

REPORT NUMBER KAR21063-01

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**SATURN CORPORATION
2002 SATURN L 100
4 DOOR SEDAN**

NHTSA NUMBER: GM0005

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SEPTEMBER 27, 2001

FINAL REPORT

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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 Saturn L 100 4 Door Sedan 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 September 25, 2001. The impact velocity of the Moving Deformable Barrier was 62.30 km/h, and the outside ambient temperature at the struck (driver's) side of the vehicle was 33.3 deg. C. The target vehicle's maximum post test static crush was 403 mm located at level 2 . The test vehicle's occupant performance is as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 40%;">Measurement Description</th> <th style="width: 30%;">Driver SID</th> <th style="width: 30%;">Passenger SID</th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) G's</td> <td style="text-align: center;">78.4</td> <td style="text-align: center;">42.9</td> </tr> <tr> <td>Left Lower Rib (LLR) G's</td> <td style="text-align: center;">85.9</td> <td style="text-align: center;">59.6</td> </tr> <tr> <td>Lower Spine (T₁₂) G's</td> <td style="text-align: center;">91.9</td> <td style="text-align: center;">51.0</td> </tr> <tr> <td>Thoracic Trauma Index (TTI) G's</td> <td style="text-align: center;">89</td> <td style="text-align: center;">55</td> </tr> <tr> <td>Pelvis (PEV) G's</td> <td style="text-align: center;">86</td> <td style="text-align: center;">68</td> </tr> </tbody> </table>				Measurement Description	Driver SID	Passenger SID	Left Upper Rib (LUR) G's	78.4	42.9	Left Lower Rib (LLR) G's	85.9	59.6	Lower Spine (T ₁₂) G's	91.9	51.0	Thoracic Trauma Index (TTI) G's	89	55	Pelvis (PEV) G's	86	68
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Pelvis (PEV) G's	86	68																			
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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 Saturn L 100 4 Door Sedan manufactured by Saturn 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 Saturn L 100 4 Door Sedan 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 62.30 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 1598 kg and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering, LLC in Adelanto, California, on September 25, 2001.

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver)		Left Rear (Passenger)	
	Installed	Operation	Installed	Operation
Front Airbag	Yes	Not Deployed	None	Not Applicable
Side Torso Airbag	None	Not Applicable	None	Not Applicable
Head Curtain Airbag	Yes	Deployed	None	Not Applicable

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 403 mm at level 2, 1350mm rearward of the left vertical impact point. The driver SID, Serial No. 275 and the passenger SID, Serial No. 274 were calibrated just prior to this test. The SID injury criteria is summarized as follows:

Measurement	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	G's	89	55
Peak Pelvic G's (PEV)	G's	86	68

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 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

Test Date: 09/25/01

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 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

Test Date: 09/25/01

TEST VEHICLE INFORMATION

Make	Saturn
Model	L 100
Body Style	4 Door Sedan
NHTSA No.	GM0005
VIN	1G8JS54F12Y502198
Color	Silver
Delivery Date	9/25/2001
Odometer Reading (mile)	62
Dealer	Saturn of Ontario
Transmission	4-Speed Automatic
Final Drive	Front
Type/Number Cylinders	4
Engine Displacement (L)	2.2
Engine Placement	Transverse

TEST VEHICLE OPTIONS

Driver Front Airbag	Yes
Rear Pass. Airbag	No
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	Yes
Head Airbag	Yes
Anti-Theft System	No
Cruise Control	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Saturn Corporation	GVWR (kg)	1806
Date of Manufacture	June-01	GAWR Front (kg)	916
		GAWR Rear (kg)	889

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	210	180
Cold Pressure (kPa)	210	180
Recommend Tire Size	P195/65R15	P195/65R15
Tire Size on Vehicle	P195/65R15	P195/65R15
Tire Manufacturer	Firestone	Firestone

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Split Bench	Bench	None	
Number of Occupants	2	3	0	5
Capacity Wt. (VCW) (kg)				420
Cargo Weight (RCLW) (kg)				80

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

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

Test Date: 09/25/01

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	416	275		406	384	
Right	kg	399	272		454	354	
Ratio	%	59.8	40.2		53.8	46.2	
Totals	kg	815	547	1362	860	738	1598

TARGET TEST WEIGHT CALCULATION*

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1362
Weight of 2 P572F Side Impact Dummies	kg	161
Rated Cargo/Luggage Weight (RCLW)	kg	80
Calculated Vehicle Target Weight (TVTW)	kg	1603

*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	674	682	690	692	1086
As Tested	mm	659	668	665	674	1249
Fully Loaded	mm	662	678	647	661	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel base	mm	2704
Total Vehicle Length at Left Side	mm	3115
Total Vehicle Length at Centerline	mm	4835
Total Vehicle Length at Right Side	mm	3115
Weight of Ballast In Cargo Area	kg	85
Amount of Stoddard Solvent in Fuel Tank	Liters	51.2*

* Per COTR

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel base	mm	2704
Target Impact Point Aft of Front Axle	mm	412
Actual Impact Point Aft of Front Axle	mm	389

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

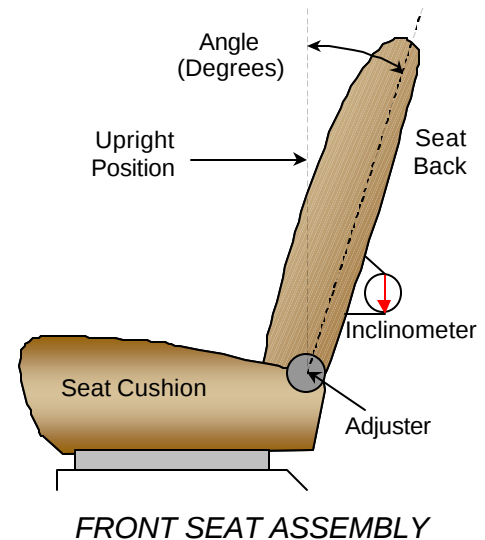
Test Date: 09/25/01

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: 25° with a seated dummy

Rear seat back angle: 26° 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: 17 seat detents

Rear seat fore/aft total travel: Seat is fixed

Driver seat fore/aft position: Placed in the 9th 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 2nd position from the top; the rear passenger seat has 5 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 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

Test Date: 09/25/01

FUEL TANK CAPACITY DATA

The "Usable Capacity" of the standard equipment fuel tank is: 59.4 liters

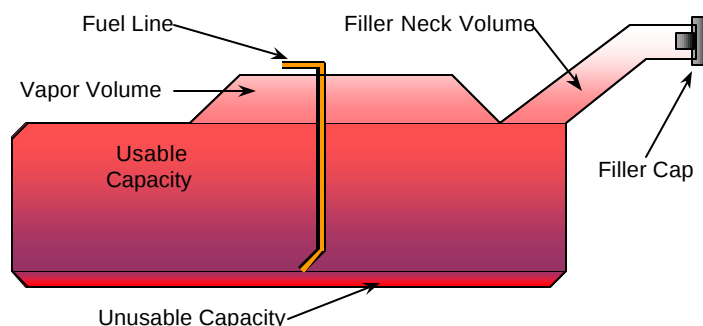
The "Usable Capacity" of any optional equipment fuel tank is: N/A liters

92-94% of "Usable Capacity" for certification to FMVSS 301 requirement: 54.6 to 55.8 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 51.2* liters

*Per COTR

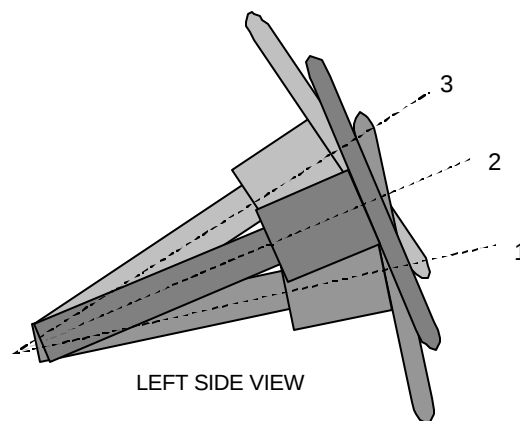
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately three (3) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender.



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: 15°

Geometric center, position 2: 25°

Uppermost, position 3: 35°

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

Test Date: 09/25/01

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	416	275		406	384	
Right	kg	399	72		454	354	
Weight Ratio	%	70.1	29.9		53.8	46.2	
Totals	kg	815	347	1162	860	738	1598

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	275	264
Level 2	Occupant H-Point	mm	403	510
Level 3	Mid Door	mm	369	588
Level 4	Window Sill	mm	329	857
Level 5	Window Top	mm	95	1329
N/A	Maximum Penetration	mm	403	

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 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

Test Date: 09/25/01

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	62.30
Trap No. 2 Velocity (Redn.)	km/h	61.1 to 62.7	62.32
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	Right	188
B	Top of Bumper	533	800	Right	150
C	Mid Level	686	700	Right	166
D	Top of Stack	813	800	Right	201

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 4
POST TEST OBSERVATIONS

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No.: GM0005

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

Test Date: 09/25/01

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID	Rear Seat SID
Dummy Type / Serial No.	P572F, SID / No. 275	P572F, SID / No. 274
Head Contact	Side Airbag	Side Airbag/Header
Upper Torso Contact	Panel	Panel
Lower Torso Contact	Panel	Panel
Left Knee Contact	Knee to Knee	Panel
Right Knee Contact	Knee to 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.

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 01		Left Rear (Passenger) Occupant Location 04	
	Installed	Operation	Installed	Operation
Front Airbag	Yes	Not Deployed	None	Not Applicable
Side Torso Airbag	None	Not Applicable	None	Not Applicable
Head Curtain Airbag	Yes	Deployed	None	Not Applicable
Seat Belt Pretensioner	Yes	Unknown	Yes	Unknown
Seat Belt Load Limiter	Yes	Unknown	Yes	Unknown

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	23(right)
Vertical Offset	mm	+/- 20	6(above)

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5
SID INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2002 Saturn L100 4 Door Sedan

NHTSA No.: GM0005

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

Test Date: 9/25/01

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	78.4	25.6	-11.2	77.5	42.9	46.9	-4.2	121.3
Lower Rib (LLR)	Y	G's	85.9	26.9	-7.5	78.8	59.6	45.0	-6.9	83.1
Lower Spine (T ₁₂)	Y	G's	91.9	29.4	-15.7	68.8	50.9	50.6	-7.7	71.9
Pelvis (PEV)	Y	G's	85.8	25.6	-15.1	86.3	67.7	35.0	-11.3	70.0

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	85.948	91.879	89	86	59.591	50.940	55	68

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	76.9	25.6	-10.1	77.5	43.5	41.3	-4.0	121.3
Lower Rib (LLR)	Y	G's	86.5	26.9	-6.7	88.1	61.4	45.0	-6.2	83.1
Lower Spine (T ₁₂)	Y	G's	92.1	29.4	-15.4	68.8	50.1	50.6	-8.5	72.5
Pelvis (PEV)	Y	G's	84.6	25.0	-15.3	86.3	68.0	35.0	-11.6	69.4

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	86.477	92.112	89	85	61.372	50.129	56	68

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	9.3	189.1	-18.0	53.4	8.3	49.0	-19.8	78.0
Head CG	Y	G's	71.9	43.8	-9.6	26.9	91.2	57.5	-6.3	69.5
Head CG	Z	G's	26.5	35.4	-27.7	44.2	14.1	41.1	-45.3	62.0
Head CG Resultant	N/A	G's	77.0	44.4			95.6	57.5		

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	433.4	35.8	54.9	55.1	384.7	53.3	67.1	59.8

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

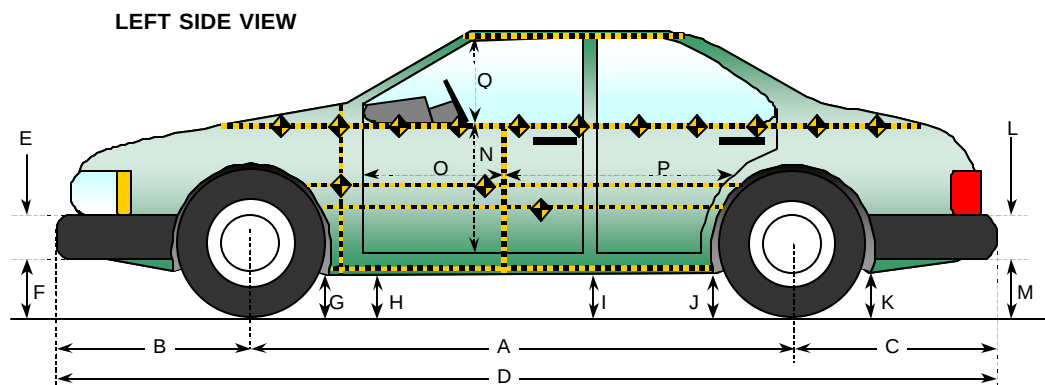
DATA SHEET NO. 6
VEHICLE PRE-TEST AND POST TEST MEASUREMENTS

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

Test Date: 09/25/01



All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2704	2630	-74
B	Front Axle To FSOV	1016	1028	12
C	Rear Axle to RSOV	1124	1150	26
D	Total Length at Centerline	4835	4803	-32
E	Front Bumper Thickness	325	325	0
F	Front Bumper Bottom to Ground	233	299	66
G	Sill Height at Front Wheel Well	195	234	39
H	Sill Height at Front Door Leading Edge	194	254	60
I	Sill Height at "B" Pillar	202	308	106
J1	Sill Height at Rear Wheel Well	192	201	9
J2	Pinch Weld Height at Rear Wheel Well	205	224	19
K	Sill Height aft of Rear Wheel Well	238	250	12
L	Rear Bumper Thickness	313	313	0
M	Rear Bumper Bottom to Ground	353	358	5
N	Sill Height to Window Bottom Sill	612	546	-66
O	Front Door Leading Edge to Impact CL	712	735	23
P	Rear Door Trailing Edge to Impact CL	1335	1245	-90
Q	Front Window Opening	413	420	7
R	Right Side Length	3115	3127	12
S	Left Side Length	3115	3025	-90
T	Vehicle Width at "B" Post	1752	1595	-157

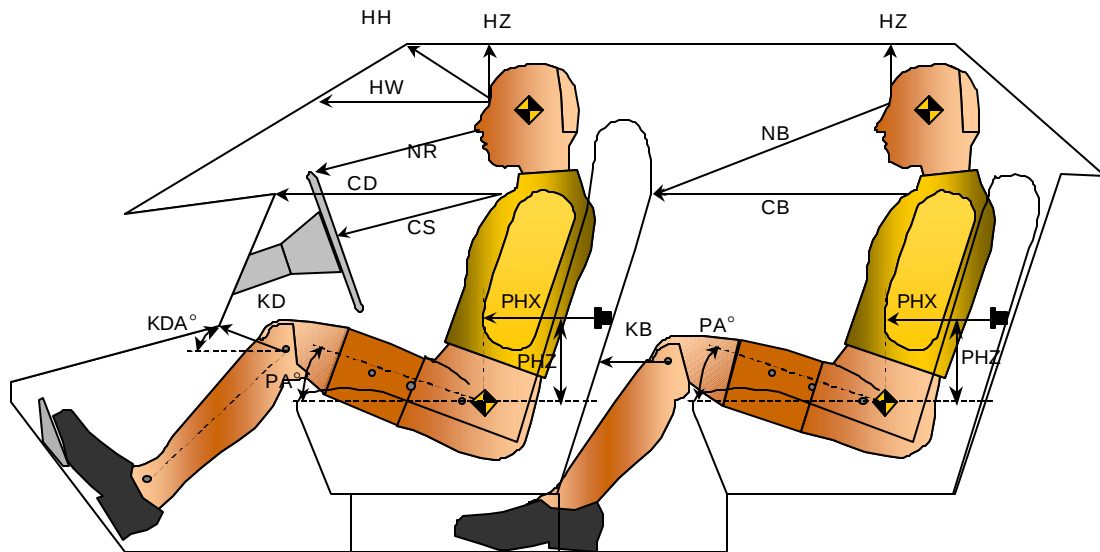
DATA SHEET NO. 7 **SID LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

Test Date: 09/25/01



Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	380	15		
HW		Head to Windshield	535			
HZ	HZ	Head to Roof	175	90	180	90
NR	NB	Nose to Rim/Nose to Seatback	490	12	582	21
CD	CB	Chest to Dash or Seatback	535	5	510	1
CS		Chest to Steering Wheel	353	14		
KDL	KBL	Left Knee to Dash or Seatback	170	34	215	
KDR	KBR	Right Knee to Dash or Seatback	162		220	
PA	PA	Pelvic Angle		23		25
PHX	PHX	H-Point to Striker (X-Axis)	215		250	
PHZ	PHZ	H-Point to Striker (Z-Axis)	149		272	

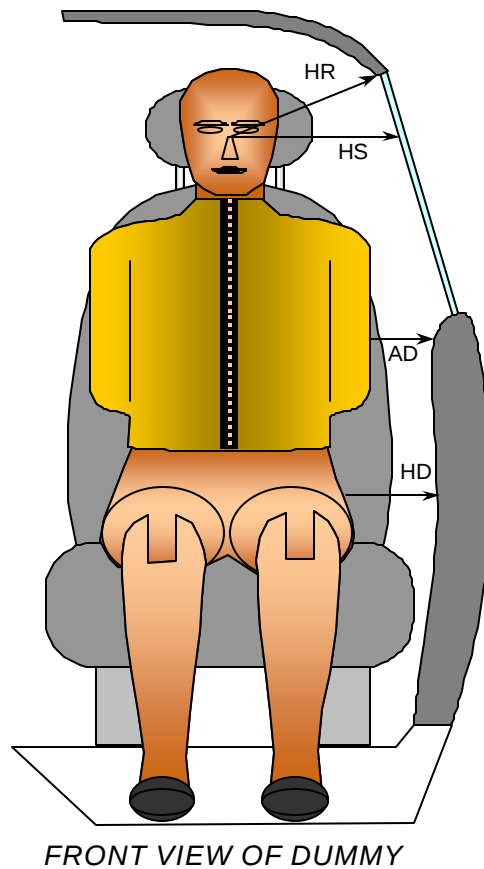
DATA SHEET NO. 8
SID LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No. GM0005

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

Test Date: 09/25/01



Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	170	185
HS	Head to Side Window	mm	312	320
AD	Arm to Door	mm	91	36
HD	H-Point to Door	mm	110	134

DATA SHEET NO. 9

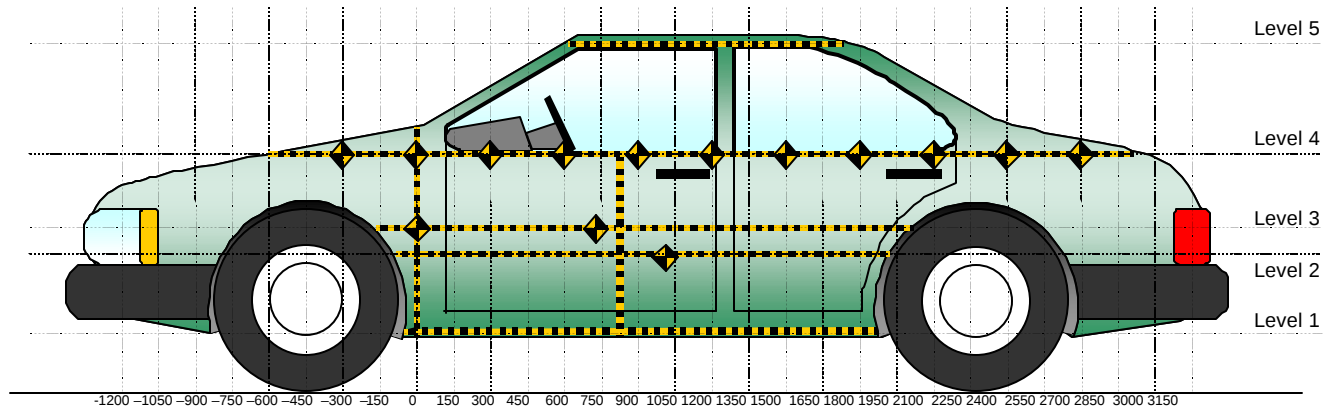
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No.: GM0005

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

Test Date: 09/25/01



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	1329
4	Window Sill	857
3	Mid Door	588
2	Occupant H-Point	510
1	Sill Top	264

DATA SHEET NO. 10 - VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No.: GM0005

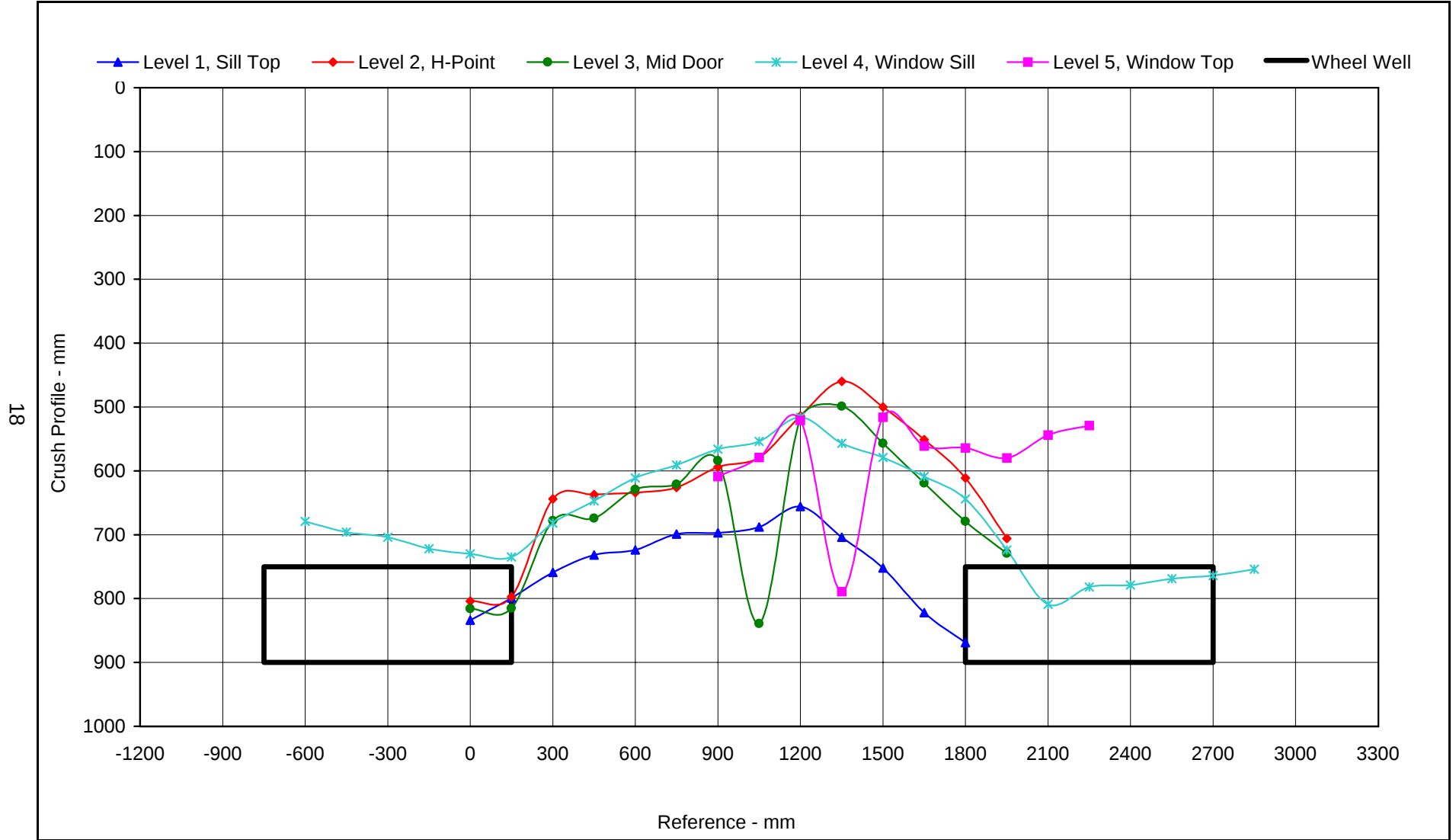
Test Program: 55/28 km/h 90° Side Impact NCAP

Test Date: 2001-09-25

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600				640					679					-39	
-450				662					696					-34	
-300				678					704					-26	
-150				693					722					-29	
0	924	861	864	788		834	804	816	730		90	57	48	58	
150	929	858	861	797		799	797	815	735		130	61	46	62	
300	931	860	863	802		759	644	678	682		172	216	185	120	
450	930	860	865	817		732	637	674	647		198	223	191	170	
600	929	862	869	822		724	634	629	611		205	228	240	211	
750	931	863	868	828		699	626	621	591		232	237	247	237	
900	931	863	868	840	593	697	594	584	566	609	234	269	284	274	-16
1050	930	862	867	840	603	688	579	839	554	579	242	283	28	286	24
1200	931	863	866	845	615	656	514	519	516	521	275	349	347	329	94
1350	932	863	868	849	626	704	460	499	557	789	228	403	369	292	-163
1500	928	864	865	848	611	752	500	557	579	516	176	364	308	269	95
1650	930	864	864	847	612	822	551	619	609	561	108	313	245	238	51
1800	927	865	862	844	611	869	611	679	644	564	58	254	183	200	47
1950		863	866	841	607		706	729	724	580		157	137	117	27
2100				835	595				809	544				26	51
2250				825	570				782	529				43	41
2400				817					779					38	
2550				729					769					-40	
2700				714					764					-50	
2850				698					754					-56	
3000															

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

DATA SHEET NO. 10...(continued)



Maximum Crush, Level 1: 275 mm at 1200 mm
 Maximum Crush, Level 2: 403 mm at 1350 mm
 Maximum Crush, Level 3: 369 mm at 1350 mm
 Maximum Crush, Level 4: 329 mm at 1200 mm
 Maximum Crush, Level 5: 95 mm at 1500 mm

Test Program: 55/28 km/h 90° Side Impact NCAP No.: GM0005
 Test Vehicle: 2002 Saturn L 100 4 Door Sedan
 Test Date: 09-25-01



DATA SHEET NO. 11

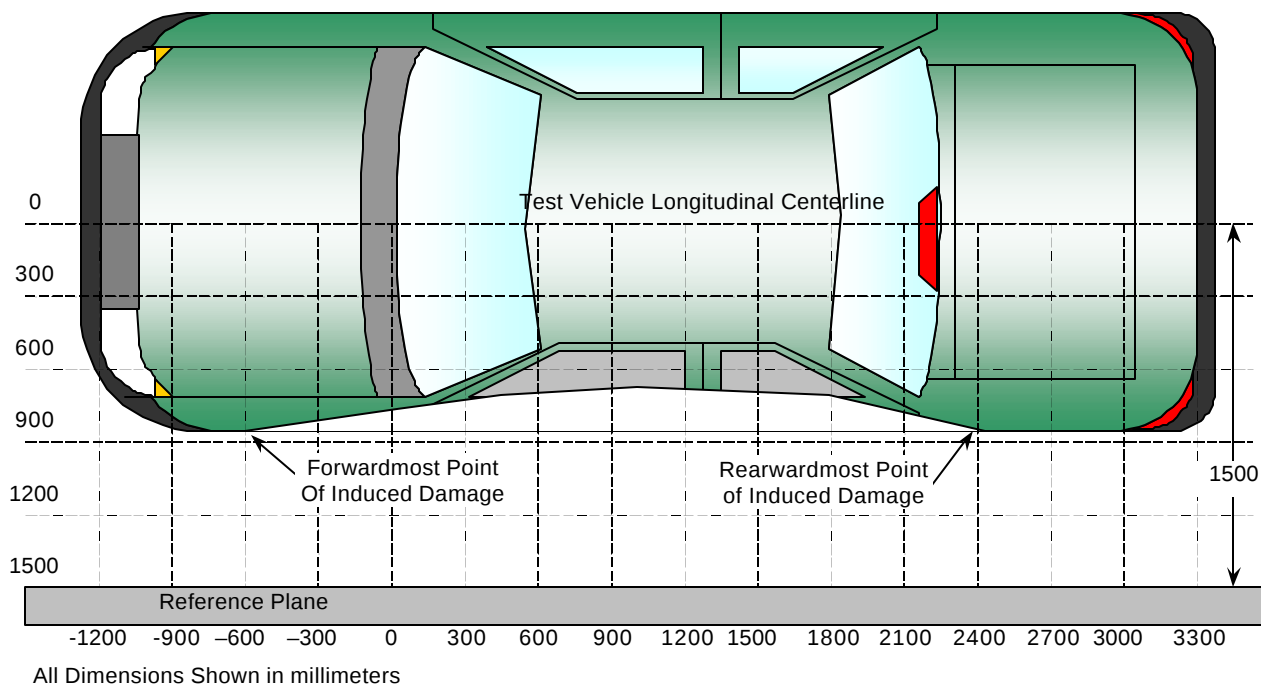
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No.: GM0005

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

Test Date: 09/25/01



TOP VIEW

Damage Profile Distances

DPD	Distance From Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	-600	4	640	679	-39
2	0	1	924	834	90
3	750	3	868	621	247
4	1650	2	864	551	313
5	2250	4	825	782	43
6	2850	4	698	754	-56

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

DATA SHEET NO. 12

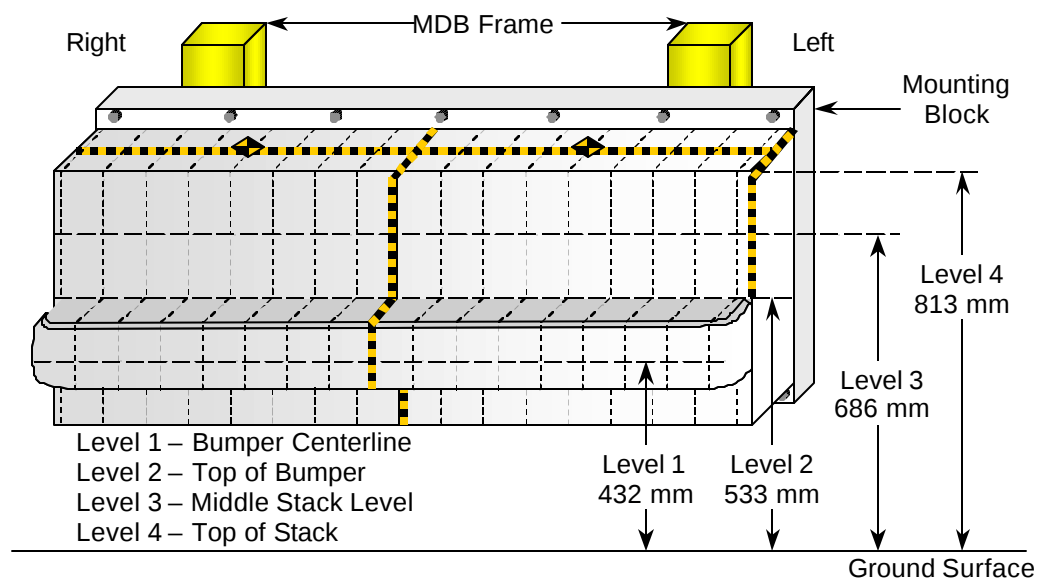
DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No.: GM0005

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

Test Date: 09/25/01



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	56	50	53	57	68	73	78	81	89	96	105	114	122	132	152	181	188
2	144	119	96	59	46	41	41	48	59	69	80	89	100	110	122	142	150
3	90	44	27	21	19	25	25	22	24	29	36	45	53	68	106	166	164
4	89	44	21	6	11	30	30	30	28	30	34	46	63	101	143	194	201

All Dimensions in mm

DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

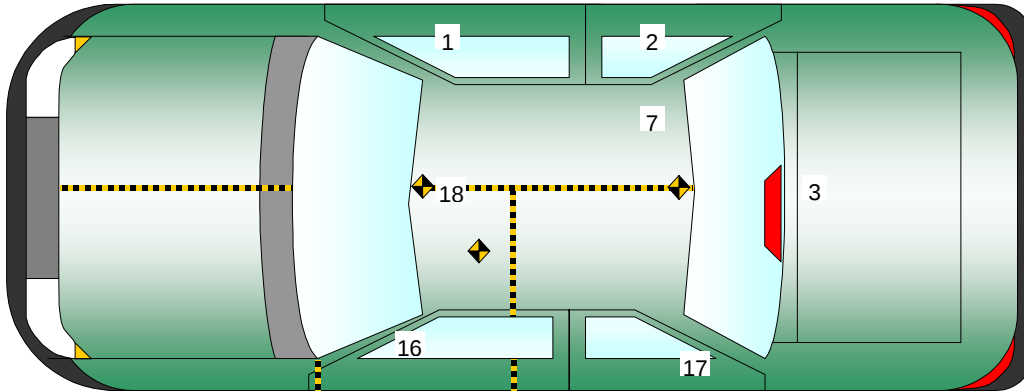
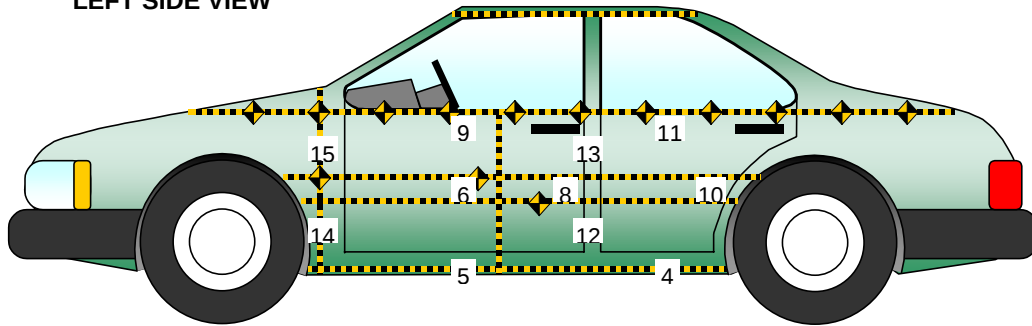
Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No.: GM0005

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

Test Date: 09/25/01

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 Saturn L100 4 Door Sedan

NHTSA No.: GM0005

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

Test Date: 9/25/01

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	2859	640	240	X	3.9	65.6	-6.3	13.8
					Y	20.0	16.6	-2.6	156.6
					Z	6.4	30.6	-9.3	10.8
					RES	20.8	16.6		
2	Right Sill at Rear Seat	1814	685	345	X	3.4	64.9	-6.8	13.6
					Y	19.2	53.1	-2.3	156.0
					Z	5.6	31.3	-5.1	10.7
					RES	19.6	53.1		
3	Rear Floorpan Above Axle	1124	0	486	X	4.3	28.4	-6.9	20.6
					Y	19.7	18.3	-1.8	145.2
					Z	8.7	17.1	-3.9	68.3
					RES	21.3	18.0		
4	Left Sill at Rear Door	1934	-705	485	Y	69.5	19.6	-47.3	15.7
5	Left Sill at Front Door	2694	-705	485	Y	95.2	16.6	-63.9	9.6
6	Front Door Centerline	2614	-735	720	Y	174.3	10.9	-120.2	26.4
7	Rear Occupant Compartment	2084	270	170	Y	16.7	6.3	-2.6	155.6
8	Front Door Mid-Rear	2434	-735	665	Y	180.1	5.4	-226.9	25.6 *
9	Front Door Upper Centerline	2614	-740	795	Y	142.0	11.0	-133.2	21.7
10	Rear Door Mid-Rear	1614	-755	655	Y	93.8	13.5	-79.9	26.8
11	Rear Door Upper Centerline	1785	-760	835	Y	184.8	13.4	-137.9	26.4
12	B-Post Lower	2104	-745	535	Y	133.4	5.0	-41.1	25.5
13	B-Post Middle	2104	-745	695	Y	206.9	3.4	-39.0	22.0
14	A-Post Lower	3224	-820	530	Y	149.3	4.5	-67.9	15.2
15	A-Post Middle	3224	-820	730	Y	55.9	3.1	-25.6	17.2
16	Front Seat Track	2704	-585	340	Y	53.8	11.2	-29.7	26.2
17	Rear Seat Structure				Y				**
18	Vehicle CG	2069	0	155	X	7.4	18.8	-7.9	23.3
					Y	24.5	26.1	-2.1	157.3
					Z	20.6	23.1	-23.2	17.9
					RES	33.3	17.8		

* Questionable data after 21.0 msec

** Not installed

DATA SHEET NO. 14
MDB ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2002 Saturn L100 4 Door Sedan

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

NHTSA No.: GM0005

Test Date: 9/25/01

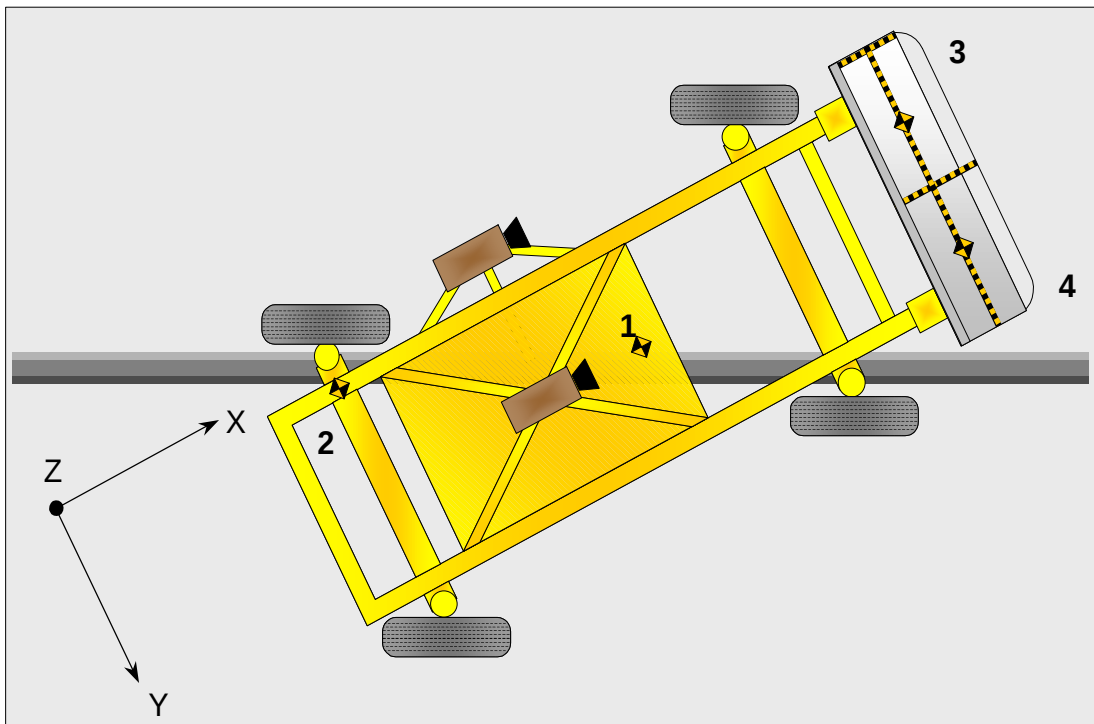
MDB ACCELEROMETER PEAK DATA AND LOCATIONS

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	1.8	168.7	-17.1	43.2
					Y	3.1	168.4	-6.5	26.5
					Z	10.7	150.8	-11.8	140.1
					RES	18.0	43.2		
2	MDB Rear	-2642	-593	608	X	2.0	104.2	-18.6	37.8
					Y	2.7	107.8	-5.8	23.9

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	26.8	52.6	-0.5



DATA SHEET NO. 15

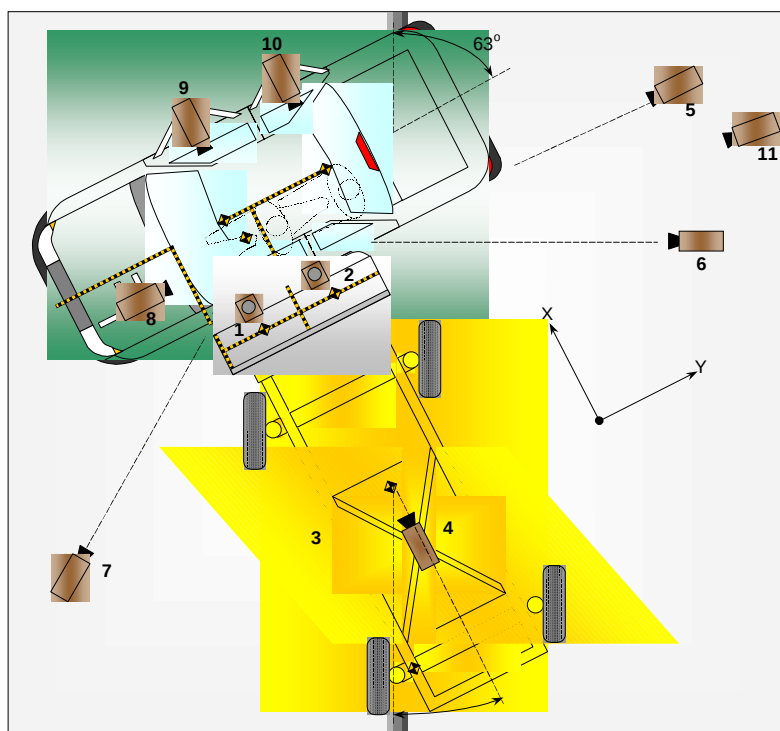
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No.: GM0005

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

Test Date: 09/25/01



No.	Camera View	Location (mm)			Angle (deg.)	Lens (mm)	Film Speed (fr./sec.)
		X	Y	Z			
1	Overhead Overall	-1220	-2630	560	-90	10	FAILED
2	Overhead Close-up	-610	-1000	5790	-90	19	980
3	MDB Onboard, Impact Point Close-Up	-2130	0	1140	-7	13	810
4	MDB Onboard, Centerline of Impact	-3050	-1650	1830	-11	13	910
5	Right Side, Ground Level, Overall	0	-18260	1680	0	24	1040
6	Right Side, Ground Level, Close-up	-8110	-21000	1700	-3	80	990
7	Left Side, Ground Level, Close-up	-1830	4670	1620	-8	13	FAILED
8	Vehicle Onboard Front SID, Front	450	40	1340	-14	19	1010
9	Vehicle Onboard Front SID, Side	1820	-860	980	-5	10	1030
10	Vehicle Onboard Rear SID, Side	1930	-1720	1040	-6	10	910
11	Real Time Coverage	N/A	N/A	N/A	N/A	N/A	24

DATA SHEET NO. 16
FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

NHTSA No.: GM0005

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

Test Date: 09/25/01

Test Time: 10:55 AM

Temperature at Time of Impact: 33.35 °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

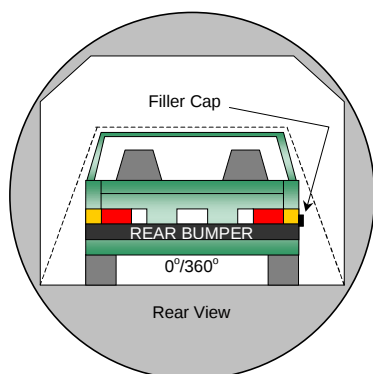
DATA SHEET NO. 17
FMVSS 301 STATIC ROLLOVER DATA SHEET

Test Vehicle: 2002 Saturn L 100 4 Door Sedan

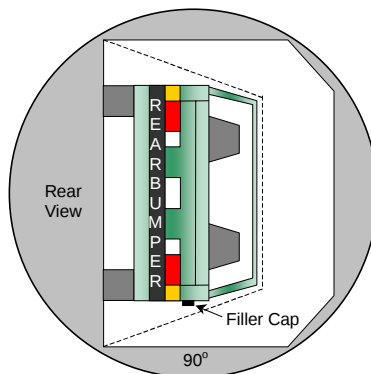
NHTSA No.: GM0005

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

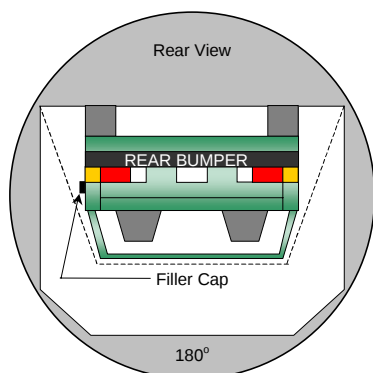
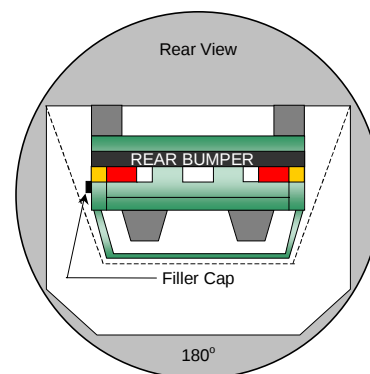
Test Date: 09/25/01



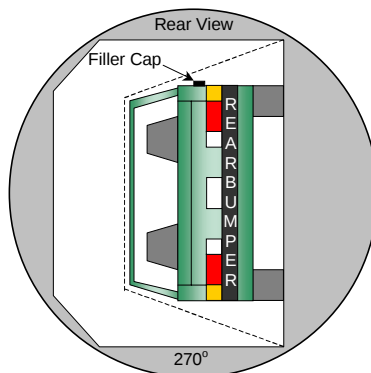
0° TO 90°



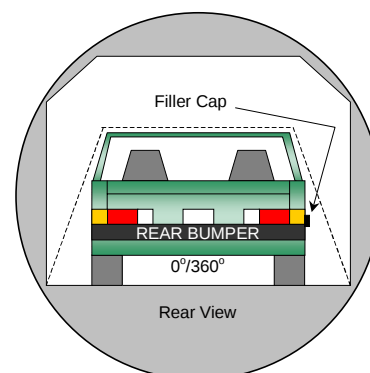
90° TO 180°



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°	80	300	0.0
180° TO 270°	77	300	0.0
270° TO 360°	80	300	0.0

APPENDIX A
PHOTOGRAPHS

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Figure A-1: Left Front, as Received



Figure A-2: Right Rear, as Received



MFD BY SATURN CORPORATION

DATE
06/01

GVWR
1806 KG
3981 LB

GAWR FRT
916 KG
2020 LB

GAWR RR
890 KG
1961 LB

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

1G8JS54F12Y502198

TYPE: PASS CAR

Figure A-3: Vehicle Certification Label



TIRE – LOADING INFORMATION

OCCUPANTS				VEHICLE CAP. WT.	
FRT.	CTR.	RR.	TOTAL	KG	LBS
2	0	3	5	420	926

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.

1G8JS54F12Y502198

MODEL: JH19 ZJE

	TIRE SIZE	SPEED RTG	COLD TIRE PRESSURE
FRT	P195/65R15	T	210KPA(30PSI)
RR	P195/65R15	T	210KPA(30PSI)
SPA	T115/70R16	M	420KPA(60PSI)

IF TIRES ARE HOT, ADD 28KPA(4PSI)

SEE OWNER'S MANUAL FOR MORE INFORMATION

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



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



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



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



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



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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

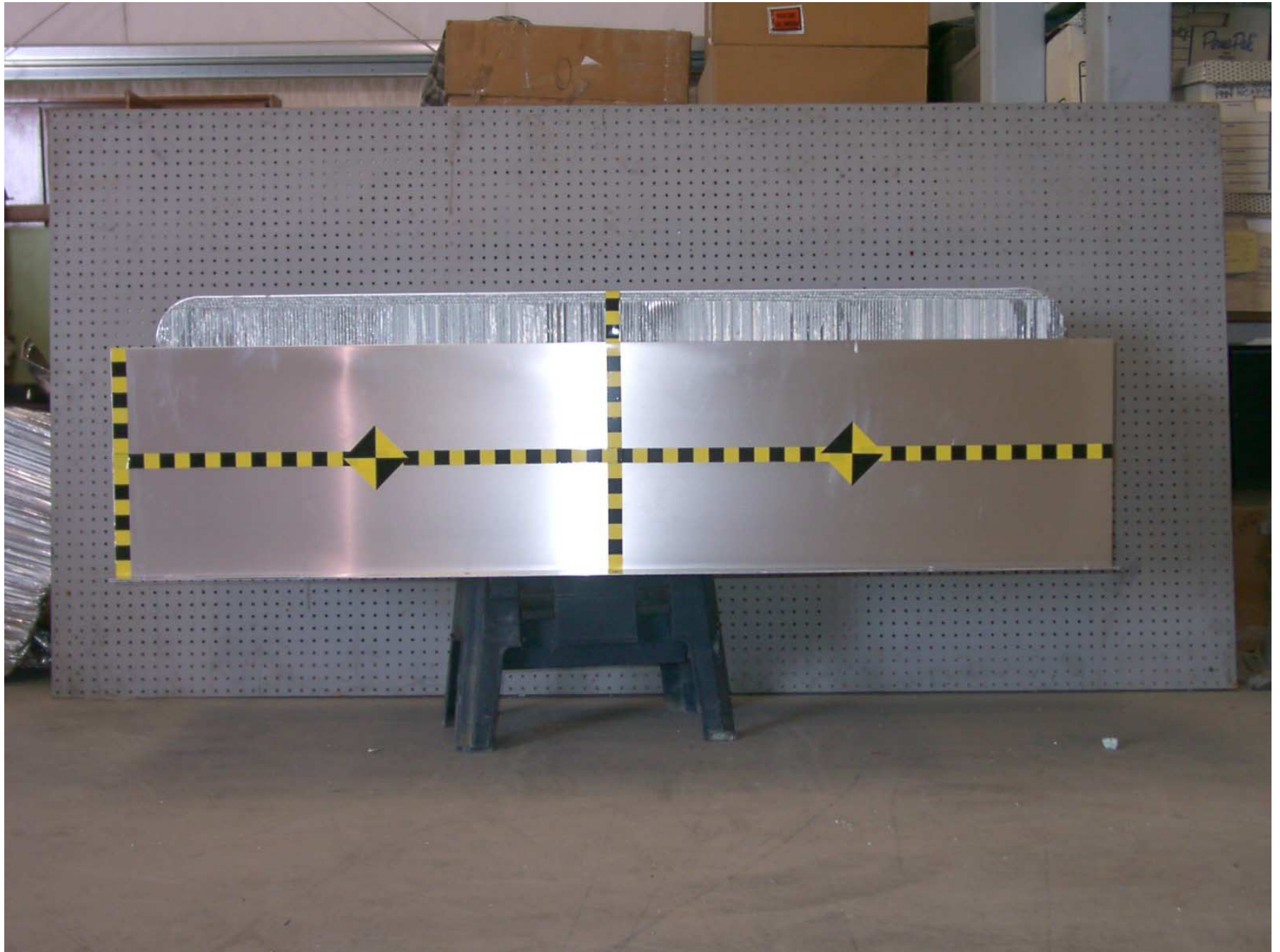


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Figure A-43: Top View of Deformable Barrier, Post-Test



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



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



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Figure A-49: Vehicle During Impact

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SID, VEHICLE, AND MDB RESPONSE DATA

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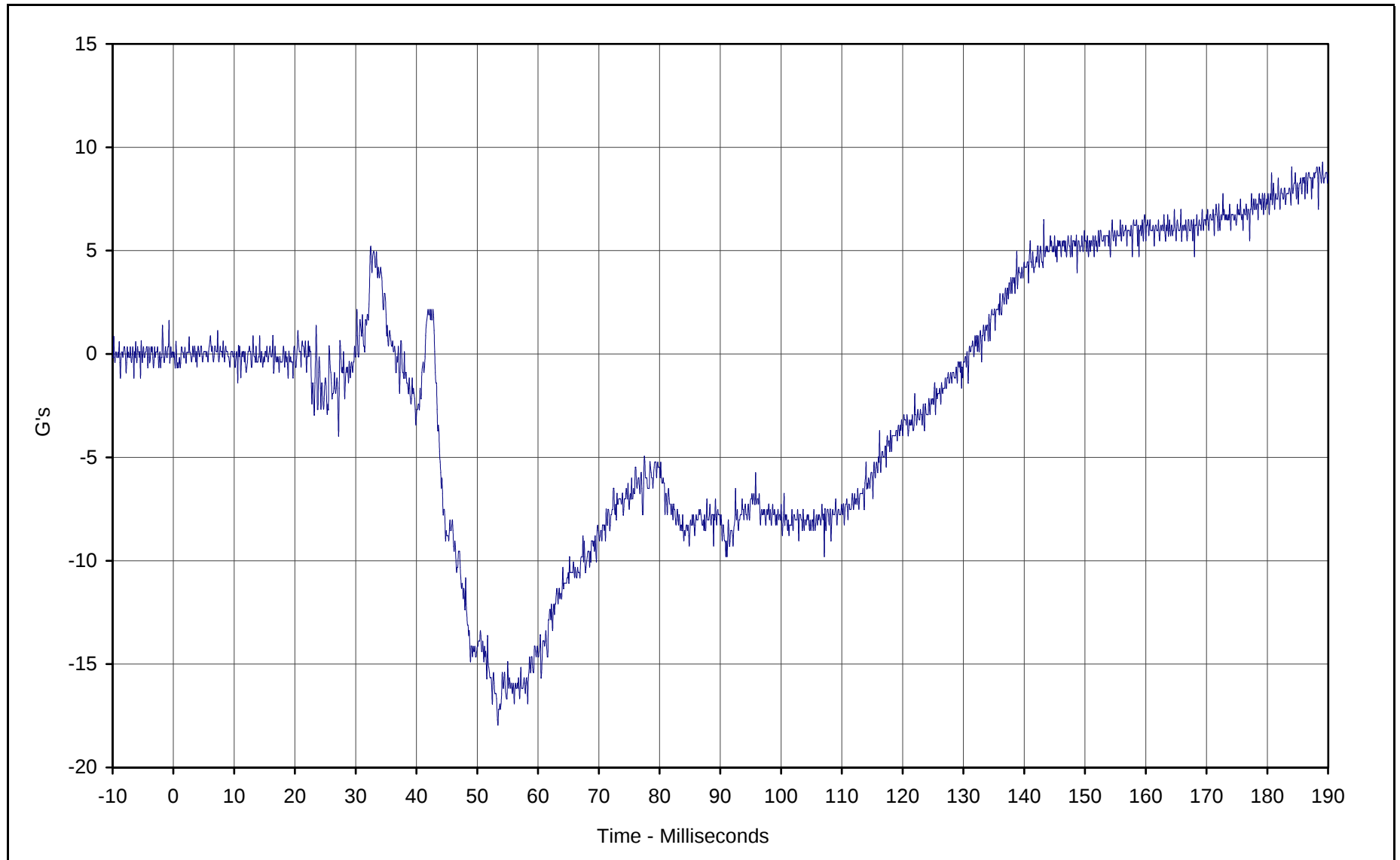
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Curve Description: Driver Head CG X

Maximum Value: 9.3 at 189.1 Milliseconds

Minimum Value: -18.0 at 53.4 Milliseconds

SAE Filter Class: 1000

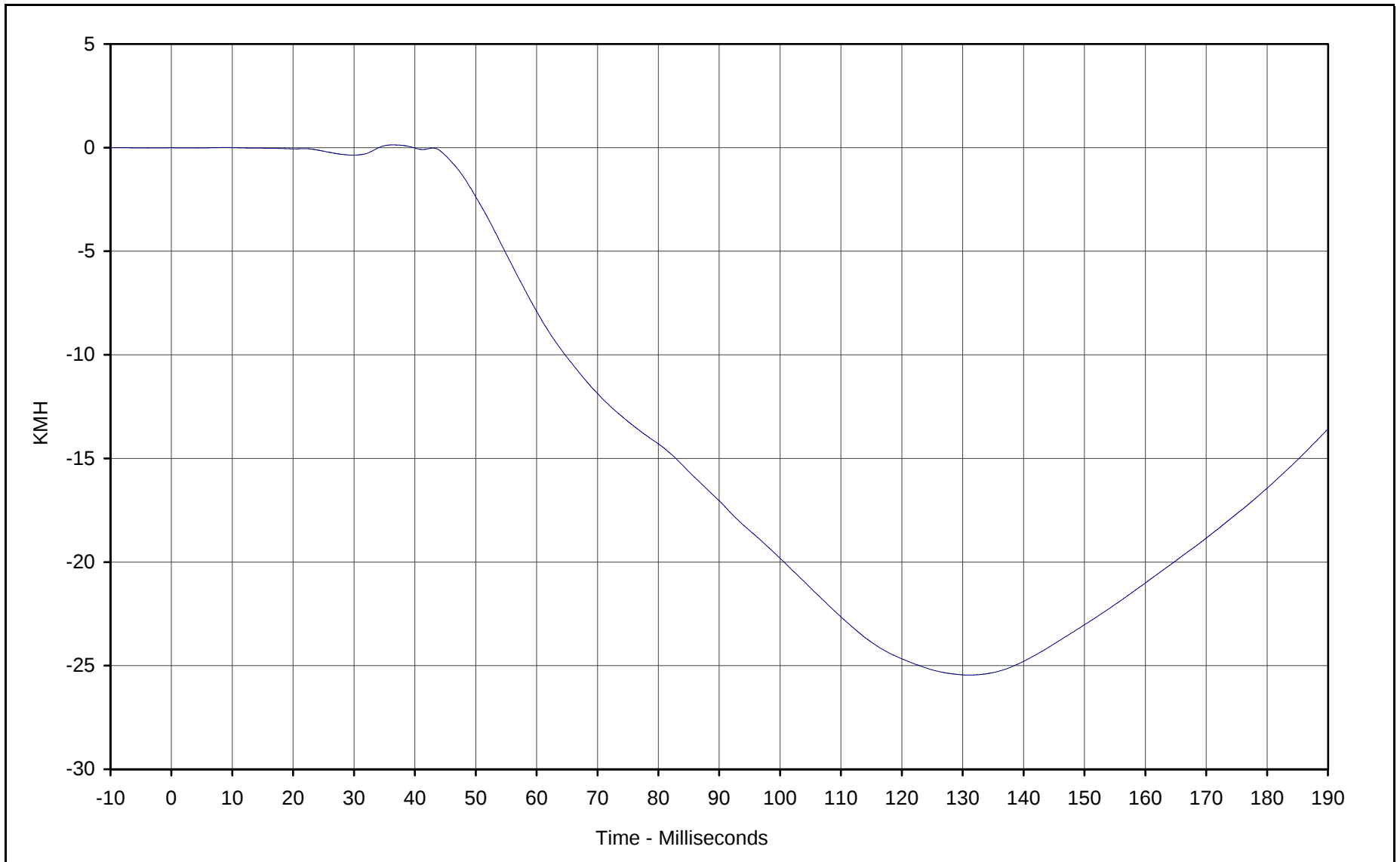
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Curve Number: FIL-001

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

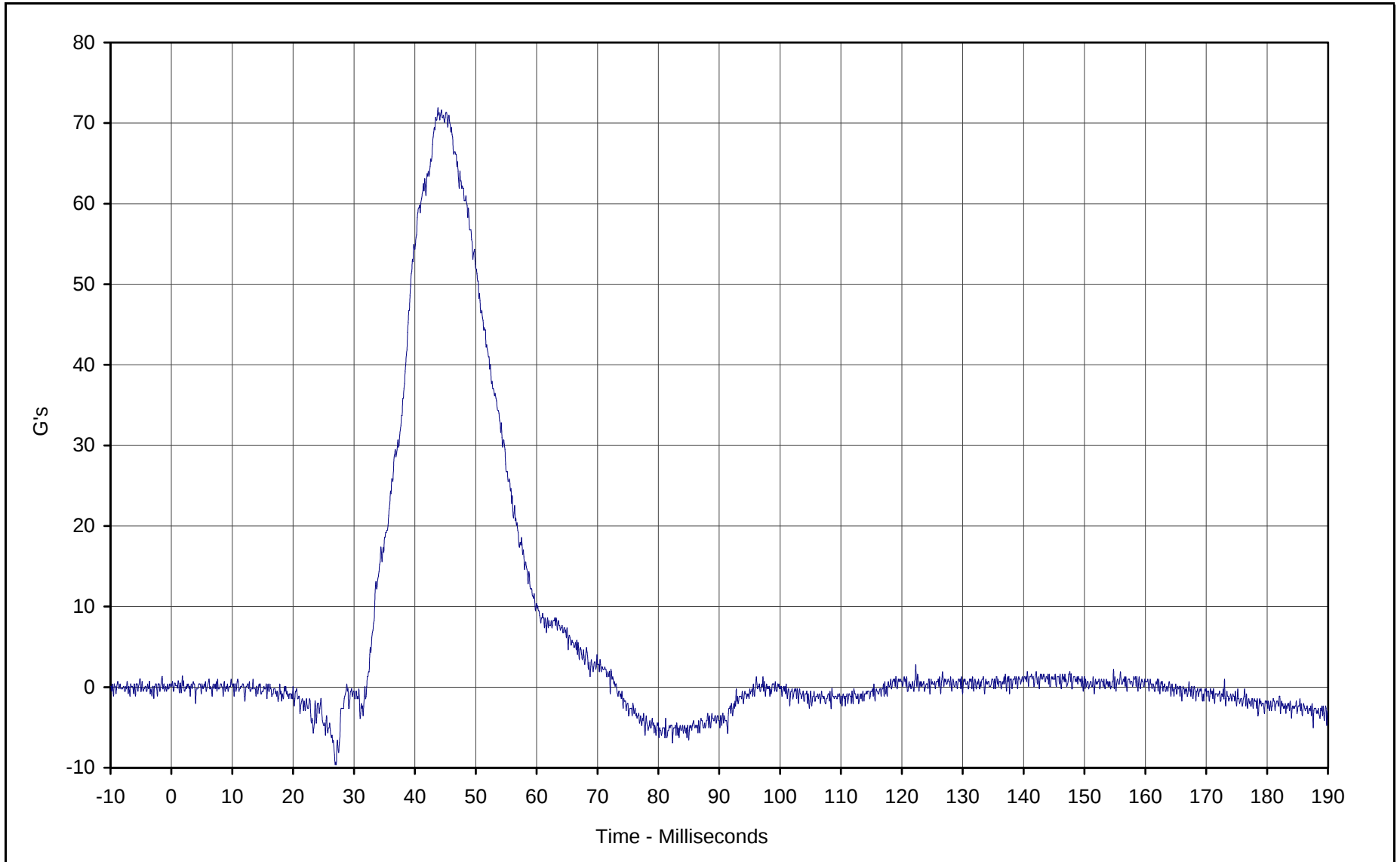




Curve Description: Driver Head CG X Velocity
Maximum Value: 0.1 at 36.4 Milliseconds
Minimum Value: -25.5 at 131.0 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-001

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

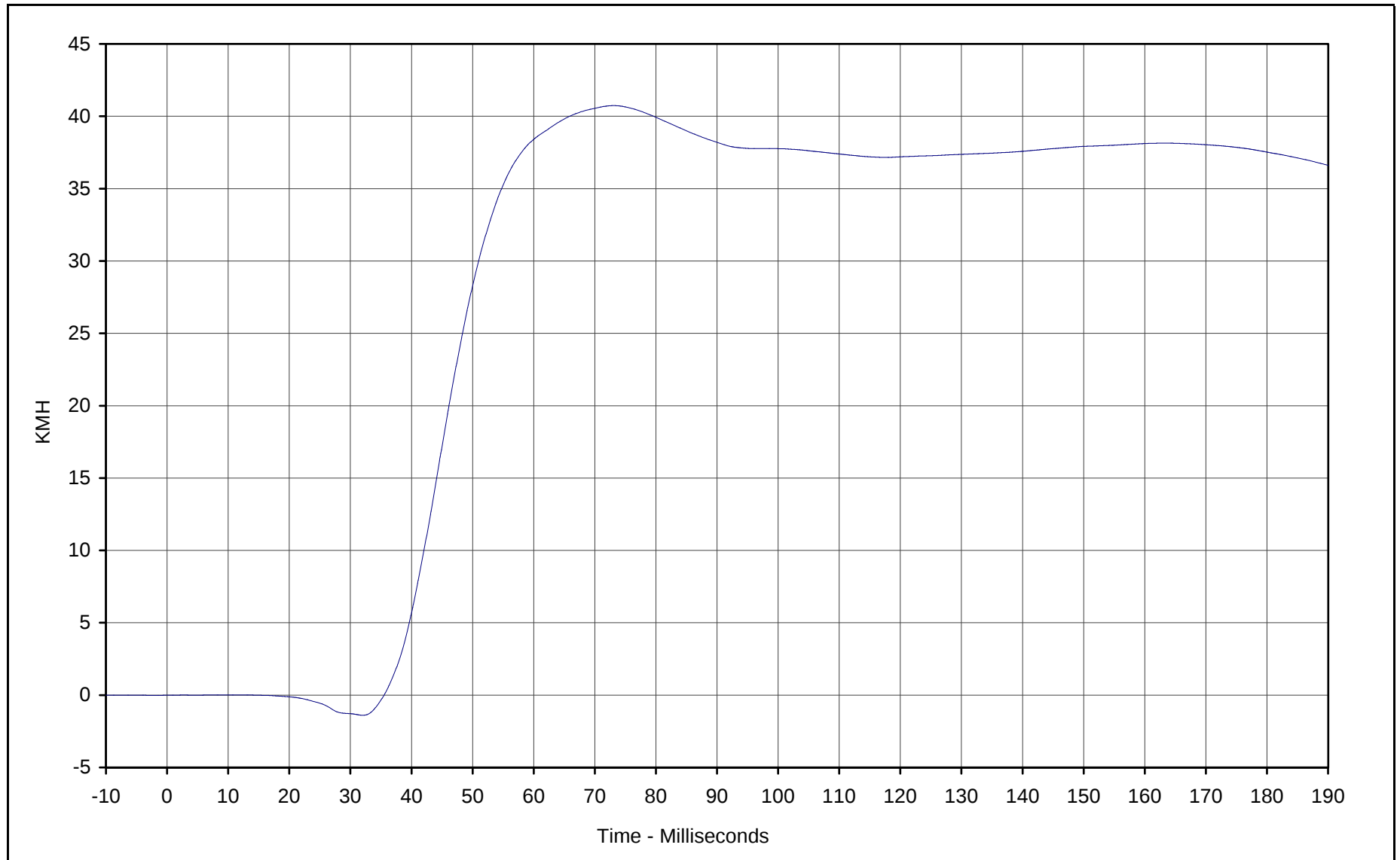




Curve Description: Driver Head CG Y
Maximum Value: 71.9 at 43.8 Milliseconds
Minimum Value: -9.6 at 26.9 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-002

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

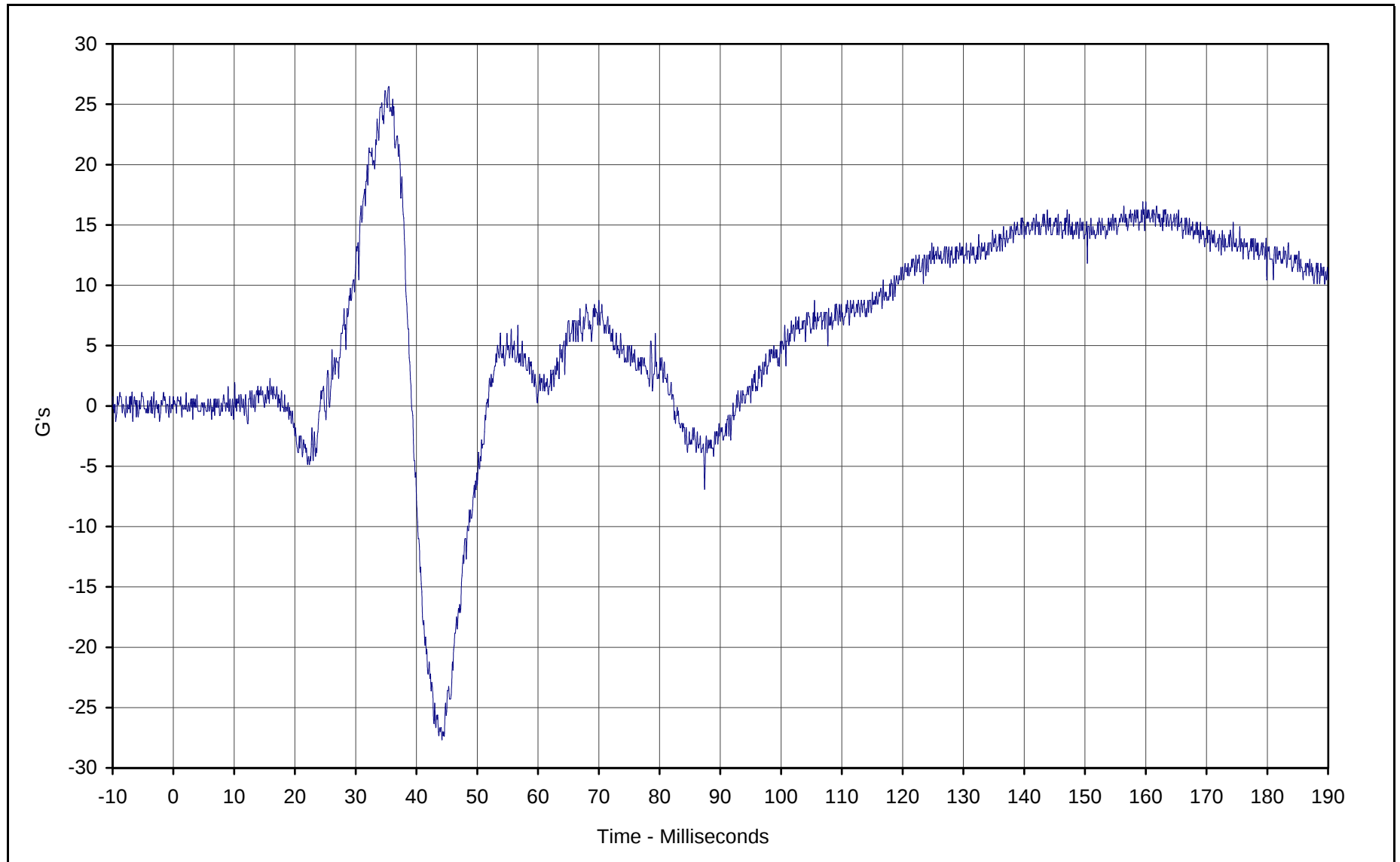




Curve Description: Driver Head CG Y Velocity
Maximum Value: 40.7 at 73.1 Milliseconds
Minimum Value: -1.4 at 32.0 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-002

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

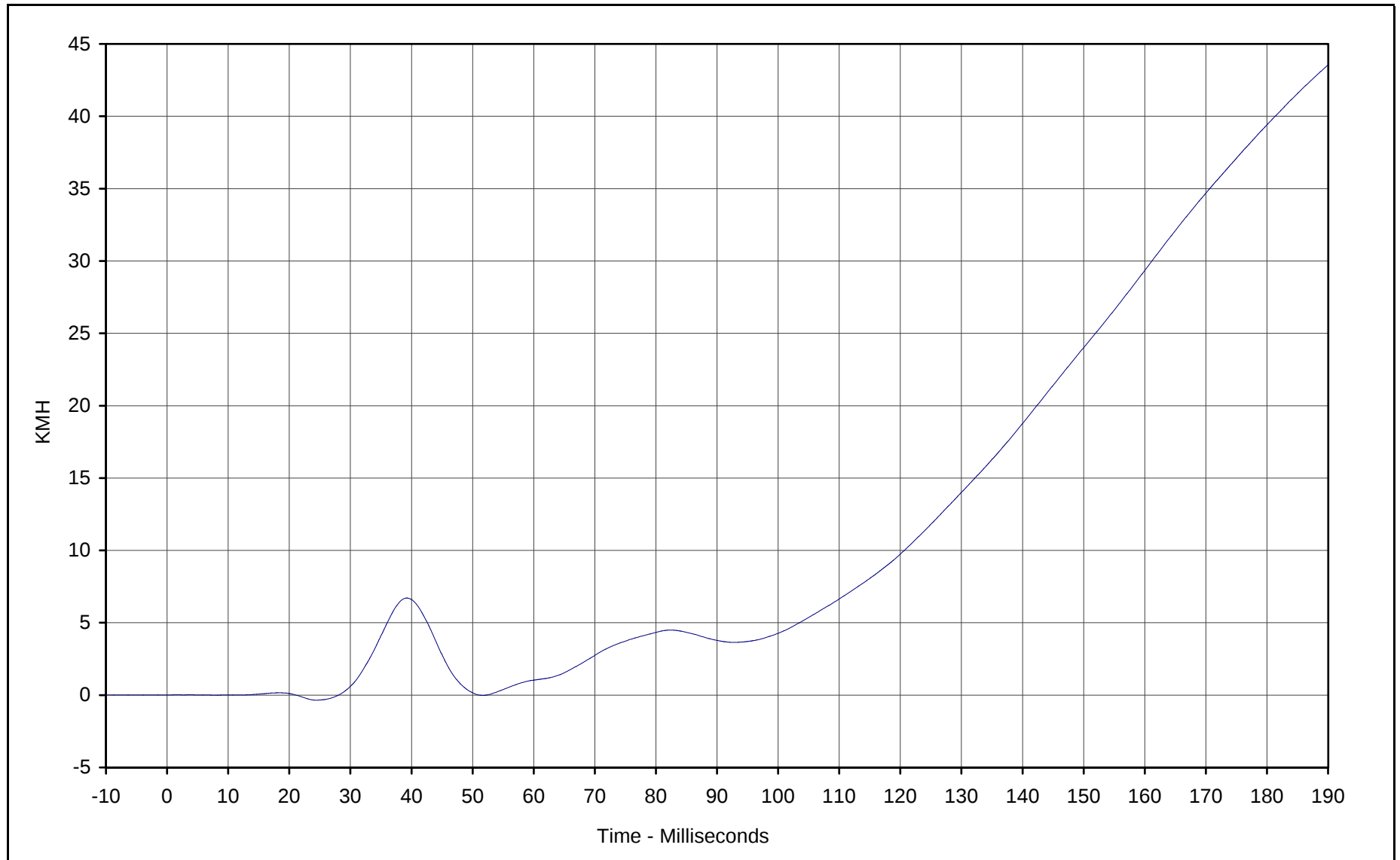




Curve Description: Driver Head CG Z
Maximum Value: 26.5 at 35.4 Milliseconds
Minimum Value: -27.7 at 44.2 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-003

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

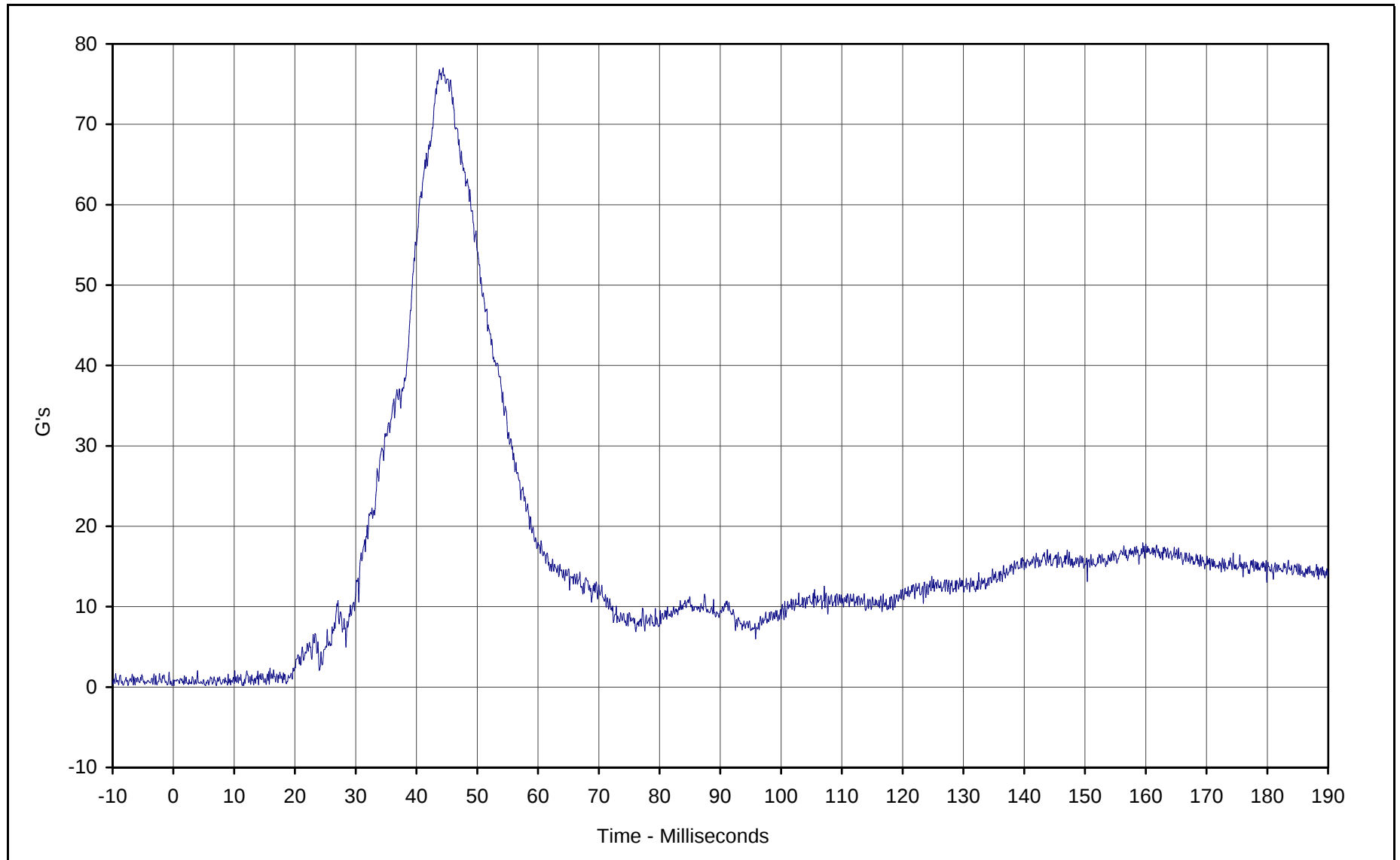




Curve Description: Driver Head CG Z Velocity
Maximum Value: 43.5 at 189.9 Milliseconds
Minimum Value: -0.3 at 24.4 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-003

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

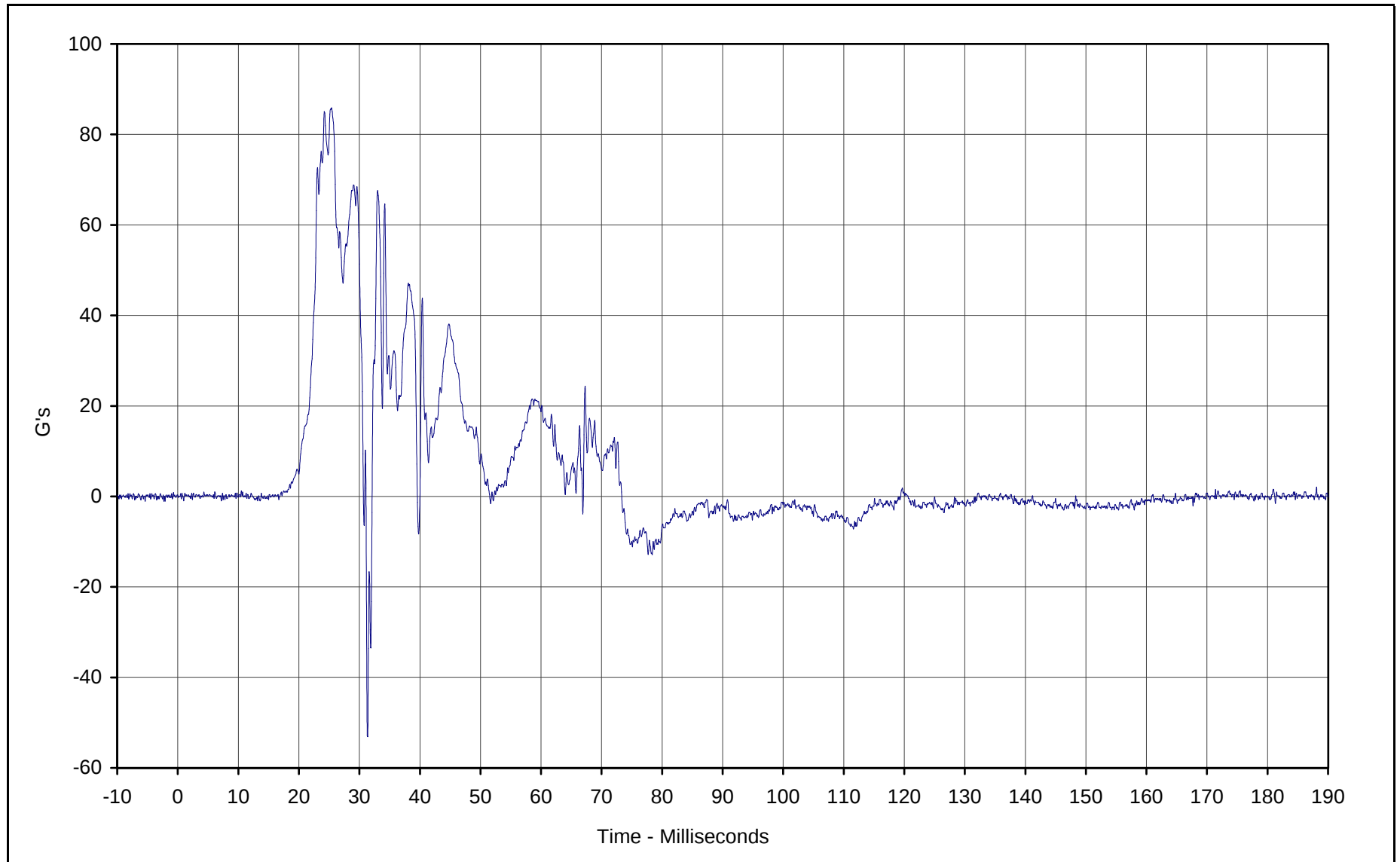




Curve Description: Driver Head CG Resultant
Maximum Value: 77.0 at 44.4 Milliseconds
Minimum Value: 0.2 at 0.1 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: RES-001

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

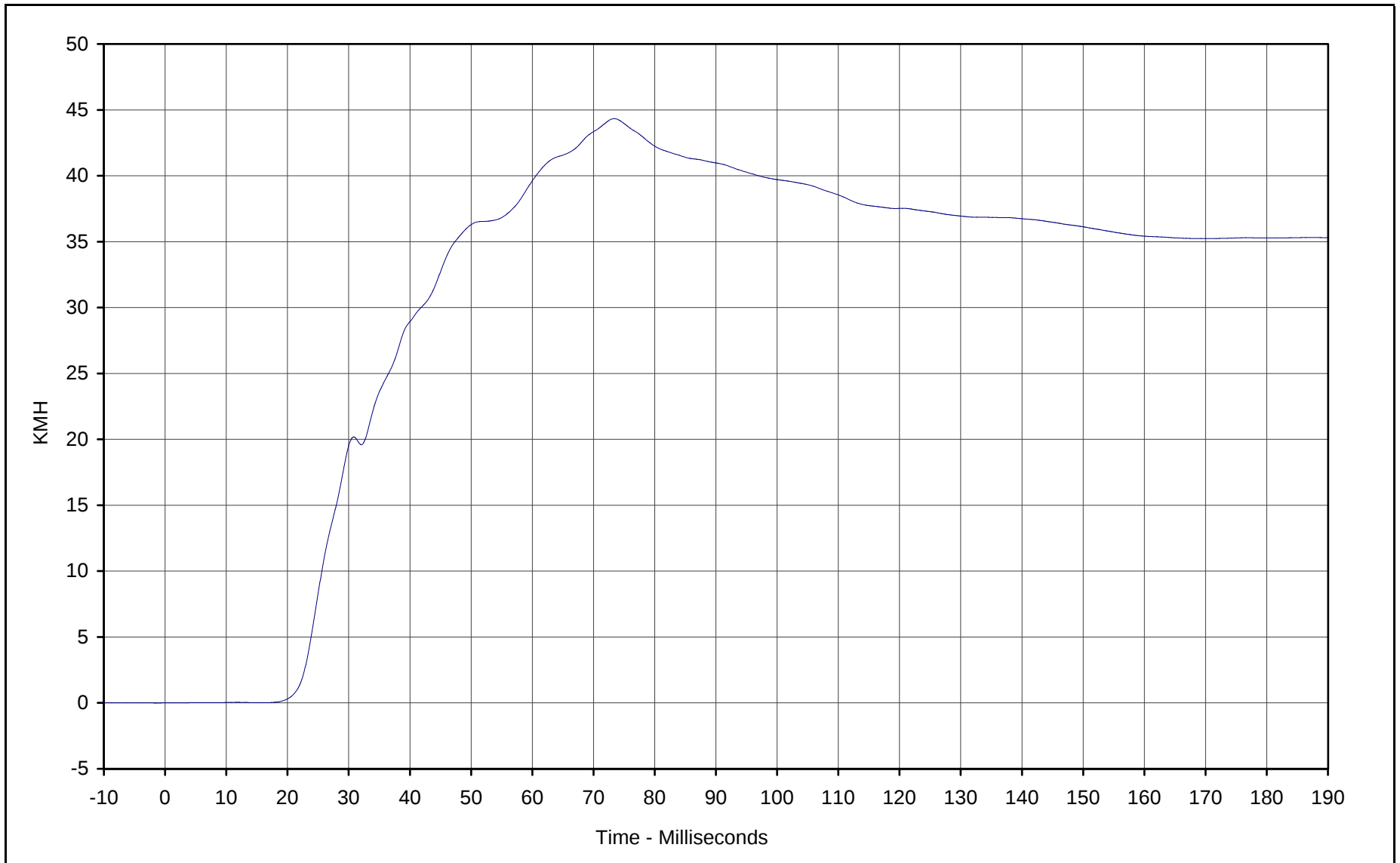




Curve Description: Driver Upper Rib Primary Y
Maximum Value: 85.9 at 25.4 Milliseconds
Minimum Value: -53.1 at 31.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-004

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Driver Upper Rib Primary Y Velocity

Maximum Value: 44.3 at 73.4 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

