

REPORT NUMBER: TO5-MGA-2002-001

**RIGID POLE SIDE IMPACT TEST AT 285 DEGREES
Task Order T0004 / RFP 0005
2001 SATURN L200 WITHOUT HEAD CURTAIN AIRBAG**

SID/HIII DRIVER POSITION

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May 6, 2002

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
VOLPE NATIONAL TRANSPORTATION SYSTEM CENTER
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This final test report was prepared for the U.S. Department of Transportation, Volpe National Transportation System Center, under Contract No. DTRS57-98-D-00041.

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SECTION 1
PURPOSE AND TEST PROCEDURE

This Side Impact test is conducted as part of Contract No. DTRS57-98-D-00041, Task Order T0004 / RFP 0005, sponsored by the U.S. Department of Transportation, Volpe National Transportation System Center. The purpose of this test is to evaluate the responses of the ES-2 and SID/HIII dummies in a 2001 Saturn L200 without head curtain airbag, when subjected to a rigid pole side impact at 285 degrees.

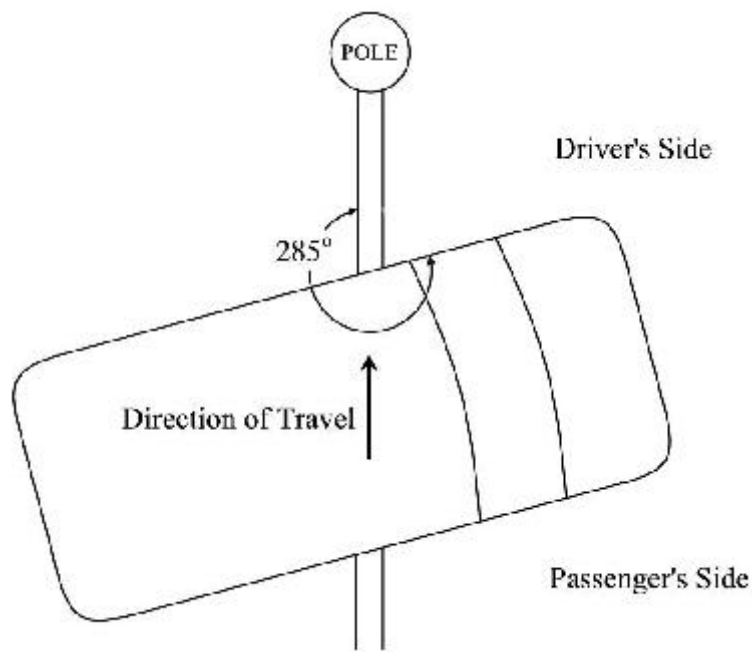
MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

SECTION 2 SUMMARY OF SIDE IMPACT TEST

A rigid pole side impact test at 285 degrees was performed on a model year 2001 Saturn L200 4-door without head curtain airbag. The subject vehicle was towed into a rigid pole at a velocity of 32.2 km/h. The weight of the vehicle as tested was 1598.6 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on May 6, 2002. Pre- and post-test photographs of the test vehicle and the dummies are included in Appendix A.

One SID/HIII side impact dummy was placed in the left front designated seating position according to instructions specified in the FMVSS 201P Laboratory Test Procedure which is dated April 21, 2000. The side impact event was documented by ten high speed cameras. Camera locations and other pertinent camera information can be found in this report.

Appendix B contains the vehicle and dummy response data traces. A summary of the dummy configuration and performance verification test data is shown in Appendix C. Dummy and vehicle calibration data can be found in Appendix D of this report. Appendix E contains the dummy peak responses.



The following table summarizes the results of the Left Side Impact test:

HIC		Left Front
	T1 (msec)	53.4
	T2 (msec)	54.1
	T2 - T1 (msec)	0.7
	HIC *	7493

Fir Filtered	Left Front
Upper Rib Y (g's)	114.9
Lower Rib Y (g's)	112.9
Lower Spine Y (g's)	99.5
Pelvis Y (g's)	55.6
TTI (g's)	107

Contacts	Left Front
Rib (msec)	42.1
Pelvis (msec)	26.8

* The head Y channel was clipped at 700 G's

TEST NOTES

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

**DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

TEST VEHICLE INFORMATION

Make	Saturn
Model	L200
Body Style	4 door
VIN	1G8JU52F81Y562619
Color	Painted Orange
Odometer Reading	27,137 miles
Transmission	automatic
Final Drive	front
Number of Cylinders	4
Engine Displacement	2.2 Liters
Engine Placement	lateral

TEST VEHICLE OPTIONS

Front Airbags	yes
Side Airbags	no
Power Windows	yes
Power Steering	yes
Power Door	yes
Tilt Wheel	yes
Air Conditioning	yes
Power Brakes	yes
Anti-lock Brakes	no
AM/FM/Cassette	yes
Cruise Control	yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Saturn Corporation	GVWR (kg)	1806
Date of Manufacture	3/01	GAWR Front (kg)	887
		GAWR Rear (kg)	919

DATA FROM TIRE PLACARD

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

Measured Parameter	Front	Rear	Third	Total
Type of Seats	bucket	bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				420
Cargo Weight (RCLW) (kg)				79.8

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

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	411.4	268.1		442.3	362.9	
Right	kg	395.5	274.4		434.1	359.3	
Ratio	%	59.8	40.2		54.8	45.2	
Totals	kg	806.9	542.5	1349.4	876.4	722.2	1598.6

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Vehicle Target Weight (TVT _W)*	kg	1598.5

* Target weight was set to match previous tests with the 2001 Saturn L200

TEST VEHICLE ATTITUDES

	Units	As Delivered	Fully Loaded	Ready for Test
Right Door Sill Angle	deg	0.9 ND	0.3 ND	0.3 ND
Left Door Sill Angle	deg	0.8 ND	0.4 ND	0.5 ND
Front Bumper Angle	deg	0.1 RD	0.1 LD	0.0
Rear Bumper Angle	deg	0.1 RD	0.1 LD	0.0

ND = Nose Down, BD = Back Down, LD = Left Down, RD = Right Down

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2703
Total Vehicle Length at Left Side	mm	4334
Total Vehicle Length at Centerline	mm	4765
Total Vehicle Length at Right Side	mm	4334
Weight of Ballast in Cargo Area	kg	0
Amount of Water in Fuel Tank	liters	68.1

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Actual Impact Point	mm	5 rear

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

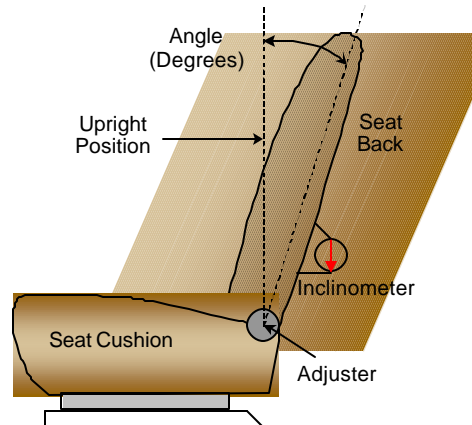
Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

NORMAL DESIGN RIDING POSITION

Driver seat back angle: 20.4 deg. measured on seat frame (adjusted forward 4.8 deg. to achieve 50 mm head clearance)

Passenger seat back angle: non adjustable



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

The driver's seat is manually operated and the rear passenger seat has no adjustments.

Driver seat fore/aft total travel: 17 detents

Rear passenger seat fore/aft total travel: non adjustable

Driver seat fore/aft position: 5th notch, 1st as one (adjusted forward 4 notches to achieve 50 mm head clearance)

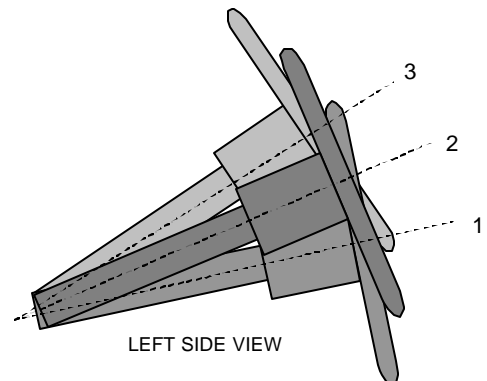
Rear passenger seat fore/aft position: non adjustable

SEAT BELT UPPER ANCHORAGE

The test vehicle "D" ring anchorage for the driver's seat position was placed in the full up position.

STEERING COLUMN ADJUSTMENT

The steering column contained 5 adjustment positions.
The column was set in the third position with top as one.



STEERING COLUMN ASSEMBLY

**DATA SHEET NO. 2
POST TEST OBSERVATIONS**

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Left Front
Dummy Type	SID/HIII
Head Contact	Pole, headrest
Upper Torso Contact	Door panel
Lower Torso Contact	Armrest
Left Knee Contact	Door panel
Right Knee Contact	Left knee

POST TEST DOOR OPENING

Description	Left Front	Left Rear
Left Side Door Opening	Remained latched	Remained latched
Right Side Door Opening	Remained latched	Remained latched

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No failures
Sill Separation	None
Windshield Damage	Wind shield cracked
Window Damage	Struck side windows down for test
Other Notable Effects	None

AIRBAG DEPLOYMENT

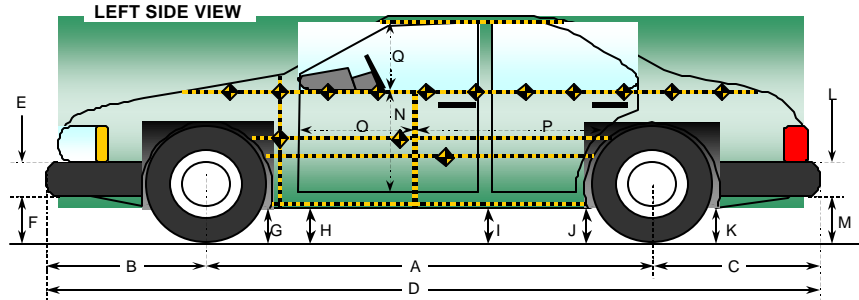
	Driver	Left Front	Left Rear
Front	No	No	
Side			
Curtain			

**SECTION 4
OCCUPANT AND VEHICLE INFORMATION**

DATA SHEET NO. 3
VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002



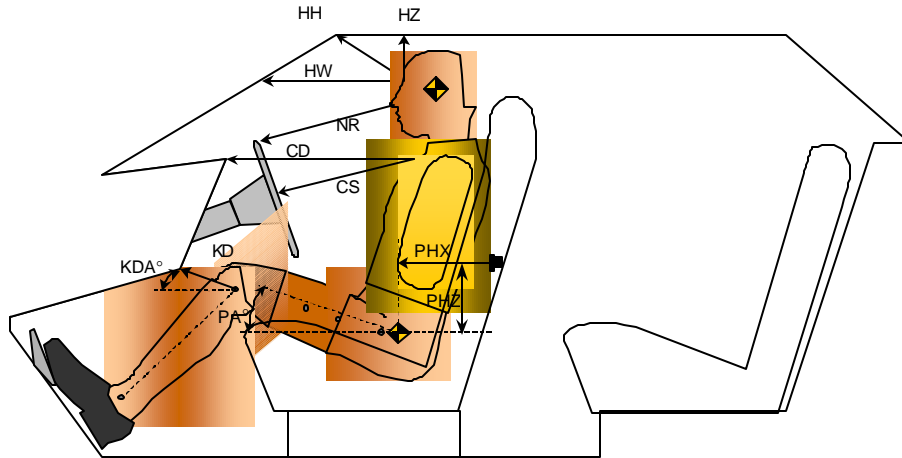
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2700	2423	277
B	Front Axle to FSOV	970	1059	89
C	Rear Axle to RSOV	1095	1135	40
D	Total Length at Centerline	4765	4617	148
E	Front Bumper Thickness	100	100	0
F	Front Bumper Bottom to Ground	570	618	48
G	Sill Height at Front Wheel Well	322	299	23
H	Sill Height at Front Door Leading Edge	320	306	14
I	Sill Height at "B" Pillar	329	298	31
J1	Sill Height at Rear Wheel Well	335	346	11
J2	Pinch Weld Height at Rear Wheel Well	329	360	31
K	Sill Height Aft of Rear Wheel Well	367	357	10
L	Rear Bumper Thickness	240	240	0
M	Rear Bumper Bottom to Ground	554	488	66
N	Sill Height to Window Bottom Sill	620	581	39
O	Front Door Leading Edge to Impact CL	701	599	102
P	Rear Door Trailing Edge to Impact CL	1338	1087	251
Q	Front Window Opening	435	395	40
R	Right Side Length	3879	3892	13
S	Left Side Length	3879	3574	305
T	Vehicle Width at "B" Post	1742	1424	318

DATA SHEET NO. 4
SID/HIII LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002



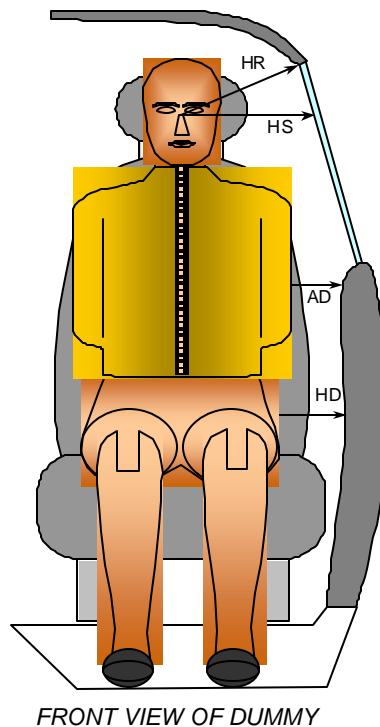
Driver Code	Measurement Description	Left Front	
		Length(mm)	Angle(°)
HH	Head to Header	320	
HW	Head to Windshield	498	
HZ	Head to Roof	176	
NR	Nose to Rim	388	
CD	Chest to Dash	471	
CS	Chest to Steering Wheel	287	
KDL	Left Knee to Dash	131	0
KDR	Right Knee to Dash	124	0
PA	Pelvic Angle (Longitudinal)		24.0
PHX	H-Point to Striker (X-Axis)	232	
PHZ	H-Point to Striker (Z-Axis)	169	

