

REPORT NUMBER KAR22001-07

**NEW CAR ASSESSMENT PROGRAM
FRONTAL BARRIER IMPACT TEST**

**KIA MOTORS CORPORATION
2002 KIA SPECTRA
4 DOOR SEDAN**

NHTSA NUMBER: M20510

**PREPARED BY:
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MAY 20, 2002

FINAL REPORT

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16. Abstract A 35 mph (56.3 km/h) frontal barrier impact was conducted on a 2002 Kia Spectra 4 Door Sedan at KARCO Engineering, LLC on 5/07/02. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and footwell intrusion performance. The impact velocity is 55.71 km/h. The ambient temperature at the barrier face at the time of impact is 23.3 degrees Celcius. The vehicle's maximum post test static crush is 480 mm at the vehicle centerline. The test vehicle is equipped with a 3-point continuous belt system and second generation supplemental airbags in both front outboard seating positions. With respect to FMVSS 208 "Occupant Crash Protection", the occupant injury criteria summary is as follows:					
Measurement Description		Units	Threshold	Driver ATD	Passenger ATD
Head Injury Criteria (HIC)		N/A	1000	459.5	355.5
Max. Thorax Accel. (3 msec Clip)		G's	60	47.6	46.6
Left Femur force		Newtons	10000	-2210.7	-3609.3
Right Femur Force		Newtons	10000	-4093.1	-2129.3
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SECTION 1

PURPOSE AND SUMMARY OF TEST M20510

1.1 PURPOSE

This 35 mph (56.3 km/h) frontal barrier impact test is part of the Vehicle Barrier Impact 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 vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 30 mph (48.3 km/h) requirements.

The 35 mph (56.3 km/h) frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Test procedure.

1.2 SUMMARY

A load cell barrier consisting of 24 load cells was impacted by a 2002 Kia Spectra 4 Door Sedan at a velocity of 55.71 km/h. The test was performed at Karco Engineering, LLC on May 7, 2002. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

One real-time and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with nine accelerometer array head, chest and pelvis triaxial accelerometers, chest displacement potentiometers, six-axis upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also placed on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 34) and the right-front passenger (position 2) ATD (Serial No. 35) were calibrated one test prior to this test.

One Hundred and Nine (109) channels of data were recorded using an on-board data acquisition system. Appendix B contains the vehicle and dummy response data traces. Appendix C contains Load Cell Barrier information. Appendix D contains the Instrumentation Data Channel assignments. Appendix E contains the Dummy Calibration data and Appendix F contains the owner's manual instructions for the occupant and restraint systems. Appendix G contains the Nine Accelerometer Head Array data.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the impact event. There was no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 480 mm and both the driver and the passenger side doors remained closed and latched during the impact event and were operable without the aid of tools after the impact.

The driver's visible contact points were as follows: The driver ATD head contacted the airbag, its chest contacted the airbag, no contact on the abdomen, the left knee contacted the steering column/dash and the right knee contacted the dash.

The passenger's visible contact points were as follows: The passenger ATD head contacted the airbag and headrest. The chest and abdomen contacted the airbag and belt. Both knees contacted the glove box.

Occupant injury data is contained in table below.

OCCUPANT DATA SUMMARY

ATD Position	HIC	Clip (g)	Chest Disp (mm)	Left Femur (N)	Right Femur (N)	Belt Spool (mm)
Driver	459.5	47.6	-31.5	-2210.7	-4093.1	169.8
Passenger	355.5	46.6	-29.4	-3609.3	-2129.3	214.8

SECTION 2
OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2002 Kia Spectra 4 Door Sedan

NHTSA No.: M20510

Test Program: 2002 NHTSA 35mph NCAP

Test Date: 5/7/02

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	$=(t_f - 32)/1.8$
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
CRASH TEST SUMMARY

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
Test Date: 5/7/02

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	55.71
Test Weight	kg	1424
Impact Angle	degrees	0
Average Rebound	mm	766
Maximum Static Crush	mm	480

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Front Door Opening	Remained closed & latched, opened w/o the aid of tools	Remained closed & latched, opened w/o the aid of tools
Rear Door Opening	Remained closed & latched, opened w/o the aid of tools	Remained closed & latched, opened w/o the aid of tools
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None

TEST DUMMY INFORMATION

Description	Driver	Passenger
Dummy Type / Serial No.	50% Male Hybrid III / No. 34	50% Male Hybrid III / No. 35
Head Contact	Airbag	Airbag/Headrest
Chest Contact	Airbag	Airbag
Abdomen Contact	None	Airbag
Left Knee Contact	Steering Column/Dash	Glove Box
Right Knee Contact	Dash	Glove Box

16mm MOVIE COVERAGE

High Speed	16
Real Time	1
Total	17

DATA CHANNELS

Driver ATD Sensors	46
Passenger ATD Sensors	46
Belt Assessment Sensors	8
Vehicle Structure Accelerometers	9
Rigid Barrier Load Cells	24
Total	133

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02

TEST VEHICLE INFORMATION

Make	Kia
Model	Spectra
Body Style	4-Door Sedan
NHTSA No.	M20510
VIN	KNAFB121025173522
Color	Silver/Gray
Delivery Date	5/2/2002
Odometer Reading (mi.)	79
Dealer	Ontario Kia
Transmission	4 Automatic
Final Drive	Front
Type/No. Cylinders	In-Line 4
Engine Displacement (L)	1.8
Engine Placement	Transverse
Front Seat Side Airbag	No

TEST VEHICLE OPTIONS

Driver Front Airbag	Yes
Pass. Front Airbag	Yes
Power Windows	No
Pre-Tensioners	Yes
Power Door Locks	No
Tilt Wheel	No
Air Conditioning	Yes
Power Brakes	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	No
Anti-lock Brakes	No
Head Airbag	No
Anti-Theft System	No
Load Limiter	Yes
Bucket Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Kia Motors Corporation	GVWR (kg)	1660
Date of Manufacture	November-01	GAWR Front (kg)	870
		GAWR Rear (kg)	790

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	200	200
Cold Pressure (kPa)	200	200
Recommend Tire Size	P185/65R14	P185/65R14
Tire Size on Vehicle	P185/65R14	P185/65R14
Tire Manufacturer	Hankook	Hankook

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	None	
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				385
Cargo Weight (RCLW) (kg)				45

DATA SHEET NO. 2...(CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	386	231		425	289	
Right	kg	390	226		430	279	
Ratio	%	62.9	37.1		60.1	39.9	
Totals	kg	776	457	1233	855	569	1424

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1233
Weight of 2 P572 ATD's	kg	152
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Vehicle Target Weight (TVTW)	kg	1430

TEST VEHICLE ATTITUDE AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	633	634	642	637	948
As Tested	mm	608	610	607	611	1019

Vehicle Wheel base (mm): 2554

Weight of Ballast secured in cargo area (kg): 0

Vehicle Components Removed: _____

* Ballast weight does not include cameras, instrumentation, and brake abort system.

FUEL SYSTEM DATA

Fuel System Capacity From Owner's Manual (L): 50.0

Usable Capacity Figure Furnished by COTR (L): 50.0

Actual Test Volume with entire fuel System Filled (L): 46.4

Test Fluid Type: Stoddard Solvent ; Specific Gravity: 0.764

Kinematic Viscosity: as per ASTM Standard D484-71 ; Color: Red

Is Vehicle Fuel Pump Electric or Mechanical?: Electric

If electric, does pump operate with ignition switch "ON" & engine "OFF"? Yes

Fuel System Particulars: Driver side filler door, tank mounted at rear.

DATA SHEET NO. 3
POST IMPACT DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan

NHTSA No.: M20510

Test Program: 2002 NHTSA 35mph NCAP

Test Date: 5/7/02

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	55.51 to 57.12	55.71
Trap No. 1 Entry Distance	mm	< 1524	1524
Trap No. 1 Exit Distance	mm	< 1524	305
Trap No. 2 Velocity (Redundant)	km/h	55.51 to 57.12	55.75
Trap No. 2 Entry Distance	mm	< 1524	1524
Trap No. 2 Exit Distance	mm	< 1524	305

VEHICLE STATIC CRUSH

Measured Parameter	Units	Pre-Test	Post-Test	Difference
Left Side	mm	4309	3920	-389
Center	mm	4499	4019	-480
Right Side	mm	4309	3981	-328

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	874
Center	mm	702
Right Side	mm	722
Average	mm	766

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

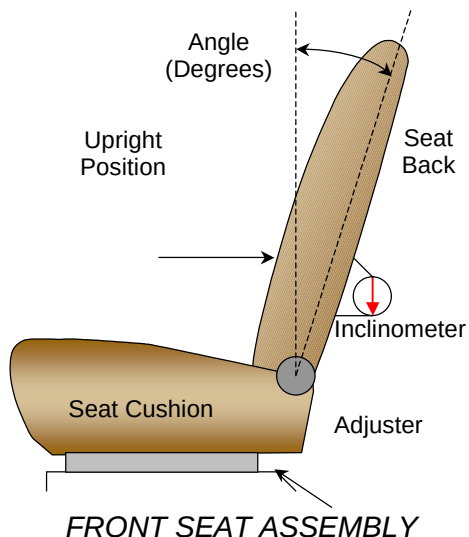
Test Vehicle: 2002 Kia Spectra 4 Door Sedan
Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
Test Date: 5/7/02

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.

Driver seat back angle: 22° with a seated dummy
Passenger seat back angle: 22° with a seated dummy



SEAT FORE/AFT POSITIONS

Both driver and passenger seats have 19 positions or detents. 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 driver and passenger.

Driver seat fore/aft total travel: 19 seating positions or detents
Driver seat fore/aft position: 10th detent from forward most
Passenger seat fore/aft total travel: 19 seating positions or detents
Passenger seat fore/aft position: 10th detent from forward most

SEAT BELT UPPER ANCHORAGE

The test vehicle is equipped with adjustable anchorages for both driver and passenger seat positions. There are 5 positions or detents. Both the driver and the passenger anchorages are placed in the 2nd position from the uppermost.

DATA SHEET NO. 4...(CONTINUED)
TEST VEHICLE INFORMATION

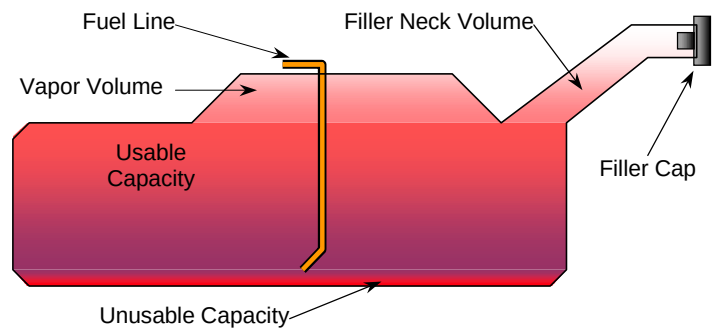
Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02

FUEL TANK CAPACITY DATA

The "Usable Capacity" of the standard equipment fuel tank is:	<u>50.0</u>	liters
The "Usable Capacity" of any optional equipment fuel tank is:	<u>50.0</u>	liters
"Usable Capacity" used for certification tests FMVSS 301 requirements:	<u>46.0 to 46.9</u>	liters
Actual amount of Stoddard solvent added to vehicle for certification test:	<u>46.4</u>	liters

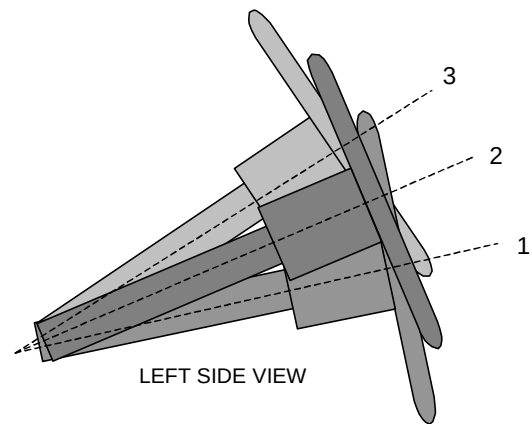
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat. Fuel lines run inside the right frame rail to the engine compartment.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured. The steering column is fixed on this vehicle as indicated by the diagram at right and the angle below.



STEERING COLUMN ASSEMBLY

NOTE: STEERING COLUMN IS FIXED

Lowermost; position 1:	<u>N/A°</u>
Geometric center; position 2:	<u>26°</u>
Uppermost position 3:	<u>N/A°</u>

DATA SHEET NO. 5
DUMMY POSITIONING IN VEHICLE

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
Test Date: 5/7/02

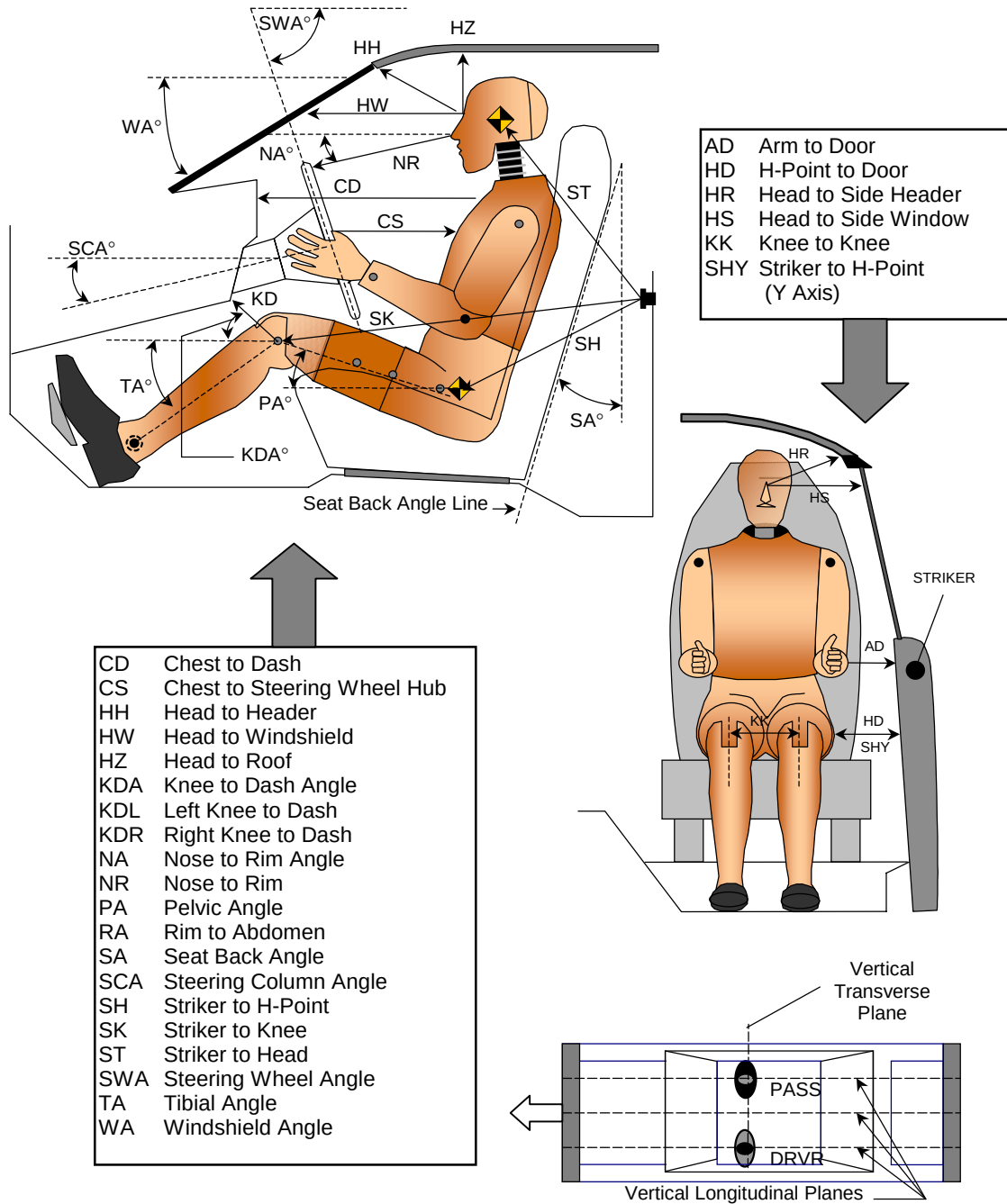
TEST DUMMY POSITION MEASUREMENTS

Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA	Windshield Angle		61		
SWA	Steering Wheel Angle		64		
SCA	Steering Column Angle		26		
SA	Seat Back Angle		22		22
HZ	Head to Roof (Z)	186	90	183	90
HH	Head to Header	330		314	
HW	Head to Windshield	550		520	
HR	Head to Side Header (Y)	219		215	
NR	Nose to Rim	441	11		
CD	Chest to Dash	536		615	
CS	Chest to Steering Hub	340			
RA	Rim to Abdomen	198			
KDL	Left Knee to Dash	166	21	165	
KDR	Right Knee to Dash	172		183	4
PA	Pelvic Angle		24		23
TA	Tibia Angle		48		42
KK	Knee to Knee (Y)	300		285	
ST	Striker to Head	586	2	575	2
SK	Striker to Knee	552	86	542	84
SH	Striker to H-Point	196		180	
SHY	Striker to H-Point (Y)	223		225	
HS	Head to Side Window	331		265	
HD	H-Point to Door (Y)	138		138	
AD	Arm to Door (Y)	126		27	

DATA SHEET NO. 5...(CONTINUED) **DUMMY POSITIONING IN VEHICLE**

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02



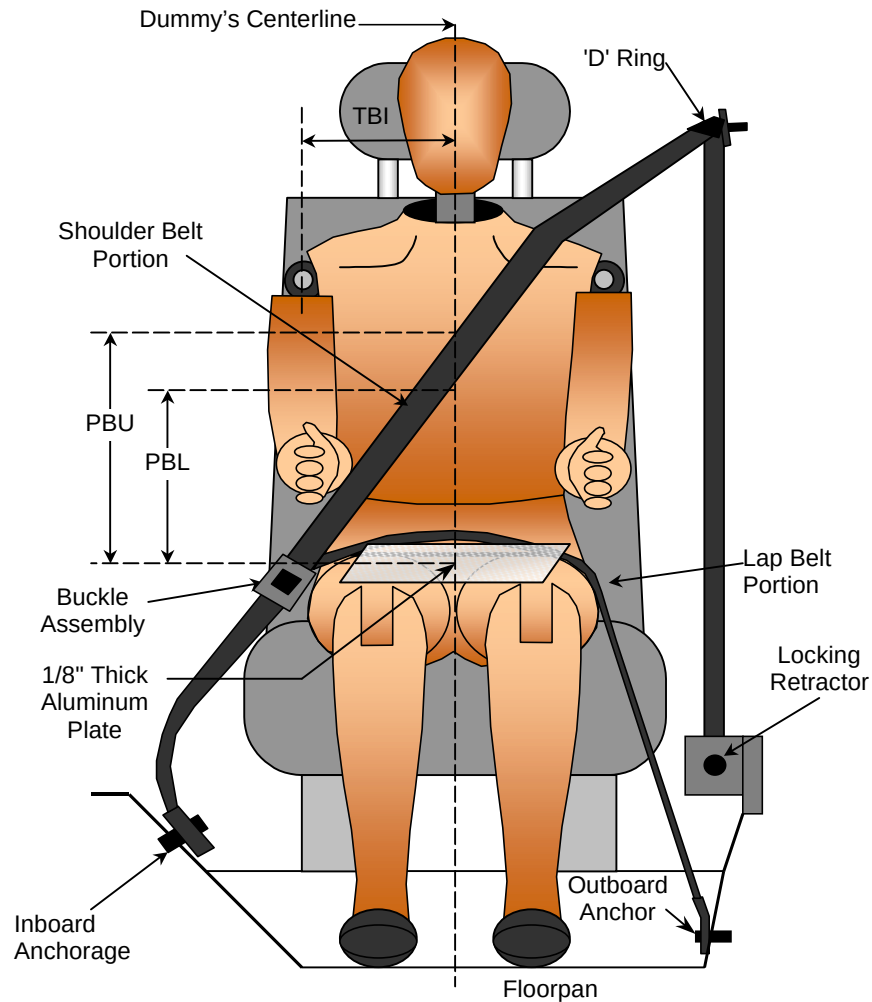
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS

DATA SHEET NO. 6

SEATBELT POSITIONING DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	215	215
PBU - Top surface of reference to belt upper edge	mm	345	300
PBL - Top surface of reference to belt lower edge	mm	270	220
Lap Belt tension	Newton's	10	10
Shoulder Belt tension	N/A	Retractor	Retractor

DATA SHEET NO. 7 - VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2002 Kia Spectra 4 Door Sedan

NHTSA No.: M20510

Test Program: 2002 NHTSA 35mph NCAP

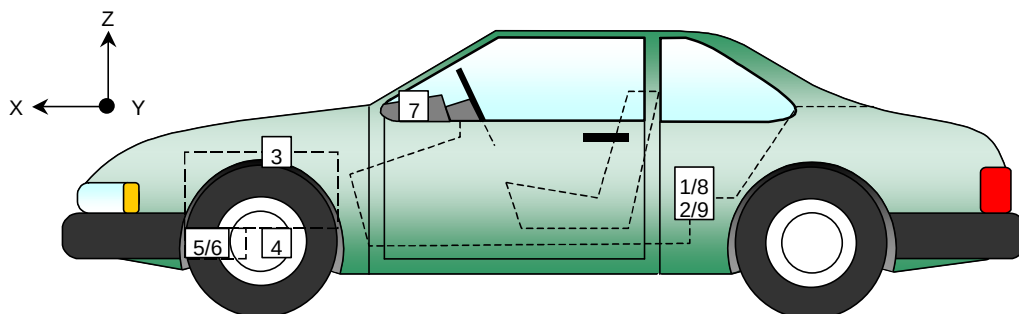
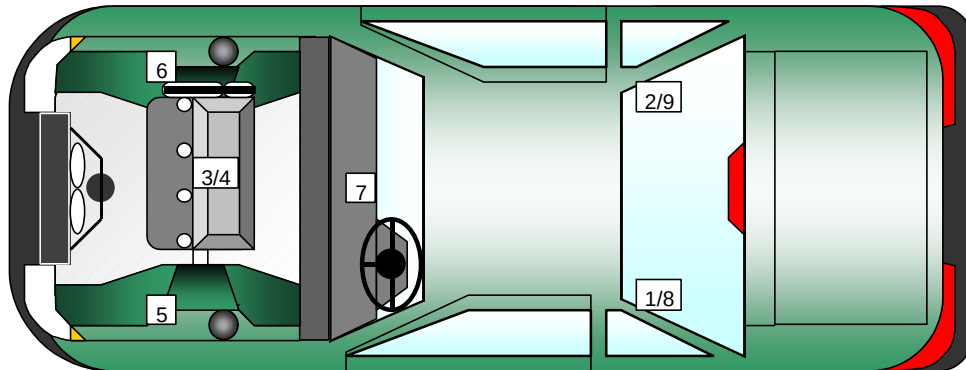
Test Date: 5/7/02

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)			Peak Values				
		X	Y	Z	Units	Max	Time	Min	Time
1	Left Rear X-Member	1700	-670	345	G's	2.2	108.0	-41.0	33.2
2	Right Rear X-Member	1750	670	345	G's	2.6	127.6	-39.8	32.7
3	Engine Top	3770	0	780	G's	16.8	39.3	-103.1	30.6
4	Engine Bottom	3670	290	120	G's	45.6	36.1	-147.3	26.6
5	Left Brake Caliper	3700	-730	230	G's	20.6	65.7	-64.6	35.1
6	Right Brake Caliper	3700	730	230	G's	17.5	65.2	-60.9	49.9
7	Instrument Panel	2890	0	890	G's	35.7	29.8	-77.0	41.0
8	Left Rear X-Member (Z-Axis)	1750	-670	345	G's	6.8	40.4	-4.4	8.1
9	Right Rear X-Member (Z-Axis)	1700	670	345	G's	5.2	19.5	-5.7	45.0

Reference Planes: X=From Rear Surface of Vehicle, Y=Vehicle Centerline, Z=Ground Plane

* Channel failed at 95.8 msec.



DATA SHEET NO. 8 - HYBRID III ATD INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan

NHTSA No.: M20510

Test Program: 2002 NHTSA 35mph NCAP

Test Date: 5/7/02

HEAD PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	13.0	229.4	-55.0	73.1	11.1	257.2	-48.6	74.6
Head CG	Y	G's	21.3	79.9	-5.1	292.5	2.9	32.4	-7.3	57.1
Head CG	Z	G's	30.6	43.2	-1.7	289.6	21.6	78.5	-1.5	16.8
Head CG Resultant	N/A	G's	57.5	73.1			52.6	74.9		

CHEST PRIMARY PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	2.3	266.7	-47.6	56.8	1.8	299.9	-46.6	67.8
Chest CG	Y	G's	6.6	82.9	-4.4	44.3	2.0	28.5	-6.3	65.7
Chest CG	Z	G's	15.8	42.3	-13.6	68.7	9.1	40.6	-3.8	66.3
Chest CG Resultant	N/A	G's	48.1	56.8			46.8	67.7		

FEMUR PEAK FORCES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Femur	Z	Newtons	1262.7	42.6	-2210.7	52.1	1155.1	39.9	-3609.3	51.0
Right Femur	Z	Newtons	2357.6	41.4	-4093.1	52.3	631.0	41.6	-2129.3	56.4

SEAT BELT SENSOR PEAK VALUES

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Shoulder Belt Pullout	N/A	MM	169.8	80.5	-20.9	31.7	214.8	98.3	-16.4	30.2
Shoulder Belt Stretch	N/A	MM/CM	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0 *
Lap Belt Force	N/A	Newtons	10482.5	51.3	6.1	0.0	7498.7	51.6	1.0	0.0
Shoulder Belt Force	N/A	Newtons	5075.0	41.6	-24.1	180.5	5026.0	74.8	-3.5	9.0

* Not used with pre-tensioner

PRIMARY HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Primary	459.5	56.3	89.0	45.6	355.5	58.1	94.0	39.6

PRIMARY CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Primary	47.6	65.9	68.9	46.6	65.6	68.6

DATA SHEET NO. 8...(continued)

Test Vehicle: 2002 Kia Spectra 4 Door Sedan

NHTSA No.: M20510

Test Program: 2002 NHTSA 35mph NCAP

Test Date: 5/7/02

PELVIC PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Pelvis	X	G's	1.6	106.3	-65.6	52.1	4.7	116.4	-61.9	51.2
Pelvis	Y	G's	12.5	63.2	-14.9	40.7	4.3	37.5	-5.8	76.8
Pelvis	Z	G's	13.7	41.4	-36.2	66.9	6.6	252.2	-29.5	62.6
Pelvis Resultant	N/A	G's	70.7	52.1			64.6	51.2		

UPPER NECK PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Neck Force	X	Newtons	528.7	64.0	-435.4	43.5	248.0	64.8	-609.7	123.1
Neck Force	Y	Newtons	294.0	110.6	-157.5	69.8	239.1	79.6	-163.5	135.6
Neck Force	Z	Newtons	1276.9	43.5	-232.2	289.7	1137.6	54.2	-109.4	124.9
Neck Force Resultant	N/A	Newtons	1349.8	43.5			1142.6	54.2		
Neck Moment	X	N•m	22.3	110.9	-10.7	80.0	4.8	89.9	-13.0	63.3
Neck Moment	Y	N•m	35.9	62.1	-19.0	273.3	41.3	129.1	-16.1	74.5
Neck Moment	Z	N•m	9.2	144.7	-29.1	91.2	14.3	89.5	-7.8	144.3
Neck Moment Resultant	N/A	N•m	38.3	62.2			42.1	129.1		

FOOT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Foot Aft	X	G's	5.2	54.5	-29.1	39.4	25.0	51.8	-97.0	38.5
Left Foot Aft	Z	G's	3.3	247.4	-82.2	38.9	13.2	60.4	-65.0	42.3
Left Foot Fore	Z	G's	21.5	28.7	-113.0	39.3	38.4	60.1	-96.8	36.2
Right Foot Aft	X	G's	70.3	51.7	-349.5	39.2	16.5	50.9	-79.0	39.3
Right Foot Aft	Z	G's	51.8	52.2	-254.6	39.9	7.2	26.3	-53.5	41.4
Right Foot Fore	Z	G's	183.5	48.7	-387.6	37.8	9.1	18.8	-84.4	33.0

UPPER AND LOWER TIBIA PEAK FORCES AND MOMENTS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Left Upper Moment	X	N•m	37.8	40.9	-17.4	196.2	19.1	111.0	-55.9	43.8
Left Upper Moment	Y	N•m	24.1	99.8	-103.5	39.9	63.6	46.7	-142.5	38.8
Right Upper Moment	X	N•m	30.1	39.2	-135.9	43.8	45.1	81.9	-1.0	218.4
Right Upper Moment	Y	N•m	36.1	55.9	-370.4	40.4	45.2	49.2	-90.1	40.7
Left Lower Moment	X	N•m	16.6	35.6	-5.9	153.0	1.3	112.4	-22.4	40.0
Left Lower Moment	Y	N•m	48.1	76.3	-41.7	40.8	45.2	47.1	-91.1	39.2
Left Lower Force	Z	Newtons	111.5	125.6	-2264.5	35.3	137.6	116.4	-2165.4	38.3
Right Lower Moment	X	N•m	68.4	52.0	-142.1	43.1	14.8	78.7	-3.0	39.4
Right Lower Moment	Y	N•m	333.5	52.7	-152.2	40.1	29.5	77.4	-34.5	41.5
Right Lower Force	Z	Newtons	283.3	252.1	-7964.7	40.2	138.5	283.4	-1971.9	41.0

DATA SHEET NO. 8...(continued)Test Vehicle: 2002 Kia Spectra 4 Door SedanNHTSA No.: M20510Test Program: 2002 NHTSA 35mph NCAPTest Date: 5/7/02**CHEST PEAK DISPLACEMENTS**

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	MM	0.1	9.4	-31.5	56.0	0.3	2.3	-29.4	60.3

HEAD REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	12.2	227.1	-55.1	72.4	10.6	258.1	-48.3	74.0
Head CG	Y	G's	20.8	77.7	-3.6	291.8	4.2	37.1	-7.1	69.8
Head CG	Z	G's	31.9	43.5	-1.2	13.3	21.6	79.4	-1.4	16.6
Head CG Resultant	N/A	G's	58.3	74.3			52.3	75.8		

CHEST REDUNDANT PEAK ACCELERATIONS

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Chest CG	X	G's	3.1	266.3	-47.7	56.8	1.7	299.9	-46.3	67.7
Chest CG	Y	G's	6.8	83.0	-3.3	30.8	2.3	76.9	-4.8	65.6
Chest CG	Z	G's	17.1	42.4	-13.1	68.6	9.9	40.7	-3.3	66.3
Chest CG Resultant	N/A	G's	48.1	56.8			46.5	65.7		

REDUNDANT HEAD INJURY CRITERIA (HIC)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG Redundant	467.8	55.6	89.2	45.4	359.5	57.7	93.6	39.8

REDUNDANT CHEST CLIP (3MSEC)

Location	Driver			Passenger		
	CLIP	T ¹	T ²	CLIP	T ¹	T ²
Chest CG Redundant	47.7	65.8	68.8	46.1	65.2	68.2

DATA SHEET NO. 9
SEATBELT ASSESSMENT TEST DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02

SEAT BELT PLACEMENT MEASUREMENTS

Measurement Description	Units	Driver	Passenger
TBI - Dummy C/L to Lap/Shoulder Belt Intersect	mm	215	215
PBU - Top surface of reference to belt upper edge	mm	345	300
PBL - Top surface of reference to belt lower edge	mm	270	220
Lap Belt tension	Newton's	10	10
Shoulder Belt tension	N/A	Retractor	Retractor

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Retractor reel to 'D' ring	mm	660	660
Shoulder belt length as measured on ATD	mm	820	850
Lap belt length as measured on ATD	mm	780	760
Remainder of belt on reel	mm	740	710
Total belt length for continuous webbing systems	mm	3000	2980

SHOULDER BELT SPOOL-OFF DATA

Measurement Description	Units	Driver	Passenger
As determined mechanically	mm	100.0	40.0
As determined electronically	mm	169.8	214.8
As determined by photography	mm		

BELT STRETCH DATA

Measurement Description	Units	Driver	Passenger
Electronically between shoulder belt load cell and "D" ring	mm/cm	*	*
Mechanically	mm/cm	None	None

*Not used with shoulder belt pre-tensioner systems.

DATA SHEET NO. 10
SUMMARY OF FMVSS 212 DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02

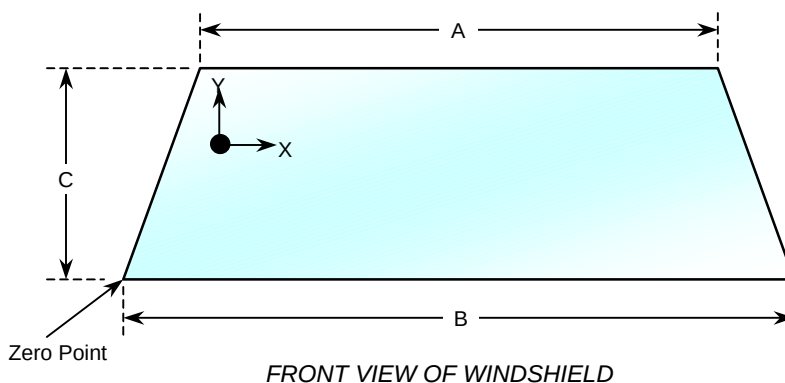
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with a rubber type adhesive. No molding covers the windshield periphery at any point.

The standard requires that the posttest retention measurement be a minimum of 75 percent of the pretest total periphery measurement for vehicles not equipped with occupant passive restraints and 50 percent for each side of the windshield for vehicles that are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.1 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test(mm)	Post-Test (mm)	% of Retention
Left Side	2055	2055	100
Right Side	2055	2055	100
Total	4110	4110	100



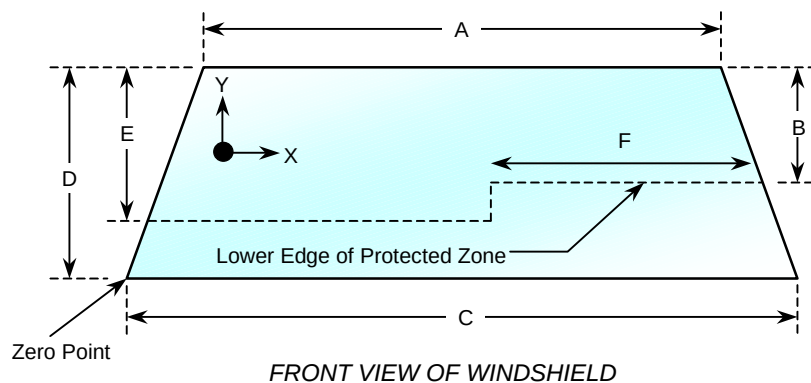
WINDSHIELD DIMENSIONS

Item	Units	Segment Length	Molding Width
A	mm	1084	10
B	mm	1456	0
C	mm	785	10

DATA SHEET NO. 11
WINDSHIELD ZONE INTRUSION FMVSS 219 DATA (PARTIAL)

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02



**WINDSHIELD AND
PROTECTED ZONE**

Item	Units	Value
A	mm	1084
B	mm	426
C	mm	1456
D	mm	785
E	mm	505
F	mm	726

A OF PROTECTED ZONE FAILURES

- A. Provide coordinates of the area that the protected zone was penetrated more than 0.25 in. by a vehicle component other than one that is normally in contact with the windshield.

X	Y
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

- B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A

DATA SHEET NO. 12
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
Test Date: 5/7/02

Test Time: 11:53 A.M.

Temperature at Time of Impact 36.1Deg. C

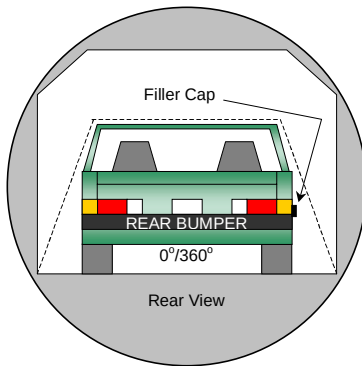
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- A. From impact until vehicle motion ceases: 0.0 oz.
(Maximum Allowable = 1 ounce)
- B. For the 5 minute period after motion ceases: 0.0 oz.
(Maximum Allowable = 5 ounces)
- C. For the following 25 minutes: 0.0 oz.
(Maximum Allowable = 1 oz./minute)
- D. Spillage Location Details: No leakage occurred

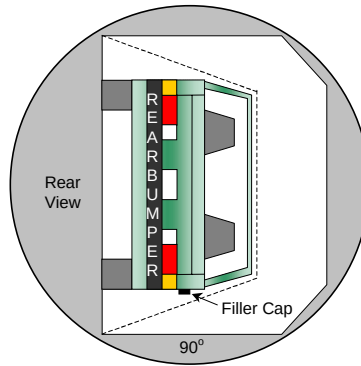
DATA SHEET NO. 13
FMVSS 301 STATIC ROLLOVER DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

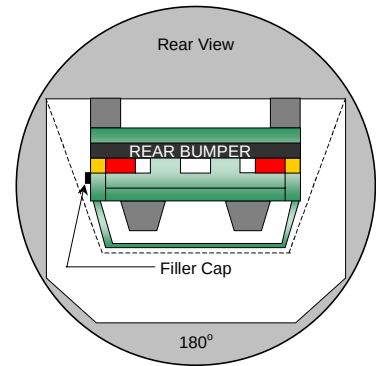
NHTSA No.: M20510
 Test Date: 5/7/02



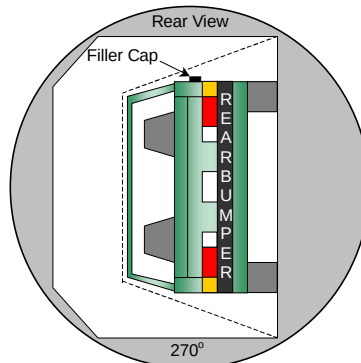
0° to 90°



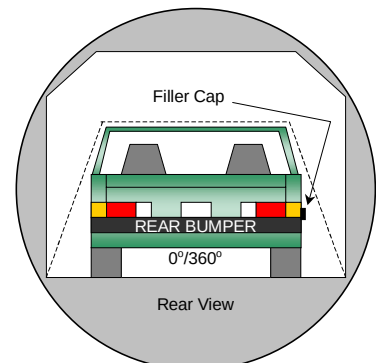
90° to 180°



180° to 270°



270° to 360°



1. The specified fixture rollover rate for each 90° of rotation is 60 to 120 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. No solvent leakage occurred during rollover.

Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° to 90°	83	300	0
90° to 180°	78	300	0
180° to 270°	79	300	0
270° to 360°	78	300	0

DATA SHEET NO. 14
VEHICLE MEASUREMENTS

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
Test Program: 2002 NHTSA 35mph NCAP

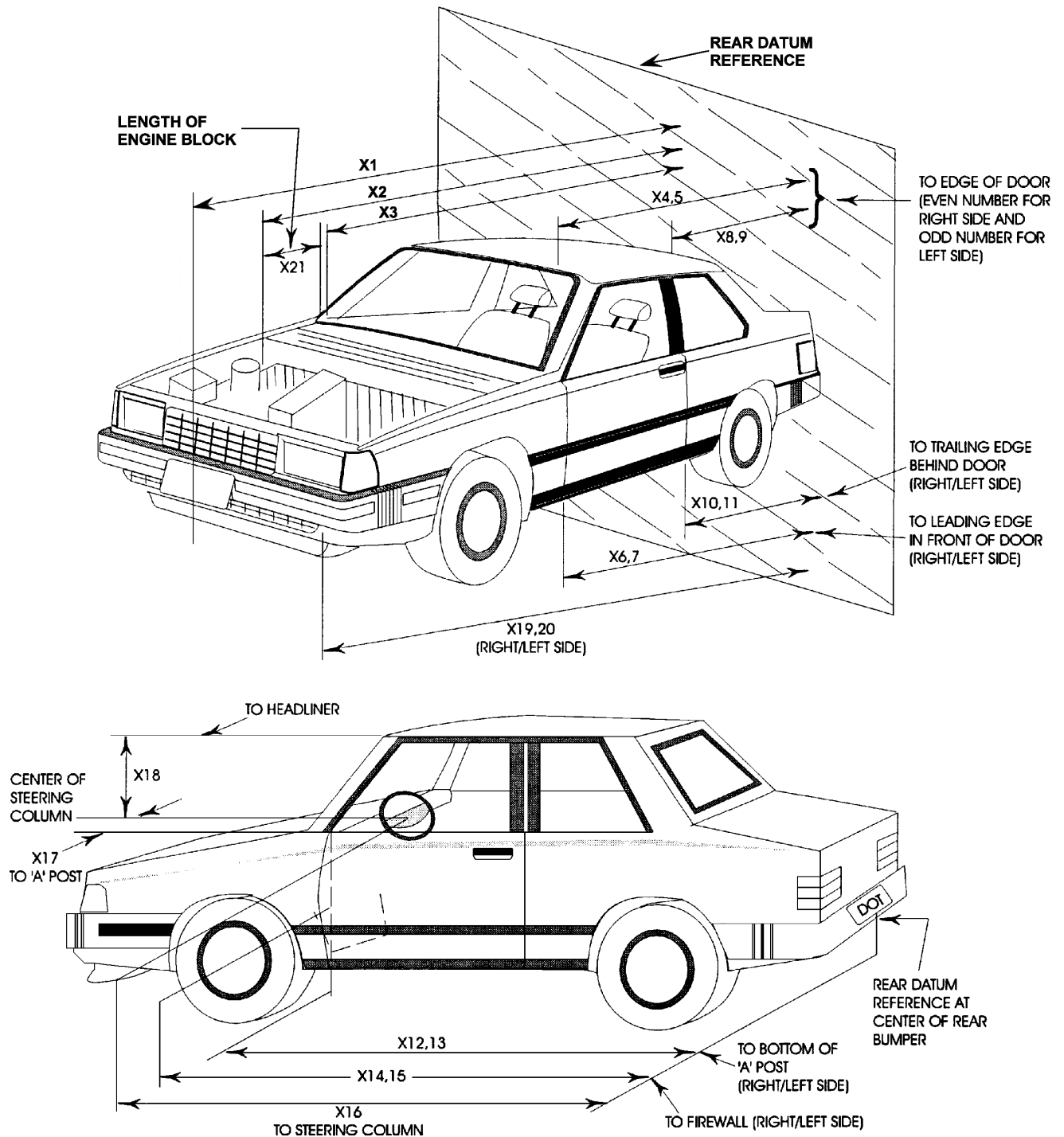
NHTSA No.: M20510
Test Date: 5/7/02

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	mm	4499	4019	-480
2	RSOV to front of engine	mm	3981	3777	-204
3	RSOV to firewall centerline	mm	3440	3342	-98
4	RSOV to leading edge of right door	mm	3105	3124	19
5	RSOV to leading edge of left door	mm	3103	3110	7
6	RSOV to lower leading edge of right door	mm	3073	3076	3
7	RSOV to lower leading edge of left door	mm	3069	3064	-5
8	RSOV to upper trailing edge of right door	mm	2057	2075	18
9	RSOV to upper trailing edge of left door	mm	2059	2067	8
10	RSOV to lower trailing edge of right door	mm	2049	2049	0
11	RSOV to lower trailing edge of left door	mm	2046	2041	-5
12	RSOV to bottom of right 'A' pillar	mm	3098	3106	8
13	RSOV to bottom of left 'A' pillar	mm	3091	3092	1
14	RSOV to firewall on right side	mm	3384	3314	-70
15	RSOV to firewall of left side	mm	3375	3282	-93
16	RSOV to steering column	mm	2705	2694	-11
17	Center of steering column to left 'A' pillar	mm	385	415	30
18	Center of steering column to headlining	mm	430	425	-5
19	RSOV to right side of front bumper	mm	4309	3981	-328
20	RSOV to left side of front bumper	mm	4309	3920	-389
21	Length of engine block	mm	460	460	0
RD	RSOV to right side of dash panel	mm	2915	2900	-15
CD	RSOV to center of dash panel	mm	2832	2787	-45
LD	RSOV to left side of dash panel	mm	2903	2896	-7

DATA SHEET NO. 14...(CONTINUED)
VEHICLE MEASUREMENTS

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02



DATA SHEET NO. 15
CAMERA LOCATIONS

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
Test Date: 5/7/02

No.	Camera View	Location (mm)			Angle (Deg.)	Film Plane to Head	Lens (mm)	Speed (fps)
		X	Y	Z				
1	Right Side, Real Time	3454	10973	1245	0	1651	Zoom	24
2	Left Side, No. 1	2000	-8250	1270	0	7937	13	1030
3	Left Side, No. 2	1060	-6370	1630	-1	6194	25	1060
4	Left Side, No. 3	6500	-10580	4640	-16	11632	65	1000
5	Left Side, No. 4	1460	-8250	3340	-17	8274	19	1000
6	Left Side, No. 5	1460	-8250	2970	-16	8183	19	910
7	Right Side, No. 1	2400	8150	1590	-2	7844	15	N/A
8	Right Side, No. 2	1000	7180	1590	0	6995	35	1030
9	Right Side, No. 3	7860	8900	2800	-9	10365	80	960
10	Right Side, No. 4	2750	9600	1520	0	9300	50	N/A
11	Overhead Overall	250	0	4460	-86	N/A	13	930
12	Front View, Driver	2970	-380	1330	-36	N/A	12	1100
13	Front View, Passenger	2970	380	1330	-7	N/A	13	840
14	Pit Camera, Engine	650	0	-1360	-90	N/A	10	850
15	Pit Camera, Fuel Tank	3760	0	-1360	-55	N/A	10	1100
16	Driver Belt	2290	-320	1130	-4	N/A	13	N/A
17	Passenger Belt	2290	-320	1130	-4	N/A	13	N/A
18	Left Side Extra	N/A	N/A	N/A	N/A	N/A	N/A	N/A

X - Barrier Face Y - Monorail Centerline Z - Ground

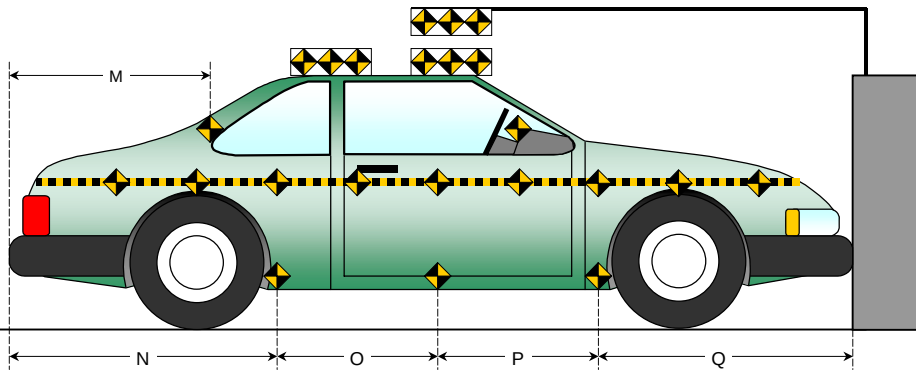
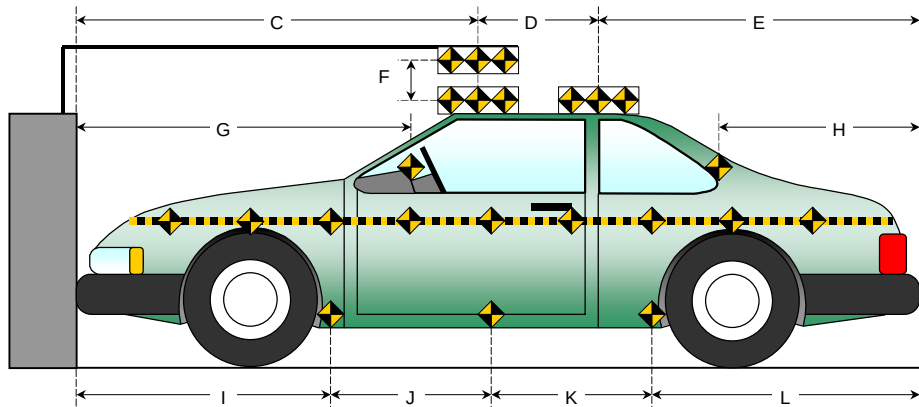
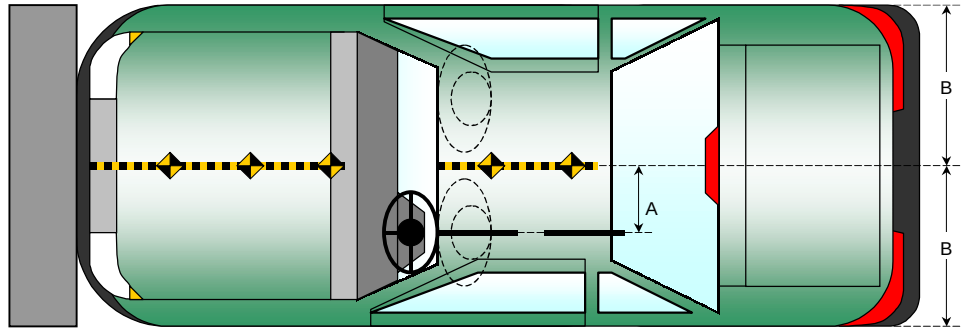
DATA SHEET NO. 16 **PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02

All Dimensions
 in mm

Item	Value
A	335
B	850
C	2214
D	609
E	1688
F	155
G	1641
H	1154
I	1351
J	866
K	866
L	1426
M	1143
N	1426
O	863
P	863
Q	1350



DATA SHEET NO. 17
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

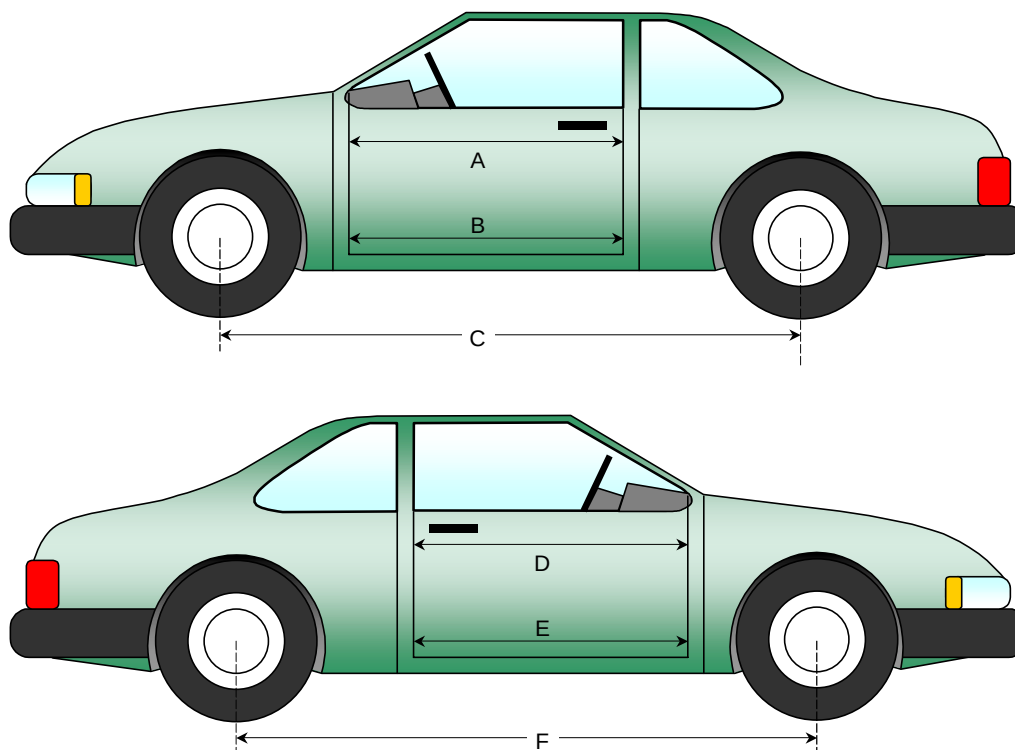
NHTSA No.: M20510
 Test Date: 5/7/02

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	970	963	-7
B	Left Side Lower	mm	899	894	-5
D	Right Side Upper	mm	967	961	-6
E	Right Side Lower	mm	872	868	-4

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheel base	mm	2554	2465	-89
F	Right Side Wheel base	mm	2554	2525	-29



DATA SHEET NO. 17...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

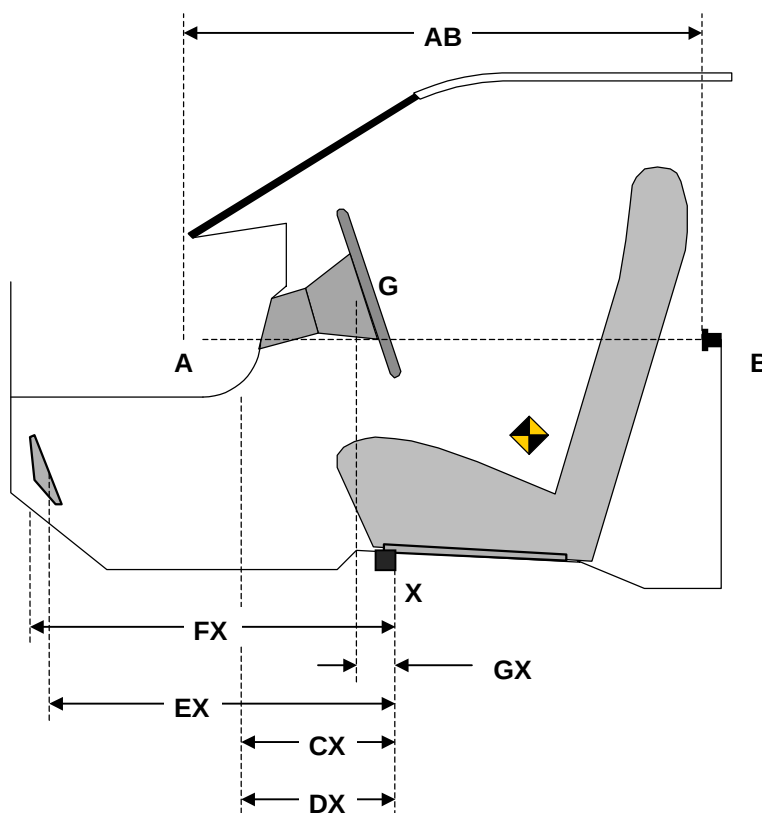
Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside window jam)	mm	970	963	-7
CX	Left Knee Bolster to X	mm	305	308	3
DX	Right Knee Bolster to X	mm	307	284	-23
EX	Brake Pedal to X	mm	593	400	-193
FX	Foot Rest to X	mm	597	558	-39
GX	Center of Steering Wheel Hub to X	mm	105	105	0

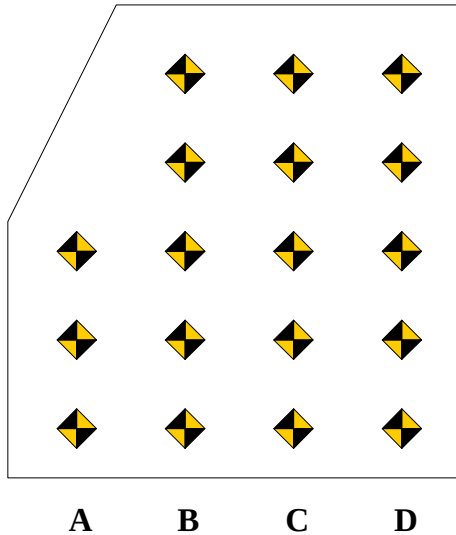
X = Left Front Seat Outboard Anchor Bolt Head



DATA SHEET NO. 17...(CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02



1 Measurement reference point for X and Z-axis is the forward outboard seat mounting bolt.

2 Columns A through D are evenly spaced.

3 Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3,4 and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.

DRIVER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		683	681	681		577	575	543		-106	-106	-138
2		607	603	602		545	529	517		-62	-74	-85
3	506	507	503	503	485	468	462	453	-21	-39	-41	-50
4	408	409	405	405	403	400	396	395	-5	-9	-9	-10
5	308	305	305	300	305	301	300	292	-3	-4	-5	-8

DRIVER FLOOR PAN Z-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1		-28	-45	-40		8	-23	-18		36	22	22
2		-93	-97	-95		-83	-100	-110		10	-3	-15
3	-102	-105	-107	-105	-103	-144	-160	-171	-1	-39	-53	-66
4	-103	-104	-105	-107	-108	-135	-157	-173	-5	-31	-52	-66
5	-108	-109	-108	-105	-108	-123	-126	-151	0	-14	-18	-46

DATA SHEET NO. 17...(CONTINUED) **VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

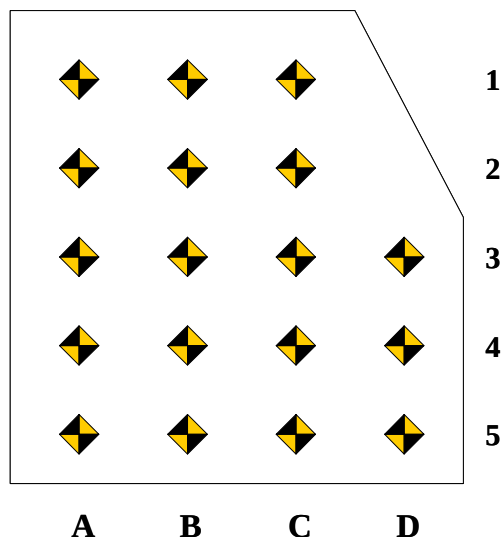
NHTSA No.: M20510
 Test Date: 5/7/02

Measurement reference point for X and Z axis is the forward outboard seat mounting bolt.

Columns A through D are evenly spaced.

Rows 1 and 2 are on the toe kick portion of the floor pan. Rows 3,4, and 5 are located on the most level portion of the floor pan.

Row 3 will be at the intersection of the toe kick and the level sections of the floor pan.



PASSENGER FLOOR PAN X-AXIS

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	708	710	713		610	632	615		-98	-78	-98	
2	610	612	613		565	575	576		-45	-37	-37	
3	512	511	513	515	465	482	485	499	-47	-29	-28	-16
4	412	410	412	414	400	401	400	405	-12	-9	-12	-9
5	311	310	311	313	296	304	300	308	-15	-6	-11	-5

PASSENGER FLOOR PAN Z-AXIS

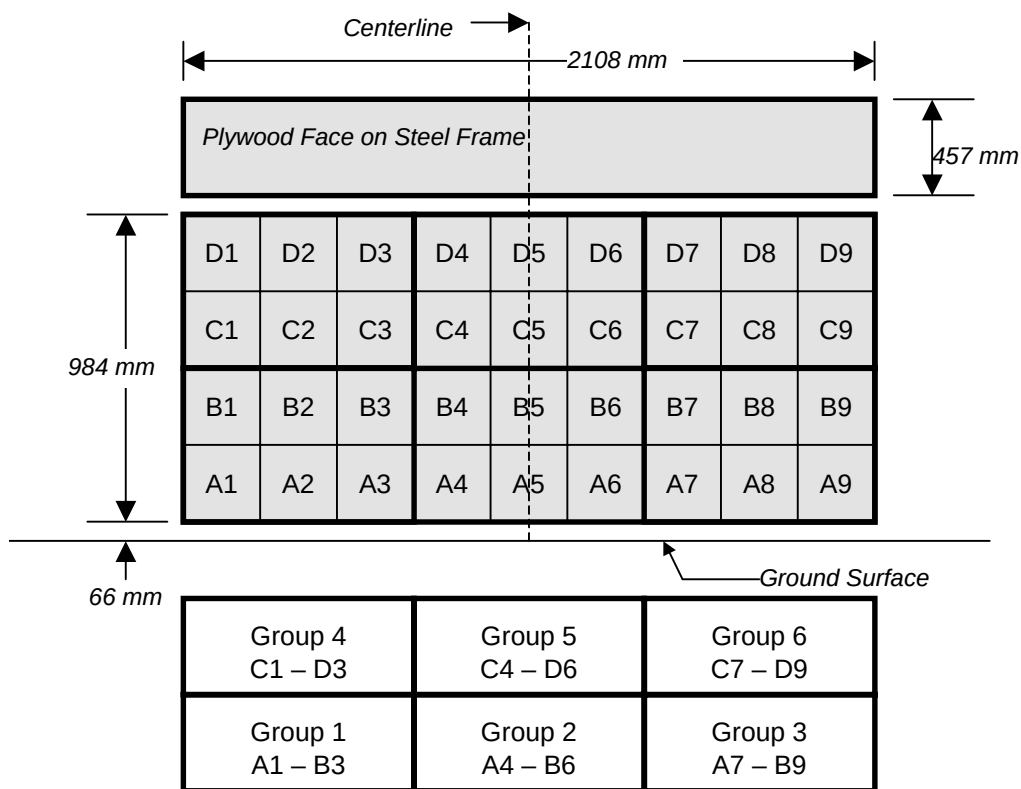
	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
1	-52	-48	-41		-25	-30	-12		27	18	29	
2	-102	-101	-101		-134	-122	-111		-32	-21	-10	
3	-105	-103	-103	-99	-129	-158	-132	-113	-24	-55	-29	-14
4	-107	-107	-110	-102	-140	-138	-117	-122	-33	-31	-7	-20
5	-100	-109	-118	-120	-130	-119	-119	-118	-30	-10	-1	2

DATA SHEET NO. 18
FIXED BARRIER LOAD CELL LOCATIONS

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02

36 Load Cell Rigid Barrier (NHTSA Standard)
Load Cell Locations on Fixed Barrier



6 Groups of 6 Load Cells Each

The Data is presented in Appendix C with the following requirements:

- 1.) Data from 36 individual load cells
- 2.) Sum data from 6 groupings shown above (6 cells/group)
- 3.) Total or sum of all 36 individual load cells
- 4.) Sum of all 36 individual load cells vs. vehicle dynamic crush

DATA SHEET NO. 19
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
 Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
 Test Date: 5/7/02

VEHICLE INFORMATION

VIN: KNAFB121025173522
 Vehicle Size Category: 4-Door Sedan

Wheel base (mm): 2554
 Test Weight (kg): 1424

ACCELEROMETER DATA

Accelerometer Location: Left rear floor pan
 Cal. Procedure/Interval: 6 months / drop test
 Integration Algorithm: NHTSA Standard
 Impact Velocity (km/h): 55.71
 Velocity Change (km/h): 64.3

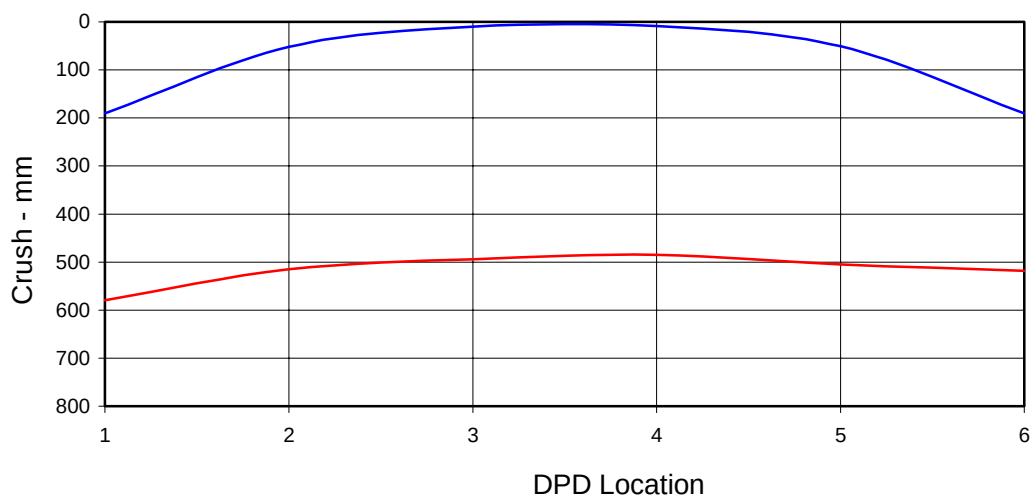
Linearity: Good
 Time of Separation (msec): 67.3

CRUSH PROFILE

Collision Deformation Classification: 12FDEW6
 Damage Region Length (mm): 1401

Midpoint of Damage: Vehicle Centerline
 Impact Mode: Full Frontal

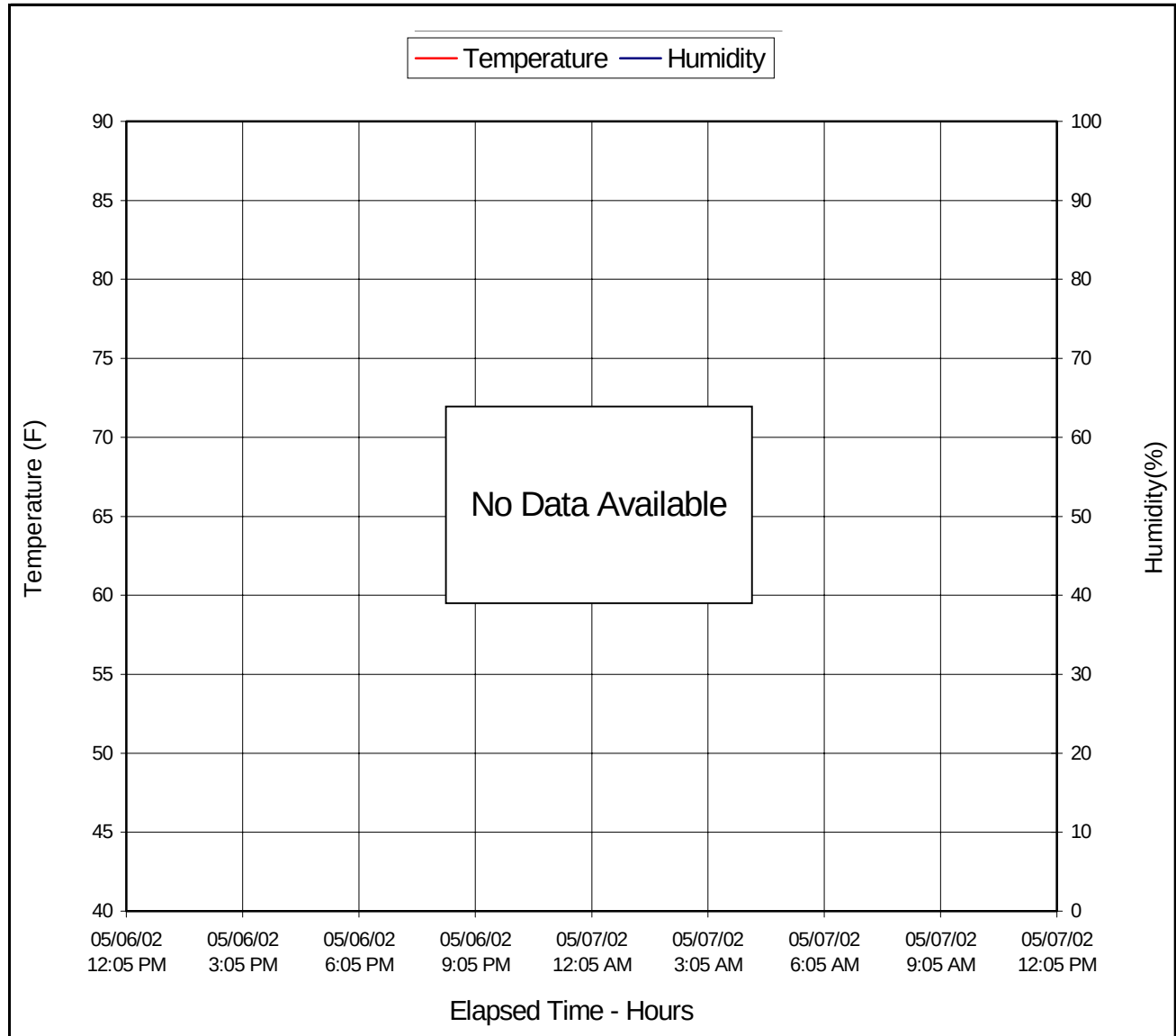
No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	190	579	-389
C2	Crush zone 2 on left side	mm	52	515	-463
C3	Crush zone 3 on left side	mm	10	494	-484
C4	Crush zone 4 on right side	mm	9	485	-476
C5	Crush zone 5 on right side	mm	51	505	-454
C6	Crush zone 6 at right side	mm	190	518	-328



DATA SHEET NO. 20
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2002 Kia Spectra 4 Door Sedan
Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510
Test Date: 5/7/02



APPENDIX A

PHOTOGRAPHS

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Figure A-1: Right Front, as Received



Figure A-2: Left Rear, as Received

MFD. BY KIA MOTORS CORP.

DATE: 11/08/01

GVWR	3660	LB	GAWR FRT	1918	LB	GAWR RR	1742	LB
PNBV	1660	KG	PNBE FRT	870	KG	PNBE RR	790	KG

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 KNAFB121025173522

TYPE PASSENGER CAR

C5

EXTERIOR PAINT COLORS

BODY	VR	MLDG.	INT. TRIM	TAPE	R	S	AX	TR
------	----	-------	-----------	------	---	---	----	----

F

DSO

Figure A-3: Vehicle Certification Label

SPECTRA**RECOMMENDED TIRE SIZE AND INFLATION PRESSURE (COLD)**
*DIMENSIONS DES PNEUS et PRESSIONS DE GONFLAGE RECOMMANDÉES (à froid)***A**

LOAD RANGE CHARGE NOMINALE	TIRE SIZE (LOAD RANGE C&D NOT PERMISSIBLE) DIMENSIONS DES PNEUS (CHARGES NOMINALES C ET D NON PERMISES)	PRESSURE PRESSION			
		FRONT AVANT	REAR ARRIÈRE		
STD	P185/65R14 85H	29 psi 200 kPa	29 psi 200 kPa		
T	T115/70D15 T115/70R15 TEMPORARY SPARE PNEU DE SECOURS PROVISoire	60 psi 415 kPa			
TOTAL LOAD = OCCUPANTS PLUS LUGGAGE CHARGE GLOBALE = OCCUPANTS PLUS BAGAGES					
MODEL MODÈLE	MAXIMUM LOAD CHARGE MAXIMALE	OCCUPANTS OCCUPANTS	DISTRIBUTION RÉPARTITION		
			FRONT AVANT	REAR ARRIÈRE	LUGGAGE BAGAGES
ALL TOUS	849 lb/385 kg	5	2	3	99 lb/45 kg
SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION			VOIR MANUEL DE CONDUCTEUR POUR DES INFORMATIONS SUPPLÉMENTAIRES		

Figure A-4: Vehicle Tire Label



Figure A-5: Front View, Pre-Test



Figure A-6: Front View, Post-Test



Figure A-7: Left Side View, Pre-Test



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



Figure A-9: Right Side View, Pre-Test



Figure A-10: Right Side View, Post-Test



Figure A-11: Right Front View, Pre-Test



Figure A-12: Right Front View, Post-Test



Figure A-13: Left Rear View, Pre-Test



Figure A-14: Left Rear View, Post-Test

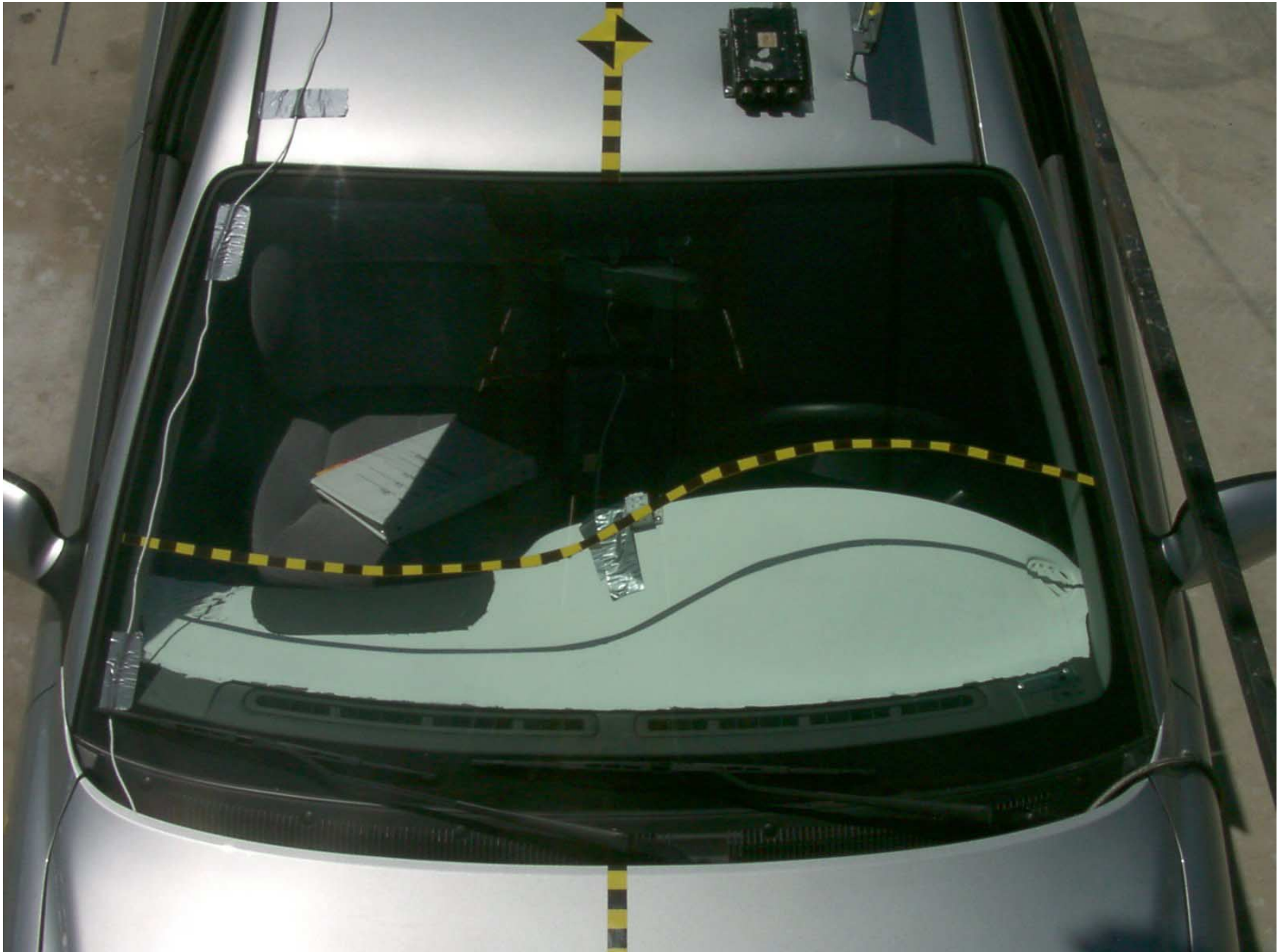


Figure A-15: Windshield, Pre-Test



Figure A-16: Windshield, Post-Test

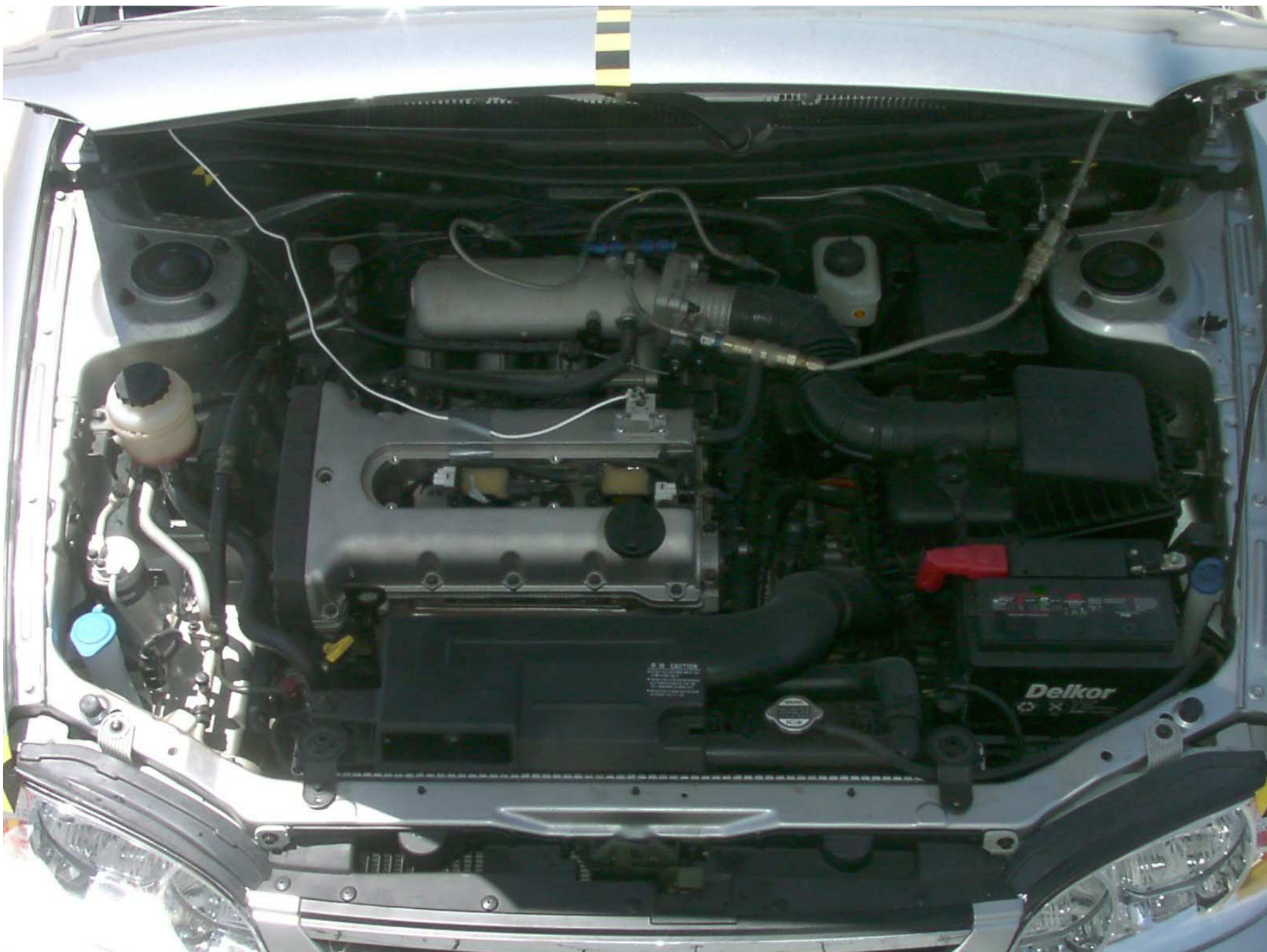


Figure A-17: Engine Compartment, Pre-Test



Figure A-18: Engine Compartment, Post-Test



Figure A-19: Fuel Cap, Pre-test



Figure A-20: Fuel Cap, Post-Test

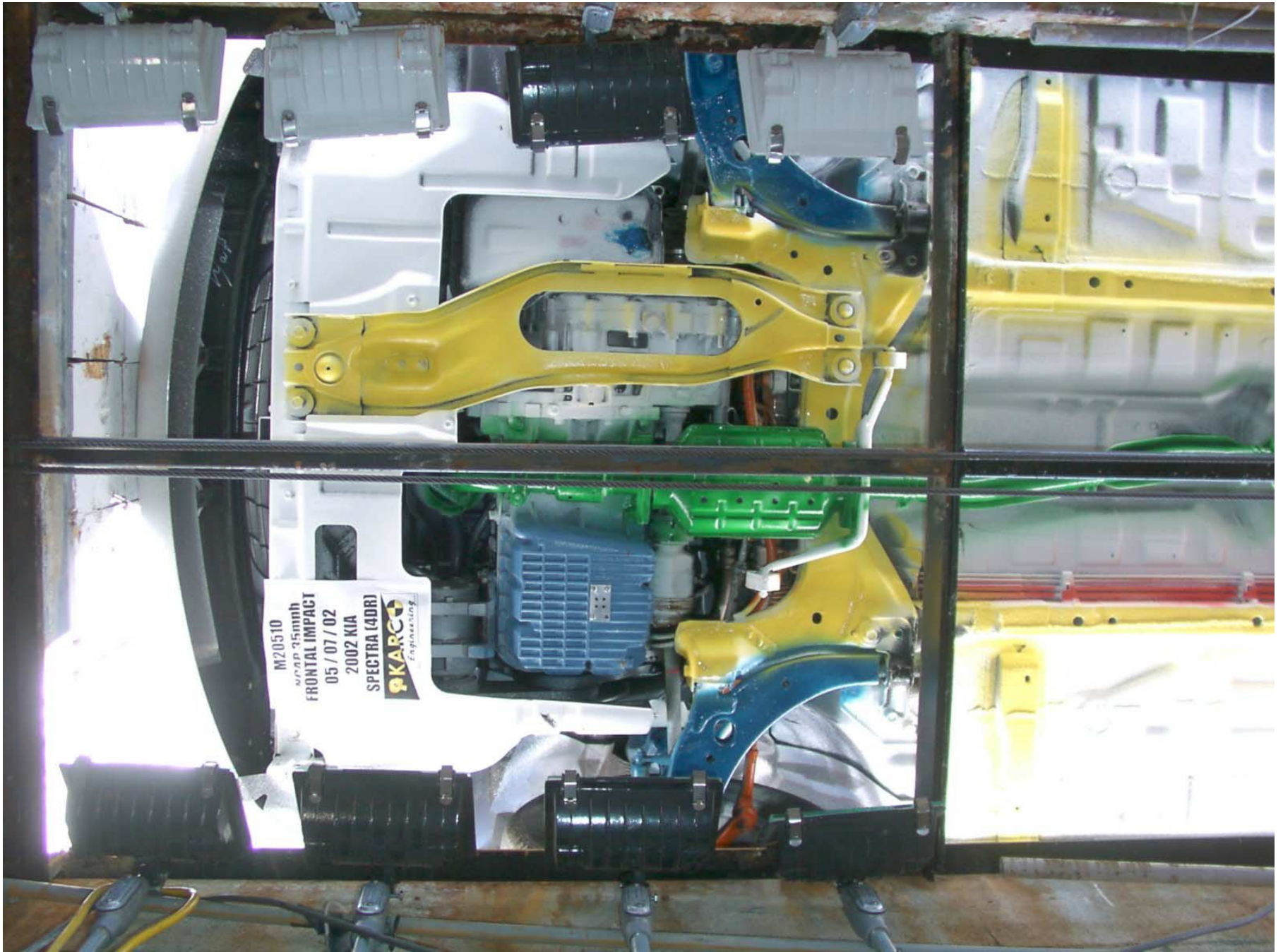


Figure A-21: Front Underside, Pre-Test



Figure A-22: Front Underside, Post-Test



Figure A-23: Rear Underside, Pre-Test



Figure A-24: Rear Underside, Post-Test



Figure A-25: Driver Dummy Front View, Pre-Test



Figure A-26: Driver Dummy Front View, Post-Test



Figure A-27: Driver Dummy Through Window, Pre-Test



Figure A-28: Driver Dummy Through Window, Post-Test



Figure A-29: Driver Dummy Door Open, Pre-Test



Figure A-30: Driver Dummy Door Open, Post-Test



Figure A-31: Driver Dummy 90° To Vehicle, Pre-Test



Figure A-32: Driver Dummy 90° To Vehicle, Post-Test



Figure A-33: Driver Dummy Feet, Pre-Test



Figure A-34: Driver Dummy Feet and Knee Contact, Post-Test



Figure A-35: Driver Side Knee Bolster, Pre-Test



Figure A-36: Driver Side Knee Bolster, Post-Test



Figure A-37: Driver Side Floor Pan, Pre-Test



Figure A-38: Driver Side Floor Pan, Post-Test

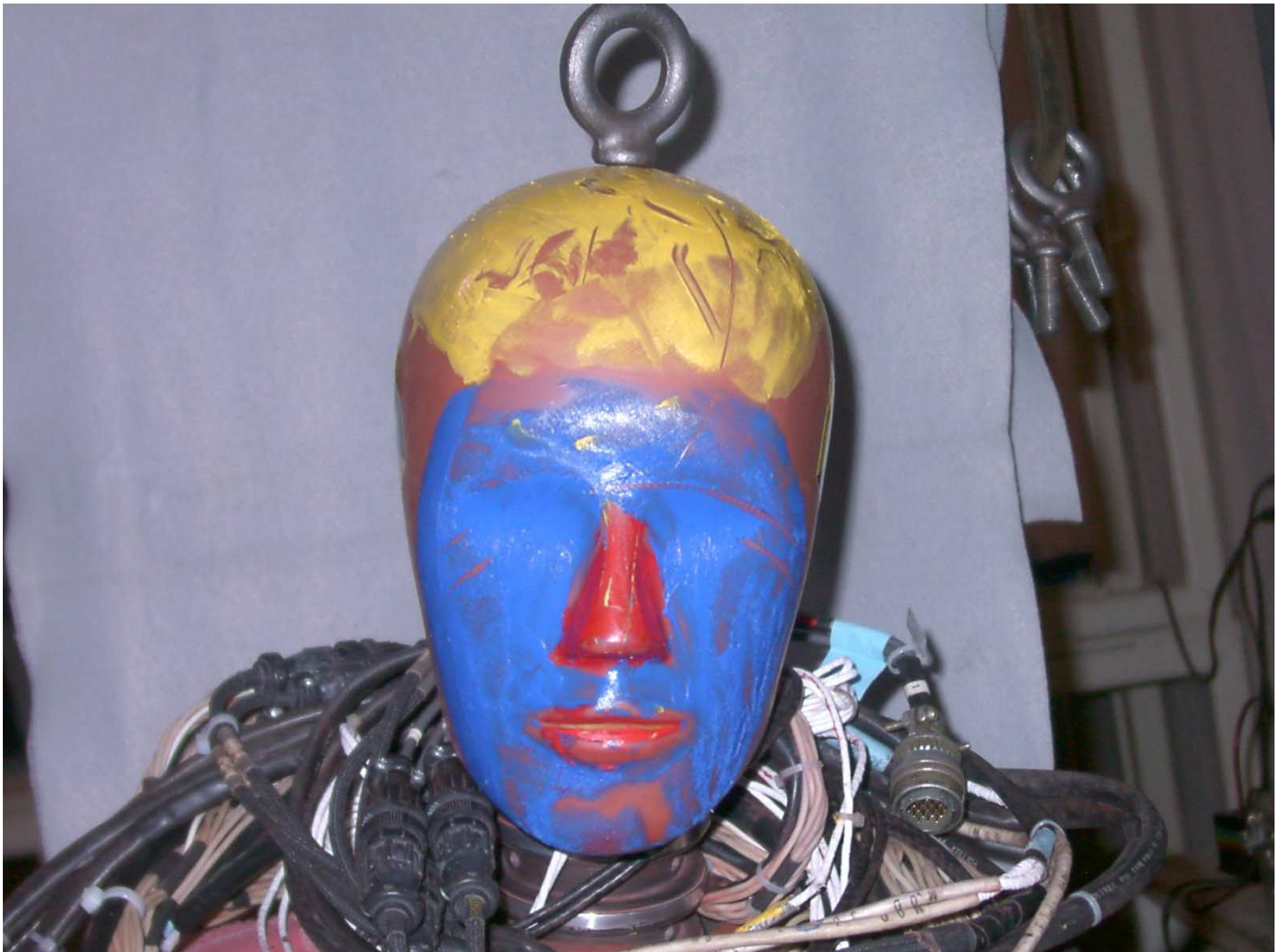


Figure A-39: Driver Dummy Head, Post-Test



Figure A-40: Driver Dummy Contact, Post-Test



Figure A-41: Passenger Dummy Front View, Pre-Test



Figure A-42: Passenger Dummy Front View, Post-Test

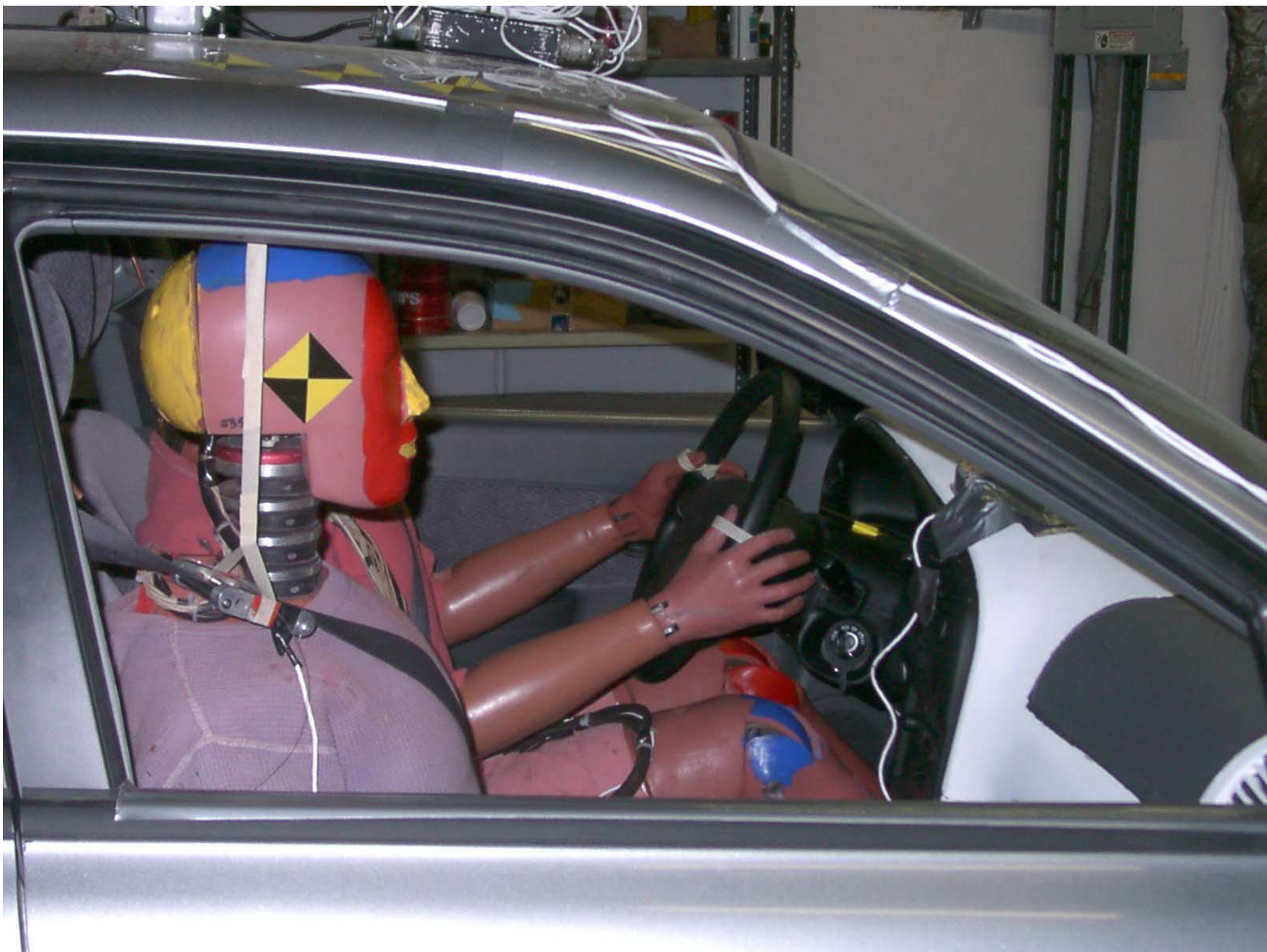


Figure A-43: Passenger Dummy Through Window, Pre-Test



Figure A-44: Passenger Dummy Through Window, Post-Test



Figure A-45: Passenger Dummy Door Open, Pre-Test



Figure A-46: Passenger Dummy Door Open, Post-Test

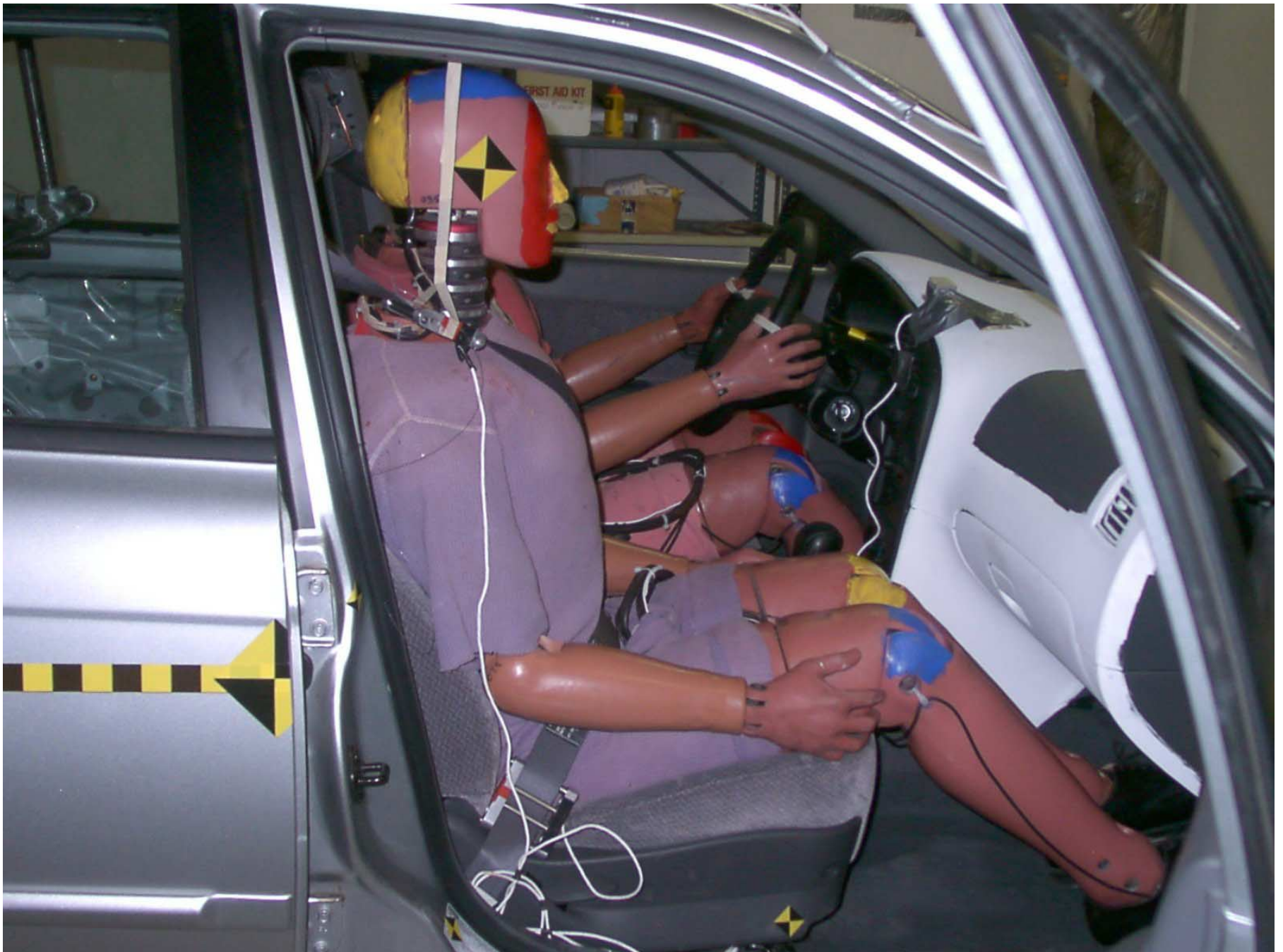


Figure A-47: Passenger Dummy 90° To Vehicle, Pre-Test



Figure A-48: Passenger Dummy 90° To Vehicle, Post-Test



Figure A-49: Passenger Dummy Feet, Pre-Test



Figure A-50: Passenger Dummy Feet and Knee Contact, Post-Test



Figure A-51: Passenger Side Floor Pan, Pre-Test



Figure A-52: Passenger Side Floor Pan, Post-Test



Figure A-53: Passenger Side Knee Bolster, Pre-Test



Figure A-54: Passenger Side Knee Bolster, Post-Test



Figure A-55: Passenger Head, Post-Test



Figure A-56: Passenger Dummy Contact, Post-Test



Figure A-57: ³/₄ Left Rear View of Doors Closed After Impact



Figure A-58: $\frac{3}{4}$ Right Rear View of Doors Closed After Impact



Figure A-59: Vehicle on Rollover Device



Figure A-60: Vehicle During Impact

APPENDIX B

DATA PLOTS

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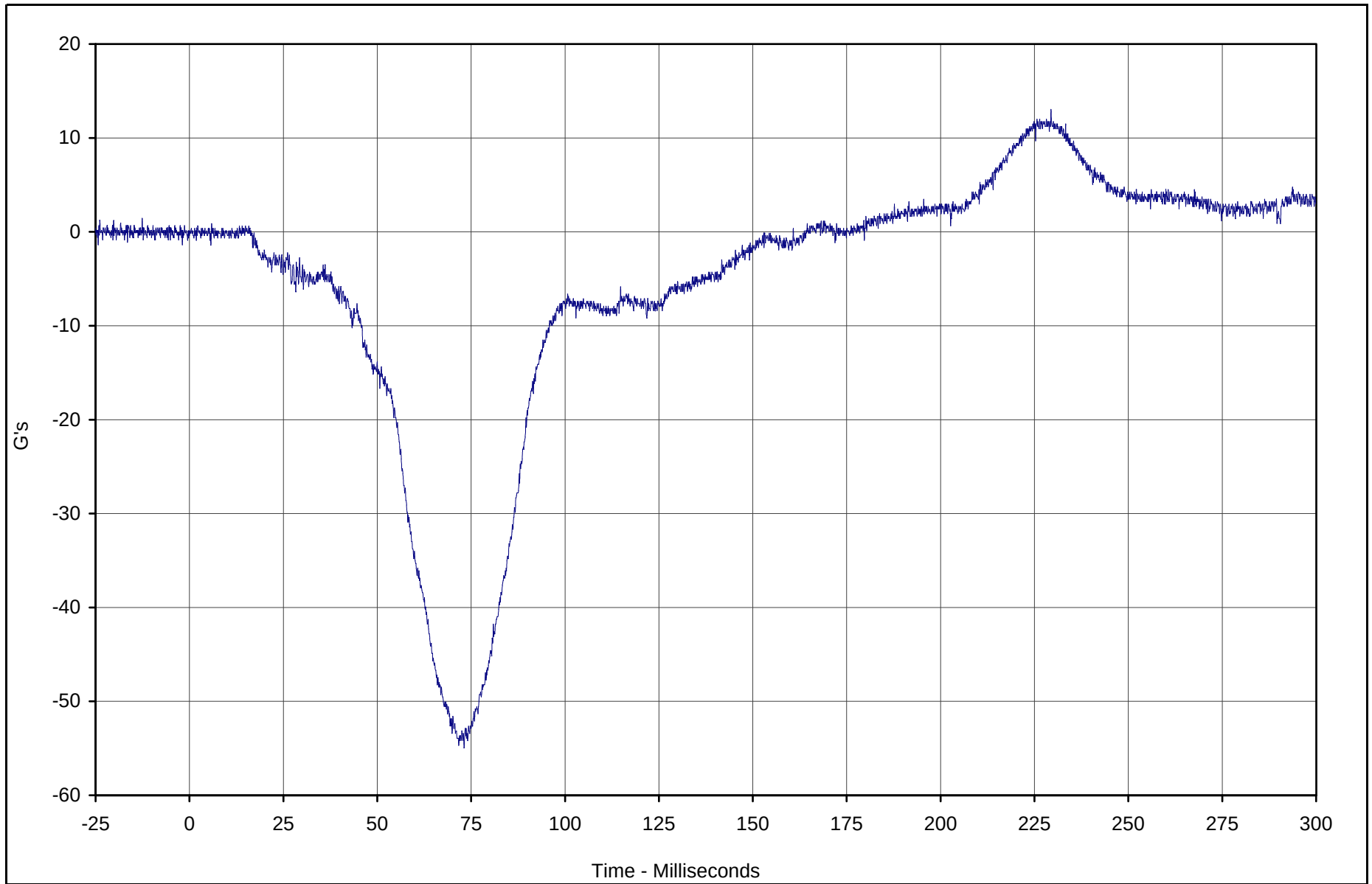
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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary X	001	FIL	G's	13.0	229.4	-55.0	73.1	1000

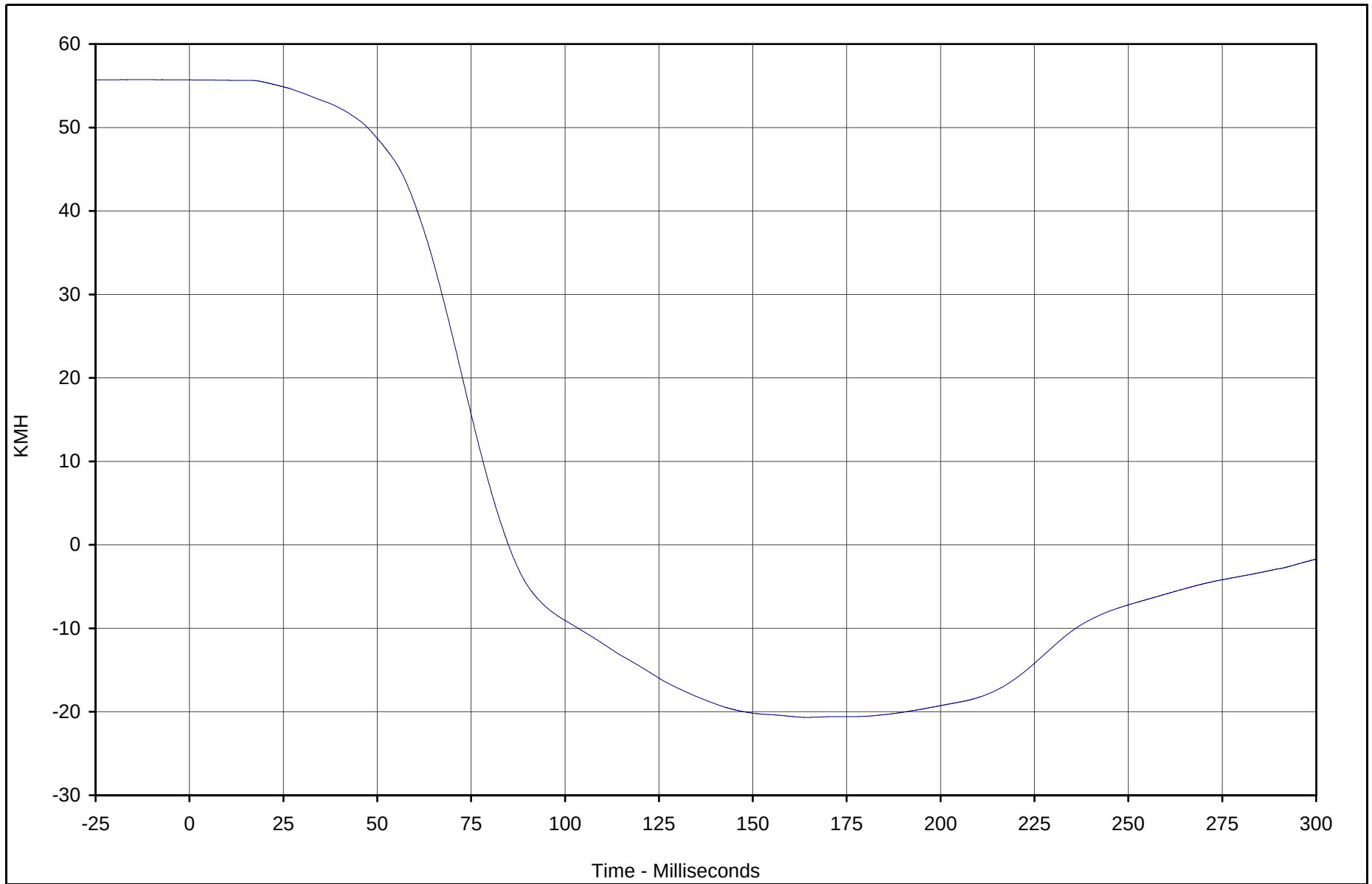


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary X Velocity	001	IN1	KMH	55.7	0.0	-20.7	164.4	180

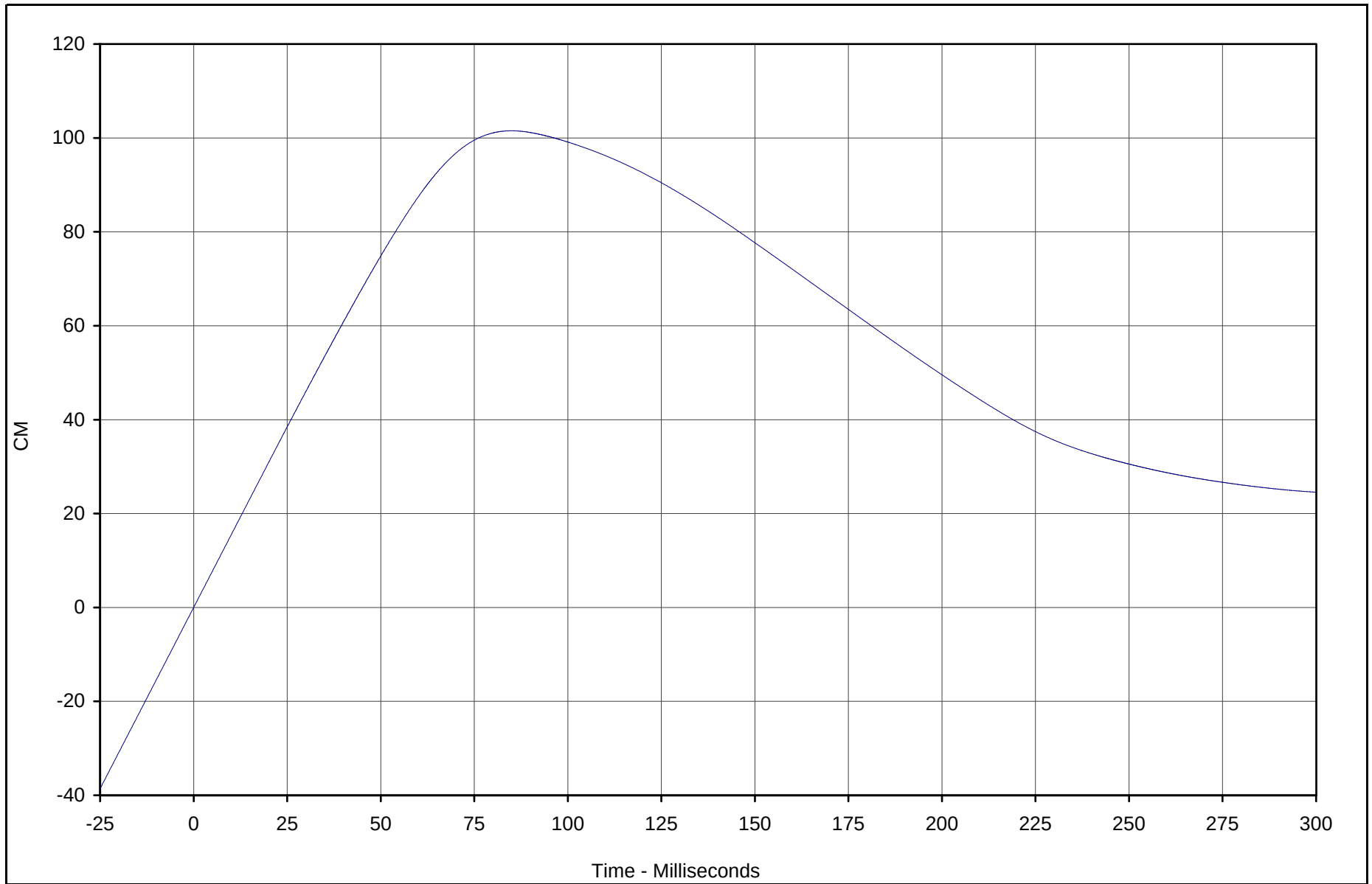


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary X Displ.	001	IN2	CM	101.5	84.9	0.0	0.0	180

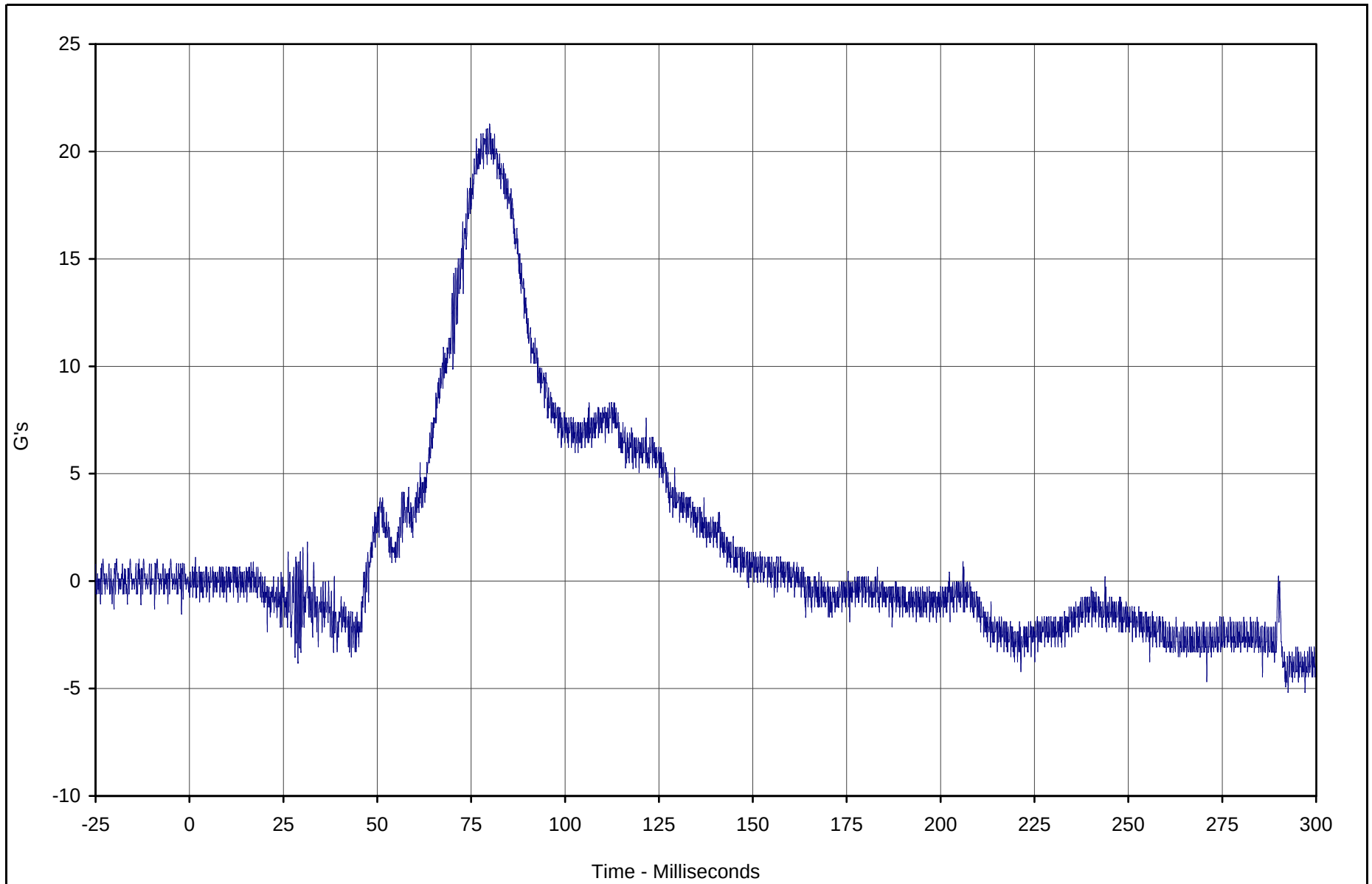


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary Y	002	FIL	G's	21.3	79.9	-5.1	292.5	1000

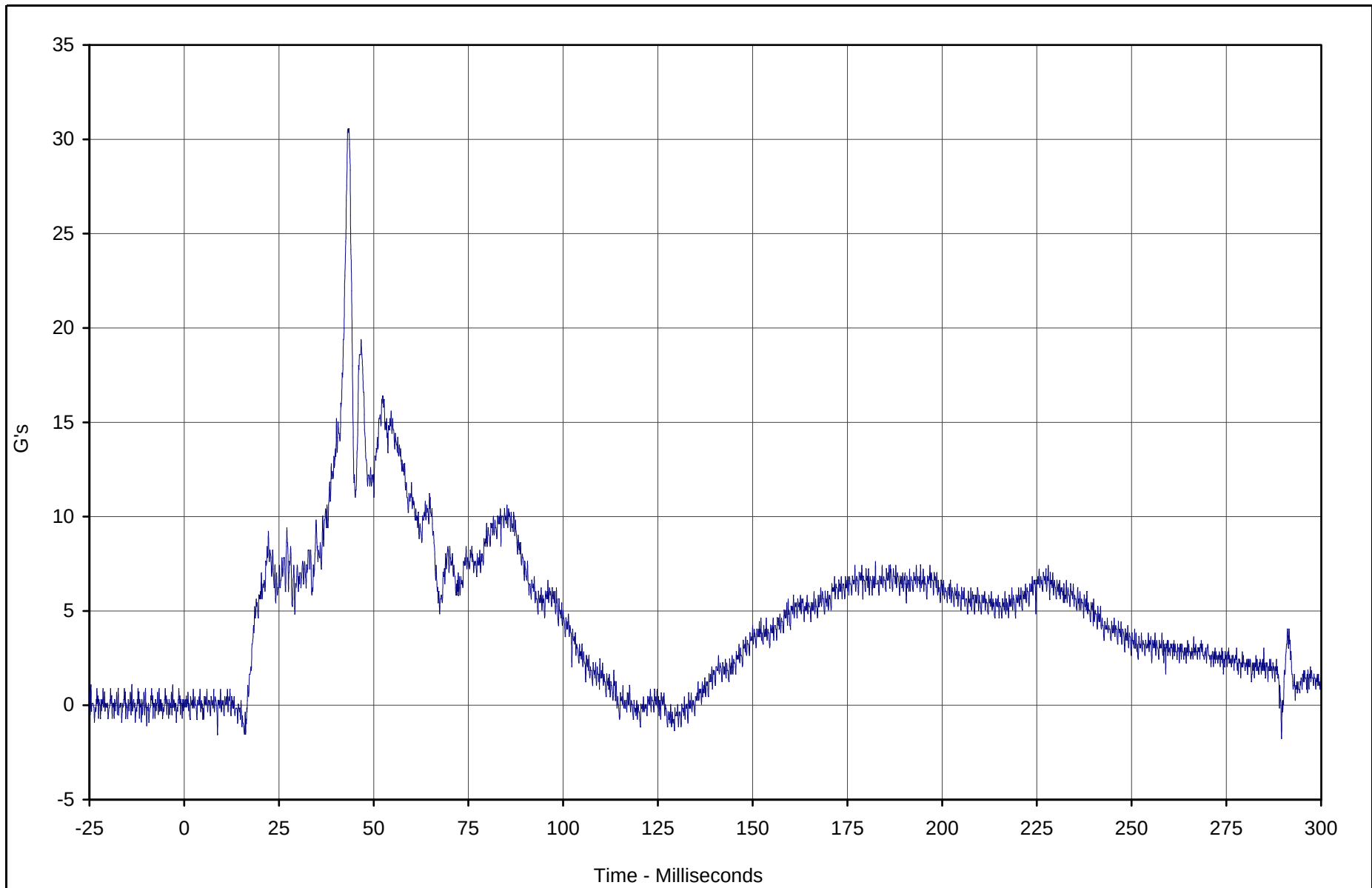


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary Z	003	FIL	G's	30.6	43.2	-1.7	289.6	1000

