

REPORT NUMBER TR-P23106-02-NC

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

**HONDA OF CANADA
2003 ACURA MDX
SUV**

NHTSA NUMBER: M35301TWG2

**PREPARED BY:
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OCTOBER 17, 2003

FINAL REPORT

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16. Abstract					
A static side airbag deployment was conducted on a 2003 Acura MDX SUV at KARCO Engineering, LLC on 10/17/03. This test was conducted to obtain data indicative 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	18.3	
Max. Thorax Accel. (3 msec clip)		G's	55	23.4	
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SECTION 1

PURPOSE AND SUMMARY OF TEST M35301TWG2

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 restraint system performance data for a side airbag deployment under current requirements.

The occupant out-of-position side airbag test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Test Procedure.

1.2 SUMMARY

The effects of a seat mounted side airbag deployment in a 2003 Acura MDX SUV with an out-of-position Hybrid III 3 Year-Old Child dummy was evaluated. The test was performed at Karco Engineering, LLC on October 17, 2003. Pre- and post-test photographs of the vehicle and dummy can be found in Appendix A.

Two high-speed film and two high-speed digital cameras were used to document the side airbag deployment event. Camera locations and other pertinent camera information can be found in this report.

One Part 572P, Hybrid III 3-Year-Old child anthropomorphic test device (ATD), was placed in the right-front passenger seat situated in the forward facing position as 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 fully instrumented with head, chest and pelvis triaxial accelerometers, chest displacement potentiometers and six-axis upper and lower neck transducers.

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 impact.

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

Occupant 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	18.3	23.4	3.0

Orientation of the Hybrid III 3 Year-Old Child Dummy was in the forward facing position leaning against door. The dummy was placed in a seated position on a booster block along the outboard edge of the seat bolster to maximize the head/neck interaction with the seat-mounted side airbag module. The top of the neck was aligned with the top of the side airbag module to maximize contact. The dummy's head was placed between the seat bolster and B-pillar. This orientation complies with section 3.1.10.1 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: 2003 Acura MDX SUV
Test Program: TWG Testing (Forward Facing Hybrid III Yr)

NHTSA No.: M35301TWG2
Test Date: 10/17/03

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: 2003 Acura MDX SUVNHTSA No.: M35301TWG2Test Program: TWG Testing (Forward Facing Hybrid III Yr)Test Date: 10/17/03**TEST DUMMY INFORMATION**

Description	Front Passenger Forward Facing
Dummy Type / Serial No.	Hybrid III 3-Year-Old Child / No. 82
Head Contact	Airbag
Chest Contact	None/ Spine Contact only
Abdomen Contact	None
Pelvis	None
Left Knee Contact	None
Right Knee Contact	None

16mm MOVIE COVERAGE

High Speed Digital	2
High Speed Digital	2
Total	4

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: 2003 Acura MDX SUV

NHTSA No.: M35301TWG2

Test Program: TWG Testing (Forward Facing Hybrid III Yr)

Test Date: 10/17/03

TEST VEHICLE INFORMATION

Make	Acura
Model	MDX
Body Style	SUV
NHTSA No.	M35301
VIN	2HNYD18763H513732
Color	Light Blue
Delivery Date	2/28/03
Odometer Reading (mi.)	134
Dealer	Valencia Honda
Transmission	5 Speed Automatic
Final Drive	Rear
Type/No. Cylinders	V-6
Engine Displacement (L)	3.5
Engine Placement	Transverse
Roof Rack	Yes
Sunroof/T-Top	Yes
Tinted Glass	Yes
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

TEST VEHICLE OPTIONS

Anti-Lock Brakes (ABS)	Yes
All Wheel Drive	Yes
Power Steering	Yes
Driver Airbag	Yes
Driver Side Bag	No
Driver Head Bag	No
Pass. Airbag	Yes
Pass. Side Bag	No
Pass. Head Bag	No
Pre-tensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes
Center Console	Yes
Air Cond.	Yes
AM/Fm Cassette	Yes
Tilt Steering	Yes
Power Door Locks	Yes
Power Windows	Yes
Power Seats	Yes
AM/FM Cassette	Yes
Other	

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda of Canada	GVWR (kg)	2599
Date of Manufacture	January-03	GAWR Front (kg)	1311
		GAWR Rear (kg)	1336

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	Split Bench	
Number of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				525
Cargo Weight (RCLW) (kg)				49

* Vehicle had undergone New Car Assessment Program Frontal Barrier Impact Test on March 13, 2003

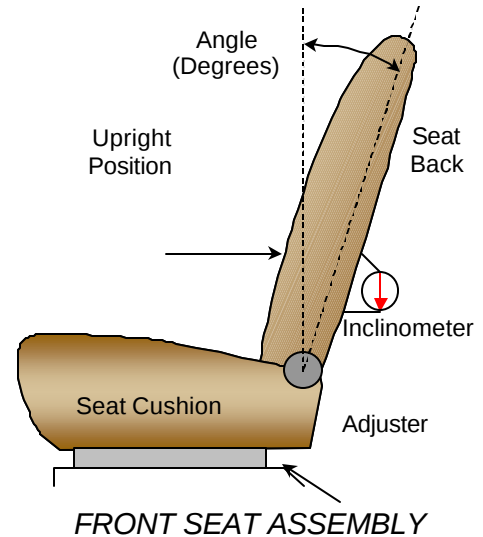
DATA SHEET NO. 3 TEST VEHICLE INFORMATION

Test Vehicle: 2003 Acura MDX SUV
 Test Program: TWG Testing (Forward Facing Hybrid III Yr)

NHTSA No.: M35301TWG2
 Test Date: 10/17/03

NOMINAL DESIGN RIDING POSITION

The driver and passenger seat backs are 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	12

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 both the driver and passenger.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Passenger Seat	224 mm	112 mm

DATA SHEET NO. 4
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2003 Acura MDX SUV
 Test Program: TWG Testing (Forward Facing Hybrid III Yr)

NHTSA No.: M35301TWG2
 Test Date: 10/17/03

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Hybrid III 3-Year-Old Child Dummy	
		Length (mm)	Angle (°)
SA	Seat Back Angle		12
HZ	Head to Roof (Z)	350	0
HB	Head to B-Pillar	0	0
HSC	Head to Seat Back Centerline	180	0
CD	Chest to Seat Back	160	0
RACL	Right Arm to Seat Back Centerline	300	0
KSCR	Right Knee to Seat Cushion Centerline	283	0
TSCR	Right Toe to Seat Cushion Centerline	133	0
TT	Toe to Toe	263	0

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

Test Vehicle: 2003 Acura MDX SUV

NHTSA No.: M35301TWG2

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

Test Date: 10/17/03

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Head CG	X	G's	16.8	10.2	-4.0	27.4
Head CG	Y	G's	0.9	52.9	-14.5	10.3
Head CG	Z	G's	15.0	23.1	-18.4	7.3
Head CG Resultant	N/A	G's	28.2	10.2		

PRIMARY HEAD INJURY CRITERIAS (HIC)

Location	Pass.			
	HIC	T ¹	T ²	Avg G
Head CG Primary (HIC15)	18.3	9.2	24.2	17.1

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Chest CG	X	G's	58.6	6.3	-5.8	57.8
Chest CG	Y	G's	3.0	32.8	-18.9	10.1
Chest CG	Z	G's	5.3	17.8	-3.0	11.3
Chest CG Resultant	N/A	G's	59.0	6.3		

PRIMARY CHEST CLIP (3MSEC)

Location	Pass.		
	CLIP	T ¹	T ²
Chest CG Primary	23.4	9.3	12.3

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Chest CG	X	MM	1.1	28.1	-3.0	17.4

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Pelvis	X	G's	7.0	25.7	-3.0	8.2
Pelvis	Y	G's	4.2	8.6	-7.5	28.1
Pelvis	Z	G's	11.2	8.7	-11.0	12.1
Pelvis Resultant	N/A	G's	12.1	8.7		

DATA SHEET NO. 5...(continued)Test Vehicle: 2003 Acura MDX SUVNHTSA No.: M35301TWG2Test Program: TWG Testing (Forward Facing Hybrid III 3 Yr.)Test Date: 10/17/03**UPPER NECK PEAK FORCES AND MOMENTS**

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Neck Force	X	Newtons	372.7	15.6	-93.4	27.8
Neck Force	Y	Newtons	41.8	54.0	-335.8	14.8
Neck Force	Z	Newtons	376.1	23.4	-447.7	7.3
Neck Force Resultant	N/A	Newtons	509.9	12.9		
Neck Moment	X	Nm	4.2	10.2	-16.6	20.1
Neck Moment	Y	Nm	21.5	12.3	-17.1	46.9
Neck Moment	Z	Nm	4.8	49.5	-9.7	22.4
Neck Moment Resultant	N/A	Nm	22.1	12.5		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass.			
			Max	Time	Min	Time
Neck Force	X	Newtons	689.2	14.8	-131.7	45.6
Neck Force	Y	Newtons	32.9	43.0	-477.3	13.7
Neck Force	Z	Newtons	331.2	23.8	-464.3	7.0
Neck Force Resultant	N/A	Newtons	801.3	14.8		
Neck Moment	X	Nm	6.9	53.0	-40.4	15.7
Neck Moment	Y	Nm	13.5	162.1	-33.9	14.9
Neck Moment	Z	Nm	4.1	27.0	-13.0	15.8
Neck Moment Resultant	N/A	Nm	54.2	15.7		

DATA SHEET NO. 6
CAMERA LOCATIONS

Test Vehicle: 2003 Acura MDX SUV
Test Program: TWG Testing (Forward Facing Hybrid III Yr)

NHTSA No.: M35301TWG2
Test Date: 10/17/03

No.	Camera View	Location (mm)			Angle (Deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	High Speed Film Side View	12	128	-2.5	0	24	1000
2	High Speed Film Front View	81	-4	32	25	17.5	910
3	High Speed Digital Side View	12	147	8	7	8	500
4	High Speed Digital Front View	77	0	27	27	5.7	500

* Cameras aligned to center of seat back as reference.

APPENDIX A

PHOTOGRAPHS



Figure A-1: Right Front ³/₄View, As Received

MFD. BY HONDA OF CANADA MFG., 01/03
A DIVISION OF HONDA CANADA INC. CANADA
GVWR 5730LBS GAWR F 2890LBS R 2945LBS
THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY,
AND THEFT PREVENTION STANDARDS IN EFFECT
ON THE DATE OF MANUFACTURE SHOWN ABOVE:

V.I.N. **2HNYD18763H513732**



MPV

Figure A-2: Vehicle Certification Label



Figure A-3: Post-Test Right Front ^{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, Full Front View



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



Figure A-8: Post-Test Dummy Position, Left Side View



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



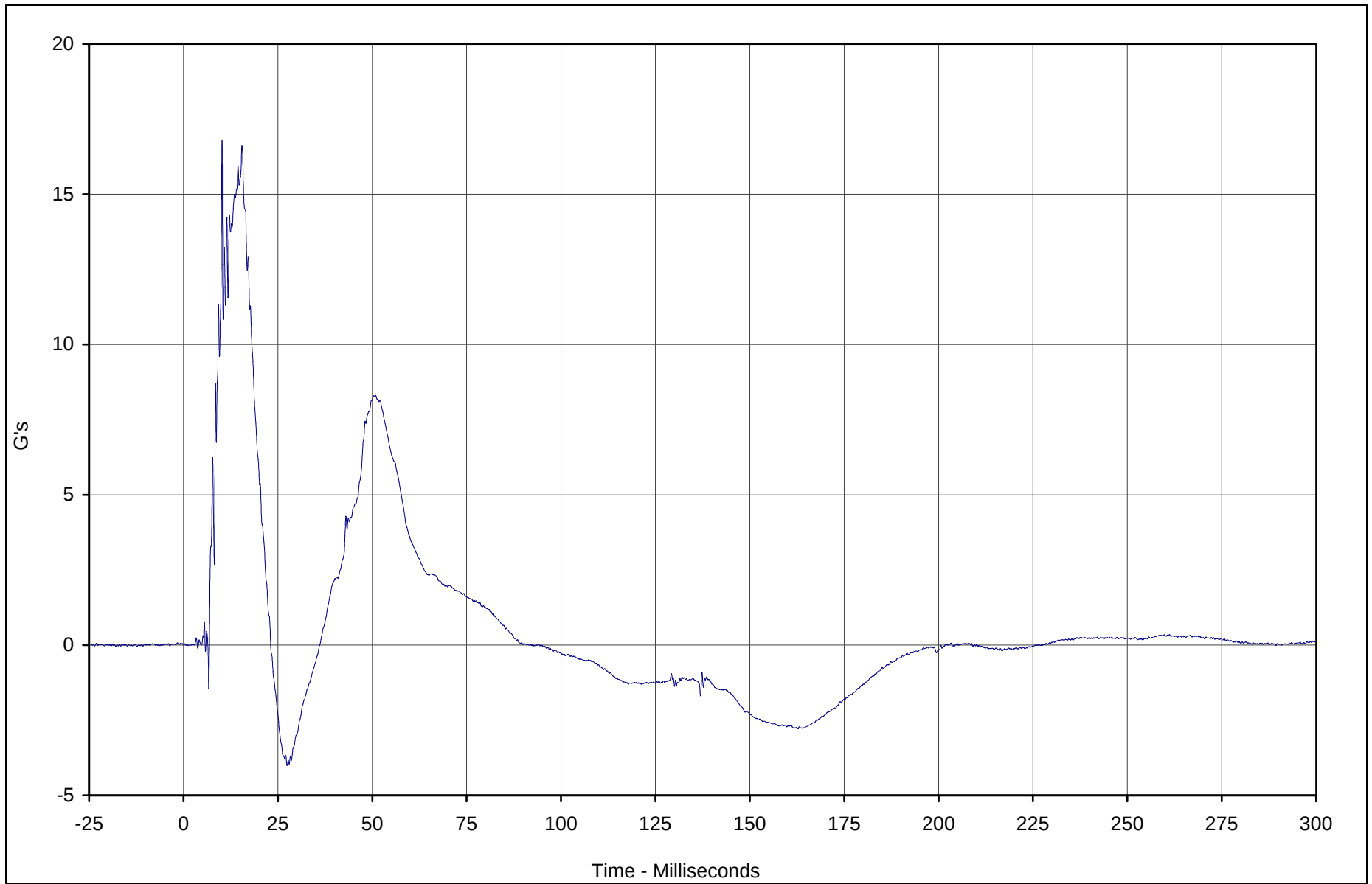
Figure A-10: Post-Test Airbag View, Left Side View



Figure A-11: Post-Test Airbag, $\frac{3}{4}$ Front View

APPENDIX B

DATA PLOTS



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Head X	001	FIL	G's	16.8	10.2	-4.0	27.4	1000

