

REPORT NUMBER KAR21130-01

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**KIA MOTORS CORPORATION
2002 KIA SEDONA LX
MINIVAN**

NHTSA NUMBER: KIA5002

**Prepared By:
KARCO ENGINEERING
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301**



DECEMBER 20, 2001

FINAL REPORT

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Prepared by: _____
Mr. James E. Gorth, Project Engineer
KARCO Engineering

Date: December 20, 2001

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

Date: December 20, 2001

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

Date: December 20, 2001

FINAL REPORT ACCEPTED BY:

Manager, Side Impact NCAP

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16. Abstract A 55/28 km/h 90 deg. Moving Deformable Barrier Side Impact NCAP Test was conducted on the subject 2002 Kia Sedona LX Minivan in accordance with the specifications of the Office of Crash Worthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at KARCO Engineering laboratories in Adelanto, California, on December 6, 2001. The impact velocity of the Moving Deformable Barrier was 61.81 km/h, and the outside ambient temperature at the struck (driver's) side of the vehicle was 11.1 deg. C. The target vehicle's maximum post test static crush was 368 mm located at level 3 . The test vehicle's occupant performance is as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;">Measurement Description</th> <th style="width: 20%;">Driver SID</th> <th style="width: 20%;">Passenger SID</th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) G's</td> <td style="text-align: center;">58.3</td> <td style="text-align: center;">34.9</td> </tr> <tr> <td>Left Lower Rib (LLR) G's</td> <td style="text-align: center;">56.8</td> <td style="text-align: center;">48.8</td> </tr> <tr> <td>Lower Spine (T₁₂) G's</td> <td style="text-align: center;">49.4</td> <td style="text-align: center;">38.2</td> </tr> <tr> <td>Thoracic Trauma Index (TTI) G's</td> <td style="text-align: center;">54</td> <td style="text-align: center;">43</td> </tr> <tr> <td>Pelvis (PEV) G's</td> <td style="text-align: center;">98</td> <td style="text-align: center;">104</td> </tr> </tbody> </table>				Measurement Description	Driver SID	Passenger SID	Left Upper Rib (LUR) G's	58.3	34.9	Left Lower Rib (LLR) G's	56.8	48.8	Lower Spine (T ₁₂) G's	49.4	38.2	Thoracic Trauma Index (TTI) G's	54	43	Pelvis (PEV) G's	98	104
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SECTION 1

PURPOSE and TEST PROCEDURE

1.1 PURPOSE

This Side Impact NCAP test is conducted as part of the FY' 2002 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract No. DTNH22-99-D-02041. The purpose of this test is to generate comparative side impact data on a 2002 Kia Sedona LX Minivan manufactured by Kia Motor Corporation.

1.2 TEST PROCEDURE

The side impact test was conducted in accordance with the current National Highway Traffic Safety Administration (NHTSA), Office of Crashworthiness Standards (OCS), laboratory test procedure NCAP Side Impact Testing, dated July 1997 and the corresponding KARCO Engineering Test Procedure KTP-214D, dated November 18, 1998. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

SECTION 2

SUMMARY OF SIDE IMPACT TEST

2.1 SUMMARY OF SIDE IMPACT NCAP TEST

A model year 2002 Kia Sedona LX Minivan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.81 km/h. The specified impact velocity range is from 61.1 to 62.7 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 2328 kg and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering in Adelanto, California, on December 6, 2001.

One (1) real-time motion picture camera and ten (10) high-speed motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information is documented in the data sheets. Pre- and post-test photographs of the vehicle and SID can be found in Appendix A. Two 50th percentile adult male Side Impact Dummy's (SID's) were placed in the driver's and left rear passenger designated seating positions according to the test procedure. Each SID is instrumented with contact switches on the pelvis and thorax, and eleven accelerometers in the following locations:

- Left Upper Rib (LUR) uni-axial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uni-axial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uni-axial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uni-axial accelerometer (Y-axis primary and redundant)
- Head Center of Gravity (CG) tri-axial accelerometers (X, Y, and Z axes)

The test vehicle was instrumented with twenty-five (25) structural accelerometers and the MDB was instrumented with five (5) accelerometers and a one (1) contact switch on the right bumper to compare left side to right side bumper impact timing. All data channels were recorded with a fully self contained on-board Test Data Acquisition System (TDAS). The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 368 mm at level 3, 1200 mm rearward of the left vertical impact point. The driver SID, Serial No. 274 and the passenger SID, Serial No. 275 were calibrated prior to this test. The SID injury criteria is summarized as follows:

Measurement	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	G's	54	43
Peak Pelvic G's (PEV)	G's	98	104

Tests summaries and post-test observations are presented in Section 3. The vehicle, camera, and occupant measurements are presented in Section 4. Appendix A contains the still photograph prints. Appendix B contains the driver and passenger SID's, vehicle, and MDB response data traces. Appendix C contains the SID's Configuration and performance verification data. Appendix D contains the test equipment information.

SECTION 3
SIDE IMPACT DUMMY (SID) AND VEHICLE TEST DATA

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

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

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

TEST VEHICLE INFORMATION

Make	Kia
Model	Sedona LX
Body Style	Minivan
NHTSA No.	KIA5002
VIN	KNDUP131126204345
Color	Green
Delivery Date	11/27/2001
Odometer Reading (mile)	135
Dealer	Hi-Desert Kia
Transmission	4-Speed Automatic
Final Drive	Front
Type/No. Cylinders	V-6
Engine Displacement (L)	3.5
Engine Placement	Longitudinal

TEST VEHICLE OPTIONS

Driver Airbag	Yes
Passenger Airbag	Yes
Power Windows	Yes
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Air Conditioning	Yes
Power Brakes	Yes
Disc Brakes, Front	Yes
Disc Brakes, Rear	No
Anti-lock Brakes	No
AM/FM/Cassette	Yes
Anti-Theft System	N/A
Cruise Control	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Kia Motor Corporation	GVWR (kg)	2674
Date of Manufacture	August-01	GAWR Front (kg)	1350
		GAWR Rear (kg)	1324

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	245	245
Cold Pressure (kPa)	245	245
Recommend Tire Size	P215/70R15	P215/70R15
Tire Size on Vehicle	P215/70R15	P215/70R15
Tire Manufacturer	Kumho	Kumho

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Split Bench	Bench	None	
Number of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				525
Cargo Weight (RCLW) (kg)				49

DATA SHEET NO. 1...(CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	619	459		663	528	
Right	kg	609	440		638	499	
Ratio	%	57.7	42.3		55.9	44.1	
Totals	kg	1228	899	2127	1301	1027	2328

TARGET TEST WEIGHT CALCULATION*

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2126
Weight of 2 P572F Side Impact Dummies	kg	161
Rated Cargo/Luggage Weight (RCLW)	kg	49
Calculated Vehicle Target Weight (TVTW)	kg	2336

*Actual As Tested Weight (ATW) will be TVTW -5/-10 kg

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	744	754	752	761	1234
As Tested	mm	732	744	731	743	1288
Fully Loaded	mm	735	749	728	746	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel base	mm	2919
Total Vehicle Length at Left Side	mm	3369
Total Vehicle Length at Centerline	mm	4919
Total Vehicle Length at Right Side	mm	3369
Weight of Ballast In Cargo Area	kg	85
Amount of Stoddard Solvent in Fuel Tank	Liters	69.7

*Per COTR

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel base	mm	2919
Target Impact Point Aft of Front Axle	mm	519
Actual Impact Point Aft of Front Axle	mm	516

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

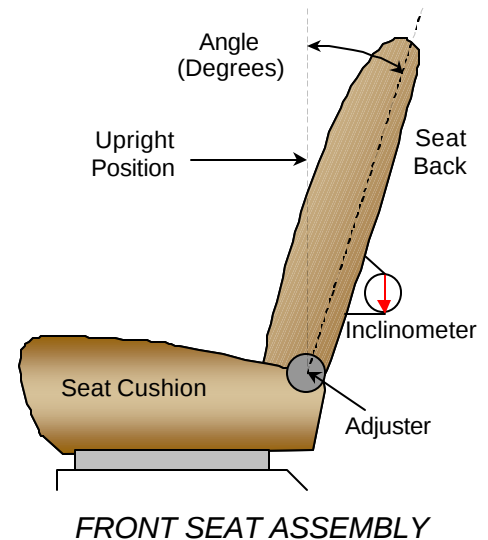
Test Date: 12/6/01

NOMINAL DESIGN RIDING POSITION

The driver's seat back is positioned to the manufacturer's designated angle. The procedure for positioning the seat is as follows: A slit is cut into fabric of the seat at the outboard edge, approximately 10-13 inches above the pivot point to expose the frame of the seat. An inclinometer is firmly placed against the flat portion of the frame surface and the seat back is adjusted to the manufacturers designated angle.

Driver seat back angle: 20° with a seated dummy

Rear seat back angle: 20° fixed



SEAT FORE/AFT POSITIONS

The driver's seat is adjustable. The fore/aft position is set to the middle.

Driver seat fore/aft total travel: 24 seat detents

Rear seat fore/aft total travel: Seat is fixed

Driver seat fore/aft position: Placed in the 12th detent

Rear seat fore/aft position: Seat is fixed

SEAT BELT UPPER ANCHORAGE

Both driver and rear passenger seats are equipped with adjustable upper seat belt anchorages. The driver's "D" ring anchorage has 5 positions and is placed in the 3rd position from the top; the rear passenger seat has 4 positions and is placed in the 2nd position from the top.

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

FUEL TANK CAPACITY DATA

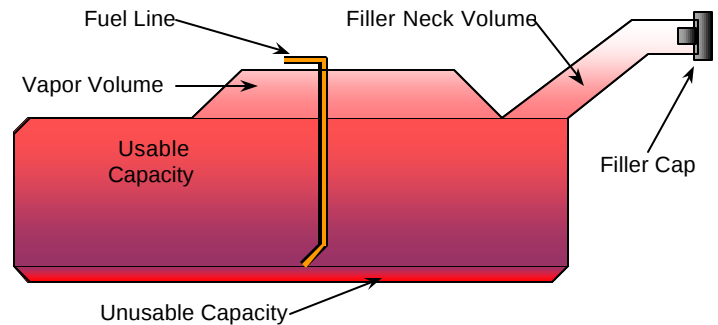
The "Usable Capacity" of the standard equipment fuel tank is: 74.9 liters

The "Usable Capacity" of any optional equipment fuel tank is: N/A liters

92-94% of "Usable Capacity" for certification to FMVSS 301 requirement: 68.9 to 70.4 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 69.7 liters

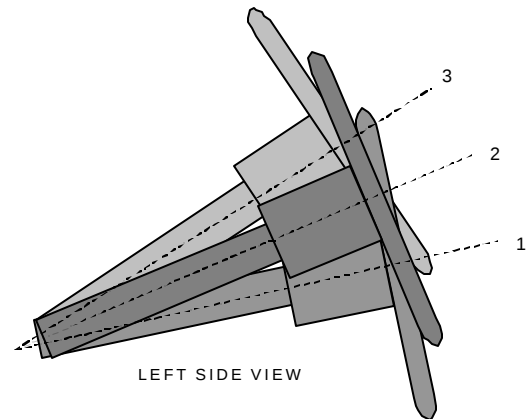
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately three (3) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender.



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 it is moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed onto the plate and the angle is measured. The tested vehicle has its steering column set at position 2 as indicated in the drawing at right and the angle below.



STEERING COLUMN ASSEMBLY

Lowermost, position 1: 26°

Geometric center, position 2: 21°

Uppermost, position 3: 17°

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	619	459		663	528	
Right	kg	609	440		638	499	
Weight Ratio	%	57.7	42.3		55.9	44.1	
Totals	kg	1228	899	2127	1301	1027	2328

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	118	312
Level 2	Occupant H-Point	mm	365	768
Level 3	Mid Door	mm	368	695
Level 4	Window Sill	mm	257	1065
Level 5	Window Top	mm	18	1640
N/A	Maximum Penetration	mm	368	

INSTRUMENTATION

Driver SID Accelerometers	11
Passenger SID Accelerometers	11
Vehicle Structure Accelerometers	25
MDB Accelerometers	5
Total	52

16mm MOVIE COVERAGE

High Speed, Vehicle On-Board	3
High Speed, Off-Board	5
High Speed, MDB On-Board	2
Real Time, Panning	1
Total	11

DATA SHEET NO. 3
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

MDB SPECIFICATIONS (mm)

Measurement Description	Length
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2590
C.G. Location aft of Front Axle	1127

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	384	308	
Right	kg	385	284	
Ratio	%	56.5	43.5	
Totals	kg	769	592	1361

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.81
Trap No. 2 Velocity (Redn.)	km/h	61.1 to 62.7	61.84
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.5

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE (mm)

Vertical Location			From Centerline		Max Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	273
B	Top of Bumper	533	800	Left	105
C	Mid Level	686	800	Left	118
D	Top of Stack	813	800	Right	159

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 4
POST TEST OBSERVATIONS

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

Description	Front Seat SID	Rear Seat SID
Dummy Type / Serial No.	P572F, SID / No. 274	P572F, SID / No. 275
Head Contact	D-Ring/Headrest	Window Frame/Headrest
Upper Torso Contact	Panel	Panel
Lower Torso Contact	Seat/Panel	Seat/Panel
Left Knee Contact	Panel	Panel
Right Knee Contact	Knee	Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	Remained closed inoperable	Remained closed inoperable
Right Side Door Opening	Remained closed operable	Remained closed operable
Seat Movement	None	None
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Pillars pushed inward with no apparent failure
Sill Separation	No Apparent Visible Failure
Windshield Damage	Glazing Cracks on Struck Side Only
Window Damage	Both Left Side Windows Broke.
Other Notable Effects	No significant items to note.

AIR BAG DEPLOYMENT

	Driver	Front Passenger	Rear Passenger
Front	No	Yes	N/A
Side	N/A	N/A	N/A

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	3(left)
Vertical Offset	mm	+/- 20	3(above)

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5
SID INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

THORAX AND PELVIS PEAK ACCELERATIONS, PRIMARY (FIR 100 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Upper Rib (LUR)	Y	G's	58.2	48.8	-6.2	185.0	34.8	65.6	-9.1	115.6
Lower Rib (LLR)	Y	G's	56.4	34.4	-8.1	184.4	48.7	55.0	-4.8	115.6
Lower Spine (T ₁₂)	Y	G's	49.4	38.1	-6.9	98.1	38.2	55.0	-5.0	111.9
Pelvis (PEV)	Y	G's	97.6	37.5	-13.5	58.8	103.2	48.1	-17.3	81.9

THORACIC TRAUMA INDEX (TTI) AND PELVIC ACCELERATION, PRIMARY (FIR 100 Filtered)

Location	Driver				Passenger			
	LLR	T ₁₂	TTI(g)	PEV(g)	LLR	T ₁₂	TTI(g)	PEV(g)
Primary Rib, Spine, and Pelvis	58.175	49.368	54	98	48.663	38.168	43	103

THORAX AND PELVIS PEAK ACCELERATIONS, REDUNDANT (FIR 100 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Upper Rib (LUR)	Y	G's	57.5	48.8	-5.6	185.0	34.5	65.6	-8.8	115.6
Lower Rib (LLR)	Y	G's	54.6	47.5	-7.9	184.4	49.0	55.0	-4.2	115.6
Lower Spine (T ₁₂)	Y	G's	49.3	38.1	-6.2	98.1	37.4	55.0	-4.8	111.9
Pelvis (PEV)	Y	G's	96.5	37.5	-13.5	58.8	100.5	48.1	-16.2	81.9

THORACIC TRAUMA INDEX (TTI) AND PELVIC ACCELERATION, REDUNDANT (FIR 100 Filtered)

Location	Driver				Passenger			
	LLR	T ₁₂	TTI(g)	PEV(g)	LLR	T ₁₂	TTI(g)	PEV(g)
Redundant Rib, Spine, and Pelvis	57.478	49.260	53	97	49.017	37.378	43	101

HEAD CG PEAK ACCELERATIONS (SAE CLASS 1000 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Head CG	X	G's	21.2	41.7	-18.9	55.6	5.5	184.4	-13.1	112.3
Head CG	Y	G's	37.1	41.3	-4.0	186.0	36.9	114.8	-17.7	58.0
Head CG	Z	G's	29.2	61.7	-10.1	52.2	62.5	94.9	-13.6	71.2
Head CG Resultant	N/A	G's	44.5	41.3			63.4	94.9		

HEAD INJURY CRITERIA (SAE CLASS 1000 Filtered)

Location	Driver				Passenger			
	HIC	T ¹	T ²	Avg G	HIC	T ¹	T ²	Avg G
Head CG	115.6	38.0	73.9	25.3	278.1	83.3	119.2	35.9

Positive Acceleration Polarities: Longitudinal (X) = Forward
 (Conforms to SAE J211) Lateral (Y) = Right
 Vertical (Z) = Down

DATA SHEET NO. 6

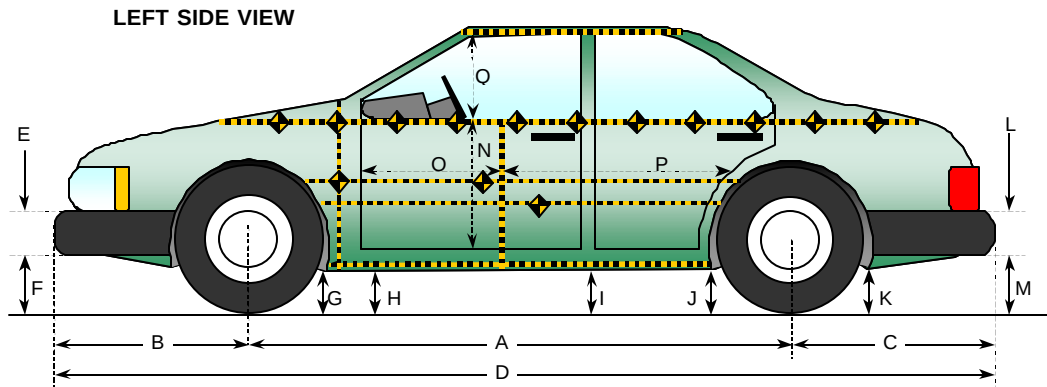
VEHICLE PRE-TEST AND POST TEST MEASUREMENTS

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01



All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2919	2926	-7
B	Front Axle To FSOV	968	994	-26
C	Rear Axle to RSOV	1037	1069	-32
D	Total Length at Centerline	4919	4947	-28
E	Front Bumper Thickness	399	399	0
F	Front Bumper Bottom to Ground	2	189	-187
G	Sill Height at Front Wheel Well	233	184	49
H	Sill Height at Front Door Leading Edge	246	206	40
I	Sill Height at "B" Pillar	259	267	-8
J1	Sill Height at Rear Wheel Well	243	252	-9
J2	Pinch Weld Height at Rear Wheel Well	268	286	-18
K	Sill Height aft of Rear Wheel Well	296	306	-10
L	Rear Bumper Thickness	308	308	0
M	Rear Bumper Bottom to Ground	322	348	-26
N	Sill Height to Window Bottom Sill	748	667	81
O	Front Door Leading Edge to Impact CL	863	722	141
P	Rear Door Trailing Edge to Impact CL	1259	1117	142
Q	Front Window Opening	512	480	32
R	Right Side Length	3369	3379	-10
S	Left Side Length	3369	3336	33
T	Vehicle Width at "B" Post	1852	1626	226

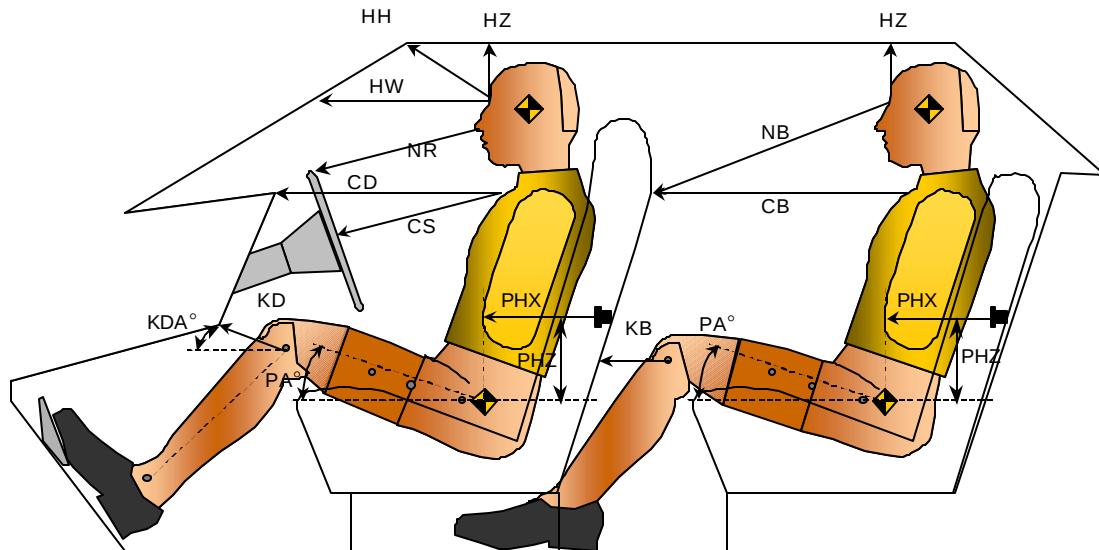
DATA SHEET NO. 7
SID LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01



Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	465	11		
HW		Head to Windshield	635			
HZ	HZ	Head to Roof	197	90	215	90
NR	NB	Nose to Rim/Nose to Seatback	528	11	580	23
CD	CB	Chest to Dash or Seatback	578	1	510	4
CS		Chest to Steering Wheel	365	15		
KDL	KBL	Left Knee to Dash or Seatback	155	25	225	20
KDR	KBR	Right Knee to Dash or Seatback	132		205	
PA	PA	Pelvic Angle		24		24
PHX	PHX	H-Point to Striker (X-Axis)	2326		376	
PHZ	PHZ	H-Point to Striker (Z-Axis)	22		134	
PHY	PHY	H-Point to Striker (Y-Axis)	236		360	

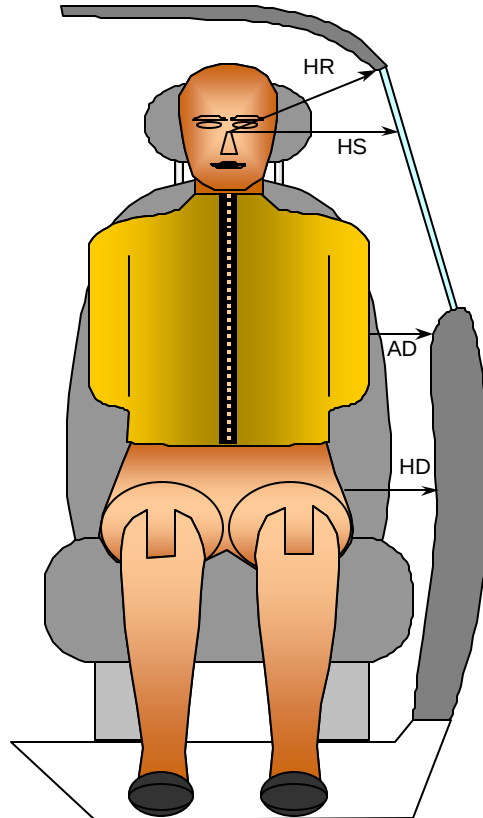
DATA SHEET NO. 8
SID LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No. KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01



FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	235	236
HS	Head to Side Window	mm	328	415
AD	Arm to Door	mm	61	223
HD	H-Point to Door	mm	175	306

DATA SHEET NO. 9

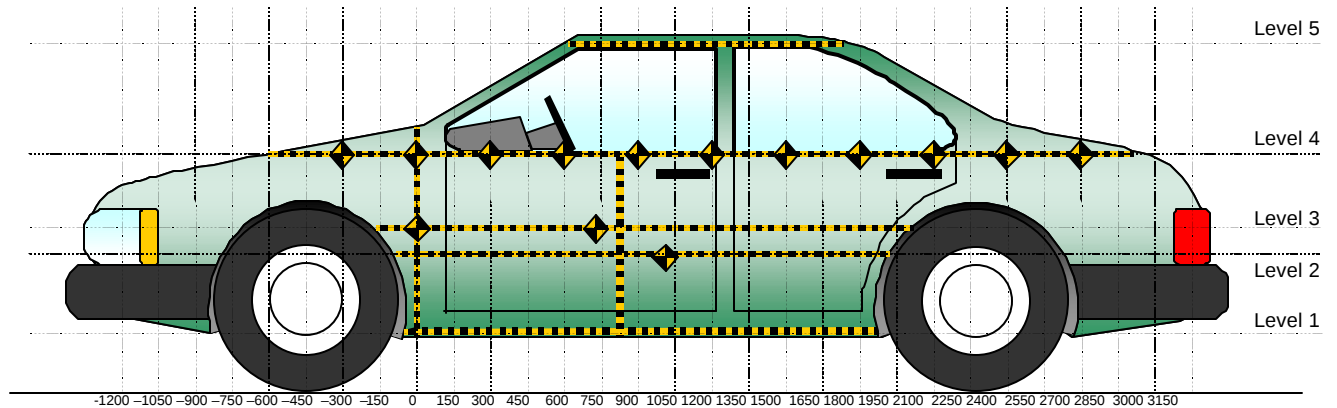
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01



All Measurements Shown in mm

LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.

Measurements taken 900mm right of impact reference.

All measurements below in mm.

Level	Measurement Description	Height Above Ground
5	Window Top	1640
4	Window Sill	1065
3	Mid Door	695
2	Occupant H-Point	768
1	Sill Top	312

DATA SHEET NO. 10 - VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

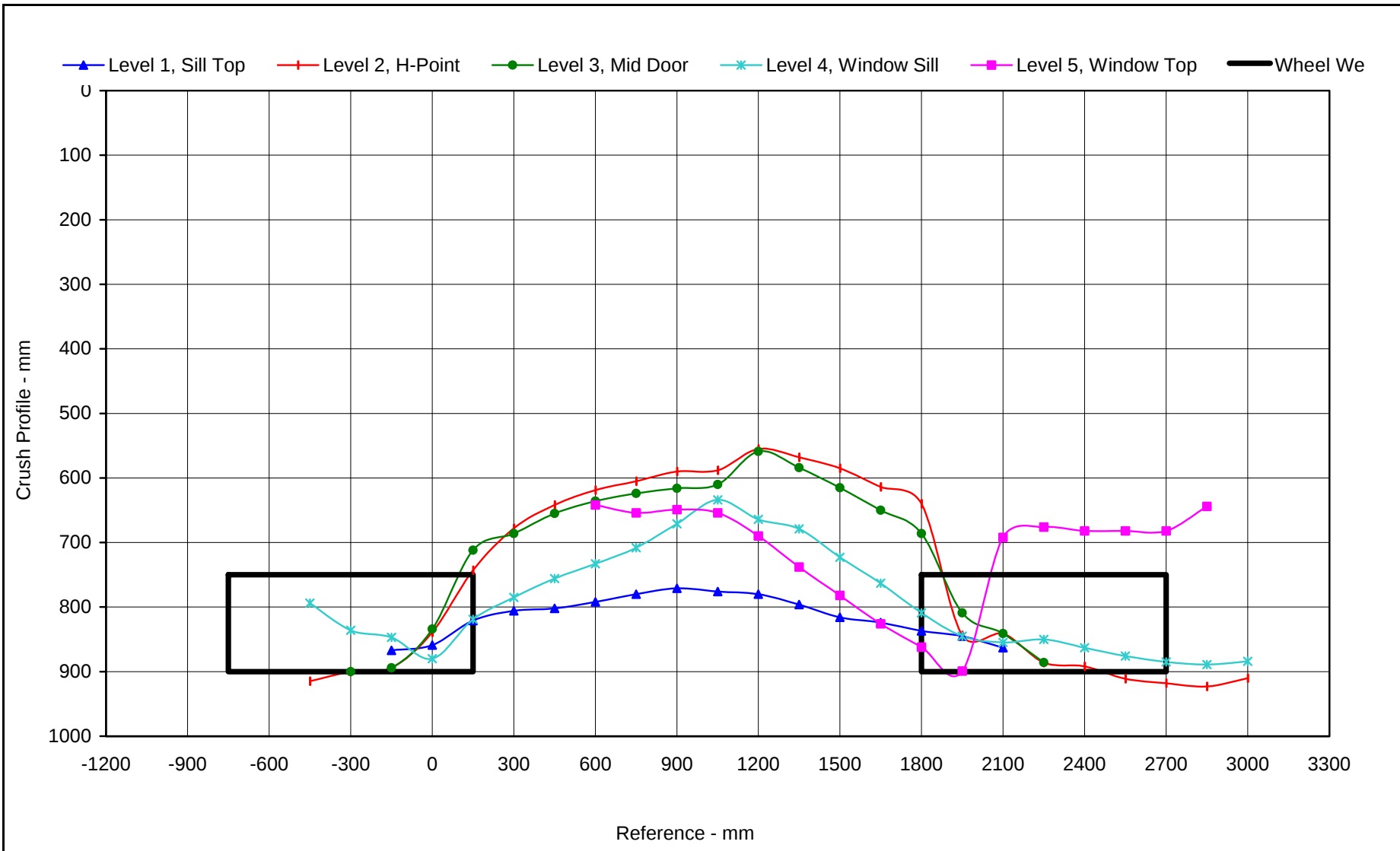
Test Date: 12/6/01

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450		940		782			915		794			25		-12	
-300		938	946	774			900	900	836			38	46	-62	
-150	899	923	928	862		867	894	894	847		32	29	34	15	
0	895	924	926	872		859	839	834	880		36	85	92	-8	
150	893	919	923	878		821	743	712	819		72	176	211	59	
300	889	918	923	883		806	678	686	785		83	240	237	98	
450	889	918	923	886		802	642	655	756		87	276	268	130	
600	888	918	924	885	635	792	619	636	733	642	96	299	288	152	-7
750	888	917	924	892	650	780	605	624	708	654	108	312	300	184	-4
900	889	920	924	892	667	771	590	616	671	649	118	330	308	221	18
1050	888	921	926	891	669	776	588	610	634	654	112	333	316	257	15
1200	889	920	927	894	665	780	555	559	664	690	109	365	368	230	-25
1350	889	924	928	894	669	796	568	584	679	738	93	356	344	215	-69
1500	890	923	927	895	671	816	585	615	723	782	74	338	312	172	-111
1650	894	929	929	898	668	824	614	650	763	826	70	315	279	135	-158
1800	893	930	930	900	669	837	640	686	809	862	56	290	244	91	-193
1950	893	932	932	901	665	845	844	809	845	899	48	88	123	56	-234
2100	889	935	936	903	666	863	841	841	855	692	26	94	95	48	-26
2250		937	935	902	669		886	886	850	676		51	49	52	-7
2400		940		898	666		892		863	682		48		35	-16
2550		938		895	661		911		876	682		27		19	-21
2700		934		890	661		918		885	682		16		5	-21
2850		929		885	639		923		889	644		6		-4	-5
3000		914		863			910		884			4		-21	

Pre-Test and Post-Test dimensions are actual distance from centerline of test vehicle.

DATA SHEET NO. 10...(continued)

18



Maximum Crush, Level 1: 118 mm at 900 mm
 Maximum Crush, Level 2: 365 mm at 1200 mm
 Maximum Crush, Level 3: 368 mm at 1200 mm
 Maximum Crush, Level 4: 257 mm at 1050 mm
 Maximum Crush, Level 5: 18 mm at 900 mm

Test Program: 55/28 km/h 90° Side Impact NCAP No.: KIA5002
 Test Vehicle: 2002 Kia Sedona LX Minivan
 Test Date: 12/06/01



KAR21130-01

DATA SHEET NO. 11

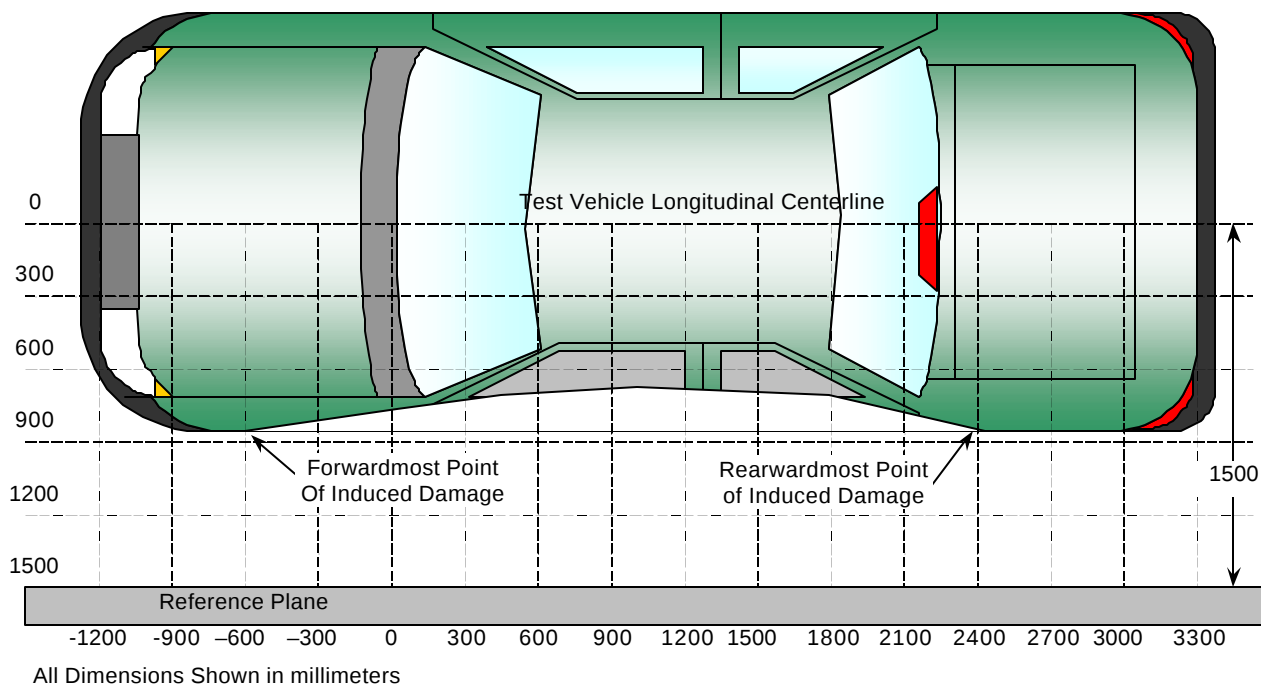
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01



TOP VIEW

Damage Profile Distances

DPD	Distance From Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	-450	2	940	915	25
2	300	2	918	678	240
3	1050	2	921	588	333
4	1800	2	930	640	290
5	2400	2	940	892	48
6	3000	2	914	910	4

Pre-Test and Post-Test measurements are distance from vehicle centerline.

DATA SHEET NO. 12

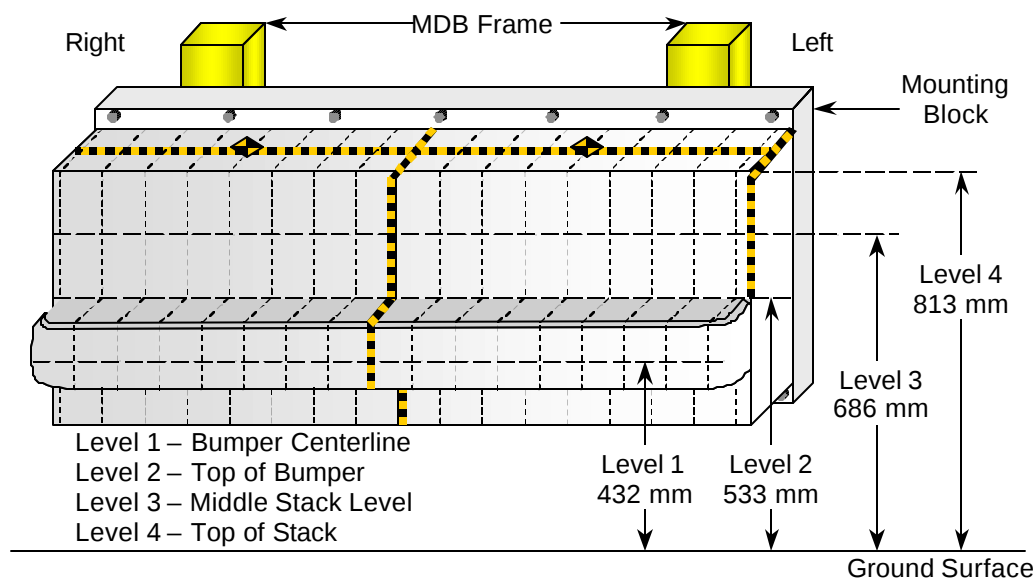
DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01



DEFORMABLE BARRIER STATIC CRUSH

Stack	Distance Right of Center								C _L	Distance Left of Center							
Level	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	273	248	249	237	231	223	225	215	208	198	197	195	192	180	177	175	174
2	105	106	92	89	86	83	82	81	81	77	76	76	72	70	67	64	61
3	118	94	65	40	29	18	18	36	34	25	19	20	29	38	52	87	127
4	90	56	52	4	-5	-11	-7	1	6	4	4	13	24	38	116	119	159

All Dimensions in mm

DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

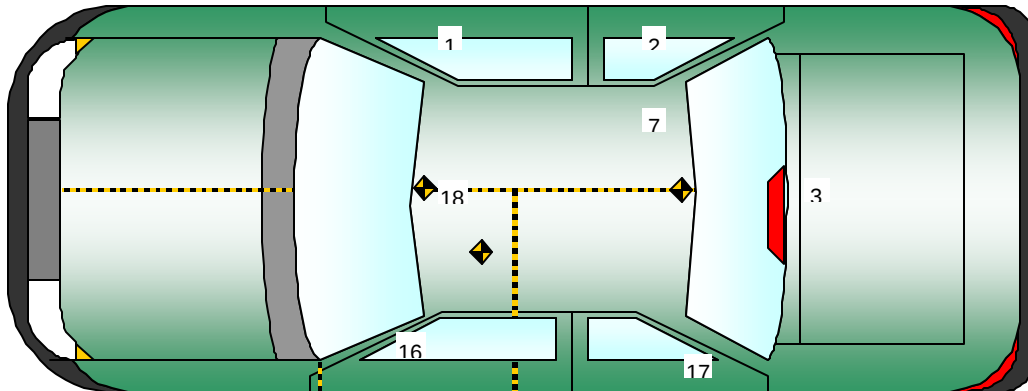
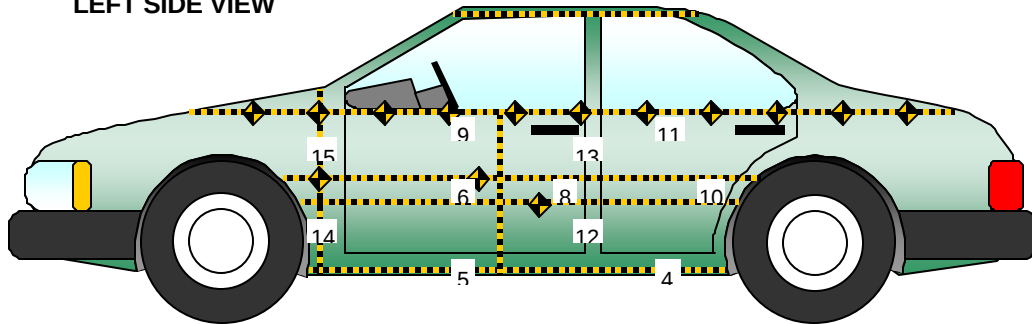
Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

LEFT SIDE VIEW



No.	Location
1	Right Sill at Front Seat
2	Right Sill at Rear Seat
3	Rear Floorpan Above Axle
4	Left Sill at Rear Door
5	Left Sill at Front Door
6	Left Front Door Centerline
7	Right Rear Occupant Compartment
8	Left Front Door Mid-Rear
9	Left Front Door Upper Centerline

No.	Location
10	Left Rear Door Mid-Rear
11	Left Rear Door Upper Centerline
12	Left Lower B-Post
13	Left Middle B-Post
14	Left Lower A-Post
15	Left Middle A-Post
16	Front Seat Track
17	Rear Seat Track or Structure
18	Vehicle CG

DATA SHEET NO. 13
VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	Right Sill at Front Seat	2810	760	405	X	2.7	74.2	-3.1	5.8
					Y	24.8	6.3	-1.7	159.9
					Z	3.5	75.3	-10.4	7.0
					RES	26.9	6.5		
2	Right Sill at Rear Seat	1920	730	475	X	2.9	74.0	-3.6	5.2
					Y	27.0	6.1	-1.5	155.2
					Z	5.5	47.7	-7.6	16.5
					RES	27.2	6.1		
3	Rear Floorpan Above Axle	850	280	580	X	2.0	70.9	-2.5	37.1
					Y	26.1	8.1	-1.7	121.6
					Z	4.5	47.5	-3.6	24.6
					RES	26.1	8.1		
4	Left Sill at Rear Door	1850	-630	350	Y	43.1	5.1	-4.7	37.5
5	Left Sill at Front Door	2915	-760	220	Y	81.6	5.5	-16.9	9.7
6	Front Door Centerline	2950	-805	845	Y	122.7	8.9	-40.0	16.2 *
7	Rear Occupant Compartment	2320	560	450	Y	21.7	6.5	-1.3	157.0
8	Front Door Mid-Rear	2570	-815	800	Y	89.3	9.5	-79.4	35.4
9	Front Door Upper Centerline	3030	-815	960	Y	152.2	15.2	-74.7	26.7 *
10	Rear Door Mid-Rear	1550	-870	810	Y	137.9	12.7	-73.3	29.9
11	Rear Door Upper Centerline	1870	-870	1100	Y	94.2	15.2	-58.6	5.0
12	B-Post Lower	2430	-780	710	Y	137.3	4.4	-40.0	35.3
13	B-Post Middle	2430	-780	915	Y	126.9	5.1	-48.3	35.7
14	A-Post Lower	3450	-850	600	Y	33.9	10.1	-5.6	14.3
15	A-Post Middle	2450	-850	1000	Y	43.5	1.9	-15.9	23.1
16	Front Seat Track	2880	-690	545	Y	56.0	22.2	-30.4	38.2
17	Rear Seat Structure				Y				**
18	Vehicle CG	3180	190	410	X	2.5	71.6	-2.6	14.3
					Y	25.6	7.2	-1.7	158.8
					Z	13.7	12.2	-12.6	7.7
					RES	28.5	7.5		

* Channels Failed, check plot for failure times

** Not installed

DATA SHEET NO. 14
MDB ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2002 Kia Sedona LX Minivan

Test Program: 55/28 km/h 90° Side Impact NCAP

NHTSA No.: KIA5002

Test Date: 12/6/01

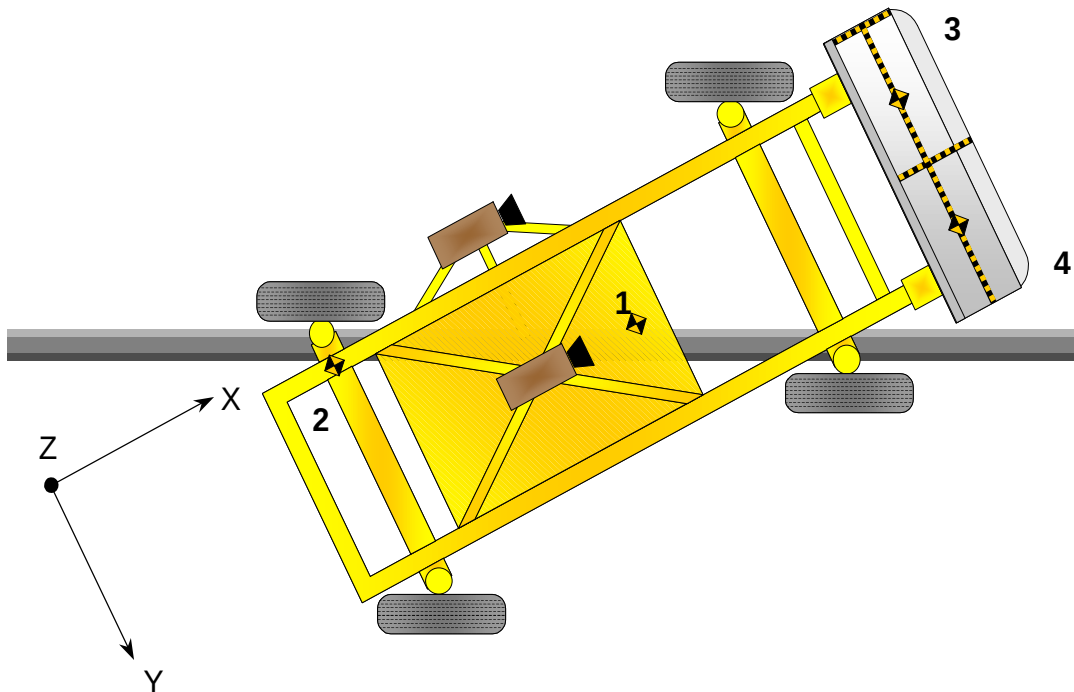
MDB ACCELEROMETER PEAK DATA AND LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	MDB CG	-1195	0	430	X	3.3	149.7	-17.5	40.5
					Y	3.4	168.0	-7.0	40.0
					Z	16.6	152.5	-16.8	162.2
					RES	19.0	35.9		
2	MDB Rear	-2642	-593	608	X	1.9	126.6	-21.1	36.0
					Y	3.3	82.6	-5.4	21.6

Reference Points X - MDB Front Axle Y - MDB Centerline Z - Ground Plane

MDB BUMPER CONTACT SWITCH DATA

Loc. No.	Contact Switch Location	Units	Peak and 50% Crossing Point			
			Max	Time	50%	Time
3	MDB Left Bumper (T=0)	% F.S	100.0	0.0	50.0	0.0
4	MDB Right Bumper	% F.S.	105.1	6.4	52.5	0.8



DATA SHEET NO. 15

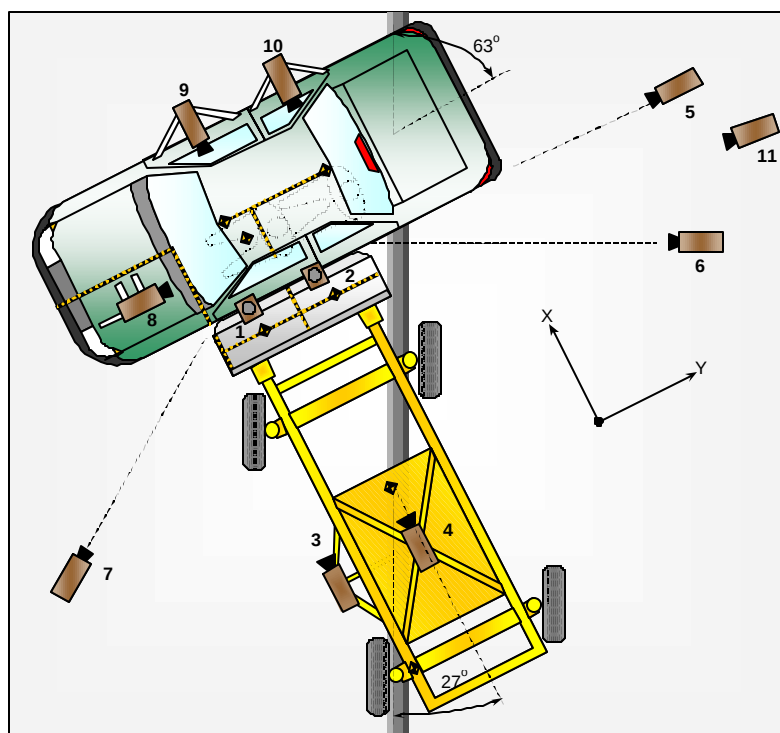
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01



No.	Camera View	Location (mm)			Angle (deg.)	Lens (mm)	Film Speed (fr./sec.)
		X	Y	Z			
1	Overhead Overall	1650	-760	5486	-90	10	1090
2	Overhead Close-up	-760	0	5790	-90	24	1020
3	MDB Onboard, Impact Point Close-Up	-2130	0	1140	-6	13	720
4	MDB Onboard, Centerline of Impact	-3050	-1650	1830	-10	13	760
5	Right Side, Ground Level, Overall	0	-20940	740	-1	50	*
6	Right Side, Ground Level, Close-up	-8840	-15510	740	0	80	980
7	Left Side, Ground Level, Close-up	-2630	4680	1450	-7	13	1030
8	Vehicle Onboard Front SID, Front	530	680	1520	-9	19	FAILED
9	Vehicle Onboard Front SID, Side	1910	-760	1170	0	10	FAILED
10	Vehicle Onboard Rear SID, Side	1900	-1730	1230	-5	10	FAILED
11	Real Time Coverage						24

DATA SHEET NO. 16

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2002 Kia Sedona LX Minivan

NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 12/6/01

Test Time: 12:31 PM

Temperature at Time of Impact: 11.1 °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 Details: No leakage occurred

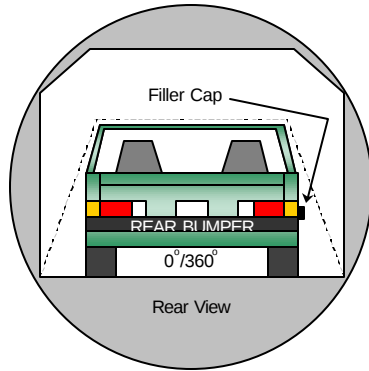
DATA SHEET NO. 17
FMVSS 301 STATIC ROLLOVER DATASHEET

Test Vehicle: 2002 Kia Sedona LX Minivan

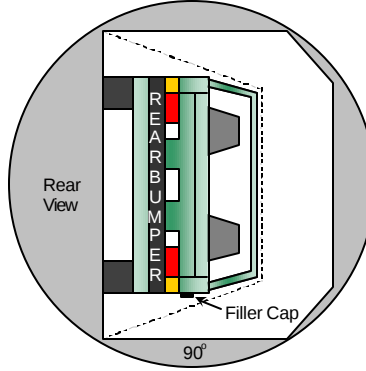
NHTSA No.: KIA5002

Test Program: 55/28 km/h 90° Side Impact NCAP

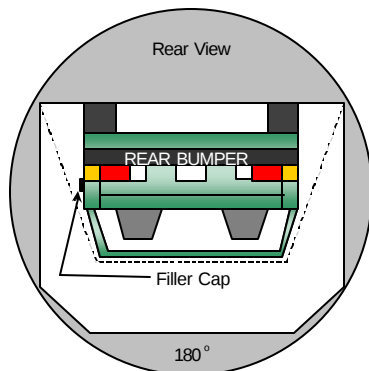
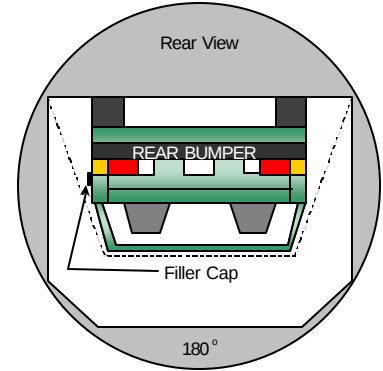
Test Date: 12/6/01



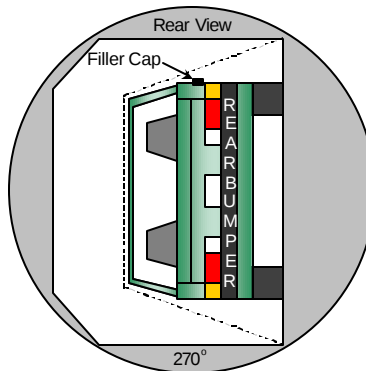
0° TO 90°



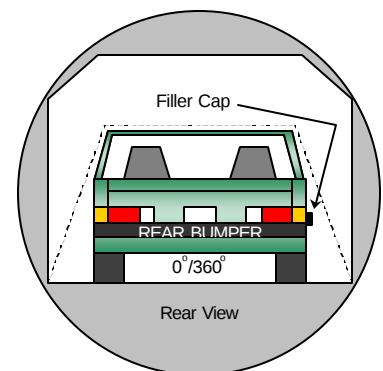
90° TO 180°



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. Details of Stoddard Solvent spillage locations.

No solvent leakage occurred during static rollover testing.

Rollover Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° TO 90°	80	300	0.0
90° TO 180°	79	300	0.0
180° TO 270°	80	300	0.0
270° TO 360°	82	300	0.0

APPENDIX A
PHOTOGRAPHS

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Figure A-1: Left Front, as Received



Figure A-2: Right Rear, as Received

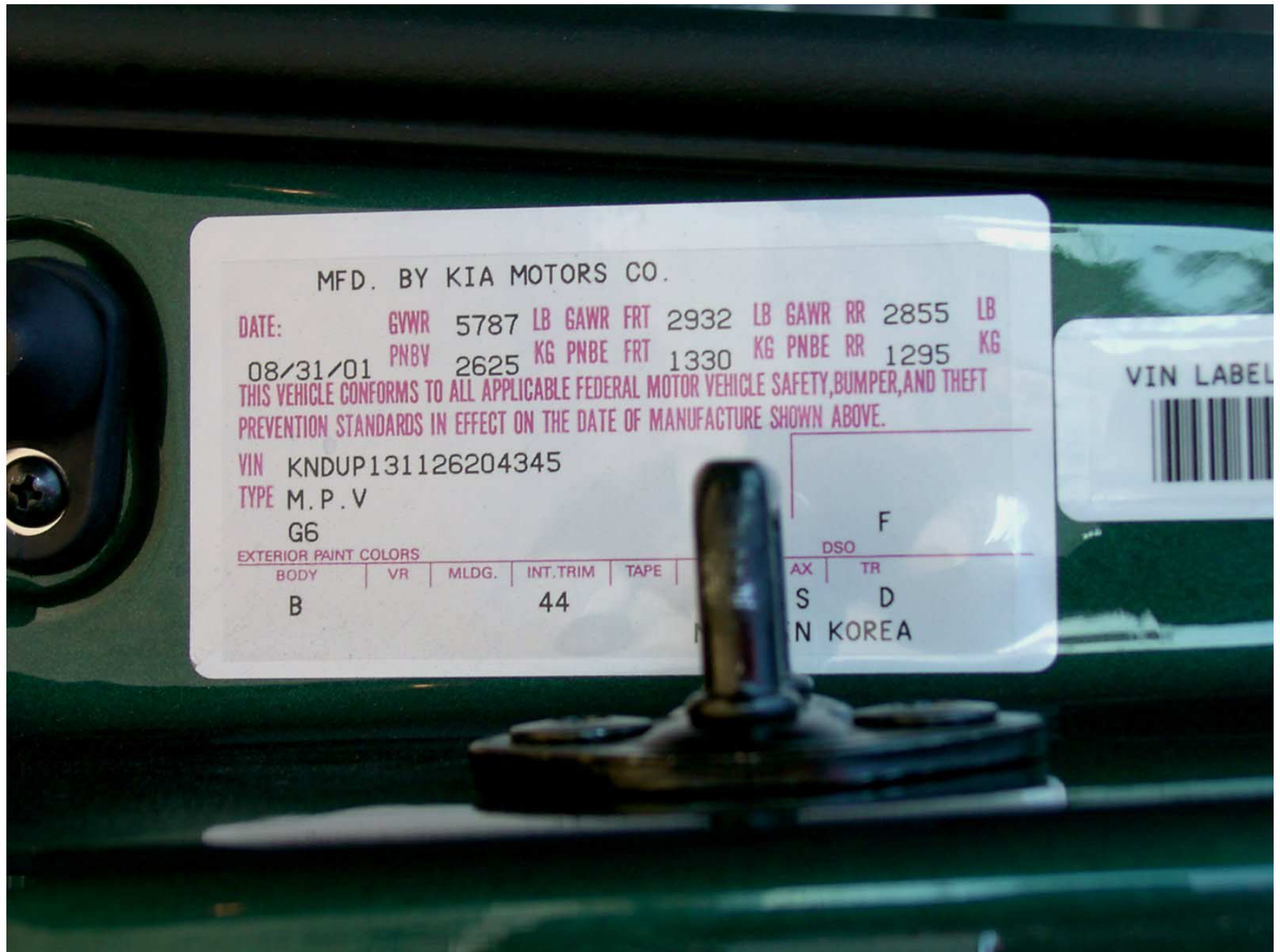


Figure A-3: Vehicle Certification Label

SEDONA

GVWR 5895LBS(2674KG)
VCW(CAPACITY) 1157LBS(525KG)

MANUFACTURED BY
KIA KIA MOTORS

GAWR(FRONT) : 2976LBS(1350KG) USING P215/70R15 TIRES
ON 15X6JJ RIMS INFLATE TO : 35PSI(COLD)

GAWR(REAR) : 2919LBS(1324KG) USING P215/70R15 TIRES
ON 15X6JJ RIMS INFLATE TO : 35PSI(COLD)

SPARE(FULL SIZE) : P215/70R15 TIRE ON 15X6JJ RIM INFLATE TO : 35PSI(COLD)

Figure A-4: Vehicle Tire Label



Figure A-5: Front View, Pre-Test



Figure A-6: Front View, Post-Test



Figure A-7: Rear View, Pre-Test



Figure A-8: Rear View, Post-Test



Figure A-9: Left (Impacted) Side View, Pre-Test



Figure A-10: Left (Impacted) Side View, Post-Test

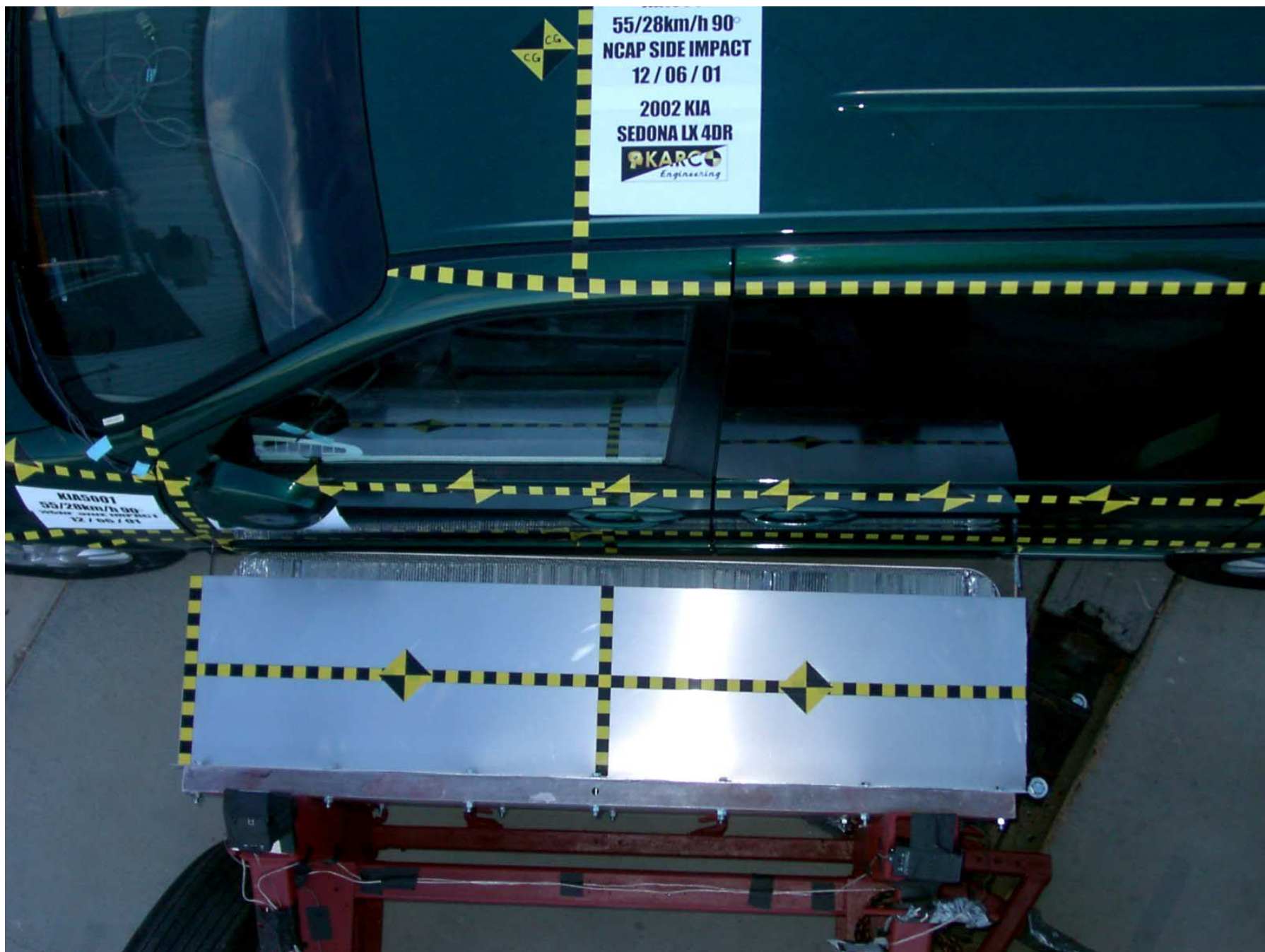


Figure A-11: Overhead Close-up View at Impact Position, Pre-Test



Figure A-12: Overhead Overall View, Pre-Test

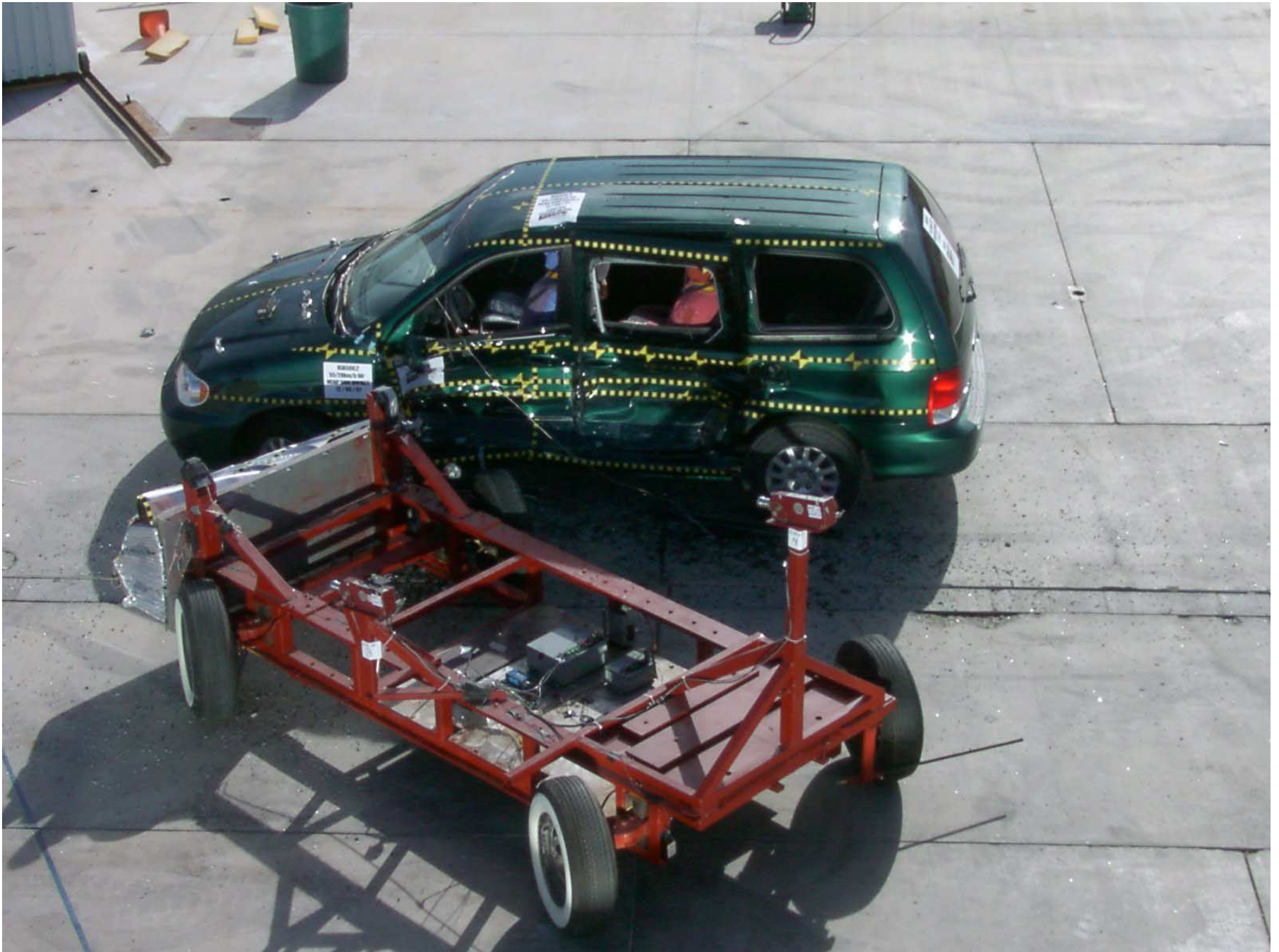


Figure A-13: Overhead Overall View, Post-Test



Figure A-14: MDB Left Side View at Impact Position, Pre-Test



Figure A-15: MDB Right Side View at Impact Position, Pre-Test



Figure A-16: Impact Point Target Close-up, Pre-Test



Figure A-17: Impact Point Target Close-up, Post-Test



Figure A-18: Left Front Door Closed, Pre-Test



Figure A-19: Left Front Door Closed, Post-Test



Figure A-20: Left Rear Door Closed, Pre-Test



Figure A-21: Left Rear Door Closed, Post-Test



Figure A-22: Driver Dummy Left Side with Door Open, Pre-Test



Figure A-23: Driver Dummy Left Side, Pre-test



Figure A-24: Driver Dummy Left Side, Post-Test



Figure A-25: Driver Dummy Clearance, Pre-Test



Figure A-26: Driver Dummy Clearance, Post-Test



Figure A-27: Driver Dummy Inside View, Pre-Test



Figure A-28: Driver Dummy Inside View, Post-Test



Figure A-29: Driver Door Inside View, Pre-Test



Figure A-30: Driver Dummy Contact Points Inside View, Post-Test



Figure A-31: Passenger Dummy Left Side with Door Open, Pre-Test



Figure A-32: Passenger Dummy Left Side, Pre-Test



Figure A-33: Passenger Dummy Left Side, Post-Test



Figure A-34: Passenger Dummy Clearance, Pre-Test



Figure A-35: Passenger Dummy Clearance, Post-Test

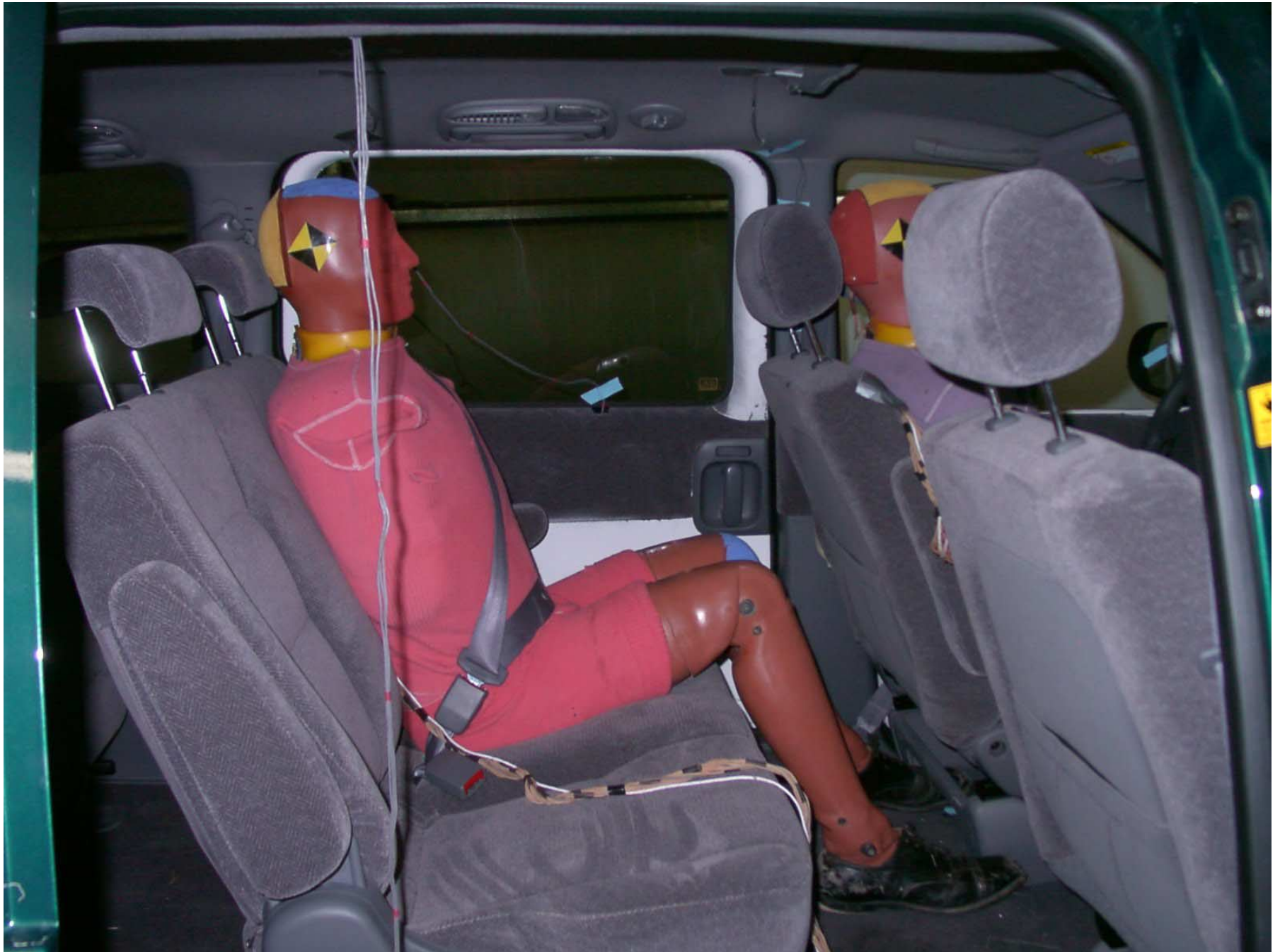


Figure A-36: Passenger Dummy Inside View, Pre-Test



Figure A-37: Passenger Dummy Inside View, Post-Test



Figure A-38: Passenger Door Inside View, Pre-Test



Figure A-39: Passenger Dummy Contact Points Inside View, Post-Test



Figure A-40: Front View of Deformable Barrier, Pre-Test



Figure A-41: Front View of Deformable Barrier, Post-Test

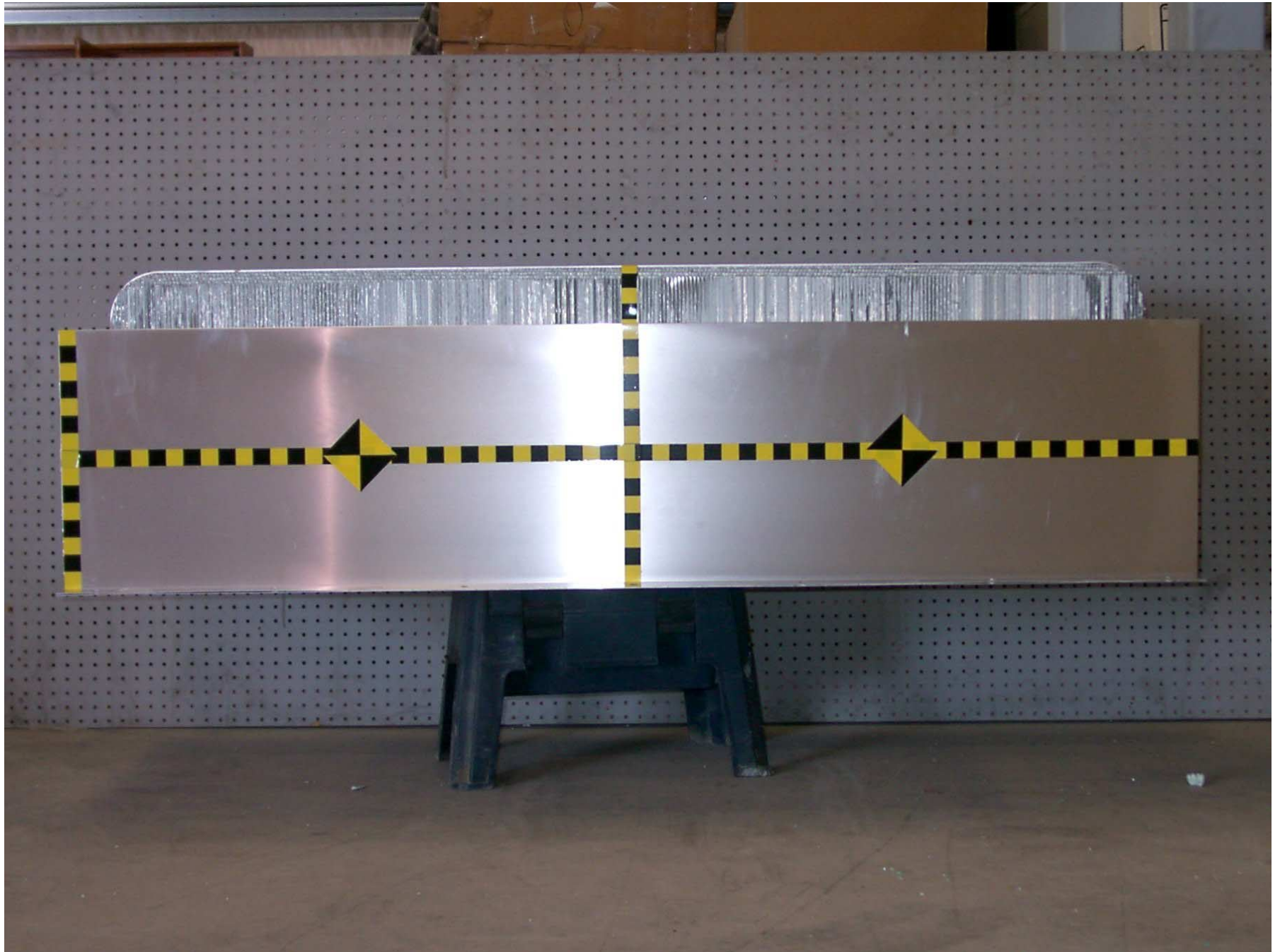


Figure A-42: Top View of Deformable Barrier, Pre-Test



Figure A-43: Top View of Deformable Barrier, Post-Test



Figure A-44: Right Side View of Deformable Barrier, Pre-Test



Figure A-45: Right Side View of Deformable Barrier, Post-Test



Figure A-46: Left Side View of Deformable Barrier, Pre-Test



Figure A-47: Left Side View of Deformable Barrier, Post-Test



Figure A-48: Vehicle on Rollover Device, Top View



Figure A-49: Vehicle During Impact

APPENDIX B
SID, VEHICLE, AND MDB RESPONSE DATA

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B-4	Driver Head CG Y Velocity	B-4
B-5	Driver Head CG Z	B-5
B-6	Driver Head CG Z Velocity	B-6
B-7	Driver Head CG Resultant	B-7
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B-9	Driver Upper Rib Primary Y Velocity	B-9
B-10	Driver Lower Rib Primary Y	B-10
B-11	Driver Lower Rib Primary Y Velocity	B-11
B-12	Driver Lower Spine Primary Y	B-12
B-13	Driver Lower Spine Primary Y Velocity	B-13
B-14	Driver Pelvis Primary Y	B-14
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B-16	Driver Upper Rib Redundant Y	B-16
B-17	Driver Upper Rib Redundant Y Velocity	B-17
B-18	Driver Lower Rib Redundant Y	B-18
B-19	Driver Lower Rib Redundant Y Velocity	B-19
B-20	Driver Lower Spine Redundant Y	B-20
B-21	Driver Lower Spine Redundant Y Velocity	B-21
B-22	Driver Pelvis Redundant Y	B-22
B-23	Driver Pelvis Redundant Y Velocity	B-23
B-24	Driver Thorax Contact	B-24
B-25	Driver Pelvis Contact	B-25

LIST OF DATA PLOTS, PASSENGER SID

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B-31	Passenger Head CG Z Velocity	B-31
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B-34	Passenger Upper Rib Primary Y Velocity	B-34
B-35	Passenger Lower Rib Primary Y	B-35
B-36	Passenger Lower Rib Primary Y Velocity	B-36
B-37	Passenger Lower Spine Primary Y	B-37
B-38	Passenger Lower Spine Primary Y Velocity	B-38
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B-40	Passenger Pelvis Primary Y Velocity	B-40
B-41	Passenger Upper Rib Redundant Y	B-41
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B-54	Right Sill at Front Seat Y Velocity	B-54
B-55	Right Sill at Front Seat Z	B-55
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B-78	Right Rear Occupant Compartment Y	B-78
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LIST OF DATA PLOTS, VEHICLE...(CONTINUED)

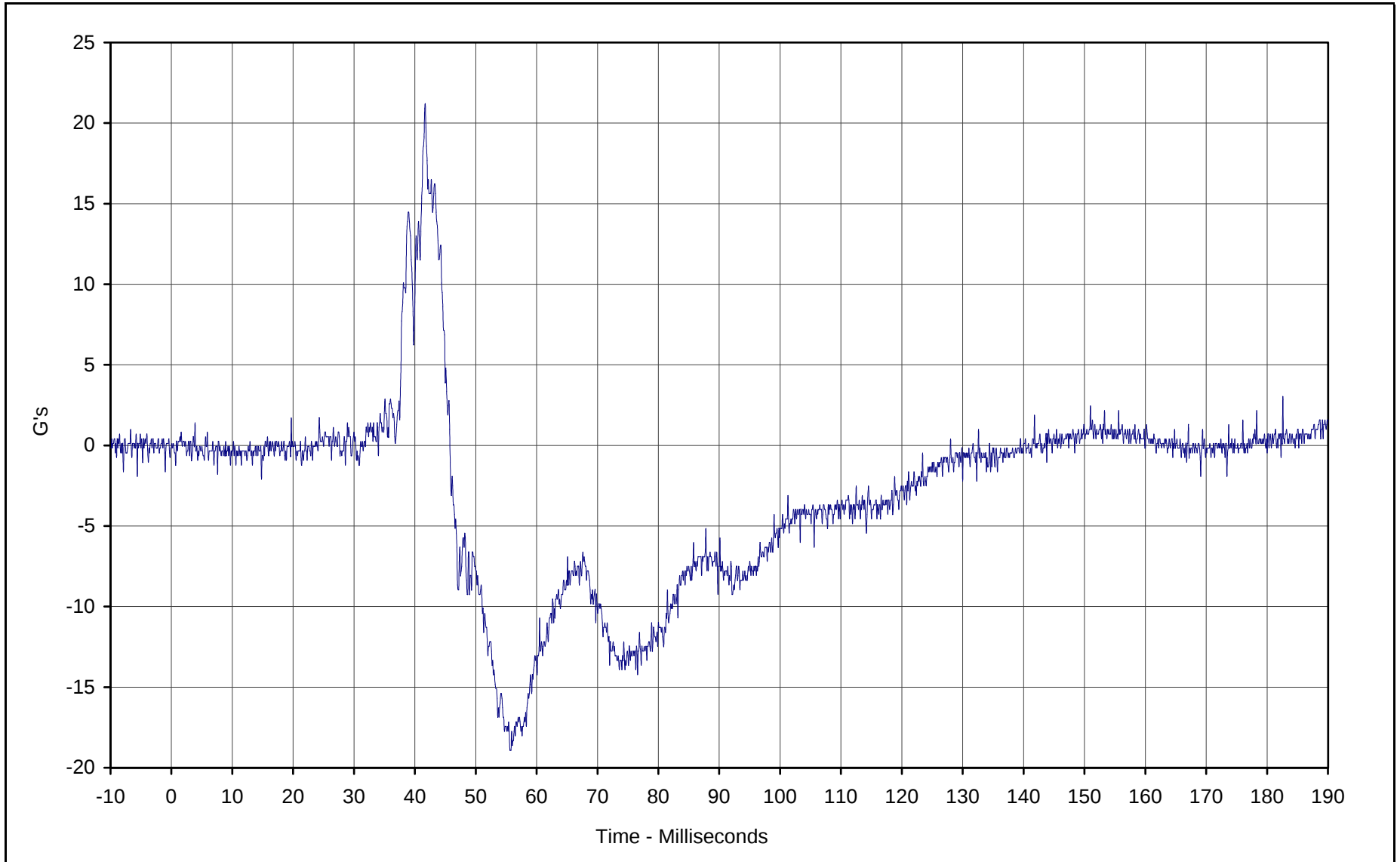
Data Plot		Page
B-80	Left Front Door Mid Rear Y	B-80
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B-82	Left Front Door Upper Centerline Y	B-82
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B-84	Left Rear Door Mid Rear Y	B-84
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B-88	Left B-Post Lower Y	B-88
B-89	Left B-Post Lower Y Velocity	B-89
B-90	Left B-Post Middle Y	B-90
B-91	Left B-Post Middle Y Velocity	B-91
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B-96	Left Front Seat Track Y	B-96
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B-117 Moving Deformable Barrier Rear Y Velocity	B-117
B-118 Moving Deformable Barrier Right Bumper Contact Time	B-118

LIST OF DATA PLOTS, FIR FILTER DATA

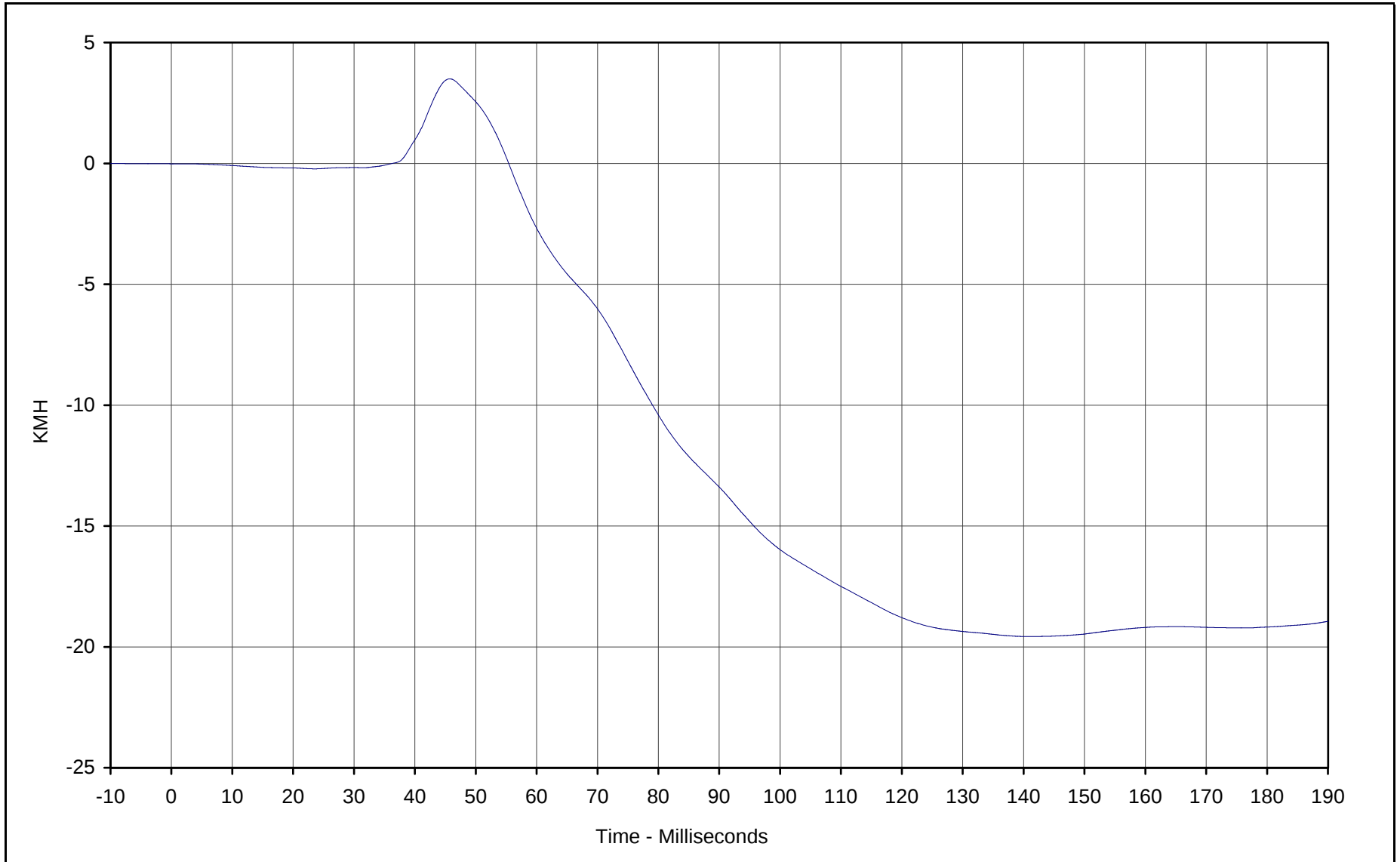
Data Plot	Page
B-119 Driver Upper Rib Primary Y	B-119
B-120 Driver Lower Rib Primary Y	B-120
B-121 Driver Lower Spine Primary Y	B-121
B-122 Driver Pelvis Primary Y	B-122
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B-126 Driver Pelvis Redundant Y	B-126
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B-129 Passenger Lower Spine Primary Y	B-129
B-130 Passenger Pelvis Primary Y	B-130
B-131 Passenger Upper Rib Redundant Y	B-131
B-132 Passenger Lower Rib Redundant Y	B-132
B-133 Passenger Lower Spine Redundant Y	B-133
B-134 Passenger Pelvis Redundant Y	B-134



Curve Description: Driver Head CG X
Maximum Value: 21.2 at 41.7 Milliseconds
Minimum Value: -18.9 at 55.6 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-001

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

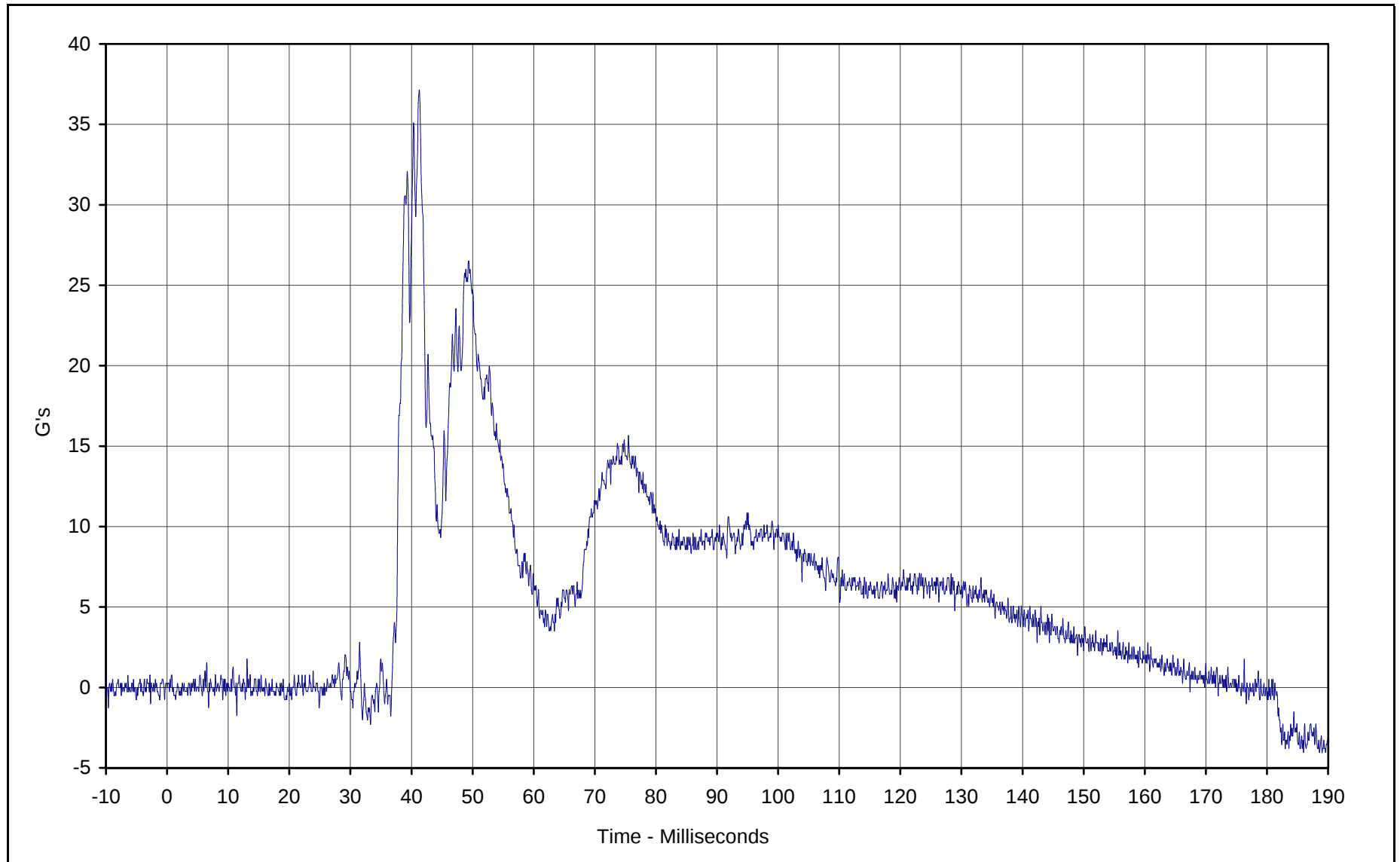




Curve Description: Driver Head CG X Velocity
Maximum Value: 3.5 at 45.7 Milliseconds
Minimum Value: -19.6 at 141.3 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-001

