

REPORT NUMBER KAR21003-03

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TEST**

**TOYOTA MOTOR MANUFACTURING
2001 TOYOTA SIENNA
MINIVAN
NHTSA NUMBER: M15106**

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



DECEMBER 22, 2000

FINAL REPORT

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Date of Acceptance

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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 2001 Toyota Sienna Minivan in accordance with the specifications of the Office of Crash Worthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at KARCO Engineering laboratories in Adelanto, California, on December 6, 2000. The impact velocity of the Moving Deformable Barrier was 62.16 km/h, and the ambient temperature at the struck (driver's) side of the vehicle was 17.7 °C. The target vehicle's maximum post test static crush was 327 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: 35%;">Measurement Description</th> <th style="width: 30%;">Driver SID</th> <th style="width: 35%;">Passenger SID</th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) G's</td> <td style="text-align: center;">59.6</td> <td style="text-align: center;">53.3</td> </tr> <tr> <td>Left Lower Rib (LLR) G's</td> <td style="text-align: center;">47.4</td> <td style="text-align: center;">49.9</td> </tr> <tr> <td>Lower Spine (T₁₂) G's</td> <td style="text-align: center;">79.3</td> <td style="text-align: center;">45.6</td> </tr> <tr> <td>Thoracic Trauma Index (TTI) G's</td> <td style="text-align: center;">69</td> <td style="text-align: center;">49</td> </tr> <tr> <td>Pelvis (PEV) G's</td> <td style="text-align: center;">94</td> <td style="text-align: center;">92</td> </tr> </tbody> </table>				Measurement Description	Driver SID	Passenger SID	Left Upper Rib (LUR) G's	59.6	53.3	Left Lower Rib (LLR) G's	47.4	49.9	Lower Spine (T ₁₂) G's	79.3	45.6	Thoracic Trauma Index (TTI) G's	69	49	Pelvis (PEV) G's	94	92
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17. Key Words New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) Side Impact Dummy (SID)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. NHTSA Technical Reference Division 400 Seventh St., SW, Room 5108 Washington, DC 20590																			
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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' 2001 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 2001 Toyota Sienna Minivan manufactured by Toyota Motor Manufacturing.

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 2001 Toyota Sienna Minivan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.11 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 2029 kg. and the test weight of the MDB was 1361 kg. The test was conducted at KARCO Engineering in Adelanto, California, on December 6, 2000.

One (1) real-time motion picture camera and eleven (11) 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 327 mm at level 2, 1050mm rearward of the left vertical impact point. The driver SID, Serial No. 274 and the passenger SID, Serial No. 275 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	69	49
Peak Pelvic G's (PEV)	G's	94	92

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: 2001 Toyota Sienna Minivan
 Test Program: 55/28 km/h 90° Side Impact NCAP

NHTSA No. M15106
 Test Date: 12/06/00

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: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00

TEST VEHICLE INFORMATION

Make	Toyota
Model	Sienna
Body Style	Minivan
NHTSA No.	M15106
VIN	4T3ZF19C0IV348340
Color	White
Delivery Date	11/29/00
Odometer Reading (mile)	27
Dealer	Valley-Hi Toyota
Transmission	4-Speed Automatic
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	3
Engine Placement	Transverse

TEST VEHICLE OPTIONS

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Manufacturing	GVWR (kg)	1236
Date of Manufacture	October-00	GAWR Front (kg)	1236
		GAWR Rear (kg)	2381

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	245	245
Cold Pressure (kPa)	245	245
Recommend Tire Size	P205/70/R15	P205/70/R15
Tire Size on Vehicle	P205/70/R15	P205/70/R15
Tire Manufacturer	Firestone	Firestone

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	Bench	
Number of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				526
Cargo Weight (RCLW) (kg)				50

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

Test Vehicle: 2001 Toyota Sienna Minivan
 Test Program: 55/28 km/h 90° Side Impact NCAP

NHTSA No.: M15106
 Test Date: 12/06/00

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	533	396		580	476	
Right	kg	518	376		536	437	
Ratio	%	57.7	42.3		55.0	45.0	
Totals	kg	1051	772	1823	1116	913	2029

TARGET TEST WEIGHT CALCULATION*

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1823
Weight of 2 P572F Side Impact Dummies	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	50
Calculated Vehicle Target Weight (TVTW)	kg	2035

*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	748	749	759	770	1225
As Tested	mm	735	742	725	740	1301
Fully Loaded	mm	732	742	733	752	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel base	mm	2892
Total Vehicle Length at Left Side	mm	3440
Total Vehicle Length at Centerline	mm	4932
Total Vehicle Length at Right Side	mm	3445
Weight of Ballast In Cargo Area	kg	51
Amount of Stoddard Solvent in Fuel Tank	Liters	73.9

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel base	mm	2892
Target Impact Point Aft of Front Axle	mm	506
Actual Impact Point Aft of Front Axle	mm	509

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No. M15106

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

Test Date: 12/06/00

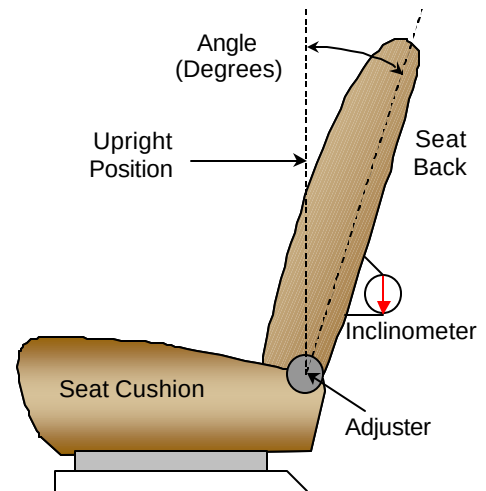
NOMINAL DESIGN RIDING POSITION

The driver's seat back is positioned to the manufacturers designated angle. The procedure for 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: 17° with a seated dummy

Rear seat back angle: 20° with a seated dummy



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

The driver's seat is adjustable and the rear middle seat is fixed. The fore/aft is set to the middle position for driver's seats

Driver seat fore/aft total travel: 16 total detents

Rear seat fore/aft total travel: Seat is fixed

Driver seat fore/aft position: Seat set at the 9th detent

Rear seat fore/aft position: Seat is fixed

SEAT BELT UPPER ANCHORAGE

The test vehicle is equipped with an adjustable "D" ring anchorage for the driver's seat position. There are 5 positions or detents. The driver's "D" ring anchorage is placed in the middle position. The rear middle seat anchor is fixed, no adjustments.

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No. M15106

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

Test Date: 12/06/00

FUEL TANK CAPACITY DATA

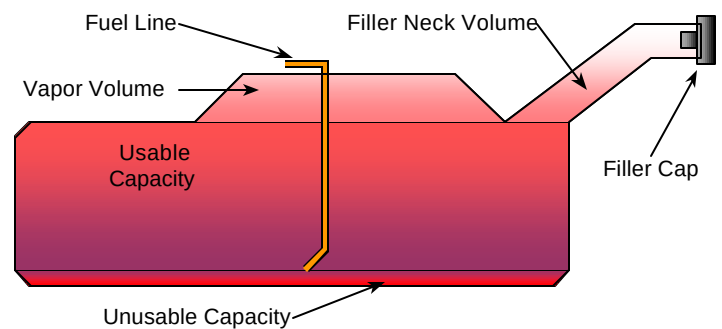
The "Usable Capacity" of the standard equipment fuel tank is: 79.4 liters

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

92-94% of "Usable Capacity" for certification to FMVSS 301 requirement: 73.1 to 74.7 liters

Actual amount of Stoddard solvent added to vehicle for certification test: 73.9 liters

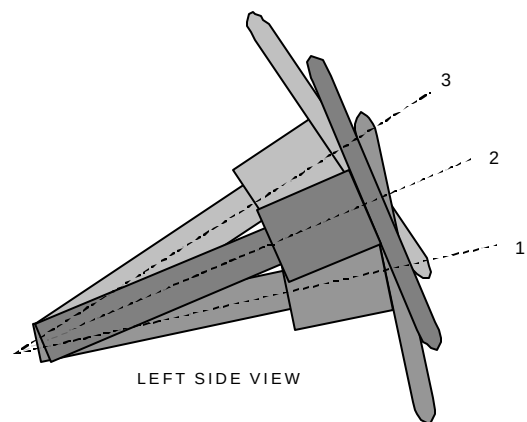
The test vehicle is equipped with an electric fuel pump. The fuel pump will operate for approximately three (3) seconds with the ignition in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes, when it is moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed onto the plate and the angle is measured. The tested vehicle has its steering column set at position 2 as indicated in the drawing at right and the angle below.



STEERING COLUMN ASSEMBLY

Lowermost, position 1: 20°

Geometric center, position 2: 28°

Uppermost, position 3: 36°

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2001 Toyota Sienna Minivan
 Test Program: 55/28 km/h 90° Side Impact NCAP

NHTSA No.: M15106
 Test Date: 12/06/00

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	533	396		580	476	
Right	kg	518	376		536	437	
Weight Ratio	%	57.7	42.3		55.0	45.0	
Totals	kg	1051	772	1823	1116	913	2029

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	92	261
Level 2	Occupant H-Point	mm	327	705
Level 3	Mid Door	mm	318	658
Level 4	Window Sill	mm	259	1014
Level 5	Window Top	mm	17	1597
N/A	Maximum Penetration	mm	327	

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	6
High Speed, MDB On-Board	2
Real Time, Panning	1
Total	12

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

Test Vehicle: 2001 Toyota Sienna Minivan
 Test Program: 55/28 km/h 90° Side Impact NCAP

NHTSA No.: M15106
 Test Date: 12/06/00

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	62.11
Trap No. 2 Velocity (Redn.)	km/h	61.1 to 62.7	62.16
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.5

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE (mm)

Vertical Location			From Centerline		Max Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	208
B	Top of Bumper	533	800	Left	90
C	Mid Level	686	800	Right	108
D	Top of Stack	813	800	Right	145

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 4
POST TEST OBSERVATIONS

Test Vehicle: 2001 Toyota Sienna Minivan
Test Program: 55/28 km/h 90° Side Impact NCAP

NHTSA No.: M15106
Test Date: 12/06/00

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID	Rear Seat SID
Dummy Type / Serial No.	P572F, SID / No. 274	P572F, SID / No. 275
Head Contact	Headrest	Window/Seat Back
Upper Torso Contact	Door Panel	Door Panel
Lower Torso Contact	Door Panel	Door Panel
Left Knee Contact	Steering Column	Door Panel/Knee
Right Knee Contact	Knee	Knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

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

POST TEST STRUCTURAL OBSERVATIONS

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

AIR BAG DEPLOYMENT

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

MDB LEFT EDGE IMPACT POINT DATA

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

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5
SID INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/05/00

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	59.6	49.5	-13.0	89.2	53.3	57.5	-11.7	109.1
Lower Rib (LLR)	Y	G's	47.4	35.6	-12.5	67.8	49.9	48.2	-6.9	109.3
Lower Spine (T ₁₂)	Y	G's	79.3	37.9	-20.1	60.4	45.6	45.1	-12.1	71.9
Pelvis (PEV)	Y	G's	94.2	32.8	-17.1	56.5	91.8	39.4	-13.4	77.1

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

Location	Driver				Passenger			
	LUR	T ₁₂	TTI(g)	PEV(g)	LUR	T ₁₂	TTI(g)	PEV(g)
Primary Rib, Spine, and Pelvis	59.578	79.329	69	94	53.339	45.557	49	92

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	59.2	49.6	-13.6	89.3	53.0	57.6	-10.9	109.3
Lower Rib (LLR)	Y	G's	47.2	49.5	-13.4	67.8	49.9	48.3	-6.3	109.5
Lower Spine (T ₁₂)	Y	G's	79.6	38.0	-19.7	60.6	45.4	45.4	-10.7	72.2
Pelvis (PEV)	Y	G's	94.5	33.0	-17.1	56.9	92.1	39.4	-13.1	80.8

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

Location	Driver				Passenger			
	LUR	T ₁₂	TTI(g)	PEV(g)	LUR	T ₁₂	TTI(g)	PEV(g)
Redundant Rib, Spine, and Pelvis	59.242	79.614	69	95	53.019	45.438	49	92

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	8.1	162.1	-17.3	82.3	11.0	88.7	-25.3	101.8
Head CG	Y	G's	34.4	58.2	-21.0	42.2	29.5	104.4	-15.6	50.0
Head CG	Z	G's	55.7	67.8	-42.5	51.7	70.1	85.2	-2.3	7.6
Head CG Resultant	N/A	G's	56.1	65.0			70.4	85.2		

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	336.2	51.2	87.1	38.8	362.4	75.8	111.7	39.9

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

DATA SHEET NO. 6

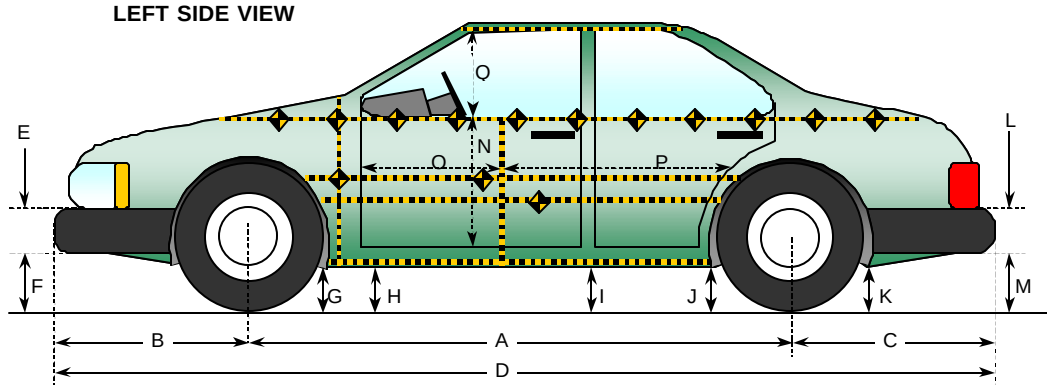
VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00



All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2892	2883	9
B	Front Axle To FSOV	970	993	-23
C	Rear Axle to RSOV	1066	1065	1
D	Total Length at Centerline	4932	4928	4
E	Front Bumper Thickness	350	350	0
F	Front Bumper Bottom to Ground	232	189	43
G	Sill Height at Front Wheel Well	216	189	27
H	Sill Height at Front Door Leading Edge	211	189	22
I	Sill Height at "B" Pillar	224	262	-38
J1	Sill Height at Rear Wheel Well	191	214	-23
J2	Pinch Weld Height at Rear Wheel Well	214	254	-40
K	Sill Height aft of Rear Wheel Well	310	324	-14
L	Rear Bumper Thickness	205	204	1
M	Rear Bumper Bottom to Ground	343	370	-27
N	Sill Height to Window Bottom Sill	698	668	30
O	Front Door Leading Edge to Impact CL	932	838	94
P	Rear Door Trailing Edge to Impact CL	1328	1261	67
Q	Front Window Opening	505	493	12
R	Right Side Length	3445	3452	-7
S	Left Side Length	3440	3427	13
T	Vehicle Width at "B" Post	1862	1693	169

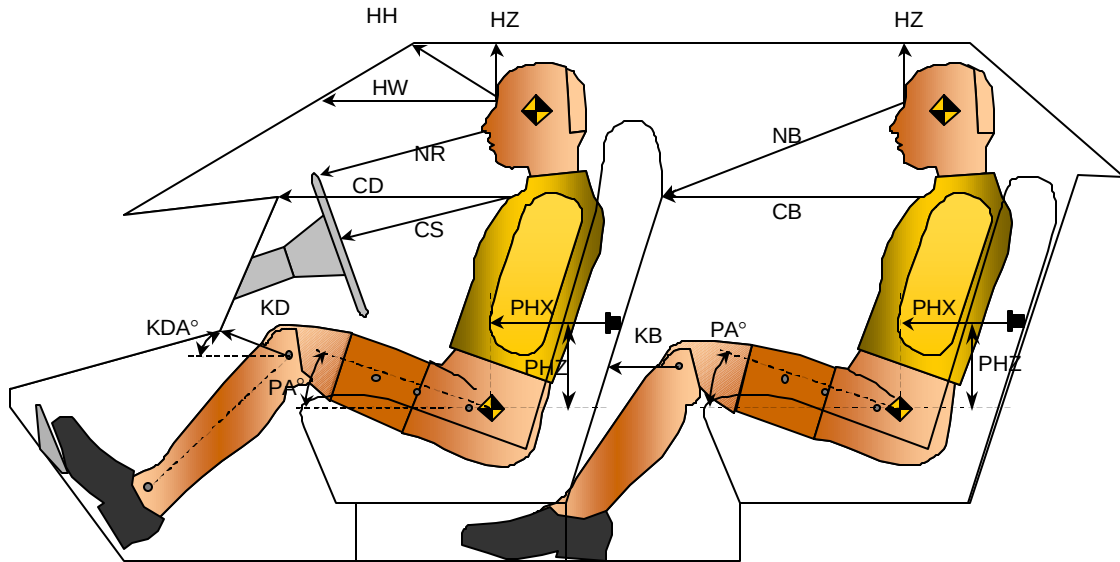
DATA SHEET NO. 7
SID LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00



Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	370	8		
HW		Head to Windshield	685			
HZ	HZ	Head to Roof	180	90	219	90
NR	NB	Nose to Rim/Nose to Seatback	460	18	720	20
CD	CB	Chest to Dash or Seatback	550	4	640	5
CS		Chest to Steering Wheel	350	23		
KDL	KBL	Left Knee to Dash or Seatback	160	22	260	
KDR	KBR	Right Knee to Dash or Seatback	183		261	
PA	PA	Pelvic Angle		15		20
PHX	PHX	H-Point to Striker (X-Axis)	327		360	
PHZ	PHZ	H-Point to Striker (Z-Axis)	142		32	

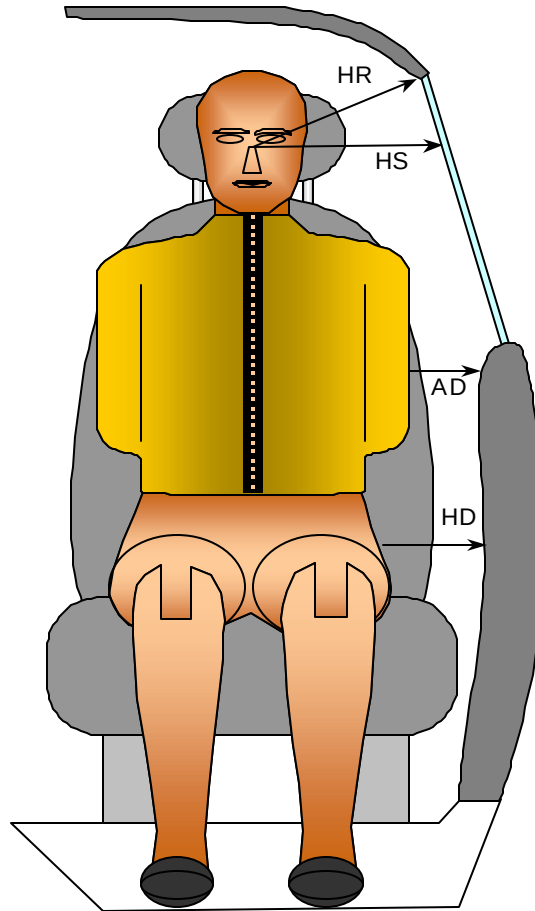
DATA SHEET NO. 8
SID LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00



FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	208	246
HS	Head to Side Window	mm	460	718
AD	Arm to Door	mm	119	161
HD	H-Point to Door	mm	151	236

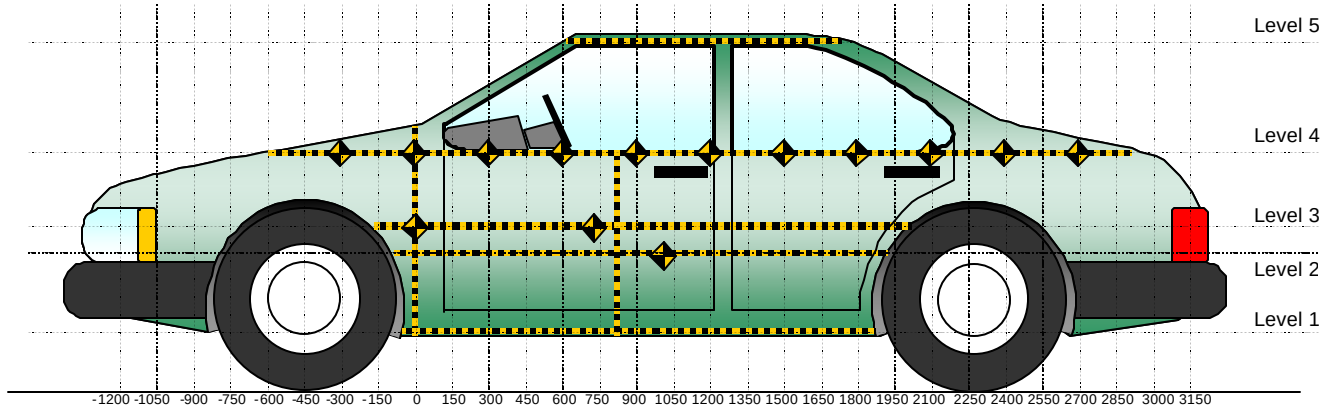
DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00



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	1597
4	Window Sill	1014
3	Mid Door	658
2	Occupant H-Point	705
1	Sill Top	261

DATA SHEET NO. 10 - VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001 Toyota Sienna Minivan
 Test Program: 55/28 km/h 90° Side Impact NCAP

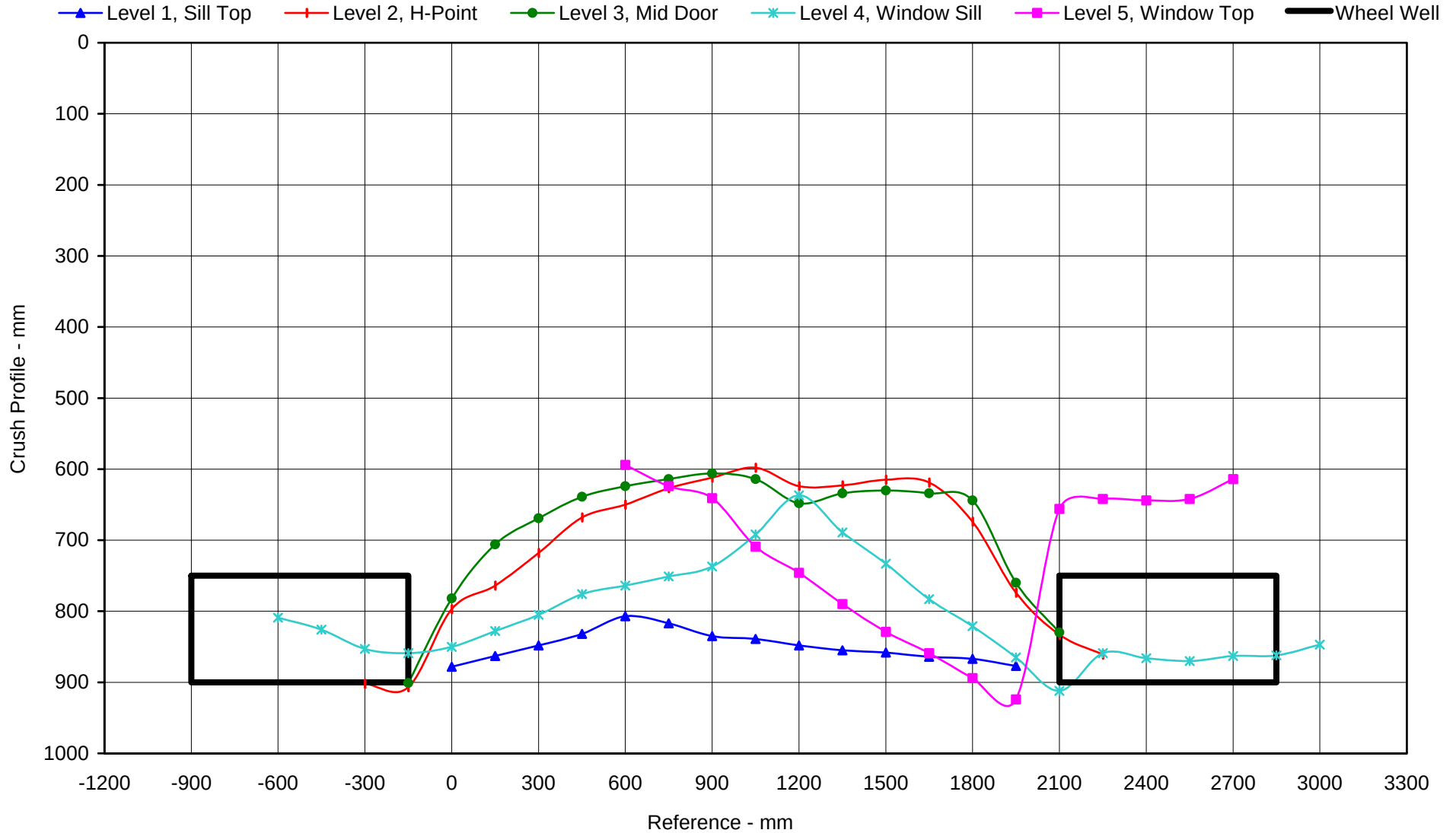
NHTSA No.: M15106
 Test Date: 12/6/00

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600				816					809					7	
-450				838					826					12	
-300		922		851			902		853			20		-2	
-150		915	920	856			907	901	859			8	19	-3	
0	906	916	915	864		878	797	782	850		28	119	133	14	
150	904	918	916	871		863	764	706	828		41	154	210	43	
300	900	919	917	875		848	718	669	805		52	201	248	70	
450	899	920	919	881		832	668	639	776		67	252	280	105	
600	899	921	921	885	611	807	650	624	764	594	92	271	297	121	17
750	901	924	923	889	627	817	627	614	751	624	84	297	309	138	3
900	896	924	924	892	639	835	612	606	737	641	61	312	318	155	-2
1050	894	925	924	892	645	839	598	614	692	709	55	327	310	200	-64
1200	898	925	924	896	647	848	624	648	637	746	50	301	276	259	-99
1350	900	925	924	899	650	855	623	634	689	790	45	302	290	210	-140
1500	894	925	922	899	652	858	615	630	733	829	36	310	292	166	-177
1650	899	923	921	899	652	864	619	634	783	859	35	304	287	116	-207
1800	904	922	919	899	651	867	674	644	821	894	37	248	275	78	-243
1950	906	920	917	899	649	877	774	760	865	924	29	146	157	34	-275
2100		920	922	898	648		833	830	912	656		87	92	-14	-8
2250		925		897	645		861		859	642		64		38	3
2400				894	635				866	644				28	-9
2550				889	624				870	642				19	-18
2700				880	609				863	614				17	-5
2850				868					862					6	
3000				851					847					4	

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

DATA SHEET NO. 10...(continued)

18



Maximum Crush, Level 1: 92 mm at 600 mm

Maximum Crush, Level 2: 327 mm at 1050 mm

Maximum Crush, Level 3: 318 mm at 900 mm

Maximum Crush, Level 4: 259 mm at 1200 mm

Maximum Crush, Level 5: 17 mm at 600 mm

Test Program: 55/28 km/h 90° Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

Test Date: 12/06/00



KAR21003-03

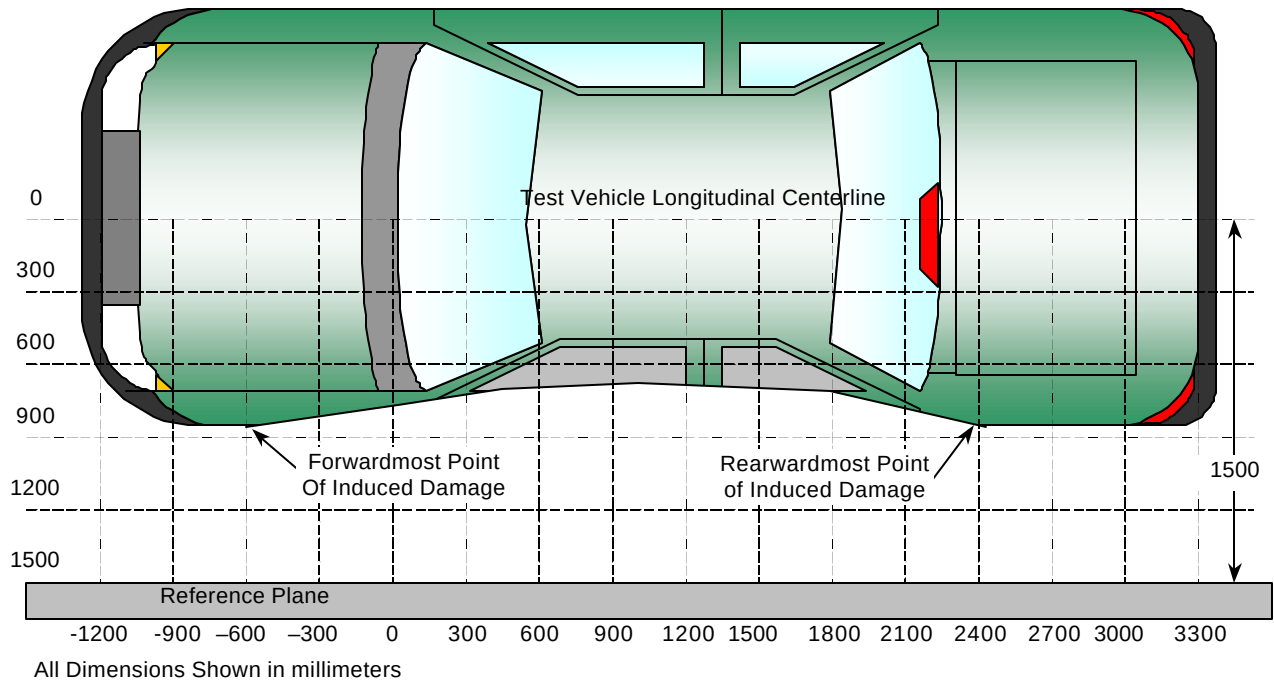
DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00



TOP VIEW

Damage Profile Distances

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	-600	4	816	809	7
2	0	3	915	782	133
3	750	3	923	614	309
4	1500	2	925	615	310
5	2250	2	925	861	64
6	3000	4	851	847	4

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

DATA SHEET NO. 12

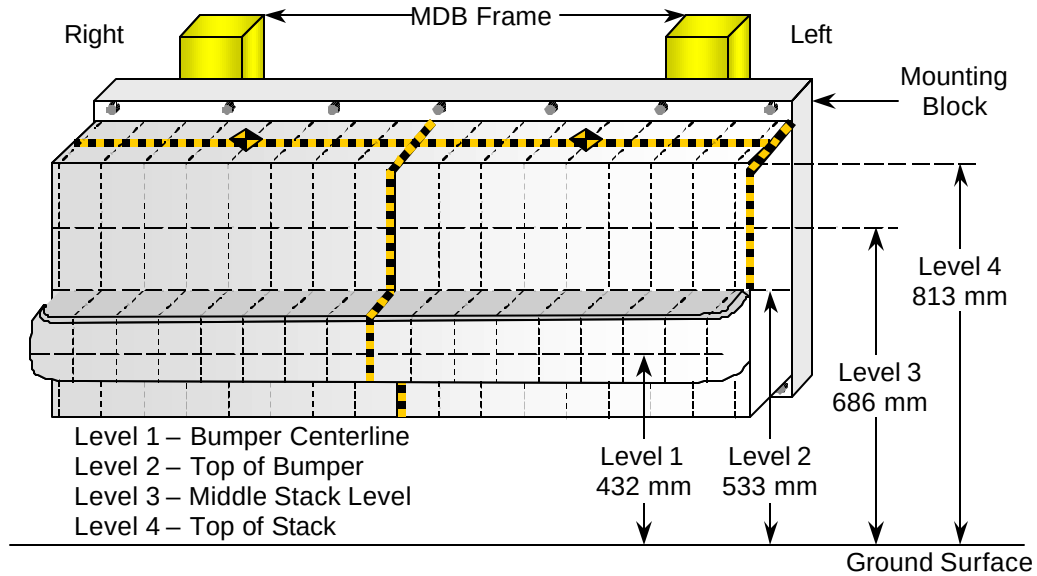
DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00



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	208	201	201	200	197	197	206	198	191	165	159	155	151	151	146	146	154
2	90	86	84	79	82	79	76	80	68	55	49	49	49	51	54	54	49
3	48	34	23	16	13	16	33	34	20	16	17	13	17	28	45	71	108
4	104	68	19	3	3	2	13	25	14	17	22	33	44	59	81	112	145

All Dimensions in mm

DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

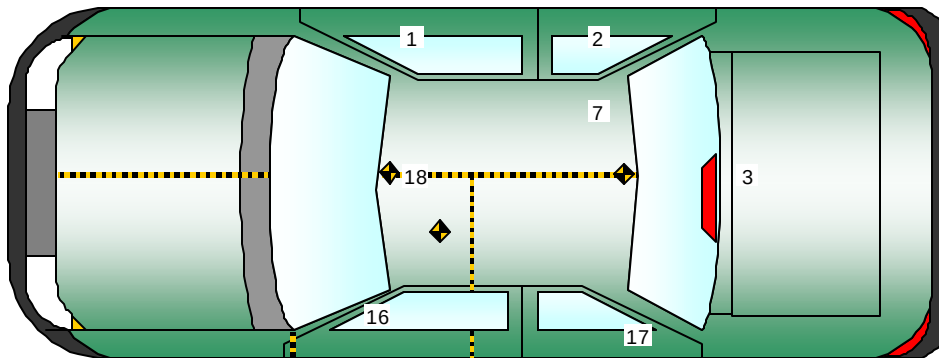
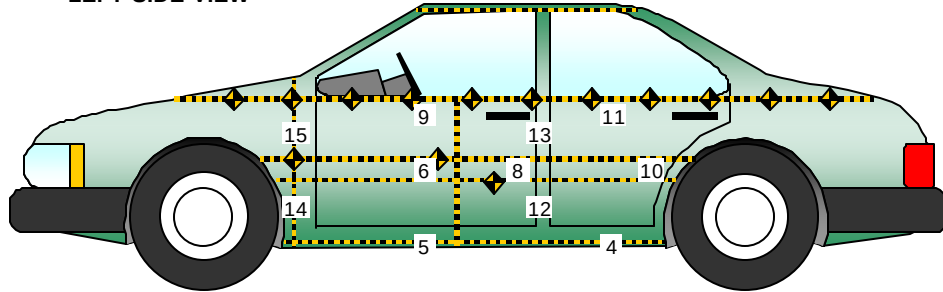
Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00

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: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/05/00

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	3060	750	405	X	2.7	64.7	-5.1	8.2
					Y	28.2	7.6	-1.7	141.2
					Z	6.2	63.5	-6.6	10.6
					RES	29.0	7.6		
2	Right Sill at Rear Seat	1880	760	440	X	4.0	62.3	-4.2	6.9
					Y	28.3	7.7	-3.2	139.5
					Z	6.0	46.0	-9.7	16.9
					RES	28.6	7.6		
3	Rear Floorpan Above Axle	680	40	540	X	2.2	62.2	-5.3	27.5
					Y	26.8	7.9	-3.6	142.3
					Z	11.5	47.7	-8.1	82.4
					RES	26.9	7.9		
4	Left Sill at Rear Door	1915	-815	280	Y	26.8	8.0	-3.4	97.0
5	Left Sill at Front Door	2820	-815	290	Y	35.9	5.7	-10.6	24.7
6	Front Door Centerline	2995	-840	715	Y	201.2	11.5	-101.7	16.6
7	Rear Occupant Compartment	2500	360	435	Y	31.3	7.2	-2.2	144.5
8	Front Door Mid-Rear	2480	-820	710	Y	92.7	6.7	-50.2	21.8
9	Front Door Upper Centerline	2875	-815	930	Y	97.5	14.2	-56.1	24.6
10	Rear Door Mid-Rear	1600	-855	720	Y	146.4	8.3	-82.4	30.6
11	Rear Door Upper Centerline	1920	-875	900	Y	194.5	8.8	-82.7	36.9
12	B-Post Lower	2410	-830	560	Y	141.7	6.0	-45.9	28.0
13	B-Post Middle	2405	-830	810	Y	97.3	5.7	-86.0	31.0
14	A-Post Lower	3445	-840	660	Y	33.5	8.7	-1.3	144.0
15	A-Post Middle	3445	-830	900	Y	37.2	8.8	-2.2	26.0
16	Front Seat Track	3000	-645	560	Y	59.7	22.5	-2.3	53.2
17	Rear Seat Structure				Y				
18	Vehicle CG	3200	30	345	X	2.3	62.2	-5.9	27.9
					Y	26.1	7.6	-2.2	135.5
					Z	7.0	53.2	-8.5	13.8
					RES	26.9	7.5		

**

** Not installed

DATA SHEET NO. 14
MDB ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2001 Toyota Sienna Minivan

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

NHTSA No.: M15106

Test Date: 12/05/00

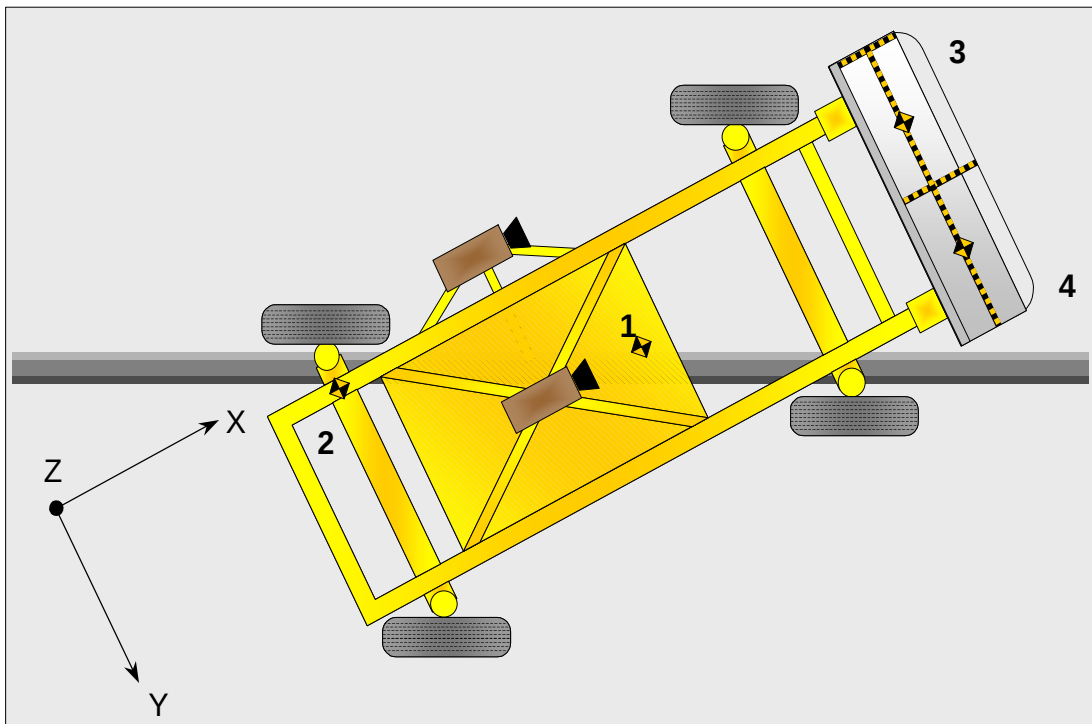
MDB ACCELEROMETER PEAK DATA AND LOCATIONS

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	2.5	147.6	-18.8	36.0
					Y	2.7	73.6	-8.3	44.3
					Z	10.7	167.3	-14.6	26.9
					RES	20.6	43.9		
2	MDB Rear	-2642	-593	608	X	2.4	112.4	-21.4	11.4
					Y	3.3	112.4	-6.0	24.3

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	0.0	0.0
4	MDB Right Bumper	% F.S.	100.7	11.2	50.3	0.0



DATA SHEET NO. 15

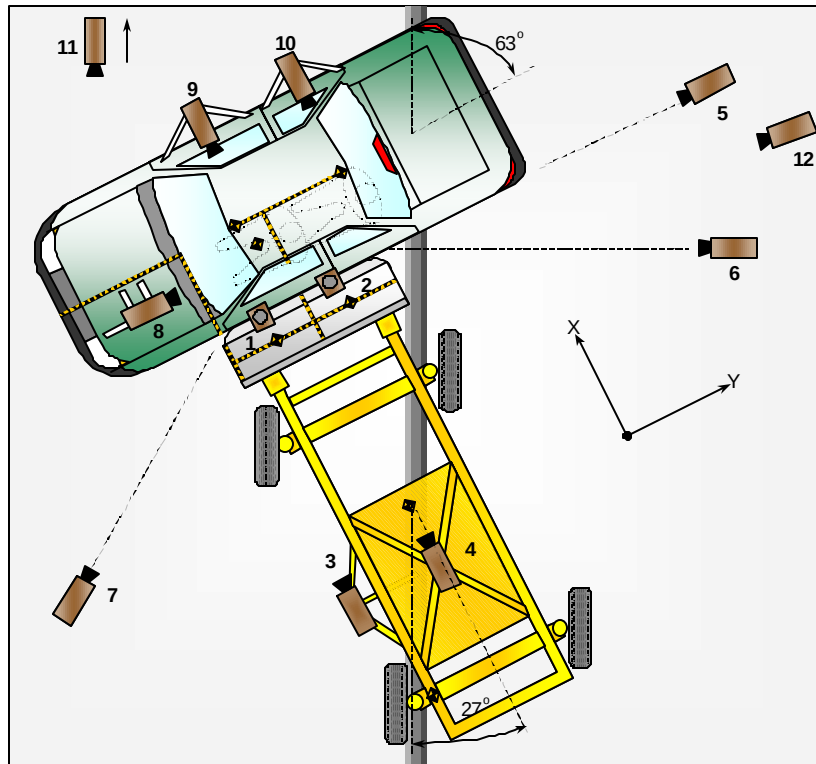
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00



No.	Camera View	Location (mm)			Angle (deg.)	Lens (mm)	Film Speed (fr./sec.)
		X	Y	Z			
1	Overhead Overall	1676	-762	5486	-86	10	911
2	Overhead Close-up	-762	0	5791	-82	24	1007
3	MDB Onboard, Impact Point Close-Up	-2134	0	1143	-7	13	812
4	MDB Onboard, Centerline of Impact	-3048	-1676	1829	-4	13	982
5	Right Side, Ground Level, Overall	9144	-18288	2210	-1	25	1060
6	Right Side, Ground Level, Close-up	0	-18898	1524	0	60	1000
7	Left Side, Ground Level, Close-up	-2362	-5410	1448	-6	13	1020
8	Vehicle Onboard Front SID, Front	-305	1219	1478	-10	19	1006
9	Vehicle Onboard Front SID, Side	1624	914	1173	0	19	1011
10	Vehicle Onboard Rear SID, Side	1981	0	1173	0	10	1021
11	Front View In-line with Track	108051	229	1021	0	80	490
12	Real Time Coverage	3072	20040	2350	N/A	Zoom	16

DATA SHEET NO. 16

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2001 Toyota Sienna Minivan

NHTSA No.: M15106

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

Test Date: 12/06/00

Test Time: 12:37 PM Temperature at Time of Impact: 17.7 °C

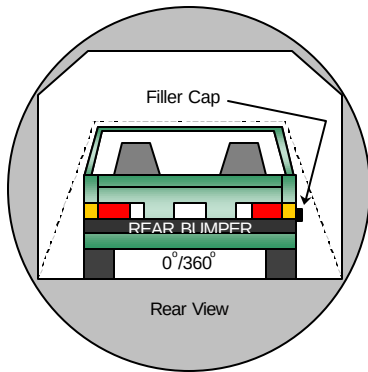
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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

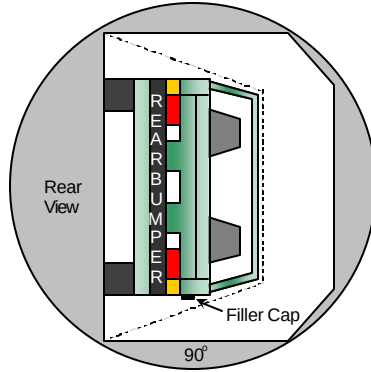
DATA SHEET NO. 17
FMVSS 301 STATIC ROLLOVER DATA SHEET

Test Vehicle: 2001 Toyota Sienna Minivan
 Test Program: 55/28 km/h 90° Side Impact NCAP

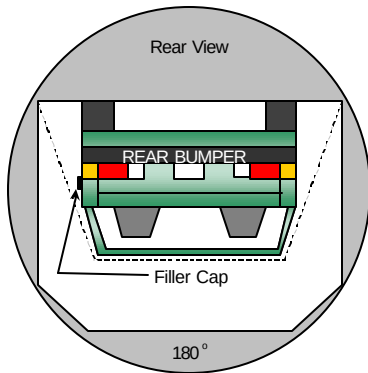
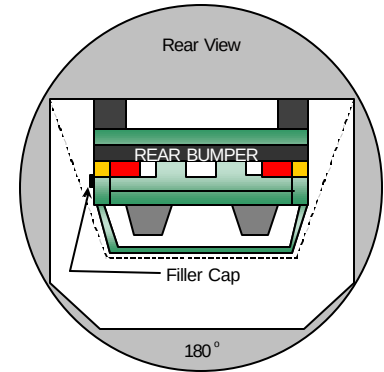
NHTSA No.: M15106
 Test Date: 12/06/00



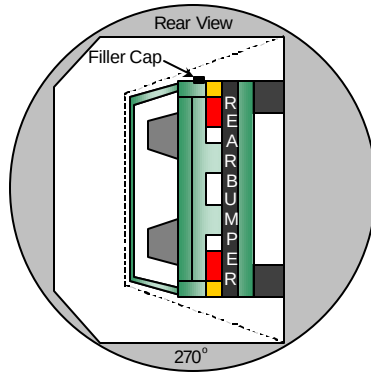
0° TO 90°



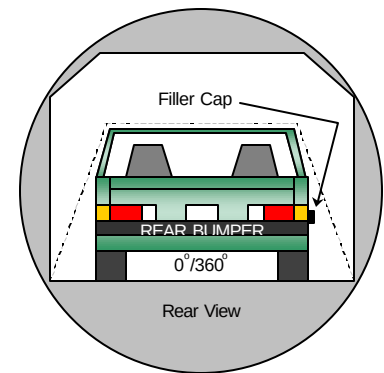
90° TO 180°



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°	81	300	0.0
90° to 180°	81	300	0.0
180° to 270°	77	300	0.0
270° to 360°	82	300	0.0

APPENDIX A
PHOTOGRAPHS

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Figure A-1: Left Front, as Received



Figure A-2: Right Rear, as Received



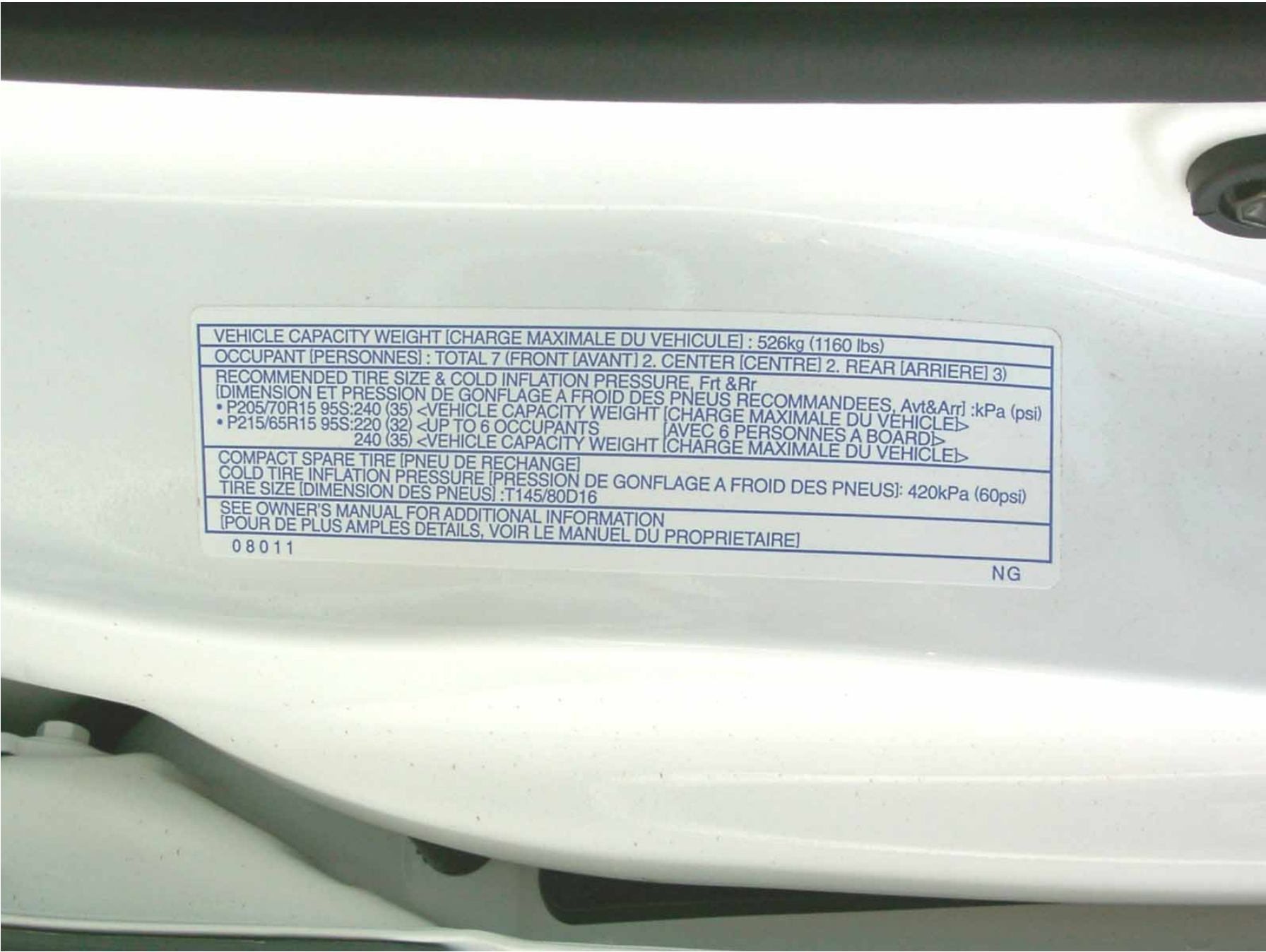
MFD.BY:TOYOTA MOTOR MANUFACTURING.
KENTUCKY,INC. DATE 10/00
GVWR 5250LB GAWR FR 2725LB RR 2725LB
WITH P205/70R15 OR P215/65R15 TIRES.
15X6.5JJ RIMS. AT 240KPA (35PSI) COLD
THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY AND
THEFT PREVENTION STANDARDS IN EFFECT ON
THE DATE OF MANUFACTURE SHOWN ABOVE.
4T3ZF19C01U348340 TYPE MPV

C/TR:040/FA11
A/TM:-01A/A540E

MODEL:MCL10L-PFSDKA
88497

BA04318264

Figure A-3: Vehicle Certification Label



VEHICLE CAPACITY WEIGHT [CHARGE MAXIMALE DU VEHICULE] : 526kg (1160 lbs)
OCCUPANT [PERSONNES] : TOTAL 7 (FRONT [AVANT] 2. CENTER [CENTRE] 2. REAR [ARRIERE] 3)
RECOMMENDED TIRE SIZE & COLD INFLATION PRESSURE, Frt &Rr [DIMENSION ET PRESSION DE GONFLAGE A FROID DES PNEUS RECOMMANDEES, Avt&Arr] :kPa (psi)
• P205/70R15 95S:240 (35) <VEHICLE CAPACITY WEIGHT [CHARGE MAXIMALE DU VEHICULE]>
• P215/65R15 95S:220 (32) <UP TO 6 OCCUPANTS [AVEC 6 PERSONNES A BOARD]>
240 (35) <VEHICLE CAPACITY WEIGHT [CHARGE MAXIMALE DU VEHICULE]>
COMPACT SPARE TIRE [PNEU DE RECHANGE]
COLD TIRE INFLATION PRESSURE [PRESSION DE GONFLAGE A FROID DES PNEUS]: 420kPa (60psi)
TIRE SIZE [DIMENSION DES PNEUS] :T145/80D16
SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION [POUR DE PLUS AMPLES DETAILS, VOIR LE MANUEL DU PROPRIETAIRE]

08011

NG

Figure A-4: Vehicle Tire Label



Figure A-5: Front View, Pre-Test



Figure A-6: Front View, Post-Test



Figure A-7: Rear View, Pre-Test



Figure A-8: Rear View, Post-Test



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



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



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



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



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



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



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



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



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



Figure A-18: Driver Dummy Left Side with Door Open, Pre-Test



Figure A-19: Driver Dummy Left Side, Pre-test



Figure A-20: Driver Dummy Left Side, Post-Test



Figure A-21: Driver Dummy Clearance, Pre-Test



Figure A-22: Driver Dummy Clearance, Post-Test



Figure A-23: Driver Dummy Inside View, Pre-Test



Figure A-24: Driver Dummy Inside View, Post-Test



Figure A-25: Driver Door Inside View, Pre-Test



Figure A-26: Driver Dummy Contact Points Inside View, Post-Test



Figure A-27: Passenger Dummy Left Side with Door Open, Pre-Test



Figure A-28: Passenger Dummy Left Side, Pre-Test



Figure A-29: Passenger Dummy Left Side, Post-Test



Figure A-30: Passenger Dummy Clearance, Pre-Test



Figure A-31: Passenger Dummy Clearance, Post-Test



Figure A-32: Passenger Dummy Inside View, Pre-Test



Figure A-33: Passenger Dummy Inside View, Post-Test



Figure A-34: Passenger Door Inside View, Pre-Test



Figure A-35: Passenger Dummy Contact Points Inside View, Post-Test

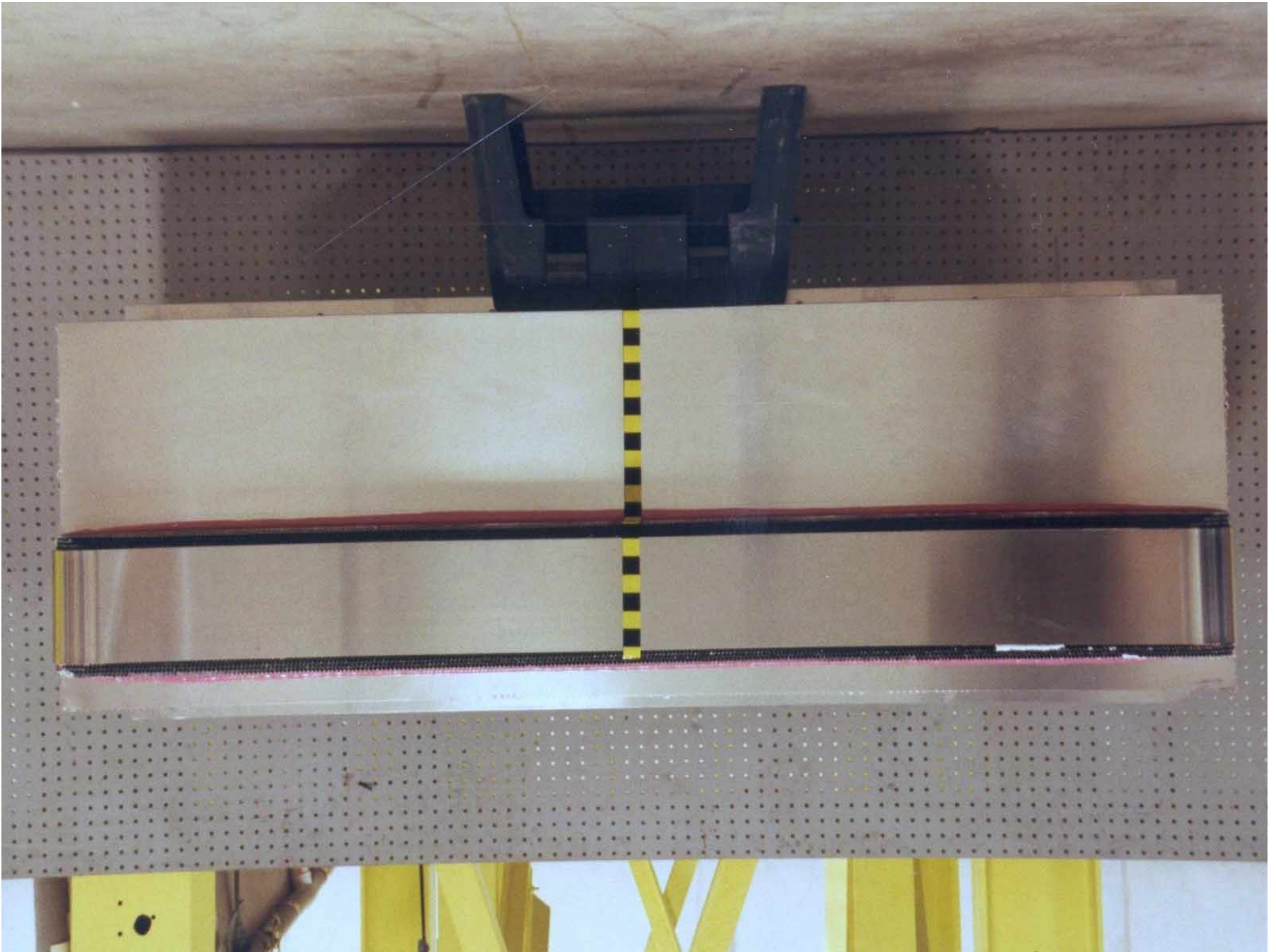


Figure A-36: Front View of Deformable Barrier, Pre-Test



Figure A-37: Front View of Deformable Barrier, Post-Test

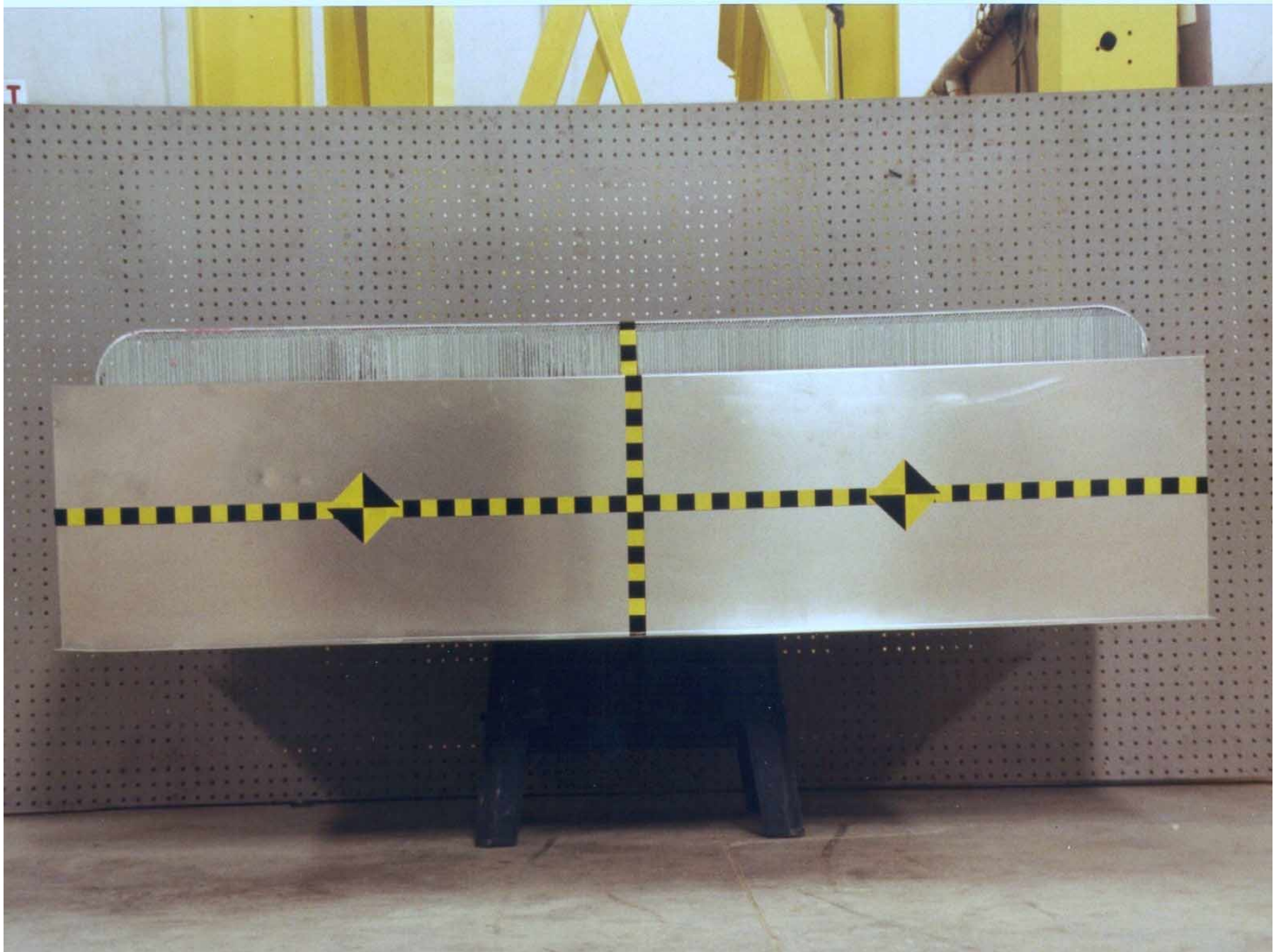


Figure A-38: Top View of Deformable Barrier, Pre-Test



Figure A-39: Top View of Deformable Barrier, Post-Test

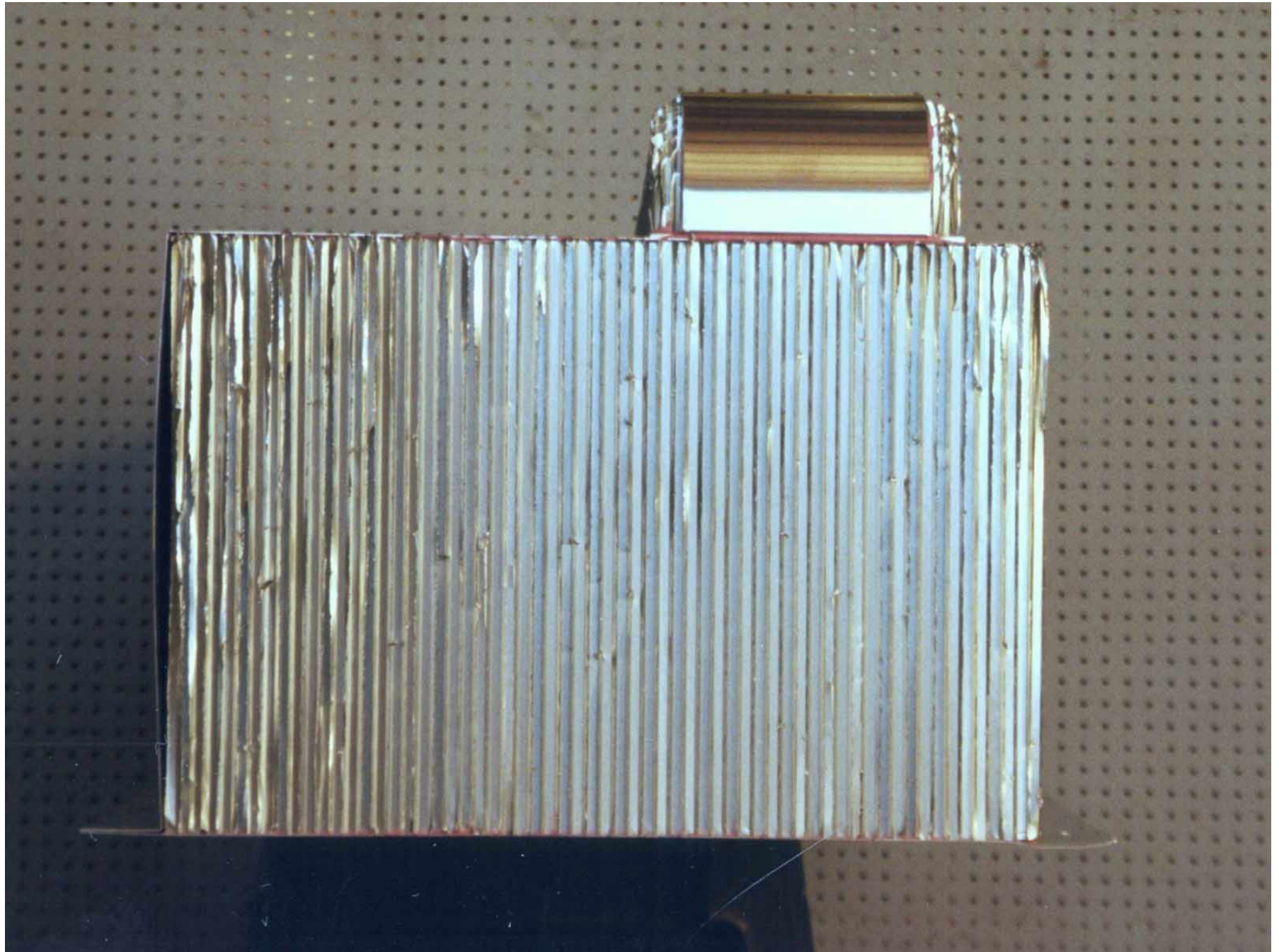


Figure A-40: Right Side View of Deformable Barrier, Pre-Test

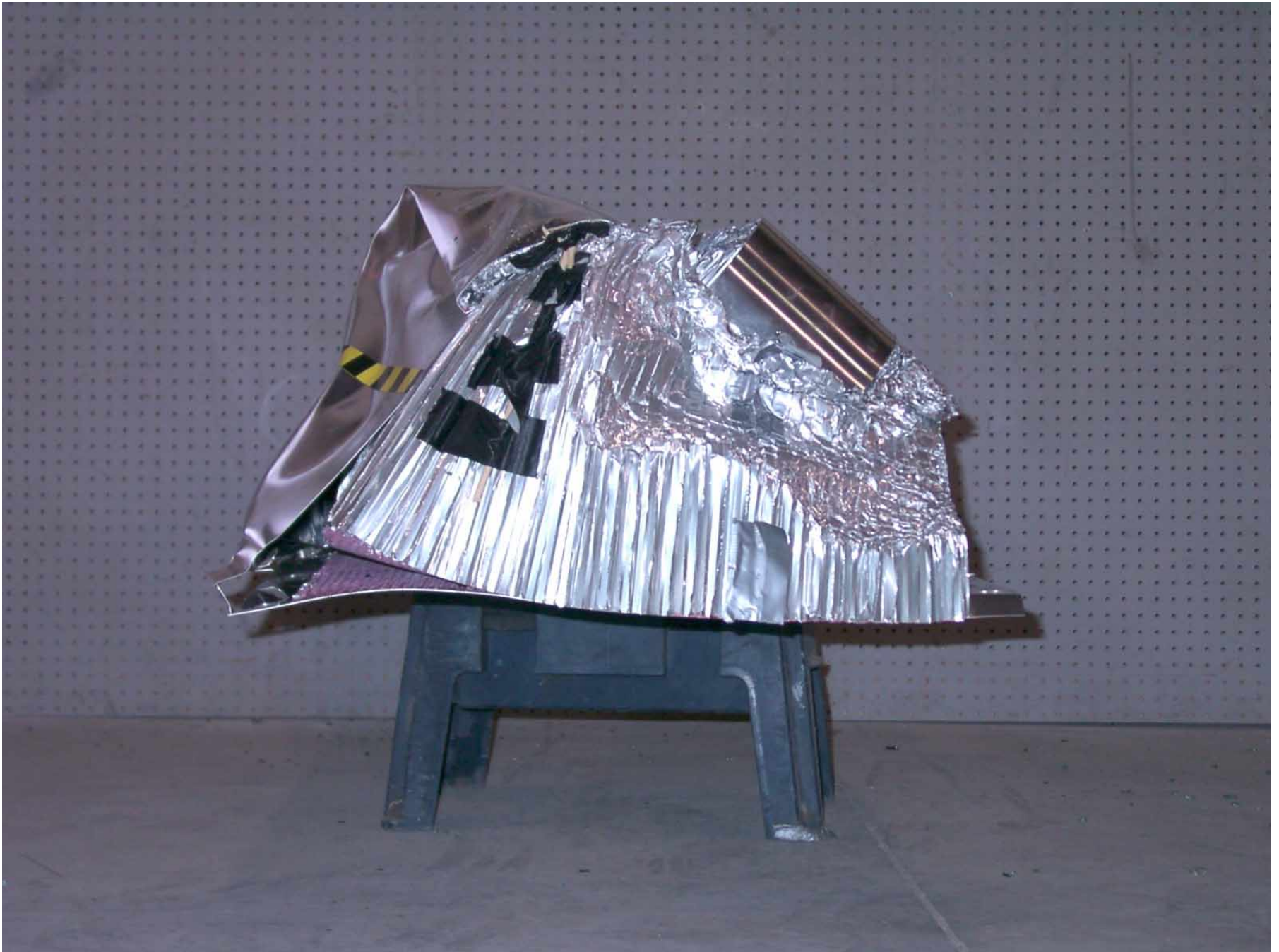


Figure A-41: Right Side View of Deformable Barrier, Post-Test



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



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



Figure A-44: Vehicle on Rollover Device, Top View

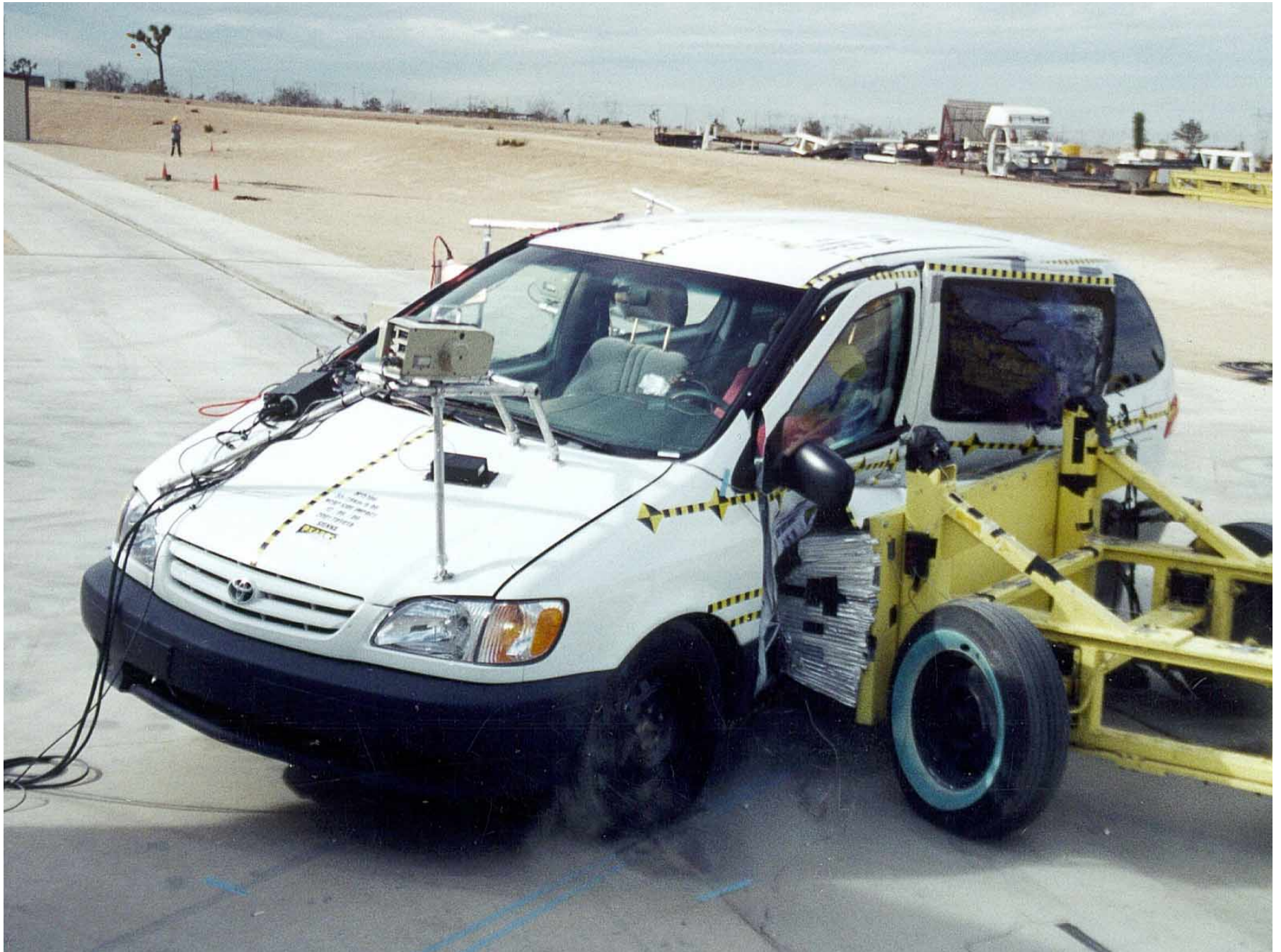


Figure A-45: Vehicle During Impact

APPENDIX B
SID, VEHICLE, AND MDB RESPONSE DATA

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B-4	Driver Head CG Y Velocity	B-4
B-5	Driver Head CG Z	B-5
B-6	Driver Head CG Z Velocity	B-6
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B-11	Driver Lower Rib Primary Y Velocity	B-11
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B-14	Driver Pelvis Primary Y	B-14
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B-35	Passenger Lower Rib Primary Y	B-35
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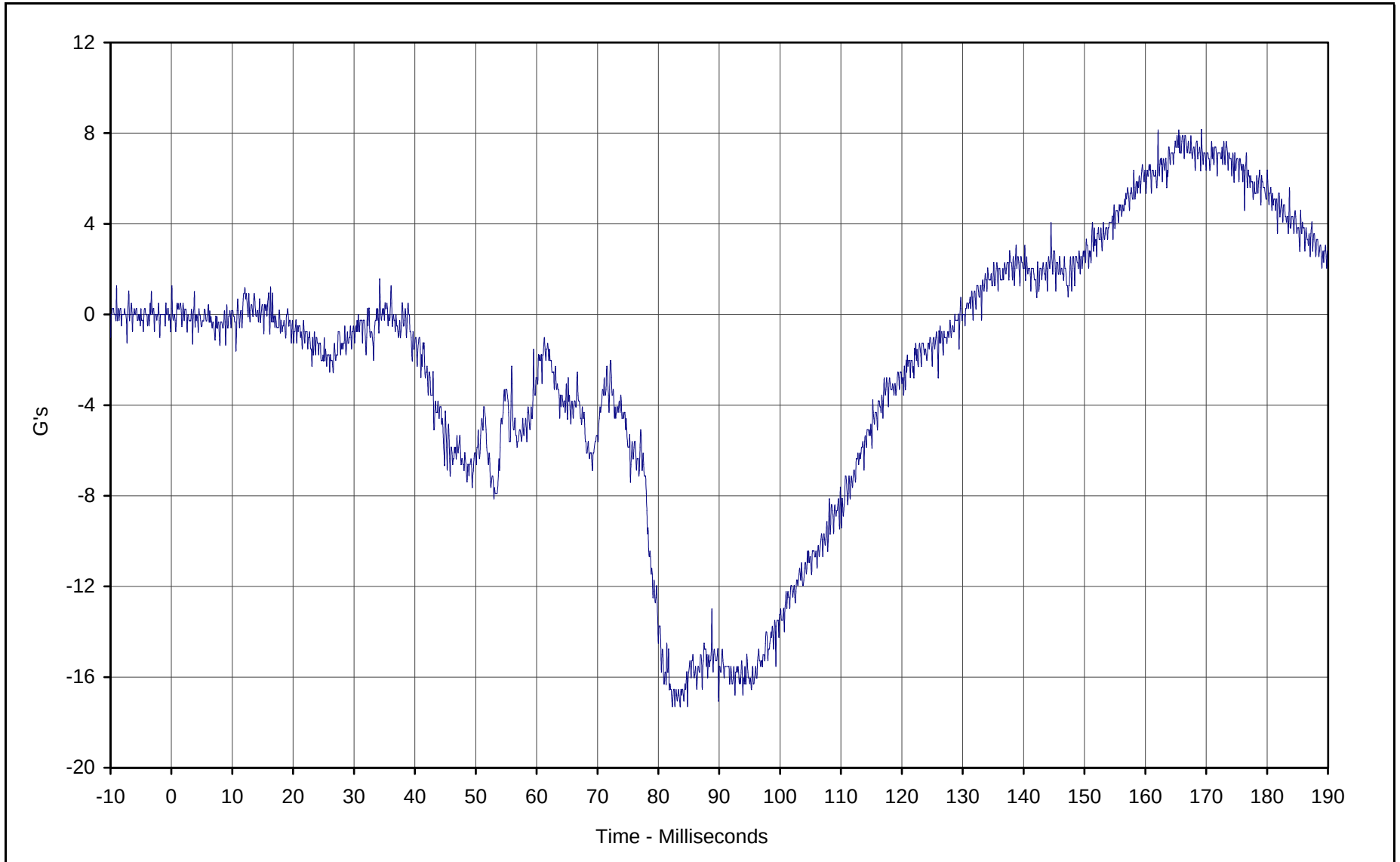
Data Plot	Page
B-80 Left Front Door Mid Rear Y	B-80
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B-89 Left B-Post Lower Y Velocity	B-89
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LIST OF DATA PLOTS, FIR FILTER DATA

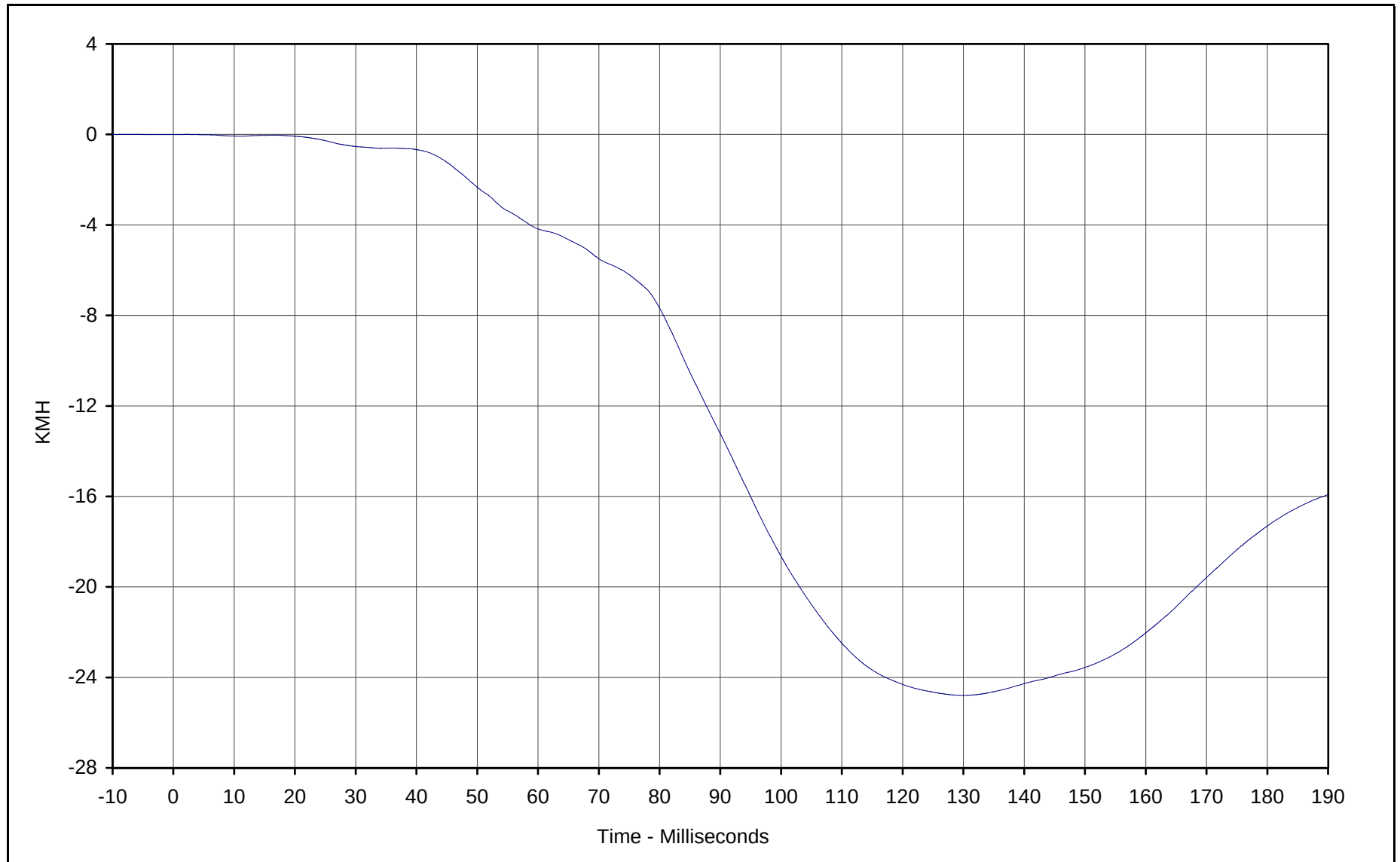
Data Plot	Page
B-119 Driver Upper Rib Primary Y	B-119
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B-133 Passenger Lower Spine Redundant Y	B-133
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Curve Description: Driver Head CG X
Maximum Value: 8.1 at 162.1 Milliseconds
Minimum Value: -17.3 at 82.3 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-001

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

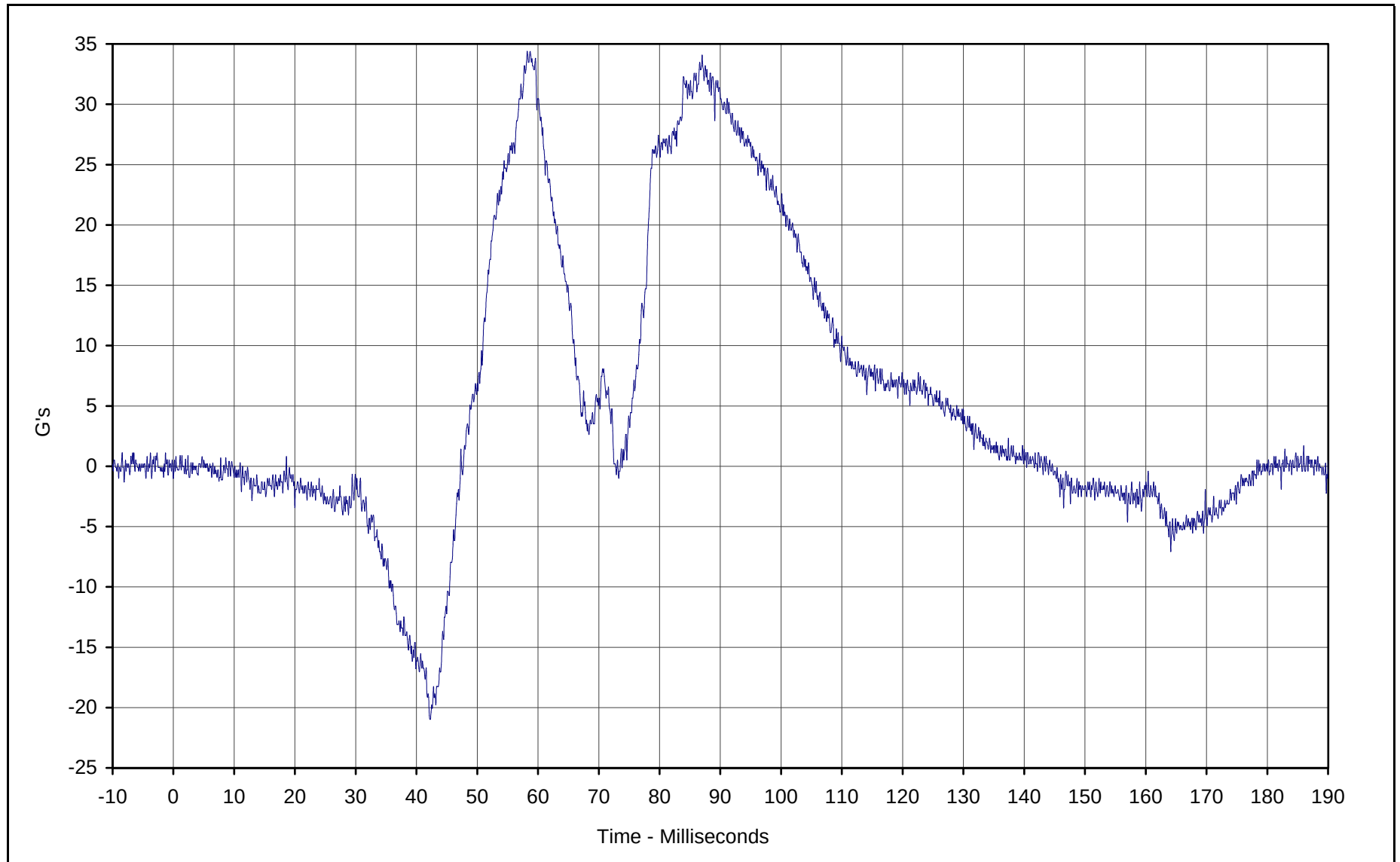




Curve Description: Driver Head CG X Velocity
Maximum Value: 0.0 at 2.2 Milliseconds
Minimum Value: -24.8 at 130.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-001

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

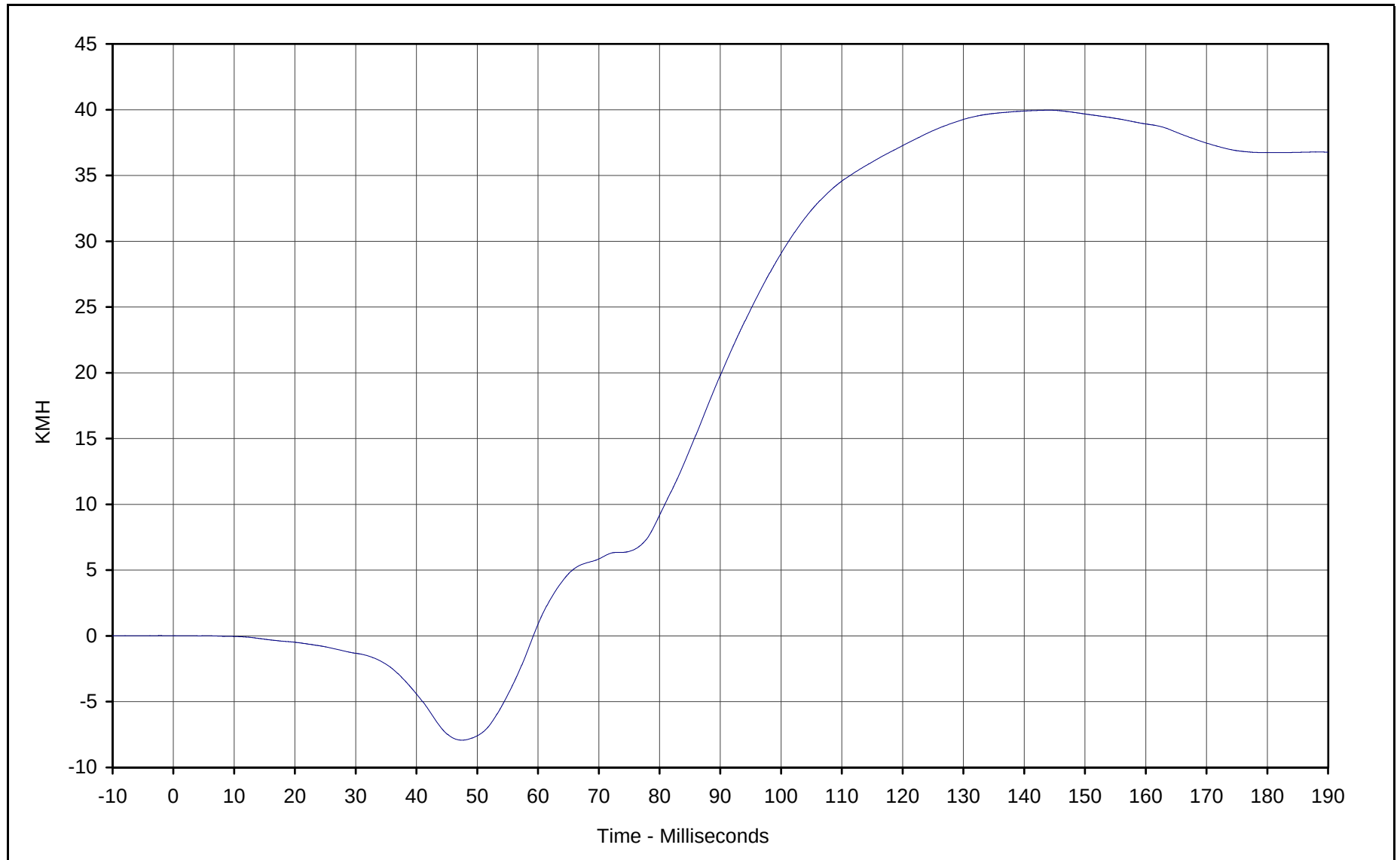




Curve Description: Driver Head CG Y
Maximum Value: 34.4 at 58.2 Milliseconds
Minimum Value: -21.0 at 42.2 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-002

