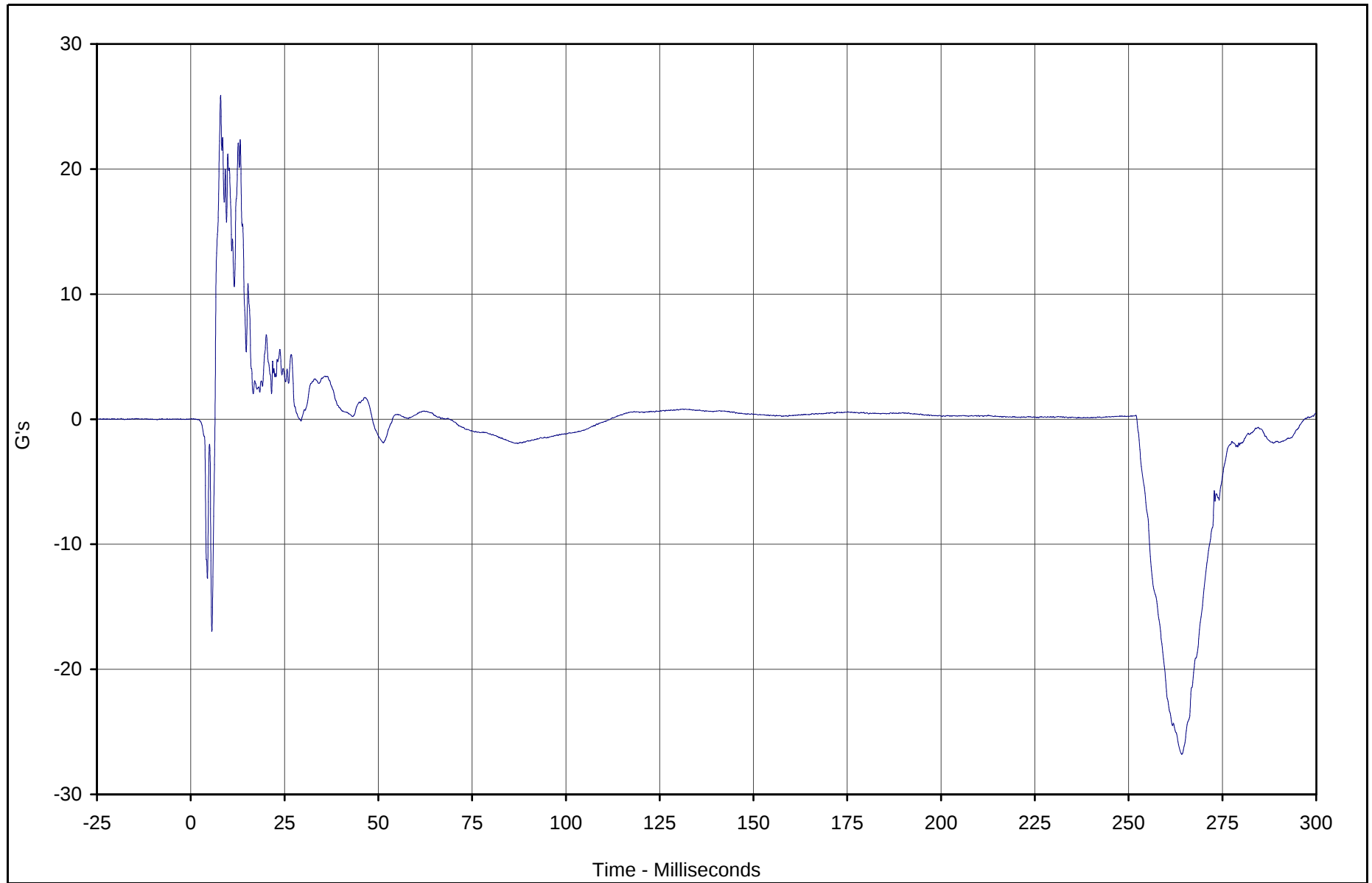


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Head Y	002	FIL	G's	25.9	8.0	-26.8	264.2	1000

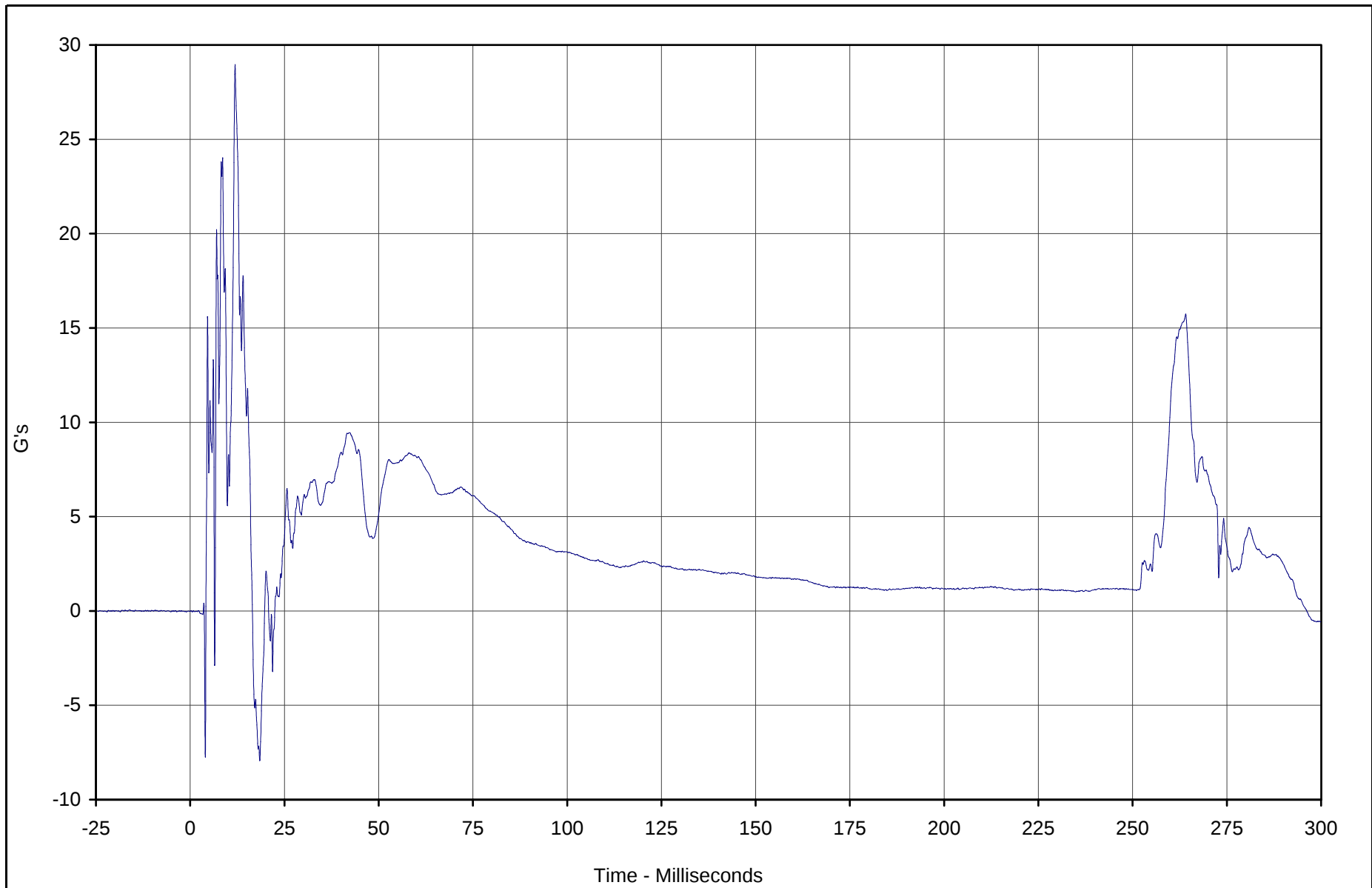


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NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Head Z	003	FIL	G's	29.0	11.9	-7.9	18.4	1000

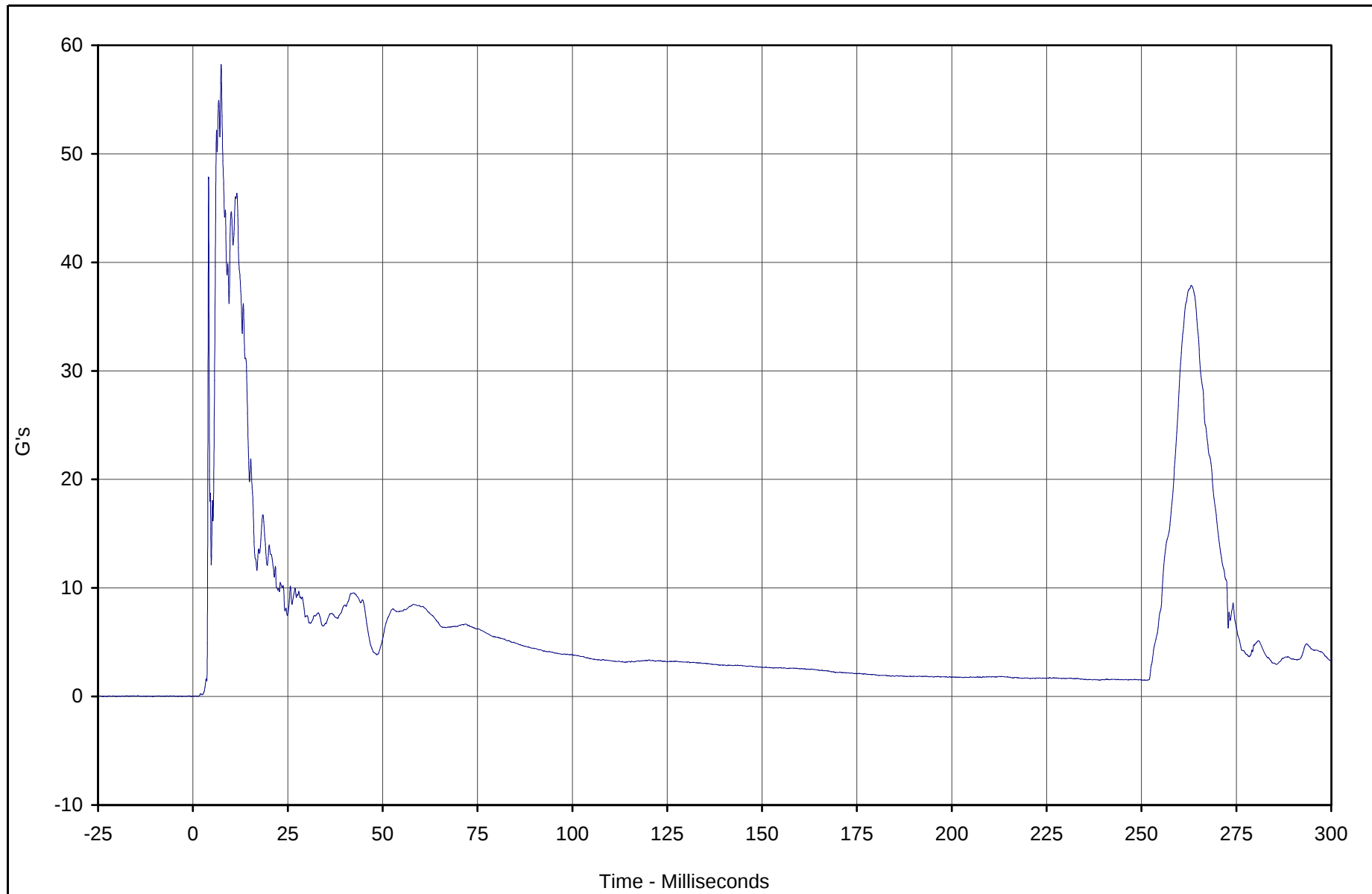


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Head Resultant	001	RES	G's	58.2	7.4	0.0	0.9	1000

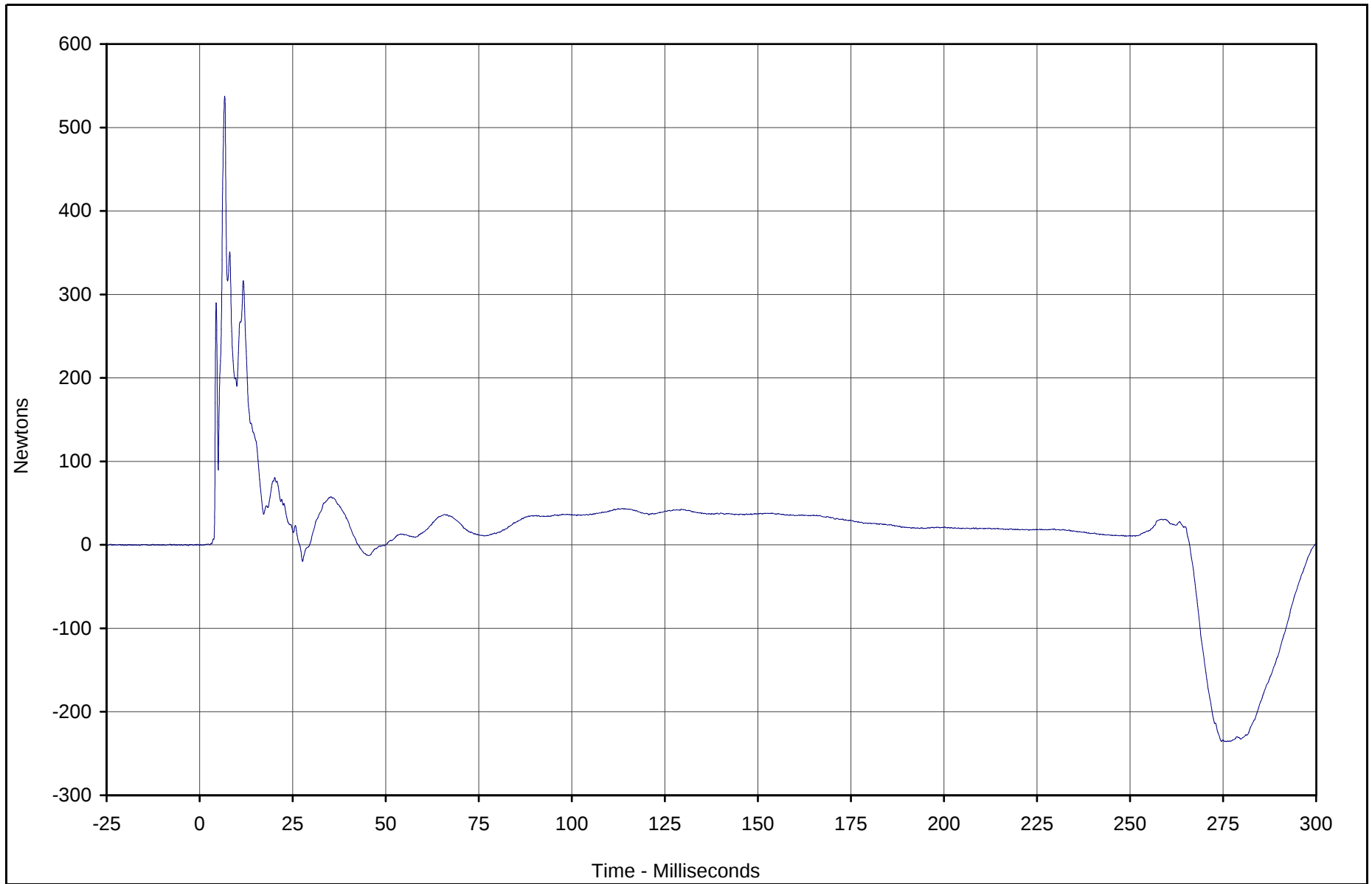


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force X	004	FIL	Newtons	537.5	6.7	-235.7	275.9	1000