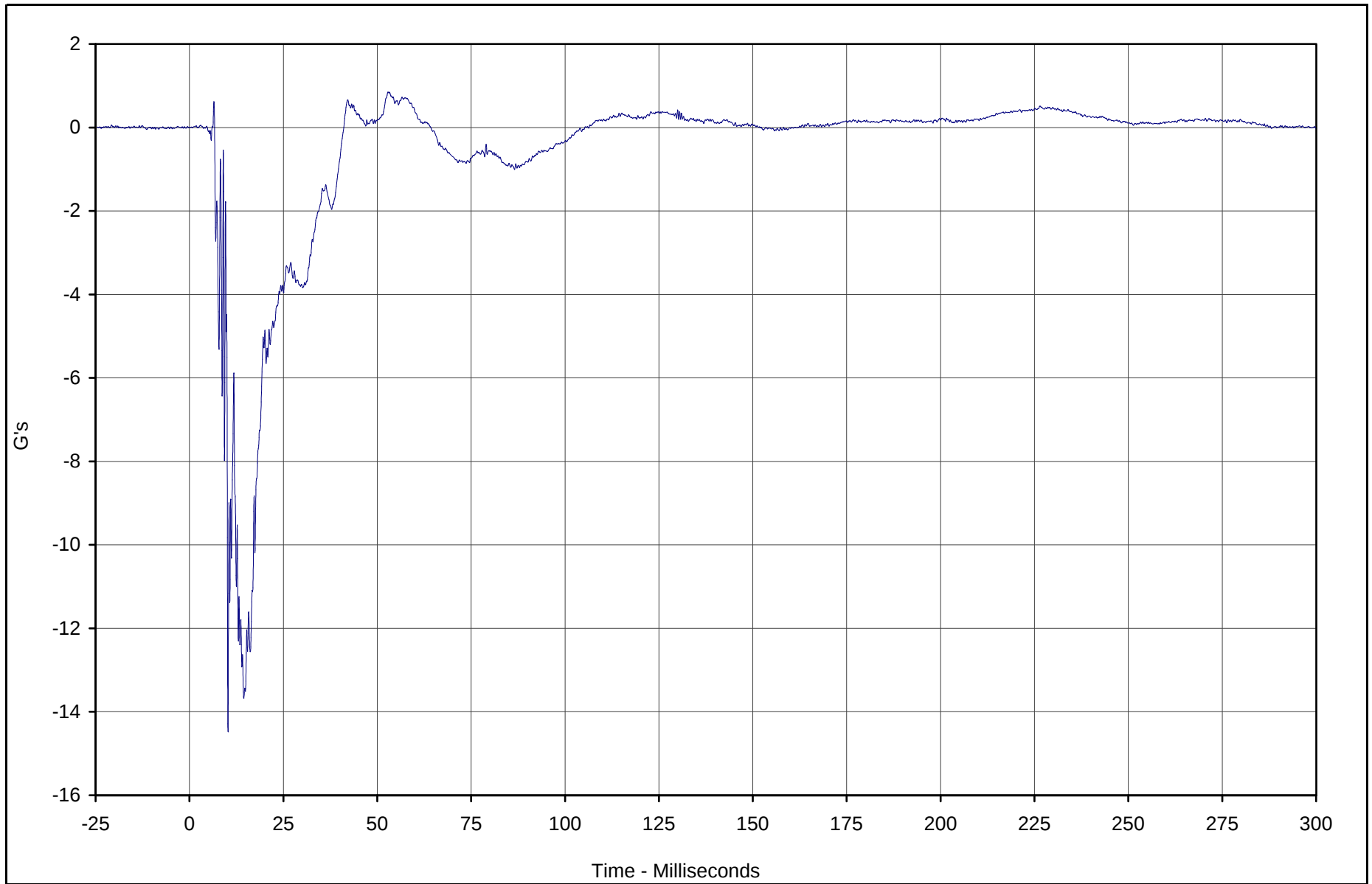


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Head Y	002	FIL	G's	0.9	52.9	-14.5	10.3	1000

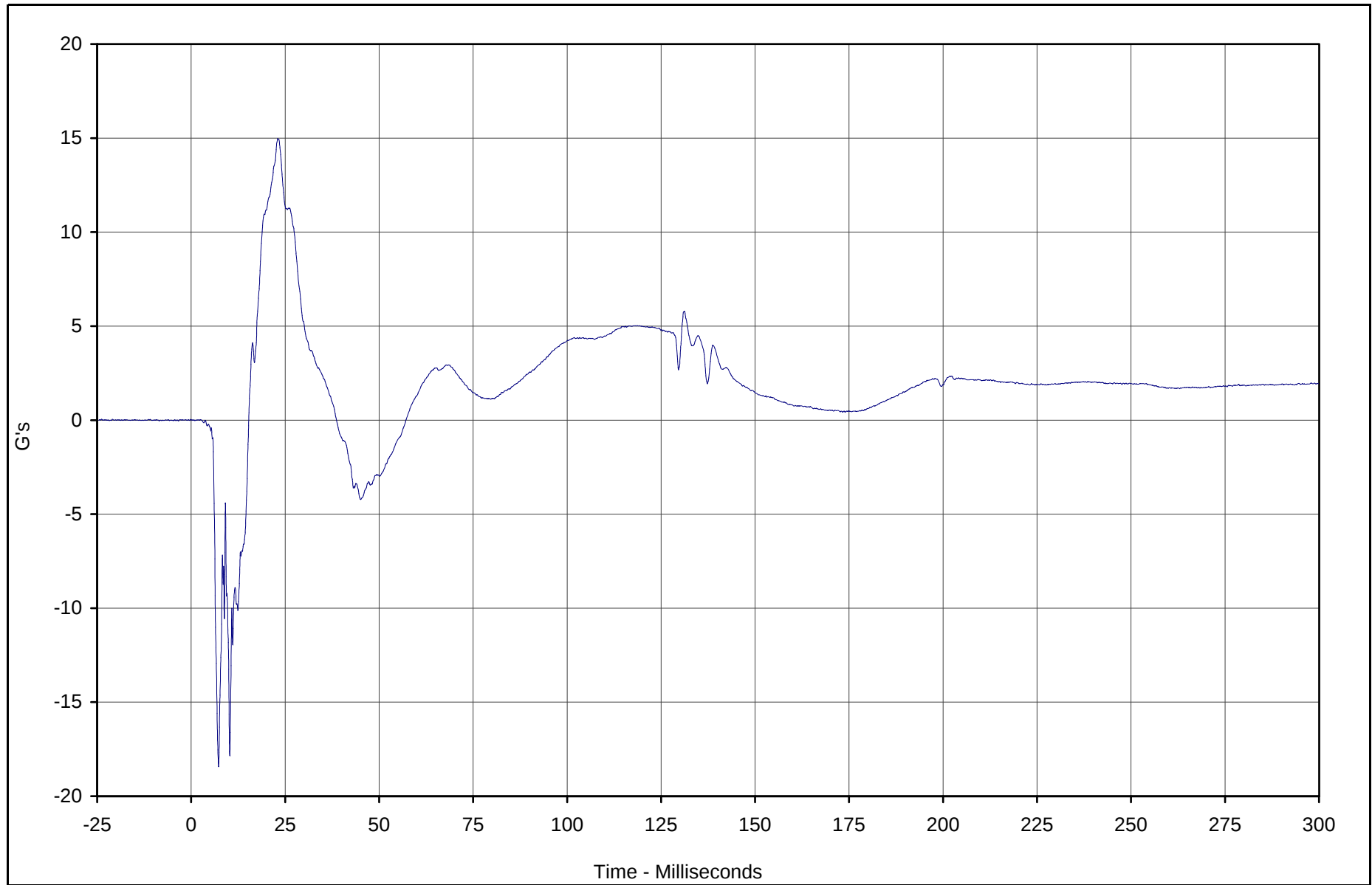


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Head Z	003	FIL	G's	15.0	23.1	-18.4	7.3	1000

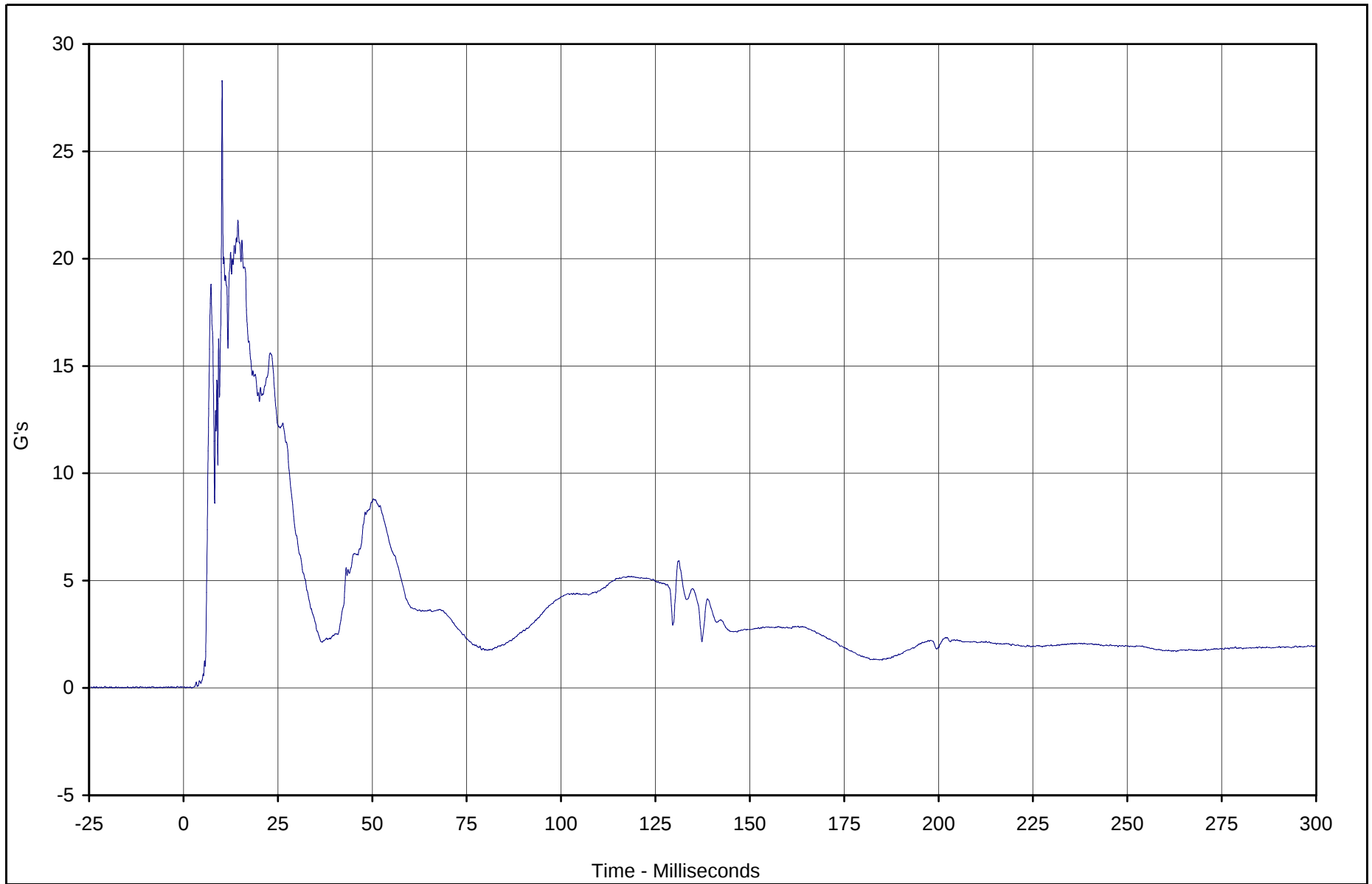


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Test Date: 10/17/03

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NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Head Resultant	001	RES	G's	28.2	10.2	0.0	2.2	1000

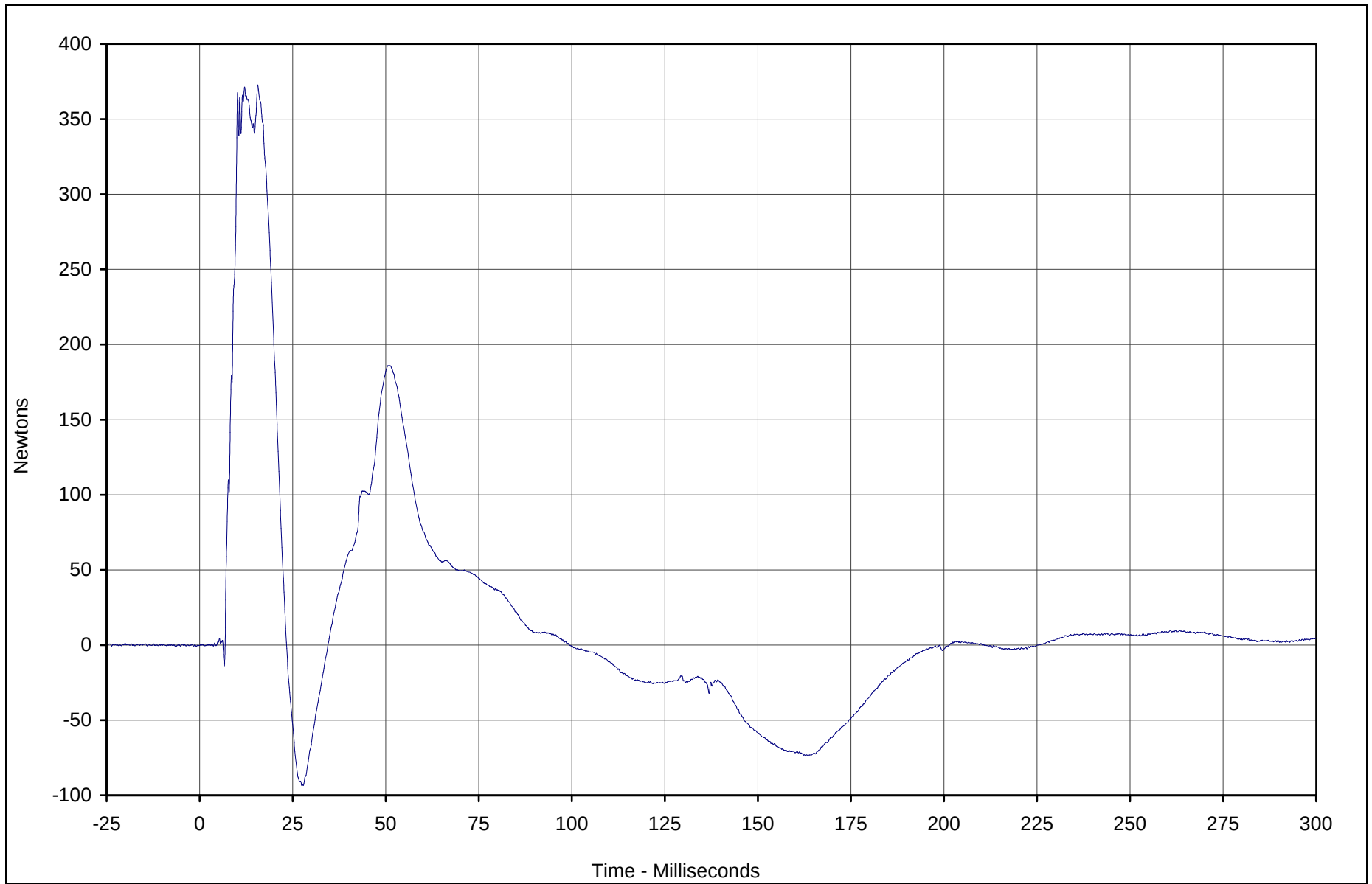


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force X	004	FIL	Newtons	372.7	15.6	-93.4	27.8	1000