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

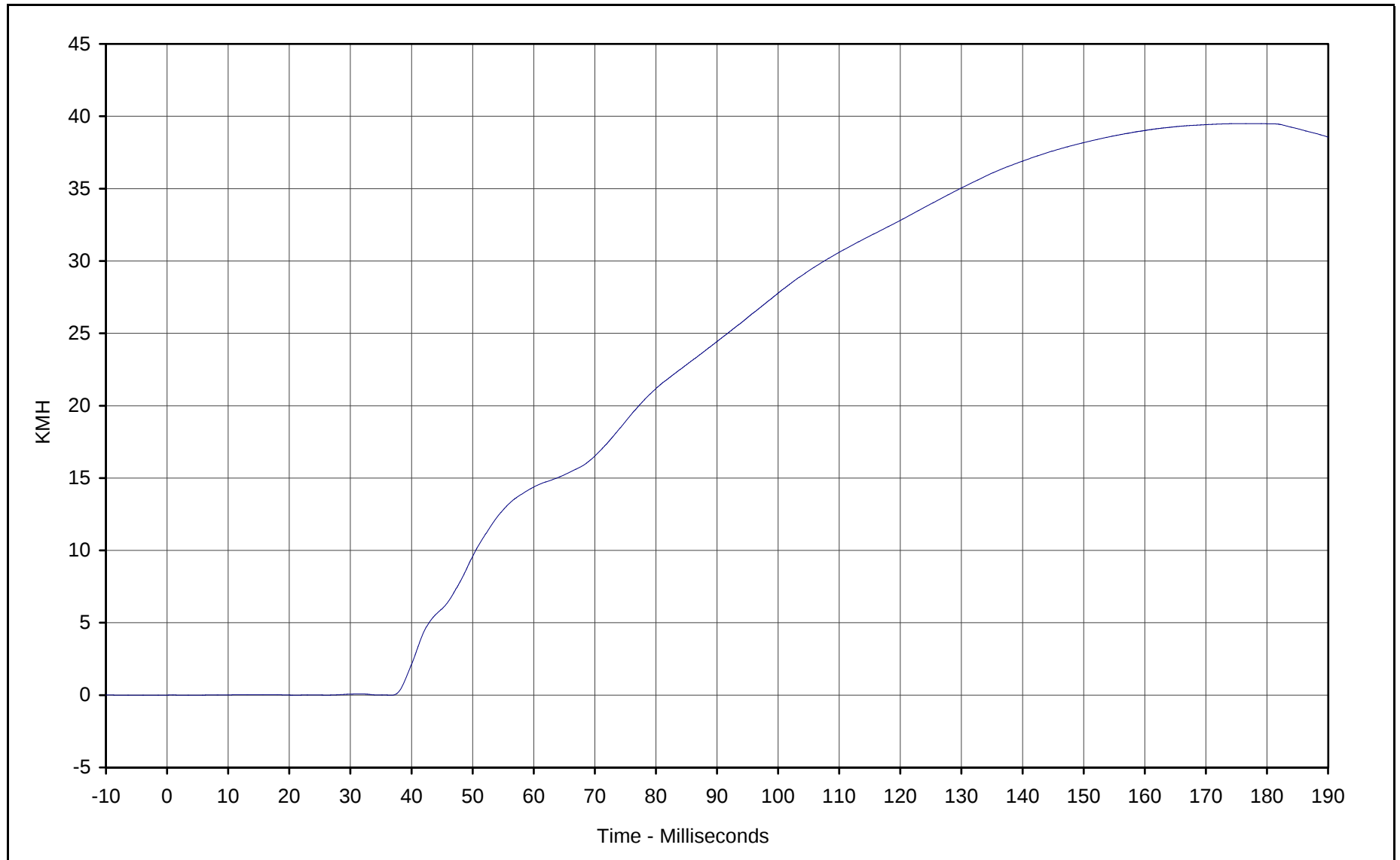




Curve Description: Driver Head CG Y
Maximum Value: 37.1 at 41.3 Milliseconds
Minimum Value: -4.0 at 186.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-002

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

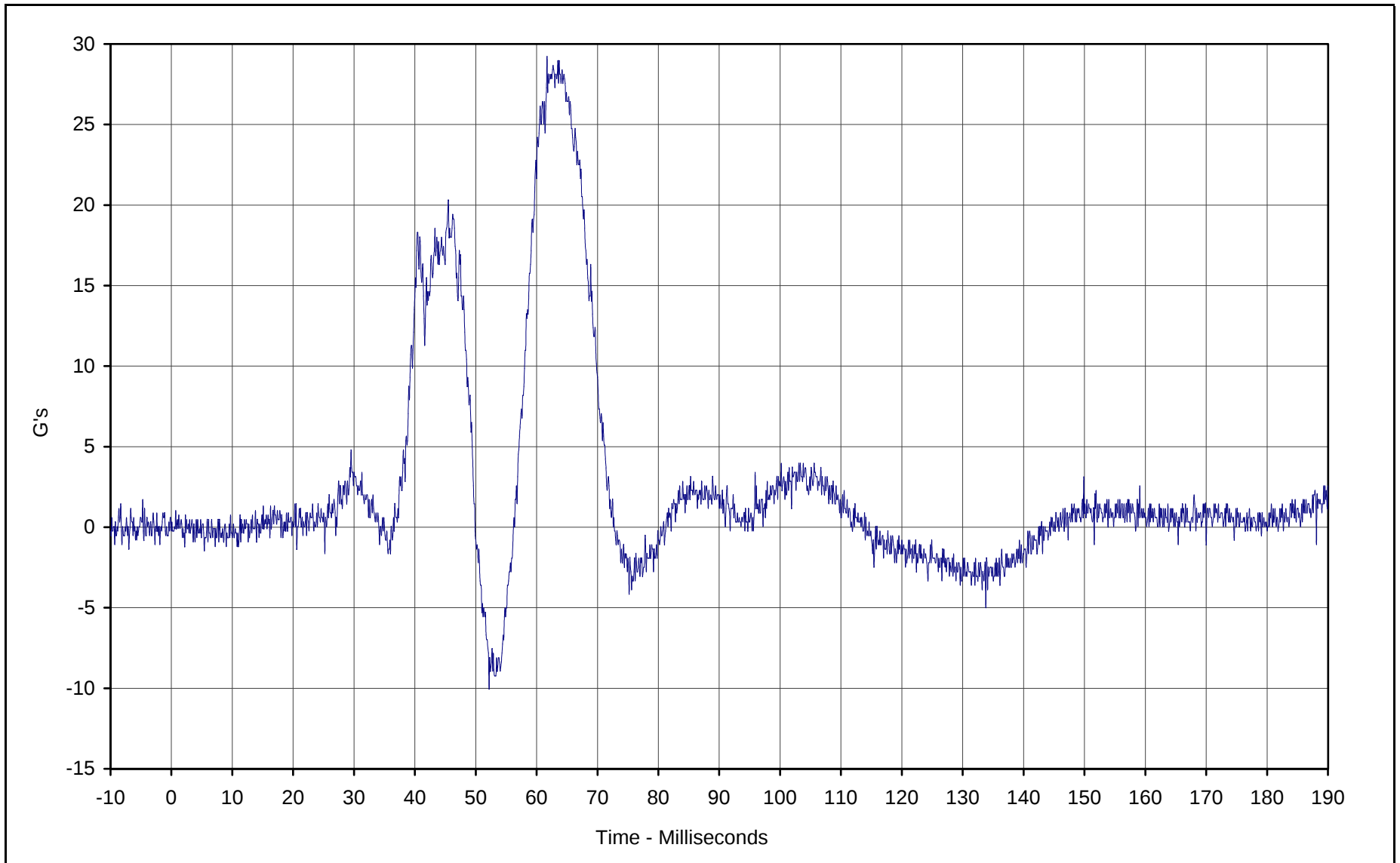




Curve Description: Driver Head CG Y Velocity
Maximum Value: 39.5 at 176.3 Milliseconds
Minimum Value: 0.0 at 36.6 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-002

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

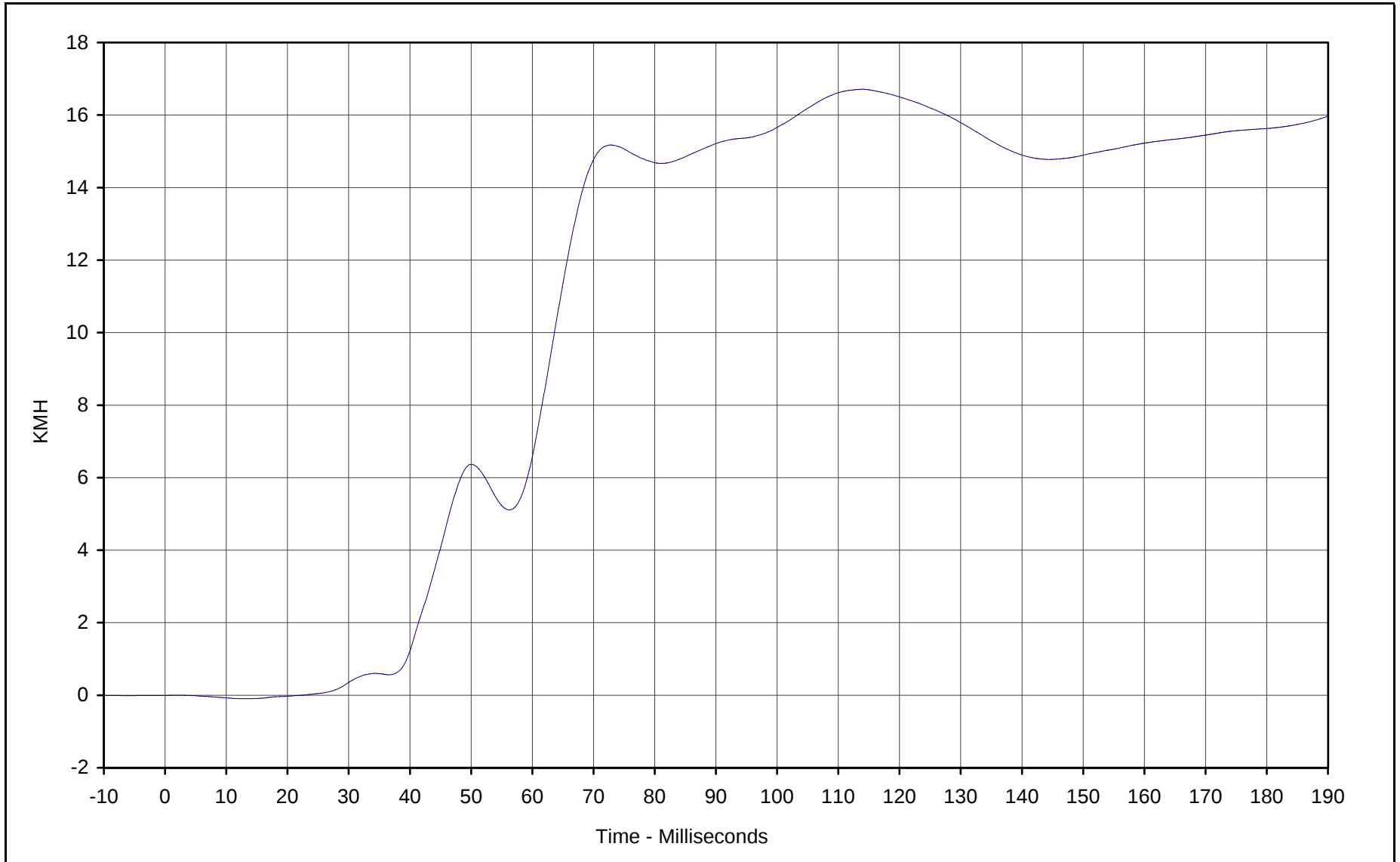




Curve Description: Driver Head CG Z
Maximum Value: 29.2 at 61.7 Milliseconds
Minimum Value: -10.1 at 52.2 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-003

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

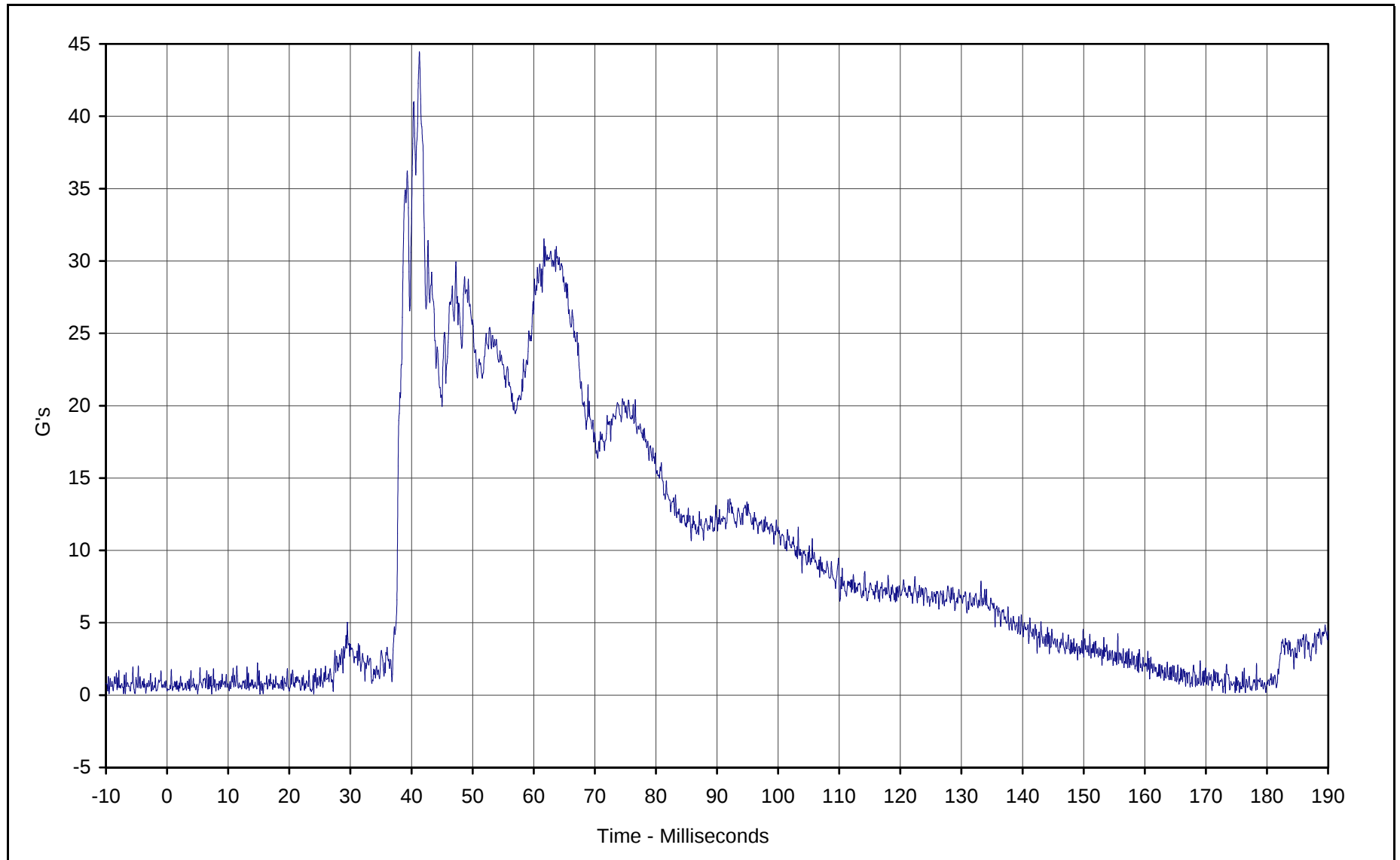




Curve Description: Driver Head CG Z Velocity
Maximum Value: 16.7 at 113.9 Milliseconds
Minimum Value: -0.1 at 13.2 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-003

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

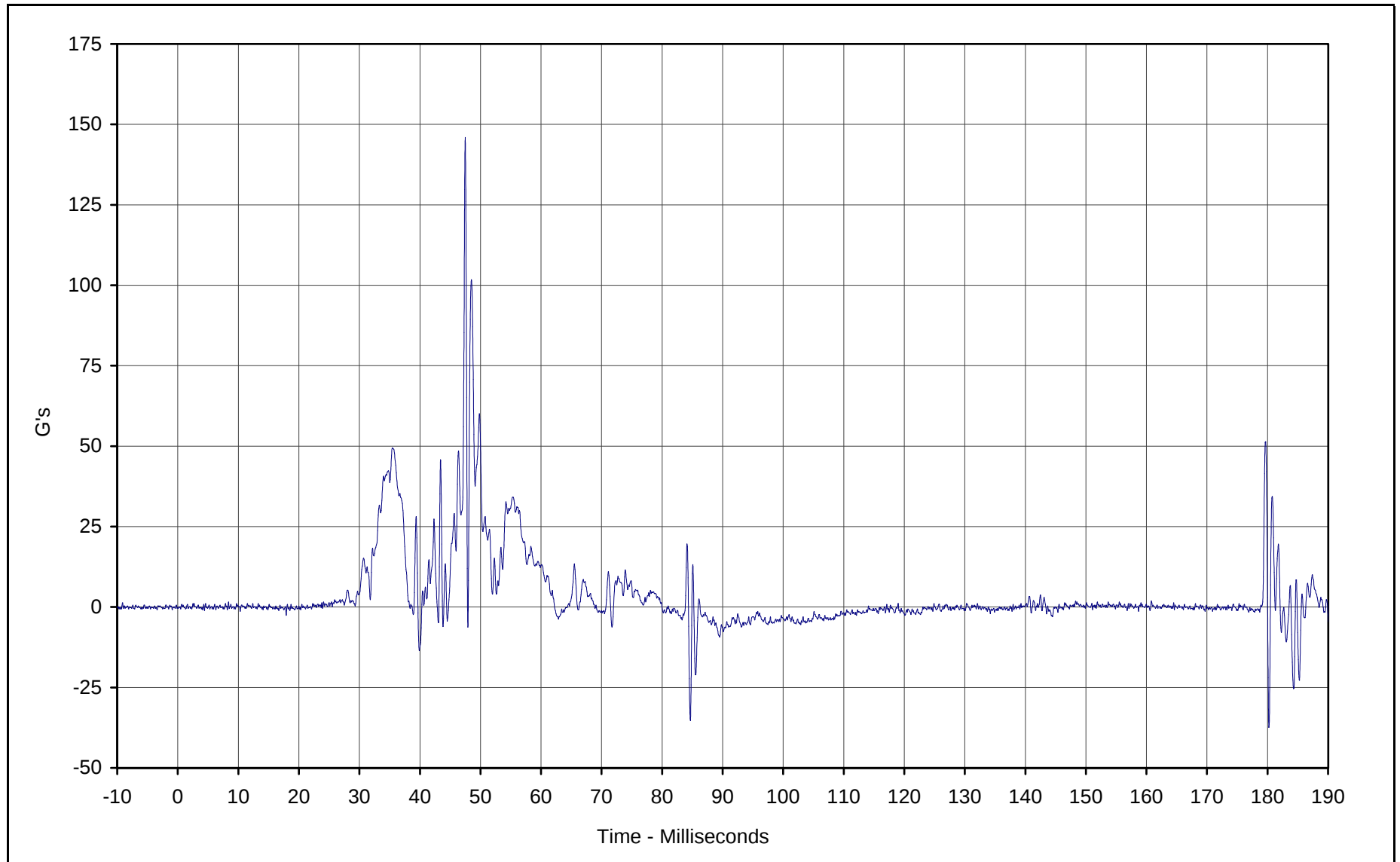




Curve Description: Driver Head CG Resultant
Maximum Value: 44.5 at 41.3 Milliseconds
Minimum Value: 0.1 at 24.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: RES-001

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

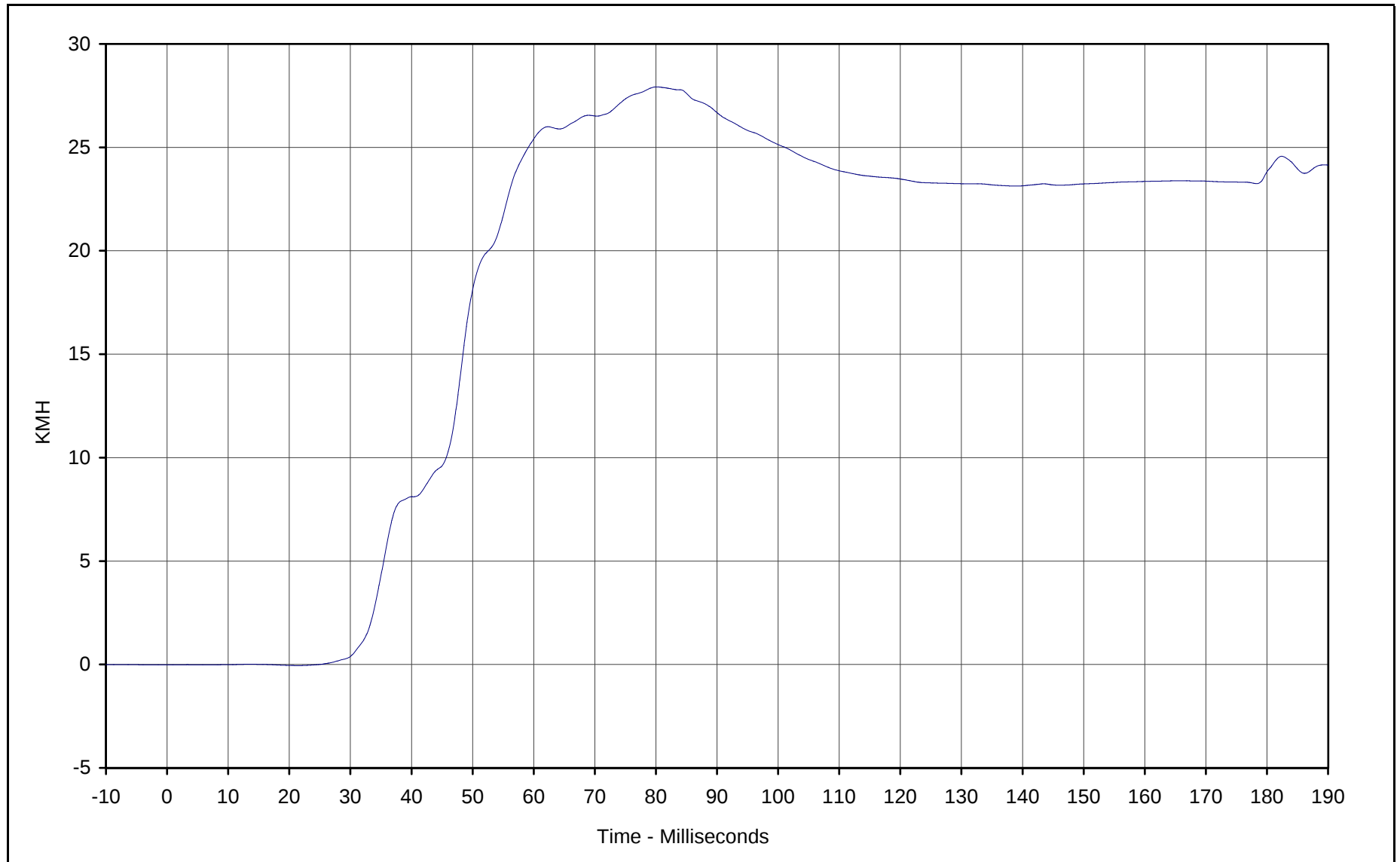




Curve Description: Driver Upper Rib Primary Y
Maximum Value: 146.0 at 47.5 Milliseconds
Minimum Value: -37.3 at 180.2 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-004

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Driver Upper Rib Primary Y Velocity

Maximum Value: 27.9 at 80.1 Milliseconds

Minimum Value: -0.1 at 21.6 Milliseconds

SAE Filter Class: 180

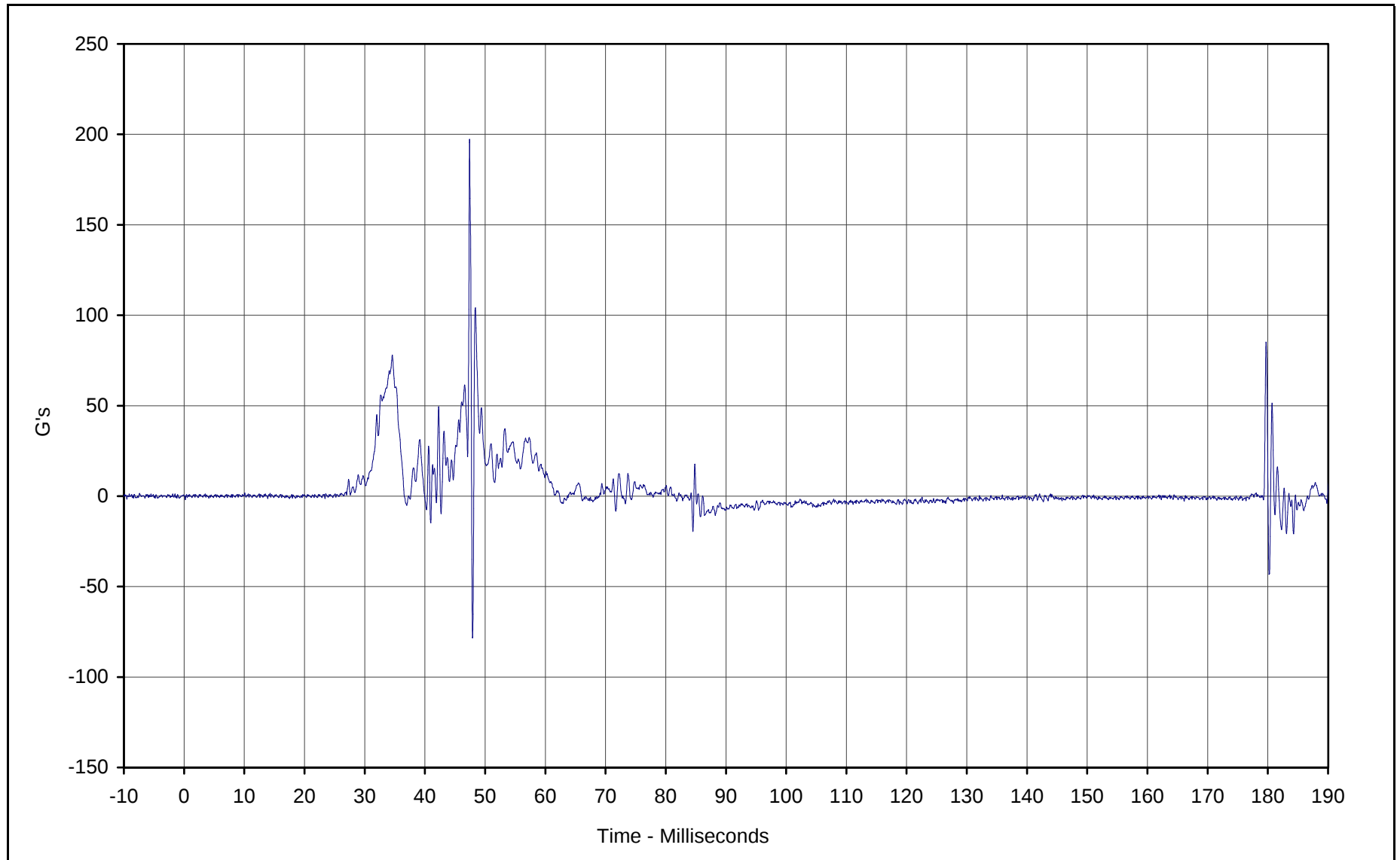
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Curve Number: IN1-004

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

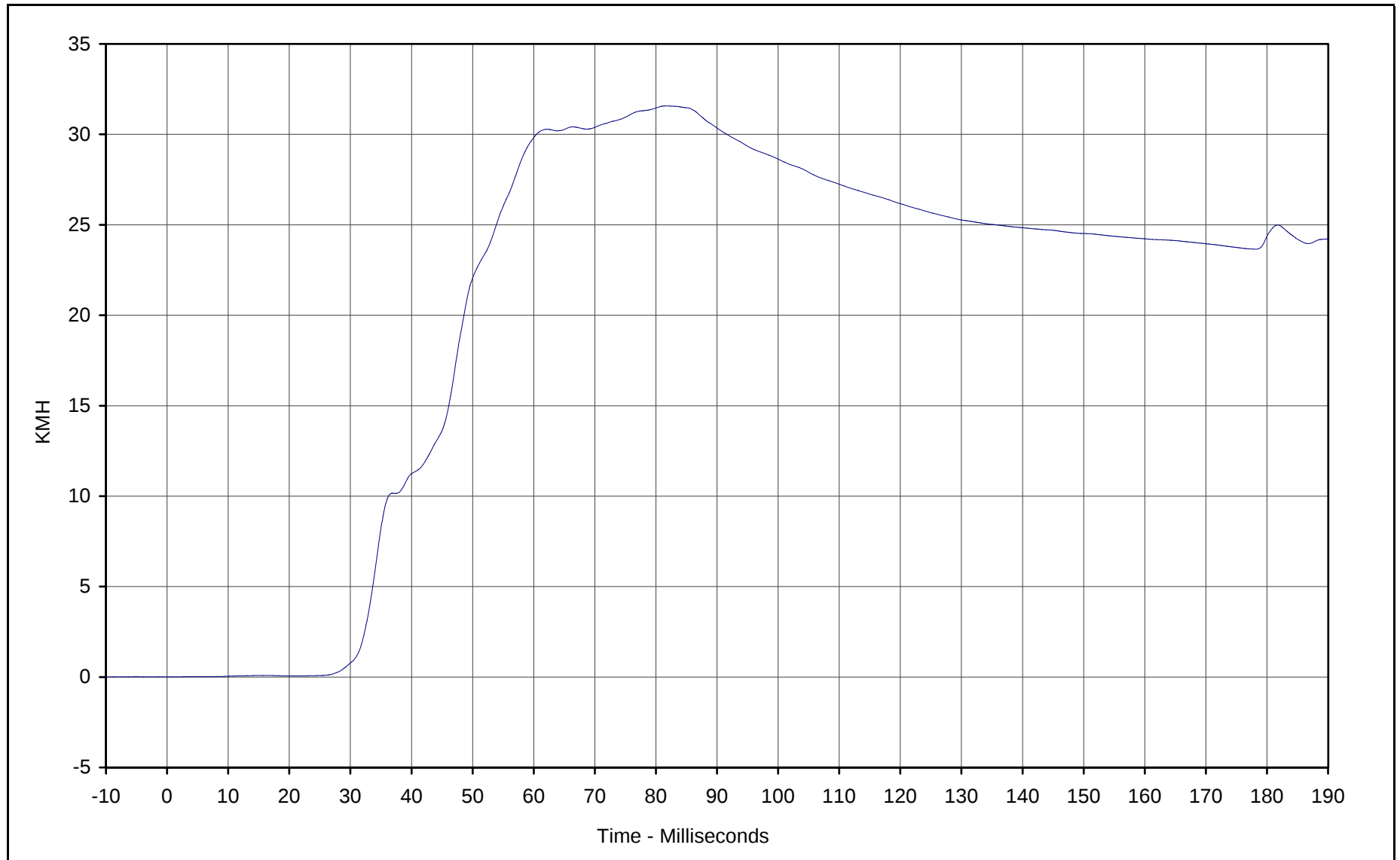




Curve Description: Driver Lower Rib Primary Y
Maximum Value: 195.4 at 47.4 Milliseconds
Minimum Value: -77.9 at 47.9 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-005

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Driver Lower Rib Primary Y Velocity

Maximum Value: 31.6 at 81.6 Milliseconds

Minimum Value: 0.0 at 0.5 Milliseconds

SAE Filter Class: 180

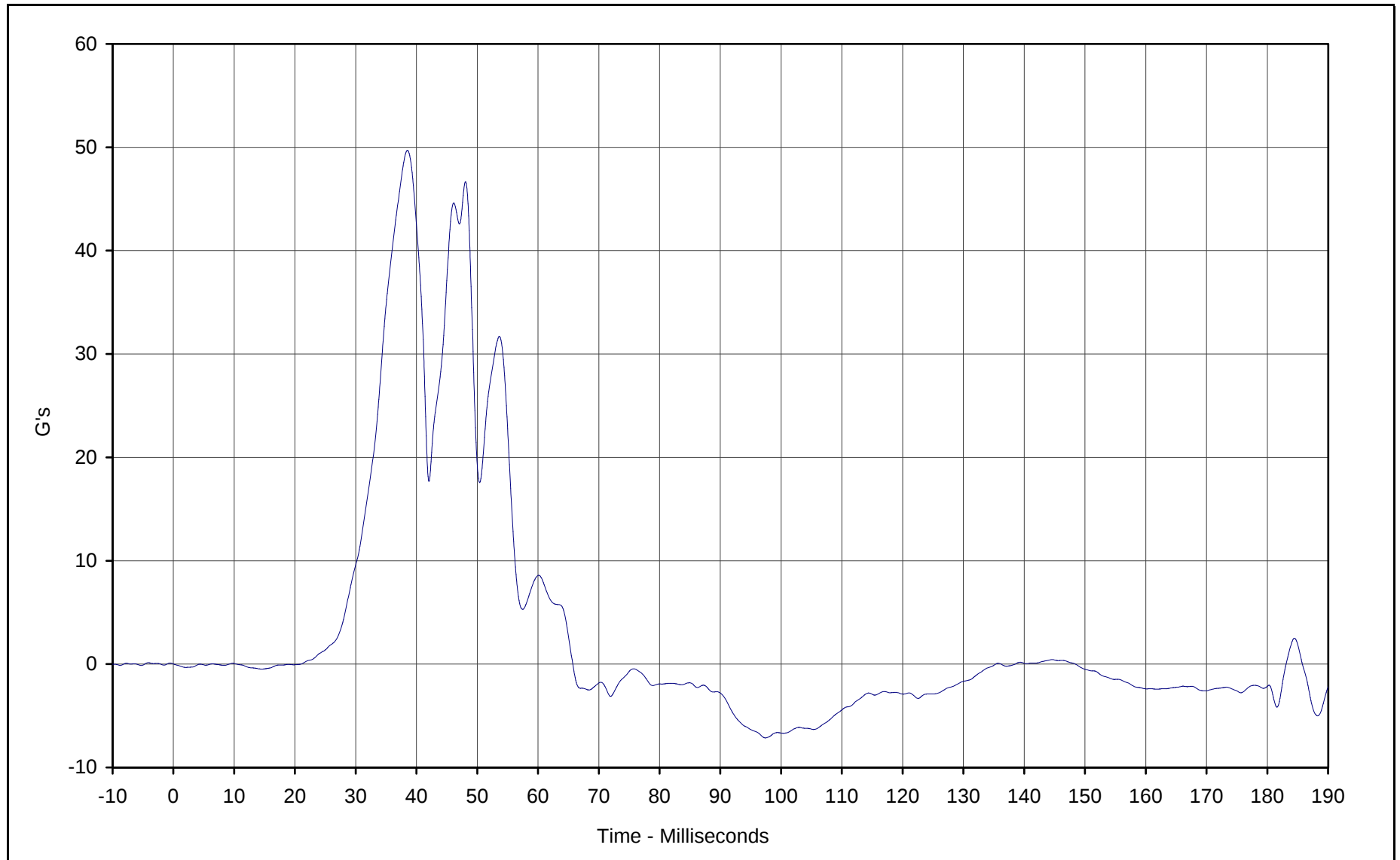
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Curve Number: IN1-005

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

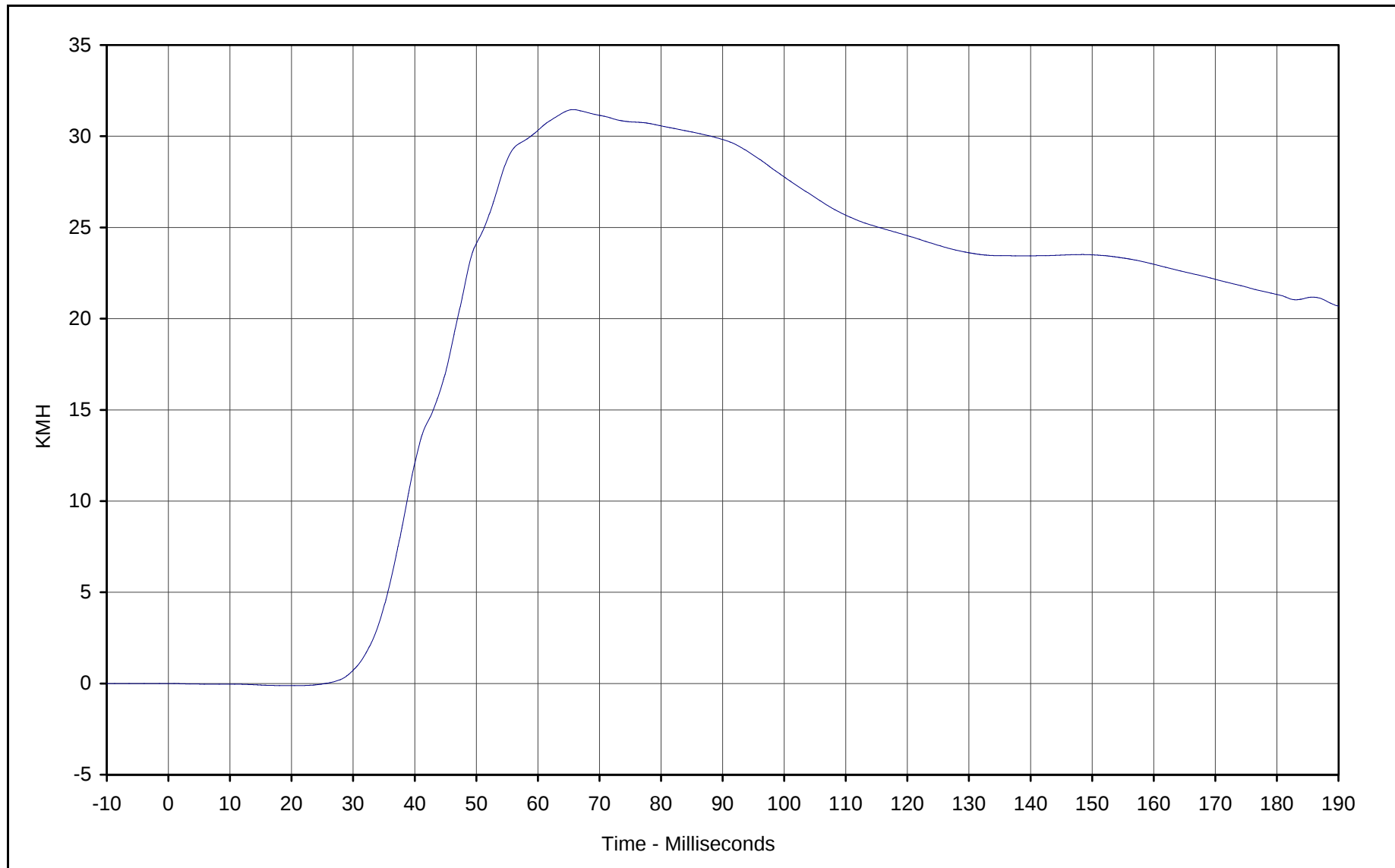




Curve Description: Driver Lower Spine Primary Y
Maximum Value: 49.7 at 38.5 Milliseconds
Minimum Value: -7.1 at 97.4 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: FIL-006

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Driver Lower Spine Primary Y Velocity

Maximum Value: 31.5 at 65.7 Milliseconds

Minimum Value: -0.1 at 21.0 Milliseconds

SAE Filter Class: 180

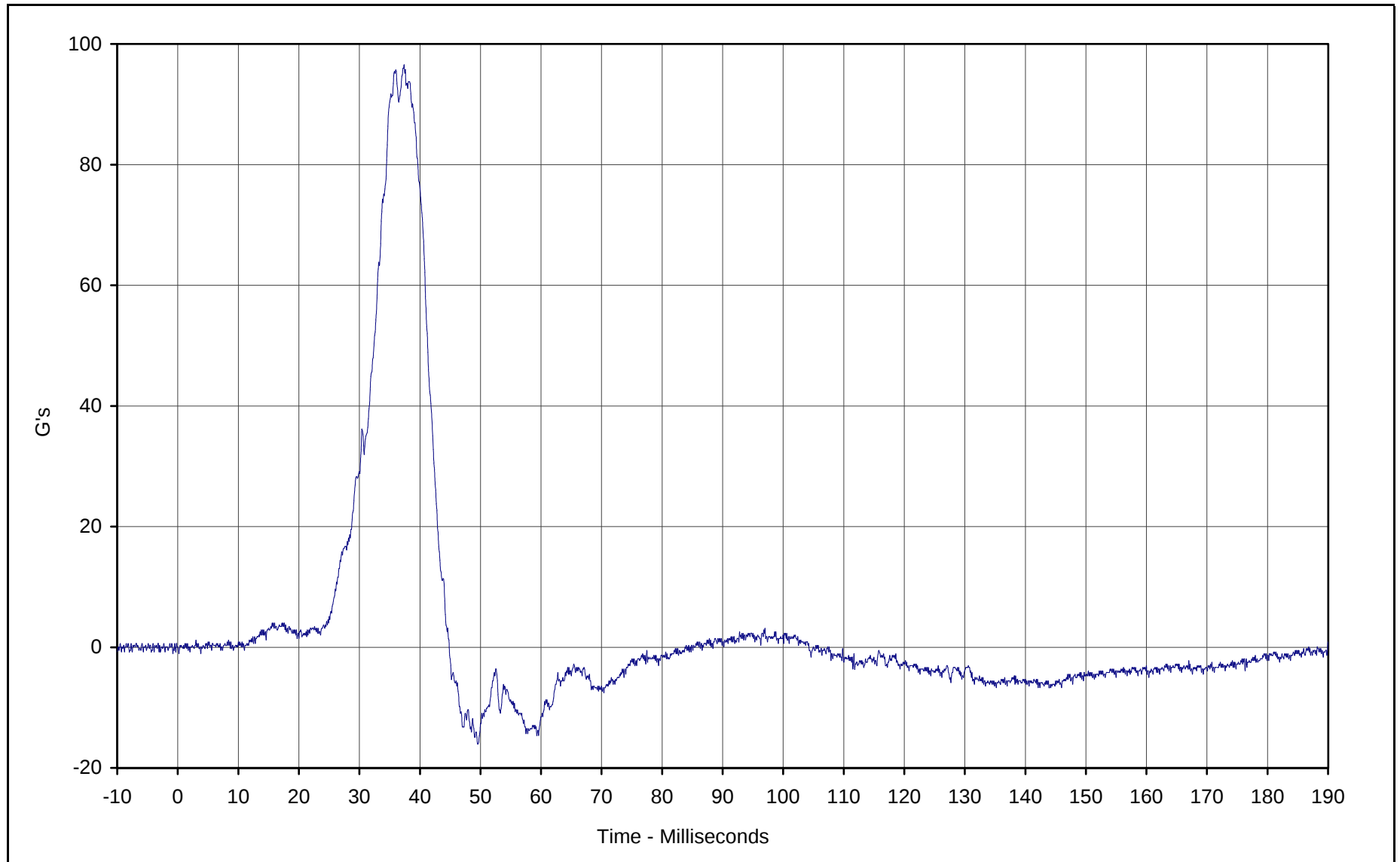
Date of Test: 12/6/01

Curve Number: IN1-006

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

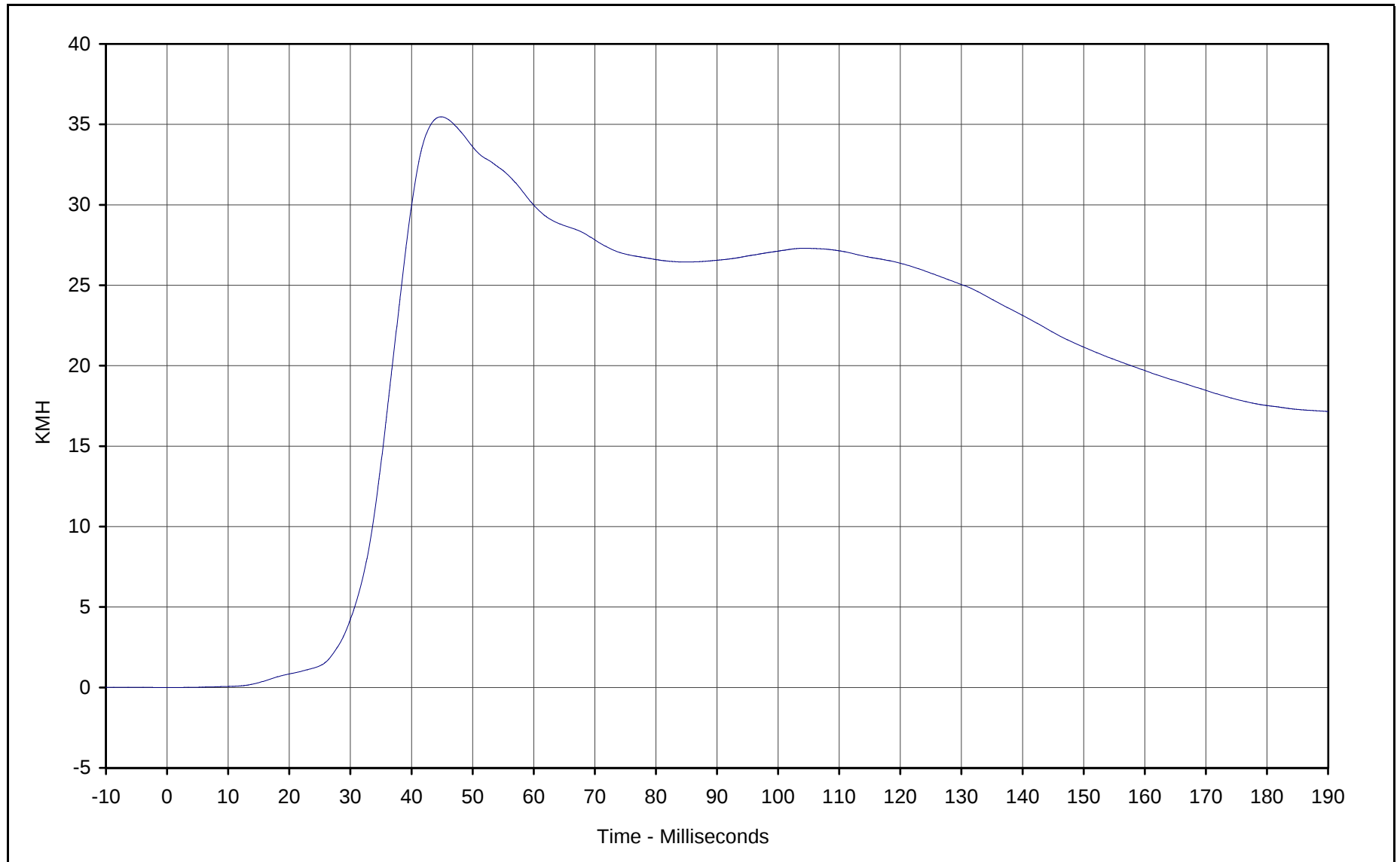




Curve Description: Driver Pelvis Primary Y
Maximum Value: 96.6 at 37.4 Milliseconds
Minimum Value: -16.0 at 49.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-007

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

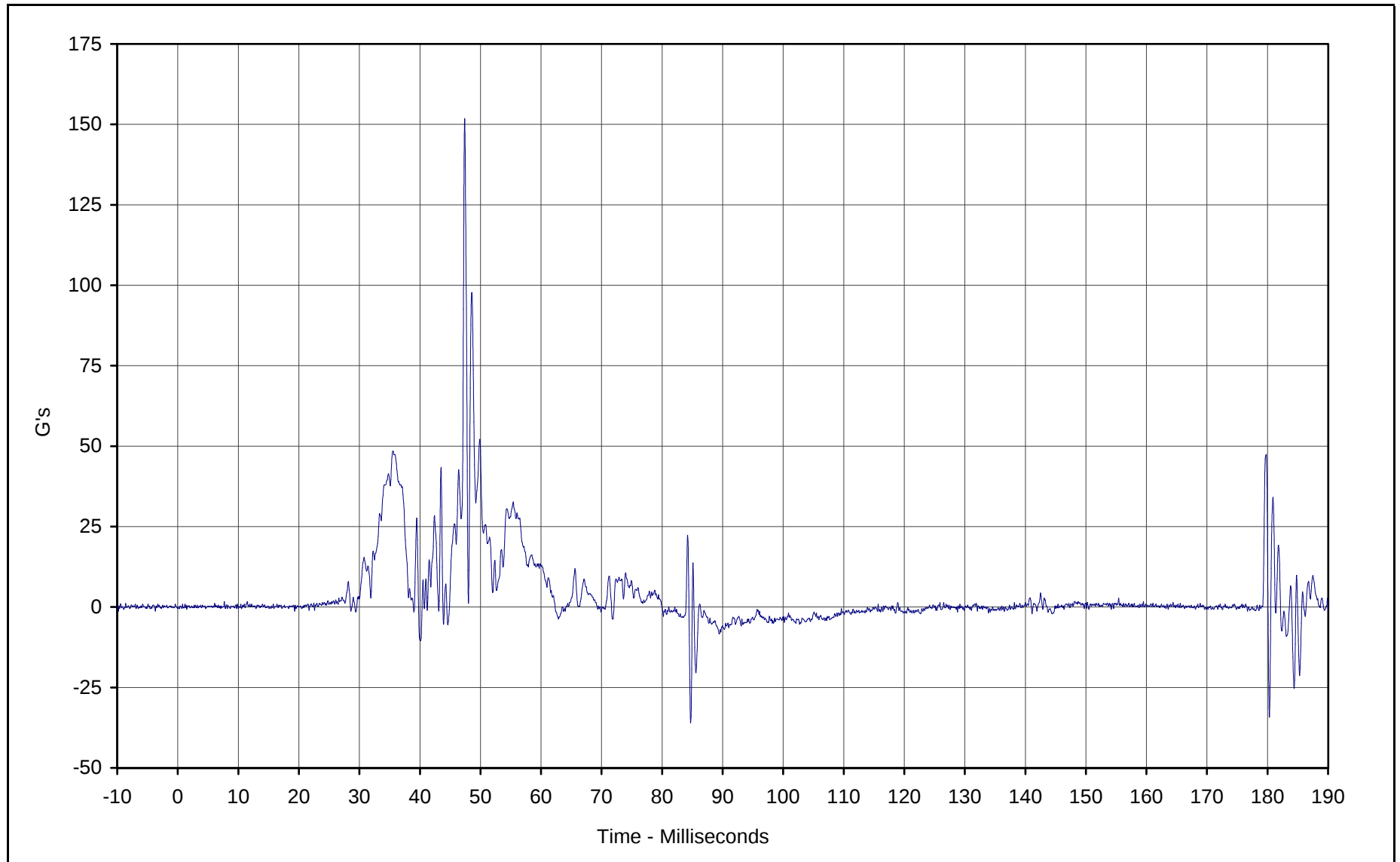




Curve Description: Driver Pelvis Primary Y Velocity
Maximum Value: 35.5 at 44.8 Milliseconds
Minimum Value: 0.0 at 0.6 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-007

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

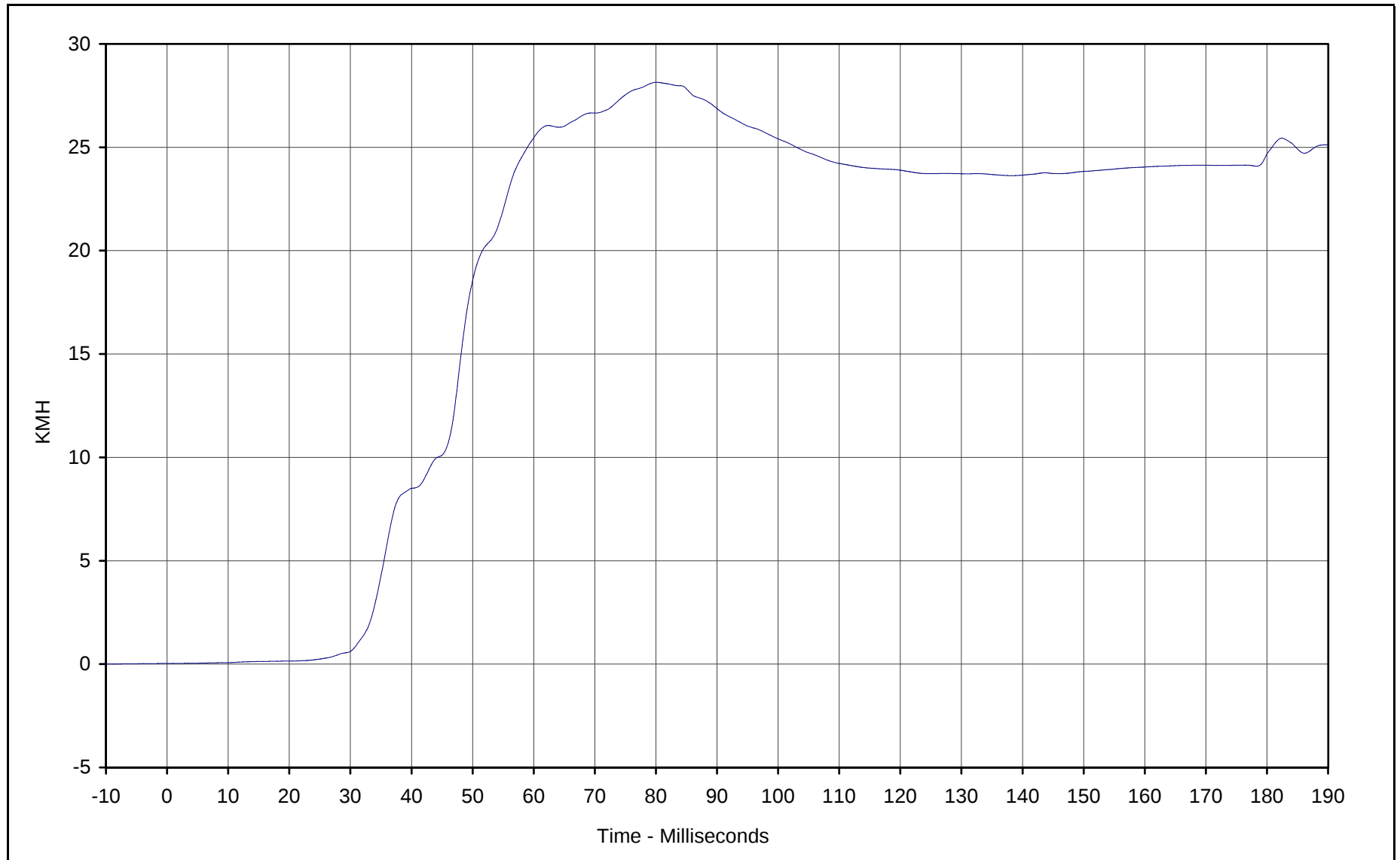




Curve Description: Driver Upper Rib Redundant Y
Maximum Value: 151.8 at 47.4 Milliseconds
Minimum Value: -35.9 at 84.7 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-008

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Driver Upper Rib Redundant Y Velocity

Maximum Value: 28.1 at 80.1 Milliseconds

Minimum Value: 0.0 at 0.6 Milliseconds

SAE Filter Class: 180

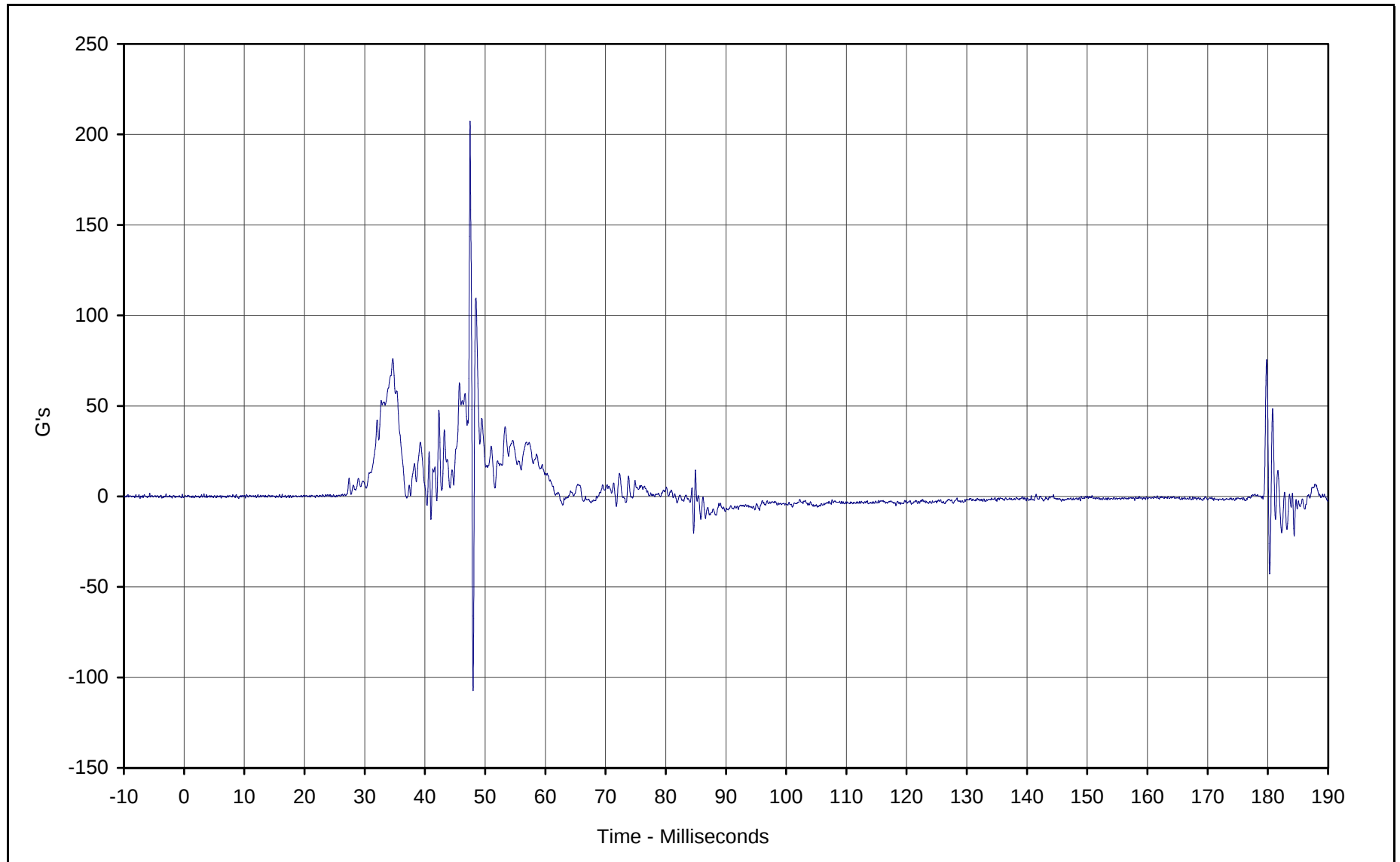
Date of Test: 12/6/01

Curve Number: IN1-008

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

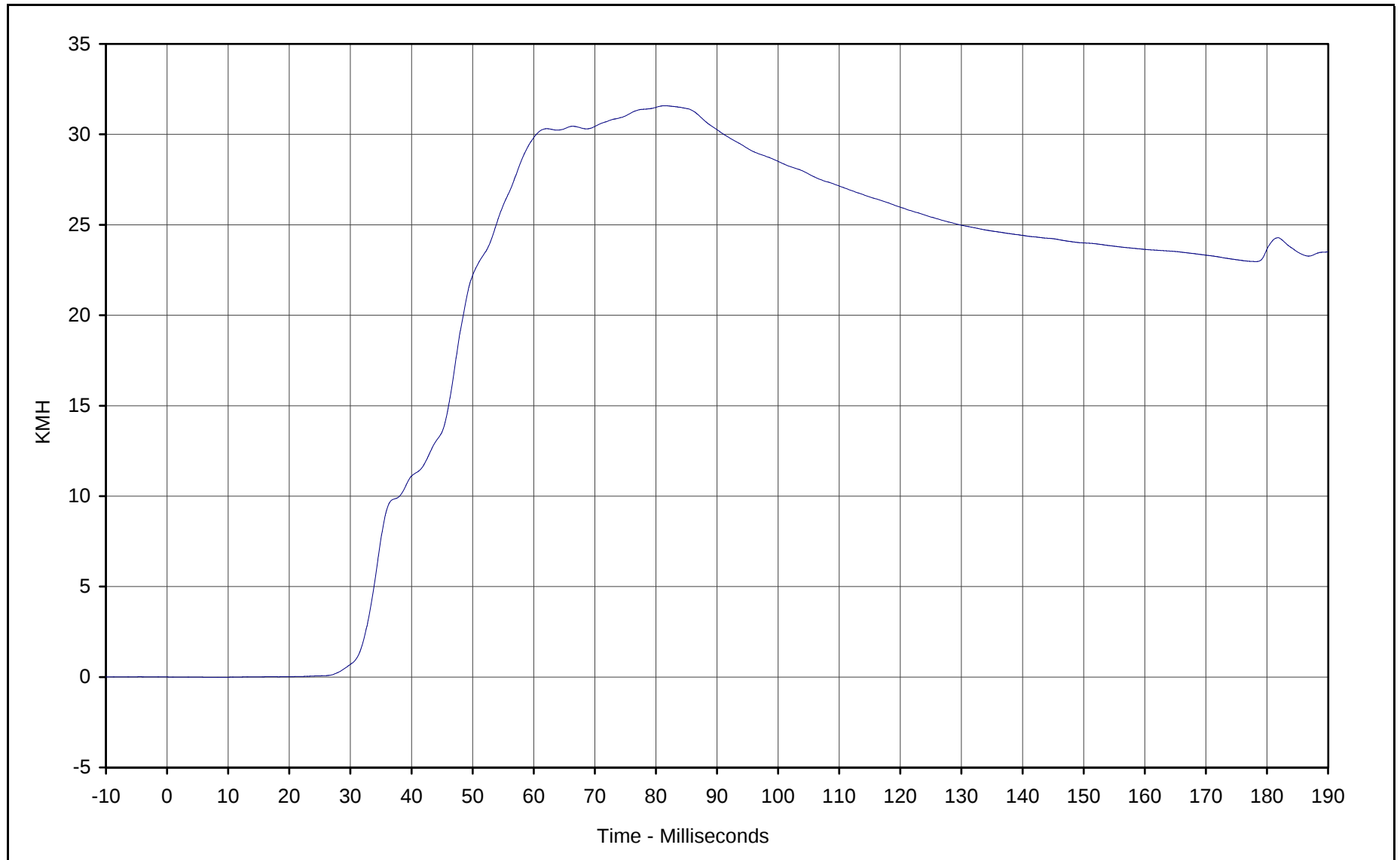




Curve Description: Driver Lower Rib Redundant Y
Maximum Value: 207.2 at 47.5 Milliseconds
Minimum Value: -107.3 at 48.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-009

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Driver Lower Rib Redundant Y Velocity

Maximum Value: 31.6 at 81.5 Milliseconds

Minimum Value: 0.0 at 7.2 Milliseconds

SAE Filter Class: 180

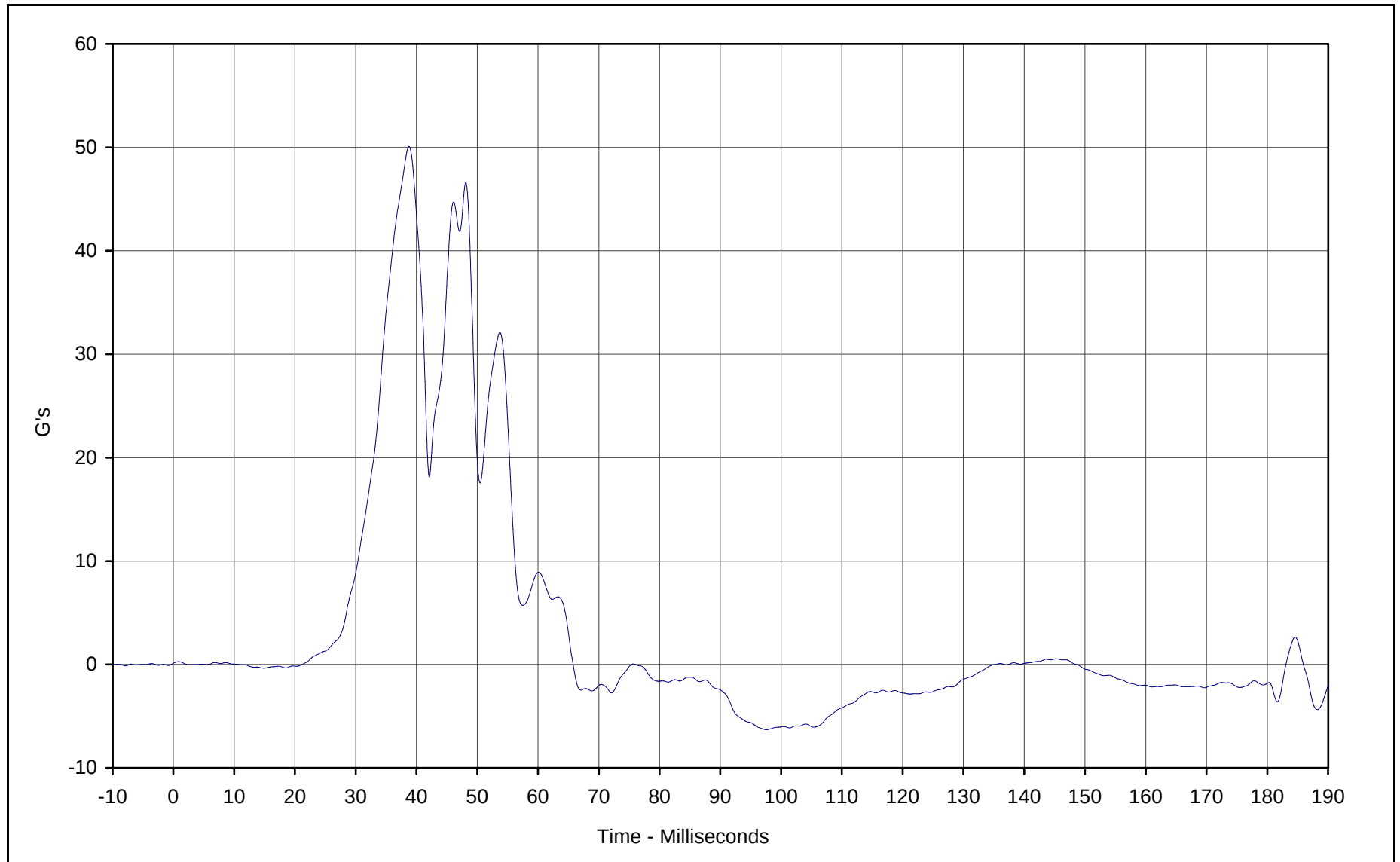
Date of Test: 12/6/01

Curve Number: IN1-009

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

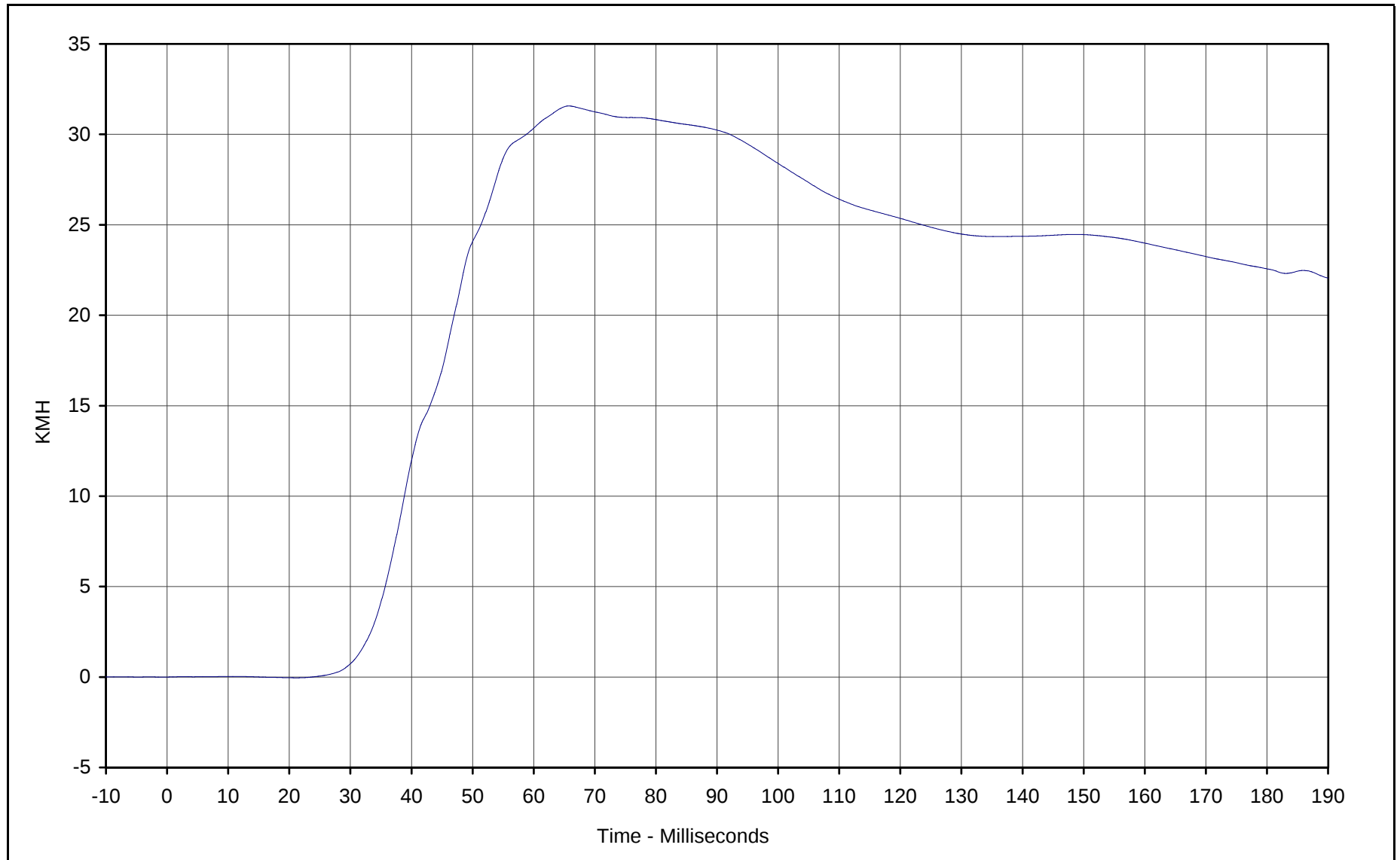




Curve Description: Driver Lower Spine Redundant Y
Maximum Value: 50.1 at 38.8 Milliseconds
Minimum Value: -6.3 at 97.6 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: FIL-010

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Driver Lower Spine Redundant Y Velocity

Maximum Value: 31.6 at 65.8 Milliseconds

Minimum Value: 0.0 at 21.2 Milliseconds

SAE Filter Class: 180

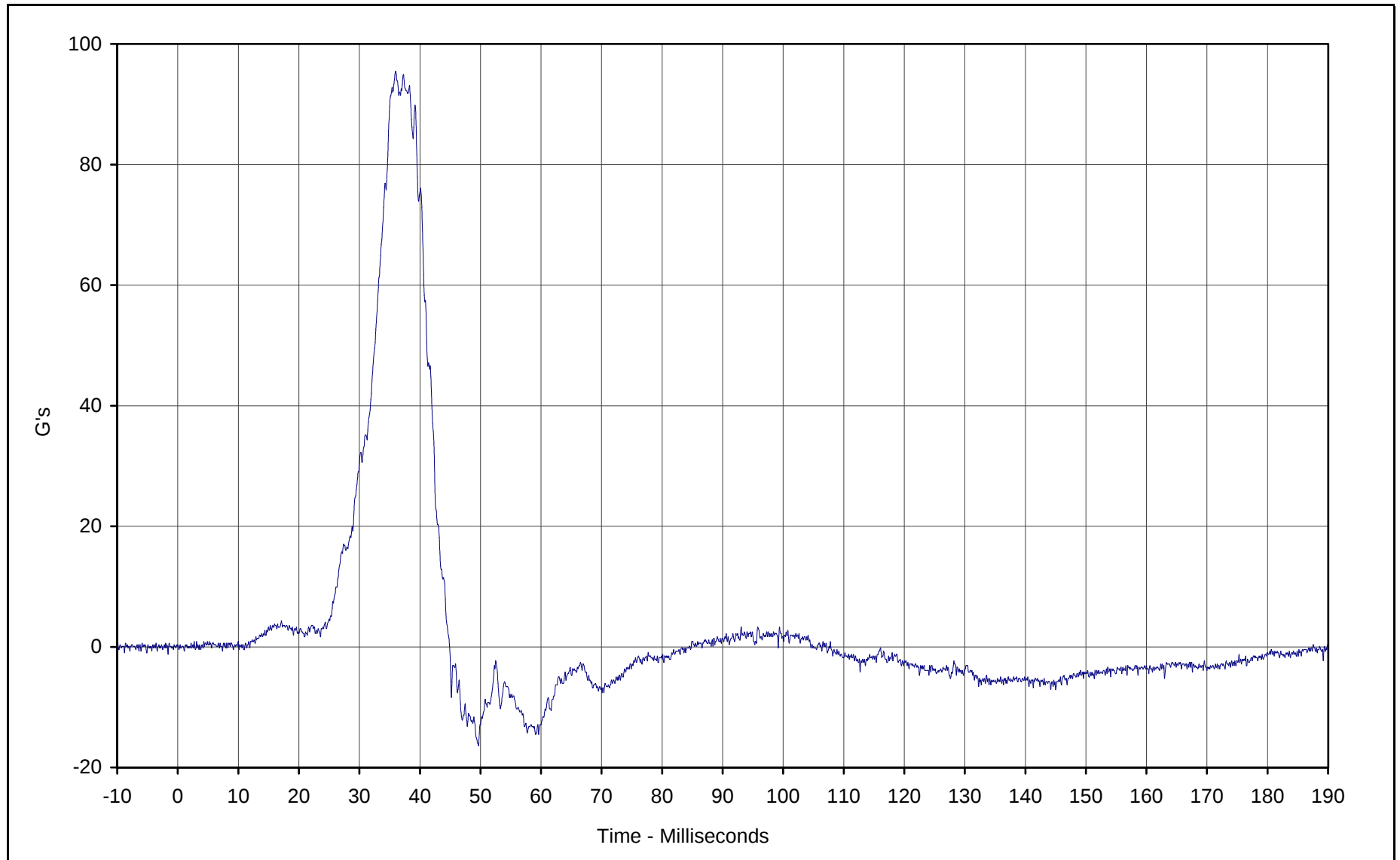
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Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

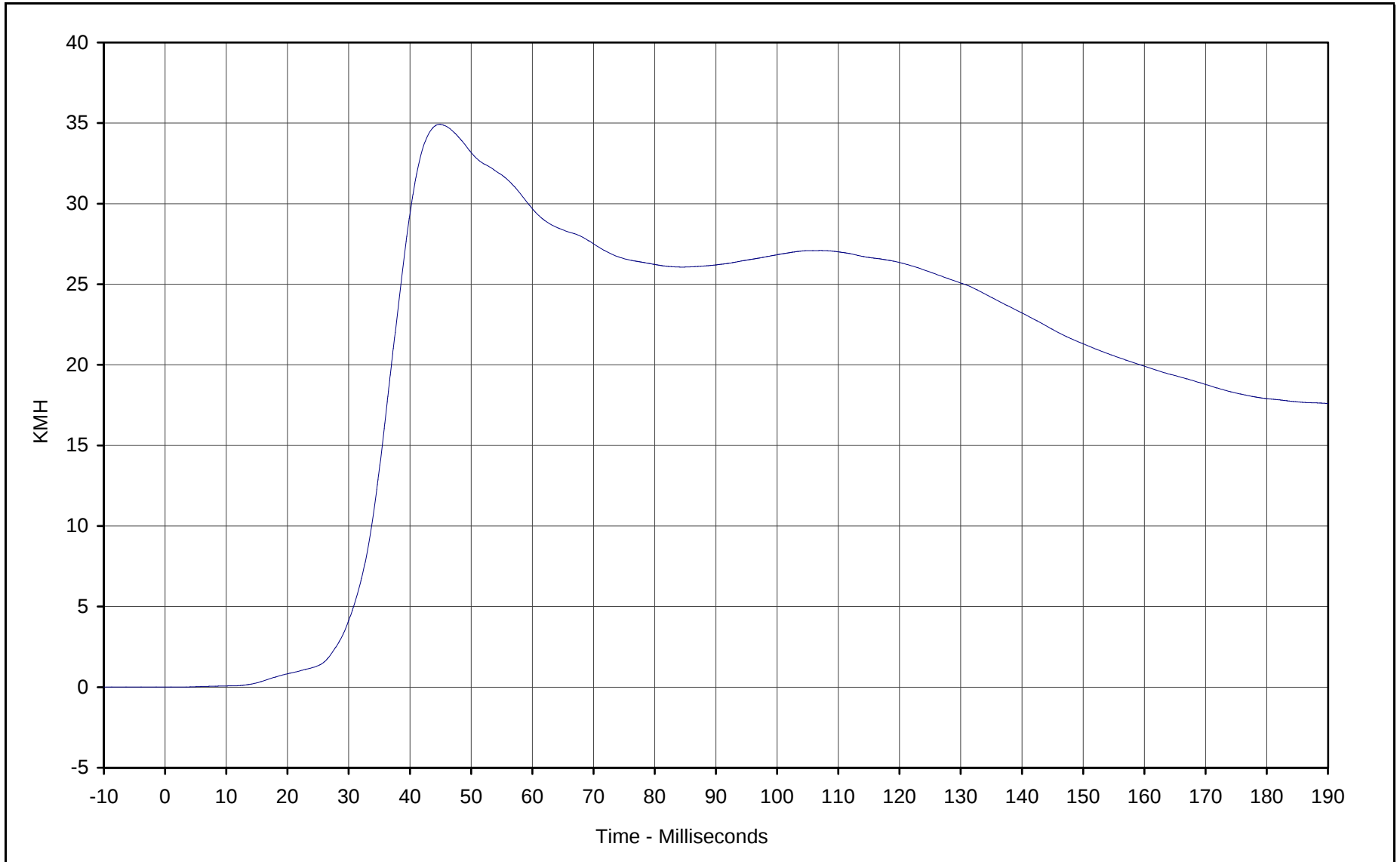




Curve Description: Driver Pelvis Redundant Y
Maximum Value: 95.5 at 36.0 Milliseconds
Minimum Value: -16.4 at 49.7 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-011

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

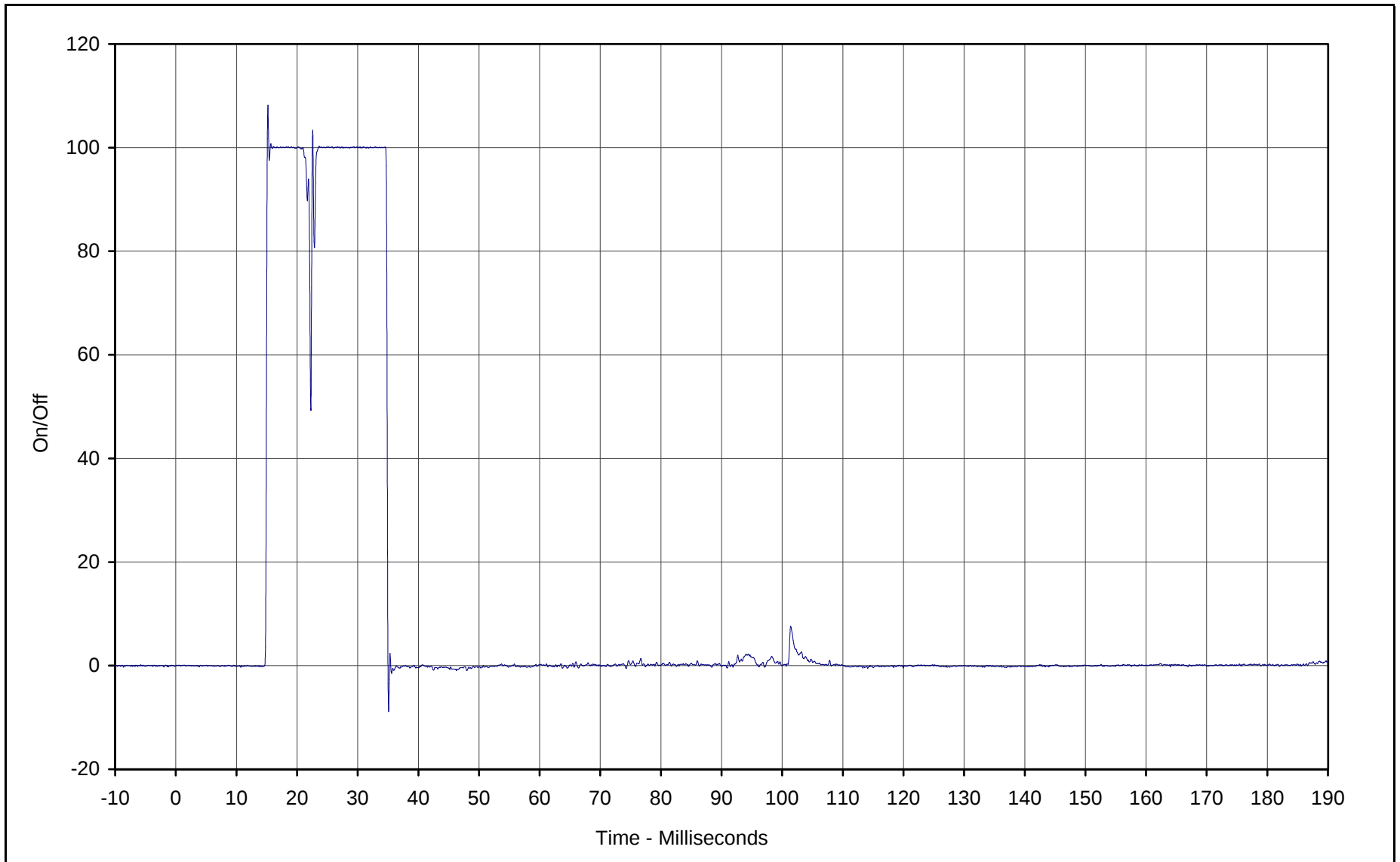




Curve Description: Driver Pelvis Redundant Y Velocity
Maximum Value: 34.9 at 44.9 Milliseconds
Minimum Value: 0.0 at 1.3 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-011

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

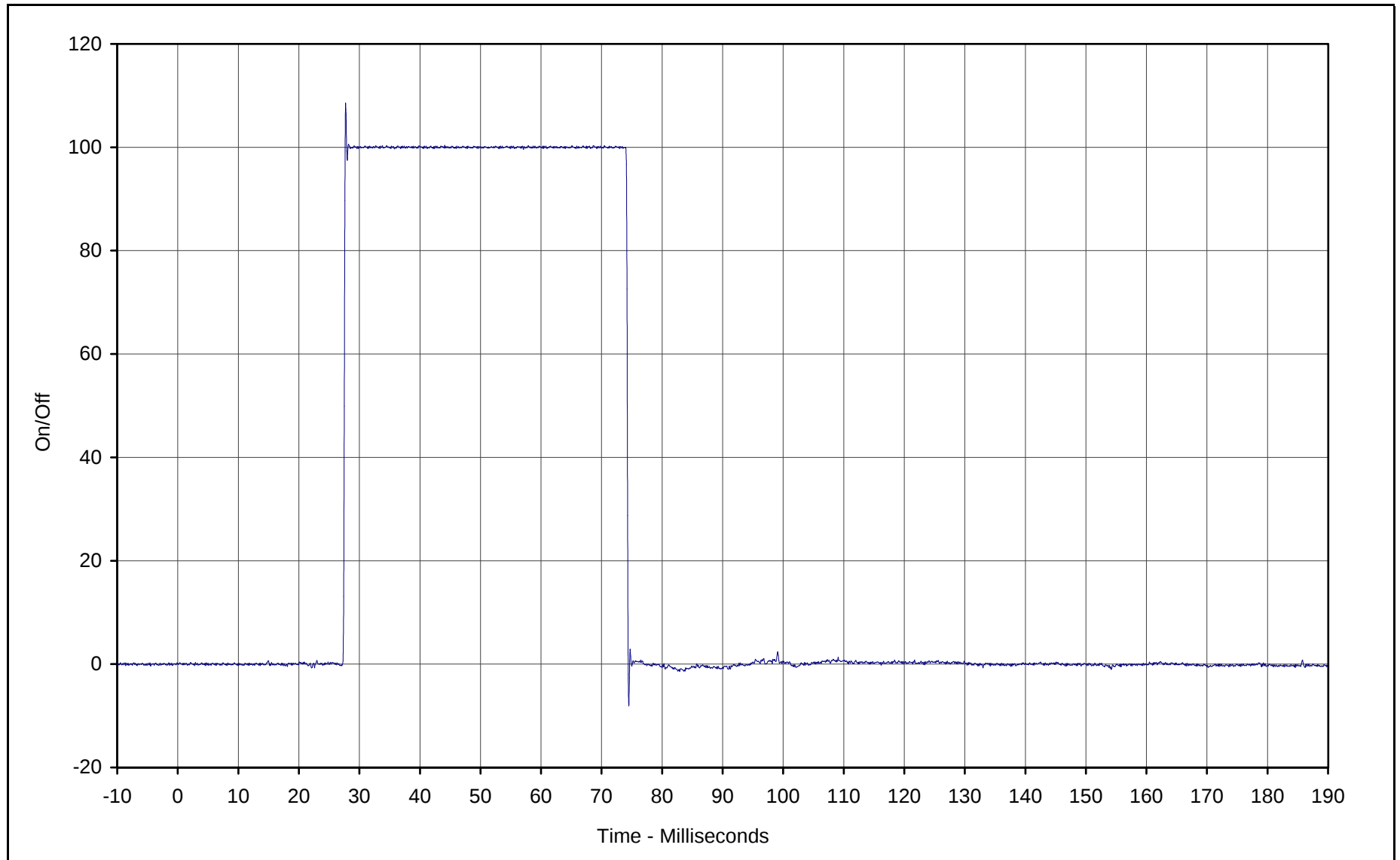




Curve Description: Driver Thorax Contact
Maximum Value: 108.2 at 15.2 Milliseconds
Crossing Point: 50% at 15.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-012

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

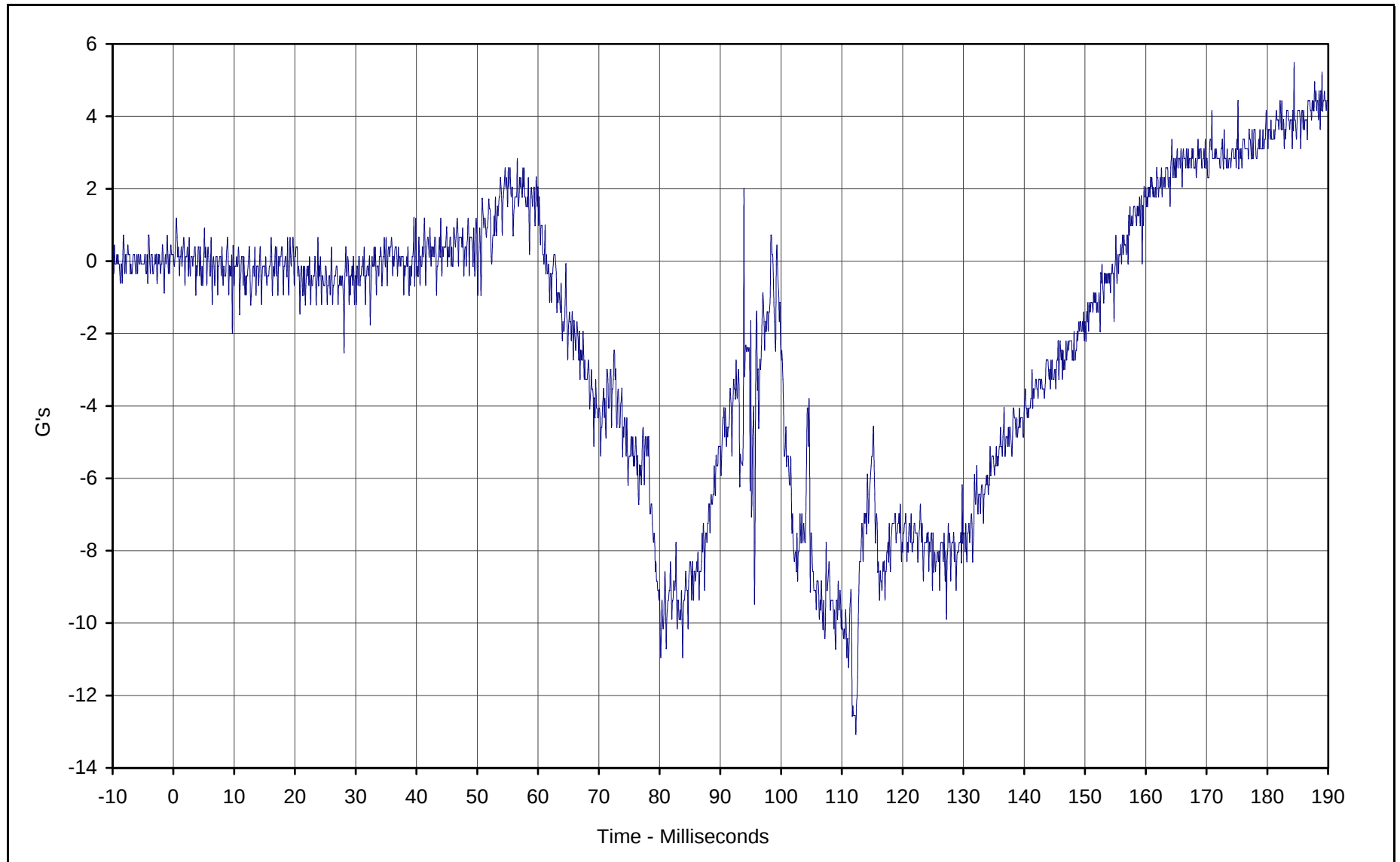




Curve Description: Driver Pelvis Contact
Maximum Value: 108.3 at 27.7 Milliseconds
Crossing Point: 50% at 27.6 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-013