DATA SHEET NO. 5
SID/HIII LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

Code	Measurement Description	Units	Left Front
HR	Head to Side Header	mm	221
HS	Head to Side Window	mm	309
AD	Arm to Door	mm	107
HD	H-Point to Door	mm	121



**DATA SHEET NO. 6
DUMMY POSITIONING**

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

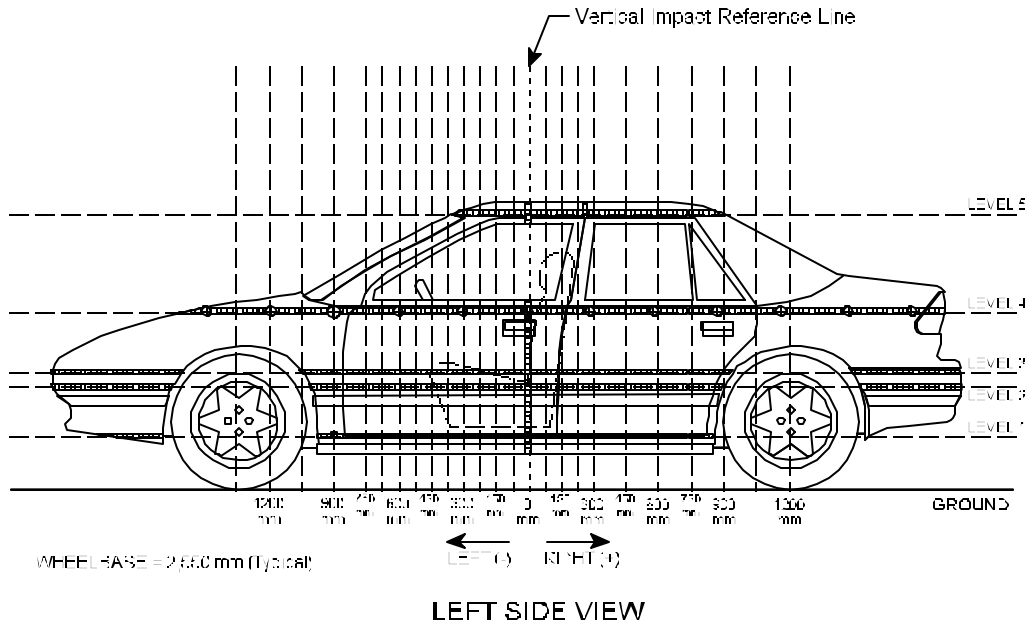
	Left Front	
	H-Point Machine	Dummy H Point after adjustment to achieve head clearance
HP to Floor Z (mm)	144	136
HP to Hinge X (mm)	763	716
HP to Sill Y (mm)	211	220
HP to Striker X (mm)	338	380
HP to Dash X (mm)	569	530
HP to Header Z (mm)	787	786
H-POINT MACHINE (deg)		
Left Knee	126	
Right Knee	125	
Left Foot	124	
Right Foot	128	
Left Leg (mm)	105	
Right Leg (mm)	103	
Hip Angle	99	
Back Angle	25	

DATA SHEET NO. 7
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

PRETEST AND POST TEST EXTERIOR PROFILE MEASUREMENTS



Measurements are taken with vehicle in the as tested condition.

Measurements along the vertical 0 mm.

Level	Measurement Description	Units	Height Above Ground
5	Window	mm	1475
4	Window Sill	mm	972
3	Mid Door	mm	714
2	Occupant H-Point	mm	606
1	Sill Top	mm	445

DATA SHEET NO. 8
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

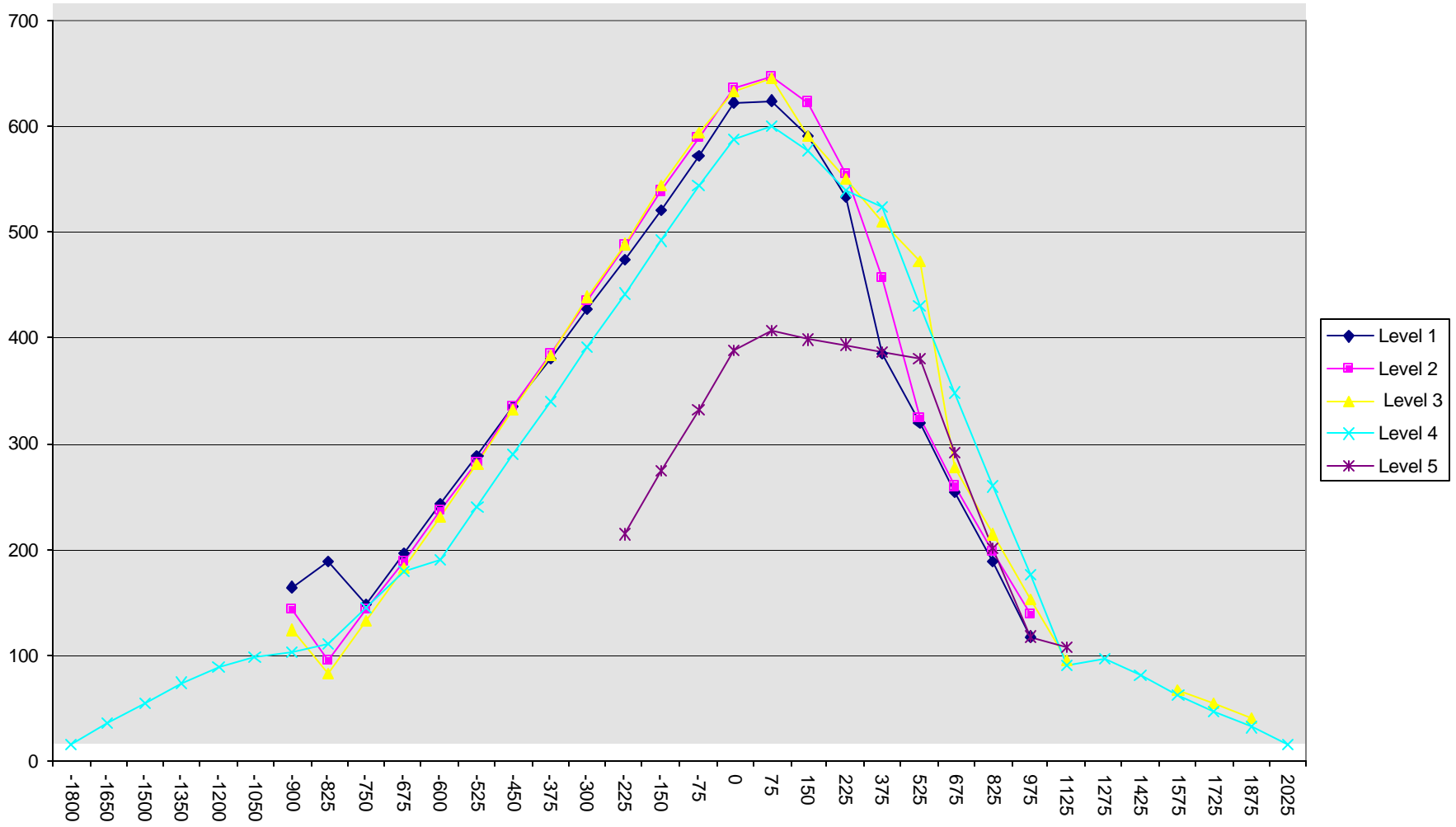
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1950															
-1800				405					421					16	
-1650				375					411					36	
-1500				351					406					55	
-1350				333					408					75	
-1200				322					410					88	
-1050				315					414					99	
-900	274	252	251	310		438	395	375	414		164	143	124	104	
-825	272	252	252	308		460	347	334	419		188	95	82	111	
-750	271	250	250	307		420	394	383	452		149	144	133	145	
-675	268	250	249	307		465	438	431	486		197	188	182	179	
-600	267	248	249	306		510	485	480	497		243	237	231	191	
-525	265	248	248	305		554	531	528	545		289	283	280	240	
-450	264	247	247	305		599	583	579	596		335	336	332	291	
-375	263	247	246	304		644	632	630	645		381	385	384	341	
-300	263	246	245	303		690	682	684	695		427	436	439	392	
-225	262	246	245	301	532	737	733	734	743	746	475	487	489	442	214
-150	262	245	244	301	525	783	784	787	793	799	521	539	543	492	274
-75	262	245	244	300	521	834	833	837	843	853	572	588	593	543	332
0	262	244	244	299	521	885	879	876	886	910	623	635	632	587	389
75	262	244	244	299	519	887	890	889	899	926	625	646	645	600	407
150	263	244	244	297	518	854	866	834	875	916	591	622	590	578	398
225	263	244	244	297	519	797	799	794	836	913	534	555	550	539	394
375	262	244	244	295	520	648	700	754	820	907	386	456	510	525	387
525	263	244	244	297	521	582	568	717	728	902	319	324	473	431	381
675	262	243	244	298	521	517	503	522	647	813	255	260	278	349	292
825	263	243	245	300	523	452	442	460	560	725	189	199	215	260	202
975	264	244	247	304	526	382	383	400	480	643	118	139	153	176	117
1125			245	311	532			340	401	640			95	90	108
1275				317					414					97	
1425				325					406					81	
1575			254	339				322	402				68	63	
1725			278	354				333	401				55	47	
1875			299	372				339	405				40	33	
2025				393					409					16	
2175															

Reference plane is parallel to test vehicle longitudinal centerline
 Given dimensions = Reference plane to car body
 Measurements in mm.

DATA SHEET NO. 8...(continued)
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

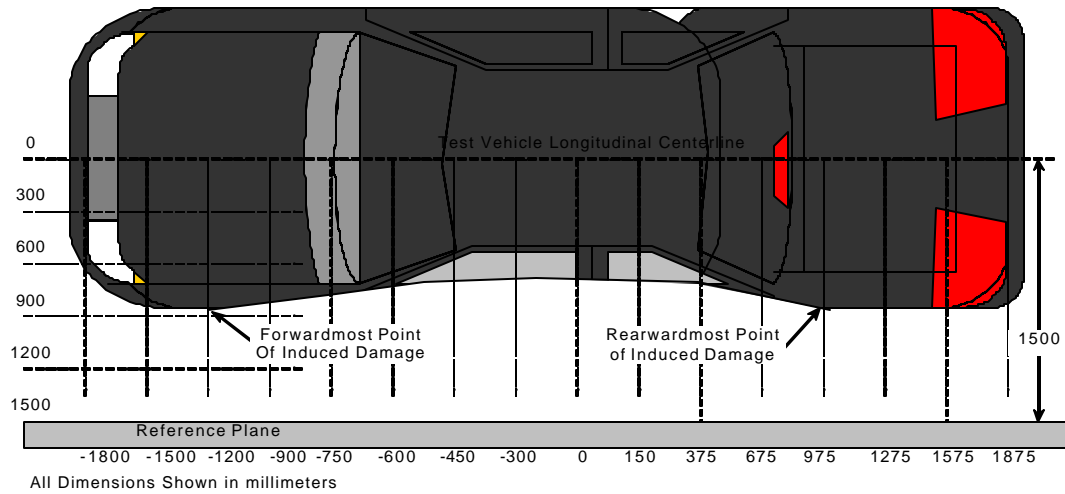


Measurement in mm.

**DATA SHEET NO. 9
VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002



TOP VIEW

Damage Profile Distances

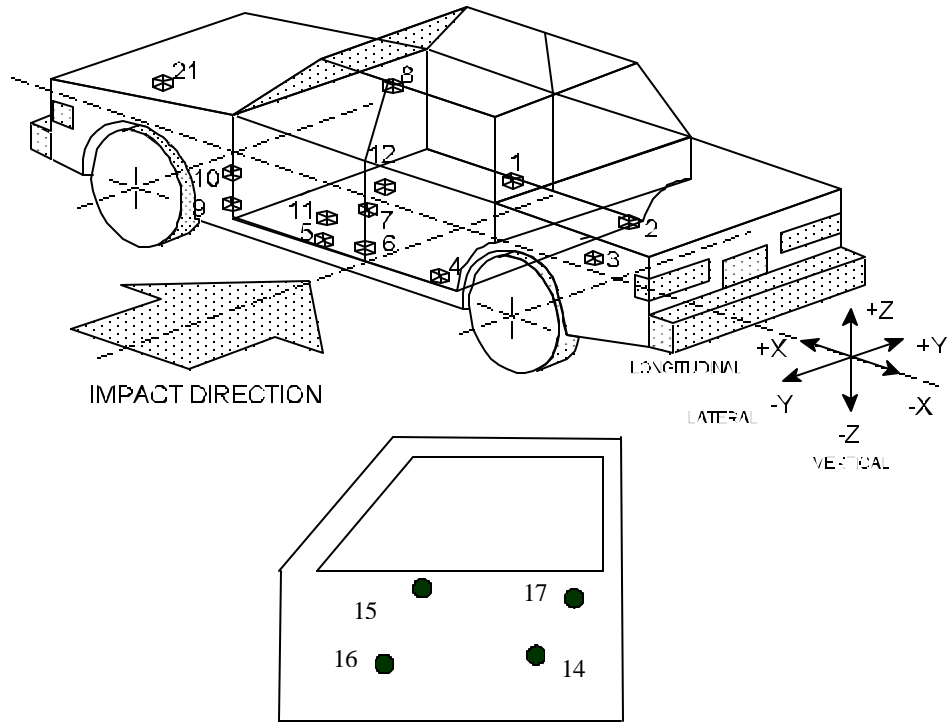
DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	1875 mm	4	393	409	16
2	1163 mm	4	319	411	92
3	345 mm	4	296	745	449
4	-525 mm	3	247	579	332
5	-1235 mm	4	317	413	96
6	-1950 mm	4	405	421	16

Reference plane is parallel to test vehicle longitudinal centerline
Given dimensions = Reference plane to car body

DATA SHEET NO. 10
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002



No.	Location
1	Right Side Sill at Front Seat
2	Right Side Sill at Rear Seat
3	Rear Floorpan Above Axle
4	Left Side Sill at Rear Door
5	Left Side Sill at Front Door
6	Left Lower B Post
7	Left Mid B Post
8	Left Upper B Post
9	Left Lower A Post
10	Left Mid A Post
11	Driver Seat Track