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

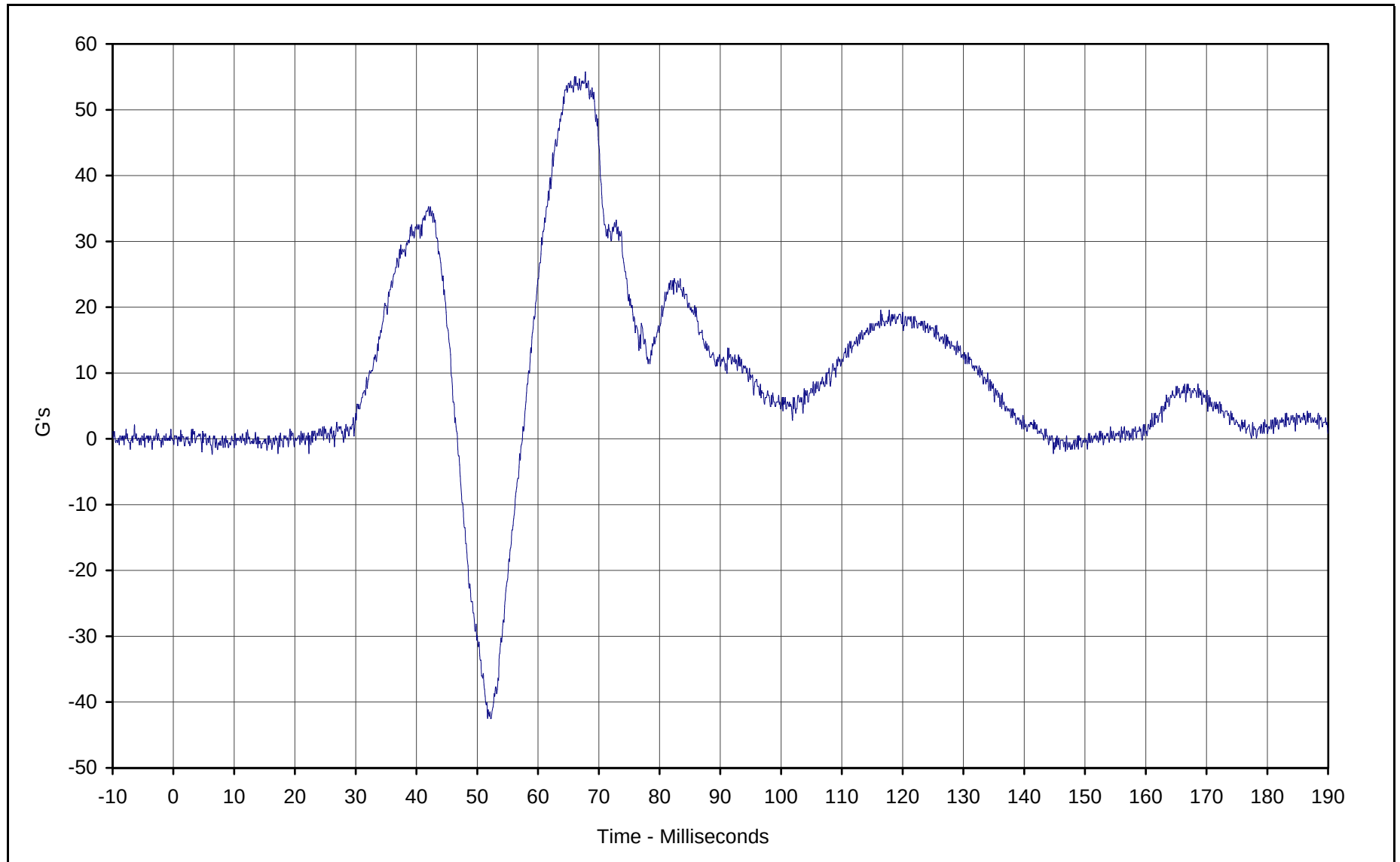




Curve Description: Driver Head CG Y Velocity
Maximum Value: 40.0 at 144.1 Milliseconds
Minimum Value: -7.9 at 47.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-002

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Driver Head CG Z

Maximum Value: 55.7 at 67.8 Milliseconds

Minimum Value: -42.5 at 51.7 Milliseconds

SAE Filter Class: 1000

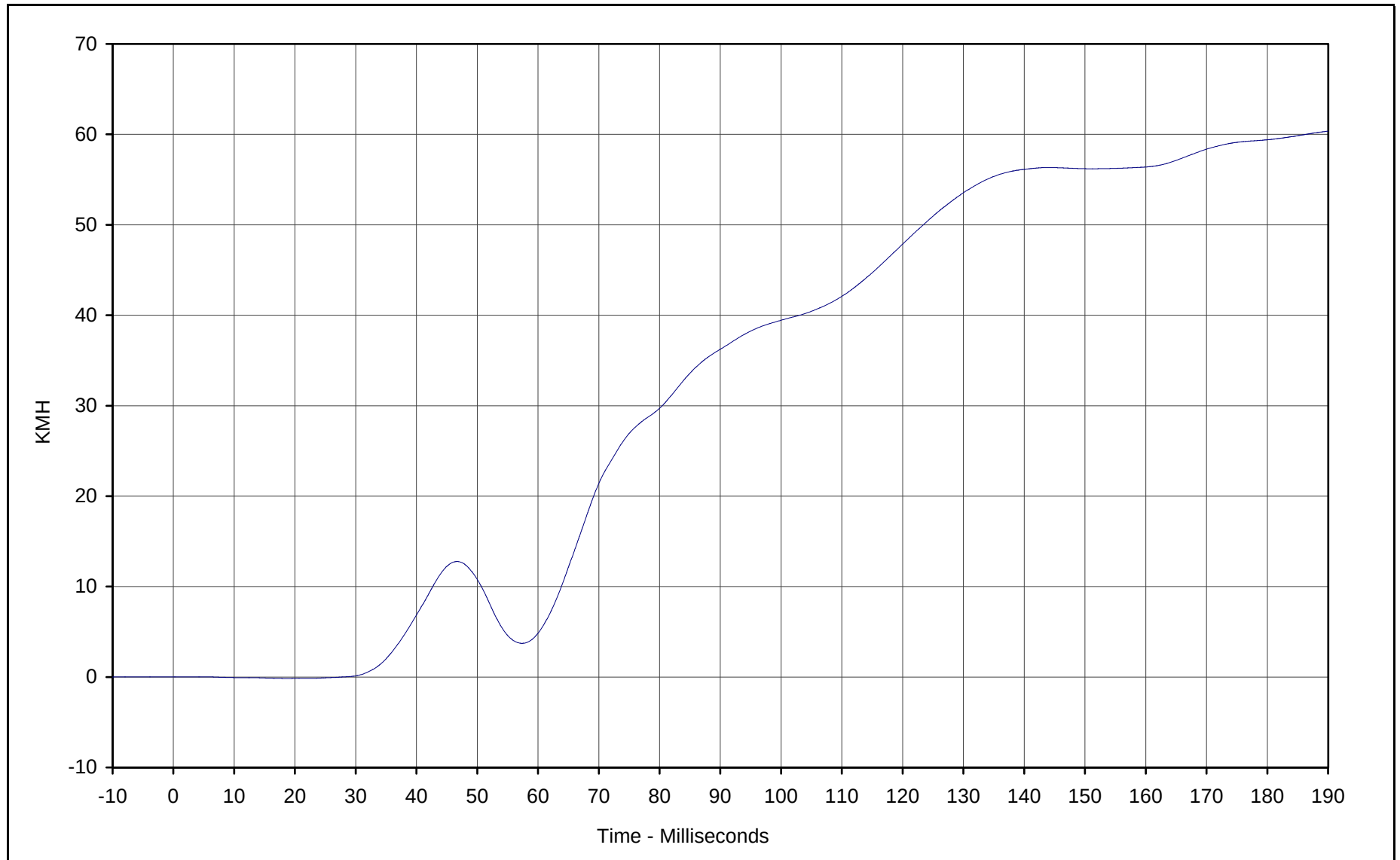
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Curve Number: FIL-003

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

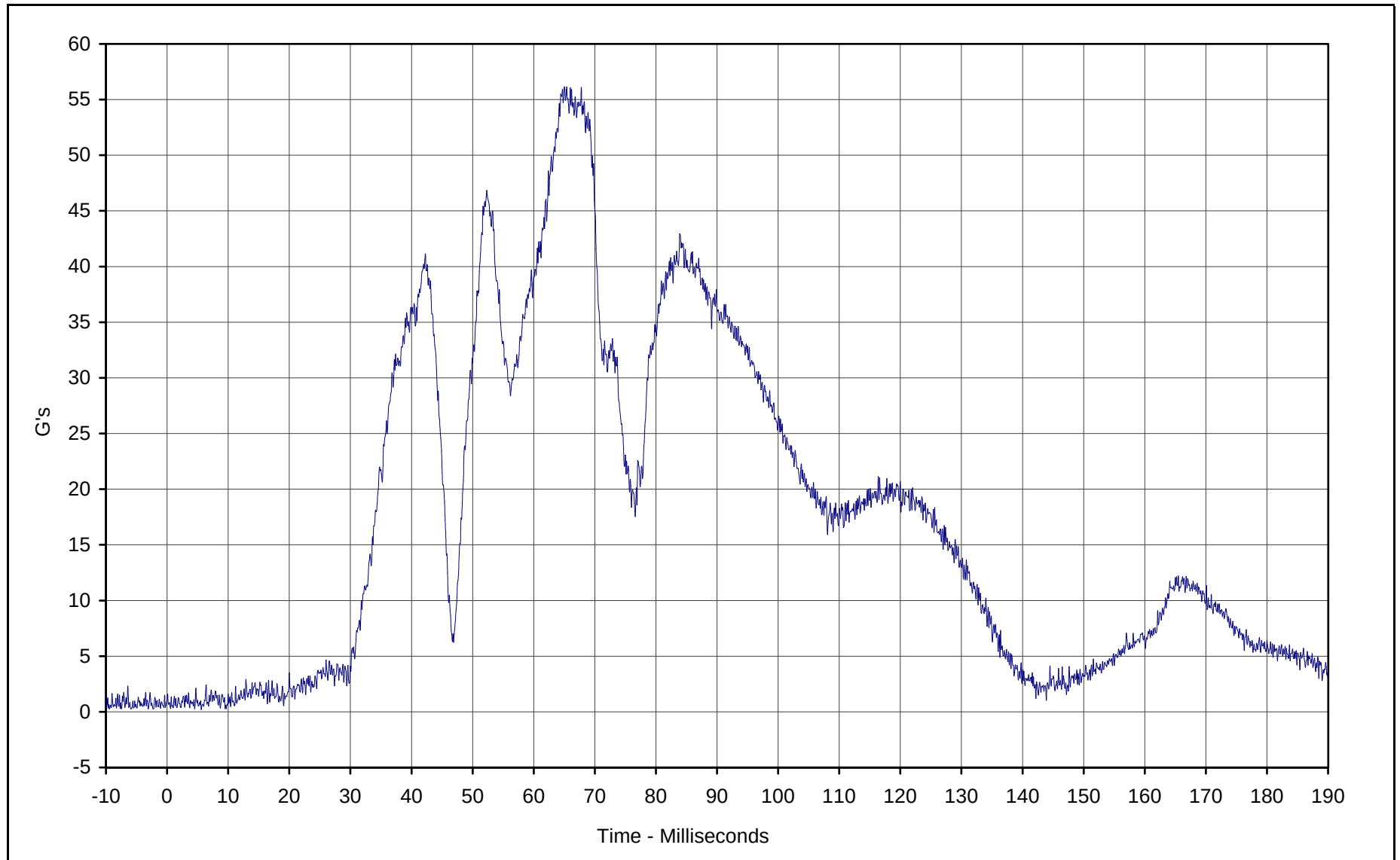




Curve Description: Driver Head CG Z Velocity
Maximum Value: 60.4 at 189.9 Milliseconds
Minimum Value: -0.2 at 18.6 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-003

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

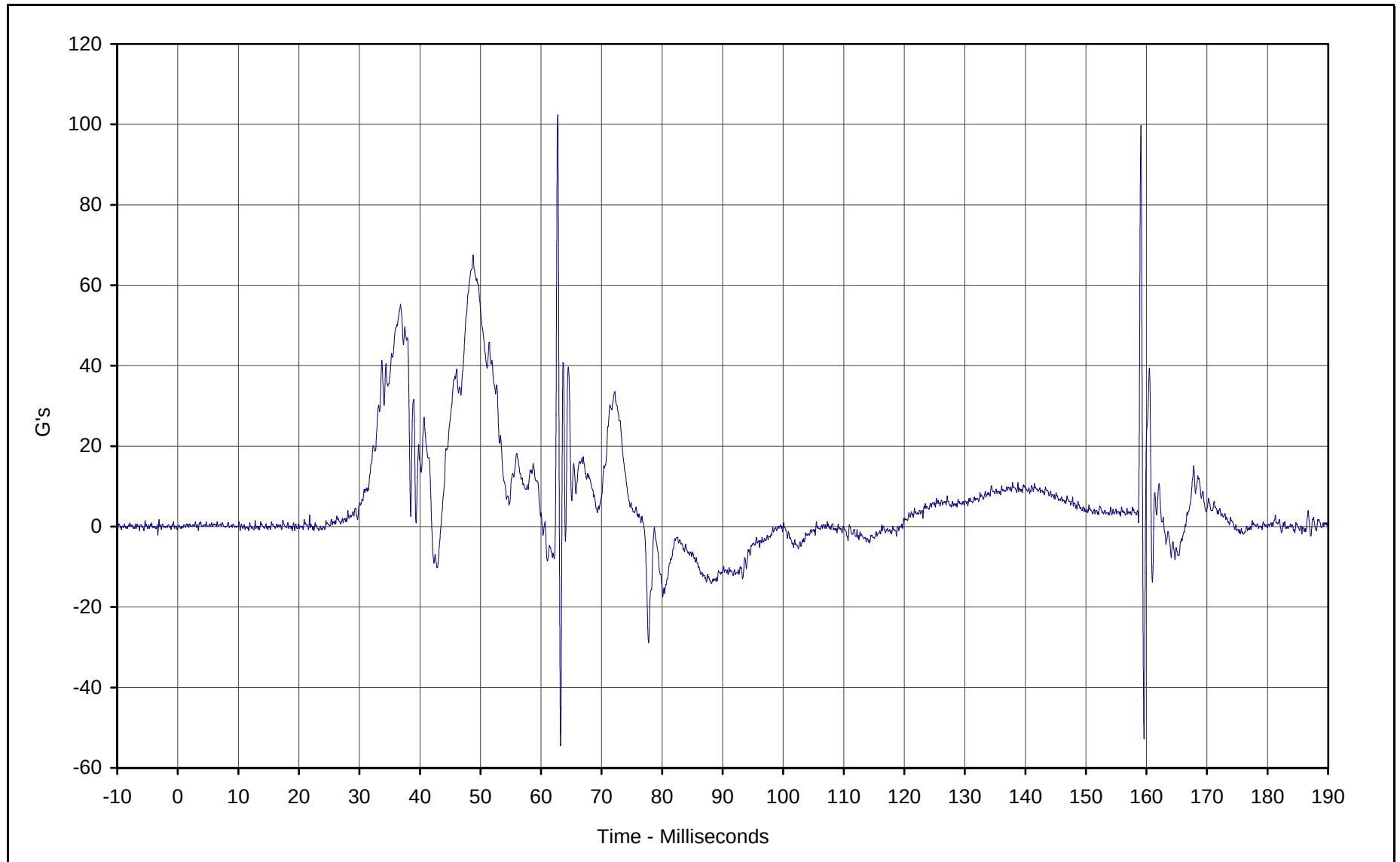




Curve Description: Driver Head CG Resultant
Maximum Value: 56.1 at 65.0 Milliseconds
Minimum Value: 0.2 at 5.6 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: RES-001

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

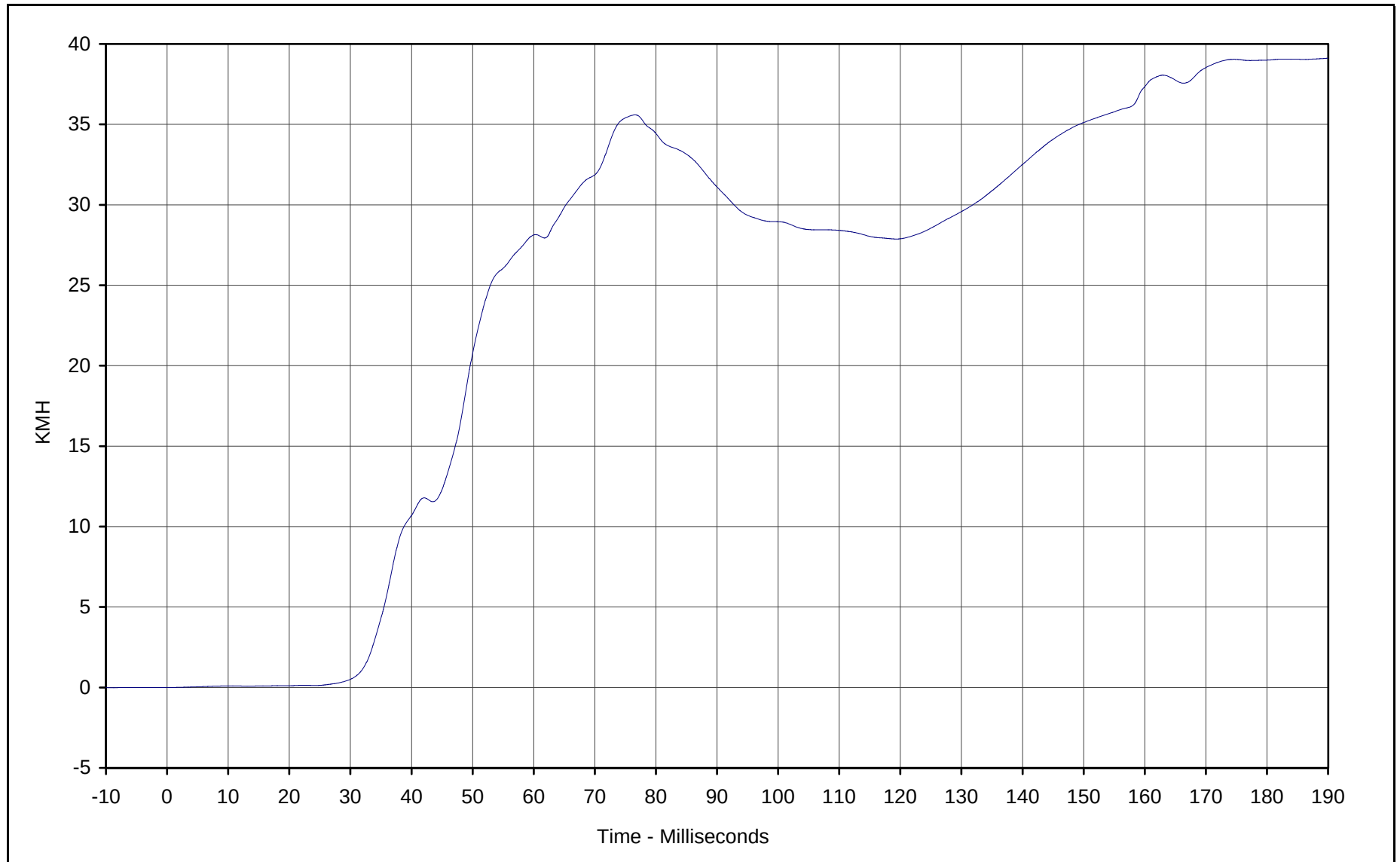




Curve Description: Driver Upper Rib Primary Y
Maximum Value: 102.0 at 62.8 Milliseconds
Minimum Value: -54.2 at 63.2 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-004

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Driver Upper Rib Primary Y Velocity

Maximum Value: 39.1 at 189.9 Milliseconds

Minimum Value: 0.0 at 0.7 Milliseconds

SAE Filter Class: 180

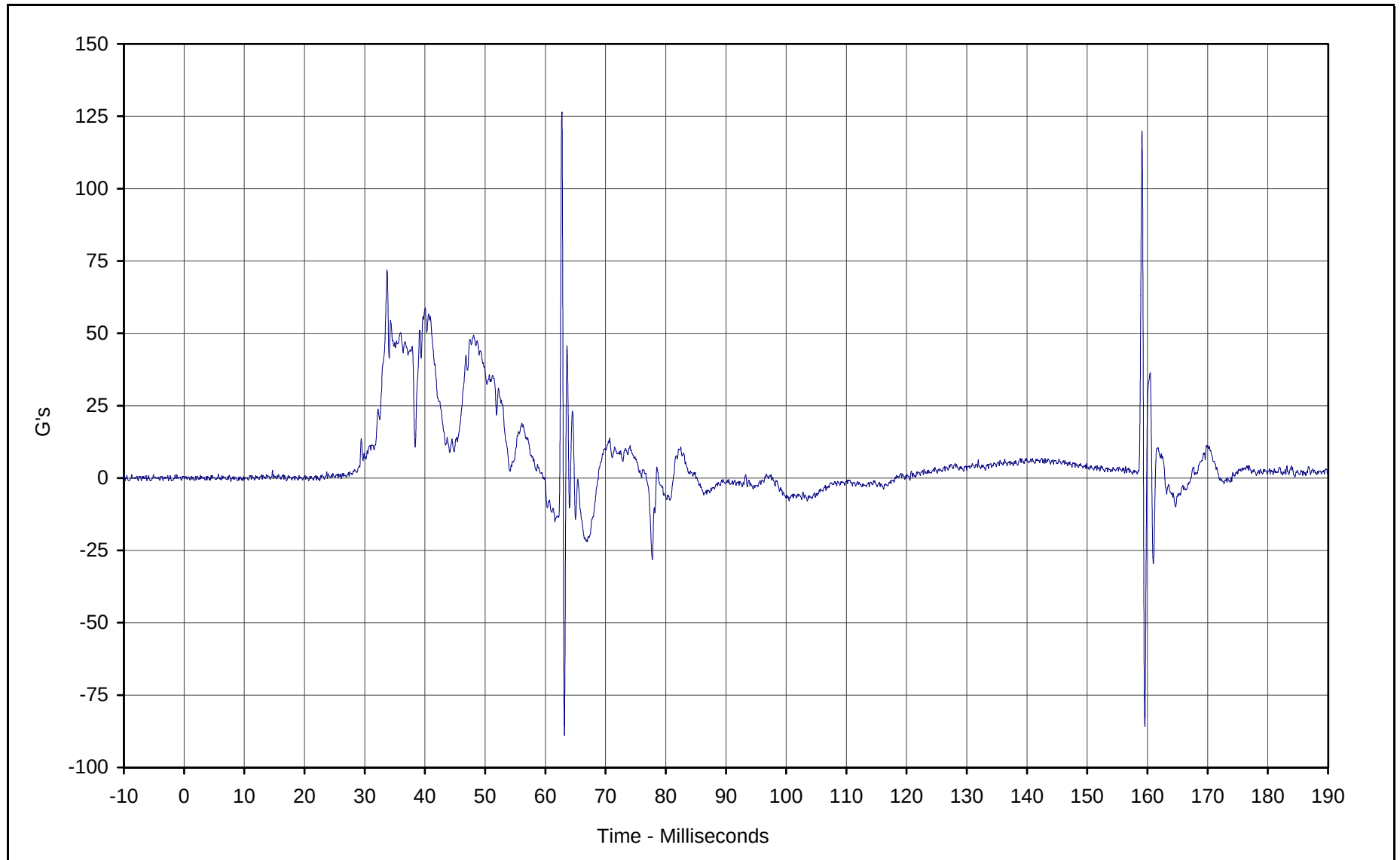
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Curve Number: IN1-004

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

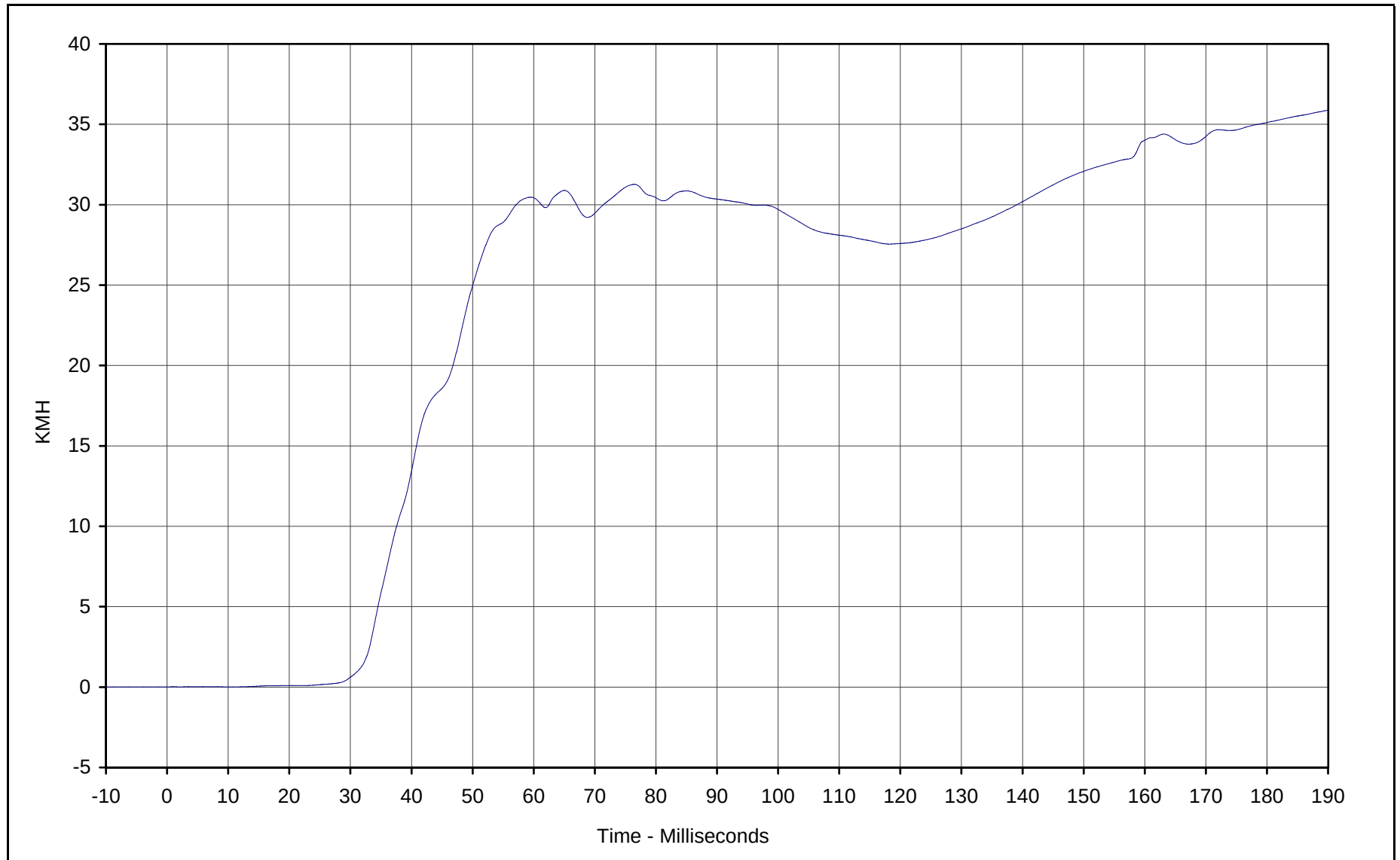




Curve Description: Driver Lower Rib Primary Y
Maximum Value: 126.1 at 62.8 Milliseconds
Minimum Value: -88.7 at 63.2 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-005

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Driver Lower Rib Primary Y Velocity

Maximum Value: 35.9 at 189.9 Milliseconds

Minimum Value: 0.0 at 10.4 Milliseconds

SAE Filter Class: 180

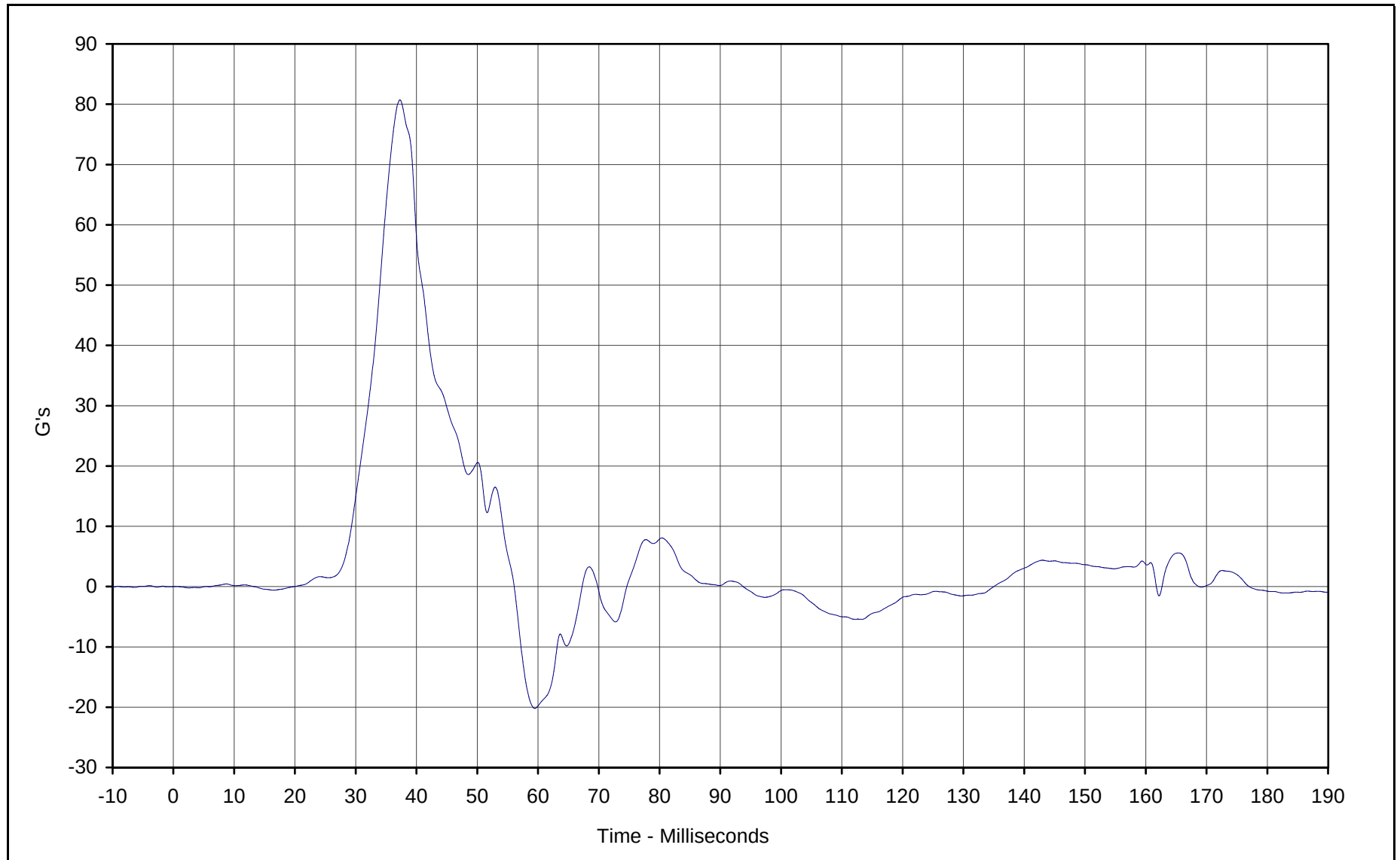
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Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

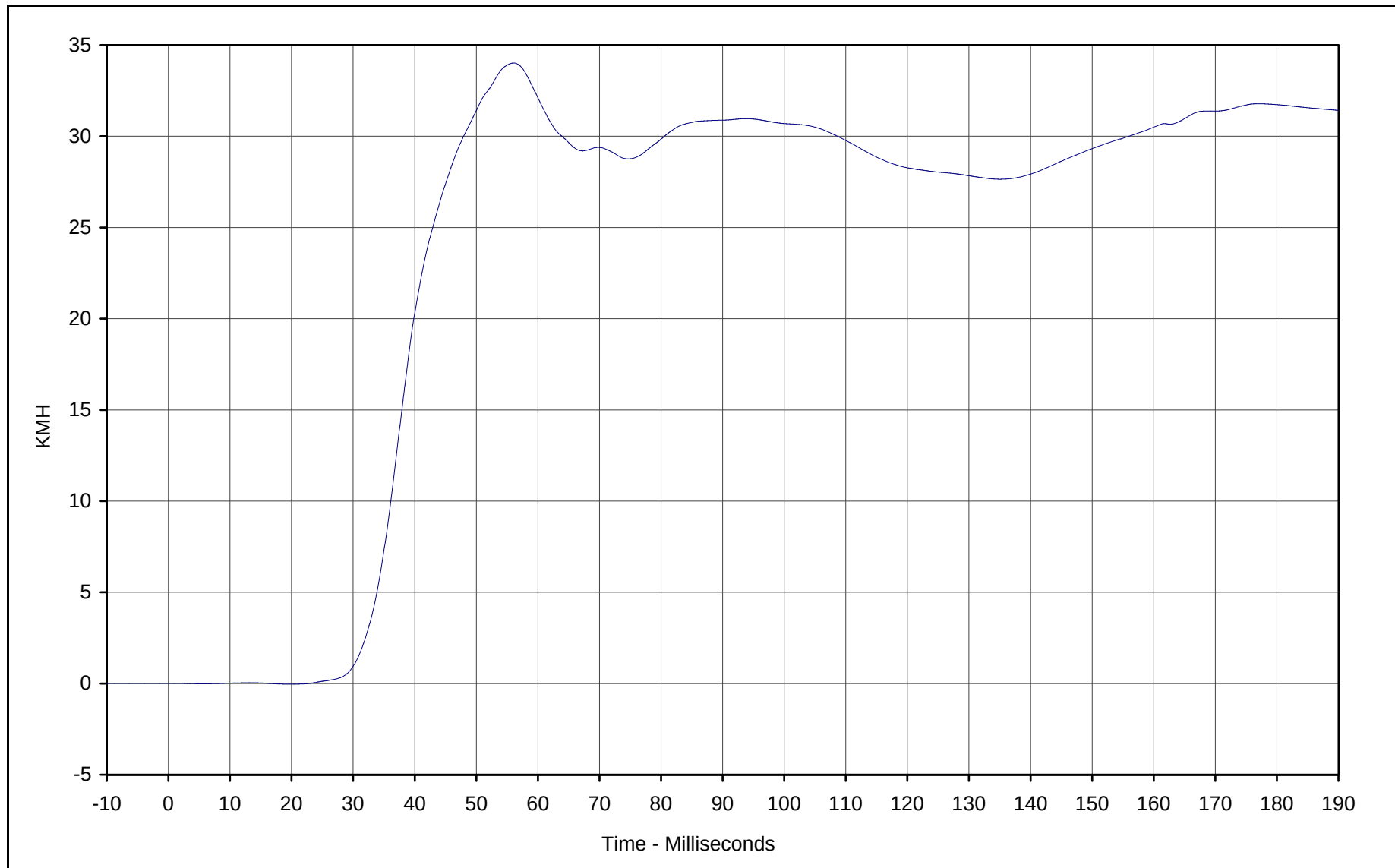




Curve Description: Driver Lower Spine Primary Y
Maximum Value: 80.7 at 37.3 Milliseconds
Minimum Value: -20.2 at 59.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: FIL-006

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Driver Lower Spine Primary Y Velocity

Maximum Value: 34.0 at 56.1 Milliseconds

Minimum Value: 0.0 at 20.0 Milliseconds

SAE Filter Class: 180

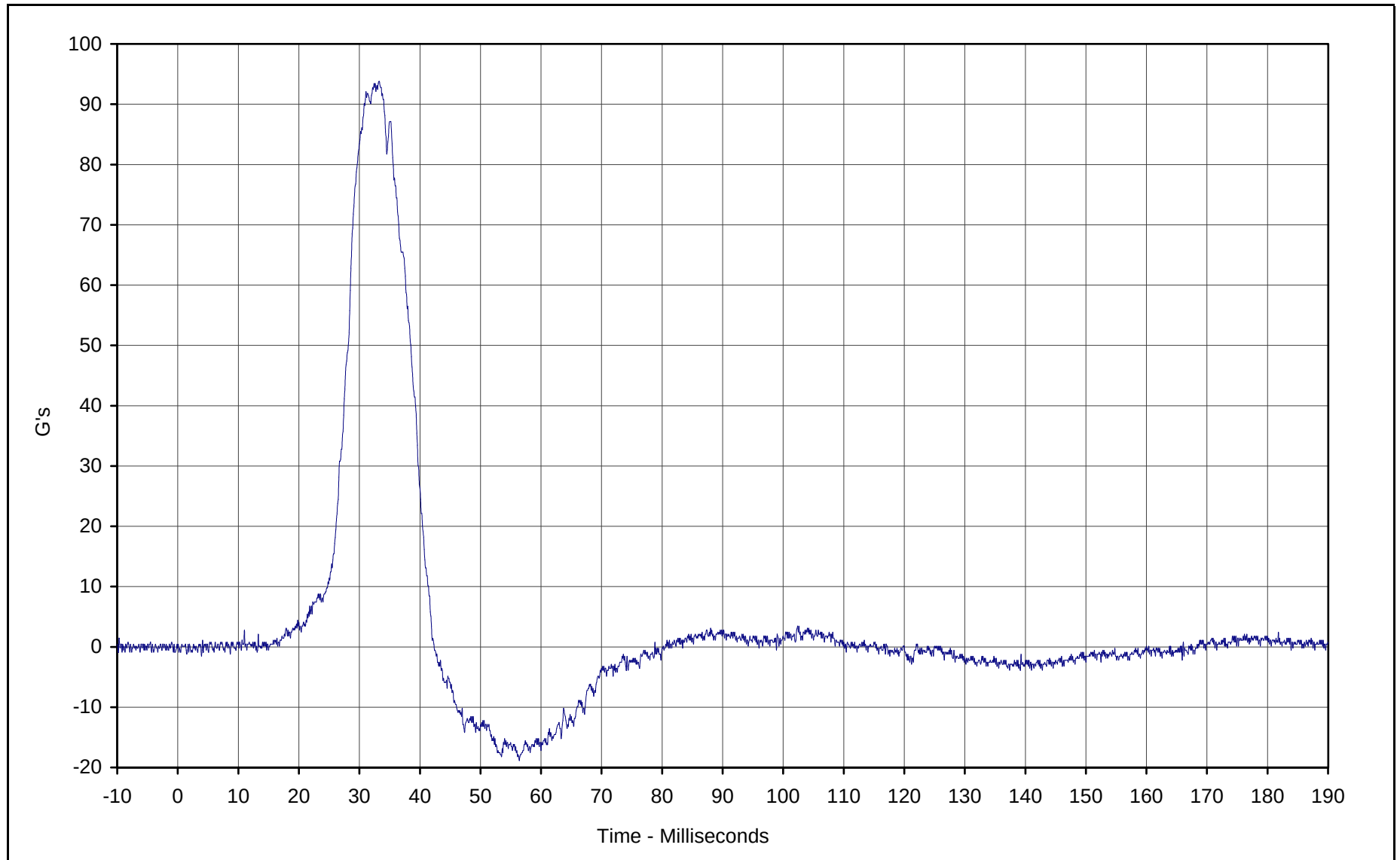
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Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

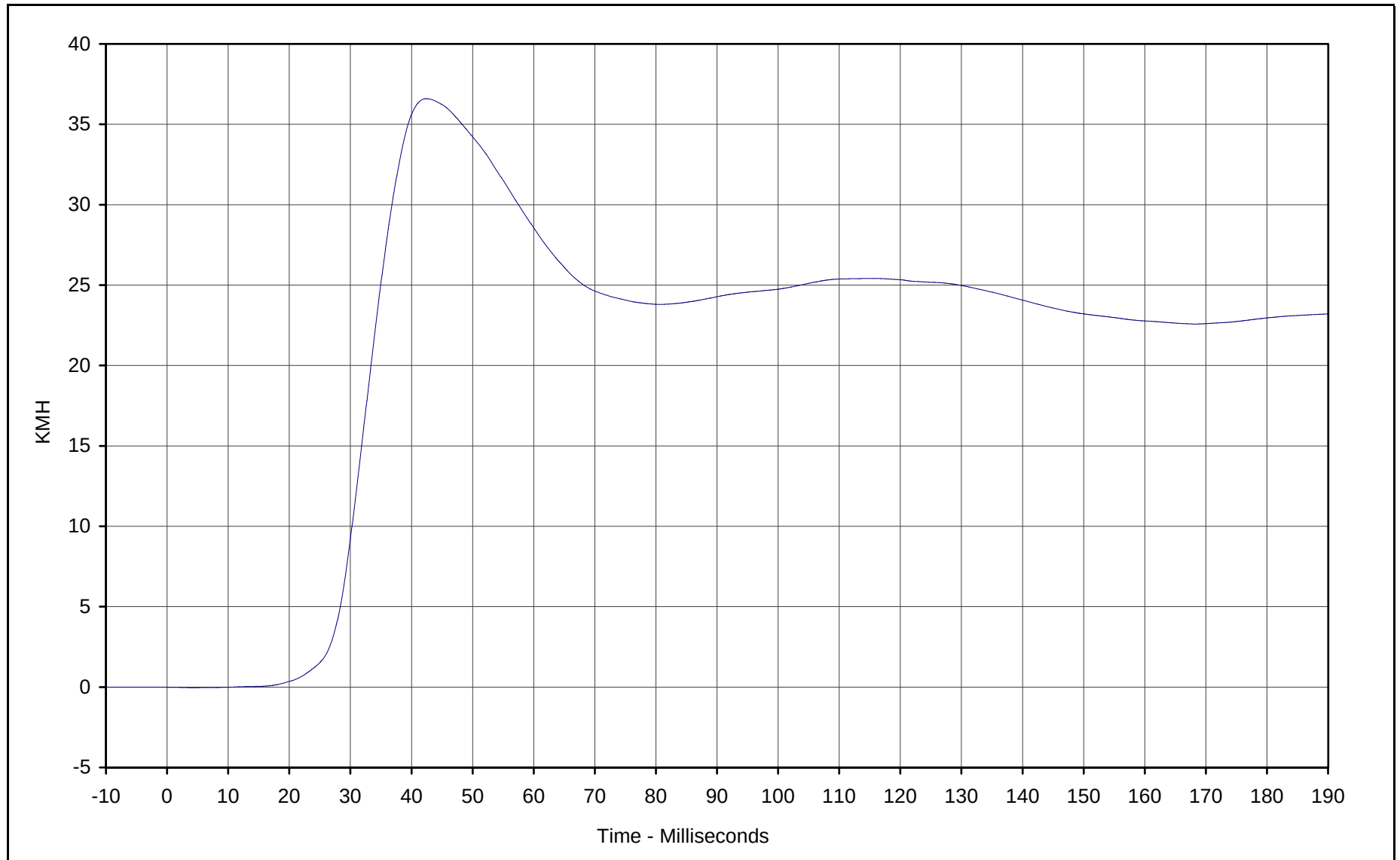




Curve Description: Driver Pelvis Primary Y
Maximum Value: 93.8 at 33.2 Milliseconds
Minimum Value: -18.9 at 56.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-007

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

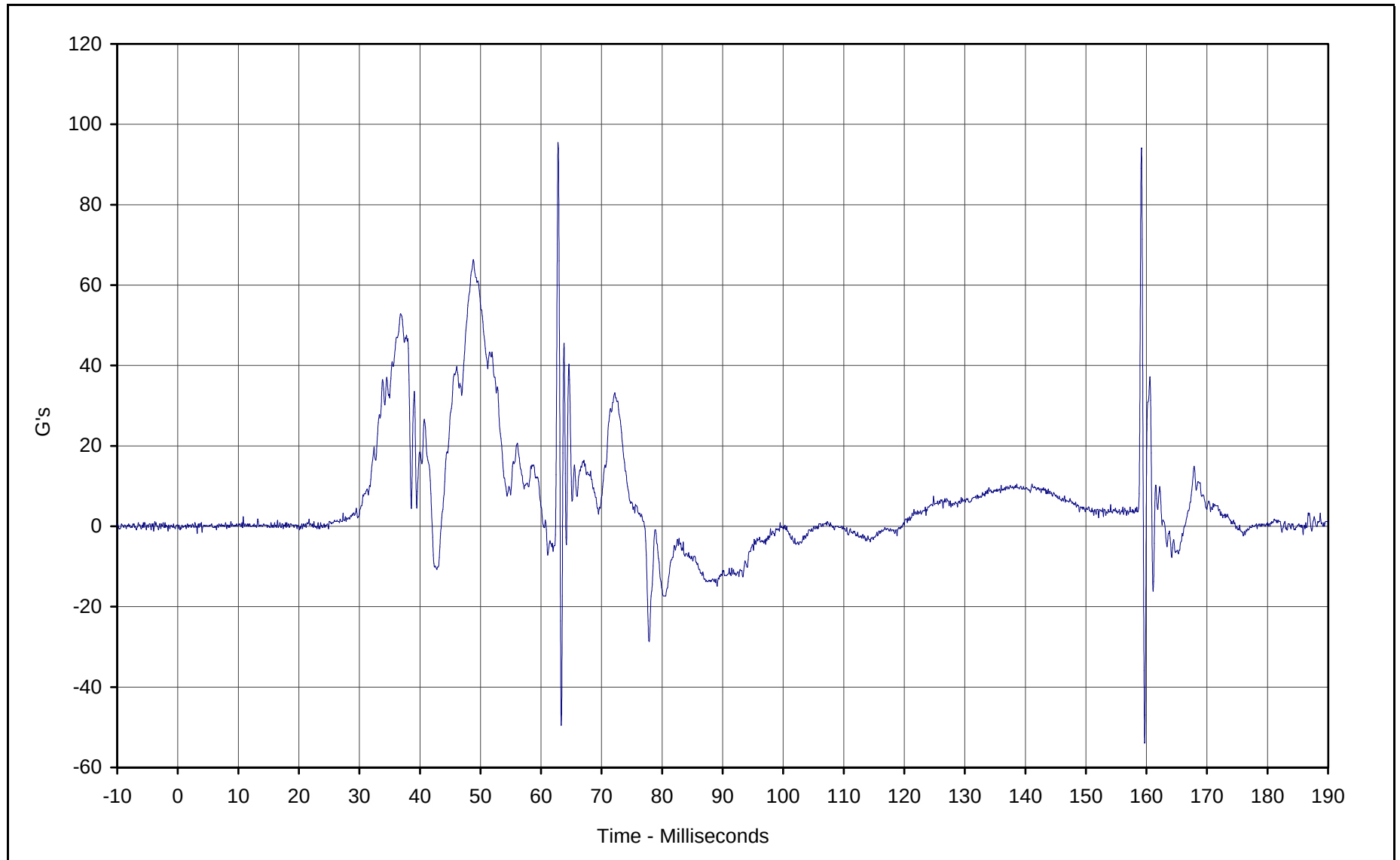




Curve Description: Driver Pelvis Primary Y Velocity
Maximum Value: 36.6 at 42.4 Milliseconds
Minimum Value: 0.0 at 4.3 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-007

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

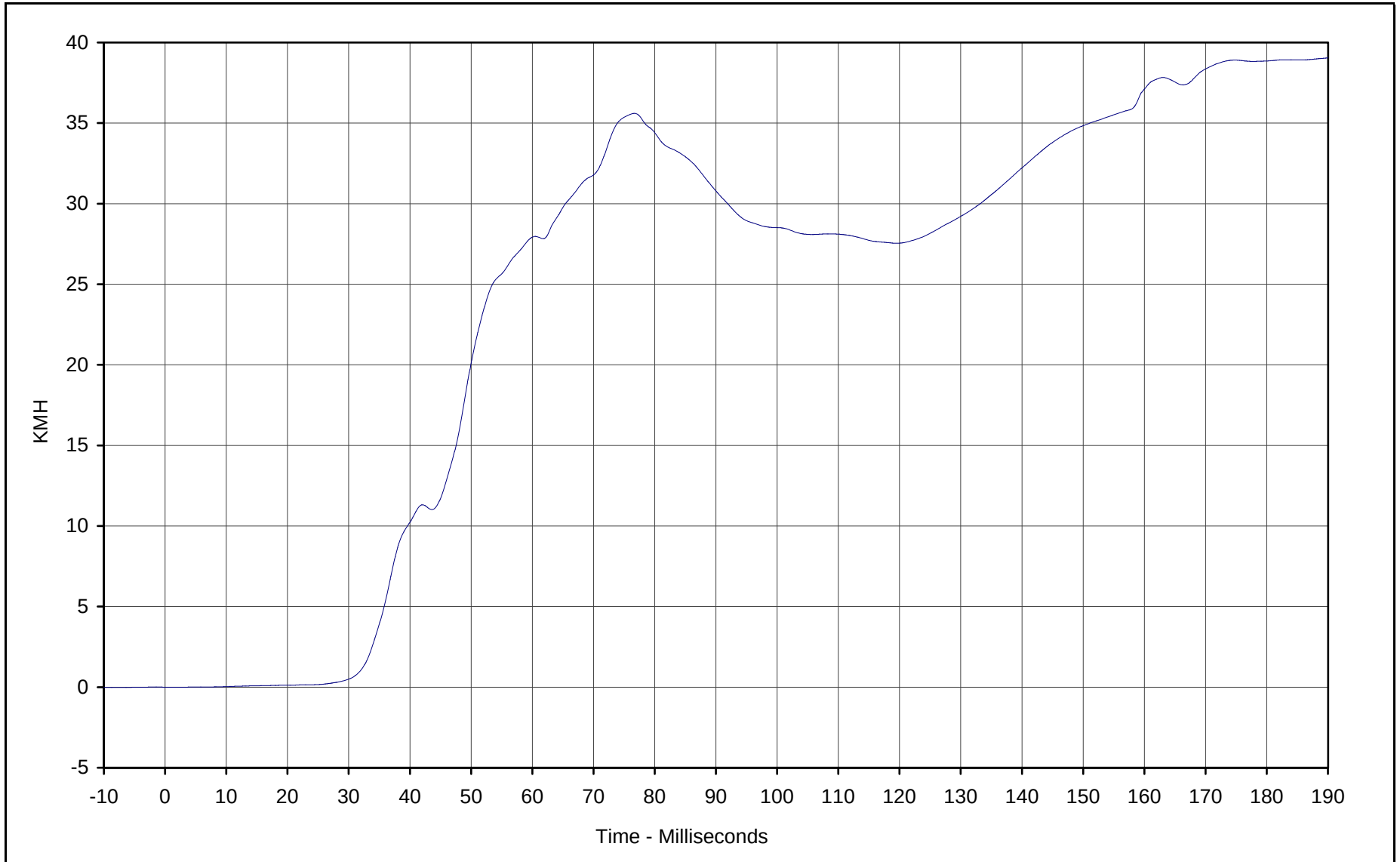




Curve Description: Driver Upper Rib Redundant Y
Maximum Value: 95.4 at 62.8 Milliseconds
Minimum Value: -53.8 at 159.7 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-008

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Driver Upper Rib Redundant Y Velocity

Maximum Value: 39.0 at 189.9 Milliseconds

Minimum Value: 0.0 at 1.3 Milliseconds

SAE Filter Class: 180

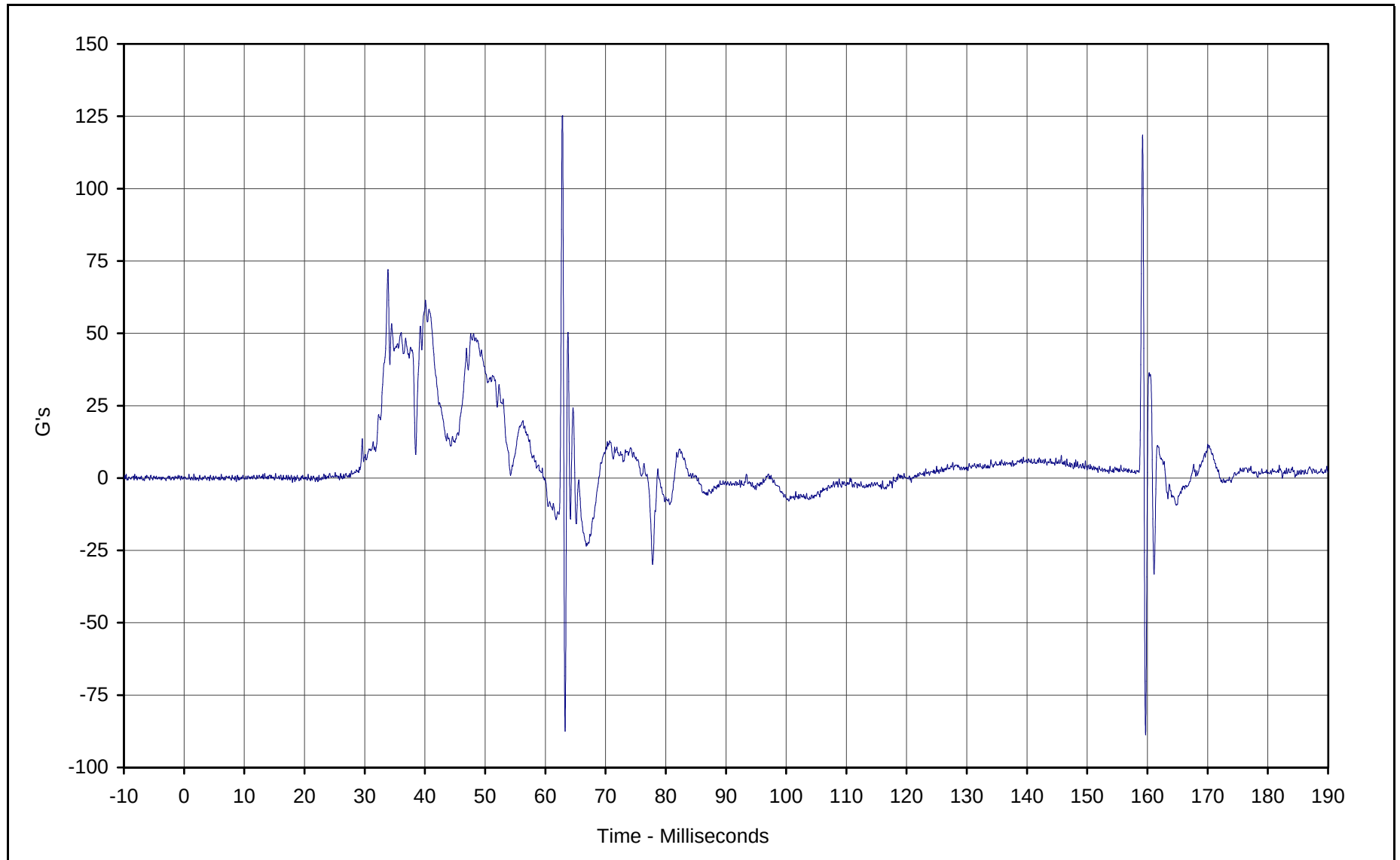
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Curve Number: IN1-008

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

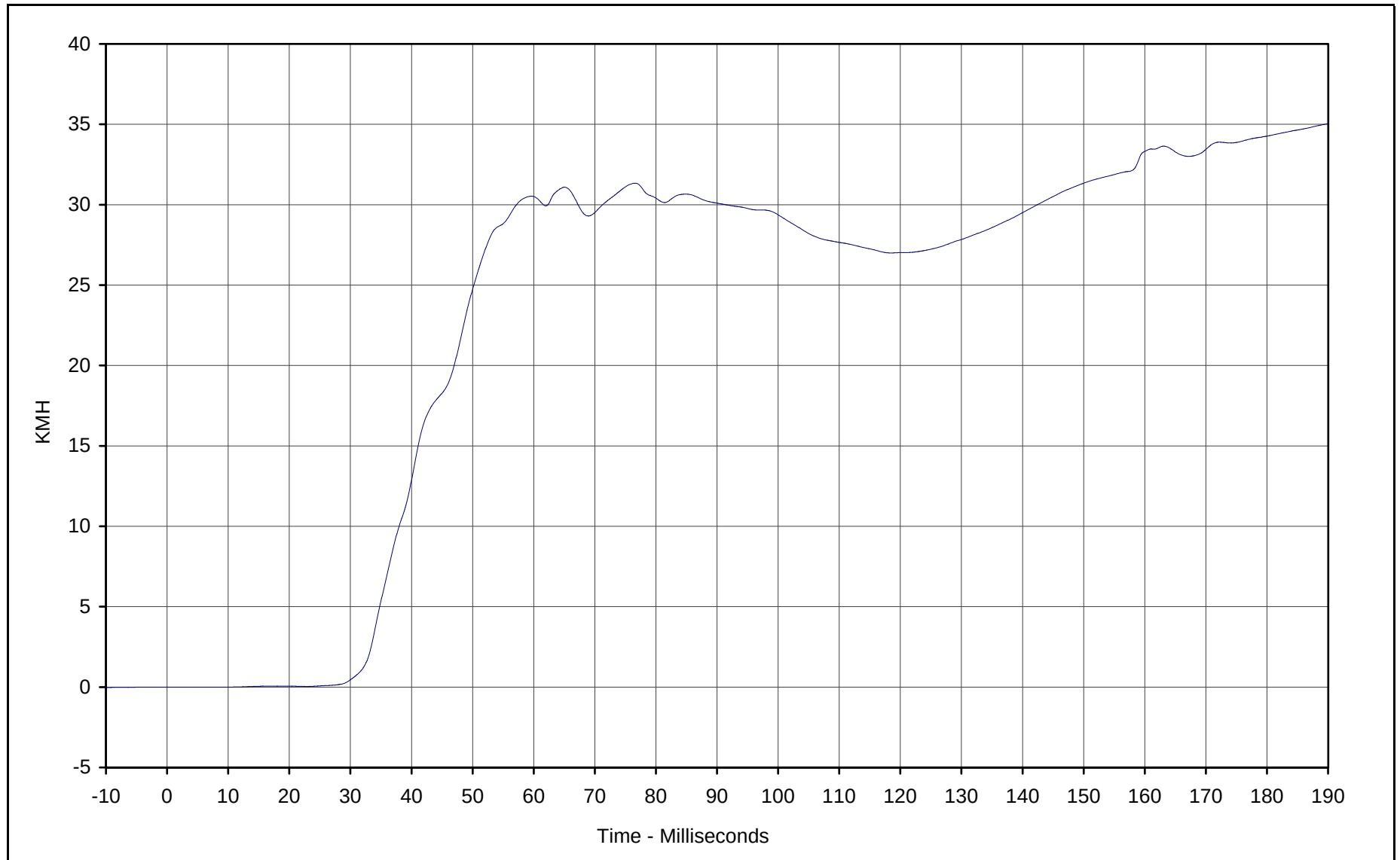




Curve Description: Driver Lower Rib Redundant Y
Maximum Value: 125.2 at 62.9 Milliseconds
Minimum Value: -88.7 at 159.7 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-009

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Driver Lower Rib Redundant Y Velocity

Maximum Value: 35.0 at 189.9 Milliseconds

Minimum Value: 0.0 at 5.8 Milliseconds

SAE Filter Class: 180

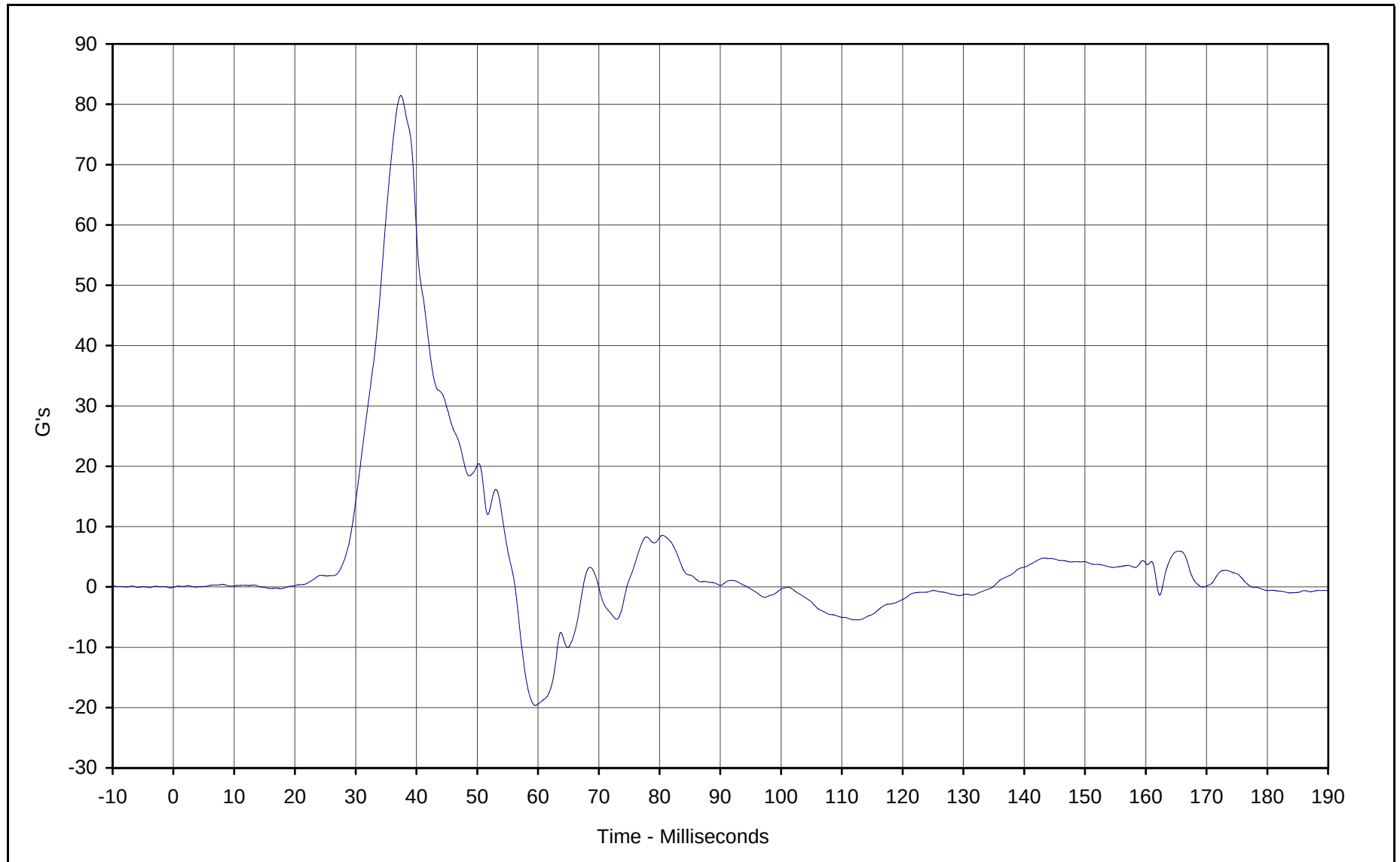
Date of Test: 12/05/00

Curve Number: IN1-009

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

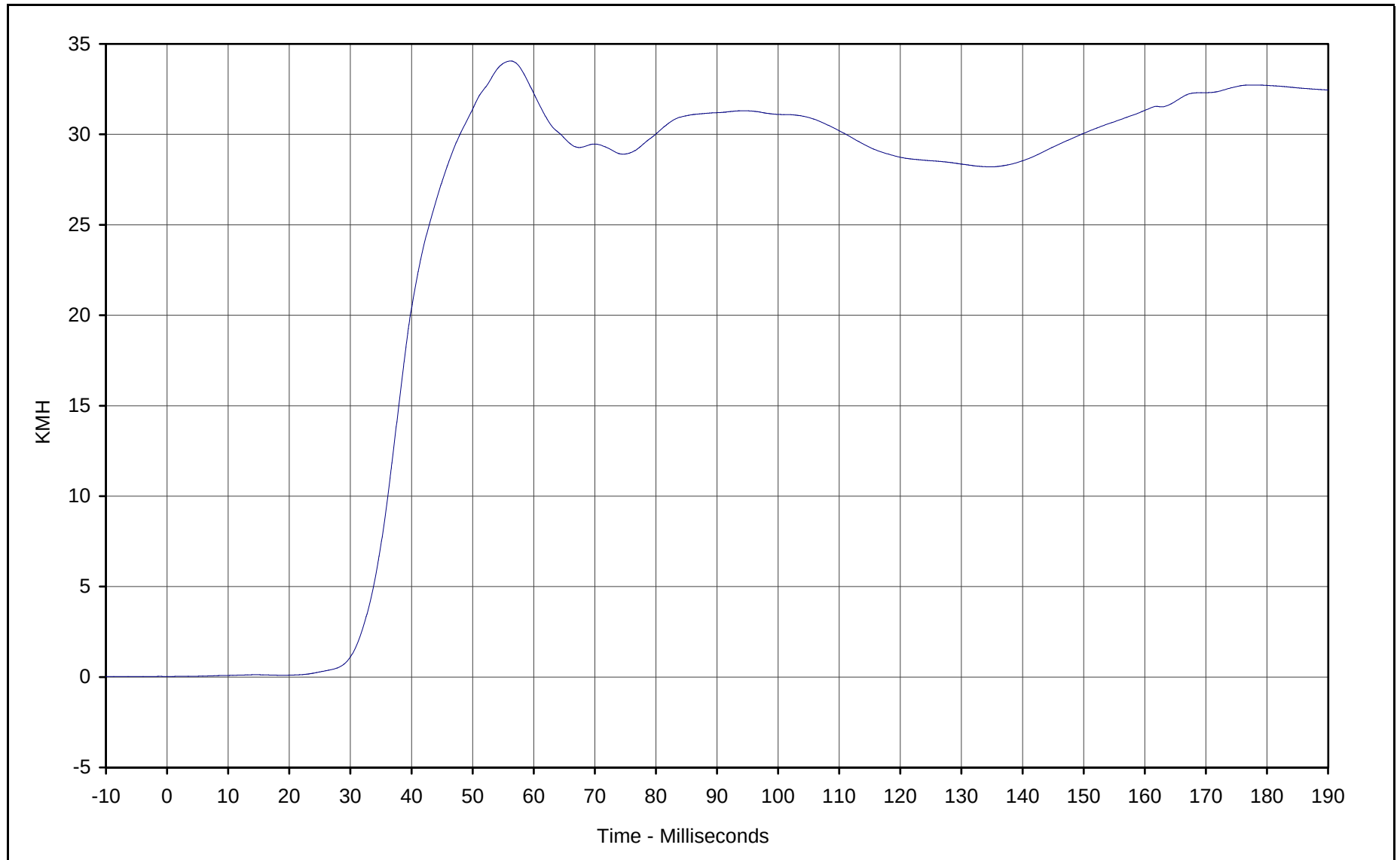




Curve Description: Driver Lower Spine Redundant Y
Maximum Value: 81.5 at 37.4 Milliseconds
Minimum Value: -19.6 at 59.6 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: FIL-010

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Driver Lower Spine Redundant Y Velocity

Maximum Value: 34.1 at 56.2 Milliseconds

Minimum Value: 0.0 at 0.2 Milliseconds

SAE Filter Class: 180

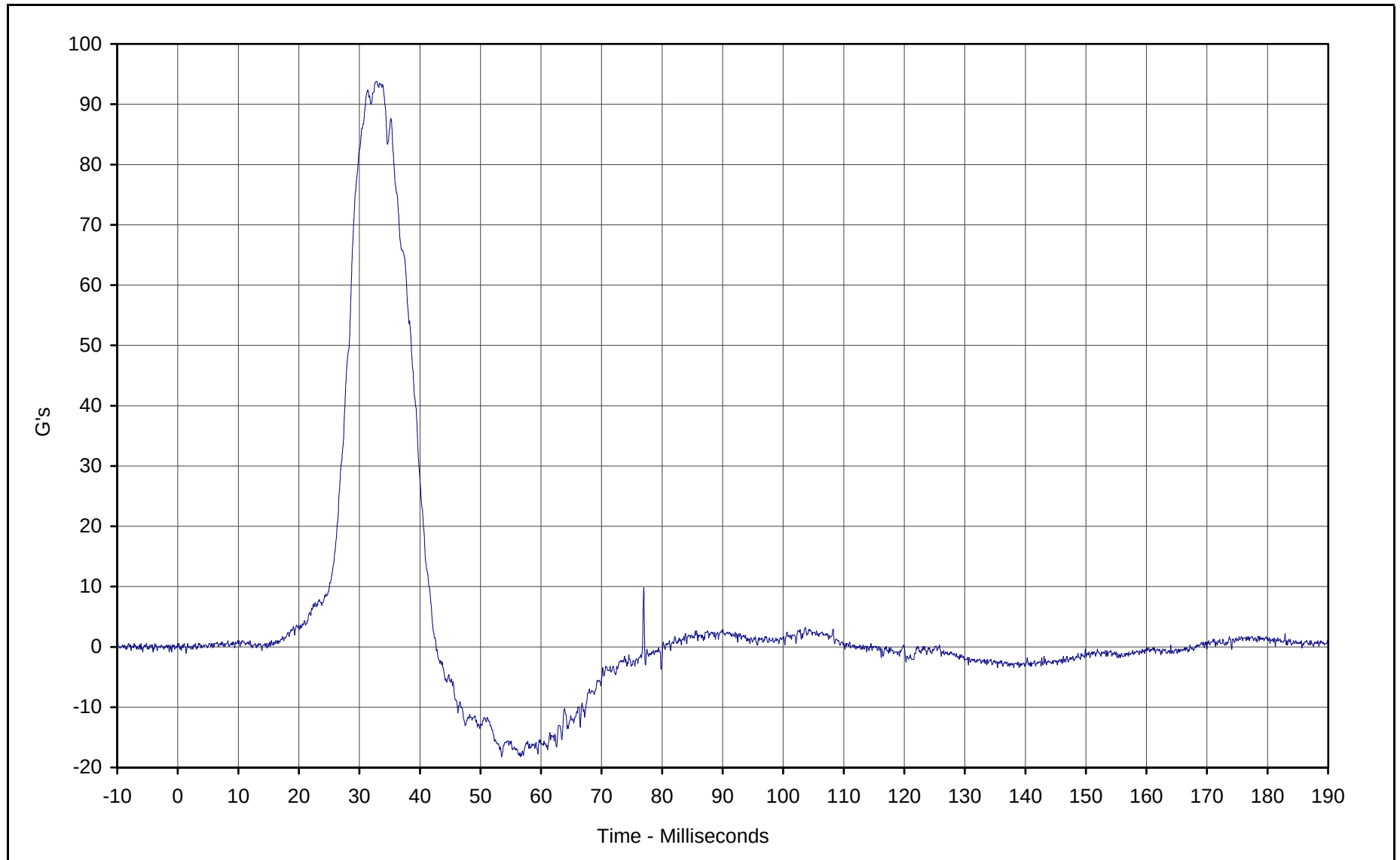
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Curve Number: IN1-0010

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

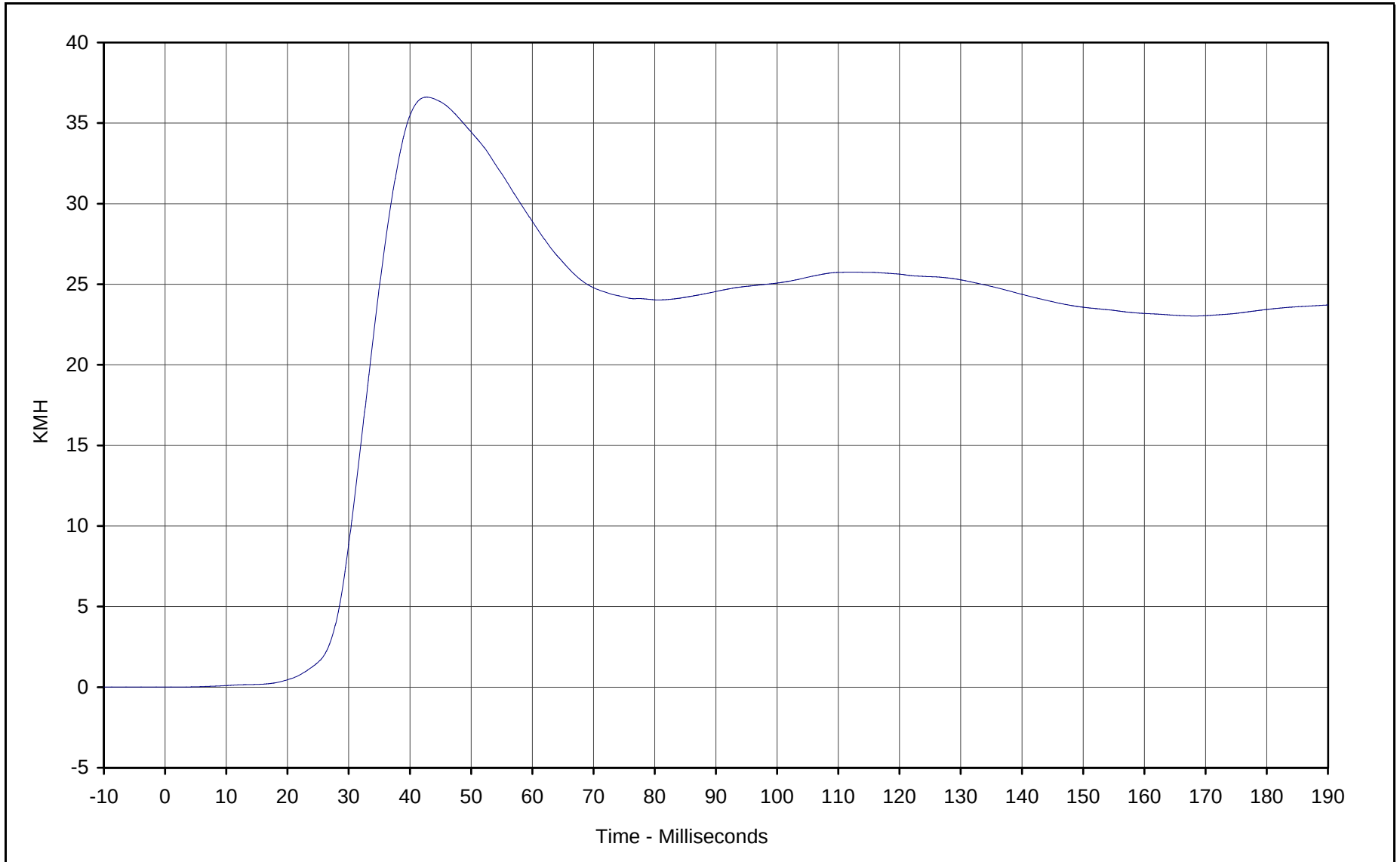




Curve Description: Driver Pelvis Redundant Y
Maximum Value: 93.7 at 32.7 Milliseconds
Minimum Value: -18.2 at 53.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-011

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

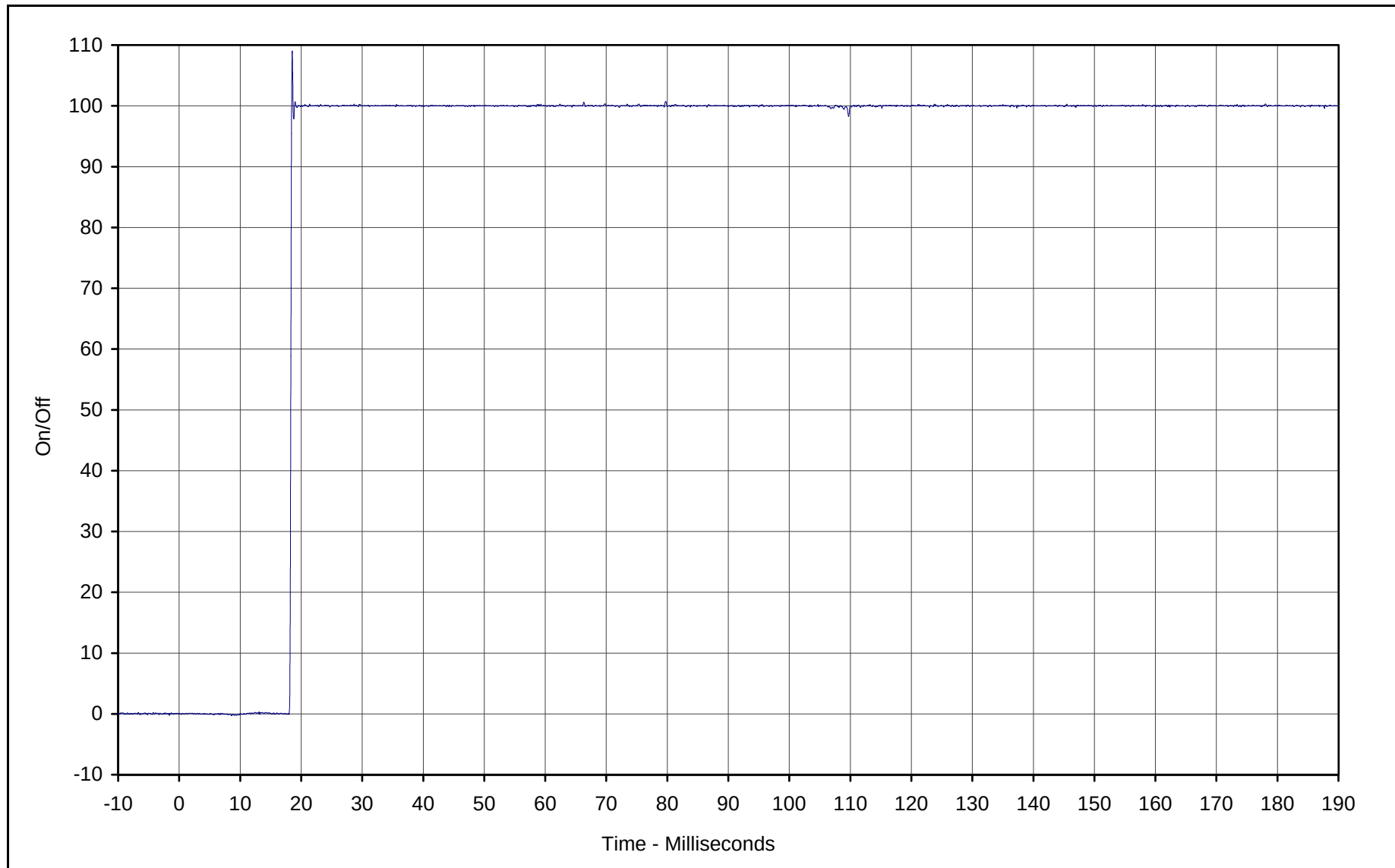




Curve Description: Driver Pelvis Redundant Y Velocity
Maximum Value: 36.6 at 42.7 Milliseconds
Minimum Value: 0.0 at 2.4 Milliseconds
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Curve Number: IN1-011

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

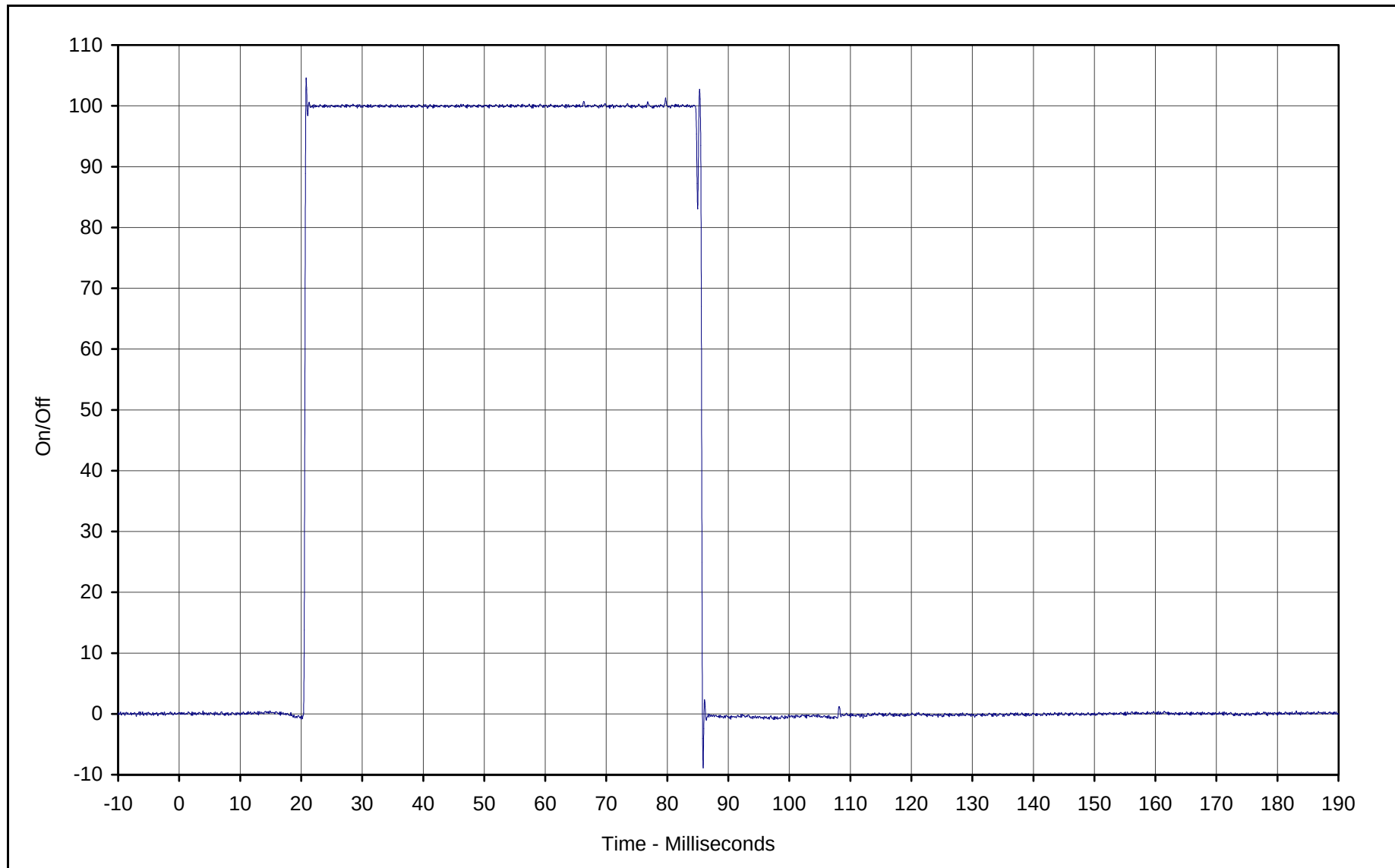




Curve Description: Driver Thorax Contact
Maximum Value: 108.7 at 18.5 Milliseconds
Crossing Point: 50% at 18.3 Milliseconds
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Date of Test: 12/05/00
Curve Number: FIL-012

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

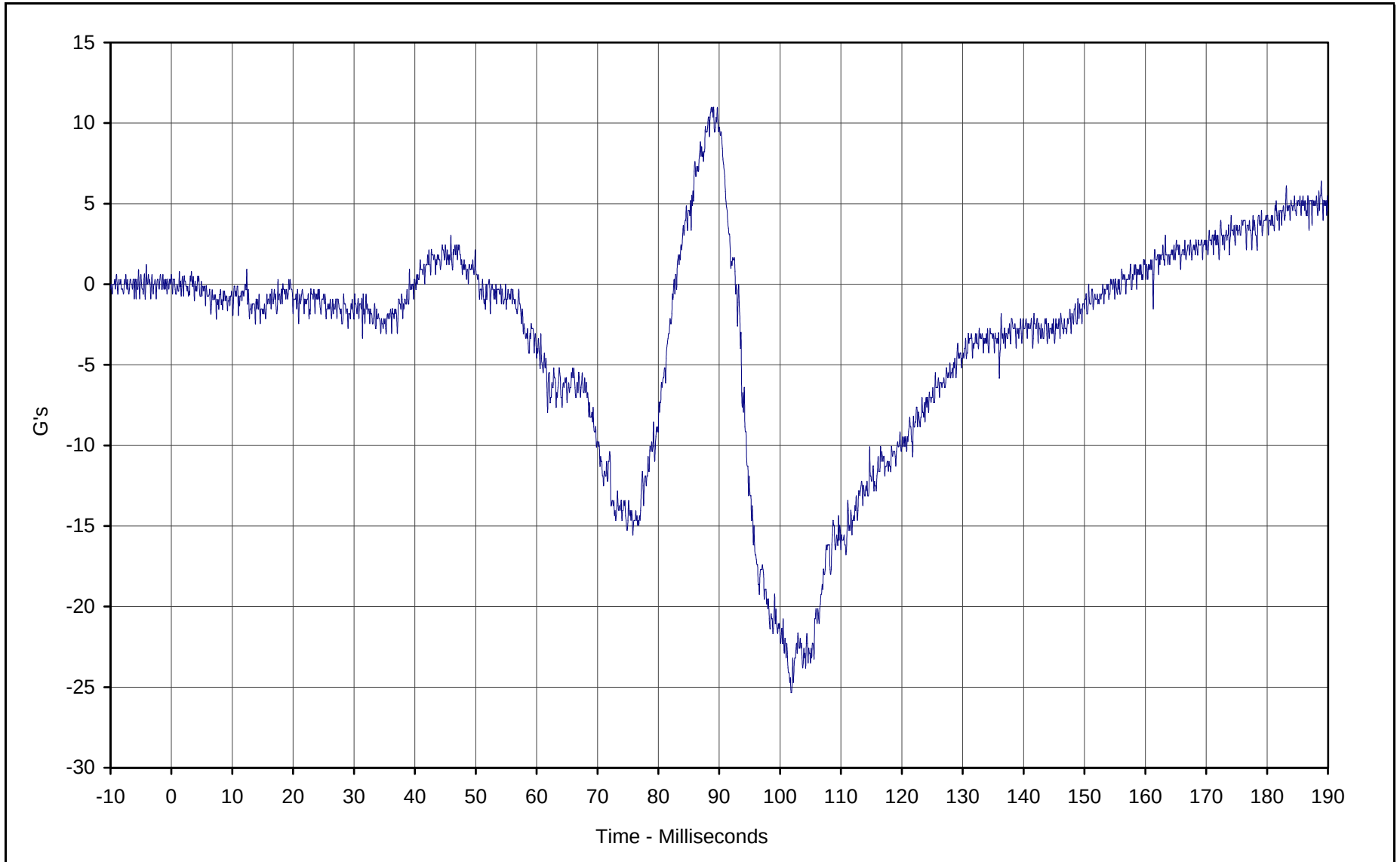




Curve Description: Driver Pelvis Contact
Maximum Value: 104.4 at 20.8 Milliseconds
Crossing Point: 50% at 20.6 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-013

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

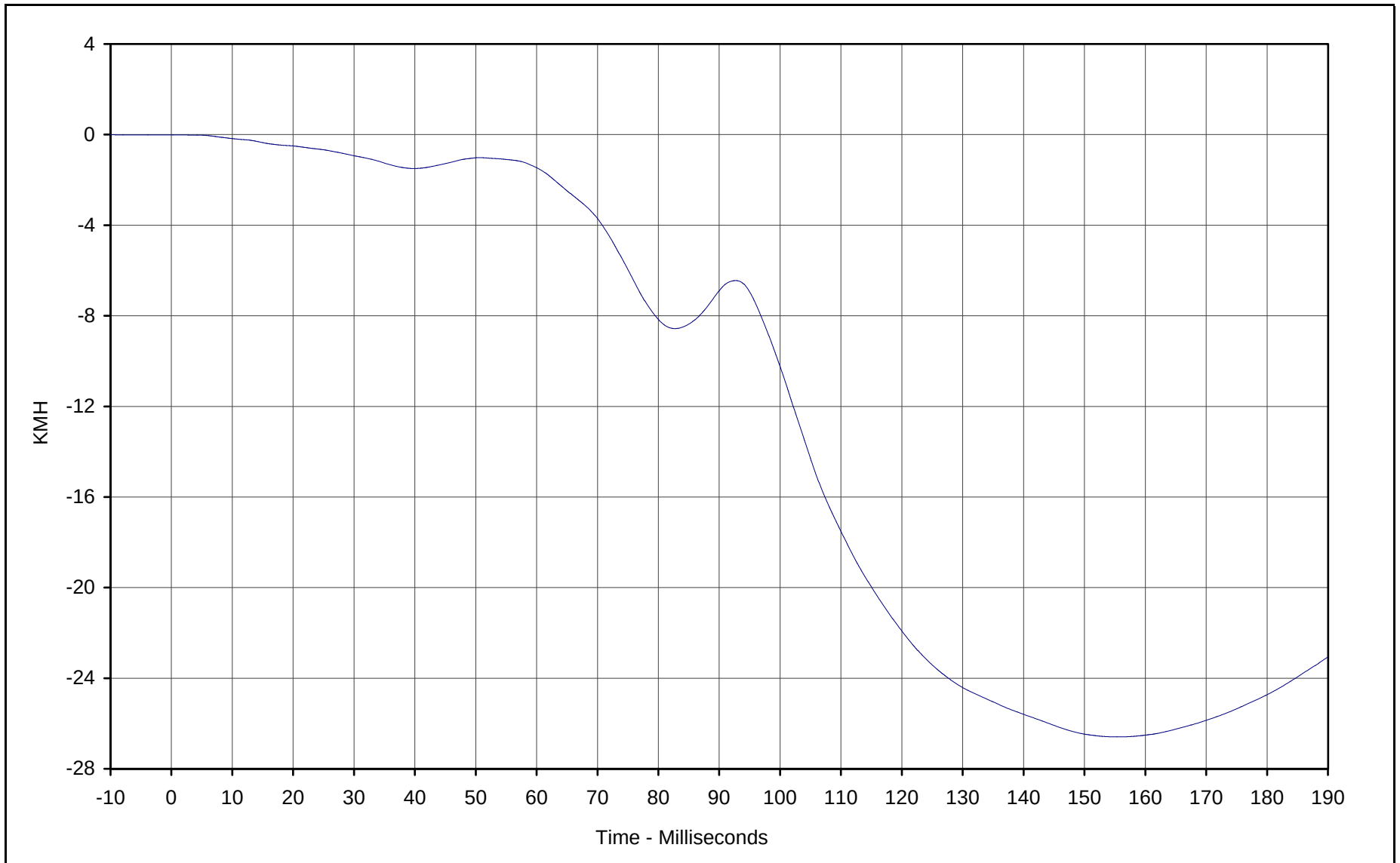




Curve Description: Pass. Head CG X
Maximum Value: 11.0 at 88.7 Milliseconds
Minimum Value: -25.3 at 101.8 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-014