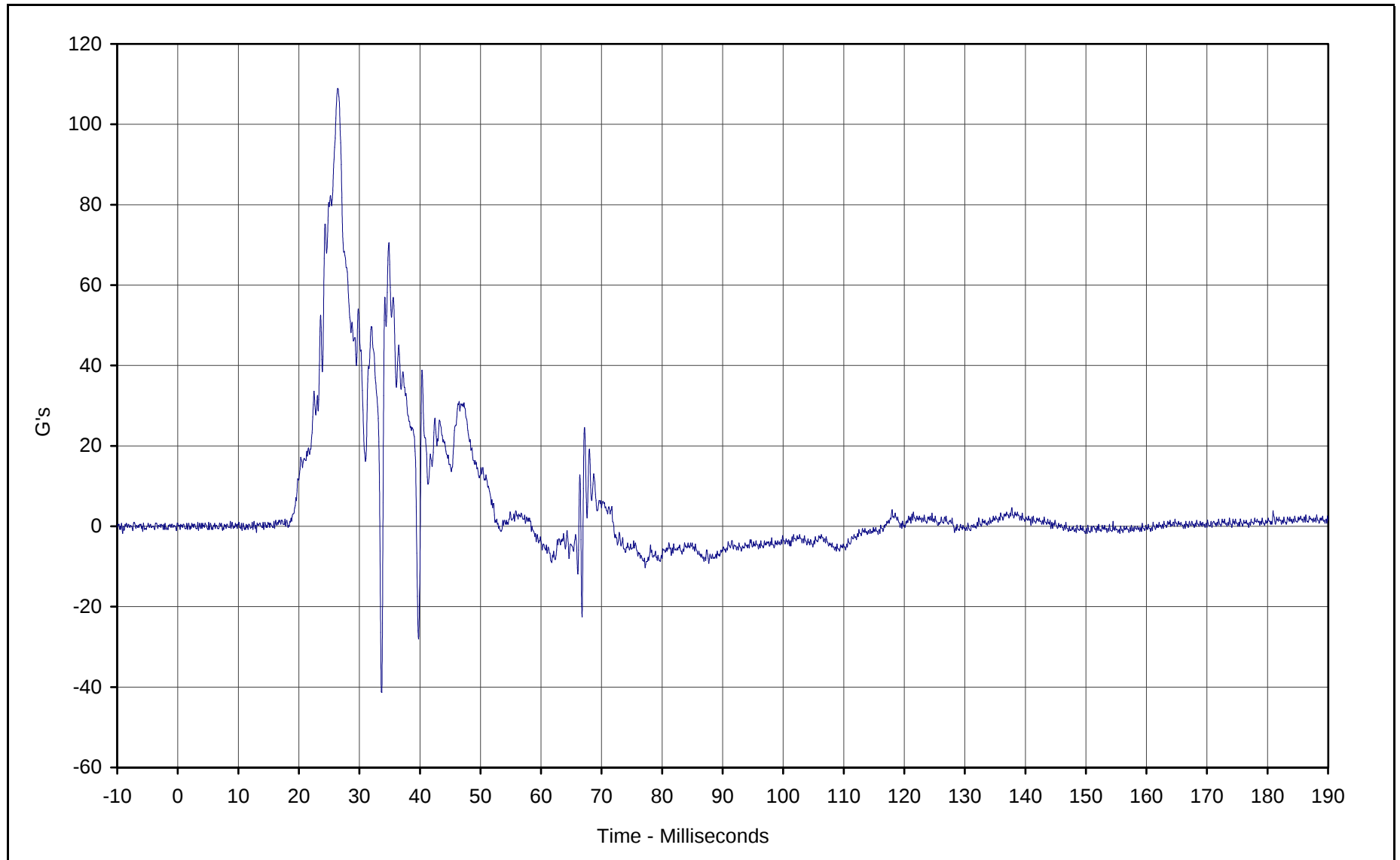
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Curve Number: IN1-004

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

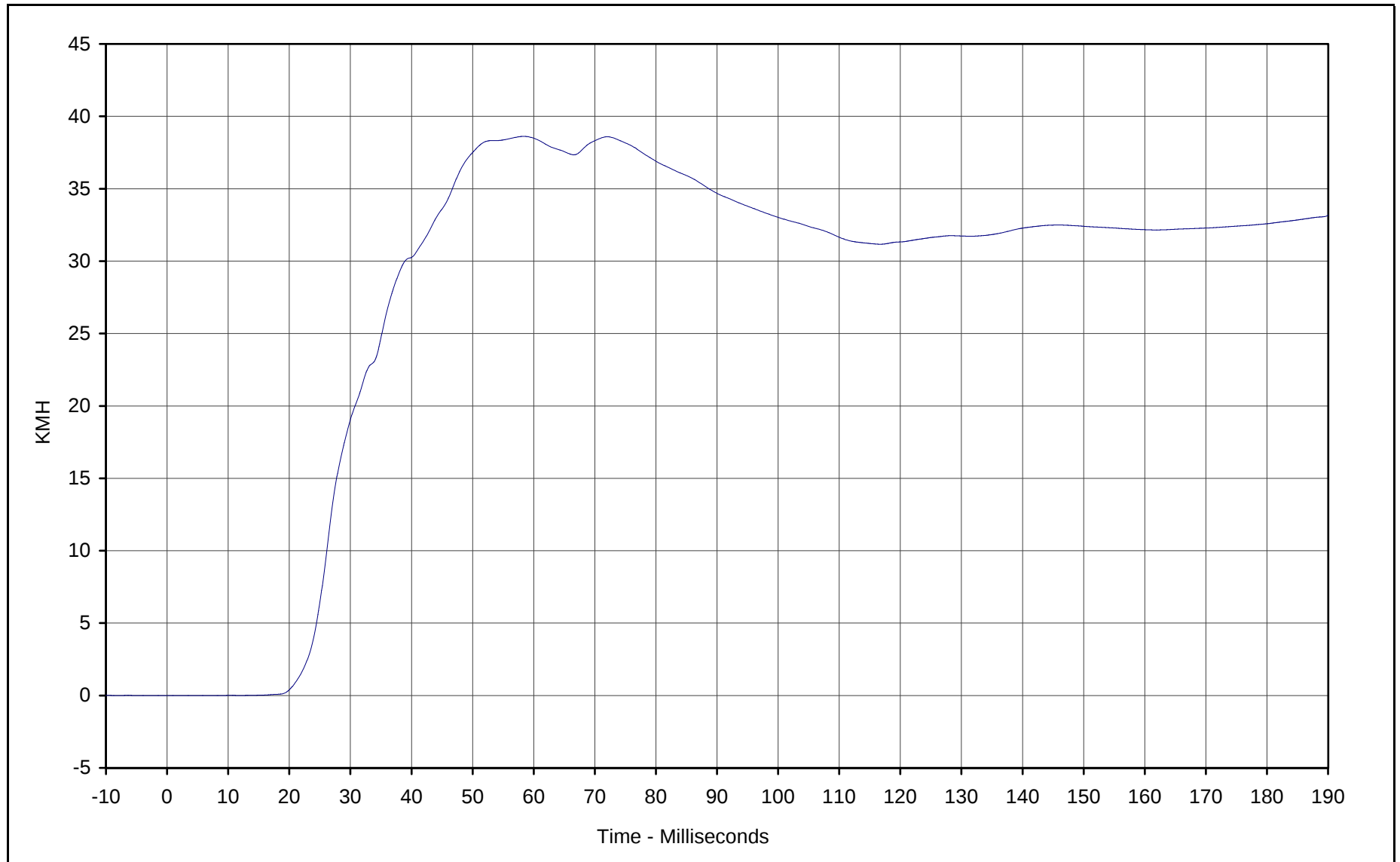




Curve Description: Driver Lower Rib Primary Y
Maximum Value: 108.9 at 26.4 Milliseconds
Minimum Value: -41.3 at 33.7 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-005

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Driver Lower Rib Primary Y Velocity

Maximum Value: 38.6 at 58.4 Milliseconds

Minimum Value: 0.0 at 8.0 Milliseconds

SAE Filter Class: 180

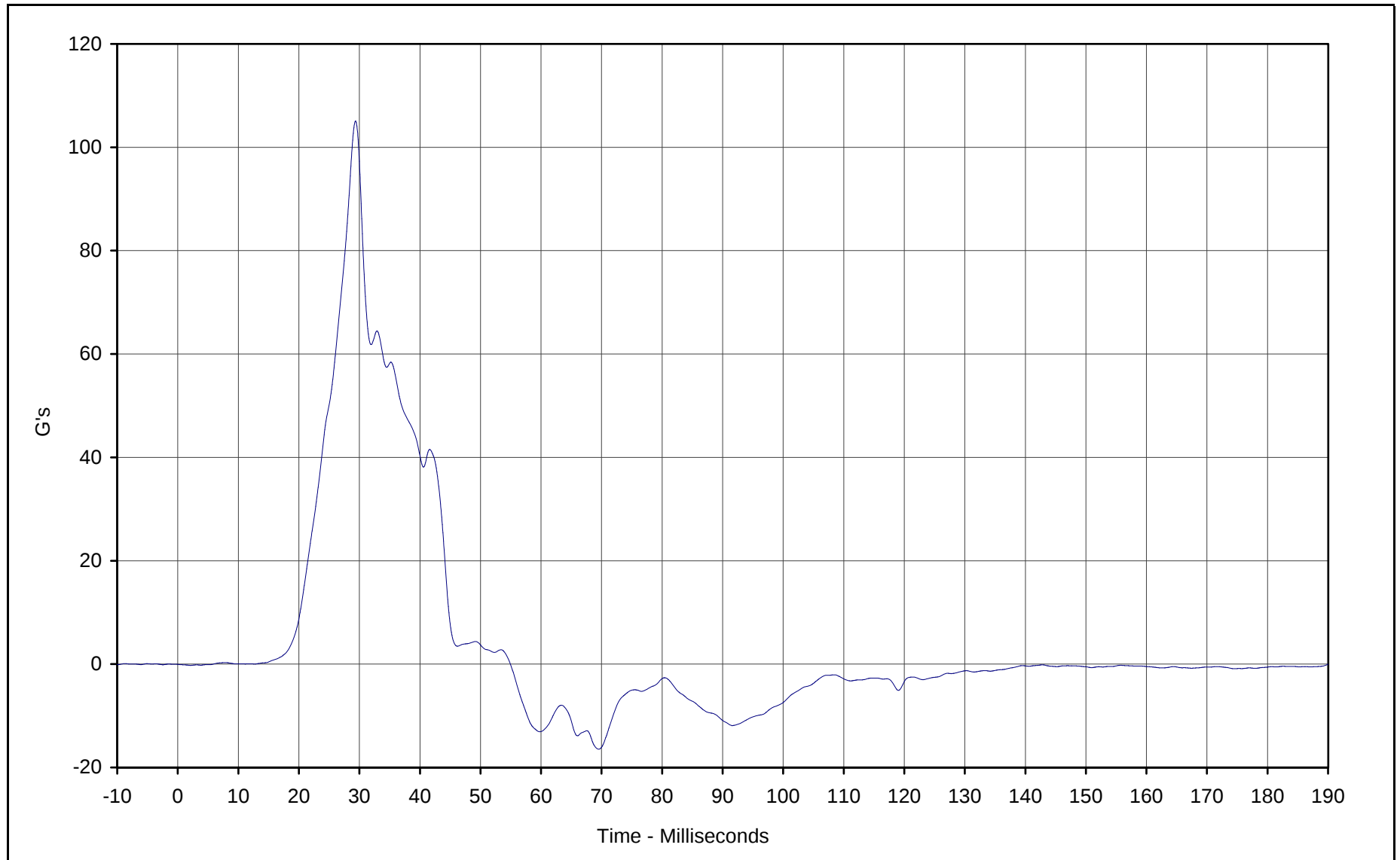
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Curve Number: IN1-005

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

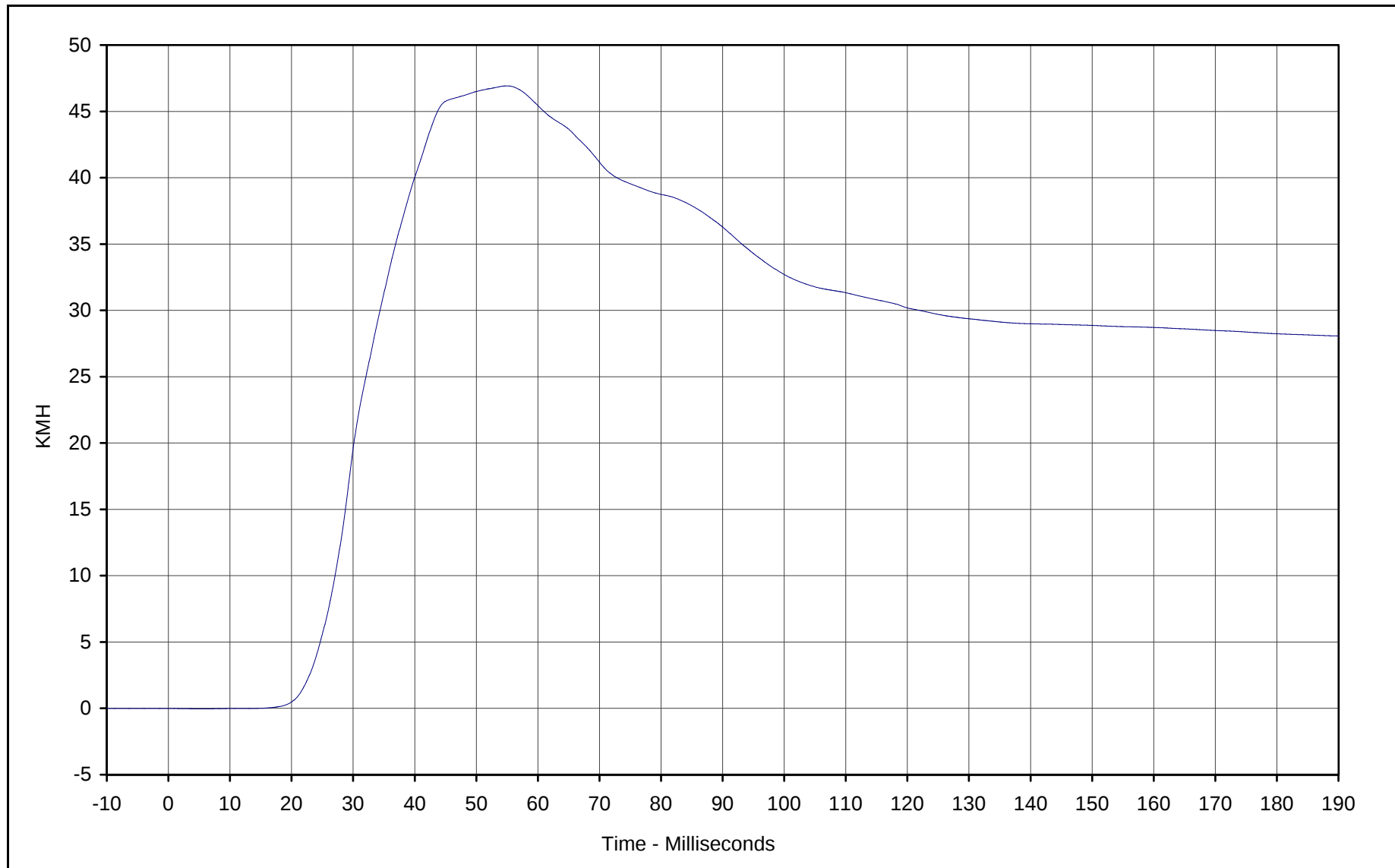




Curve Description: Driver Lower Spine Primary Y
Maximum Value: 105.1 at 29.4 Milliseconds
Minimum Value: -16.5 at 69.5 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: FIL-006

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Driver Lower Spine Primary Y Velocity

Maximum Value: 46.9 at 55.0 Milliseconds

Minimum Value: 0.0 at 5.9 Milliseconds

SAE Filter Class: 180

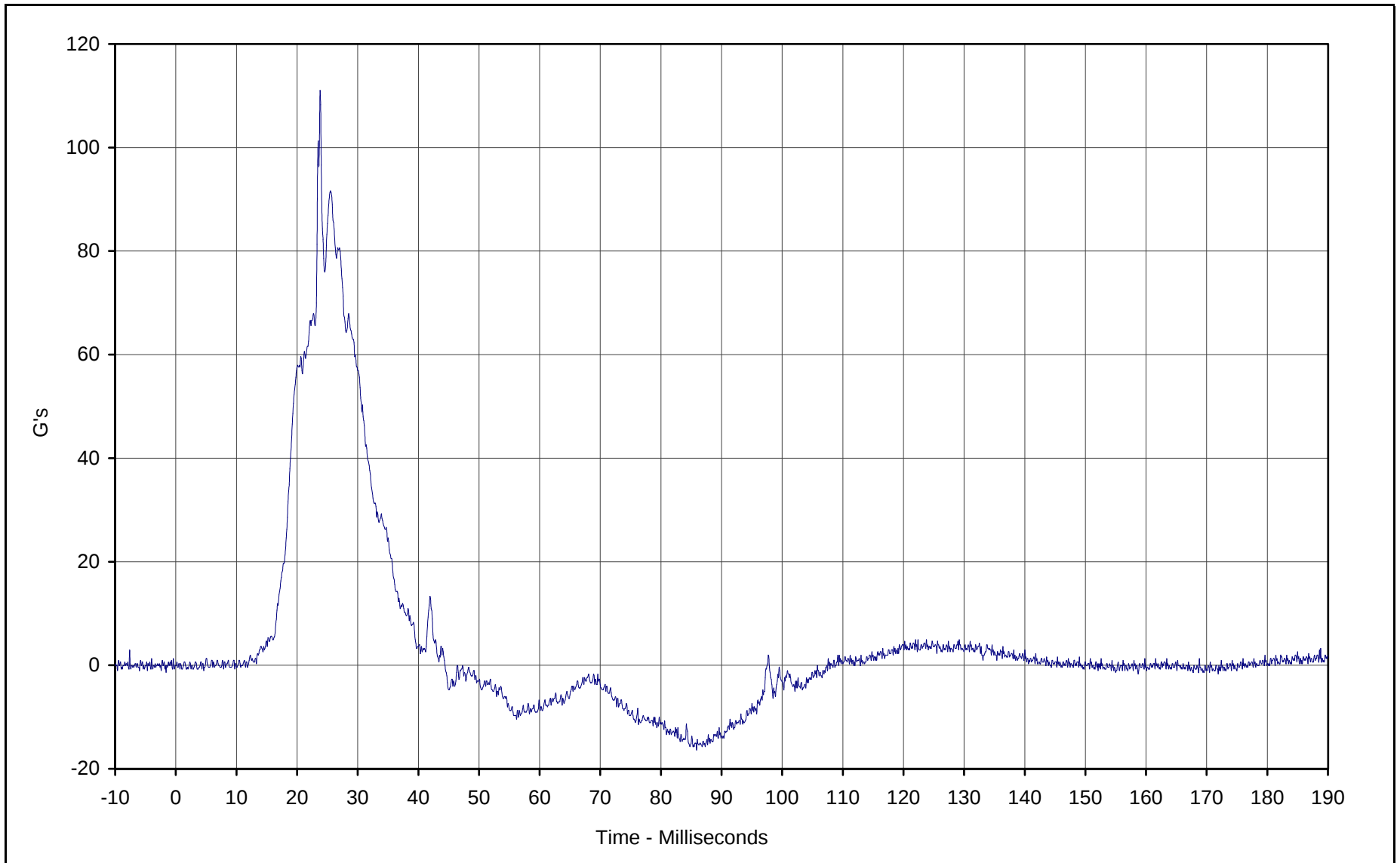
Date of Test: 9/25/01

Curve Number: IN1-006

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

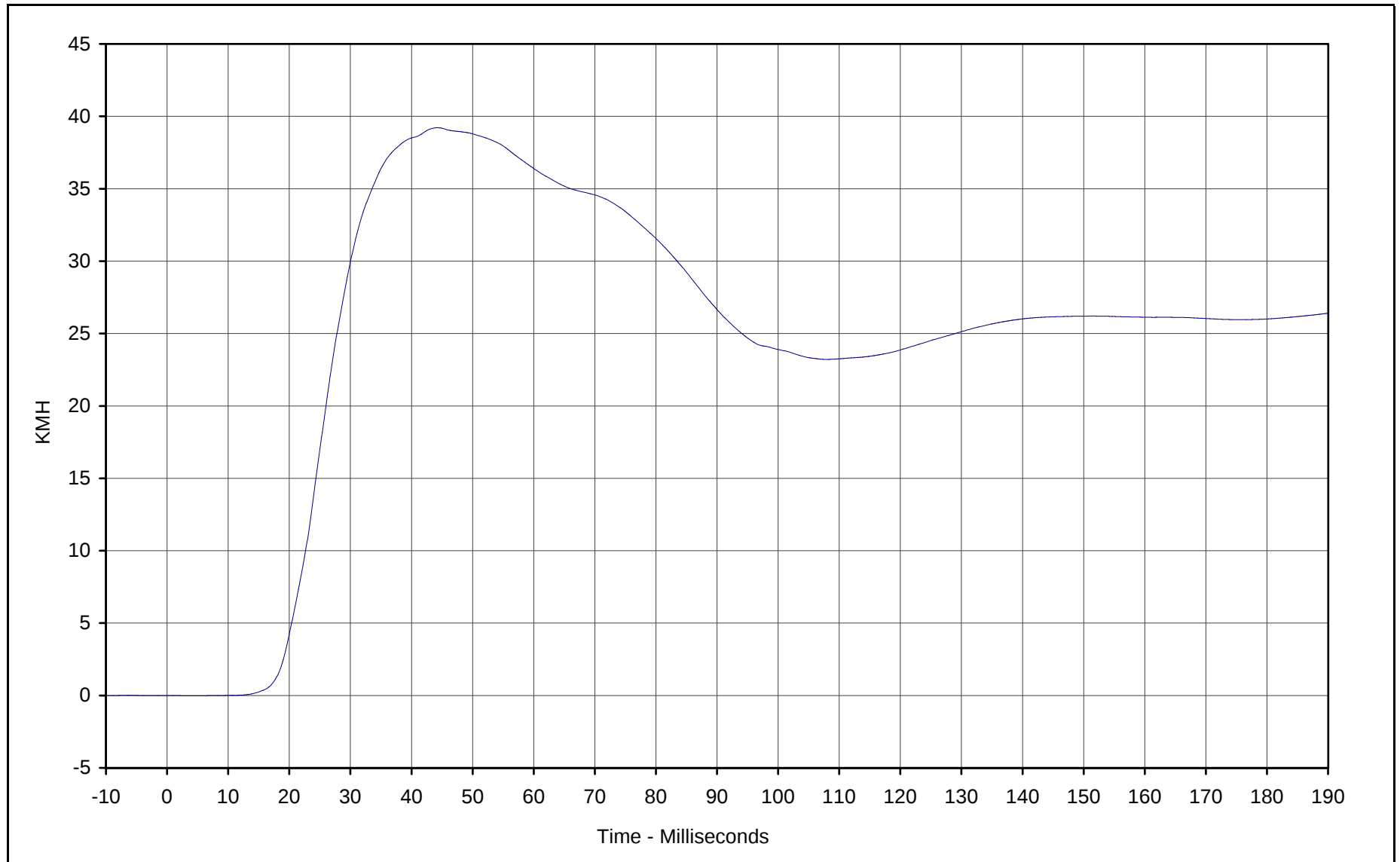




Curve Description: Driver Pelvis Primary Y
Maximum Value: 110.9 at 23.8 Milliseconds
Minimum Value: -16.4 at 85.9 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-007

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

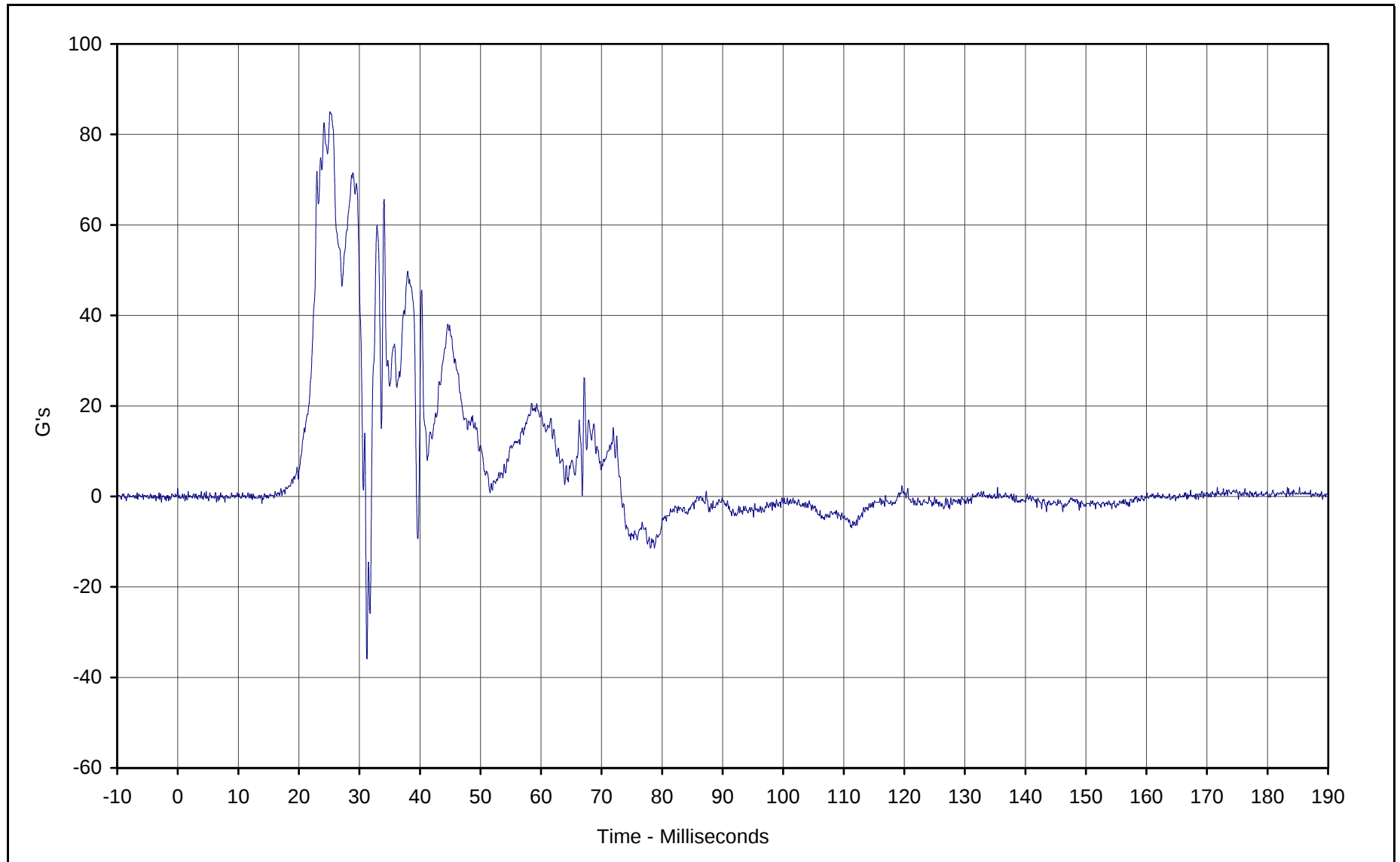




Curve Description: Driver Pelvis Primary Y Velocity
Maximum Value: 39.2 at 44.3 Milliseconds
Minimum Value: 0.0 at 4.5 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-007

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

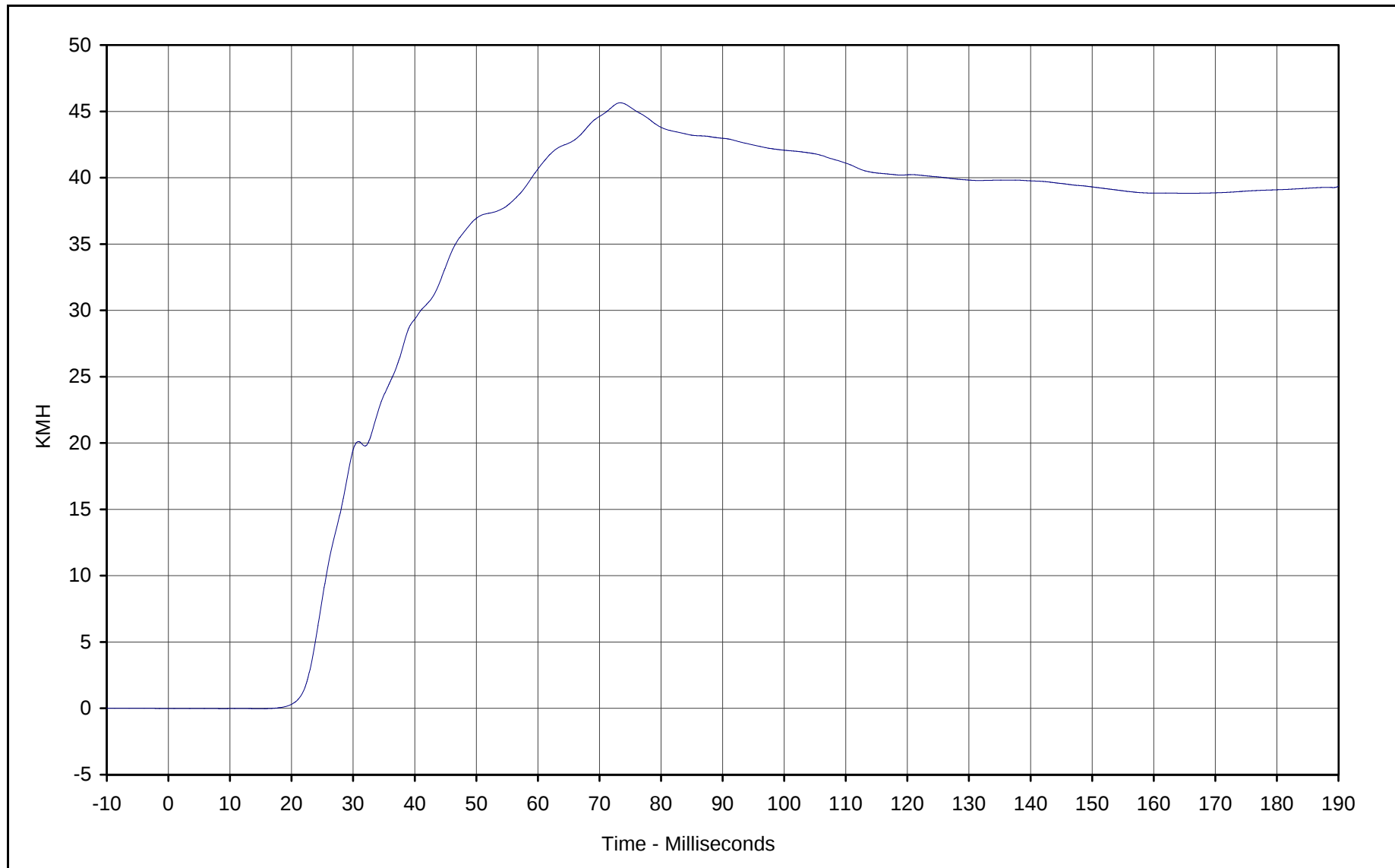




Curve Description: Driver Upper Rib Redundant Y
Maximum Value: 85.0 at 25.1 Milliseconds
Minimum Value: -35.9 at 31.3 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-008

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Driver Upper Rib Redundant Y Velocity

Maximum Value: 45.6 at 73.4 Milliseconds

Minimum Value: 0.0 at 14.8 Milliseconds

SAE Filter Class: 180

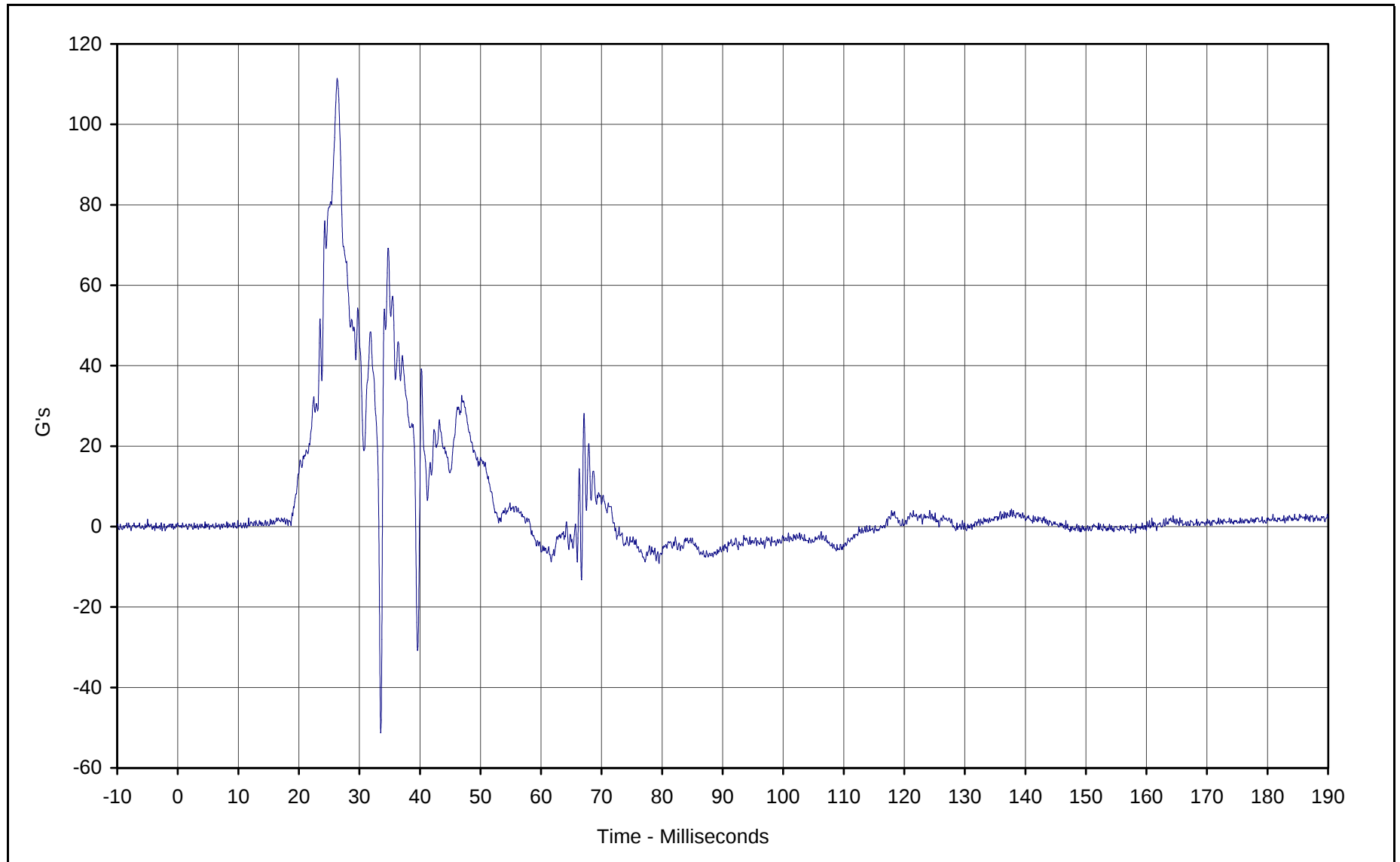
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Curve Number: IN1-008

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

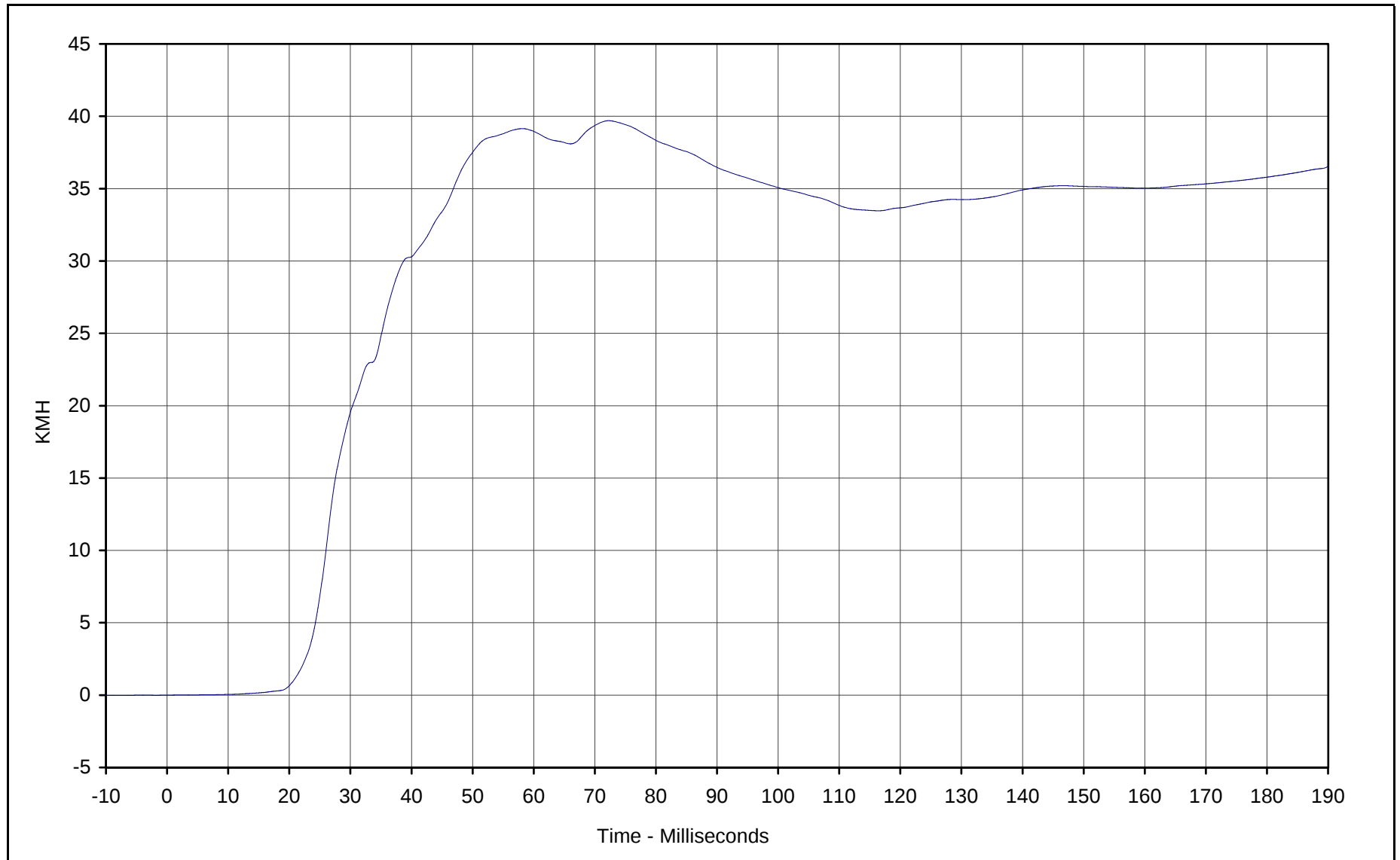




Curve Description: Driver Lower Rib Redundant Y
Maximum Value: 111.4 at 26.3 Milliseconds
Minimum Value: -51.2 at 33.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-009

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Driver Lower Rib Redundant Y Velocity

Maximum Value: 39.7 at 72.3 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

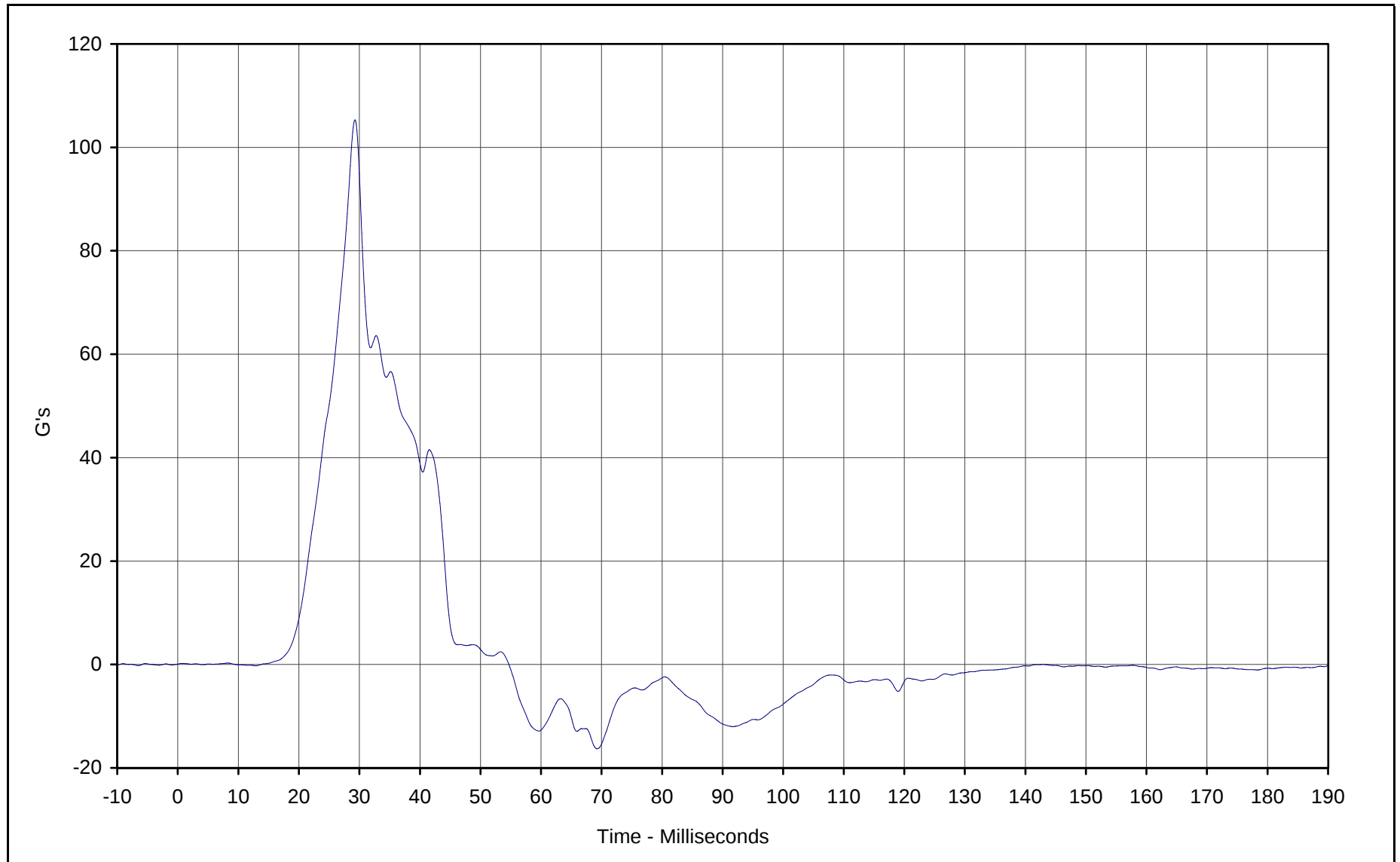
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Curve Number: IN1-009

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

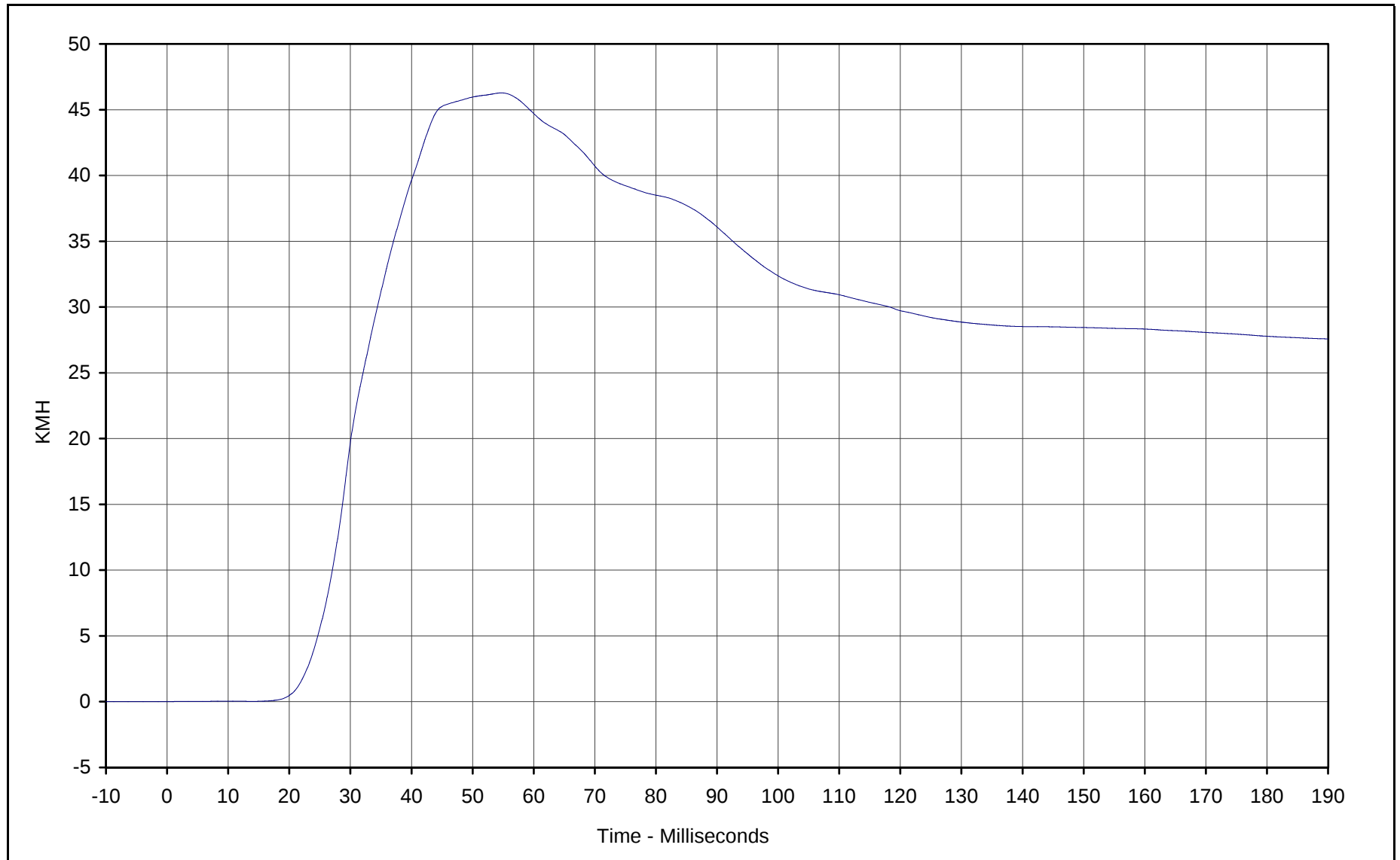




Curve Description: Driver Lower Spine Redundant Y
Maximum Value: 105.3 at 29.3 Milliseconds
Minimum Value: -16.3 at 69.3 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: FIL-010

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Driver Lower Spine Redundant Y Velocity

Maximum Value: 46.3 at 54.7 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

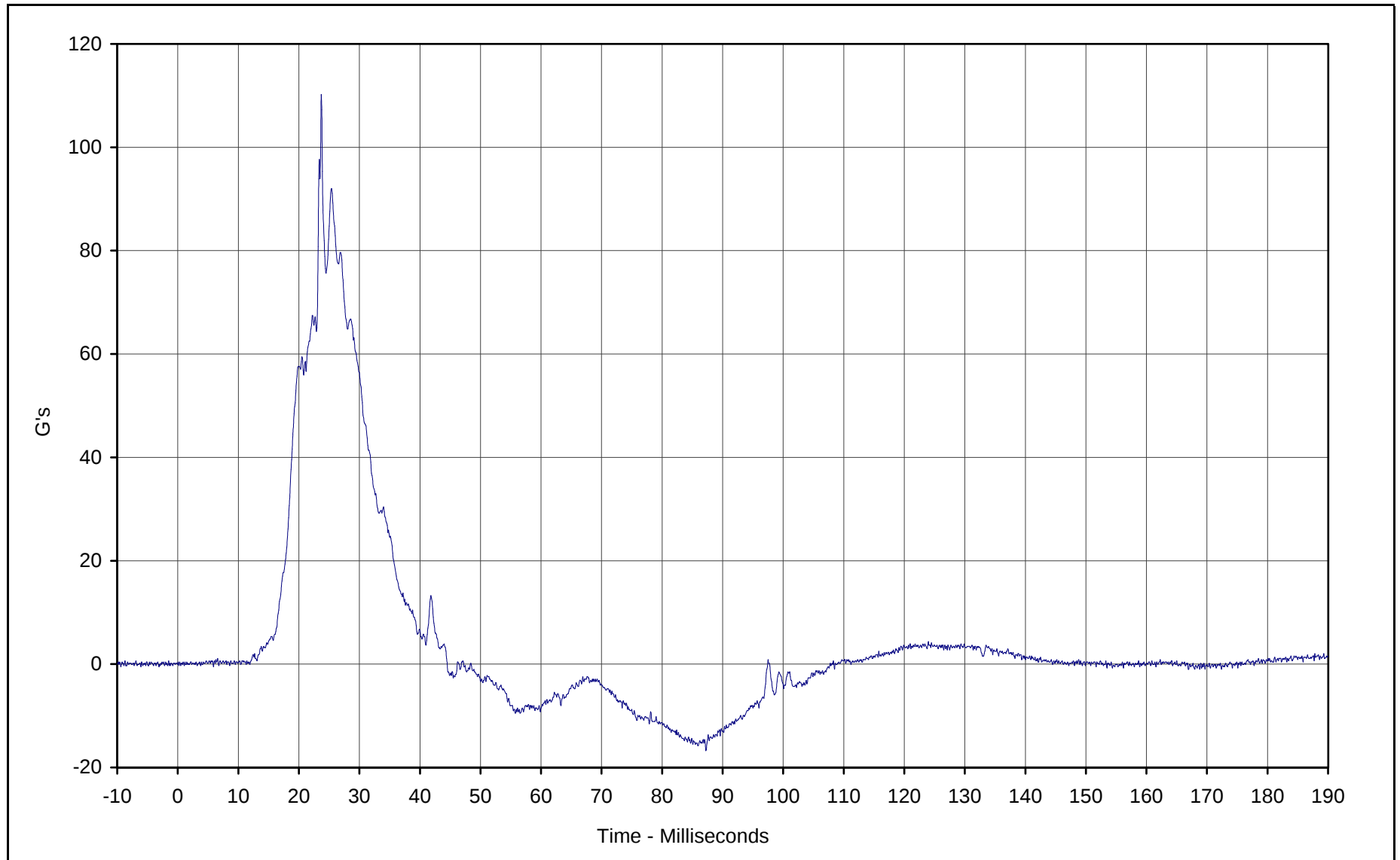
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Curve Number: IN1-0010

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

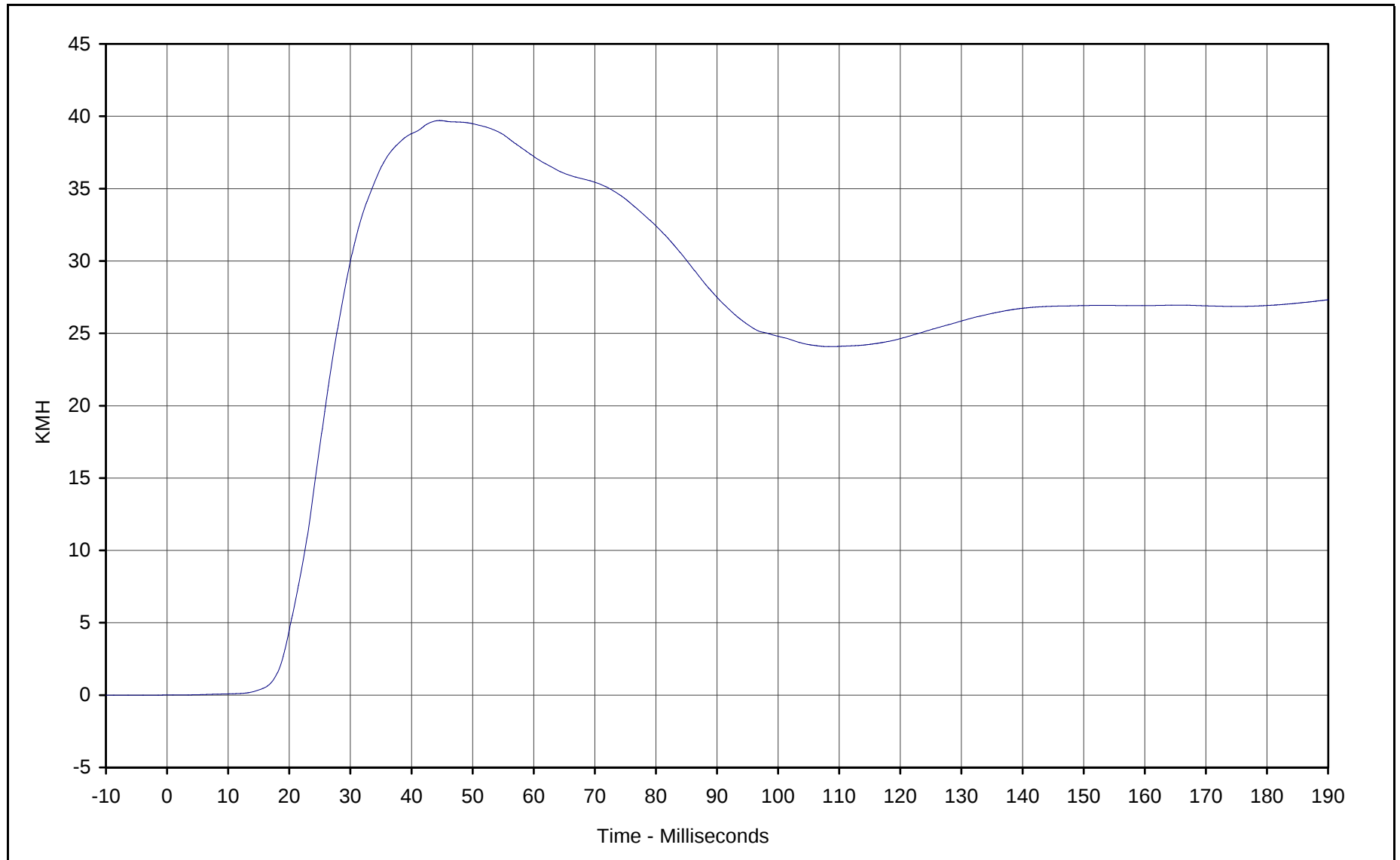




Curve Description: Driver Pelvis Redundant Y
Maximum Value: 110.1 at 23.7 Milliseconds
Minimum Value: -16.7 at 87.2 Milliseconds
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Date of Test: 9/25/01
Curve Number: FIL-011

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

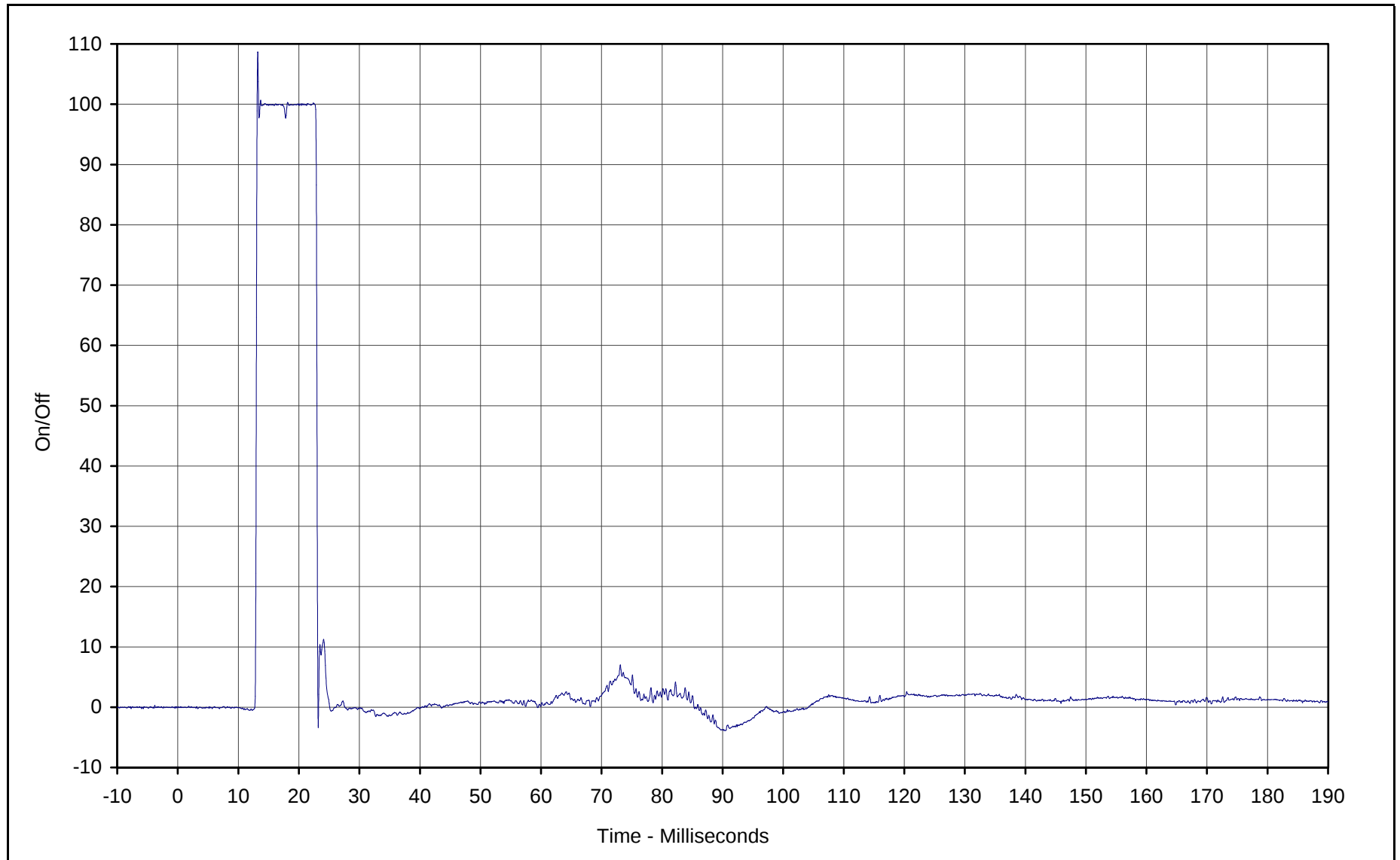




Curve Description: Driver Pelvis Redundant Y Velocity
Maximum Value: 39.7 at 44.6 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-011

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Driver Thorax Contact

Maximum Value: 108.6 at 13.2 Milliseconds

Crossing Point: 50% at 13.0 Milliseconds

SAE Filter Class: 1000

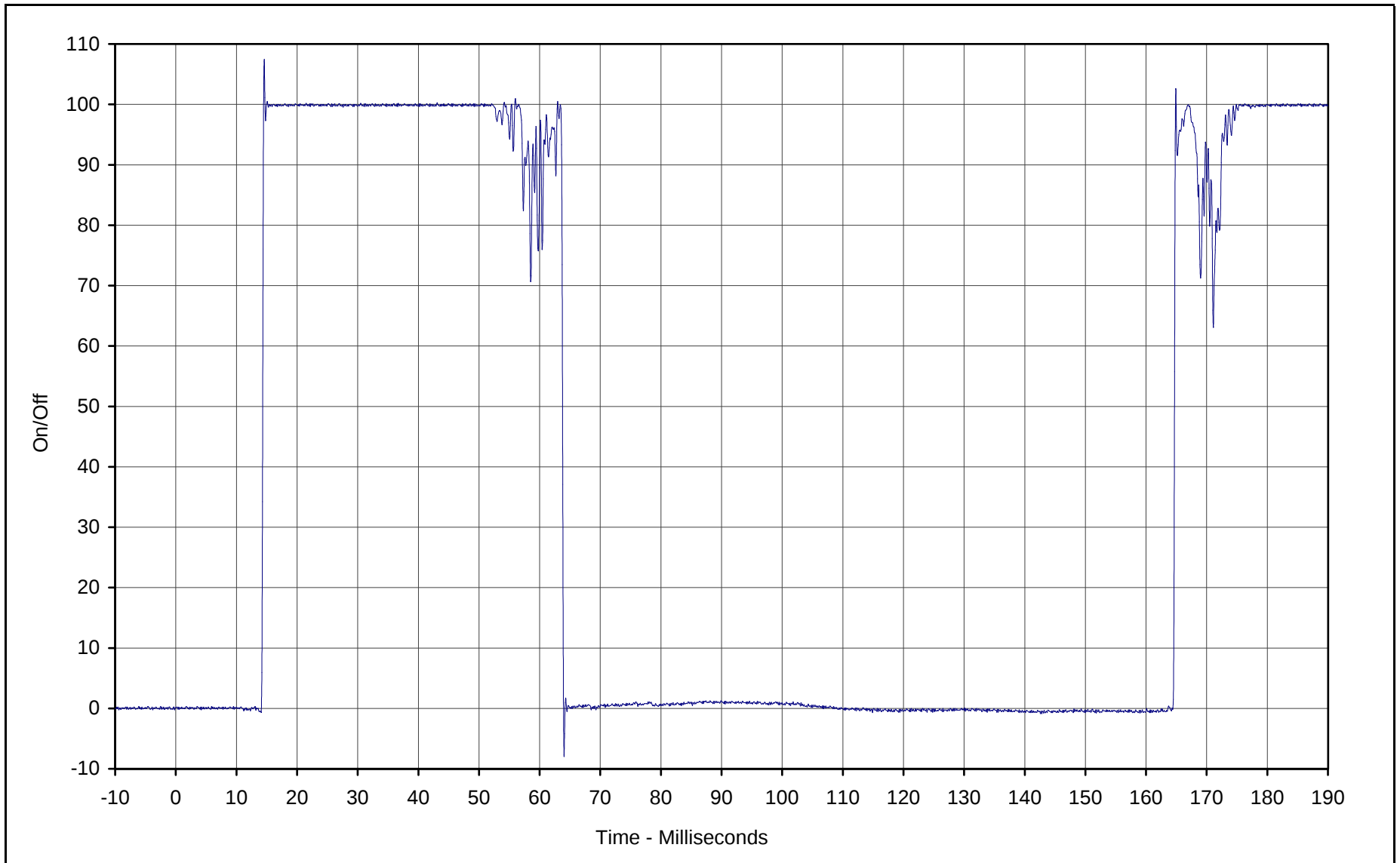
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Curve Number: FIL-012

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

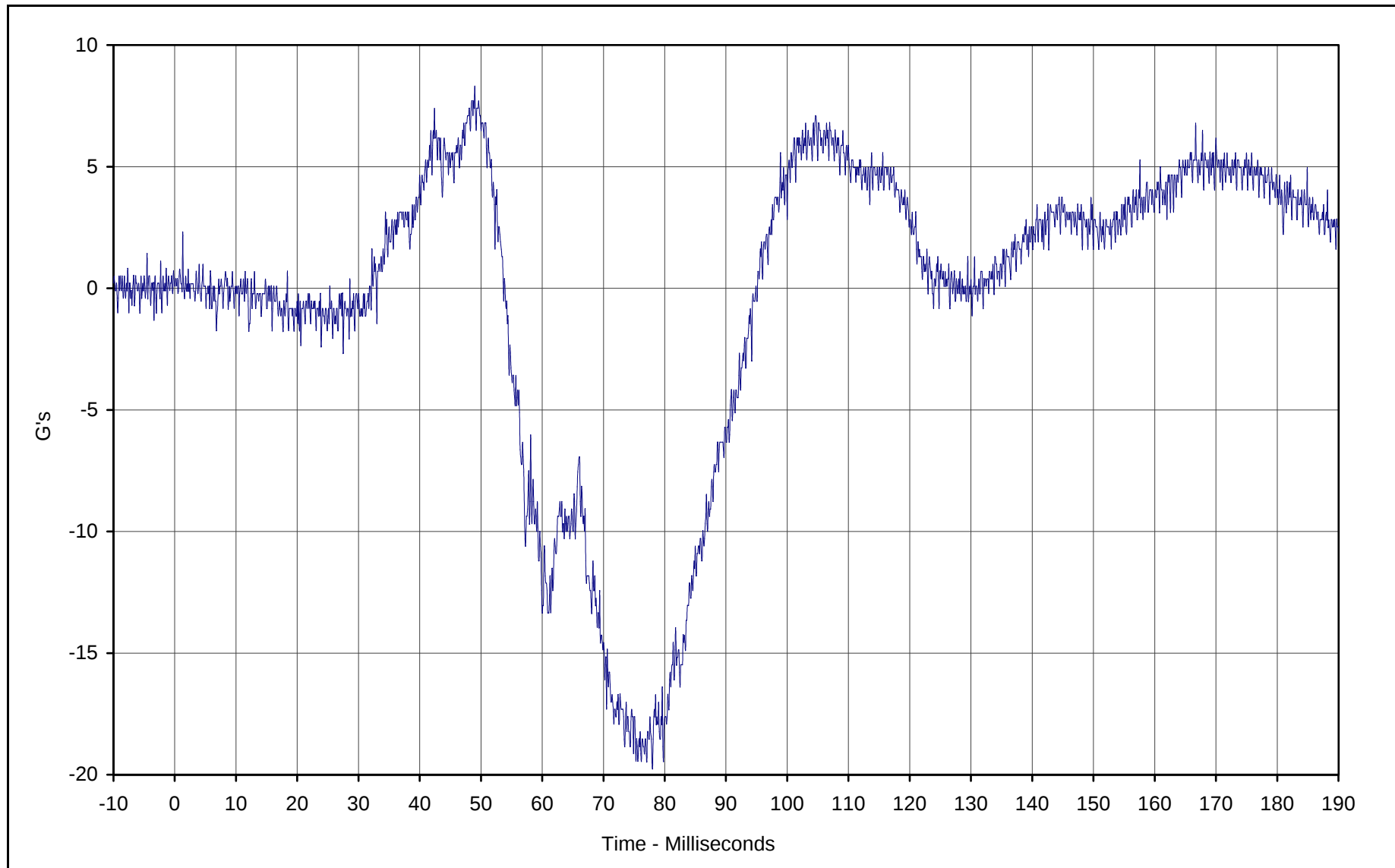




Curve Description: Driver Pelvis Contact
Maximum Value: 107.5 at 14.6 Milliseconds
Crossing Point: 50% at 14.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-013

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

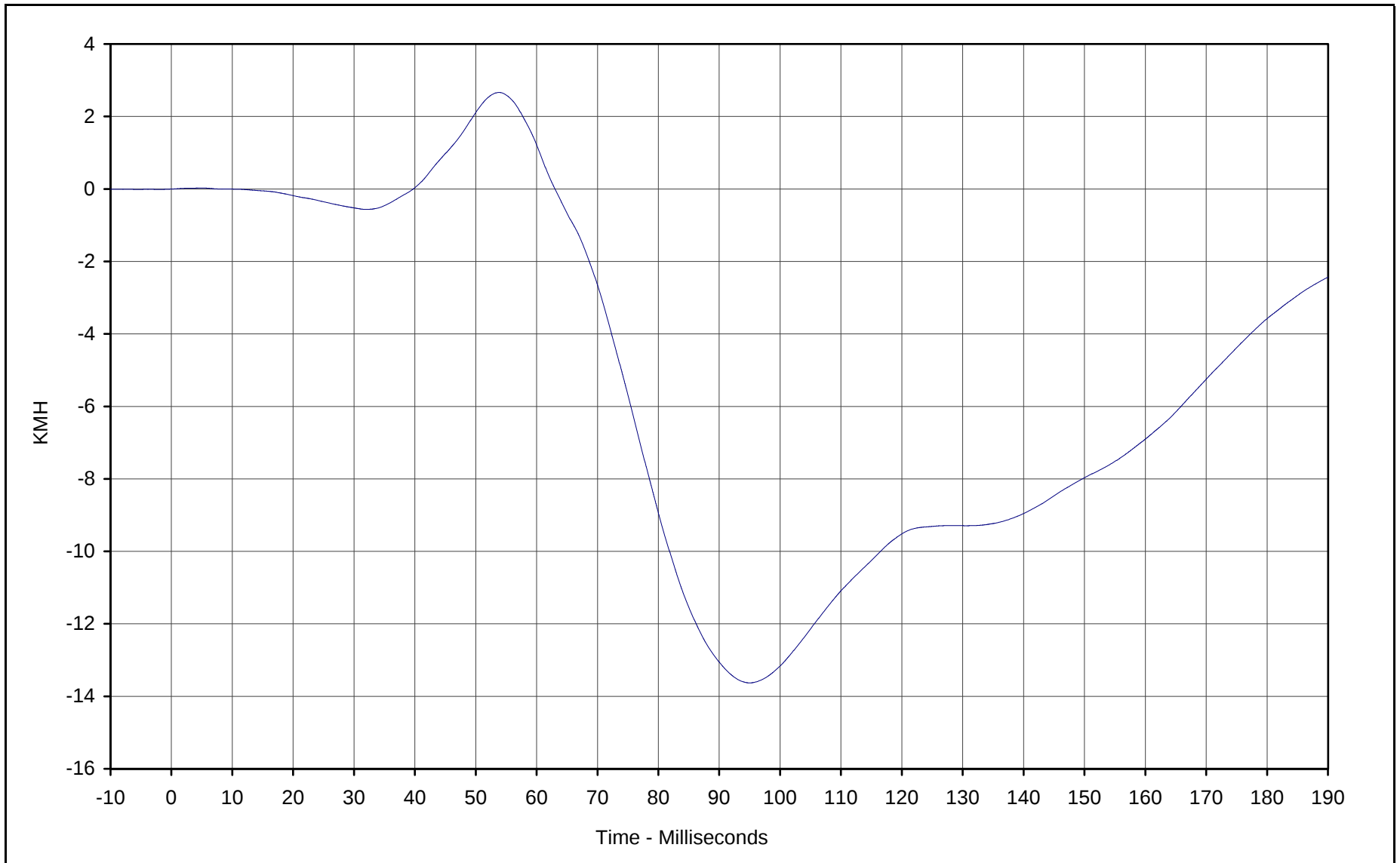




Curve Description: Pass. Head CG X
Maximum Value: 8.3 at 49.0 Milliseconds
Minimum Value: -19.8 at 78.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-014

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

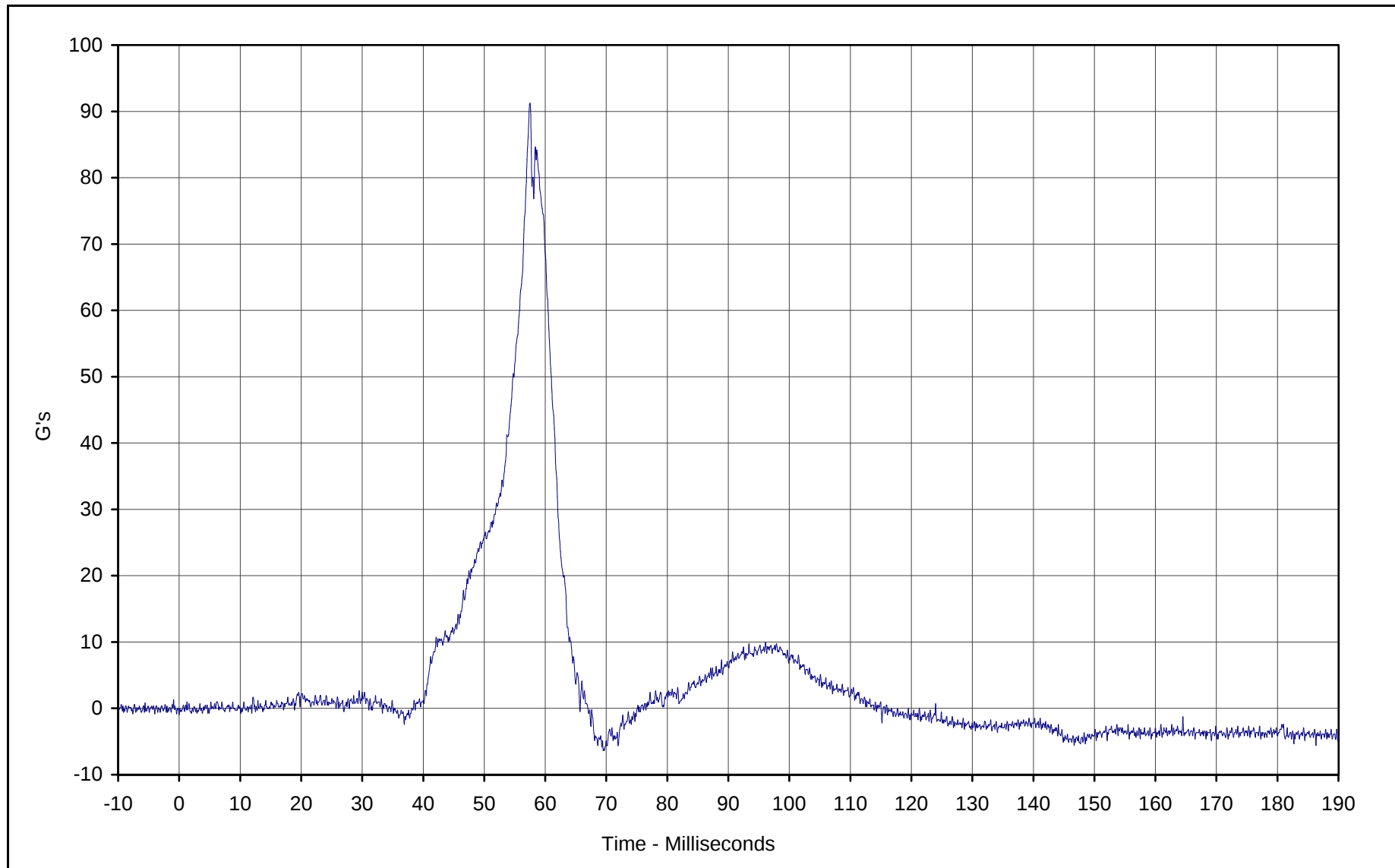




Curve Description: Pass. Head CG X Velocity
Maximum Value: 2.7 at 53.8 Milliseconds
Minimum Value: -13.6 at 95.0 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-014

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

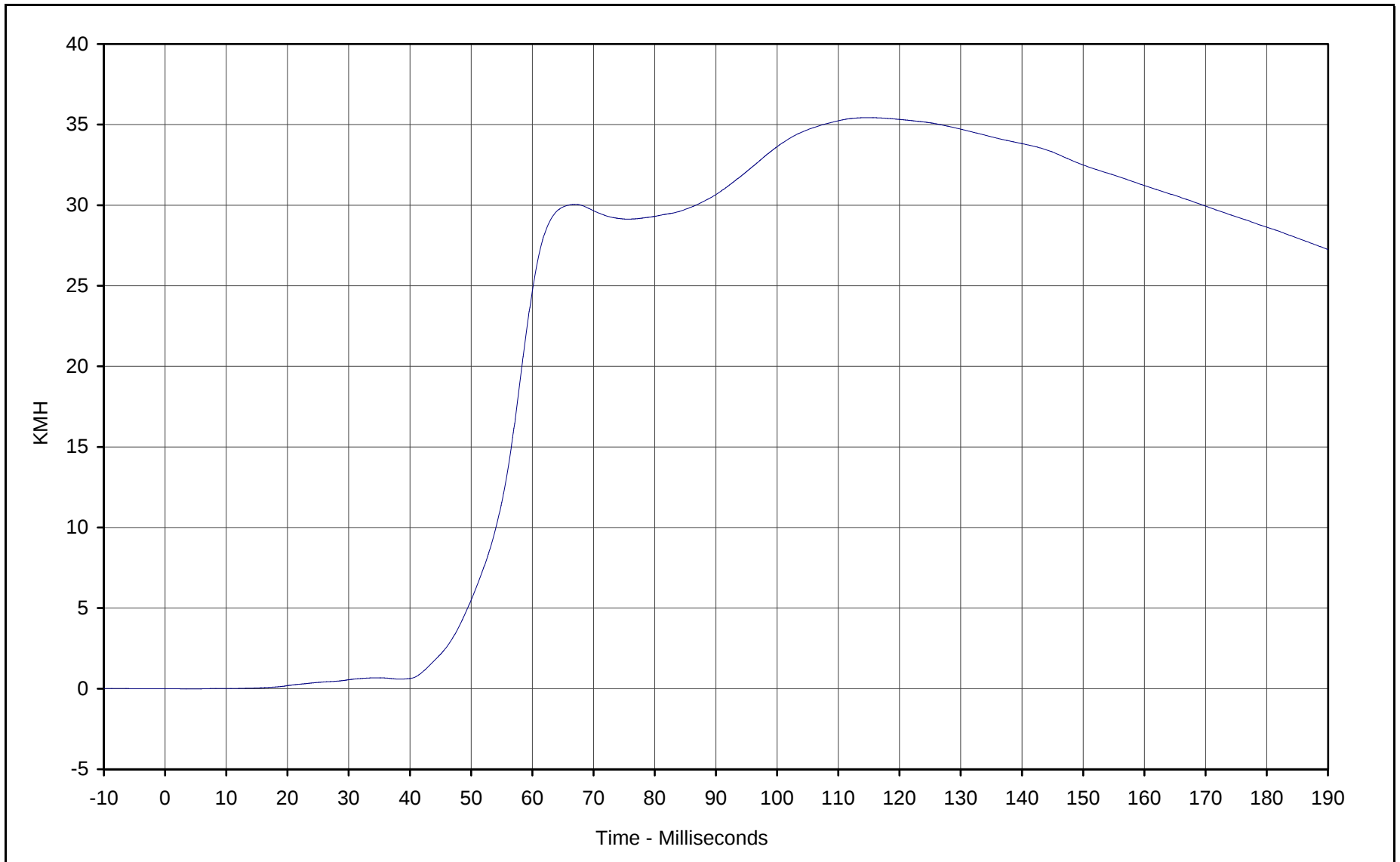




Curve Description: Pass. Head CG Y
Maximum Value: 91.2 at 57.5 Milliseconds
Minimum Value: -6.3 at 69.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-015

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

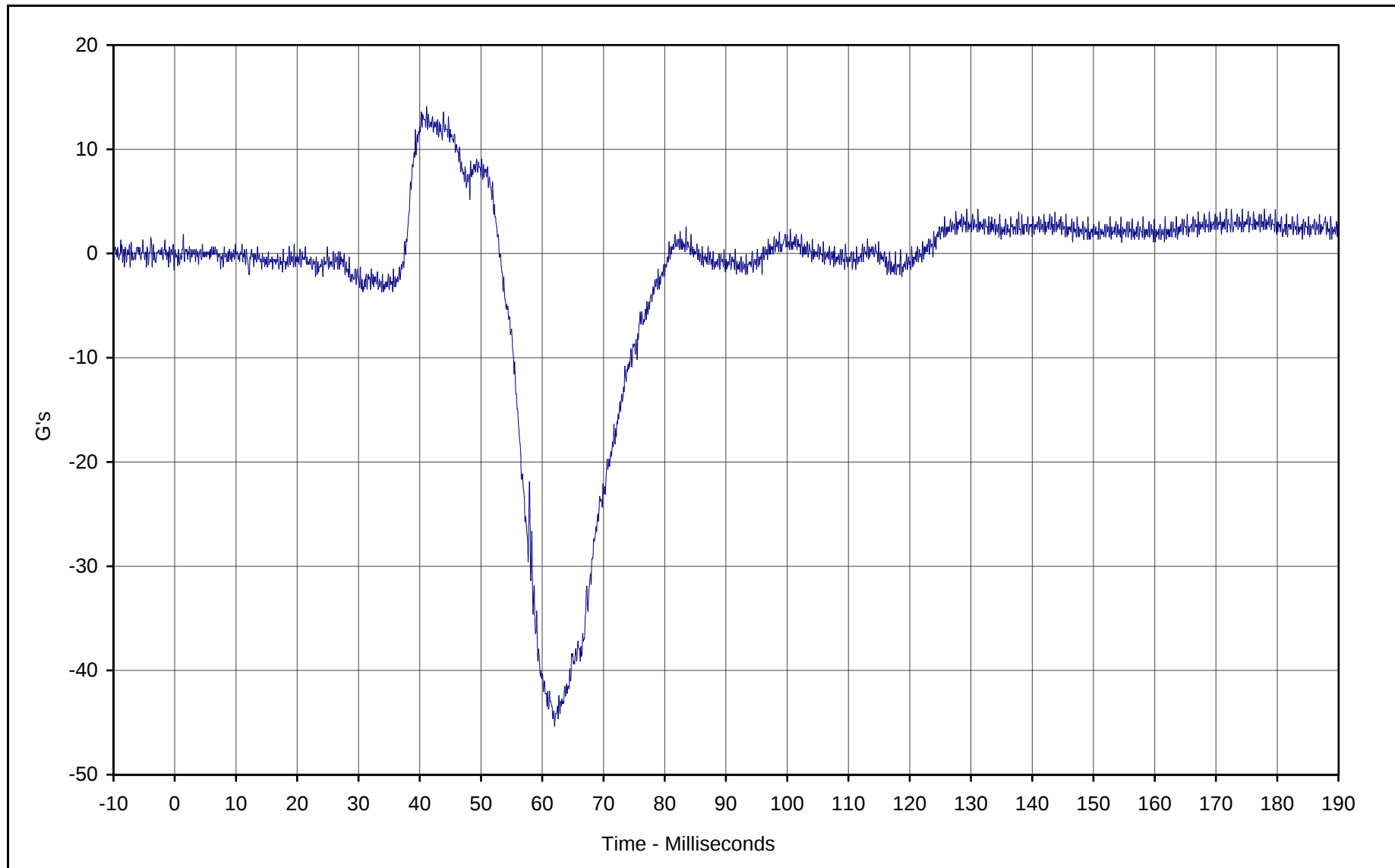




Curve Description: Pass. Head CG Y Velocity
Maximum Value: 35.4 at 114.9 Milliseconds
Minimum Value: 0.0 at 4.6 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-015

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

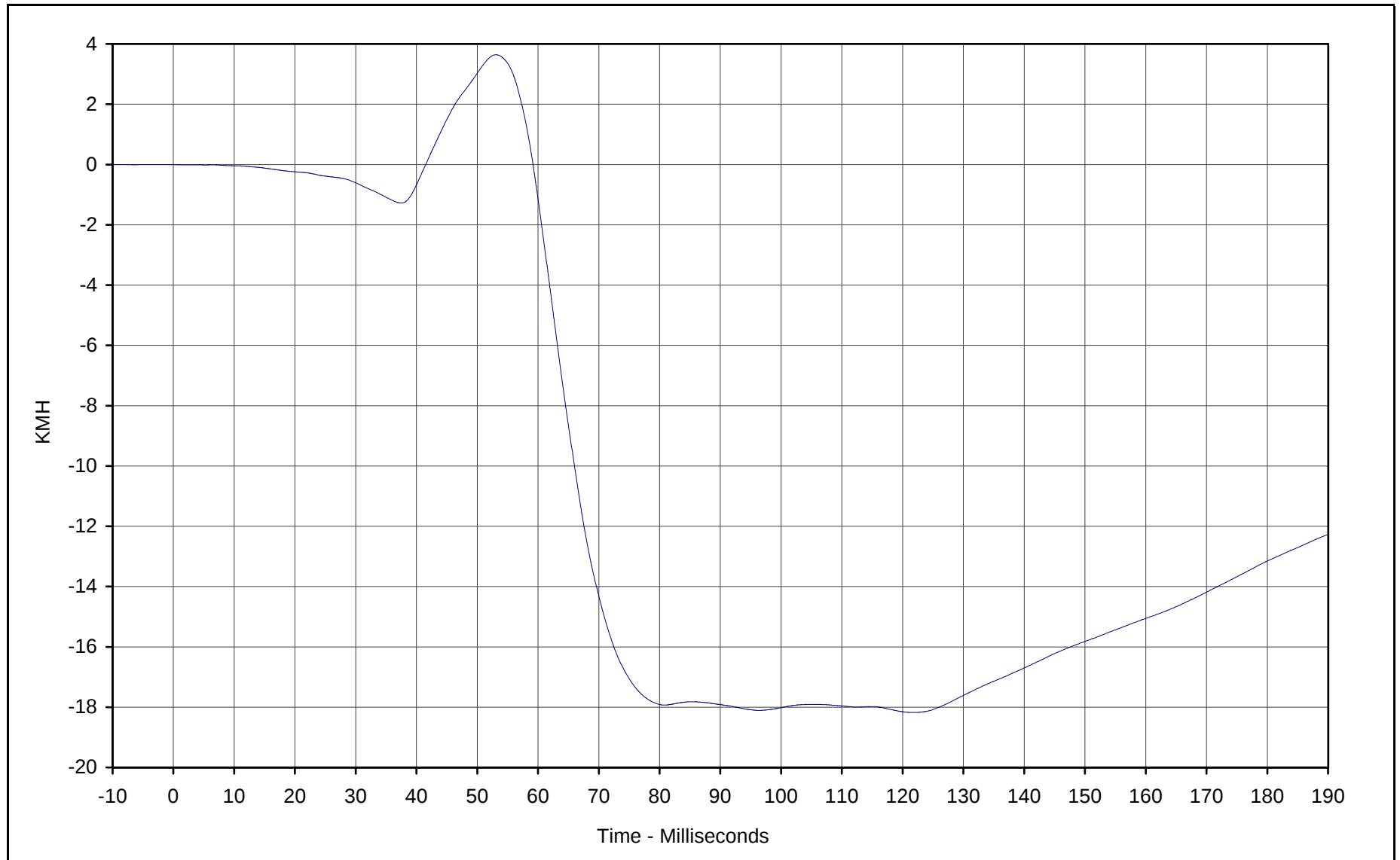




Curve Description: Pass. Head CG Z
Maximum Value: 14.1 at 41.1 Milliseconds
Minimum Value: -45.3 at 62.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-016