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

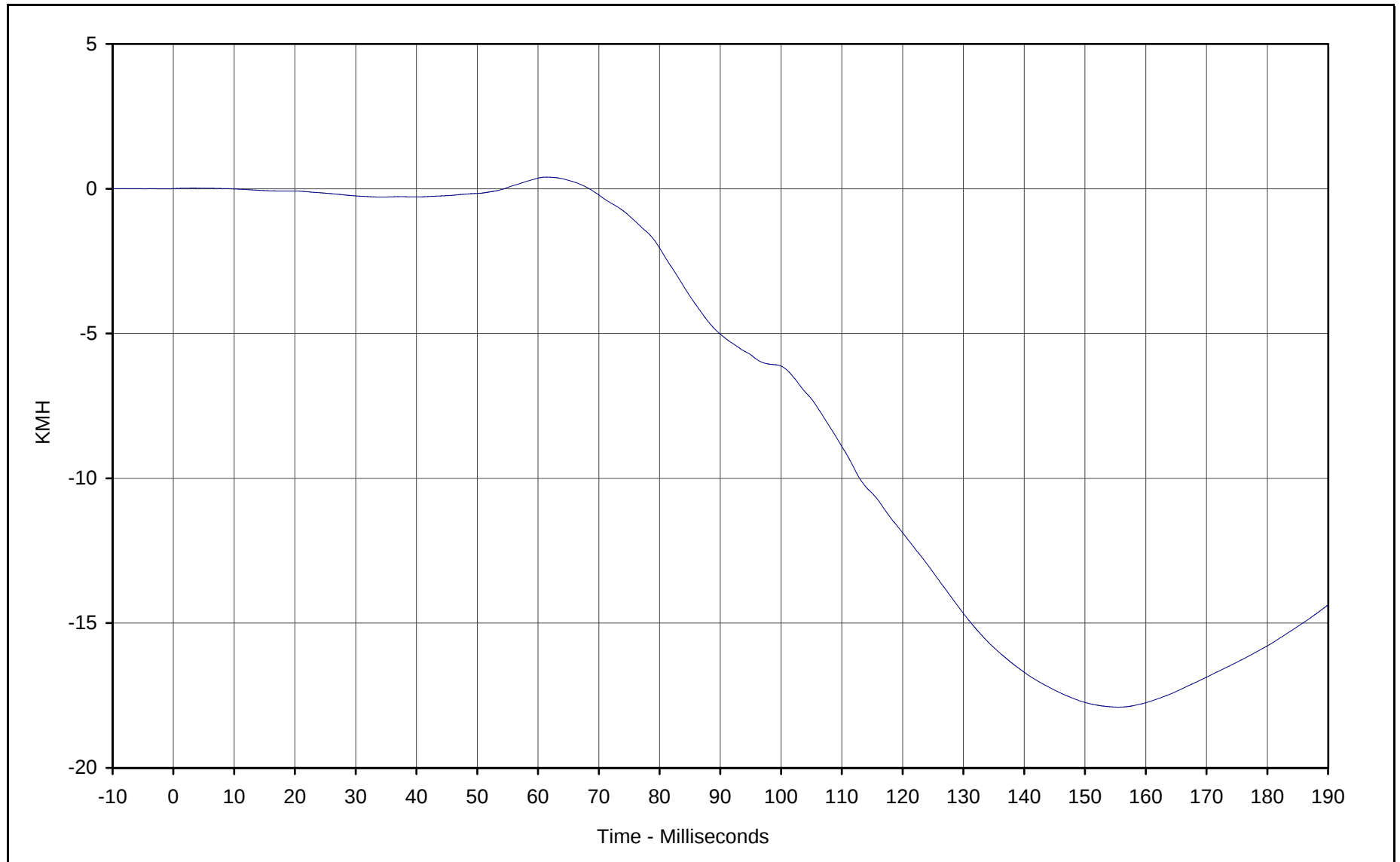




Curve Description: Pass. Head CG X
Maximum Value: 5.5 at 184.4 Milliseconds
Minimum Value: -13.1 at 112.3 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-014

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

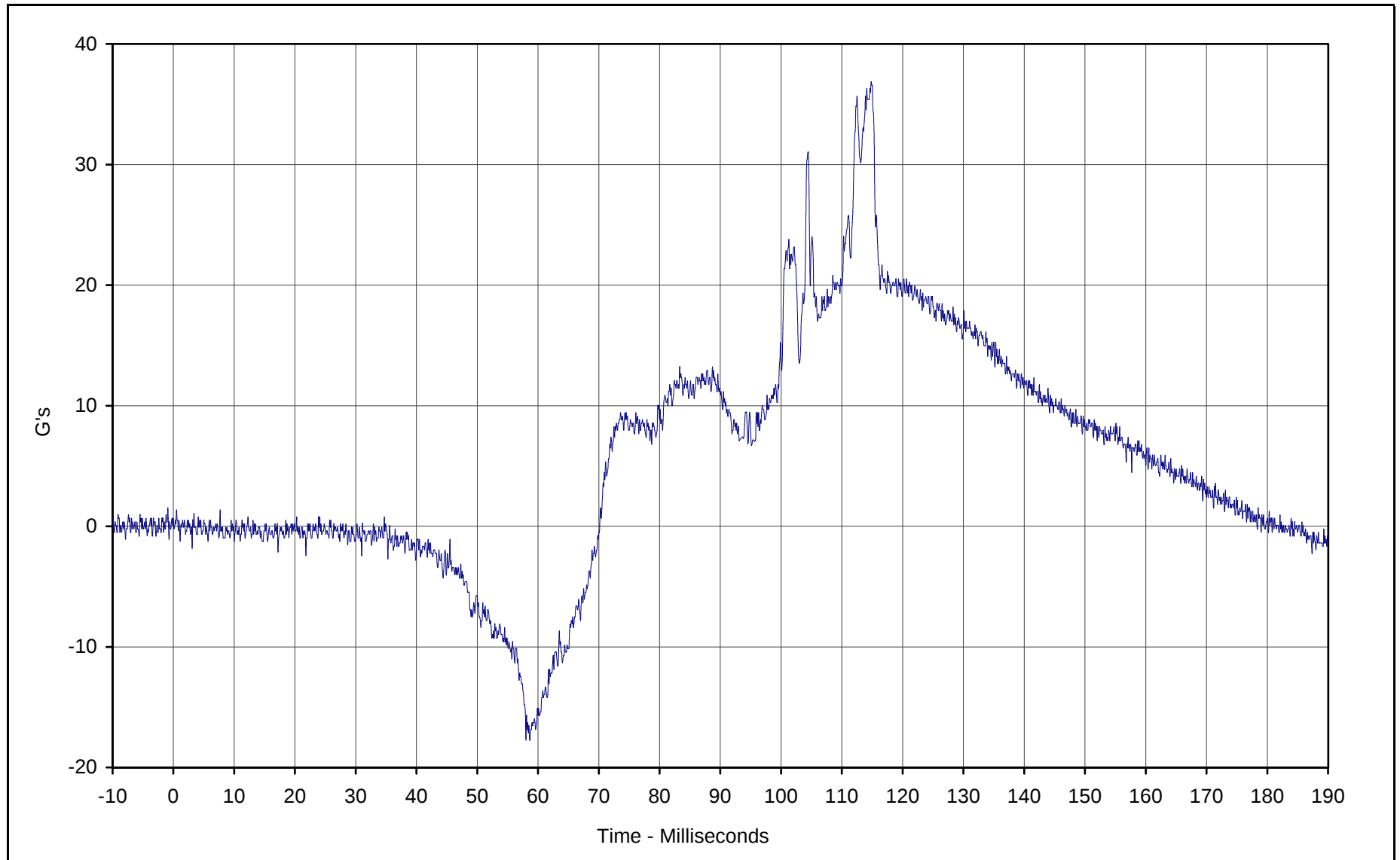




Curve Description: Pass. Head CG X Velocity
Maximum Value: 0.4 at 61.4 Milliseconds
Minimum Value: -17.9 at 155.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-014

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

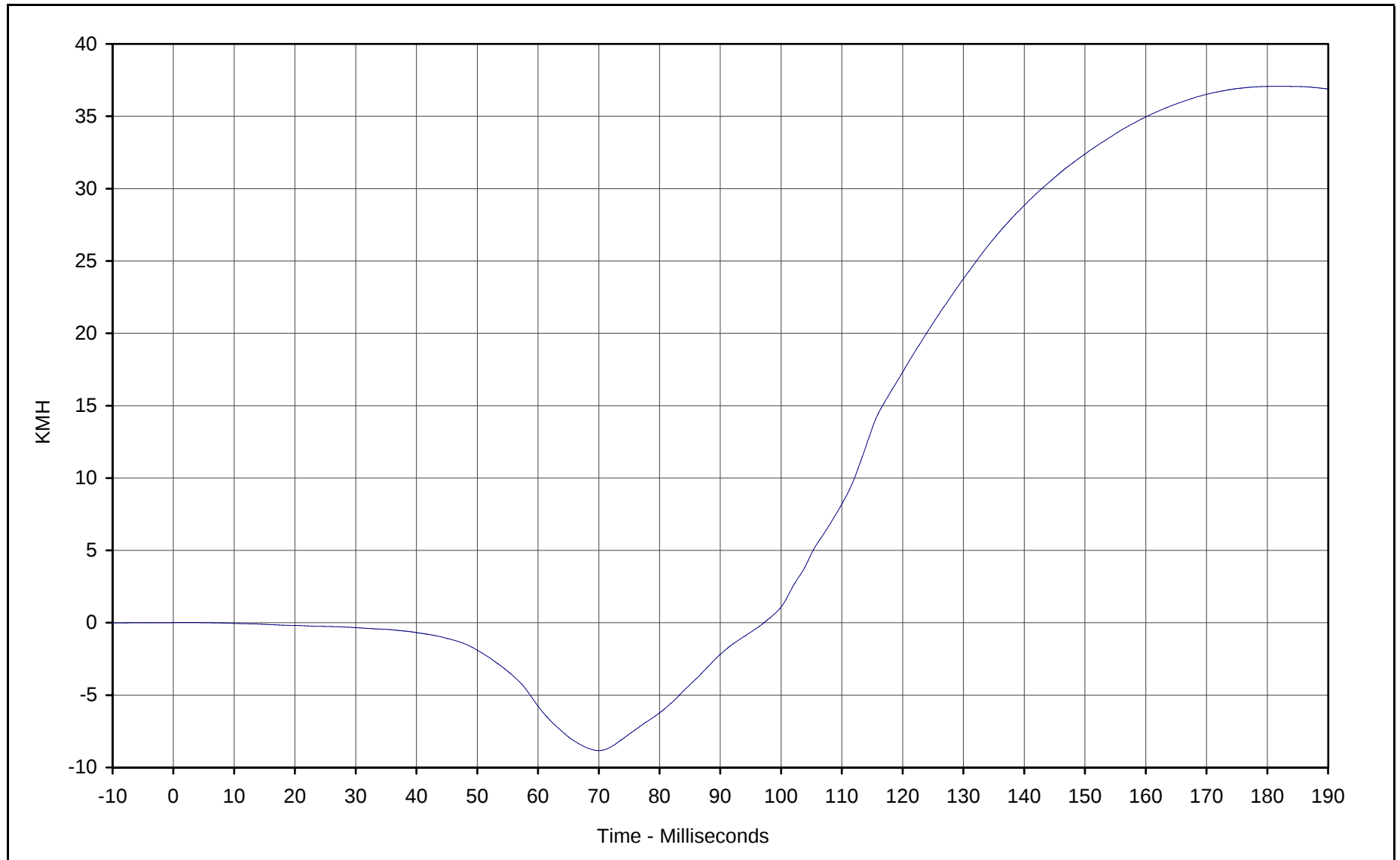




Curve Description: Pass. Head CG Y
Maximum Value: 36.9 at 114.8 Milliseconds
Minimum Value: -17.7 at 58.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-015

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

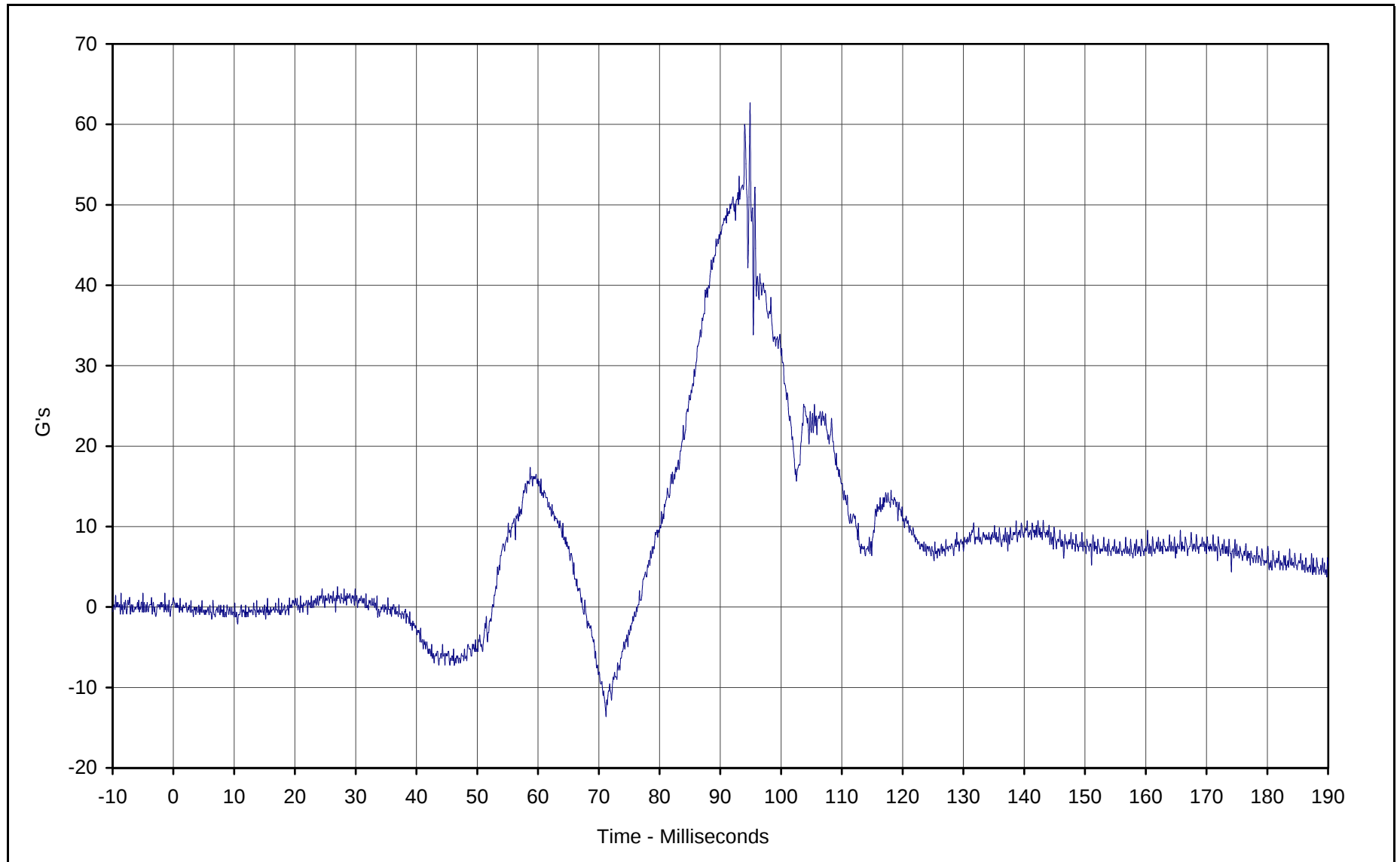




Curve Description: Pass. Head CG Y Velocity
Maximum Value: 37.1 at 181.8 Milliseconds
Minimum Value: -8.8 at 70.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-015

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

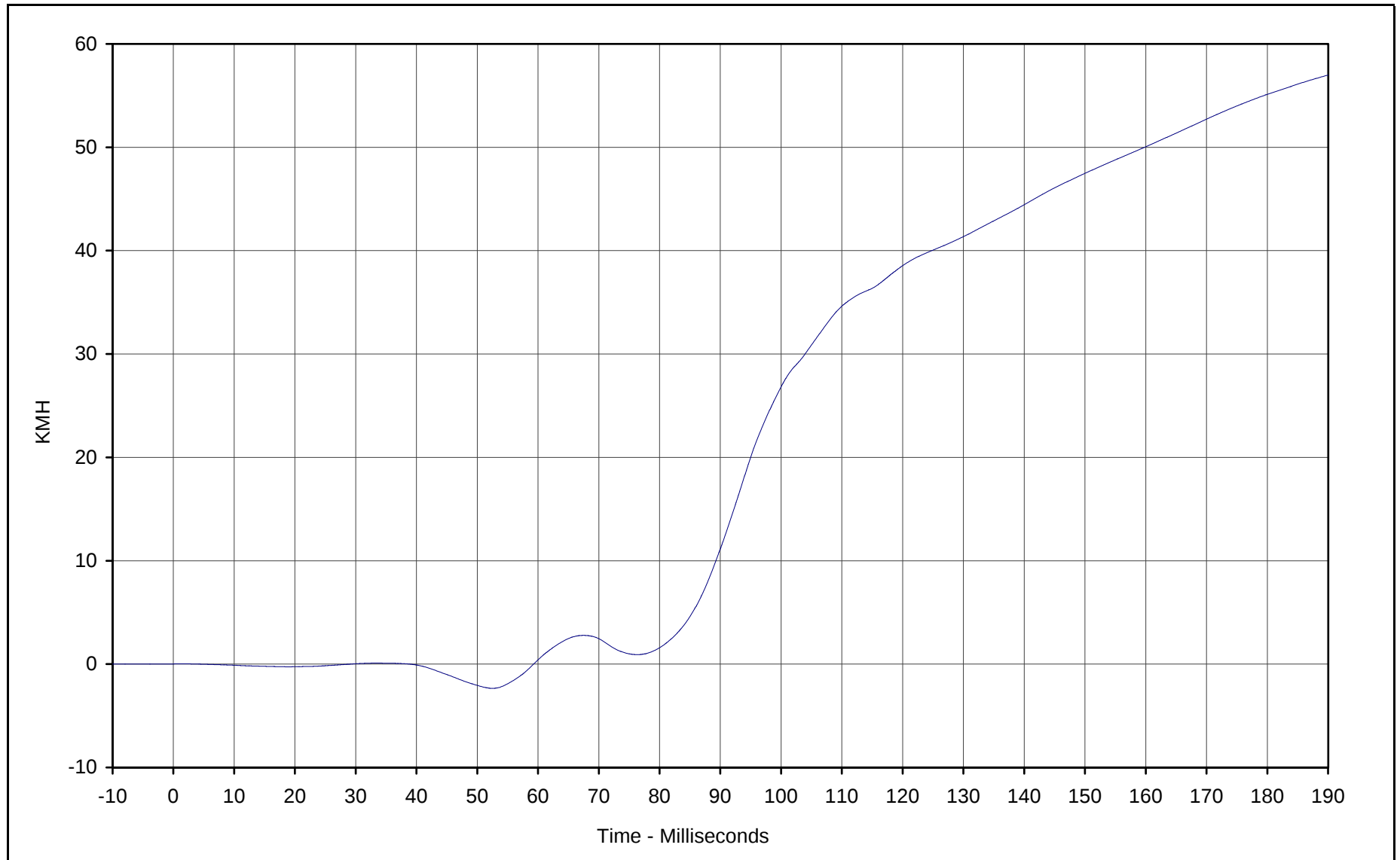




Curve Description: Pass. Head CG Z
Maximum Value: 62.5 at 94.9 Milliseconds
Minimum Value: -13.6 at 71.2 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-016

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

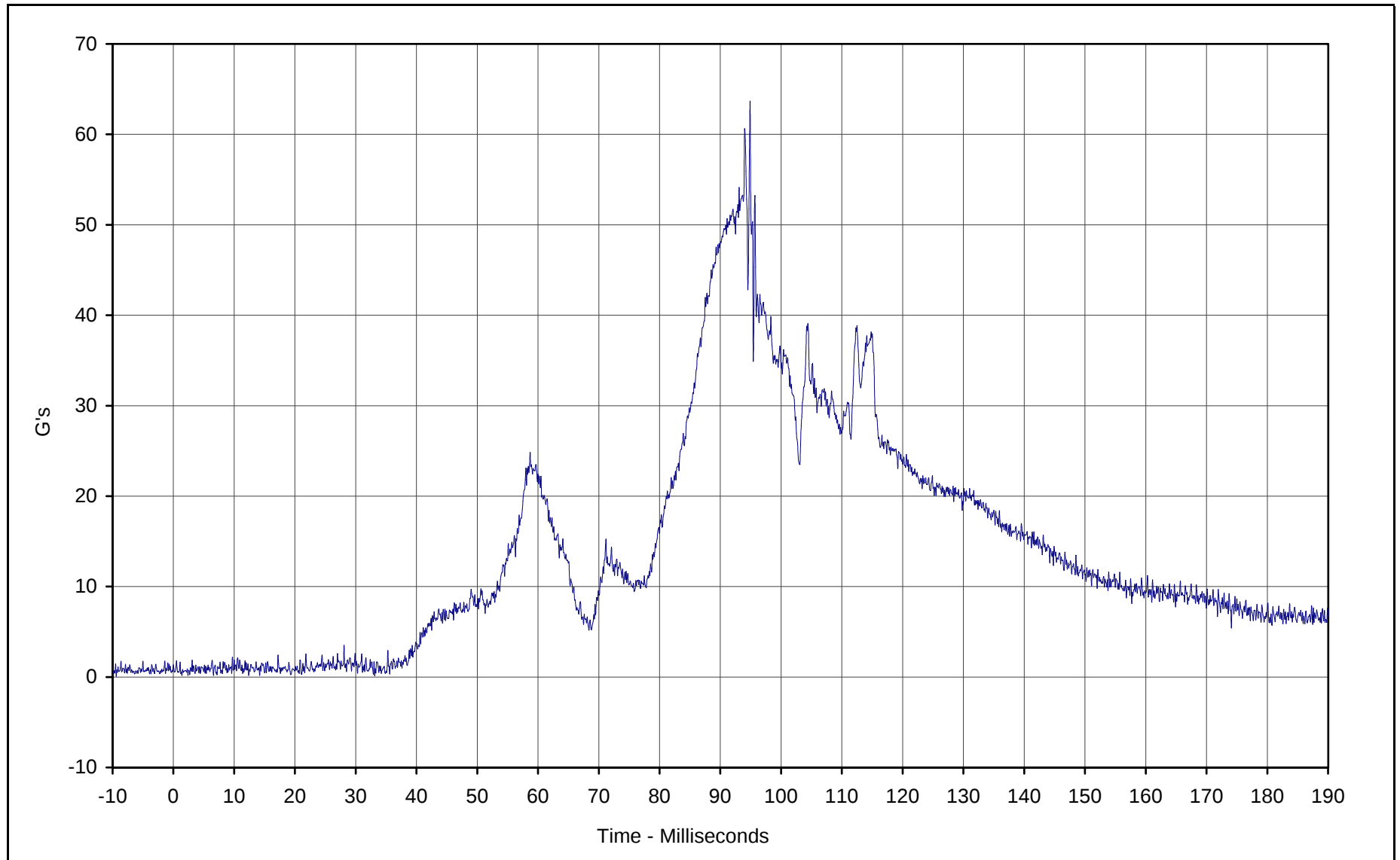




Curve Description: Pass. Head CG Z Velocity
Maximum Value: 57.0 at 189.9 Milliseconds
Minimum Value: -2.3 at 52.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-016

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

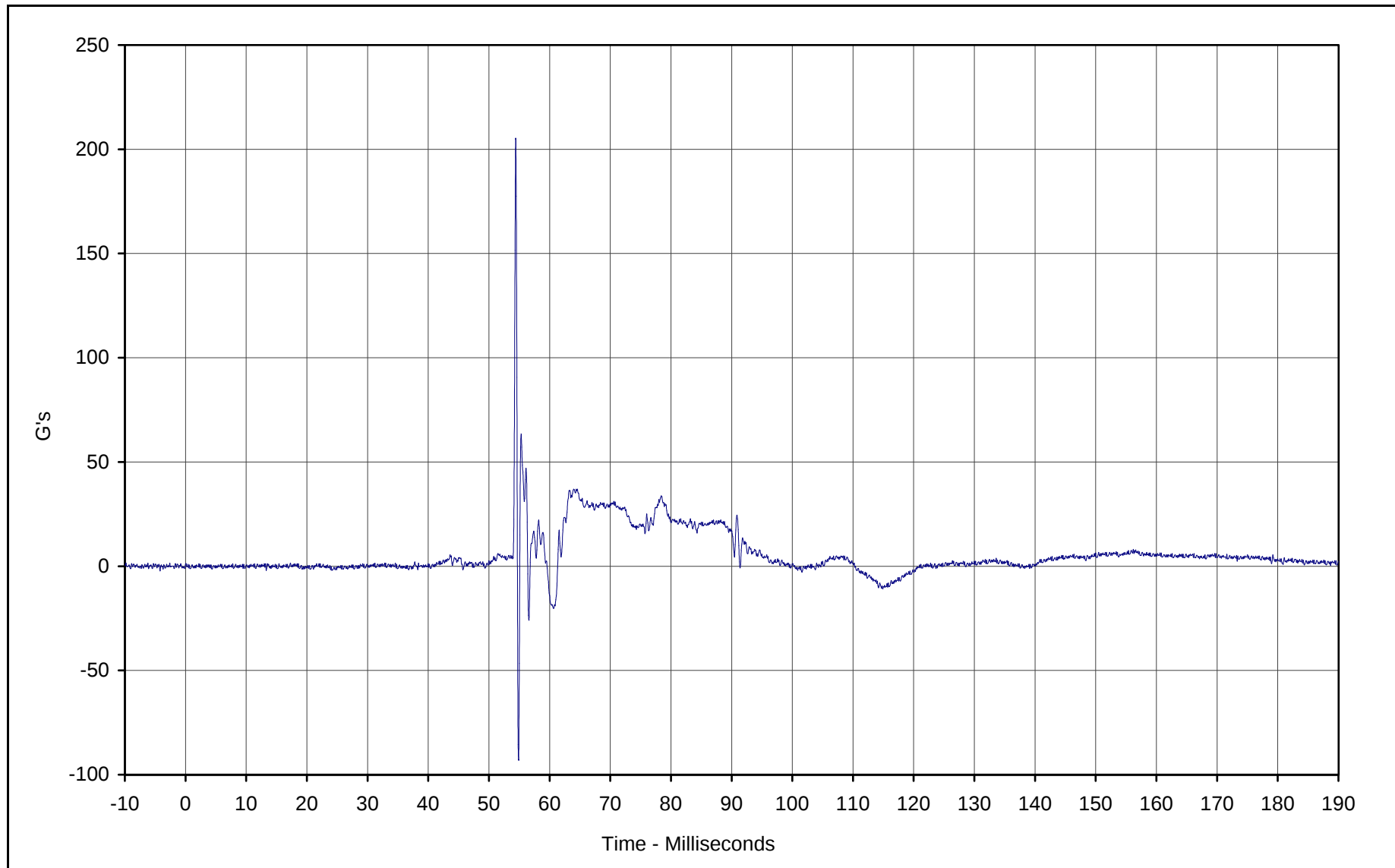




Curve Description: Pass. Head CG Resultant
Maximum Value: 63.4 at 94.9 Milliseconds
Minimum Value: 0.2 at 2.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: RES-014

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

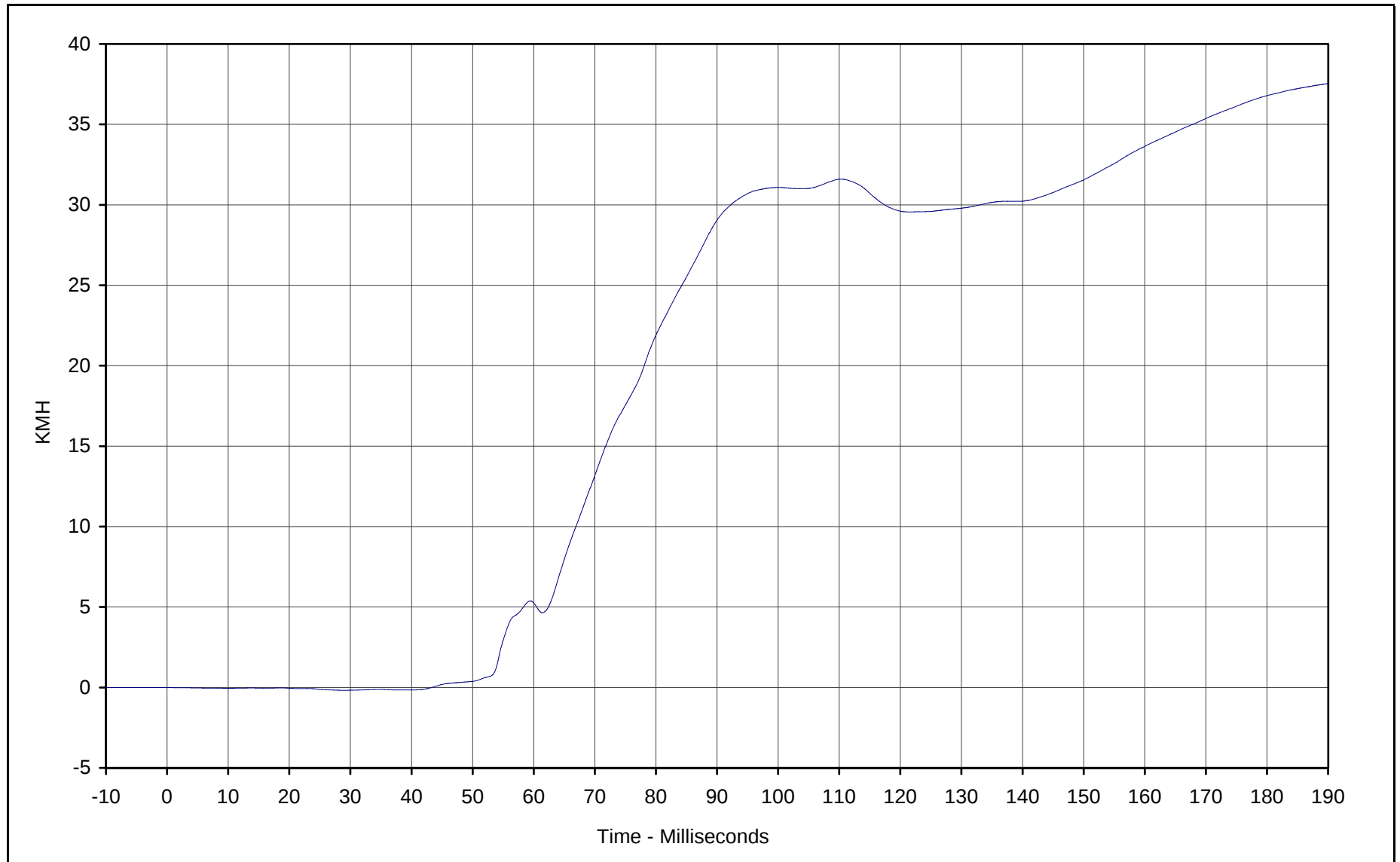




Curve Description: Pass. Upper Rib Primary Y
Maximum Value: 204.9 at 54.4 Milliseconds
Minimum Value: -92.7 at 54.9 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-017

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Pass. Upper Rib Primary Y Velocity

Maximum Value: 37.5 at 189.9 Milliseconds

Minimum Value: -0.2 at 28.8 Milliseconds

SAE Filter Class: 180

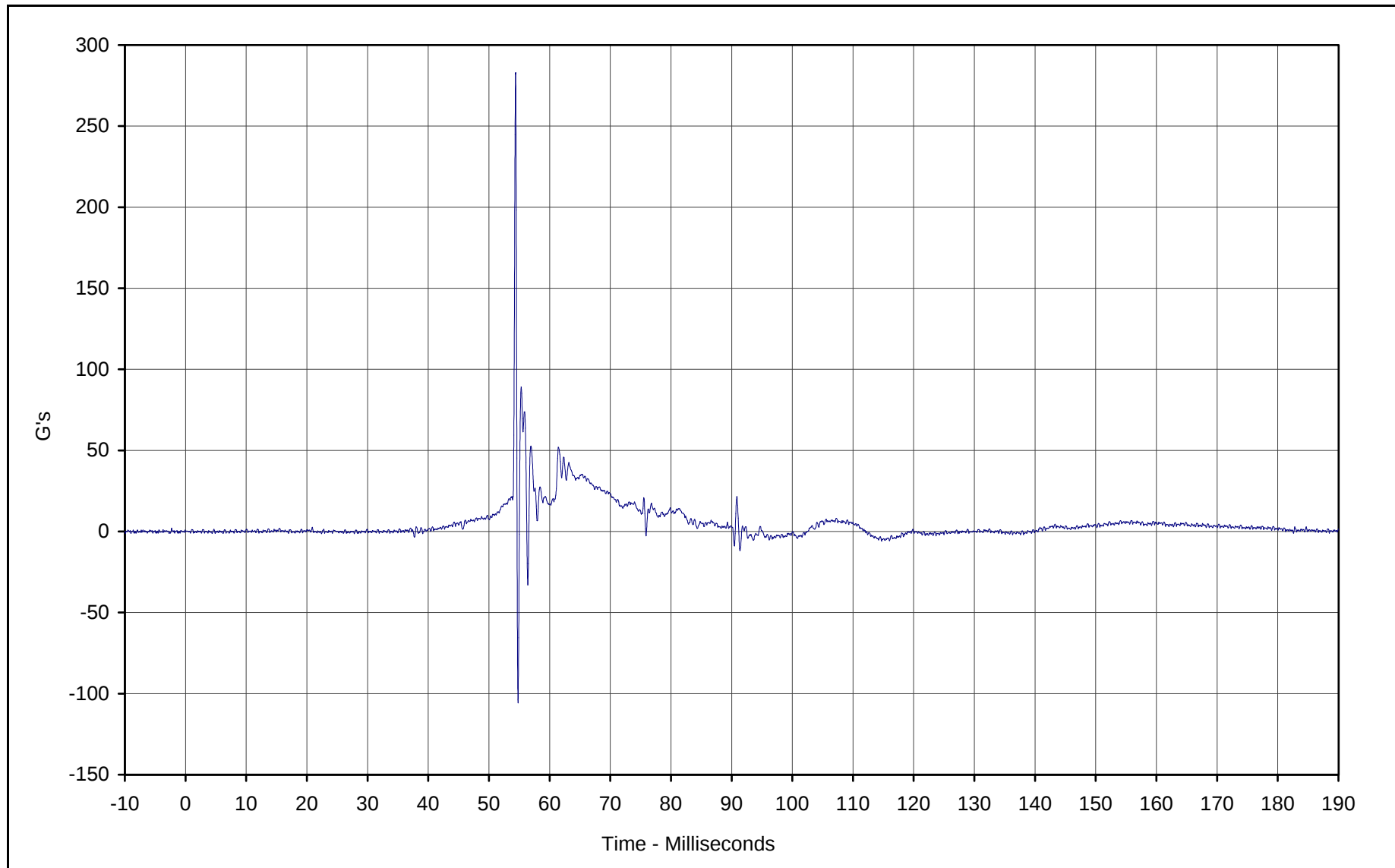
Date of Test: 12/6/01

Curve Number: IN1-017

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

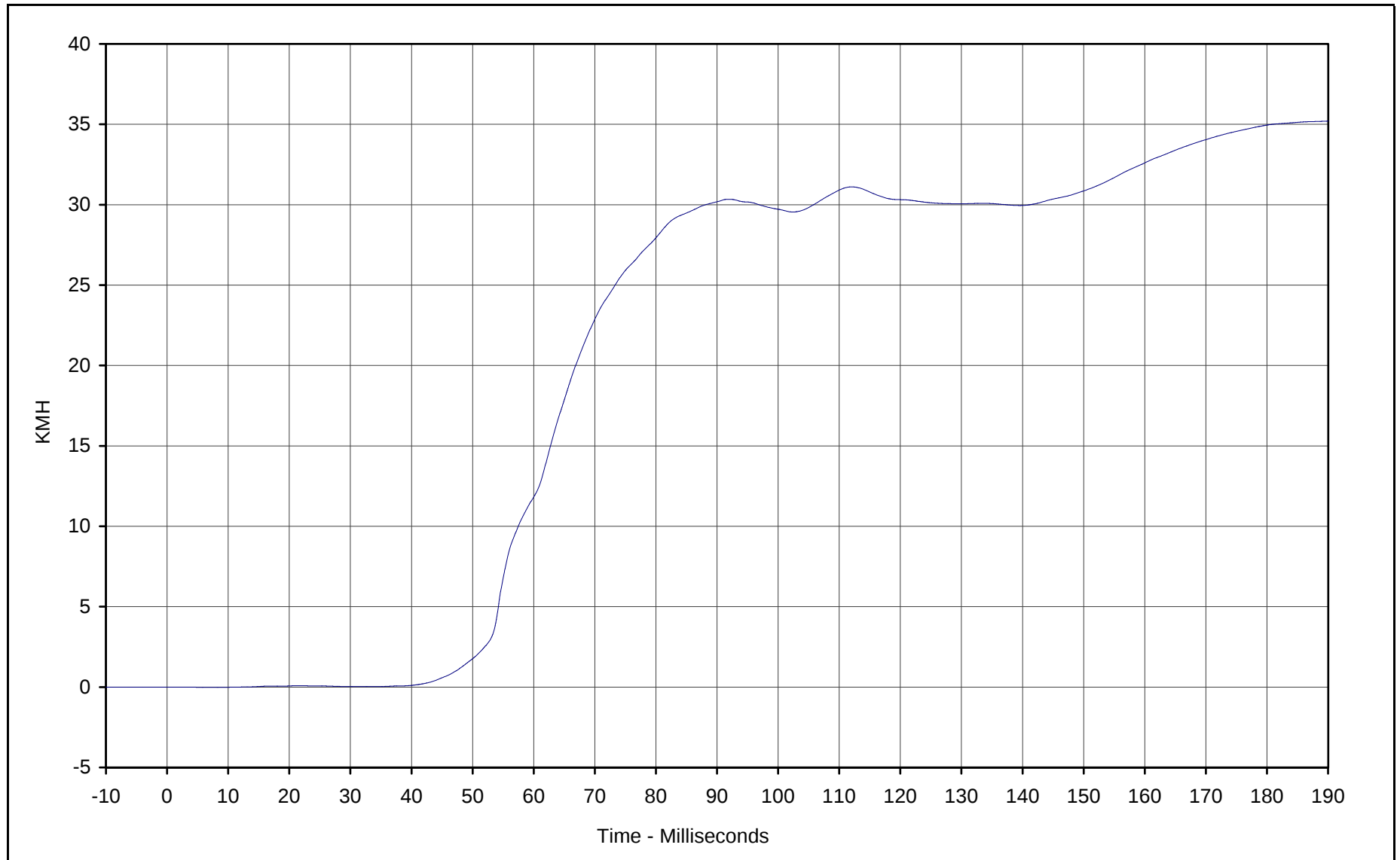




Curve Description: Pass. Lower Rib Primary Y
Maximum Value: 282.0 at 54.4 Milliseconds
Minimum Value: -105.7 at 54.8 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-018

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Pass. Lower Rib Primary Y Velocity

Maximum Value: 35.2 at 189.9 Milliseconds

Minimum Value: 0.0 at 7.9 Milliseconds

SAE Filter Class: 180

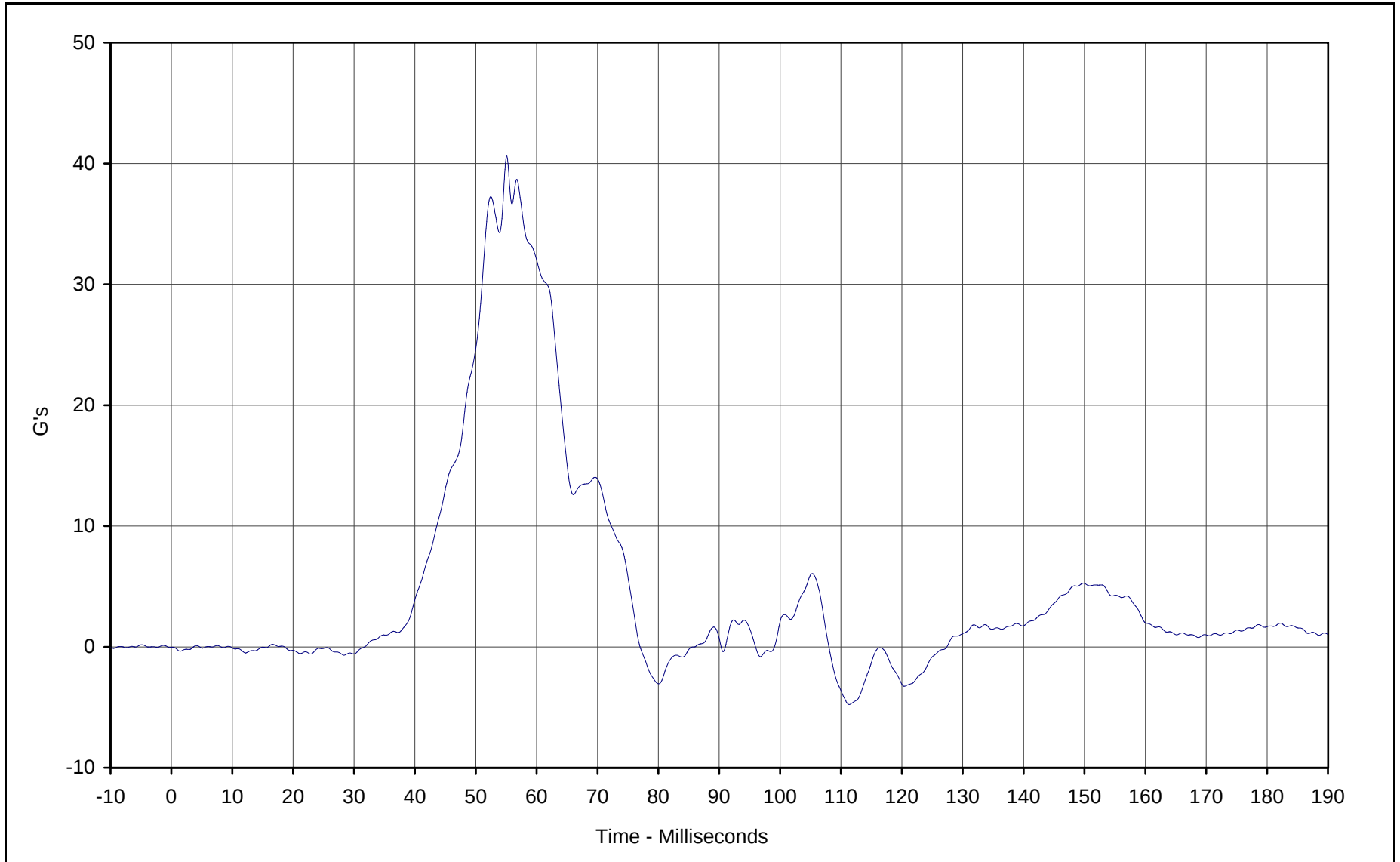
Date of Test: 12/6/01

Curve Number: IN1-018

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

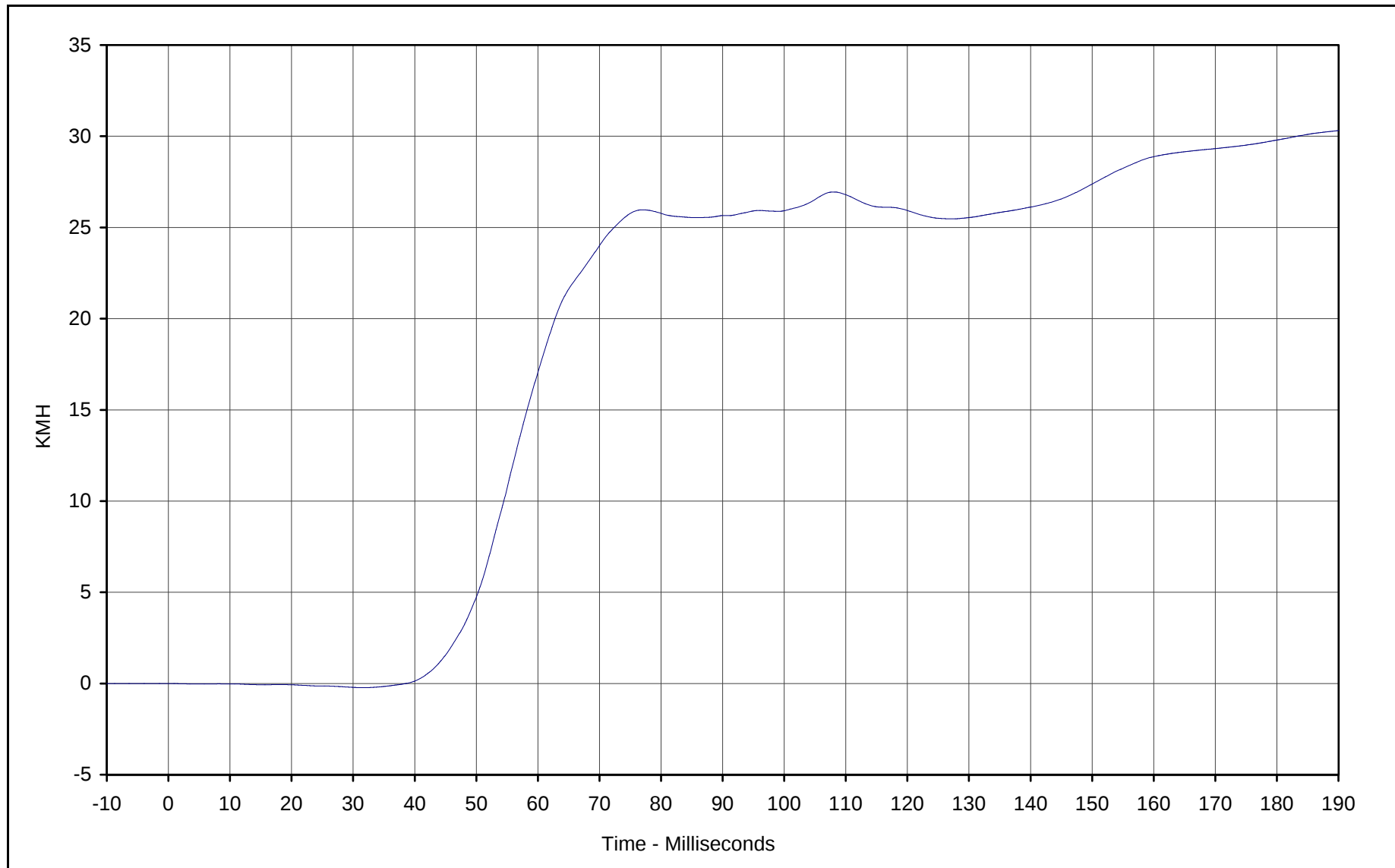




Curve Description: Pass. Lower Spine Primary Y
Maximum Value: 40.6 at 55.1 Milliseconds
Minimum Value: -4.8 at 111.4 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: FIL-019

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Pass. Lower Spine Primary Y Velocity

Maximum Value: 30.3 at 189.9 Milliseconds

Minimum Value: -0.2 at 31.8 Milliseconds

SAE Filter Class: 180

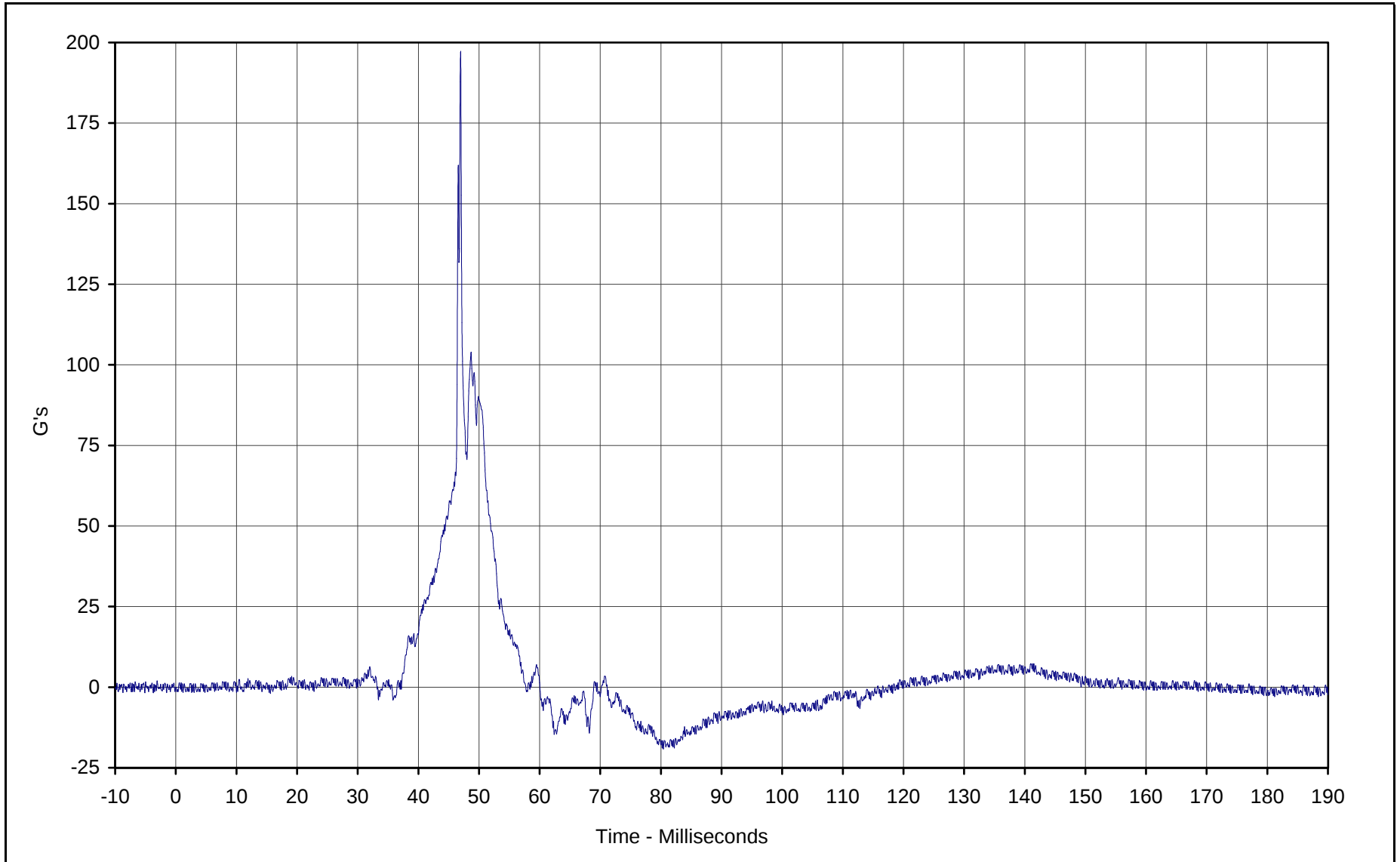
Date of Test: 12/6/01

Curve Number: IN1-019

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

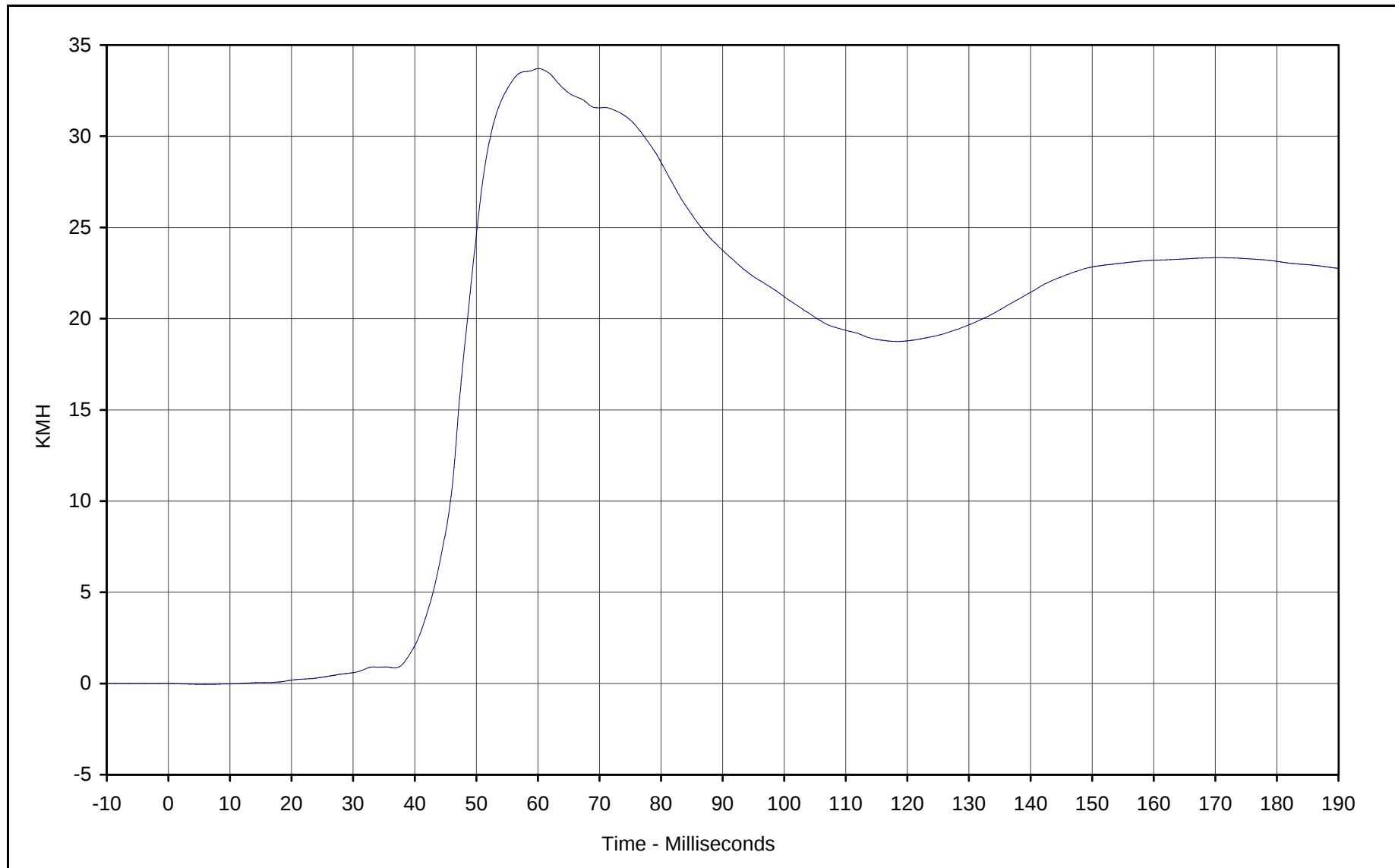




Curve Description: Pass. Pelvis Primary Y
Maximum Value: 196.7 at 47.0 Milliseconds
Minimum Value: -19.2 at 80.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-020

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

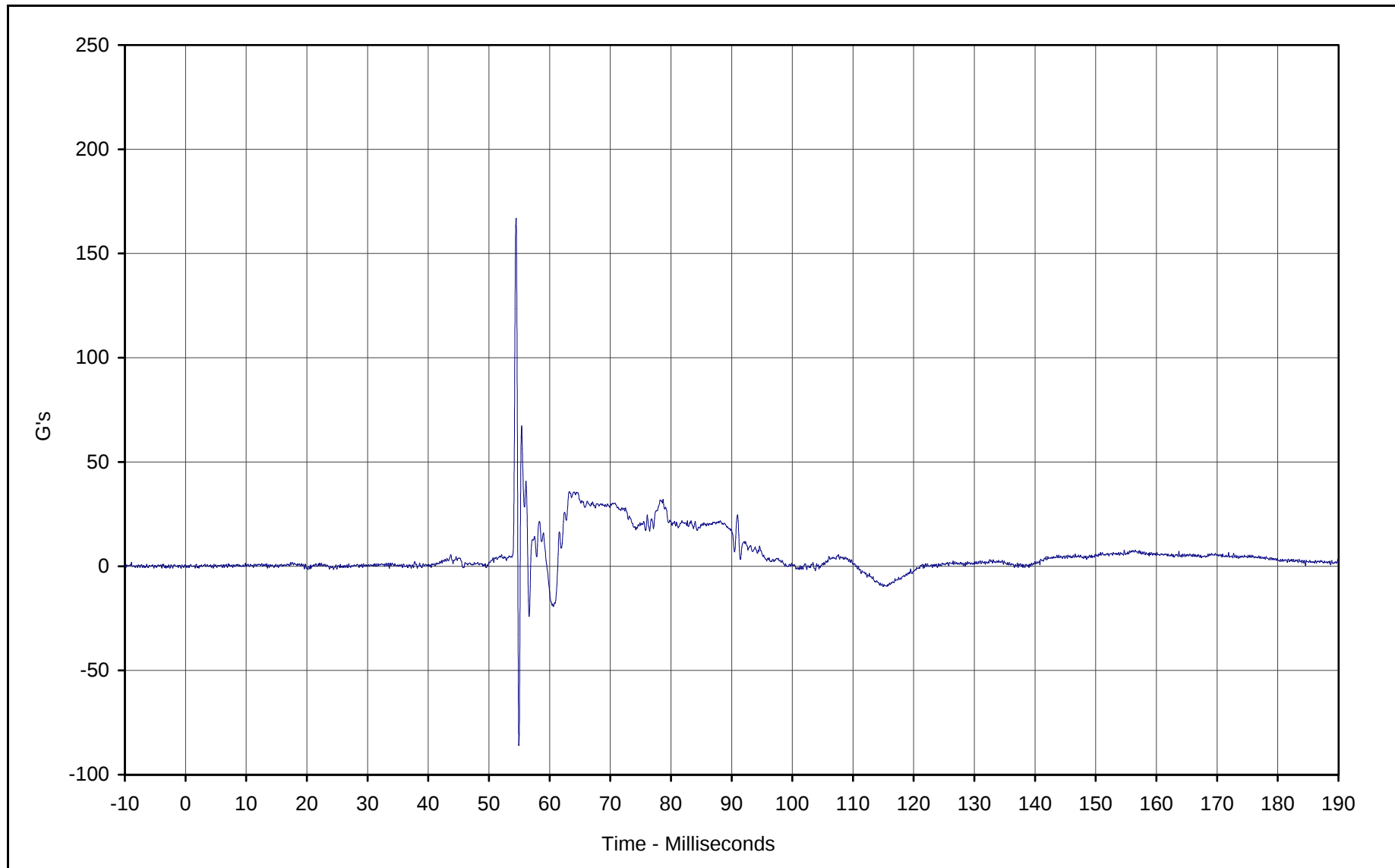




Curve Description: Pass. Pelvis Primary Y Velocity
Maximum Value: 33.7 at 60.1 Milliseconds
Minimum Value: -0.1 at 5.9 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-020

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

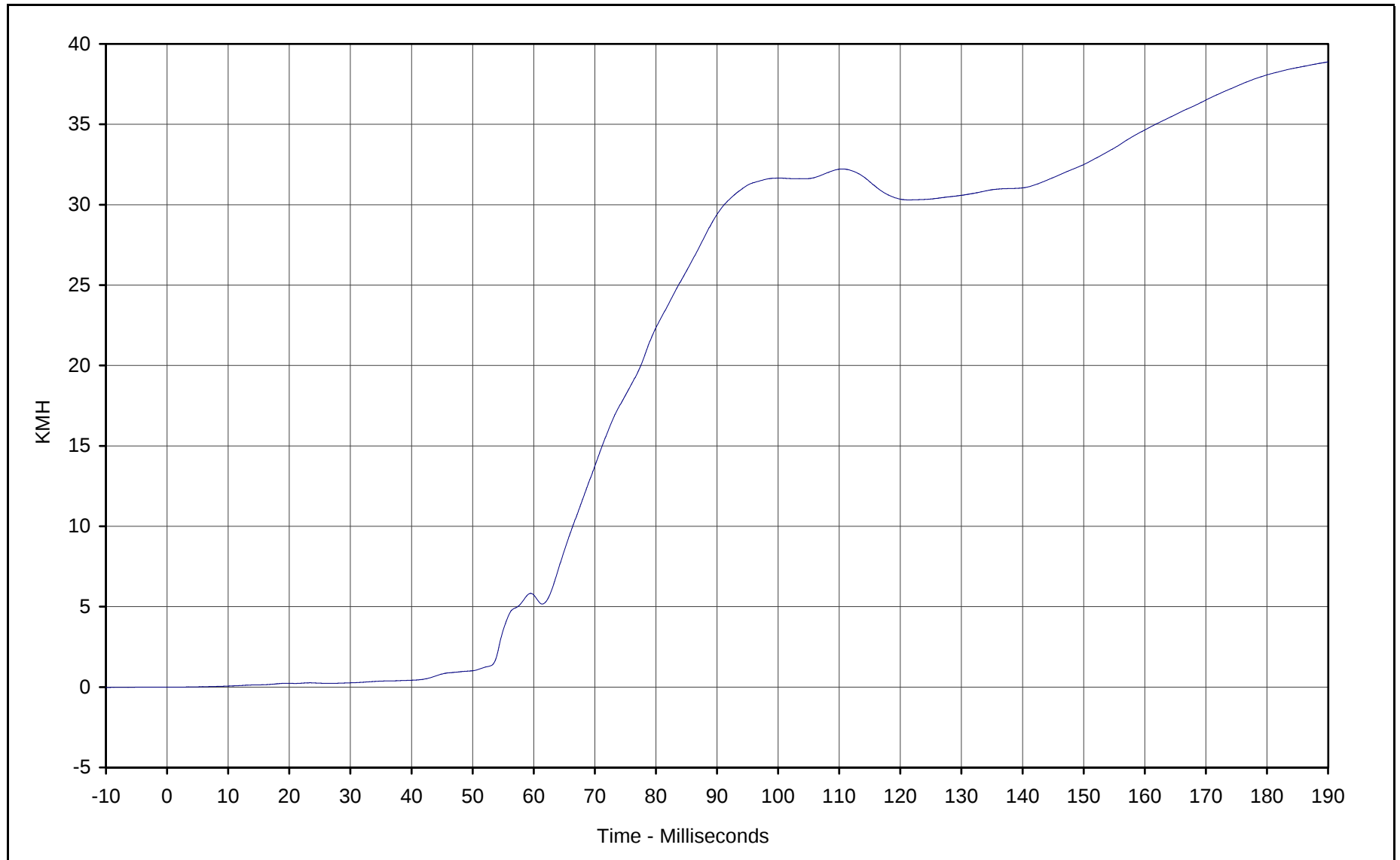




Curve Description: Pass. Upper Rib Redundant Y
Maximum Value: 166.5 at 54.5 Milliseconds
Minimum Value: -85.5 at 54.9 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-021

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Pass. Upper Rib Redundant Y Velocity

Maximum Value: 38.9 at 189.9 Milliseconds

Minimum Value: 0.0 at 0.2 Milliseconds

SAE Filter Class: 180

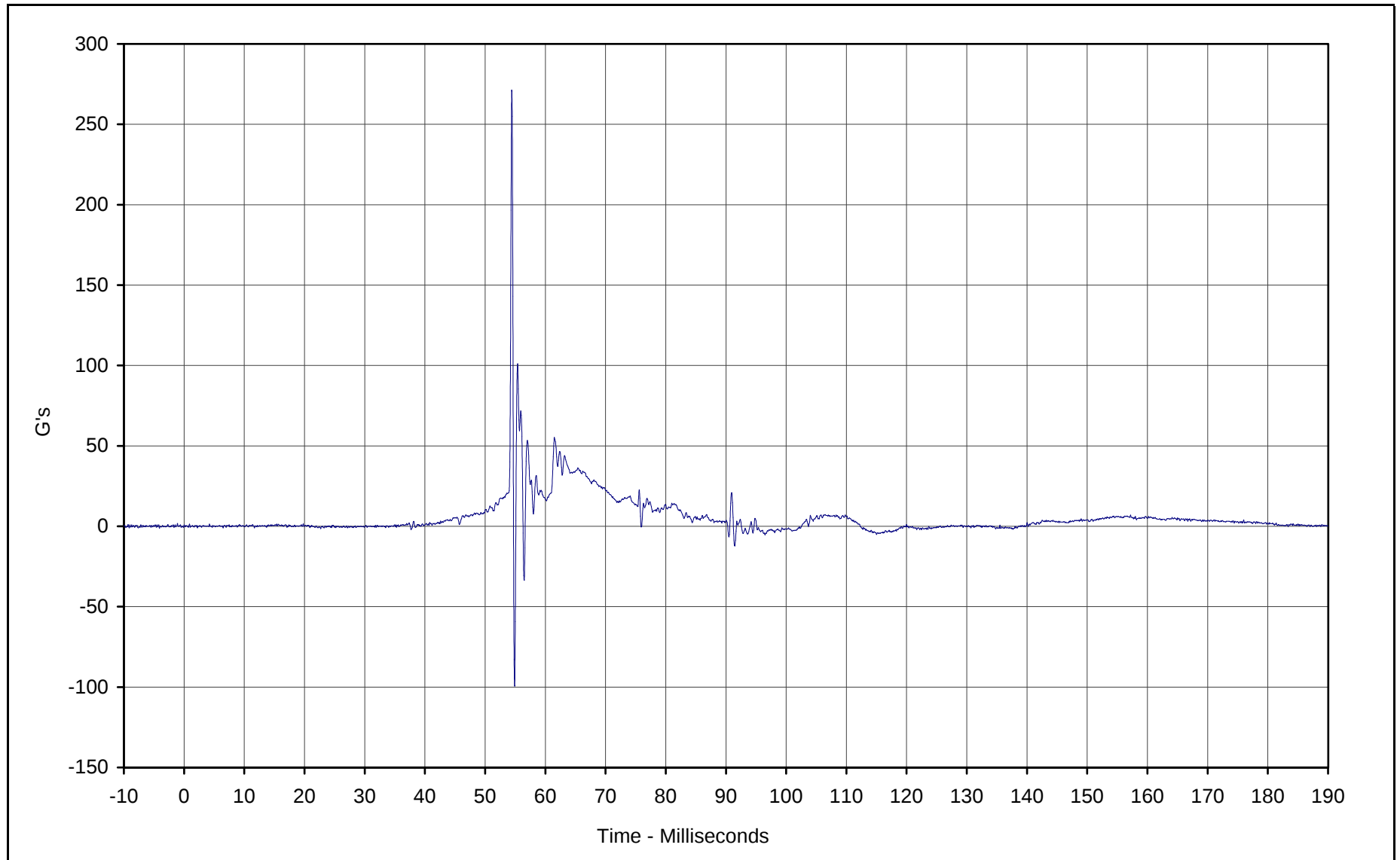
Date of Test: 12/6/01

Curve Number: IN1-021

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

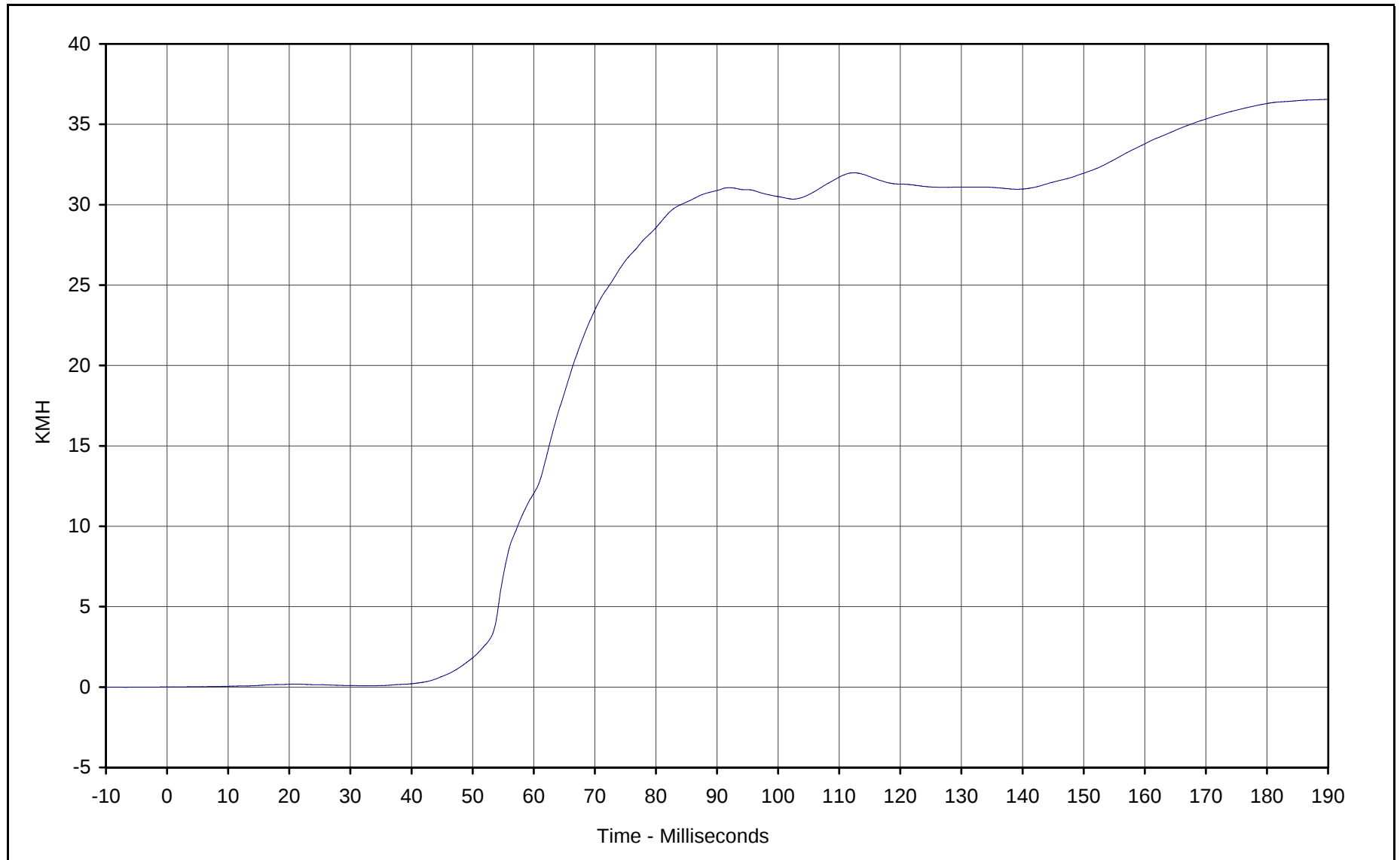




Curve Description: Pass. Lower Rib Redundant Y
Maximum Value: 270.6 at 54.4 Milliseconds
Minimum Value: -99.2 at 54.9 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-022

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Pass. Lower Rib Redundant Y Velocity

Maximum Value: 36.6 at 189.9 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

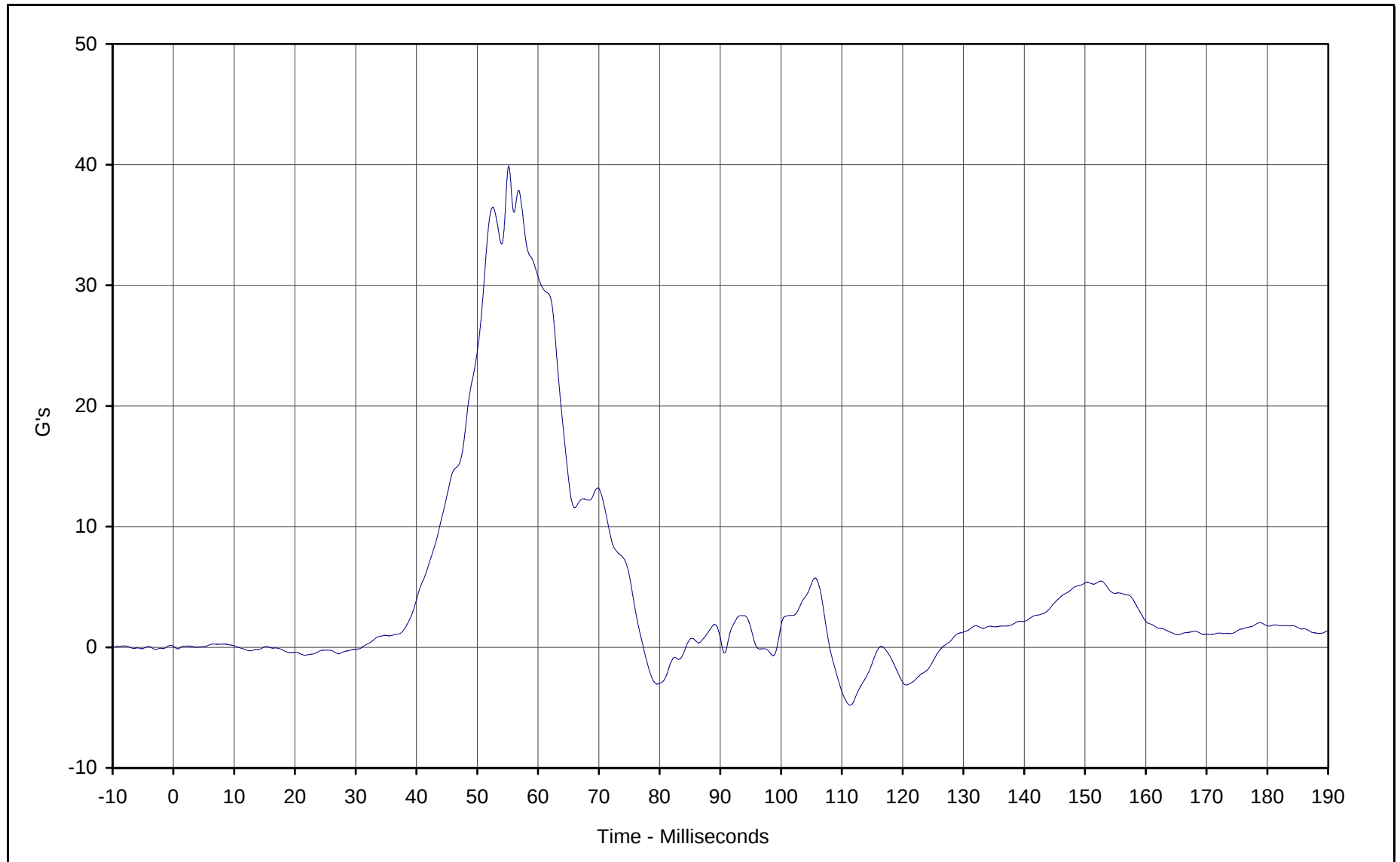
Date of Test: 12/6/01

Curve Number: IN1-022

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

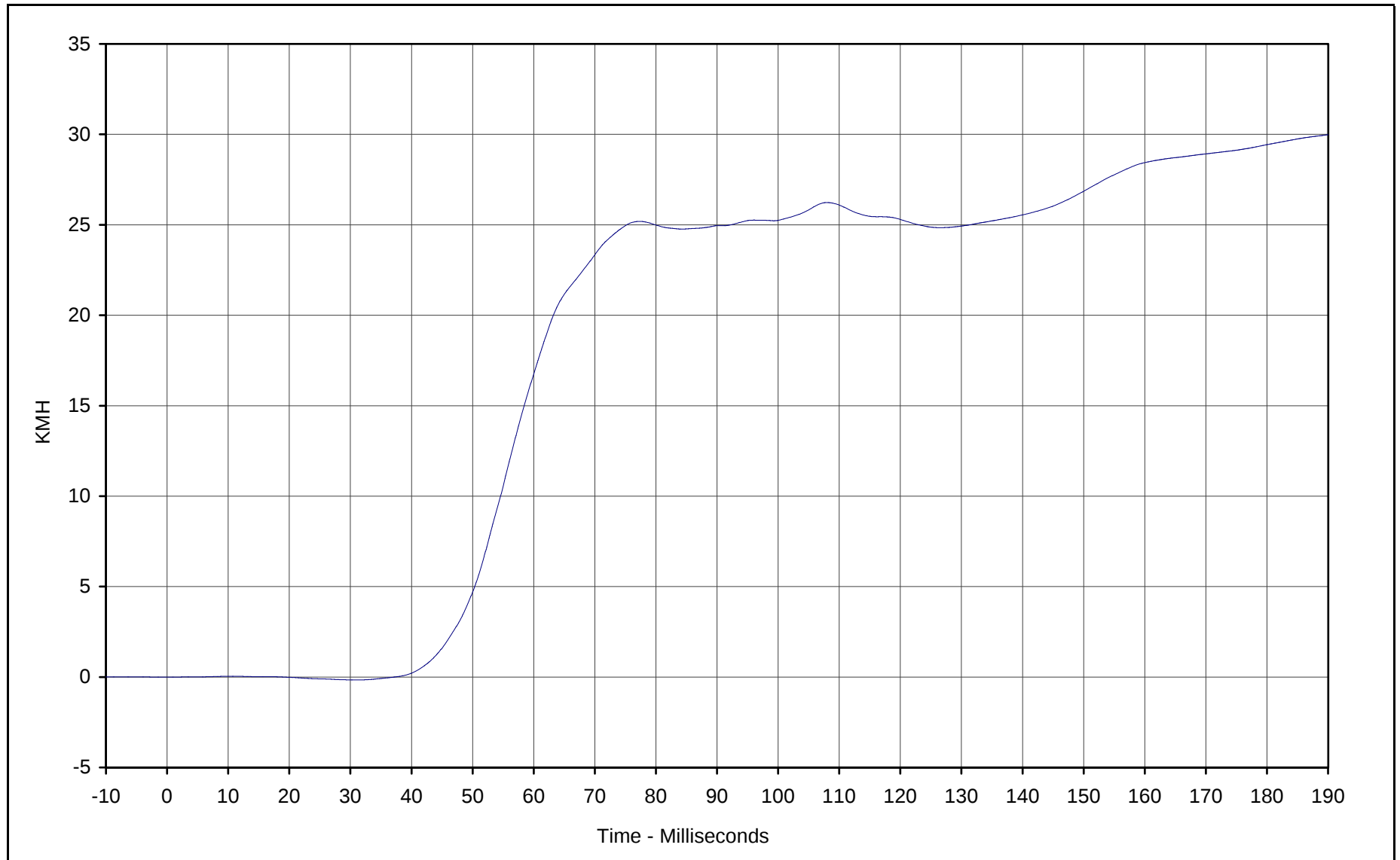




Curve Description: Pass. Lower Spine Redundant Y
Maximum Value: 39.9 at 55.2 Milliseconds
Minimum Value: -4.8 at 111.4 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: FIL-023

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Pass. Lower Spine Redundant Y Velocity

Maximum Value: 30.0 at 189.9 Milliseconds

Minimum Value: -0.2 at 31.1 Milliseconds

SAE Filter Class: 180

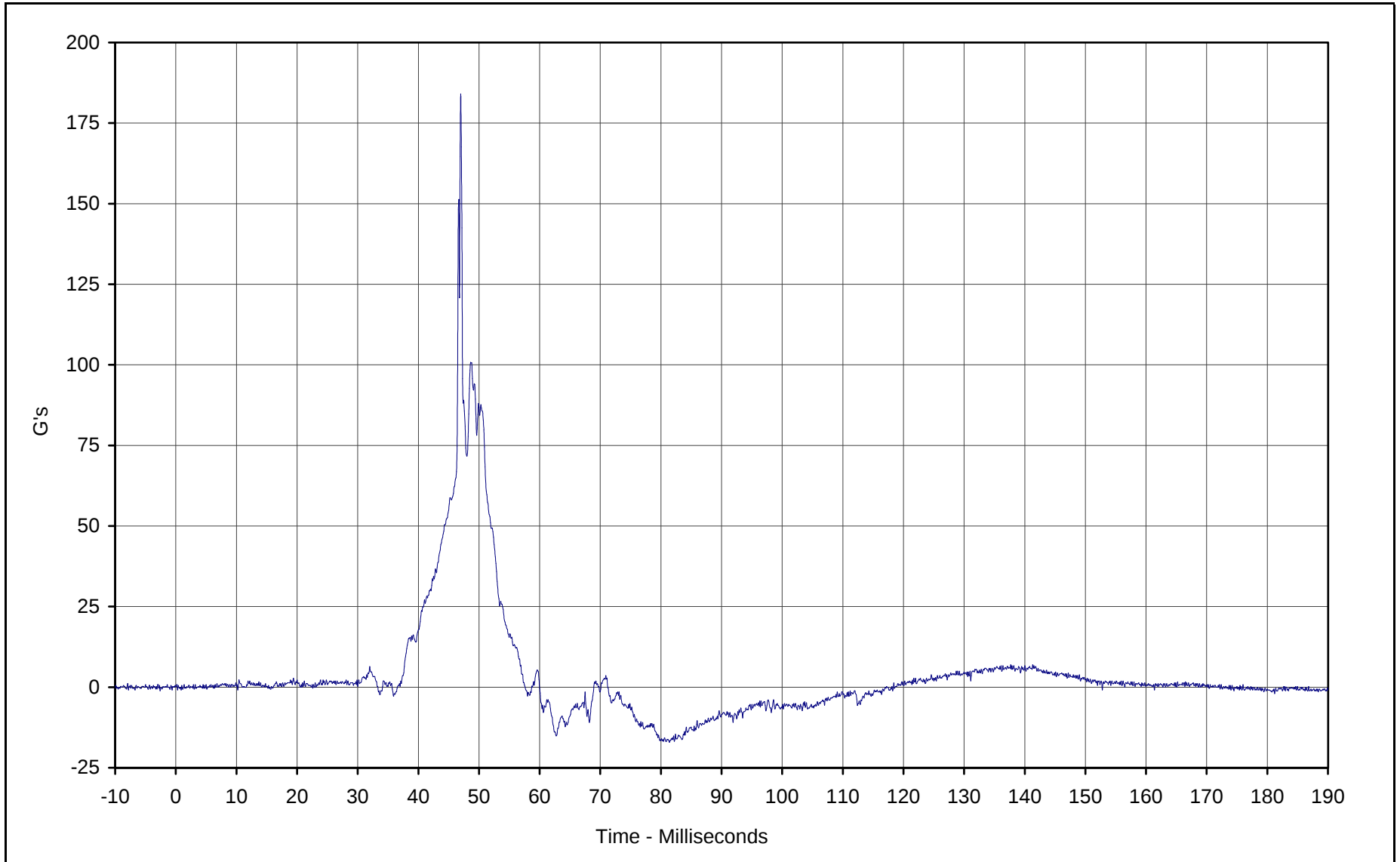
Date of Test: 12/6/01

Curve Number: IN1-023

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

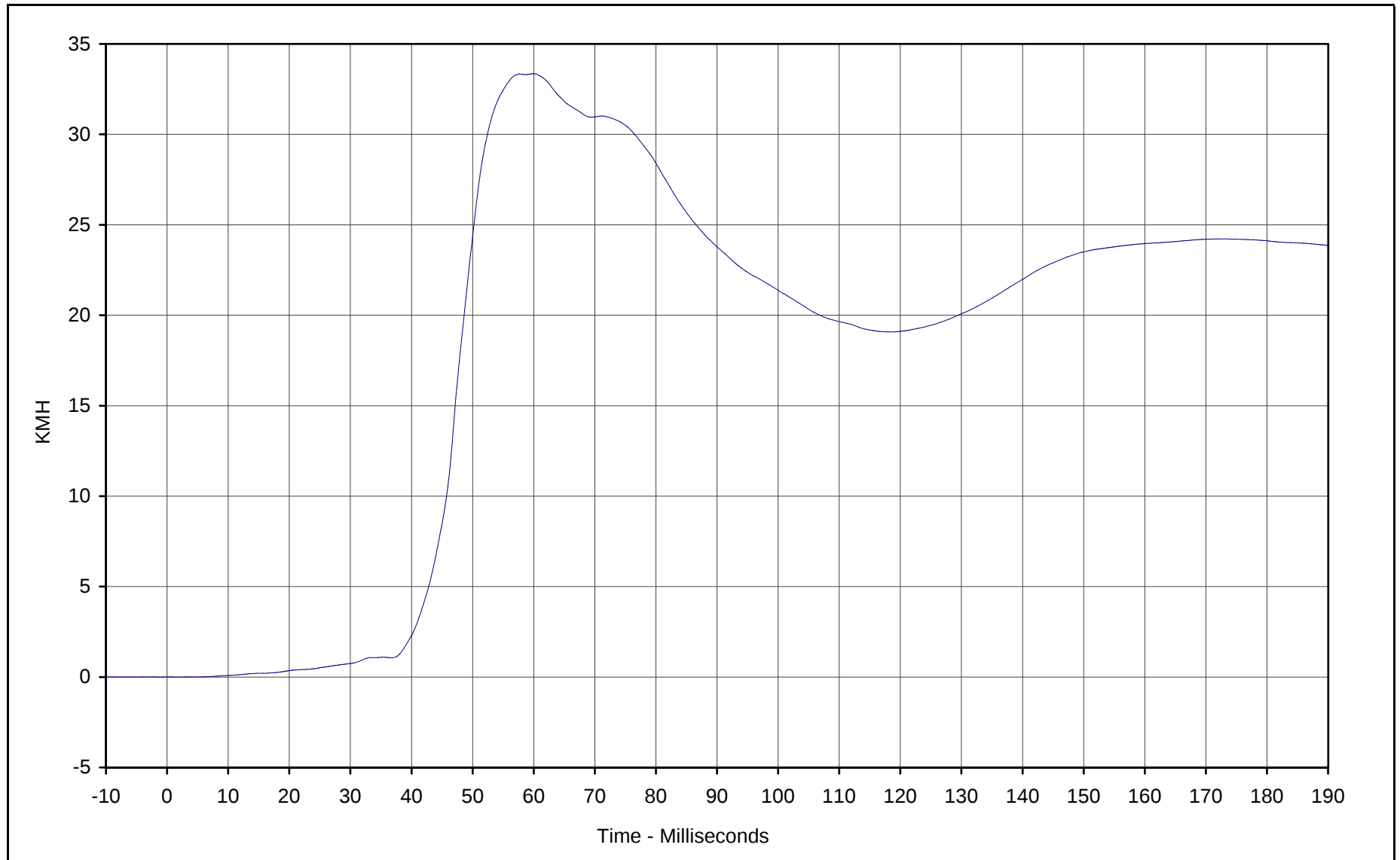




Curve Description: Pass. Pelvis Redundant Y
Maximum Value: 184.1 at 47.0 Milliseconds
Minimum Value: -17.1 at 81.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-024

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

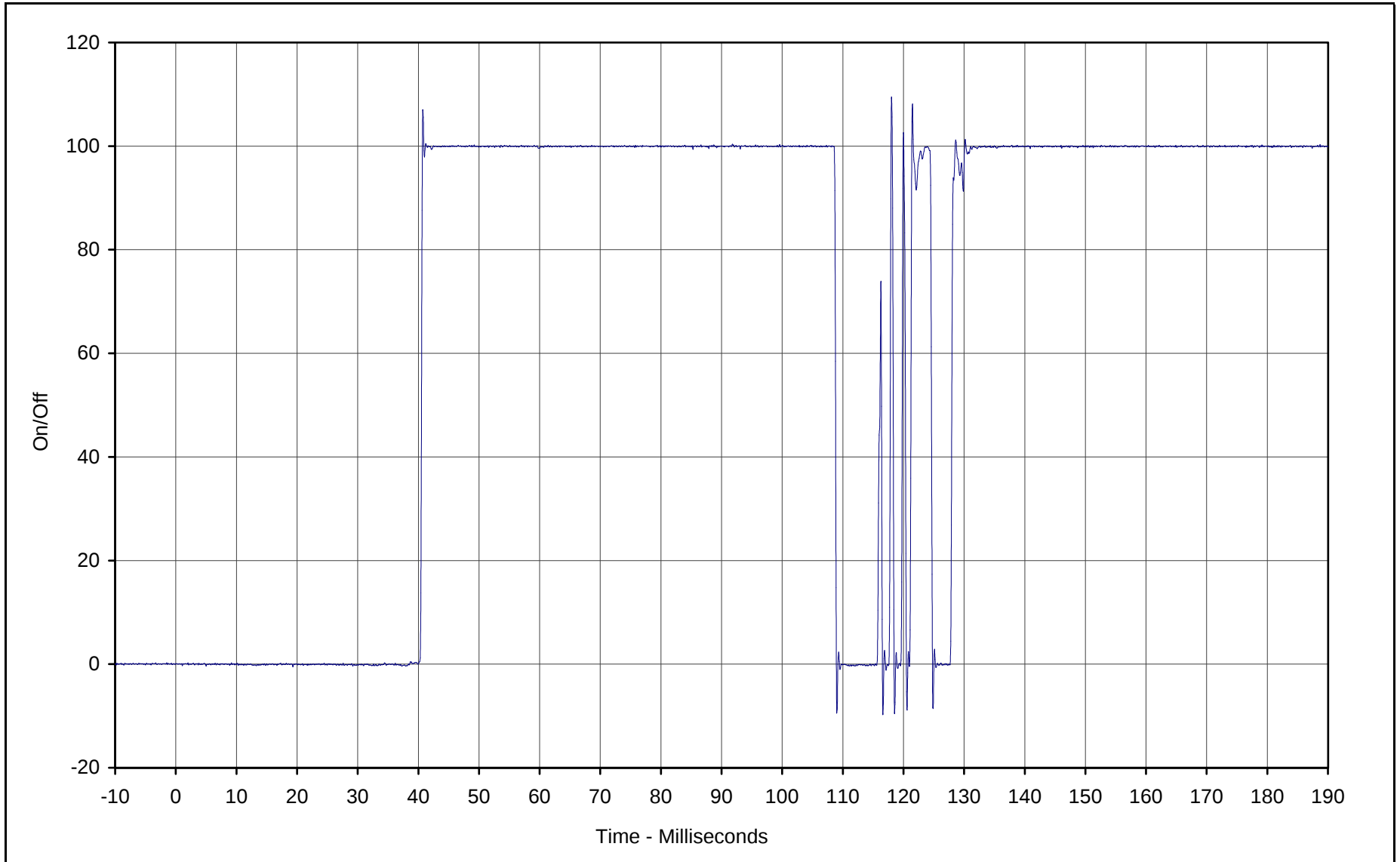




Curve Description: Pass. Pelvis Redundant Y Velocity
Maximum Value: 33.4 at 59.9 Milliseconds
Minimum Value: 0.0 at 1.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-024

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

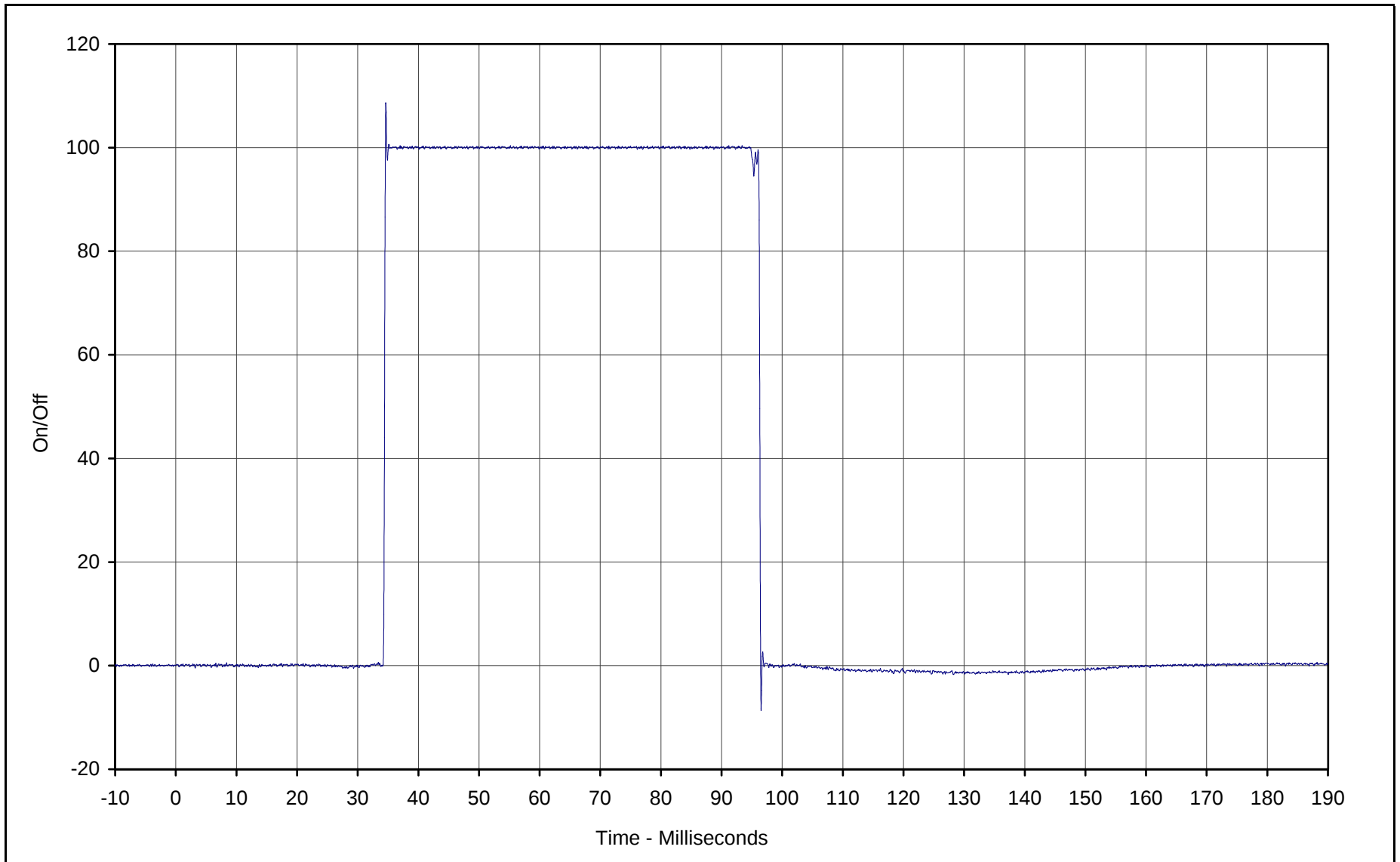




Curve Description: Pass. Thorax Contact
Maximum Value: 109.2 at 118.0 Milliseconds
Crossing Point: 50% at 40.1 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-025