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

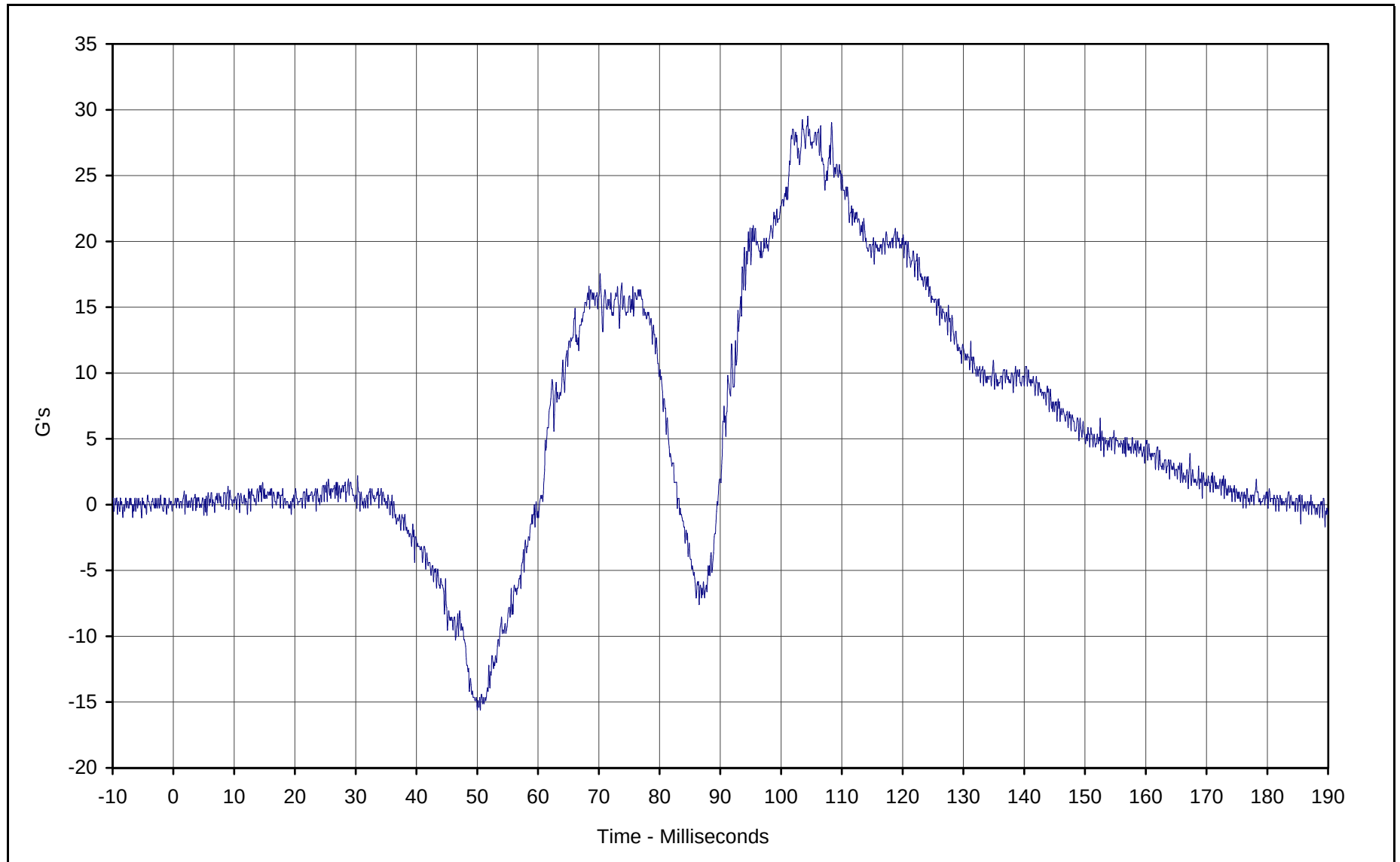




Curve Description: Pass. Head CG X Velocity
Maximum Value: 0.0 at 0.3 Milliseconds
Minimum Value: -26.6 at 155.8 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-014

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

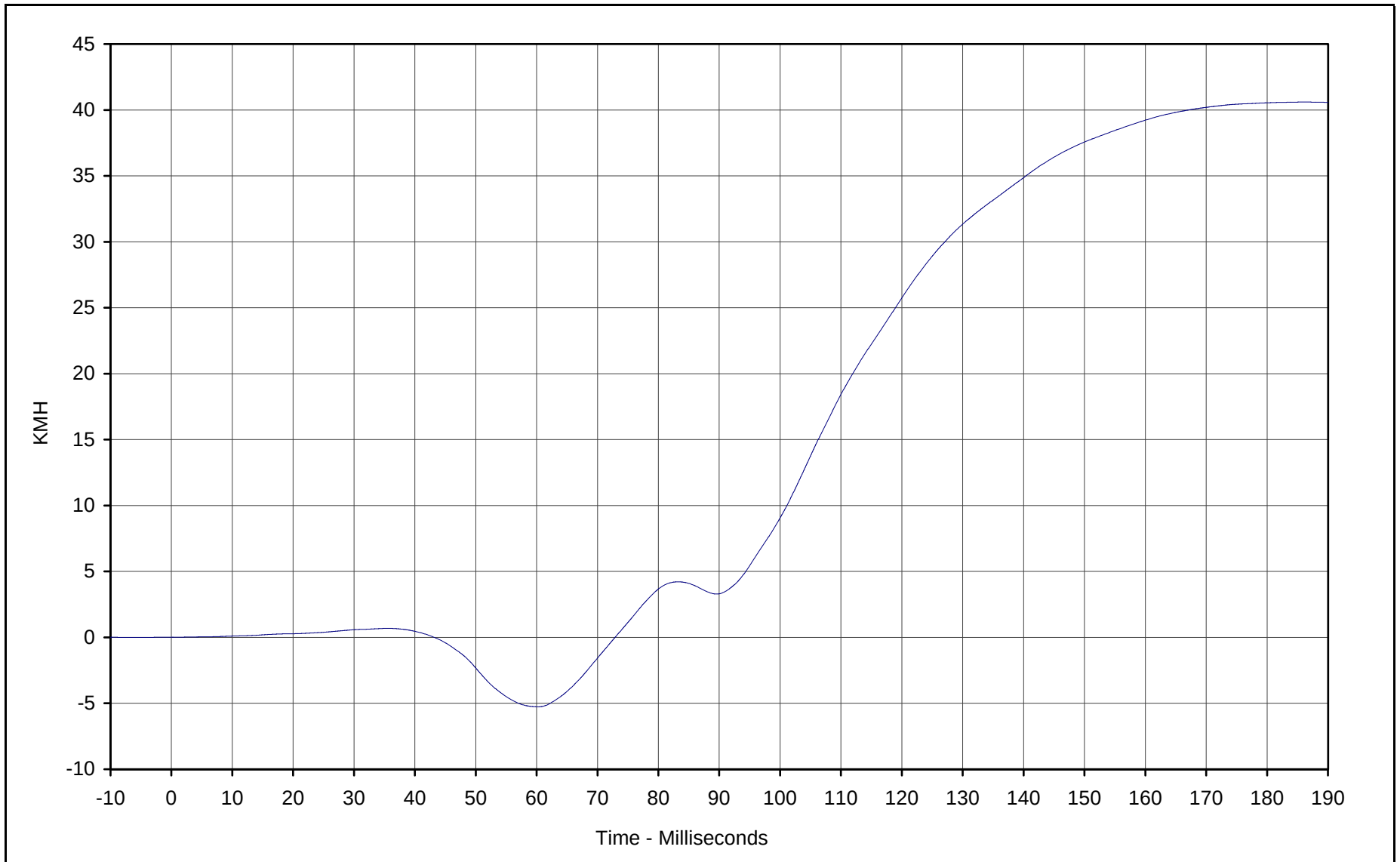




Curve Description: Pass. Head CG Y
Maximum Value: 29.5 at 104.4 Milliseconds
Minimum Value: -15.6 at 50.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-015

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

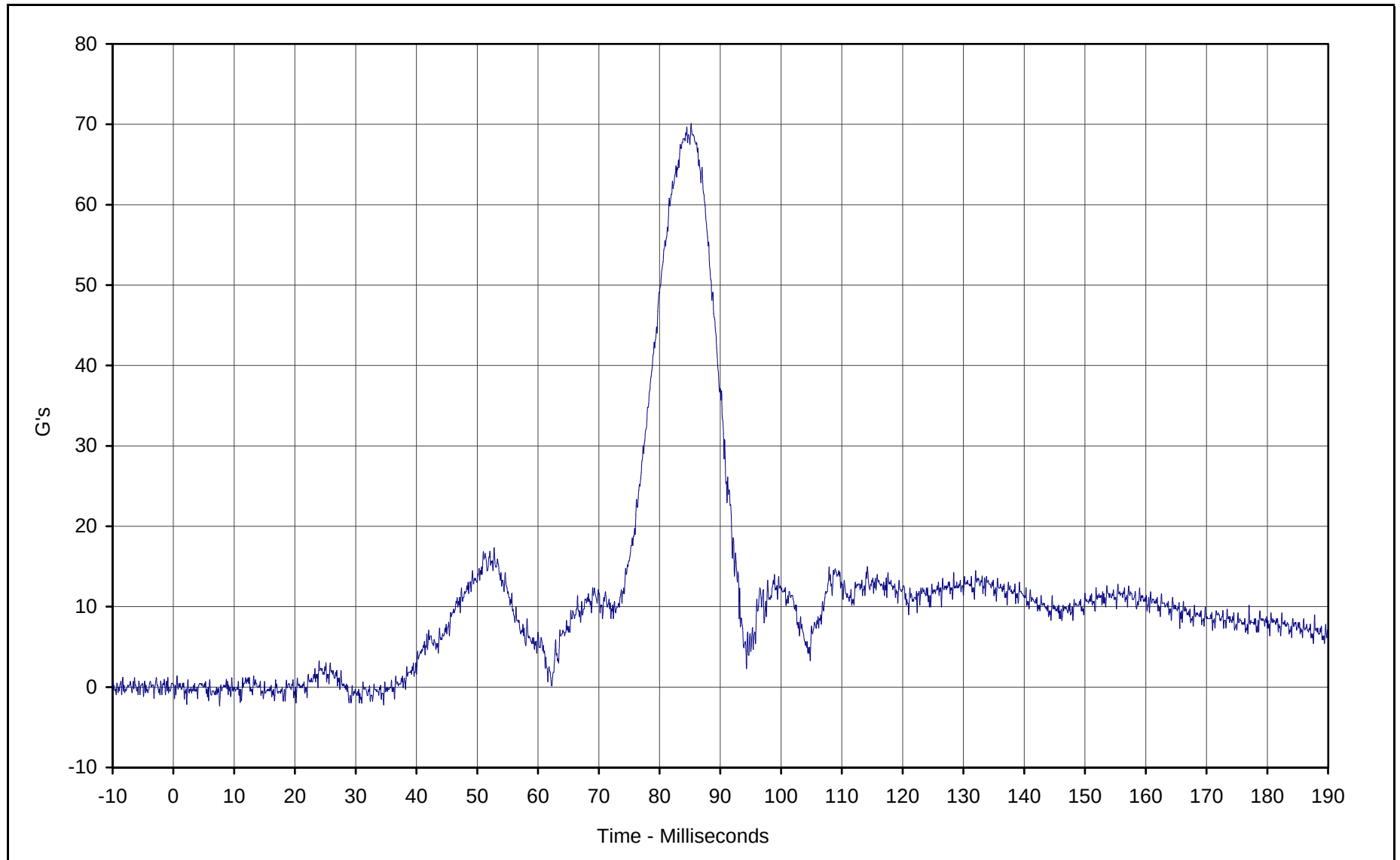




Curve Description: Pass. Head CG Y Velocity
Maximum Value: 40.6 at 185.9 Milliseconds
Minimum Value: -5.3 at 60.2 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-015

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

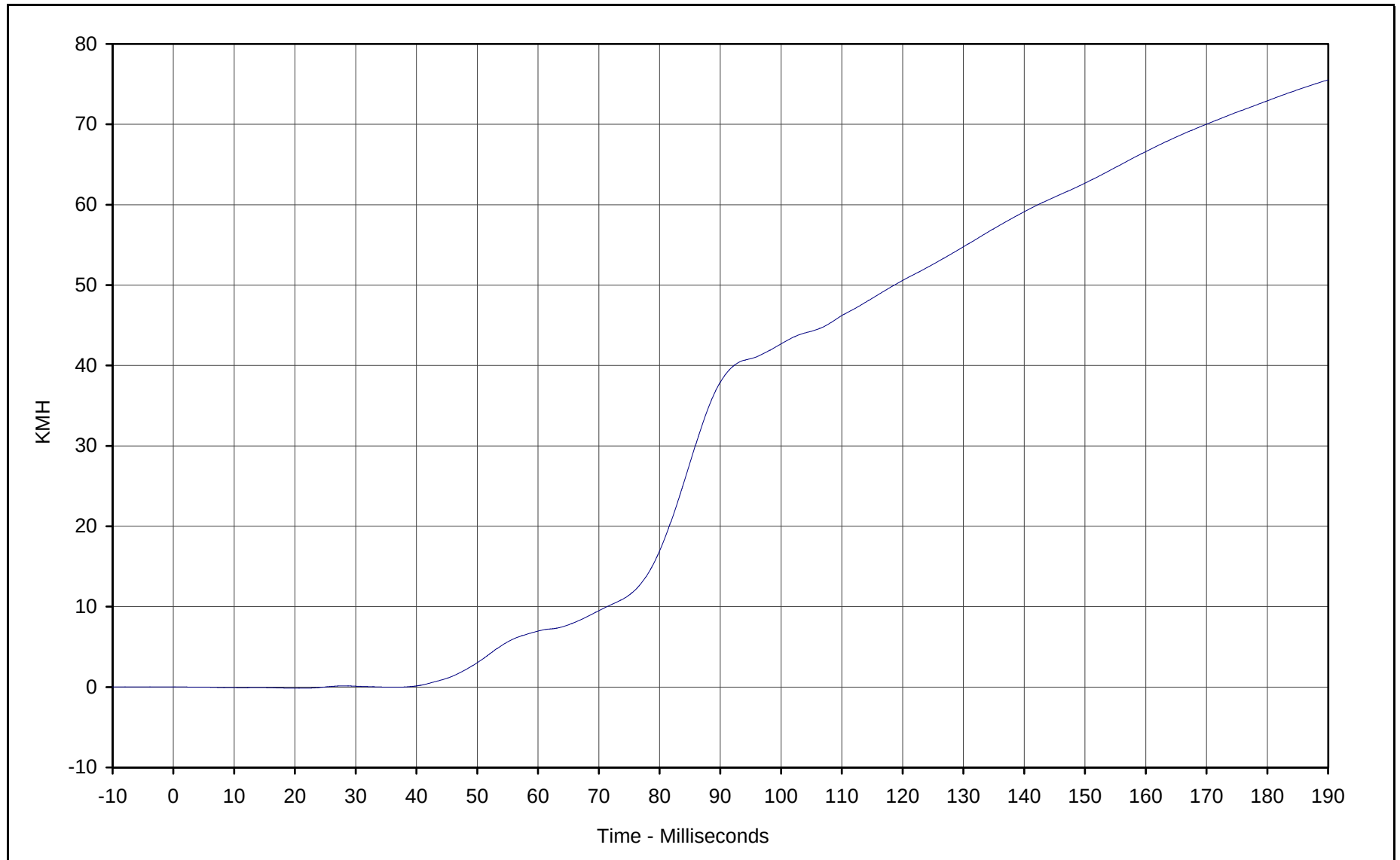




Curve Description: Pass. Head CG Z
Maximum Value: 70.1 at 85.2 Milliseconds
Minimum Value: -2.3 at 7.6 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-016

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

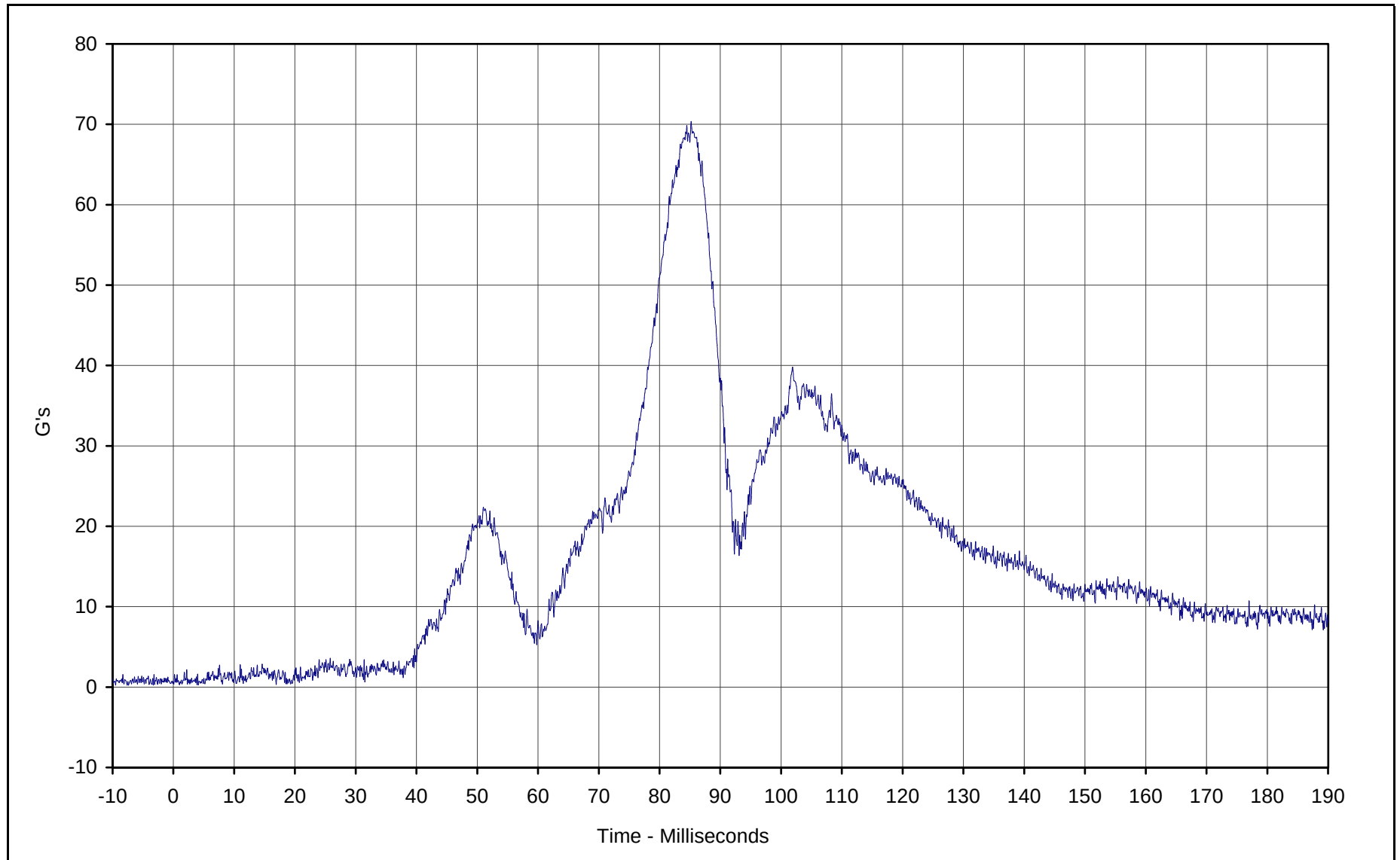




Curve Description: Pass. Head CG Z Velocity
Maximum Value: 75.5 at 189.9 Milliseconds
Minimum Value: -0.1 at 21.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-016

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

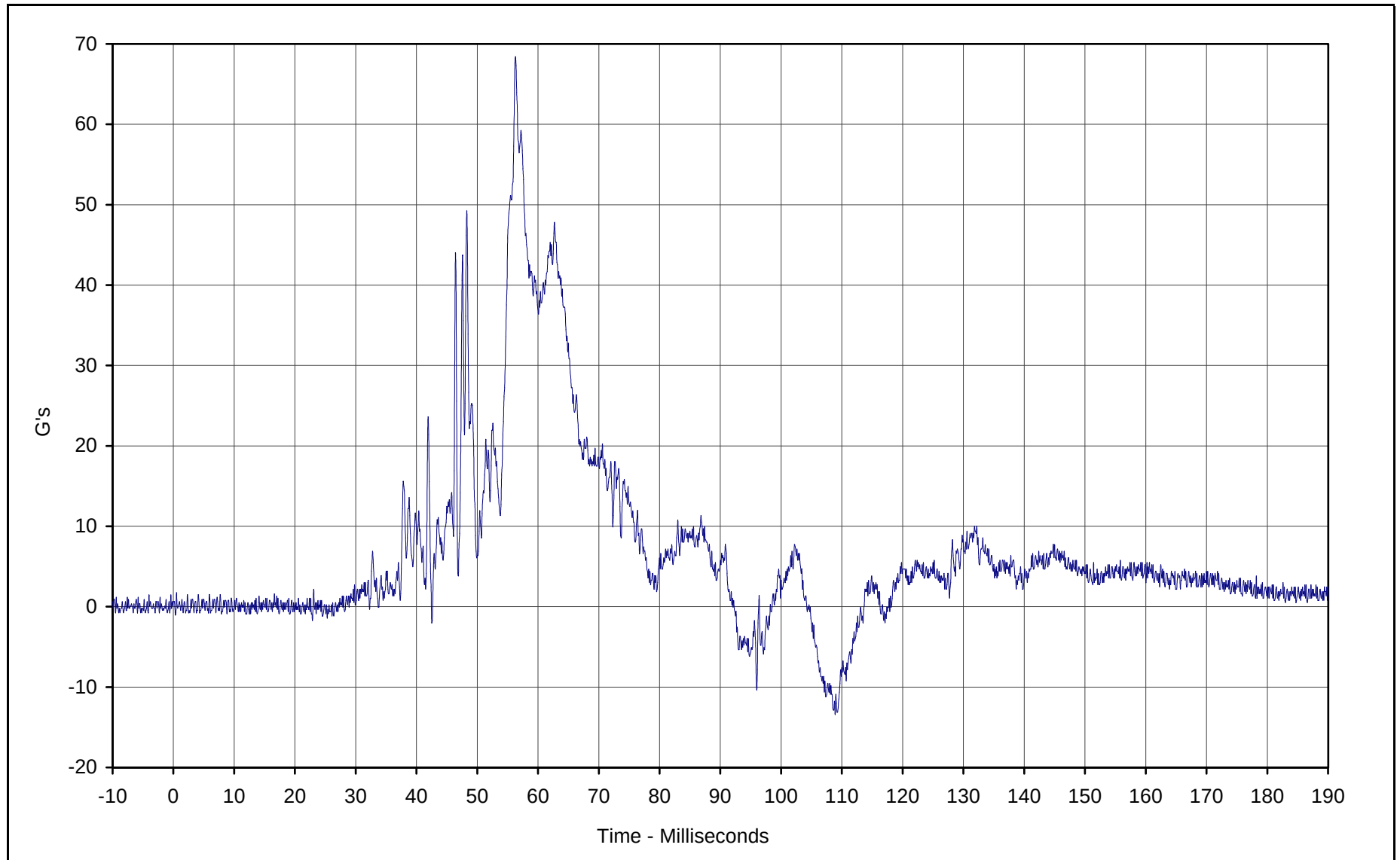




Curve Description: Pass. Head CG Resultant
Maximum Value: 70.4 at 85.2 Milliseconds
Minimum Value: 0.3 at 3.9 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: RES-014

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

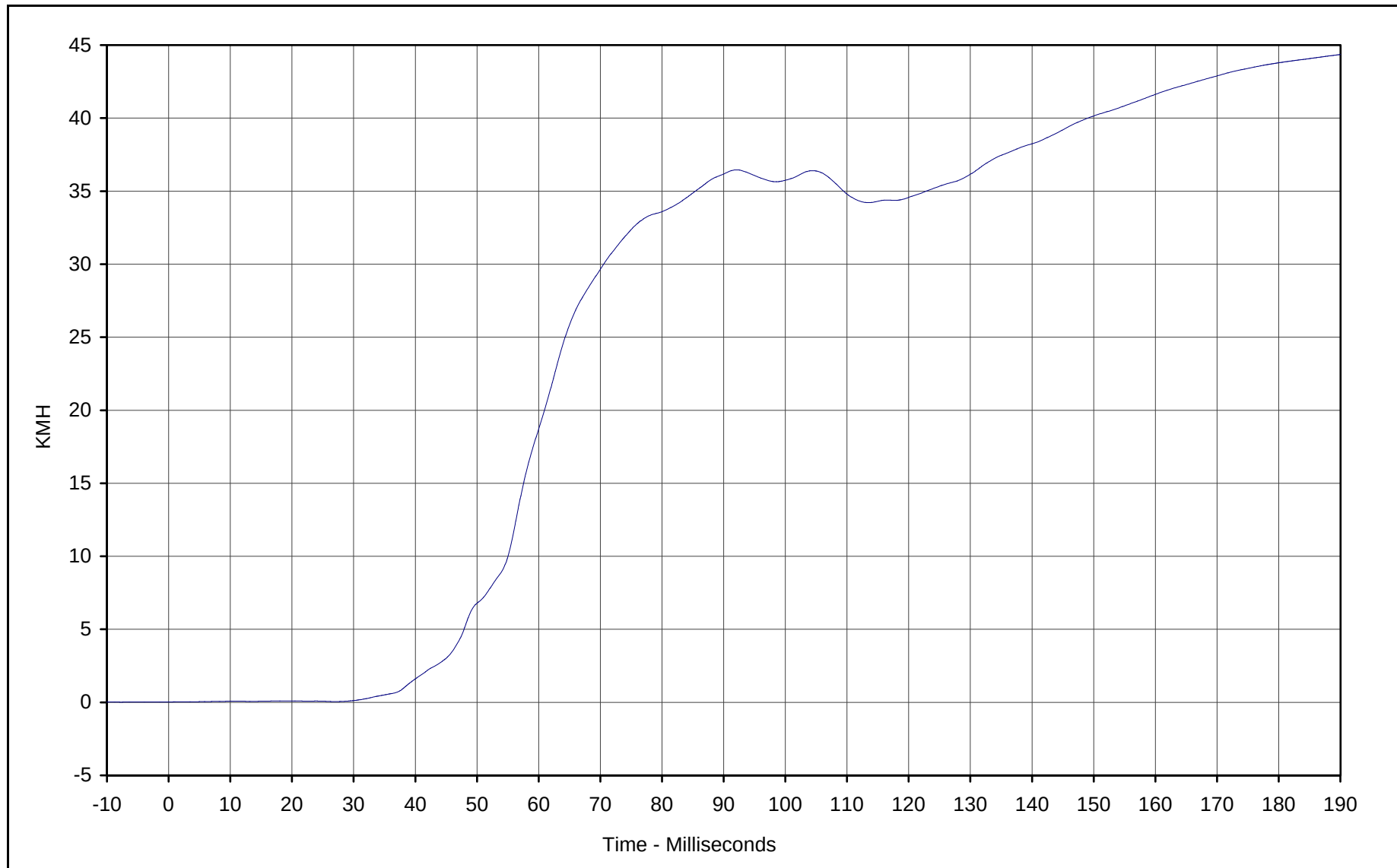




Curve Description: Pass. Upper Rib Primary Y
Maximum Value: 68.4 at 56.3 Milliseconds
Minimum Value: -13.4 at 108.9 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-017

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Pass. Upper Rib Primary Y Velocity

Maximum Value: 44.3 at 189.9 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

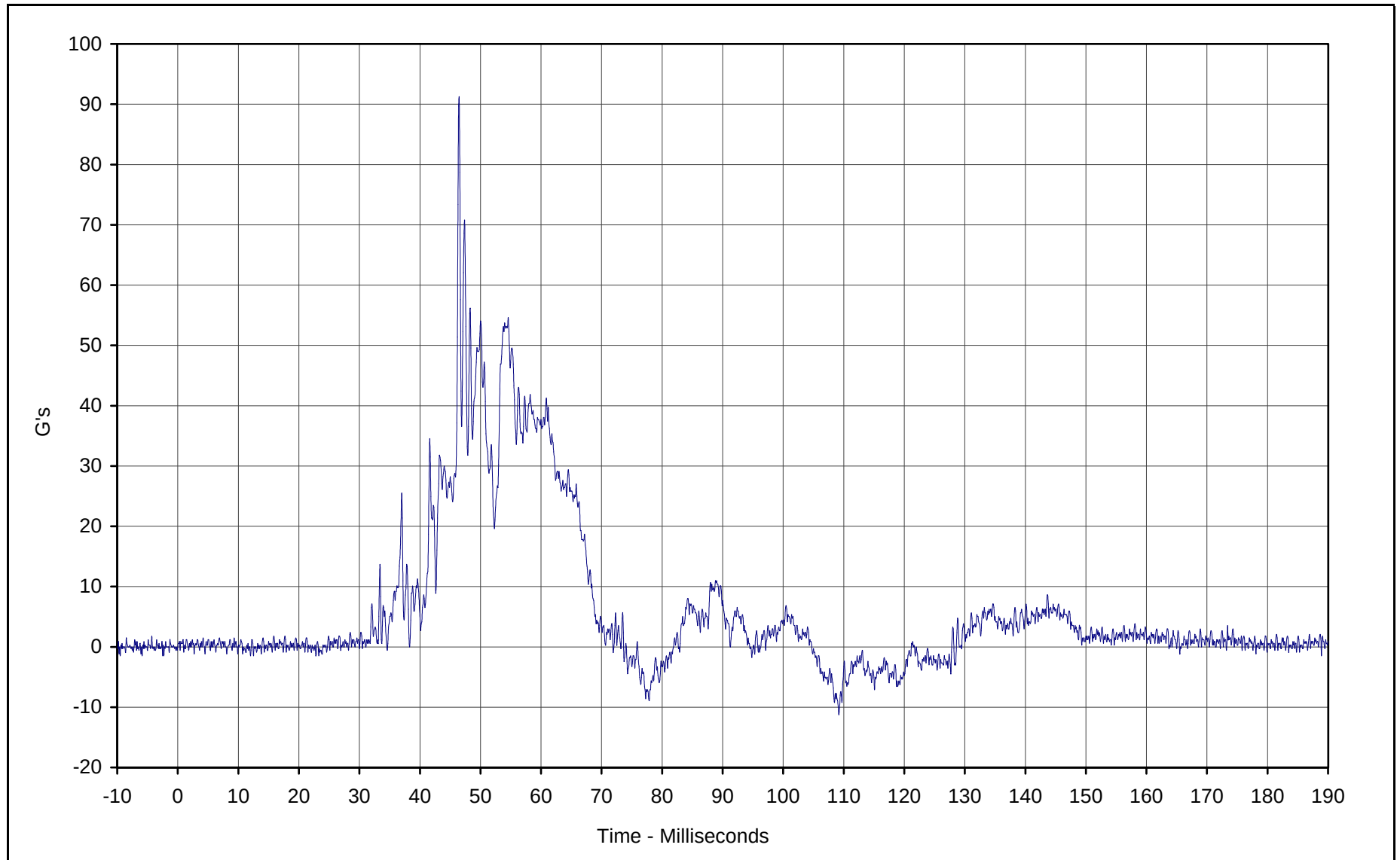
Date of Test: 12/05/00

Curve Number: IN1-017

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

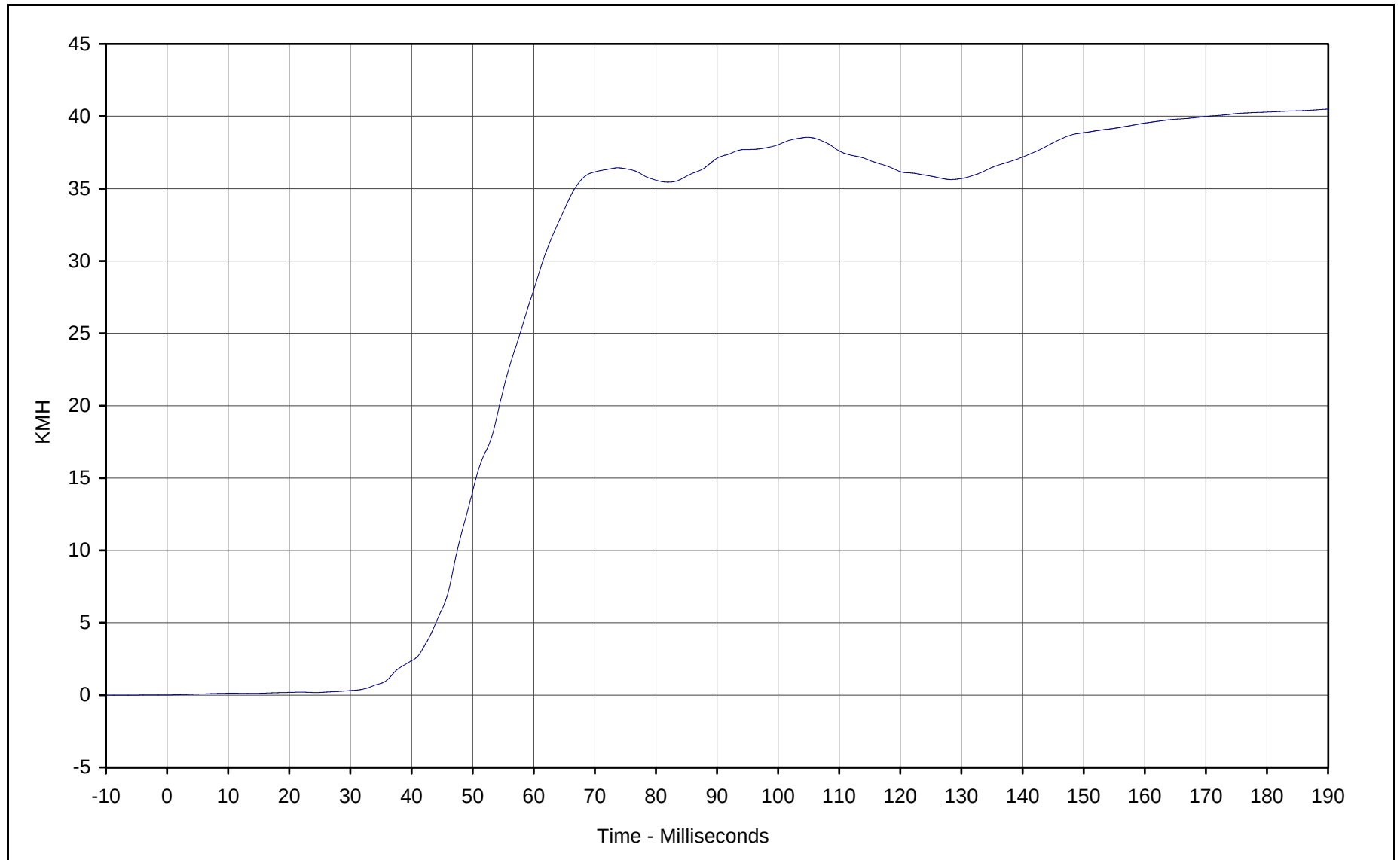




Curve Description: Pass. Lower Rib Primary Y
Maximum Value: 91.2 at 46.5 Milliseconds
Minimum Value: -11.3 at 109.2 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-018

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Pass. Lower Rib Primary Y Velocity

Maximum Value: 40.5 at 189.9 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

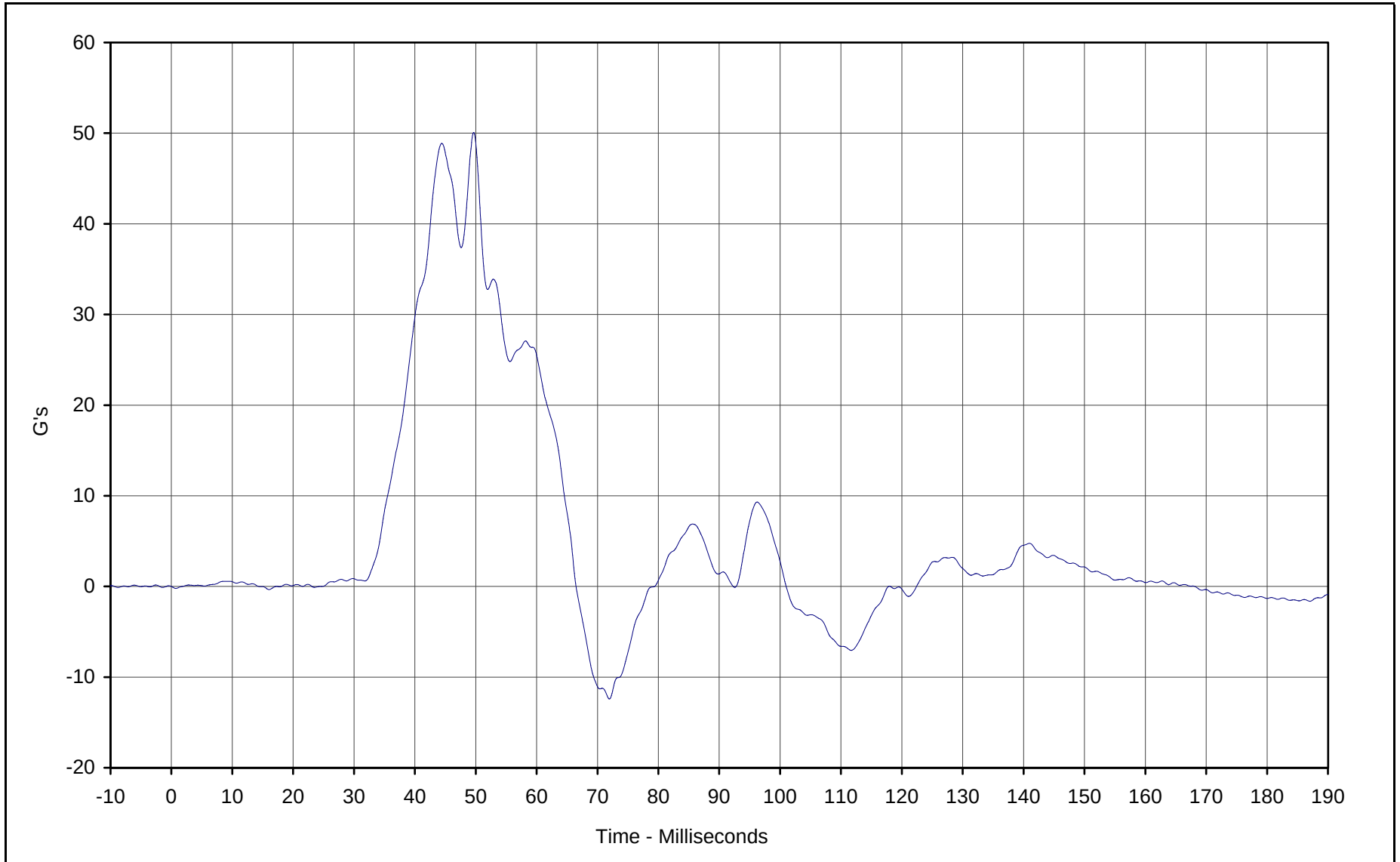
Date of Test: 12/05/00

Curve Number: IN1-018

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

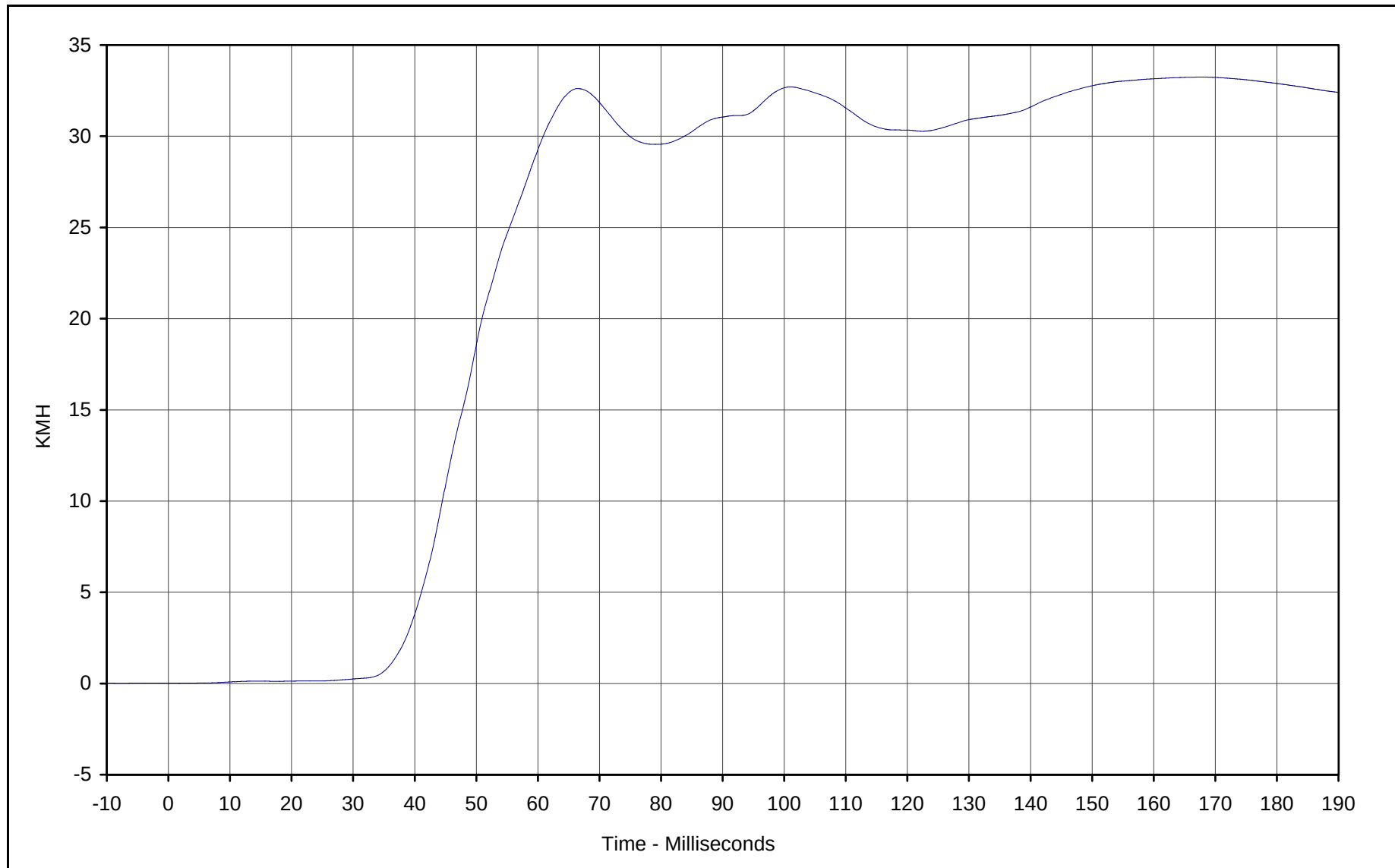




Curve Description: Pass. Lower Spine Primary Y
Maximum Value: 50.1 at 49.6 Milliseconds
Minimum Value: -12.4 at 72.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: FIL-019

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Pass. Lower Spine Primary Y Velocity

Maximum Value: 33.2 at 168.1 Milliseconds

Minimum Value: 0.0 at 1.8 Milliseconds

SAE Filter Class: 180

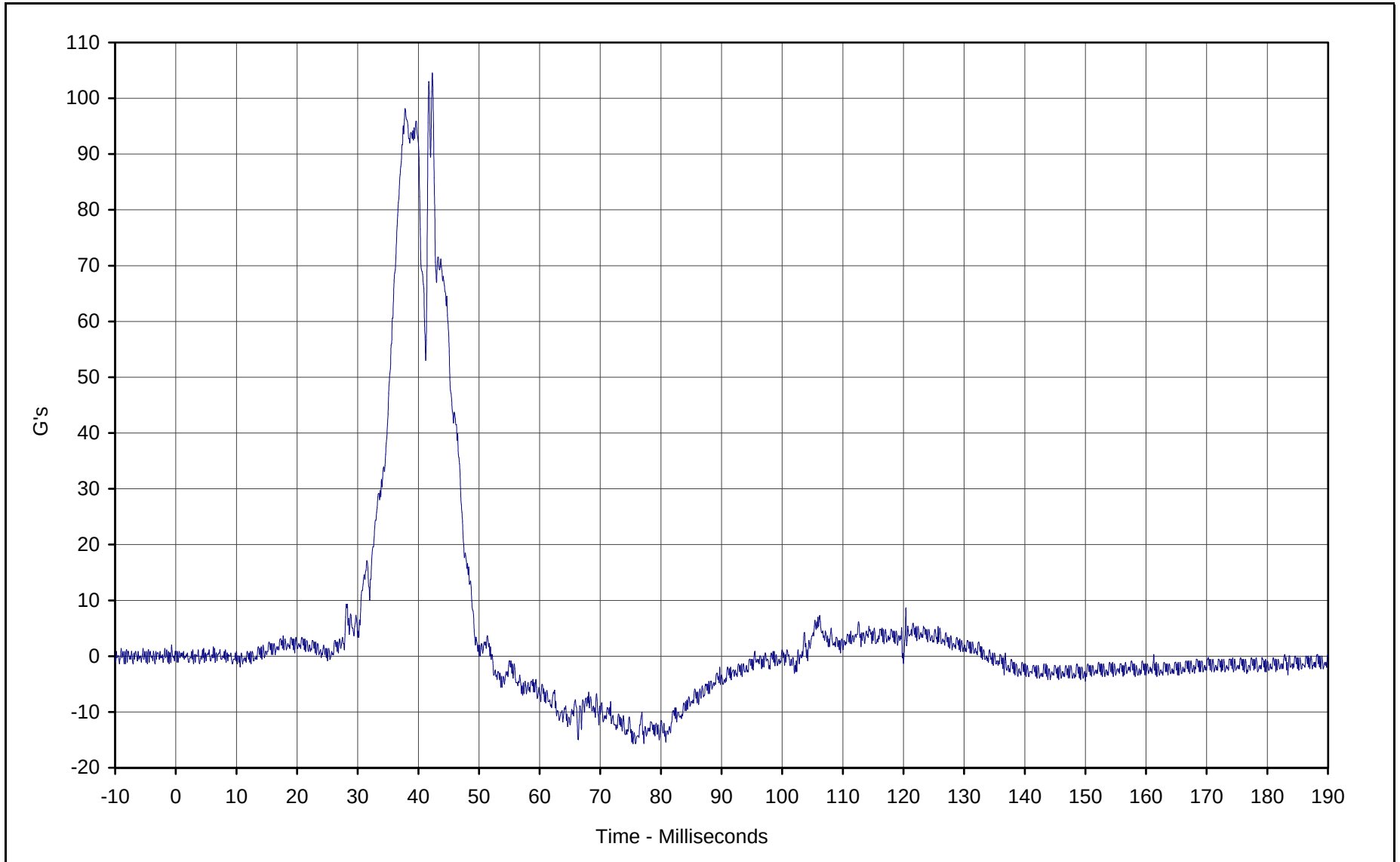
Date of Test: 12/05/00

Curve Number: IN1-019

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

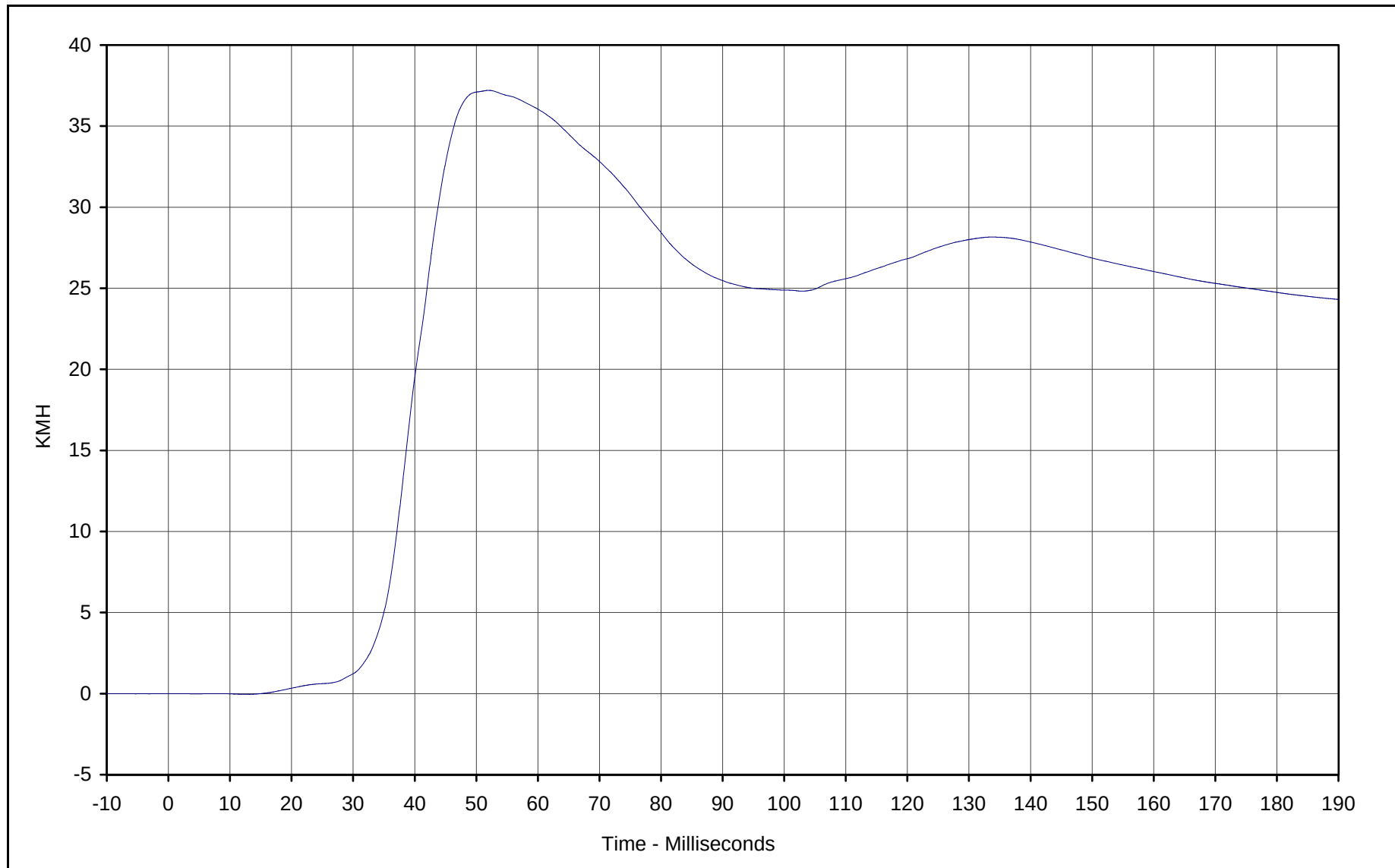




Curve Description: Pass. Pelvis Primary Y
Maximum Value: 104.6 at 42.3 Milliseconds
Minimum Value: -15.7 at 75.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-020

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

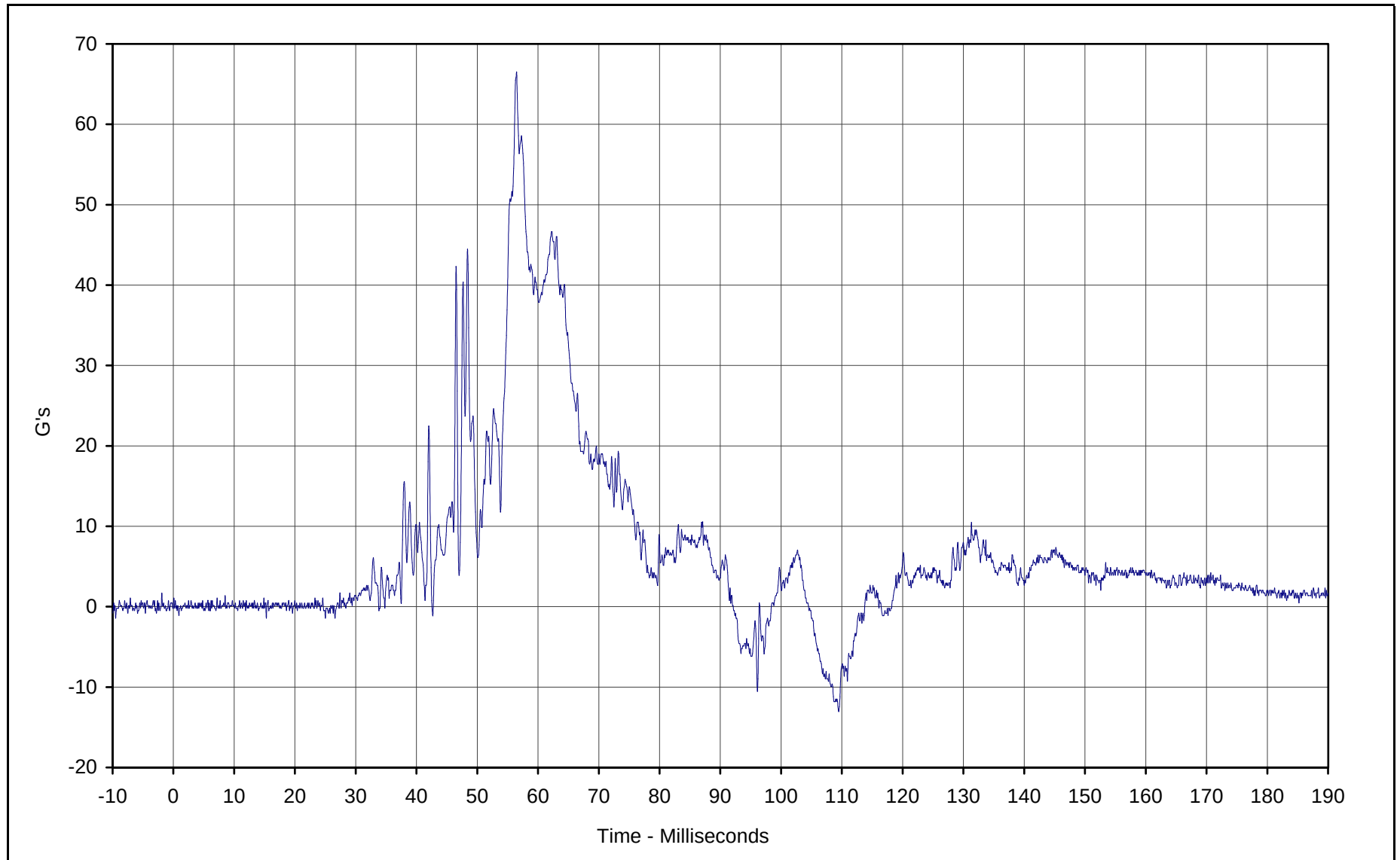




Curve Description: Pass. Pelvis Primary Y Velocity
Maximum Value: 37.2 at 52.0 Milliseconds
Minimum Value: 0.0 at 13.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-020

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

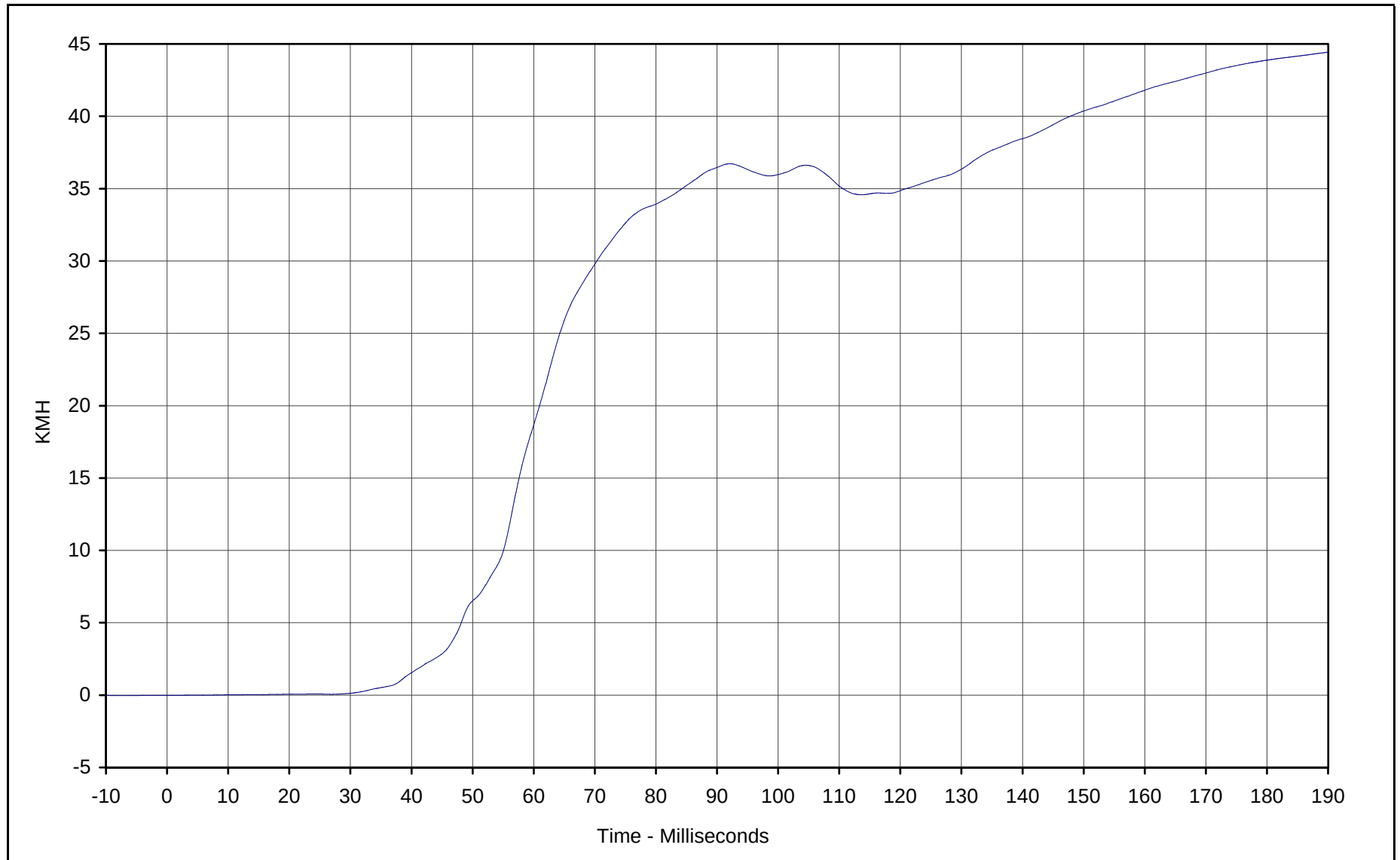




Curve Description: Pass. Upper Rib Redundant Y
Maximum Value: 66.4 at 56.5 Milliseconds
Minimum Value: -13.1 at 109.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-021

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Pass. Upper Rib Redundant Y Velocity

Maximum Value: 44.4 at 189.9 Milliseconds

Minimum Value: 0.0 at 1.7 Milliseconds

SAE Filter Class: 180

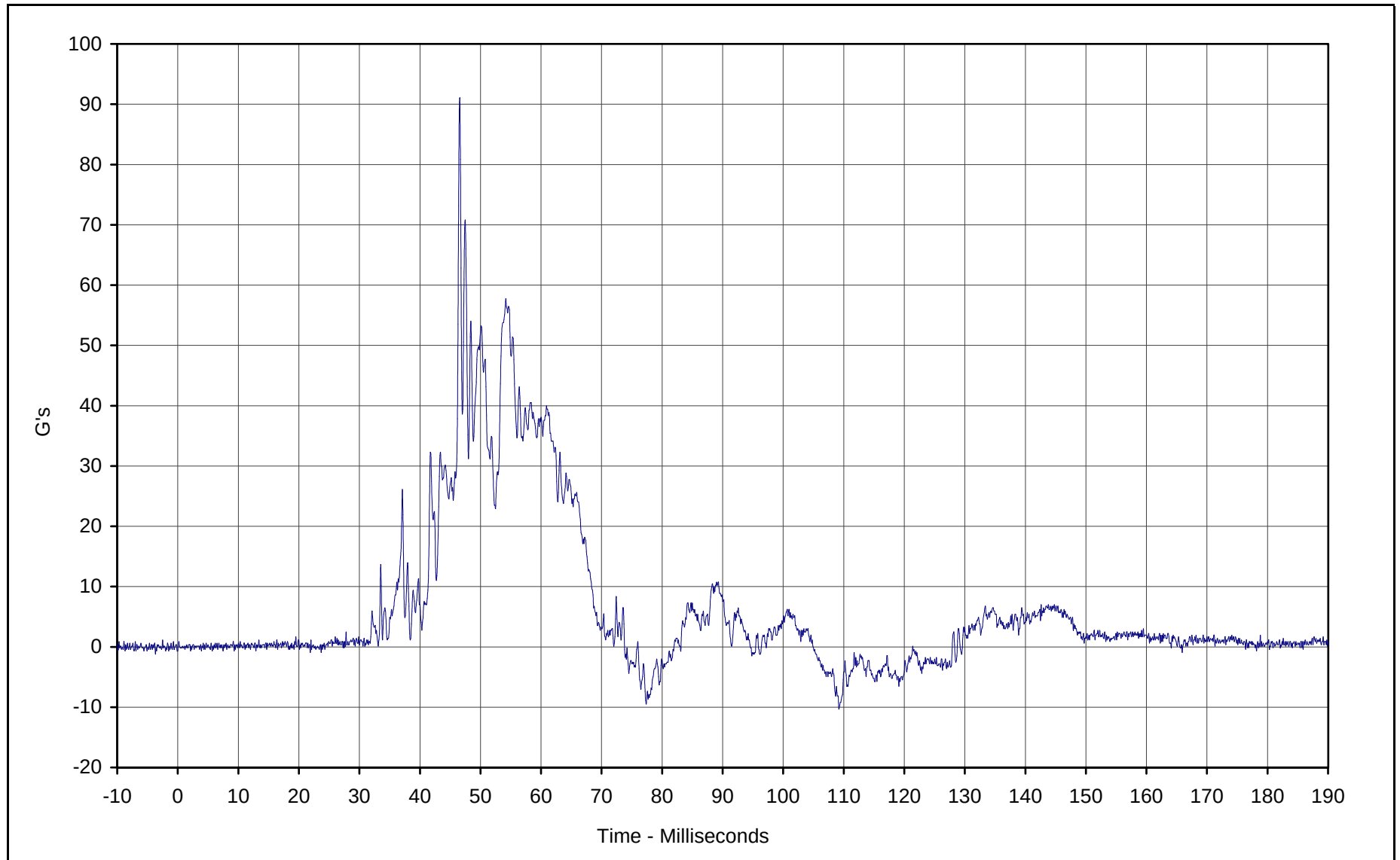
Date of Test: 12/05/00

Curve Number: IN1-021

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

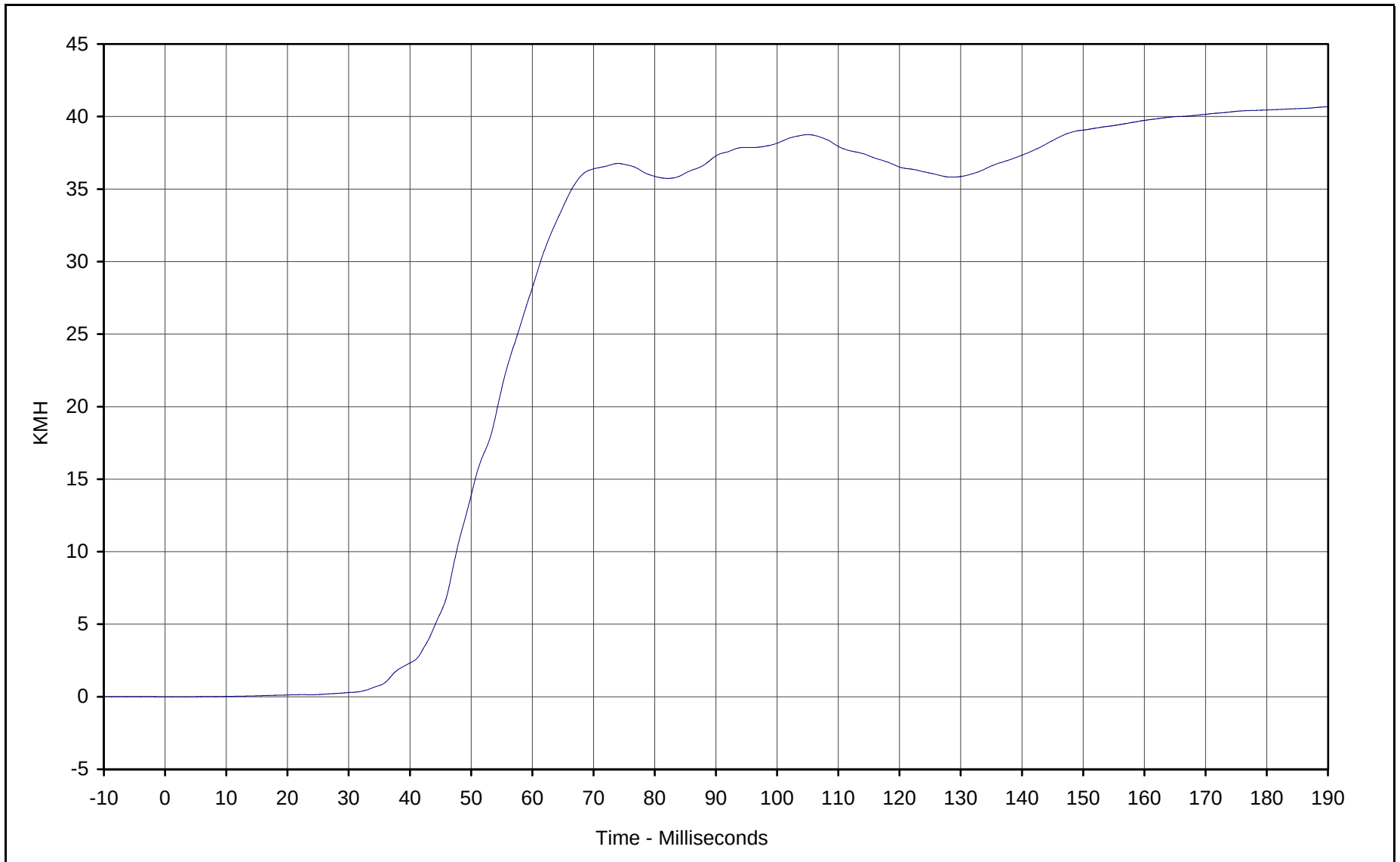




Curve Description: Pass. Lower Rib Redundant Y
Maximum Value: 91.0 at 46.6 Milliseconds
Minimum Value: -10.3 at 109.2 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-022

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Pass. Lower Rib Redundant Y Velocity

Maximum Value: 40.7 at 189.9 Milliseconds

Minimum Value: 0.0 at 1.6 Milliseconds

SAE Filter Class: 180

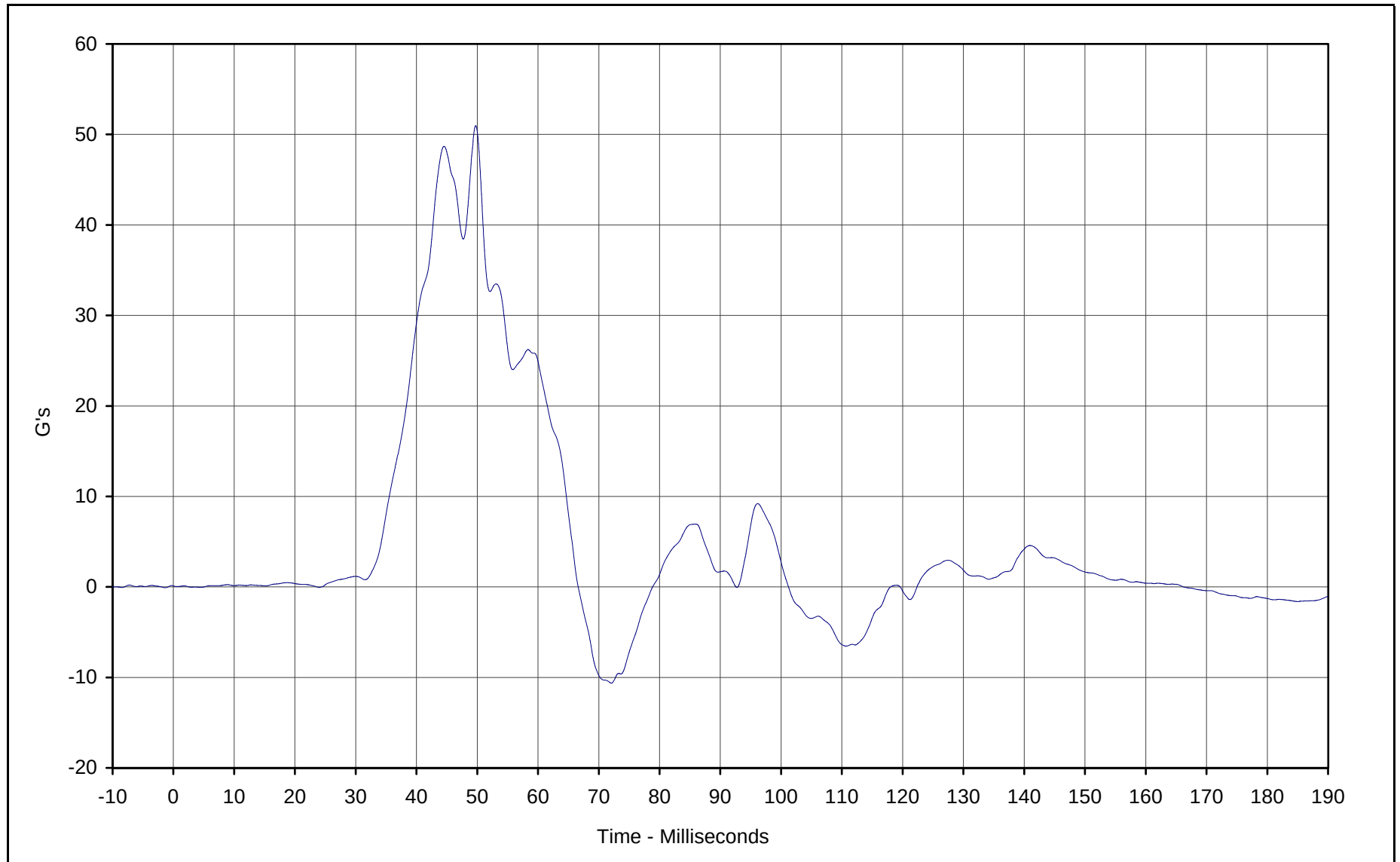
Date of Test: 12/05/00

Curve Number: IN1-022

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

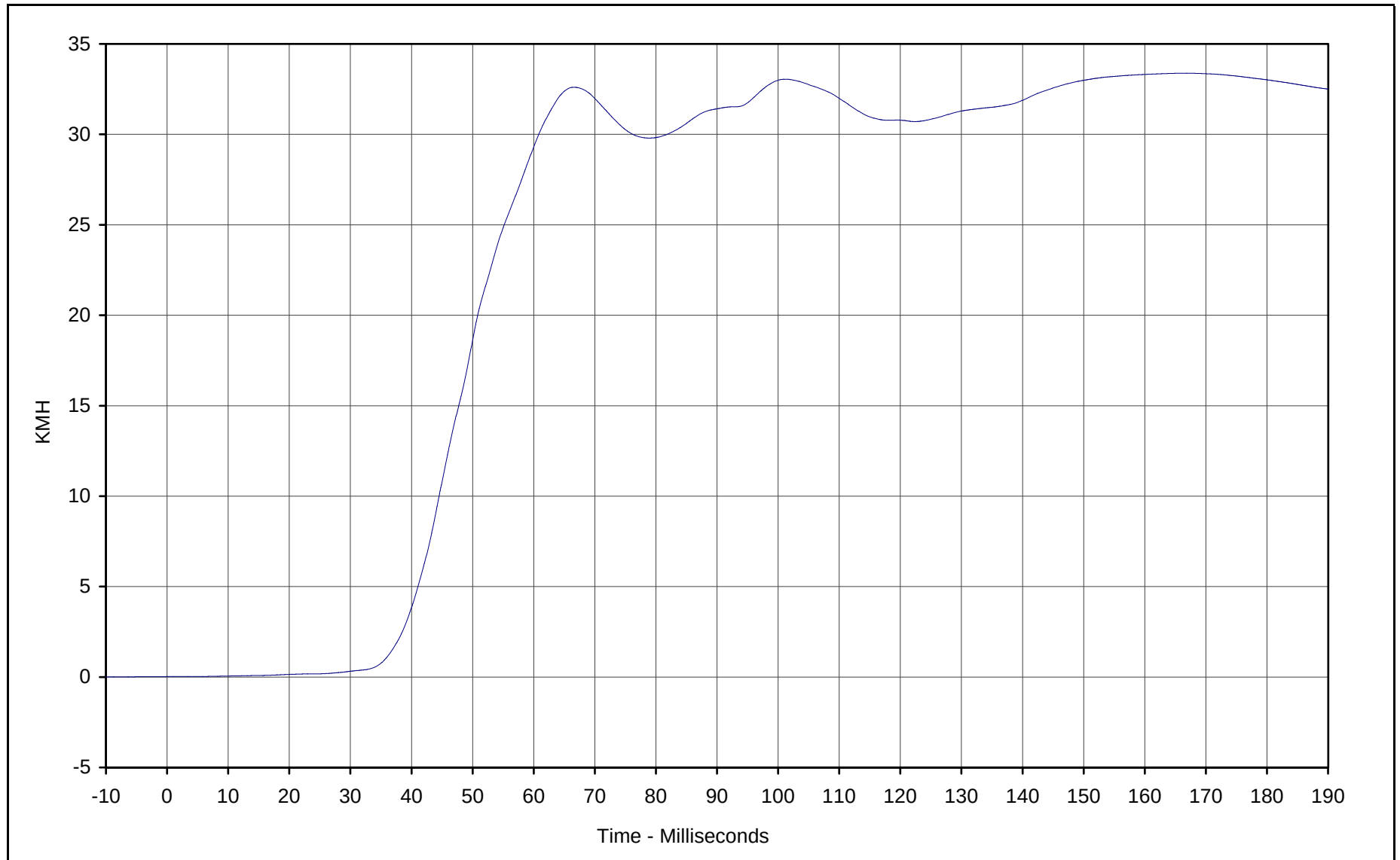




Curve Description: Pass. Lower Spine Redundant Y
Maximum Value: 51.0 at 49.7 Milliseconds
Minimum Value: -10.6 at 72.1 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: FIL-023

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Pass. Lower Spine Redundant Y Velocity

Maximum Value: 33.4 at 166.2 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

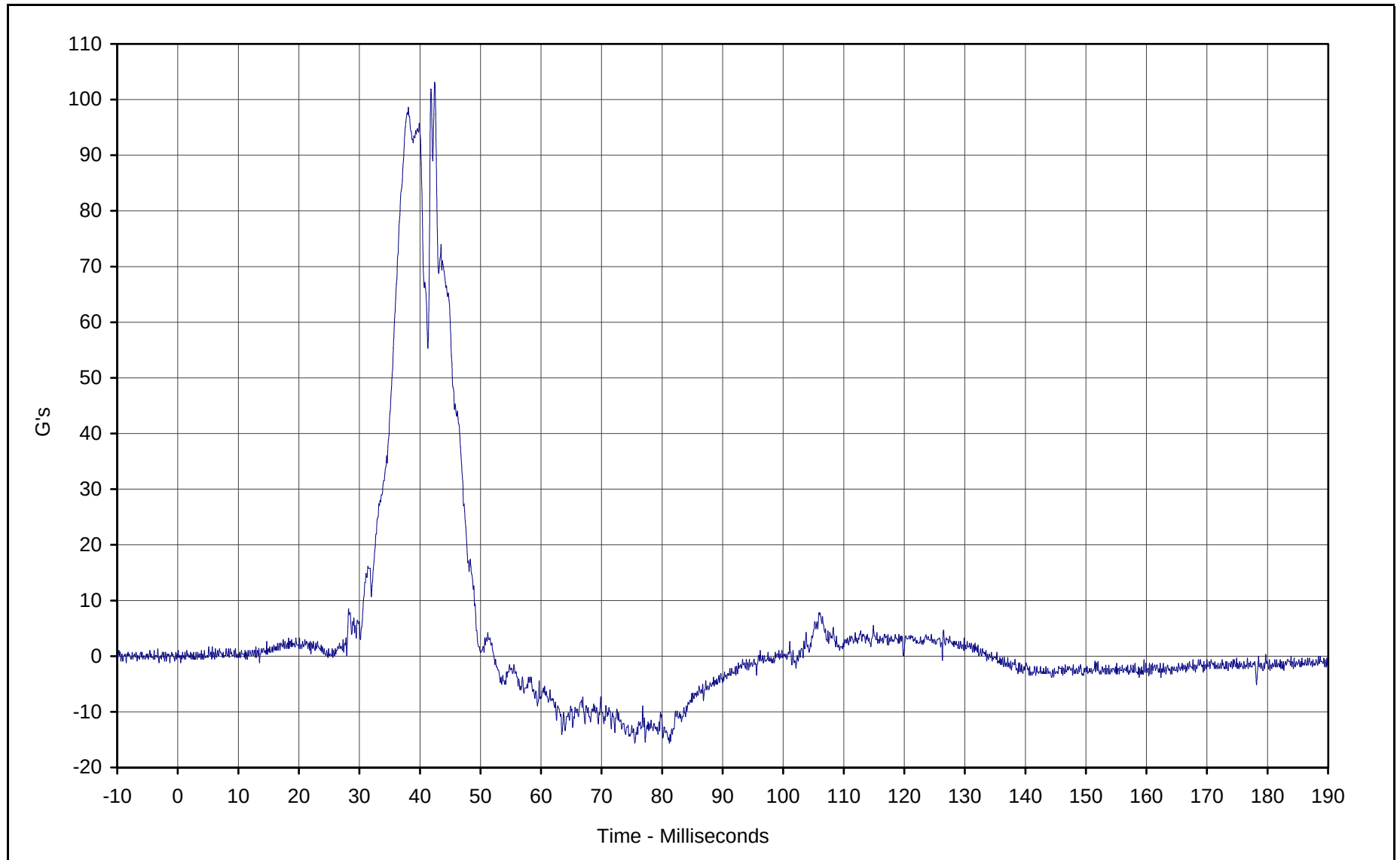
Date of Test: 12/05/00

Curve Number: IN1-023

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

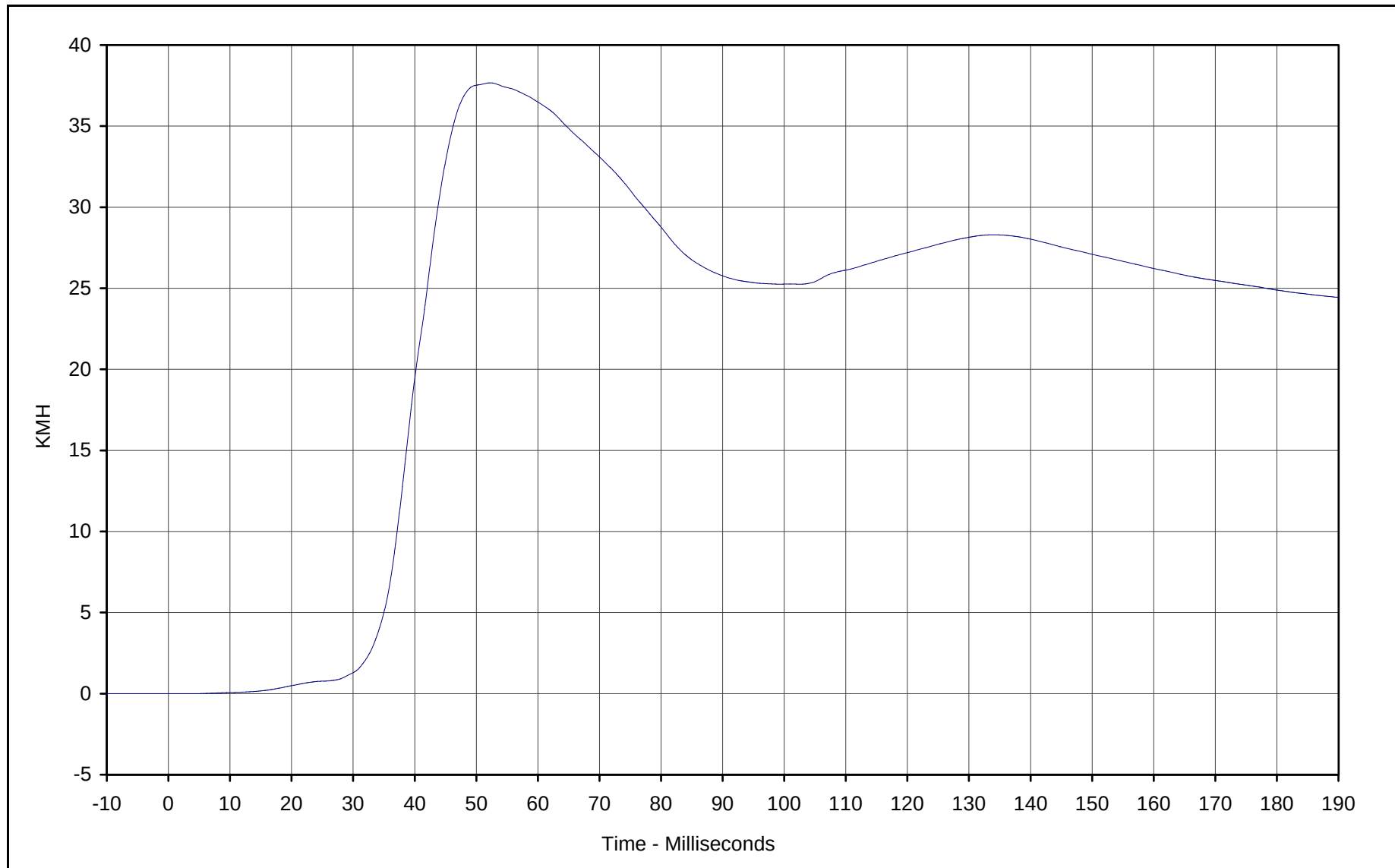




Curve Description: Pass. Pelvis Redundant Y
Maximum Value: 103.1 at 42.4 Milliseconds
Minimum Value: -15.6 at 75.5 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-024

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Pass. Pelvis Redundant Y Velocity

Maximum Value: 37.7 at 52.3 Milliseconds

Minimum Value: 0.0 at 1.0 Milliseconds

SAE Filter Class: 180

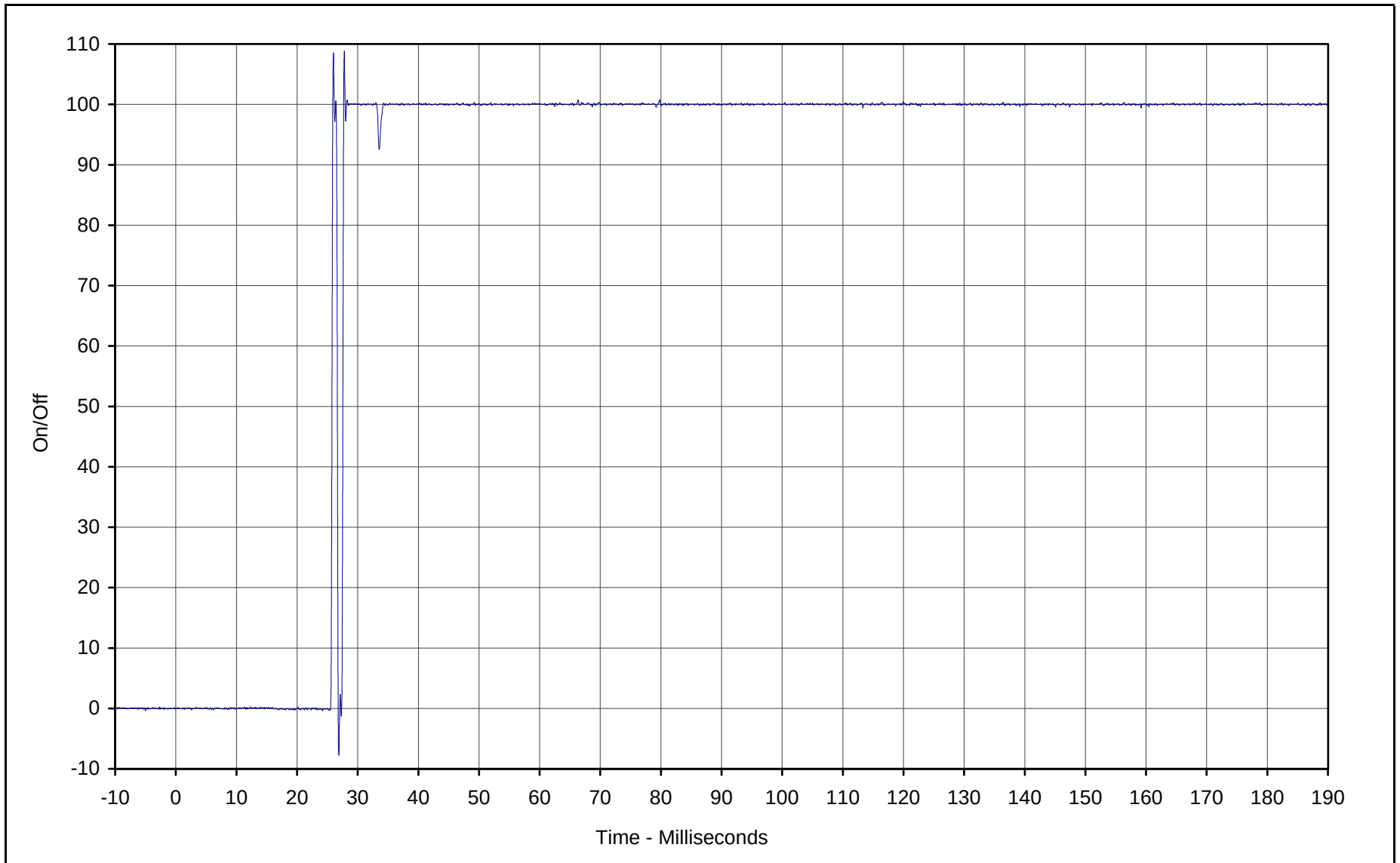
Date of Test: 12/05/00

Curve Number: IN1-024

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

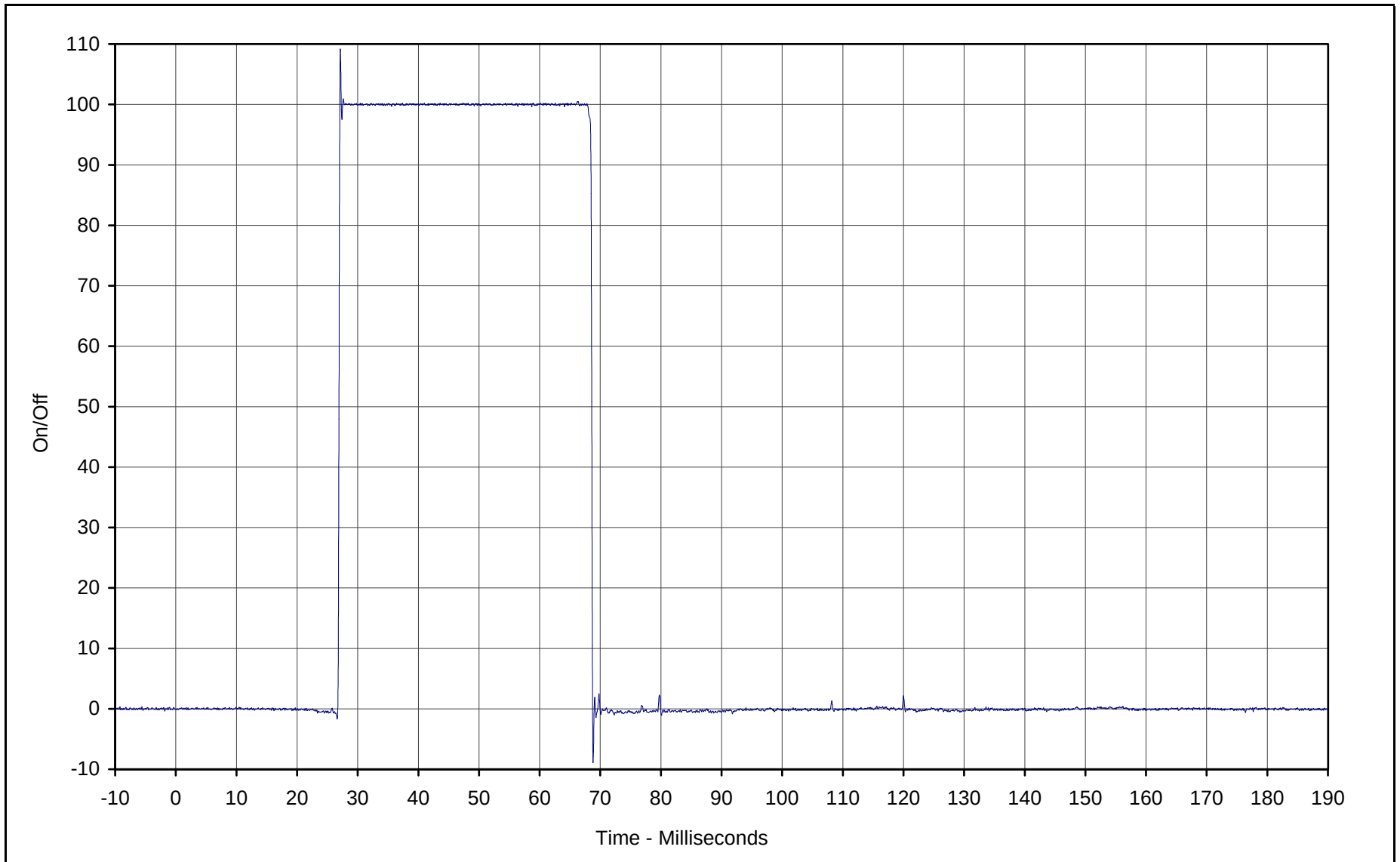




Curve Description: Pass. Thorax Contact
Maximum Value: 108.8 at 27.8 Milliseconds
Crossing Point: 50% at 25.8 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-025