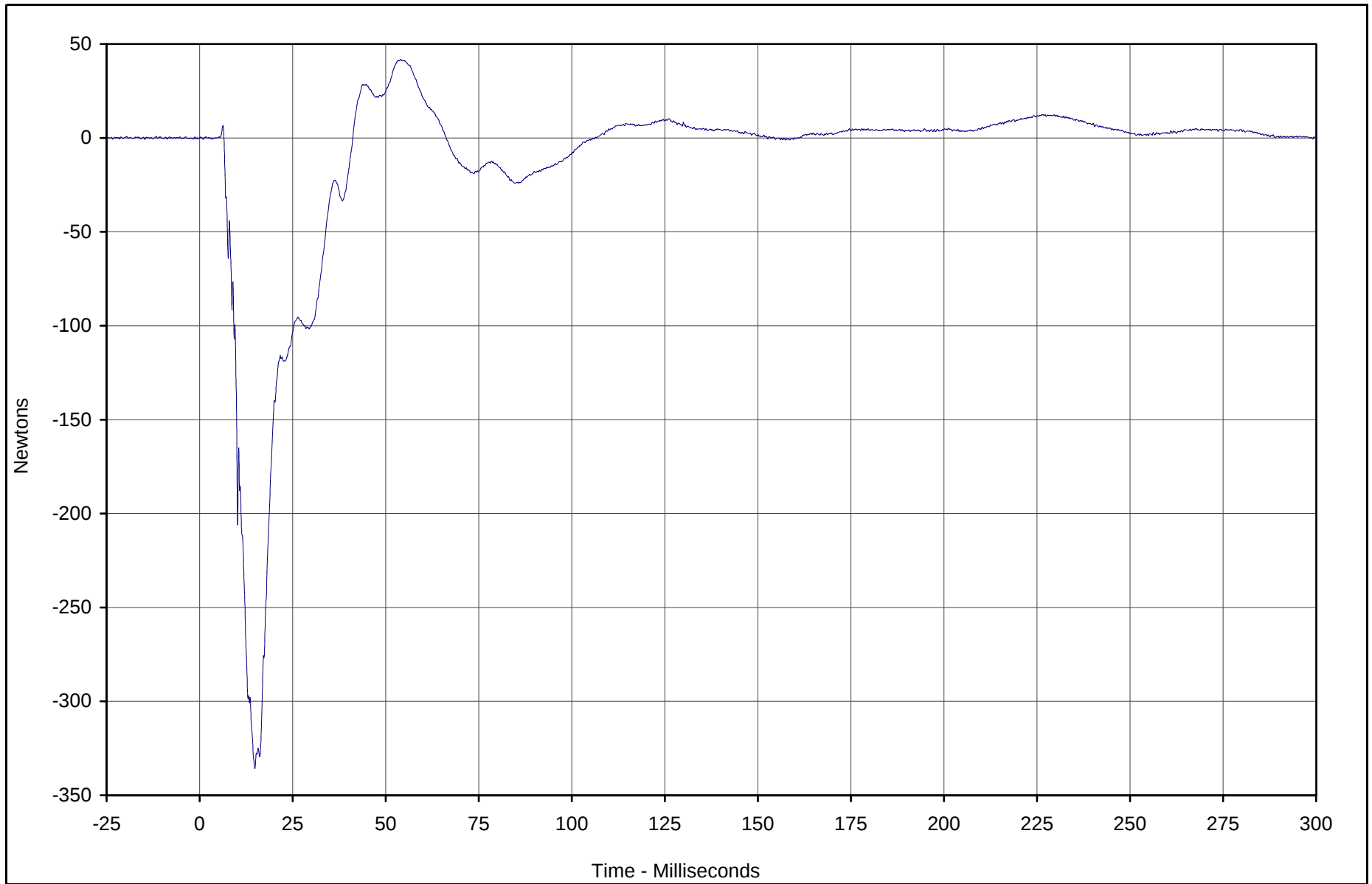


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force Y	005	FIL	Newtons	41.8	54.0	-335.8	14.8	1000

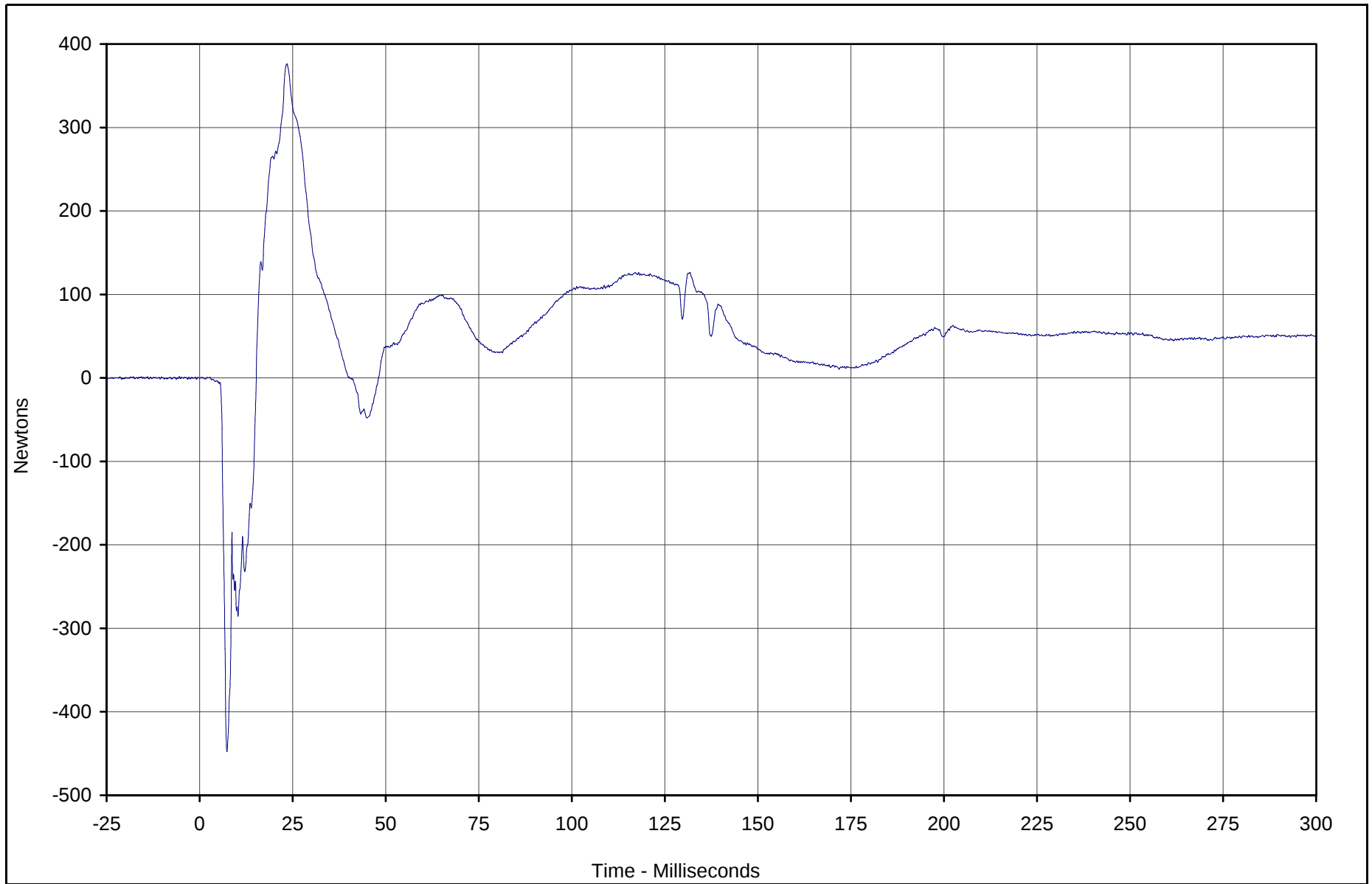


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force Z	006	FIL	Newtons	376.1	23.4	-447.7	7.3	1000

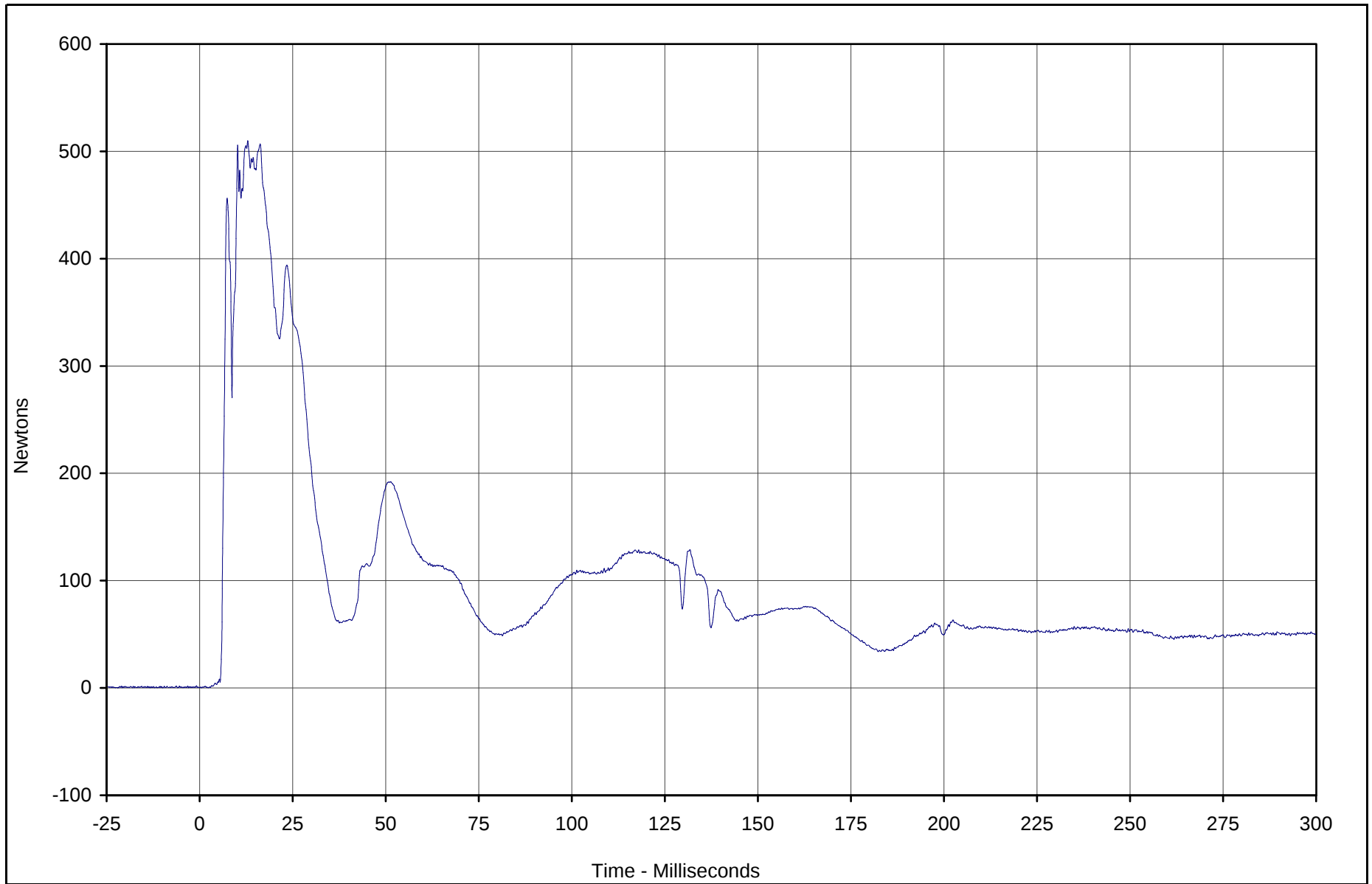


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force Resultant	004	RES	Newtons	509.9	12.9	0.1	2.3	1000

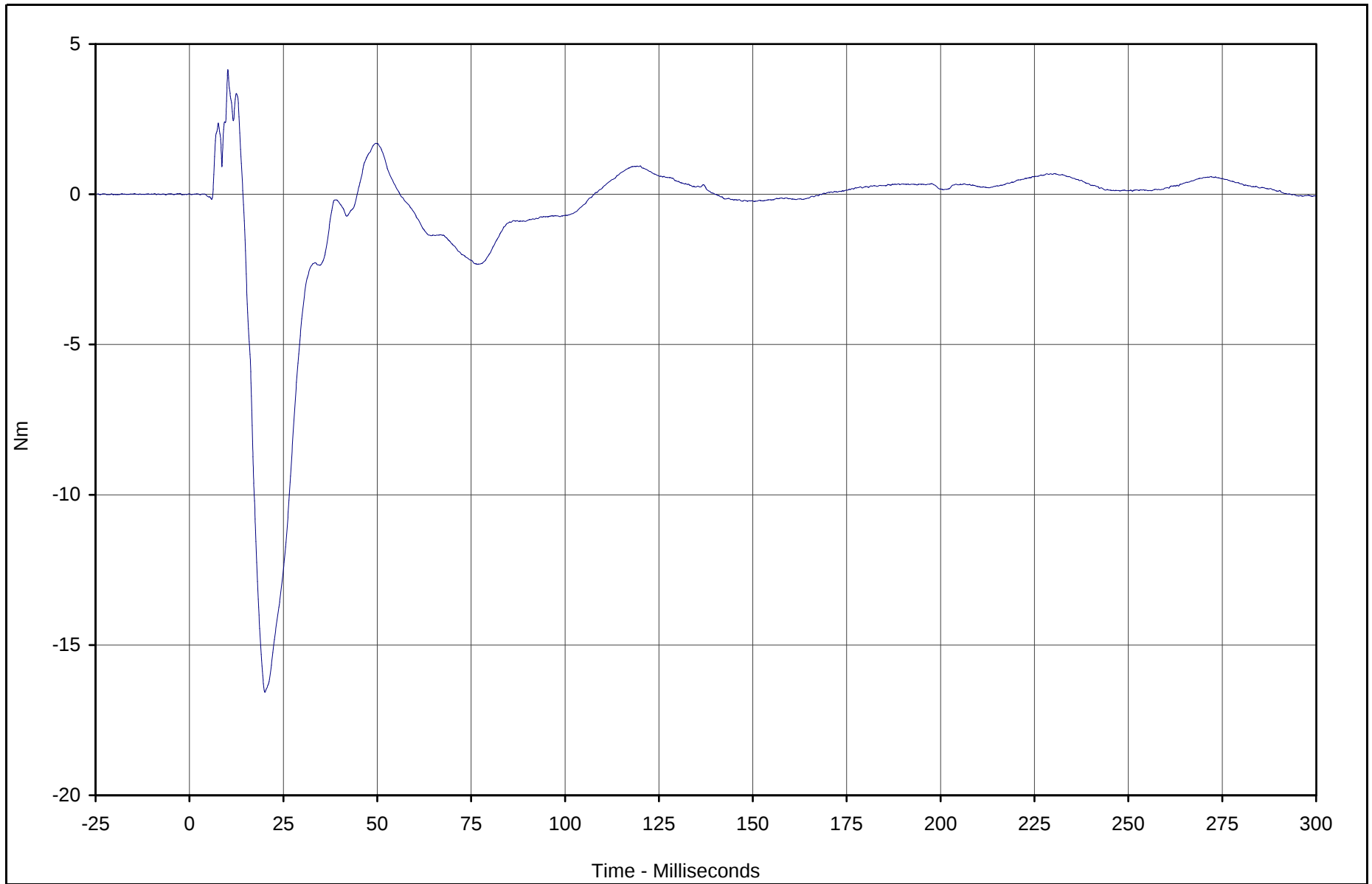


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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment X	007	FIL	Nm	4.2	10.2	-16.6	20.1	600