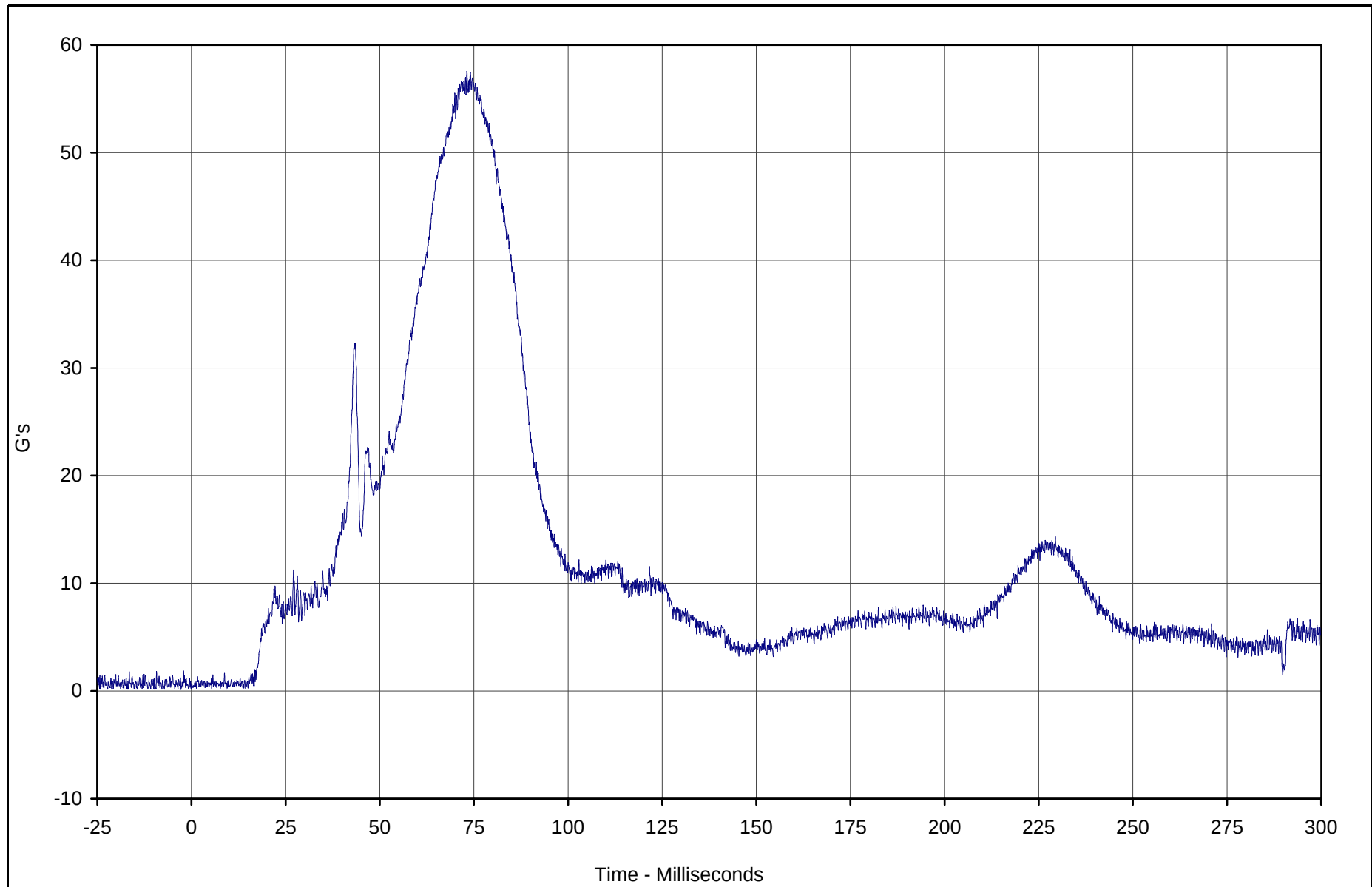


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Resultant Primary	001	RES	G's	57.5	73.1	0.2	5.4	1000

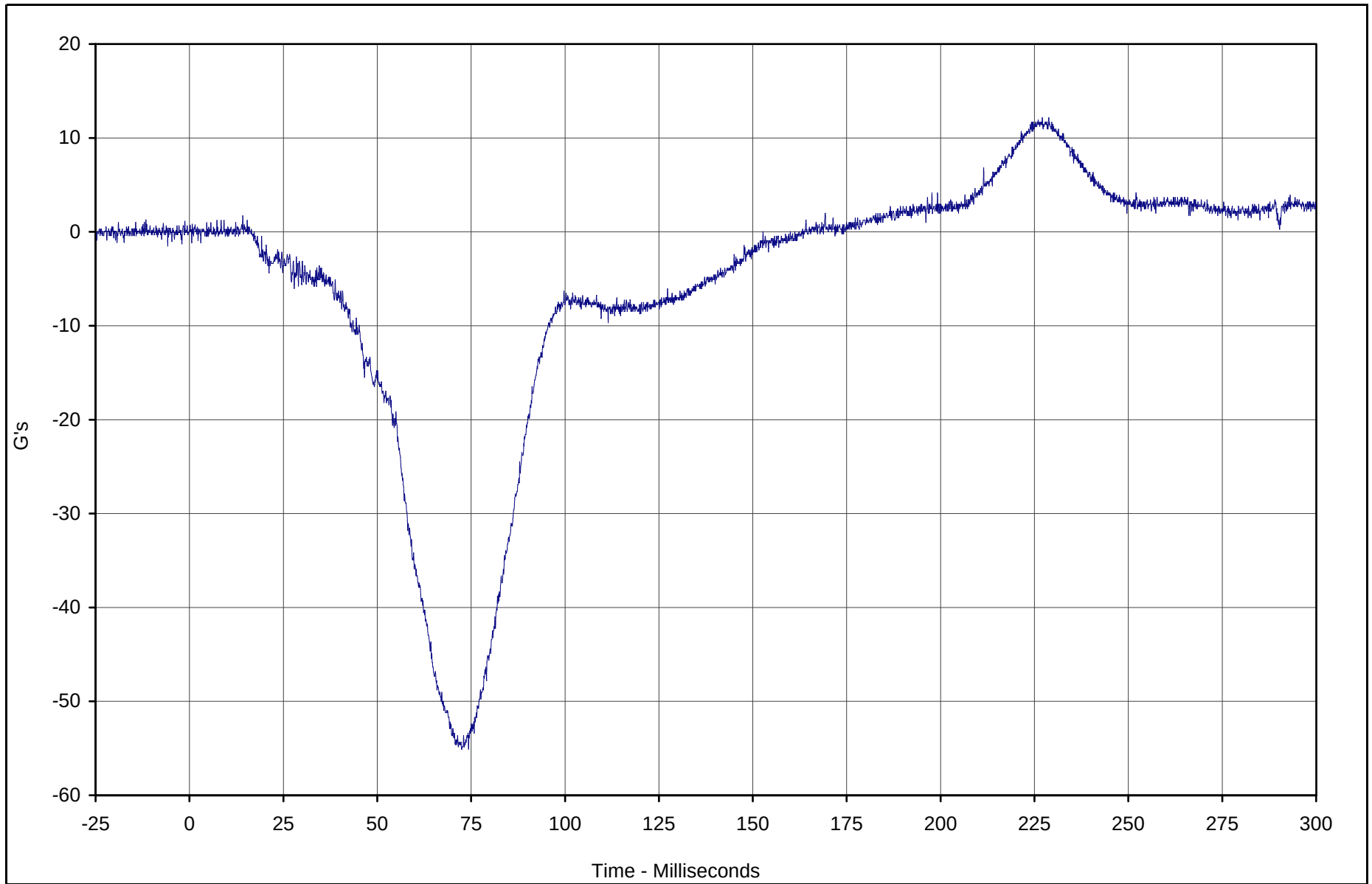


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant X	004	FIL	G's	12.2	227.1	-55.1	72.4	1000

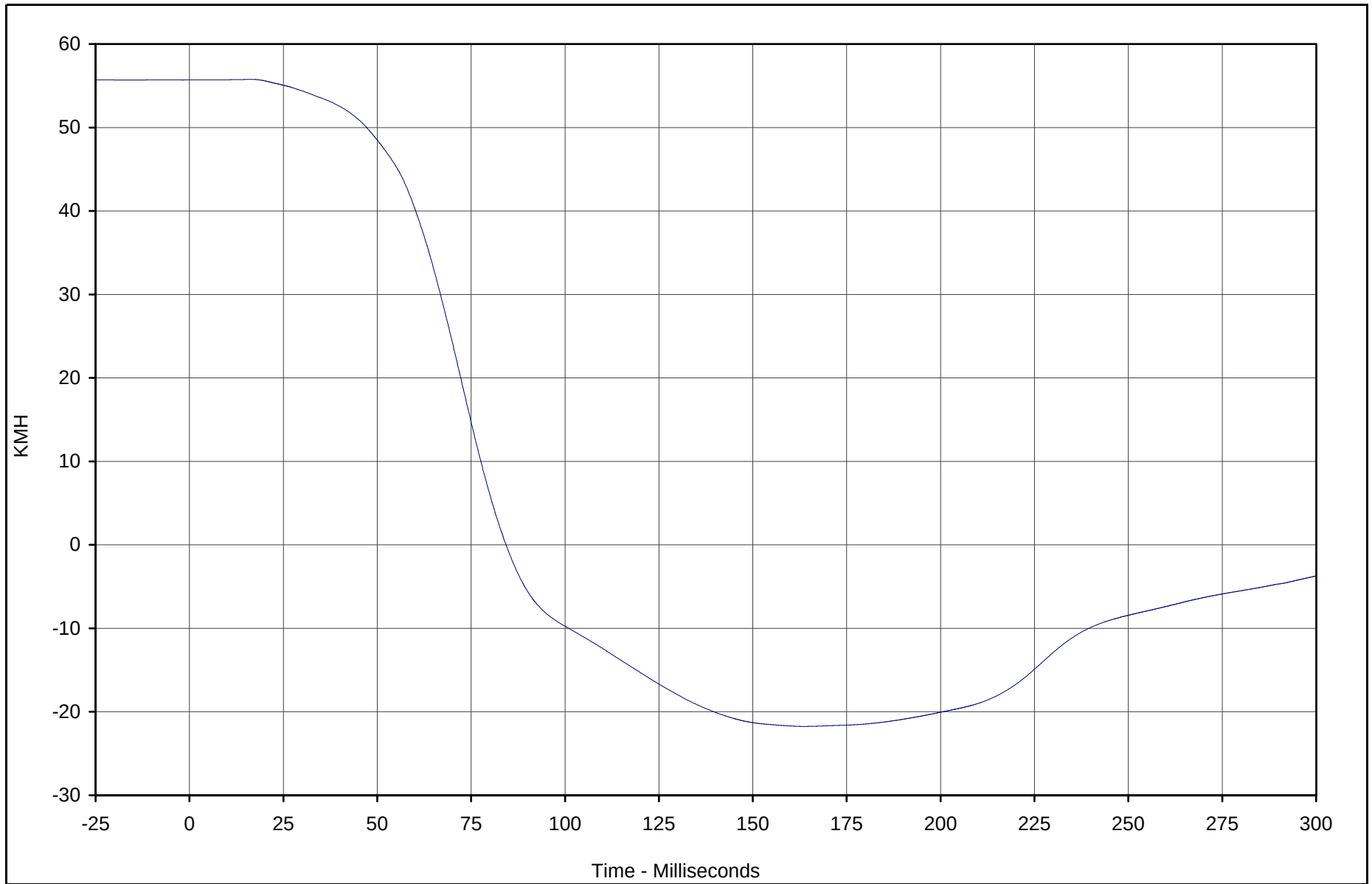


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant X Velocity	004	IN1	KMH	55.8	16.3	-21.7	163.6	180

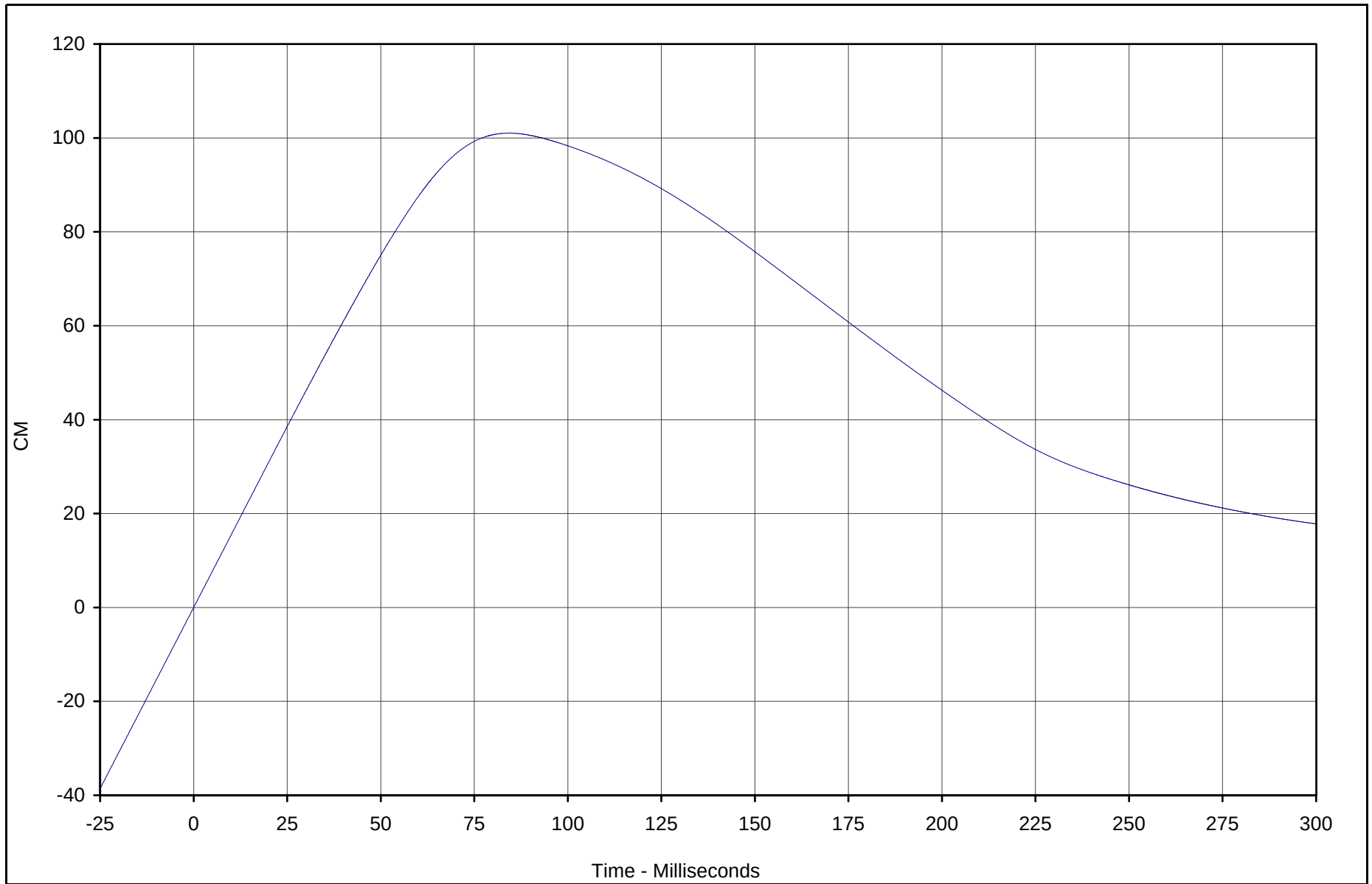


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant X Displ.	004	IN2	CM	101.0	84.3	0.0	0.0	180

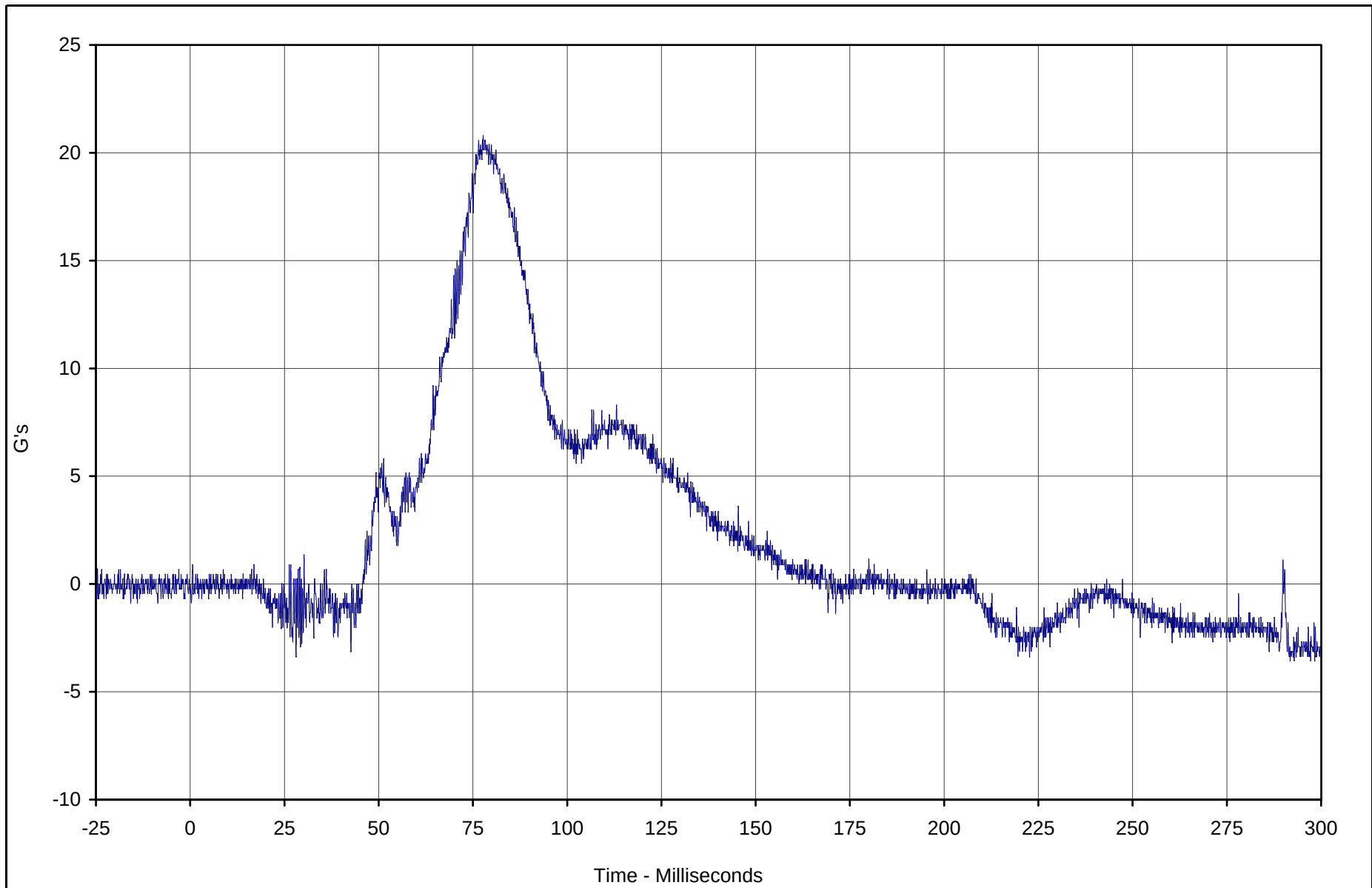


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant Y	005	FIL	G's	20.8	77.7	-3.6	291.8	1000

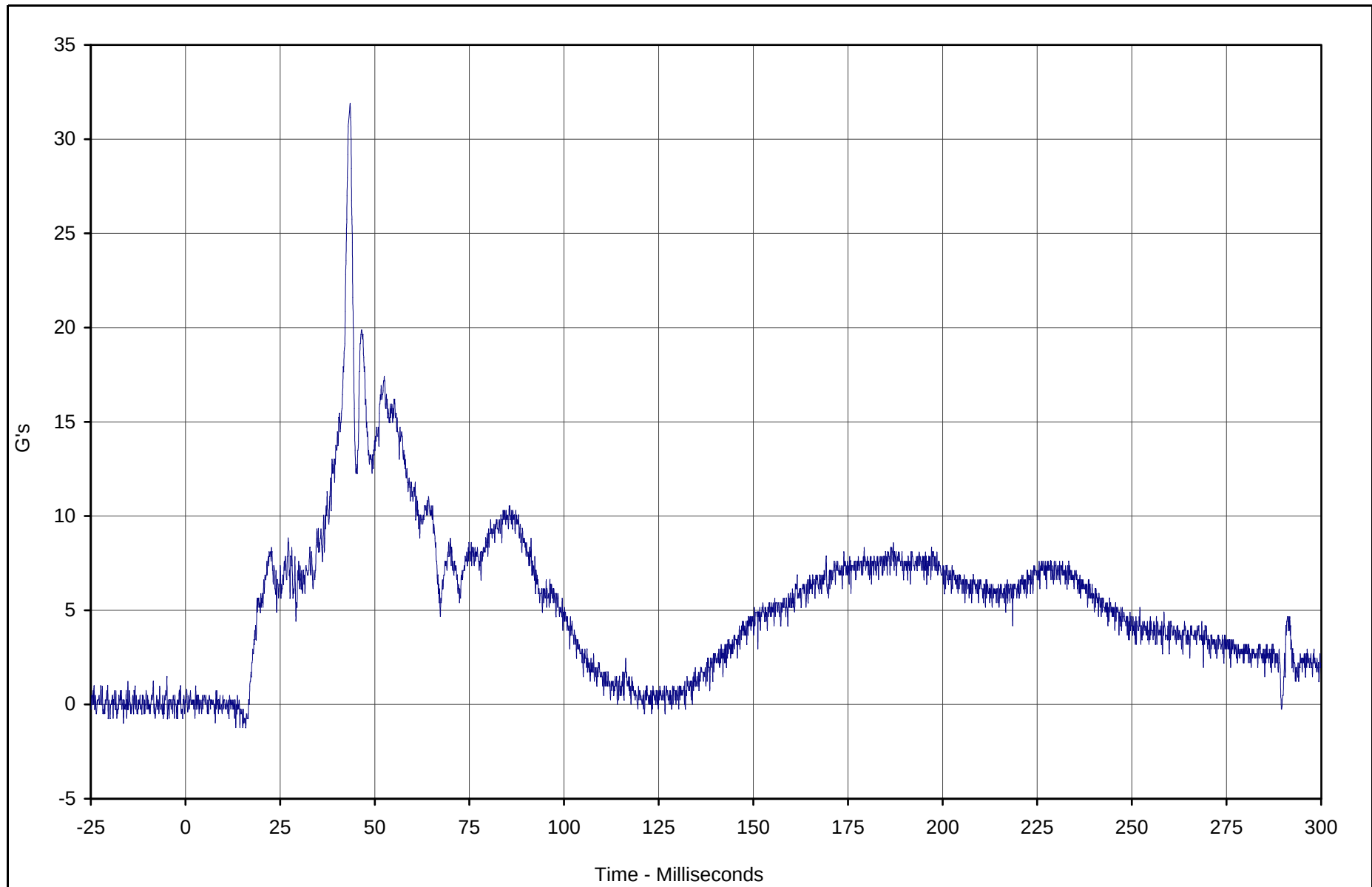


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Redundant Z	006	FIL	G's	31.9	43.5	-1.2	13.3	1000

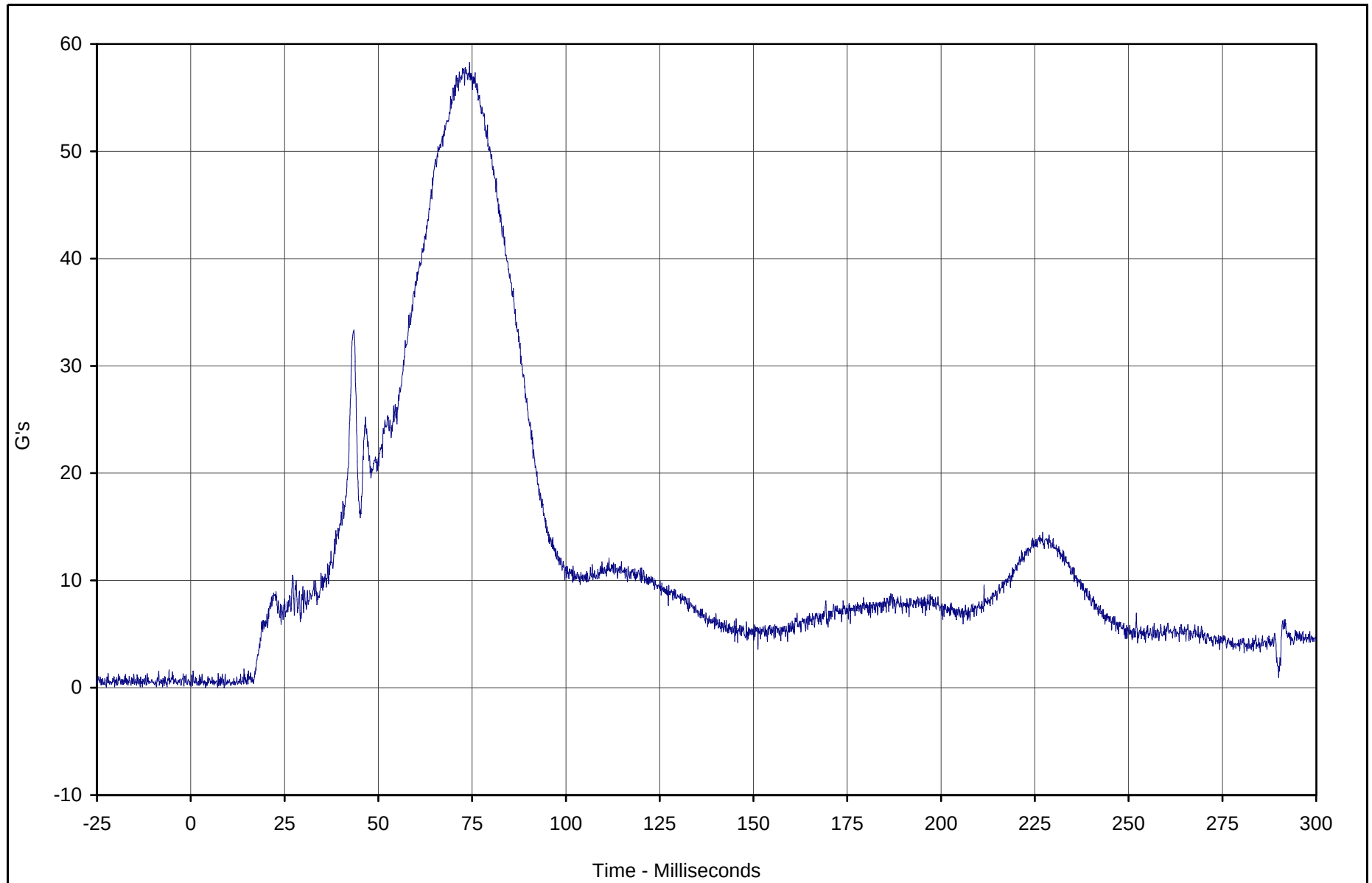


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Resultant Redundant	004	RES	G's	58.3	74.3	0.0	3.9	1000

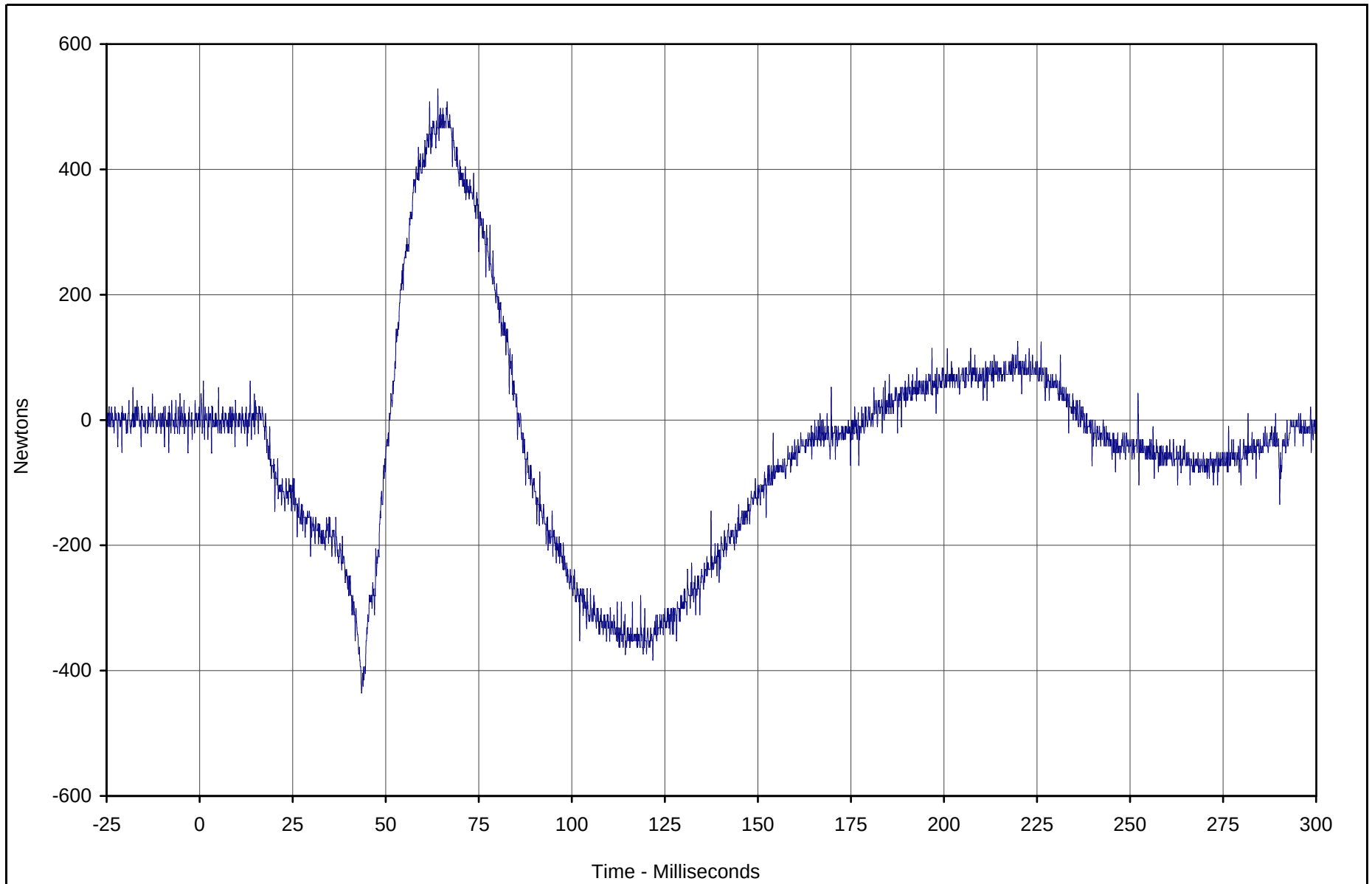


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force X	007	FIL	Newtons	528.7	64.0	-435.4	43.5	1000

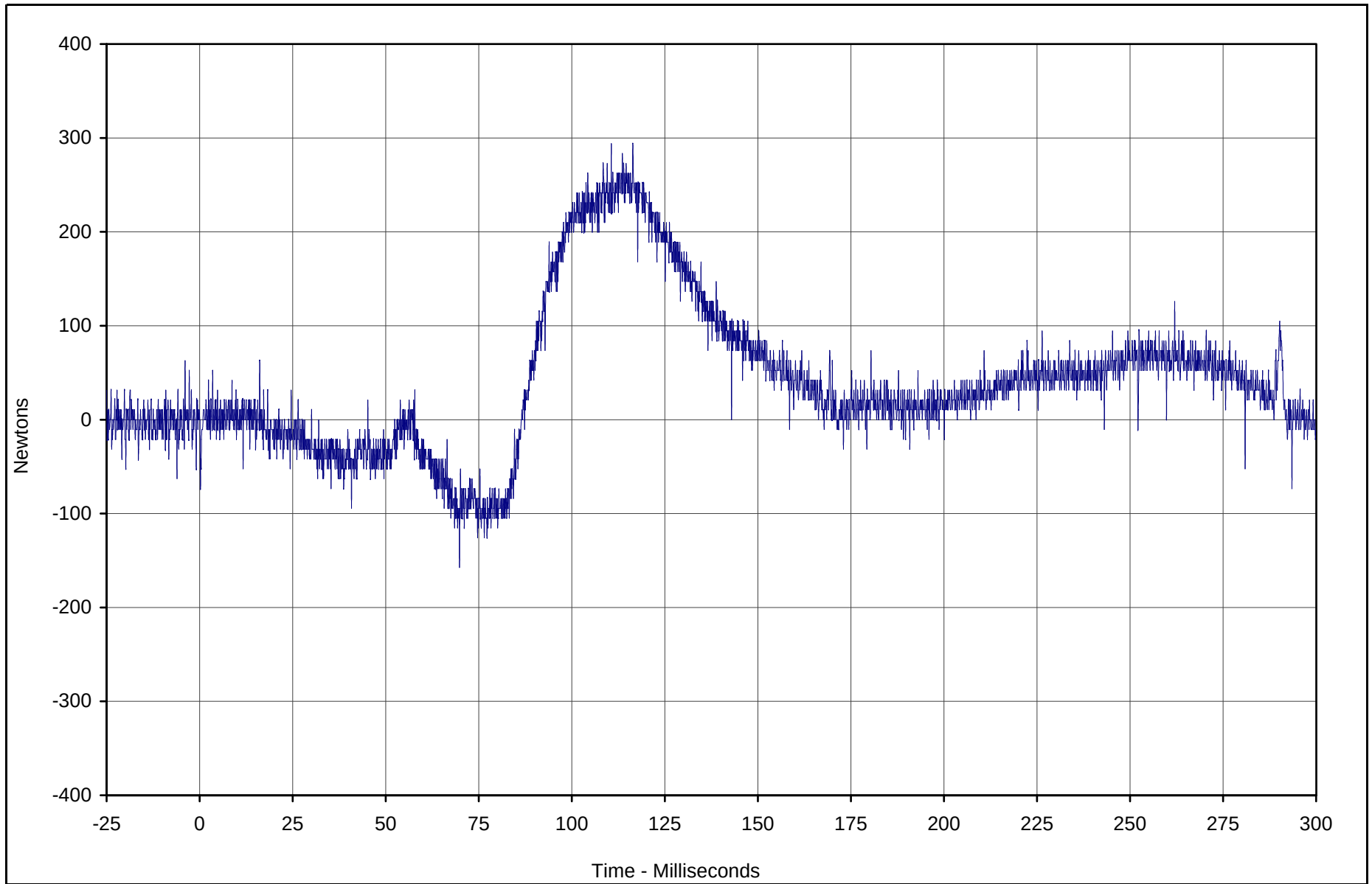


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force Y	008	FIL	Newtons	294.0	110.6	-157.5	69.8	1000

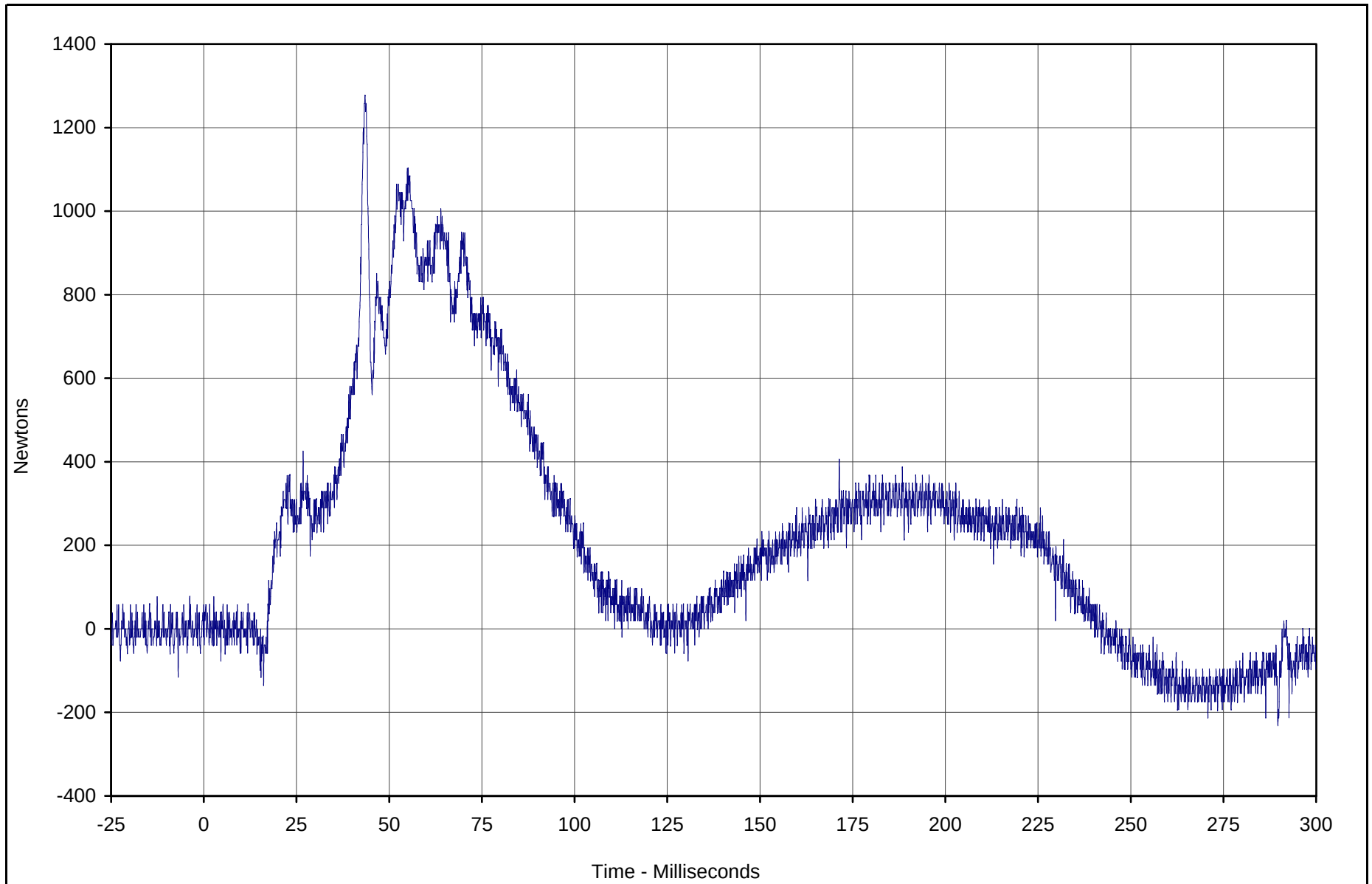


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force Z	009	FIL	Newtons	1276.9	43.5	-232.2	289.7	1000

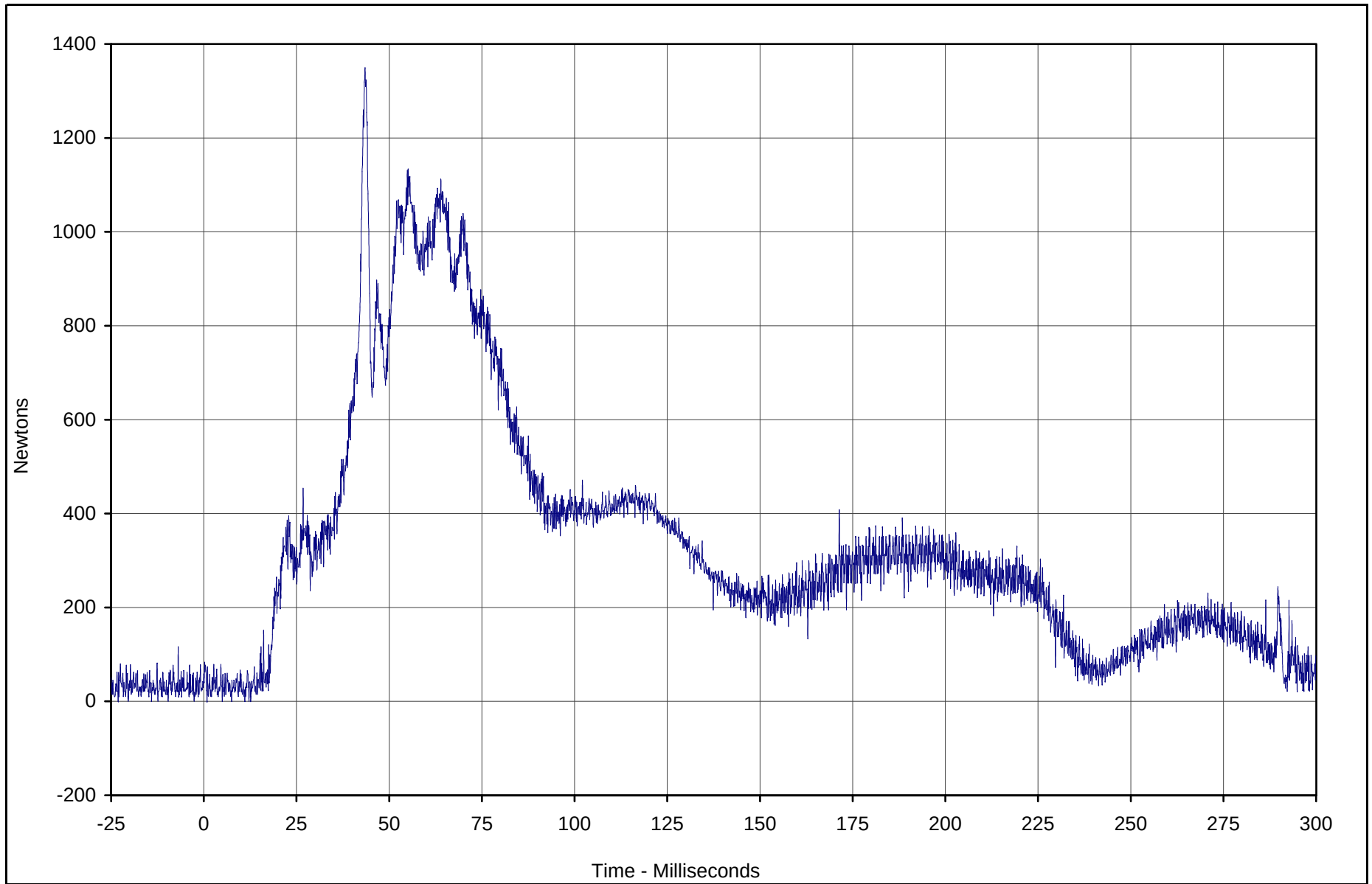


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Force Resultant	007	RES	Newtons	1349.8	43.5	0.0	0.9	1000

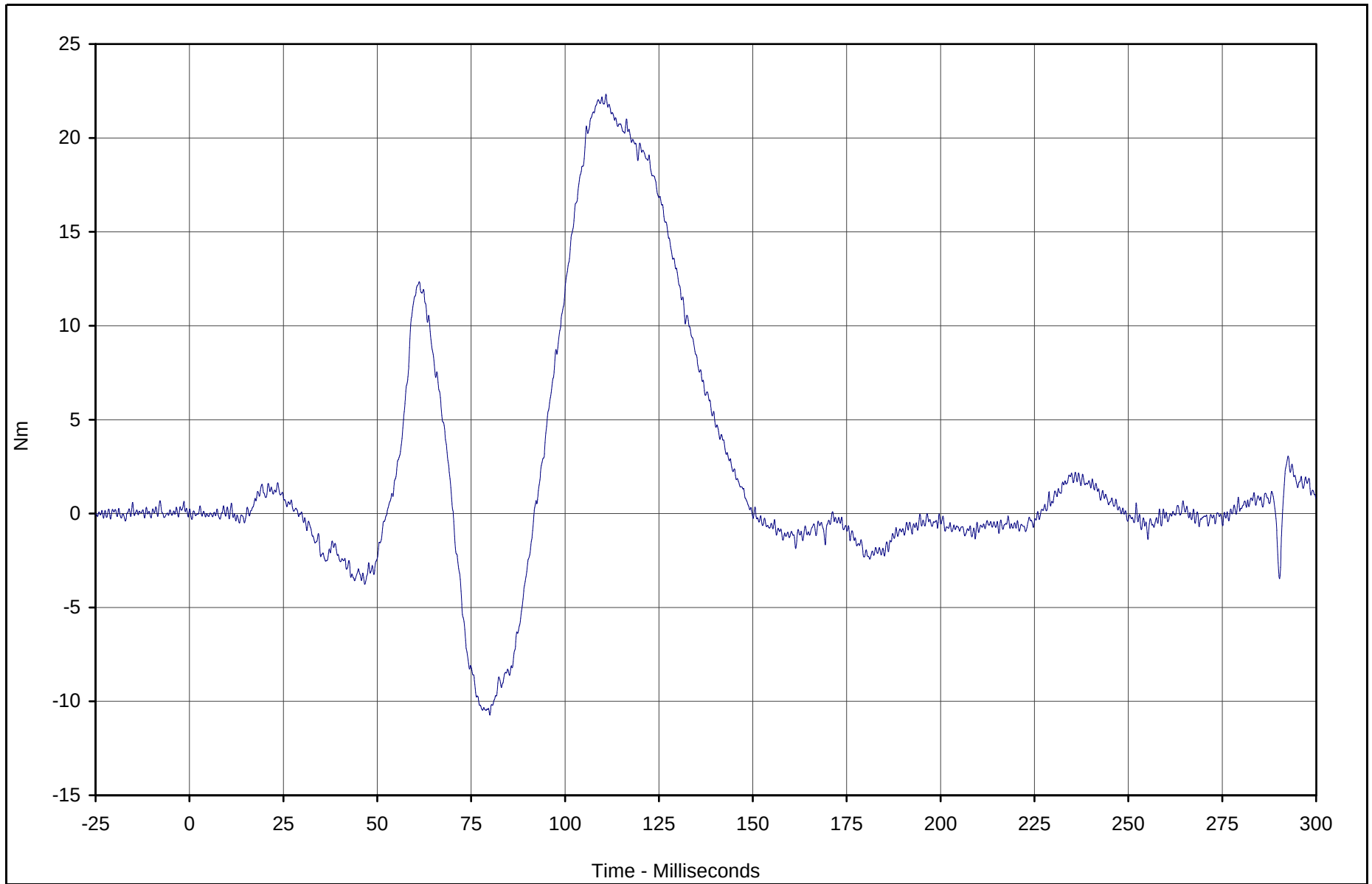


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment X	010	FIL	Nm	22.3	110.9	-10.7	80.0	600

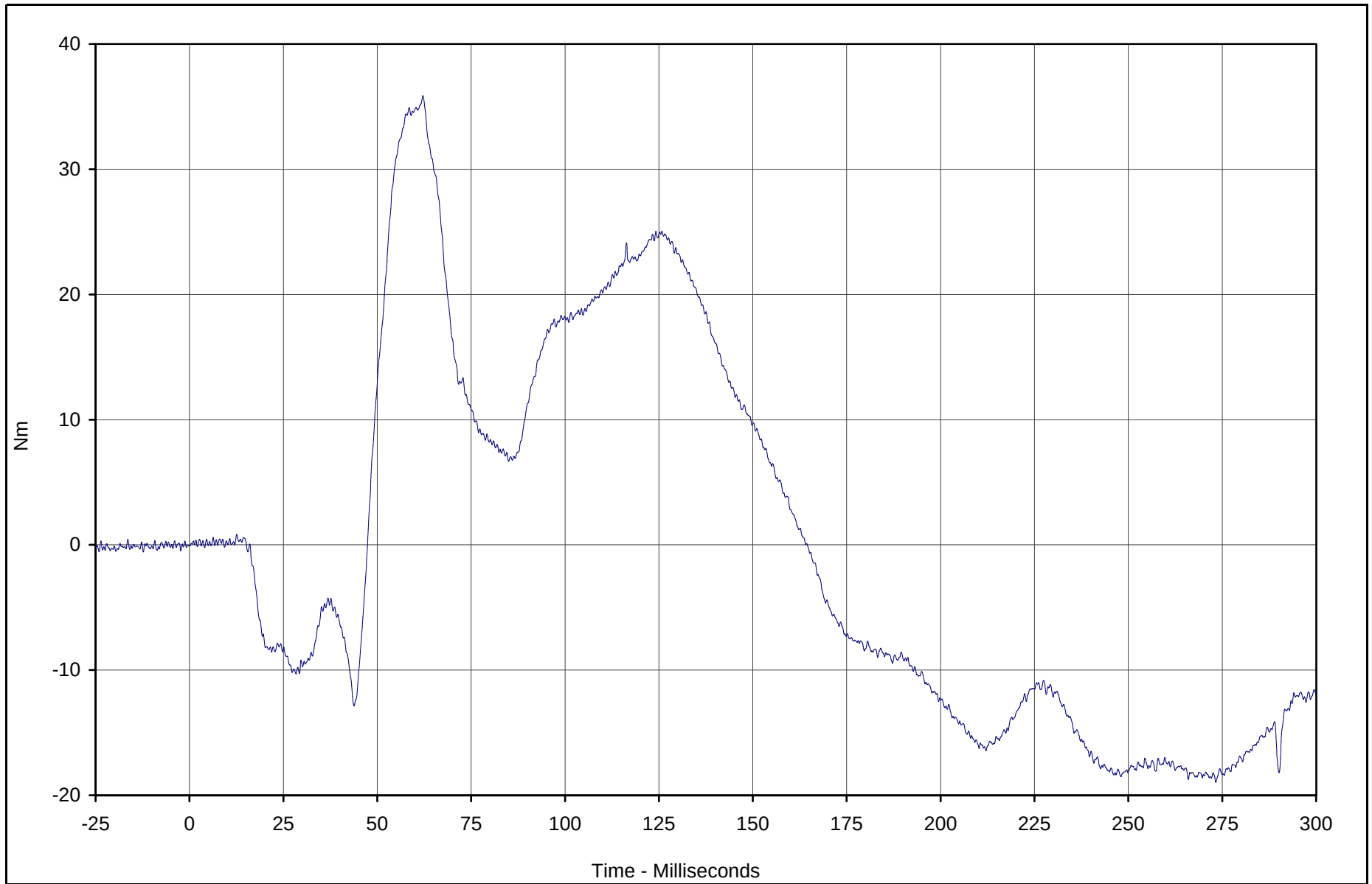


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment Y	011	FIL	Nm	35.9	62.1	-19.0	273.3	600

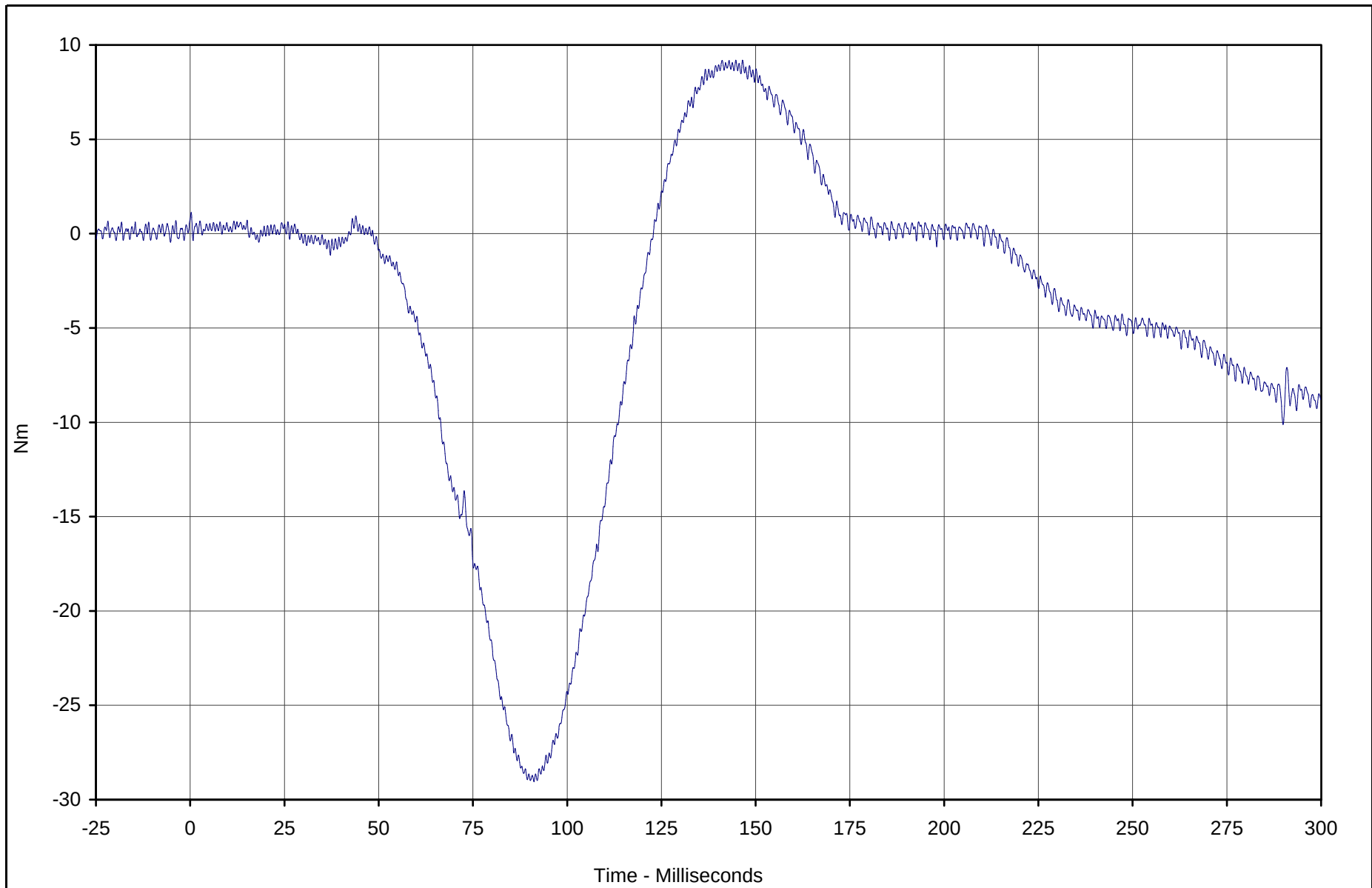


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment Z	012	FIL	Nm	9.2	144.7	-29.1	91.2	600

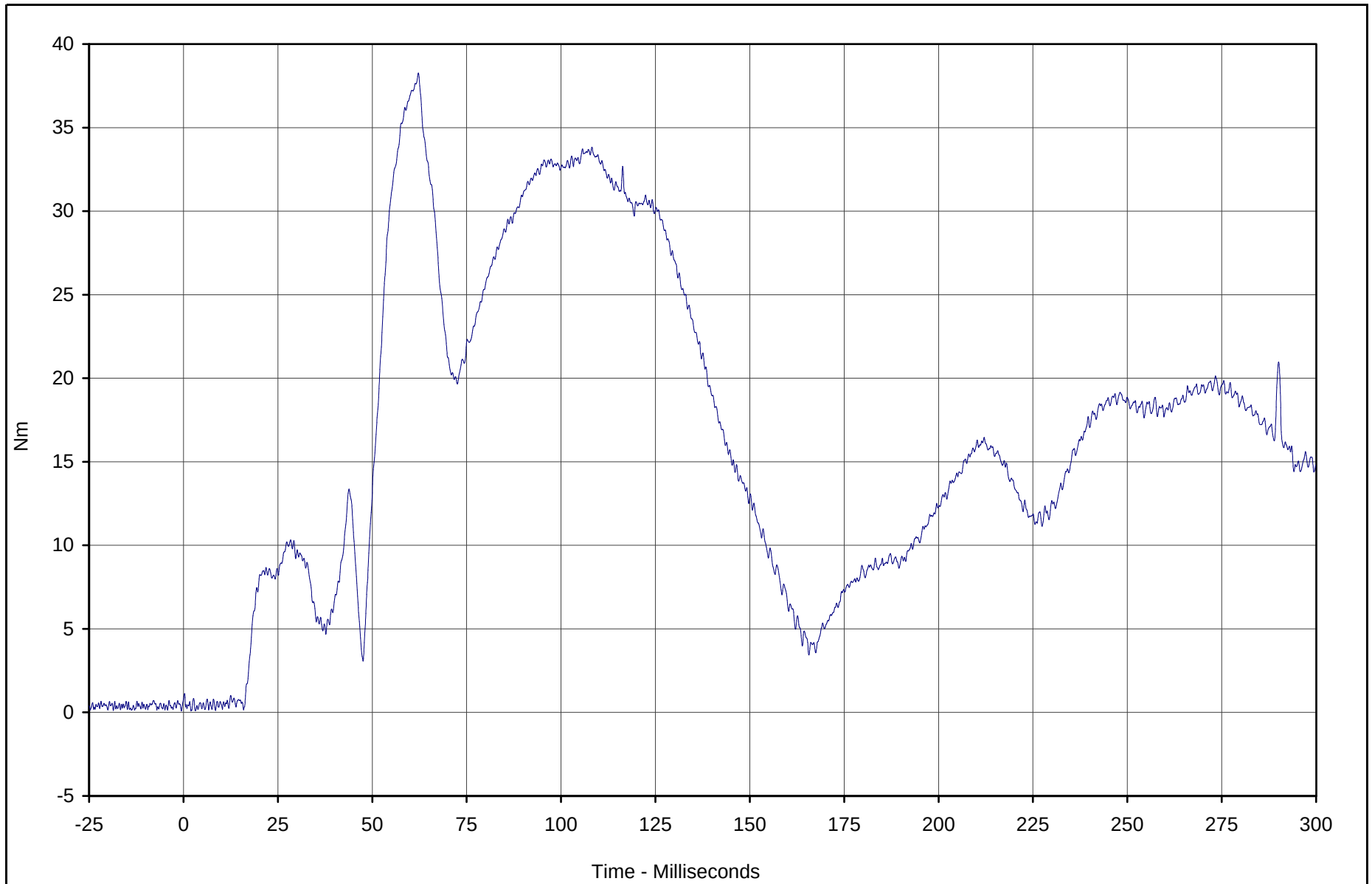


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Neck Moment Resultant	010	RES	Nm	38.3	62.2	0.1	2.0	600



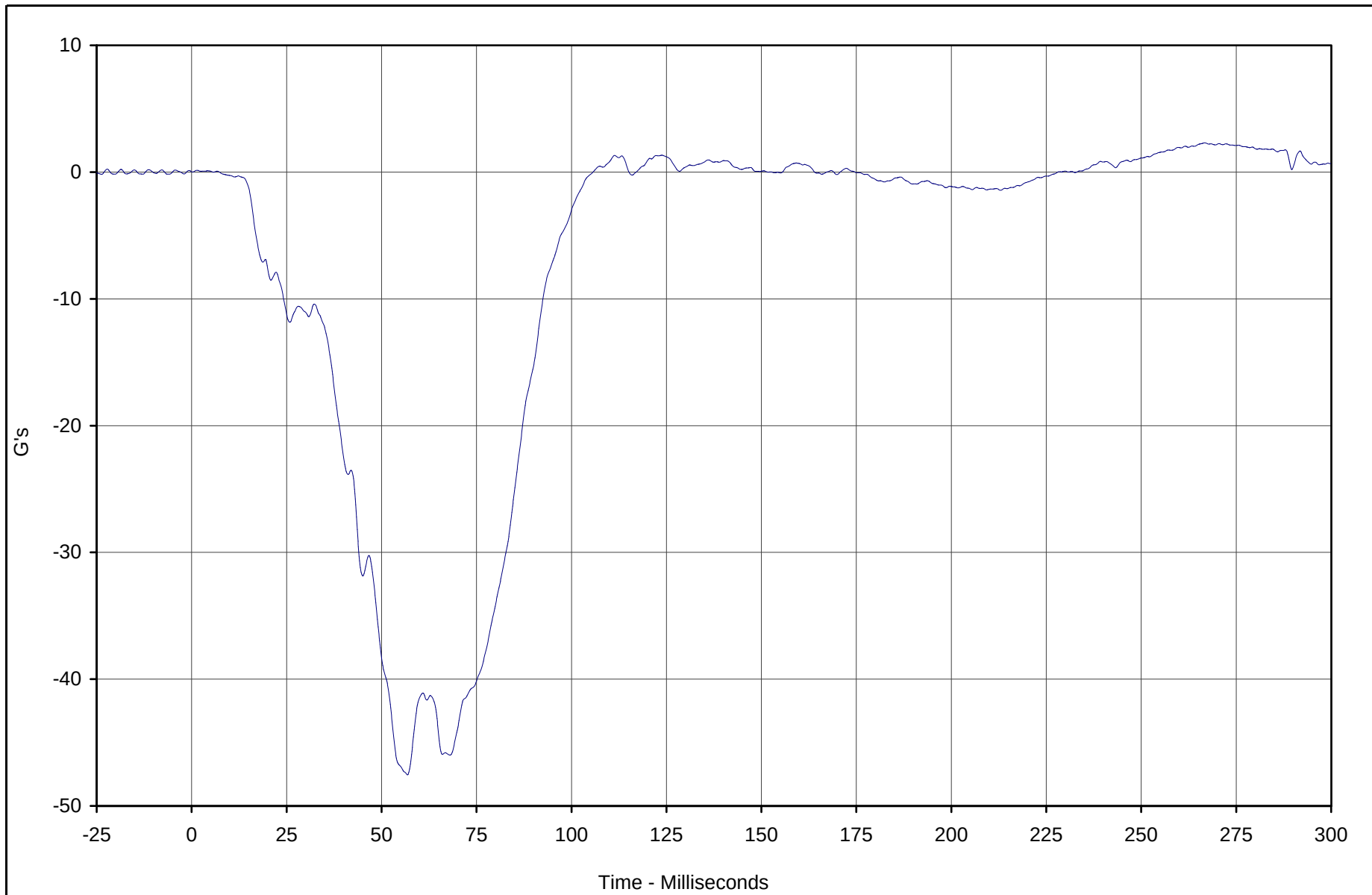
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary X	013	FIL	G's	2.3	266.7	-47.6	56.8	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

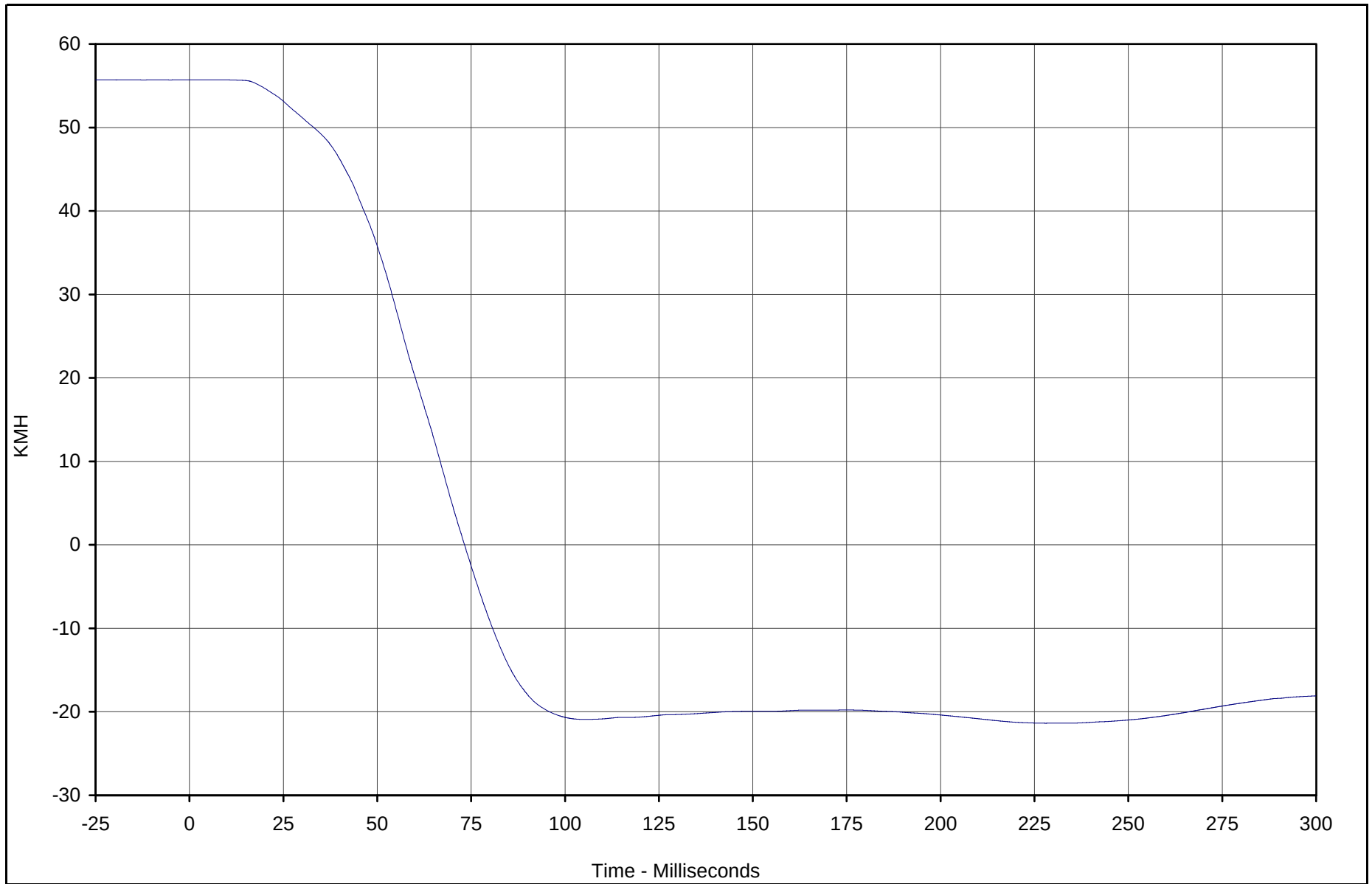
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary X Velocity	013	IN1	KMH	55.7	7.3	-21.4	228.0	180



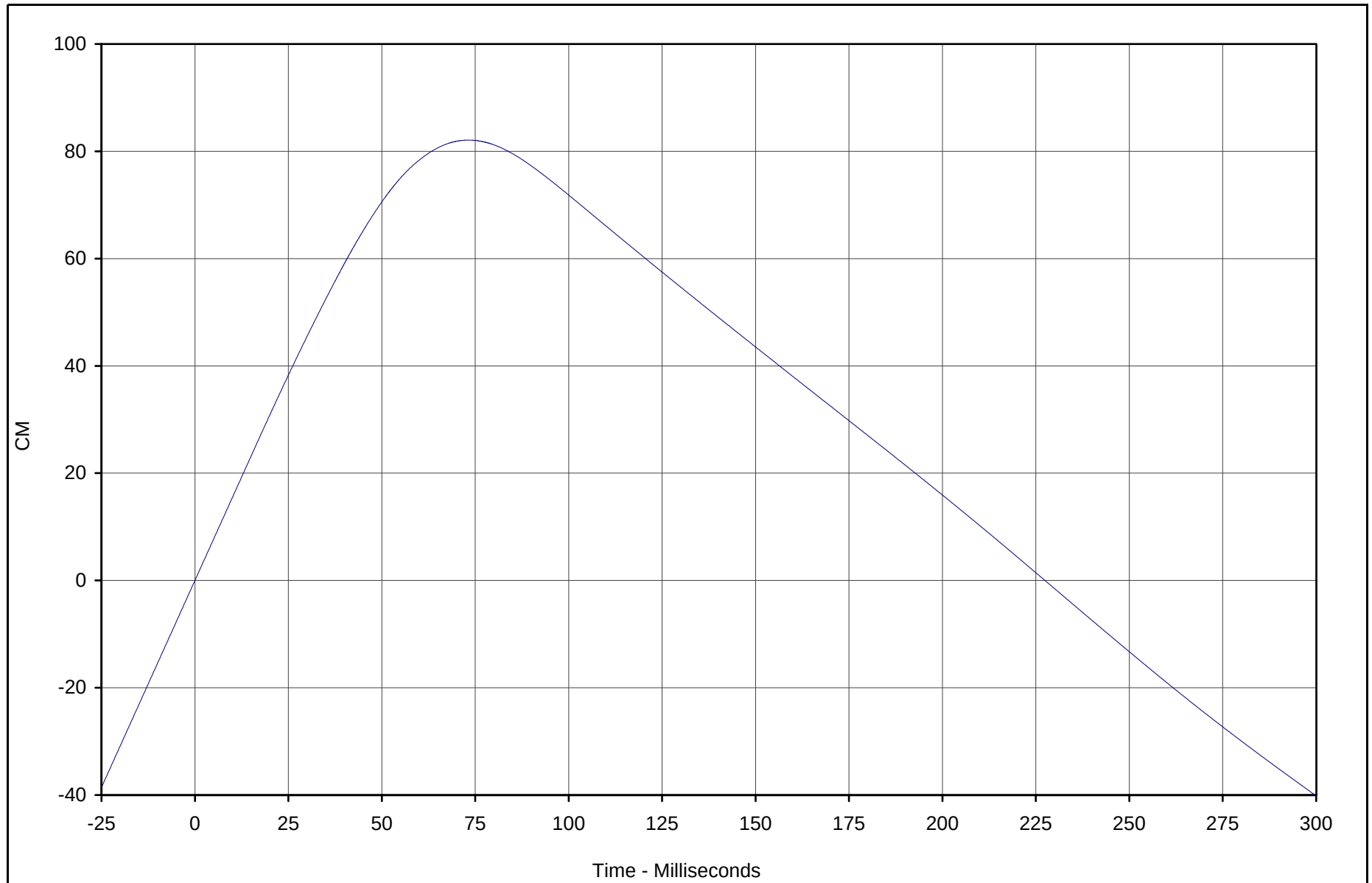
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary X Displ.	013	IN2	CM	82.1	73.2	-40.1	299.9	180



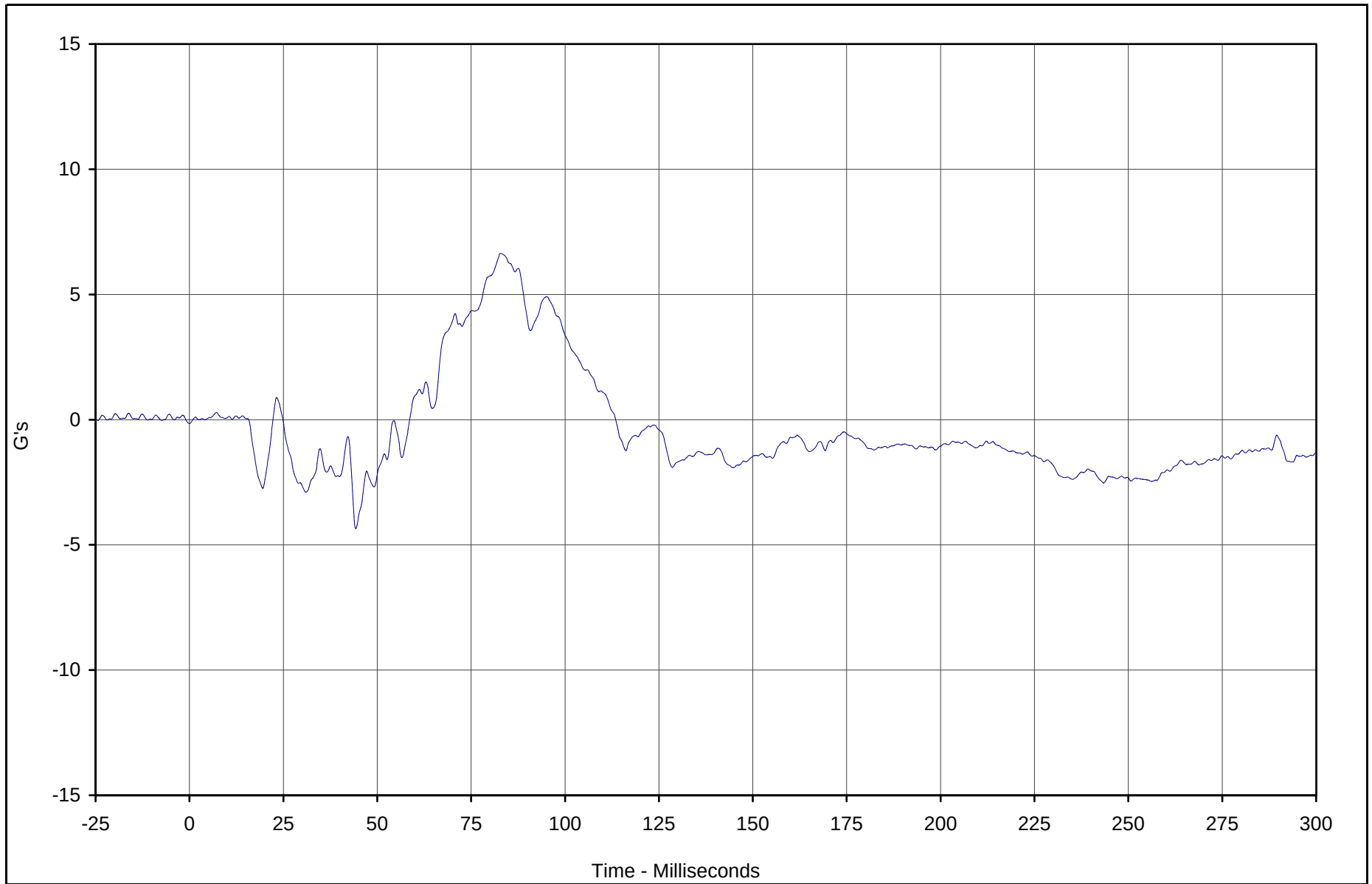
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary Y	014	FIL	G's	6.6	82.9	-4.4	44.3	180



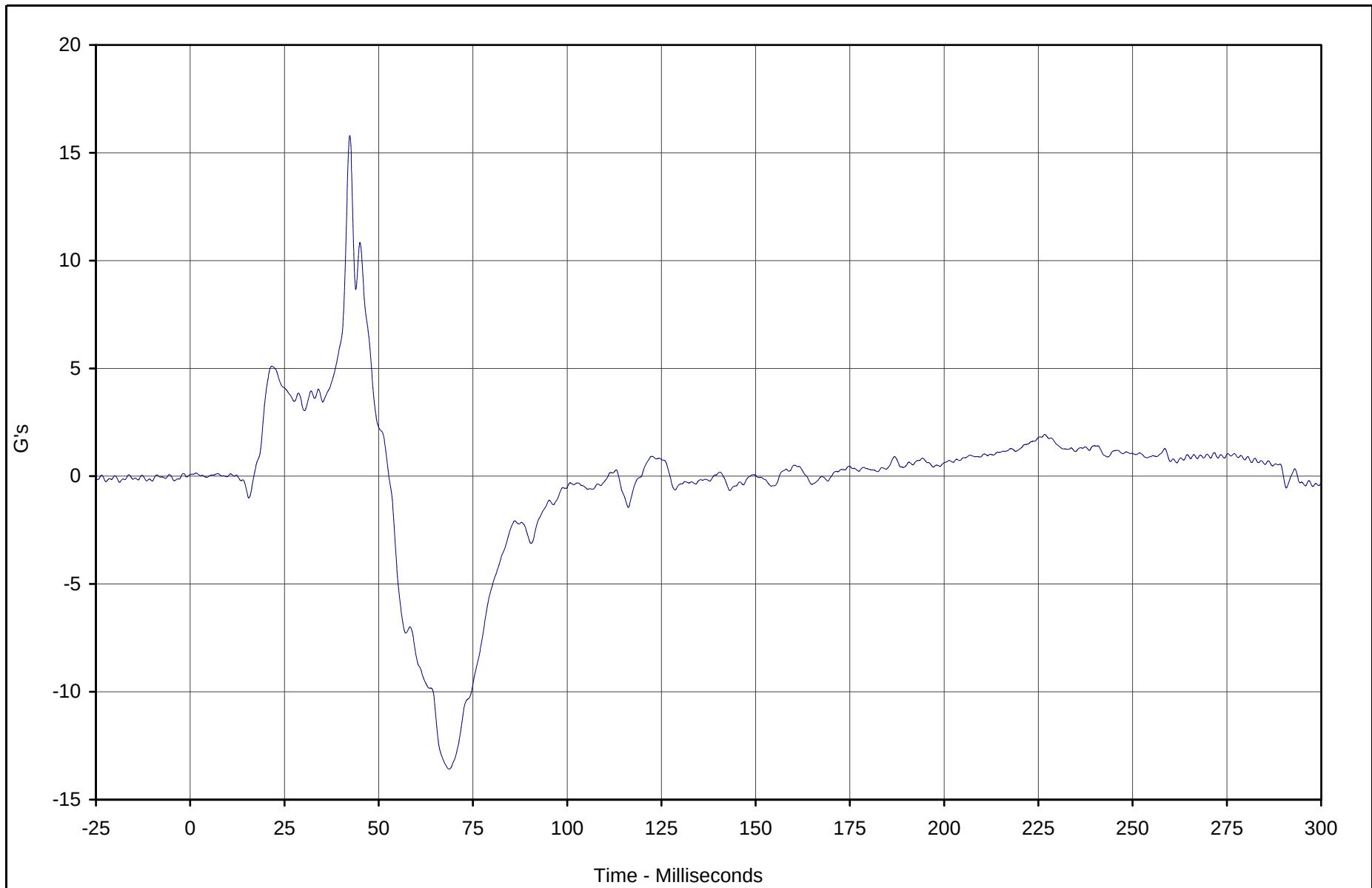
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Primary Z	015	FIL	G's	15.8	42.3	-13.6	68.7	180

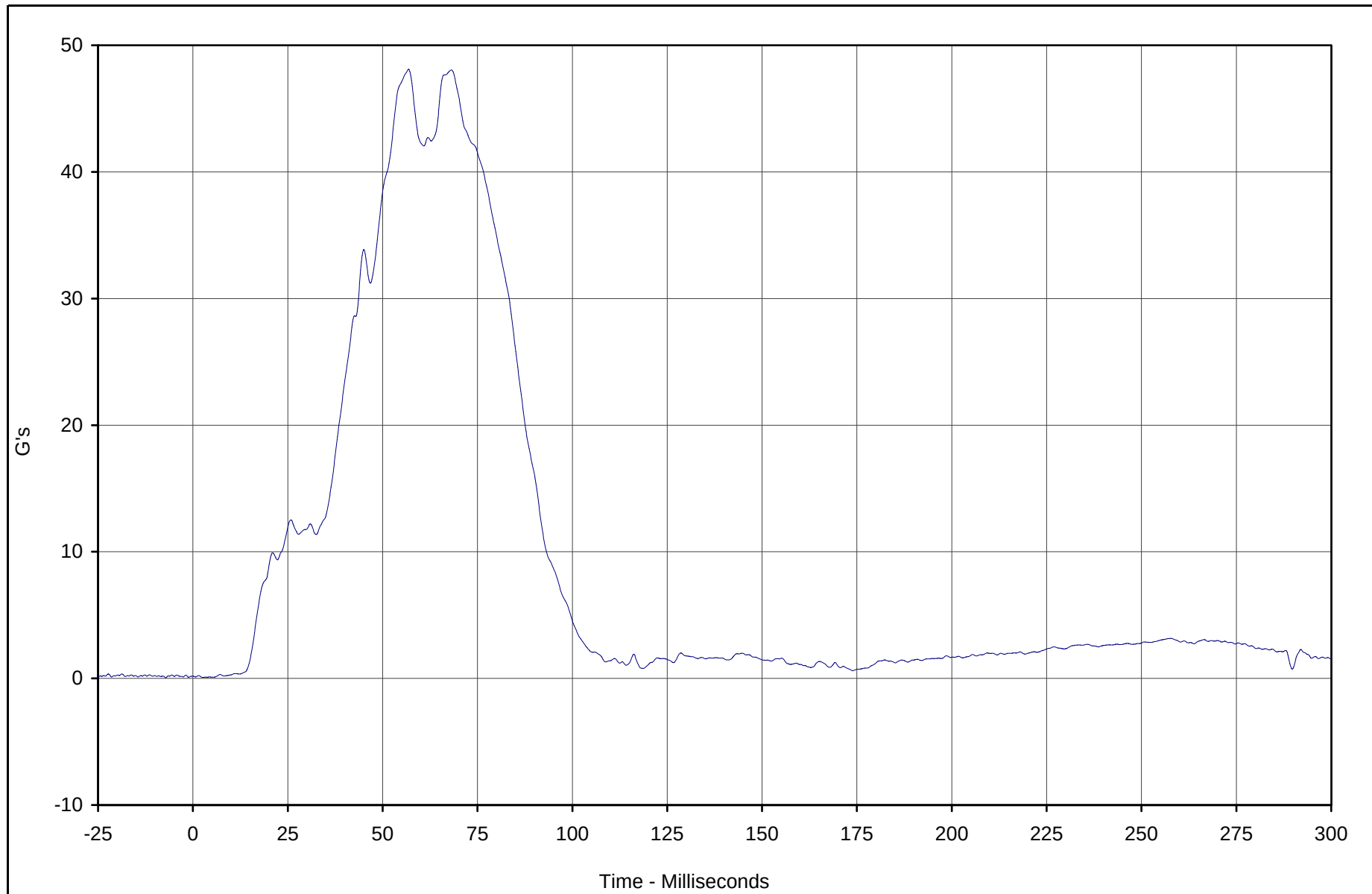


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Resultant Primary	013	RES	G's	48.1	56.8	0.1	2.7	180



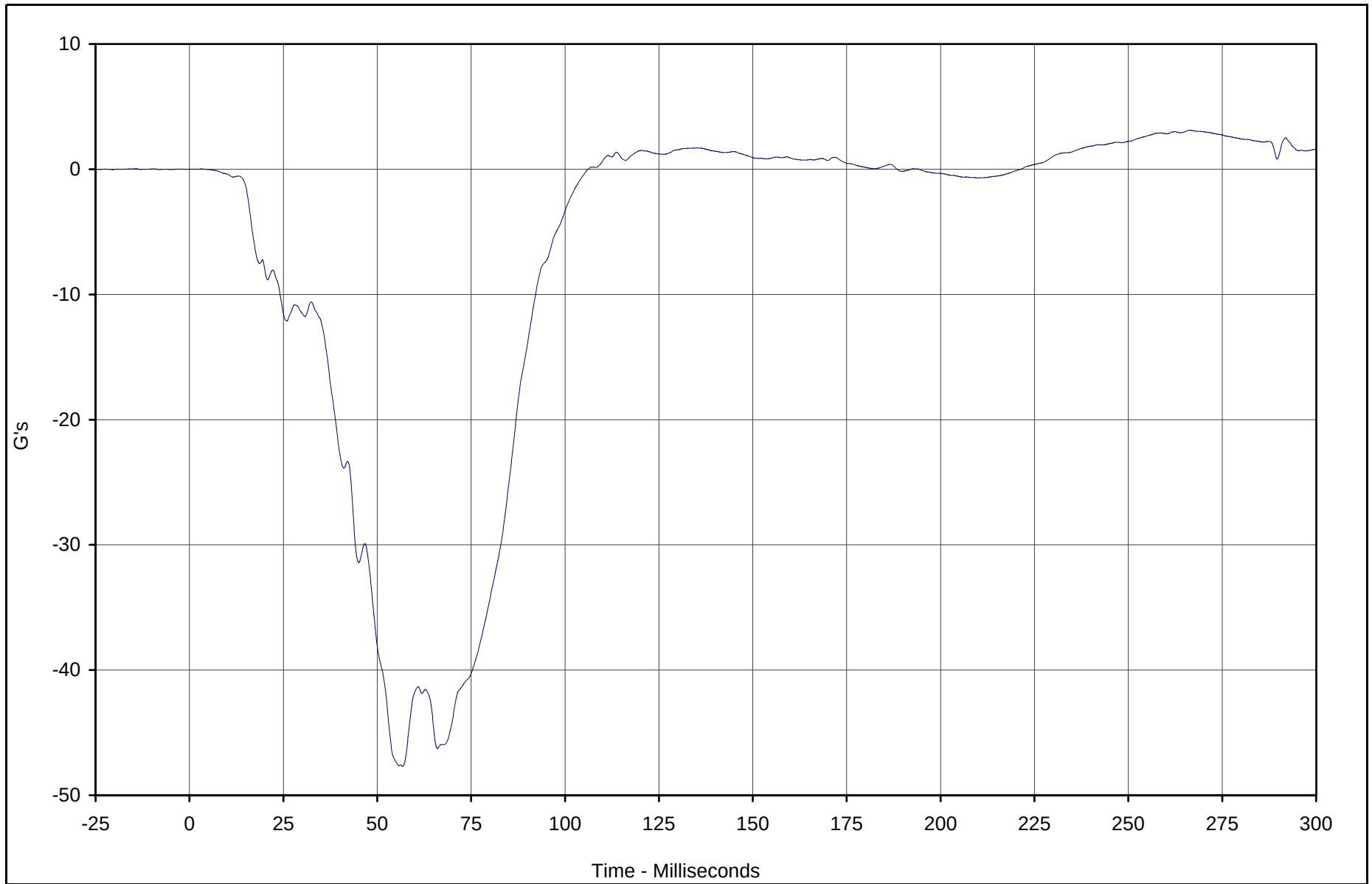
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant X	016	FIL	G's	3.1	266.3	-47.7	56.8	180



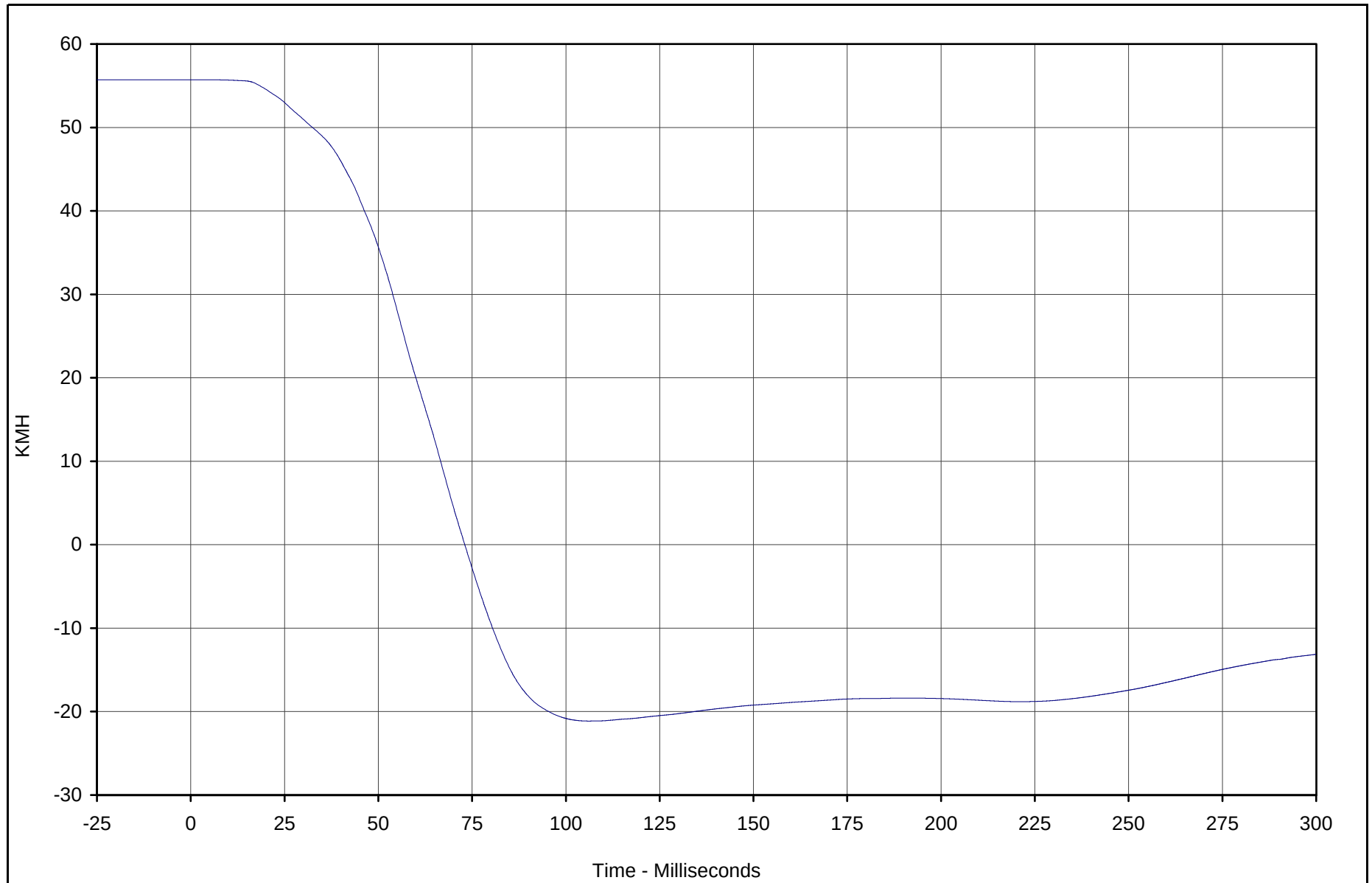
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant X Velocity	016	IN1	KMH	55.7	4.2	-21.1	106.1	180

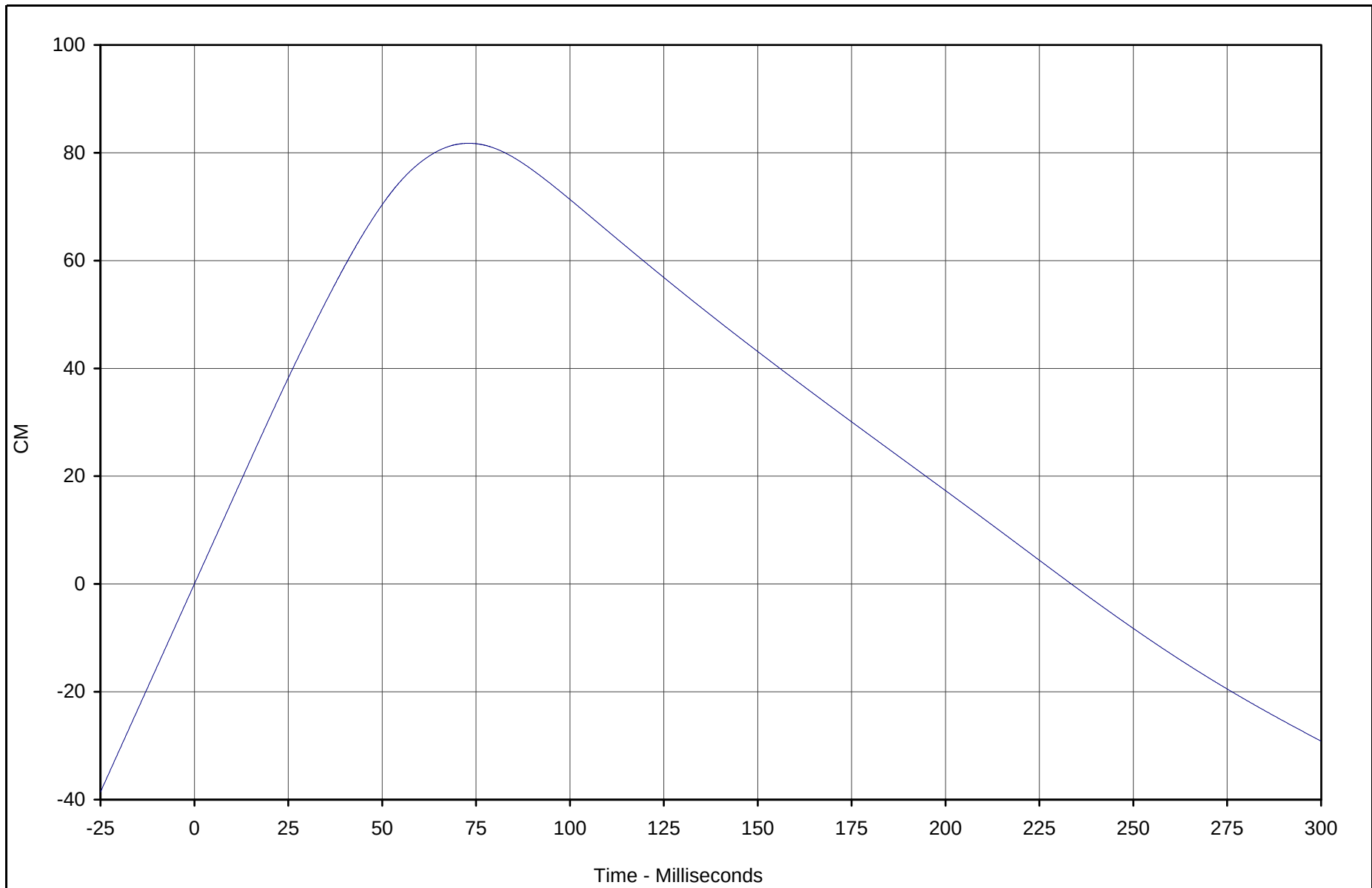


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant X Displ.	016	IN2	CM	81.8	73.0	-29.1	299.9	180

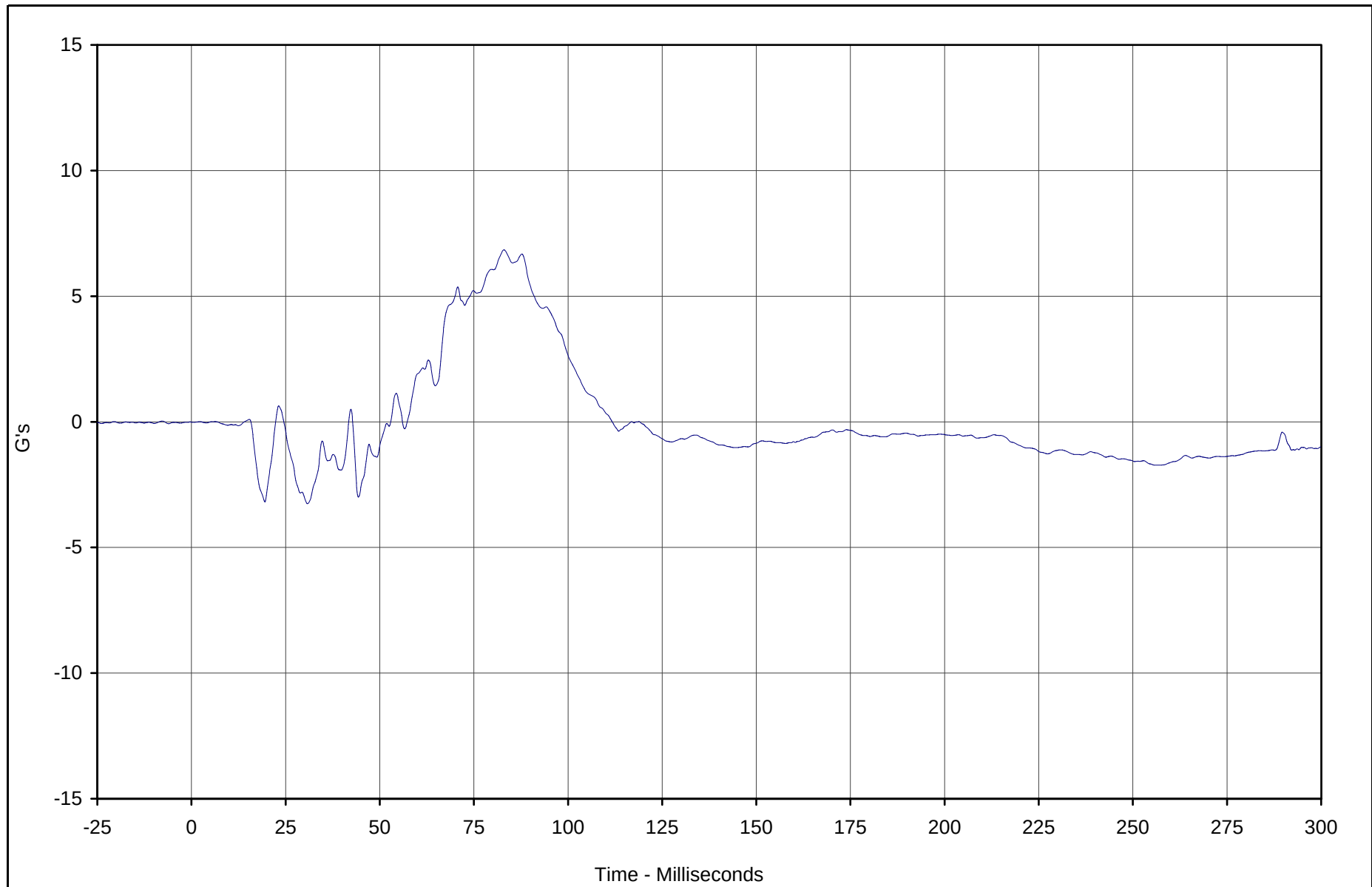


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant Y	017	FIL	G's	6.8	83.0	-3.3	30.8	180

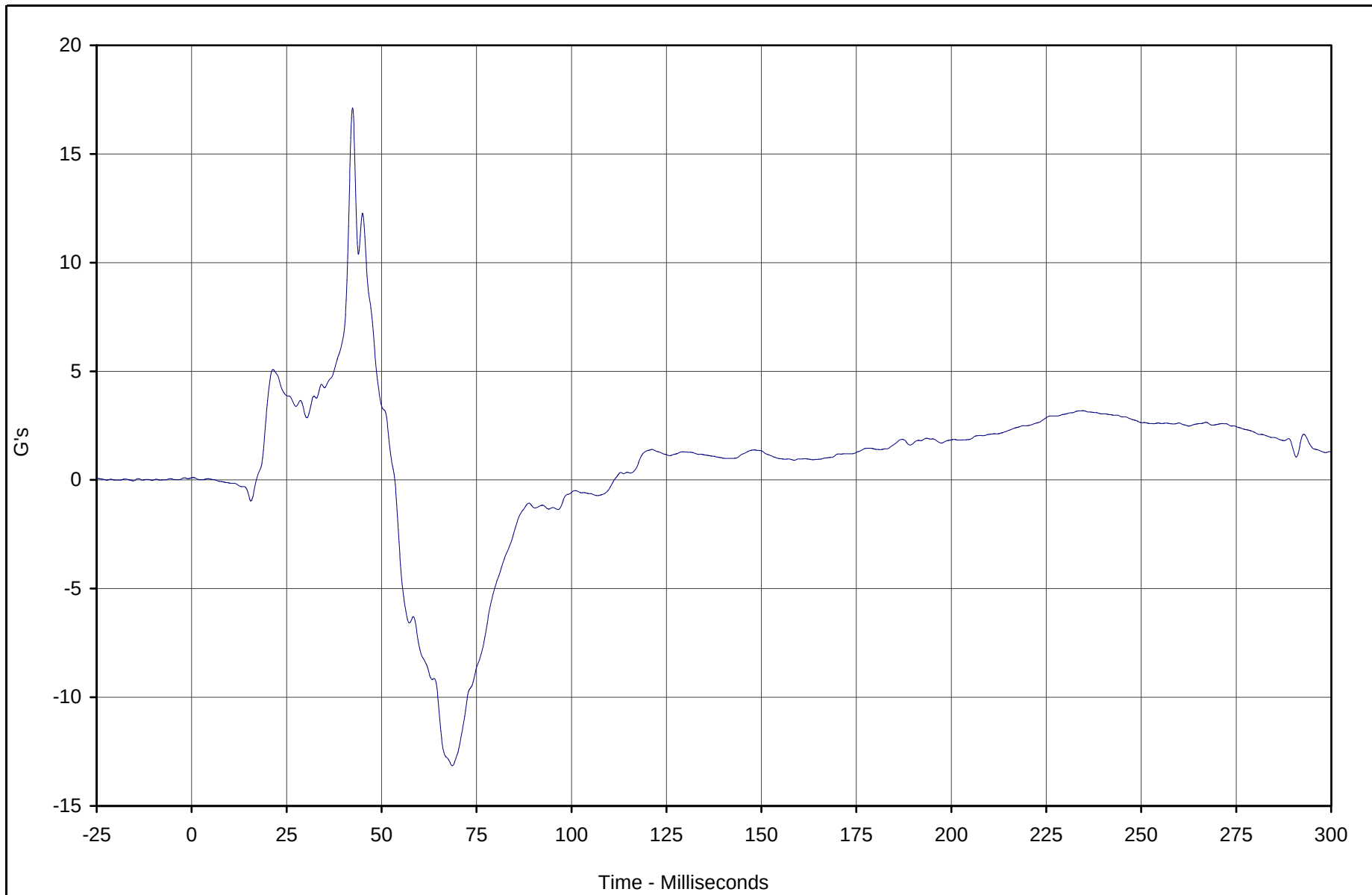


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Redundant Z	018	FIL	G's	17.1	42.4	-13.1	68.6	180



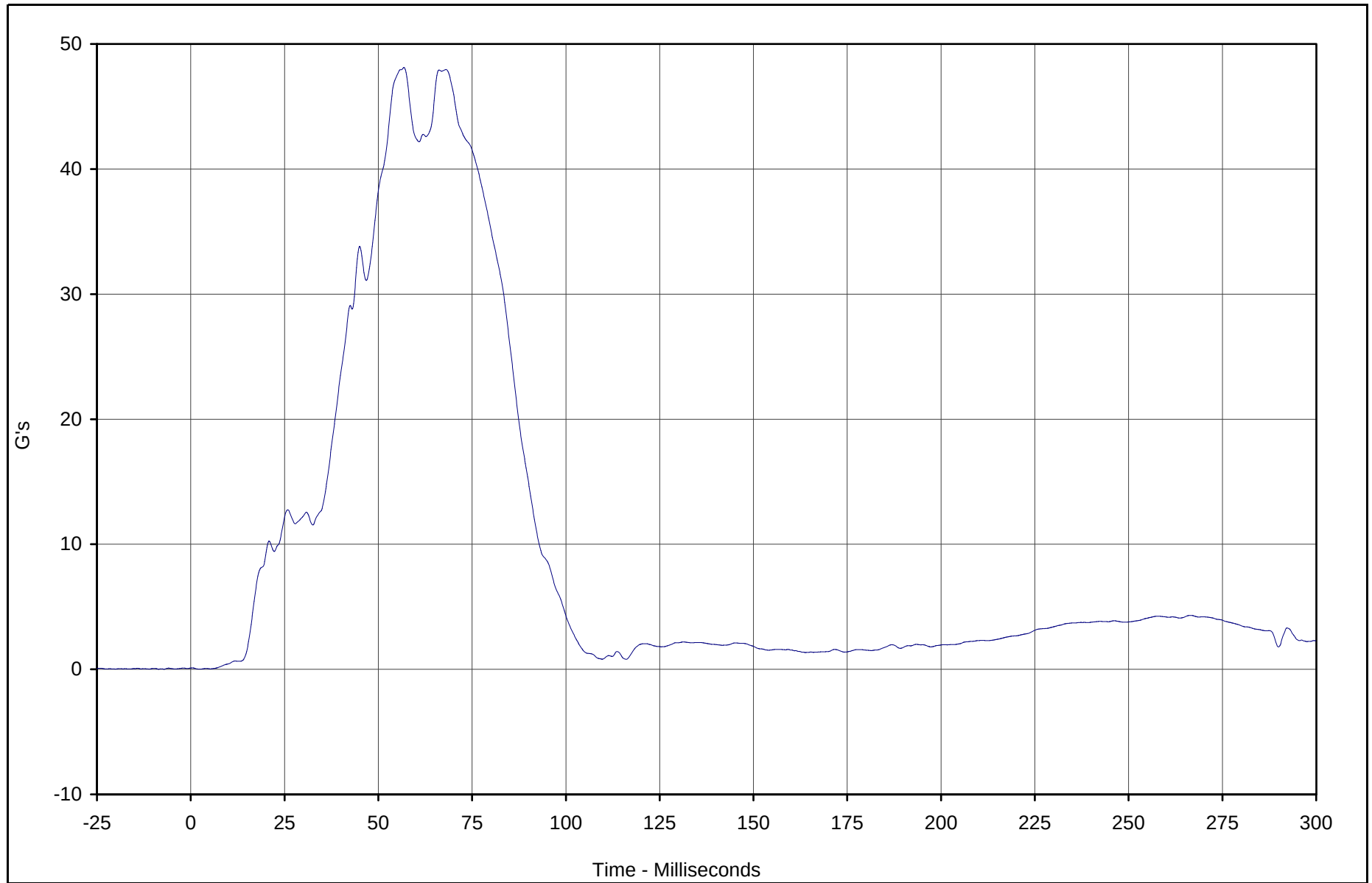
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Resultant Redundant	016	RES	G's	48.1	56.8	0.0	2.1	180



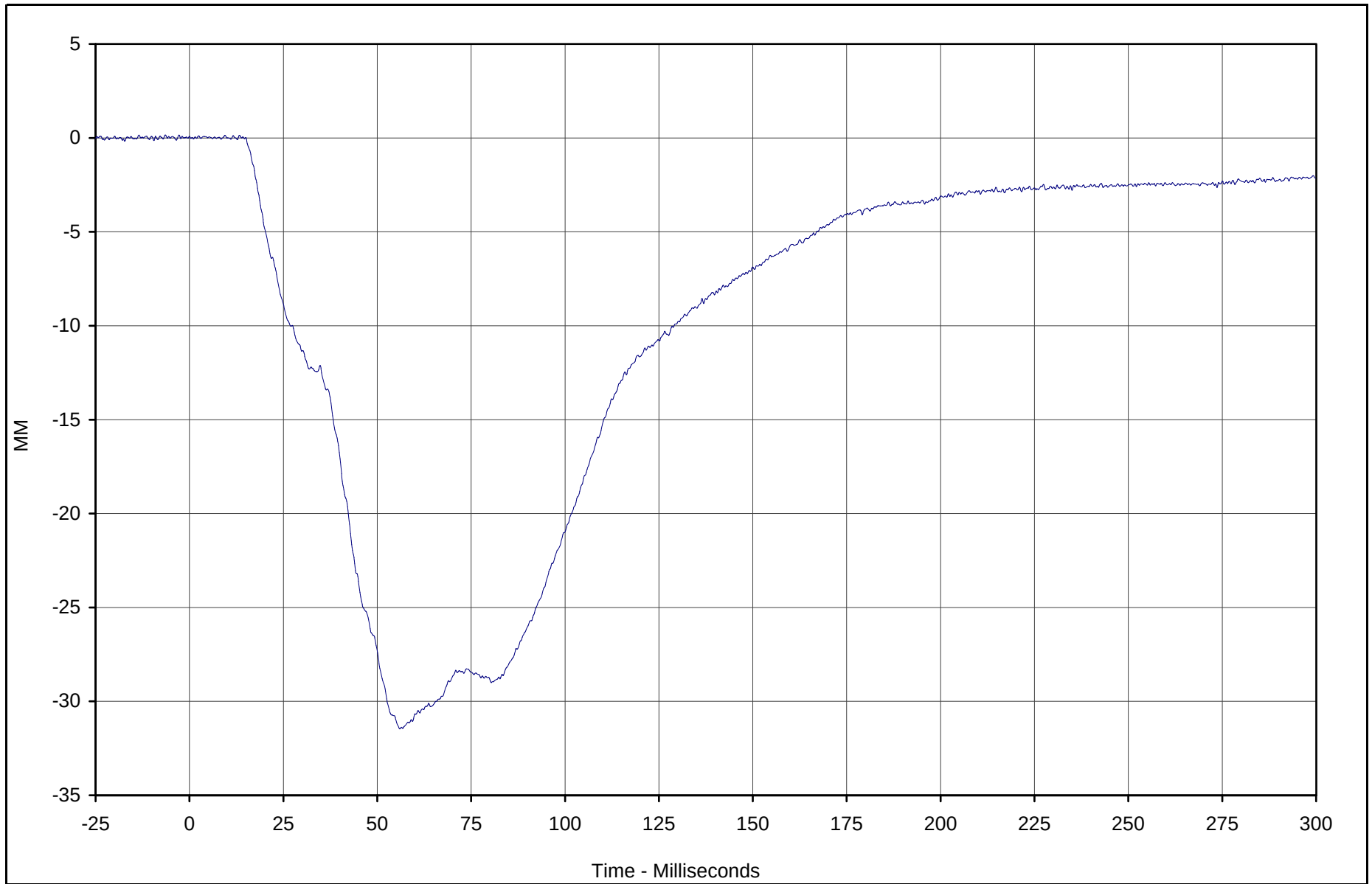
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Chest Displacement X	019	FIL	MM	0.1	9.4	-31.5	56.0	600

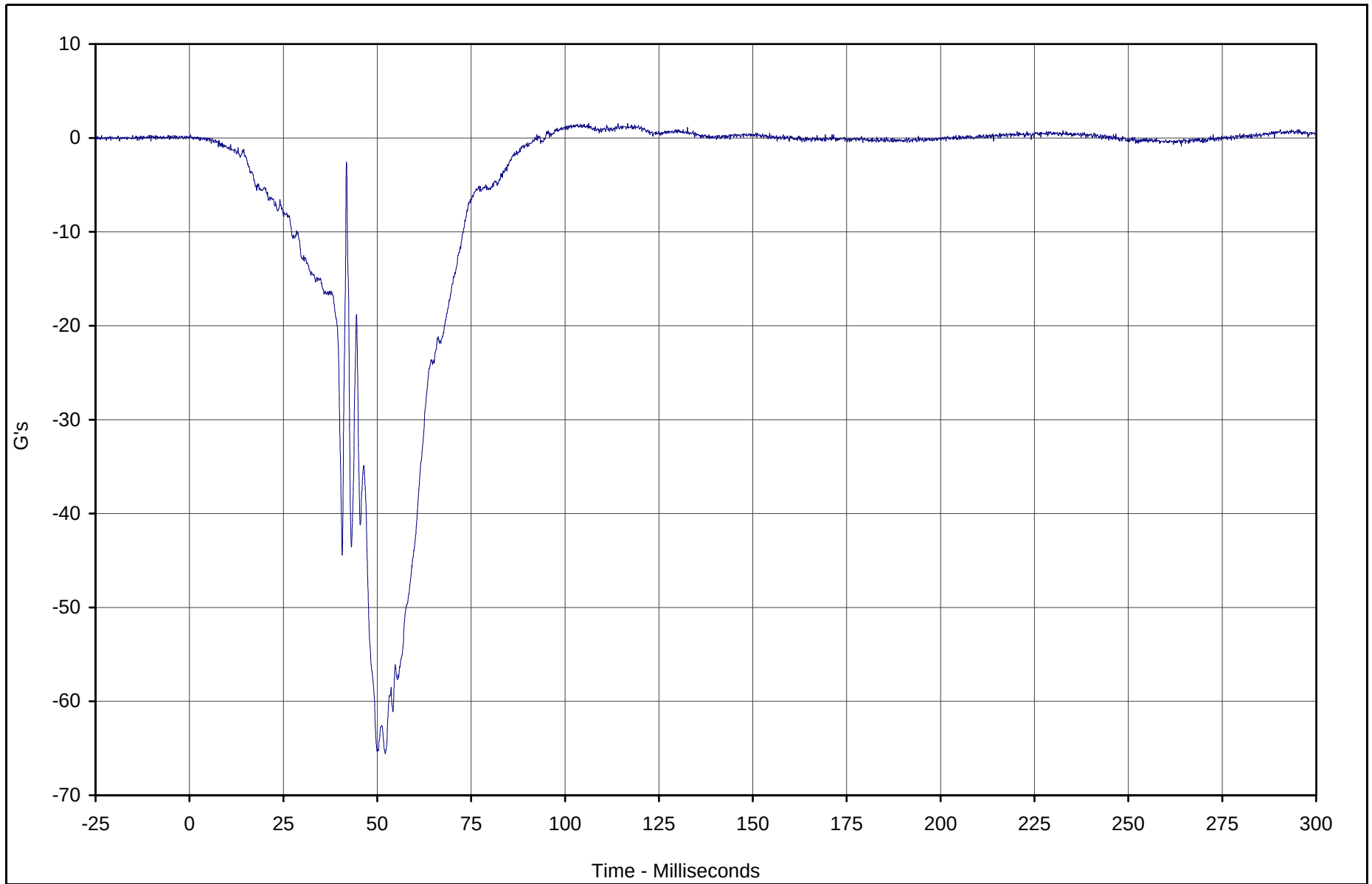


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis X	020	FIL	G's	1.6	106.3	-65.6	52.1	1000

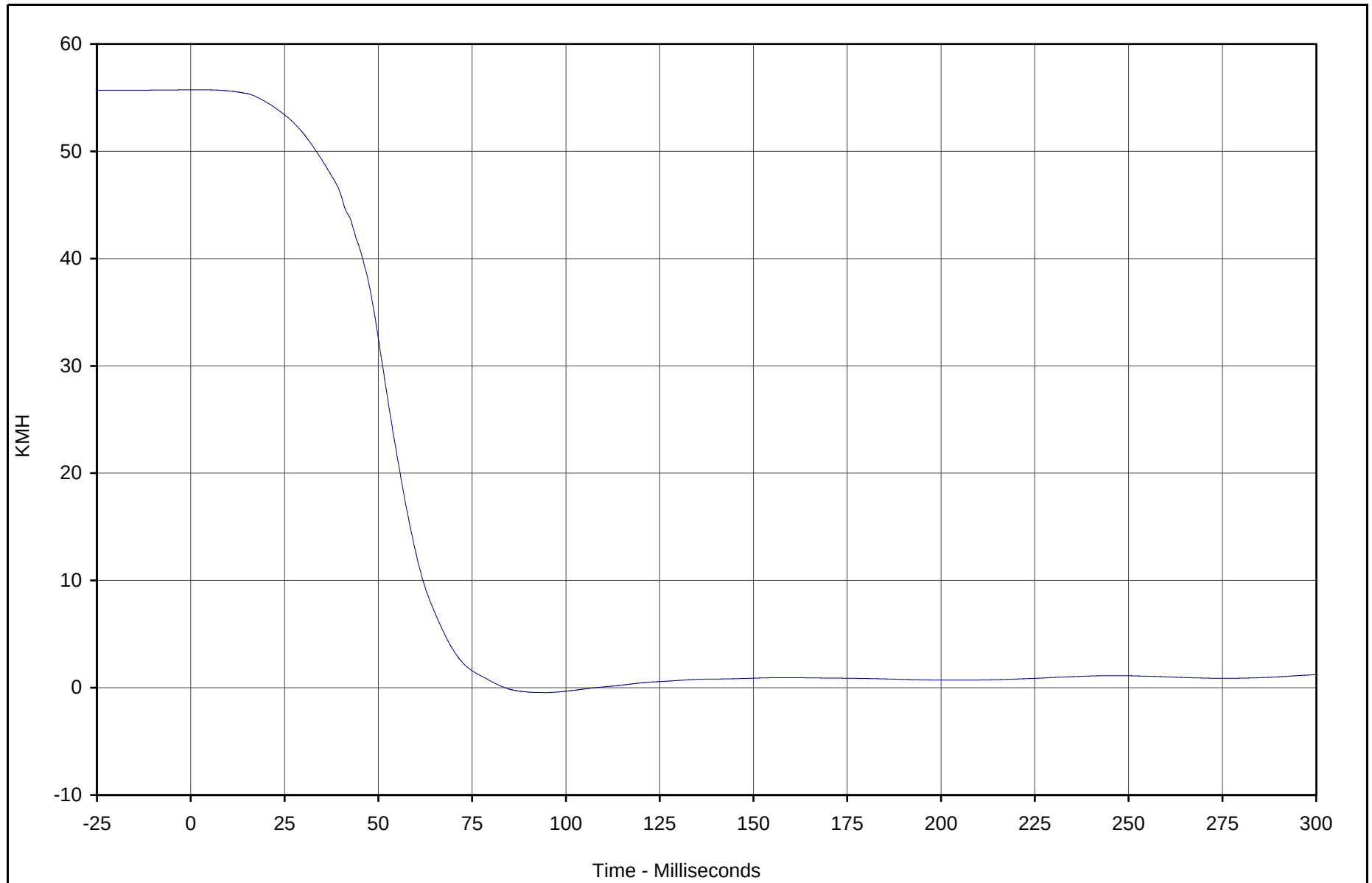


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis X Velocity	020	IN1	KMH	55.7	1.8	-0.5	94.6	180

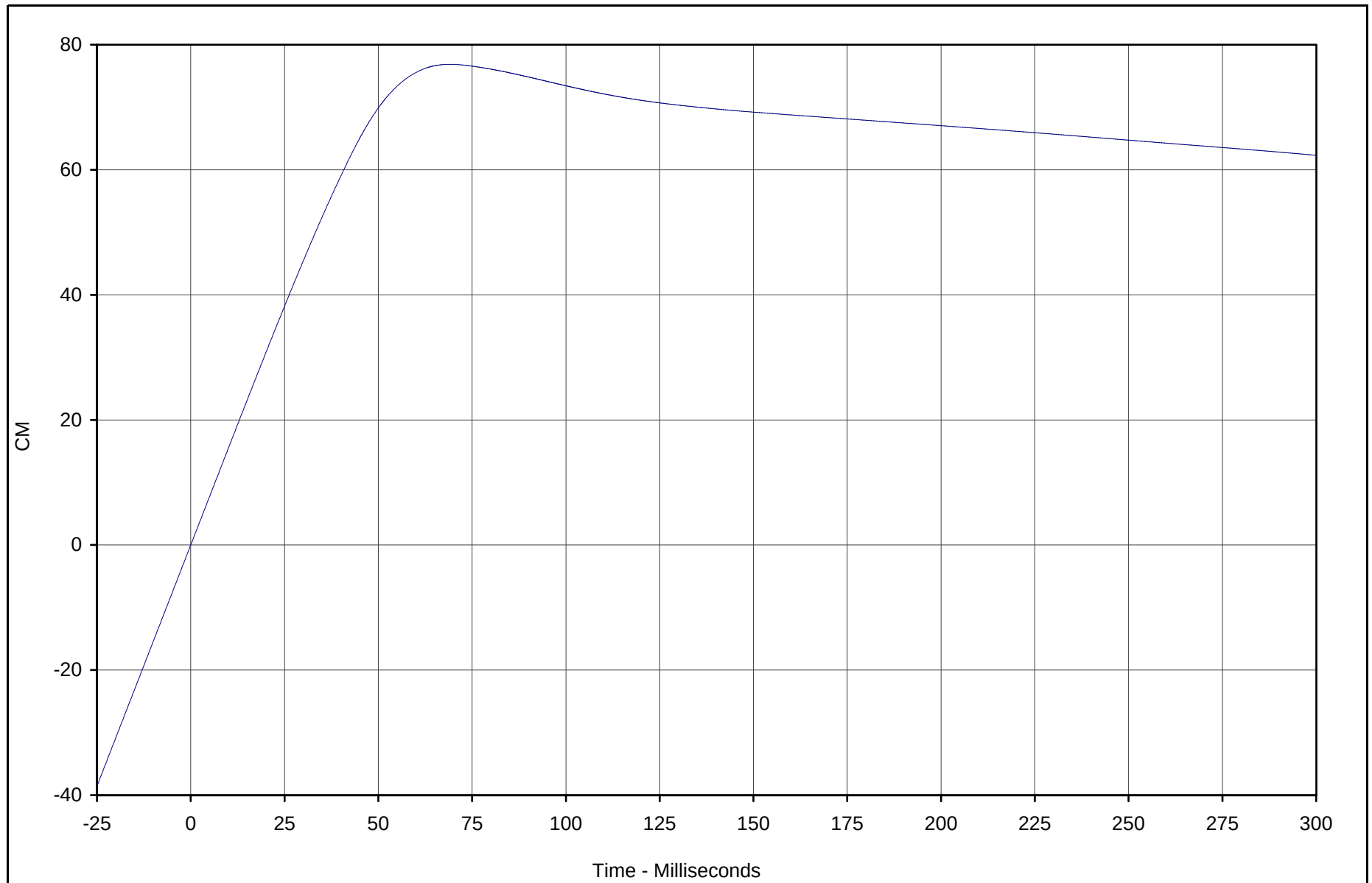


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis X Displ.	020	IN2	CM	76.9	69.1	0.0	0.0	180