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

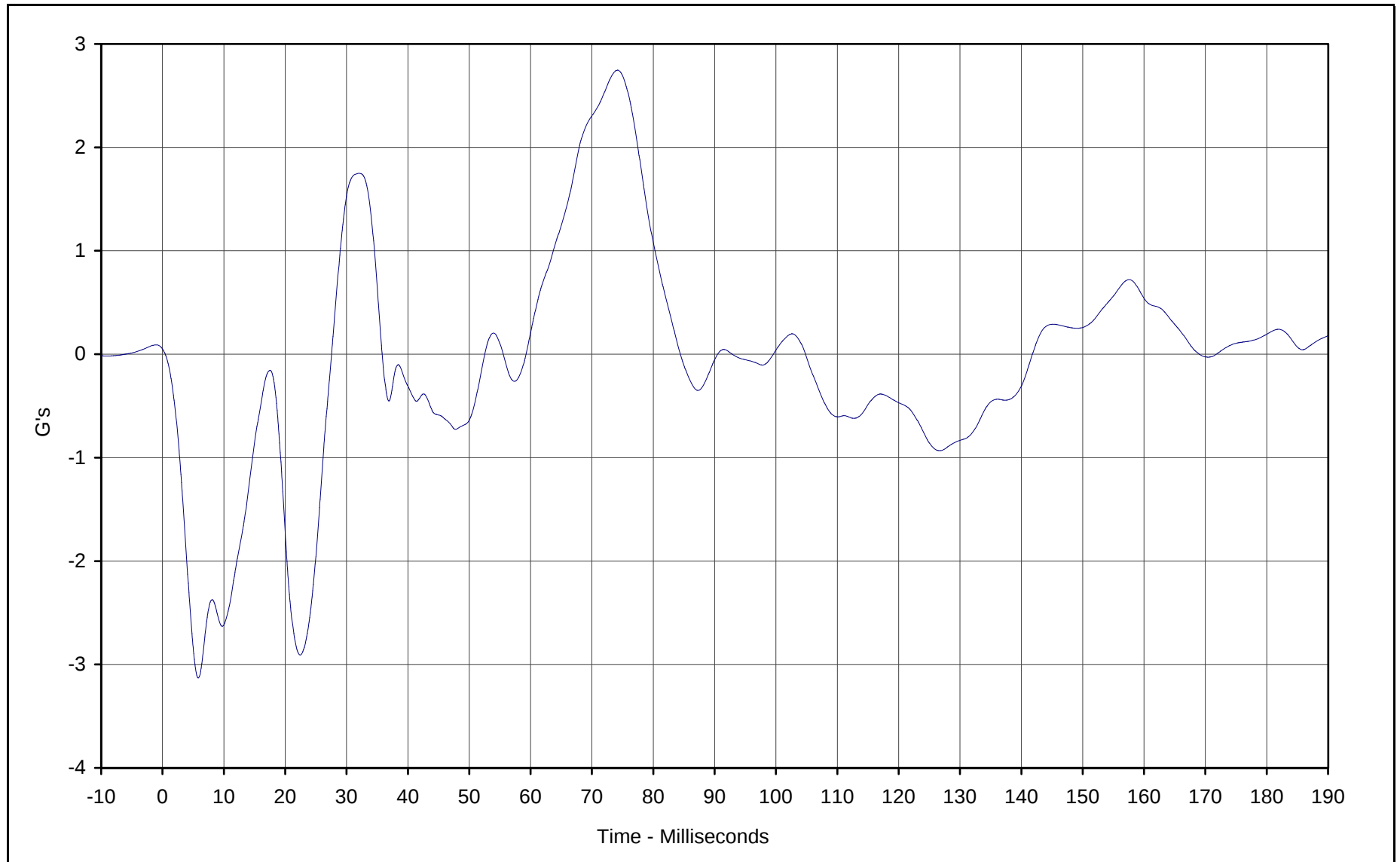




Curve Description: Pass. Pelvis Contact
Maximum Value: 108.5 at 34.6 Milliseconds
Crossing Point: 50% at 34.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-026

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

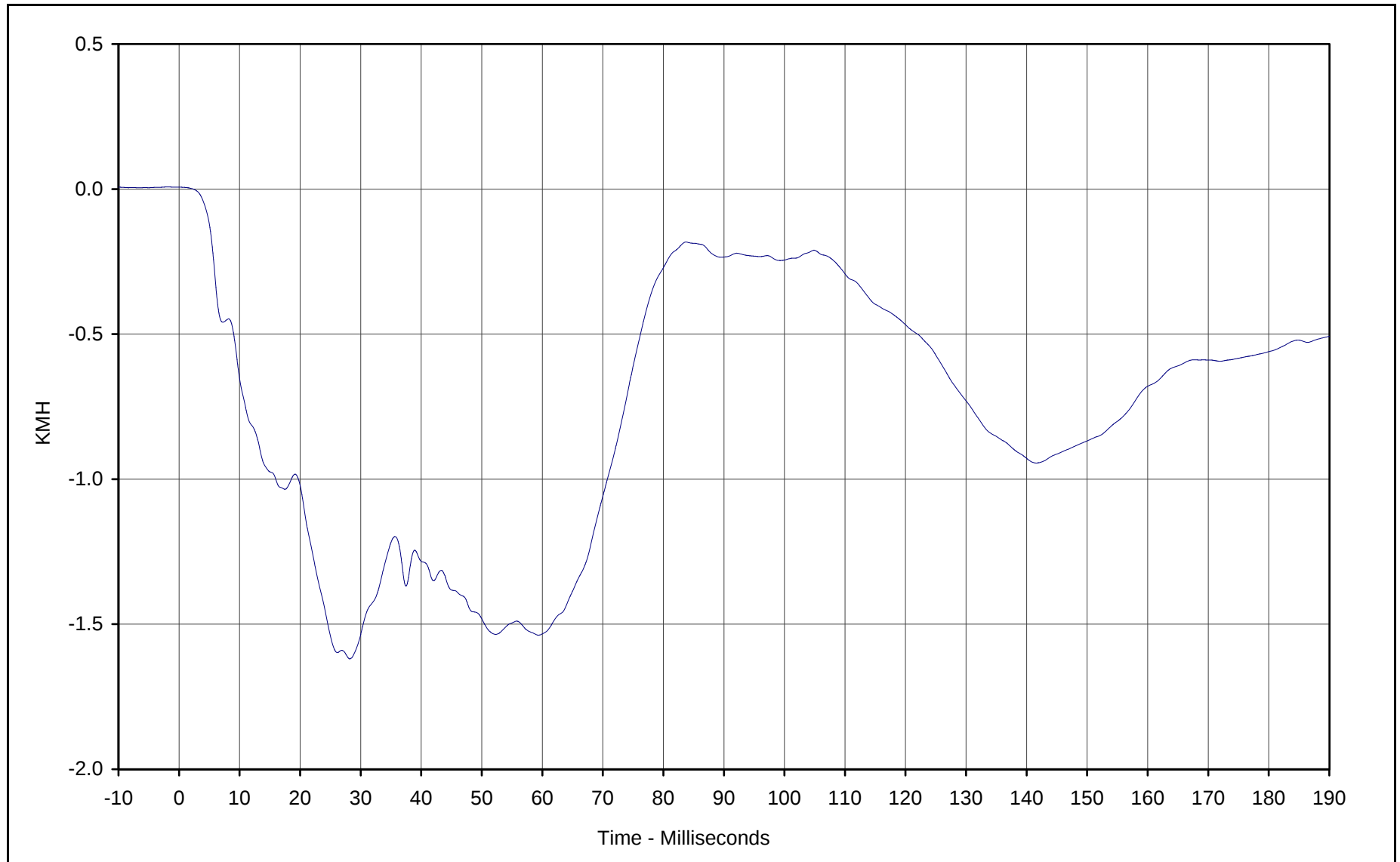




Curve Description: Right Sill at Front Seat X
Maximum Value: 2.7 at 74.2 Milliseconds
Minimum Value: -3.1 at 5.8 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: FIL-027

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

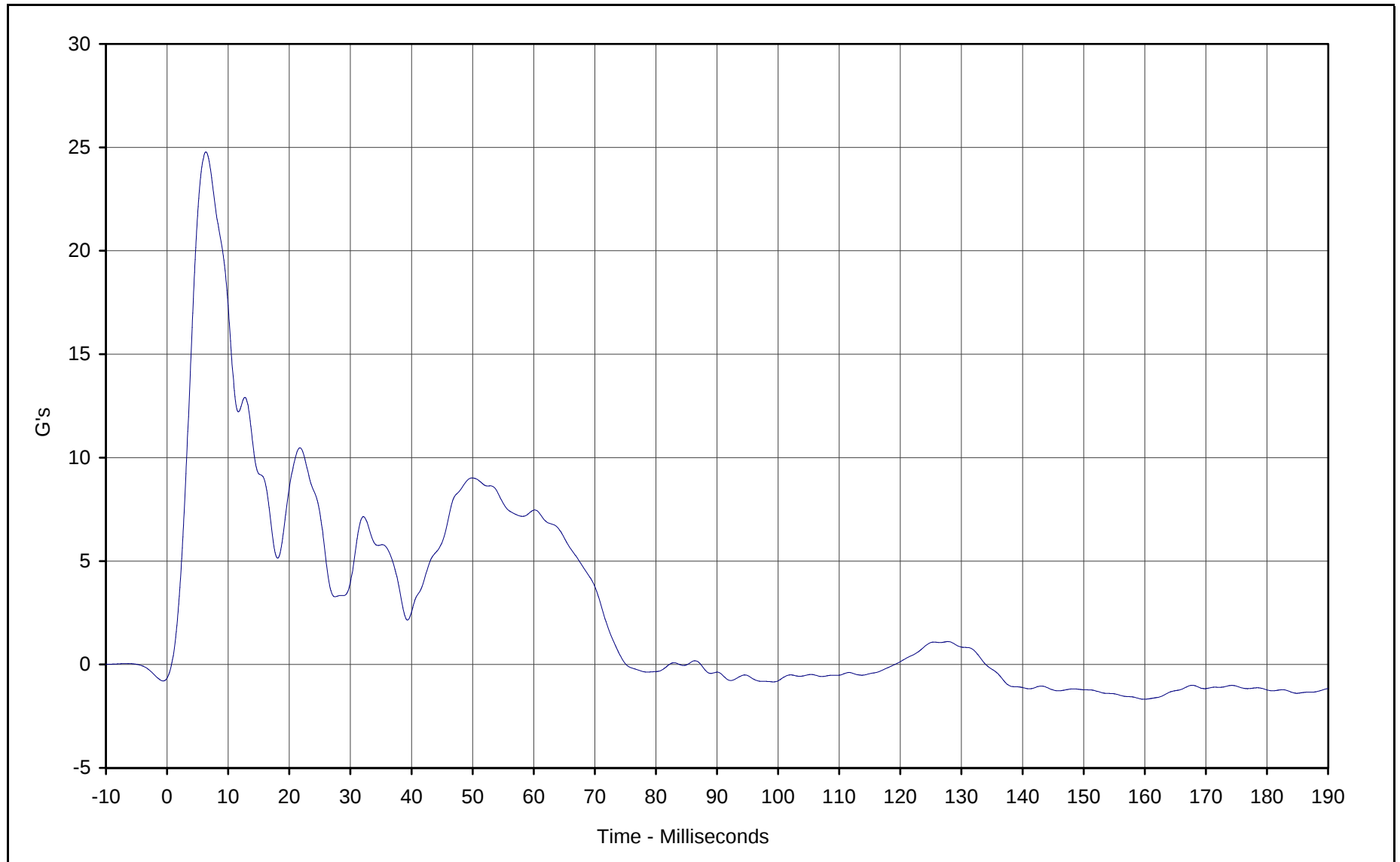




Curve Description: Right Sill at Front Seat X Velocity
Maximum Value: 0.0 at 0.0 Milliseconds
Minimum Value: -1.6 at 28.2 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-027

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

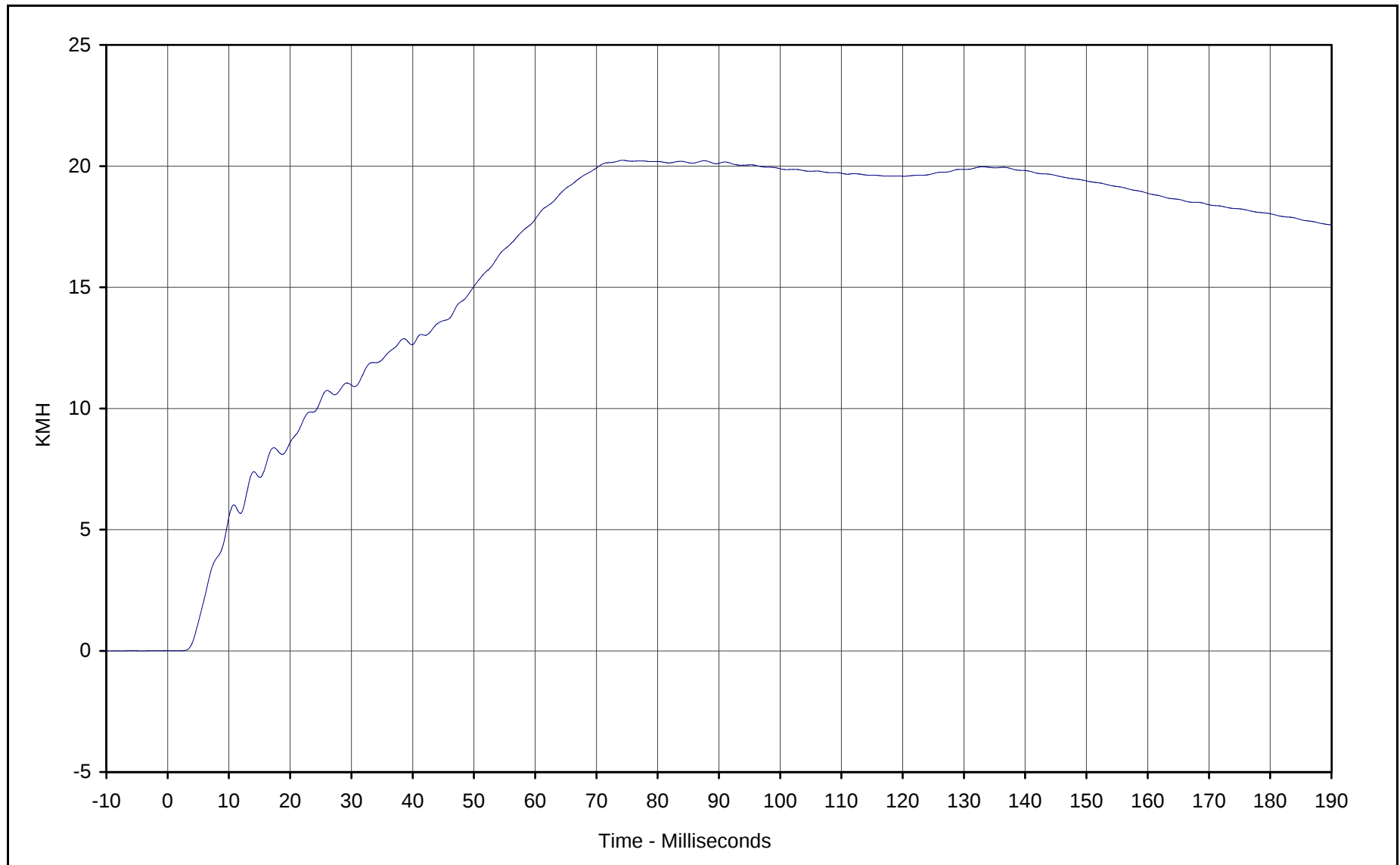




Curve Description: Right Sill at Front Seat Y
Maximum Value: 24.8 at 6.3 Milliseconds
Minimum Value: -1.7 at 159.9 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: FIL-028

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

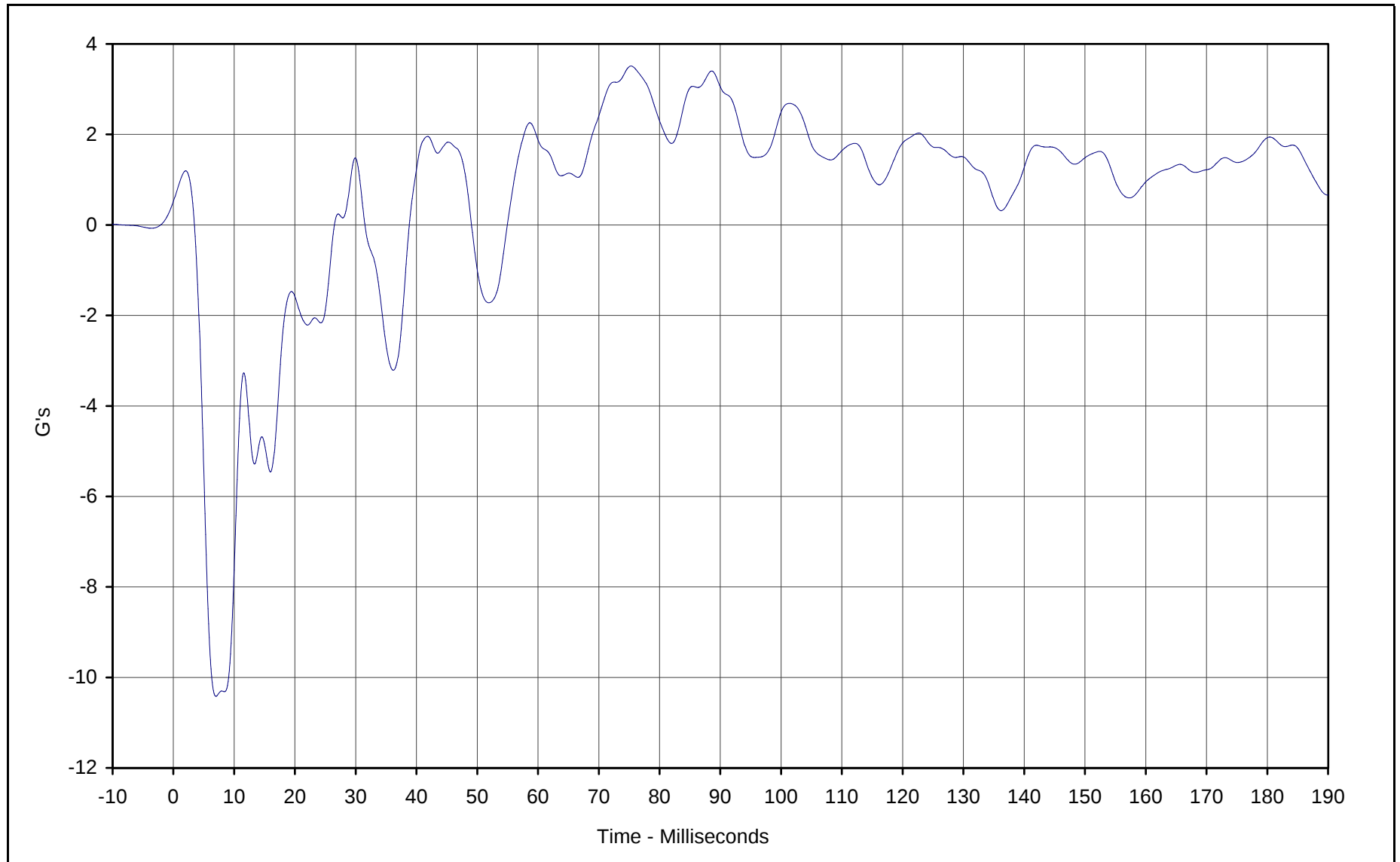




Curve Description: Right Sill at Front Seat Y Velocity
Maximum Value: 20.2 at 74.3 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-028

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

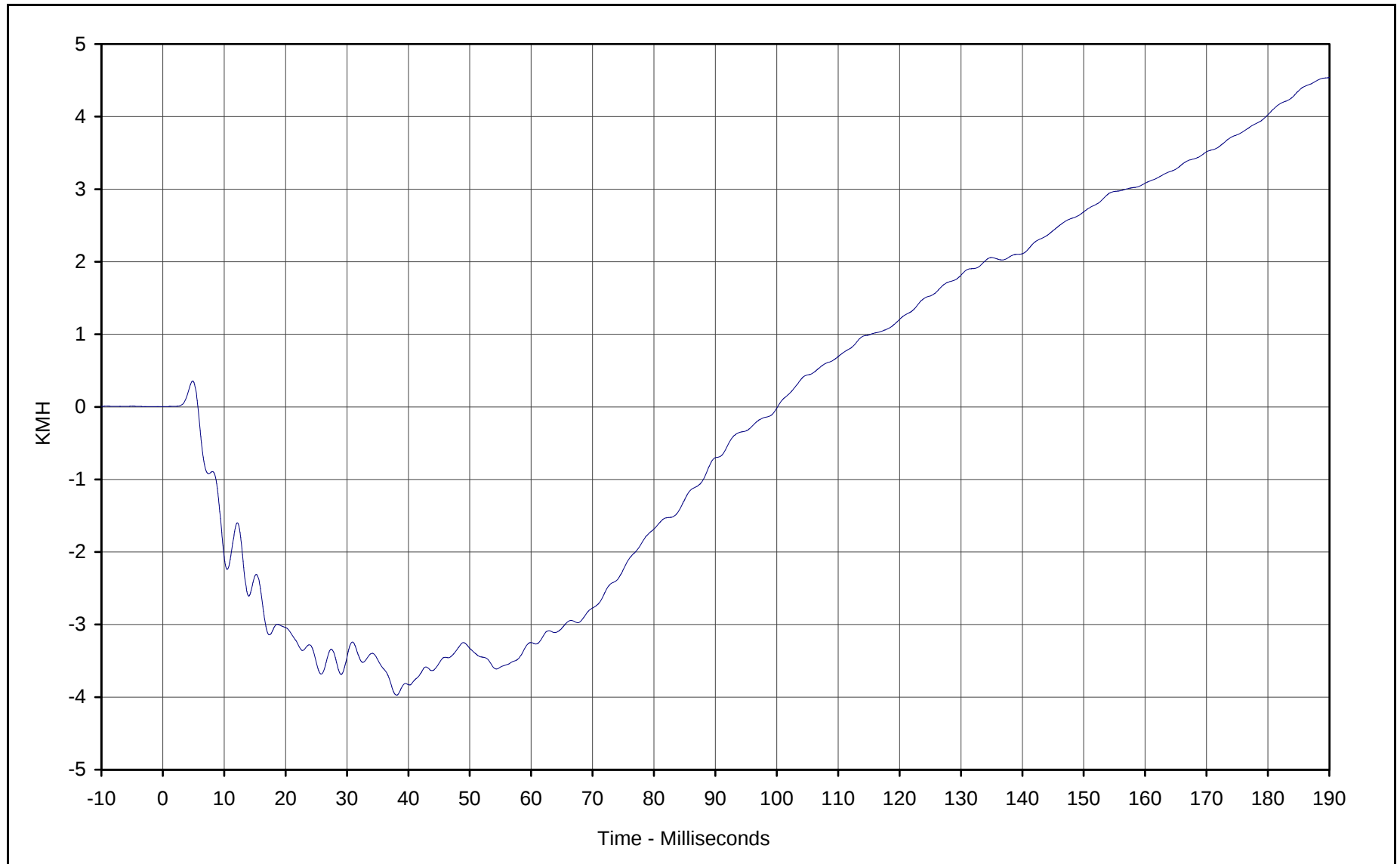




Curve Description: Right Sill at Front Seat Z
Maximum Value: 3.5 at 75.3 Milliseconds
Minimum Value: -10.4 at 7.0 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: FIL-029

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

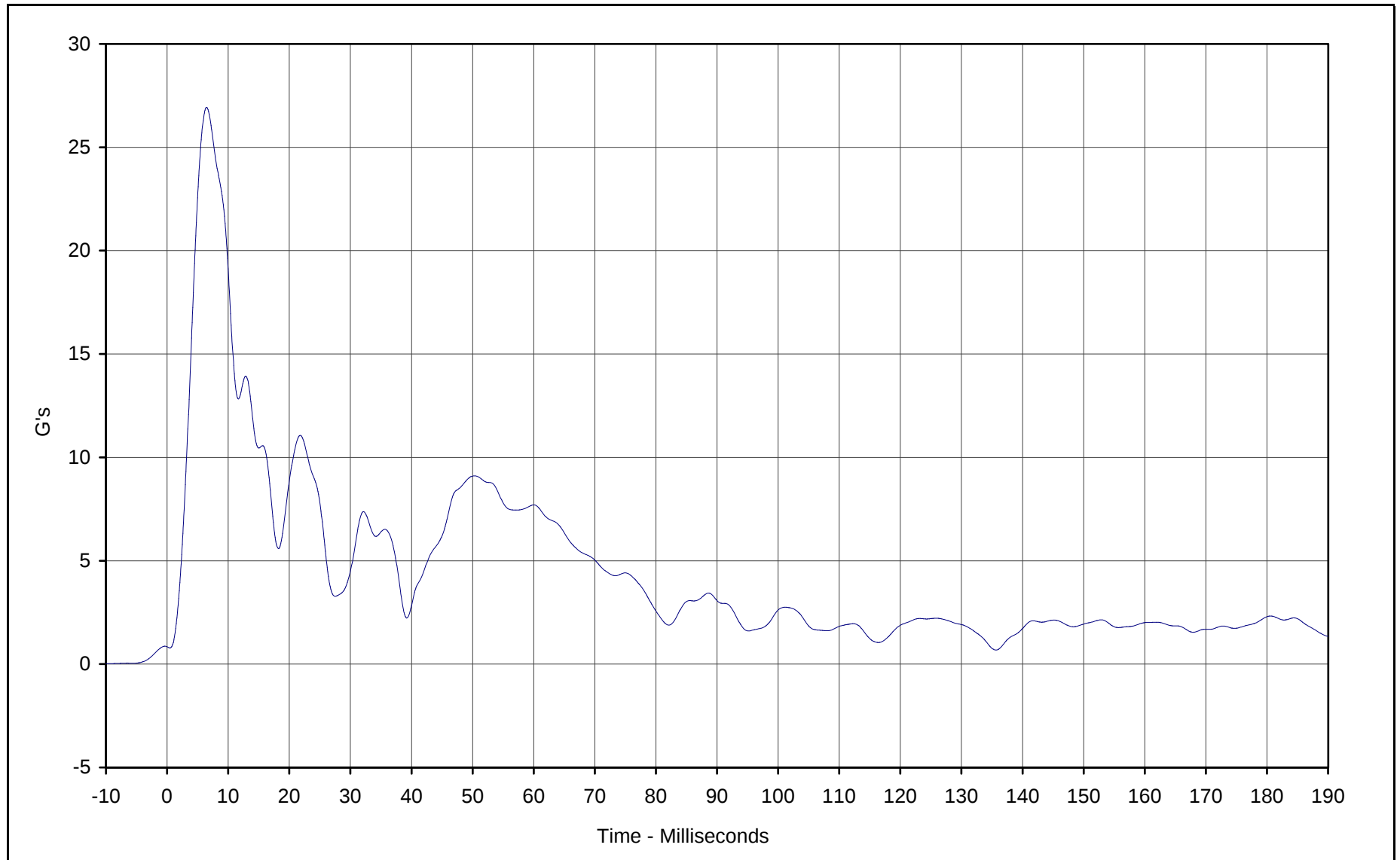




Curve Description: Right Sill at Front Seat Z Velocity
Maximum Value: 4.5 at 189.9 Milliseconds
Minimum Value: -4.0 at 38.1 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-029

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

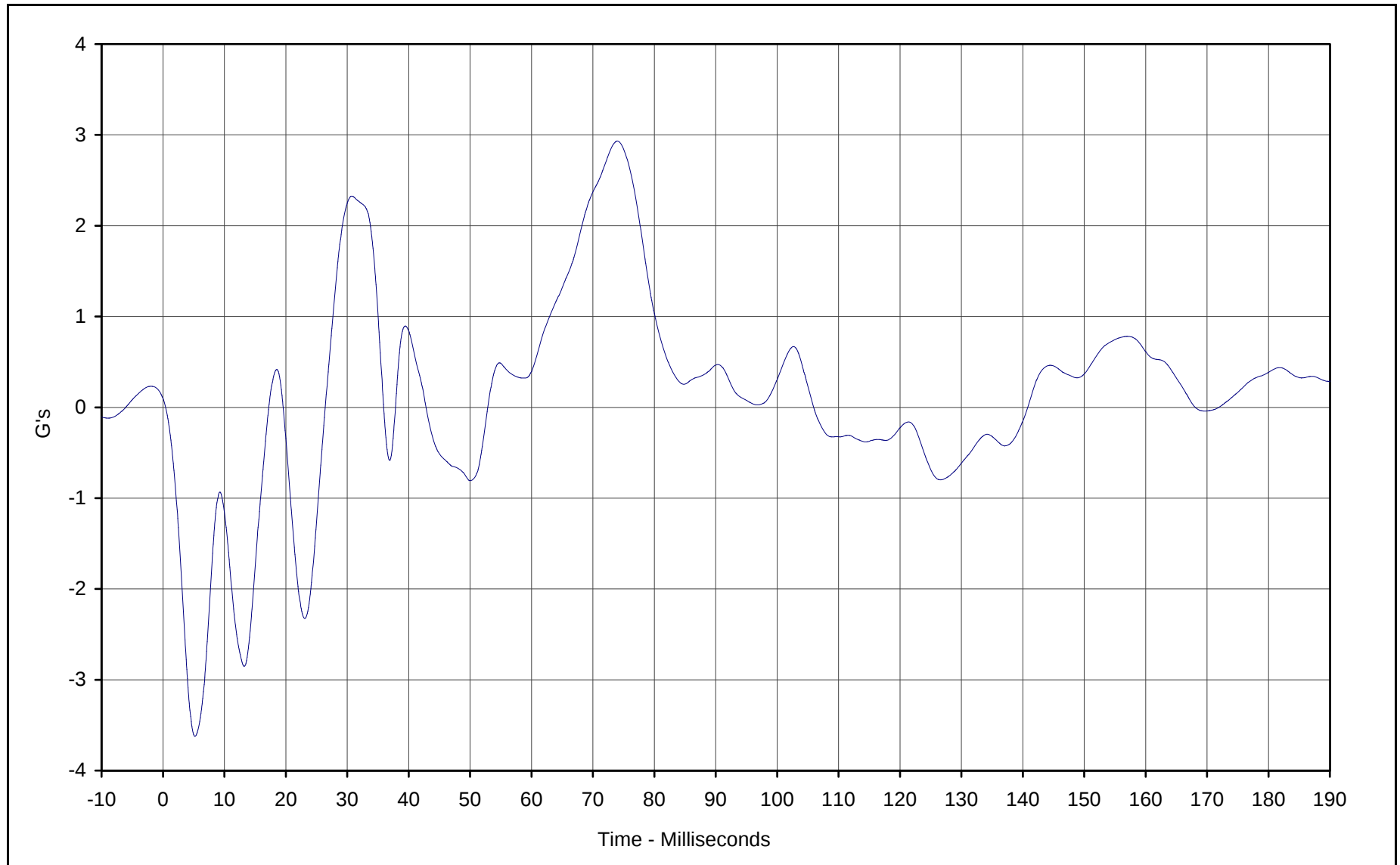




Curve Description: Right Sill at Front Seat Resultant
Maximum Value: 26.9 at 6.5 Milliseconds
Minimum Value: 0.7 at 135.6 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: RES-027

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

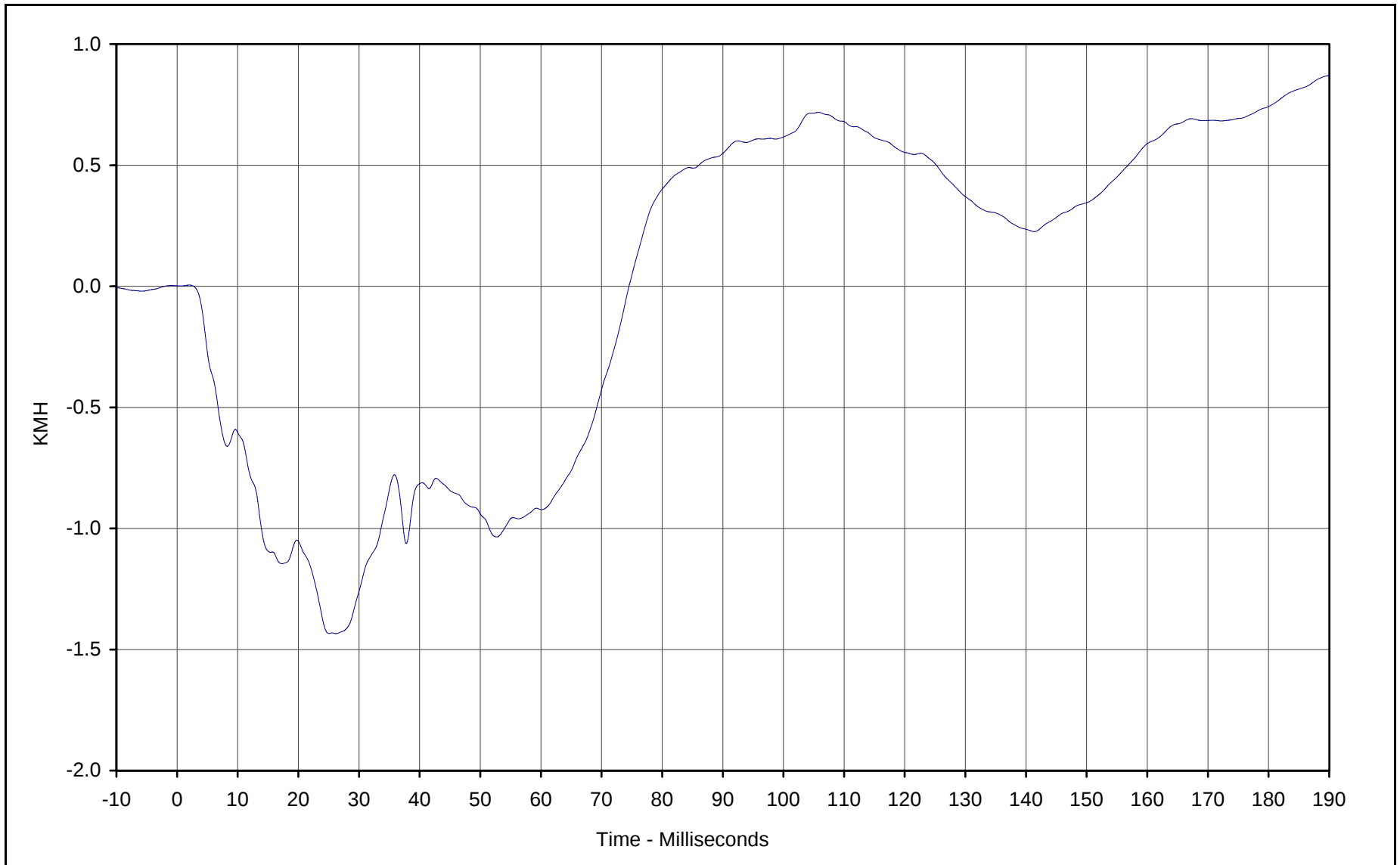




Curve Description: Right Sill at Rear Seat X
Maximum Value: 2.9 at 74.0 Milliseconds
Minimum Value: -3.6 at 5.2 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-030

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



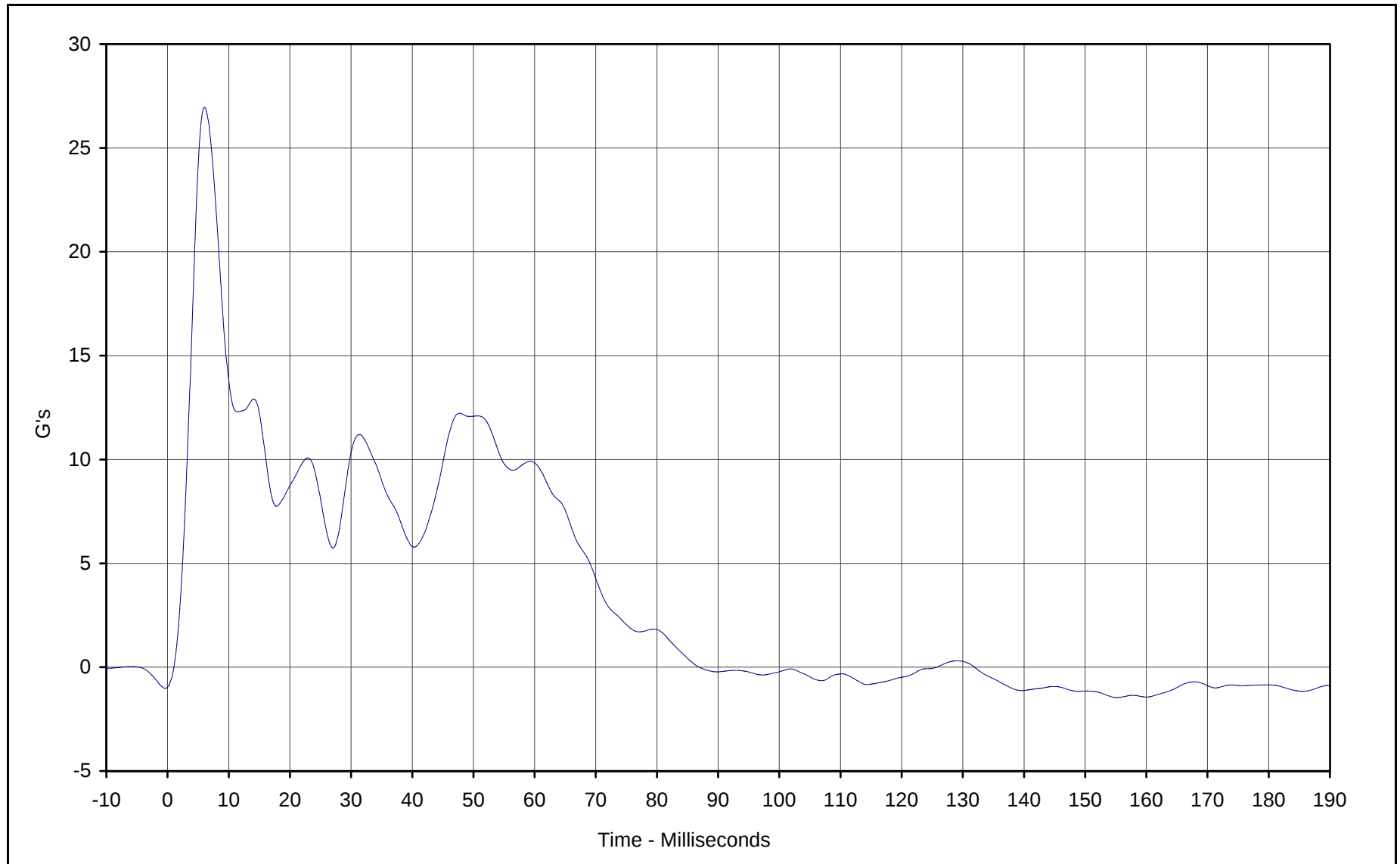


Curve Description: Right Sill at Rear Seat X Velocity
Maximum Value: 0.9 at 189.9 Milliseconds
Minimum Value: -1.4 at 26.2 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-030

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



B-60

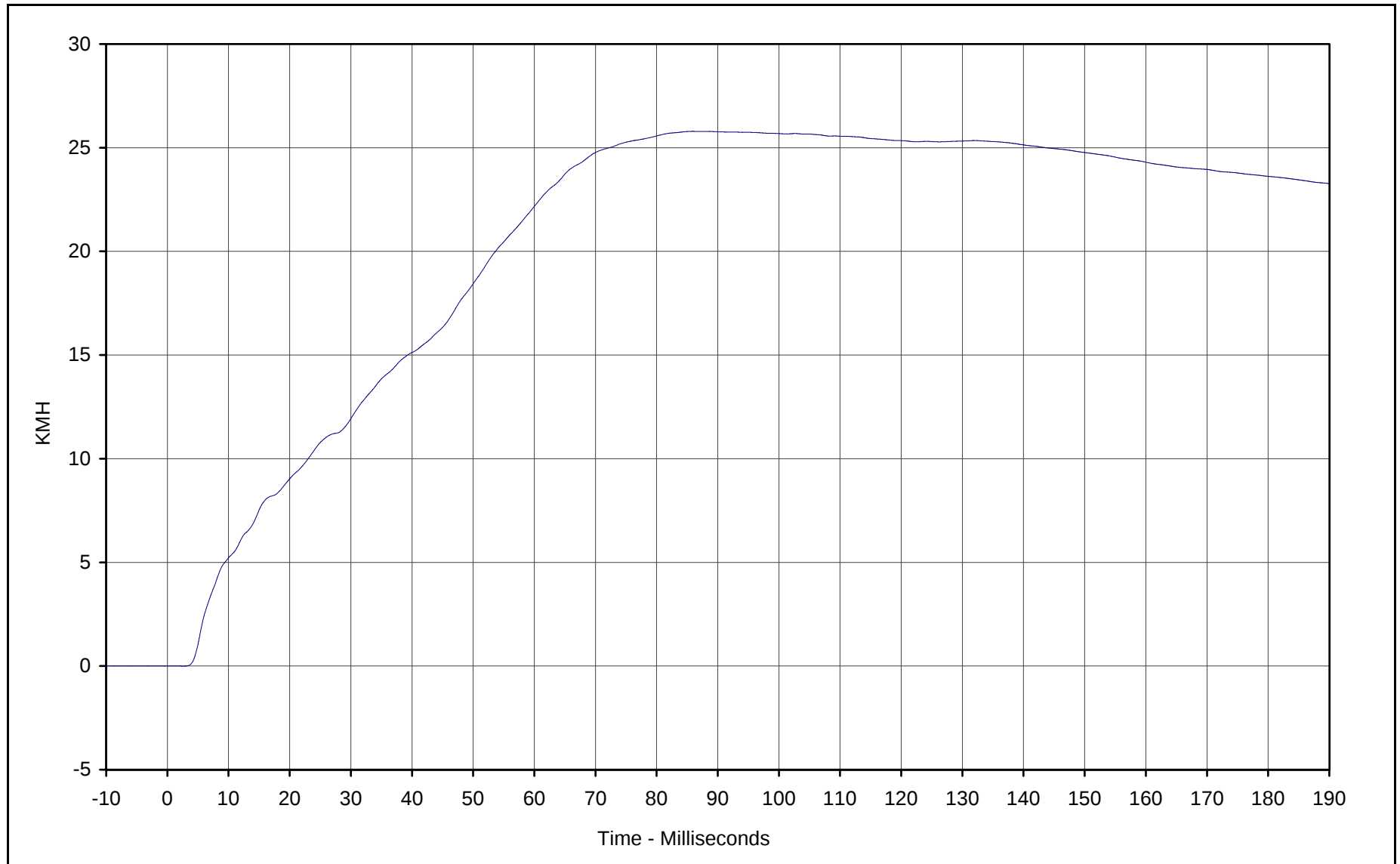


Curve Description: Right Sill at Rear Seat Y
Maximum Value: 27.0 at 6.1 Milliseconds
Minimum Value: -1.5 at 155.2 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-031

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



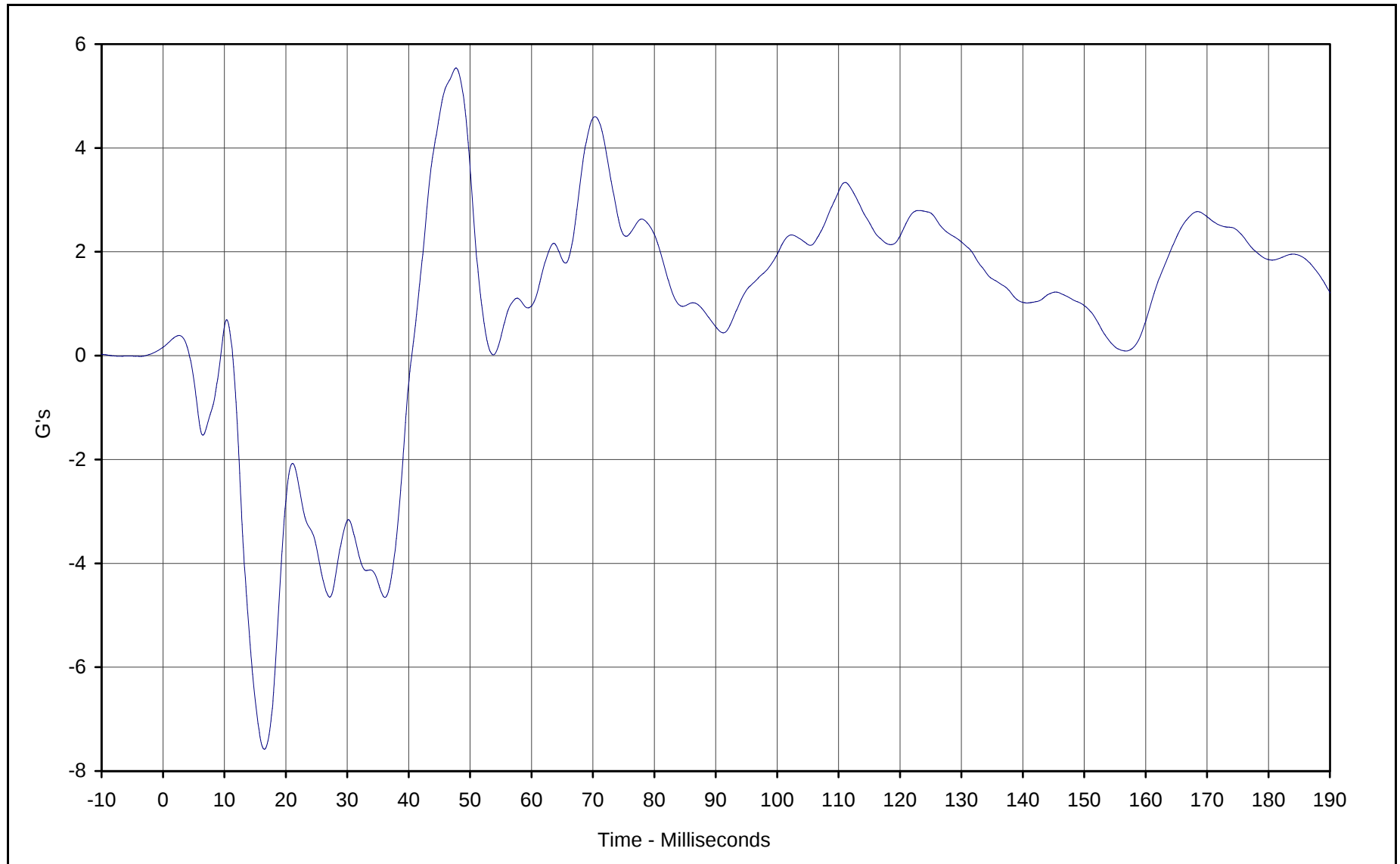
KAR21130-01



Curve Description: Right Sill at Rear Seat Y Velocity
Maximum Value: 25.8 at 85.9 Milliseconds
Minimum Value: 0.0 at 2.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-031

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

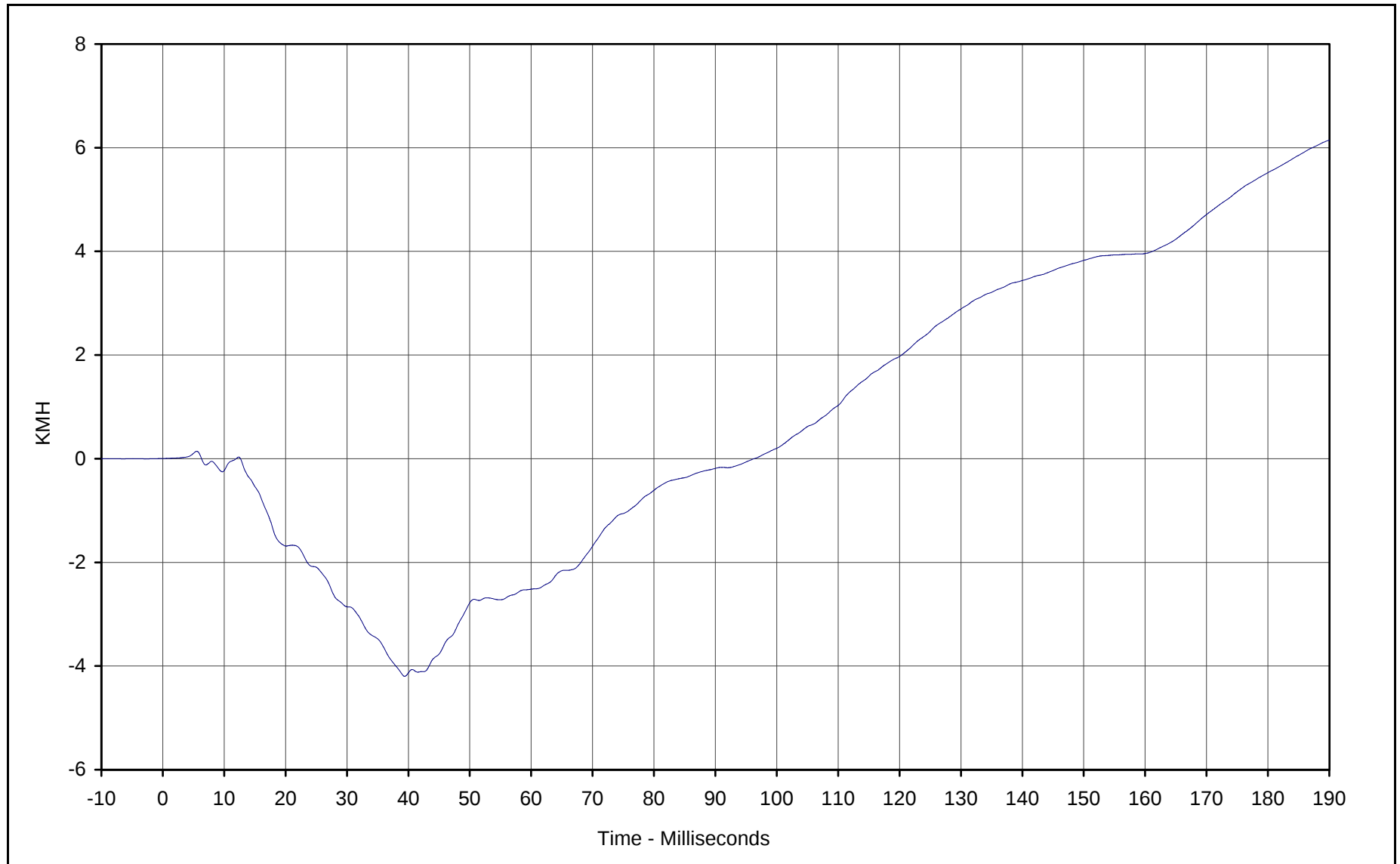




Curve Description: Right Sill at Rear Seat Z
Maximum Value: 5.5 at 47.7 Milliseconds
Minimum Value: -7.6 at 16.5 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-032

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

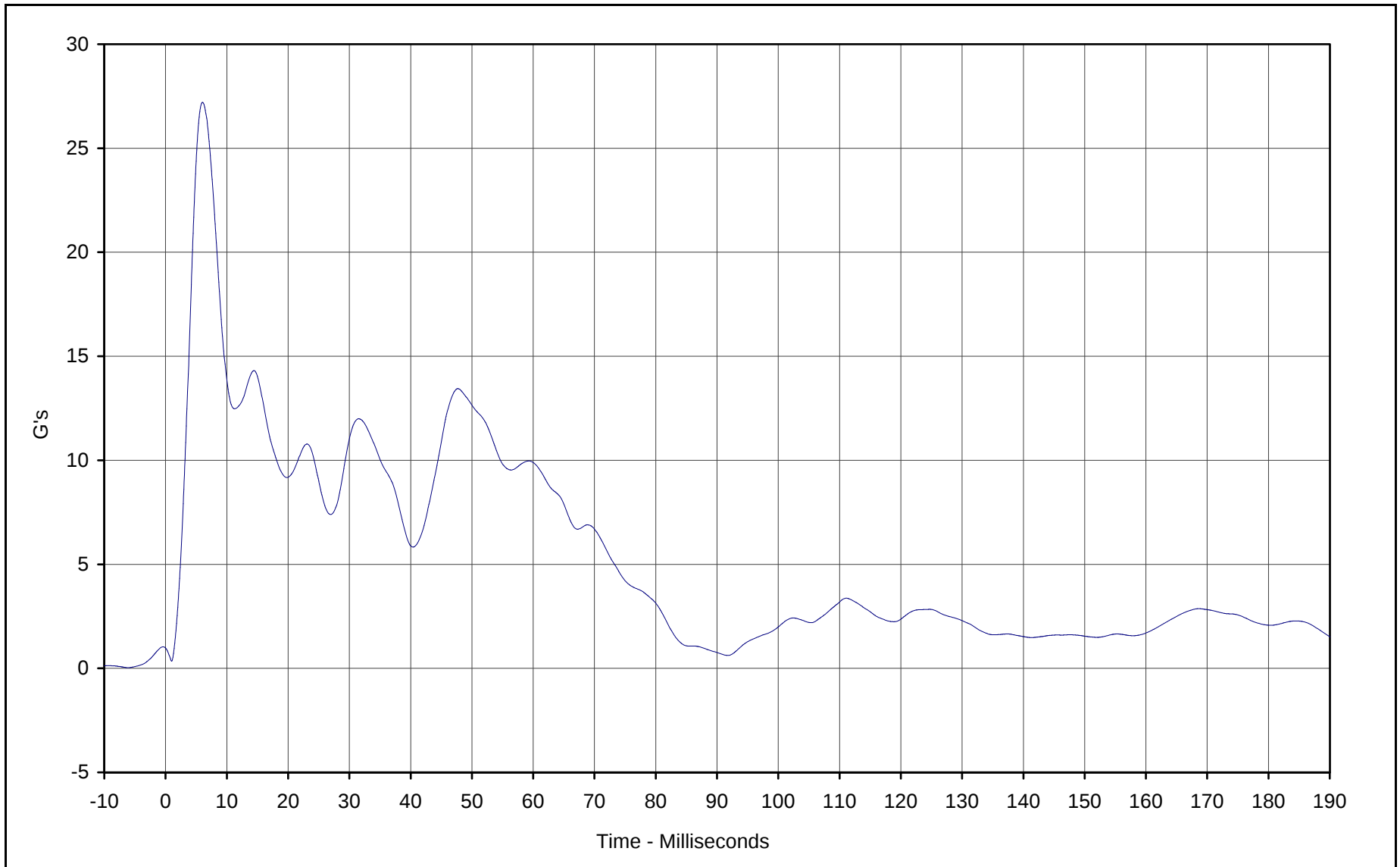




Curve Description: Right Sill at Rear Seat Z Velocity
Maximum Value: 6.1 at 189.9 Milliseconds
Minimum Value: -4.2 at 39.4 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-032

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

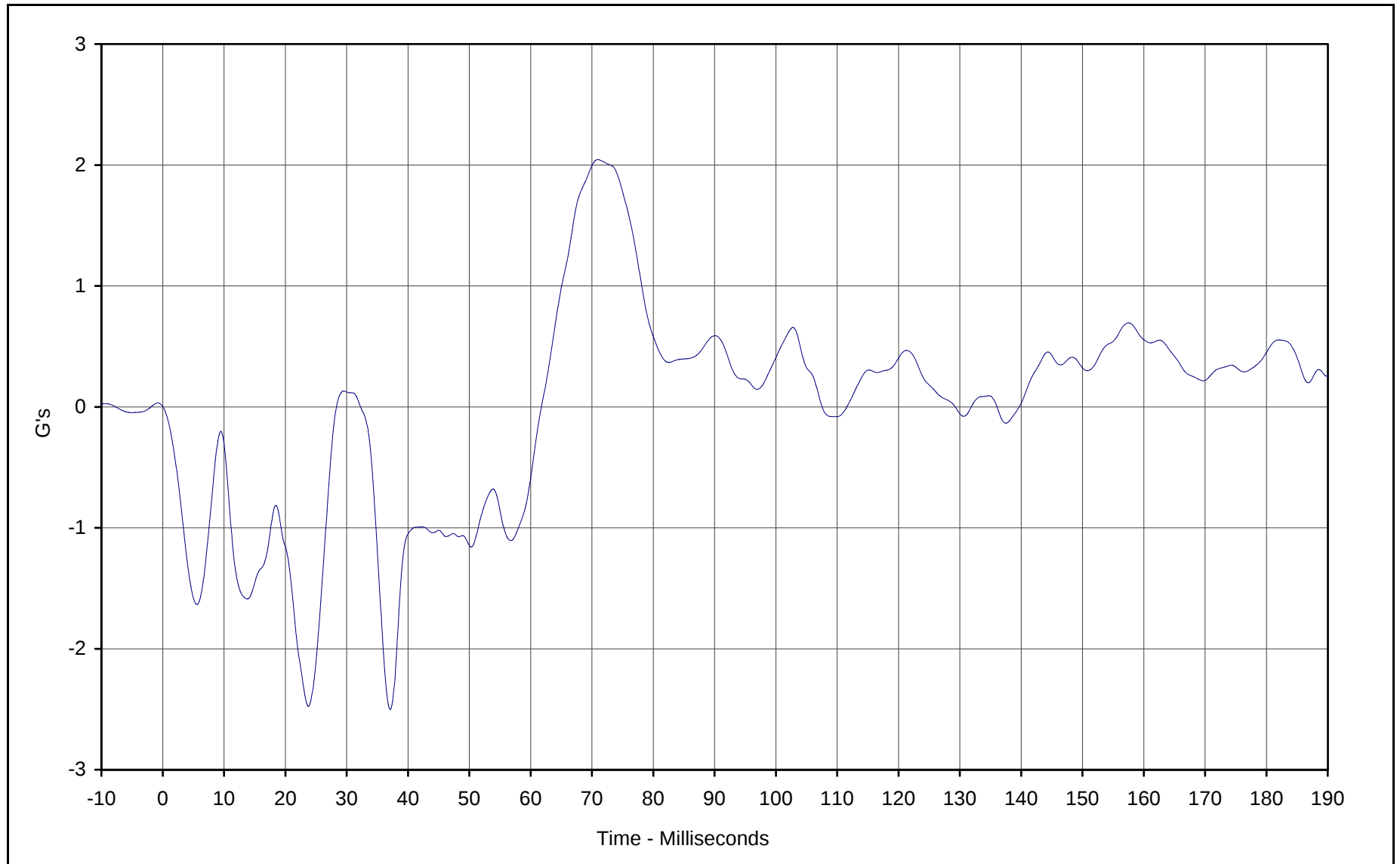




Curve Description: Right Sill at Rear Seat Resultant
Maximum Value: 27.2 at 6.1 Milliseconds
Minimum Value: 0.3 at 1.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: RES-030

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

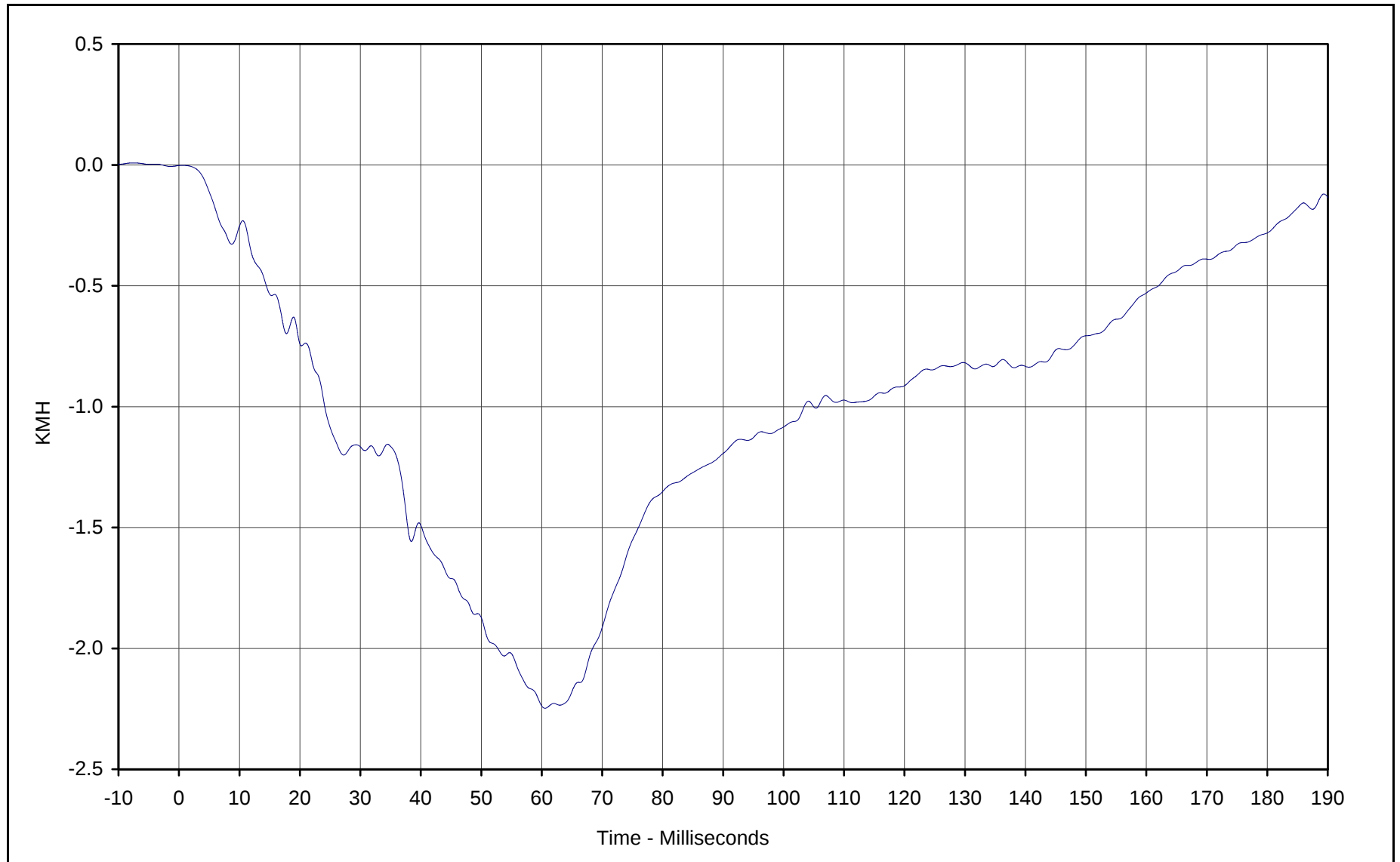




Curve Description: Rear Floor Above Axle X
Maximum Value: 2.0 at 70.9 Milliseconds
Minimum Value: -2.5 at 37.1 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-033

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

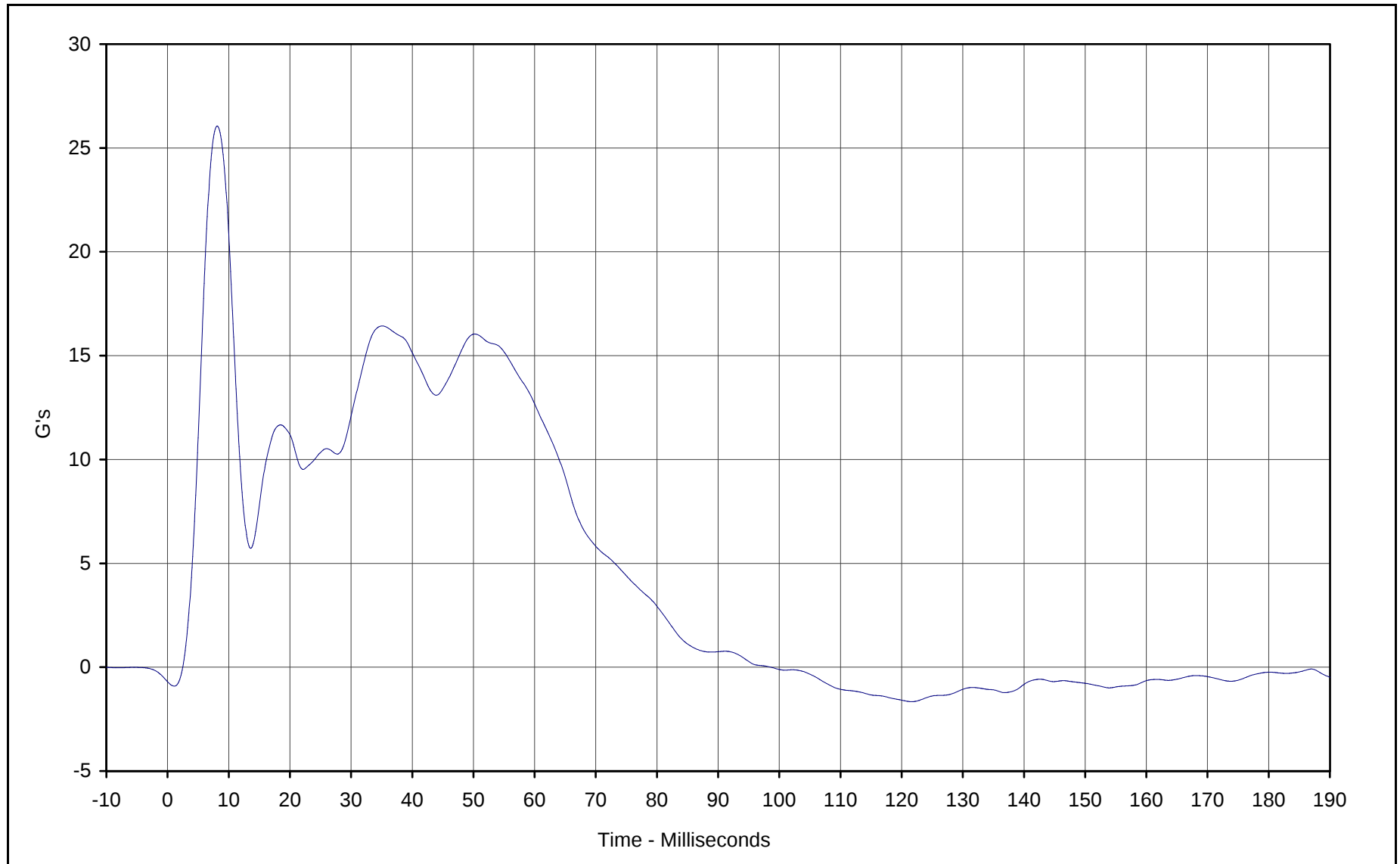




Curve Description: Rear Floor Above Axle X Velocity
Maximum Value: 0.0 at 0.5 Milliseconds
Minimum Value: -2.2 at 60.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-033

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

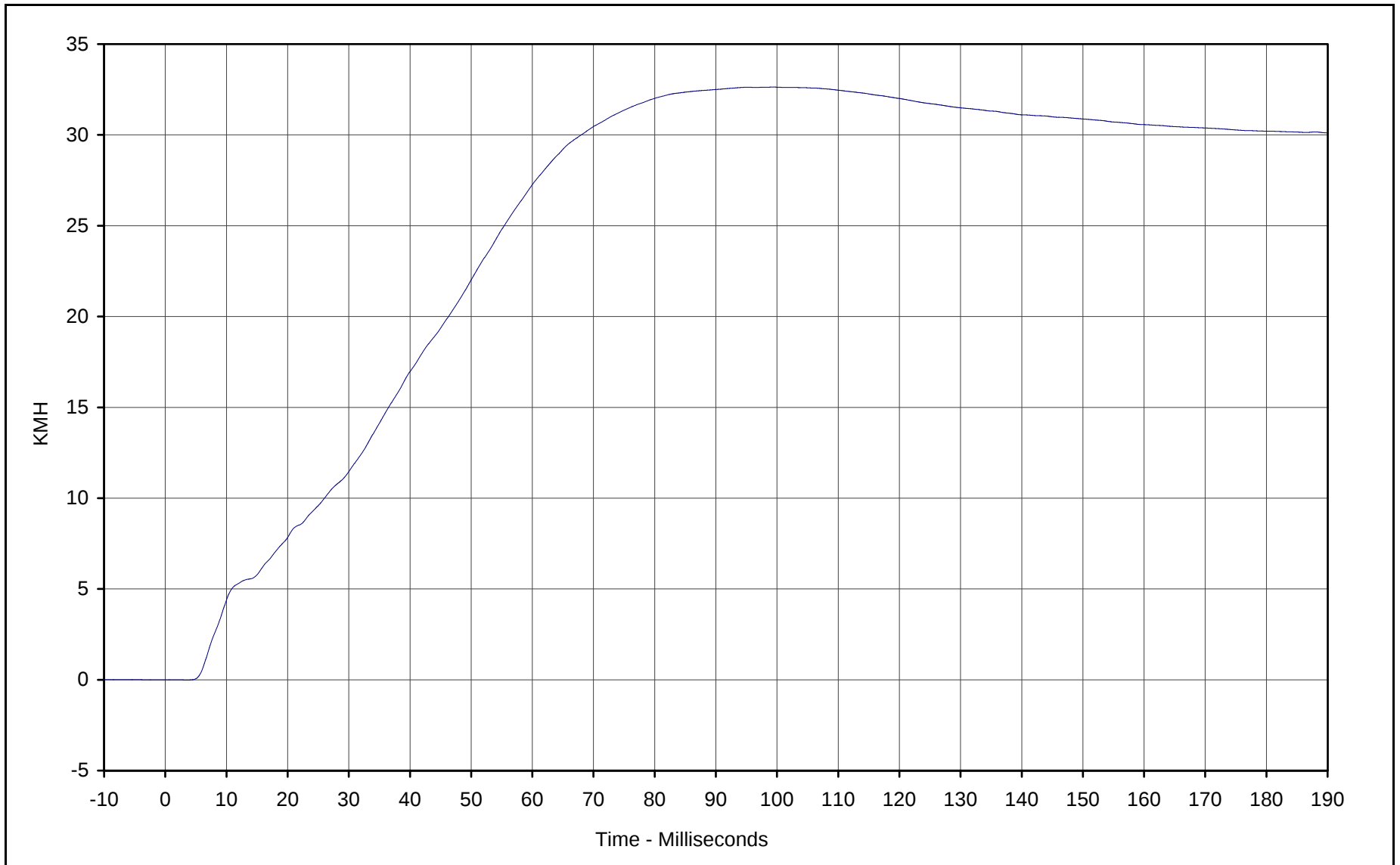




Curve Description: Rear Floor Above Axle Y
Maximum Value: 26.1 at 8.1 Milliseconds
Minimum Value: -1.7 at 121.6 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-034

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

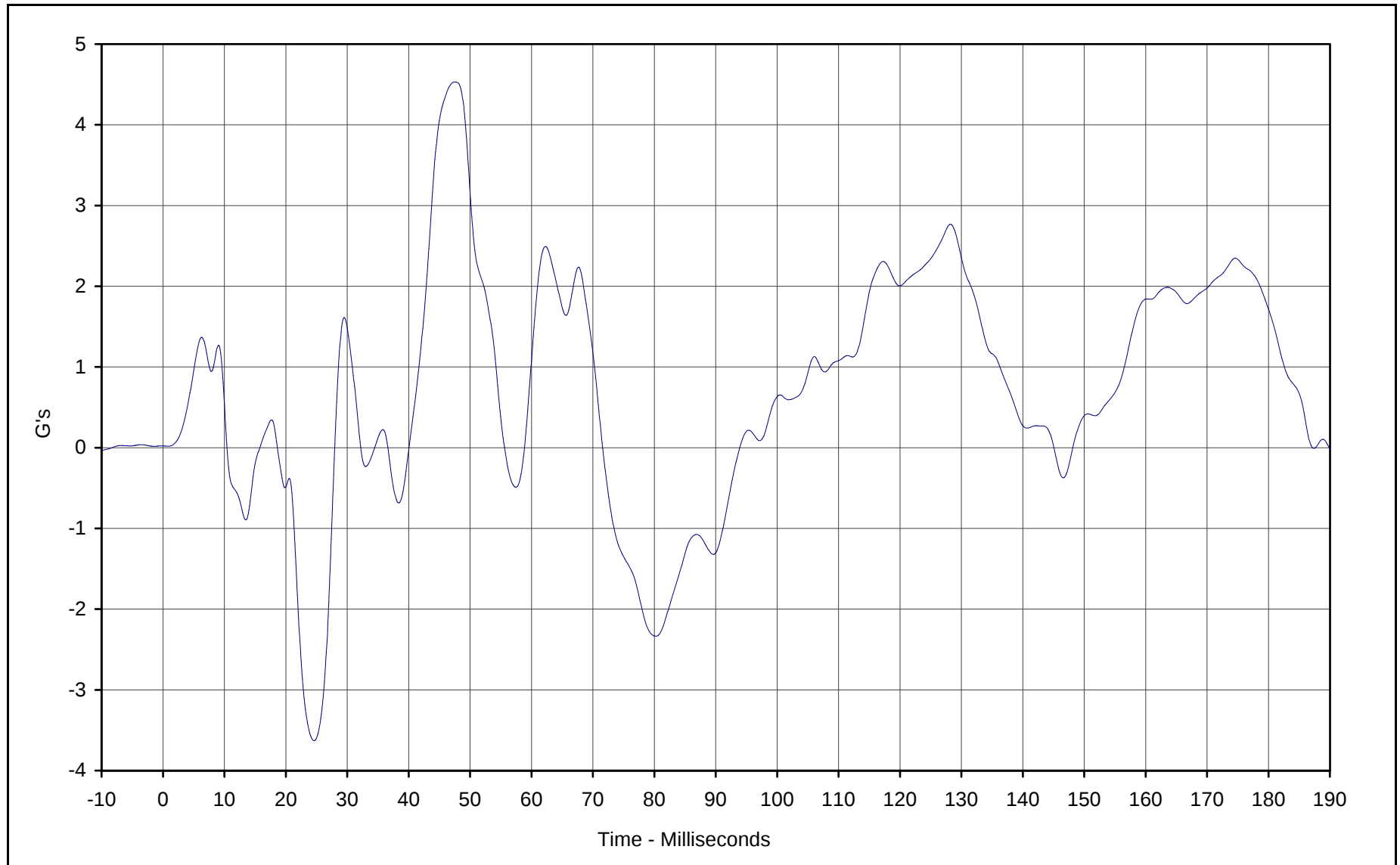




Curve Description: Rear Floor Above Axle Y Velocity
Maximum Value: 32.6 at 99.4 Milliseconds
Minimum Value: 0.0 at 3.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-034

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

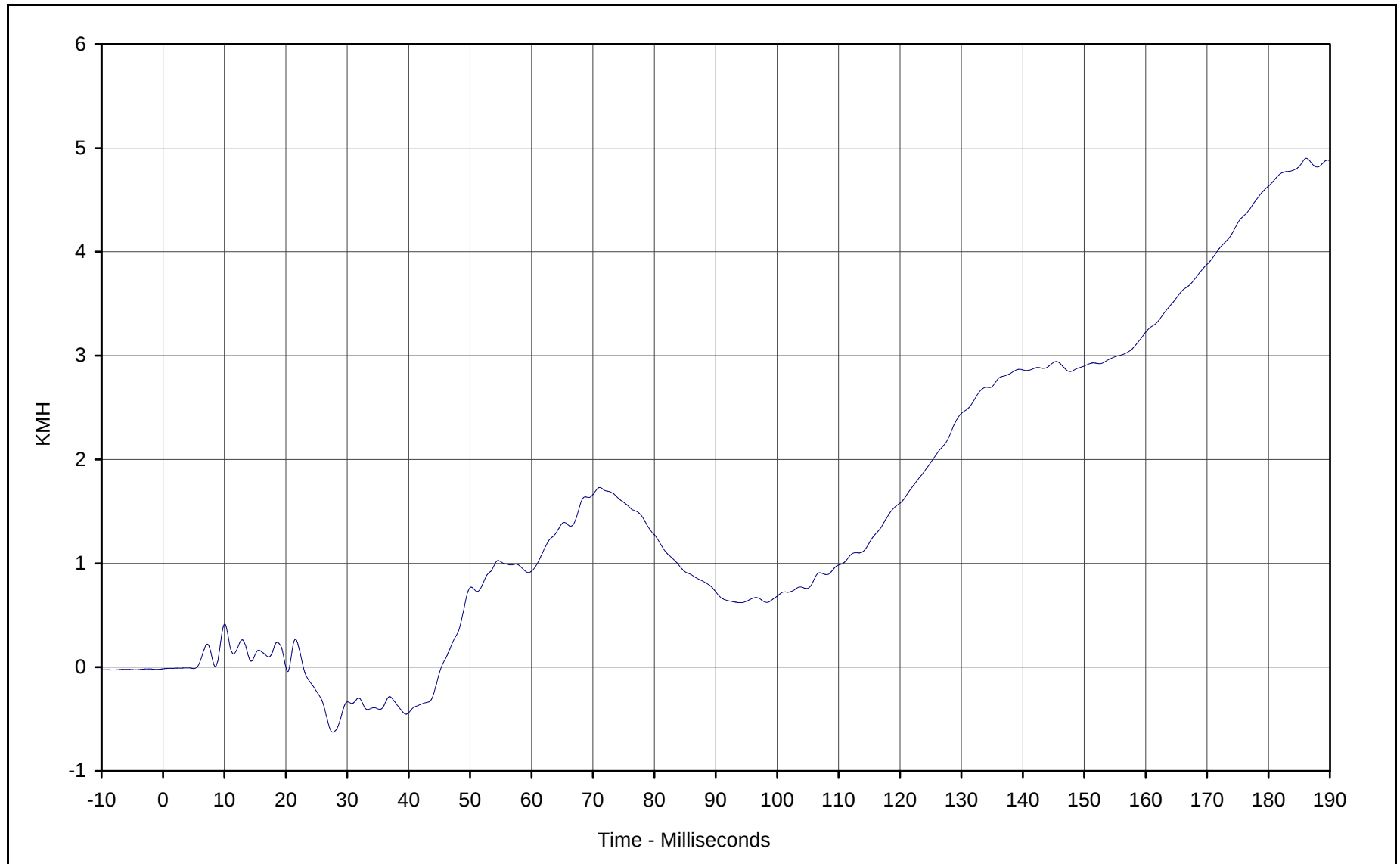




Curve Description: Rear Floor Above Axle Z
Maximum Value: 4.5 at 47.5 Milliseconds
Minimum Value: -3.6 at 24.6 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-035

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

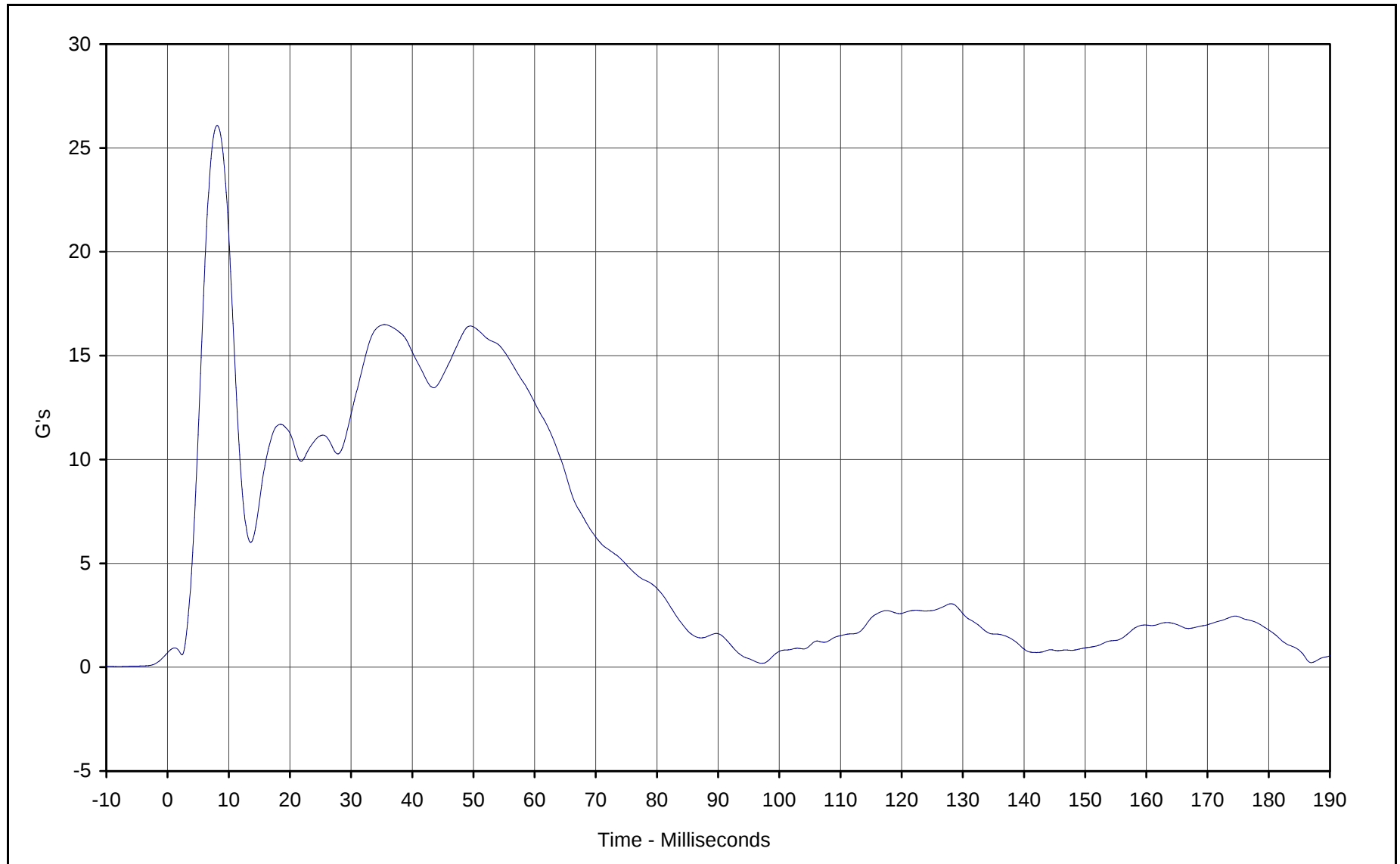




Curve Description: Rear Floor Above Axle Z Velocity
Maximum Value: 4.9 at 186.2 Milliseconds
Minimum Value: -0.6 at 27.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-035

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

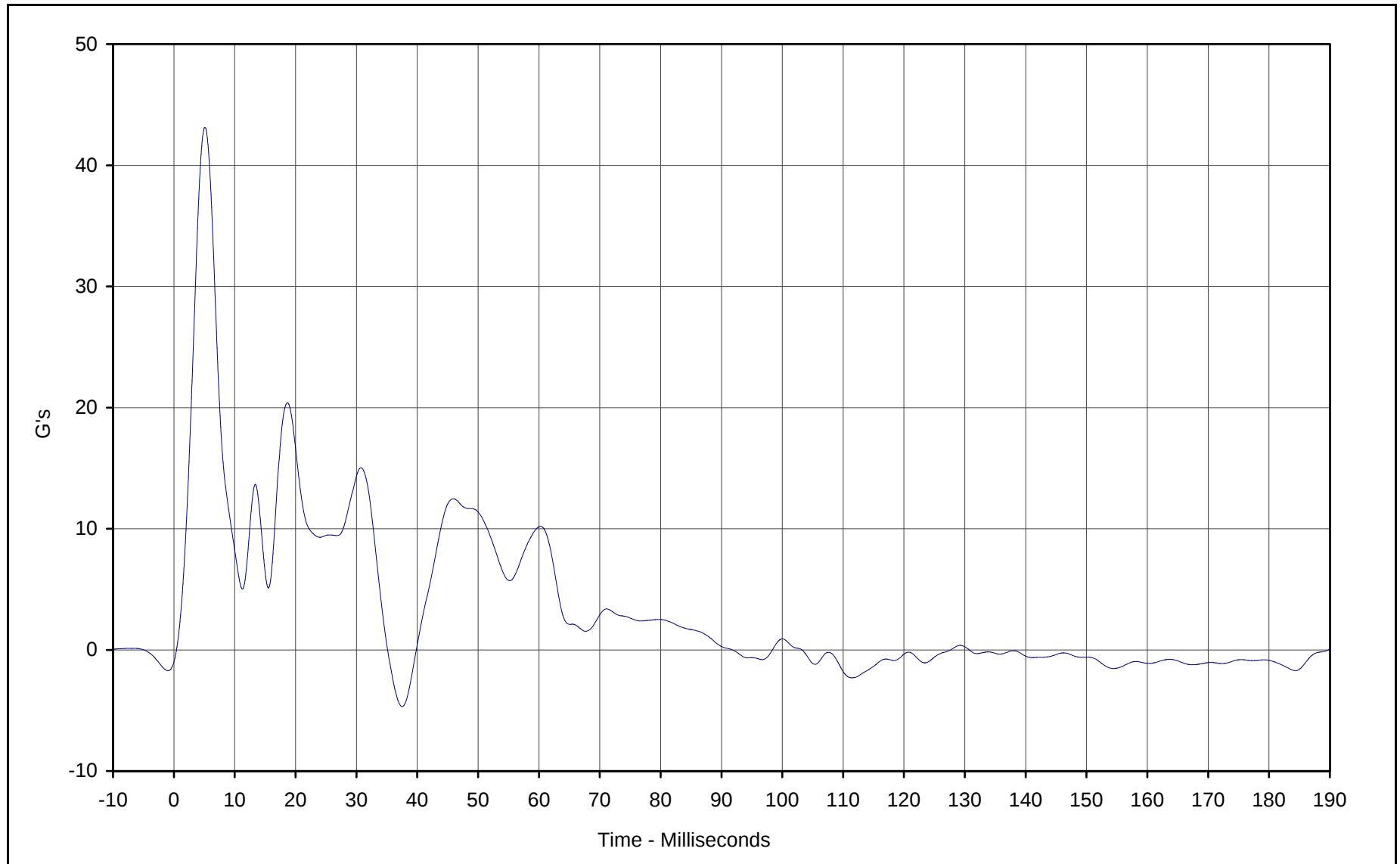




Curve Description: Rear Floor Above Axle Resultant
Maximum Value: 26.1 at 8.1 Milliseconds
Minimum Value: 0.2 at 97.2 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: RES-033

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

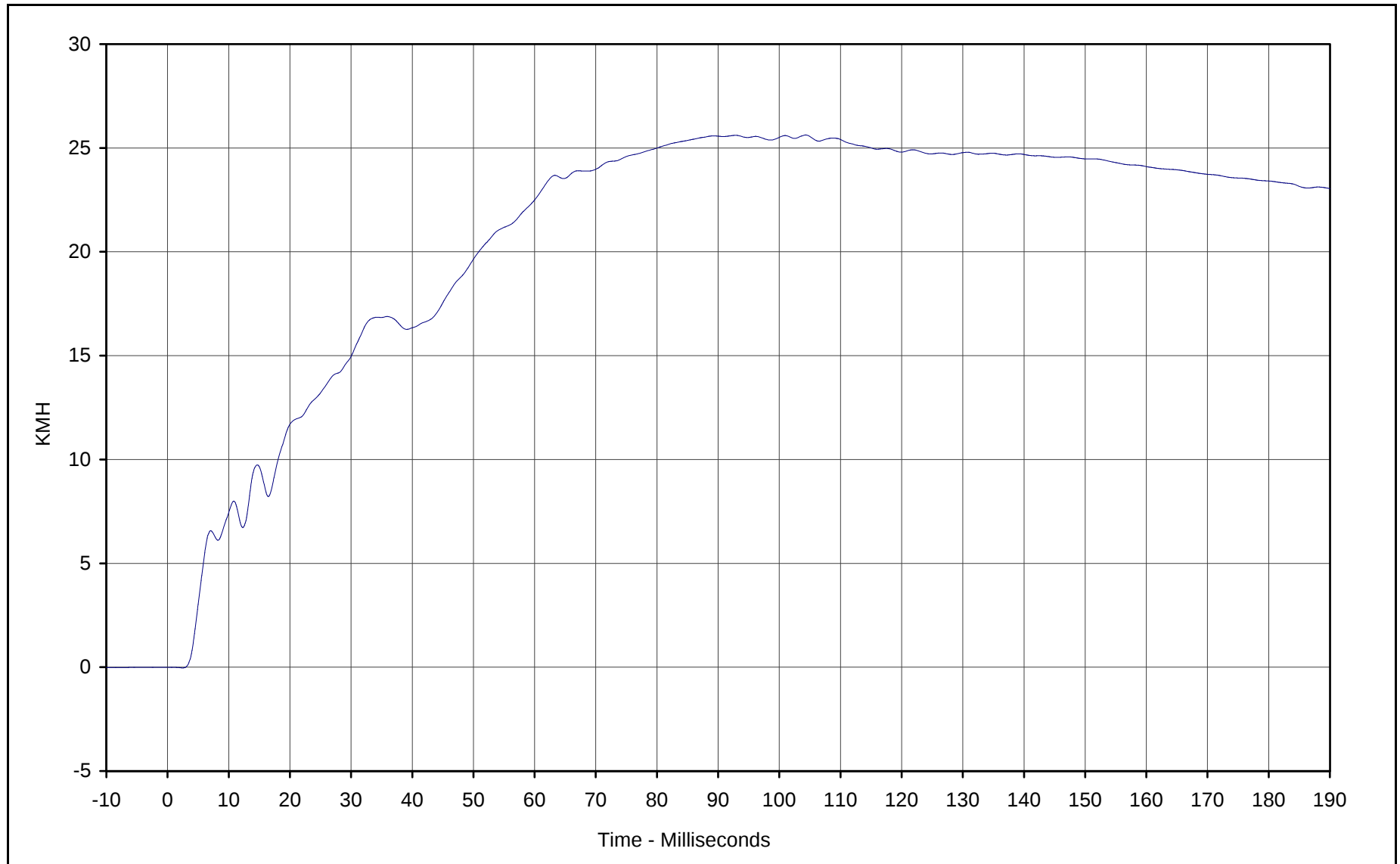




Curve Description: Left Sill at Rear Door Y
Maximum Value: 43.1 at 5.1 Milliseconds
Minimum Value: -4.7 at 37.5 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-036

