REPORT NUMBER TR-P23106-11-NC

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

MITSUBISHI MOTORS
2004 GALANT
4 DOOR SEDAN

NHTSA NUMBER: M45601TWG2

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

JUNE 28, 2004

FINAL REPORT

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15. Supplementary Notes

16. Abstract

A static side airbag deployment was conducted on a 2004 Mitsubishi Galant 4 Door Sedan at KARCO Engineering, LLC on 6/28/2004. 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	9.1	
Max. Thorax Accel. (3 msec clip)	G's	55	23.7	

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PURPOSE AND SUMMARY OF TEST M45601TWG2

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 torso airbag deployment in a 2004 Mitsubishi Galant 4 Door Sedan with an out-of-position Hybrid III 3 Year-Old Child dummy were evaluated. The test was performed at Karco Engineering, LLC on June 28, 2004. Pre- and post-test photographs of the vehicle and dummy can be found in Appendix A.

Two high-speed film and one high-speed digital 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 forward, according to the dummy placement instructions (3.3.3.1) 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 the 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 airbag contacted the ATD’s back at chest level. 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	9.1	23.7	-4.8

Orientation of the Hybrid III 3 Year-old Child Dummy was in the forward facing position leaning against the passenger door. The dummy spine was aligned with the deploying trajectory of the airbag. The lower legs were extended. Synthetic foam was used to raise the dummy. This orientation complies with section 3.3.3.1 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: 2004 Mitsubishi Galant 4 Door Sedan NHTSA No.: M45601TWG2
Test Program: TWG Testing (Forward Facing Hybrid III 3 Yr.) Test Date: 6/28/04

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	^oF	^oC	=(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 Mitsubishi Galant 4 Door Sedan NHTSA No.: M45601TWG2

Test Program: TWG Testing (Forward Facing Hybrid III 3 Yr.) Test Date: 6/28/04

TEST DUMMY INFORMATION

Description	Passenger Seat Forward Facing
Dummy Type / Serial No.	082
Head Contact	No
Chest Contact	No
Abdomen Contact	No
Pelvis	No
Left Knee Contact	No
Right Knee Contact	No

16mm MOVIE COVERAGE

High Speed Film	3
High Speed Digital	0
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 Mitsubishi Galant 4 Door Sedan NHTSA No.: M45601TWG2

Test Program: TWG Testing (Forward Facing Hybrid III 3 Yr.) Test Date: 6/28/04

TEST VEHICLE INFORMATION

Make	Mitsubishi
Model	Galant
Body Style	4-Door Sedan
NHTSA No.	M45601
VIN	4A3AB36F44E066407
Color	Red
Delivery Date	15/5/2003
Odometer Reading (mile)	59
Dealer	Lancaster Mitusbishi
Transmission	4 Speed Automatic
Final Drive	Front
Type/Number Cylinders	In-Line 4
Engine Displacement (L)	2.4
Engine Placement	Transverse

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	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Mitsubishi Motors
Date of Manufacture	November-04

GVWR (kg)	1960
GAWR Front (kg)	1040
GAWR Rear (kg)	920

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	280	280
Cold Pressure (kPa)	220	220
Recommend Tire Size	P215/60R16	P215/60R06
Tire Size on Vehicle	P215/60R16	P215/60R06
Tire Manufacturer	Bridgestone	Bridgestone

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bucket	None	
Number of Occupants	2	3	0	5
Capacity Wt. (VCW) (kg)				375
Cargo Weight (RCLW) (kg)				35

* Vehicle had undergone New Car Assessment Program Side Impact Test on December 22, 2003

DATA SHEET NO. 3

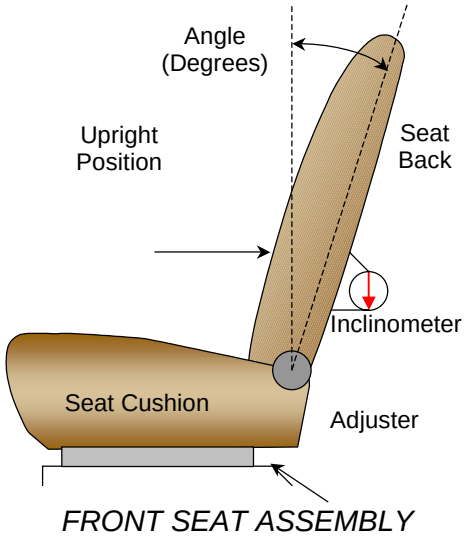
TEST VEHICLE INFORMATION

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan NHTSA No.: M45601TWG2

Test Program: TWG Testing (Forward Facing Hybrid III 3 Yr.) Test Date: 6/28/04

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.



FRONT SEAT ASSEMBLY

SEAT BACK ANGLES

Position	Deg.
Passenger w/ Dummy	25

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	23	12

DATA SHEET NO. 4

DUMMY POSITIONING INFORMATION

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan NHTSA No.: M45601TWG2

Test Program: TWG Testing (Forward Facing Hybrid III 3 Yr.) Test Date: 6/28/04

TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Hybrid III 3-Year-Old Child Dummy	
		Length (mm)	Angle (^{o})
SA	Seat Back Angle		25
AMW	Airbag Module Width	95	
ABW	Airbag Width	300	
AML	Airbag Module Length	200	
ABL	Airbag Length	350	
HD	Head CG to Door Panel/ Window	245	
HSC	Head to Seat Back Centerline	55	
HB	Head to B-Pillar	185	
HZ	Head to Roof (Z)	285	
HHD	Head to Header	530	
CD	Chest to Dash	700	
CS	Chest to Seatback	180	
RACL	Right Arm to Seatback Centerline	290	
LACL	Left Arm to Seatback Centerline	95	
RA	Right Arm to Door Panel	85	
RL	Left Arm to Door Panel	285	
KK	Knee to Knee	150	
TT	Toe to Toe	200	
KSCR	Right Knee to Seat Cuhion Centerline	220	
KSCL	Leftt Knee to Seat Cuhion Centerline	350	
TSCR	Right Toe to Seat Cushion Centerline	160	

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

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan NHTSA No.: M45601TWG2

Test Program: TWG Testing (Forward Facing Hybrid III 3 Yr.) Test Date: 6/28/04

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Pass. Max	Time	Min	Time
Head CG	X	G's	12.9	6.5	-7.6	4.5
Head CG	Y	G's	6.4	5.6	-4.3	29.6
Head CG	Z	G's	8.2	31.4	-26.5	7.0
Head CG Resultant	N/A	G's	27.4	7.0		

PRIMARY HEAD INJURY CRITERIA (HIC)

Location	Pass. HIC	T^1	T^2	Avg G
Head CG Primary (HIC15)	9.1	3.3	9.6	18.3

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Pass. Max	Time	Min	Time
Chest CG	X	G's	134.1	3.5	-10.0	20.1
Chest CG	Y	G's	18.1	7.9	-22.2	3.1
Chest CG	Z	G's	11.8	4.0	-43.4	5.5
Chest CG Resultant	N/A	G's	136.0	3.5		

PRIMARY CHEST CLIP (3MSEC)

Location	Pass. CLIP	T^1	T^2
Chest CG Primary	23.7	2.2	5.2

CHEST PEAK DISPLACEMENTS

Location	Axis	Units	Pass. Max	Time	Min	Time
Chest CG	X	MM	0.3	3.4	-4.8	7.5

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Pass. Max	Time	Min	Time
Pelvis	X	G's	27.6	10.2	-18.3	17.0
Pelvis	Y	G's	6.1	33.8	-37.2	17.0
Pelvis	Z	G's	8.6	16.6	-67.5	17.1
Pelvis Resultant	N/A	G's	75.1	17.0		

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan NHTSA No.: M45601TWG2

Test Program: TWG Testing (Forward Facing Hybrid III 3 Yr.) Test Date: 6/28/04

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. Max	Pass. Time	Pass. Min	Pass. Time
Neck Force	X	Newtons	129.7	5.8	-112.1	29.7
Neck Force	Y	Newtons	293.8	8.7	-115.7	4.7
Neck Force	Z	Newtons	194.0	31.5	-701.6	7.0
Neck Force Resultant	N/A	Newtons	732.3	7.0		
Neck Moment	X	Nm	7.9	13.0	-7.7	33.7
Neck Moment	Y	Nm	19.7	8.7	-10.2	34.9
Neck Moment	Z	Nm	3.4	6.8	-4.0	35.5
Neck Moment Resultant	N/A	Nm	20.0	8.8		

LOWER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Pass. Max	Pass. Time	Pass. Min	Pass. Time
Neck Force	X	Newtons	715.9	5.3	-136.6	38.3
Neck Force	Y	Newtons	231.8	4.6	-140.3	14.0
Neck Force	Z	Newtons	192.2	31.8	-764.9	4.7
Neck Force Resultant	N/A	Newtons	879.8	6.6		
Neck Moment	X	Nm	10.7	4.8	-15.0	28.9
Neck Moment	Y	Nm	10.1	158.6	-19.9	6.7
Neck Moment	Z	Nm	6.1	4.8	-1.7	280.1
Neck Moment Resultant	N/A	Nm	21.6	6.6		

DATA SHEET NO. 6

CAMERA LOCATIONS

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan NHTSA No.: M45601TWG2

Test Program: TWG Testing (Forward Facing Hybrid III 3 Yr.) Test Date: 6/1/2004

No.	Camera View	Location (mm)			Angle (Deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	High Speed Film Side View	280	3450	10	0.0	24	900
2	High Speed Film Front View	1530	100	41	7.0	9.00	1020
3	High Speed Digital Side View	80	3170	8	0.0	25	1000

* Cameras aligned to center of seat back as reference

APPENDIX A

PHOTOGRAPHS

Figure A-1: Right Front ¾ View, As Received

Figure A-2: Vehicle Certification Label

Figure A-3: Post-Test Right Front ¾ View of Prior Test

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

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

Figure A-6: Pre-Test Dummy Position, ¾ View

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

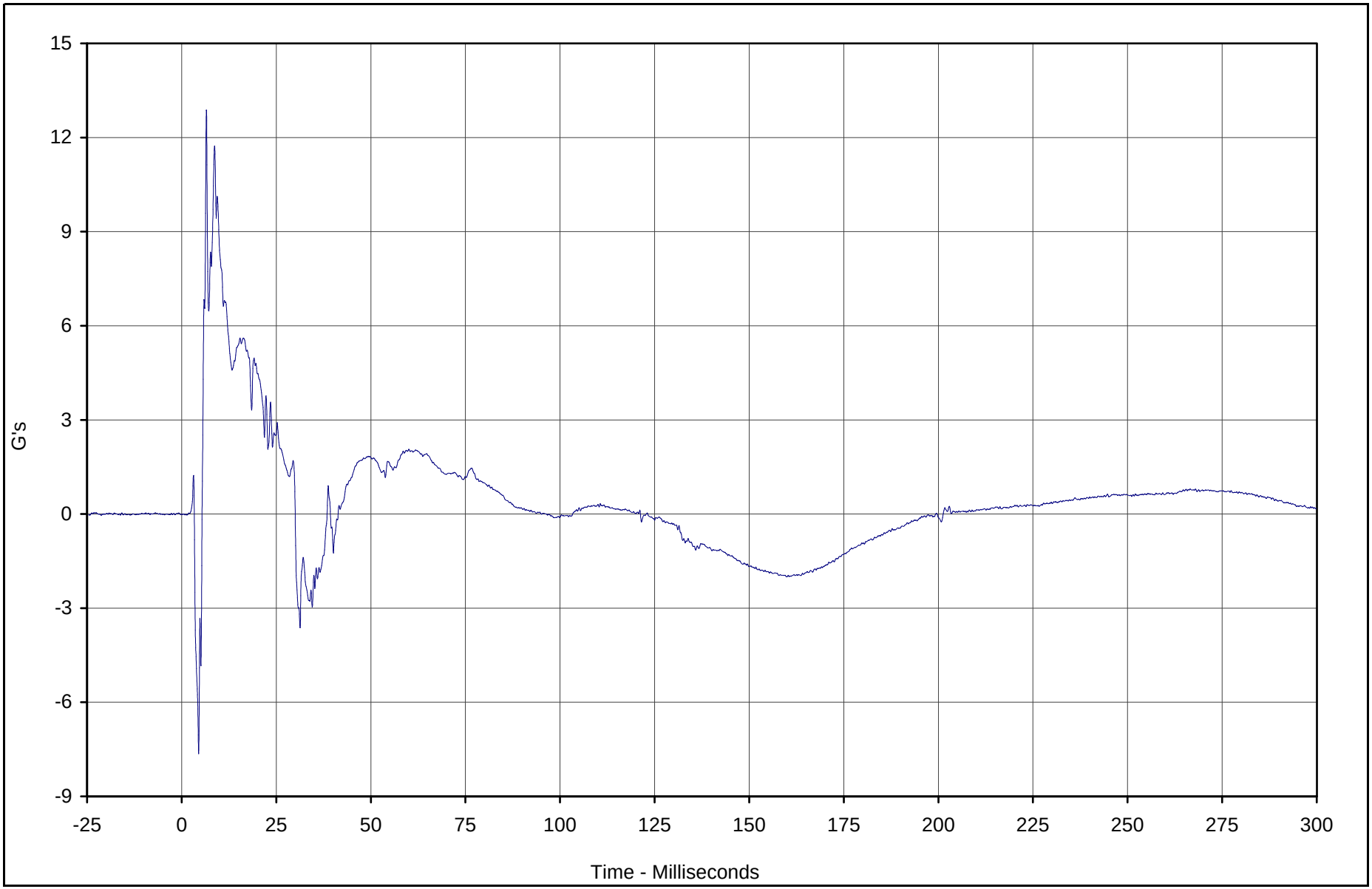
Figure A-8: Post-Test Dummy Position and Airbag, Overhead View