No.	Location
12	Vehicle CG
13	Left A Pillar @ Roof
14	Left Front Door @ Pelvis
15	Left Front Door @ Arm
16	Left Front Door @ Knee
17	Left Front Door @ Rib
19	Left Driver Seat Frame
20	Right Driver Seat Frame
21	Lower Center Radiator Support

DATA SHEET NO. 10...(continued)
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Long. (X) Maximums (g's)		Lat. (Y) Maximums (g's)		Vert. (Z) Maximums (g's)		Resultant (g's)
		Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Max.
1	Right Side Sill at Front Seat	1.2	3.0	11.0	0.4	3.6	4.7	11.3
2	Right Side Sill at Rear Seat	1.2	2.8	10.1	0.3	3.2	2.5	10.3
3	Rear Floorpan Above Axle	3.7	2.9	9.8	0.1	3.7	3.8	9.9
4	Left Side Sill at Rear Door			13.9	0.1			
5	Left Side Sill at Front Door			84.6	23.9			
6	Left Lower B Post			76.3	10.3			
7	Left Mid B Post			64.1	22.4			
8	Left Upper B Post			64.2	12.1			
9	Left Lower A Post			24.5	4.6			
10	Left Mid A Post			8.7	2.4			
11	Driver Left Seat Track			99.5	5.0			
12	Vehicle CG	1.7	4.7	15.1	0.4	10.0	10.4	15.7
13	Left A Pillar @ Roof			36.5	1.4			
14	Left Front Door @ Pelvis			166.8	71.4			
15	Left Front Door @ Arm			86.2	46.0			
16	Left Front Door @ Knee			99.3	60.5			
17	Left Front Door @ Rib			146.7	4.9			
19	Left Driver Seat Frame			77.9	14.1			
20	Right Driver Seat Frame			71.8	16.6			
21	Lower Center Radiator Support	2.3	10.9	8.4	9.1	10.6	13.9	15.1

Sign Convention X - (+ forward)
 Y - (+ to right)
 Z - (+ down)

DATA SHEET NO. 10...(continued)
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002

VEHICLE ACCELEROMETER COORDINATES

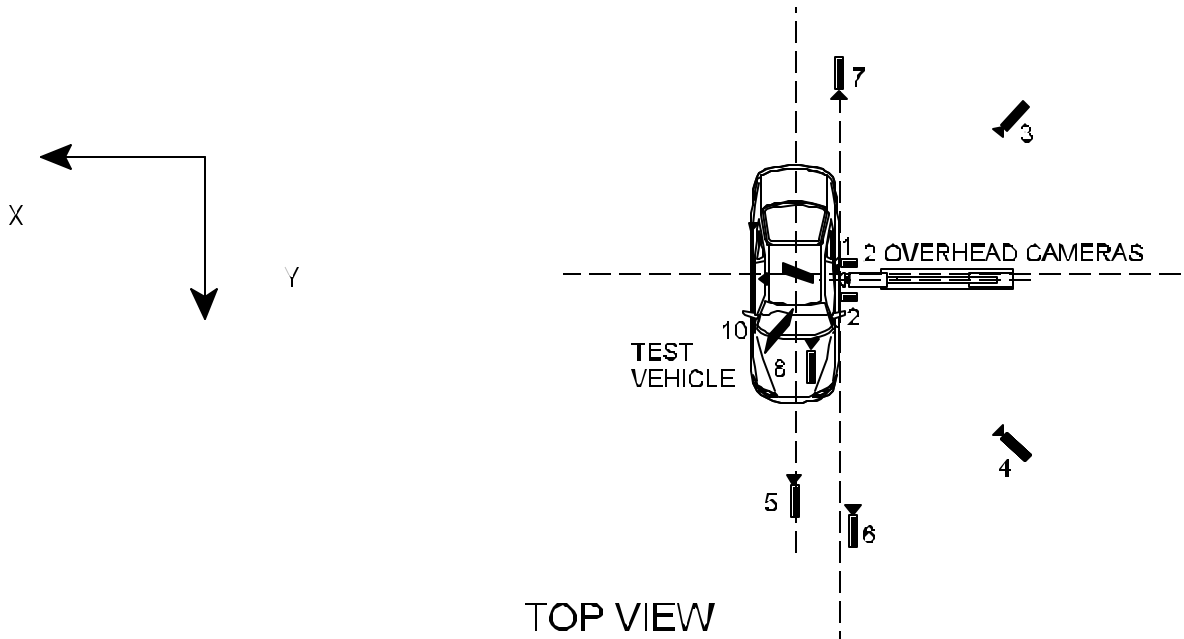
Loc. No.	Description	Coordinates (mm)*		
		X	Y	Z
1	Right Side Sill at Front Seat	2508	693	316
2	Right Side Sill at Rear Seat	1550	661	316
3	Rear Floorpan Above Axle	1040	0	612
4	Left Side Sill at Rear Door	1542	-661	316
5	Left Side Sill at Front Door	2494	-673	313
6	Left Lower B Post	2143	-680	375
7	Left Mid B Post	2086	-742	937
8	Left Upper B Post	2072	-534	1417
9	Left Lower A Post	3122	-730	554
10	Left Mid A Post	3220	-788	939
11	Driver Left Seat Track	2373	-545	445
12	Vehicle CG	2538	-15	510
13	Left A Pillar @ Roof	2685	-516	1324
14	Left Front Door @ Pelvis	2433	-750	749
15	Left Front Door @ Arm	2676	-753	880
16	Left Front Door @ Knee	2881	-749	697
17	Left Front Door @ Rib	2398	-746	1023
19	Left Driver Seat Frame	2130	-575	822
20	Right Driver Seat Frame	2130	-175	828
21	Lower Center Radiator Support	4392	0	304

Sign Convention X - Rear Bumper (+ forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Plane (+ up)

DATA SHEET NO. 11
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: May 6, 2002



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	-810	0	5000	8	1015
2	Overhead Close-up	0	0	5000	13	1005
3	Left Side 45° Rearward Pole View	-3650	-7530	1268	50	1005
4	Left Side 45° Forward Pole View	-3640	5010	1370	50	930
5	Real Time					
6	Front Ground Level Vehicle/Pole Impact	-750	9440	1421	25	1010
7	Rear Ground Level Vehicle/Pole Impact	-1000	-9410	1445	25	791
8	Test Vehicle Onboard Hood				8	518
9	Test Vehicle Onboard Driver Hip				13	513
10	Test Vehicle Onboard Driver Head Contact				13	503

Reference Points X - + Forward of Impact
 Y - + Right of Impact
 Z - + Up from Ground

**APPENDIX A
PHOTOGRAPHS**

TABLE OF PHOTOGRAPHS

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Photo No. A-3 - Pre-Test Rear View of Test Vehicle



Photo No. A-4 - Post-Test Rear View of Test Vehicle

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Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

A-6



Photo No. A-6 - Post-Test Left Side View of Test Vehicle

A-7



Photo No. A-7 - Pre-Test Left Front View



Photo No. A-8 - Post-Test Left Front View

A-9



Photo No. A-9 - Pre-Test Overhead View

A-10

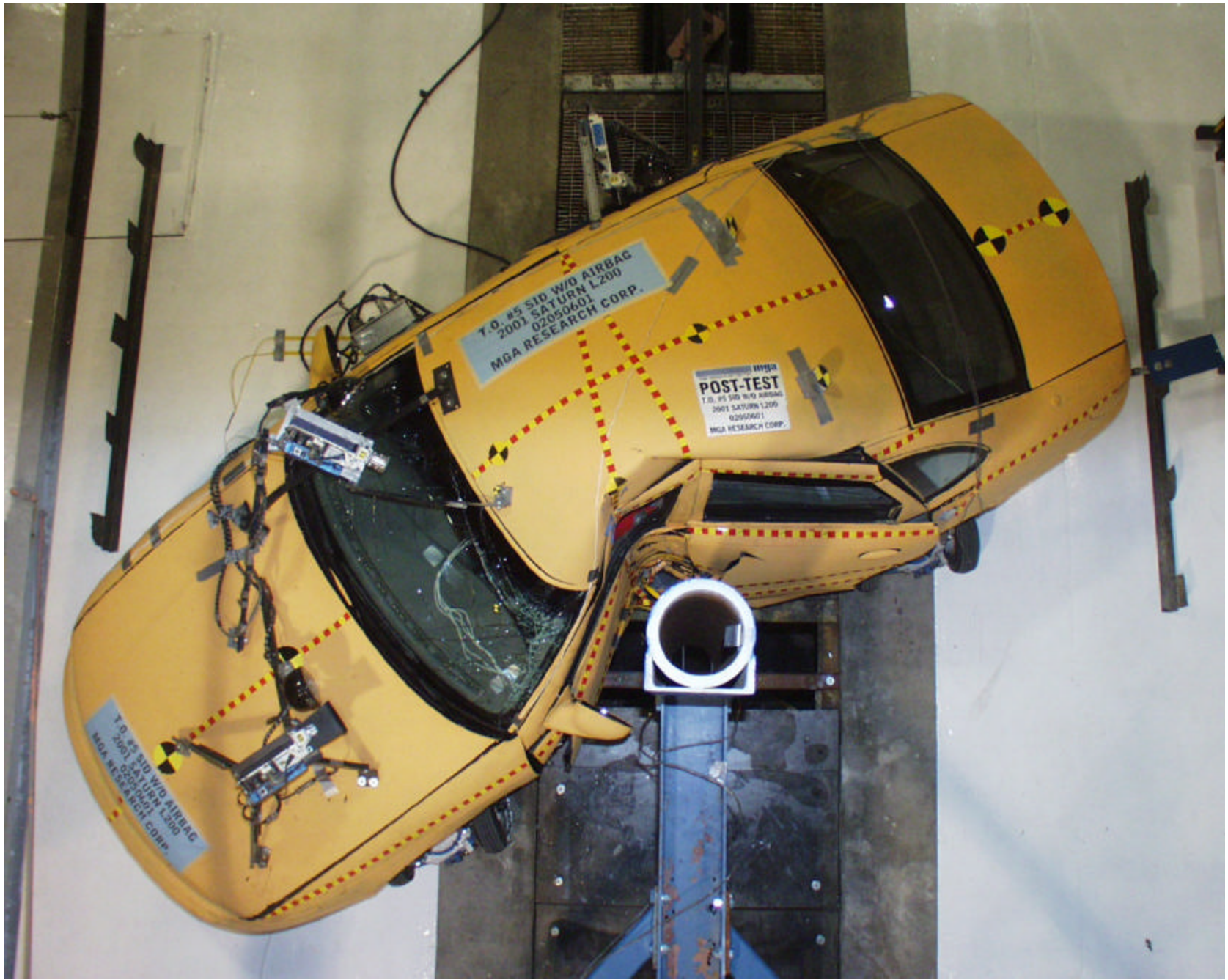


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Photo No. A-16 - Post-Test Driver Dummy Left Side View

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Photo No. A-21 - Post-Test Driver Dummy Head Contact

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Photo No. A-22 - Post-Test Driver Dummy Contact

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Photo No. A-23 - Pre-Test Seat Position



MFD BY SATURN CORPORATION

DATE
03/01

GVWR
1806 KG
3982 LB

GAWR FRT
887 KG
1956 LB

GAWR RR
919 KG
2026 LB

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

1G8JU52F81Y562619

TYPE: PASS CAR

A-24

Photo No. A-24 - Vehicle Certification



TIRE - LOADING INFORMATION

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

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.

1G8JU52F81Y562619

MODEL: JK19 ZJE

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

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

SEE OWNER'S MANUAL FOR MORE INFORMATION

A-25

Photo No. A-25 - Tire Placard



Photo No. A-26 - Pre-Test Impact Point on Test Vehicle



Photo No. A-27 - Post-Test Impact Point on Test Vehicle



Photo No. A-28 – Impact

APPENDIX B
SID/HIII AND VEHICLE RESPONSE DATA TRACES

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* Data over 700 G's was clipped

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* No Valid Data after 110 msec.