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

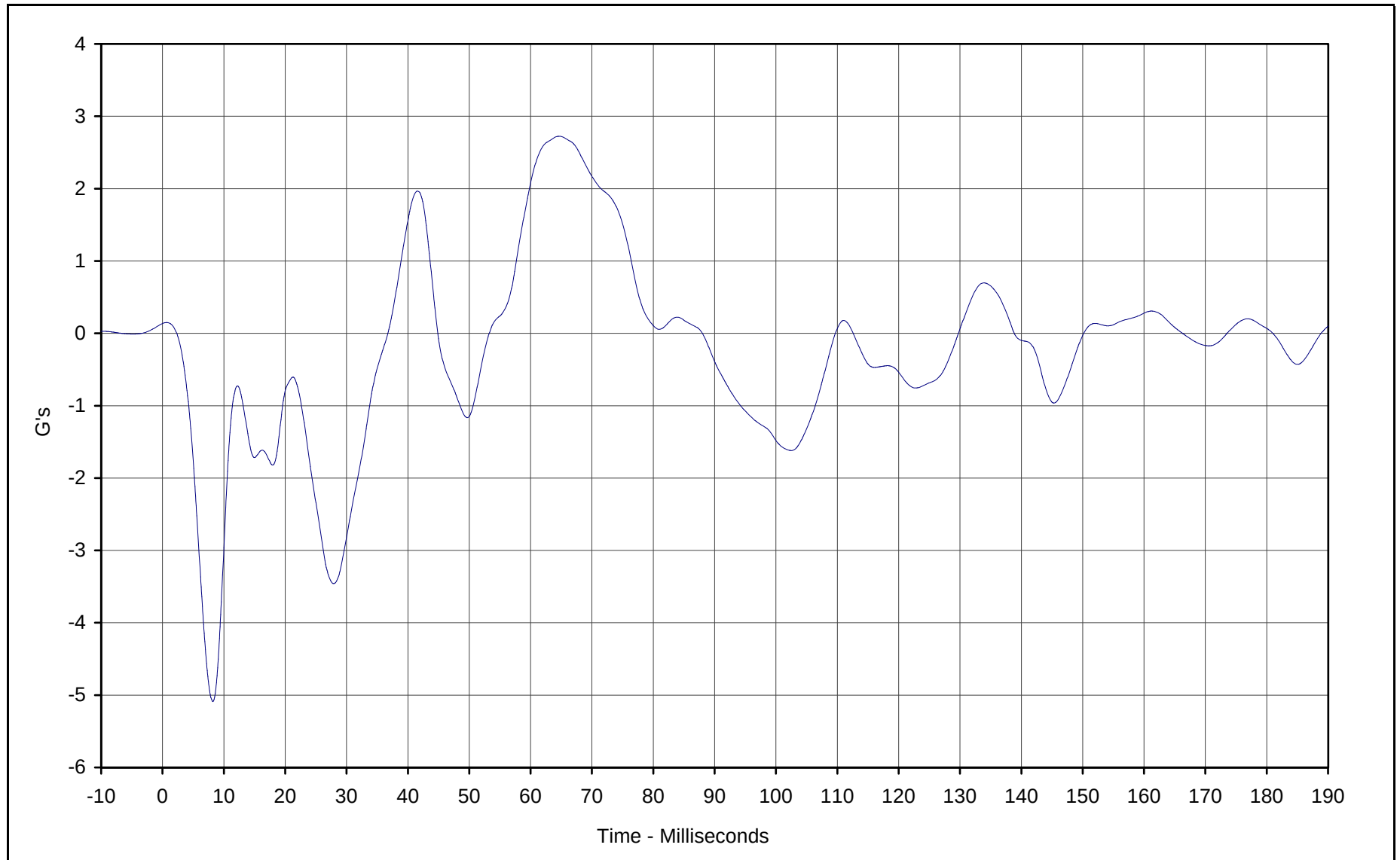




Curve Description: Pass. Pelvis Contact
Maximum Value: 108.9 at 27.1 Milliseconds
Crossing Point: 50% at 27.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-026

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

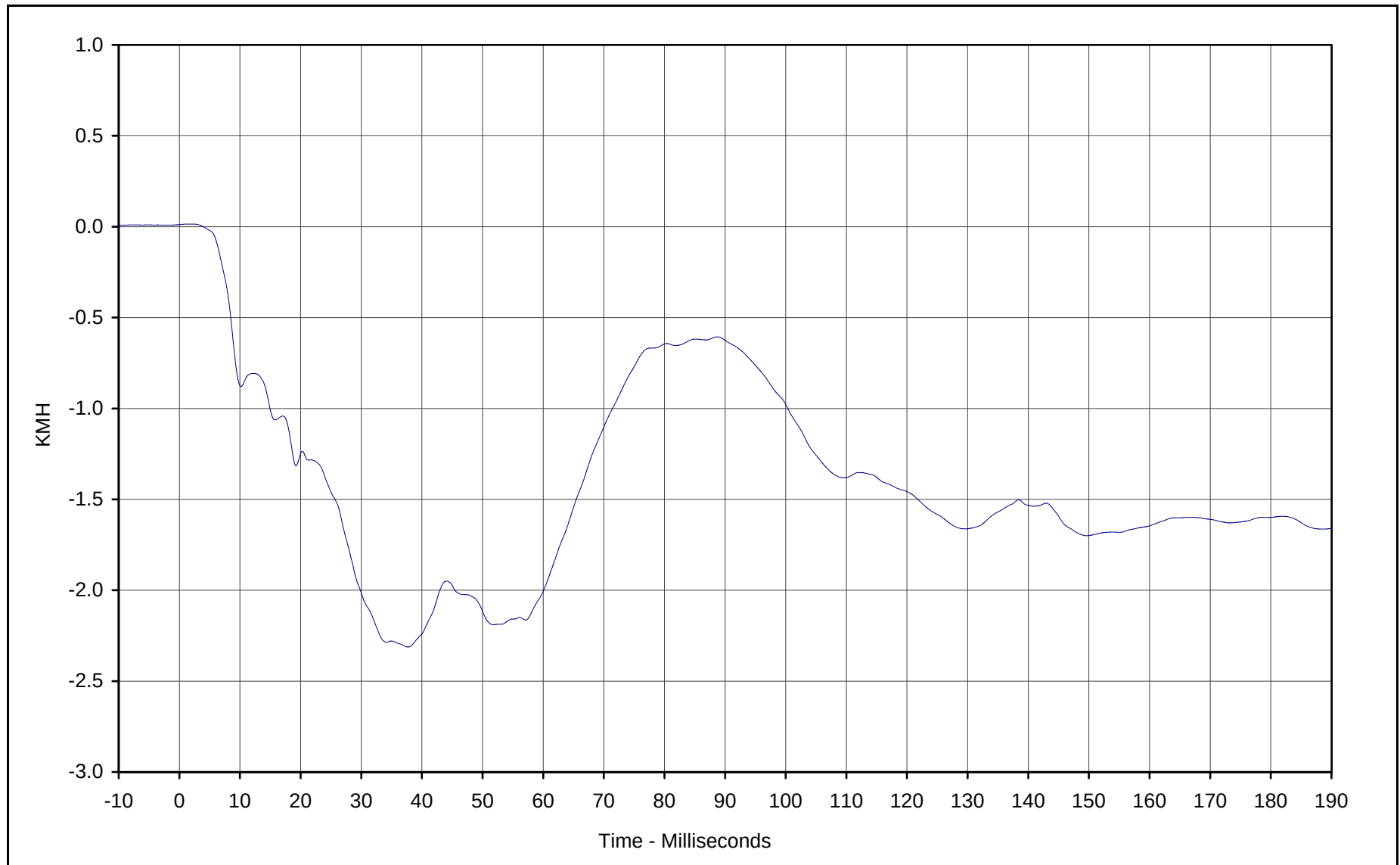




Curve Description: Right Sill at Front Seat X
Maximum Value: 2.7 at 64.7 Milliseconds
Minimum Value: -5.1 at 8.2 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-027

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

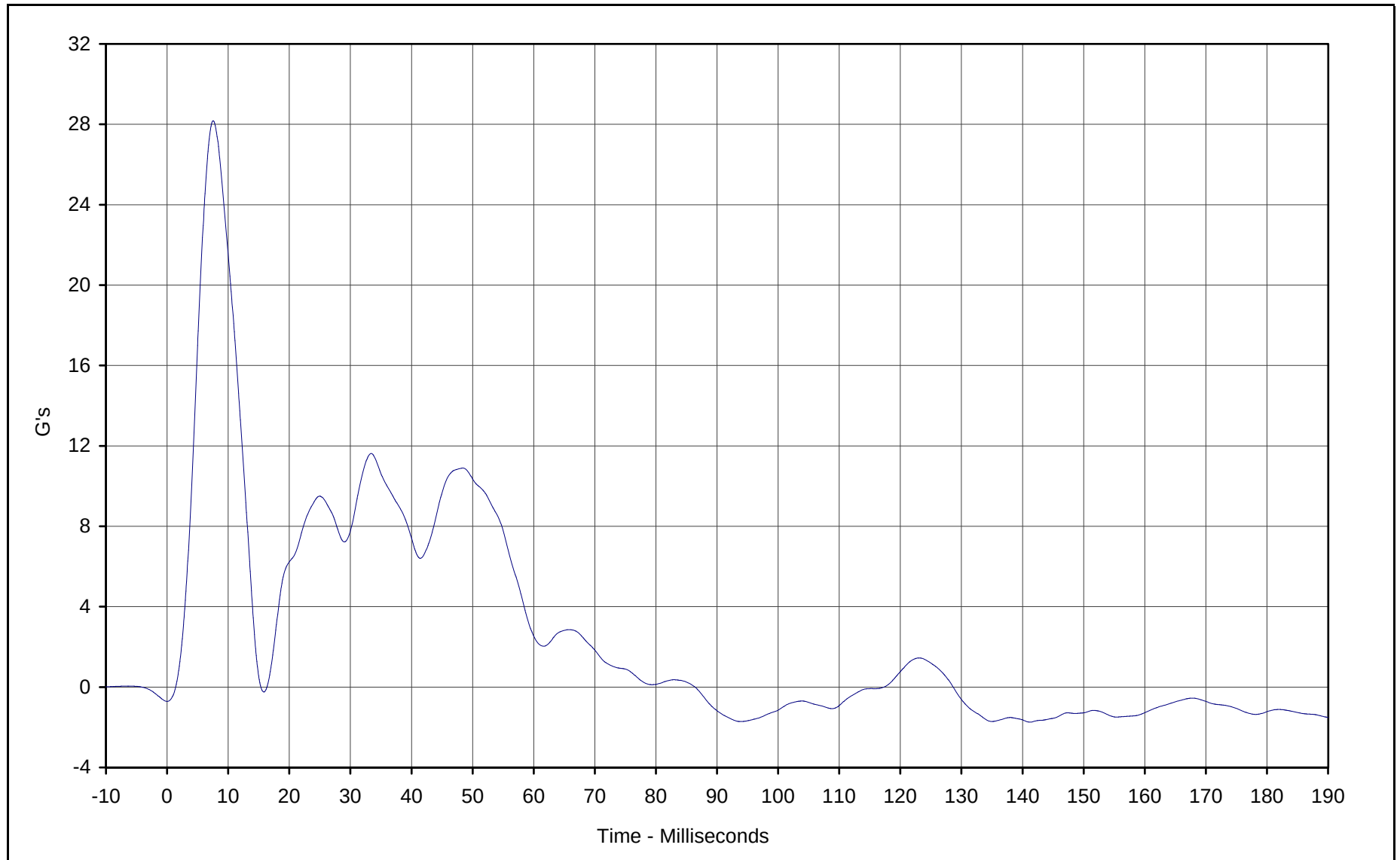




Curve Description: Right Sill Front Seat X Velocity
Maximum Value: 0.0 at 1.9 Milliseconds
Minimum Value: -2.3 at 37.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-027

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

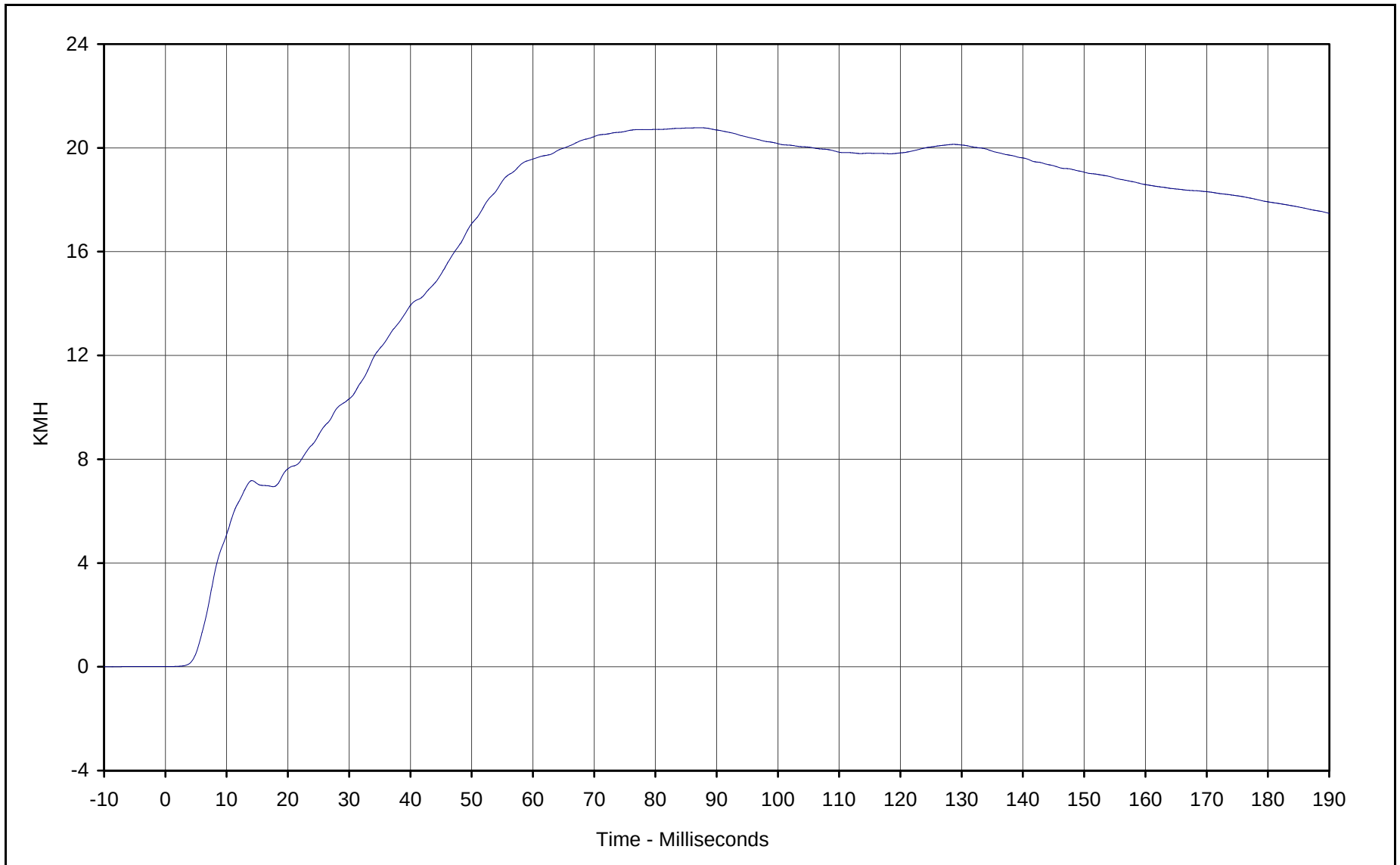




Curve Description: Right Sill at Front Seat Y
Maximum Value: 28.2 at 7.6 Milliseconds
Minimum Value: -1.7 at 141.2 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-028

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

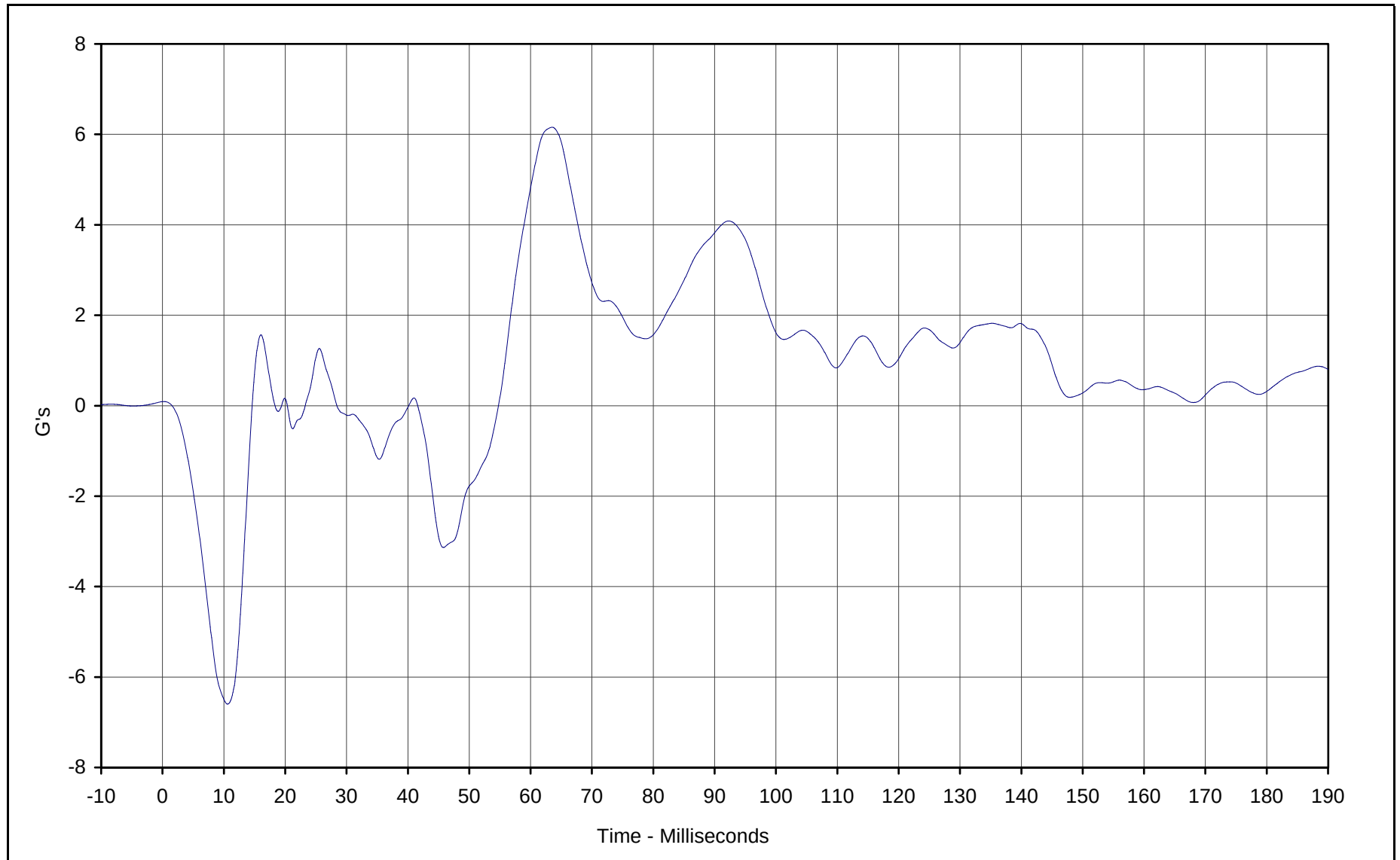




Curve Description: Right Sill Front Seat Y Velocity
Maximum Value: 20.8 at 87.1 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-028

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

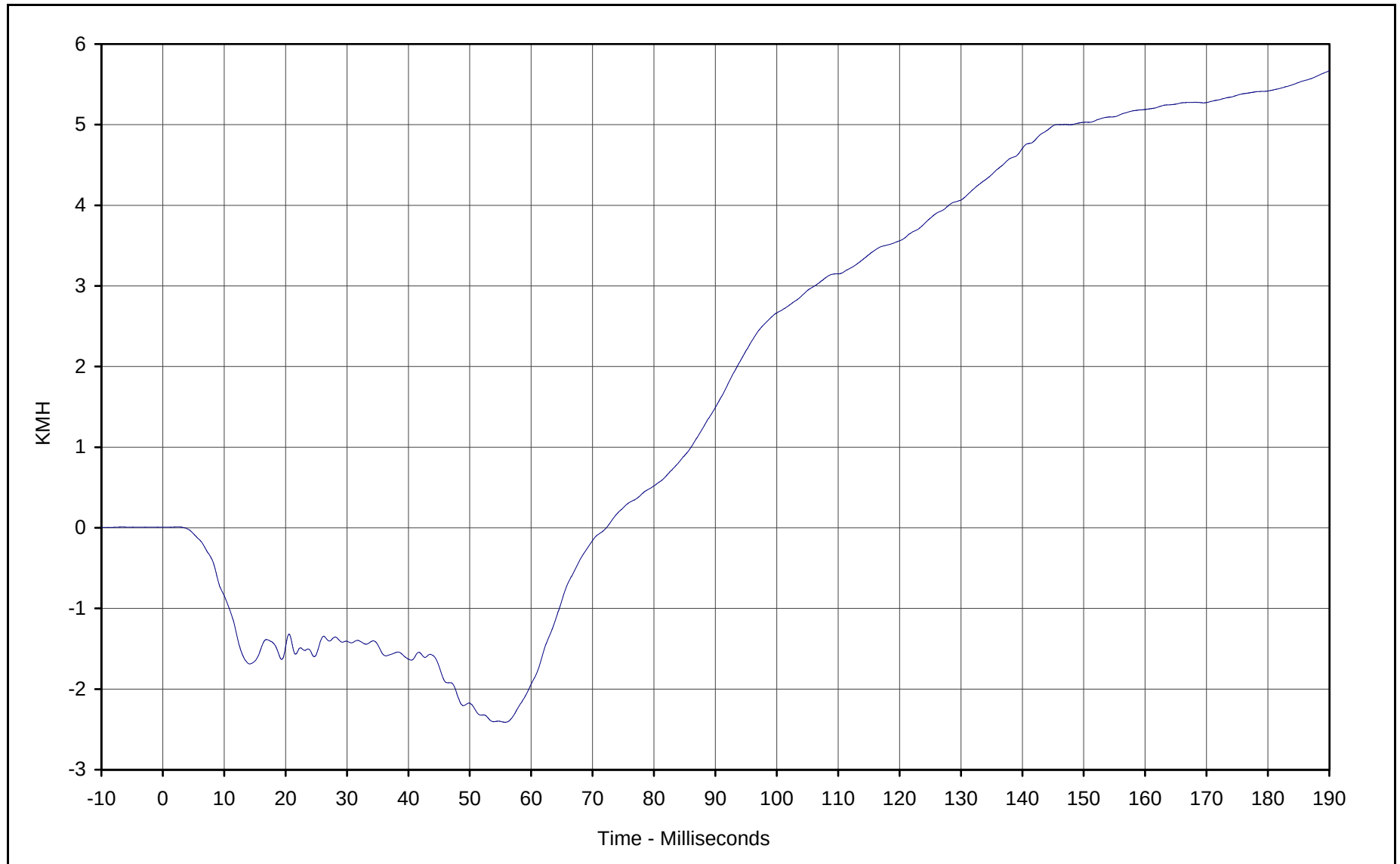




Curve Description: Right Sill at Front Seat Z
Maximum Value: 6.2 at 63.5 Milliseconds
Minimum Value: -6.6 at 10.6 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-029

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

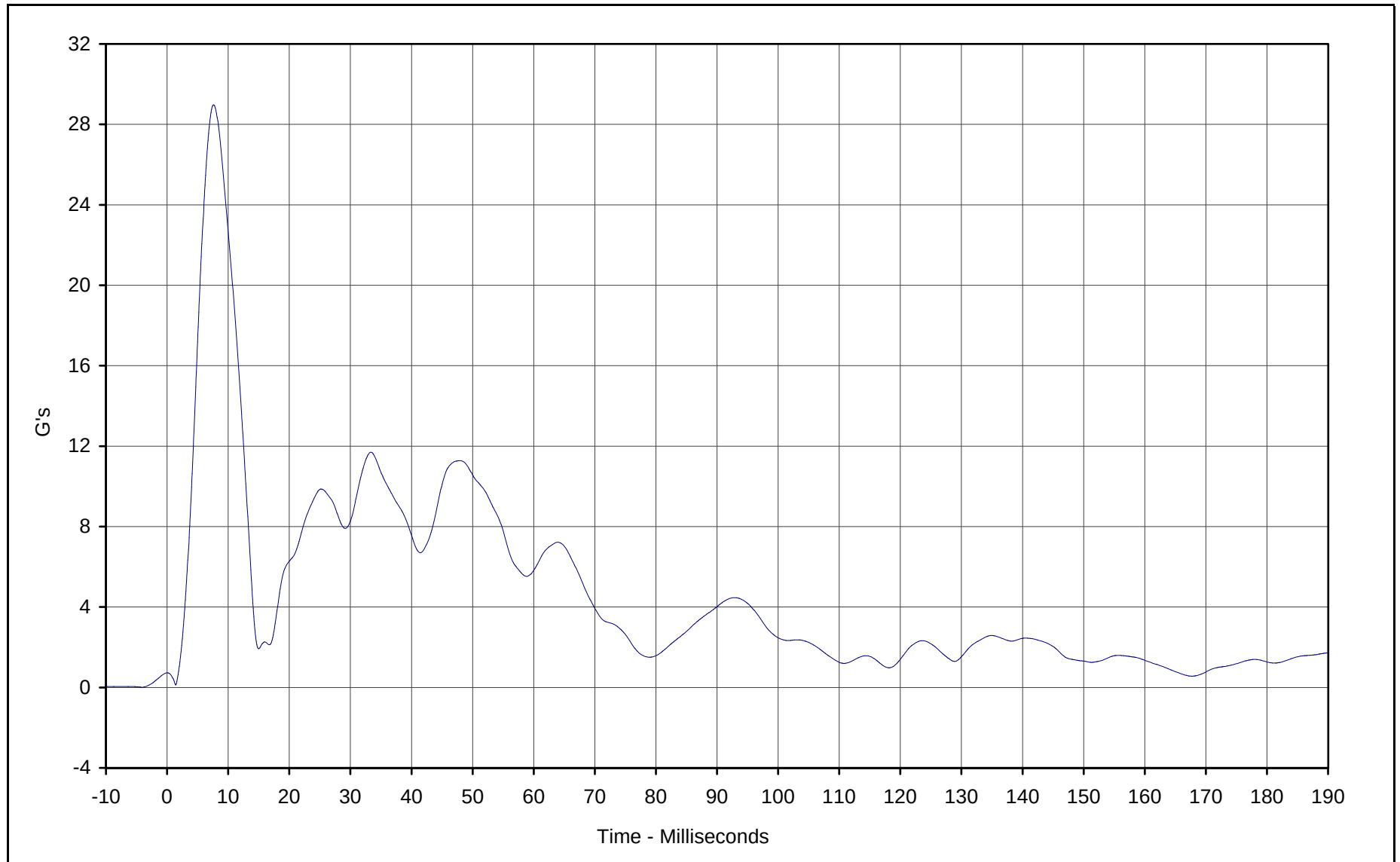




Curve Description: Right Sill Front Seat Z Velocity
Maximum Value: 5.7 at 189.9 Milliseconds
Minimum Value: -2.4 at 55.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-029

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

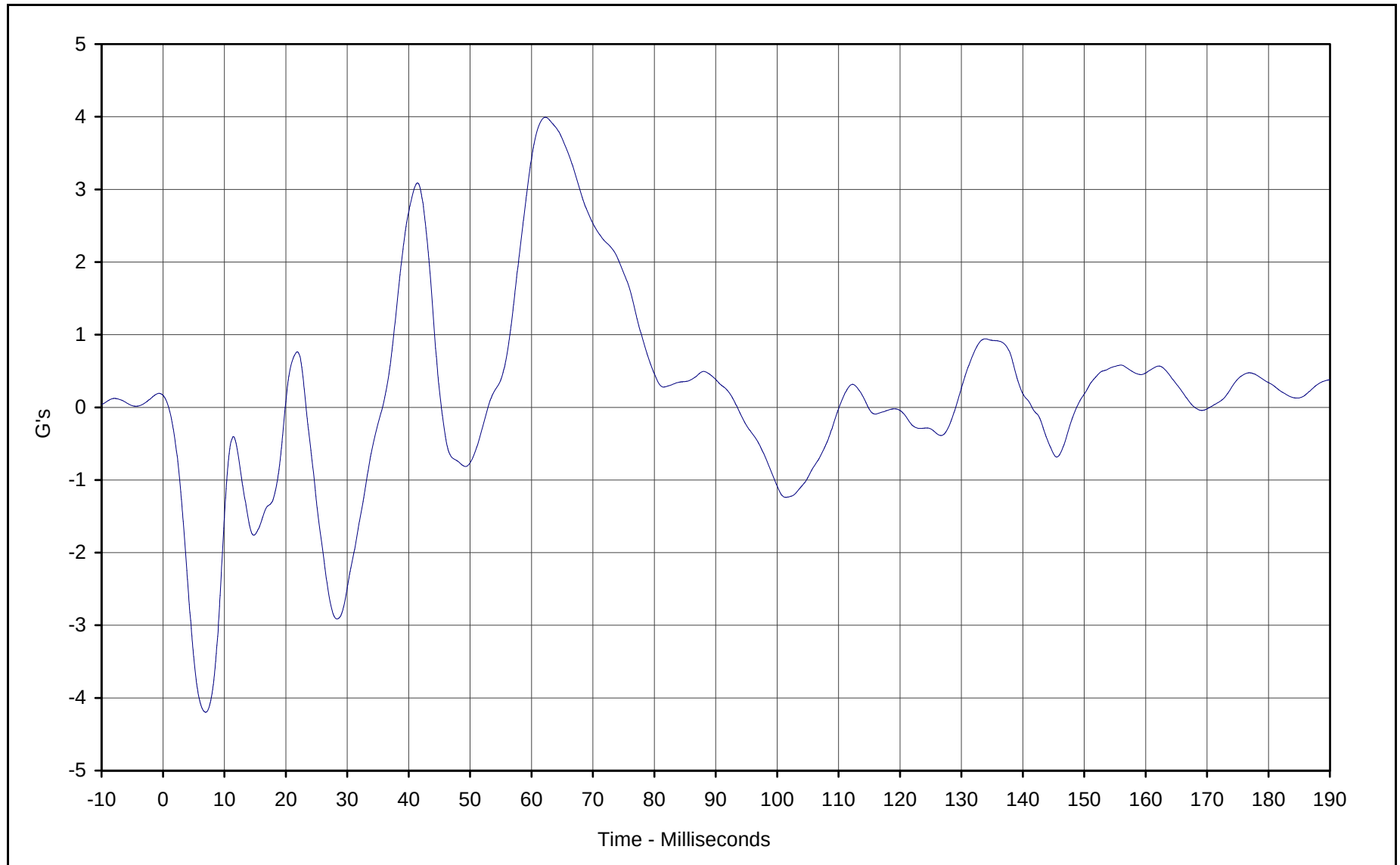




Curve Description: Right Sill at Front Seat Resultant
Maximum Value: 29.0 at 7.6 Milliseconds
Minimum Value: 0.1 at 1.4 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: RES-027

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

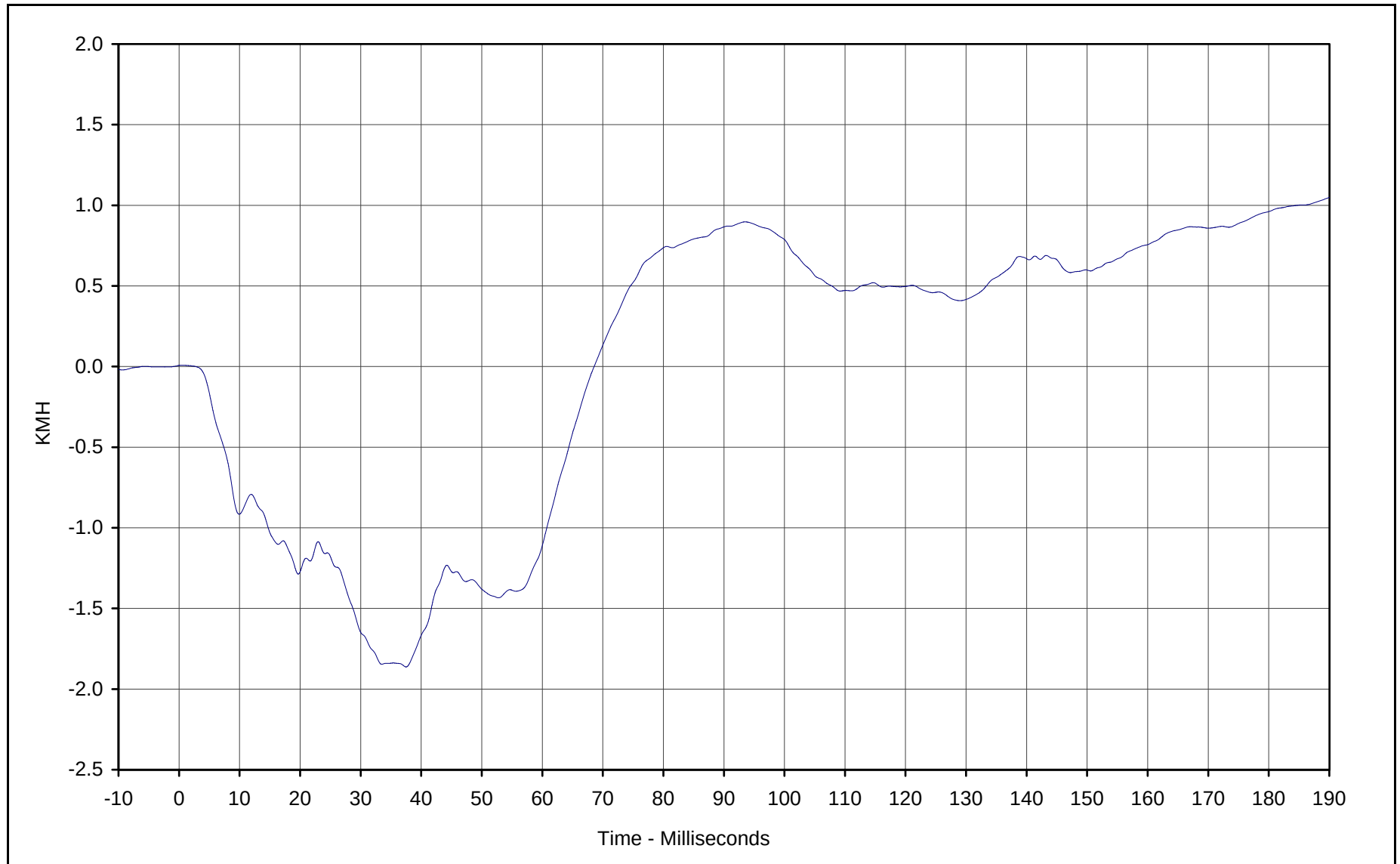




Curve Description: Right Sill at Rear Seat X
Maximum Value: 4.0 at 62.3 Milliseconds
Minimum Value: -4.2 at 6.9 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-030

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan



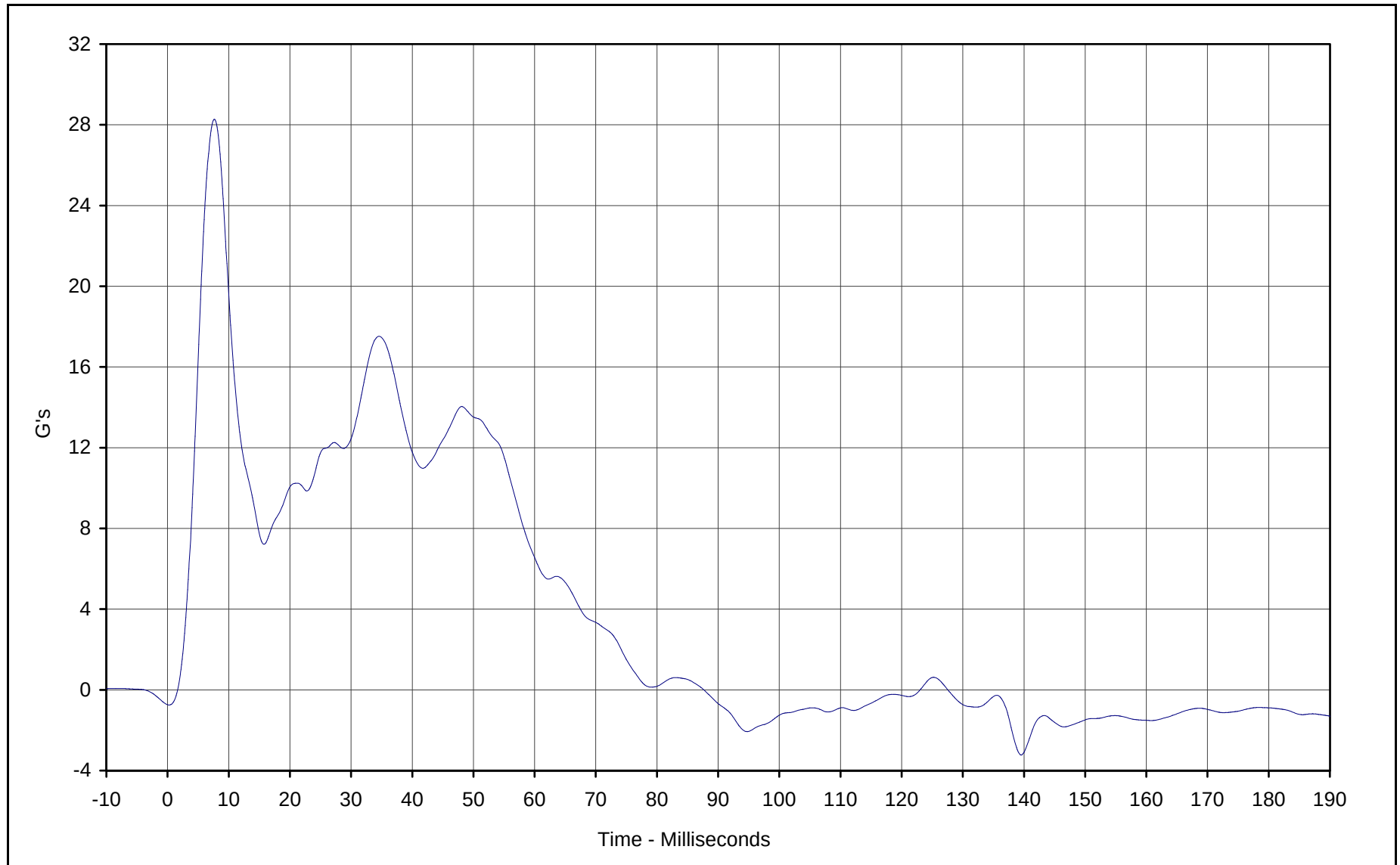


Curve Description: Right Sill Rear Seat X Velocity
Maximum Value: 1.0 at 189.9 Milliseconds
Minimum Value: -1.9 at 37.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-030

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan



B-60

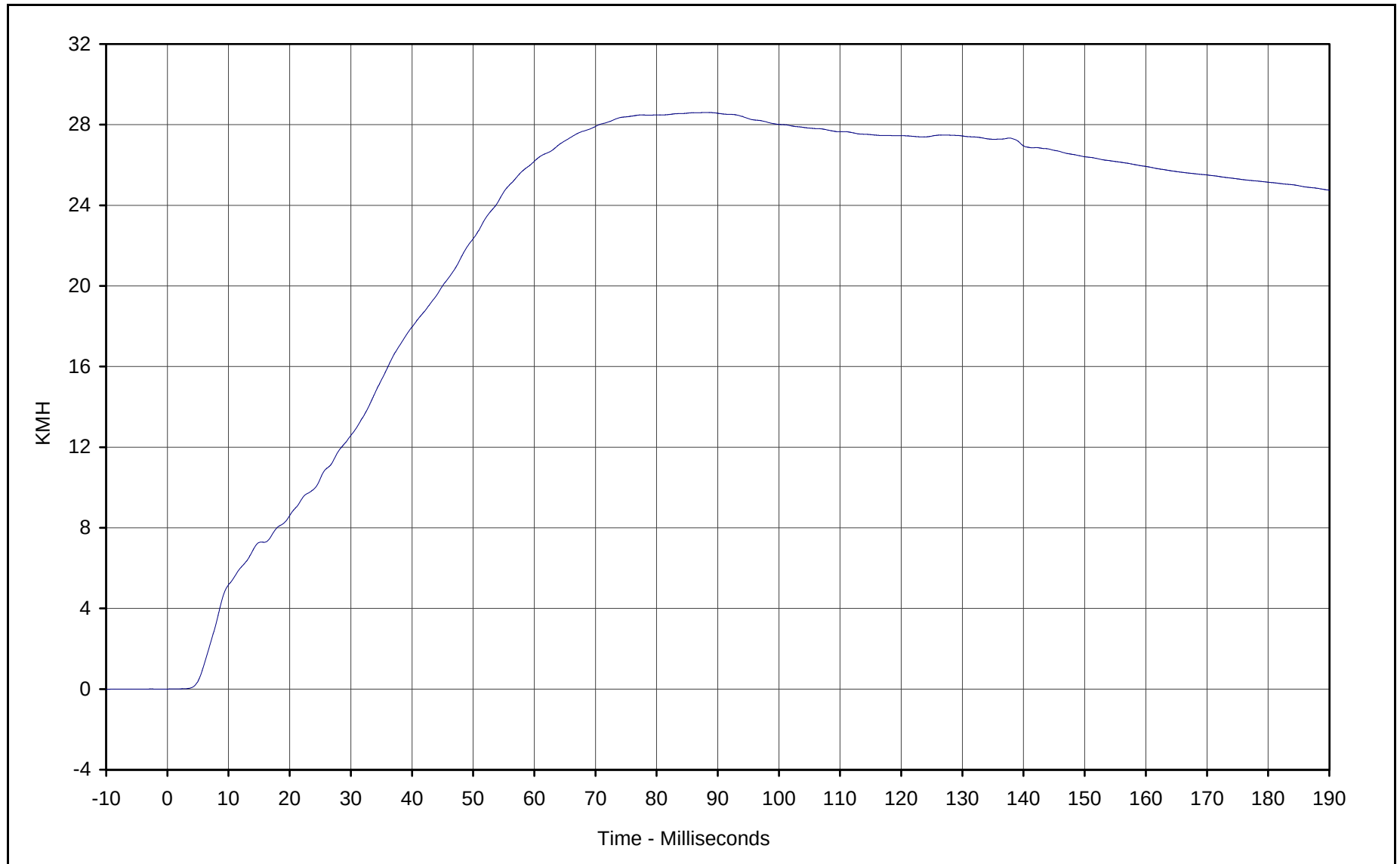


Curve Description: Right Sill at Rear Seat Y
Maximum Value: 28.3 at 7.7 Milliseconds
Minimum Value: -3.2 at 139.5 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-031

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan



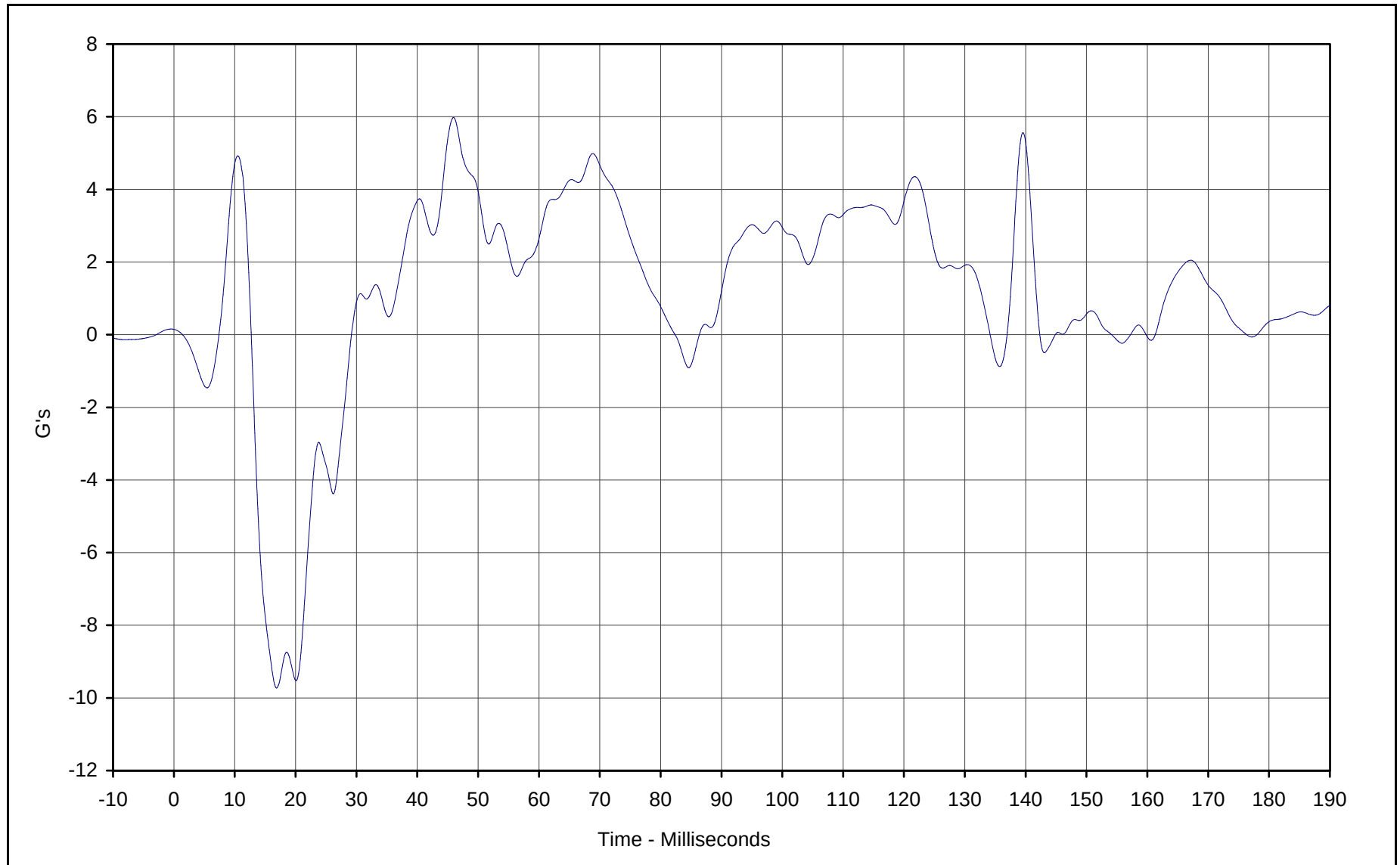
KAR21003-03



Curve Description: Right Sill Rear Seat Y Velocity
Maximum Value: 28.6 at 88.1 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-031

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

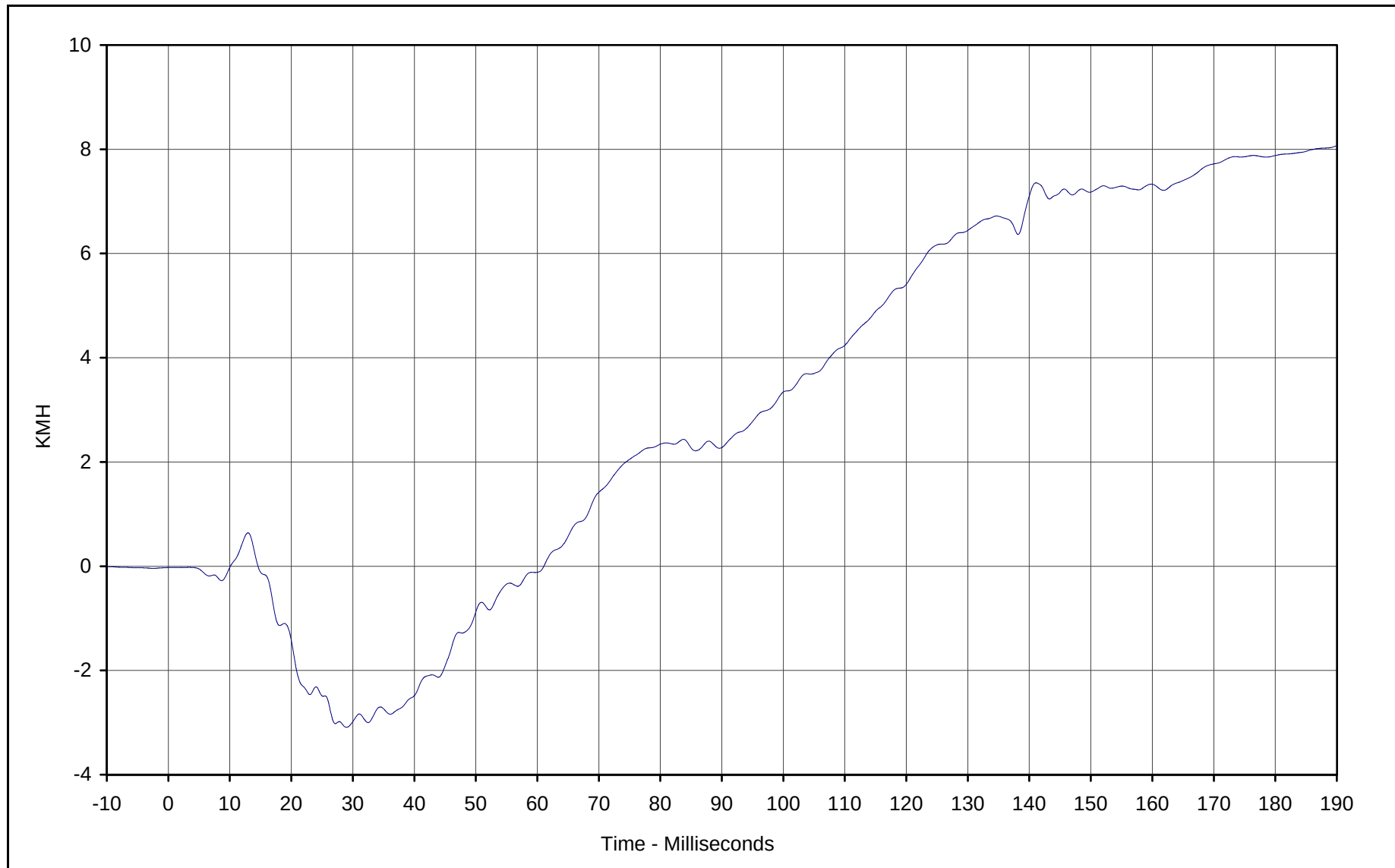




Curve Description: Right Sill at Rear Seat Z
Maximum Value: 6.0 at 46.0 Milliseconds
Minimum Value: -9.7 at 16.9 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-032

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

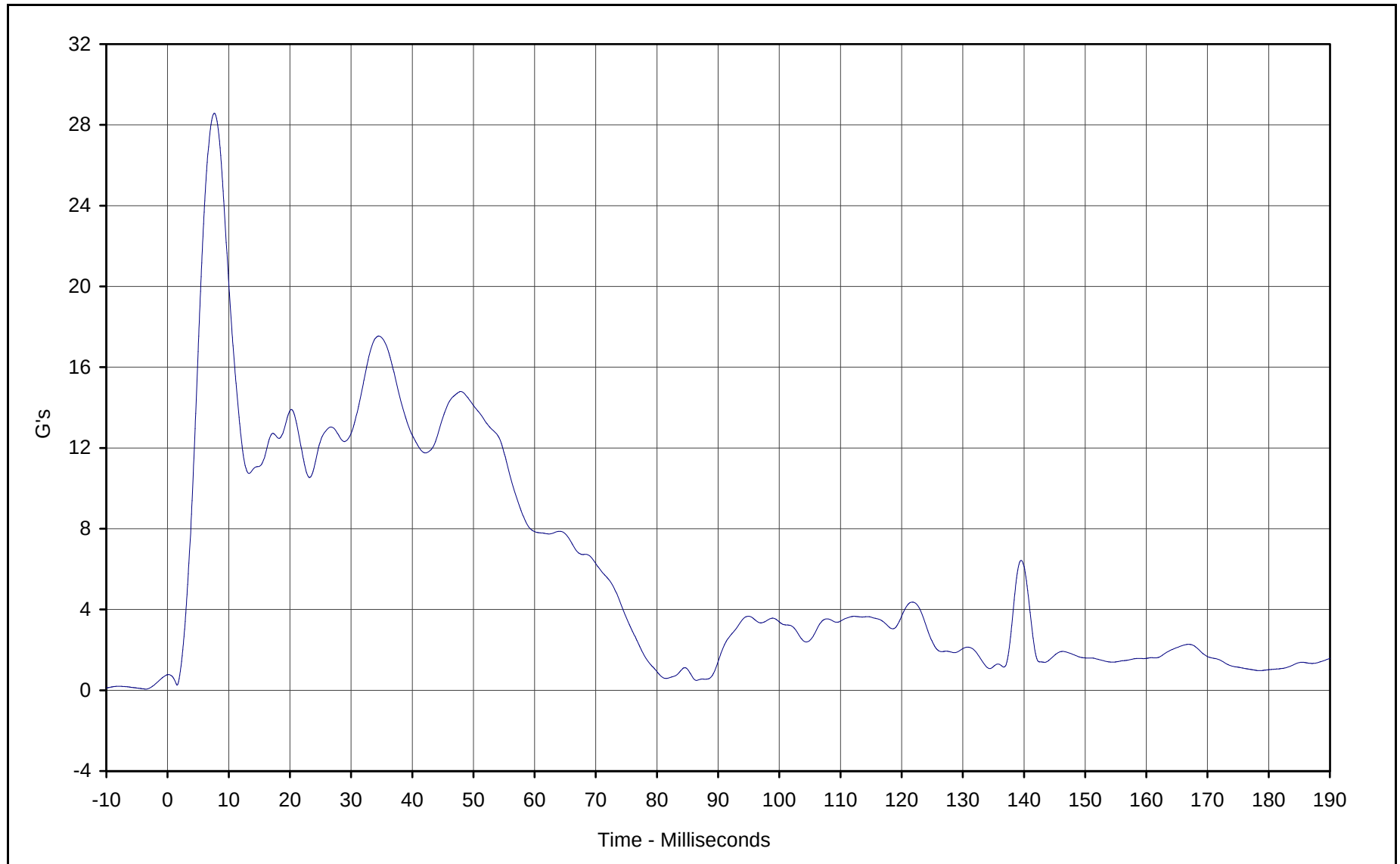




Curve Description: Right Sill Rear Seat Z Velocity
Maximum Value: 8.1 at 189.9 Milliseconds
Minimum Value: -3.1 at 29.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-032

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

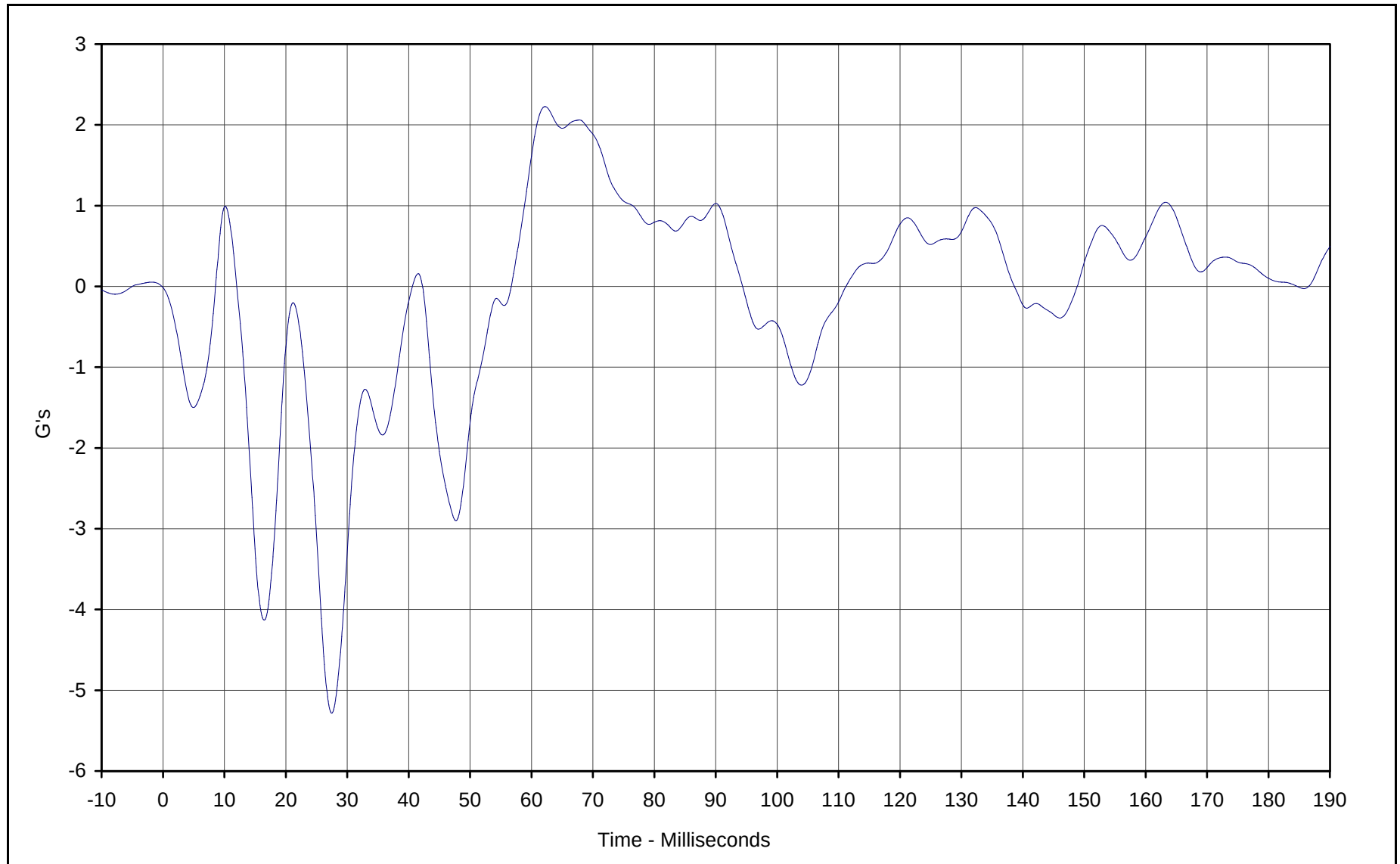




Curve Description: Right Sill at Rear Resultant
Maximum Value: 28.6 at 7.6 Milliseconds
Minimum Value: 0.3 at 1.6 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: RES-030

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

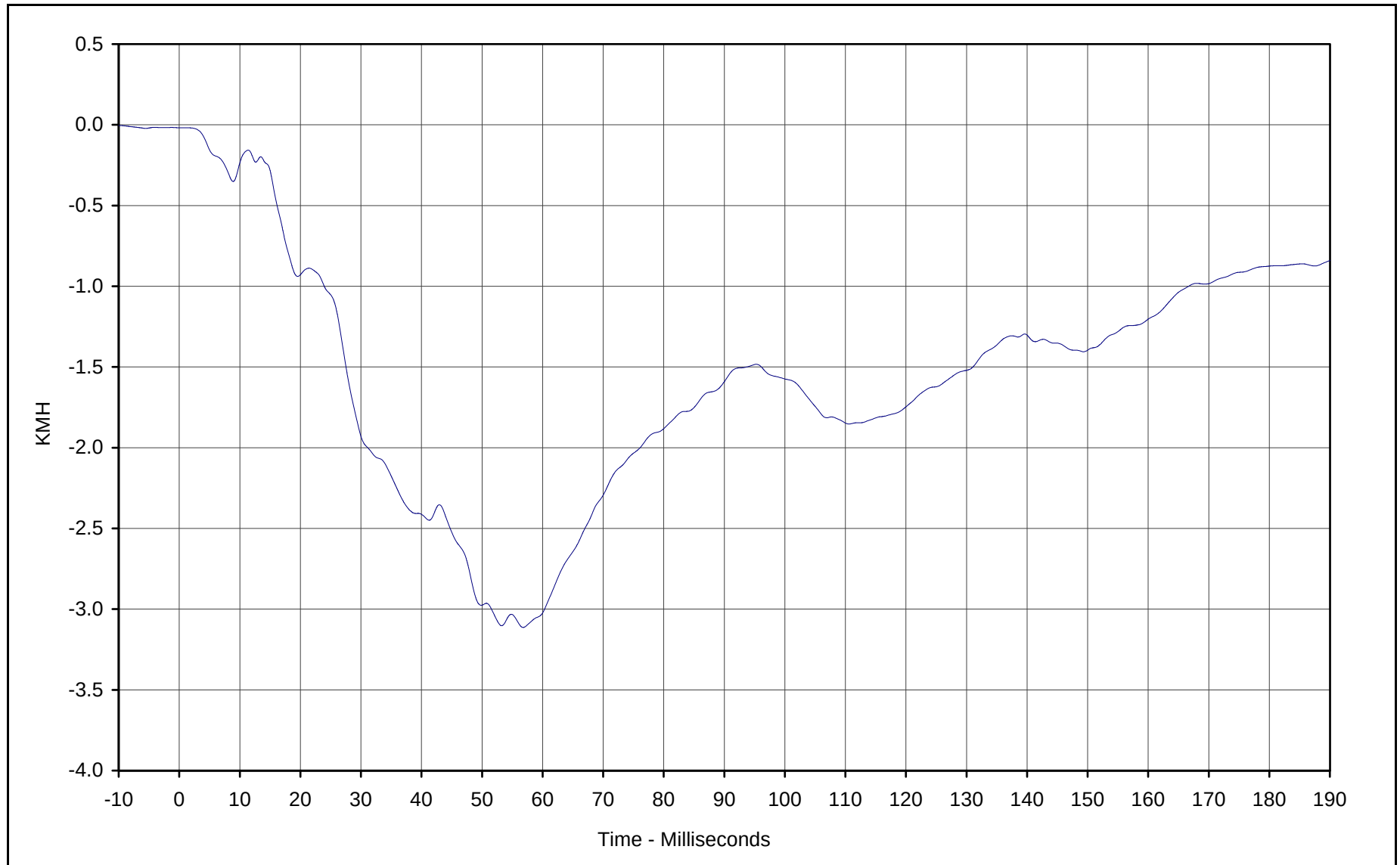




Curve Description: Rear Floor Above Axle X
Maximum Value: 2.2 at 62.2 Milliseconds
Minimum Value: -5.3 at 27.5 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-033

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

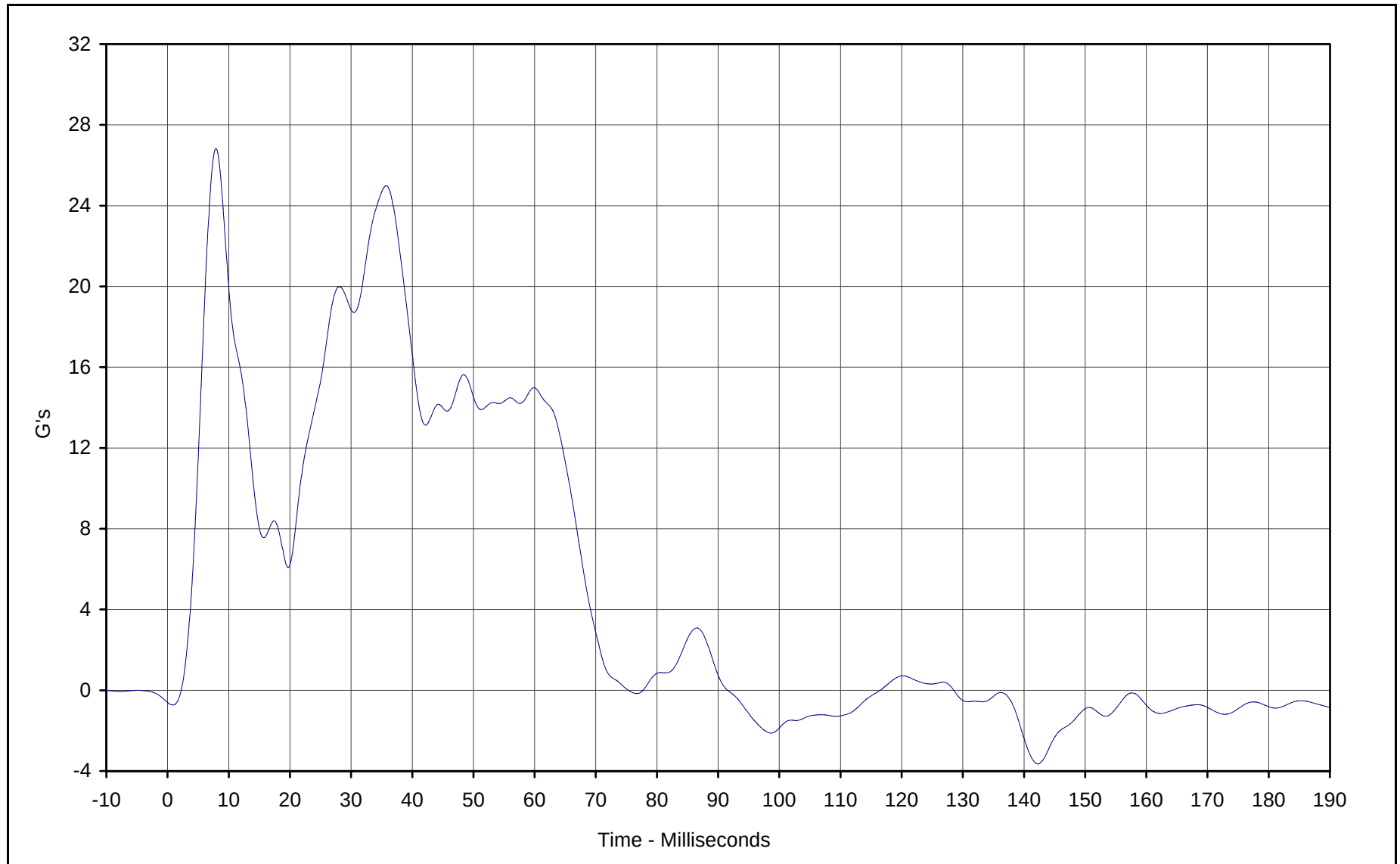




Curve Description: Rear Floorpan Above Axle X
Maximum Value: 0.0 at 1.2 Milliseconds
Minimum Value: -3.1 at 56.8 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-033

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

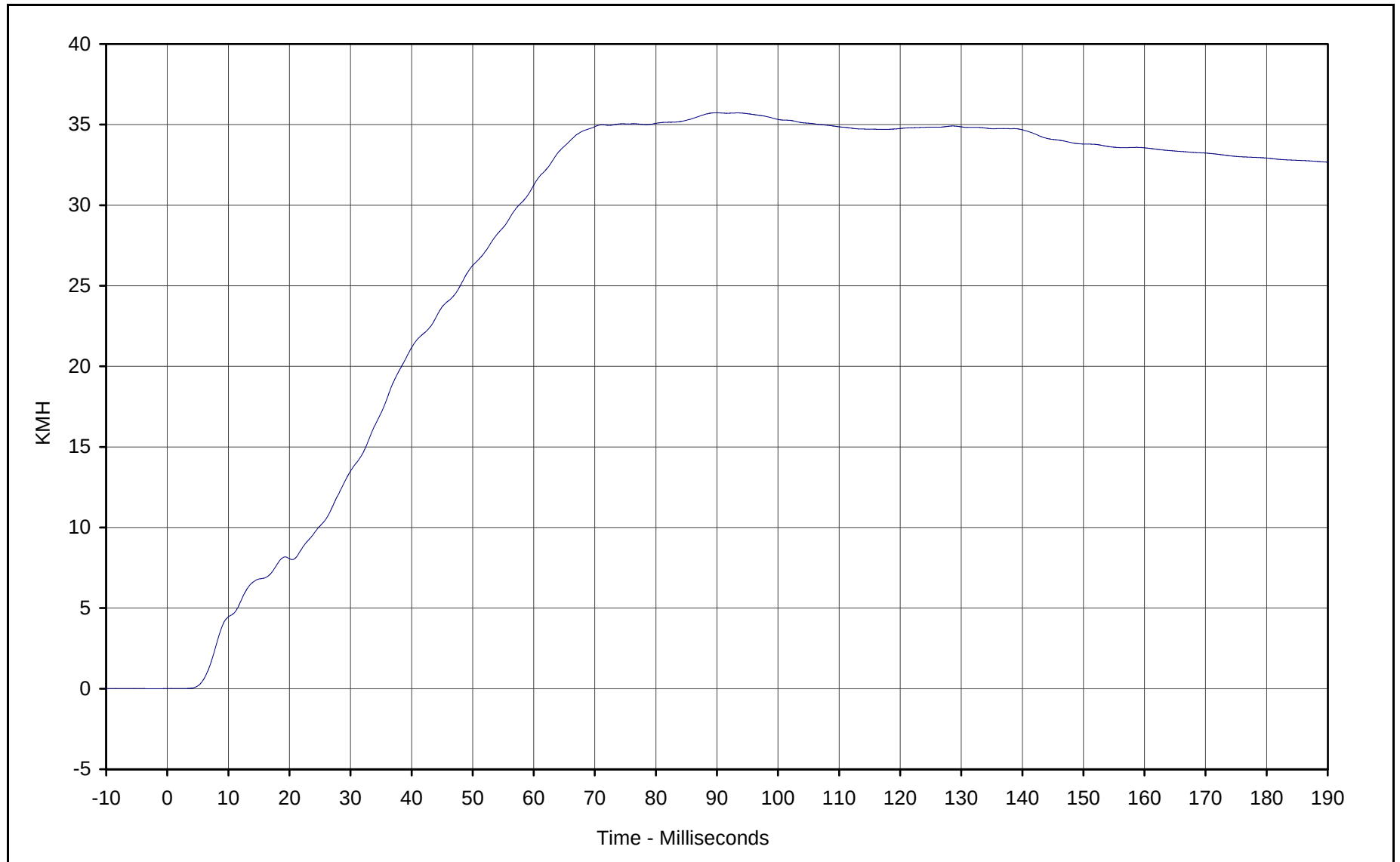




Curve Description: Rear Floor Above Axle Y
Maximum Value: 26.8 at 7.9 Milliseconds
Minimum Value: -3.6 at 142.3 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-034

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

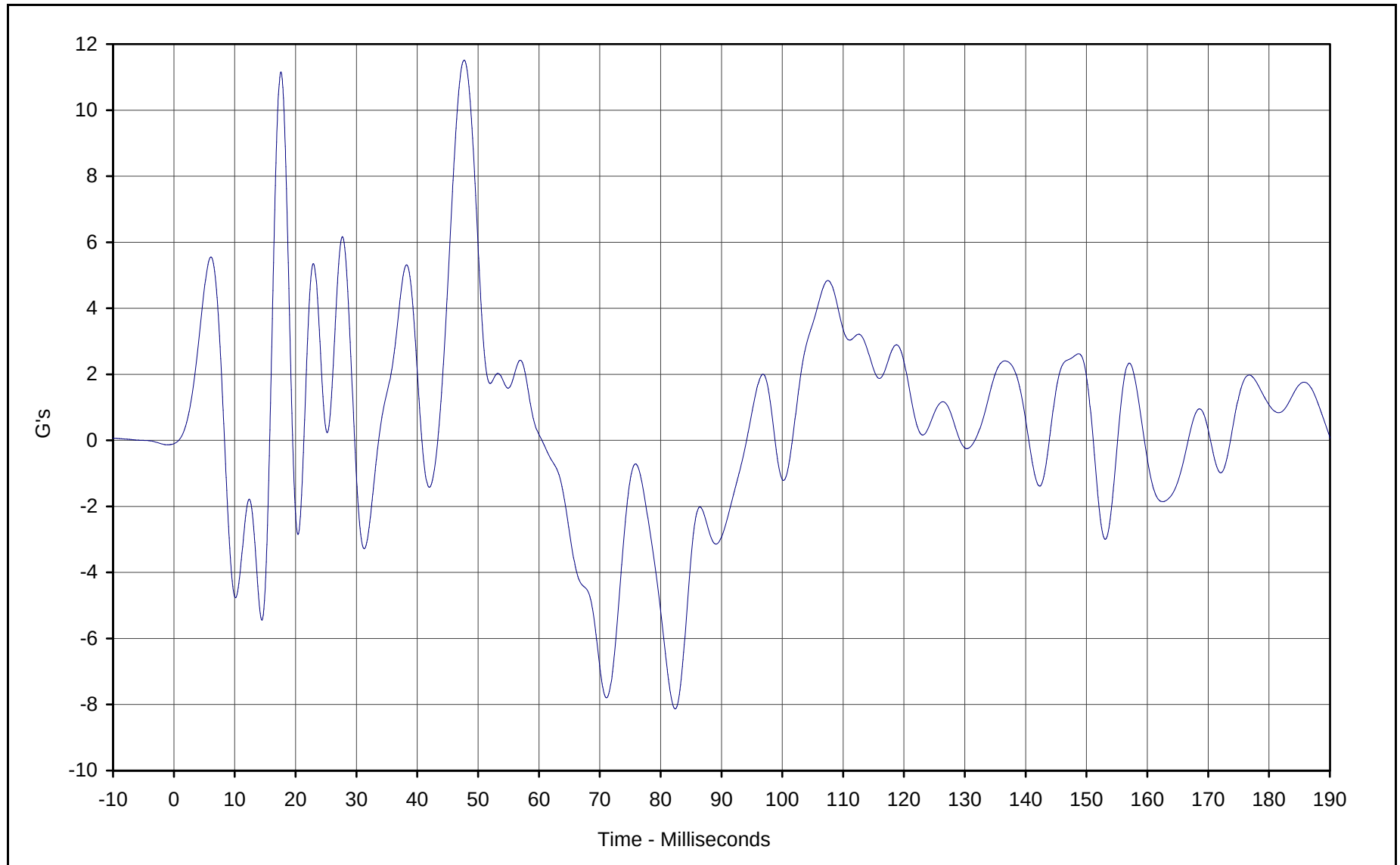




Curve Description: Rear Floorpan Above Axle Y
Maximum Value: 35.7 at 89.8 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-034

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

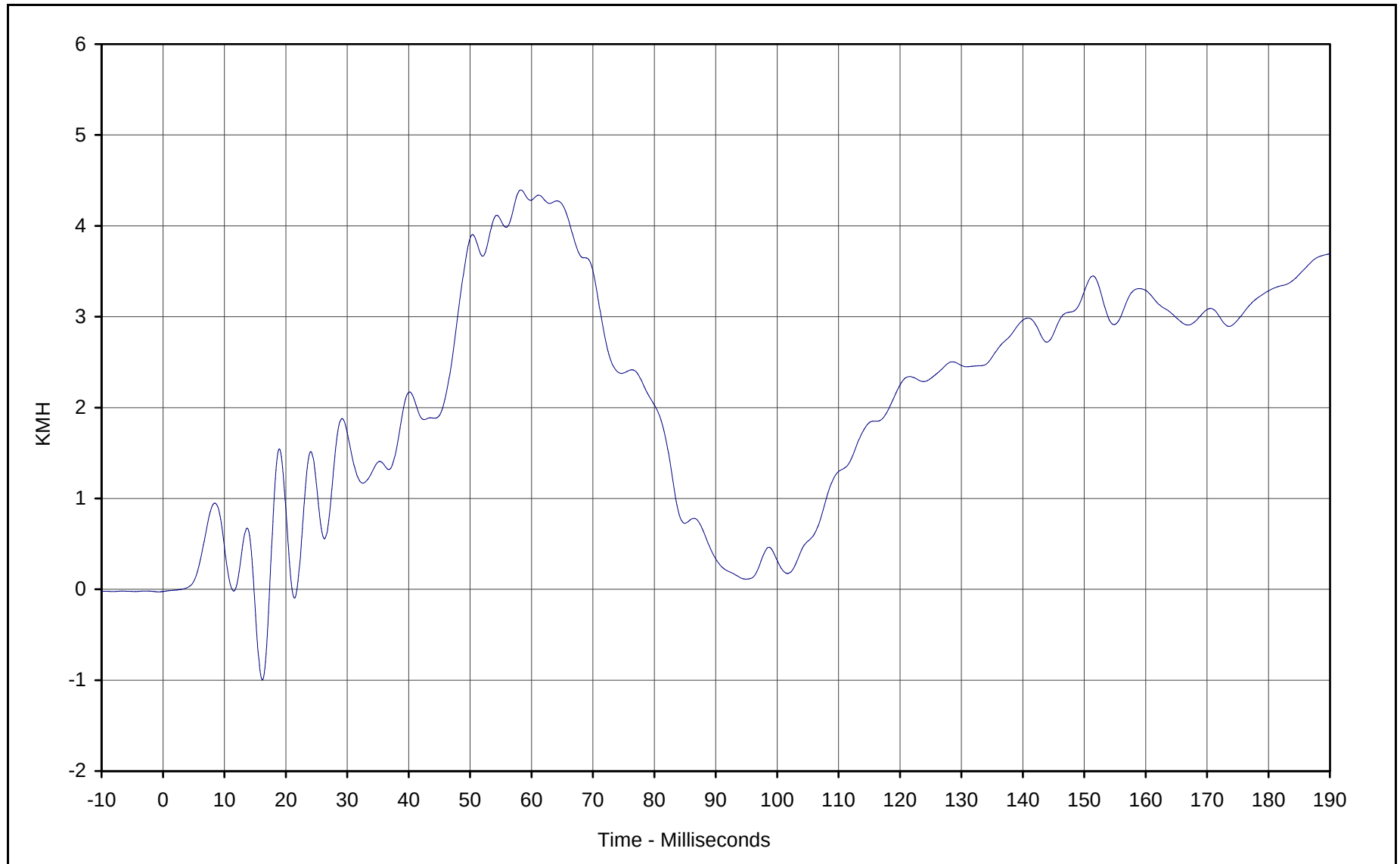




Curve Description: Rear Floor Above Axle Z
Maximum Value: 11.5 at 47.7 Milliseconds
Minimum Value: -8.1 at 82.4 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-035

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

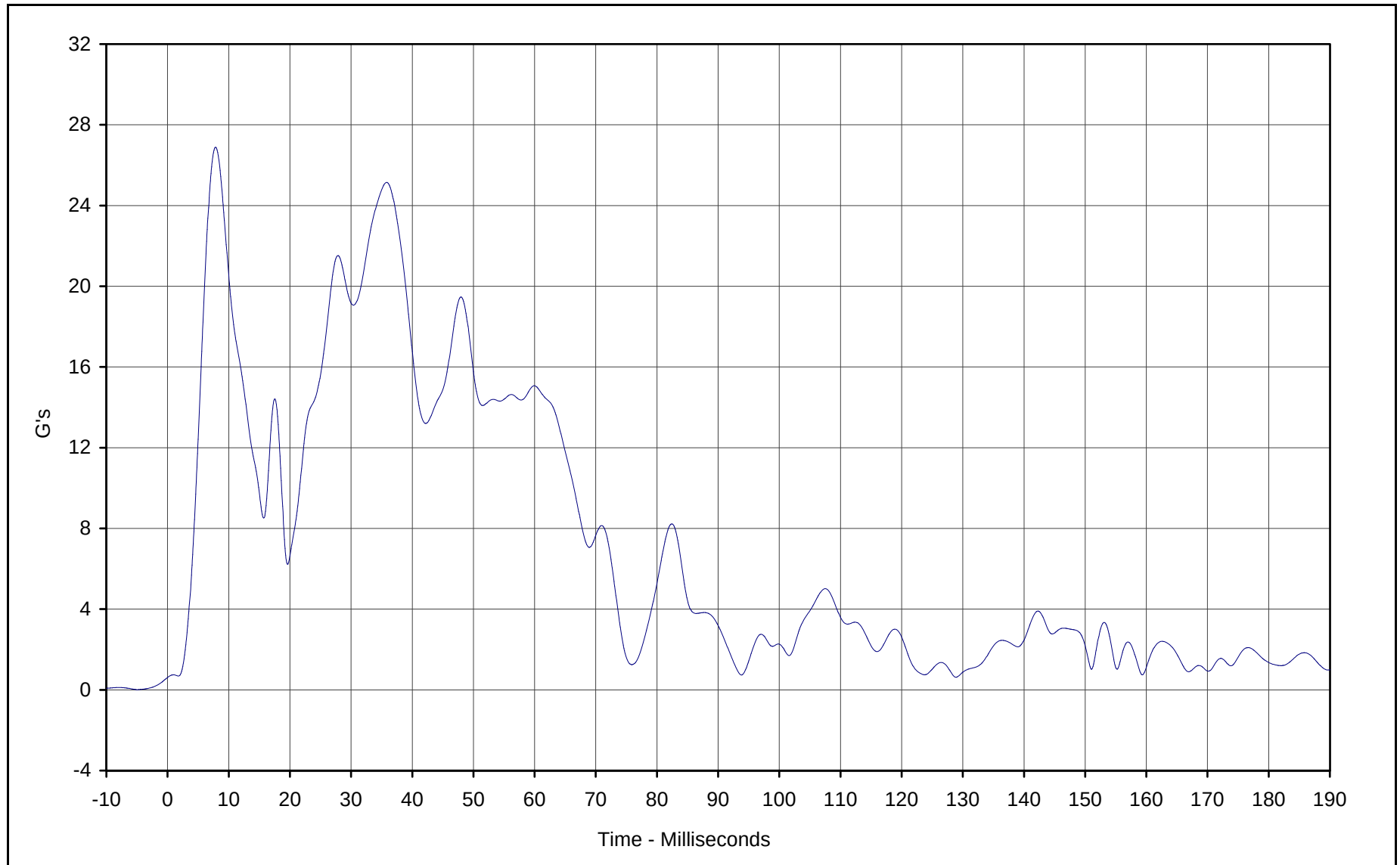




Curve Description: Rear Floorpan Above Axle Z
Maximum Value: 4.4 at 58.3 Milliseconds
Minimum Value: -1.0 at 16.2 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-035

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

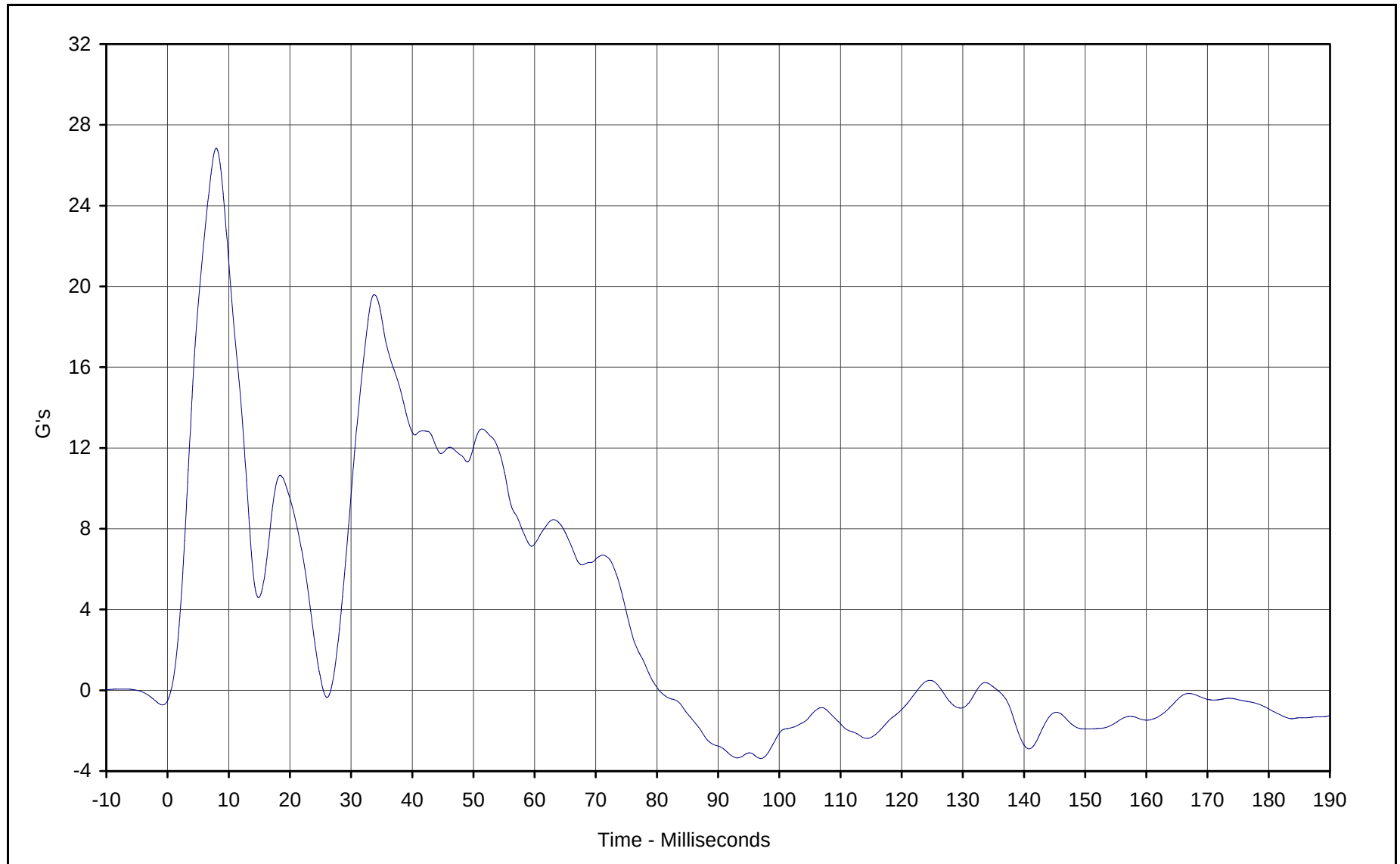




Curve Description: Rear Floor Above Axle Resultant
Maximum Value: 26.9 at 7.9 Milliseconds
Minimum Value: 0.6 at 0.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: RES-033

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

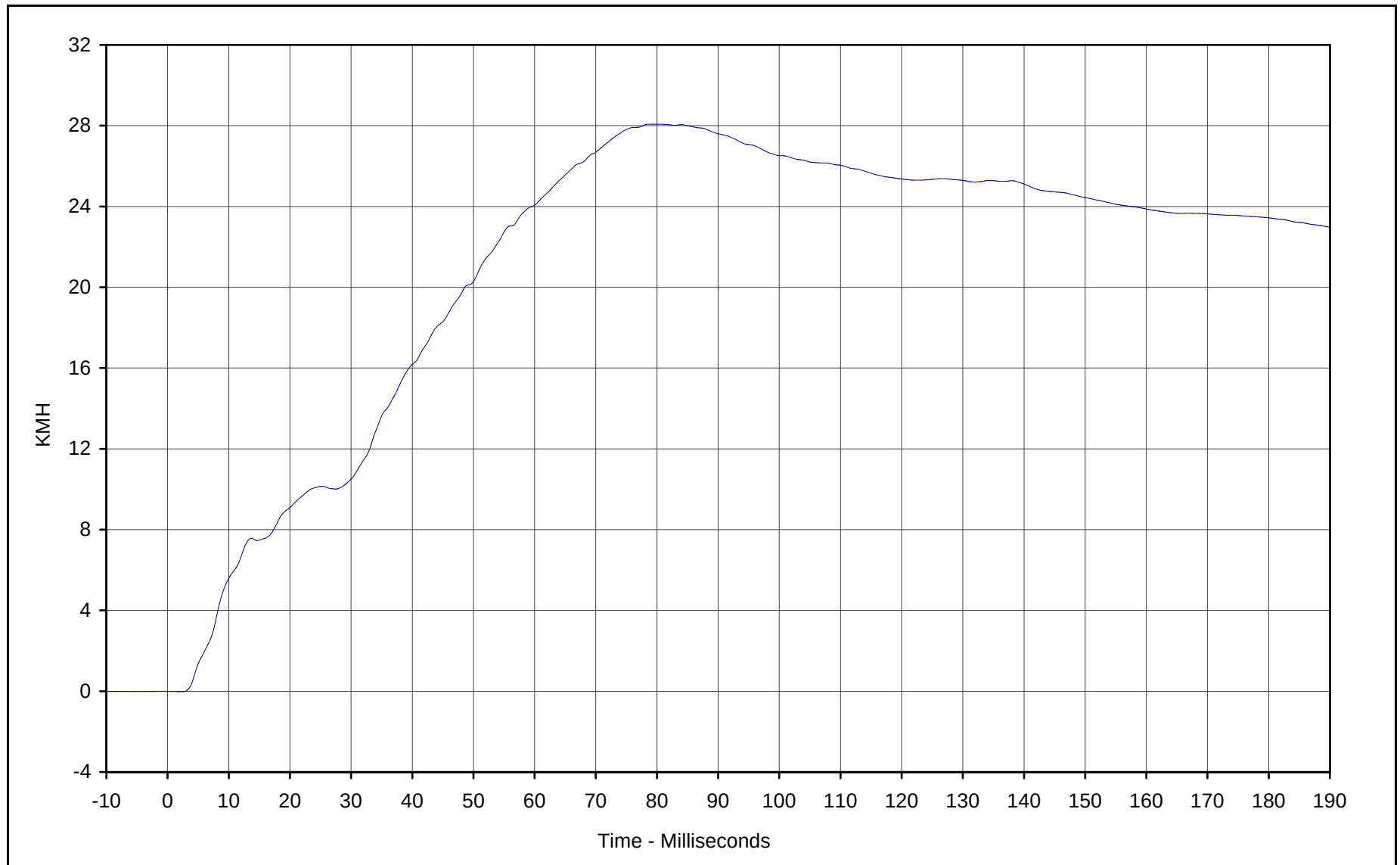




Curve Description: Left Sill at Rear Door Y
Maximum Value: 26.8 at 8.0 Milliseconds
Minimum Value: -3.4 at 97.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-036