Figure A-9: Post-Test, Left Side View

Figure A-10: Post-Test Airbag

APPENDIX B

DATA PLOTS



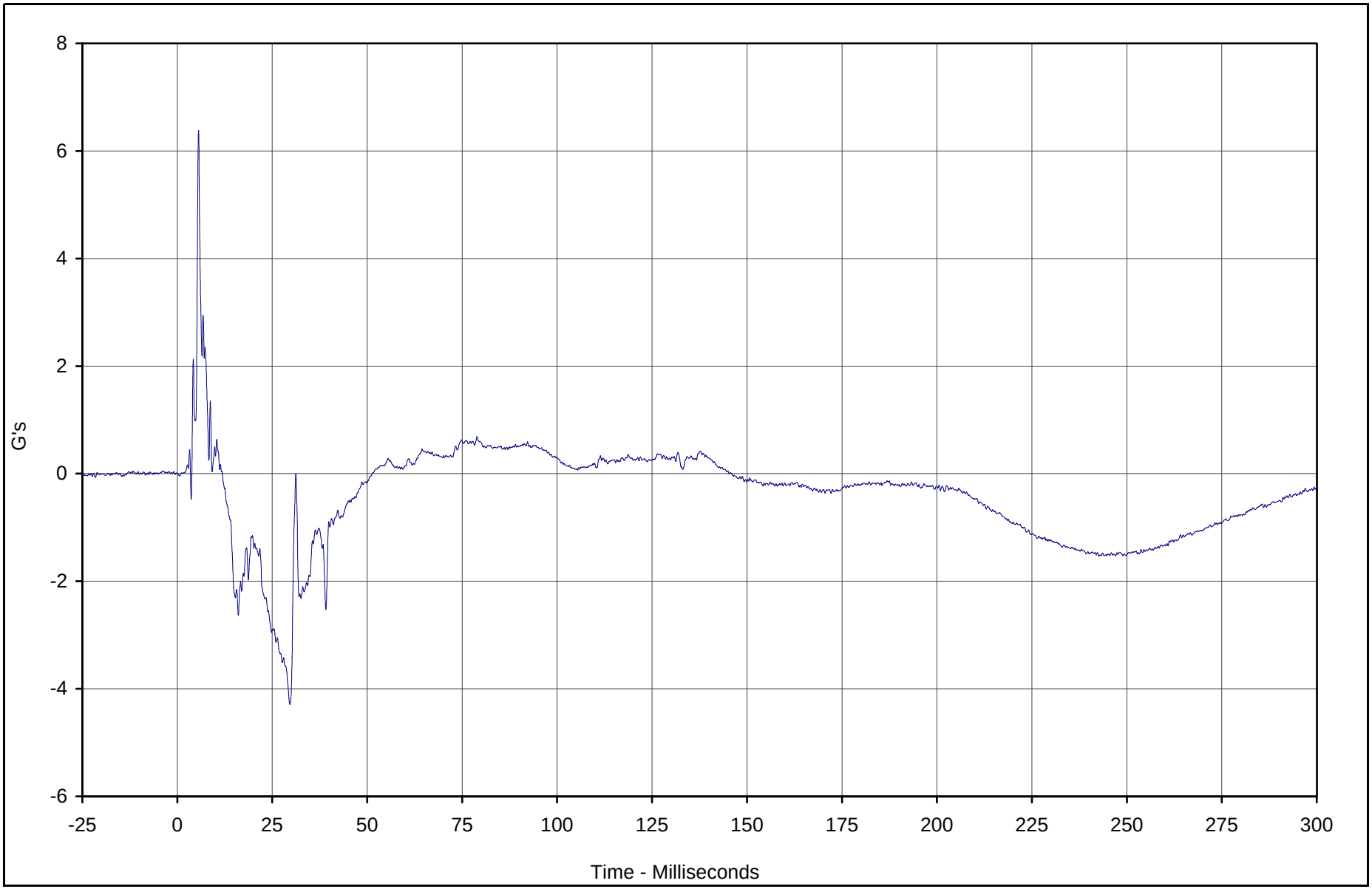
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Head X	001	FIL	G's	12.9	6.5	-7.6	4.5	1000

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



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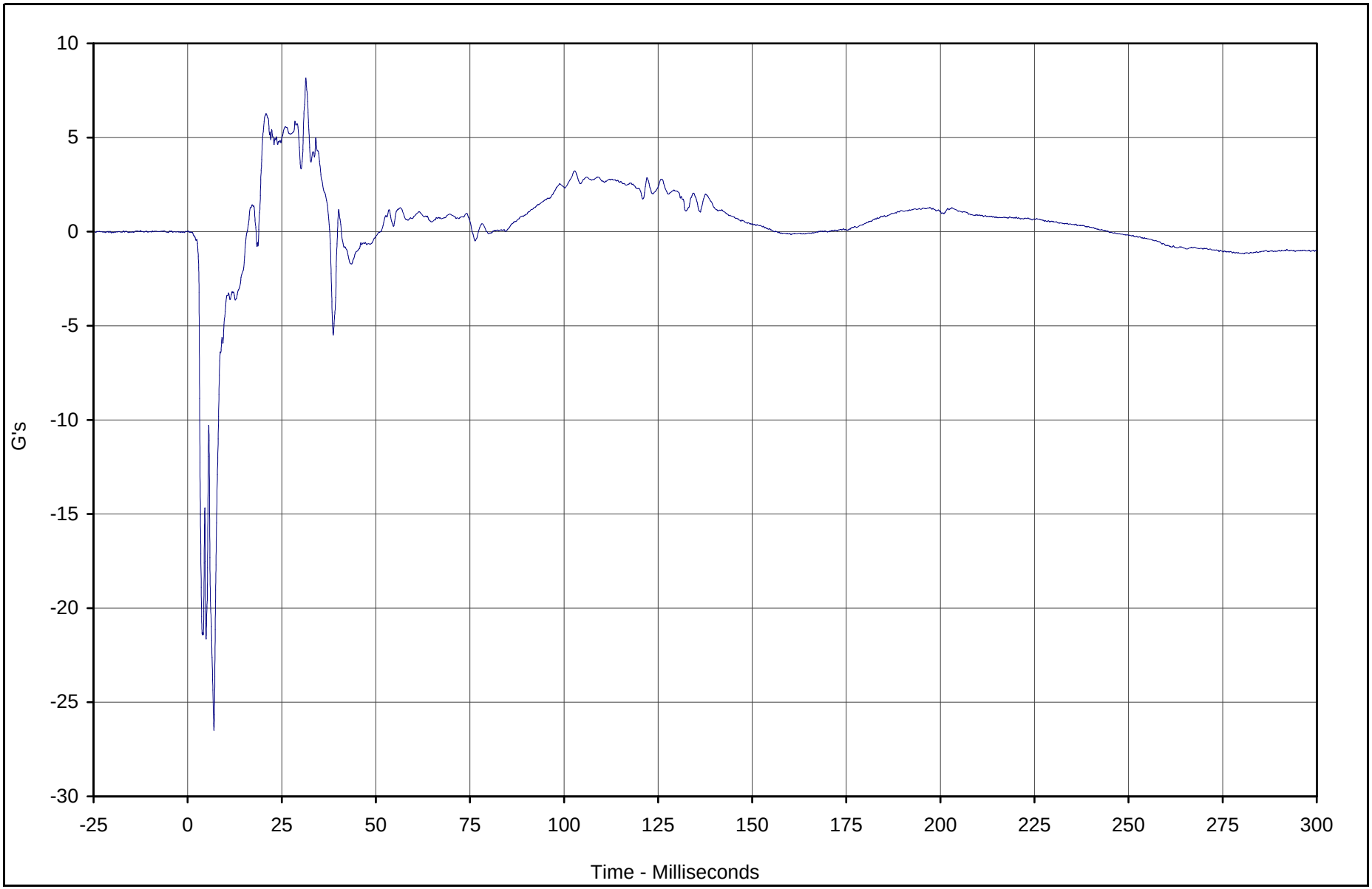
Pass. Head Y	002	FIL	G's	6.4	5.6	-4.3	29.6	1000

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



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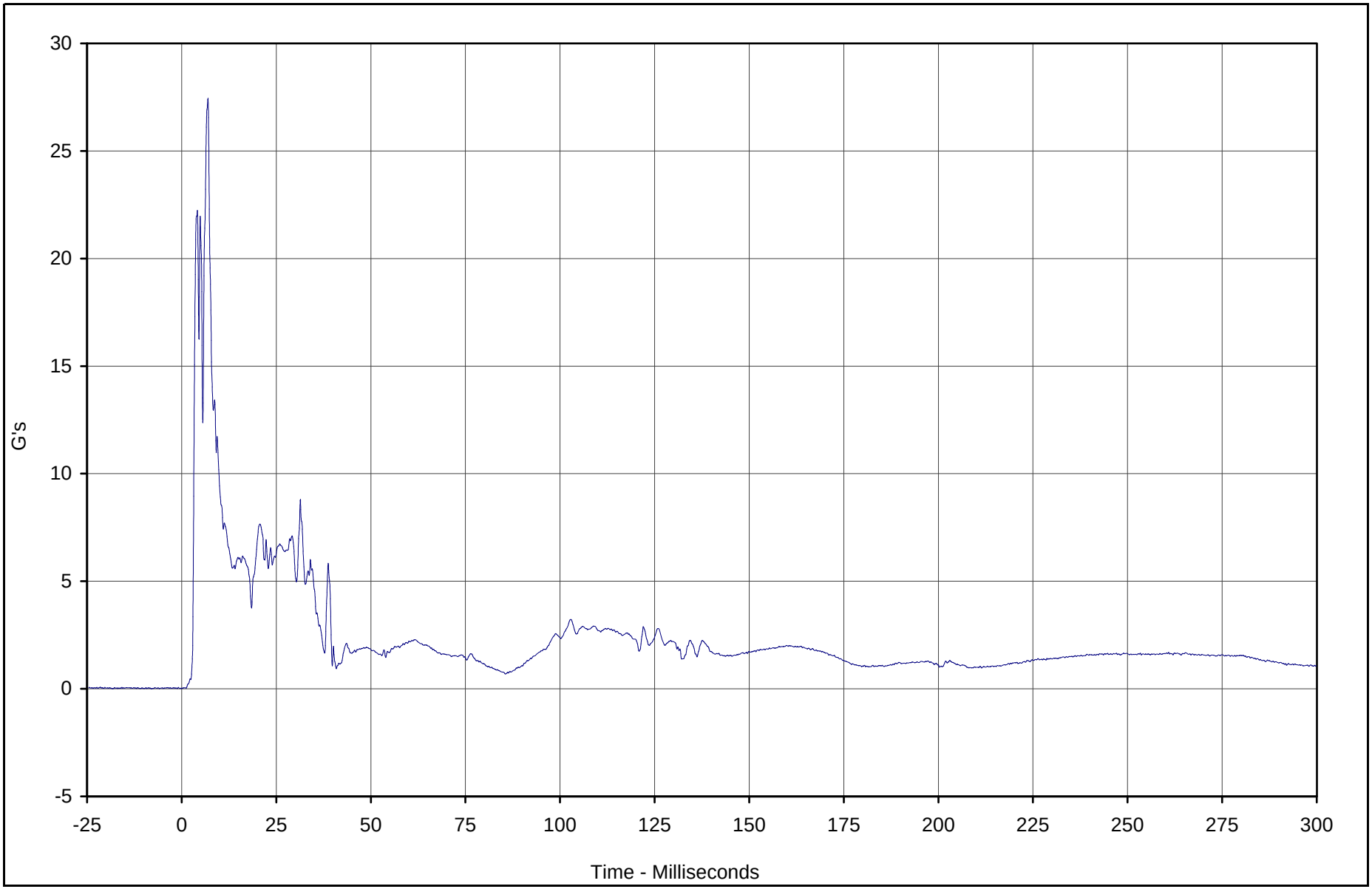
Pass. Head Z	003	FIL	G's	8.2	31.4	-26.5	7.0	1000

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



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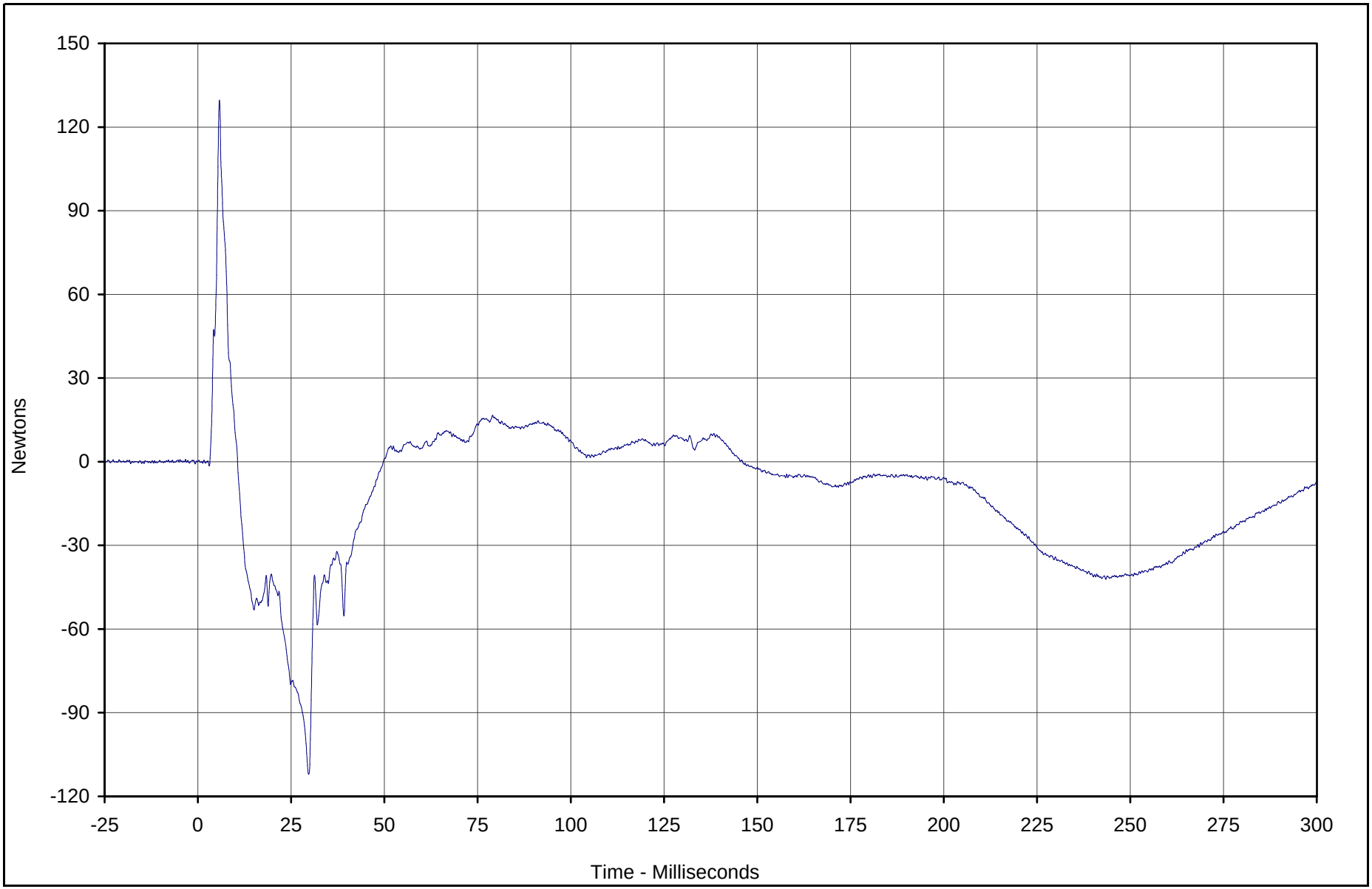
Pass. Head Resultant	001	RES	G's	27.4	7.0	0.0	0.0	1000