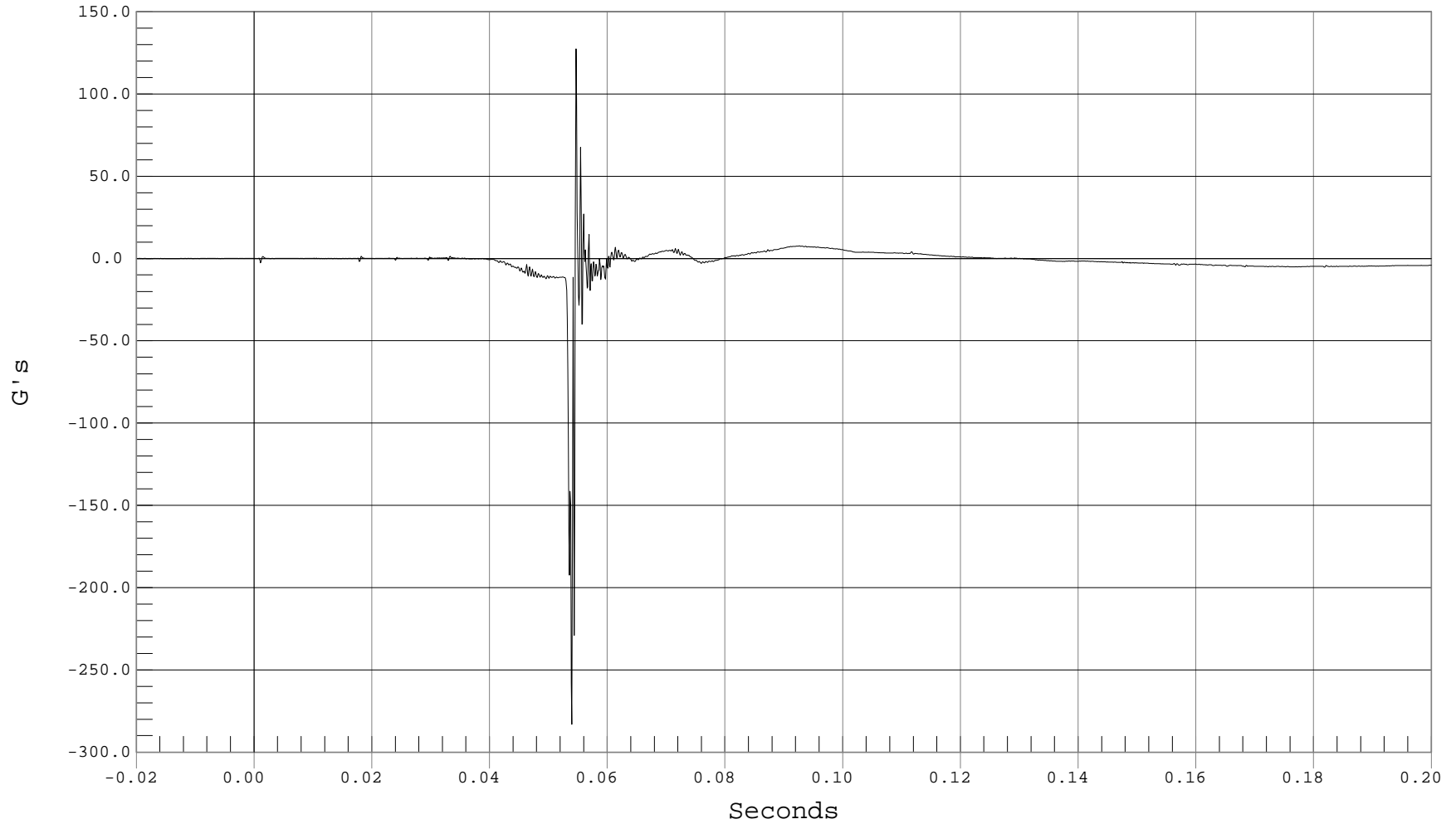
DRIVER HEAD X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

1 DRIVER HEAD X, B02036AT.A01

Ymin = -283.11 G's @ 0.0539 Seconds, Ymax = 127.4 G's @ 0.0546 Seconds



B-1



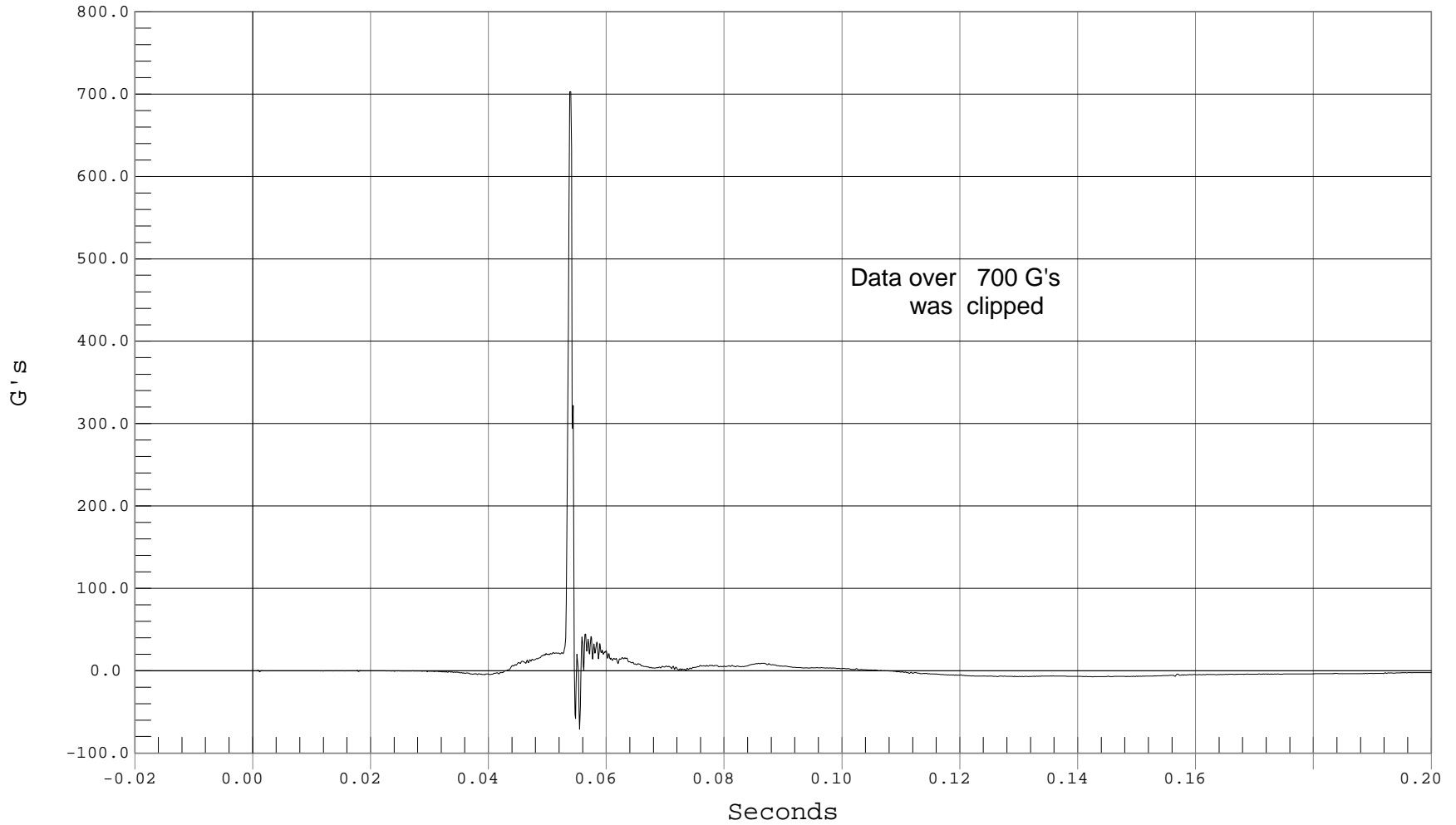
DRIVER HEAD Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

— 1 DRIVER HEAD Y, B02036AT.A02

Ymin = -71.15 G's @ 0.0554 Seconds, Ymax = 702.75 G's @ 0.0537 Seconds



B-2



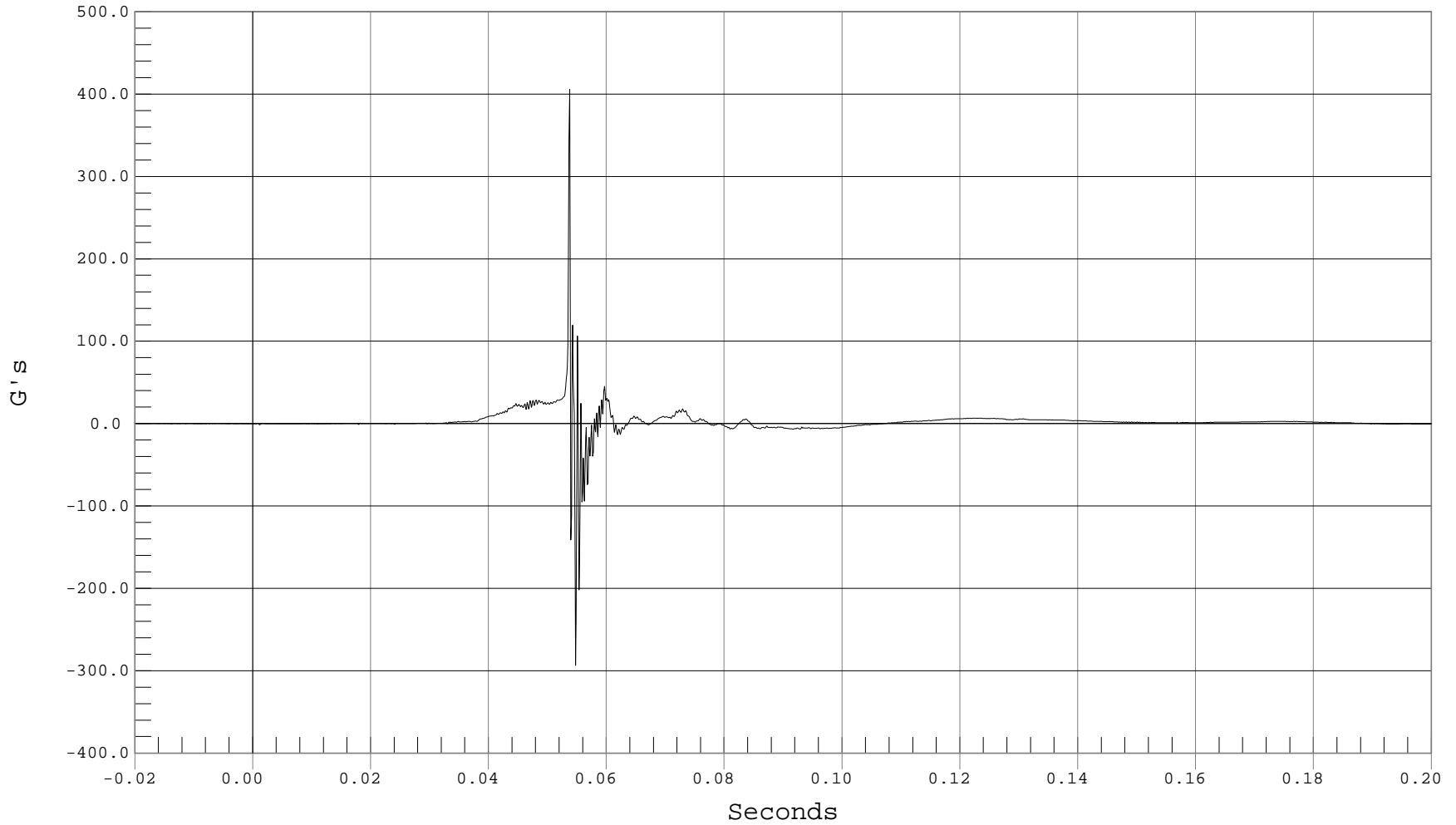
DRIVER HEAD Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

1 DRIVER HEAD Z, B02036AT.A03

Ymin = -293.73 G's @ 0.0547 Seconds, Ymax = 405.89 G's @ 0.0537 Seconds





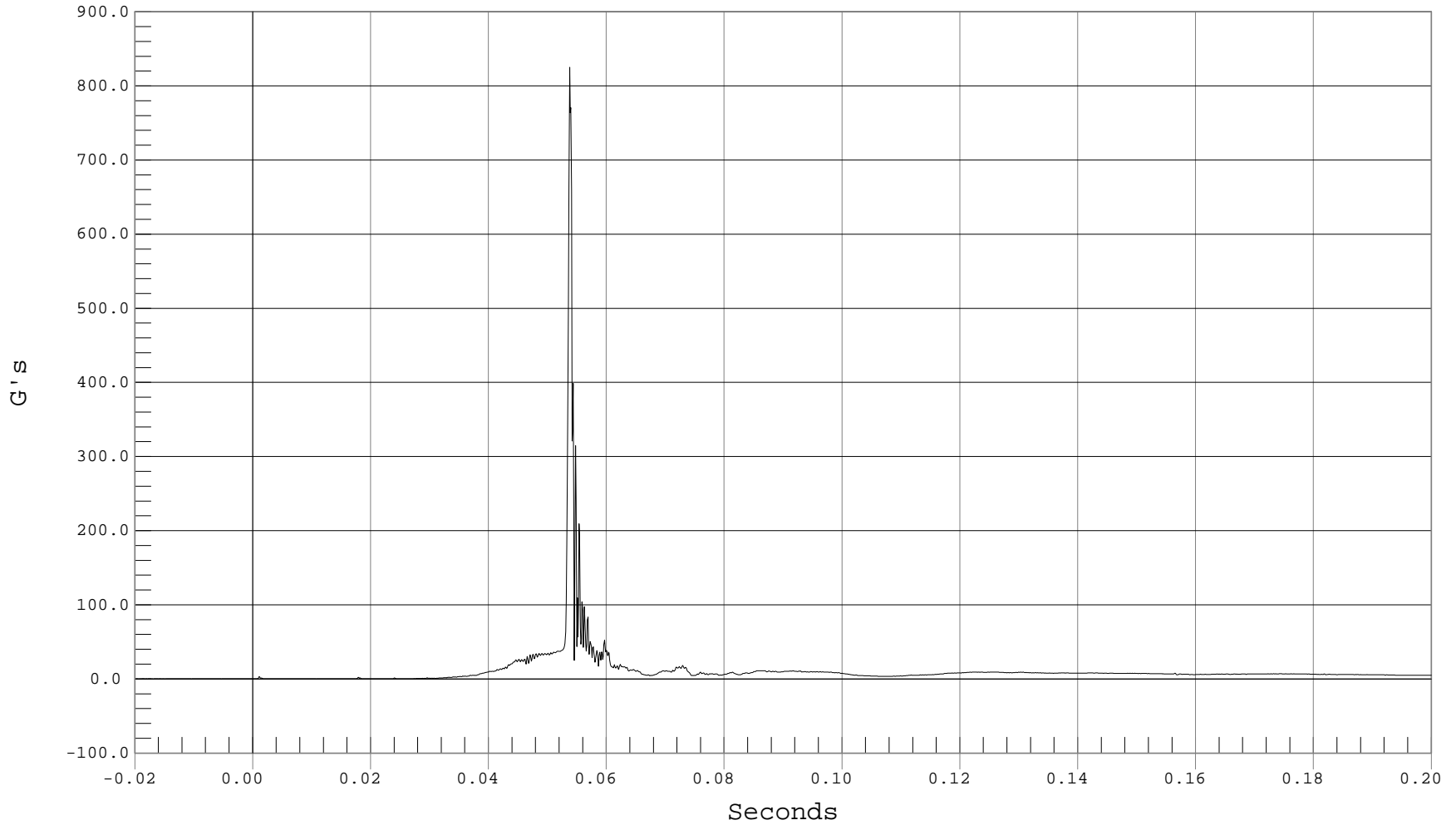
DRIVER HEAD RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