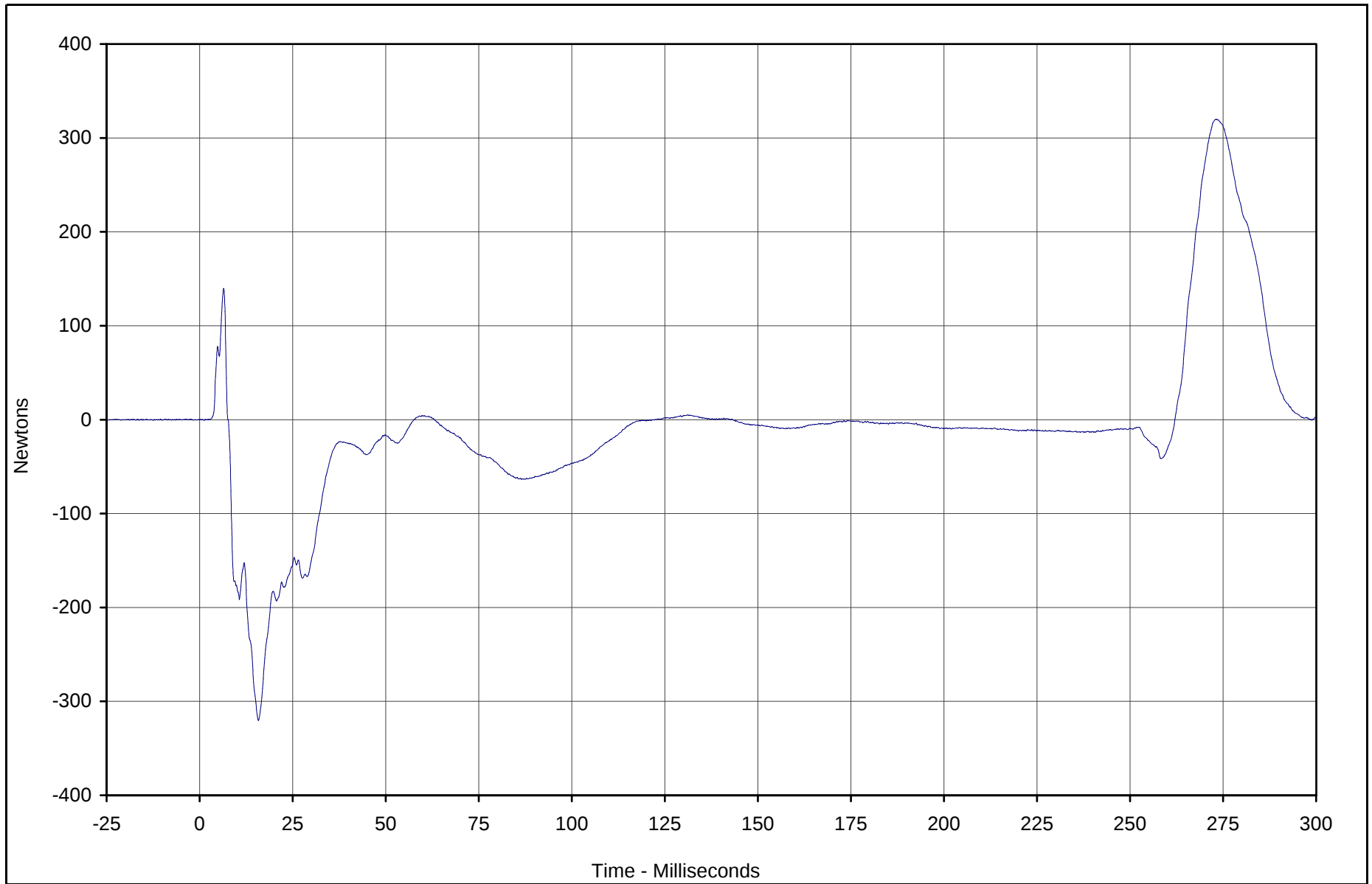


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force Y	005	FIL	Newtons	319.7	273.0	-320.4	15.8	1000

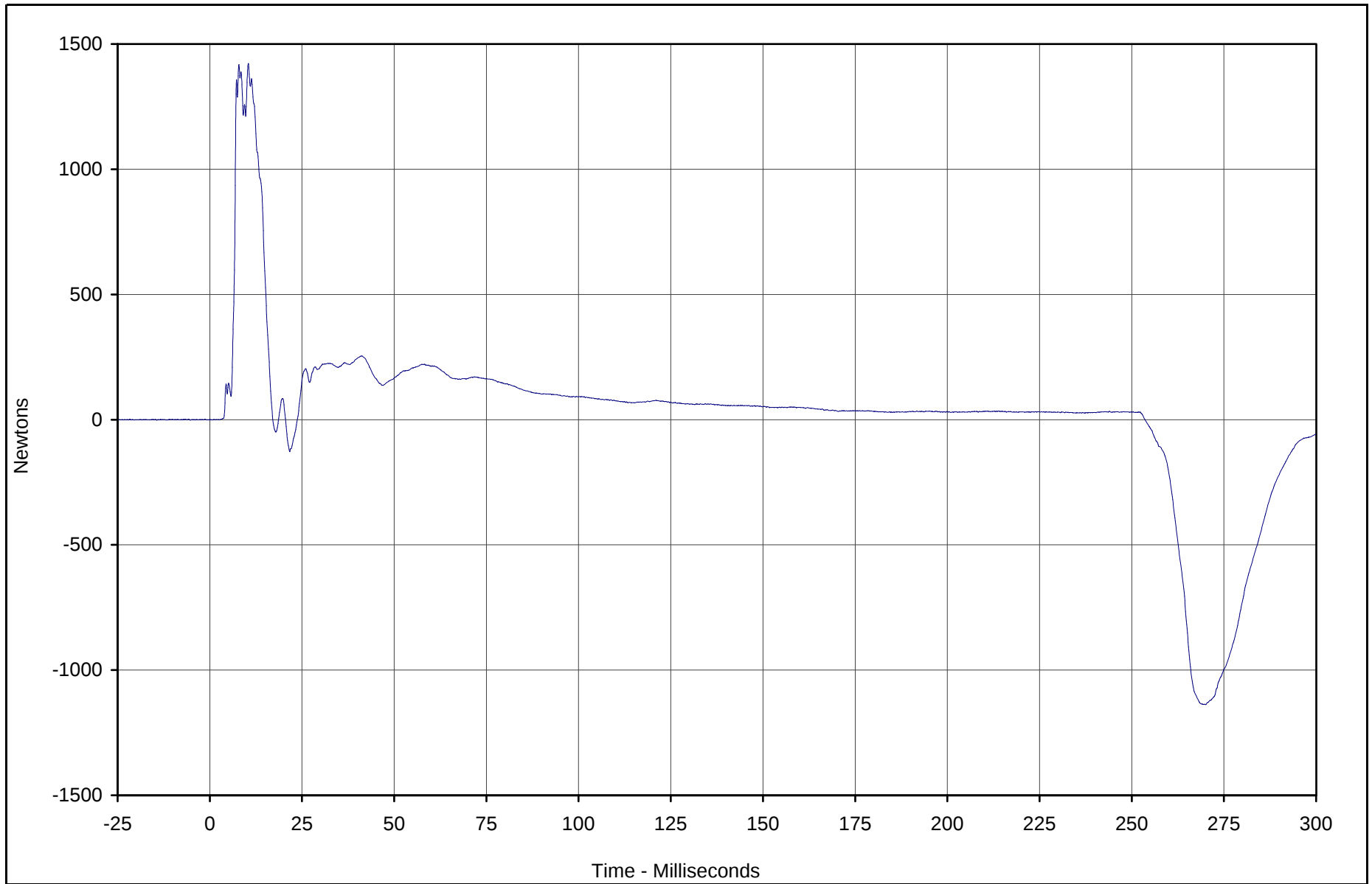


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force Z	006	FIL	Newtons	1422.4	10.4	-1138.1	270.0	1000

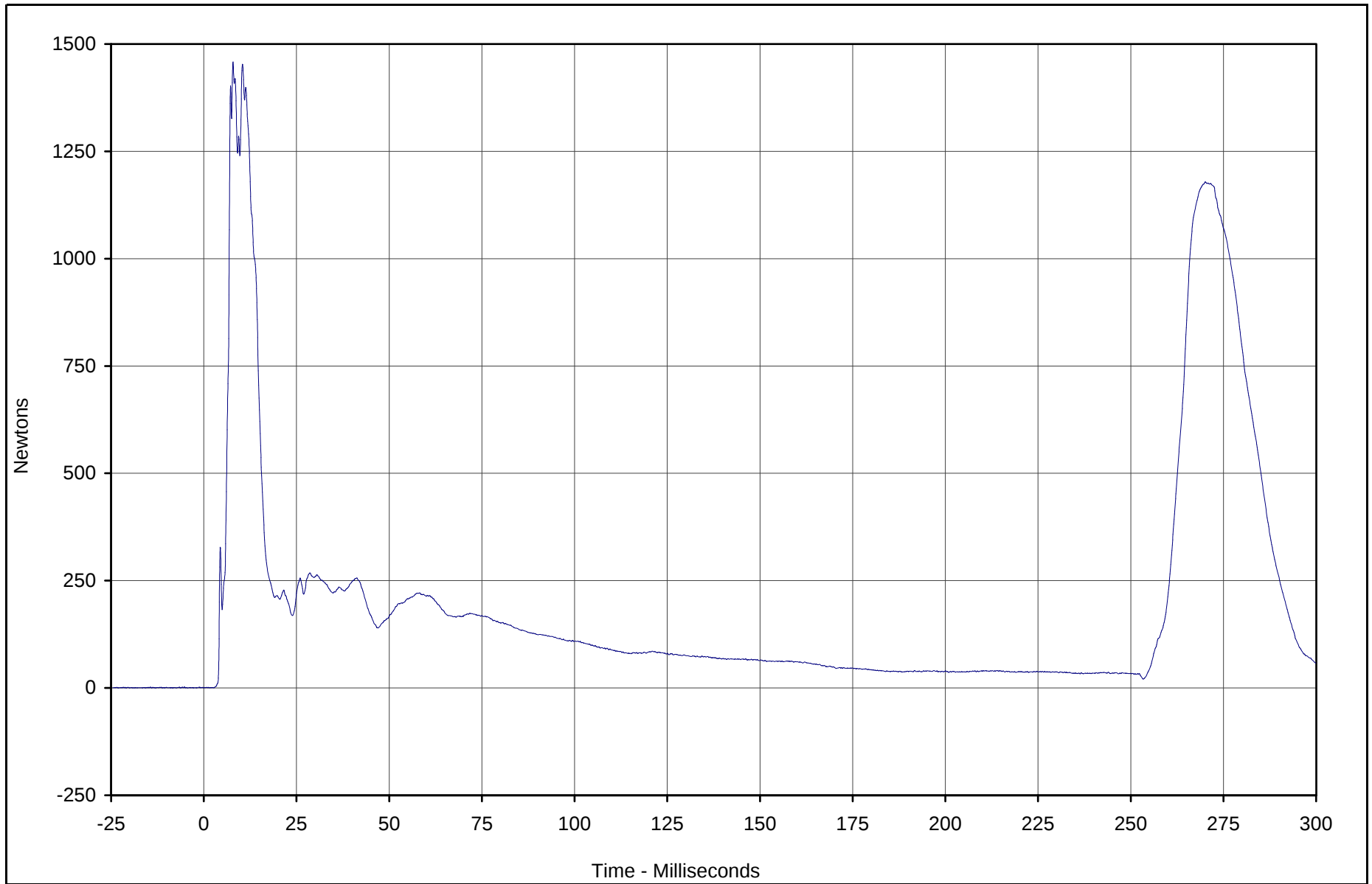


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force Resultant	004	RES	Newtons	1458.1	7.9	0.4	2.7	1000