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



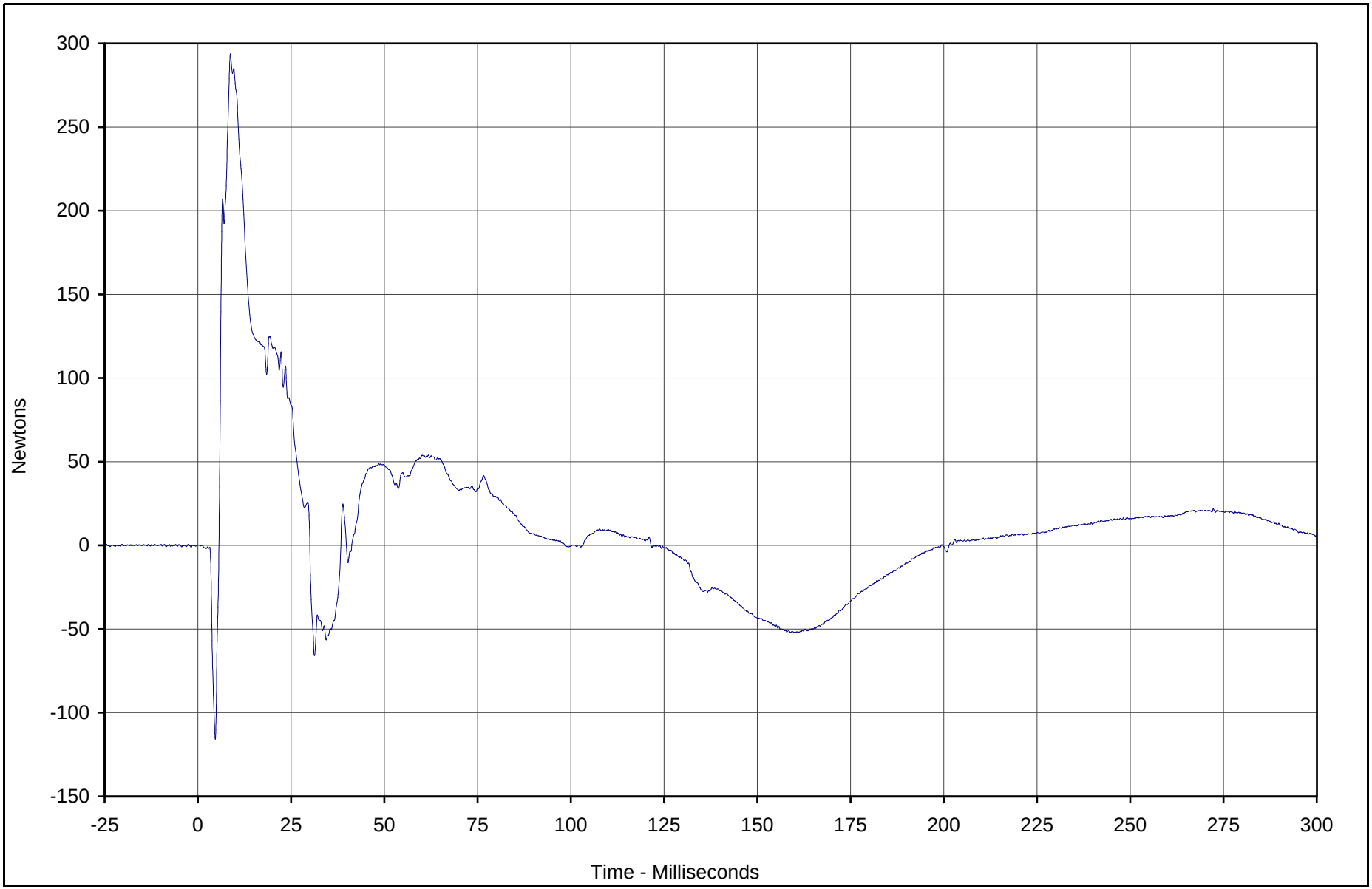
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force X	004	FIL	Newtons	129.7	5.8	-112.1	29.7	1000

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



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Pass. Upper Neck Force Y	005	FIL	Newtons	293.8	8.7	-115.7	4.7	1000

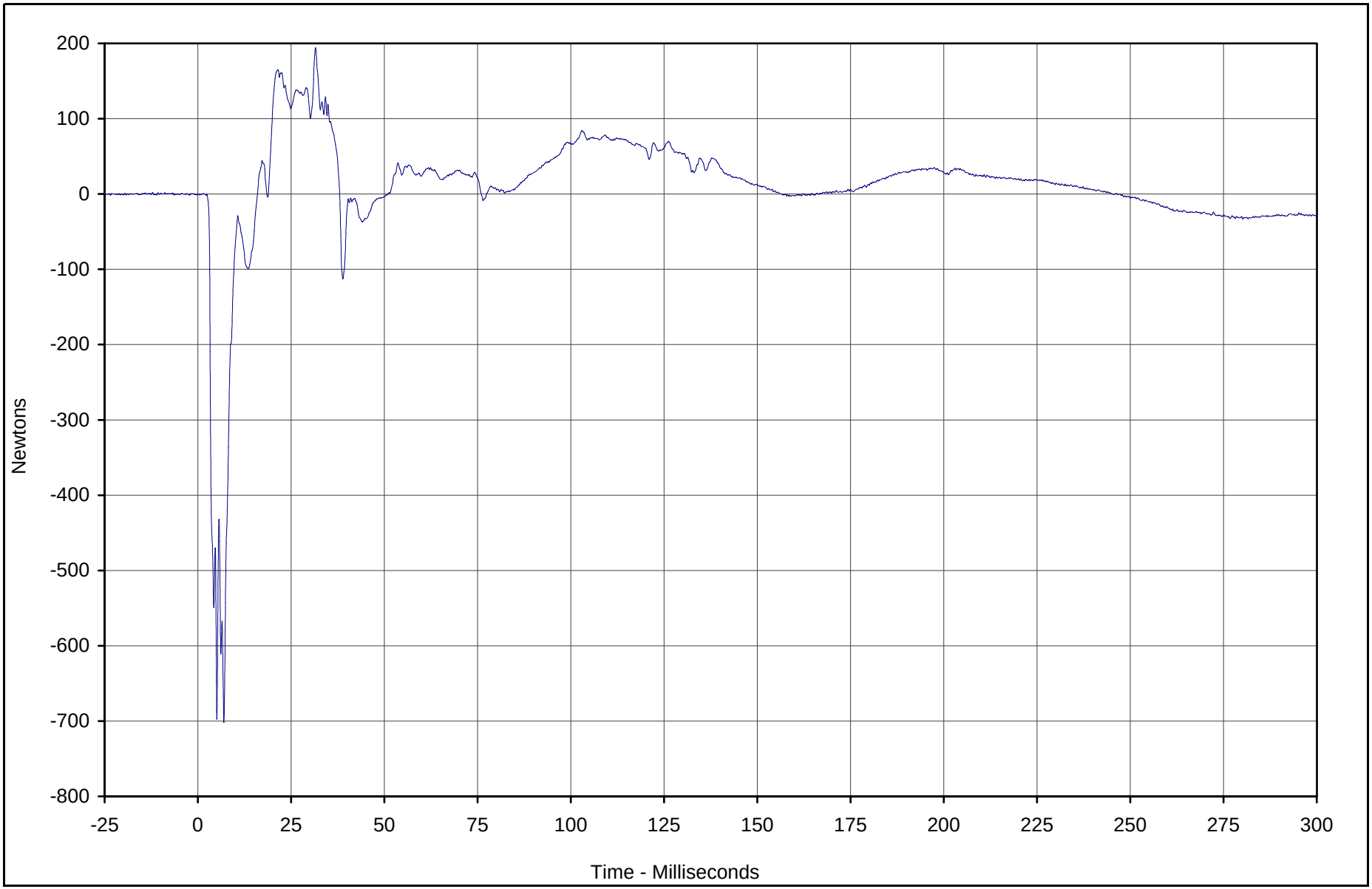
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



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Pass. Upper Neck Force Z	006	FIL	Newtons	194.0	31.5	-701.6	7.0	1000

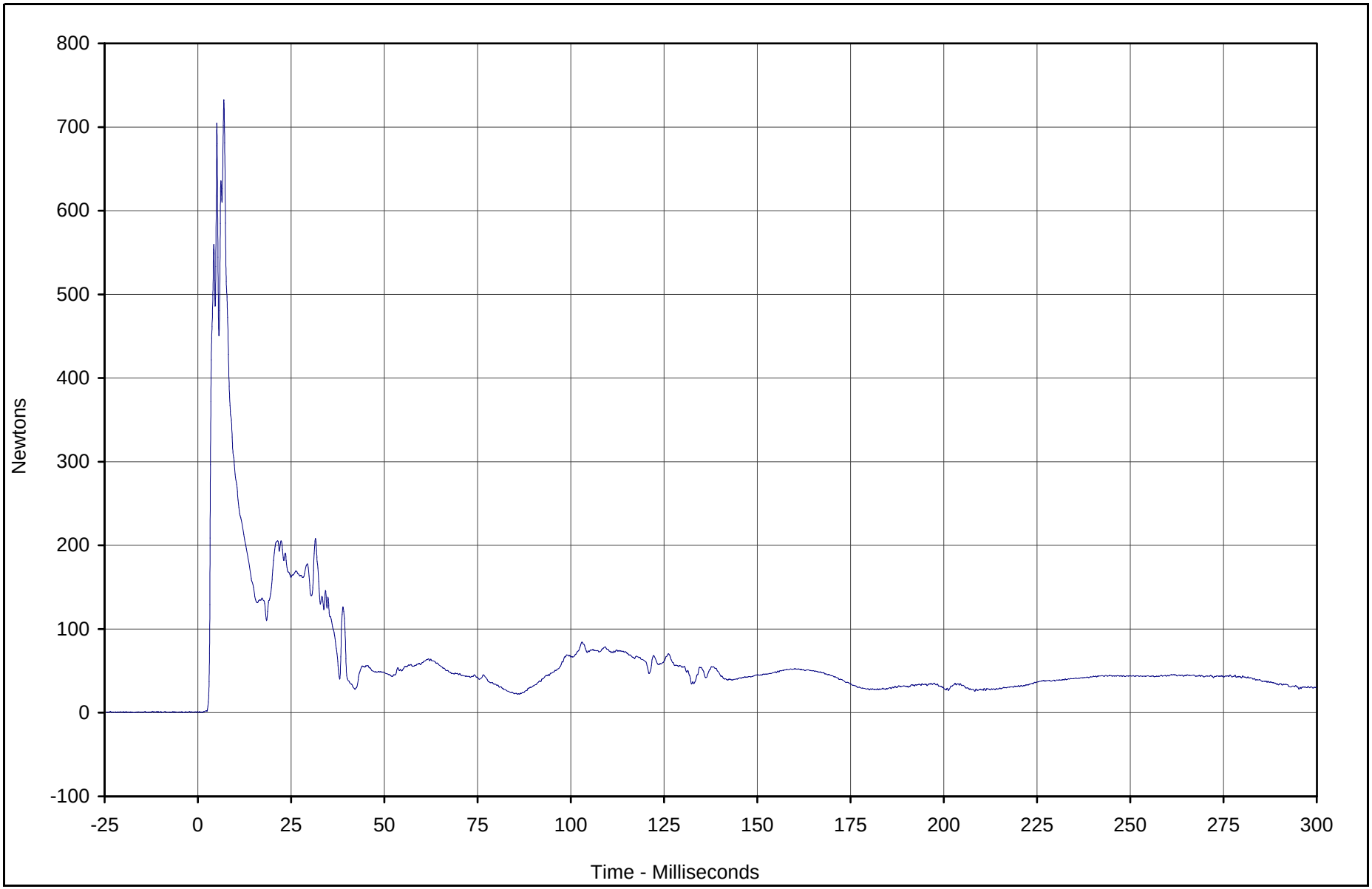
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Force Resultant	004	RES	Newtons	732.3	7.0	0.4	1.2	1000

KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

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

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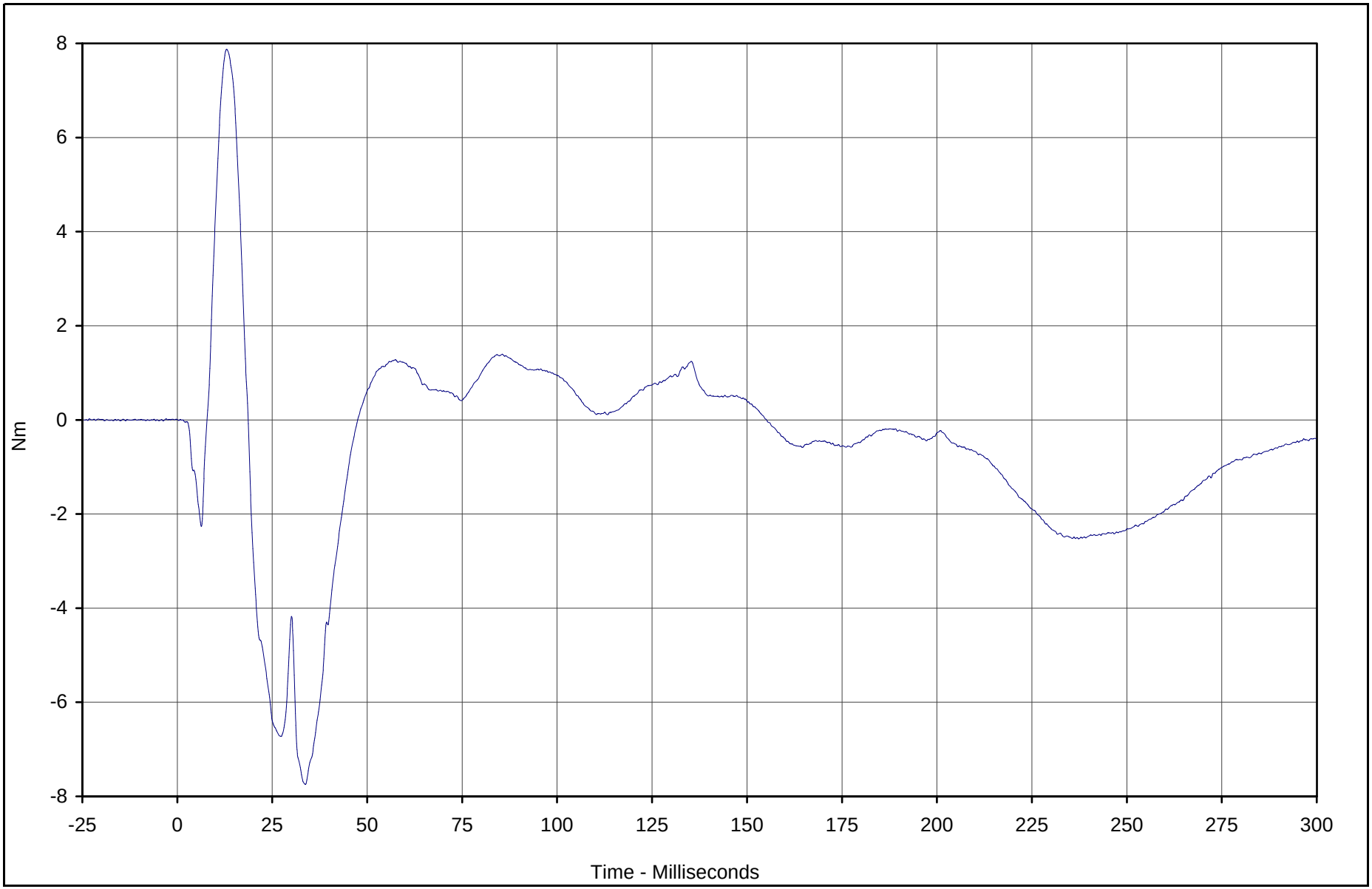