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

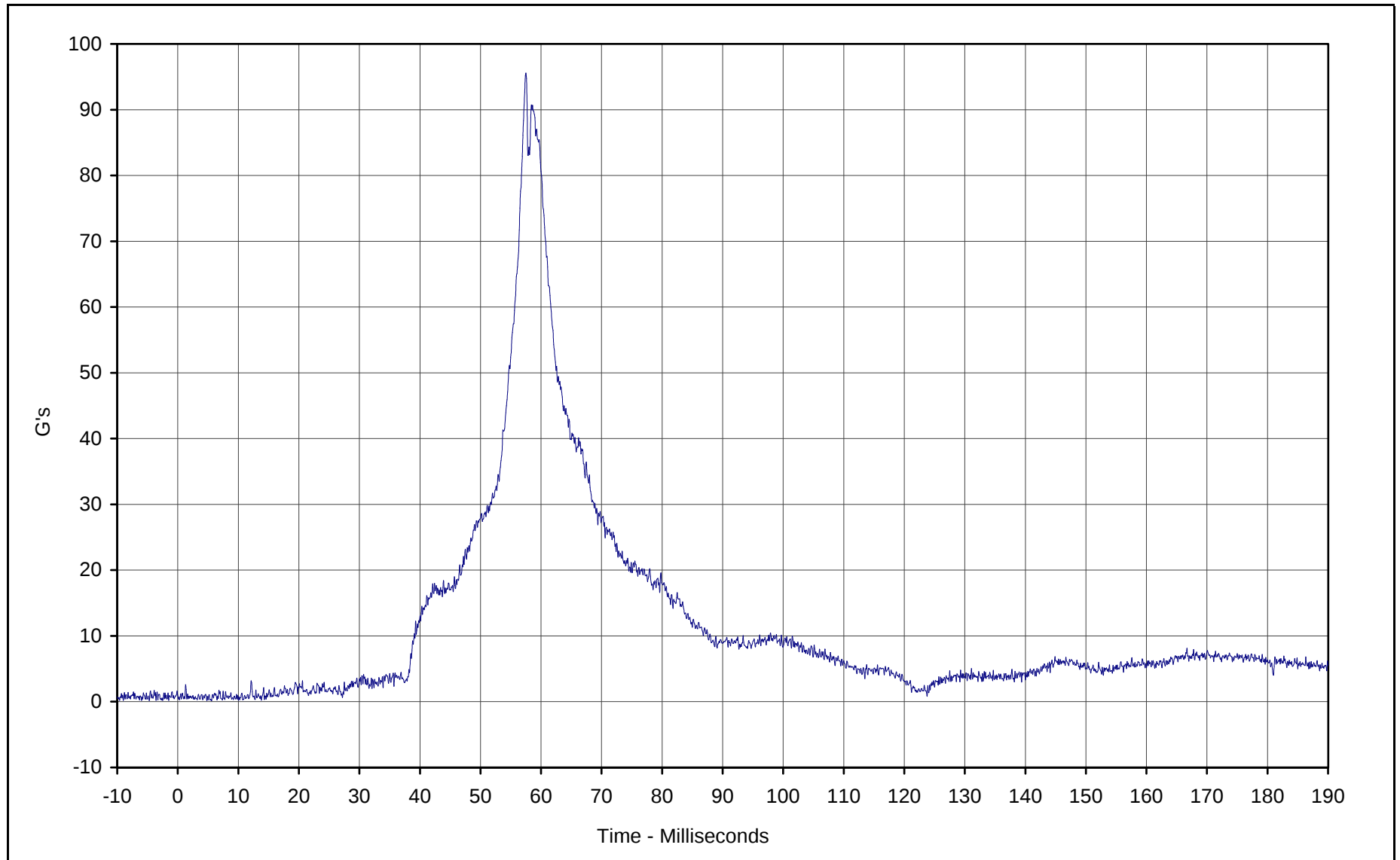




Curve Description: Pass. Head CG Z Velocity
Maximum Value: 3.6 at 53.1 Milliseconds
Minimum Value: -18.2 at 121.8 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-016

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

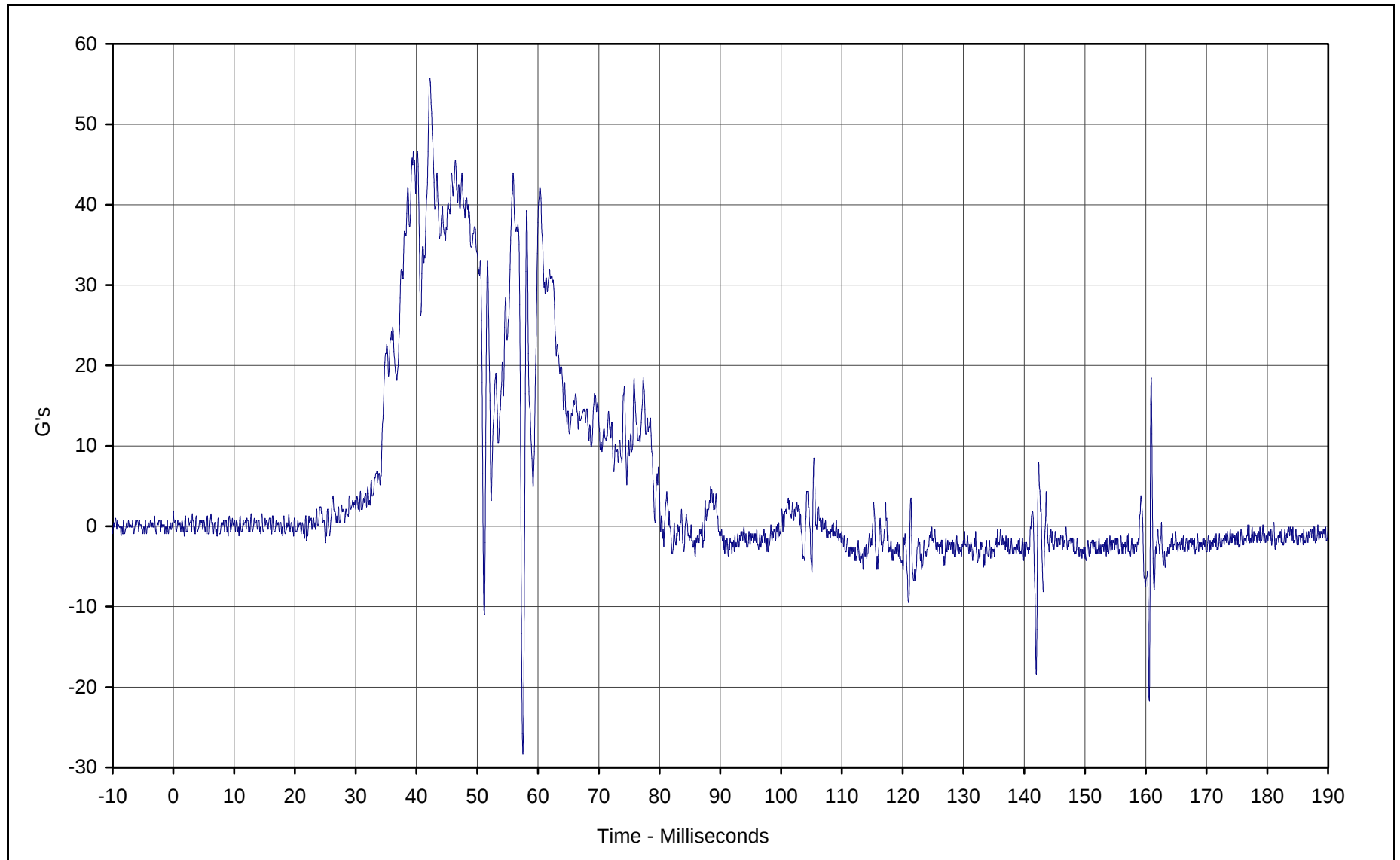




Curve Description: Pass. Head CG Resultant
Maximum Value: 95.6 at 57.5 Milliseconds
Minimum Value: 0.2 at 4.8 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: RES-014

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

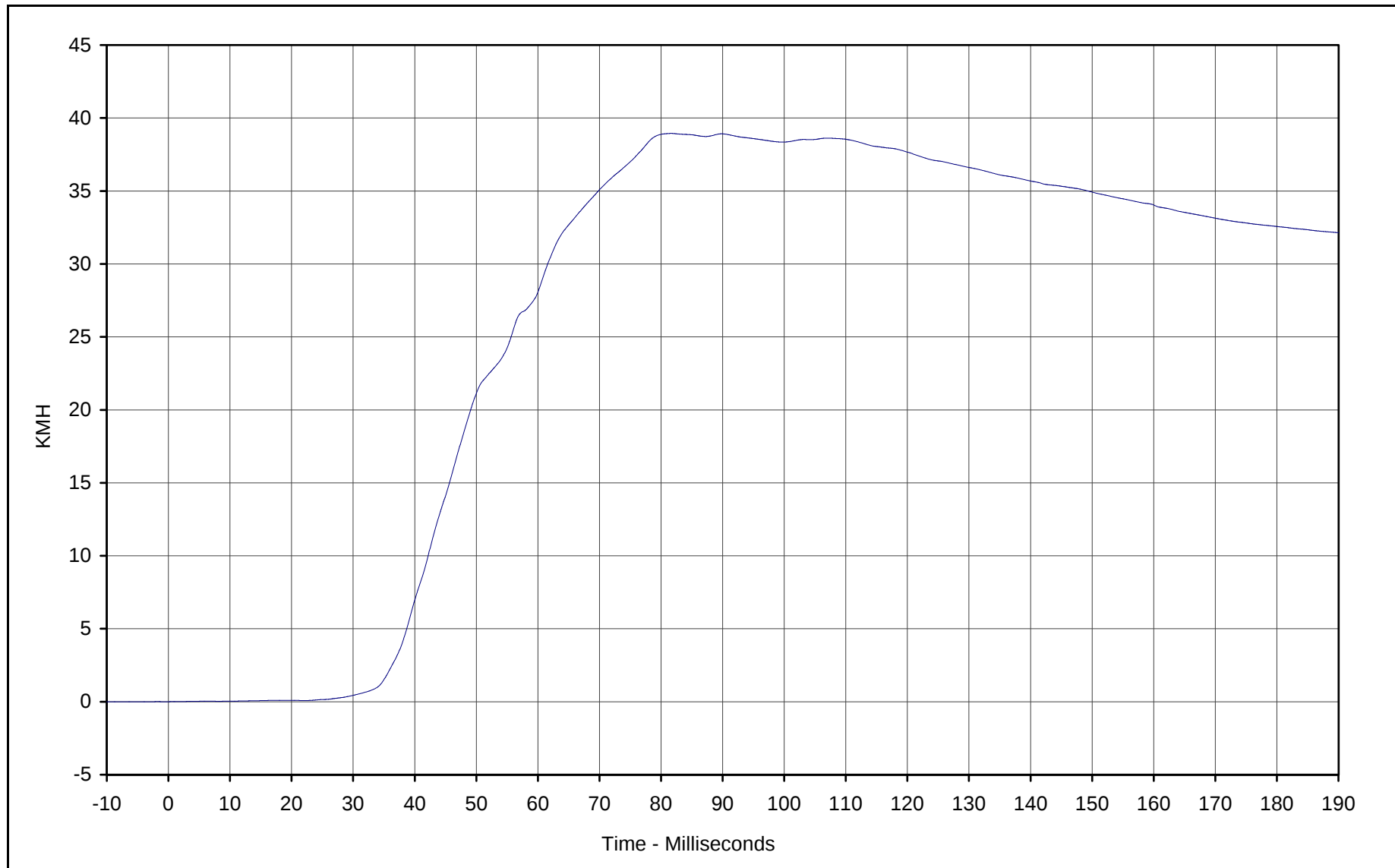




Curve Description: Pass. Upper Rib Primary Y
Maximum Value: 55.8 at 42.2 Milliseconds
Minimum Value: -28.3 at 57.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-017

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Pass. Upper Rib Primary Y Velocity

Maximum Value: 38.9 at 81.7 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

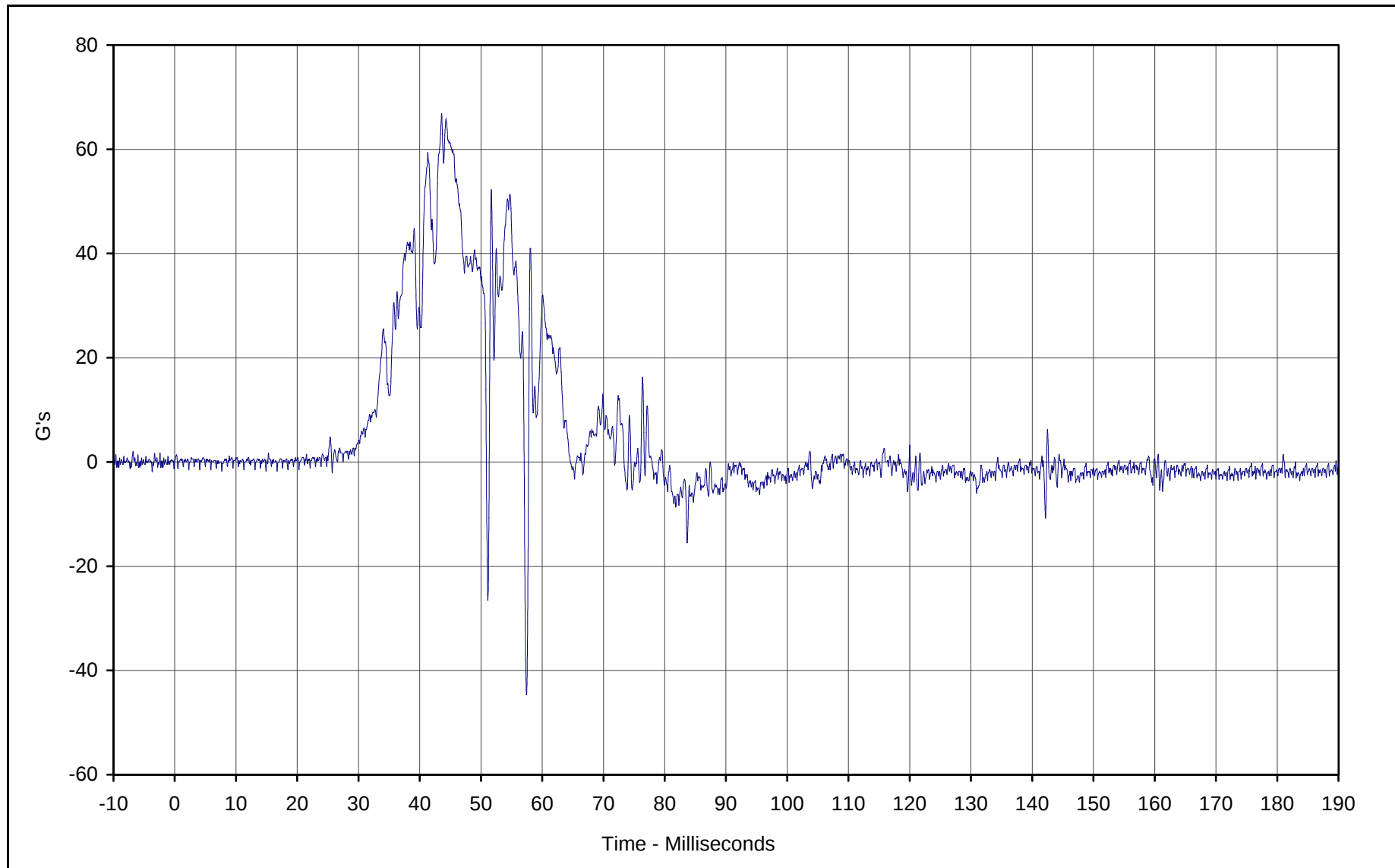
Date of Test: 9/25/01

Curve Number: IN1-017

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

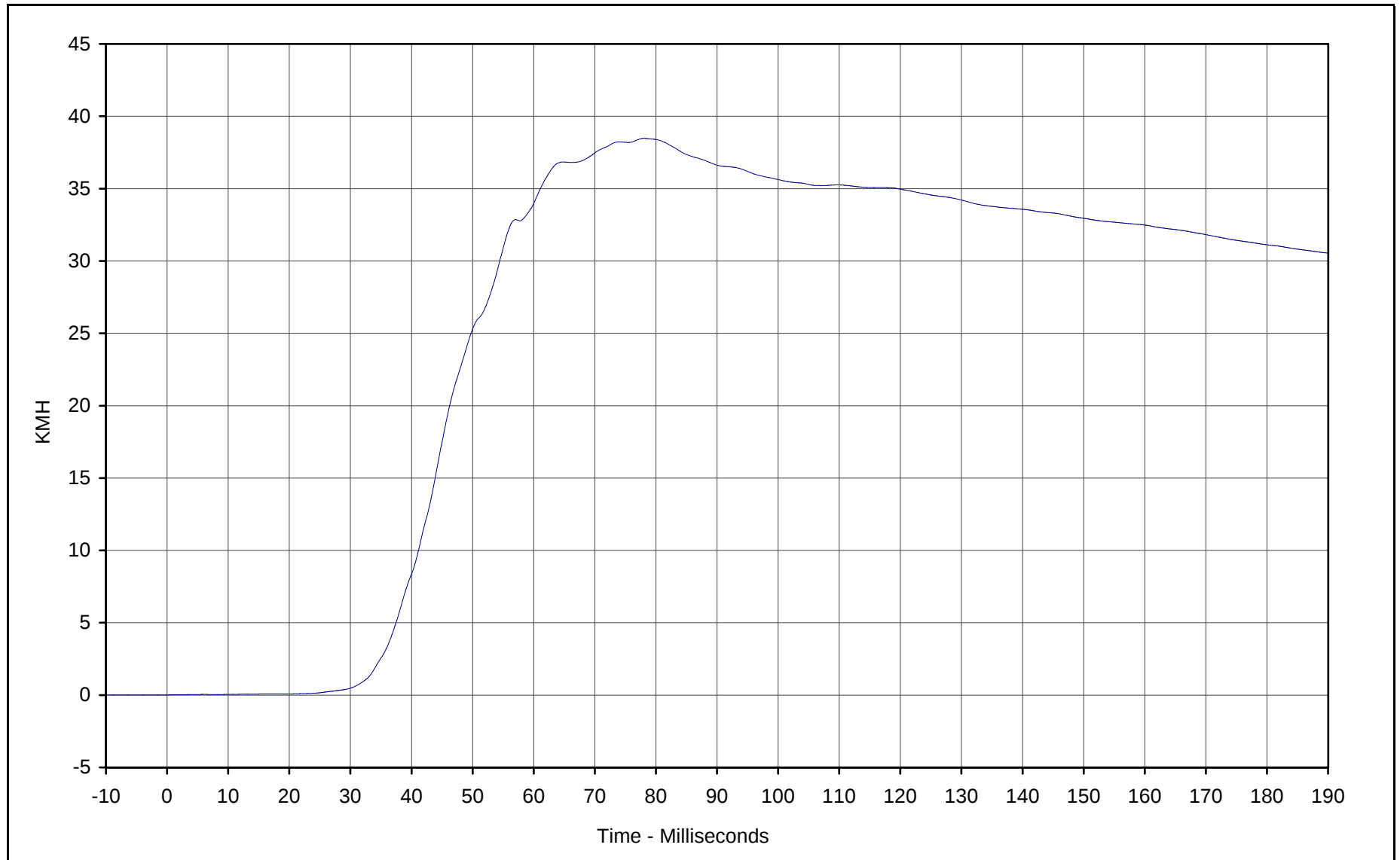




Curve Description: Pass. Lower Rib Primary Y
Maximum Value: 66.8 at 43.6 Milliseconds
Minimum Value: -44.6 at 57.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-018

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Pass. Lower Rib Primary Y Velocity

Maximum Value: 38.5 at 78.0 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

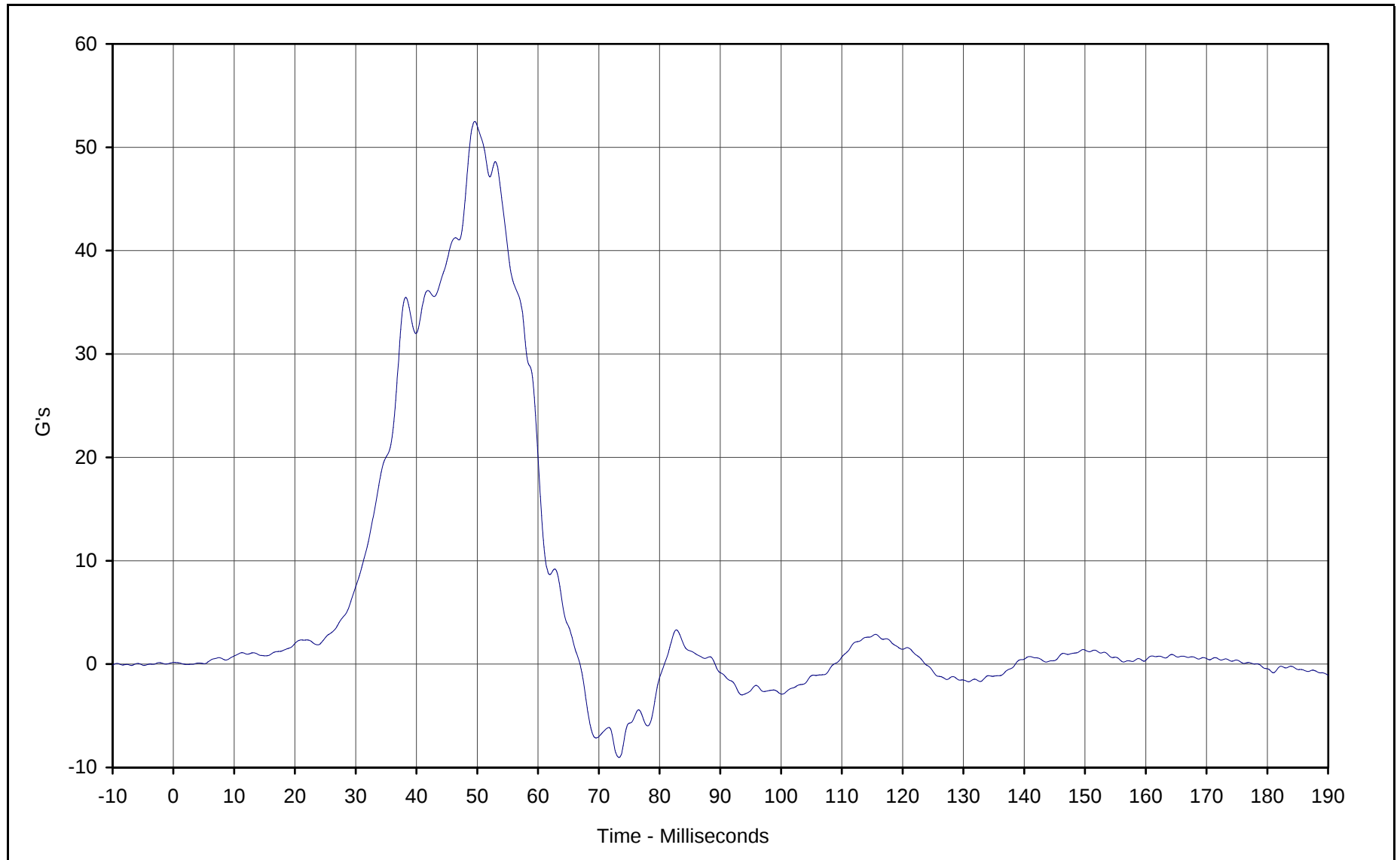
Date of Test: 9/25/01

Curve Number: IN1-018

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

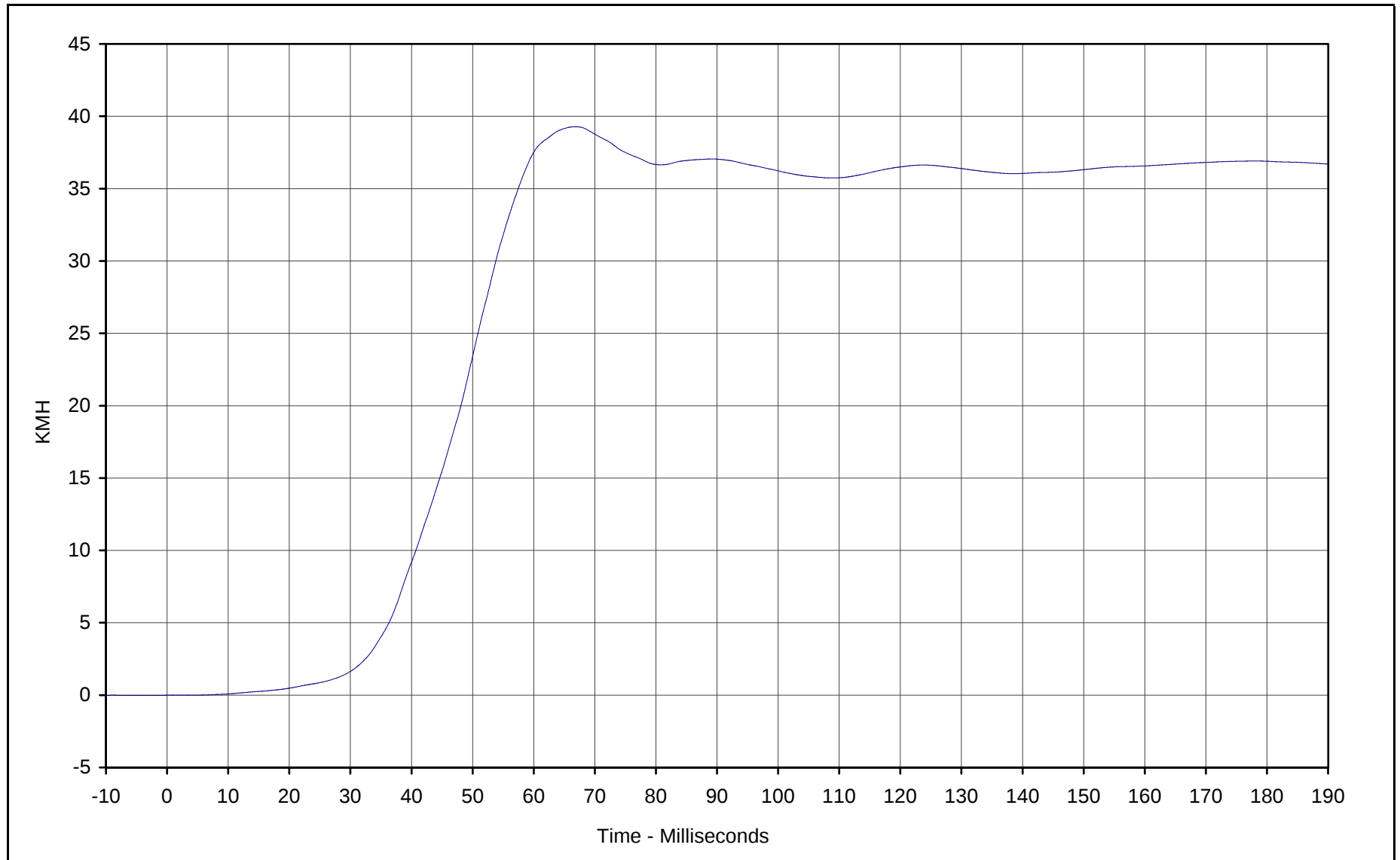




Curve Description: Pass. Lower Spine Primary Y
Maximum Value: 52.5 at 49.6 Milliseconds
Minimum Value: -9.0 at 73.4 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: FIL-019

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Pass. Lower Spine Primary Y Velocity

Maximum Value: 39.3 at 66.9 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

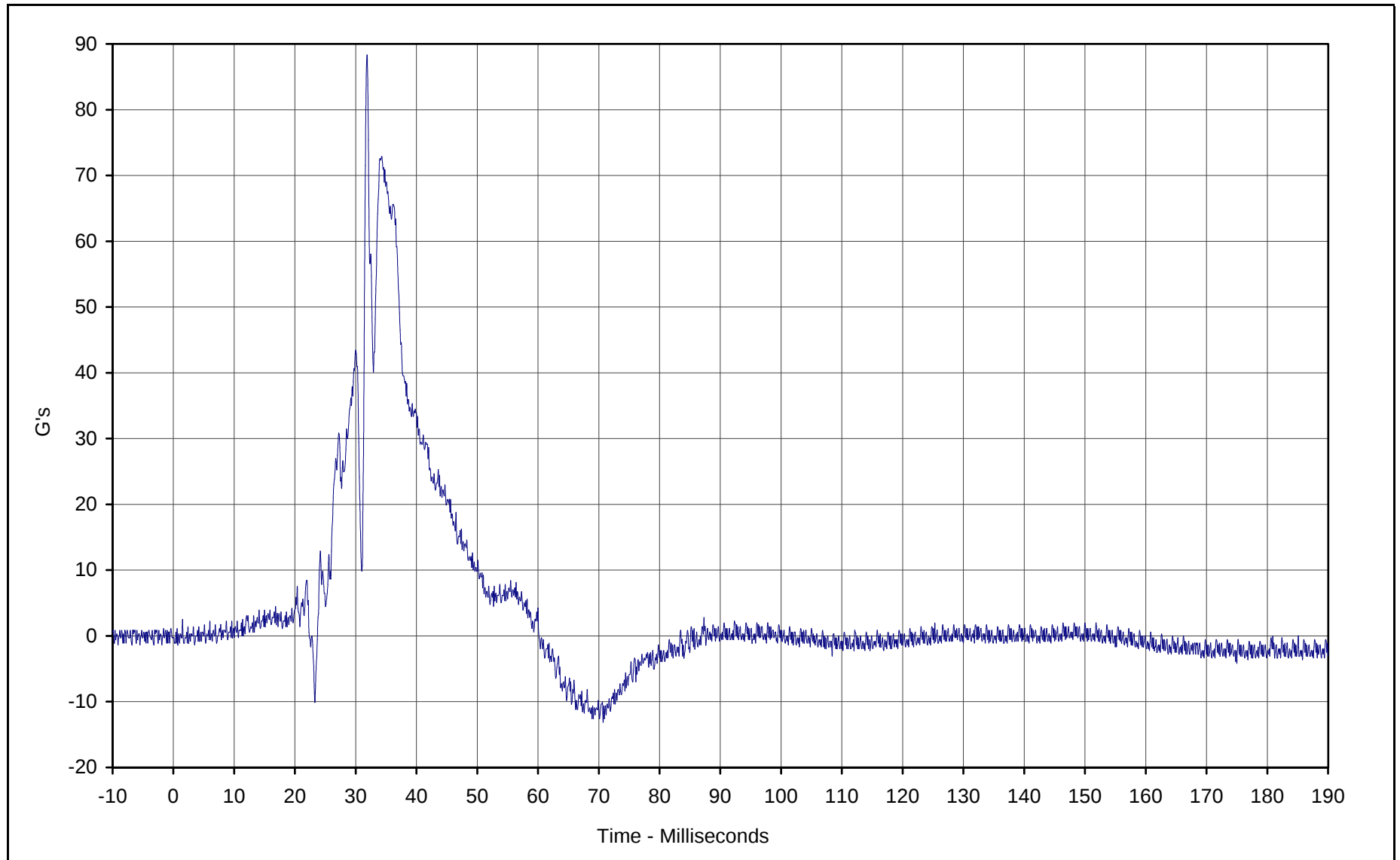
Date of Test: 9/25/01

Curve Number: IN1-019

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

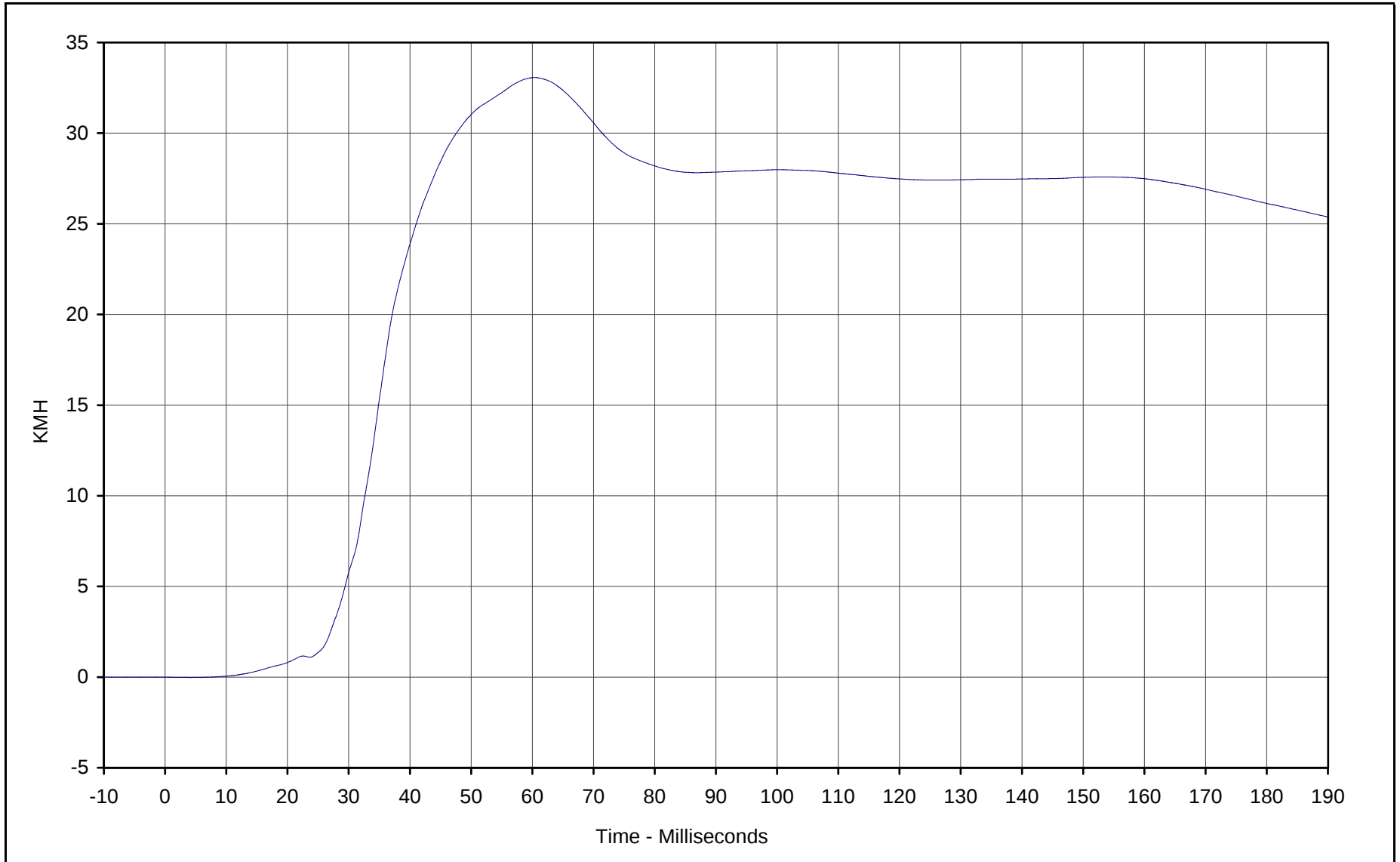




Curve Description: Pass. Pelvis Primary Y
Maximum Value: 88.3 at 31.9 Milliseconds
Minimum Value: -13.2 at 70.7 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-020

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

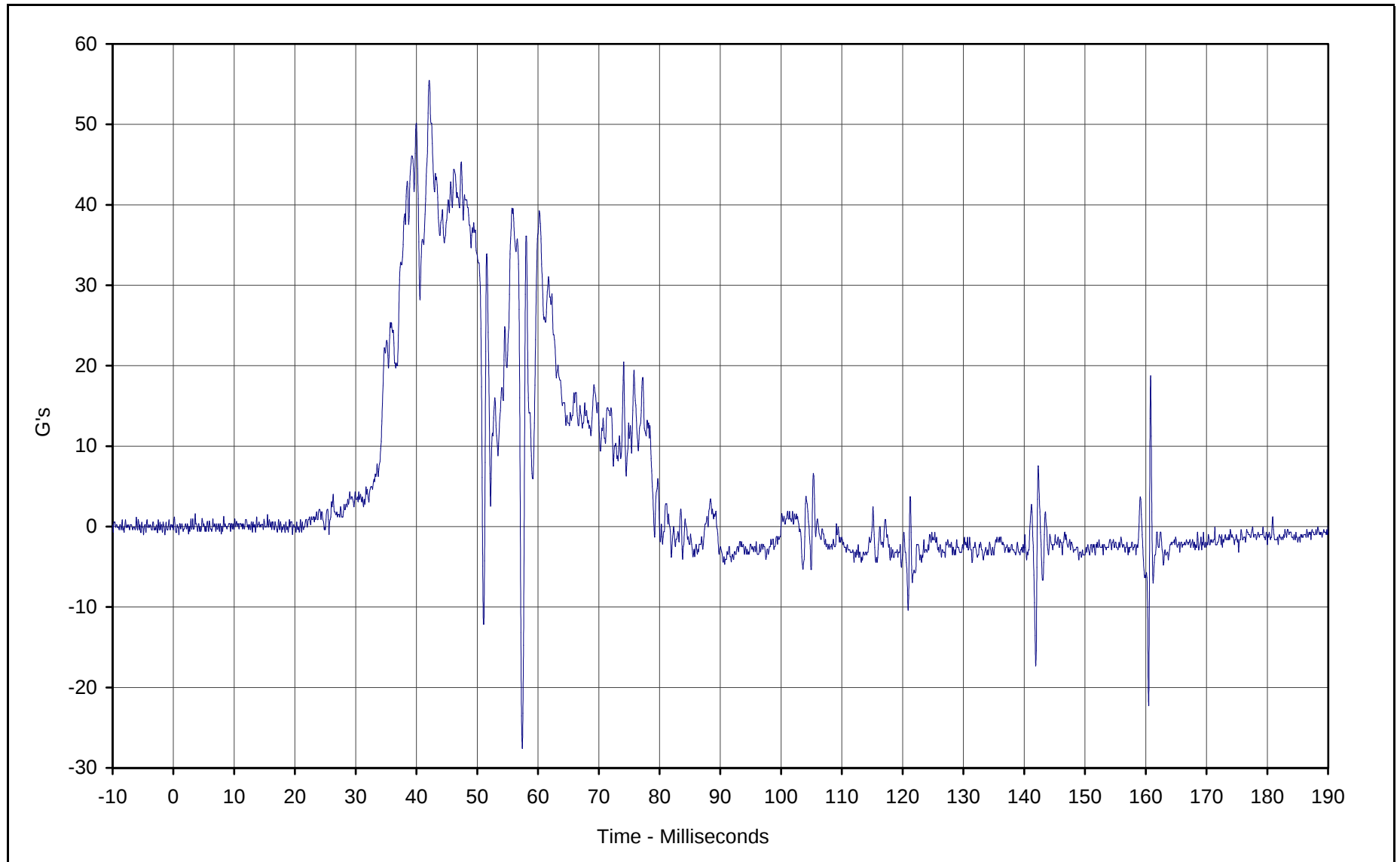




Curve Description: Pass. Pelvis Primary Y Velocity
Maximum Value: 33.1 at 60.3 Milliseconds
Minimum Value: 0.0 at 4.1 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-020

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

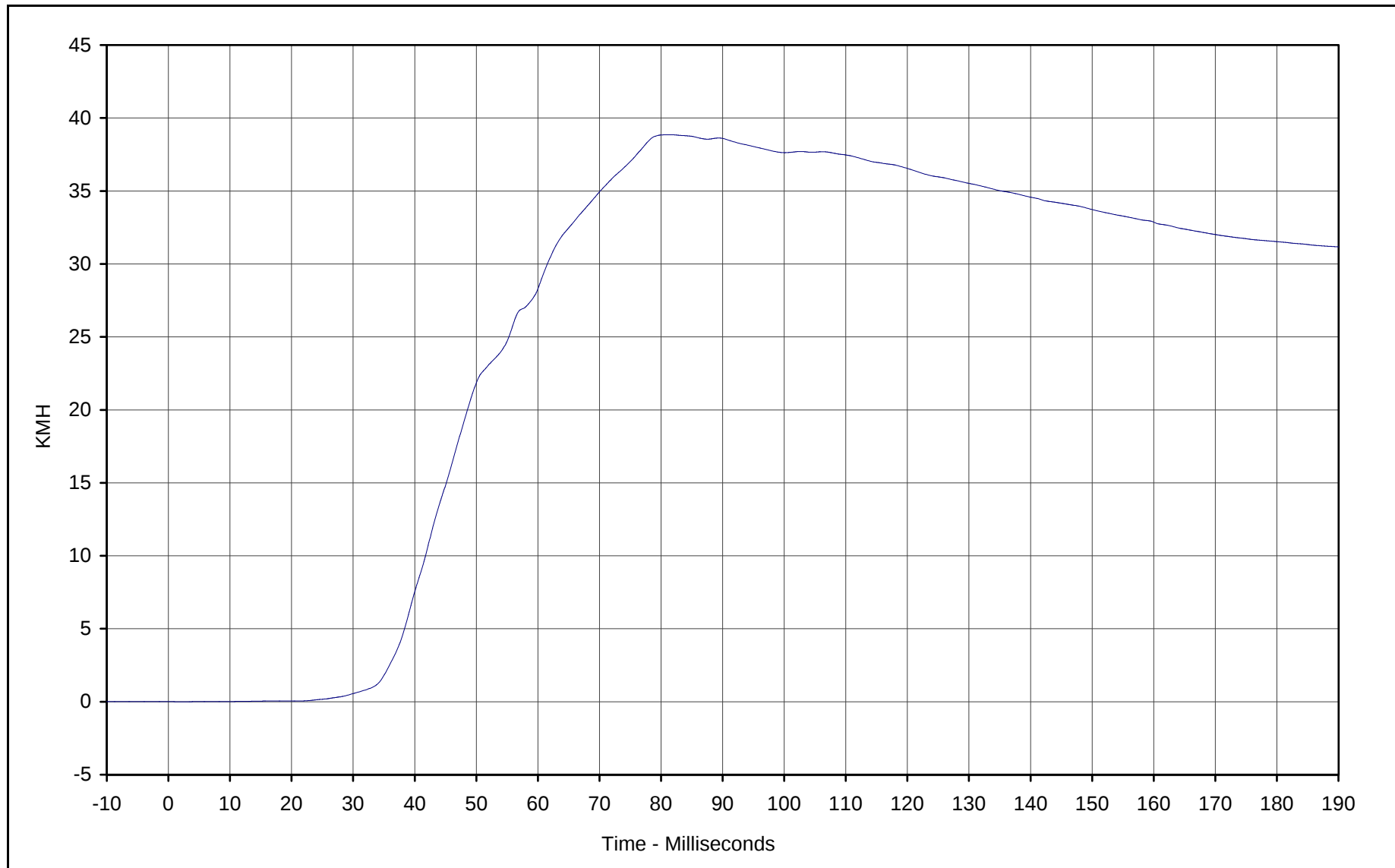




Curve Description: Pass. Upper Rib Redundant Y
Maximum Value: 55.5 at 42.1 Milliseconds
Minimum Value: -27.6 at 57.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-021

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Pass. Upper Rib Redundant Y Velocity

Maximum Value: 38.9 at 81.5 Milliseconds

Minimum Value: 0.0 at 2.6 Milliseconds

SAE Filter Class: 180

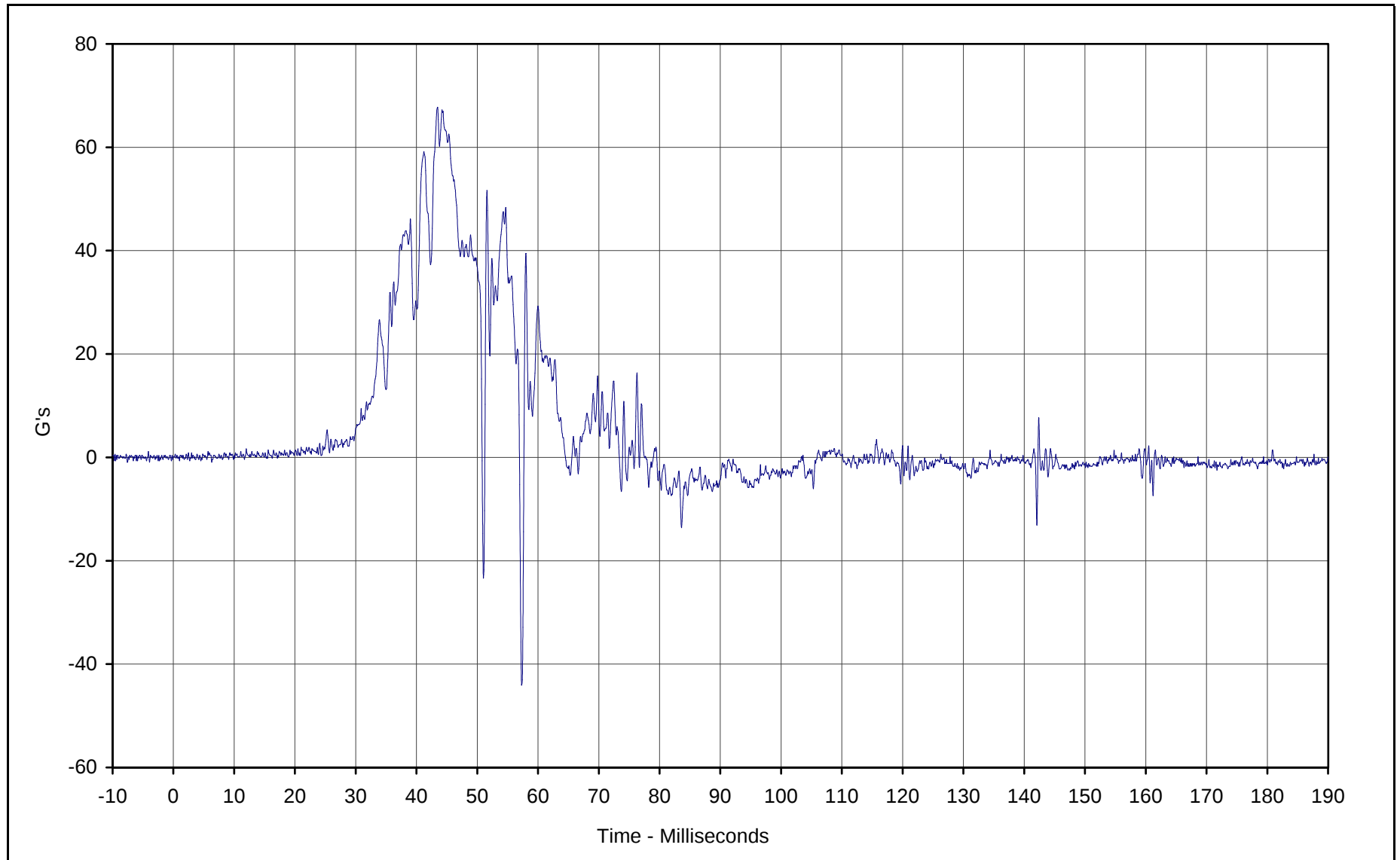
Date of Test: 9/25/01

Curve Number: IN1-021

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

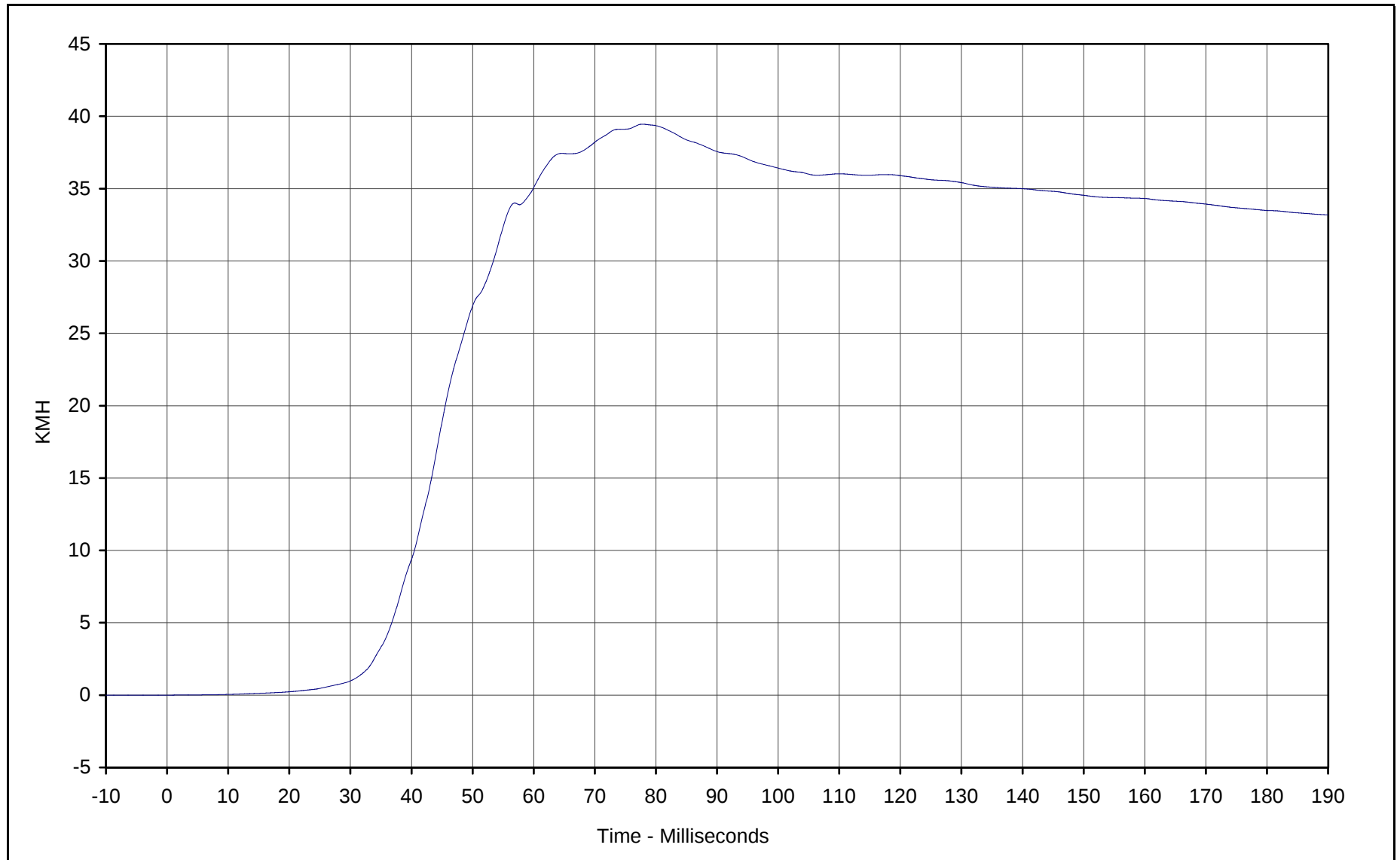




Curve Description: Pass. Lower Rib Redundant Y
Maximum Value: 67.7 at 43.5 Milliseconds
Minimum Value: -44.0 at 57.3 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-022

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Pass. Lower Rib Redundant Y Velocity

Maximum Value: 39.5 at 77.8 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

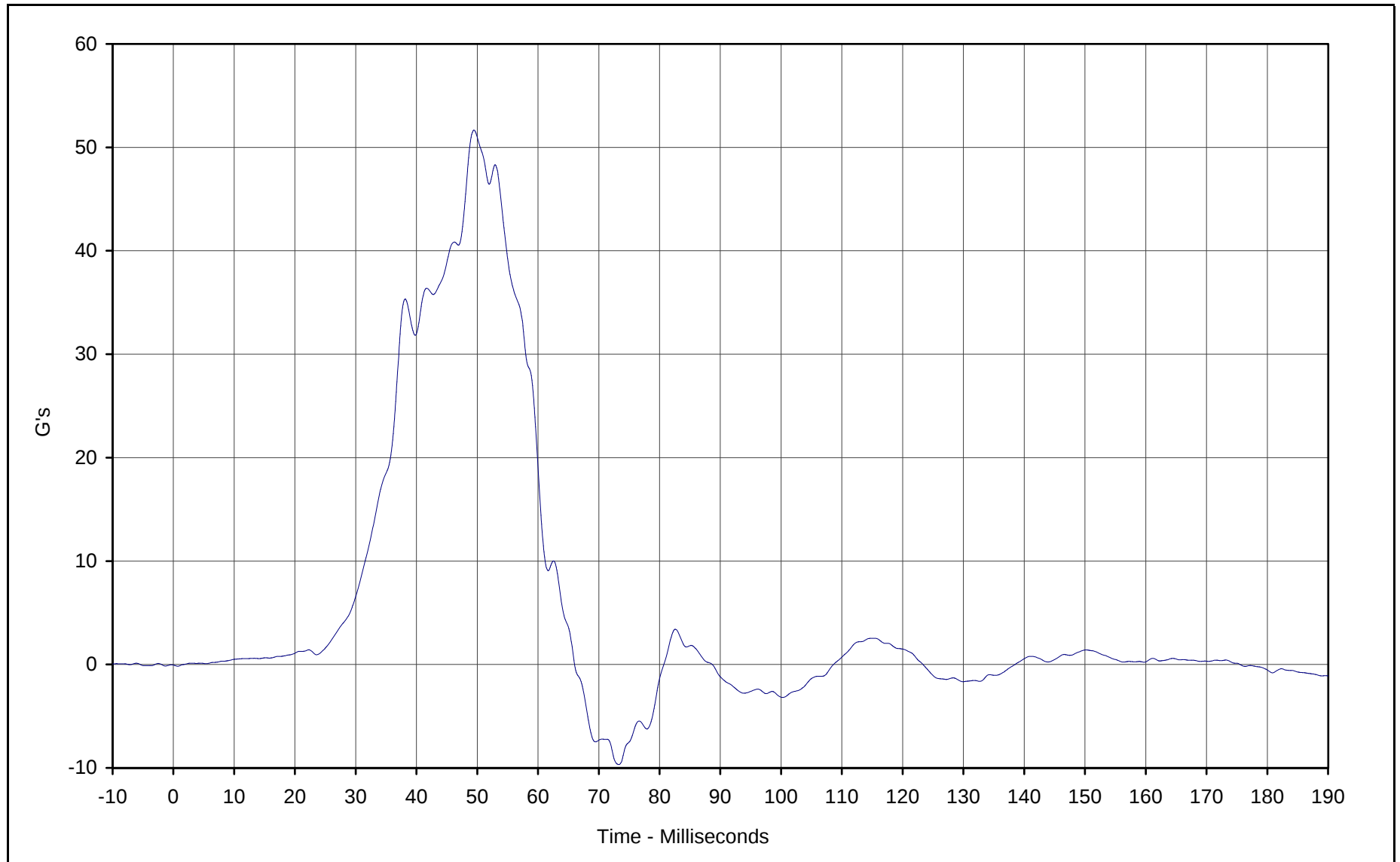
Date of Test: 9/25/01

Curve Number: IN1-022

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

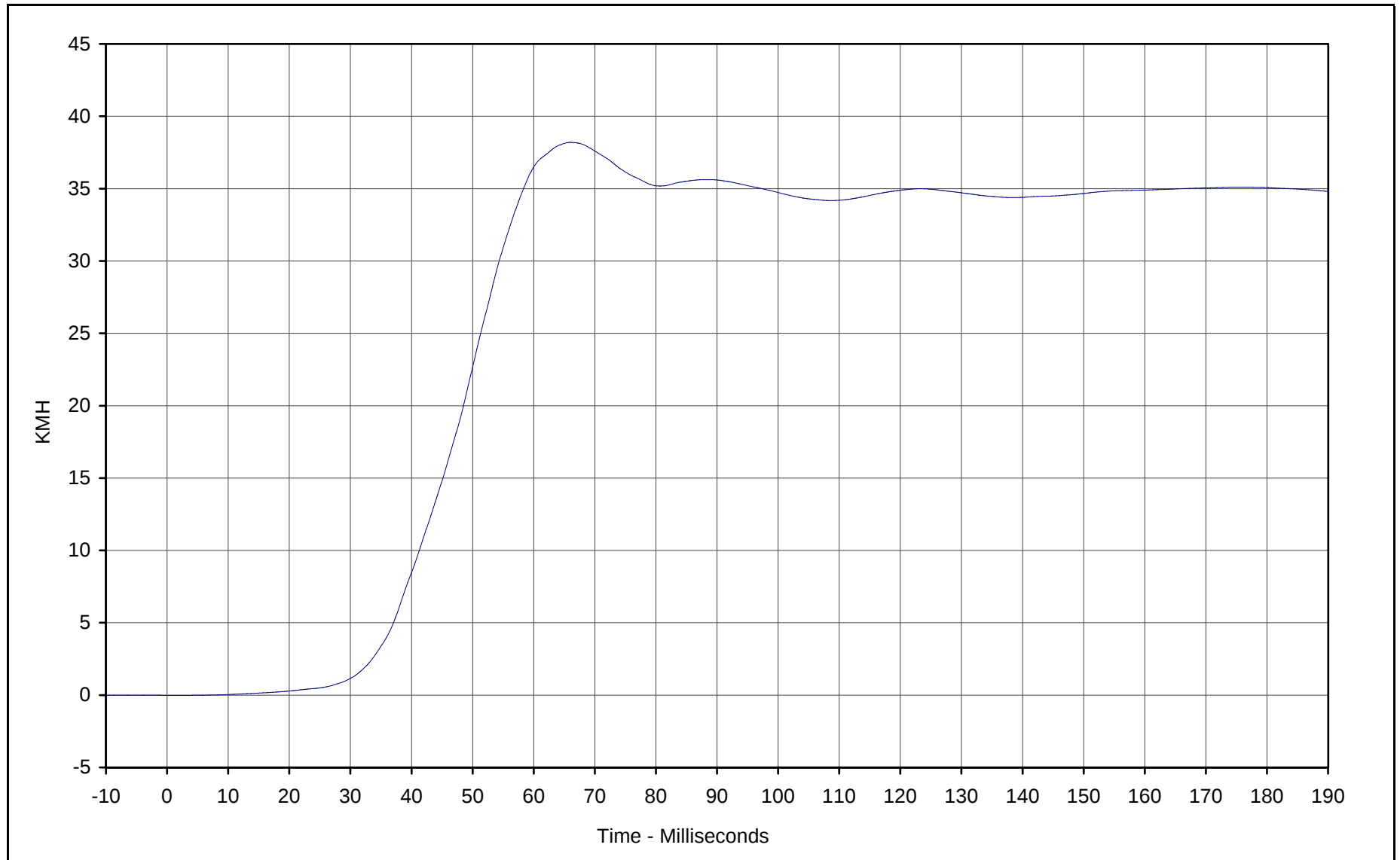




Curve Description: Pass. Lower Spine Redundant Y
Maximum Value: 51.7 at 49.4 Milliseconds
Minimum Value: -9.7 at 73.3 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: FIL-023

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Pass. Lower Spine Redundant Y Velocity

Maximum Value: 38.2 at 66.0 Milliseconds

Minimum Value: 0.0 at 1.7 Milliseconds

SAE Filter Class: 180

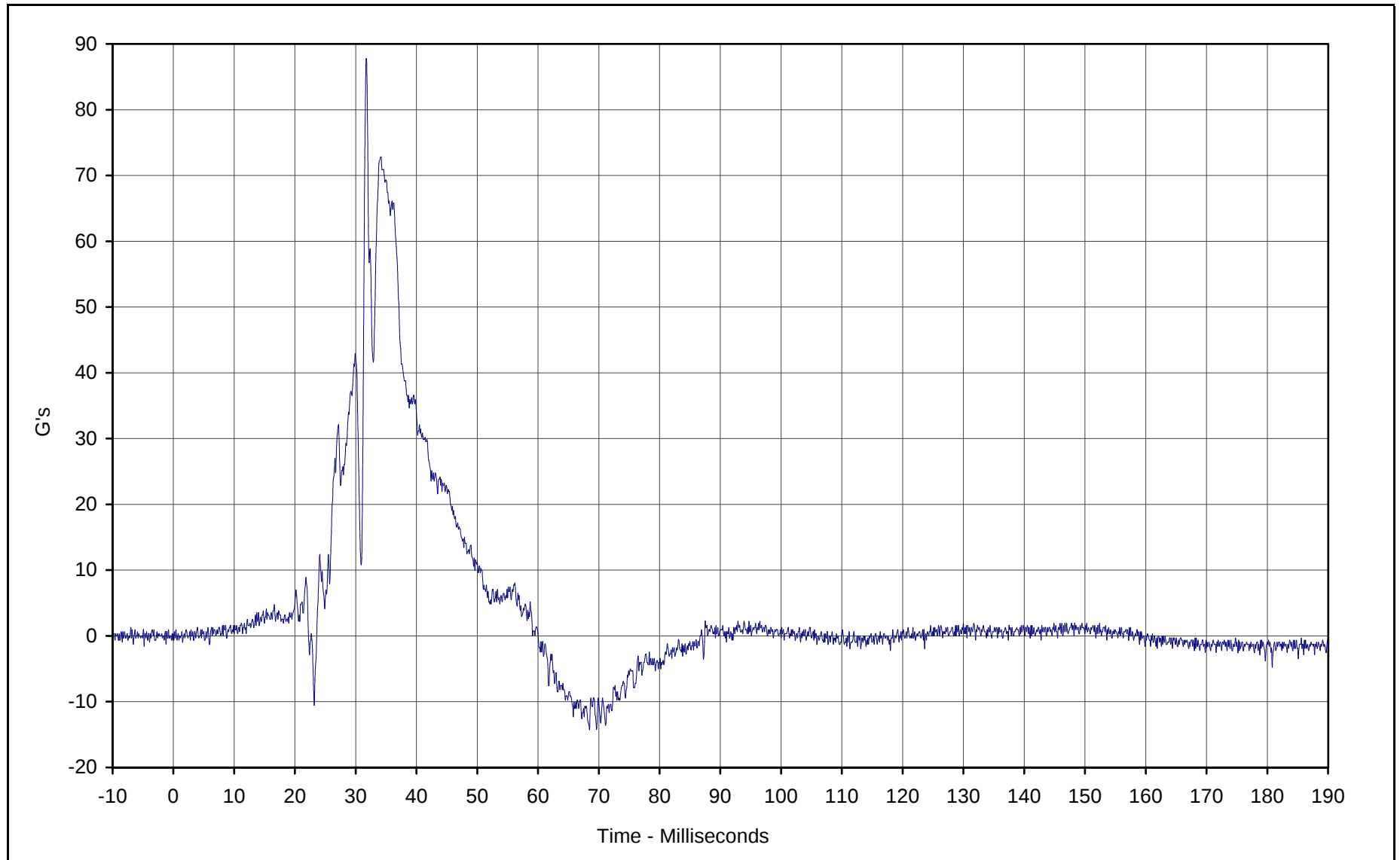
Date of Test: 9/25/01

Curve Number: IN1-023

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

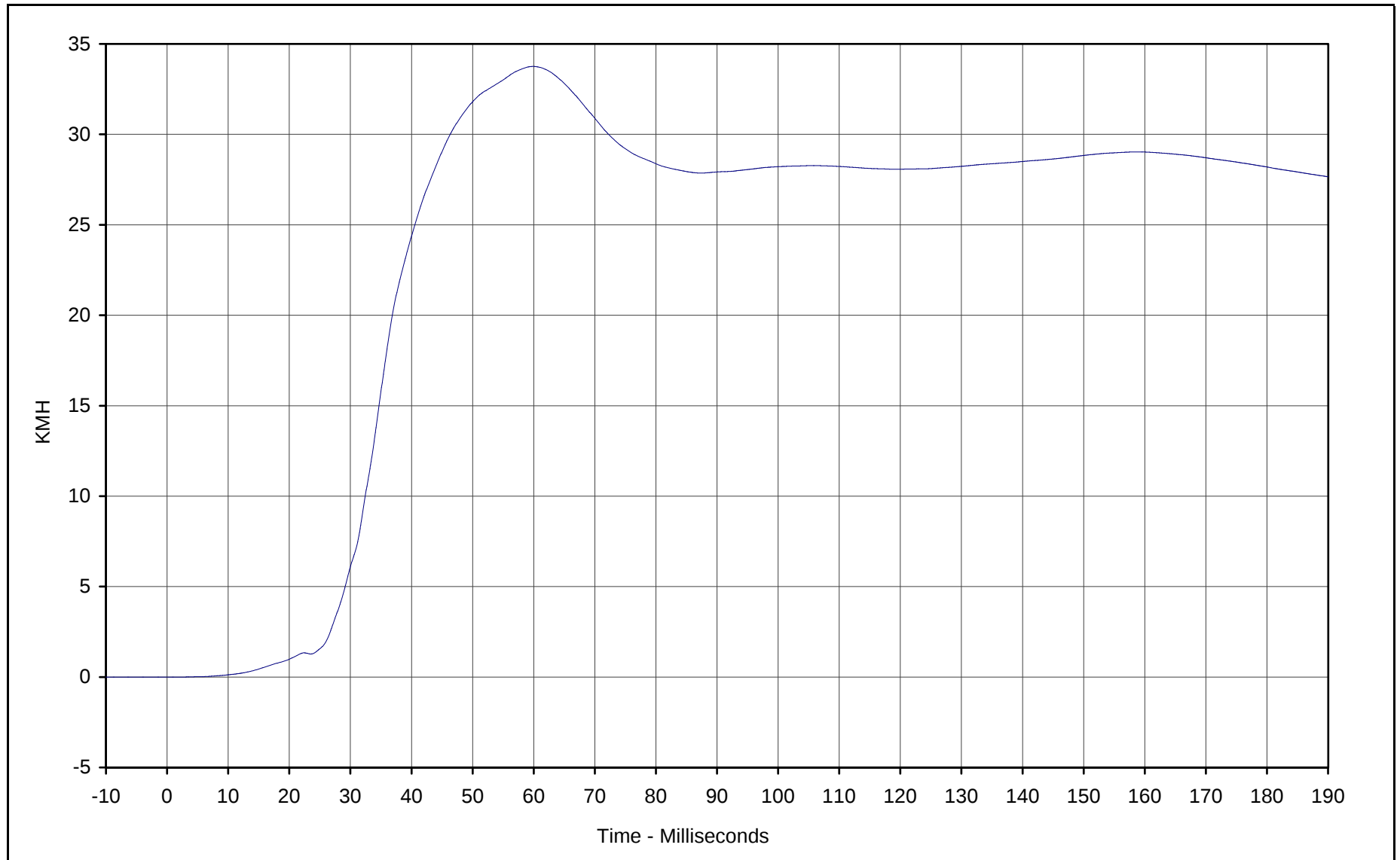




Curve Description: Pass. Pelvis Redundant Y
Maximum Value: 87.7 at 31.7 Milliseconds
Minimum Value: -14.2 at 68.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-024

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

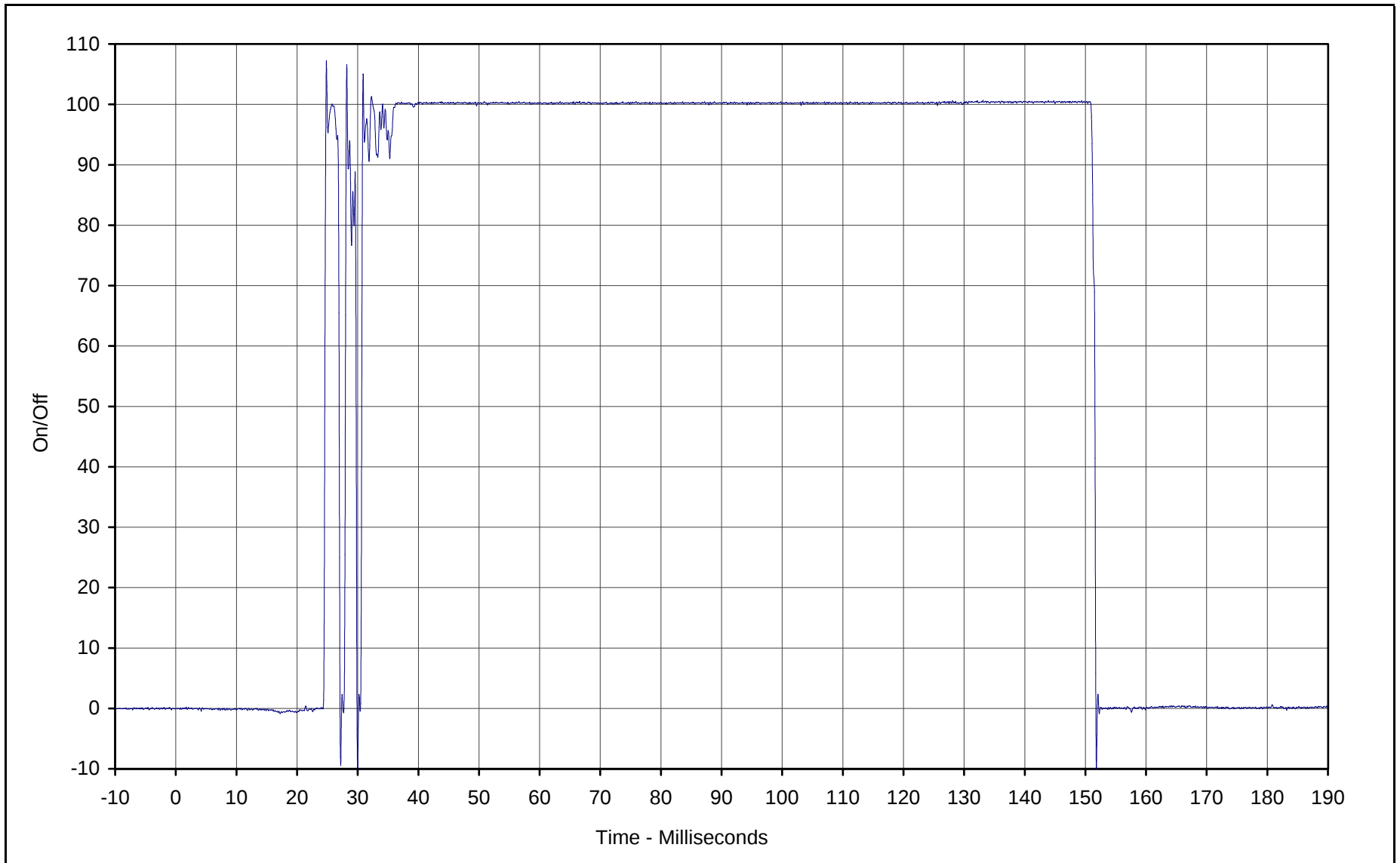




Curve Description: Pass. Pelvis Redundant Y Velocity
Maximum Value: 33.8 at 59.9 Milliseconds
Minimum Value: 0.0 at 1.5 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-024

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

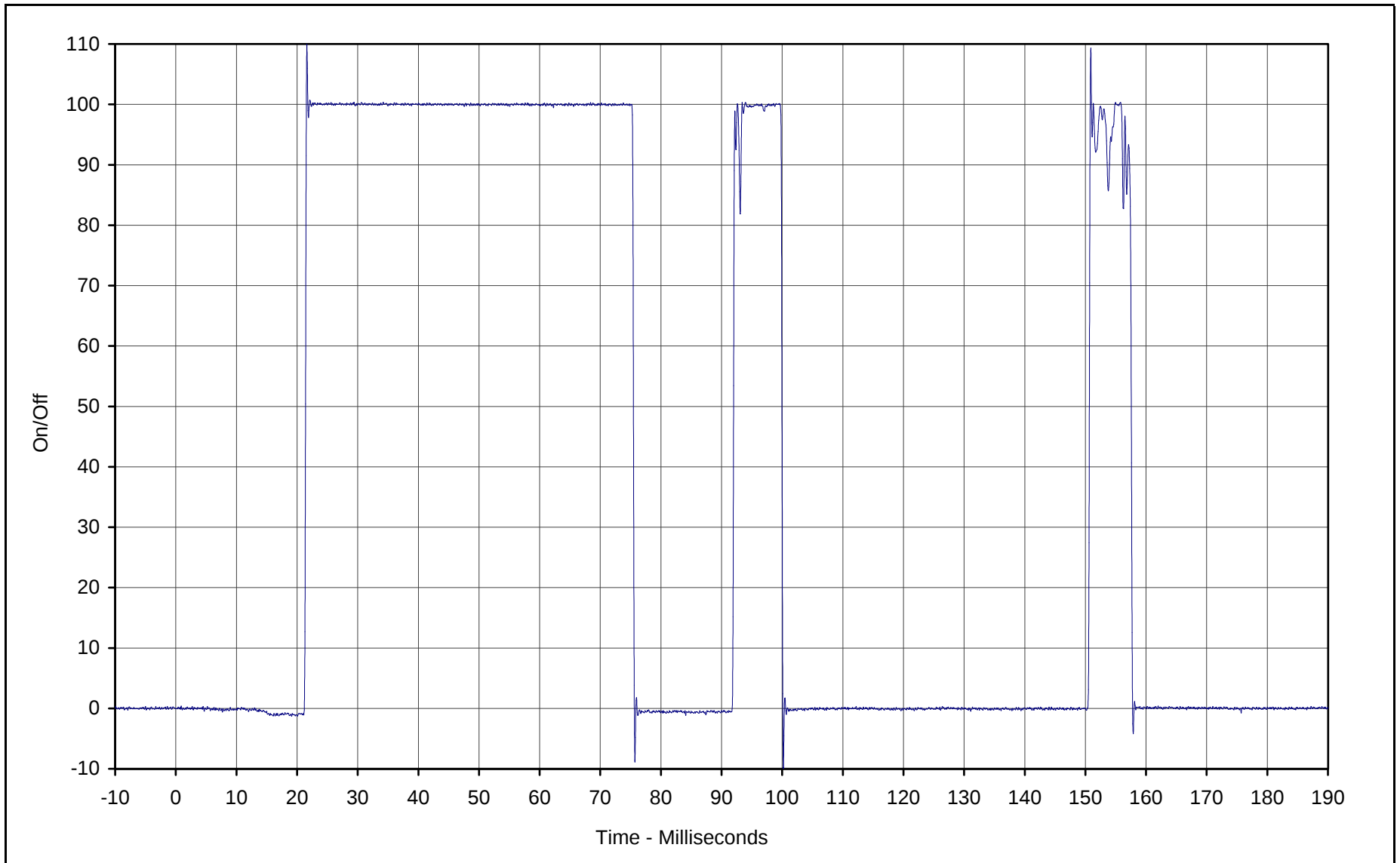




Curve Description: Pass. Thorax Contact
Maximum Value: 106.8 at 24.8 Milliseconds
Crossing Point: 50% at 24.6 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-025

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Pass. Pelvis Contact

Maximum Value: 109.6 at 21.6 Milliseconds

Crossing Point: 50% at 21.4 Milliseconds

SAE Filter Class: 1000

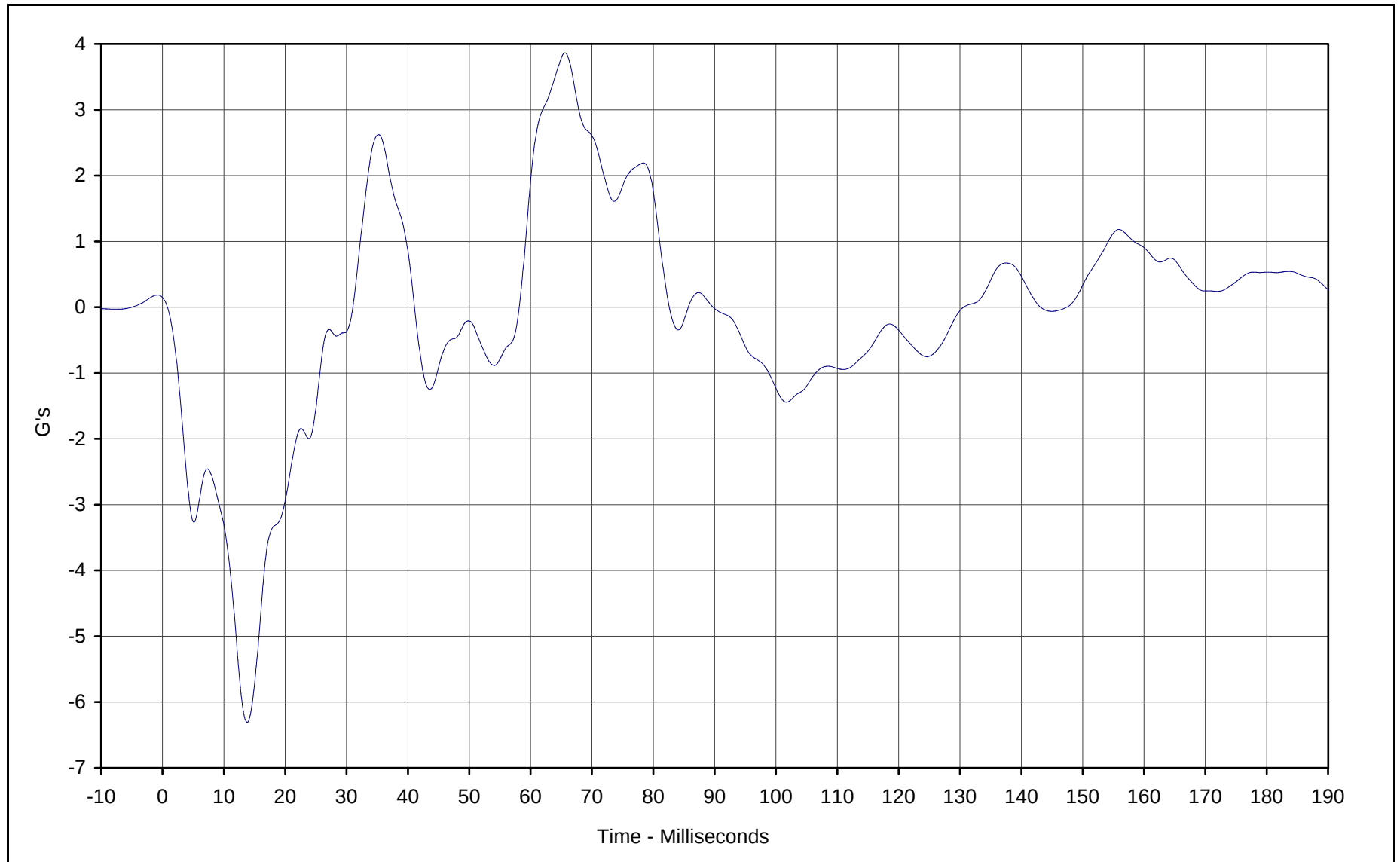
Date of Test: 9/25/01

Curve Number: FIL-026

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

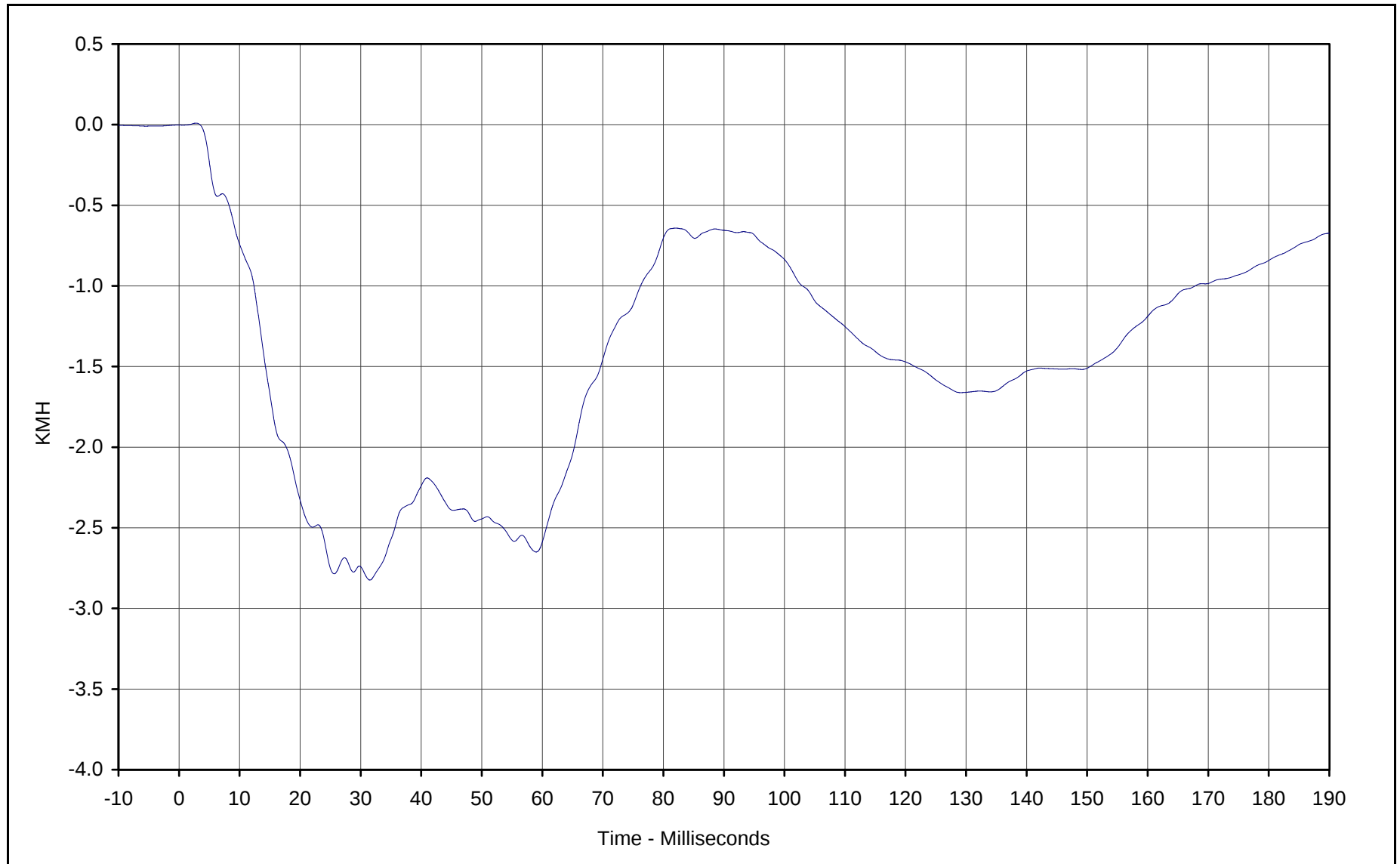




Curve Description: Right Sill at Front Seat X
Maximum Value: 3.9 at 65.6 Milliseconds
Minimum Value: -6.3 at 13.8 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-027

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

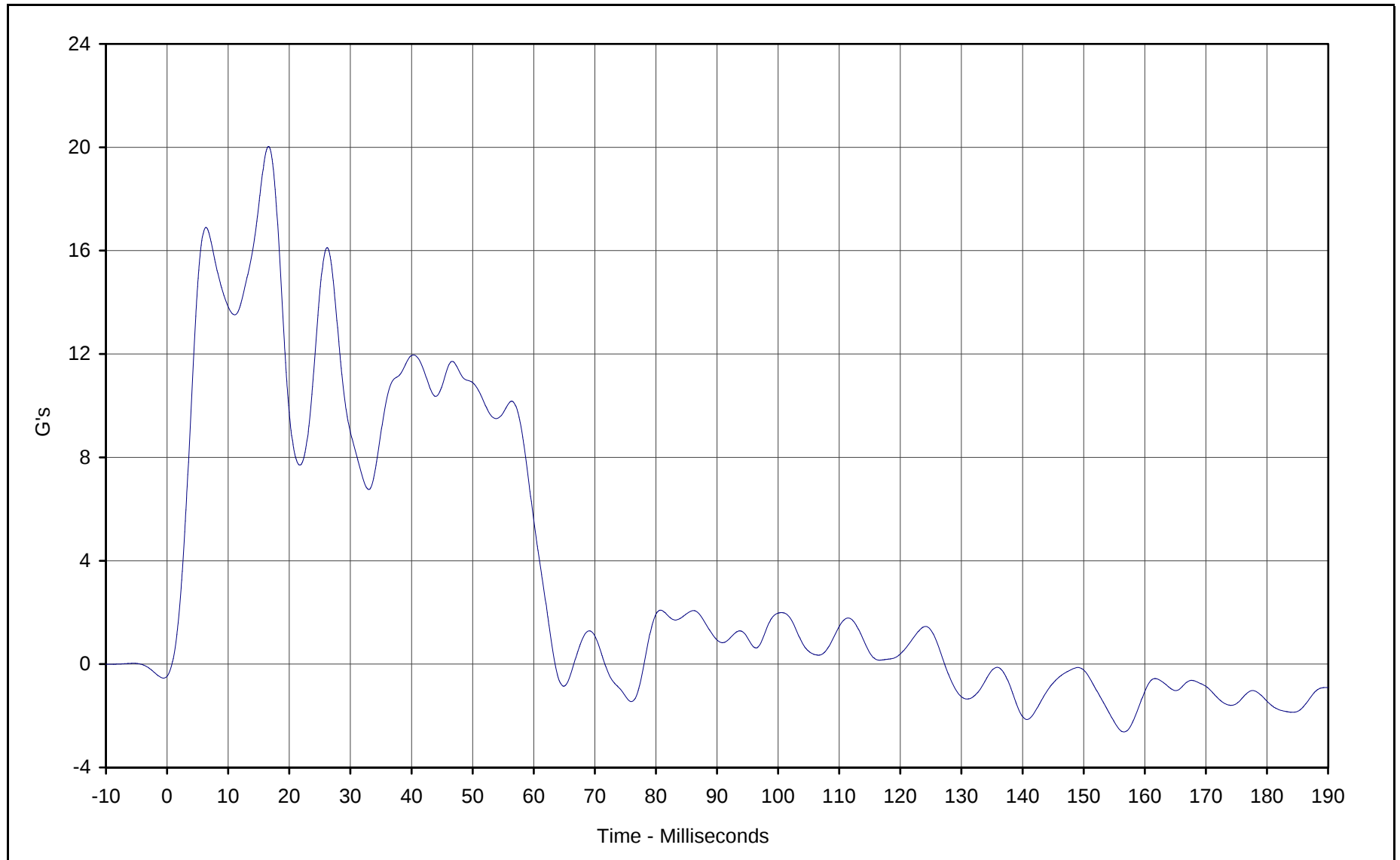




Curve Description: Right Sill at Front Seat X Velocity
Maximum Value: 0.0 at 2.8 Milliseconds
Minimum Value: -2.8 at 31.5 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-027

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

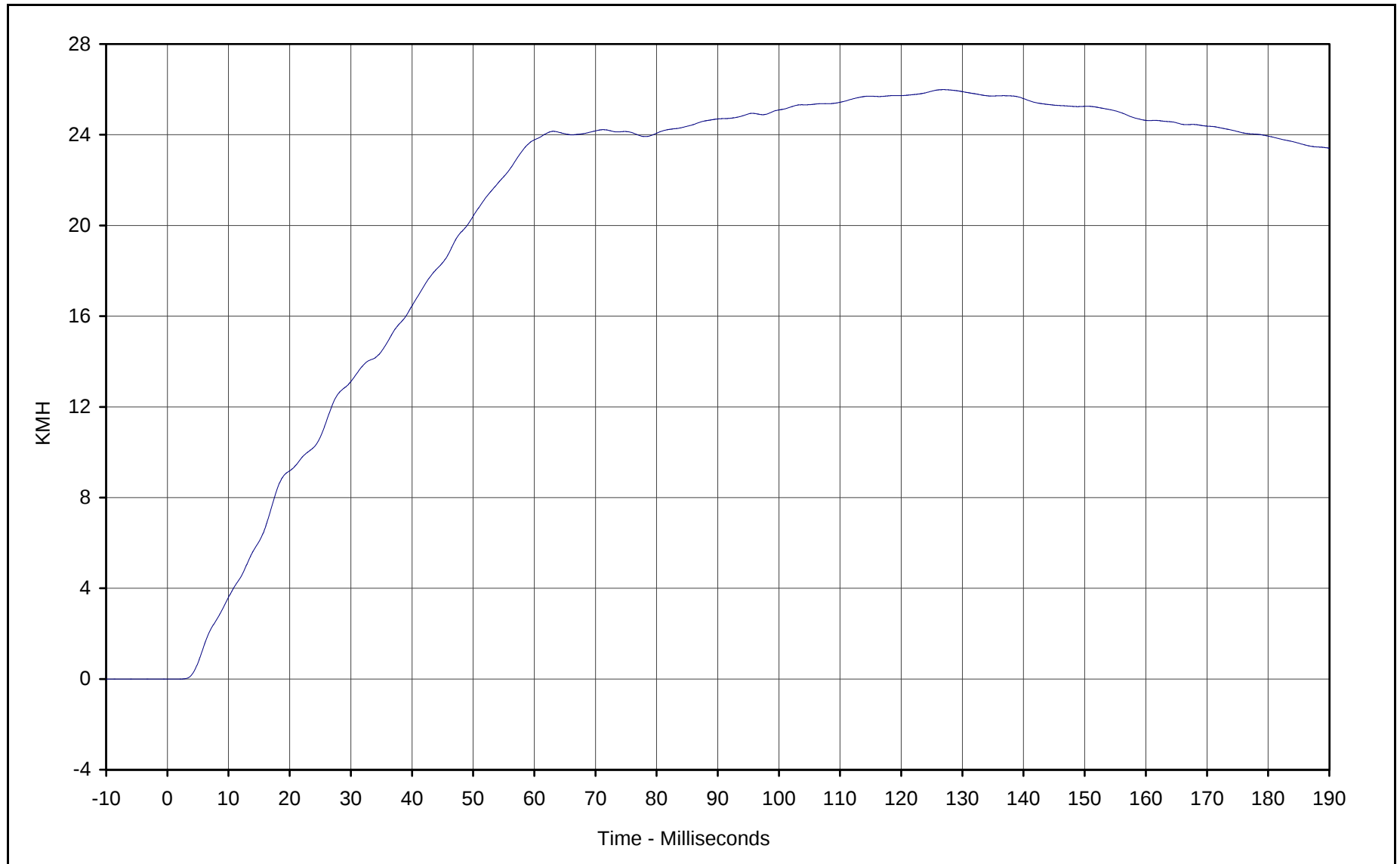




Curve Description: Right Sill at Front Seat Y
Maximum Value: 20.0 at 16.6 Milliseconds
Minimum Value: -2.6 at 156.6 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-028