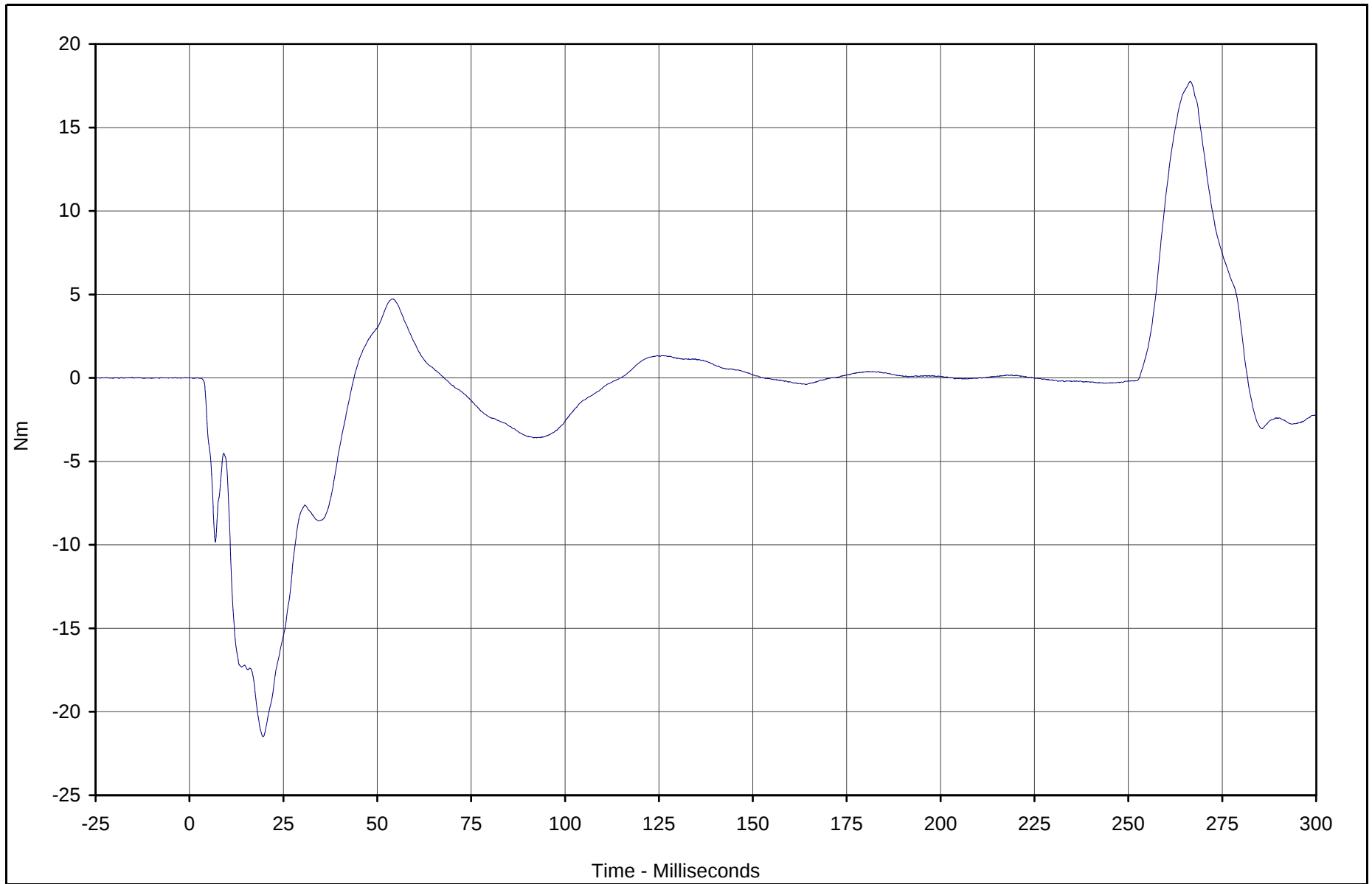


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment X	007	FIL	Nm	17.8	266.5	-21.5	19.6	600

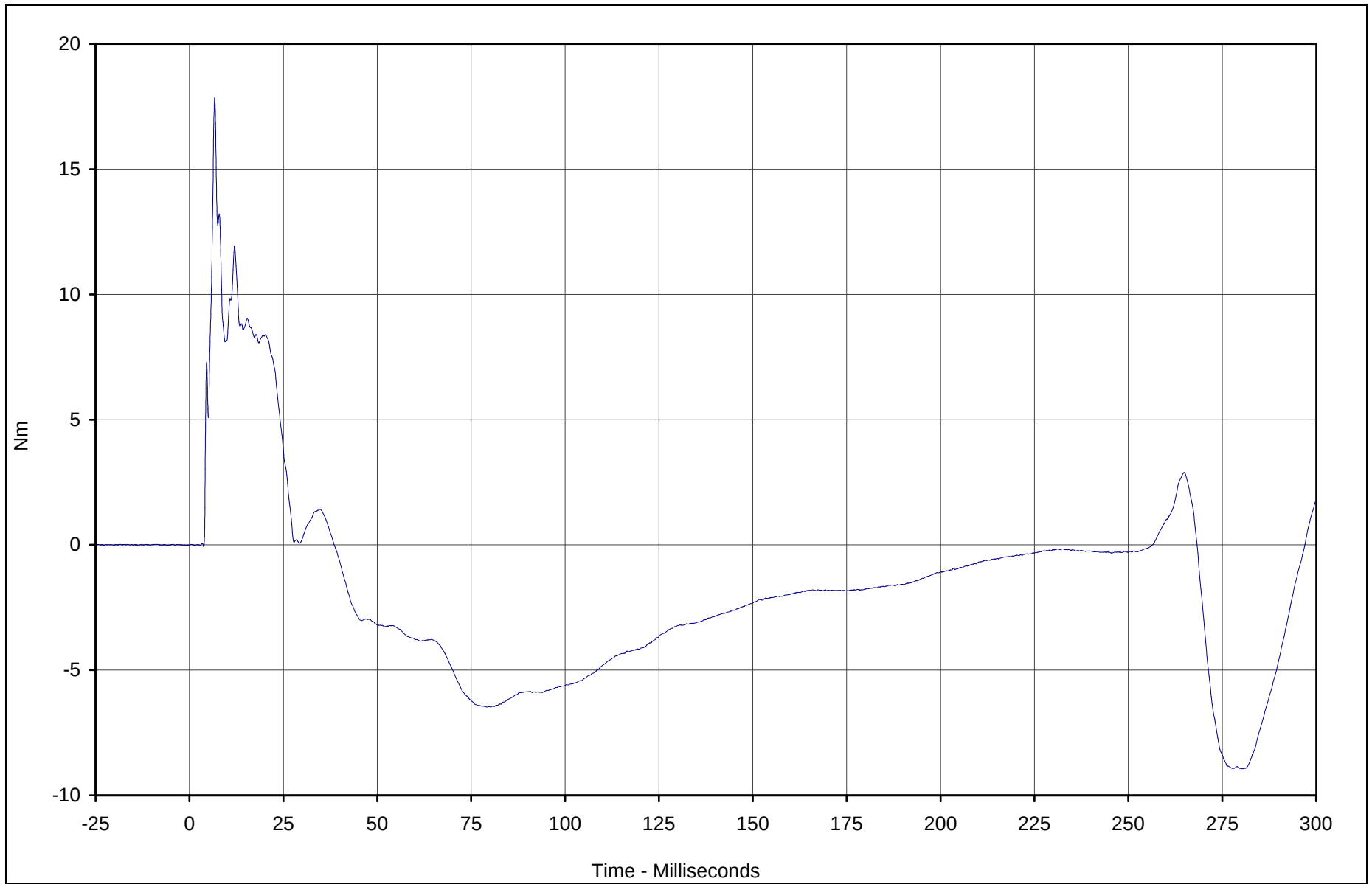


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment Y	008	FIL	Nm	17.8	6.7	-8.9	280.3	600

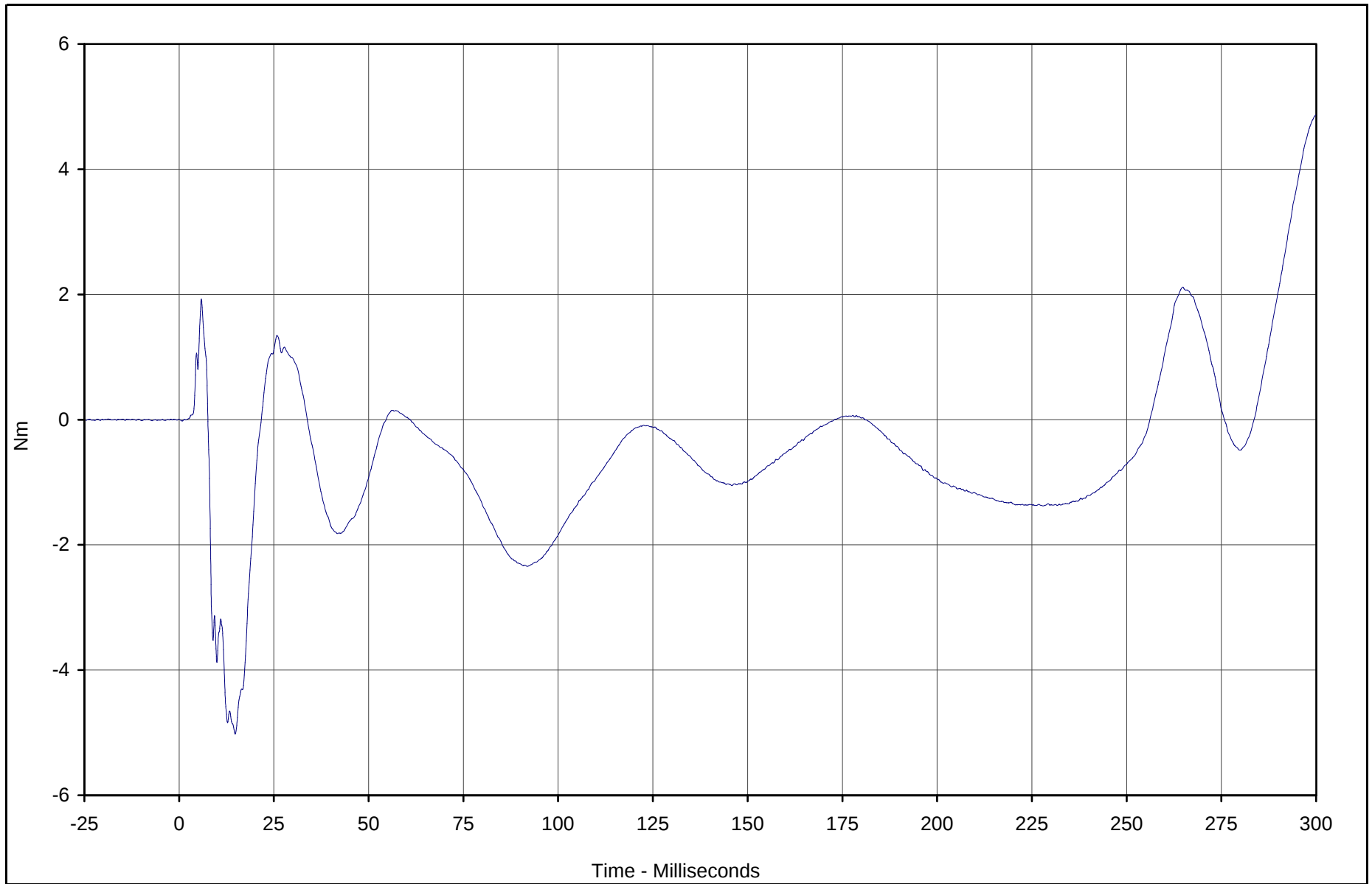


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment Z	009	FIL	Nm	4.9	299.9	-5.0	14.8	600

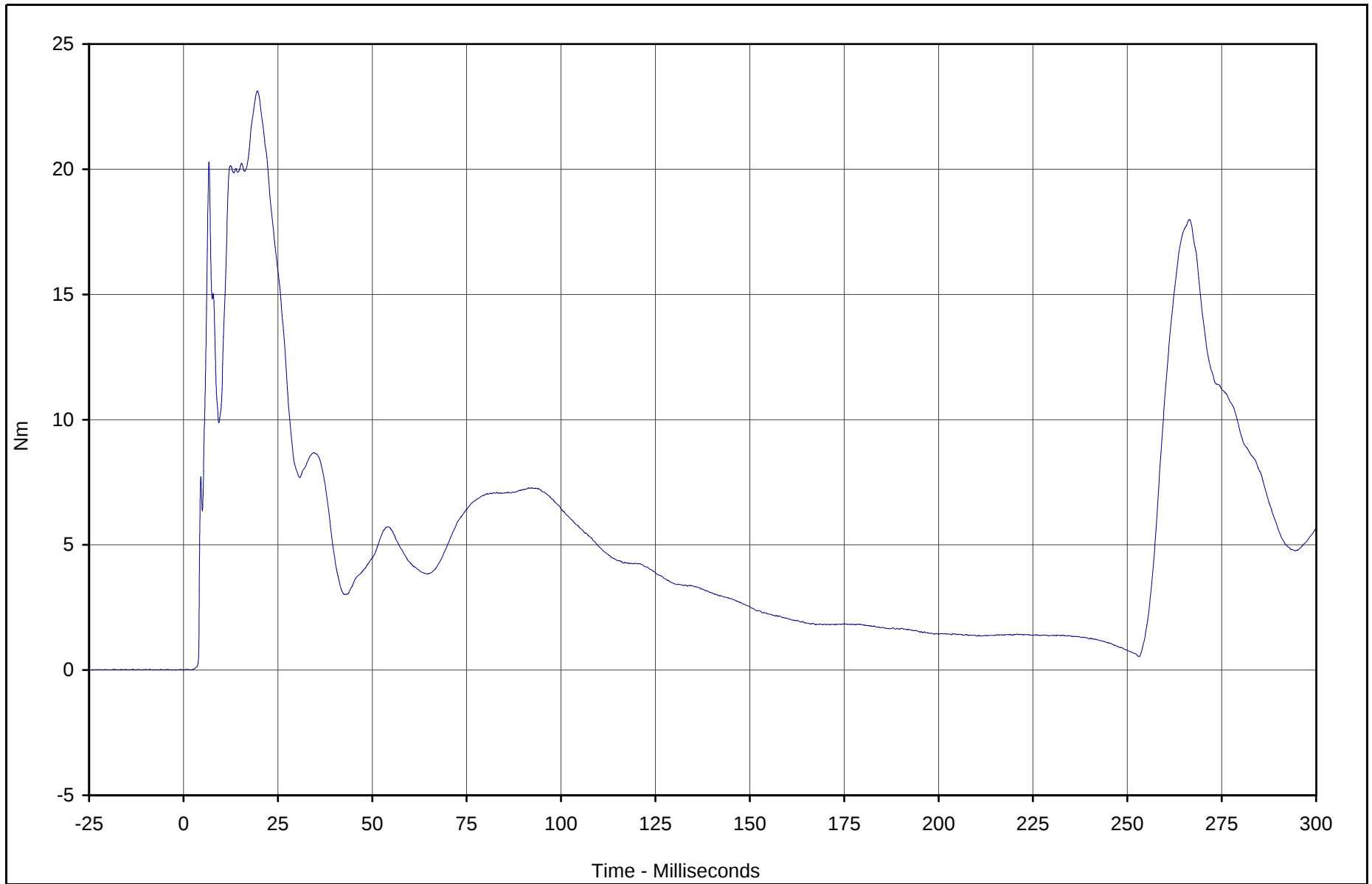


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment Resultant	007	RES	Nm	23.1	19.6	0.0	0.1	600