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

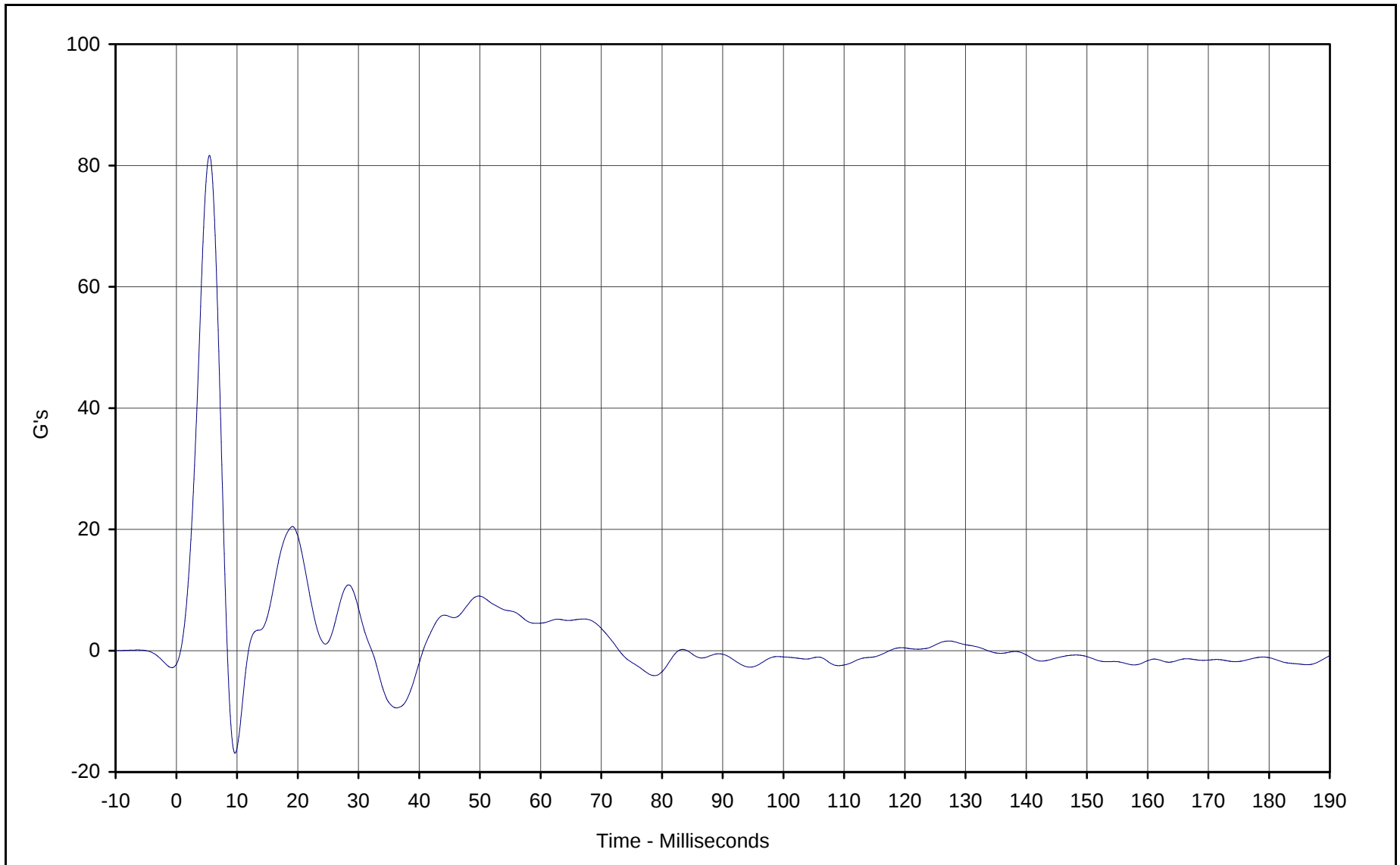




Curve Description: Left Sill at Rear Door Y Velocity
Maximum Value: 25.6 at 104.3 Milliseconds
Minimum Value: 0.0 at 2.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-036

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

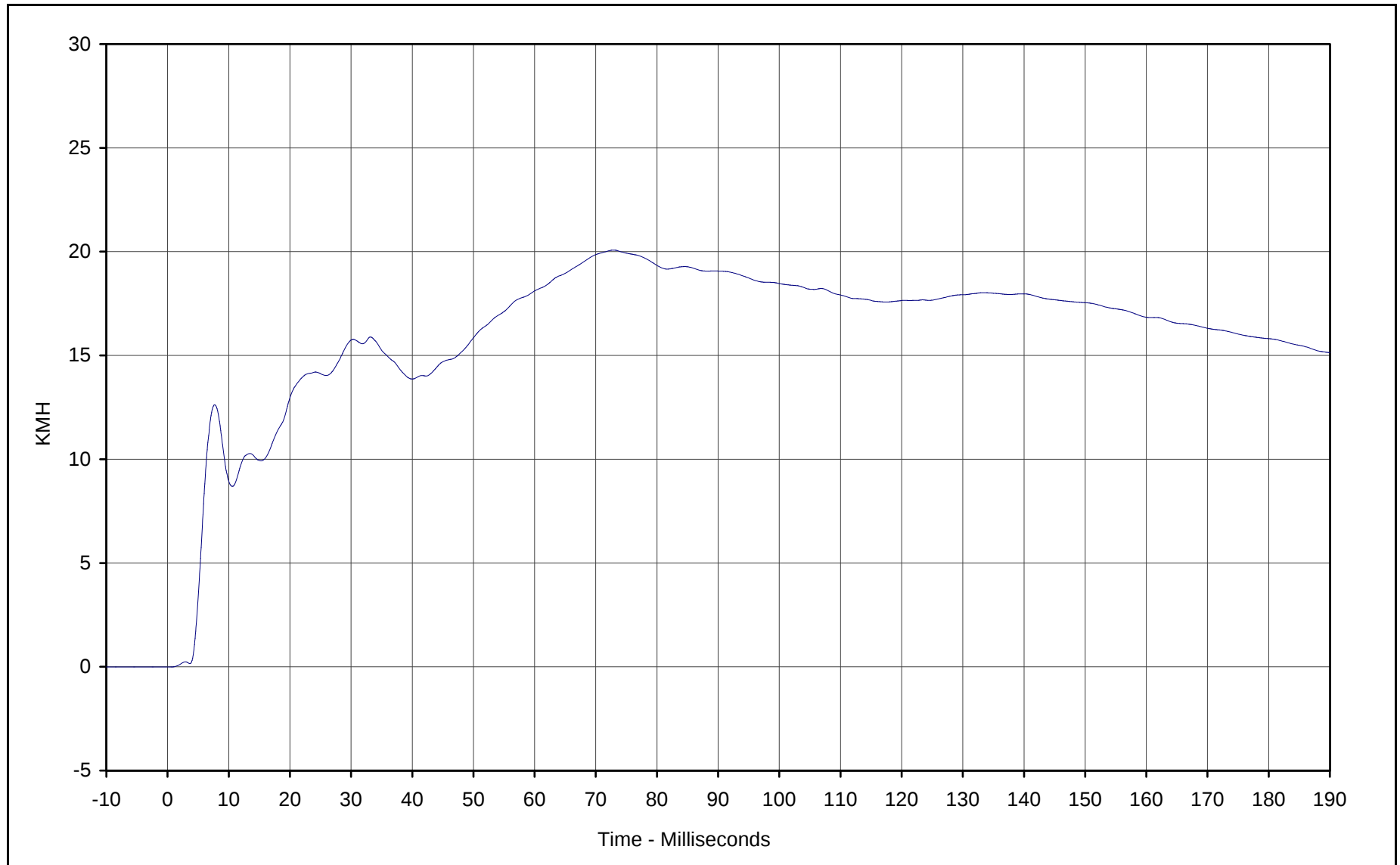




Curve Description: Left Sill at Front Door Y
Maximum Value: 81.6 at 5.5 Milliseconds
Minimum Value: -16.9 at 9.7 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-037

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

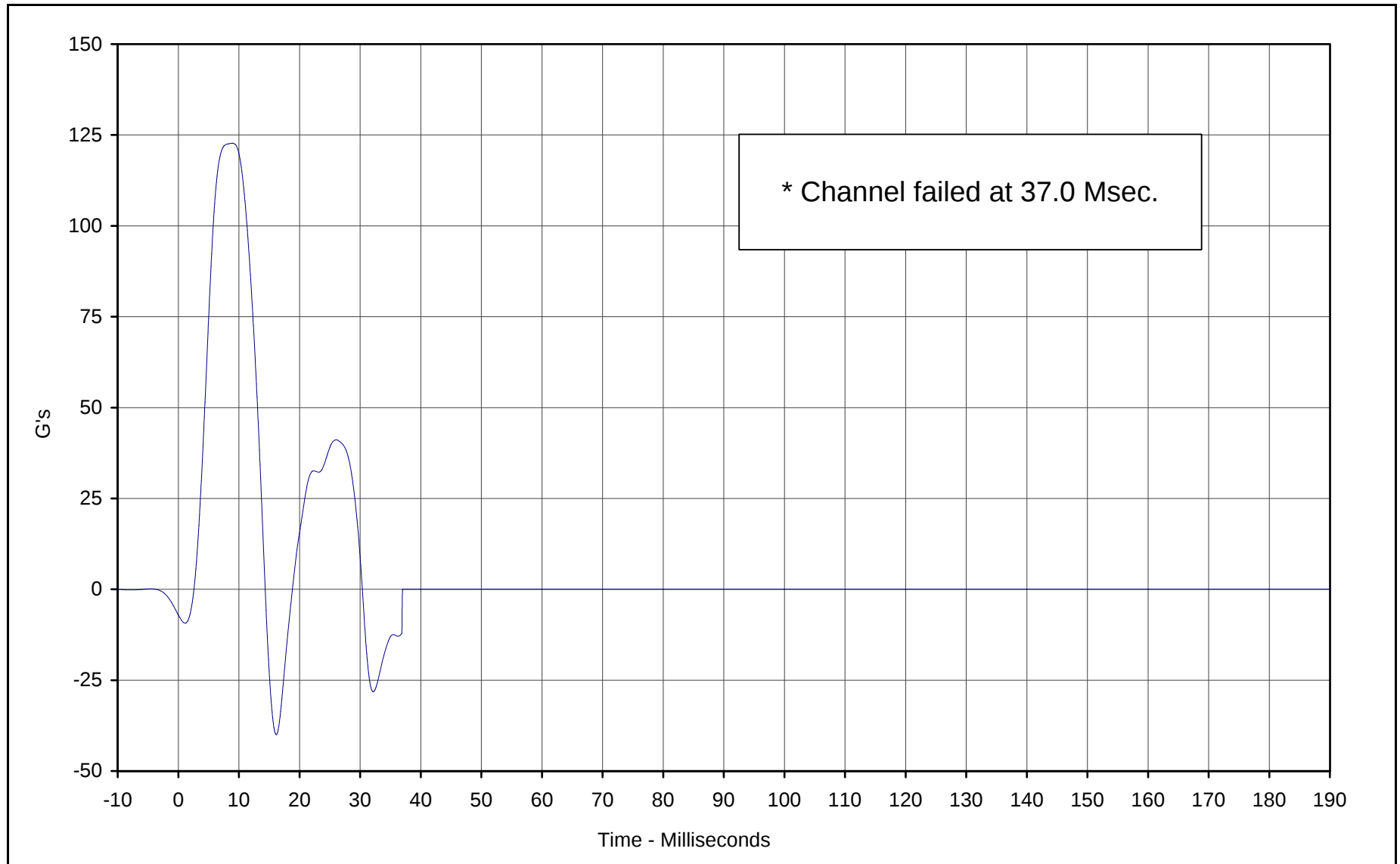




Curve Description: Left Sill at Front Door Y Velocity
Maximum Value: 20.1 at 72.9 Milliseconds
Minimum Value: 0.0 at 0.3 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-037

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Left Front Door Centerline Y *

Maximum Value: 122.7 at 8.9 Milliseconds

Minimum Value: -40.0 at 16.2 Milliseconds

SAE Filter Class: 60

Date of Test: 11/19/01

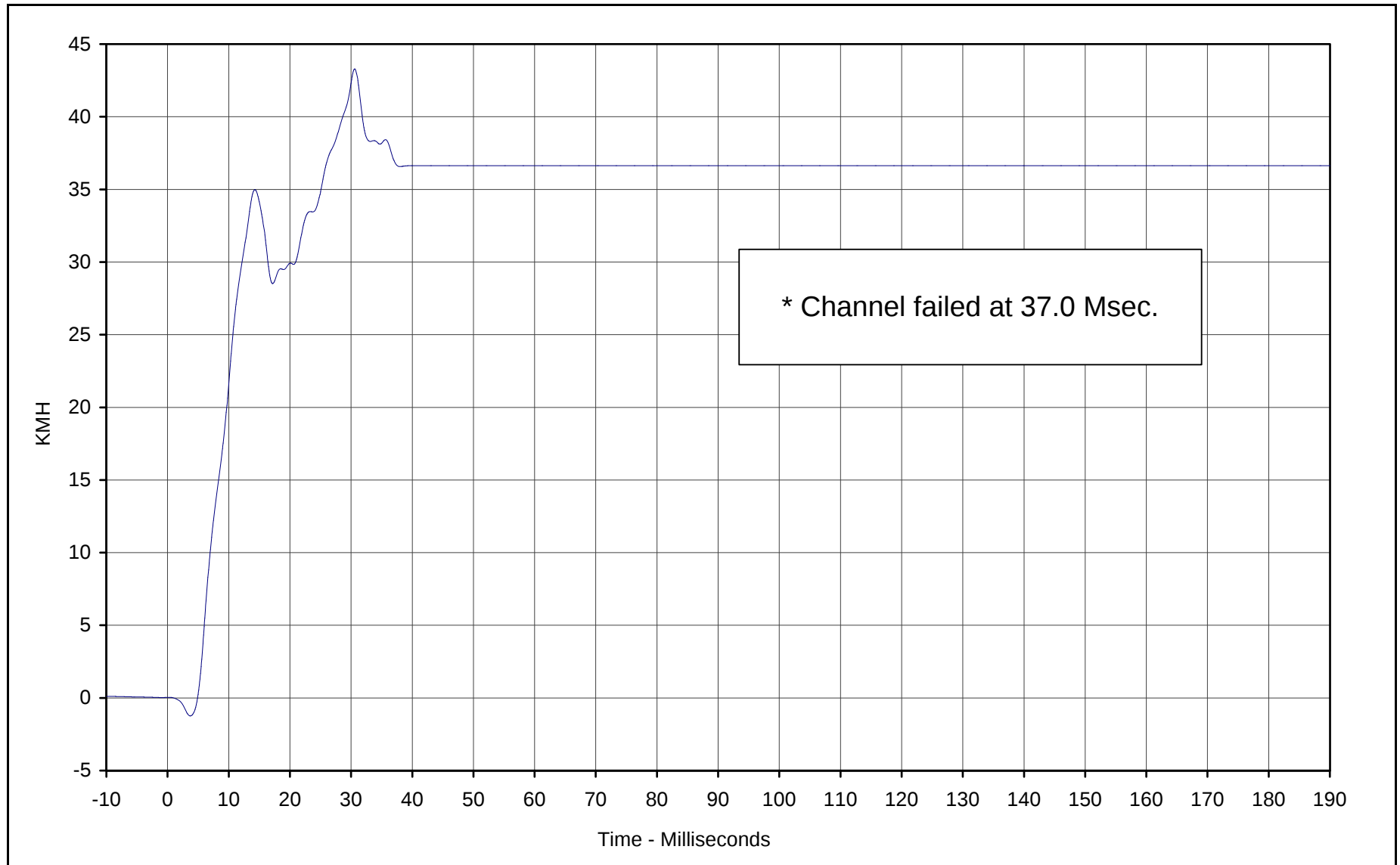
Curve Number: FIL-038

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006

Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

* Channel failed at 37.0 Msec.





Curve Description: Left Front Door CL Y Velocity *

Maximum Value: 43.3 at 30.6 Milliseconds

Minimum Value: -1.2 at 3.7 Milliseconds

SAE Filter Class: 180

Date of Test: 12/6/01

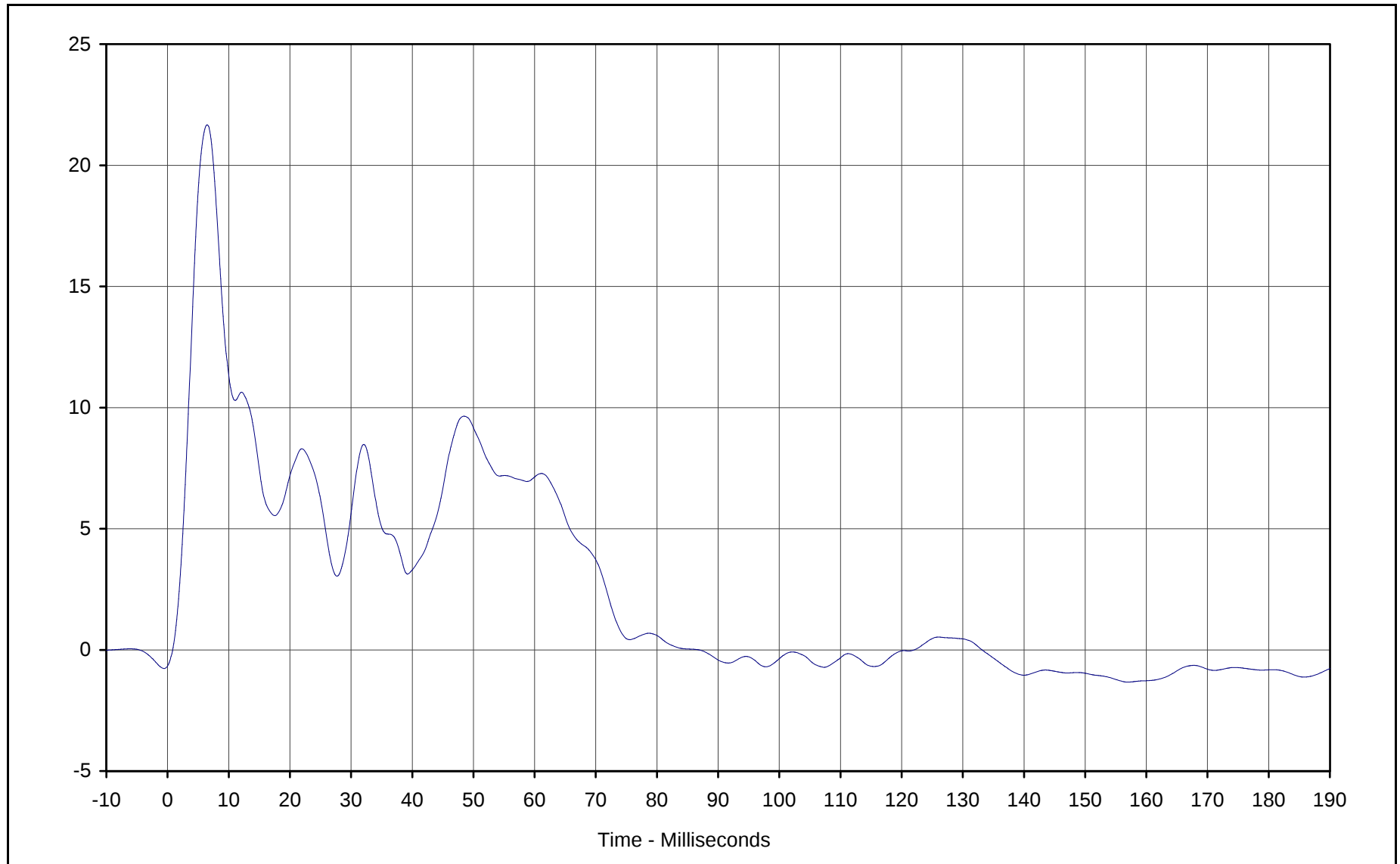
Curve Number: IN1-038

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

* Channel failed at 37.0 Msec.

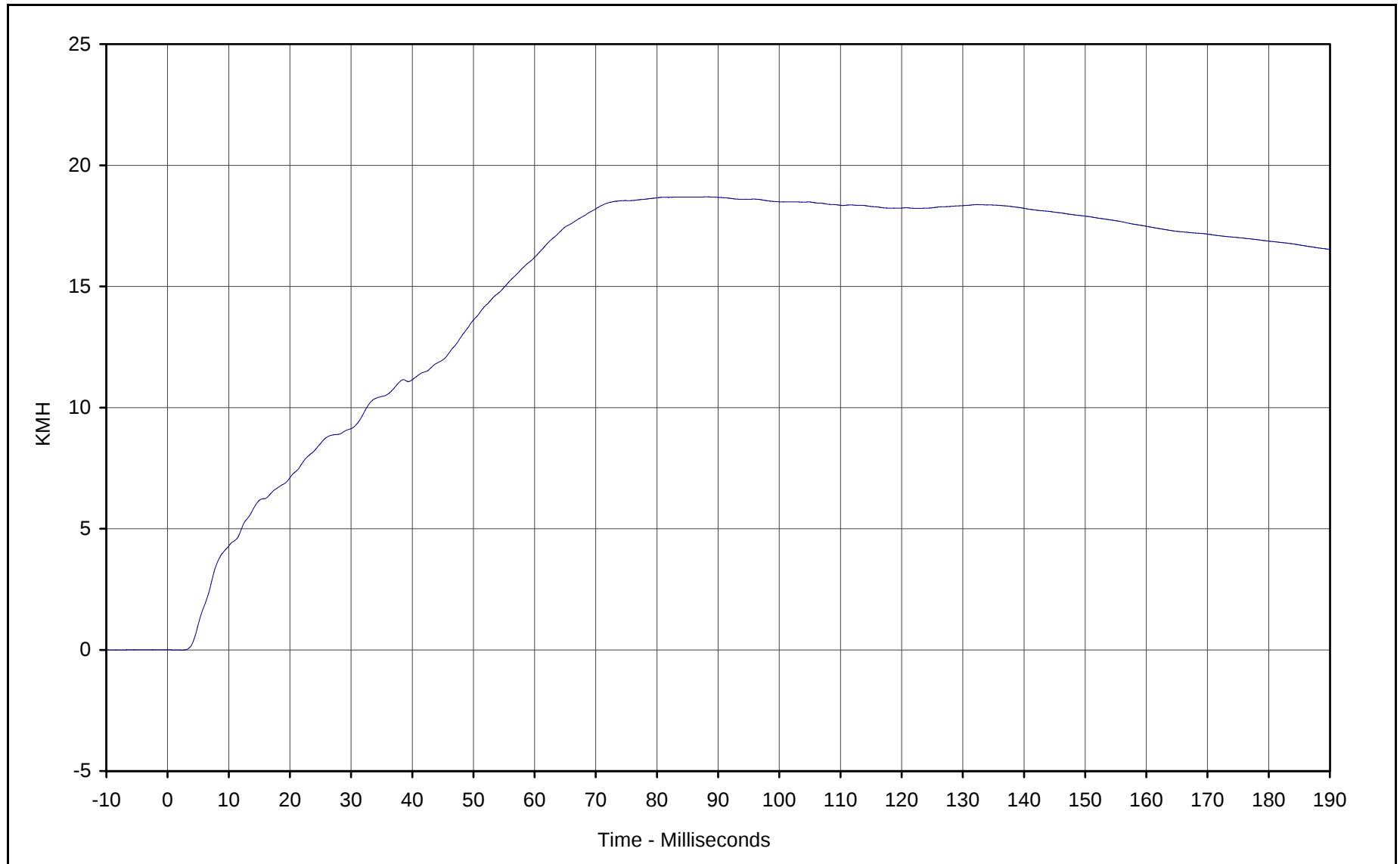




Curve Description: Right Rear Occ. Compartment Y
Maximum Value: 21.7 at 6.5 Milliseconds
Minimum Value: -1.3 at 157.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-039

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



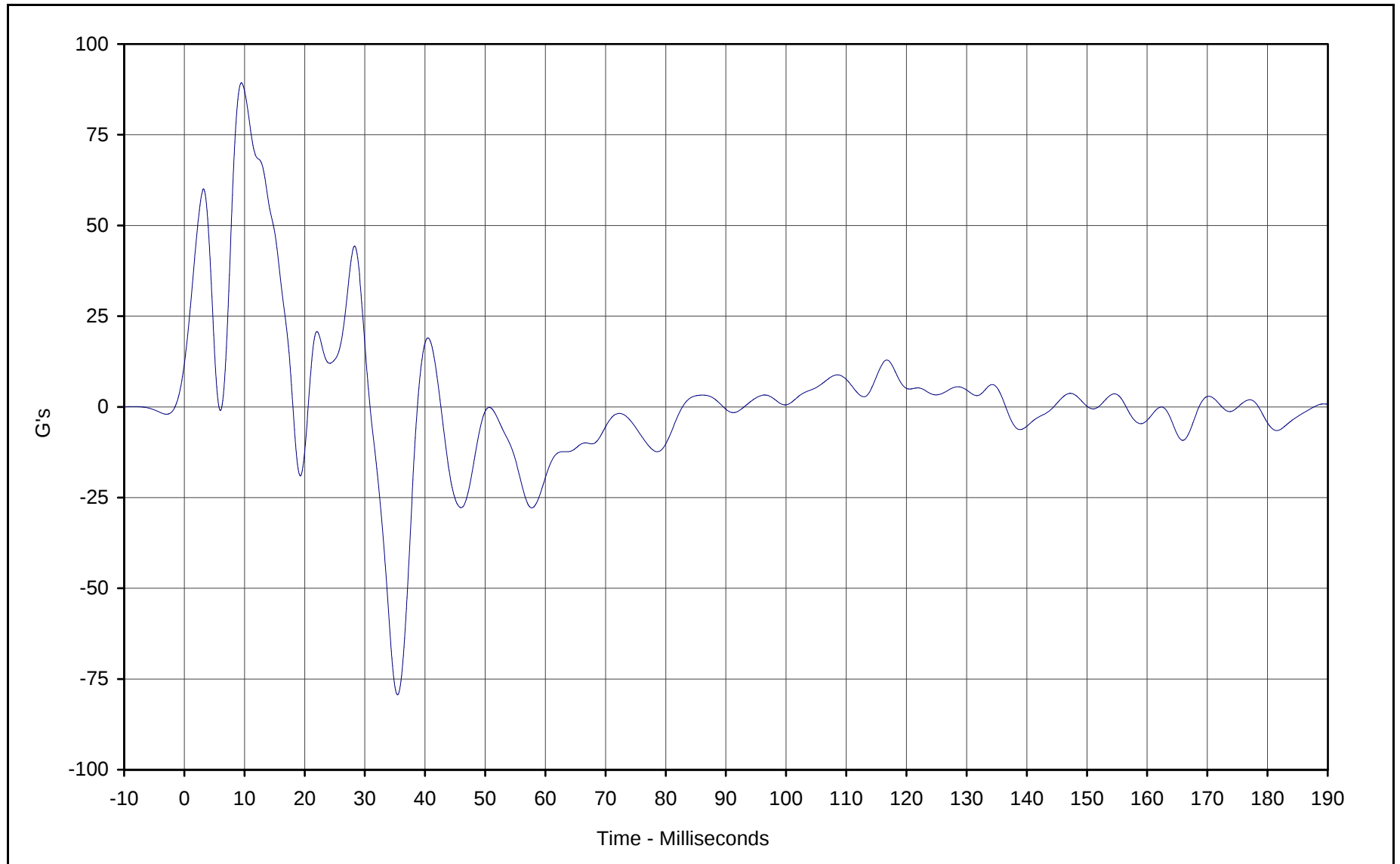


Curve Description: Right Rear Occ. Comp. Y Velocity
Maximum Value: 18.7 at 88.1 Milliseconds
Minimum Value: 0.0 at 2.4 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-039

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



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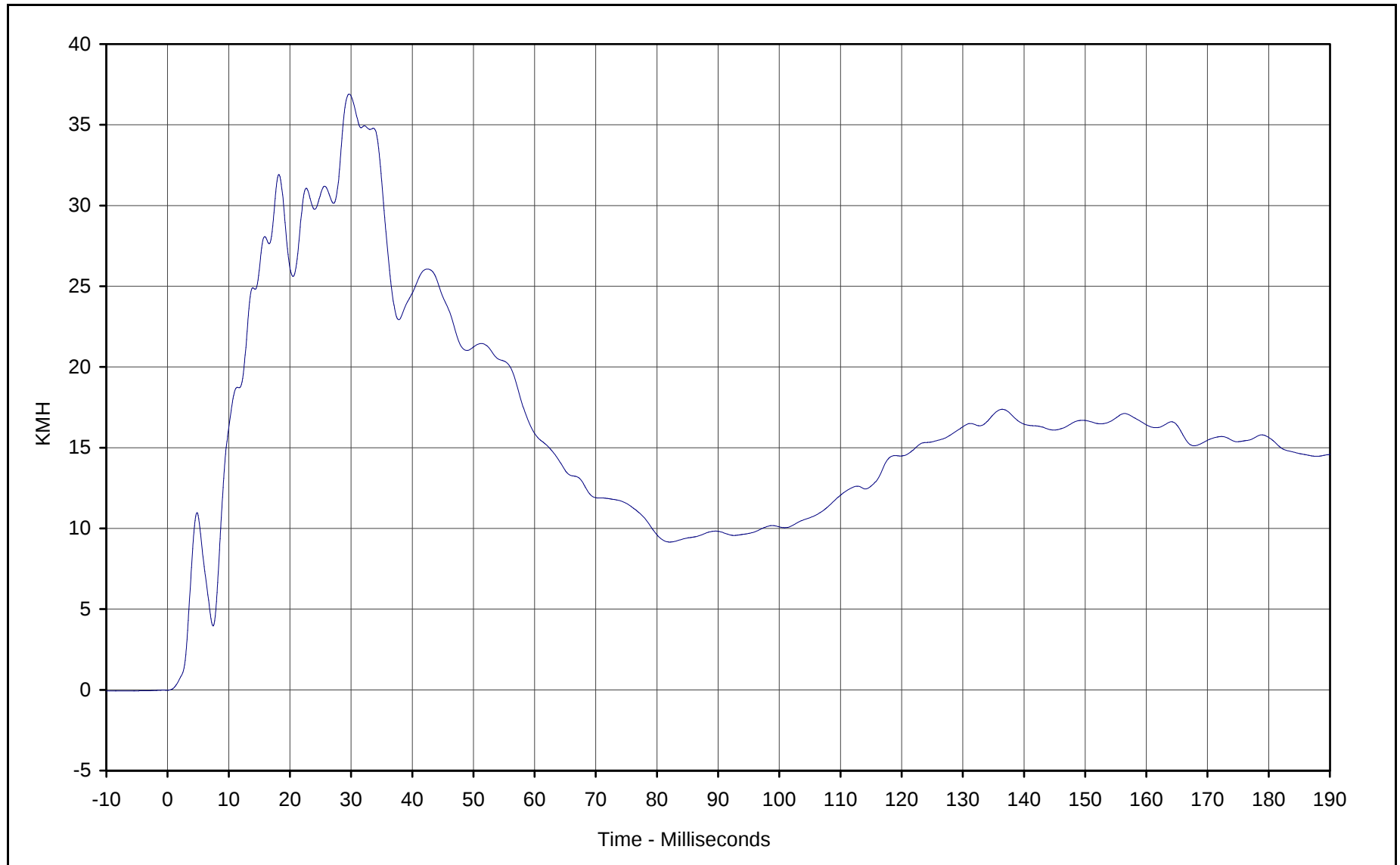


Curve Description: Left Front Door Mid Rear Y
Maximum Value: 89.3 at 9.5 Milliseconds
Minimum Value: -79.4 at 35.4 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: FIL-040

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan



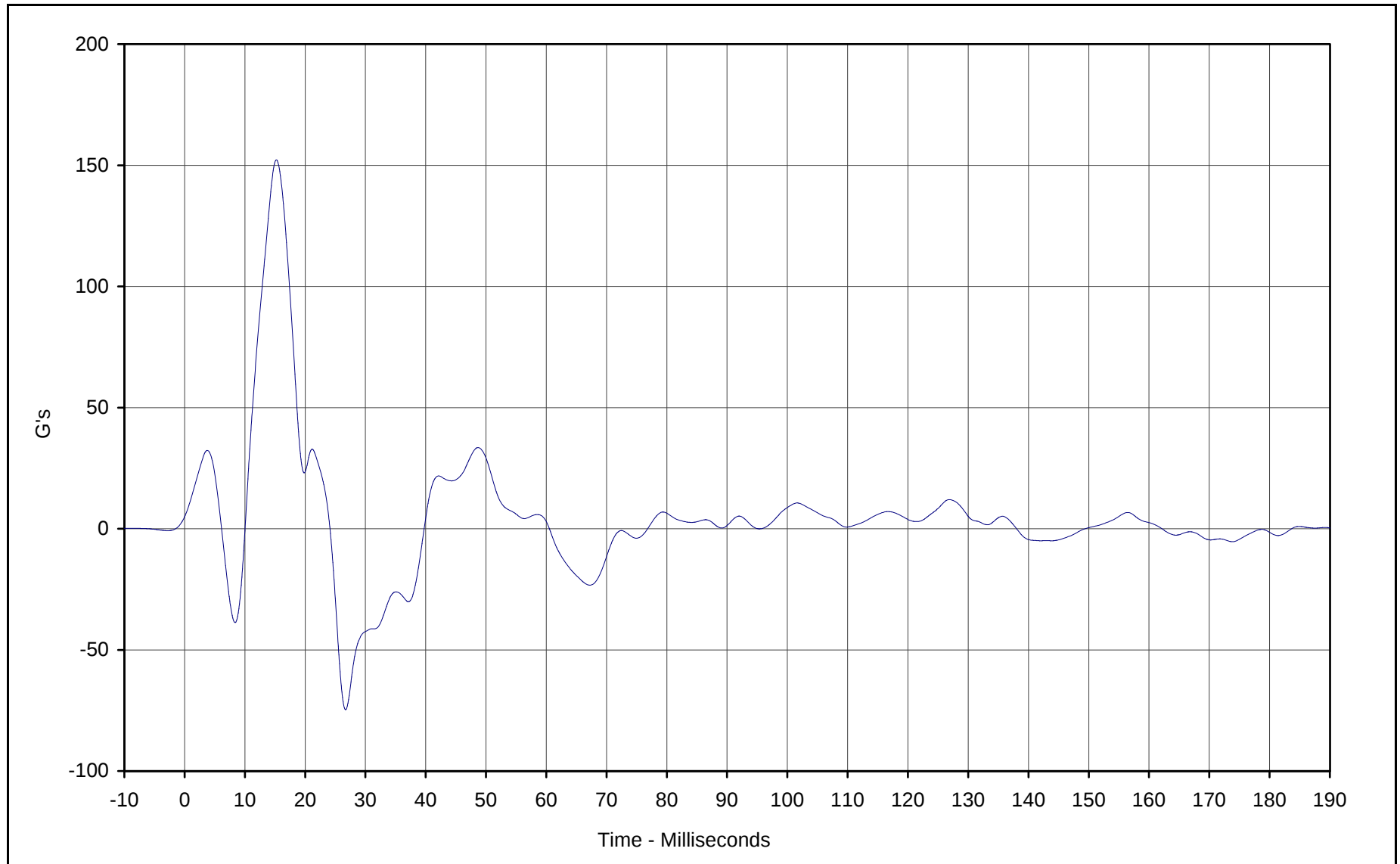
KAR21130-01



Curve Description: Left Front Door Mid Rear Y Velocity
Maximum Value: 36.9 at 29.7 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-040

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

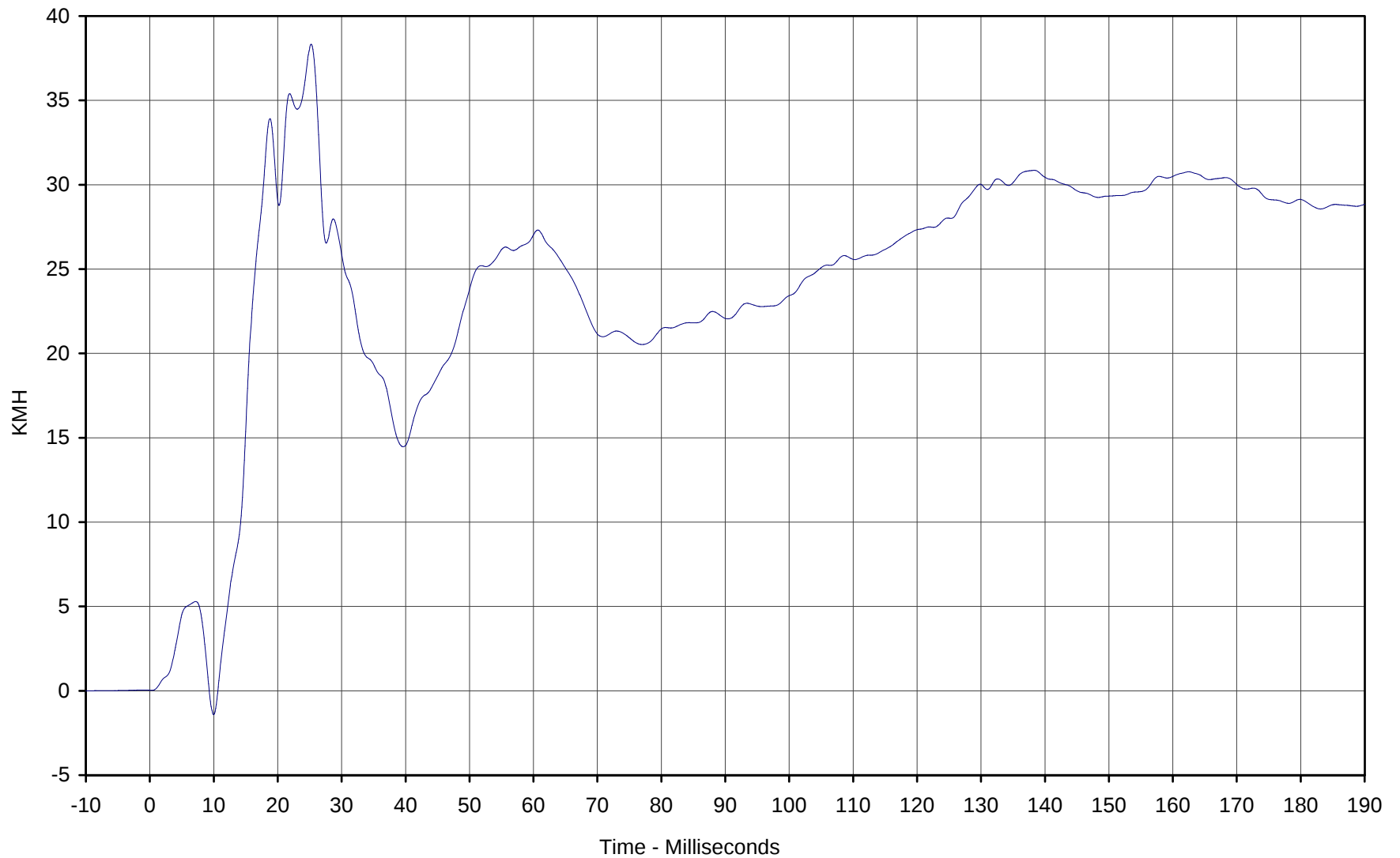




Curve Description: Left Front Door Upper CL Y
Maximum Value: 152.2 at 15.2 Milliseconds
Minimum Value: -74.7 at 26.7 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: FIL-041

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan





Curve Description: Left Front Door Upper CL Y Velocity

Maximum Value: 38.3 at 25.2 Milliseconds

Minimum Value: -1.4 at 10.0 Milliseconds

SAE Filter Class: 180

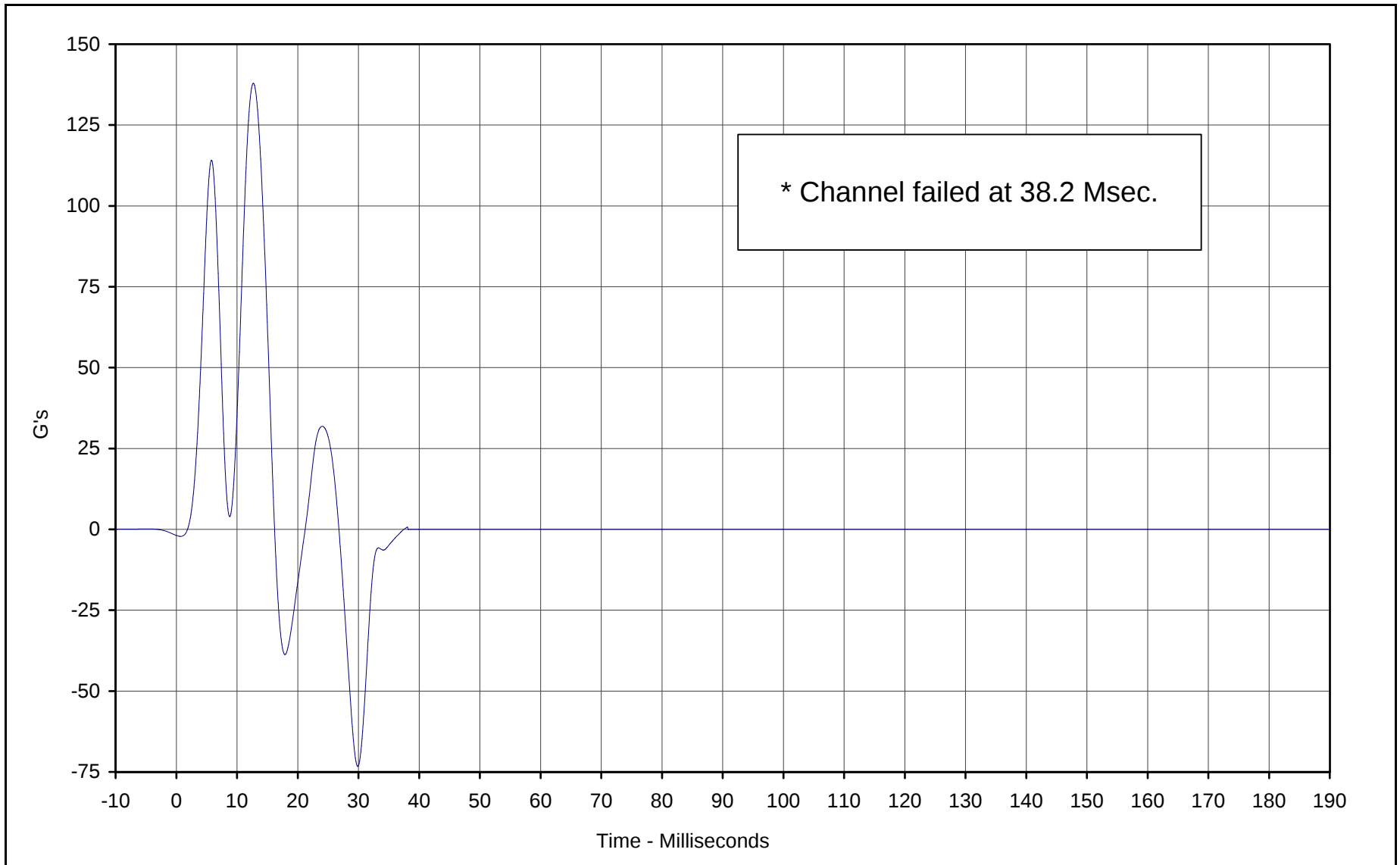
Date of Test: 12/6/01

Curve Number: IN1-041

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Left Rear Door Mid Rear Y *

Maximum Value: 137.9 at 12.7 Milliseconds

Minimum Value: -73.3 at 29.9 Milliseconds

SAE Filter Class: 60

Date of Test: 11/19/01

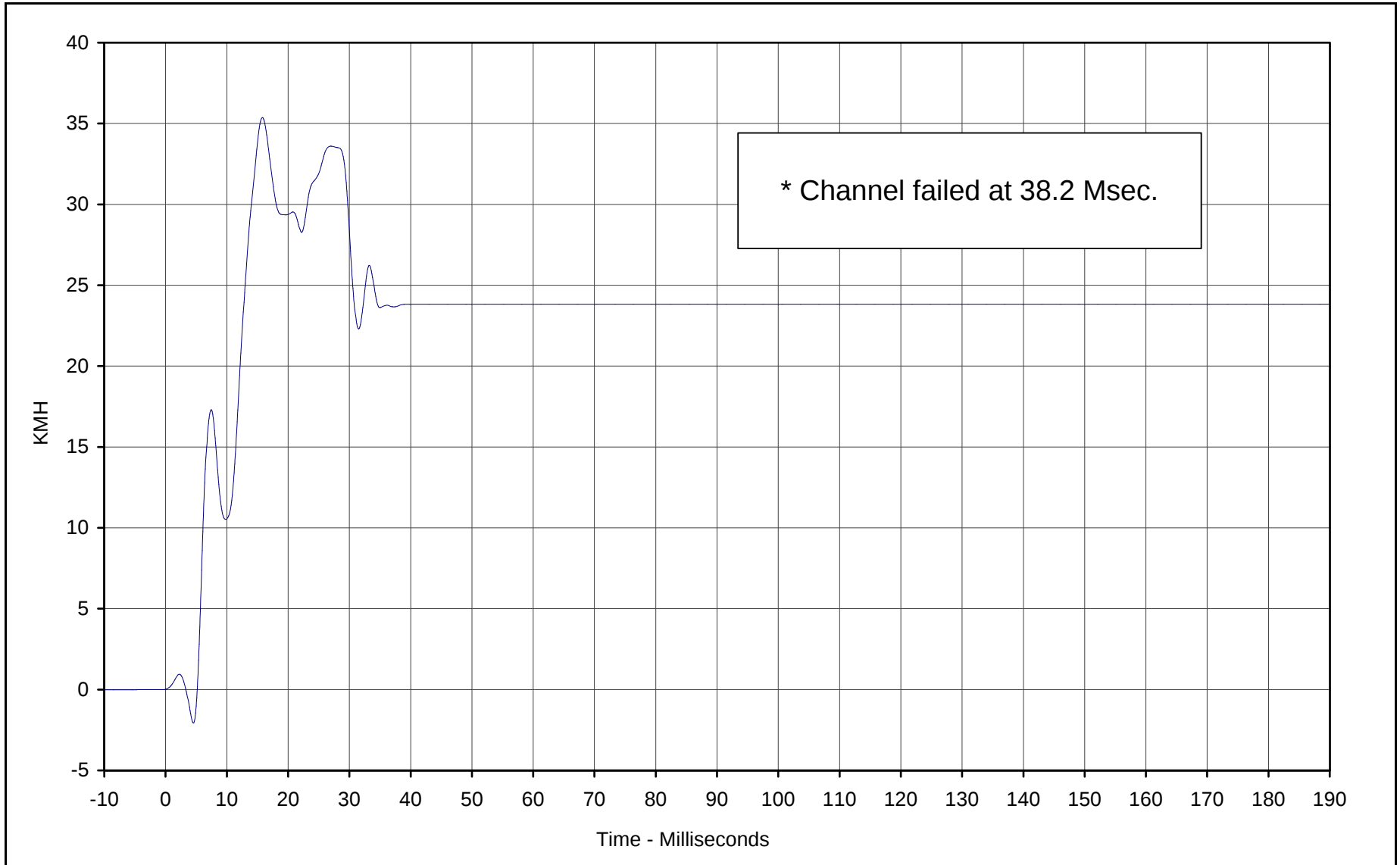
Curve Number: FIL-042

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006

Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

* Channel failed at 38.2 Msec.





Curve Description: Left Rear Door Mid Rear Y Velocity *

Maximum Value: 35.4 at 15.8 Milliseconds

Minimum Value: -2.1 at 4.5 Milliseconds

SAE Filter Class: 180

Date of Test: 12/6/01

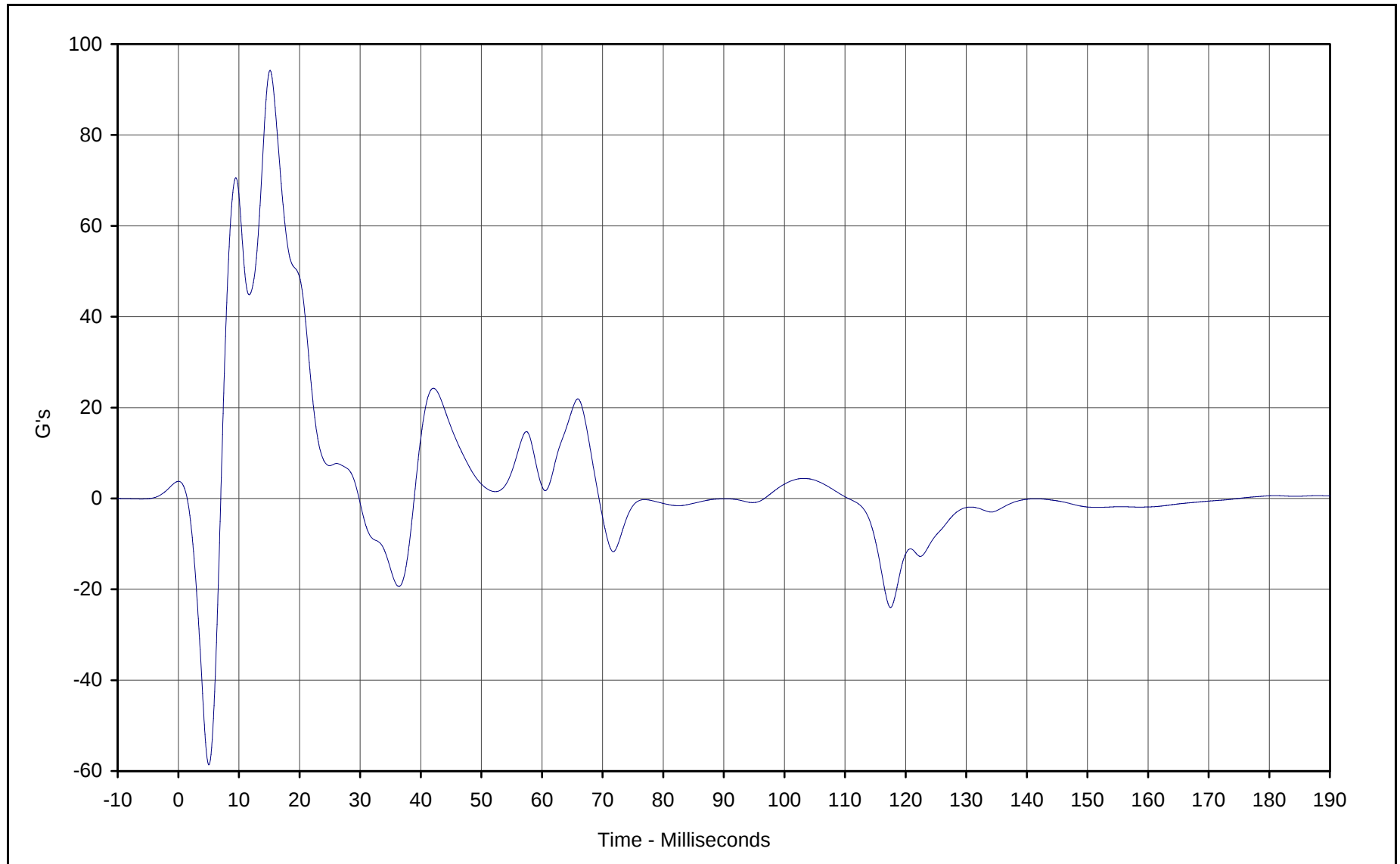
Curve Number: IN1-042

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

* Channel failed at 38.2 Msec.

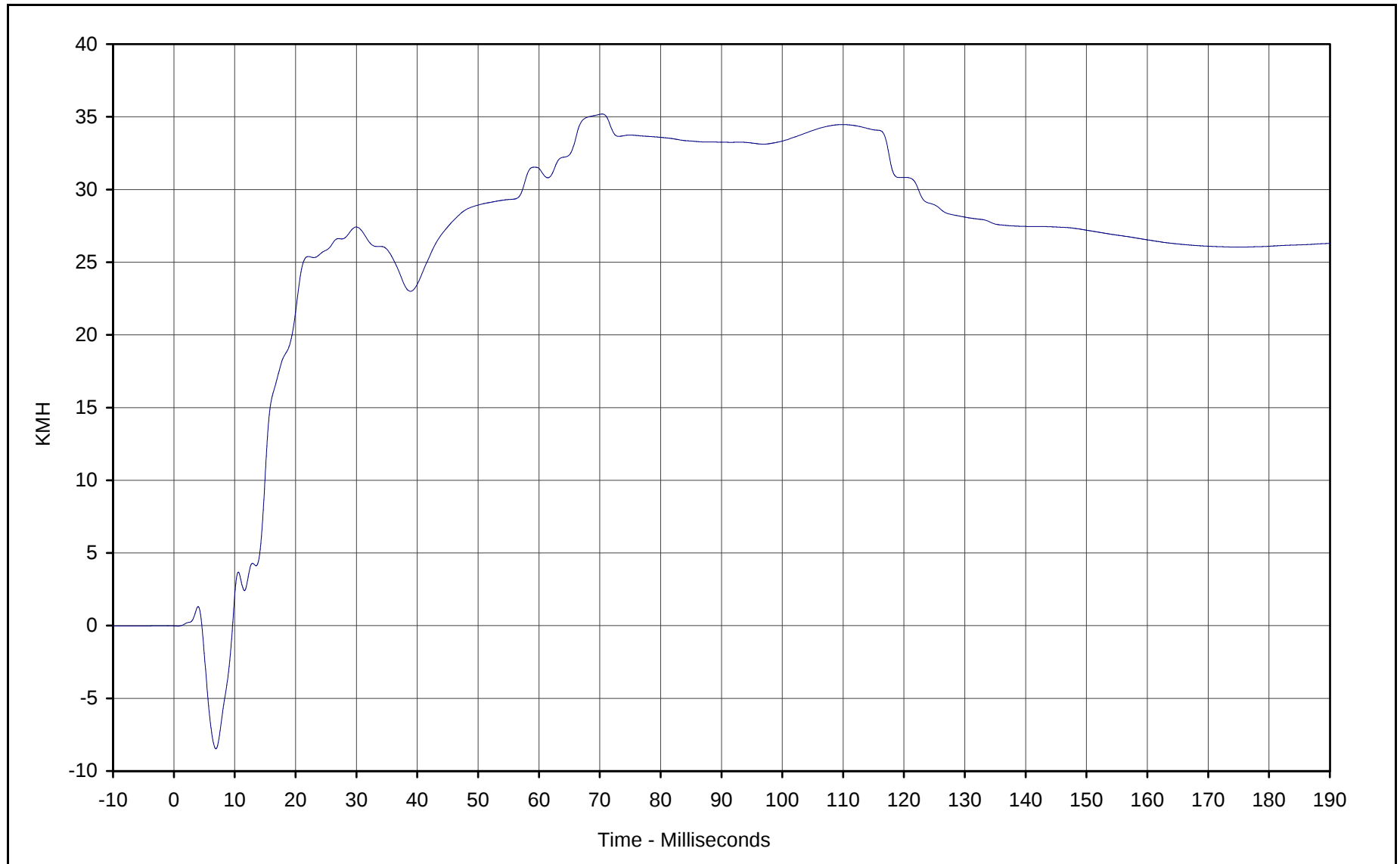




Curve Description: Left Rear Door Upper CL Y
Maximum Value: 94.2 at 15.2 Milliseconds
Minimum Value: -58.6 at 5.0 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: FIL-043

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan





Curve Description: Left Rear Door Upper CL Y Velocity

Maximum Value: 35.2 at 70.4 Milliseconds

Minimum Value: -8.5 at 6.9 Milliseconds

SAE Filter Class: 180

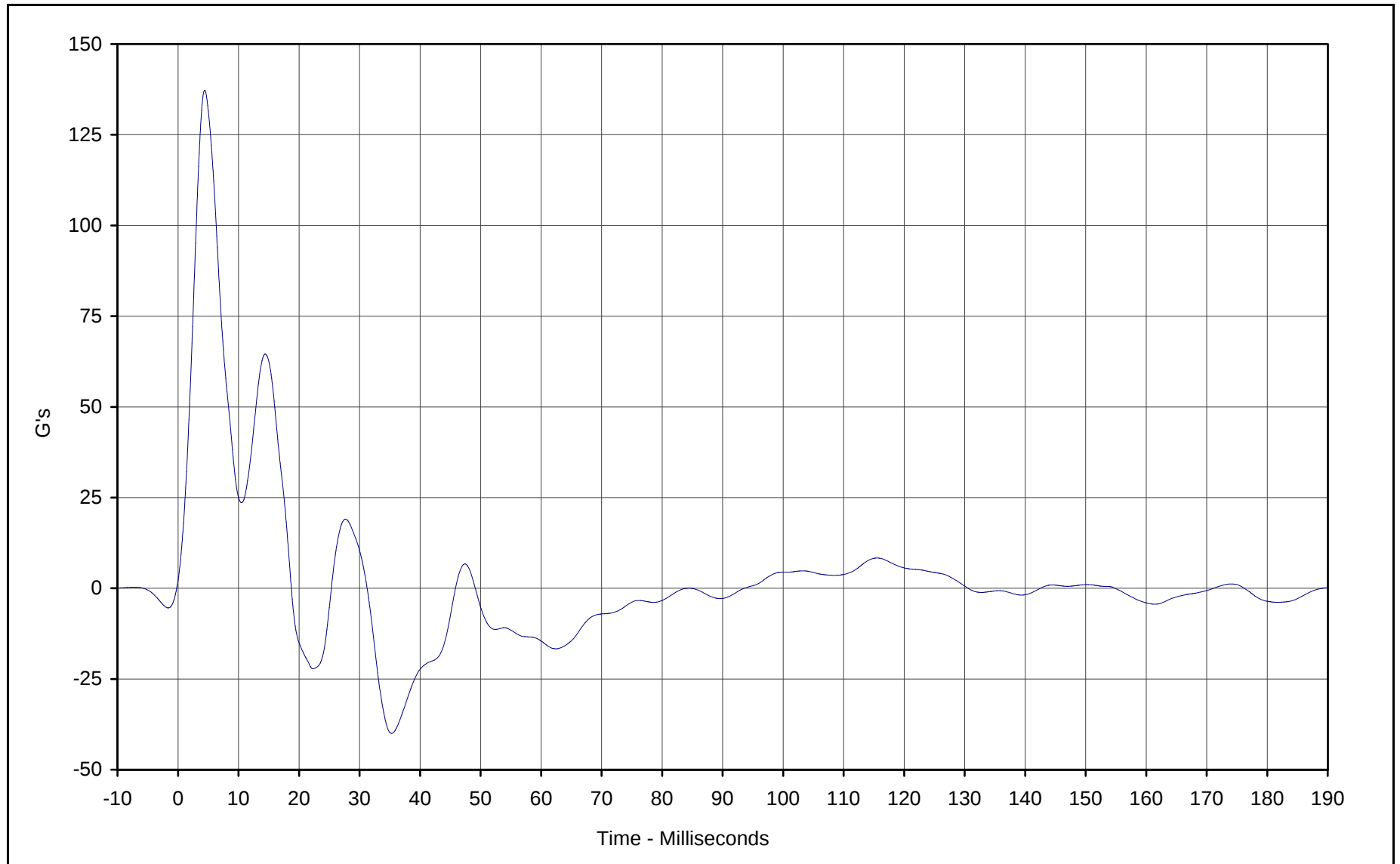
Date of Test: 12/6/01

Curve Number: IN1-043

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

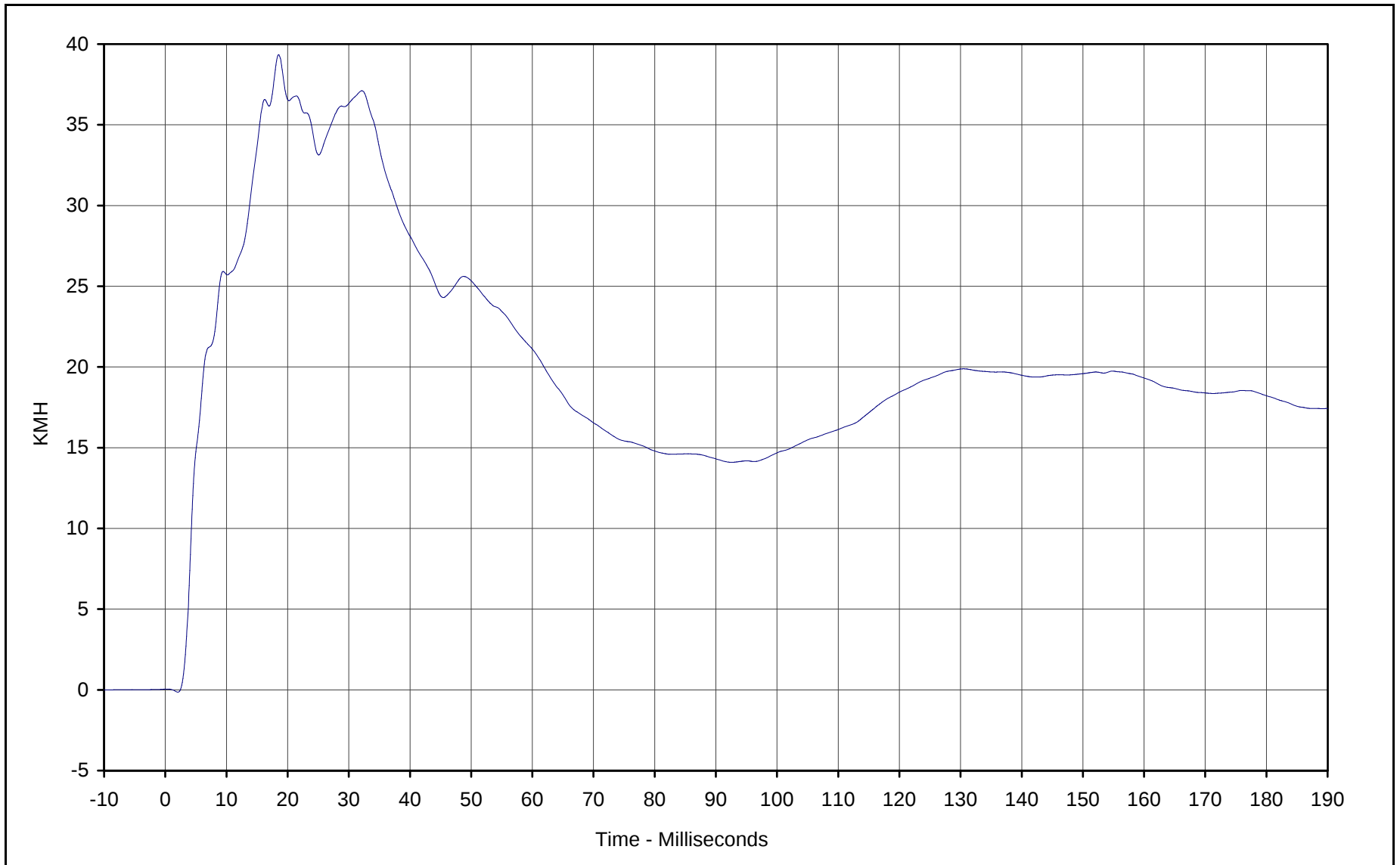




Curve Description: Left B-Post Lower Y
Maximum Value: 137.3 at 4.4 Milliseconds
Minimum Value: -40.0 at 35.3 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-044

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



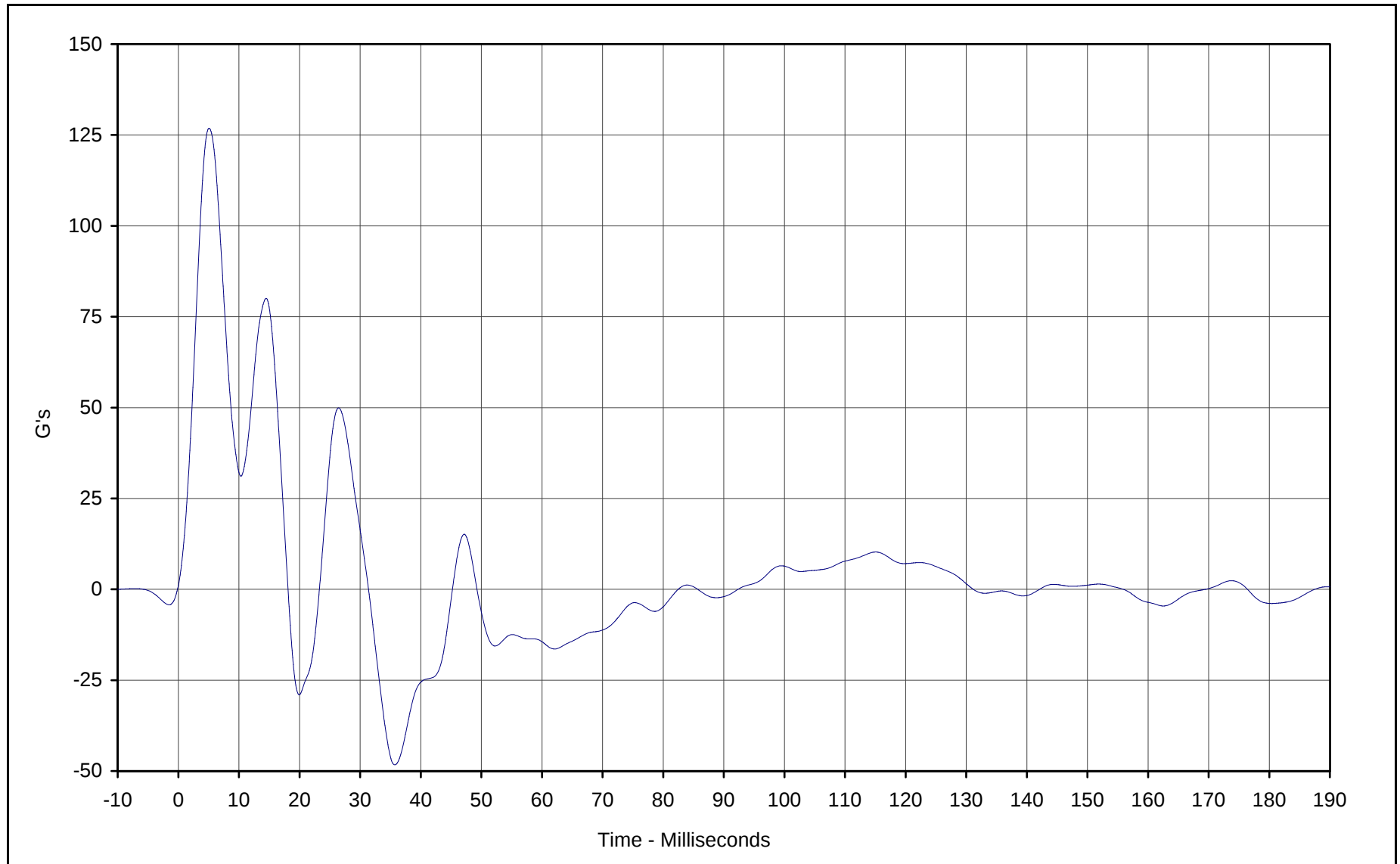


Curve Description: Left B-Post Lower Y Velocity
Maximum Value: 39.3 at 18.5 Milliseconds
Minimum Value: -0.1 at 2.1 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-044

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



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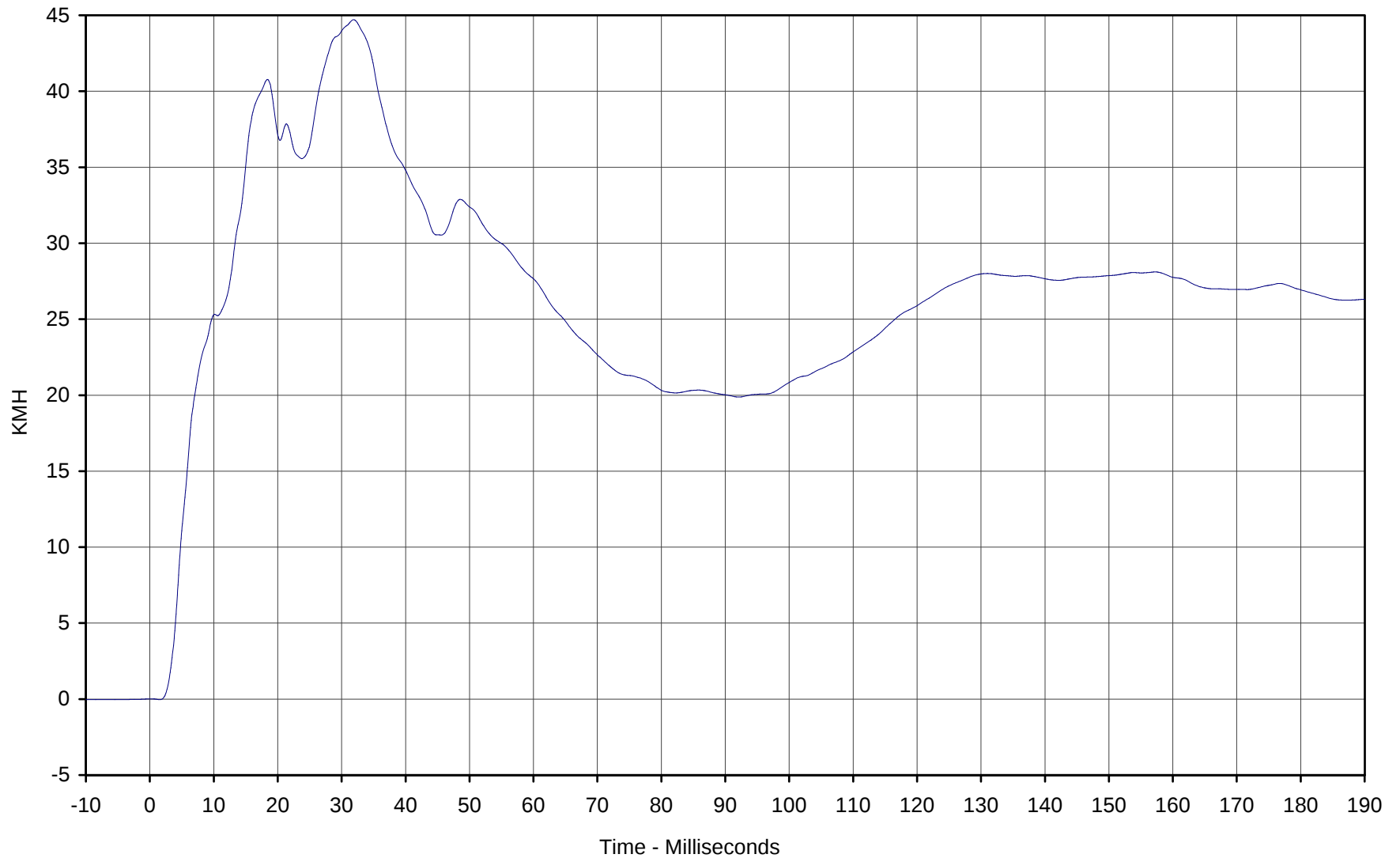
Curve Description: Left B-Post Middle Y
Maximum Value: 126.9 at 5.1 Milliseconds
Minimum Value: -48.3 at 35.7 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-045

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



KAR21130-01

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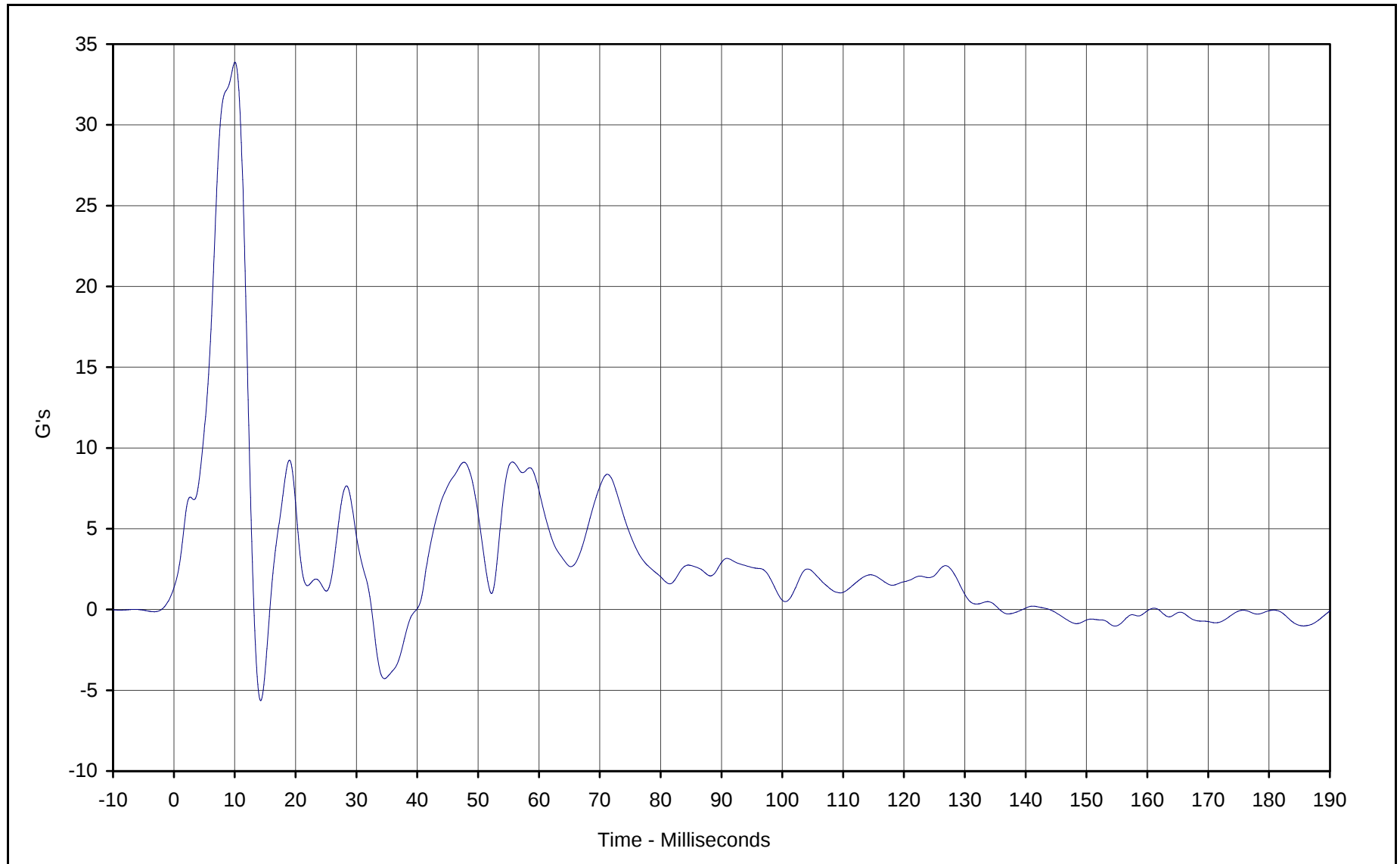


Curve Description: Left B-Post Middle Y Velocity
Maximum Value: 44.7 at 31.9 Milliseconds
Minimum Value: 0.0 at 1.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-045

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



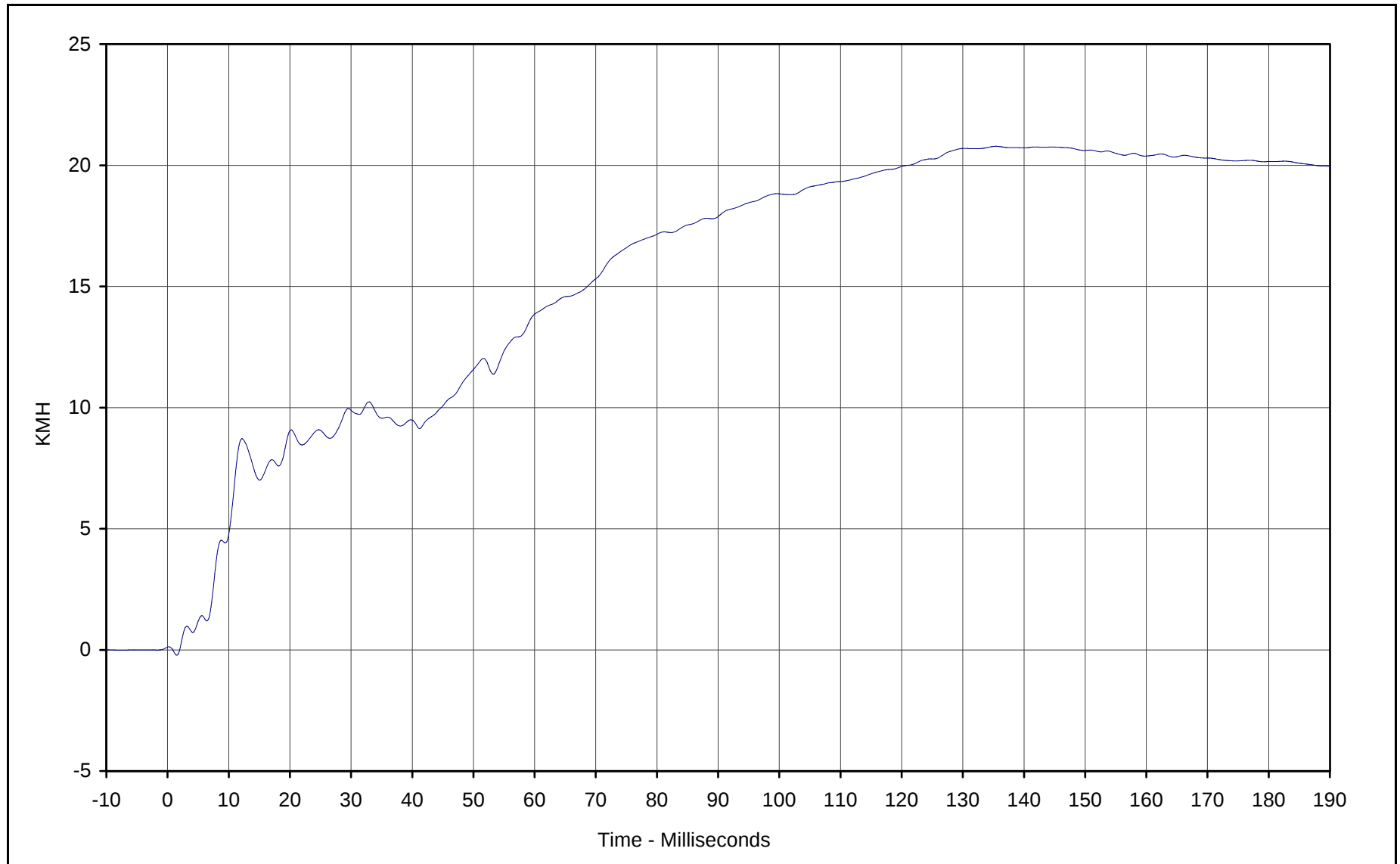
KAR21130-01



Curve Description: Left A-Post Lower Y
Maximum Value: 33.9 at 10.1 Milliseconds
Minimum Value: -5.6 at 14.3 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-046

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

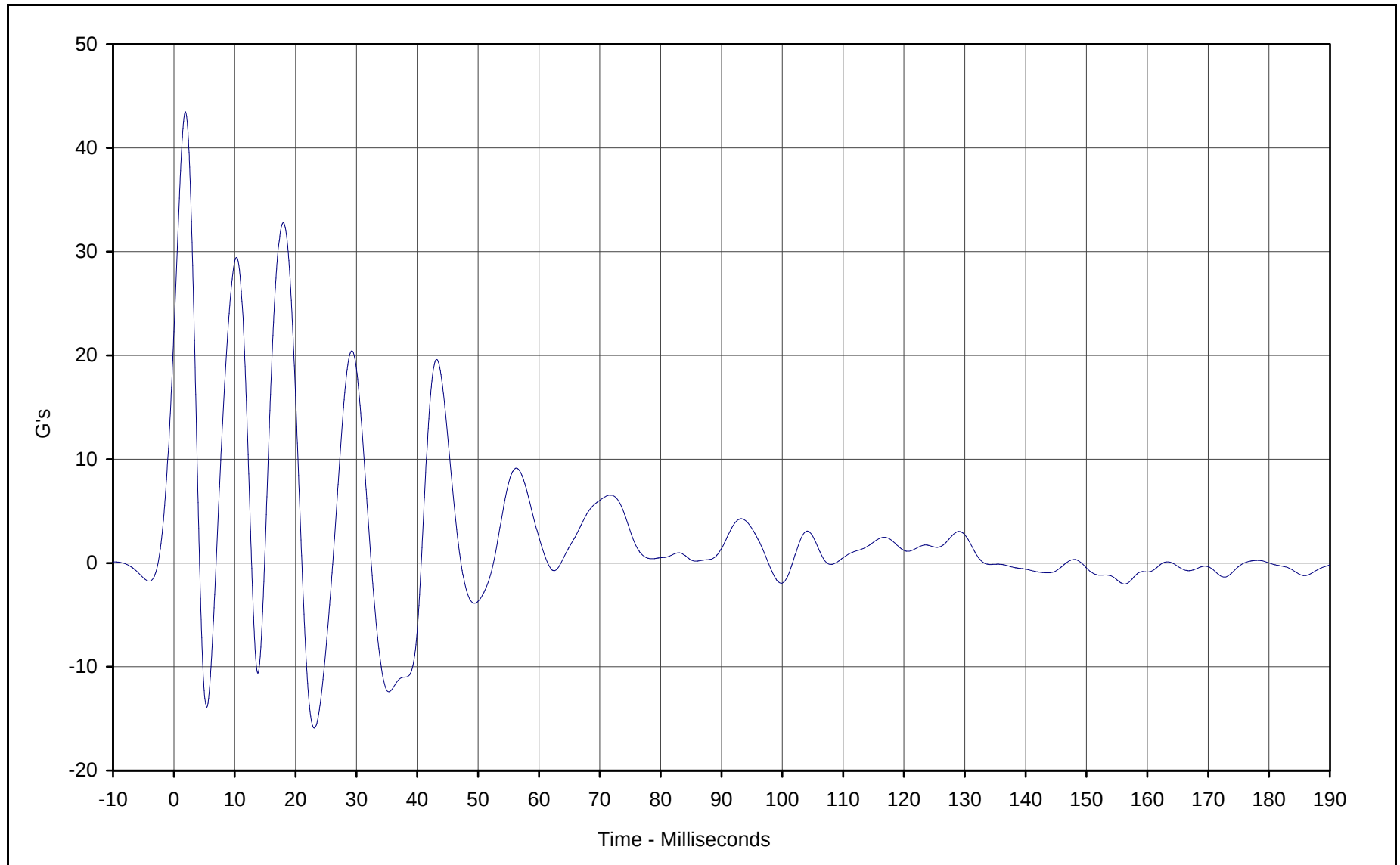




Curve Description: Left A-Post Lower Y Velocity
Maximum Value: 20.8 at 135.4 Milliseconds
Minimum Value: -0.2 at 1.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-046

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

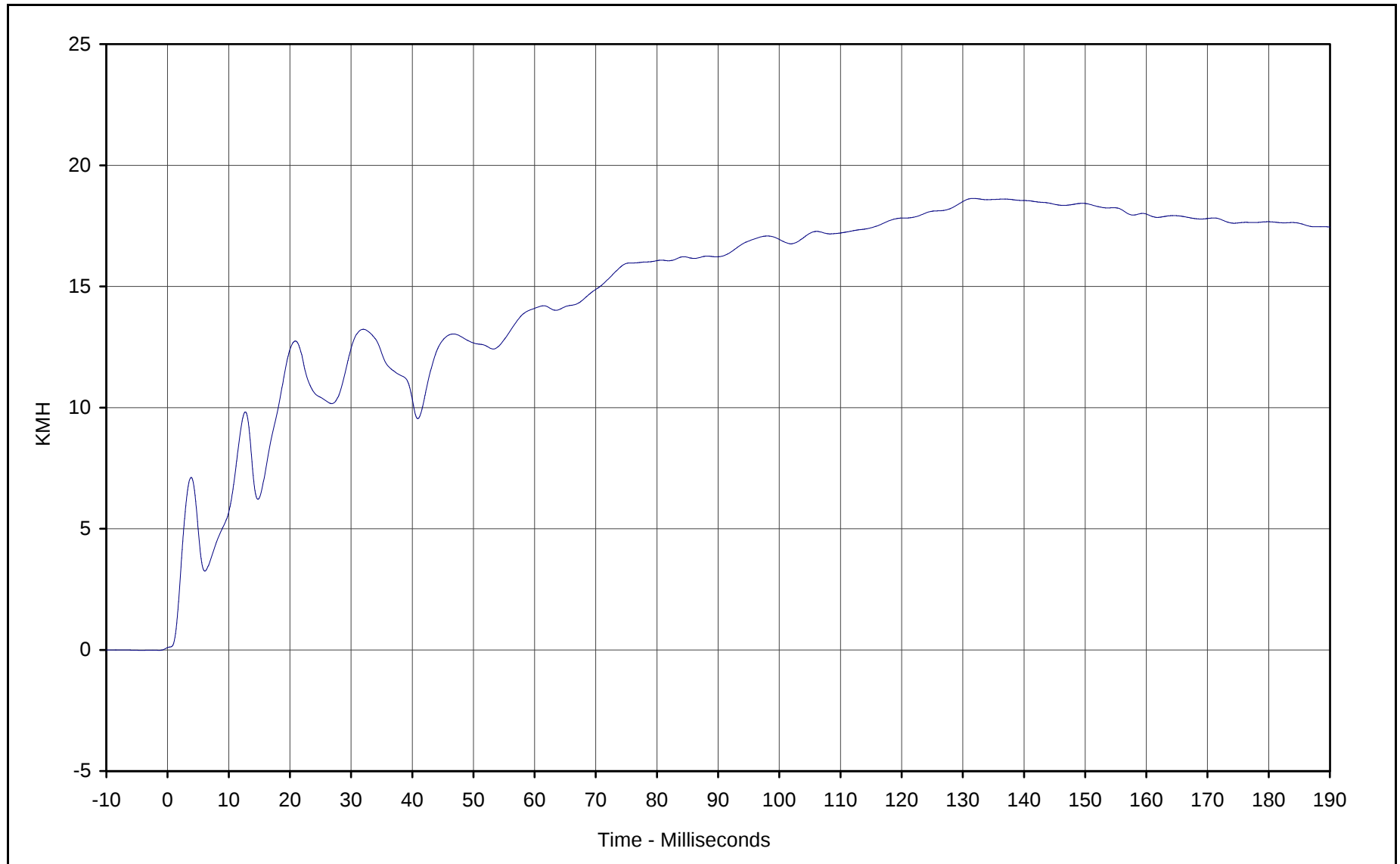




Curve Description: Left A-Post Middle Y
Maximum Value: 43.5 at 1.9 Milliseconds
Minimum Value: -15.9 at 23.1 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-047

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

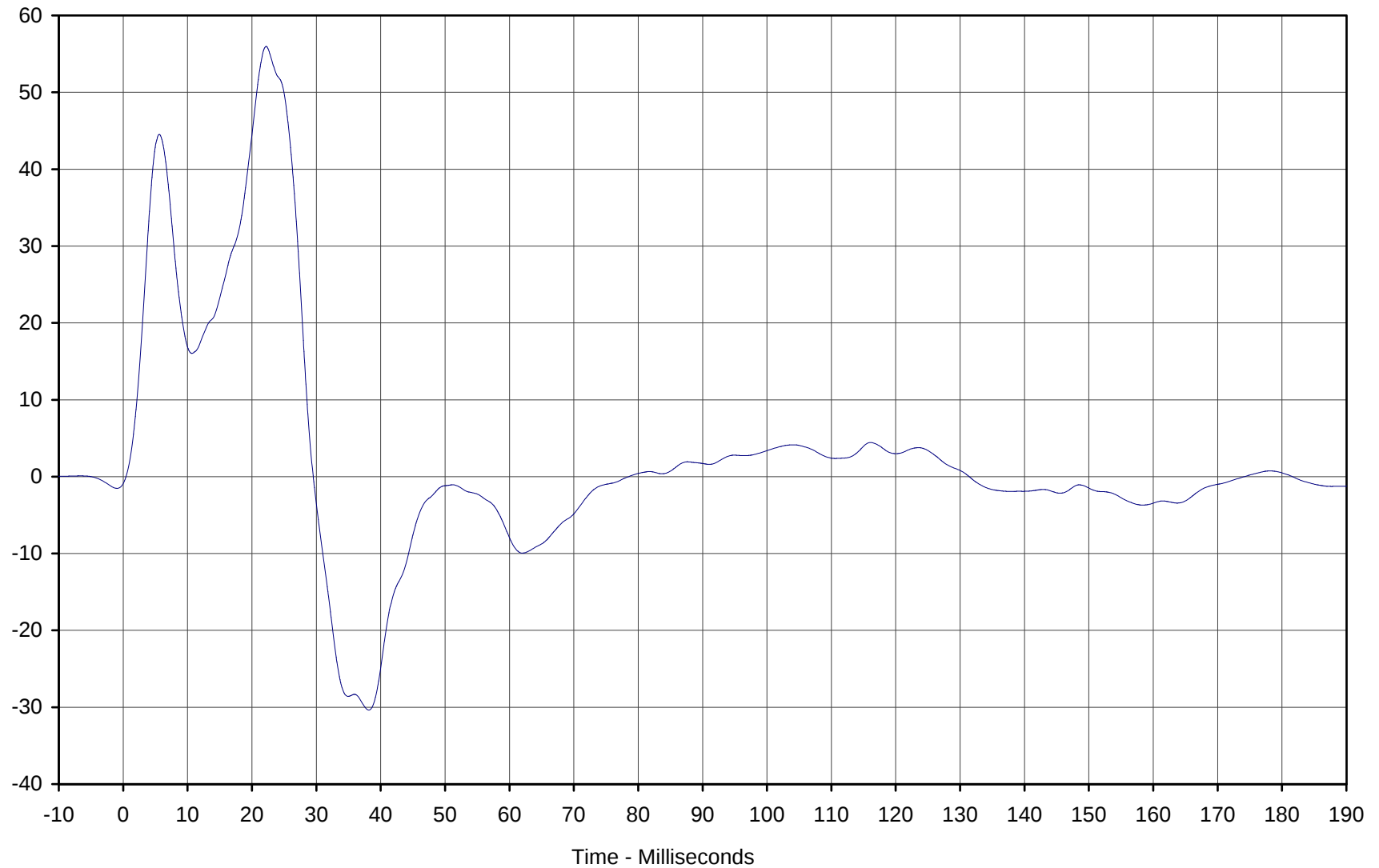




Curve Description: Left A-Post Middle Y Velocity
Maximum Value: 18.6 at 131.7 Milliseconds
Minimum Value: 0.1 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-047