— 1 DRIVER HEAD RESULTANT, B02036AV.A01

Ymin = .03 G's @ -0.0191 Seconds, Ymax = 825.33 G's @ 0.0537 Seconds





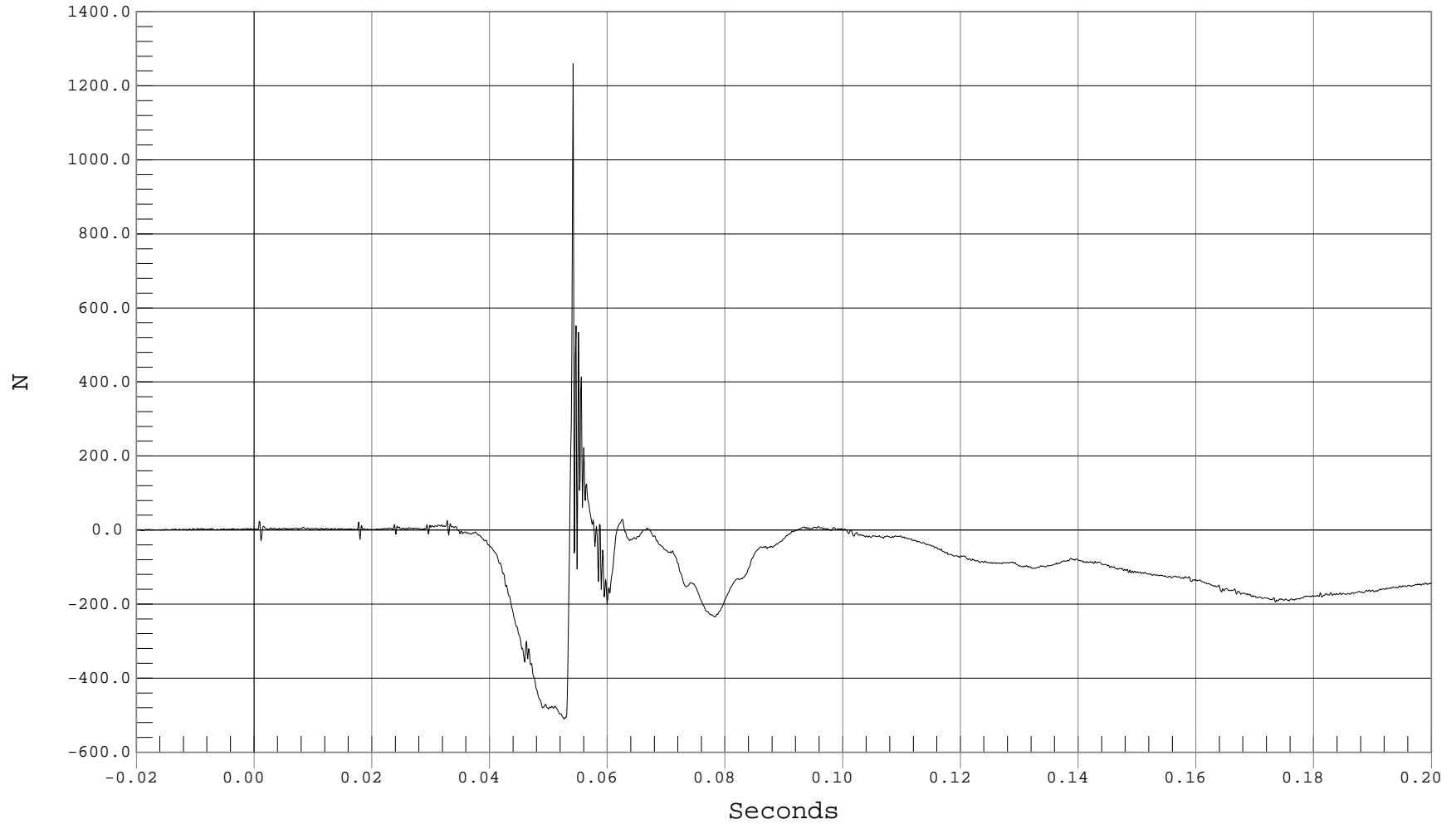
DRIVER UPPER NECK FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

1 DRIVER NECK FX, B02036FT.F15

Ymin = -510.59 N @ 0.0526 Seconds, Ymax = 1259.99 N @ 0.0541 Seconds



B-5



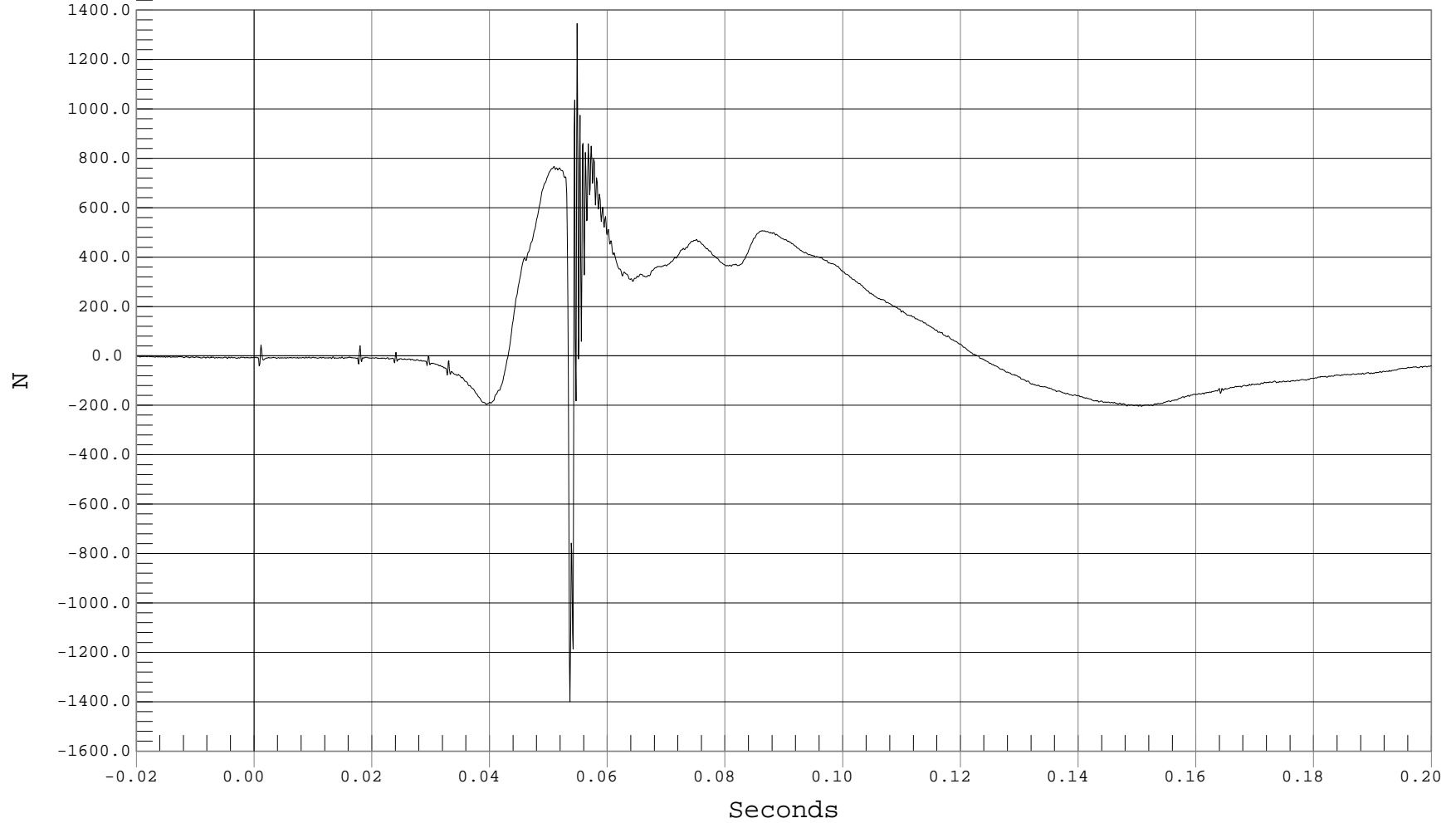
DRIVER UPPER NECK FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

1 DRIVER NECK FY, B02036FT.F16

Ymin = -1400.36 N @ 0.0536 Seconds, Ymax = 1344.94 N @ 0.0548 Seconds



B-6



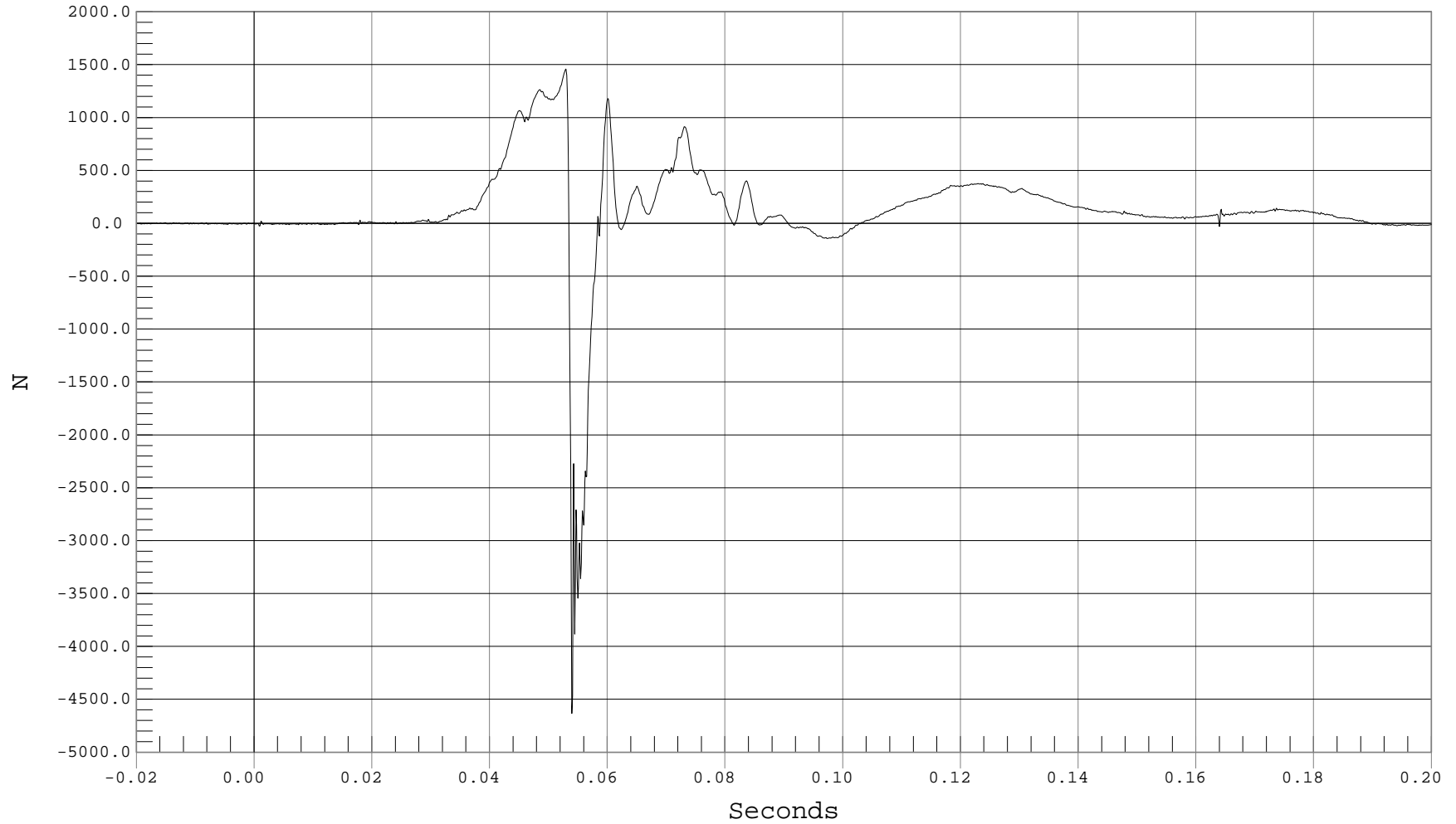
DRIVER UPPER NECK FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

— 1 DRIVER NECK FZ, B02036FT.F17

Ymin = -4635.27 N @ 0.0539 Seconds, Ymax = 1459.34 N @ 0.0529 Seconds



B-7



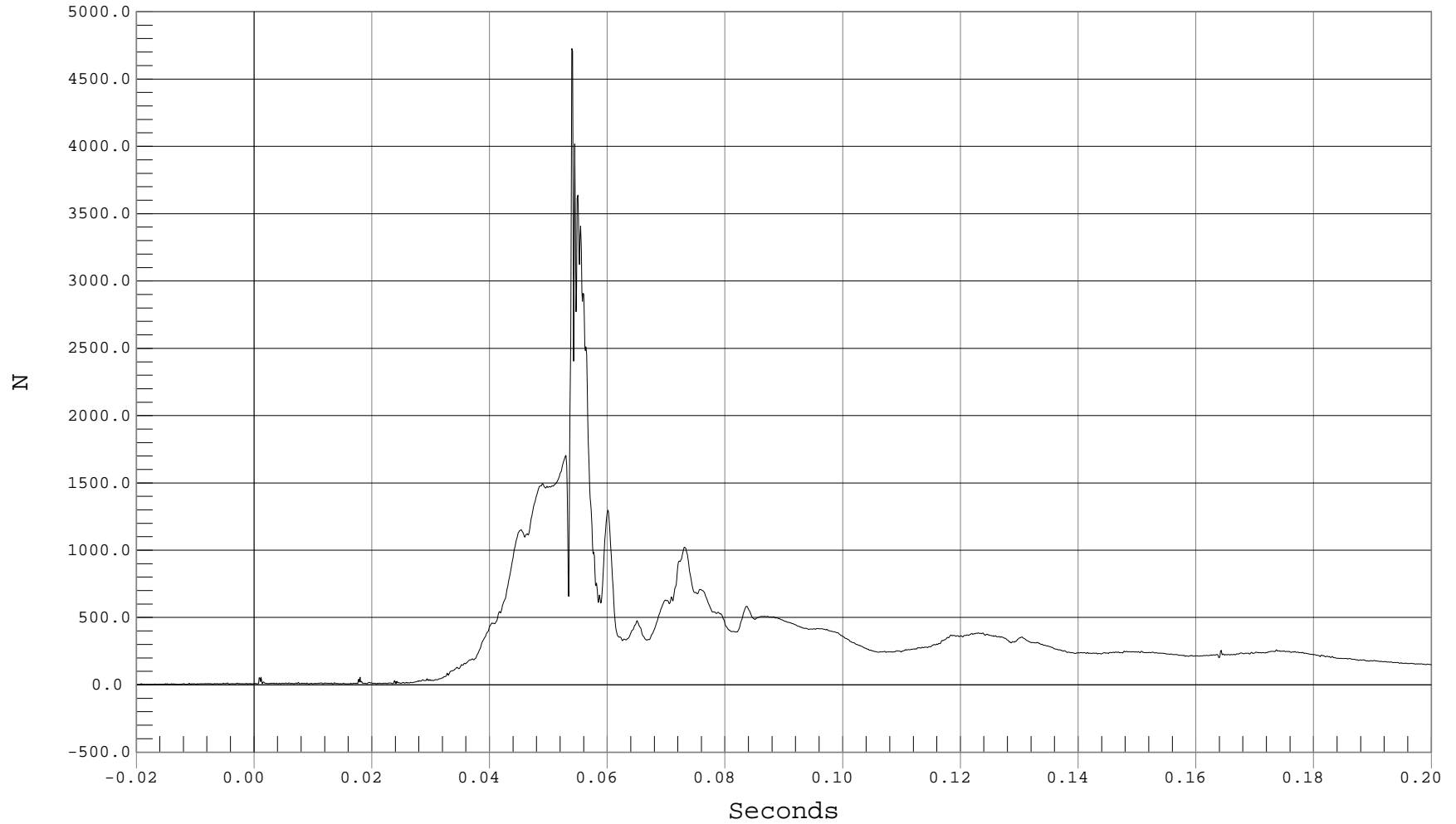
DRIVER UPPER NECK FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE RESULTANT, B02036FV.F15