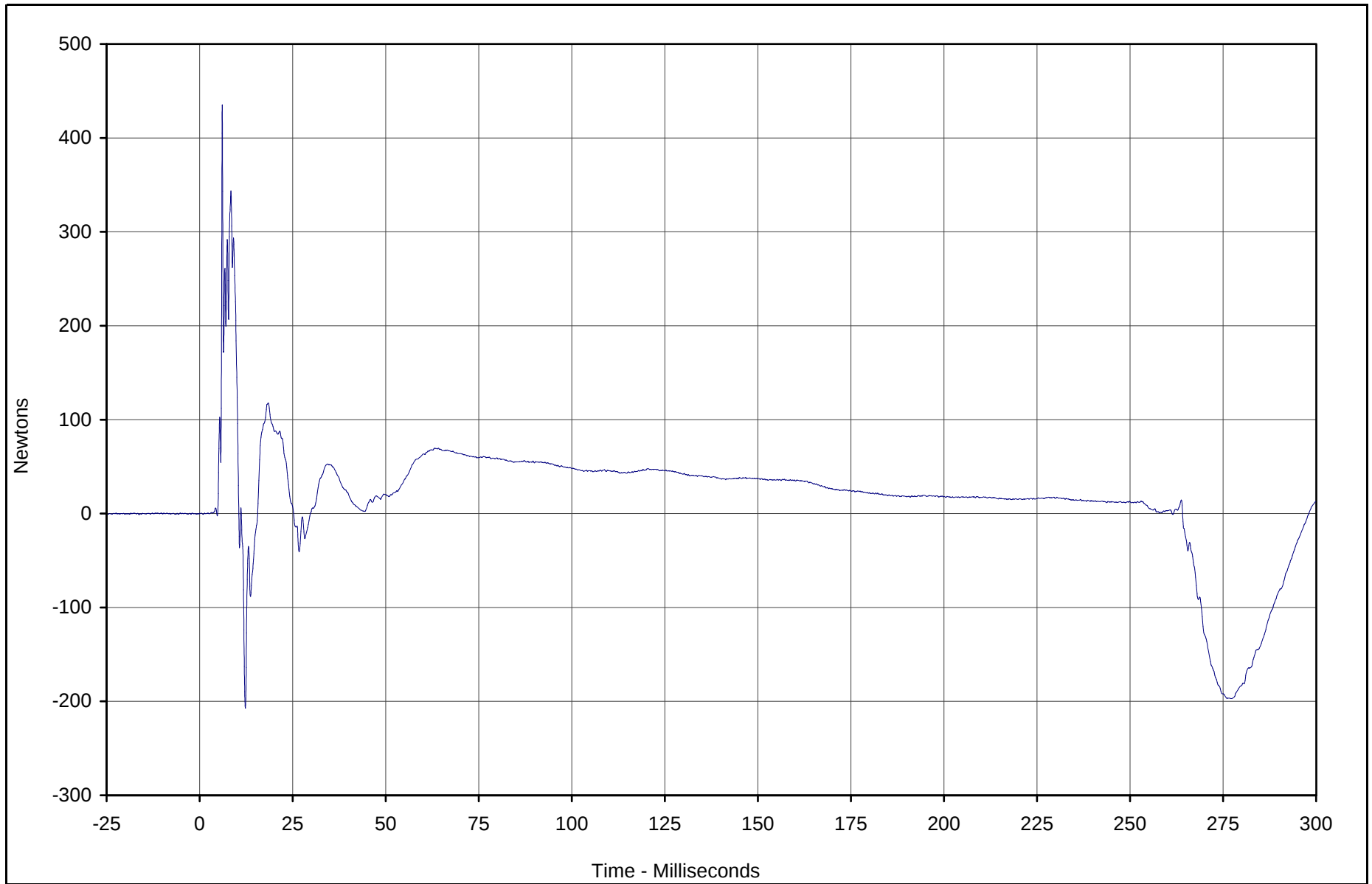


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force X	010	FIL	Newtons	434.5	6.1	-207.1	12.3	1000

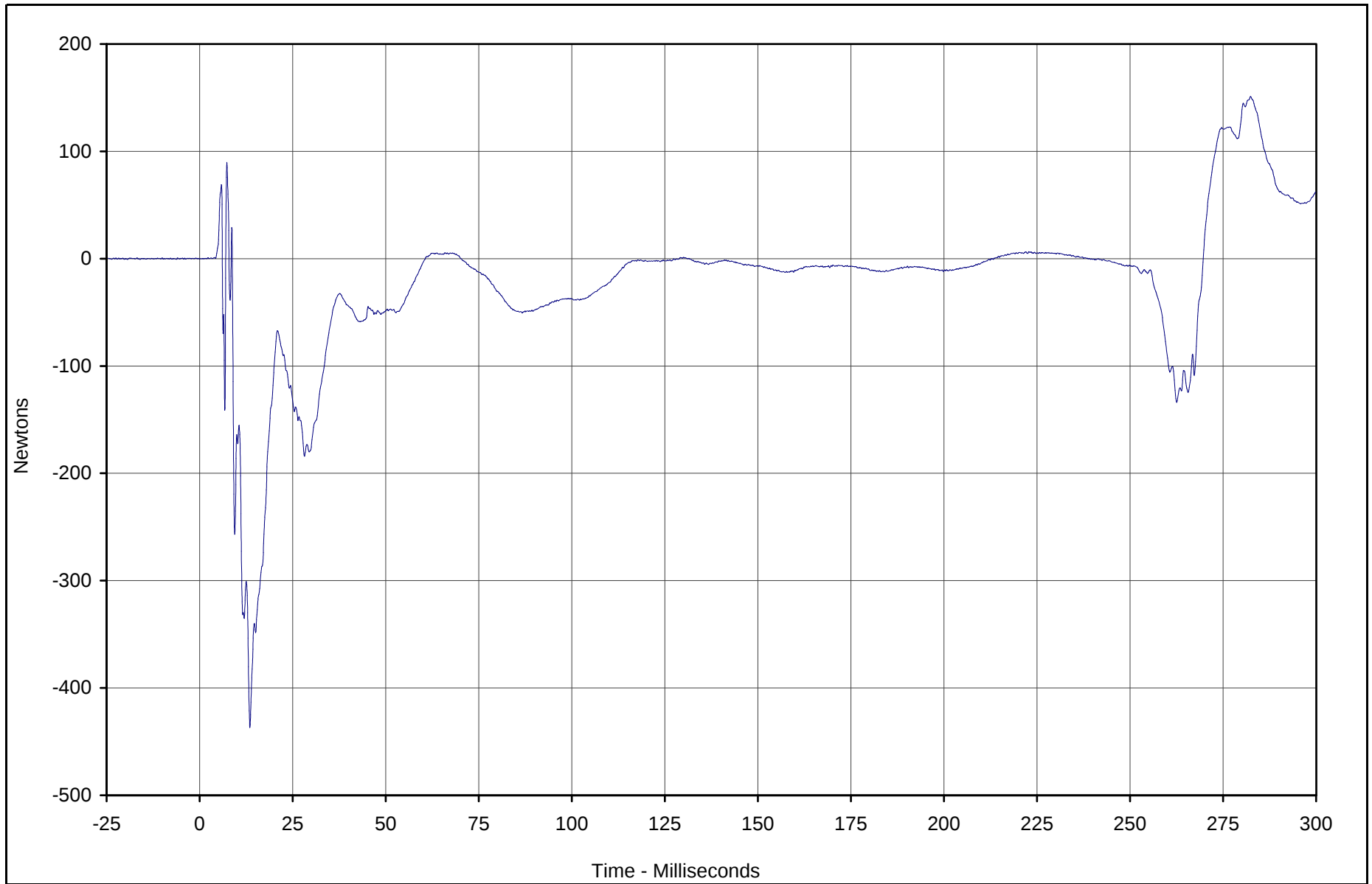


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force Y	011	FIL	Newtons	151.1	282.4	-437.0	13.5	1000

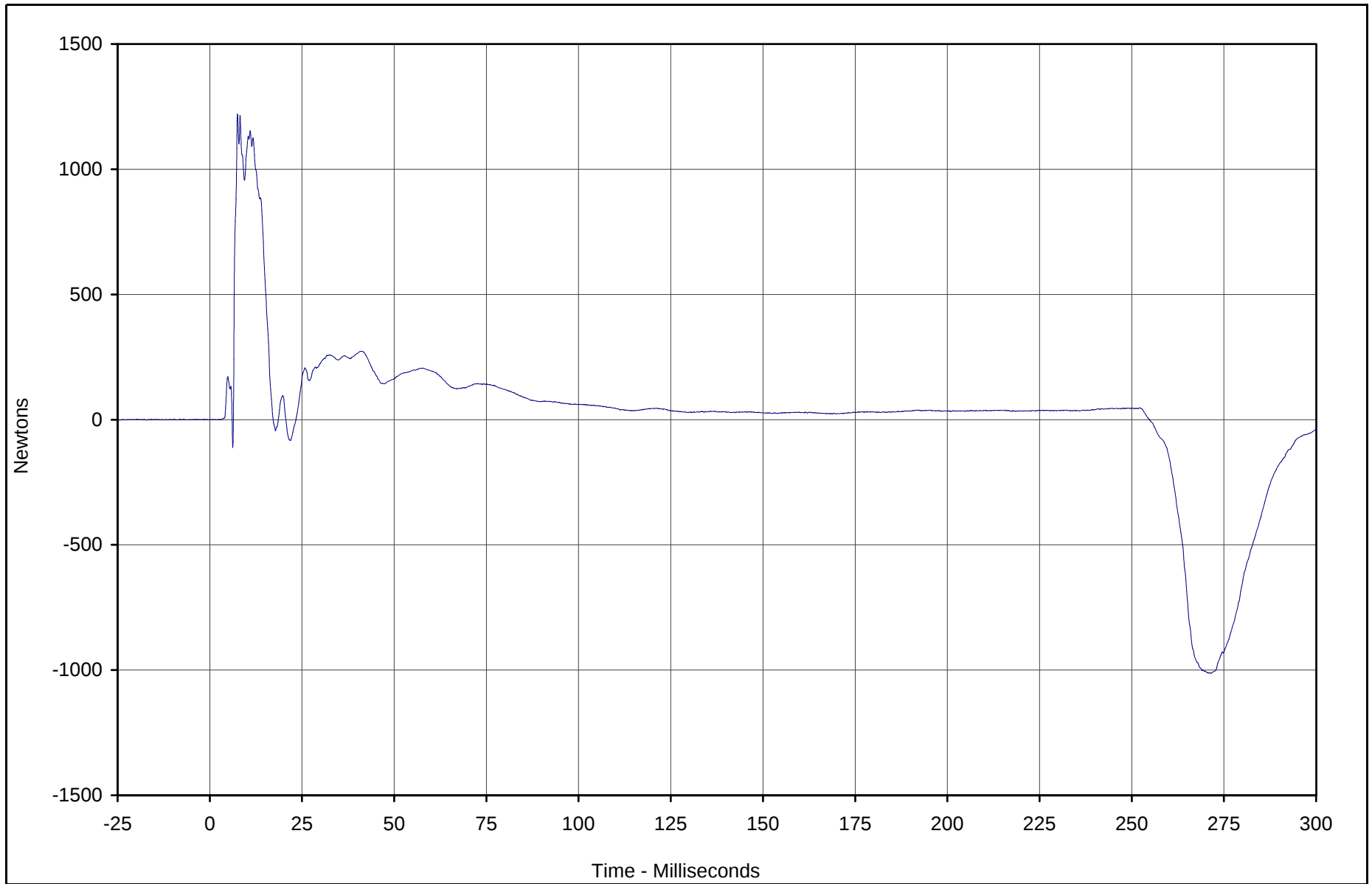


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force Z	012	FIL	Newtons	1219.2	7.5	-1012.7	270.8	1000