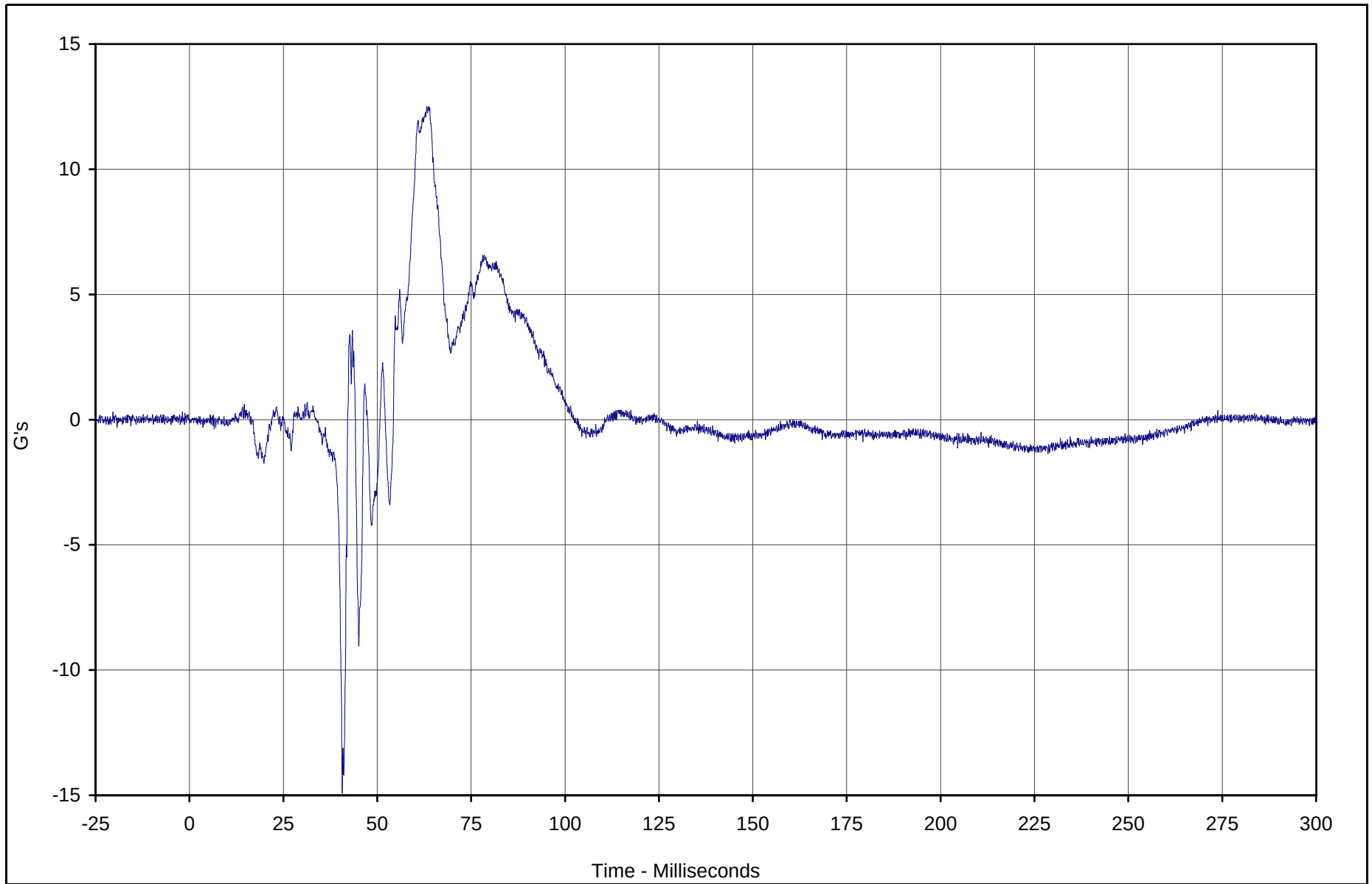


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis Y	021	FIL	G's	12.5	63.2	-14.9	40.7	1000

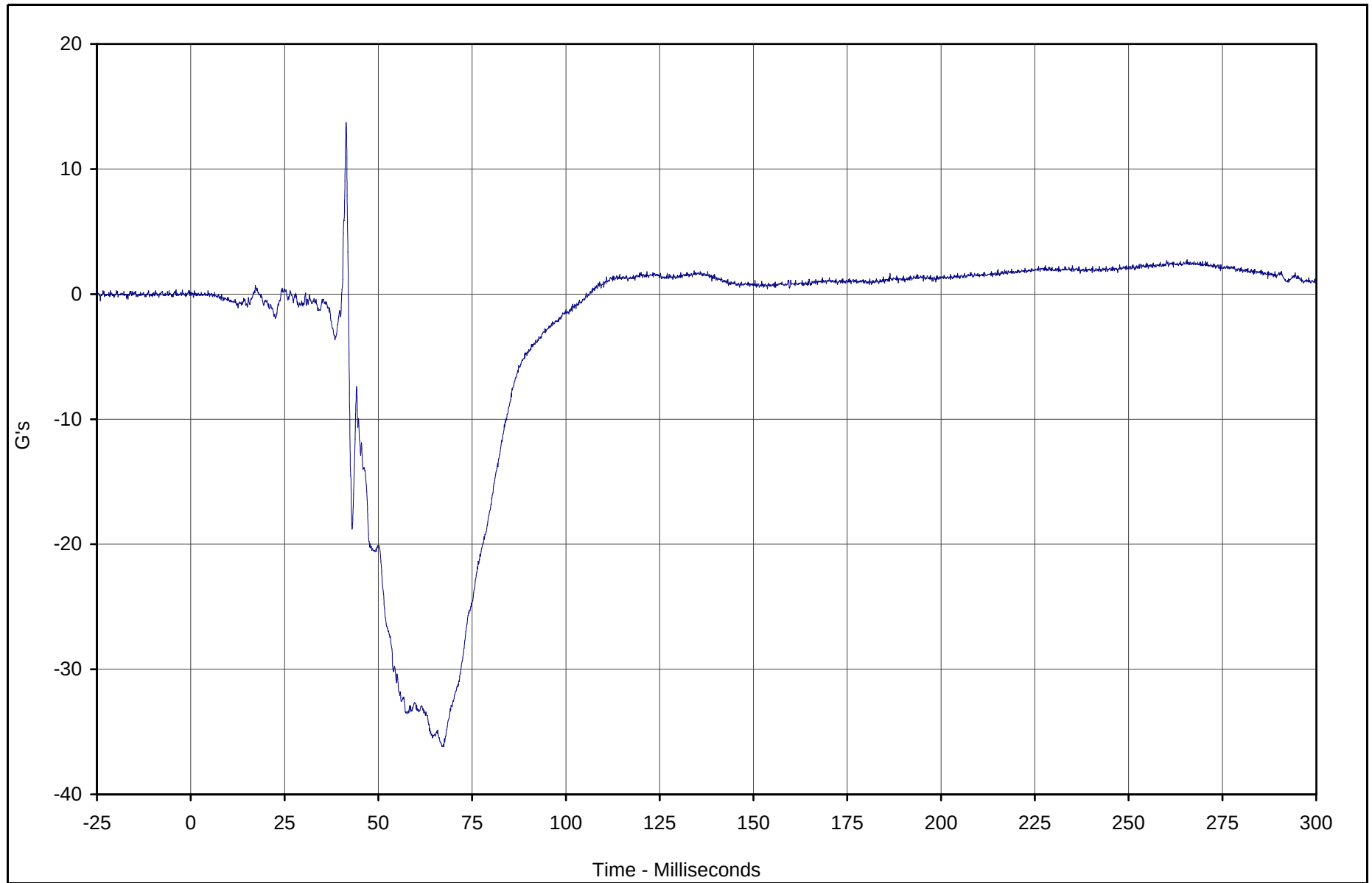


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis Z	022	FIL	G's	13.7	41.4	-36.2	66.9	1000

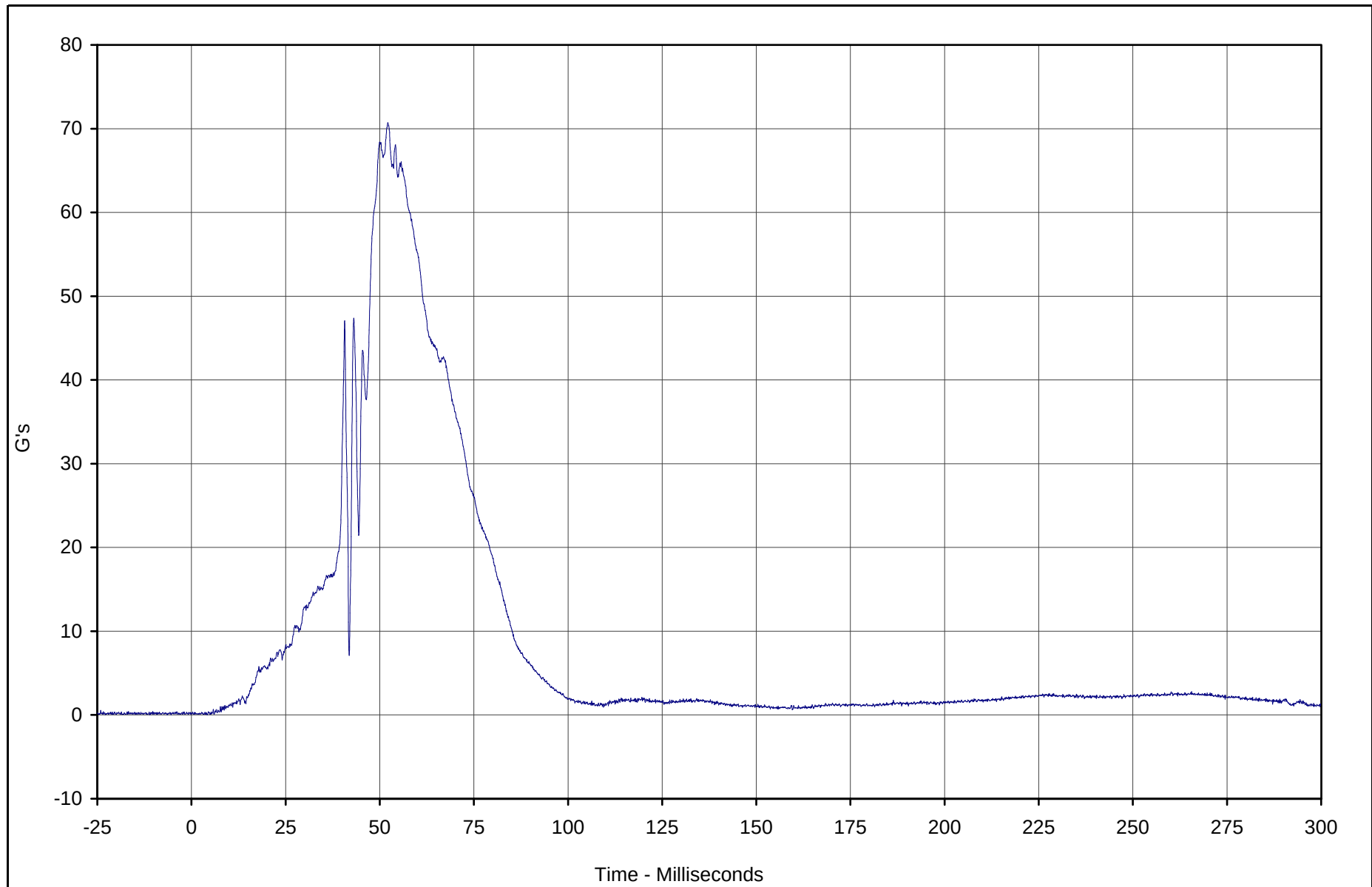


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Pelvis Resultant	023	RES	G's	70.7	52.1	0.0	4.2	1000



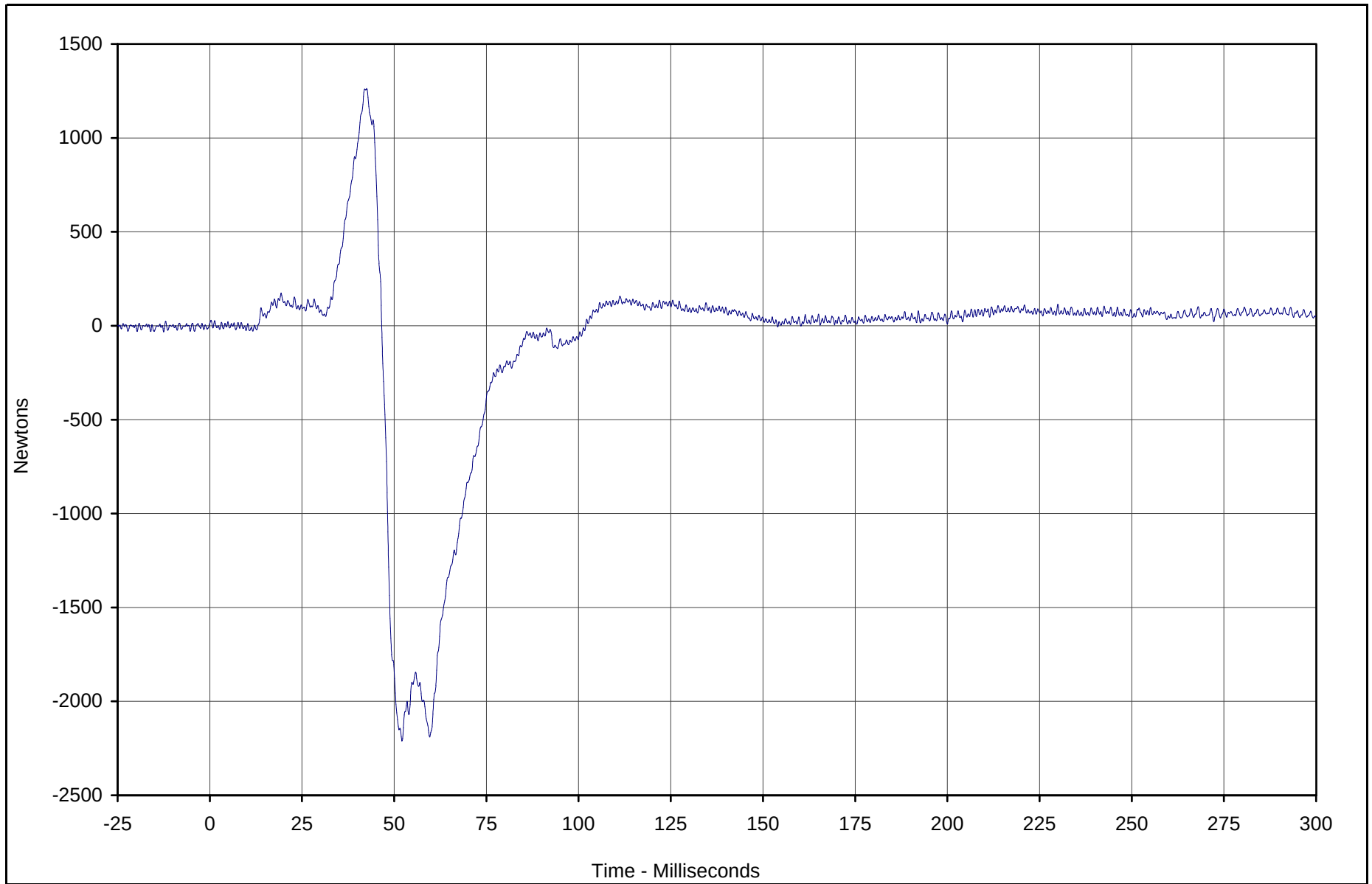
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Femur Force	023	FIL	Newtons	1262.7	42.6	-2210.7	52.1	600



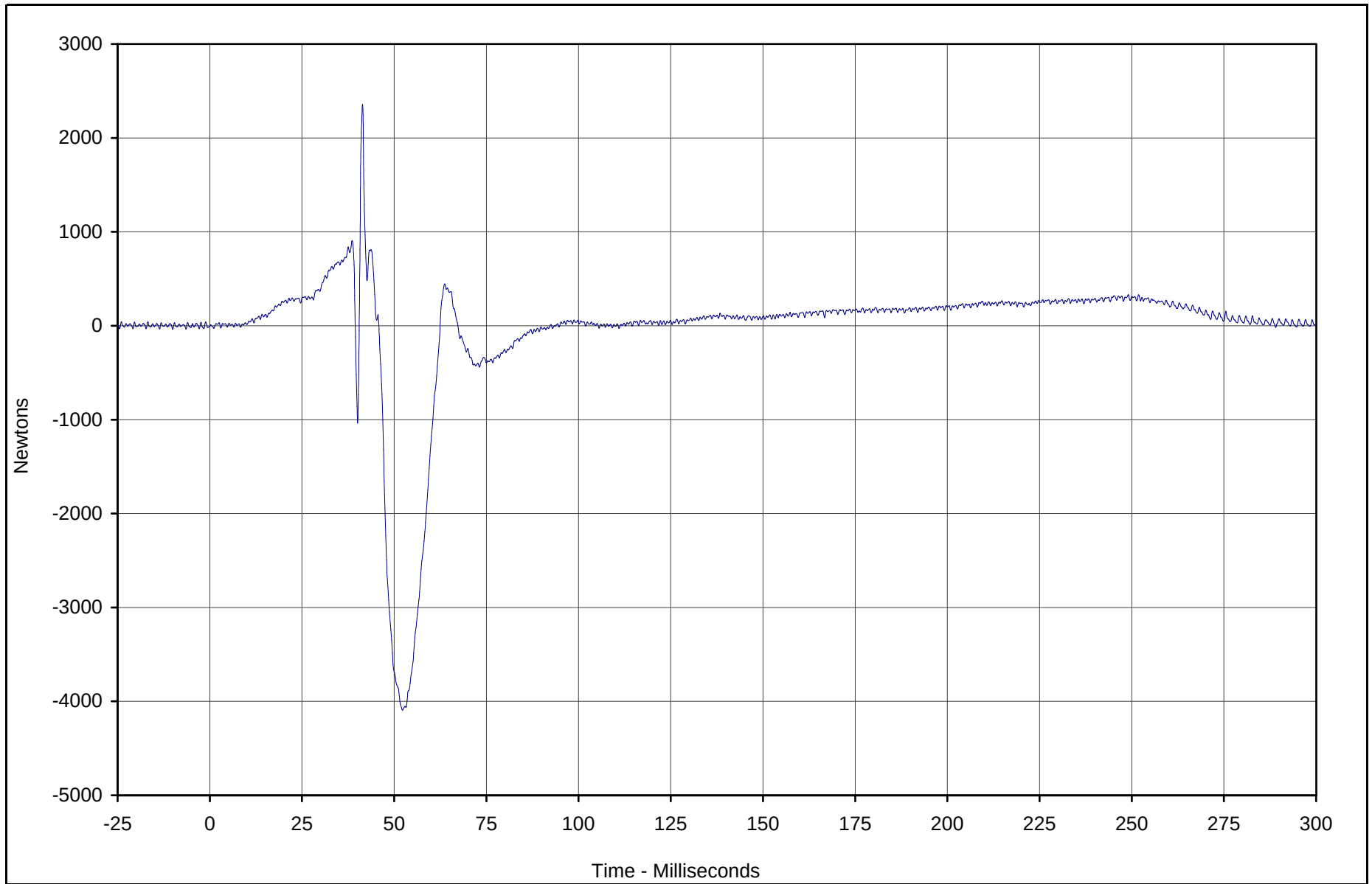
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Femur Force	024	FIL	Newtons	2357.6	41.4	-4093.1	52.3	600

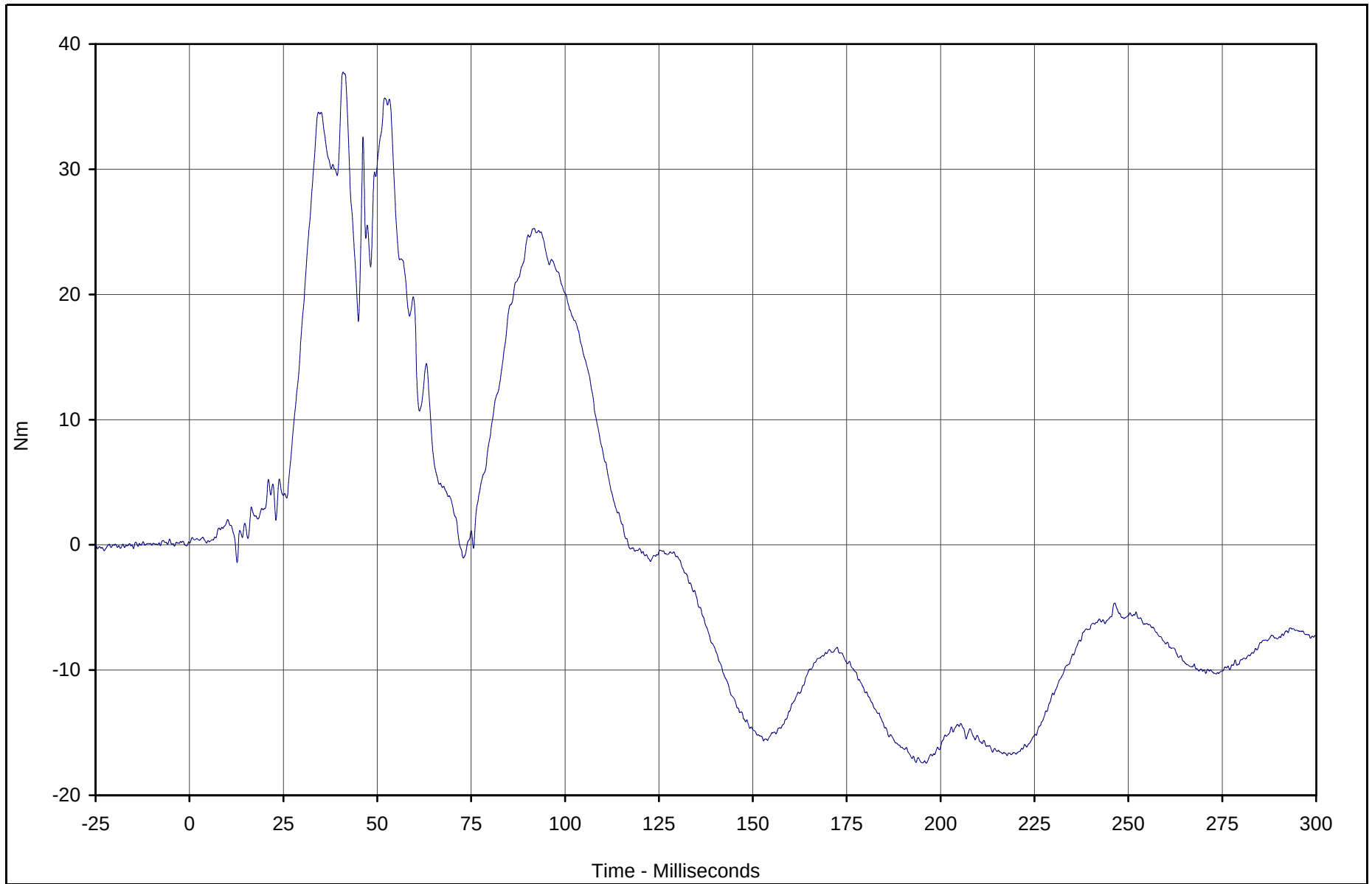


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Upper Tibia Moment X	025	FIL	Nm	37.8	40.9	-17.4	196.2	600

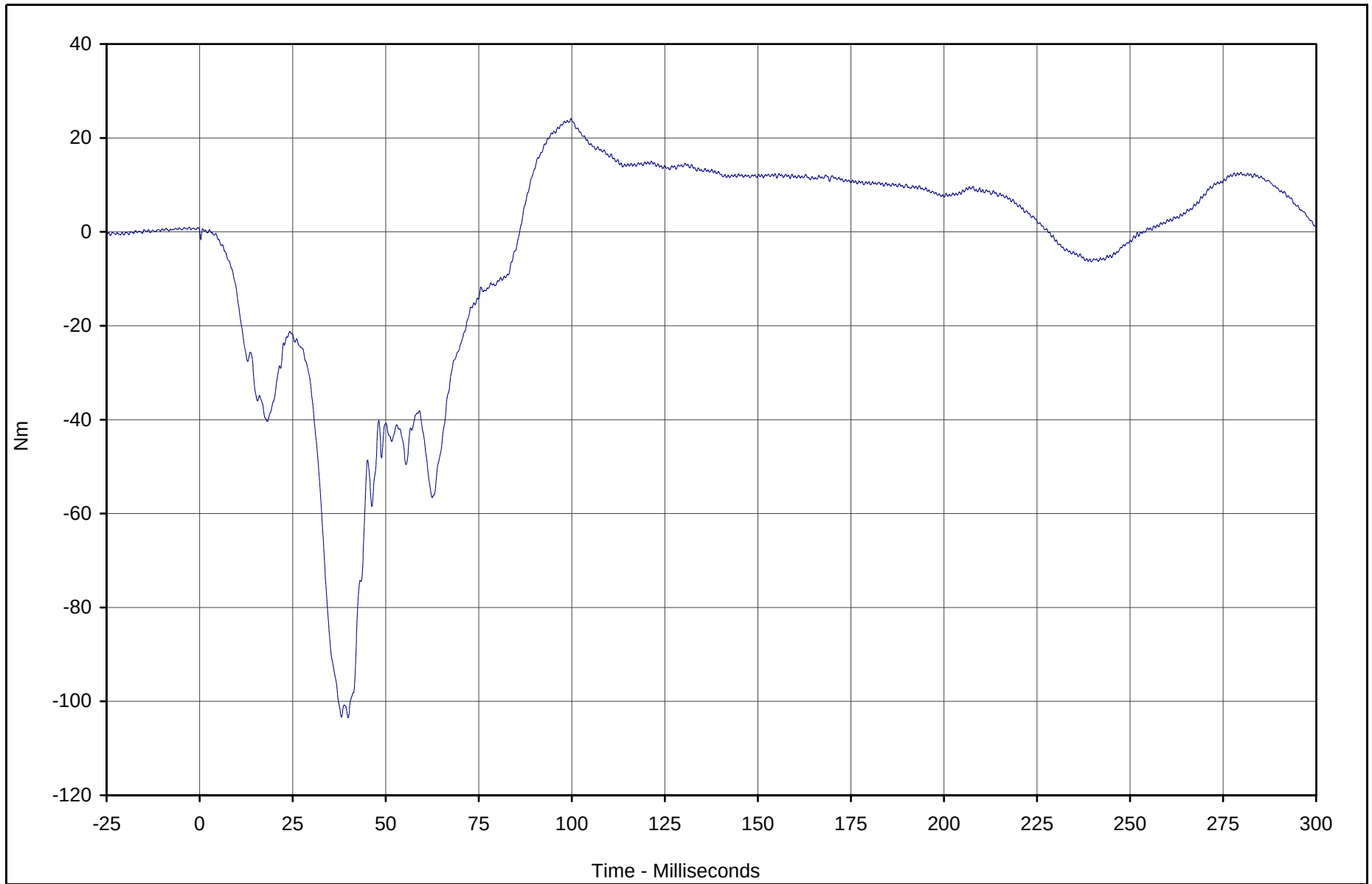


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Upper Tibia Moment Y	026	FIL	Nm	24.1	99.8	-103.5	39.9	600

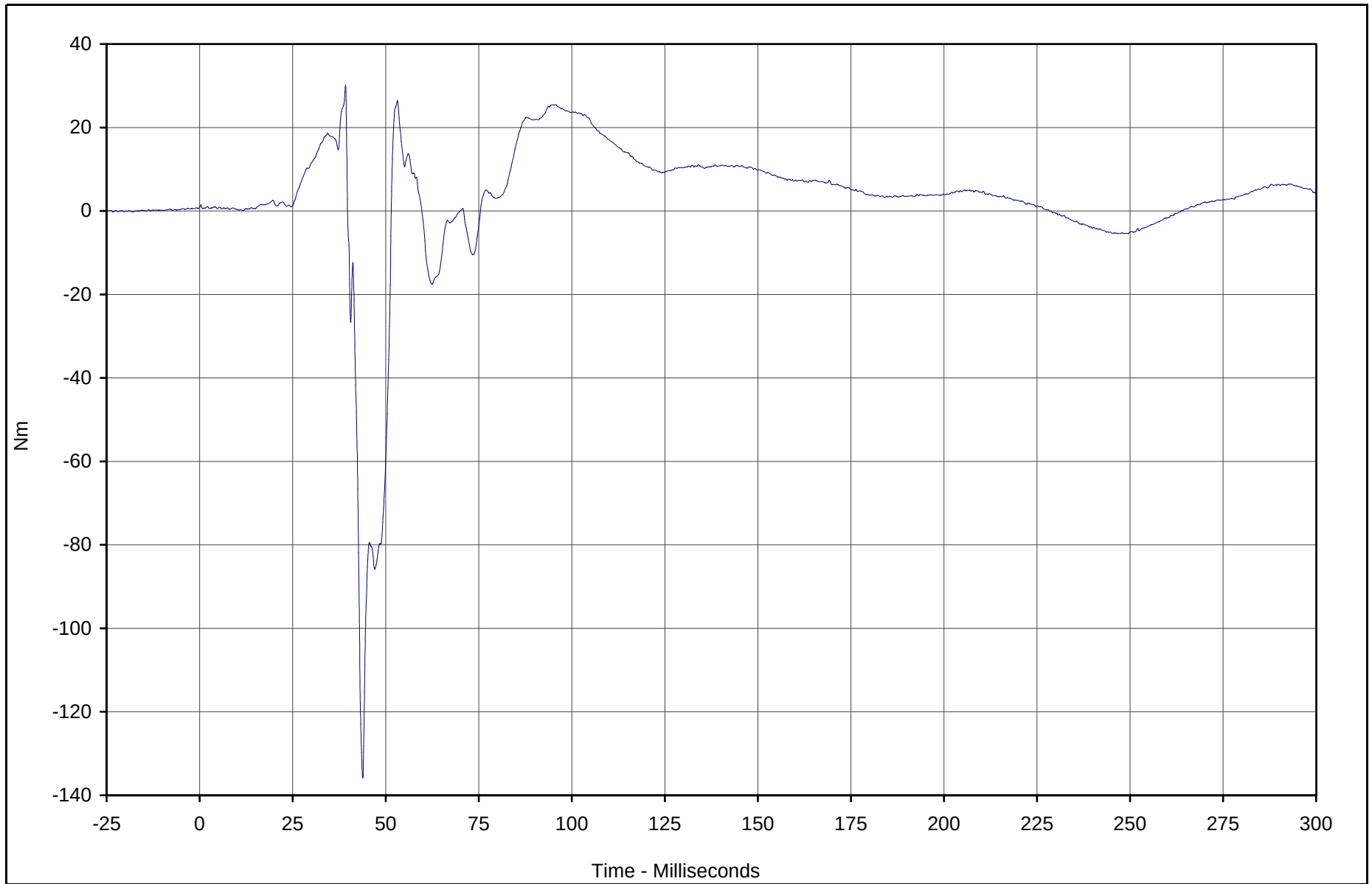


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Upper Tibia Moment X	027	FIL	Nm	30.1	39.2	-135.9	43.8	600

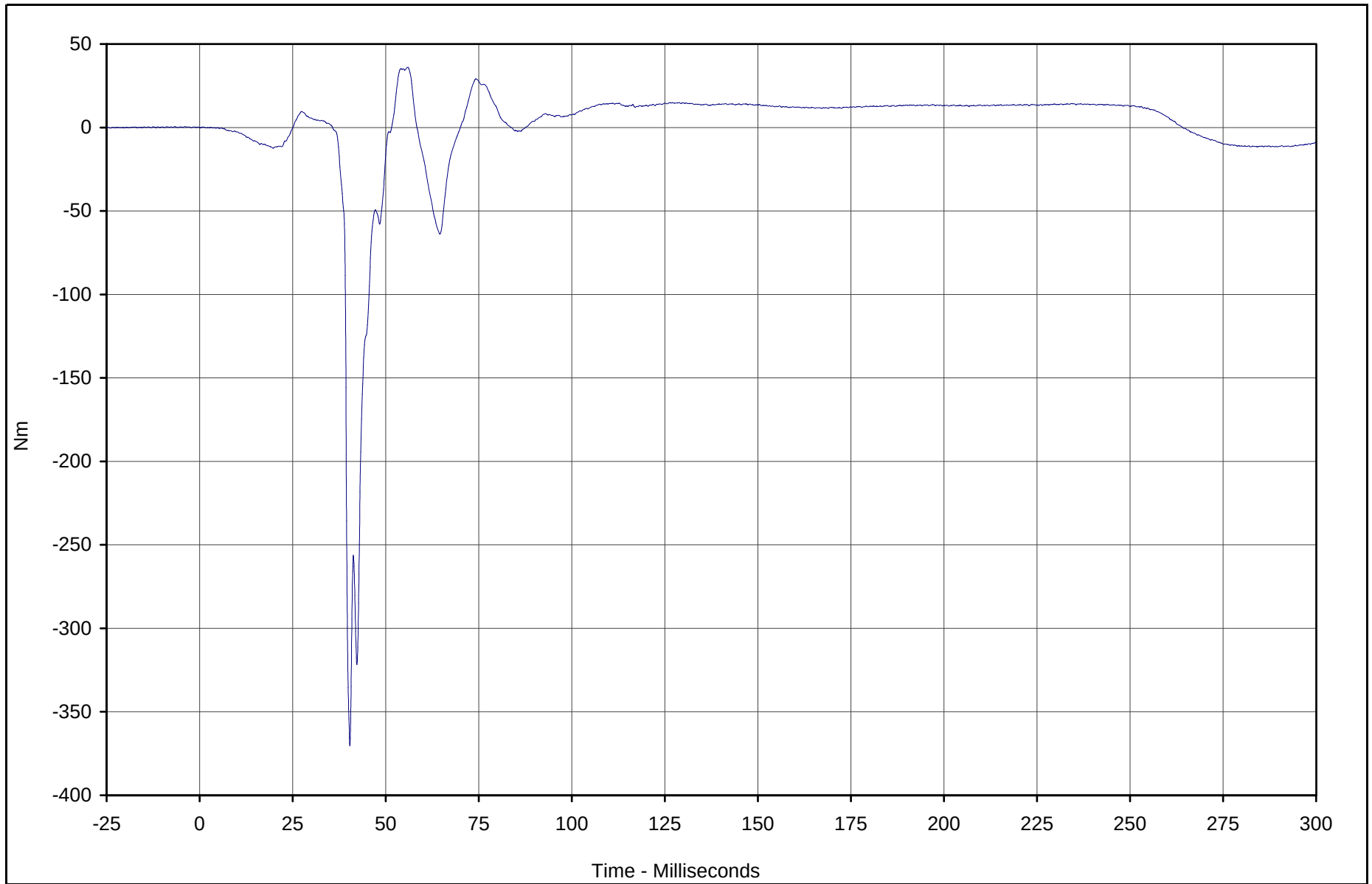


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Upper Tibia Moment Y	028	FIL	Nm	36.1	55.9	-370.4	40.4	600

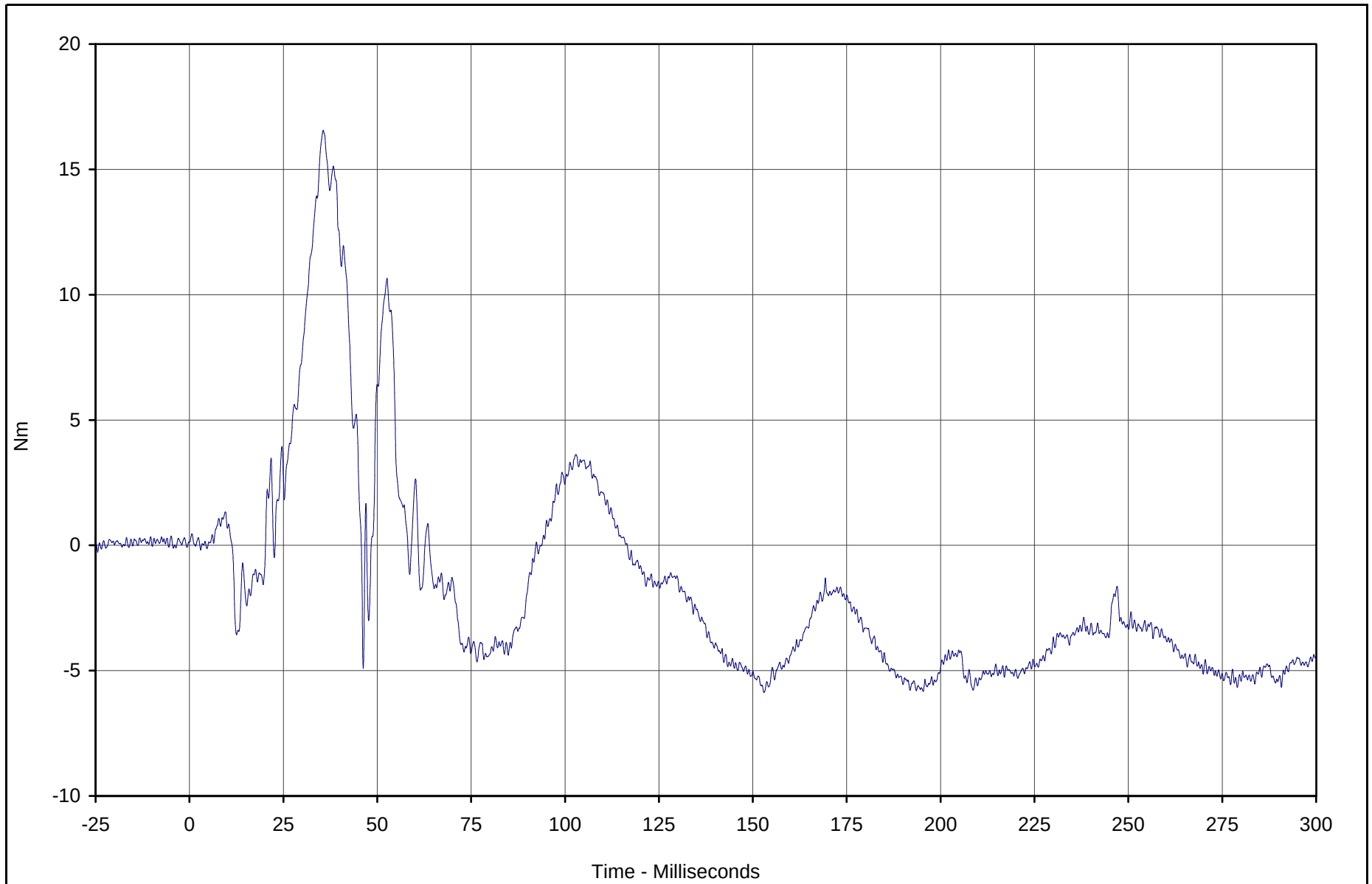


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Lower Tibia Moment X	029	FIL	Nm	16.6	35.6	-5.9	153.0	600

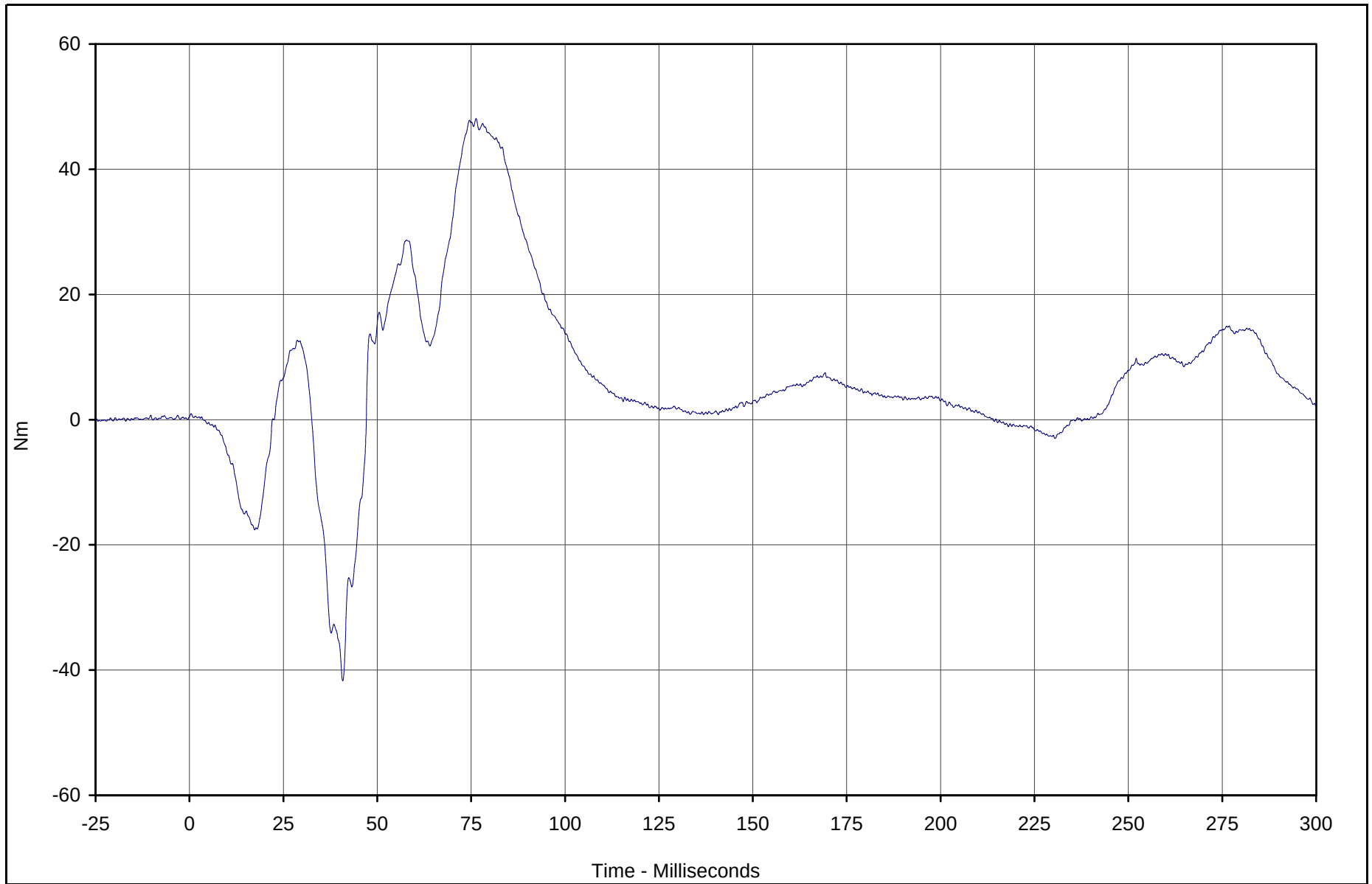


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Lower Tibia Moment Y	030	FIL	Nm	48.1	76.3	-41.7	40.8	600

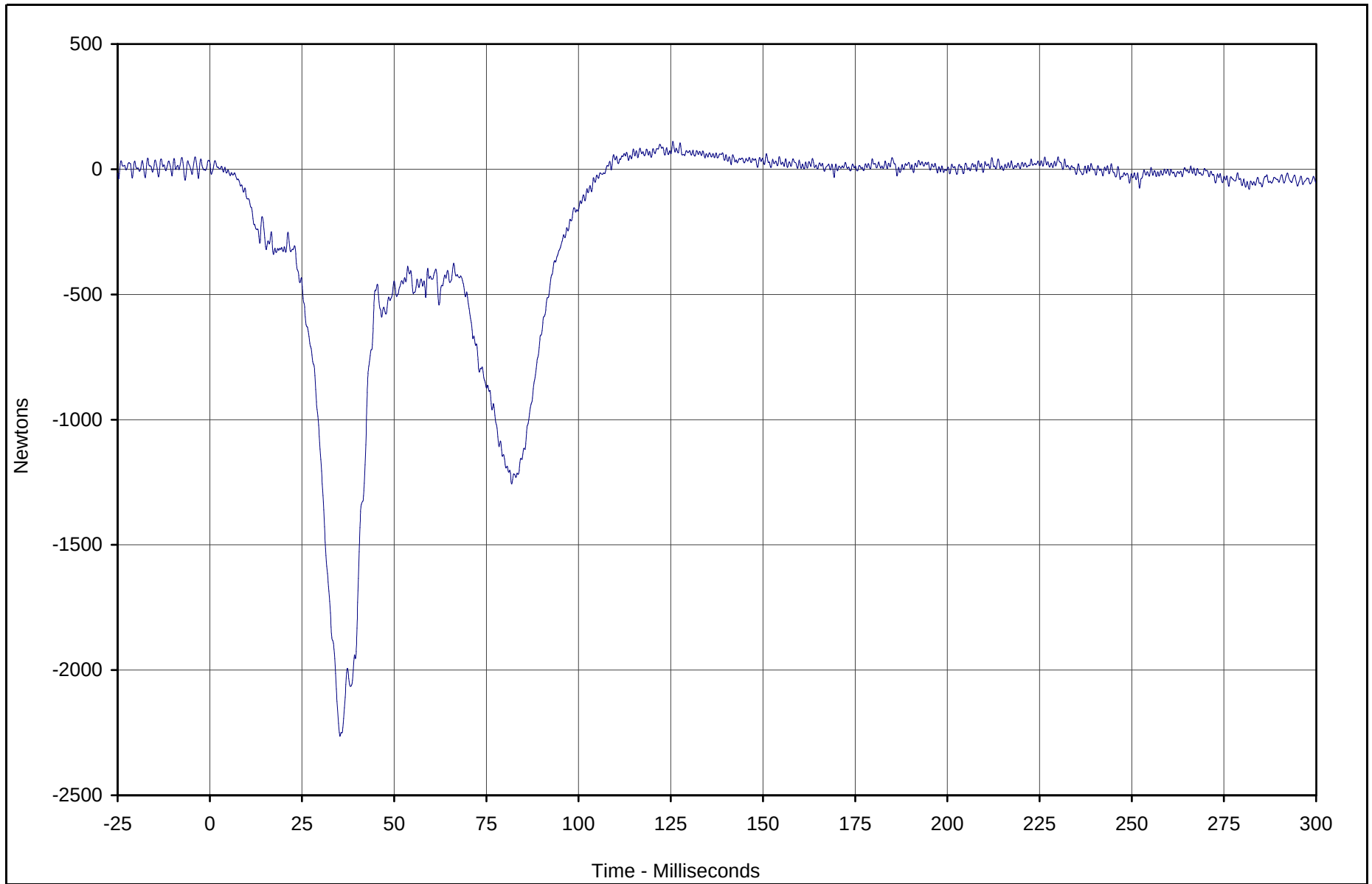


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Lower Tibia Force Z	031	FIL	Newtons	111.5	125.6	-2264.5	35.3	600

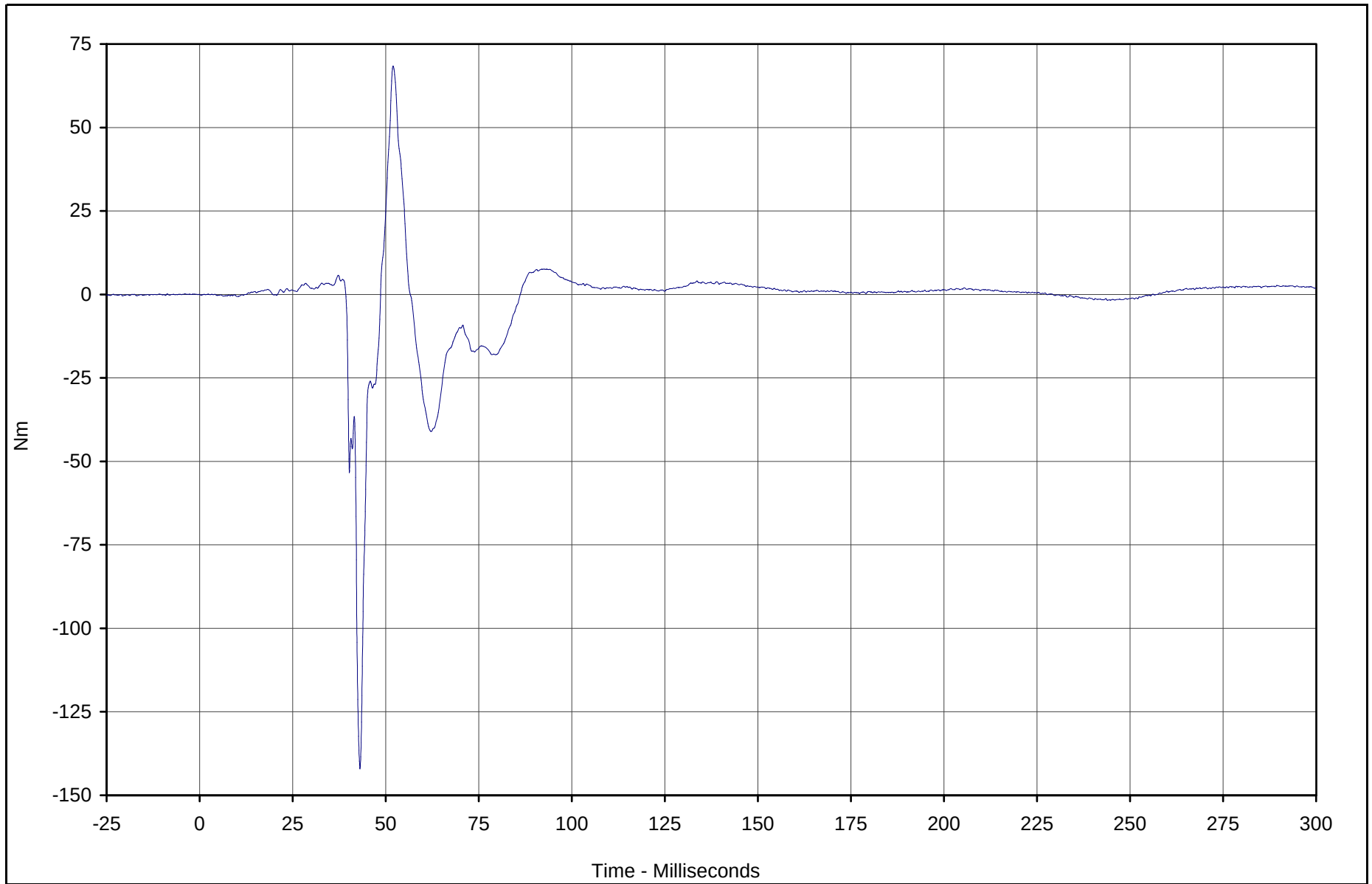


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Lower Tibia Moment X	032	FIL	Nm	68.4	52.0	-142.1	43.1	600



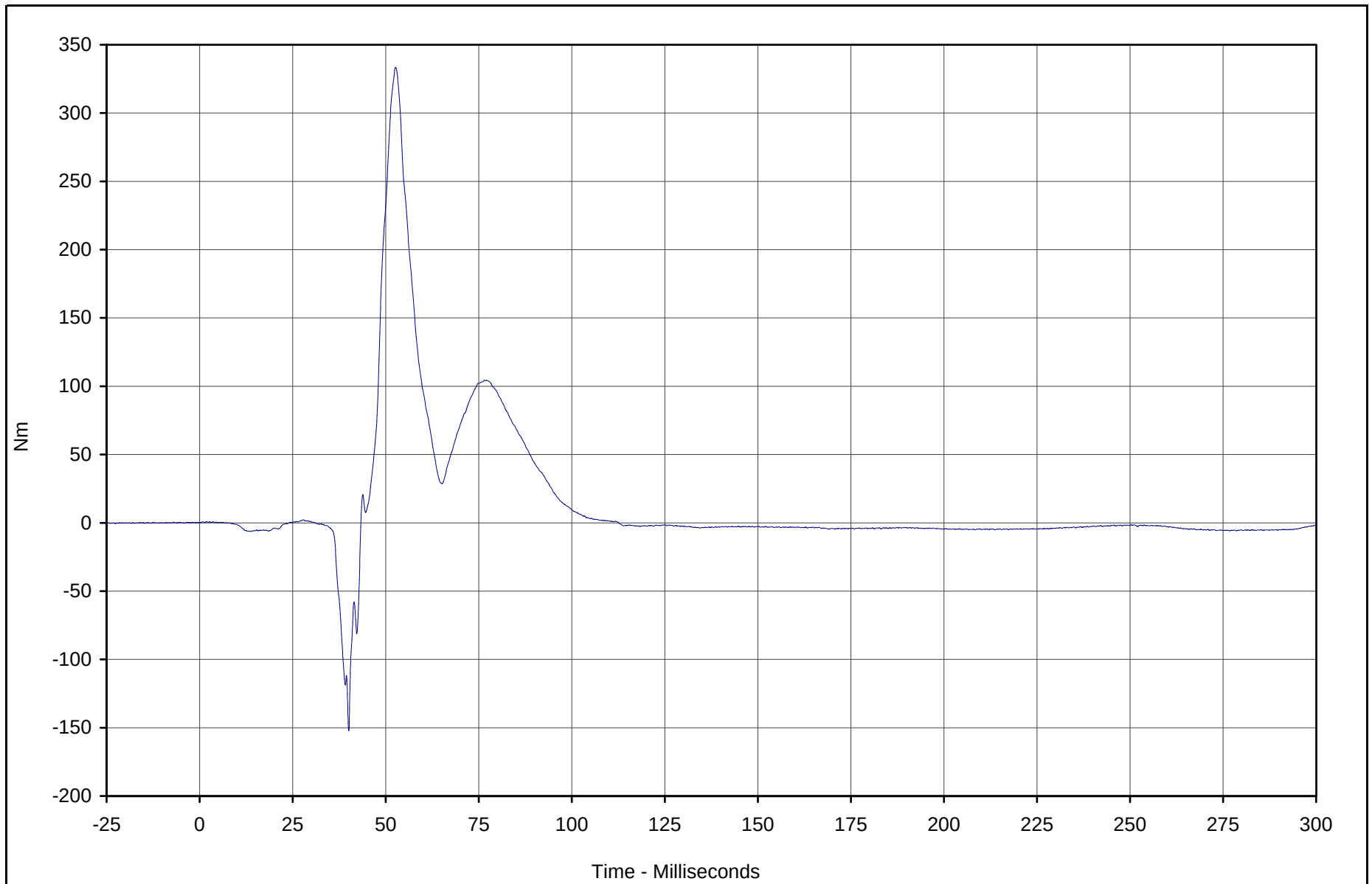
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-50



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Lower Tibia Moment Y	033	FIL	Nm	333.5	52.7	-152.2	40.1	600



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

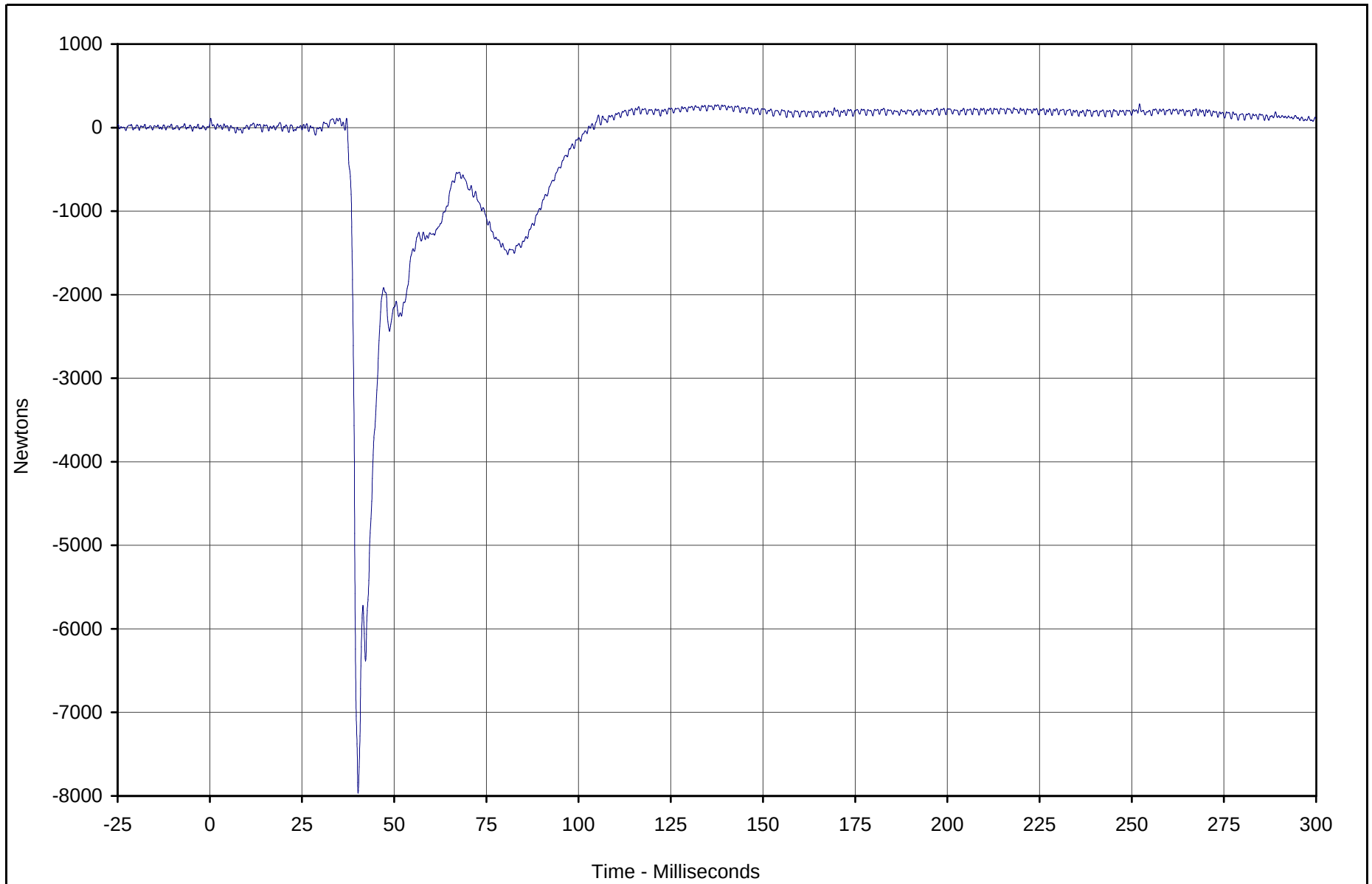
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-51



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Lower Tibia Force Z	034	FIL	Newtons	283.3	252.1	-7964.7	40.2	600



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

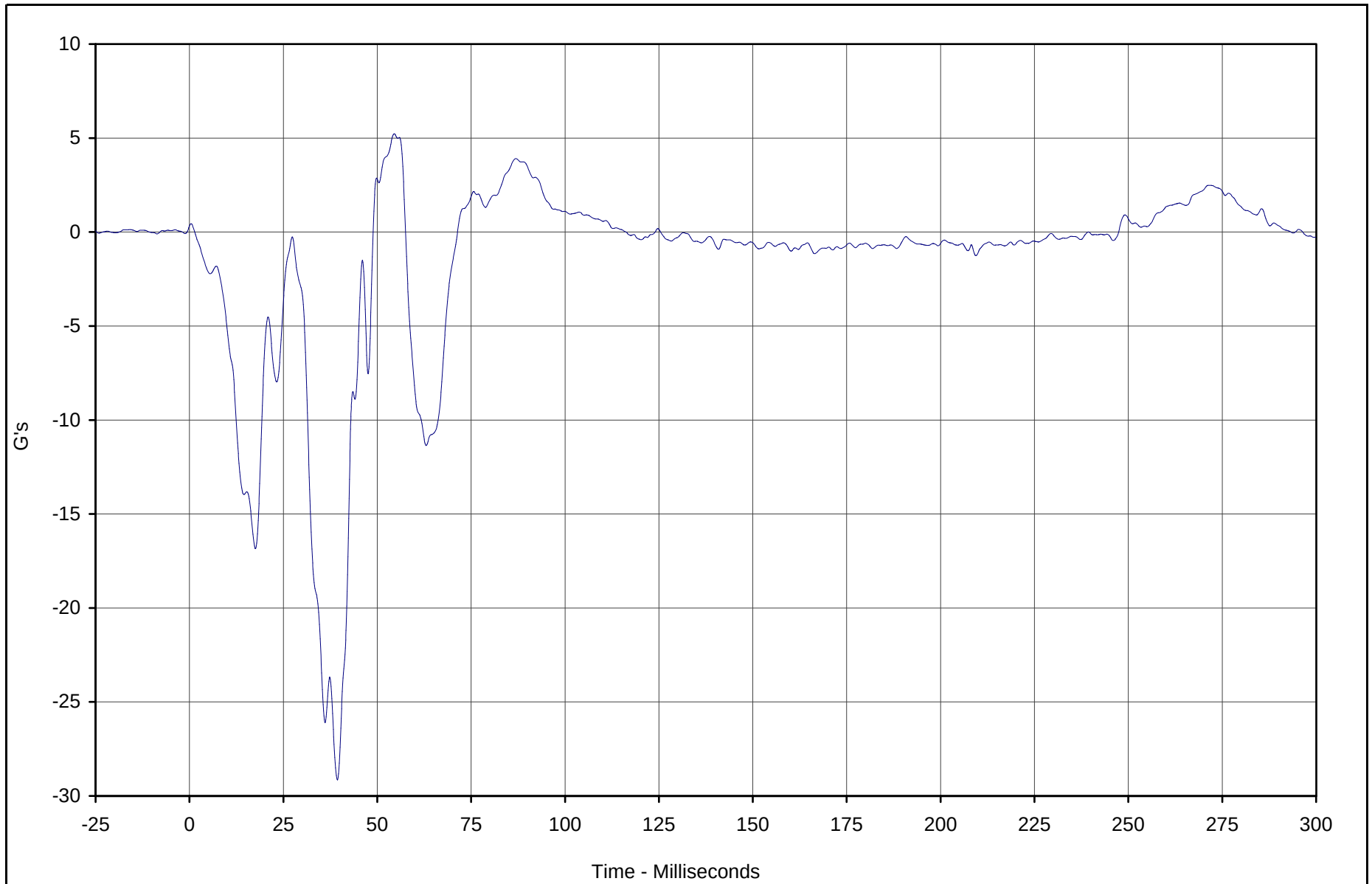
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-52



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Foot Aft X	035	FIL	G's	5.2	54.5	-29.1	39.4	180



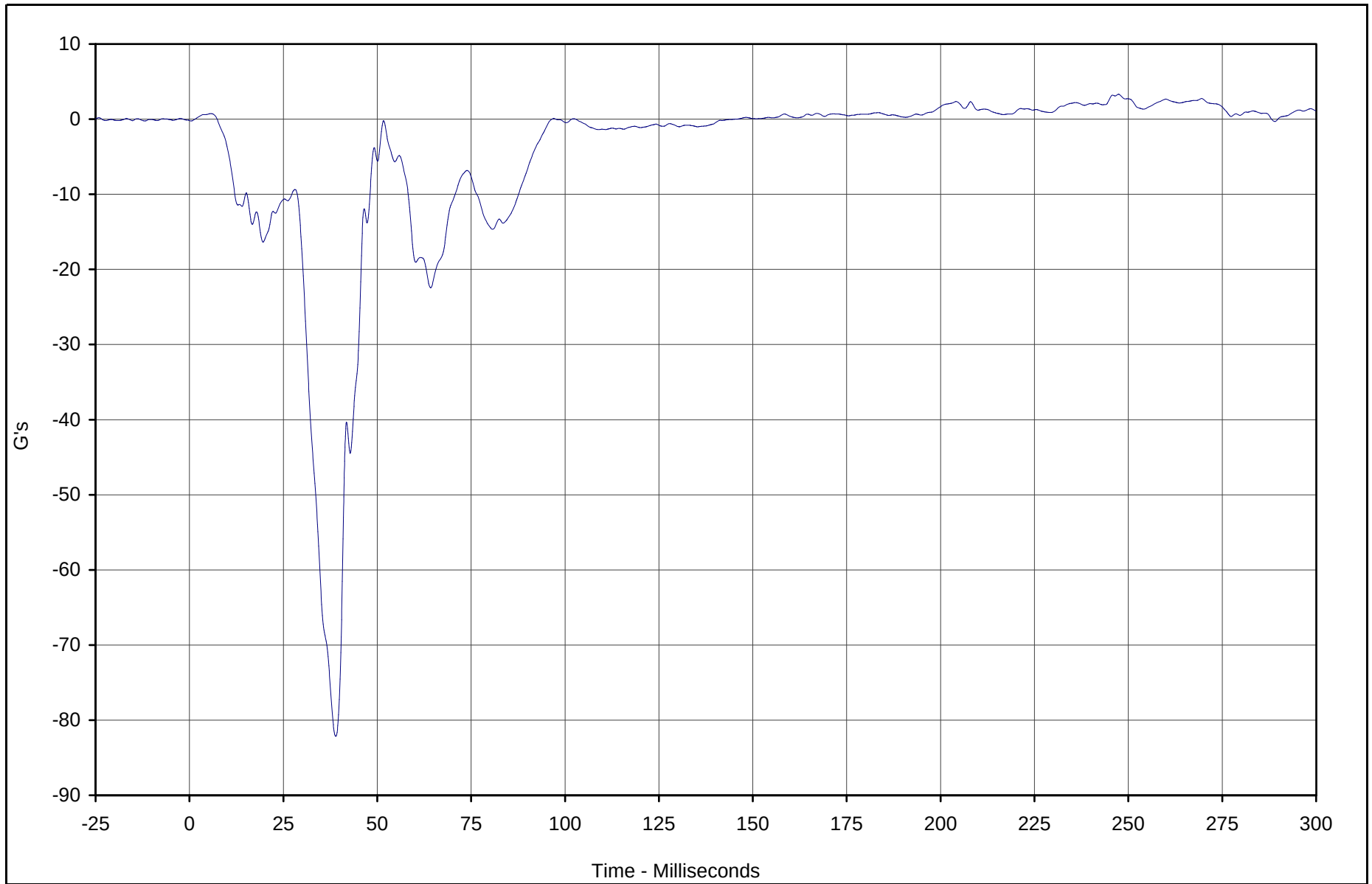
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Foot Aft Z	036	FIL	G's	3.3	247.4	-82.2	38.9	180



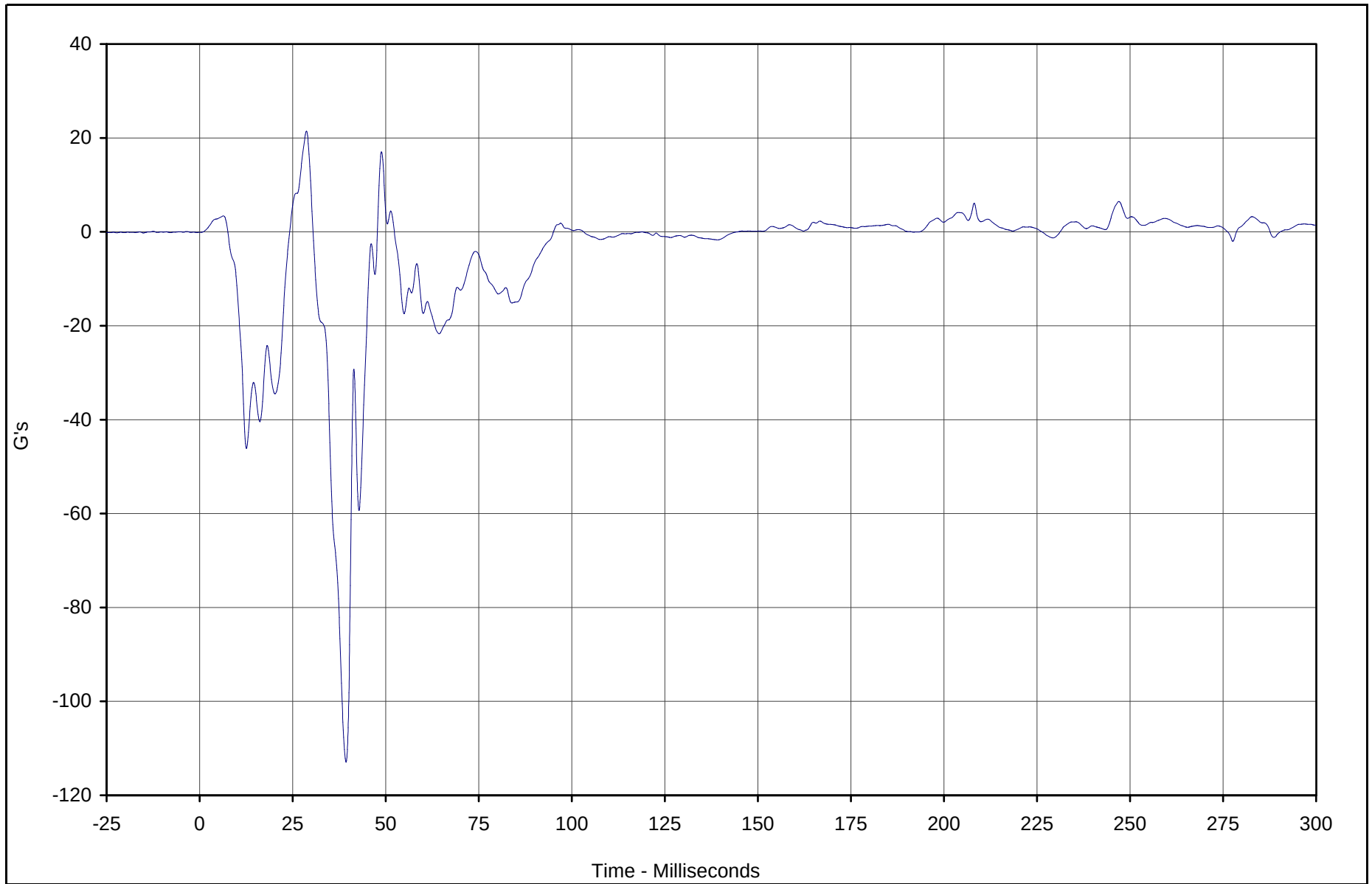
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-54



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Left Foot Fore Z	037	FIL	G's	21.5	28.7	-113.0	39.3	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

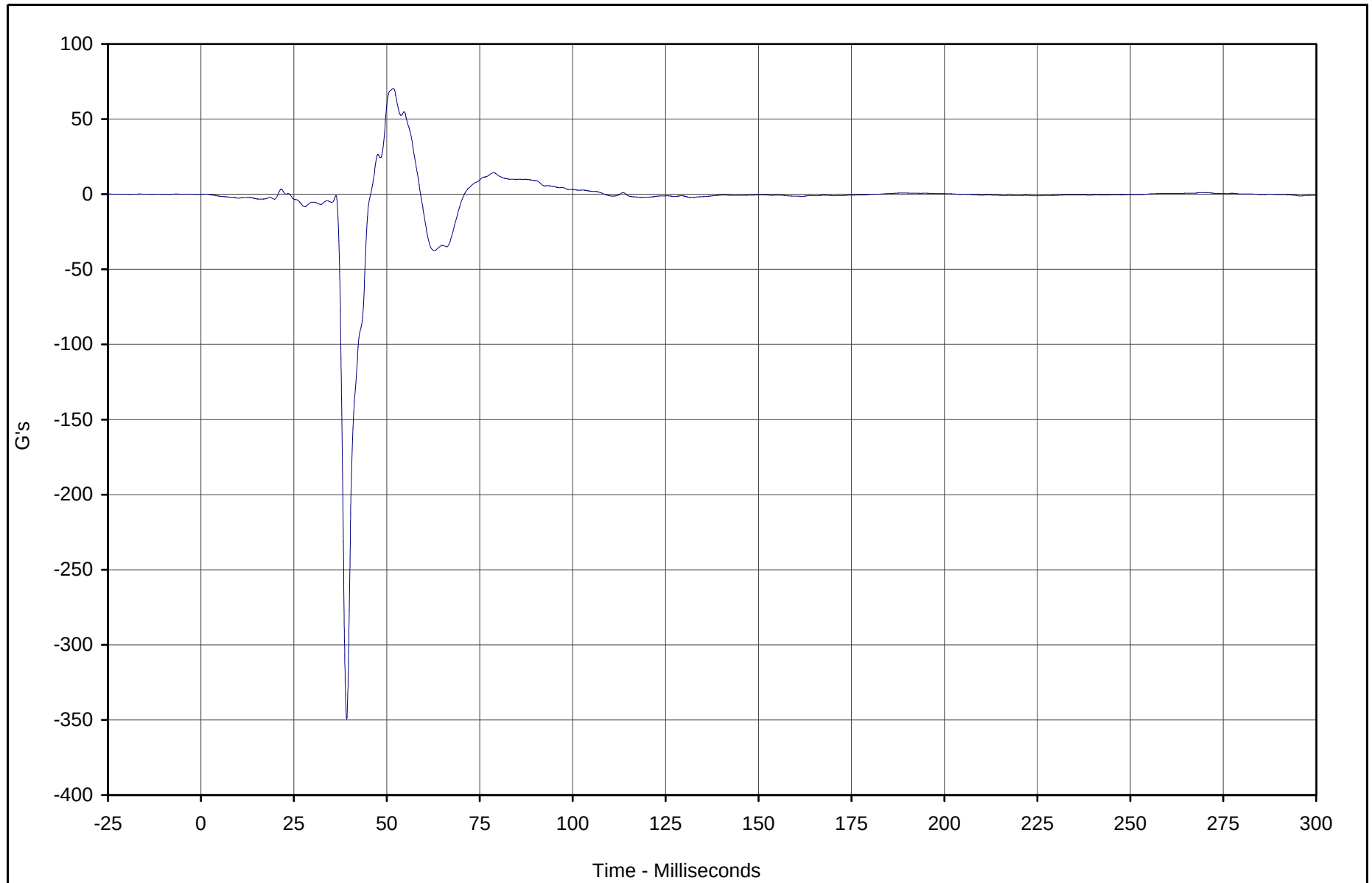
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-55



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Foot Aft X	038	FIL	G's	70.3	51.7	-349.5	39.2	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

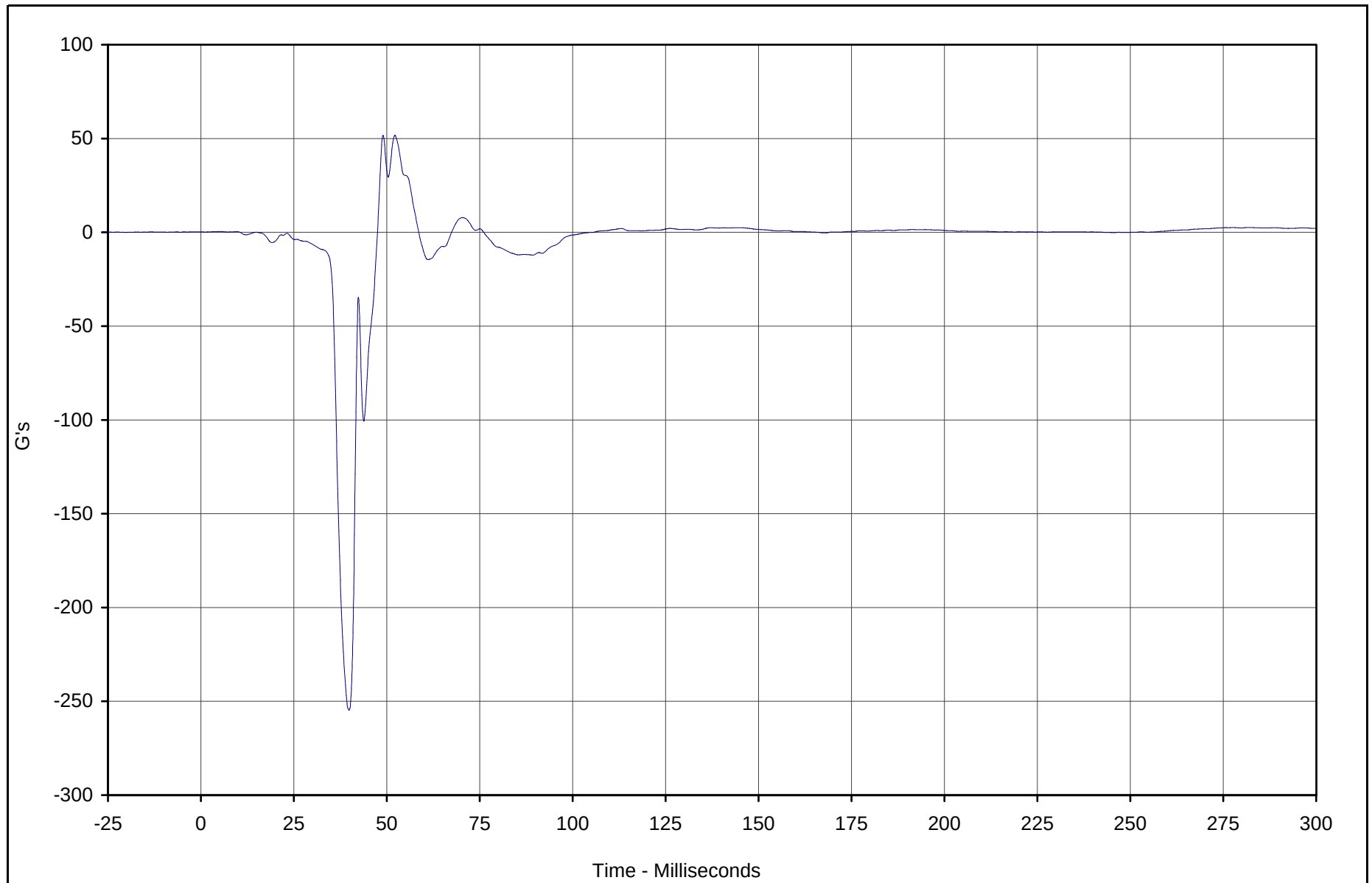
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-56



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Foot Aft Z	039	FIL	G's	51.8	52.2	-254.6	39.9	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

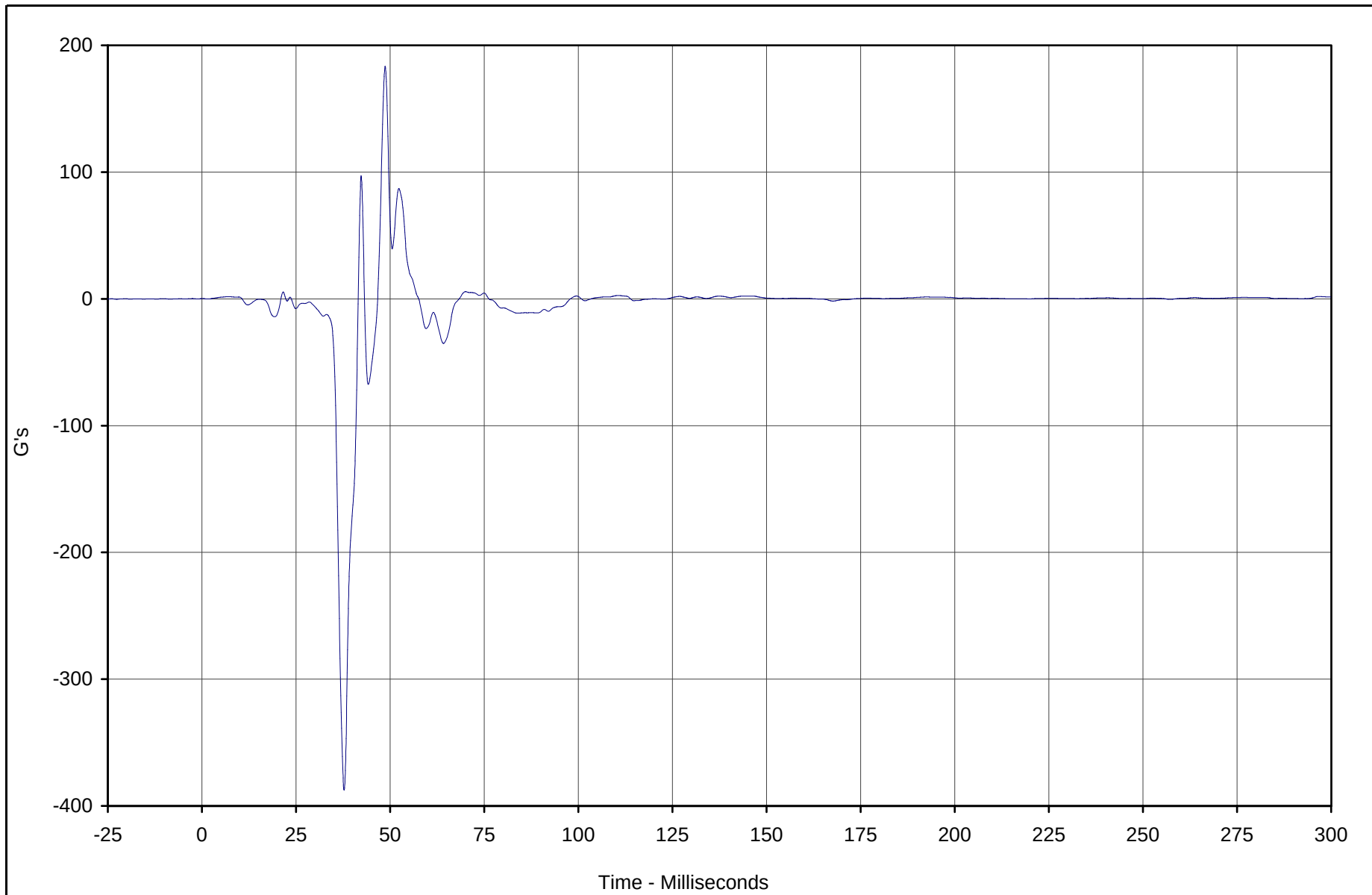
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-57



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Right Foot Fore Z	040	FIL	G's	183.5	48.7	-387.6	37.8	180



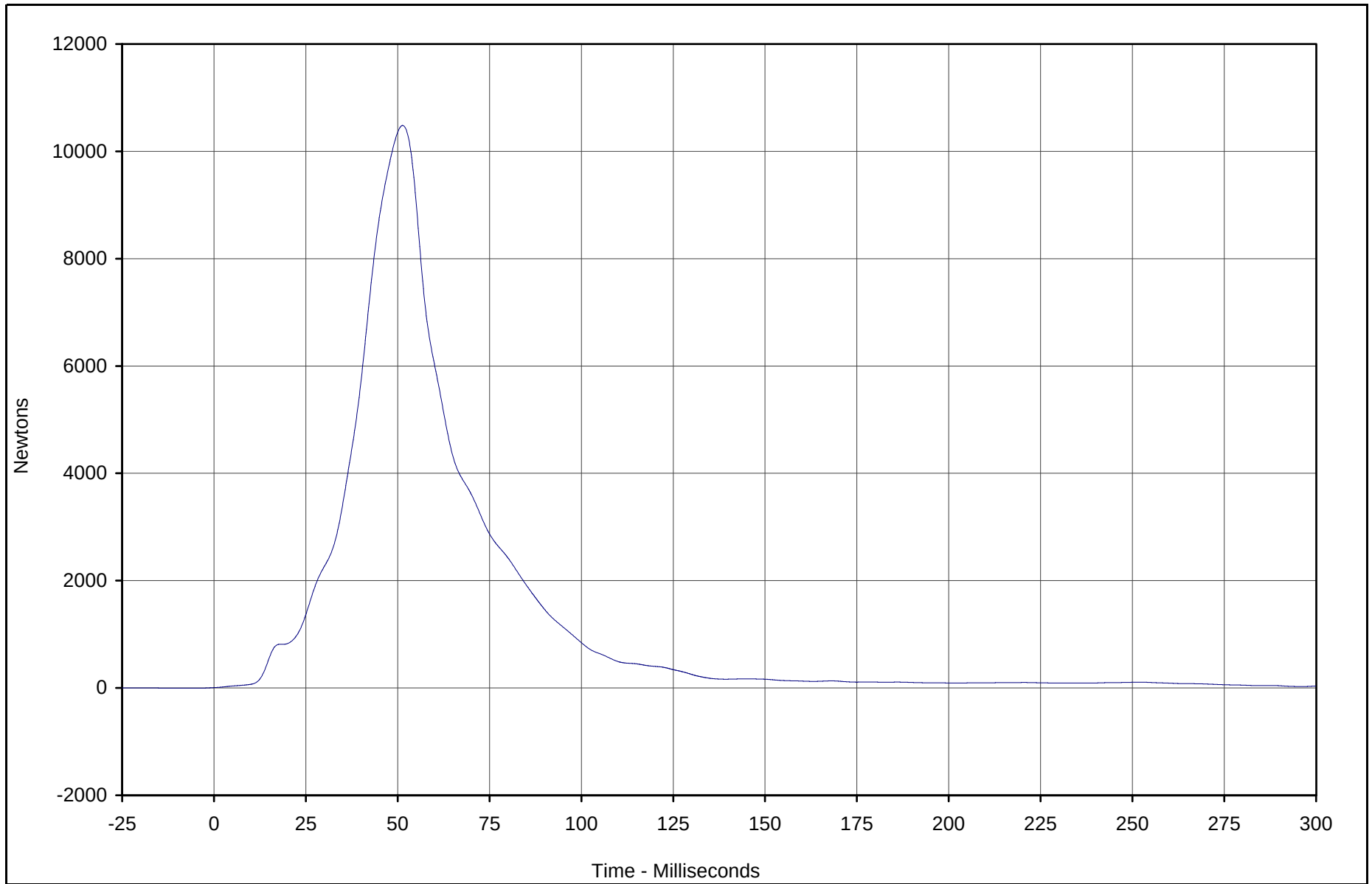
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Lap Belt Force	041	FIL	Newtons	10482.5	51.3	6.1	0.0	60

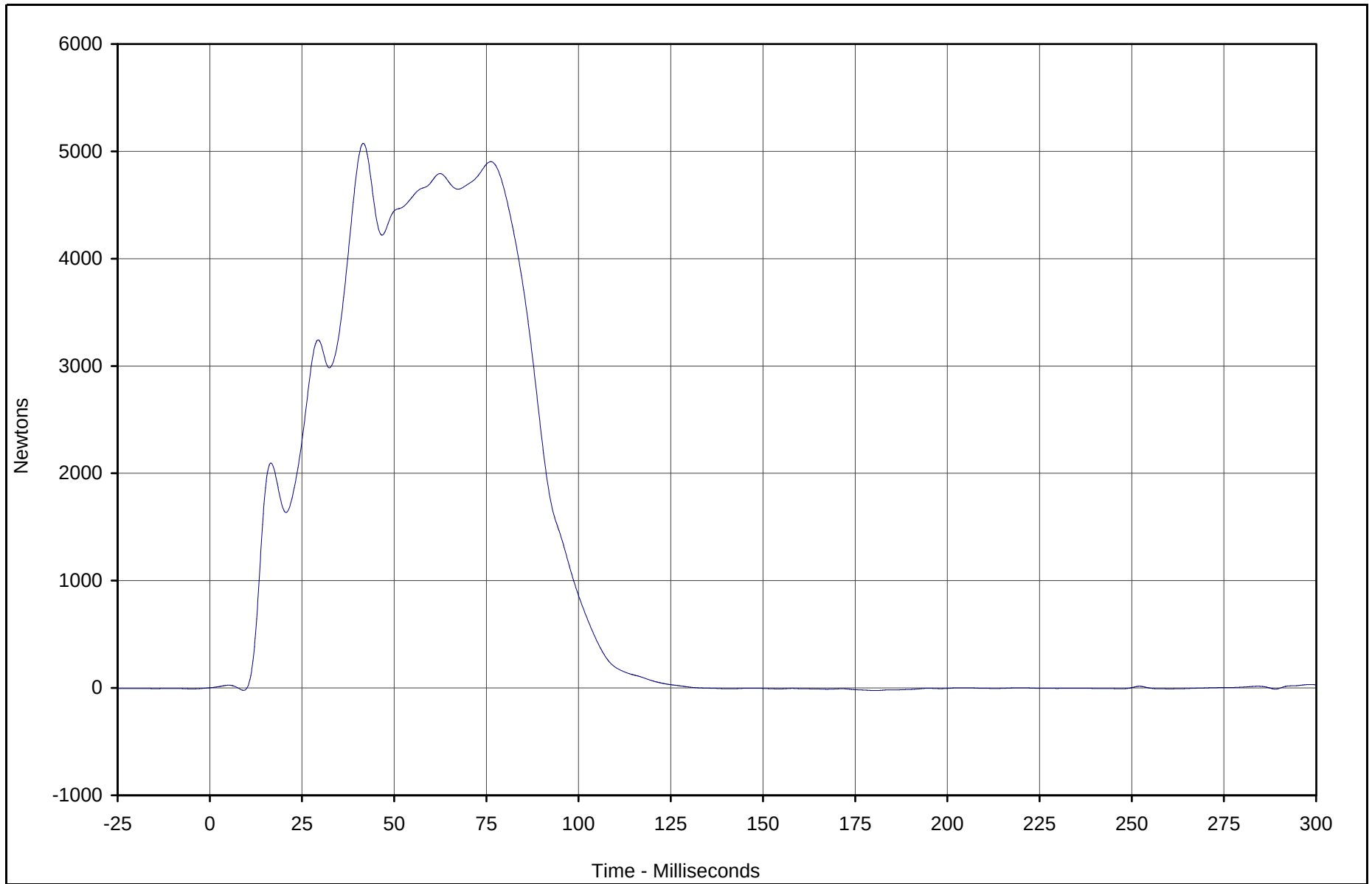


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Shoulder Belt Force	042	FIL	Newtons	5075.0	41.6	-24.1	180.5	60



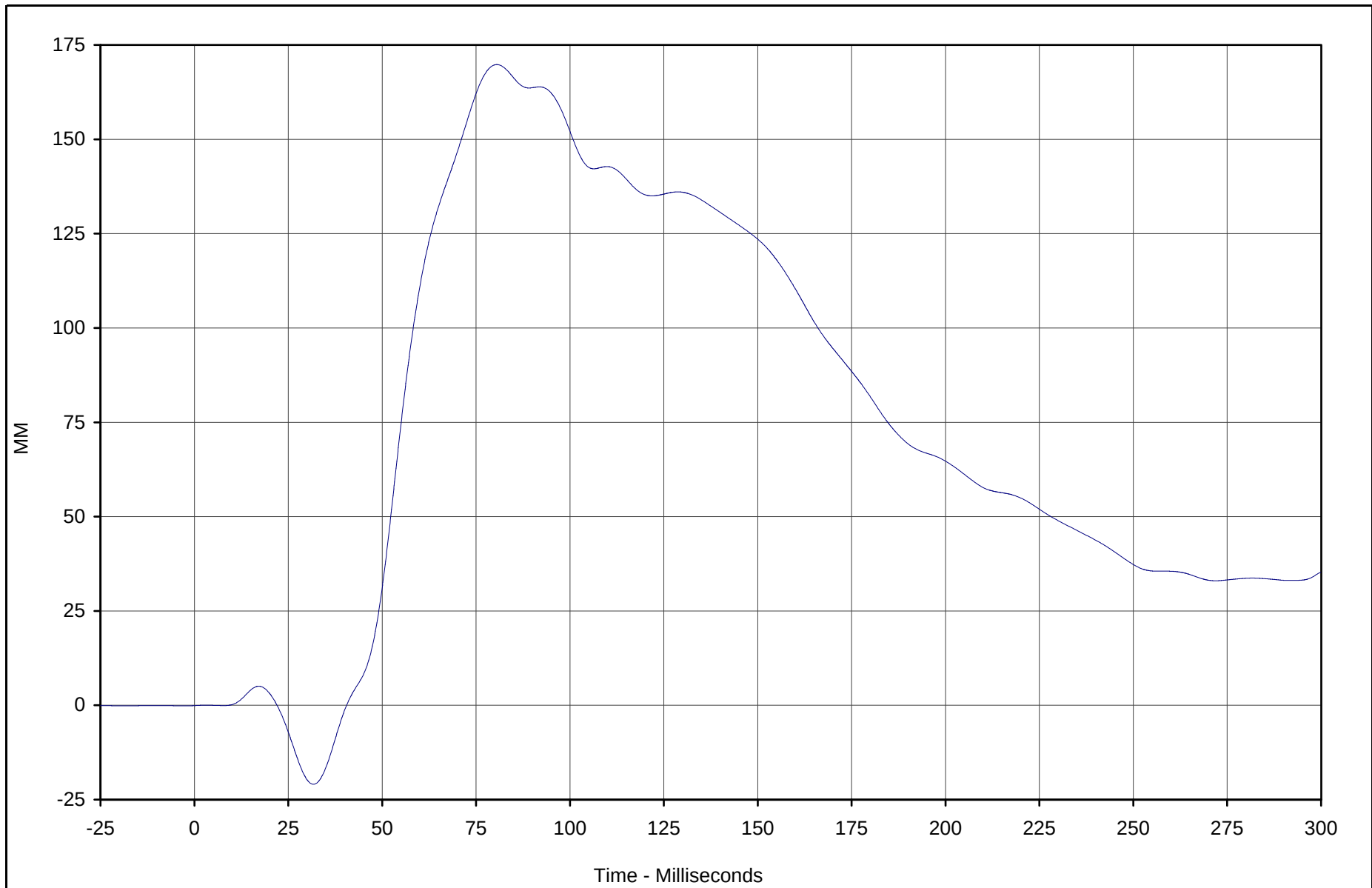
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-60



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Shoulder Belt Pullout	043	FIL	MM	169.8	80.5	-20.9	31.7	60



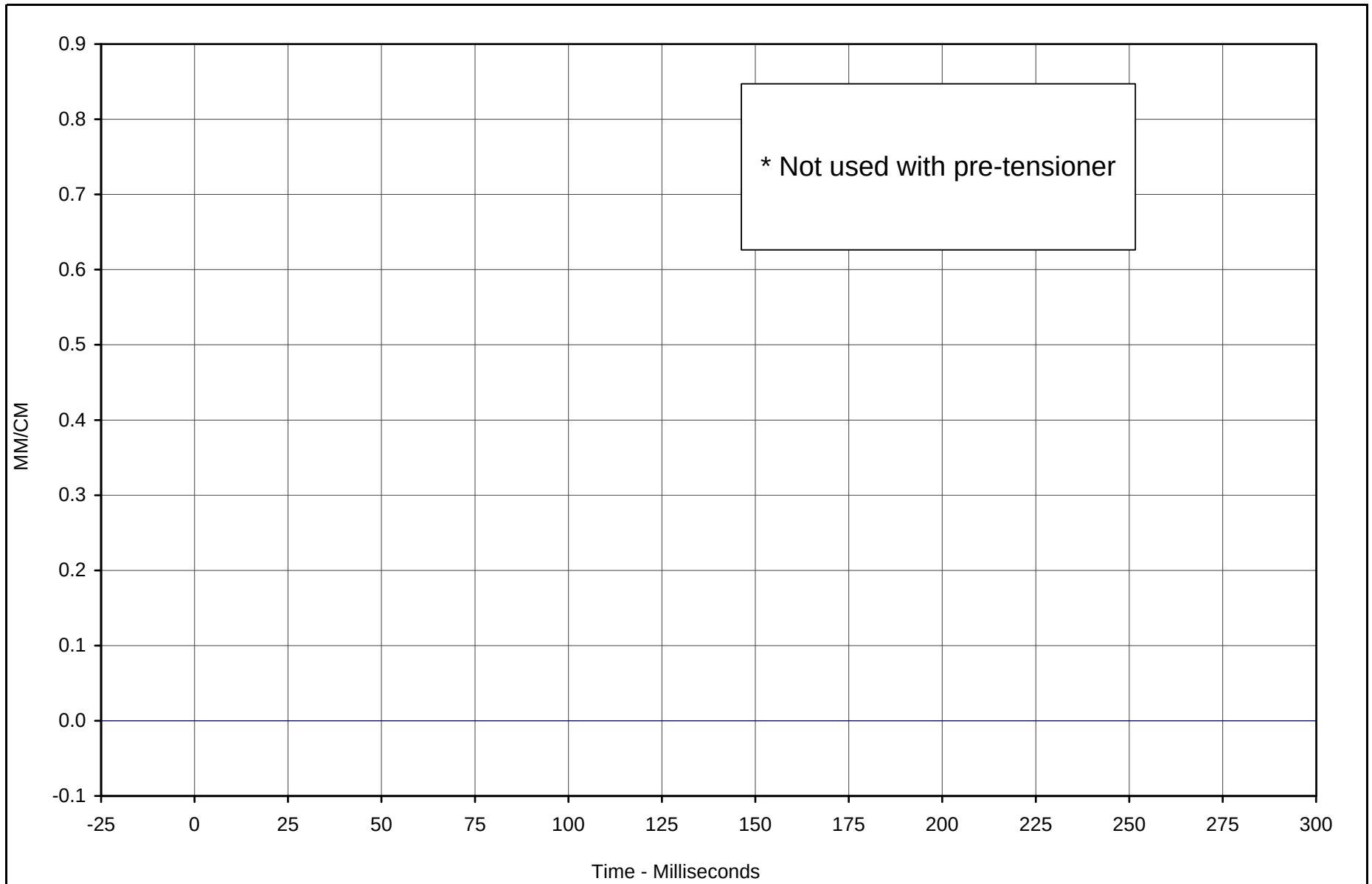
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



* Not used with pre-tensioner

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Shoulder Belt Elongation	044	FIL	MM/CM	0.00	0.0	0.00	0.0	60

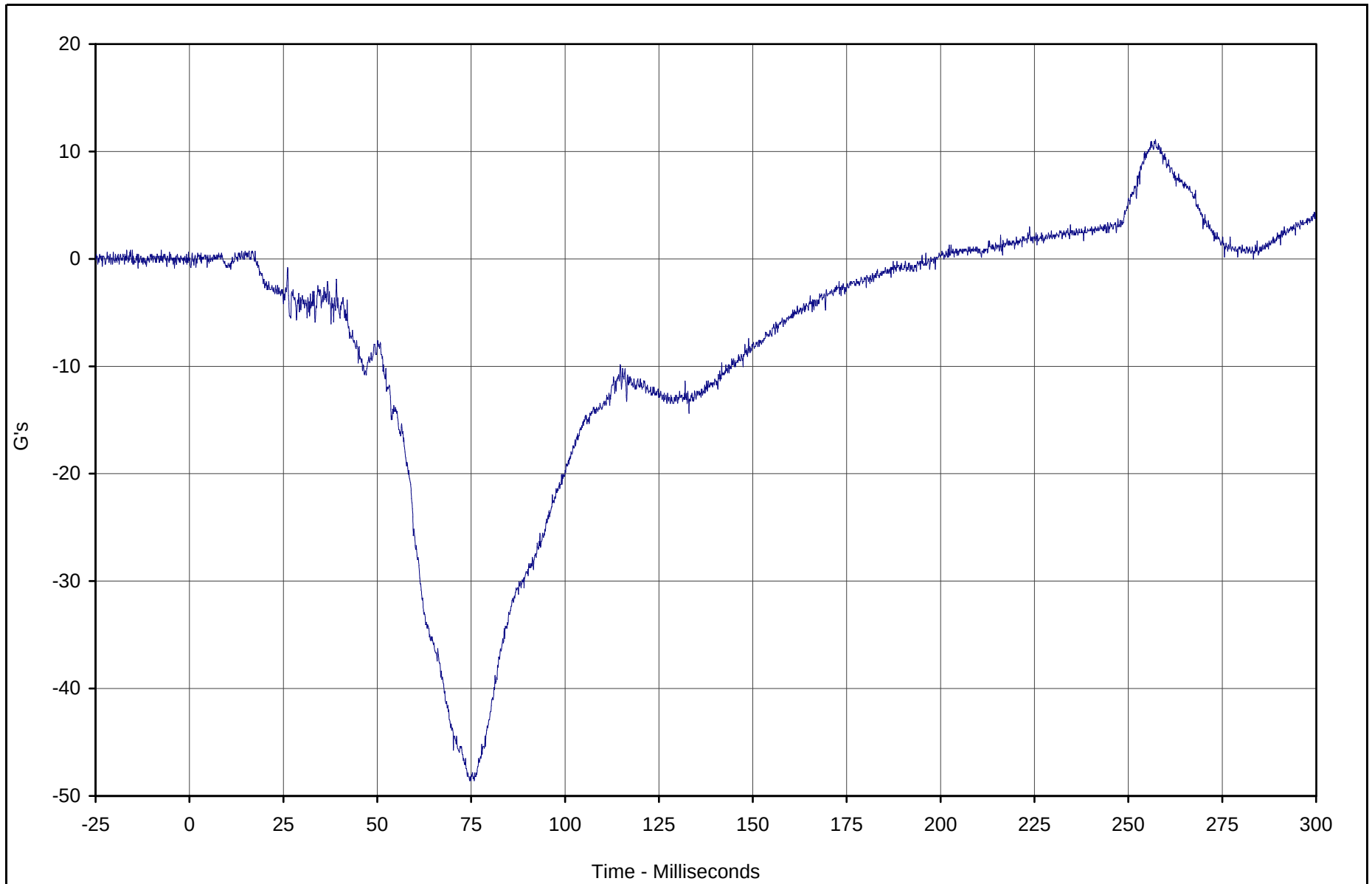


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X	045	FIL	G's	11.1	257.2	-48.6	74.6	1000



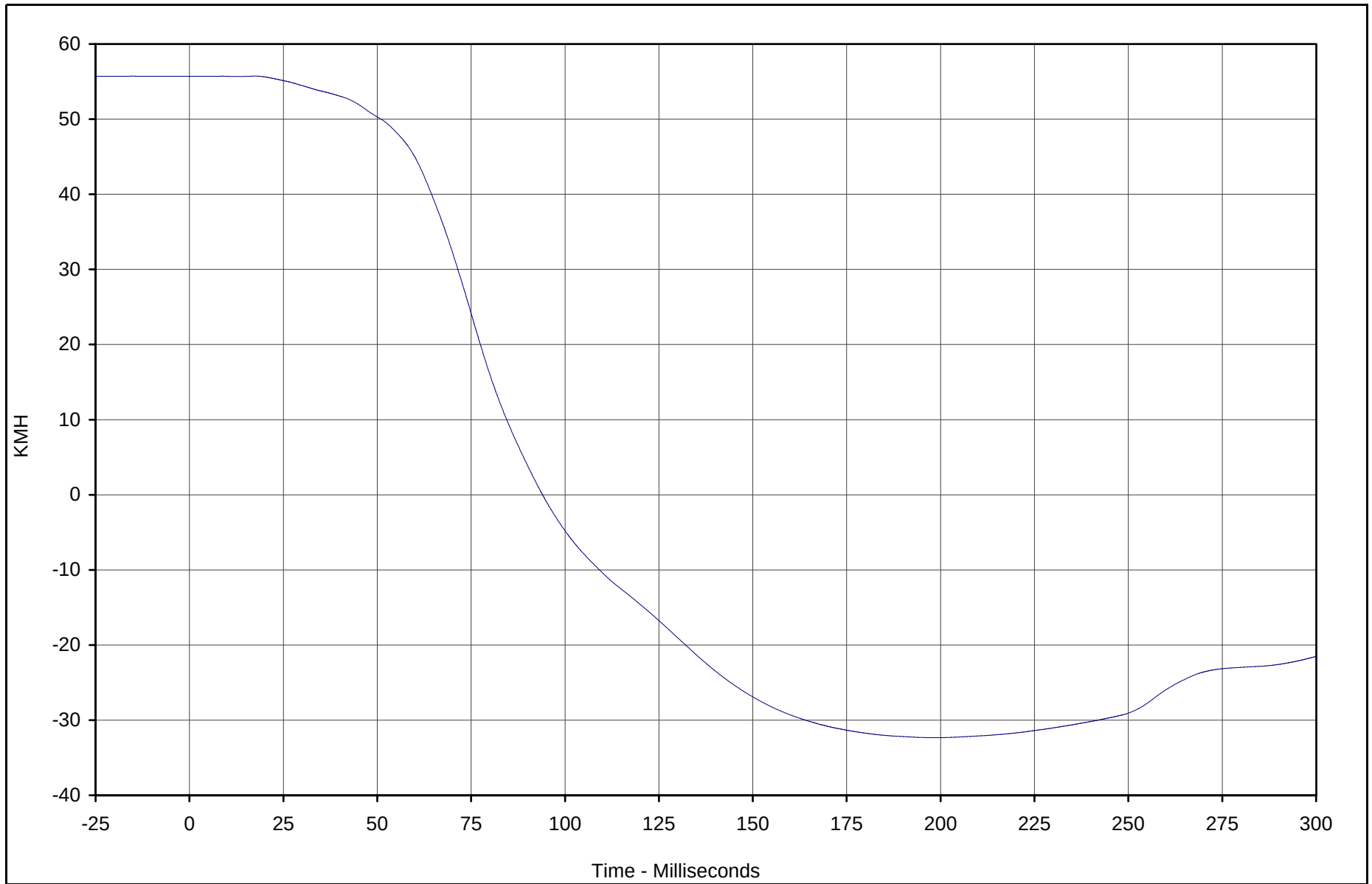
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X Velocity	045	IN1	KMH	55.7	17.5	-32.3	198.8	180



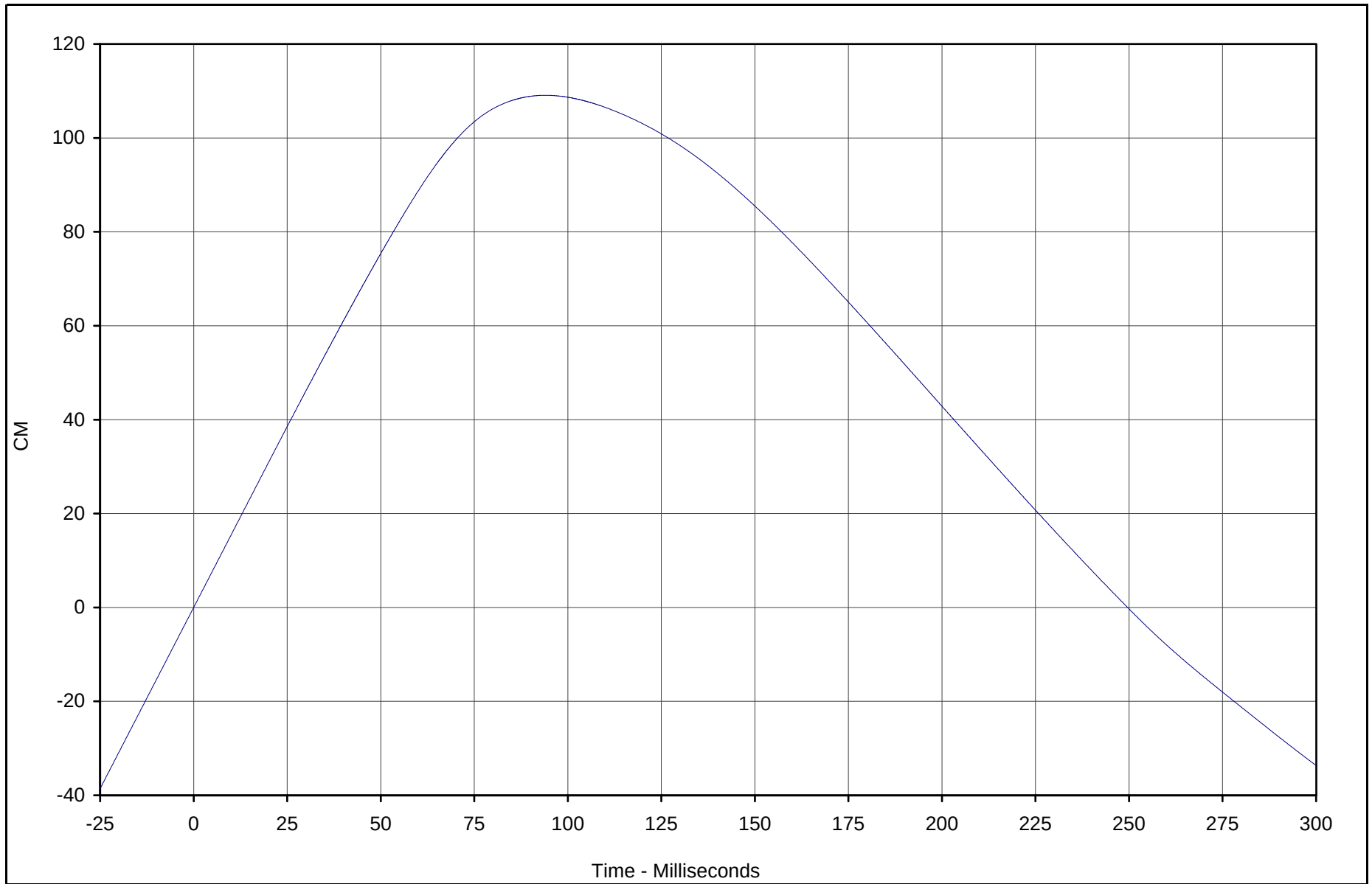
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X Displ.	045	IN2	CM	109.1	94.0	-33.6	299.9	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

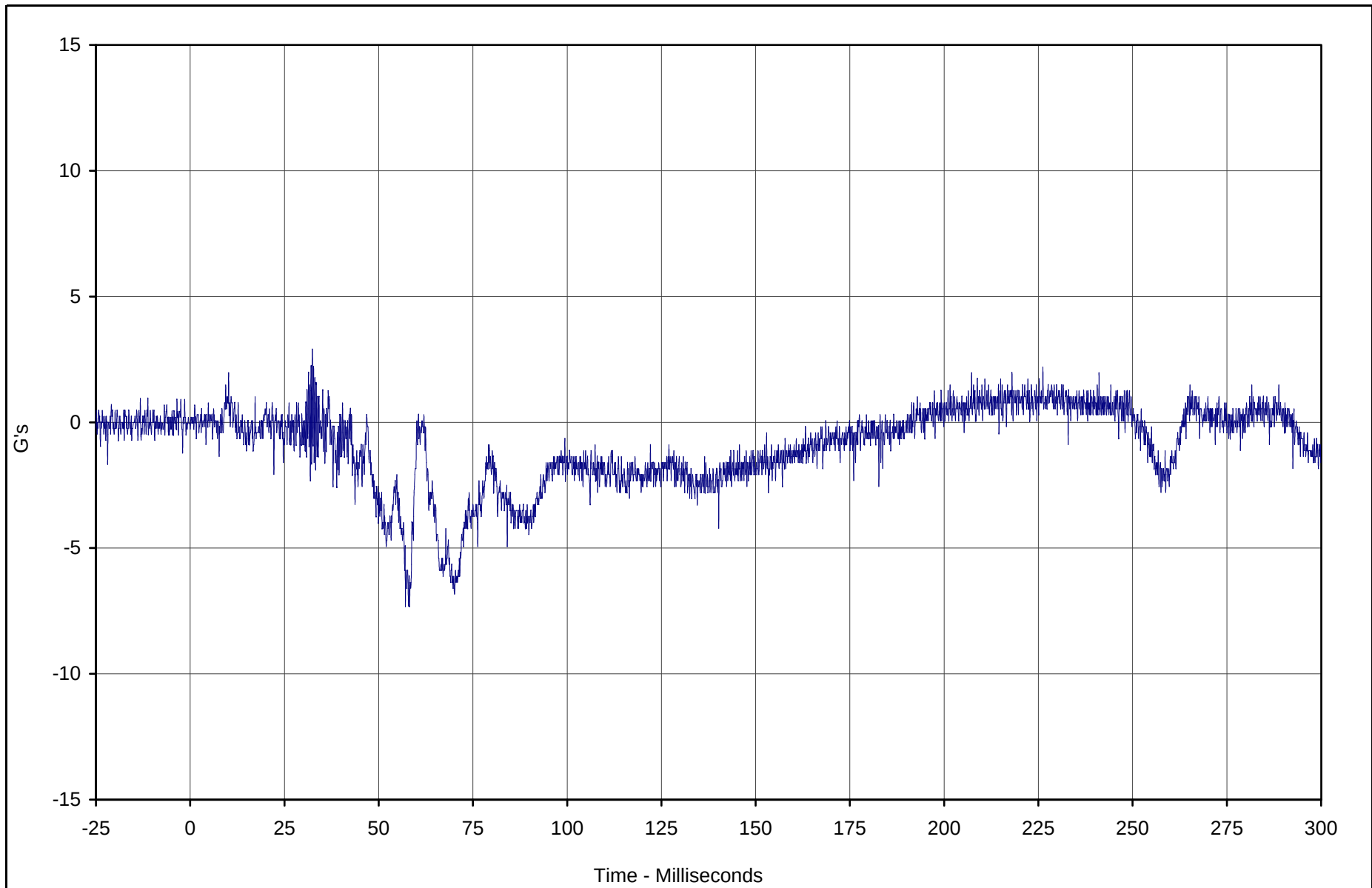
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-65



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary Y	046	FIL	G's	2.9	32.4	-7.3	57.1	1000



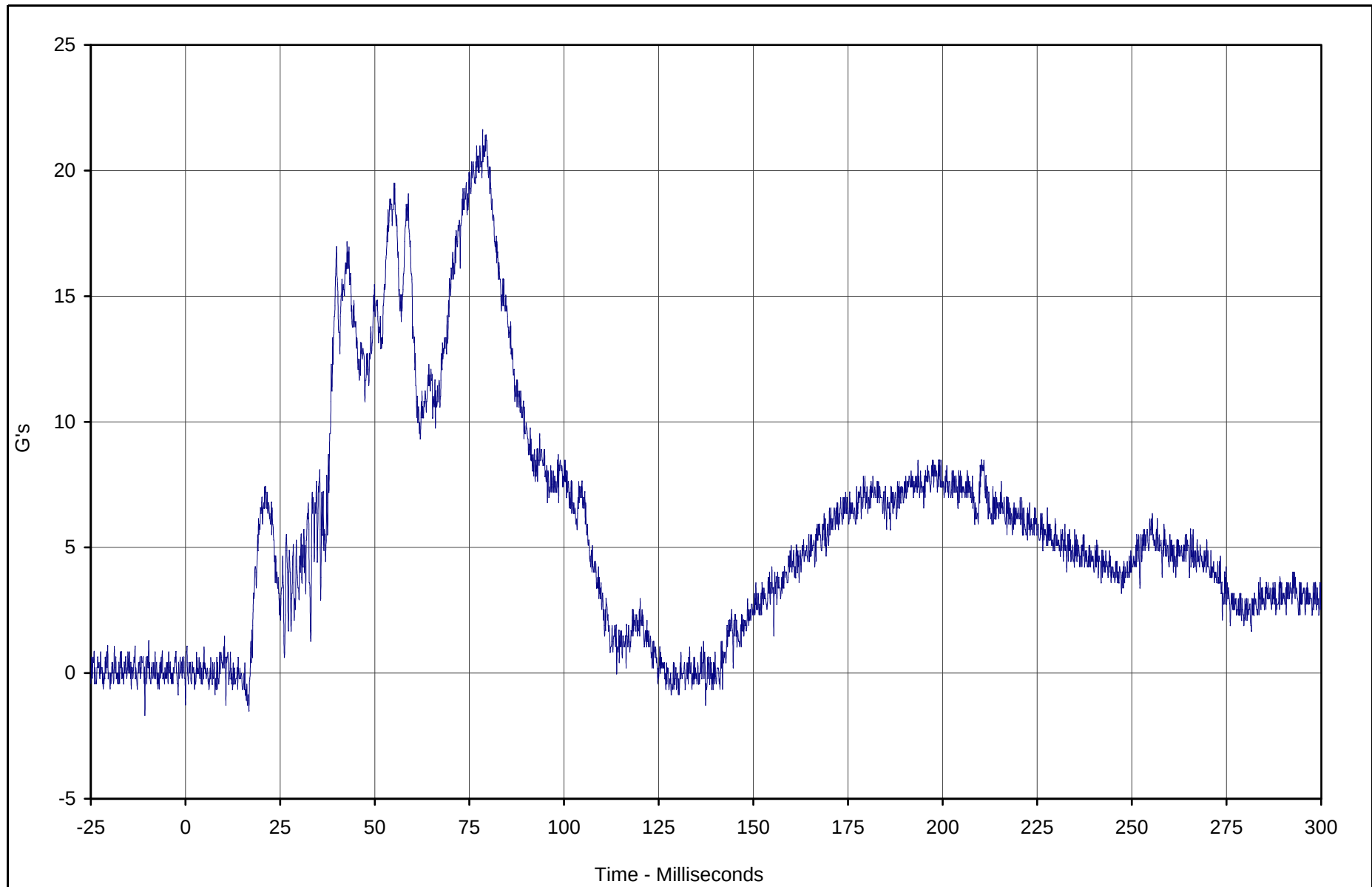
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary Z	047	FIL	G's	21.6	78.5	-1.5	16.8	1000