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

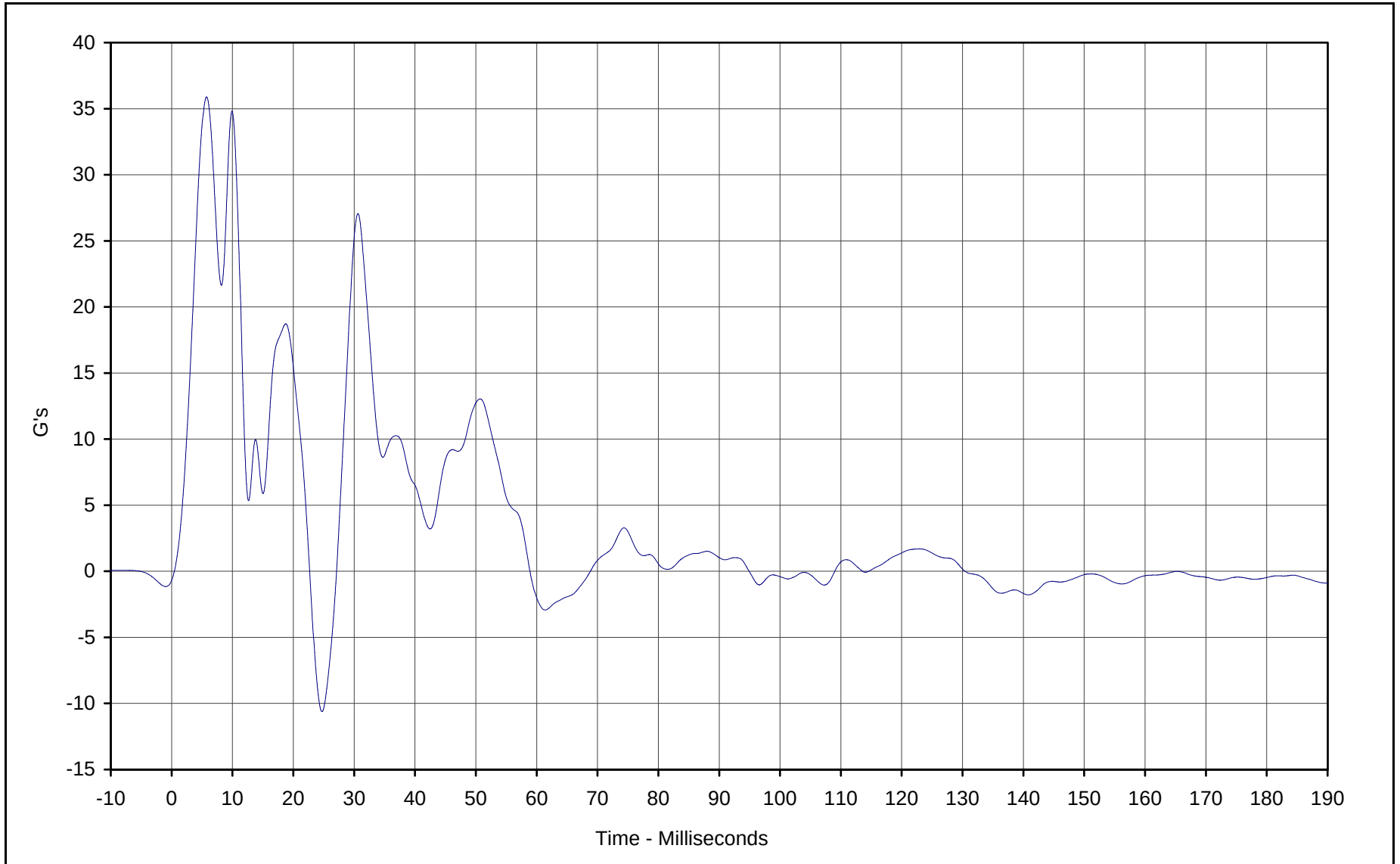




Curve Description: Left Sill at Rear Door Y Velocity
Maximum Value: 28.1 at 78.7 Milliseconds
Minimum Value: 0.0 at 2.4 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-036

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

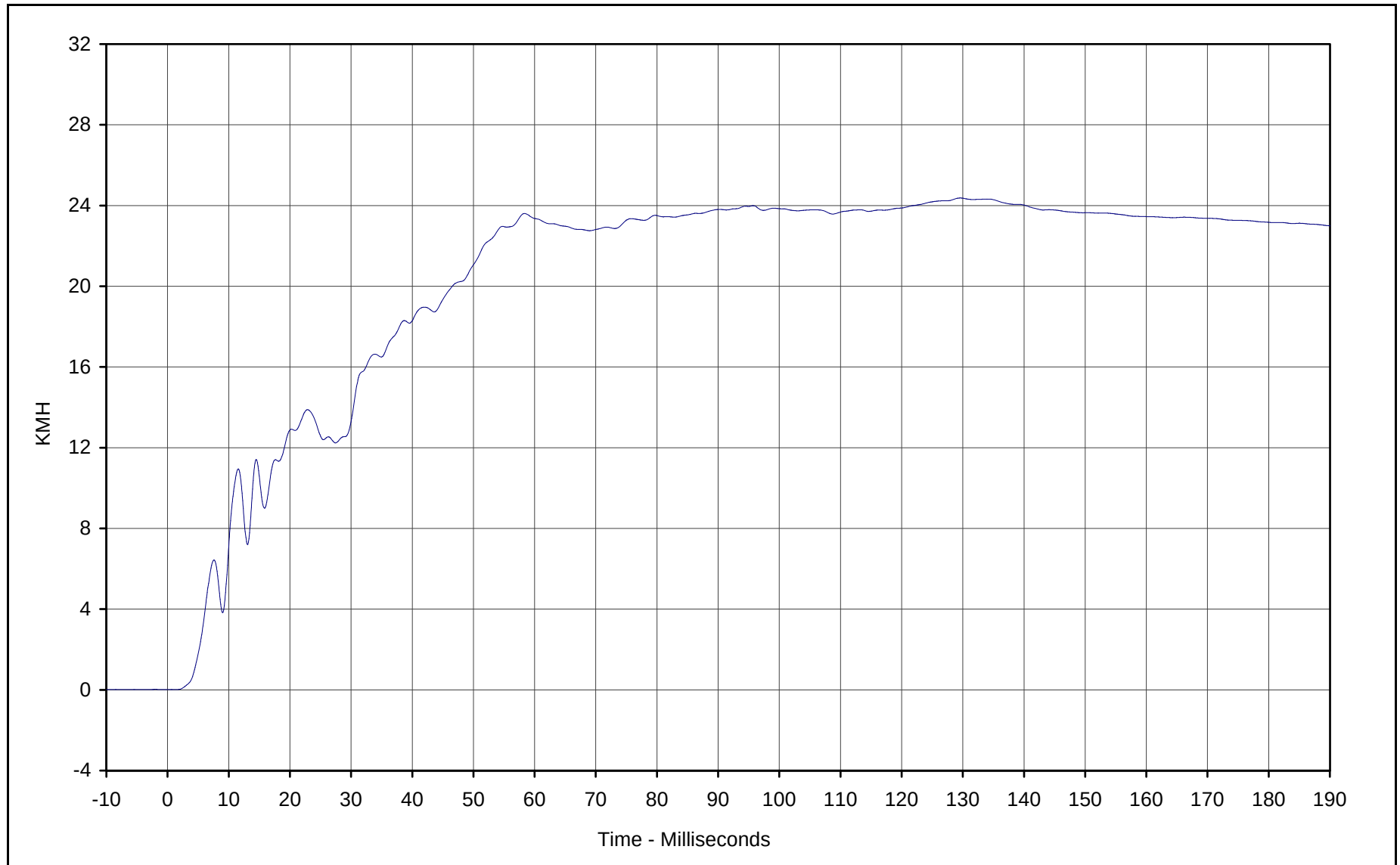




Curve Description: Left Sill at Front Door Y
Maximum Value: 35.9 at 5.7 Milliseconds
Minimum Value: -10.6 at 24.7 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-037

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

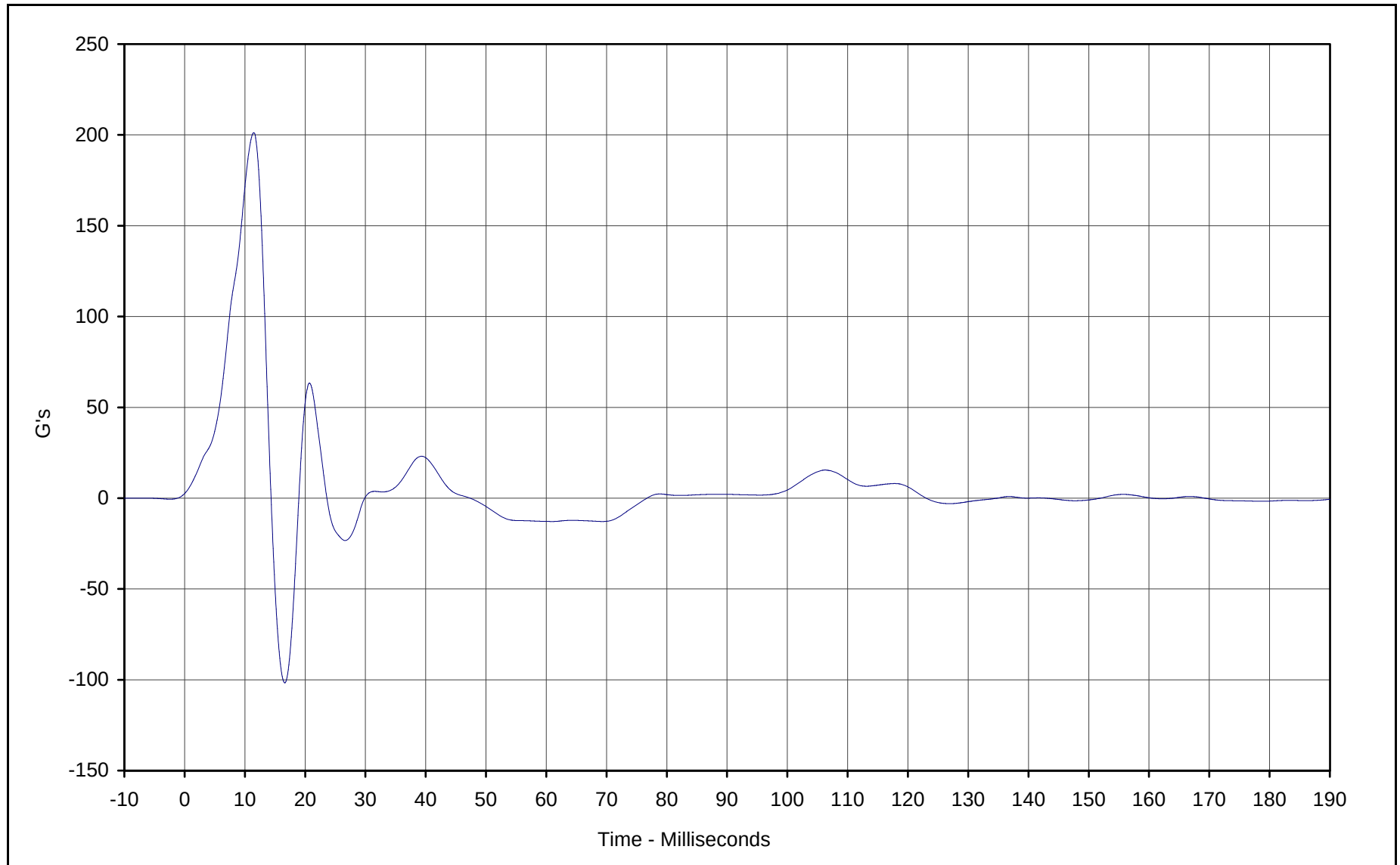




Curve Description: Left Sill at Front Door Y Velocity
Maximum Value: 24.4 at 129.6 Milliseconds
Minimum Value: 0.0 at 1.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-037

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

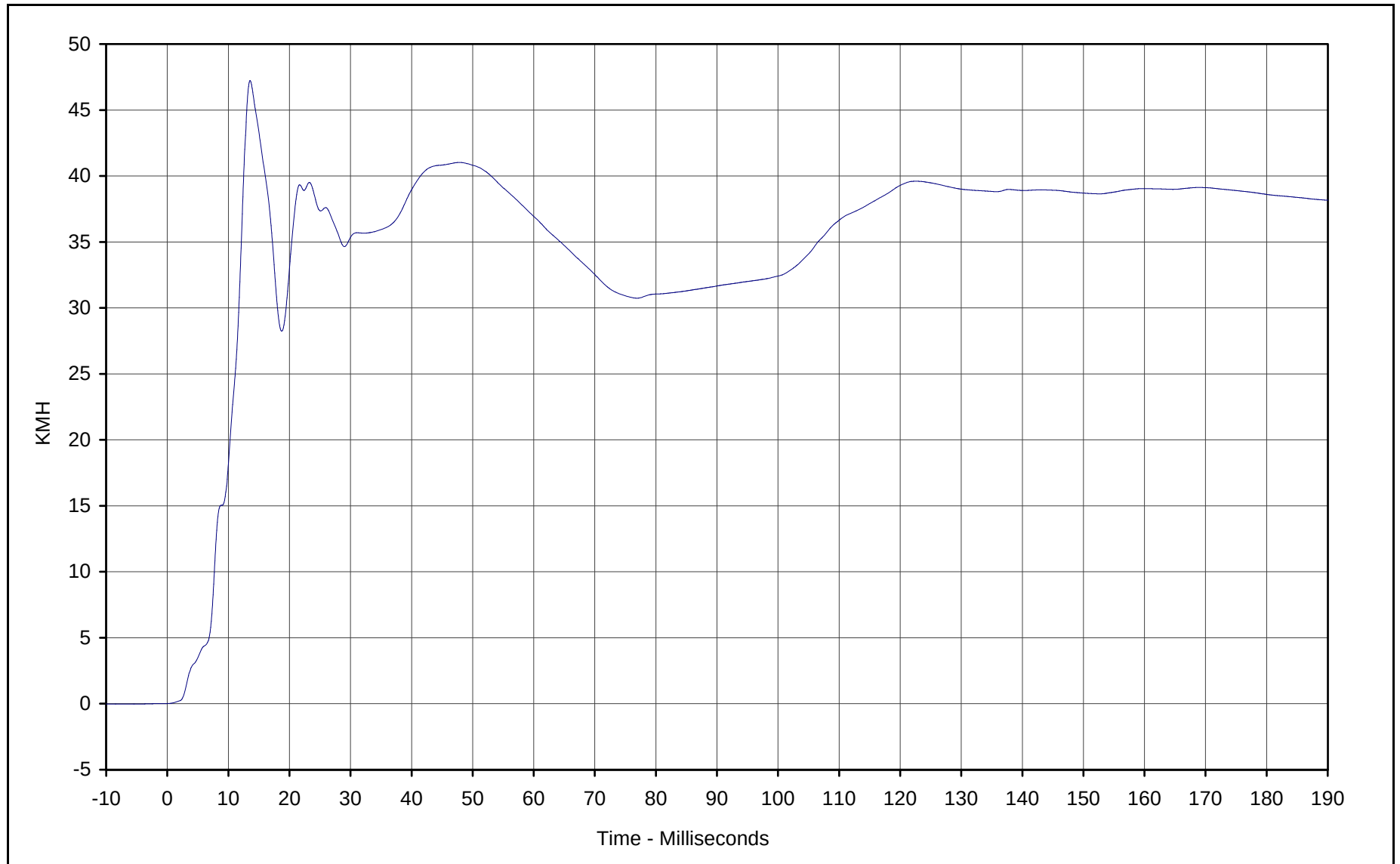




Curve Description: Left Front Door Centerline Y
Maximum Value: 201.2 at 11.5 Milliseconds
Minimum Value: -101.7 at 16.6 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-038

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

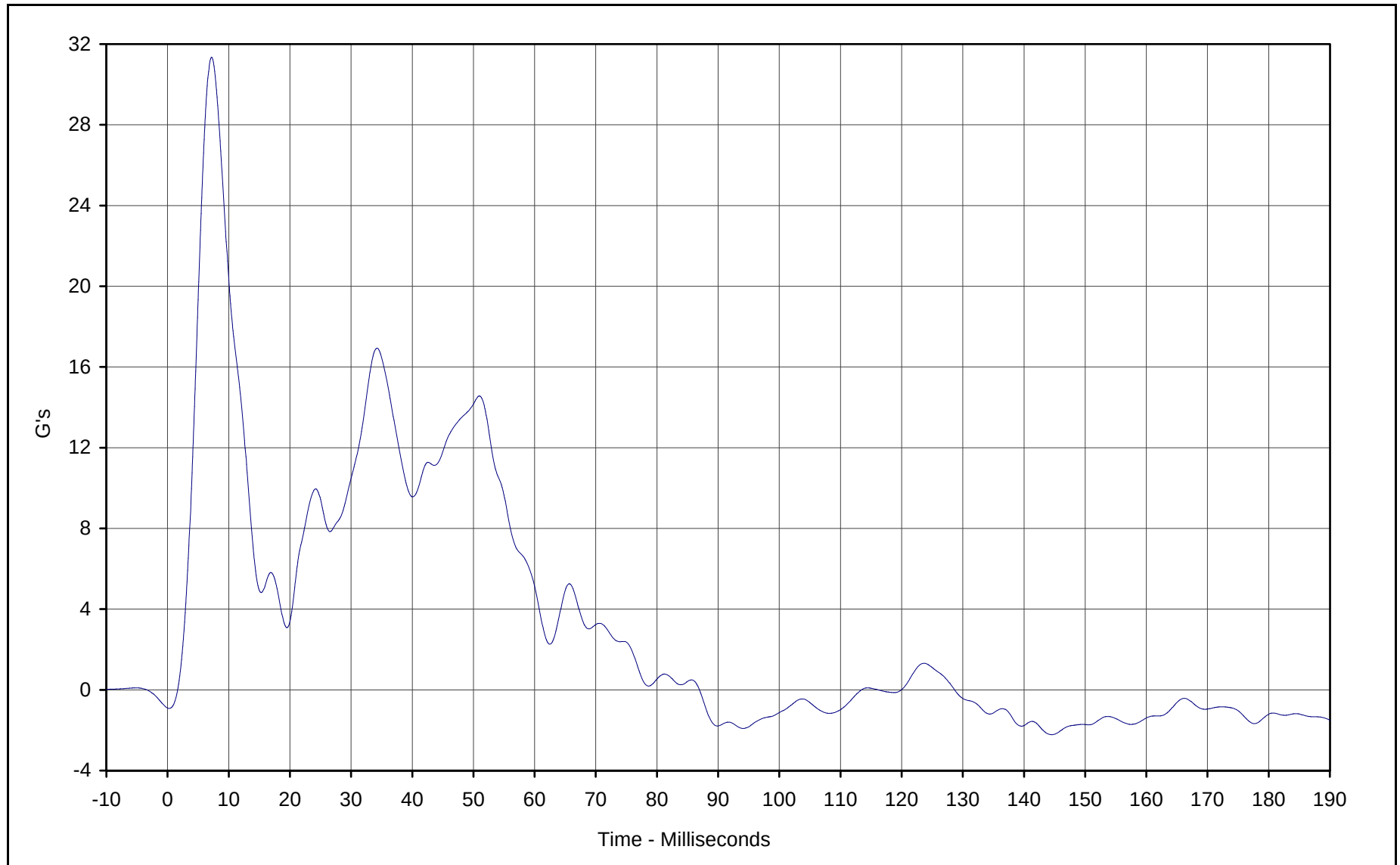




Curve Description: Left Front Door CL Y Velocity
Maximum Value: 47.2 at 13.6 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-038

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

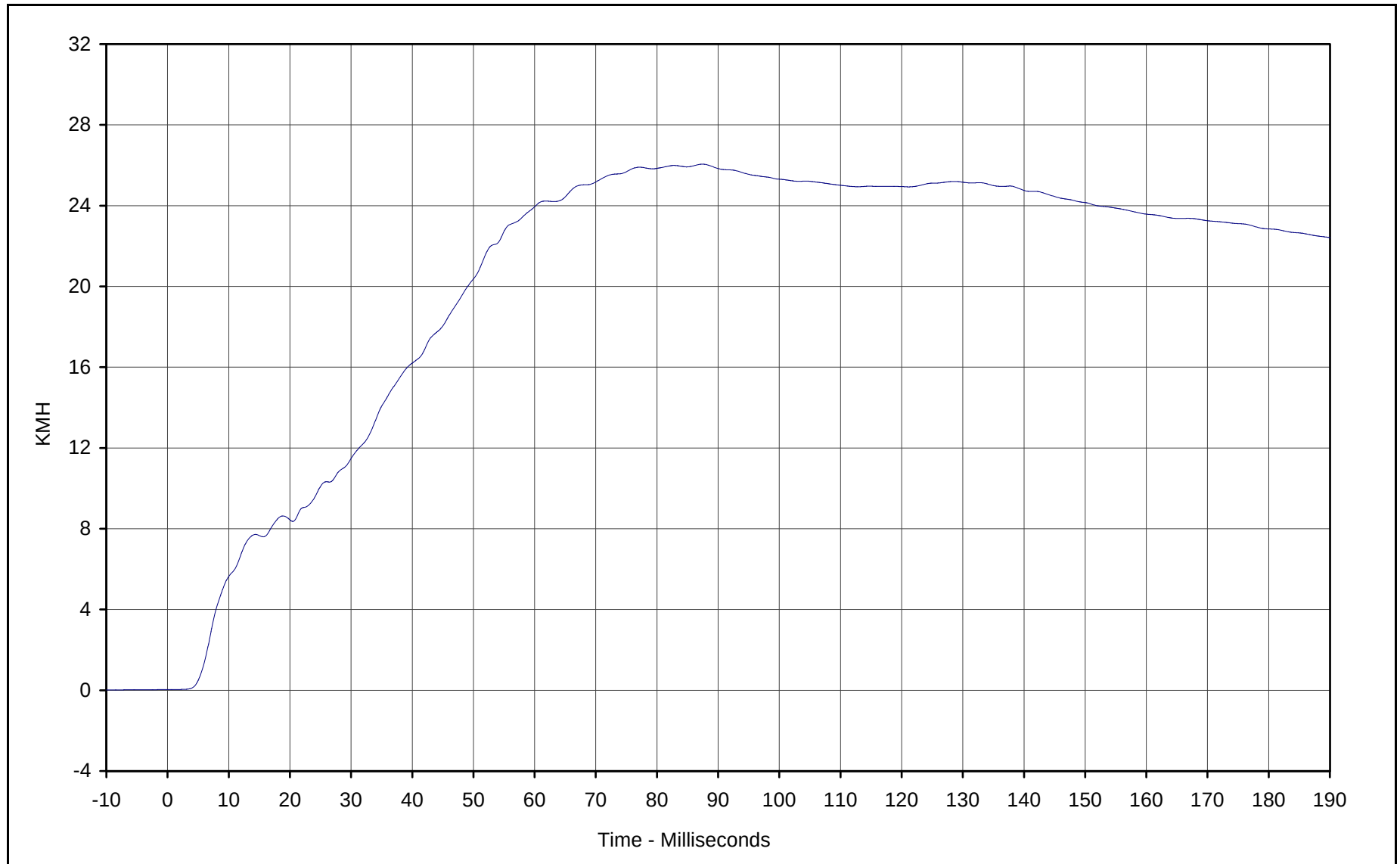




Curve Description: Right Rear Occ. Compartment Y
Maximum Value: 31.3 at 7.2 Milliseconds
Minimum Value: -2.2 at 144.5 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-039

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

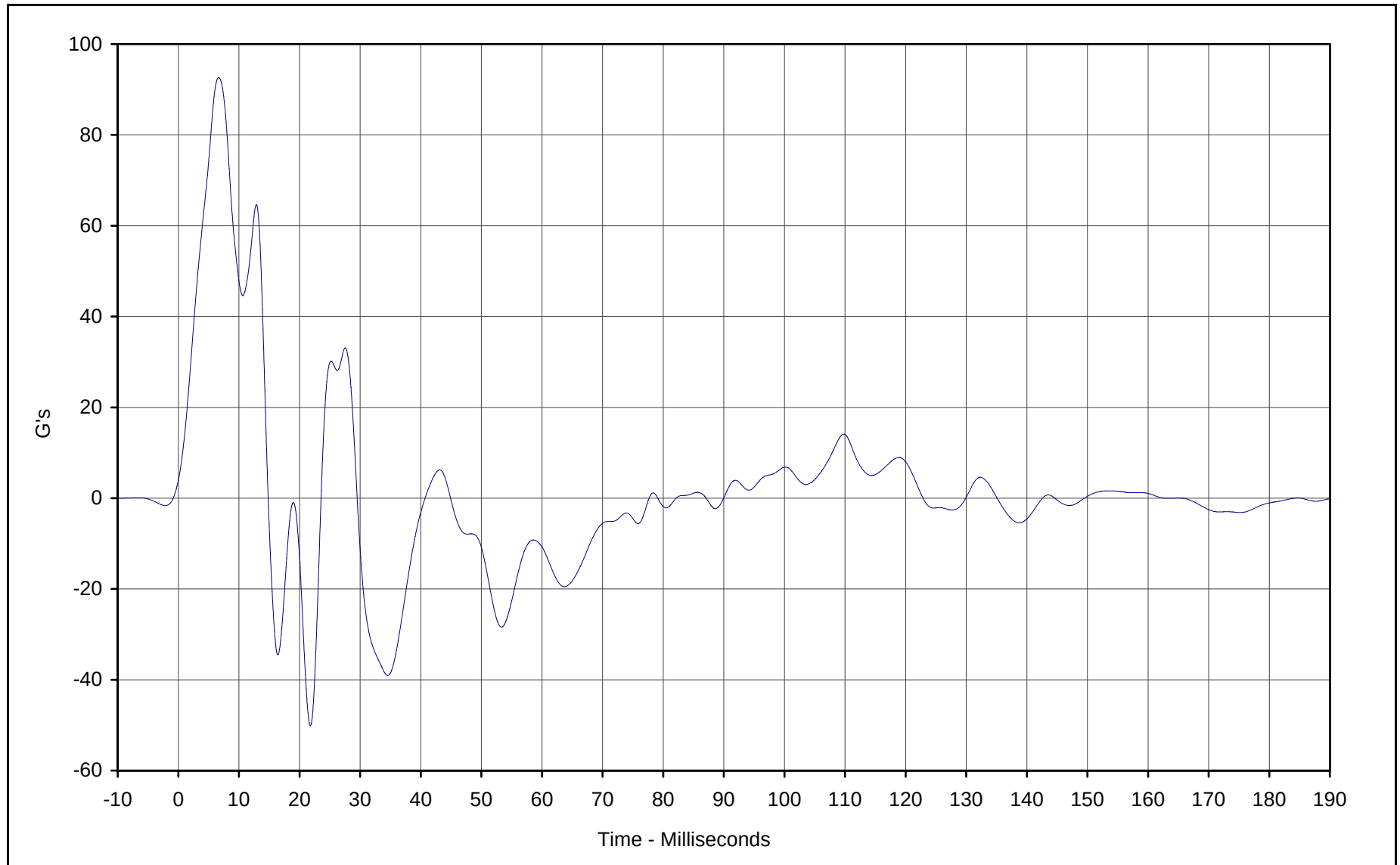




Curve Description: Right Rear Occ. Comp. Y Velocity
Maximum Value: 26.1 at 87.4 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-039

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

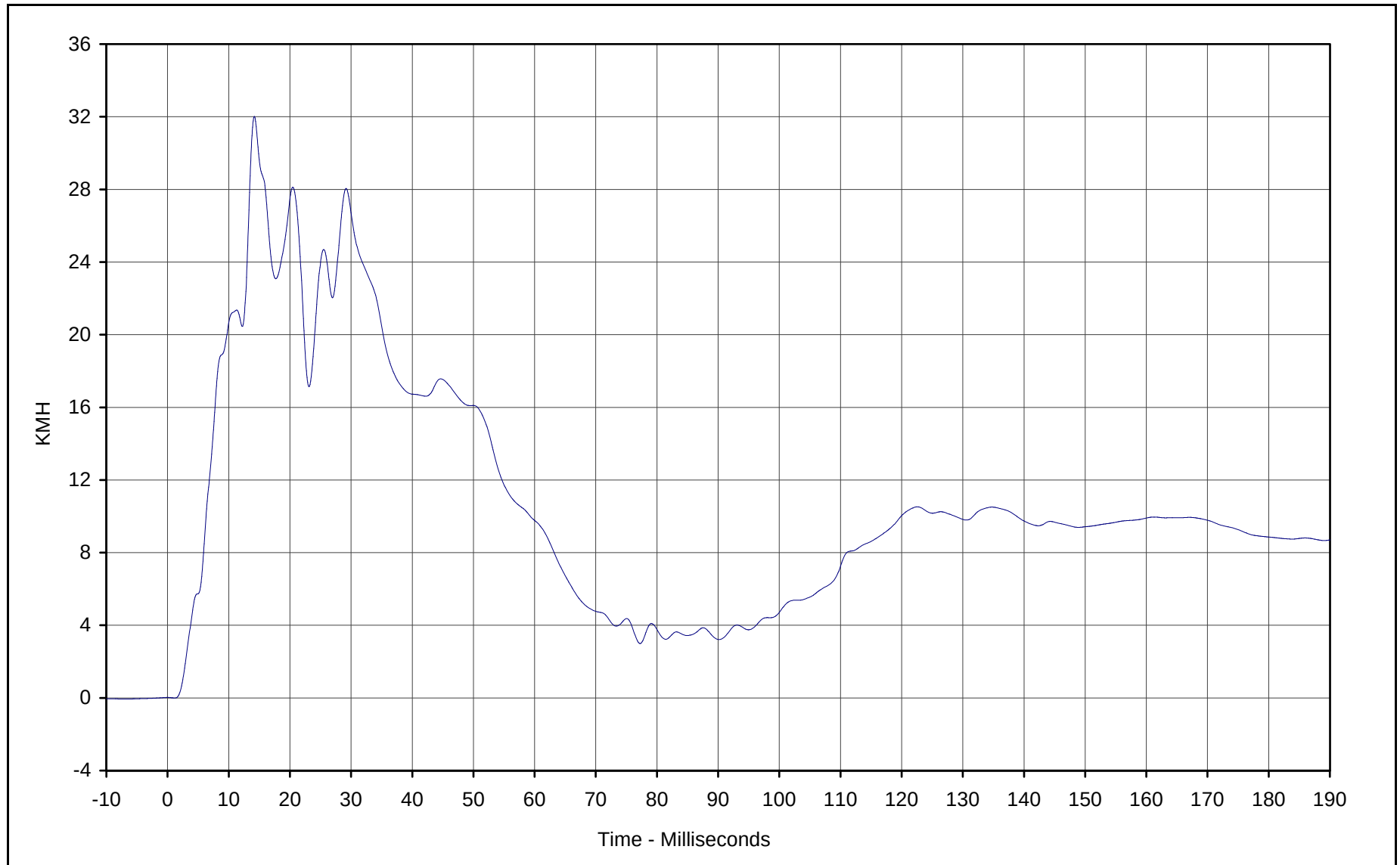




Curve Description: Left Front Door Mid Rear Y
Maximum Value: 92.7 at 6.7 Milliseconds
Minimum Value: -50.2 at 21.8 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-040

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

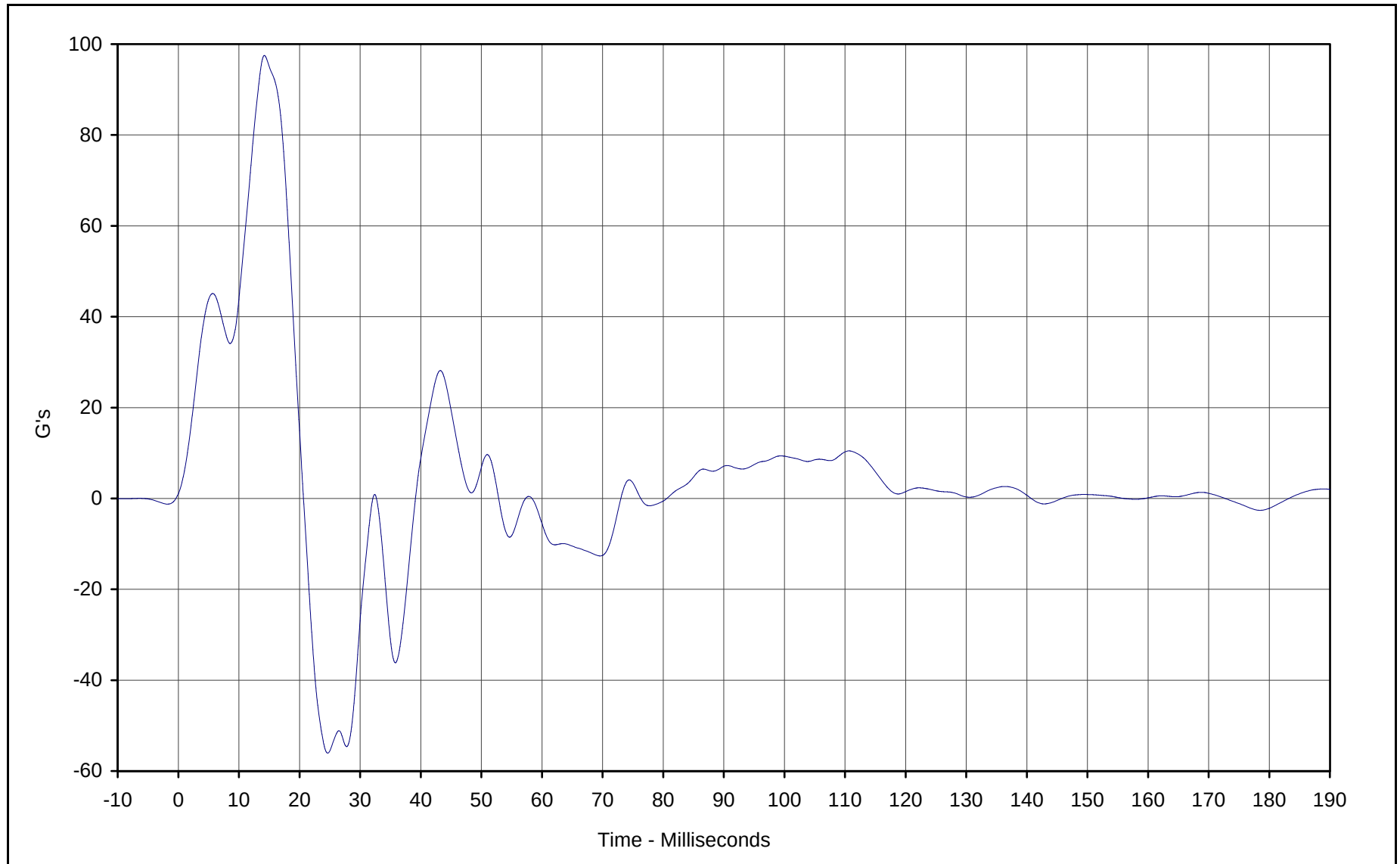




Curve Description: Left Front Door Mid Rear Y Velocity
Maximum Value: 32.0 at 14.2 Milliseconds
Minimum Value: 0.0 at 1.1 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-040

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

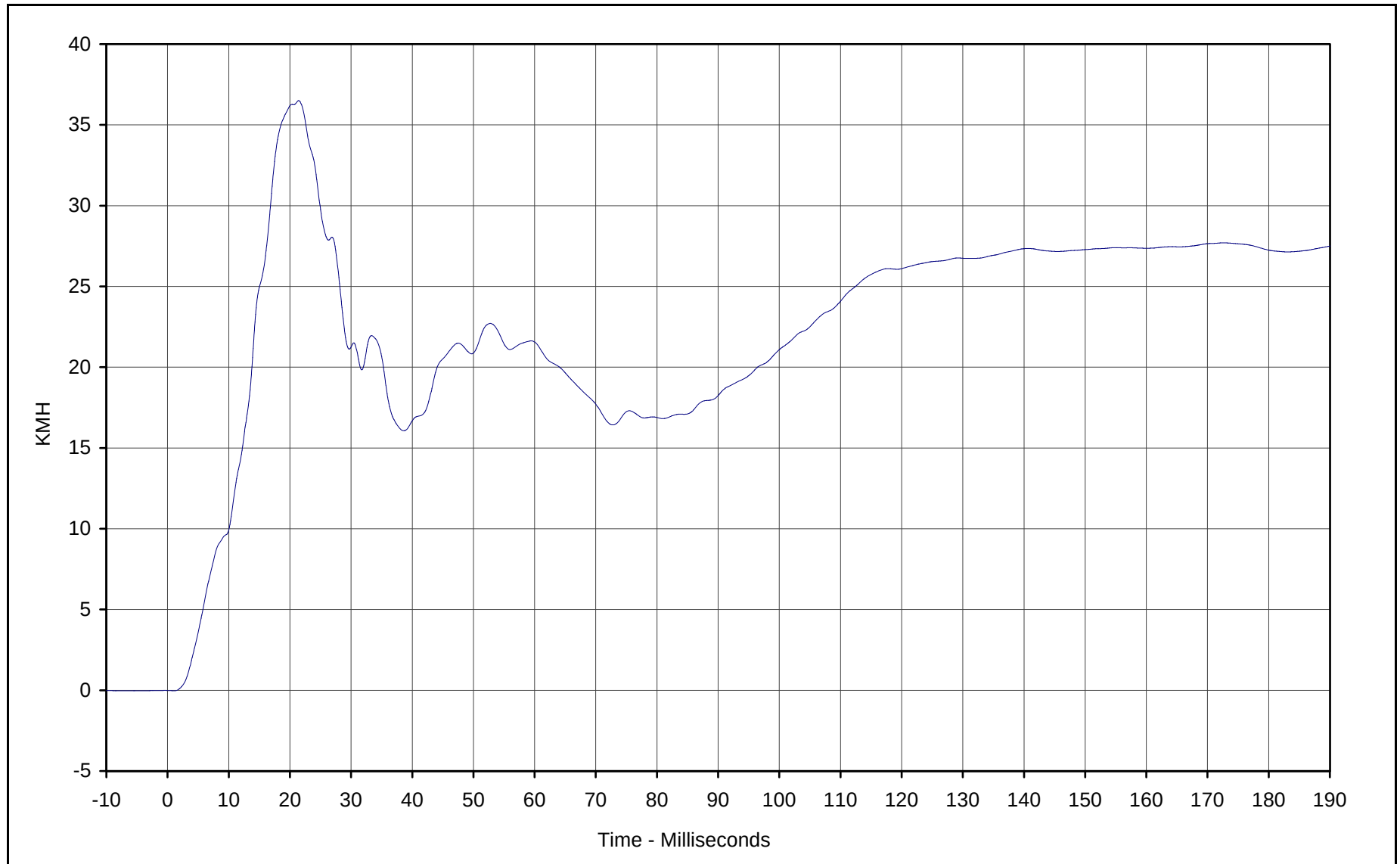




Curve Description: Left Front Door Upper CL Y
Maximum Value: 97.5 at 14.2 Milliseconds
Minimum Value: -56.1 at 24.6 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-041

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Left Front Door Upper CL Y Velocity

Maximum Value: 36.5 at 21.4 Milliseconds

Minimum Value: 0.0 at 1.0 Milliseconds

SAE Filter Class: 180

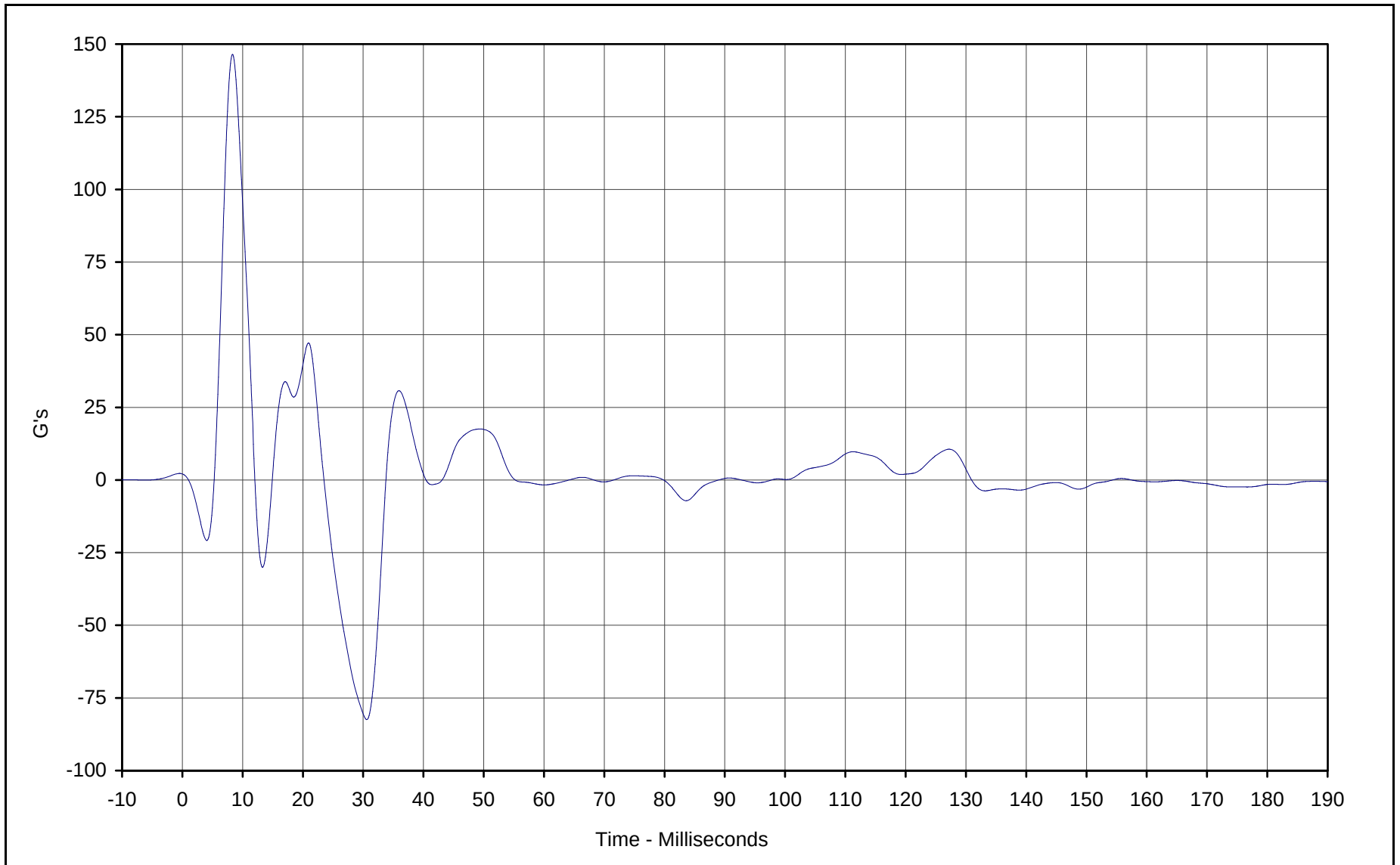
Date of Test: 12/05/00

Curve Number: IN1-041

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

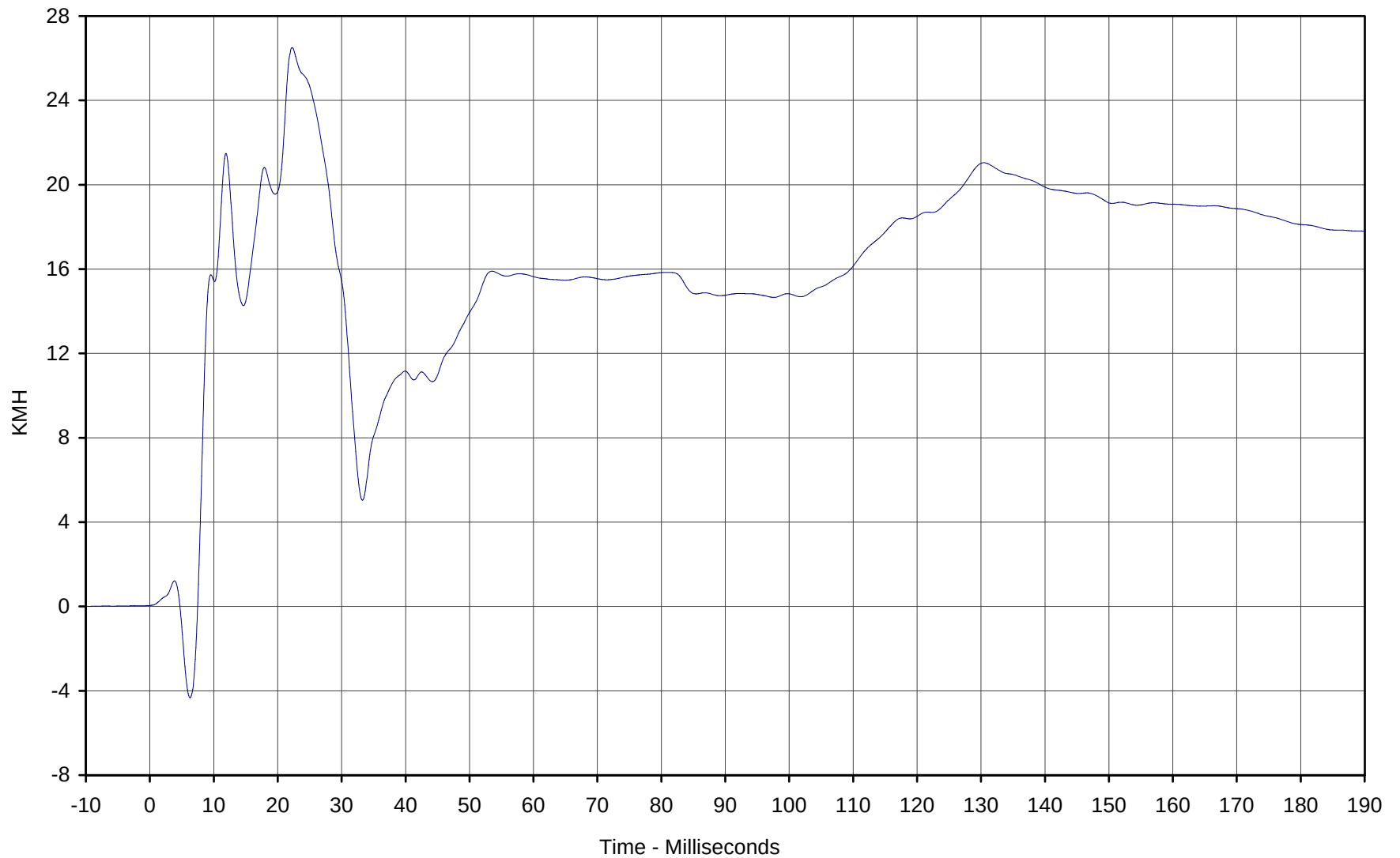




Curve Description: Left Rear Door Mid Rear Y
Maximum Value: 146.4 at 8.3 Milliseconds
Minimum Value: -82.4 at 30.6 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-042

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

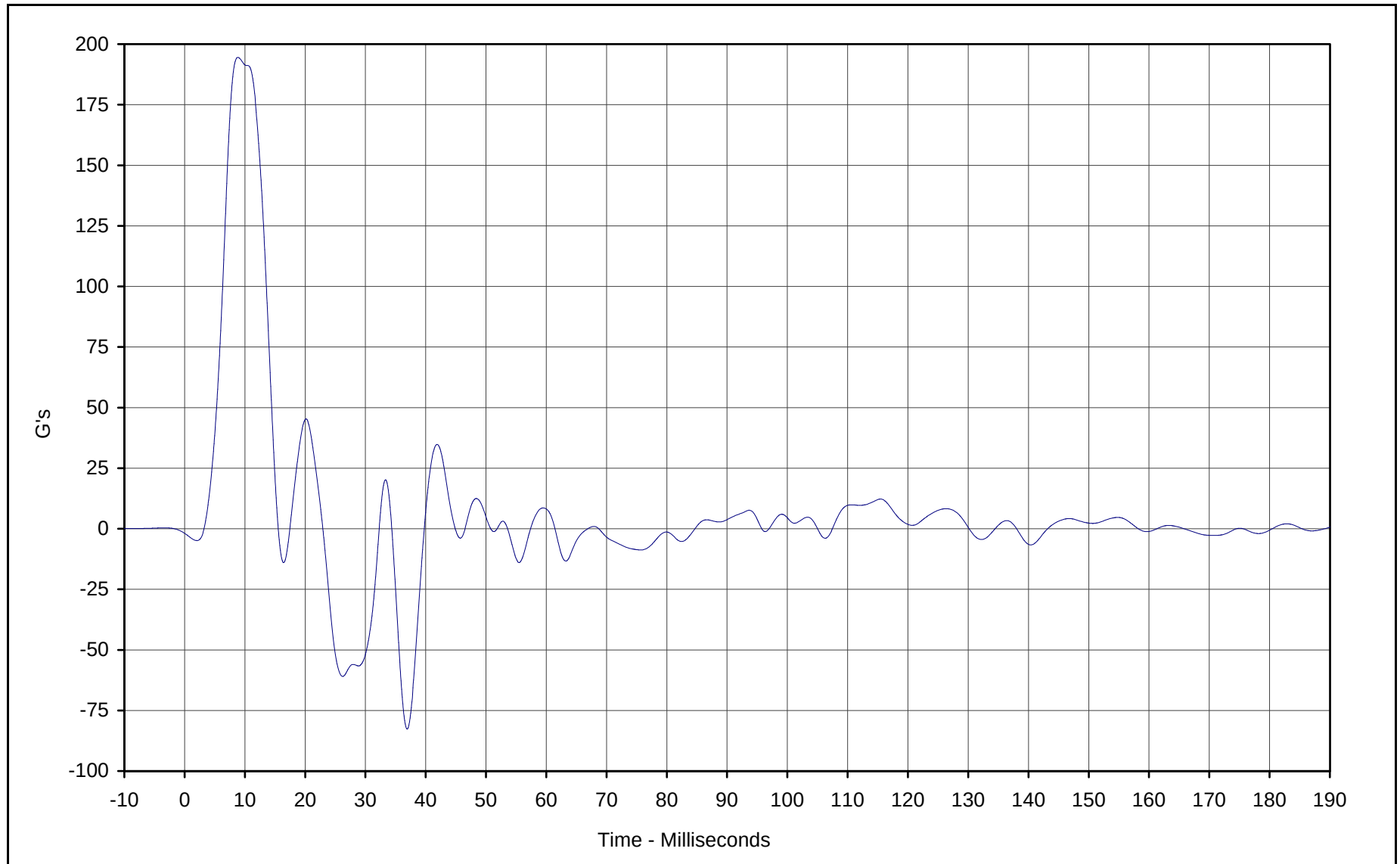




Curve Description: Left Rear Door Mid Rear Y Velocity
Maximum Value: 26.5 at 22.3 Milliseconds
Minimum Value: -4.3 at 6.3 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-042

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

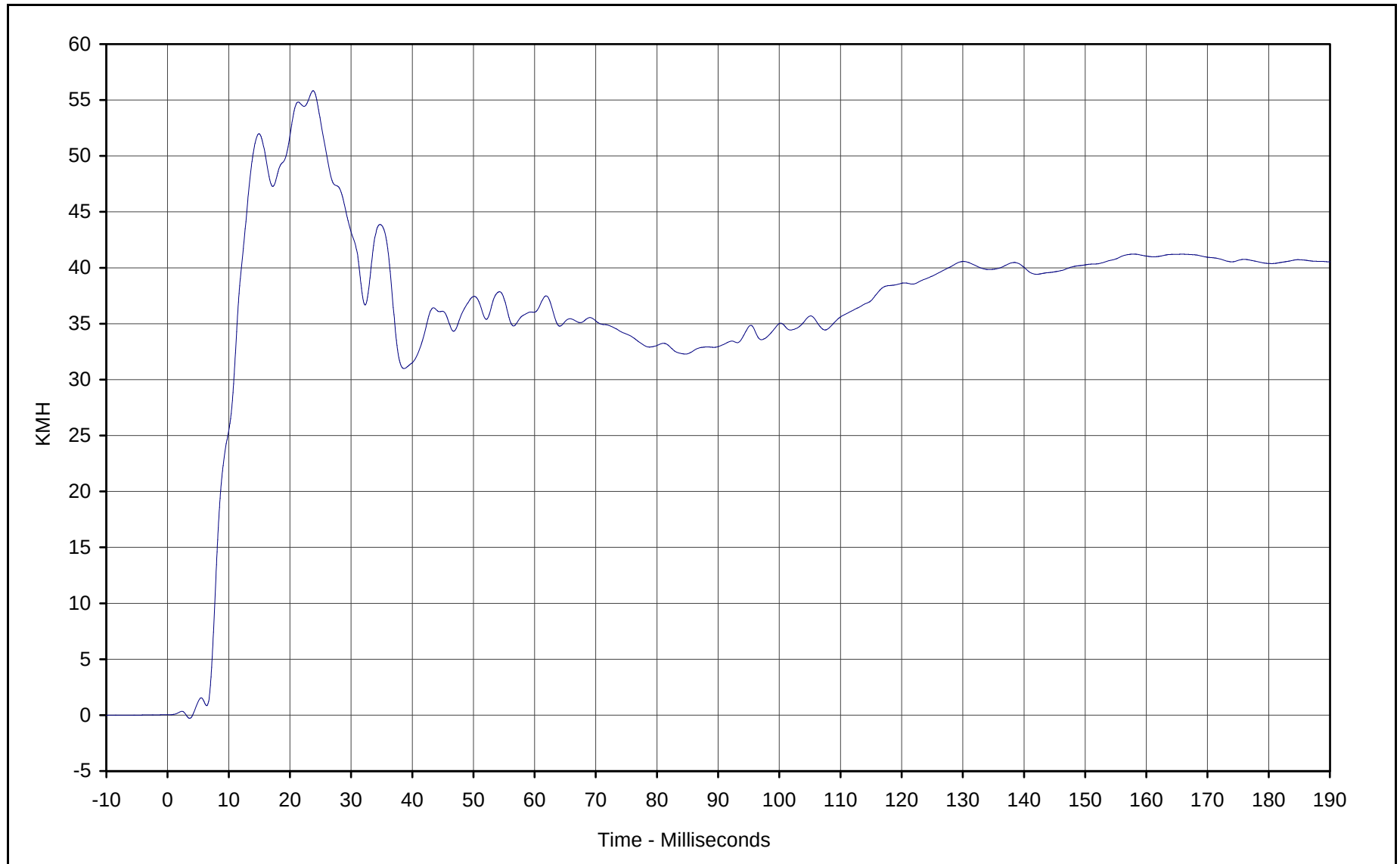




Curve Description: Left Rear Door Upper CL Y
Maximum Value: 194.5 at 8.8 Milliseconds
Minimum Value: -82.7 at 36.9 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-043

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Left Rear Door Upper CL Y Velocity

Maximum Value: 55.8 at 23.8 Milliseconds

Minimum Value: -0.3 at 3.6 Milliseconds

SAE Filter Class: 180

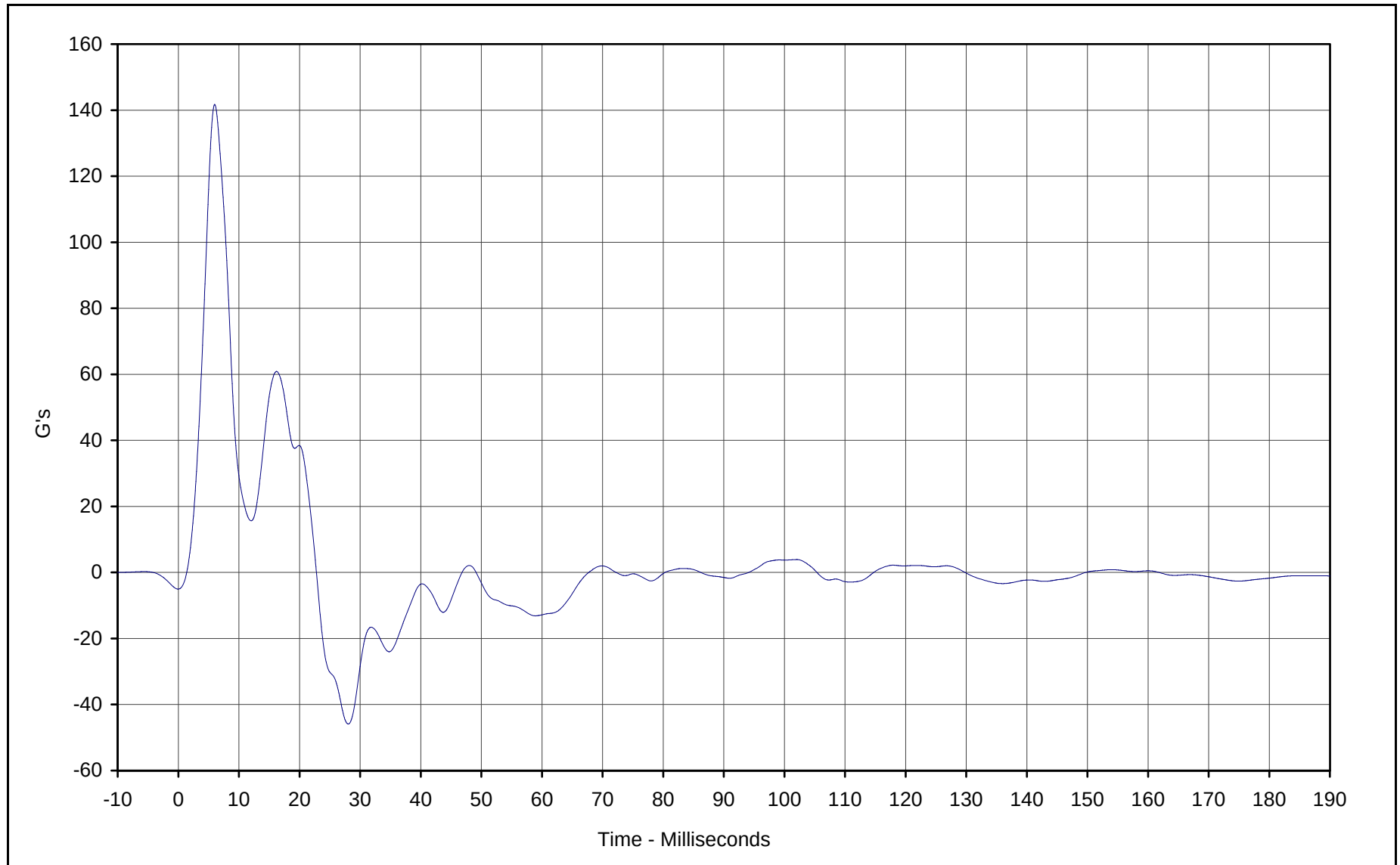
Date of Test: 12/05/00

Curve Number: IN1-043

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

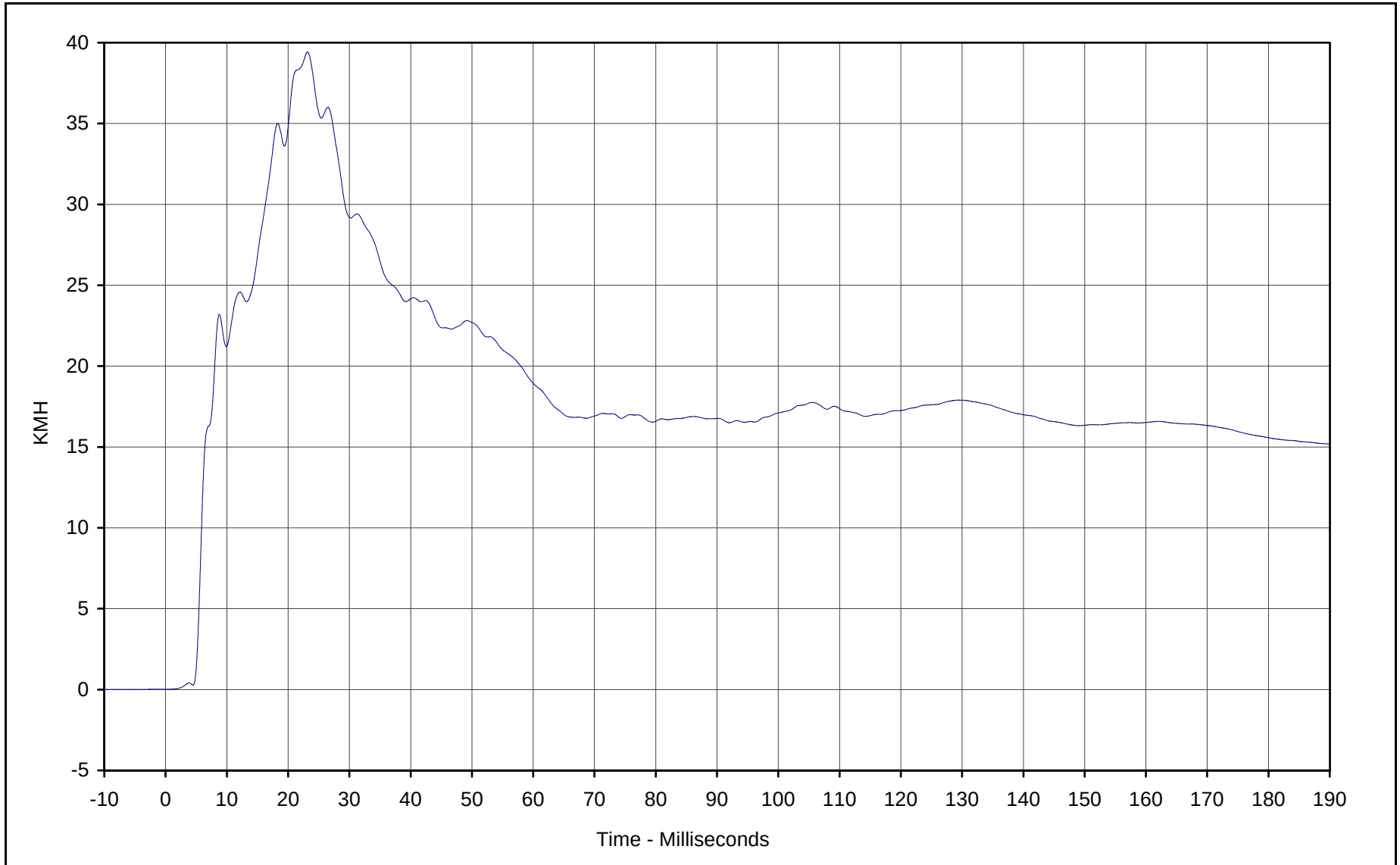




Curve Description: Left B-Post Lower Y
Maximum Value: 141.7 at 6.0 Milliseconds
Minimum Value: -45.9 at 28.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-044

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan



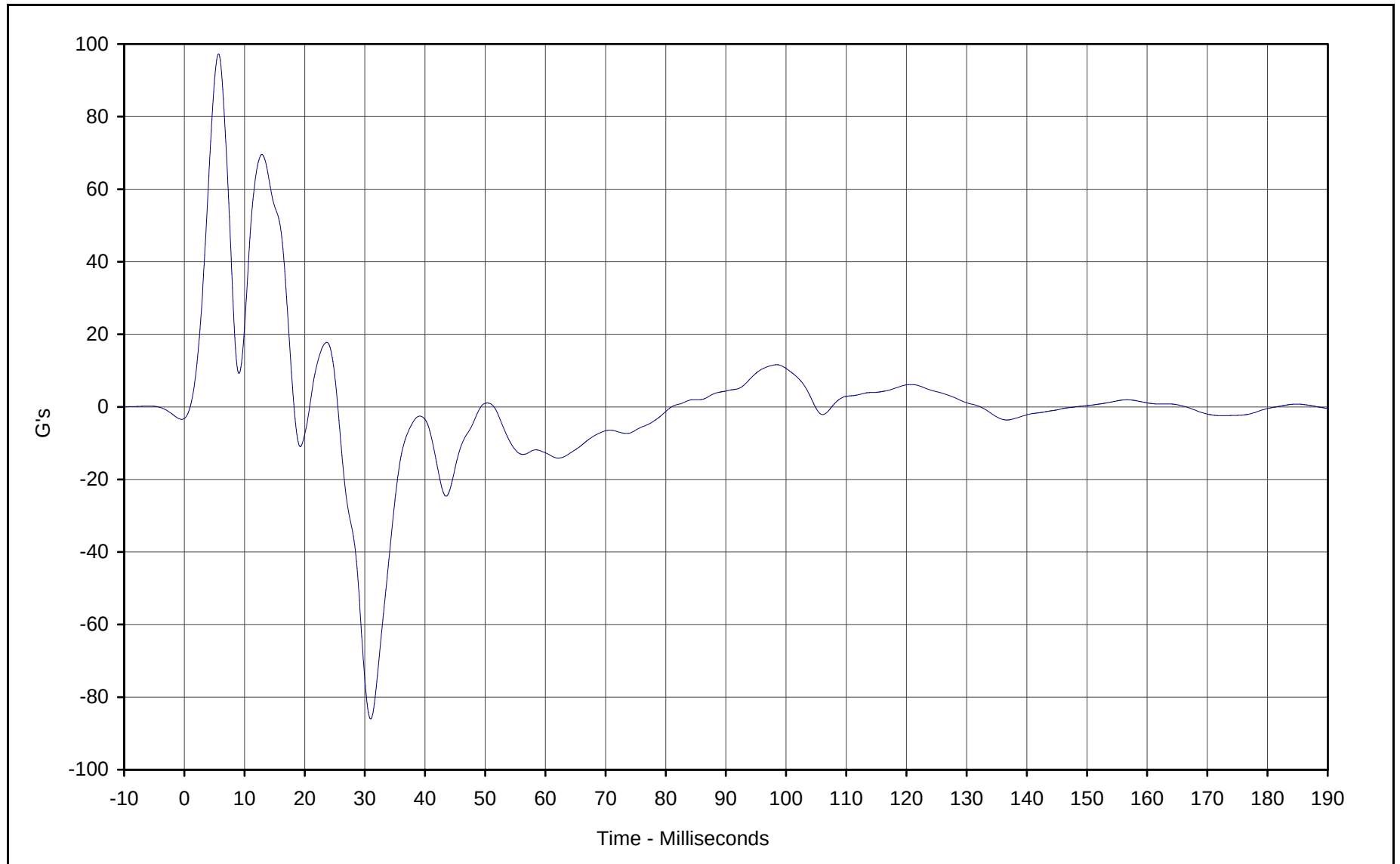


Curve Description: Left B-Post Lower Y Velocity
Maximum Value: 39.4 at 23.2 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-044

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan



B-90

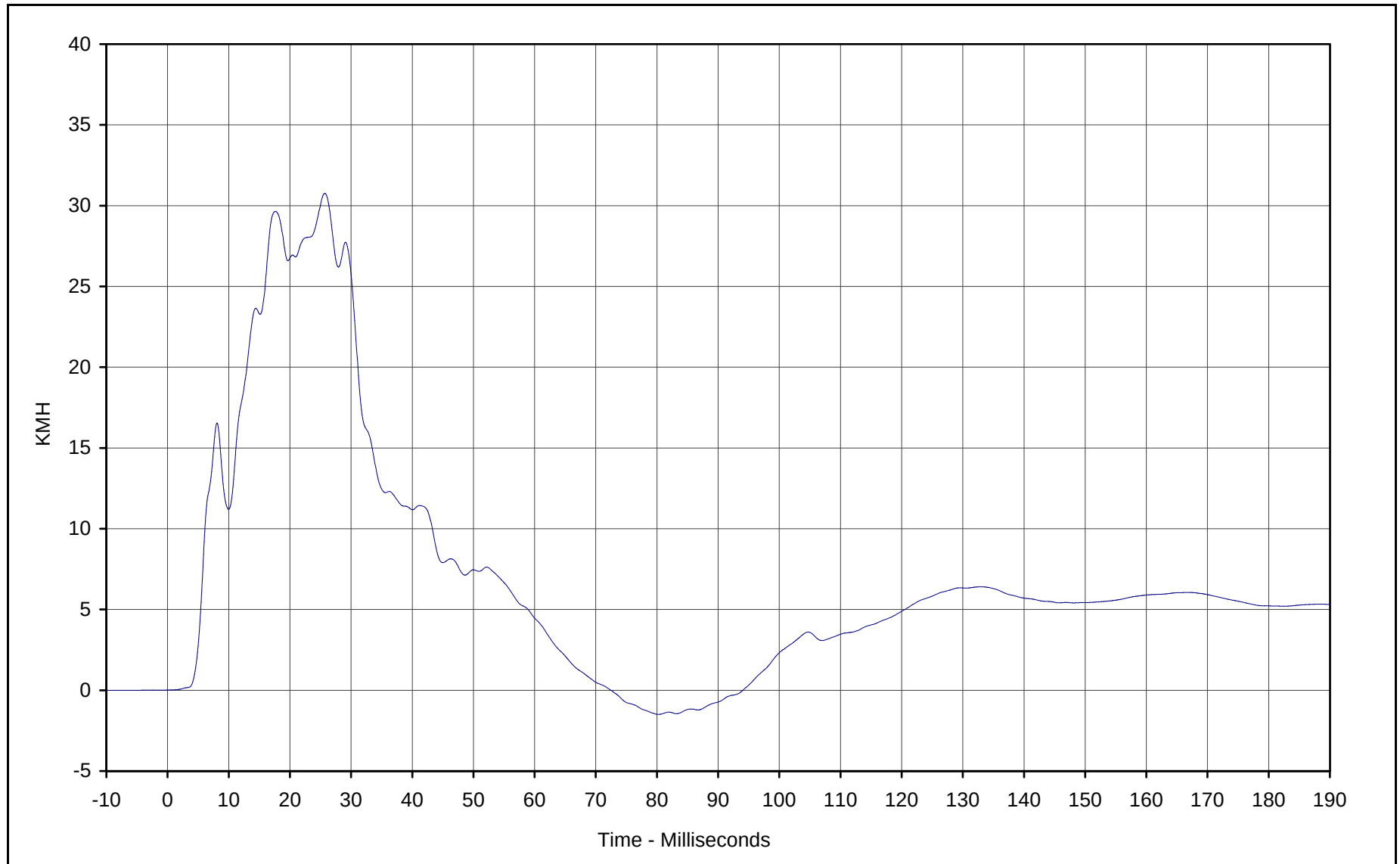


Curve Description: Left B-Post Middle Y
Maximum Value: 97.3 at 5.7 Milliseconds
Minimum Value: -86.0 at 31.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-045

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan



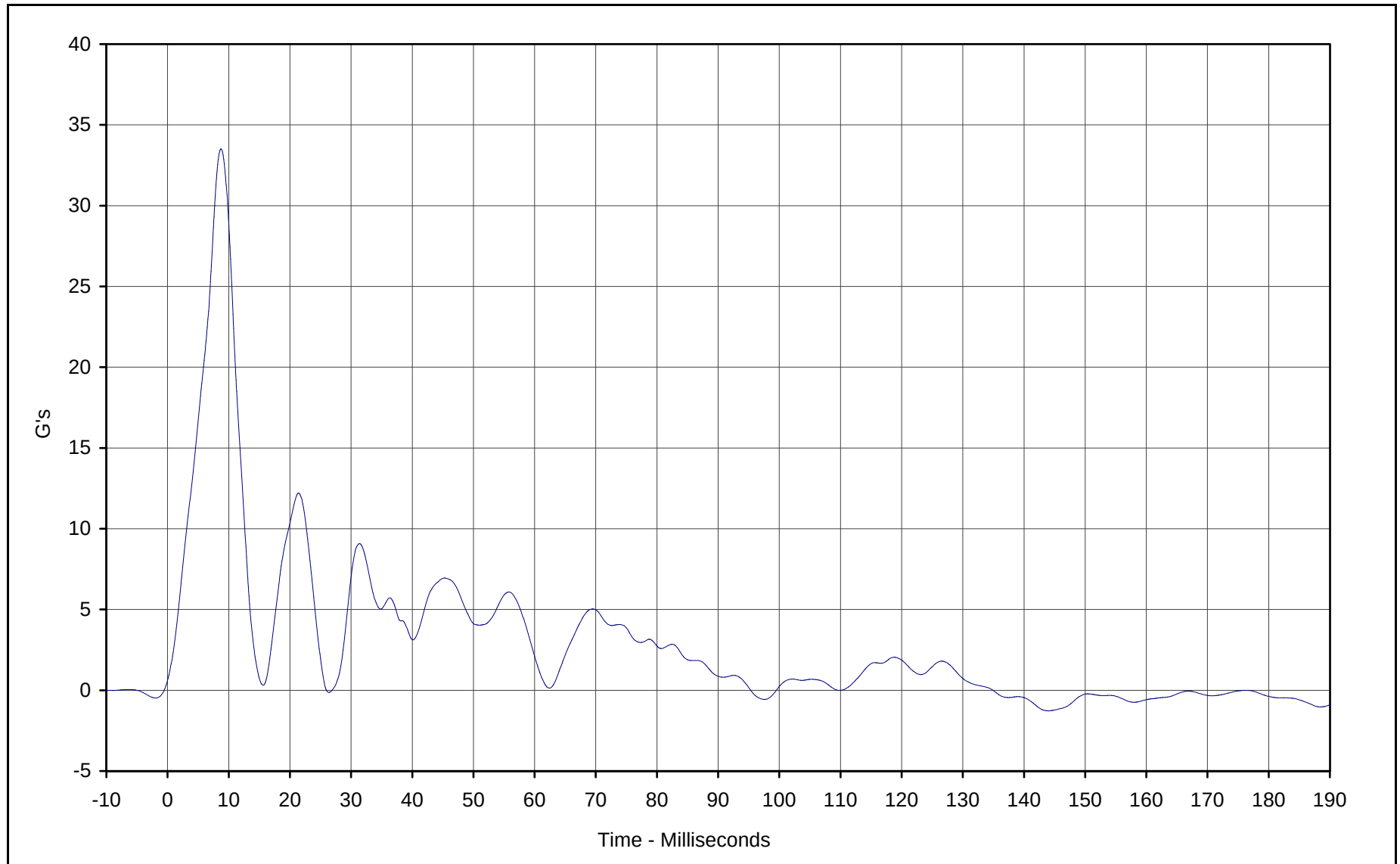
KAR21003-03



Curve Description: Left B-Post Middle Y Velocity
Maximum Value: 30.8 at 25.7 Milliseconds
Minimum Value: -1.5 at 80.3 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-045

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

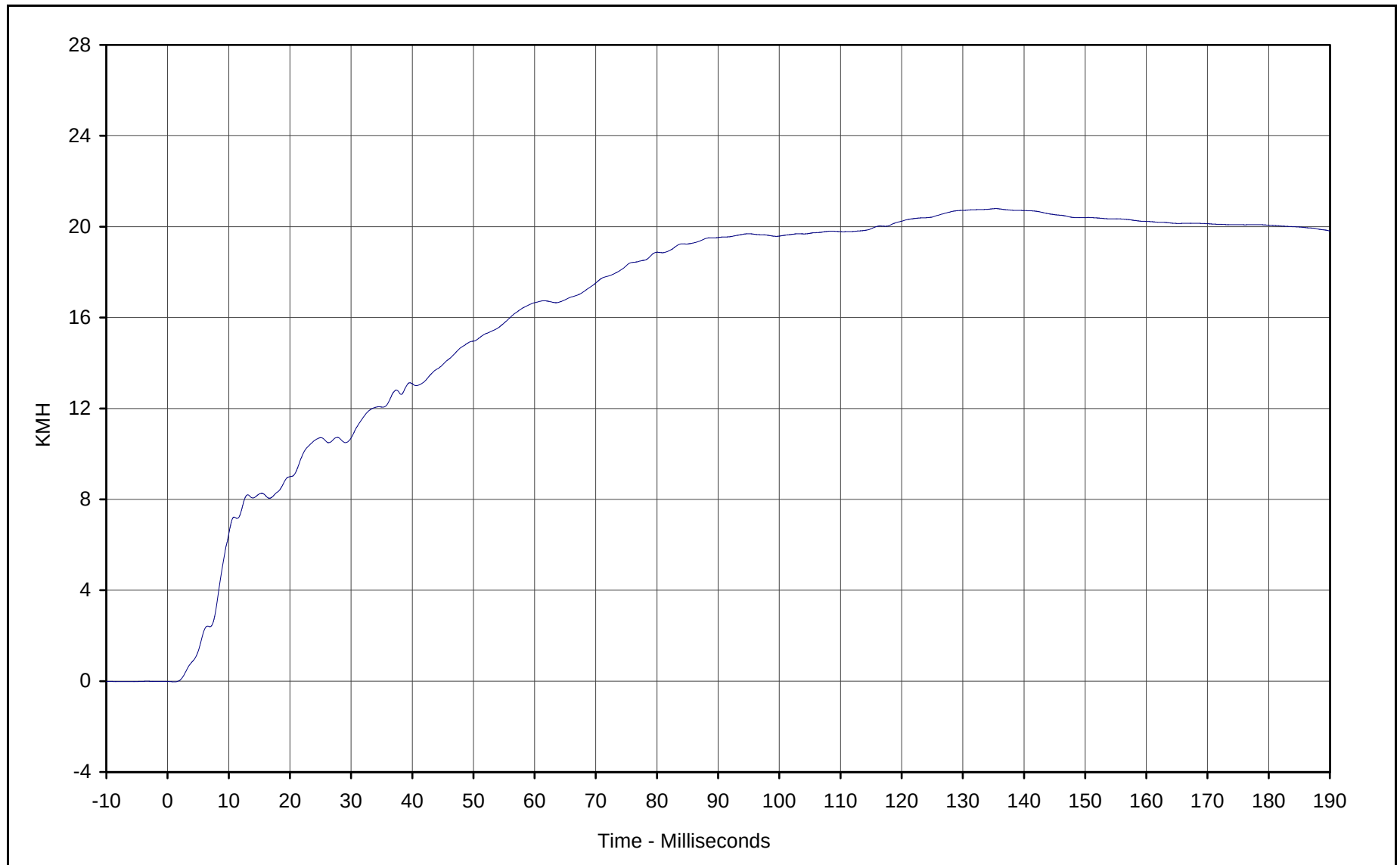




Curve Description: Left A-Post Lower Y
Maximum Value: 33.5 at 8.7 Milliseconds
Minimum Value: -1.3 at 144.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-046

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

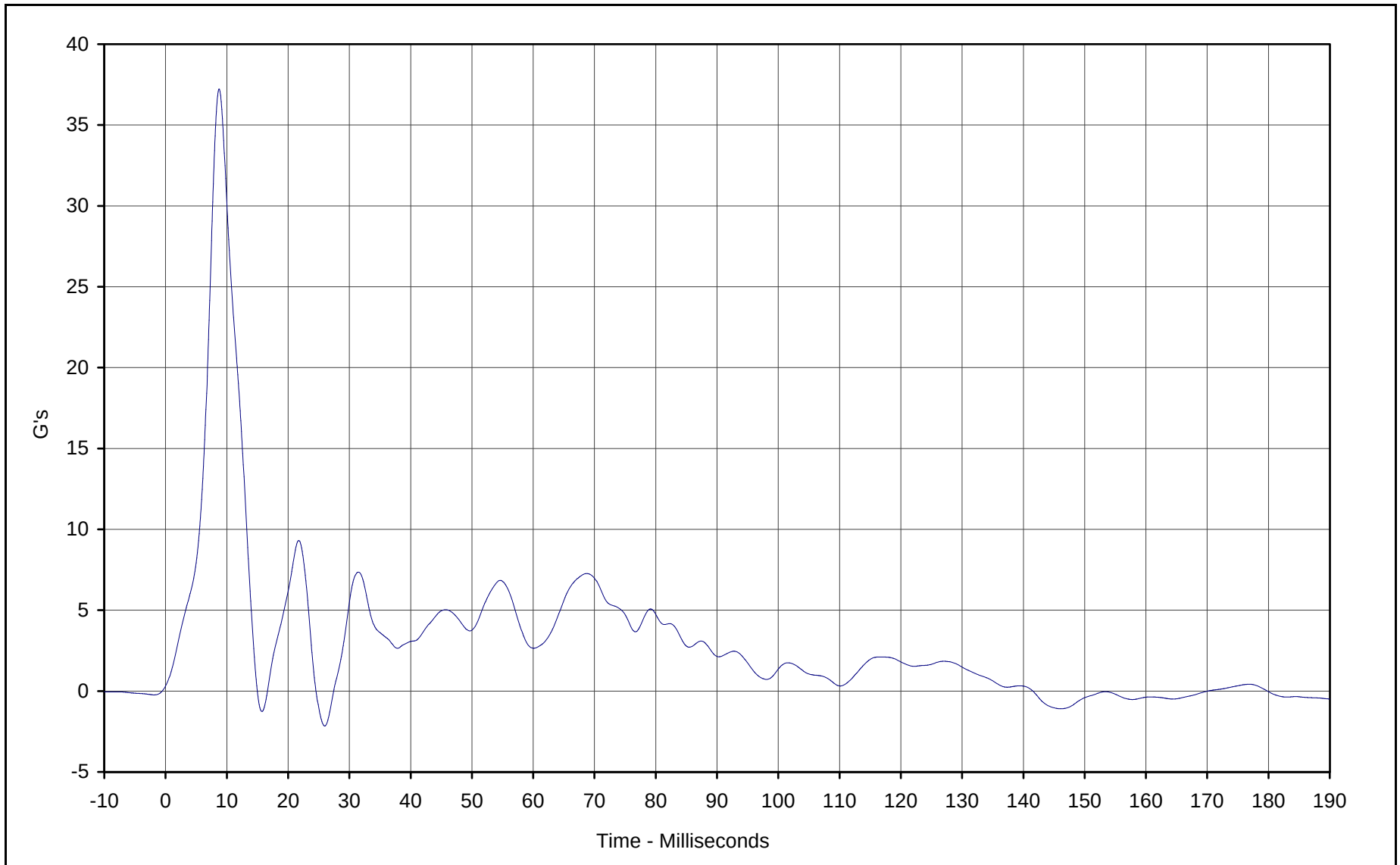




Curve Description: Left A-Post Lower Y Velocity
Maximum Value: 20.8 at 135.4 Milliseconds
Minimum Value: 0.0 at 1.1 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-046

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

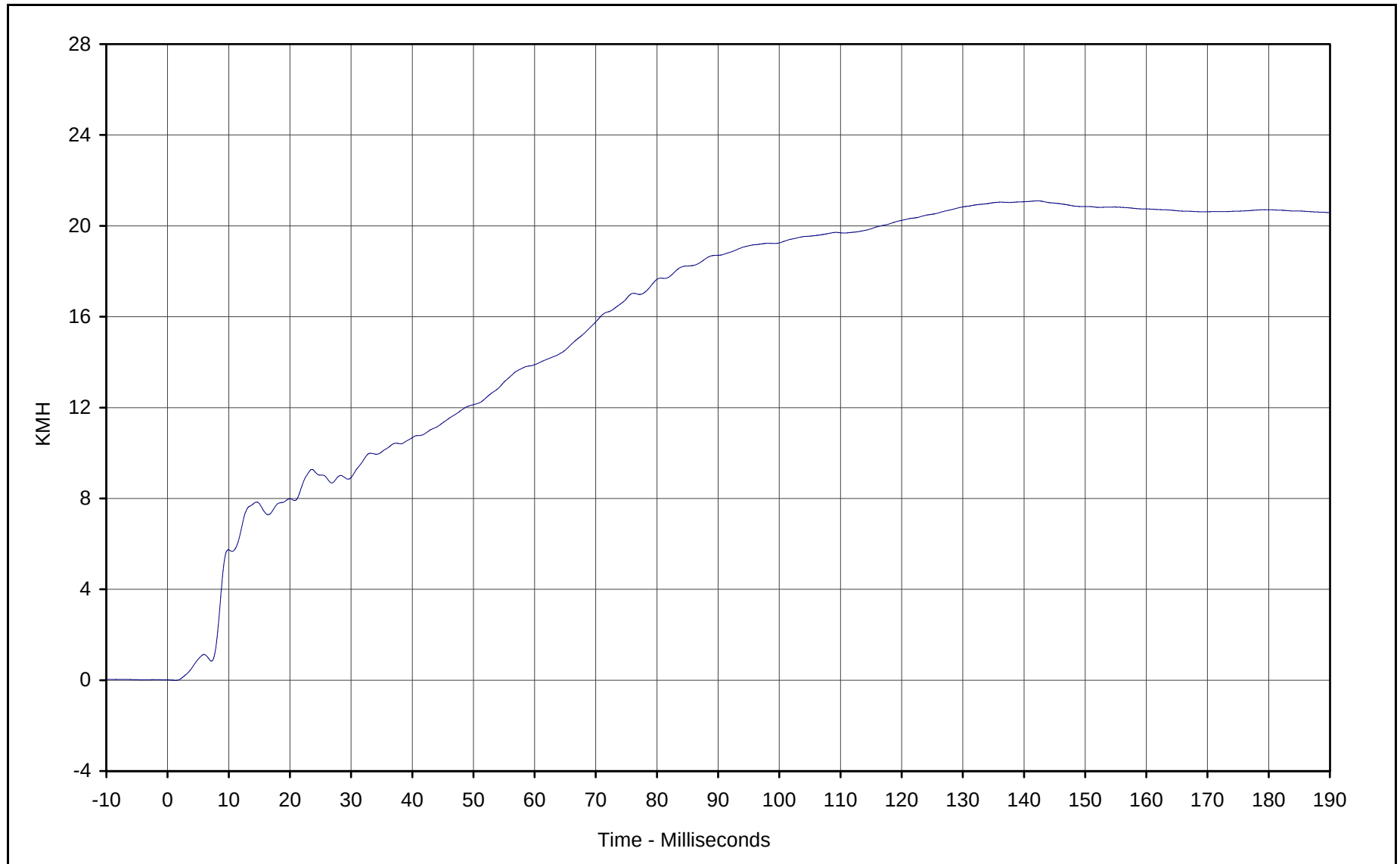




Curve Description: Left A-Post Middle Y
Maximum Value: 37.2 at 8.8 Milliseconds
Minimum Value: -2.2 at 26.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-047

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

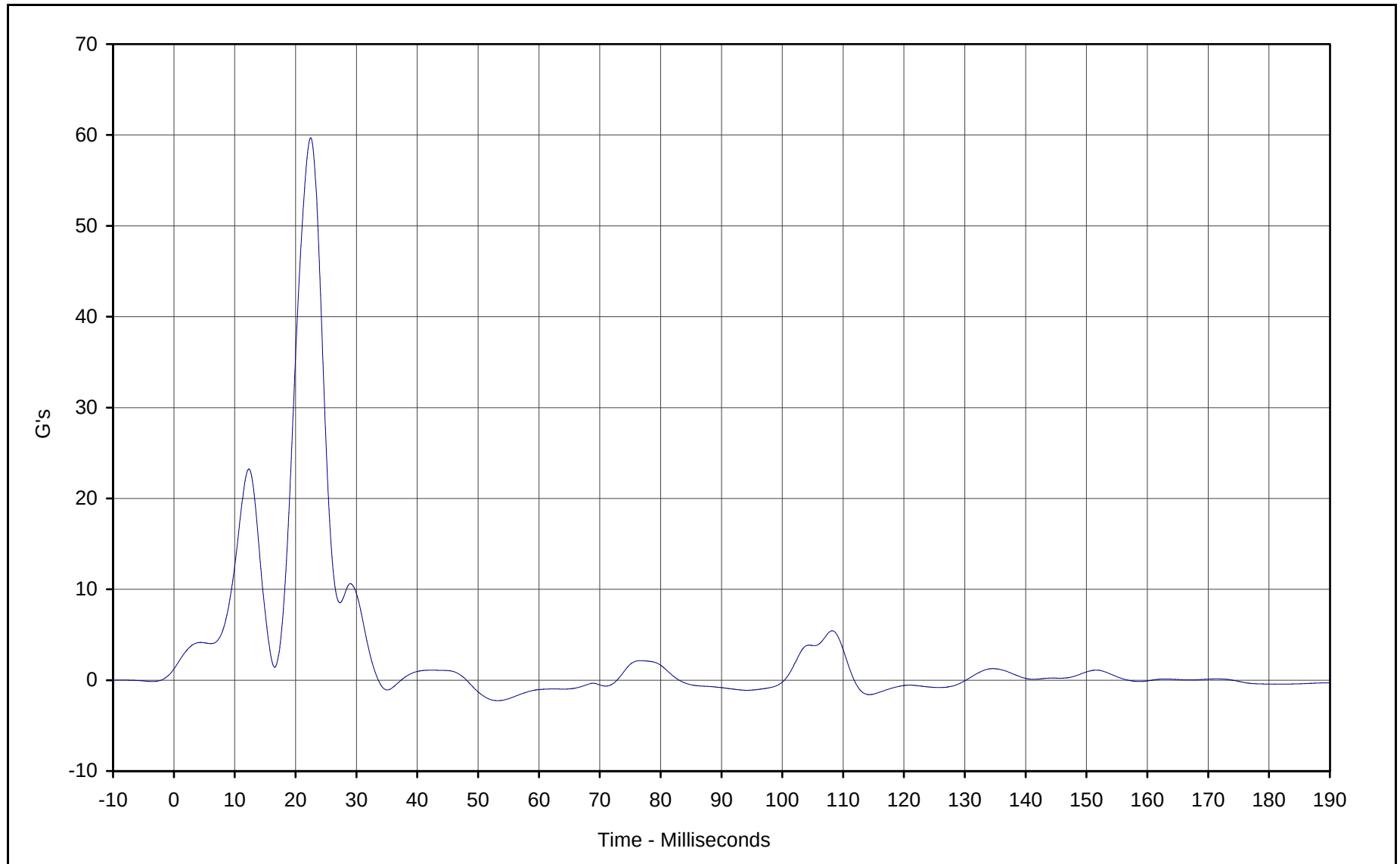




Curve Description: Left A-Post Middle Y Velocity
Maximum Value: 21.1 at 142.2 Milliseconds
Minimum Value: 0.0 at 1.3 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-047