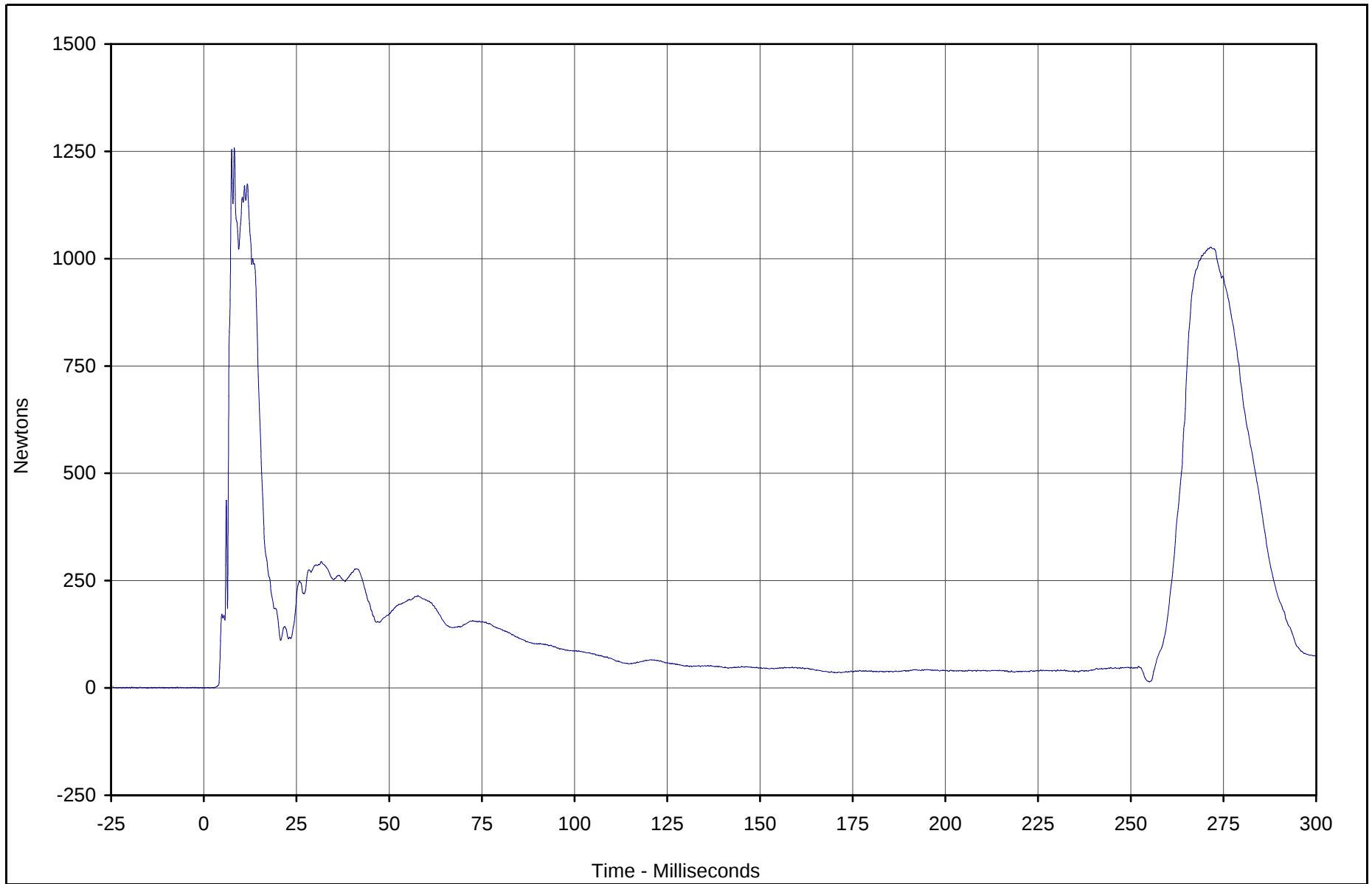


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force Resultant	010	RES	Newtons	1257.7	8.2	0.2	0.3	1000

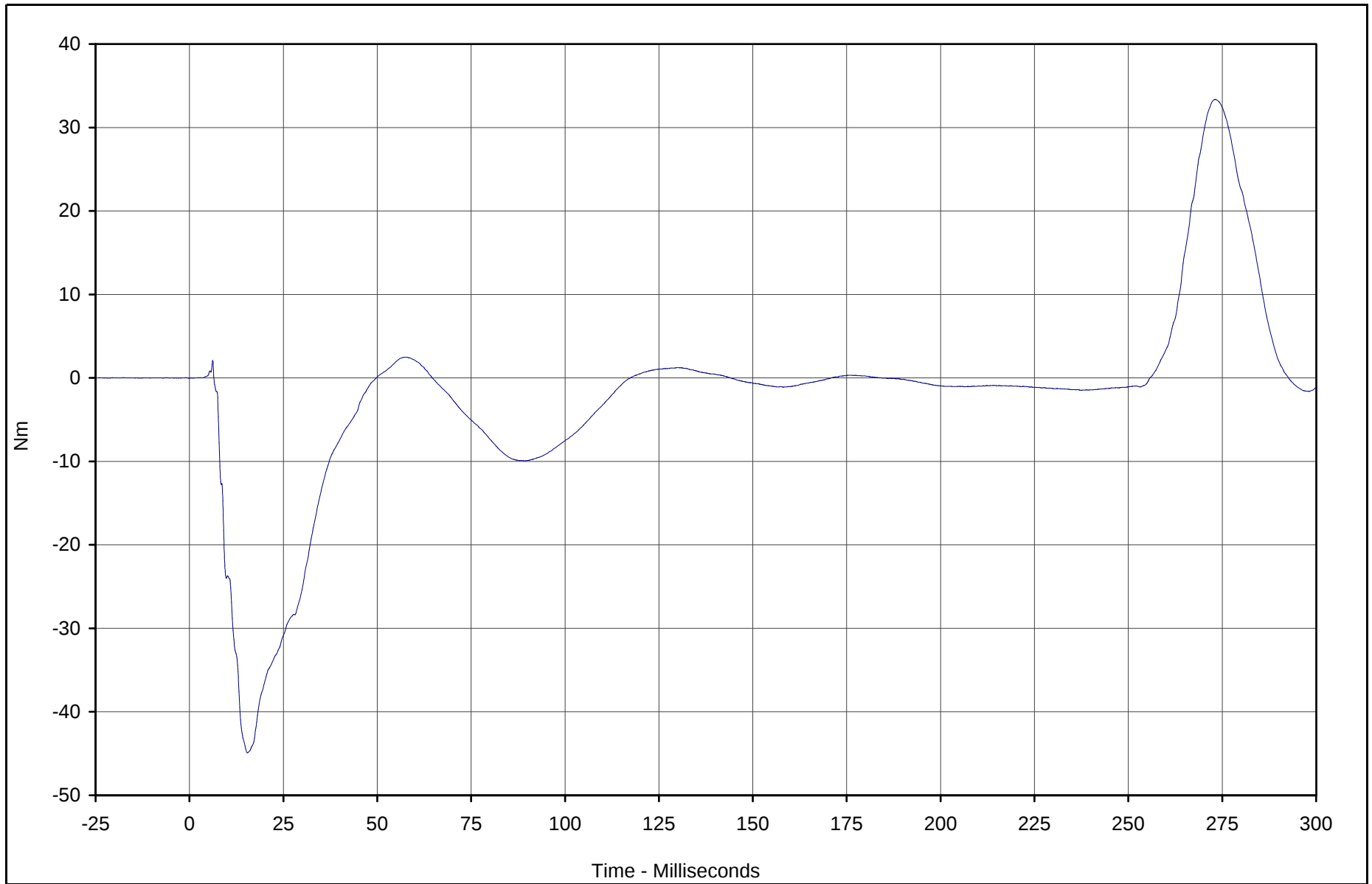


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment X	013	FIL	Nm	33.4	273.1	-44.9	15.4	600

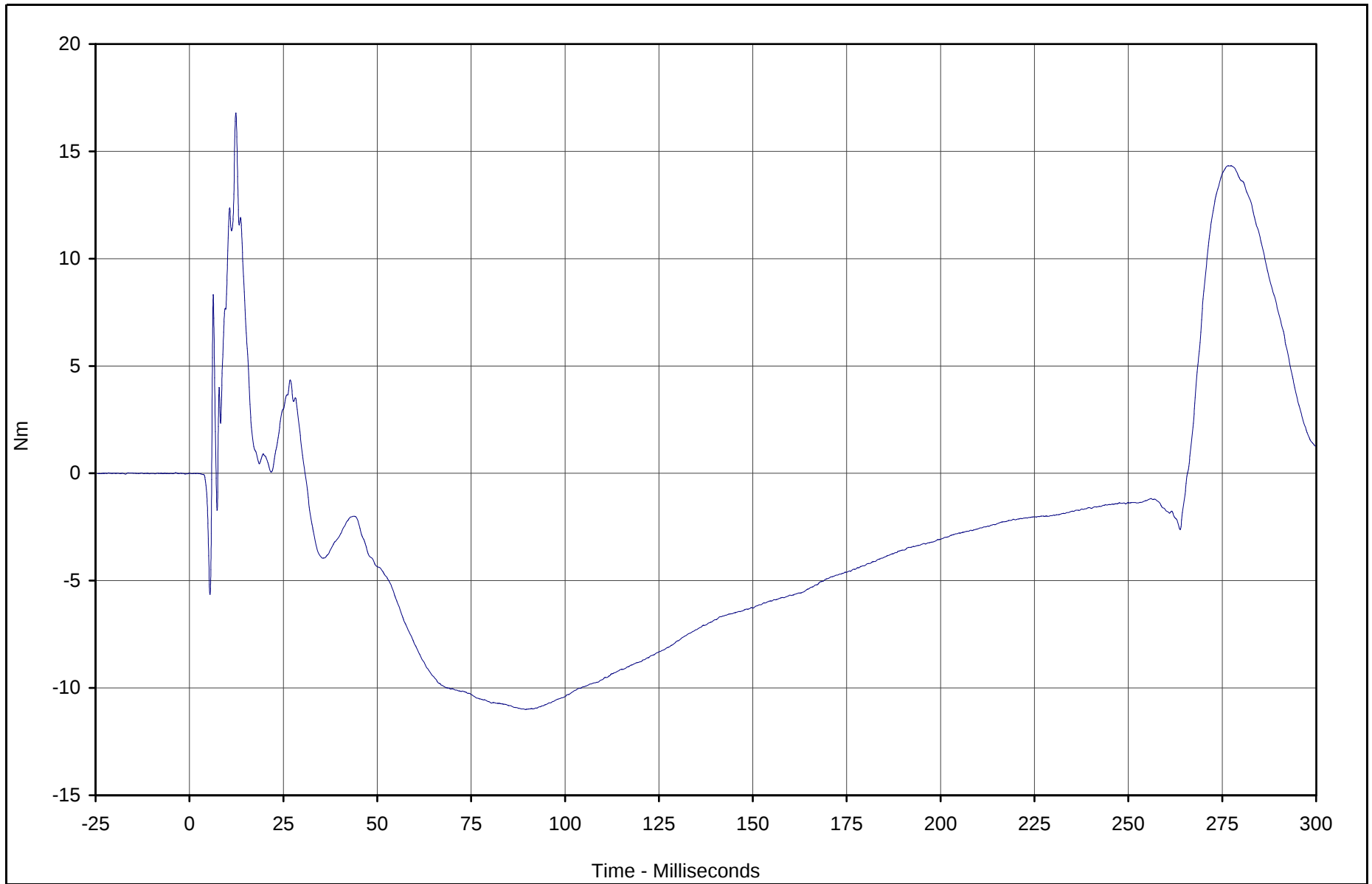


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment Y	014	FIL	Nm	16.8	12.4	-11.0	89.5	600

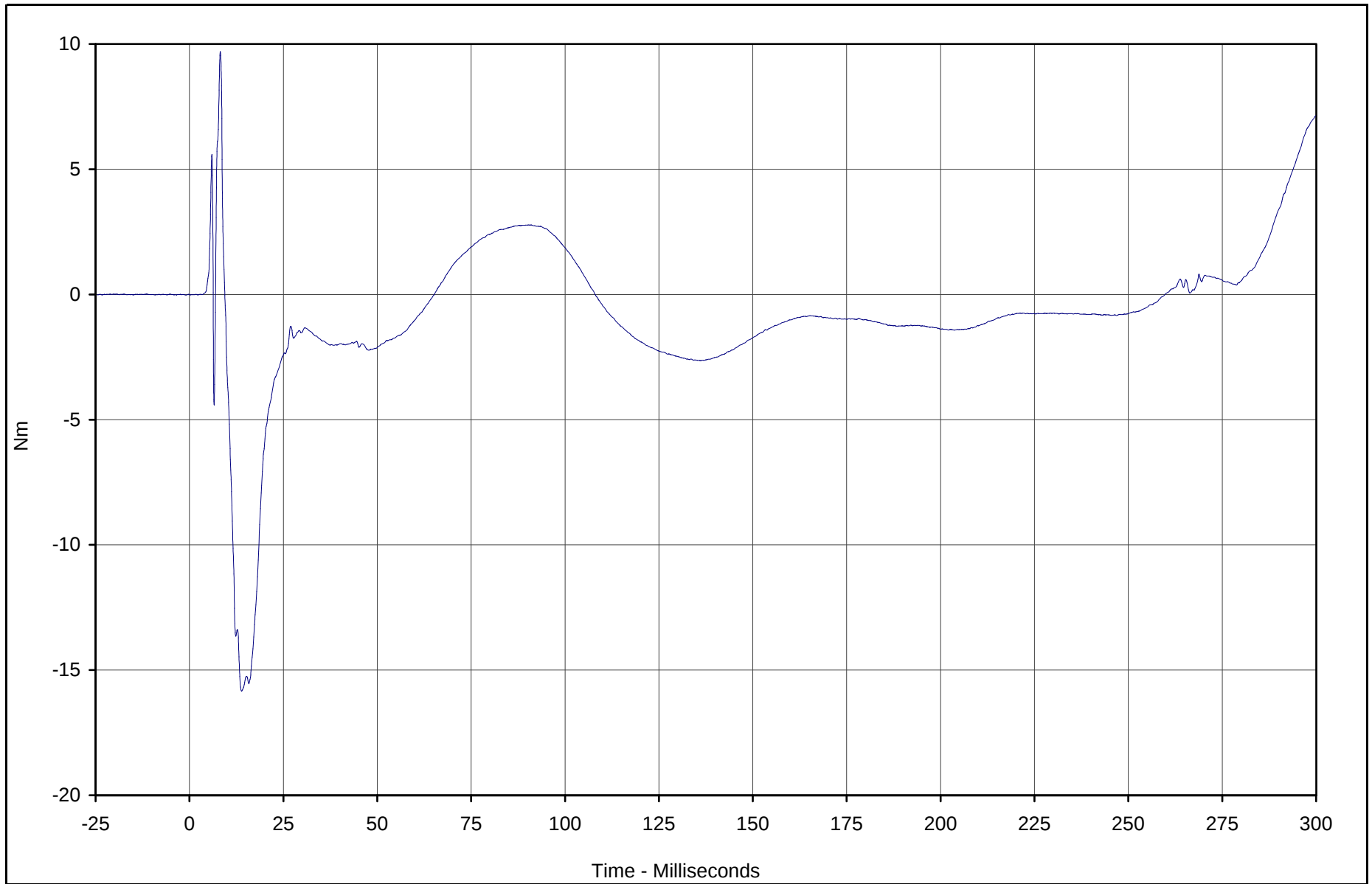


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment Z	015	FIL	Nm	9.7	8.2	-15.8	13.9	600