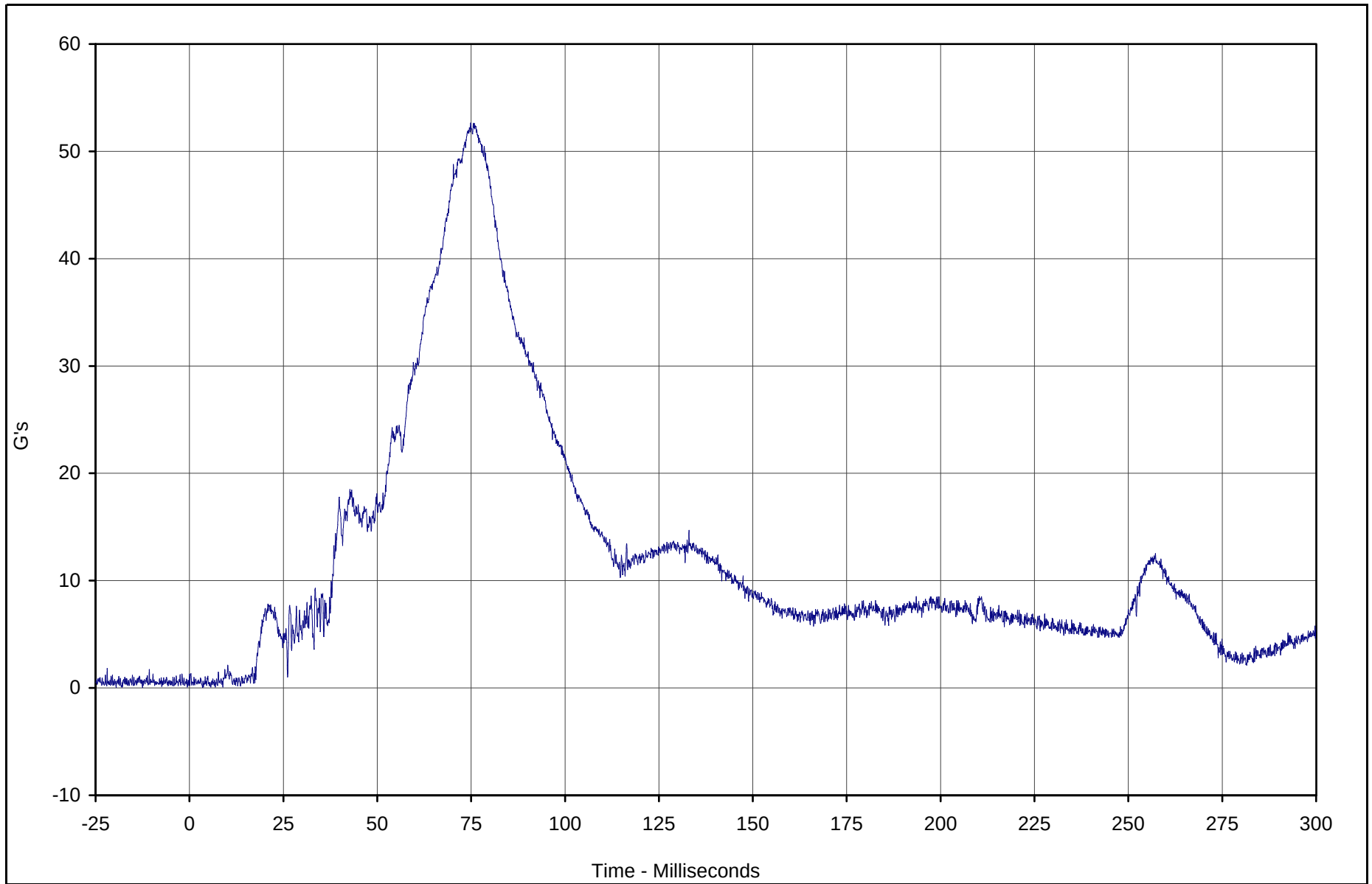


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Resultant Primary	045	RES	G's	52.6	74.9	0.1	3.5	1000

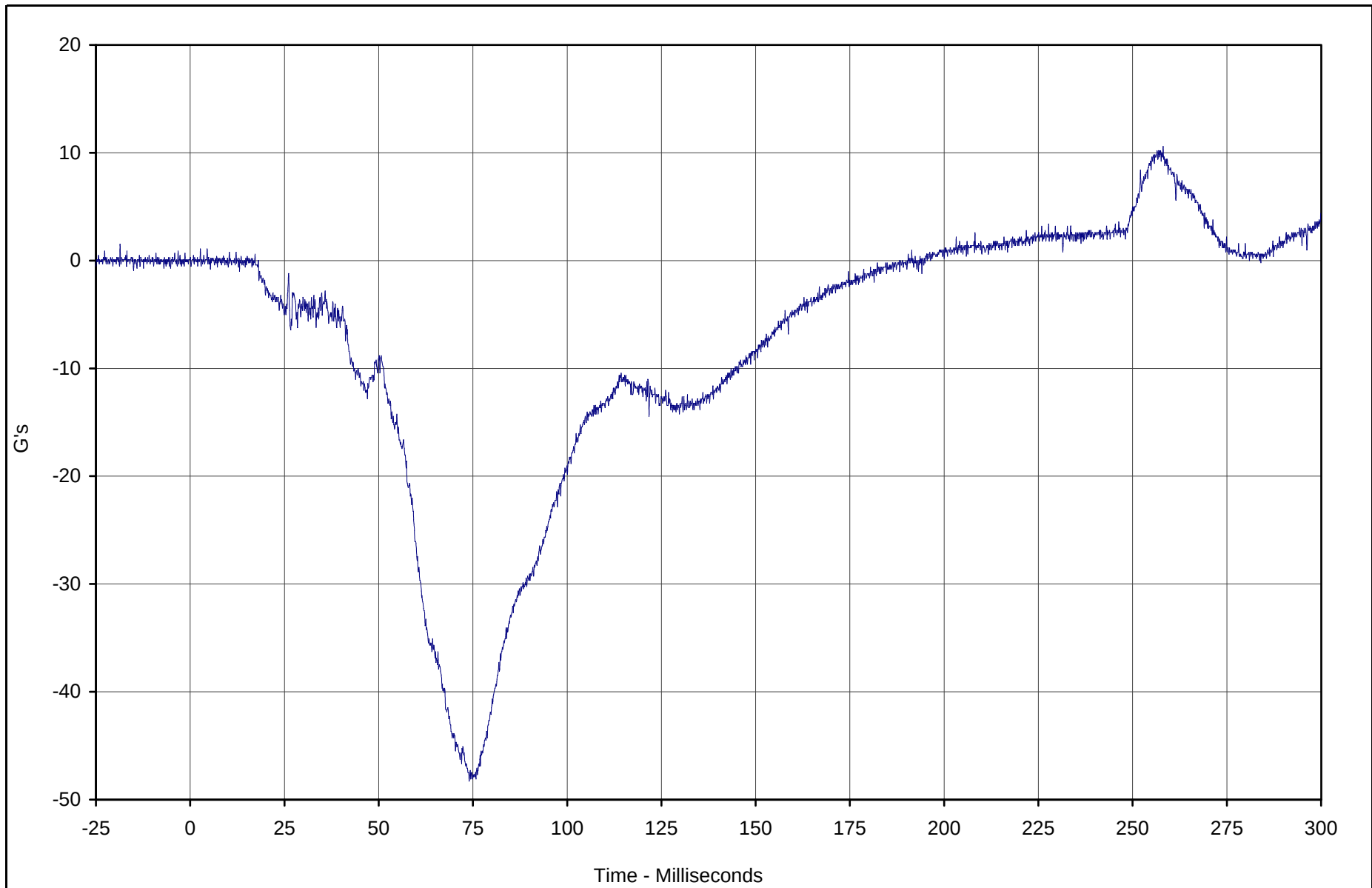


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant X	048	FIL	G's	10.6	258.1	-48.3	74.0	1000

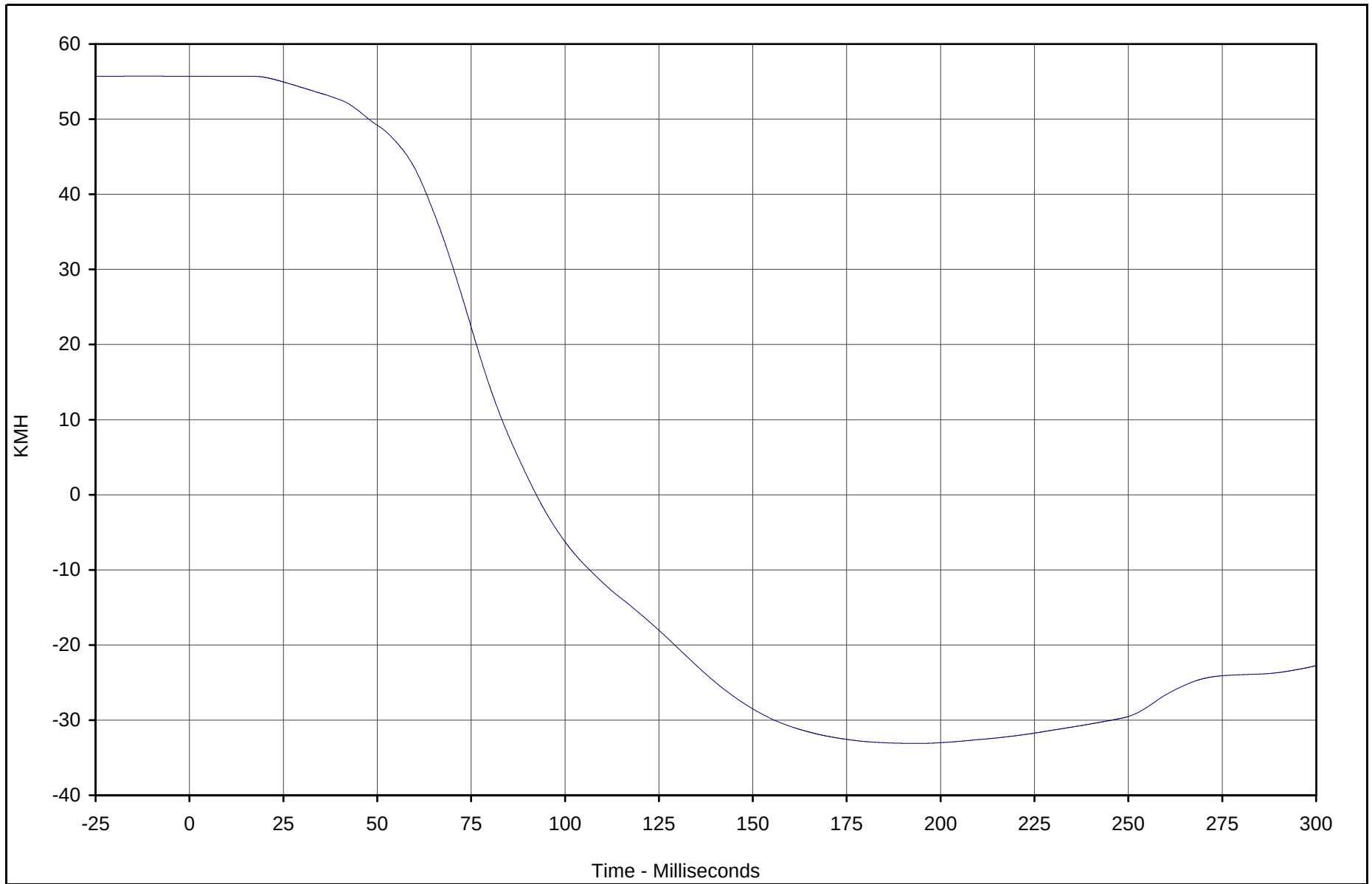


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant X Velocity	048	IN1	KMH	55.7	5.0	-33.1	194.6	180



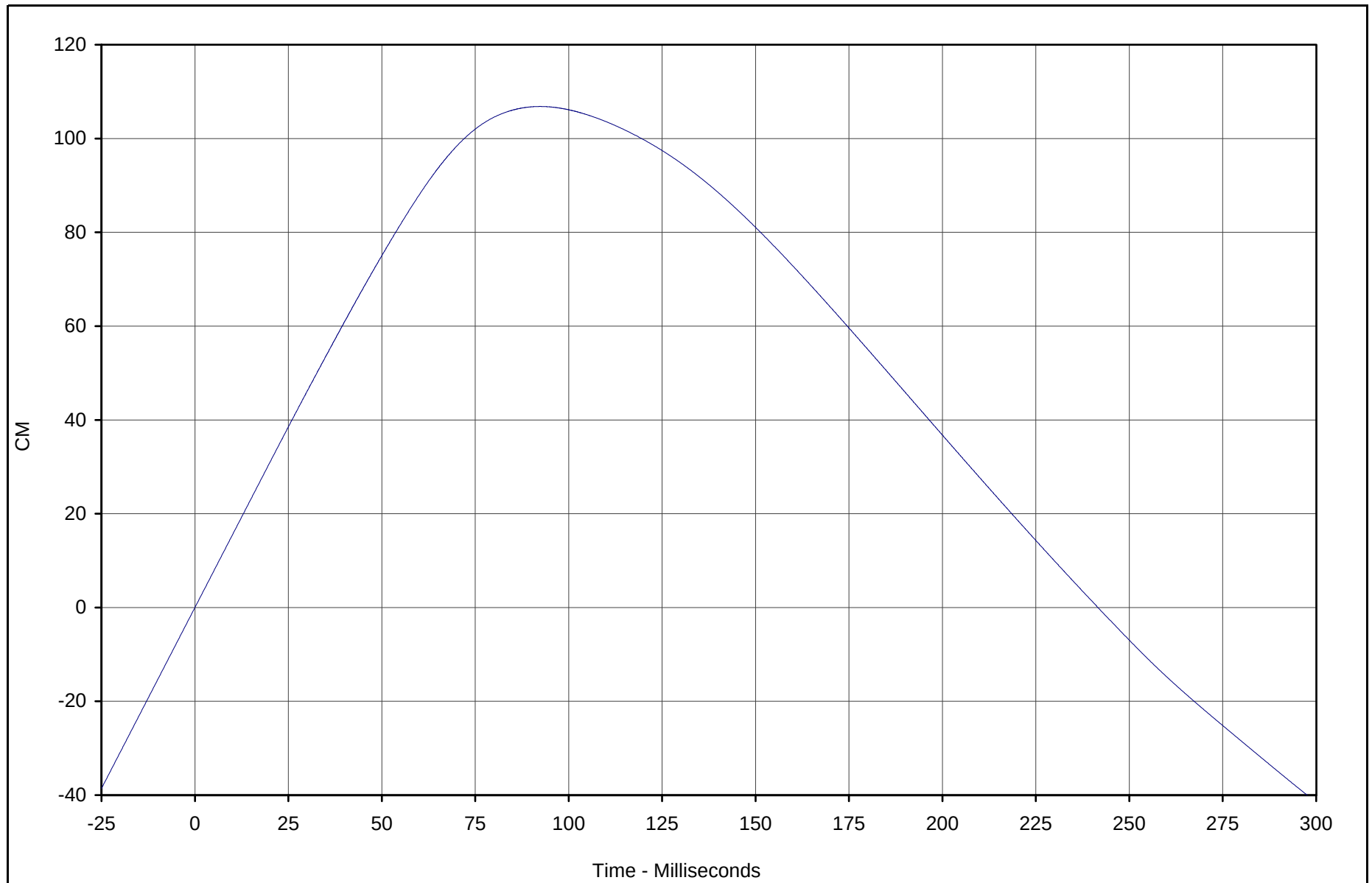
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant X Displ.	048	IN2	CM	106.8	92.4	-41.5	299.9	180



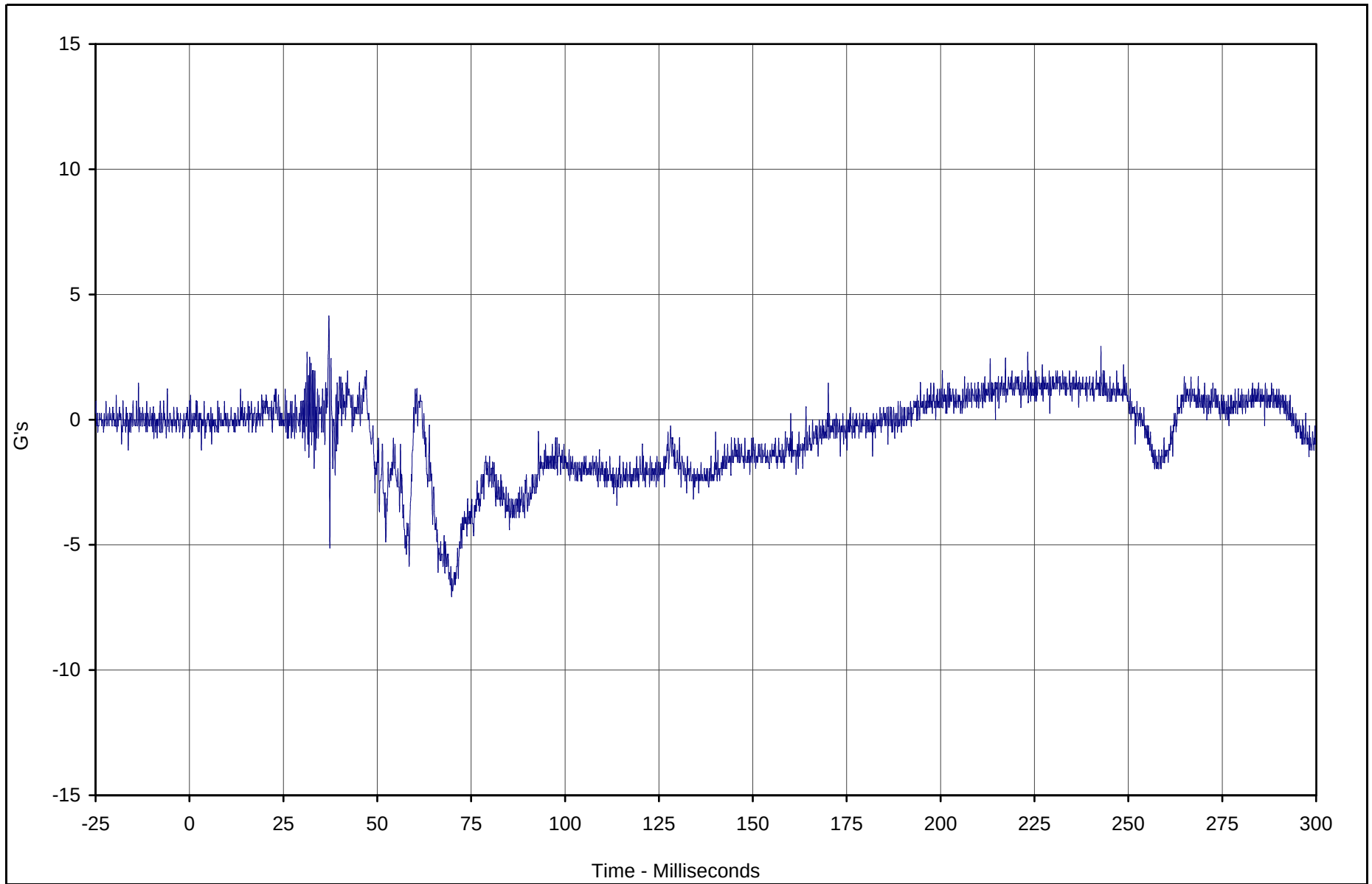
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant Y	049	FIL	G's	4.2	37.1	-7.1	69.8	1000

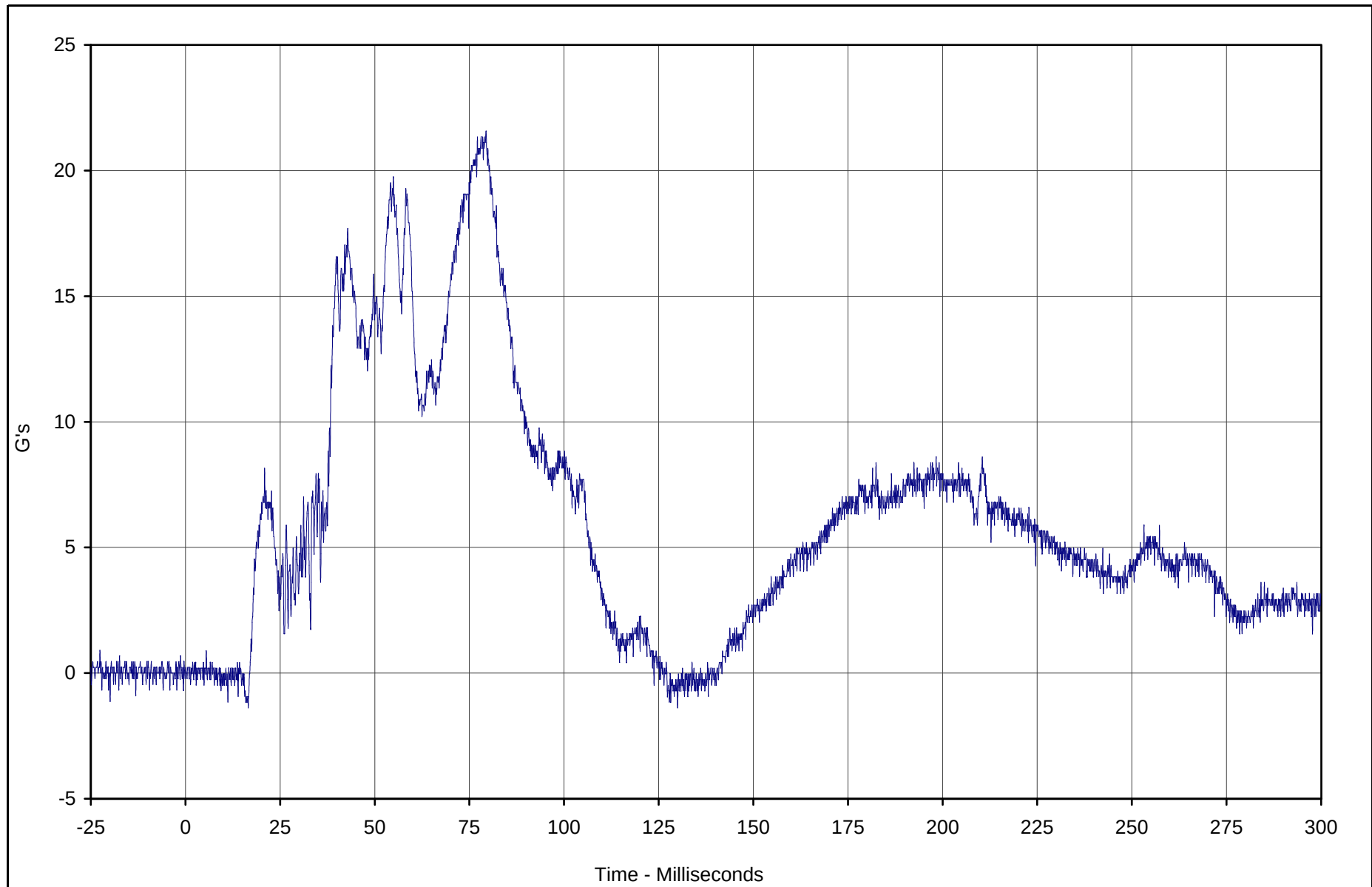


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Redundant Z	050	FIL	G's	21.6	79.4	-1.4	16.6	1000

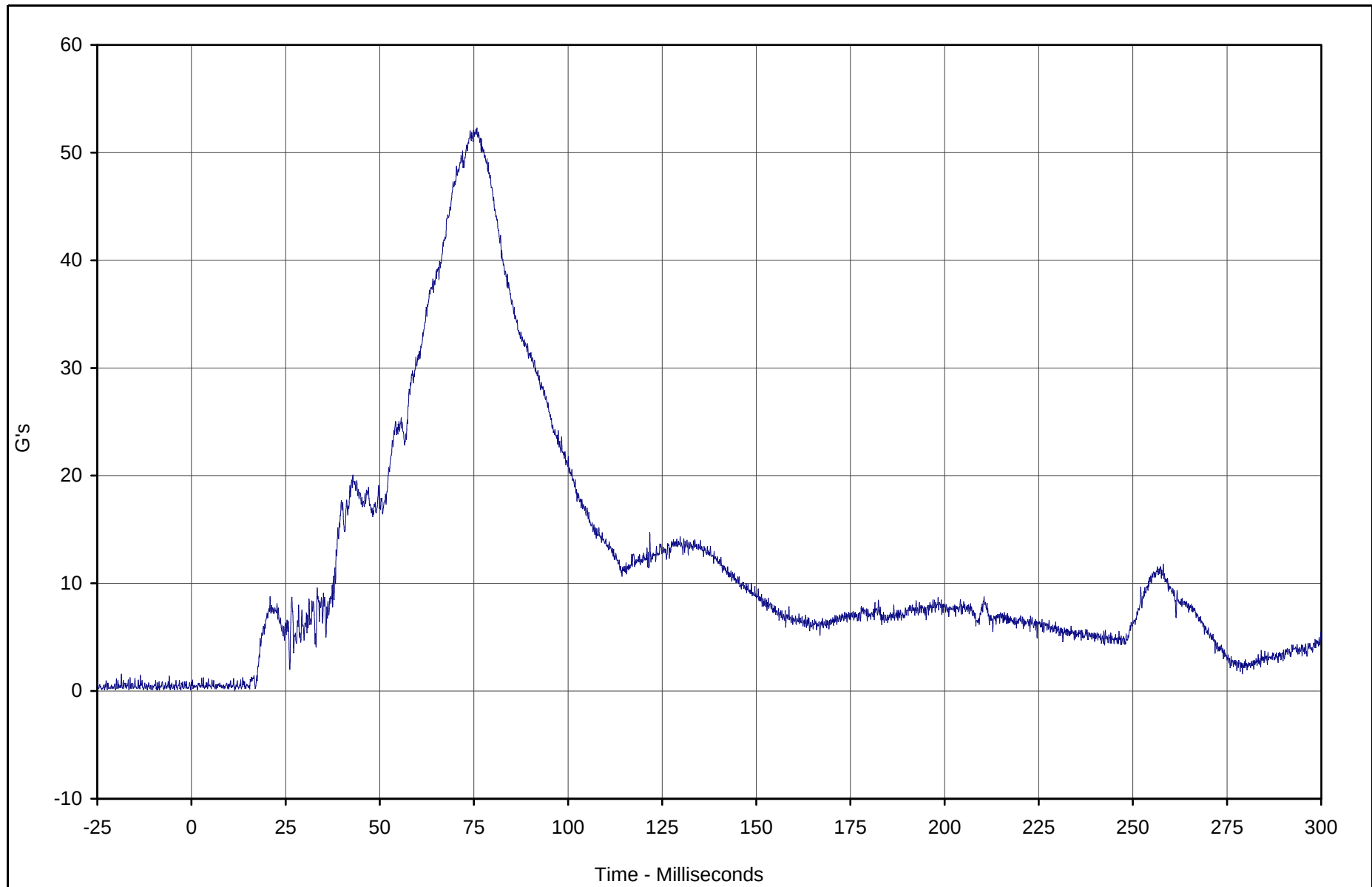


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Resultant Redundant	048	RES	G's	52.3	75.8	0.0	11.5	1000

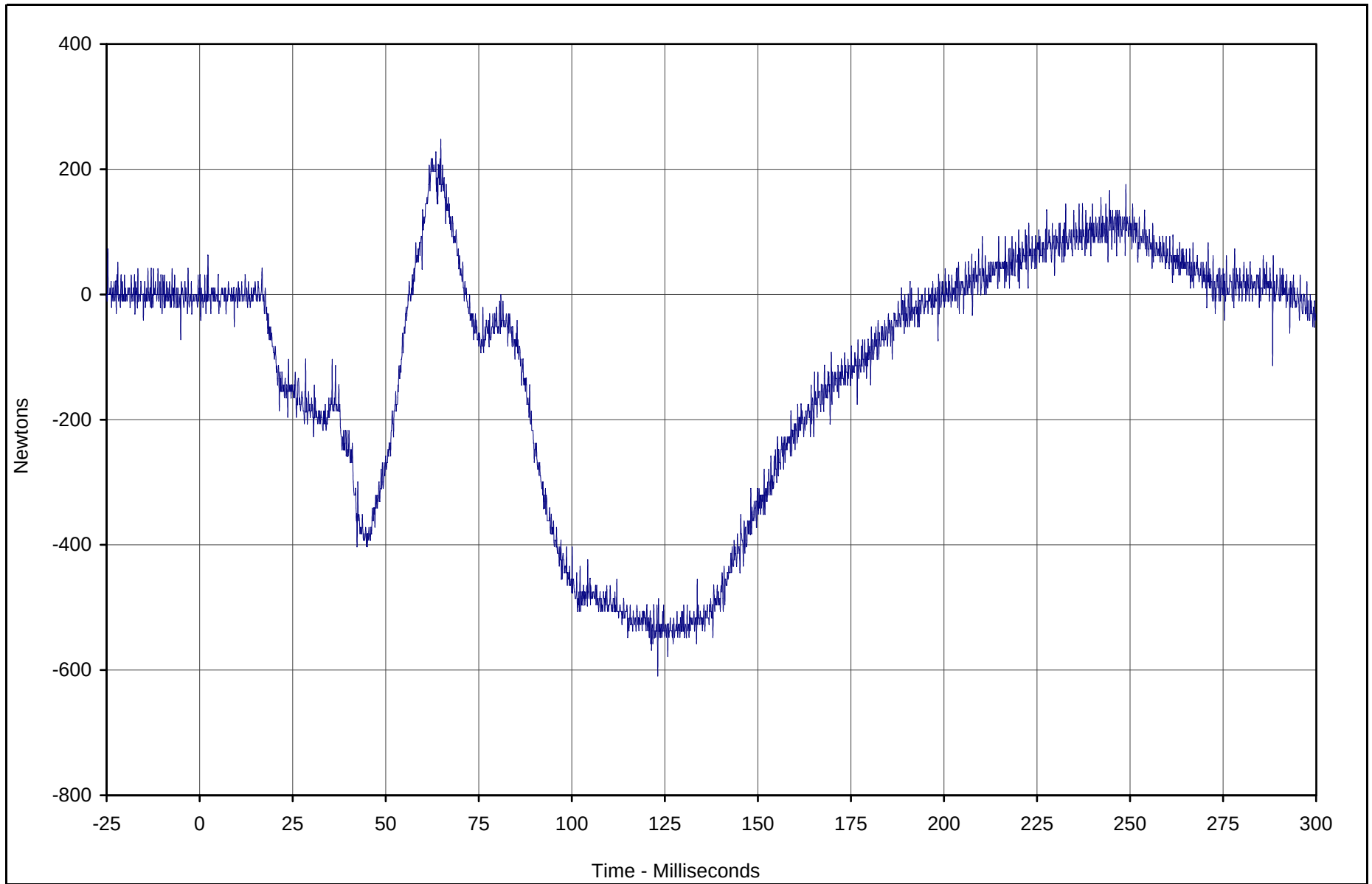


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force X	051	FIL	Newtons	248.0	64.8	-609.7	123.1	1000

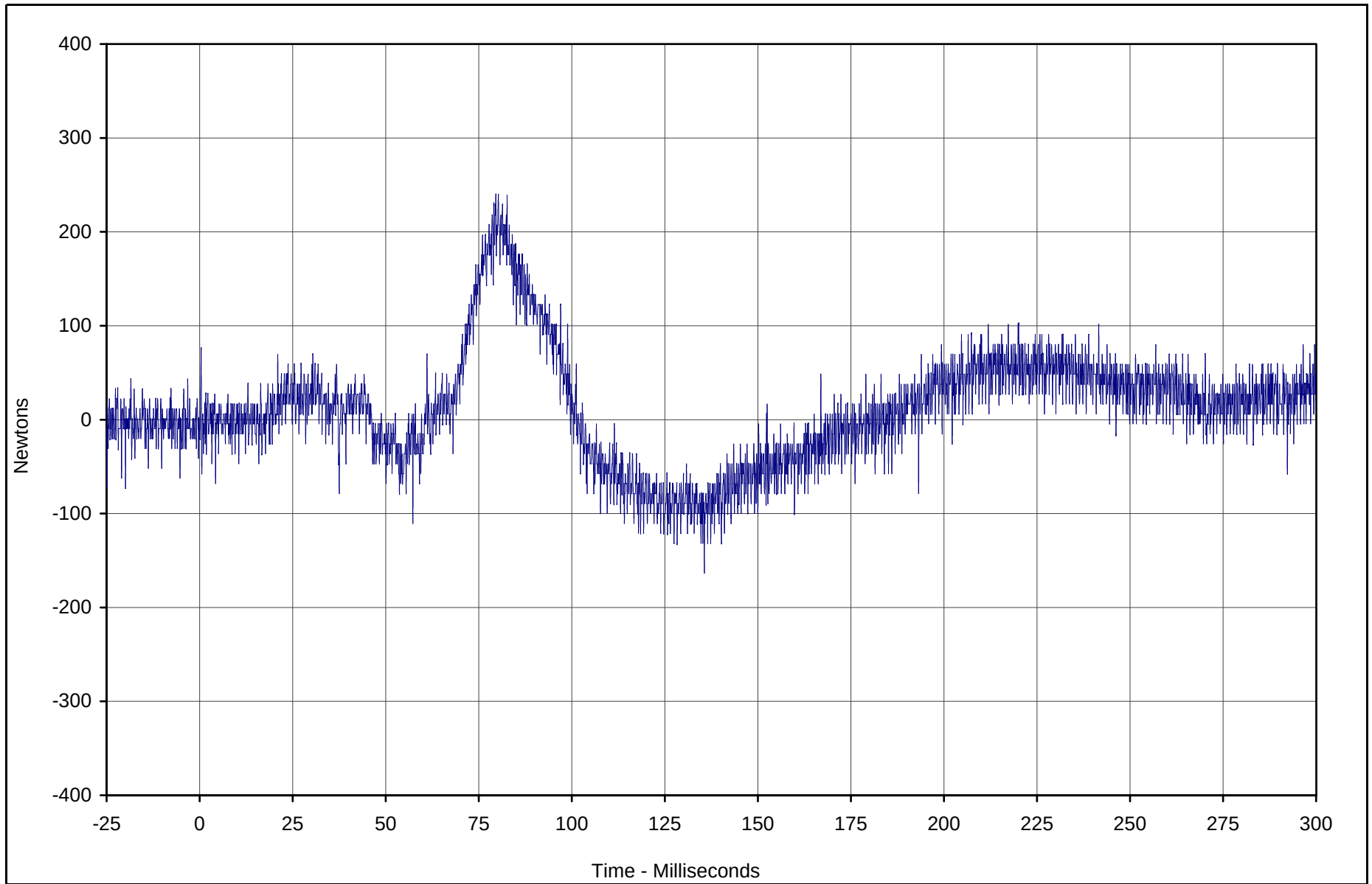


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force Y	052	FIL	Newtons	239.1	79.6	-163.5	135.6	1000

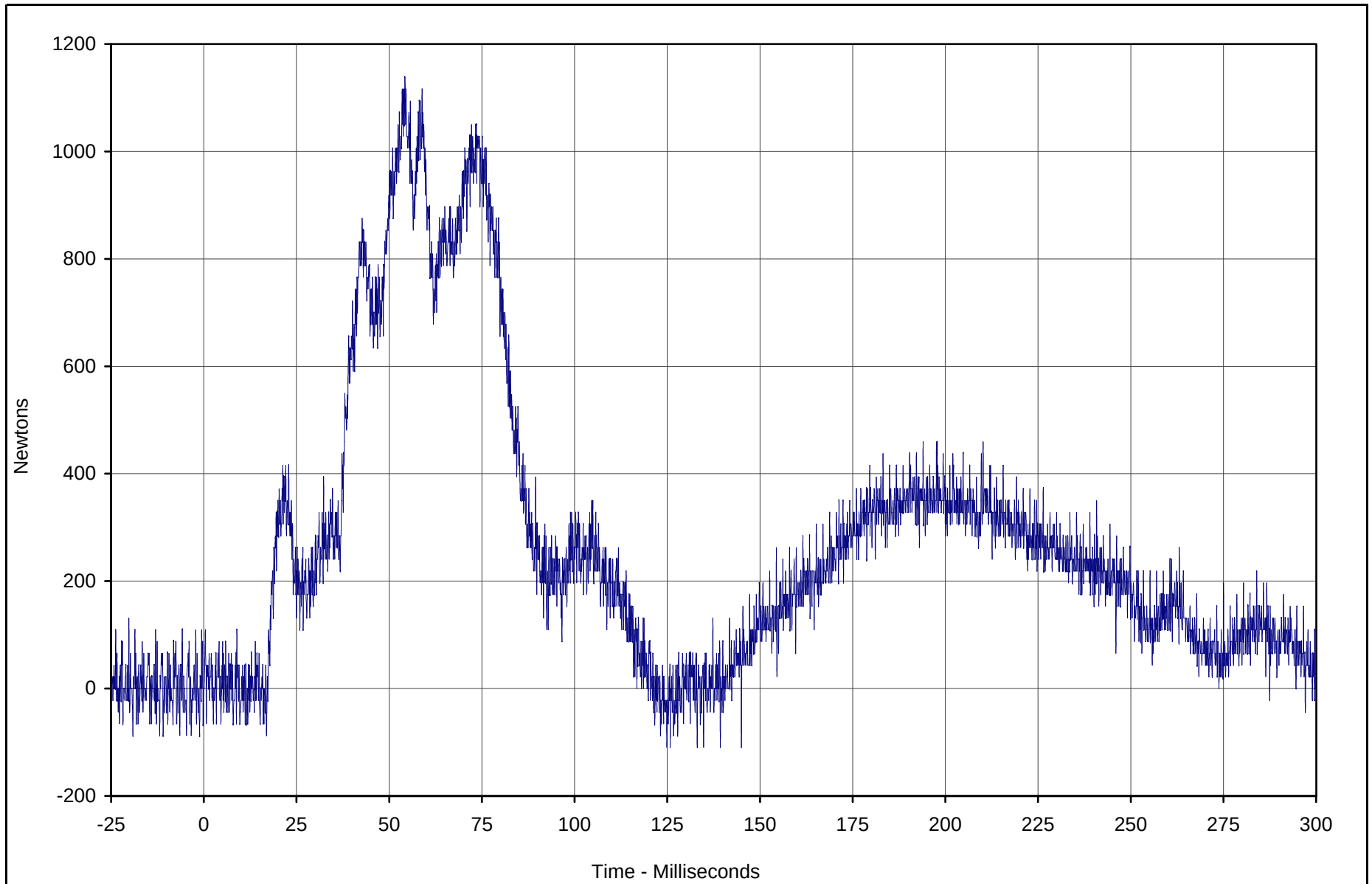


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force Z	053	FIL	Newtons	1137.6	54.2	-109.4	124.9	1000

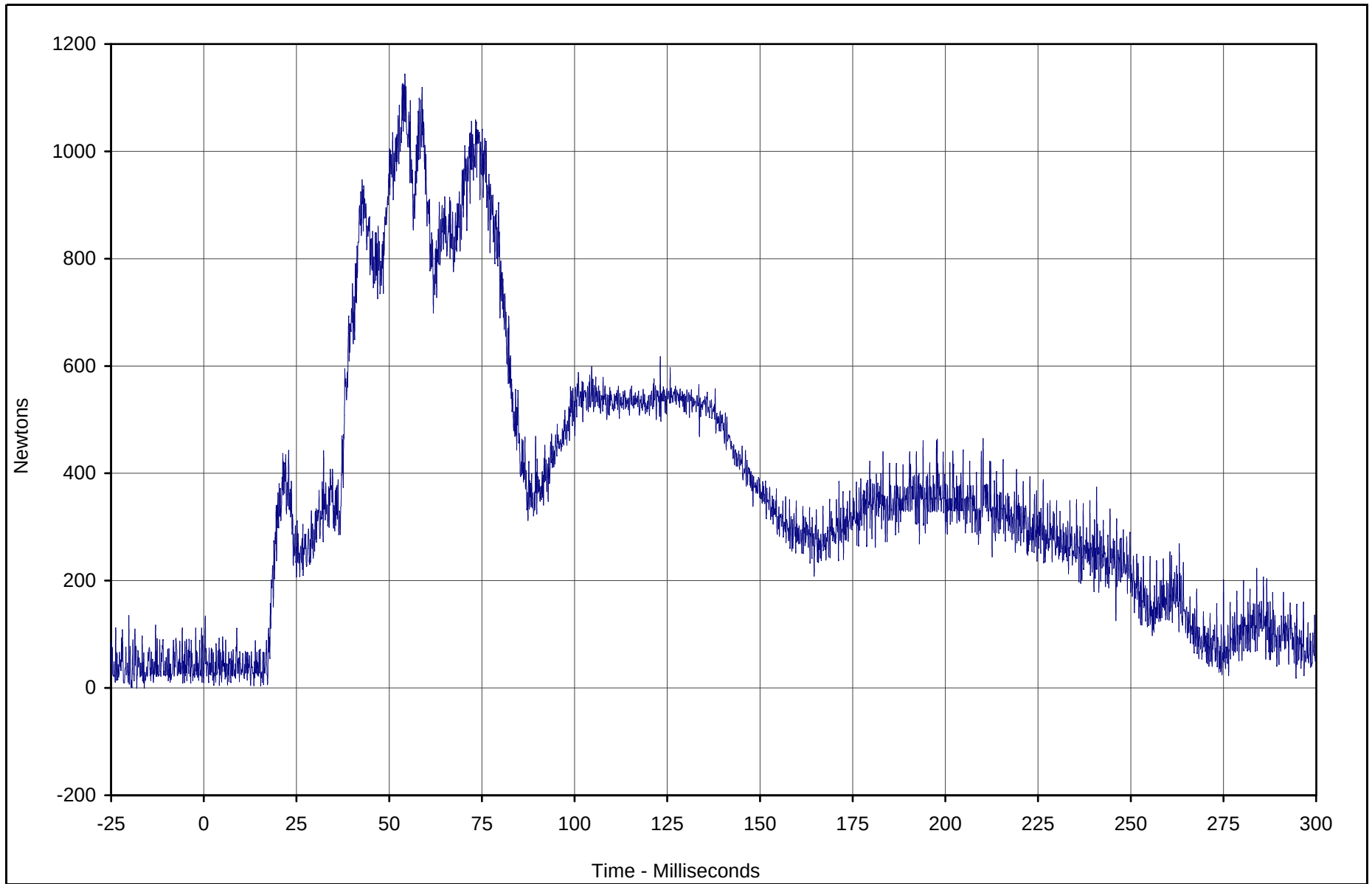


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Force Resultant	051	RES	Newtons	1142.6	54.2	4.6	4.2	1000

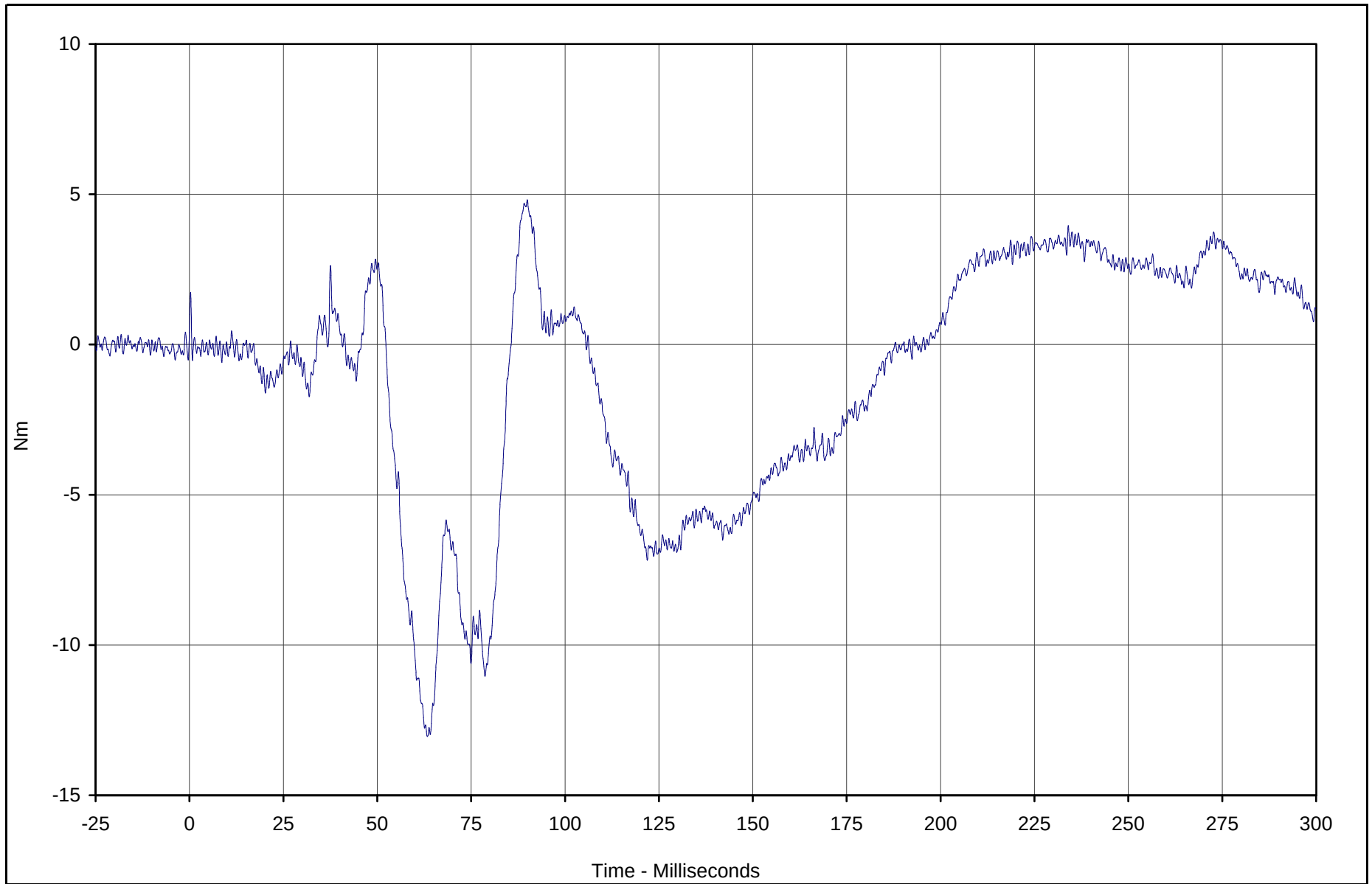


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment X	054	FIL	Nm	4.8	89.9	-13.0	63.3	600

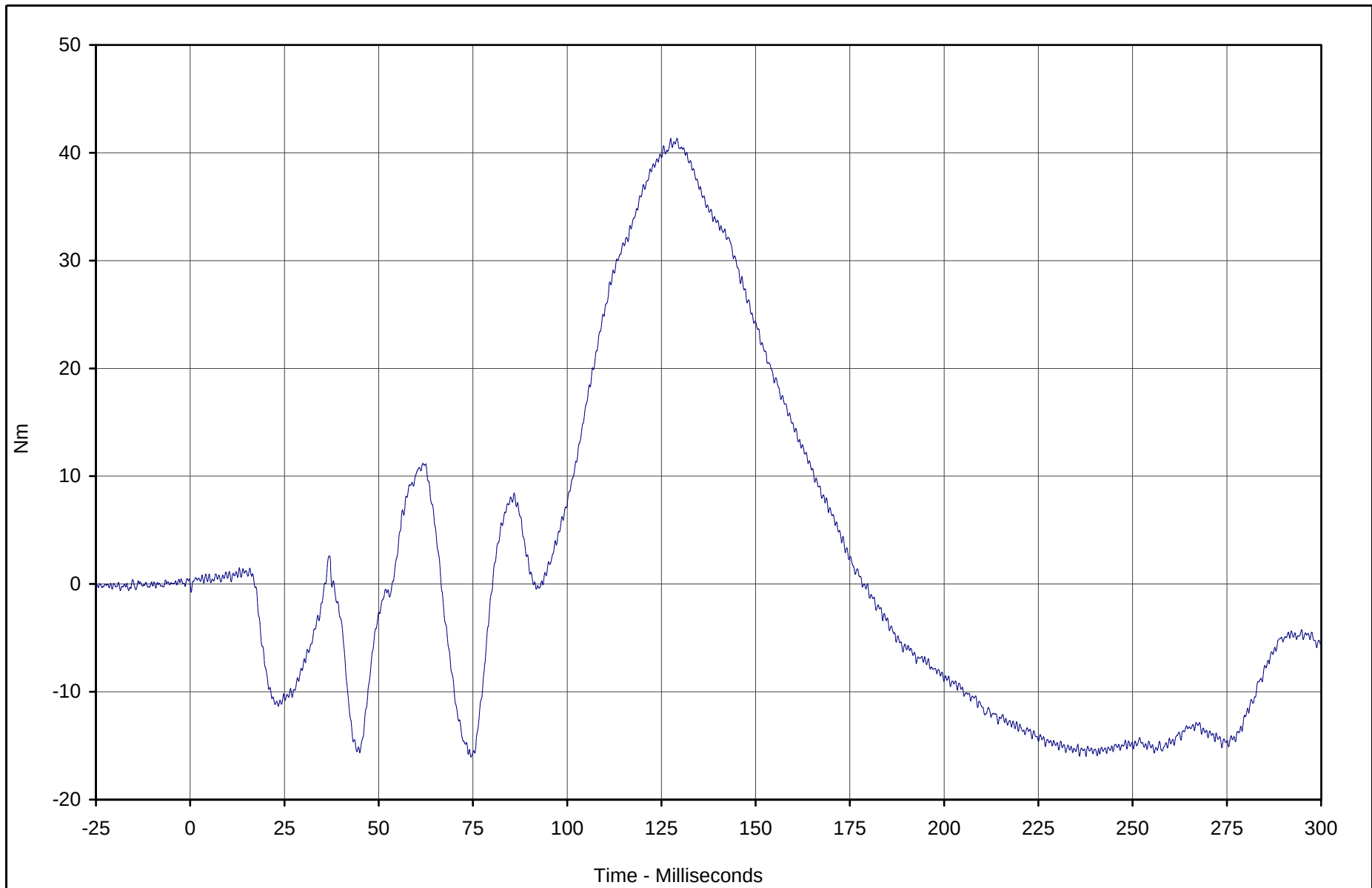


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment Y	055	FIL	Nm	41.3	129.1	-16.1	74.5	600



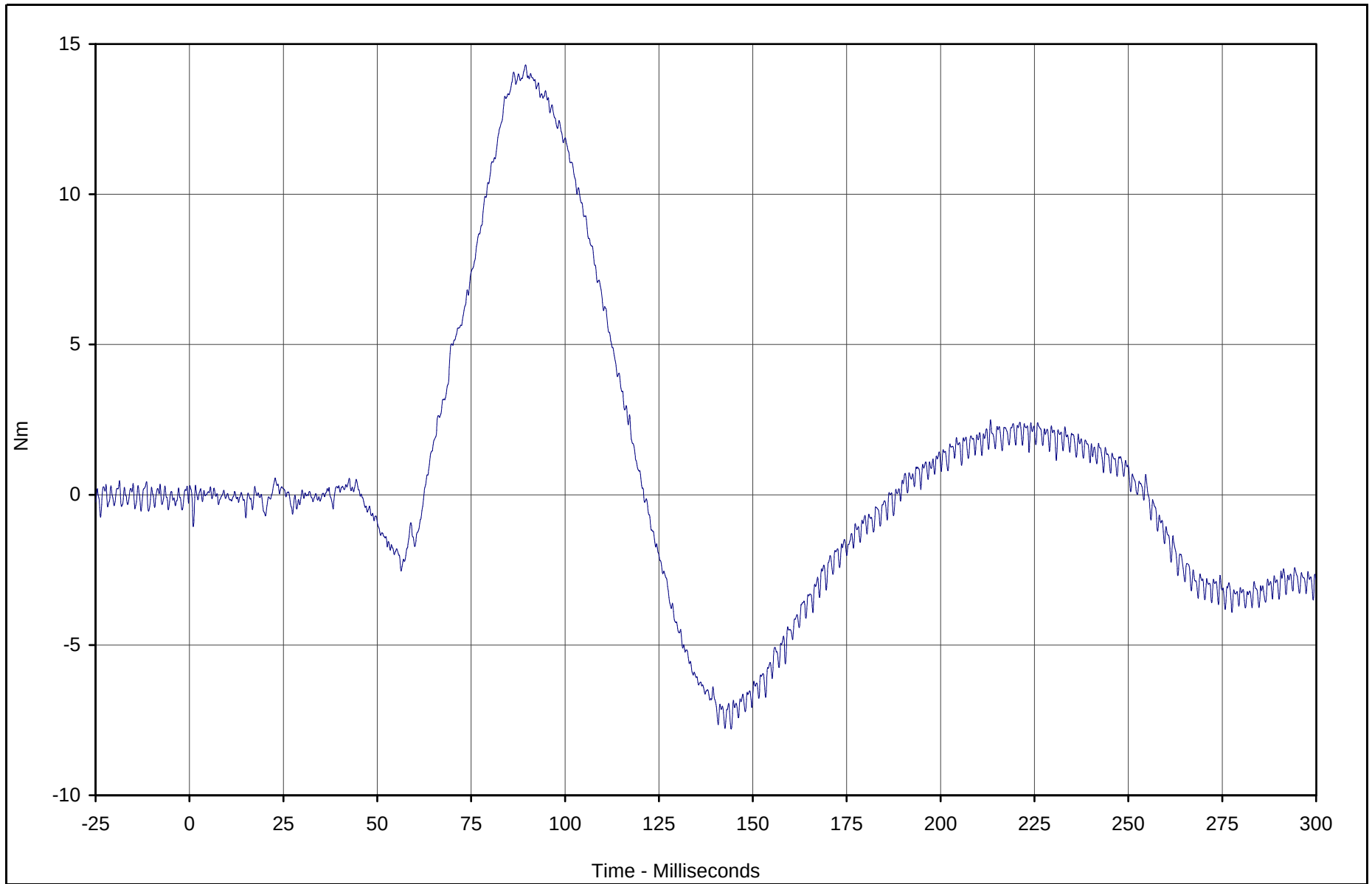
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-80



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment Z	056	FIL	Nm	14.3	89.5	-7.8	144.3	600



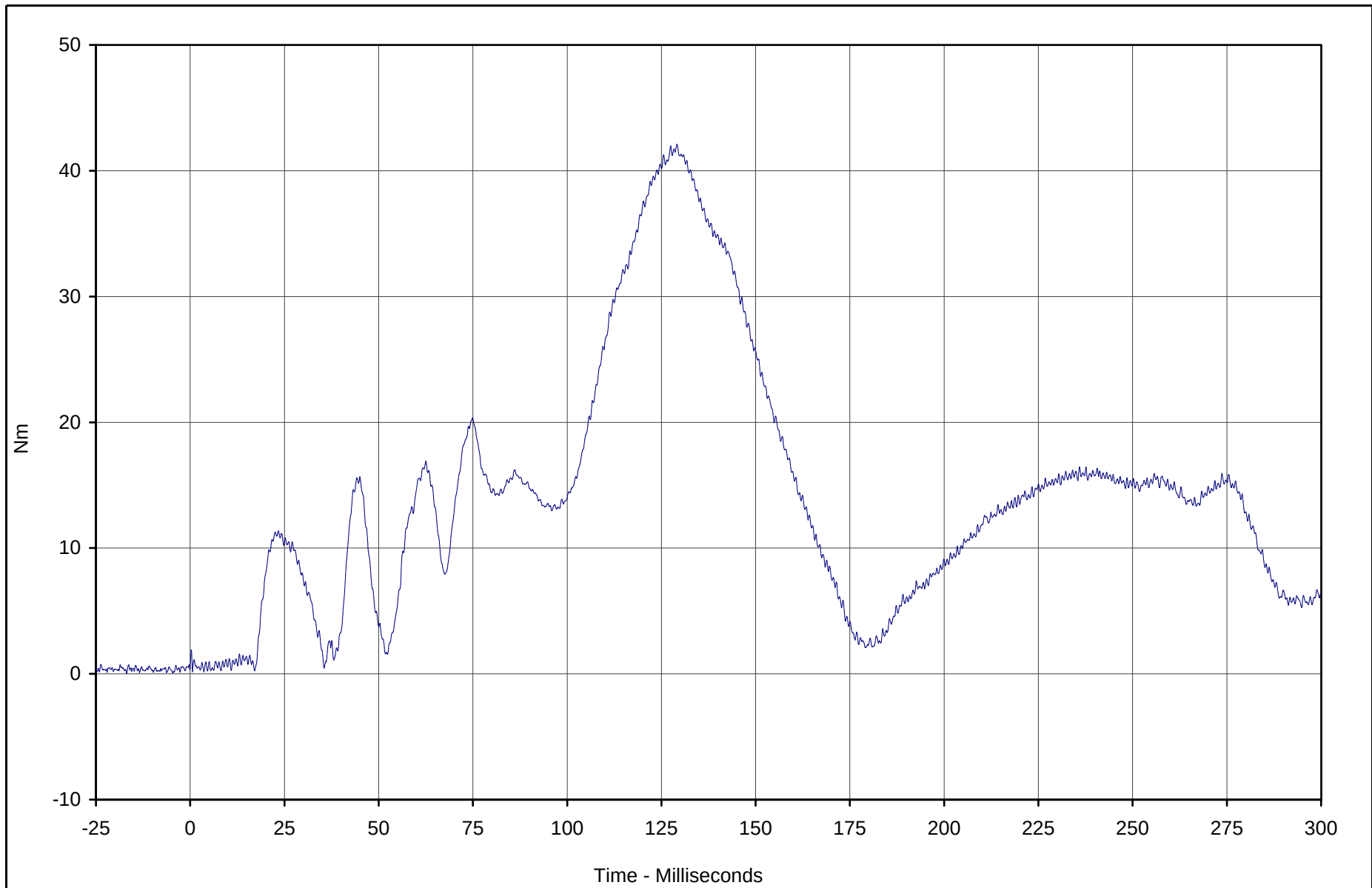
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Neck Moment Resultant	054	RES	Nm	42.1	129.1	0.2	3.6	600



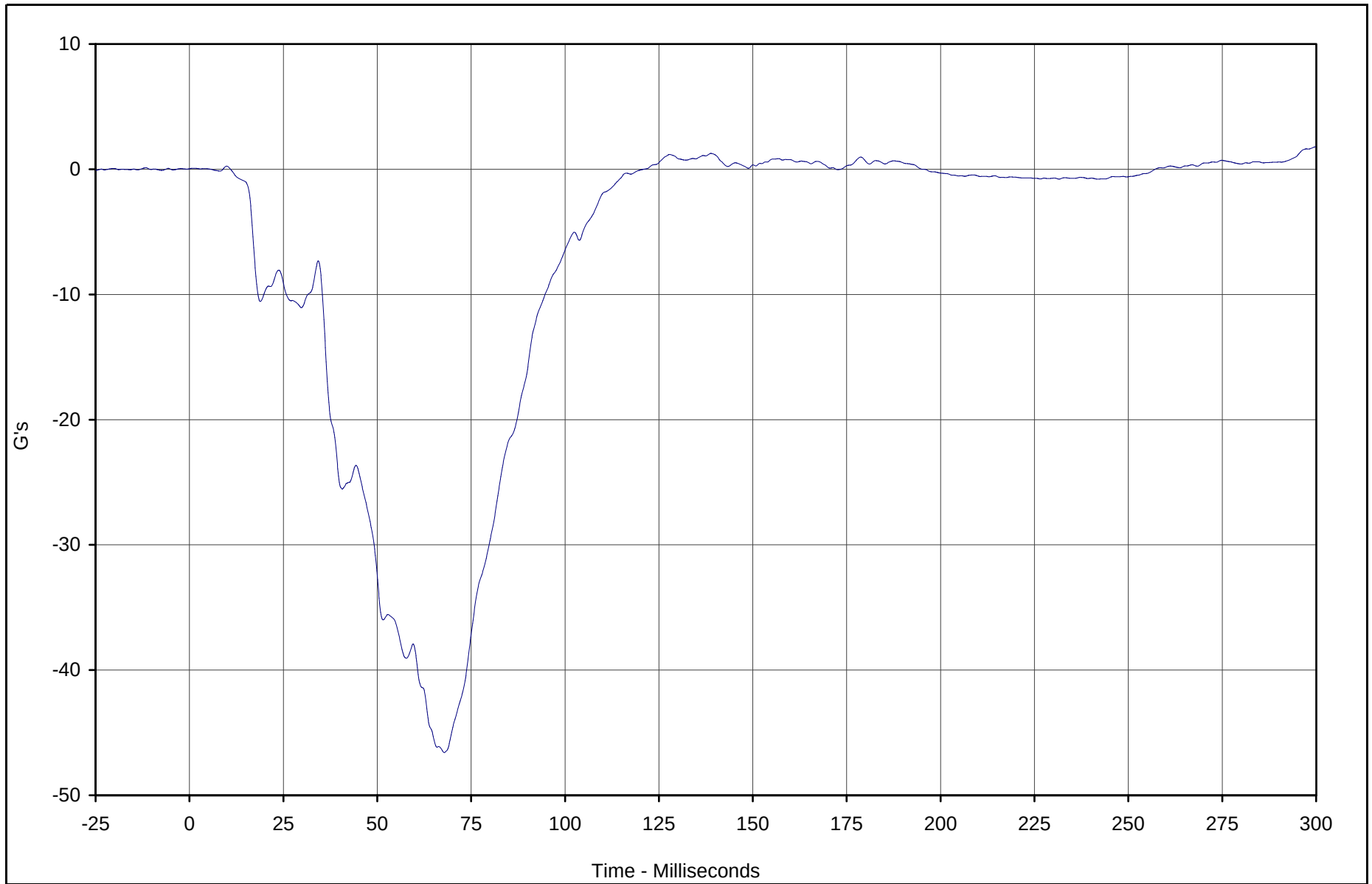
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-82



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary X	057	FIL	G's	1.8	299.9	-46.6	67.8	180



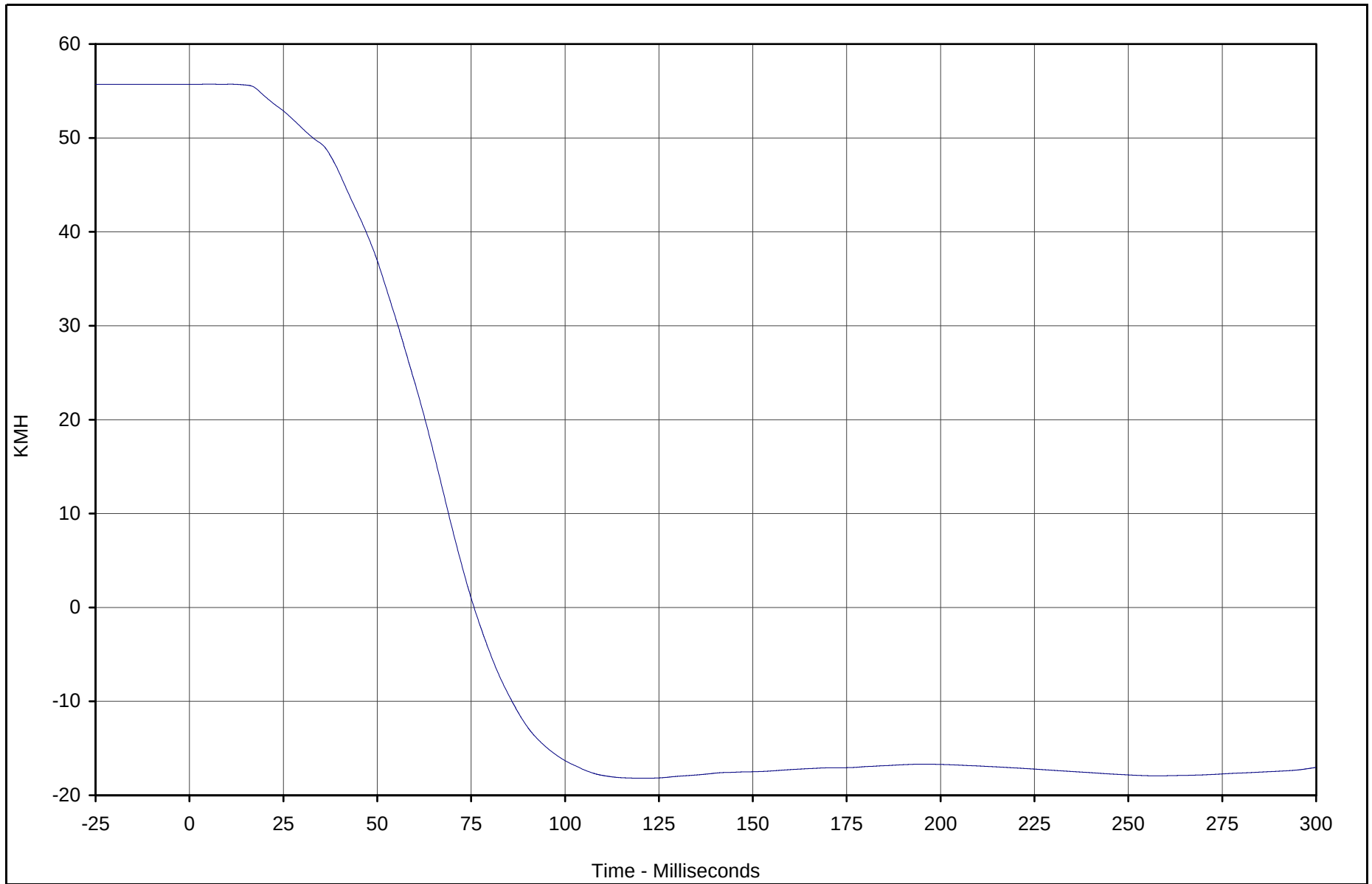
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary X Velocity	057	IN1	KMH	55.7	10.9	-18.2	120.9	180

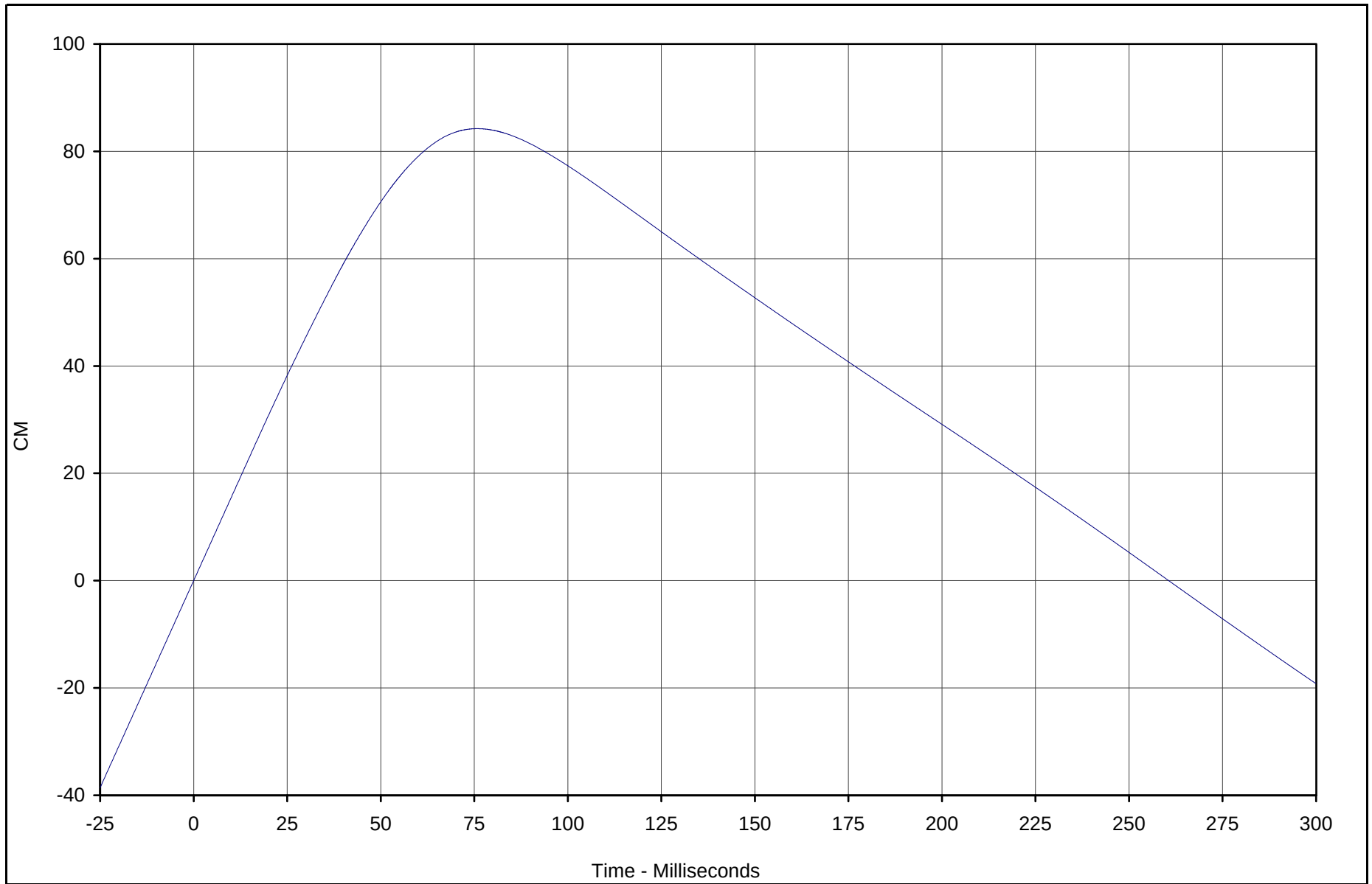


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary X Displ.	057	IN2	CM	84.2	75.8	-19.2	299.9	180



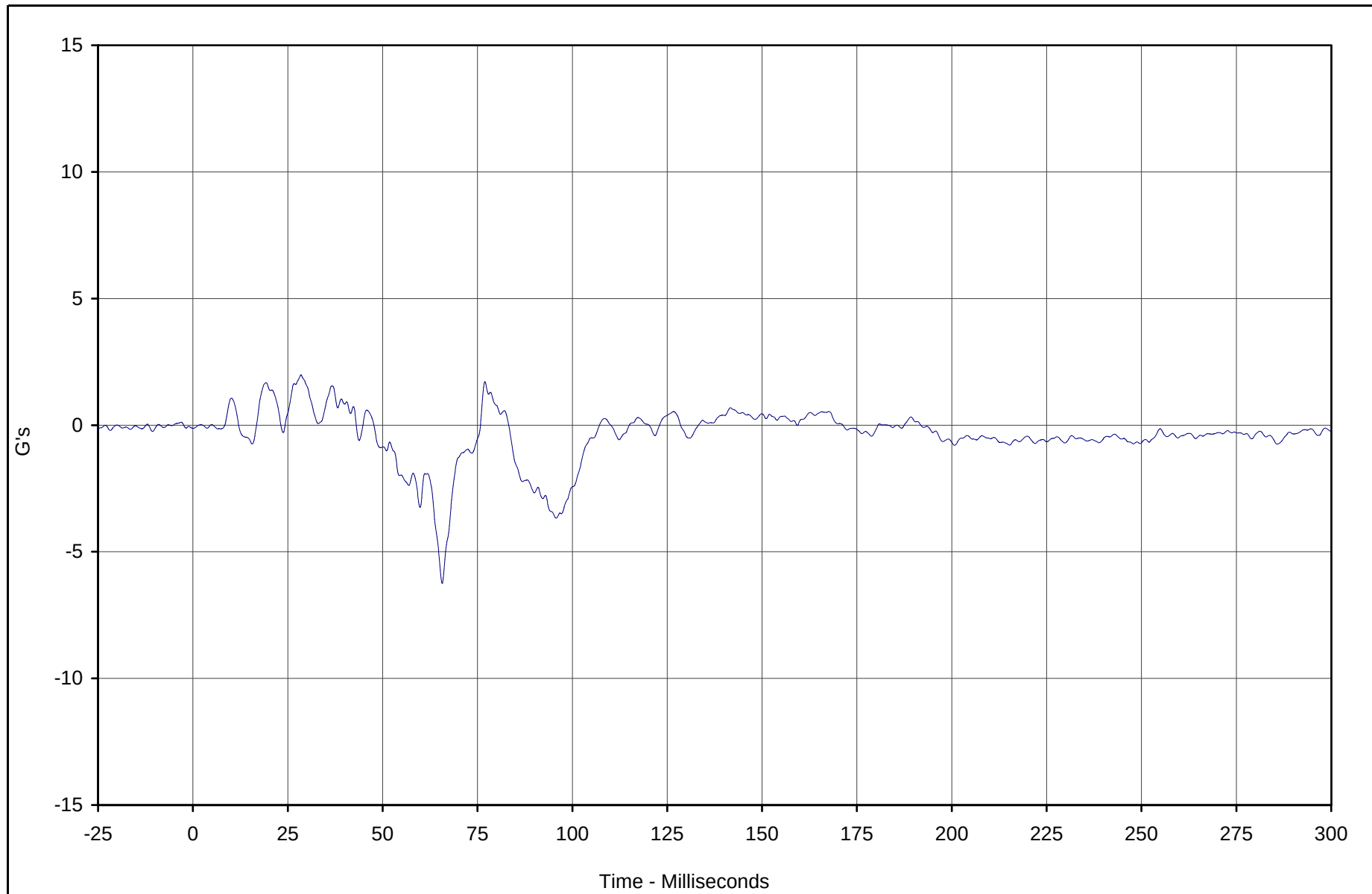
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-85



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary Y	058	FIL	G's	2.0	28.5	-6.3	65.7	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

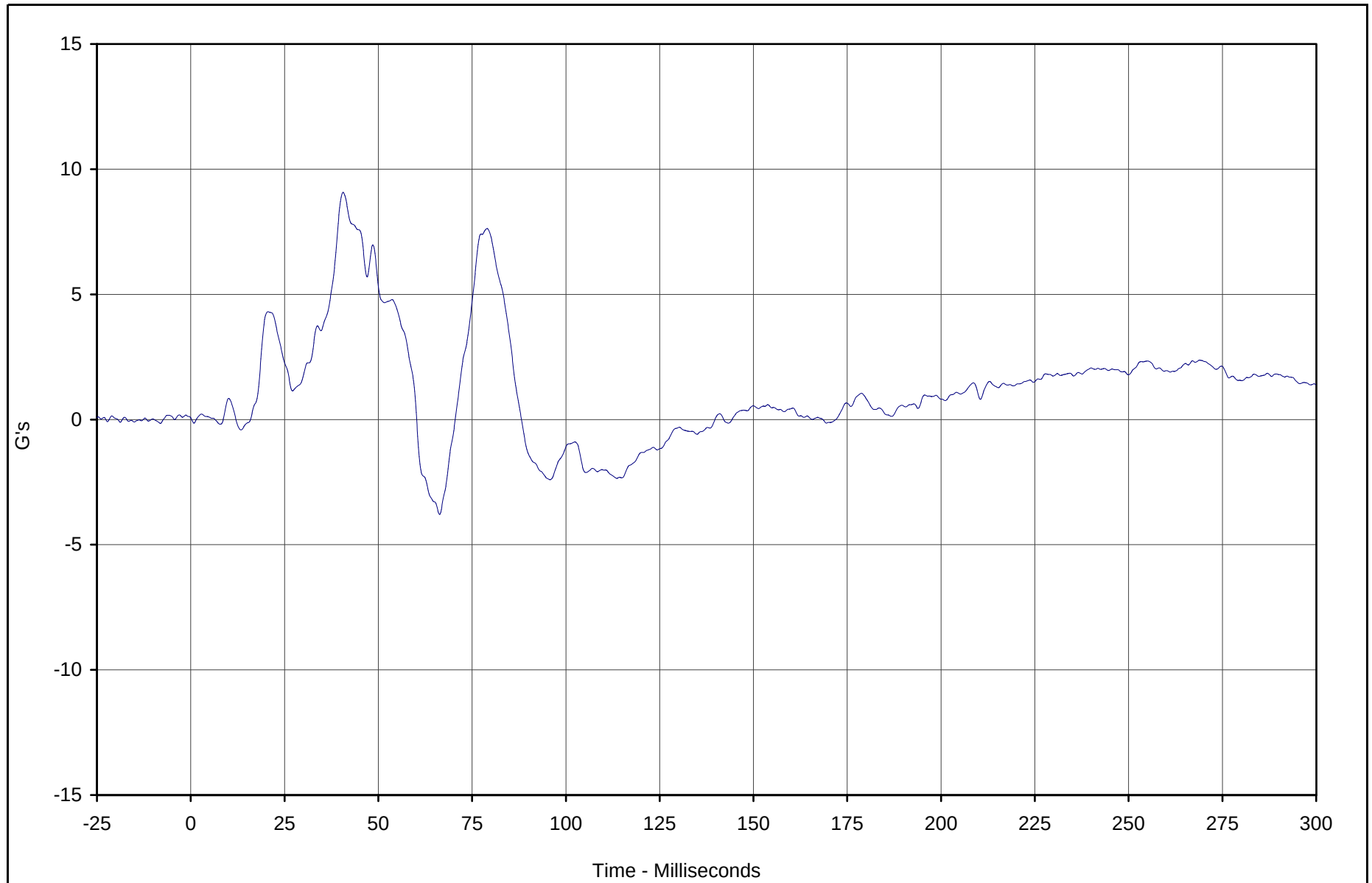
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-86



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Primary Z	059	FIL	G's	9.1	40.6	-3.8	66.3	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

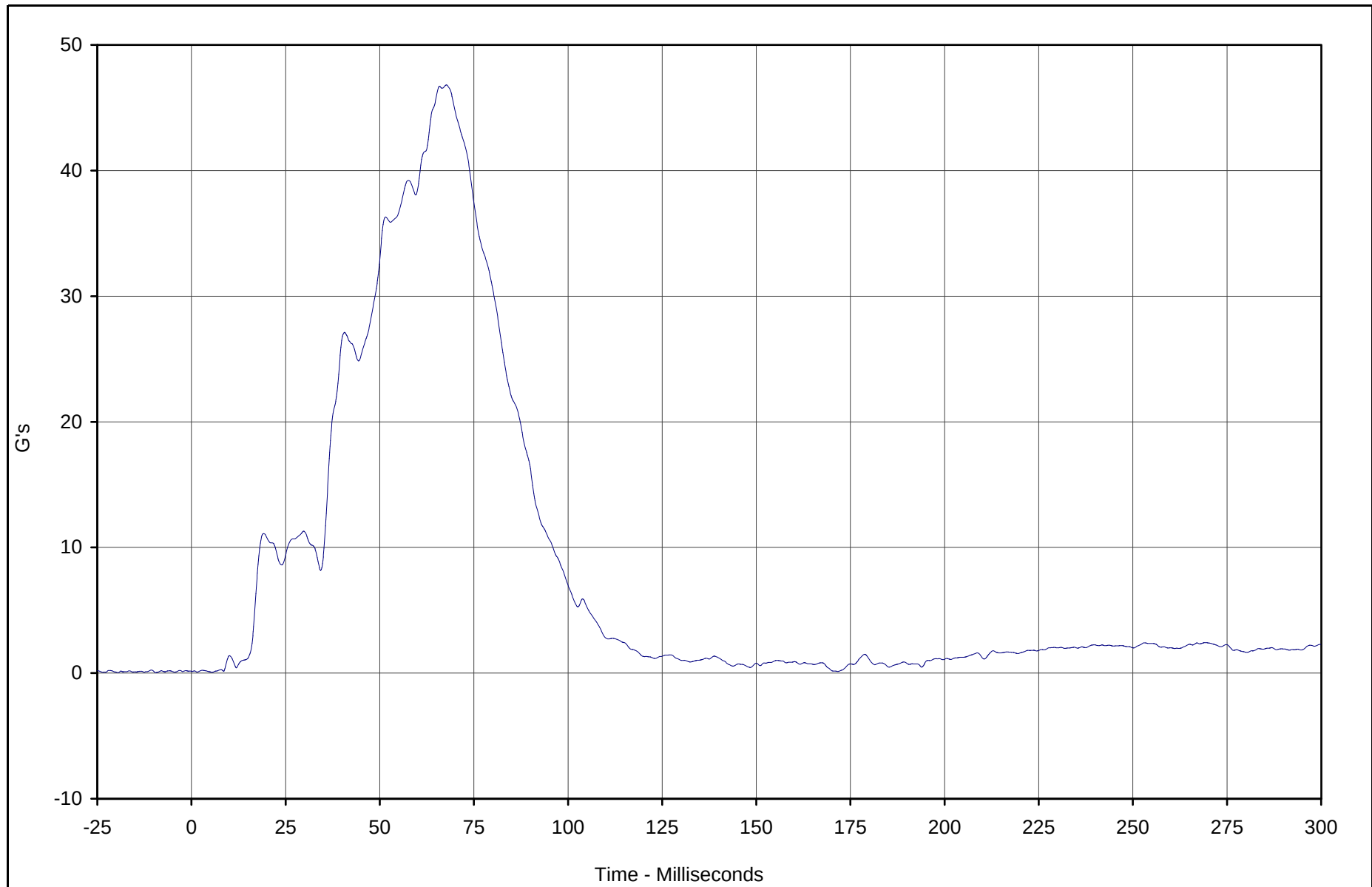
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-87



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Resultant Primary	057	RES	G's	46.8	67.7	0.1	5.5	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

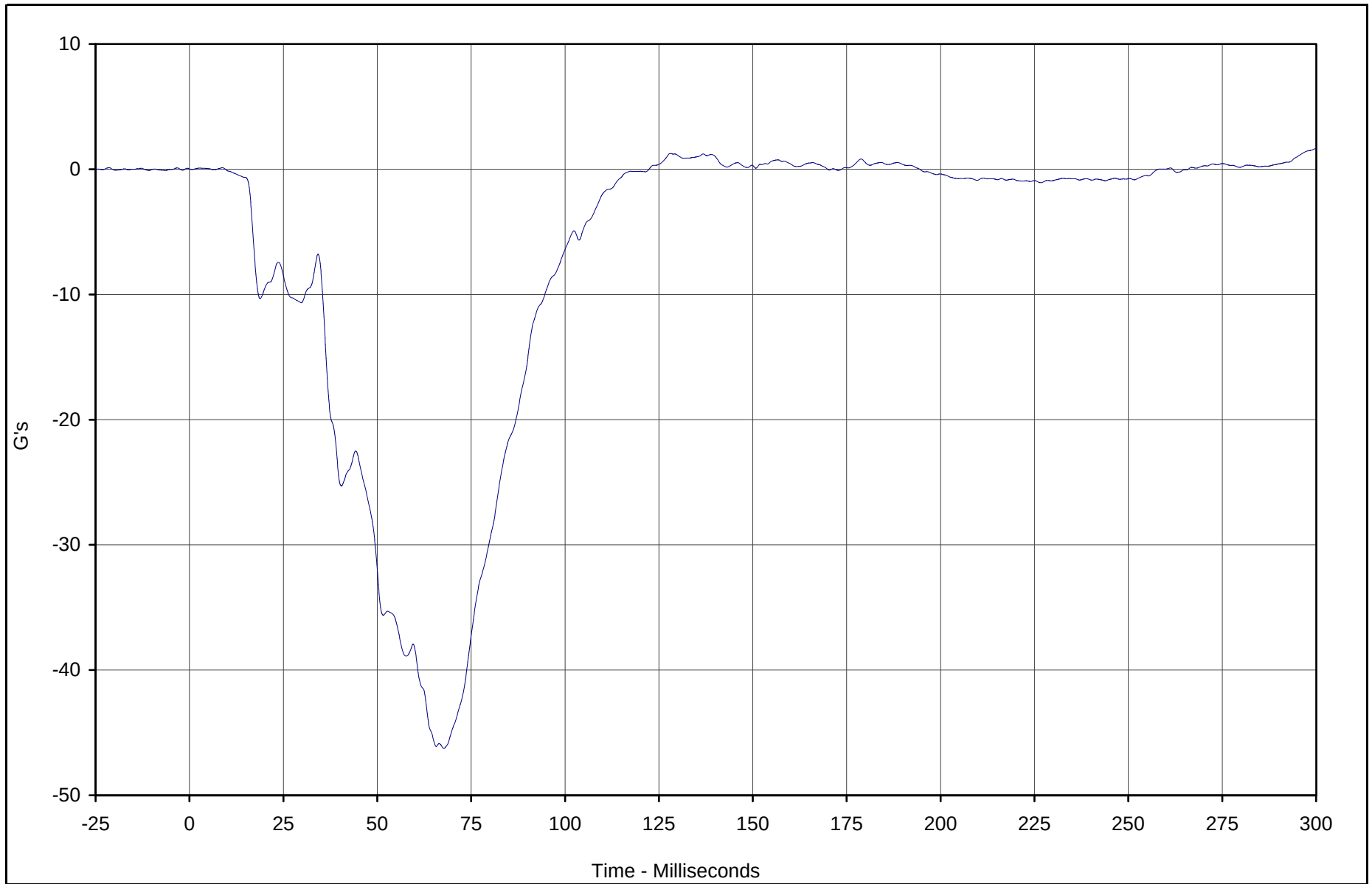
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-88



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant X	060	FIL	G's	1.7	299.9	-46.3	67.7	180



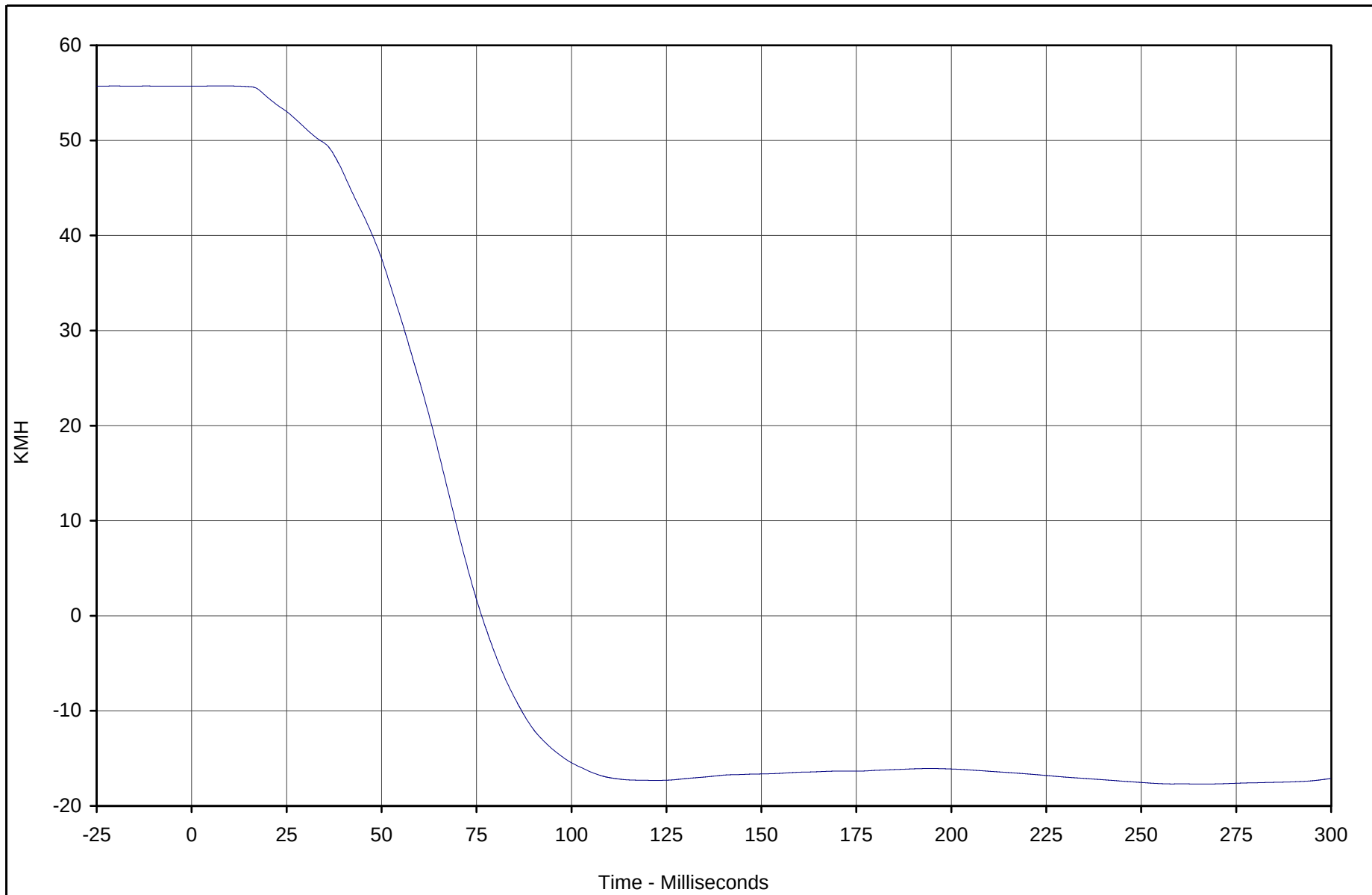
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant X Velocity	060	IN1	KMH	55.7	9.6	-17.7	265.9	180



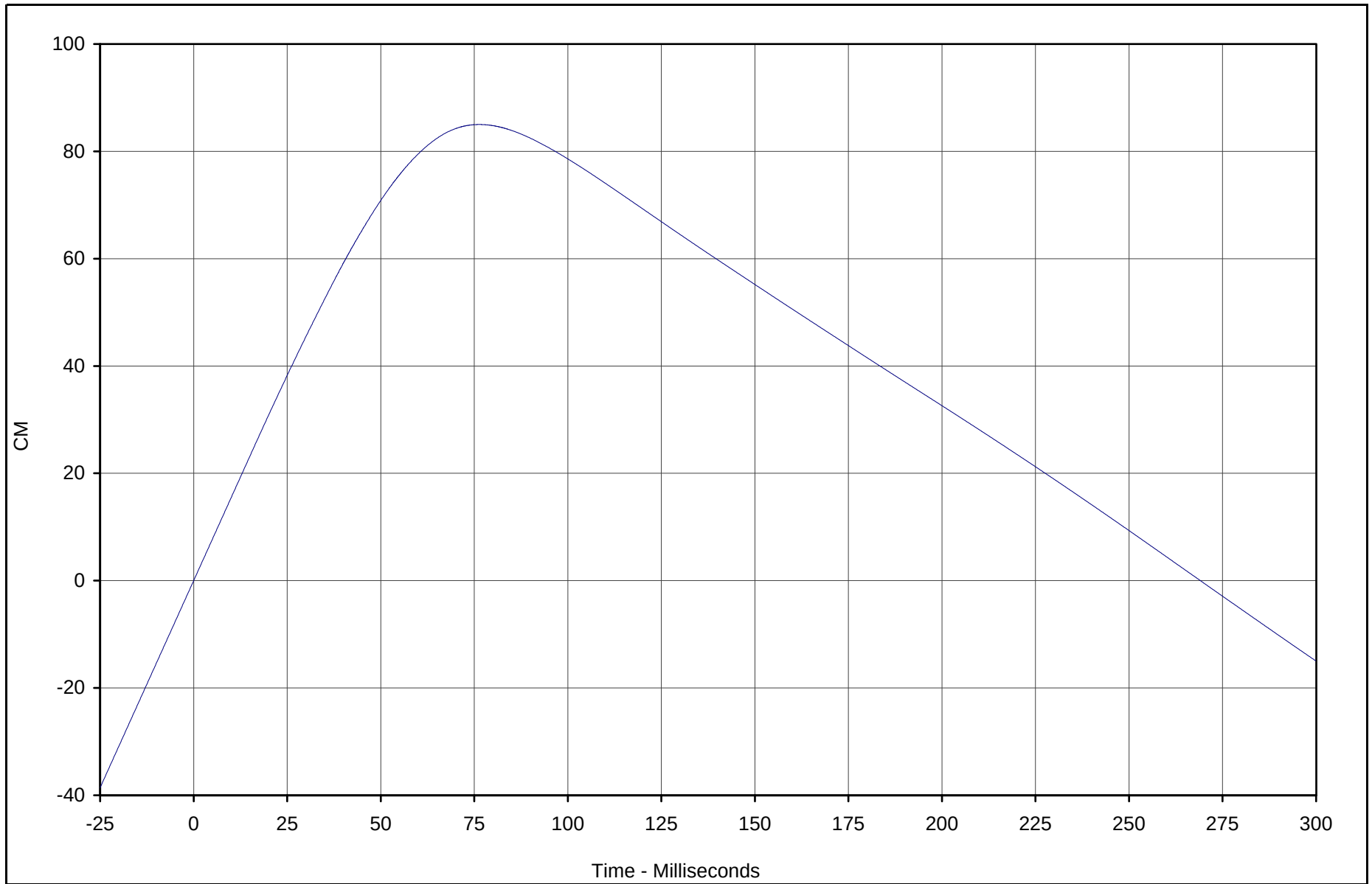
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-90



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant X Displ.	060	IN2	CM	85.0	76.3	-14.9	299.9	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

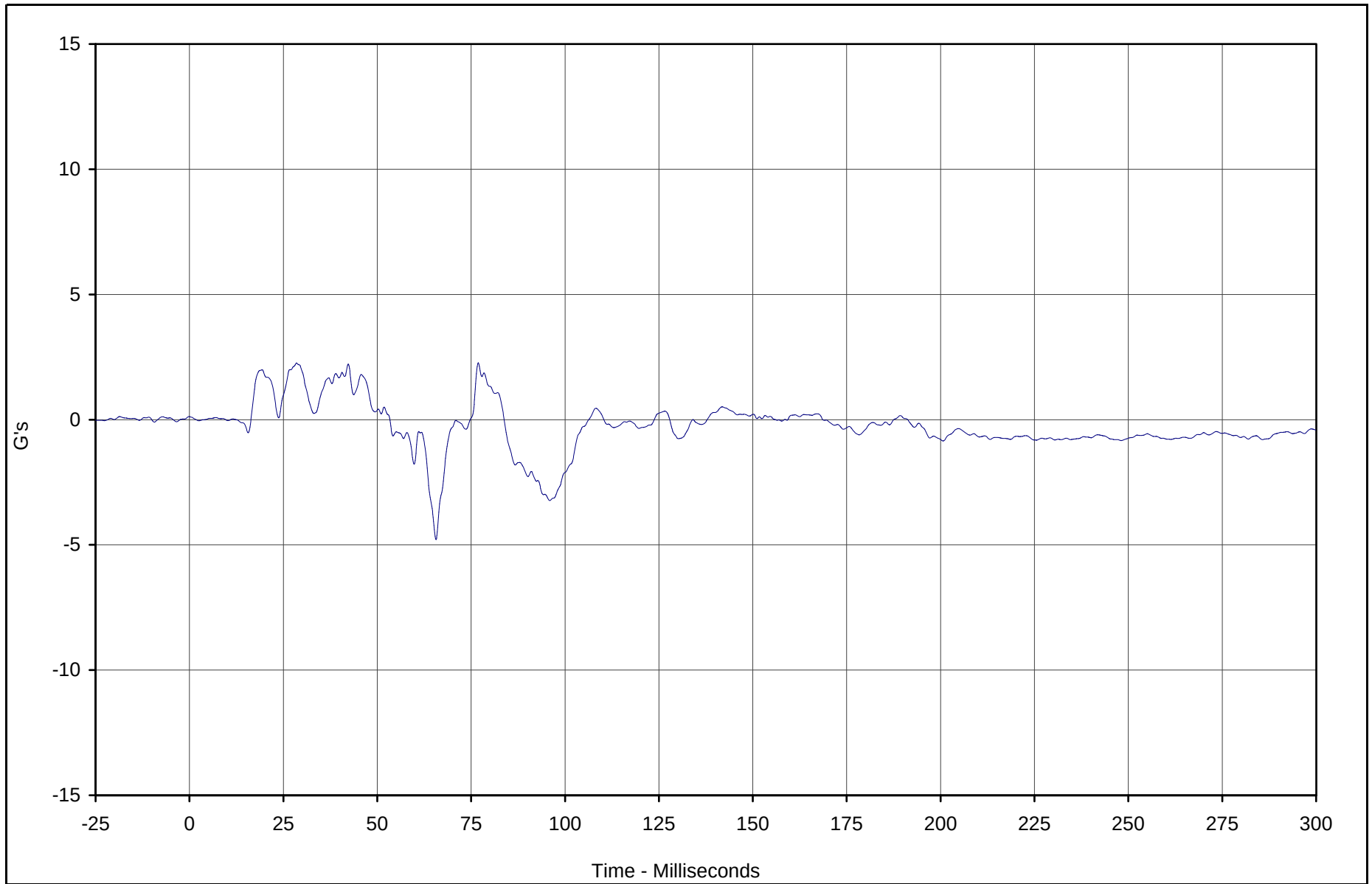
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-91



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant Y	061	FIL	G's	2.3	76.9	-4.8	65.6	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

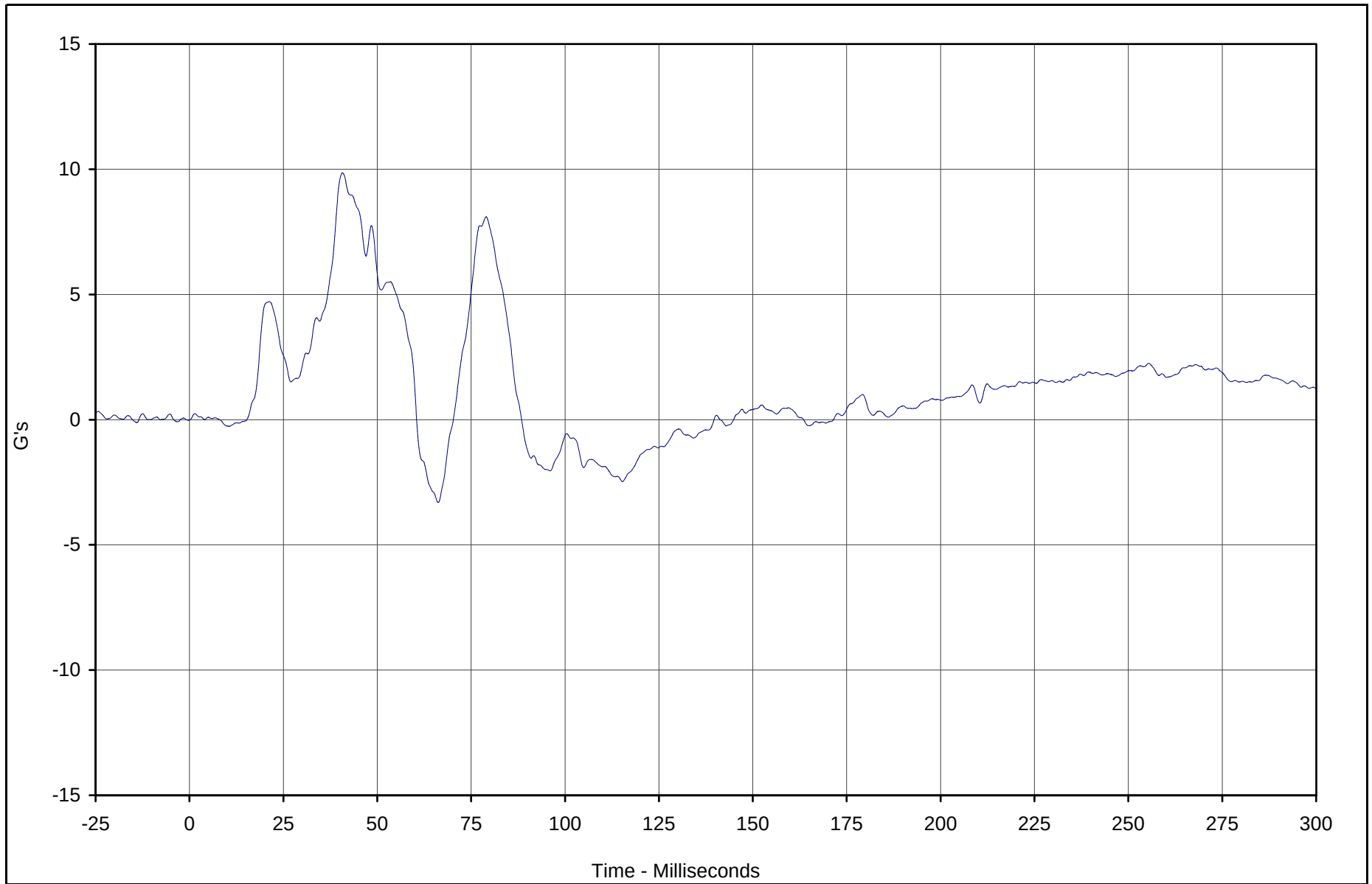
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-92



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Redundant Z	062	FIL	G's	9.9	40.7	-3.3	66.3	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

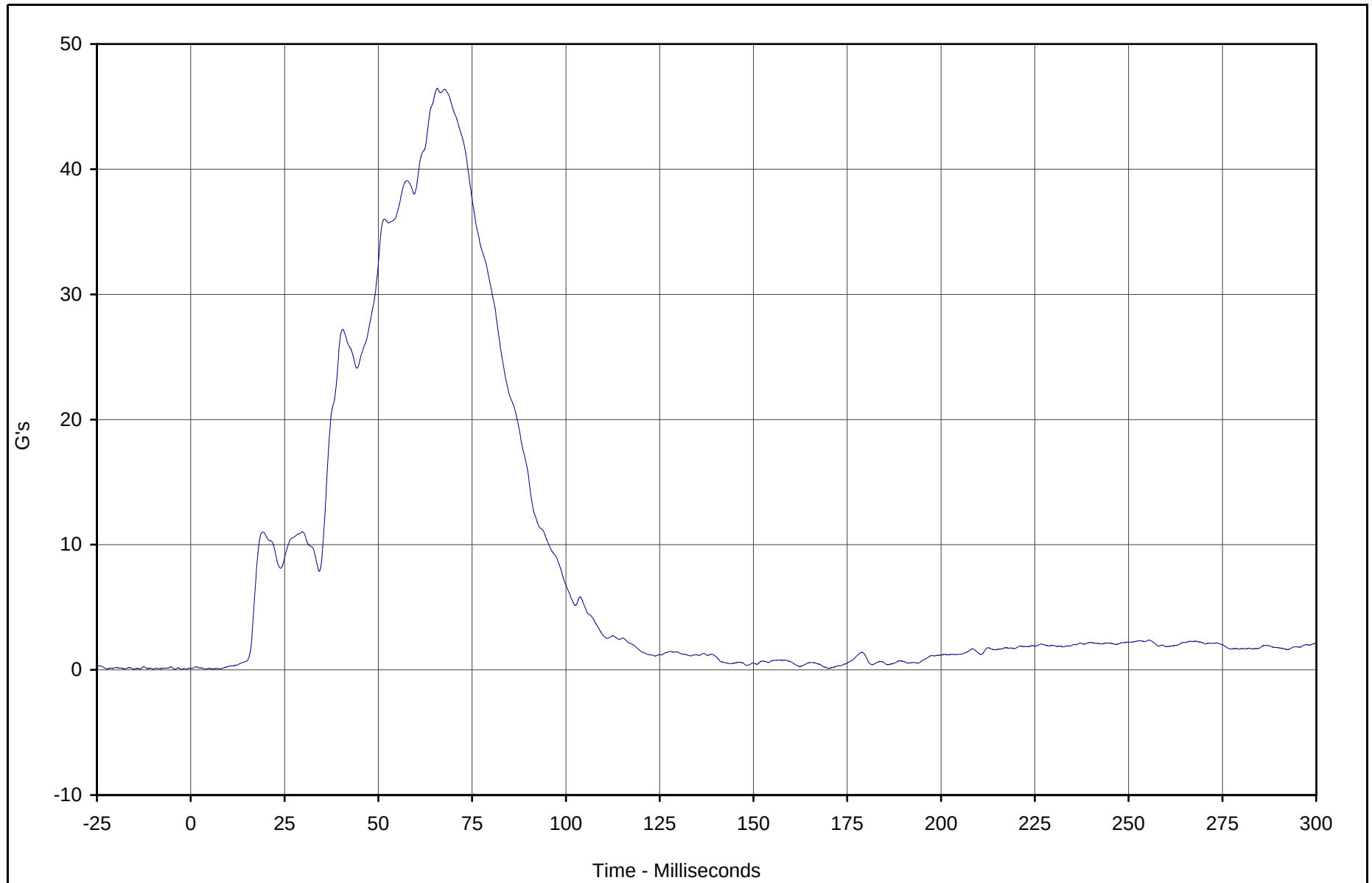
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Resultant Redundant	060	RES	G's	46.5	65.7	0.1	4.0	180



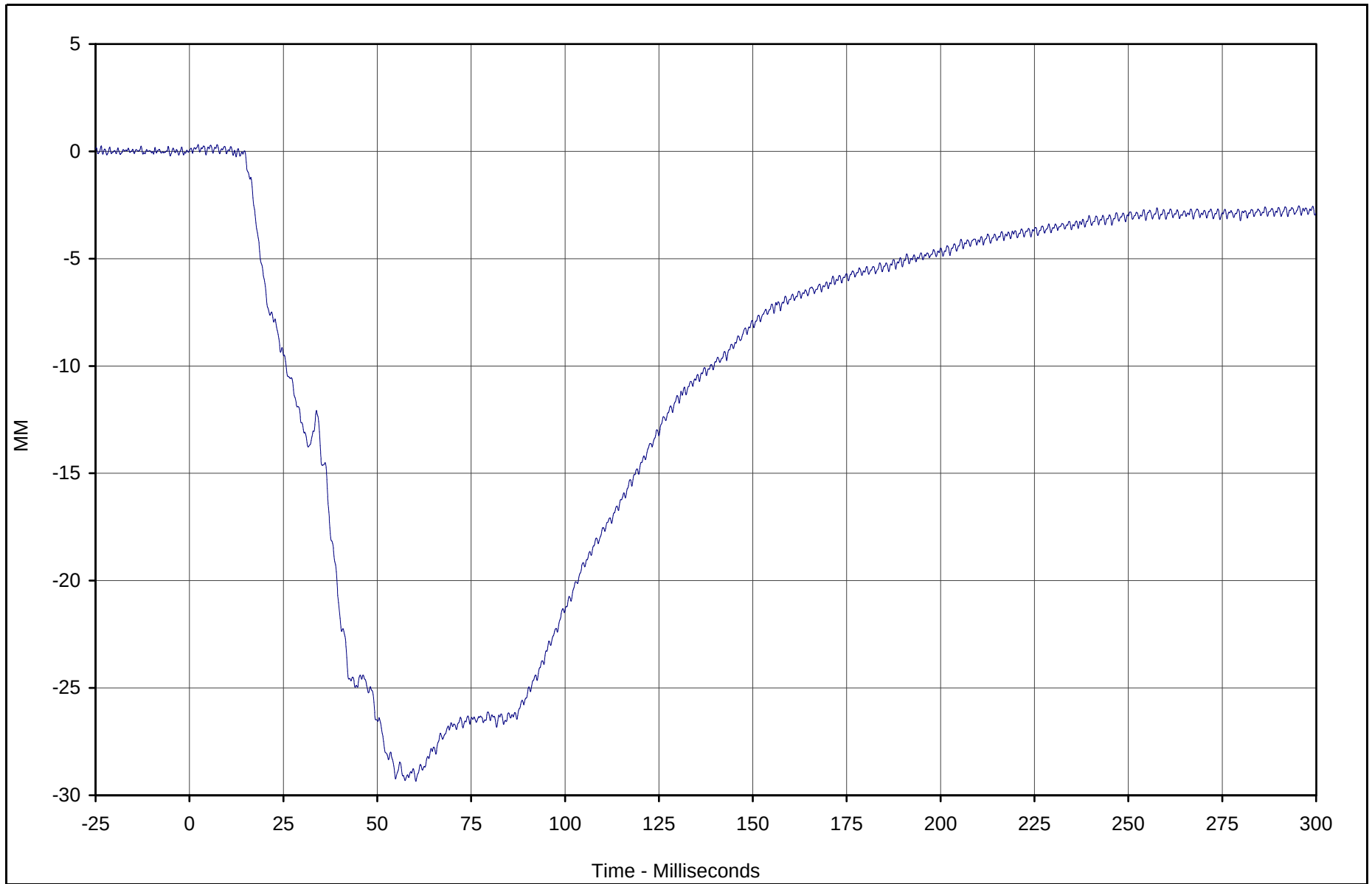
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Chest Displacement X	063	FIL	MM	0.3	2.3	-29.4	60.3	600

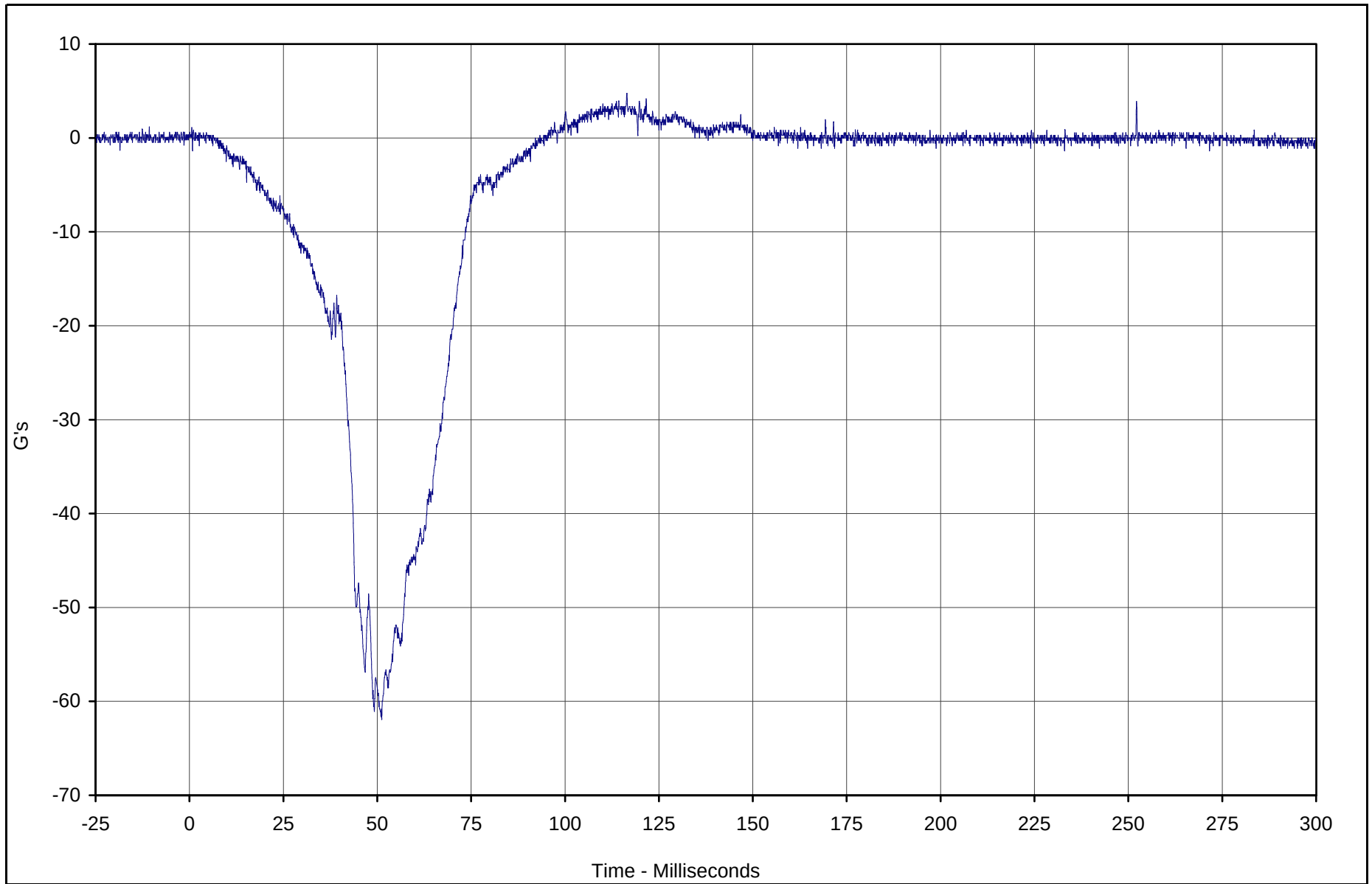


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis X	064	FIL	G's	4.7	116.4	-61.9	51.2	1000

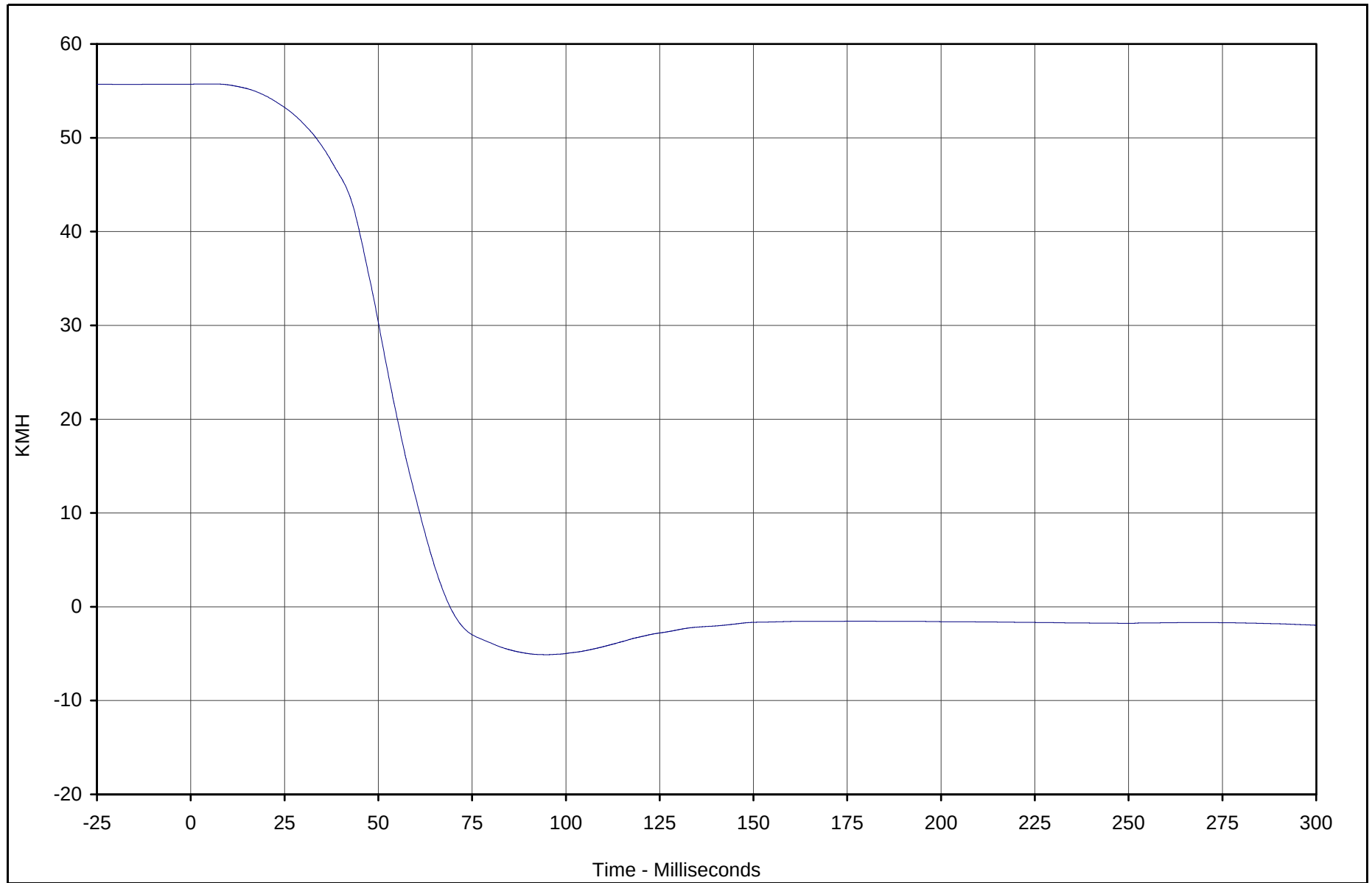


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis X Velocity	064	IN1	KMH	55.7	5.7	-5.1	94.8	180