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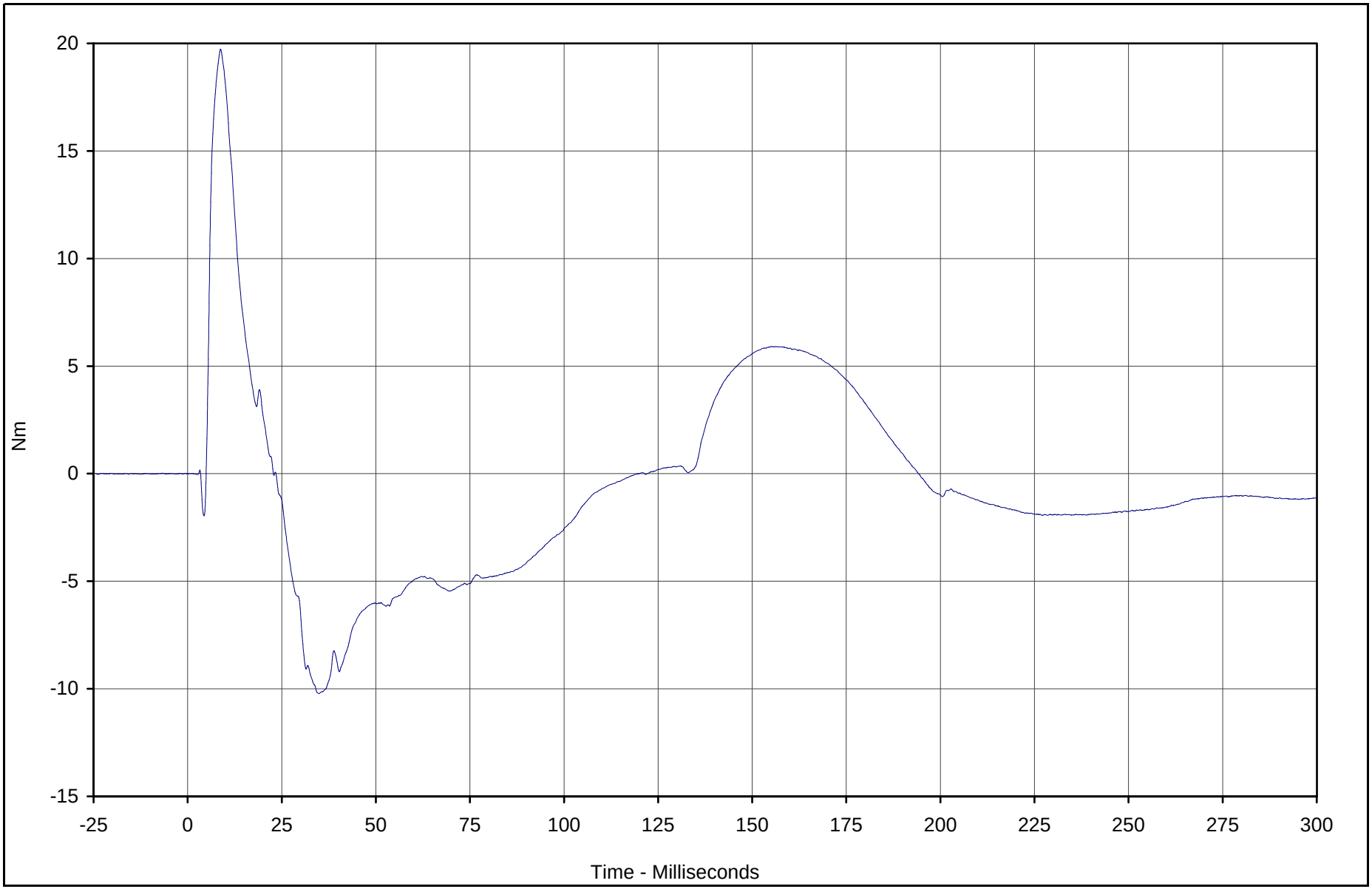
Pass. Upper Neck Moment X	007	FIL	Nm	7.9	13.0	-7.7	33.7	600

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



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Pass. Upper Neck Moment Y	008	FIL	Nm	19.7	8.7	-10.2	34.9	600

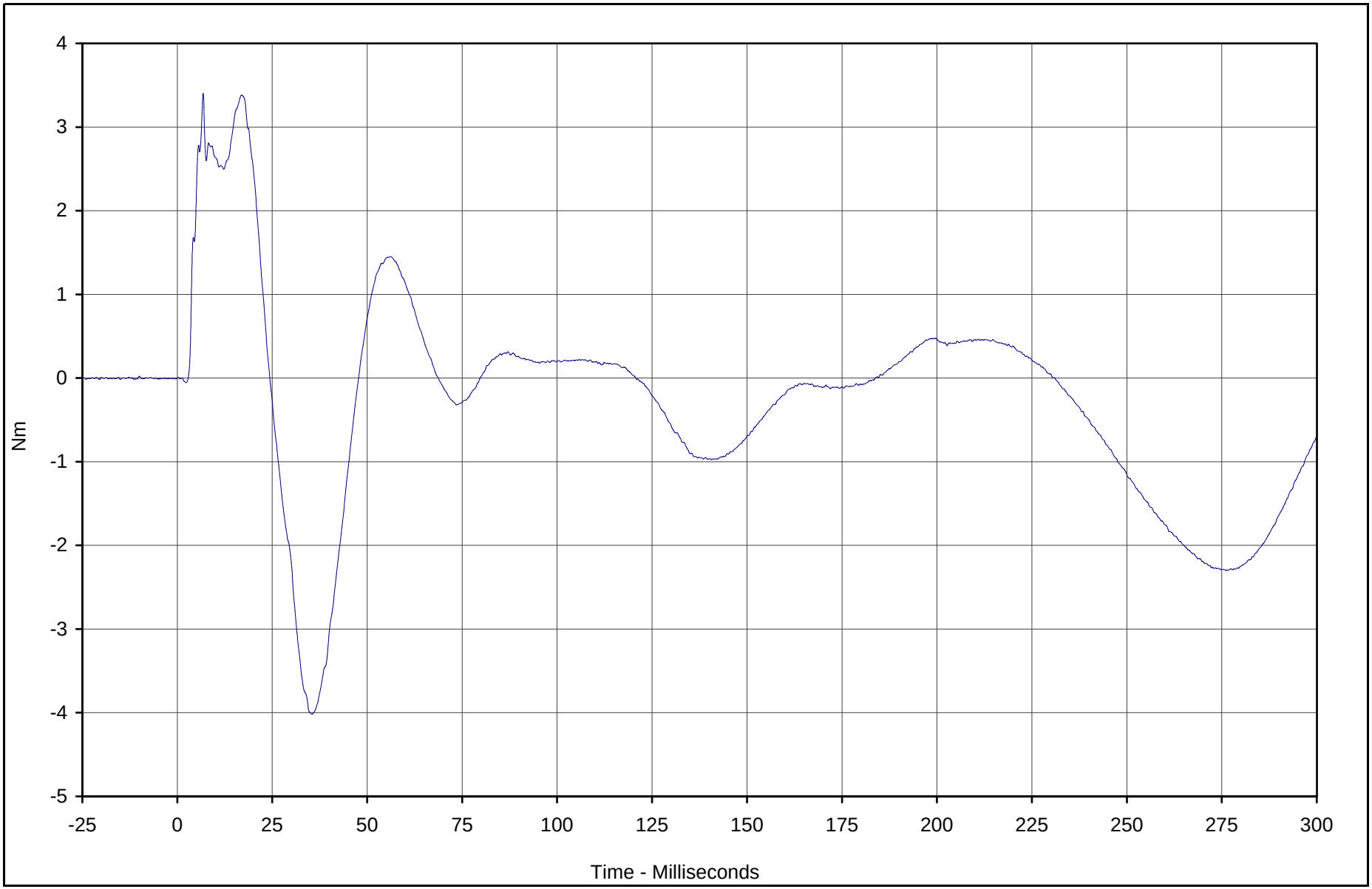
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment Z	009	FIL	Nm	3.4	6.8	-4.0	35.5	600

KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

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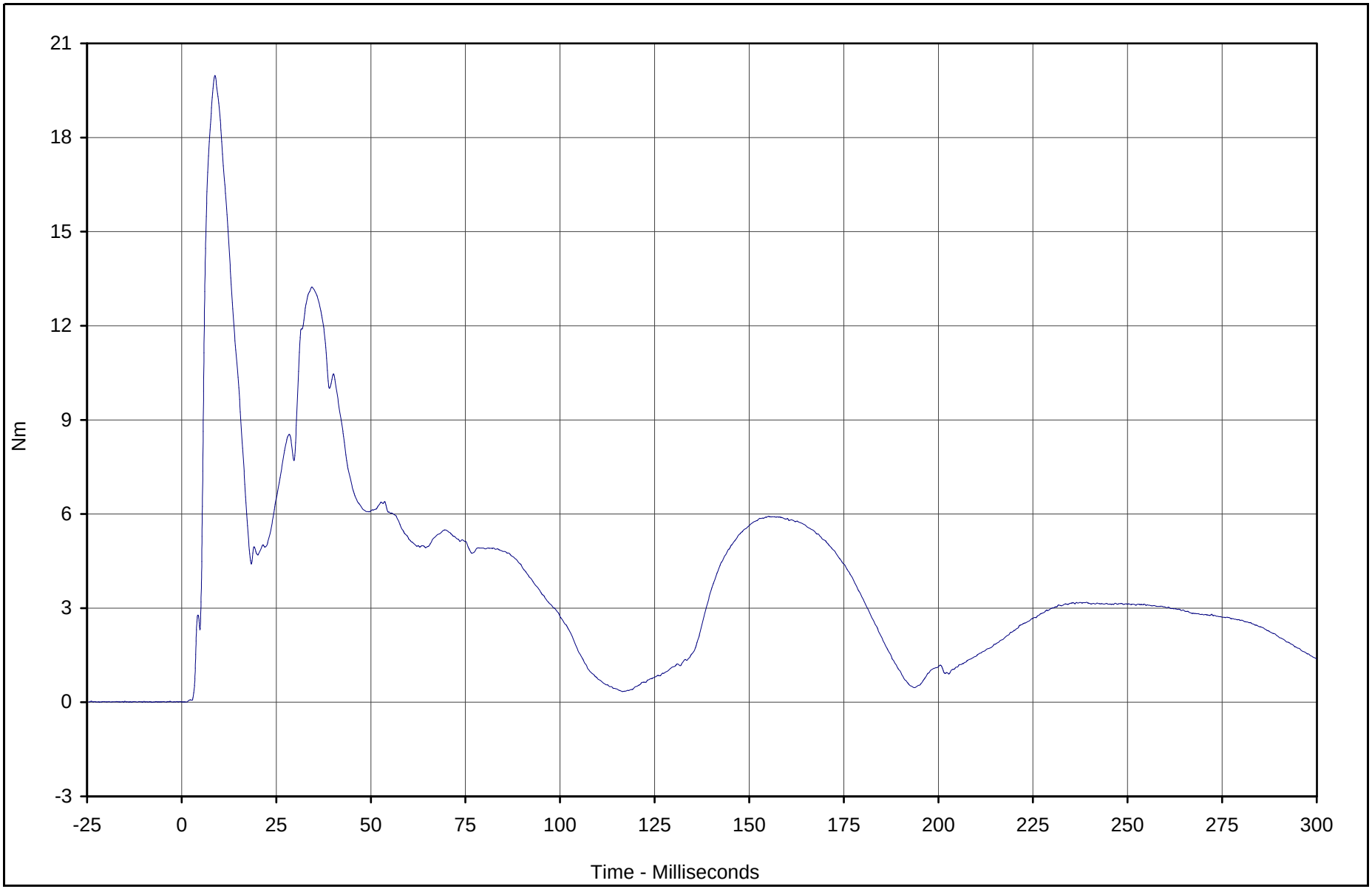


Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Upper Neck Moment Resultant	007	RES	Nm	20.0	8.8	0.0	1.4	600

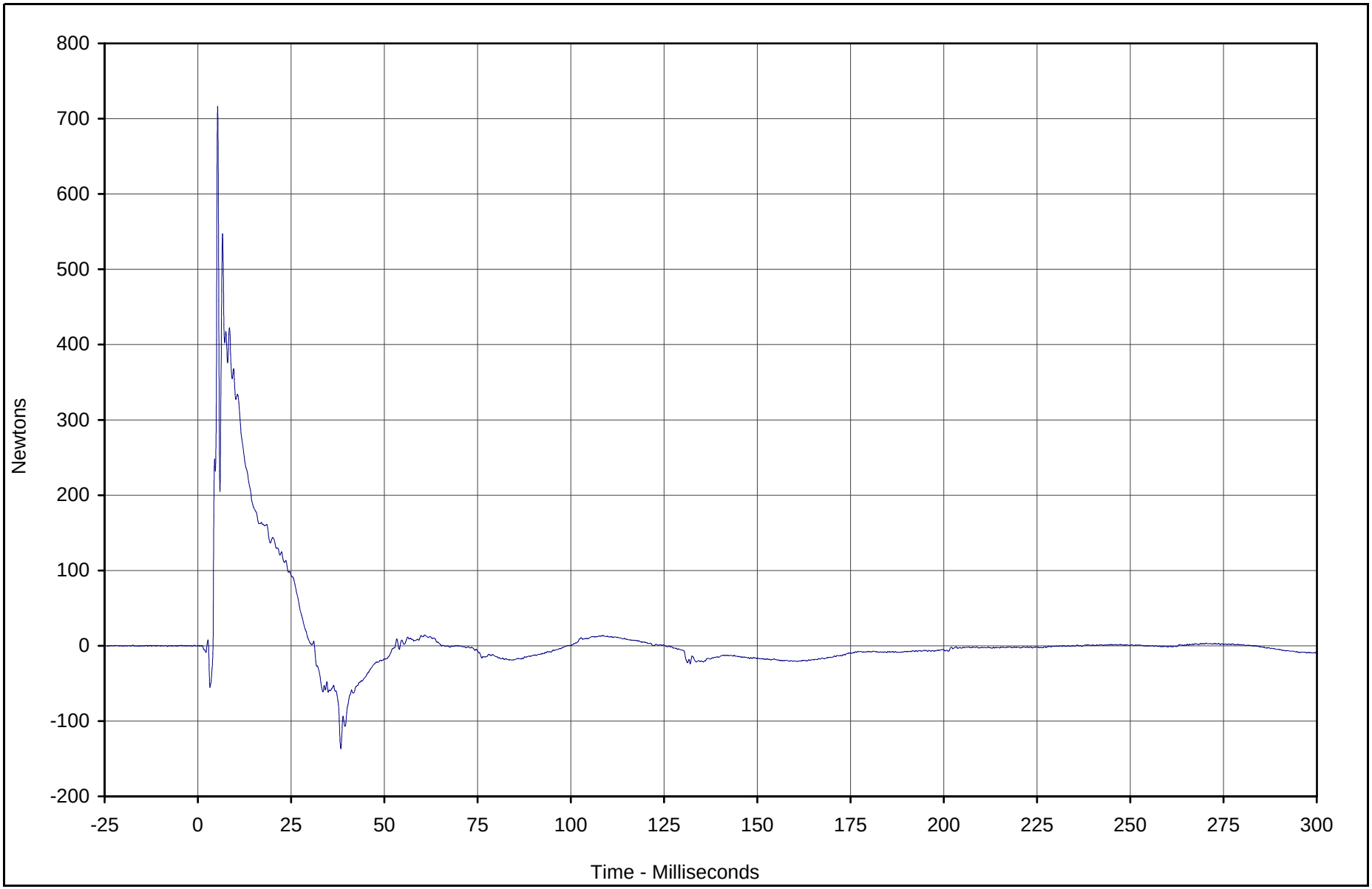
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