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

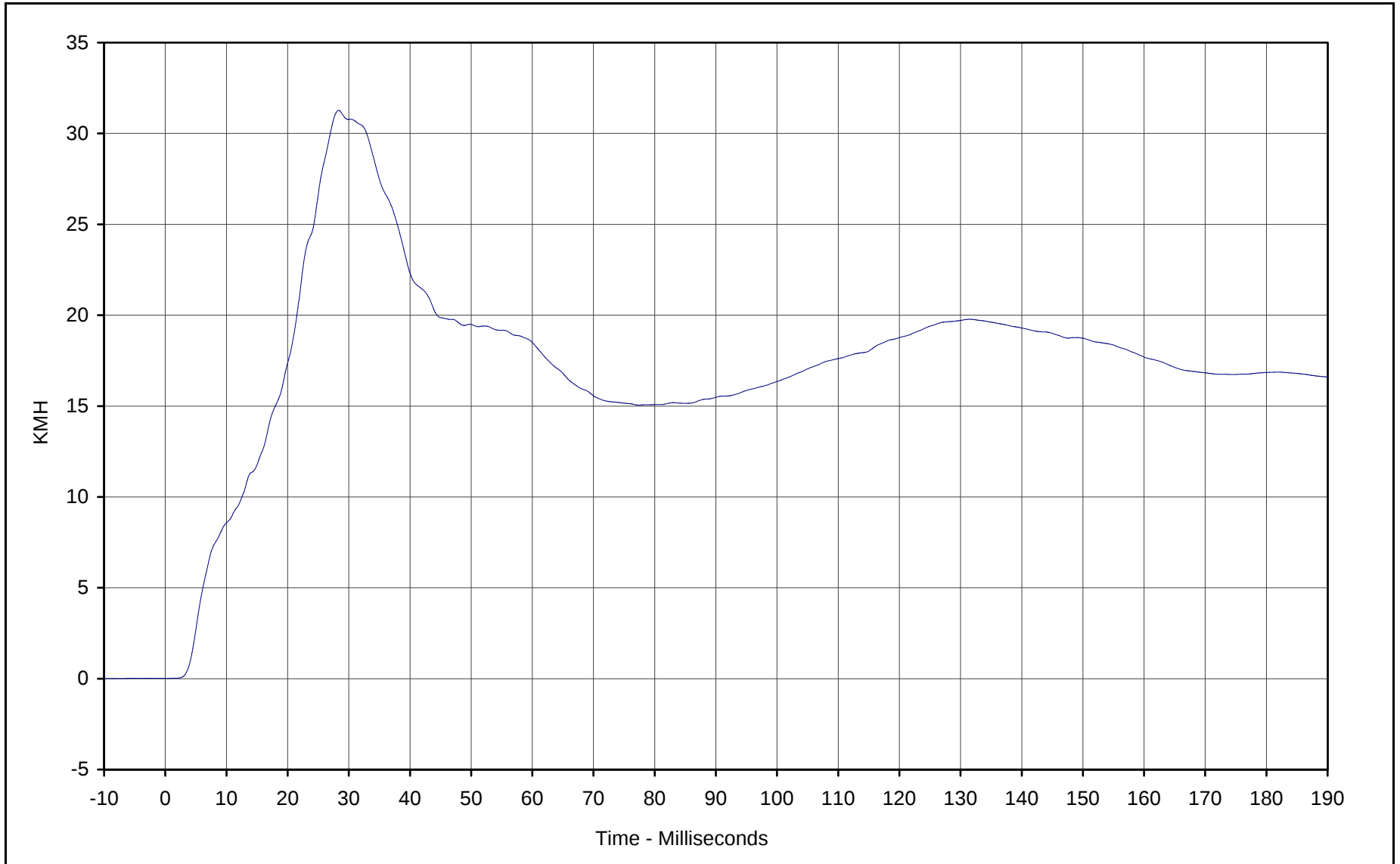




Curve Description: Left Front Seat Track Y
Maximum Value: 56.0 at 22.2 Milliseconds
Minimum Value: -30.4 at 38.2 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-048

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

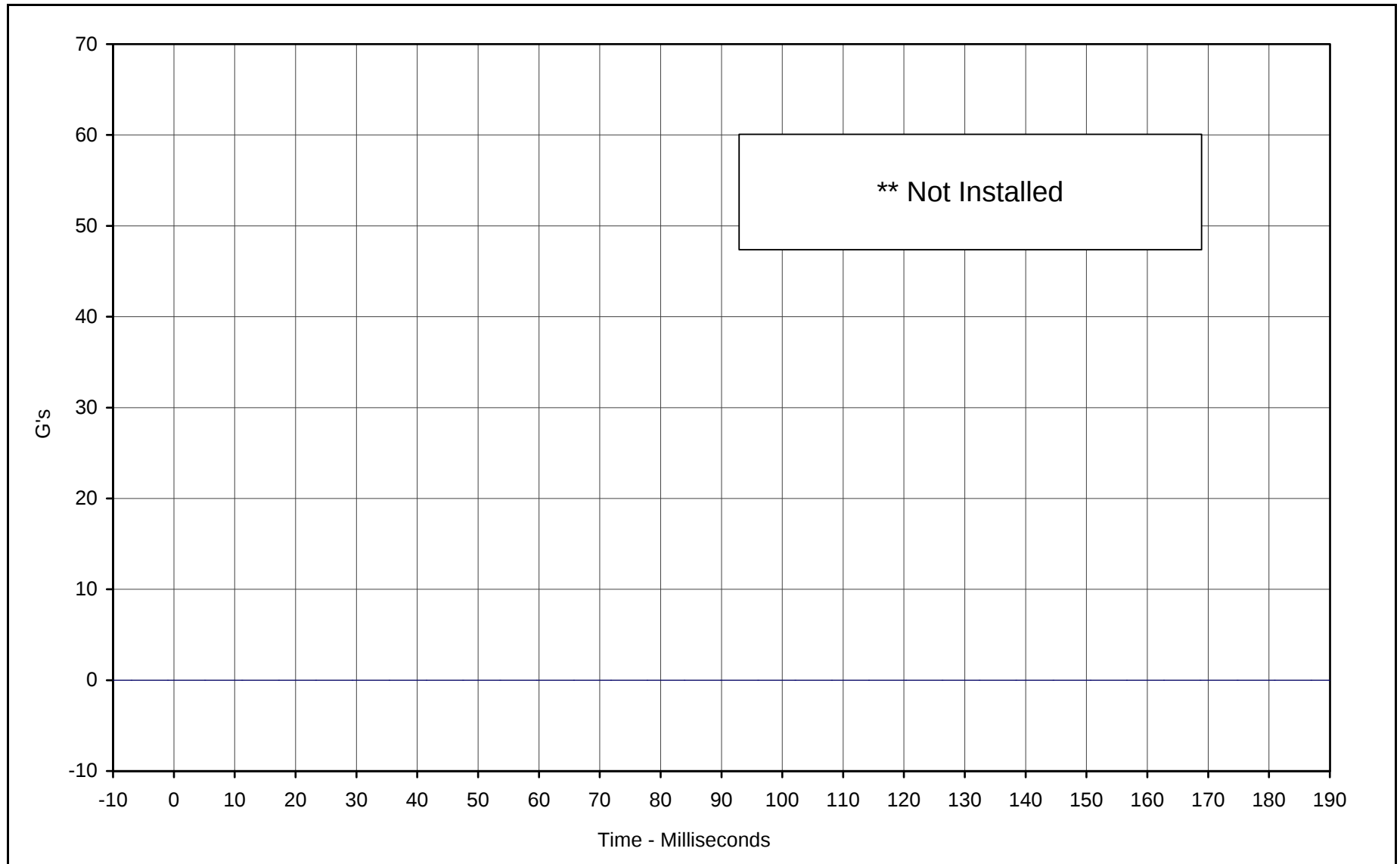




Curve Description: Left Front Seat Track Y Velocity
Maximum Value: 31.3 at 28.3 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-048

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Left Rear Seat Structure Y **

Maximum Value: 0.0 at 0.0 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 60

Date of Test: 12/6/01

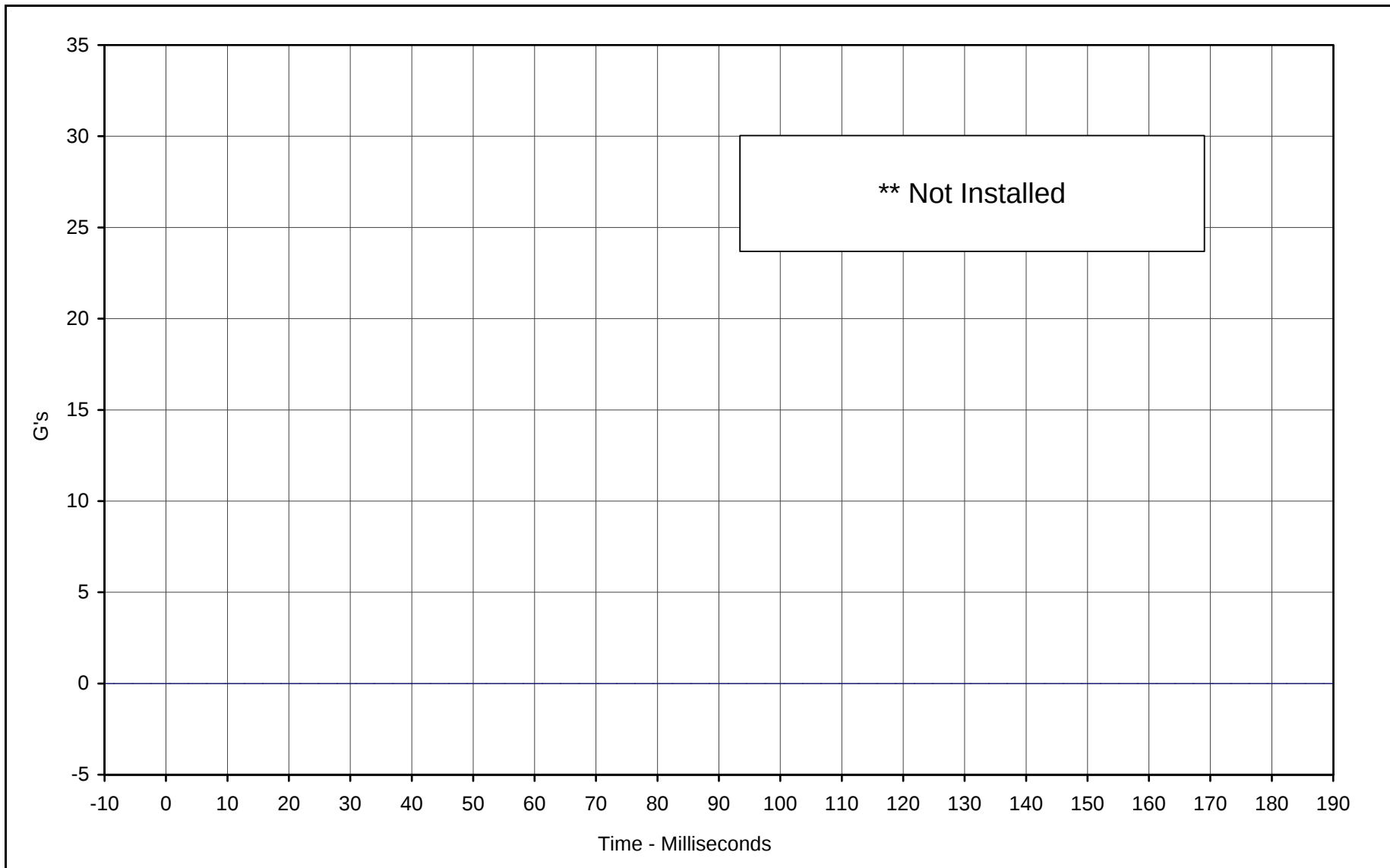
Curve Number: FIL-049

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

** Not Installed





Curve Description: Left Rear Seat Structure Y Velocity **

Maximum Value: 0.0 at 0.0 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 12/6/01

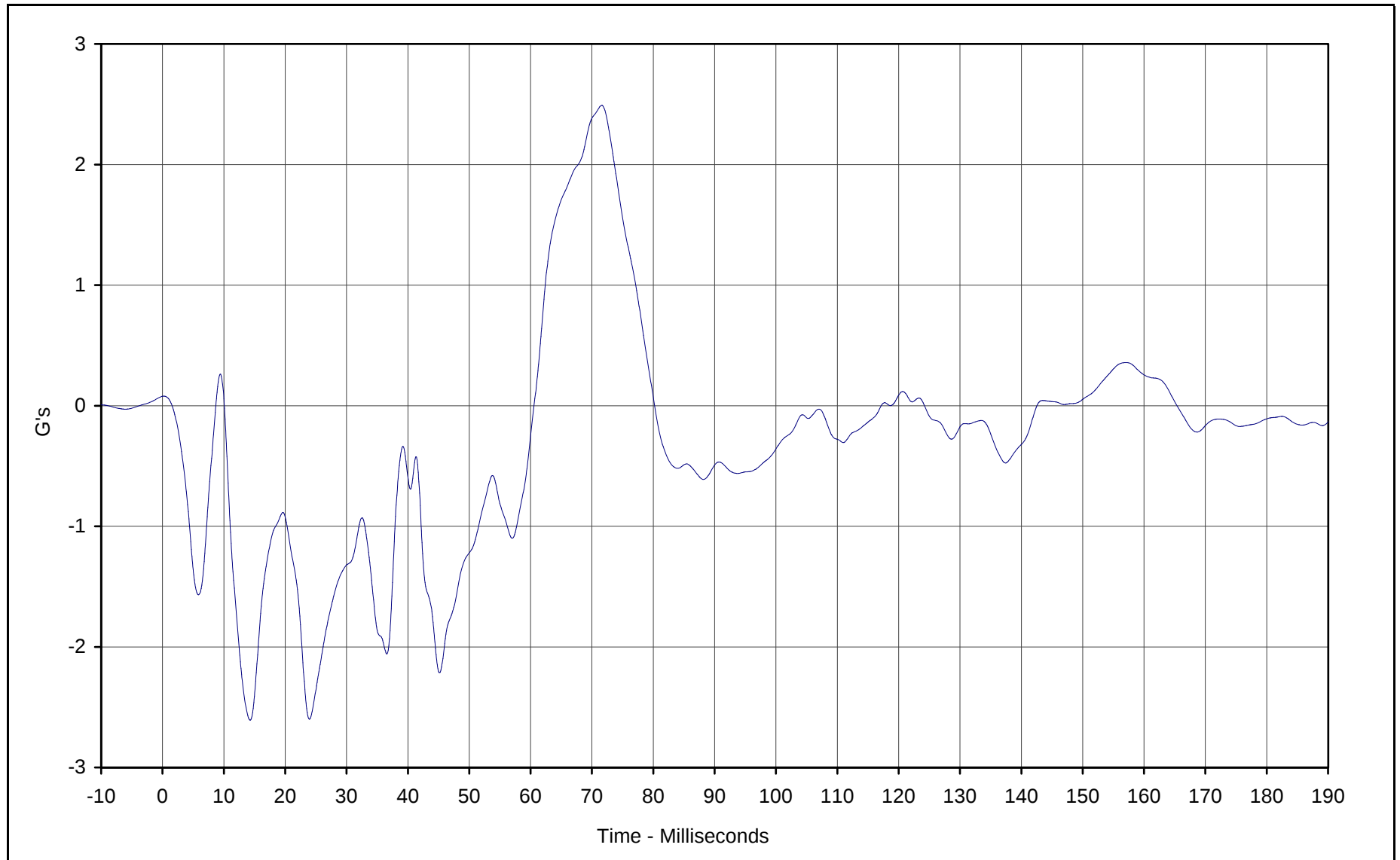
Curve Number: IN1-049

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

** Not Installed

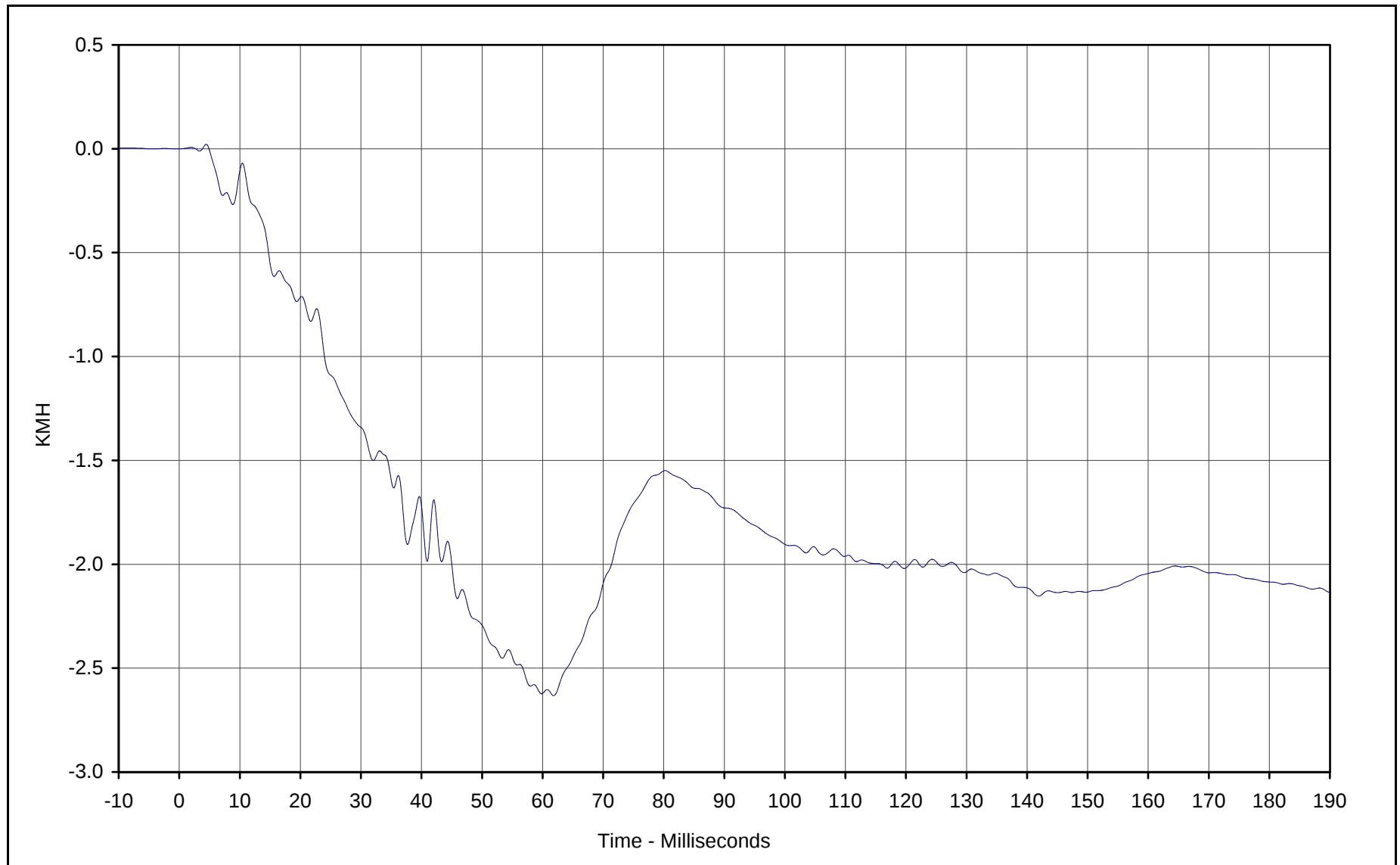




Curve Description: Vehicle CG X
Maximum Value: 2.5 at 71.6 Milliseconds
Minimum Value: -2.6 at 14.3 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: FIL-050

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

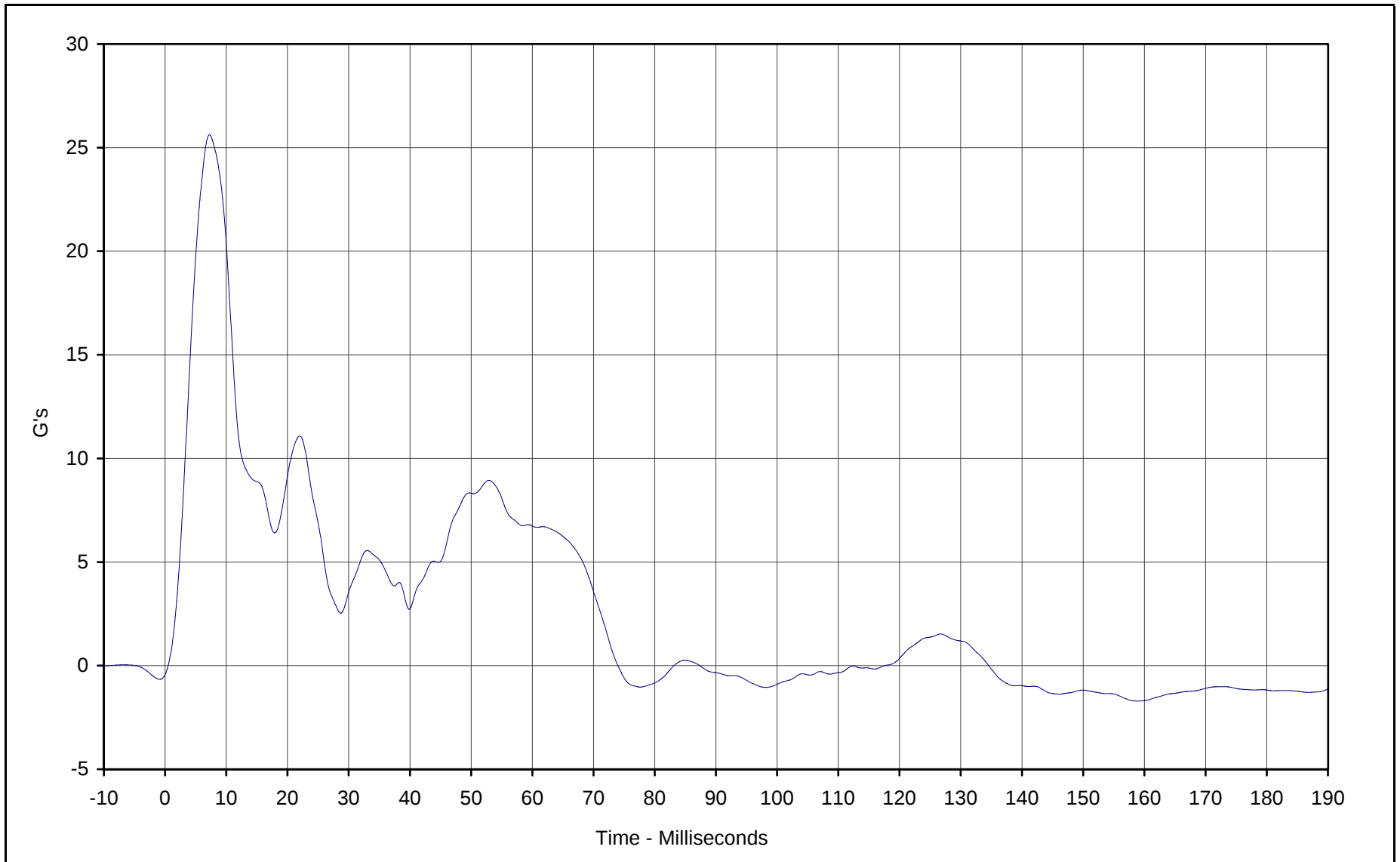




Curve Description: Vehicle CG X Velocity
Maximum Value: 0.0 at 4.5 Milliseconds
Minimum Value: -2.6 at 61.8 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-050

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

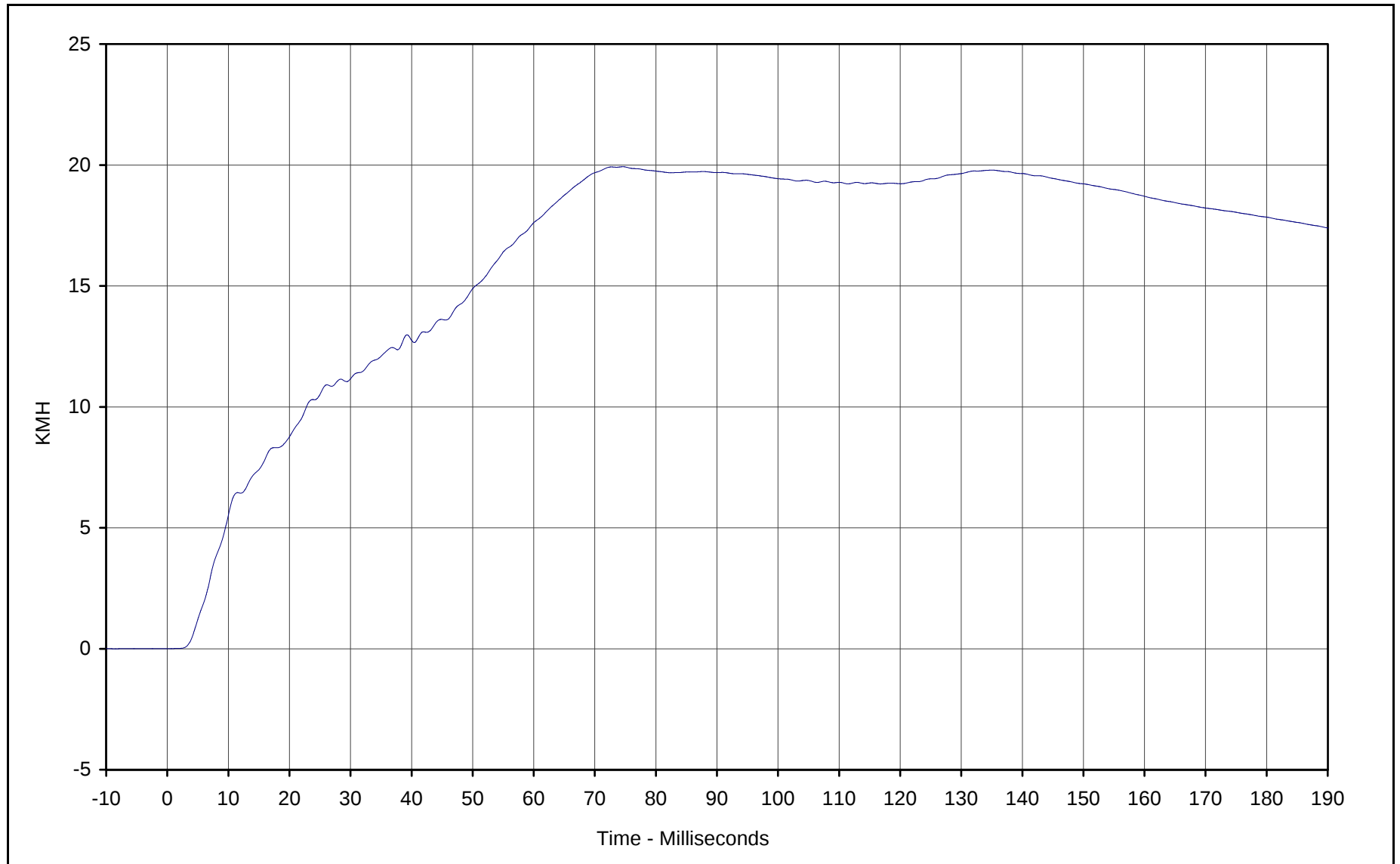




Curve Description: Vehicle CG Y
Maximum Value: 25.6 at 7.2 Milliseconds
Minimum Value: -1.7 at 158.8 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: FIL-051

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

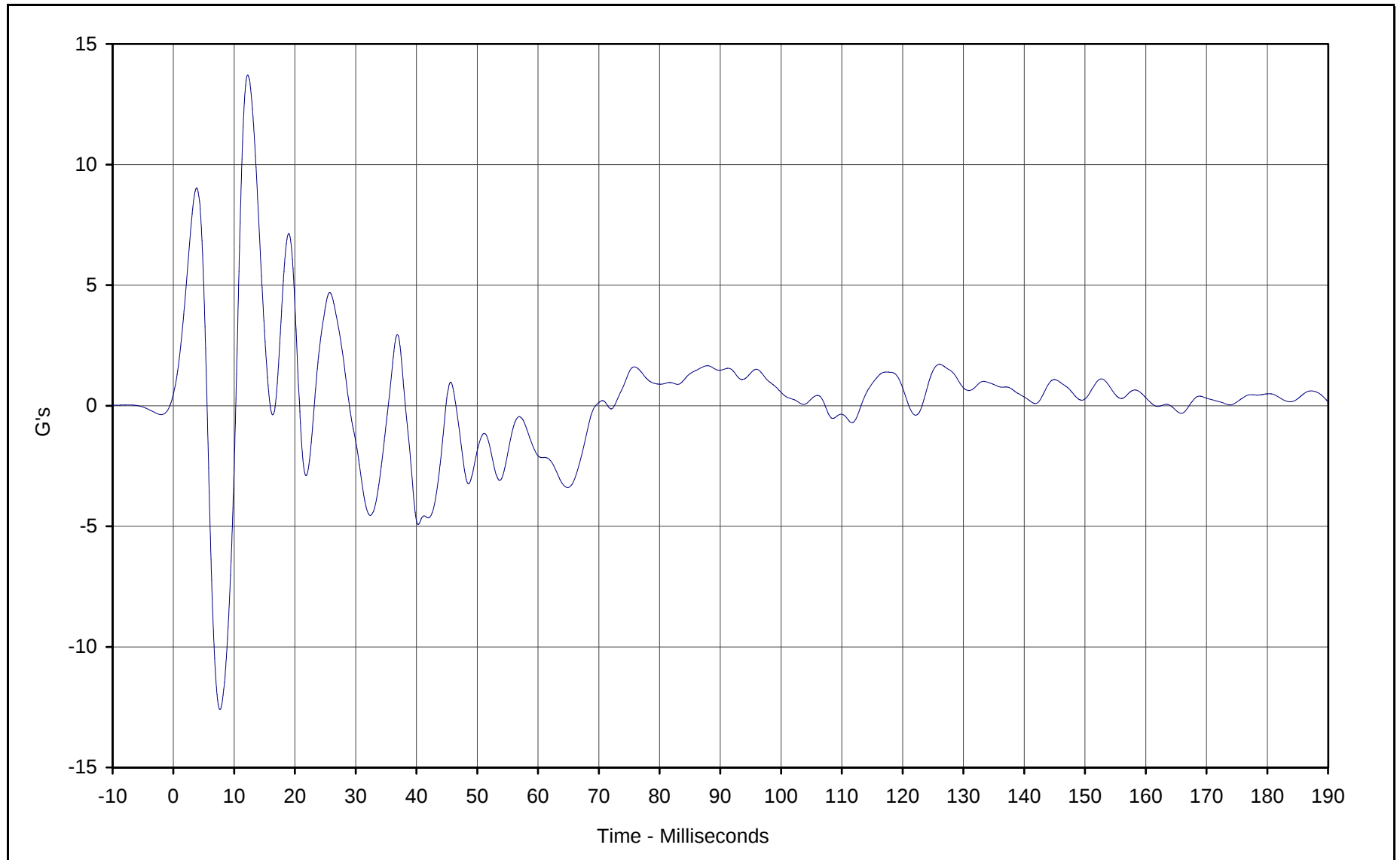




Curve Description: Vehicle CG Y Velocity
Maximum Value: 19.9 at 74.6 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-051

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

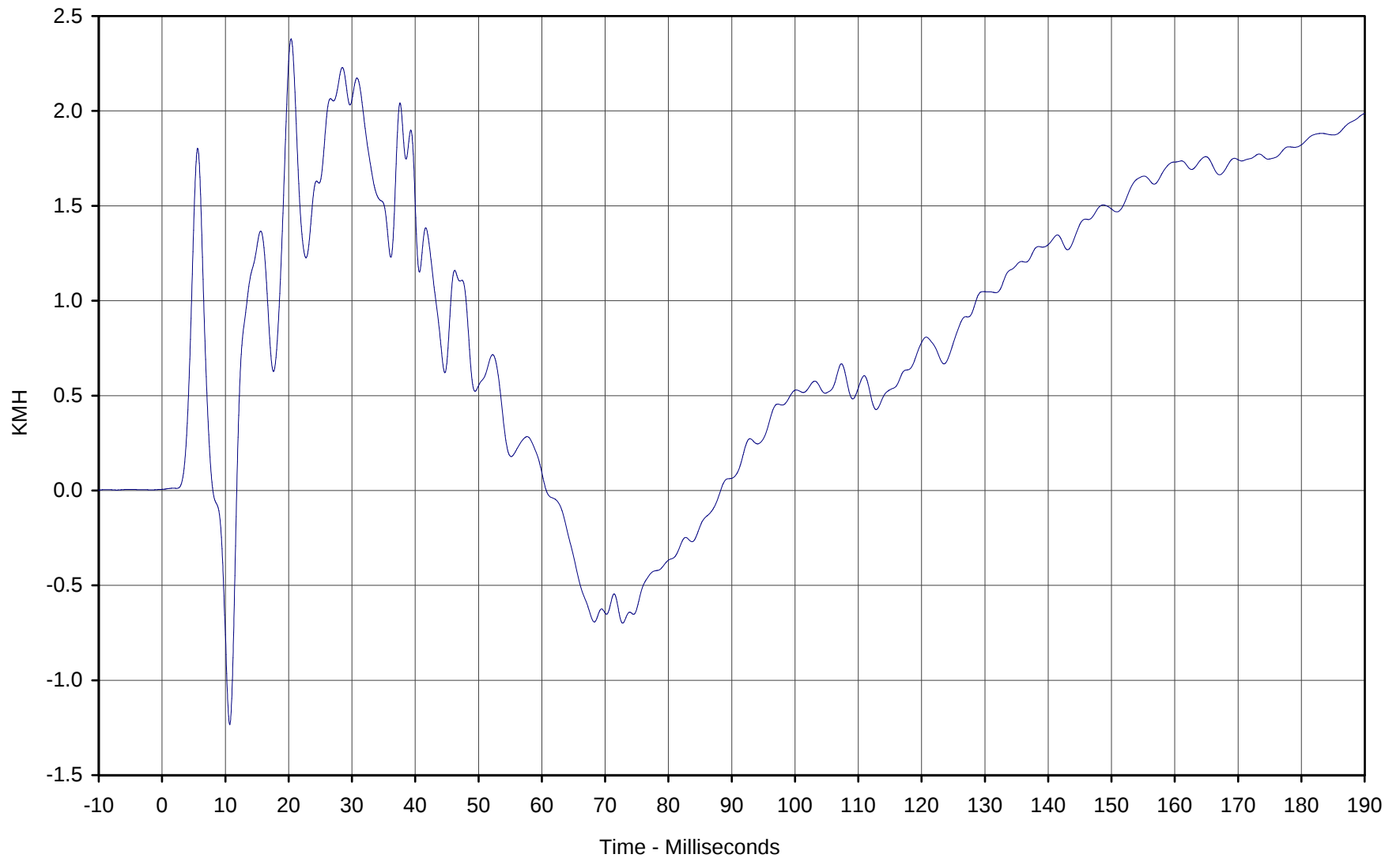




Curve Description: Vehicle CG Z
Maximum Value: 13.7 at 12.2 Milliseconds
Minimum Value: -12.6 at 7.7 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: FIL-052

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

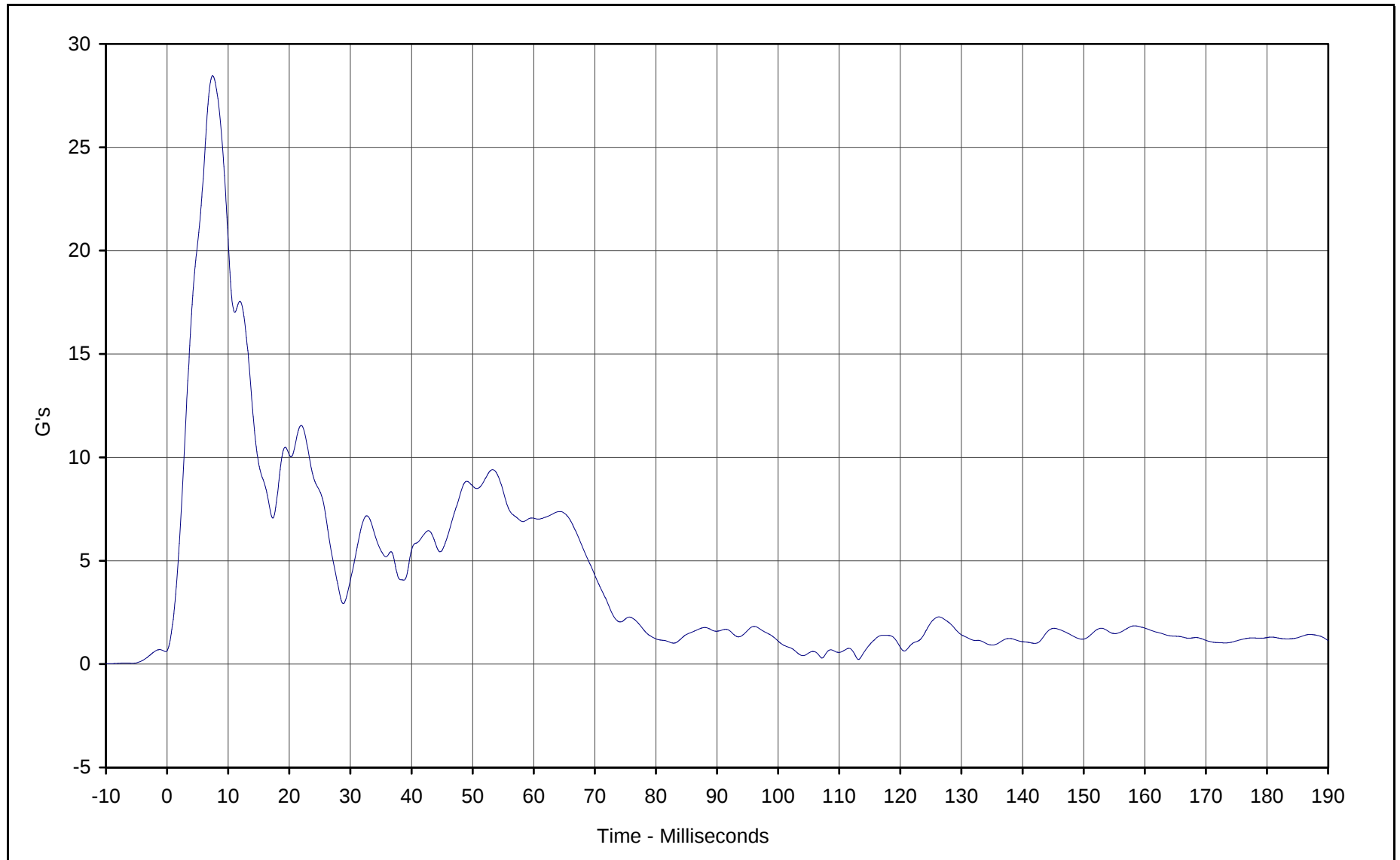




Curve Description: Vehicle CG Z Velocity
Maximum Value: 2.4 at 20.4 Milliseconds
Minimum Value: -1.2 at 10.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-052

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

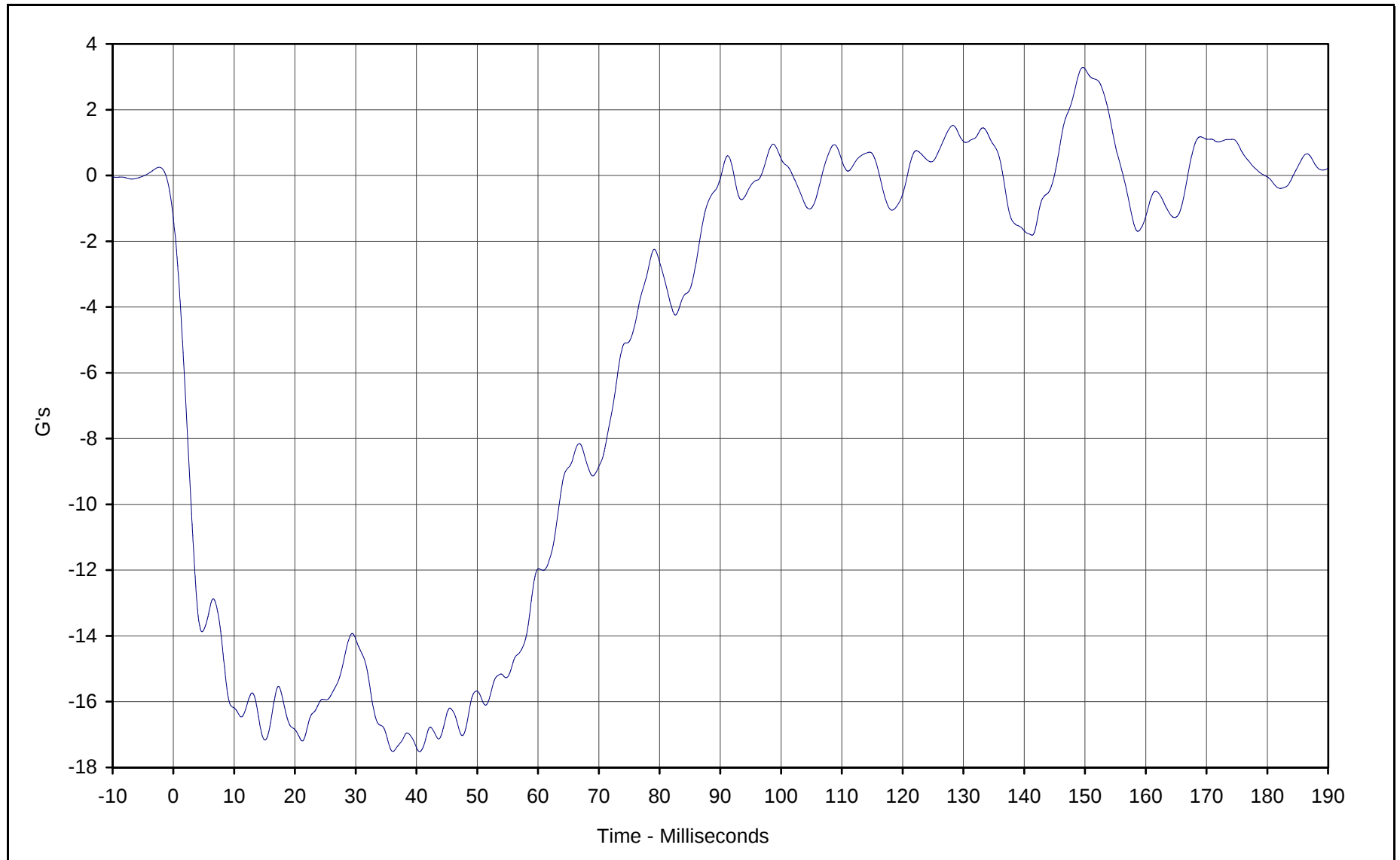




Curve Description: Vehicle CG Resultant
Maximum Value: 28.5 at 7.5 Milliseconds
Minimum Value: 0.2 at 113.2 Milliseconds
SAE Filter Class: 60
Date of Test: 11/19/01
Curve Number: RES-050

Test Program: 55/28 km/h Side Impact NCAP No.: GM0006
Test Vehicle: 2002 Chevrolet Malibu 4 Door Sedan

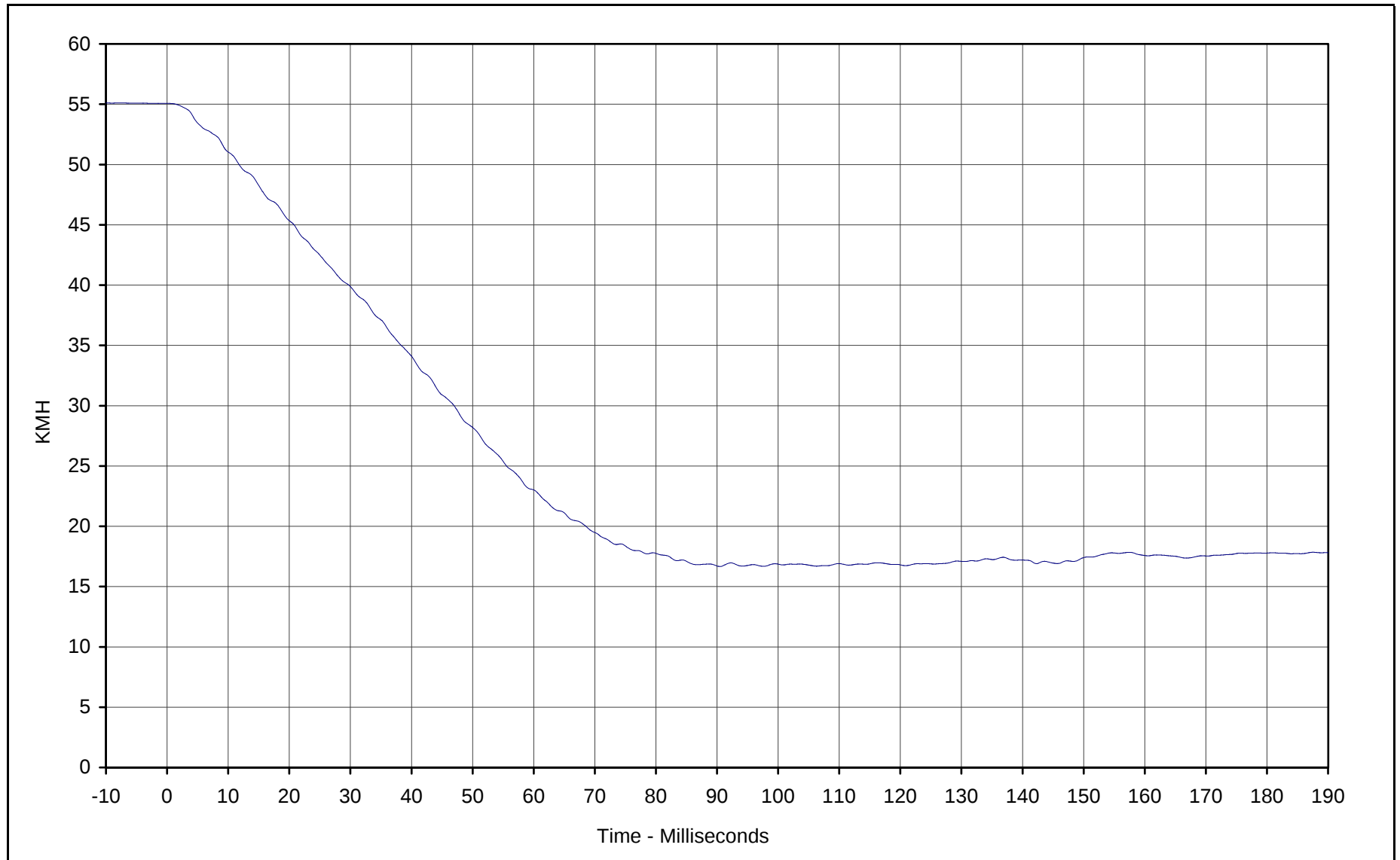




Curve Description: MDB CG X
Maximum Value: 3.3 at 149.7 Milliseconds
Minimum Value: -17.5 at 40.5 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-053

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

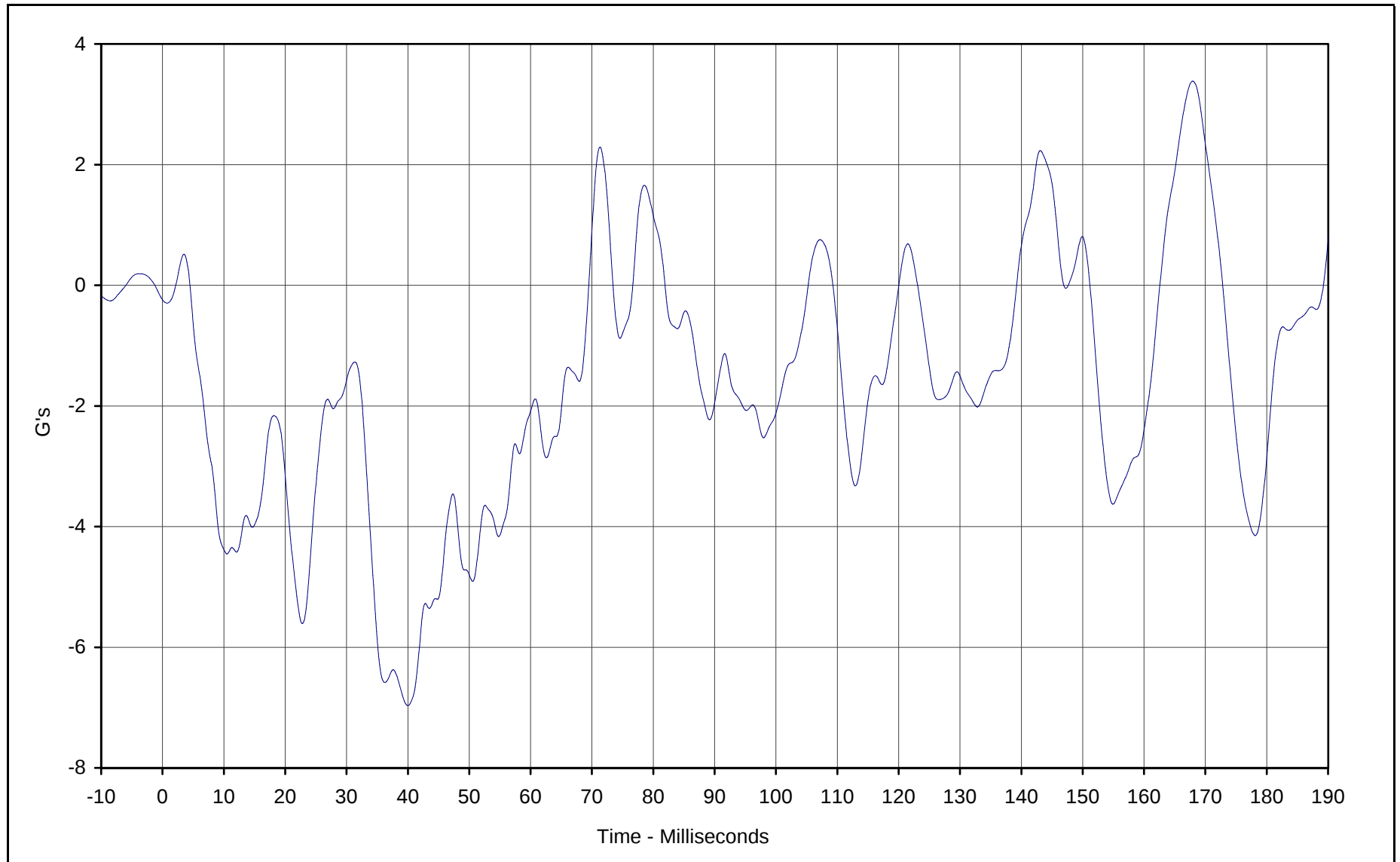




Curve Description: MDB CG X Velocity
Maximum Value: 55.1 at 0.0 Milliseconds
Minimum Value: 16.7 at 90.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-053

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

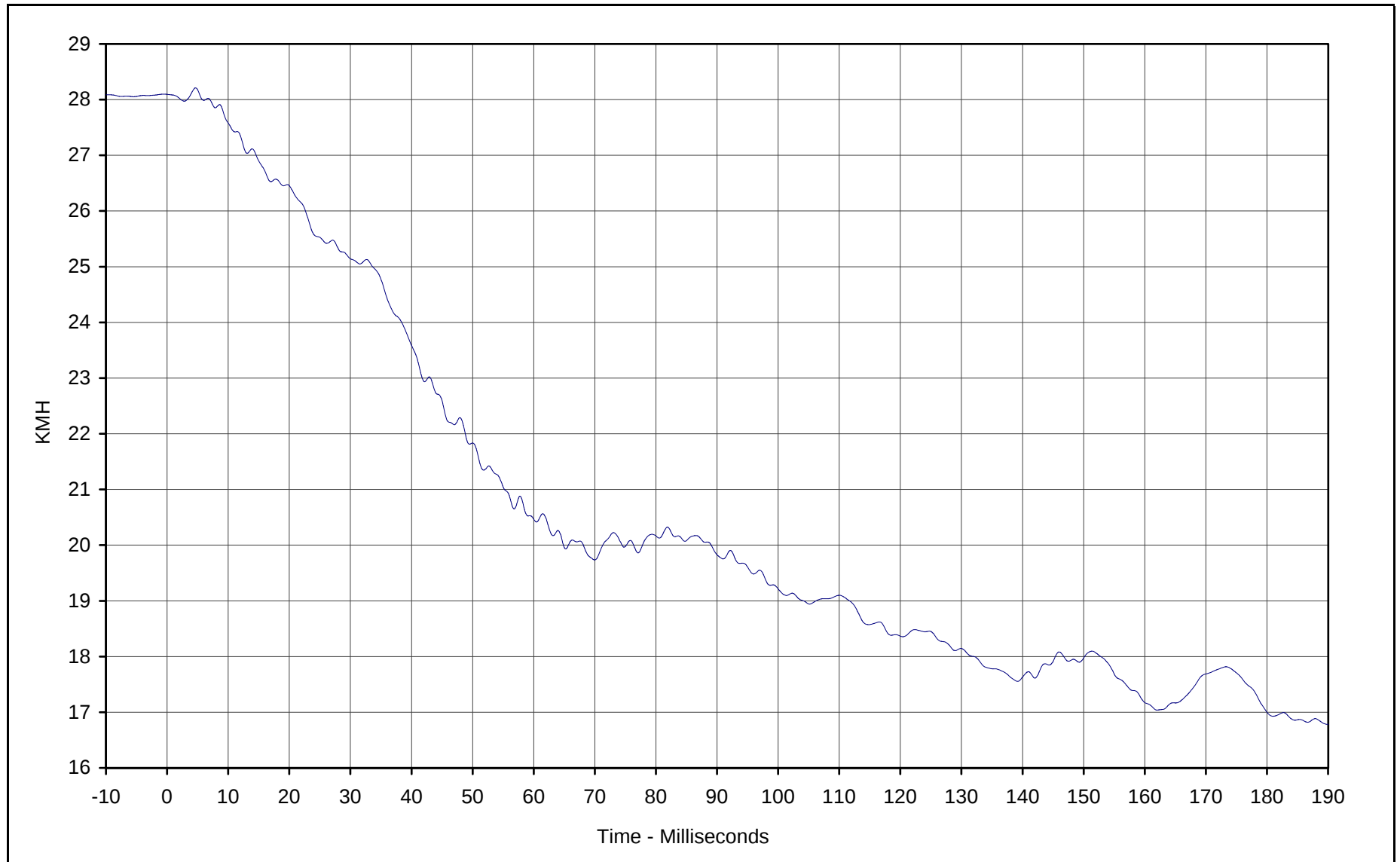




Curve Description: MDB CG Y
Maximum Value: 3.4 at 168.0 Milliseconds
Minimum Value: -7.0 at 40.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-054

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

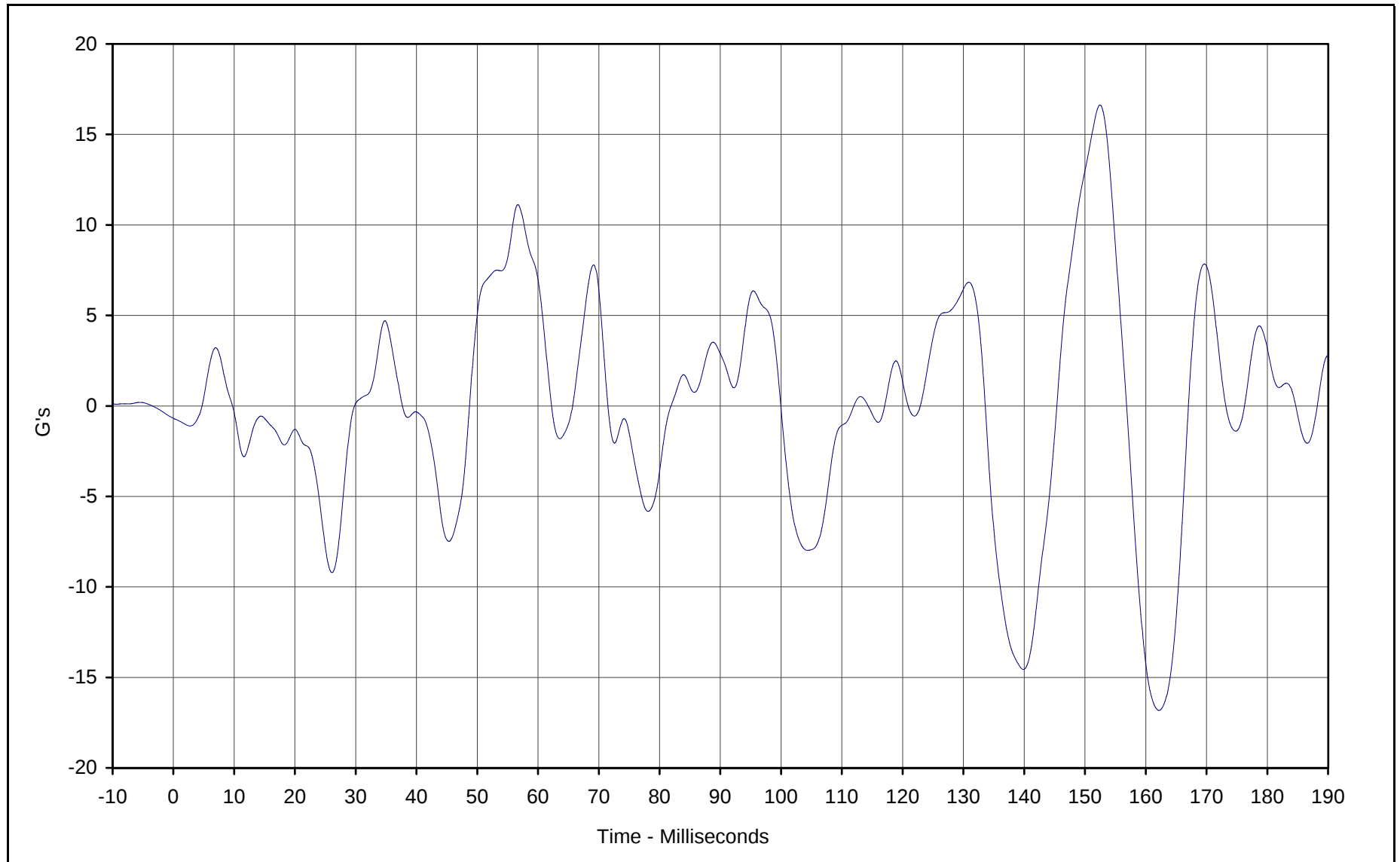




Curve Description: MDB CG Y Velocity
Maximum Value: 28.2 at 4.7 Milliseconds
Minimum Value: 16.8 at 189.8 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-054

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

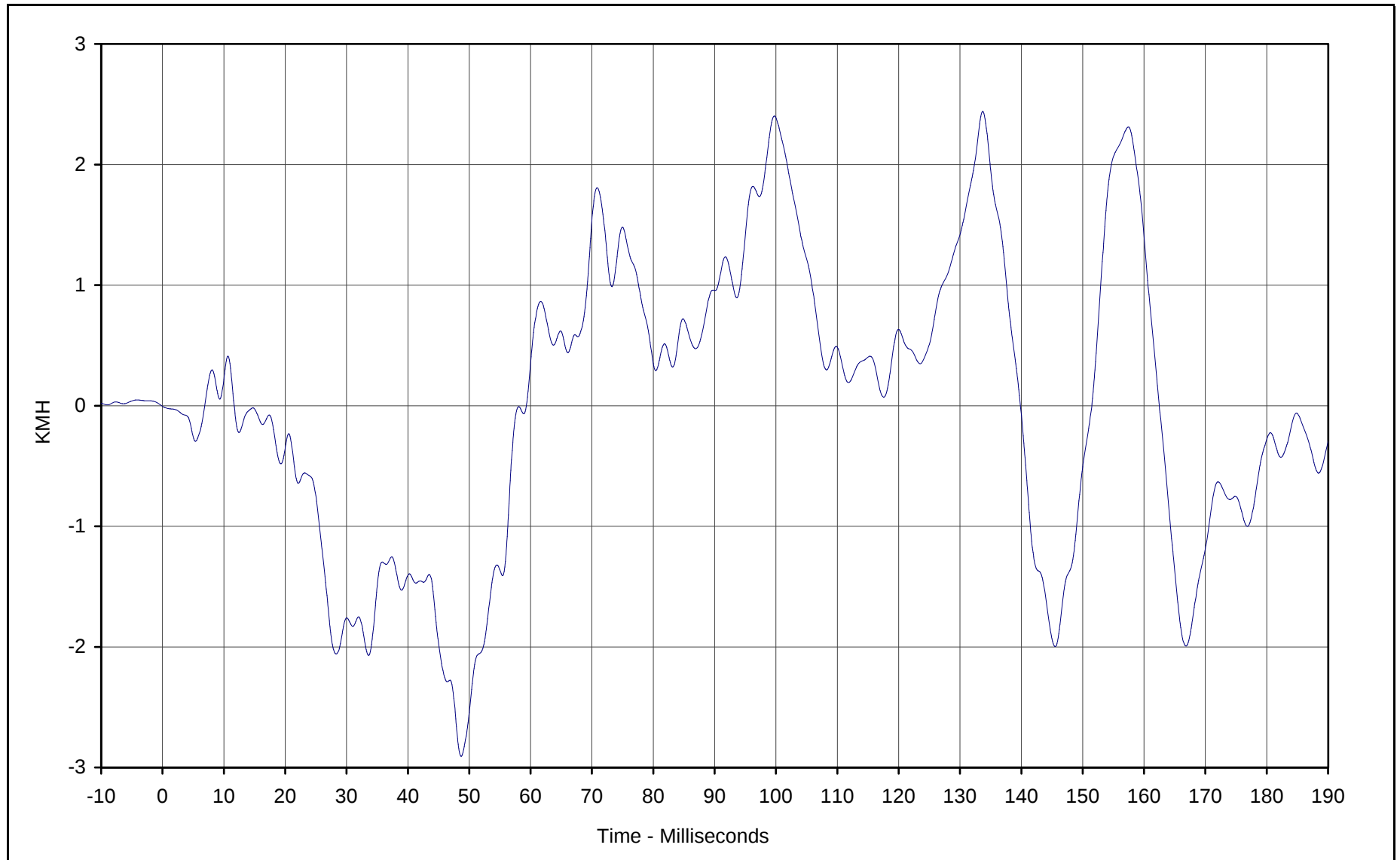




Curve Description: MDB CG Z
Maximum Value: 16.6 at 152.5 Milliseconds
Minimum Value: -16.8 at 162.2 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-055

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

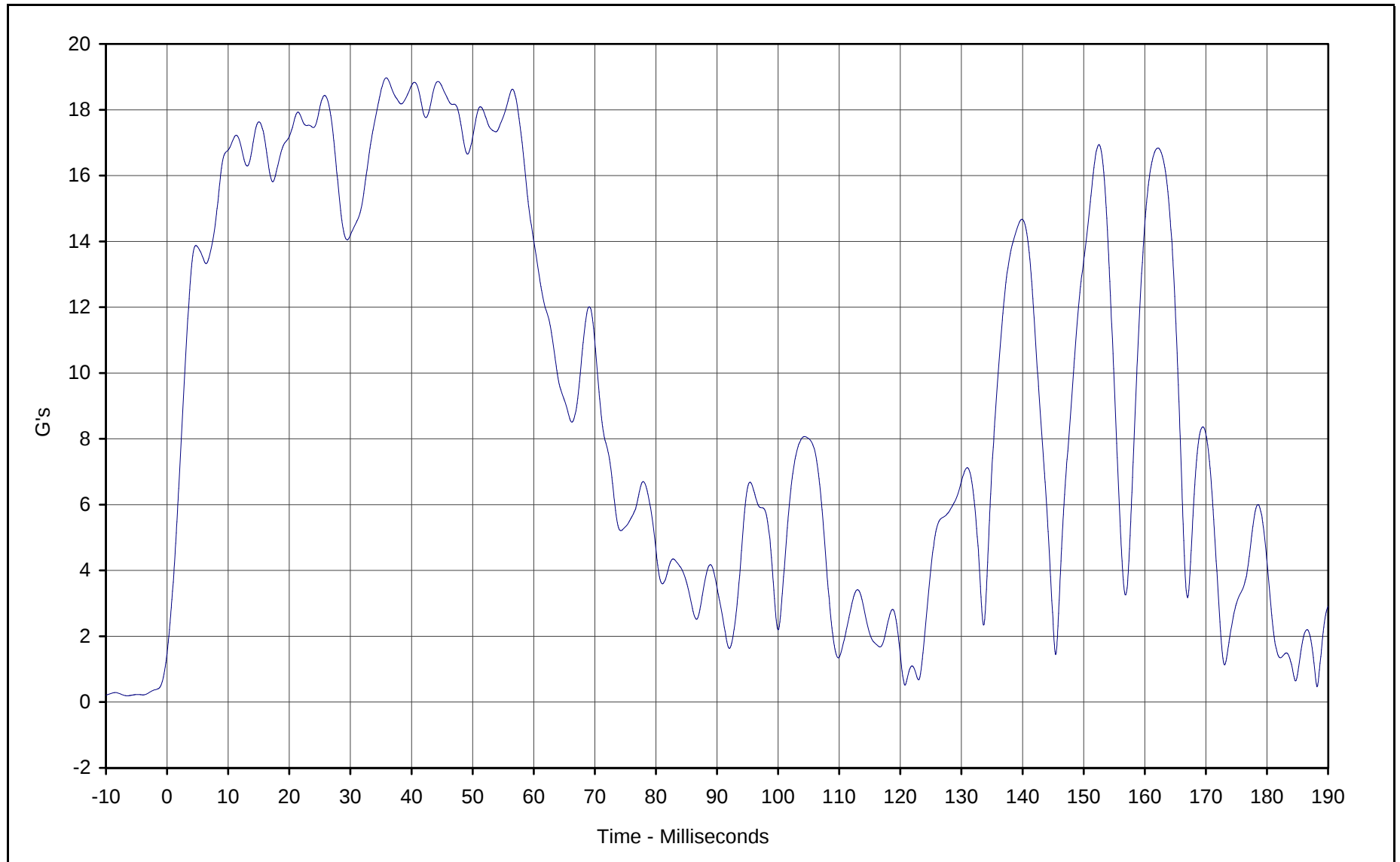




Curve Description: MDB CG Z Velocity
Maximum Value: 2.4 at 133.7 Milliseconds
Minimum Value: -2.9 at 48.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-055

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

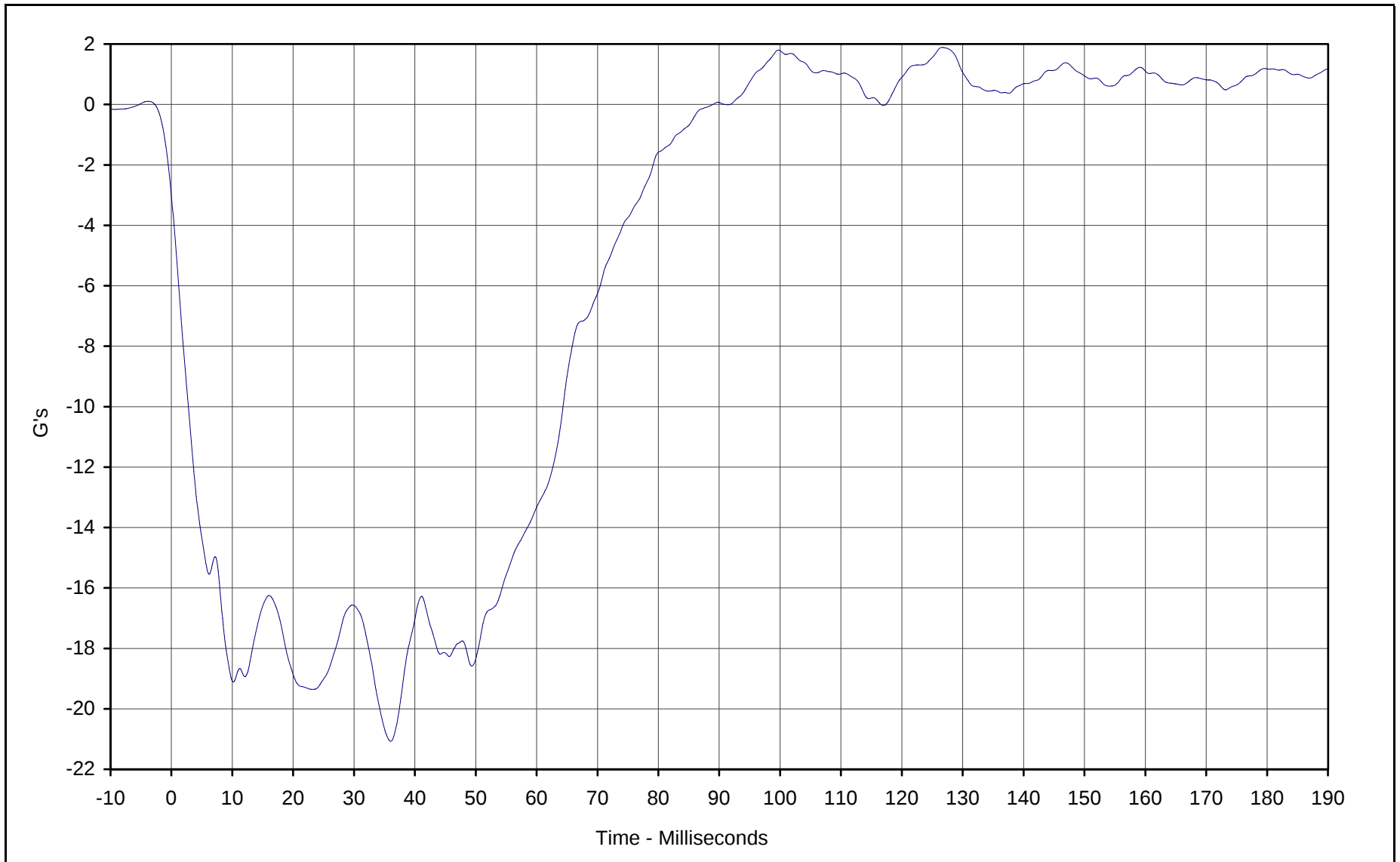




Curve Description: CG Resultant
Maximum Value: 19.0 at 35.9 Milliseconds
Minimum Value: 0.5 at 188.2 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: RES-053

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

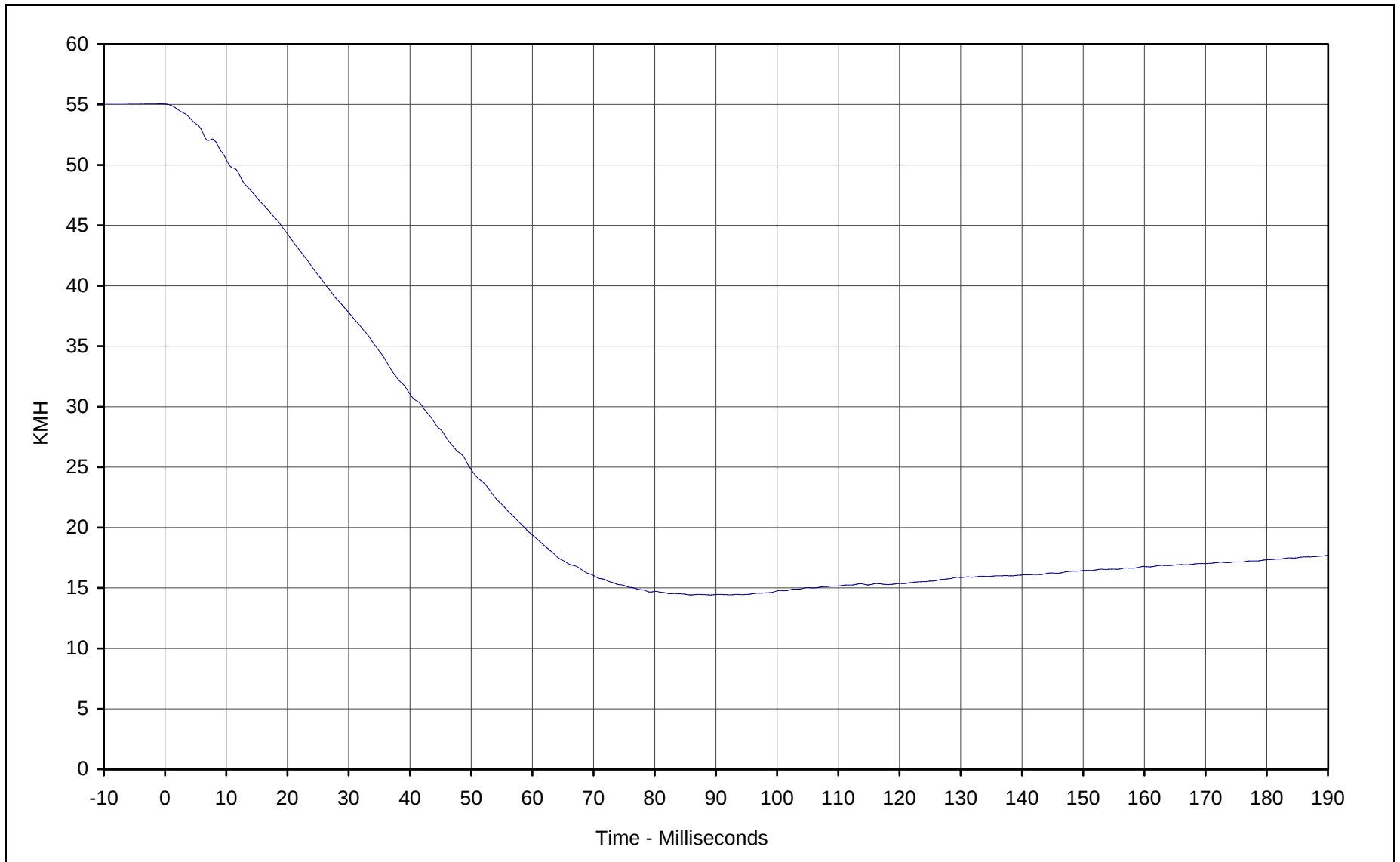




Curve Description: MDB Rear X
Maximum Value: 1.9 at 126.6 Milliseconds
Minimum Value: -21.1 at 36.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-056

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

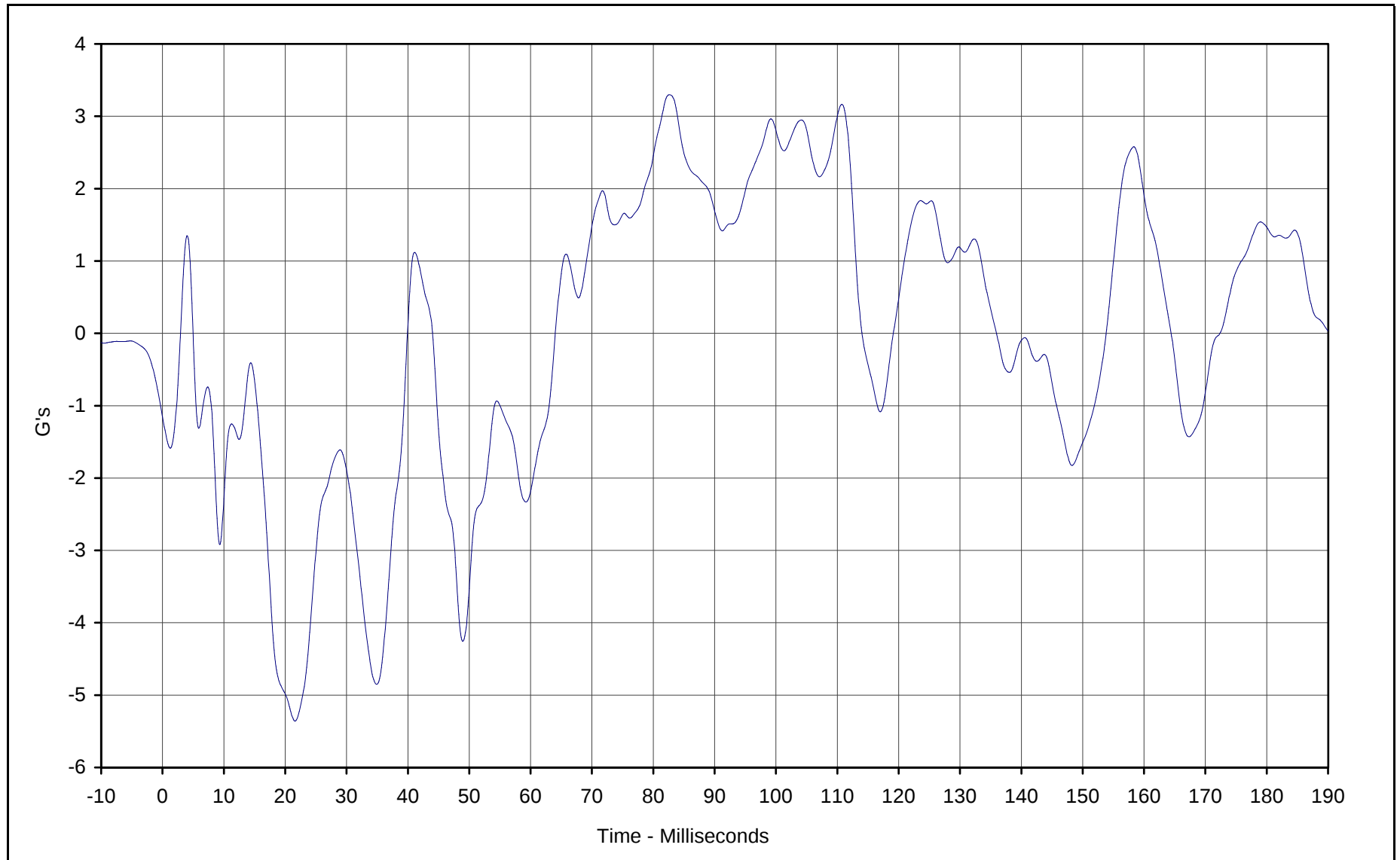




Curve Description: MDB Rear X Velocity
Maximum Value: 55.0 at 0.0 Milliseconds
Minimum Value: 14.4 at 85.9 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-056

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

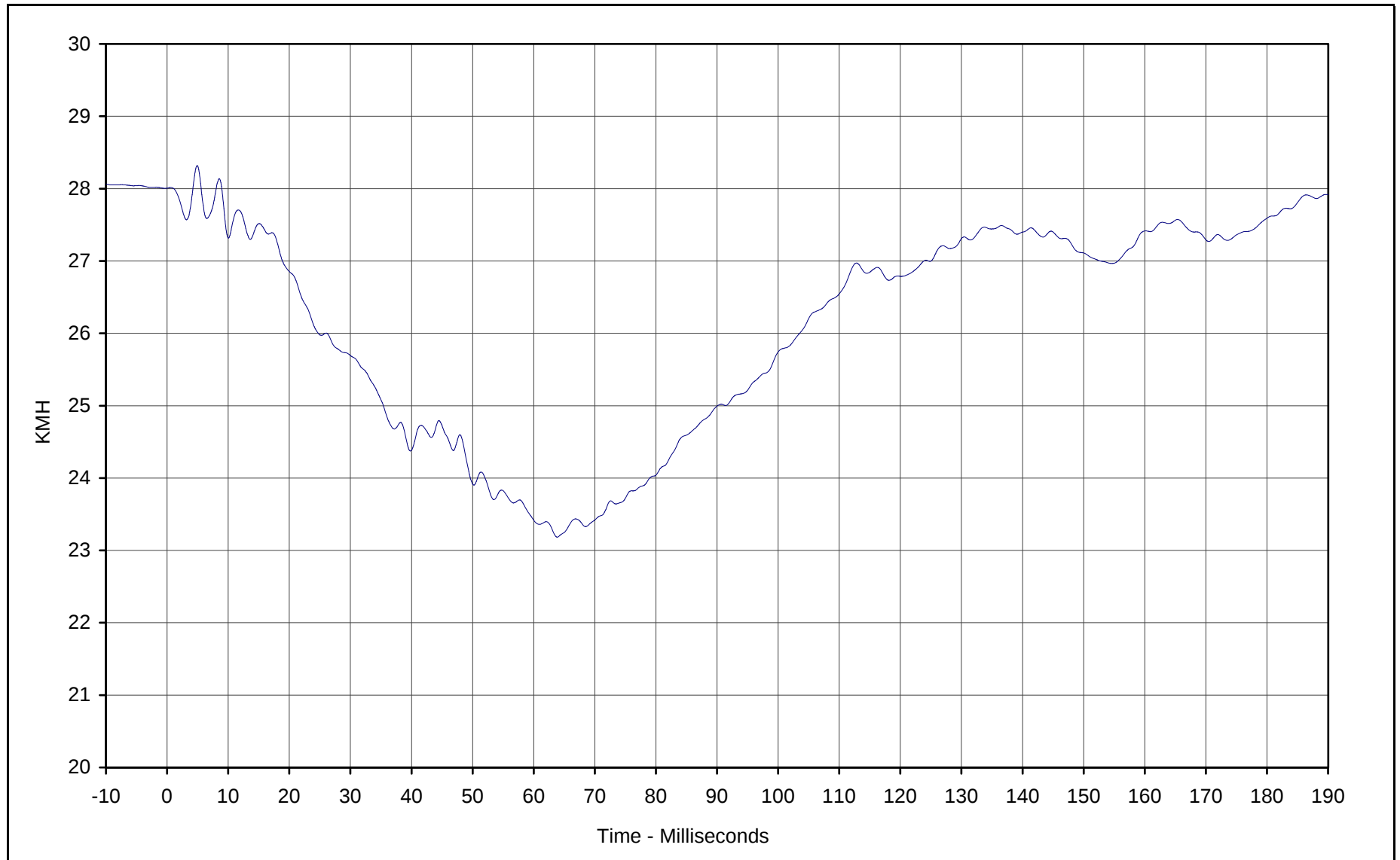




Curve Description: MDB Rear Y
Maximum Value: 3.3 at 82.6 Milliseconds
Minimum Value: -5.4 at 21.6 Milliseconds
SAE Filter Class: 60
Date of Test: 12/6/01
Curve Number: FIL-057

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

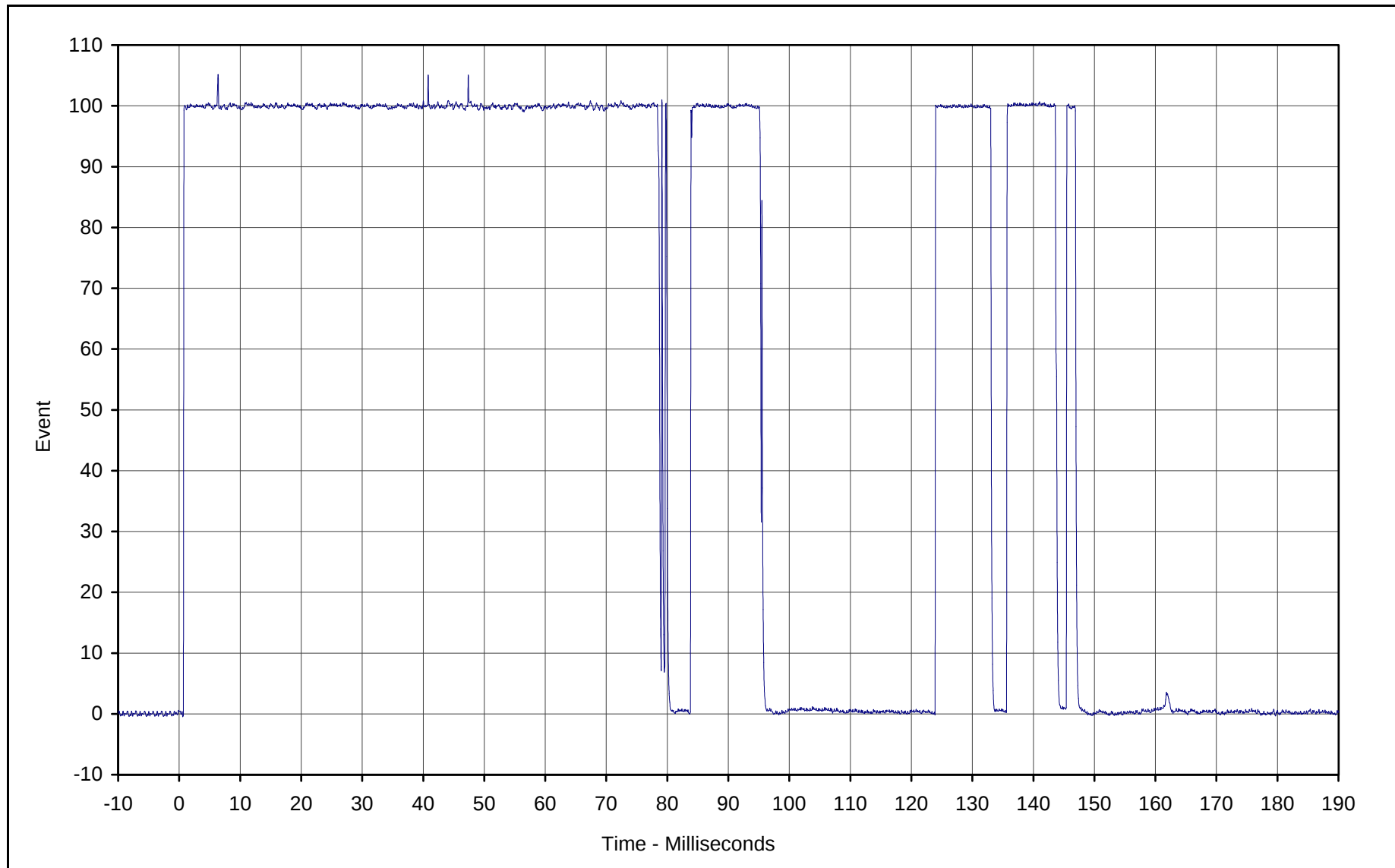




Curve Description: MDB Rear Y Velocity
Maximum Value: 28.3 at 4.9 Milliseconds
Minimum Value: 23.2 at 63.9 Milliseconds
SAE Filter Class: 180
Date of Test: 12/6/01
Curve Number: IN1-057

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

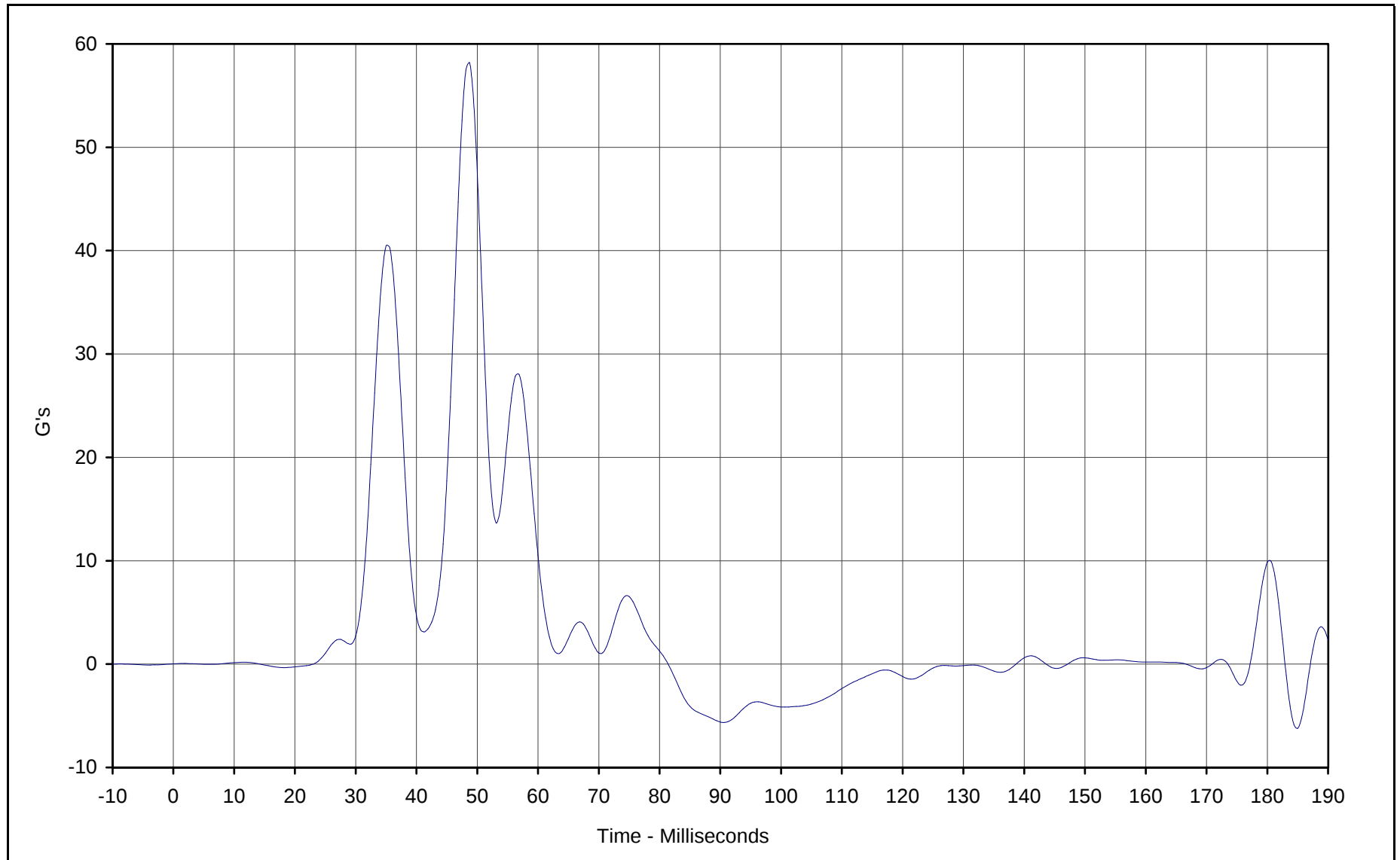




Curve Description: MDB Right Bumper Contact
Maximum Value: 105.1 at 6.4 Milliseconds
Crossing Point: 50% at 0.8 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/6/01
Curve Number: FIL-058