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

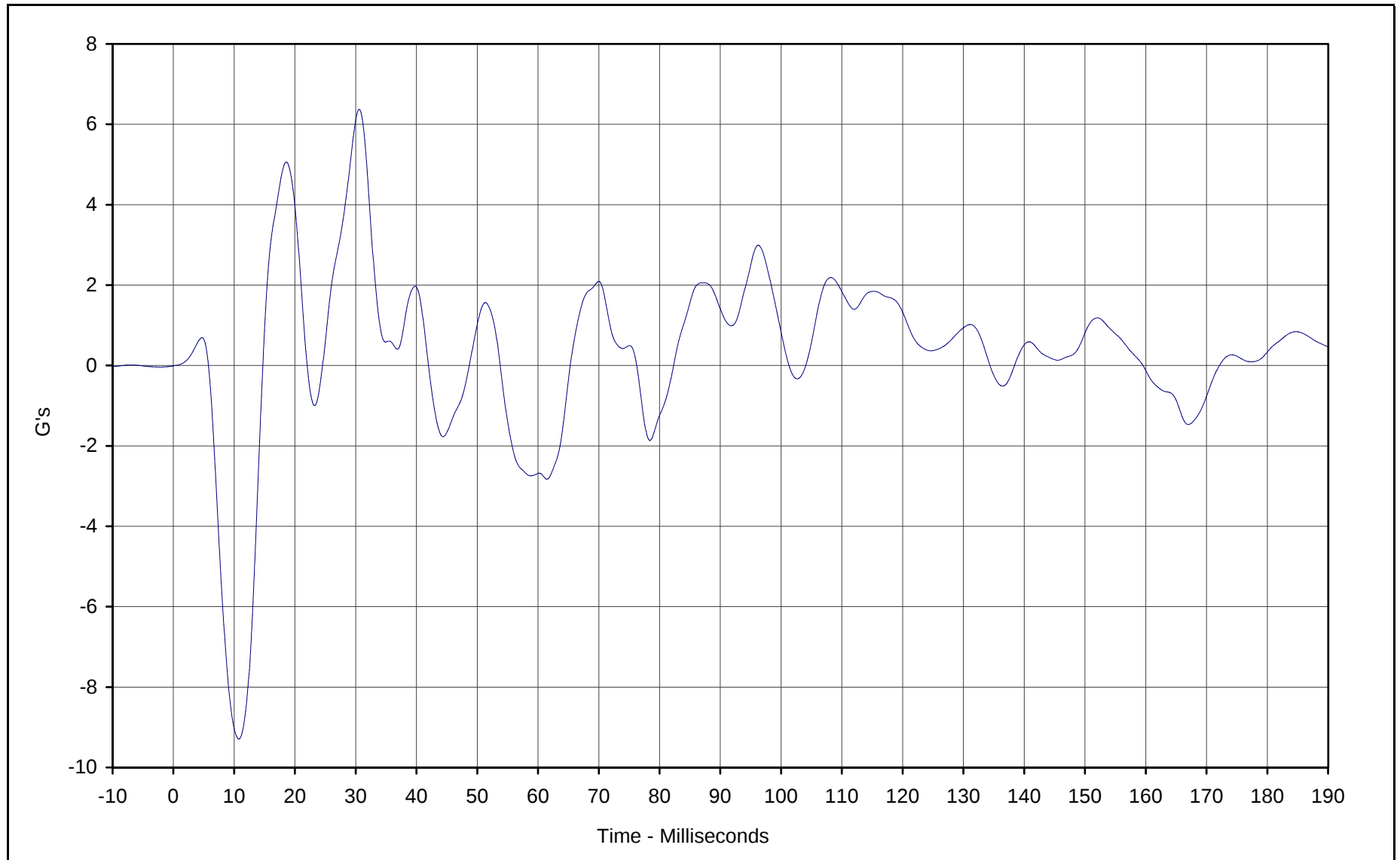




Curve Description: Right Sill at Front Seat Y Velocity
Maximum Value: 26.0 at 126.9 Milliseconds
Minimum Value: 0.0 at 2.1 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-028

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

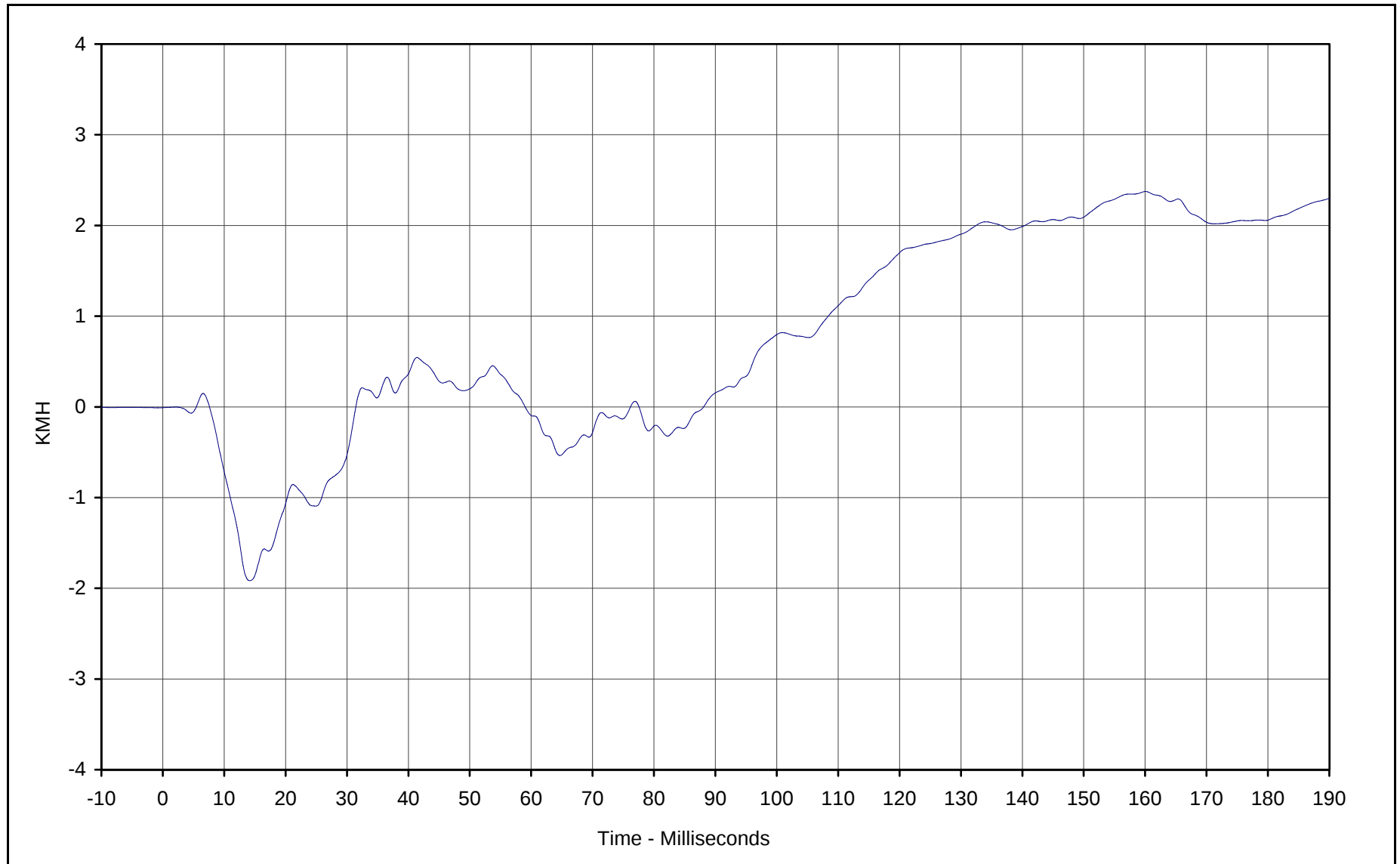




Curve Description: Right Sill at Front Seat Z
Maximum Value: 6.4 at 30.6 Milliseconds
Minimum Value: -9.3 at 10.8 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-029

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

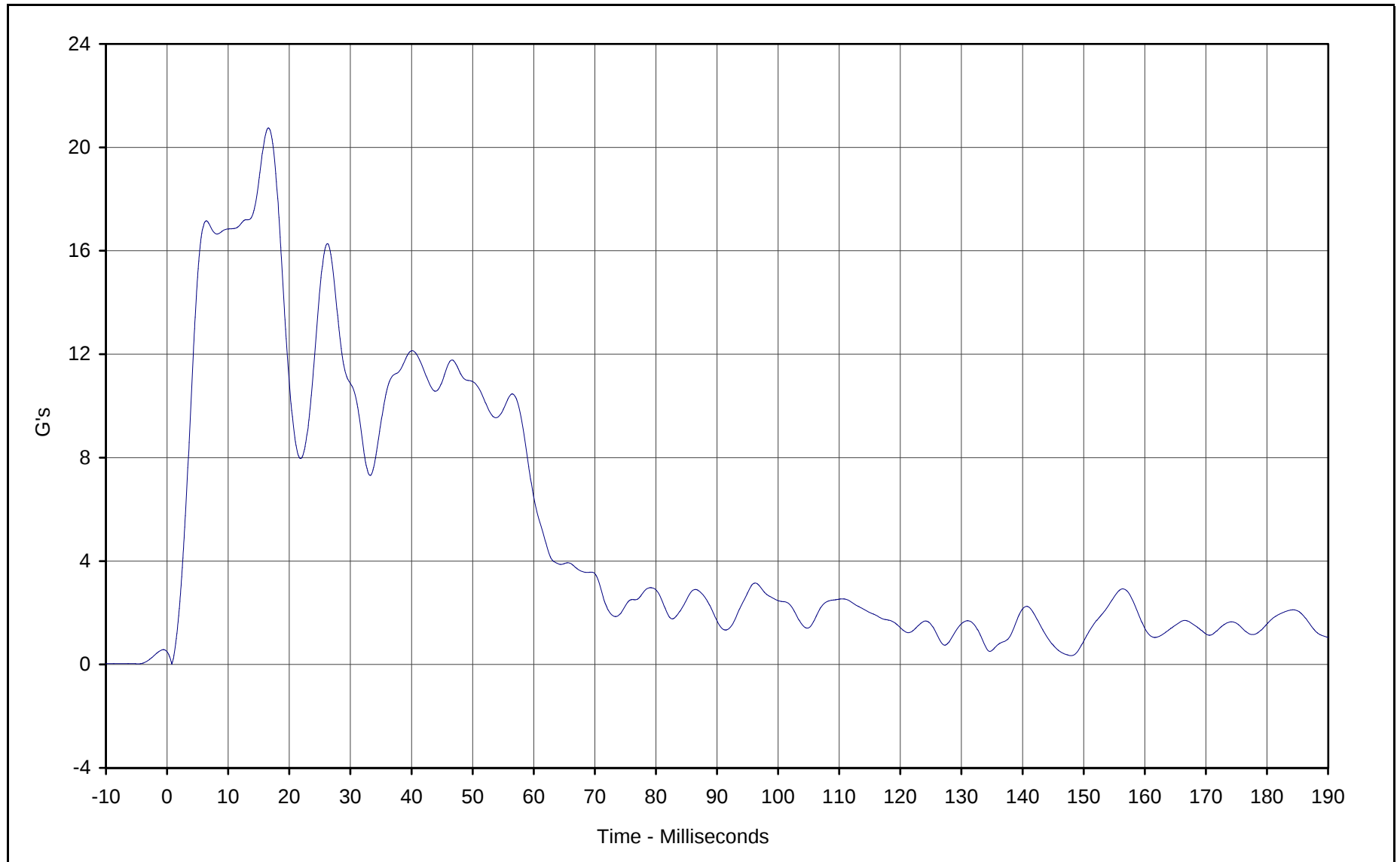




Curve Description: Right Sill at Front Seat Z Velocity
Maximum Value: 2.4 at 160.1 Milliseconds
Minimum Value: -1.9 at 14.2 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-029

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

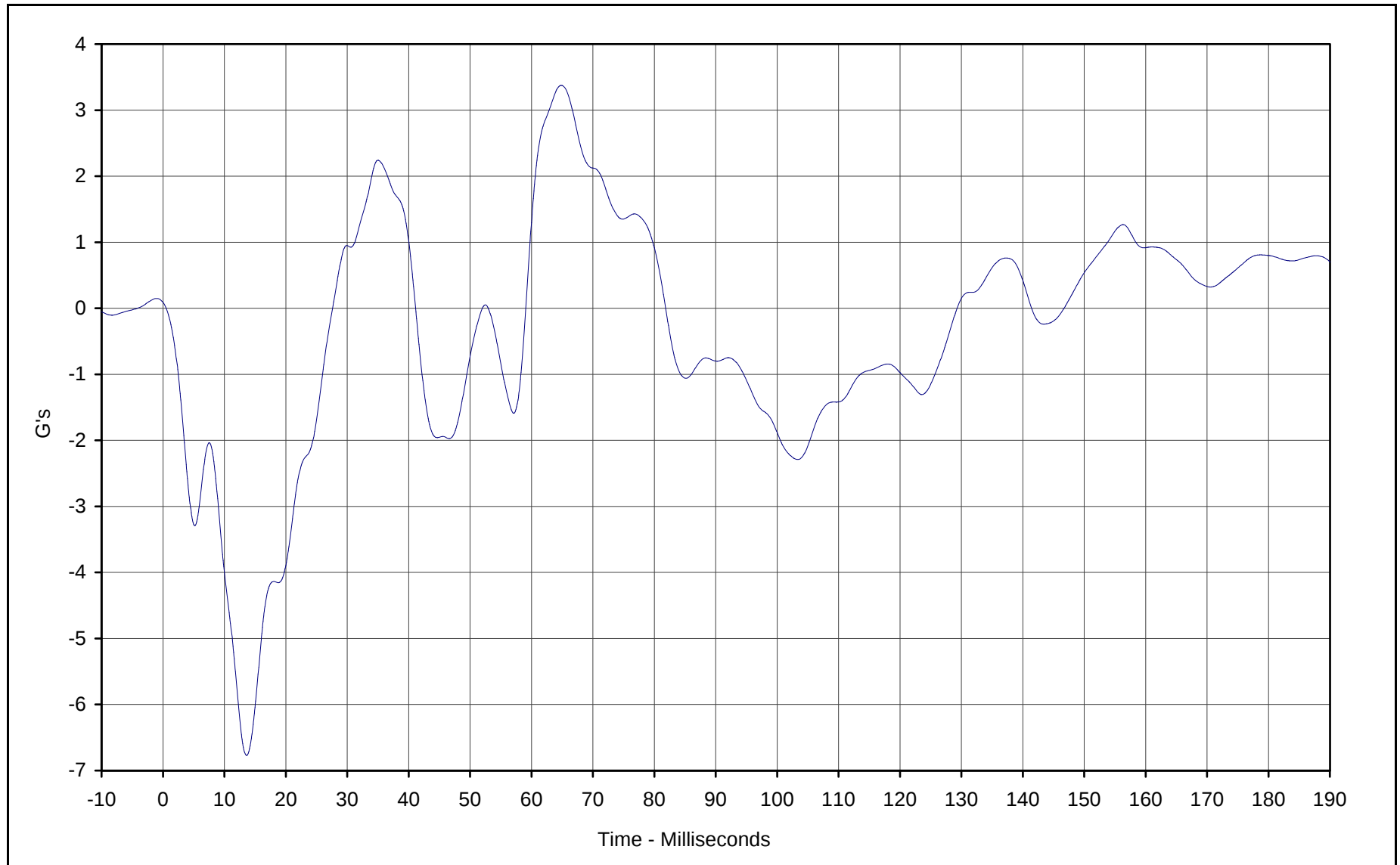




Curve Description: Right Sill at Front Seat Resultant
Maximum Value: 20.8 at 16.6 Milliseconds
Minimum Value: 0.0 at 0.8 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: RES-027

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

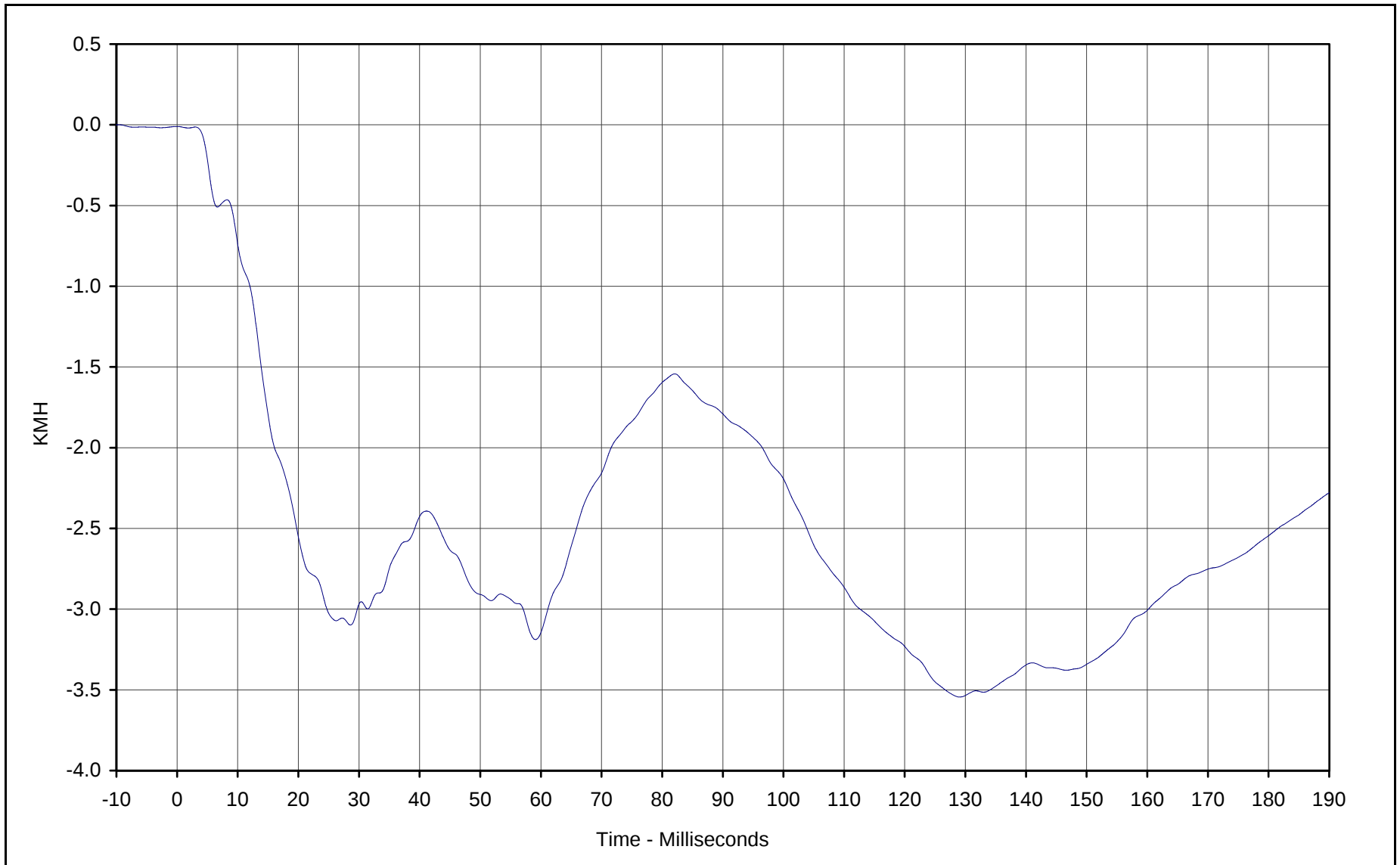




Curve Description: Right Sill at Rear Seat X
Maximum Value: 3.4 at 64.9 Milliseconds
Minimum Value: -6.8 at 13.6 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-030

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



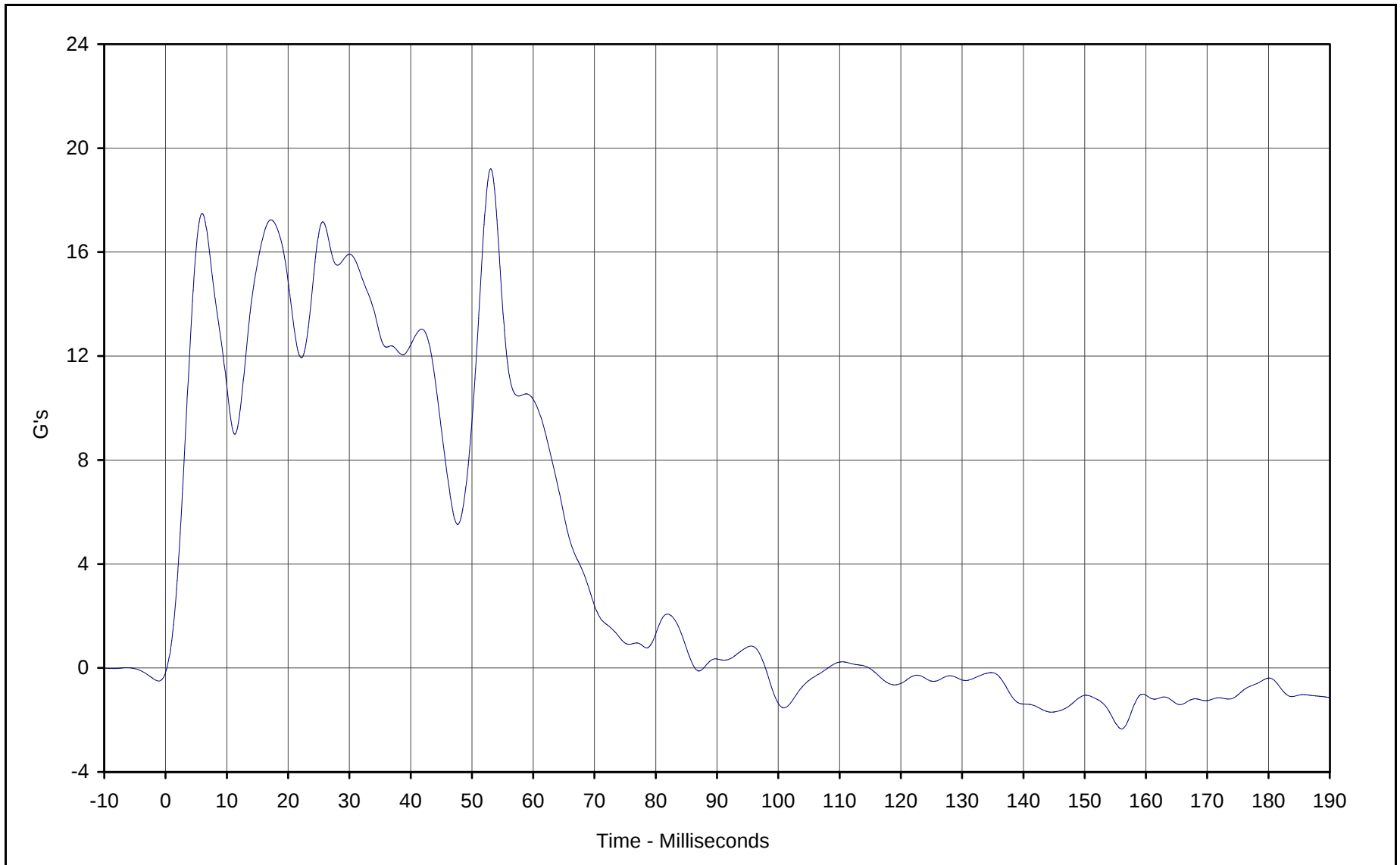


Curve Description: Right Sill at Rear Seat X Velocity
Maximum Value: 0.0 at 0.0 Milliseconds
Minimum Value: -3.5 at 129.1 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-030

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



B-60

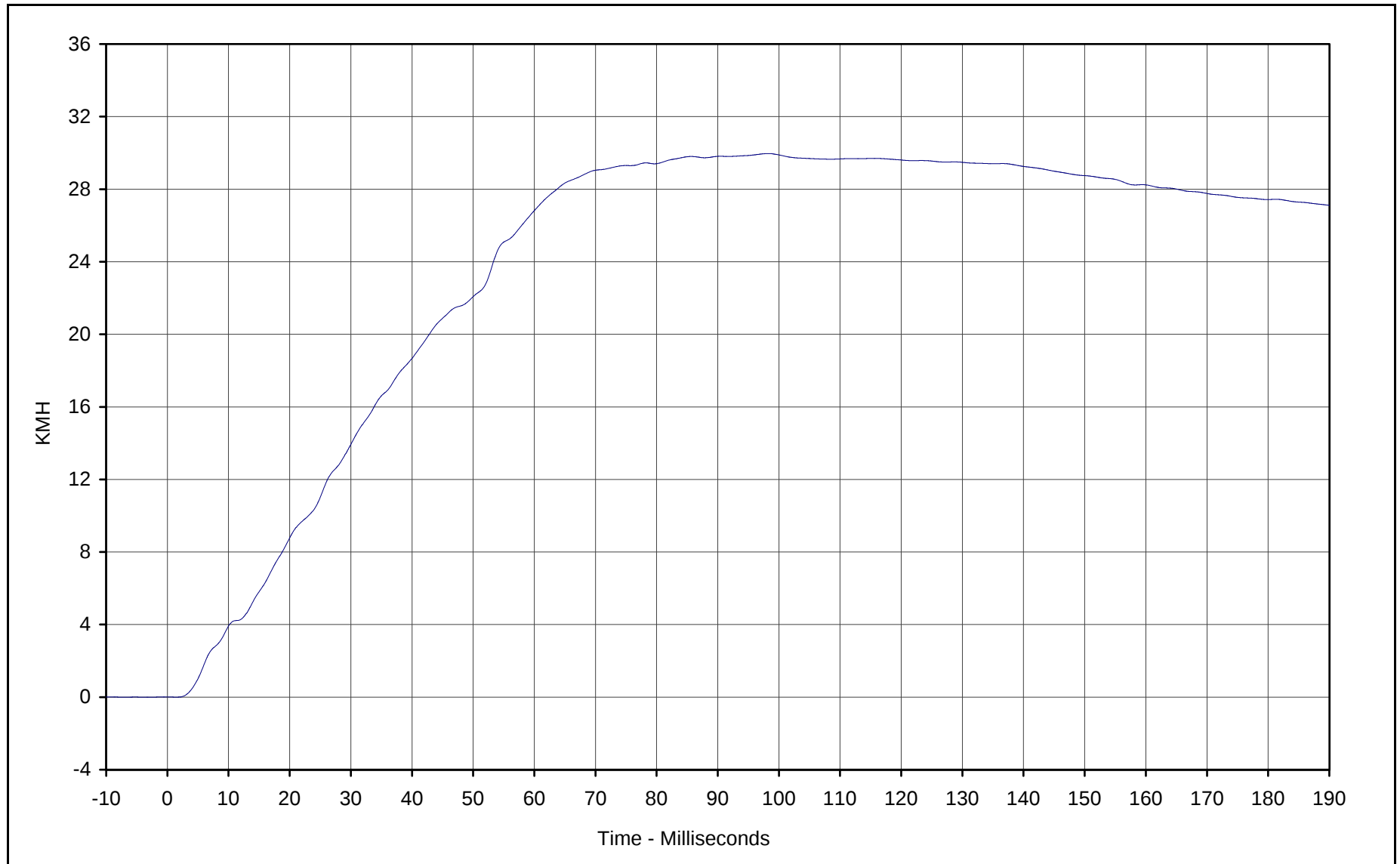


Curve Description: Right Sill at Rear Seat Y
Maximum Value: 19.2 at 53.1 Milliseconds
Minimum Value: -2.3 at 156.0 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-031

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



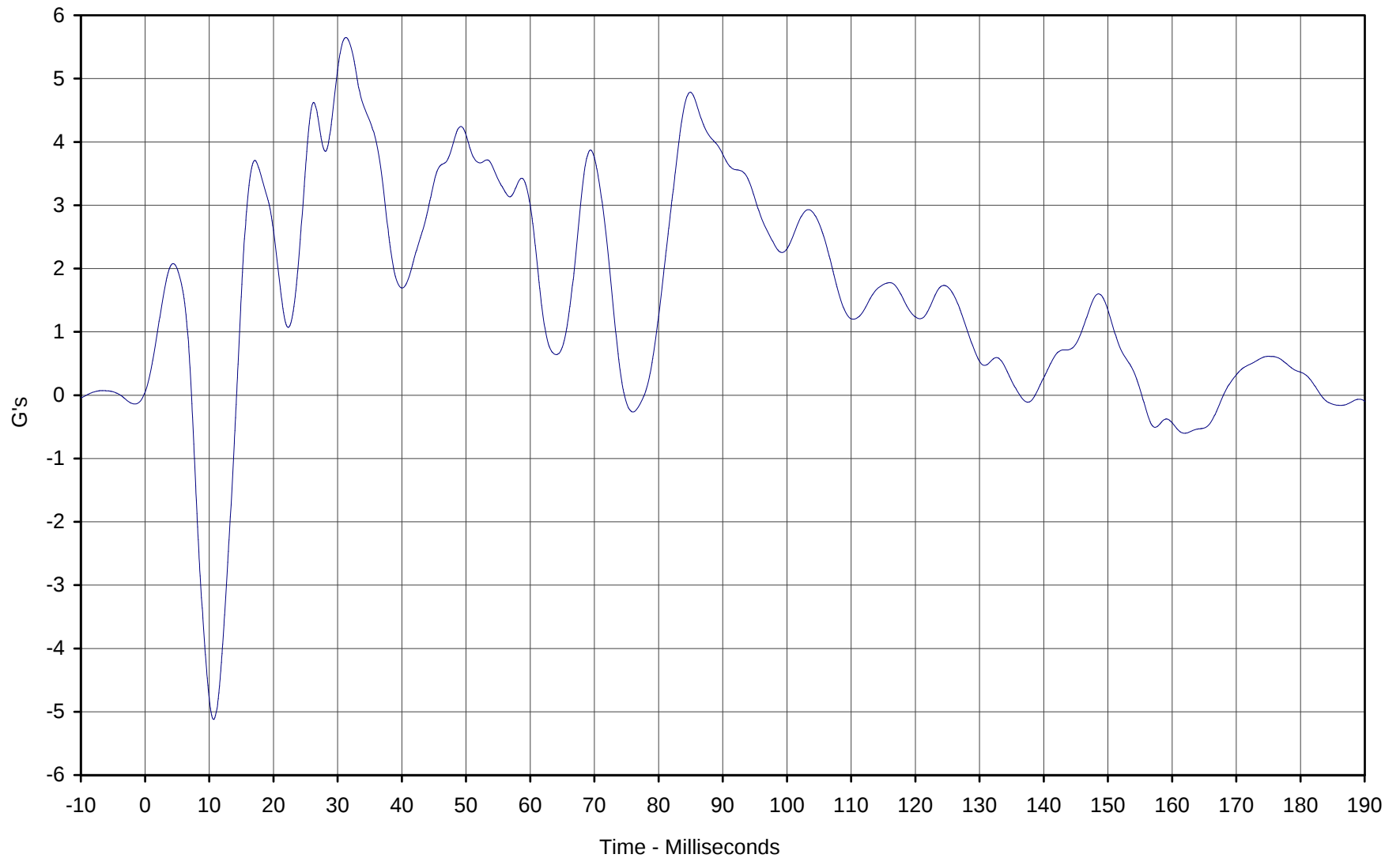
KAR21063-01



Curve Description: Right Sill at Rear Seat Y Velocity
Maximum Value: 30.0 at 98.3 Milliseconds
Minimum Value: 0.0 at 1.5 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-031

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

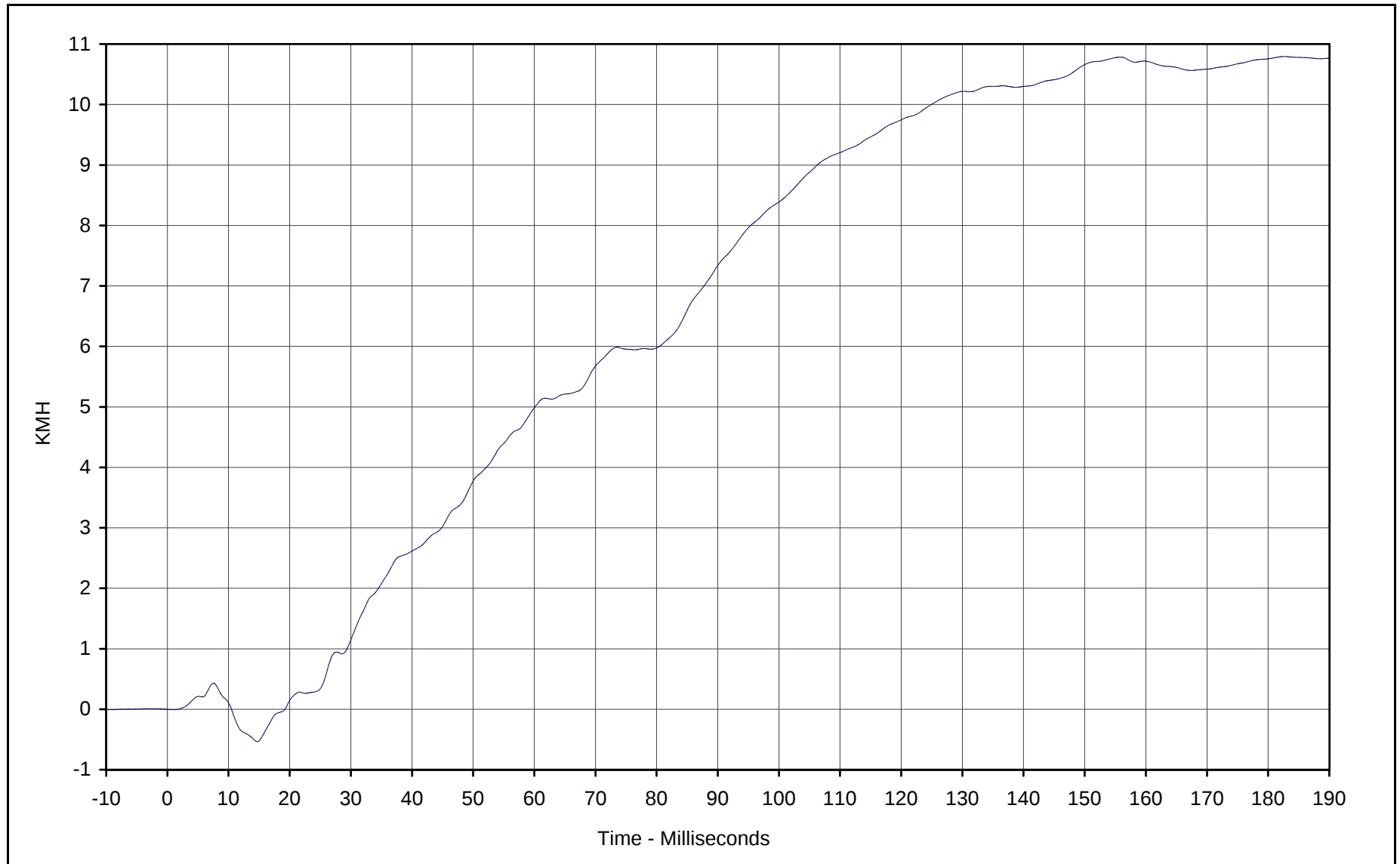




Curve Description: Right Sill at Rear Seat Z
Maximum Value: 5.6 at 31.3 Milliseconds
Minimum Value: -5.1 at 10.7 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-032

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

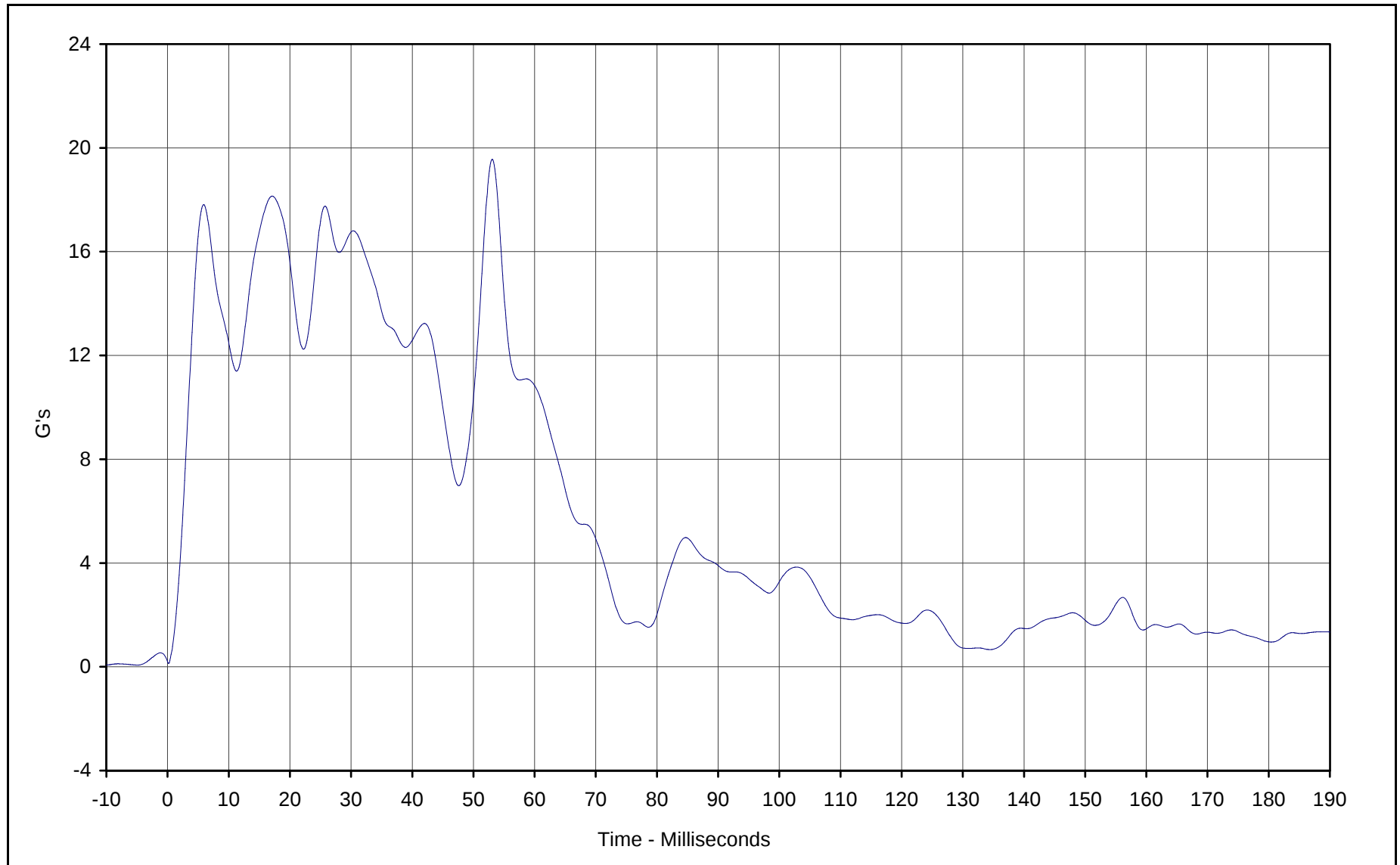




Curve Description: Right Sill at Rear Seat Z Velocity
Maximum Value: 10.8 at 182.7 Milliseconds
Minimum Value: -0.5 at 14.7 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-032

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

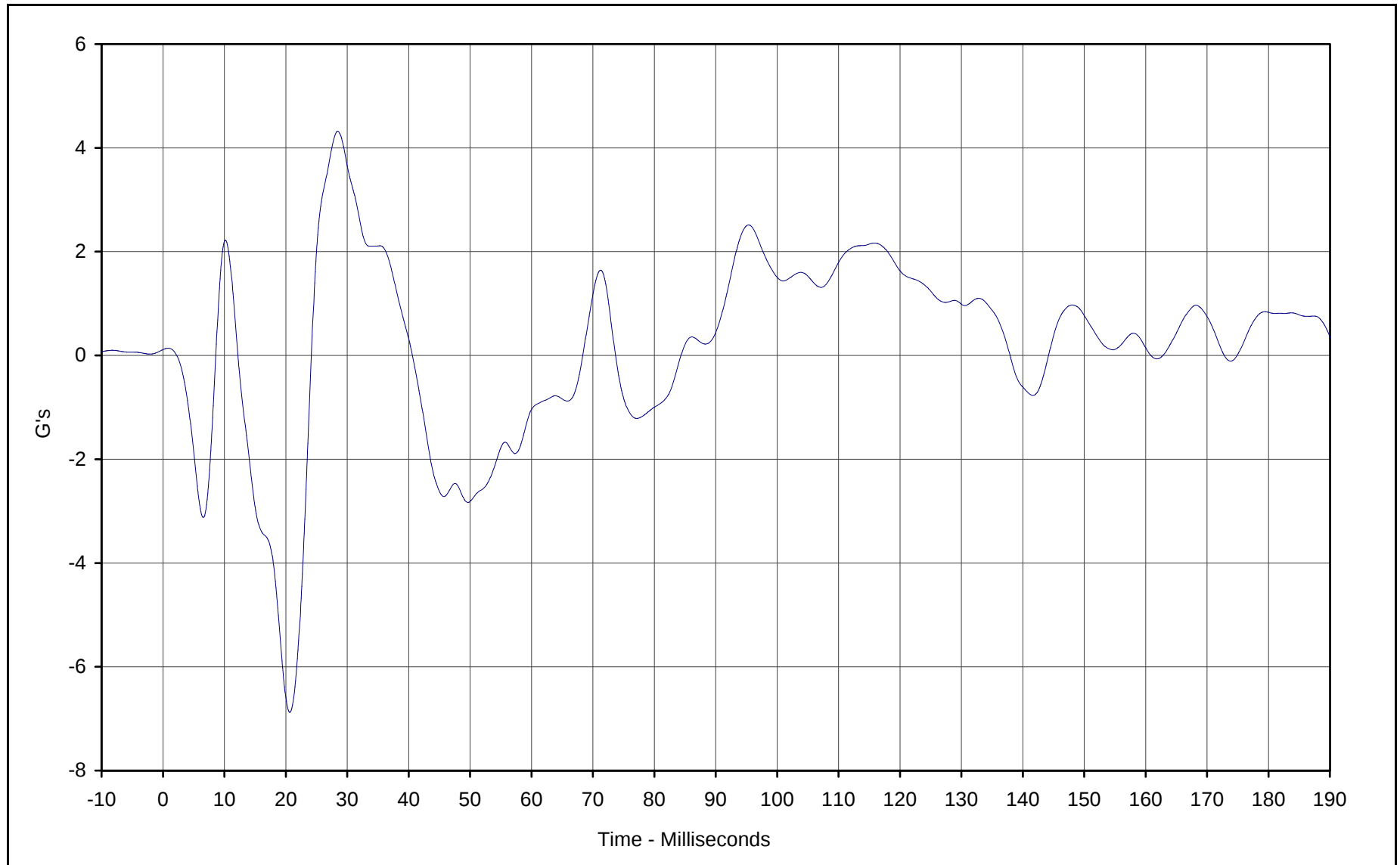




Curve Description: Right Sill at Rear Seat Resultant
Maximum Value: 19.6 at 53.1 Milliseconds
Minimum Value: 0.1 at 0.2 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: RES-030

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

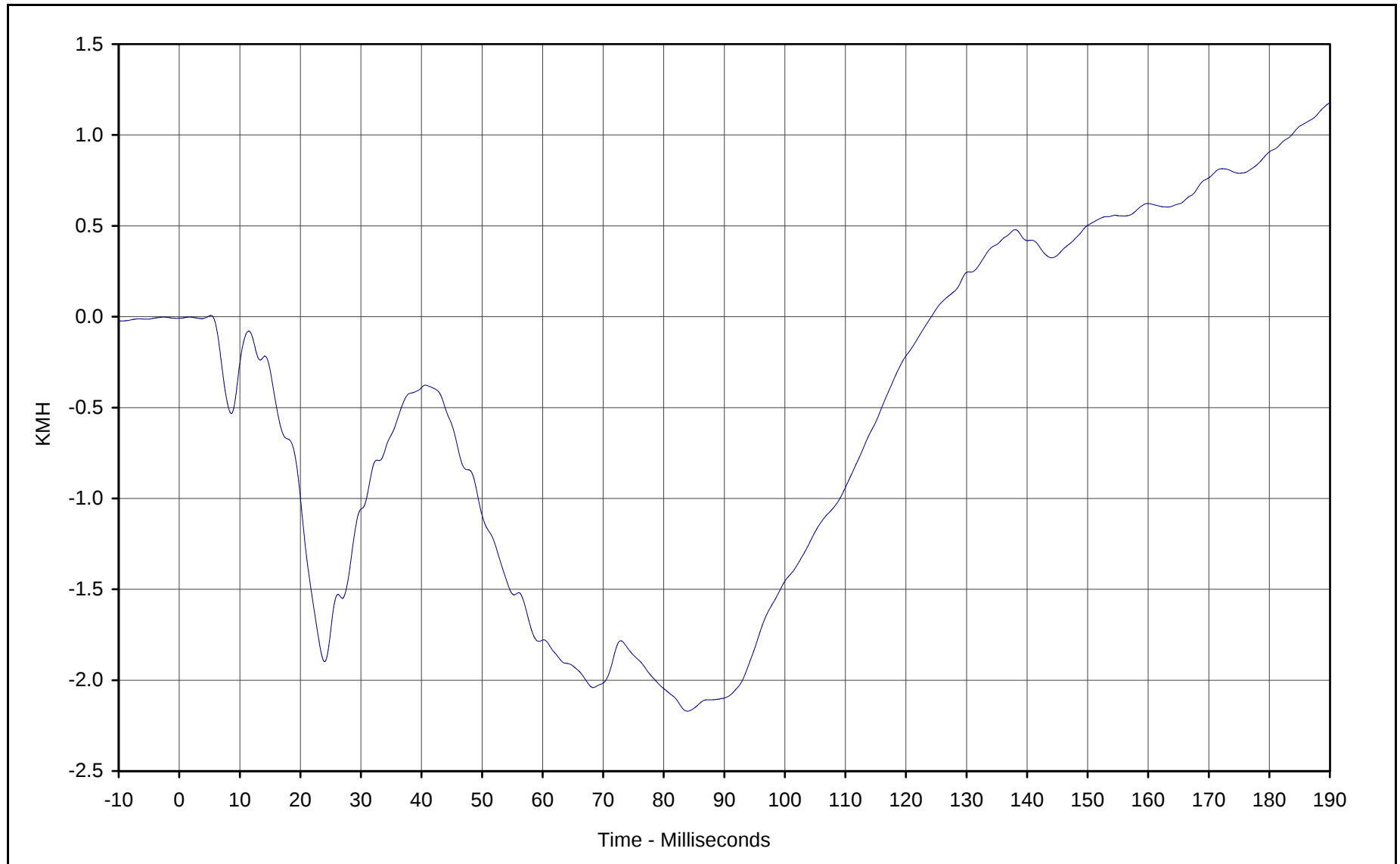




Curve Description: Rear Floor Above Axle X
Maximum Value: 4.3 at 28.4 Milliseconds
Minimum Value: -6.9 at 20.6 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-033

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

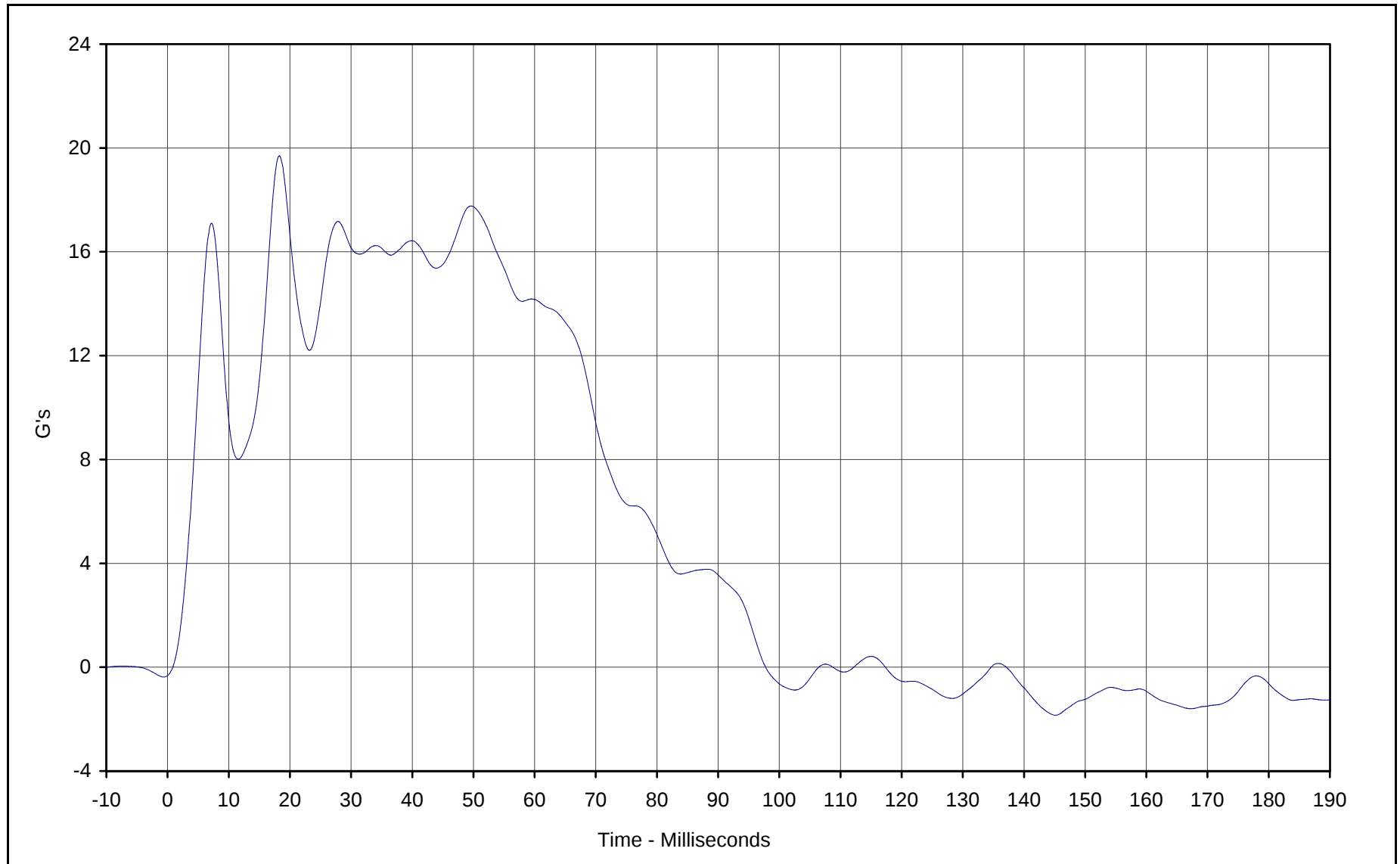




Curve Description: Rear Floor Above Axle X Velocity
Maximum Value: 1.2 at 189.9 Milliseconds
Minimum Value: -2.2 at 83.9 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-033

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

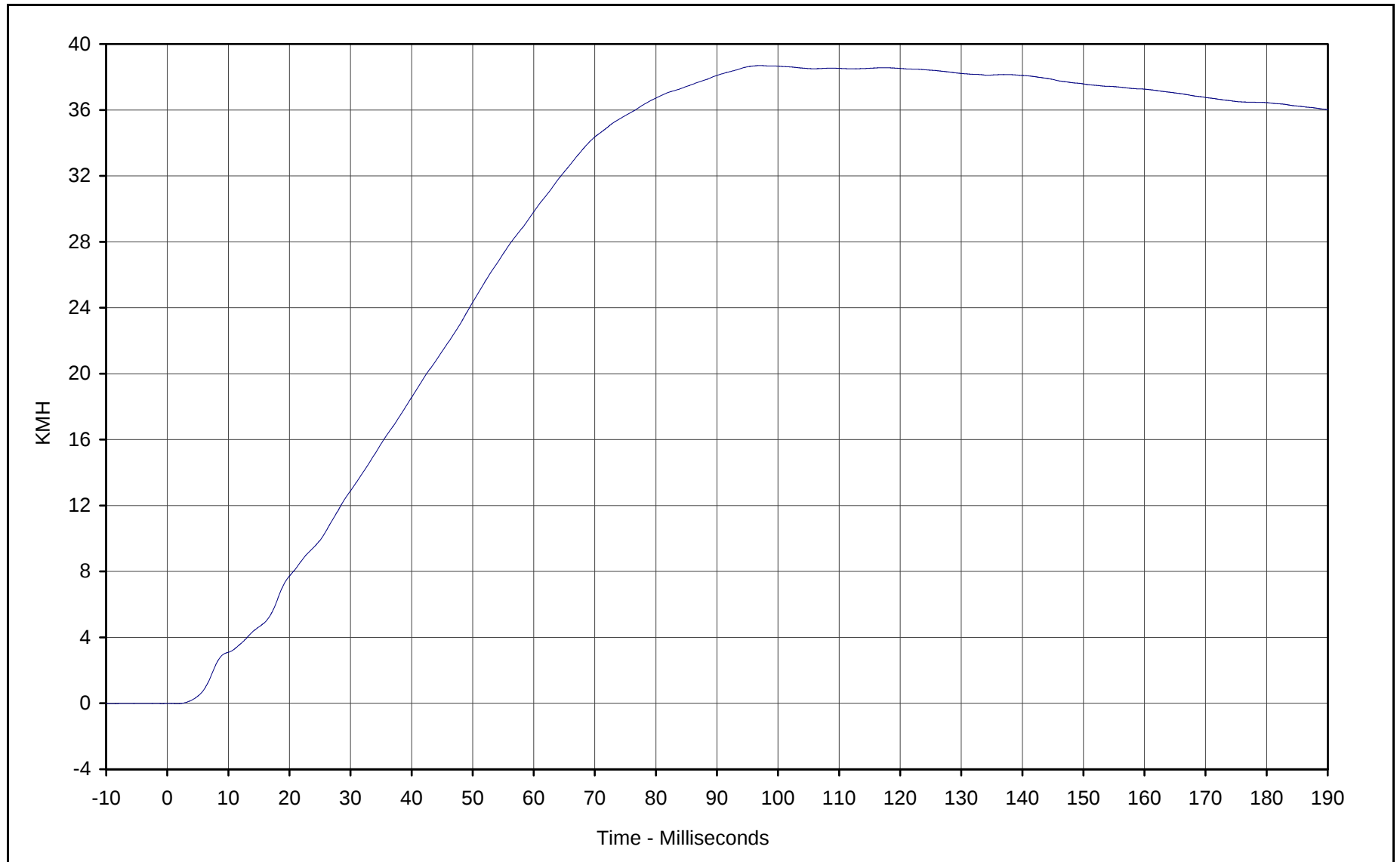




Curve Description: Rear Floor Above Axle Y
Maximum Value: 19.7 at 18.3 Milliseconds
Minimum Value: -1.8 at 145.2 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-034

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

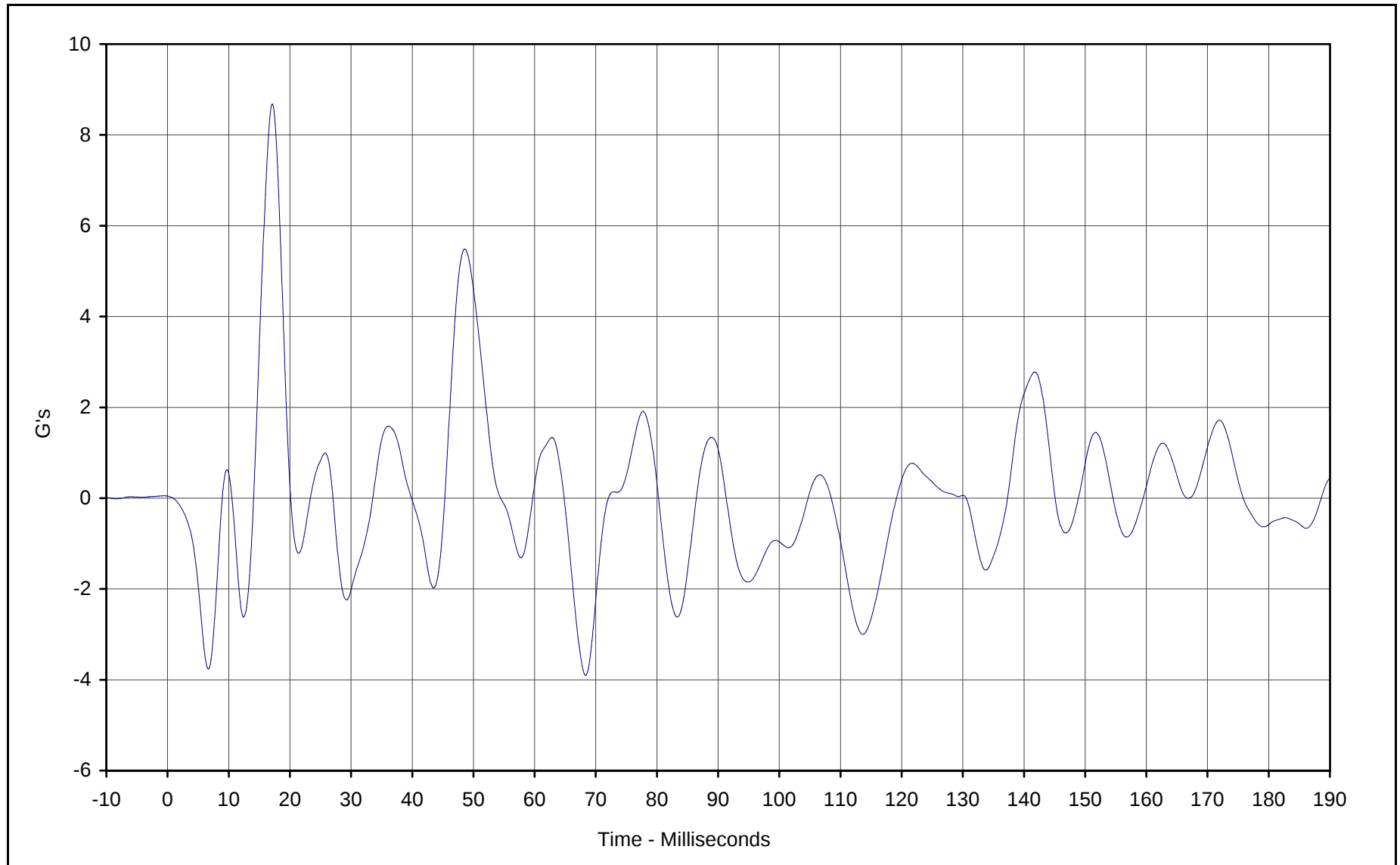




Curve Description: Rear Floor Above Axle Y Velocity
Maximum Value: 38.7 at 97.1 Milliseconds
Minimum Value: 0.0 at 1.7 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-034

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

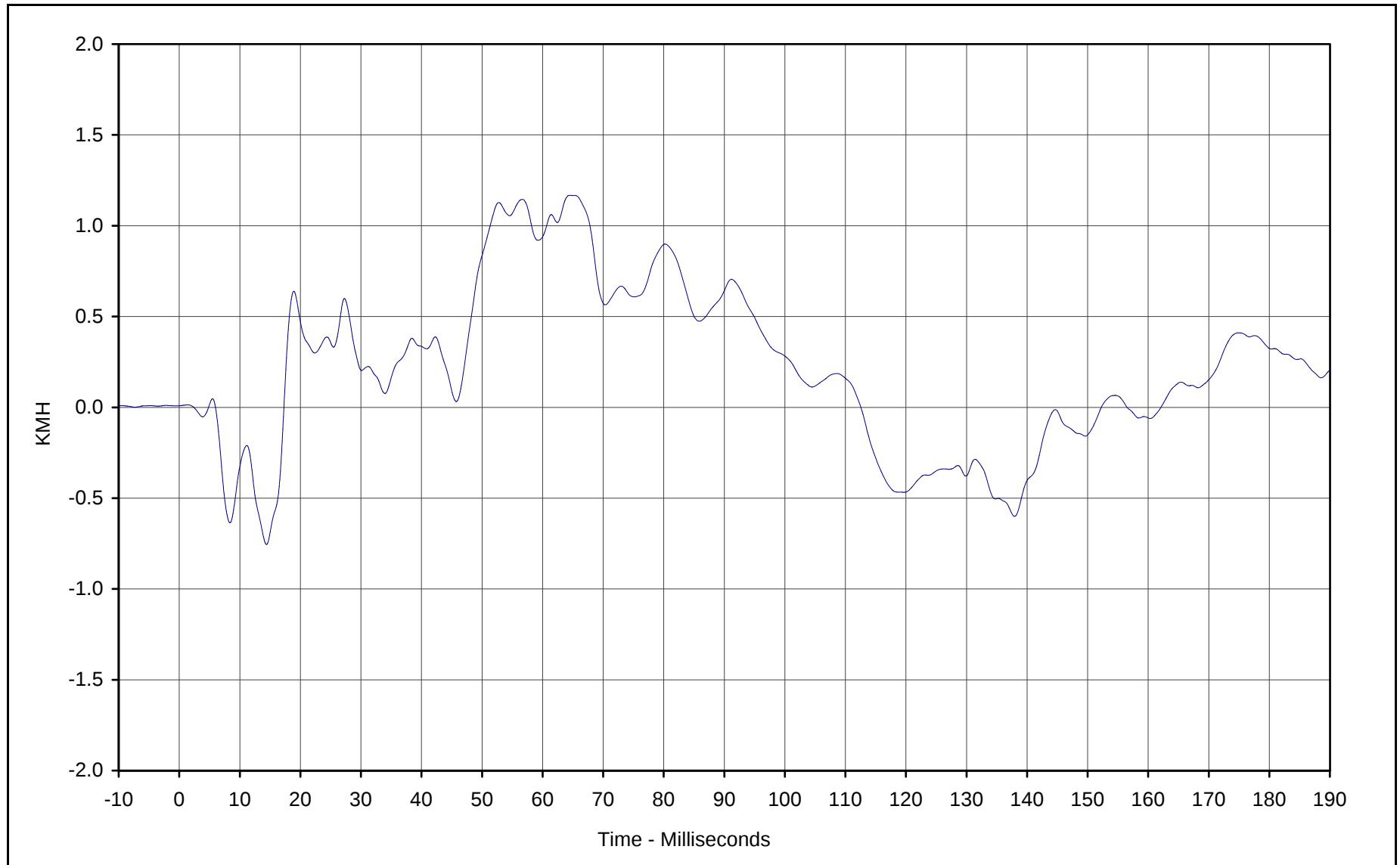




Curve Description: Rear Floor Above Axle Z
Maximum Value: 8.7 at 17.1 Milliseconds
Minimum Value: -3.9 at 68.3 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-035

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

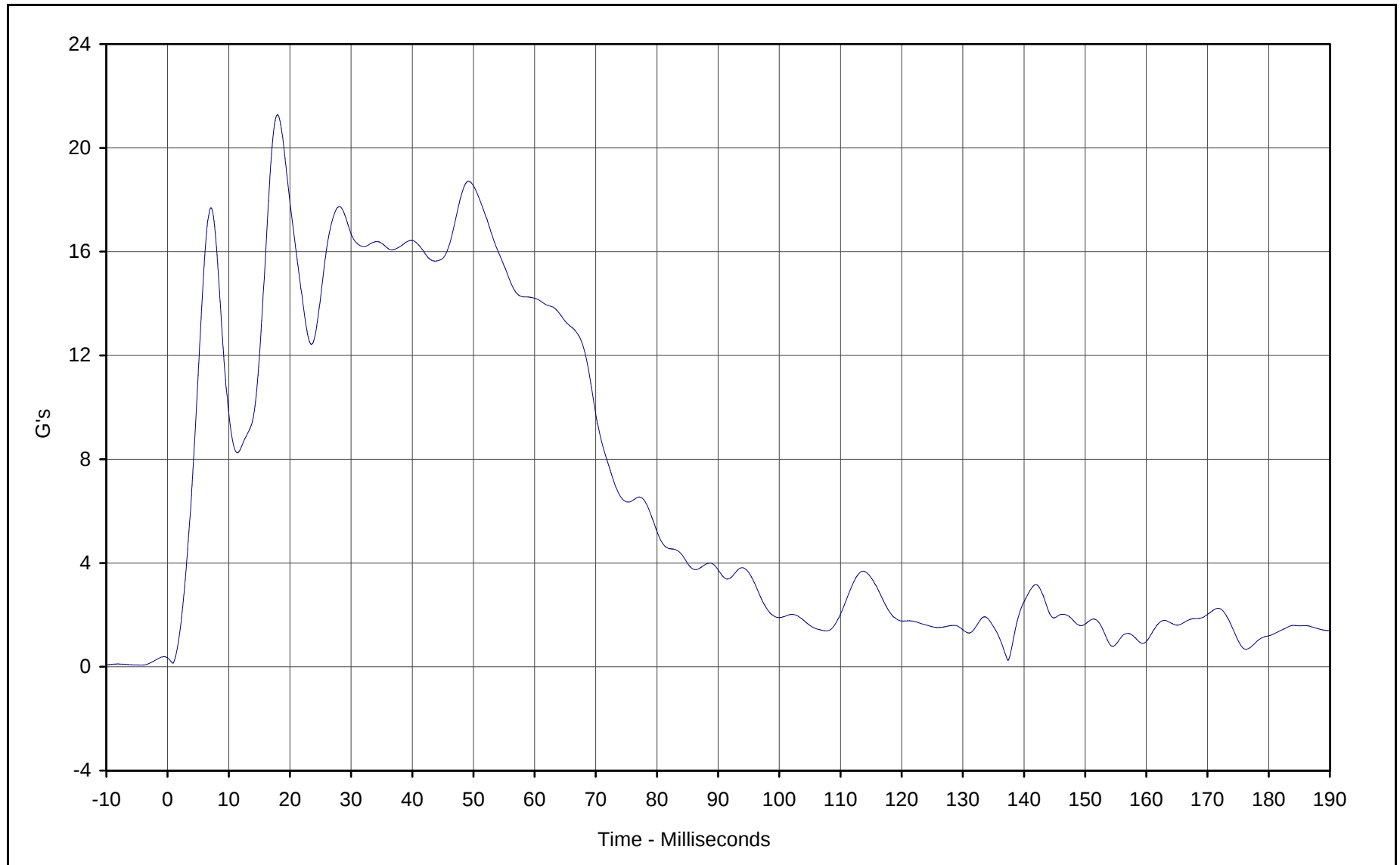




Curve Description: Rear Floor Above Axle Z Velocity
Maximum Value: 1.2 at 64.5 Milliseconds
Minimum Value: -0.8 at 14.4 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-035

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

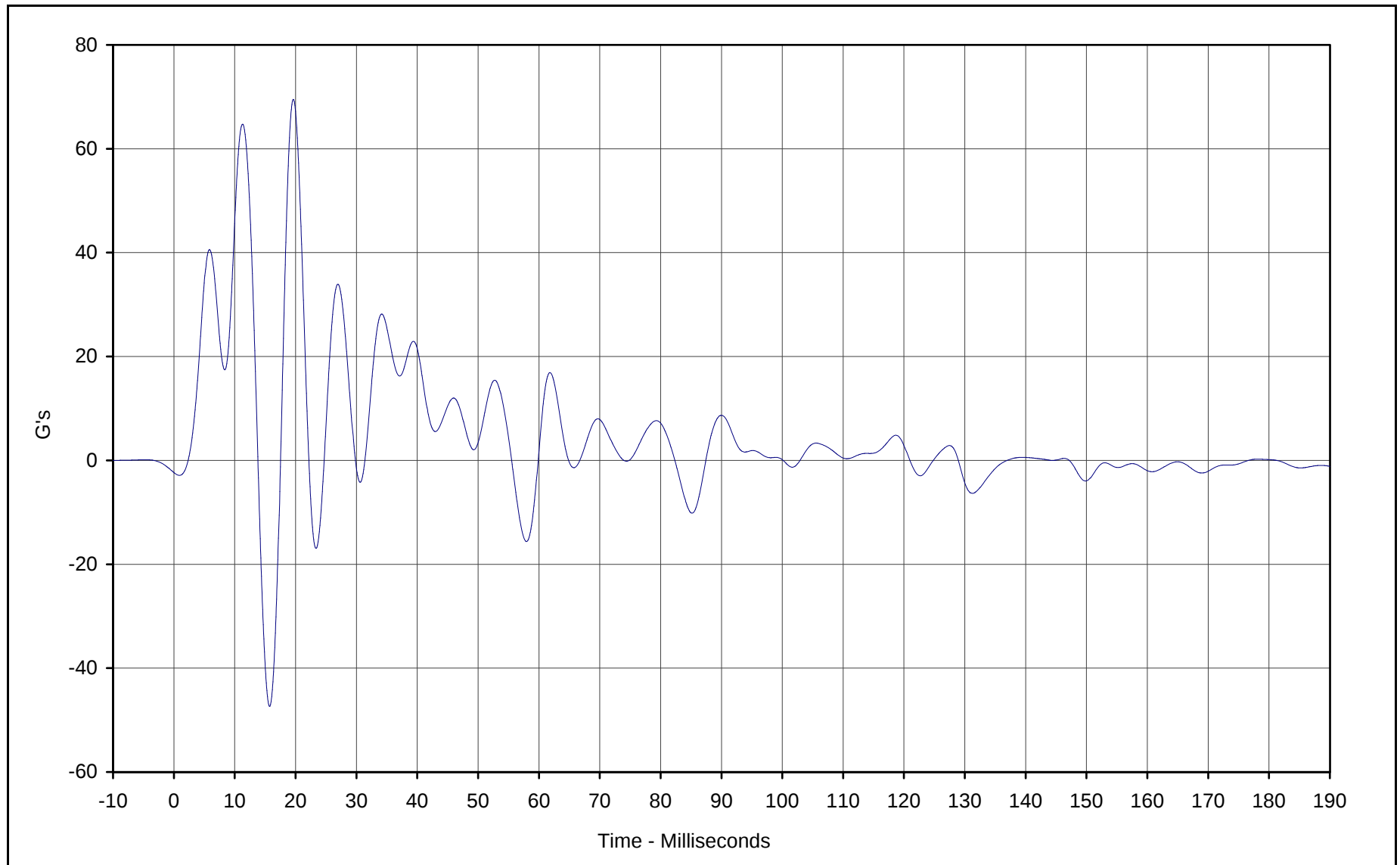




Curve Description: Rear Floor Above Axle Resultant
Maximum Value: 21.3 at 18.0 Milliseconds
Minimum Value: 0.1 at 0.8 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: RES-033

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

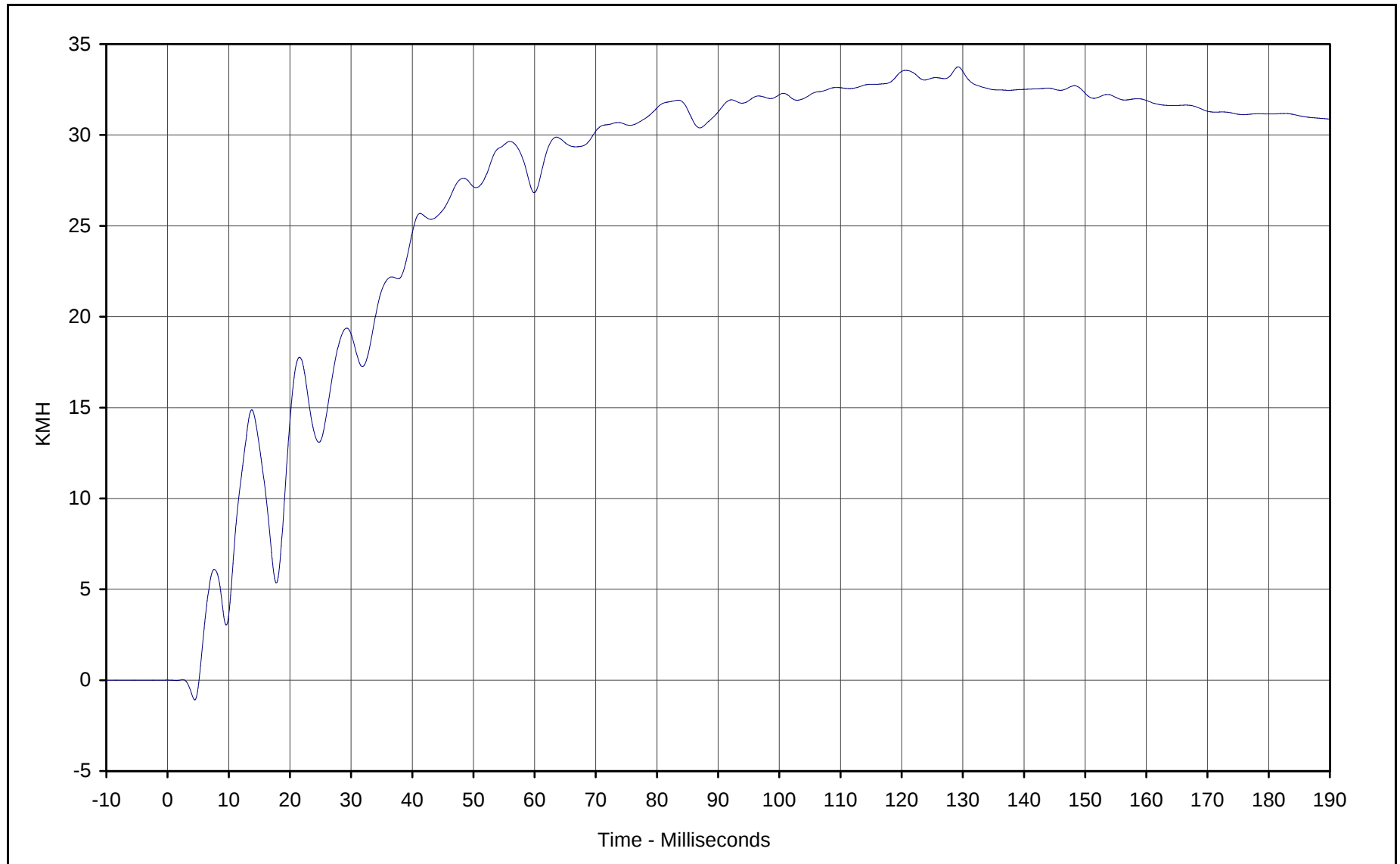




Curve Description: Left Sill at Rear Door Y
Maximum Value: 69.5 at 19.6 Milliseconds
Minimum Value: -47.3 at 15.7 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-036

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

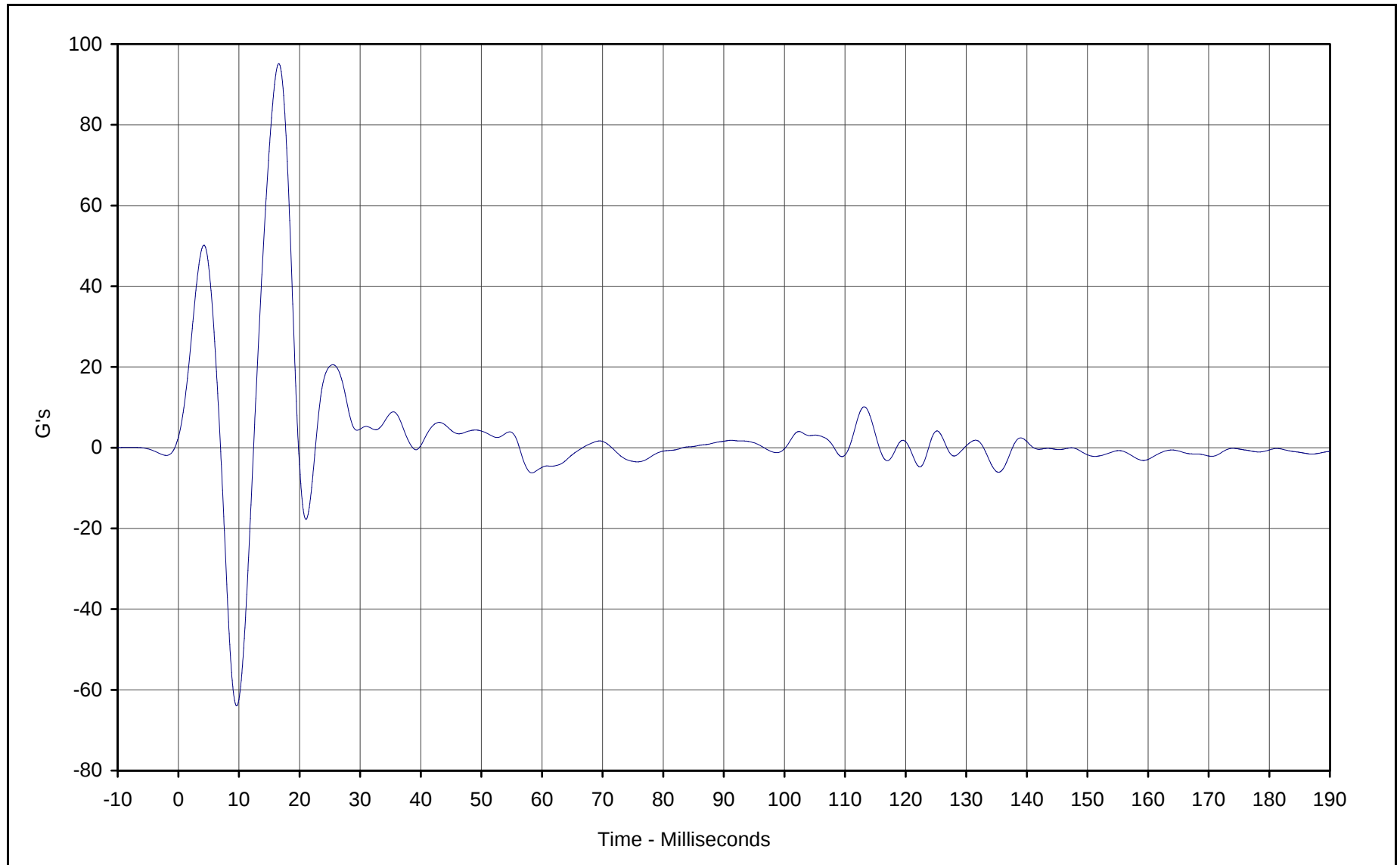




Curve Description: Left Sill at Rear Door Y Velocity
Maximum Value: 33.7 at 129.2 Milliseconds
Minimum Value: -1.1 at 4.4 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-036

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

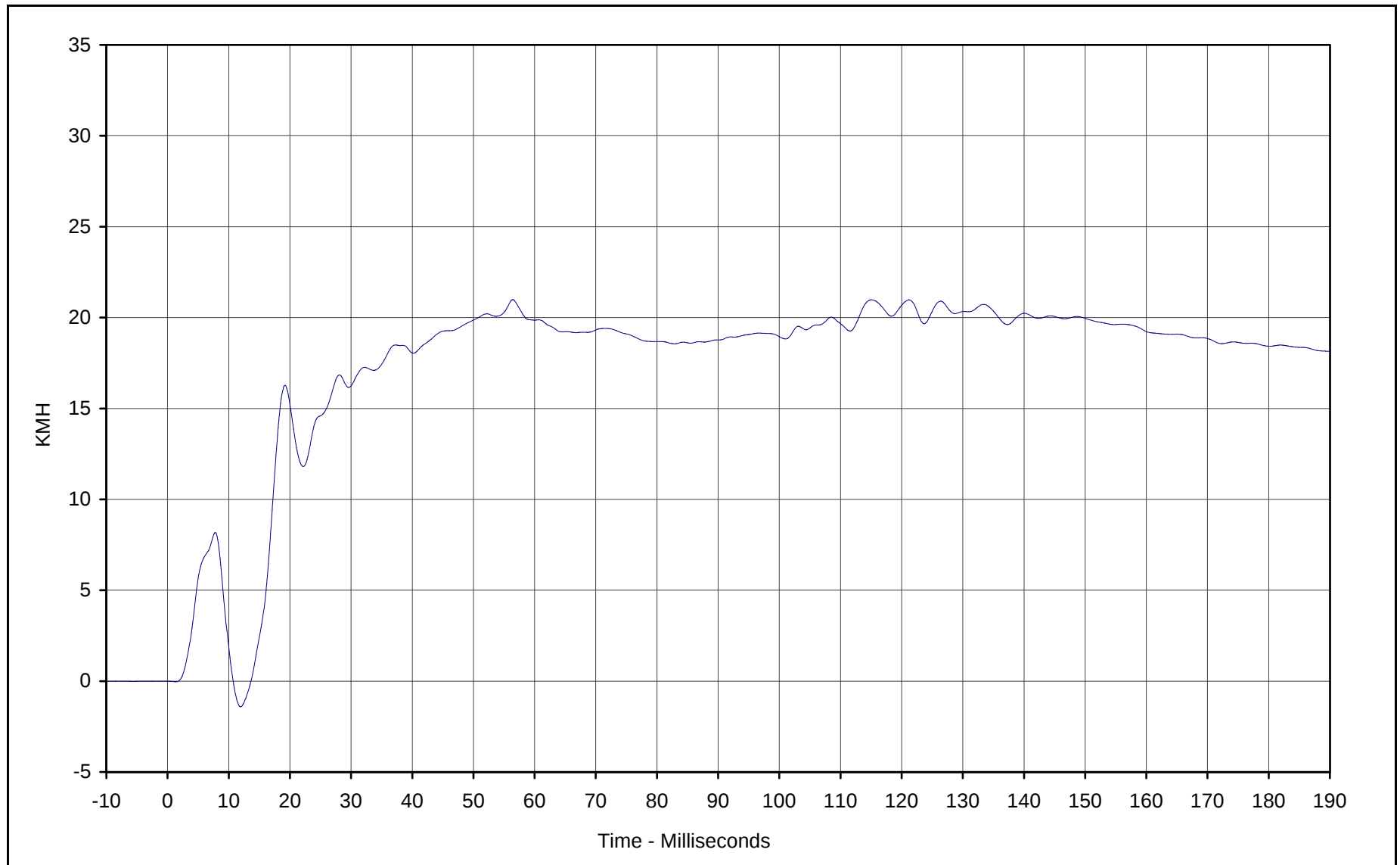




Curve Description: Left Sill at Front Door Y
Maximum Value: 95.2 at 16.6 Milliseconds
Minimum Value: -63.9 at 9.6 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-037

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

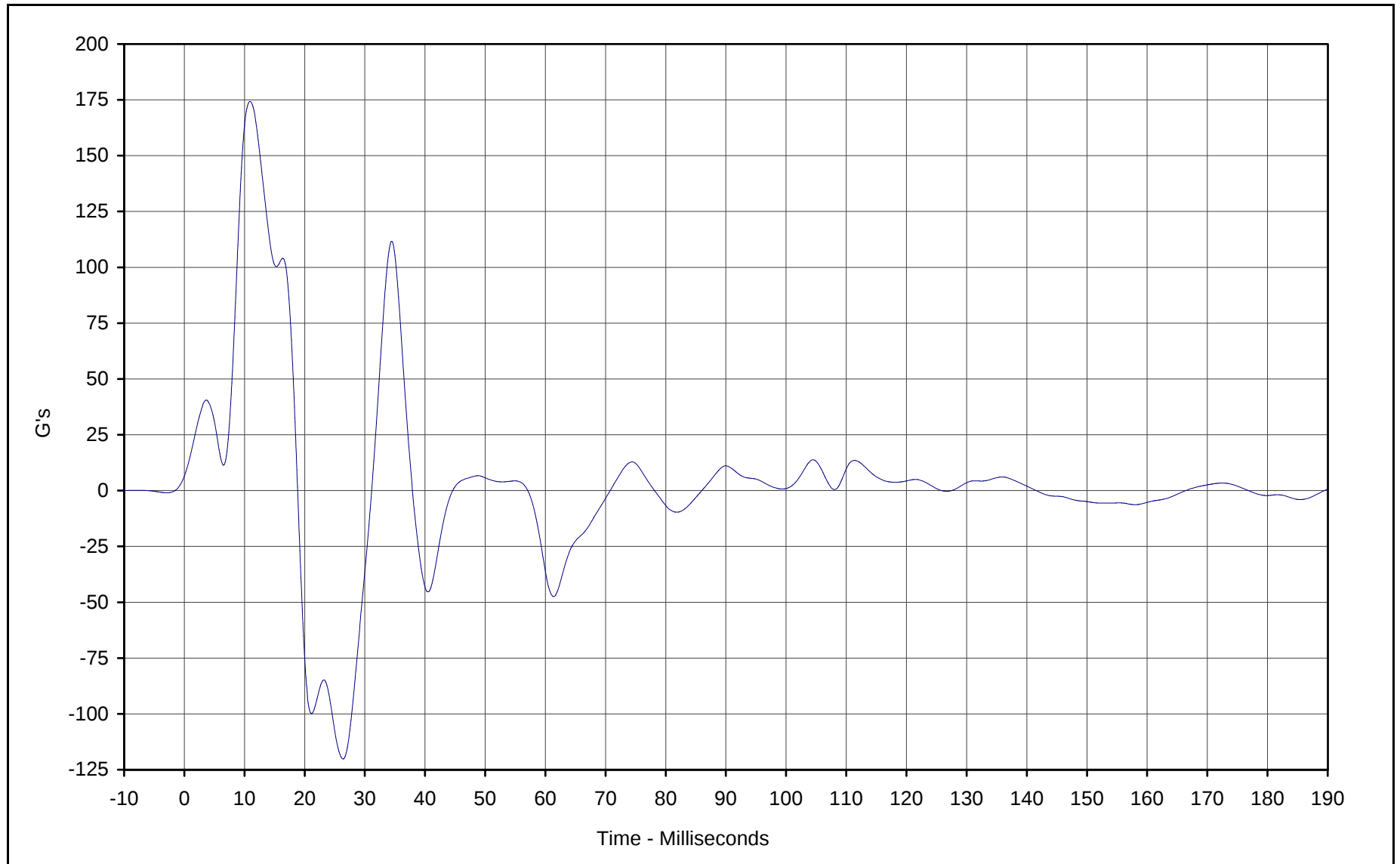




Curve Description: Left Sill at Front Door Y Velocity
Maximum Value: 21.0 at 56.4 Milliseconds
Minimum Value: -1.4 at 12.0 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-037