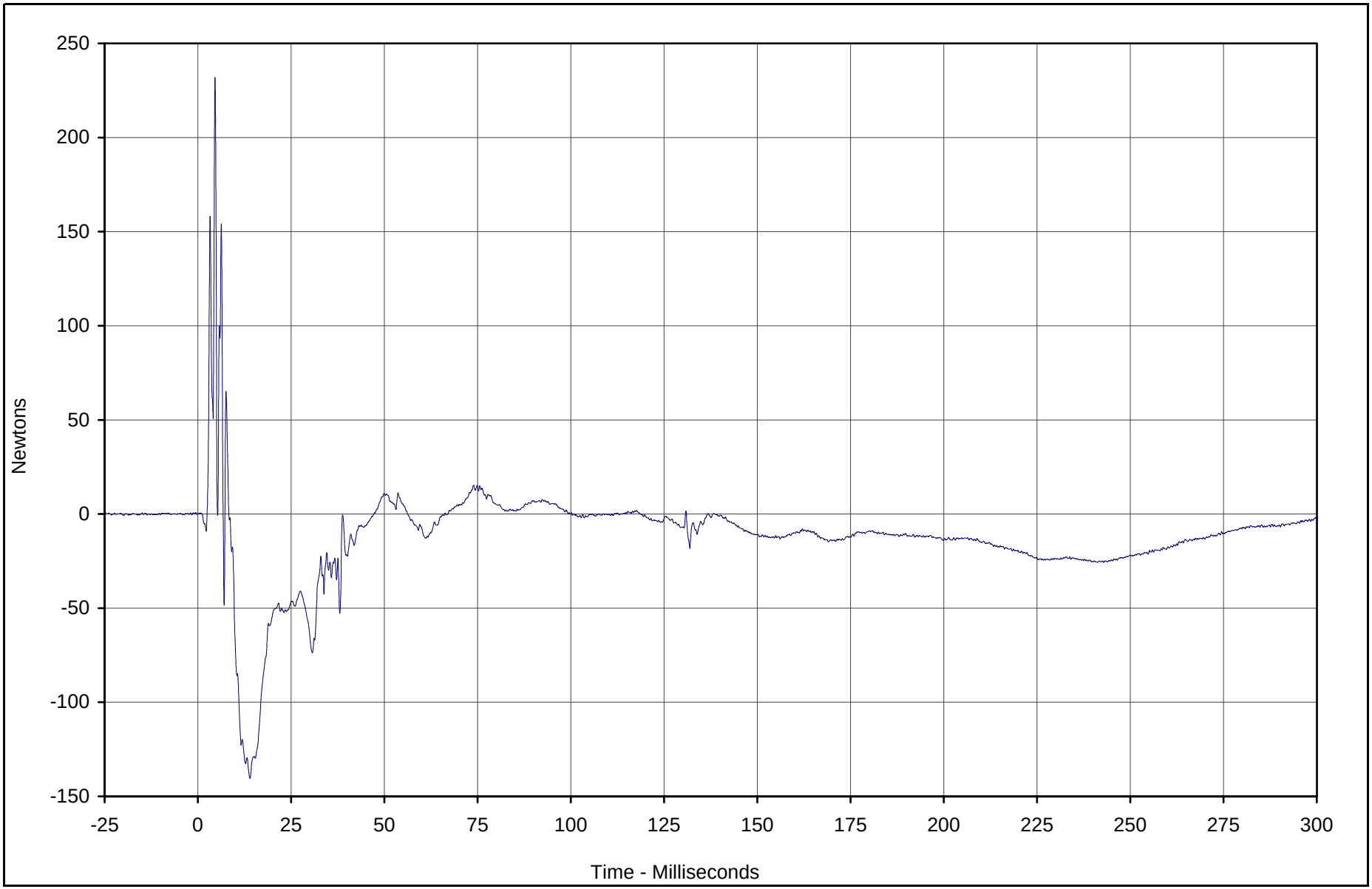
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force X	010	FIL	Newtons	715.9	5.3	-136.6	38.3	1000

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force Y	011	FIL	Newtons	231.8	4.6	-140.3	14.0	1000

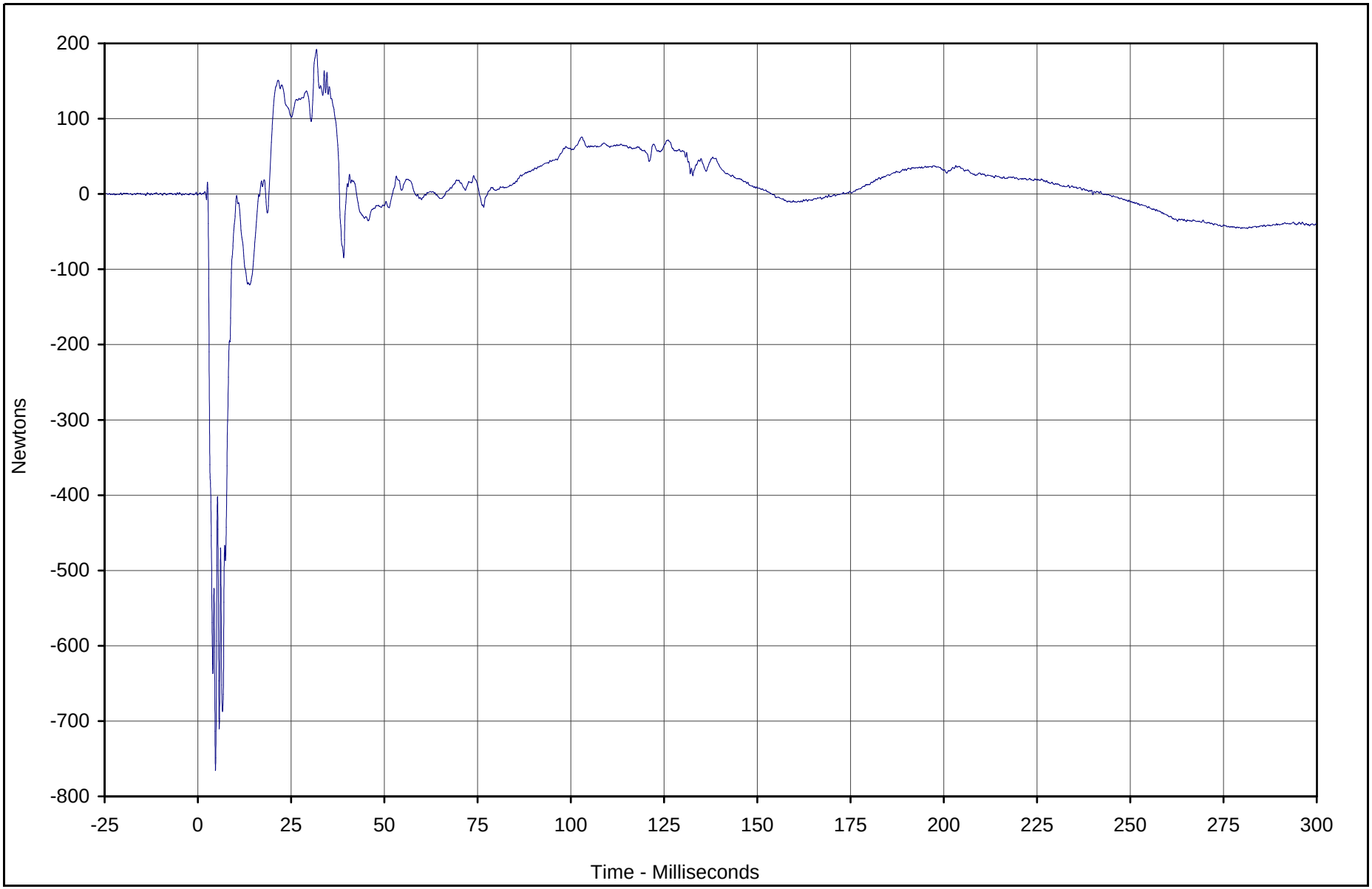
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force Z	012	FIL	Newtons	192.2	31.8	-764.9	4.7	1000

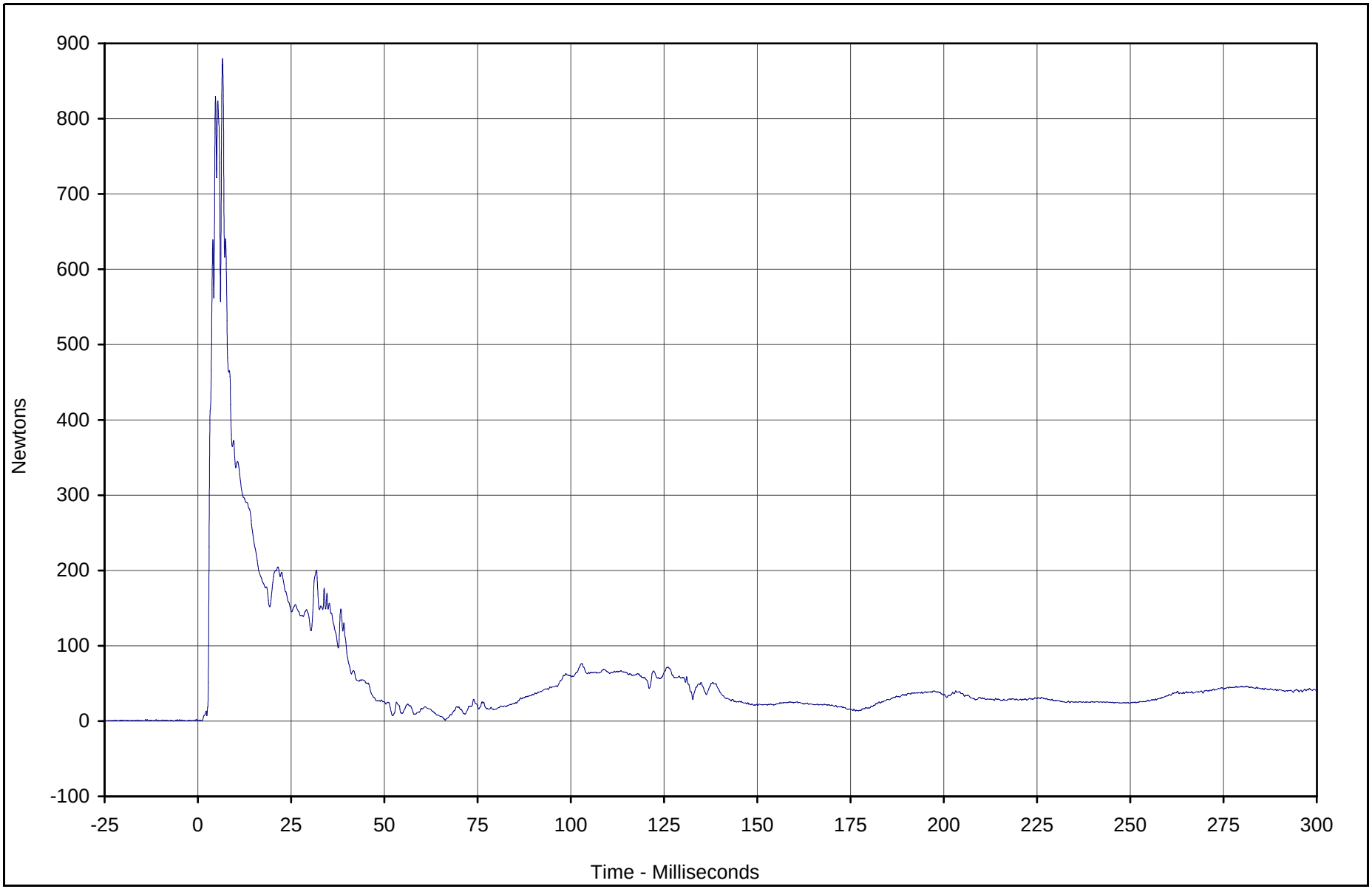
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



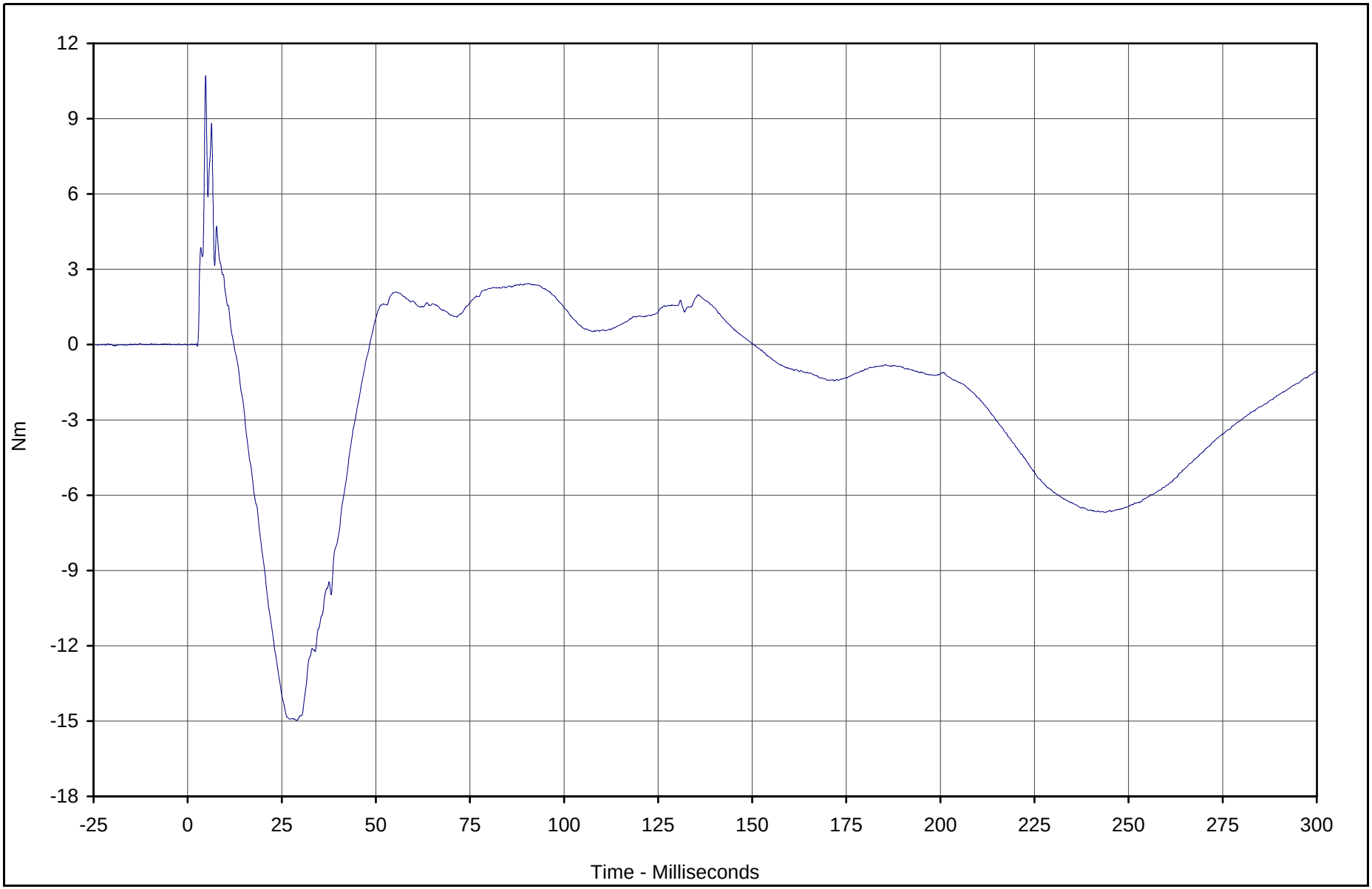
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Force Resultant	010	RES	Newtons	879.8	6.6	0.2	1.1	1000

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment X	013	FIL	Nm	10.7	4.8	-15.0	28.9	600