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

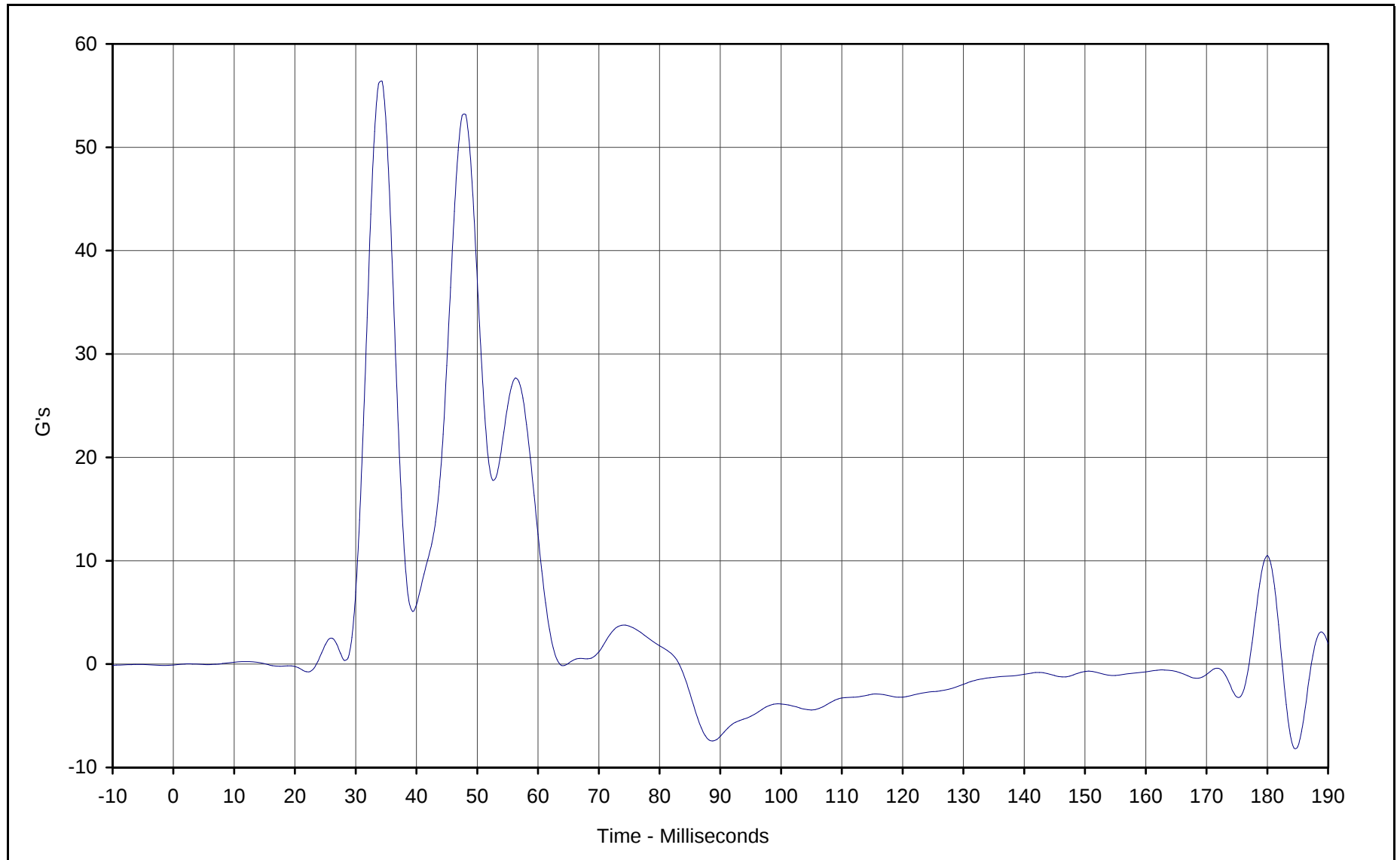




Curve Description: Driver Upper Rib Primary Y
Maximum Value: 58.2 at 48.8 Milliseconds
Minimum Value: -6.2 at 185.0 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-004

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

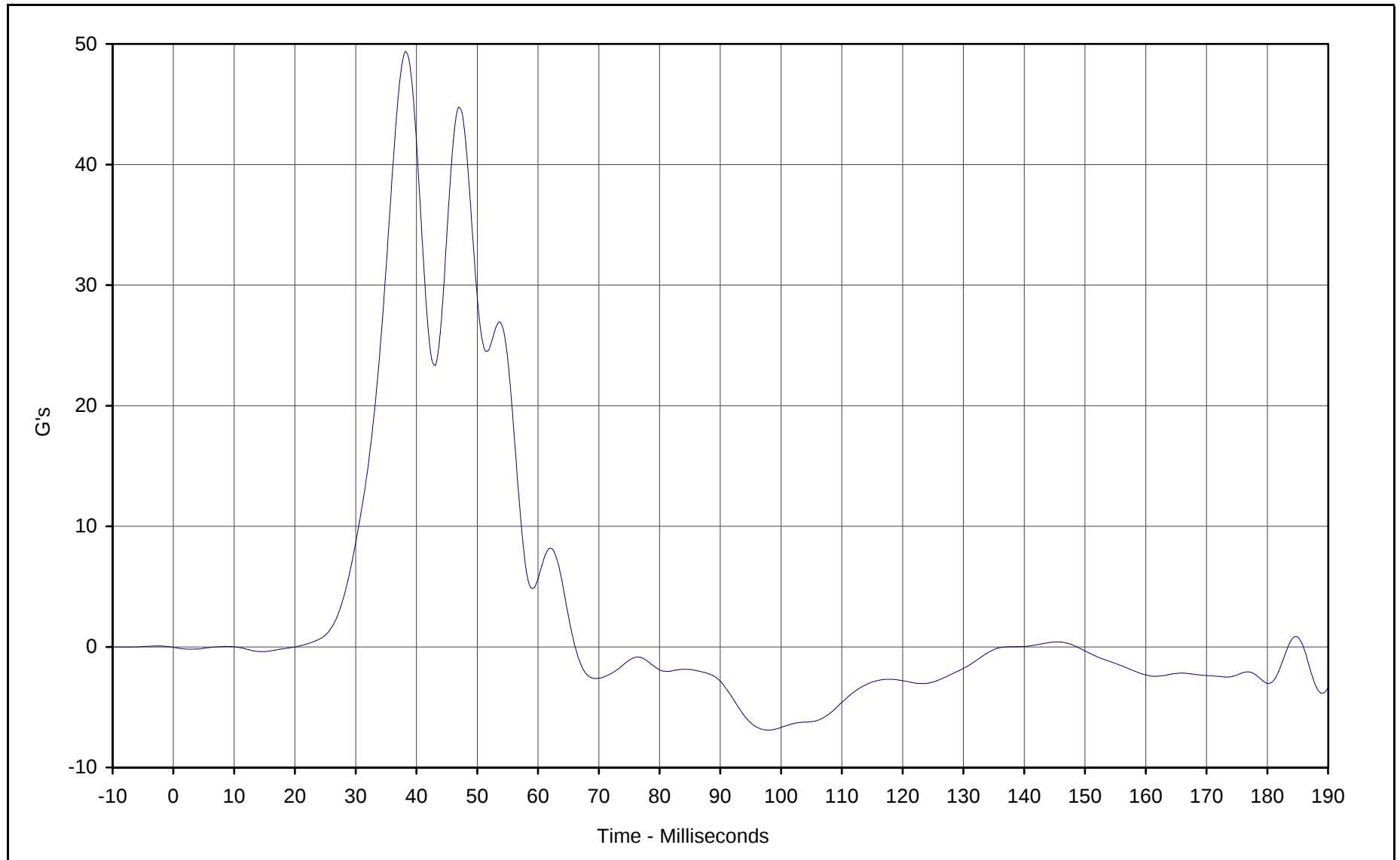




Curve Description: Driver Lower Rib Primary Y
Maximum Value: 56.4 at 34.4 Milliseconds
Minimum Value: -8.1 at 184.4 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-005

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

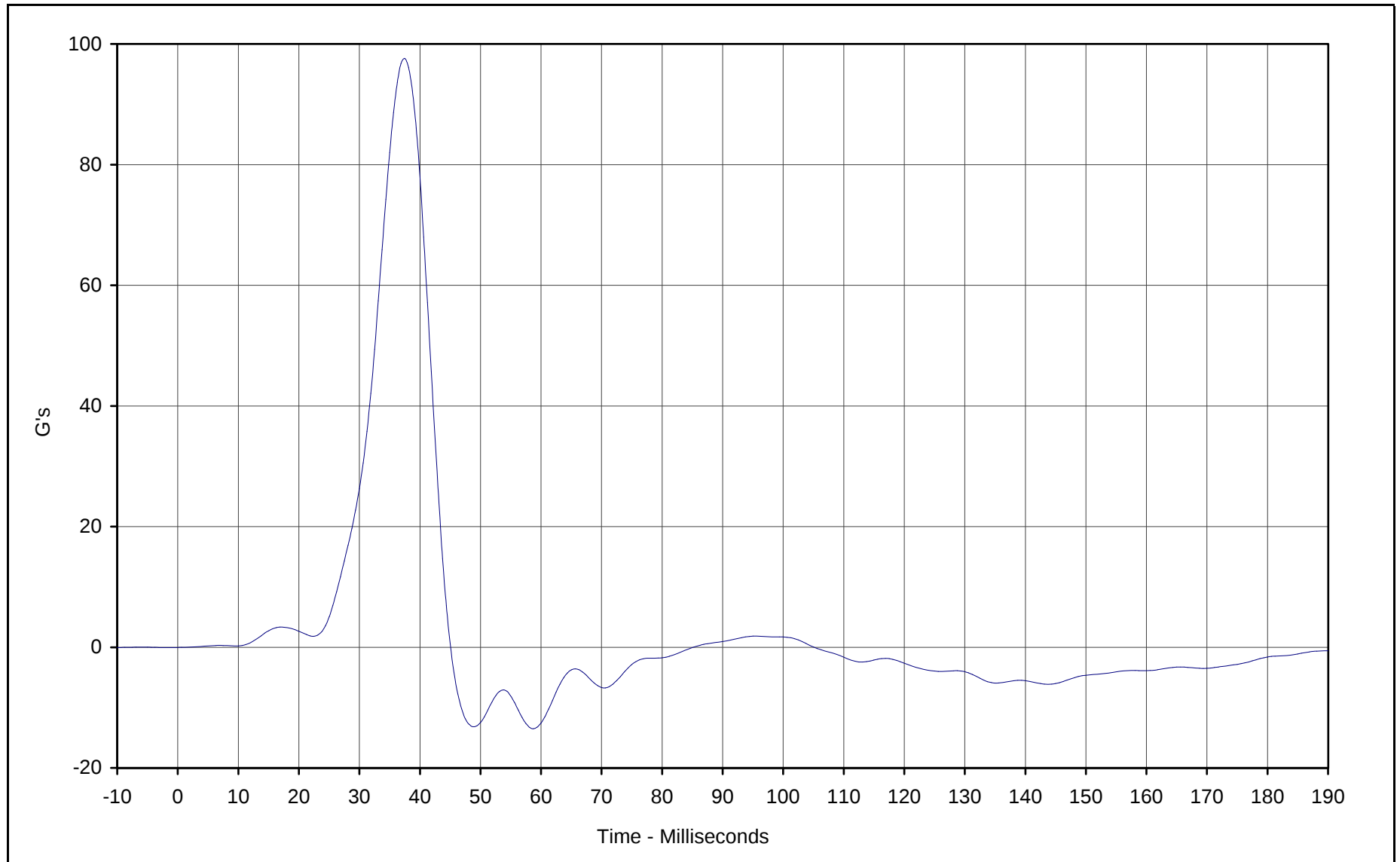




Curve Description: Driver Lower Spine Primary Y
Maximum Value: 49.4 at 38.1 Milliseconds
Minimum Value: -6.9 at 98.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-006

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

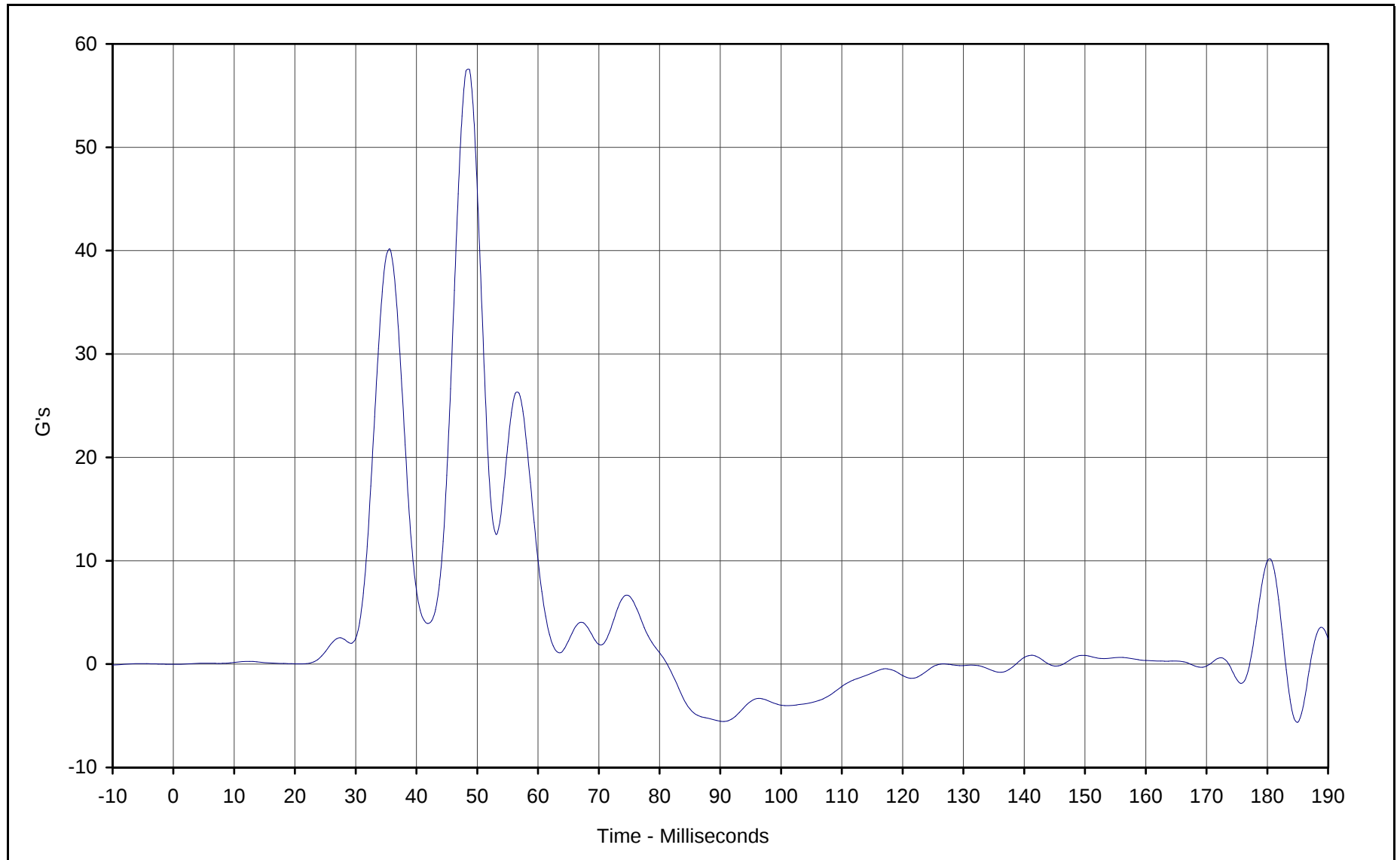




Curve Description: Driver Pelvis Primary Y
Maximum Value: 97.6 at 37.5 Milliseconds
Minimum Value: -13.5 at 58.8 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-007

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

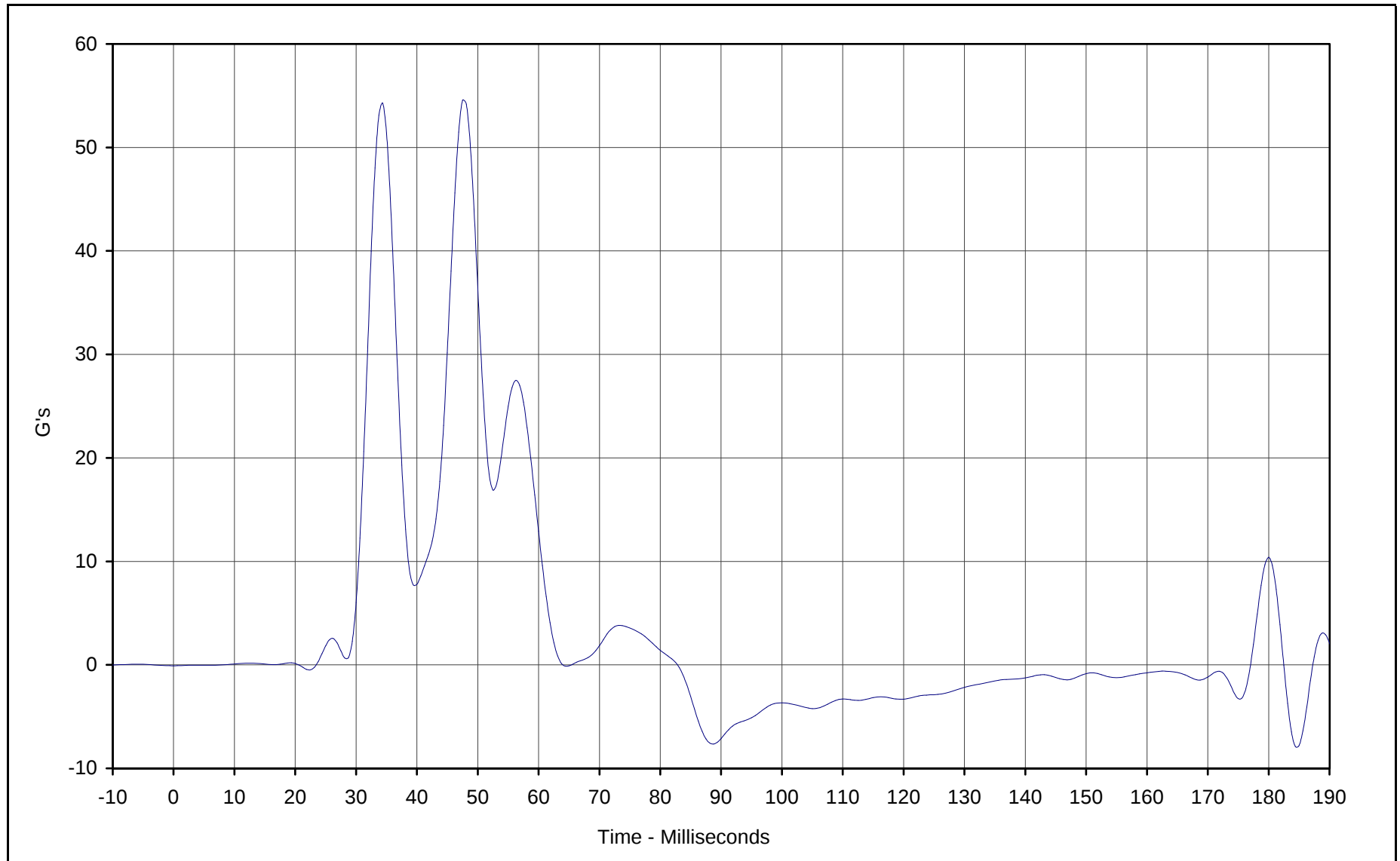




Curve Description: Driver Upper Rib Redundant Y
Maximum Value: 57.5 at 48.8 Milliseconds
Minimum Value: -5.6 at 185.0 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-008

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

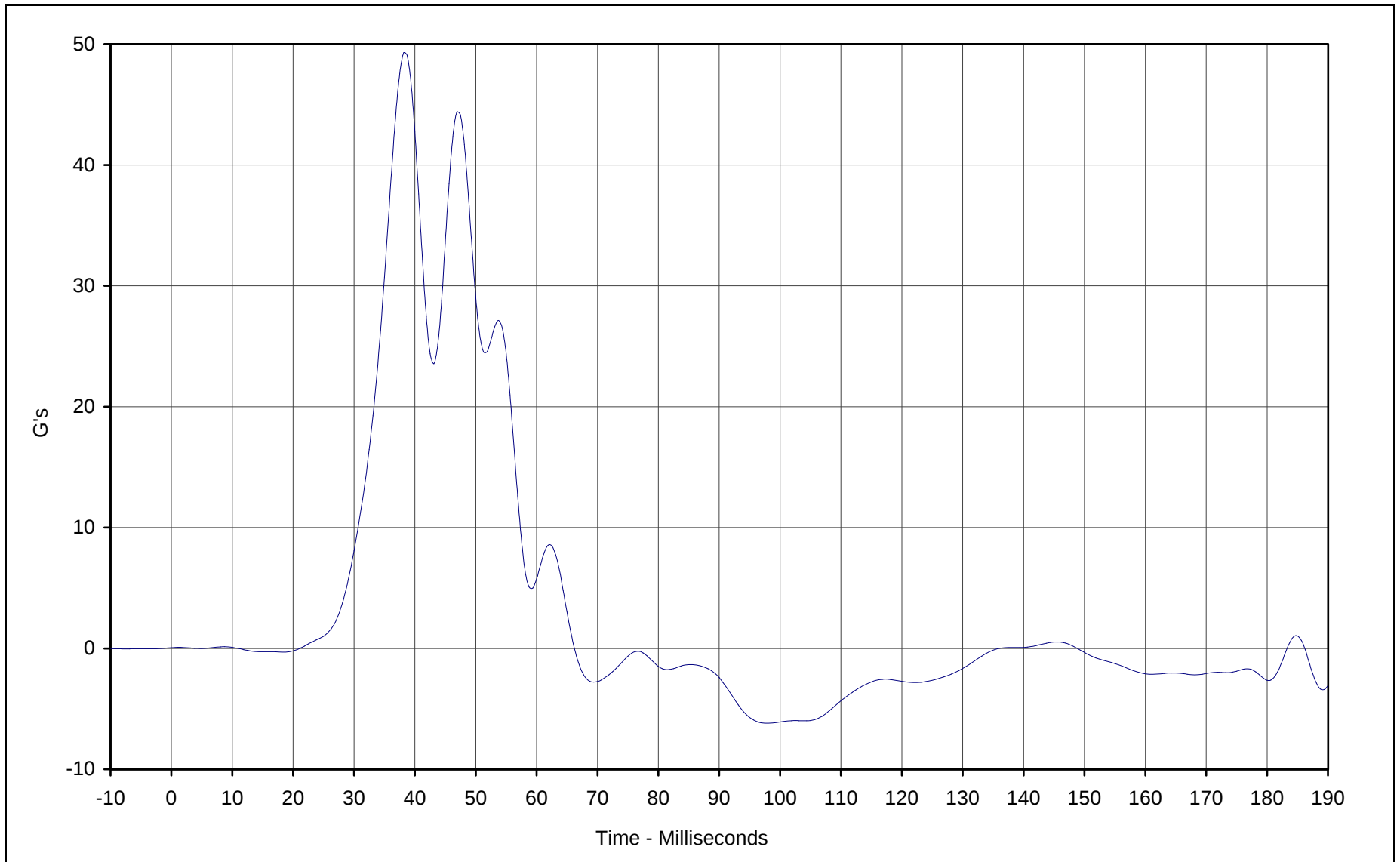




Curve Description: Driver Lower Rib Redundant Y
Maximum Value: 54.6 at 47.5 Milliseconds
Minimum Value: -7.9 at 184.4 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-009

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

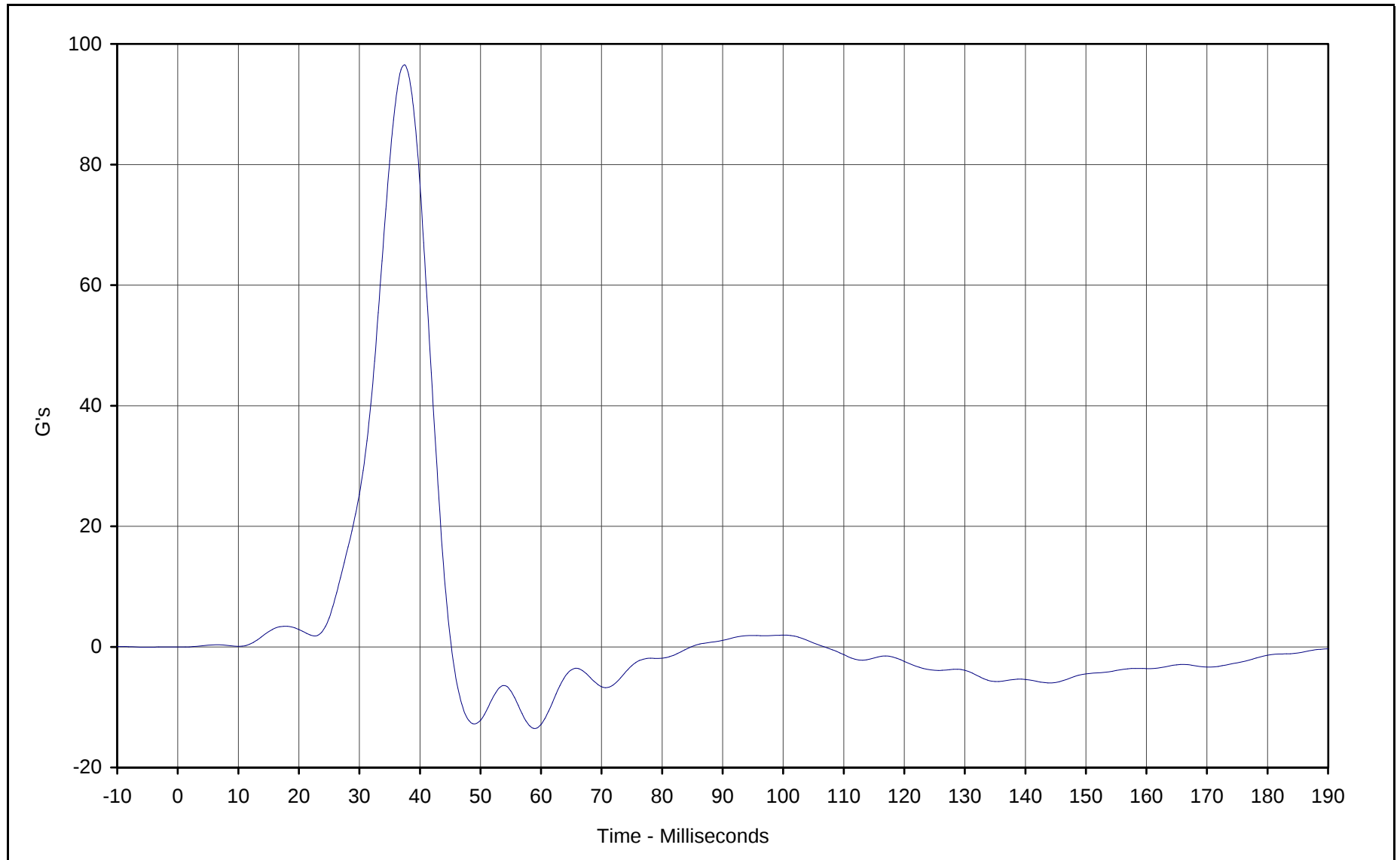




Curve Description: Driver Lower Spine Redundant Y
Maximum Value: 49.3 at 38.1 Milliseconds
Minimum Value: -6.2 at 98.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-010

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

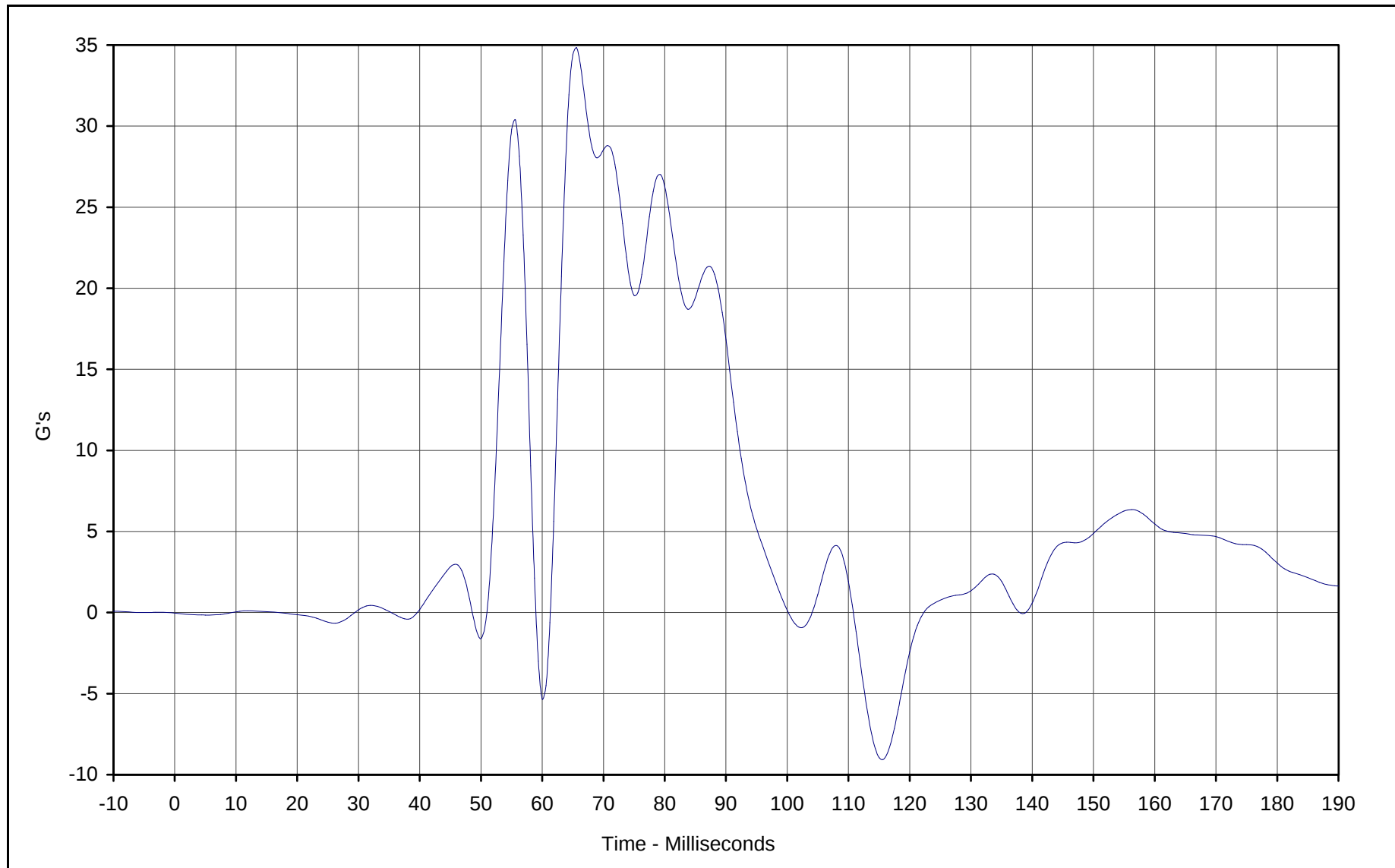




Curve Description: Driver Pelvis Redundant Y
Maximum Value: 96.5 at 37.5 Milliseconds
Minimum Value: -13.5 at 58.8 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-011

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Pass. Upper Rib Primary Y

Maximum Value: 34.8 at 65.6 Milliseconds

Minimum Value: -9.1 at 115.6 Milliseconds

SAE Filter Class: FIR 100

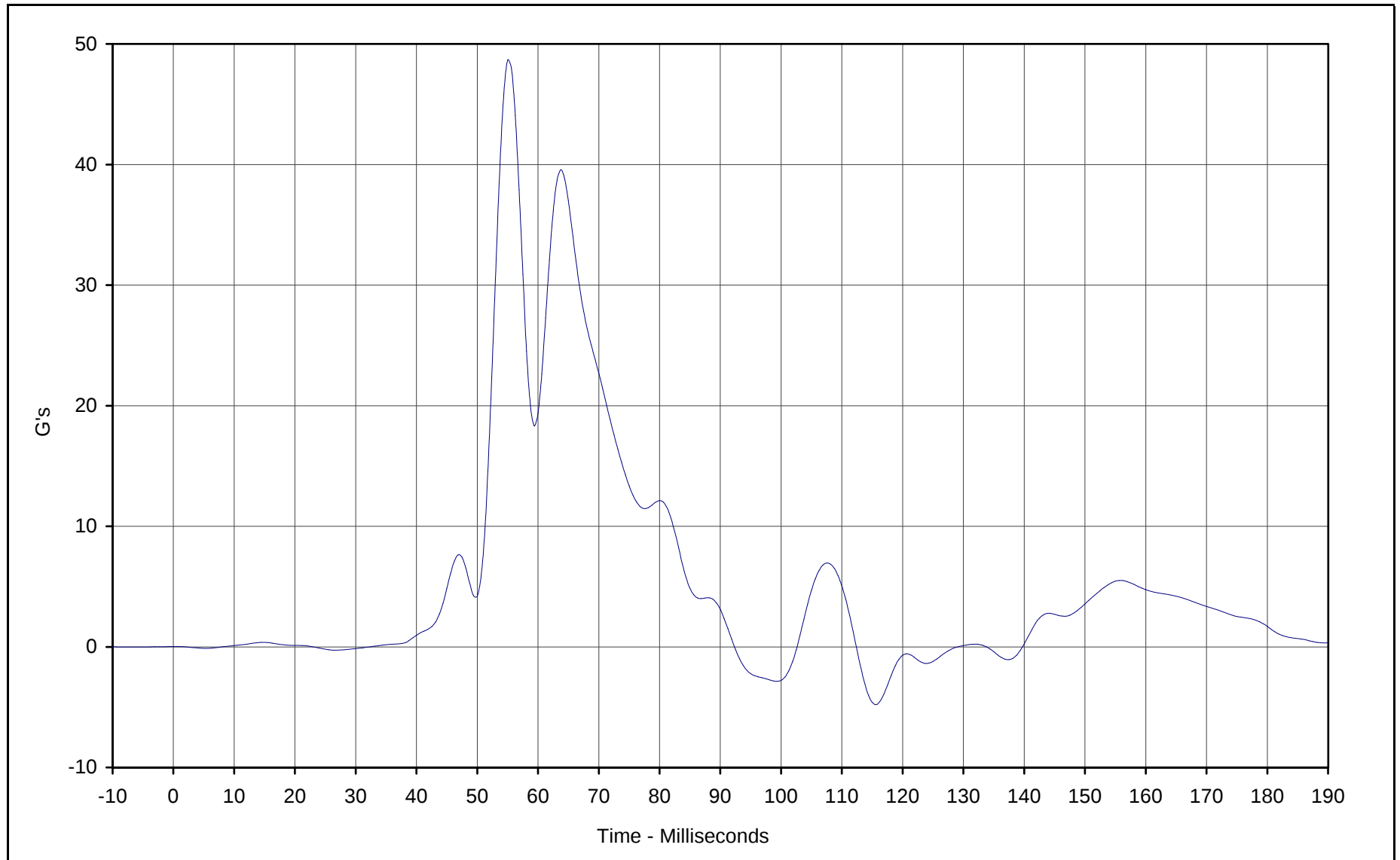
Date of Test: 12/6/01

Curve Number: FIR-017

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002

Test Vehicle: 2002 Kia Sedona LX Minivan

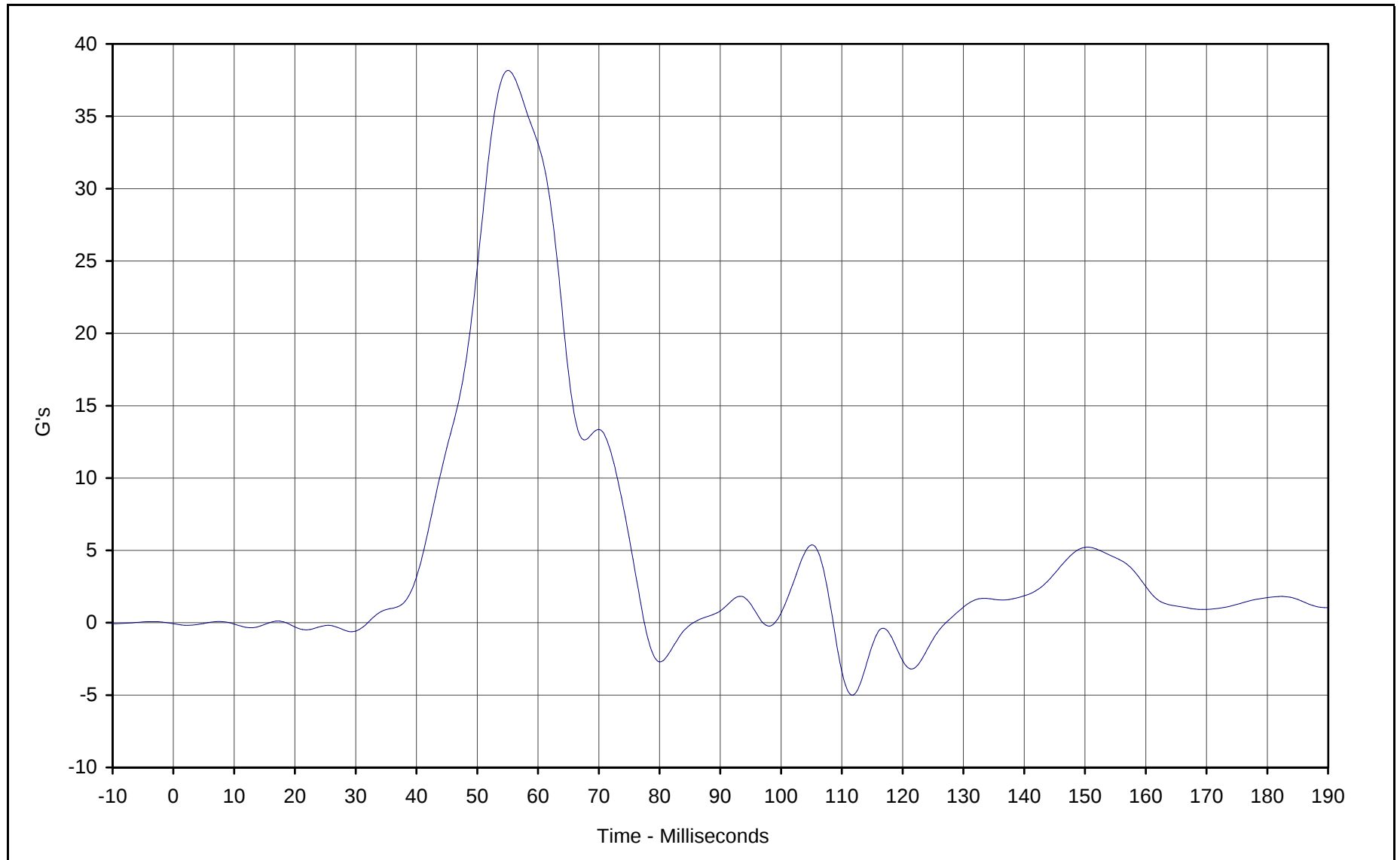




Curve Description: Pass. Lower Rib Primary Y
Maximum Value: 48.7 at 55.0 Milliseconds
Minimum Value: -4.8 at 115.6 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-018

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

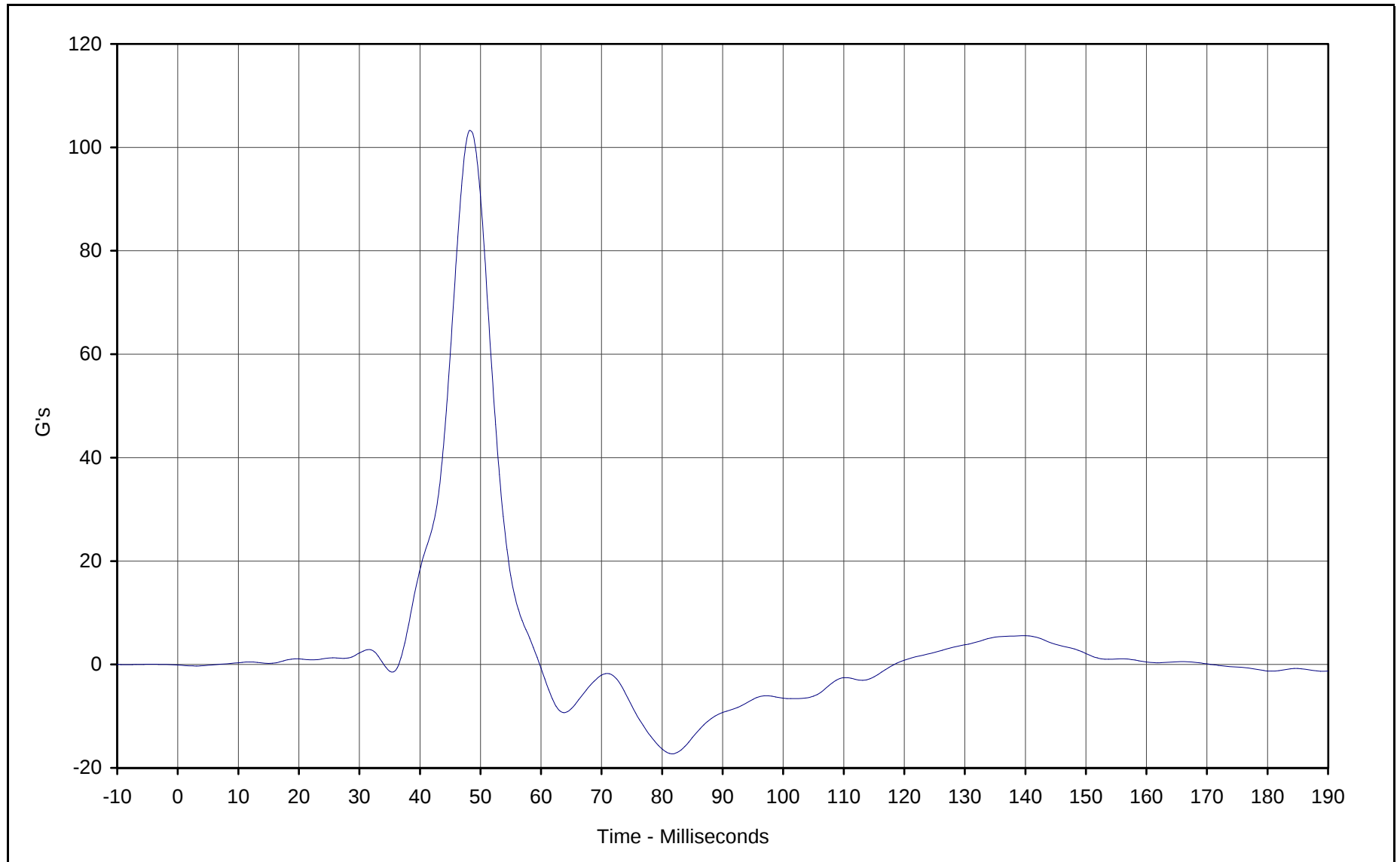




Curve Description: Pass. Lower Spine Primary Y
Maximum Value: 38.2 at 55.0 Milliseconds
Minimum Value: -5.0 at 111.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-019

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

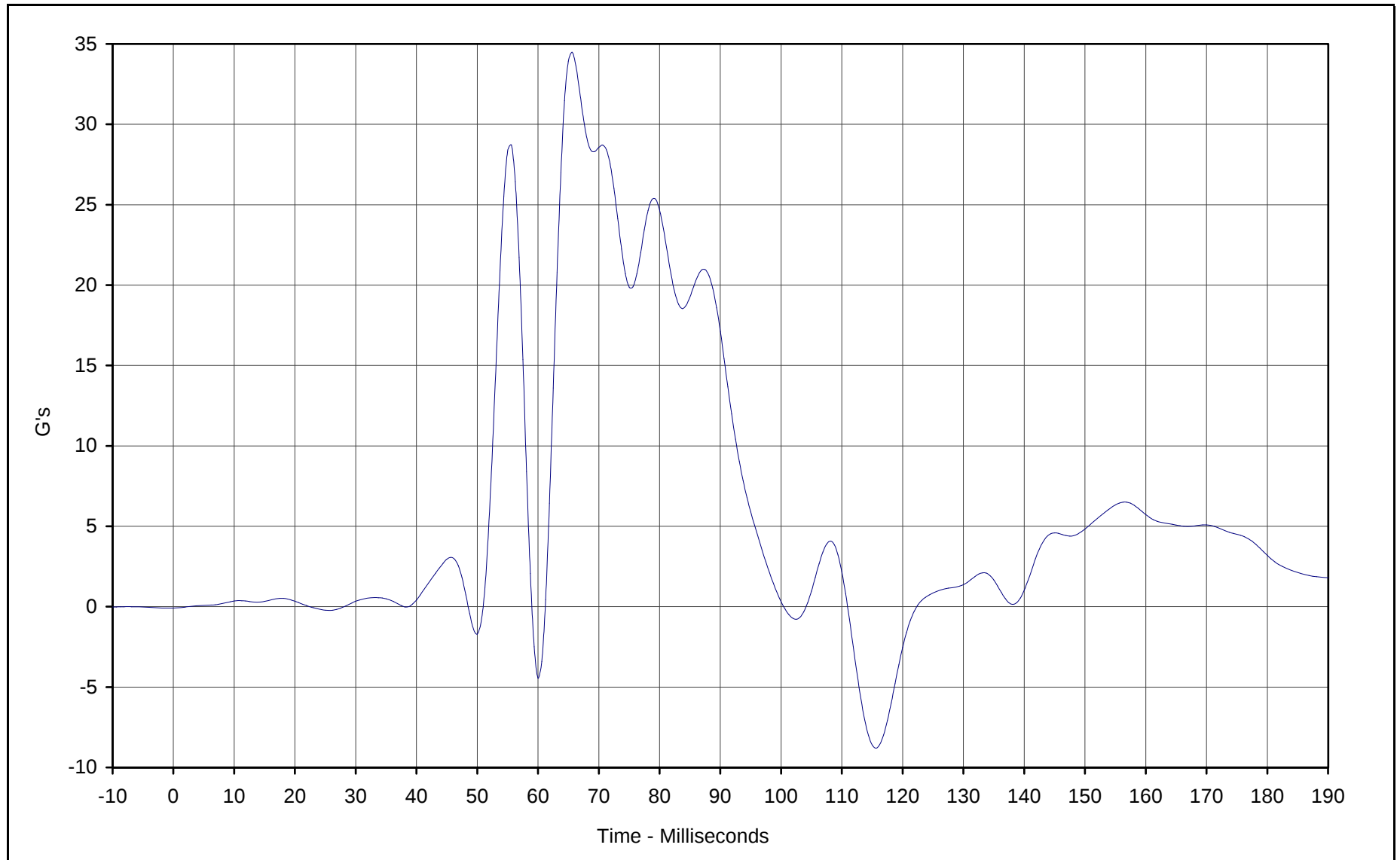




Curve Description: Pass. Pelvis Primary Y
Maximum Value: 103.2 at 48.1 Milliseconds
Minimum Value: -17.3 at 81.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-020

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

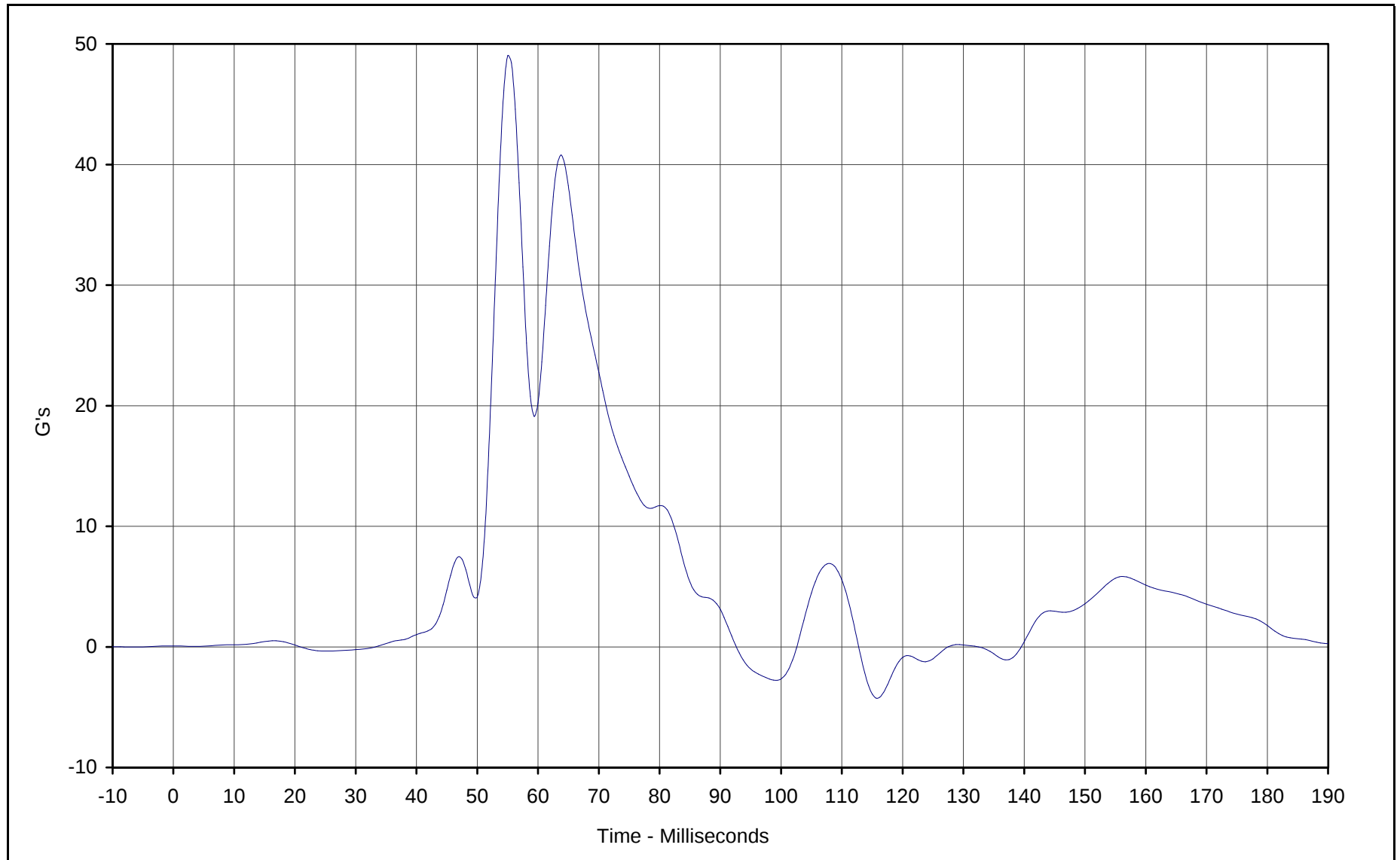




Curve Description: Pass. Upper Rib Redundant Y
Maximum Value: 34.5 at 65.6 Milliseconds
Minimum Value: -8.8 at 115.6 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-021

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

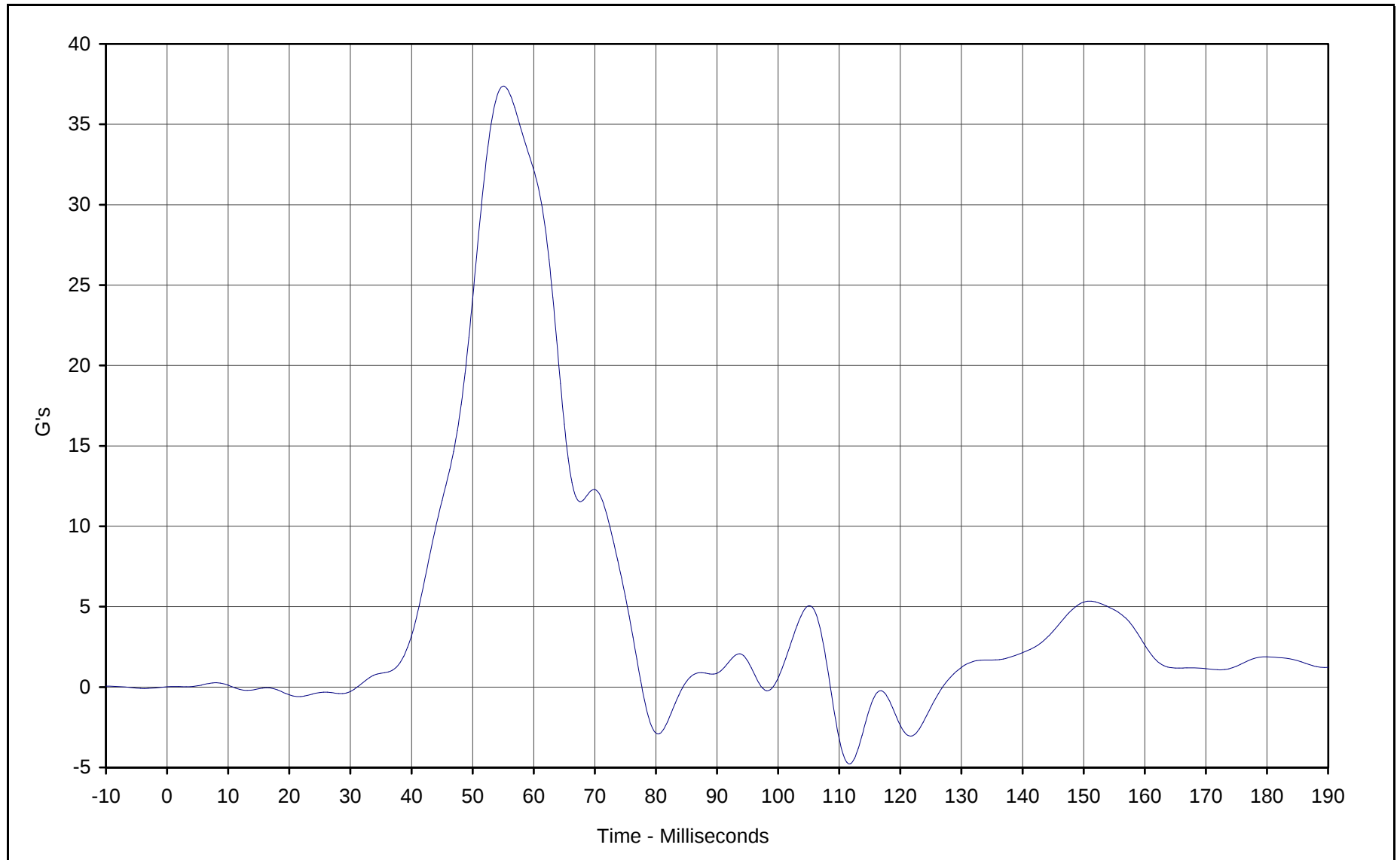




Curve Description: Pass. Lower Rib Redundant Y
Maximum Value: 49.0 at 55.0 Milliseconds
Minimum Value: -4.2 at 115.6 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-022

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan

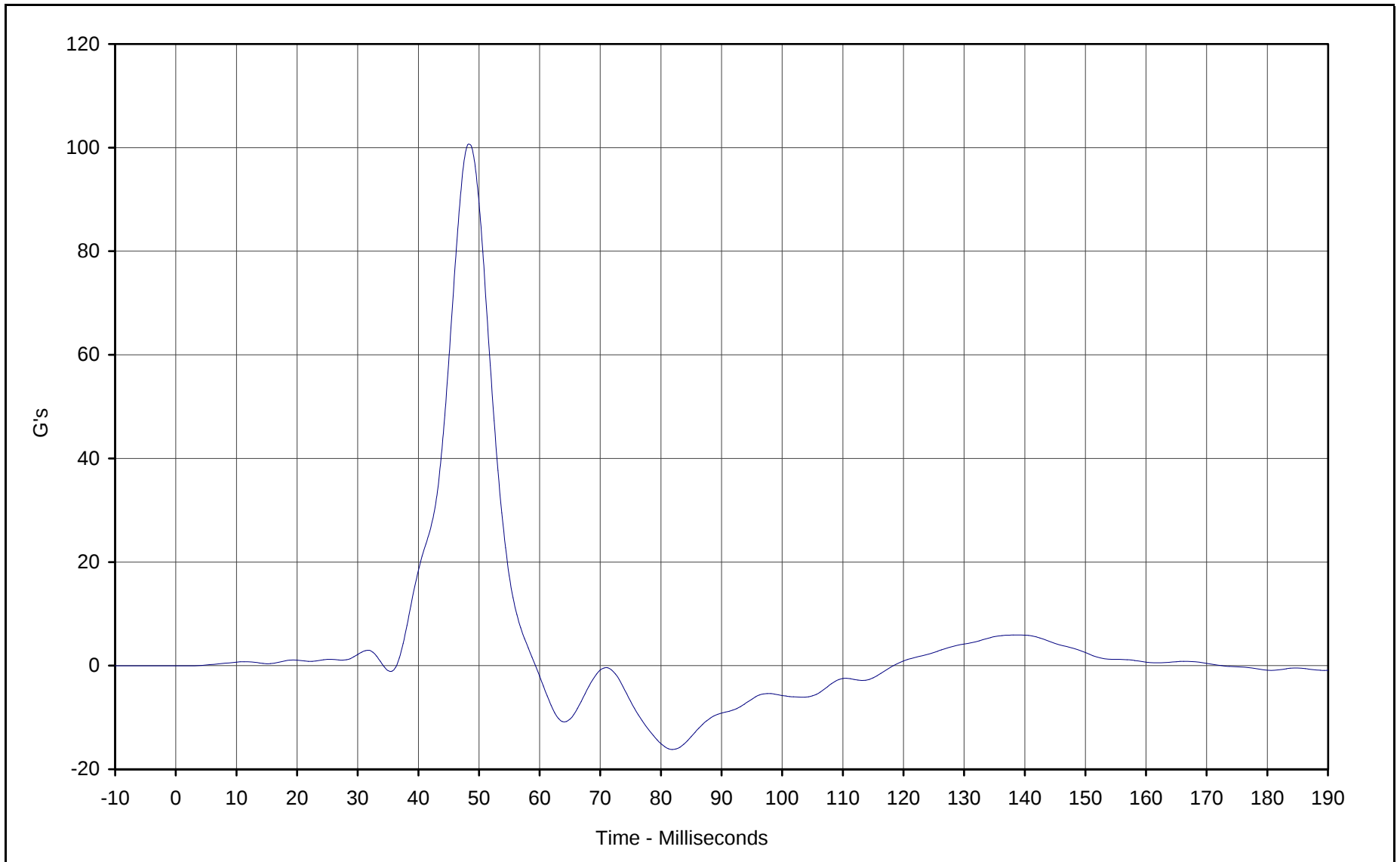




Curve Description: Pass. Lower Spine Redundant Y
Maximum Value: 37.4 at 55.0 Milliseconds
Minimum Value: -4.8 at 111.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-023

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan





Curve Description: Pass. Pelvis Redundant Y
Maximum Value: 100.5 at 48.1 Milliseconds
Minimum Value: -16.2 at 81.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/01
Curve Number: FIR-024

Test Program: 55/28 km/h Side Impact NCAP No.: KIA5002
Test Vehicle: 2002 Kia Sedona LX Minivan



APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
PRE-TEST SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA



Performance Verification Data Side Impact Dummy (SID) External Dimensions

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	21.1	Pass
Laboratory relative humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	895	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	505	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	515	Pass
KV- Knee Pivot From Floor	mm	490 to 505	495	Pass
HW- Hip Width	mm	356 to 391	380	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001

Test Date



Performance Verification Data Side Impact Dummy (SID) Thorax Lateral Impact

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: TI11G

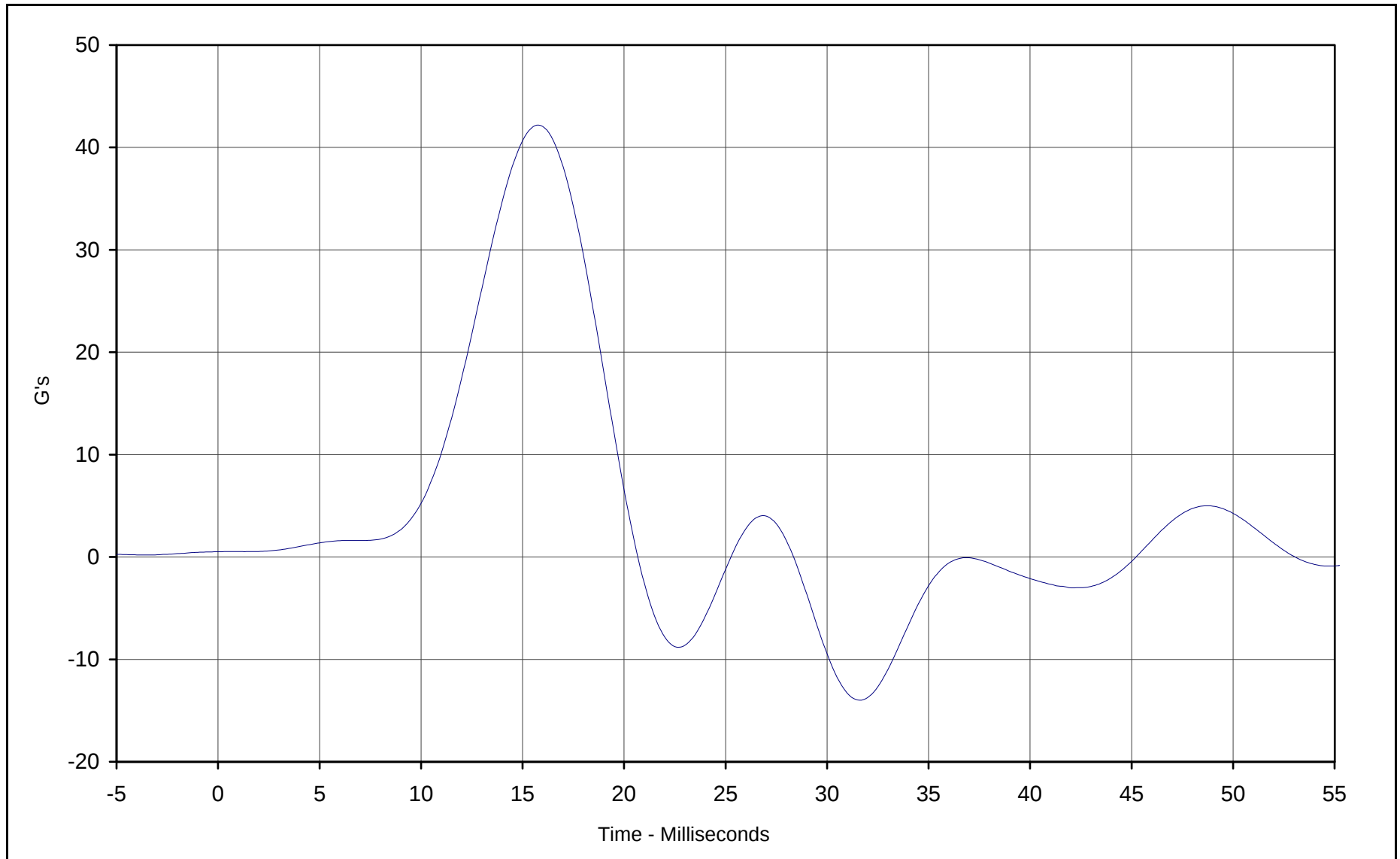
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.27	Pass
Left Upper Rib Acceleration	G's	37.0 to 46.0	42.2	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	41.6	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.1	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001

Test Date

C-3



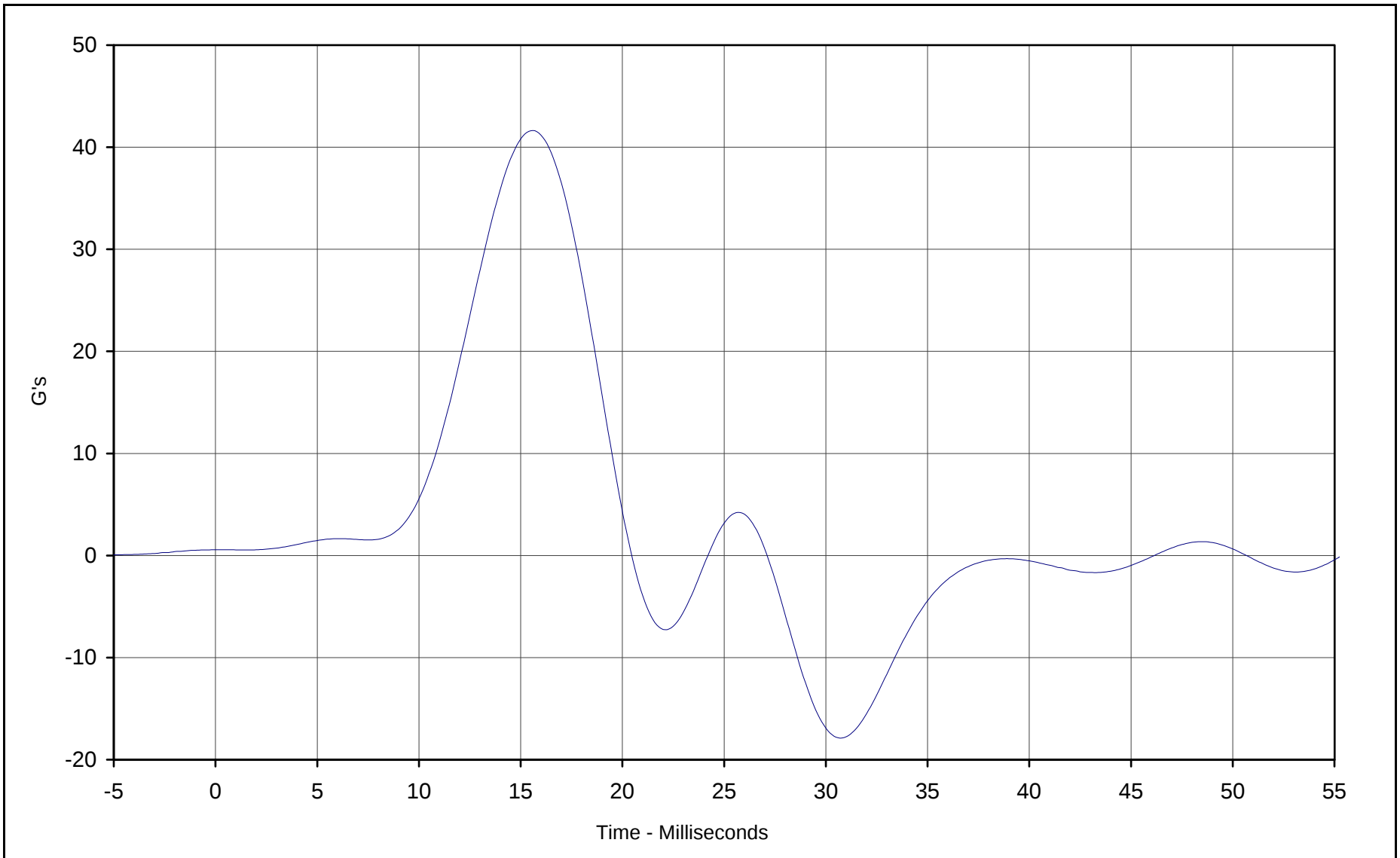
Curve Description: Left Upper Rib Y Acceleration
Maximum Value: 42.2 at 15.8 Milliseconds
Minimum Value: -14.0 at 31.6 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 11/21/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 274 Test I.D.: TI11G



KAR21130-01

C-4



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 41.6 at 15.6 Milliseconds

Minimum Value: -17.9 at 30.7 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 11/21/01

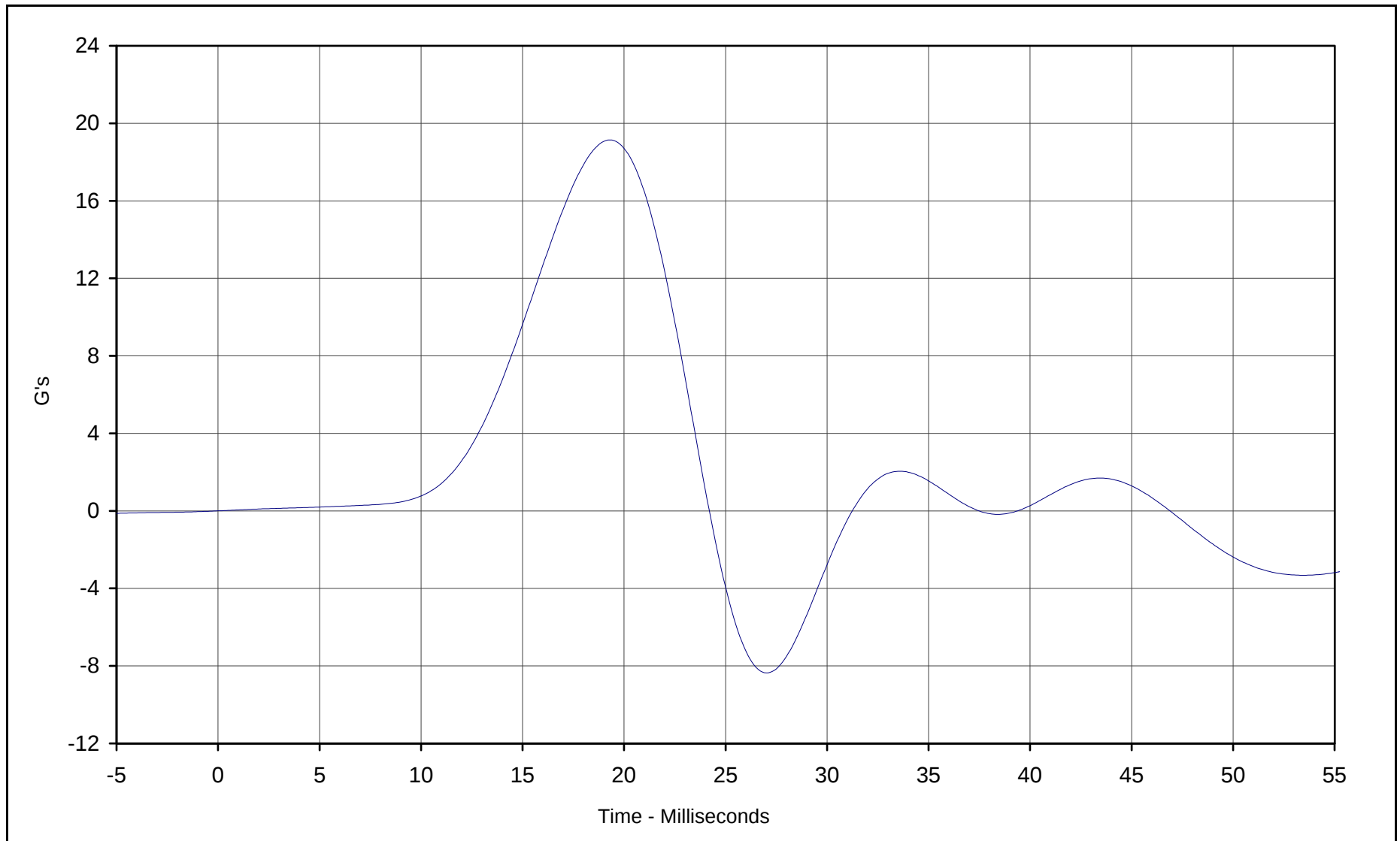
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 274 Test I.D.: TI11G



KAR21130-01

C-5



Curve Description: Lower Spine Y Acceleration
Maximum Value: 19.1 at 19.3 Milliseconds
Minimum Value: -8.4 at 27.0 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 11/21/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 274 Test I.D.: TI11G



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Left Side Pelvis Lateral Impact

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: PI11G

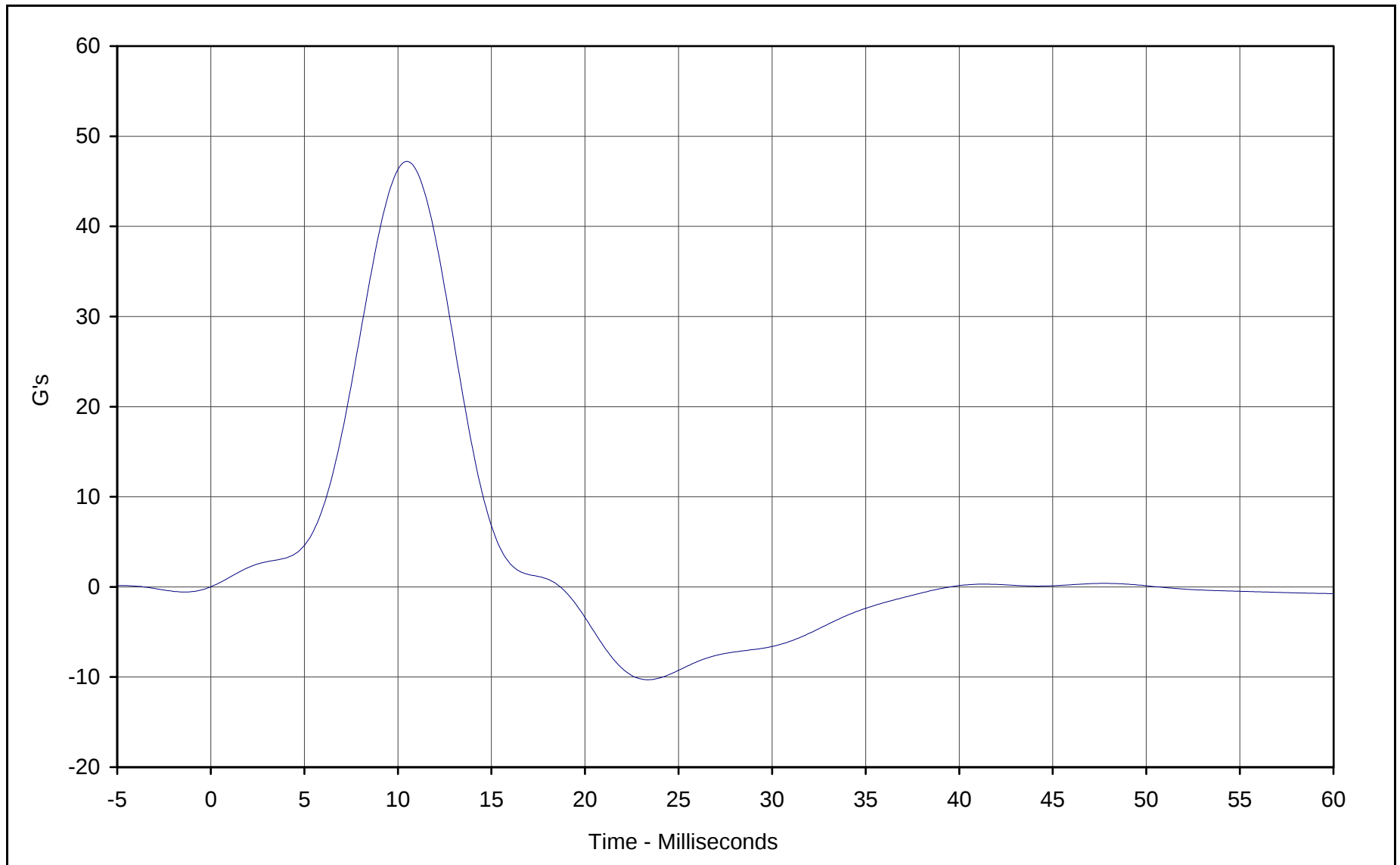
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.33	Pass
Pelvis Acceleration	G's	40.0 to 60.0	47.2	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	6.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001

Test Date

C-7



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 47.2 at 10.5 Milliseconds
Minimum Value: -10.3 at 23.3 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 11/21/01

Test Program: SID Left Side Pelvis Lateral Impact
Test Information: SID S/N: 274 Test I.D.: PI11G



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Abdominal Compression Test

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: AB11G

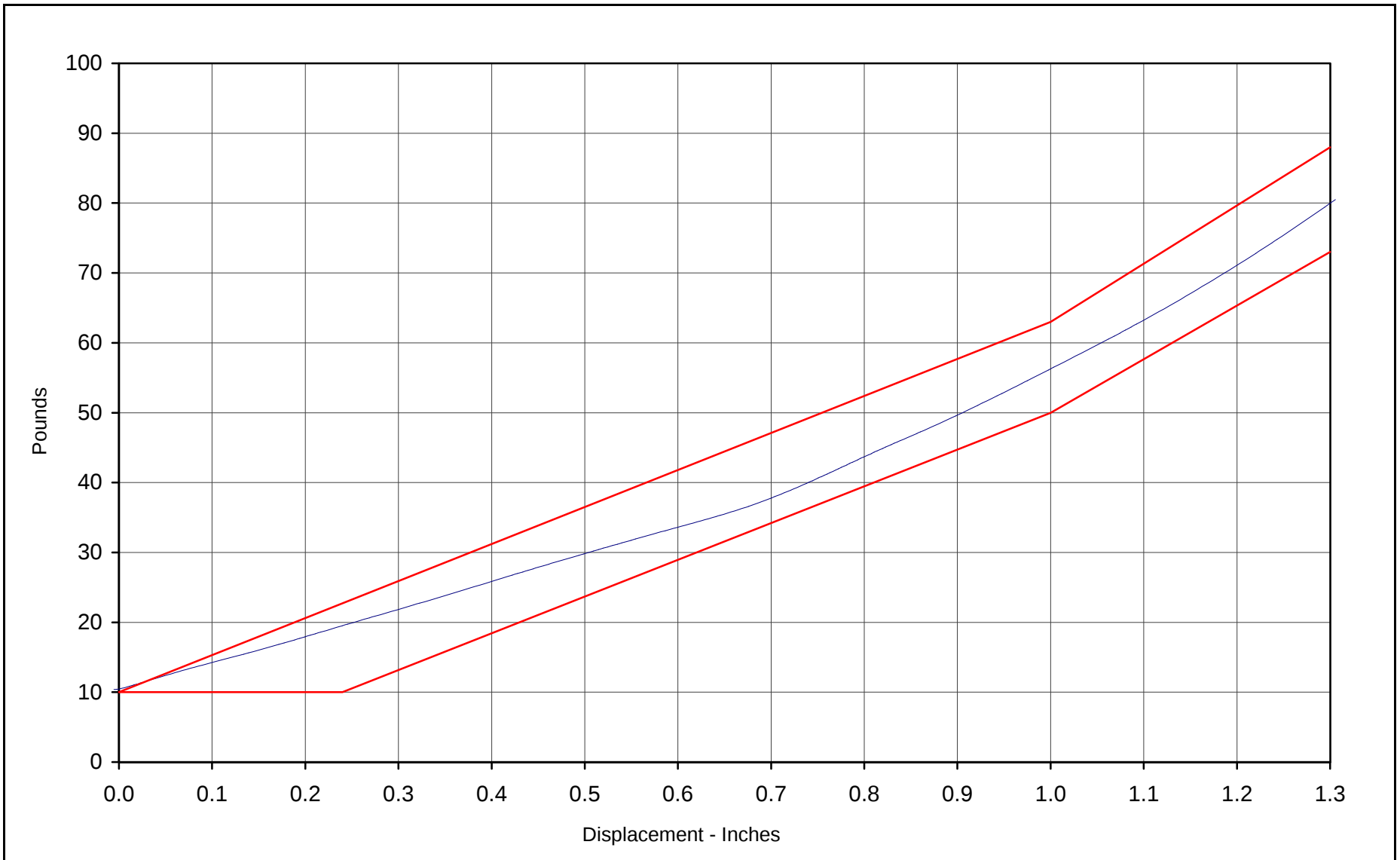
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force at 0.5 Inches of Displacement	Pounds	23.0 to 36.0	29.8	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	40.5	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	56.1	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	79.4	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001

Test Date

C-9

Curve Description: Abdomen Force vs. DisplacementForce at 0.5 In.: 29.8 PoundsForce at 0.75 In.: 40.5 PoundsForce at 1.0 In.: 56.1 PoundsForce at 1.3 In.: 79.4 PoundsDate of Test: 11/21/01Test Program: SID Abdominal CompressionTest Information: SID S/N: 274 Test I.D.: AB11G

KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Head Drop Calibration

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: HD11G

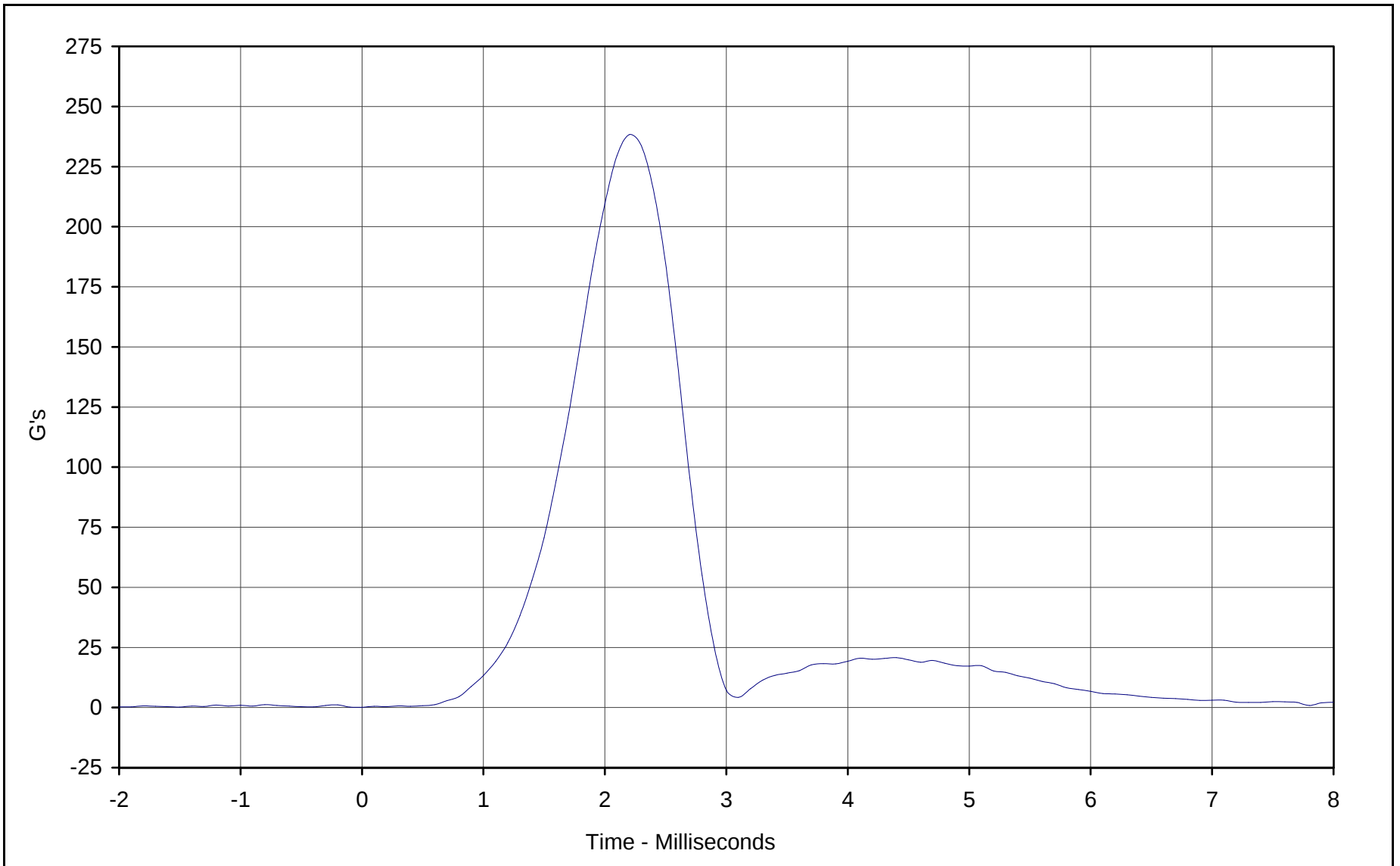
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	210.0 to 260.0	238.3	Pass
Peak Lateral Acceleration	G's	≤10.0	5.3	Pass
Time Above 100 G's	Msec.	0.9 to 1.5	1.0	Pass
Is Resultant Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001

Test Date

C-11



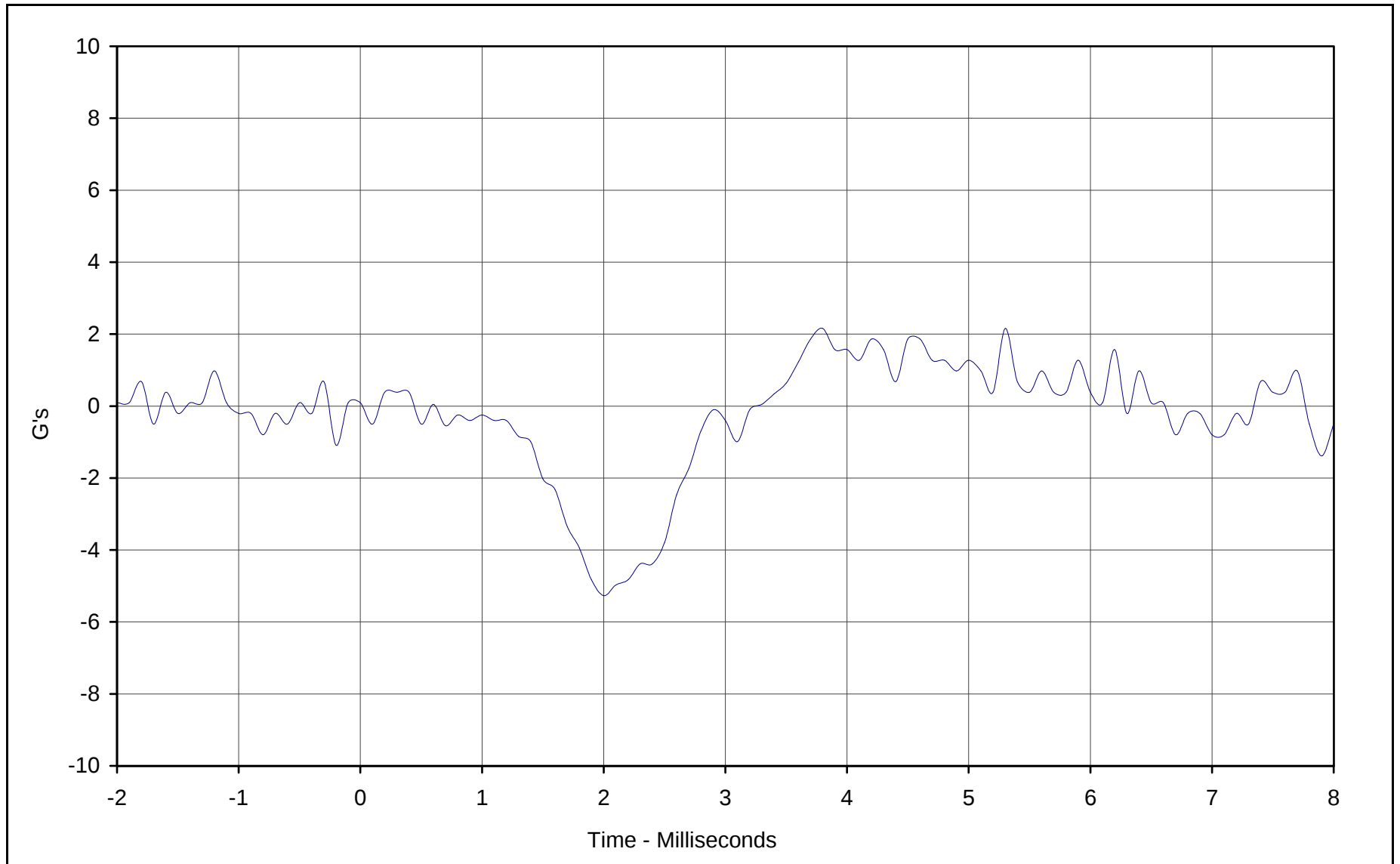
Curve Description: Head Resultant Acceleration
Maximum Value: 238.3 at 2.2 Milliseconds
Minimum Value: 0.1 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 11/21/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 274 Test I.D.: HD11G



KAR21130-01

C-12



Curve Description: Head Y Axis Acceleration

Maximum Value: 2.2 at 3.8 Milliseconds

Minimum Value: -5.3 at 2 Milliseconds

SAE Filter Class: 1000

Date of Test: 11/21/01

Test Program: SID Head Drop Calibration

Test Information: SID S/N: 274 Test I.D.: HD11G



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) External Dimensions

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	21.1	Pass
Laboratory relative humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	900	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	500	Pass
HW- Hip Width	mm	356 to 391	385	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001

Test Date



Performance Verification Data Side Impact Dummy (SID) Thorax Lateral Impact

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: TI11H

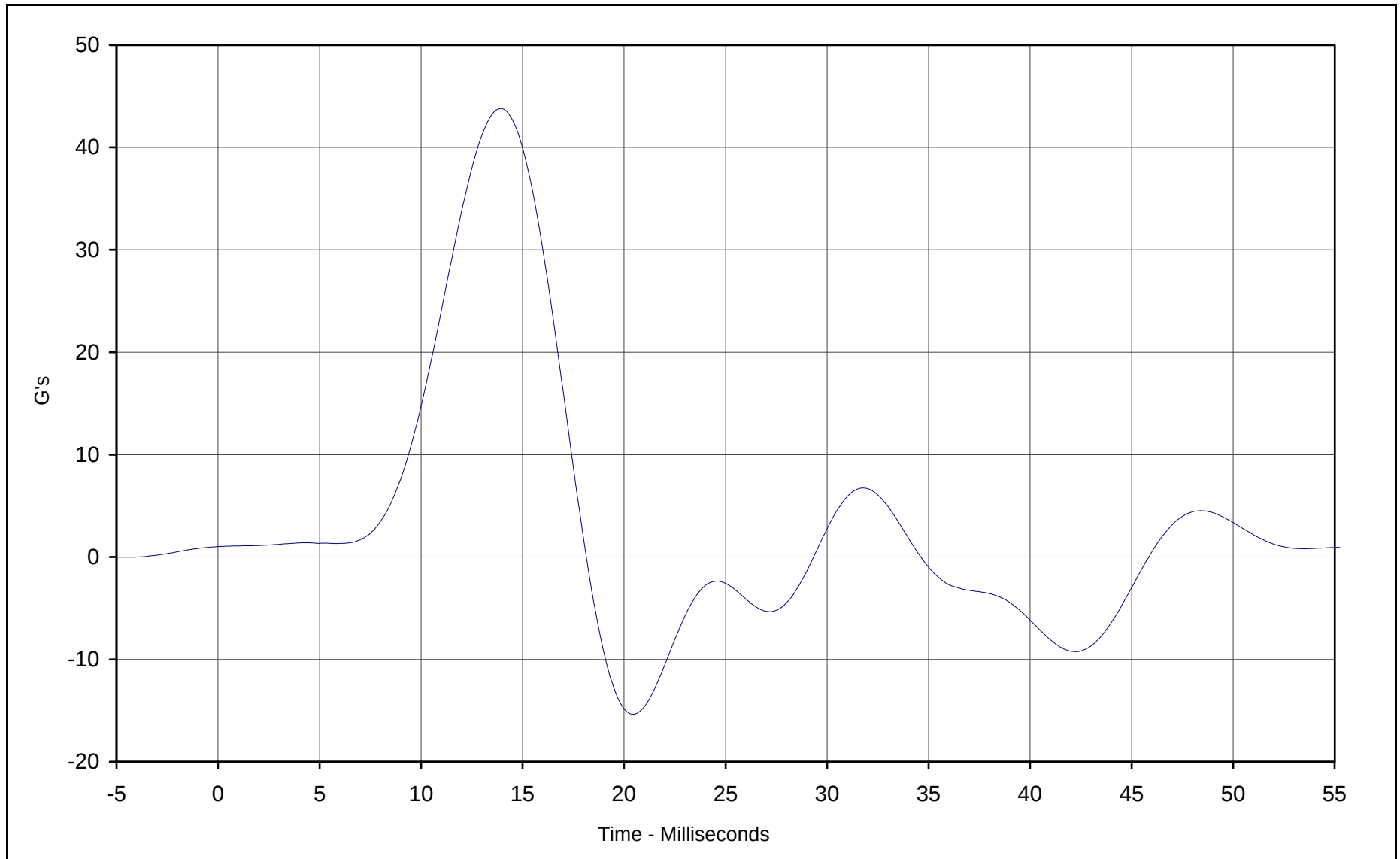
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.27	Pass
Left Upper Rib Acceleration	G's	37.0 to 46.0	43.8	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	42.9	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.0	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001