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

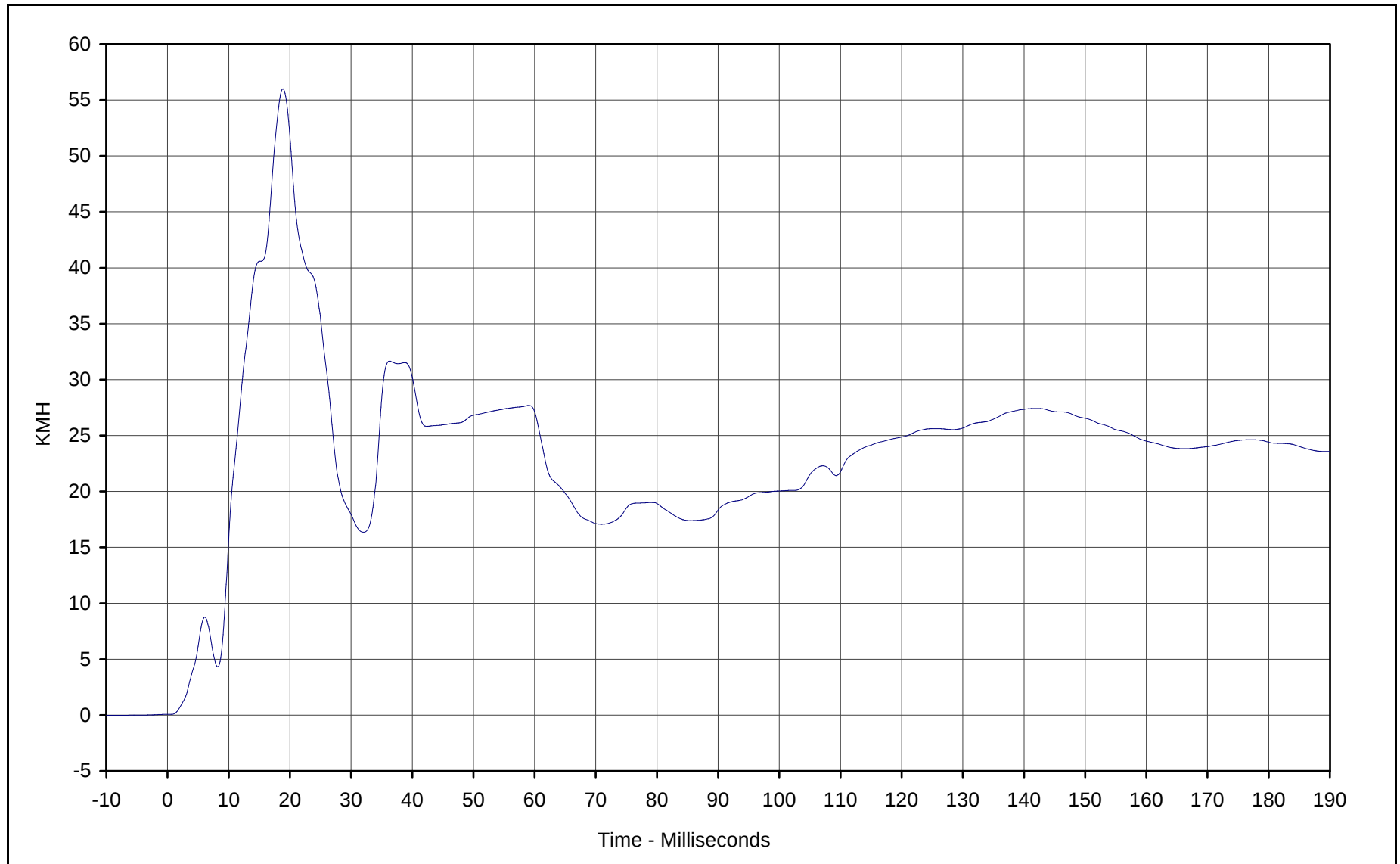




Curve Description: Left Front Door Centerline Y
Maximum Value: 174.3 at 10.9 Milliseconds
Minimum Value: -120.2 at 26.4 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-038

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

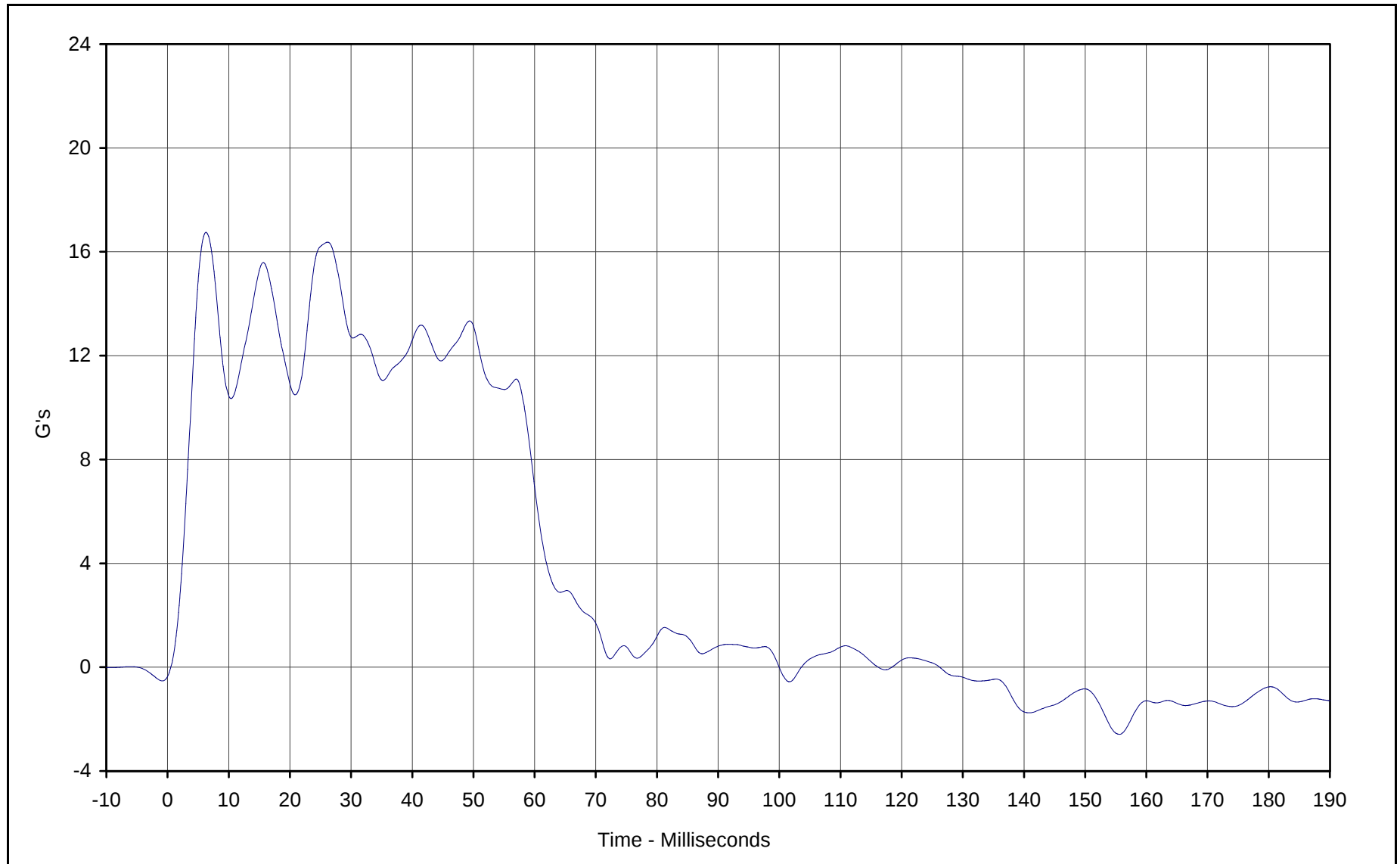




Curve Description: Left Front Door CL Y Velocity
Maximum Value: 56.0 at 18.9 Milliseconds
Minimum Value: 0.1 at 0.4 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-038

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

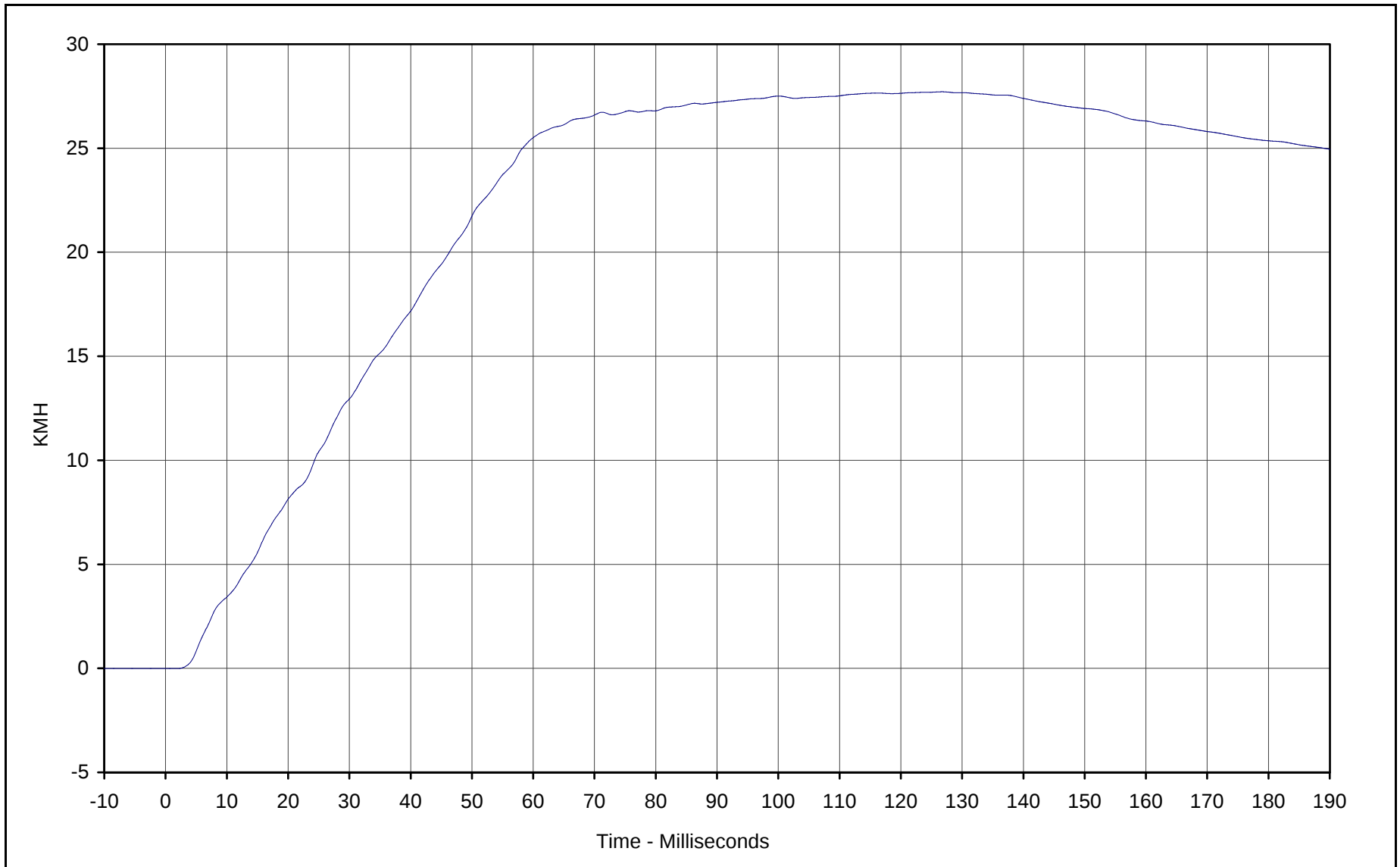




Curve Description: Right Rear Occ. Compartment Y
Maximum Value: 16.7 at 6.3 Milliseconds
Minimum Value: -2.6 at 155.6 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-039

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



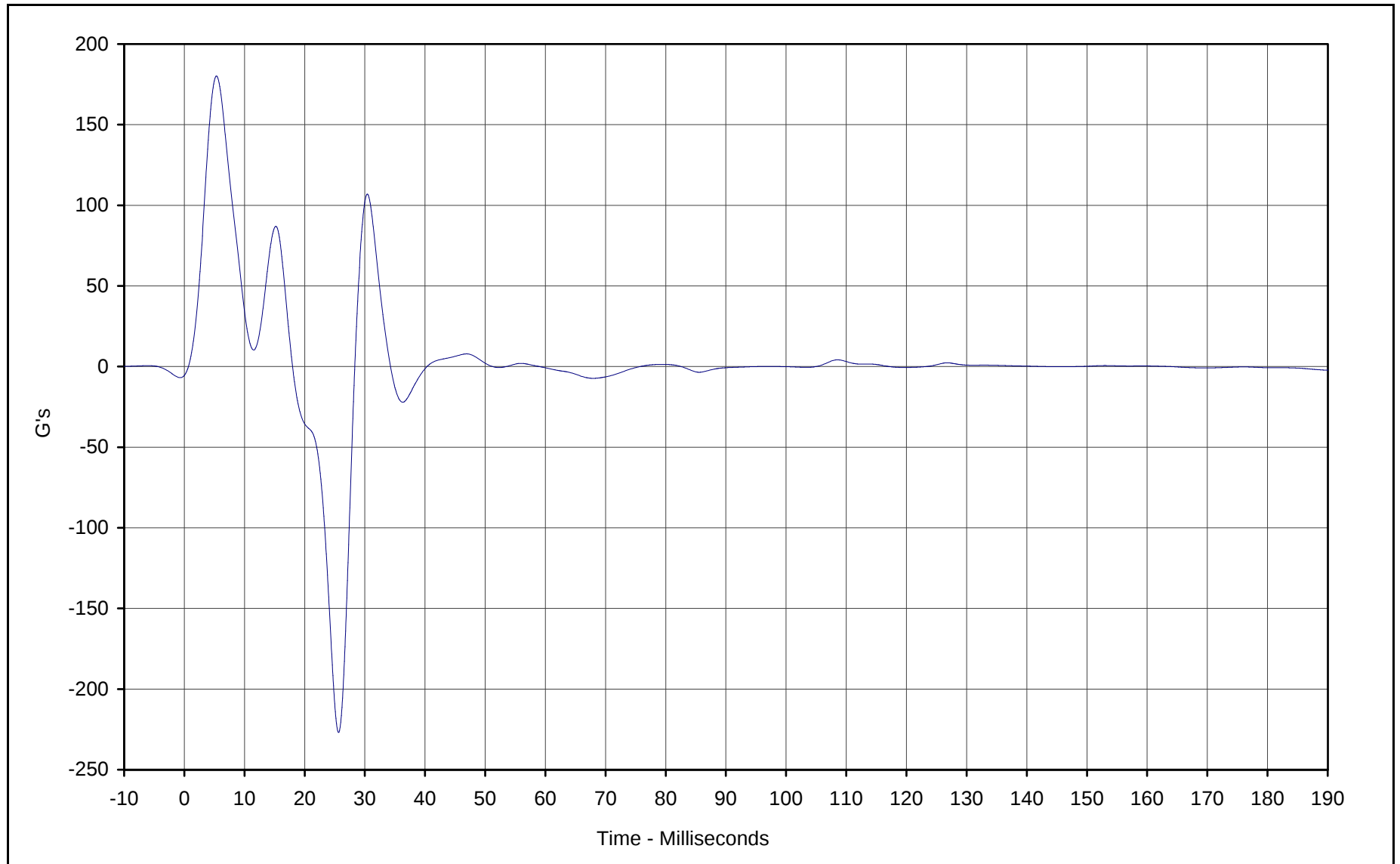


Curve Description: Right Rear Occ. Comp. Y Velocity
Maximum Value: 27.7 at 126.7 Milliseconds
Minimum Value: 0.0 at 1.8 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-039

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



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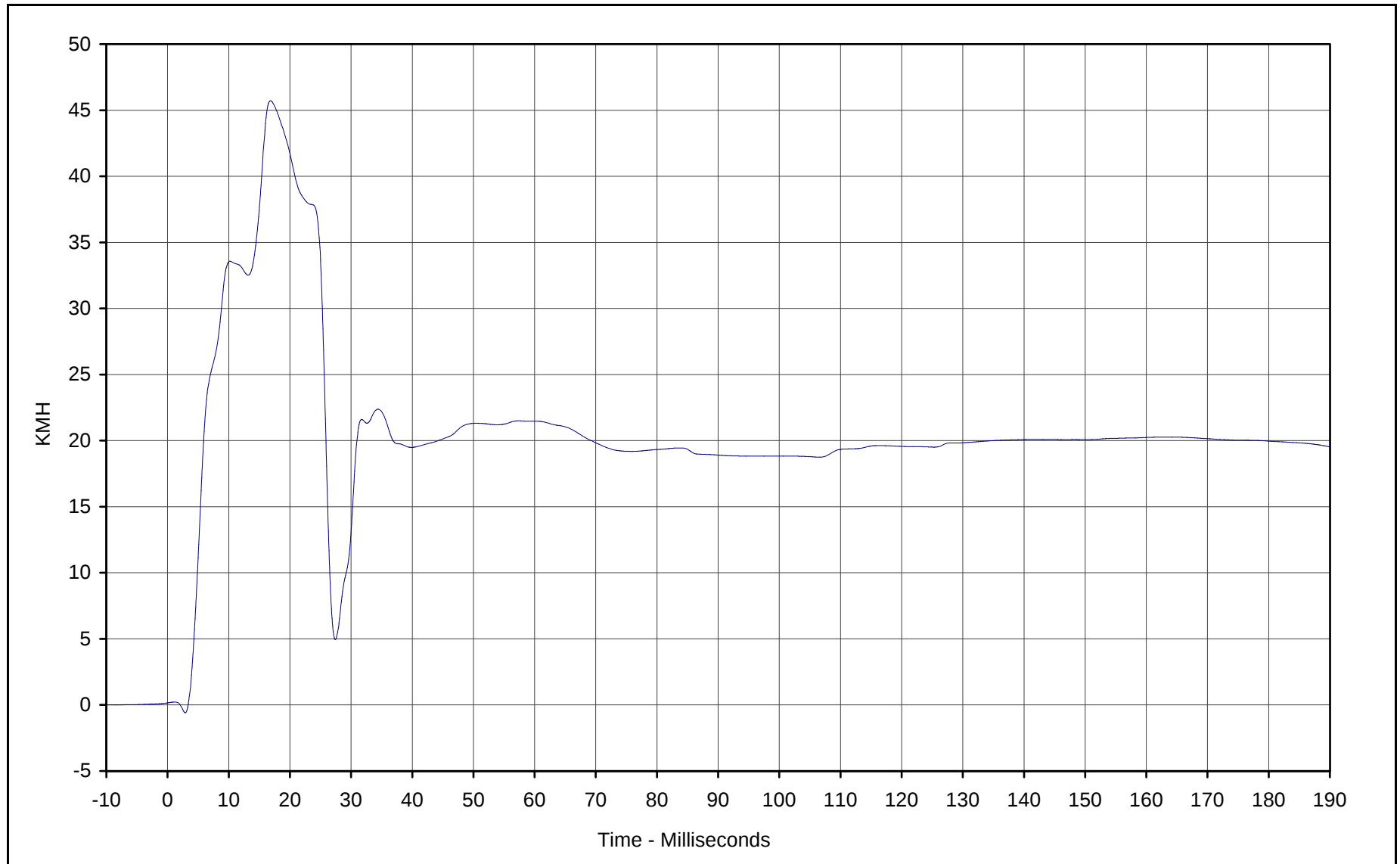


Curve Description: Left Front Door Mid Rear Y
Maximum Value: 180.1 at 5.4 Milliseconds
Minimum Value: -226.9 at 25.6 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-040

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



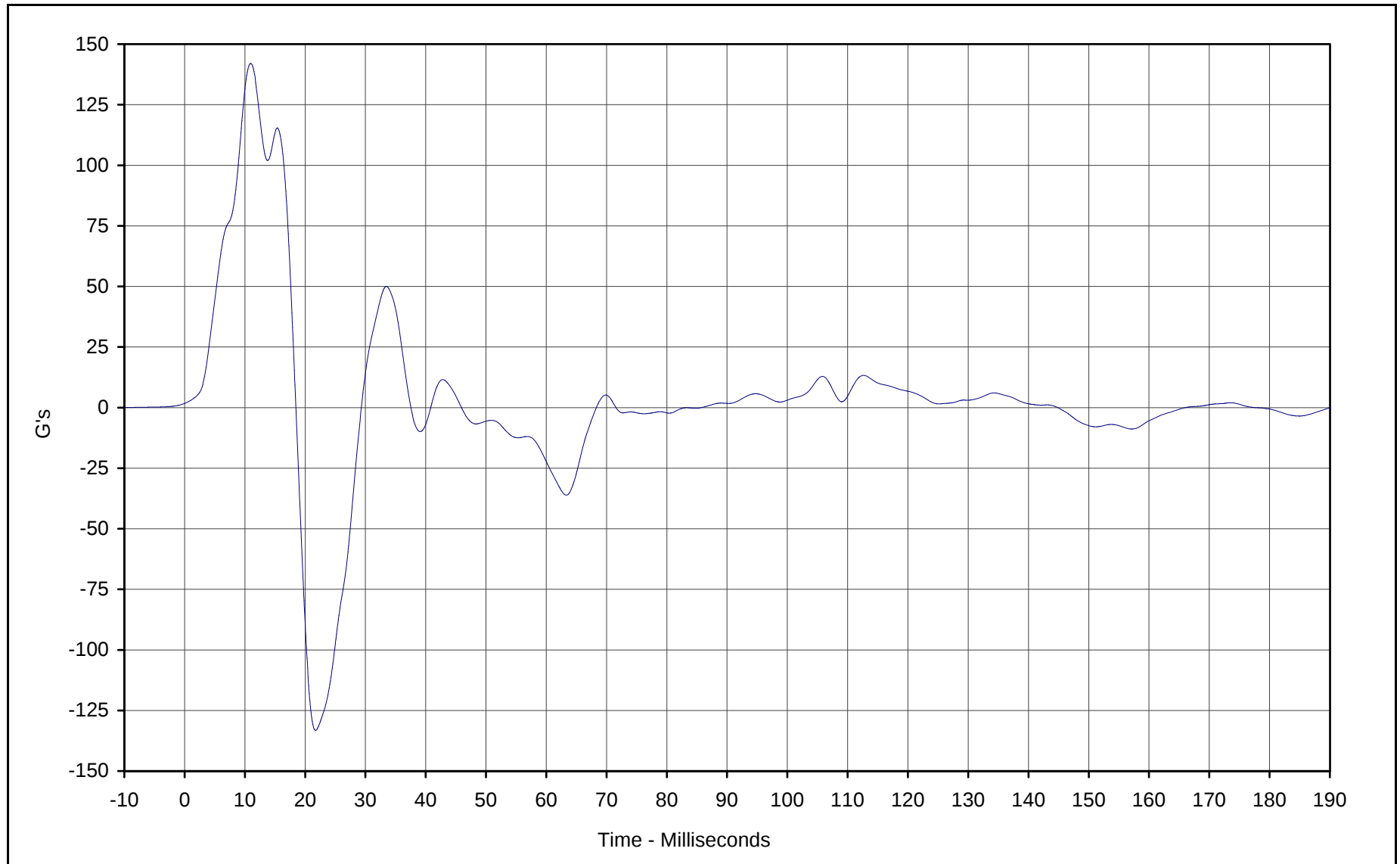
KAR21063-01



Curve Description: Left Front Door Mid Rear Y Velocity
Maximum Value: 45.7 at 16.8 Milliseconds
Minimum Value: -0.6 at 2.9 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-040

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

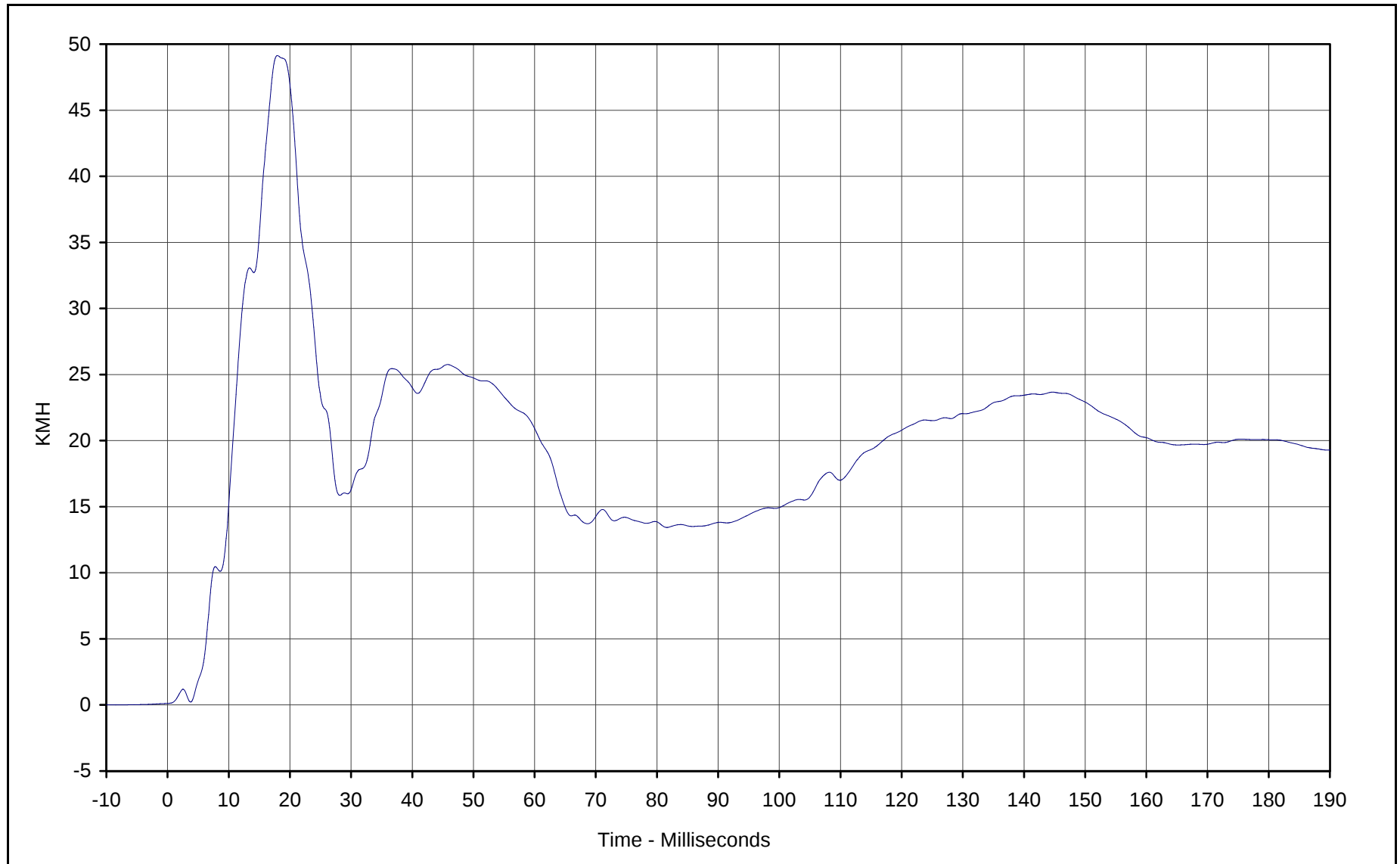




Curve Description: Left Front Door Upper CL Y
Maximum Value: 142.0 at 11.0 Milliseconds
Minimum Value: -133.2 at 21.7 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-041

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Left Front Door Upper CL Y Velocity

Maximum Value: 49.1 at 18.0 Milliseconds

Minimum Value: 0.1 at 0.0 Milliseconds

SAE Filter Class: 180

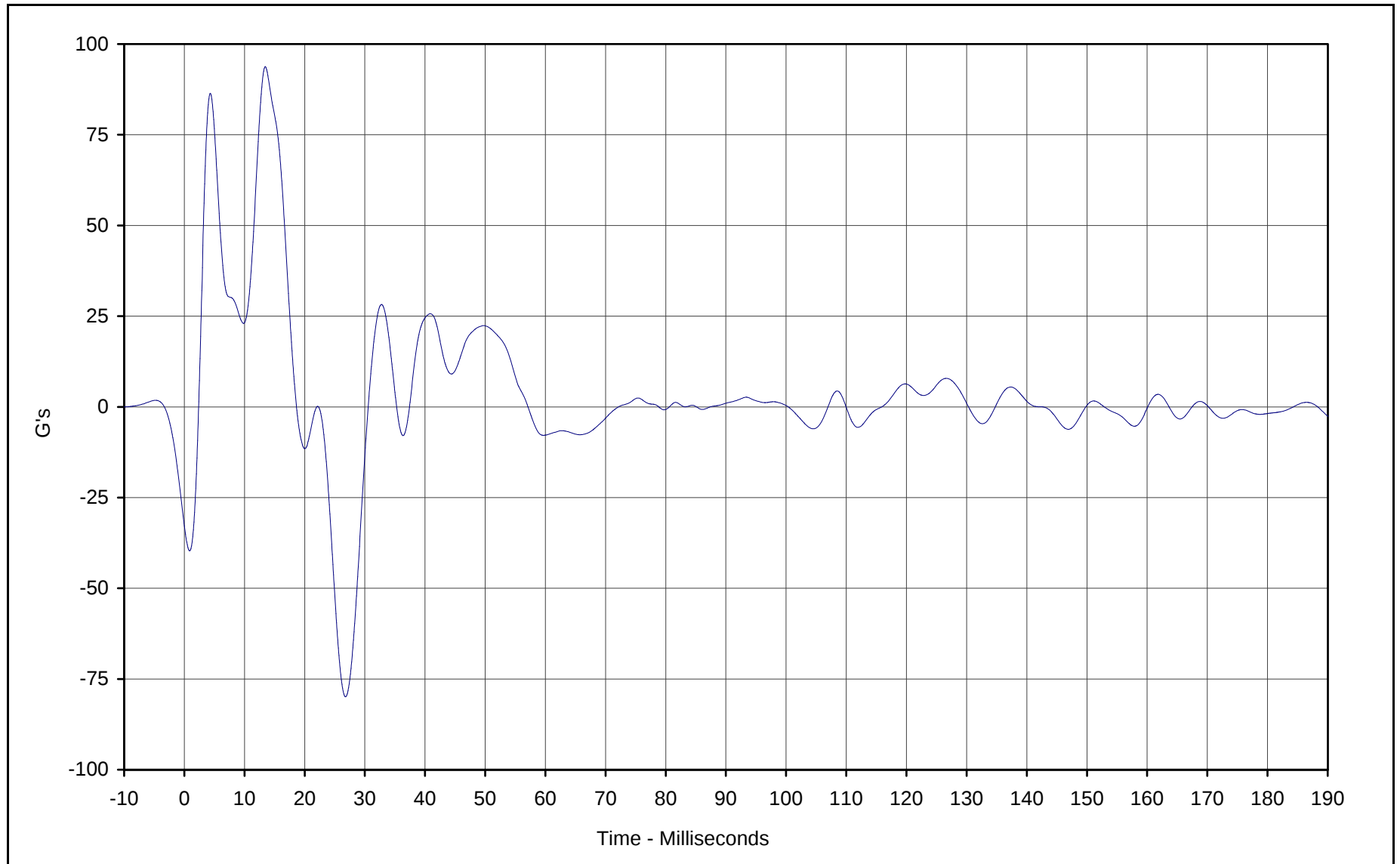
Date of Test: 9/25/01

Curve Number: IN1-041

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

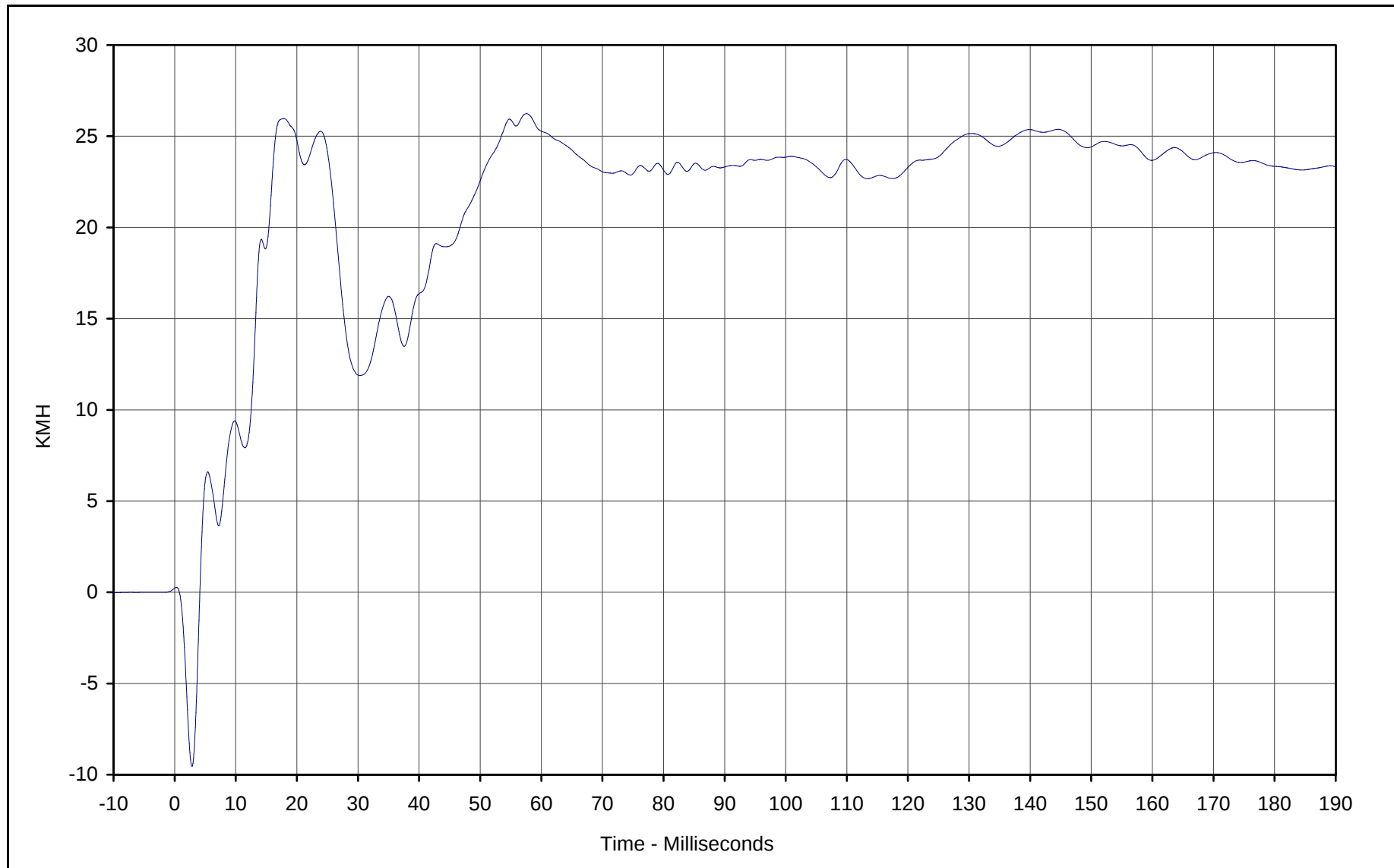




Curve Description: Left Rear Door Mid Rear Y
Maximum Value: 93.8 at 13.5 Milliseconds
Minimum Value: -79.9 at 26.8 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-042

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

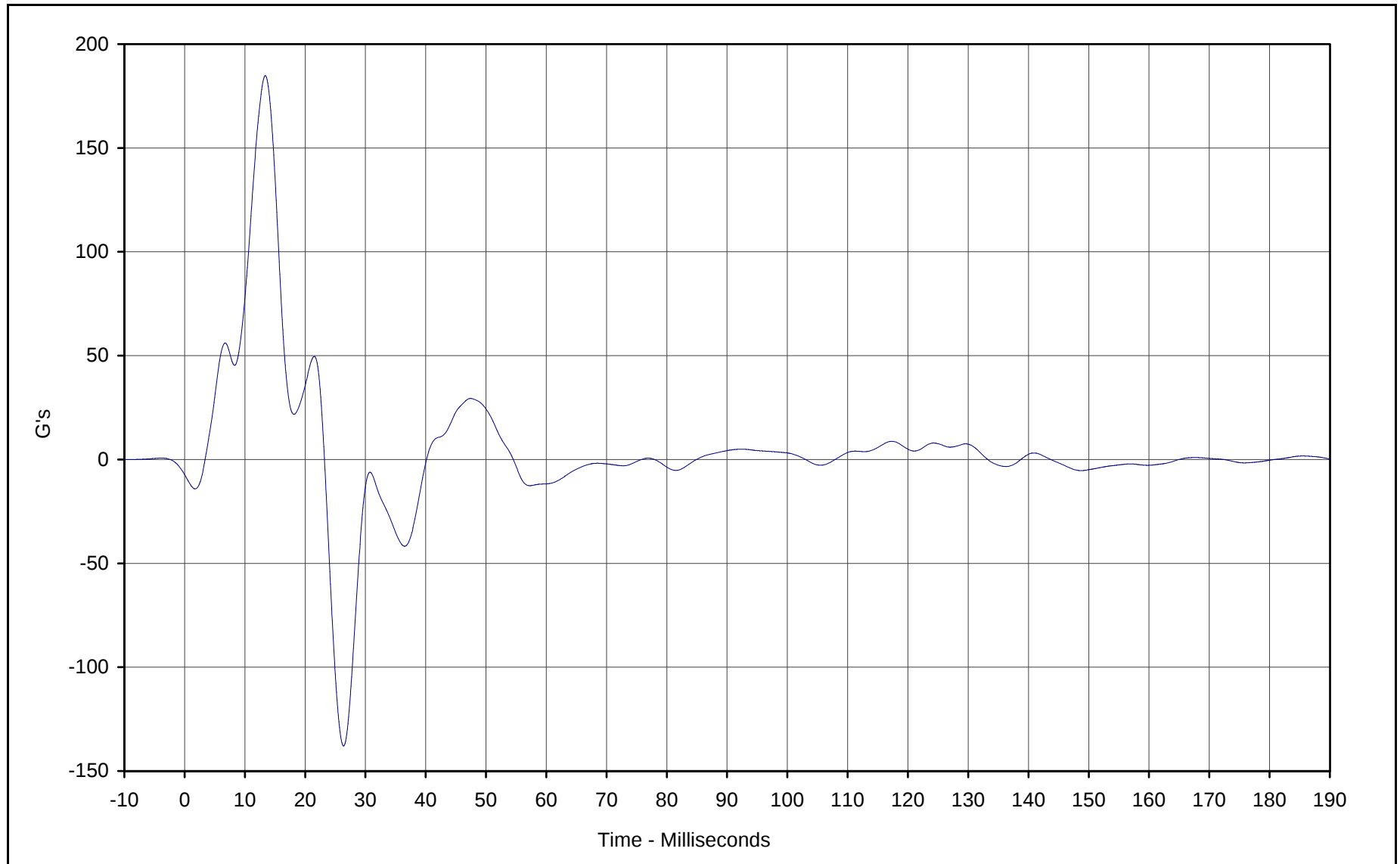




Curve Description: Left Rear Door Mid Rear Y Velocity
Maximum Value: 26.2 at 57.6 Milliseconds
Minimum Value: -9.5 at 2.8 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-042

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

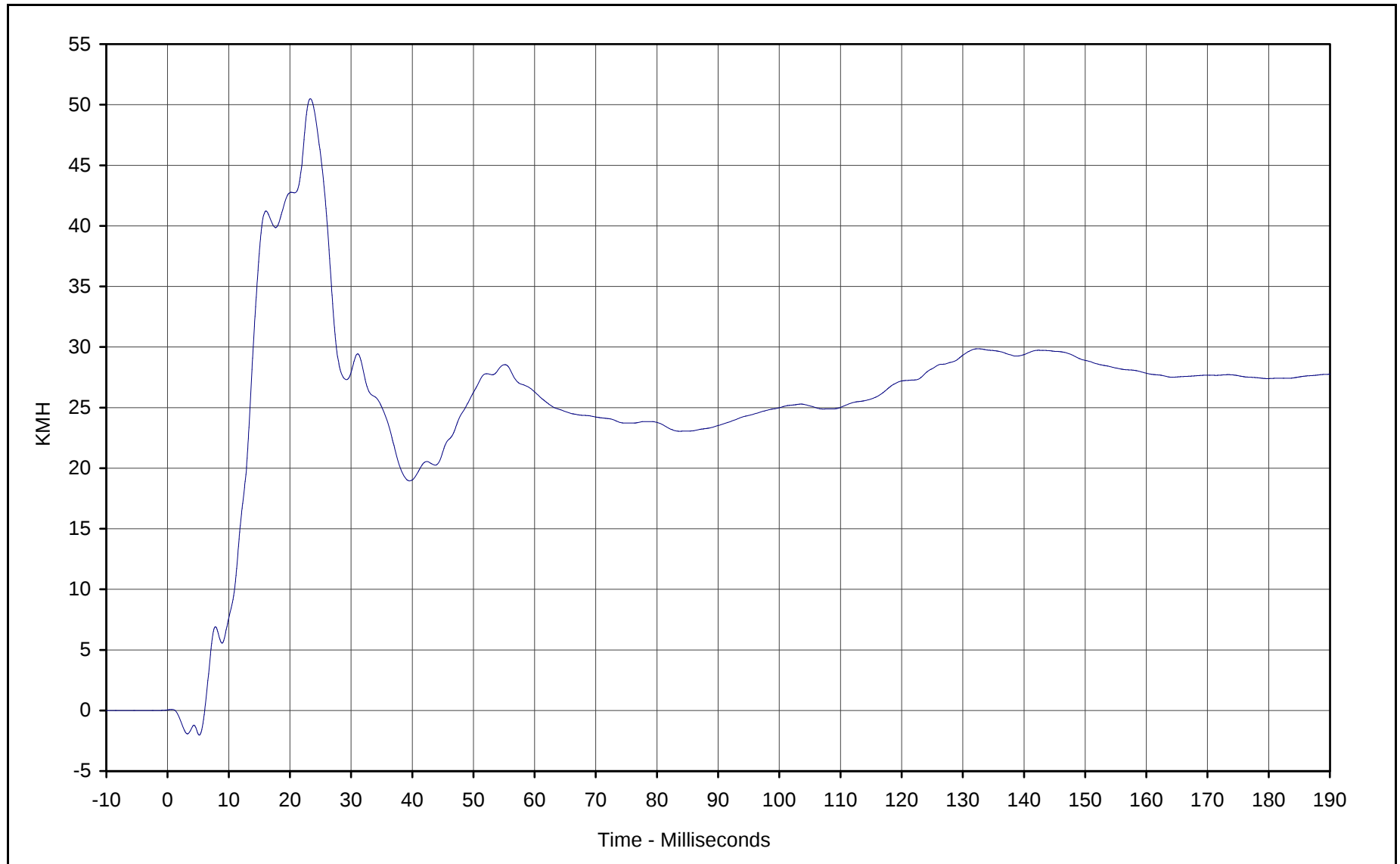




Curve Description: Left Rear Door Upper CL Y
Maximum Value: 184.8 at 13.4 Milliseconds
Minimum Value: -137.9 at 26.4 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-043

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

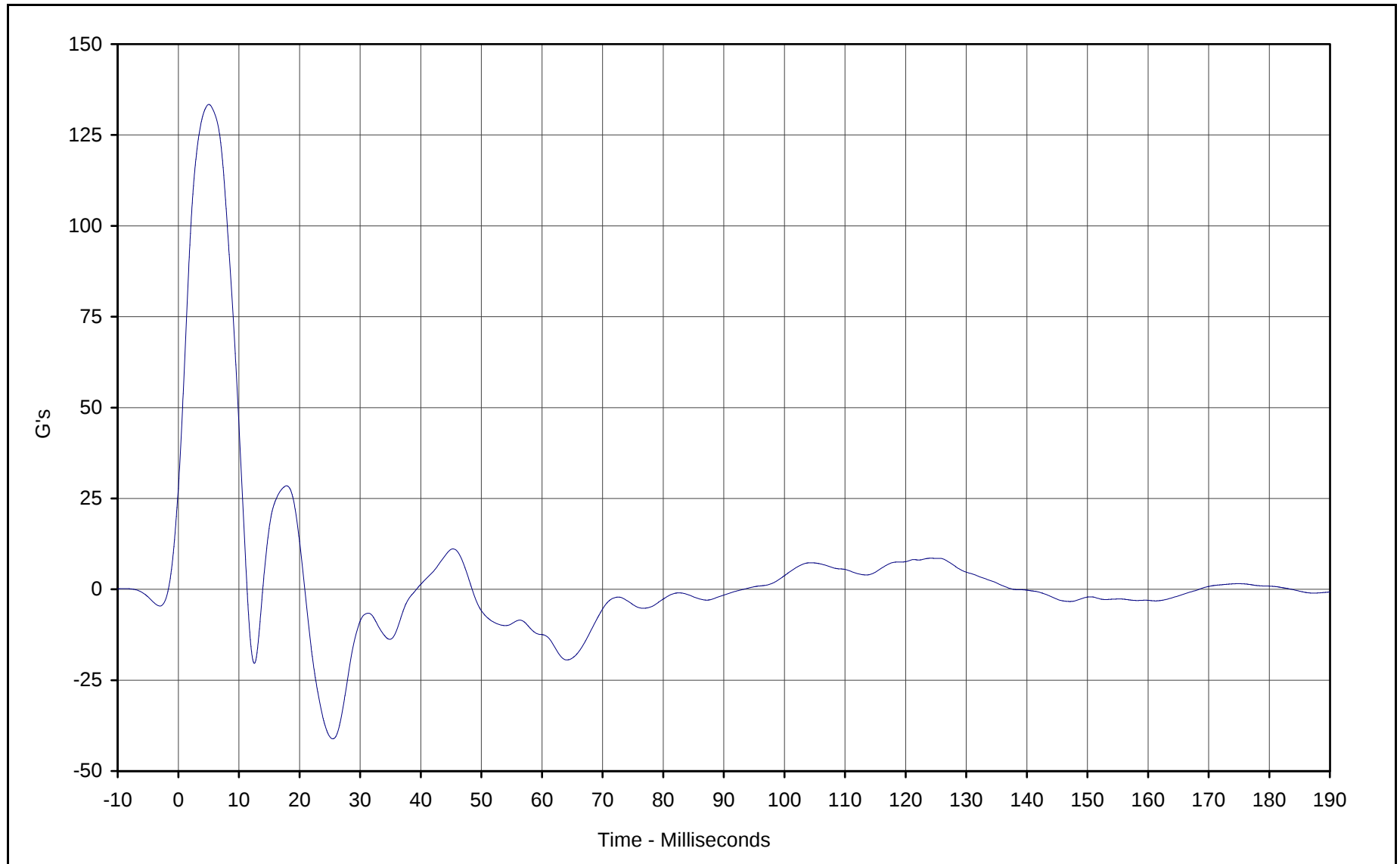




Curve Description: Left Rear Door Upper CL Y Velocity
Maximum Value: 50.5 at 23.3 Milliseconds
Minimum Value: -2.0 at 5.2 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-043

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

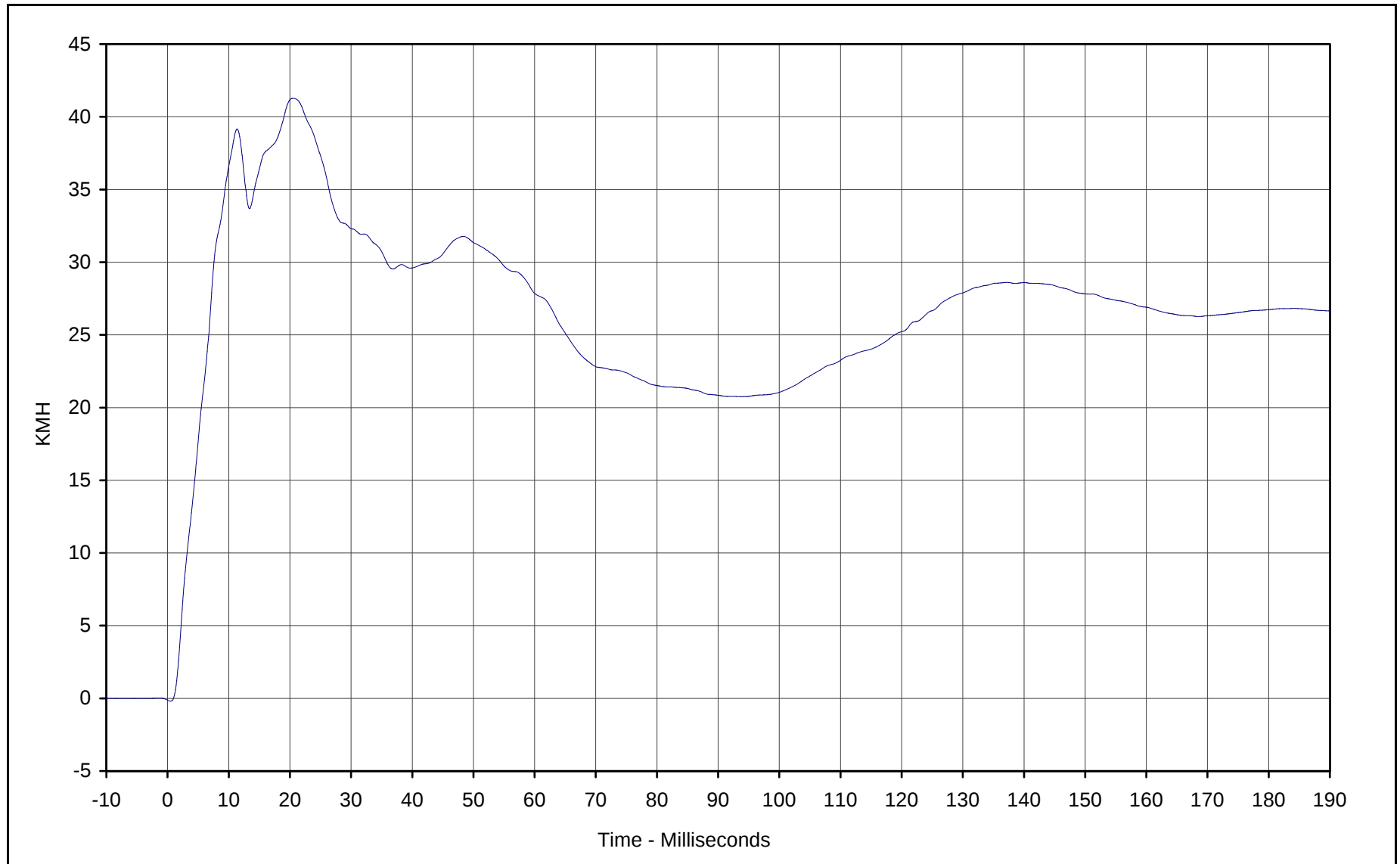




Curve Description: Left B-Post Lower Y
Maximum Value: 133.4 at 5.0 Milliseconds
Minimum Value: -41.1 at 25.5 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-044

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



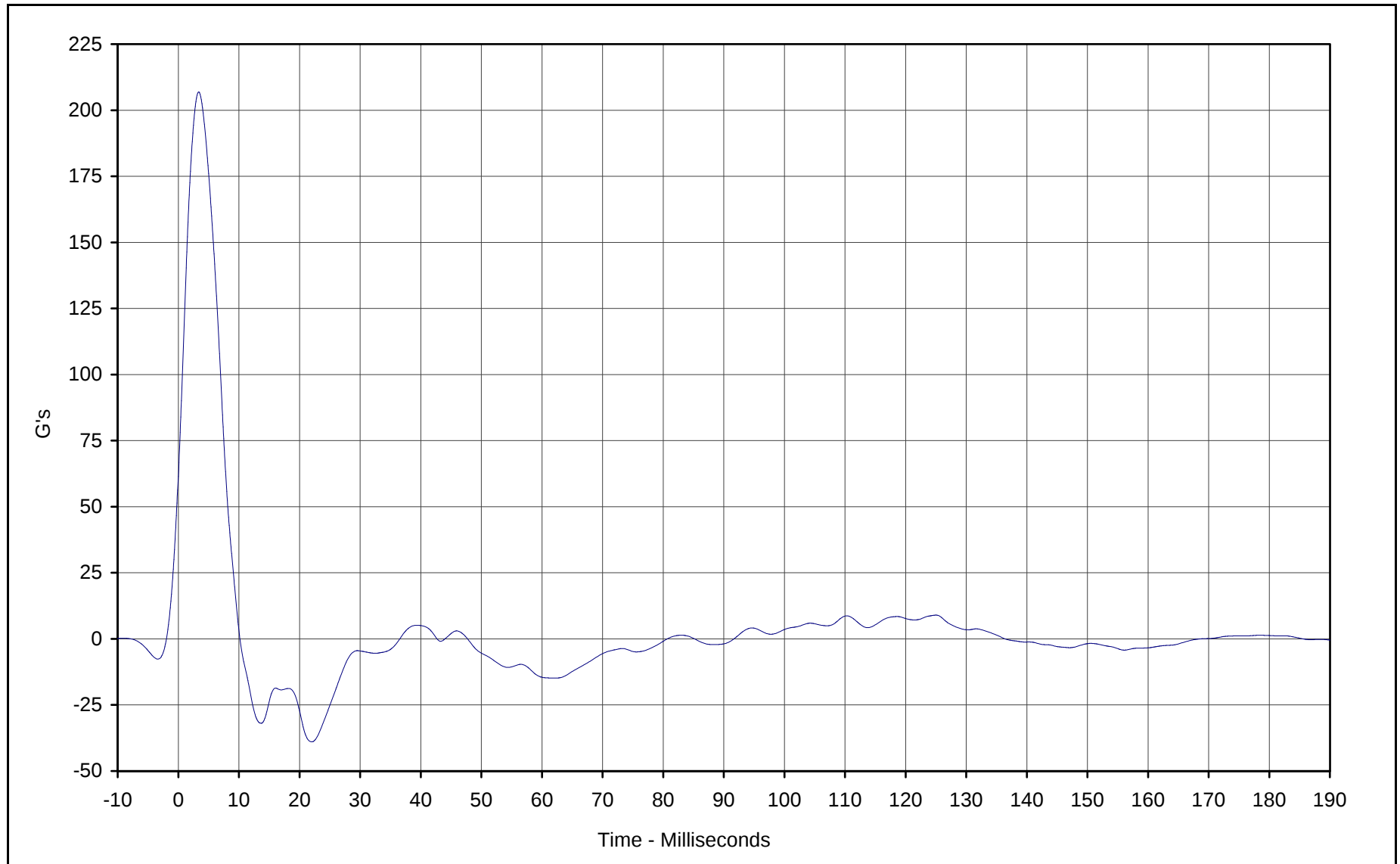


Curve Description: Left B-Post Lower Y Velocity
Maximum Value: 41.3 at 20.5 Milliseconds
Minimum Value: -0.2 at 0.5 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-044

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



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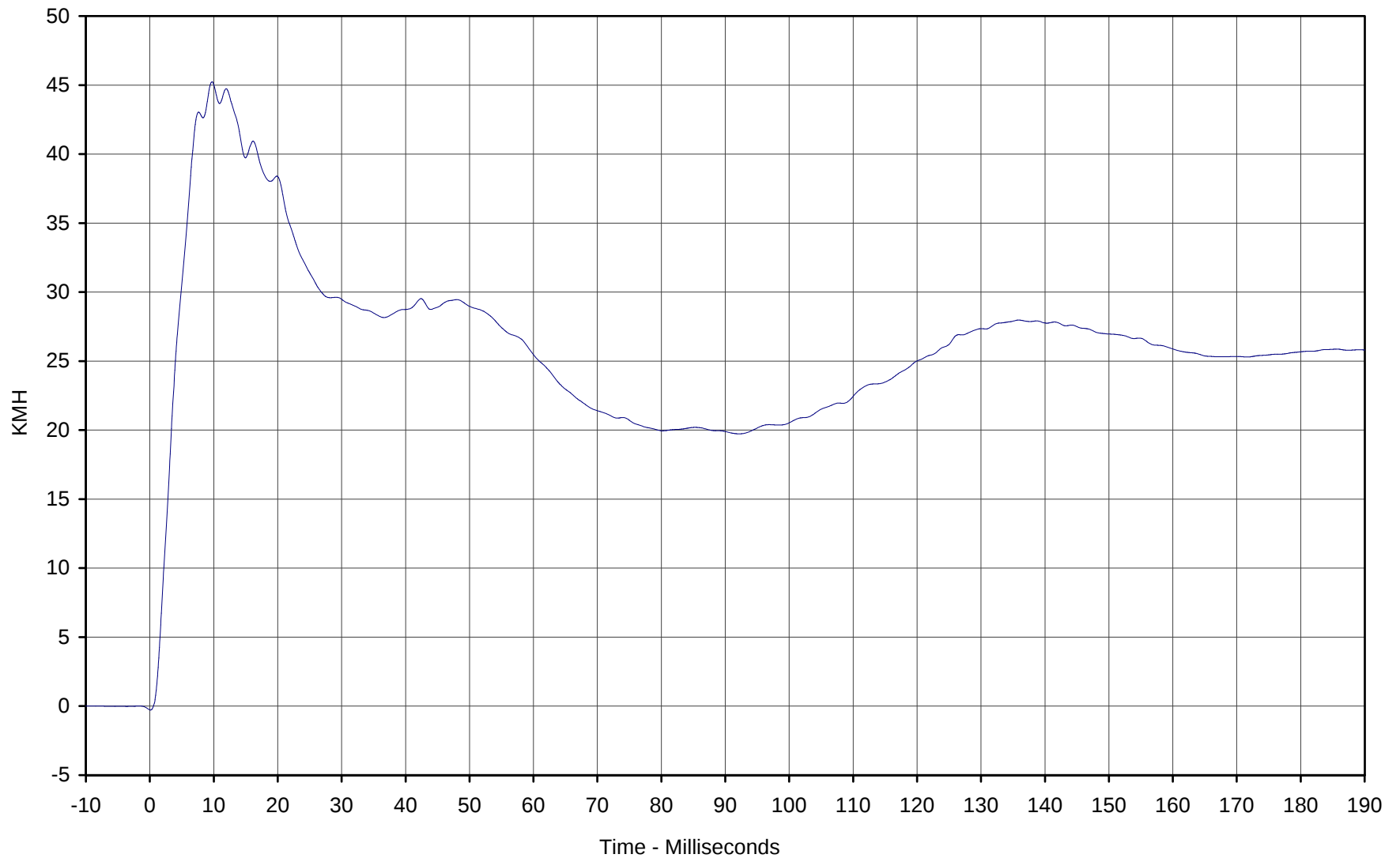


Curve Description: Left B-Post Middle Y
Maximum Value: 206.9 at 3.4 Milliseconds
Minimum Value: -39.0 at 22.0 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-045

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



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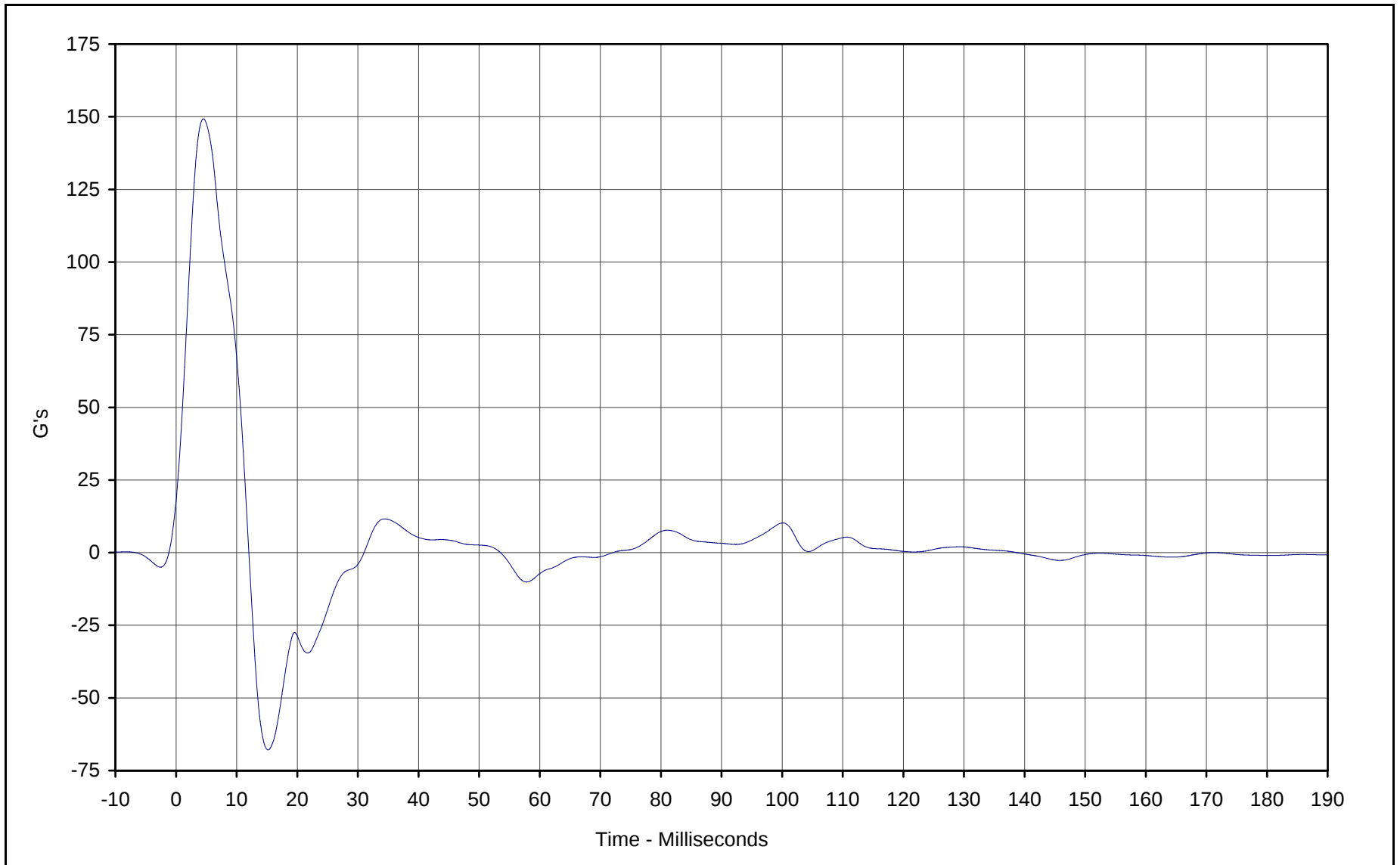


Curve Description: Left B-Post Middle Y Velocity
Maximum Value: 45.2 at 9.7 Milliseconds
Minimum Value: -0.3 at 0.1 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-045

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



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Curve Description: Left A-Post Lower Y

Maximum Value: 149.3 at 4.5 Milliseconds

Minimum Value: -67.9 at 15.2 Milliseconds

SAE Filter Class: 60

Date of Test: 9/25/01

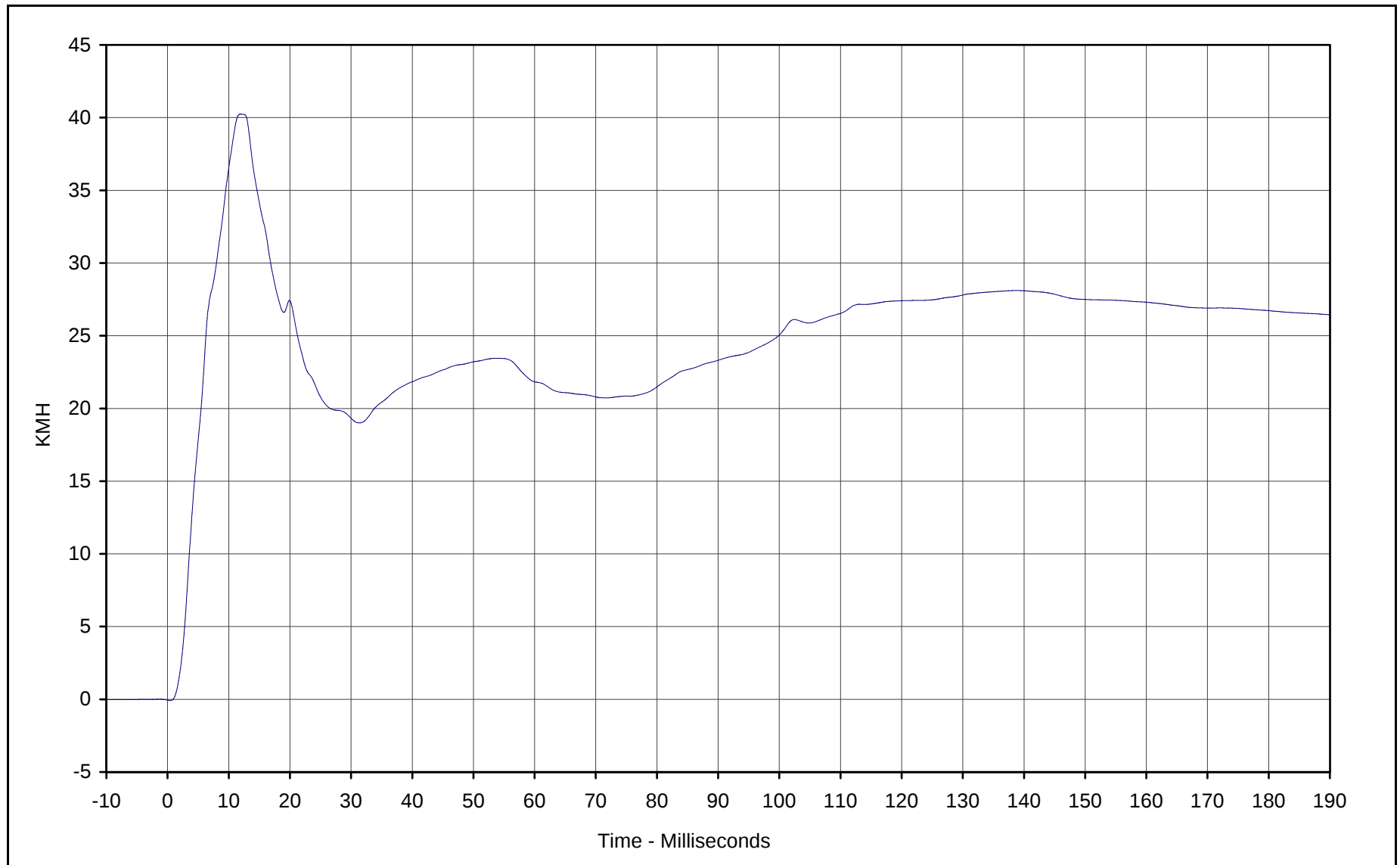
Curve Number: FIL-046

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan



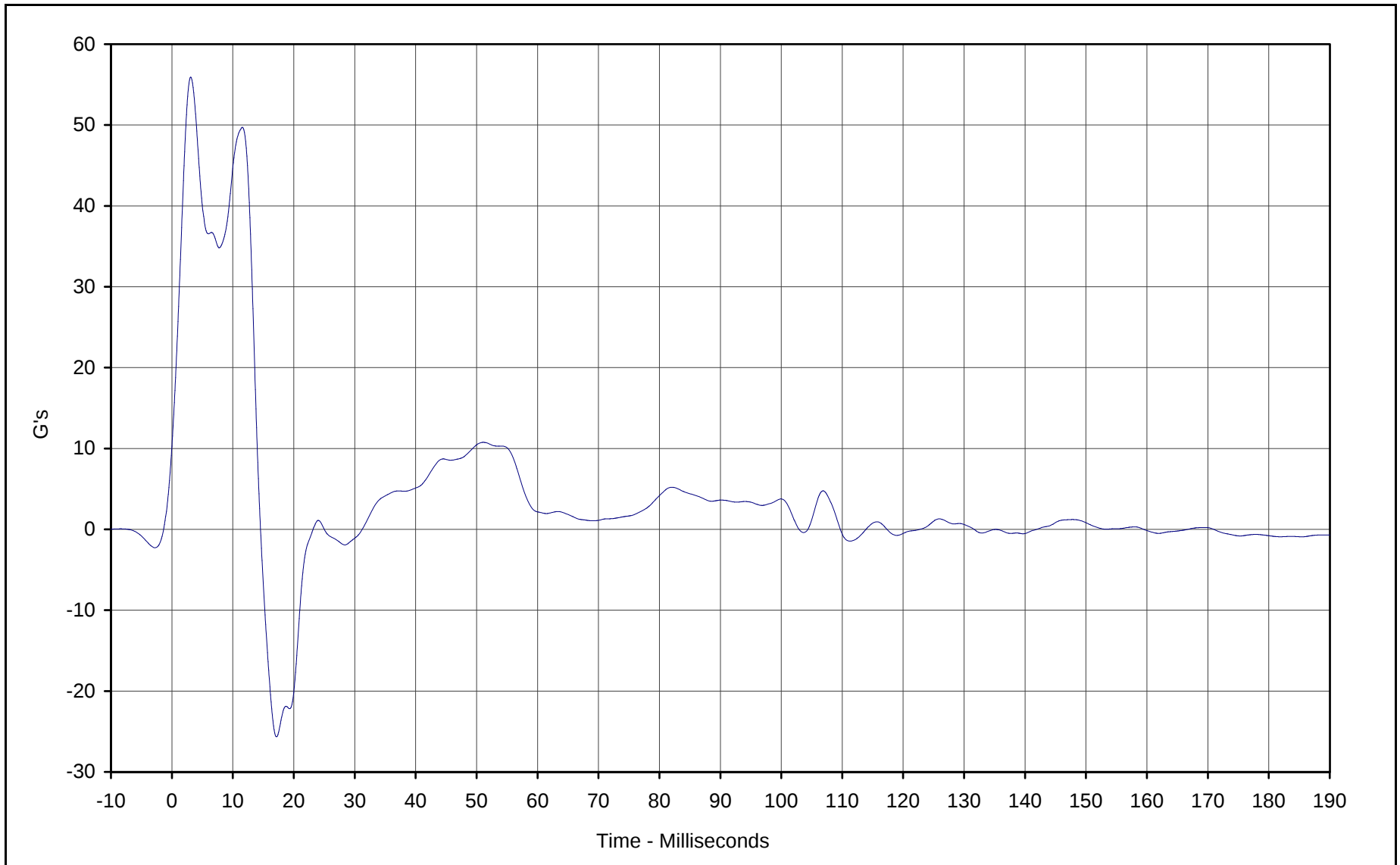
KAR21063-01



Curve Description: Left A-Post Lower Y Velocity
Maximum Value: 40.2 at 11.9 Milliseconds
Minimum Value: -0.1 at 0.4 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-046

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

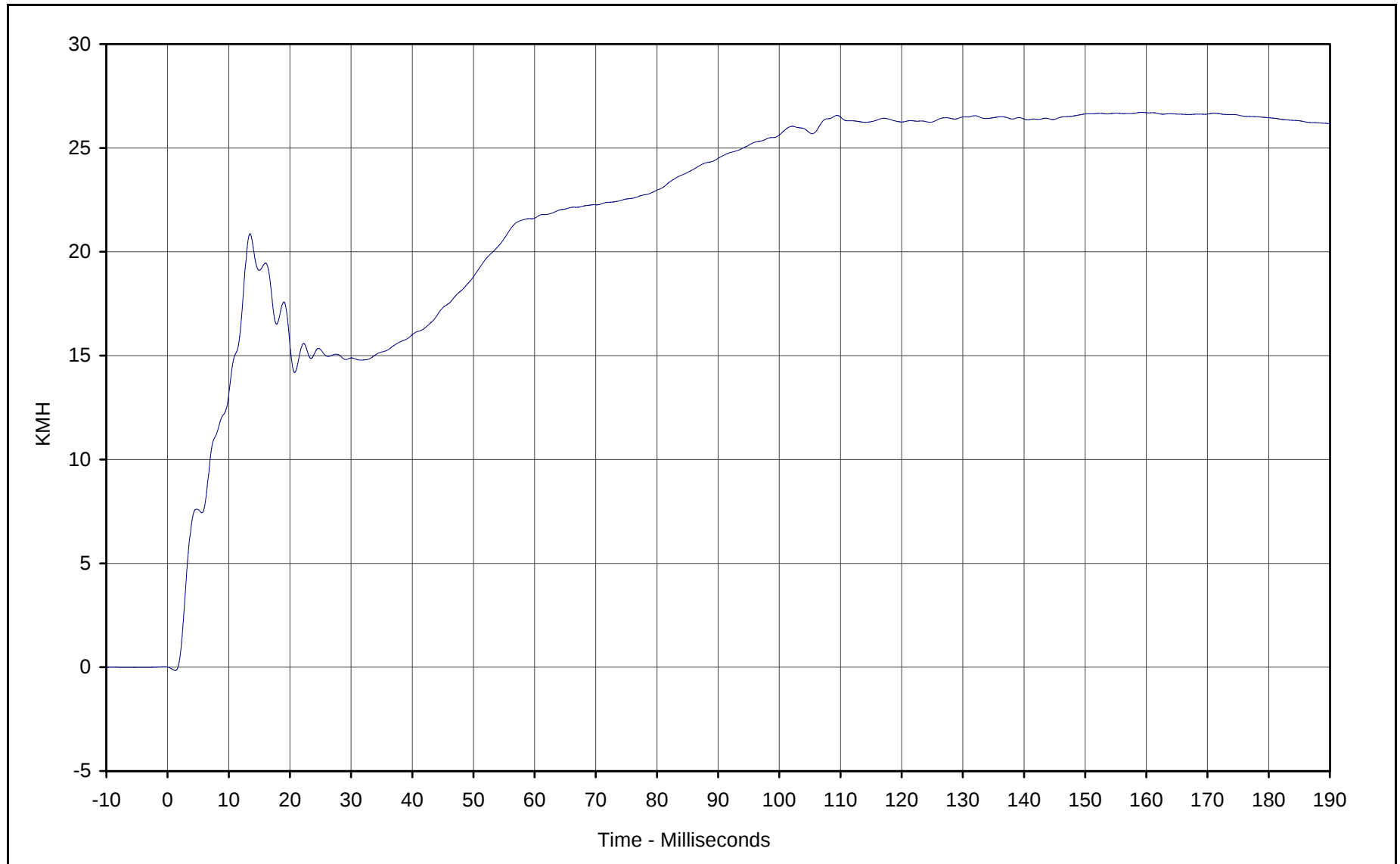




Curve Description: Left A-Post Middle Y
Maximum Value: 55.9 at 3.1 Milliseconds
Minimum Value: -25.6 at 17.2 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-047

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

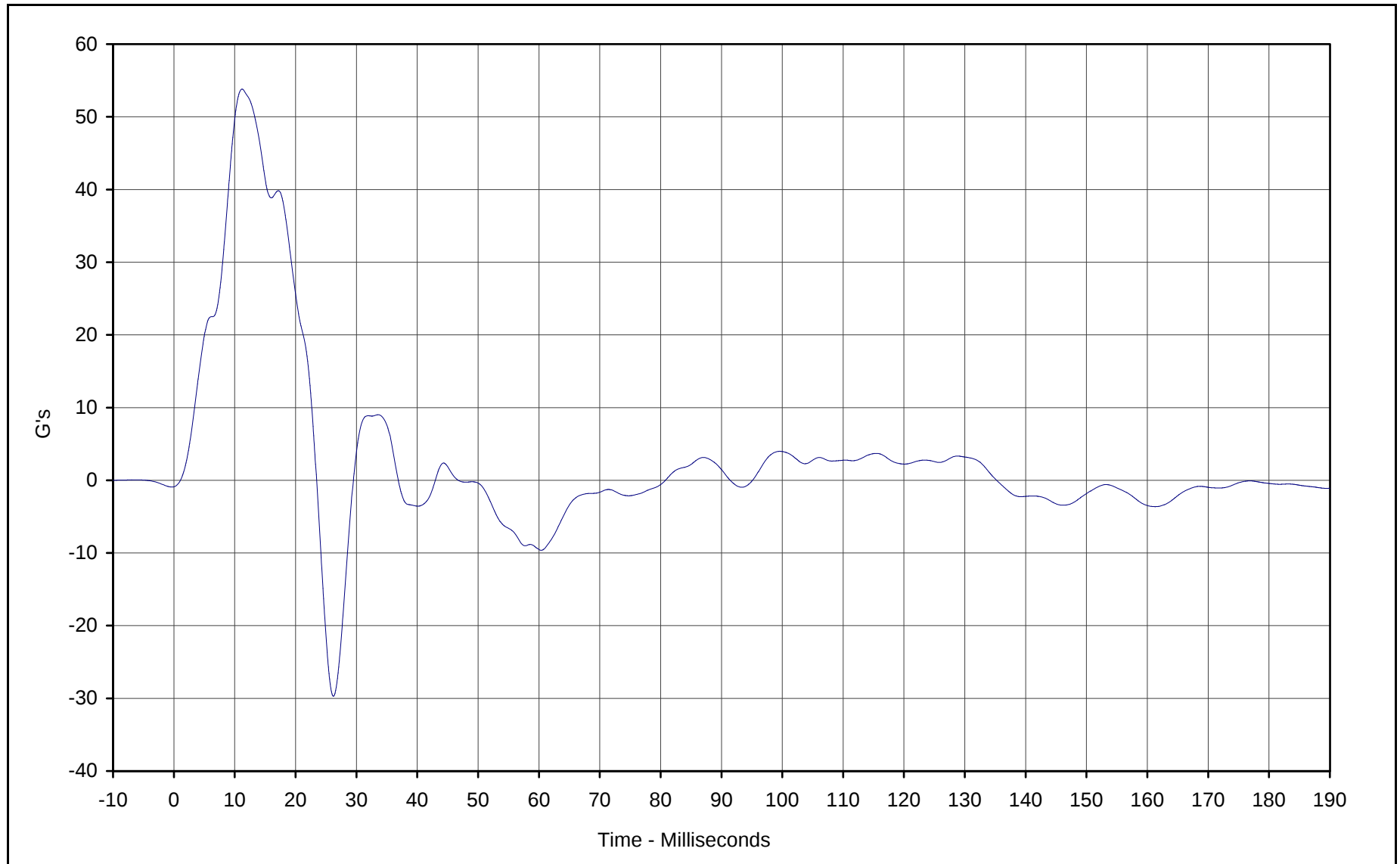




Curve Description: Left A-Post Middle Y Velocity
Maximum Value: 26.7 at 159.2 Milliseconds
Minimum Value: -0.2 at 1.2 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-047

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

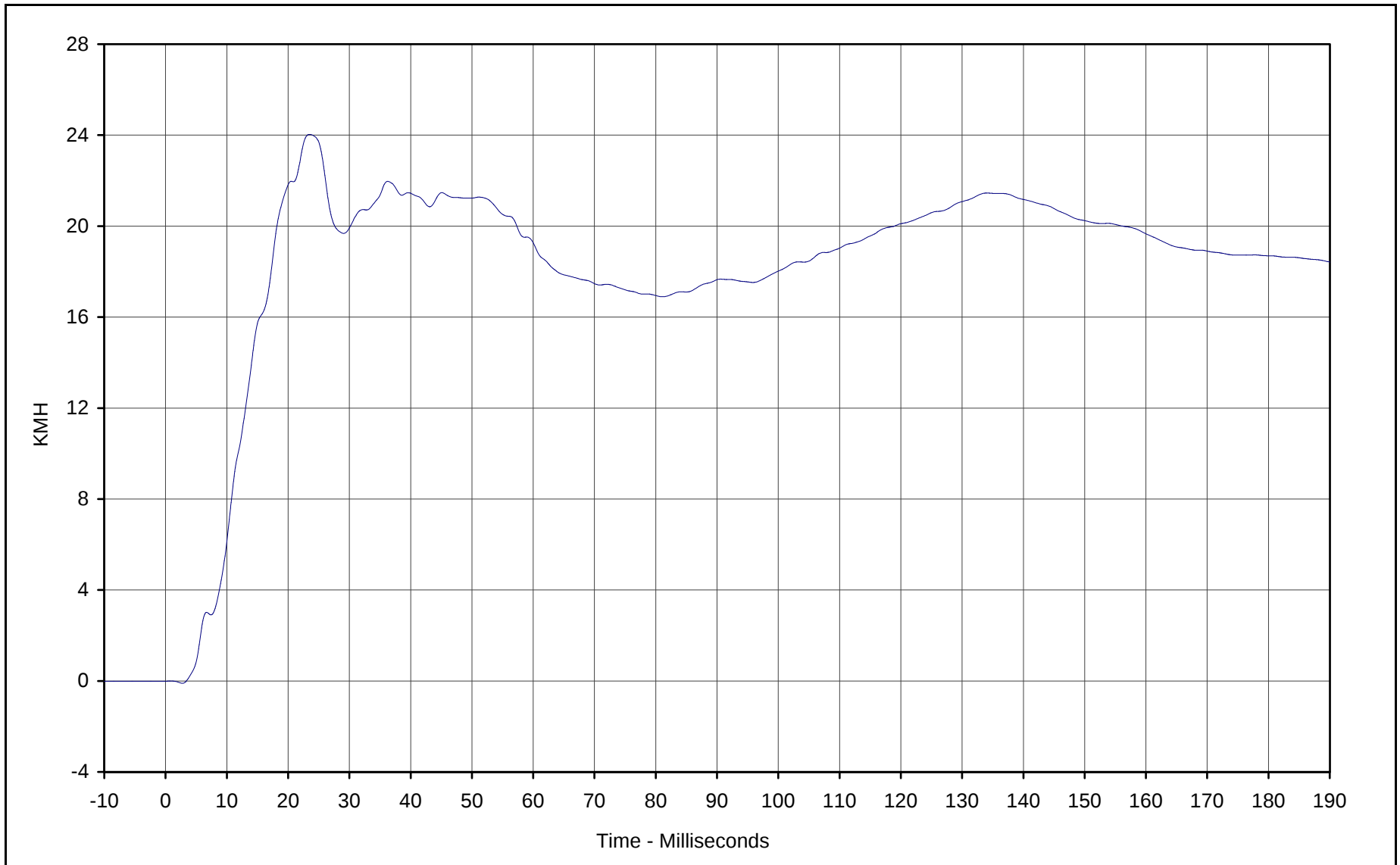




Curve Description: Left Front Seat Track Y
Maximum Value: 53.8 at 11.2 Milliseconds
Minimum Value: -29.7 at 26.2 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-048

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

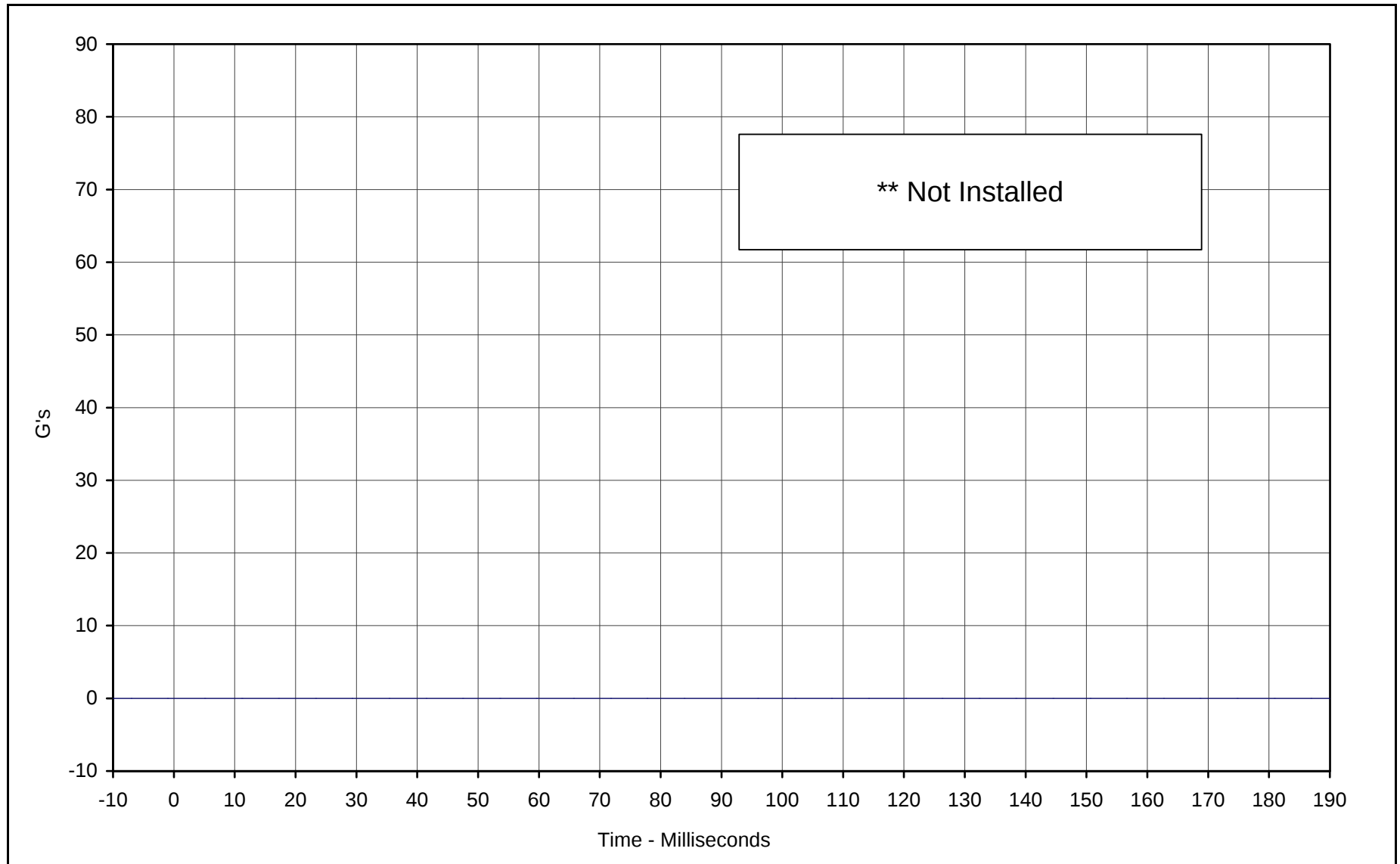




Curve Description: Left Front Seat Track Y Velocity
Maximum Value: 24.0 at 23.5 Milliseconds
Minimum Value: -0.1 at 2.8 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-048