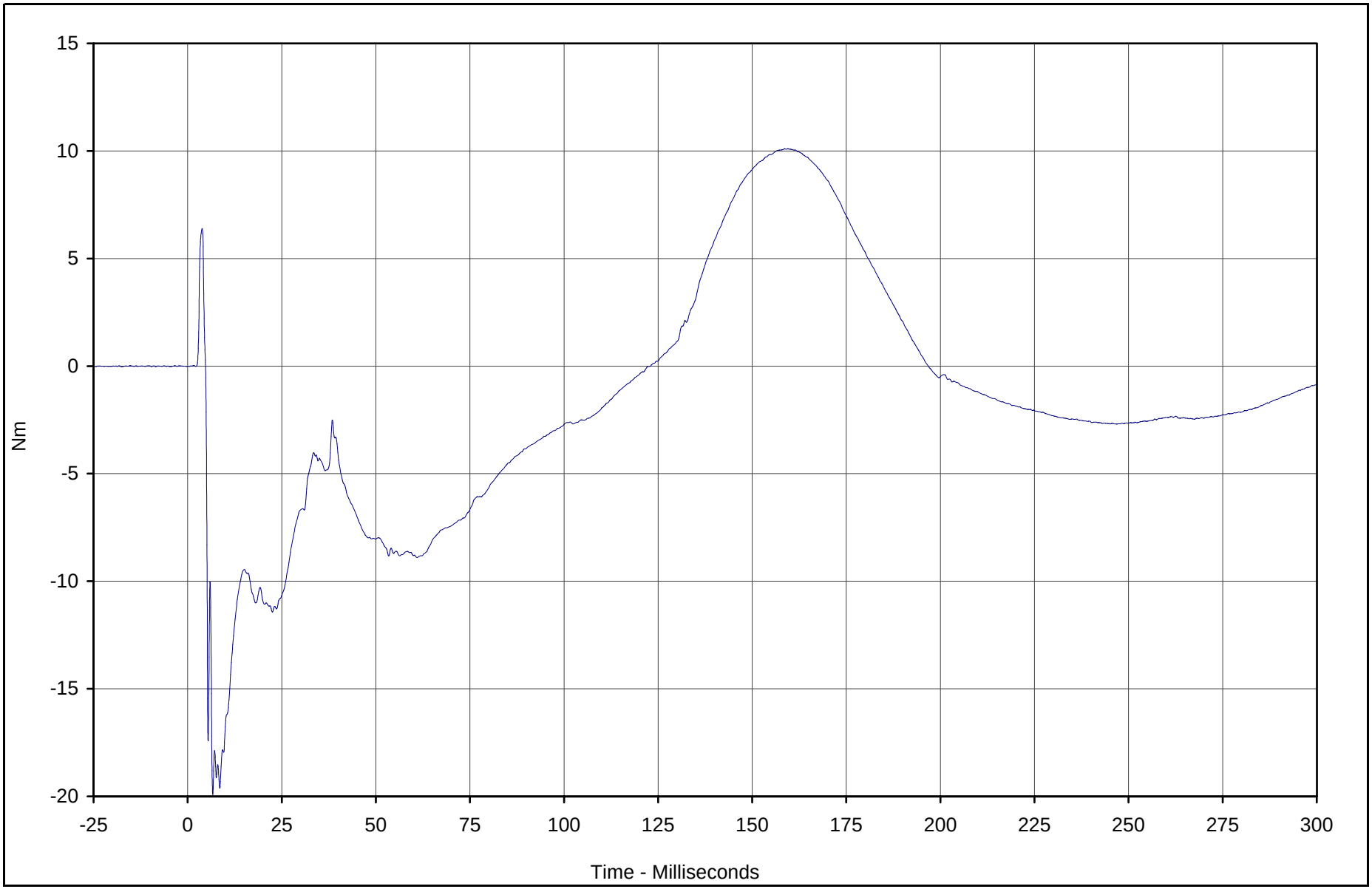
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



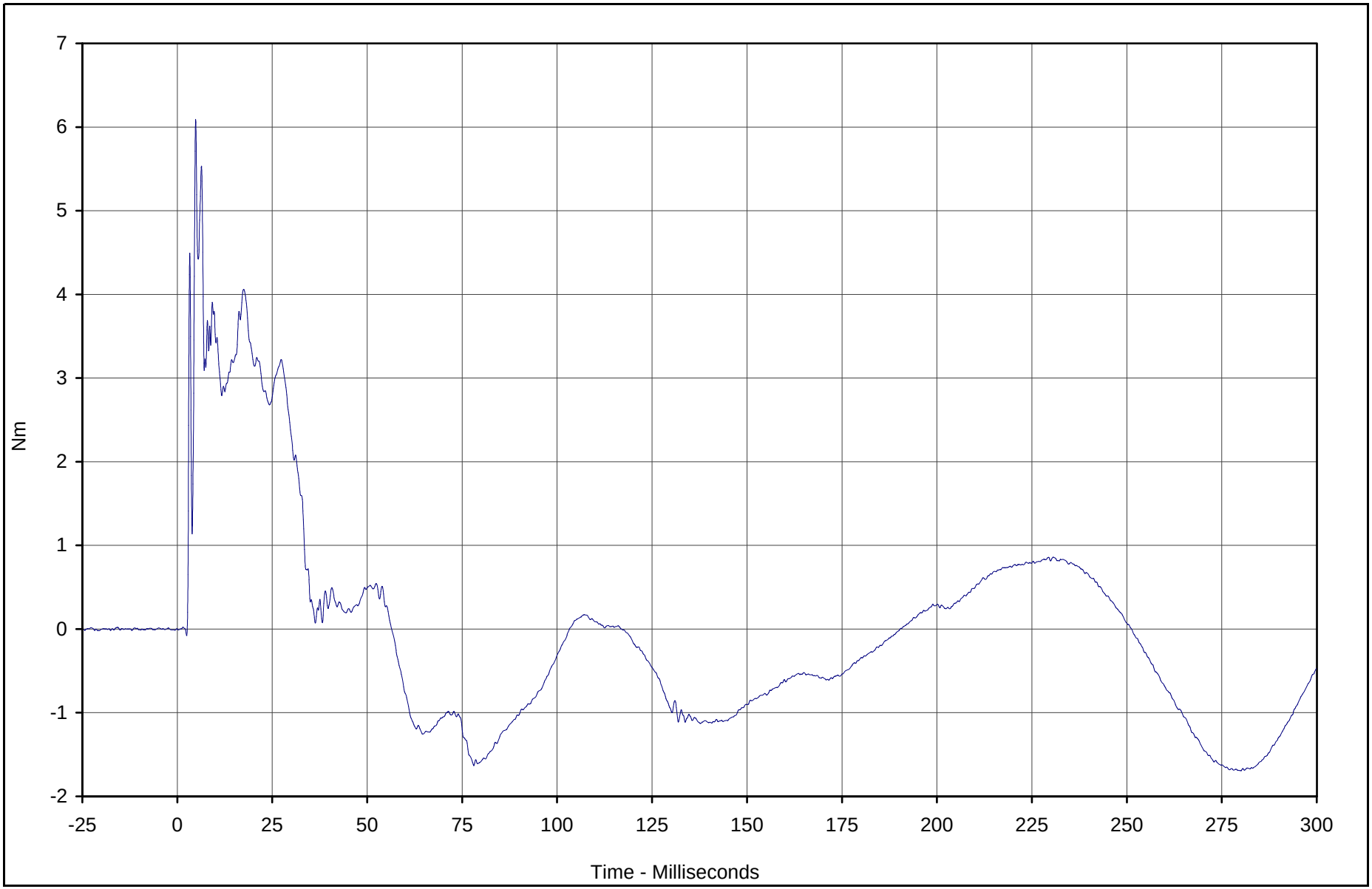
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment Y	014	FIL	Nm	10.1	158.6	-19.9	6.7	600

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment Z	015	FIL	Nm	6.1	4.8	-1.7	280.1	600

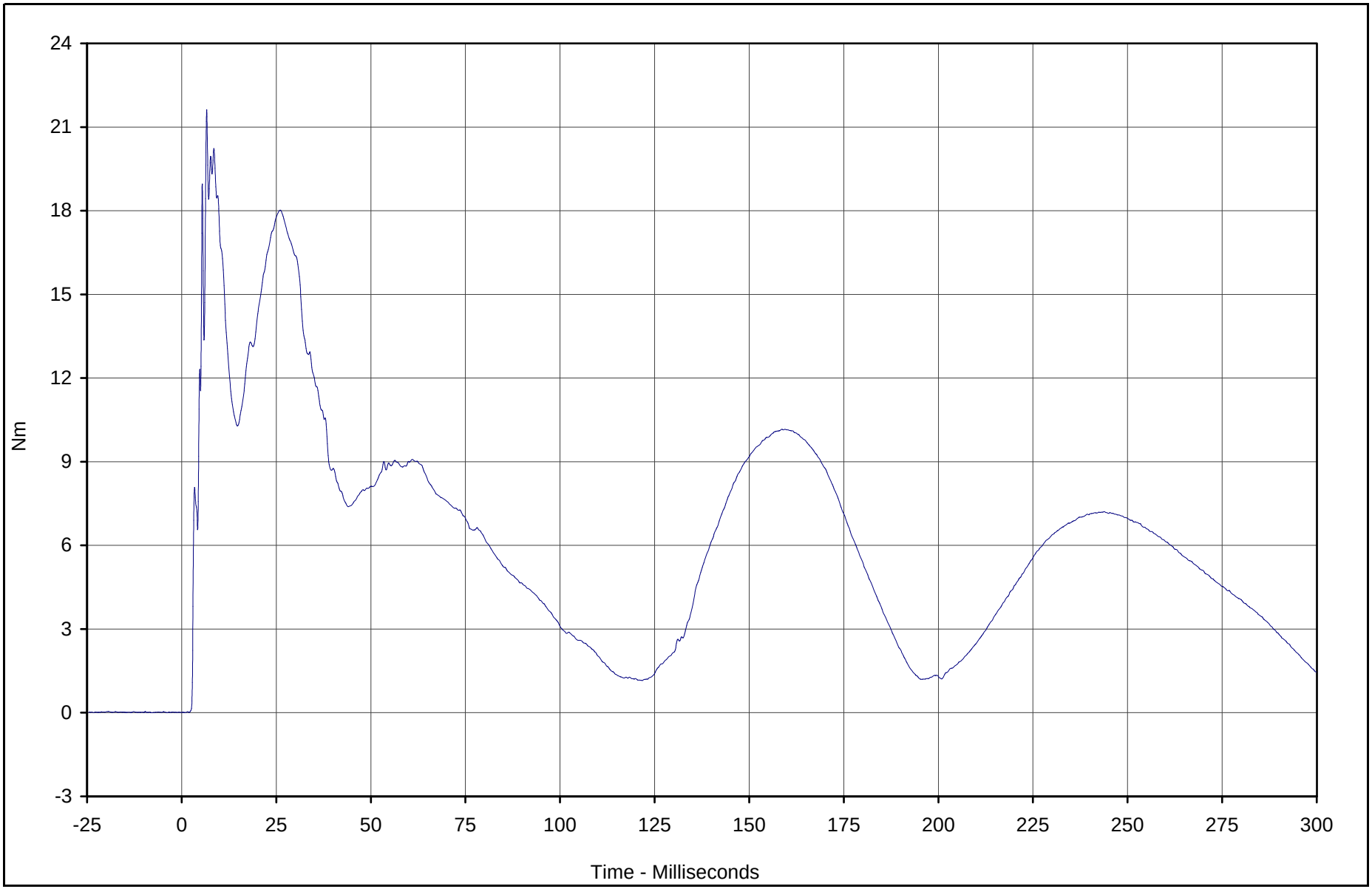
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Lower Neck Moment Resultant	013	RES	Nm	21.6	6.6	0.0	0.7	600

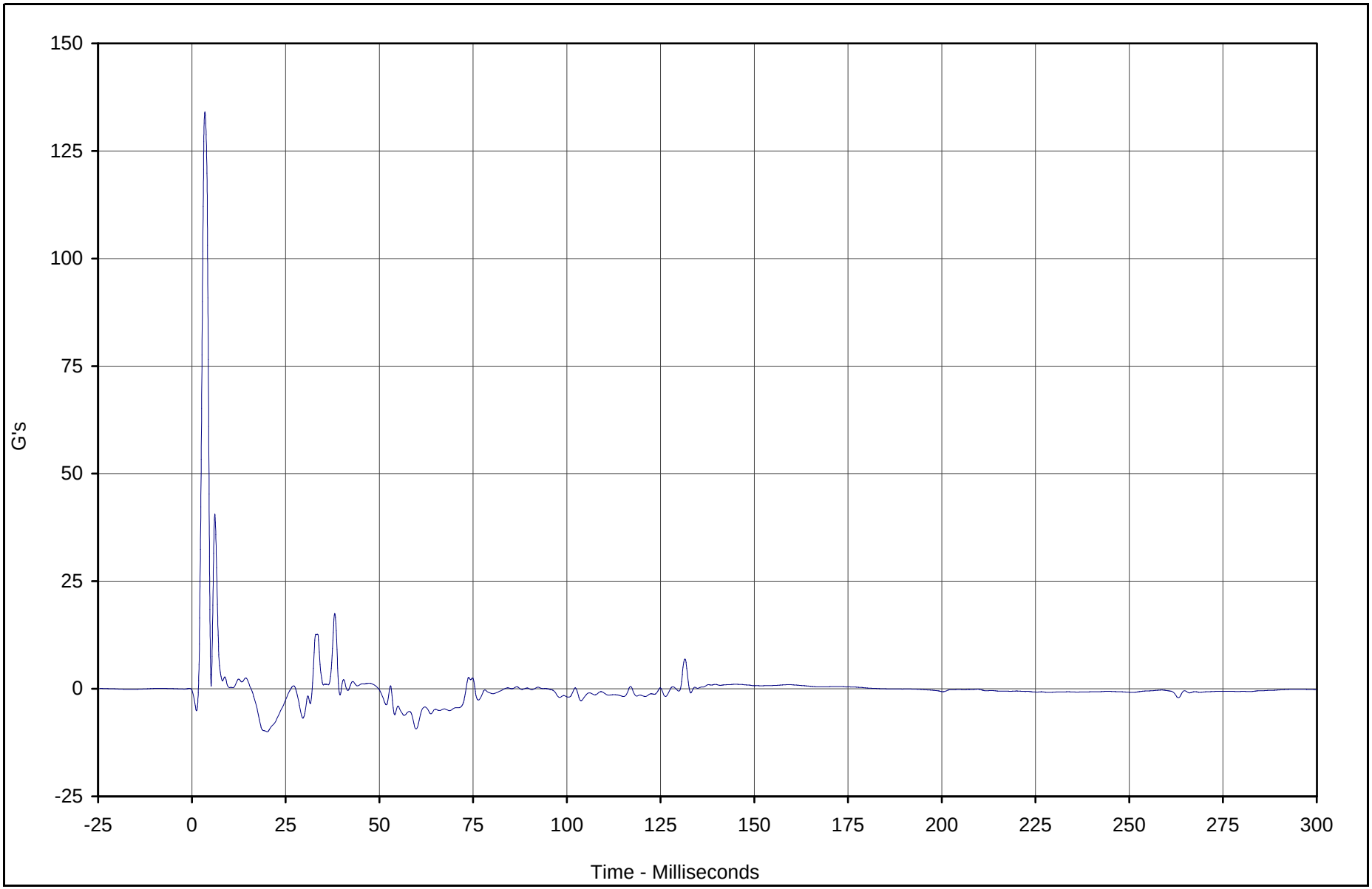
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest X	016	FIL	G's	134.1	3.5	-10.0	20.1	180