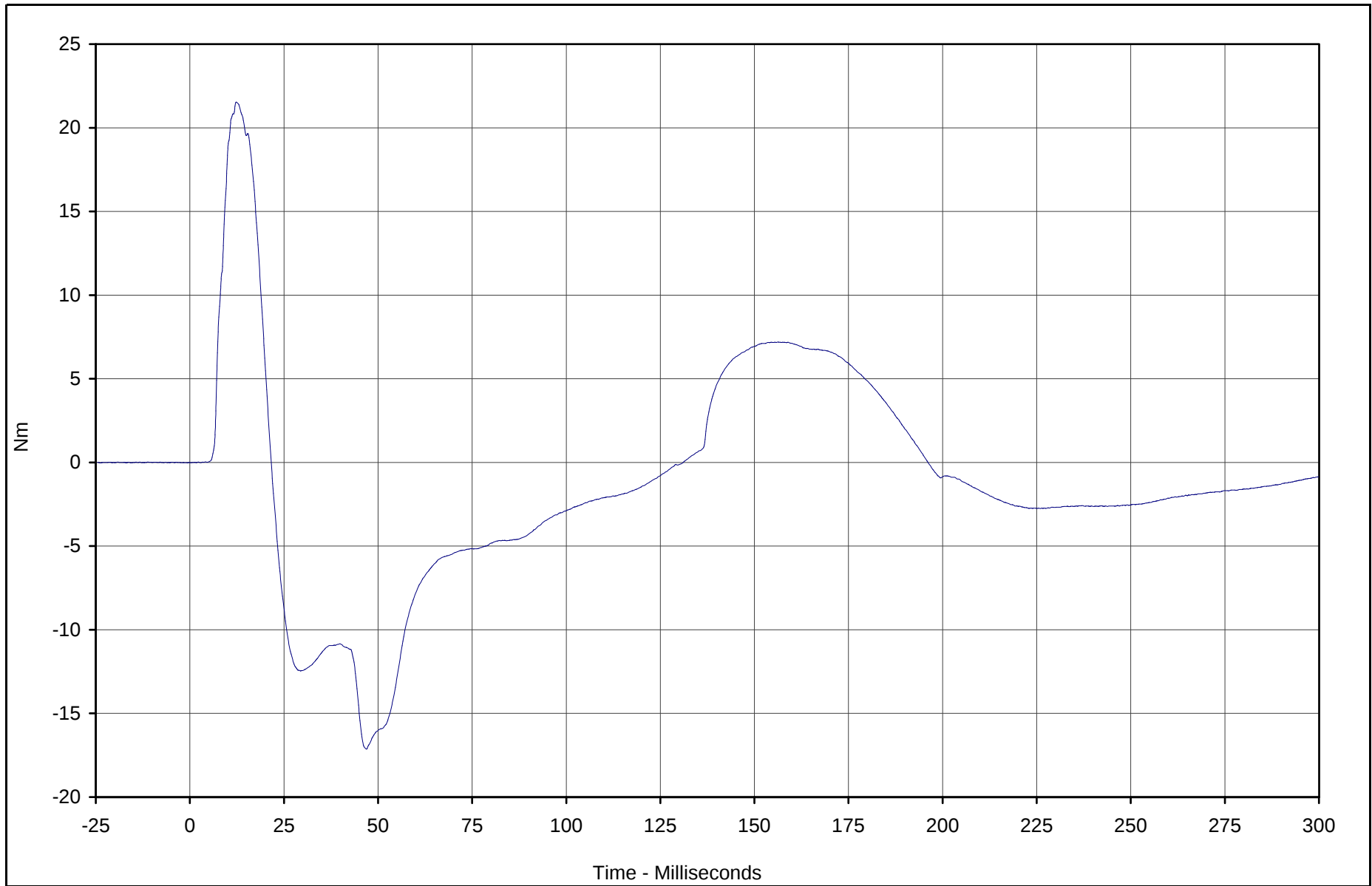


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment Y	008	FIL	Nm	21.5	12.3	-17.1	46.9	600

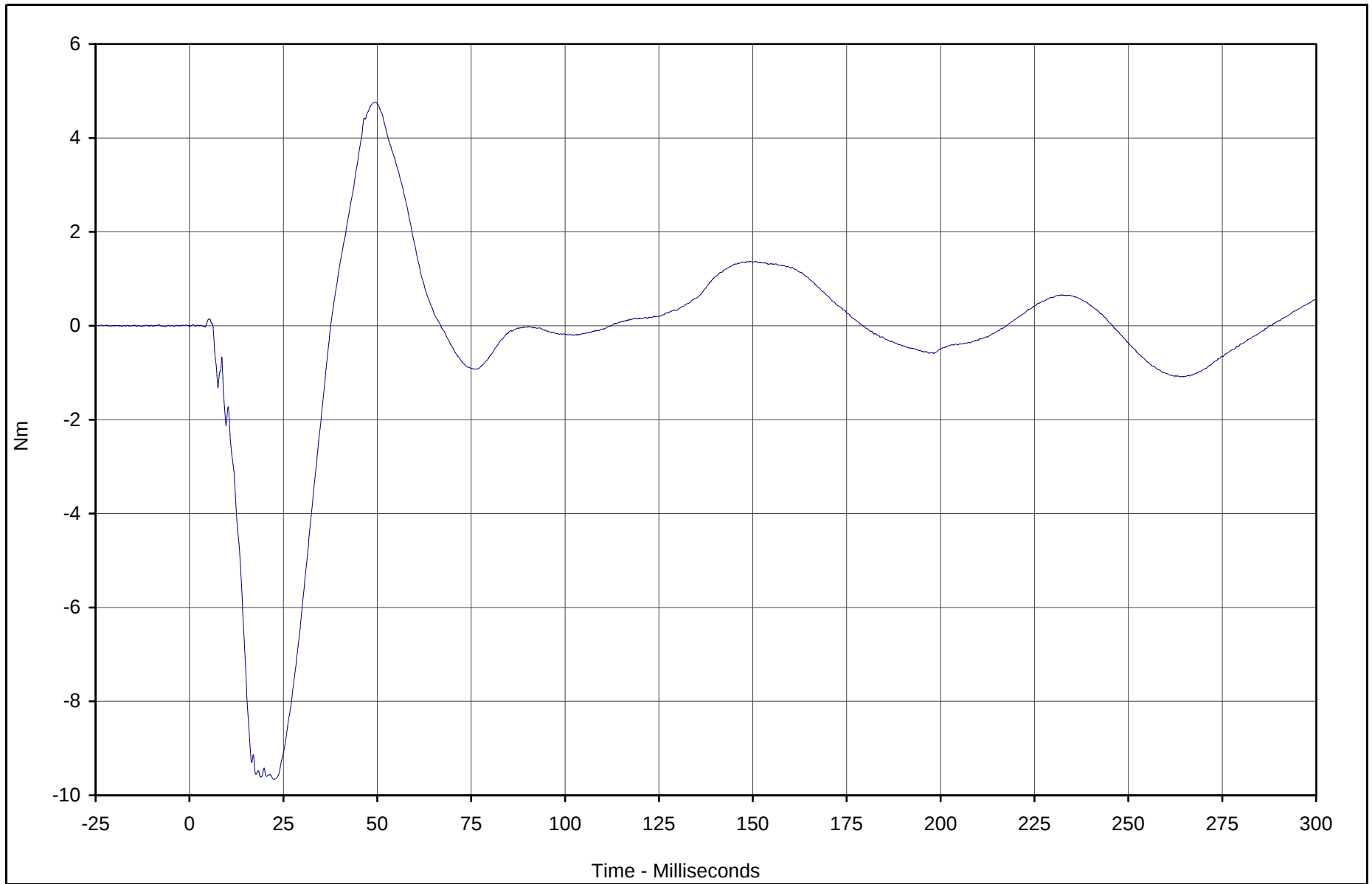


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment Z	009	FIL	Nm	4.8	49.5	-9.7	22.4	600

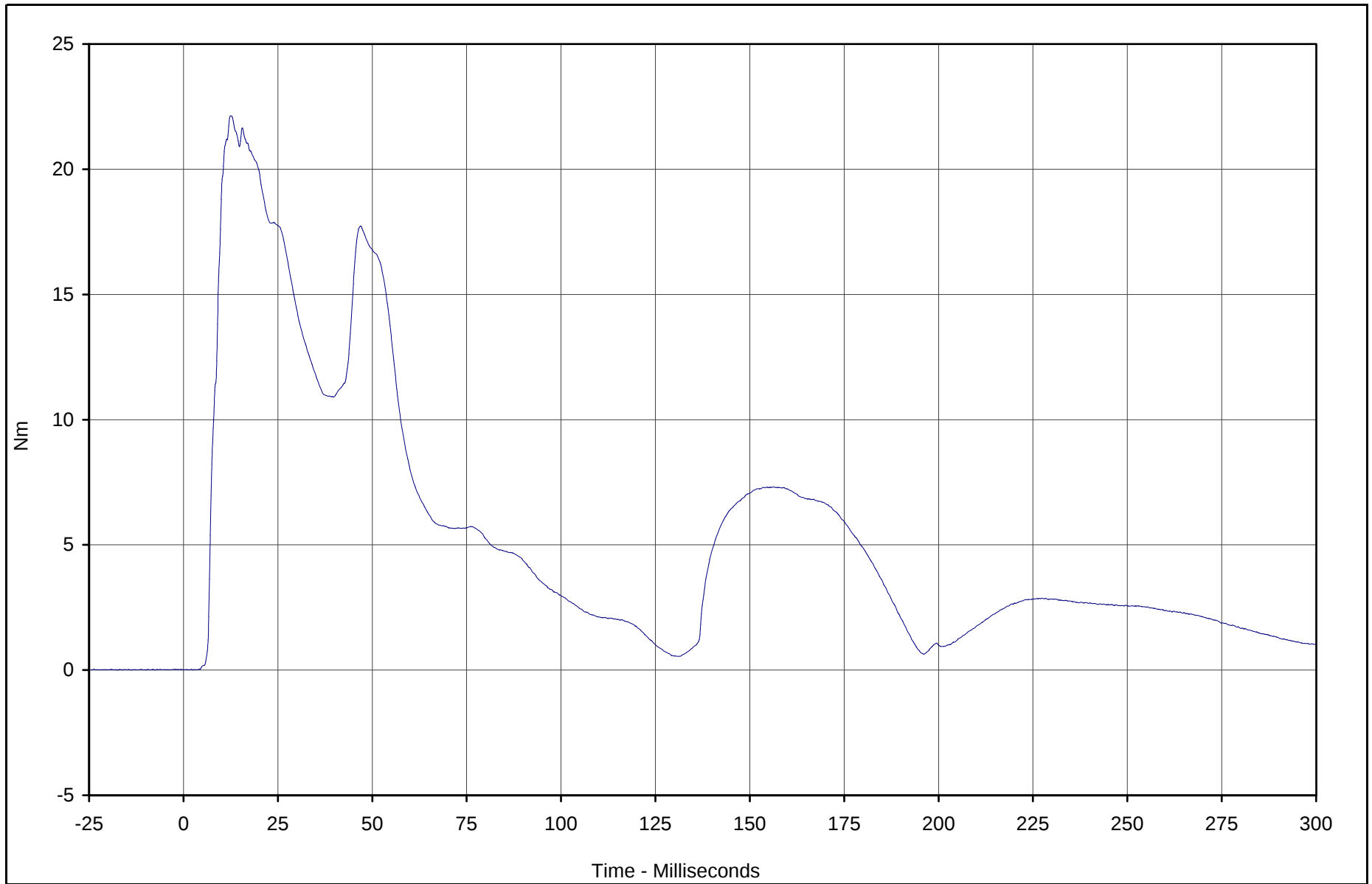


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment Resultant	007	RES	Nm	22.1	12.5	0.0	2.5	600

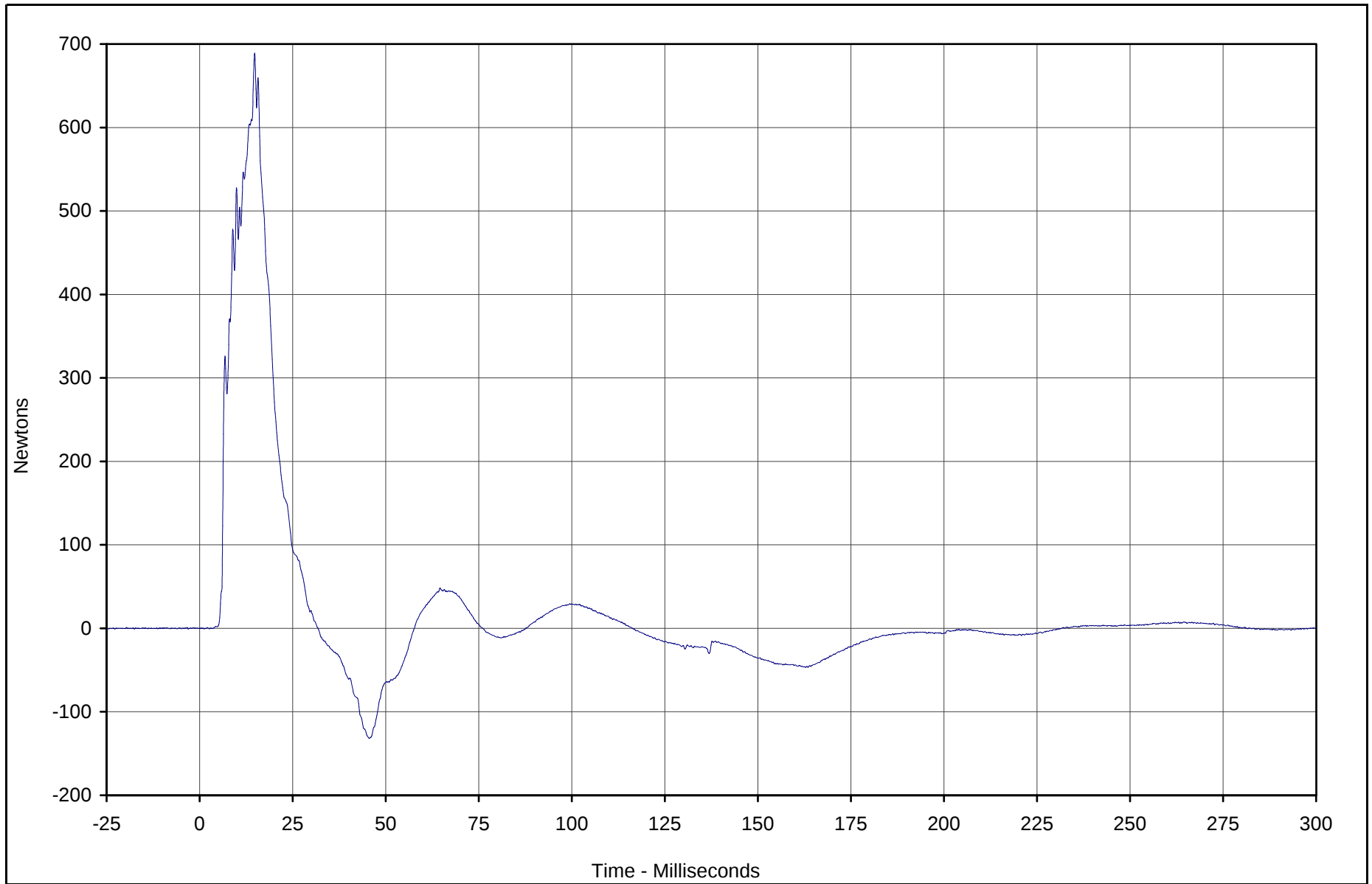


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force X	010	FIL	Newtons	689.2	14.8	-131.7	45.6	1000