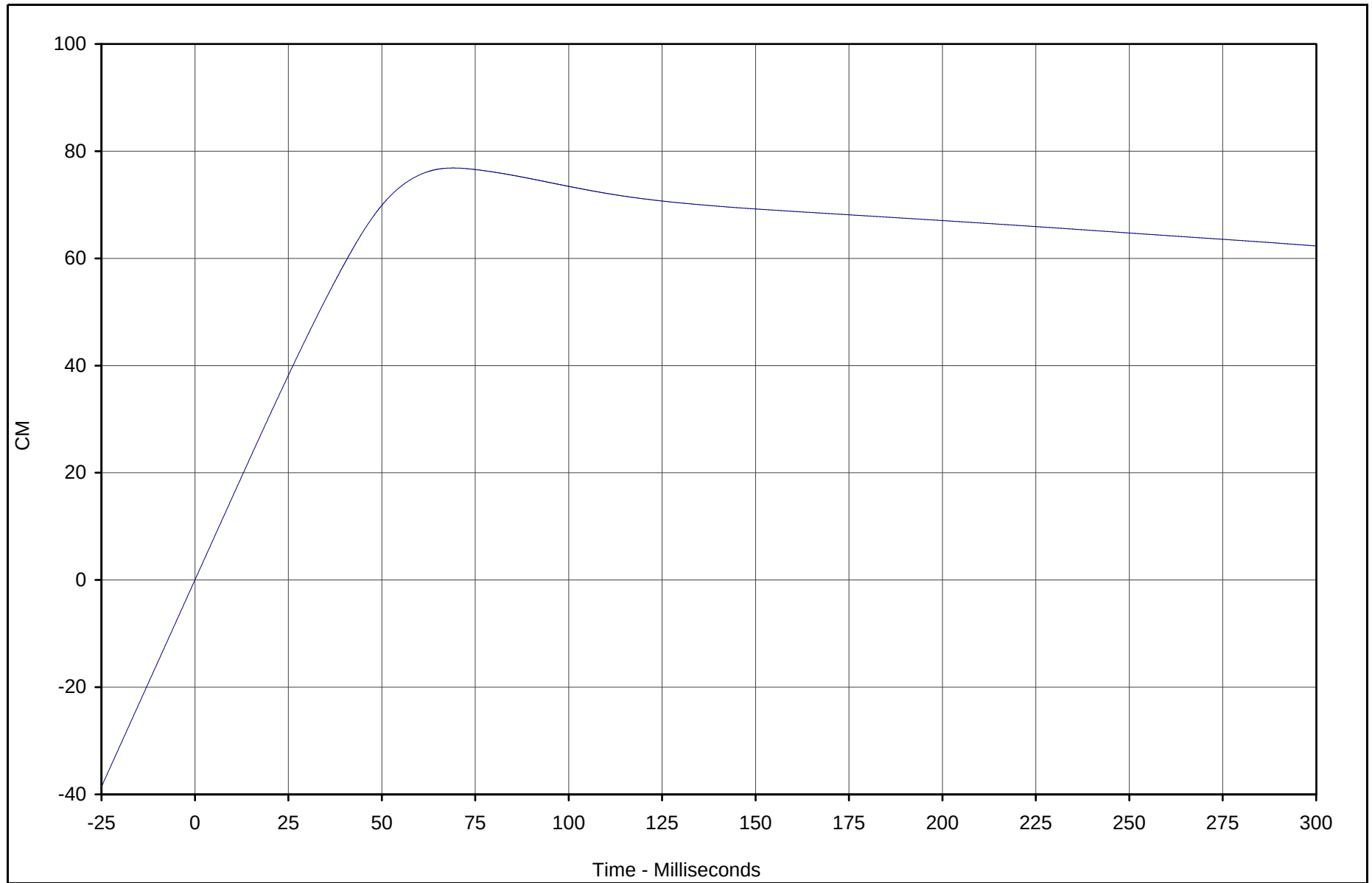


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis X Displ.	064	IN2	CM	76.9	69.1	0.0	0.0	180

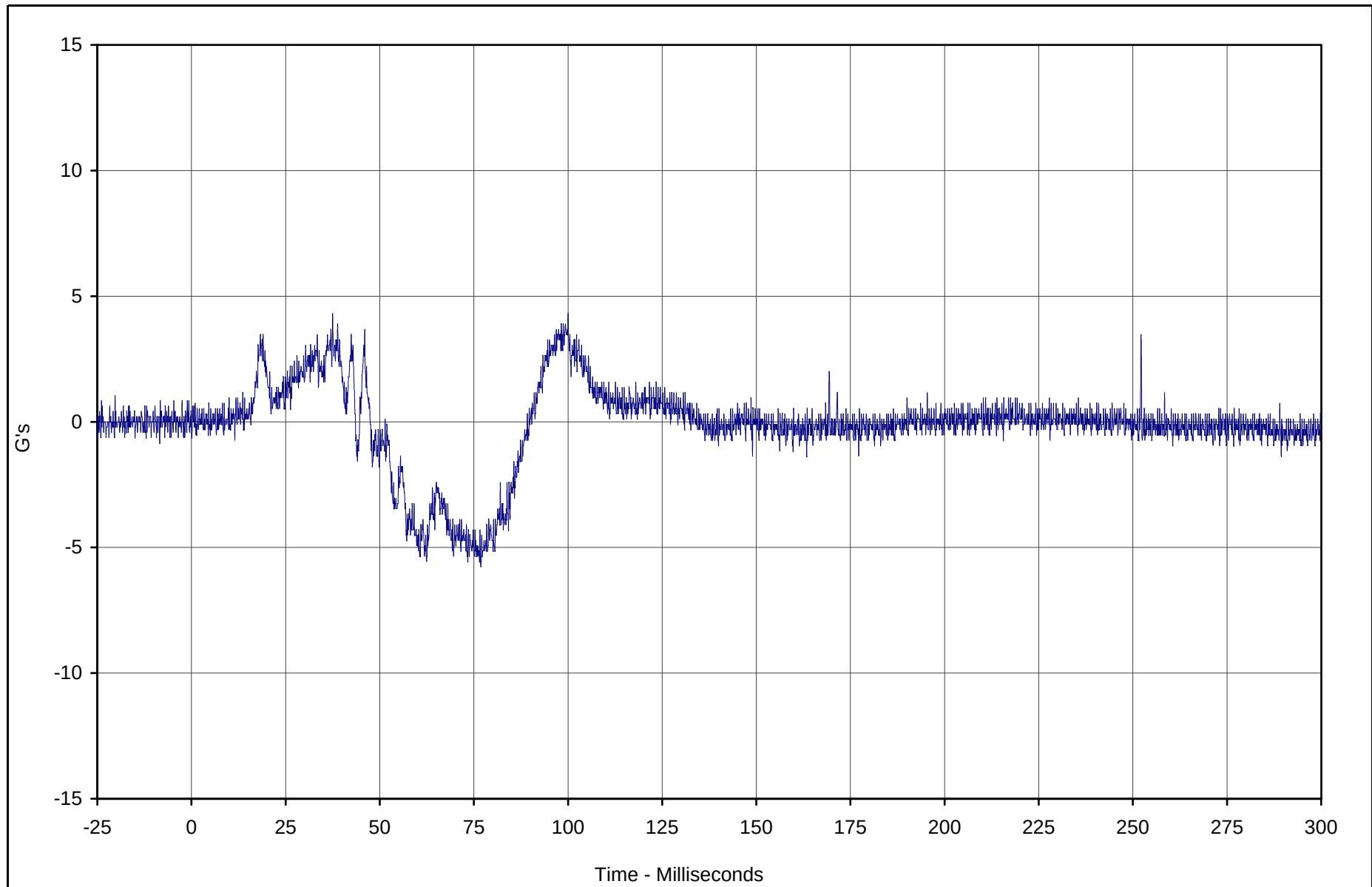


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis Y	065	FIL	G's	4.3	37.5	-5.8	76.8	1000

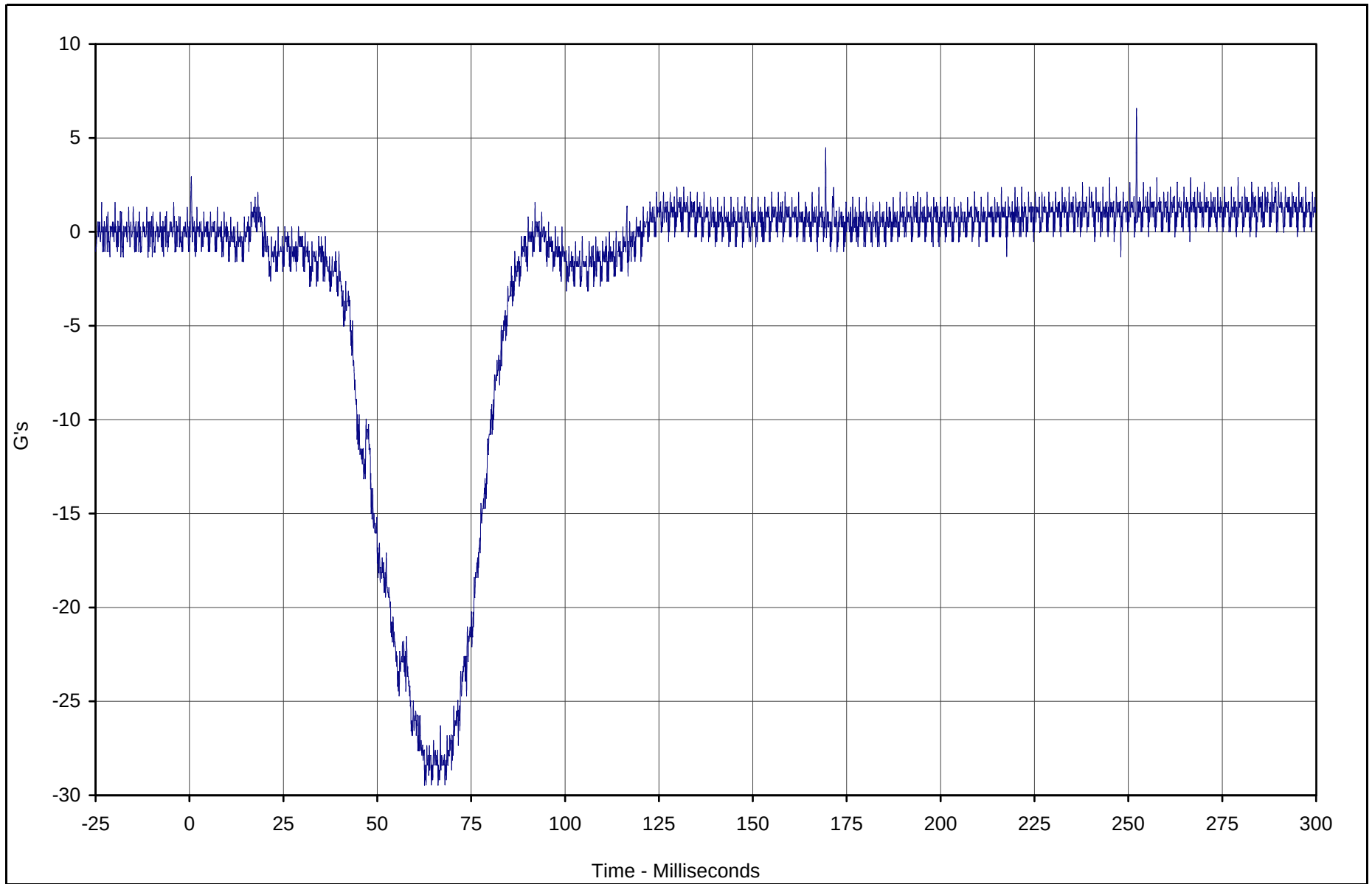


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis Z	066	FIL	G's	6.6	252.2	-29.5	62.6	1000



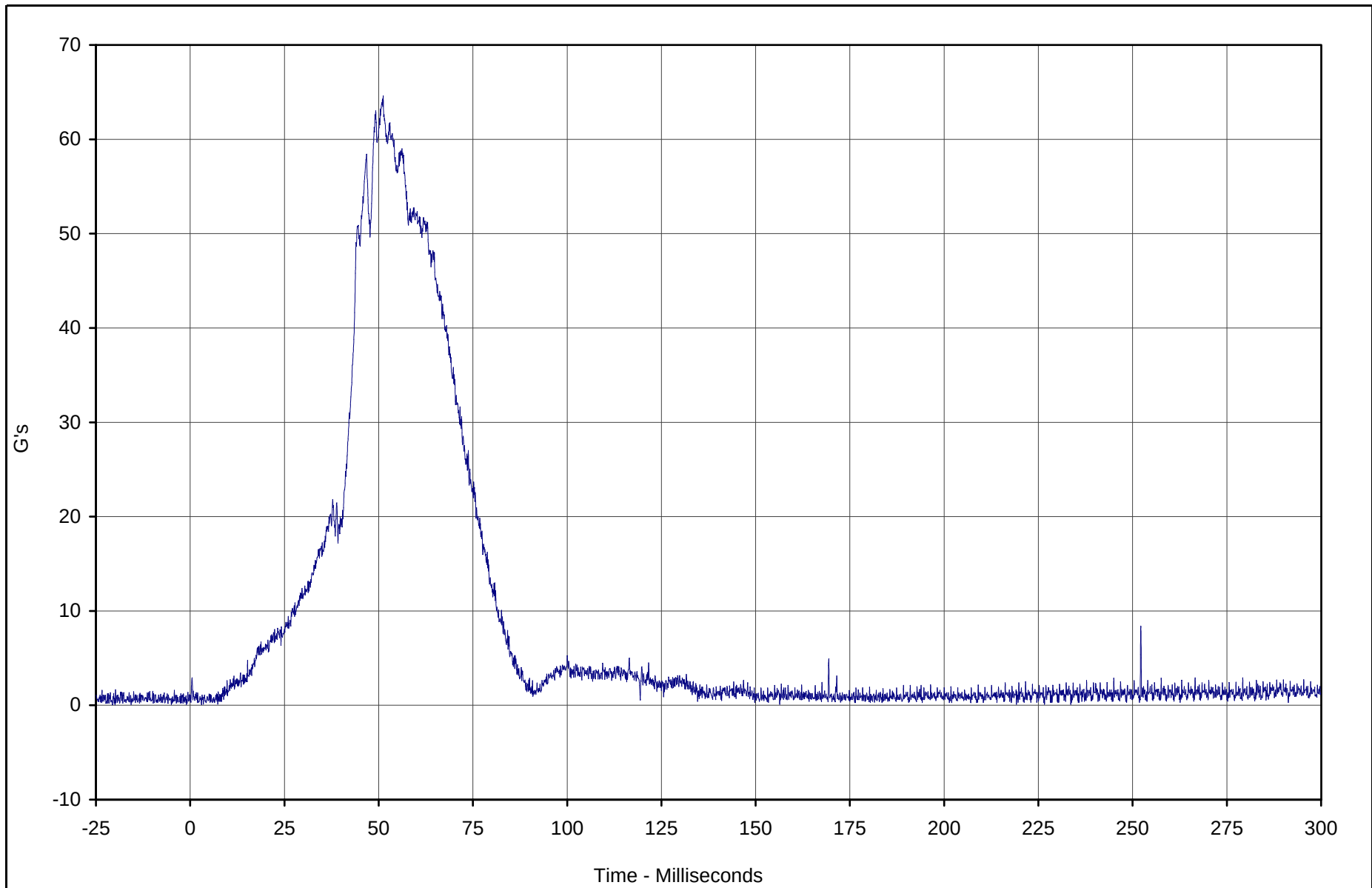
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Pelvis Resultant	066	RES	G's	64.6	51.2	0.1	3.0	1000



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

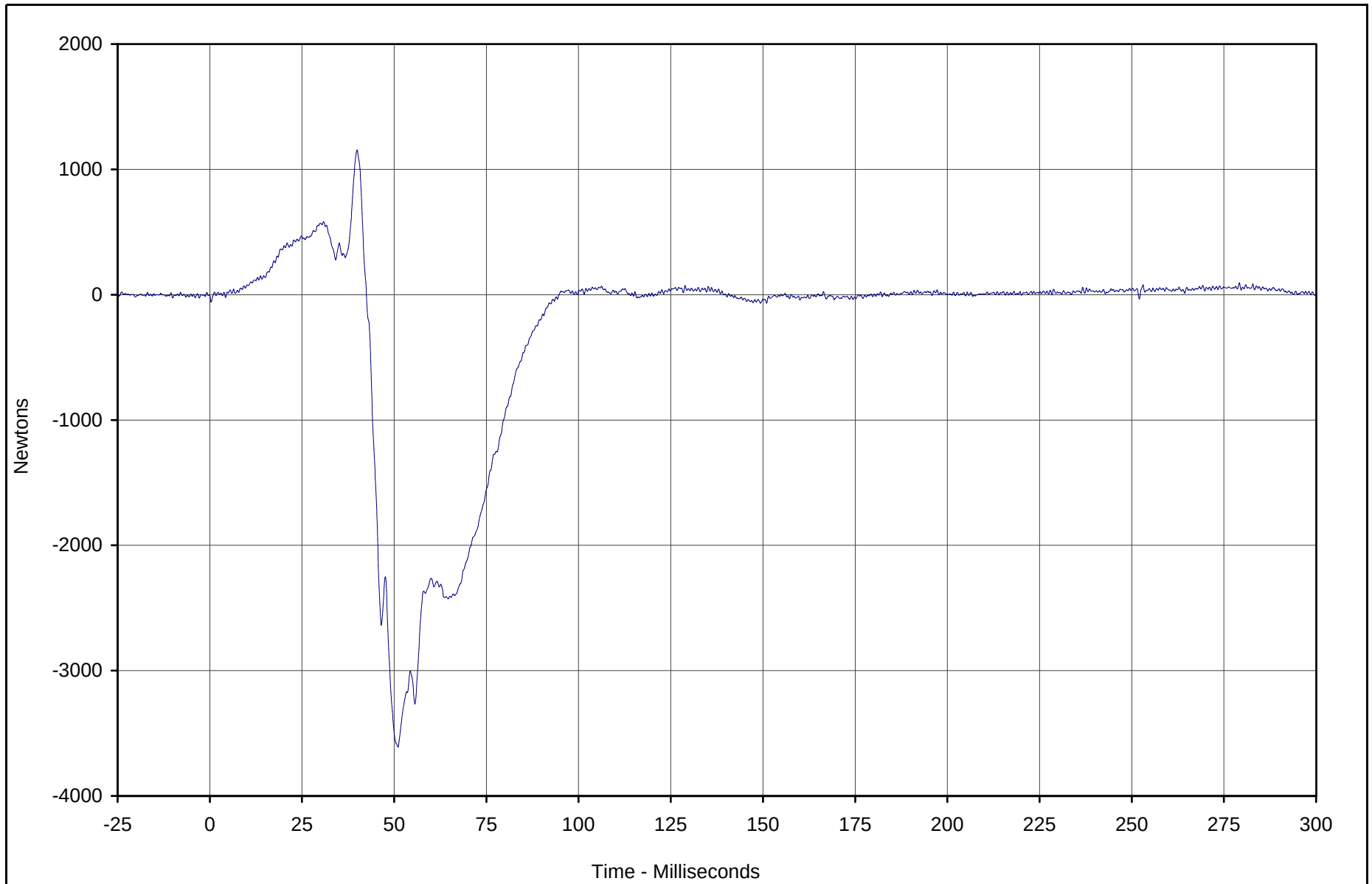
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Femur Force	067	FIL	Newtons	1155.1	39.9	-3609.3	51.0	600



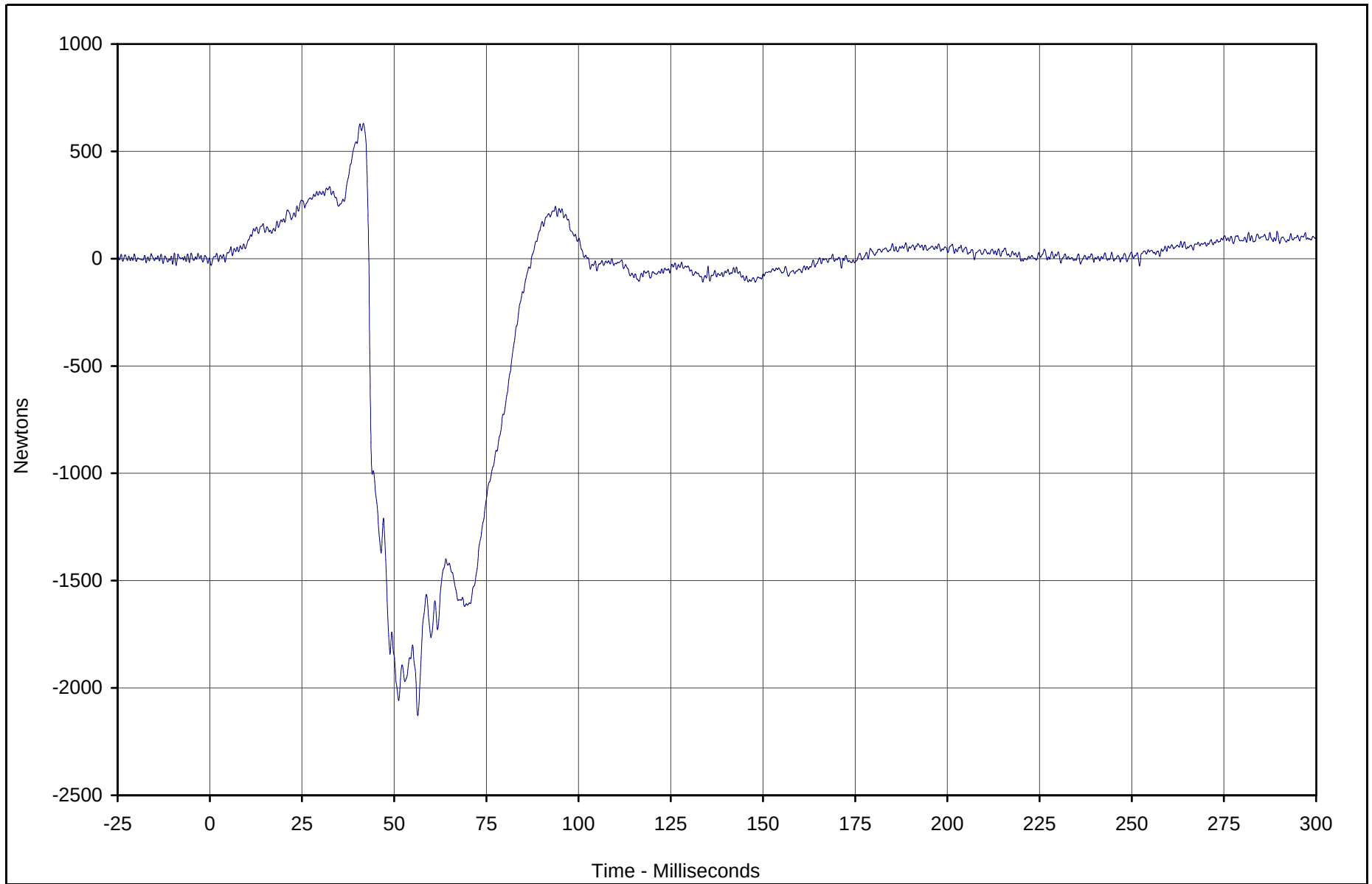
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Femur Force	068	FIL	Newtons	631.0	41.6	-2129.3	56.4	600

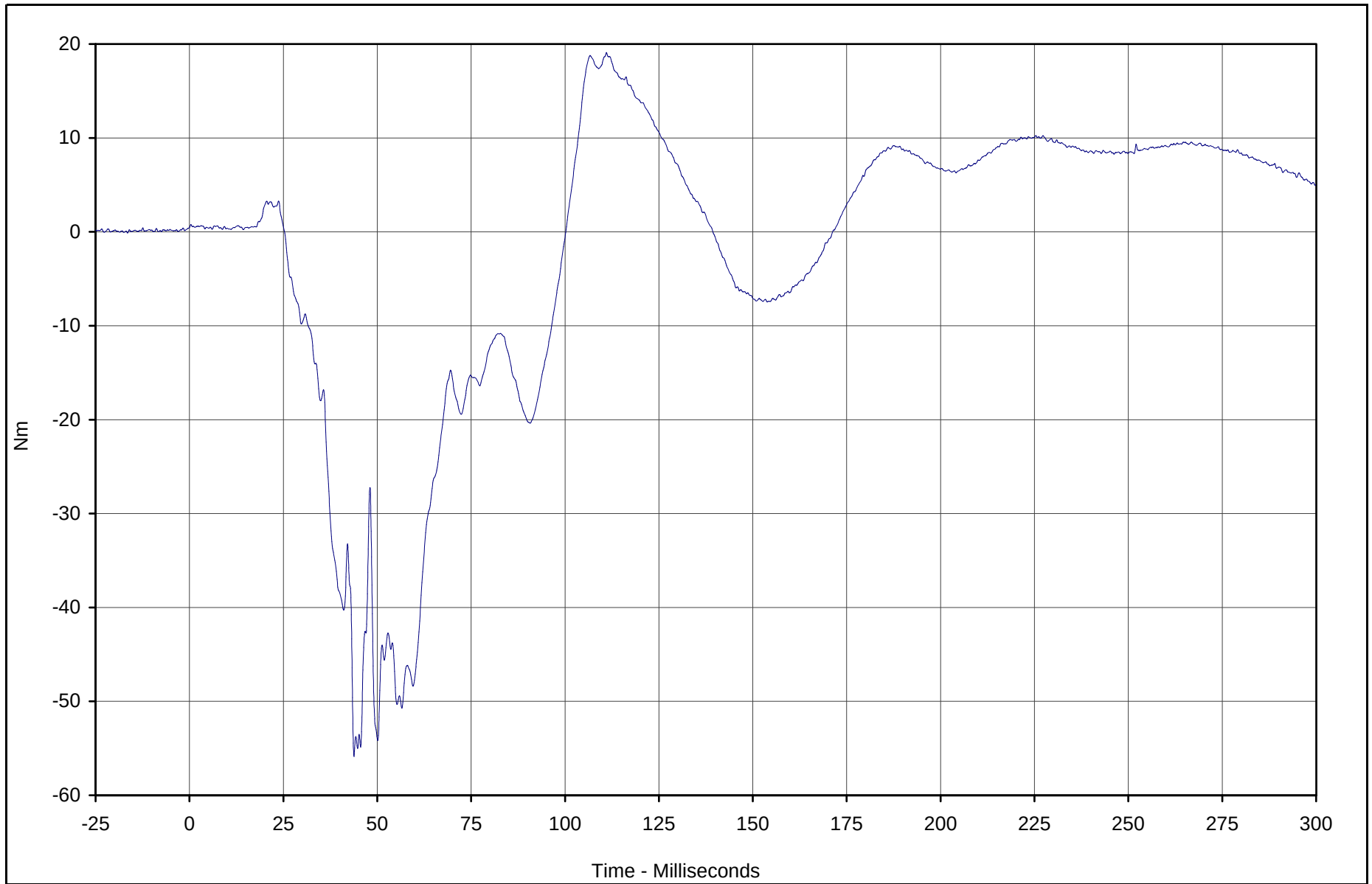


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Upper Tibia Moment X	069	FIL	Nm	19.1	111.0	-55.9	43.8	600



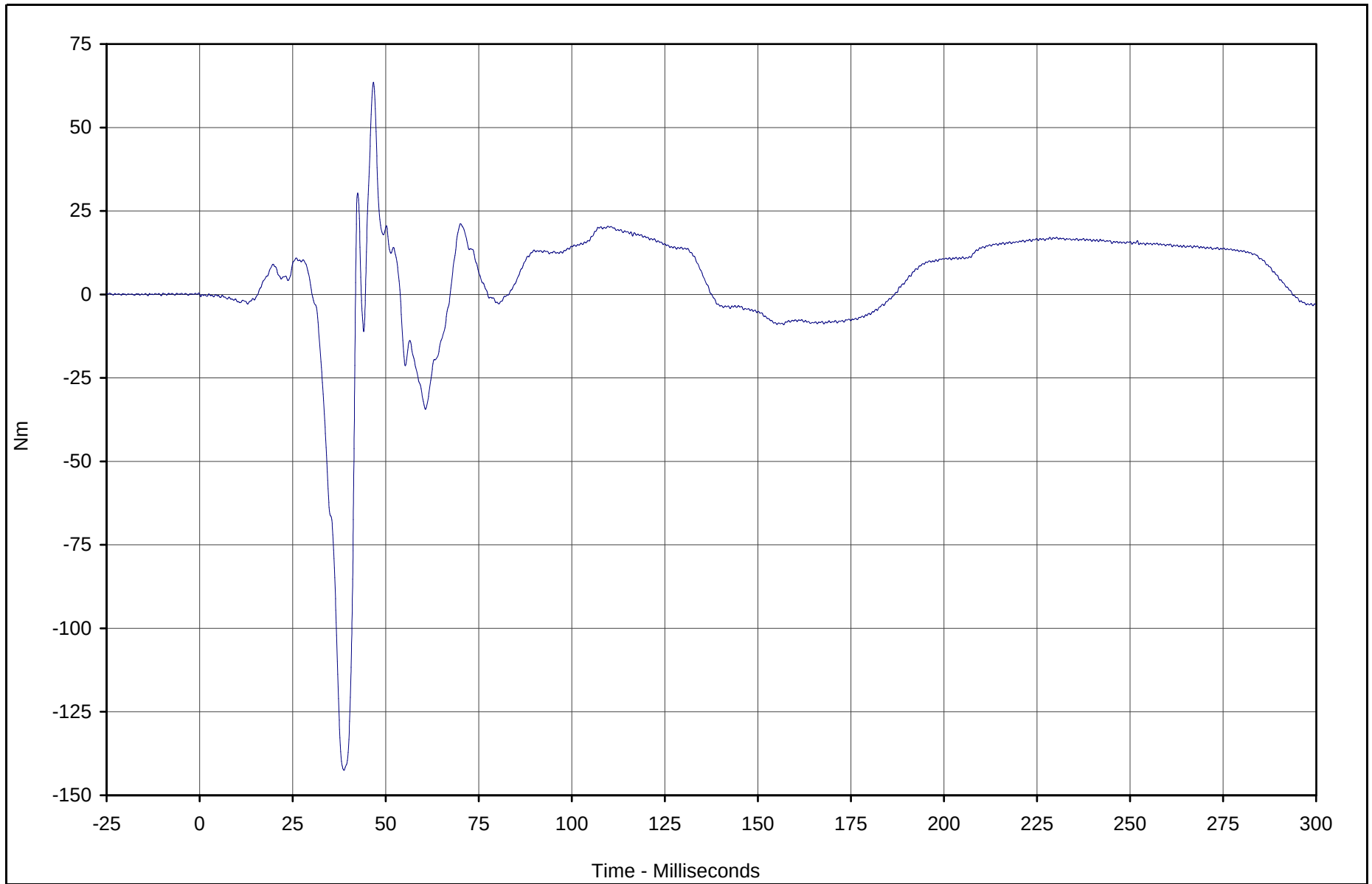
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Upper Tibia Moment Y	070	FIL	Nm	63.6	46.7	-142.5	38.8	600



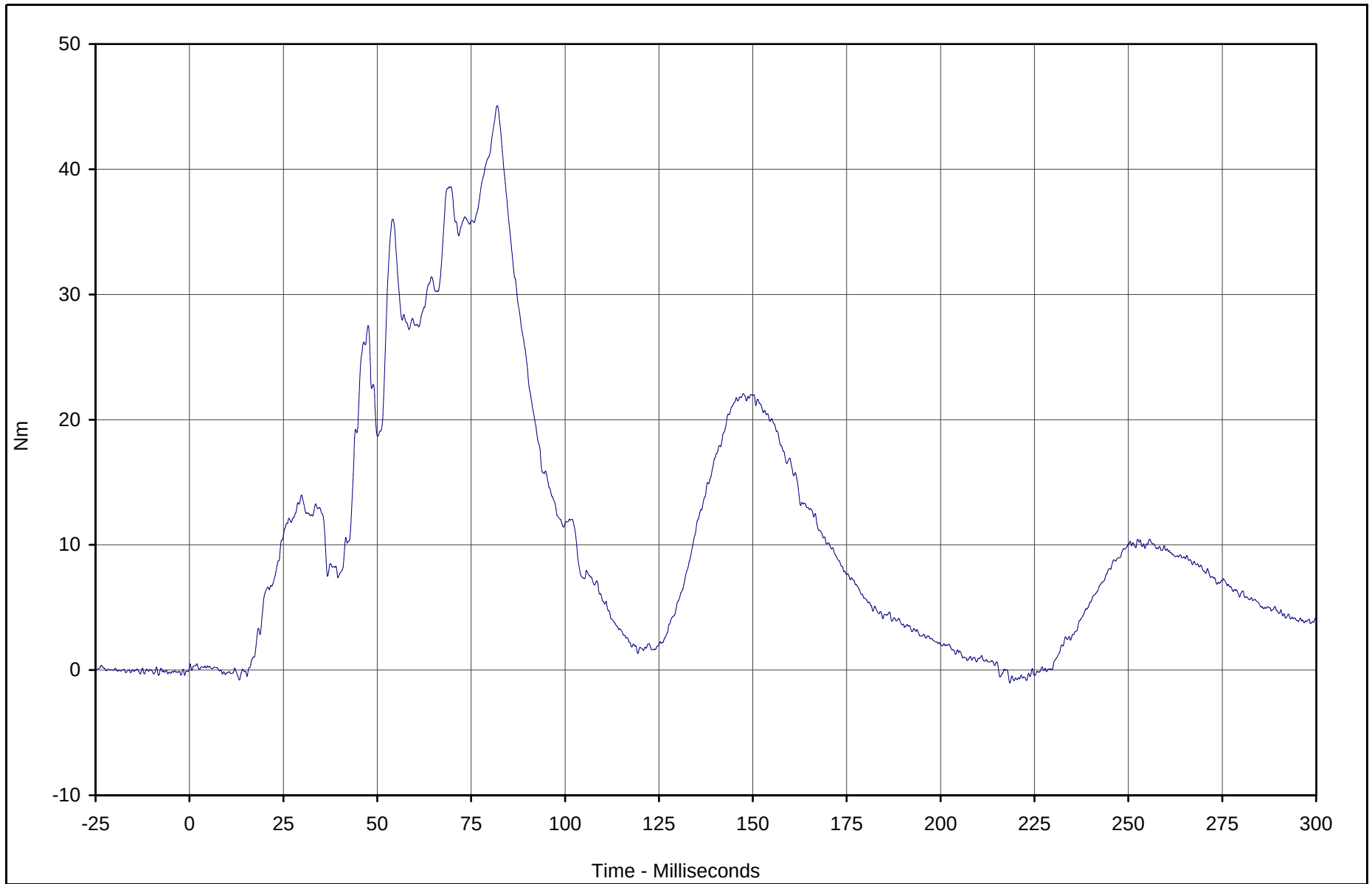
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Upper Tibia Moment X	071	FIL	Nm	45.1	81.9	-1.0	218.4	600

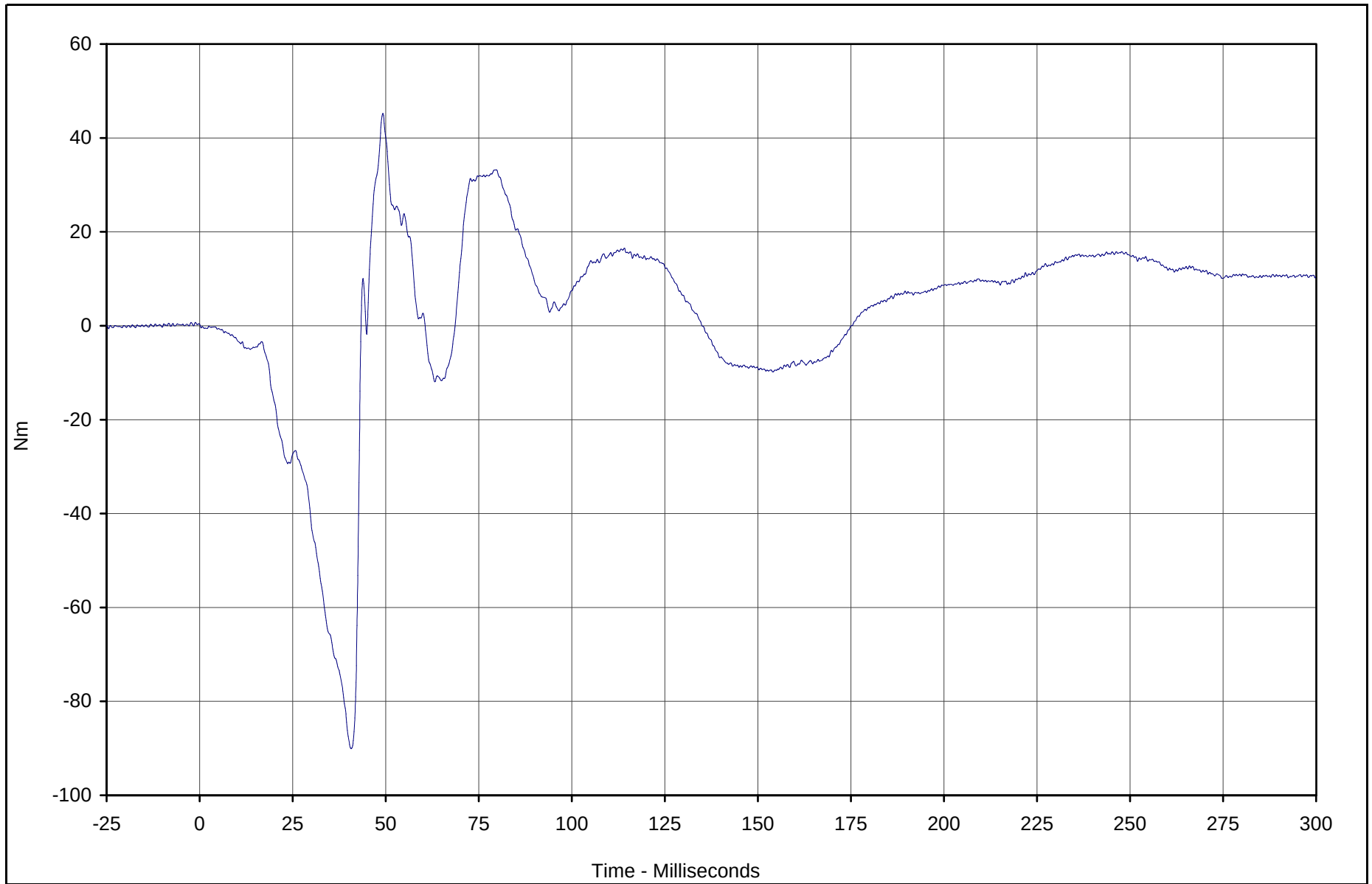


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Upper Tibia Moment Y	072	FIL	Nm	45.2	49.2	-90.1	40.7	600

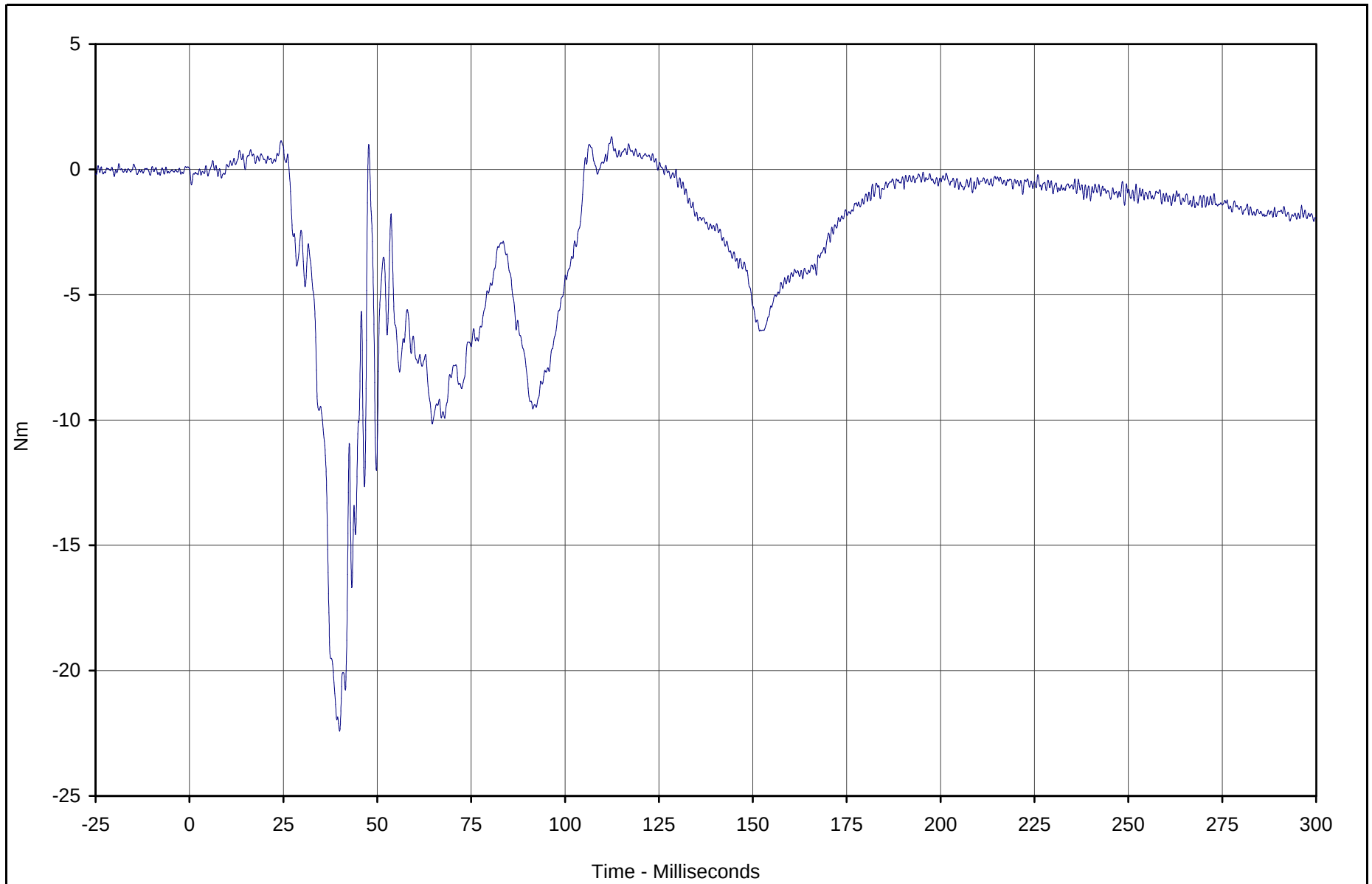


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Lower Tibia Moment X	073	FIL	Nm	1.3	112.4	-22.4	40.0	600

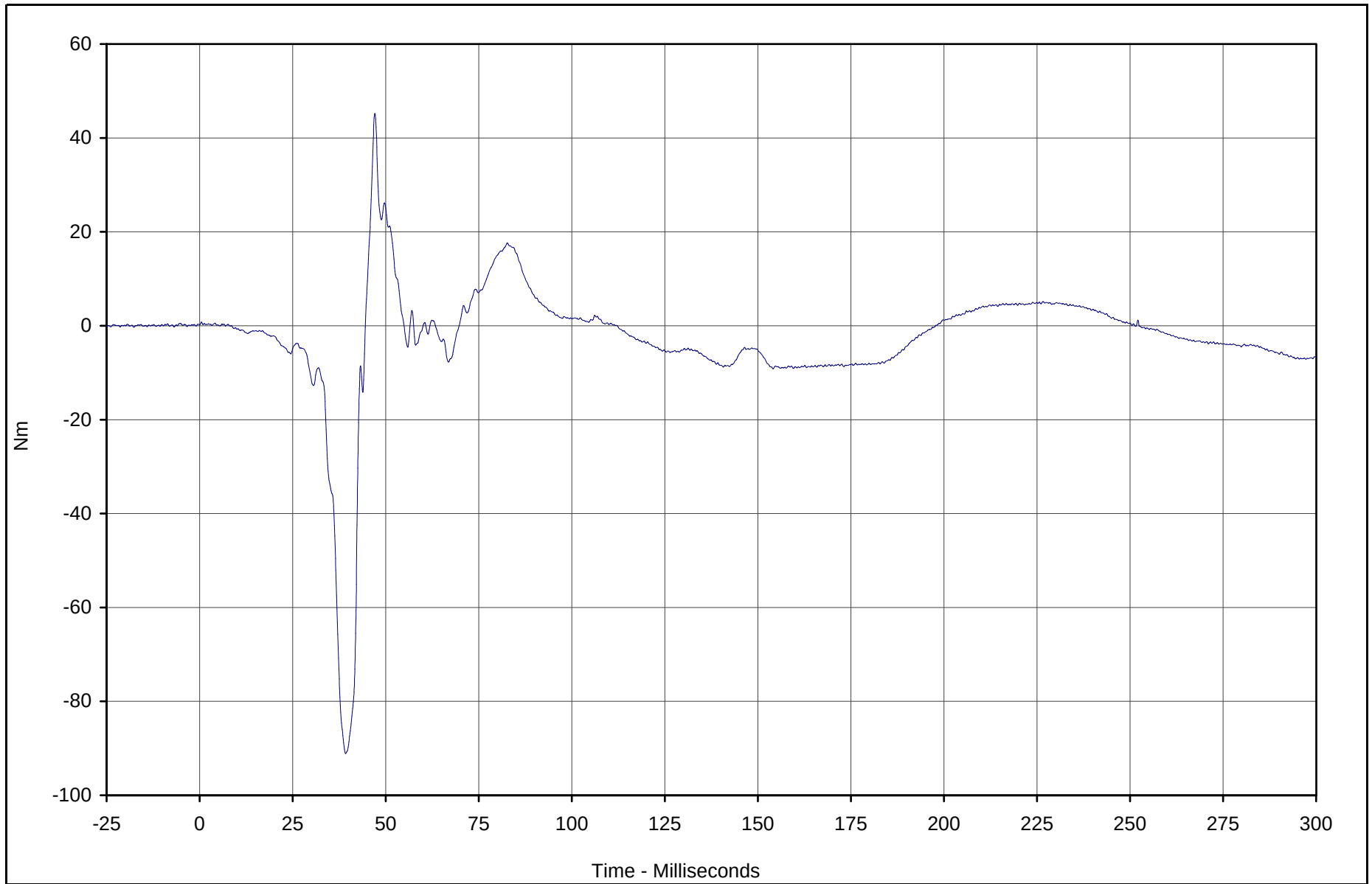


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Lower Tibia Moment Y	074	FIL	Nm	45.2	47.1	-91.1	39.2	600

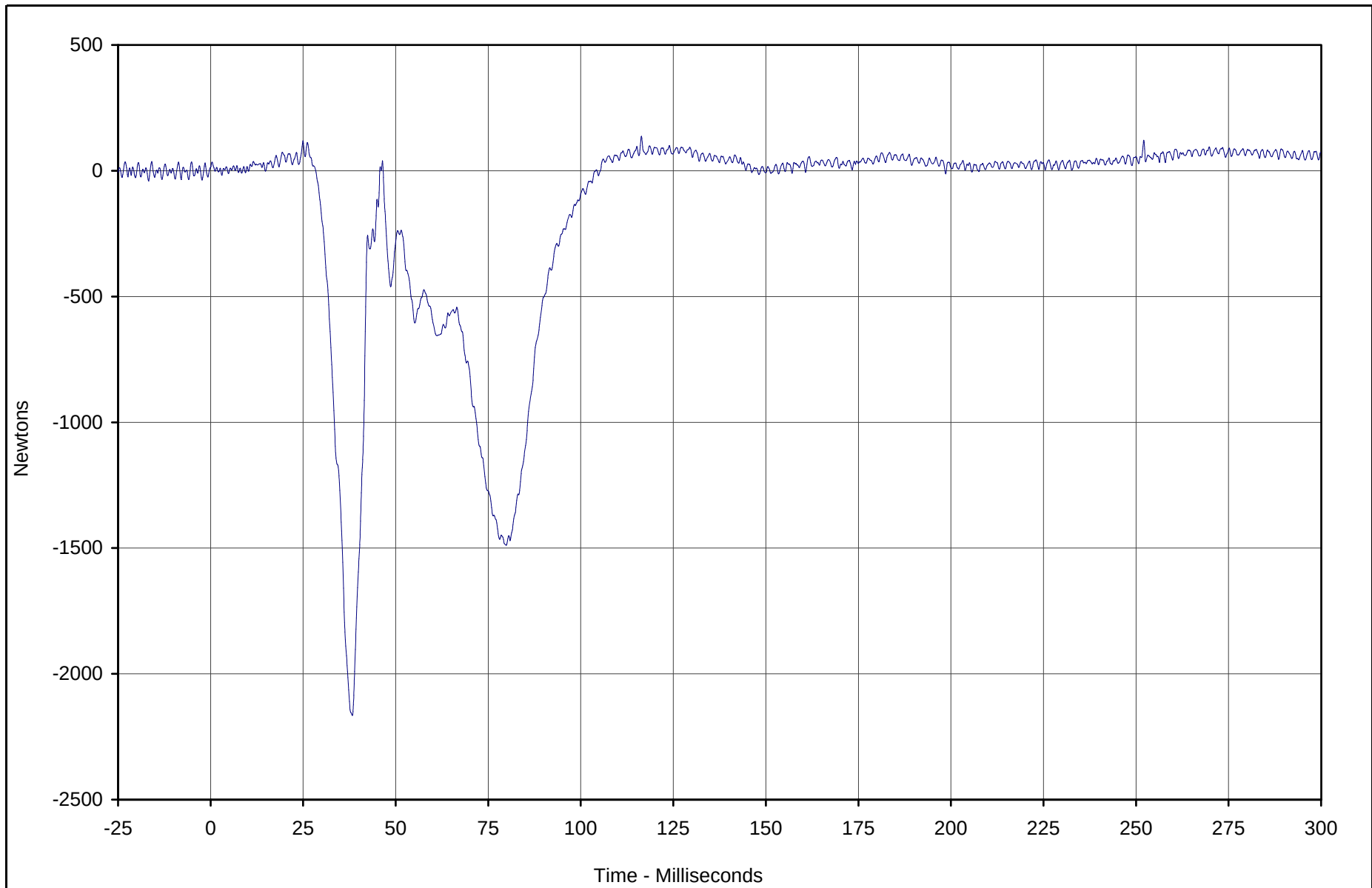


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Lower Tibia Force Z	075	FIL	Newtons	137.6	116.4	-2165.4	38.3	600

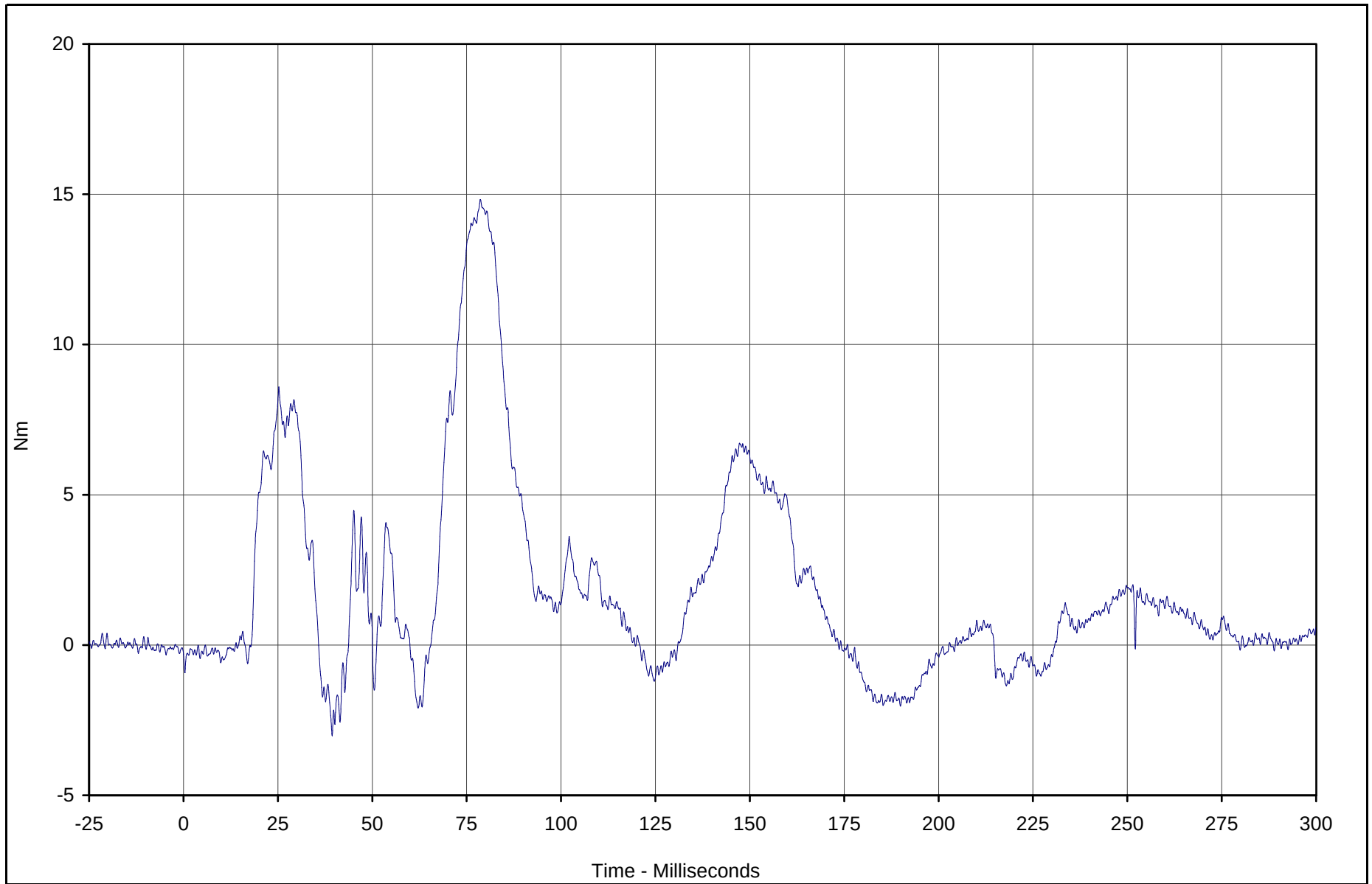


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Lower Tibia Moment X	076	FIL	Nm	14.8	78.7	-3.0	39.4	600

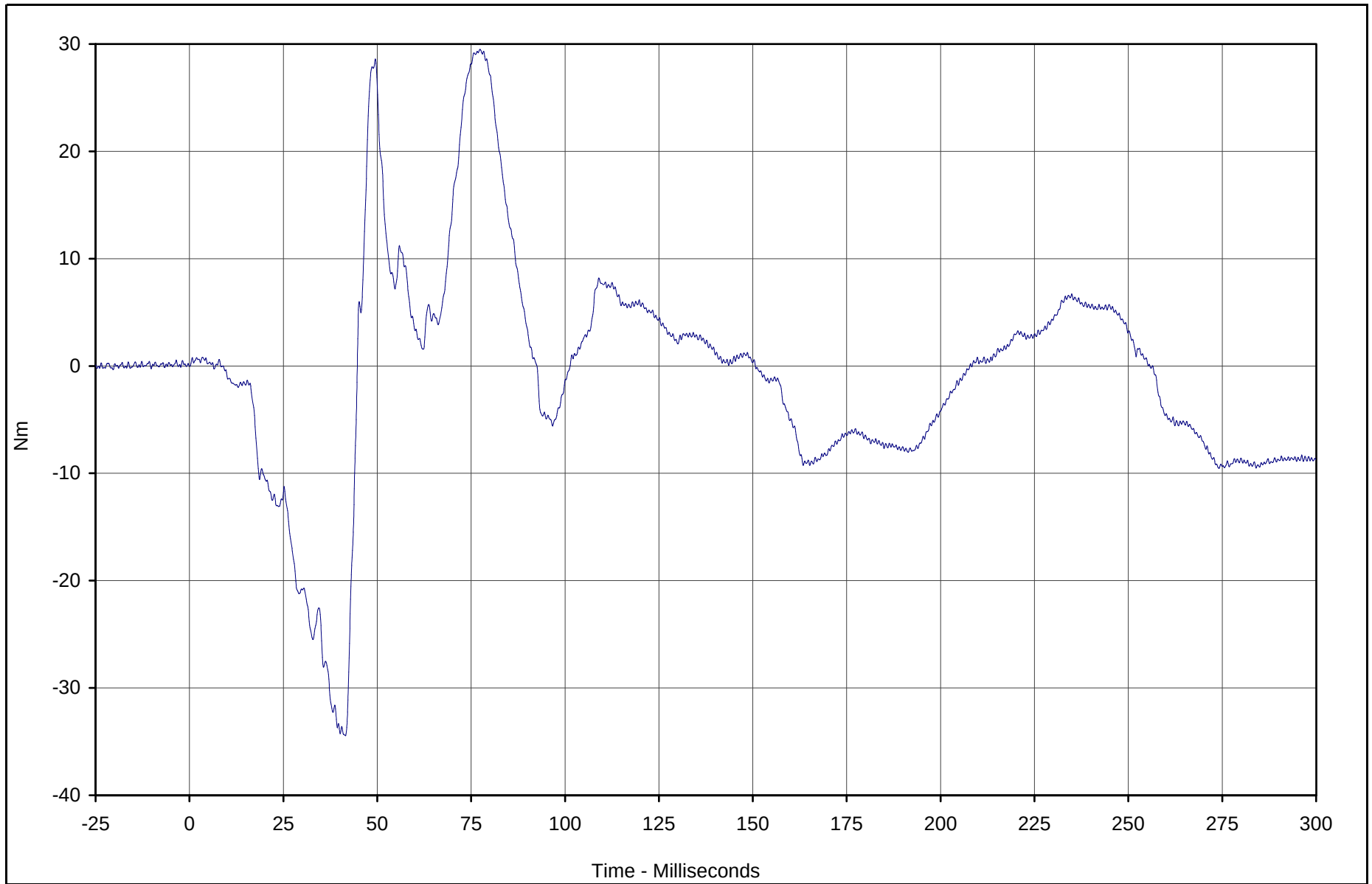


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Lower Tibia Moment Y	077	FIL	Nm	29.5	77.4	-34.5	41.5	600

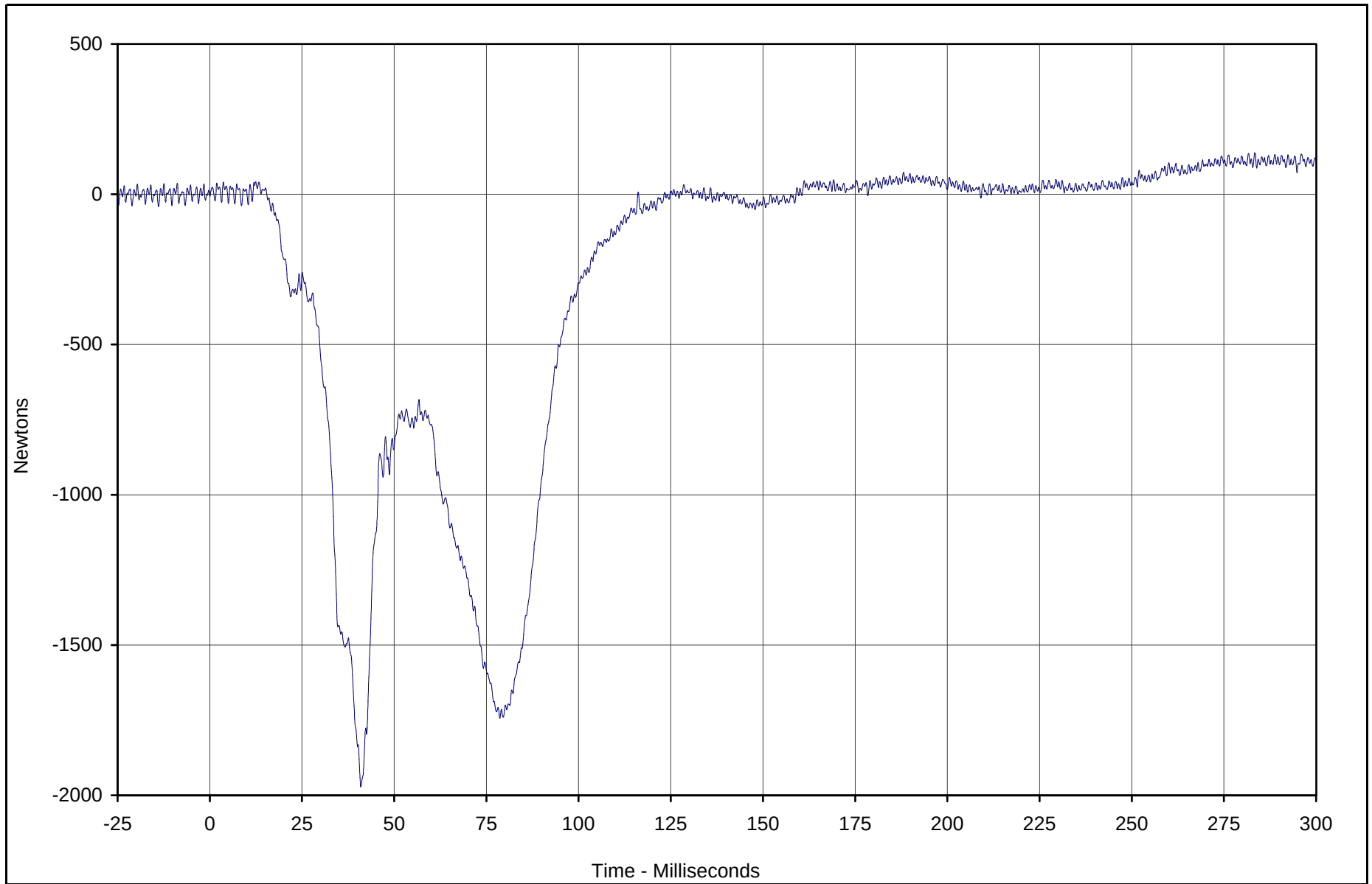


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right lower Tibia Force Z	078	FIL	Newtons	138.5	283.4	-1971.9	41.0	600

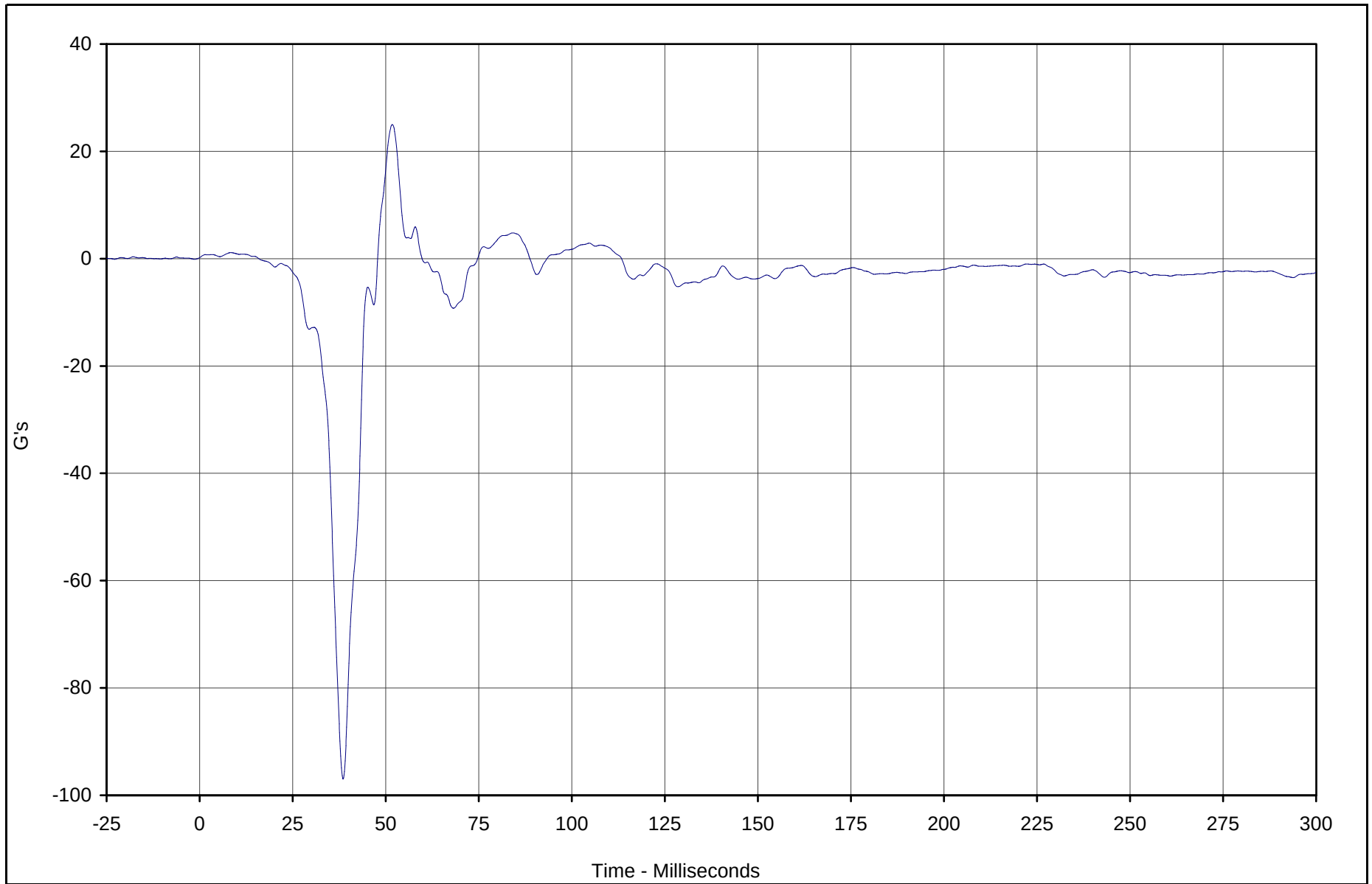


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Foot Aft X	079	FIL	G's	25.0	51.8	-97.0	38.5	180



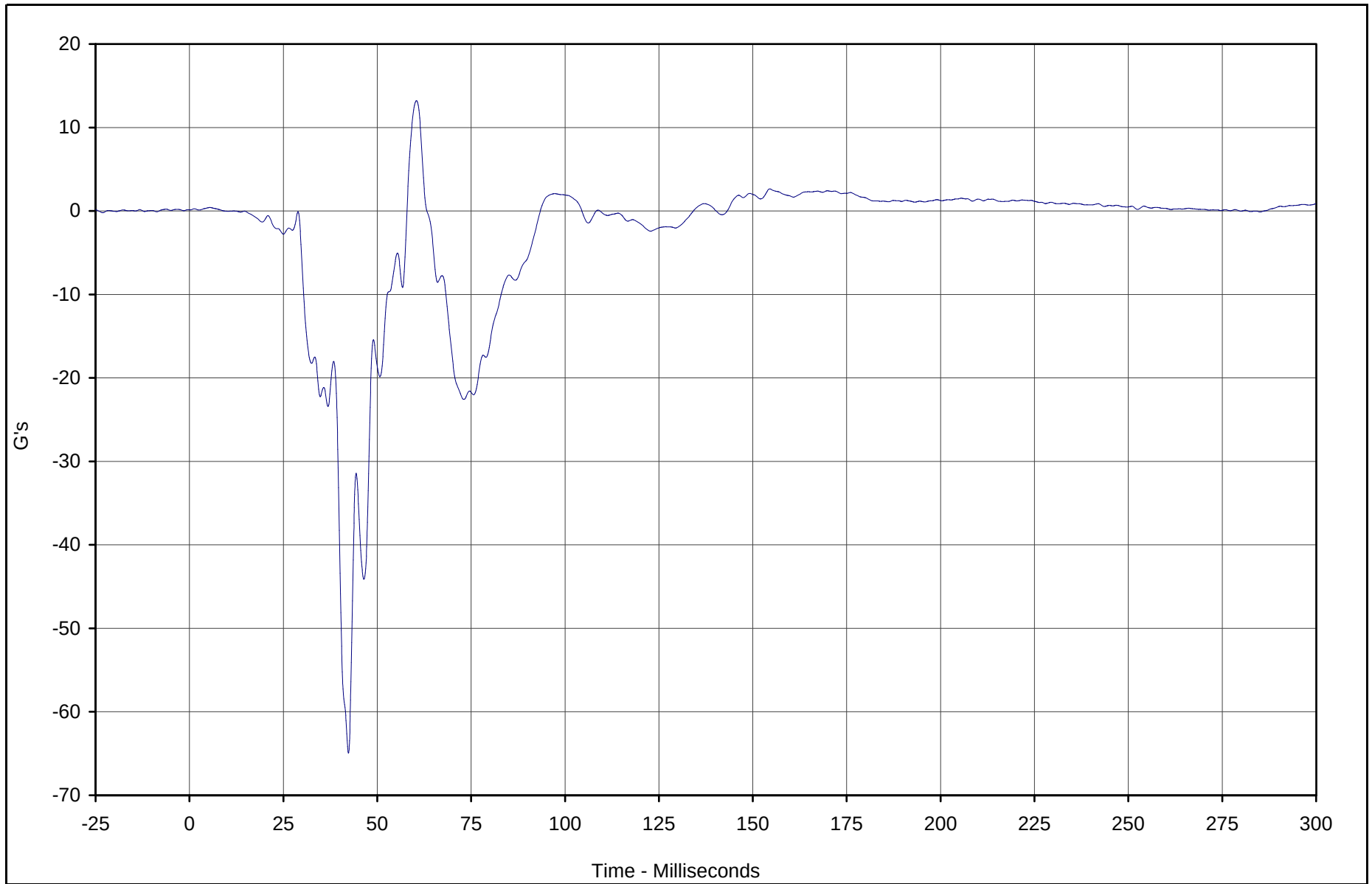
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Foot Aft Z	080	FIL	G's	13.2	60.4	-65.0	42.3	180



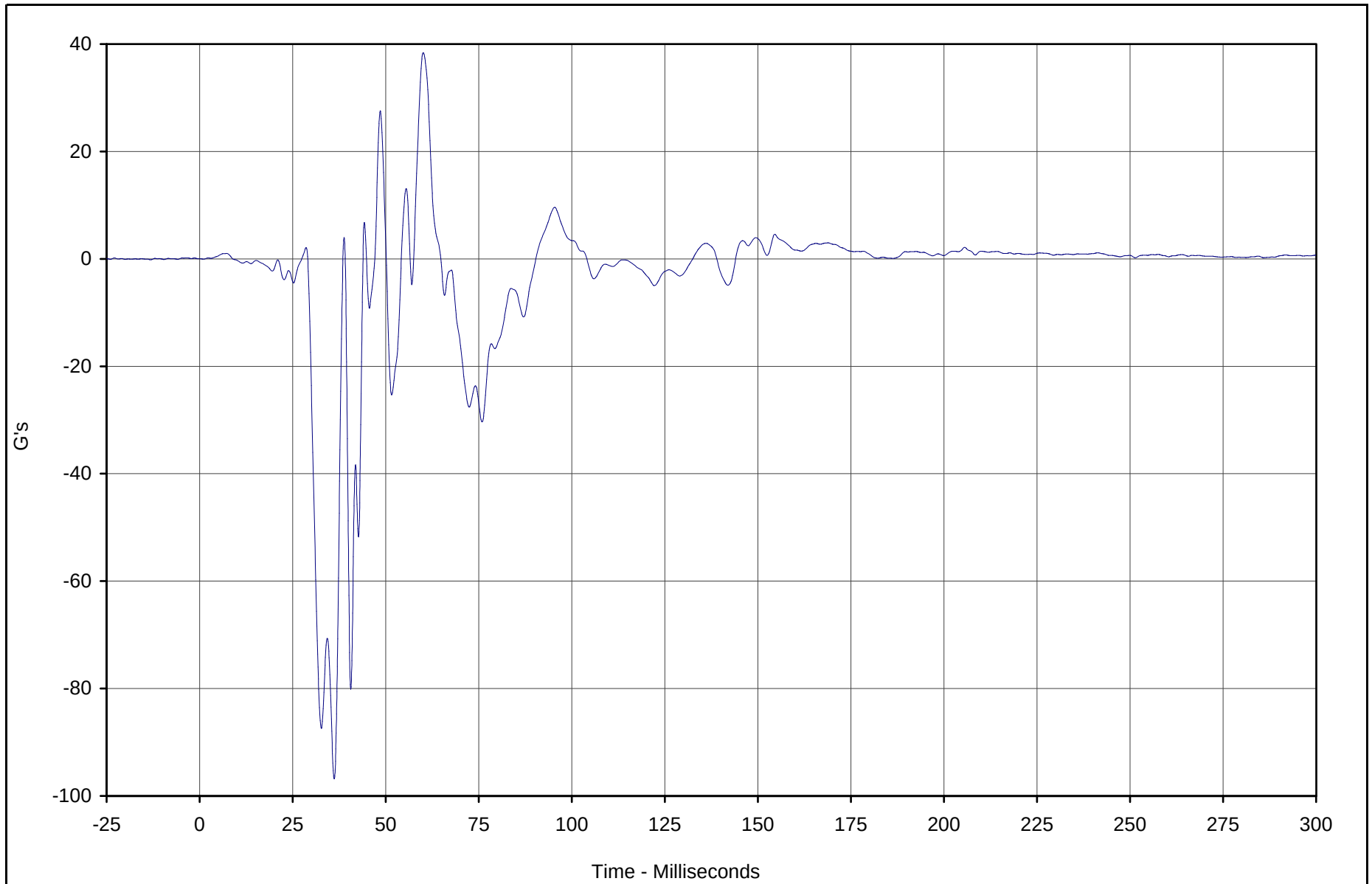
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Left Foot Fore Z	081	FIL	G's	38.4	60.1	-96.8	36.2	180

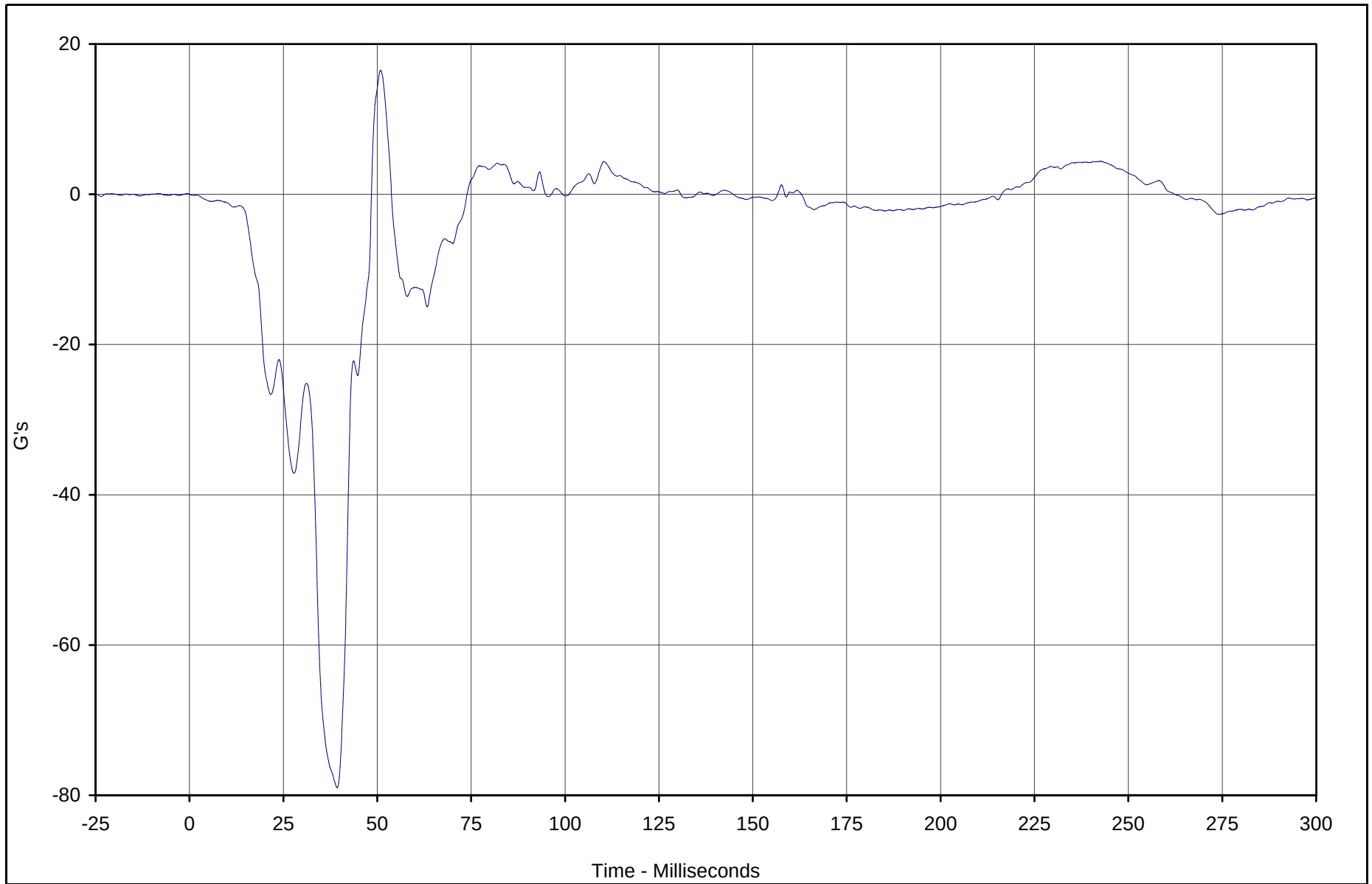


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Foot Aft X	082	FIL	G's	16.5	50.9	-79.0	39.3	180

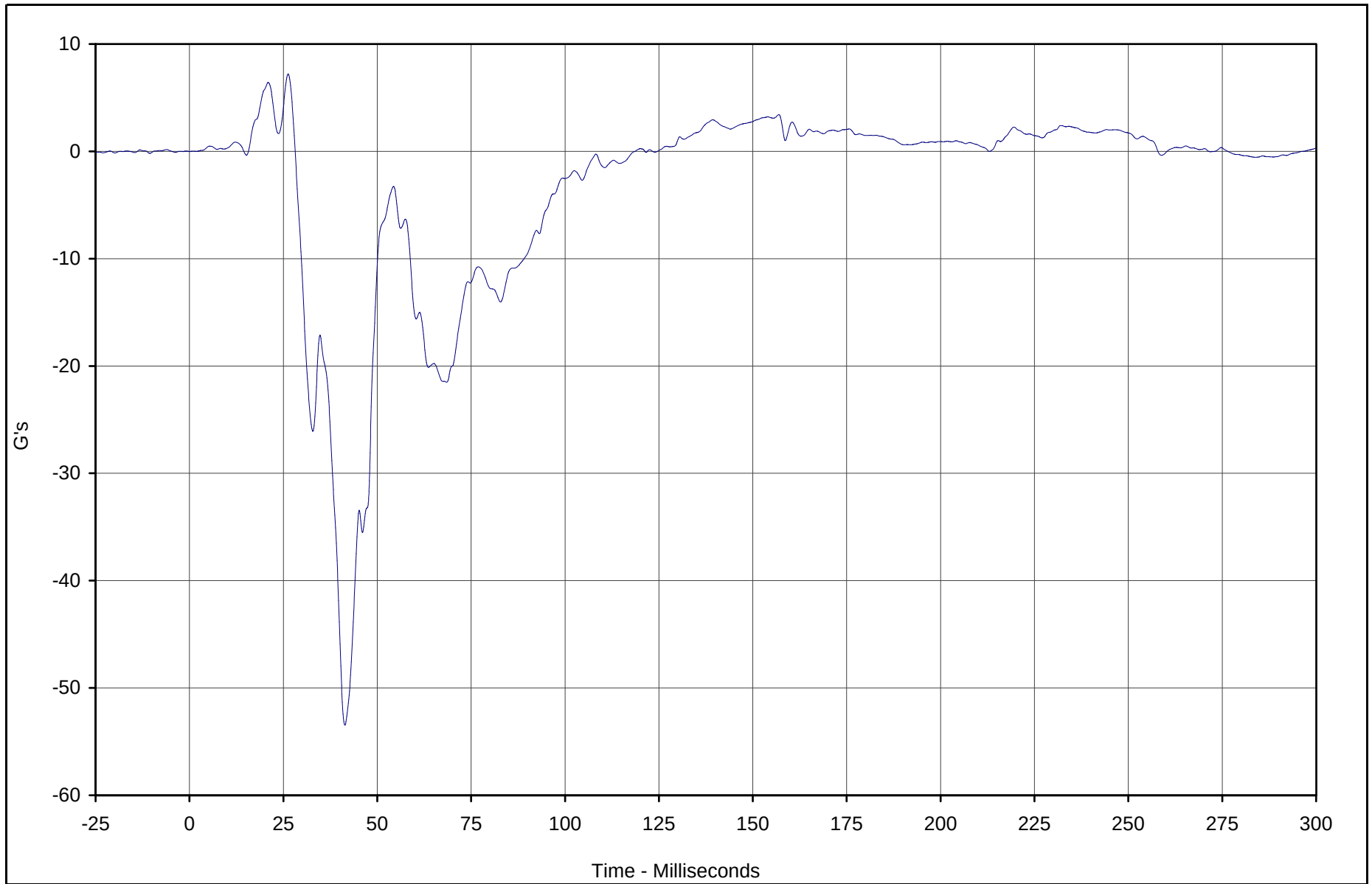


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Foot Aft Z	083	FIL	G's	7.2	26.3	-53.5	41.4	180

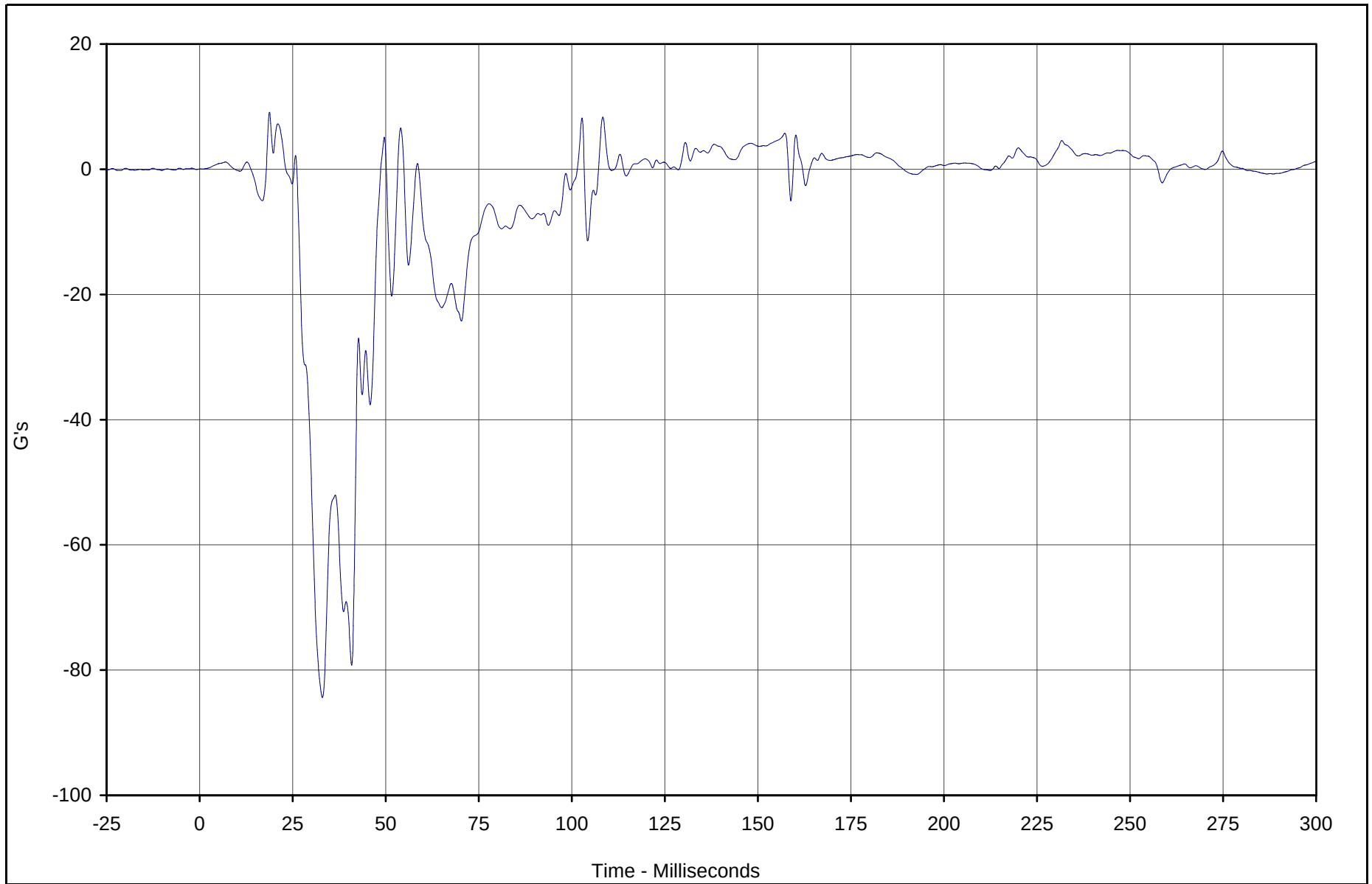


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Right Foot Fore Z	084	FIL	G's	9.1	18.8	-84.4	33.0	180

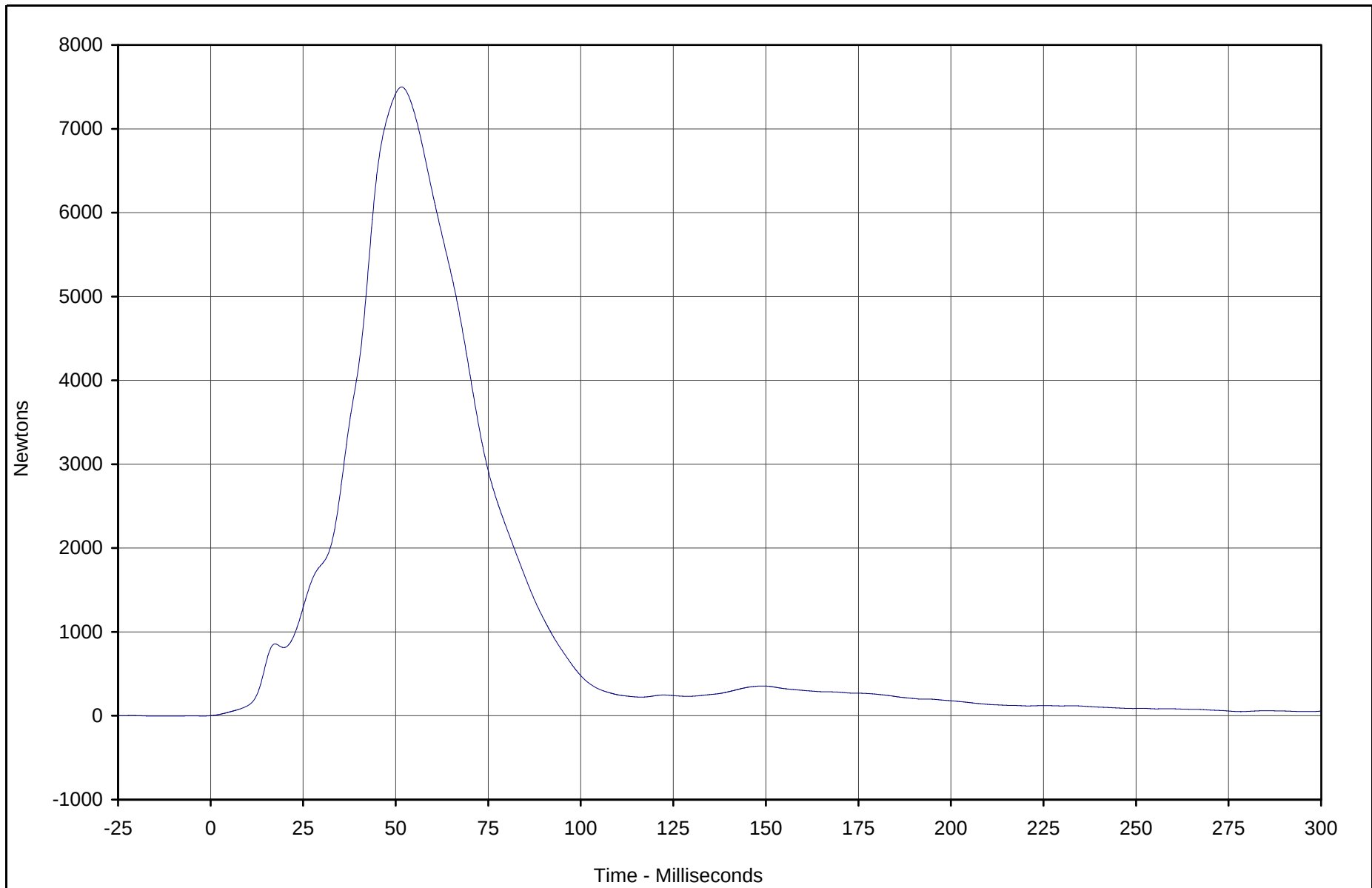


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Lap Belt Force	085	FIL	Newtons	7498.7	51.6	1.0	0.0	60



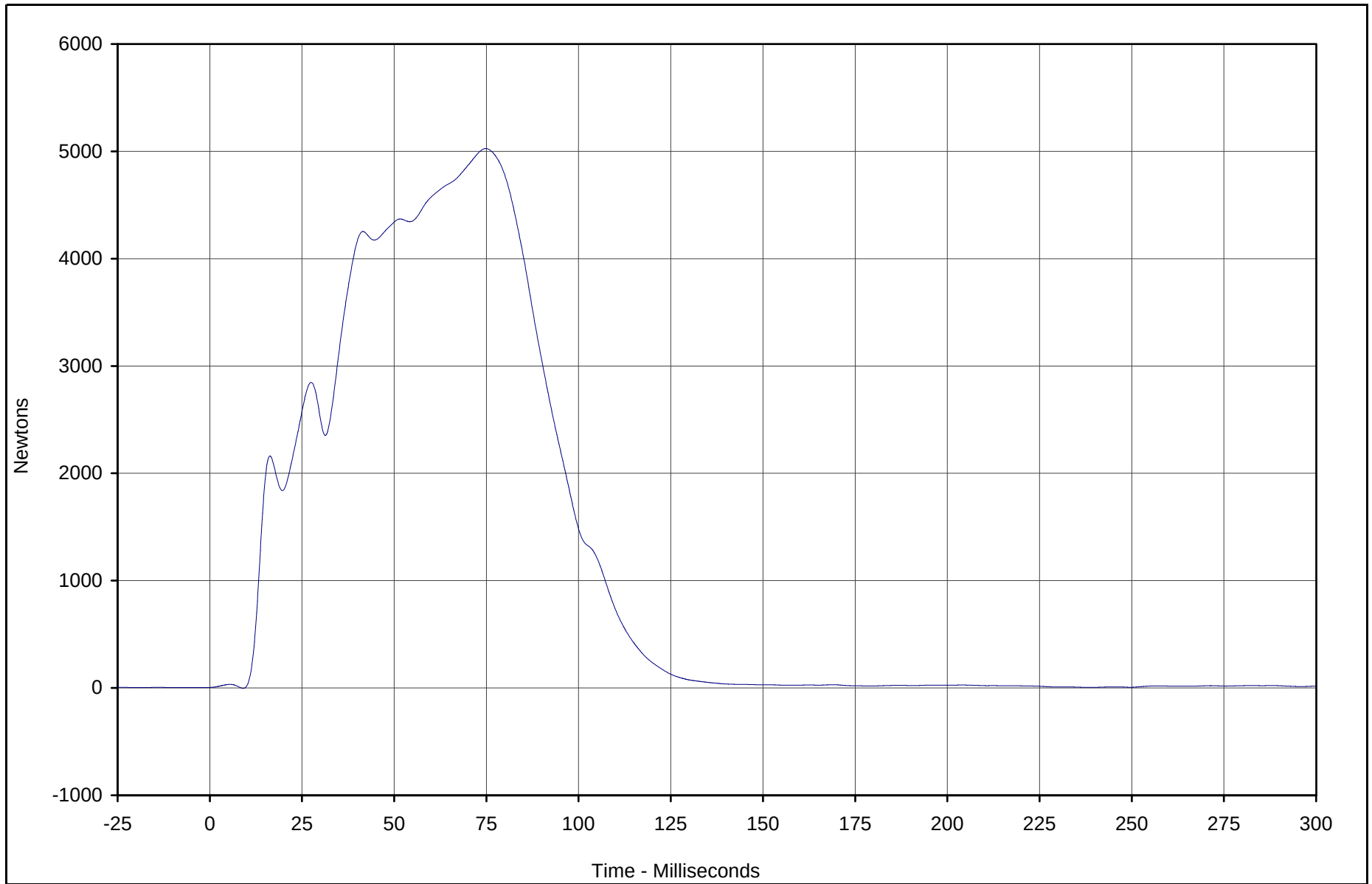
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-120



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Shoulder Belt Force	086	FIL	Newtons	5026.0	74.8	-3.5	9.0	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

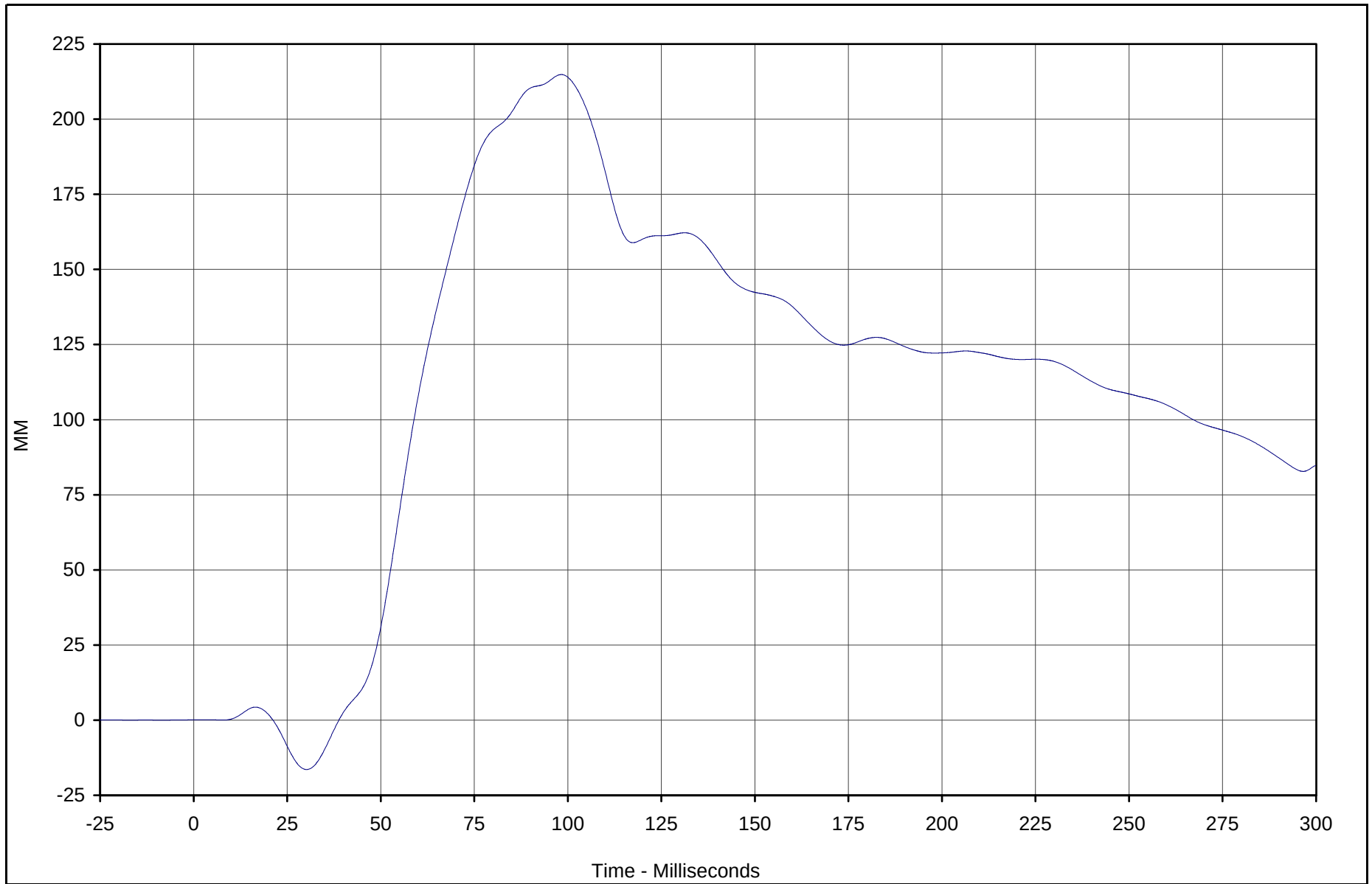
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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B-121



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Shoulder Belt Pullout	087	FIL	MM	214.8	98.3	-16.4	30.2	60



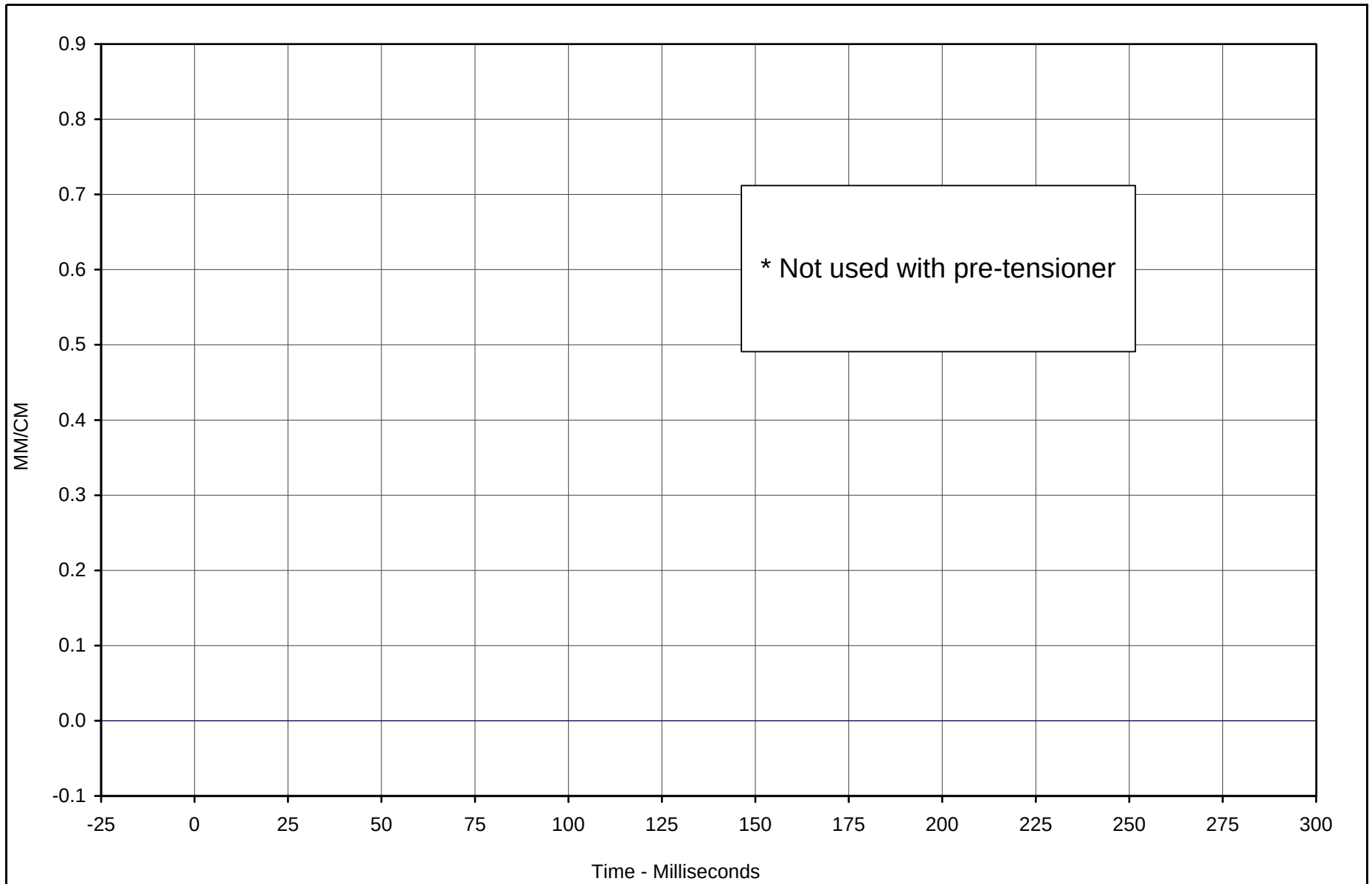
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



* Not used with pre-tensioner

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Shoulder Belt Elongation	088	FIL	MM/CM	0.00	0.0	0.00	0.0	60



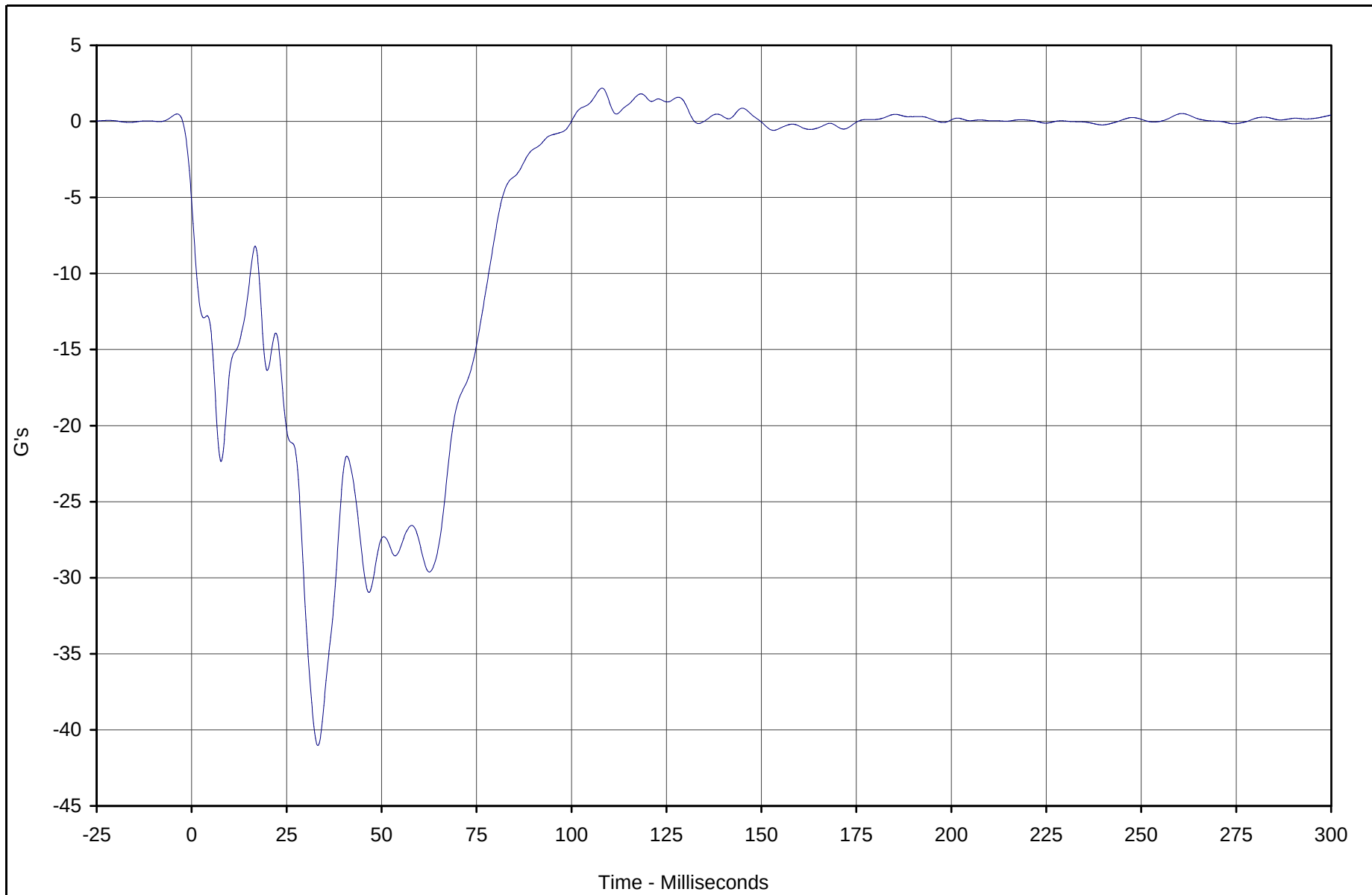
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-123



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear X	089	FIL	G's	2.2	108.0	-41.0	33.2	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

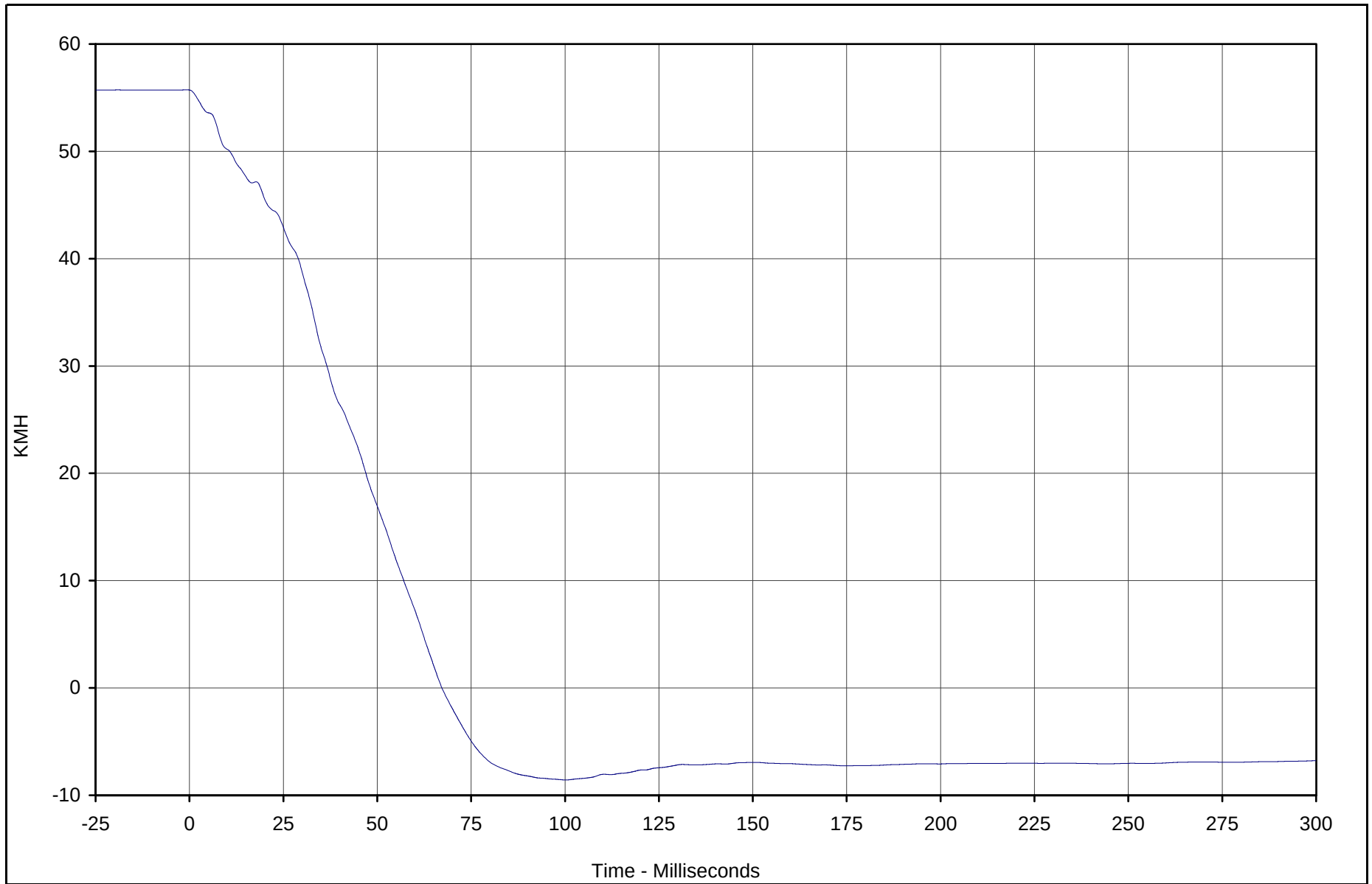
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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B-124



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear X Velocity	089	IN1	KMH	55.7	0.0	-8.6	100.2	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

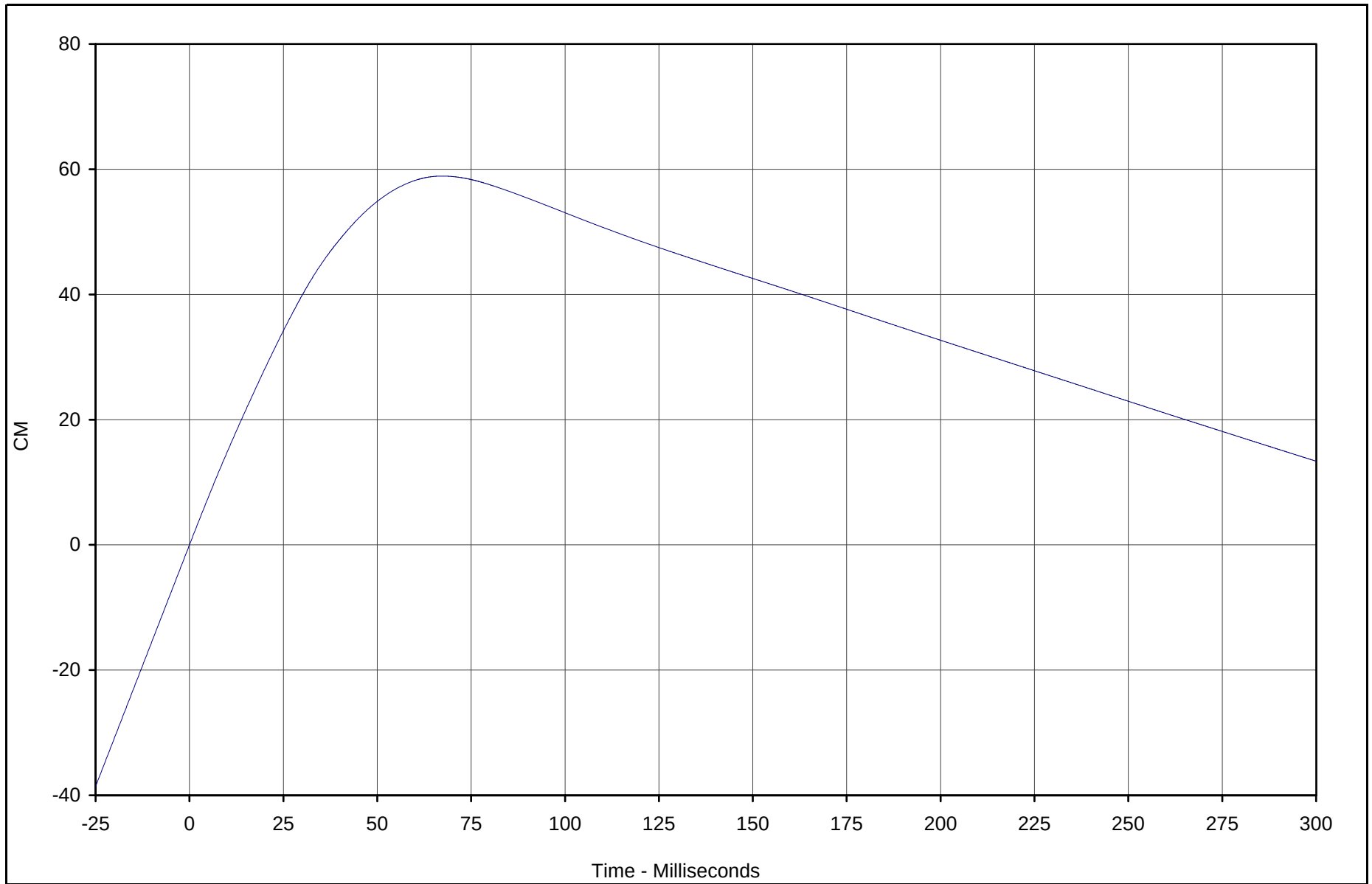
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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B-125



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear X Displ.	089	IN2	CM	58.9	67.2	0.0	0.0	180



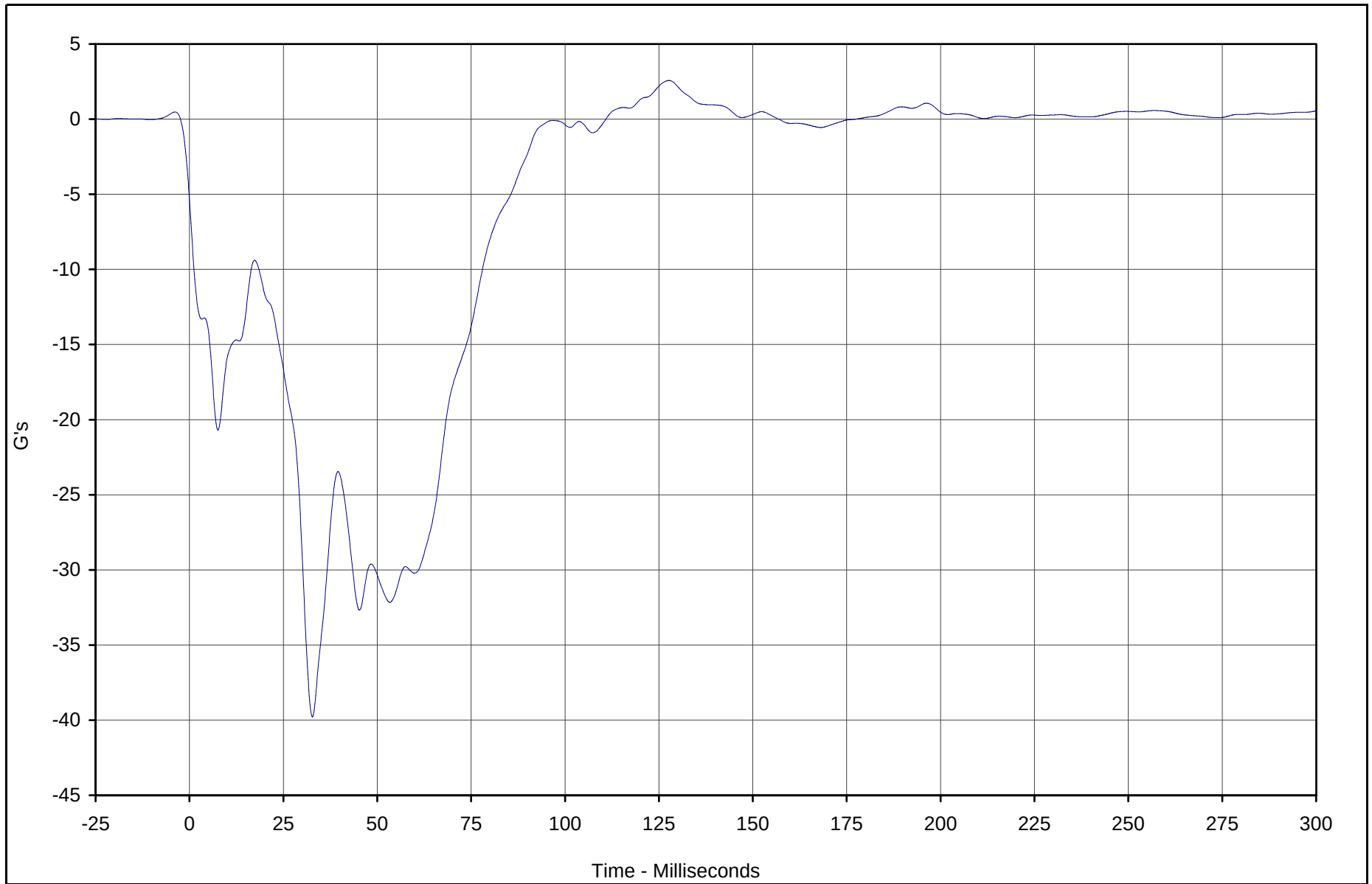
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear X	090	FIL	G's	2.6	127.6	-39.8	32.7	60



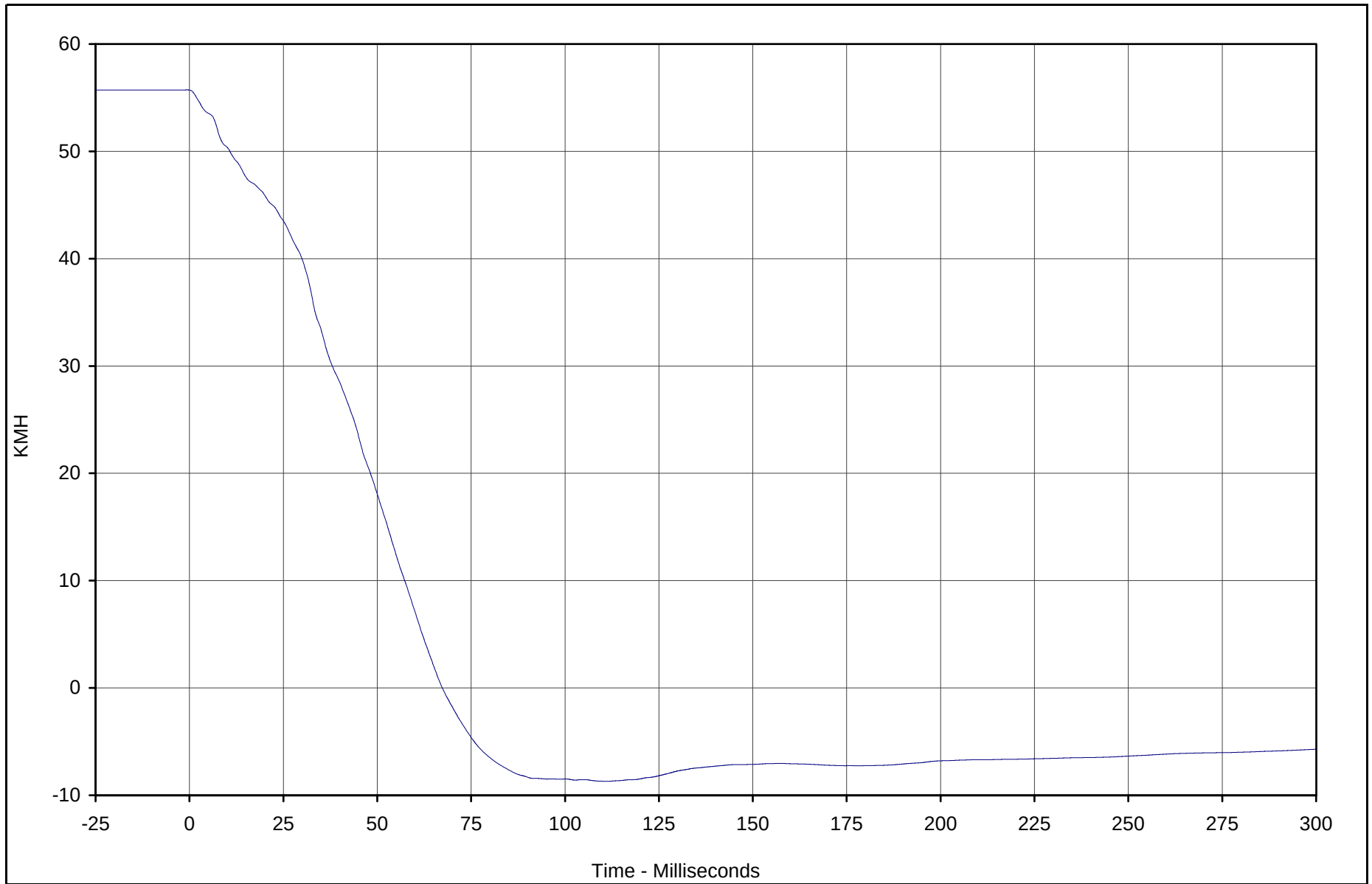
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-127