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





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: 9/25/01

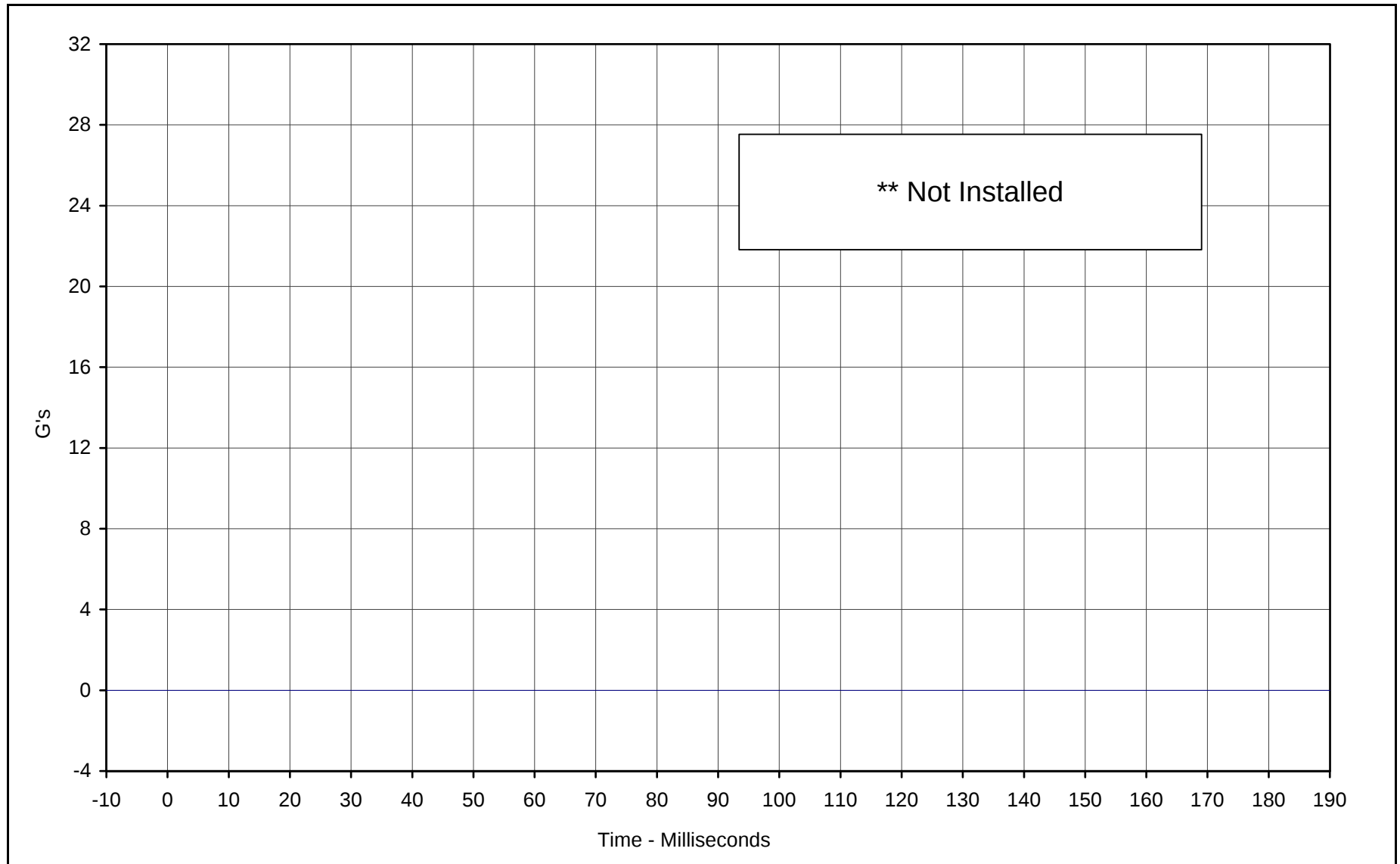
Curve Number: FIL-049

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

** 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: 9/25/01

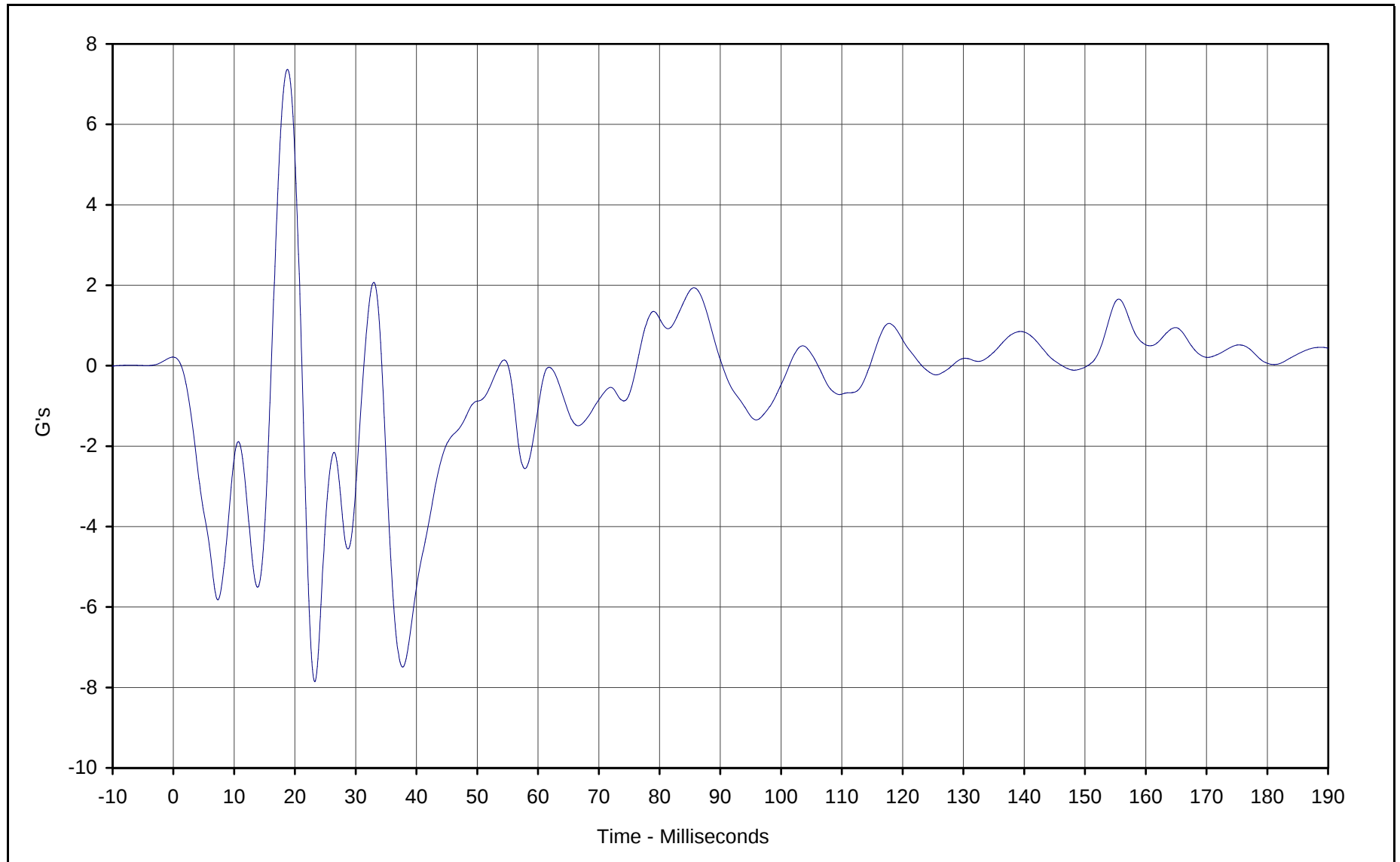
Curve Number: IN1-049

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005

Test Vehicle: 2002 Saturn L100 4 Door Sedan

** Not Installed

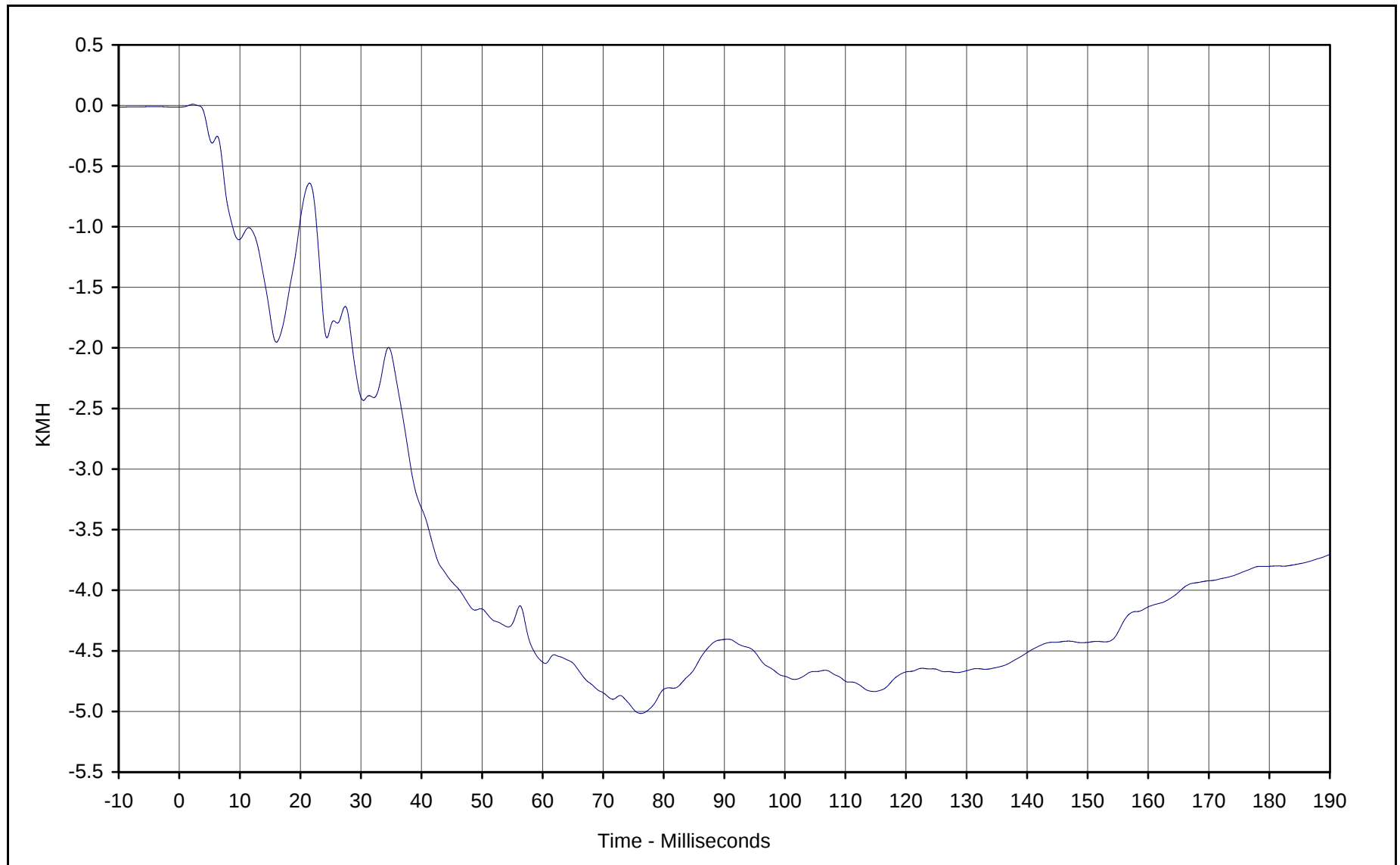




Curve Description: Vehicle CG X
Maximum Value: 7.4 at 18.8 Milliseconds
Minimum Value: -7.9 at 23.3 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-050

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

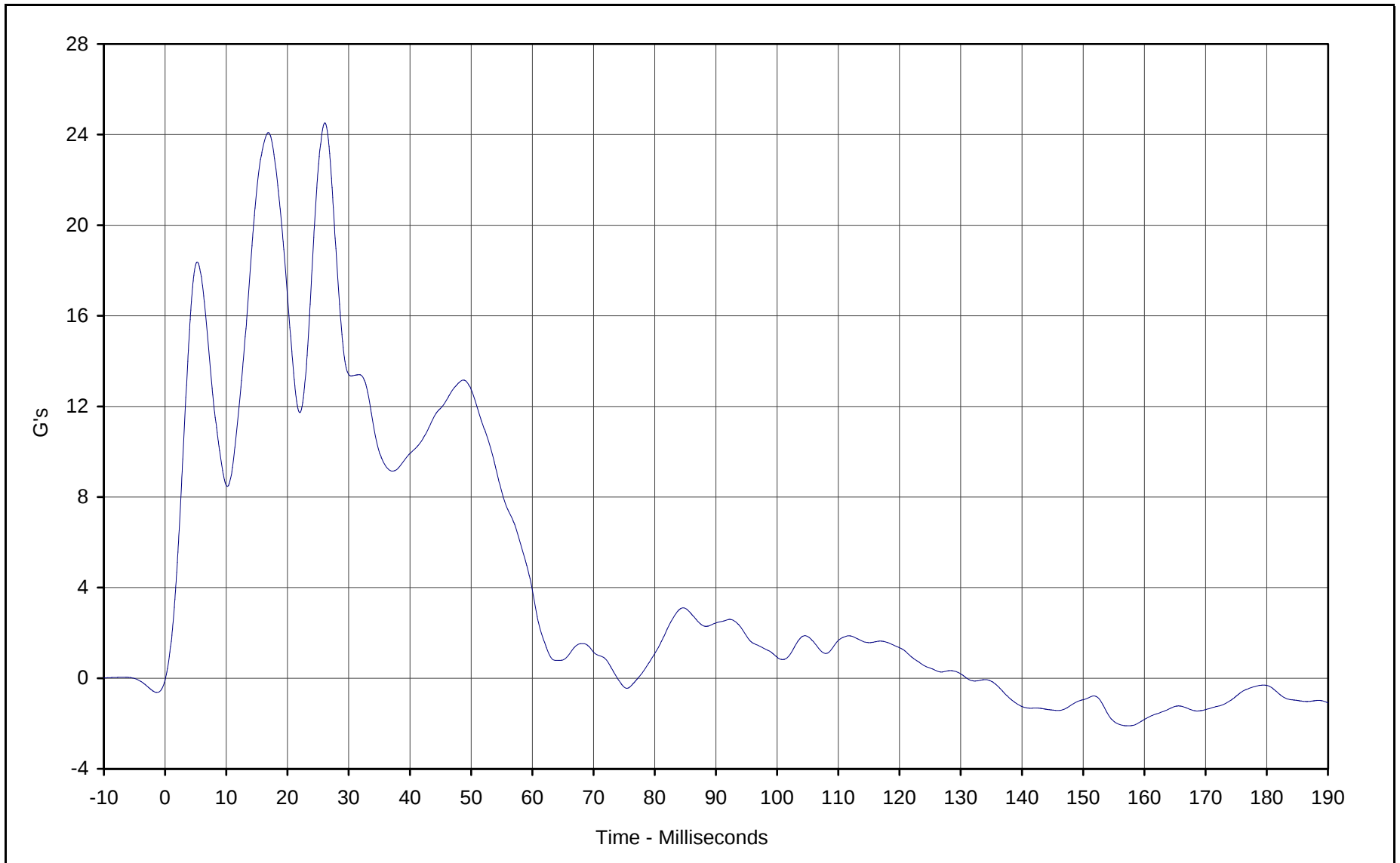




Curve Description: Vehicle CG X Velocity
Maximum Value: 0.0 at 2.3 Milliseconds
Minimum Value: -5.0 at 76.2 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-050

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

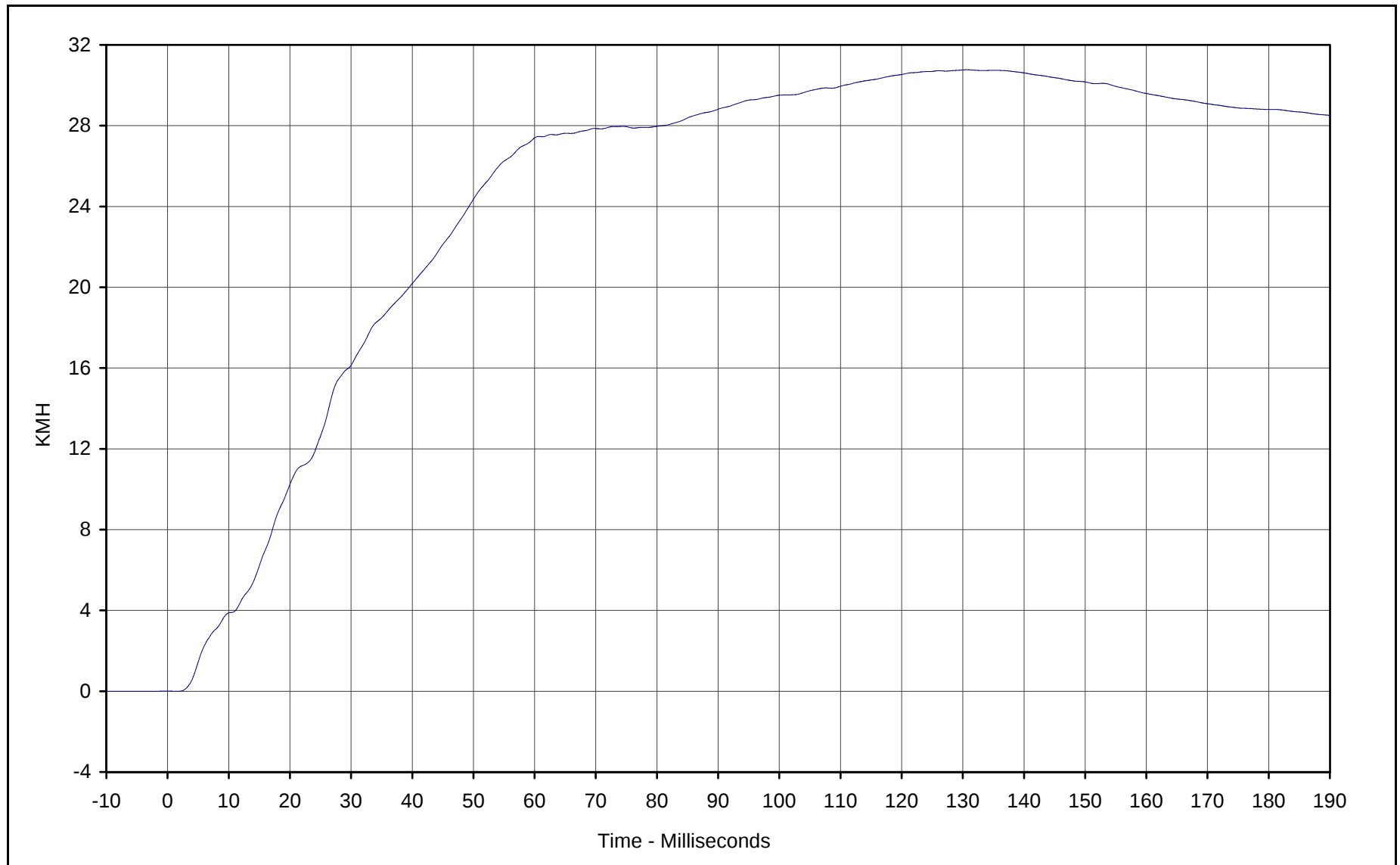




Curve Description: Vehicle CG Y
Maximum Value: 24.5 at 26.1 Milliseconds
Minimum Value: -2.1 at 157.3 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-051

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

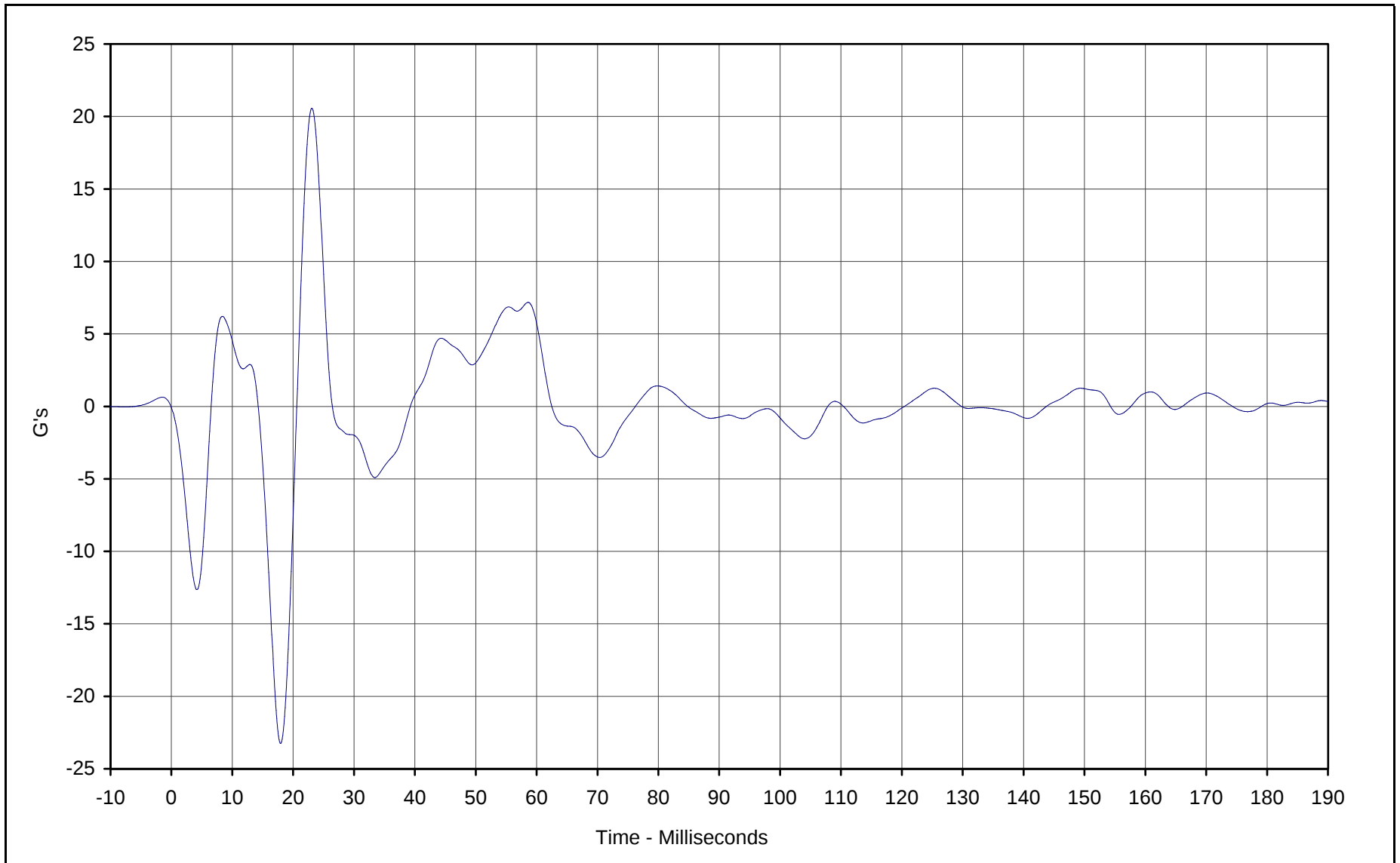




Curve Description: Vehicle CG Y Velocity
Maximum Value: 30.8 at 130.7 Milliseconds
Minimum Value: 0.0 at 1.6 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-051

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

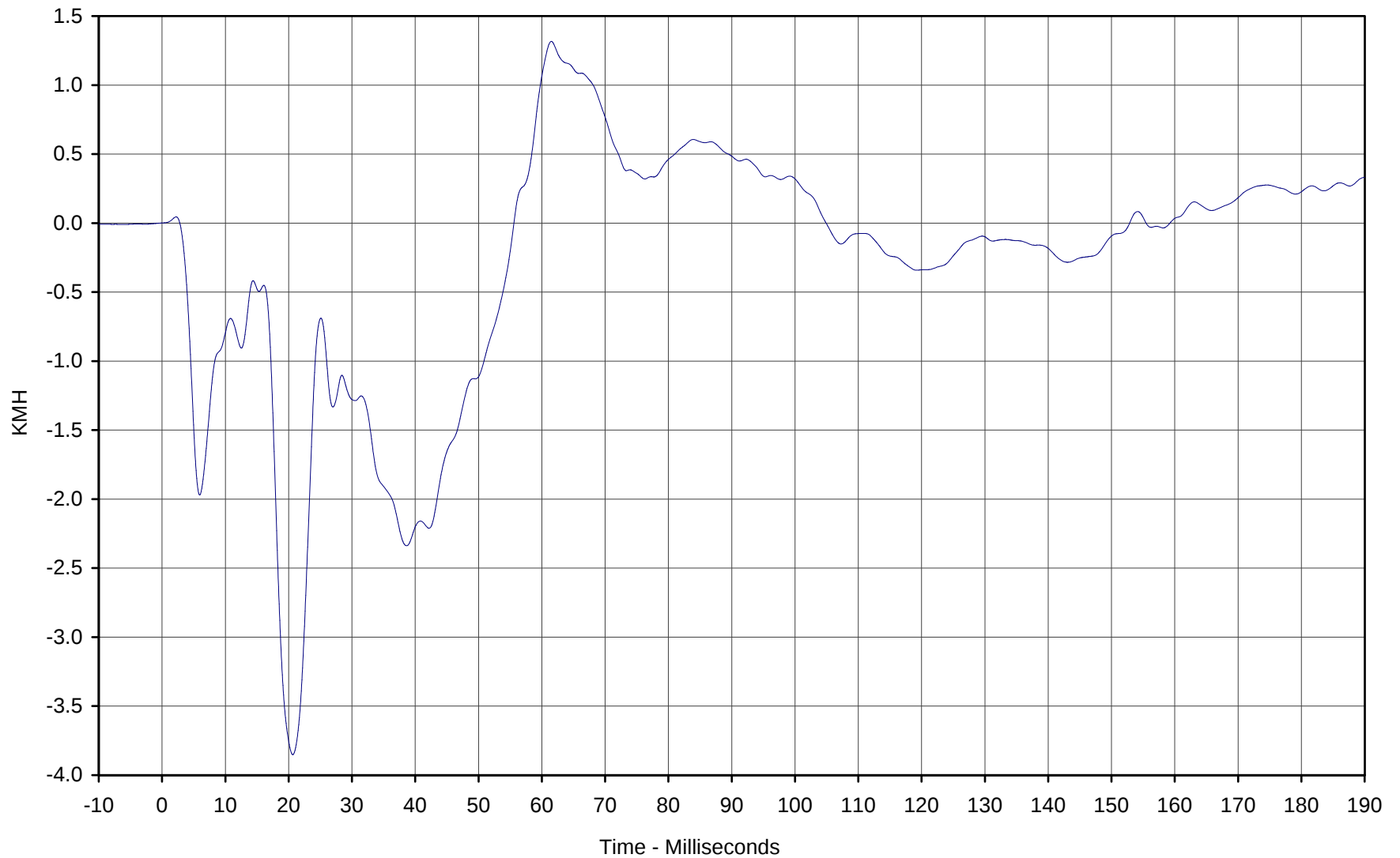




Curve Description: Vehicle CG Z
Maximum Value: 20.6 at 23.1 Milliseconds
Minimum Value: -23.2 at 17.9 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-052

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

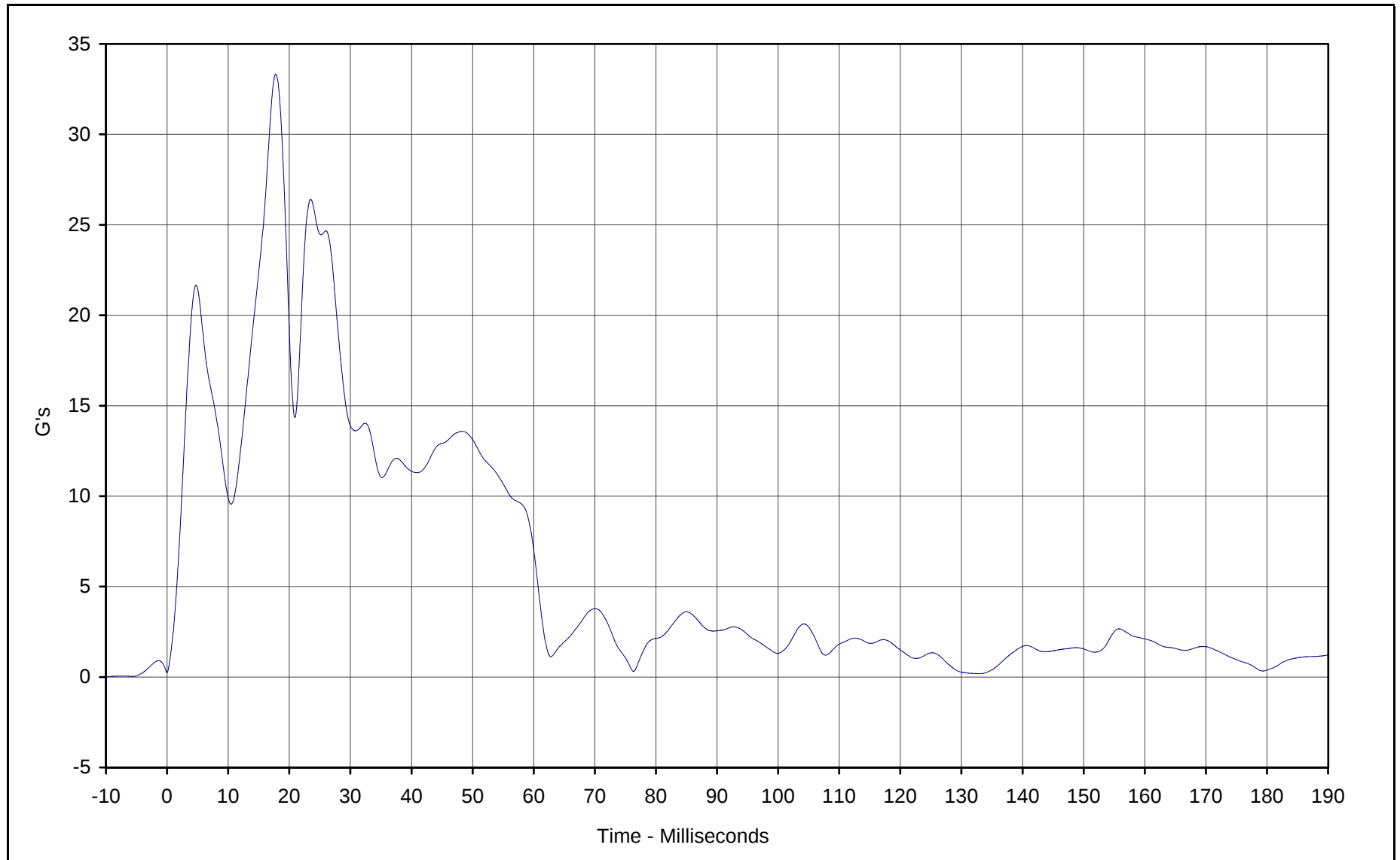




Curve Description: Vehicle CG Z Velocity
Maximum Value: 1.3 at 61.5 Milliseconds
Minimum Value: -3.9 at 20.7 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-052

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

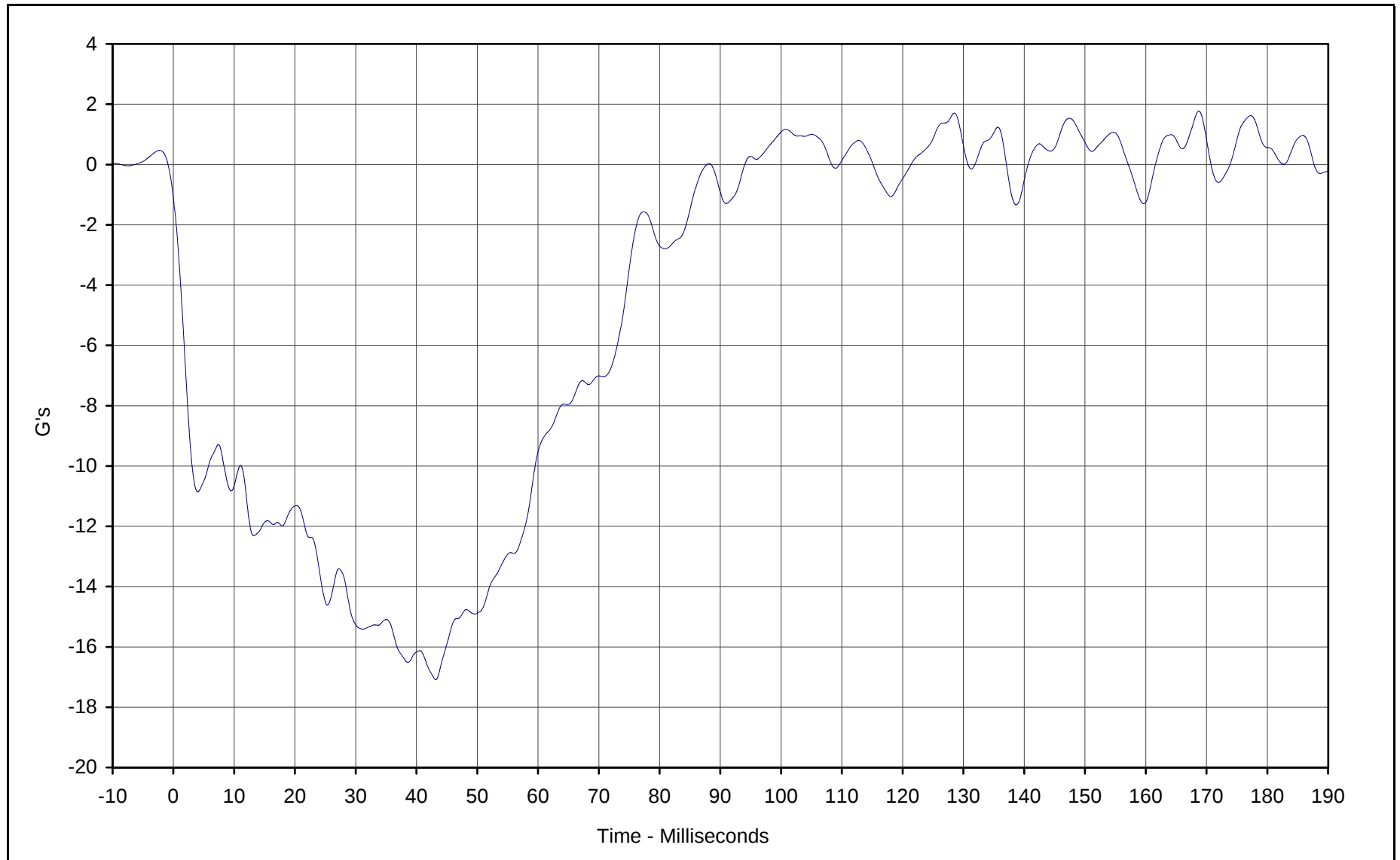




Curve Description: Vehicle CG Resultant
Maximum Value: 33.3 at 17.8 Milliseconds
Minimum Value: 0.2 at 132.9 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: RES-050

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

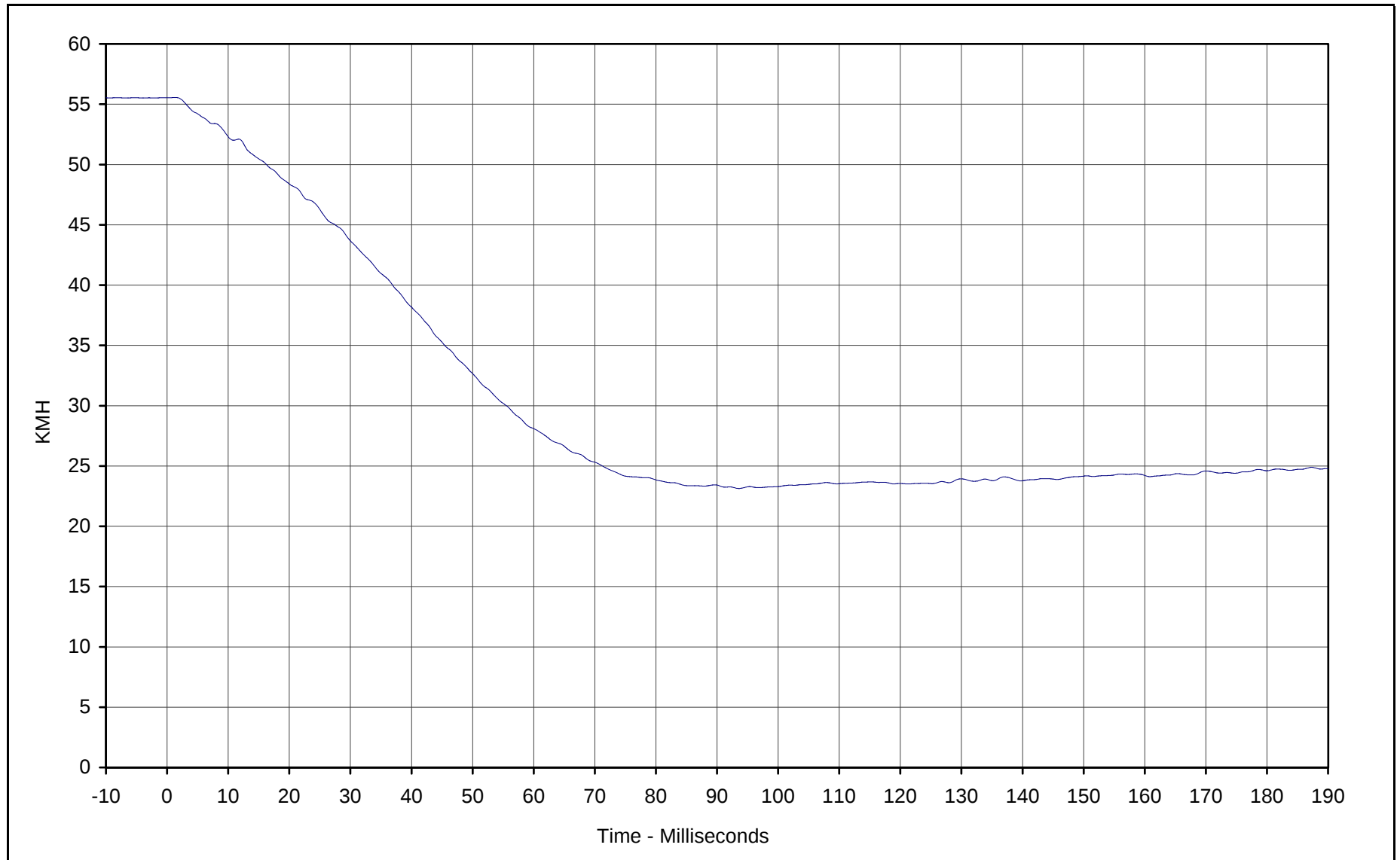




Curve Description: MDB CG X
Maximum Value: 1.8 at 168.7 Milliseconds
Minimum Value: -17.1 at 43.2 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-053

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

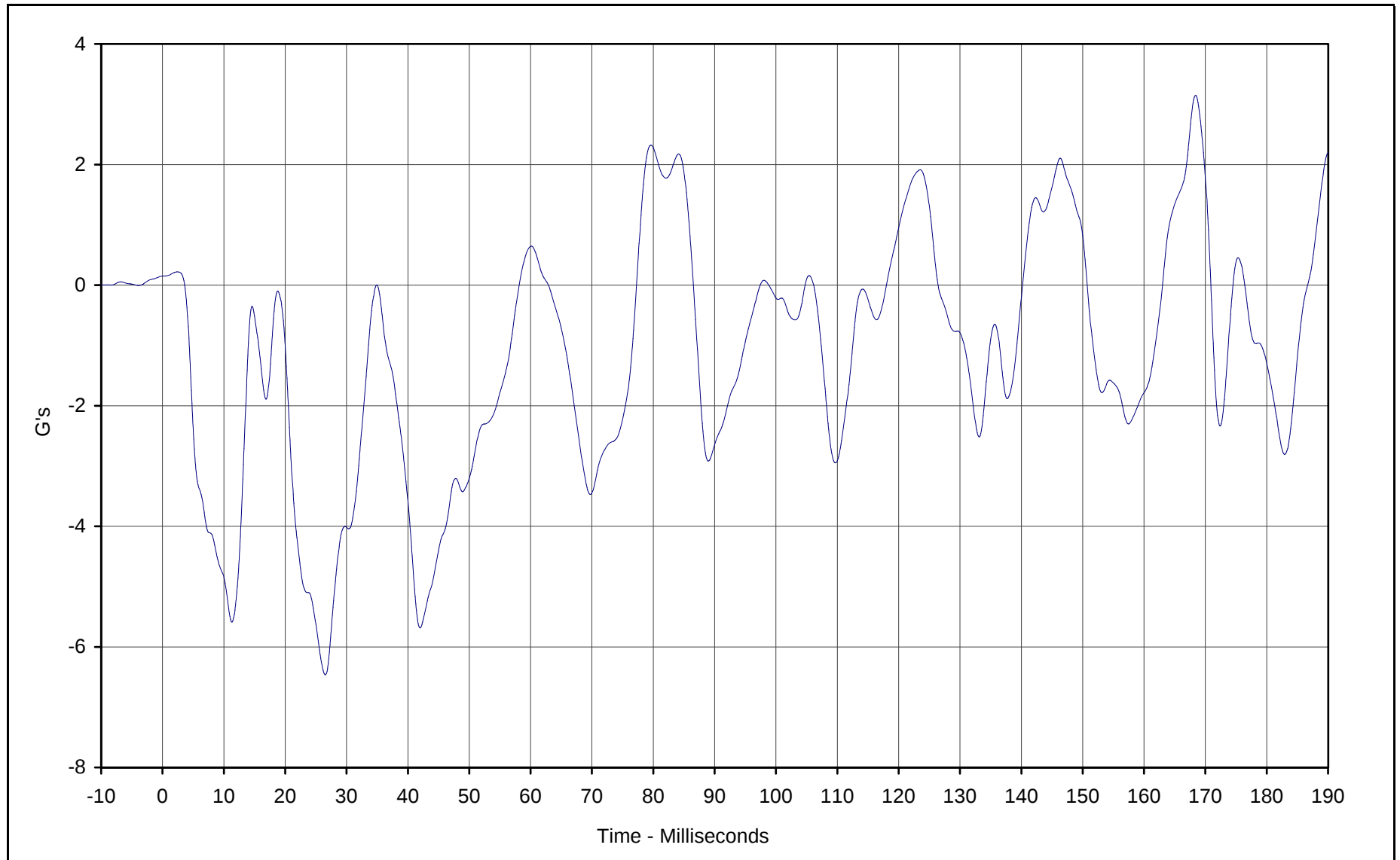




Curve Description: MDB CG X Velocity
Maximum Value: 55.6 at 1.3 Milliseconds
Minimum Value: 23.1 at 93.6 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-053

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

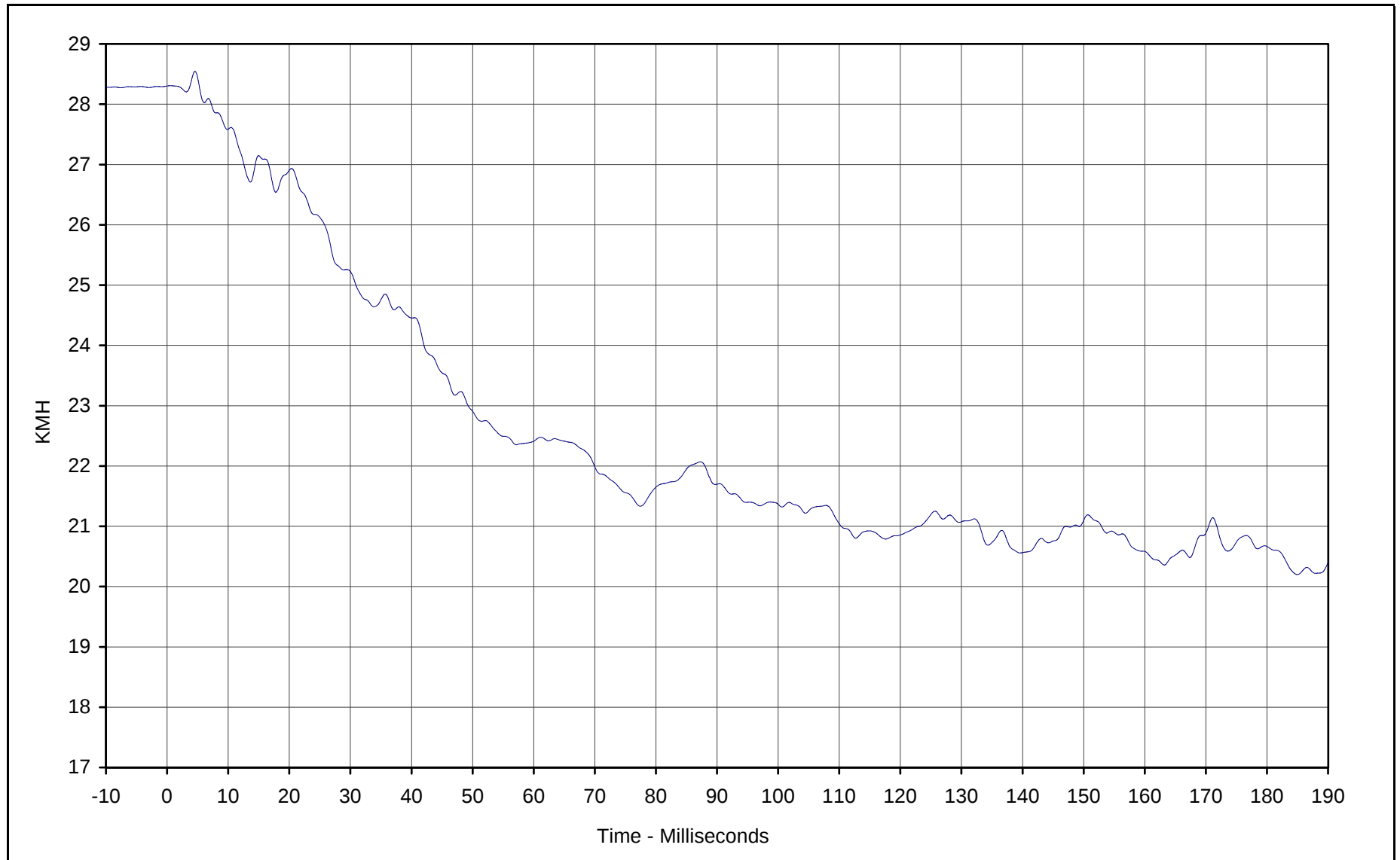




Curve Description: MDB CG Y
Maximum Value: 3.1 at 168.4 Milliseconds
Minimum Value: -6.5 at 26.5 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-054

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

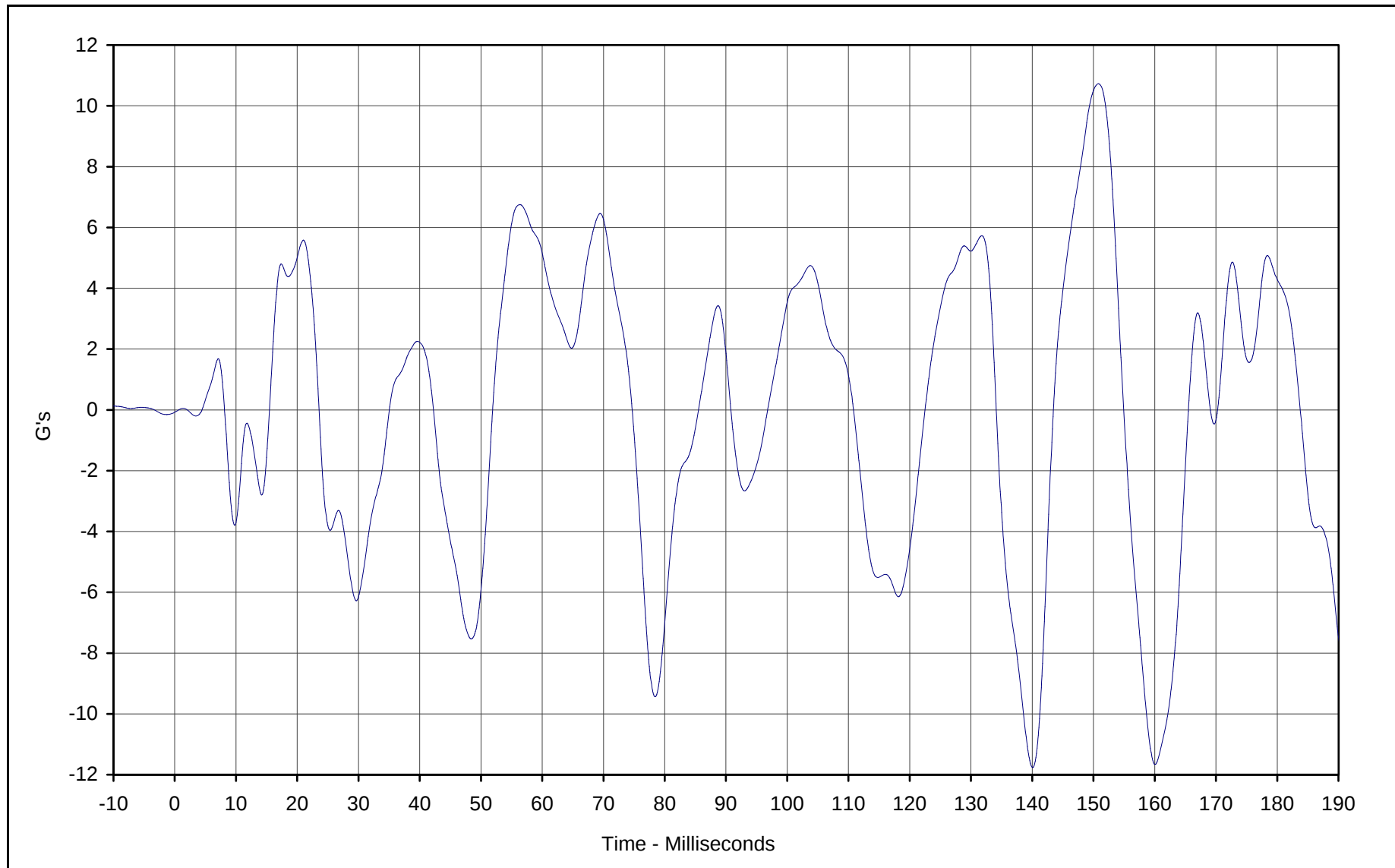




Curve Description: MDB CG Y Velocity
Maximum Value: 28.5 at 4.6 Milliseconds
Minimum Value: 20.2 at 185.0 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-054

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

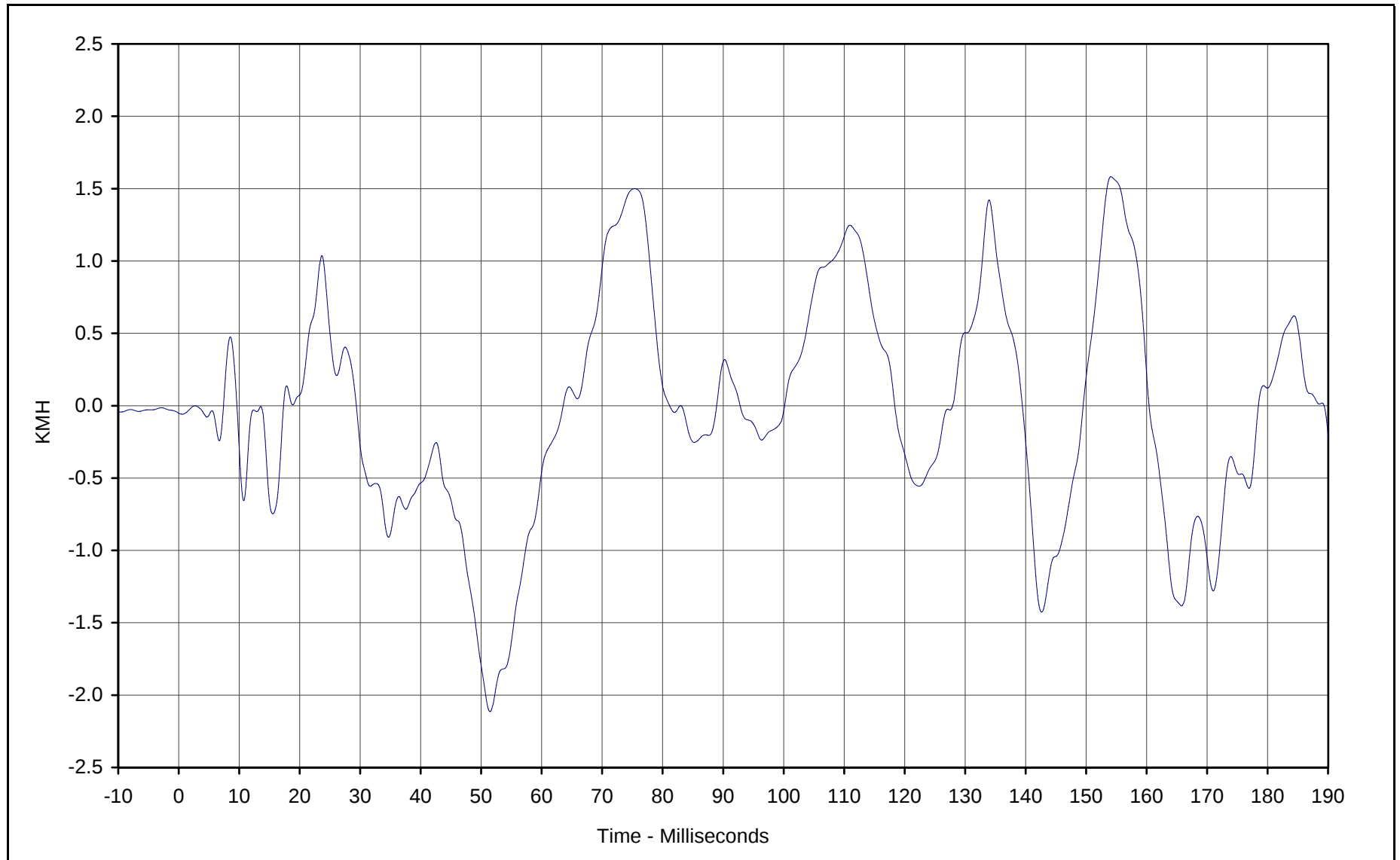




Curve Description: MDB CG Z
Maximum Value: 10.7 at 150.8 Milliseconds
Minimum Value: -11.8 at 140.1 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-055

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

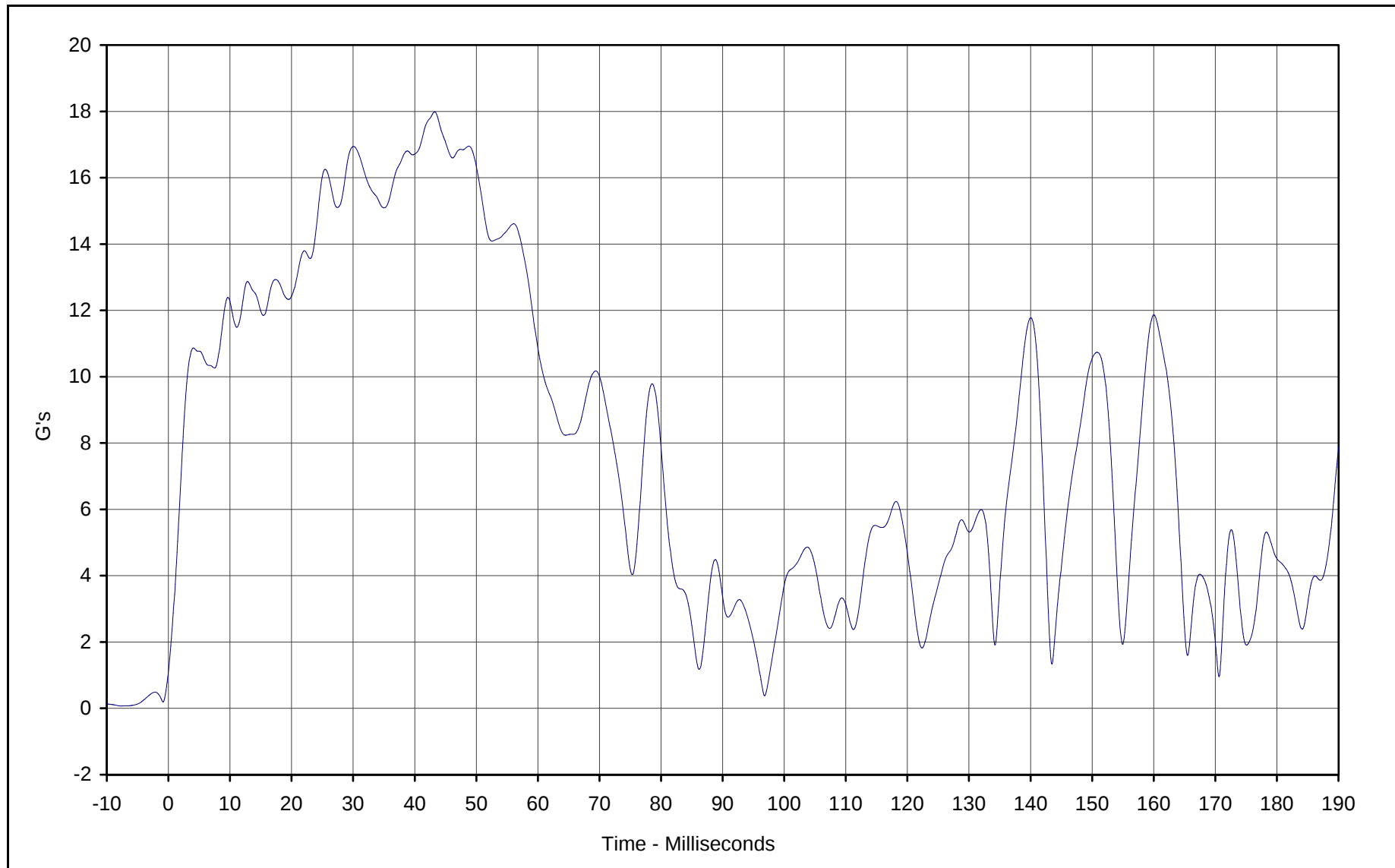




Curve Description: MDB CG Z Velocity
Maximum Value: 1.6 at 154.1 Milliseconds
Minimum Value: -2.1 at 51.5 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-055

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

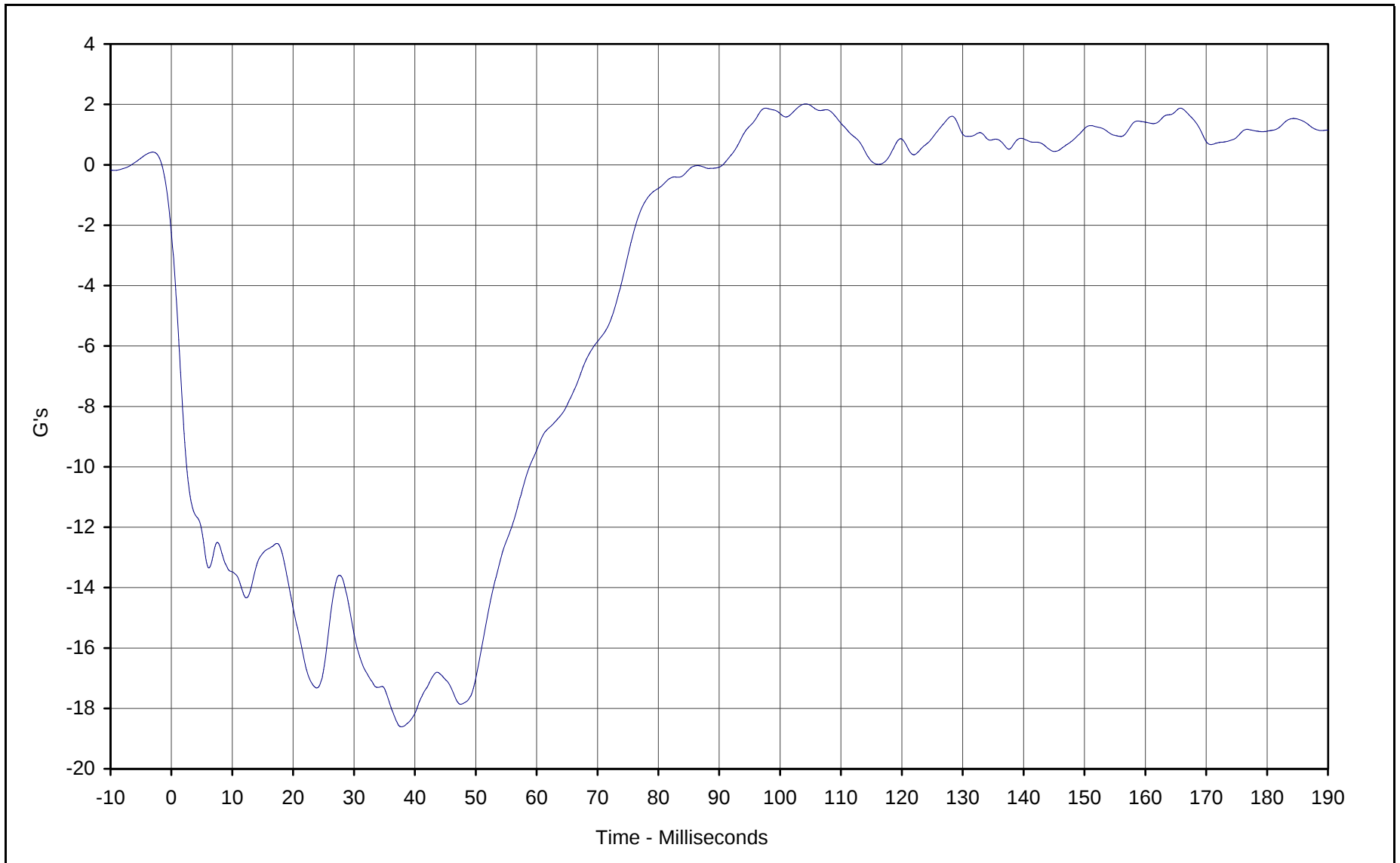




Curve Description: MDB CG Resultant
Maximum Value: 18.0 at 43.2 Milliseconds
Minimum Value: 0.4 at 96.8 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: RES-053

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

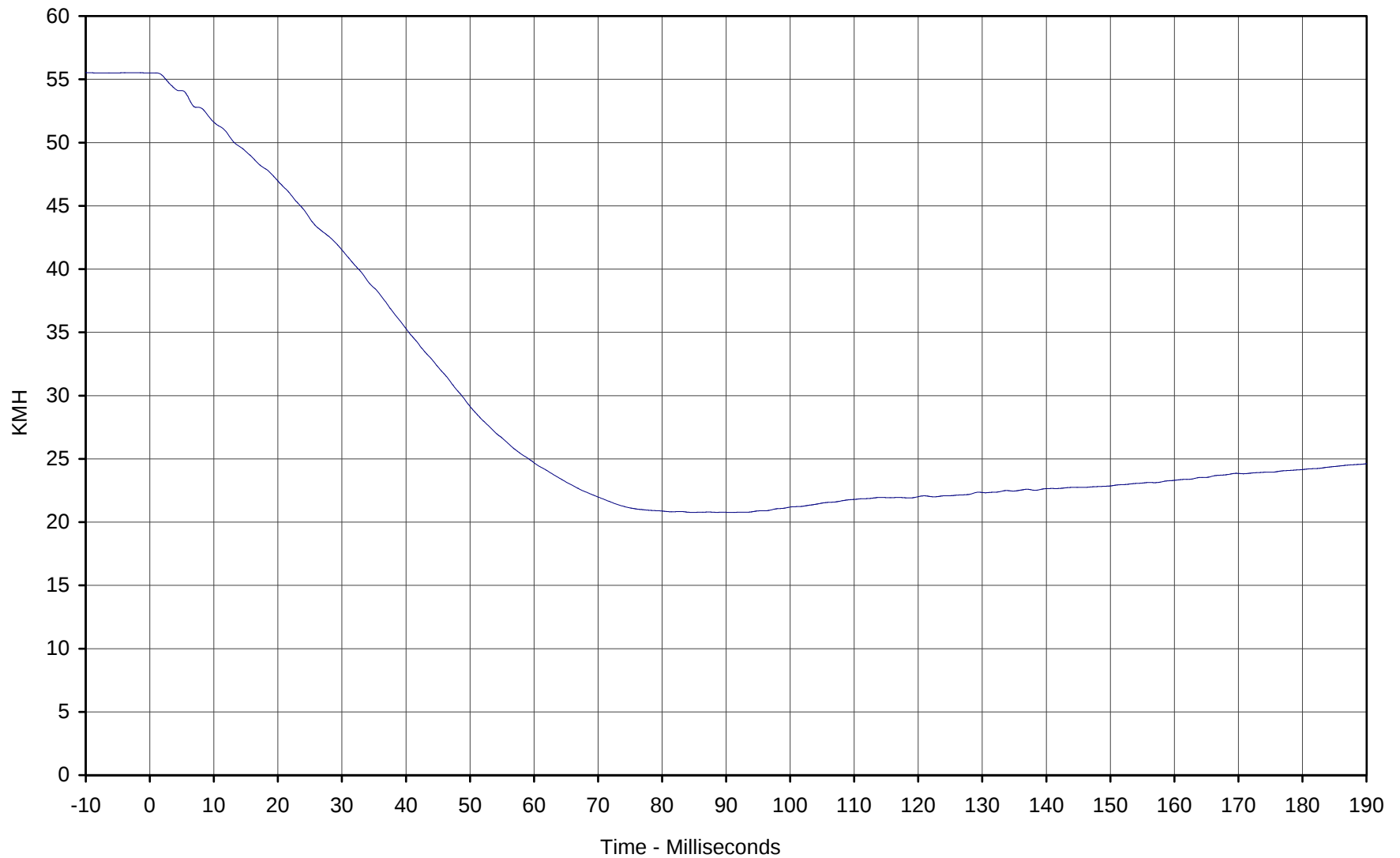




Curve Description: MDB Rear X
Maximum Value: 2.0 at 104.2 Milliseconds
Minimum Value: -18.6 at 37.8 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-056

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

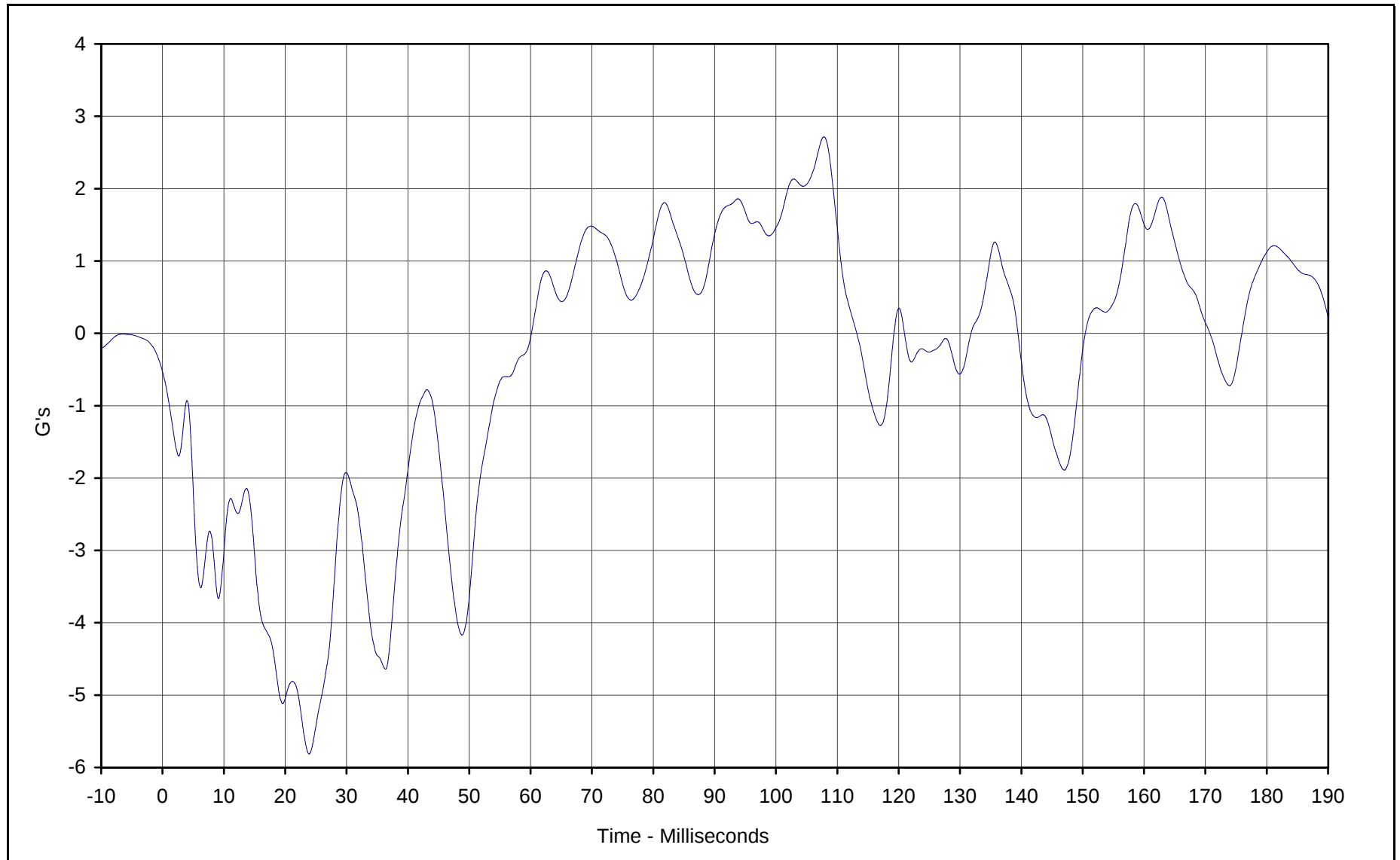




Curve Description: MDB Rear X Velocity
Maximum Value: 55.5 at 0.8 Milliseconds
Minimum Value: 20.8 at 90.9 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-056

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

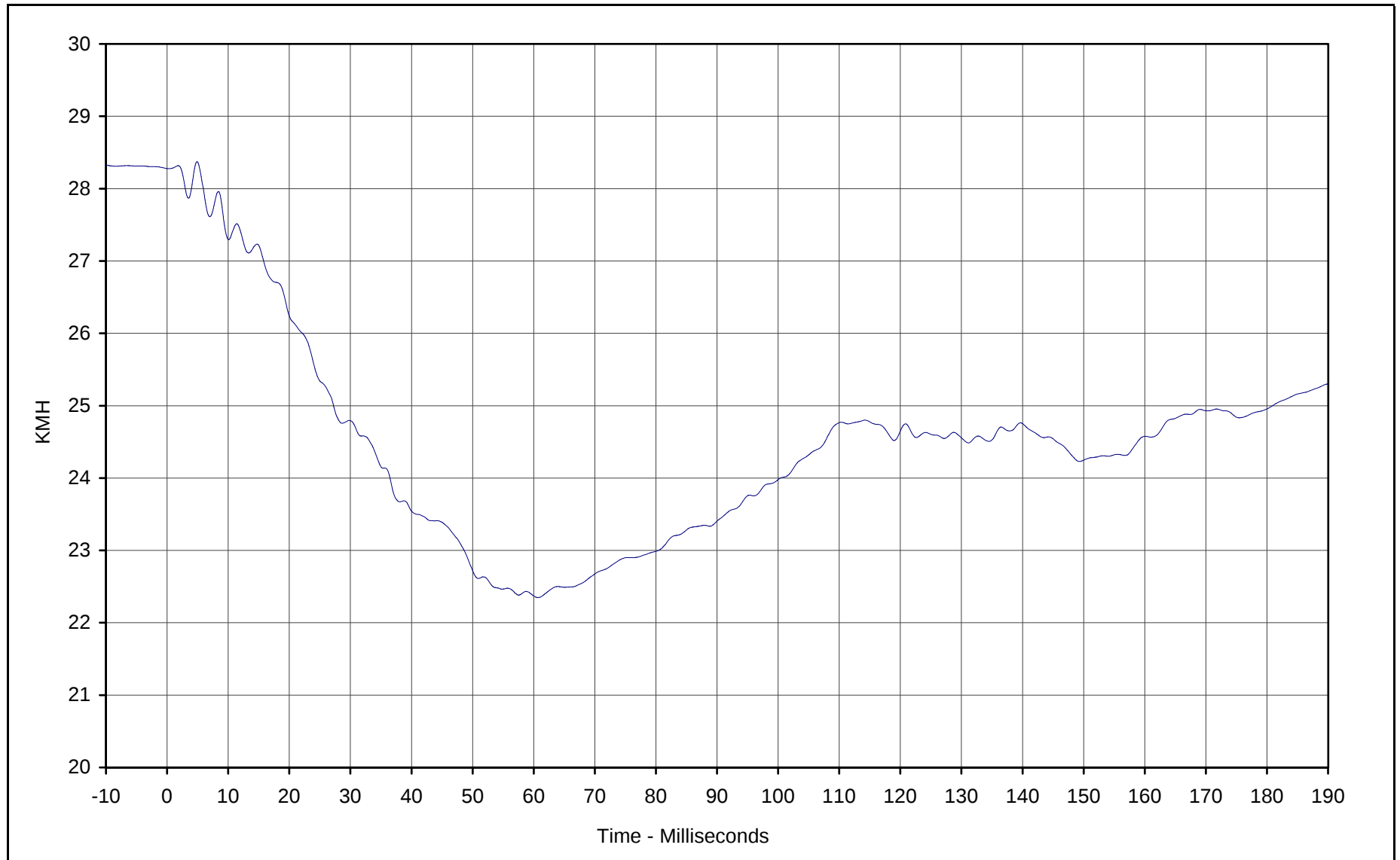




Curve Description: MDB Rear Y
Maximum Value: 2.7 at 107.8 Milliseconds
Minimum Value: -5.8 at 23.9 Milliseconds
SAE Filter Class: 60
Date of Test: 9/25/01
Curve Number: FIL-057

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

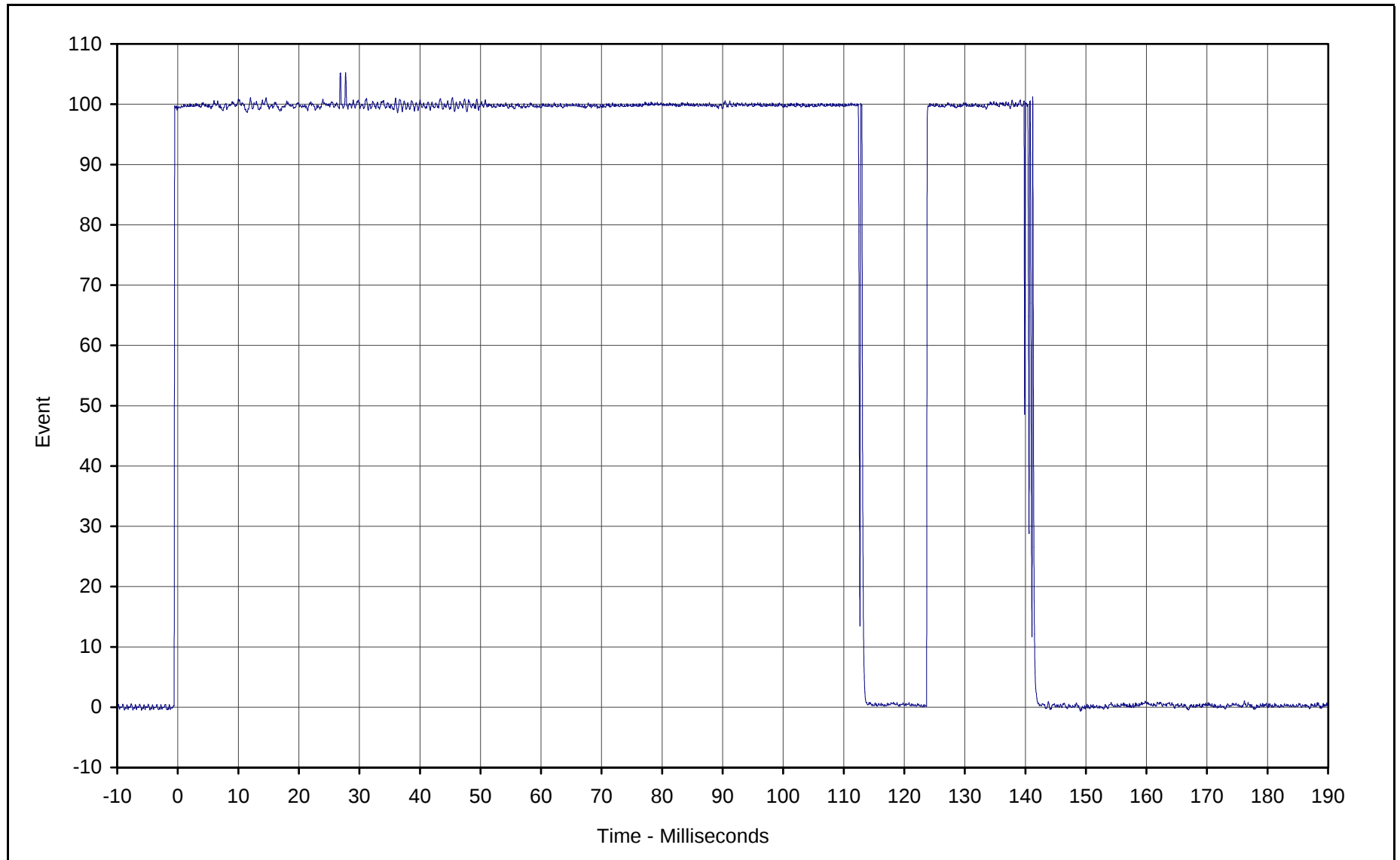




Curve Description: MDB Rear Y Velocity
Maximum Value: 28.4 at 4.9 Milliseconds
Minimum Value: 22.3 at 60.7 Milliseconds
SAE Filter Class: 180
Date of Test: 9/25/01
Curve Number: IN1-057

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

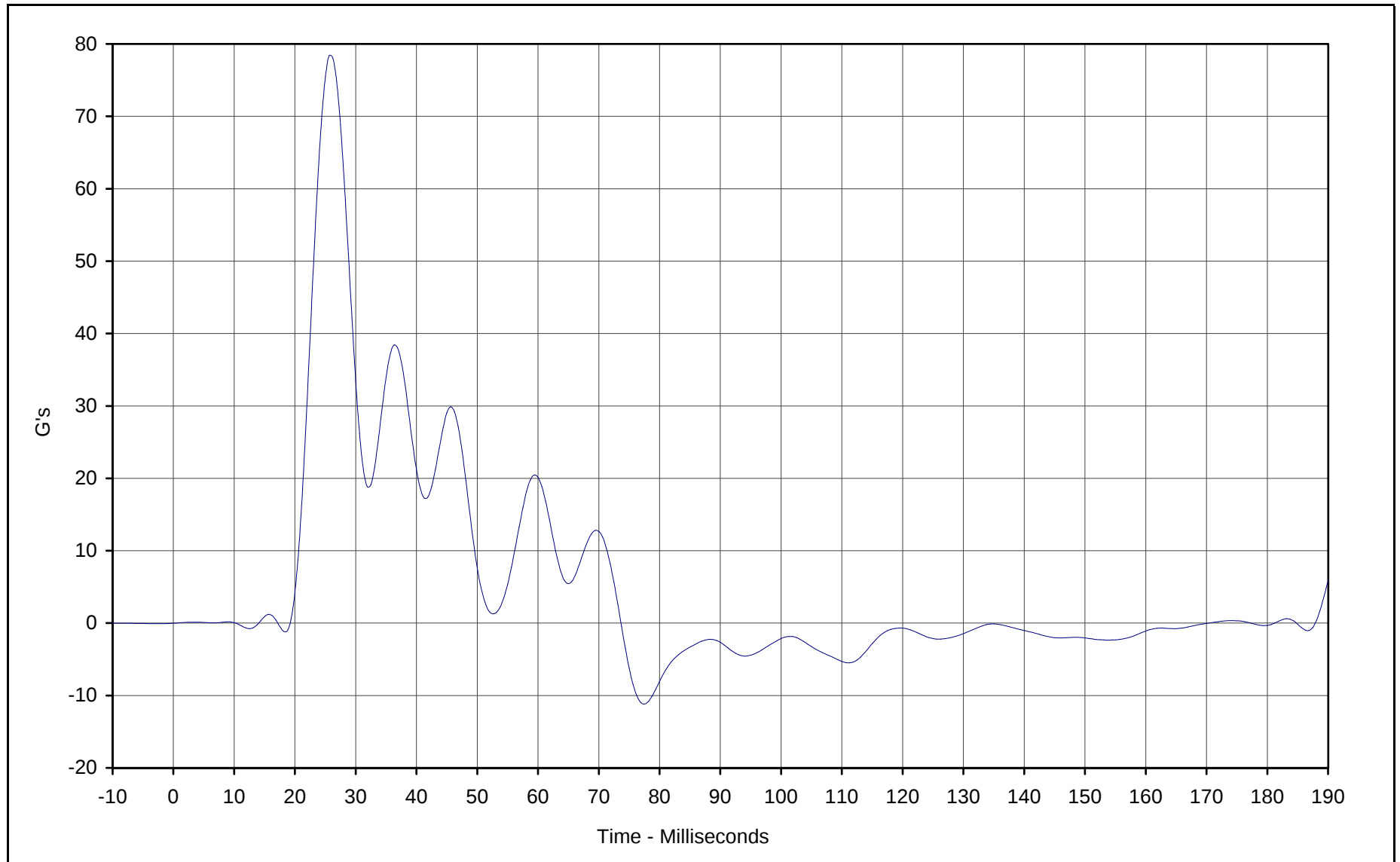




Curve Description: MDB Right Bumper Contact
Maximum Value: 105.1 at 26.8 Milliseconds
Crossing Point: 50% at -0.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/25/01
Curve Number: FIL-058

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

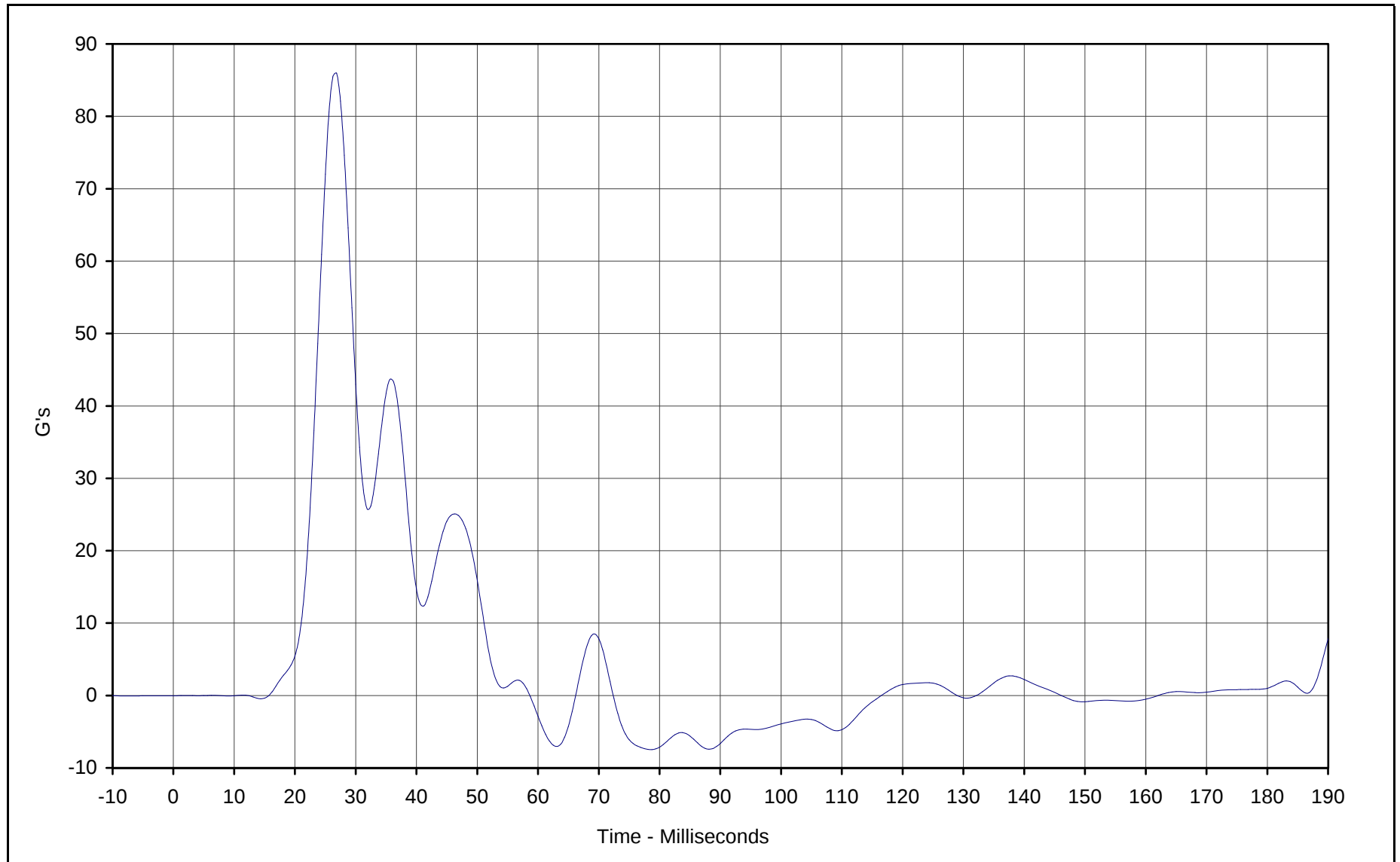




Curve Description: Driver Upper Rib Primary Y
Maximum Value: 78.4 at 25.6 Milliseconds
Minimum Value: -11.2 at 77.5 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-004