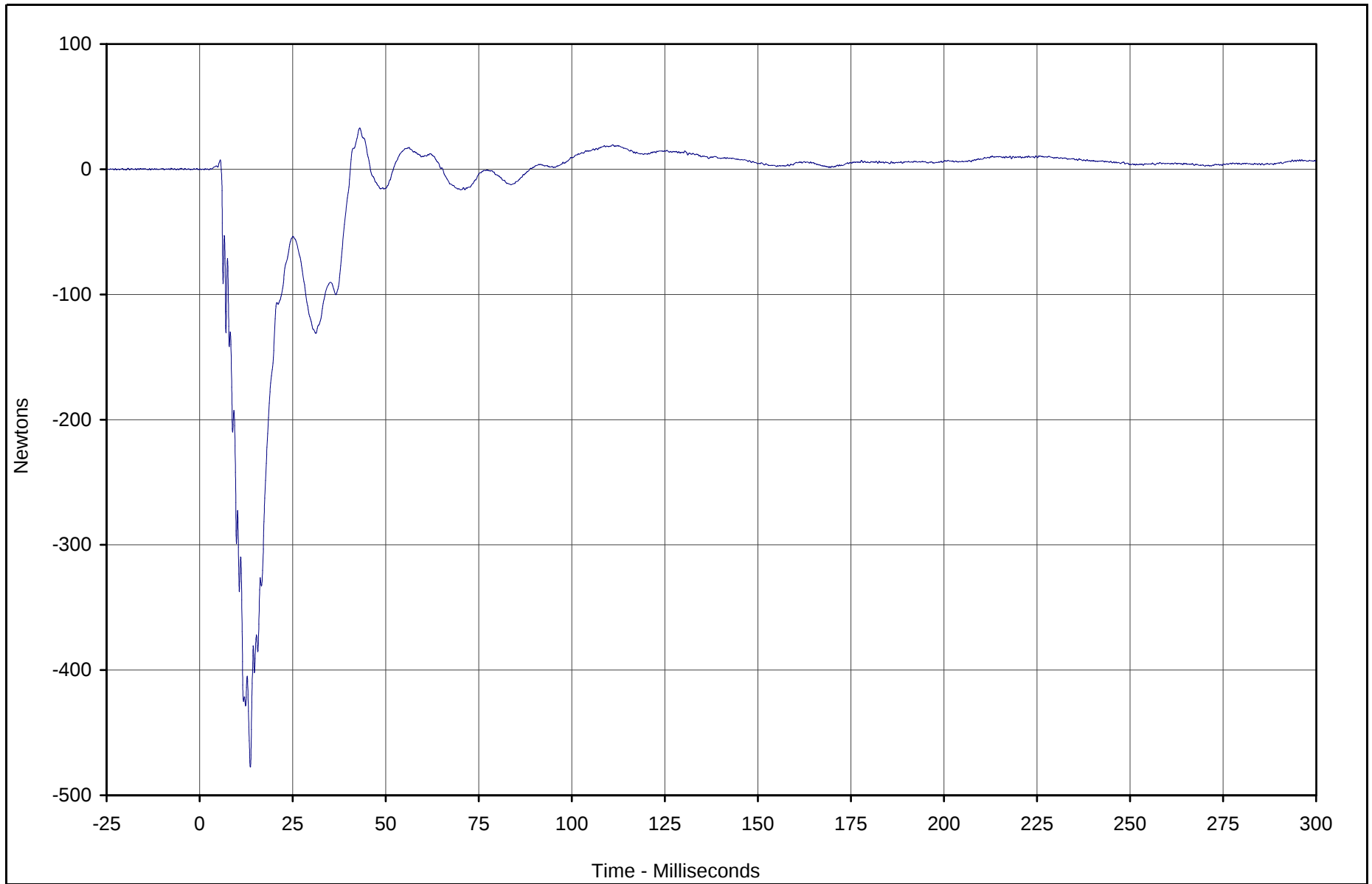


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force Y	011	FIL	Newtons	32.9	43.0	-477.3	13.7	1000

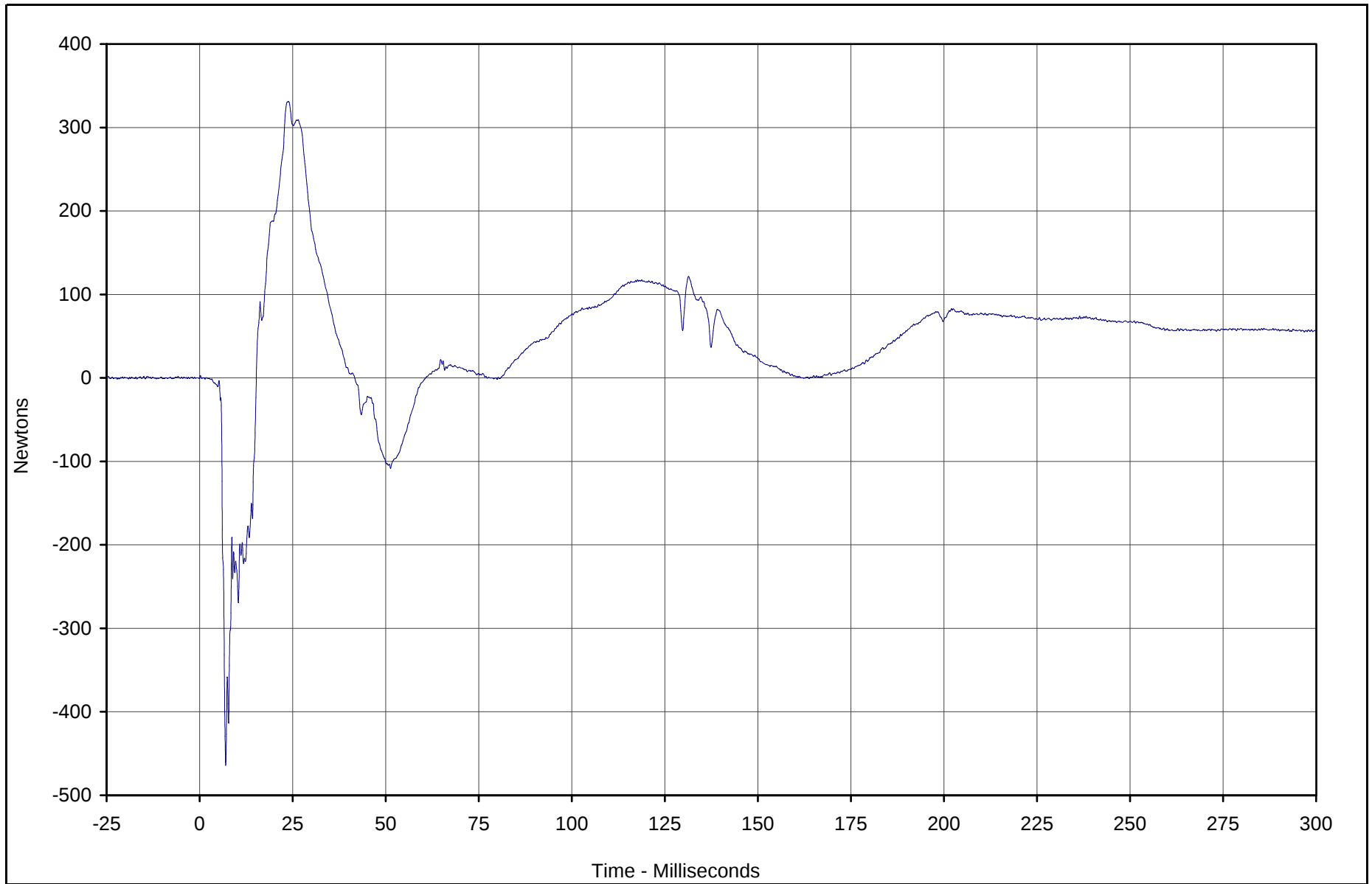


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force Z	012	FIL	Newtons	331.2	23.8	-464.3	7.0	1000

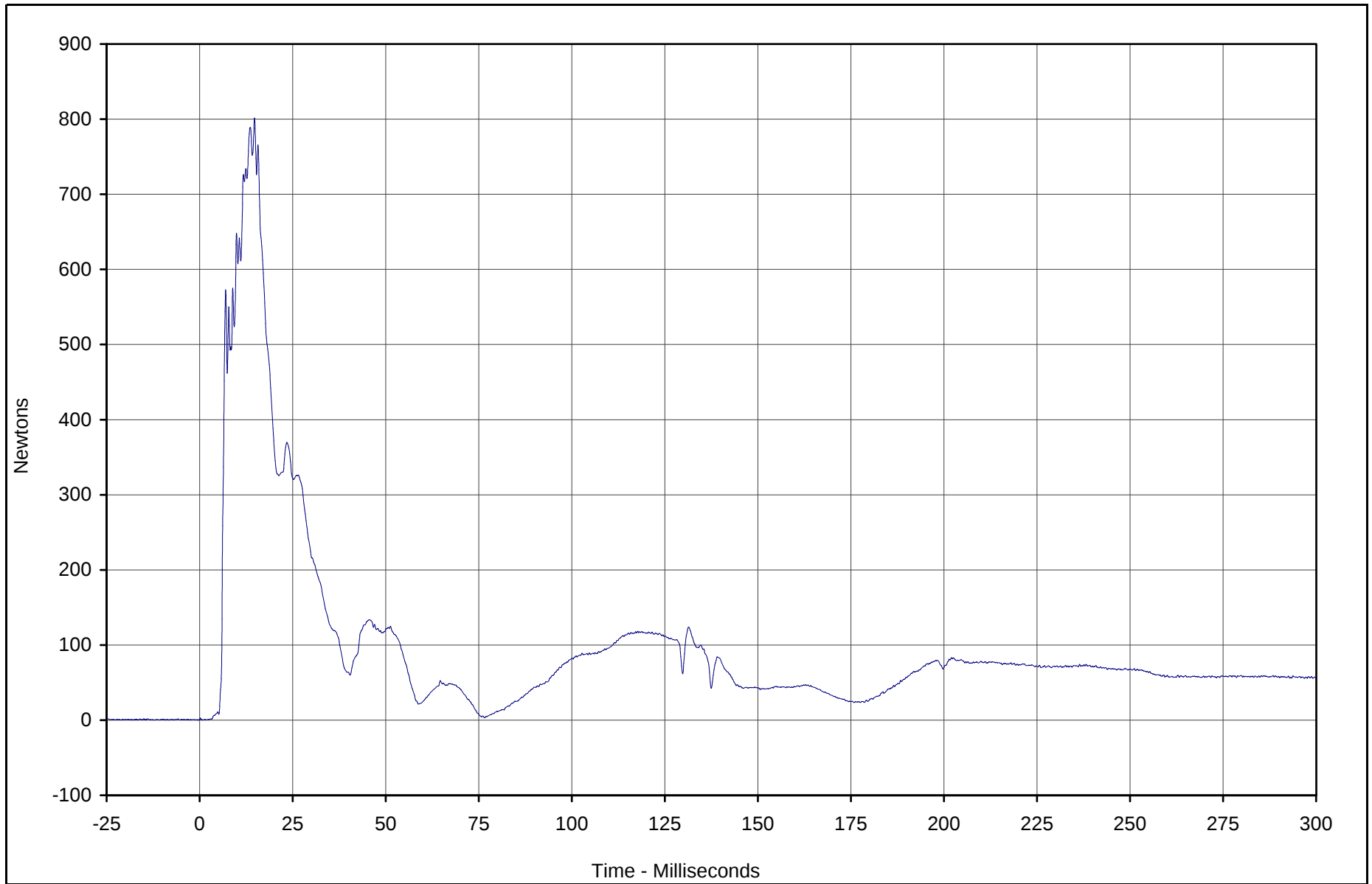


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force Resultant	010	RES	Newtons	801.3	14.8	0.2	1.0	1000

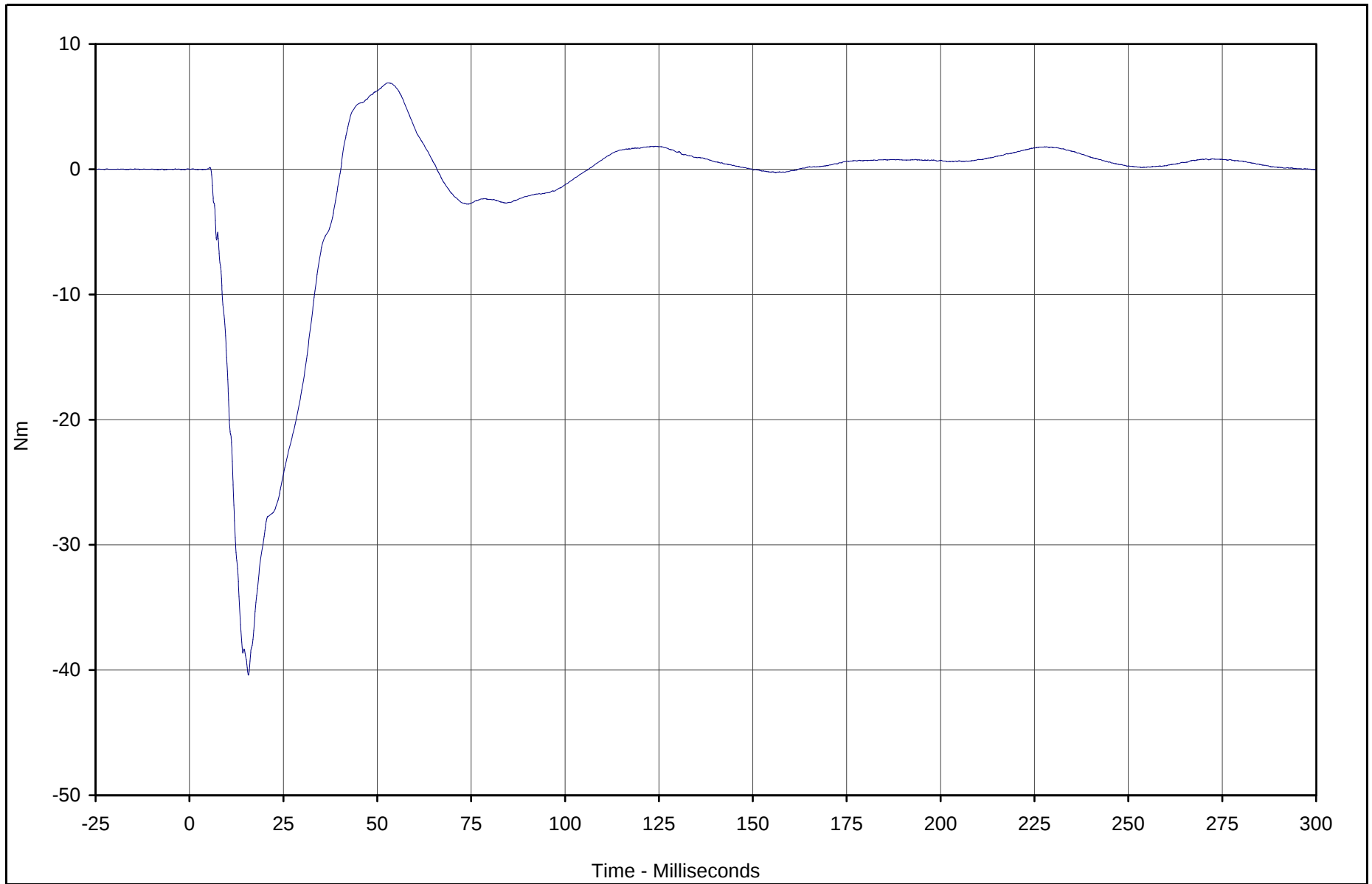


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment X	013	FIL	Nm	6.9	53.0	-40.4	15.7	600