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear X Velocity	090	IN1	KMH	55.7	0.0	-8.7	110.9	180



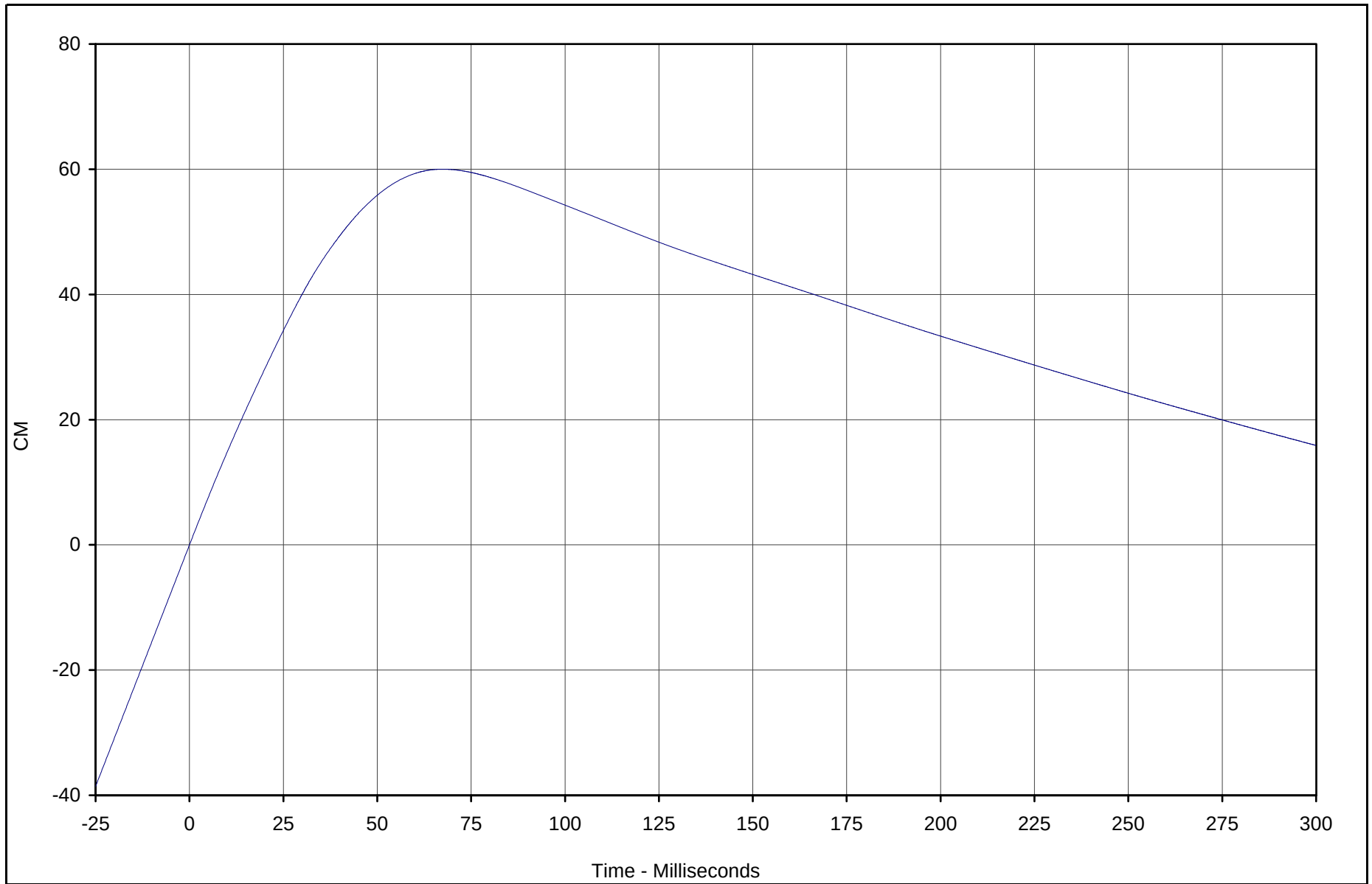
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear X Displ.	090	IN2	CM	60.0	67.3	0.0	0.0	180

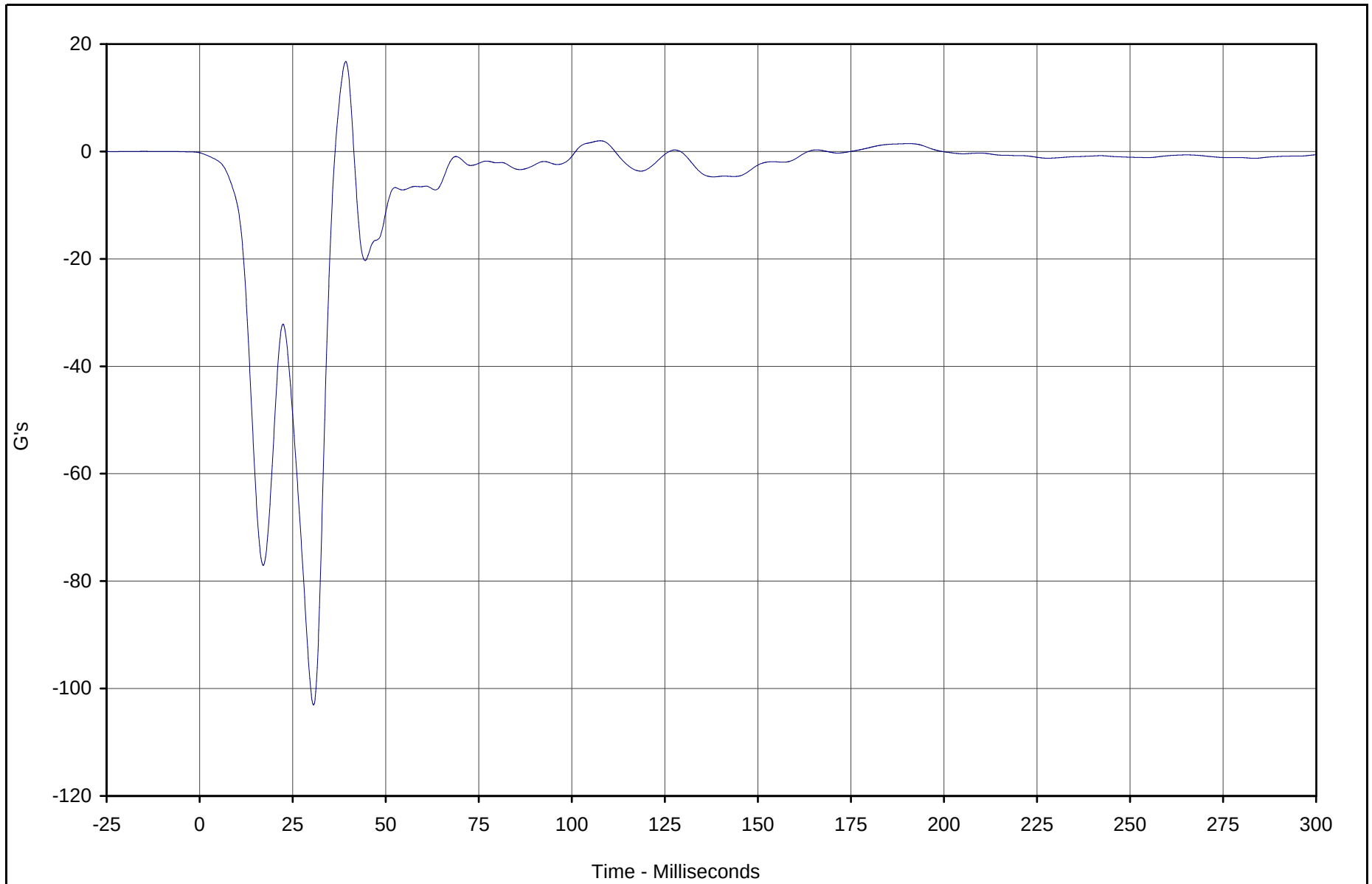


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Top	091	FIL	G's	16.8	39.3	-103.1	30.6	60



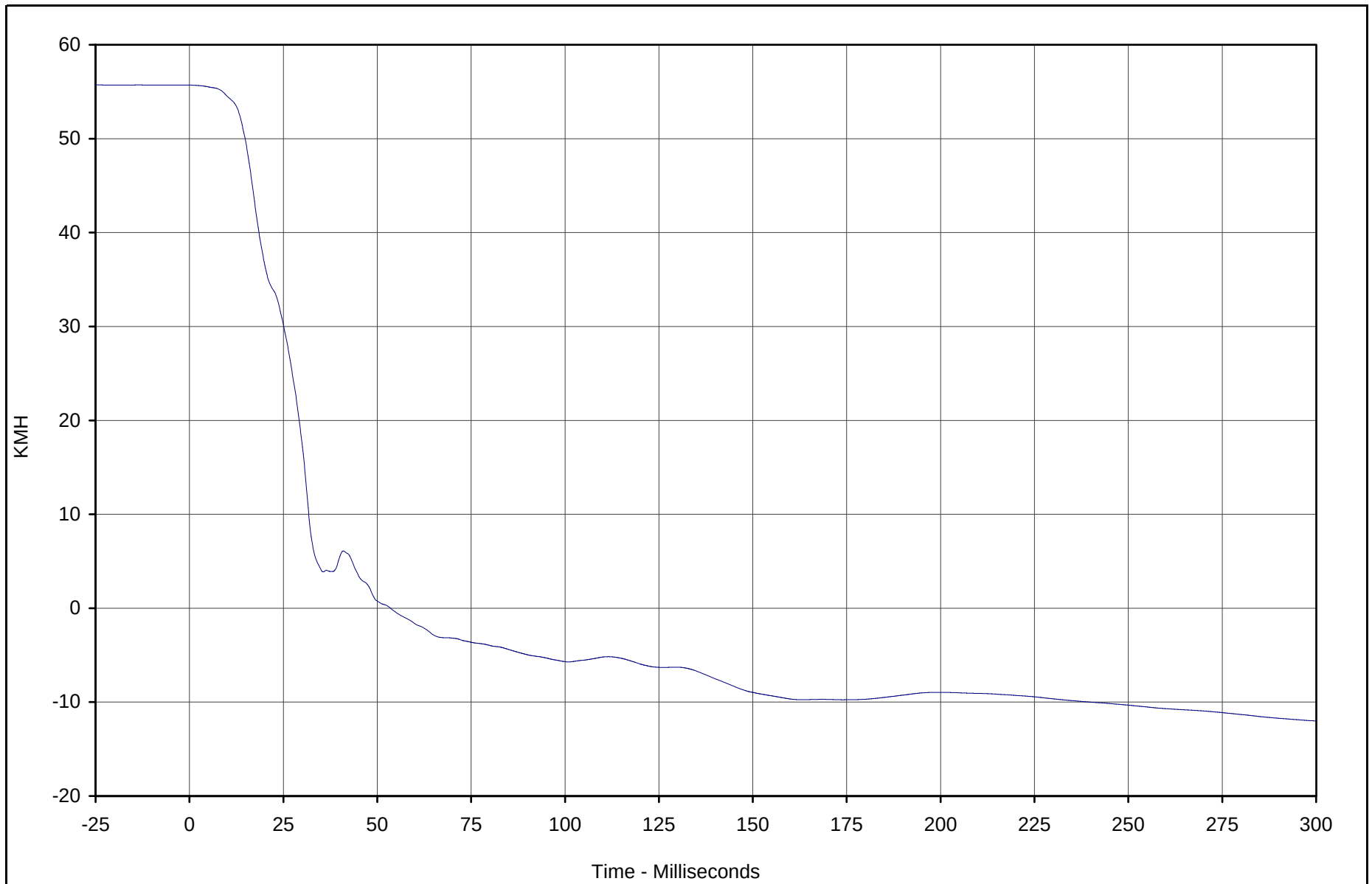
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Top Velocity	091	IN1	KMH	55.7	0.0	-12.0	299.9	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

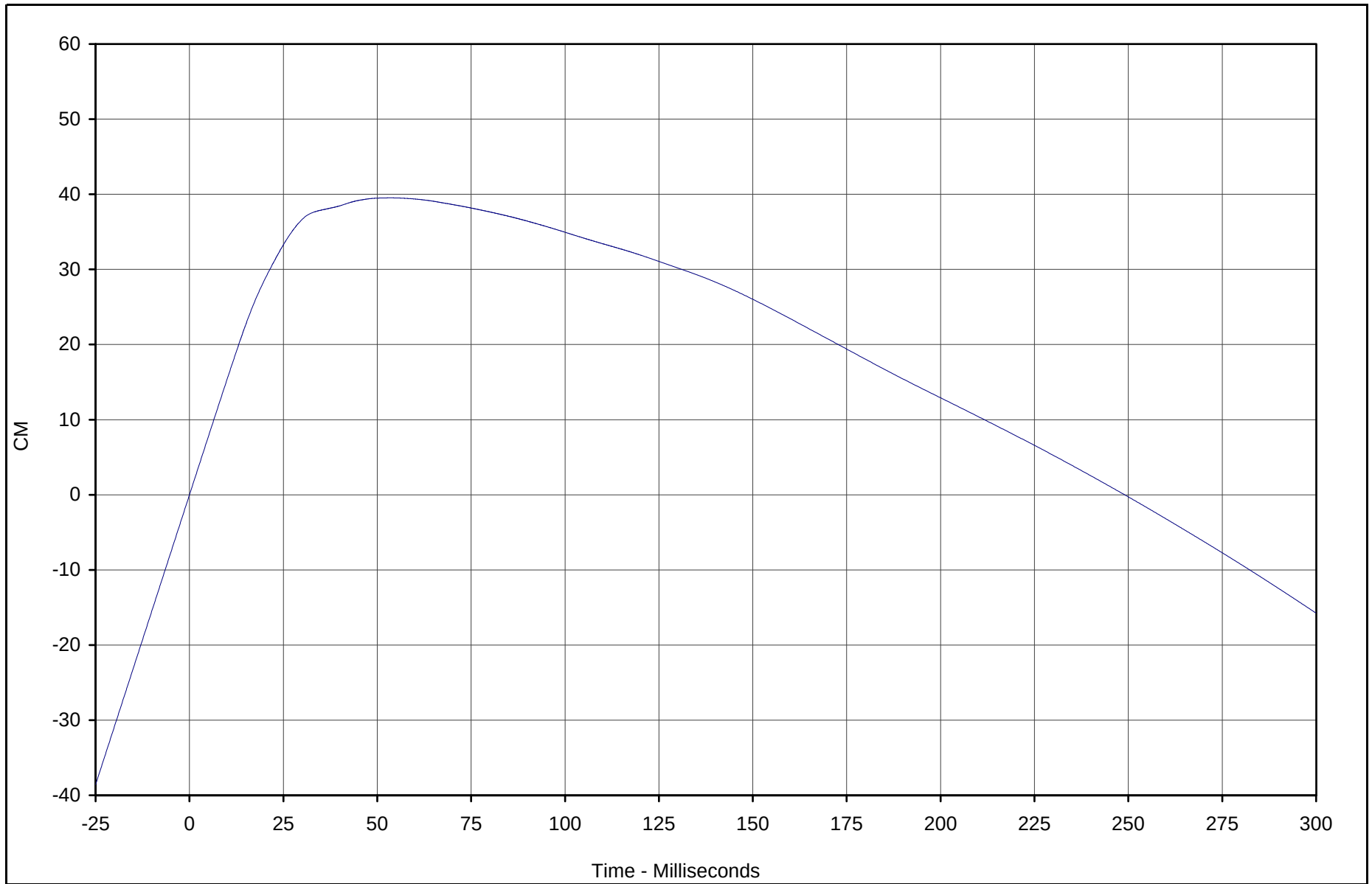
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-131



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Top Displacement	091	IN2	CM	39.5	53.5	-15.7	299.9	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

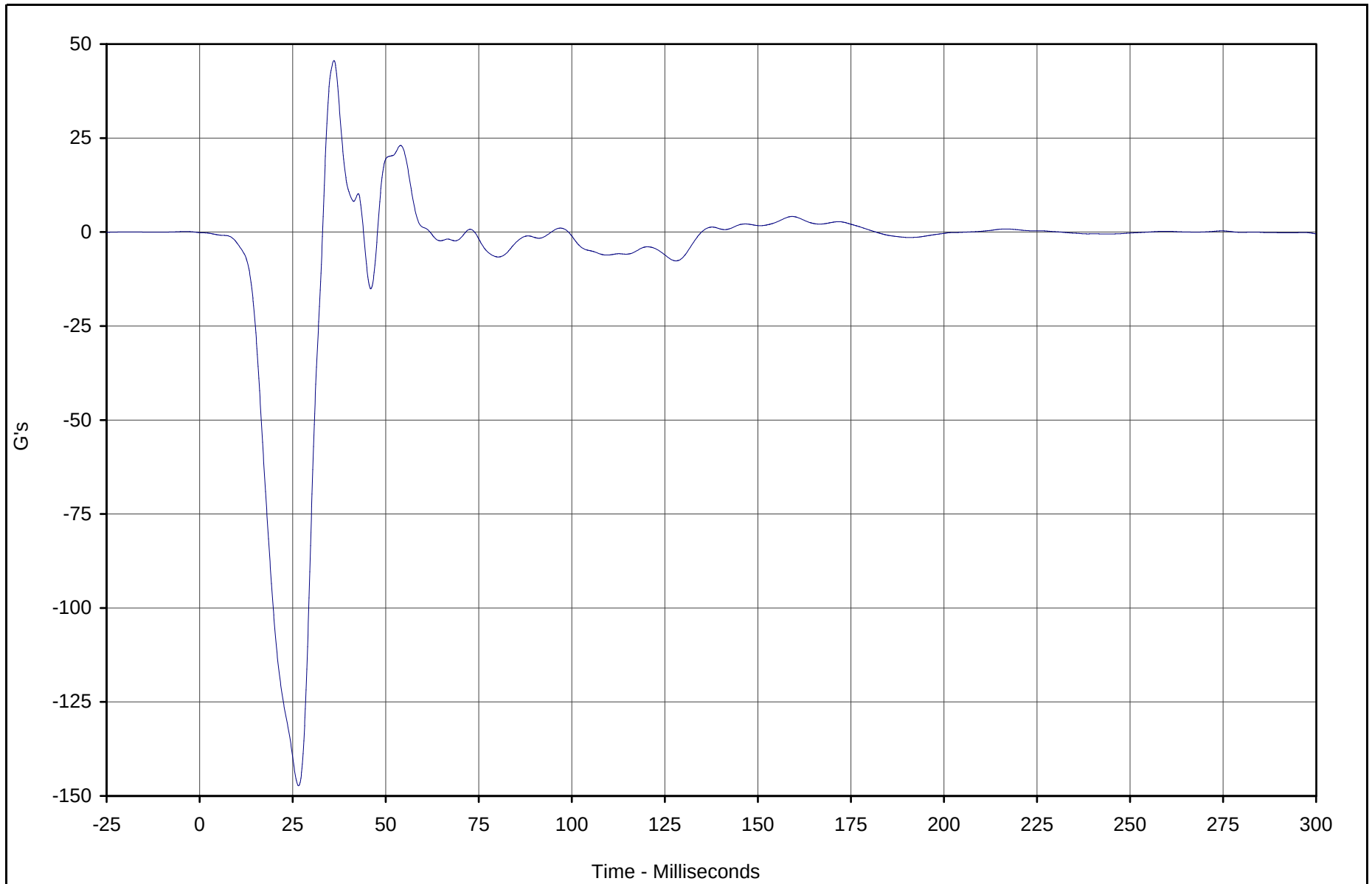
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-132



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Bottom	092	FIL	G's	45.6	36.1	-147.3	26.6	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

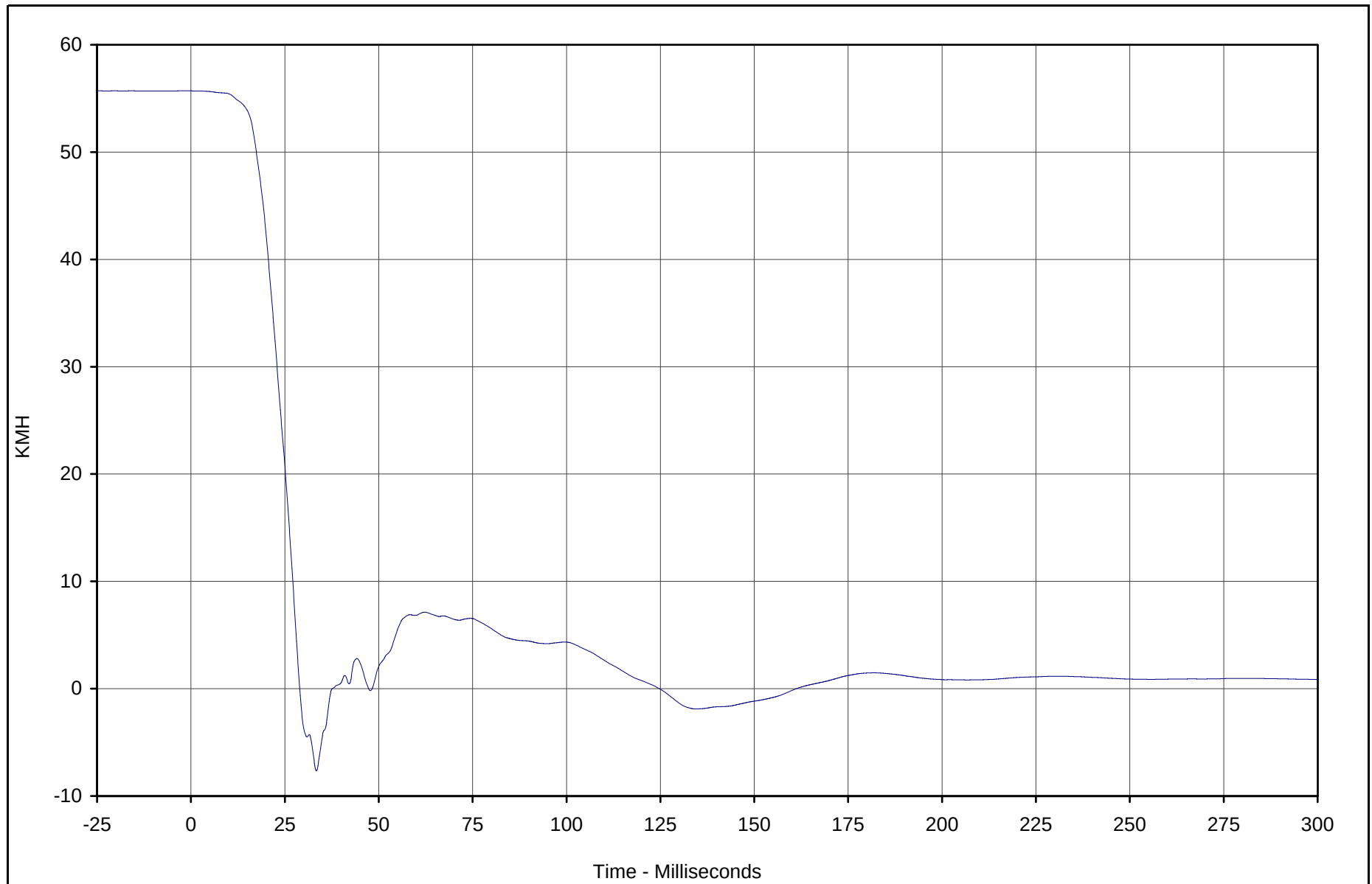
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-133



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Bottom Velocity	092	IN1	KMH	55.7	0.0	-7.7	33.4	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

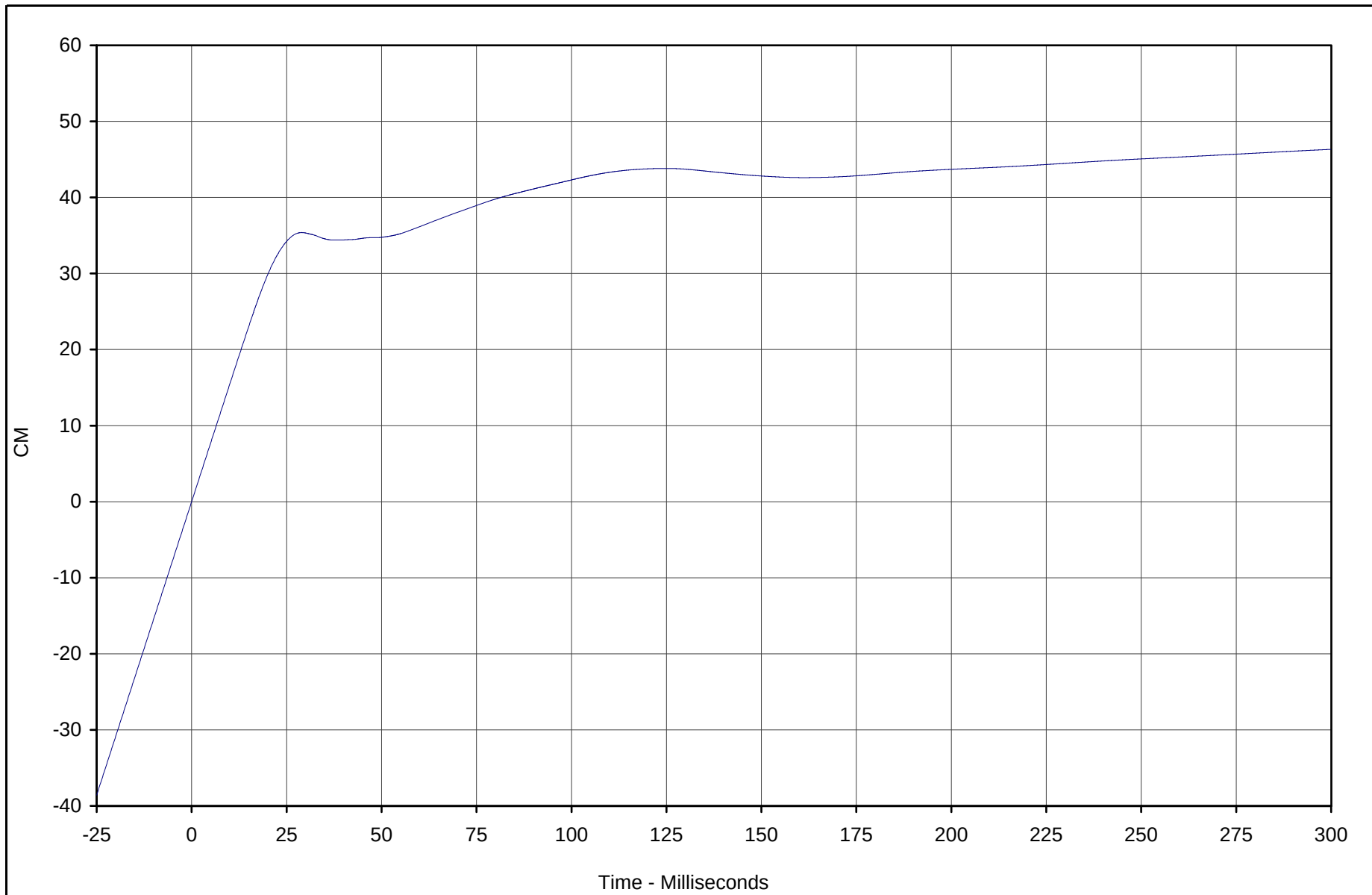
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

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B-134



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Engine Bottom Displacement	092	IN2	CM	46.3	299.9	0.0	0.0	180



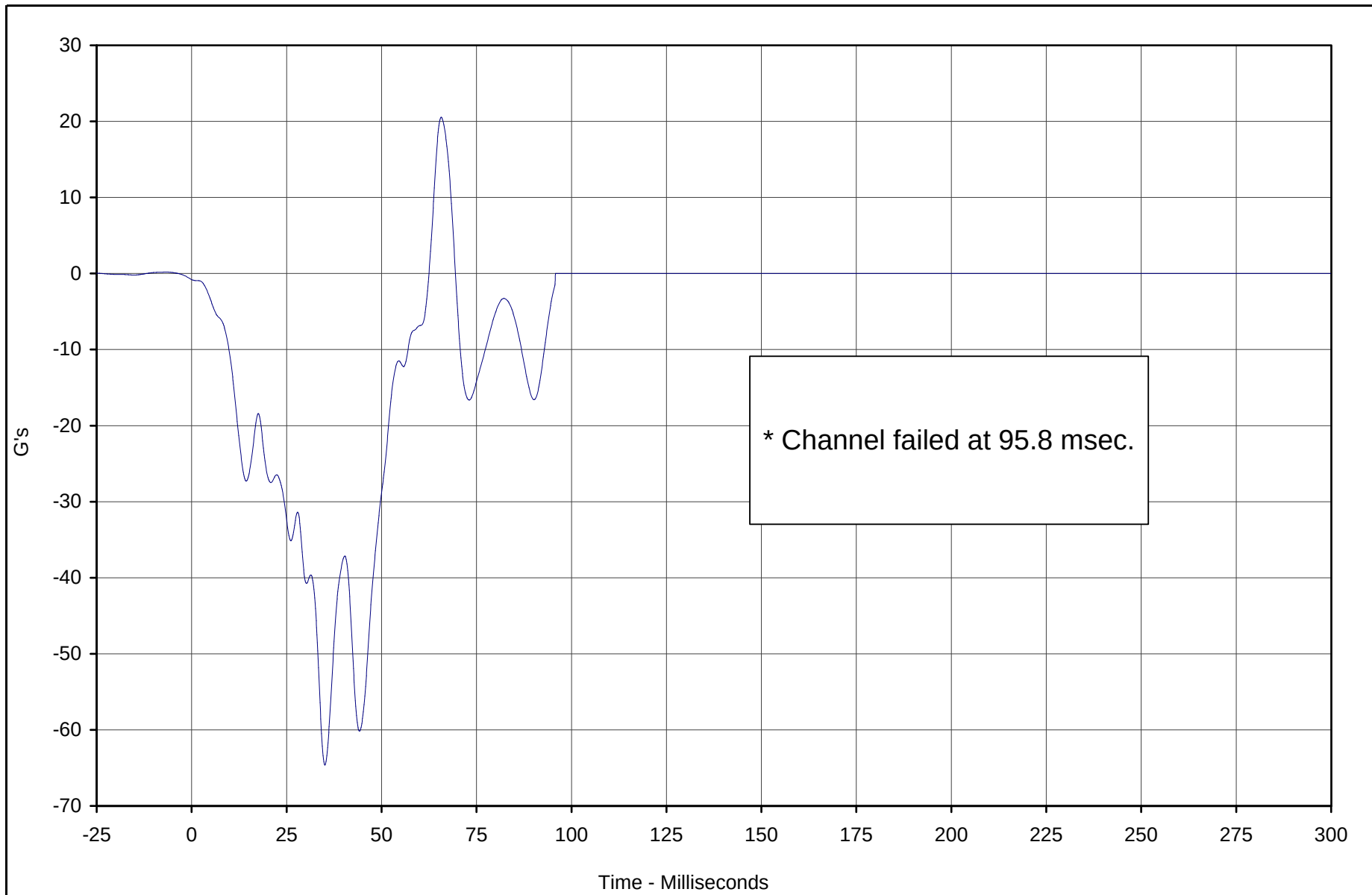
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



* Channel failed at 95.8 msec.

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Brake Caliper	093	FIL	G's	20.6	65.7	-64.6	35.1	60

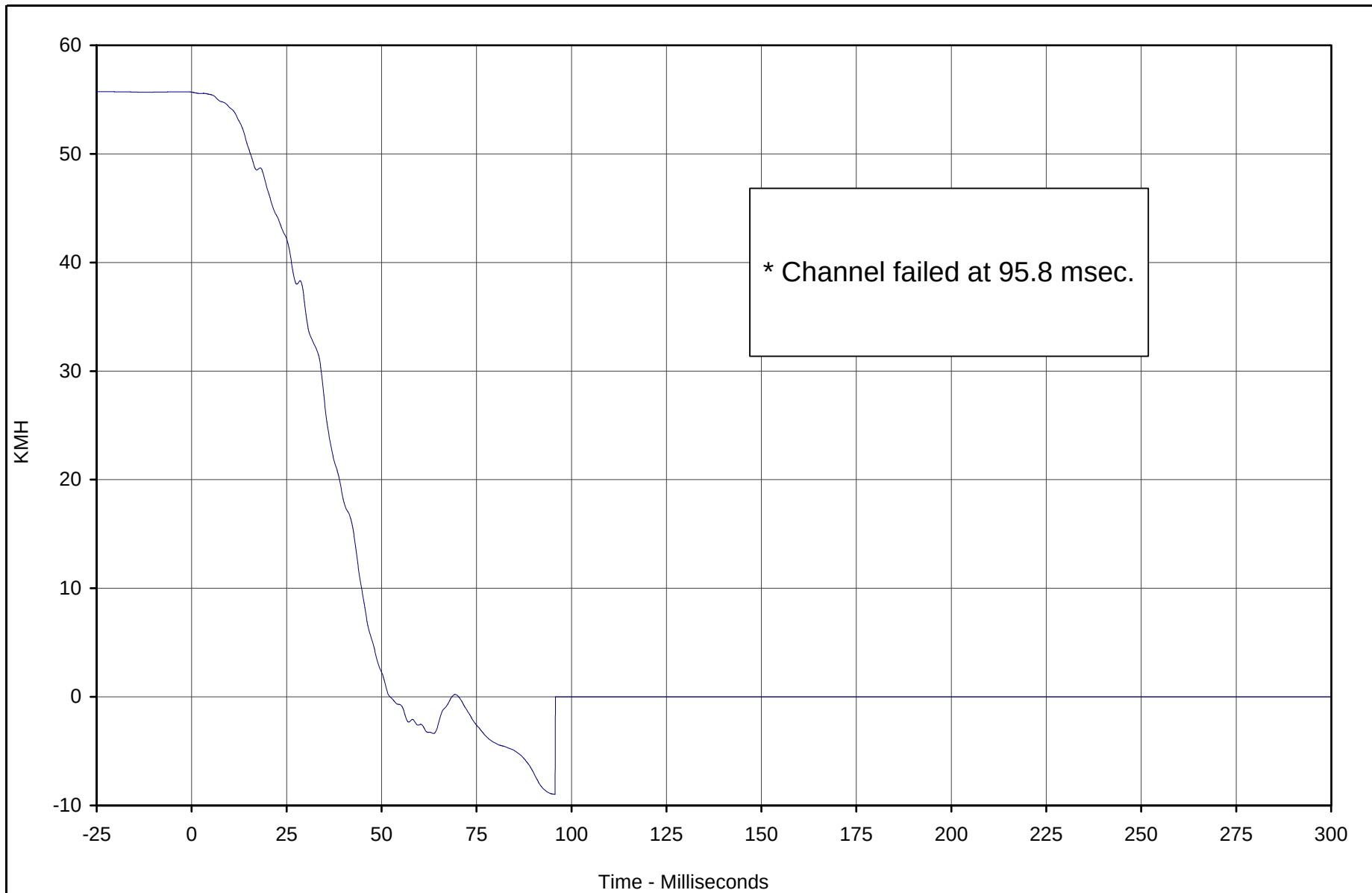


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



* Channel failed at 95.8 msec.

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Brake Caliper Velocity	093	IN1	KMH	55.7	0.0	-9.0	95.7	180

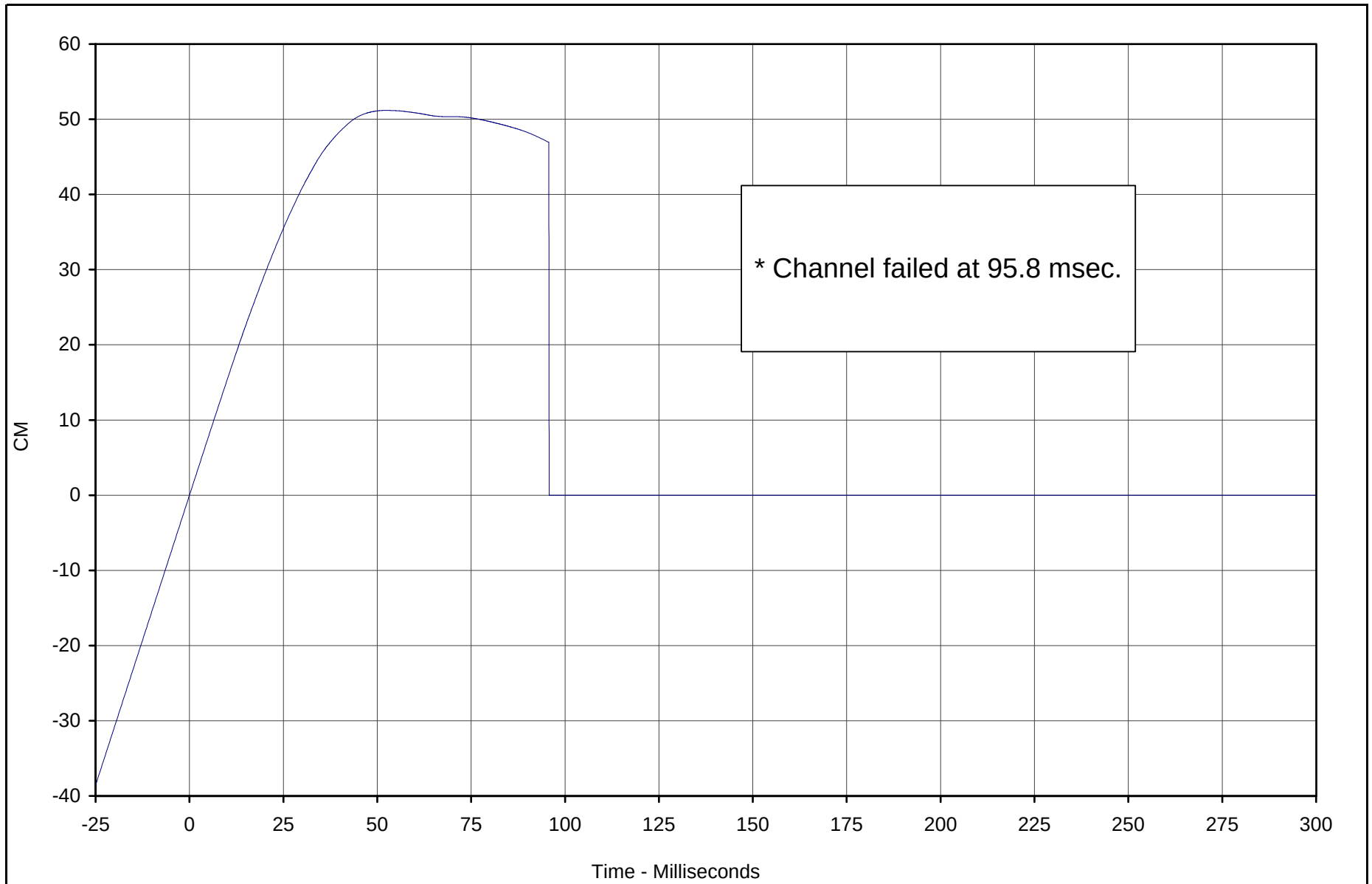


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



* Channel failed at 95.8 msec.

Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Brake Caliper Displ.	093	IN2	CM	51.2	52.2	0.0	95.8	180

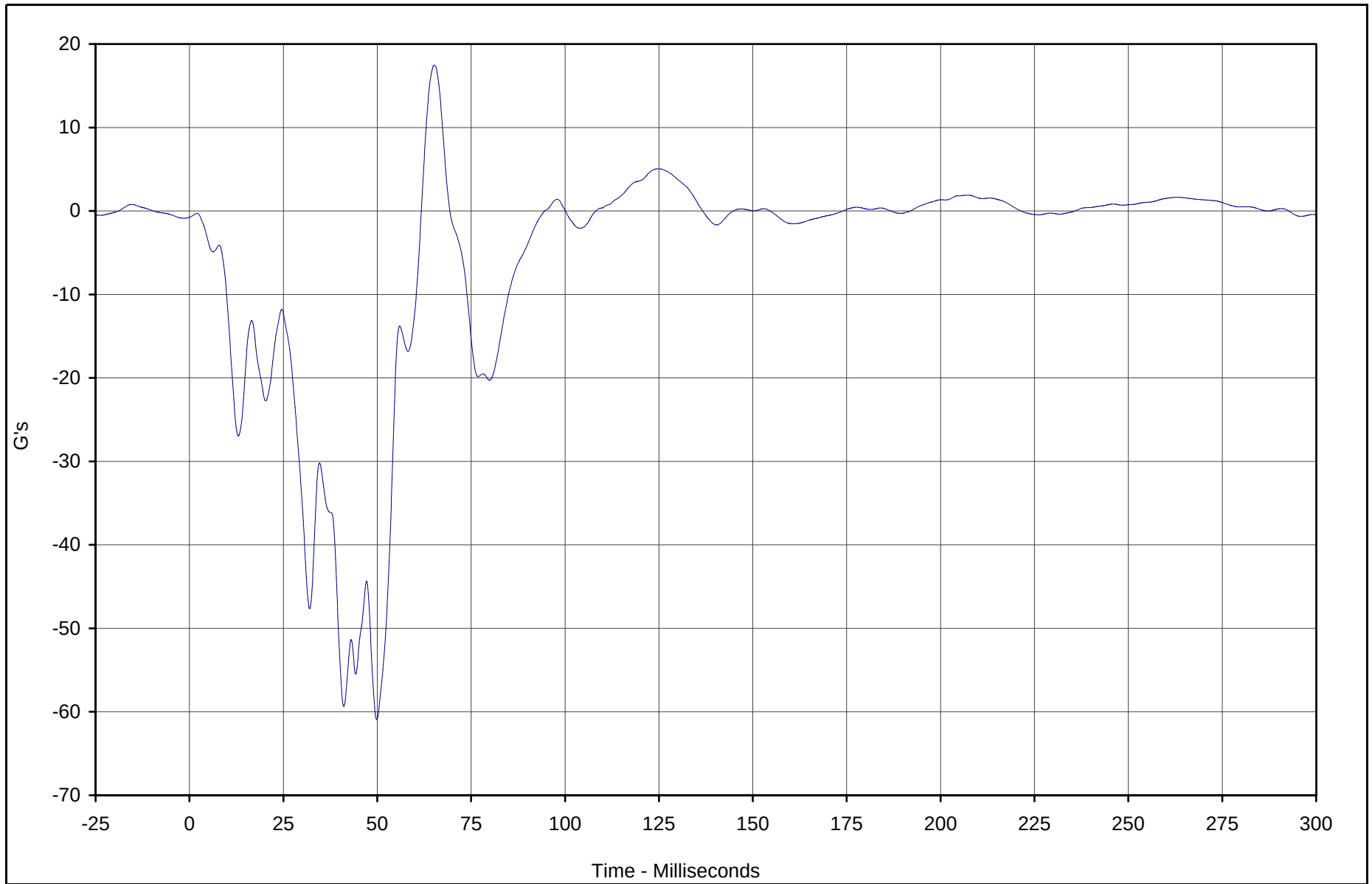


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Brake Caliper	094	FIL	G's	17.5	65.2	-60.9	49.9	60



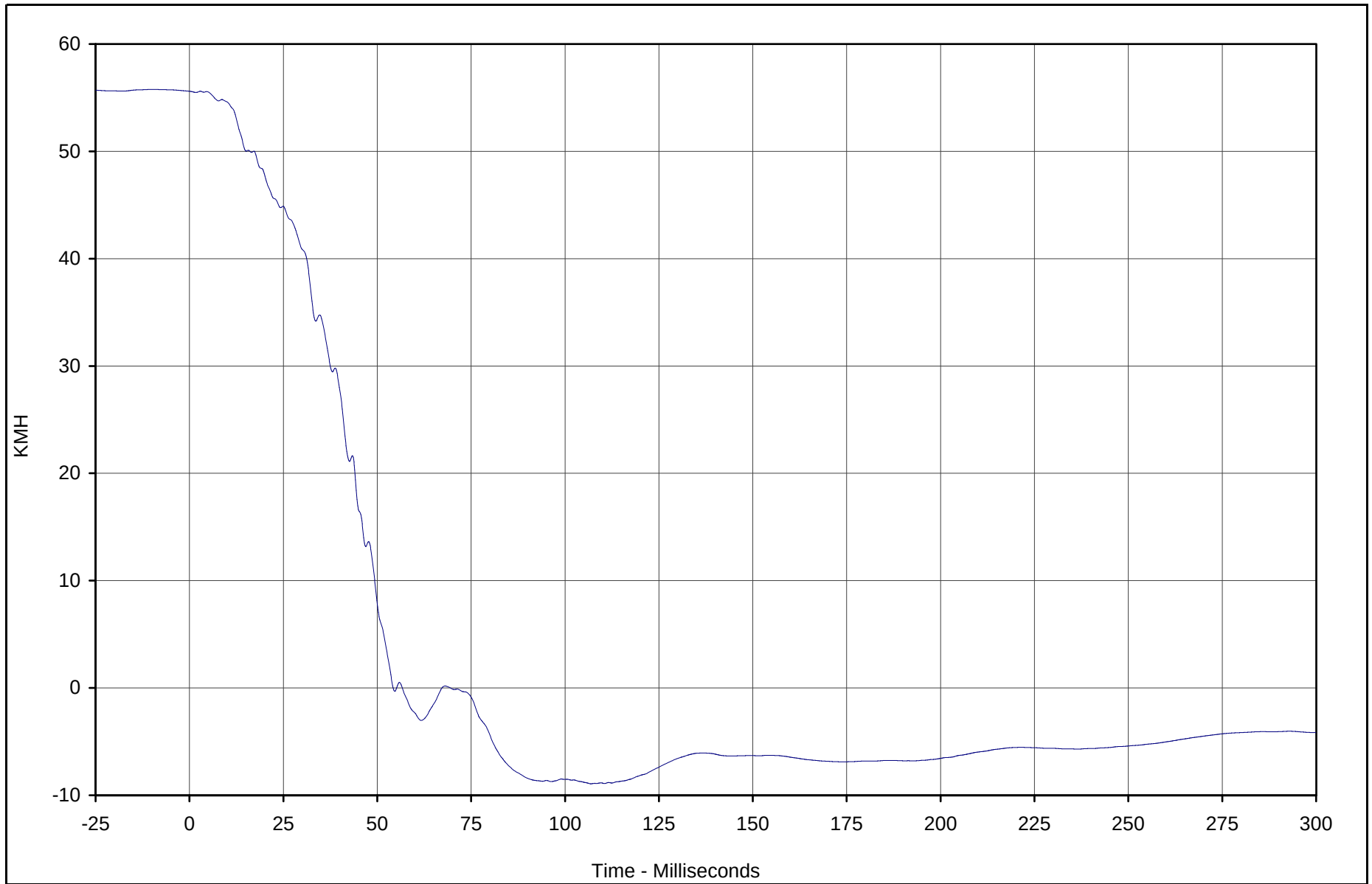
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-139



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Brake Caliper Velocity	094	IN1	KMH	55.6	2.9	-8.9	106.9	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

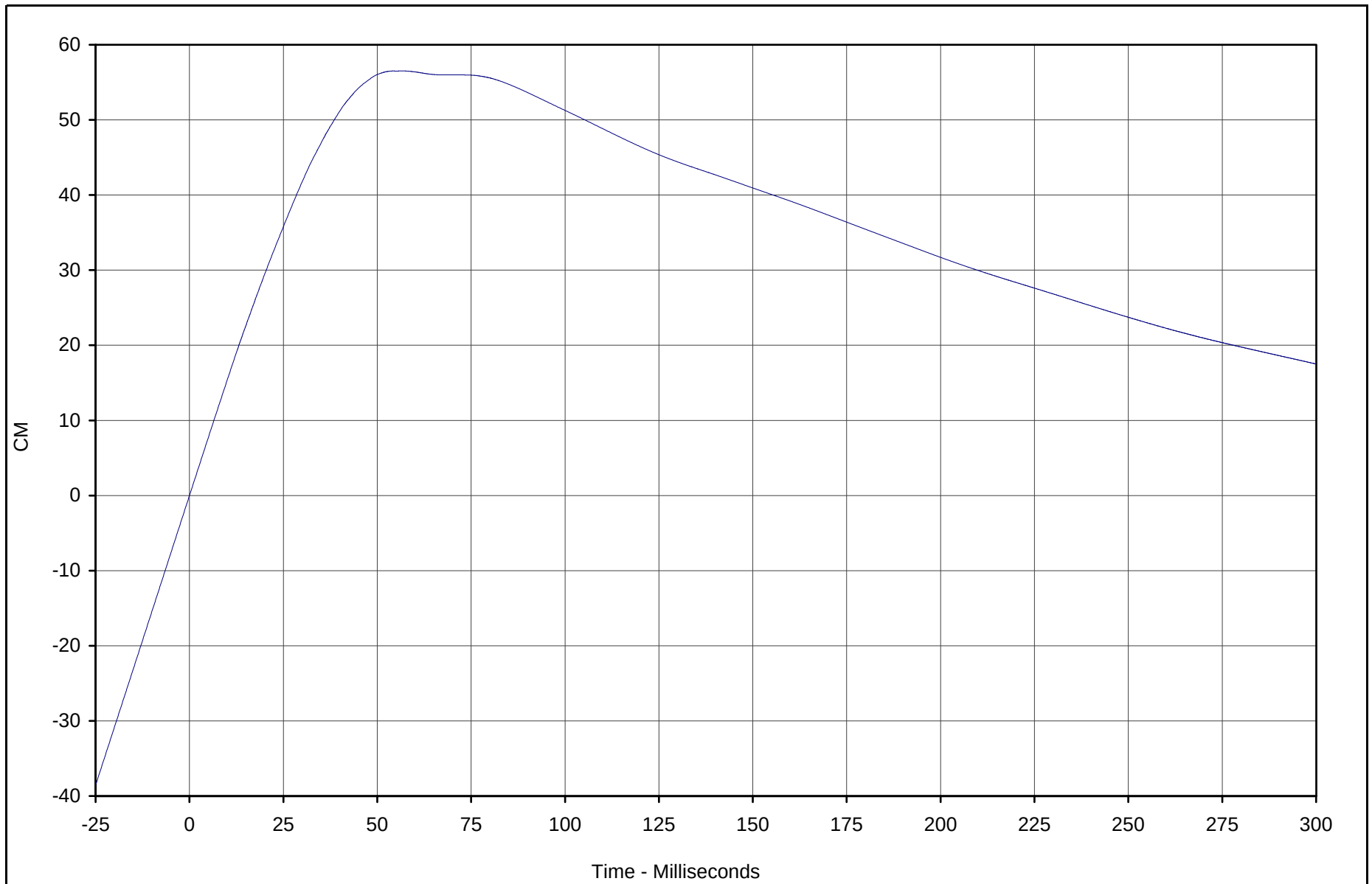
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-140



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Brake Caliper Displ.	094	IN2	CM	56.5	56.7	0.0	0.0	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

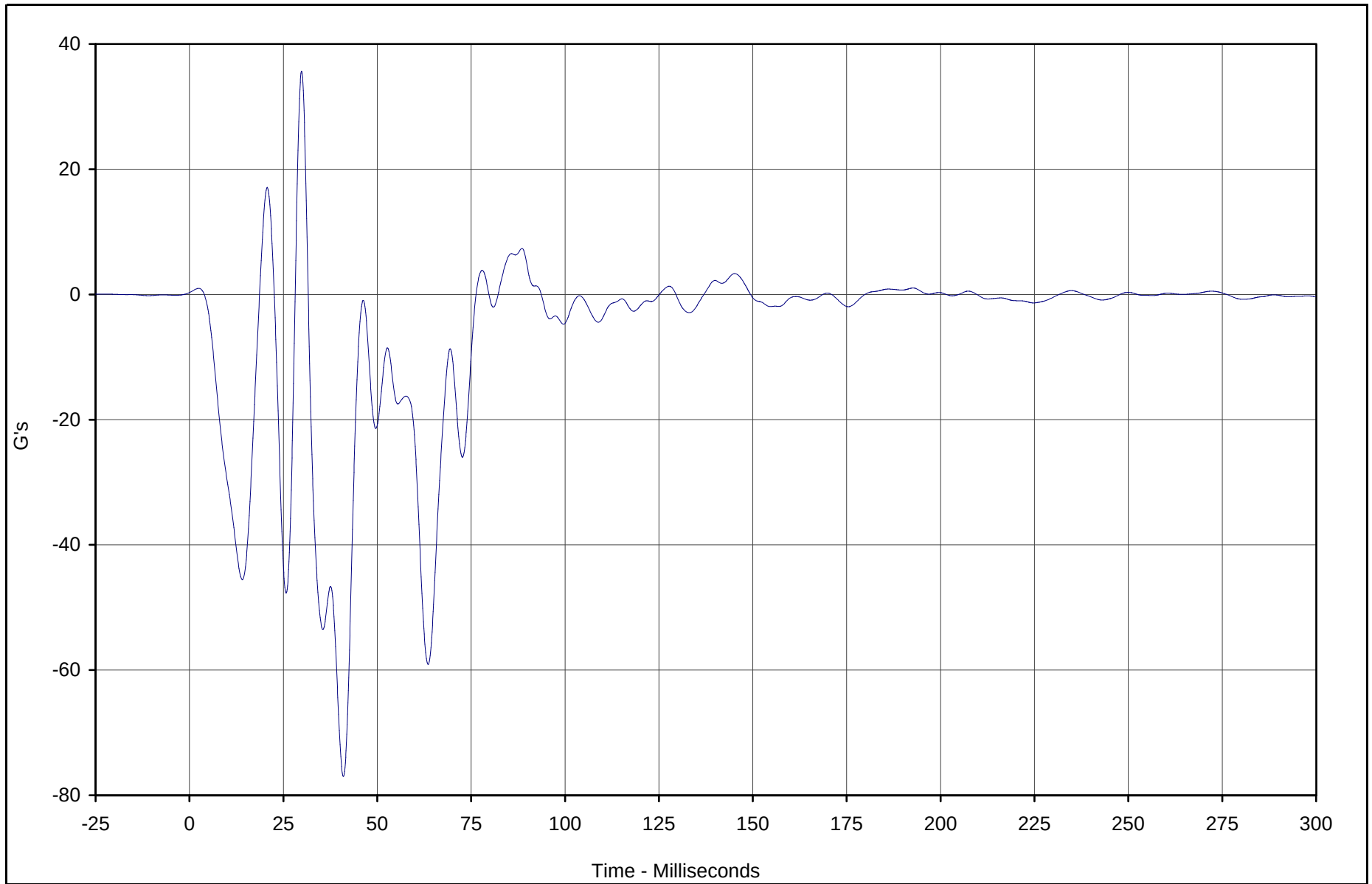
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-141



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Instrument Panel	095	FIL	G's	35.7	29.8	-77.0	41.0	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

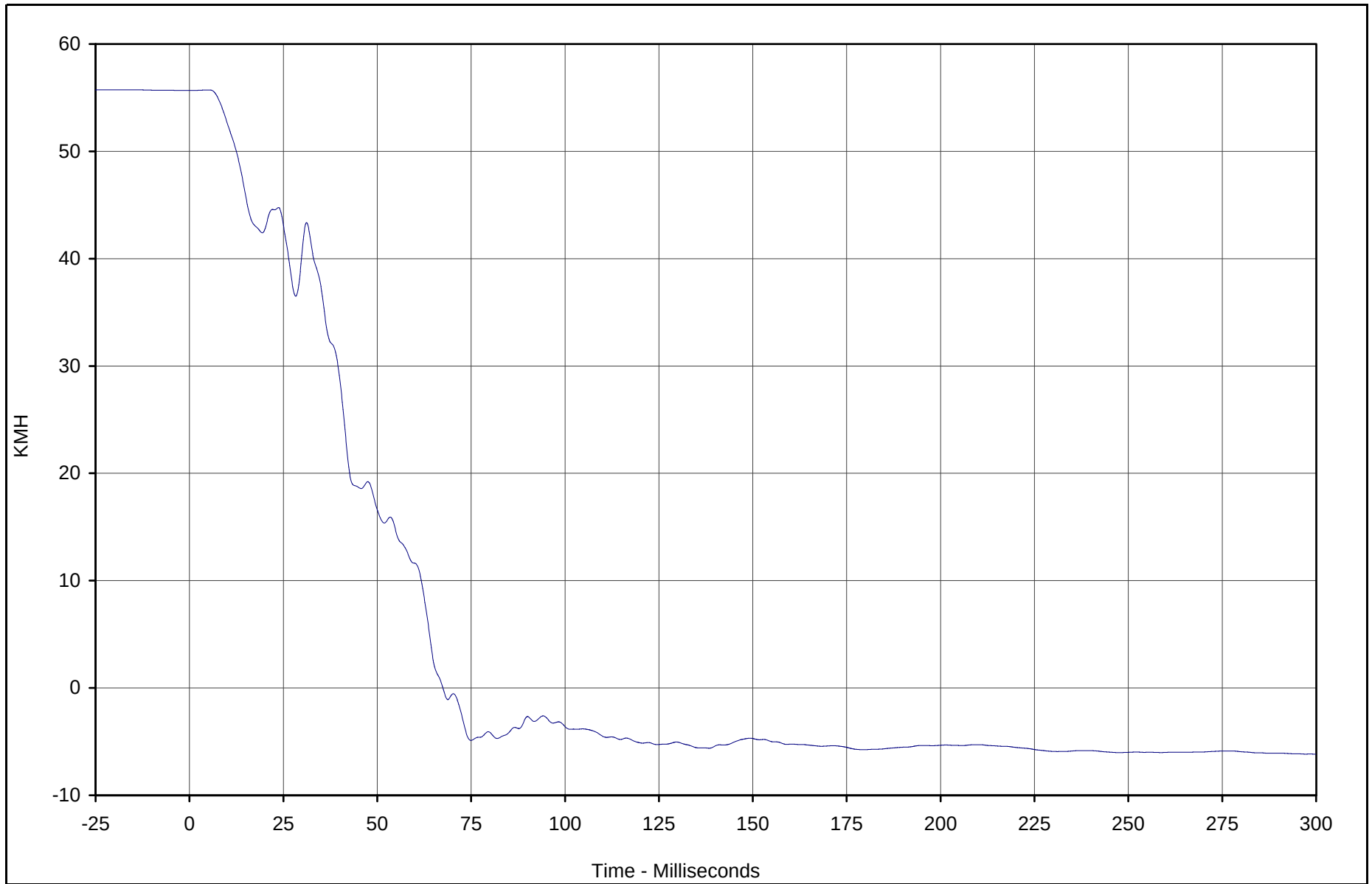
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-142



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Instrument Panel Velocity	095	IN1	KMH	55.7	5.3	-6.2	299.9	180



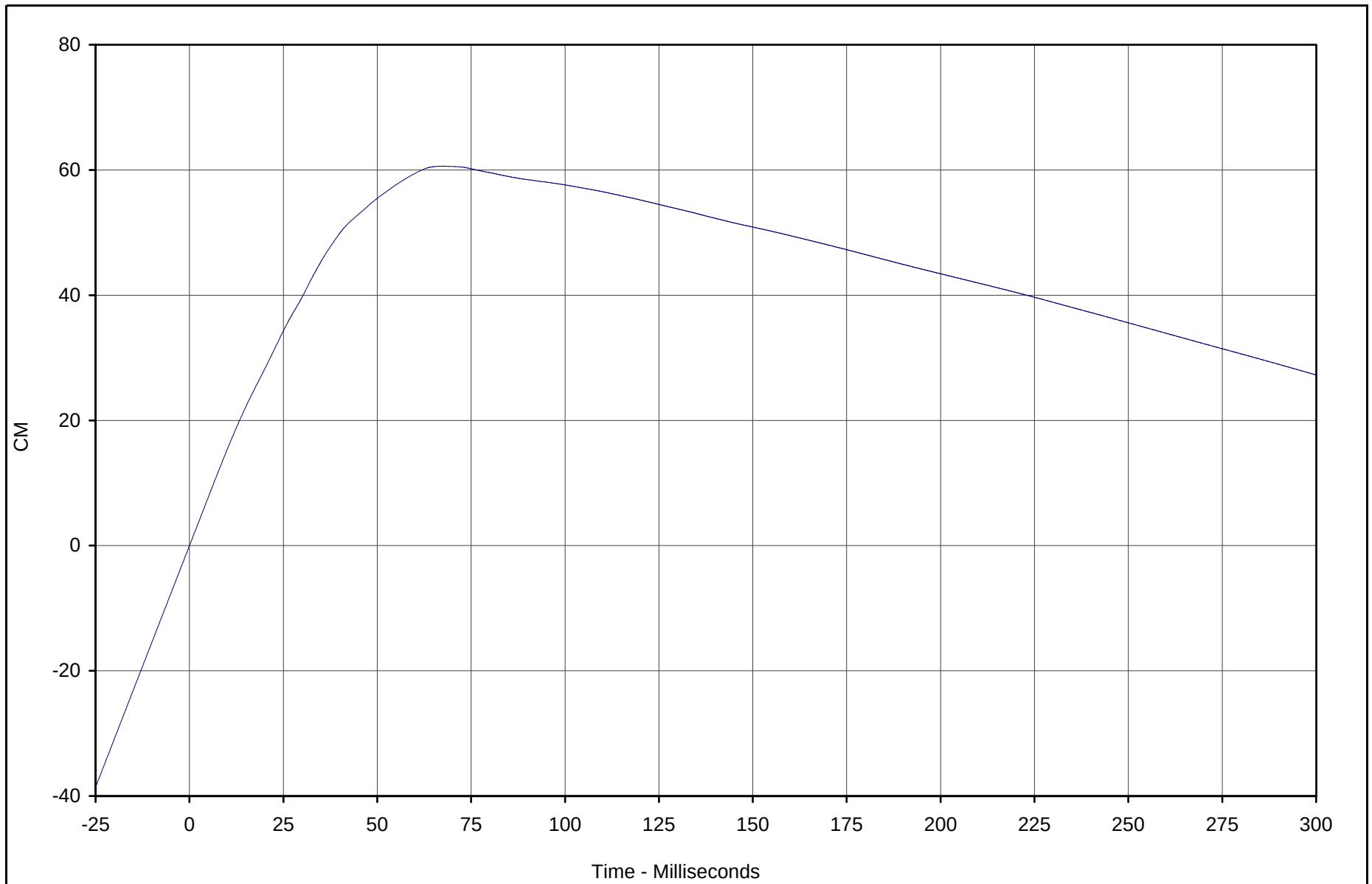
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Instrument Panel Displacement	095	IN2	CM	60.6	67.5	0.0	0.0	180



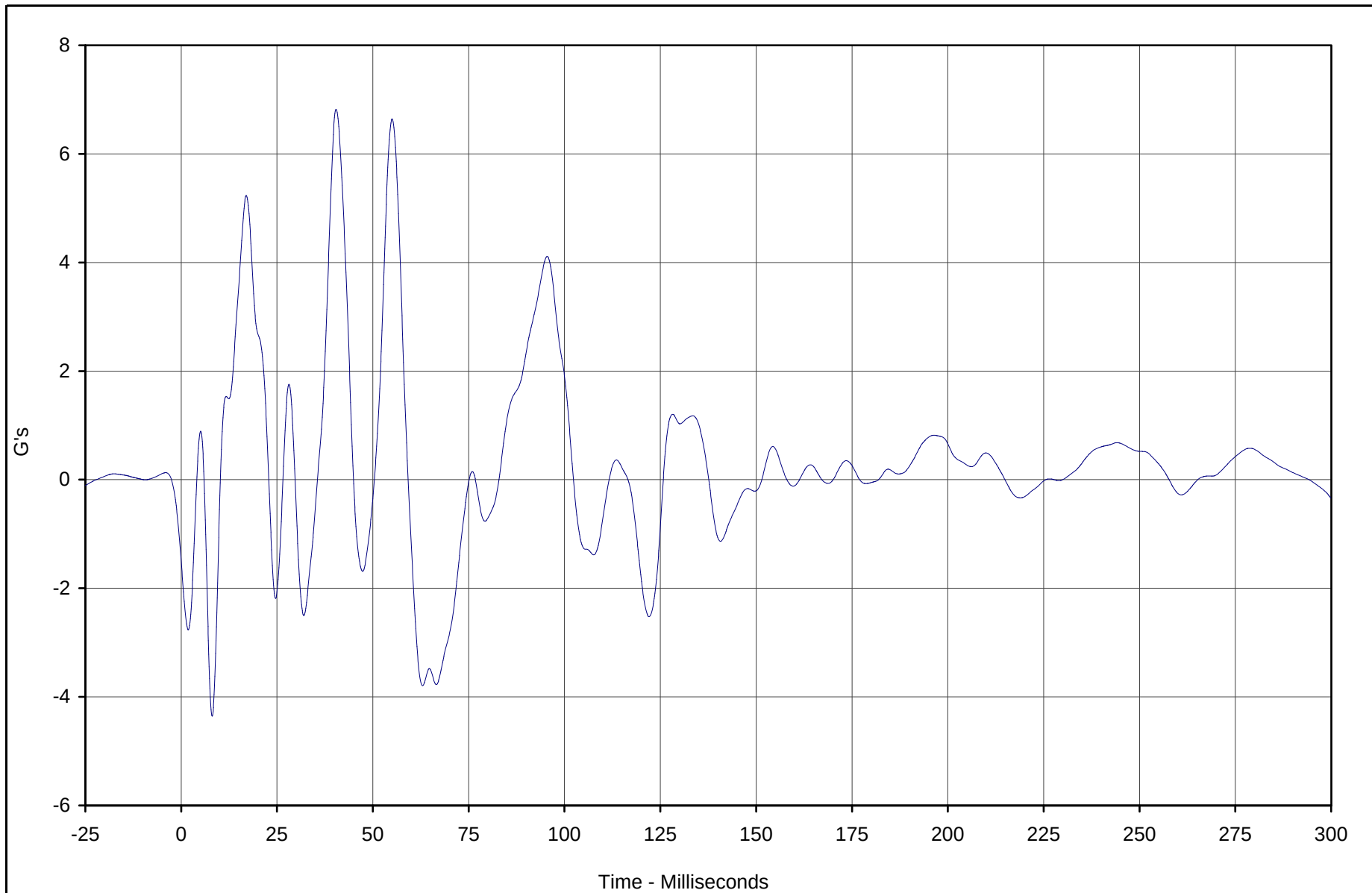
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-144



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear Z	096	FIL	G's	6.8	40.4	-4.4	8.1	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

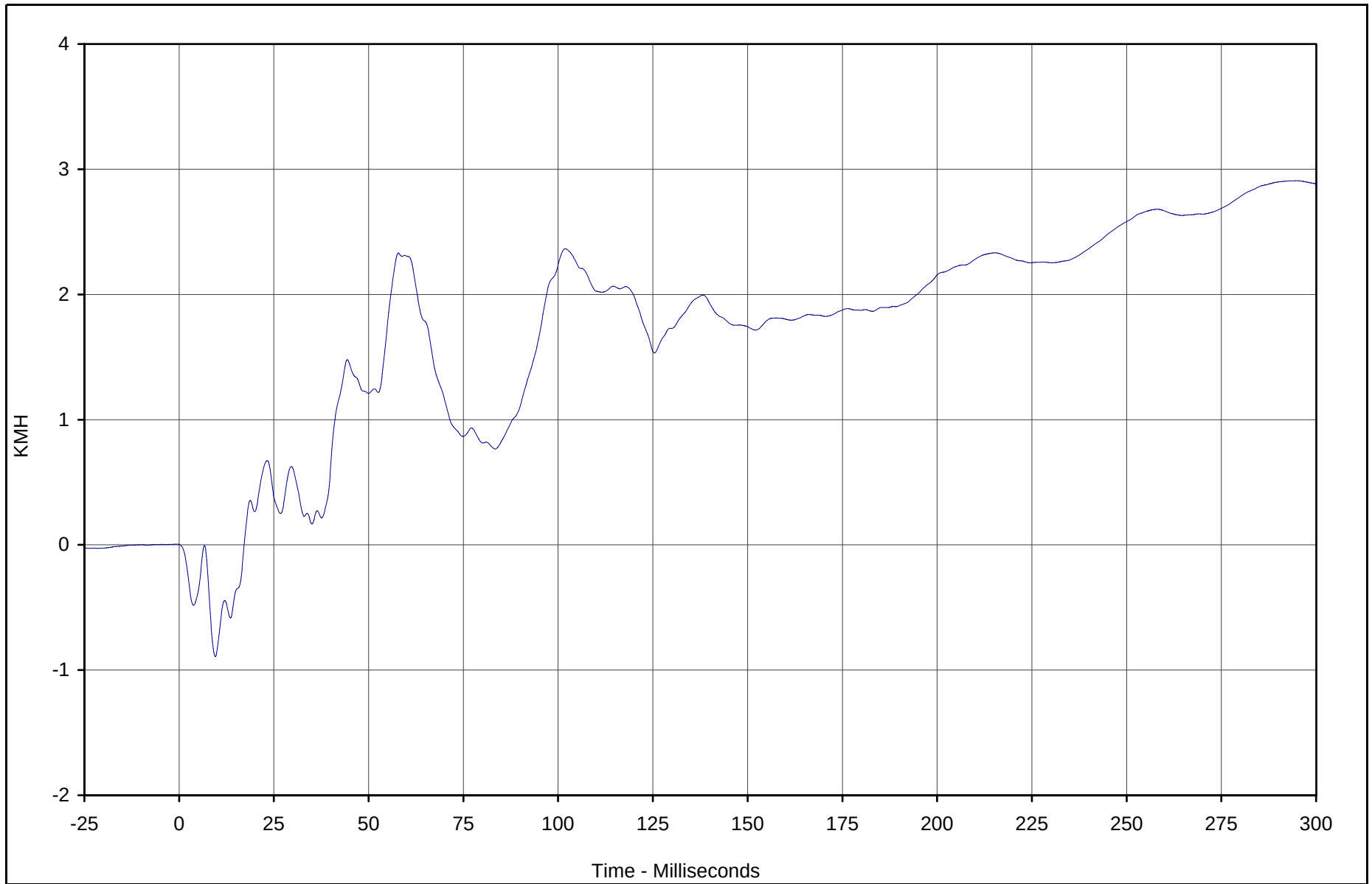
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-145



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear Z Velocity	096	IN1	KMH	2.9	294.8	-0.9	9.5	180



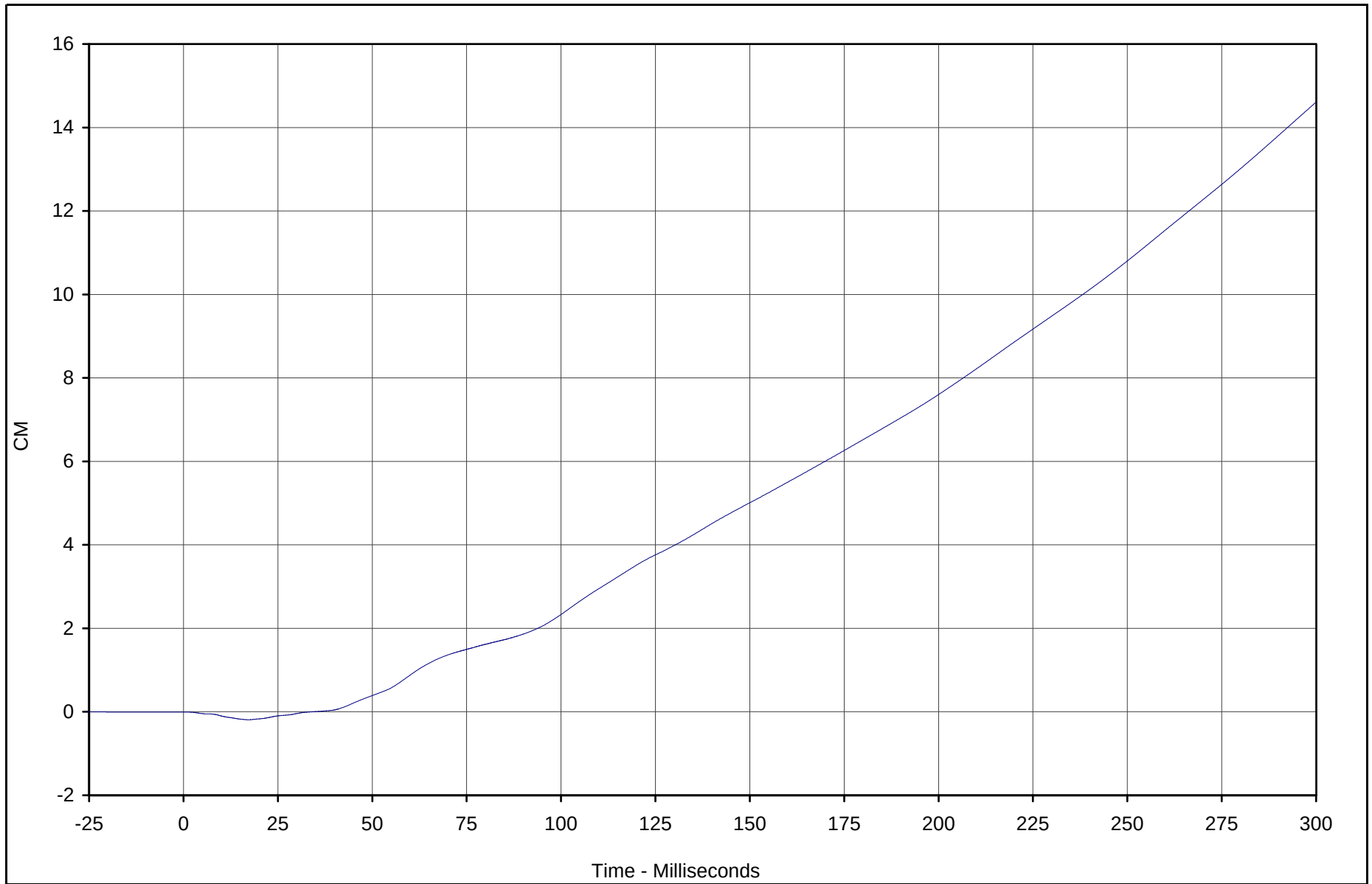
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Left Rear Z Displ.	096	IN2	CM	14.6	299.9	-0.2	17.2	180



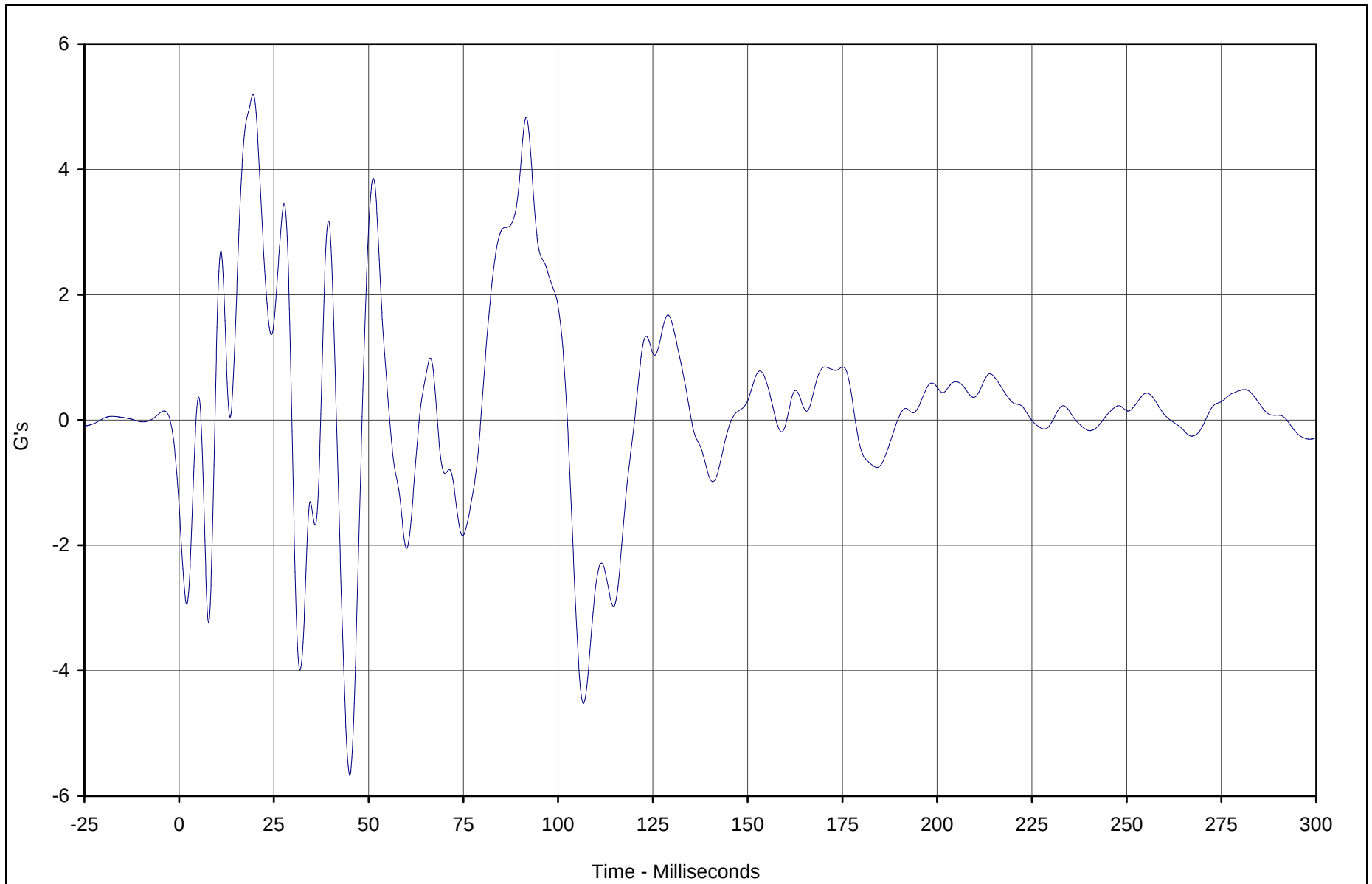
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

B-147



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear Z	097	FIL	G's	5.2	19.5	-5.7	45.0	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

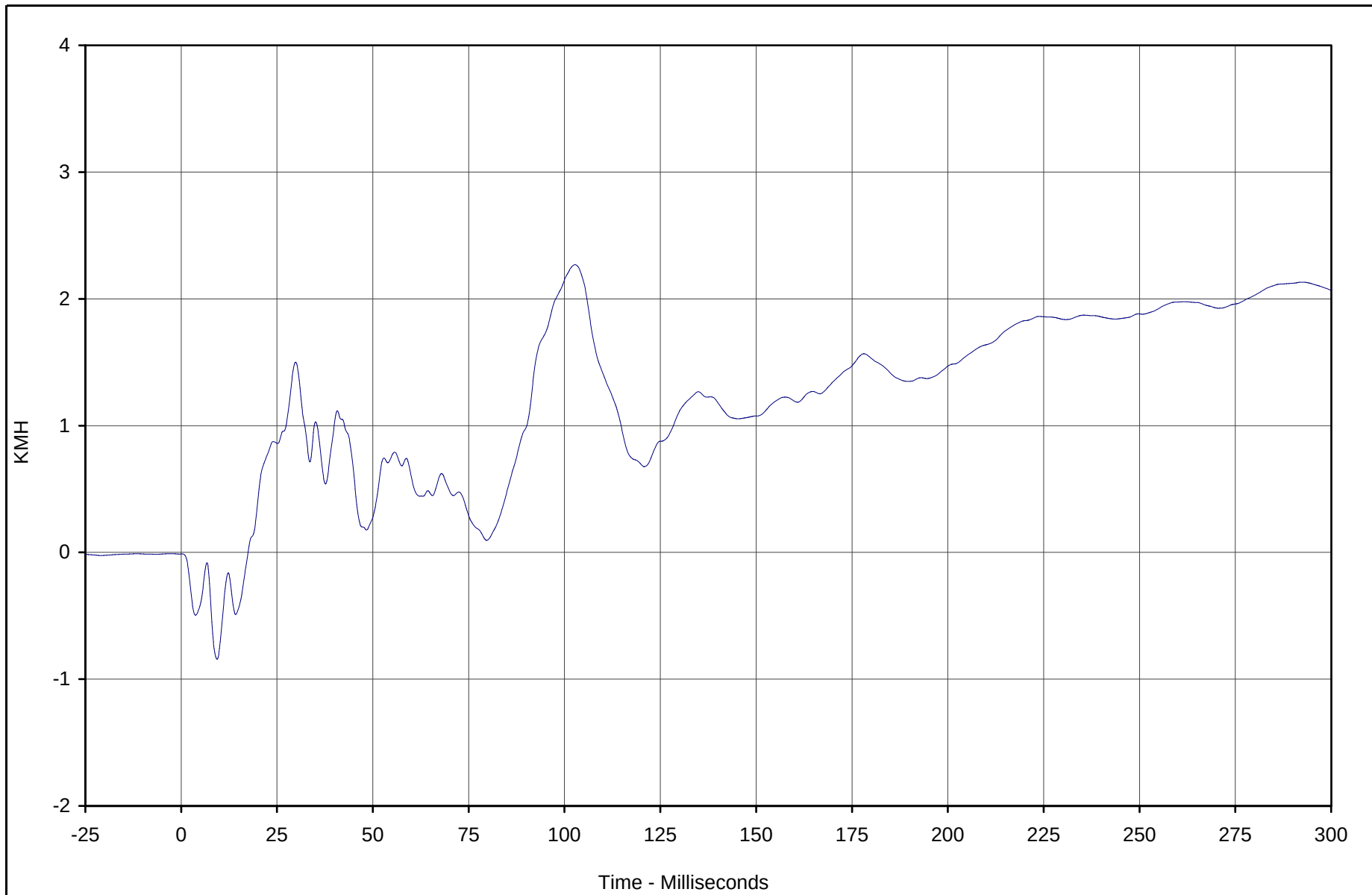
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

B-148



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear Z Velocity	097	IN1	KMH	2.3	102.7	-0.8	9.4	180



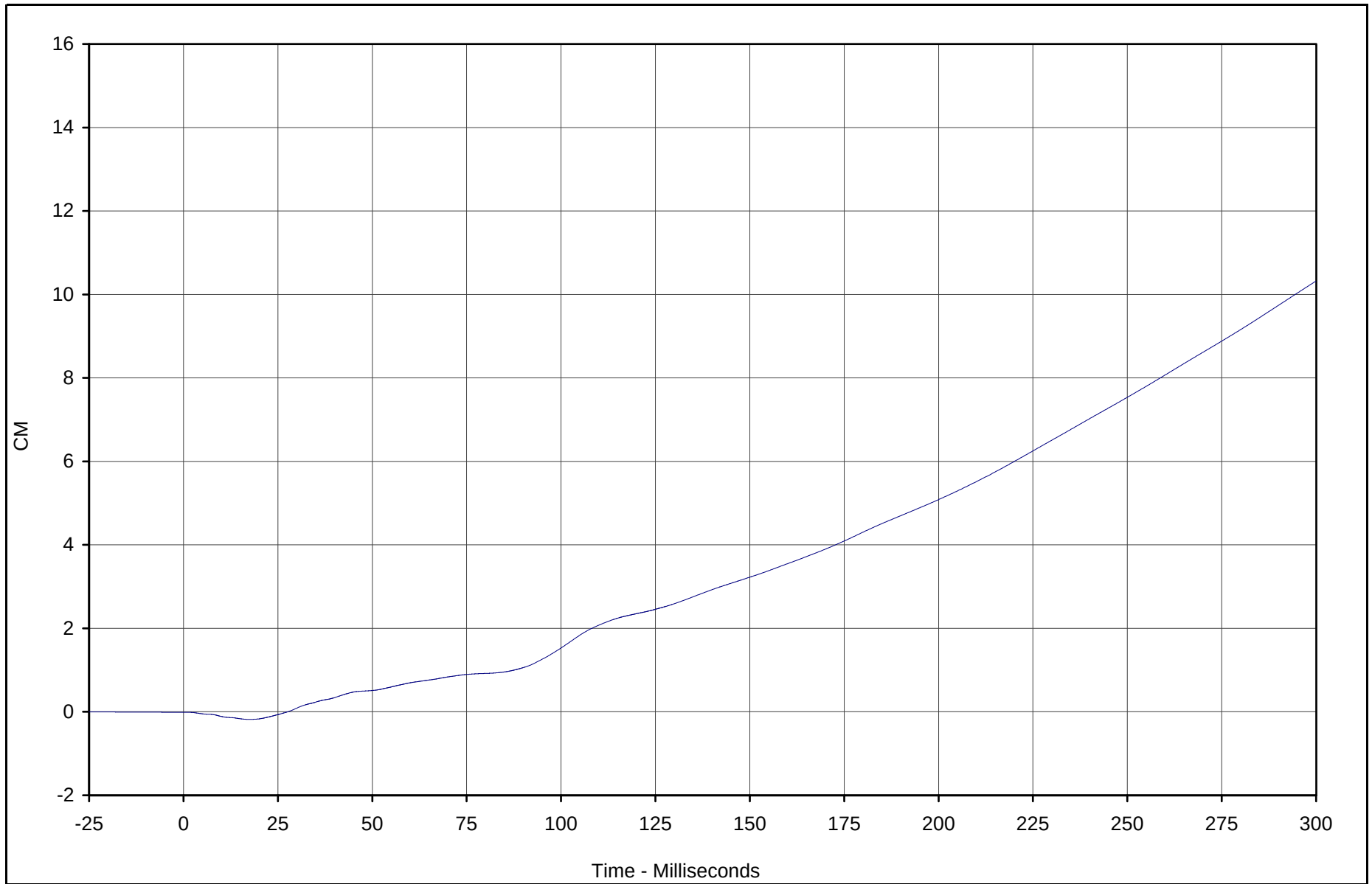
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Vehicle Right Rear Z Displ.	097	IN2	CM	10.3	299.9	-0.2	17.4	180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

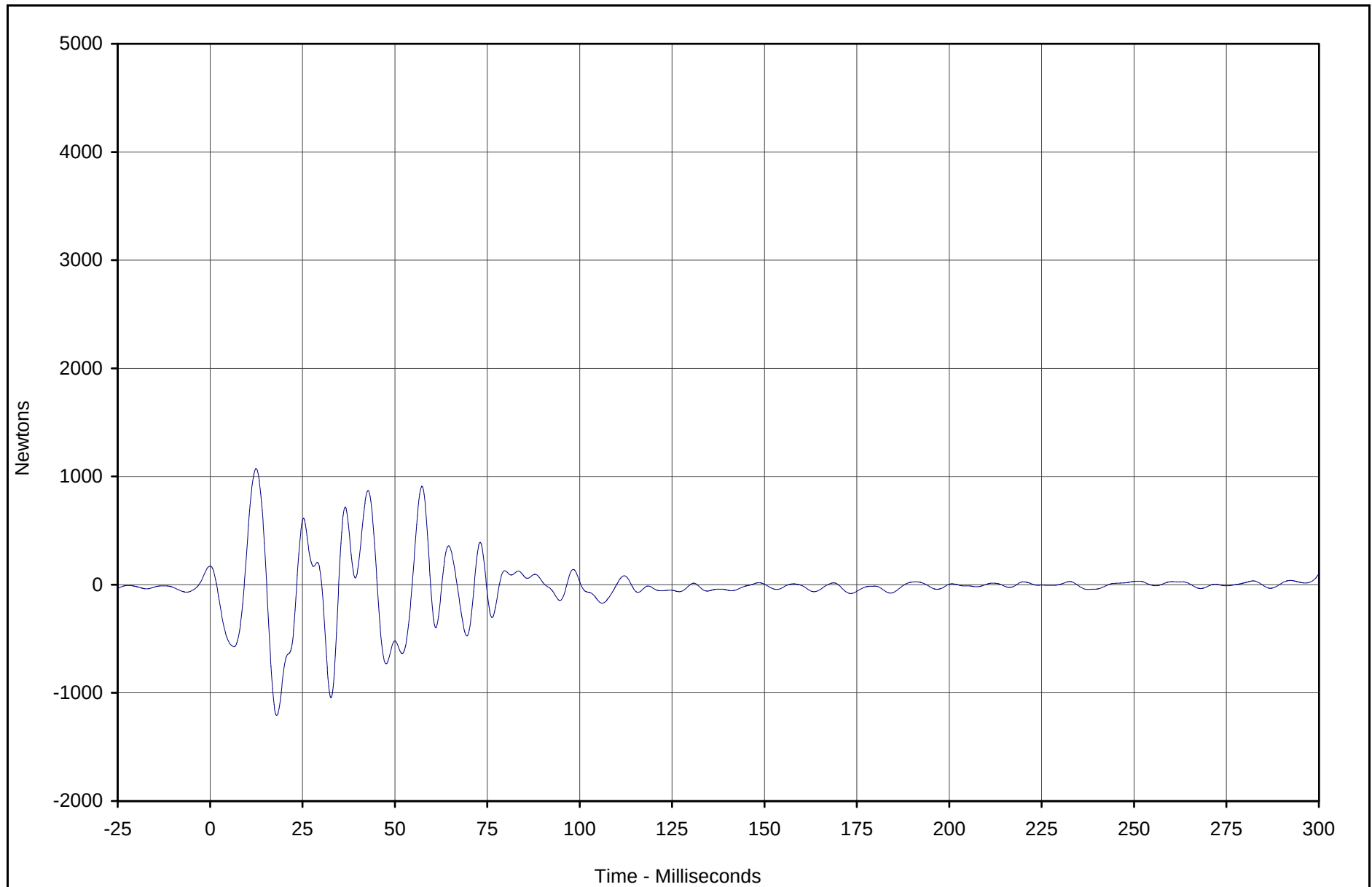
Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

APPENDIX C

LOAD CELL BARRIER DATA PLOTS

C-1



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force A2	099	FIL	Newtons	1074.7	12.4	-1207.2	18.0	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

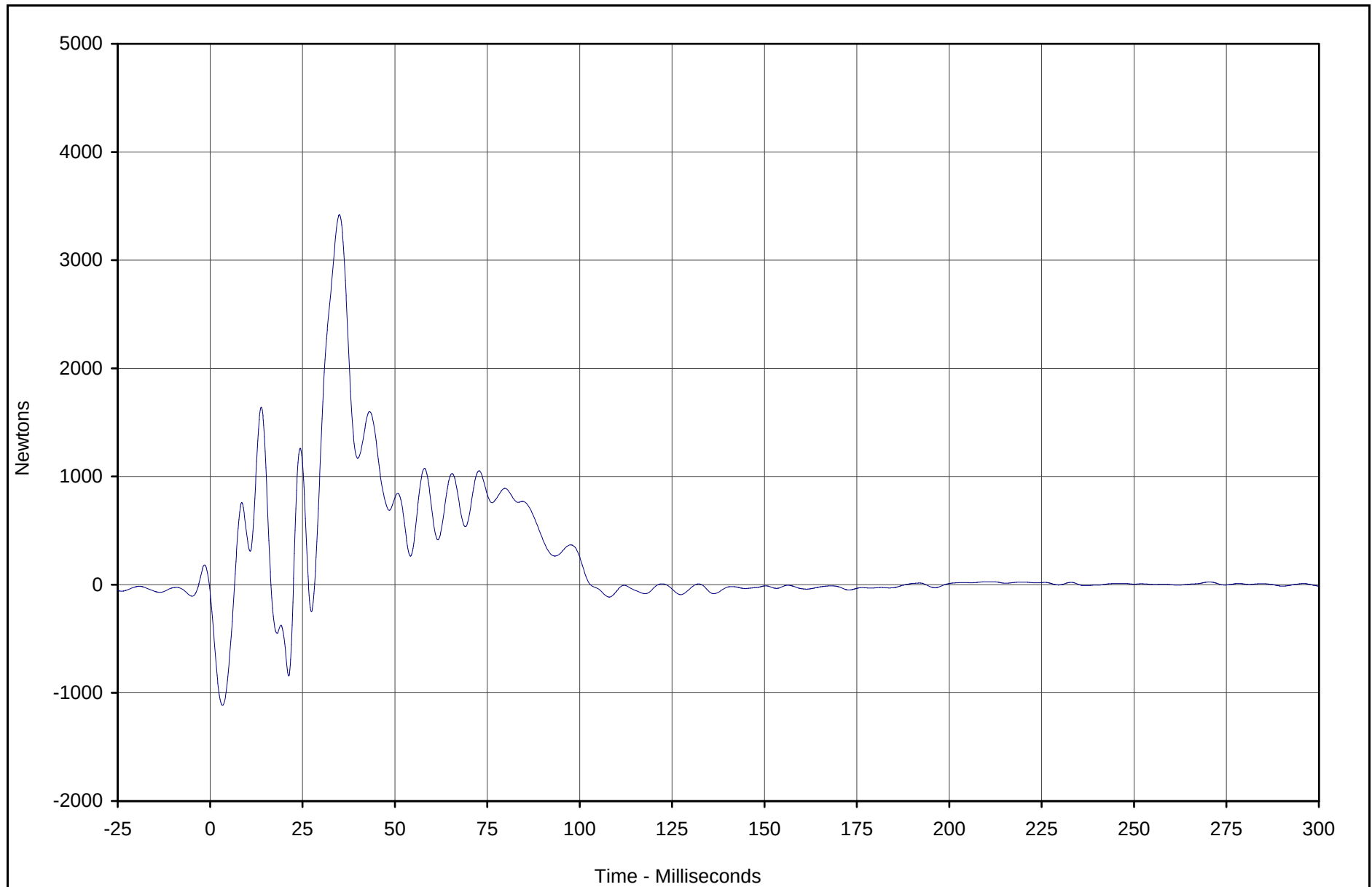
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-2



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force A3	100	FIL	Newtons	3419.7	35.0	-1114.9	3.4	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

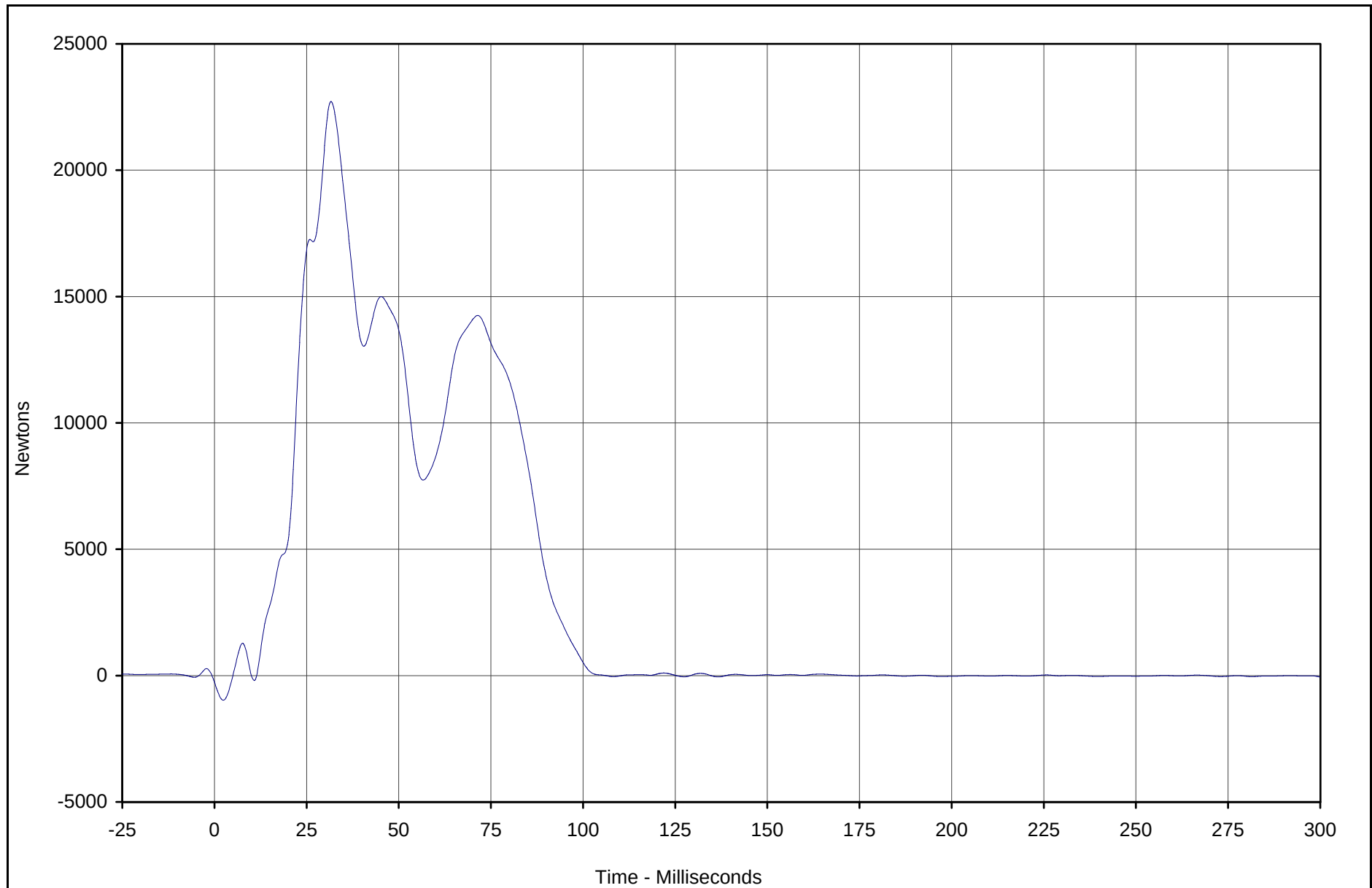
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-3



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force A4	101	FIL	Newtons	22717.9	31.6	-974.0	2.4	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

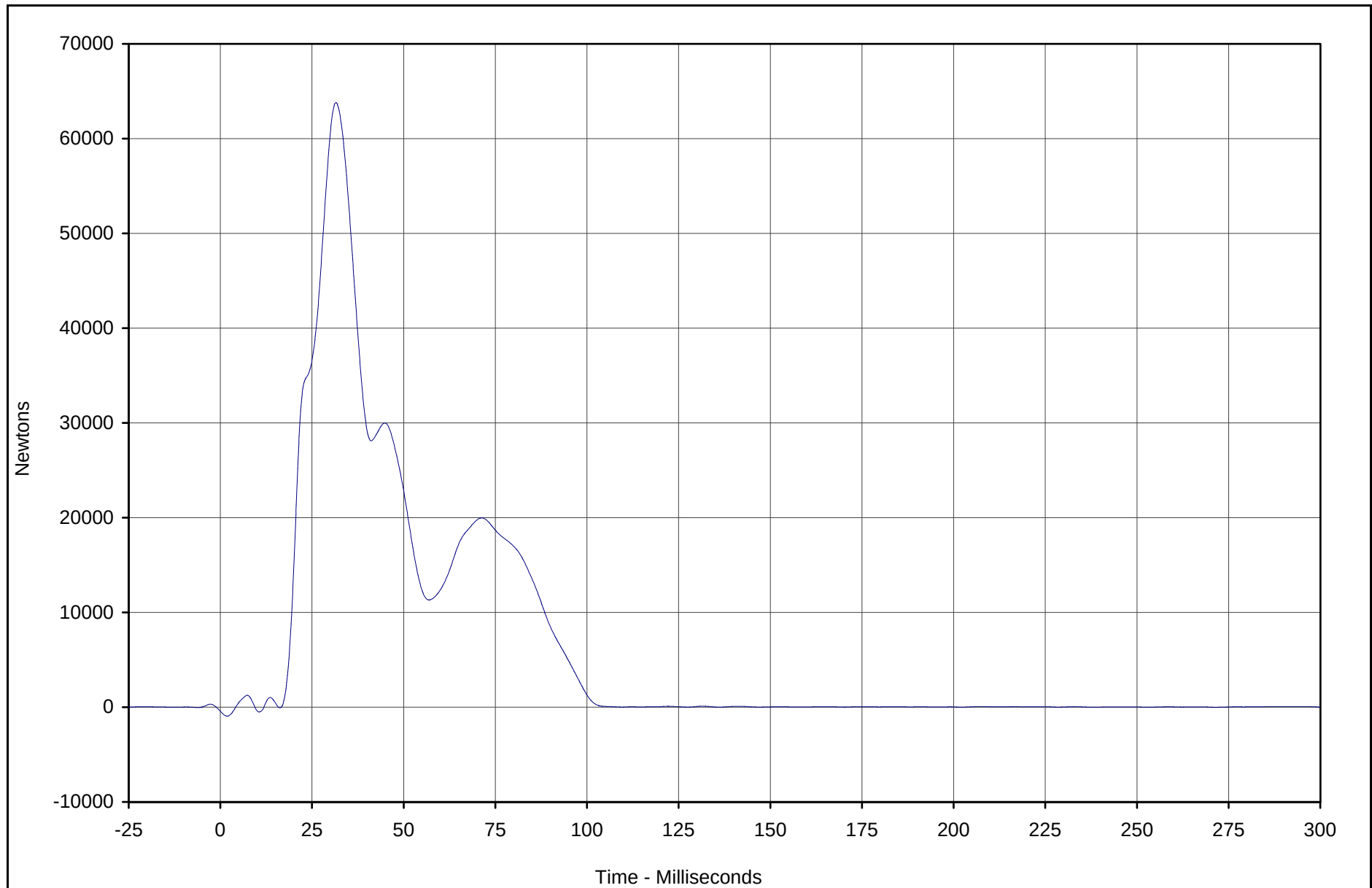
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-4



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force A5	102	FIL	Newtons	63799.2	31.5	-944.8	1.8	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

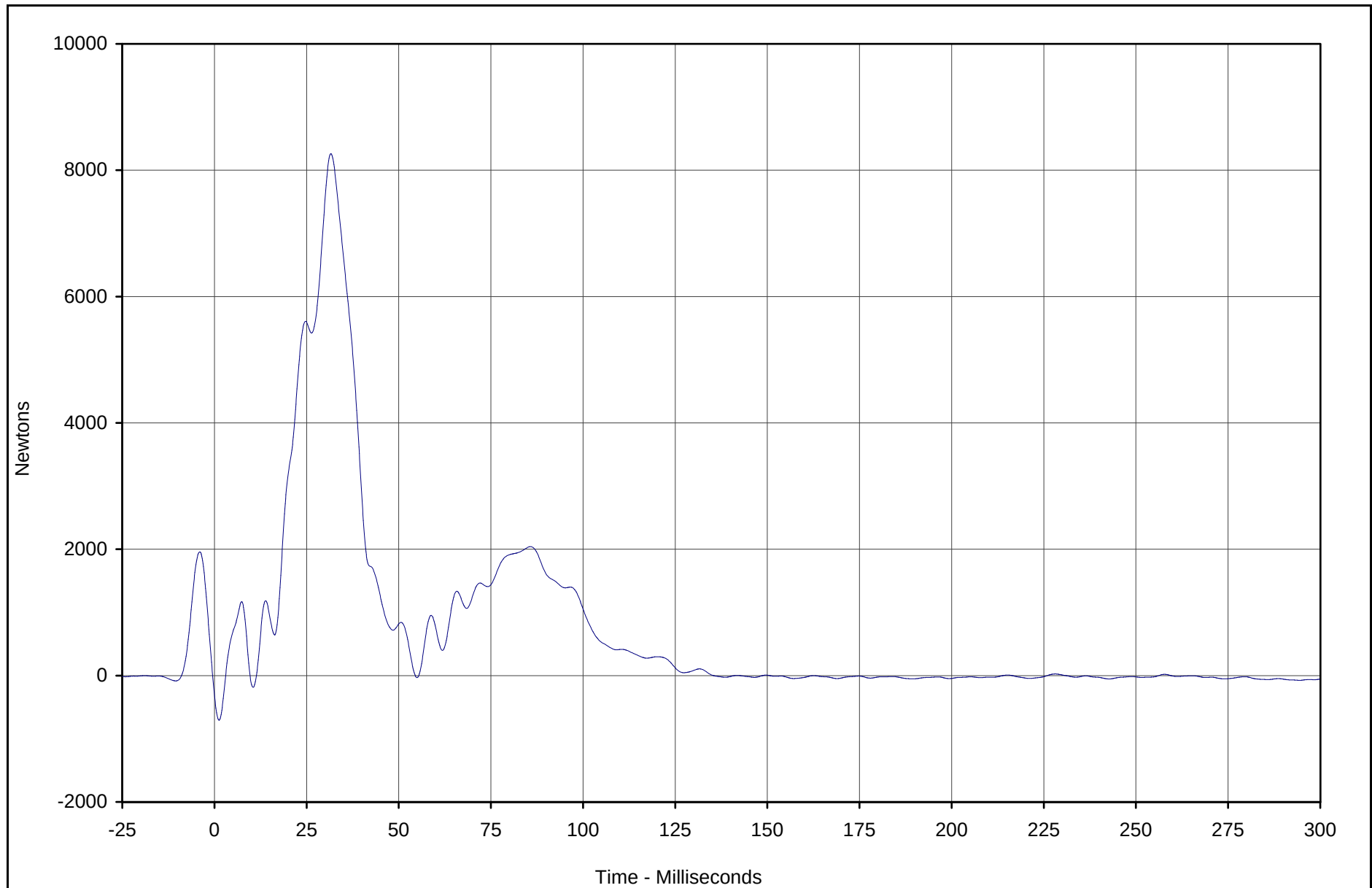
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-5



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force A6	103	FIL	Newtons	8263.3	31.6	-707.1	1.3	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

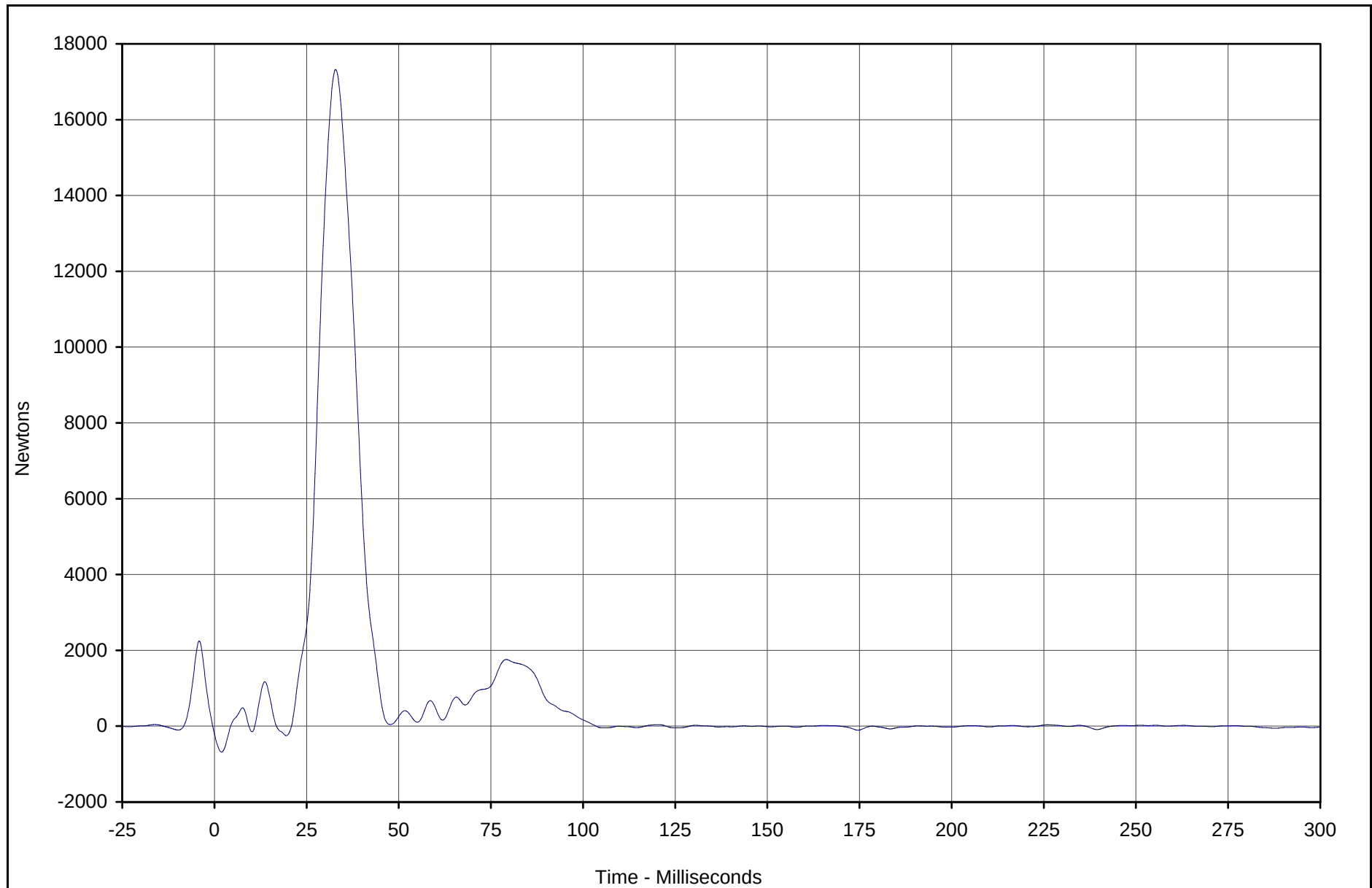
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-6



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force A7	104	FIL	Newtons	17324.3	32.9	-684.6	1.9	60

Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

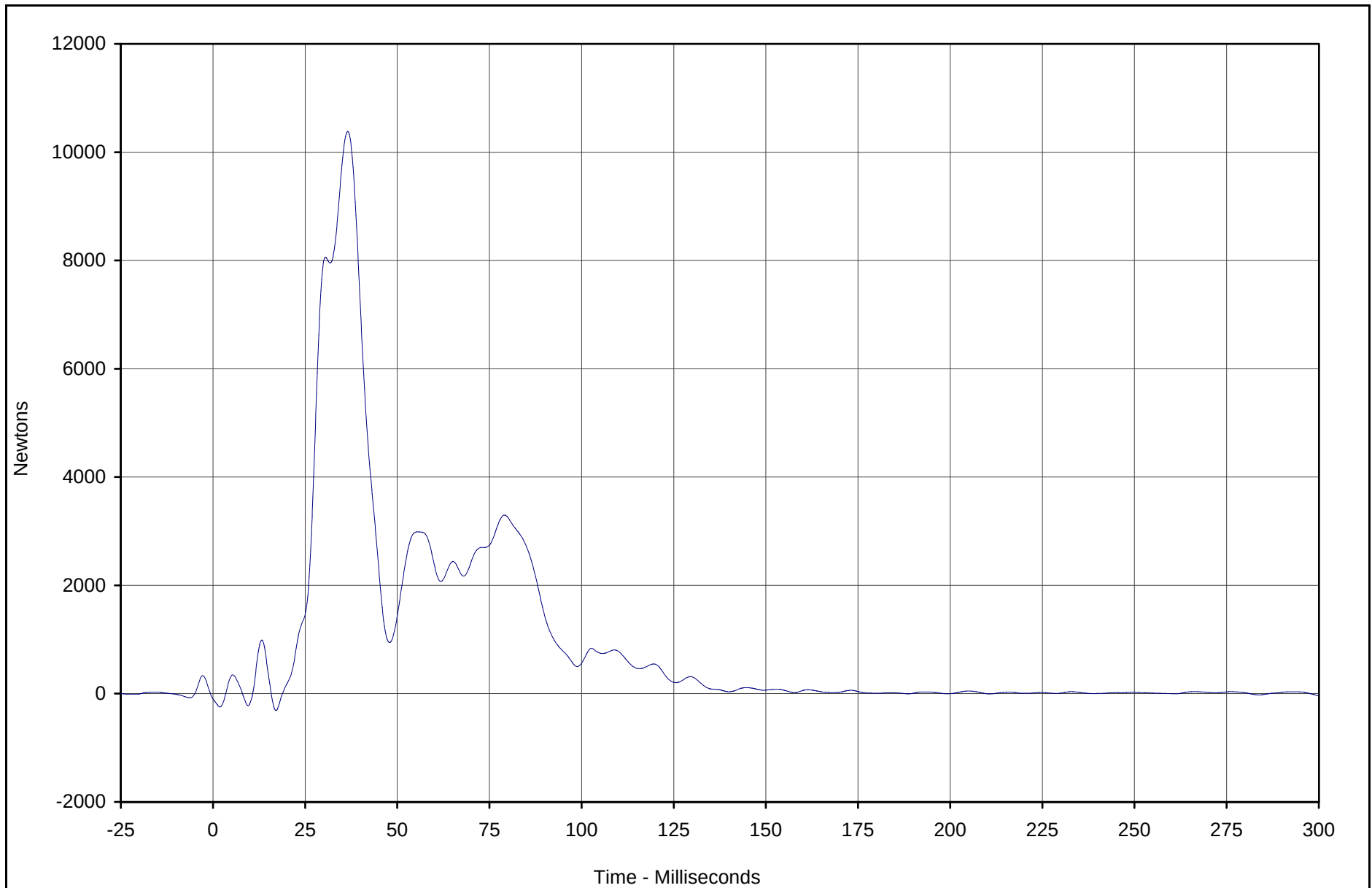
Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



KAR22001-07

C-7



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force A8	105	FIL	Newtons	10383.4	36.6	-310.2	17.1	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

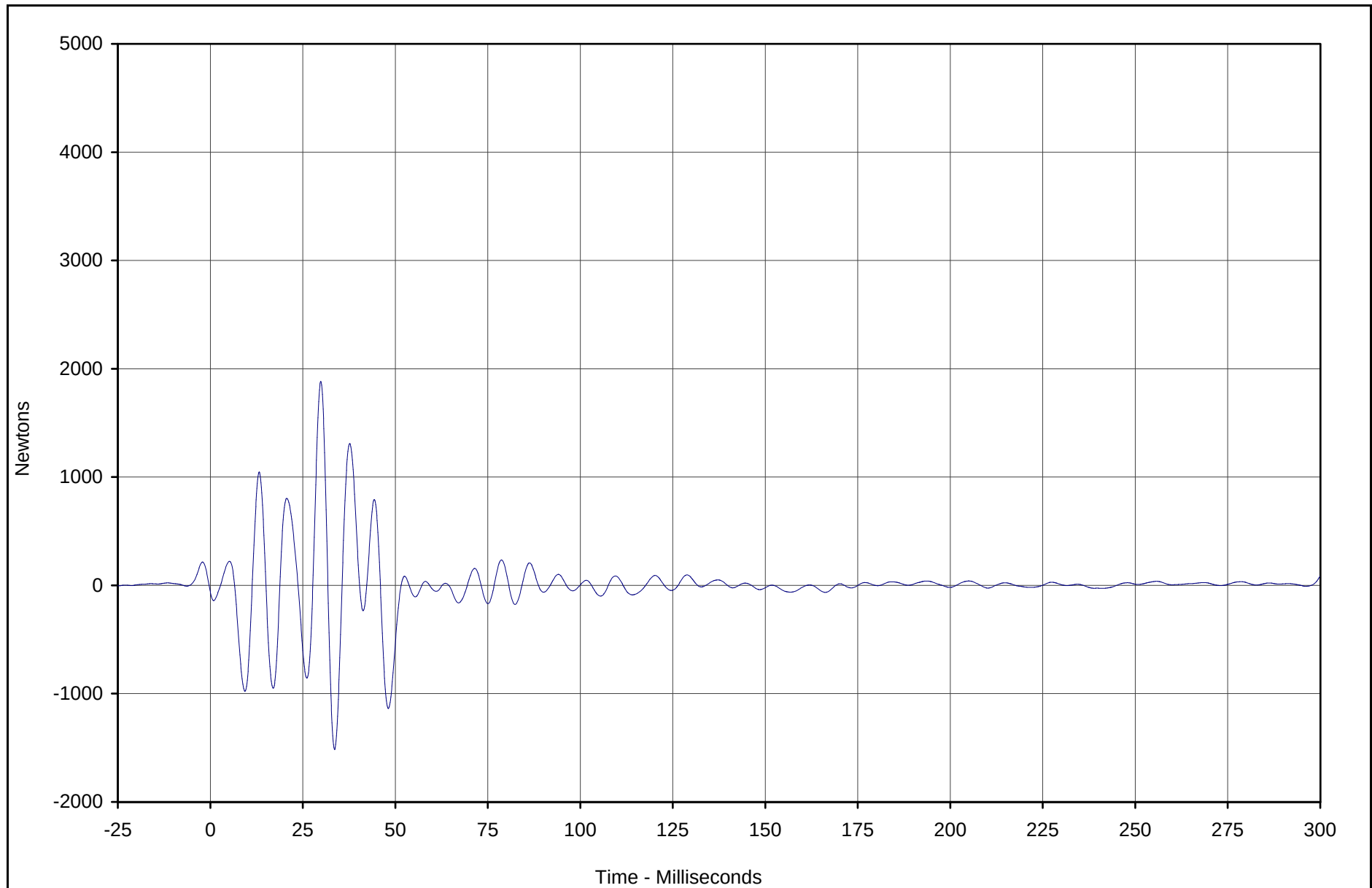
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-8