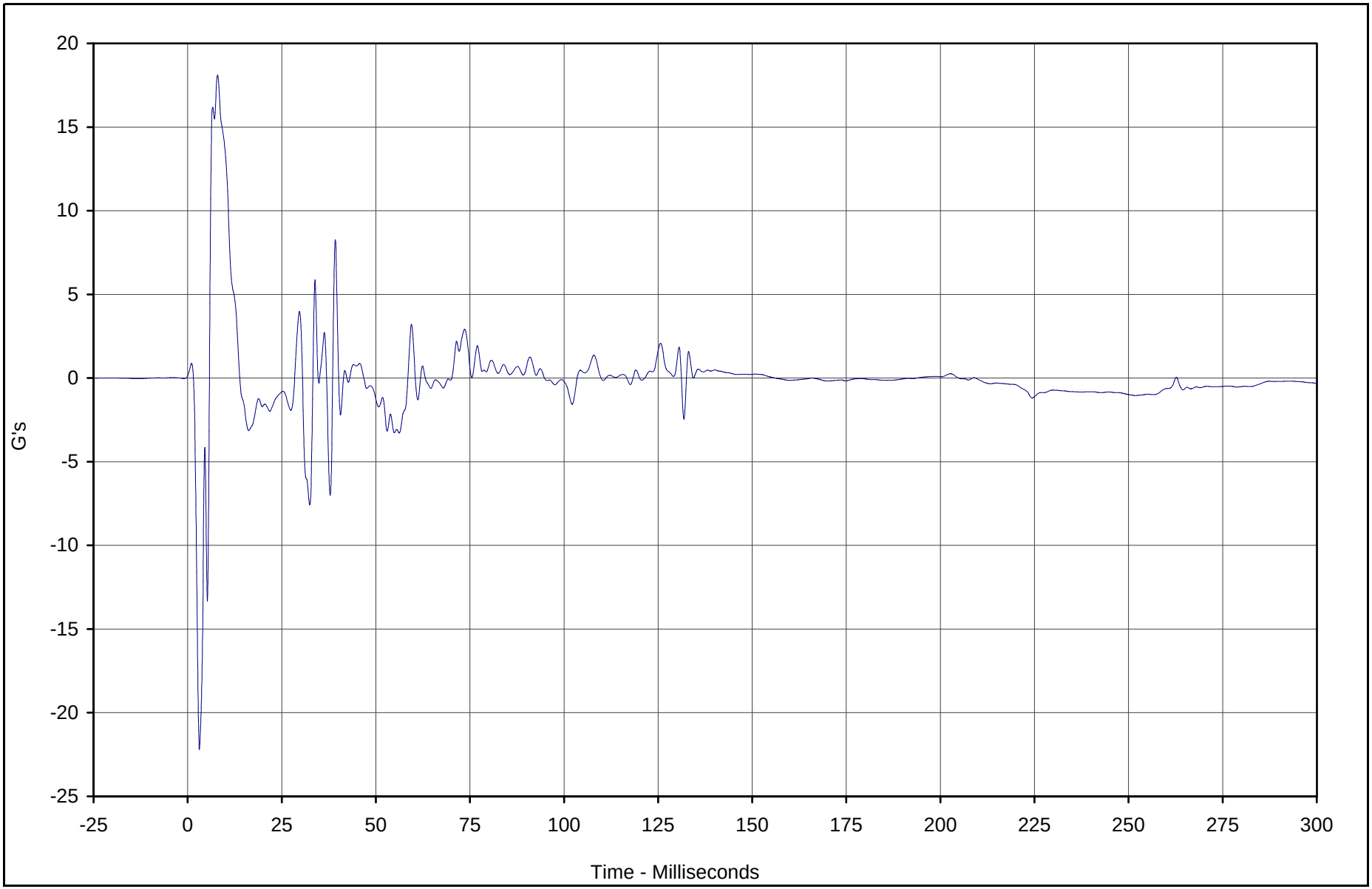
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



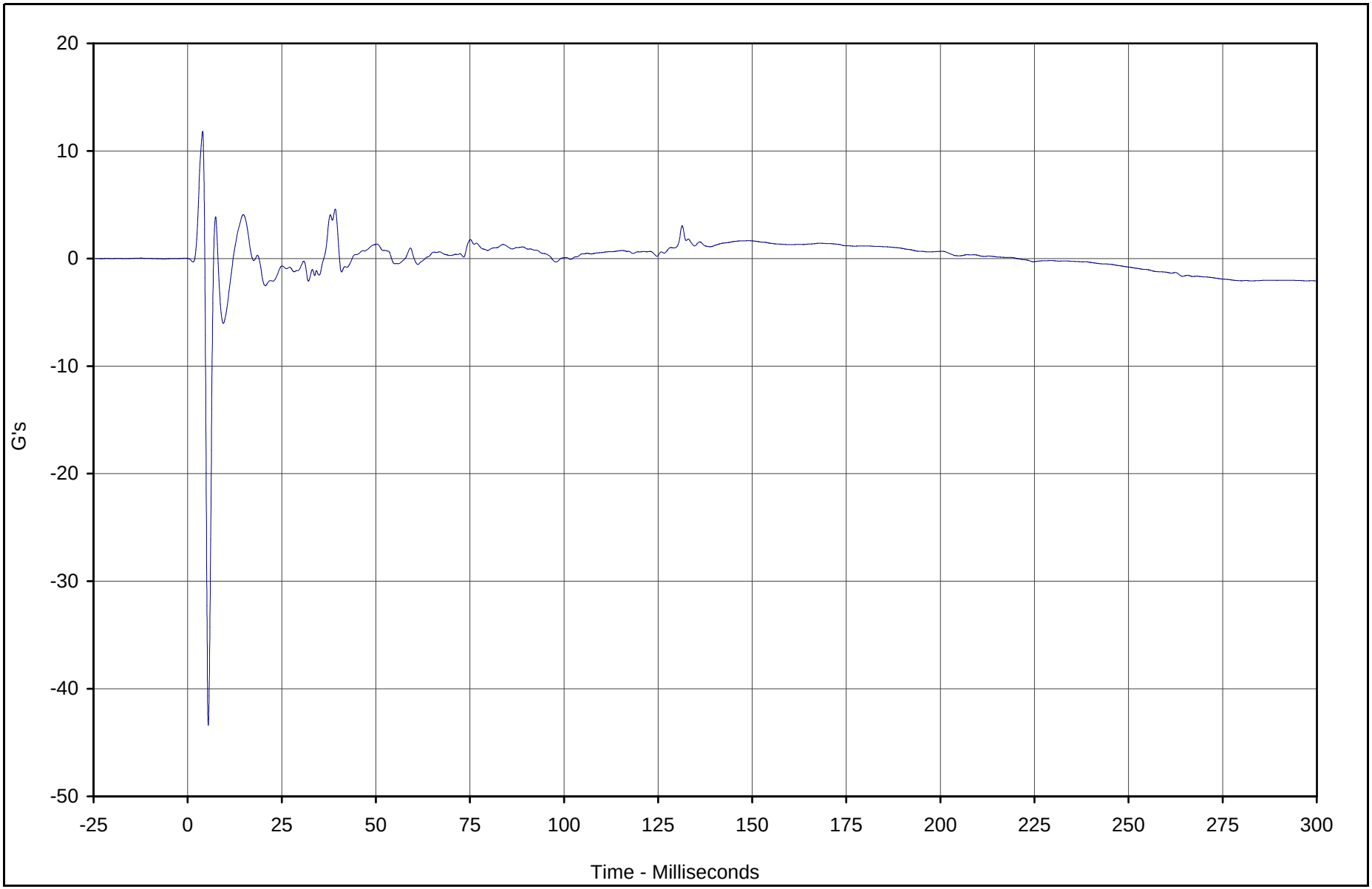
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Y	017	FIL	G's	18.1	7.9	-22.2	3.1	180

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Z	018	FIL	G's	11.8	4.0	-43.4	5.5	180

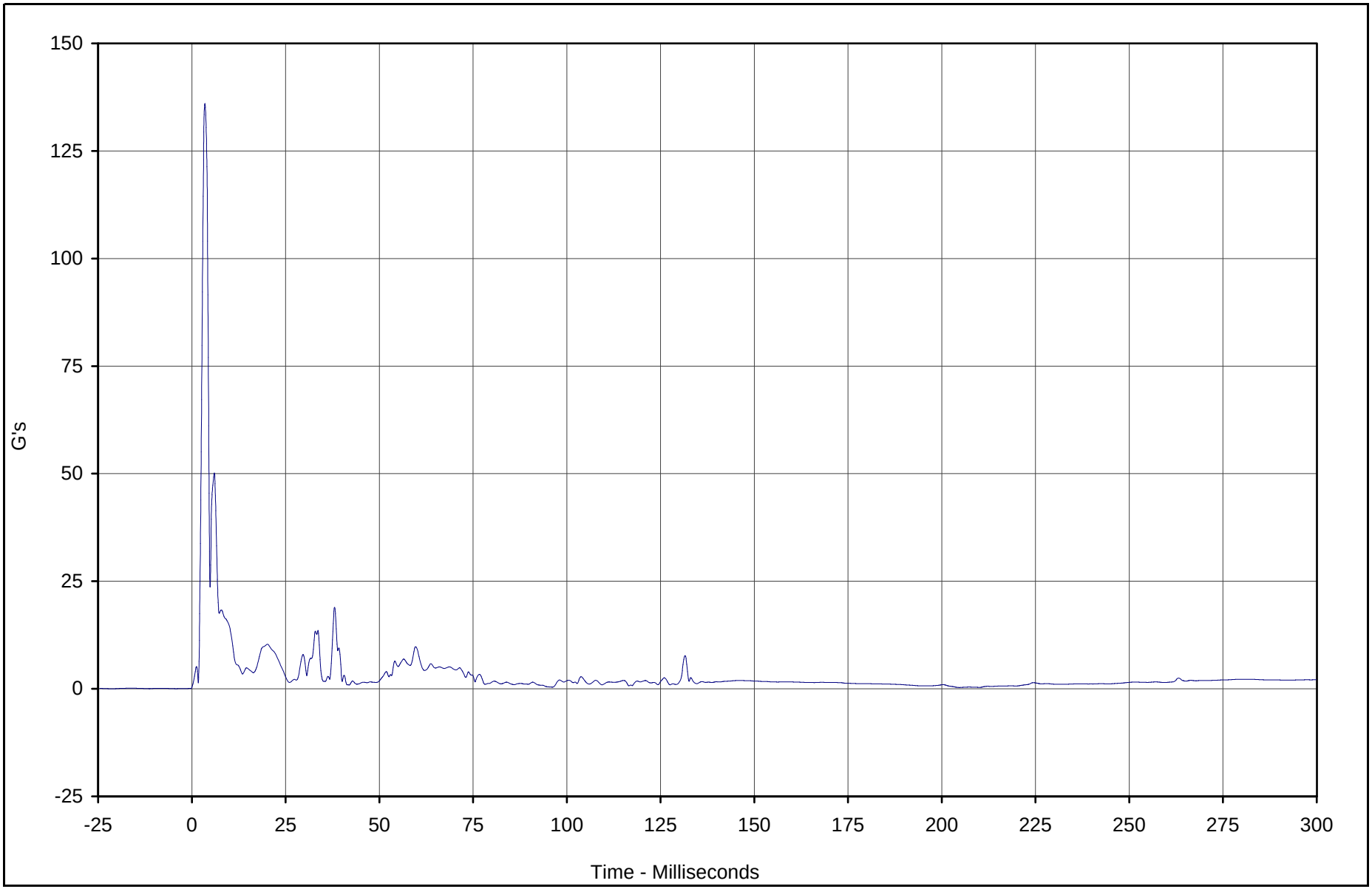
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Resultant	016	RES	G's	136.0	3.5	0.3	204.7	180

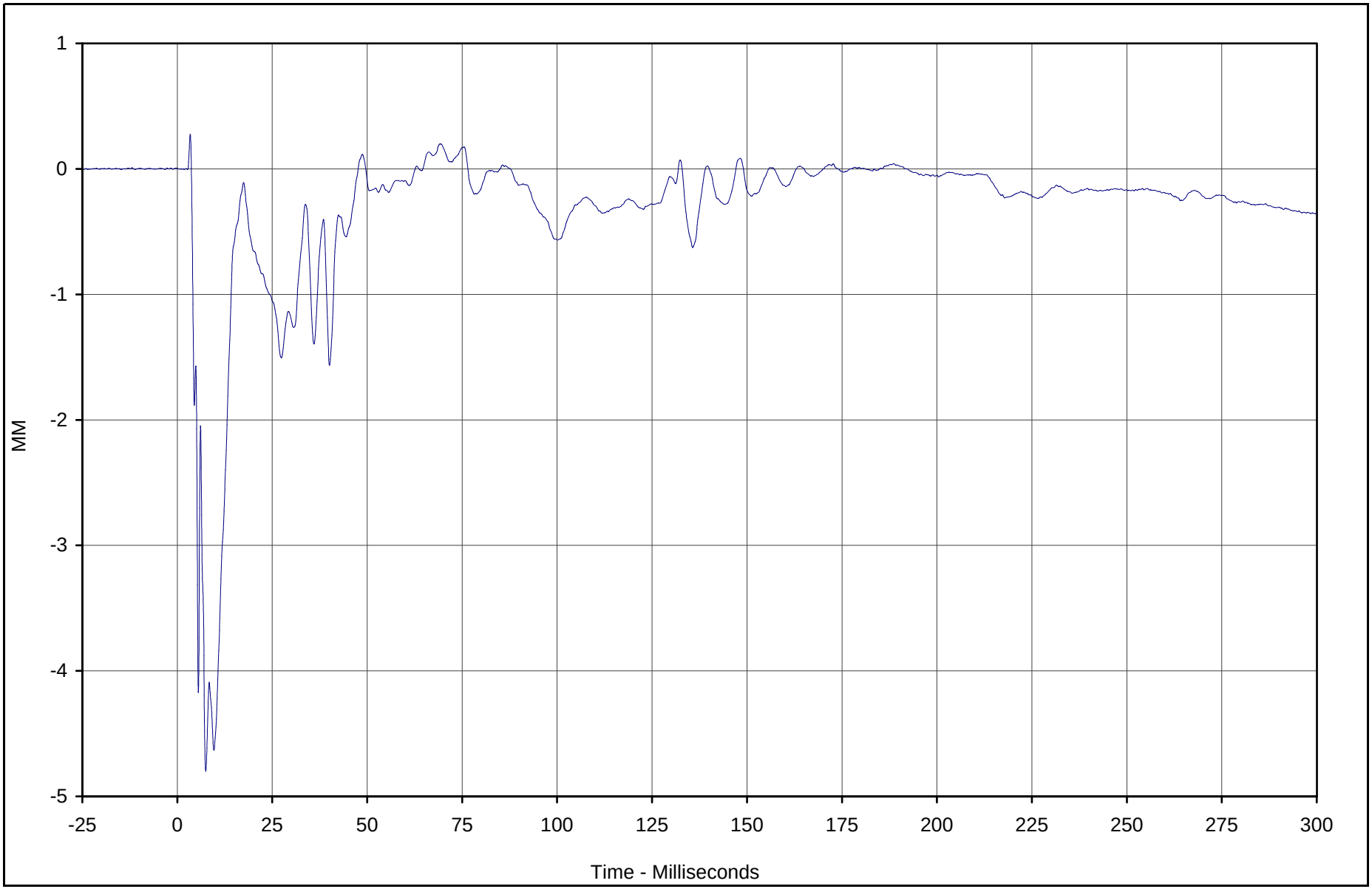
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Chest Displacement	019	FIL	MM	0.3	3.4	-4.8	7.5	600