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

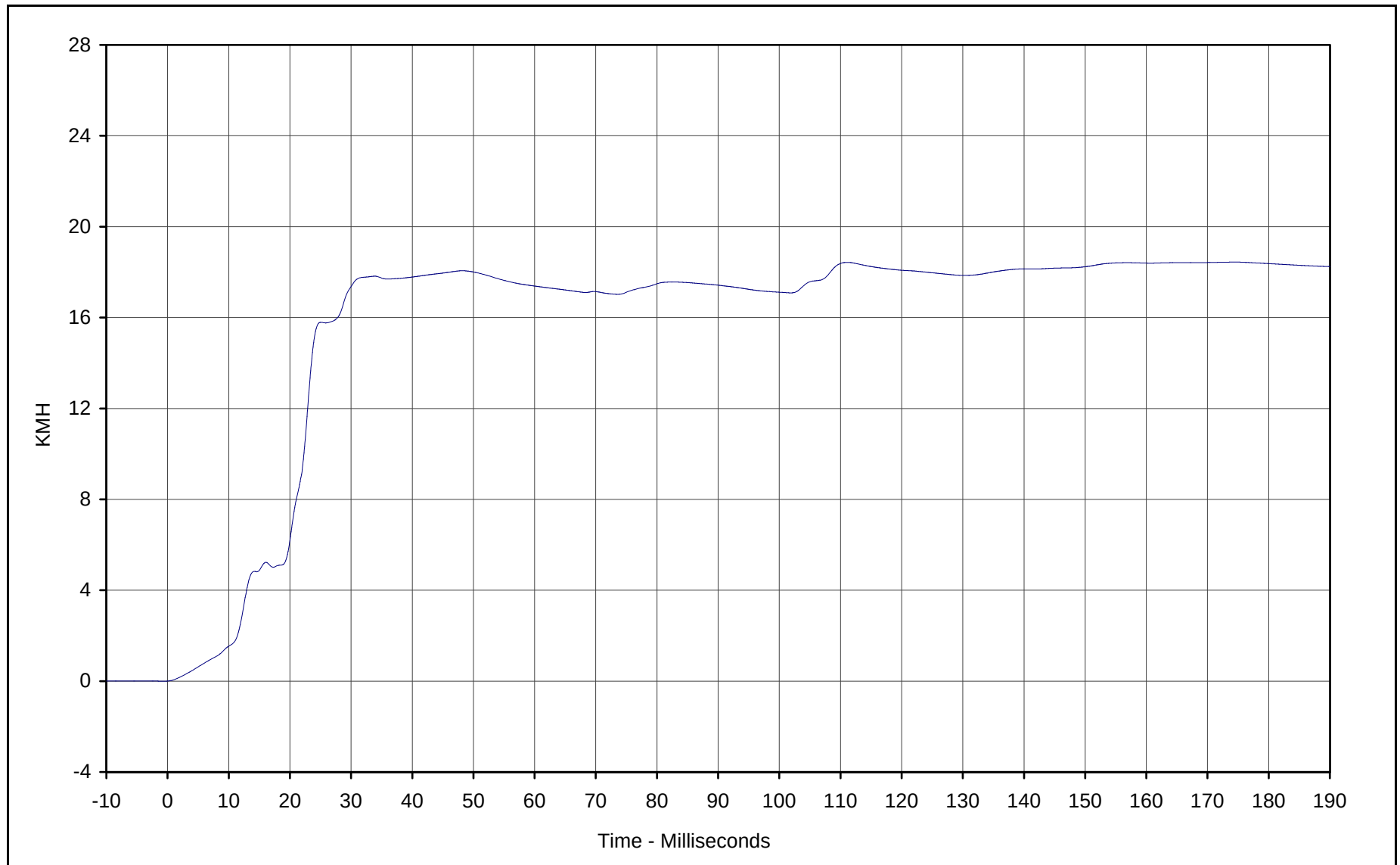




Curve Description: Left Front Seat Track Y
Maximum Value: 59.7 at 22.5 Milliseconds
Minimum Value: -2.3 at 53.2 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-048

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

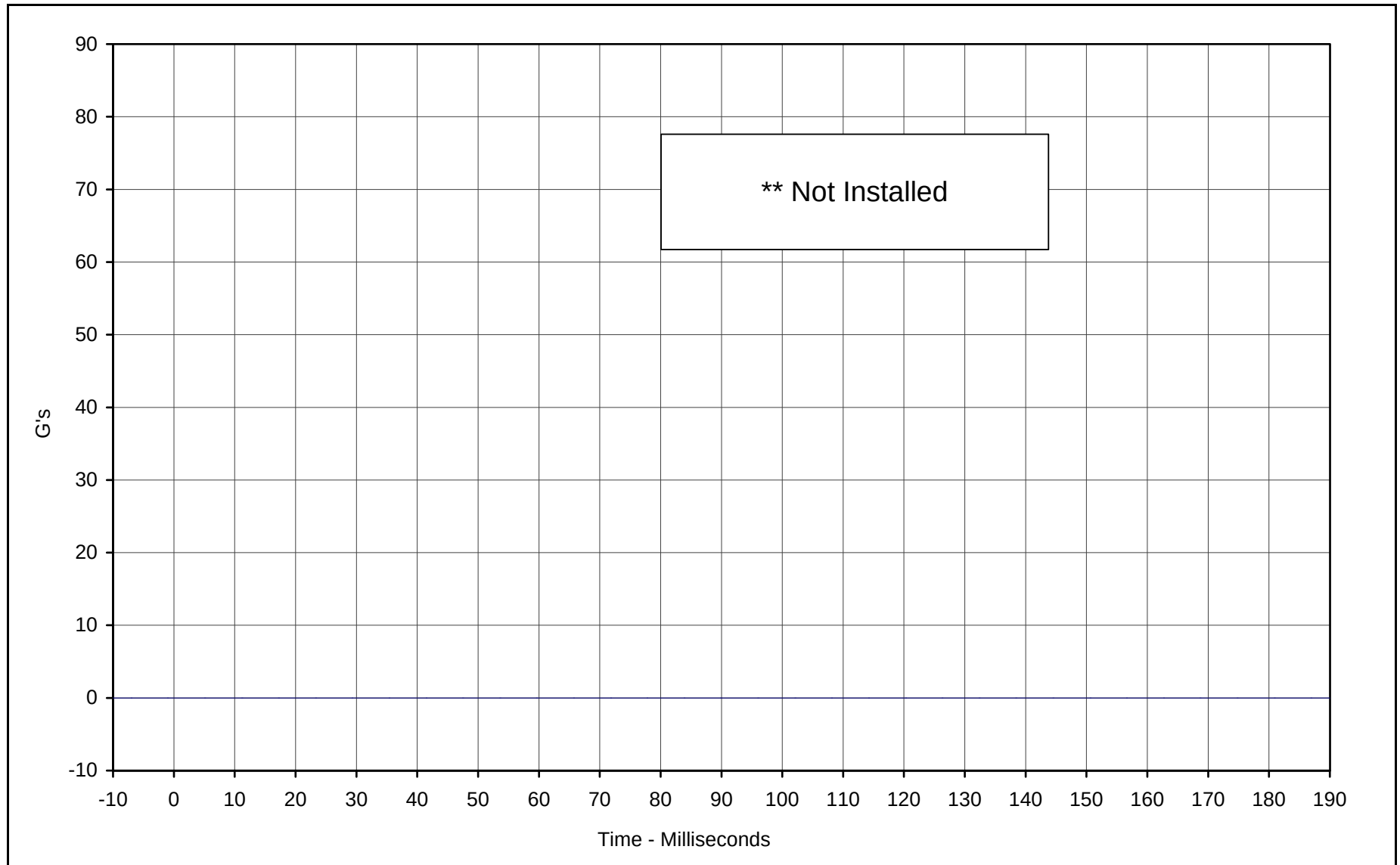




Curve Description: Left Front Seat Track Y Velocity
Maximum Value: 18.4 at 174.6 Milliseconds
Minimum Value: 0.0 at 0.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-048

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Left Rear Seat Structure Y **

Maximum Value: 0.0 at 0.0 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 60

Date of Test: 12/05/00

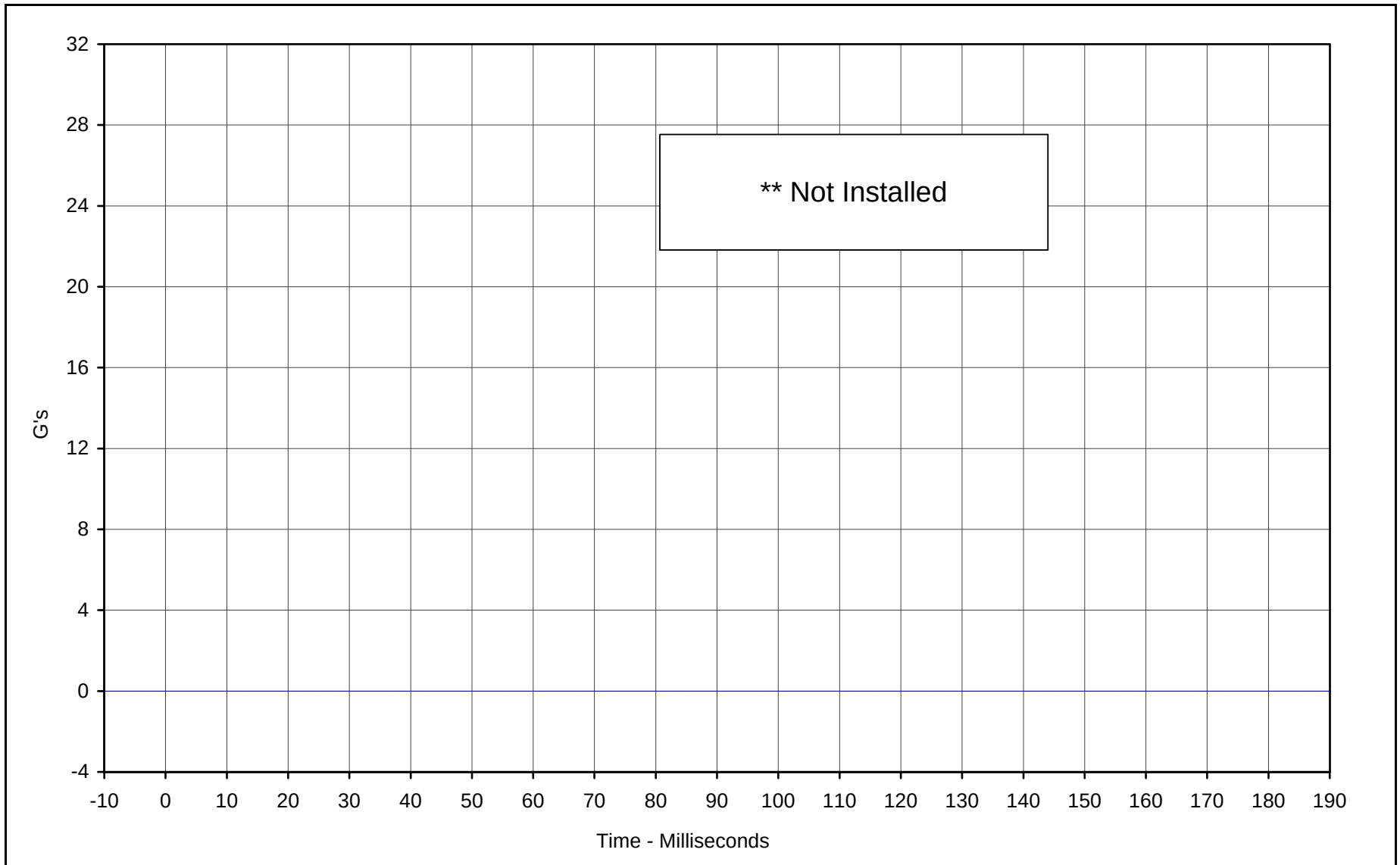
Curve Number: FIL-049

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

** Not Installed





Curve Description: Left Rear Seat Structure Y Velocity **

Maximum Value: 0.0 at 0.0 Milliseconds

Minimum Value: 0.0 at 0.0 Milliseconds

SAE Filter Class: 180

Date of Test: 12/05/00

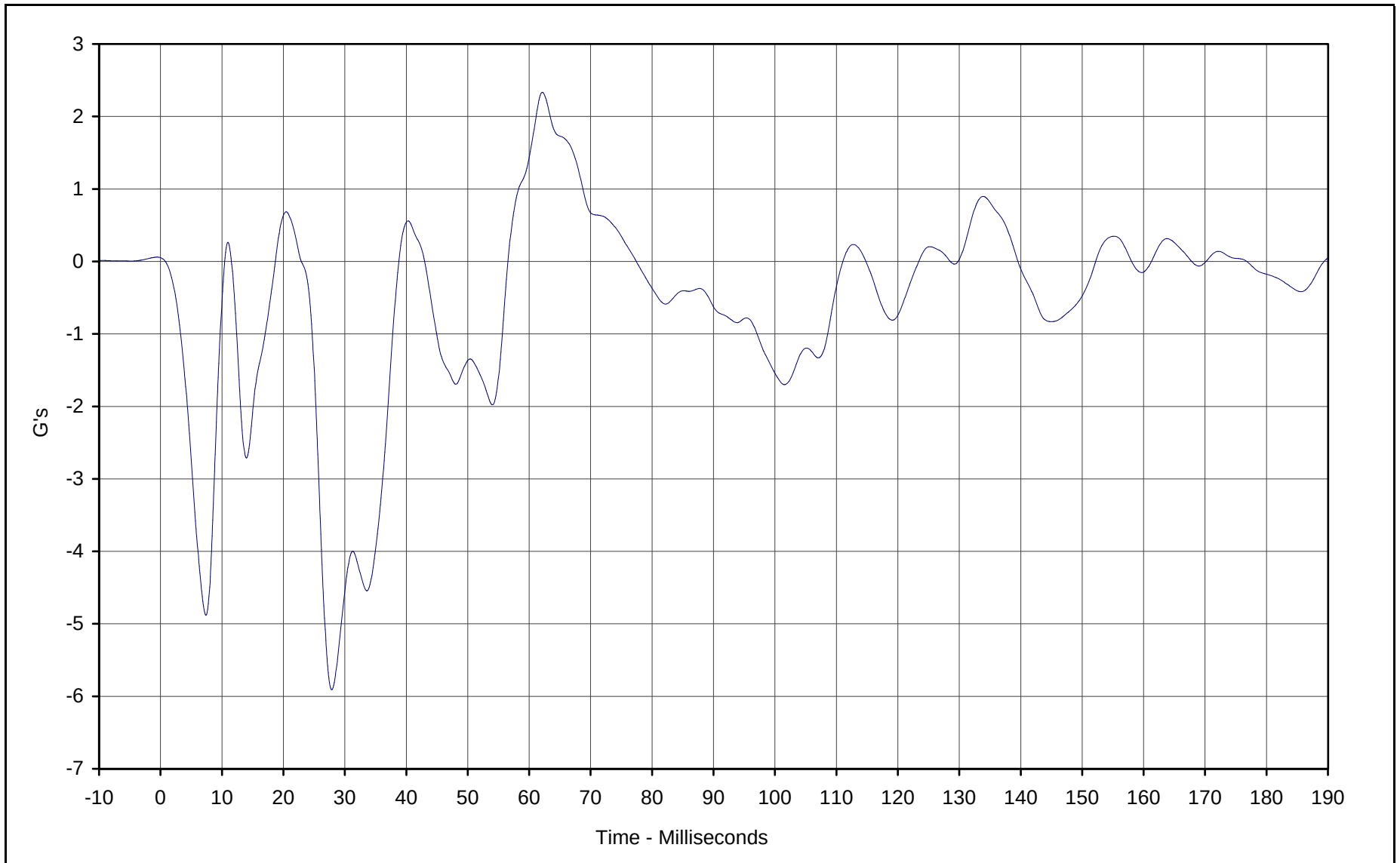
Curve Number: IN1-049

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

** Not Installed

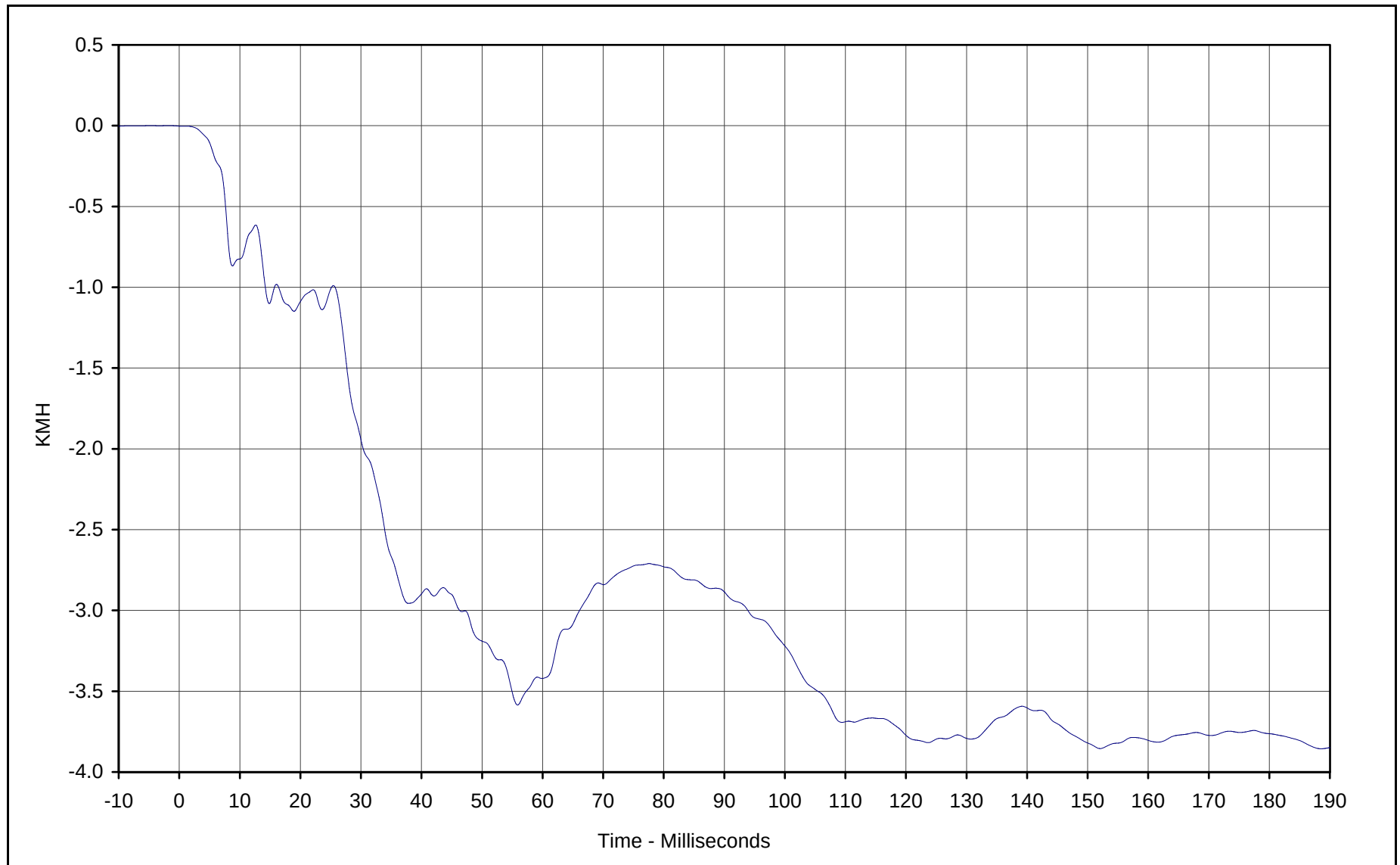




Curve Description: Vehicle CG X
Maximum Value: 2.3 at 62.2 Milliseconds
Minimum Value: -5.9 at 27.9 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-050

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

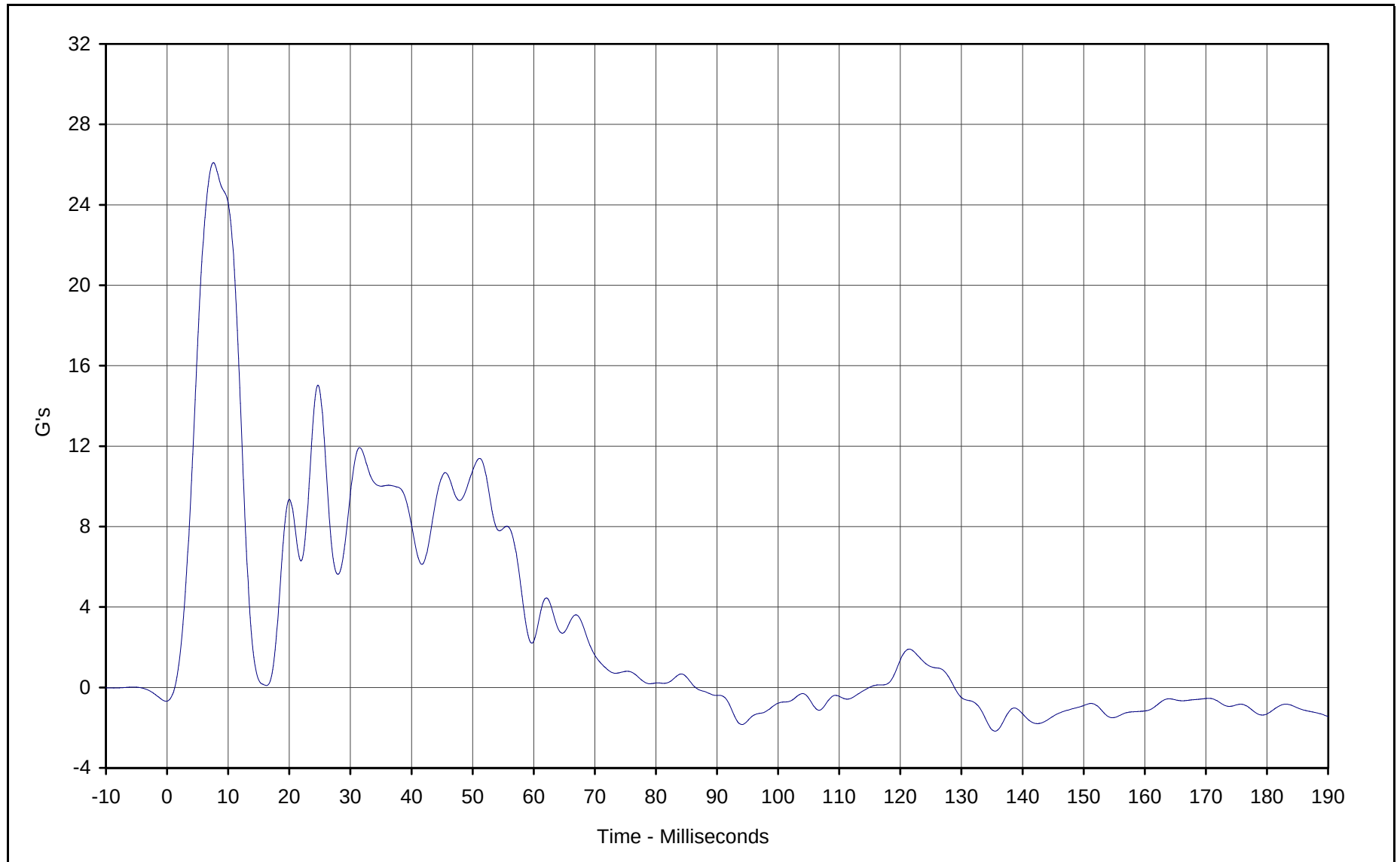




Curve Description: Vehicle CG X Velocity
Maximum Value: 0.0 at 0.0 Milliseconds
Minimum Value: -3.9 at 188.5 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-050

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

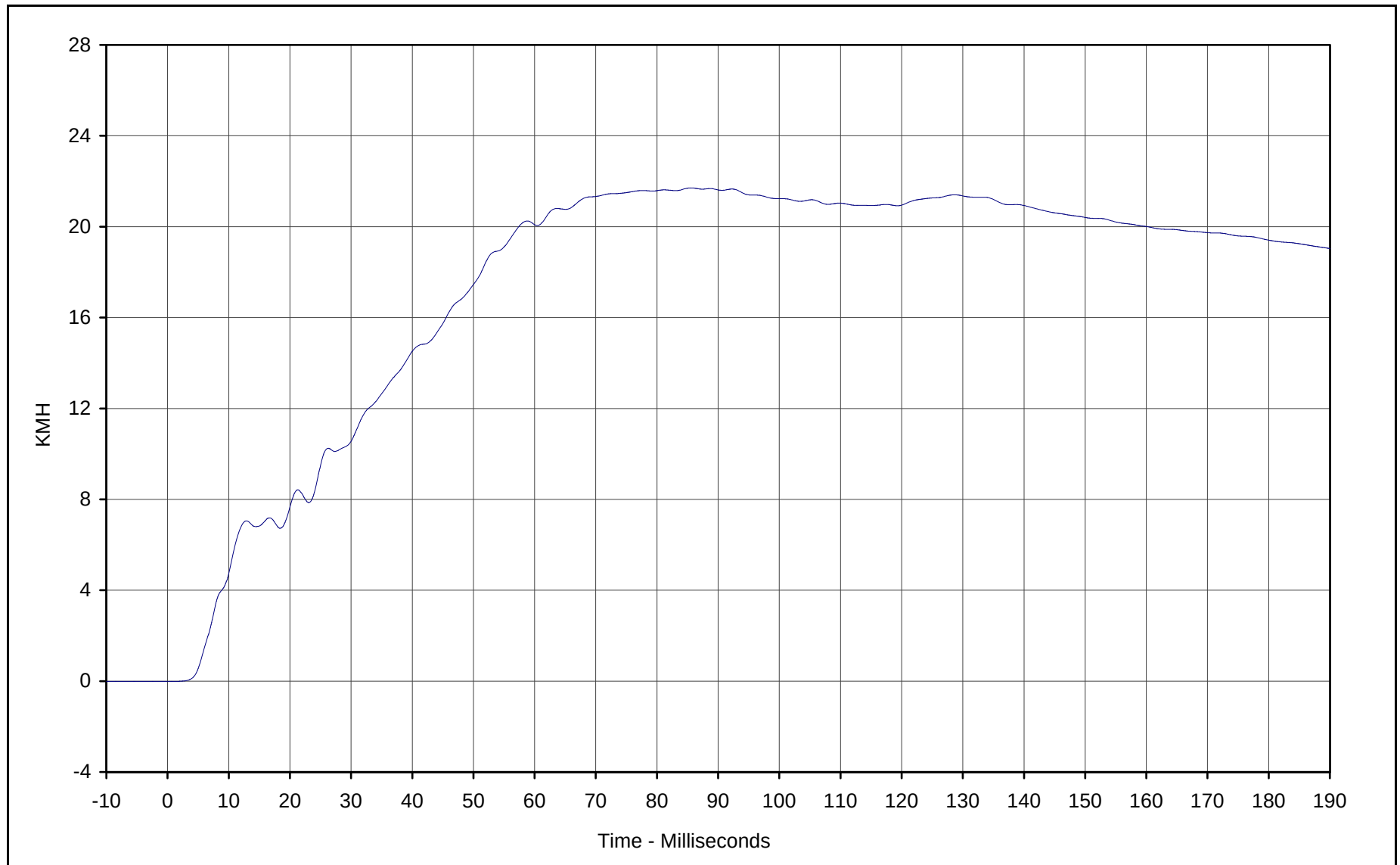




Curve Description: Vehicle CG Y
Maximum Value: 26.1 at 7.6 Milliseconds
Minimum Value: -2.2 at 135.5 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-051

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

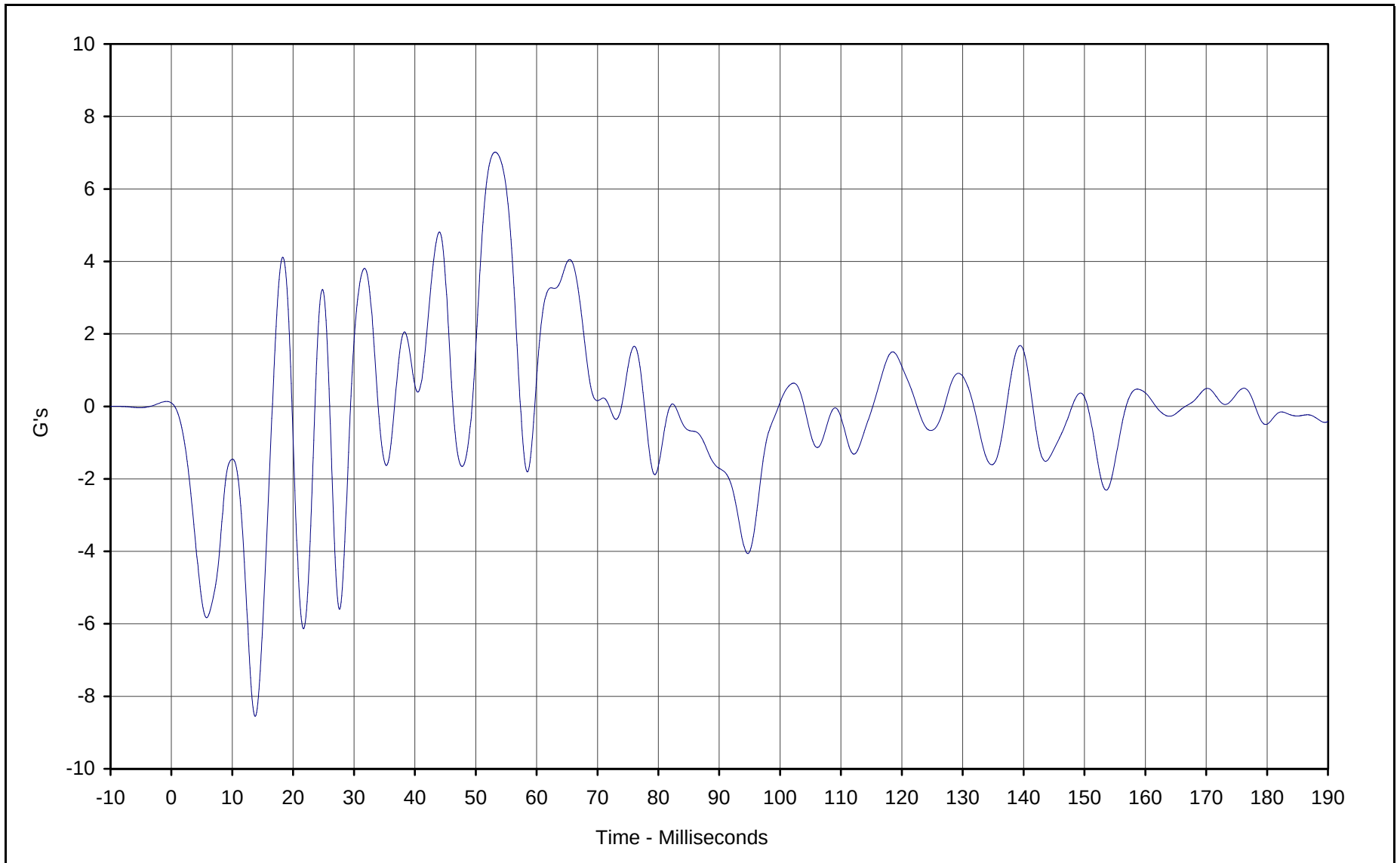




Curve Description: Vehicle CG Y Velocity
Maximum Value: 21.7 at 85.6 Milliseconds
Minimum Value: 0.0 at 1.0 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-051

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

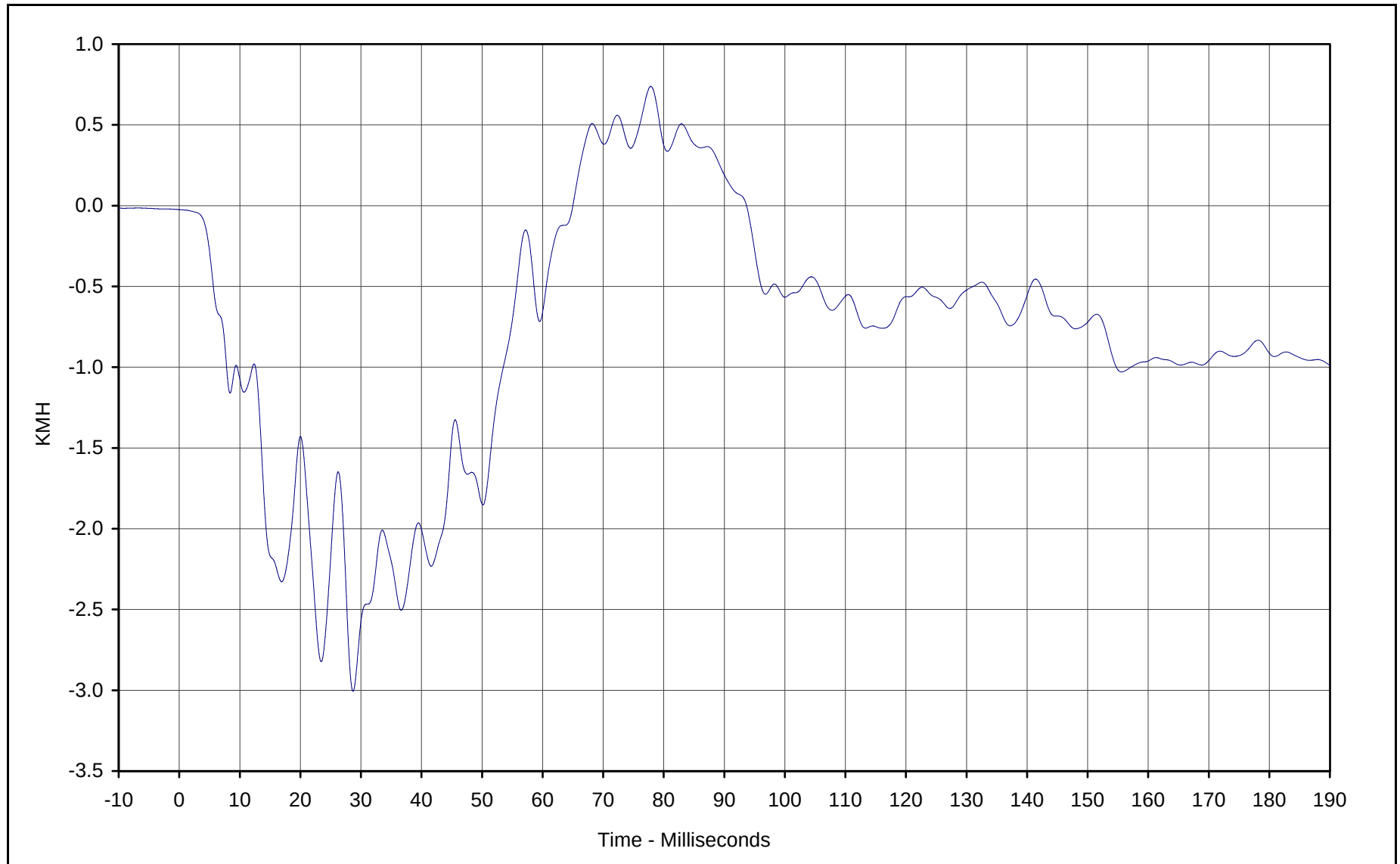




Curve Description: Vehicle CG Z
Maximum Value: 7.0 at 53.2 Milliseconds
Minimum Value: -8.5 at 13.8 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-052

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

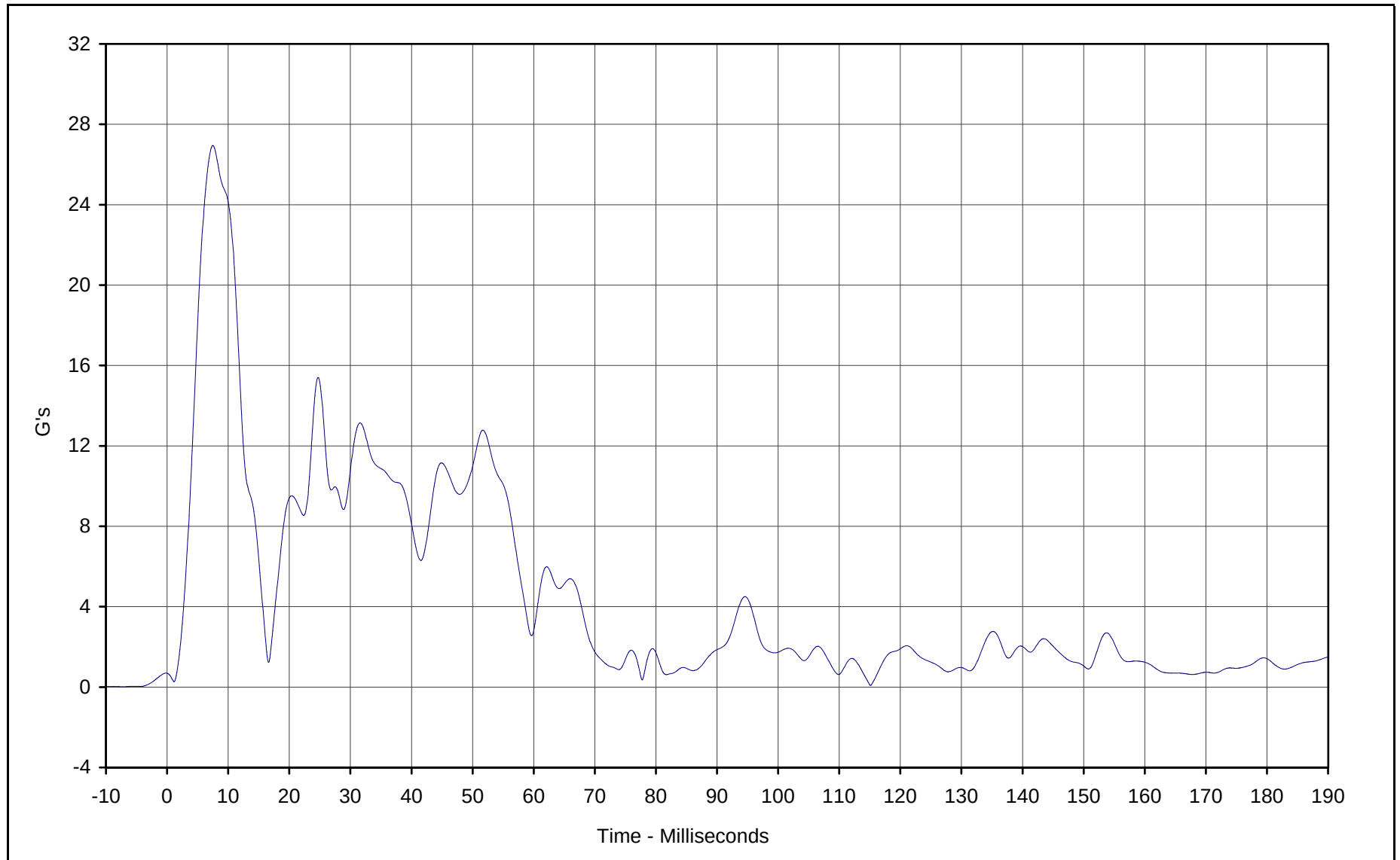




Curve Description: Vehicle CG Z Velocity
Maximum Value: 0.7 at 77.9 Milliseconds
Minimum Value: -3.0 at 28.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-052

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

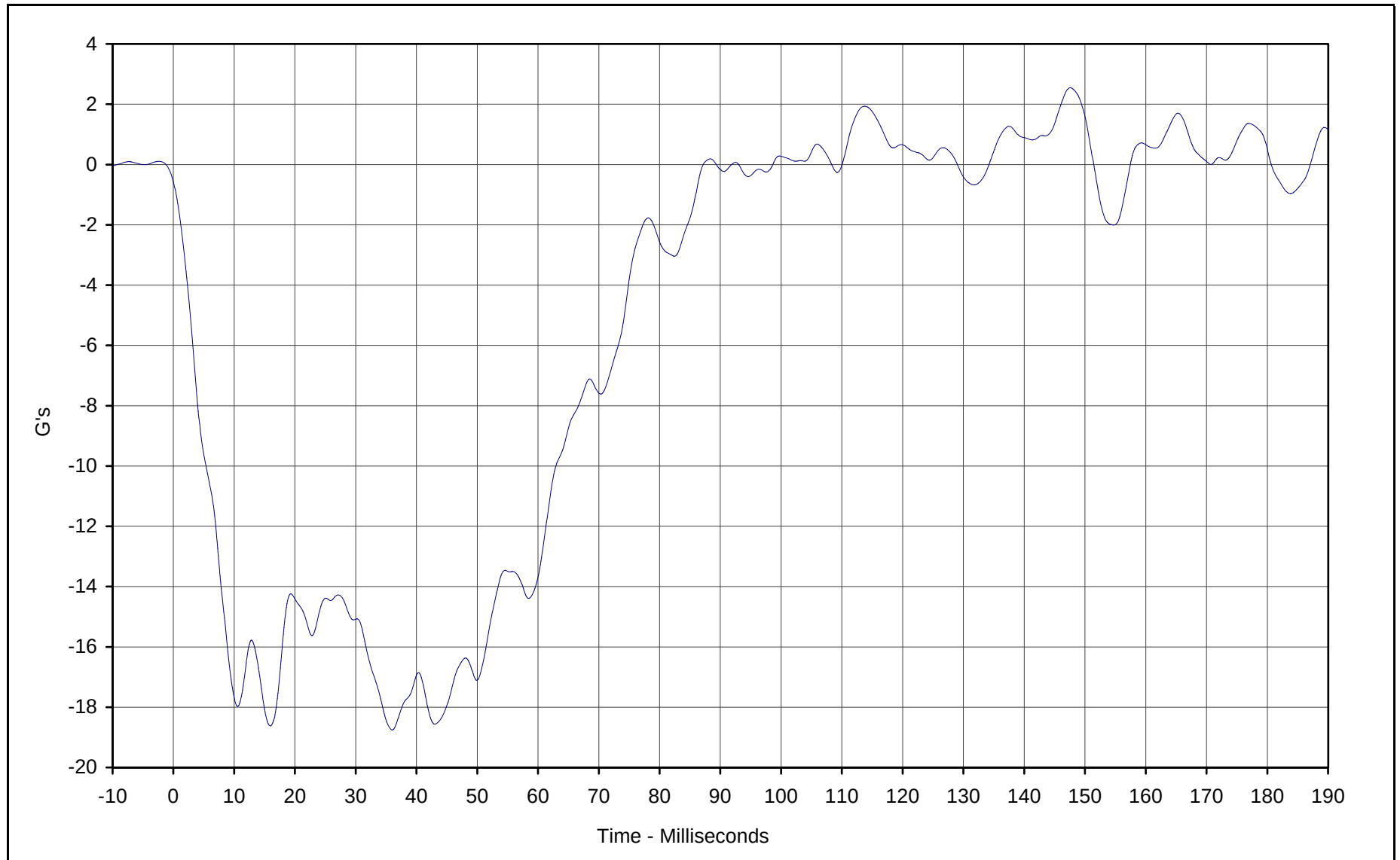




Curve Description: Vehicle CG Resultant
Maximum Value: 26.9 at 7.5 Milliseconds
Minimum Value: 0.1 at 115.1 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: RES-050

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

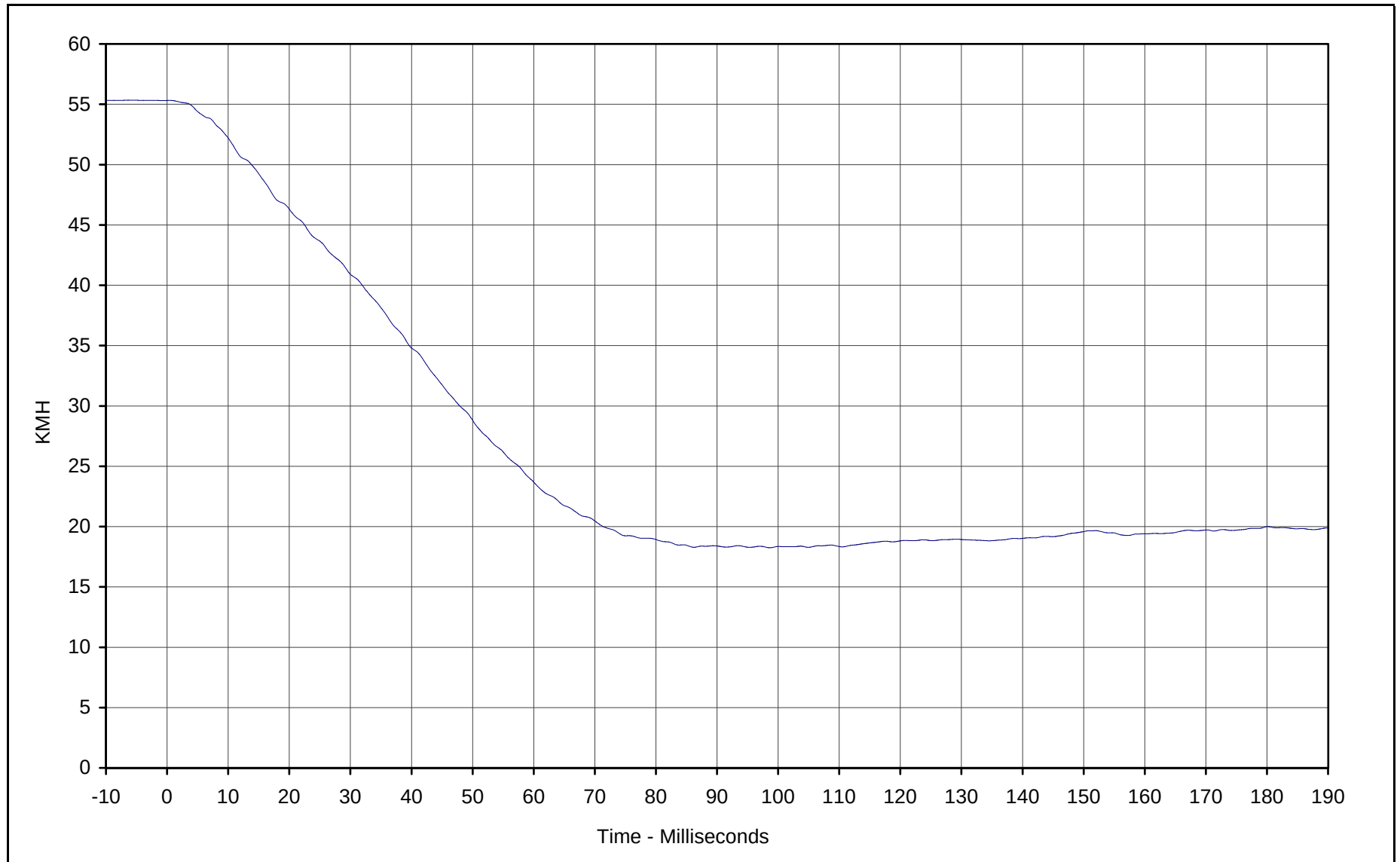




Curve Description: MDB CG X
Maximum Value: 2.5 at 147.6 Milliseconds
Minimum Value: -18.8 at 36.0 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-053

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

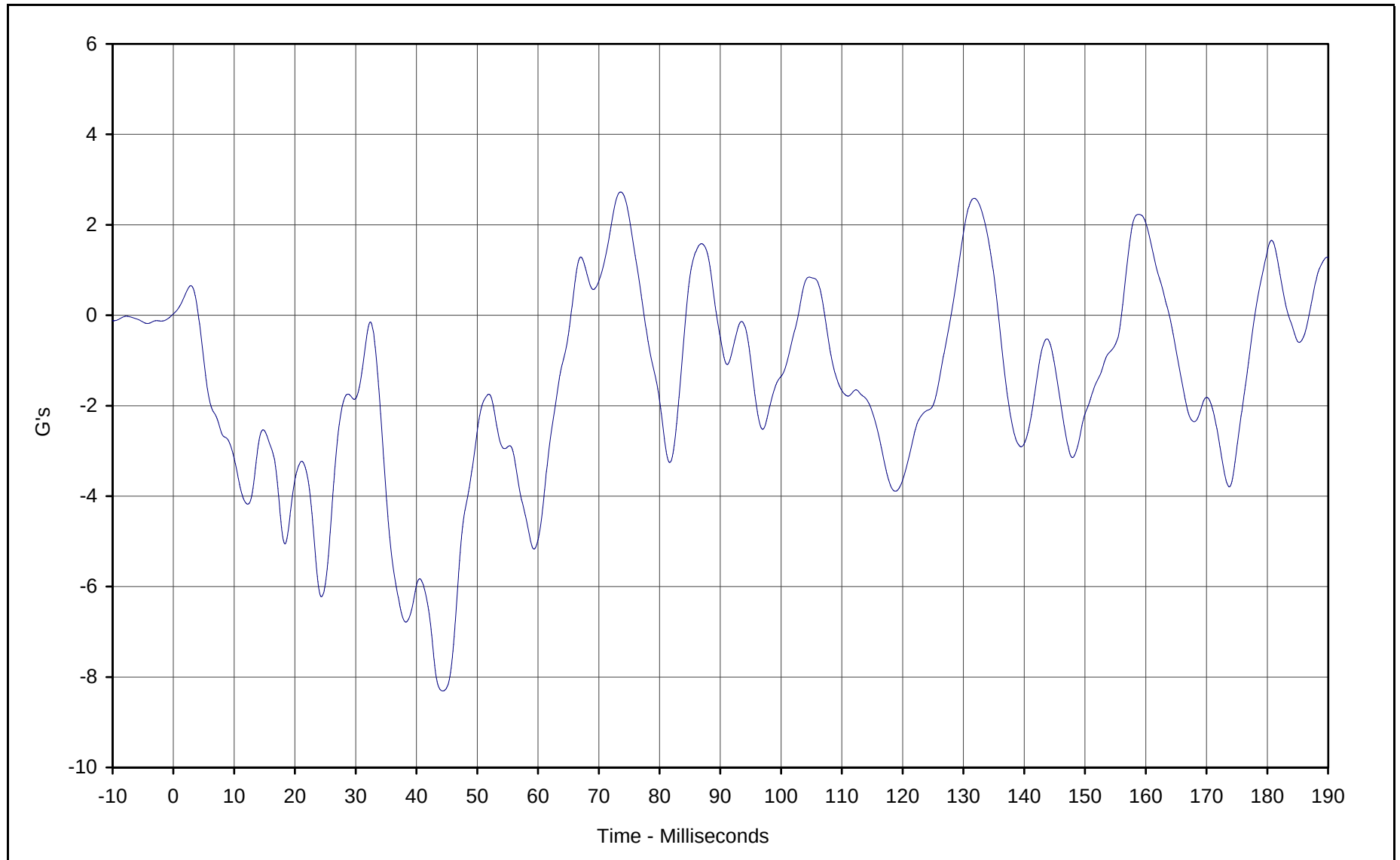




Curve Description: MDB CG X Velocity
Maximum Value: 55.3 at 0.4 Milliseconds
Minimum Value: 18.2 at 98.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-053

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

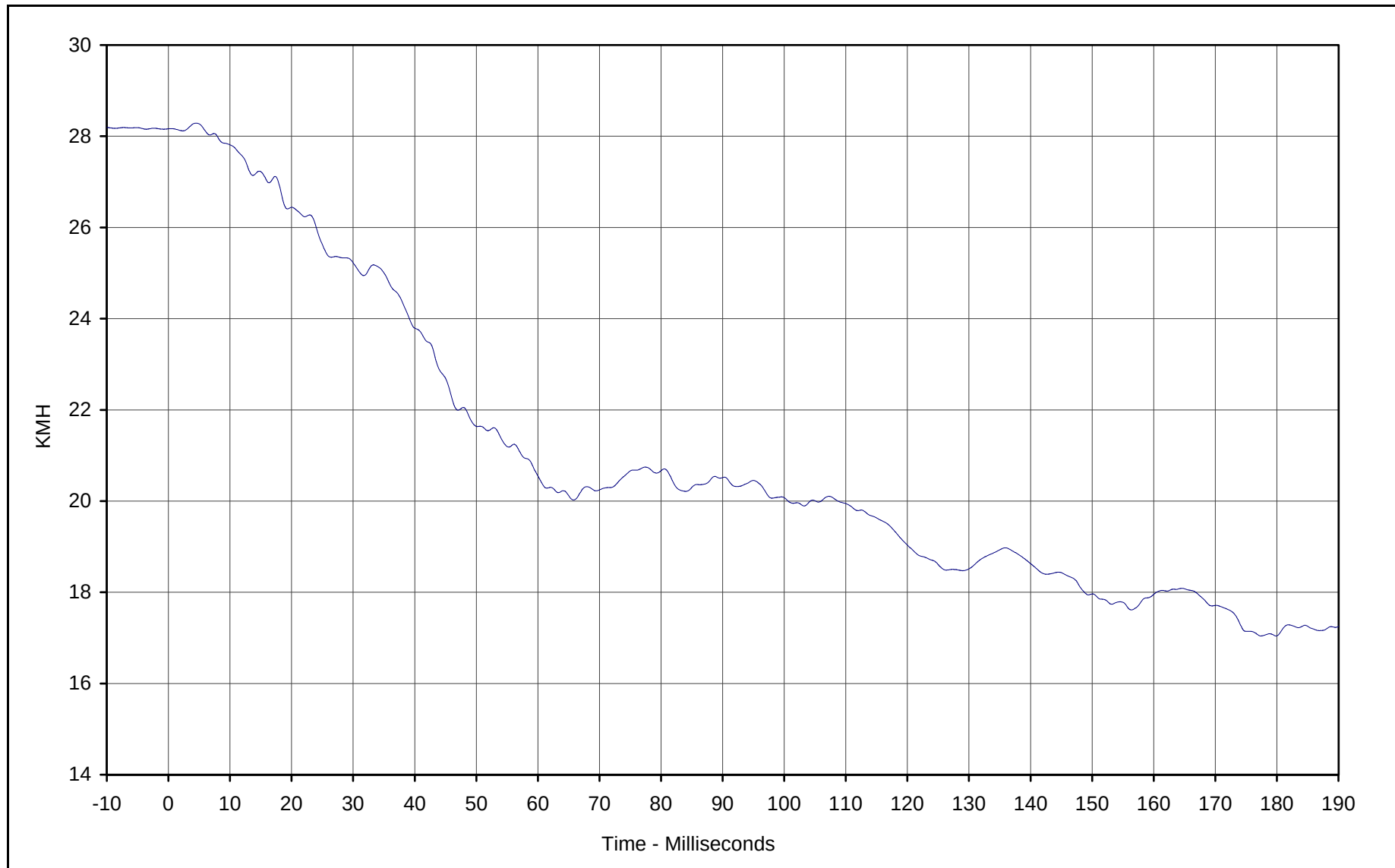




Curve Description: MDB CG Y
Maximum Value: 2.7 at 73.6 Milliseconds
Minimum Value: -8.3 at 44.3 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-054

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

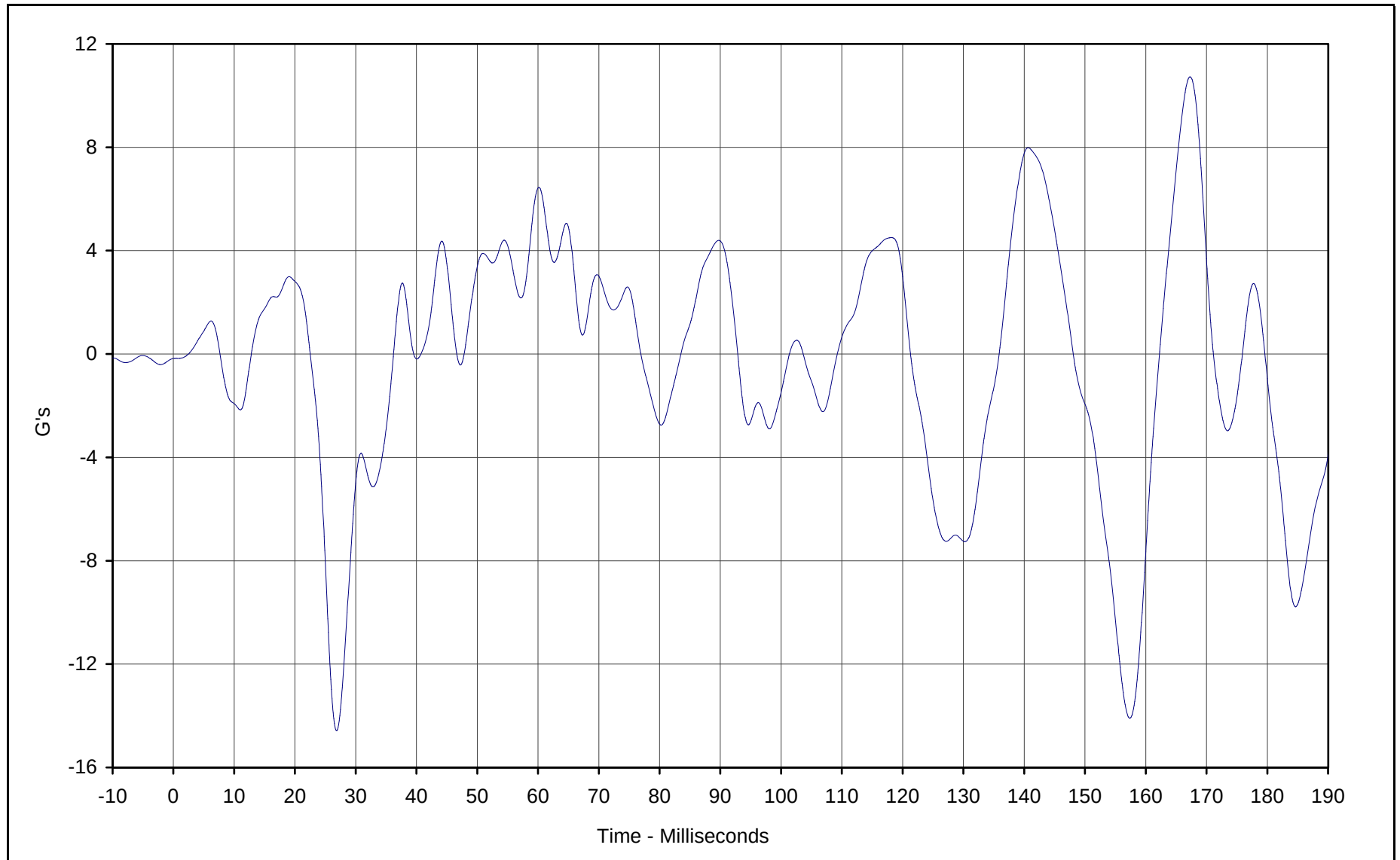




Curve Description: MDB CG Y Velocity
Maximum Value: 28.3 at 4.5 Milliseconds
Minimum Value: 17.0 at 177.4 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-054

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

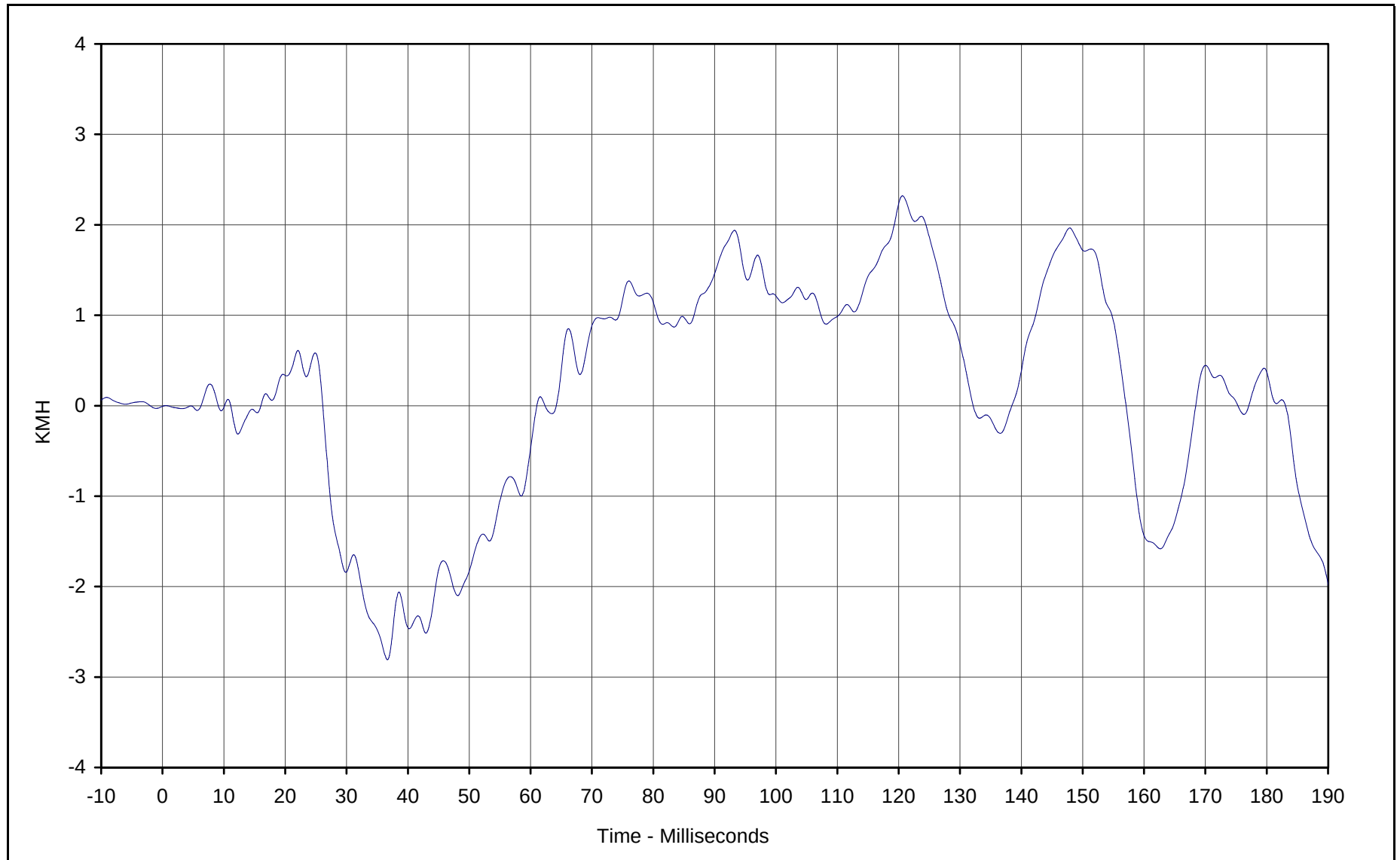




Curve Description: MDB CG Z
Maximum Value: 10.7 at 167.3 Milliseconds
Minimum Value: -14.6 at 26.9 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-055

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

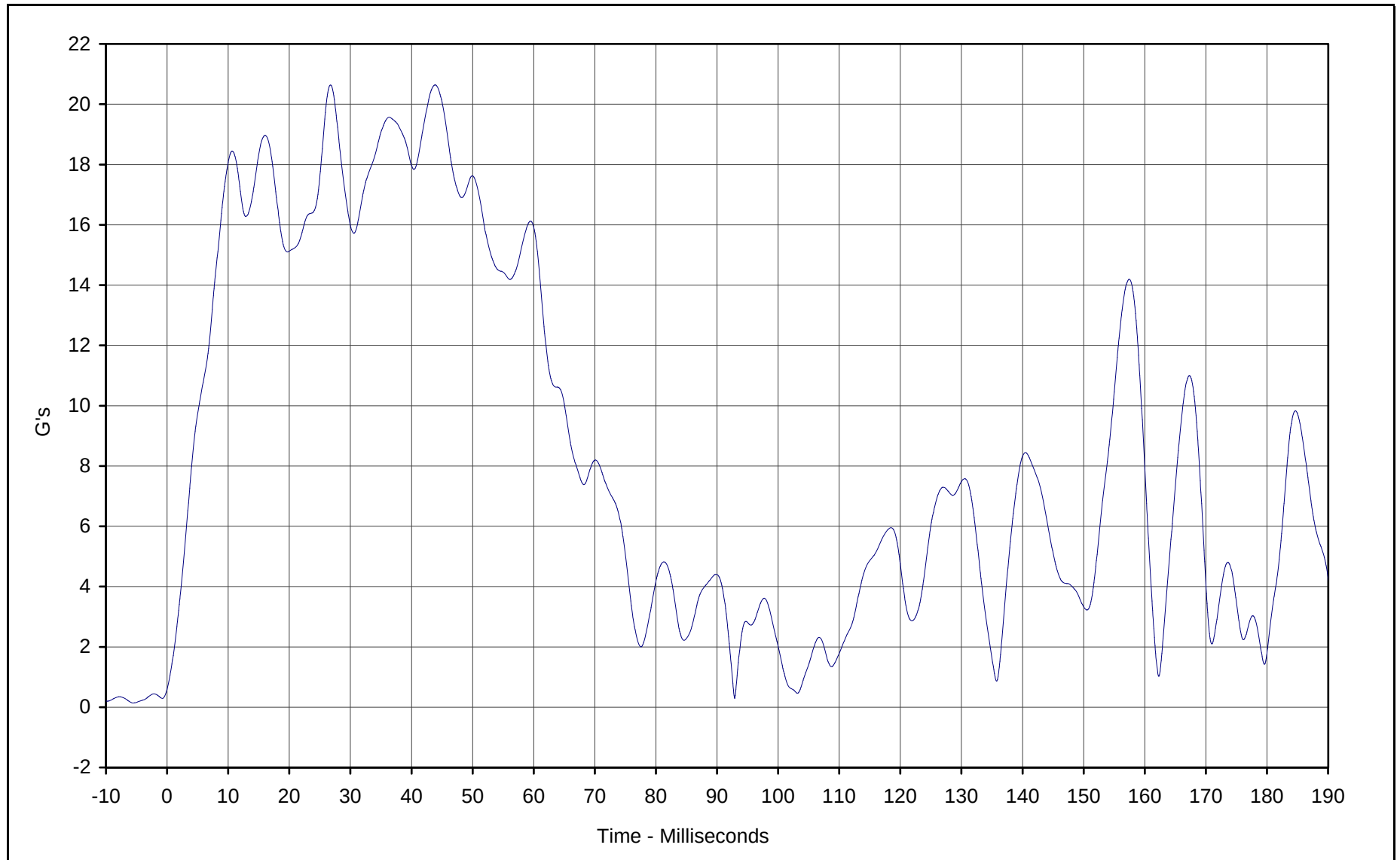




Curve Description: MDB CG Z Velocity
Maximum Value: 2.3 at 120.6 Milliseconds
Minimum Value: -2.8 at 36.7 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-055

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: MDB CG Resultant

Maximum Value: 20.6 at 43.9 Milliseconds

Minimum Value: 0.3 at 92.9 Milliseconds

SAE Filter Class: 60

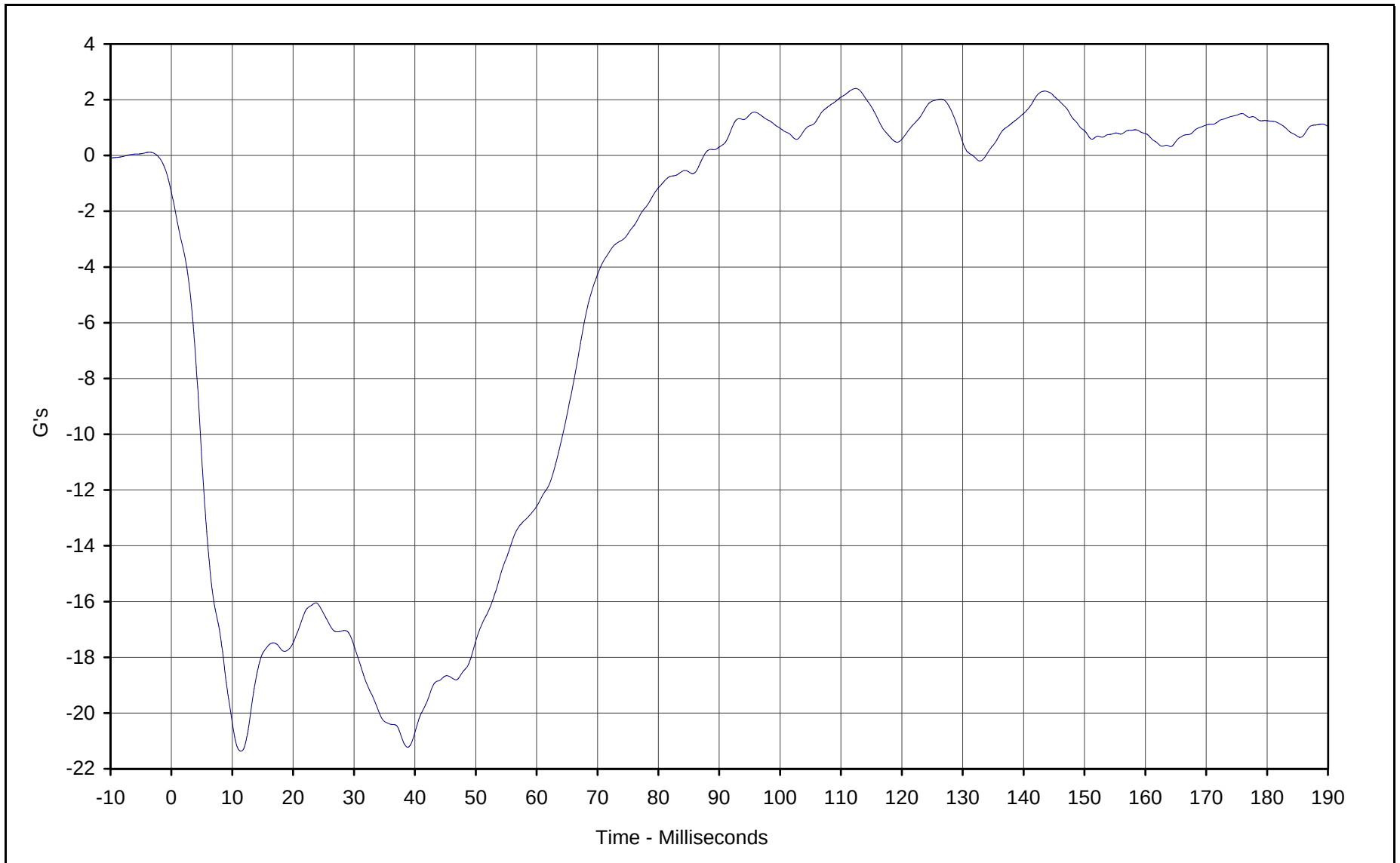
Date of Test: 12/05/00

Curve Number: RES-053

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

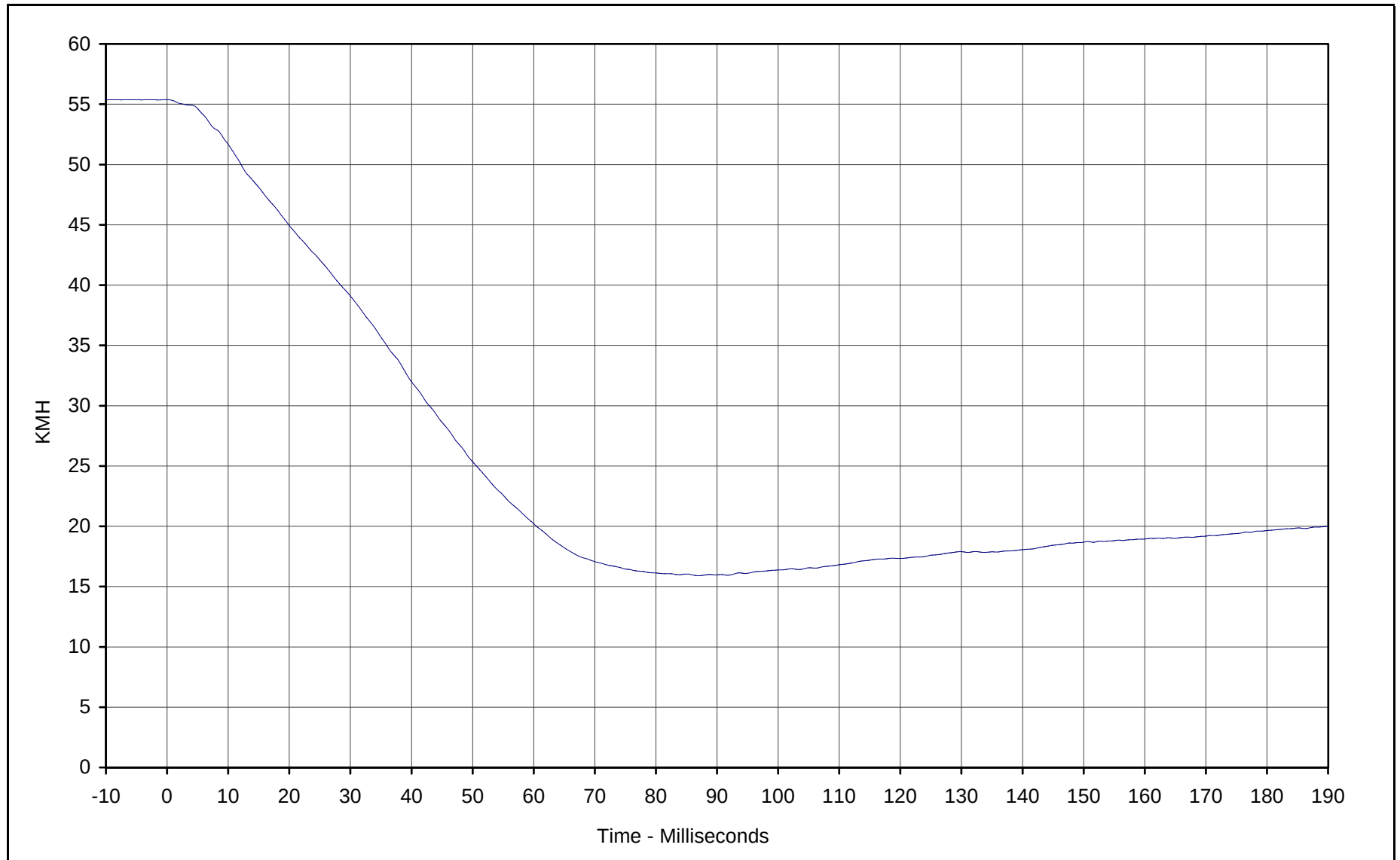




Curve Description: MDB Rear X
Maximum Value: 2.4 at 112.4 Milliseconds
Minimum Value: -21.4 at 11.4 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-056

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

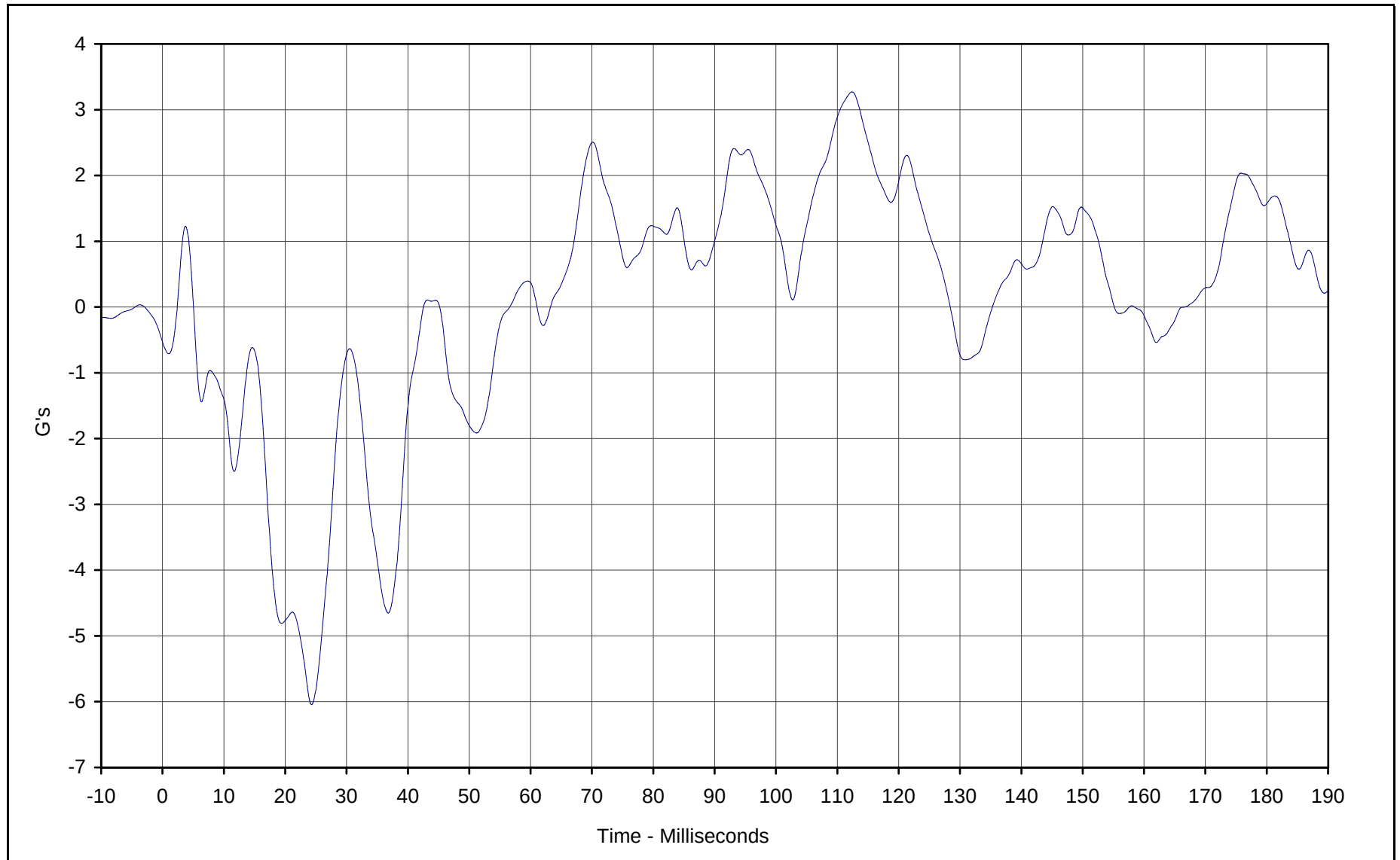




Curve Description: MDB Rear X Velocity
Maximum Value: 55.4 at 0.0 Milliseconds
Minimum Value: 15.9 at 86.9 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-056

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

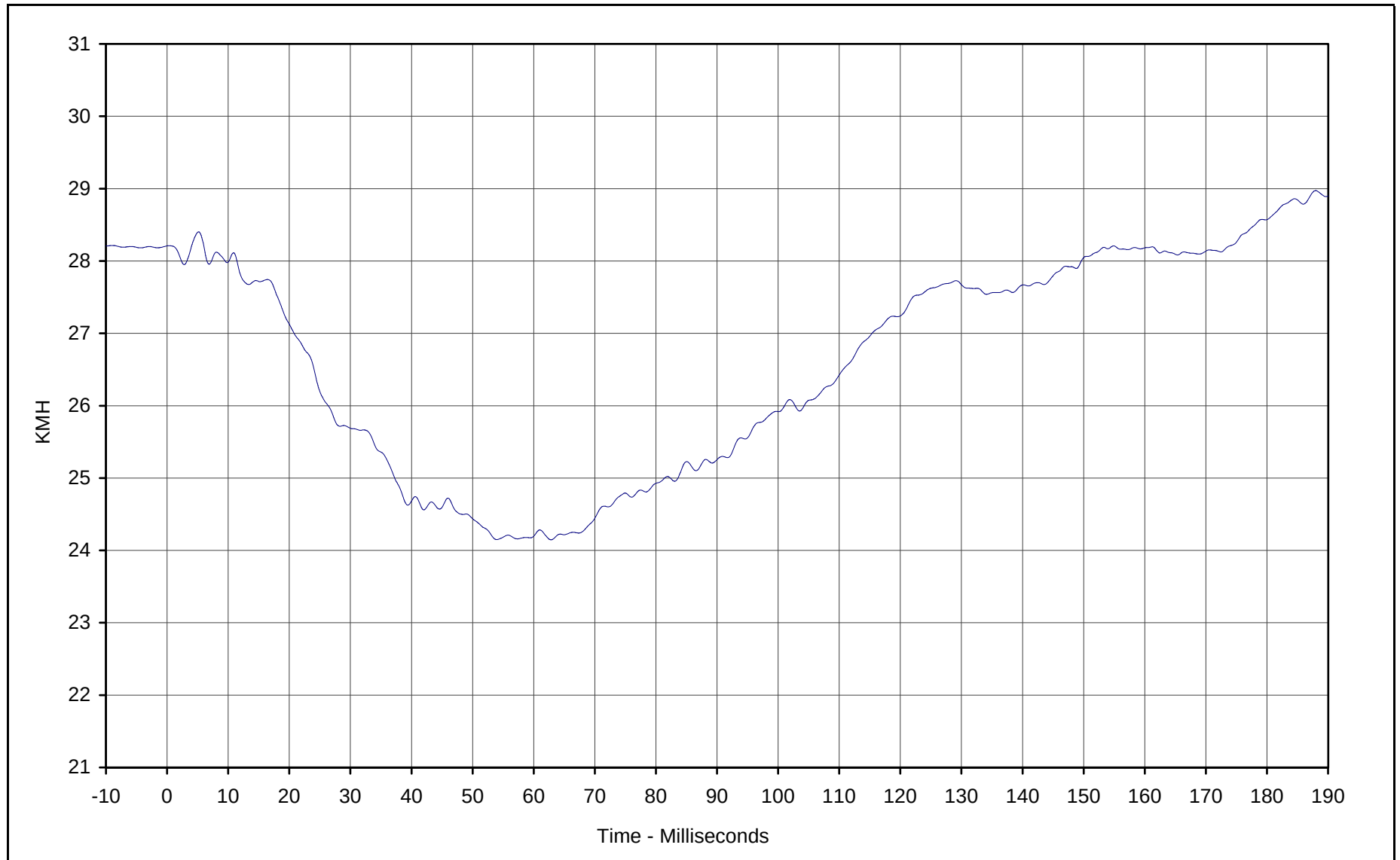




Curve Description: MDB Rear Y
Maximum Value: 3.3 at 112.4 Milliseconds
Minimum Value: -6.0 at 24.3 Milliseconds
SAE Filter Class: 60
Date of Test: 12/05/00
Curve Number: FIL-057

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

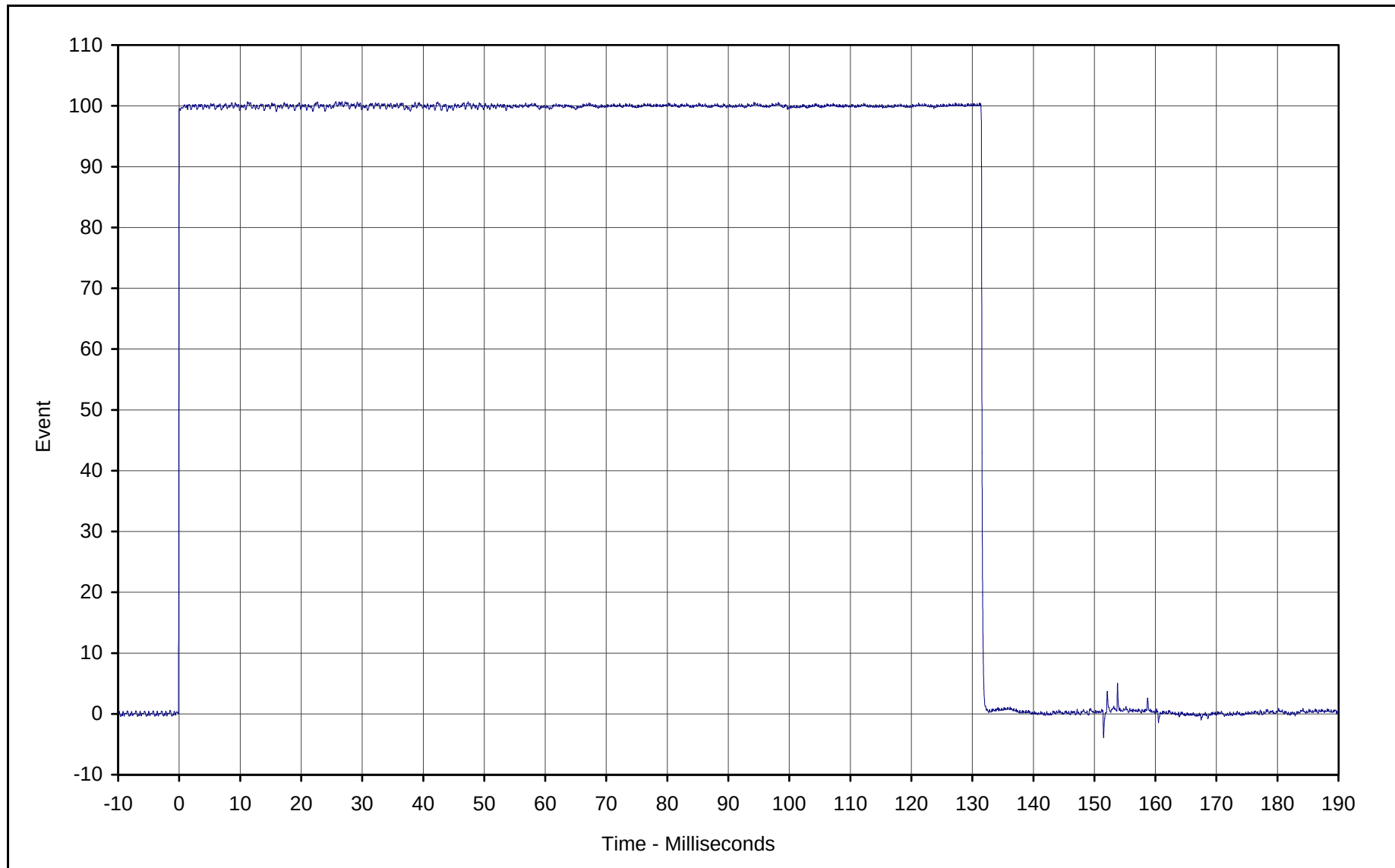




Curve Description: MDB Rear Y Velocity
Maximum Value: 29.0 at 188.0 Milliseconds
Minimum Value: 24.1 at 62.8 Milliseconds
SAE Filter Class: 180
Date of Test: 12/05/00
Curve Number: IN1-057

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

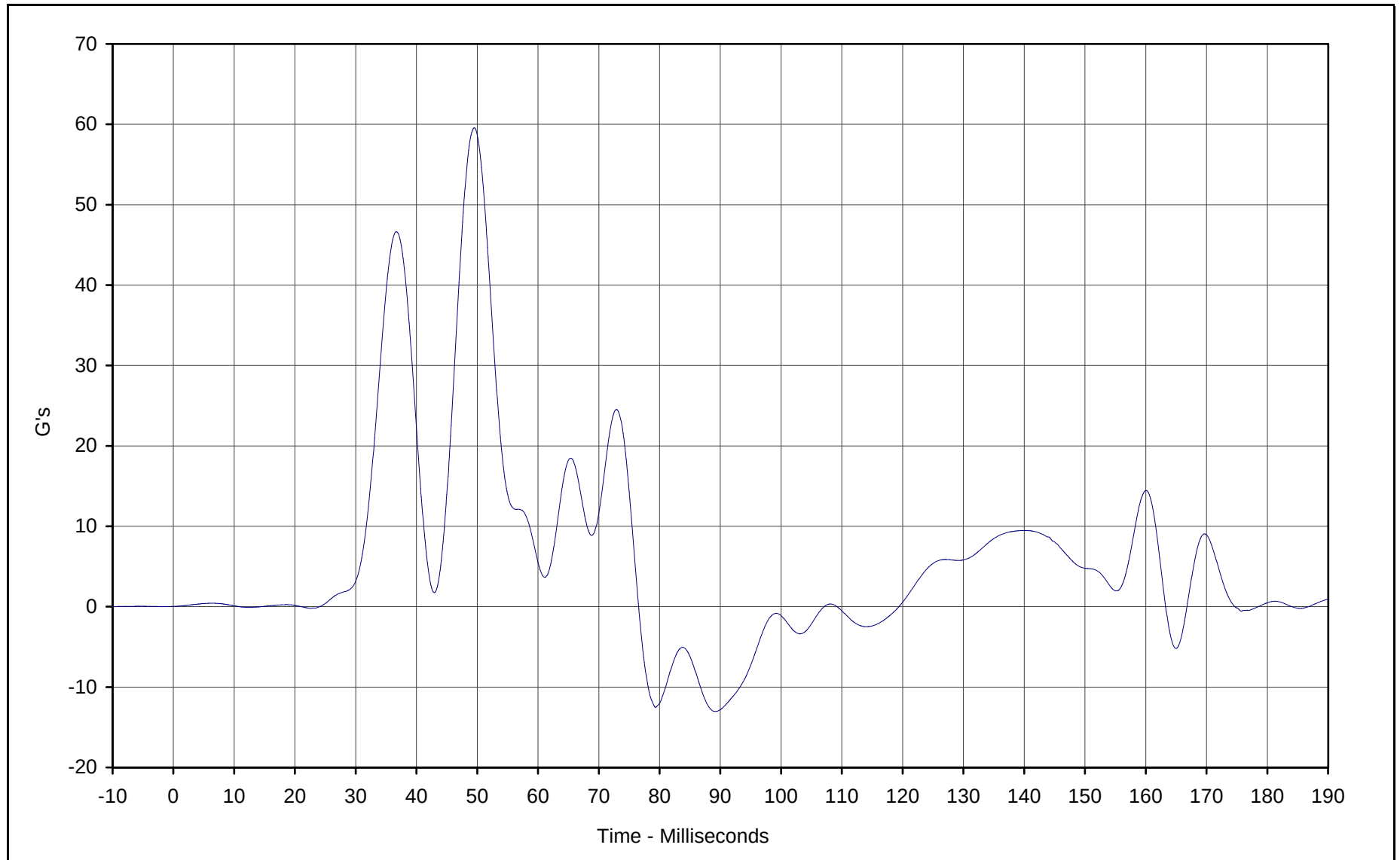




Curve Description: MDB Right Bumper Contact
Maximum Value: 100.7 at 11.2 Milliseconds
Crossing Point: 50% at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/05/00
Curve Number: FIL-058