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force A9	106	FIL	Newtons	1883.3	29.9	-1515.9	33.6	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

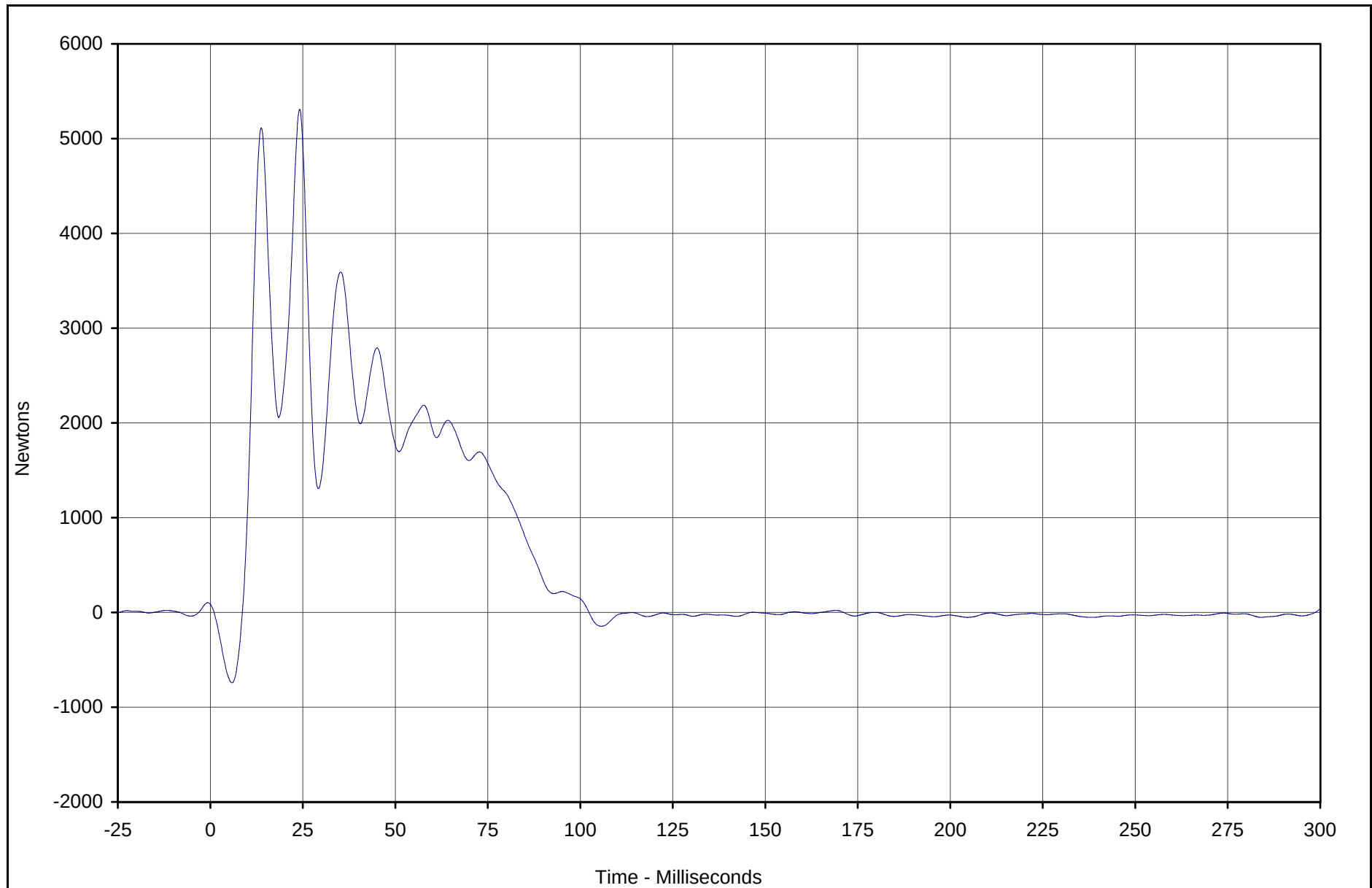
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-9



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force B2	108	FIL	Newtons	5307.8	24.1	-743.4	5.9	60

Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

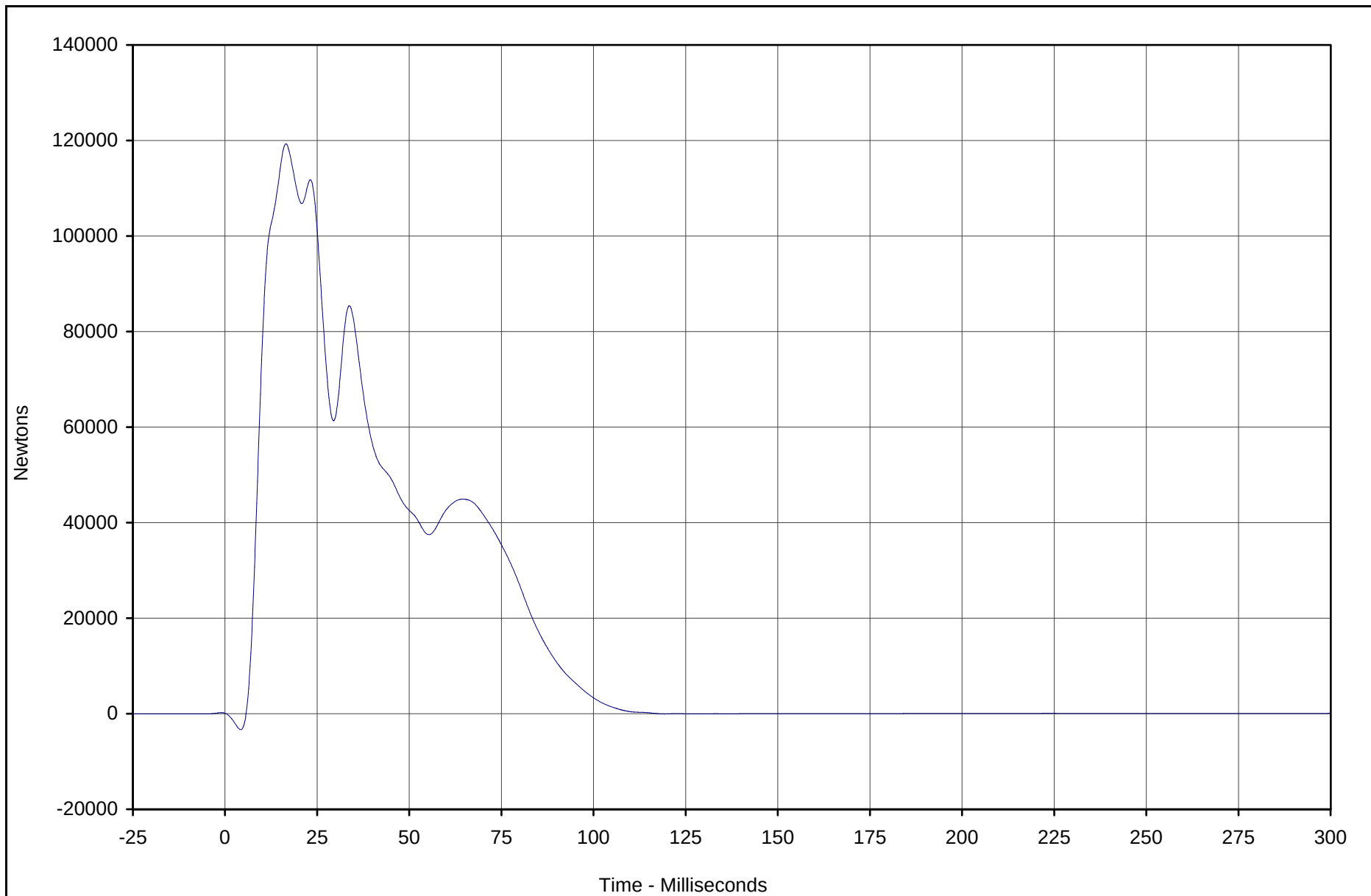
Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



KAR22001-07

C-10



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force B3	109	FIL	Newtons	119309.6	16.5	-3345.4	4.3	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

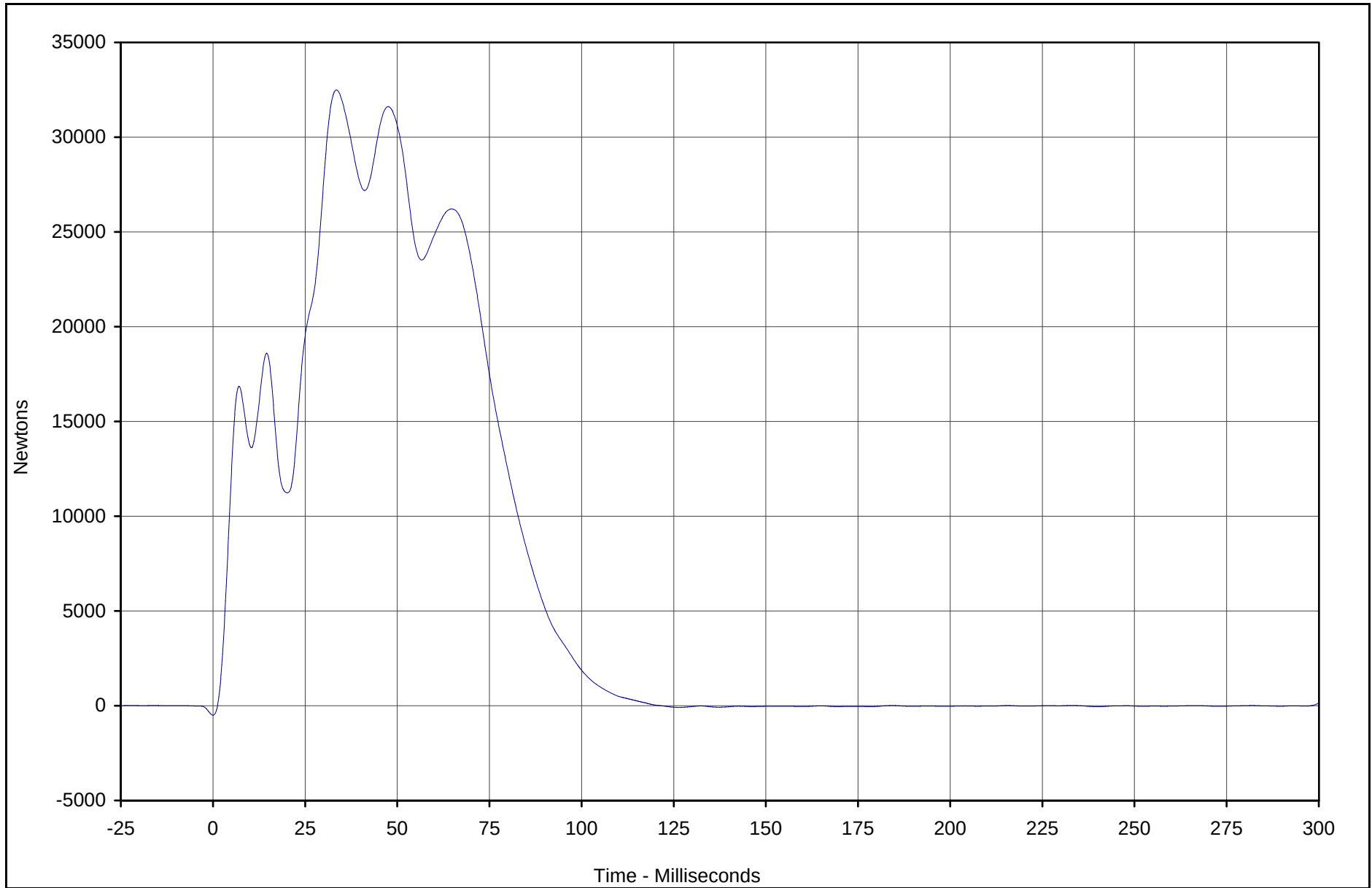
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-11



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force B4	110	FIL	Newtons	32495.3	33.5	-503.9	0.0	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

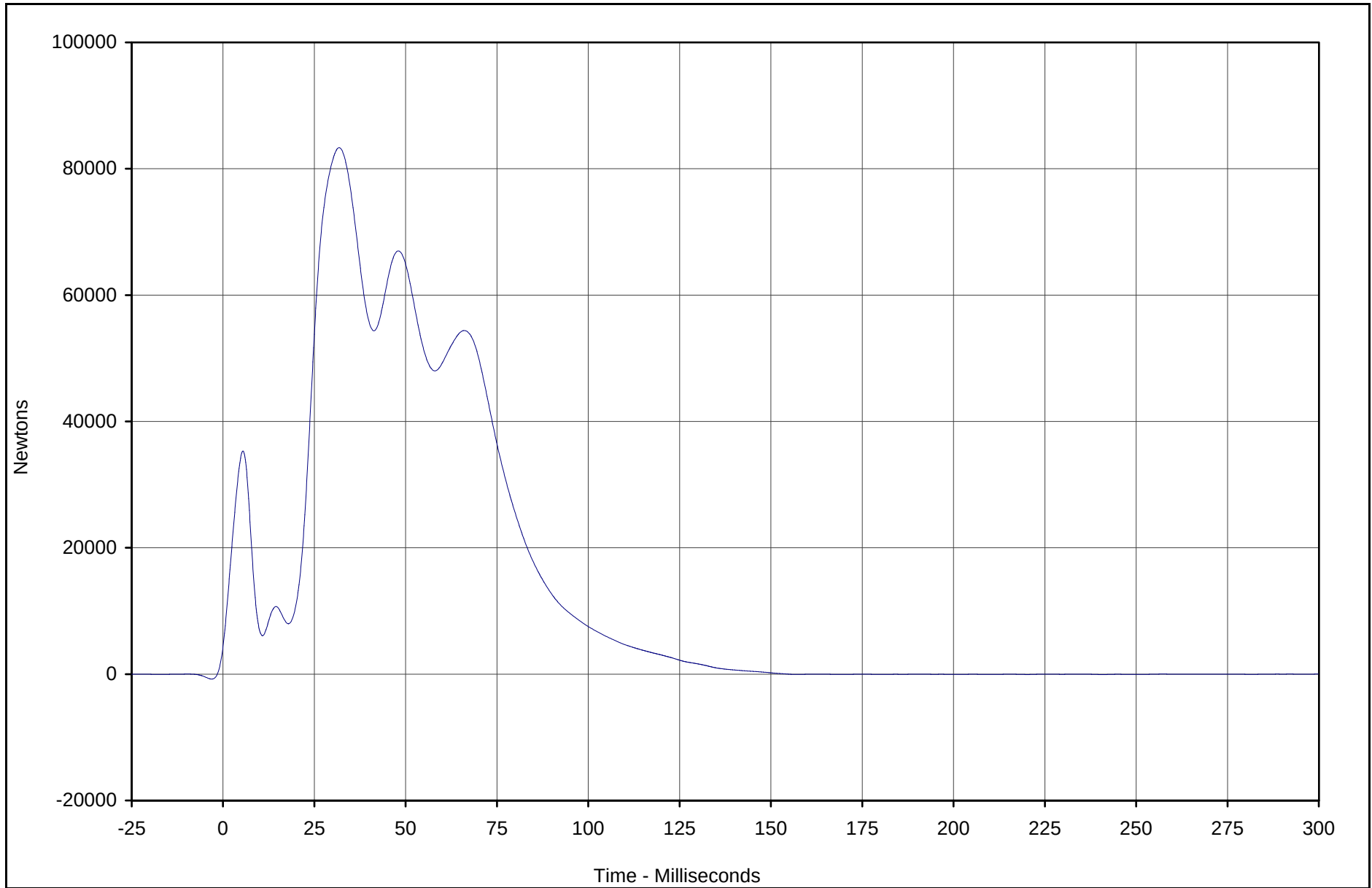
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-12



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force B5	111	FIL	Newtons	83346.7	31.8	-61.8	240.8	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

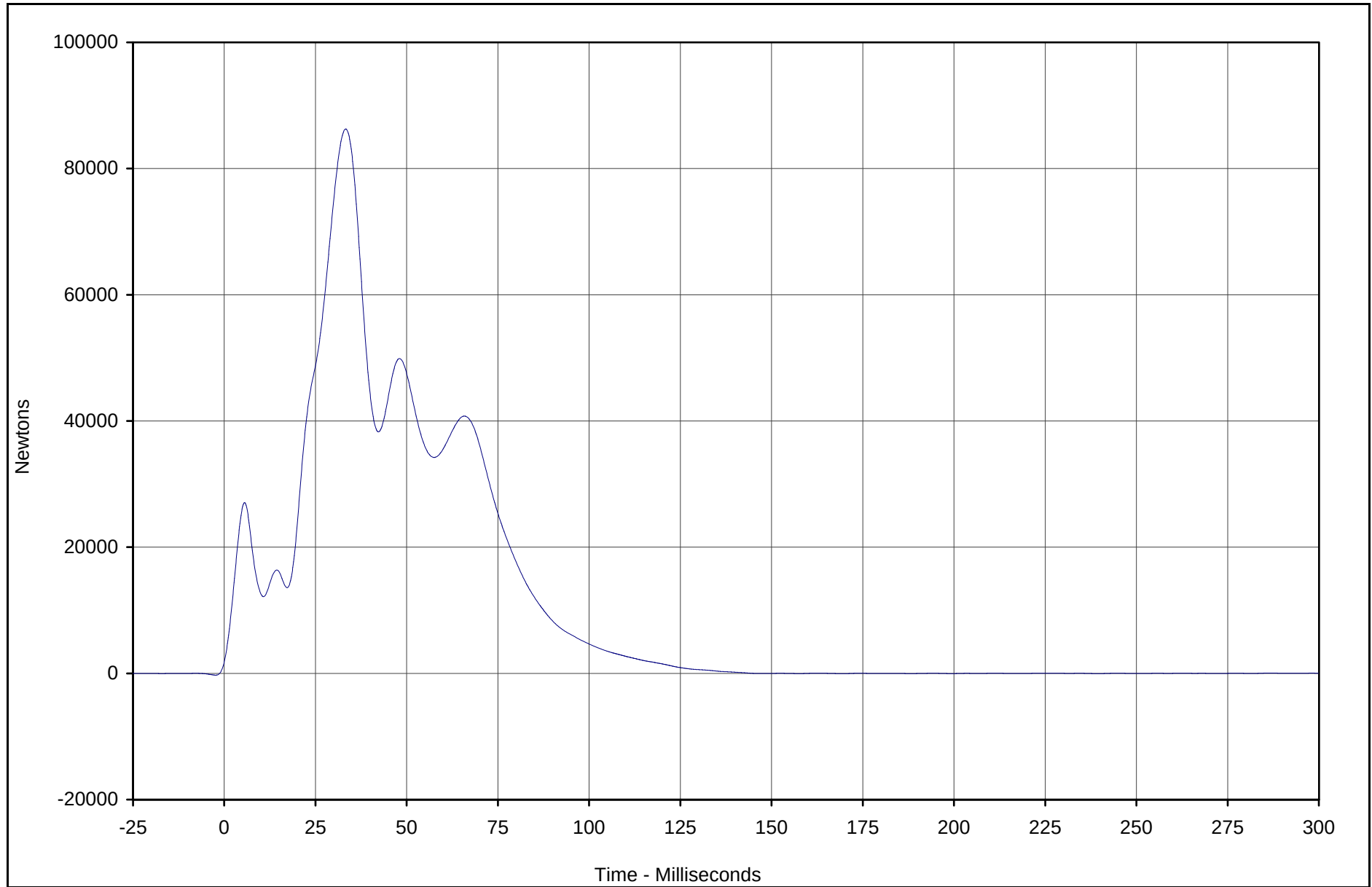
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-13



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force B6	112	FIL	Newtons	86275.3	33.3	-42.9	239.6	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

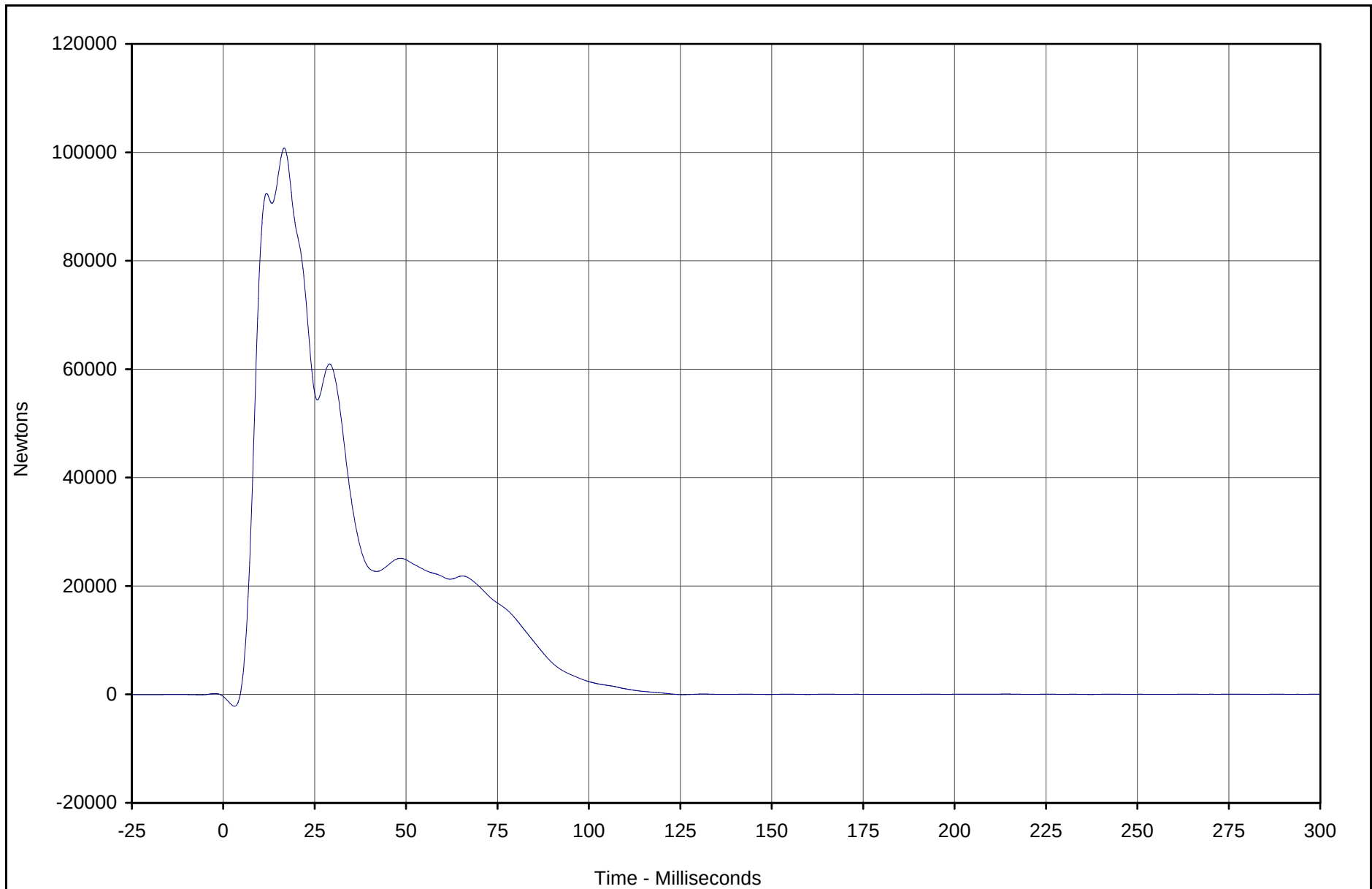
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-14



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force B7	113	FIL	Newtons	100783.9	16.7	-2174.4	3.1	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

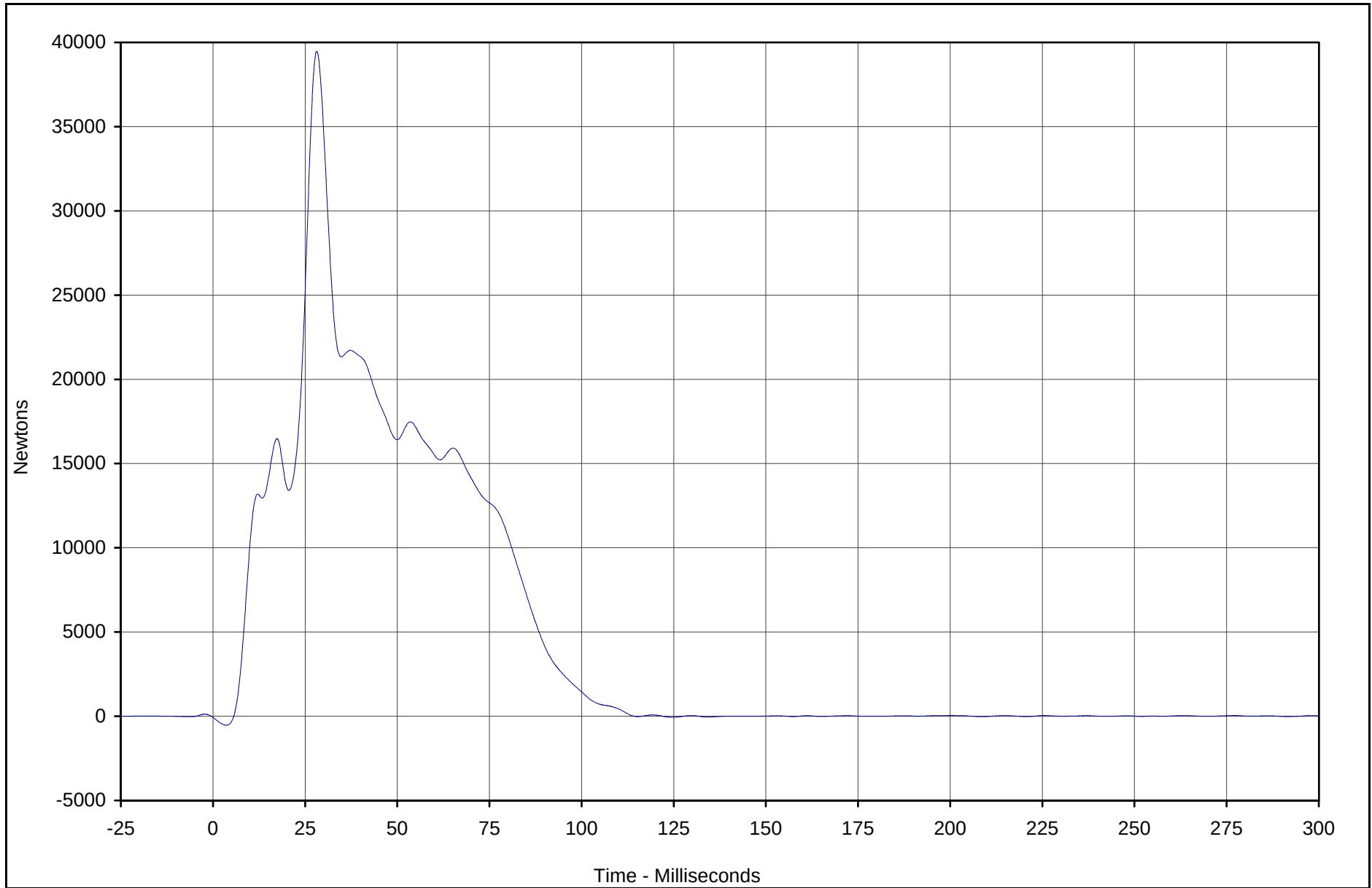
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-15



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force B8	114	FIL	Newtons	39464.8	28.1	-530.2	3.7	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

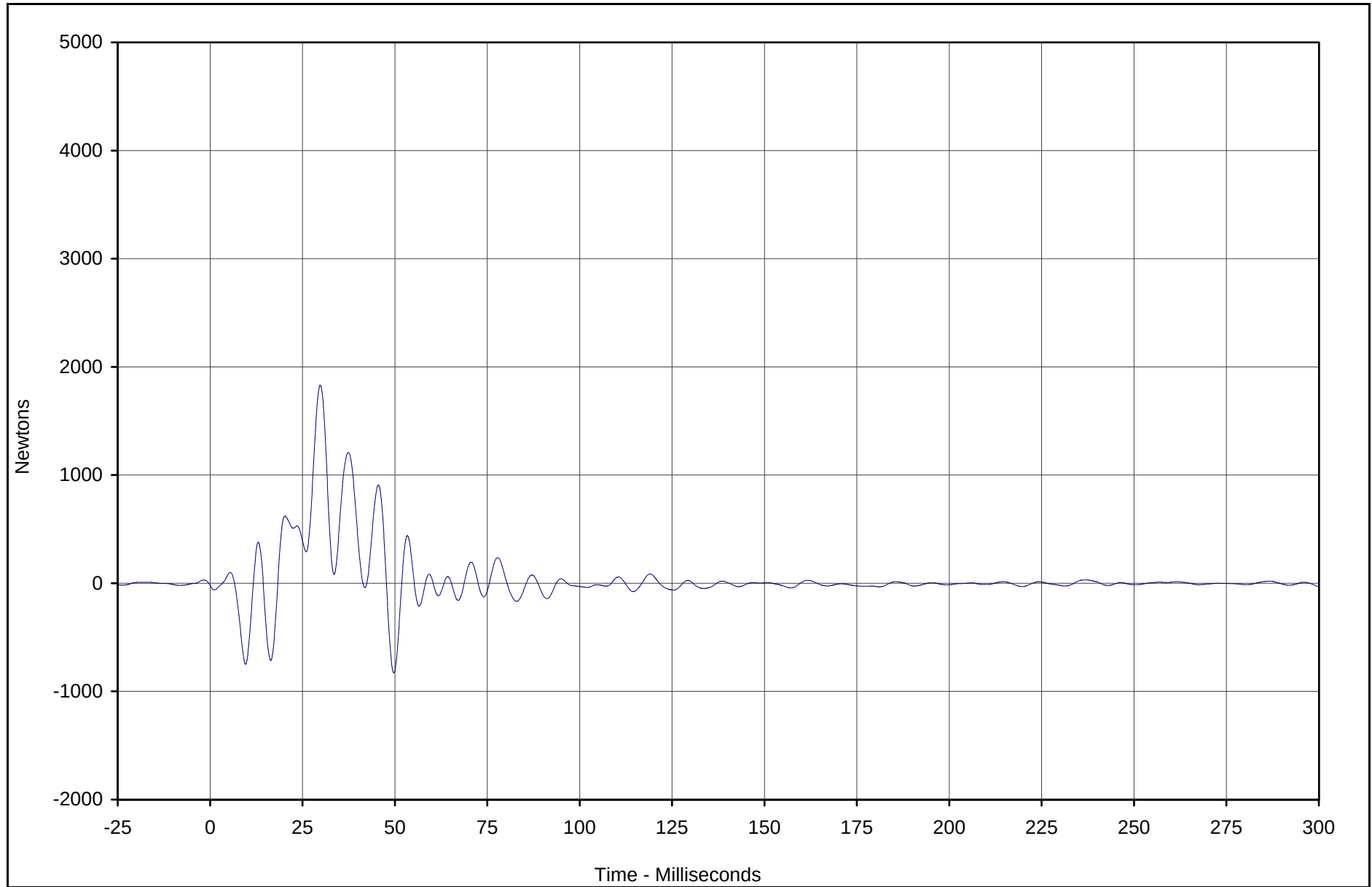
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-16



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force B9	115	FIL	Newtons	1830.8	29.8	-828.6	49.7	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

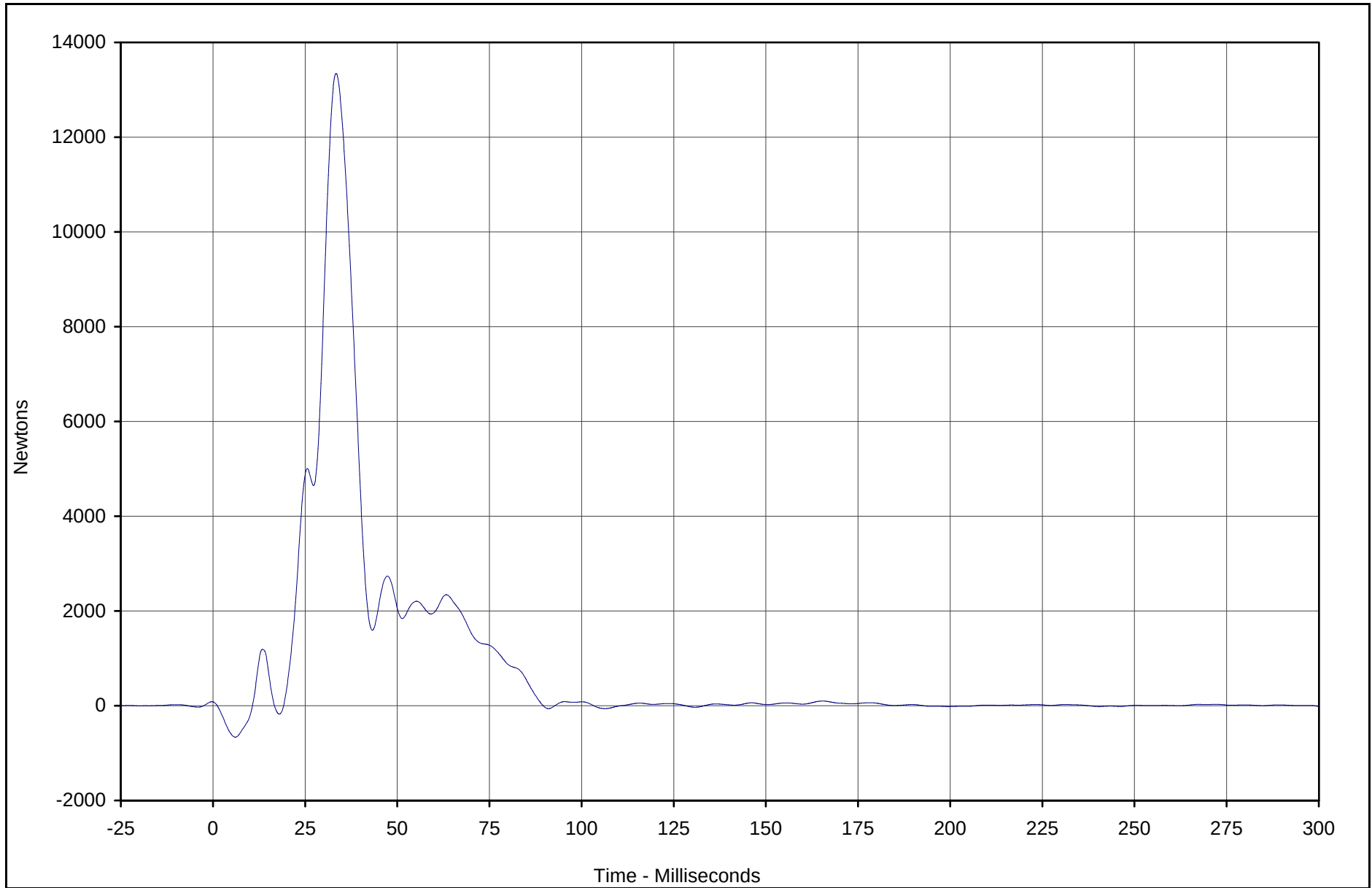
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-17



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force C2	117	FIL	Newtons	13348.9	33.4	-663.7	6.1	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

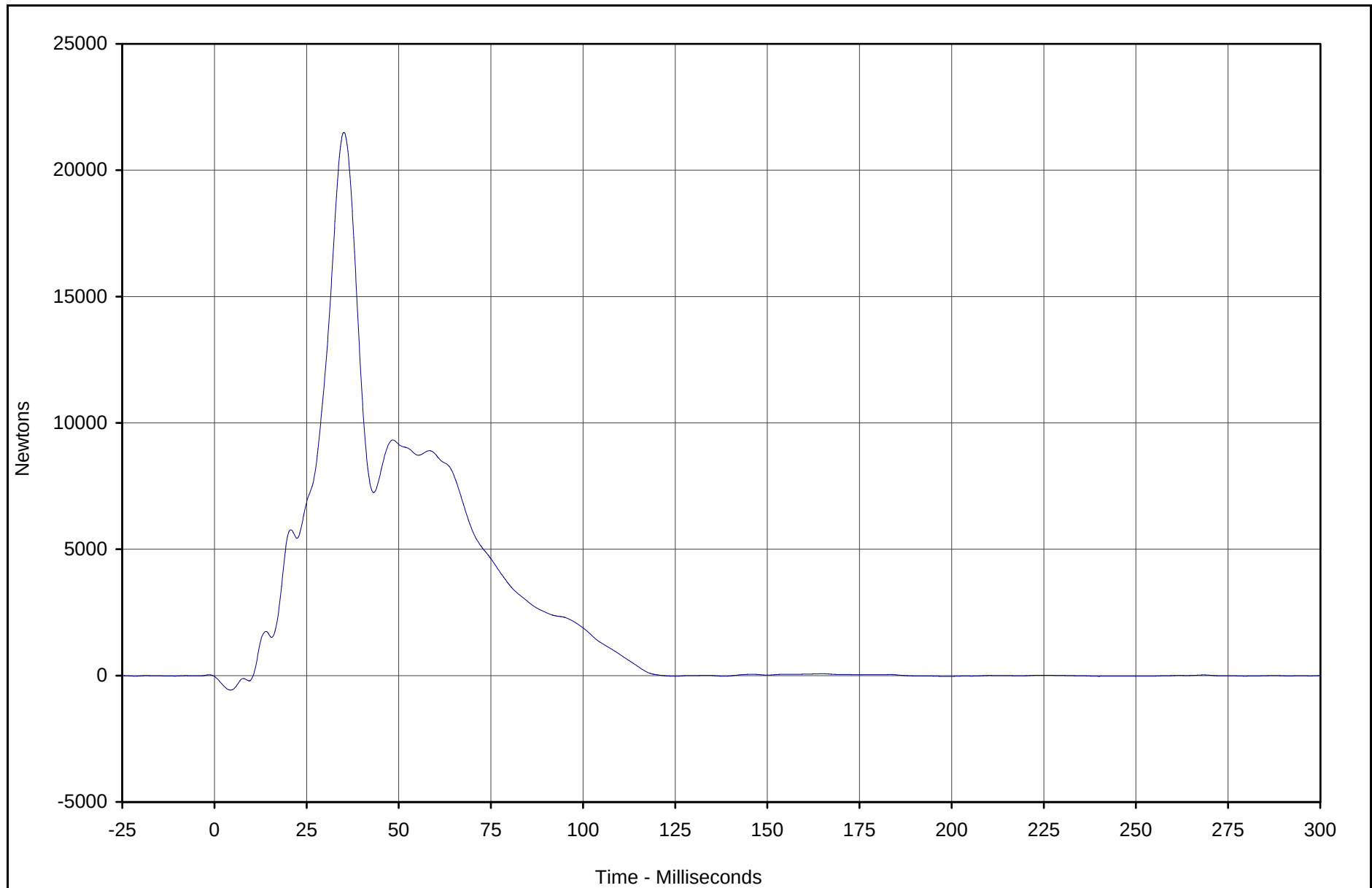
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-18



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force C3	118	FIL	Newtons	21500.0	35.1	-571.2	4.4	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

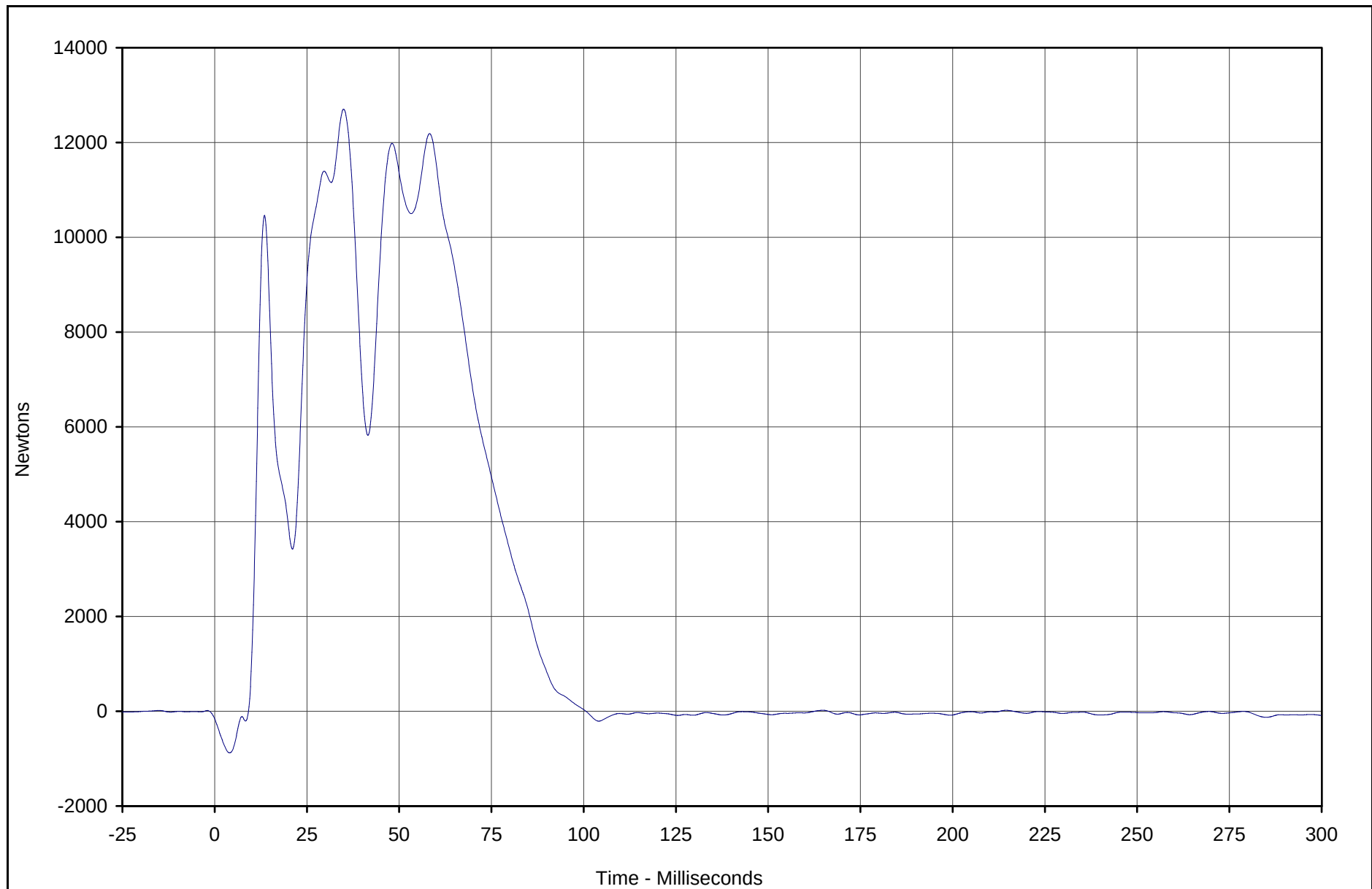
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-19



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force C4	119	FIL	Newtons	12703.5	34.9	-877.7	4.1	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

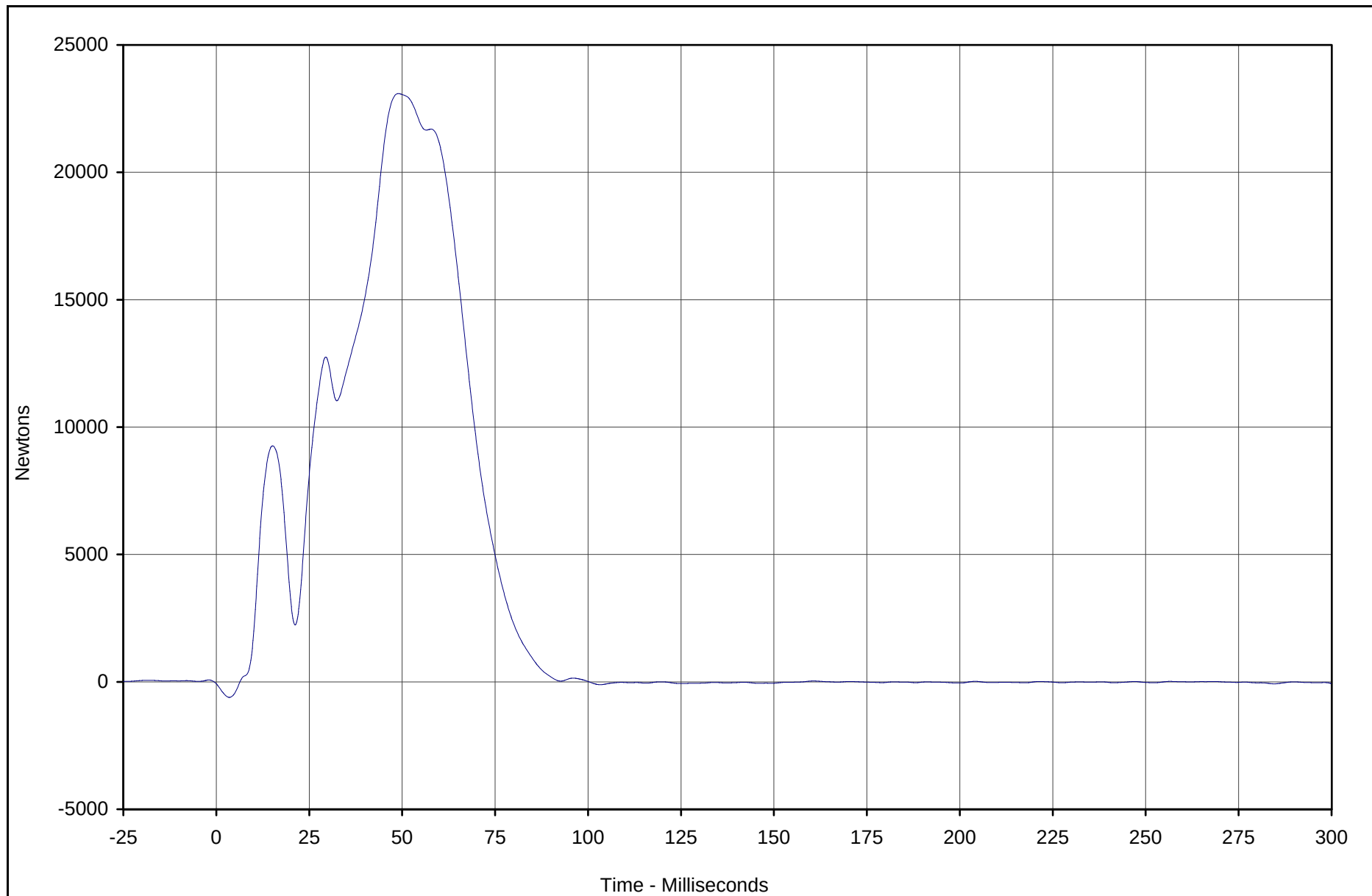
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-20



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force C5	120	FIL	Newtons	23090.6	49.0	-609.0	3.5	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

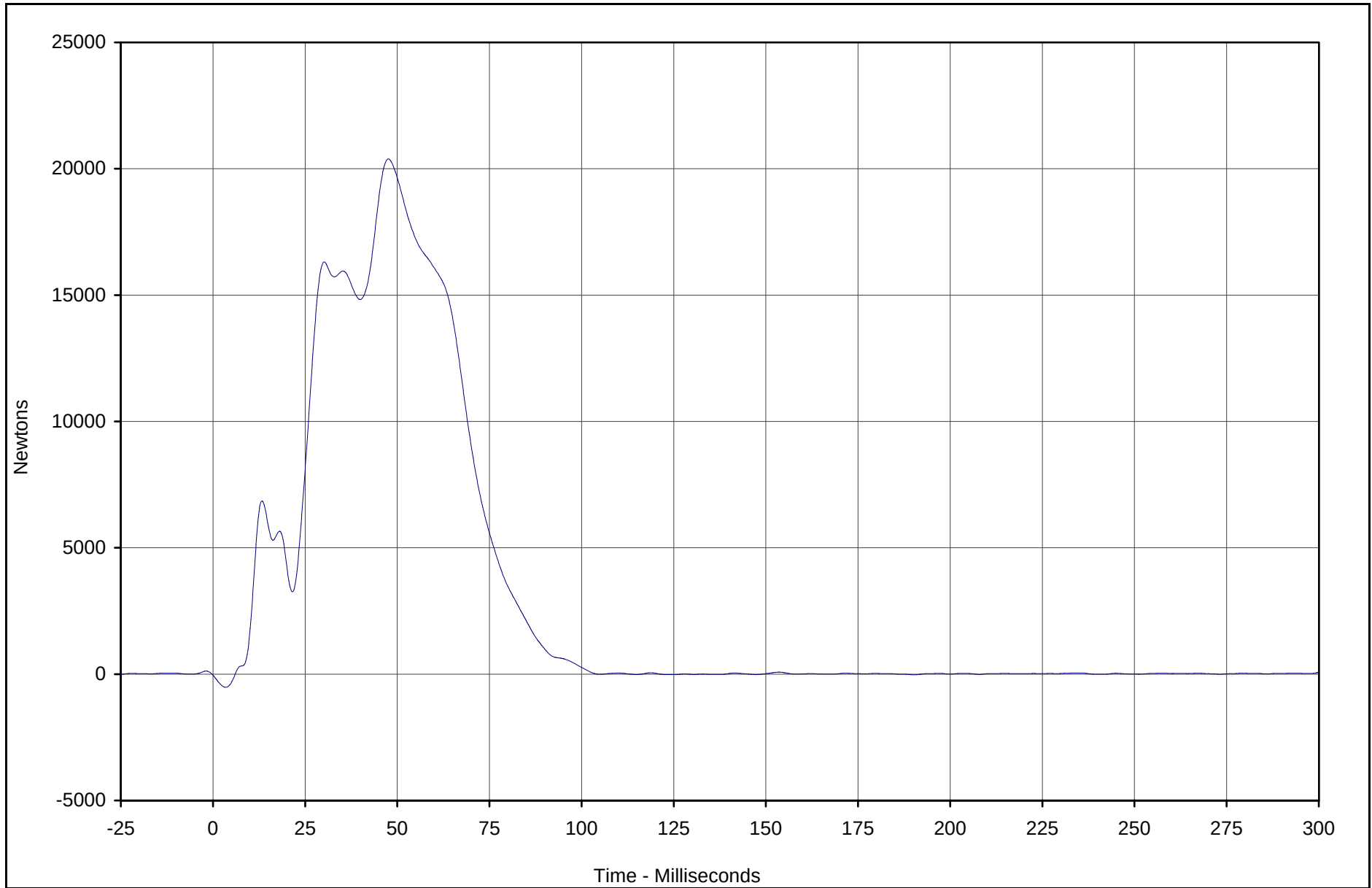
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-21



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force C6	121	FIL	Newtons	20386.6	47.6	-520.9	3.4	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

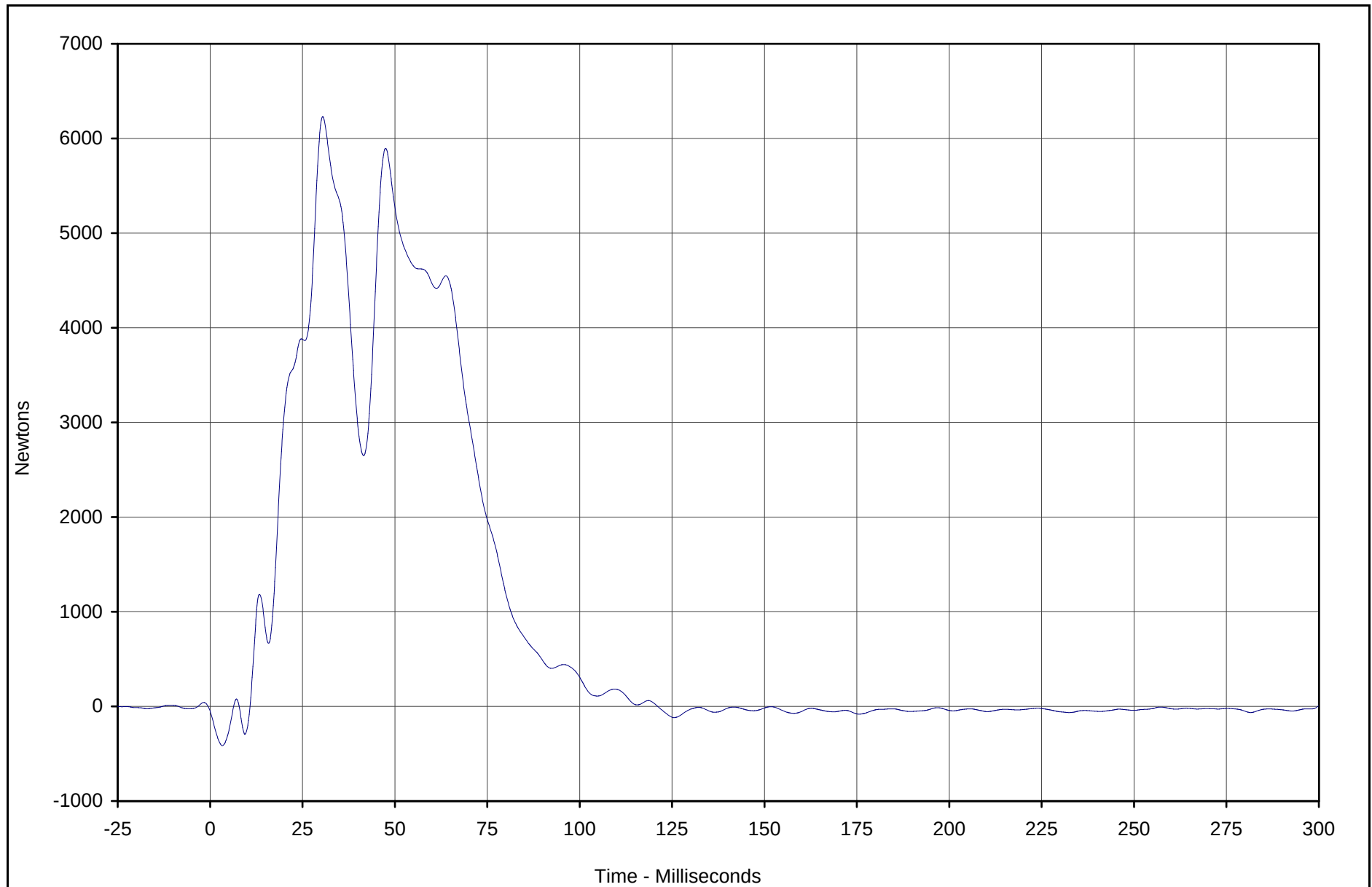
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-22



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force C7	122	FIL	Newtons	6232.0	30.5	-414.7	3.3	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

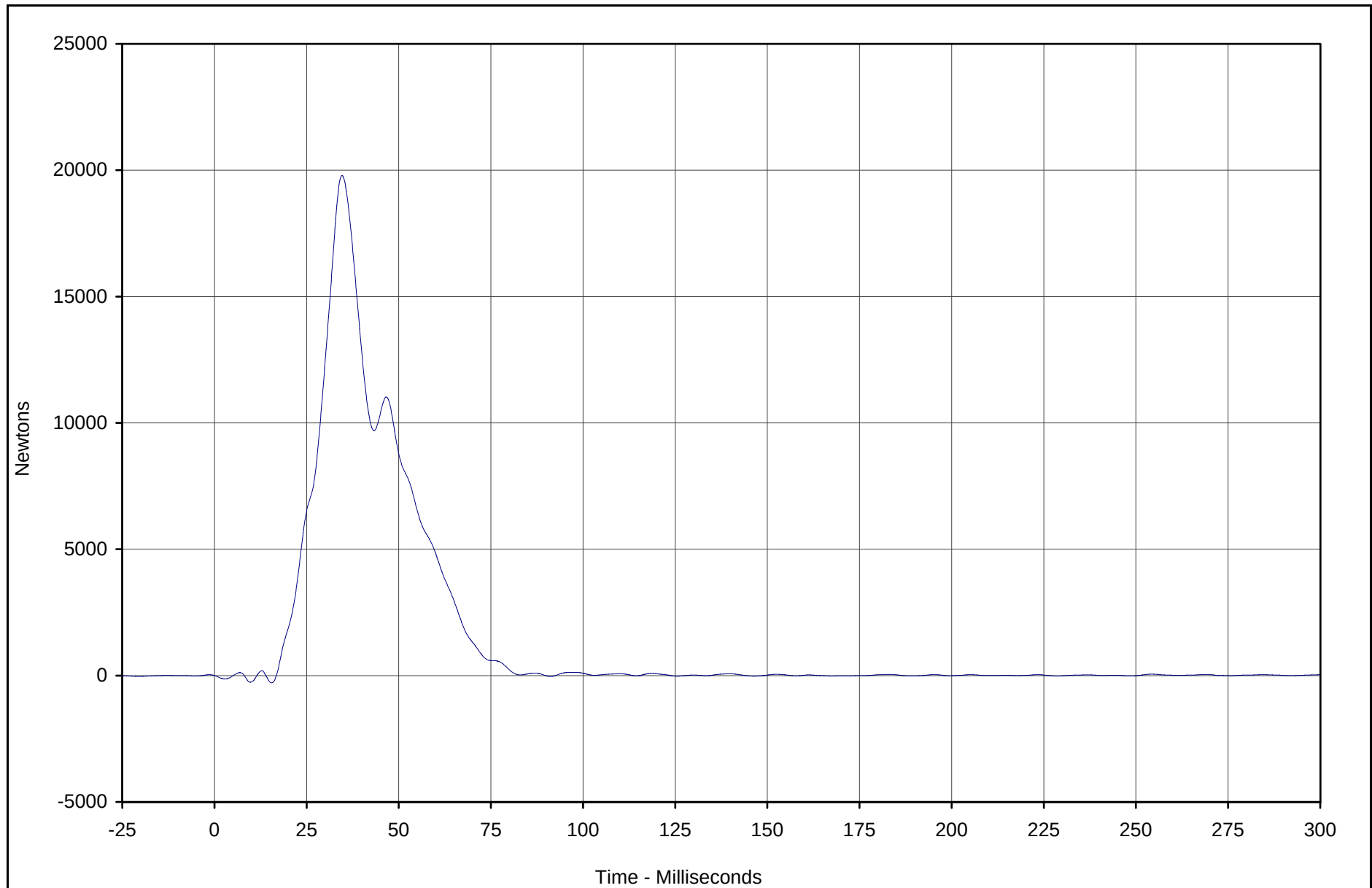
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-23



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force C8	123	FIL	Newtons	19796.3	34.6	-287.0	15.5	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

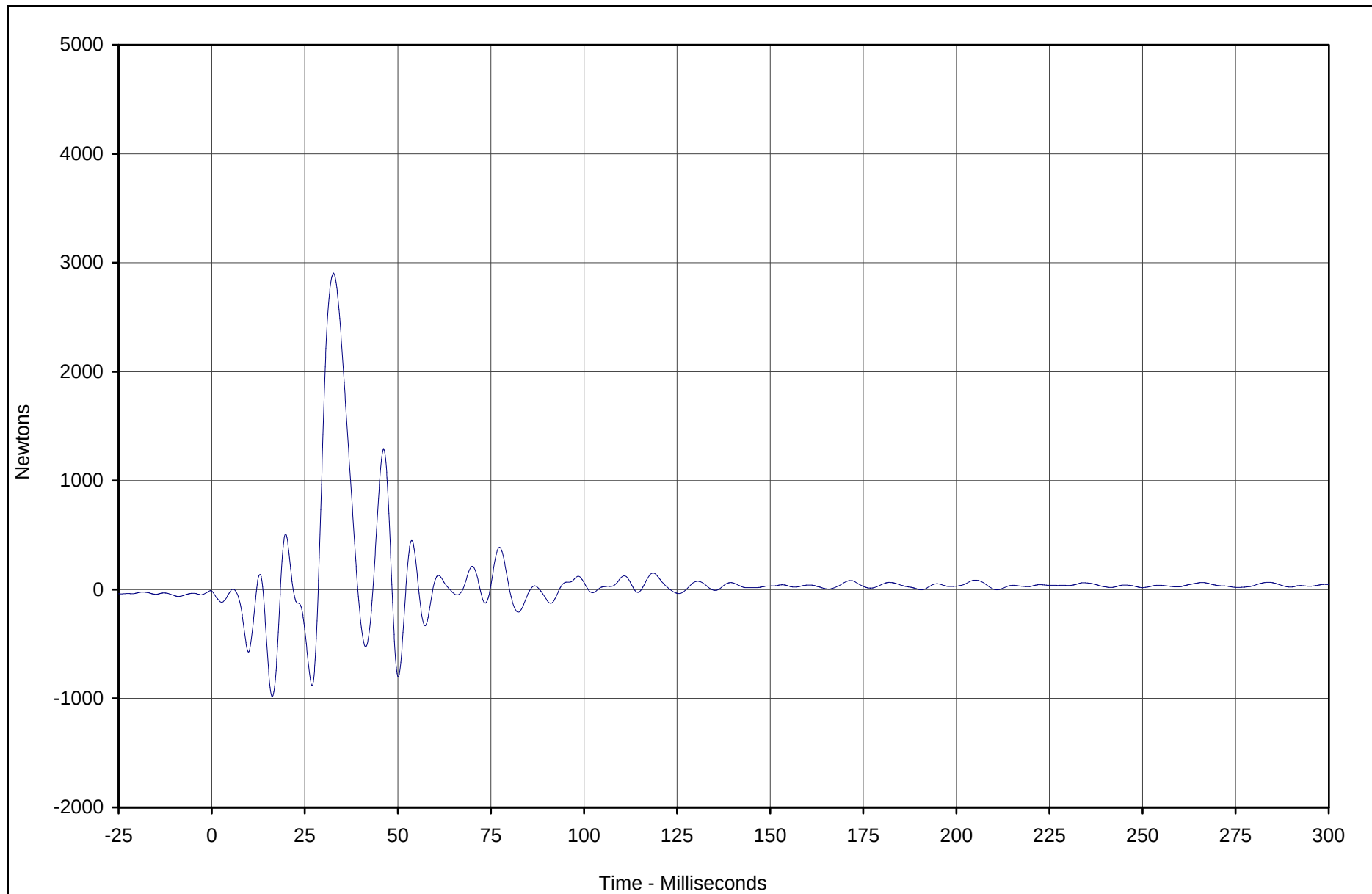
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-24



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Barrier Force C9	124	FIL	Newtons	2904.2	32.7	-982.5	16.3	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

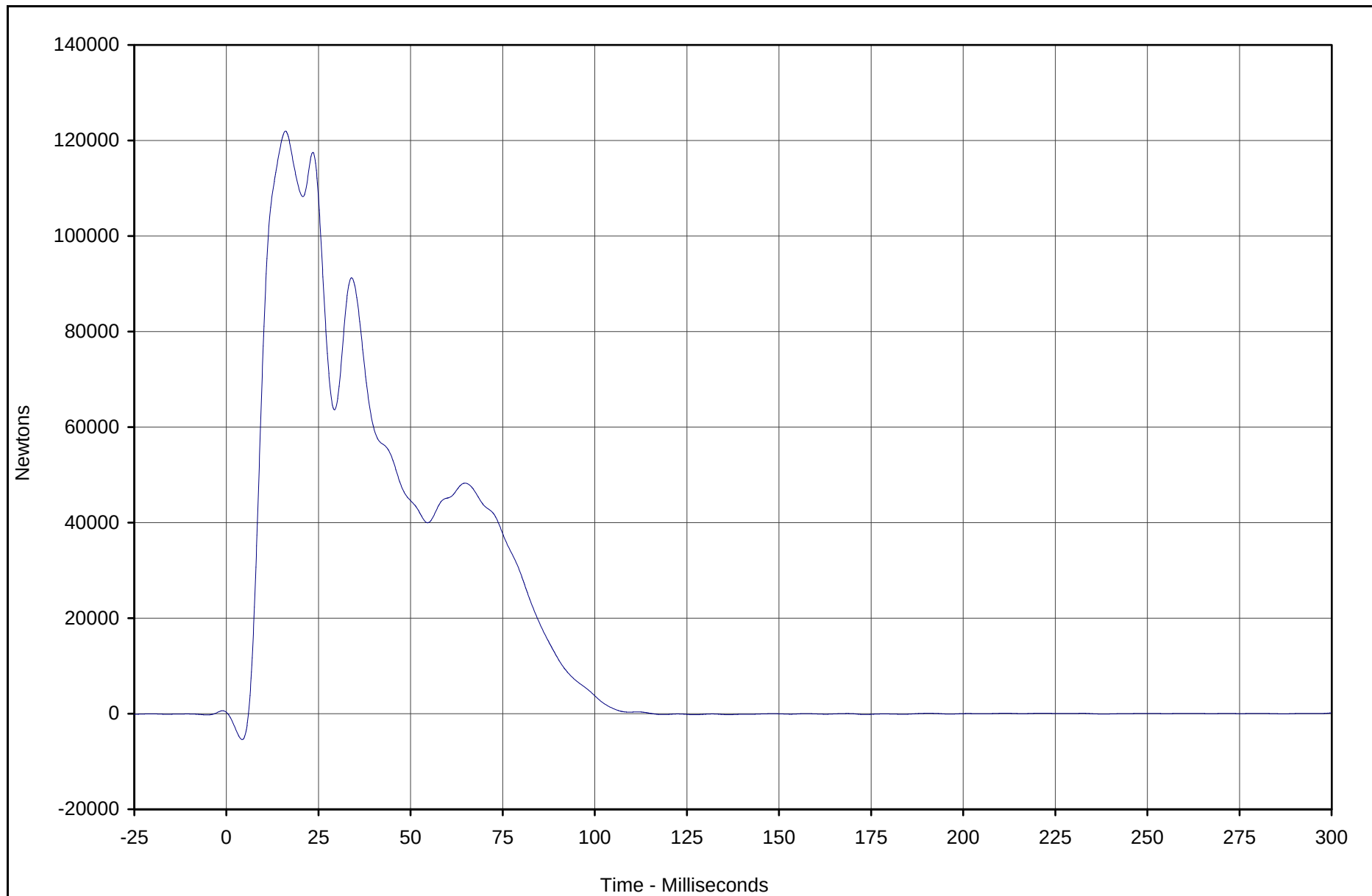
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-25



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 1	001	SUM	Newtons	121956.1	16.0	-5415.2	4.3	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

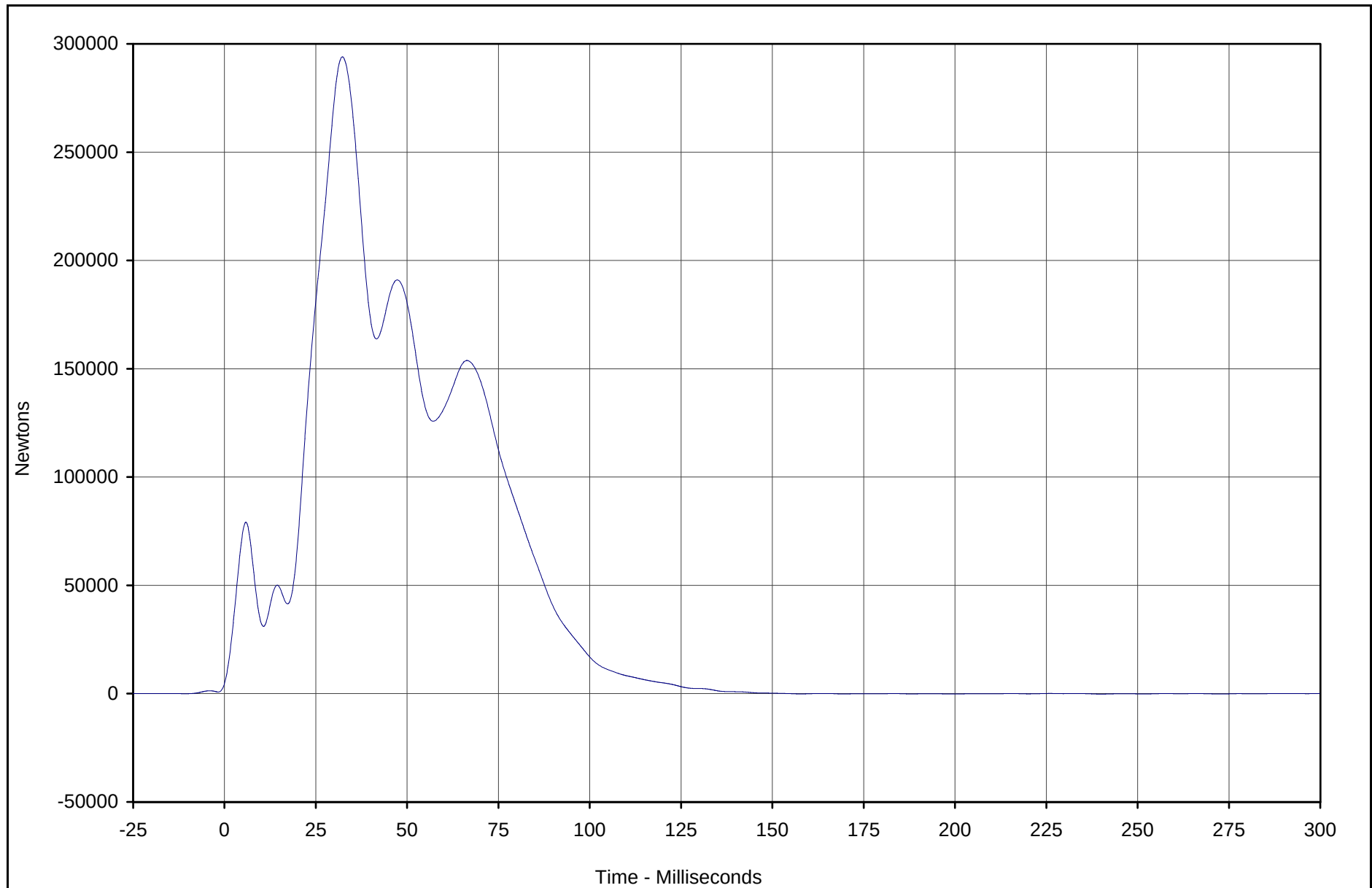
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-26



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 2	002	SUM	Newtons	293987.8	32.3	-212.3	240.0	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

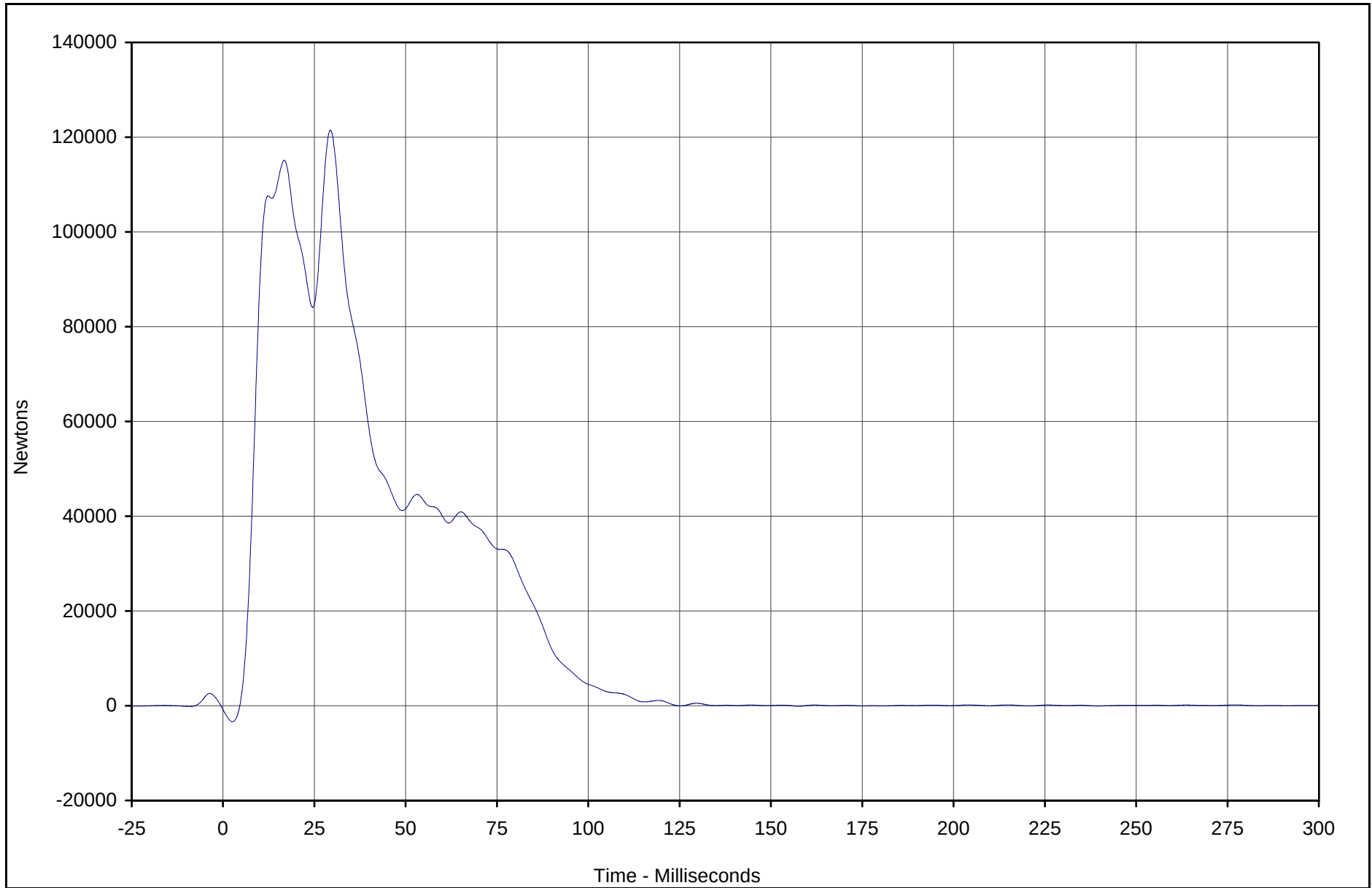
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-27



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 3	003	SUM	Newtons	121503.1	29.4	-3383.2	2.6	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

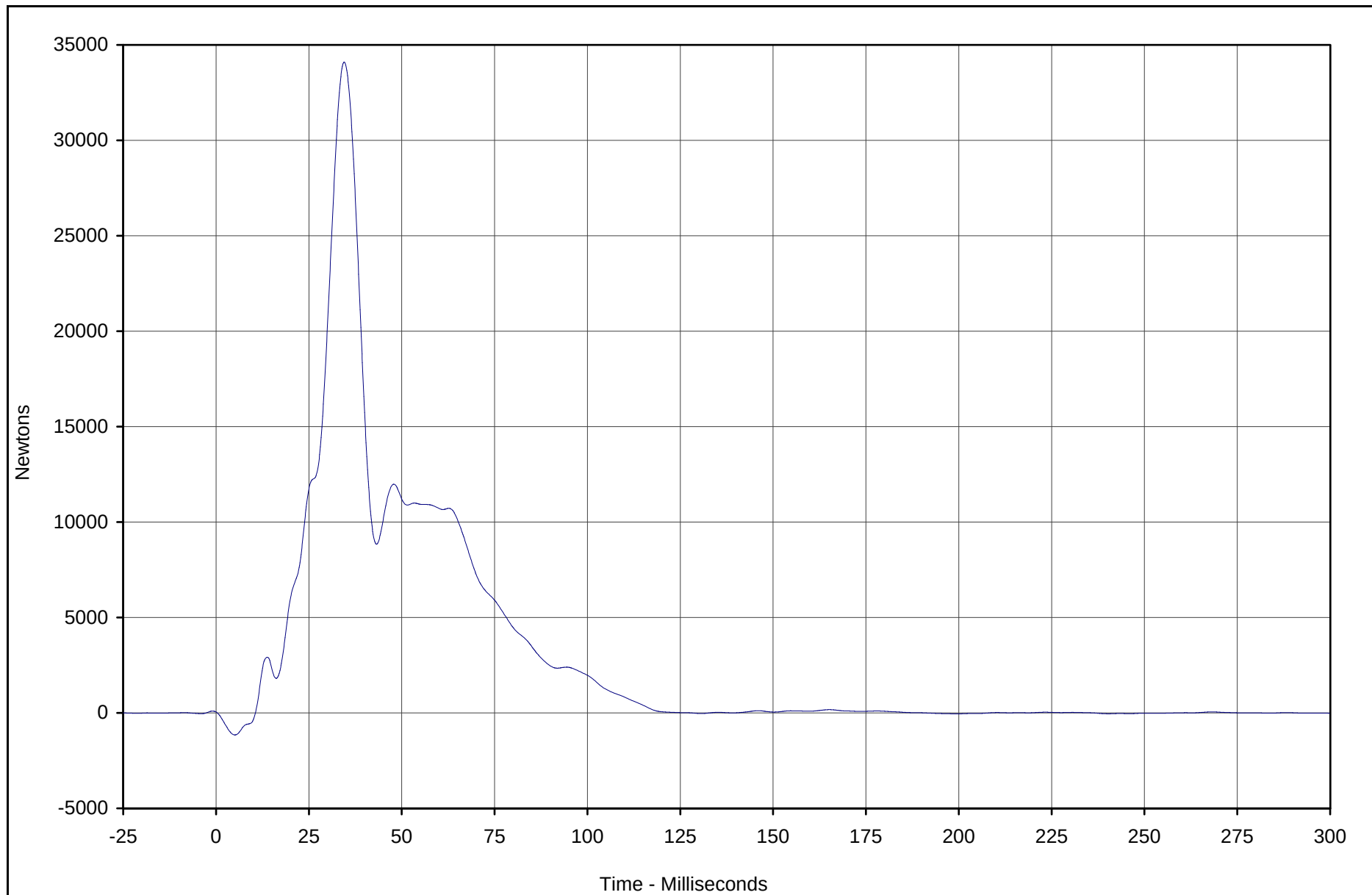
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-28



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 4	004	SUM	Newtons	34104.6	34.5	-1155.4	5.1	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

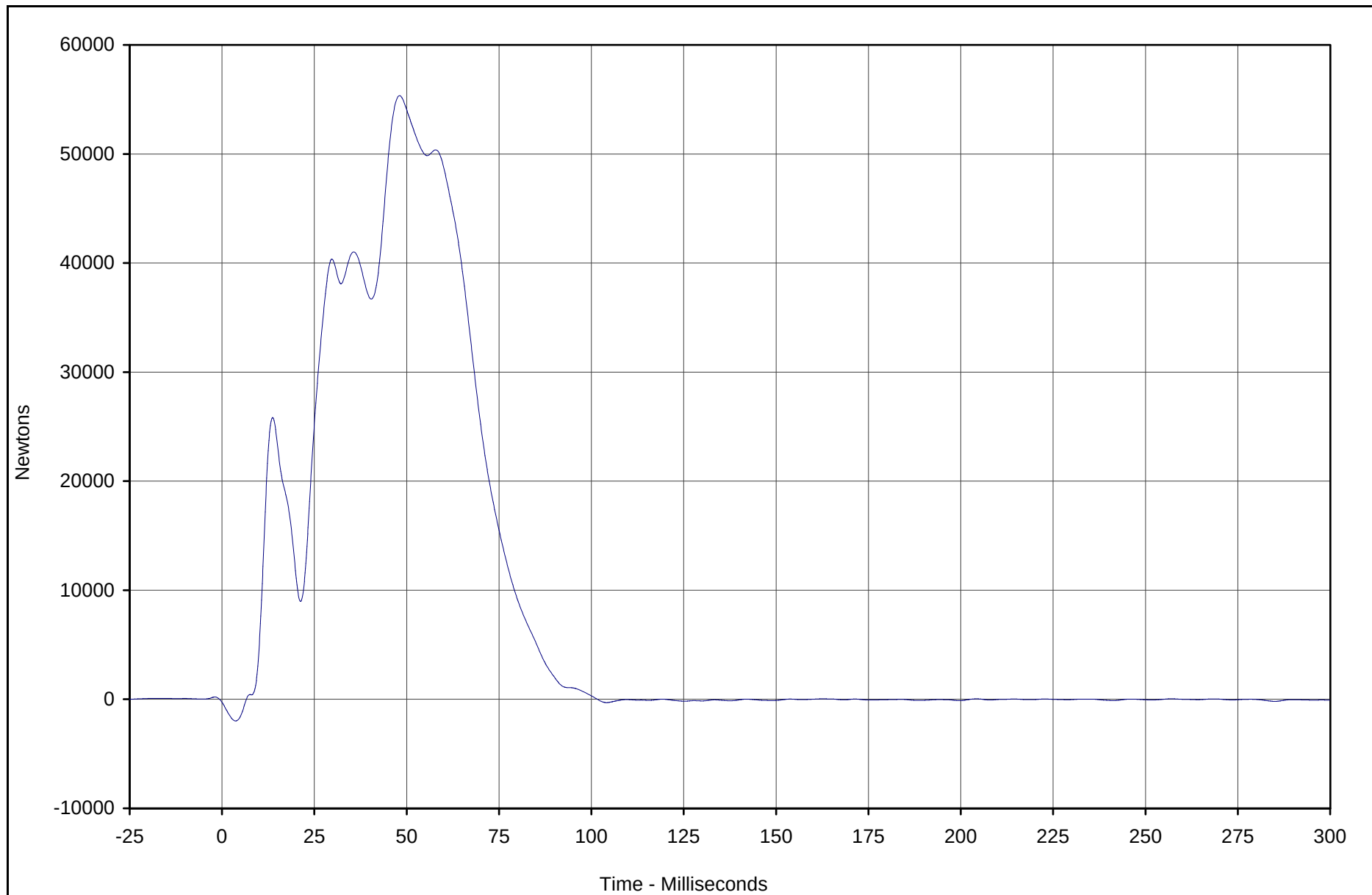
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-29



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 5	005	SUM	Newtons	55348.5	48.1	-1987.9	3.7	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

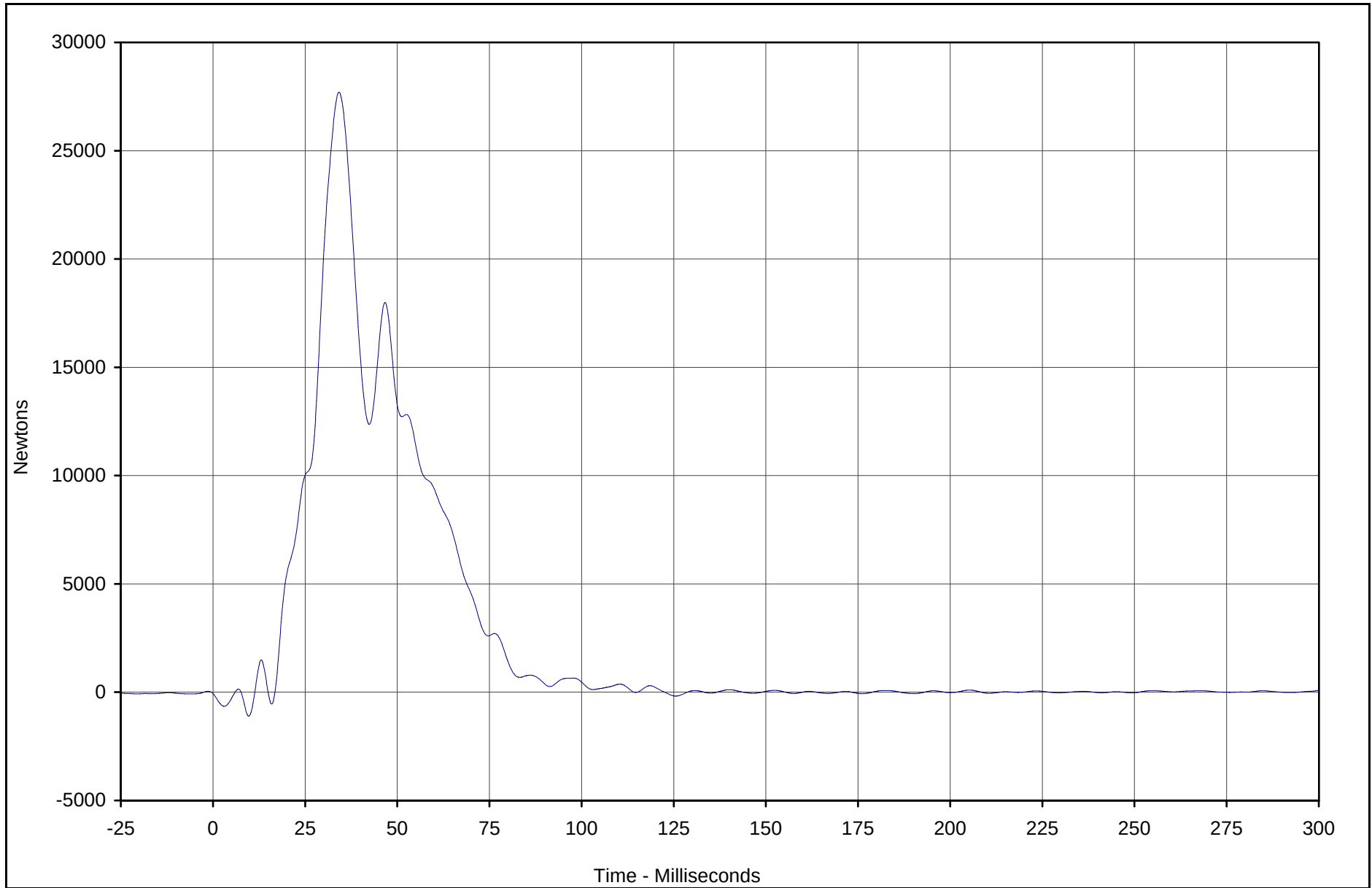
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-30



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Sum Group 6	006	SUM	Newtons	27700.9	34.2	-1106.9	9.7	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

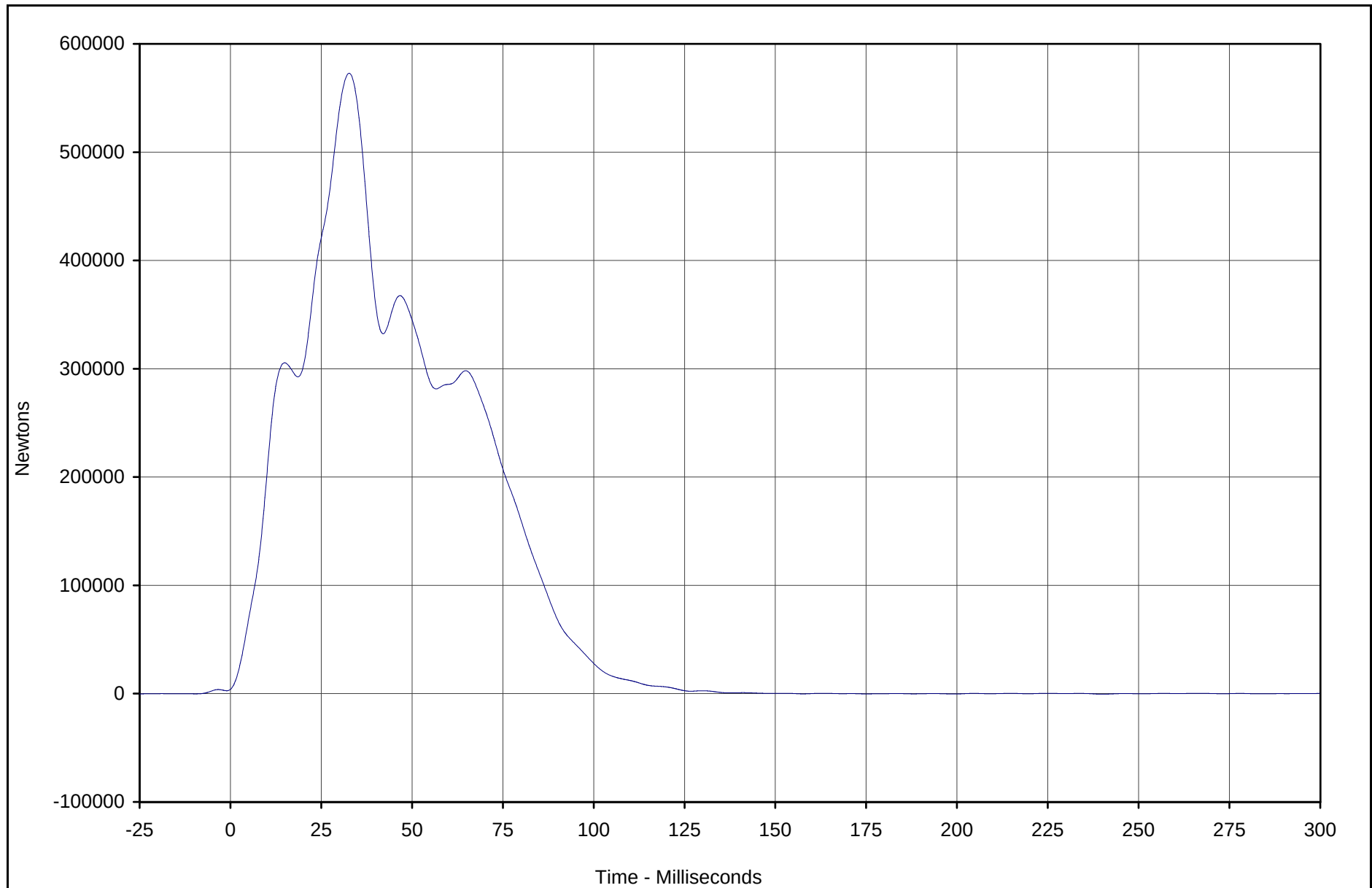
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-31



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Barrier Force Total Sum	007	SUM	Newtons	572882.3	32.7	-502.4	240.0	60



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

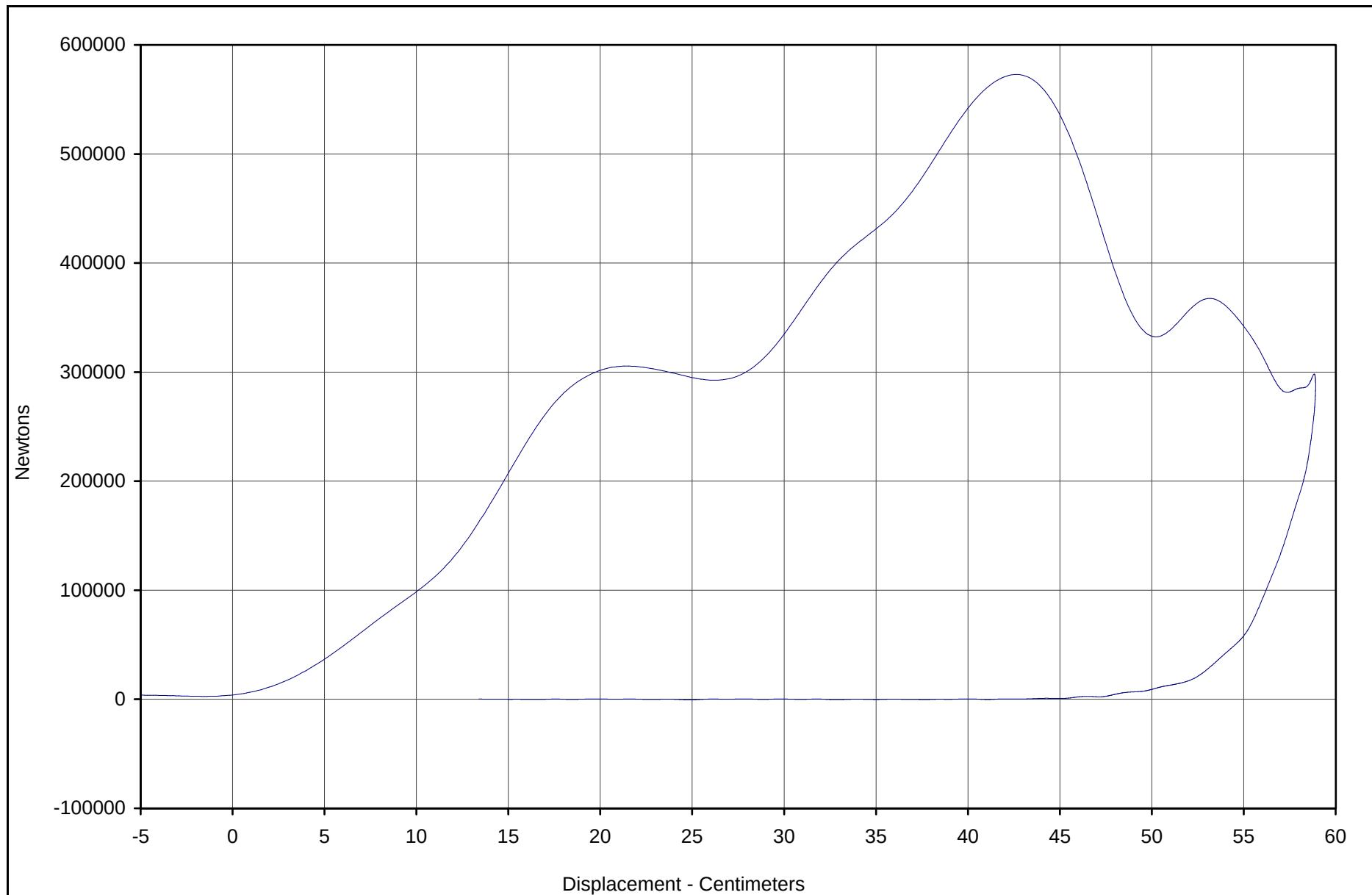
Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

C-32



Curve Description	CURNO	Type	Units	Max	CM	Energy (Joules)	SAE Class
Barrier Force Total Sum vs. Displ.	001	XVY	Newtons	572882.3	42.6	170174.8	60/180



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07

BARRIER LOAD CELL SUMMARY DATA

Test Vehicle: 2002 Kia Spectra 4 Door Sedan

NHTSA No.: M20510

Test Program: 2002 NHTSA 35mph NCAP

Test Date: 5/7/02

Location	Max	Time	Min	Time
Driver Barrier Force A2	1074.7	12.4	-1207.2	18.0
Driver Barrier Force A3	3419.7	35.0	-1114.9	3.4
Driver Barrier Force A4	22717.9	31.6	-974.0	2.4
Driver Barrier Force A5	63799.2	31.5	-944.8	1.8
Driver Barrier Force A6	8263.3	31.6	-707.1	1.3
Driver Barrier Force A7	17324.3	32.9	-684.6	1.9
Driver Barrier Force A8	10383.4	36.6	-310.2	17.1
Driver Barrier Force A9	1883.3	29.9	-1515.9	33.6
Driver Barrier Force B2	5307.8	24.1	-743.4	5.9
Driver Barrier Force B3	119309.6	16.5	-3345.4	4.3
Driver Barrier Force B4	32495.3	33.5	-503.9	0.0
Driver Barrier Force B5	83346.7	31.8	-61.8	240.8
Driver Barrier Force B6	86275.3	33.3	-42.9	239.6
Driver Barrier Force B7	100783.9	16.7	-2174.4	3.1
Driver Barrier Force B8	39464.8	28.1	-530.2	3.7
Driver Barrier Force B9	1830.8	29.8	-828.6	49.7
Driver Barrier Force C2	13348.9	33.4	-663.7	6.1
Driver Barrier Force C3	21500.0	35.1	-571.2	4.4
Driver Barrier Force C4	12703.5	34.9	-877.7	4.1
Driver Barrier Force C5	23090.6	49.0	-609.0	3.5
Driver Barrier Force C6	20386.6	47.6	-520.9	3.4
Driver Barrier Force C7	6232.0	30.5	-414.7	3.3
Driver Barrier Force C8	19796.3	34.6	-287.0	15.5
Driver Barrier Force C9	2904.2	32.7	-982.5	16.3
Barrier Force Sum Group 1	121956.1	16.0	-5415.2	4.3
Barrier Force Sum Group 2	293987.8	32.3	-212.3	240.0
Barrier Force Sum Group 3	121503.1	29.4	-3383.2	2.6
Barrier Force Sum Group 4	34104.6	34.5	-1155.4	5.1
Barrier Force Sum Group 5	55348.5	48.1	-1987.9	3.7
Barrier Force Sum Group 6	27700.9	34.2	-1106.9	9.7
Barrier Force Total Sum	572882.3	32.7	-502.4	240.0

Locations A1,B1,C1, and D1 through D9 (12 locations) were not recorded.

APPENDIX D

INSTRUMENTATION DATA CHANNEL ASSIGNMENTS

2002 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 34
5/7/02
2002 Kia Spectra 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	HEAD, PRIMARY	X	KEAC039	Accel.,1/2 bridge	Endevco	7264-2000	G
2	HEAD, PRIMARY	Y	KEAC038	Accel.,1/2 bridge	Endevco	7264-2000	G
3	HEAD, PRIMARY	Z	KEAC027	Accel.,1/2 bridge	Endevco	7264-2000	G
4	HEAD, REDUNDANT	X	KEAC031	Accel.,1/2 bridge	Endevco	7264-2000	G
5	HEAD, REDUNDANT	Y	KEAC032	Accel.,1/2 bridge	Endevco	7264-2000	G
6	HEAD, REDUNDANT	Z	KEAC026	Accel.,1/2 bridge	Endevco	7264-2000	G
7	NECK FORCE	X	GPUN02FX	Load cell, six axis neck	R. A. Denton	1716A	N
8	NECK FORCE	Y	GPUN02FY	Load cell, six axis neck	R. A. Denton	1716A	N
9	NECK FORCE	Z	GPUN02FZ	Load cell, six axis neck	R. A. Denton	1716A	N
10	NECK MOMENT	X	GPUN02MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
11	NECK MOMENT	Y	GPUN02MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
12	NECK MOMENT	Z	GPUN02MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
13	CHEST , PRIMARY	X	GPAC031	Accel., 1/2 bridge	Endevco	7264-2000	G
14	CHEST , PRIMARY	Y	GPAC024	Accel., 1/2 bridge	Endevco	7264-2000	G
15	CHEST , PRIMARY	Z	GPAC029	Accel., 1/2 bridge	Endevco	7264-2000	G
16	CHEST , REDUNDANT	X	KEAC023	Accel.,1/2 bridge	Endevco	7264-200	G
17	CHEST , REDUNDANT	Y	KEAC022	Accel.,1/2 bridge	Endevco	7264-200	G
18	CHEST , REDUNDANT	Z	KEAC024	Accel.,1/2 bridge	Endevco	7264-200	G
19	CHEST DISPLACEMENT	X	GPCP001	Rotary Pot Chest	Servo	14CBI	MM
20	PELVIS, PRIMARY	X	KEAC019	Accel.,1/2 bridge	Endevco	7264-200	G
21	PELVIS, PRIMARY	Y	KEAC020	Accel.,1/2 bridge	Endevco	7264-200	G
22	PELVIS, PRIMARY	Z	KEAC021	Accel.,1/2 bridge	Endevco	7264-200	G
23	LEFT FEMUR FORCE	Z	KEFF001	Load cell, Femur	R.A. Denton	2121	N
24	RIGHT FEMUR FORCE	Z	KEFF002	Load cell, Femur	R.A. Denton	2121	N

2002 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Driver A.T.D. Serial Number 34
5/7/02
2002 Kia Spectra 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
25	UP. TIBIA LEFT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
26	UP. TIBIA LEFT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
27	UP. TIBIA RIGHT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
28	UP. TIBIA RIGHT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
29	LWR. TIBIA LEFT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
30	LWR. TIBIA LEFT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
31	LWR. TIBIA LEFT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
32	LWR. TIBIA RIGHT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
33	LWR. TIBIA RIGHT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
34	LWR. TIBIA RIGHT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
35	FOOT LEFT, AFT	X	KEIC003X	Accel., Foot Triax	I.C. Sensor	3031-500	G
36	FOOT LEFT, AFT	Z	KEIC003Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
37	FOOT LEFT, FORE	Z	KEIC003Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
38	FOOT RIGHT, AFT	X	KEIC004X	Accel., Foot Triax	I.C. Sensor	3031-500	G
39	FOOT RIGHT, AFT	Z	KEIC004Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
40	FOOT RIGHT, FORE	Z	KEIC004Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
41	LAP BELT FORCE	X	KELC003	Load cell, Seat belt	Lebow	3371	N
42	SHOULDER BELT FORCE	X	KELC004	Load cell, Seat belt	Lebow	3371	N
43	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	CM
44	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

2002 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 35
5/7/02
2002 Kia Spectra 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
45	HEAD, PRIMARY	X	GPAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
46	HEAD, PRIMARY	Y	GPAC002	Accel., 1/2 bridge	Endevco	7264-2000	G
47	HEAD, PRIMARY	Z	GPAC003	Accel., 1/2 bridge	Endevco	7264-2000	G
48	HEAD, REDUNDANT	X	GPAC032	Accel., 1/2 bridge	Endevco	7264-2000	G
49	HEAD, REDUNDANT	Y	GPAC021	Accel., 1/2 bridge	Endevco	7264-2000	G
50	HEAD, REDUNDANT	Z	GPAC026	Accel., 1/2 bridge	Endevco	7264-2000	G
51	NECK FORCE	X	GPUN01FX	Load cell, six axis neck	R. A. Denton	1716A	N
52	NECK FORCE	Y	GPUN01FY	Load cell, six axis neck	R. A. Denton	1716A	N
53	NECK FORCE	Z	GPUN01FZ	Load cell, six axis neck	R. A. Denton	1716A	N
54	NECK MOMENT	X	GPUN01MX	Load cell, six axis neck	R. A. Denton	1716A	Nm
55	NECK MOMENT	Y	GPUN01MY	Load cell, six axis neck	R. A. Denton	1716A	Nm
56	NECK MOMENT	Z	GPUN01MZ	Load cell, six axis neck	R. A. Denton	1716A	Nm
57	CHEST , PRIMARY	X	GPAC005	Accel., 1/2 bridge	Endevco	7264-2000	G
58	CHEST , PRIMARY	Y	GPAC011	Accel., 1/2 bridge	Endevco	7264-2000	G
59	CHEST , PRIMARY	Z	GPAC010	Accel., 1/2 bridge	Endevco	7264-2000	G
60	CHEST , REDUNDANT	X	GPAC034	Accel., 1/2 bridge	Endevco	7264-2000	G
61	CHEST , REDUNDANT	Y	GPAC023	Accel., 1/2 bridge	Endevco	7264-2000	G
62	CHEST , REDUNDANT	Z	GPAC020	Accel., 1/2 bridge	Endevco	7264-2000	G
63	CHEST DISPLACEMENT	X	GPCP002	Rotary Pot Chest	Servo	14CBI	MM
64	PELVIS, PRIMARY	X	GPAC025	Accel., 1/2 bridge	Endevco	7264-2000	G
65	PELVIS, PRIMARY	Y	GPAC022	Accel., 1/2 bridge	Endevco	7264-2000	G
66	PELVIS, PRIMARY	Z	GPAC019	Accel., 1/2 bridge	Endevco	7264-2000	G
67	LEFT FEMUR FORCE	Z	KEFF003	Load cell, Femur	R.A. Denton	2121	N
68	RIGHT FEMUR FORCE	Z	KEFF004	Load cell, Femur	R.A. Denton	2121	N

2002 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Passenger A.T.D. Serial Number 35
5/7/02
2002 Kia Spectra 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
69	UP. TIBIA LEFT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
70	UP. TIBIA LEFT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
71	UP. TIBIA RIGHT MOM.	X	GPUT09MX	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
72	UP. TIBIA RIGHT MOM.	Y	GPUT09MY	2 ch., Upper tibia gage	R. A. Denton	1583	Nm
73	LWR. TIBIA LEFT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
74	LWR. TIBIA LEFT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
75	LWR. TIBIA LEFT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
76	LWR. TIBIA RIGHT MOM.	X	GPLT09MX	3 ch., lower tibia gage	R. A. Denton	3093	Nm
77	LWR. TIBIA RIGHT MOM.	Y	GPLT09MY	3 ch., lower tibia gage	R. A. Denton	3093	Nm
78	LWR. TIBIA RIGHT FORCE	Z	GPLT09FZ	3 ch., lower tibia gage	R. A. Denton	3093	N
79	FOOT LEFT, AFT	X	KEIC002X	Accel., Foot Triax	I.C. Sensor	3031-500	G
80	FOOT LEFT, AFT	Z	KEIC002Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
81	FOOT LEFT, FORE	Z	KEIC002Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
82	FOOT RIGHT, AFT	X	KEIC001X	Accel., Foot Triax	I.C. Sensor	3031-500	G
83	FOOT RIGHT, AFT	Z	KEIC001Y	Accel., Foot Triax	I.C. Sensor	3031-500	G
84	FOOT RIGHT, FORE	Z	KEIC001Z	Accel., Foot Triax	I.C. Sensor	3031-500	G
85	LAP BELT FORCE	X	KELC001	Load cell, Seat belt	Lebow	3371	N
86	SHOULDER BELT FORCE	X	KELC002	Load cell, Seat belt	Lebow	3371	N
87	SHOULDER BELT SPOOL	X	KEPP001	Pullout pot	Celesco	PTX101-0030	MM
88	SHOULDER BELT ELONG.	X	KEEP001	Linear pot., belt stretch	E.T.I.	LCP8-10 10K	MM/CM

**2002 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Vehicle Accelerometers
5/7/02
2002 Kia Spectra 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
89	Left Rear	X	KEVA002	Accel., Pre-Amp	I.C.S/Karco	3031-500	G
90	Right Rear	X	KEVA006	Accel., Vehicle block	I.C. Sensor	3031-200	G
91	Engine Top	X	KEVA012	Accel., Vehicle block	I.C. Sensor	3031-500	G
92	Engine Bottom	X	KEVA008	Accel., Vehicle block	I.C. Sensor	3031-500	G
93	Left Brake Caliper	X	KEVA007	Accel., Vehicle block	I.C. Sensor	3031-500	G
94	Right Brake Caliper	X	KEVA001	Accel., Vehicle block	I.C. Sensor	3031-500	G
95	Instrument Panel	X	KEVA011	Accel., Vehicle block	I.C. Sensor	3031-200	G
96	Left Rear	Z	KEVA005	Accel., Vehicle block	I.C. Sensor	3031-500	G
97	Right Rear	Z	KEVA010	Accel., Vehicle block	I.C. Sensor	3031-200	G

**2002 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
5/7/02
2002 Kia Spectra 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
98	BARRIER FORCE A1	X	BARRIER	Not Used	N/A	N/A	N/A
99	BARRIER FORCE A2	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
100	BARRIER FORCE A3	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
101	BARRIER FORCE A4	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
102	BARRIER FORCE A5	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
103	BARRIER FORCE A6	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
104	BARRIER FORCE A7	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
105	BARRIER FORCE A8	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
106	BARRIER FORCE A9	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
107	BARRIER FORCE B1	X	BARRIER	Not Used	N/A	N/A	N/A
108	BARRIER FORCE B2	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
109	BARRIER FORCE B3	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
110	BARRIER FORCE B4	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
111	BARRIER FORCE B5	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
112	BARRIER FORCE B6	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
113	BARRIER FORCE B7	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
114	BARRIER FORCE B8	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
115	BARRIER FORCE B9	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N

**2002 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Rigid Load Cell Barrier
5/7/02
2002 Kia Spectra 4 Door Sedan**

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
116	BARRIER FORCE C1	X	BARRIER	Not Used	N/A	N/A	N/A
117	BARRIER FORCE C2	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
118	BARRIER FORCE C3	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
119	BARRIER FORCE C4	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
120	BARRIER FORCE C5	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
121	BARRIER FORCE C6	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
122	BARRIER FORCE C7	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
123	BARRIER FORCE C8	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
124	BARRIER FORCE C9	X	BARRIER	Load Cell, LCB	Lebow	1220-FS	N
125	BARRIER FORCE D1	X	BARRIER	Not Used	N/A	N/A	N/A
126	BARRIER FORCE D2	X	BARRIER	Not Used	N/A	N/A	N/A
127	BARRIER FORCE D3	X	BARRIER	Not Used	N/A	N/A	N/A
128	BARRIER FORCE D4	X	BARRIER	Not Used	N/A	N/A	N/A
129	BARRIER FORCE D5	X	BARRIER	Not Used	N/A	N/A	N/A
130	BARRIER FORCE D6	X	BARRIER	Not Used	N/A	N/A	N/A
131	BARRIER FORCE D7	X	BARRIER	Not Used	N/A	N/A	N/A
132	BARRIER FORCE D8	X	BARRIER	Not Used	N/A	N/A	N/A
133	BARRIER FORCE D9	X	BARRIER	Not Used	N/A	N/A	N/A

2002 NHTSA 35mph NCAP
Instrumentation Data Channel Assignments
Nine Accelerometer Head Array Channels
5/7/02
2002 Kia Spectra 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
134	Driver Head CG	X	KEAC039	Accel.,1/2 bridge	Endevco	7264-2000	G
135	Driver Head CG	Y	KEAC038	Accel.,1/2 bridge	Endevco	7264-2000	G
136	Driver Head CG	Z	KEAC027	Accel.,1/2 bridge	Endevco	7264-2000	G
137	Driver Y-arm	Z	GPAC016	Accel., 1/2 bridge	Endevco	7264-2000	G
138	Driver Y-arm	X	GPAC015	Accel., 1/2 bridge	Endevco	7264-2000	G
139	Driver X-arm	Z	GPAC004	Accel., 1/2 bridge	Endevco	7264-2000	G
140	Driver X-arm	Y	GPAC018	Accel., 1/2 bridge	Endevco	7264-2000	G
141	Driver Z-arm	X	GPAC006	Accel., 1/2 bridge	Endevco	7264-2000	G
142	Driver Z-arm	Y	GPAC007	Accel., 1/2 bridge	Endevco	7264-2000	G
143	Passenger Head CG	X	GPAC027	Accel., 1/2 bridge	Endevco	7264-2000	G
144	Passenger Head CG	Y	GPAC002	Accel., 1/2 bridge	Endevco	7264-2000	G
145	Passenger Head CG	Z	GPAC003	Accel., 1/2 bridge	Endevco	7264-2000	G
146	Passenger Y-arm	Z	GPAC012	Accel., 1/2 bridge	Endevco	7264-2000	G
147	Passenger Y-arm	X	GPAC001	Accel., 1/2 bridge	Endevco	7264-2000	G
148	Passenger X-arm	Z	GPAC036	Accel., 1/2 bridge	Endevco	7264-2000	G
149	Passenger X-arm	Y	GPAC014	Accel., 1/2 bridge	Endevco	7264-2000	G
150	Passenger Z-arm	X	GPAC030	Accel., 1/2 bridge	Endevco	7264-2000	G
151	Passenger Z-arm	Y	GPAC037	Accel., 1/2 bridge	Endevco	7264-2000	G

* Duplicate of Head CG Primary Channels

APPENDIX E

DUMMY CALIBRATION DATA



Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Knee Impact Test

ATD Serial No.: 034

Location: Left Knee

Test I.D.: LK01C

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.09	Pass
Peak Probe Force	N	4715 to 5782	5276	Pass
Overall Test Results				Pass

ATD Serial No.: 034

Location: Right Knee

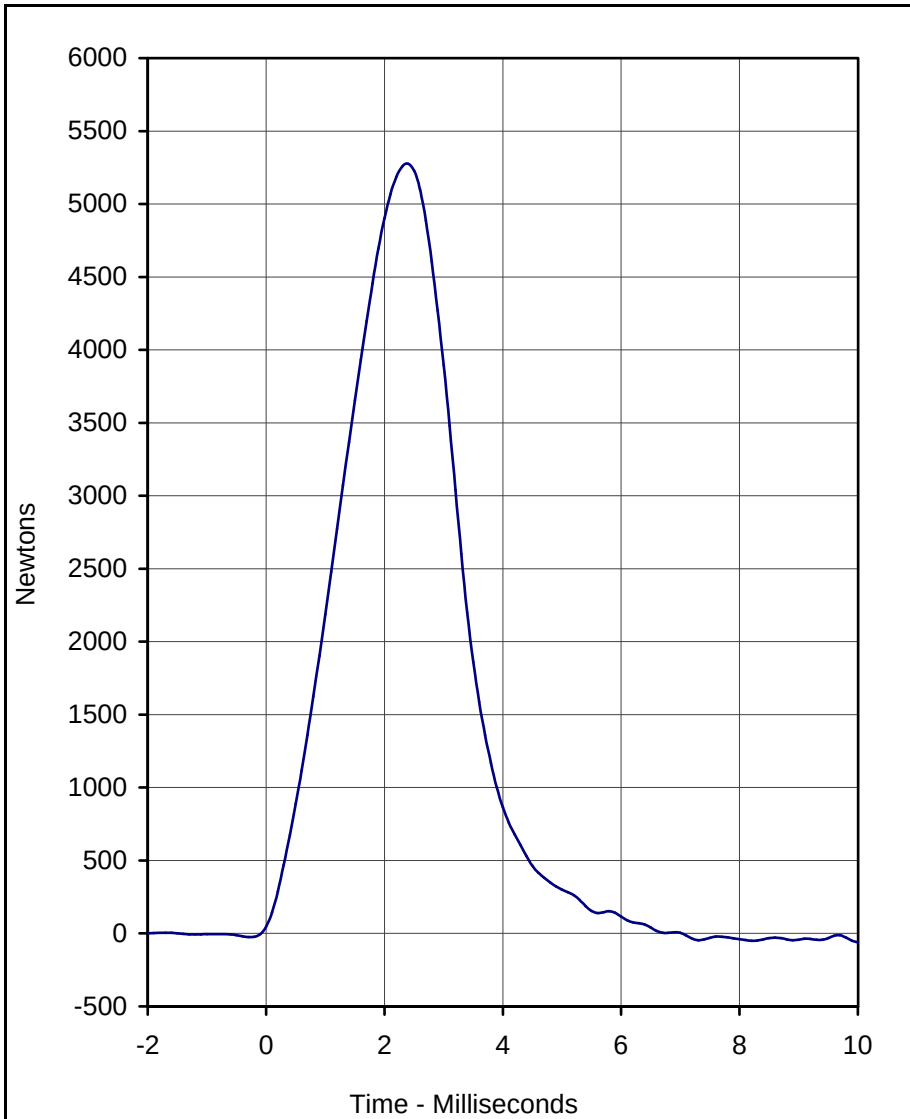
Test I.D.: LK01D

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.13	Pass
Peak Probe Force	N	4715 to 5782	5231	Pass
Overall Test Results				Pass

Laboratory Technician

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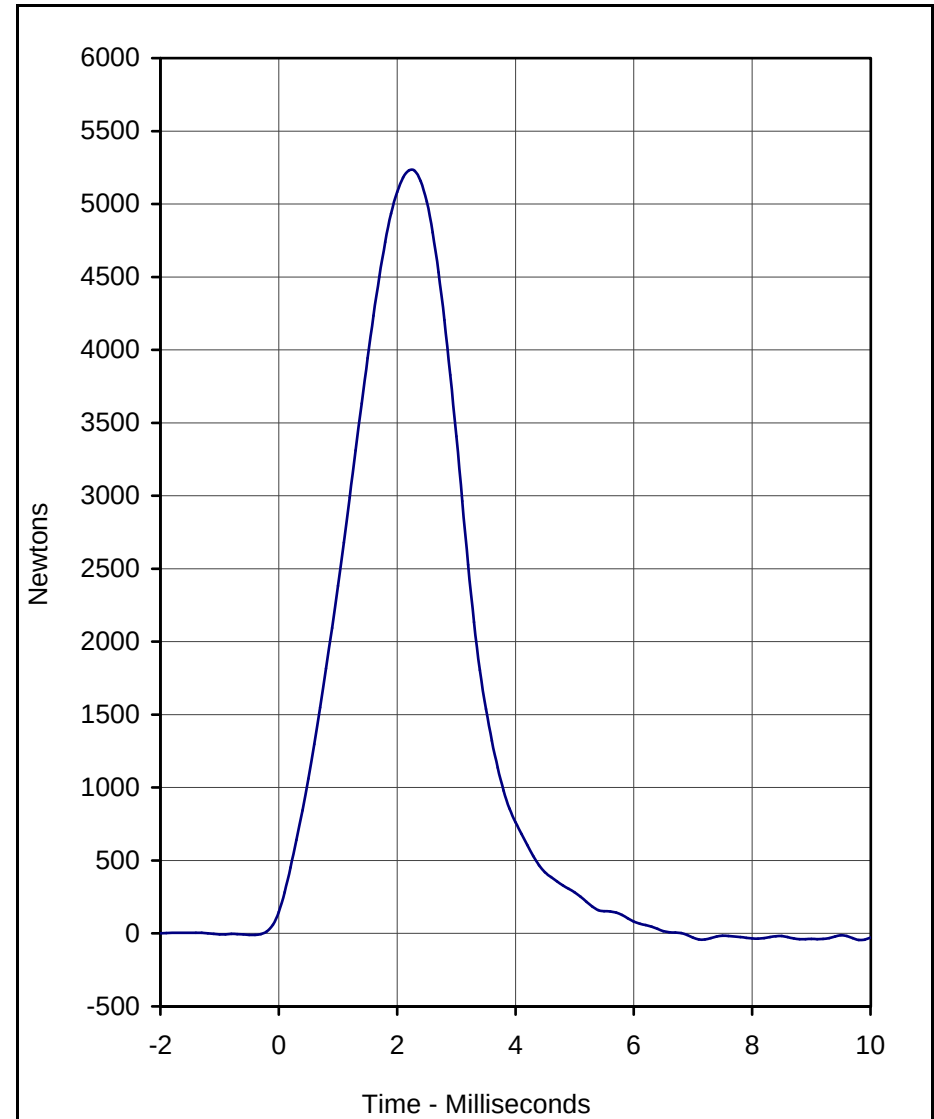
Test Date