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

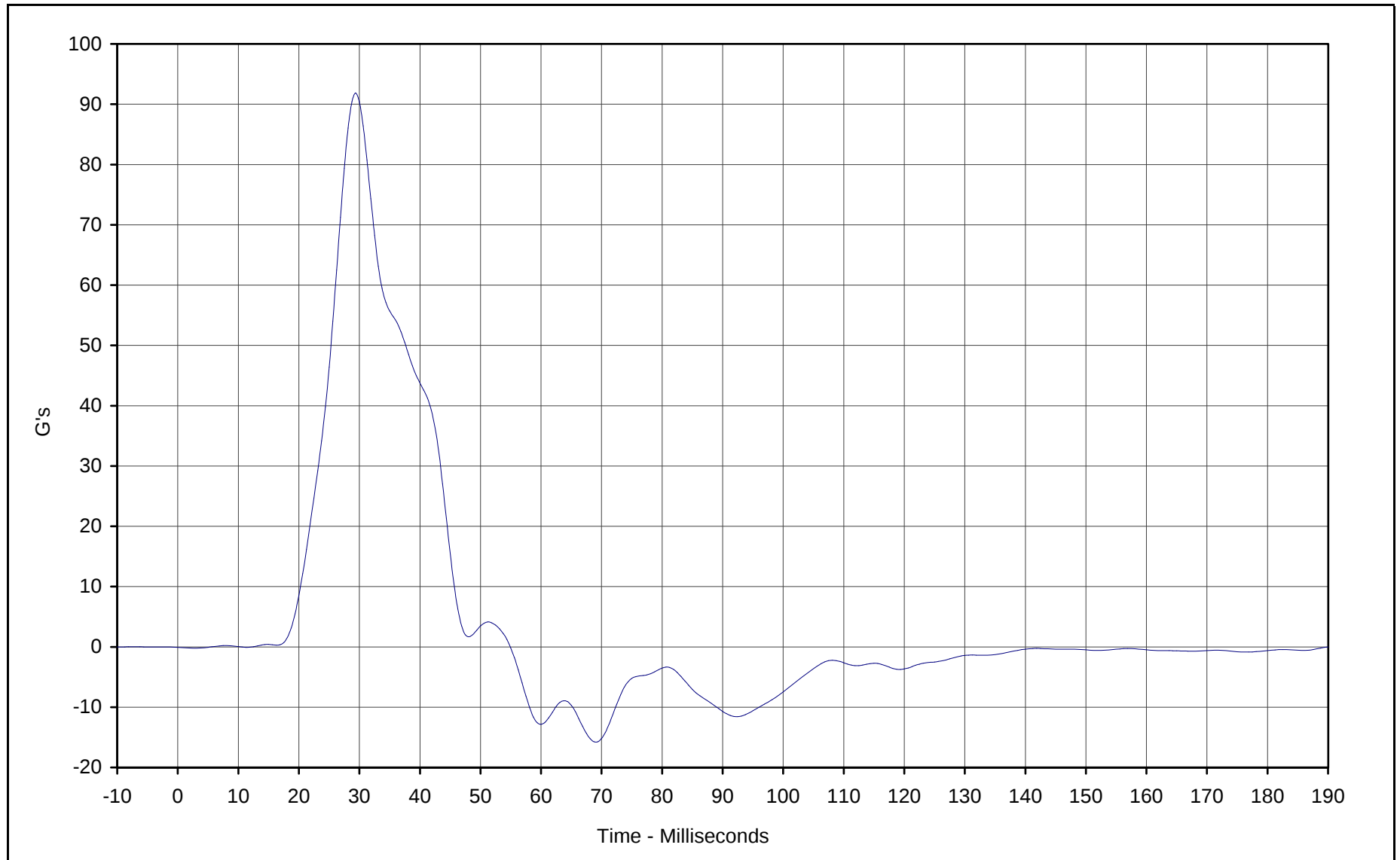




Curve Description: Driver Lower Rib Primary Y
Maximum Value: 85.9 at 26.9 Milliseconds
Minimum Value: -7.5 at 78.8 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-005

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

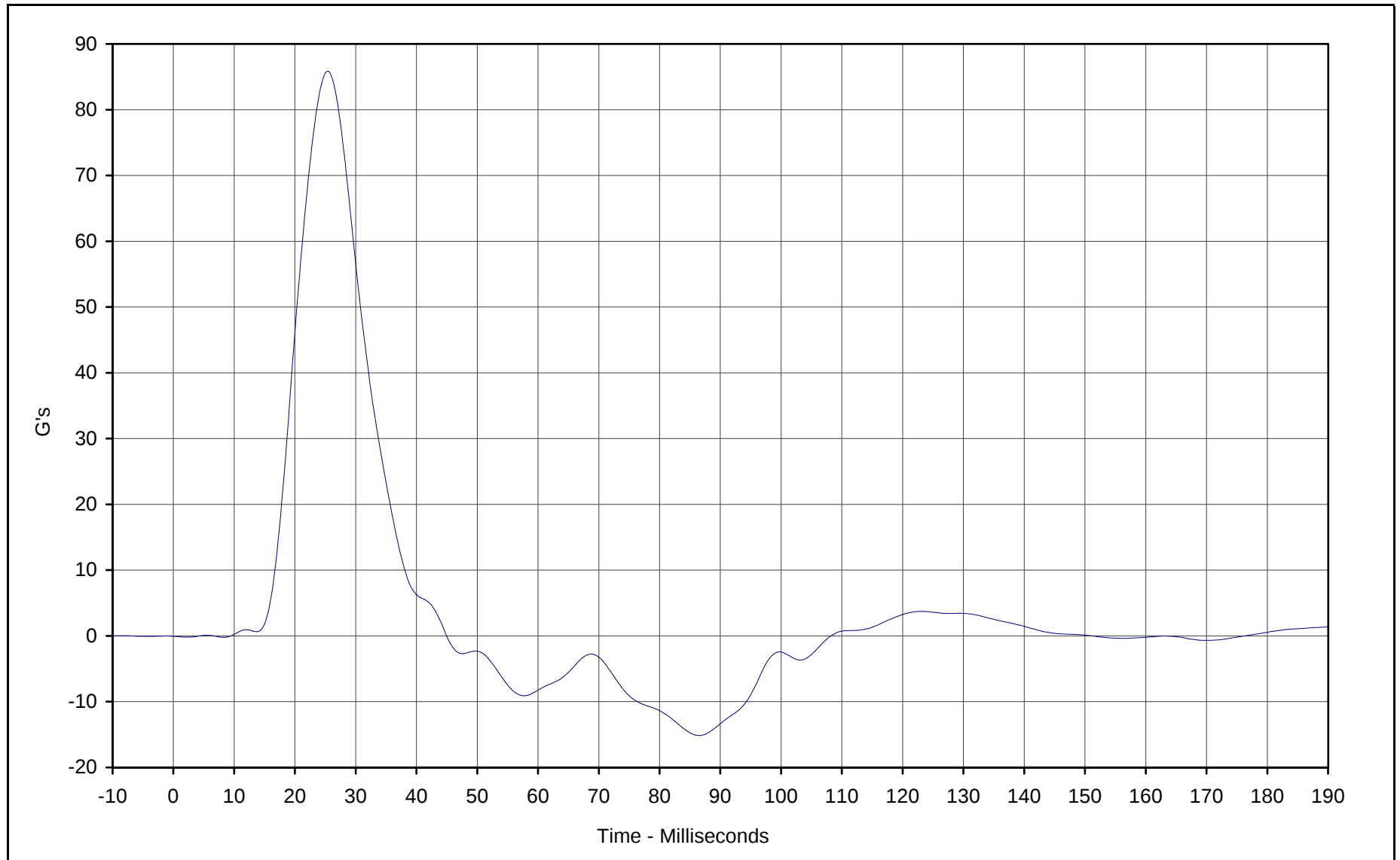




Curve Description: Driver Lower Spine Primary Y
Maximum Value: 91.9 at 29.4 Milliseconds
Minimum Value: -15.7 at 68.8 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-006

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

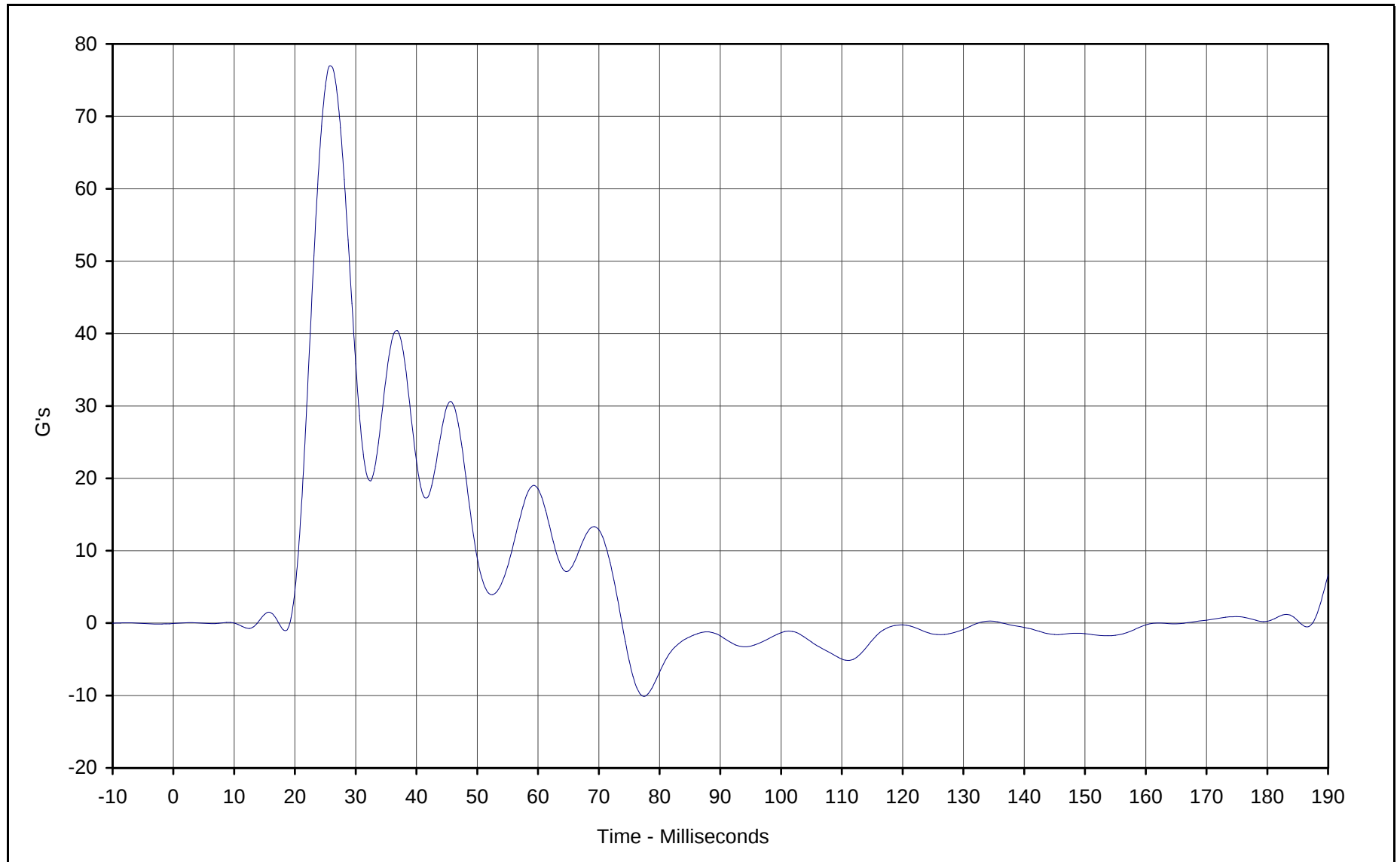




Curve Description: Driver Pelvis Primary Y
Maximum Value: 85.8 at 25.6 Milliseconds
Minimum Value: -15.1 at 86.3 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-007

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

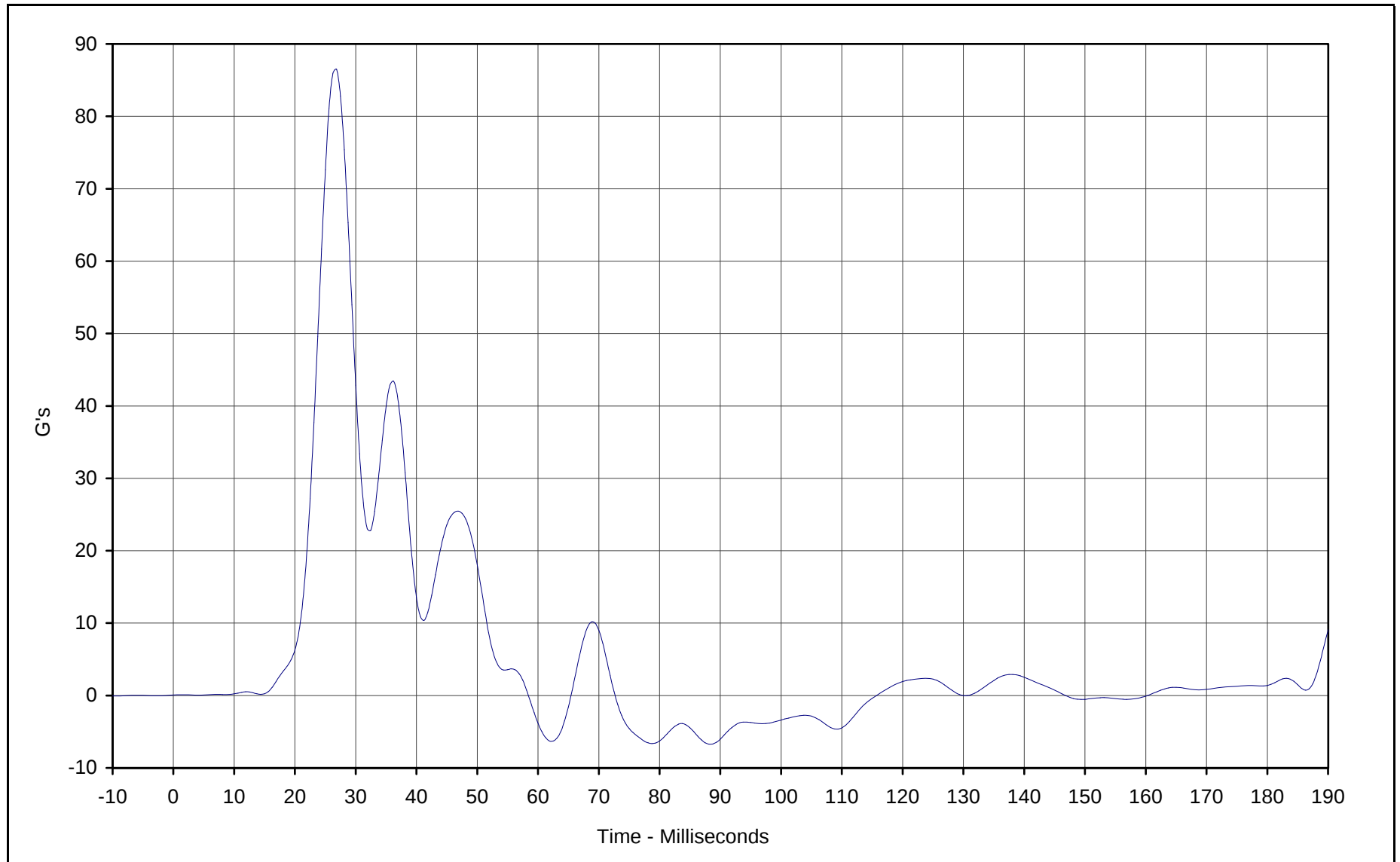




Curve Description: Driver Upper Rib Redundant Y
Maximum Value: 76.9 at 25.6 Milliseconds
Minimum Value: -10.1 at 77.5 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-008

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

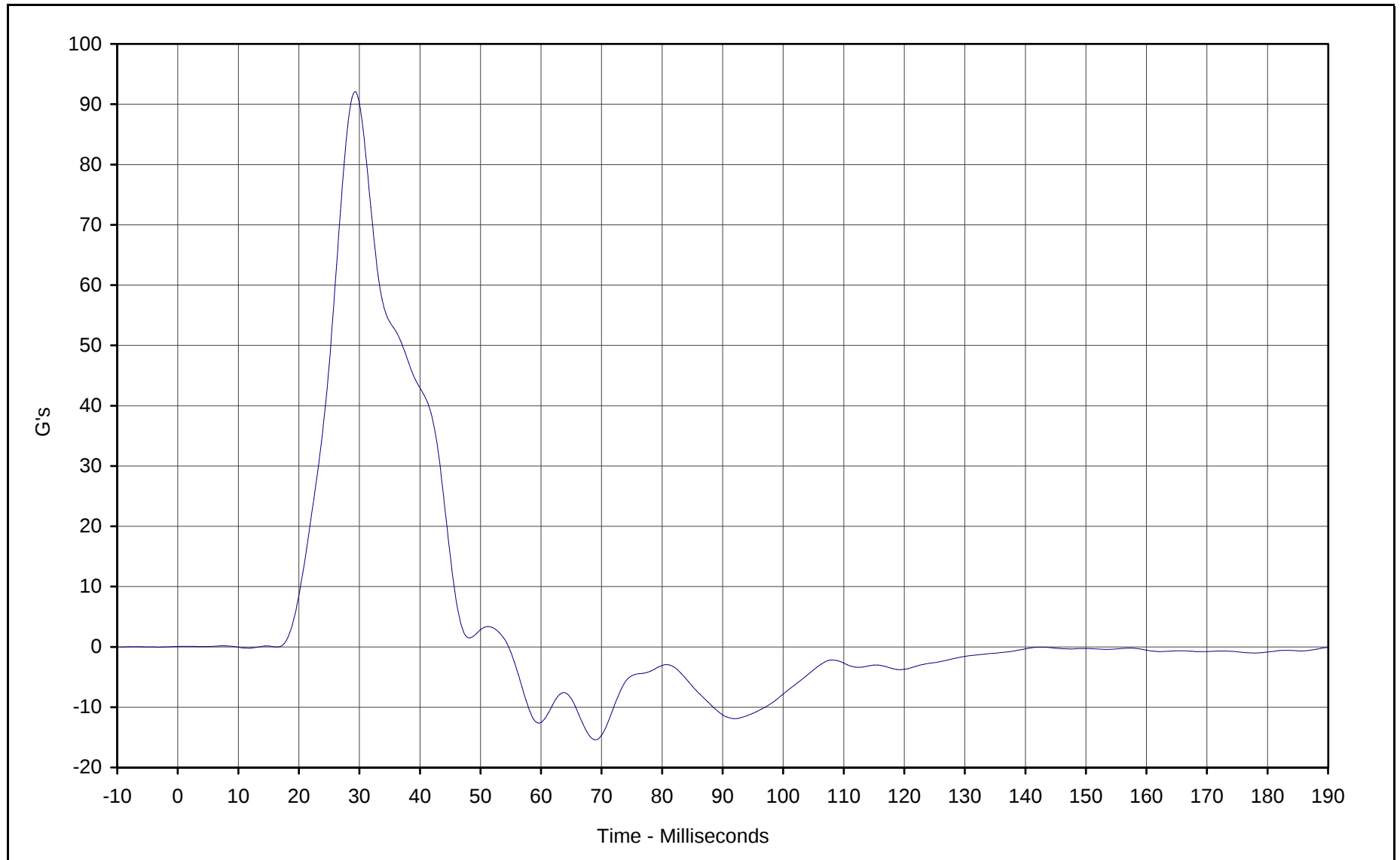




Curve Description: Driver Lower Rib Redundant Y
Maximum Value: 86.5 at 26.9 Milliseconds
Minimum Value: -6.7 at 88.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-009

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

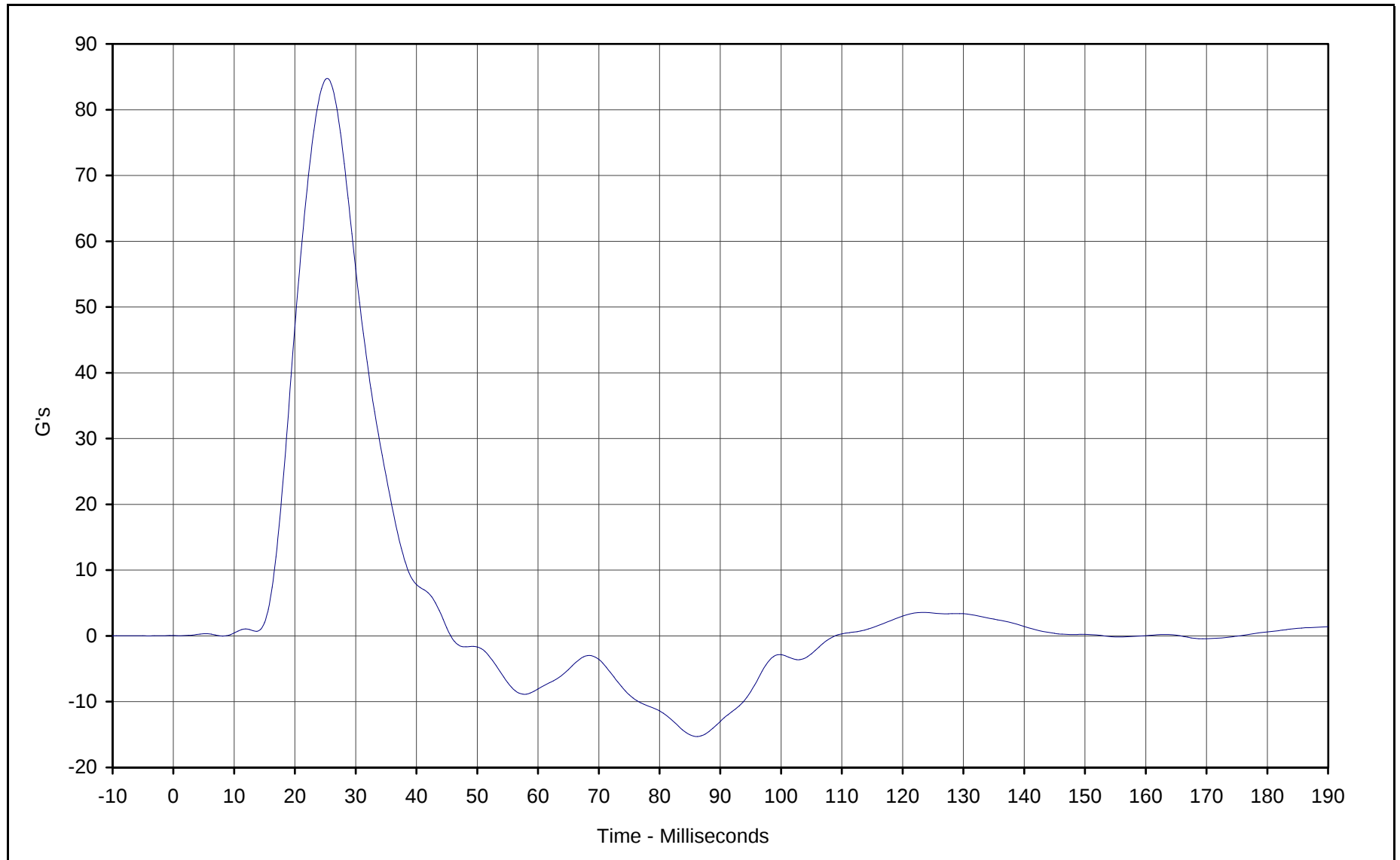




Curve Description: Driver Lower Spine Redundant Y
Maximum Value: 92.1 at 29.4 Milliseconds
Minimum Value: -15.4 at 68.8 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-010

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

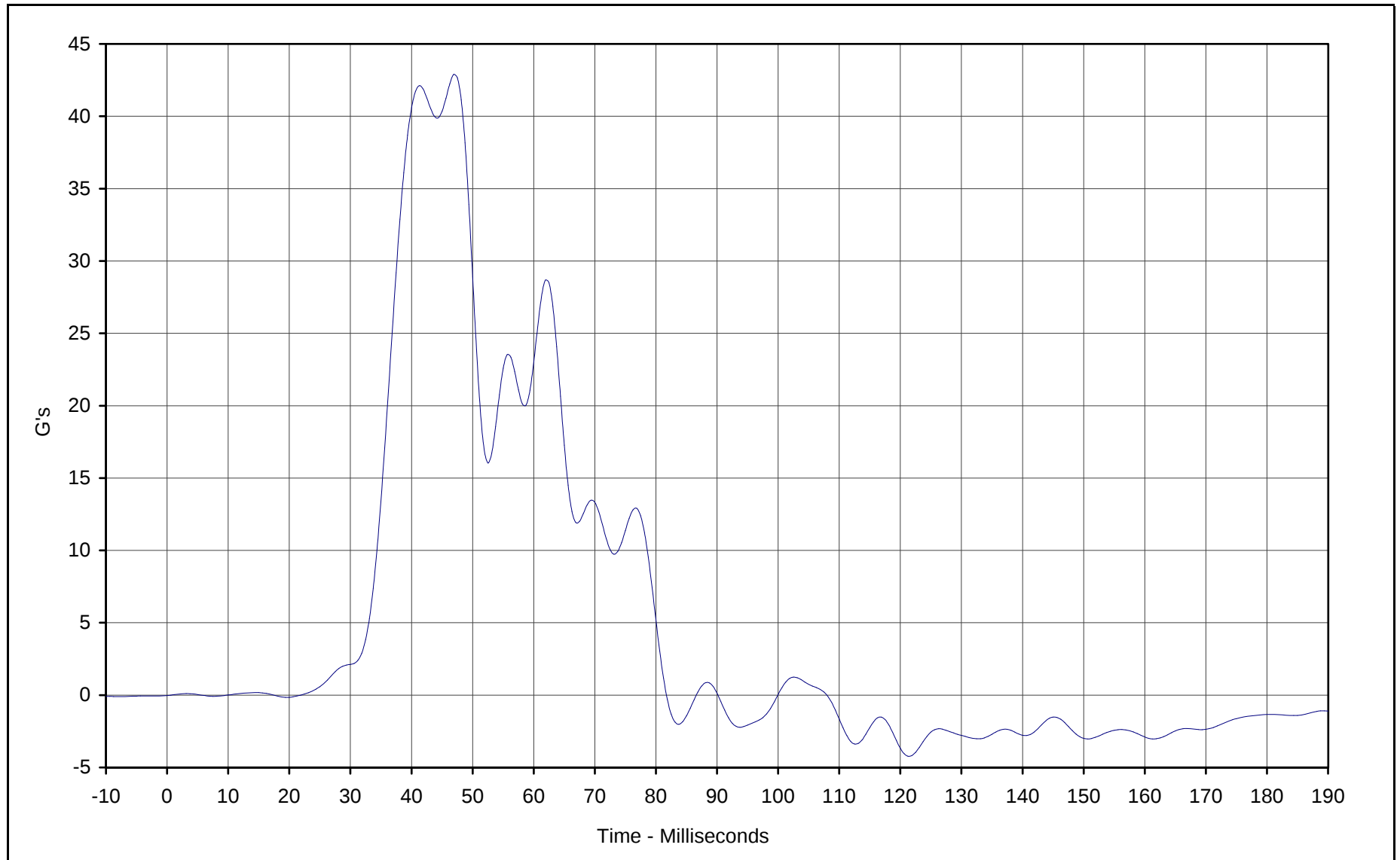




Curve Description: Driver Pelvis Redundant Y
Maximum Value: 84.6 at 25.0 Milliseconds
Minimum Value: -15.3 at 86.3 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-011

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

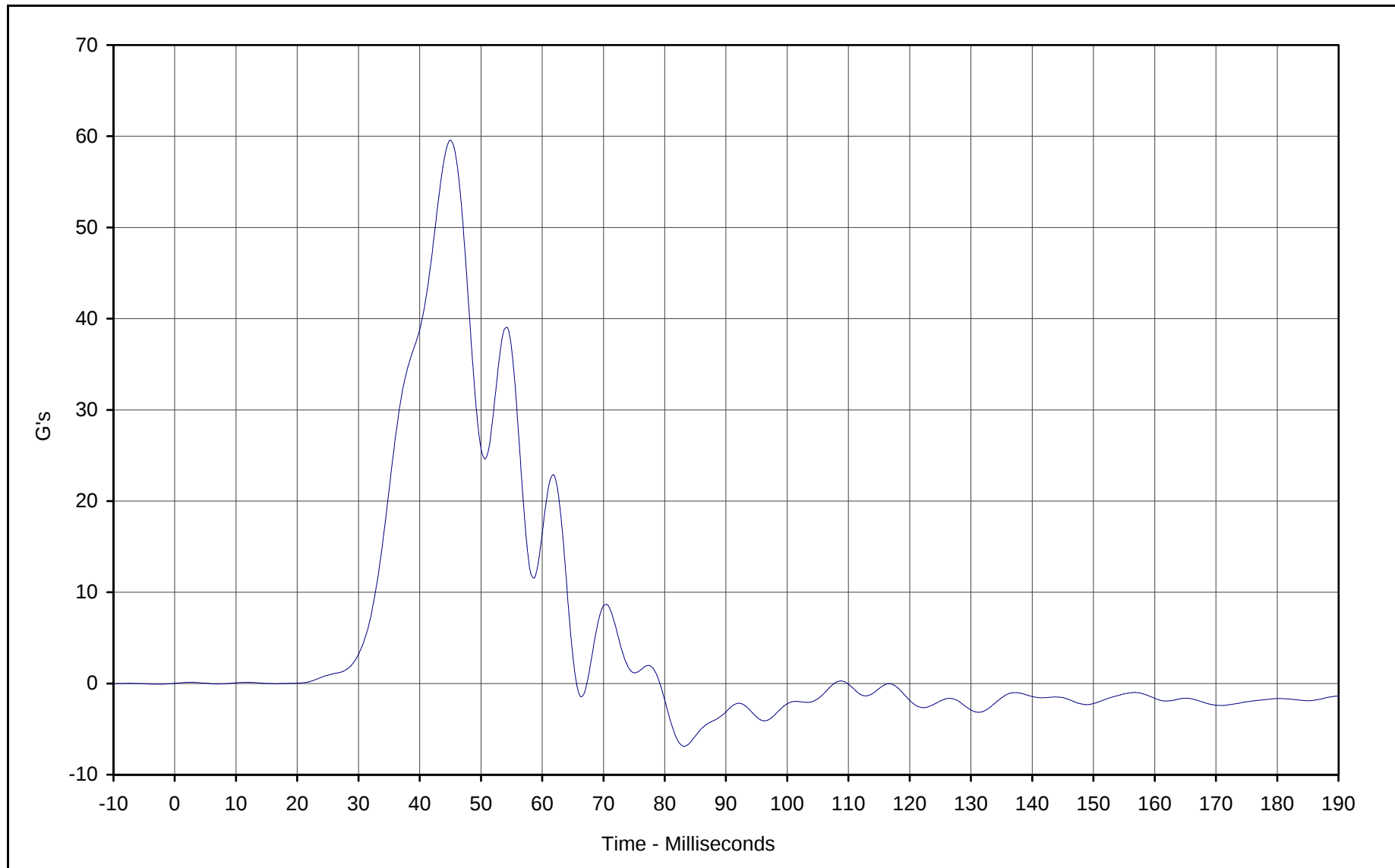




Curve Description: Pass. Upper Rib Primary Y
Maximum Value: 42.9 at 46.9 Milliseconds
Minimum Value: -4.2 at 121.3 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-017

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

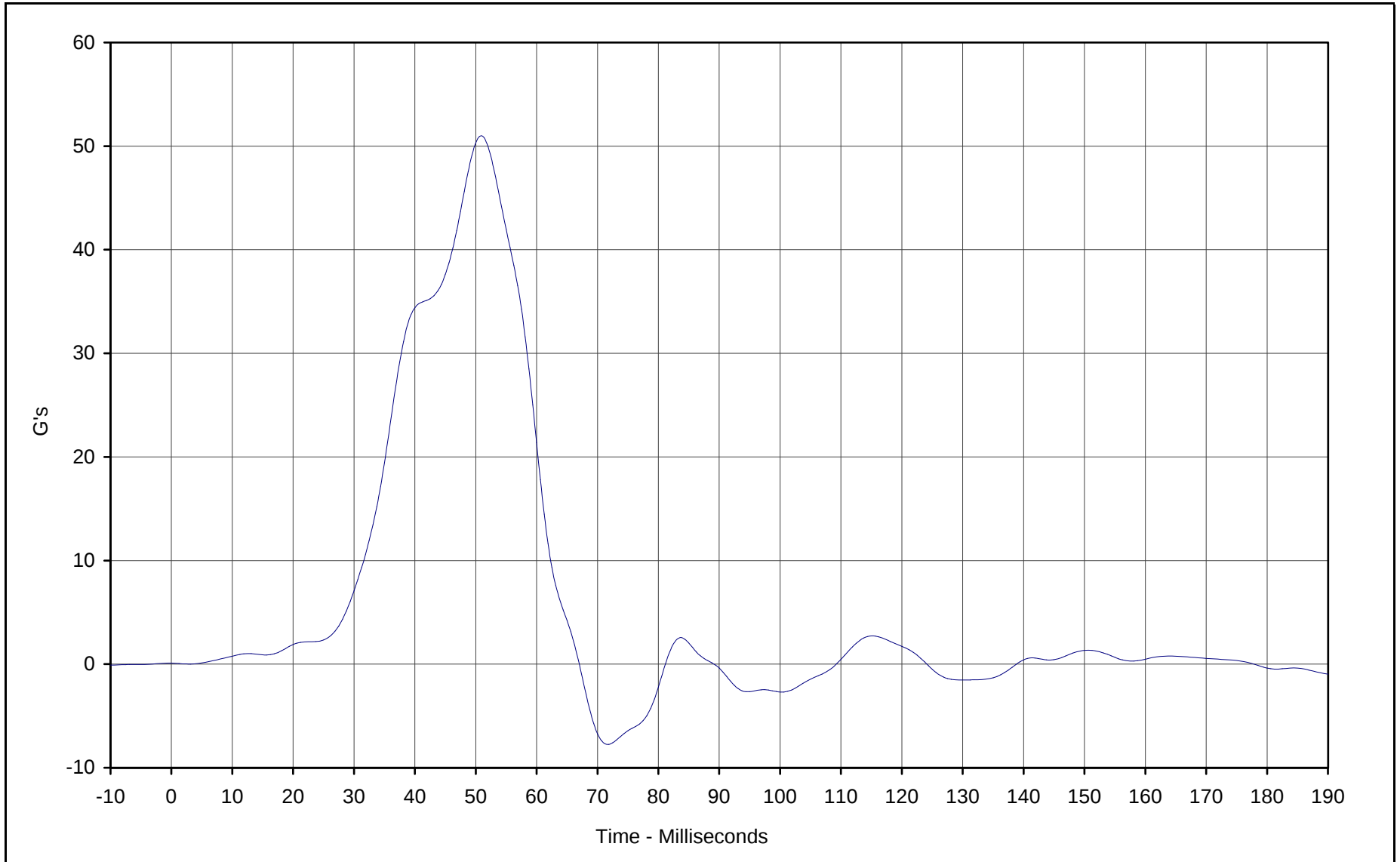




Curve Description: Pass. Lower Rib Primary Y
Maximum Value: 59.6 at 45.0 Milliseconds
Minimum Value: -6.9 at 83.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-018

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

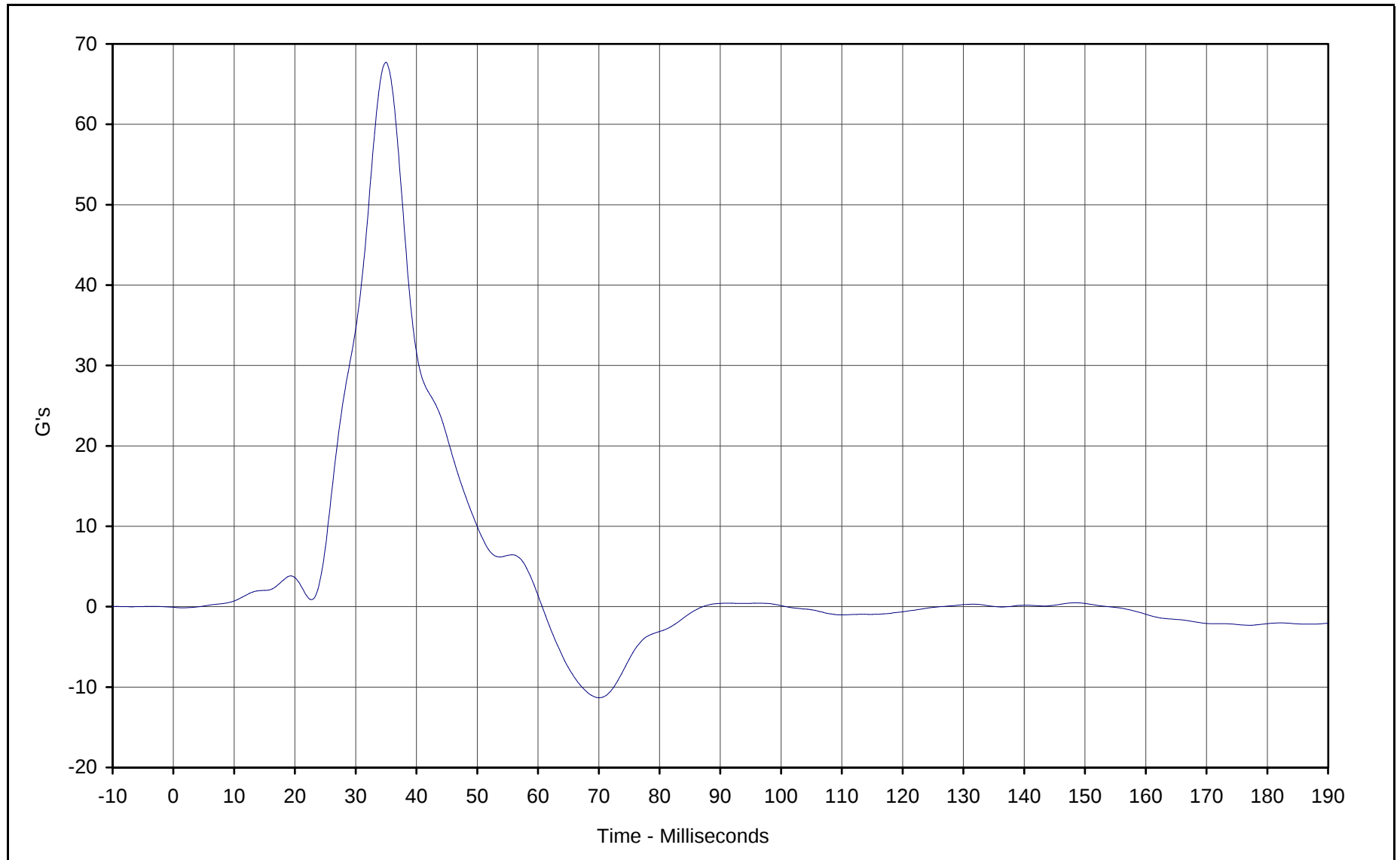




Curve Description: Pass. Lower Spine Primary Y
Maximum Value: 50.9 at 50.6 Milliseconds
Minimum Value: -7.7 at 71.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-019

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

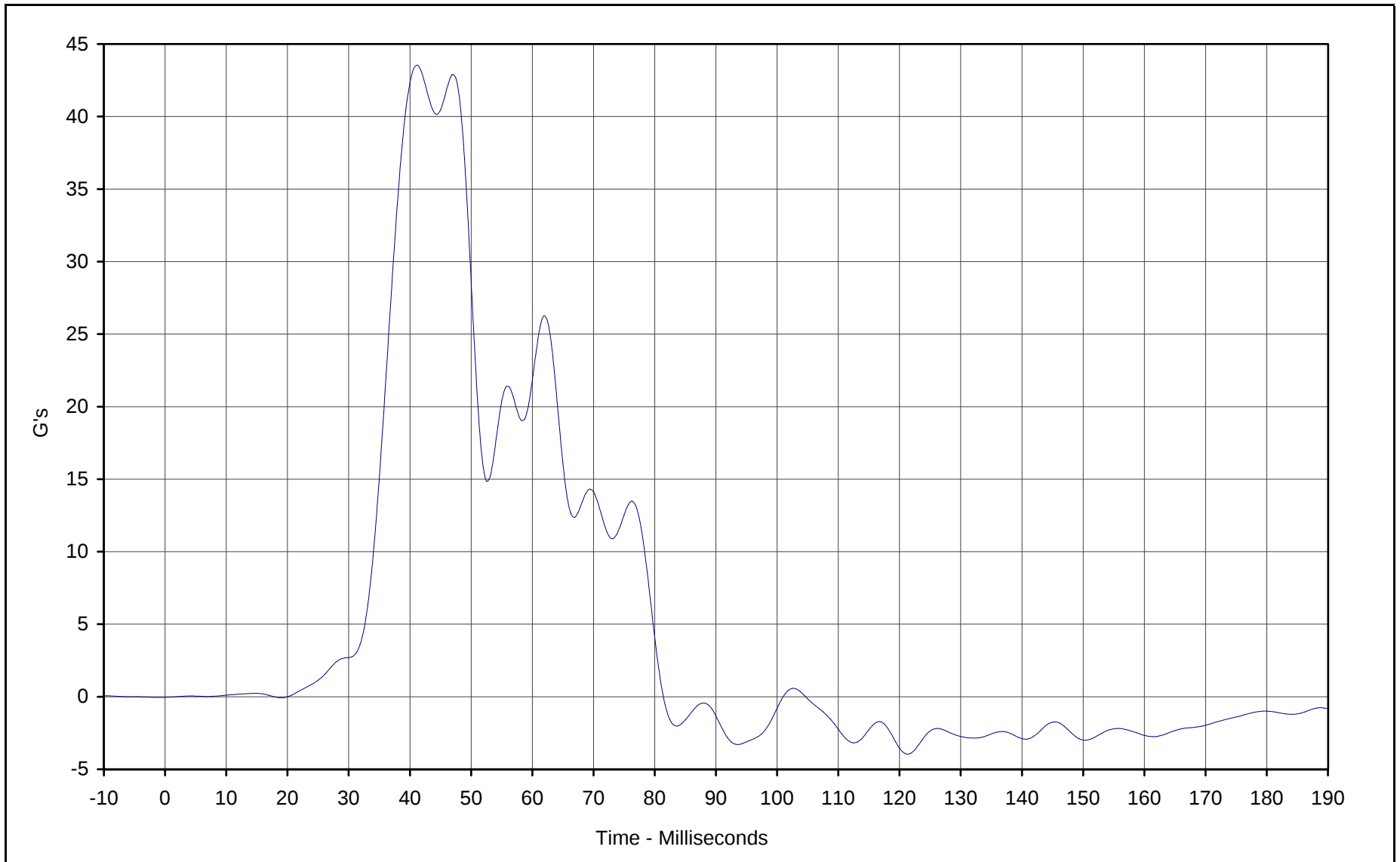




Curve Description: Pass. Pelvis Primary Y
Maximum Value: 67.7 at 35.0 Milliseconds
Minimum Value: -11.3 at 70.0 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-020

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

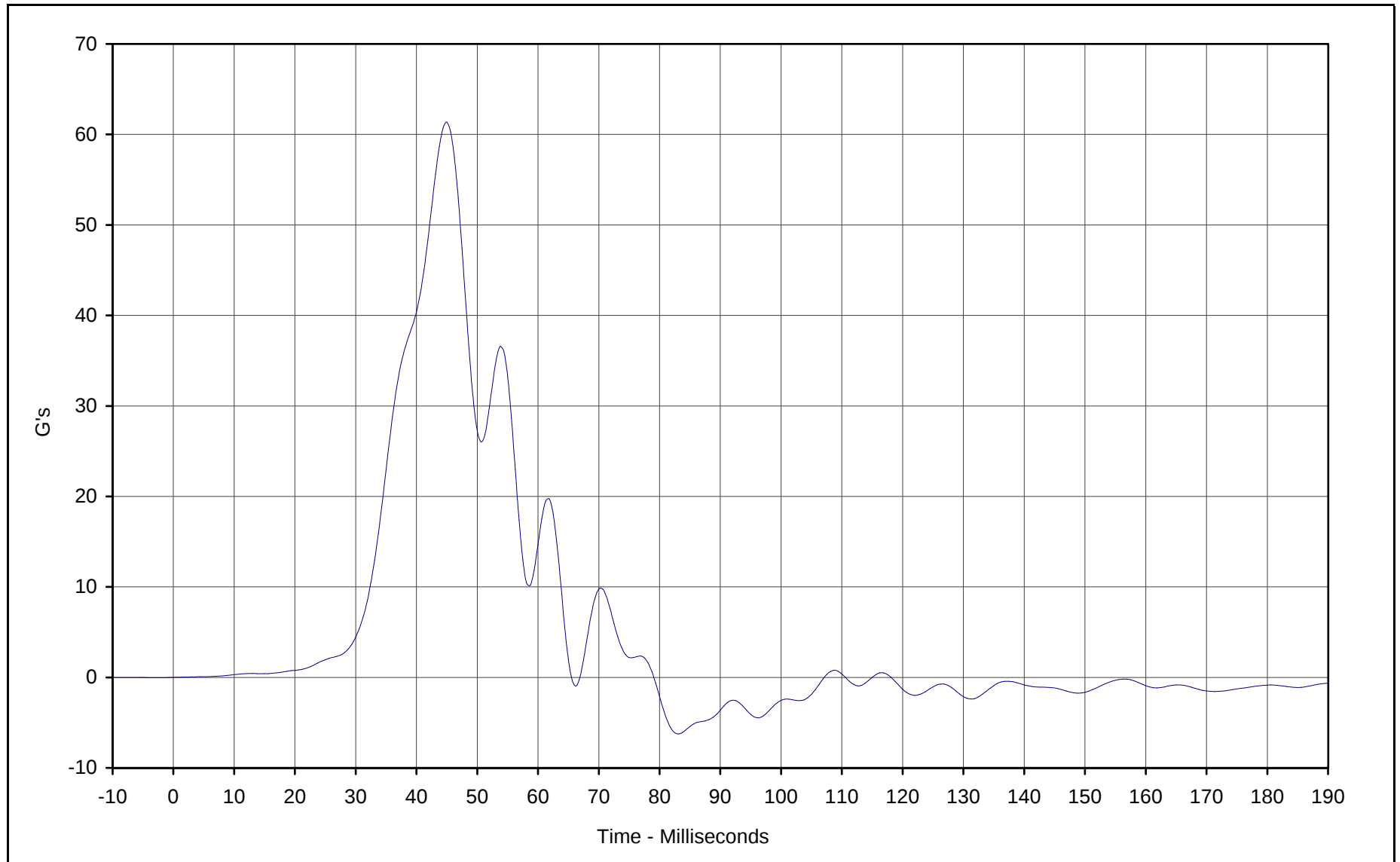




Curve Description: Pass. Upper Rib Redundant Y
Maximum Value: 43.5 at 41.3 Milliseconds
Minimum Value: -4.0 at 121.3 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-021

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

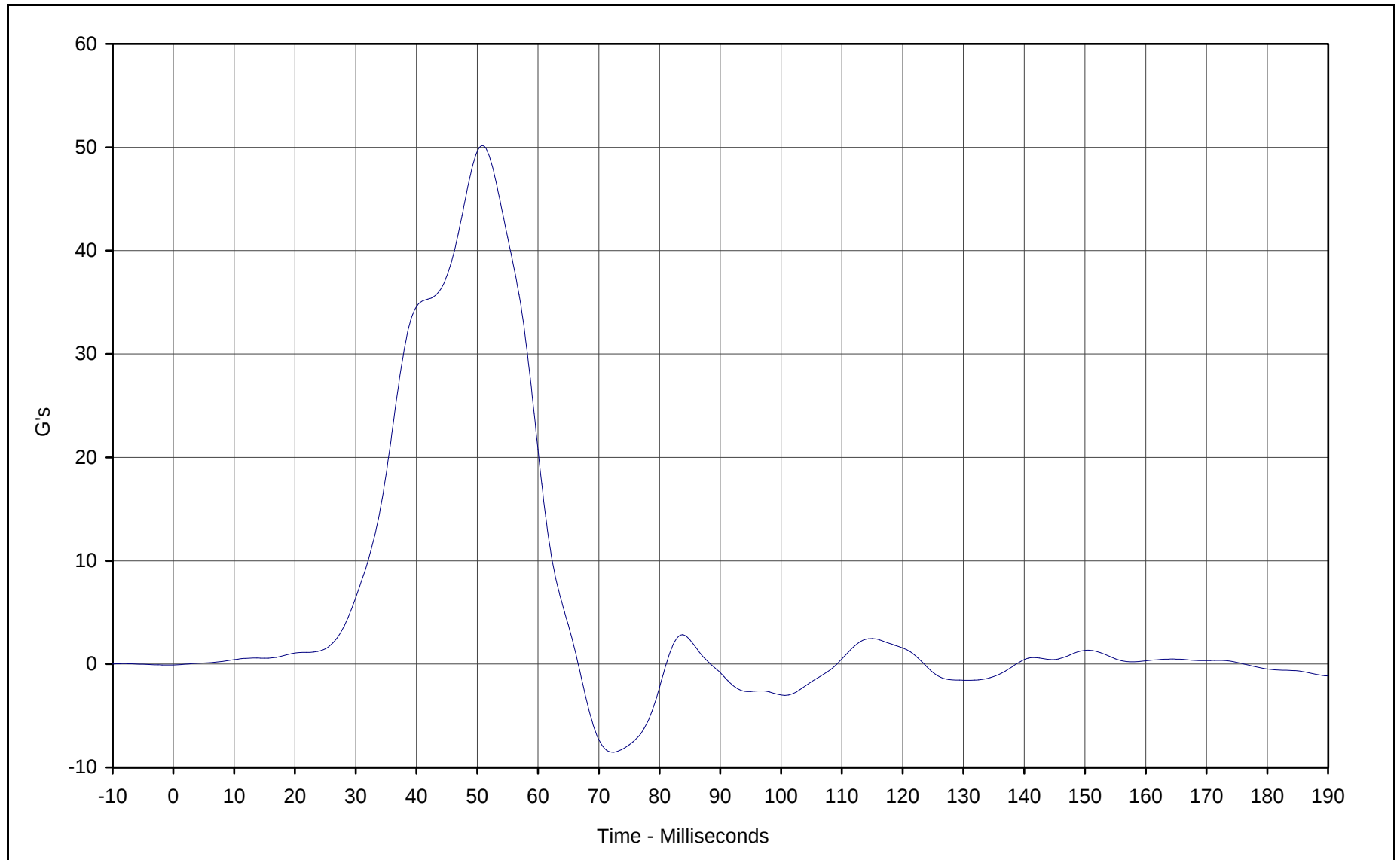




Curve Description: Pass. Lower Rib Redundant Y
Maximum Value: 61.4 at 45.0 Milliseconds
Minimum Value: -6.2 at 83.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-022

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan

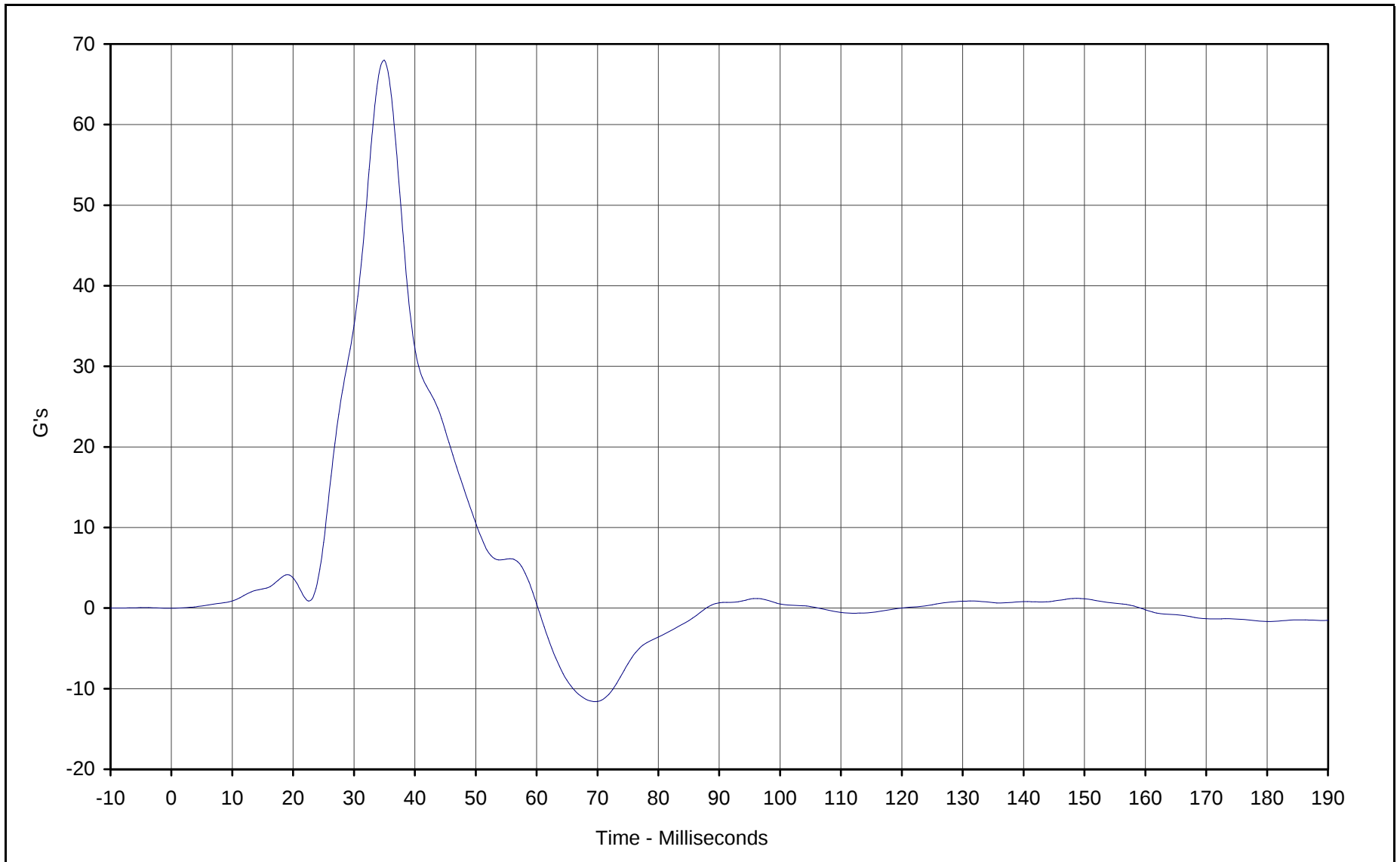




Curve Description: Pass. Lower Spine Redundant Y
Maximum Value: 50.1 at 50.6 Milliseconds
Minimum Value: -8.5 at 72.5 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-023

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan





Curve Description: Pass. Pelvis Redundant Y
Maximum Value: 68.0 at 35.0 Milliseconds
Minimum Value: -11.6 at 69.4 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/25/01
Curve Number: FIR-024

Test Program: 55/28 km/h Side Impact NCAP No.: GM0005
Test Vehicle: 2002 Saturn L100 4 Door Sedan



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	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

September 20, 2001

Test Date

Approved By

Date



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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: TI09A

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	39.3	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	38.7	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	18.4	Pass
Overall Test Results				Pass

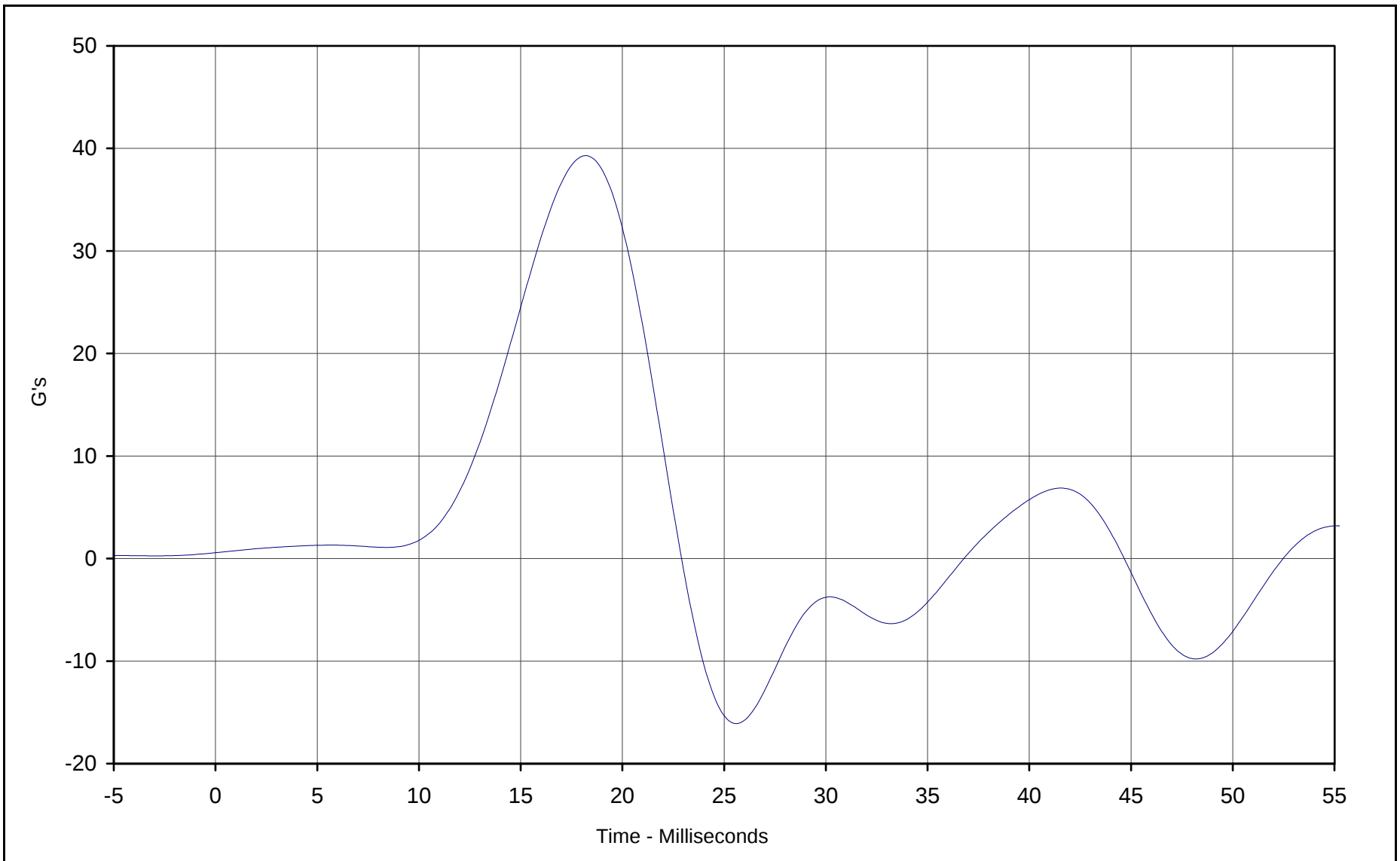
Laboratory Technician

September 20, 2001
Test Date

Approved By

Date

C-3



Curve Description: Left Upper Rib Y Acceleration

Maximum Value: 39.3 at 18.2 Milliseconds

Minimum Value: -16.1 at 25.6 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 9/20/01

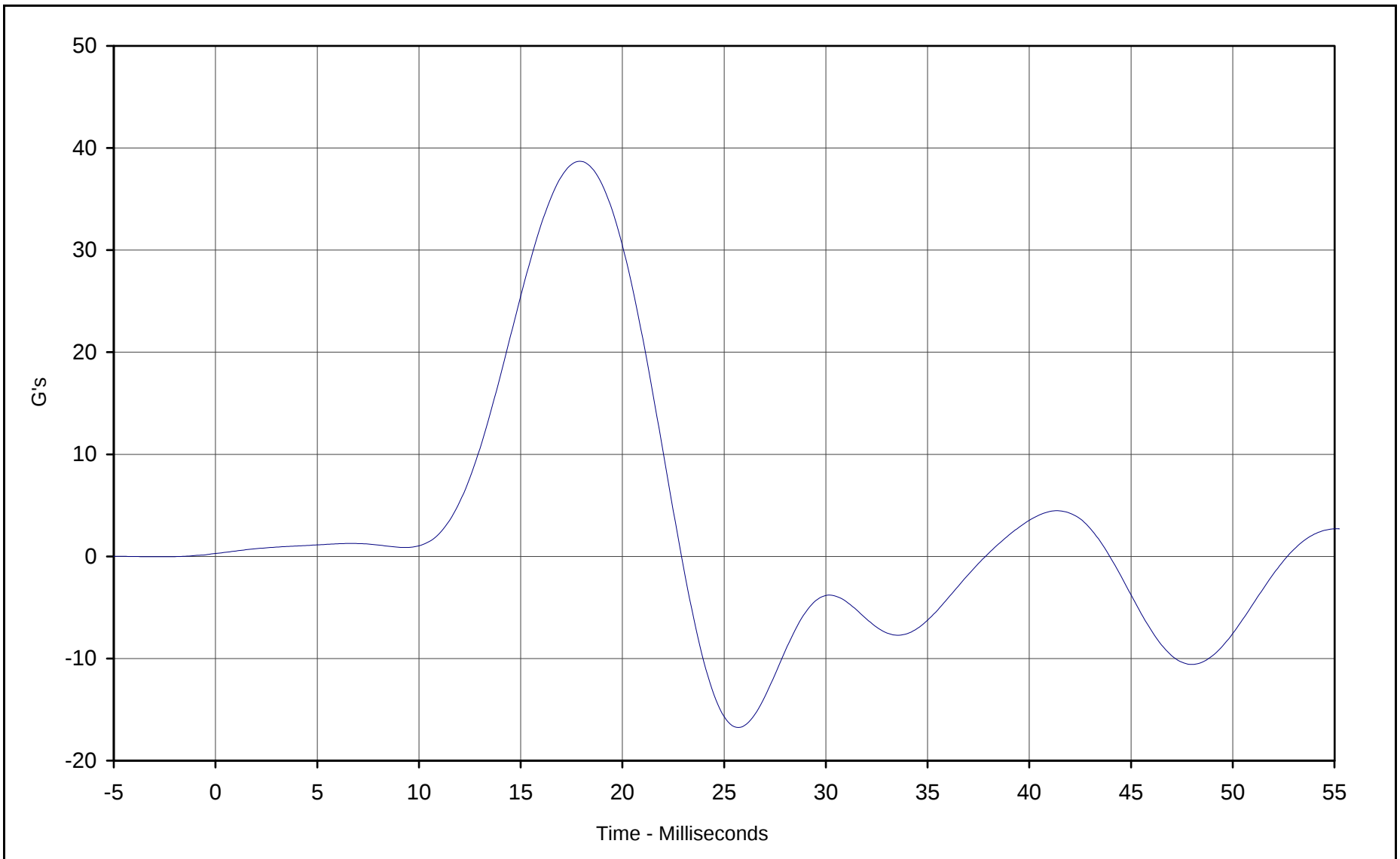
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 274 Test I.D.: TI09A



KAR21063-01

C-4



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 38.7 at 17.9 Milliseconds

Minimum Value: -16.8 at 25.7 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 9/20/01

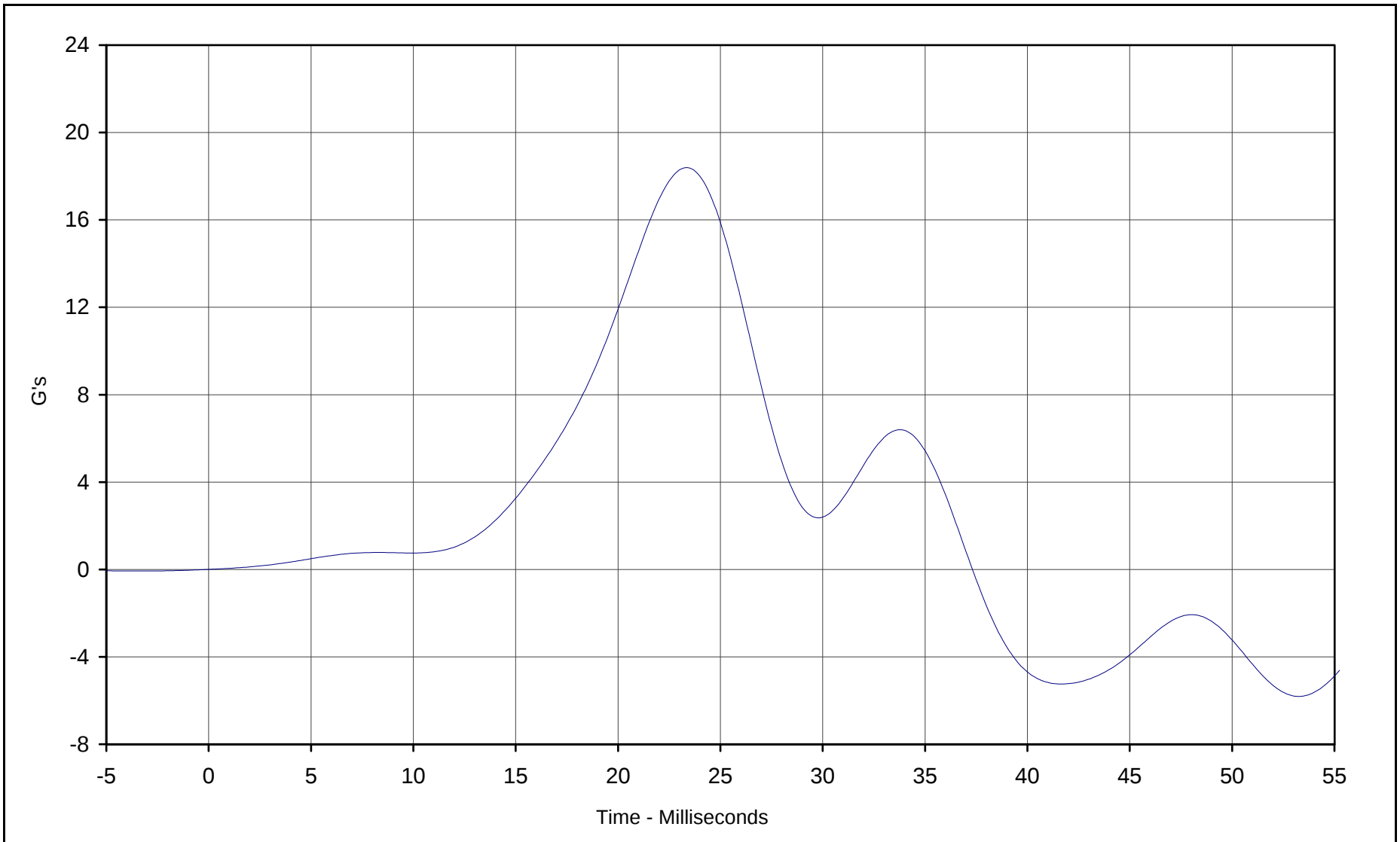
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 274 Test I.D.: TI09A



KAR21063-01

C-5



Curve Description: Lower Spine Y Acceleration
Maximum Value: 18.4 at 23.4 Milliseconds
Minimum Value: -5.8 at 53.2 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/20/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 274 Test I.D.: TI09A



KAR21063-01



Performance Verification Data

Side Impact Dummy (SID)

Left Side Pelvis Lateral Impact

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: PI09A

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	41.4	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

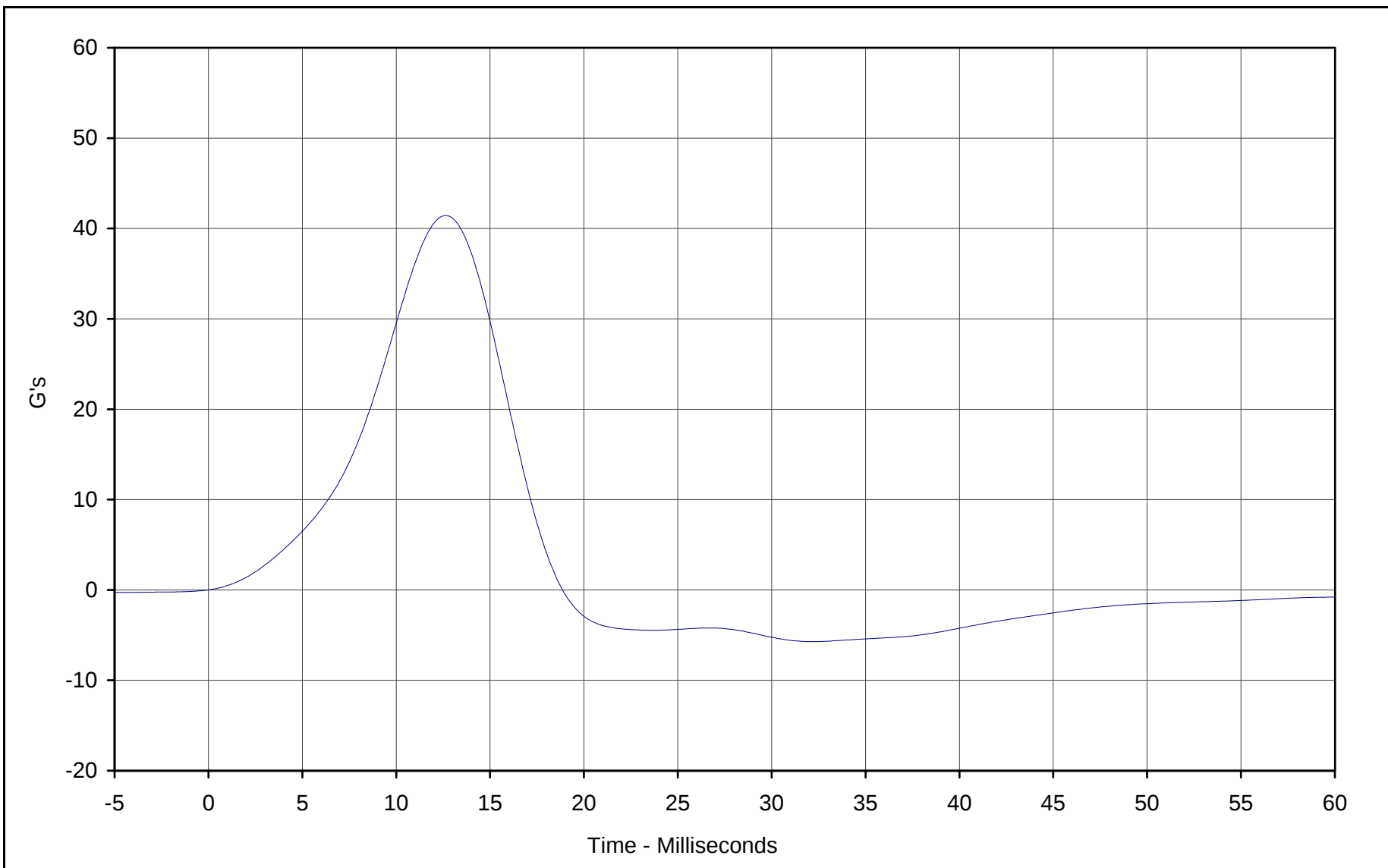
September 20, 2001

Test Date

Approved By

Date

C-7



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 41.4 at 12.6 Milliseconds
Minimum Value: -5.7 at 32.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/20/01

Test Program: SID Left Side Pelvis Lateral Impact
Test Information: SID S/N: 274 Test I.D.: PI09A



KAR21063-01



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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: AB09A

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	28.9	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	83.6	Pass
Overall Test Results				Pass

Laboratory Technician

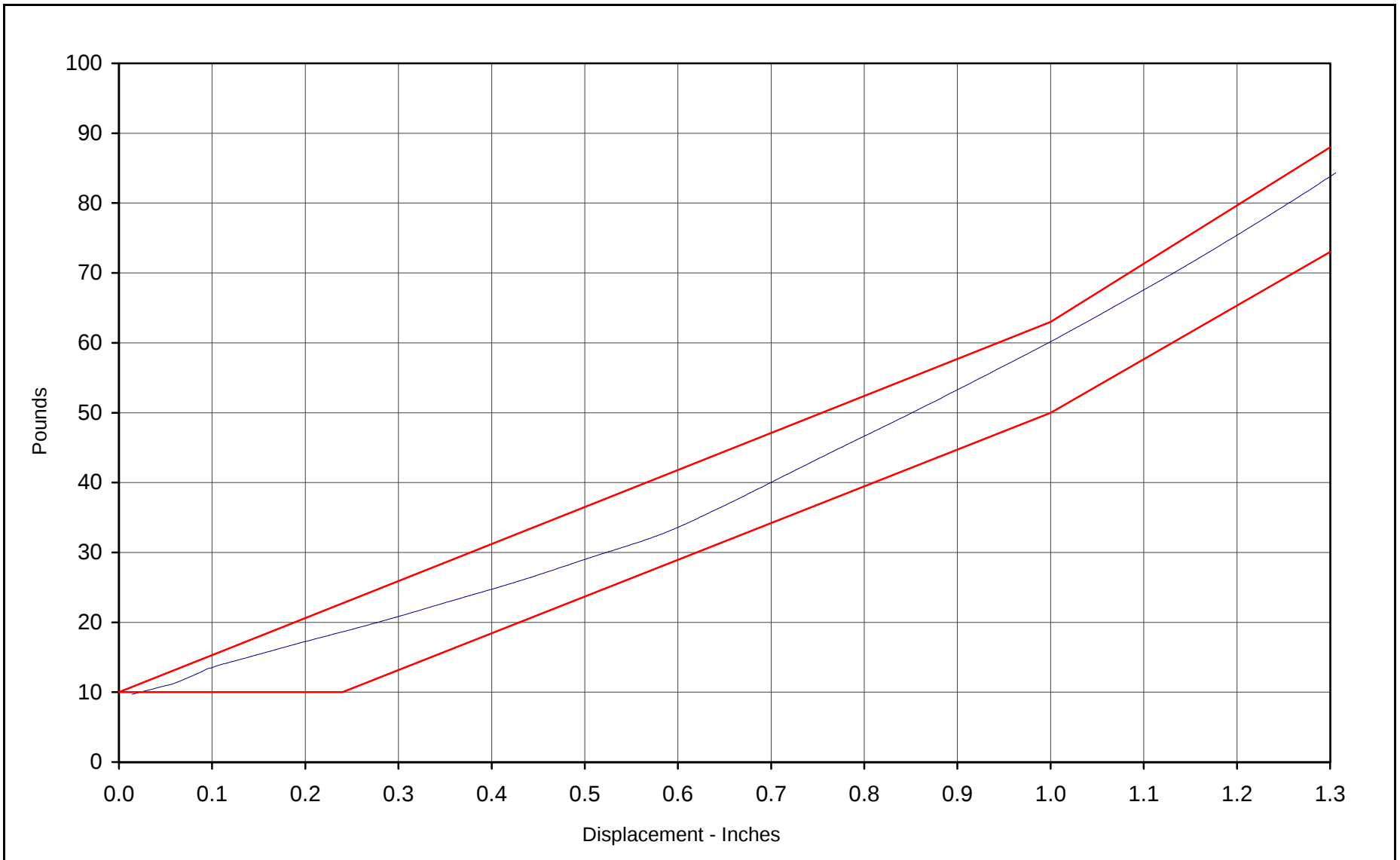
September 19, 2001

Test Date

Approved By

Date

C-9



Curve Description: Abdomen Force vs. Displacement

Force at 0.5 In.: 28.9 Pounds

Force at 0.75 In.: 43.1 Pounds

Force at 1.0 In.: 59.9 Pounds

Force at 1.3 In.: 83.6 Pounds

Date of Test: 9/19/01

Test Program: SID Abdominal Compression

Test Information: SID S/N: 274 Test I.D.: AB09A



KAR21063-01



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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: SH09A

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	234.0	Pass
Peak Lateral Acceleration	G's	≤10.0	1.2	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

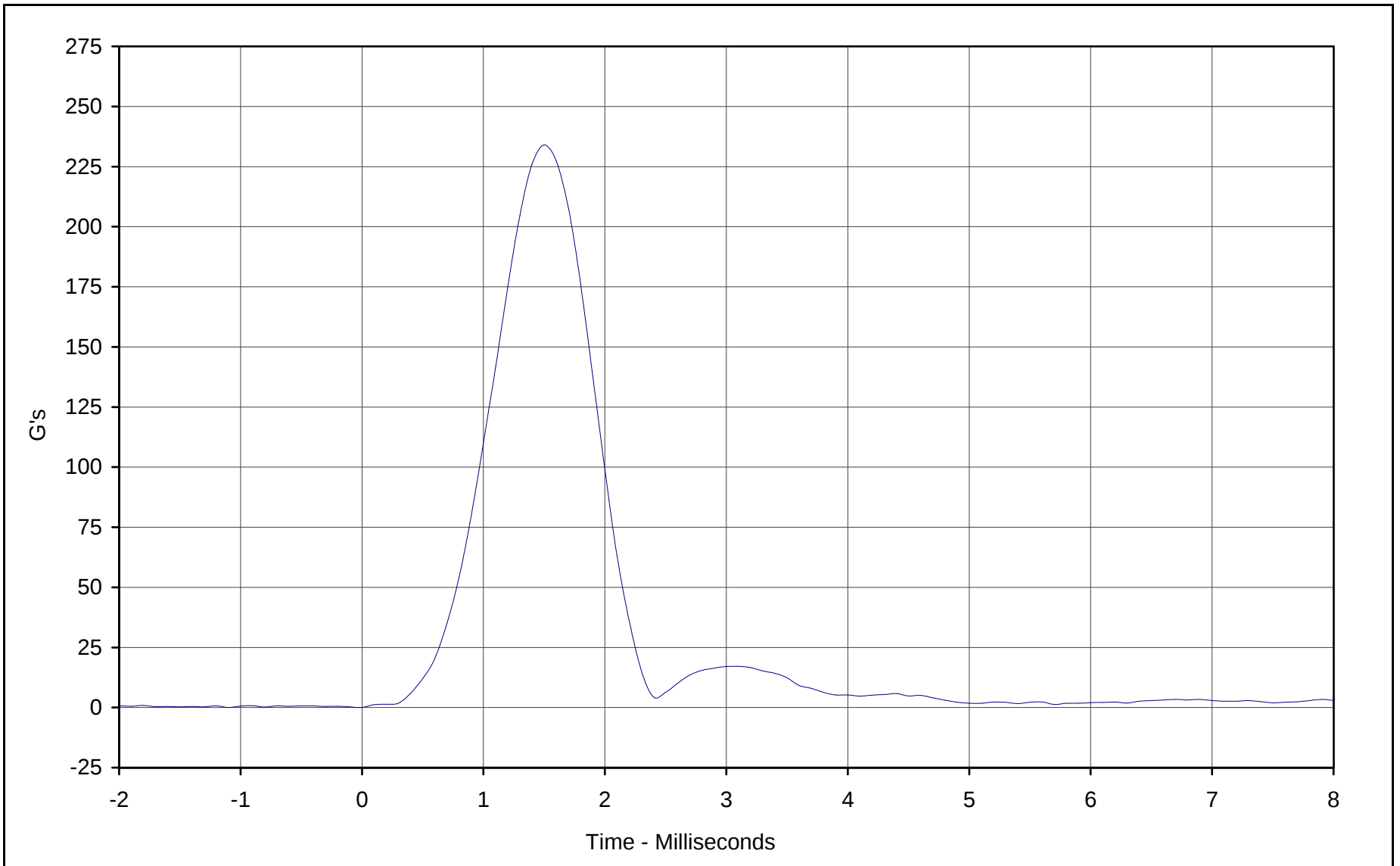
September 19, 2001

Test Date

Approved By

Date

C-11



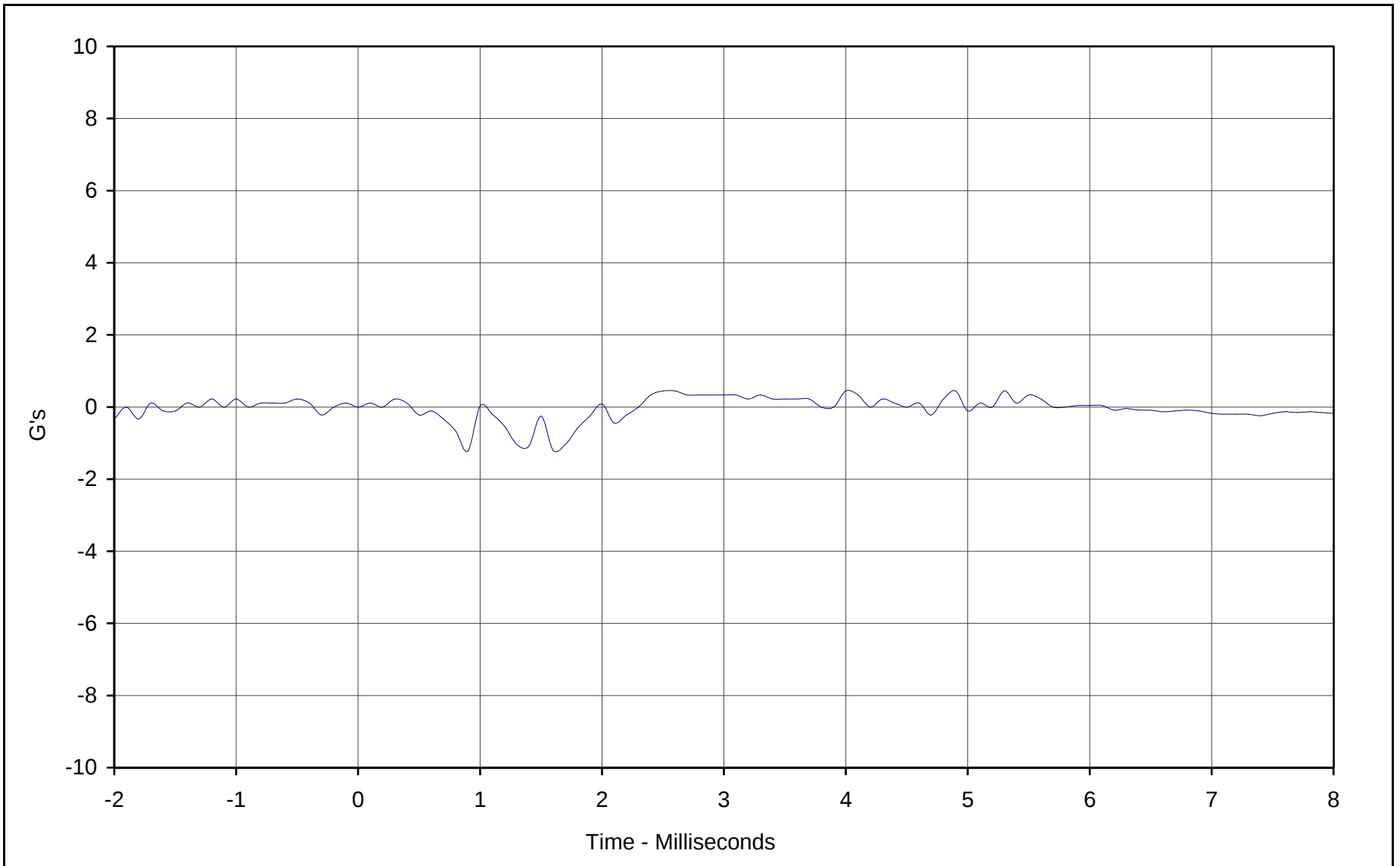
Curve Description: Head Resultant Acceleration
Maximum Value: 234.0 at 1.5 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/19/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 274 Test I.D.: SH09A



KAR21063-01

C-12



Curve Description: Head Y Axis Acceleration
Maximum Value: 0.4 at 2.5 Milliseconds
Minimum Value: -1.2 at 0.9 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/19/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 274 Test I.D.: SH09A



KAR21063-01



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	908	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	525	Pass
KV- Knee Pivot From Floor	mm	490 to 505	495	Pass
HW- Hip Width	mm	356 to 391	375	Pass
Overall Test Results				Pass

Laboratory Technician

September 20, 2001

Test Date

Approved By

Date



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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: TI09B

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	43.6	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	44.2	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.8	Pass
Overall Test Results				Pass

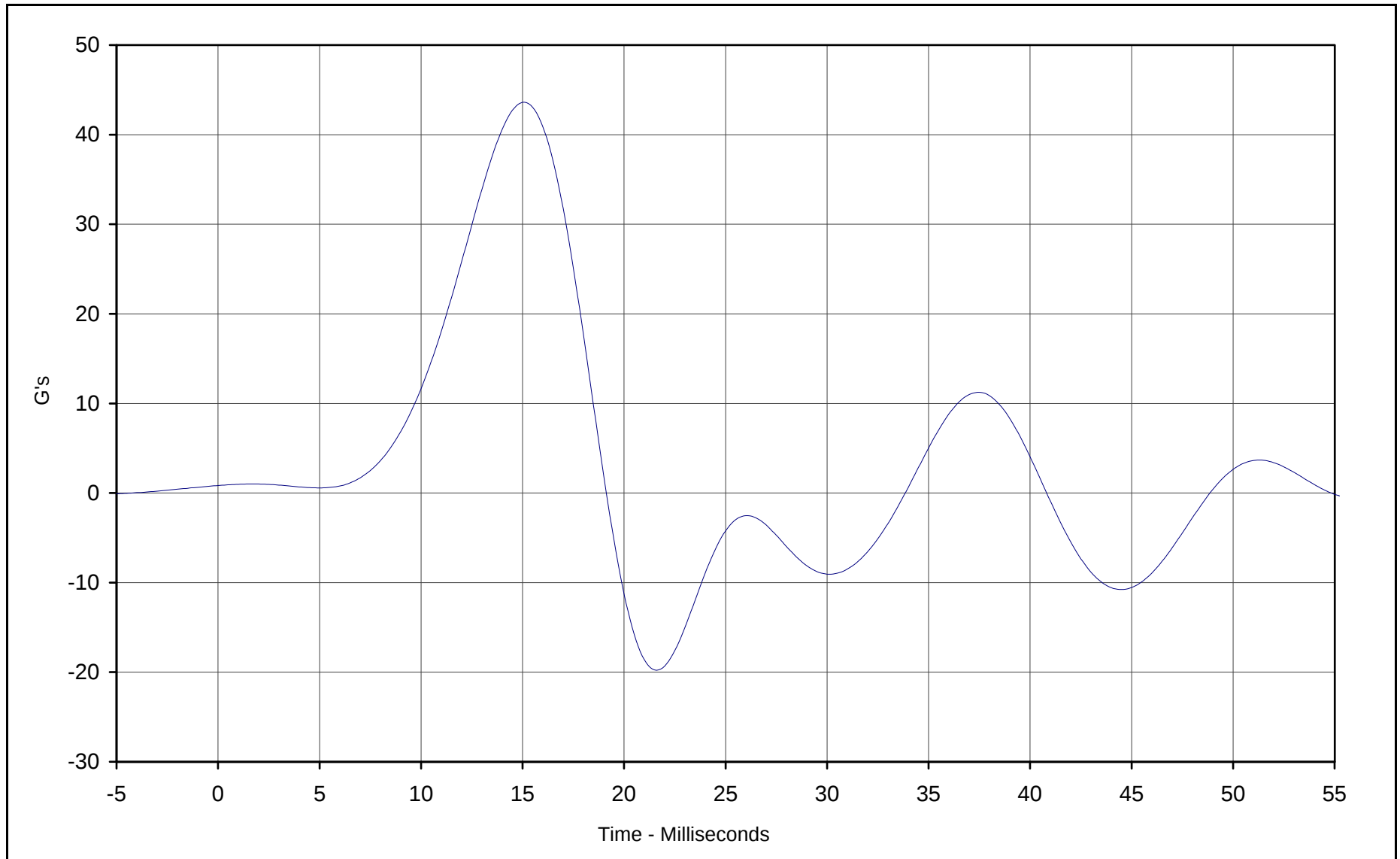
Laboratory Technician

September 20, 2001
Test Date

Approved By

Date

C-15



Curve Description: Left Upper Rib Y Acceleration

Maximum Value: 43.6 at 15.1 Milliseconds

Minimum Value: -19.8 at 21.6 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 9/20/01