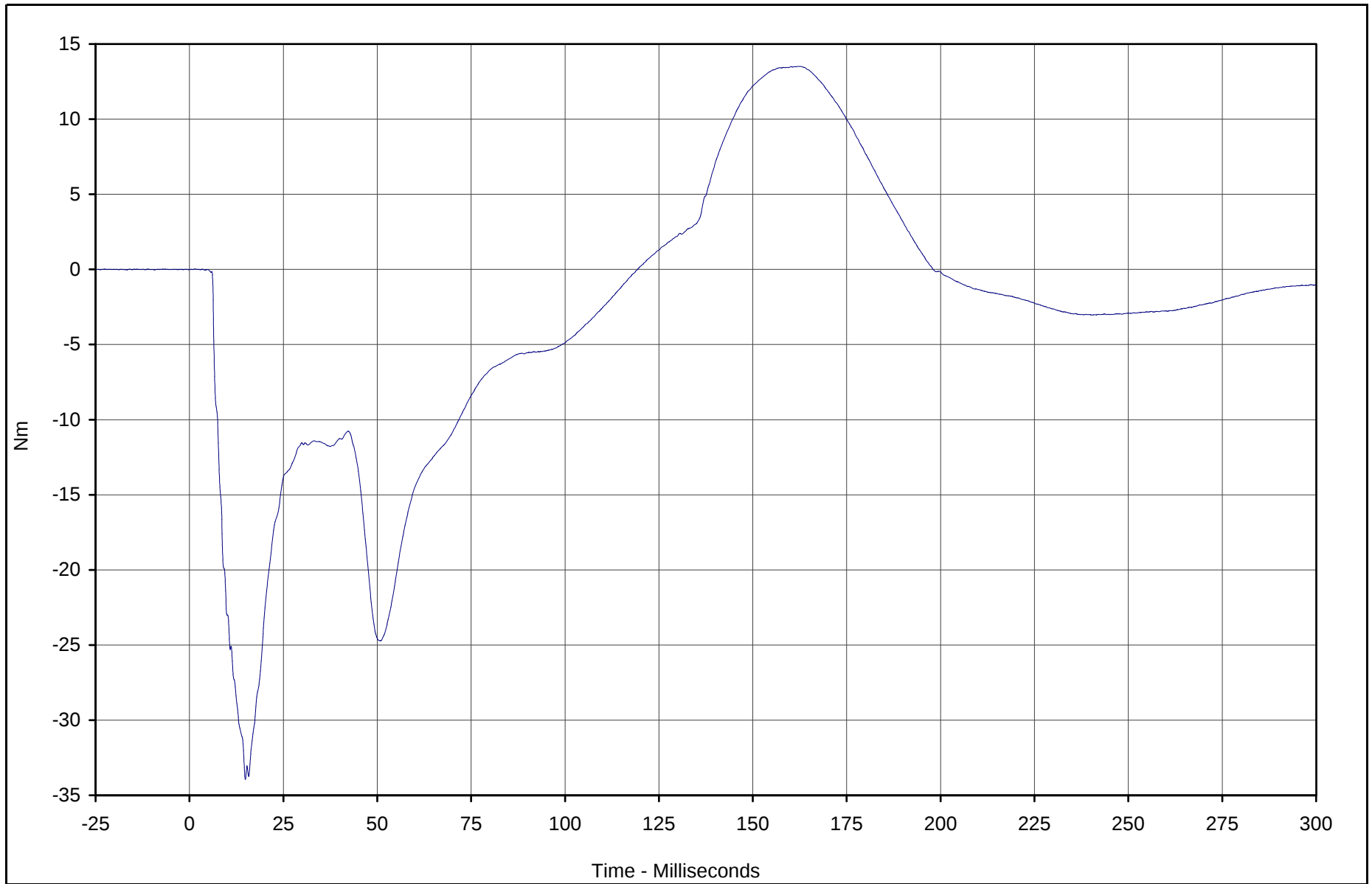


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment Y	014	FIL	Nm	13.5	162.1	-33.9	14.9	600

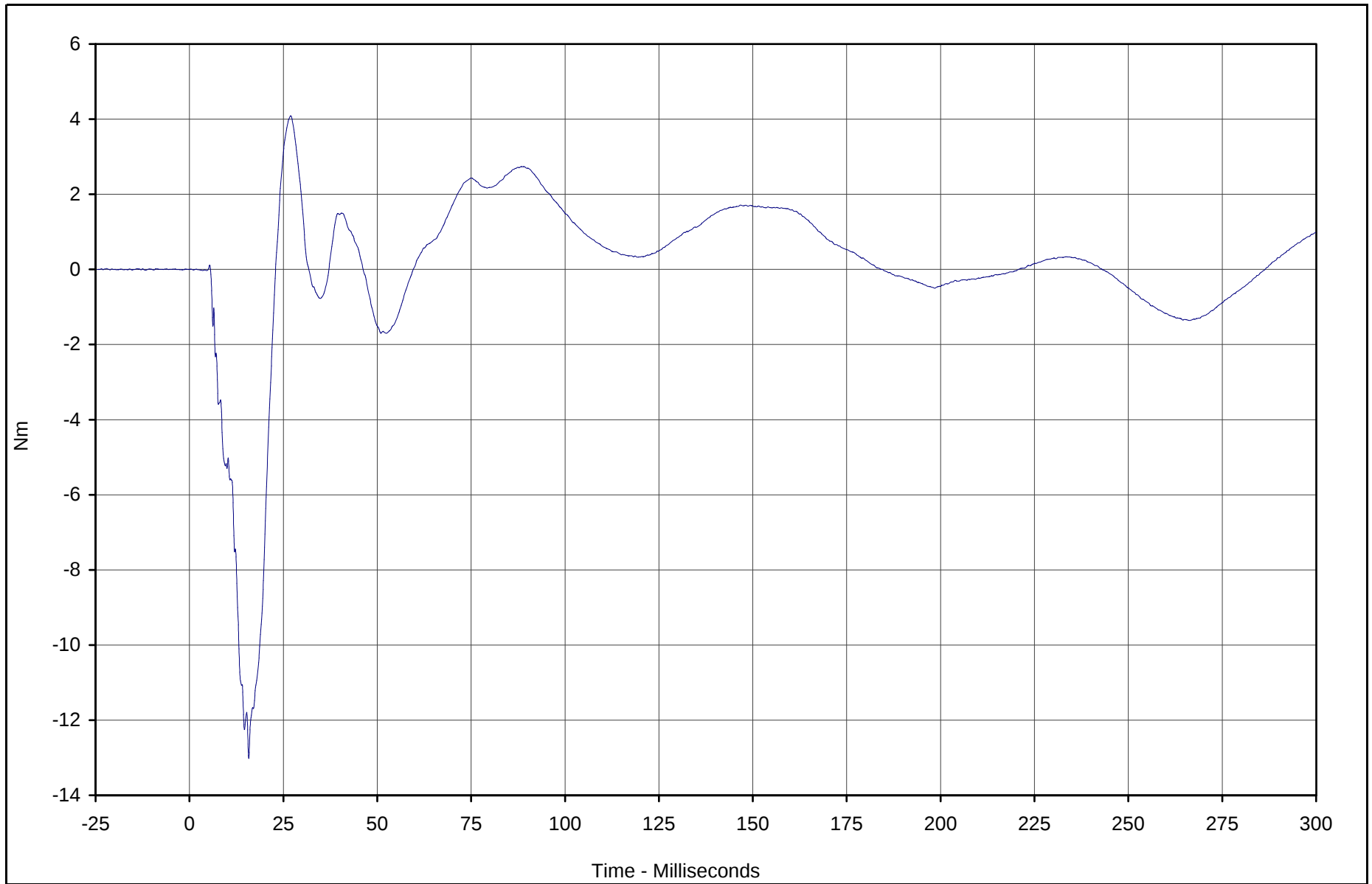


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment Z	015	FIL	Nm	4.1	27.0	-13.0	15.8	600

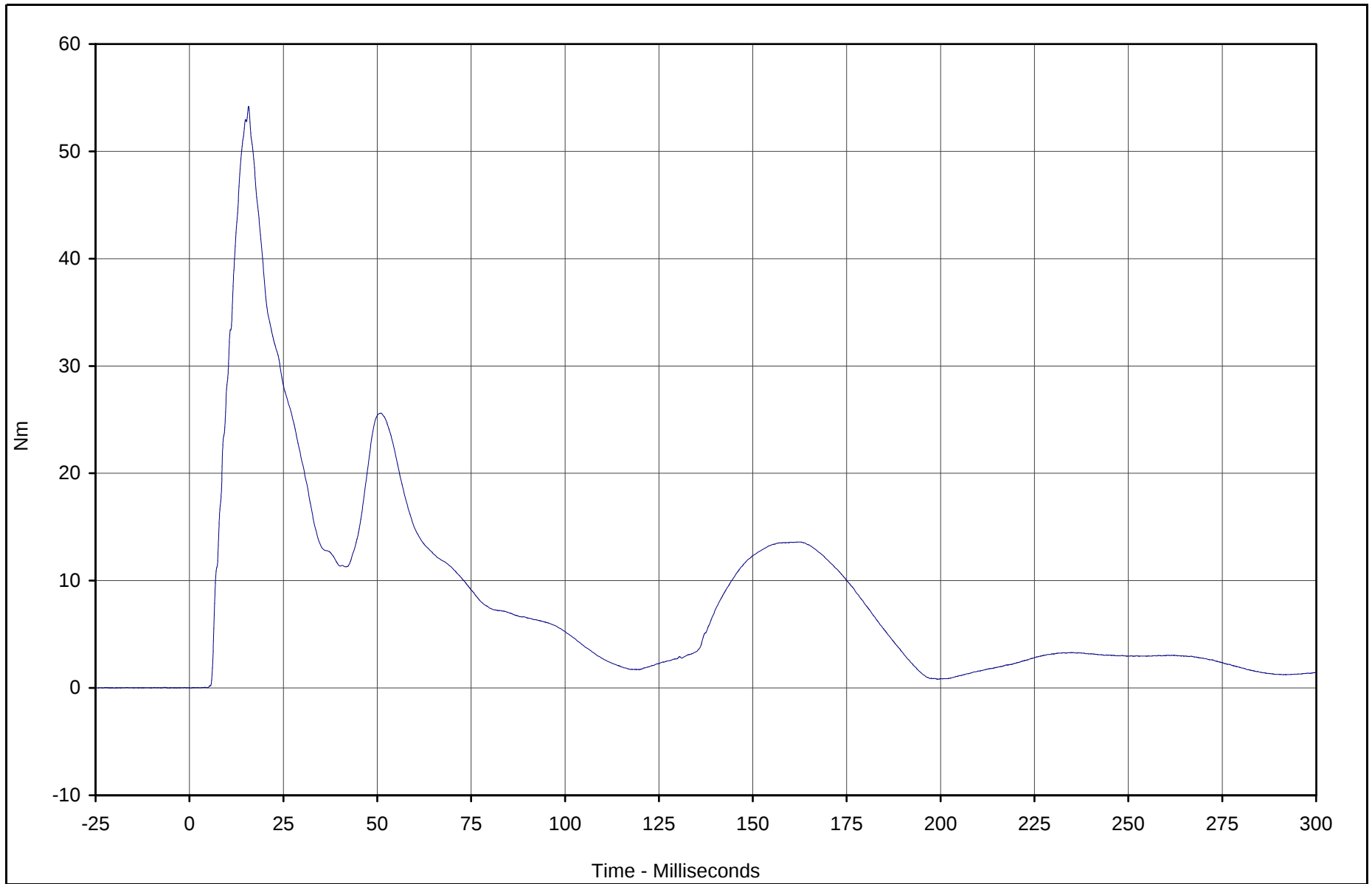


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment Resultant	013	RES	Nm	54.2	15.7	0.0	0.2	600

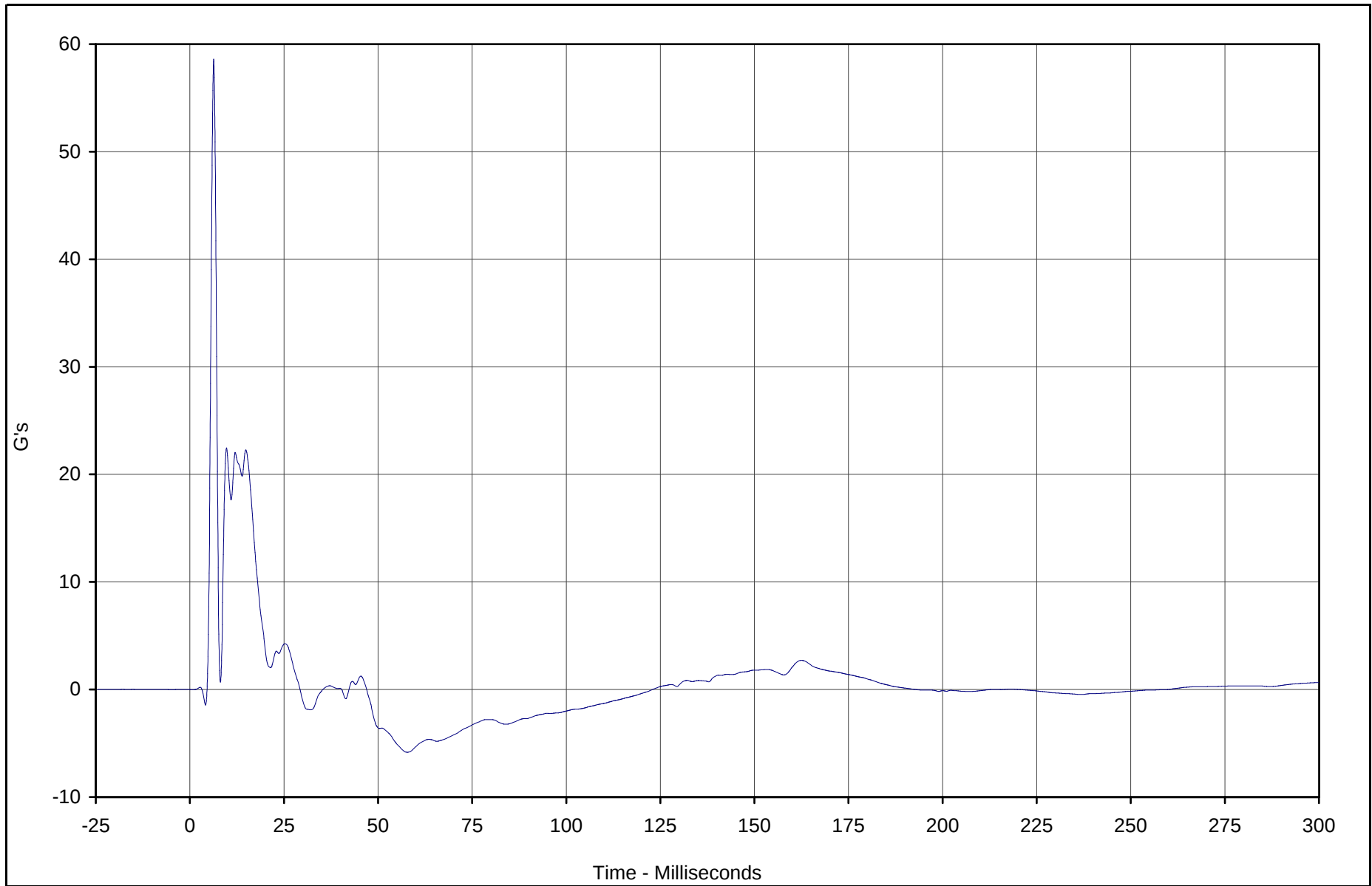


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest X	016	FIL	G's	58.6	6.3	-5.8	57.8	180