Curve Description	Location	Test I.D.	CURNO	Type
Probe Force	Left Knee	LK01C	001	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	5275.8	2.4	-62.1	10.0	600

Test Program: Hybrid III 50th Percentile Male Knee Impact Test
 Test Date: 4/24/02



Curve Description	Location	Test I.D.	CURNO	Type
Probe Force	Right Knee	LK01D	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	5230.9	2.2	-44.6	9.8	600

A.T.D. Serial No.: 034





Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Head Drop Test

ATD Serial No.: 034

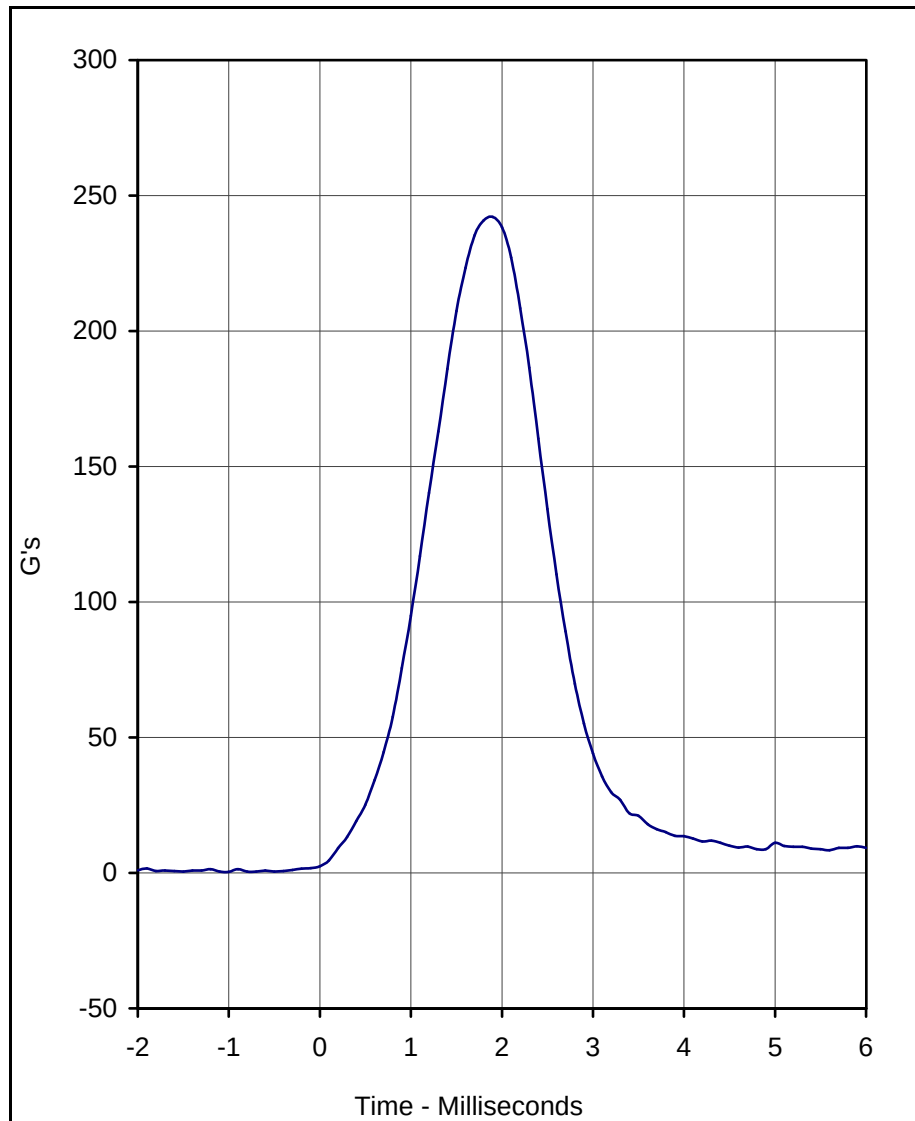
Test I.D.: HD01C

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	242.1	Pass
Peak Lateral Acceleration	G's	≤15.0	2.4	Pass
Overall Test Results				Pass

Laboratory Technician

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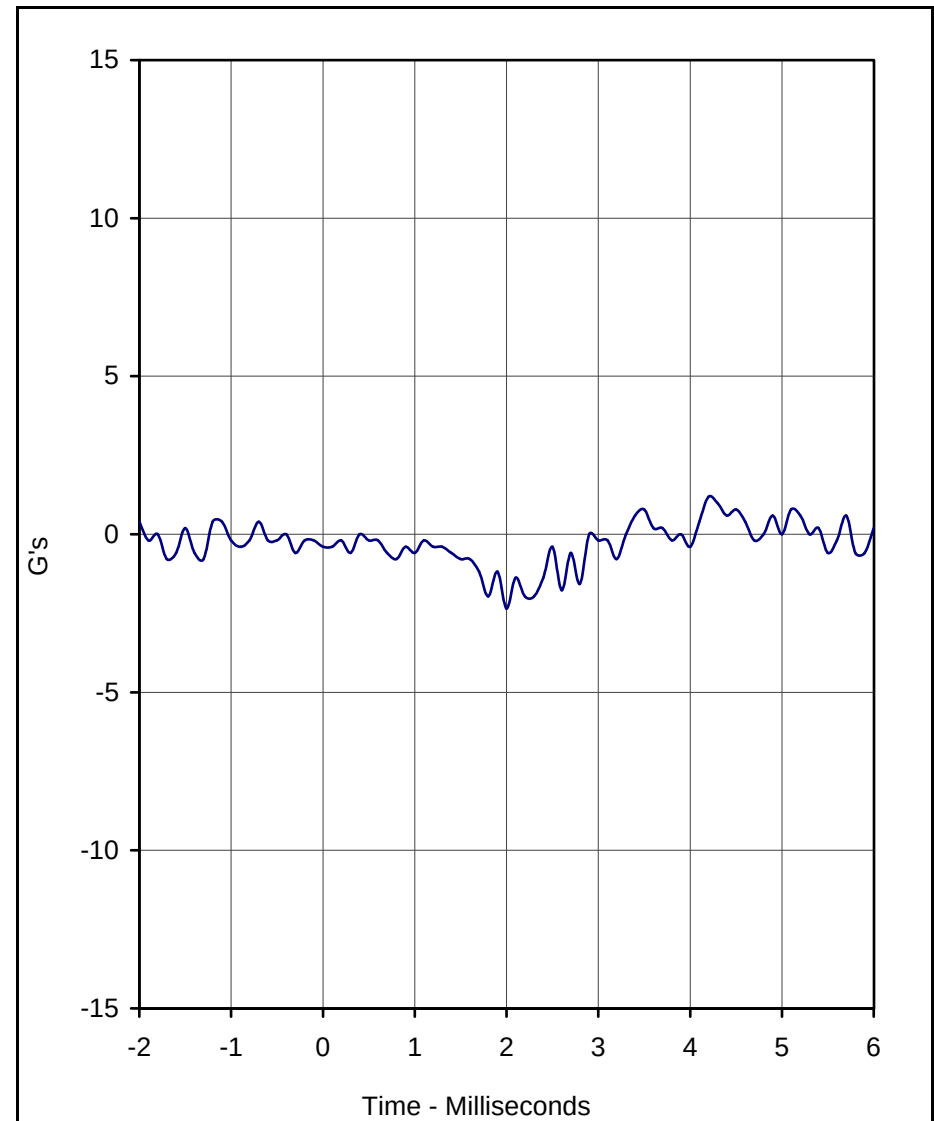
Test Date



Curve Description	CURNO	Type
Head Resultant	001	RES

Units	Max	Time	Min	Time	SAE Class
G's	242.1	1.9	0.4	-1.0	1000

Test Program: Hybrid III 50th Percentile Male Head Drop Test
 Test Date: 4/24/02



Curve Description	CURNO	Type
Head Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	1.2	4.2	-2.4	2.0	1000

A.T.D. Serial No.: 034
 Test I.D.: HD01C





Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Thorax Impact Test

ATD Serial No.: 034

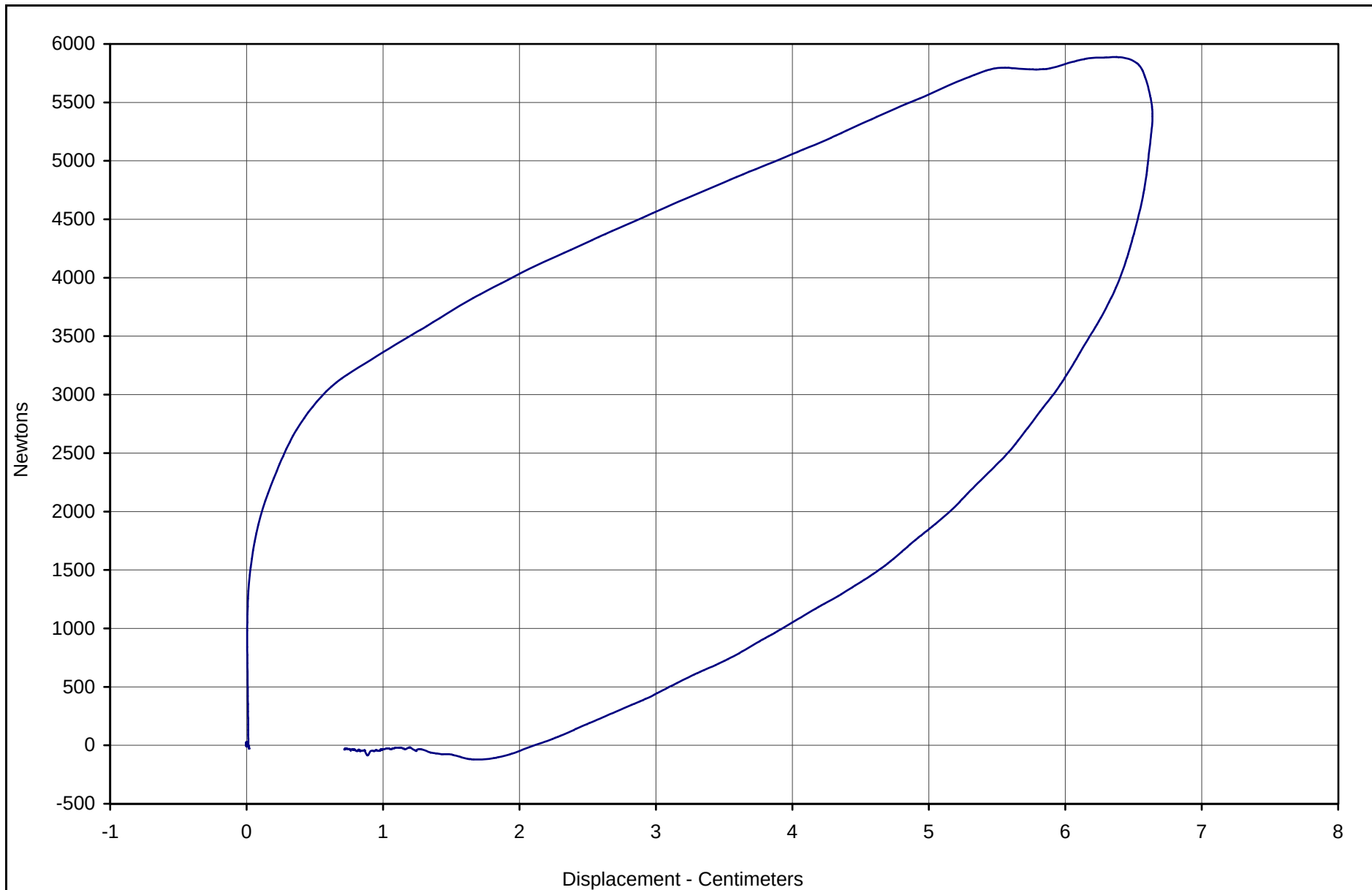
Test I.D.: CH05T

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.80	Pass
Peak Probe Force	Newtons	5159 to 5893	5888	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.64	Pass
Internal Hysteresis	%	69 to 85	76.1	Pass
Overall Test Results				Pass

Laboratory Technician

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Test Date



Curve Description	CURNO	Type	Hysteresis	Peak Chest Displ.	Peak Probe Force	SAE Class
Probe Force vs. Chest Displacement	001	FIL	76.1	6.64	5888.3	180



Test Program: Hybrid III 50th Percentile Male Thorax Impact

A.T.D. Serial No.: 034

Test Date: 4/24/02

Test I.D.: CH05T



Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Neck Flexion Test

ATD Serial No.: 034

Test I.D.: NF05A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.92	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.7	Pass
	20 Msec.	G's	17.6 to 22.6	22.1	Pass
	30 Msec.	G's	12.5 to 18.5	18.4	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	18.4	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	36.2	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	67.5	Pass
	Time	Msec.	57.0 to 64.0	62.5	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	116.2	Pass
Moment About Occipital Condyle	Maximum	Nm	84.1 to 108.5	88.7	Pass
	Time	Msec.	47.0 to 58.0	53.8	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	99.3	Pass
Overall Test Results					Pass

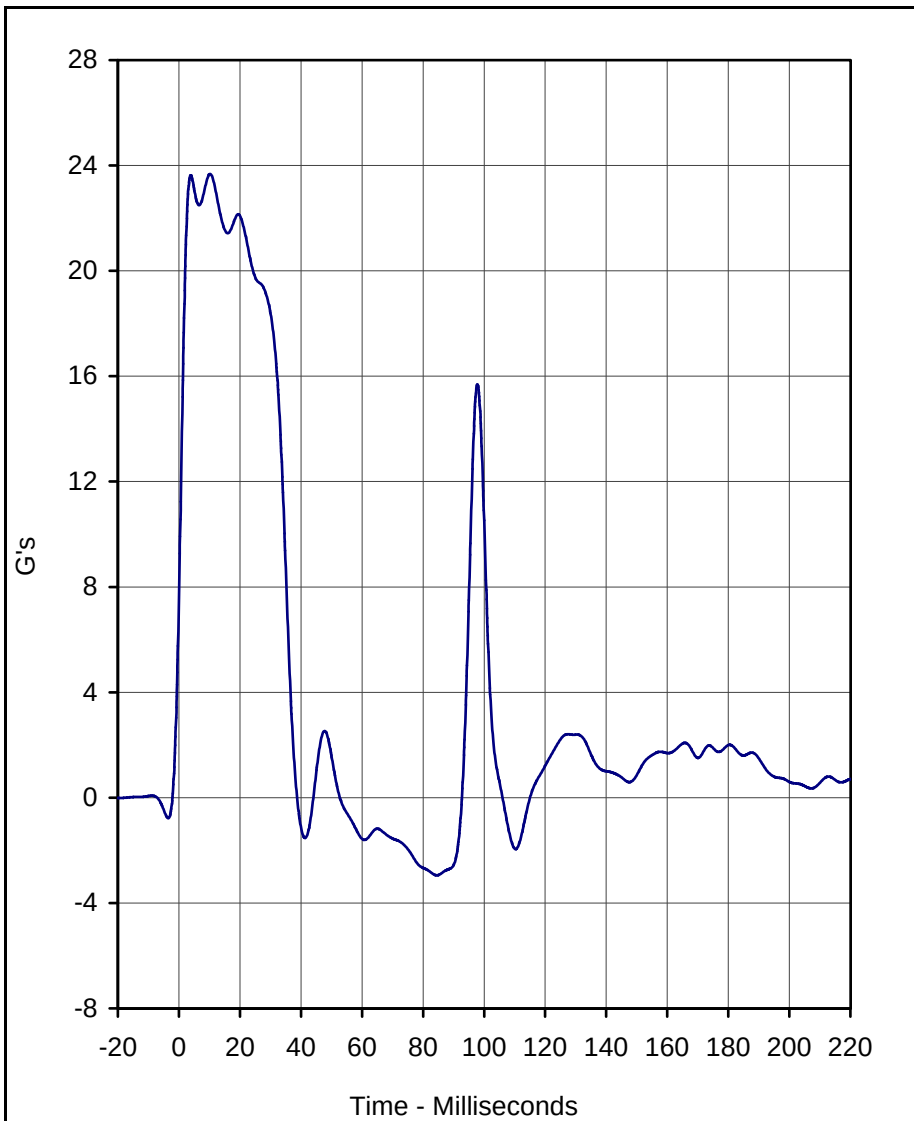
Laboratory Technician

April 24, 2002

Test Date

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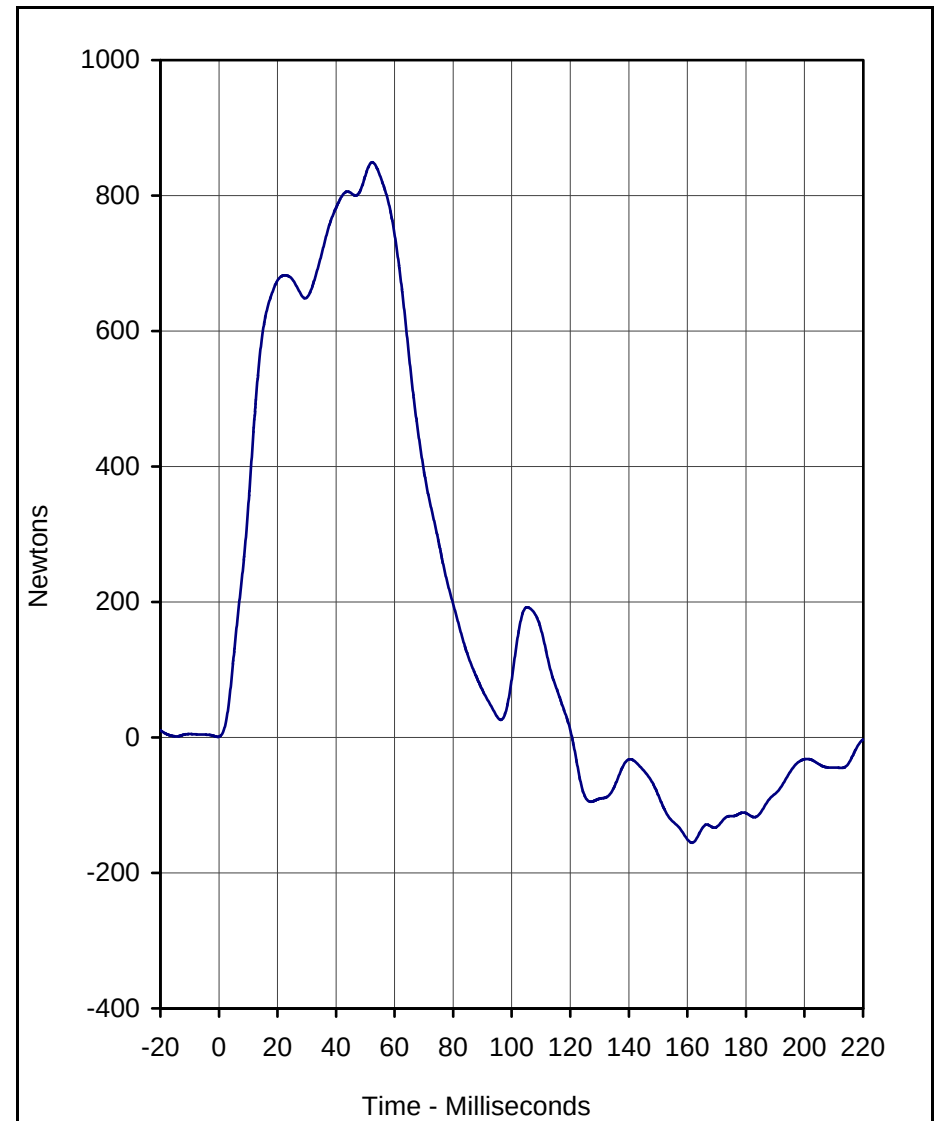
KAR22001-07



Curve Description	CURNO	Type
Pendulum Deceleration	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	23.7	10.2	-2.9	84.5	60

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 Test Date: 4/24/02

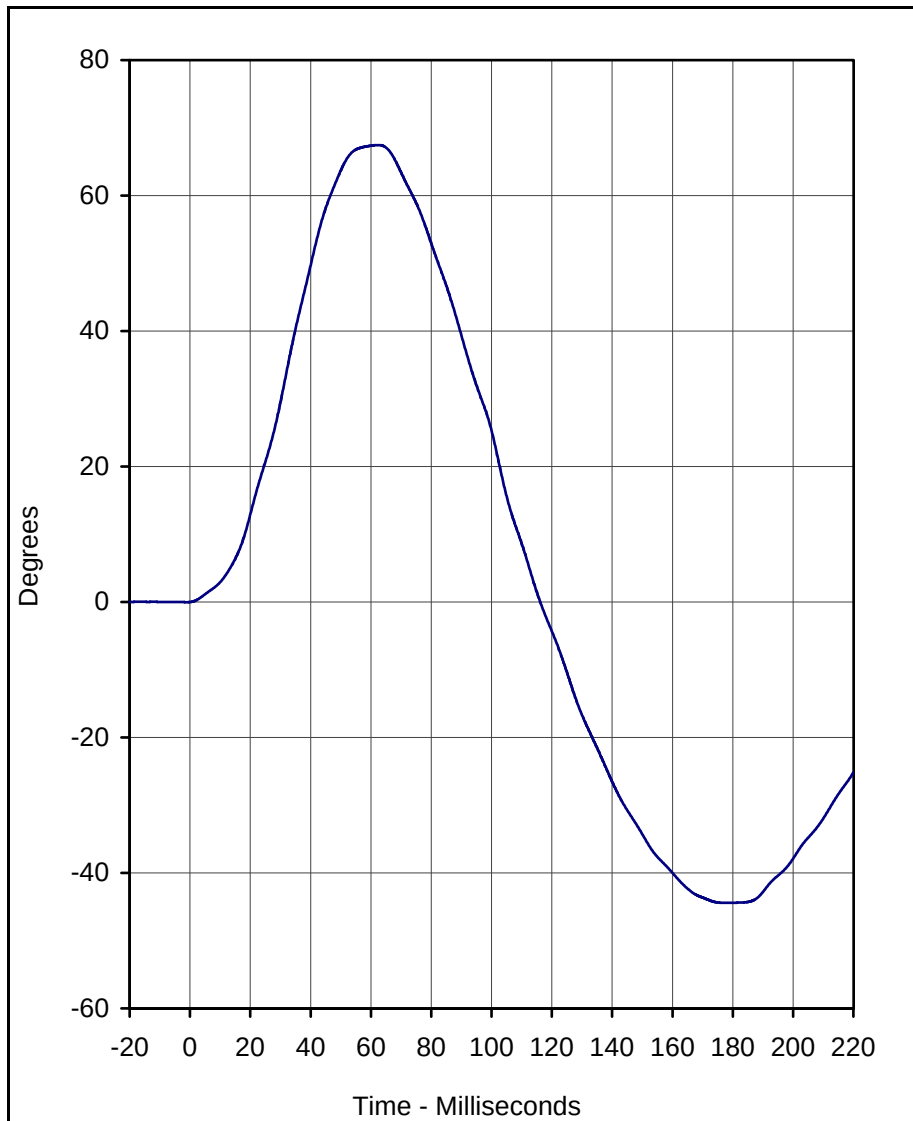


Curve Description	CURNO	Type
Neck Force X	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	849.1	52.4	-155.3	161.6	60

A.T.D. Serial No.: 034
 Test I.D.: NF05A

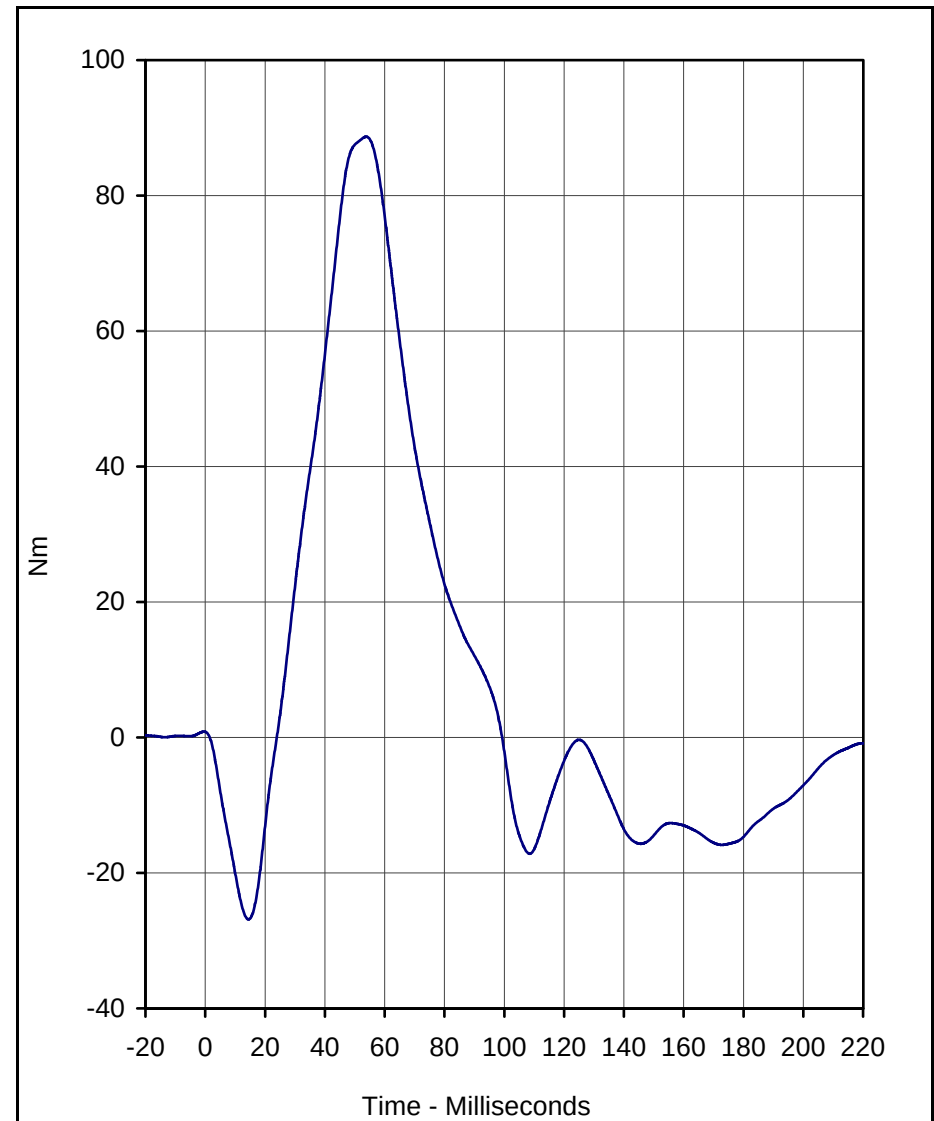




Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	67.5	62.5	-44.4	178.4	60

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 Test Date: 4/24/02



Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	88.7	53.8	-26.9	14.5	60

A.T.D. Serial No.: 034
 Test I.D.: NF05A





Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Neck Extension Test

ATD Serial No.: 034

Test I.D.: NE05A

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	6.13	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	20.0	Pass
	20 Msec.	G's	14.0 to 19.0	17.8	Pass
	30 Msec.	G's	11.0 to 16.0	15.9	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.9	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	38.0	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	86.8	Pass
	Time	Msec.	72.0 to 82.0	76.7	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	147.7	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to- 79.9	-76.4	Pass
	Time	Msec.	65.0 to 79.0	65.7	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	141.7	Pass
Overall Test Results					Pass

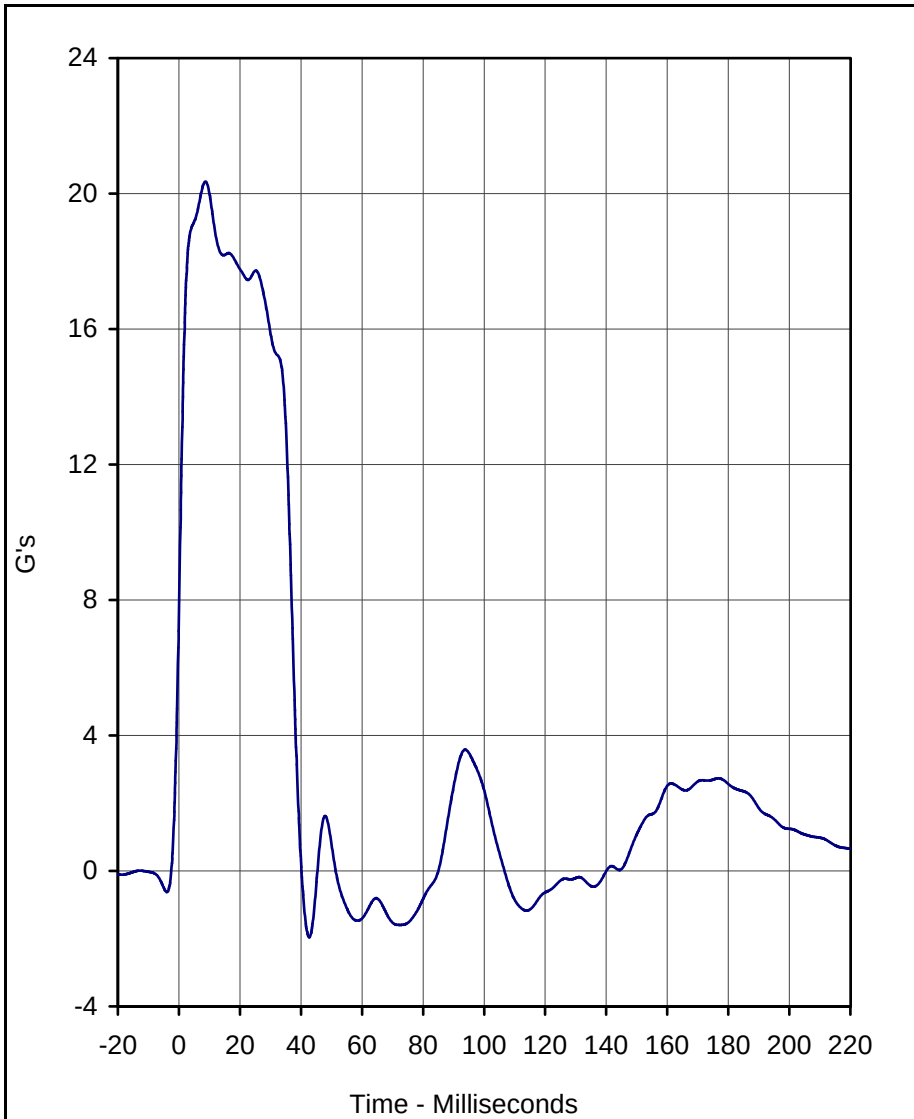
Laboratory Technician

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Test Date

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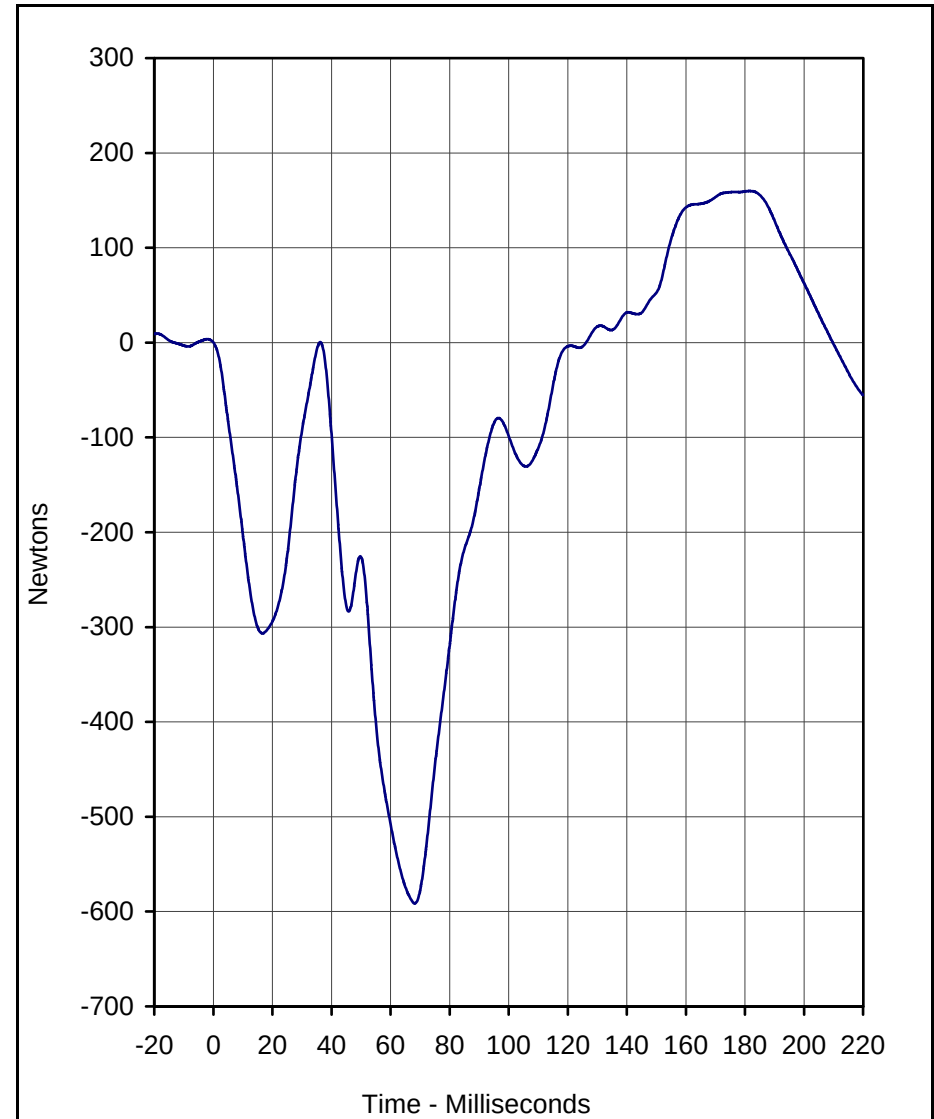
KAR22001-07



Curve Description	CURNO	Type
Pendulum Deceleration	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	20.4	8.7	-2.0	42.7	60

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 Test Date: 4/24/02

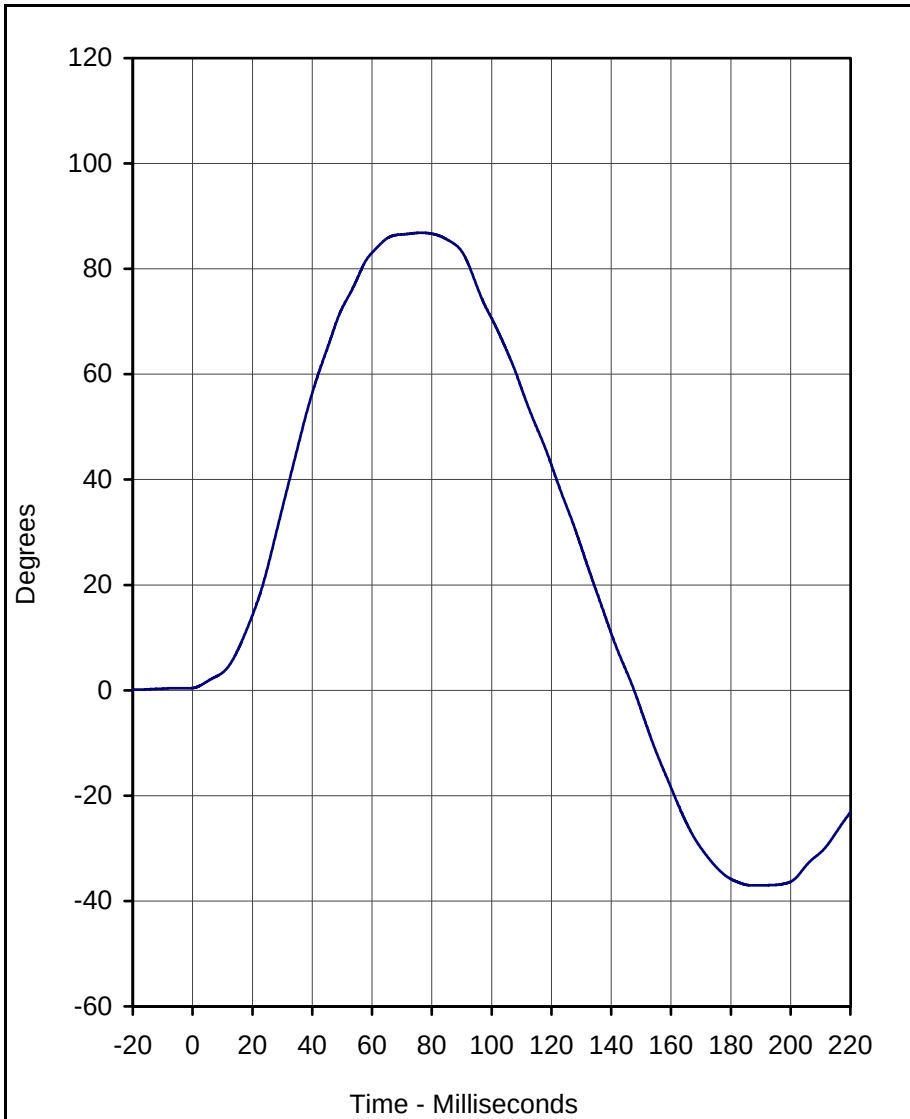


Curve Description	CURNO	Type
Neck Force X	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	159.8	181.5	-591.3	68.2	60

A.T.D. Serial No.: 034
 Test I.D.: NE05A

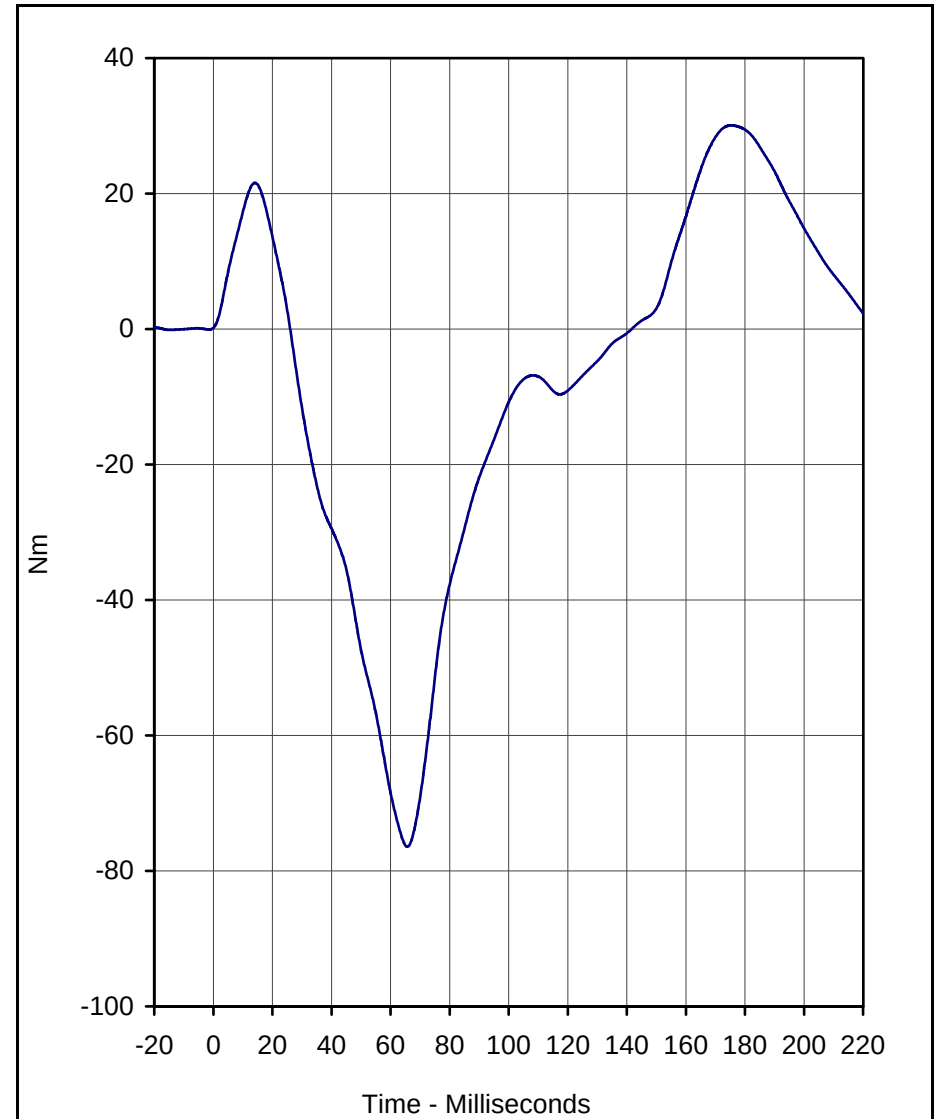




Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	86.8	76.7	-37.0	187.6	60

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 Test Date: 4/24/02



Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	30.1	175.3	-76.4	65.7	60

A.T.D. Serial No.: 034
 Test I.D.: NE05A





Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

External Measurements

ATD Serial No.: 034

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	515	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	145	Pass
G - Elbow back to wrist pivot	mm	290 to 305	300	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	340	Pass
J - Elbow rest height	mm	190 to 211	205	Pass
K - Buttock to knee length	mm	579 to 604	600	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	490	Pass
N - Buttock popliteal length	mm	452 to 477	475	Pass
O - Chest depth	mm	213 to 229	225	Pass
P - Foot length	mm	251 to 267	255	Pass
V - Shoulder breadth	mm	422 to 437	435	Pass
W - Foot breadth	mm	91 to 107	100	Pass
Y - Chest circumference	mm	970 to 1001	985	Pass
Z - Waist circumference	mm	836 to 866	850	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results				Pass

Laboratory Technician

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Test Date

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KAR22001-07



Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Knee Impact Test

ATD Serial No.: 035

Location: Left Knee

Test I.D.: LK01E

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.13	Pass
Peak Probe Force	N	4715 to 5782	5467	Pass
Overall Test Results				Pass

ATD Serial No.: 035

Location: Right Knee

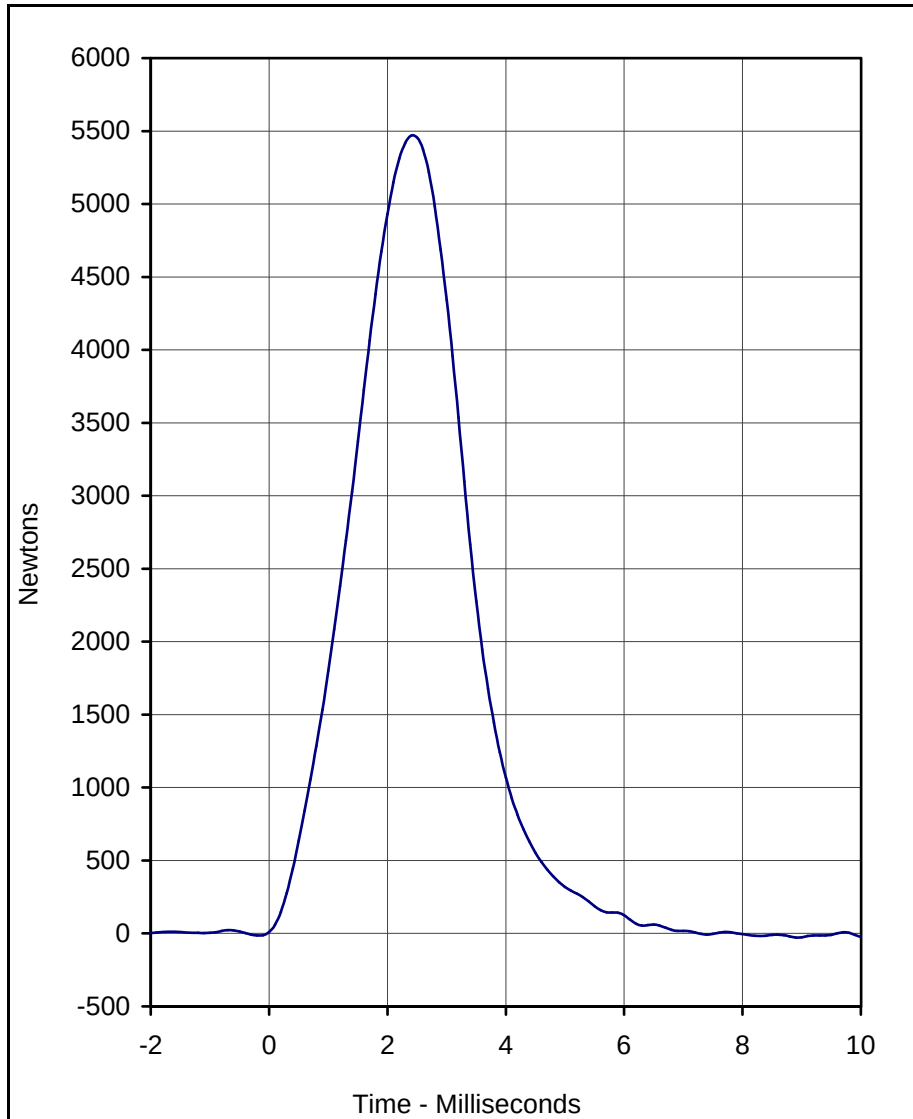
Test I.D.: RK10D

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Pendulum Velocity at T=0	m/sec	2.07 to 2.13	2.10	Pass
Peak Probe Force	N	4715 to 5782	5704	Pass
Overall Test Results				Pass

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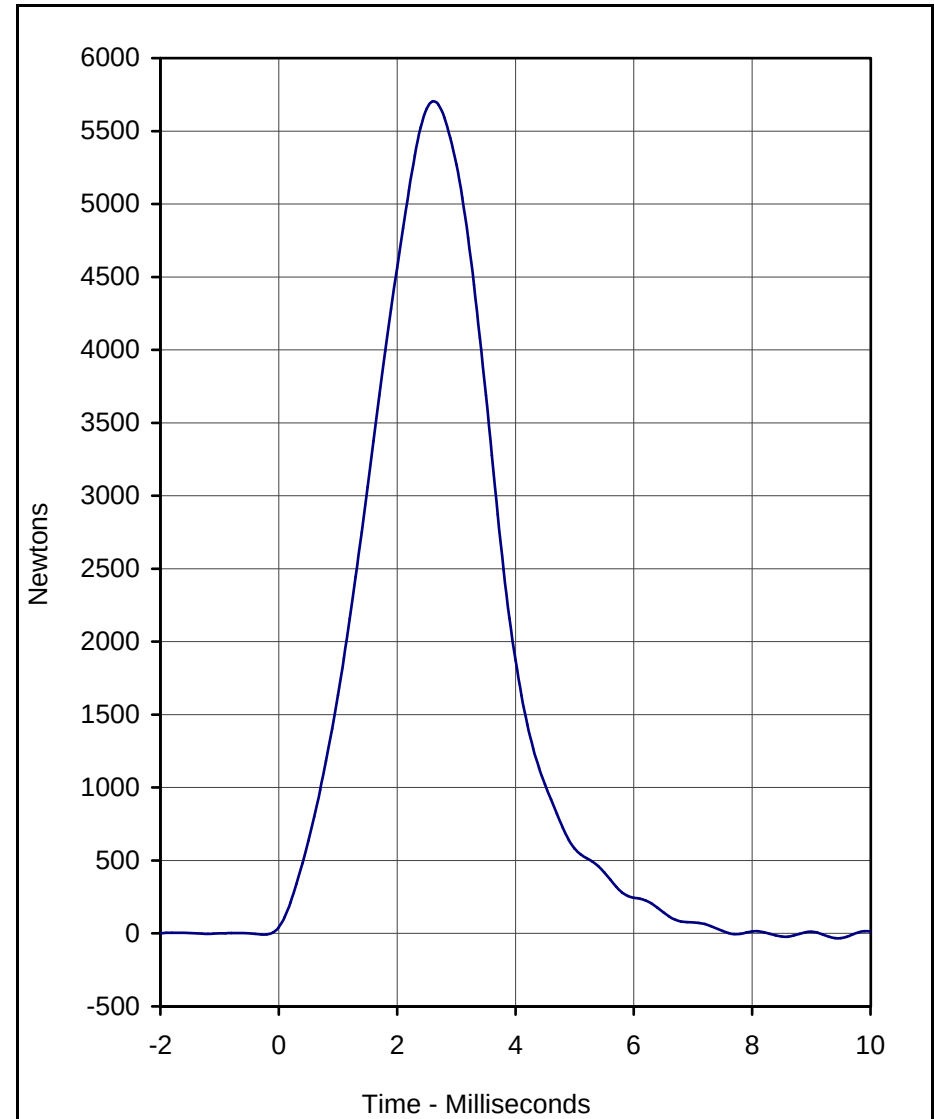
Test Date



Curve Description	Location	Test I.D.	CURNO	Type
Probe Force	Left Knee	LK01E	001	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	5467.3	2.4	-28.0	8.9	600

Test Program: Hybrid III 50th Percentile Male Knee Impact Test
 Test Date: 4/24/02



Curve Description	Location	Test I.D.	CURNO	Type
Probe Force	Right Knee	RK10D	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	5704.1	2.6	-32.7	9.5	600

A.T.D. Serial No.: 035





Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Head Drop Test

ATD Serial No.: 035

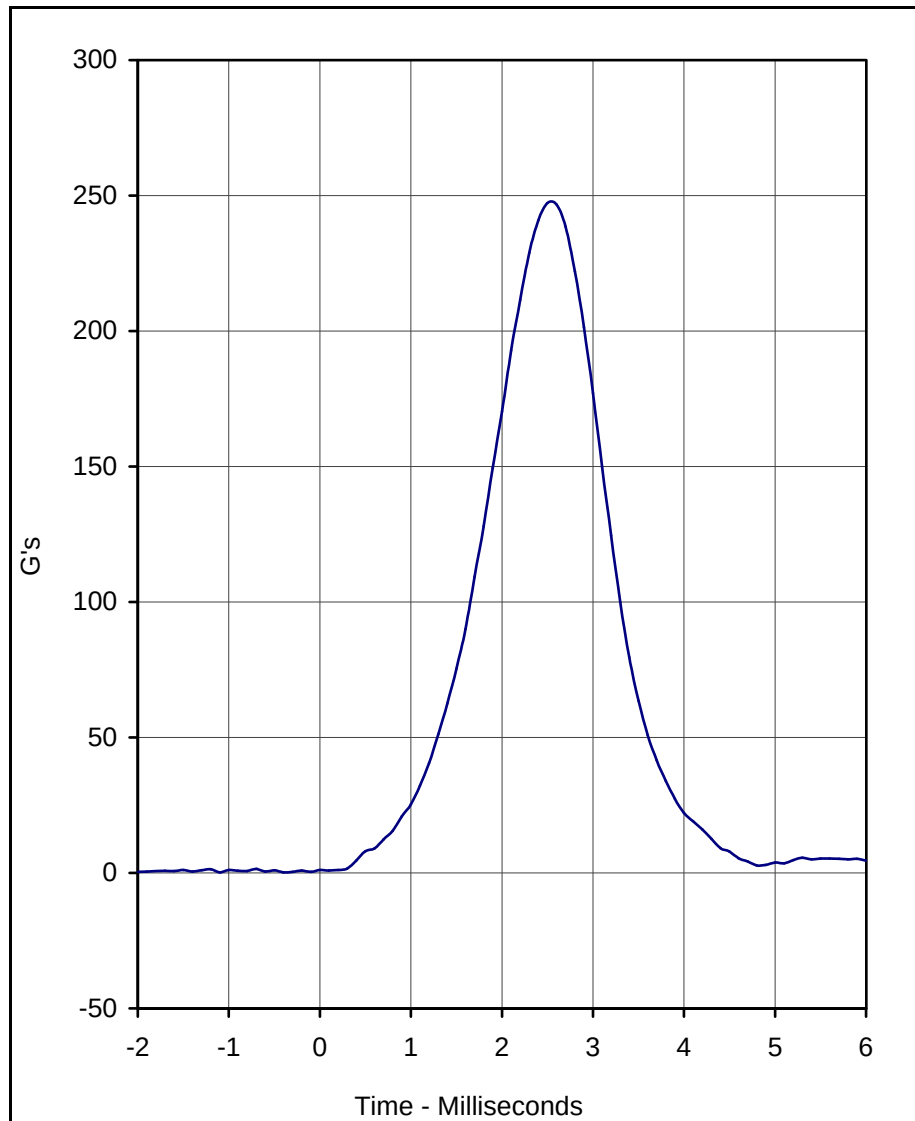
Test I.D.: HD01D

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.6	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	225.0 to 275.0	247.2	Pass
Peak Lateral Acceleration	G's	≤15.0	5.3	Pass
Overall Test Results				Pass

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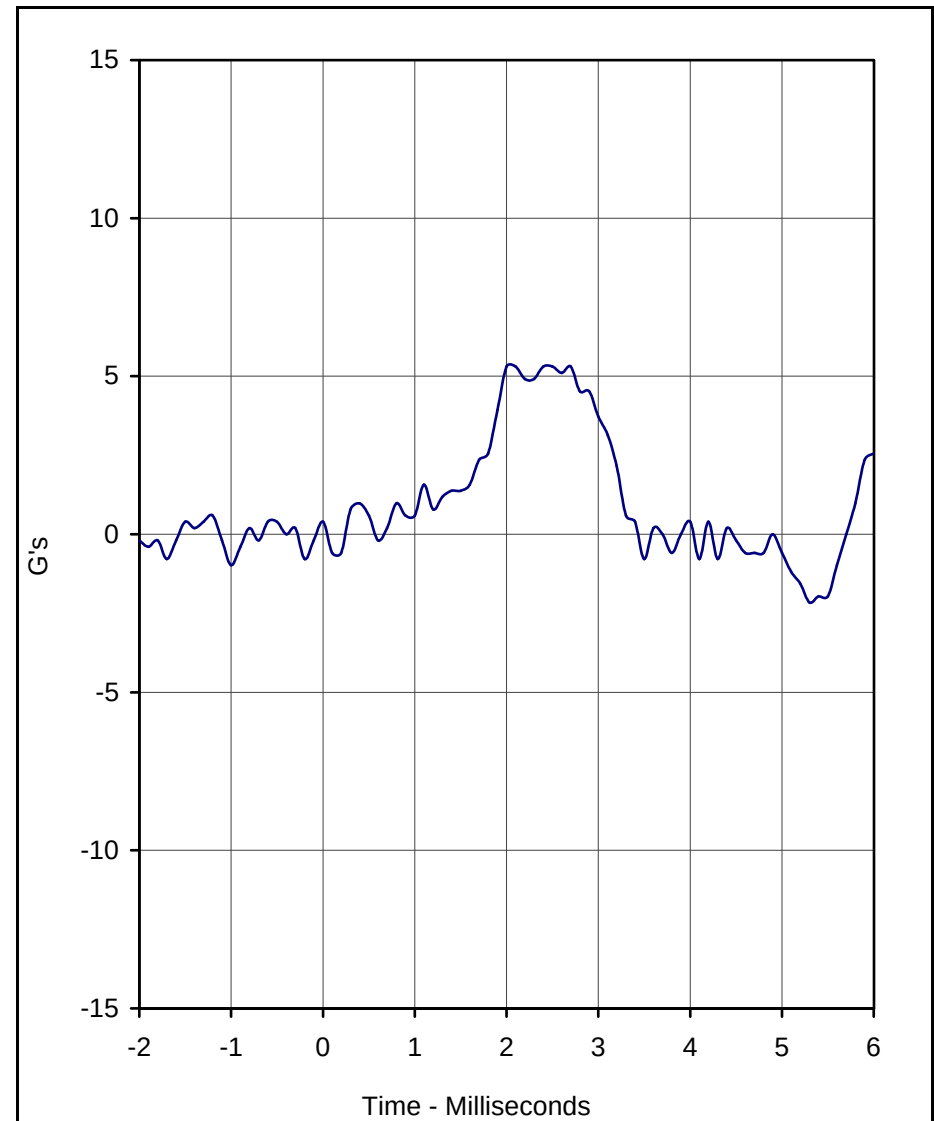
Test Date



Curve Description	CURNO	Type
Head Resultant	001	RES

Units	Max	Time	Min	Time	SAE Class
G's	247.2	2.5	0.2	-1.1	1000

Test Program: Hybrid III 50th Percentile Male Head Drop Test
 Test Date: 4/24/02



Curve Description	CURNO	Type
Head Y	002	FIL

Units	Max	Time	Min	Time	SAE Class
G's	5.3	2.0	-2.2	5.3	1000

A.T.D. Serial No.: 035
 Test I.D.: HD01D





Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Thorax Impact Test

ATD Serial No.: 035

Test I.D.: CH05Y

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	6.58 to 6.82	6.67	Pass
Peak Probe Force	Newtons	5159 to 5893	5712	Pass
Peak Sternum Displacement	CM	6.35 to 7.26	6.44	Pass
Internal Hysteresis	%	69 to 85	76.1	Pass
Overall Test Results				Pass

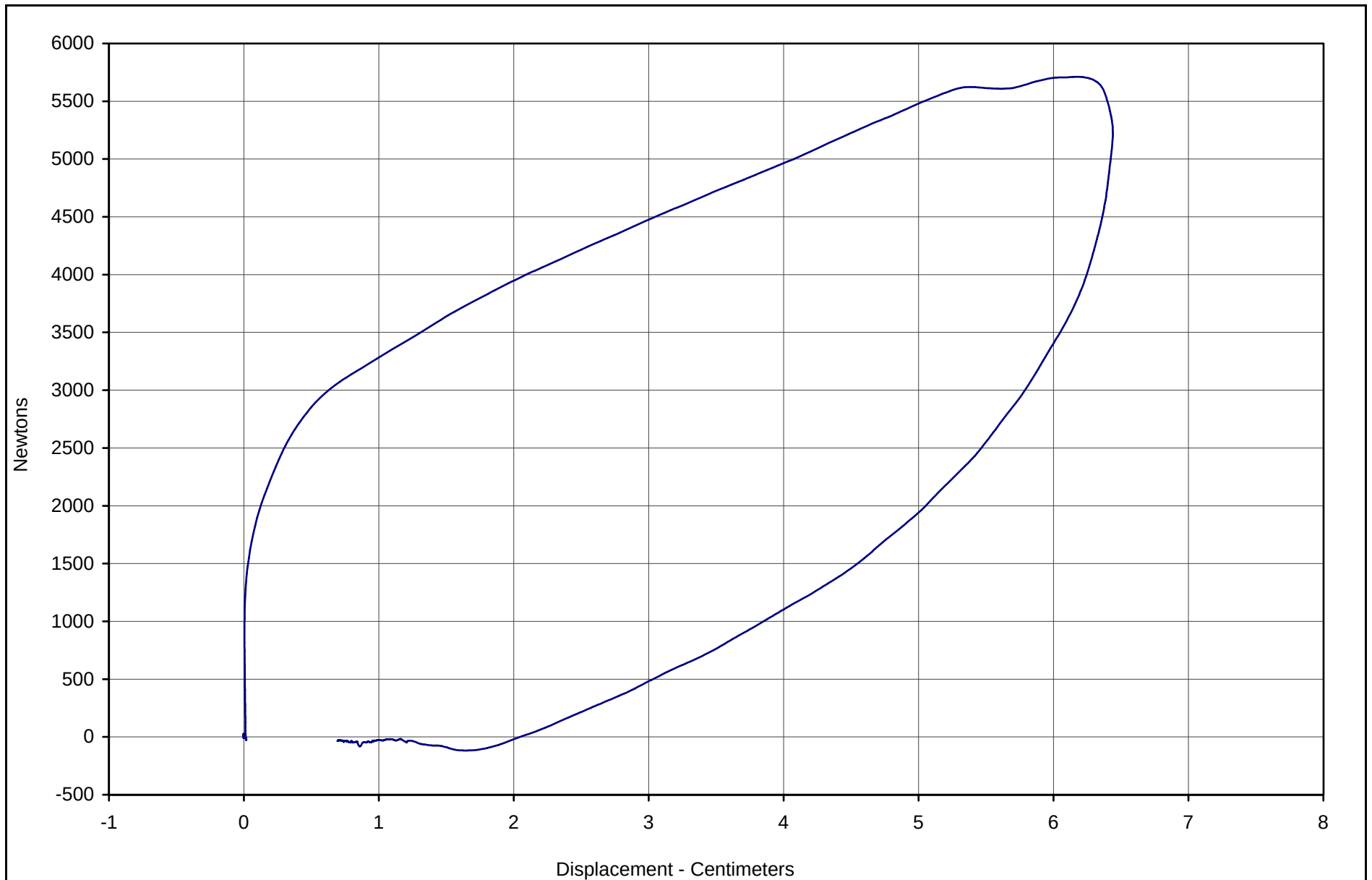
E-18

KAR22001-07

Laboratory Technician

April 24, 2002

Test Date



Curve Description	CURNO	Type	Hysteresis	Peak Chest Displ.	Peak Probe Force	SAE Class
Probe Force vs. Chest Displacement	001	FIL	76.1	6.44	5711.6	180



Test Program: Hybrid III 50th Percentile Male Thorax Impact

A.T.D. Serial No.: 035

Test Date: 4/24/02

Test I.D.: CH05Y



Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Neck Flexion Test

ATD Serial No.: 035

Test I.D.: NF05B

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	6.89 to 7.13	6.98	Pass
Pendulum Deceleration	10 Msec.	G's	22.5 to 27.5	23.4	Pass
	20 Msec.	G's	17.6 to 22.6	21.2	Pass
	30 Msec.	G's	12.5 to 18.5	17.6	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 29.0	17.6	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	34.0 to 42.0	37.3	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	64.0 to 78.0	67.4	Pass
	Time	Msec.	57.0 to 64.0	63.9	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	113.0 to 128.0	116.1	Pass
Moment About Occipital Condyle	Maximum	Nm	84.1 to 108.5	90.9	Pass
	Time	Msec.	47.0 to 58.0	54.2	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	97.0 to 107.0	99.8	Pass
Overall Test Results					Pass

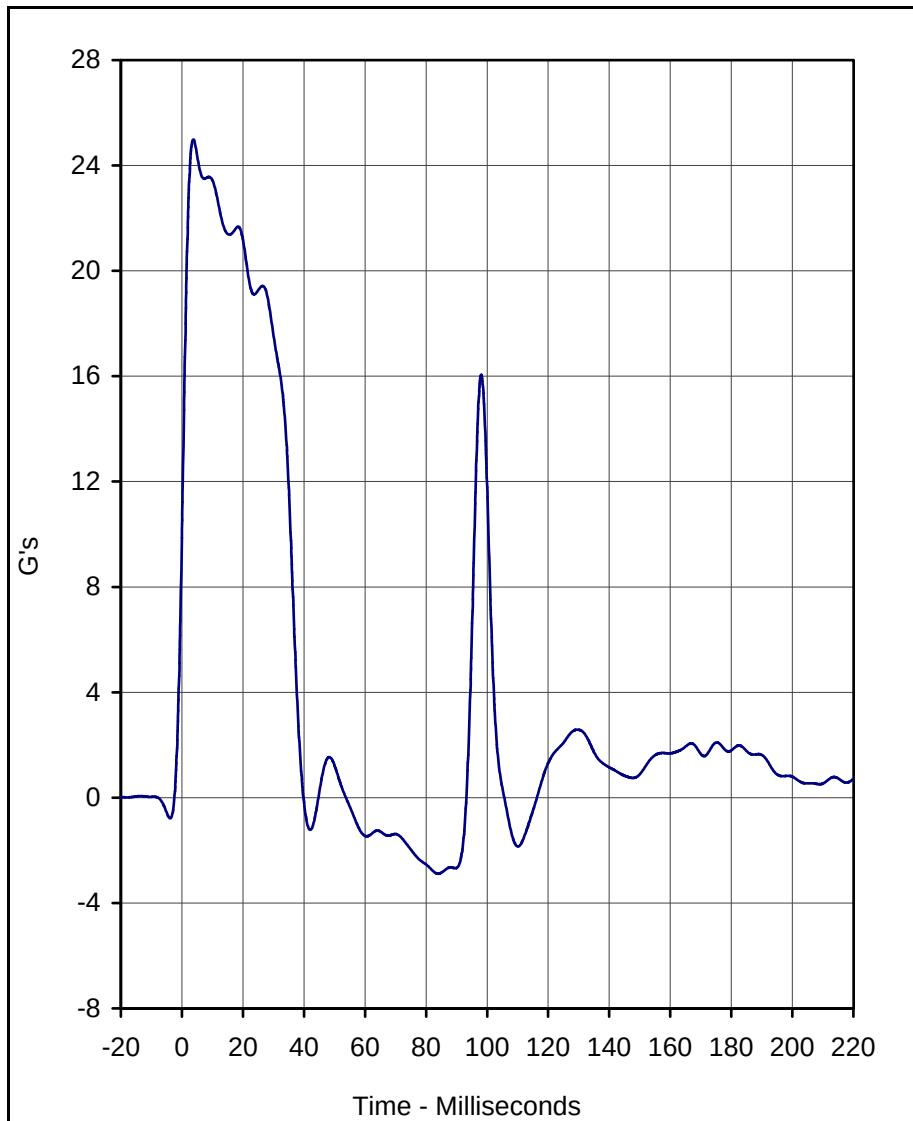
Laboratory Technician

April 24, 2002

Test Date

E-20

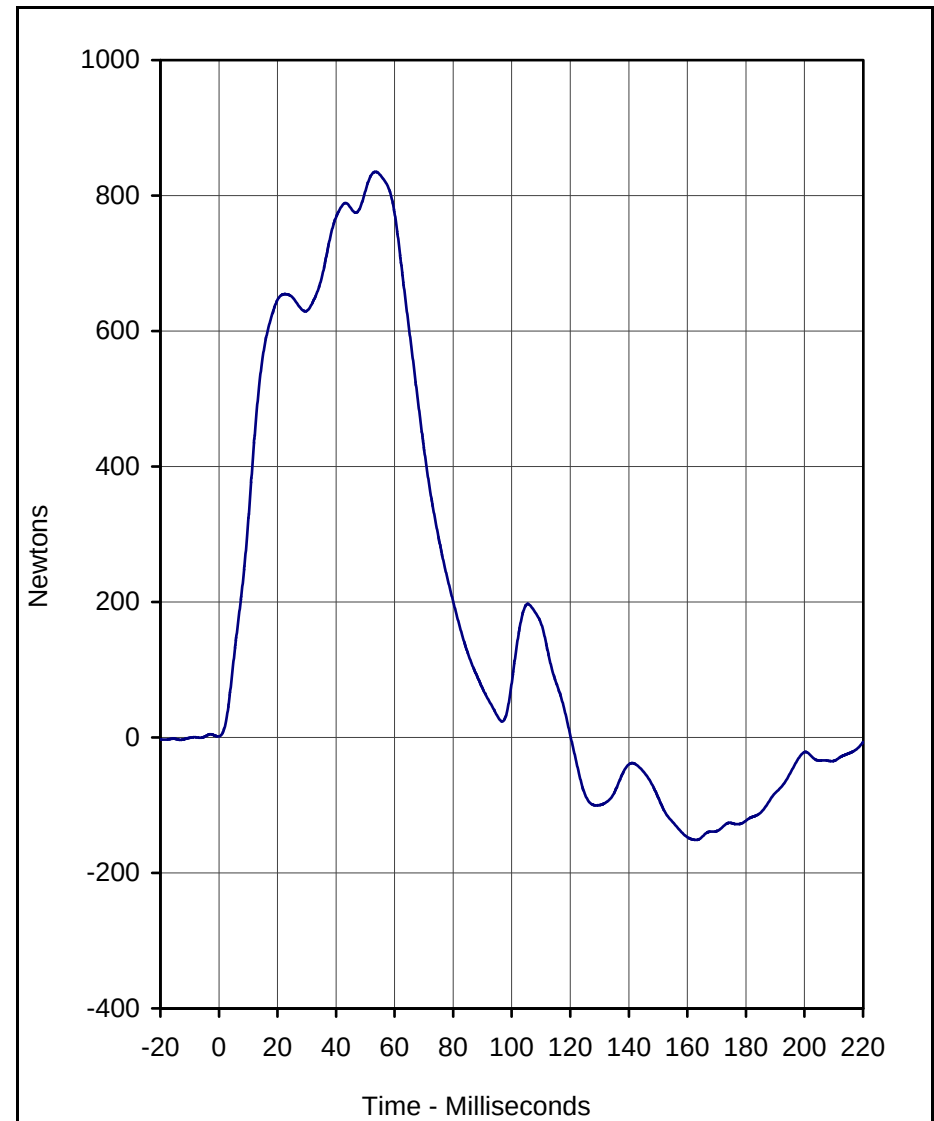
KAR22001-07



Curve Description	CURNO	Type
Pendulum Deceleration	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	25.0	3.7	-2.9	84.0	60

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 Test Date: 4/24/02

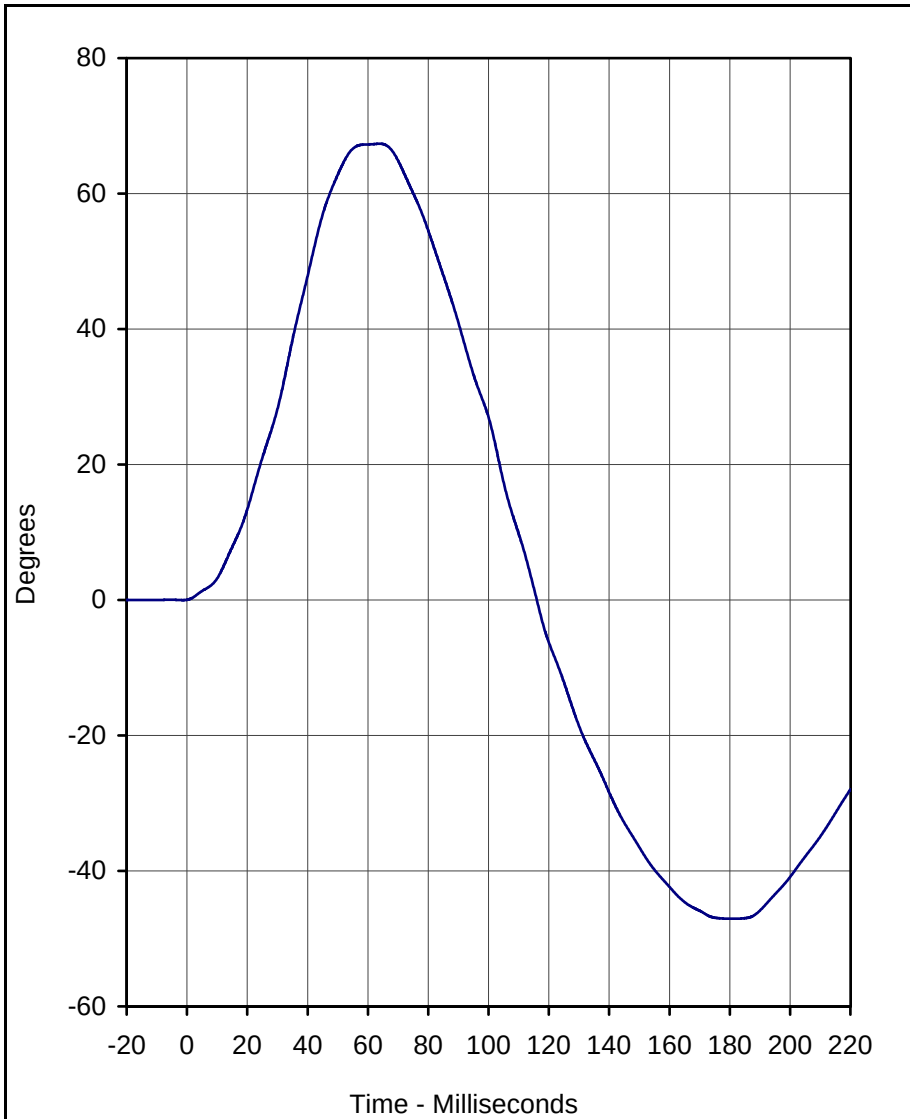


Curve Description	CURNO	Type
Neck Force X	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	835.1	53.5	-151.3	162.9	60

A.T.D. Serial No.: 035
 Test I.D.: NF05B

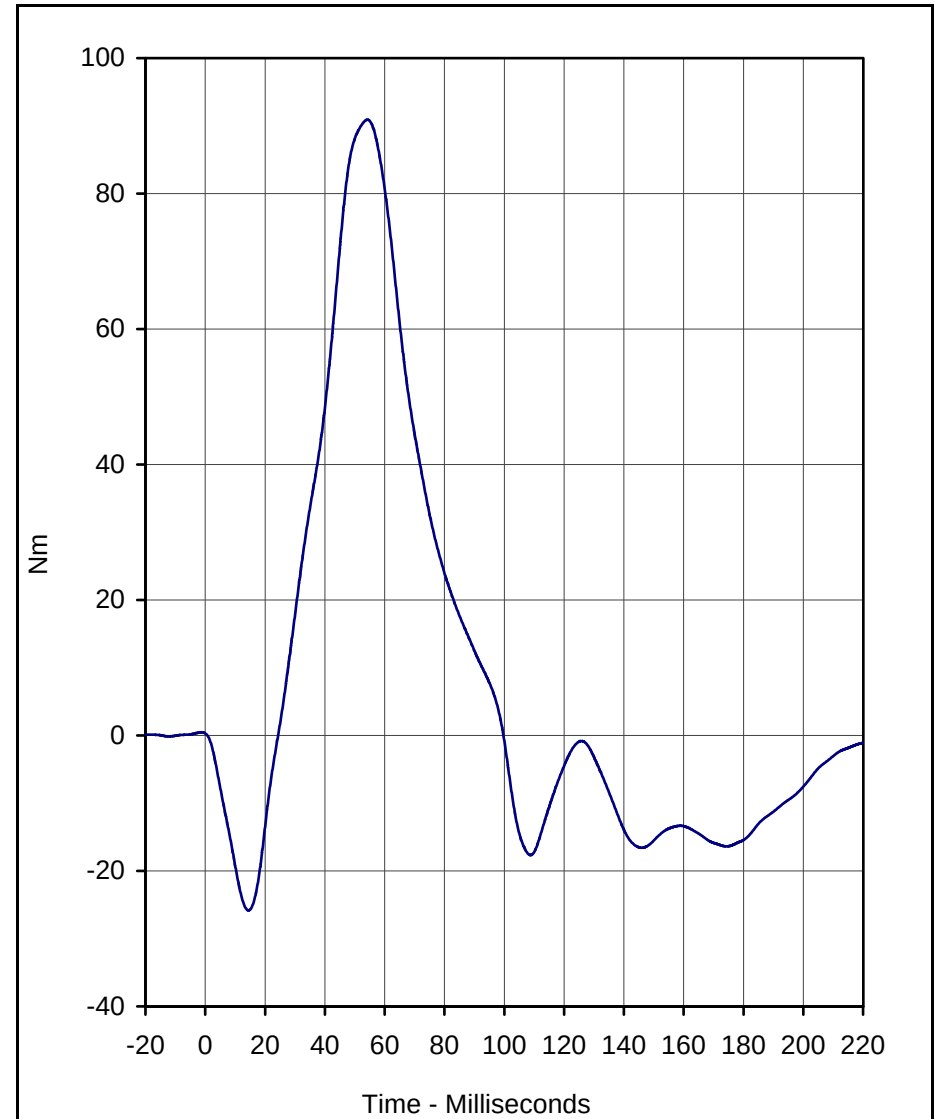




Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	67.4	63.9	-47.1	180.7	60

Test Program: Hybrid III 50th Percentile Male Neck Flexion Test
 Test Date: 4/24/02



Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	90.9	54.2	-25.8	14.5	60

A.T.D. Serial No.: 035
 Test I.D.: NF05B





Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

Neck Extension Test

ATD Serial No.: 035

Test I.D.: NE05B

Tested Parameter		Units	Specification	Result	Pass/Fail
Laboratory Temperature		°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity		%	10 to 70	30	Pass
Pendulum Velocity		m/s	5.94 to 6.19	5.99	Pass
Pendulum Deceleration	10 Msec.	G's	17.2 to 21.2	18.9	Pass
	20 Msec.	G's	14.0 to 19.0	16.6	Pass
	30 Msec.	G's	11.0 to 16.0	15.2	Pass
Peak Pendulum Decel. after 30 Msec.		G's	≤ 22.0	15.2	Pass
Deceleration Decay, Time to Cross 5 G's		Msec.	38.0 to 46.0	40.6	Pass
Maximum "D" Plane Rotation	Maximum	Degrees	81.0 to 106.0	83.2	Pass
	Time	Msec.	72.0 to 82.0	78.6	Pass
"D" Plane Rotation Decay, Time To Zero Crossing		Msec.	147.0 to 174.0	147.9	Pass
Moment About Occipital Condyle	Maximum	Nm	-52.9 to- 79.9	-75.7	Pass
	Time	Msec.	65.0 to 79.0	65.6	Pass
Positive Moment Decay, Time To Zero Crossing		Msec.	120.0 to 148.0	144.7	Pass
Overall Test Results					Pass

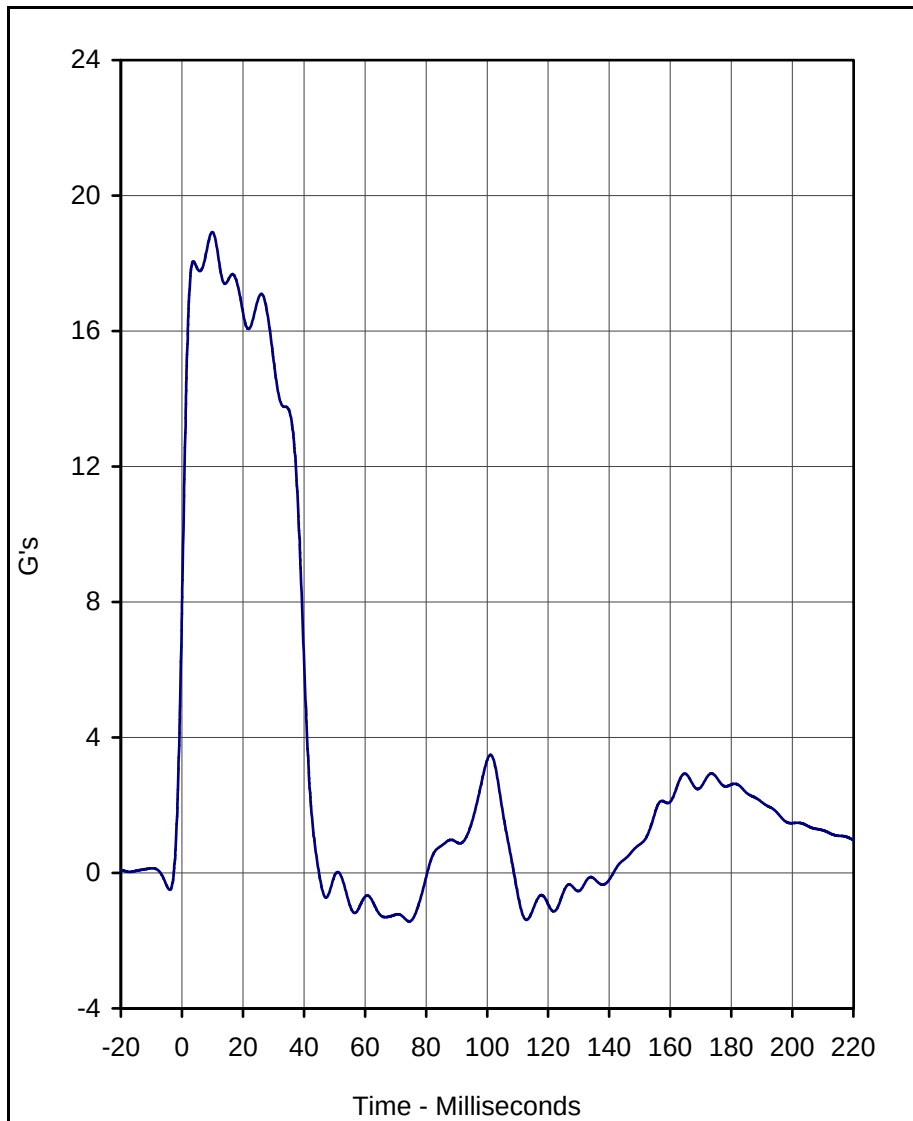
Laboratory Technician

April 24, 2002

Test Date

E-23

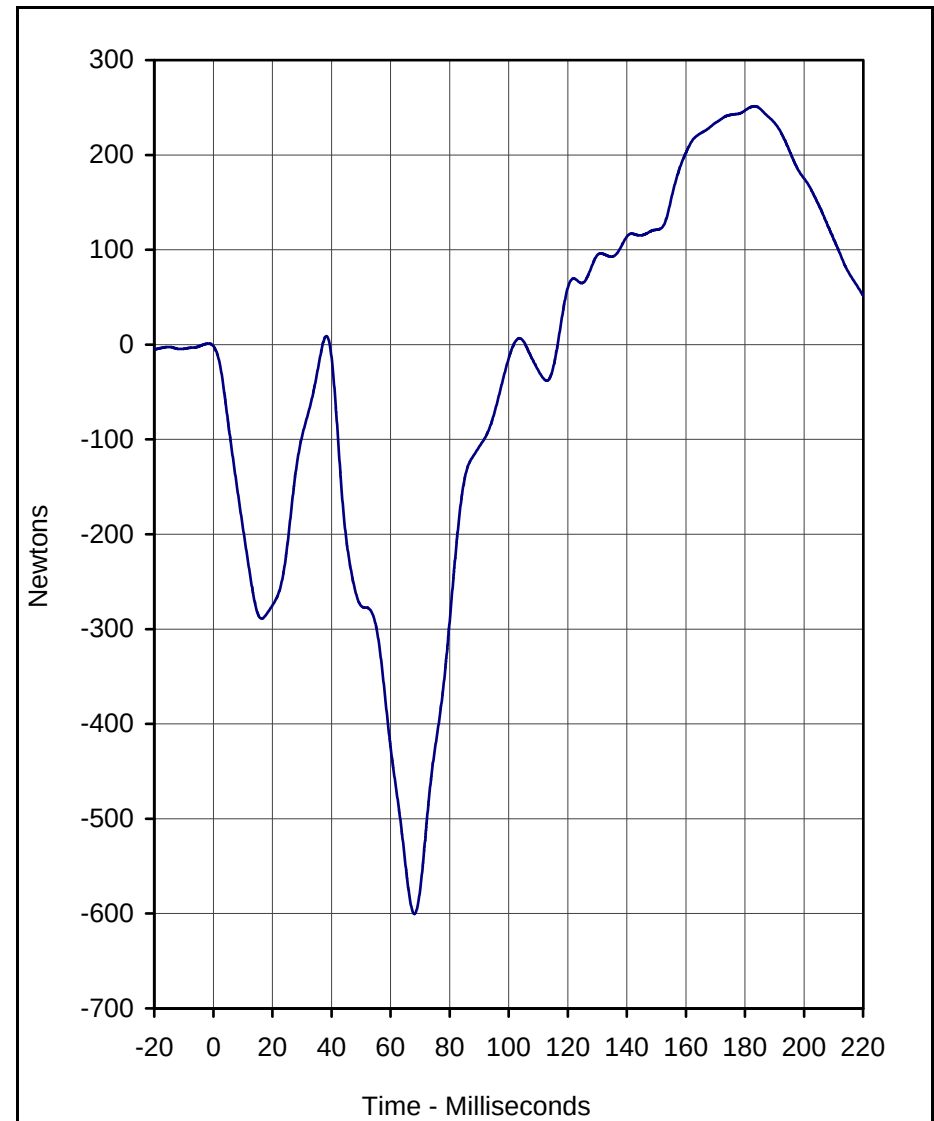
KAR22001-07



Curve Description	CURNO	Type
Pendulum Deceleration	001	FIL

Units	Max	Time	Min	Time	SAE Class
G's	18.9	10.0	-1.4	74.5	60

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 Test Date: 4/24/02

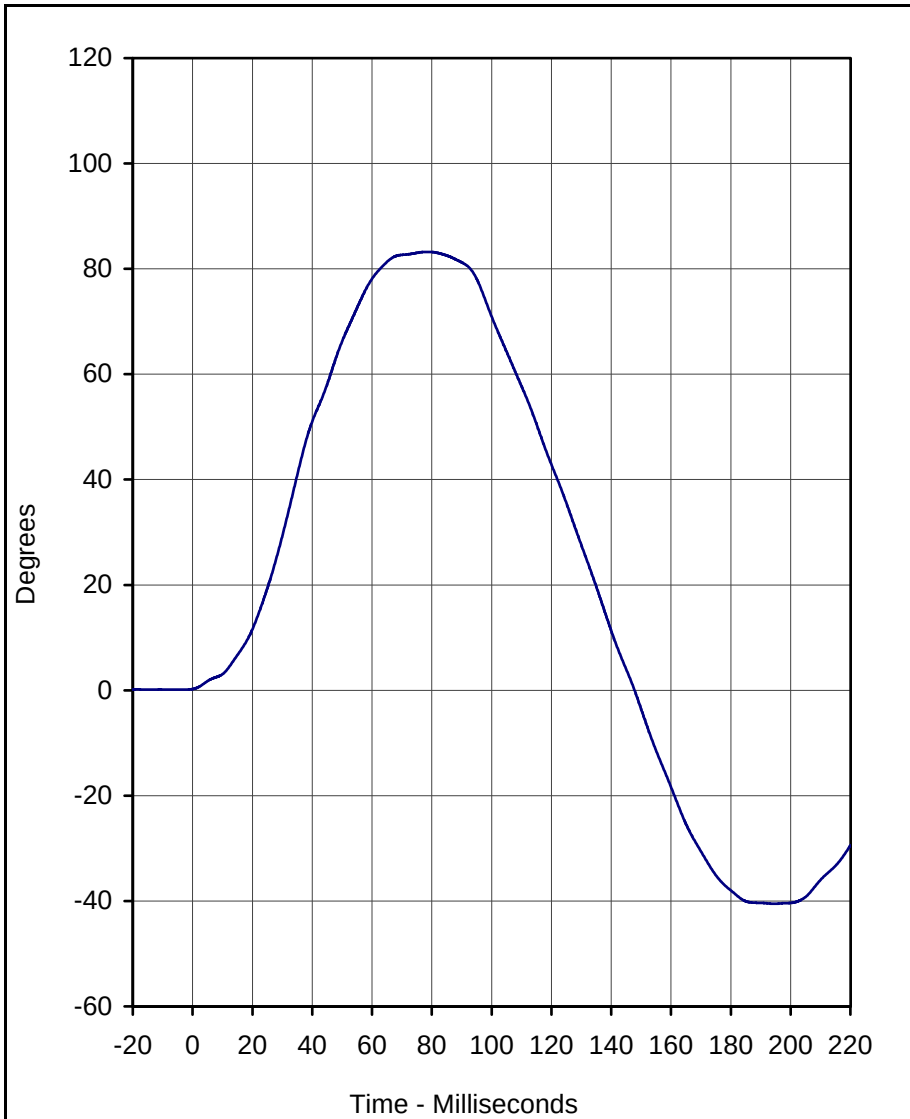


Curve Description	CURNO	Type
Neck Force X	002	FIL

Units	Max	Time	Min	Time	SAE Class
Newtons	251.2	183.2	-600.3	68.1	60

A.T.D. Serial No.: 035
 Test I.D.: NE05B

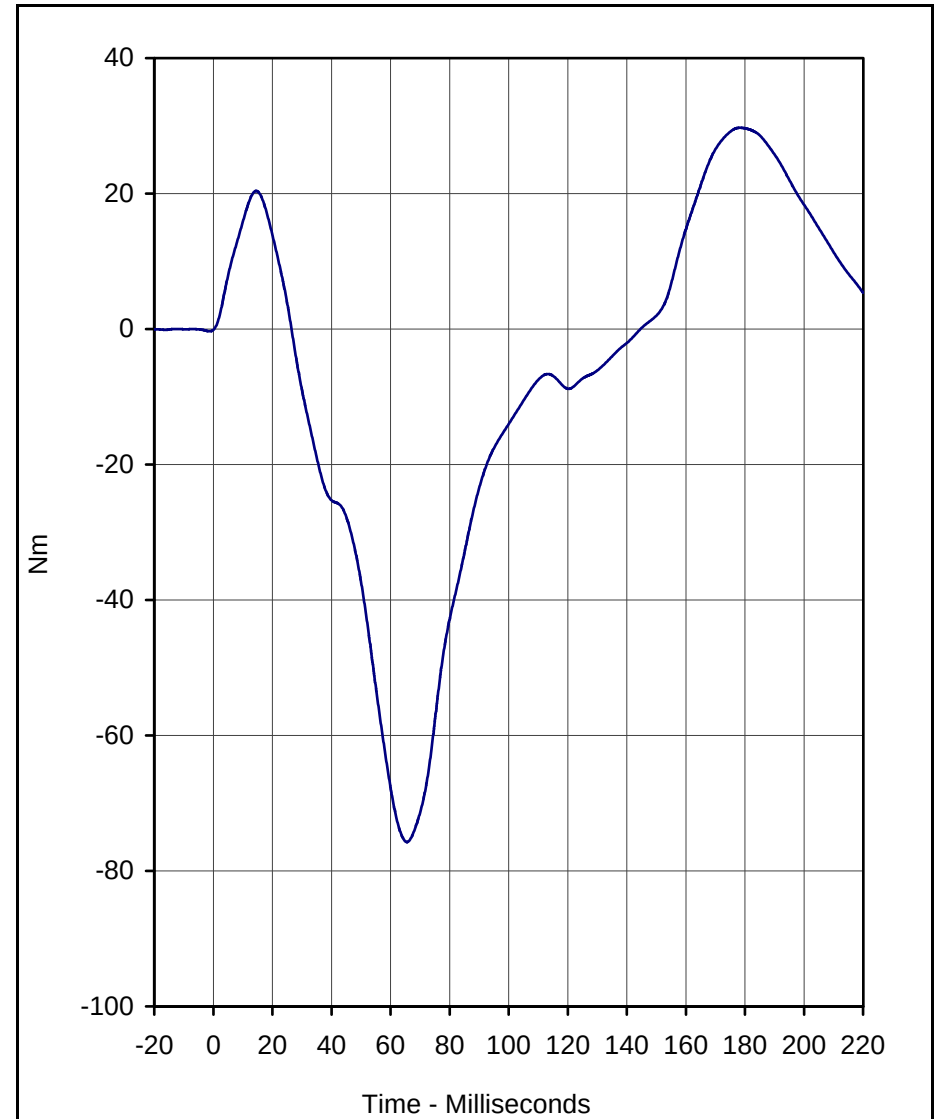




Curve Description	CURNO	Type
"D" Plane Rotation	003	FIL

Units	Max	Time	Min	Time	SAE Class
Degrees	83.2	78.6	-40.5	194.5	60

Test Program: Hybrid III 50th Percentile Male Neck Extension Test
 Test Date: 4/24/02



Curve Description	CURNO	Type
Moment About Occipital Condyle	004	FIL

Units	Max	Time	Min	Time	SAE Class
Nm	29.7	178.3	-75.7	65.6	60

A.T.D. Serial No.: 035
 Test I.D.: NE05B





Hybrid III Calibration Data Sheet

Hybrid III 50th Percentile Male

External Measurements

ATD Serial No.: 035

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	20.6 to 22.2	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
A - Total sitting height	mm	879 to 889	885	Pass
B - Shoulder pivot height	mm	505 to 521	520	Pass
C - "H" point height	mm	84 to 89	85	Pass
D - "H" point from seat back	mm	135 to 140	135	Pass
E - Shoulder pivot from back	mm	84 to 94	90	Pass
F - Thigh clearance	mm	140 to 155	150	Pass
G - Elbow back to wrist pivot	mm	290 to 305	295	Pass
H - Skull cap to back line	mm	41 to 46	45	Pass
I - Shoulder to elbow length	mm	330 to 345	340	Pass
J - Elbow rest height	mm	190 to 211	205	Pass
K - Buttock to knee length	mm	579 to 604	585	Pass
L - Popliteal length	mm	429 to 455	450	Pass
M - Knee pivot height	mm	485 to 500	495	Pass
N - Buttock popliteal length	mm	452 to 477	475	Pass
O - Chest depth	mm	213 to 229	220	Pass
P - Foot length	mm	251 to 267	260	Pass
V - Shoulder breadth	mm	422 to 437	435	Pass
W - Foot breadth	mm	91 to 107	105	Pass
Y - Chest circumference	mm	970 to 1001	1000	Pass
Z - Waist circumference	mm	836 to 866	860	Pass
AA - Location for chest circumference	mm	429 to 434	430	Pass
BB - Location for waist circumference	mm	226 to 231	230	Pass
Overall Test Results				Pass

Laboratory Technician

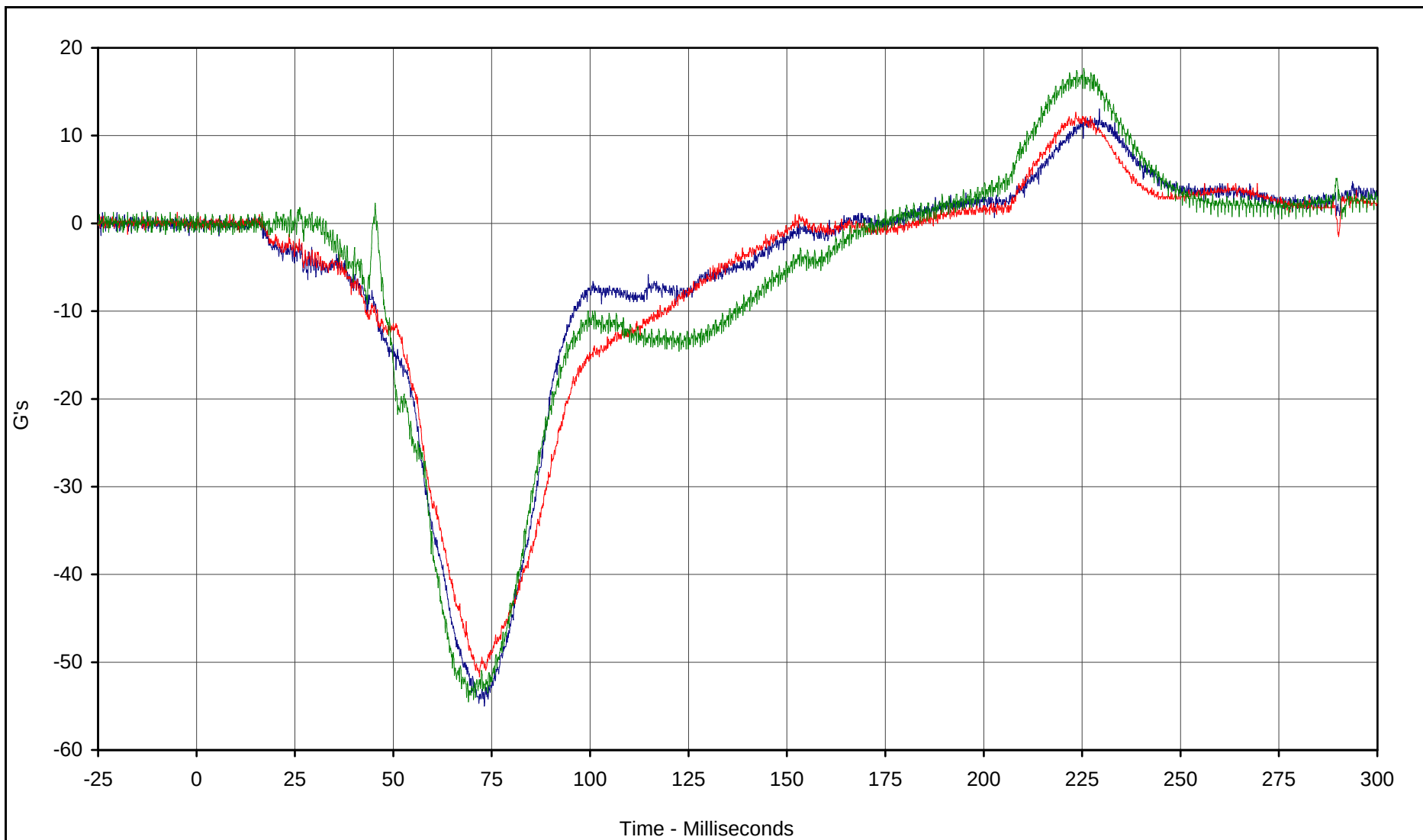
April 24, 2002

Test Date

APPENDIX G

NINE ACCELEROMETER HEAD ARRAY DATA

G-1



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Blue Primary X	134	FIL	G's	13.0	229.4	-55.0	73.1	1000
Driver NAHA Yarm-X	138	FIL	G's	12.7	223.4	-51.7	71.9	1000
Driver NAHA Zarm-X	141	FIL	G's	17.7	225.4	-54.5	69.1	1000



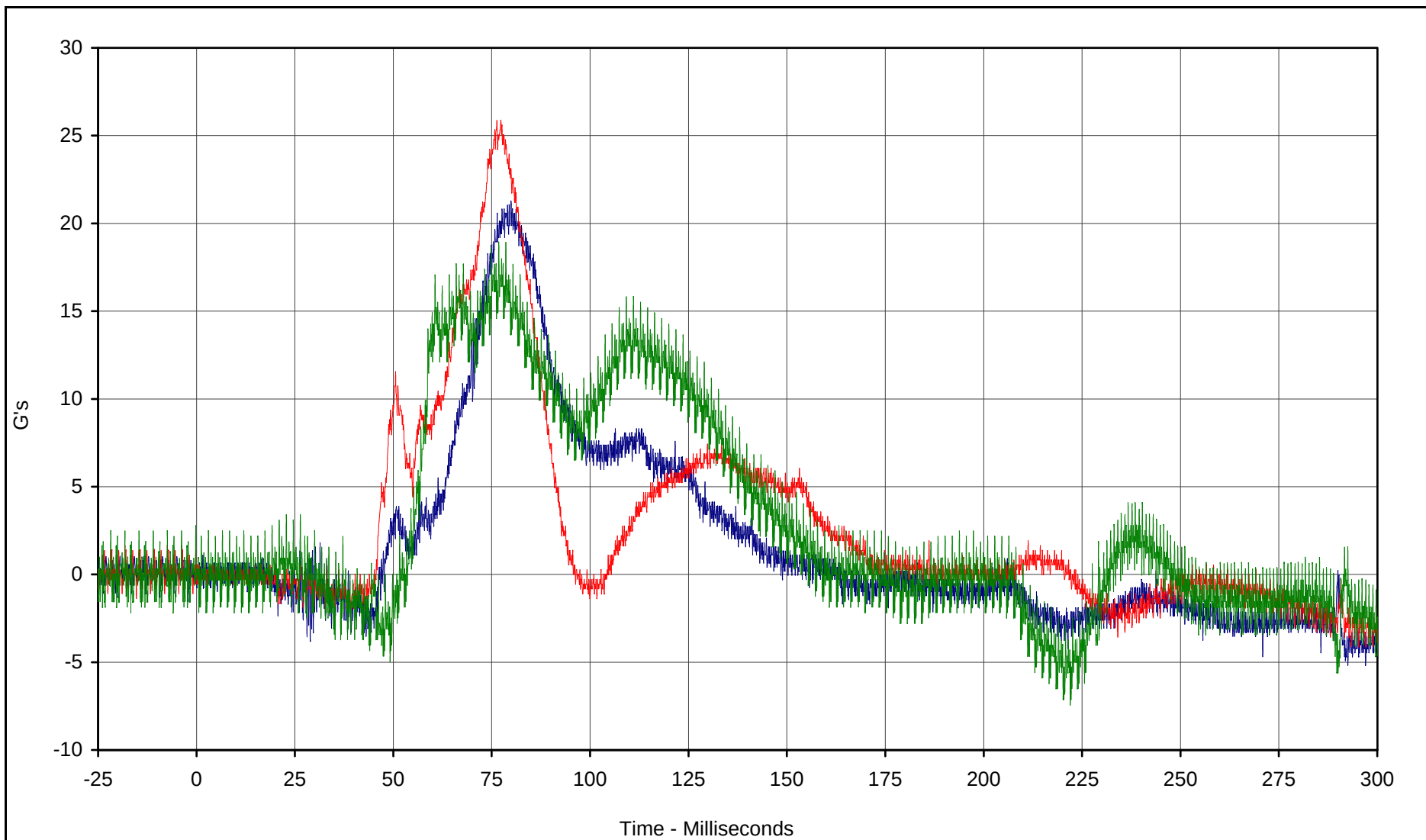
Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510

KAR22001-07



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary Y	135	FIL	G's	21.3	79.9	-5.1	292.5	1000
Driver NAHA Xarm-Y	140	FIL	G's	25.9	76.3	-4.1	293.5	1000
Driver NAHA Zarm-Y	142	FIL	G's	18.9	76.8	-7.4	222.0	1000

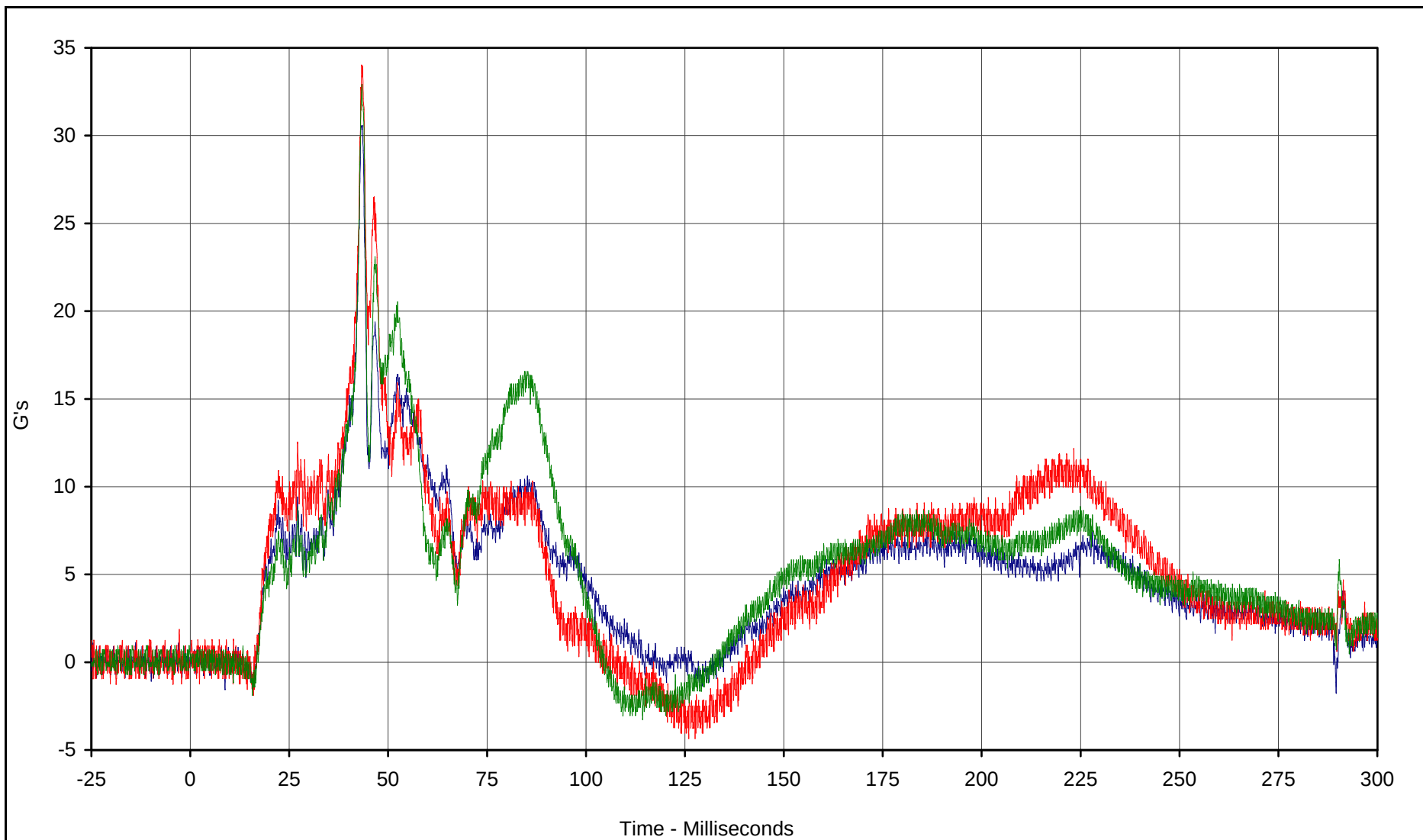


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Driver Head Primary Z	136	FIL	G's	30.6	43.2	-1.7	289.6	1000
Driver NAHA Xarm-Z	139	FIL	G's	34.0	43.3	-4.4	126.0	1000
Driver NAHA Yarm-Z	137	FIL	G's	32.9	43.4	-3.3	114.3	1000

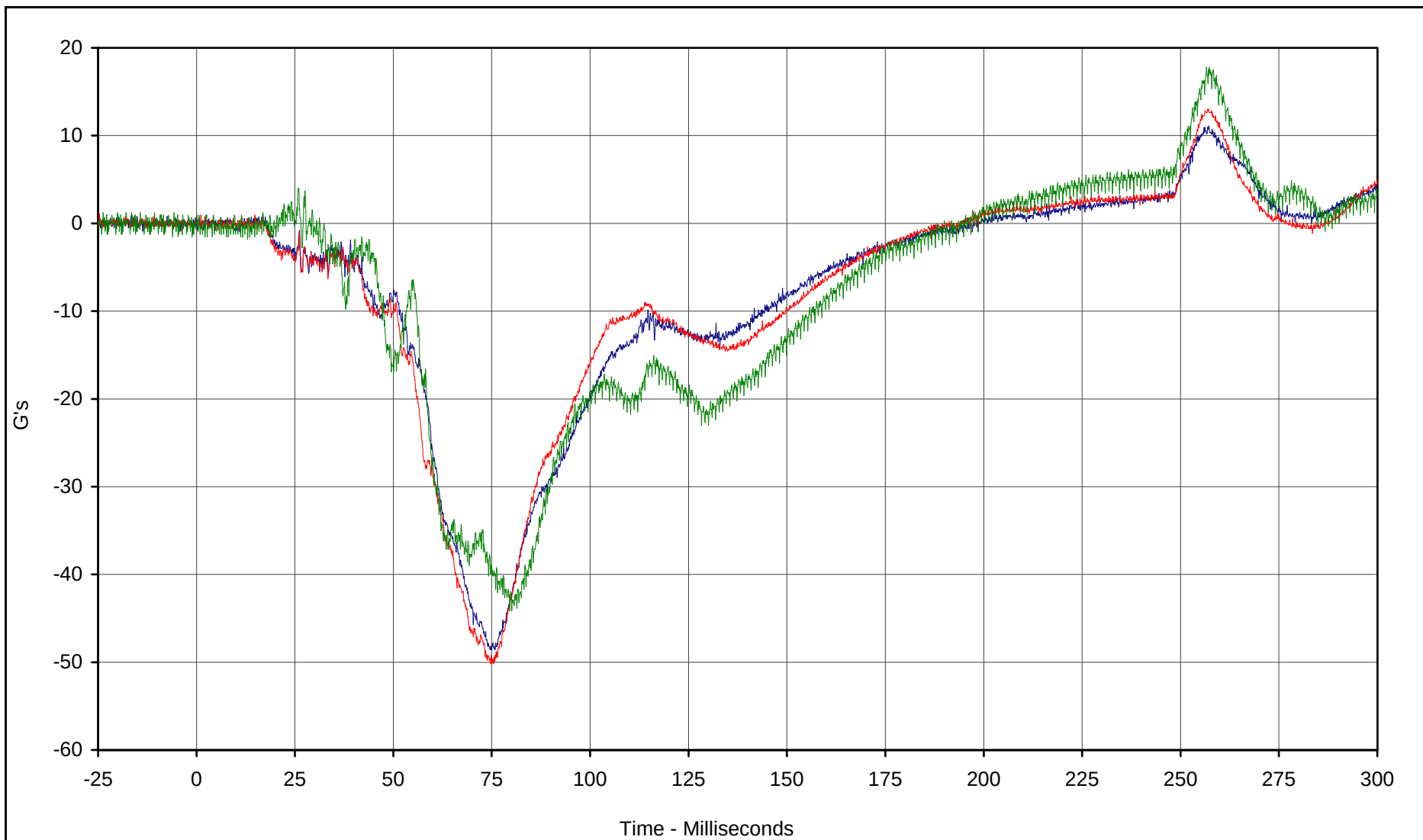


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary X	143	FIL	G's	11.1	257.2	-48.6	74.6	1000
Passenger NAHA Yarm-X	147	FIL	G's	13.0	256.9	-50.2	74.7	1000
Passenger NAHA Zarm-X	150	FIL	G's	17.8	256.6	-44.2	79.6	1000

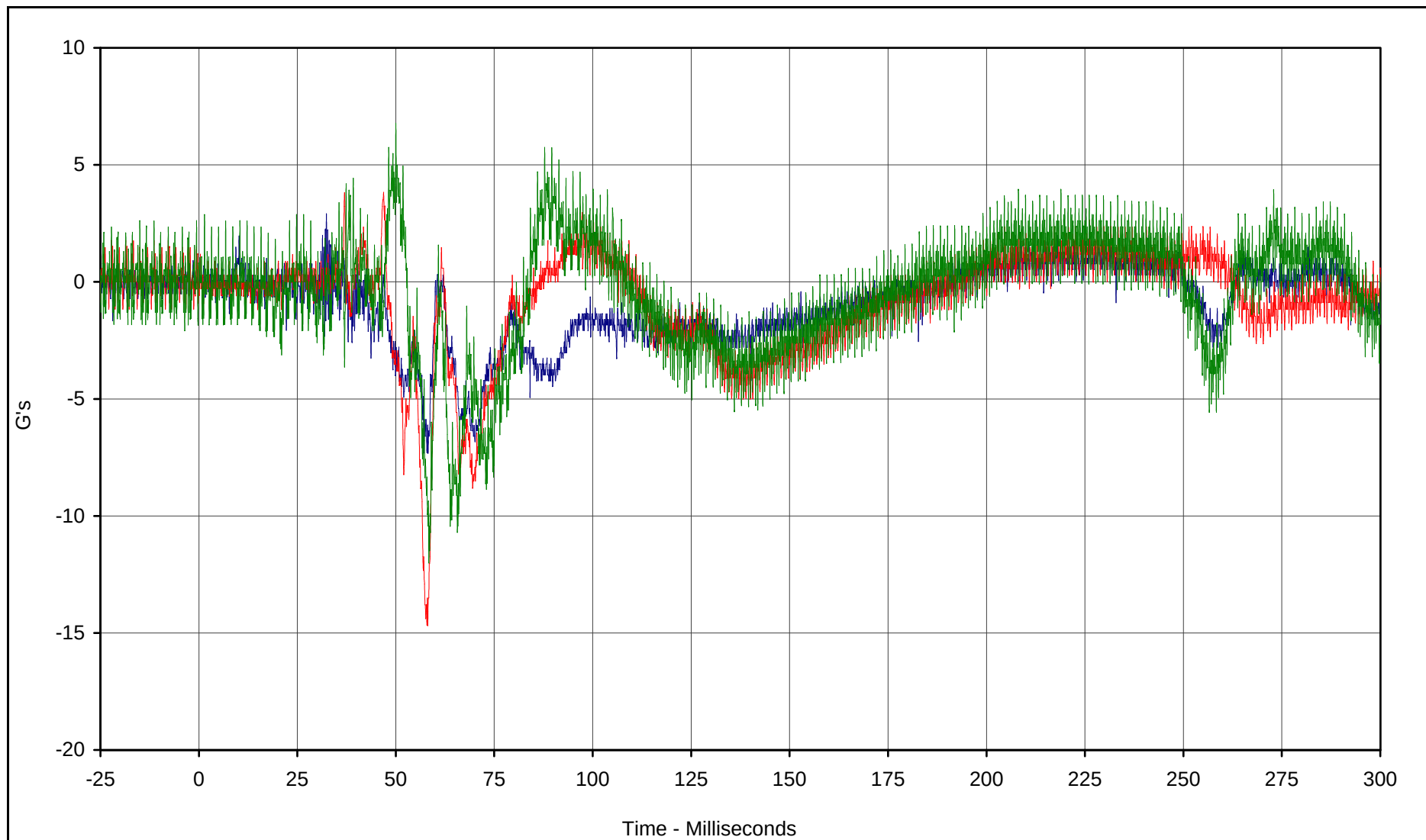


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary Y	144	FIL	G's	2.9	32.4	-7.3	57.1	1000
Passenger NAHA Xarm-Y	149	FIL	G's	3.8	37.0	-14.7	57.9	1000
Passenger NAHA Zarm-Y	151	FIL	G's	6.8	50.0	-12.0	58.4	1000

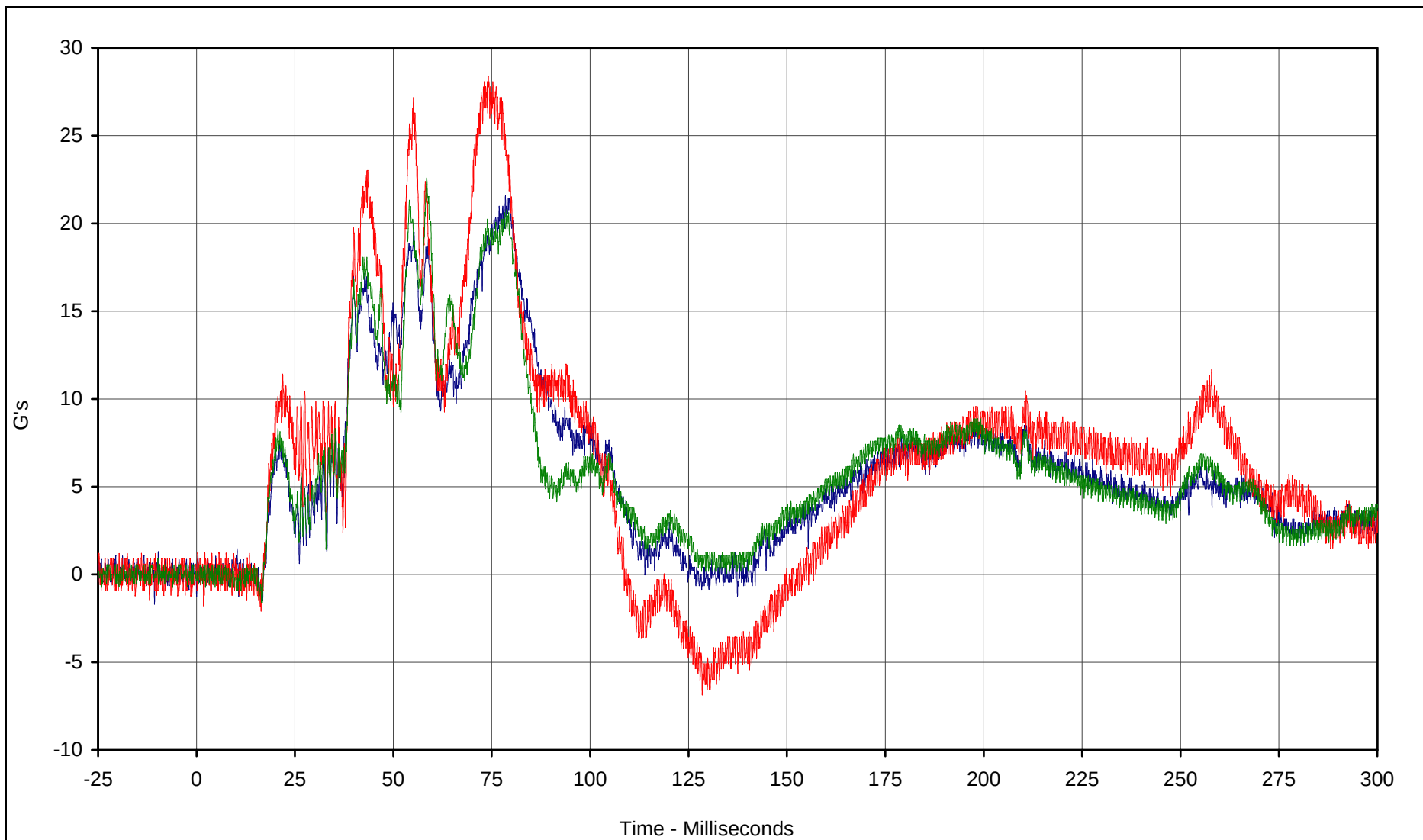


Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510



Curve Description	CURNO	Type	Units	Max	Time	Min	Time	SAE Class
Passenger Head Primary Z	145	FIL	G's	21.6	78.5	-1.5	16.8	1000
Passenger NAHA Xarm-Z	148	FIL	G's	28.4	74.1	-6.9	128.5	1000
Passenger NAHA Yarm-Z	146	FIL	G's	22.6	58.5	-1.6	16.5	1000



Test Vehicle: 2002 Kia Spectra 4 Door Sedan

Test Date: 5/7/02

Test Program: 2002 NHTSA 35mph NCAP

NHTSA No.: M20510