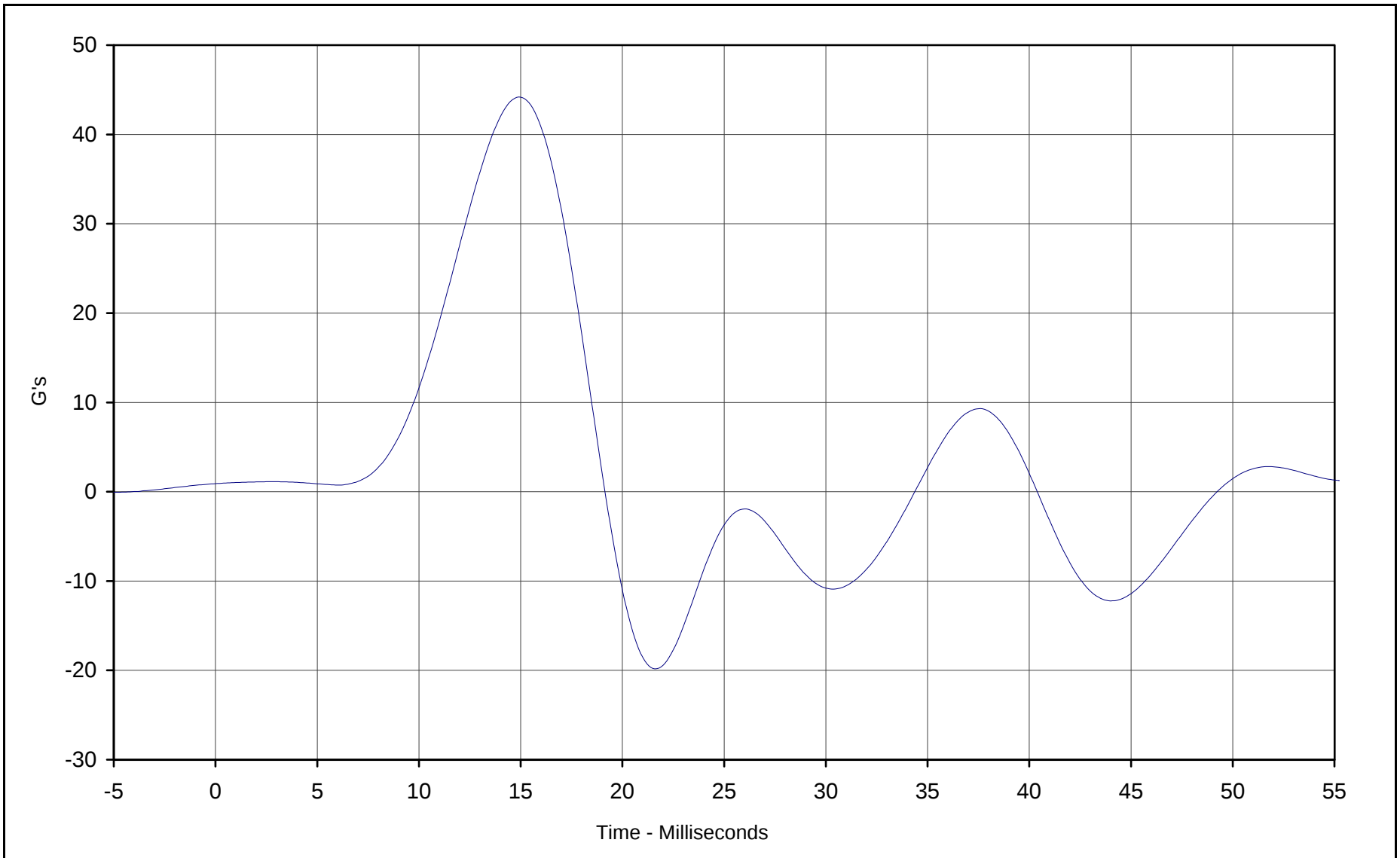
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 275 Test I.D.: TI09B



KAR21063-01

C-16



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 44.2 at 14.9 Milliseconds

Minimum Value: -19.8 at 21.6 Milliseconds

SAE Filter Class: FIR 100

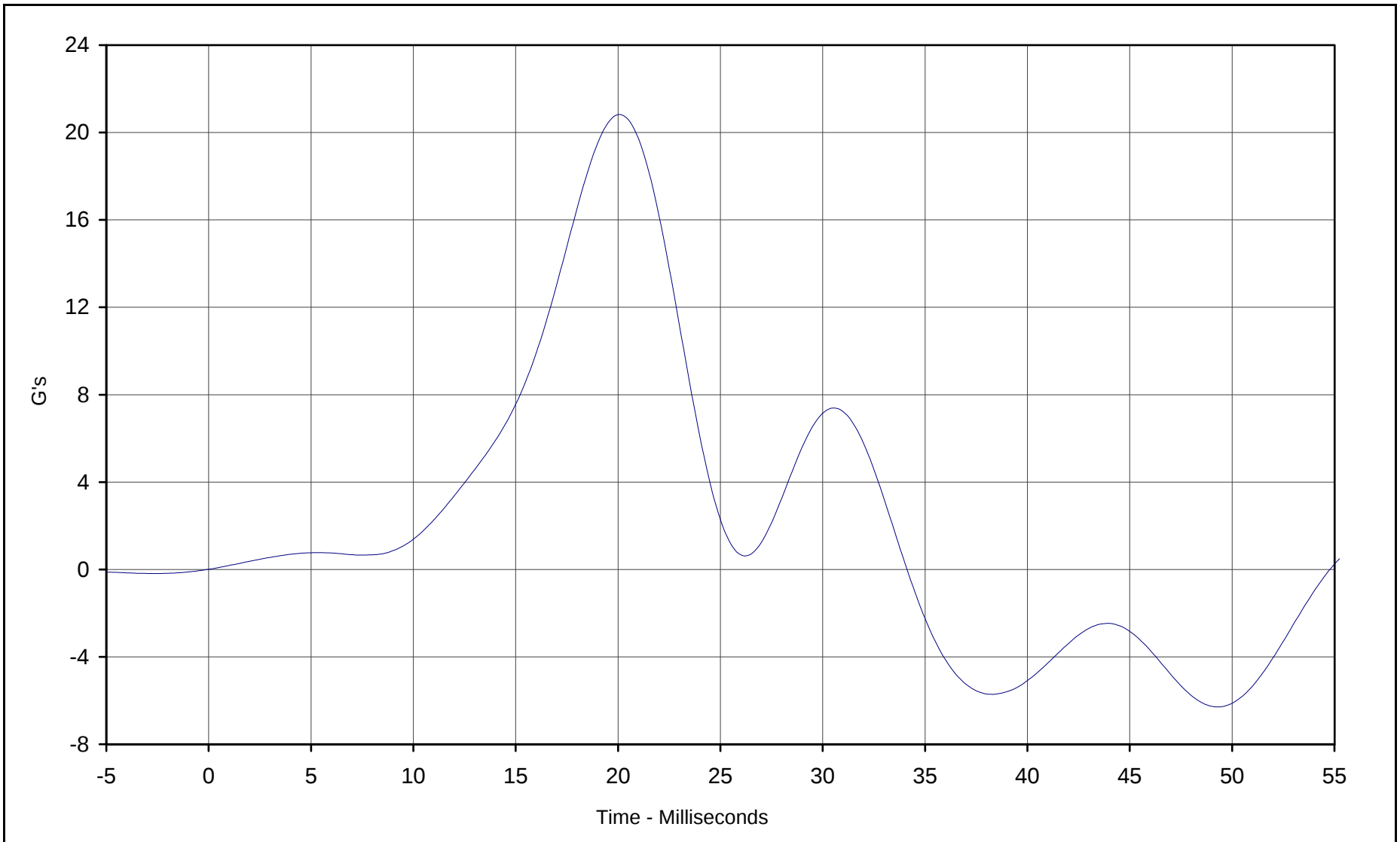
Date of Test: 9/20/01

Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 275 Test I.D.: TI09B



KAR21063-01



Curve Description: Lower Spine Y Acceleration
Maximum Value: 20.8 at 20.1 Milliseconds
Minimum Value: -6.3 at 49.3 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/20/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 275 Test I.D.: TI09B





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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: PI09B

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	42.6	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

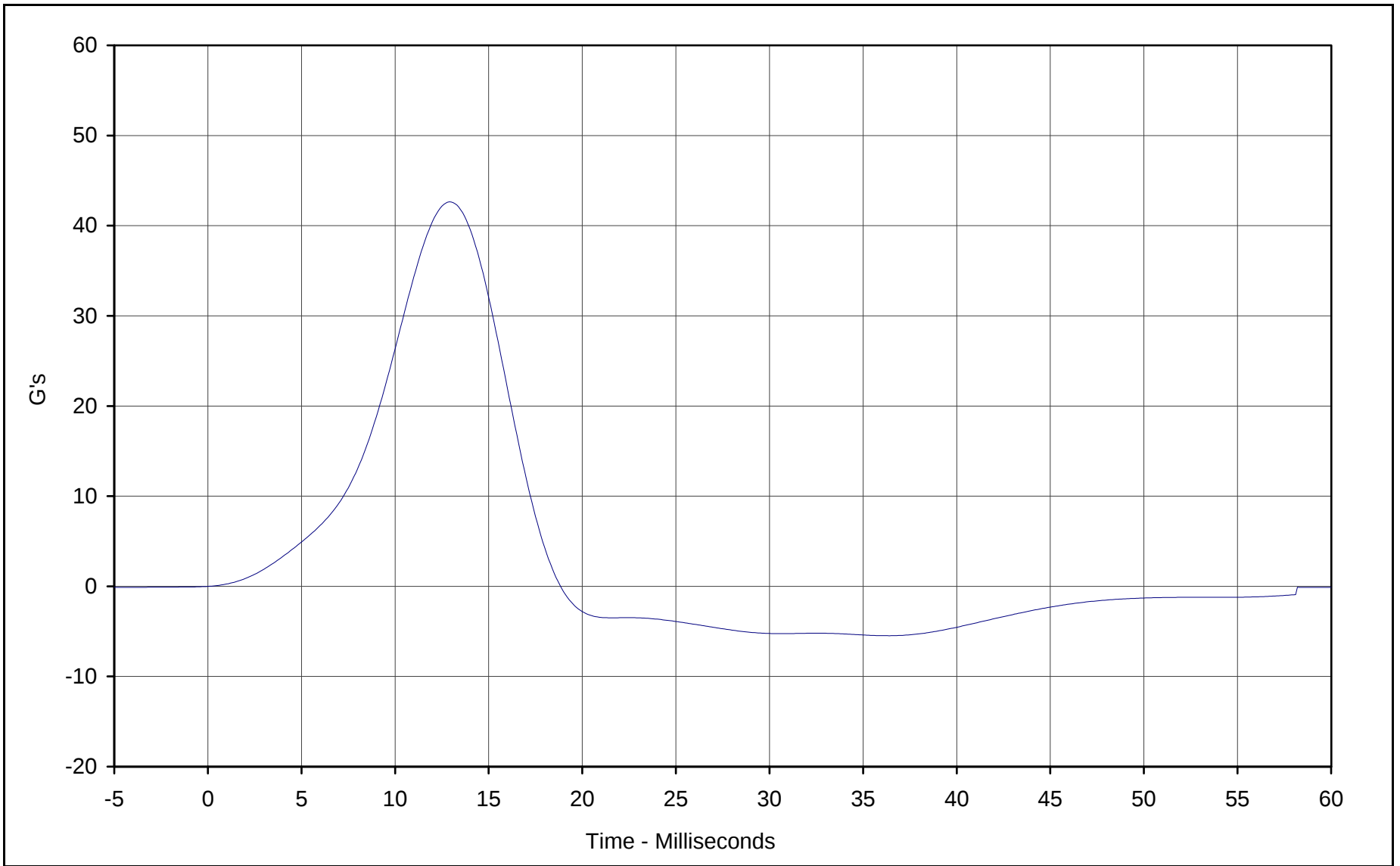
Laboratory Technician

September 20, 2001
Test Date

Approved By

Date

C-19



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 42.6 at 12.9 Milliseconds
Minimum Value: -5.5 at 36.4 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/20/01

Test Program: SID Left Side Pelvis Lateral Impact
Test Information: SID S/N: 275 Test I.D.: PI09B



KAR21063-01



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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: AB09B

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	28.2	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	42.1	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	58.5	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	81.5	Pass
Overall Test Results				Pass

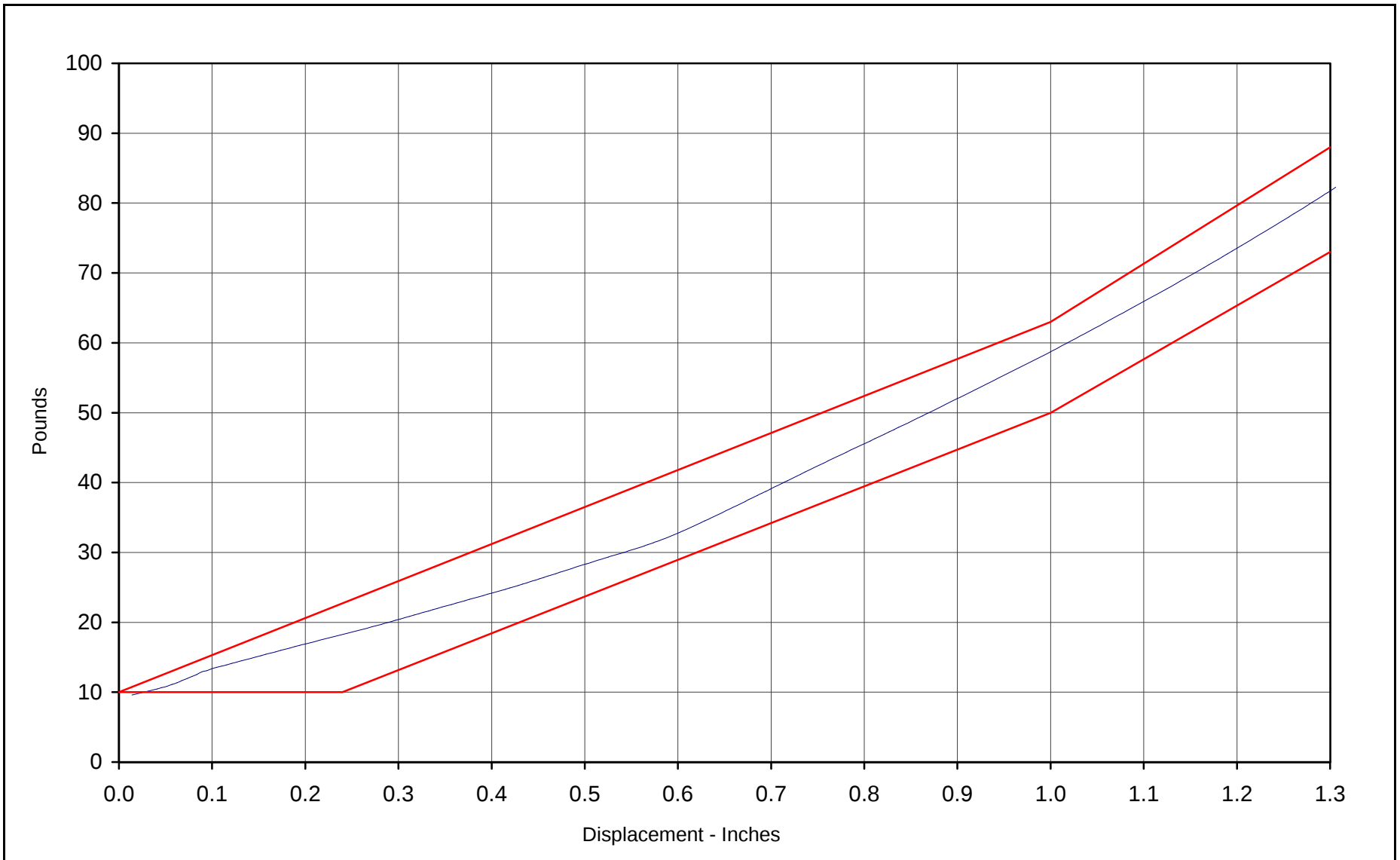
Laboratory Technician

September 19, 2001
Test Date

Approved By

Date

C-21



Curve Description: Abdomen Force vs. Displacement

Force at 0.5 In.: 28.2 Pounds

Force at 0.75 In.: 42.1 Pounds

Force at 1.0 In.: 58.5 Pounds

Force at 1.3 In.: 81.5 Pounds

Date of Test: 9/19/01

Test Program: SID Abdominal Compression

Test Information: SID S/N: 275 Test I.D.: AB09B



KAR21063-01



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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: SH09B

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	241.0	Pass
Peak Lateral Acceleration	G's	≤10.0	1.3	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

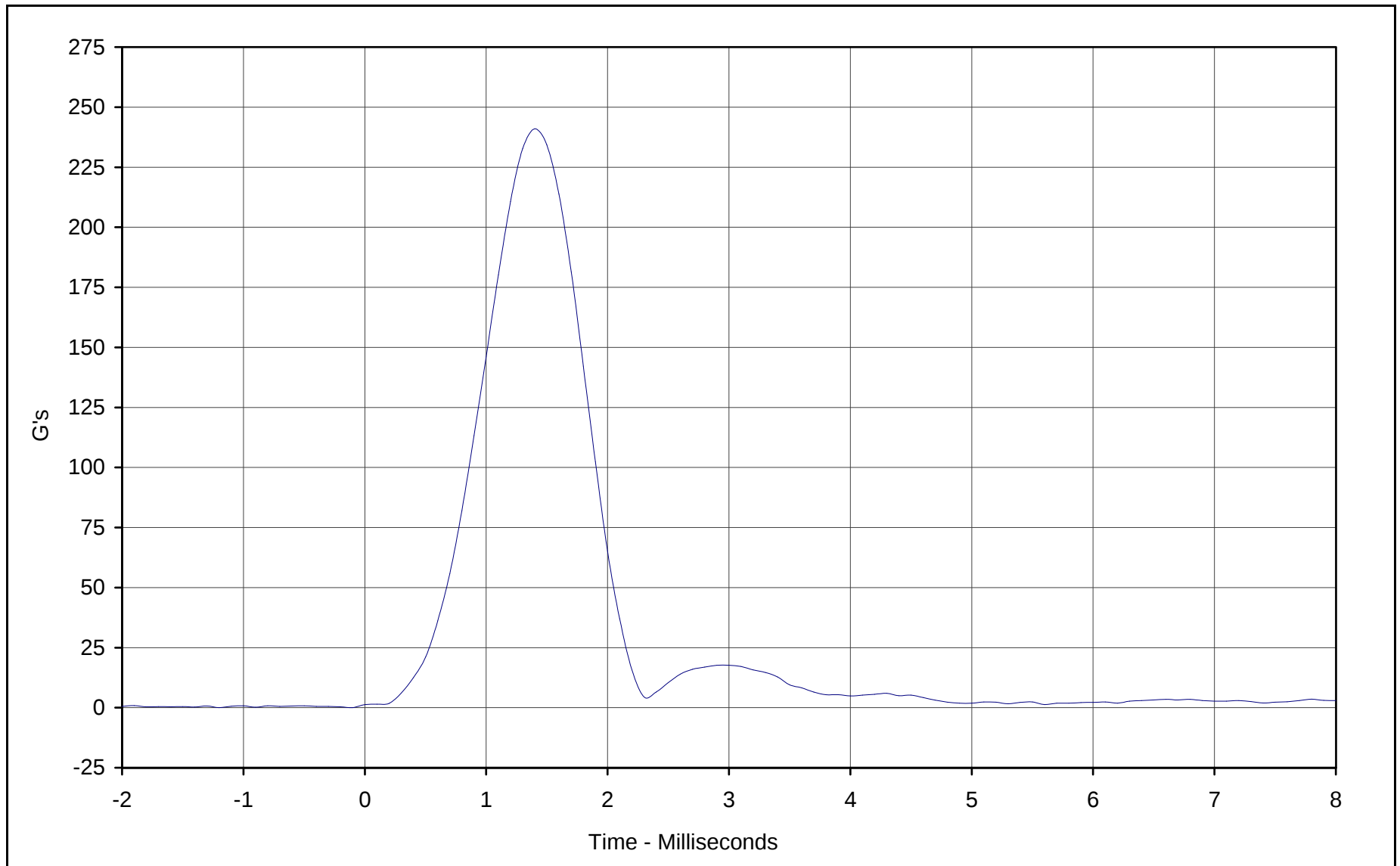
September 19, 2001

Test Date

Approved By

Date

C-23



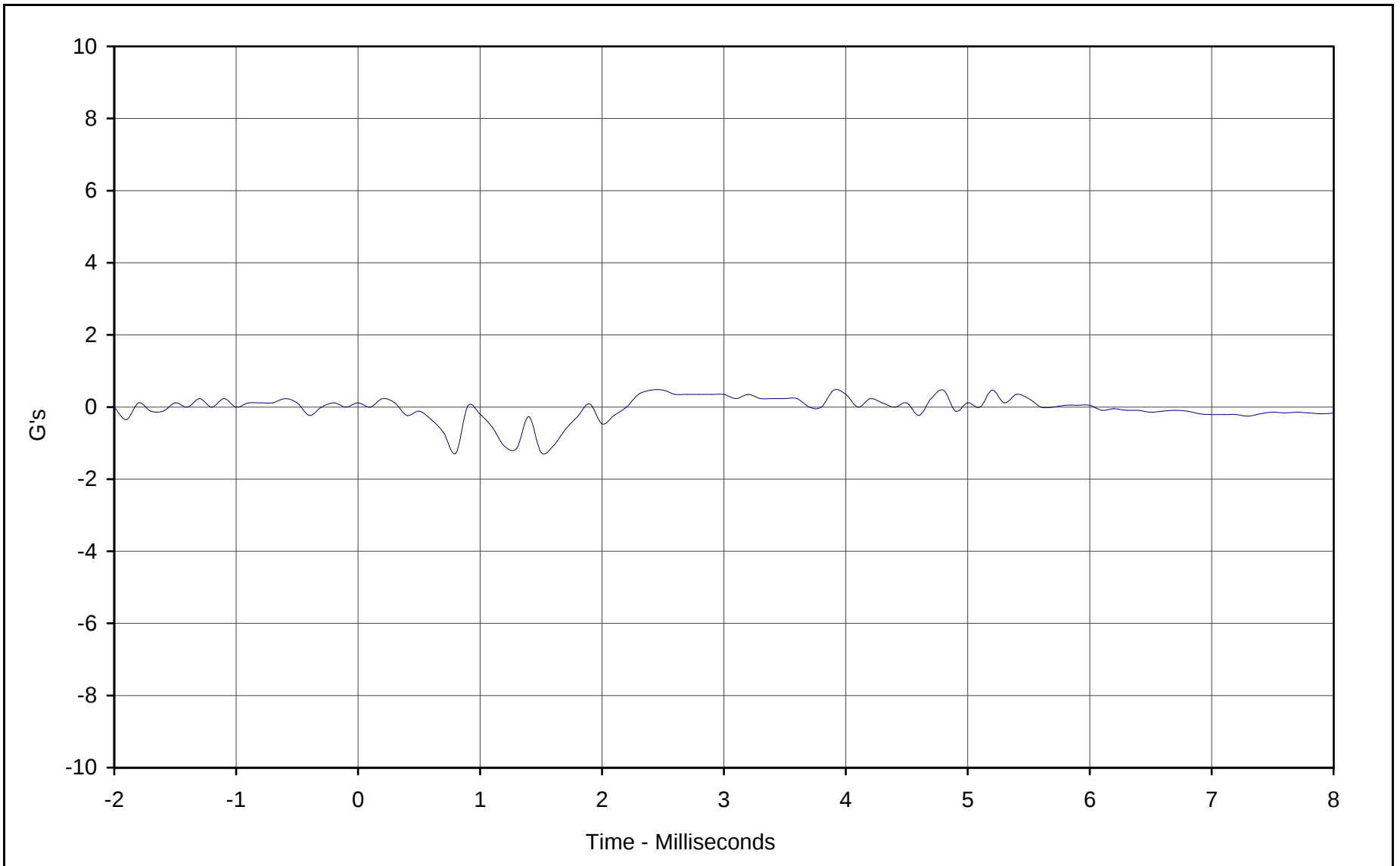
Curve Description: Head Resultant Acceleration
Maximum Value: 241.0 at 1.4 Milliseconds
Minimum Value: 1.3 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/19/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: SH09B



KAR21063-01

C-24



Curve Description: Head Y Axis Acceleration
Maximum Value: 0.5 at 2.4 Milliseconds
Minimum Value: -1.3 at 0.8 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/19/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: SH09B



KAR21063-01

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

September 27, 2001

Test Date

Approved By

Date



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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: TI09C

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	43.4	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	44.0	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.1	Pass
Overall Test Results				Pass

Laboratory Technician

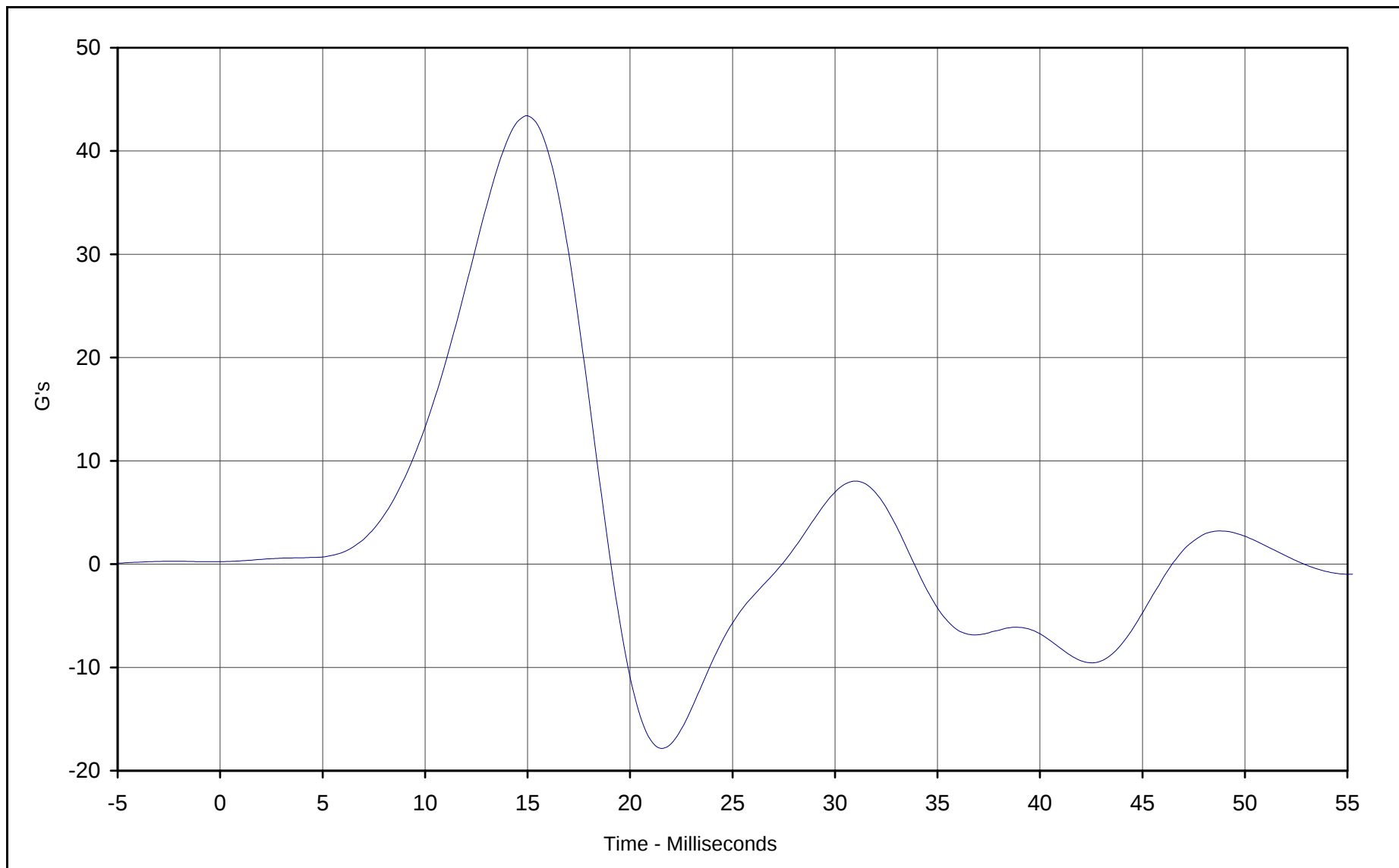
September 26, 2001

Test Date

Approved By

Date

C-27



Curve Description: Left Upper Rib Y Acceleration

Maximum Value: 43.4 at 15.0 Milliseconds

Minimum Value: -17.8 at 21.6 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 9/26/01

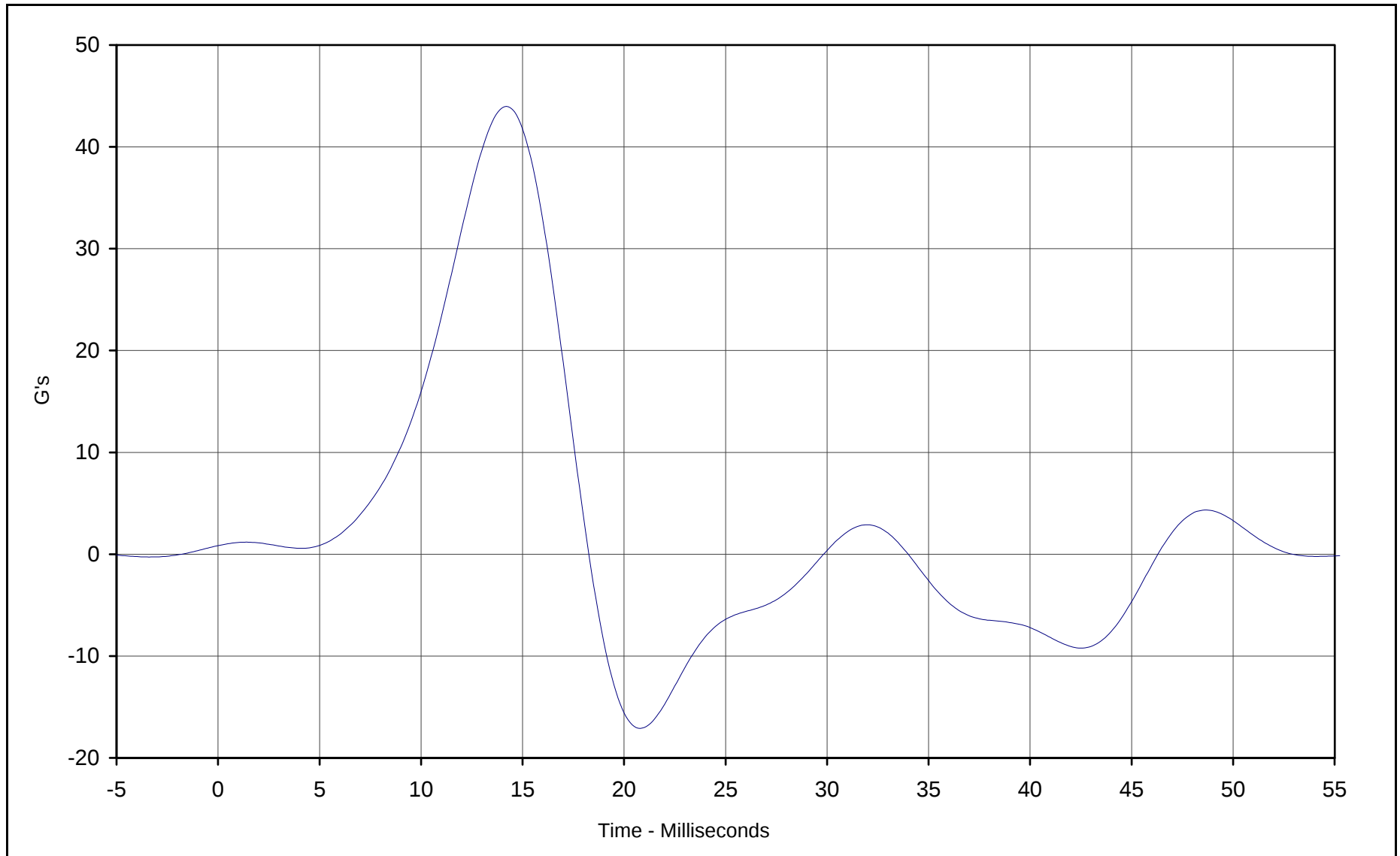
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 274 Test I.D.: TI09C



KAR21063-01

C-28



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 44.0 at 14.2 Milliseconds

Minimum Value: -17.1 at 20.8 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 9/26/01

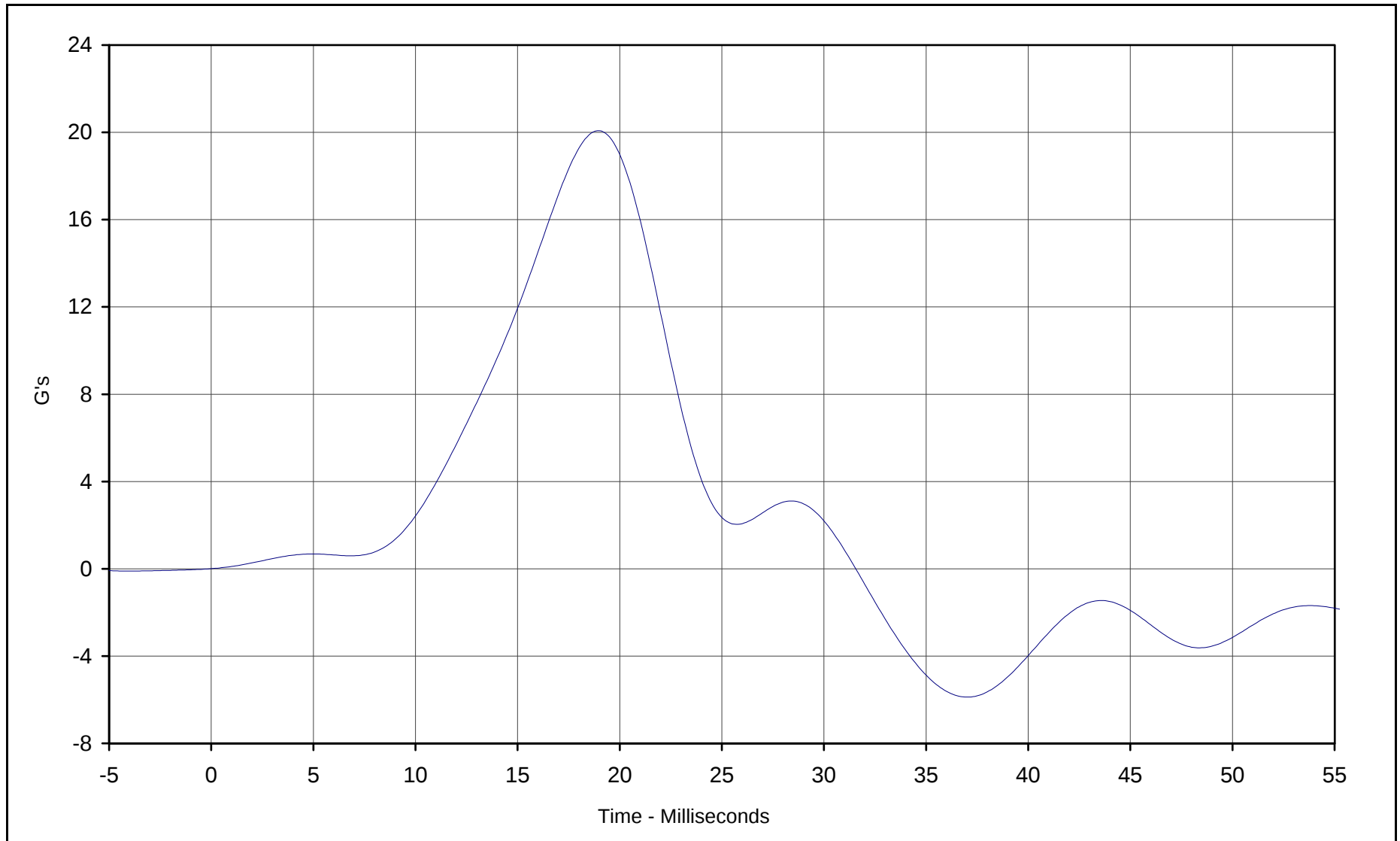
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 274 Test I.D.: TI09C



KAR21063-01

C-29



Curve Description: Lower Spine Y Acceleration
Maximum Value: 20.1 at 19.0 Milliseconds
Minimum Value: -5.9 at 37.0 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/26/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 274 Test I.D.: TI09C



KAR21063-01



Performance Verification Data

Side Impact Dummy (SID)

Left Side Pelvis Lateral Impact

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: PI09C

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	40.8	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	6.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

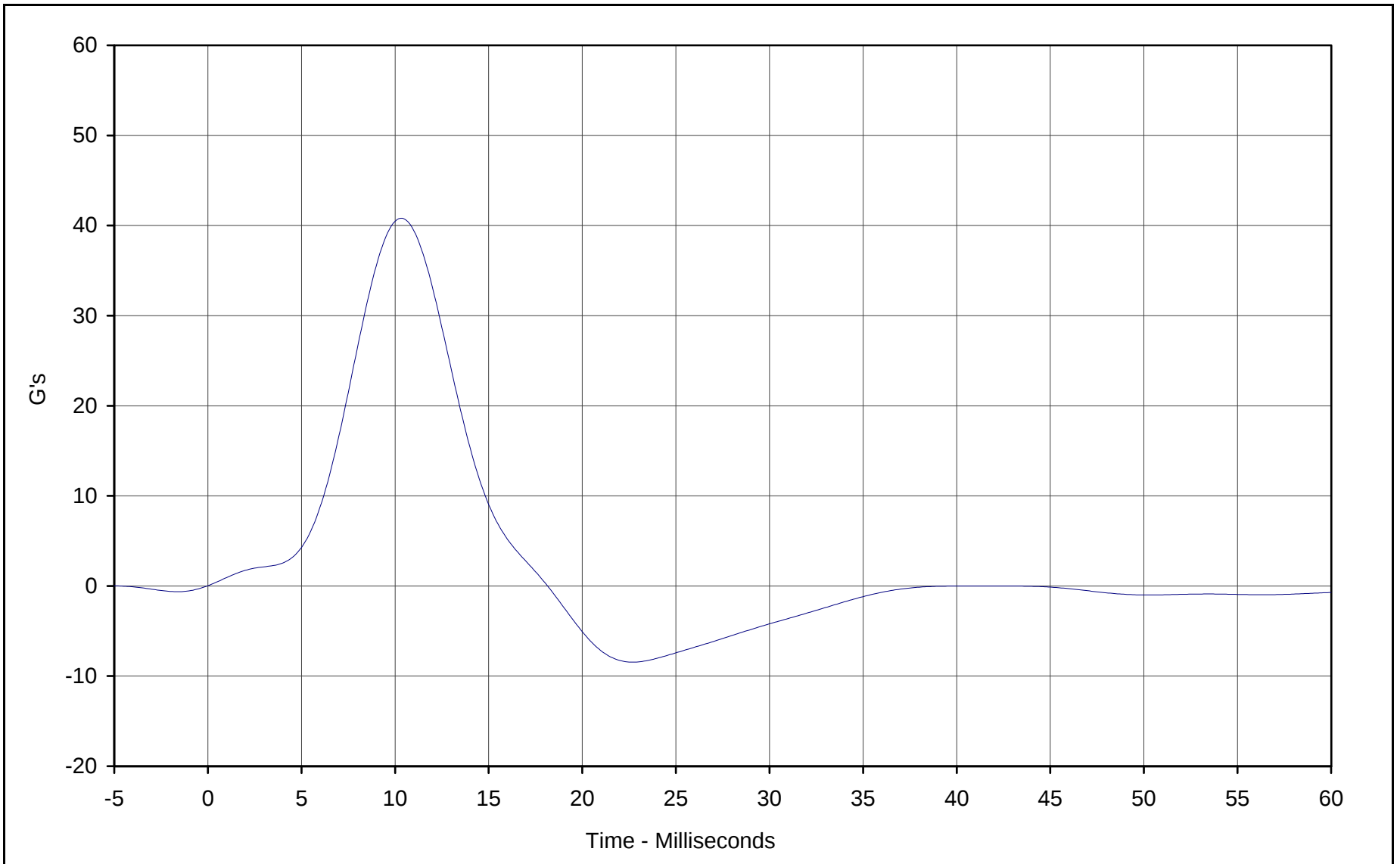
September 26, 2001

Test Date

Approved By

Date

C-31



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 40.8 at 10.3 Milliseconds
Minimum Value: -8.5 at 22.6 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/26/01

Test Program: SID Left Side Pelvis Lateral Impact
Test Information: SID S/N: 274 Test I.D.: PI09C



KAR21063-01



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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: AB09C

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	27.6	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	41.1	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	56.8	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	79.3	Pass
Overall Test Results				Pass

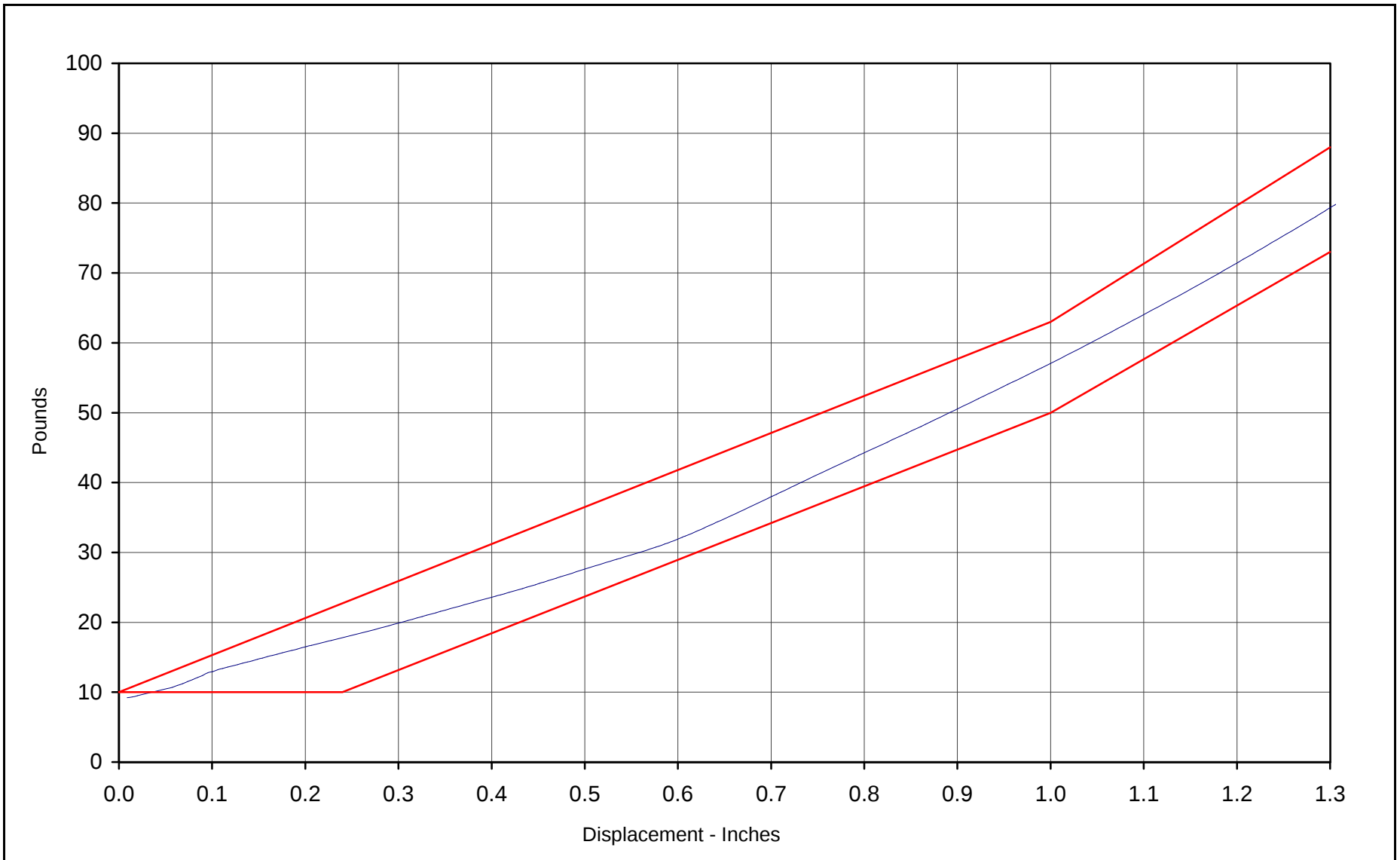
Laboratory Technician

September 27, 2001
Test Date

Approved By

Date

C-33

Curve Description: Abdomen Force vs. DisplacementForce at 0.5 In.: 27.6 PoundsForce at 0.75 In.: 41.1 PoundsForce at 1.0 In.: 56.8 PoundsForce at 1.3 In.: 79.3 PoundsDate of Test: 9/27/01Test Program: SID Abdominal CompressionTest Information: SID S/N: 274 Test I.D.: AB09C

KAR21063-01



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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: SH09C

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	242.9	Pass
Peak Lateral Acceleration	G's	≤10.0	3.2	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

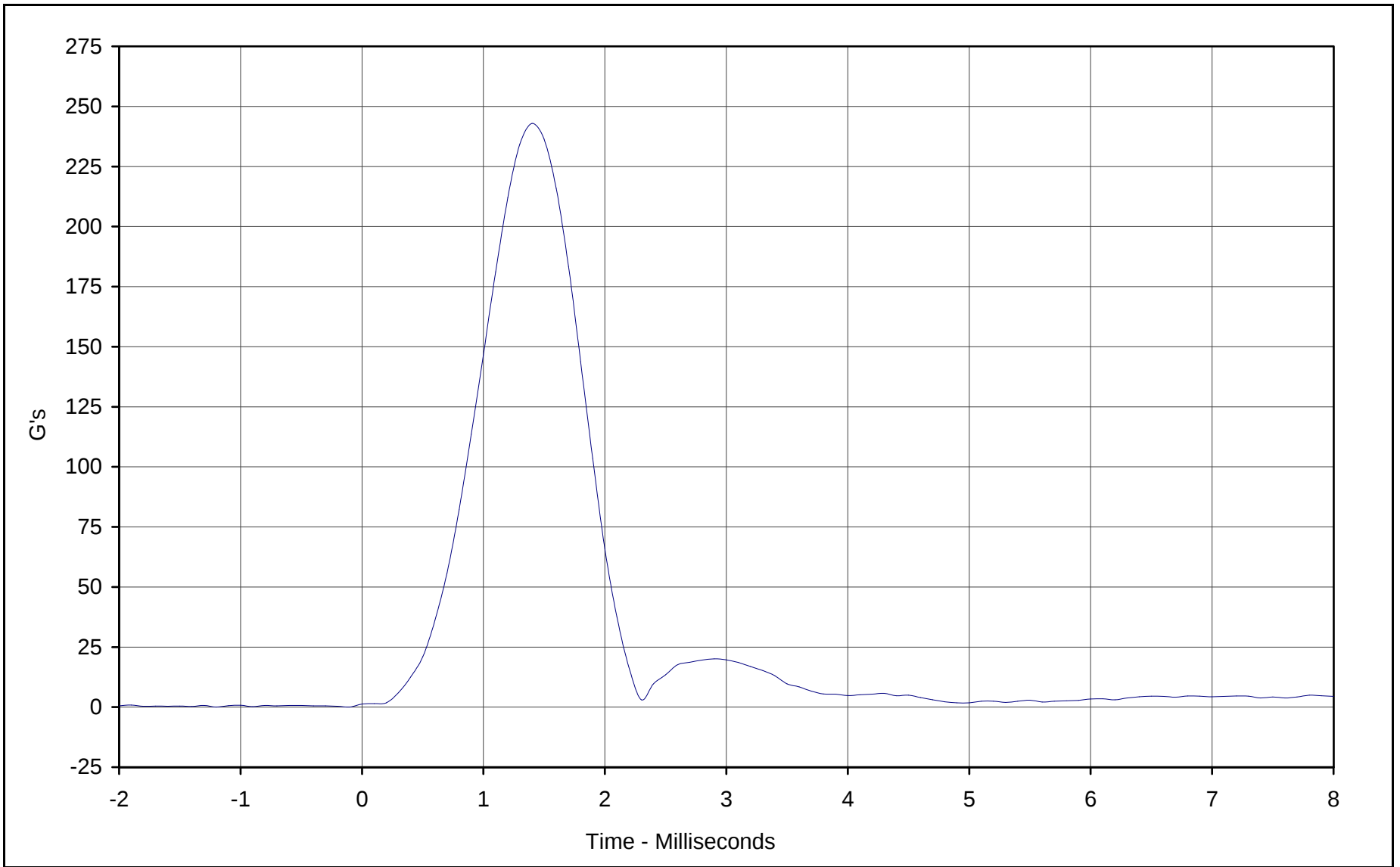
September 27, 2001

Test Date

Approved By

Date

C-35

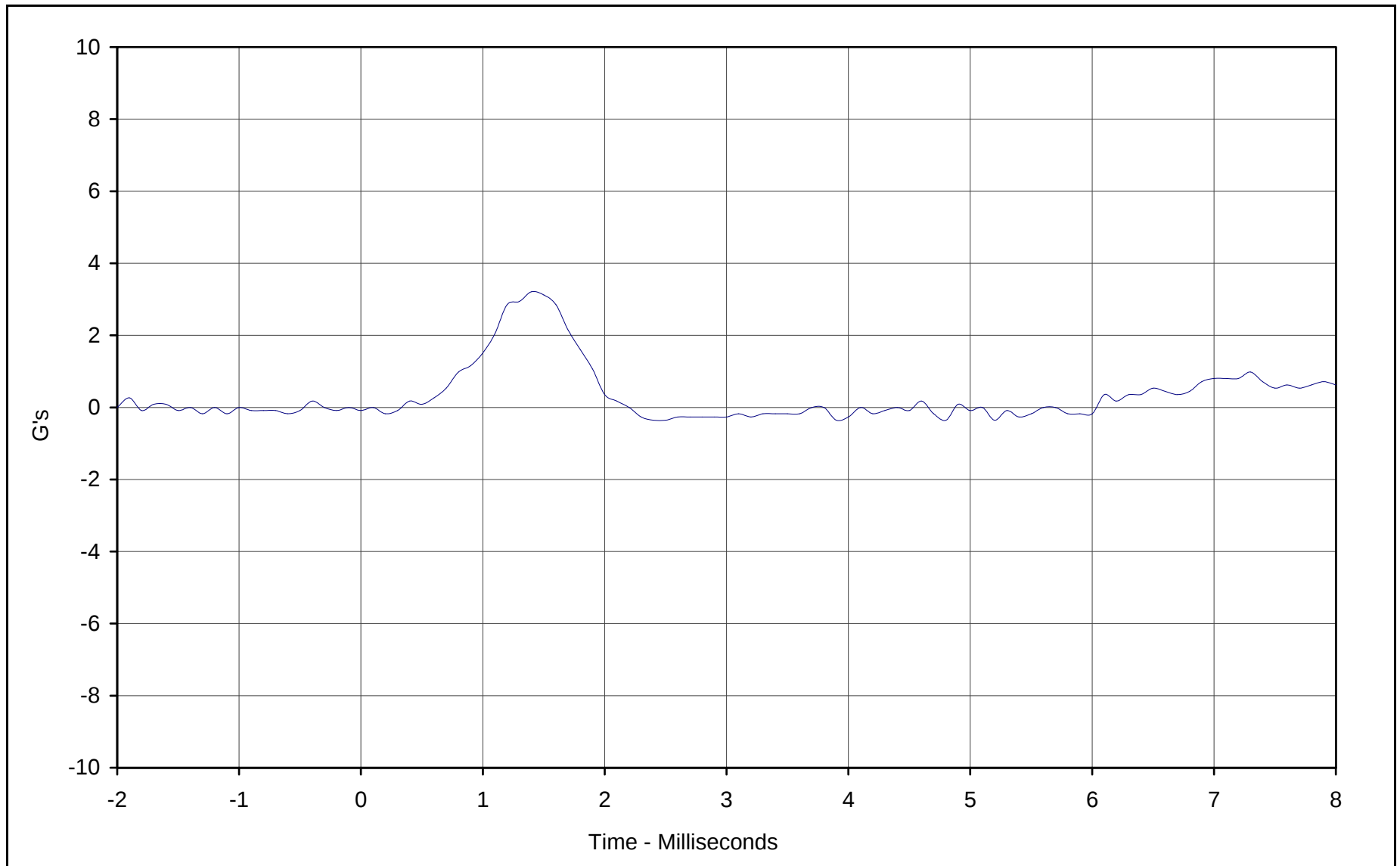


Curve Description: Head Resultant Acceleration
Maximum Value: 242.9 at 1.4 Milliseconds
Minimum Value: 1.3 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/27/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 274 Test I.D.: SH09C



KAR21063-01



Curve Description: Head Y Axis Acceleration
Maximum Value: 3.2 at 1.4 Milliseconds
Minimum Value: -0.4 at 2.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/27/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 274 Test I.D.: SH09C





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	908	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	525	Pass
KV- Knee Pivot From Floor	mm	490 to 505	495	Pass
HW- Hip Width	mm	356 to 391	375	Pass
Overall Test Results				Pass

Laboratory Technician

September 27, 2001
Test Date

Approved By

Date



Performance Verification Data

Side Impact Dummy (SID)

Thorax Lateral Impact

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: TI09D

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	44.0	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	20.5	Pass
Overall Test Results				Pass

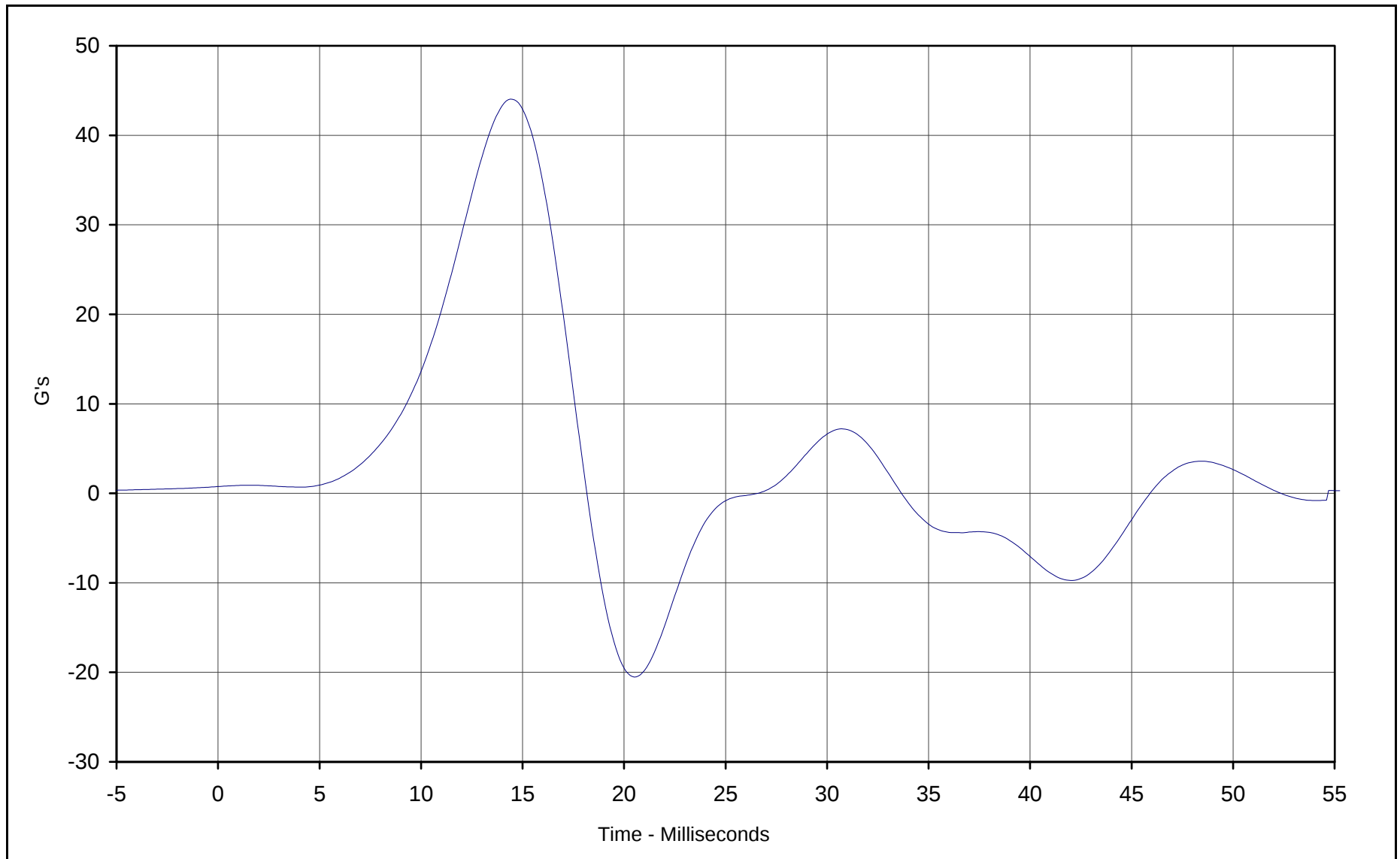
Laboratory Technician

September 26, 2001
Test Date

Approved By

Date

C-39



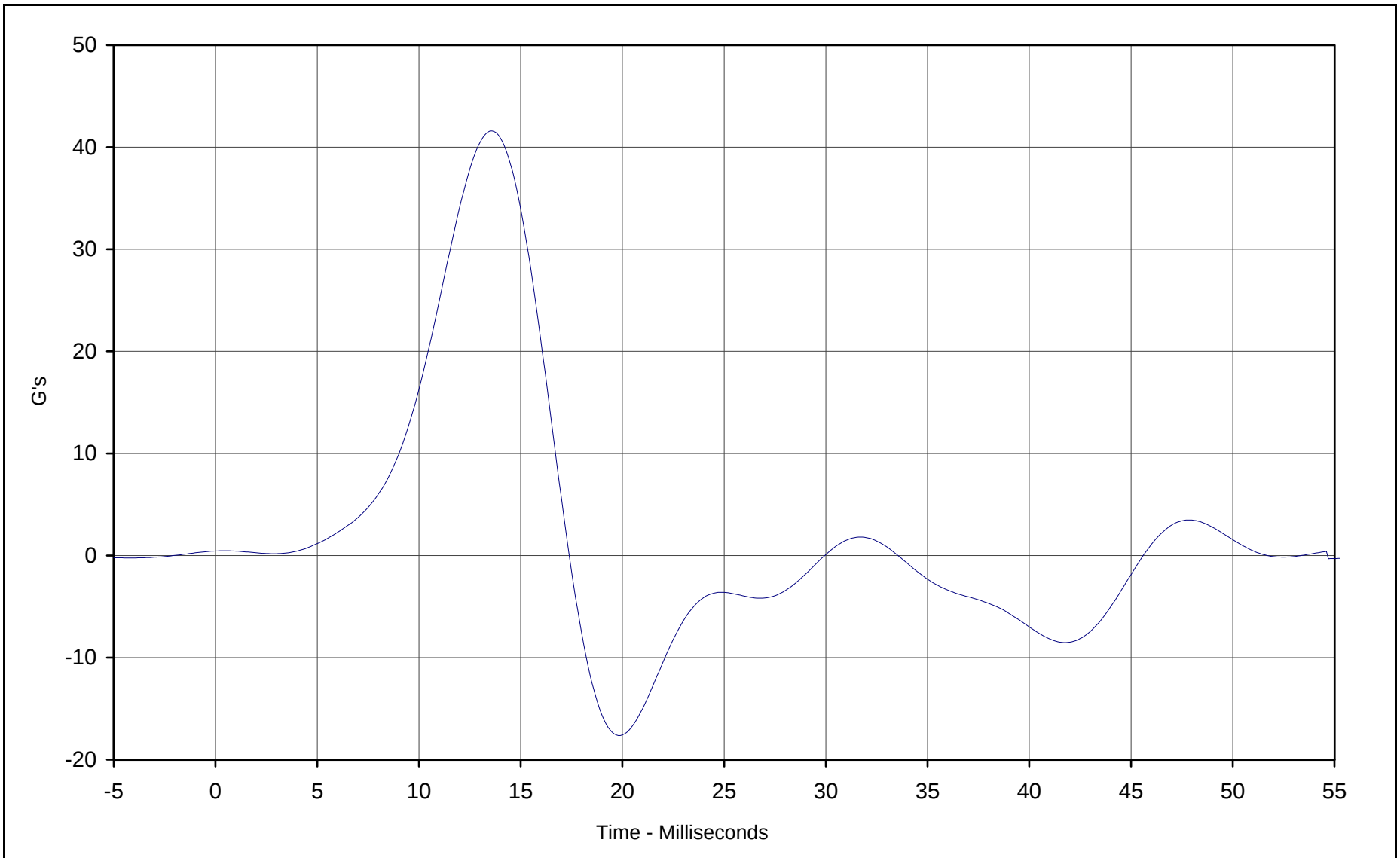
Curve Description: Left Upper Rib Y Acceleration
Maximum Value: 44.0 at 14.4 Milliseconds
Minimum Value: -20.5 at 20.5 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/26/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 275 Test I.D.: TI09D



KAR21063-01

C-40



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 41.6 at 13.6 Milliseconds

Minimum Value: -17.6 at 19.8 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 9/26/01

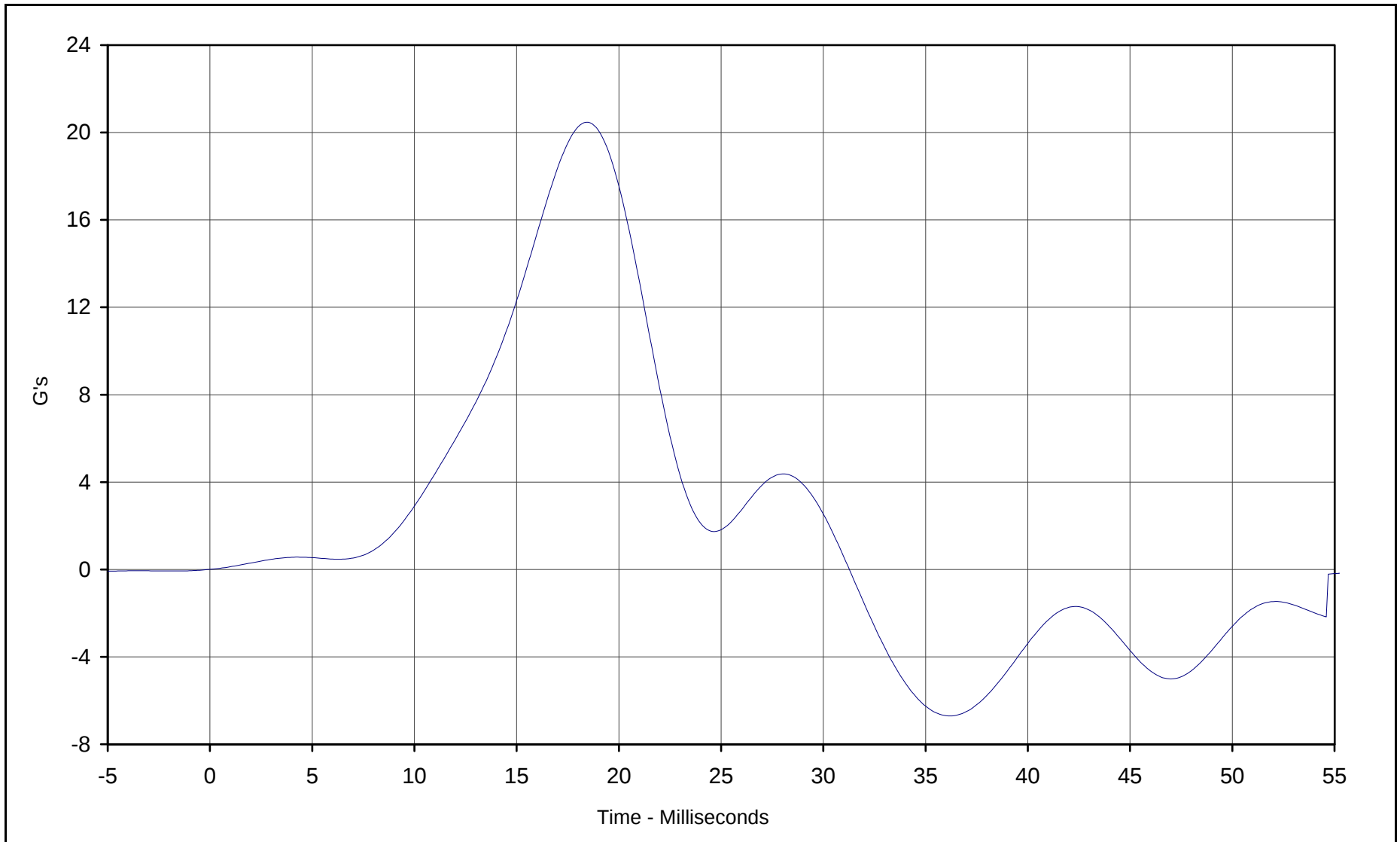
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 275 Test I.D.: TI09D



KAR21063-01

C-41



Curve Description: Lower Spine Y Acceleration
Maximum Value: 20.5 at 18.4 Milliseconds
Minimum Value: -6.7 at 36.2 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/26/01

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 275 Test I.D.: TI09D



KAR21063-01



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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: PI09D

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	41.5	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	6.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

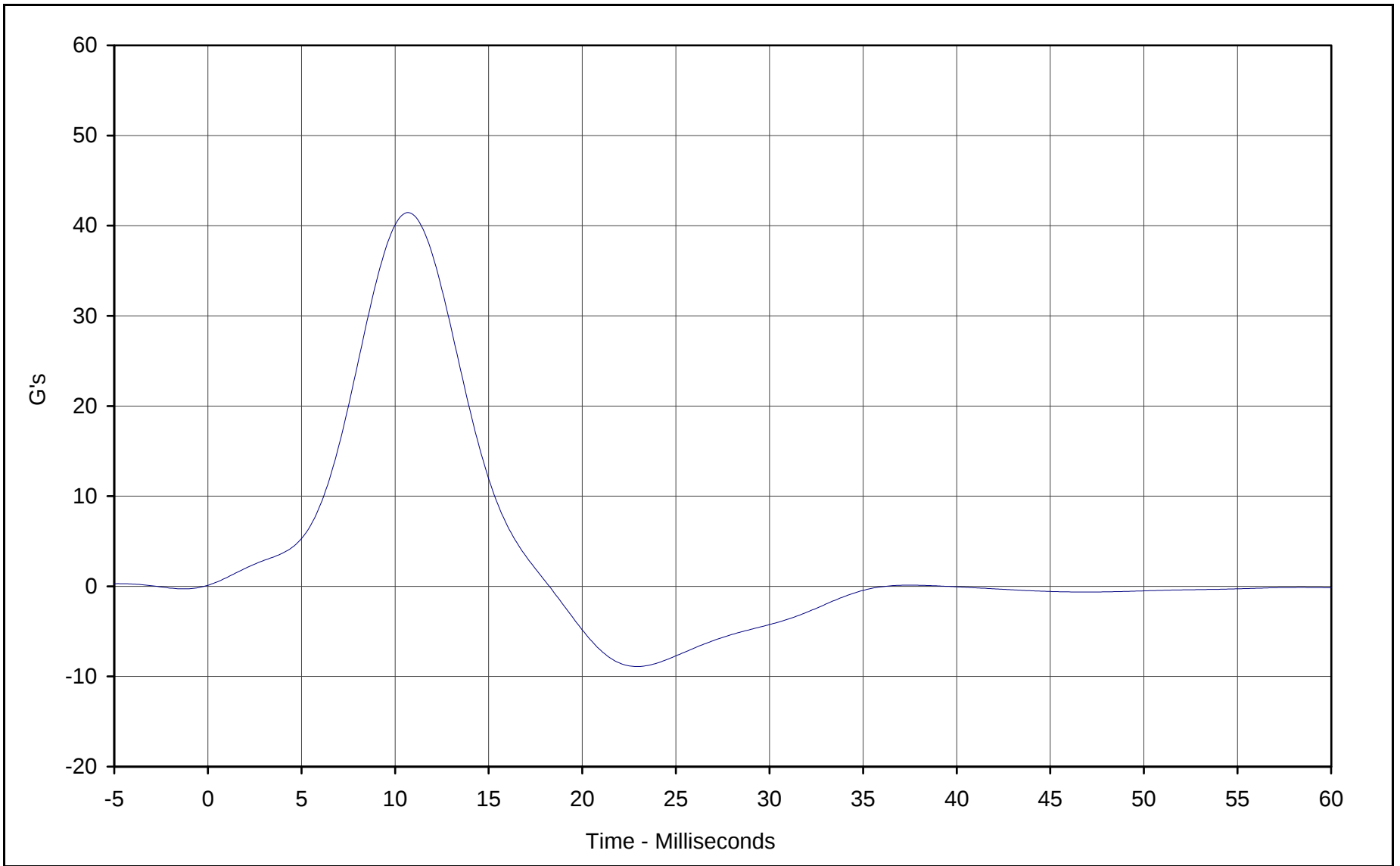
September 26, 2001

Test Date

Approved By

Date

C-43



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 41.5 at 10.7 Milliseconds
Minimum Value: -8.9 at 22.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 9/26/01

Test Program: SID Left Side Pelvis Lateral Impact
Test Information: SID S/N: 275 Test I.D.: PI09D



KAR21063-01



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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: AB09D

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	25.5	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	38.1	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	52.6	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	73.4	Pass
Overall Test Results				Pass

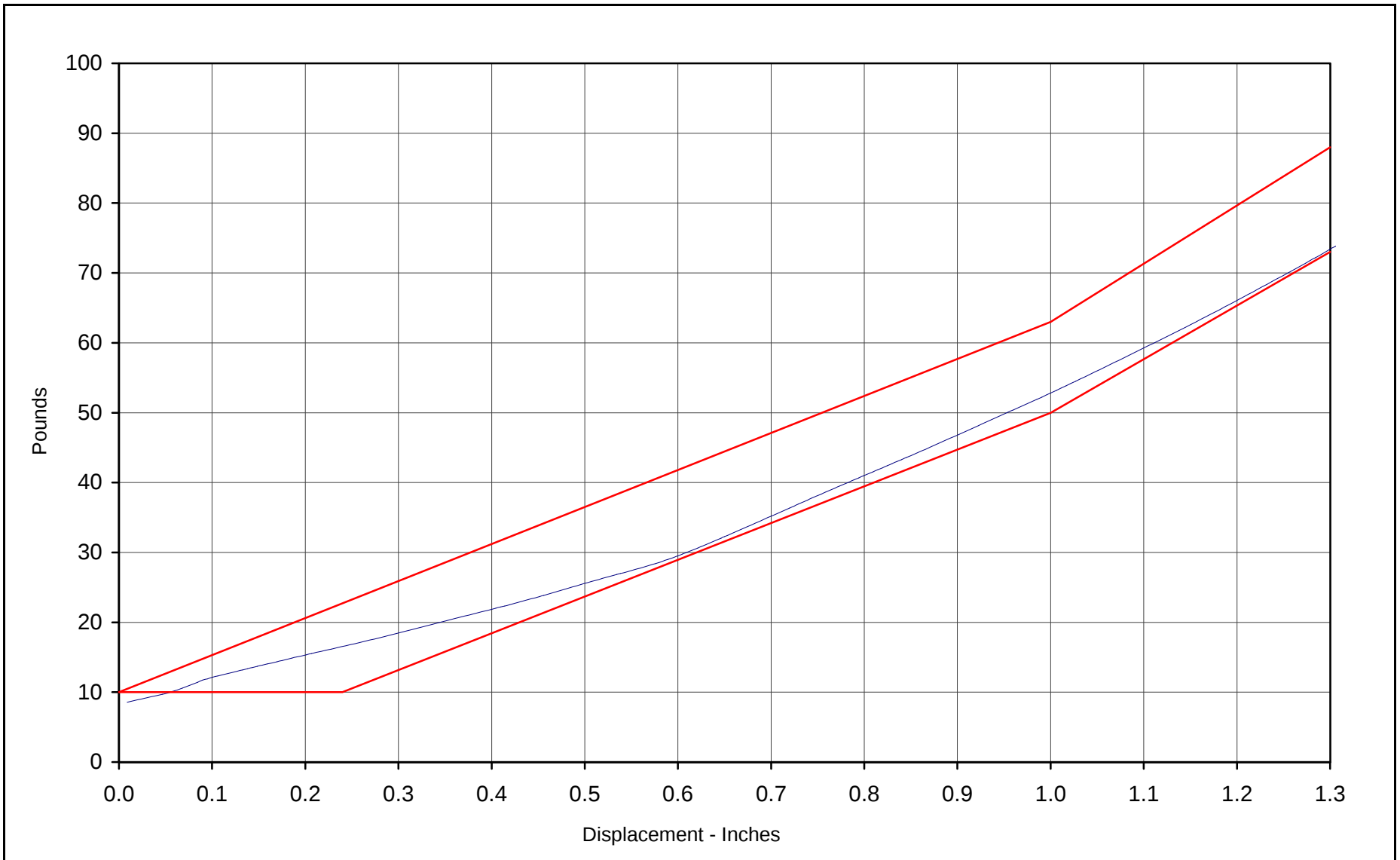
Laboratory Technician

September 27, 2001
Test Date

Approved By

Date

C-45



Curve Description: Abdomen Force vs. Displacement

Force at 0.5 In.: 25.5 Pounds

Force at 0.75 In.: 38.1 Pounds

Force at 1.0 In.: 52.6 Pounds

Force at 1.3 In.: 73.4 Pounds

Date of Test: 9/27/01

Test Program: SID Abdominal Compression

Test Information: SID S/N: 275 Test I.D.: AB09D



KAR21063-01



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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: SH09D

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	230.8	Pass
Peak Lateral Acceleration	G's	≤10.0	3.5	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

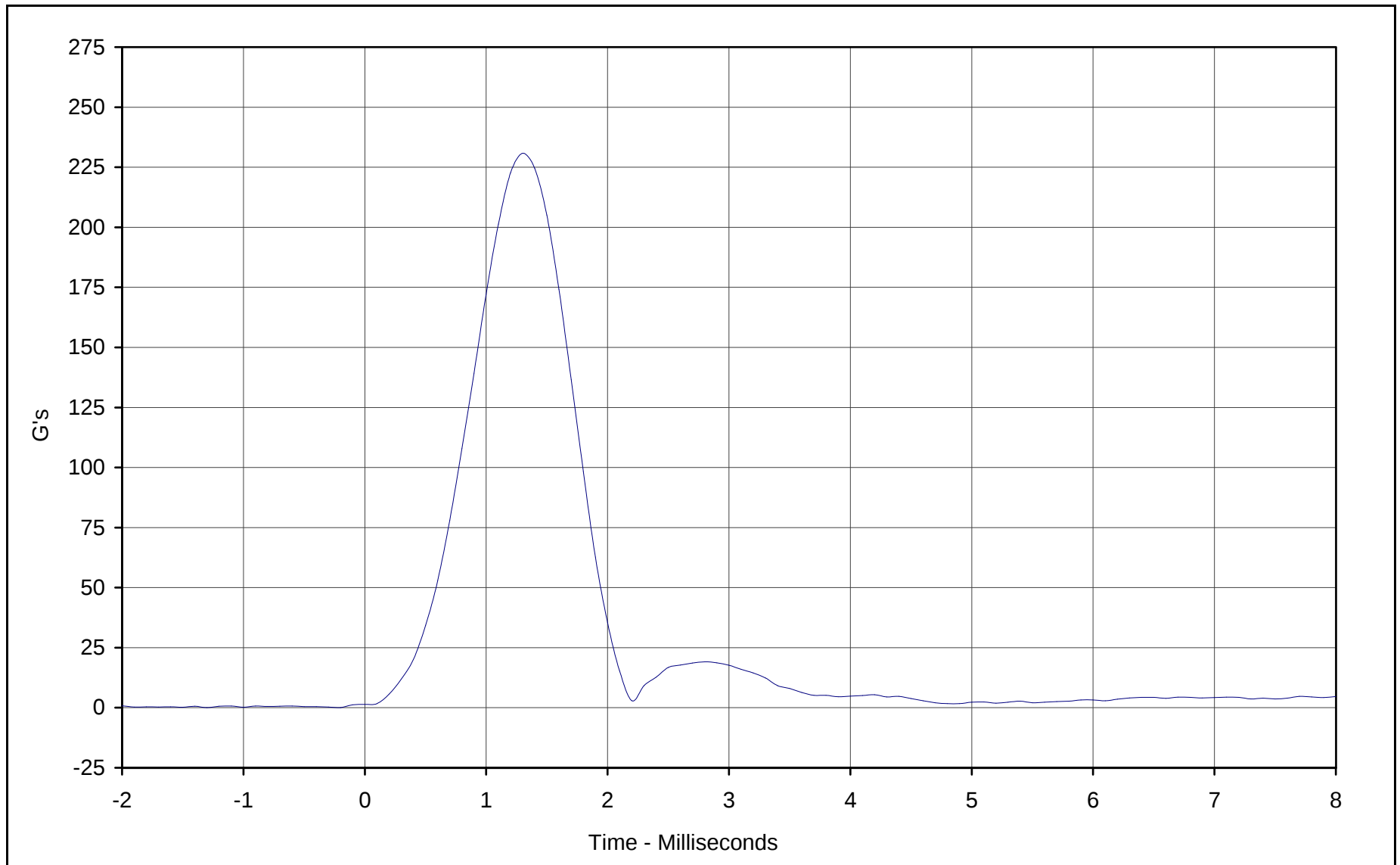
September 27, 2001

Test Date

Approved By

Date

C-47



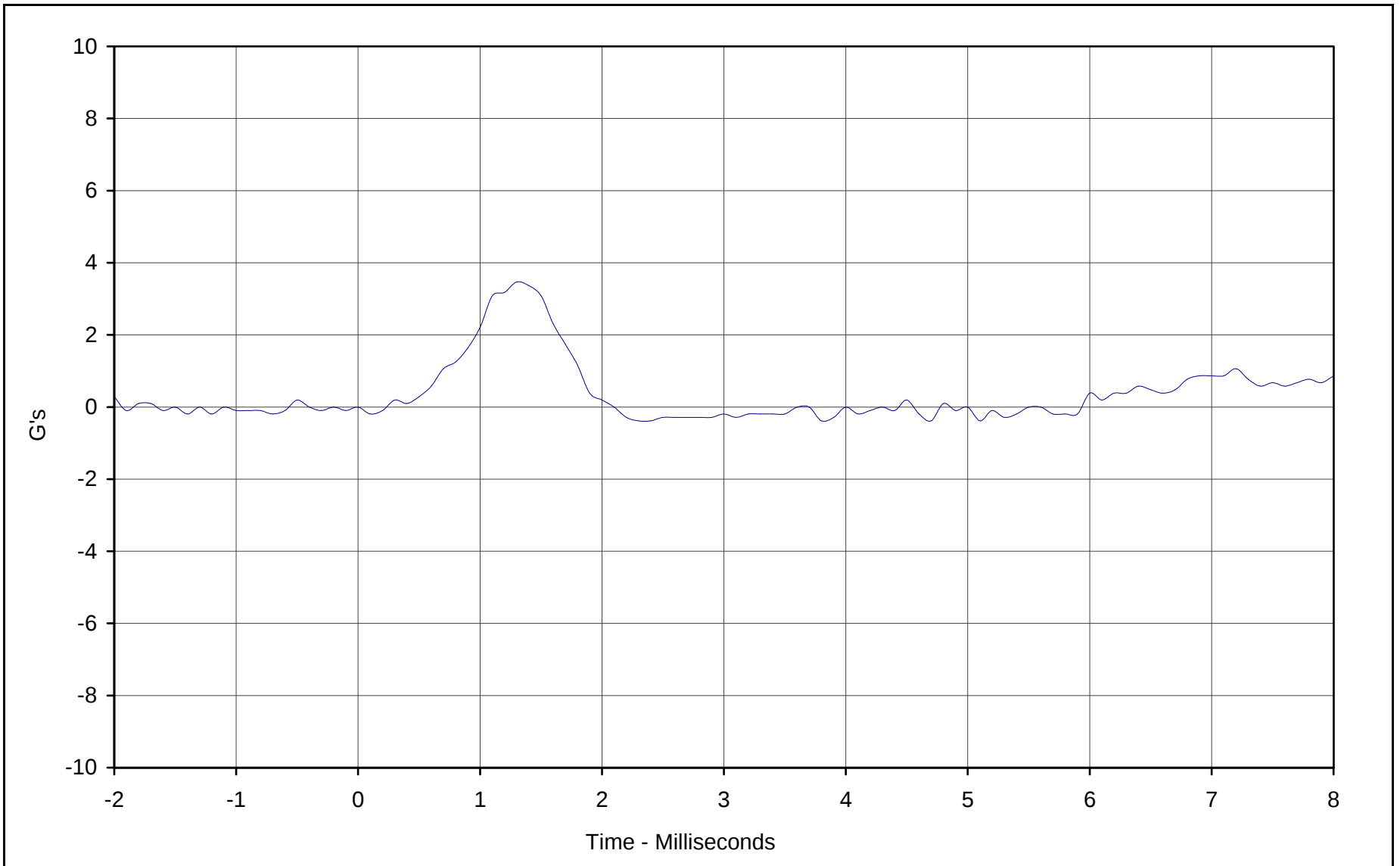
Curve Description: Head Resultant Acceleration
Maximum Value: 230.8 at 1.3 Milliseconds
Minimum Value: 1.4 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 9/27/01

Test Program: SID Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: SH09D



KAR21063-01

C-48



Curve Description: Head Y Axis Acceleration

Maximum Value:	3.5	at	1.3	Milliseconds
Minimum Value:	-0.4	at	2.3	Milliseconds
SAE Filter Class:	1000			
Date of Test:	9/27/01			

Test Program: SID Head Drop Calibration

Test Information: SID S/N: 275 Test I.D.: SH09D



KAR21063-01

APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Driver S.I.D. Serial Number 274
9/25/01
2002 Saturn L100 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
1	Head CG	X	KEAC086	Accel.,1/2 bridge	Endevco	7264-2000X	G
2	Head CG	Y	KEAC087	Accel.,1/2 bridge	Endevco	7264-2000Y	G
3	Head CG	Z	KEAC088	Accel.,1/2 bridge	Endevco	7264-2000Z	G
4	Upper Rib Primary	Y	KEAC070	Accel.,1/2 bridge	Endevco	7264-2000X	G
5	Lower Rib, Primary	Y	KEAC071	Accel.,1/2 bridge	Endevco	7264-2000Y	G
6	Lower Spine, Primary	Y	KEAC072	Accel.,1/2 bridge	Endevco	7264-2000Z	G
7	Pelvis, Primary	Y	KEAC090	Accel.,Full bridge	Endevco	7264-2000X	G
8	Upper Rib Redundant	Y	KEAC076	Accel.,1/2 bridge	Endevco	7264-2000X	G
9	Lower Rib, Redundant	Y	KEAC077	Accel.,1/2 bridge	Endevco	7264-2000Y	G
10	Lower Spine, Redundant	Y	KEAC078	Accel.,1/2 bridge	Endevco	7264-2000Z	G
11	Pelvis, Redundant	Y	KEAC089	Accel.,1/2 bridge	Endevco	7264-2000X	G
12	Thorax Contact	N/A	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%
13	Pelvis Contact	N/A	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%

55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Passenger S.I.D. Serial Number 275
9/25/01
2002 Saturn L100 4 Door Sedan

CH.	LOCATION	AXIS	IDENT. NO.	DESCRIPTION	MFR	MODEL	UNITS
14	Head CG	X	KEAC069	Accel.,1/2 bridge	Endevco	7264-2000X	G
15	Head CG	Y	KEAC080	Accel.,1/2 bridge	Endevco	7264-2000Y	G
16	Head CG	Z	KEAC082	Accel.,1/2 bridge	Endevco	7264-2000Z	G
17	Upper Rib Primary	Y	KEAC066	Accel.,1/2 bridge	Endevco	7264-2000X	G
18	Lower Rib, Primary	Y	KEAC067	Accel.,1/2 bridge	Endevco	7264-2000Y	G
19	Lower Spine, Primary	Y	KEAC068	Accel.,1/2 bridge	Endevco	7264-2000Z	G
20	Pelvis, Primary	Y	KEAC079	Accel.,1/2 bridge	Endevco	7264-2000X	G
21	Upper Rib Redundant	Y	KEAC073	Accel.,1/2 bridge	Endevco	7264-2000X	G
22	Lower Rib, Redundant	Y	KEAC074	Accel.,1/2 bridge	Endevco	7264-2000Y	G
23	Lower Spine, Redundant	Y	KEAC075	Accel.,1/2 bridge	Endevco	7264-2000Z	G
24	Pelvis, Redundant	Y	KEAC081	Accel.,1/2 bridge	Endevco	7264-2000X	G
25	Thorax Contact	Y	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%
26	Pelvis Contact	Y	T0	Contact Switch	Tapeswitch	8 oz. Yellow	%

55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Vehicle Accelerometers
9/25/01

2002 Saturn L100 4 Door Sedan

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
9/25/01
2002 Saturn L100 4 Door Sedan

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	%