Ymin = 1.43 N @ -0.0180 Seconds, Ymax = 4726.29 N @ 0.0539 Seconds





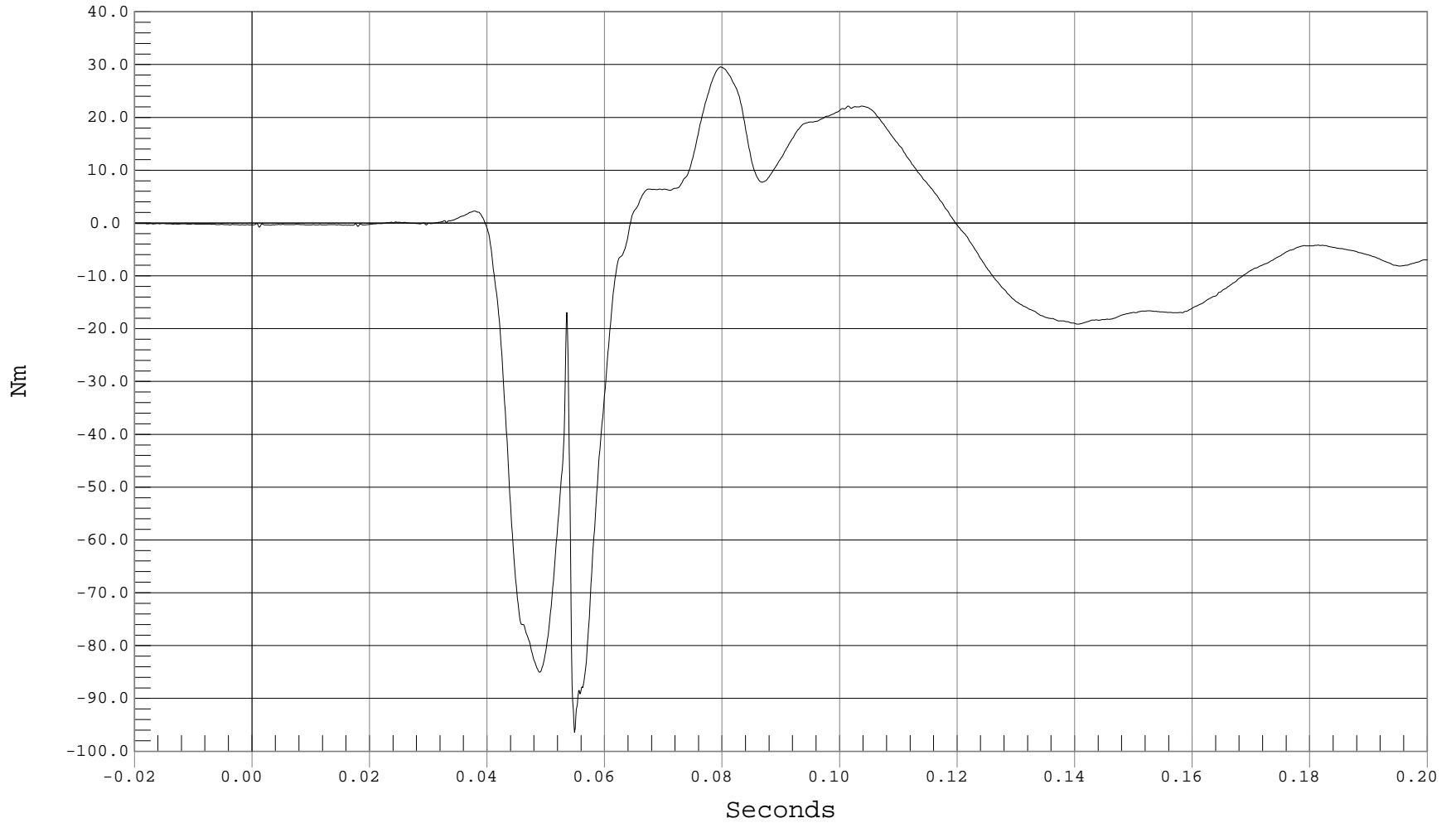
DRIVER UPPER NECK MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 600

1 DRIVER NECK MX, B02036MF.M18

Ymin = -96.4 Nm @ 0.0548 Seconds, Ymax = 29.55 Nm @ 0.0796 Seconds





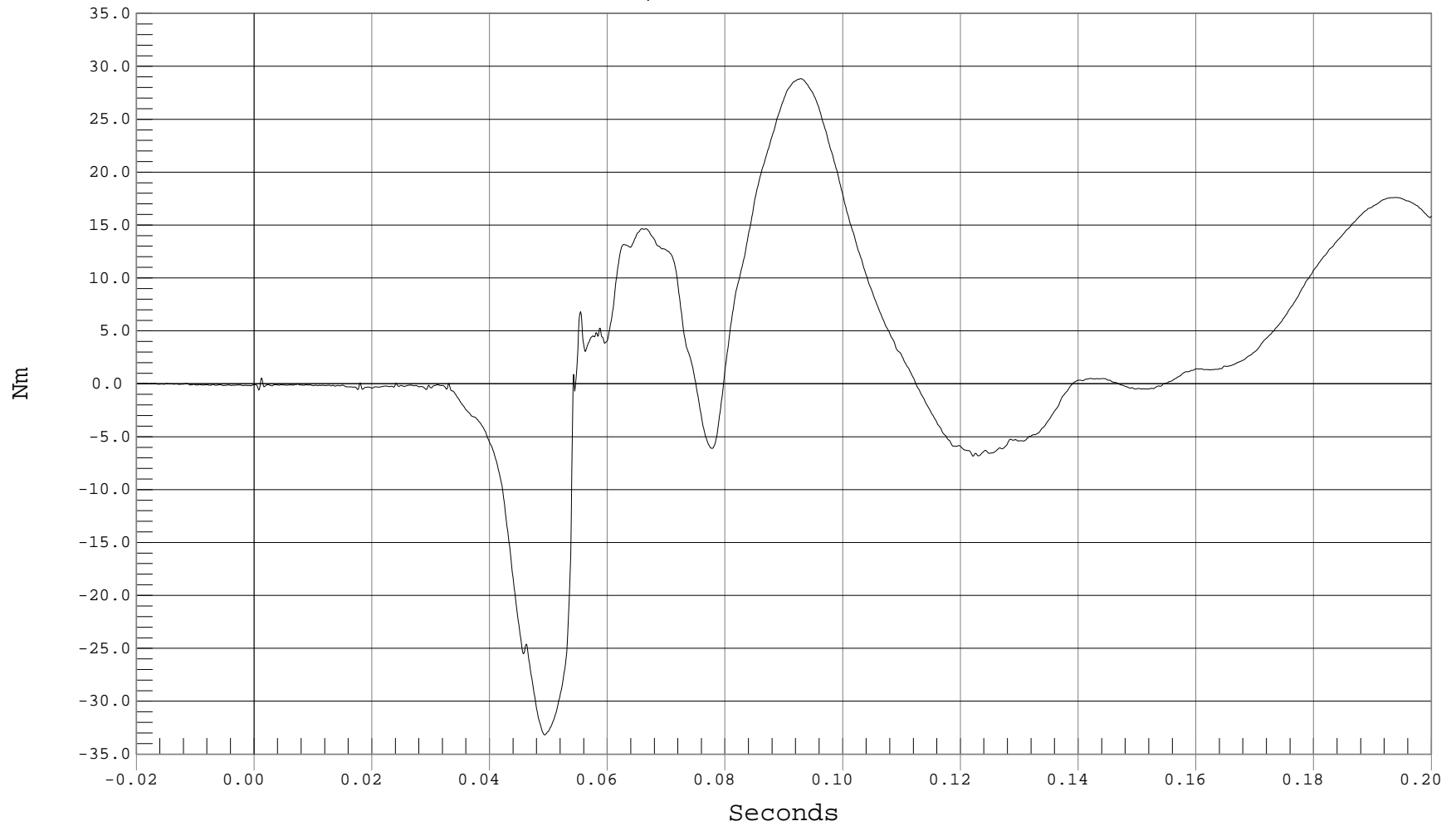
DRIVER UPPER NECK MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 600

— 1 DRIVER NECK MY, B02036MF.M19

Ymin = -33.18 Nm @ 0.0493 Seconds, Ymax = 28.83 Nm @ 0.0928 Seconds



B-10



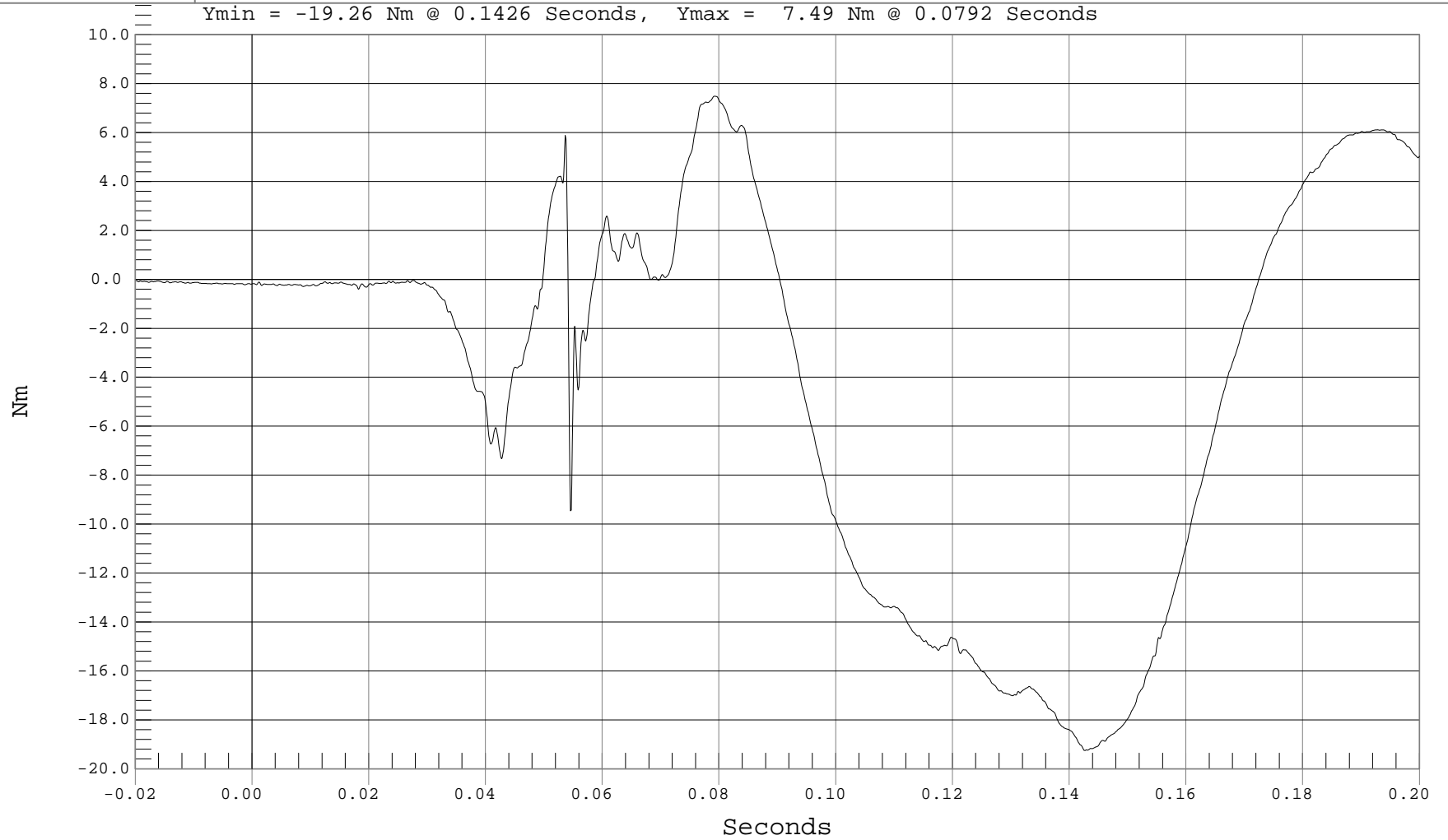
DRIVER UPPER NECK MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 600