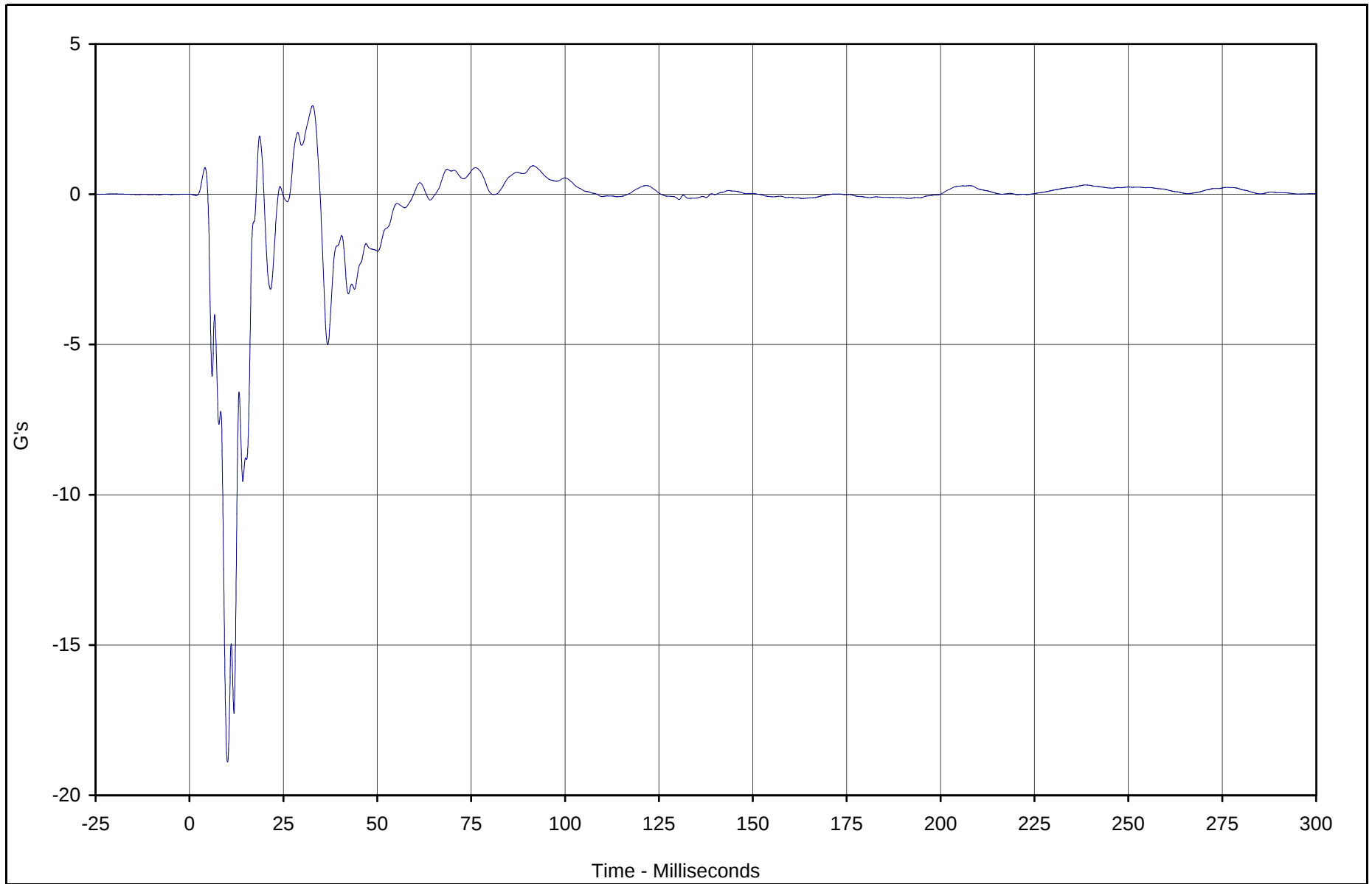


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Y	017	FIL	G's	3.0	32.8	-18.9	10.1	180

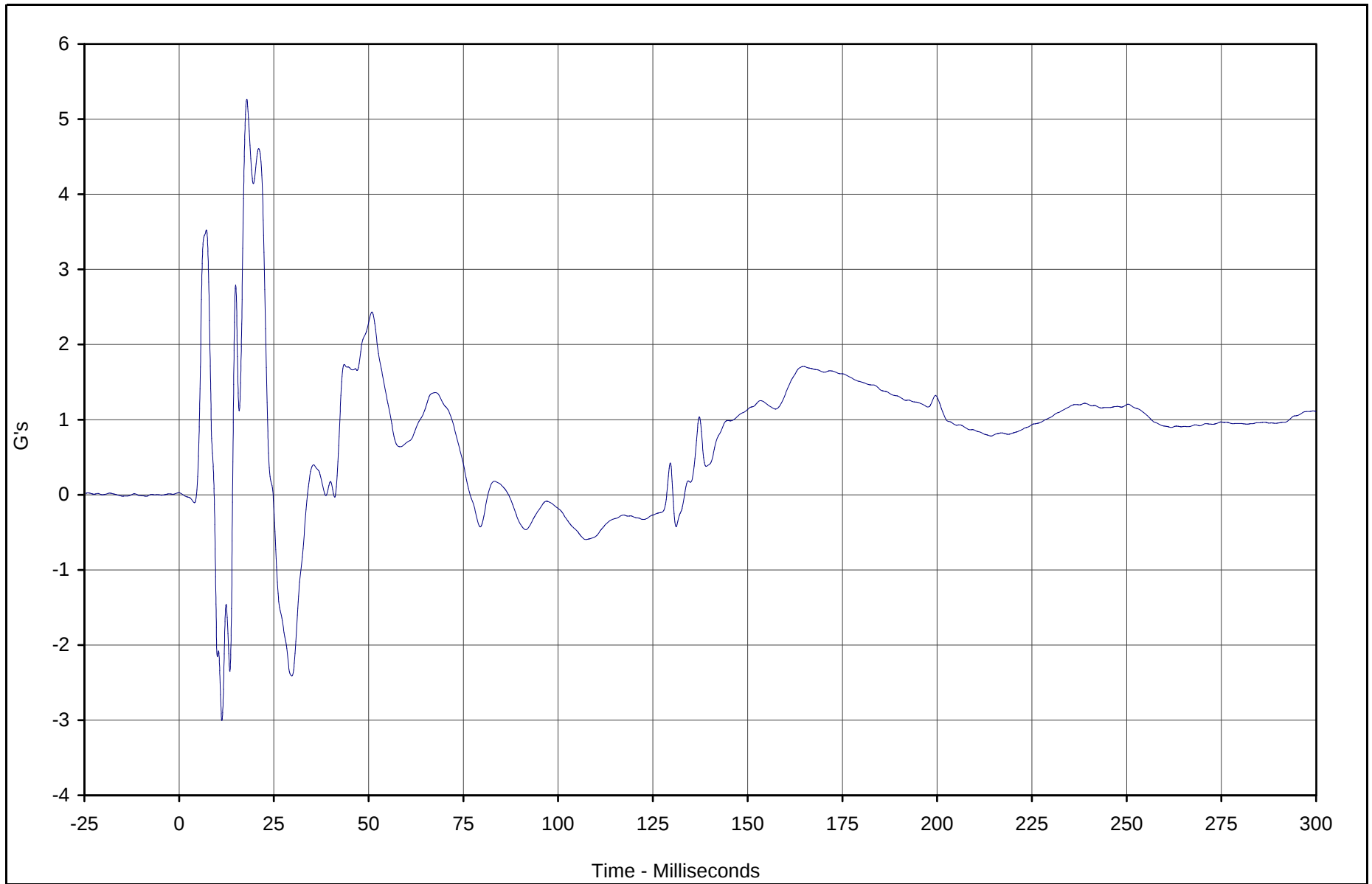


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Z	018	FIL	G's	5.3	17.8	-3.0	11.3	180

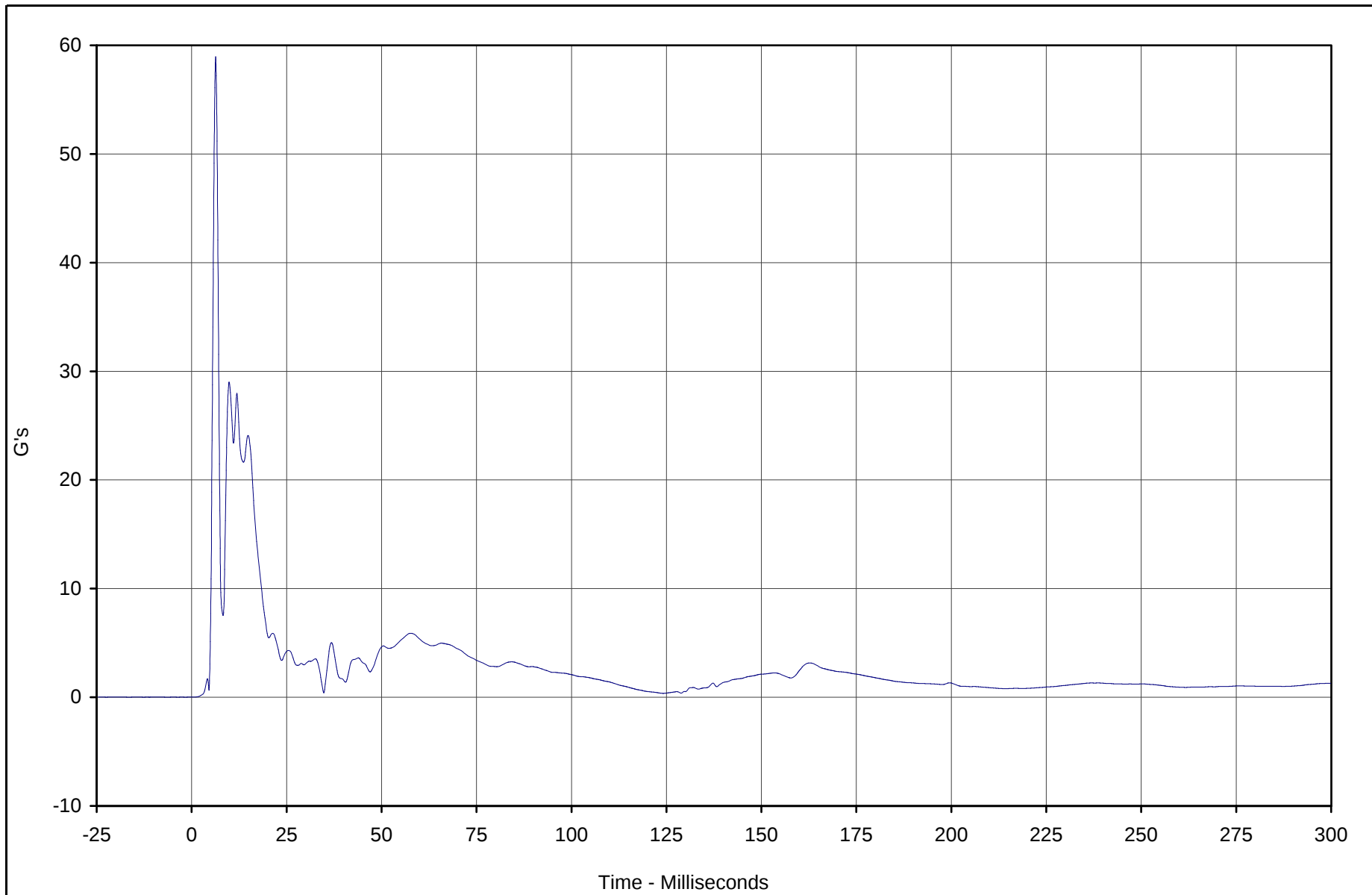


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Resultant	016	RES	G's	59.0	6.3	0.0	0.8	180

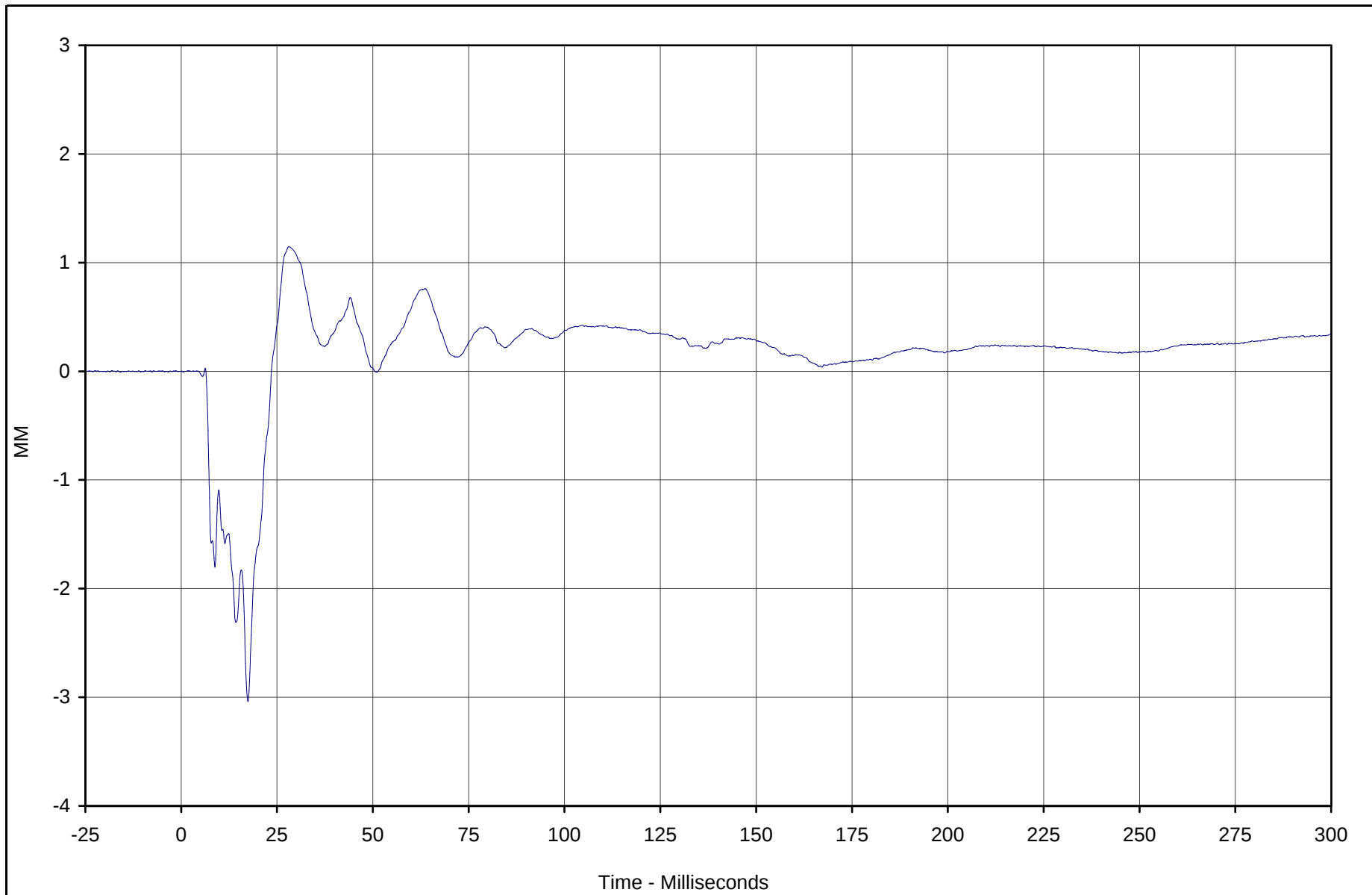


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Displacement	019	FIL	MM	1.1	28.1	-3.0	17.4	600