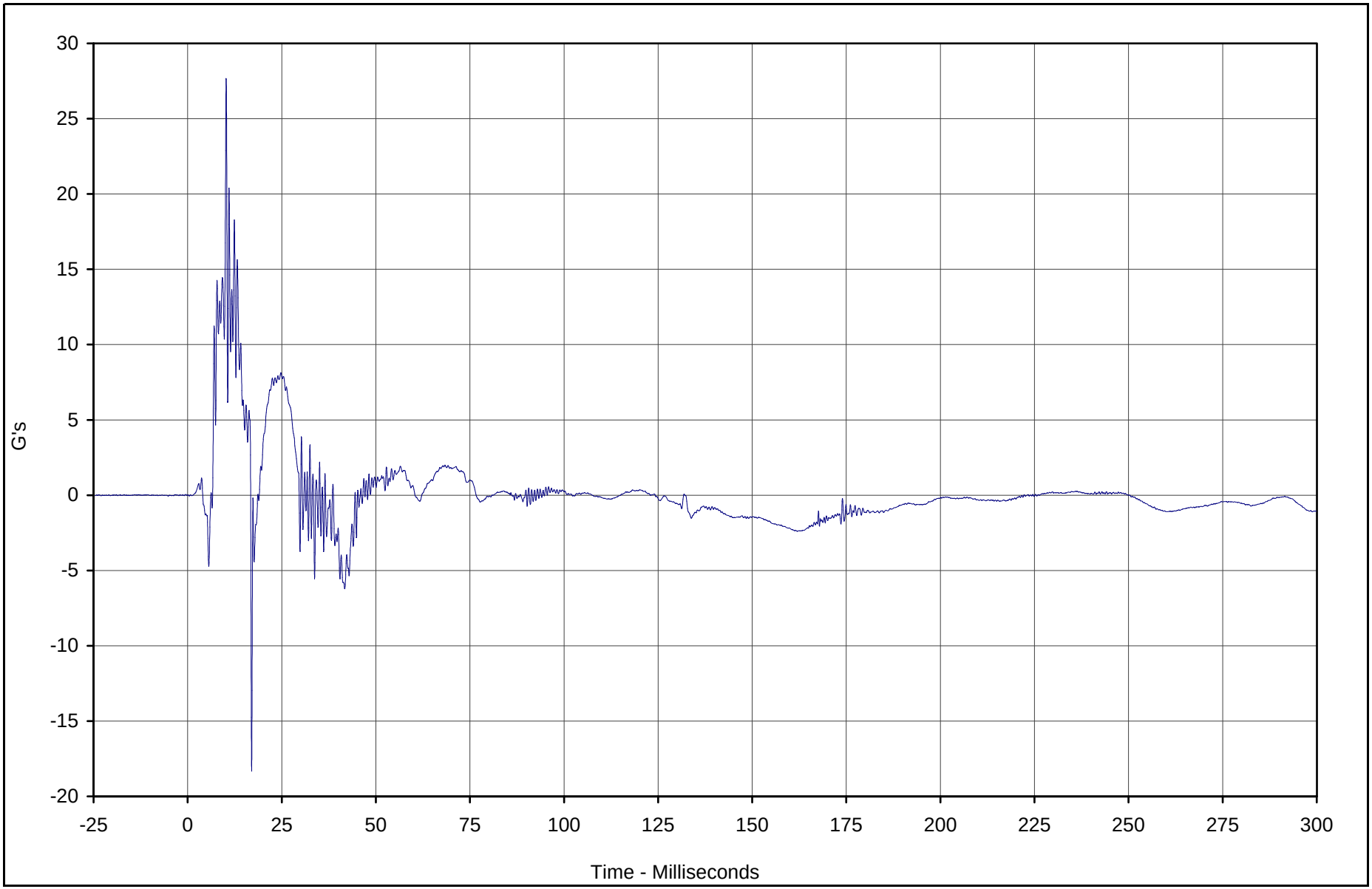
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



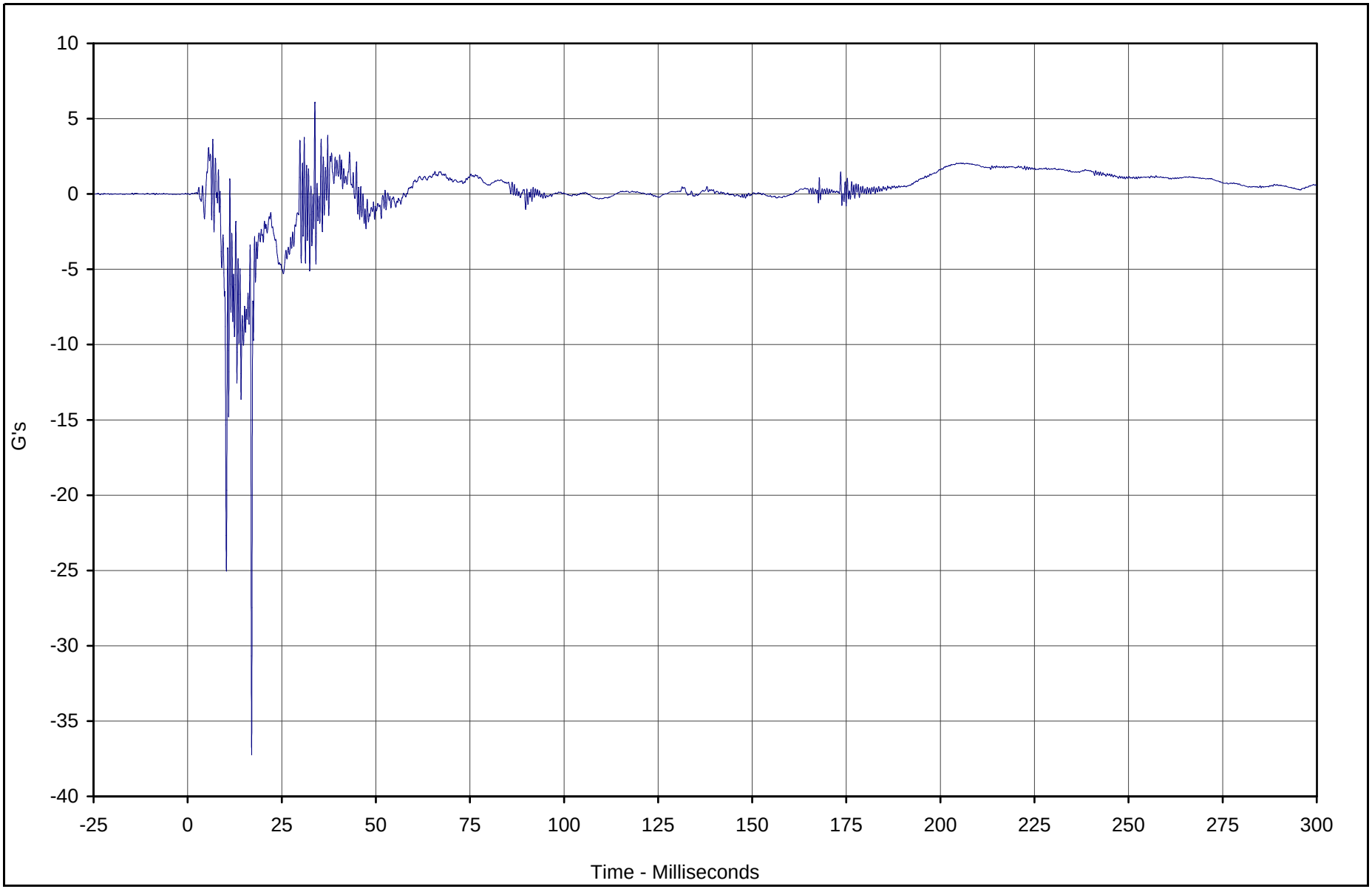
Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis X	020	FIL	G's	27.6	10.2	-18.3	17.0	1000

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis Y	021	FIL	G's	6.1	33.8	-37.2	17.0	1000

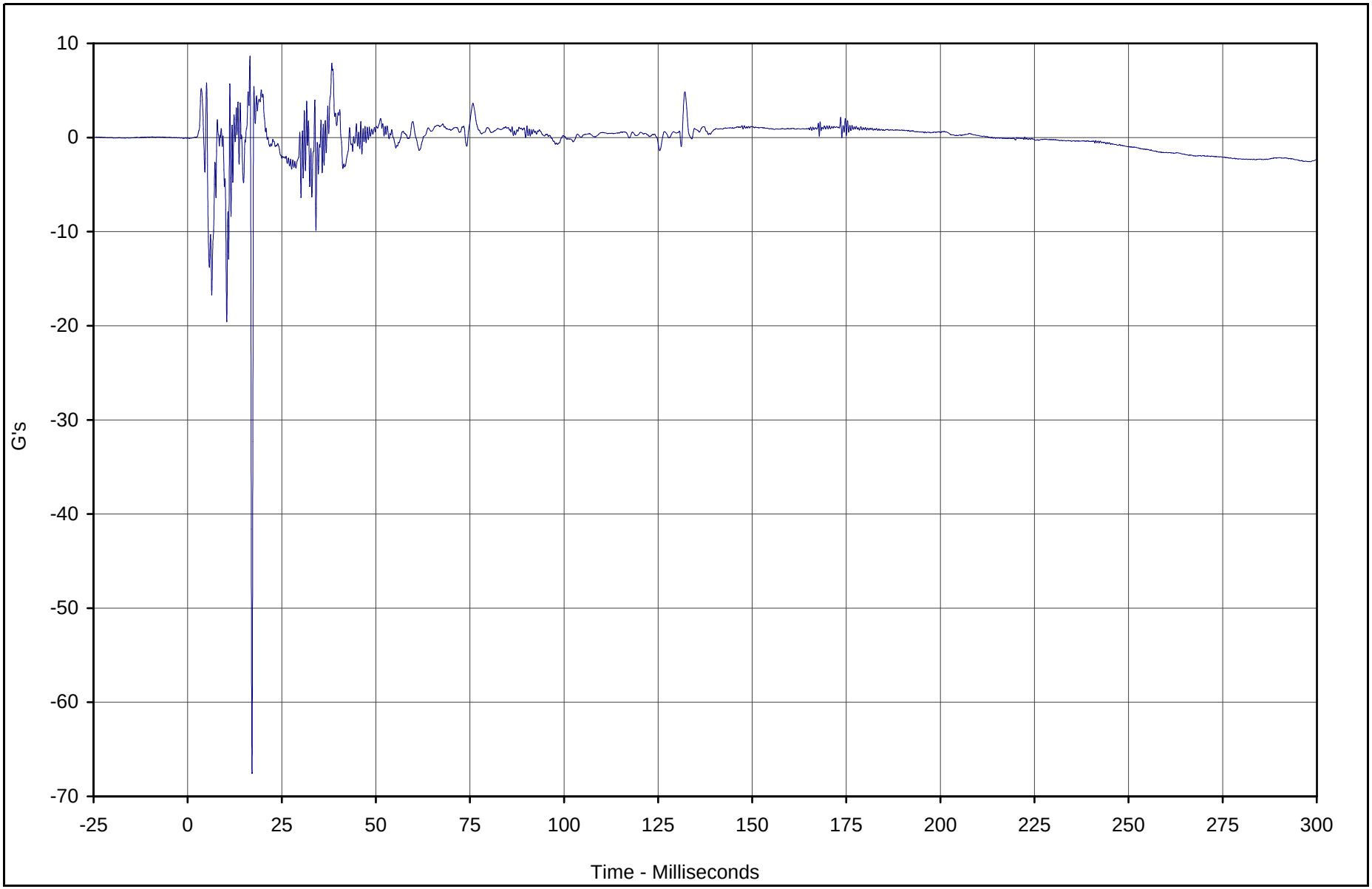
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis Z	022	FIL	G's	8.6	16.6	-67.5	17.1	1000

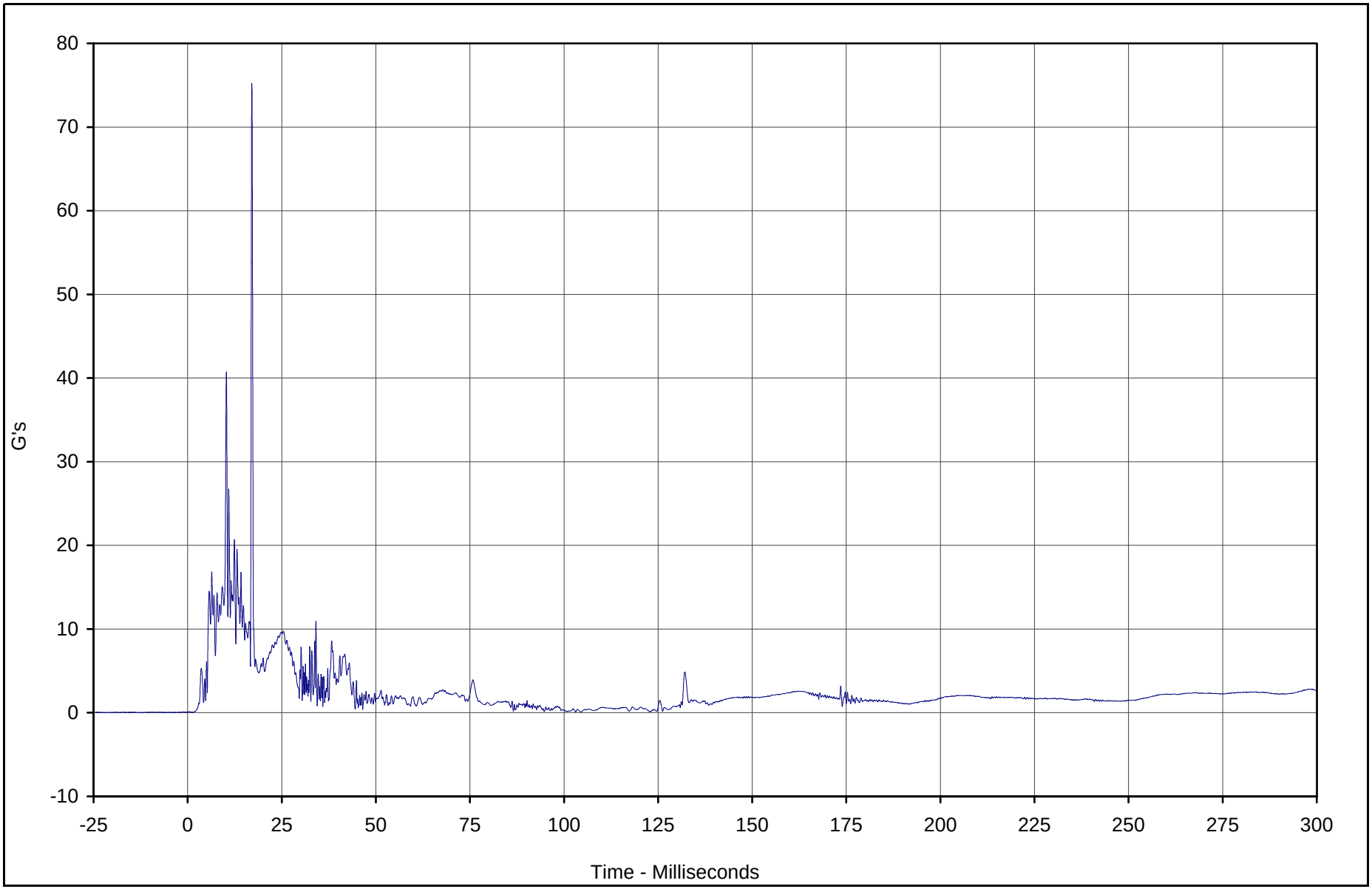
KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Pass. Pelvis Resultant	020	RES	G's	75.1	17.0	0.0	1.4	1000

KARCO Engineering

Test Vehicle: 2004 Mitsubishi Galant 4 Door Sedan

Test Date: 6/28/04

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

NHTSA No.: M45601TWG2

APPENDIX C

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

TWG Testing (Forward Facing Hybrid III 3 Yr.)
Instrumentation Data Channel Assignments
A.T.D. Serial Number 082
6/28/04
2004 Mitsubishi Galant 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