— 1 DRIVER NECK MZ, B02036MF.M20

Ymin = -19.26 Nm @ 0.1426 Seconds, Ymax = 7.49 Nm @ 0.0792 Seconds



B-11



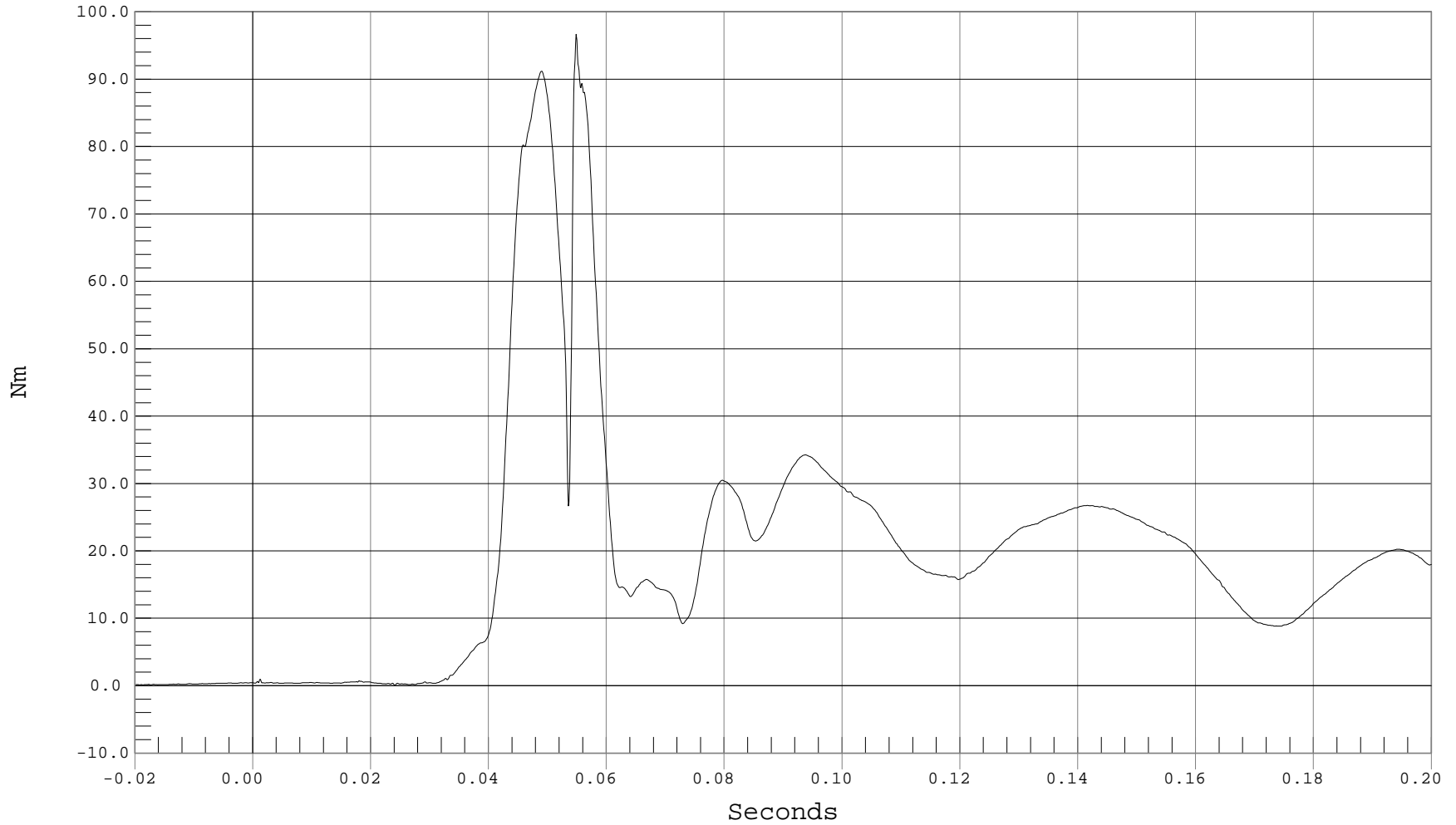
DRIVER UPPER NECK MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 600

1 DRIVER UPPER NECK MOMENT RESULTANT, B02036MV.M18

Ymin = .09 Nm @ 0.0241 Seconds, Ymax = 96.64 Nm @ 0.0548 Seconds





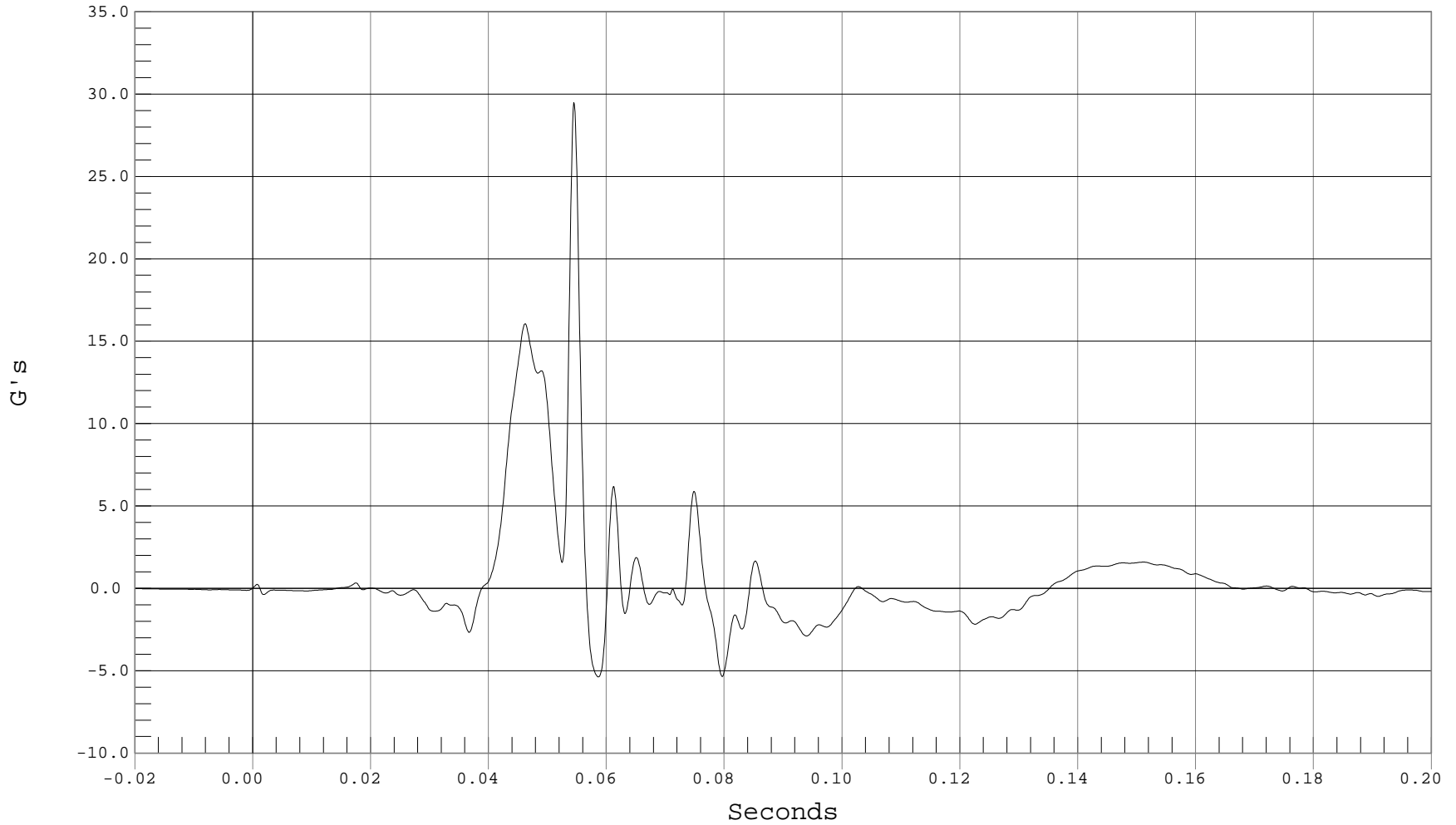
UPPER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE X, B02036AF.A06

Ymin = -5.38 G's @ 0.0585 Seconds, Ymax = 29.48 G's @ 0.0544 Seconds





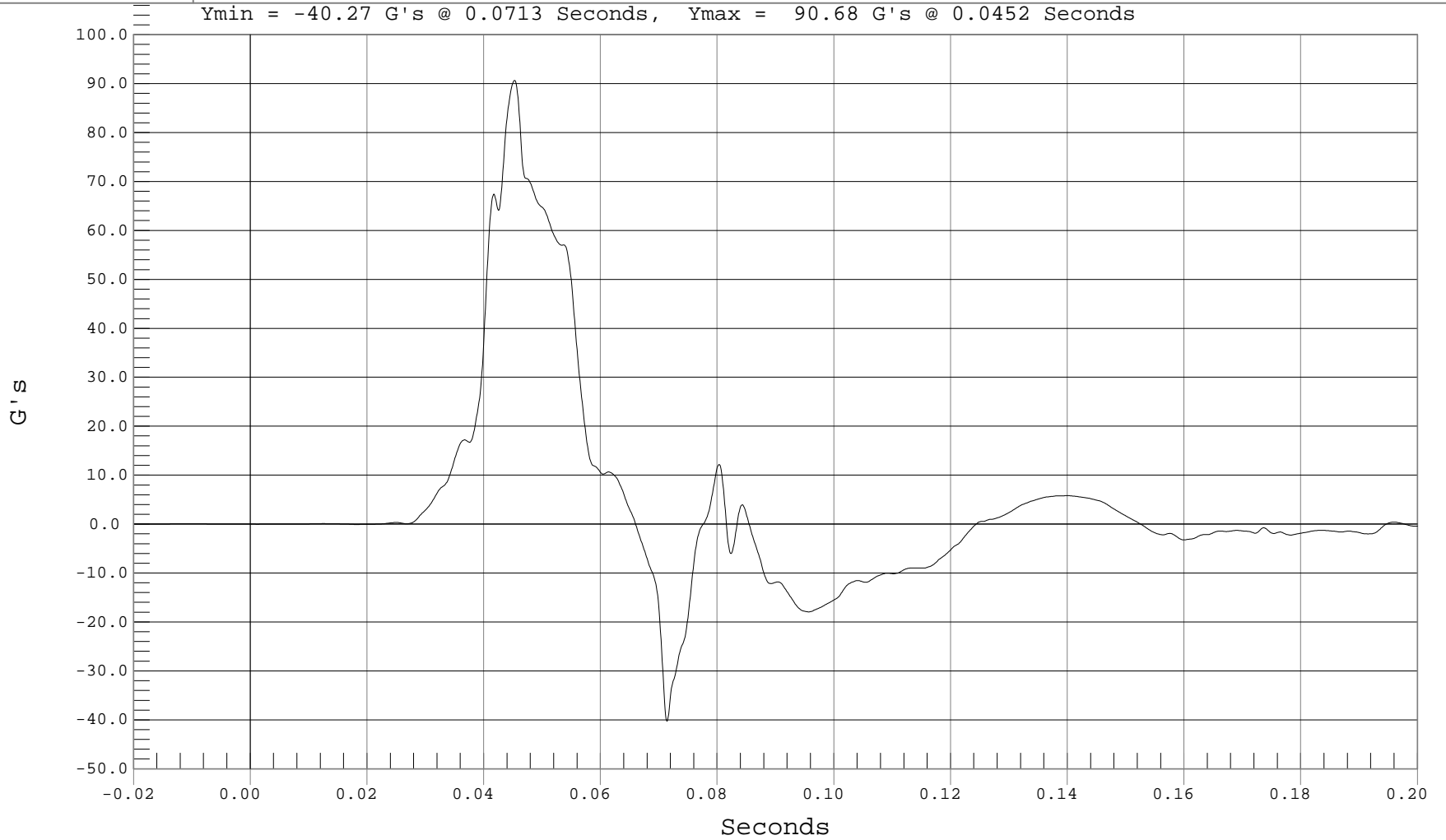
UPPER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE Y, B02036AF.A07

Ymin = -40.27 G's @ 0.0713 Seconds, Ymax = 90.68 G's @ 0.0452 Seconds



B-14



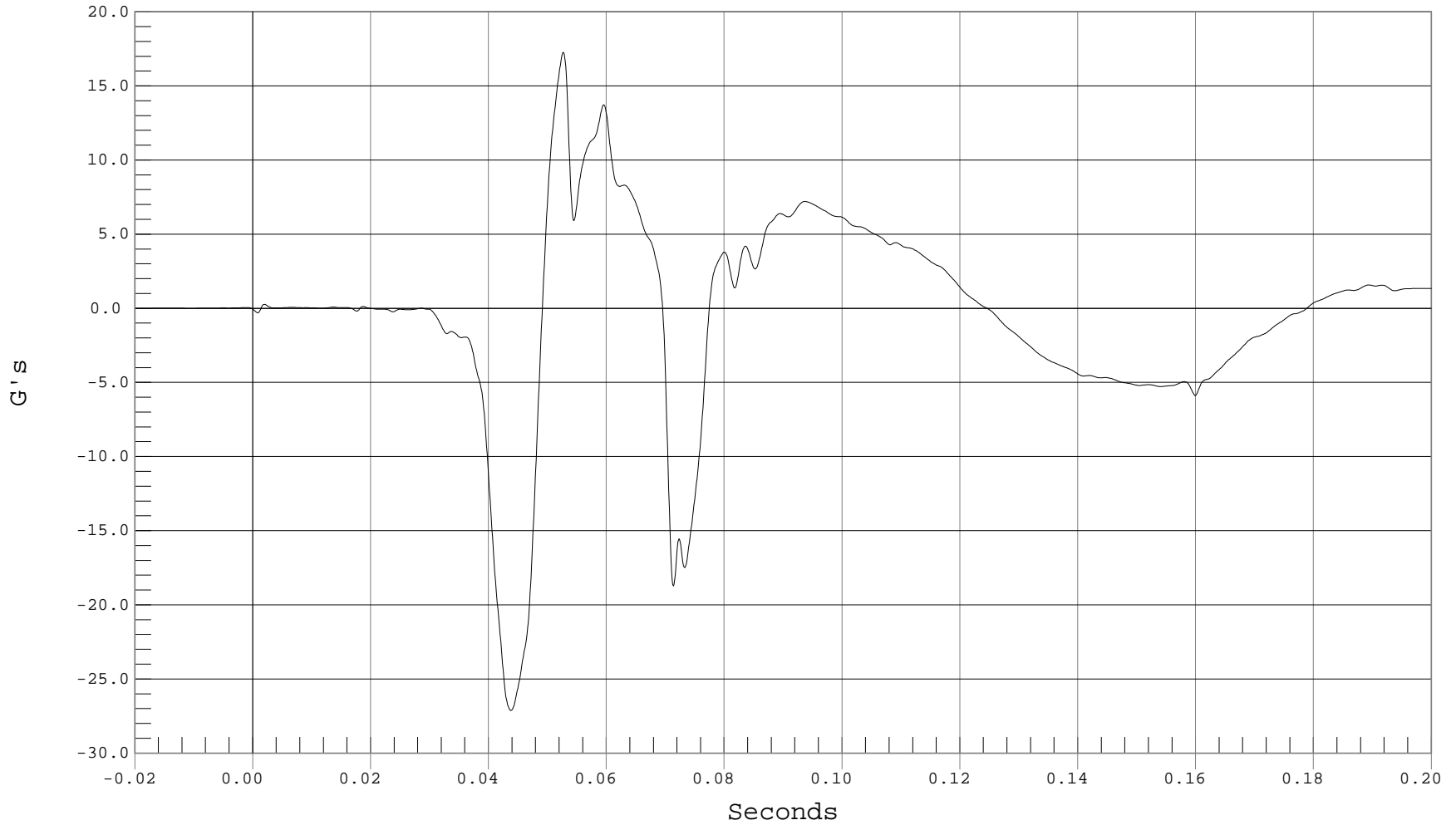
UPPER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE Z, B02036AF.A08