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

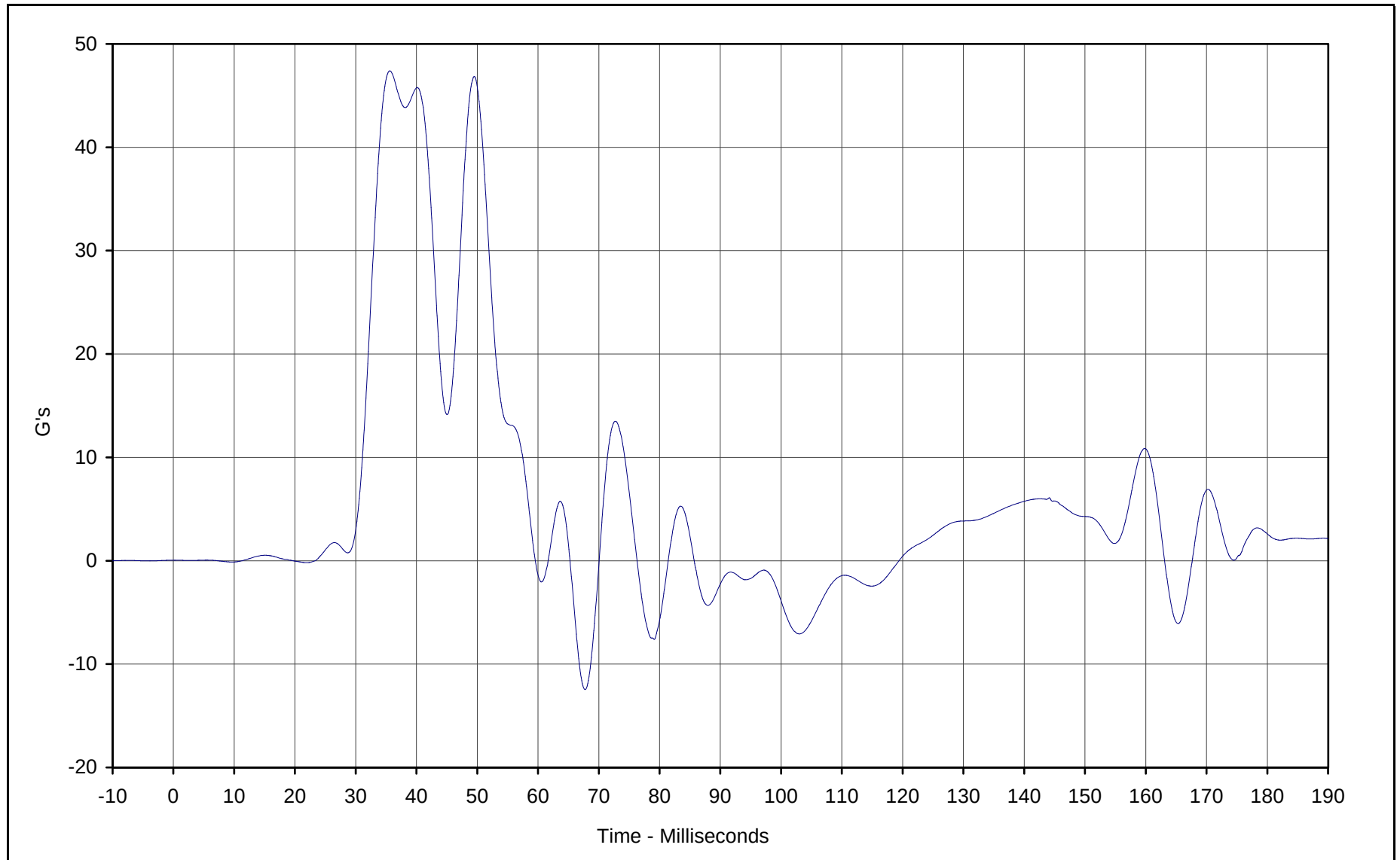




Curve Description: Driver Upper Rib Primary Y
Maximum Value: 59.6 at 49.5 Milliseconds
Minimum Value: -13.0 at 89.2 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-004

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

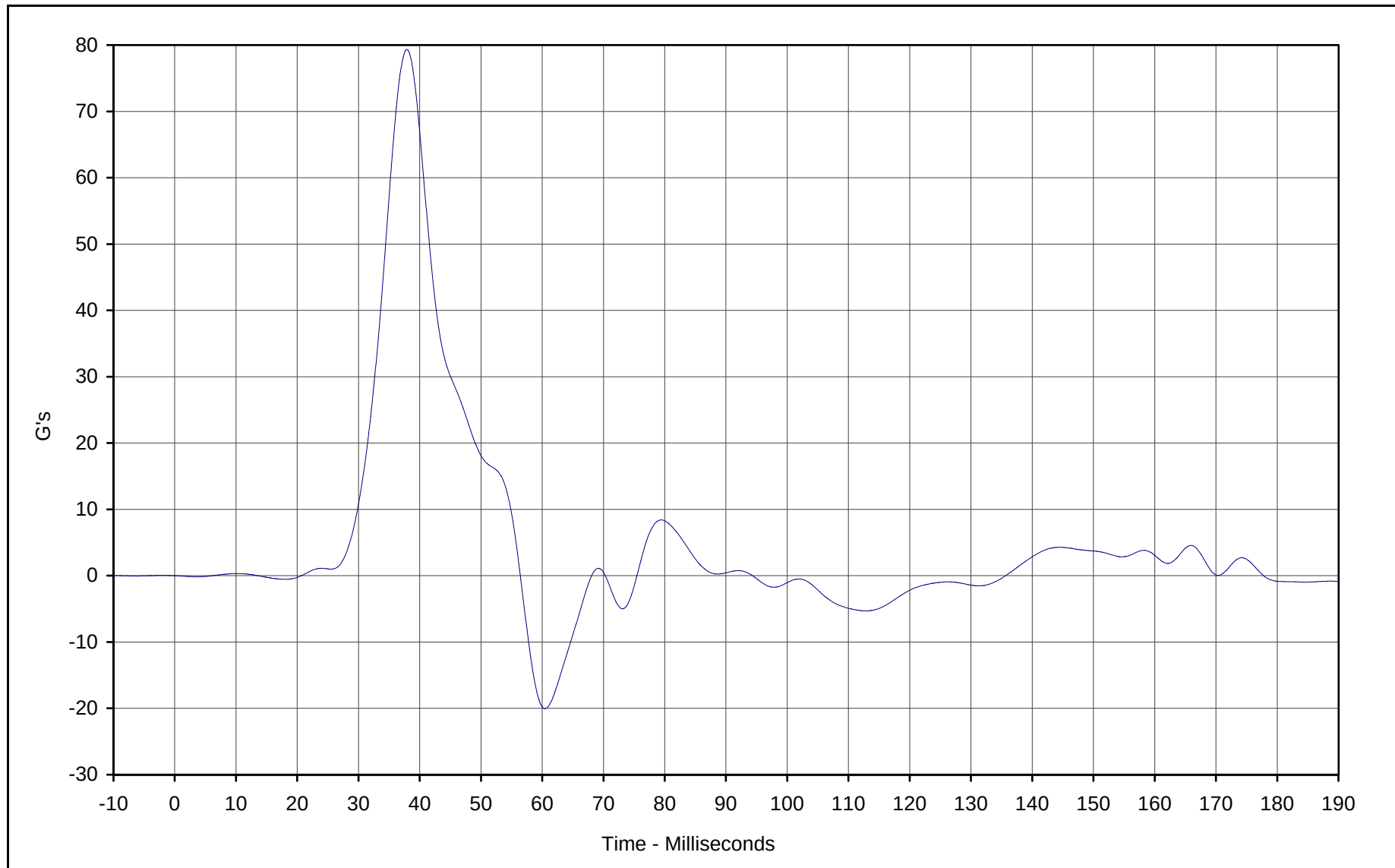




Curve Description: Driver Lower Rib Primary Y
Maximum Value: 47.4 at 35.6 Milliseconds
Minimum Value: -12.5 at 67.8 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-005

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

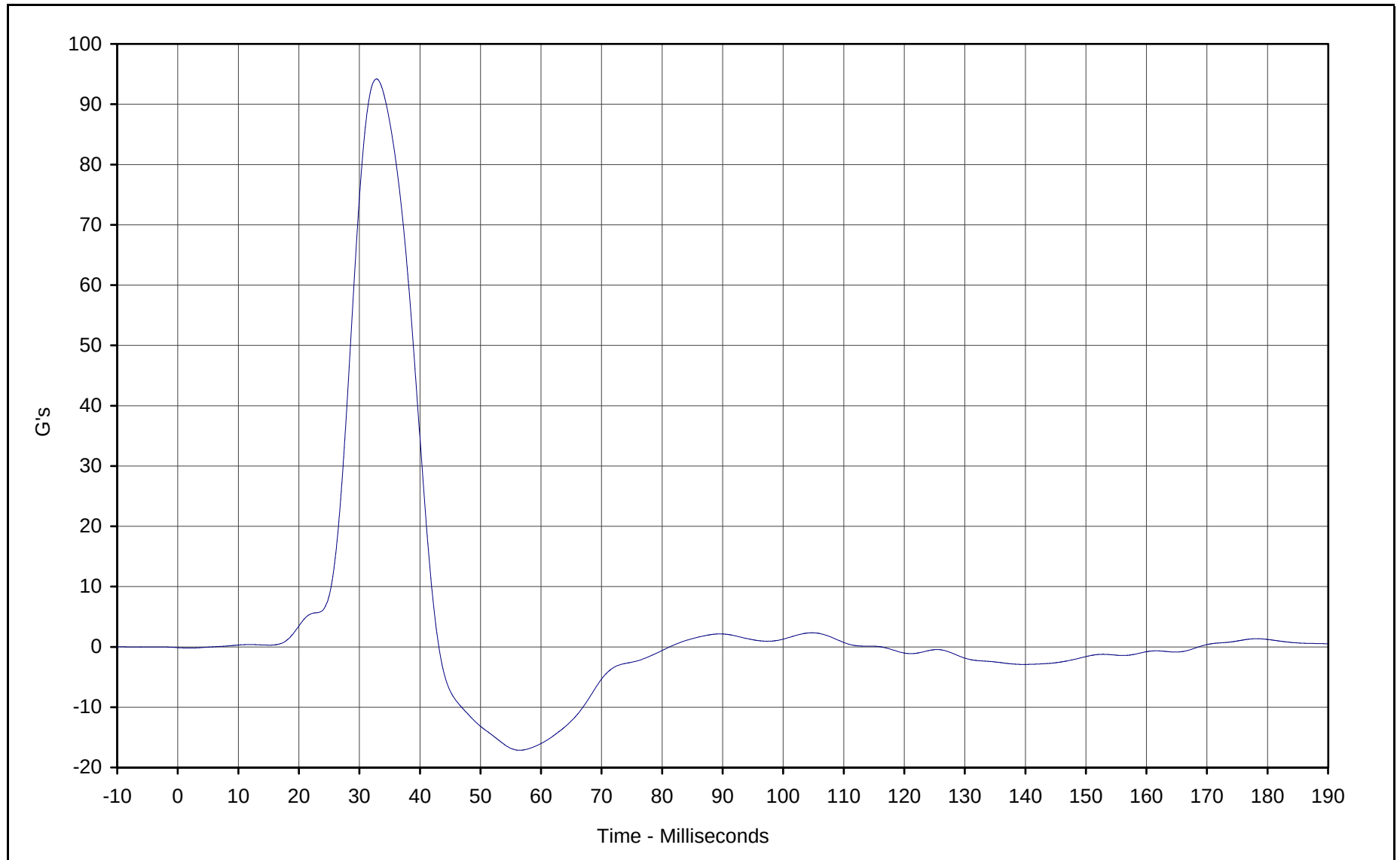




Curve Description: Driver Lower Spine Primary Y
Maximum Value: 79.3 at 37.9 Milliseconds
Minimum Value: -20.1 at 60.4 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-006

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

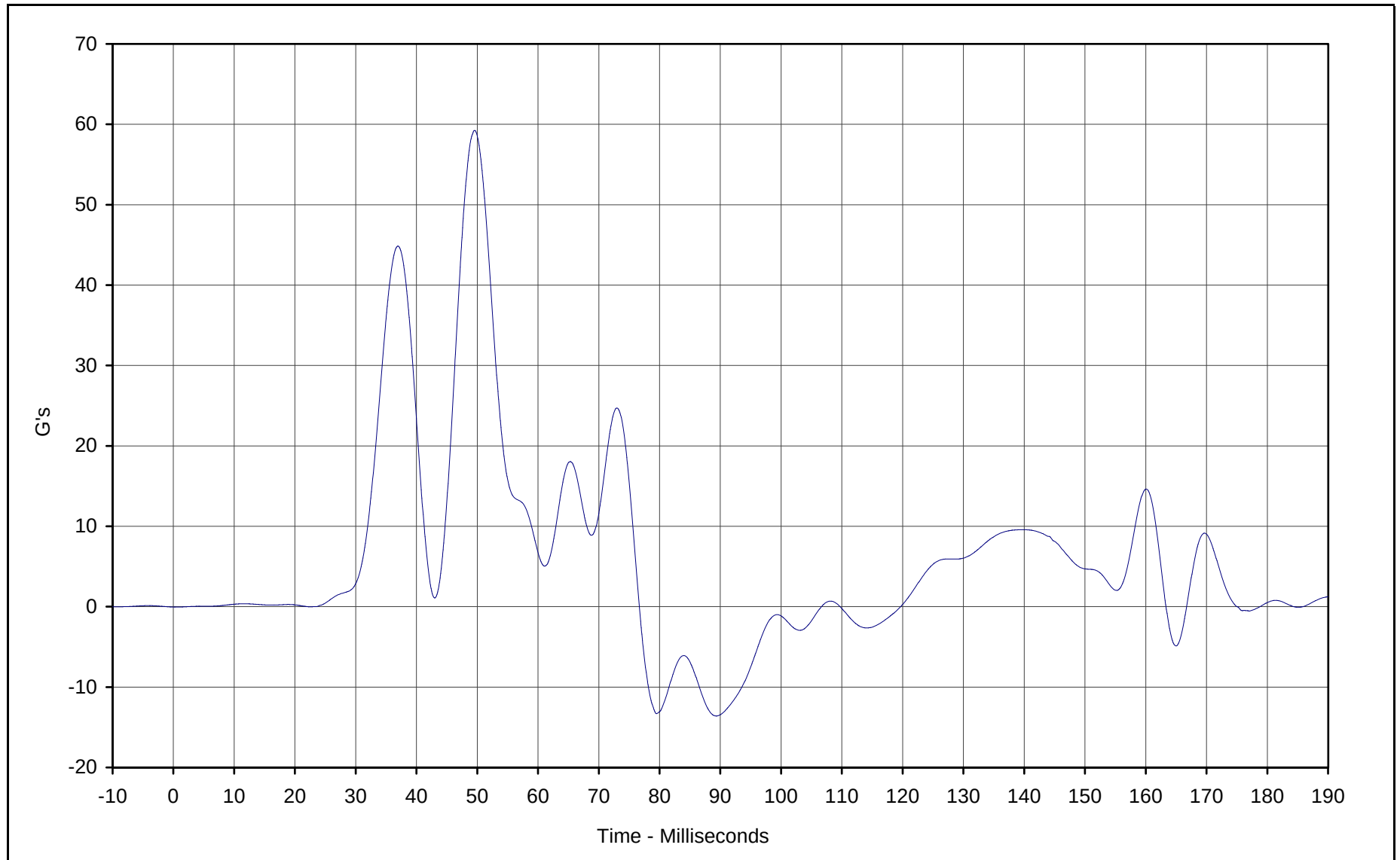




Curve Description: Driver Pelvis Primary Y
Maximum Value: 94.2 at 32.8 Milliseconds
Minimum Value: -17.1 at 56.5 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-007

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

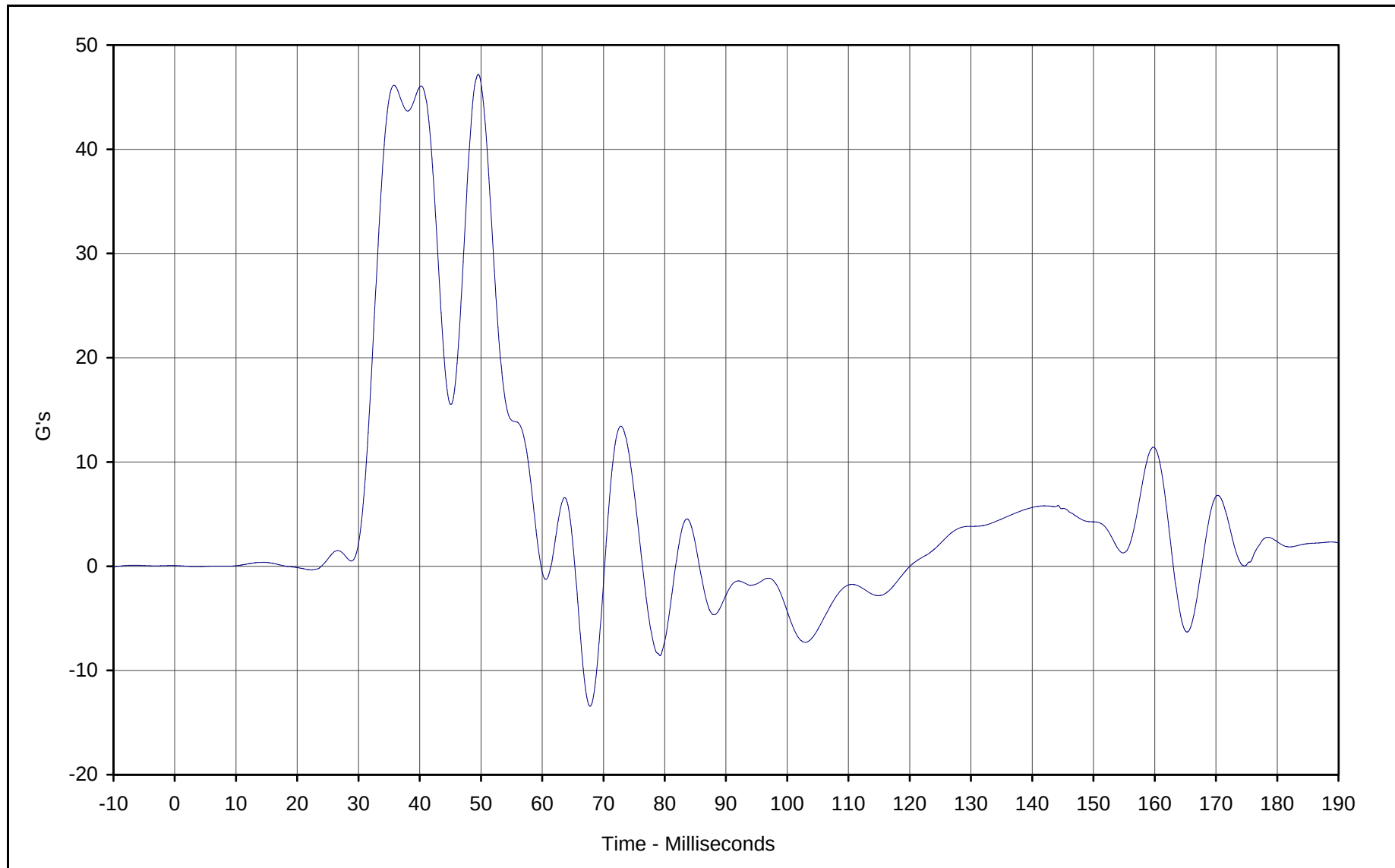




Curve Description: Driver Upper Rib Redundant Y
Maximum Value: 59.2 at 49.6 Milliseconds
Minimum Value: -13.6 at 89.3 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-008

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

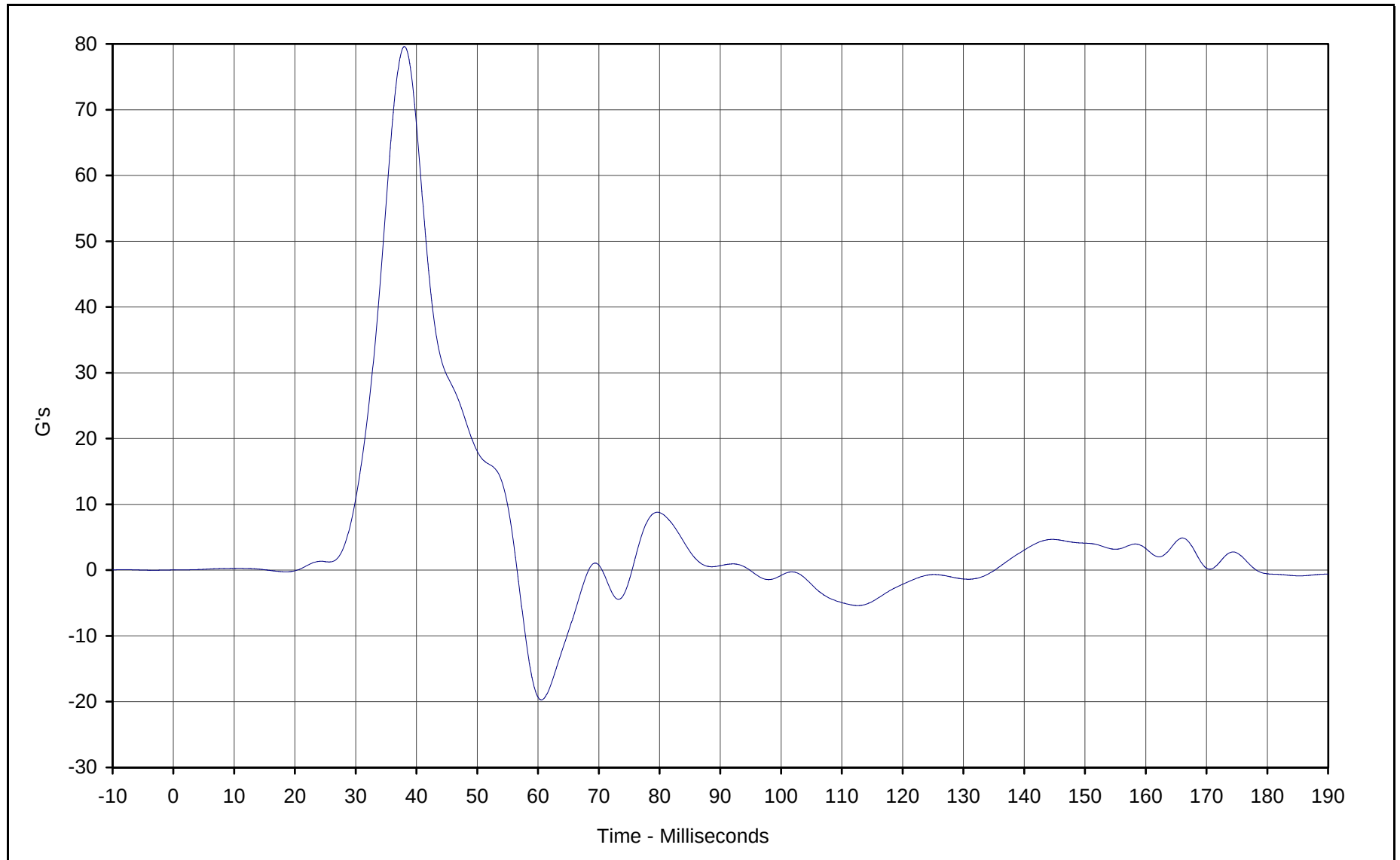




Curve Description: Driver Lower Rib Redundant Y
Maximum Value: 47.2 at 49.5 Milliseconds
Minimum Value: -13.4 at 67.8 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-009

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

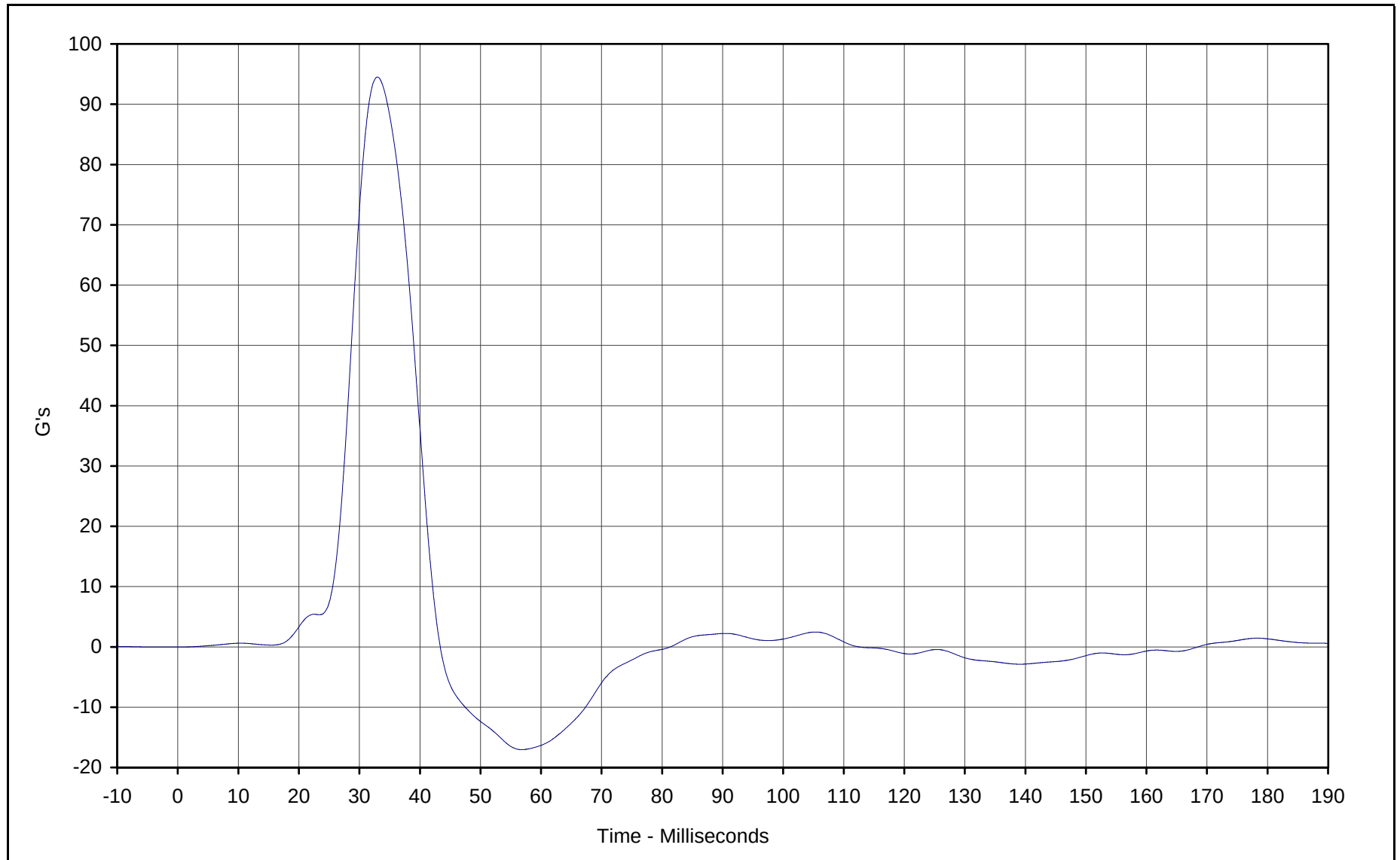




Curve Description: Driver Lower Spine Redundant Y
Maximum Value: 79.6 at 38.0 Milliseconds
Minimum Value: -19.7 at 60.6 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-010

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

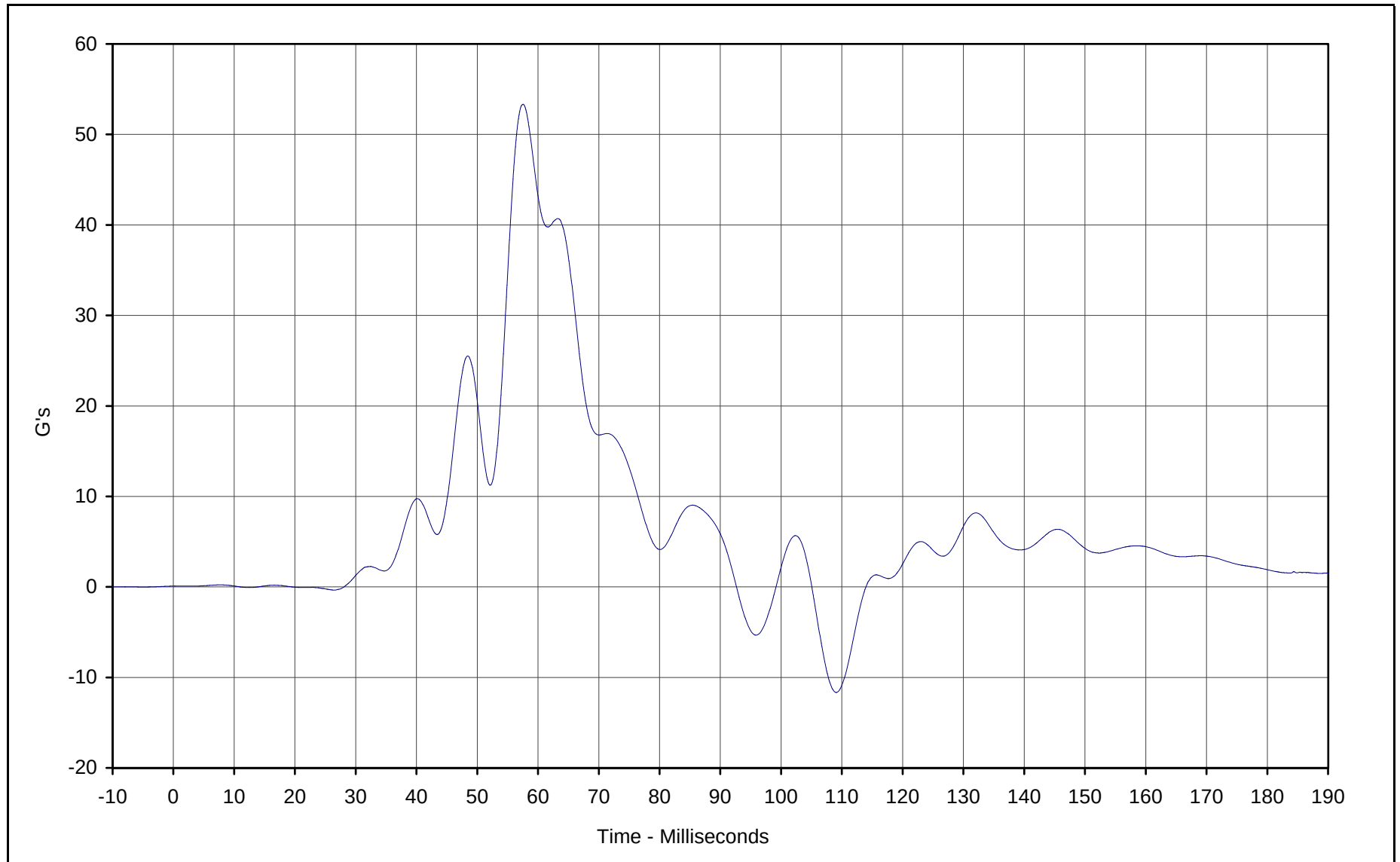




Curve Description: Driver Pelvis Redundant Y
Maximum Value: 94.5 at 33.0 Milliseconds
Minimum Value: -17.1 at 56.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-011

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

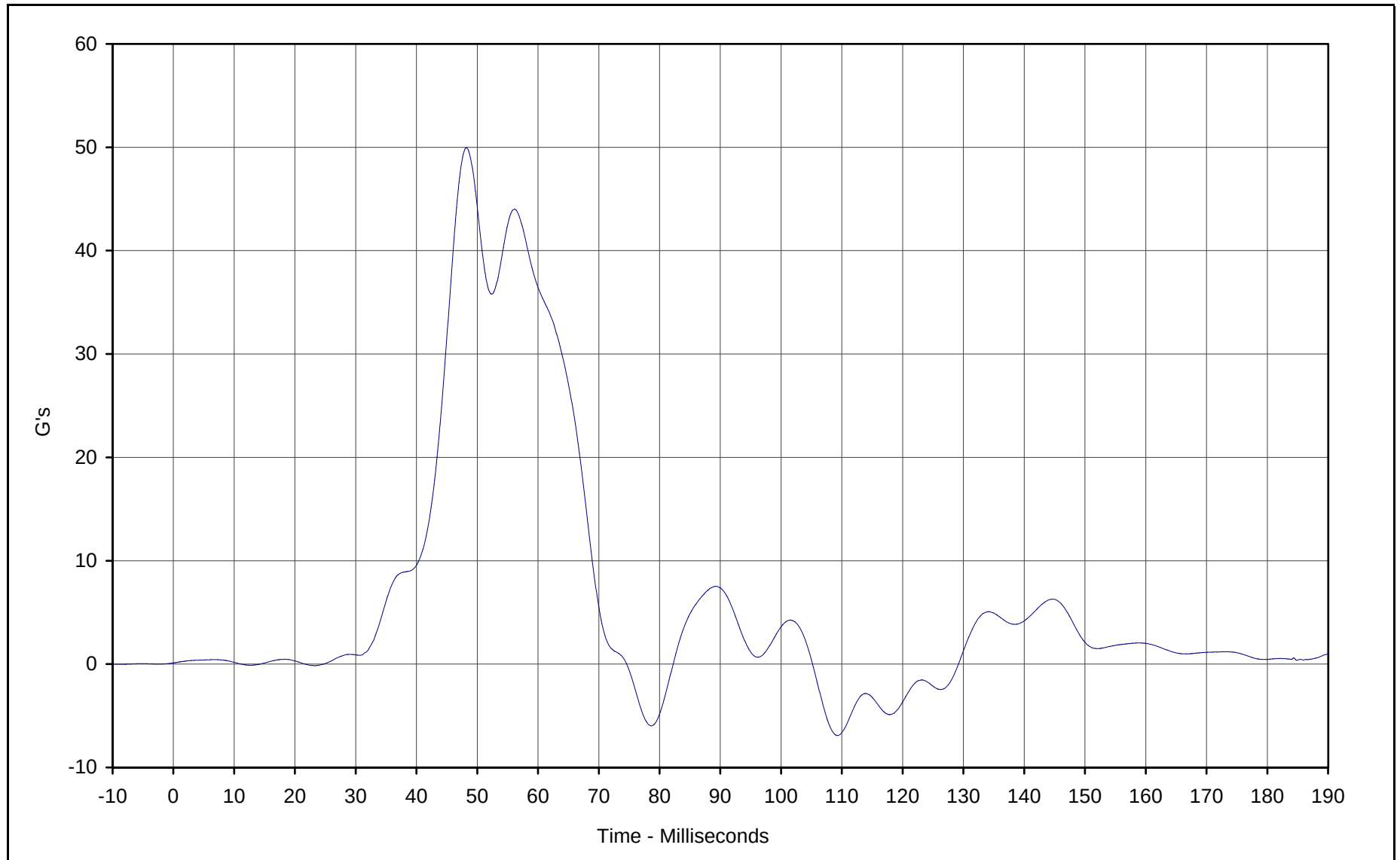




Curve Description: Pass. Upper Rib Primary Y
Maximum Value: 53.3 at 57.5 Milliseconds
Minimum Value: -11.7 at 109.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-017

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

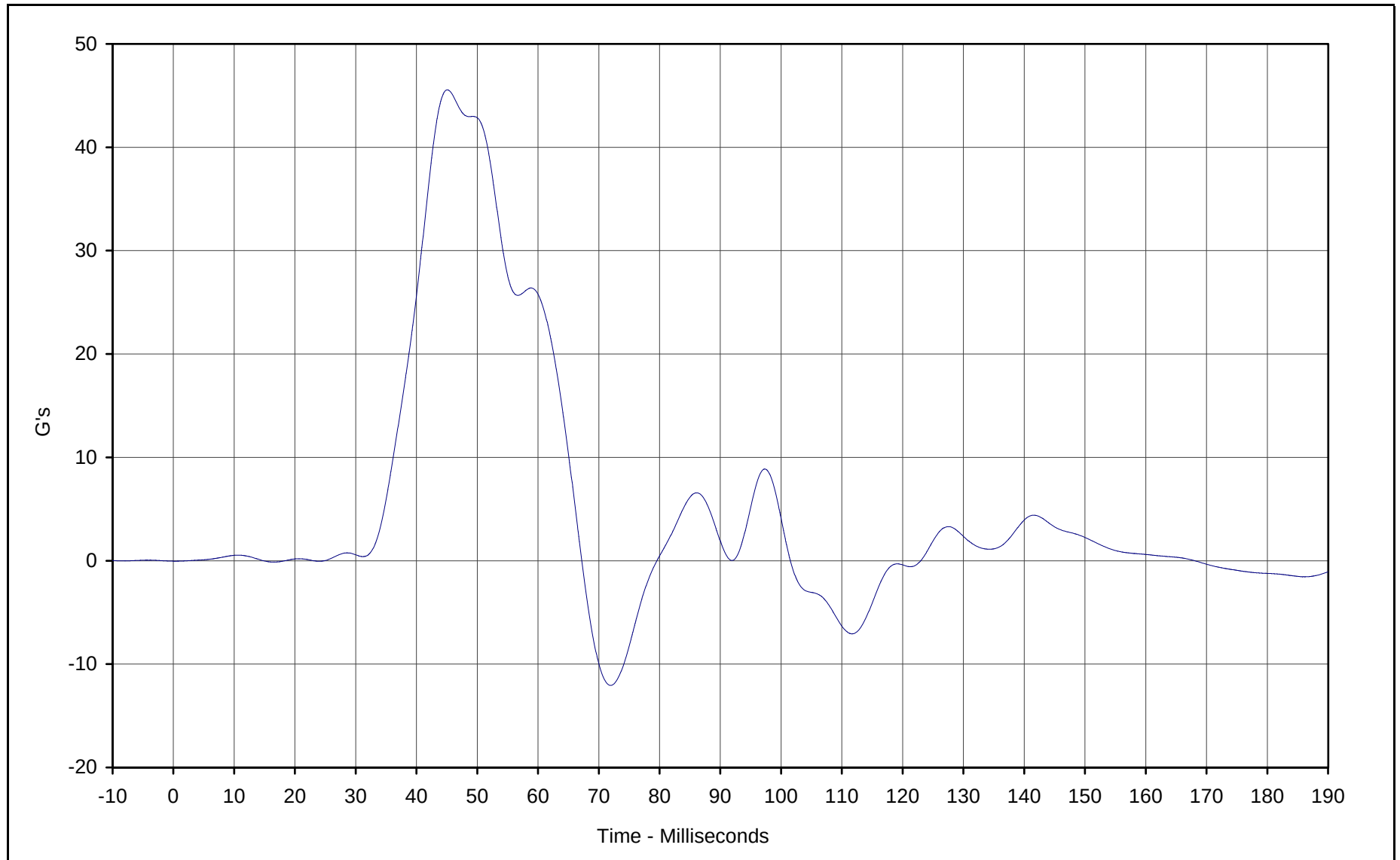




Curve Description: Pass. Lower Rib Primary Y
Maximum Value: 49.9 at 48.2 Milliseconds
Minimum Value: -6.9 at 109.3 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-018

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Pass. Lower Spine Primary Y

Maximum Value: 45.6 at 45.1 Milliseconds

Minimum Value: -12.1 at 71.9 Milliseconds

SAE Filter Class: FIR 100

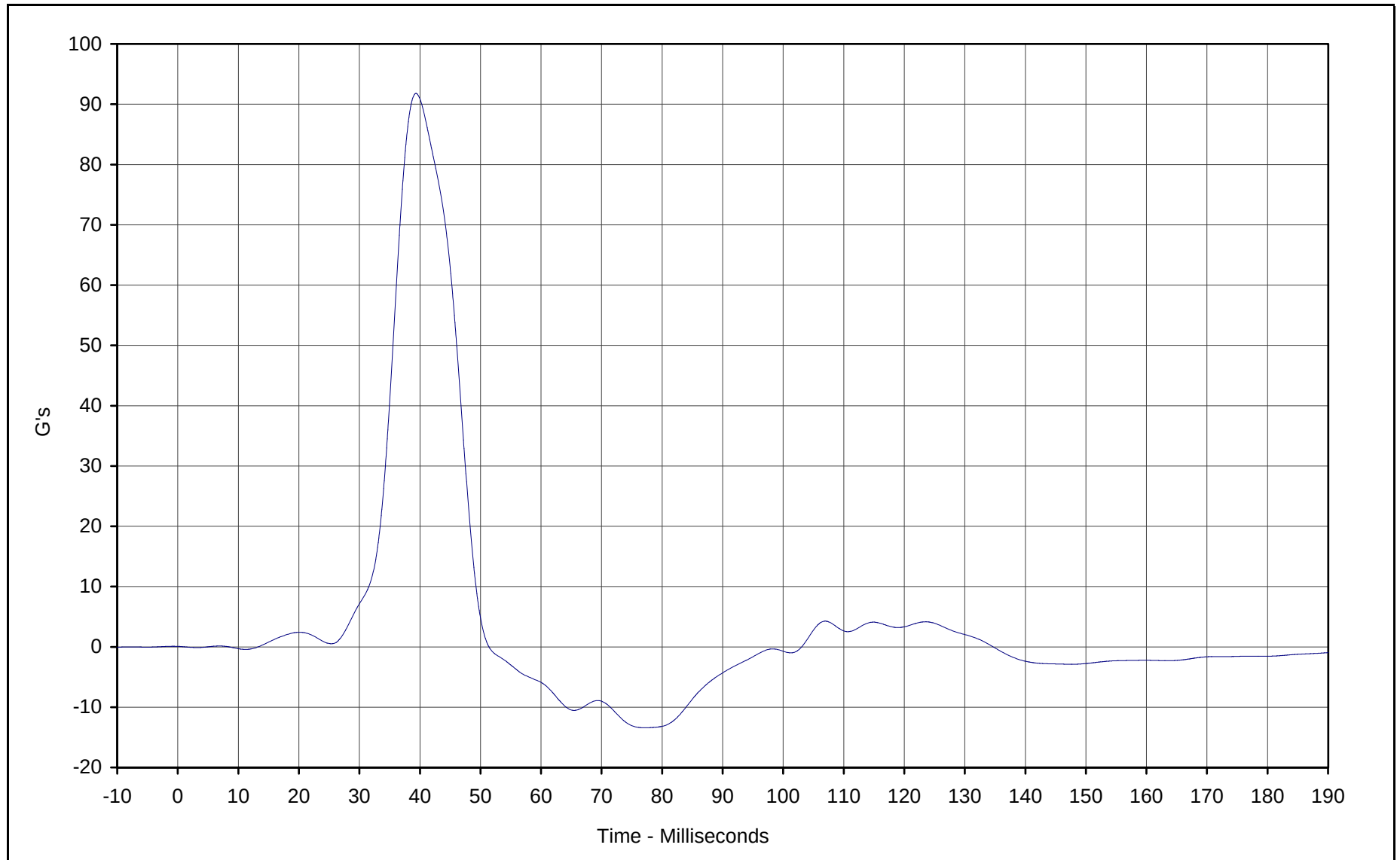
Date of Test: 12/05/00

Curve Number: FIR-019

Test Program: 55/28 km/h Side Impact NCAP No.: M15106

Test Vehicle: 2001 Toyota Sienna Minivan

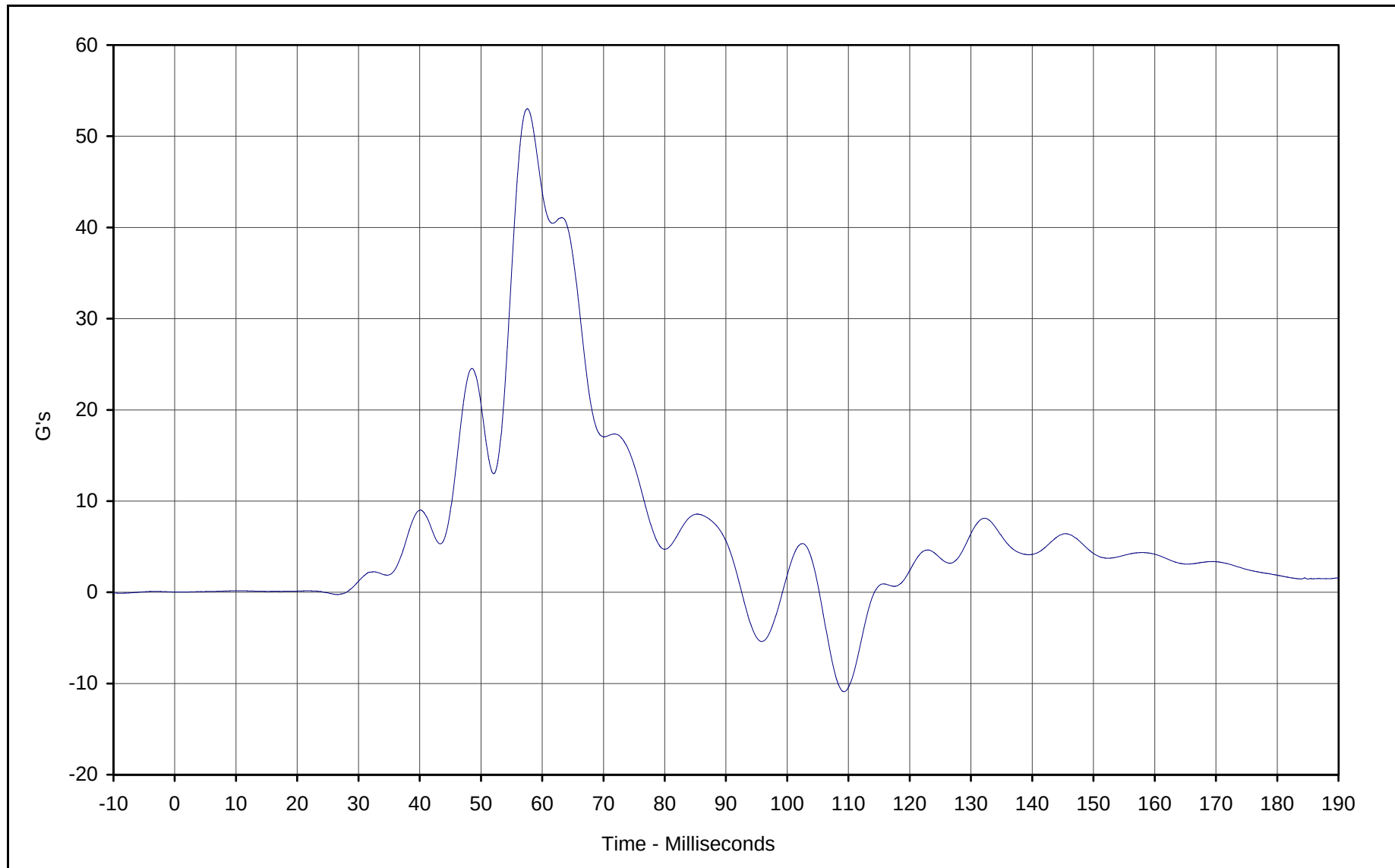




Curve Description: Pass. Pelvis Primary Y
Maximum Value: 91.8 at 39.4 Milliseconds
Minimum Value: -13.4 at 77.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-020

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

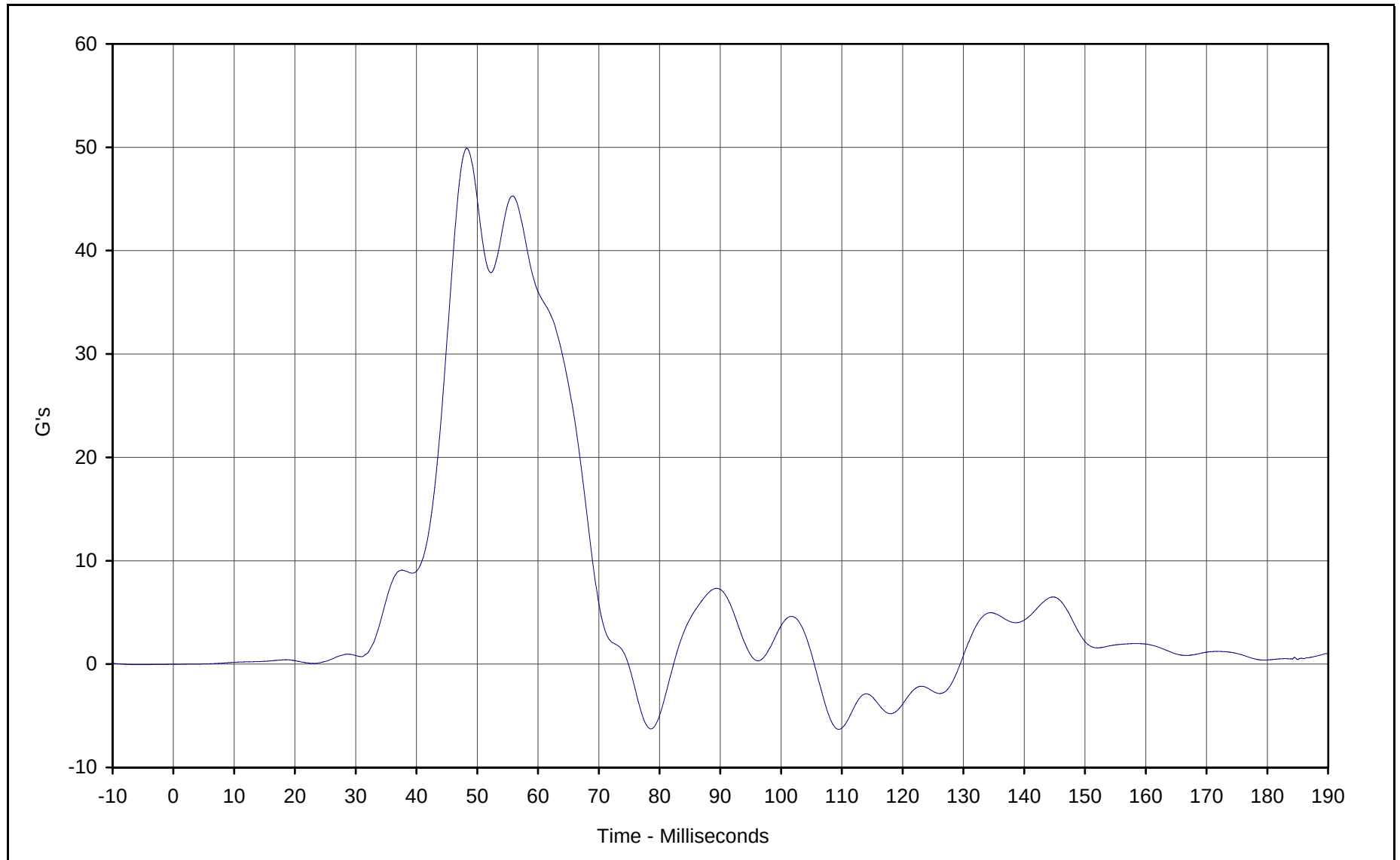




Curve Description: Pass. Upper Rib Redundant Y
Maximum Value: 53.0 at 57.6 Milliseconds
Minimum Value: -10.9 at 109.3 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-021

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

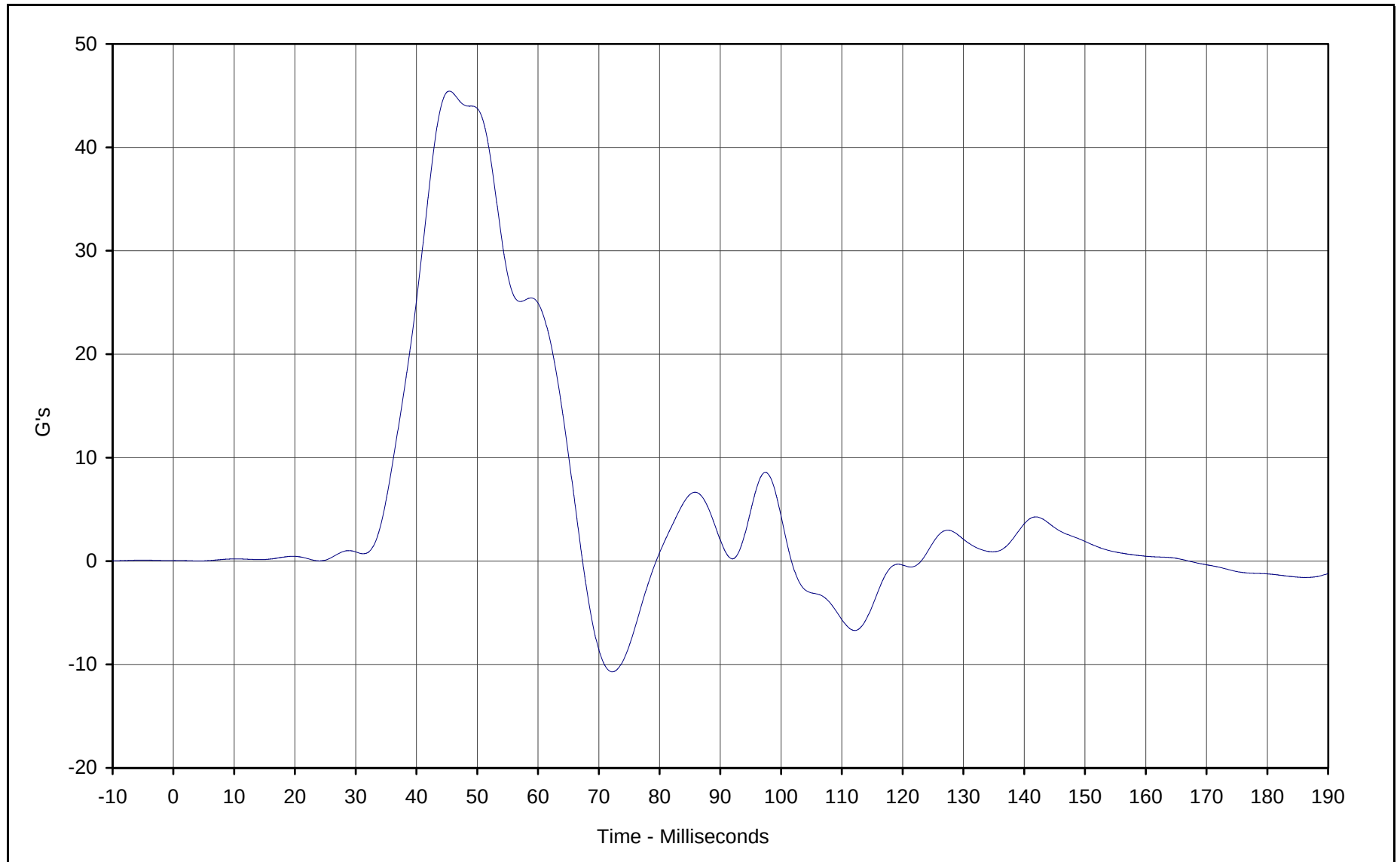




Curve Description: Pass. Lower Rib Redundant Y
Maximum Value: 49.9 at 48.3 Milliseconds
Minimum Value: -6.3 at 109.5 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-022

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan

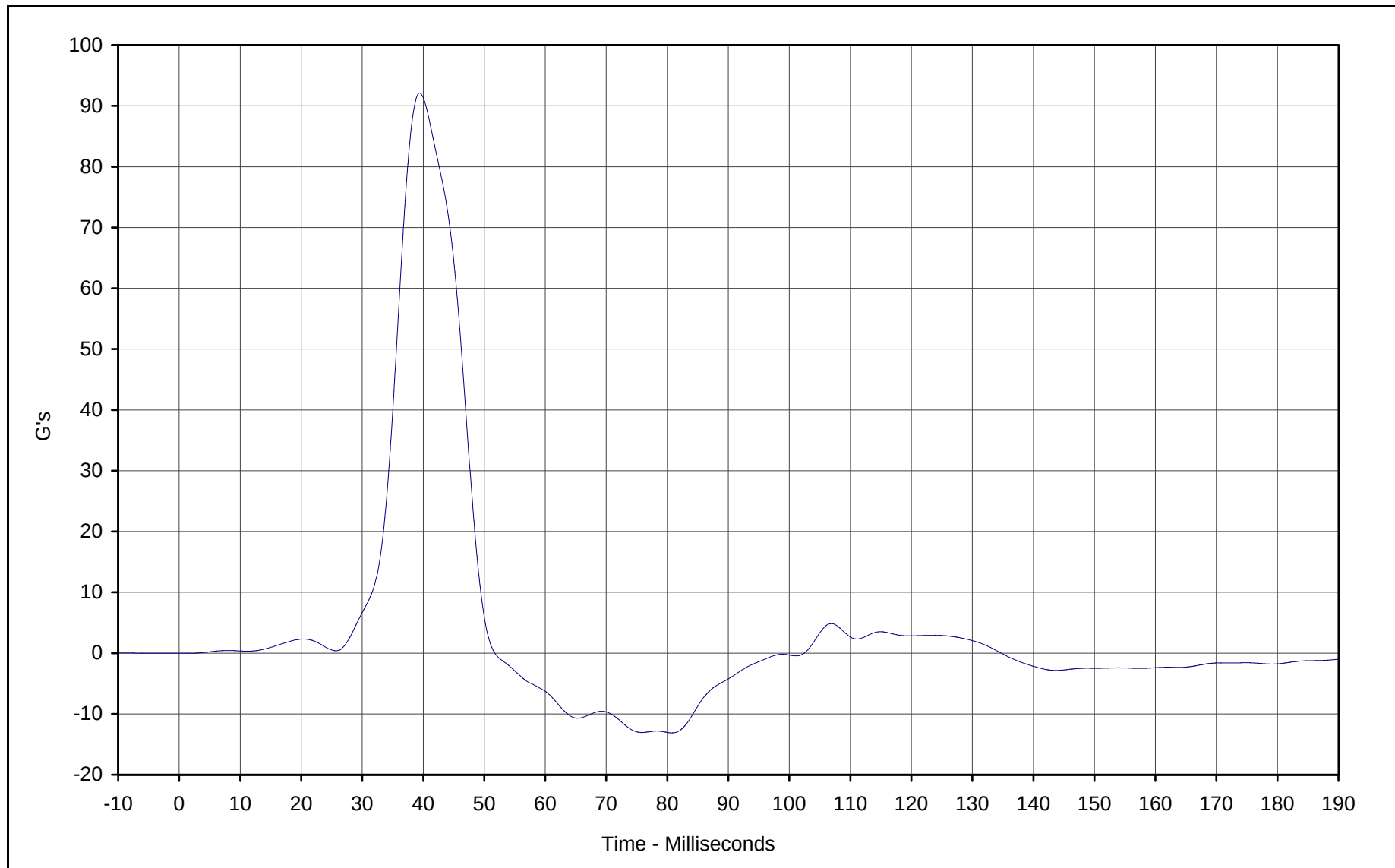




Curve Description: Pass. Lower Spine Redundant Y
Maximum Value: 45.4 at 45.4 Milliseconds
Minimum Value: -10.7 at 72.2 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-023

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan





Curve Description: Pass. Pelvis Redundant Y
Maximum Value: 92.1 at 39.4 Milliseconds
Minimum Value: -13.1 at 80.8 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/05/00
Curve Number: FIR-024

Test Program: 55/28 km/h Side Impact NCAP No.: M15106
Test Vehicle: 2001 Toyota Sienna Minivan



APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
PRE-TEST SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA



Performance Verification Data Side Impact Dummy (SID) External Dimensions

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	20.6	Pass
Laboratory relative humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	900	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	510	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	521	Pass
KV- Knee Pivot From Floor	mm	490 to 505	501	Pass
HW- Hip Width	mm	356 to 391	363	Pass
Overall Test Results				Pass

Laboratory Technician

December 4, 2000

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.: TI10D

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.27	Pass
Left Upper Rib Acceleration	G's	37.0 to 46.0	42.8	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	41.3	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.2	Pass
Overall Test Results				Pass

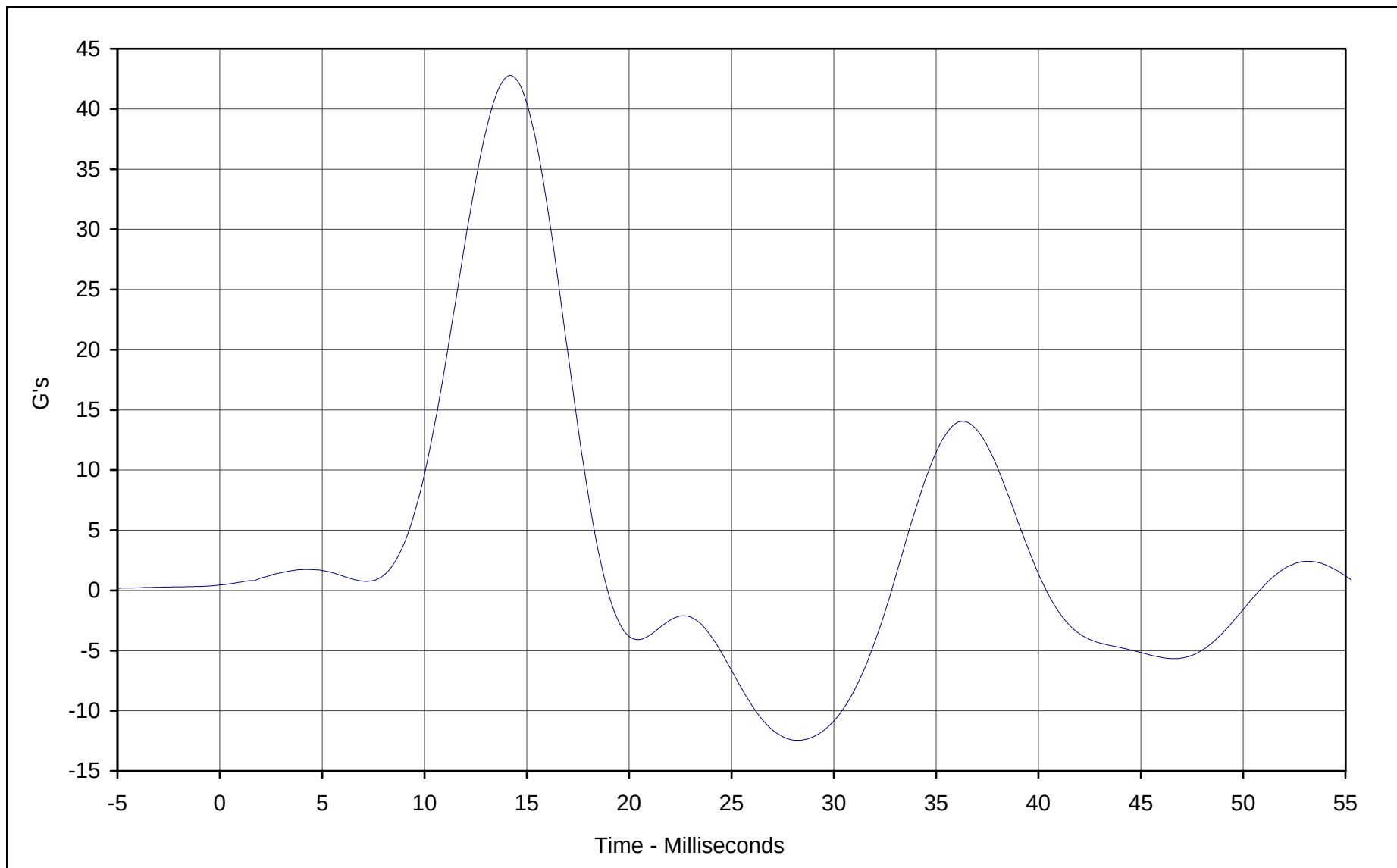
Laboratory Technician

December 1, 2000

Test Date

Approved By

Date



Curve Description: Left Upper Rib Y Acceleration

Maximum Value: 42.8 at 14.2 Milliseconds

Minimum Value: -12.5 at 28.3 Milliseconds

SAE Filter Class: FIR 100

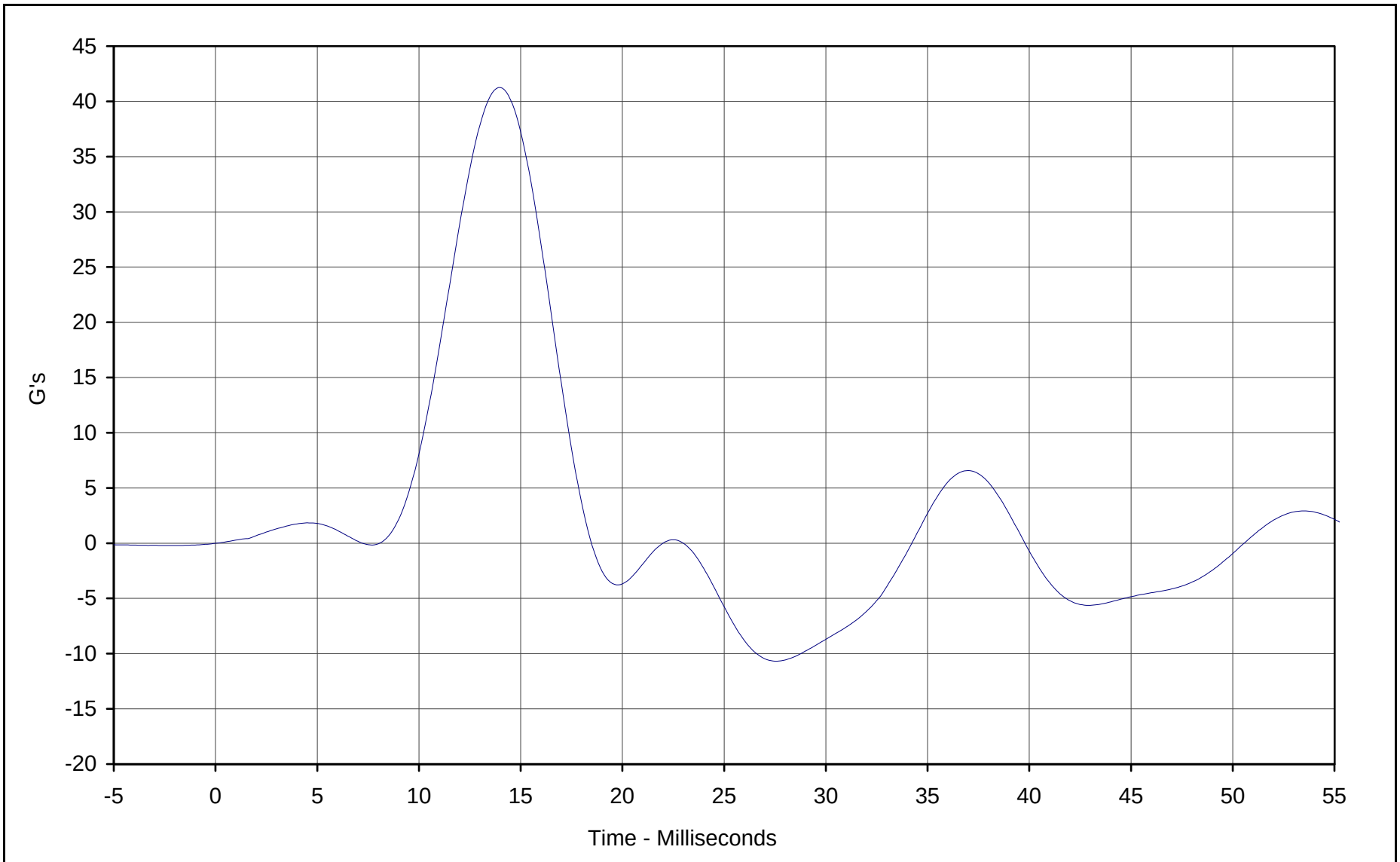
Date of Test: 12/1/00

Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 274 Test I.D.: TI10D



C-4



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 41.3 at 14.0 Milliseconds

Minimum Value: -10.7 at 27.6 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 12/1/00

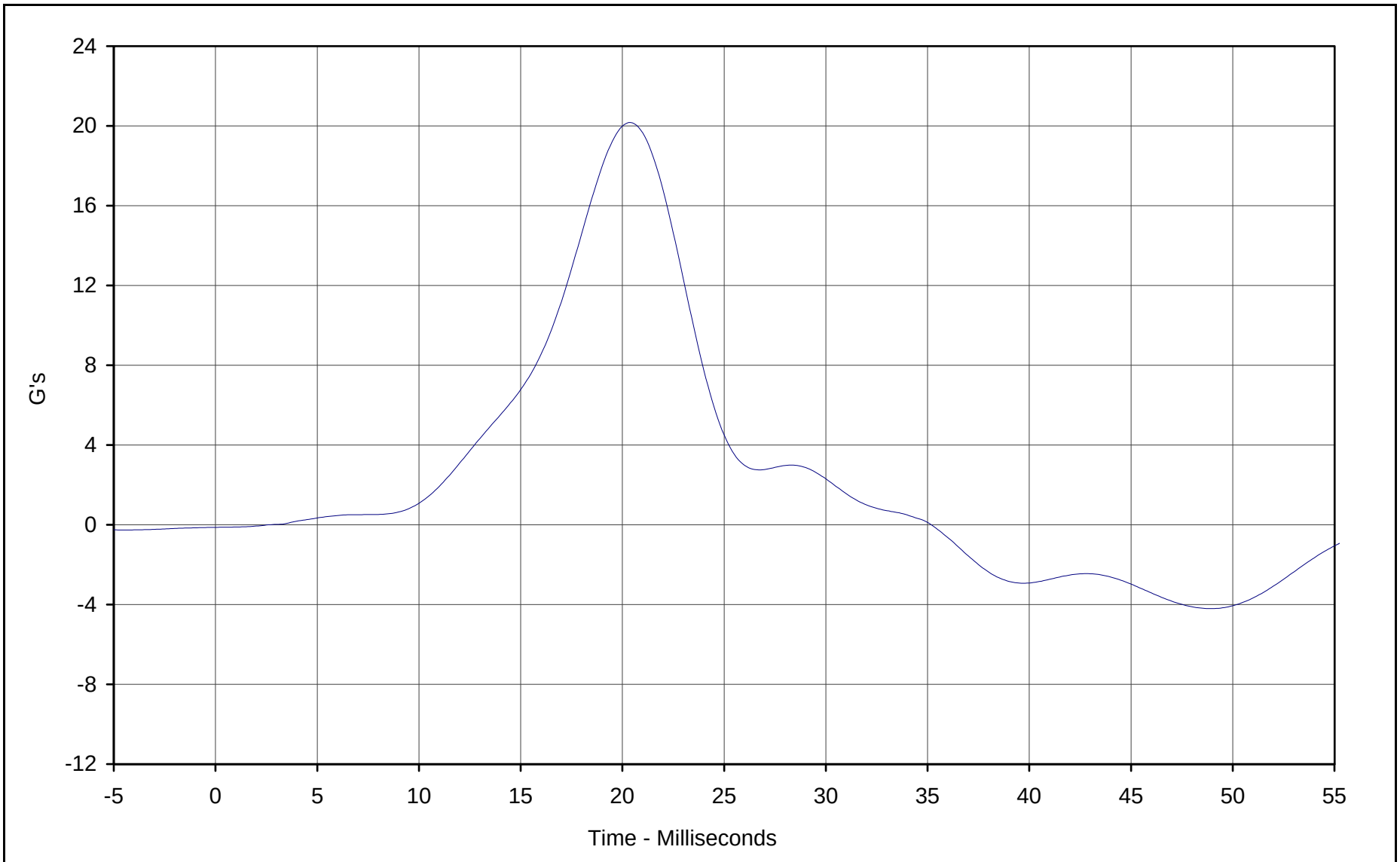
Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 274 Test I.D.: TI10D



KAR21003-03

C-5



Curve Description: Lower Spine Y Acceleration
Maximum Value: 20.2 at 20.4 Milliseconds
Minimum Value: -4.2 at 49.0 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/1/00

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 274 Test I.D.: TI10D



KAR21003-03



Performance Verification Data

Side Impact Dummy (SID)

Left Side Pelvis Lateral Impact

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: PI11C

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	4.26	Pass
Pelvis Acceleration	G's	40.0 to 60.0	47.3	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	5.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

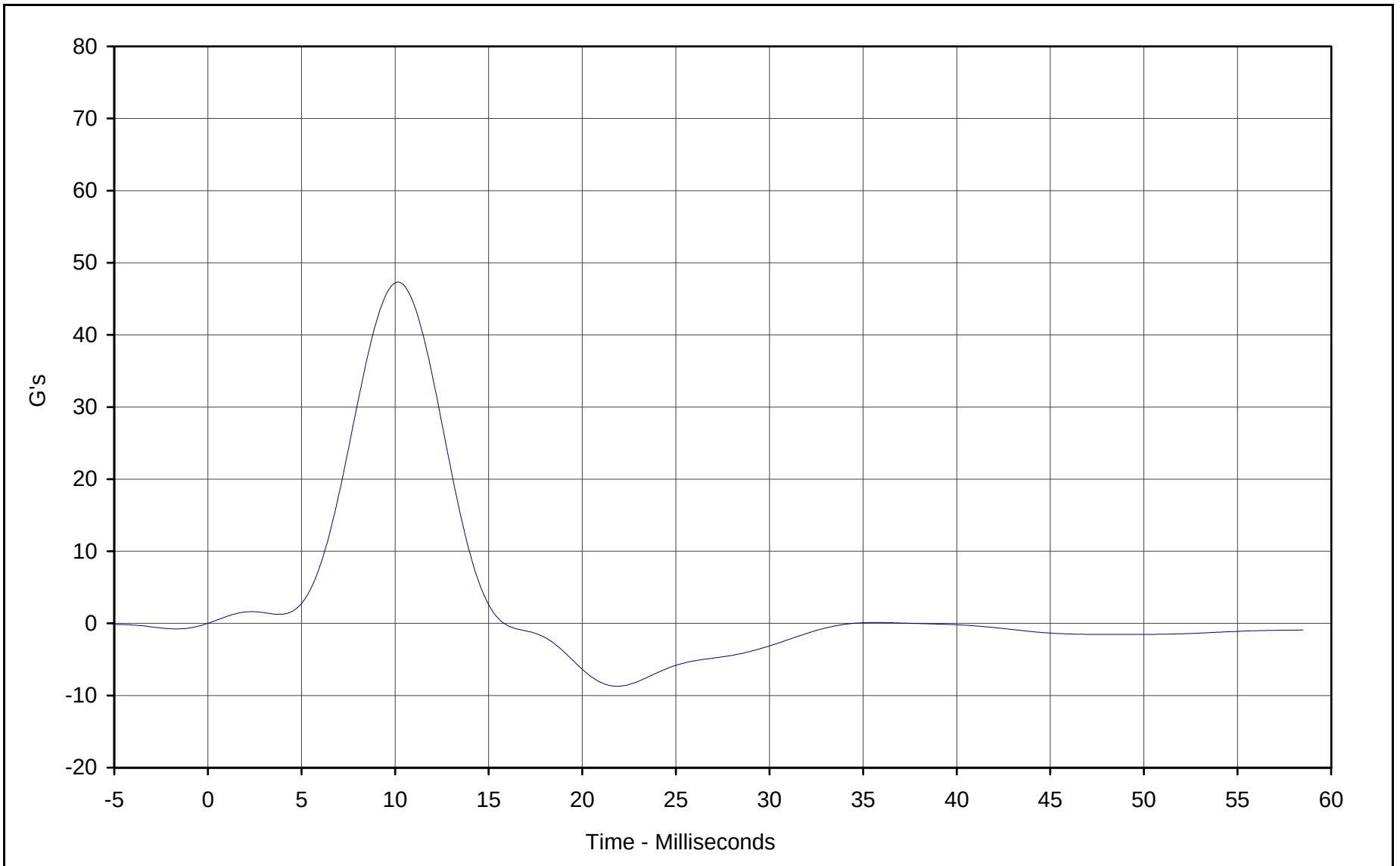
December 1, 2000

Test Date

Approved By

Date

C-7



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 47.3 at 10.2 Milliseconds
Minimum Value: -8.7 at 21.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/1/00

Test Program: Left Side Pelvis Lateral Impact
Test Information: SID S/N: 274 Test I.D.: PI11C



KAR21003-03



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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: AB12A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force at 0.5 Inches of Displacement	Pounds	23.0 to 36.0	29.1	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	42.8	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	59.2	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	82.1	Pass
Overall Test Results				Pass

Laboratory Technician

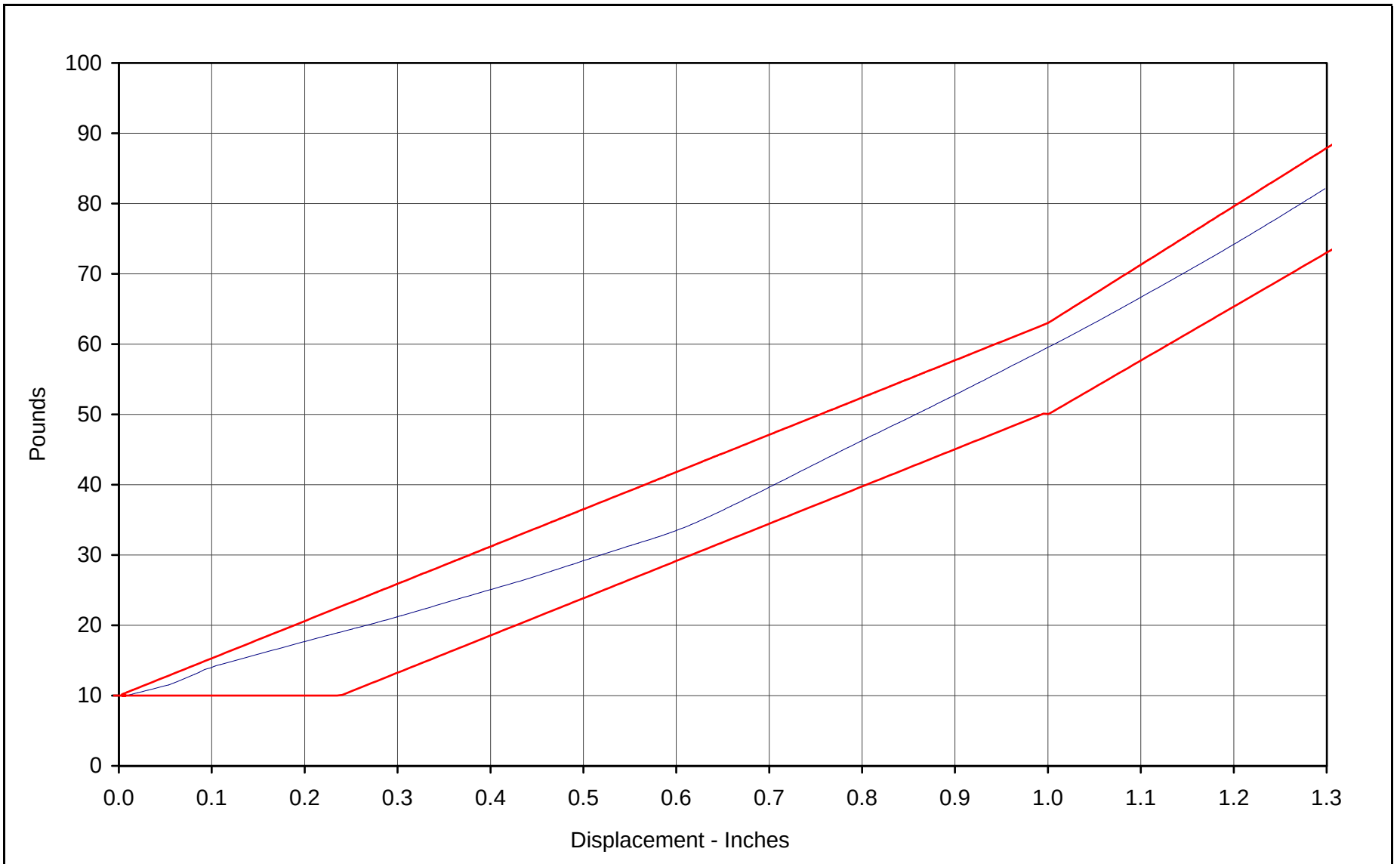
December 2, 2000

Test Date

Approved By

Date

C-9

Curve Description: Abdomen Force vs. DisplacementForce at 0.5 In.: 29.1 PoundsForce at 0.75 In.: 42.8 PoundsForce at 1.0 In.: 59.2 PoundsForce at 1.3 In.: 82.1 PoundsDate of Test: 12/2/00Test Program: Hybrid II Abdominal CompressionTest Information: SID S/N: 274 Test I.D.: AB12A

KAR21003-03



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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: HD12A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	69	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	210.0 to 260.0	246.0	Pass
Peak Lateral Acceleration	G's	≤10.0	4.4	Pass
Time Above 100 G's	Msec.	0.9 to 1.5	1.3	Pass
Is Resultant Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

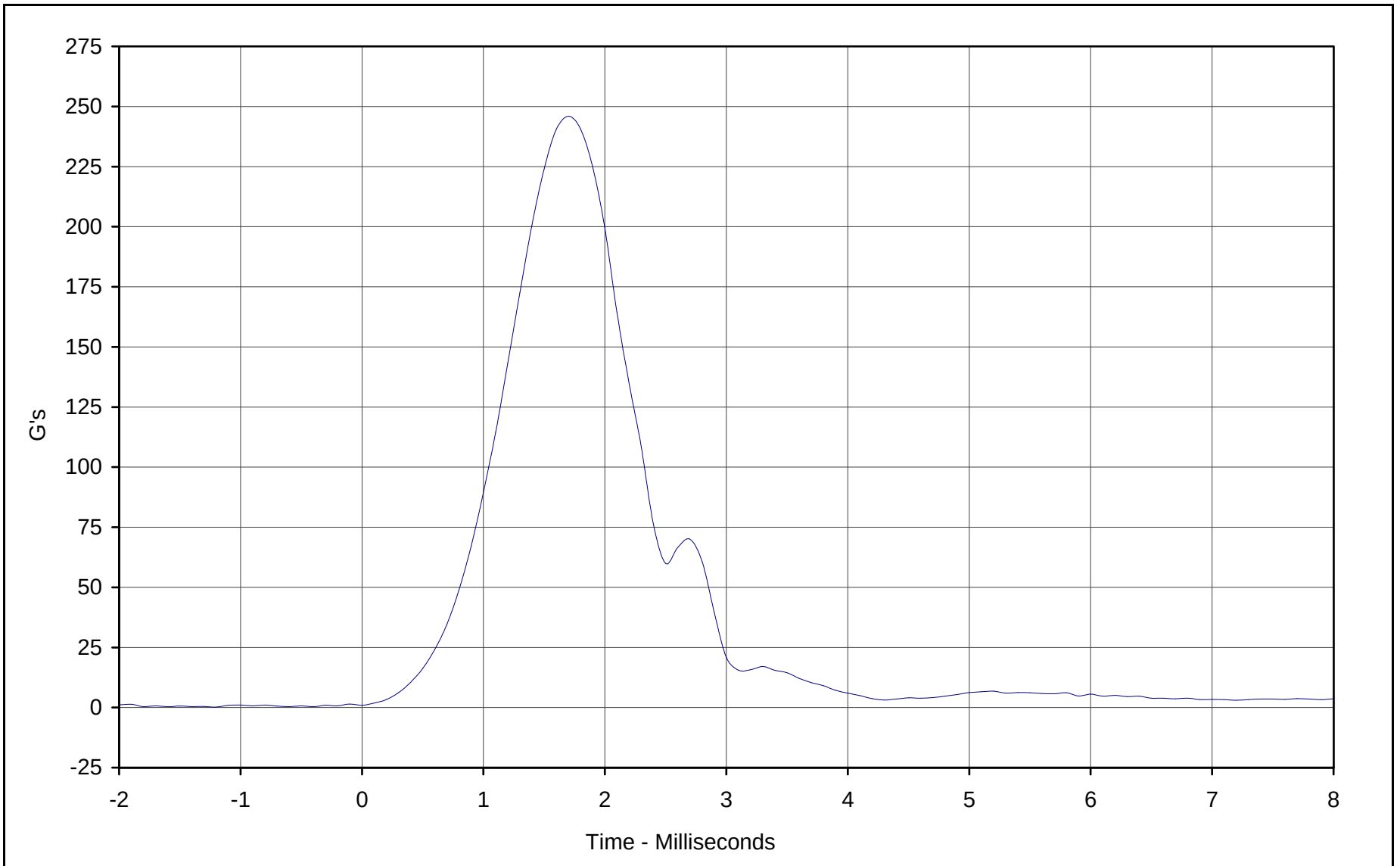
December 2, 2000

Test Date

Approved By

Date

C-11



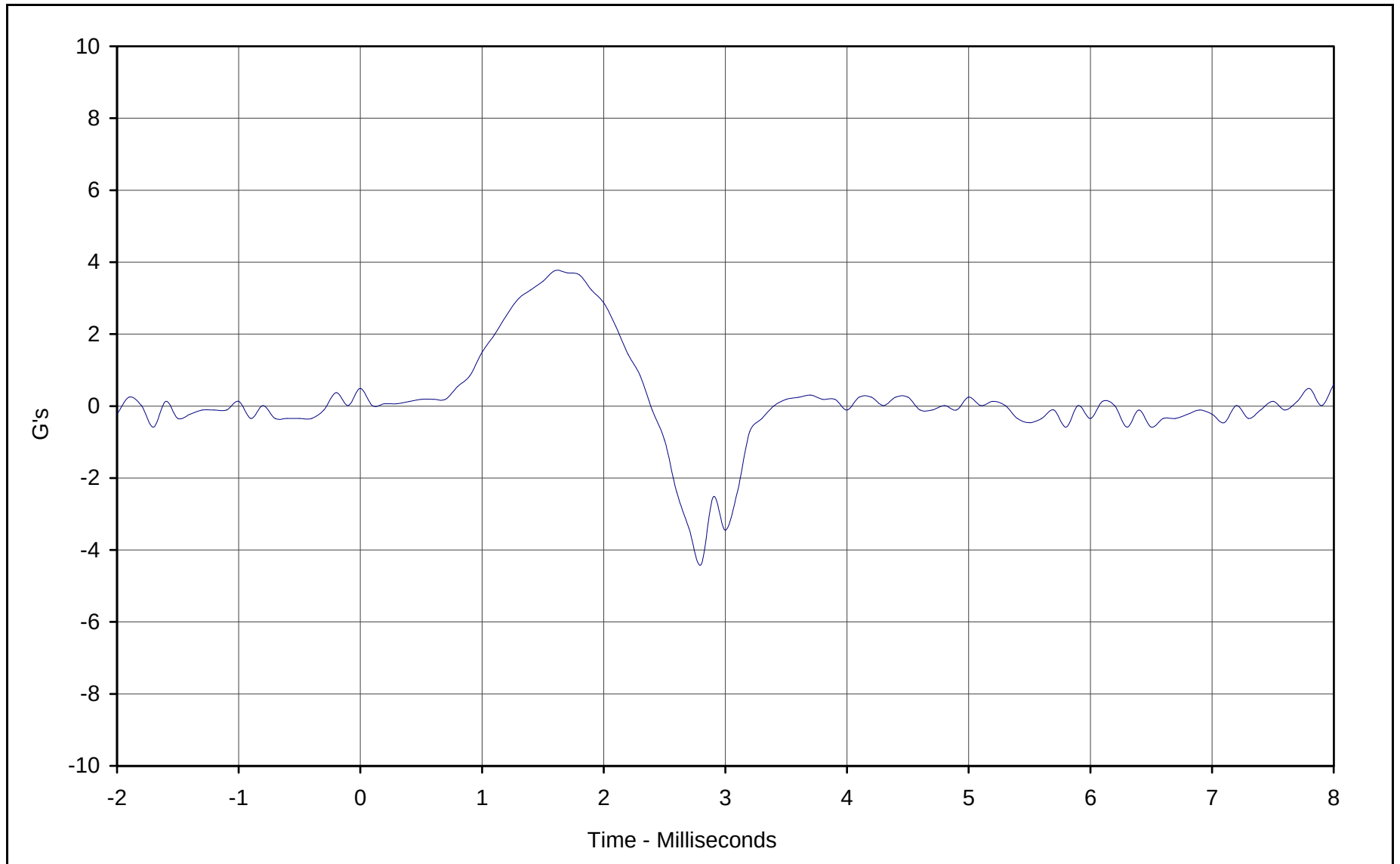
Curve Description: Head Resultant Acceleration
Maximum Value: 246.0 at 1.7 Milliseconds
Minimum Value: 1.0 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/2/00

Test Program: Hybrid II Head Drop Calibration
Test Information: SID S/N: 274 Test I.D.: HD12A



KAR21003-03

C-12



Curve Description: Head Y Axis Acceleration

Maximum Value:	<u>3.8</u>	at	<u>1.6</u>	Milliseconds
Minimum Value:	<u>-4.4</u>	at	<u>2.8</u>	Milliseconds
SAE Filter Class:	<u>1000</u>			
Date of Test:	<u>12/2/00</u>			