Test Date

C-15



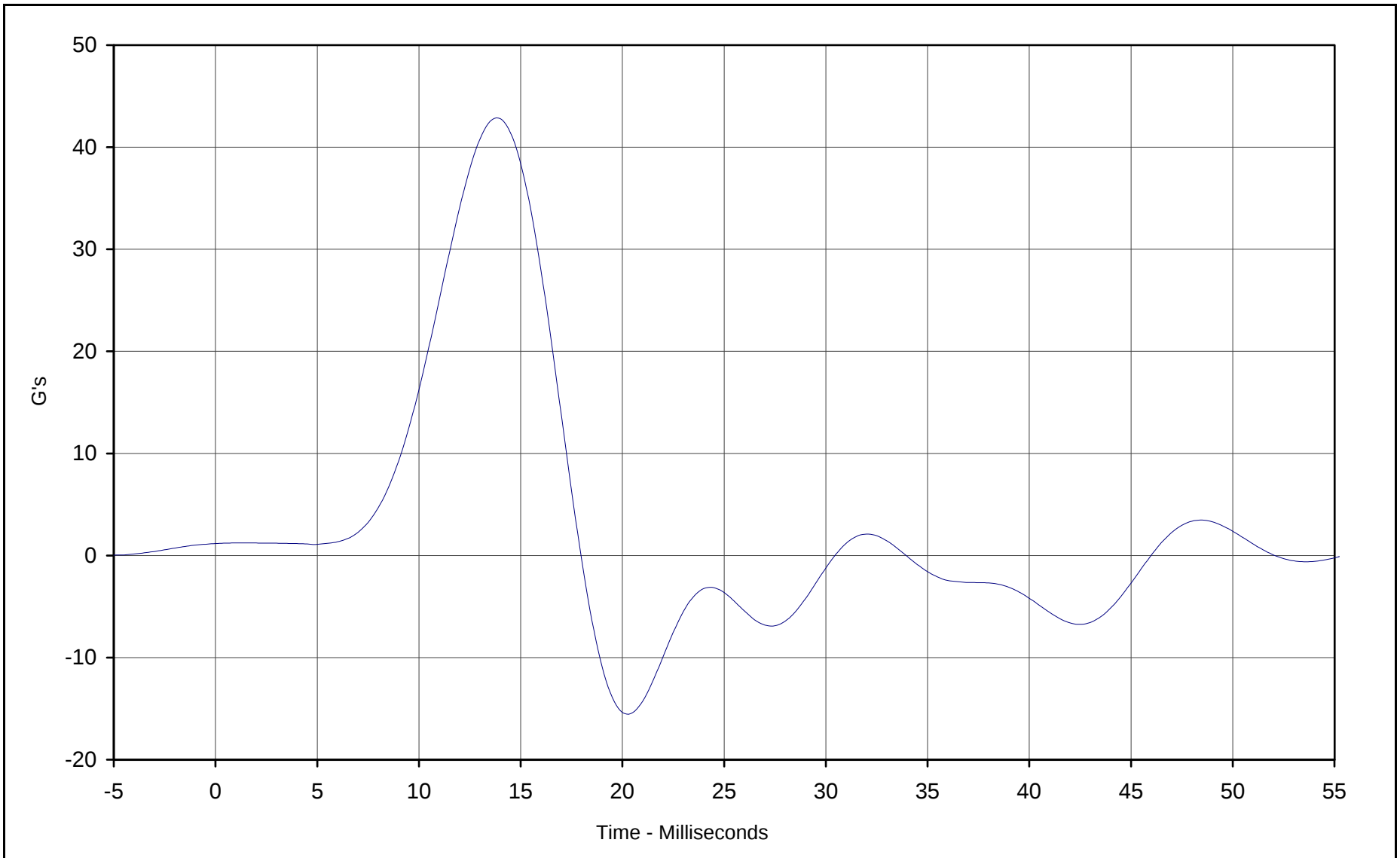
Curve Description: Left Upper Rib Y Acceleration
Maximum Value: 43.8 at 13.9 Milliseconds
Minimum Value: -15.4 at 20.4 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 11/21/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 275 Test I.D.: TI11H



KAR21130-01

C-16



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 42.9 at 13.8 Milliseconds

Minimum Value: -15.5 at 20.3 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 11/21/01

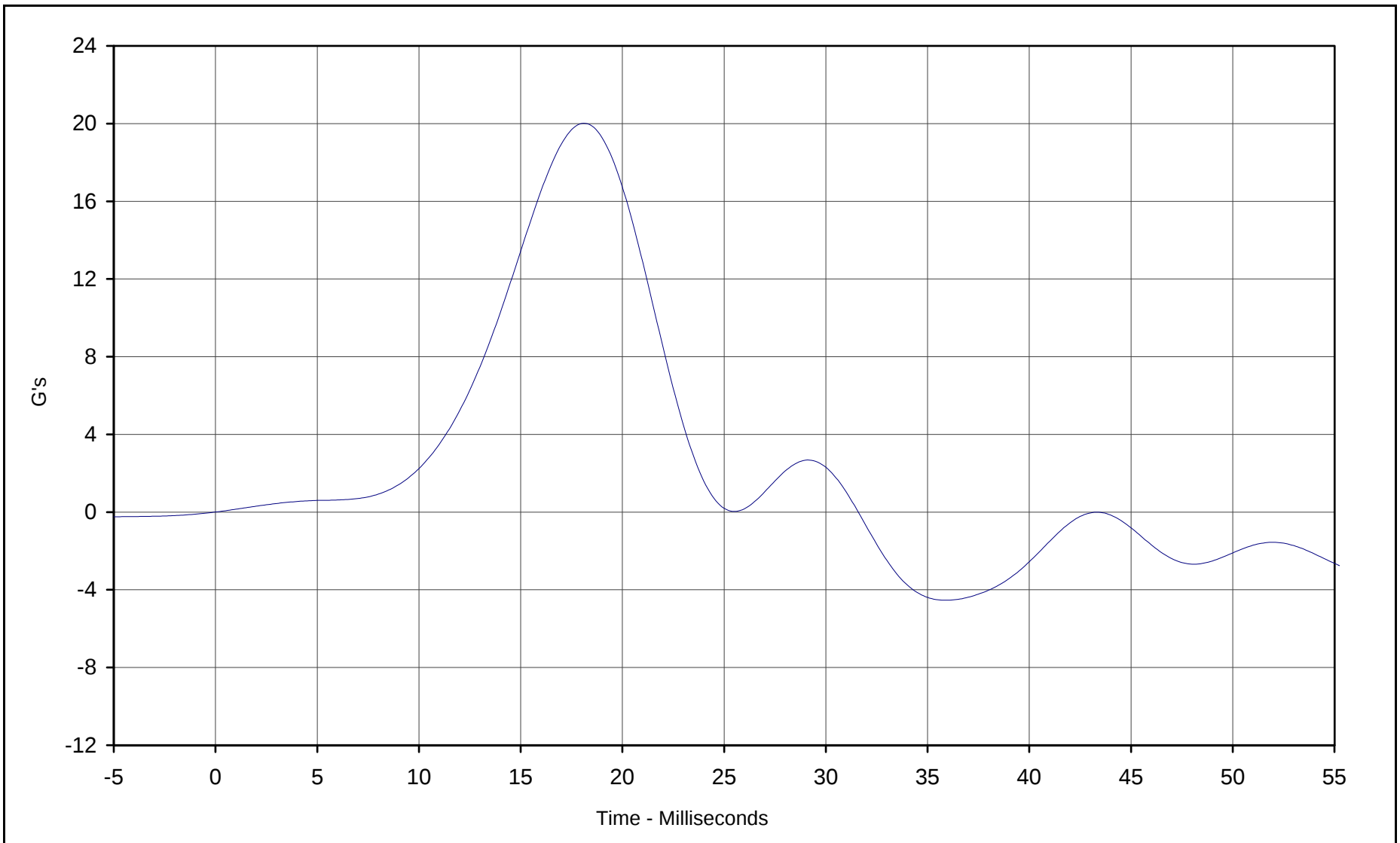
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 275 Test I.D.: TI11H



KAR21130-01

C-17



Curve Description: Lower Spine Y Acceleration
Maximum Value: 20.0 at 18.1 Milliseconds
Minimum Value: -4.5 at 35.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 11/21/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 275 Test I.D.: TI11H



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Left Side Pelvis Lateral Impact

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: PI11H

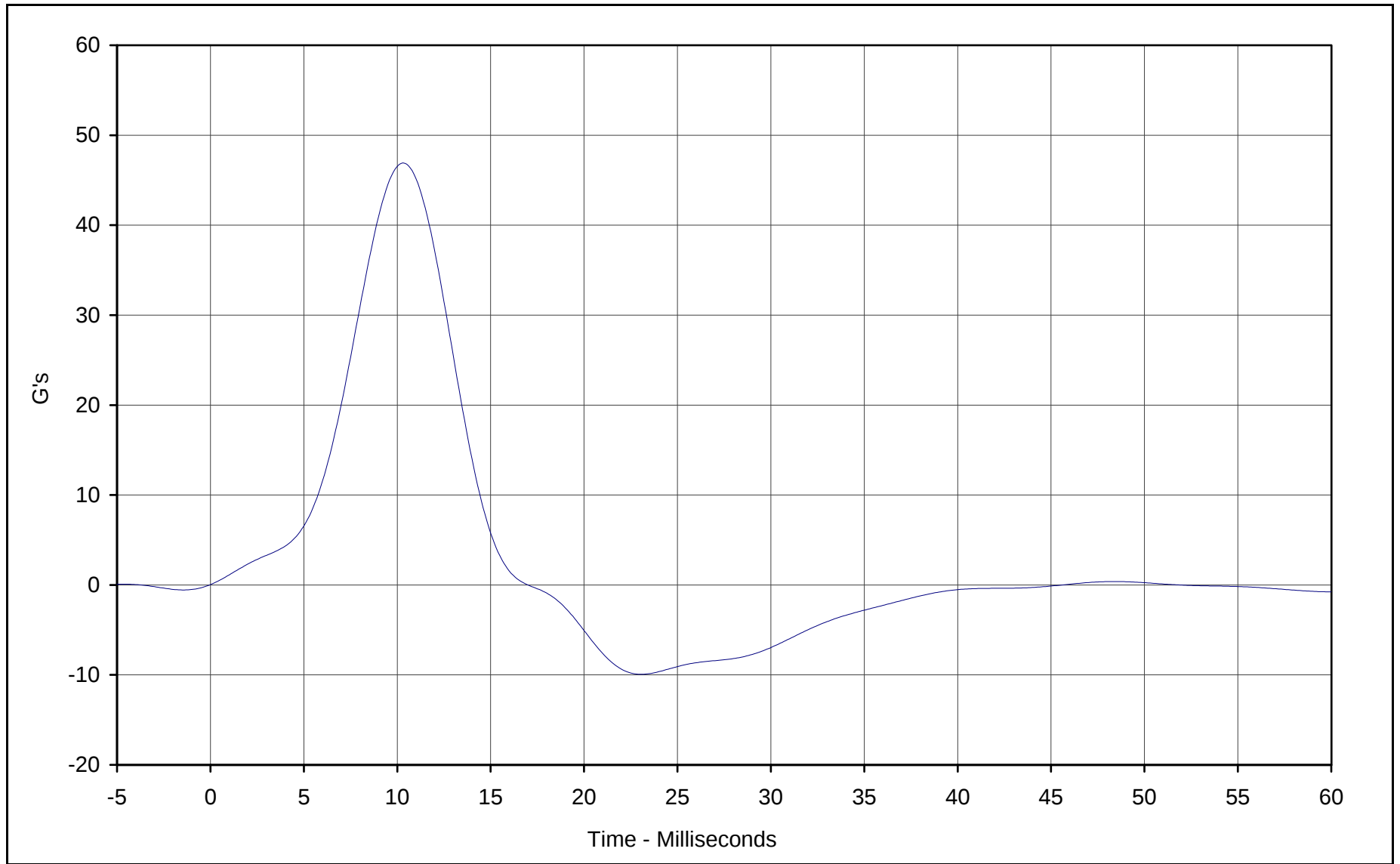
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.33	Pass
Pelvis Acceleration	G's	40.0 to 60.0	46.9	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	6.5	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001

Test Date

C-19



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 46.9 at 10.3 Milliseconds
Minimum Value: -9.9 at 23.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 11/21/01

Test Program: SID Left Side Pelvis Lateral Impact
Test Information: SID S/N: 275 Test I.D.: PI11H



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Abdominal Compression Test

ATD Serial No.: 275

Part Serial No.: N/A

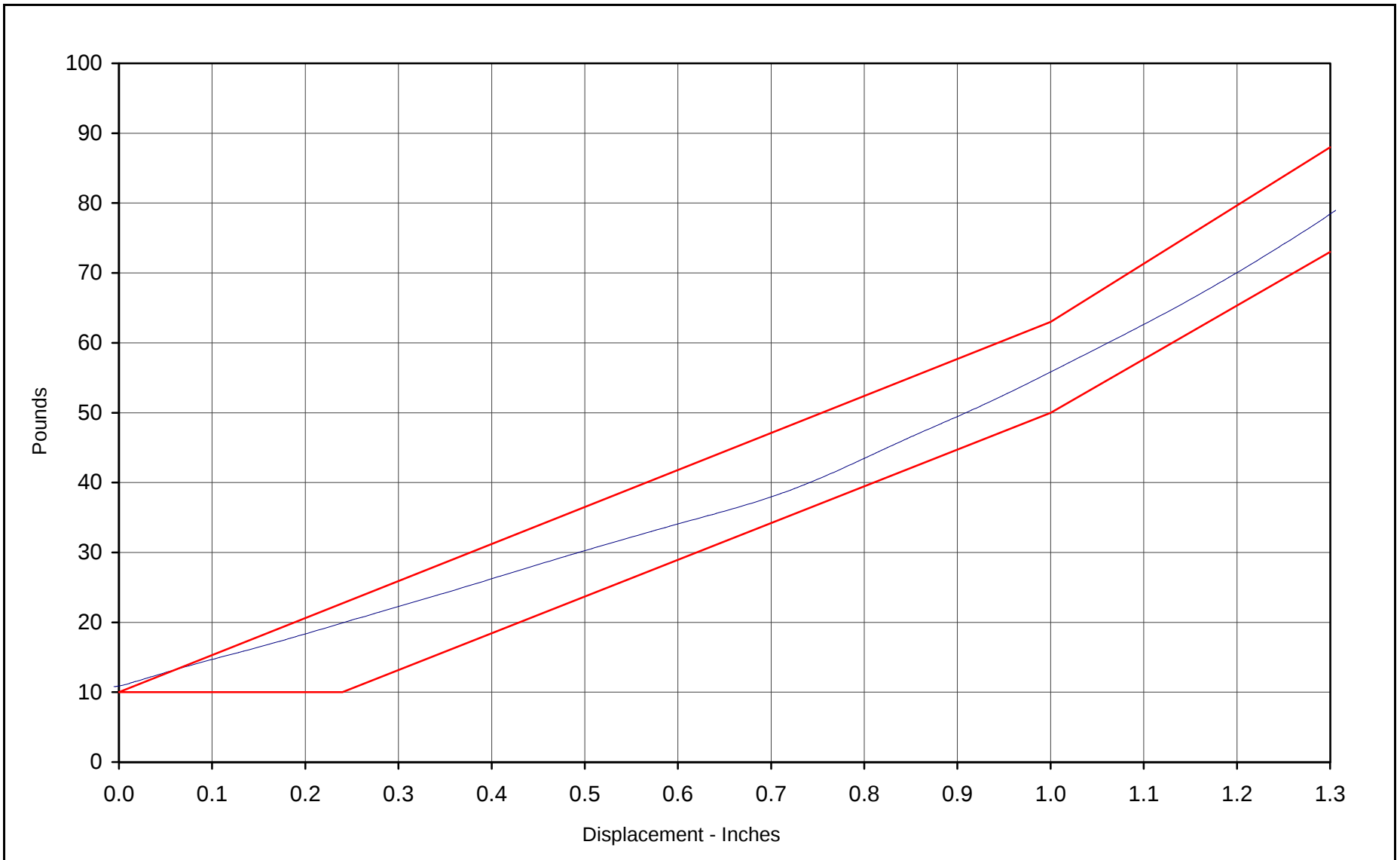
Test I.D.: AB11H

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force at 0.5 Inches of Displacement	Pounds	23.0 to 36.0	30.1	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	40.5	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	55.6	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	78.3	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001

Test Date



Curve Description: Abdomen Force vs. Displacement

Force at 0.5 In.: 30.1 Pounds

Force at 0.75 In.: 40.5 Pounds

Force at 1.0 In.: 55.6 Pounds

Force at 1.3 In.: 78.3 Pounds

Date of Test: 11/21/01

Test Program: SID Abdominal Compression

Test Information: SID S/N: 275 Test I.D.: AB11H





Performance Verification Data Side Impact Dummy (SID) Head Drop Calibration

ATD Serial No.: 275

Part Serial No.: N/A

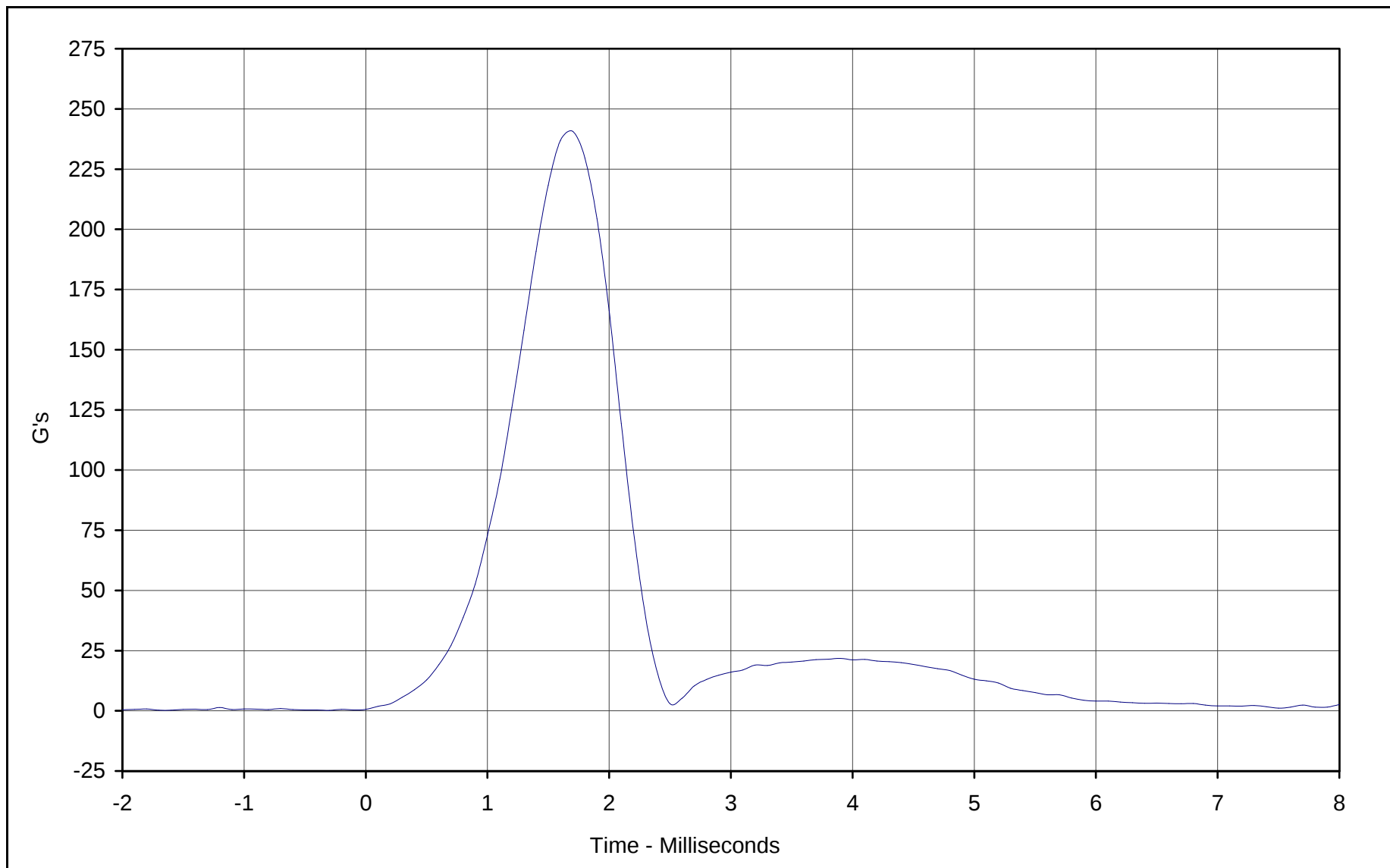
Test I.D.: HD11H

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	210.0 to 260.0	240.6	Pass
Peak Lateral Acceleration	G's	≤10.0	3.8	Pass
Time Above 100 G's	Msec.	0.9 to 1.5	1.0	Pass
Is Resultant Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

November 21, 2001
Test Date

C-23



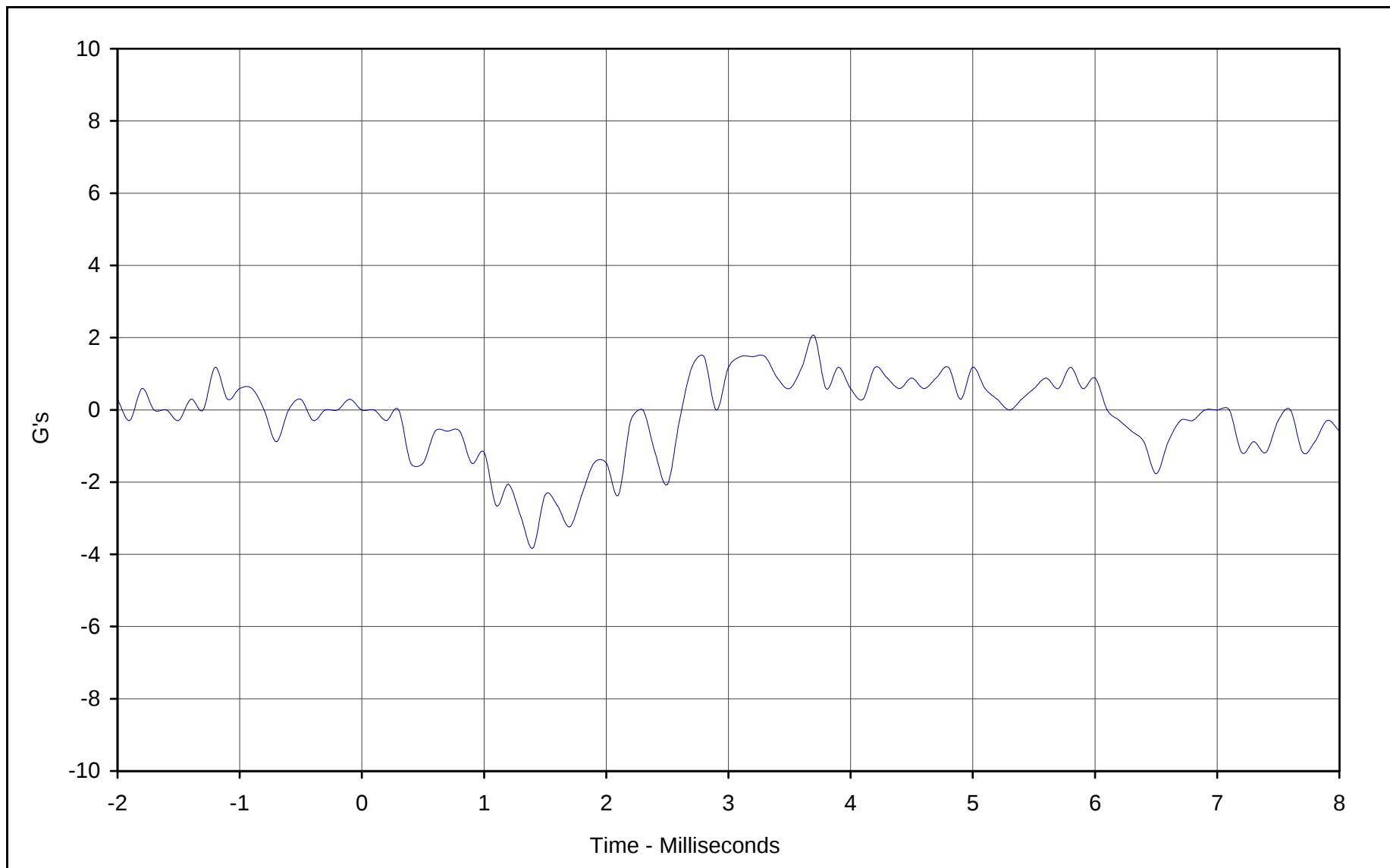
Curve Description: Head Resultant Acceleration
Maximum Value: 240.6 at 1.7 Milliseconds
Minimum Value: 0.6 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 11/21/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: HD11H



KAR21130-01

C-24



Curve Description: Head Y Axis Acceleration
Maximum Value: 2.1 at 3.7 Milliseconds
Minimum Value: -3.8 at 1.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 11/21/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: HD11H



KAR21130-01

APPENDIX C
POST-TEST SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA



Performance Verification Data Side Impact Dummy (SID) External Dimensions

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	21.1	Pass
Laboratory relative humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	906	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	515	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	500	Pass
HW- Hip Width	mm	356 to 391	365	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date



Performance Verification Data Side Impact Dummy (SID) Thorax Lateral Impact

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: TI12A

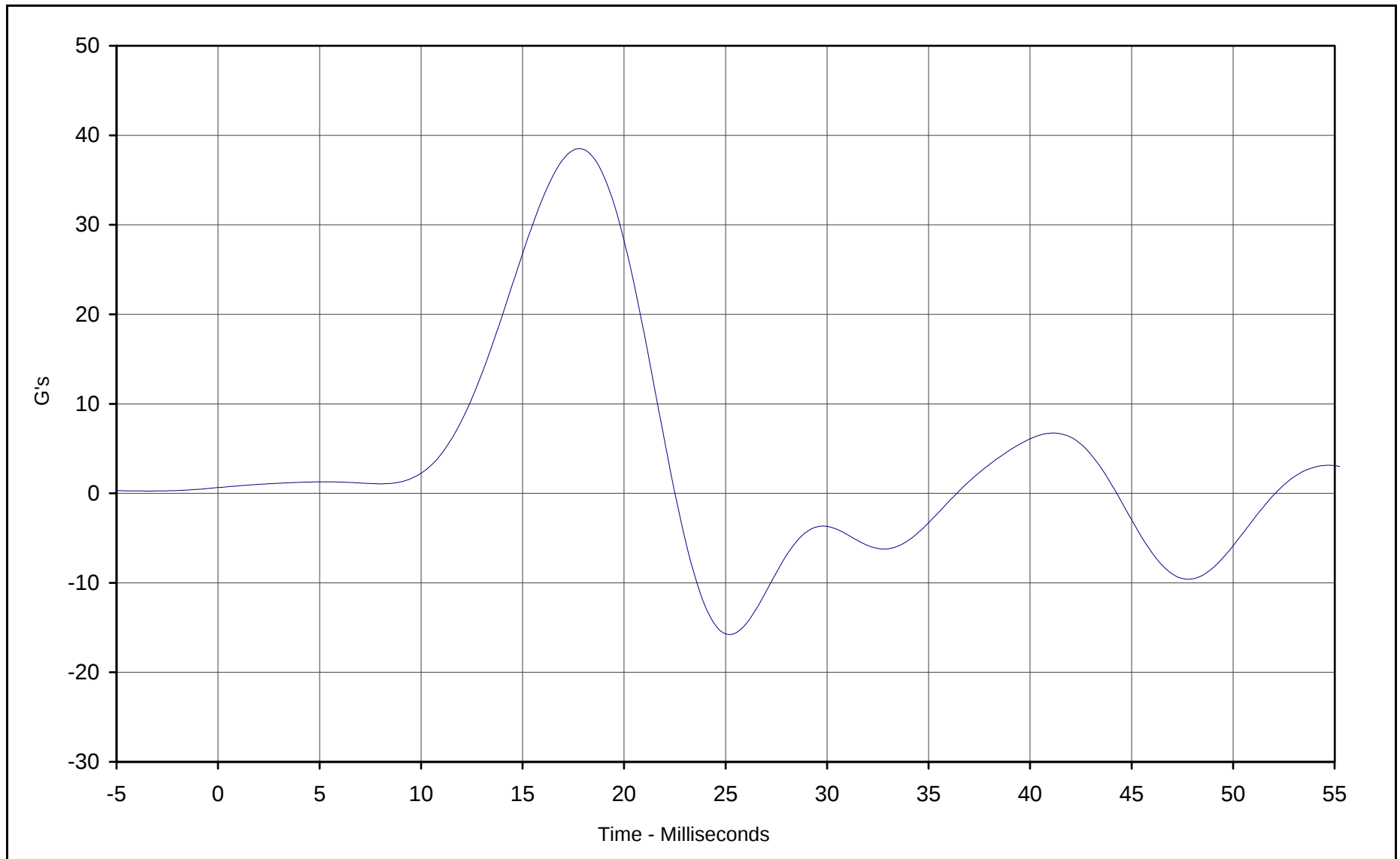
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.27	Pass
Left Upper Rib Acceleration	G's	37.0 to 46.0	38.5	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	37.9	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.3	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date

C-27



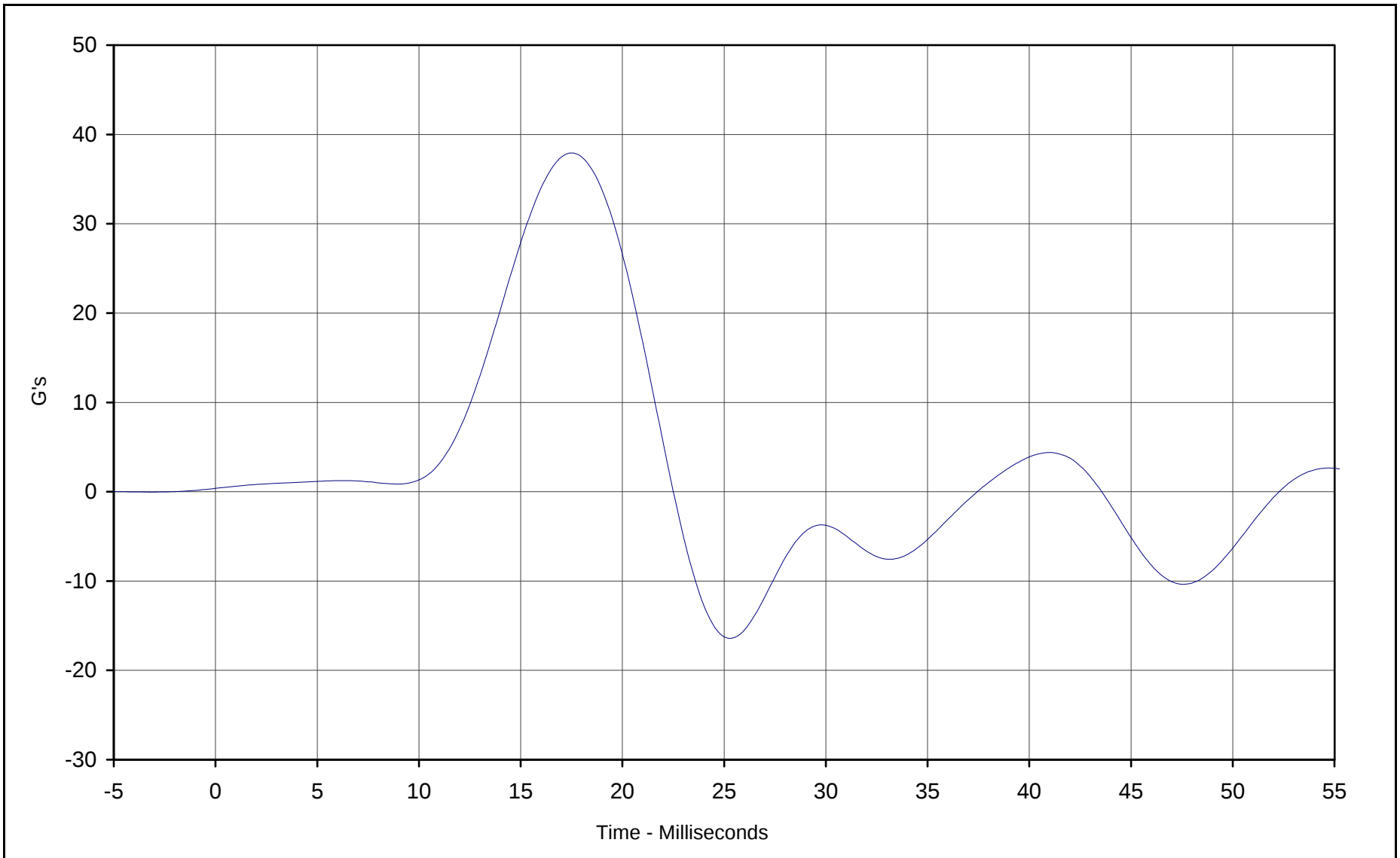
Curve Description: Left Upper Rib Y Acceleration
Maximum Value: 38.5 at 17.8 Milliseconds
Minimum Value: -15.8 at 25.2 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/8/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 274 Test I.D.: TI12A



KAR21130-01

C-28



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 37.9 at 17.5 Milliseconds

Minimum Value: -16.4 at 25.3 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 12/8/01

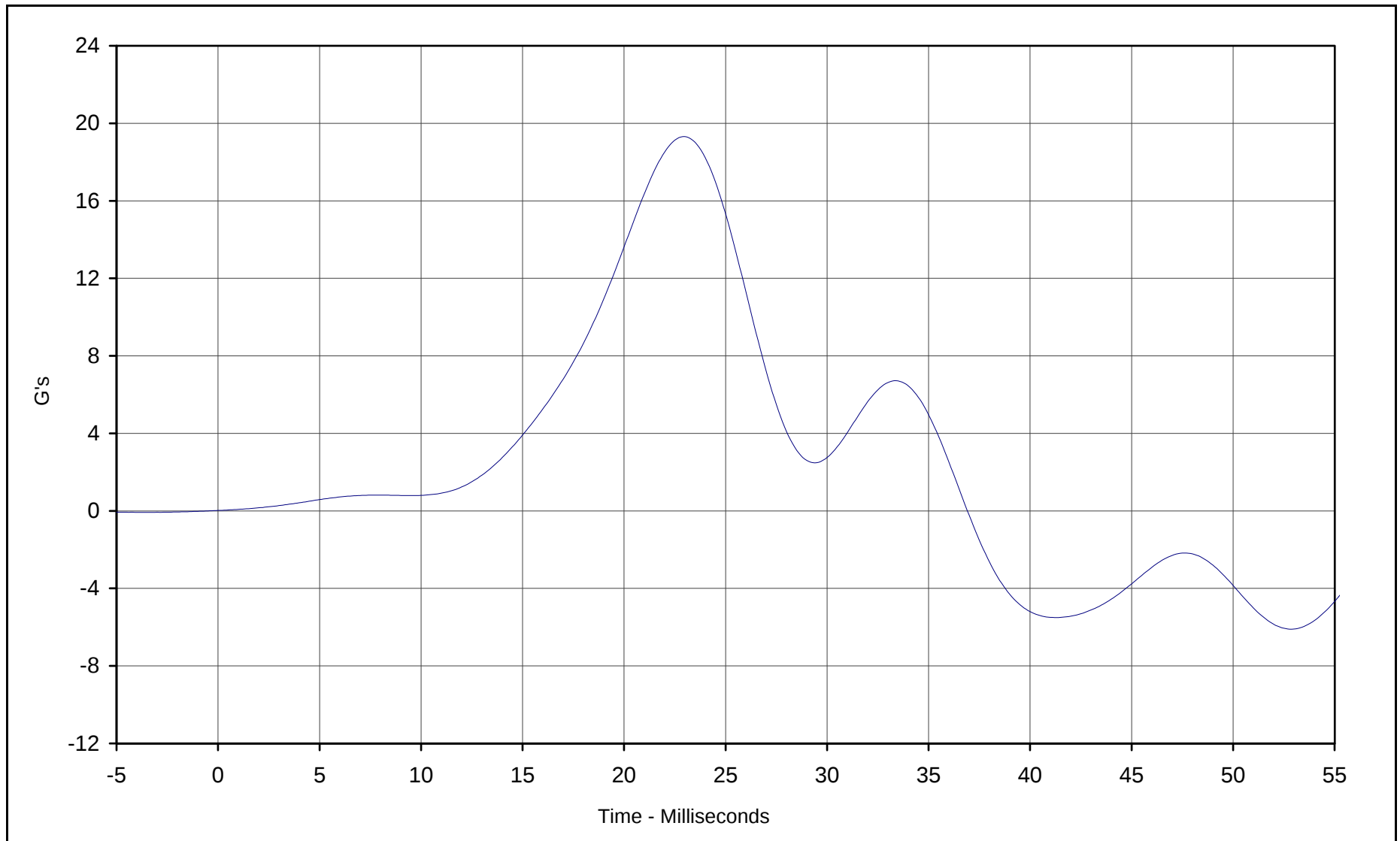
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 274 Test I.D.: TI12A



KAR21130-01

C-29



Curve Description: Lower Spine Y Acceleration
Maximum Value: 19.3 at 23.0 Milliseconds
Minimum Value: -6.1 at 52.8 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/8/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 274 Test I.D.: TI12A



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Left Side Pelvis Lateral Impact

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: PI12A

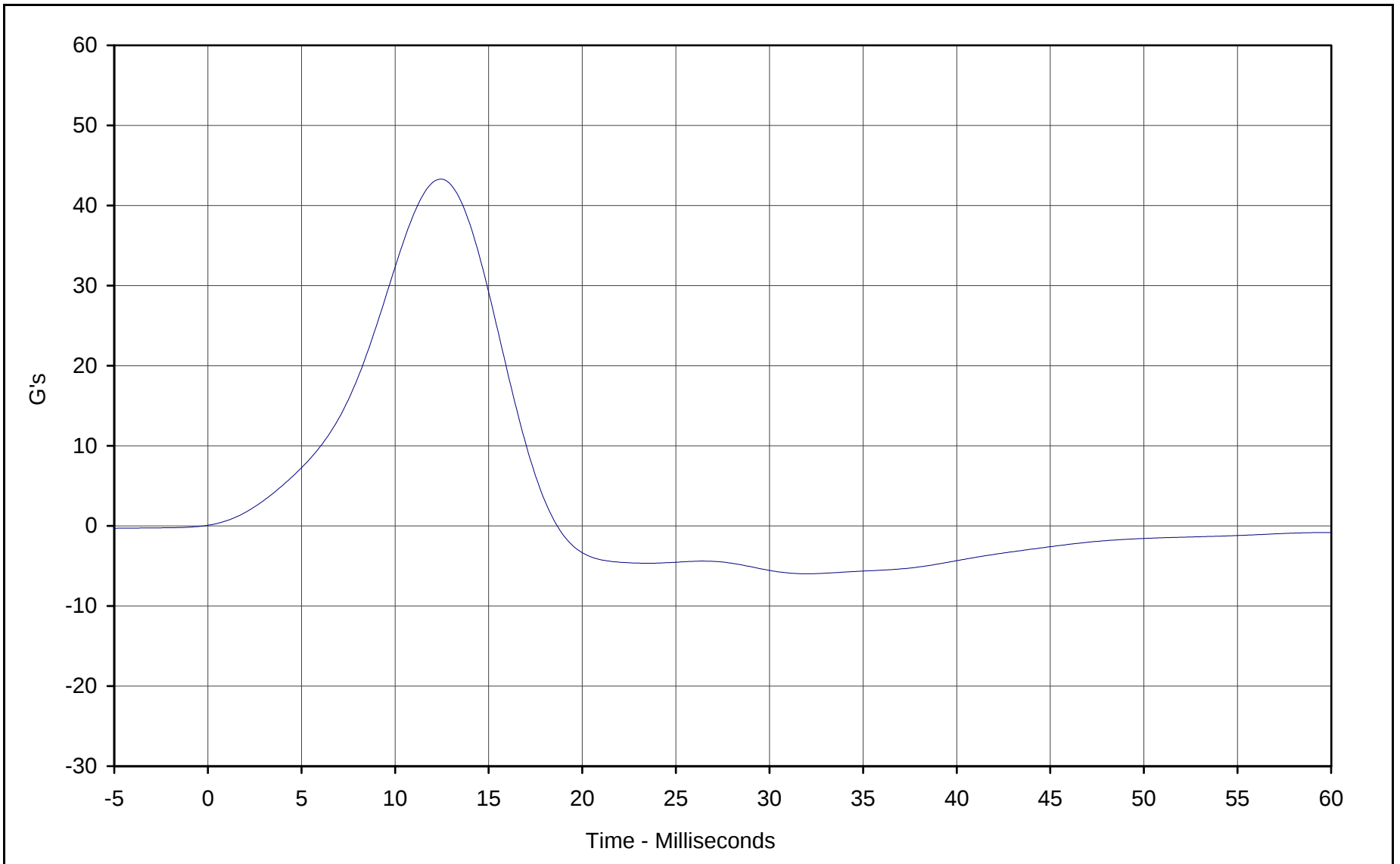
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.33	Pass
Pelvis Acceleration	G's	40.0 to 60.0	43.3	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	6.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date

C-31



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 43.3 at 12.4 Milliseconds
Minimum Value: -6.0 at 31.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/8/01

Test Program: SID Left Side Pelvis Lateral Impact
Test Information: SID S/N: 274 Test I.D.: PI12A



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Abdominal Compression Test

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: AB12A

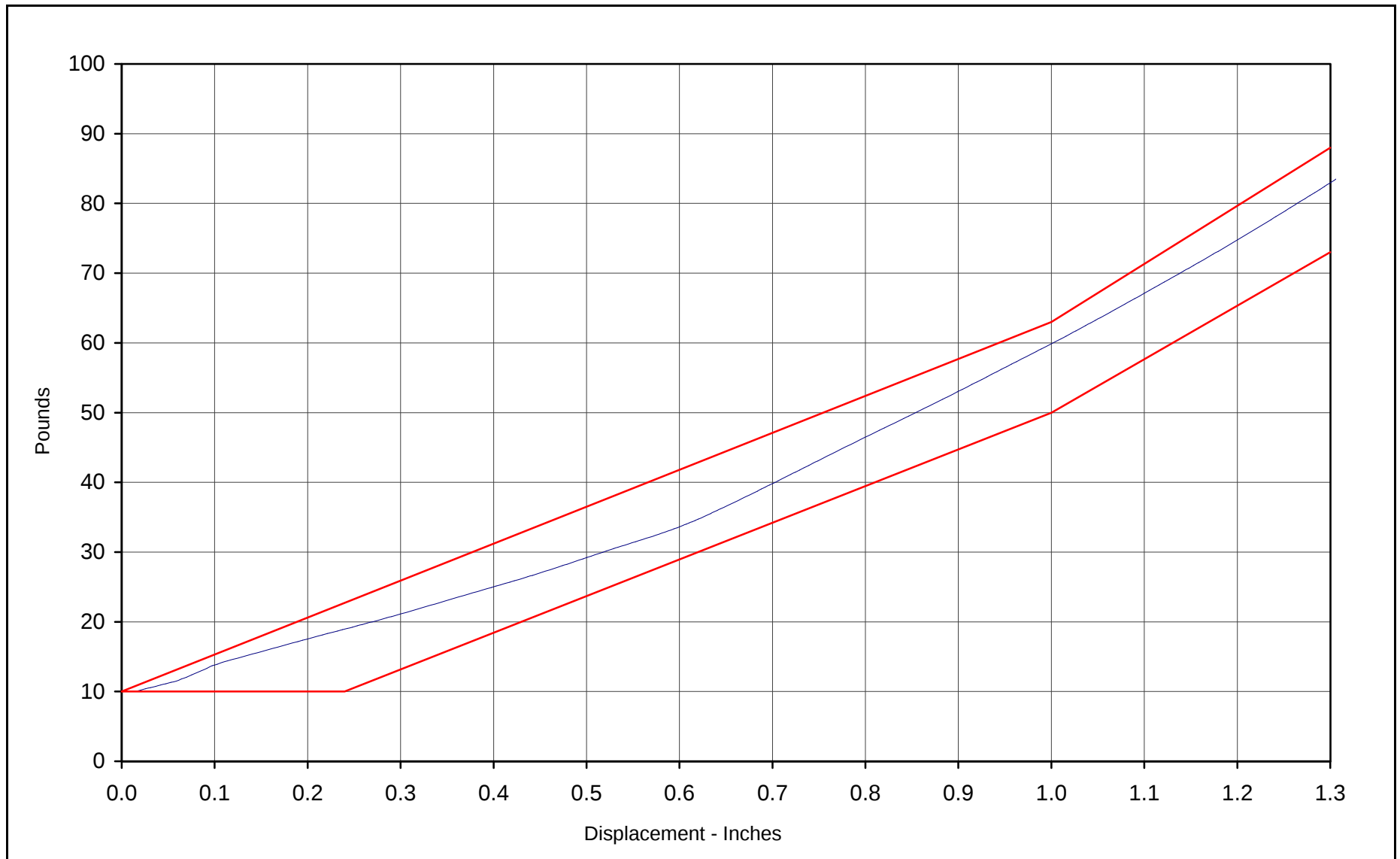
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force at 0.5 Inches of Displacement	Pounds	23.0 to 36.0	29.0	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	43.1	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	59.9	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	82.9	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date

C-33

Curve Description: Abdomen Force vs. DisplacementForce at 0.5 In.: 29.0 PoundsForce at 0.75 In.: 43.1 PoundsForce at 1.0 In.: 59.9 PoundsForce at 1.3 In.: 82.9 PoundsDate of Test: 12/8/01Test Program: SID Abdominal CompressionTest Information: SID S/N: 274 Test I.D.: AB12A

KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Head Drop Calibration

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: SH12A

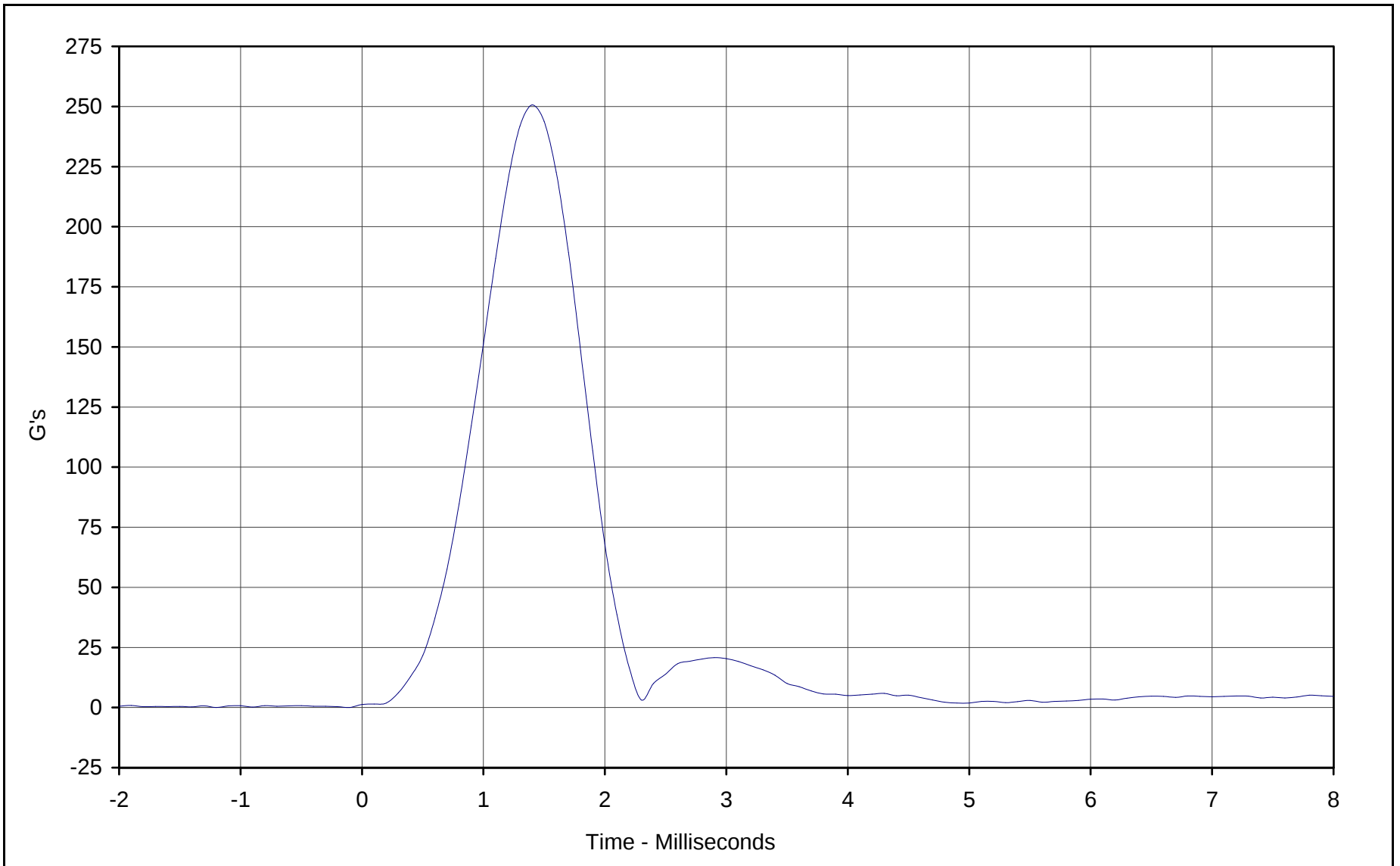
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	210.0 to 260.0	250.6	Pass
Peak Lateral Acceleration	G's	≤10.0	4.0	Pass
Time Above 100 G's	Msec.	0.9 to 1.5	1.1	Pass
Is Resultant Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date

C-35

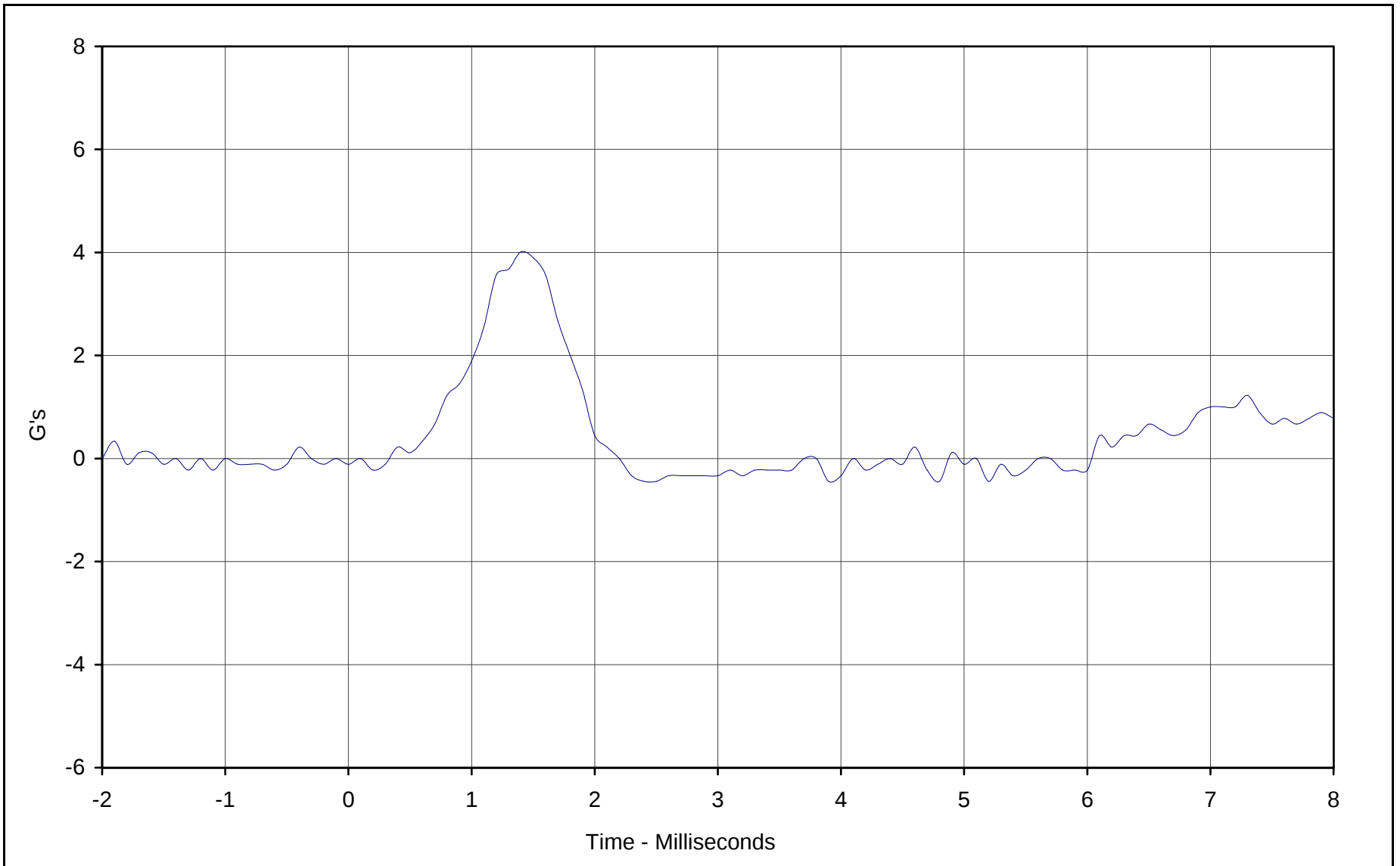


Curve Description: Head Resultant Acceleration
Maximum Value: 250.6 at 1.4 Milliseconds
Minimum Value: 1.3 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/8/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 274 Test I.D.: SH12A



KAR21130-01



Curve Description: Head Y Axis Acceleration

Maximum Value:	4.0	at	1.4	Milliseconds
Minimum Value:	-0.4	at	2.4	Milliseconds
SAE Filter Class:	1000			
Date of Test:	12/8/01			

Test Program: SID Head Drop Calibration

Test Information: SID S/N: 274 Test I.D.: SH12A





Performance Verification Data Side Impact Dummy (SID) External Dimensions

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	21.1	Pass
Laboratory relative humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	905	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	500	Pass
HW- Hip Width	mm	356 to 391	375	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date



Performance Verification Data Side Impact Dummy (SID) Thorax Lateral Impact

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: TI12B

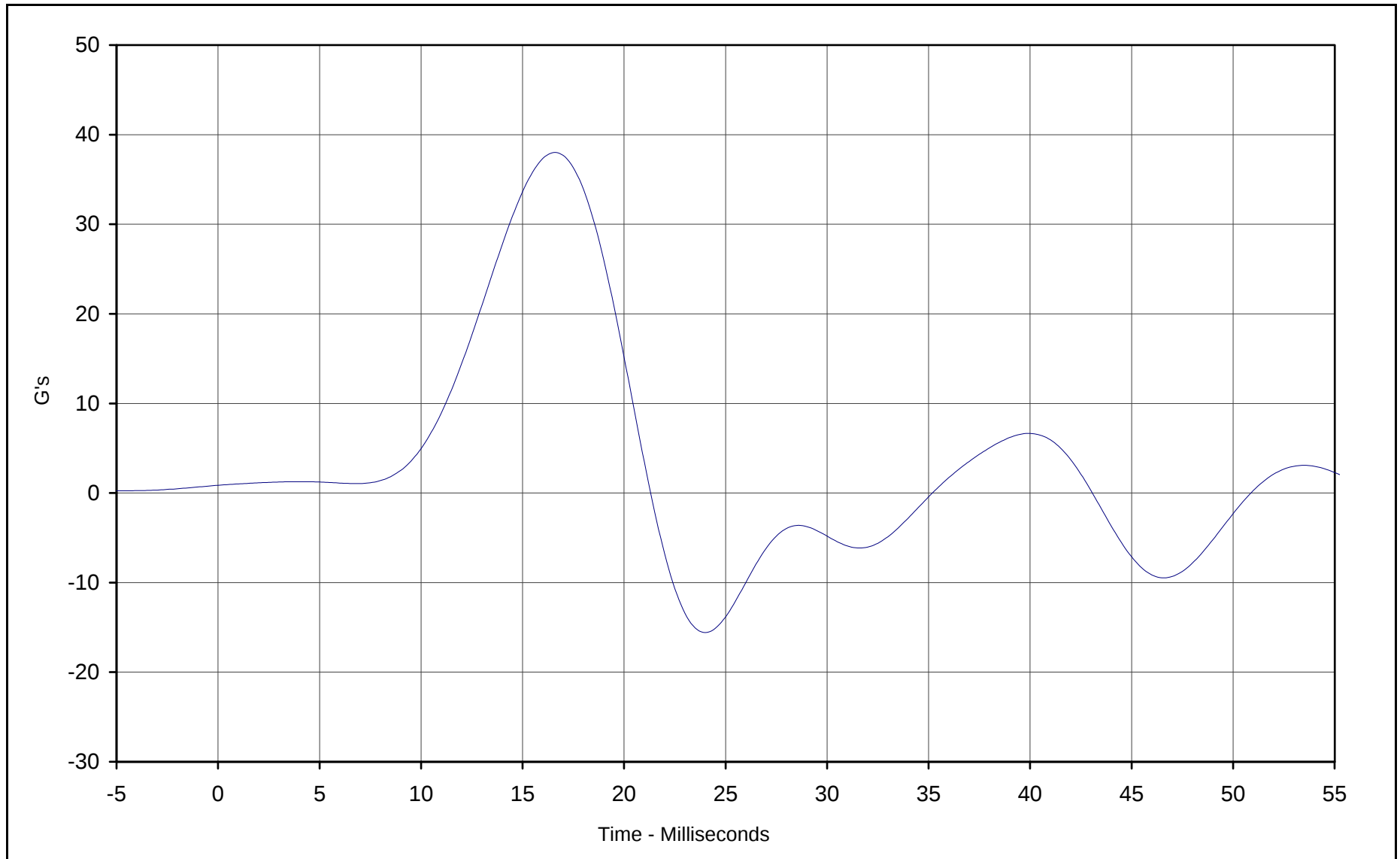
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.27	Pass
Left Upper Rib Acceleration	G's	37.0 to 46.0	38.0	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	38.2	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	18.9	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date

C-39



Curve Description: Left Upper Rib Y Acceleration

Maximum Value: 38.0 at 17.1 Milliseconds

Minimum Value: -15.6 at 24.5 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 12/8/01

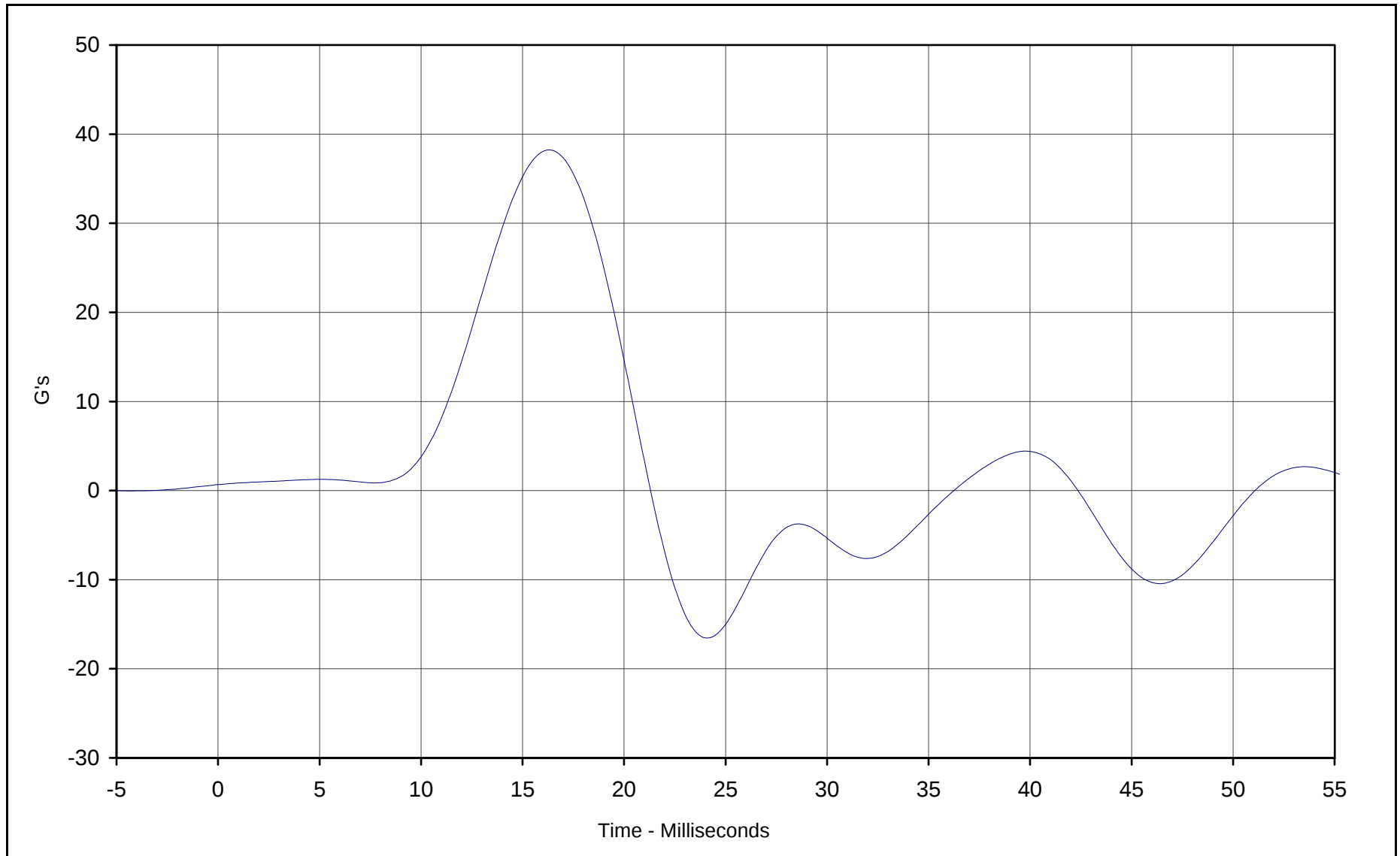
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 275 Test I.D.: TI12B



KAR21130-01

C-40



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 38.2 at 16.8 Milliseconds

Minimum Value: -16.6 at 24.6 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 12/8/01

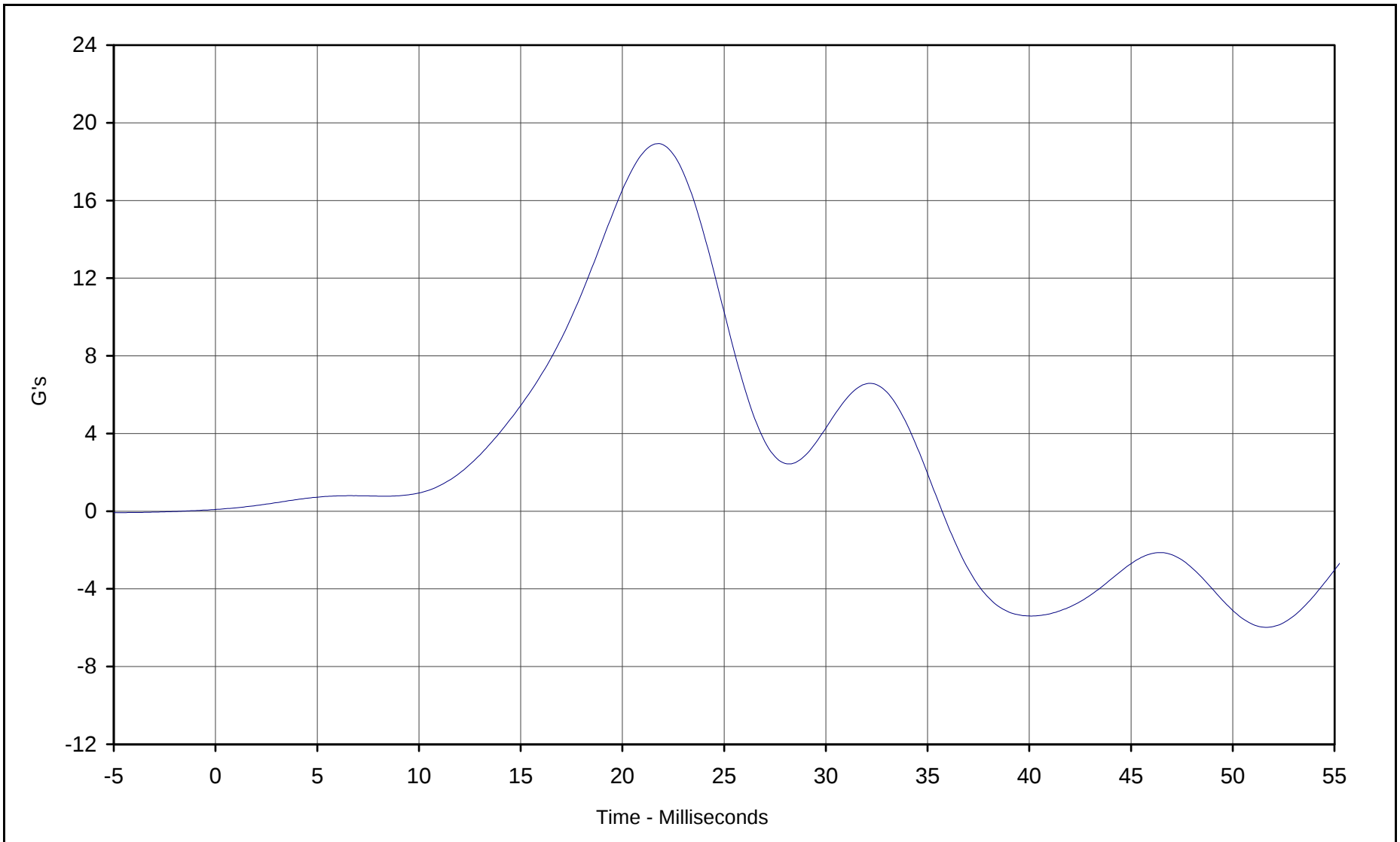
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 275 Test I.D.: TI12B



KAR21130-01

C-41



Curve Description: Lower Spine Y Acceleration
Maximum Value: 18.9 at 22.3 Milliseconds
Minimum Value: -6.0 at 52.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/8/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 275 Test I.D.: TI12B



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Left Side Pelvis Lateral Impact

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: PI12B

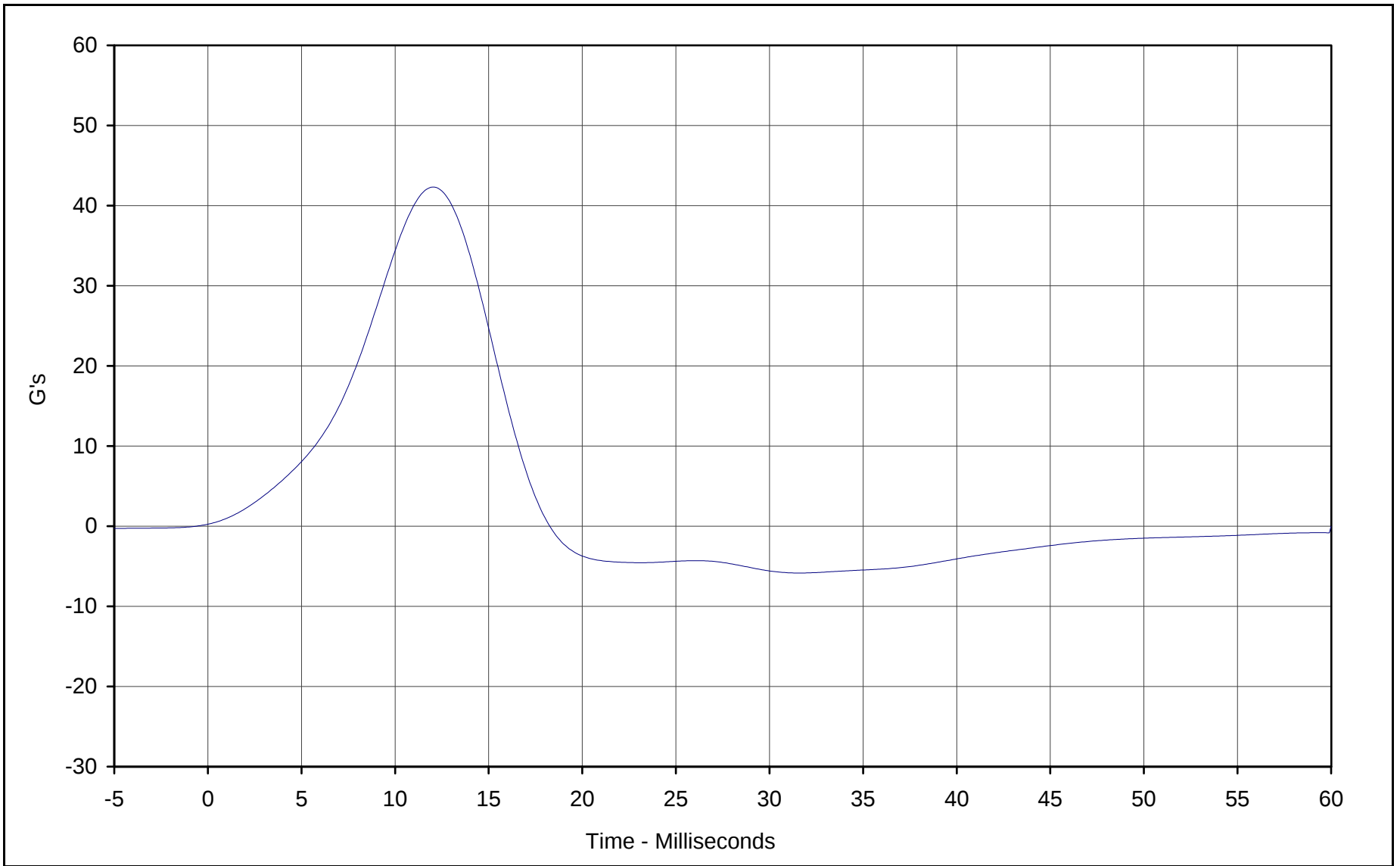
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.33	Pass
Pelvis Acceleration	G's	40.0 to 60.0	42.3	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	7.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date

C-43



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 42.3 at 12.0 Milliseconds
Minimum Value: -5.8 at 31.5 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/8/01

Test Program: SID Left Side Pelvis Lateral Impact
Test Information: SID S/N: 275 Test I.D.: PI12B



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Abdominal Compression Test

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: AB12B

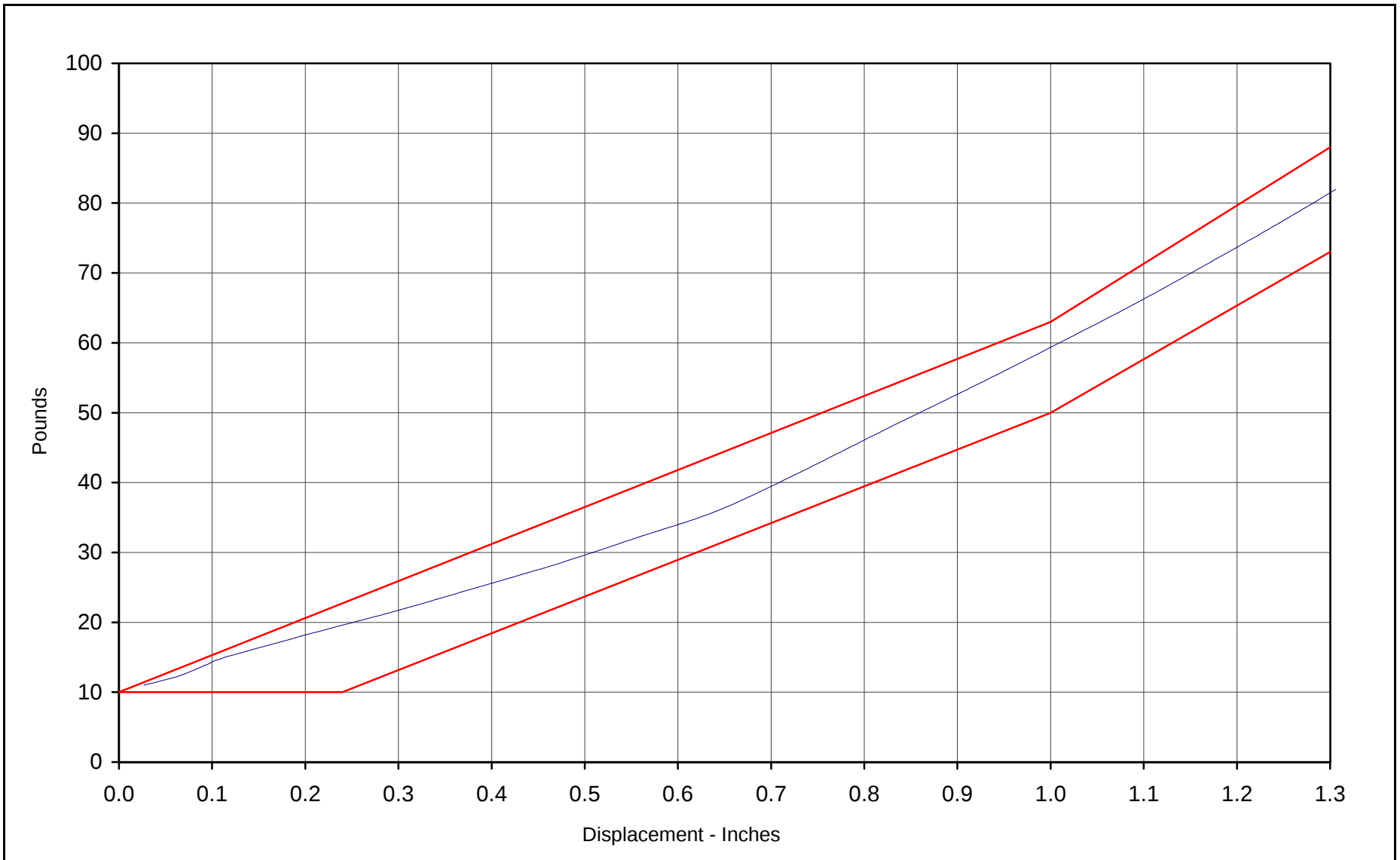
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force at 0.5 Inches of Displacement	Pounds	23.0 to 36.0	29.5	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	42.7	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	59.3	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	81.1	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date

C-45



Curve Description: Abdomen Force vs. Displacement

Force at 0.5 In.: 29.5 Pounds

Force at 0.75 In.: 42.7 Pounds

Force at 1.0 In.: 59.3 Pounds

Force at 1.3 In.: 81.1 Pounds

Date of Test: 12/8/01

Test Program: SID Abdominal Compression

Test Information: SID S/N: 275 Test I.D.: AB12B



KAR21130-01



Performance Verification Data Side Impact Dummy (SID) Head Drop Calibration

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: SH12B

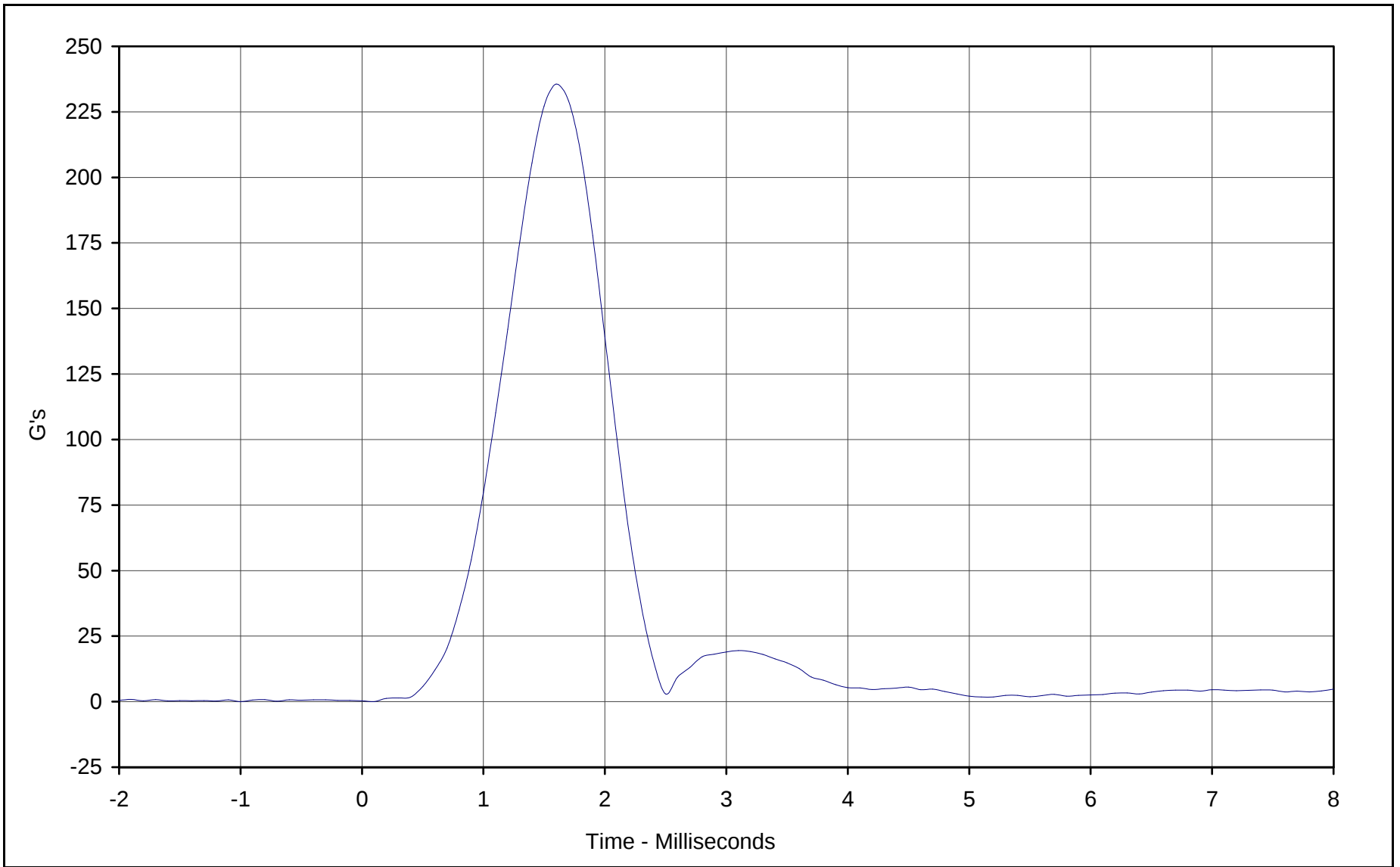
Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	210.0 to 260.0	235.6	Pass
Peak Lateral Acceleration	G's	≤10.0	2.0	Pass
Time Above 100 G's	Msec.	0.9 to 1.5	1.1	Pass
Is Resultant Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

December 8, 2001

Test Date

C-47



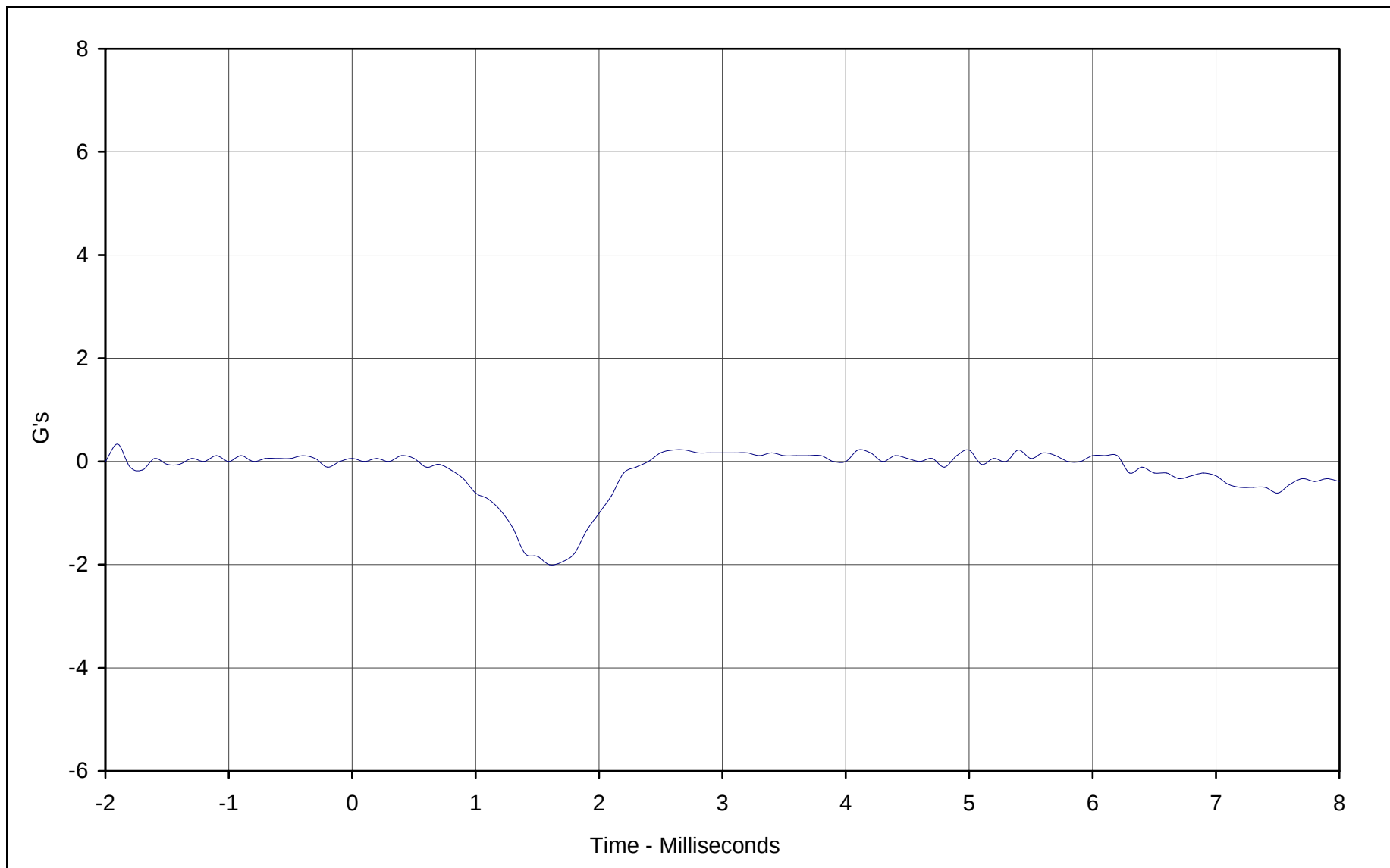
Curve Description: Head Resultant Acceleration
Maximum Value: 235.6 at 1.6 Milliseconds
Minimum Value: 0.0 at 0.1 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/8/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: SH12B



KAR21130-01

C-48



Curve Description: Head Y Axis Acceleration
Maximum Value: 0.2 at 2.6 Milliseconds
Minimum Value: -2.0 at 1.6 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/8/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: SH12B



KAR21130-01

APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

Instrumentation Data Channel Assignments

Driver S.I.D. Serial Number 275

12/6/01

2002 Kia Sedona LX Minivan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	Head CG	X	KEAC069	Accel.,1/2 bridge	Endevco	7264-2000X	G
2	Head CG	Y	KEAC080	Accel.,1/2 bridge	Endevco	7264-2000Y	G
3	Head CG	Z	KEAC082	Accel.,1/2 bridge	Endevco	7264-2000Z	G
4	Upper Rib Primary	Y	KEAC066	Accel.,1/2 bridge	Endevco	7264-2000X	G
5	Lower Rib, Primary	Y	KEAC067	Accel.,1/2 bridge	Endevco	7264-2000Y	G
6	Lower Spine, Primary	Y	KEAC068	Accel.,1/2 bridge	Endevco	7264-2000Z	G
7	Pelvis, Primary	Y	KEAC079	Accel.,1/2 bridge	Endevco	7264-2000X	G
8	Upper Rib Redundant	Y	KEAC073	Accel.,1/2 bridge	Endevco	7264-2000X	G
9	Lower Rib, Redundant	Y	KEAC074	Accel.,1/2 bridge	Endevco	7264-2000Y	G
10	Lower Spine, Redundant	Y	KEAC075	Accel.,1/2 bridge	Endevco	7264-2000Z	G
11	Pelvis, Redundant	Y	KEAC081	Accel.,1/2 bridge	Endevco	7264-2000X	G
12	Thorax Contact	Y	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%
13	Pelvis Contact	Y	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%

55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Passenger S.I.D. Serial Number 274
12/6/01
2002 Kia Sedona LX Minivan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
14	Head CG	X	KEAC086	Accel.,1/2 bridge	Endevco	7264-2000X	G
15	Head CG	Y	KEAC087	Accel.,1/2 bridge	Endevco	7264-2000Y	G
16	Head CG	Z	KEAC088	Accel.,1/2 bridge	Endevco	7264-2000Z	G
17	Upper Rib Primary	Y	KEAC070	Accel.,1/2 bridge	Endevco	7264-2000X	G
18	Lower Rib, Primary	Y	KEAC071	Accel.,1/2 bridge	Endevco	7264-2000Y	G
19	Lower Spine, Primary	Y	KEAC072	Accel.,1/2 bridge	Endevco	7264-2000Z	G
20	Pelvis, Primary	Y	KEAC090	Accel.,Full bridge	Endevco	7264-2000X	G
21	Upper Rib Redundant	Y	KEAC076	Accel.,1/2 bridge	Endevco	7264-2000X	G
22	Lower Rib, Redundant	Y	KEAC077	Accel.,1/2 bridge	Endevco	7264-2000Y	G
23	Lower Spine, Redundant	Y	KEAC078	Accel.,1/2 bridge	Endevco	7264-2000Z	G
24	Pelvis, Redundant	Y	KEAC089	Accel.,1/2 bridge	Endevco	7264-2000X	G
25	Thorax Contact	N/A	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%
26	Pelvis Contact	N/A	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%

55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Vehicle Accelerometers
12/6/01
2002 Kia Sedona LX Minivan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
27	Right at Sill Front Seat	X	KETX2A	Accel., Triax	I.C. Sensor	3031-200	G
28	Right at Sill Front Seat	Y	KETX2B	Accel., Triax	I.C. Sensor	3031-200	G
29	Right at Sill Front Seat	Z	KETX2C	Accel., Triax	I.C. Sensor	3031-200	G
30	Right at Sill Rear Seat	X	KETX3A	Accel., Triax	I.C. Sensor	3031-500	G
31	Right at Sill Rear Seat	Y	KETX3B	Accel., Triax	I.C. Sensor	3031-500	G
32	Right at Sill Rear Seat	Z	KETX3C	Accel., Triax	I.C. Sensor	3031-500	G
33	Rear Floorpan Above Axle	X	KETX4A	Accel., Triax	I.C. Sensor	3031-500	G
34	Rear Floorpan Above Axle	Y	KETX4B	Accel., Triax	I.C. Sensor	3031-500	G
35	Rear Floorpan Above Axle	Z	KETX4C	Accel., Triax	I.C. Sensor	3031-500	G
36	Left Sill at Rear Door	Y	KEVA012	Accel., Vehicle block	I.C. Sensor	3031-500	G
37	Left Sill at Front Door	Y	KEVA001	Accel., Vehicle block	I.C. Sensor	3031-500	G
38	Left Front Door Centerline	Y	ICST004X	Accel., Triax	I.C. Sensor	3031-500	G
39	Rear Occupant Compartment	Y	KEVA006	Accel., Vehicle block	I.C. Sensor	3031-200	G
40	Left Front Door Mid-Rear	Y	ICST004Y	Accel., Triax	I.C. Sensor	3031-500	G
41	Left Front Door Upper Centerline	Y	ICST004Z	Accel., Triax	I.C. Sensor	3031-500	G
42	Rear Door Mid-Rear	Y	ICST005X	Accel., Triax	I.C. Sensor	3031-500	G
43	Rear Door Upper Centerline	Y	ICST005Y	Accel., Triax	I.C. Sensor	3031-500	G
44	B-Post Lower	Y	KEBX2A	Accel., Biax	I.C. Sensor	3031-500	G
45	B-Post Middle	Y	KEBX2B	Accel., Biax	I.C. Sensor	3031-500	G
46	A-Post Lower	Y	KEBX1A	Accel., Biax	I.C. Sensor	3031-200	G
47	A-Post Middle	Y	KEBX1B	Accel., Biax	I.C. Sensor	3031-500	G
48	Front Seat Track	Y	KEIC008Y	Single	I.C. Sensor	3031-500	G
49	Rear Seat Structure	Y	N/A	N/A	N/A	N/A	N/A
50	Vehicle CG	X	KETX2A	Accel., Triax	I.C. Sensor	3031-200	G
51	Vehicle CG	Y	KETX2B	Accel., Triax	I.C. Sensor	3031-200	G
52	Vehicle CG	Z	KETX2C	Accel., Triax	I.C. Sensor	3031-200	G

55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Moving Deformable Barrier
12/6/01
2002 Kia Sedona LX Minivan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
53	MDB CG	X	ICST001X	Accel., Triax	I.C. Sensor	3031-100	G
54	MDB CG	Y	ICST001Y	Accel., Triax	I.C. Sensor	3031-100	G
55	MDB CG	Z	ICST001Z	Accel., Triax	I.C. Sensor	3031-100	G
56	MDB Rear Centerline	X	ICST002X	Accel., Biax	I.C. Sensor	3031-100	G
57	MDB Rear Centerline	Y	ICST002Y	Accel., Biax	I.C. Sensor	3031-100	G
58	Right Bumper Contact	N/A	T0	Contact Switch	Tapeswitch	40 oz. Grey	%