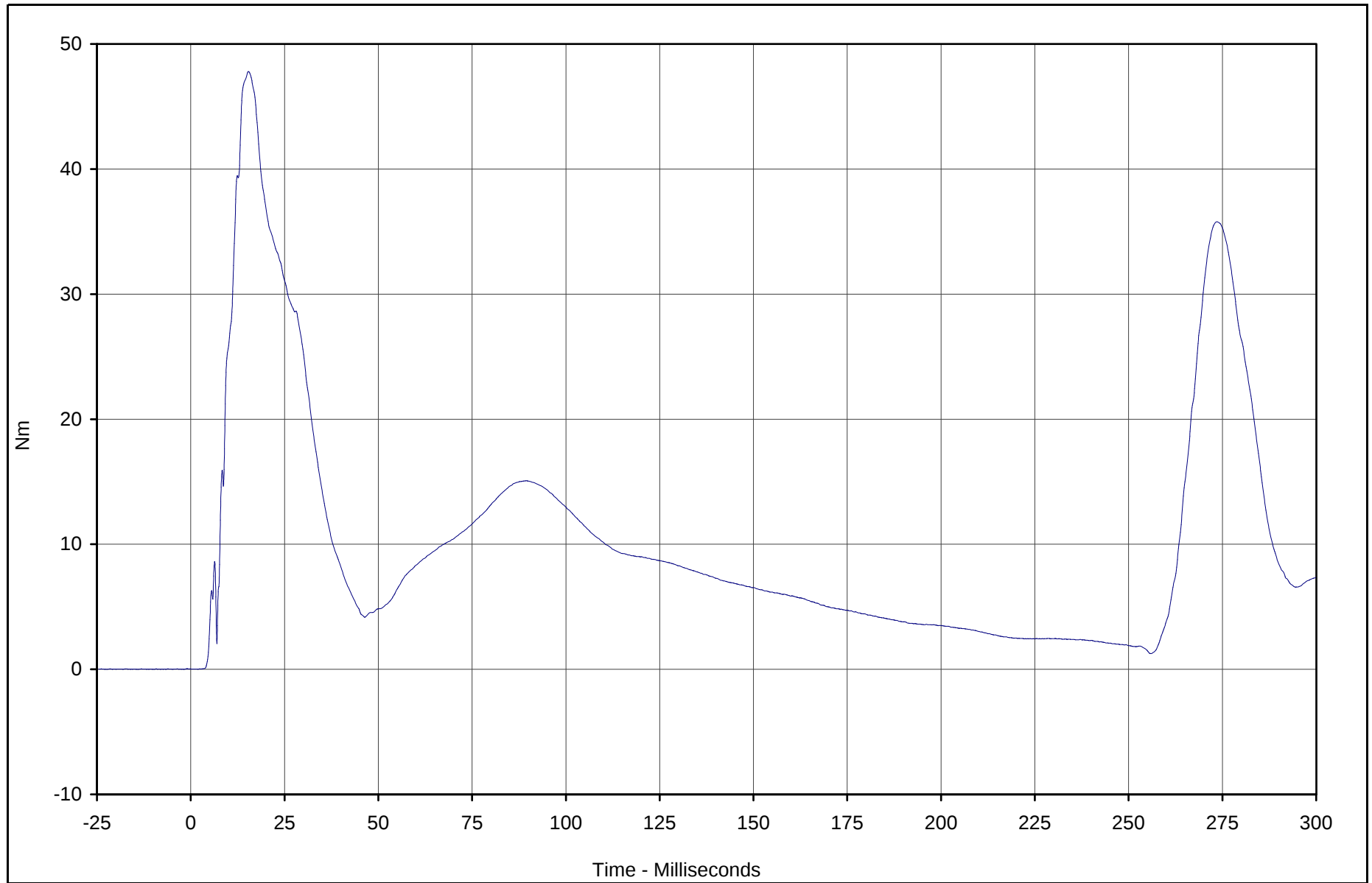


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment Resultant	013	RES	Nm	47.8	15.4	0.0	1.9	600

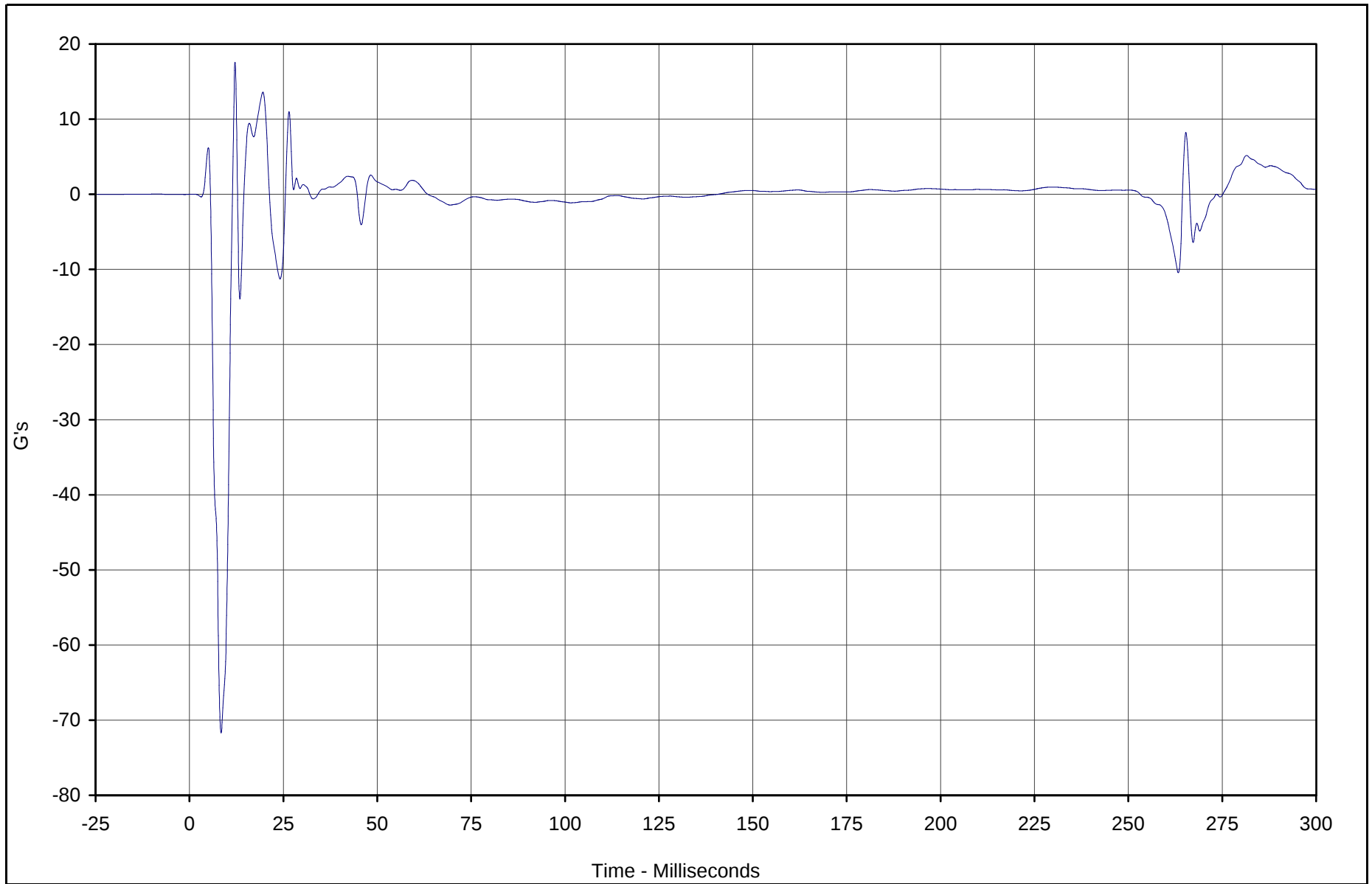


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest X	016	FIL	G's	17.6	12.1	-71.7	8.4	180

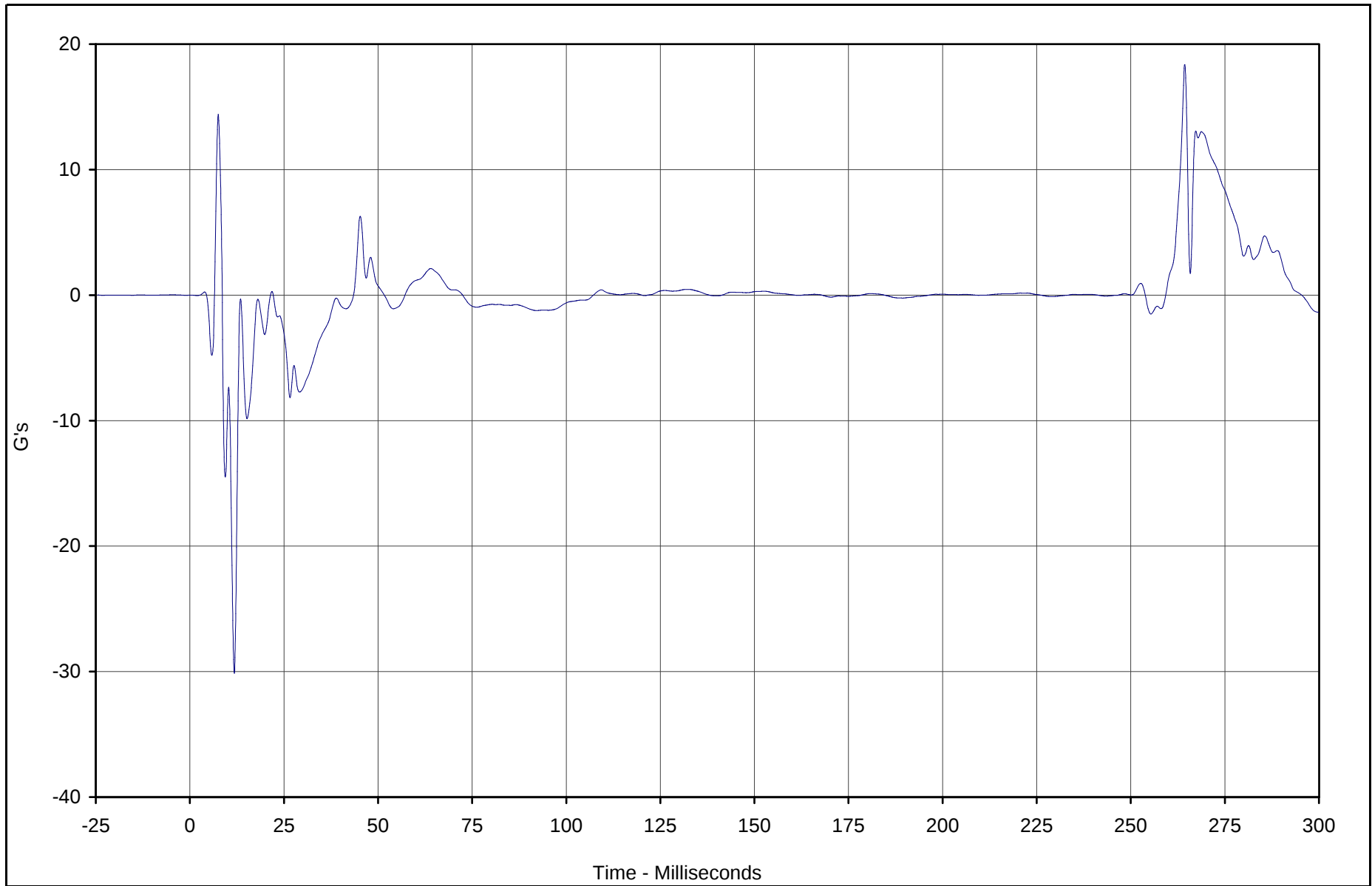


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Y	017	FIL	G's	18.4	264.3	-30.1	11.8	180

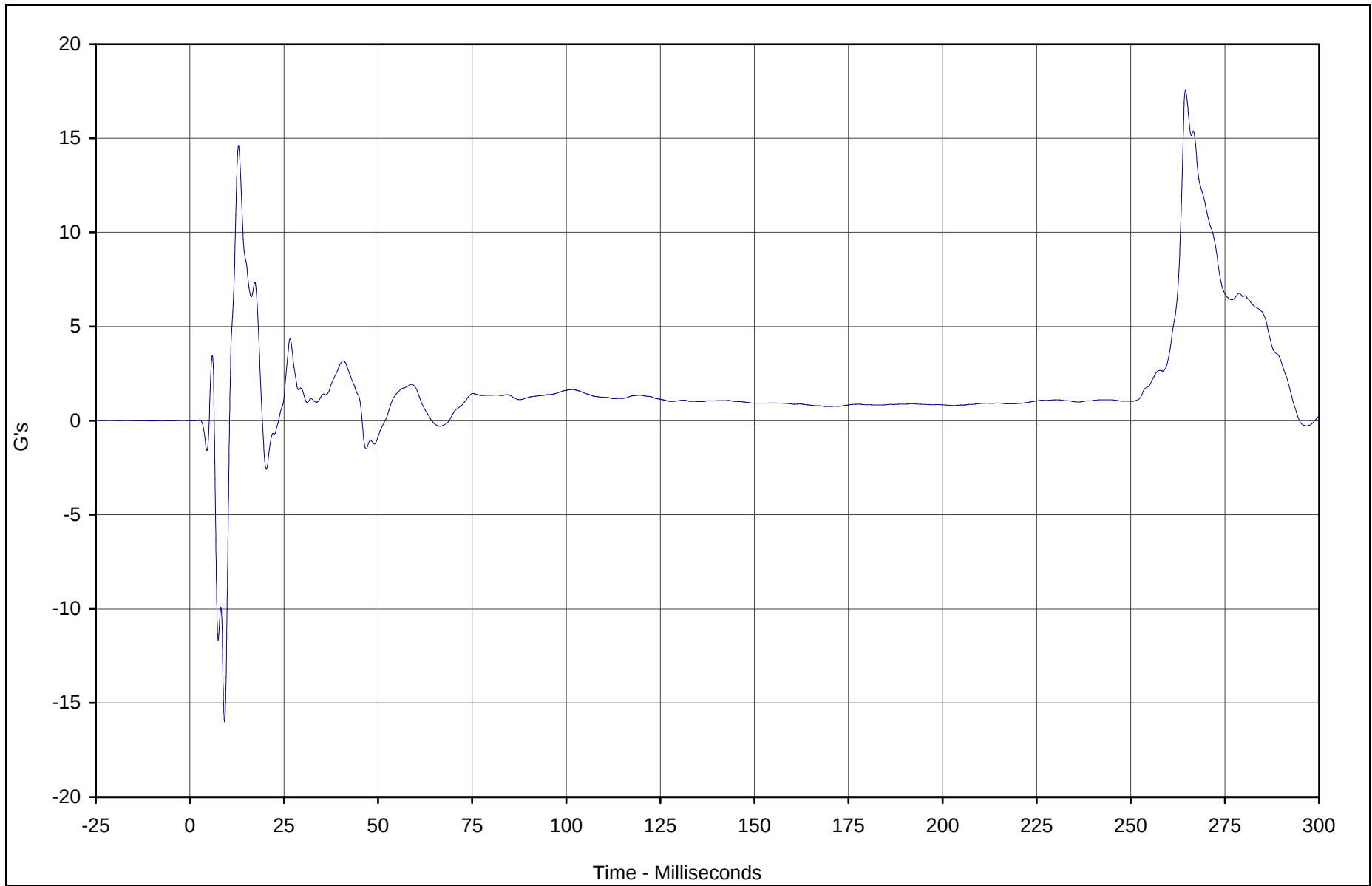


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Z	018	FIL	G's	17.5	264.5	-16.0	9.2	180