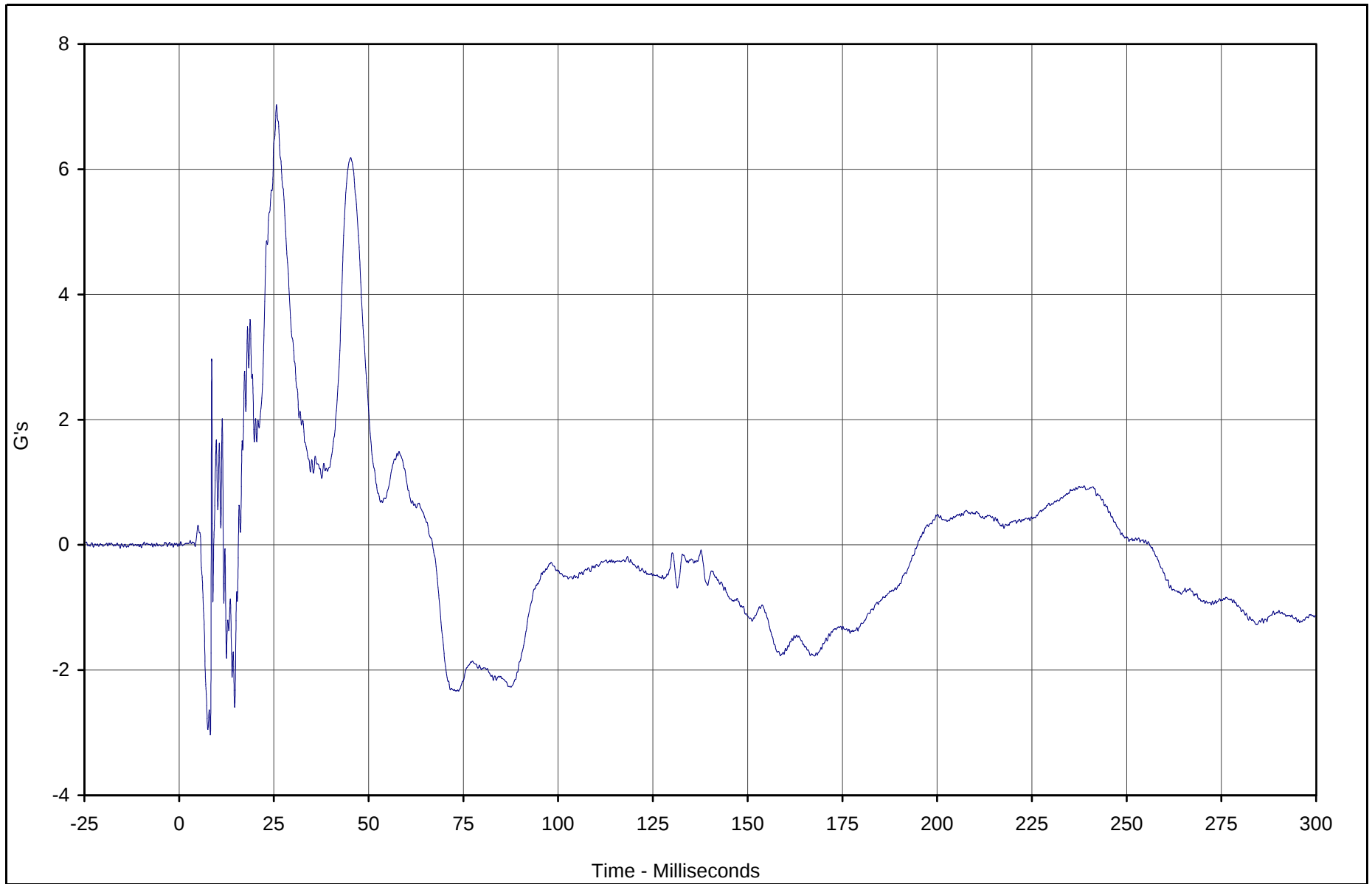


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis X	020	FIL	G's	7.0	25.7	-3.0	8.2	1000

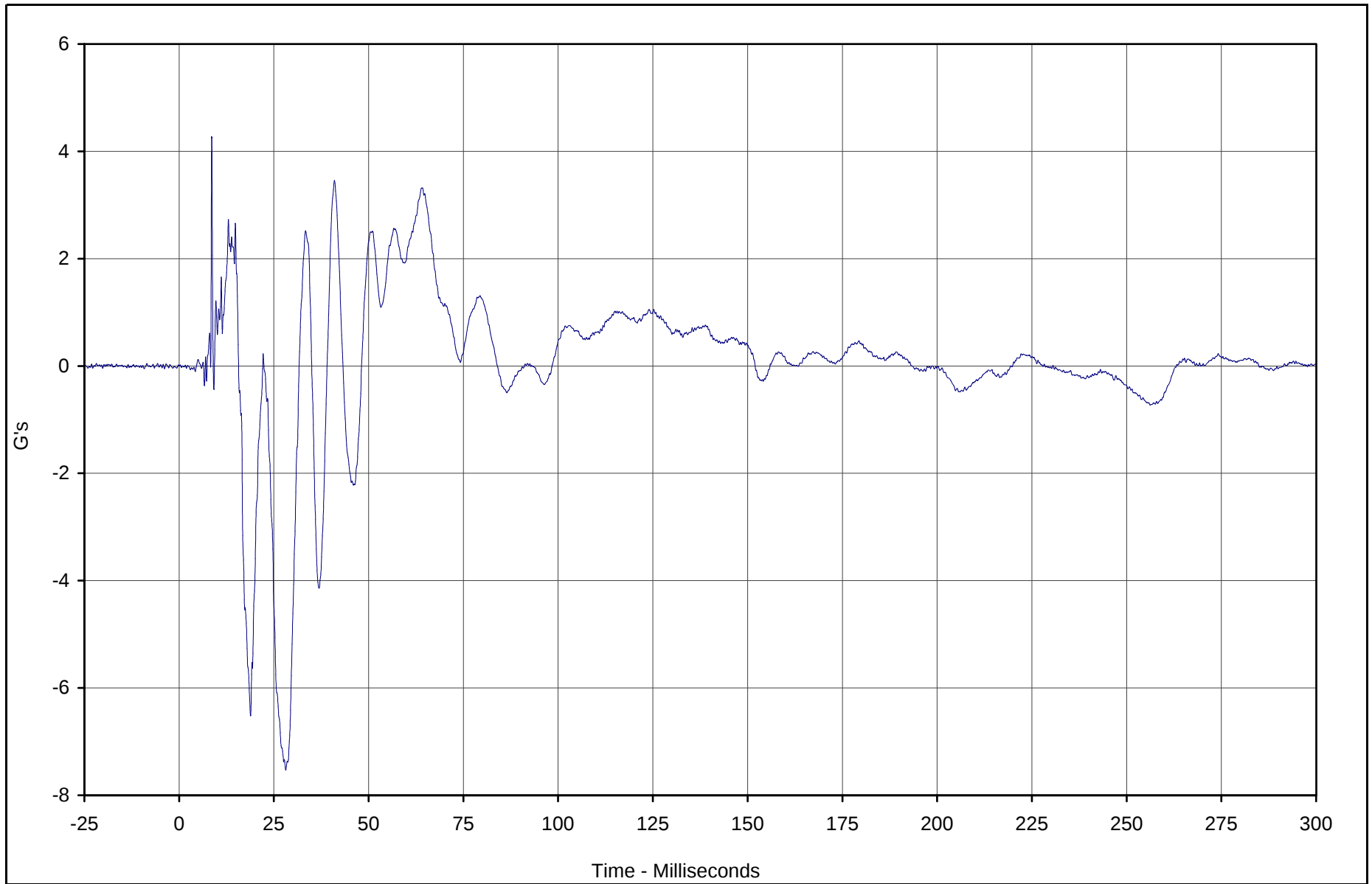


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis Y	021	FIL	G's	4.2	8.6	-7.5	28.1	1000

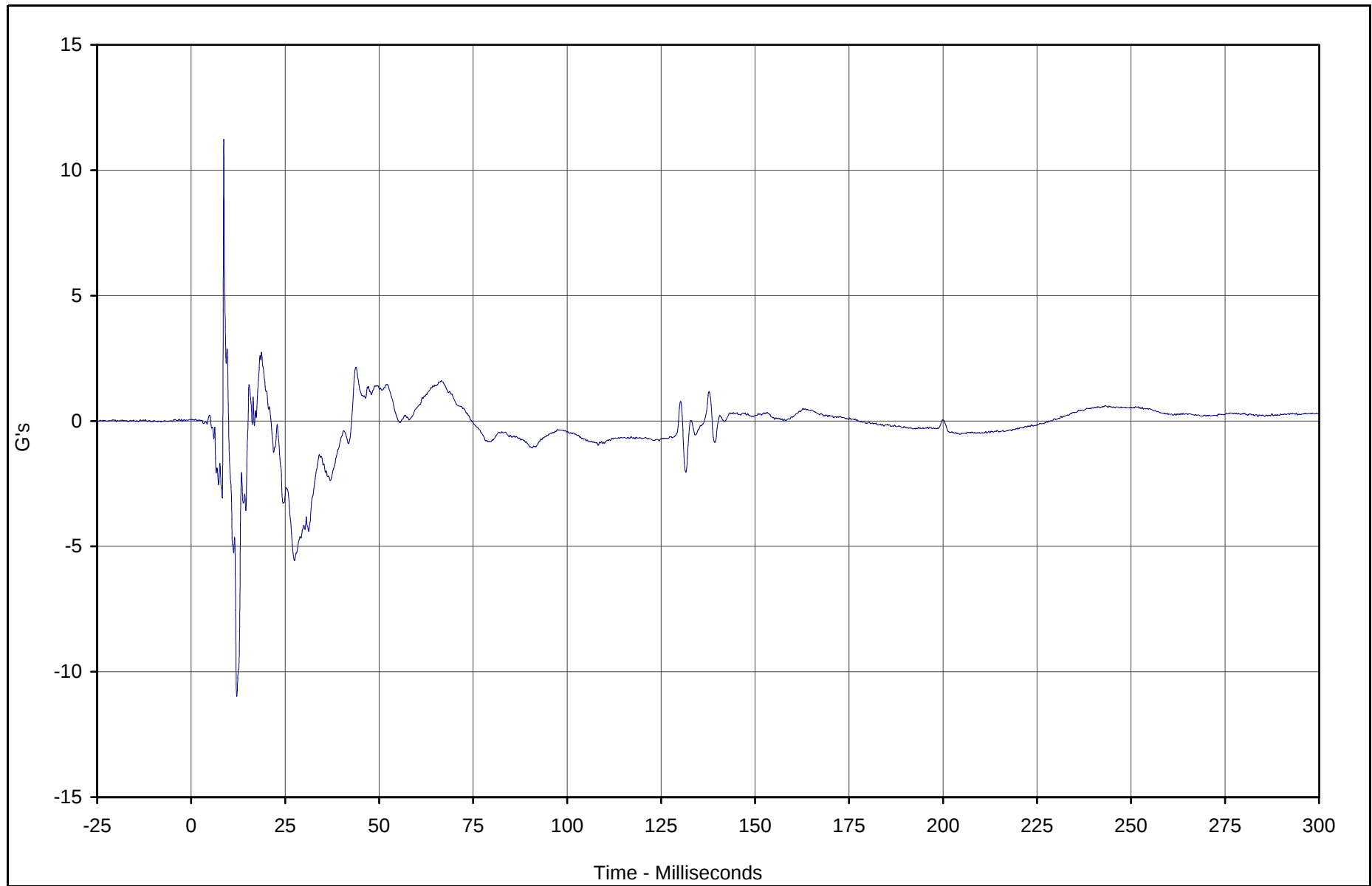


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis Z	022	FIL	G's	11.2	8.7	-11.0	12.1	1000

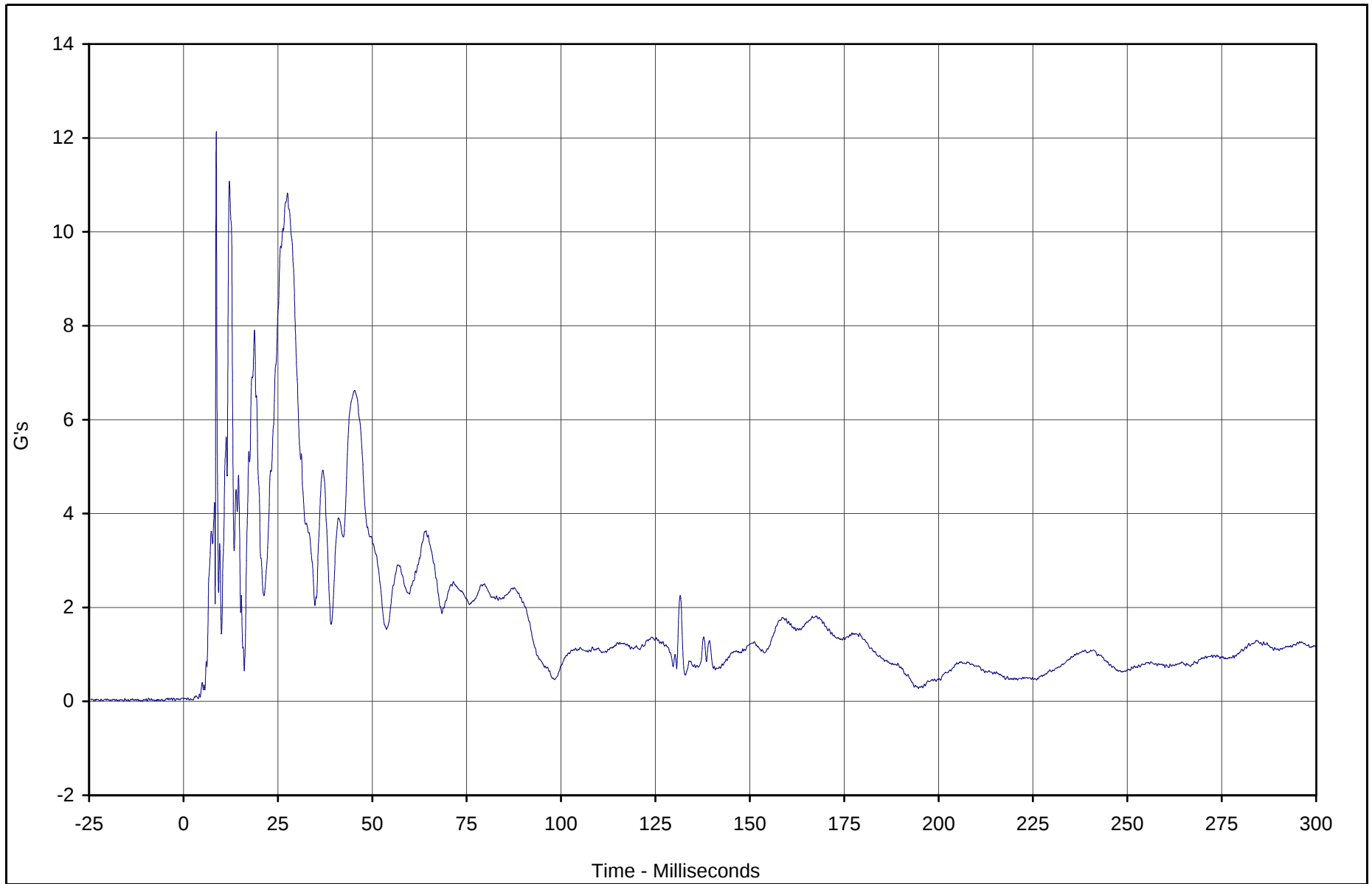


Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis Resultant	020	RES	G's	12.1	8.7	0.0	1.5	1000



Test Vehicle: 2003 Acura MDX SUV

Test Date: 10/17/03

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

NHTSA No.: M35301TWG2

APPENDIX C

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

TWG Testing (Forward Facing Hybrid III 3 Yr.)
Instrumentation Data Channel Assignments
A.T.D. Serial Number 082
10/17/03
2003 Acura MDX SUV

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