Test Program: Hybrid II Head Drop Calibration

Test Information: SID S/N: 274 Test I.D.: HD12A



KAR21003-03



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	20.6	Pass
Laboratory relative humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	905	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	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	360	Pass
Overall Test Results				Pass

Laboratory Technician

December 4, 2000

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.: TI10E

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	39.6	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	39.5	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	20.5	Pass
Overall Test Results				Pass

Laboratory Technician

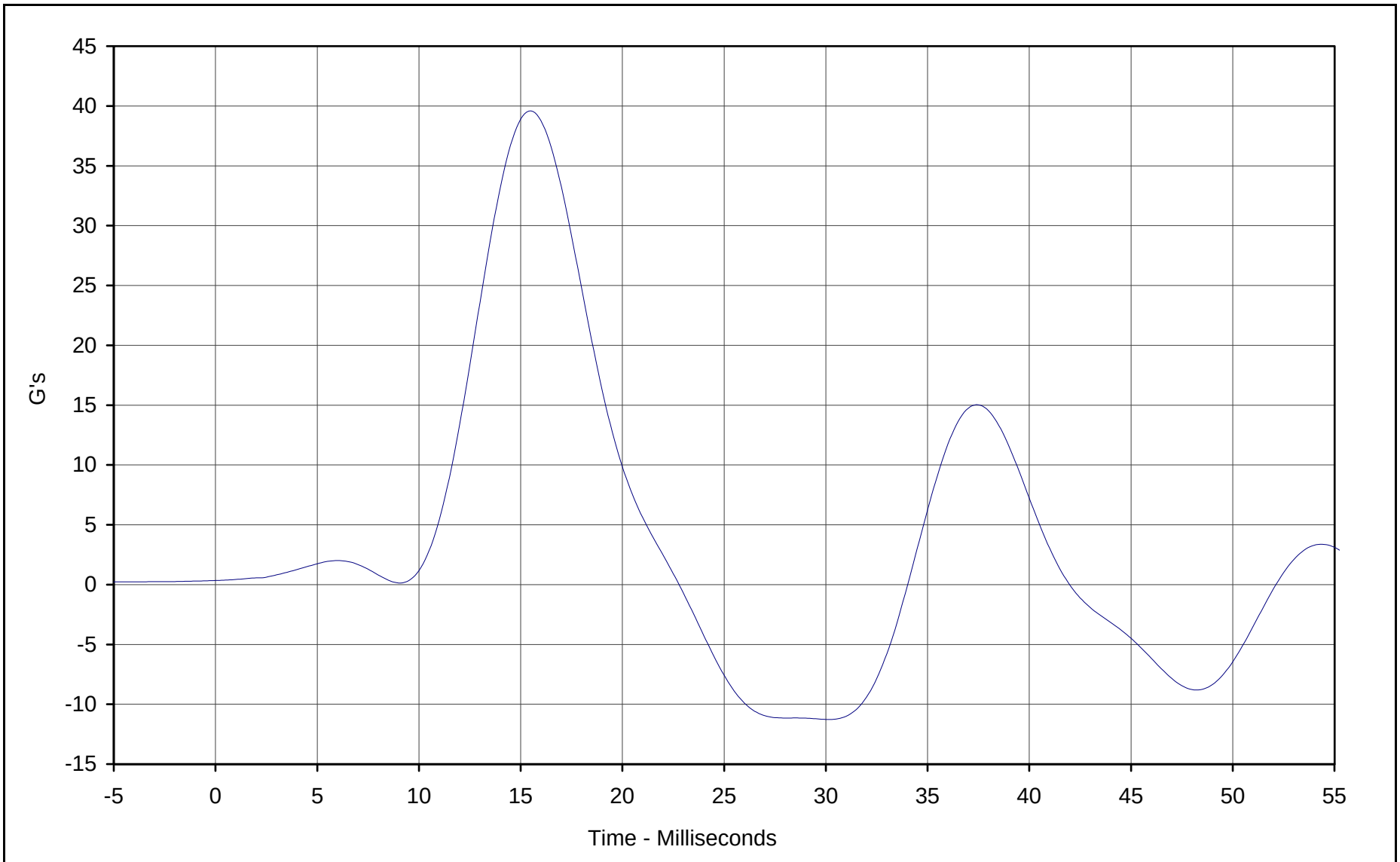
December 1, 2000

Test Date

Approved By

Date

C-15



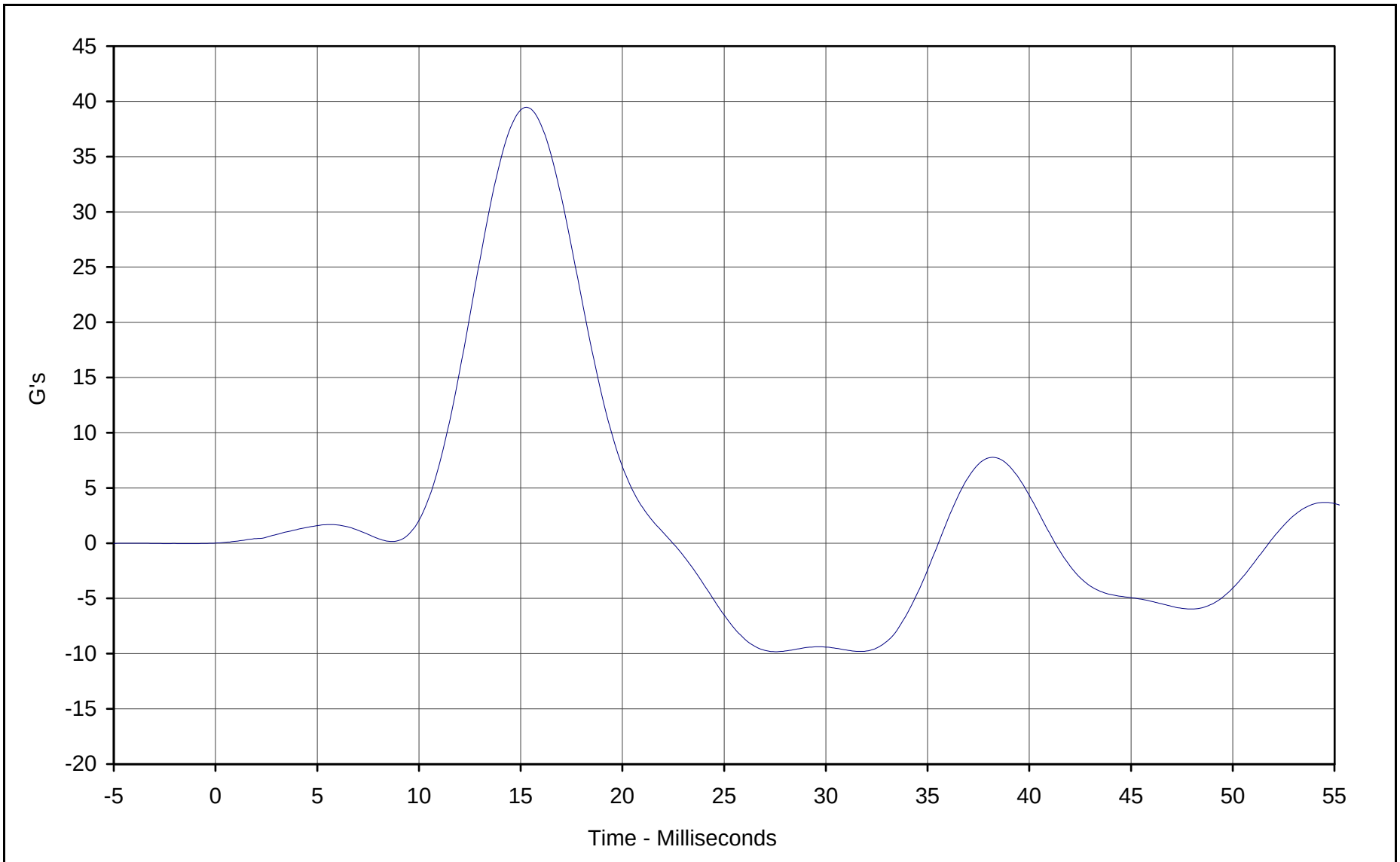
Curve Description: Left Upper Rib Y Acceleration
Maximum Value: 39.6 at 15.5 Milliseconds
Minimum Value: -11.3 at 30.2 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/1/00

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 275 Test I.D.: TI10E



KAR21003-03

C-16



Curve Description: Left Lower Rib Y Acceleration

Maximum Value: 39.5 at 15.3 Milliseconds

Minimum Value: -9.8 at 27.5 Milliseconds

SAE Filter Class: FIR 100

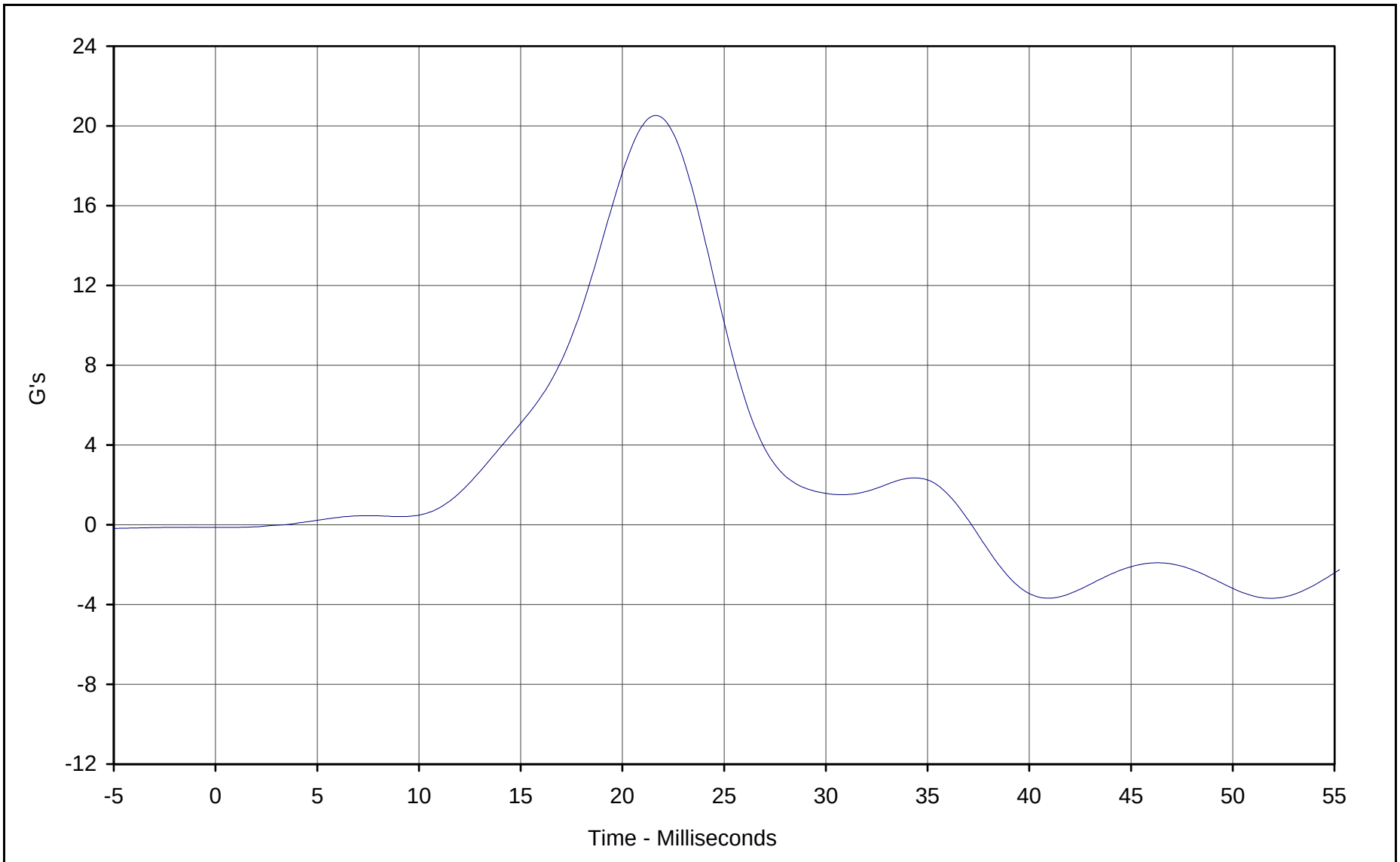
Date of Test: 12/1/00

Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 275 Test I.D.: TI10E



KAR21003-03



Curve Description: Lower Spine Y Acceleration

Maximum Value: 20.5 at 21.6 Milliseconds

Minimum Value: -3.7 at 51.9 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 12/1/00

Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 275 Test I.D.: TI10E





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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: PI11D

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	4.28	Pass
Pelvis Acceleration	G's	40.0 to 60.0	45.7	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	6.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

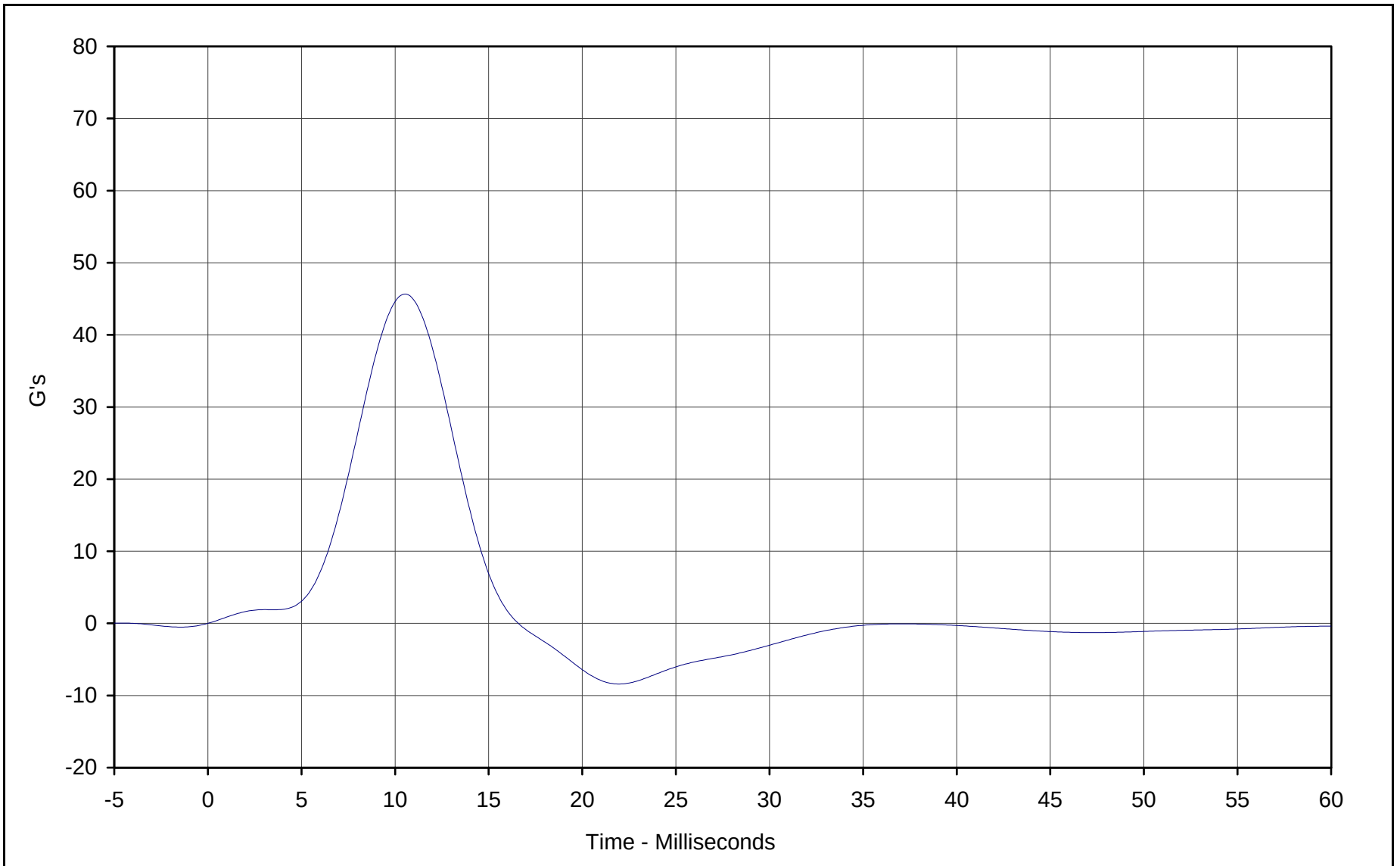
December 1, 2000

Test Date

Approved By

Date

C-19



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 45.7 at 10.5 Milliseconds
Minimum Value: -8.4 at 22.0 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/1/00

Test Program: Left Side Pelvis Lateral Impact
Test Information: SID S/N: 275 Test I.D.: PI11D



KAR21003-03



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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: AB12B

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force at 0.5 Inches of Displacement	Pounds	23.0 to 36.0	30.2	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	44.5	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	61.4	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	85.0	Pass
Overall Test Results				Pass

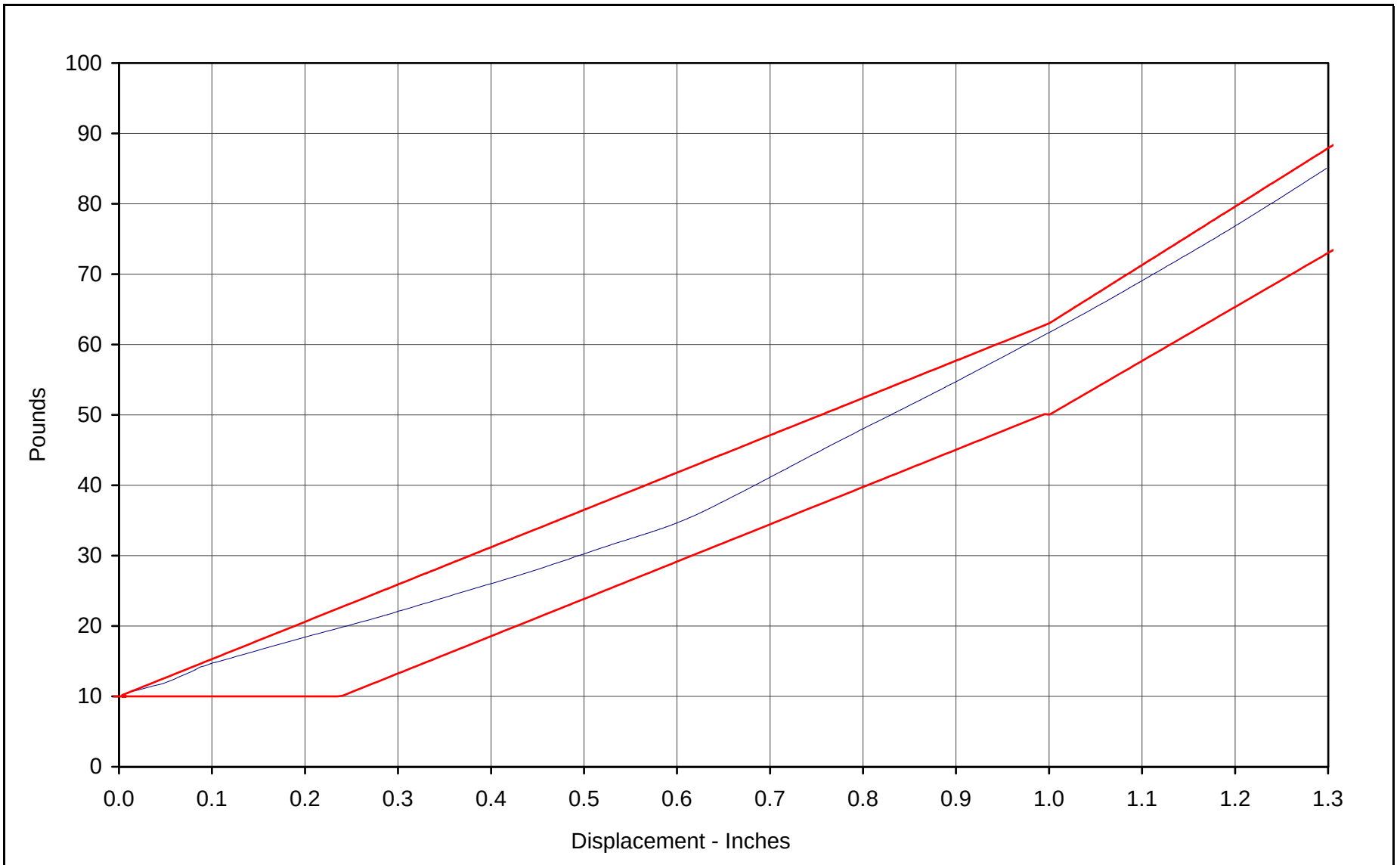
Laboratory Technician

December 2, 2000

Test Date

Approved By

Date



Curve Description: Abdomen Force vs. Displacement

Force at 0.5 In.: 30.2 Pounds

Force at 0.75 In.: 44.5 Pounds

Force at 1.0 In.: 61.4 Pounds

Force at 1.3 In.: 85.0 Pounds

Date of Test: 12/2/00

Test Program: Hybrid II Abdominal Compression

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





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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: HD12B

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	69	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Peak Resultant Acceleration	G's	210.0 to 260.0	248.1	Pass
Peak Lateral Acceleration	G's	≤10.0	7.8	Pass
Time Above 100 G's	Msec.	0.9 to 1.5	1.1	Pass
Is Resultant Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

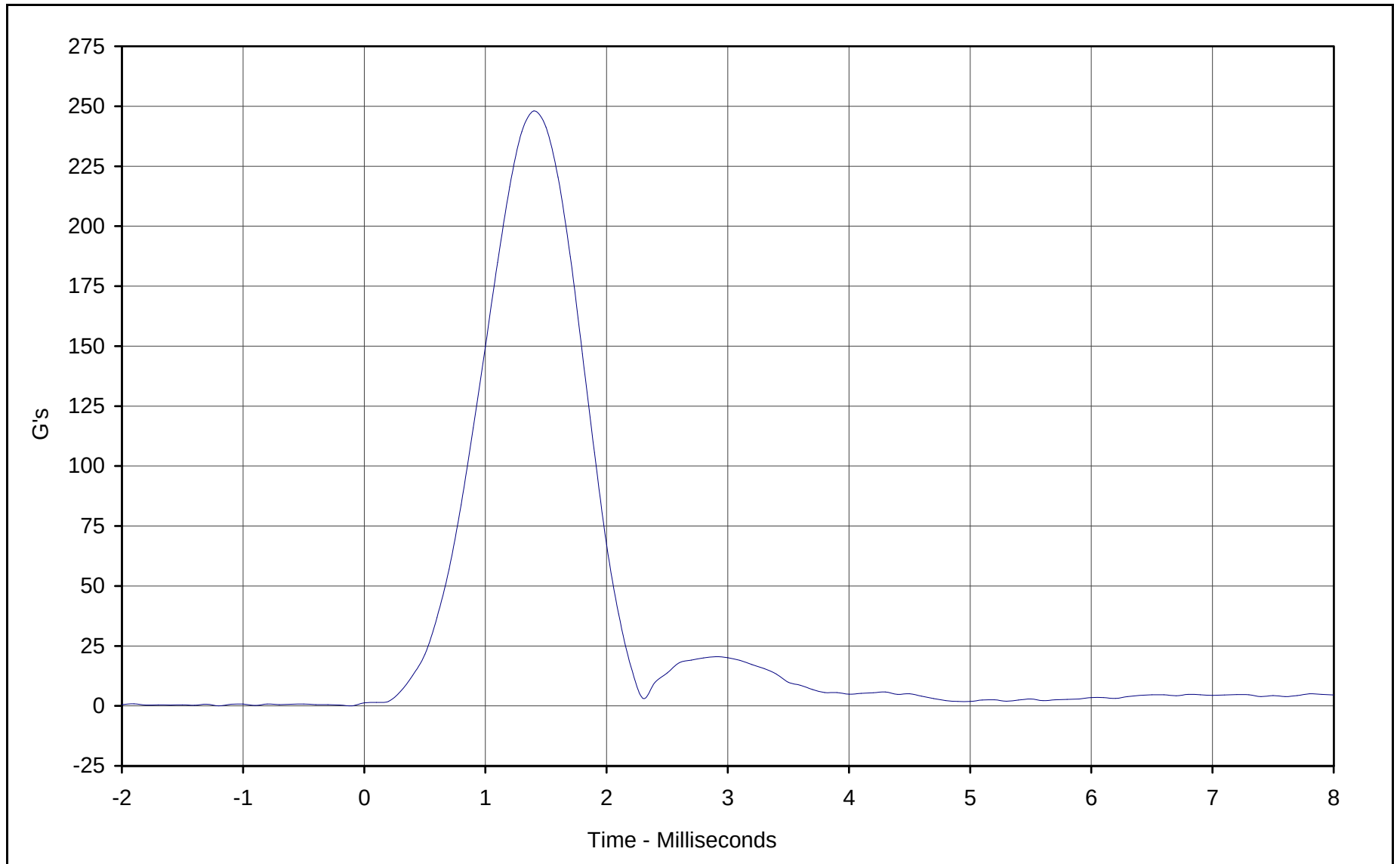
December 2, 2000

Test Date

Approved By

Date

C-23



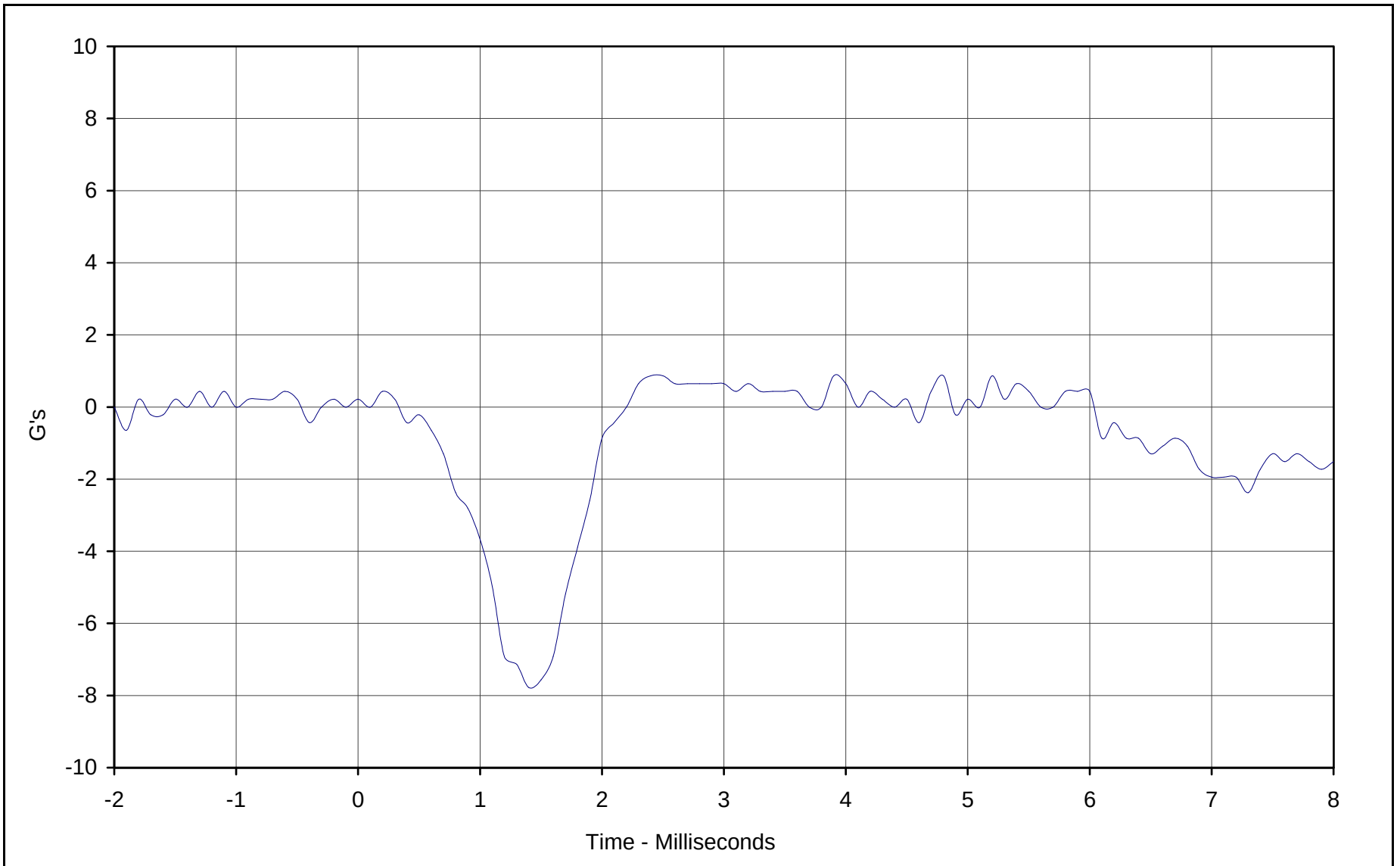
Curve Description: Head Resultant Acceleration
Maximum Value: 248.1 at 1.4 Milliseconds
Minimum Value: 1.3 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/2/00

Test Program: Hybrid II Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: HD12B



KAR21003-03

C-24



Curve Description: Head Y Axis Acceleration
Maximum Value: 0.9 at 2.4 Milliseconds
Minimum Value: -7.8 at 1.4 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/2/00

Test Program: Hybrid II Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: HD12B



KAR21003-03

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	512	Pass
KH- Knee Pivot From Back Line	mm	511 to 526	520	Pass
KV- Knee Pivot From Floor	mm	490 to 505	495	Pass
HW- Hip Width	mm	356 to 391	365	Pass
Overall Test Results				Pass

Laboratory Technician

December 7, 2000

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.: TI11A

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	41.3	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	40.7	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.3	Pass
Overall Test Results				Pass

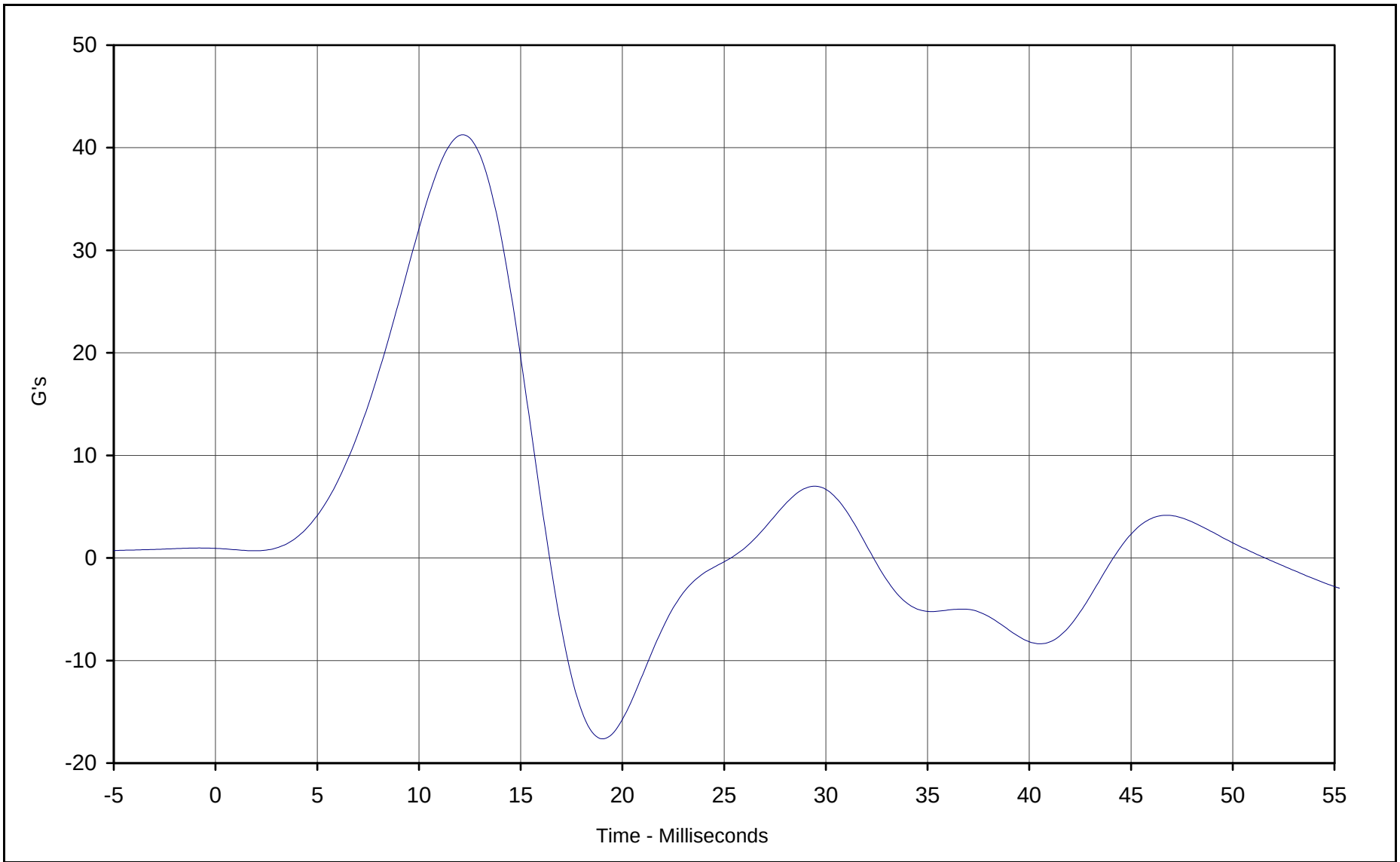
Laboratory Technician

December 6, 2000

Test Date

Approved By

Date



Curve Description: Left Upper Rib Y Acceleration

Maximum Value: 41.3 at 12.1 Milliseconds

Minimum Value: -17.6 at 19.0 Milliseconds

SAE Filter Class: FIR 100

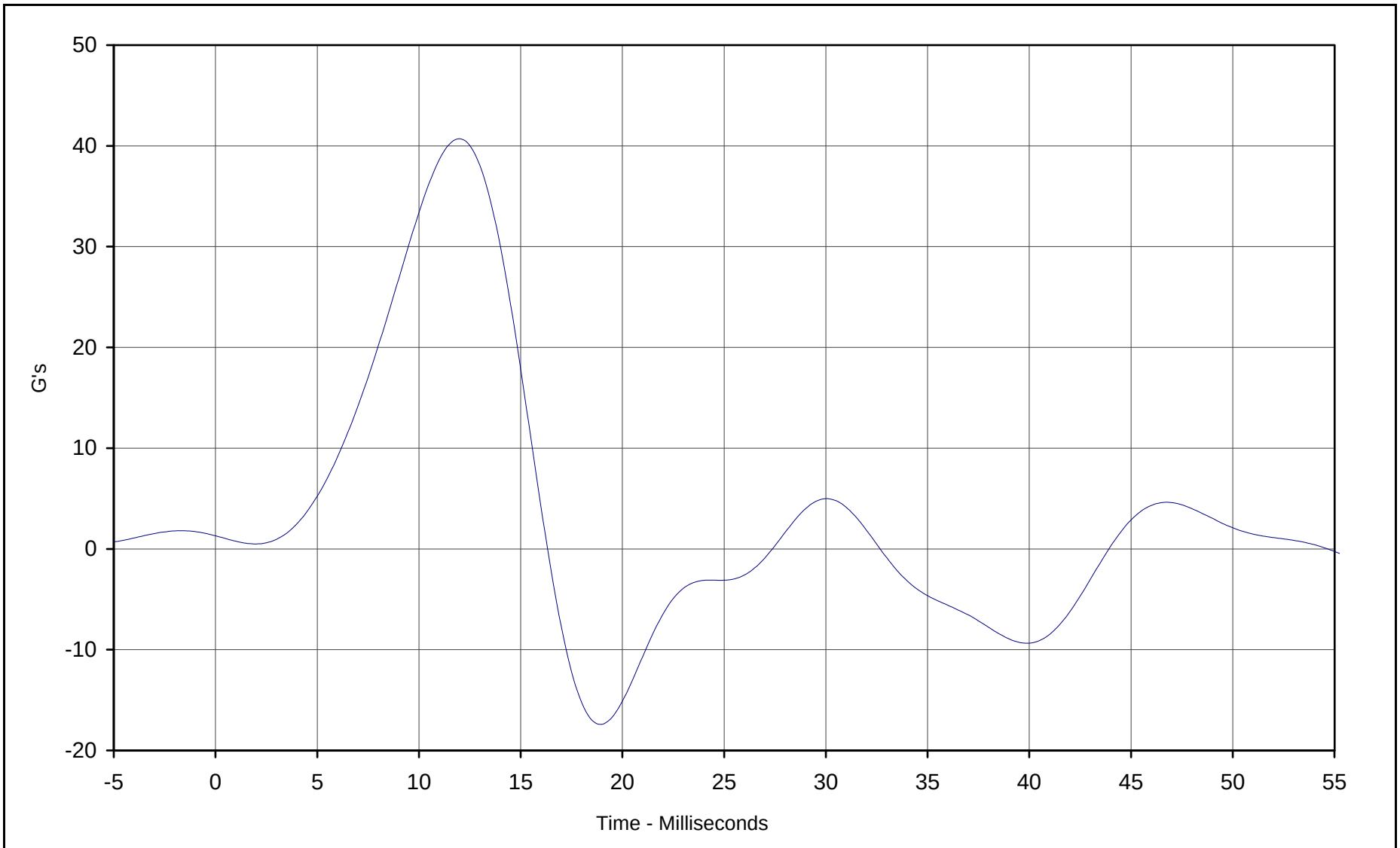
Date of Test: 12/6/00

Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 274 Test I.D.: TI11A



C-28

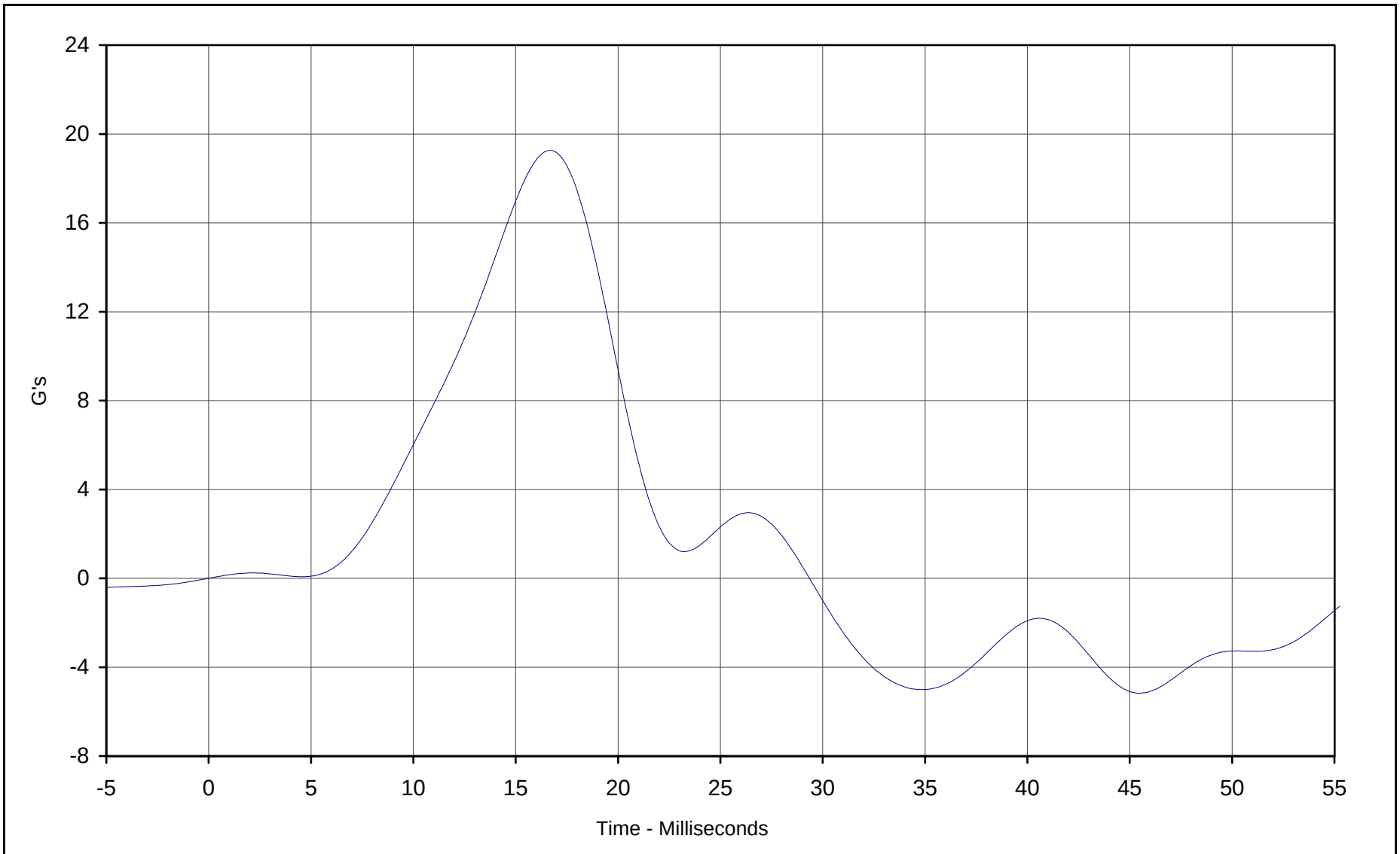


Curve Description: Left Lower Rib Y Acceleration
Maximum Value: 40.7 at 12.0 Milliseconds
Minimum Value: -17.4 at 18.9 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/00

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 274 Test I.D.: TI11A



KAR21003-03



Curve Description: Lower Spine Y Acceleration
Maximum Value: 19.3 at 16.7 Milliseconds
Minimum Value: -5.2 at 45.5 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/00

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 274 Test I.D.: TI11A





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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: PI11E

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	56.3	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	5.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

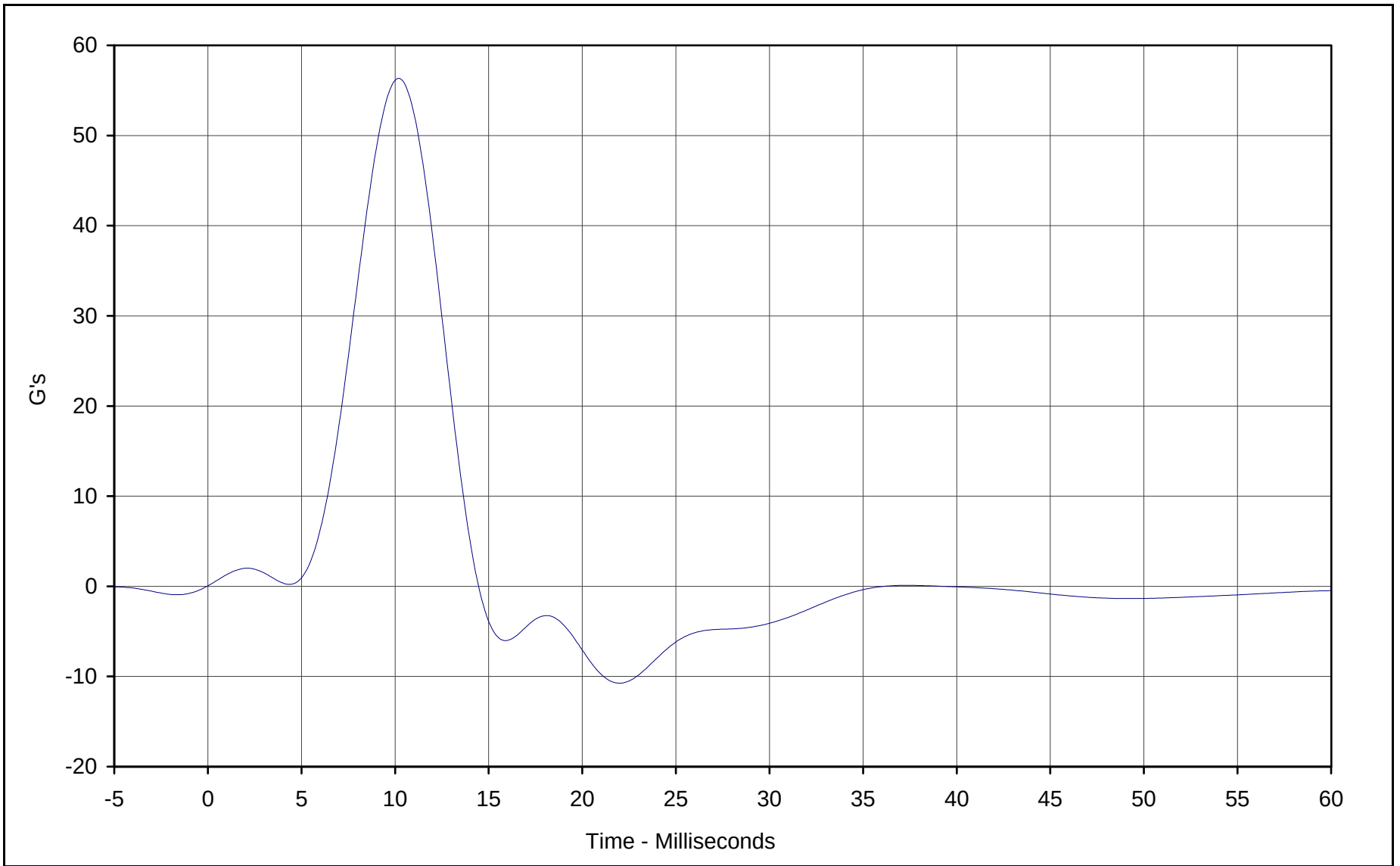
Laboratory Technician

December 6, 2000

Test Date

Approved By

Date



Curve Description: Pelvis Y Axis Acceleration
Maximum Value: 56.3 at 10.2 Milliseconds
Minimum Value: -10.7 at 22.0 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/00

Test Program: Left Side Pelvis Lateral Impact
Test Information: SID S/N: 274 Test I.D.: PI11E





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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: AB12C

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force at 0.5 Inches of Displacement	Pounds	23.0 to 36.0	29.4	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	42.8	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	59.5	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	81.9	Pass
Overall Test Results				Pass

Laboratory Technician

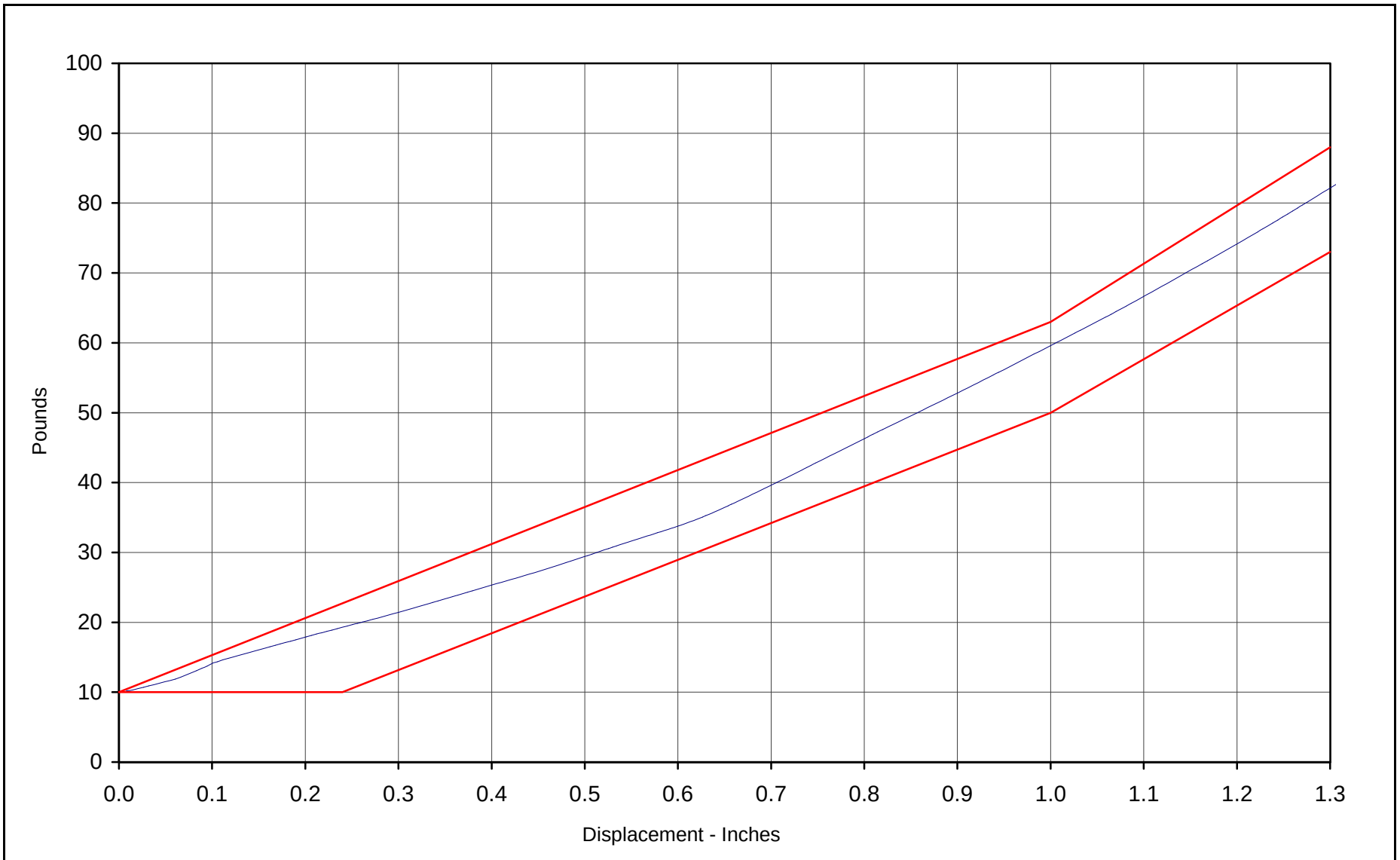
December 6, 2000

Test Date

Approved By

Date

C-33

Curve Description: Abdomen Force vs. DisplacementForce at 0.5 In.: 29.4 PoundsForce at 0.75 In.: 42.8 PoundsForce at 1.0 In.: 59.5 PoundsForce at 1.3 In.: 81.9 PoundsDate of Test: 12/6/00Test Program: Hybrid II Abdominal CompressionTest Information: SID S/N: 274 Test I.D.: AB12C

KAR21003-03



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

ATD Serial No.: 274

Part Serial No.: N/A

Test I.D.: HD12C

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	237.3	Pass
Peak Lateral Acceleration	G's	≤10.0	7.3	Pass
Time Above 100 G's	Msec.	0.9 to 1.5	1.0	Pass
Is Resultant Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

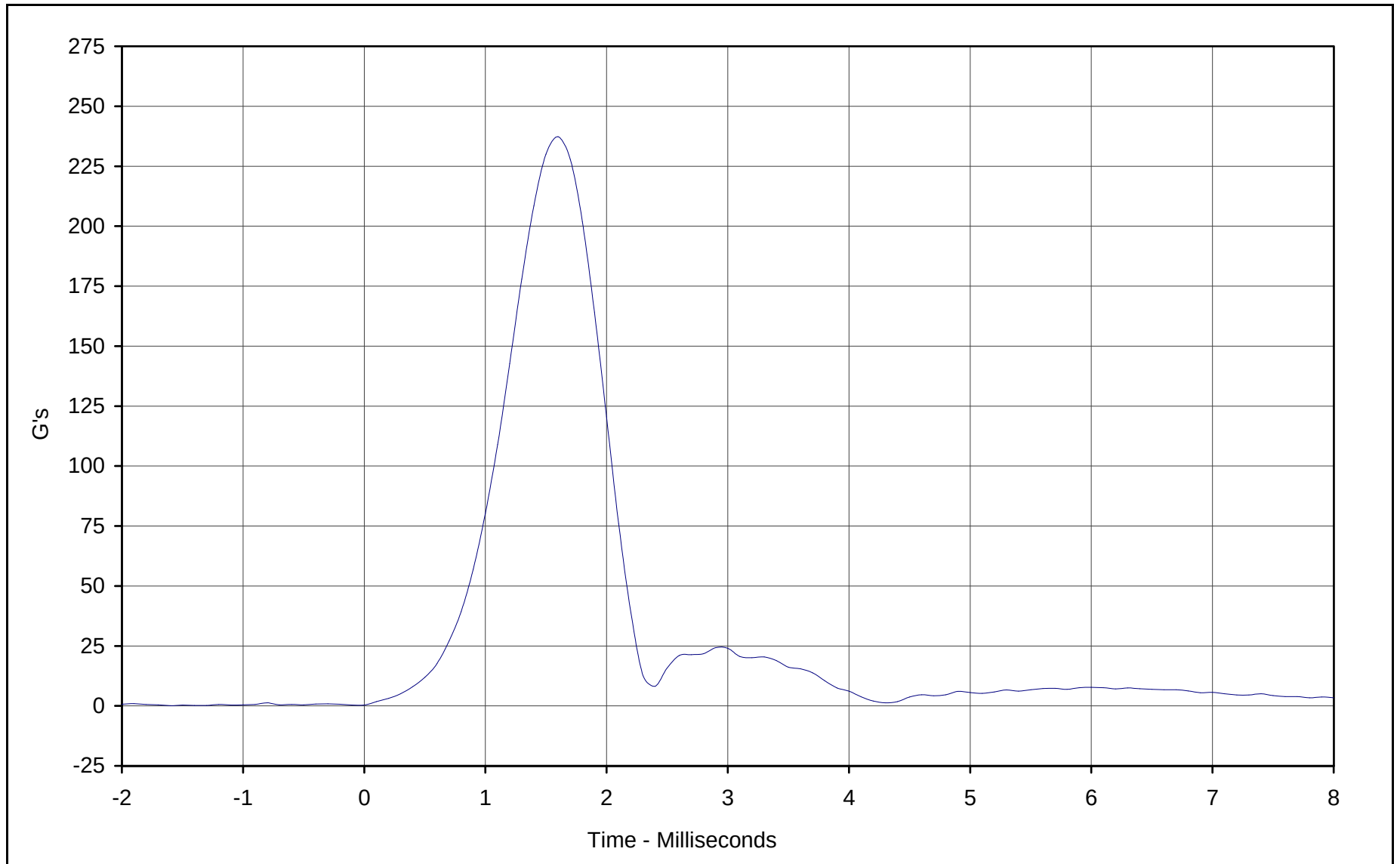
December 7, 2000

Test Date

Approved By

Date

C-35

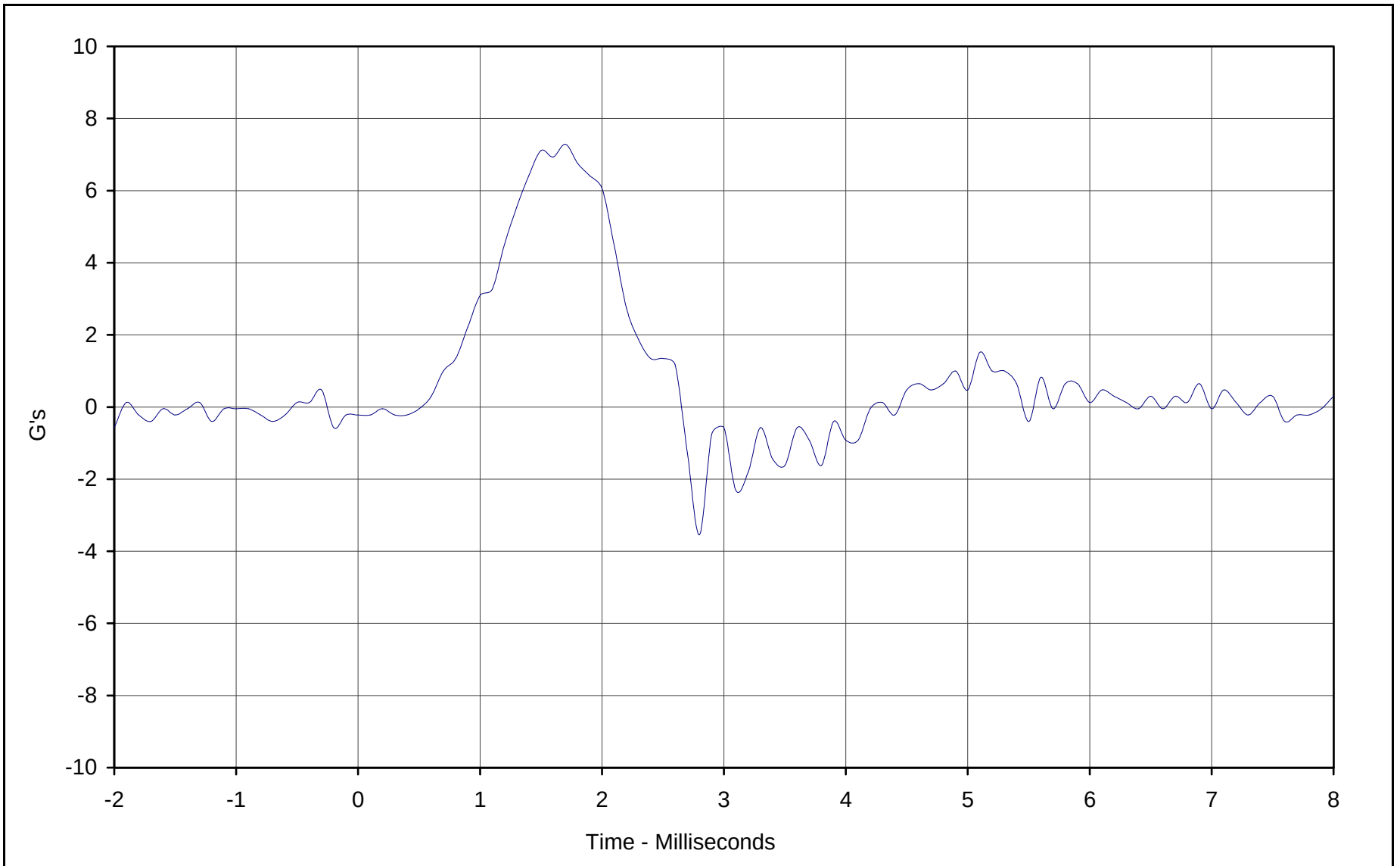


Curve Description: Head Resultant Acceleration
Maximum Value: 237.3 at 1.6 Milliseconds
Minimum Value: 0.4 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/7/00

Test Program: Hybrid II Head Drop Calibration
Test Information: SID S/N: 274 Test I.D.: HD12C



KAR21003-03



Curve Description: Head Y Axis Acceleration
Maximum Value: 7.3 at 1.7 Milliseconds
Minimum Value: -3.5 at 2.8 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/7/00

Test Program: Hybrid II Head Drop Calibration
Test Information: SID S/N: 274 Test I.D.: HD12C





Performance Verification Data Side Impact Dummy (SID) External Dimensions

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: N/A

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory temperature	°C	20.4 to 22.1	21.1	Pass
Laboratory relative humidity	%	10 to 70	30	Pass
SH- Seated Height	mm	889 to 909	905	Pass
HP- Hip Point Height	mm	99 (reference)	99	Pass
RH- Rib Height	mm	502 to 520	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	360	Pass
Overall Test Results				Pass

Laboratory Technician

December 7, 2000

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.: TI11B

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°C	18.9 to 25.5	21.1	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Probe Velocity	m/s	4.21 to 4.33	4.27	Pass
Left Upper Rib Acceleration	G's	37.0 to 46.0	42.7	Pass
Left Lower Rib Acceleration	G's	37.0 to 46.0	41.2	Pass
Thoracic Spine Acceleration	G's	15.0 to 22.0	19.0	Pass
Overall Test Results				Pass

Laboratory Technician

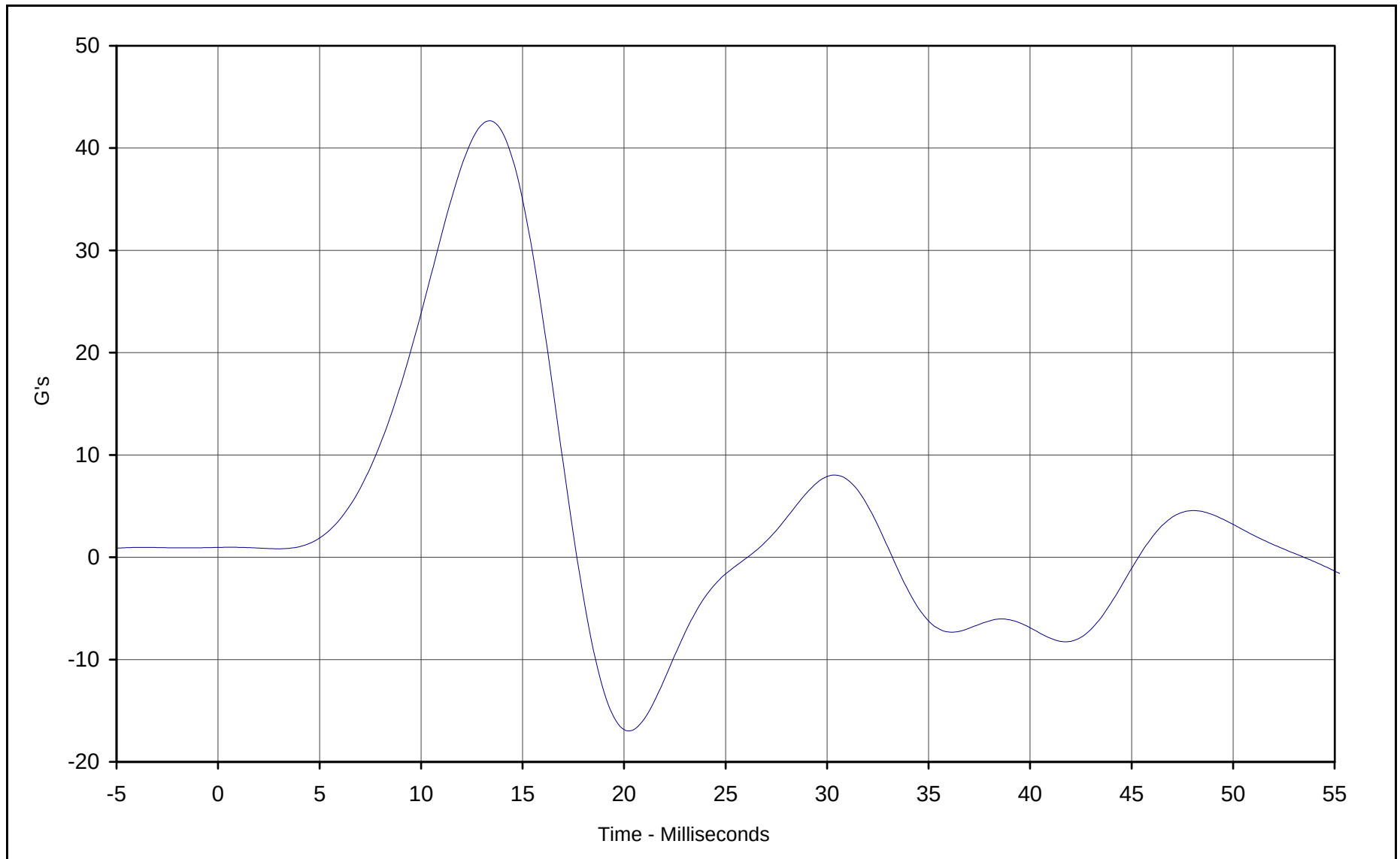
December 6, 2000

Test Date

Approved By

Date

C-39



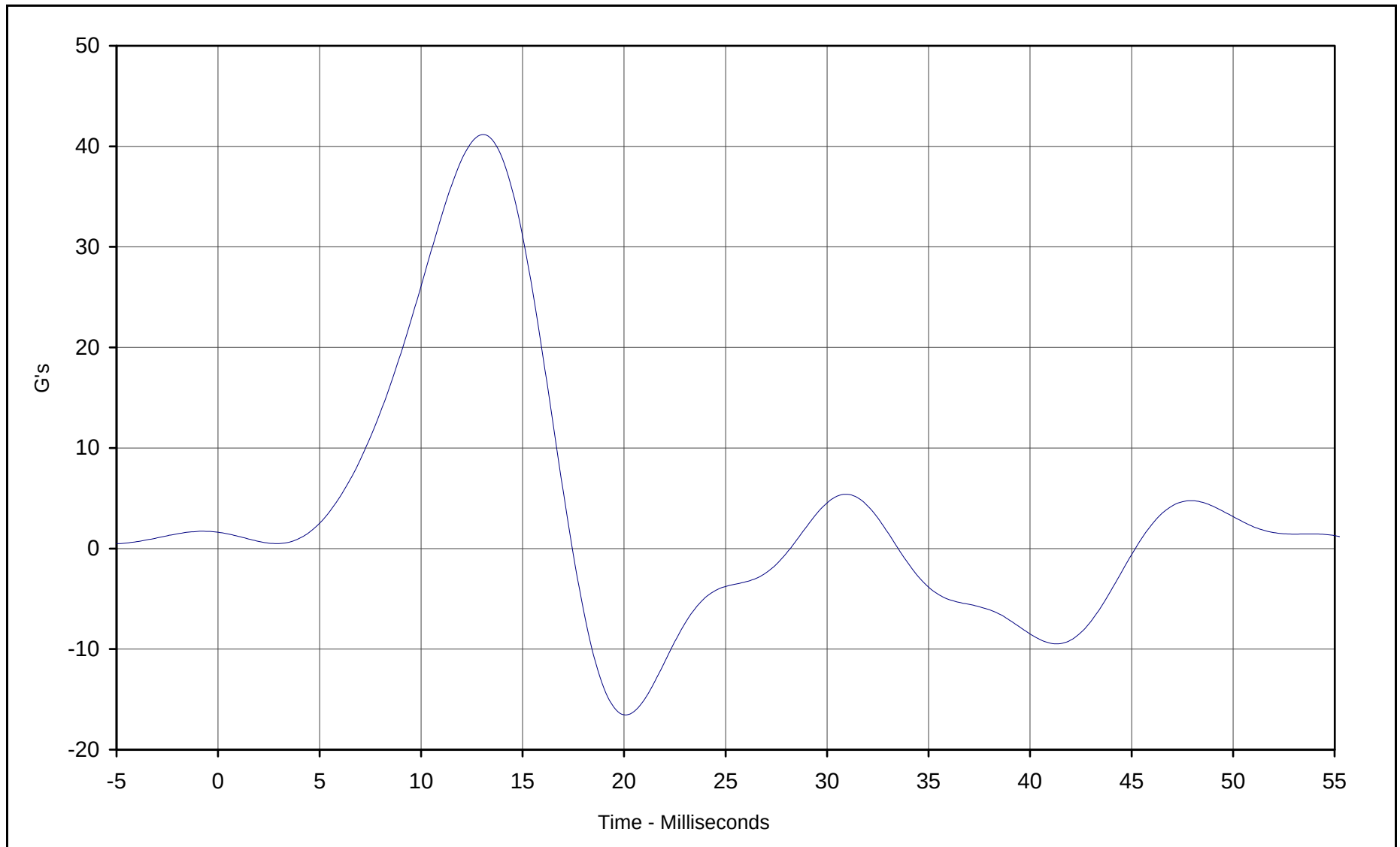
Curve Description: Left Upper Rib Y Acceleration
Maximum Value: 42.7 at 13.4 Milliseconds
Minimum Value: -17.0 at 20.2 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/00

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 275 Test I.D.: TI11B



KAR21003-03

C-40



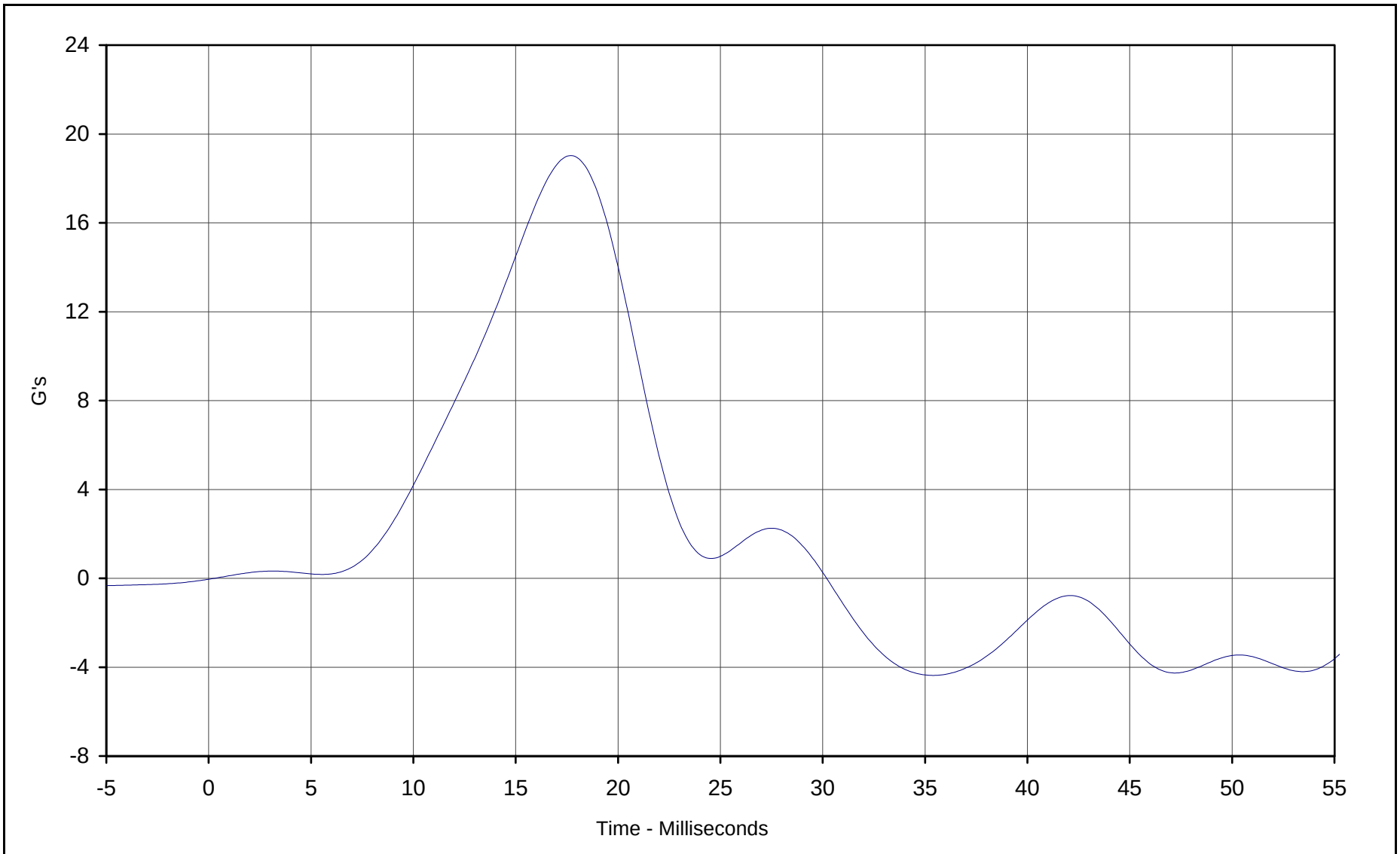
Curve Description: Left Lower Rib Y Acceleration
Maximum Value: 41.2 at 13.1 Milliseconds
Minimum Value: -16.5 at 20.1 Milliseconds
SAE Filter Class: FIR 100
Date of Test: 12/6/00

Test Program: SID Thorax Lateral Impact Test
Test Information: SID S/N: 275 Test I.D.: TI11B



KAR21003-03

C-41



Curve Description: Lower Spine Y Acceleration

Maximum Value: 19.0 at 17.7 Milliseconds

Minimum Value: -4.4 at 35.4 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 12/6/00

Test Program: SID Thorax Lateral Impact Test

Test Information: SID S/N: 275 Test I.D.: TI11B



KAR21003-03



Performance Verification Data

Side Impact Dummy (SID)

Left Side Pelvis Lateral Impact

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: PI11F

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	58.0	Pass
Acceleration Time Above 20 G's	Msec.	3.0 to 7.0 Msec.	5.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

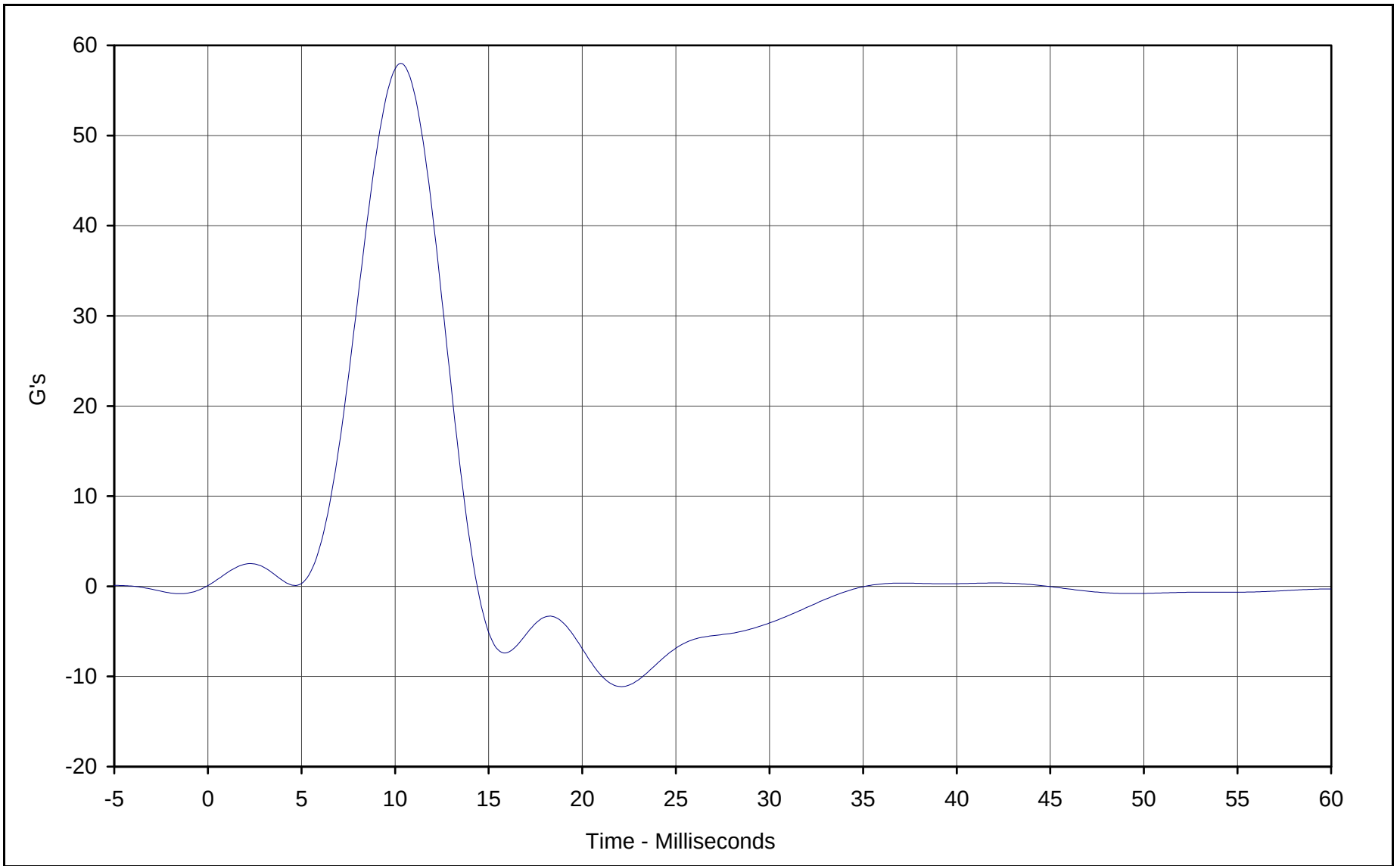
December 6, 2000

Test Date

Approved By

Date

C-43



Curve Description: Pelvis Y Axis Acceleration

Maximum Value: 58.0 at 10.3 Milliseconds

Minimum Value: -11.1 at 22.1 Milliseconds

SAE Filter Class: FIR 100

Date of Test: 12/6/00

Test Program: Left Side Pelvis Lateral Impact

Test Information: SID S/N: 275 Test I.D.: PI11F



KAR21003-03



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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: AB12D

Tested Parameter	Units	Specification	Result	Pass/Fail
Laboratory Temperature	°F	66 to 78	70	Pass
Laboratory Relative Humidity	%	10 to 70	30	Pass
Force at 0.5 Inches of Displacement	Pounds	23.0 to 36.0	29.0	Pass
Force at 0.75 Inches of Displacement	Pounds	36.0 to 50.0	43.2	Pass
Force at 1.0 Inches of Displacement	Pounds	50.0 to 63.0	59.8	Pass
Force at 1.3 Inches of Displacement	Pounds	73.0 to 88.0	83.5	Pass
Overall Test Results				Pass

Laboratory Technician

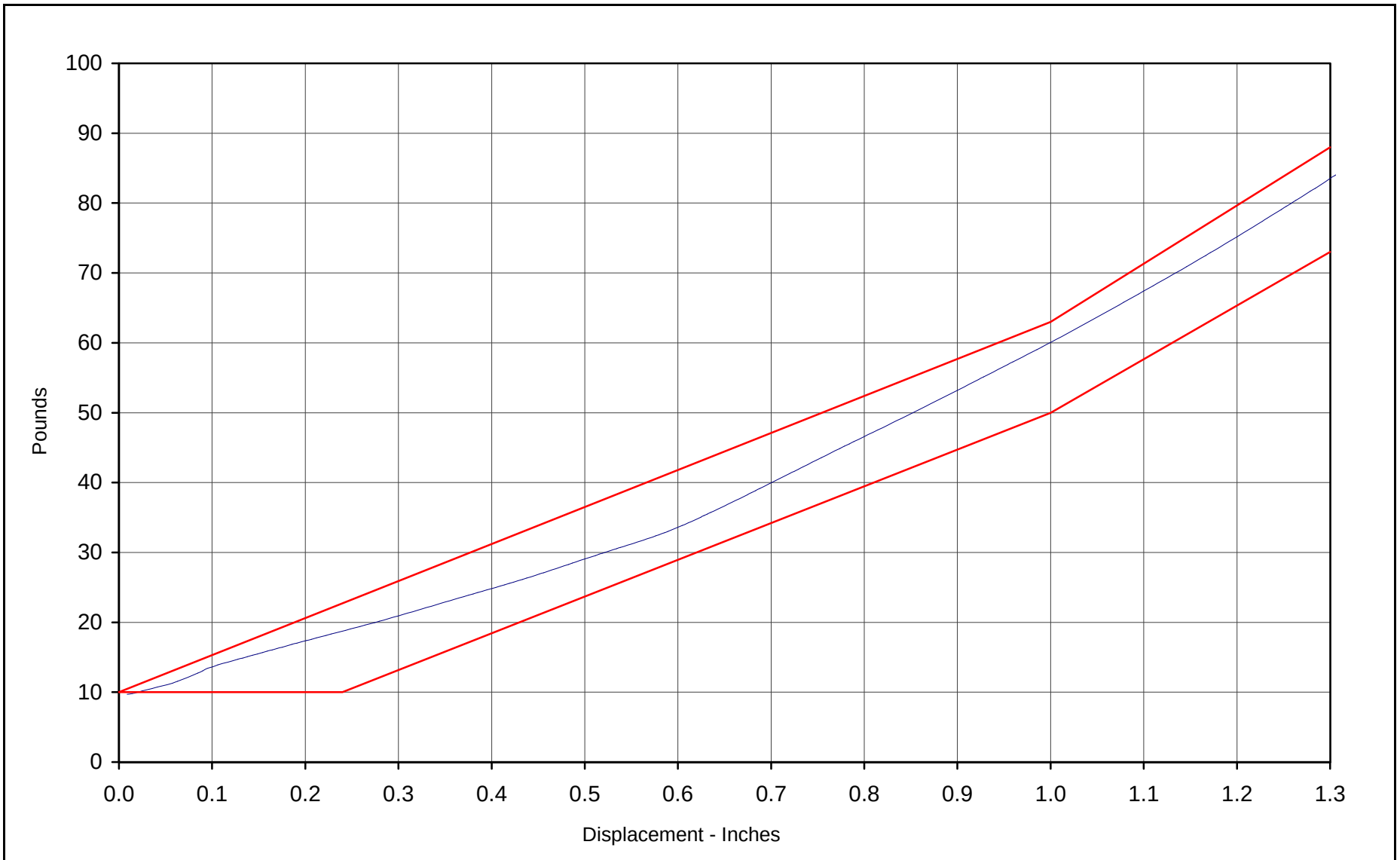
December 6, 2000

Test Date

Approved By

Date

C-45



Curve Description: Abdomen Force vs. Displacement

Force at 0.5 In.: 29.0 Pounds

Force at 0.75 In.: 43.2 Pounds

Force at 1.0 In.: 59.8 Pounds

Force at 1.3 In.: 83.5 Pounds

Date of Test: 12/6/00

Test Program: Hybrid II Abdominal Compression

Test Information: SID S/N: 275 Test I.D.: AB12D



KAR21003-03



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

ATD Serial No.: 275

Part Serial No.: N/A

Test I.D.: HD12D

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	241.7	Pass
Peak Lateral Acceleration	G's	≤10.0	5.8	Pass
Time Above 100 G's	Msec.	0.9 to 1.5	1.0	Pass
Is Resultant Acceleration Unimodal?	Yes/No	Yes	Yes	Pass
Overall Test Results				Pass

Laboratory Technician

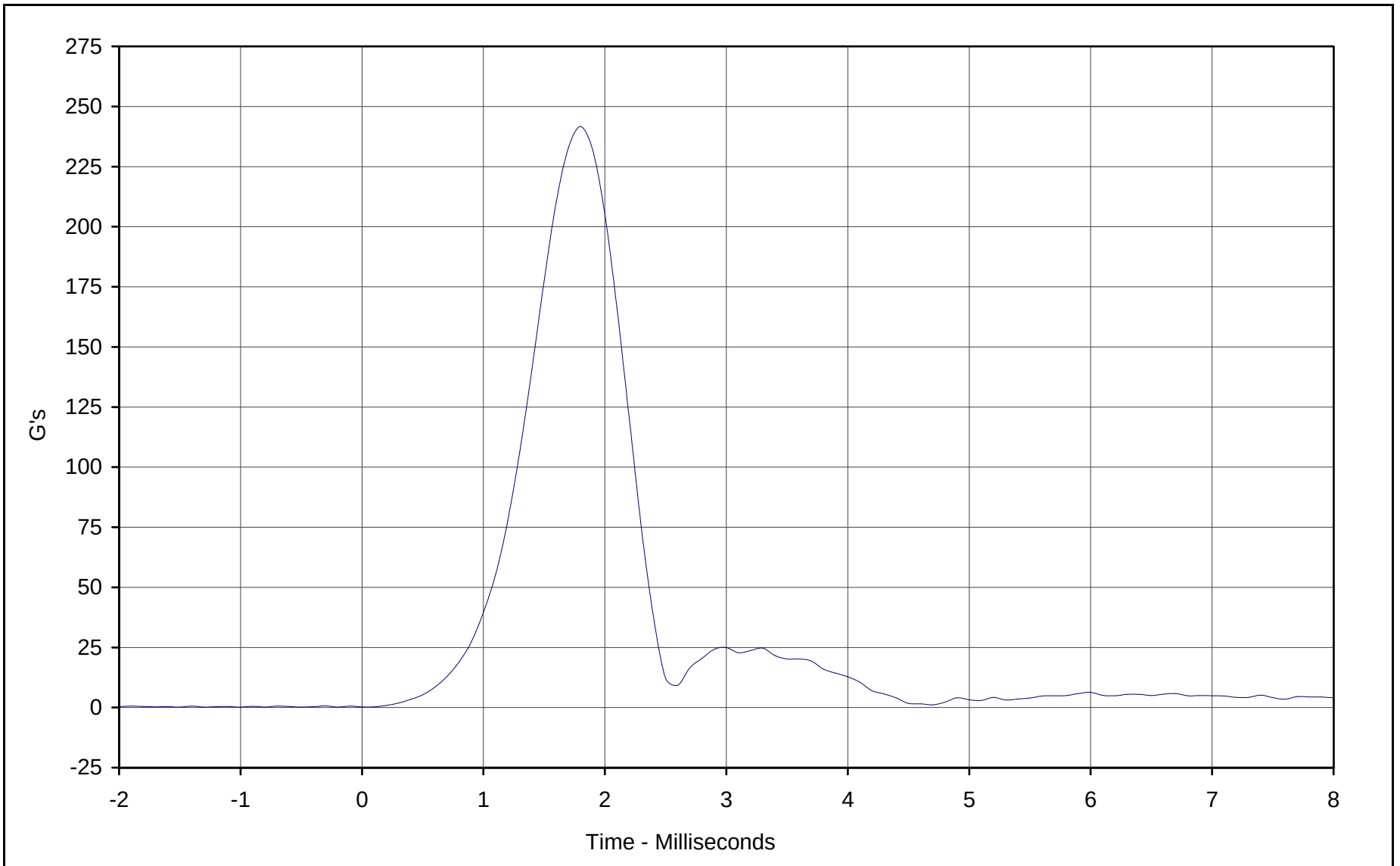
December 7, 2000

Test Date

Approved By

Date

C-47



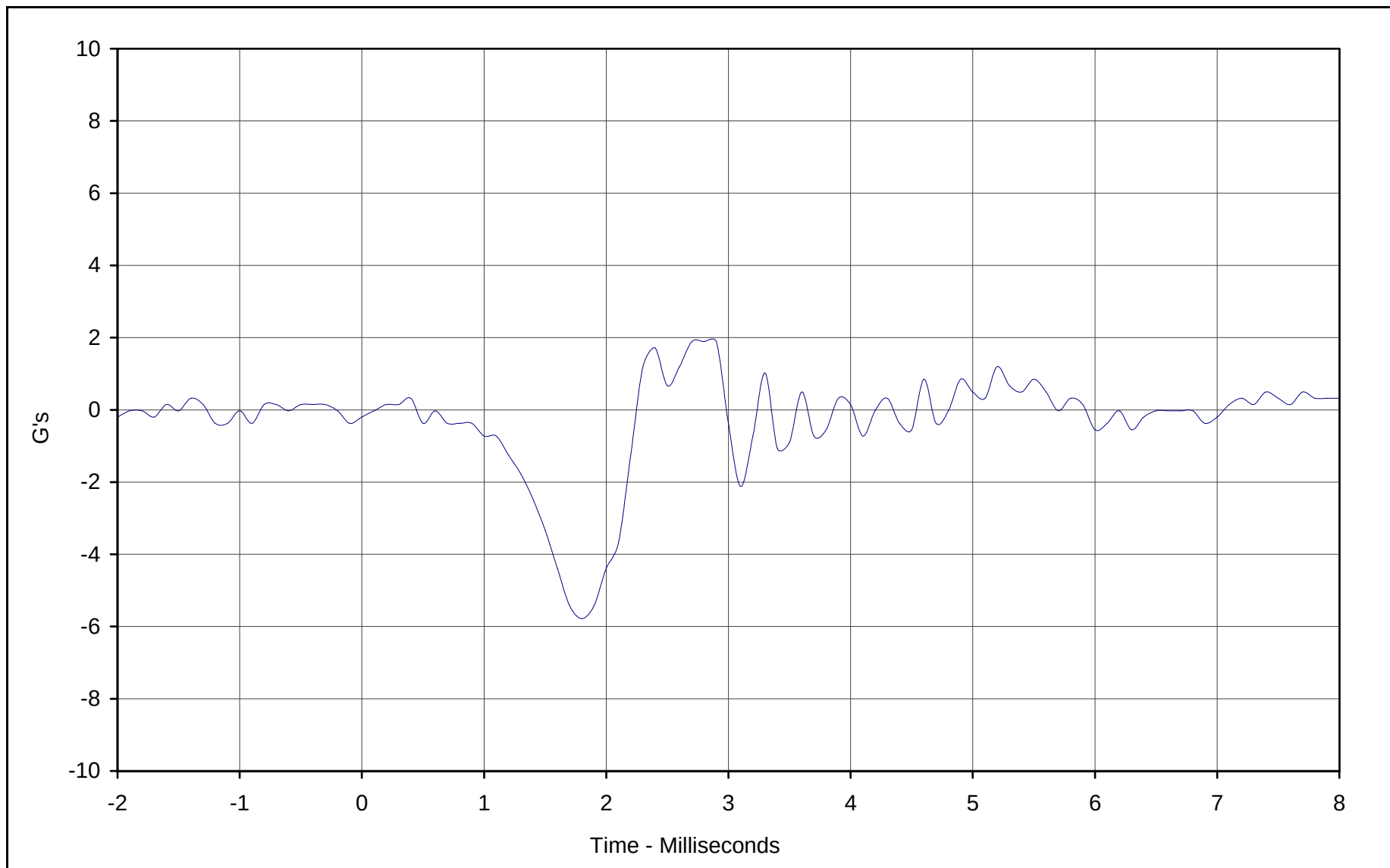
Curve Description: Head Resultant Acceleration
Maximum Value: 241.7 at 1.8 Milliseconds
Minimum Value: 0.3 at 0.0 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/7/00

Test Program: Hybrid II Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: HD12D



KAR21003-03

C-48



Curve Description: Head Y Axis Acceleration
Maximum Value: 1.9 at 2.7 Milliseconds
Minimum Value: -5.8 at 1.8 Milliseconds
SAE Filter Class: 1000
Date of Test: 12/7/00

Test Program: Hybrid II Head Drop Calibration
Test Information: SID S/N: 275 Test I.D.: HD12D



KAR21003-03

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
12/05/00
2001 Toyota Sienna Minivan

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
12/05/00
2001 Toyota Sienna Minivan

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
12/05/00
2001 Toyota Sienna Minivan

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

55/28 km/h Side Impact NCAP
Instrumentation Data Channel Assignments
Moving Deformable Barrier
12/05/00
2001 Toyota Sienna Minivan

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