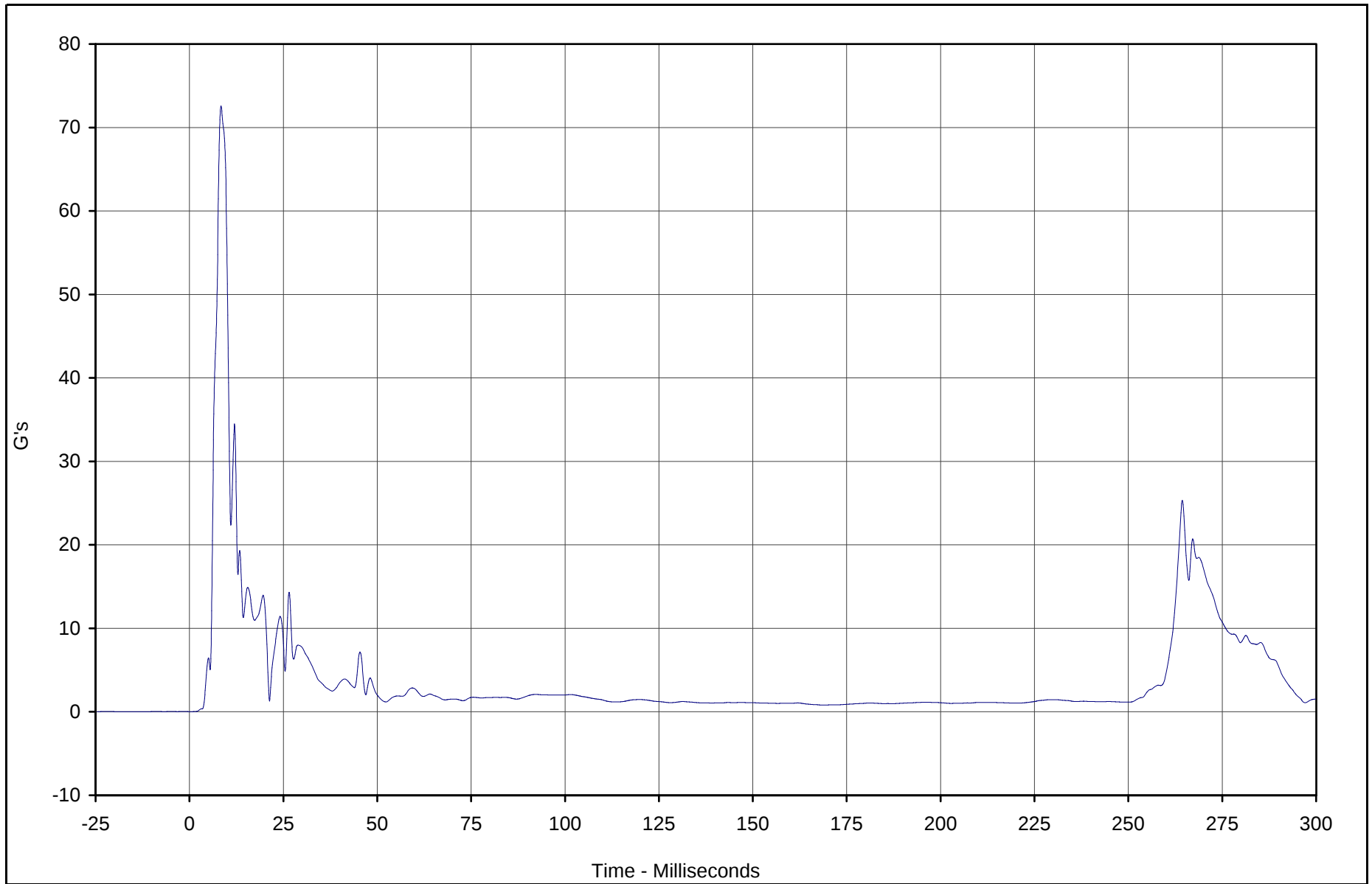


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Resultant	016	RES	G's	72.6	8.4	0.0	0.0	180

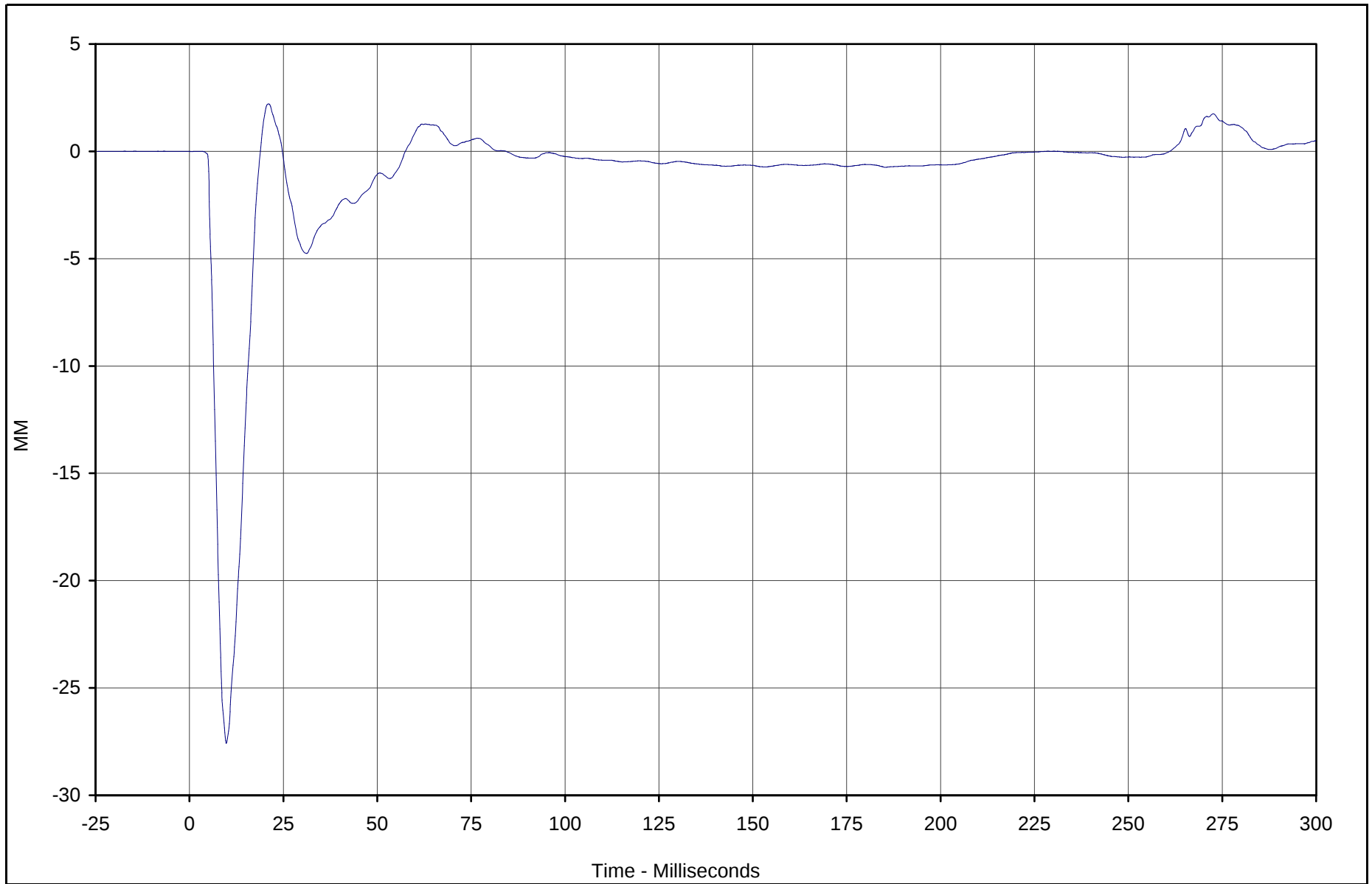


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Displacement	019	FIL	MM	2.2	21.0	-27.6	9.8	600

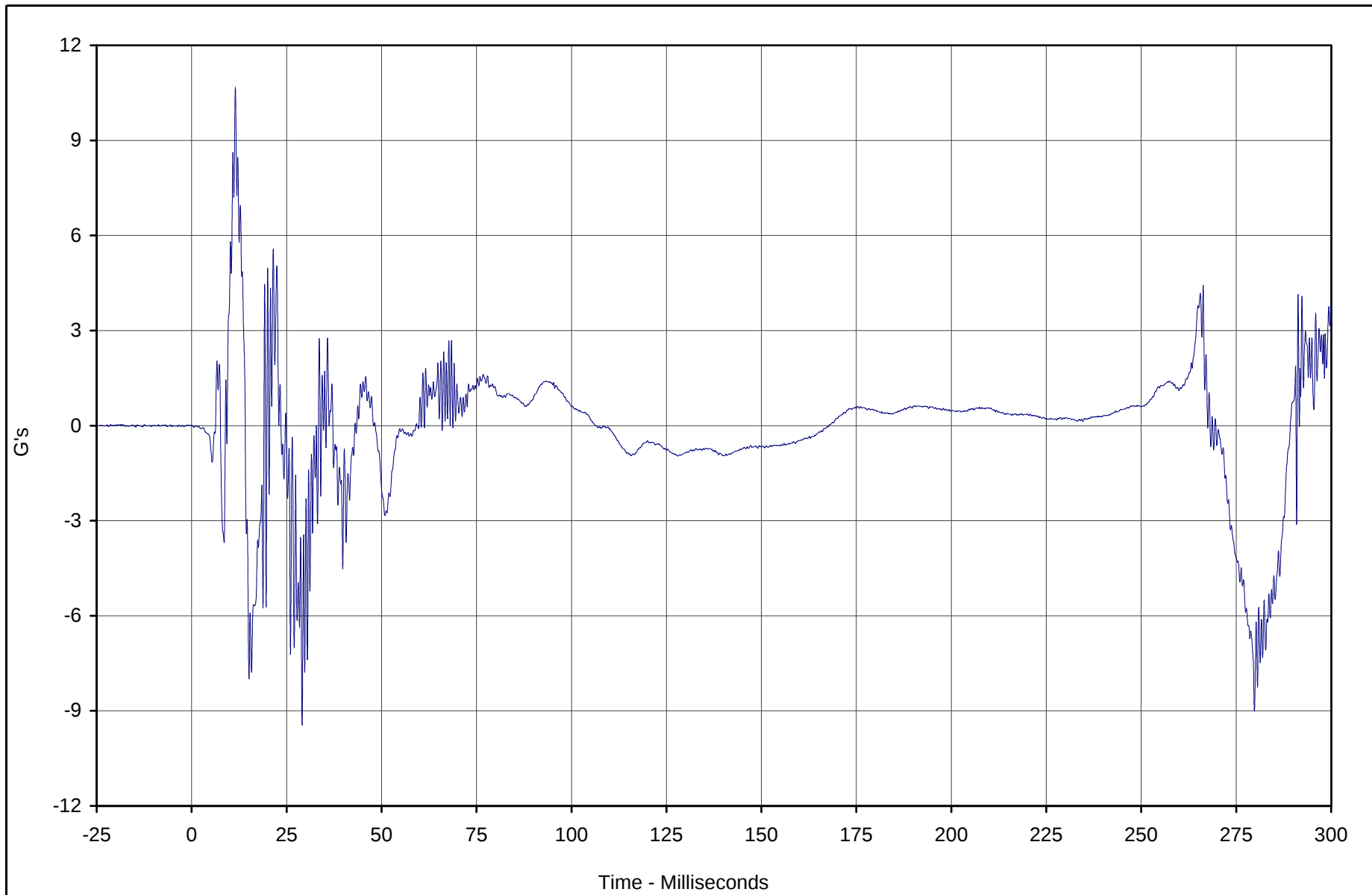


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis X	020	FIL	G's	10.7	11.5	-9.4	29.1	1000

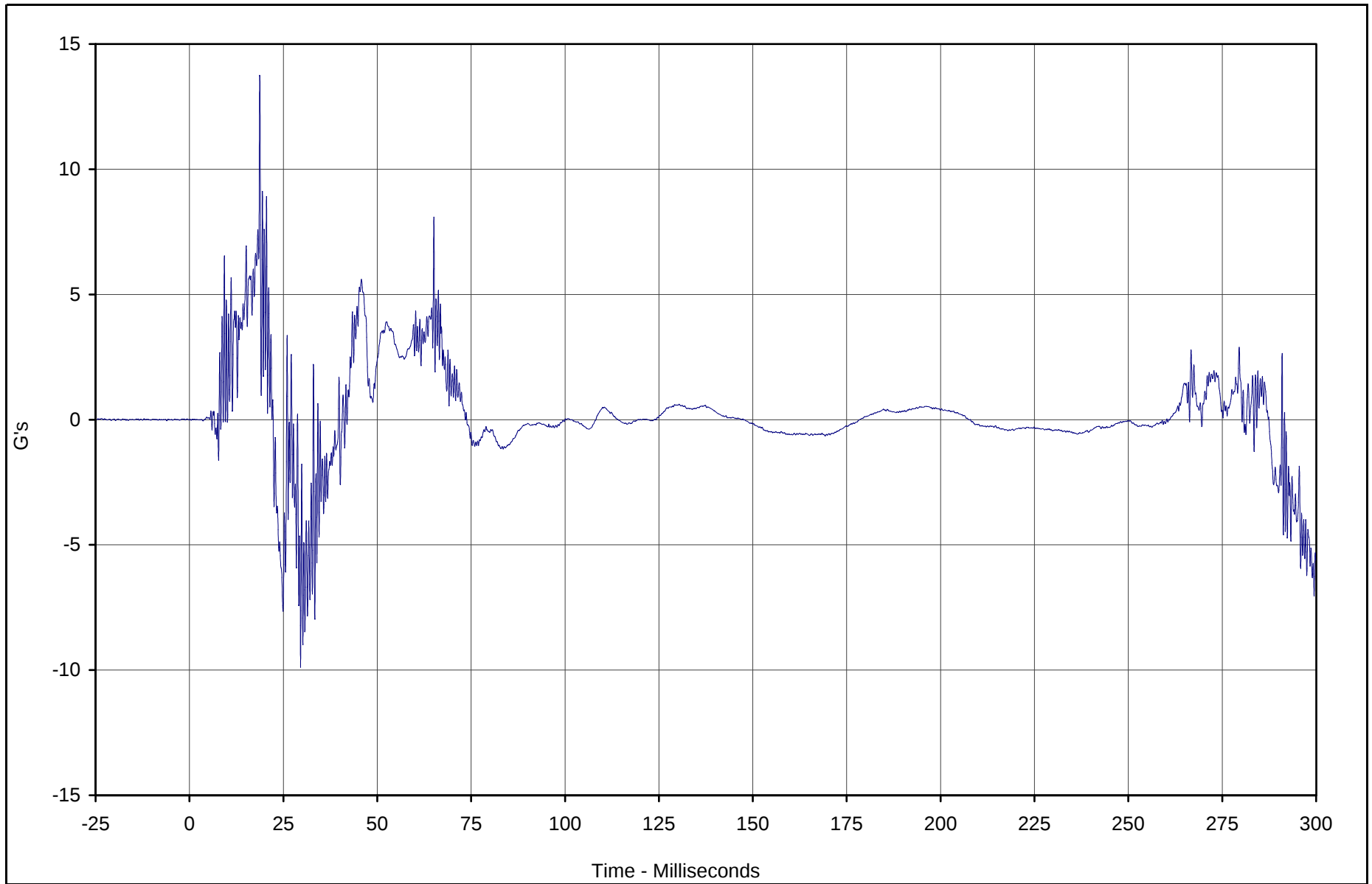


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis Y	021	FIL	G's	13.7	18.7	-9.9	29.6	1000

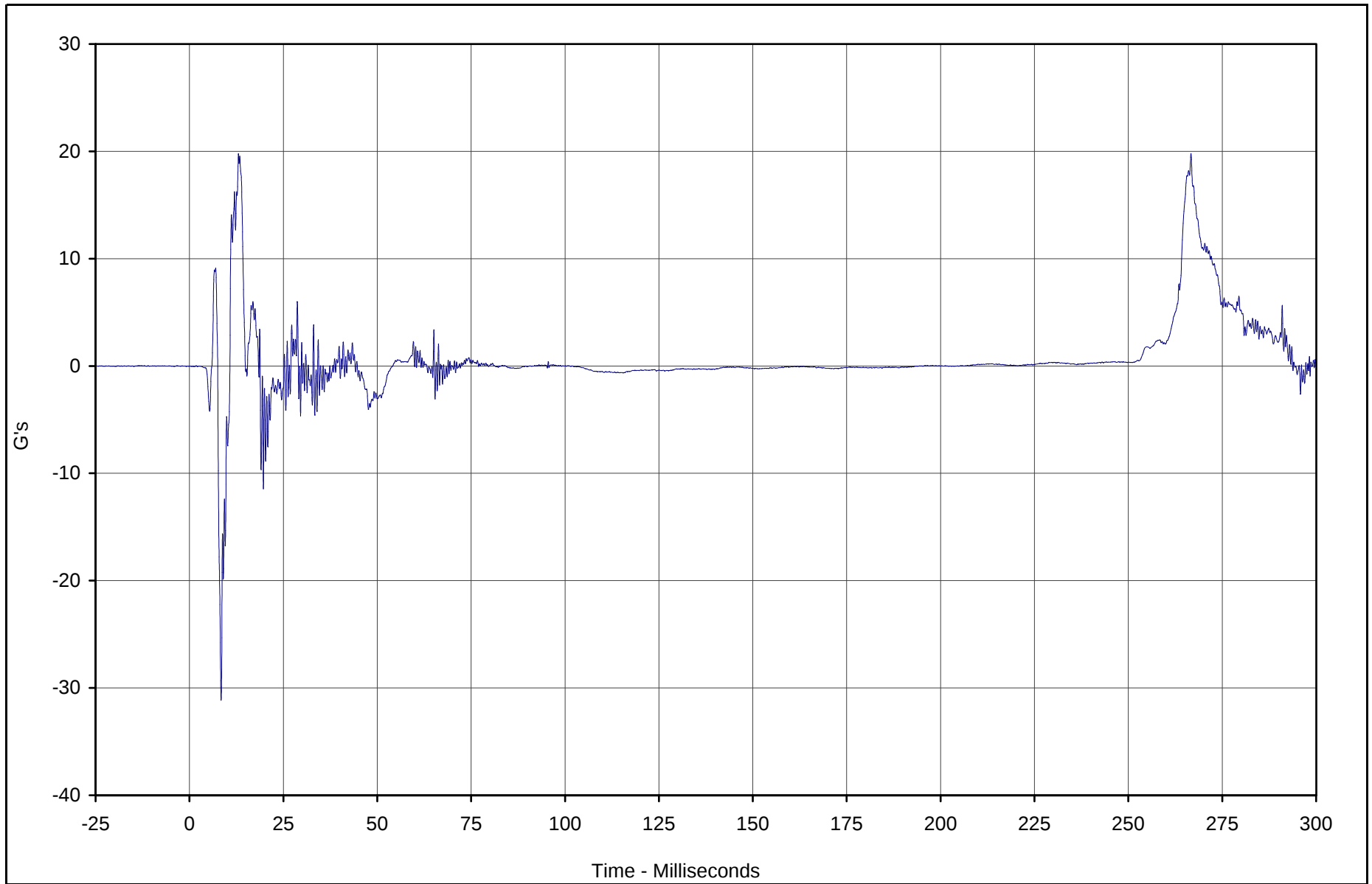


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis Z	022	FIL	G's	19.8	266.7	-31.2	8.4	1000

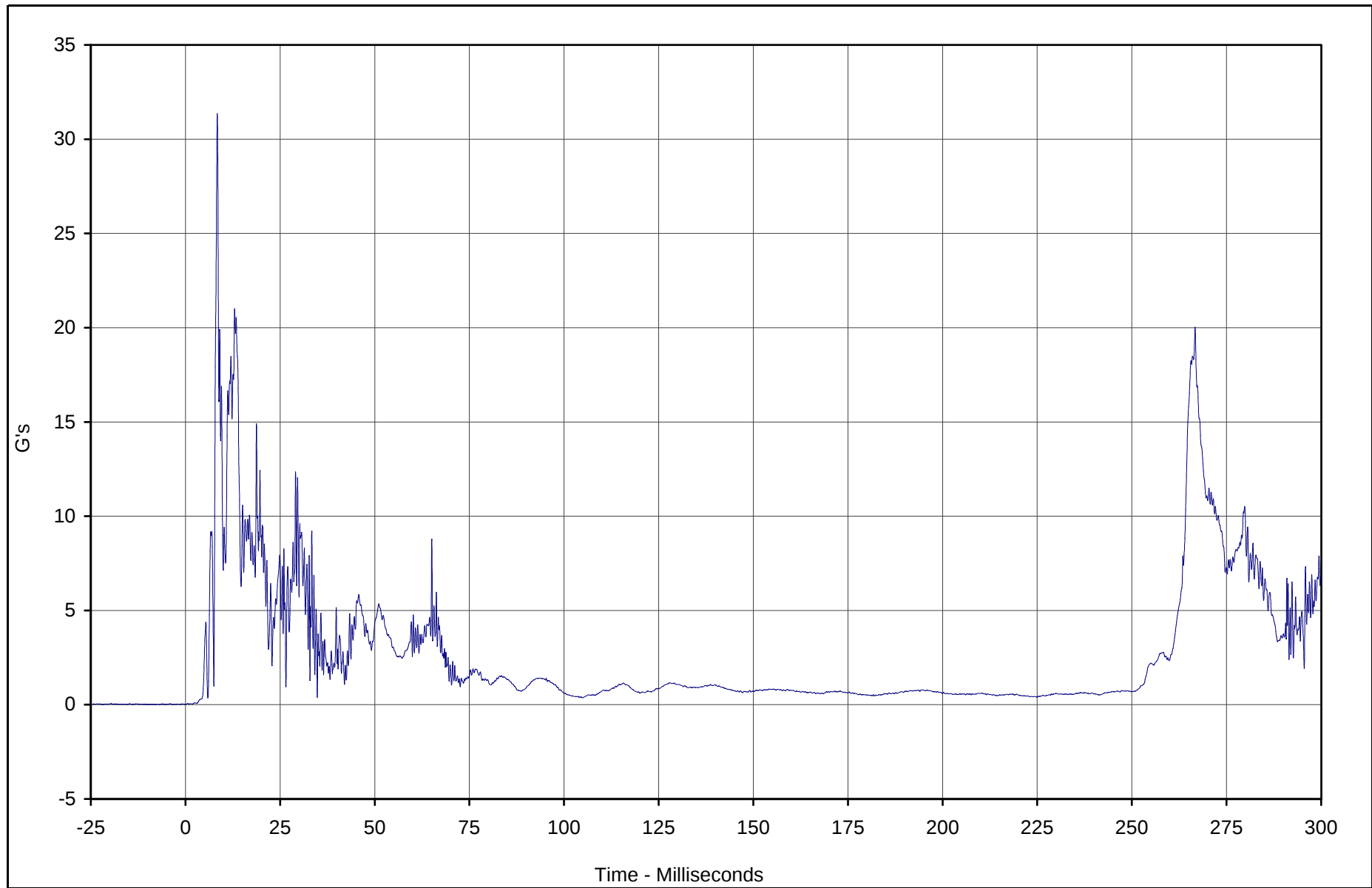


Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis Resultant	020	RES	G's	31.4	8.4	0.0	0.1	1000



Test Vehicle: 2004 Lincoln LS 4 Door Sedan

Test Date: 5/27/04

Test Program: TWG Testing (Rearward Facing Hybrid III 3 Yr.)

NHTSA No.: M40205TWG2

APPENDIX C

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

TWG Testing (Rearward Facing Hybrid III 3 Yr.)
Instrumentation Data Channel Assignments
A.T.D. Serial Number 082
5/27/04
2004 Lincoln LS 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	GPAC050	Accel.,1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	GPAC051	Accel.,1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	GPAC052	Accel.,1/2 bridge	Endevco	7264-2000	G
4	UPPER NECK FORCE	X	082UNFX	Load cell, six axis neck	R. A. Denton	IF-234	N
5	UPPER NECK FORCE	Y	082UNFY	Load cell, six axis neck	R. A. Denton	IF-234	N
6	UPPER NECK FORCE	Z	082UNFZ	Load cell, six axis neck	R. A. Denton	IF-234	N
7	UPPER NECK MOMENT	X	082UNMX	Load cell, six axis neck	R. A. Denton	IF-234	Nm
8	UPPER NECK MOMENT	Y	082UNMY	Load cell, six axis neck	R. A. Denton	IF-234	Nm
9	UPPER NECK MOMENT	Z	082UNMZ	Load cell, six axis neck	R. A. Denton	IF-234	Nm
10	LOWER NECK FORCE	X	082LNFX	Load cell, six axis neck	R. A. Denton	3303	N
11	LOWER NECK FORCE	Y	082LNFY	Load cell, six axis neck	R. A. Denton	3303	N
12	LOWER NECK FORCE	Z	082LNFZ	Load cell, six axis neck	R. A. Denton	3303	N
13	LOWER NECK MOMENT	X	082LNMX	Load cell, six axis neck	R. A. Denton	3303	Nm
14	LOWER NECK MOMENT	Y	082LNMY	Load cell, six axis neck	R. A. Denton	3303	Nm
15	LOWER NECK MOMENT	Z	082LNMZ	Load cell, six axis neck	R. A. Denton	3303	Nm
16	CHEST , PRIMARY	X	2116-A11	Accel., Full Bridge	Entran	2000JF	G
17	CHEST , PRIMARY	Y	2116-A14	Accel., Full Bridge	Entran	2000JF	G
18	CHEST , PRIMARY	Z	2116-A23	Accel., Full Bridge	Entran	2000JF	G
19	CHEST DISPLACEMENT	X	082CP	Rotary Pot Chest	Servo	14CBI	MM
20	PELVIS, PRIMARY	X	2116-A12	Accel., Full Bridge	Entran	2000JF	G
21	PELVIS, PRIMARY	Y	2116-A19	Accel., Full Bridge	Entran	2000JF	G
22	PELVIS, PRIMARY	Z	2116-A17	Accel., Full Bridge	Entran	2000JF	G