Ymin = -27.13 G's @ 0.0437 Seconds, Ymax = 17.27 G's @ 0.0526 Seconds



B-15



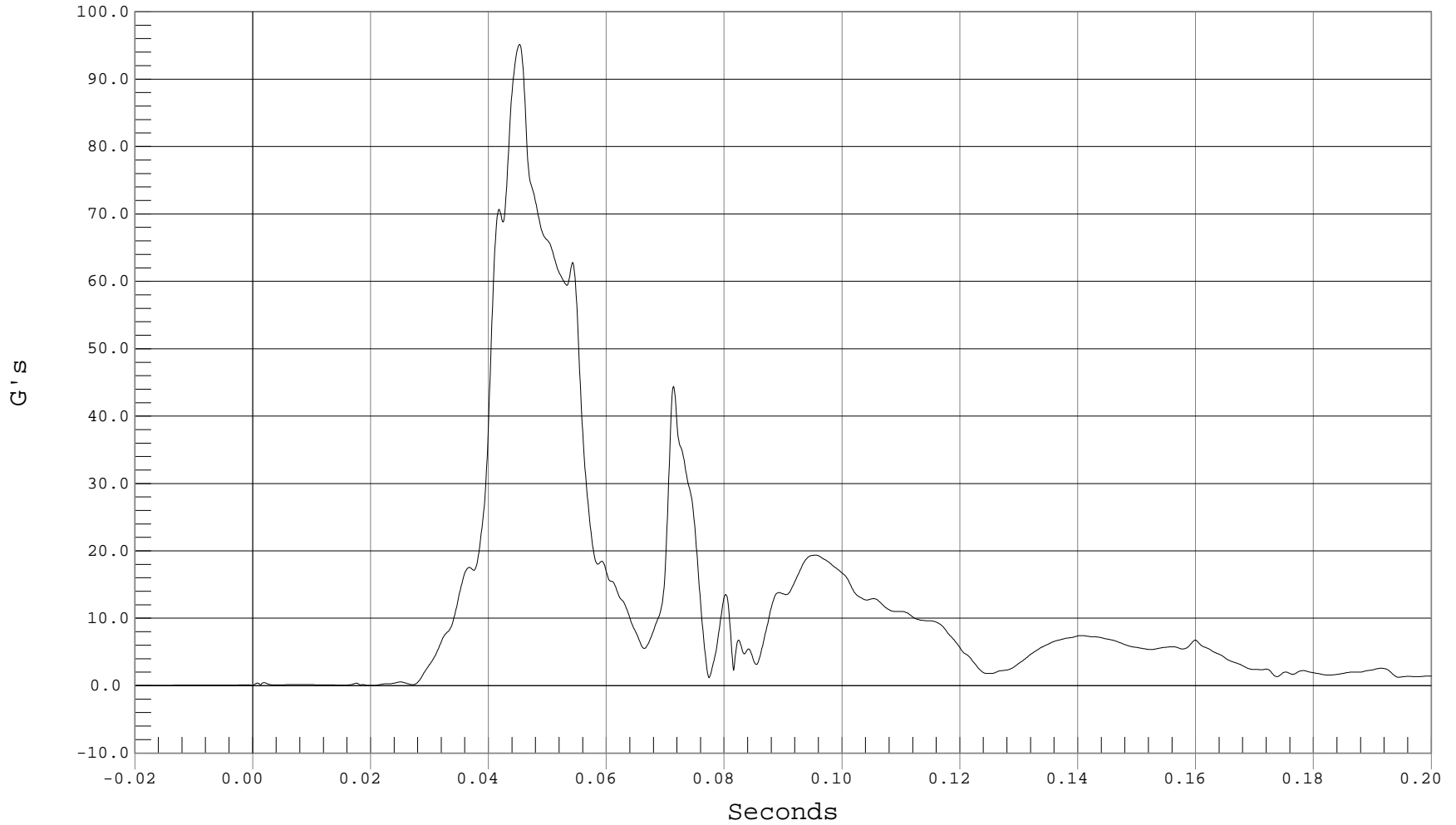
UPPER SPINE RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE RESULTANT, B02036AV.A06

Ymin = .02 G's @ -0.0192 Seconds, Ymax = 95.15 G's @ 0.0452 Seconds



B-16



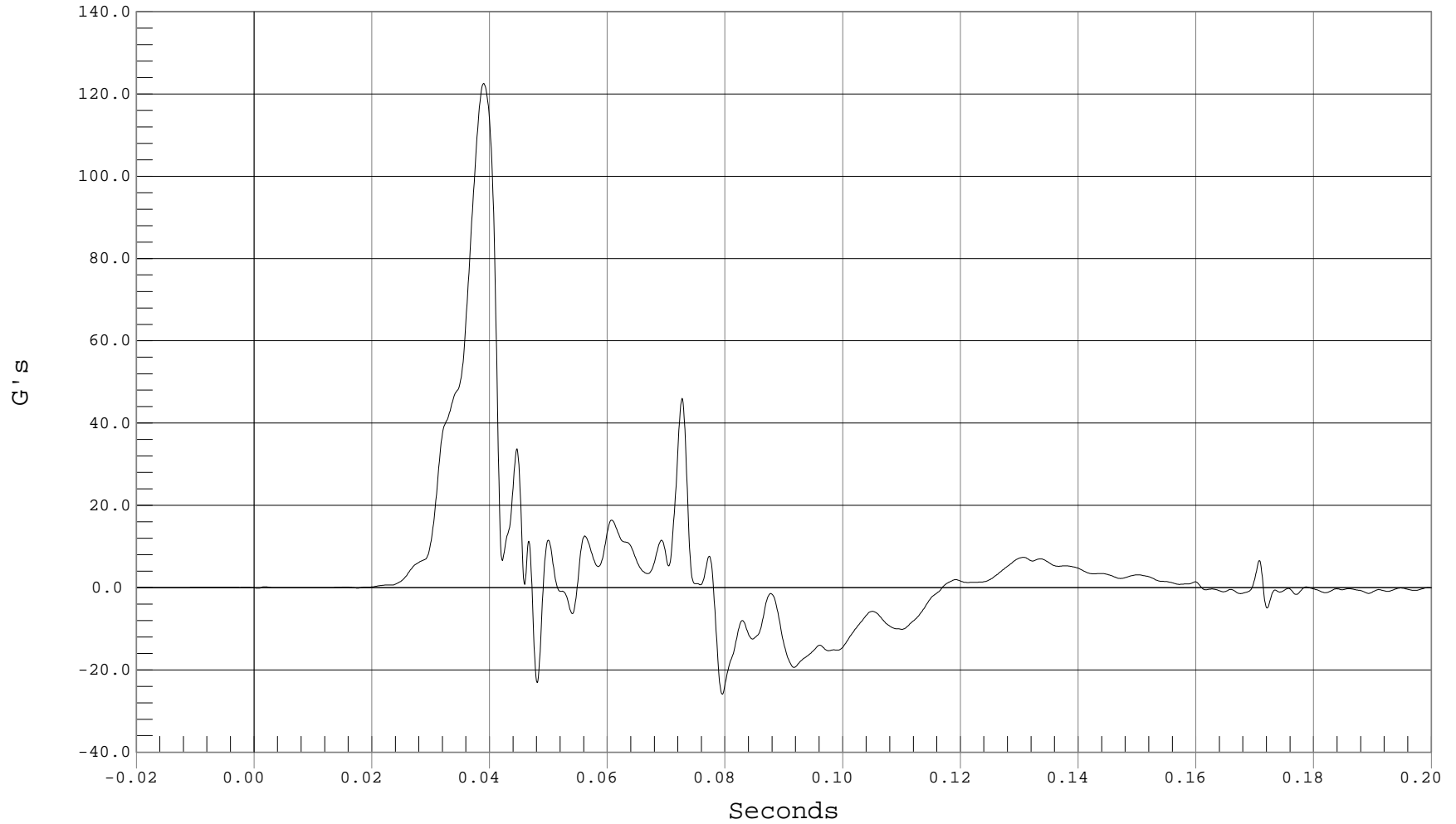
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER UPPER RIB Y, B02036AF.A04

Ymin = -25.88 G's @ 0.0794 Seconds, Ymax = 122.58 G's @ 0.0389 Seconds





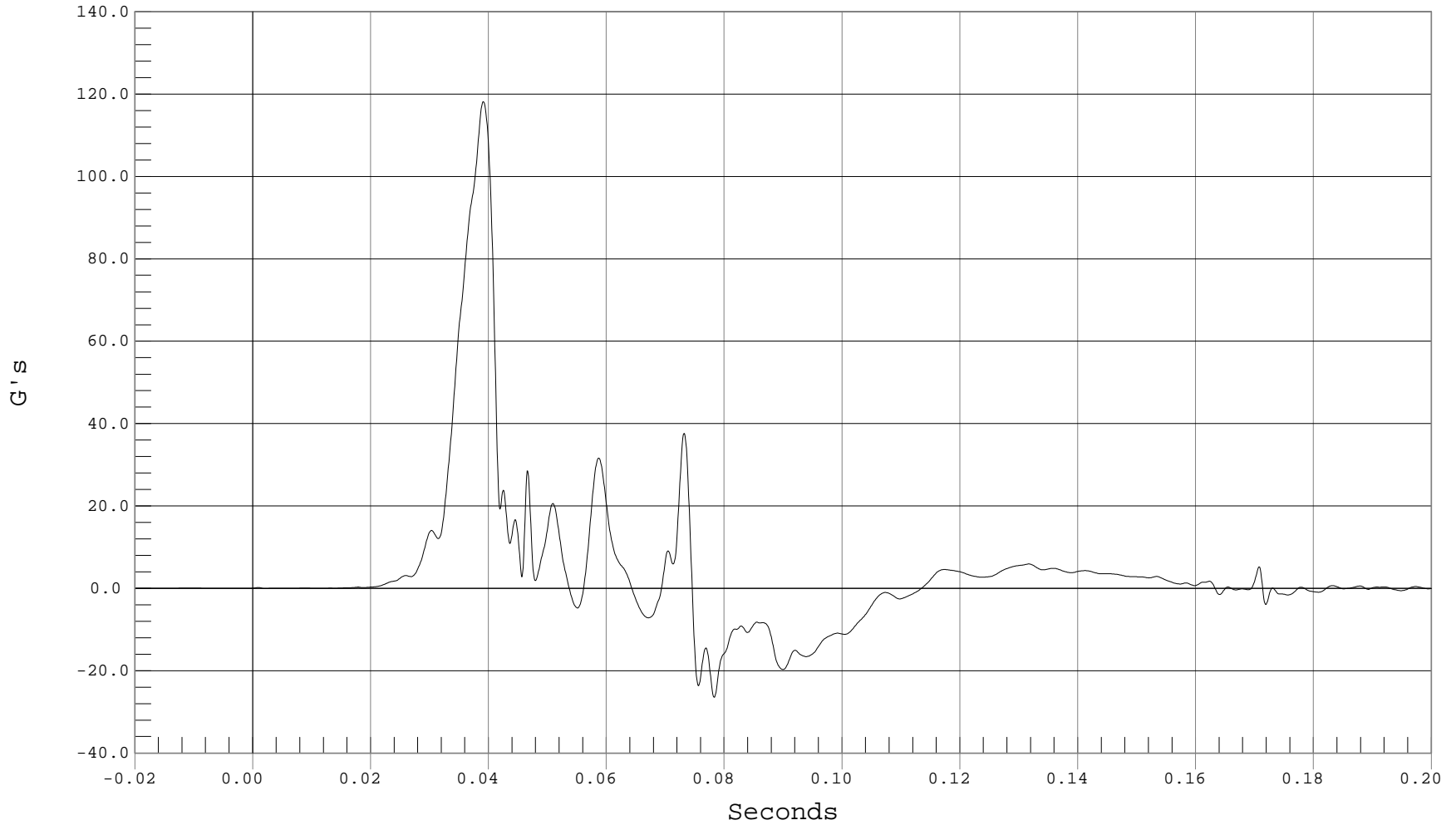
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER LOWER RIB Y, B02036AF.A05

Ymin = -26.47 G's @ 0.0782 Seconds, Ymax = 118.18 G's @ 0.0390 Seconds



B-18



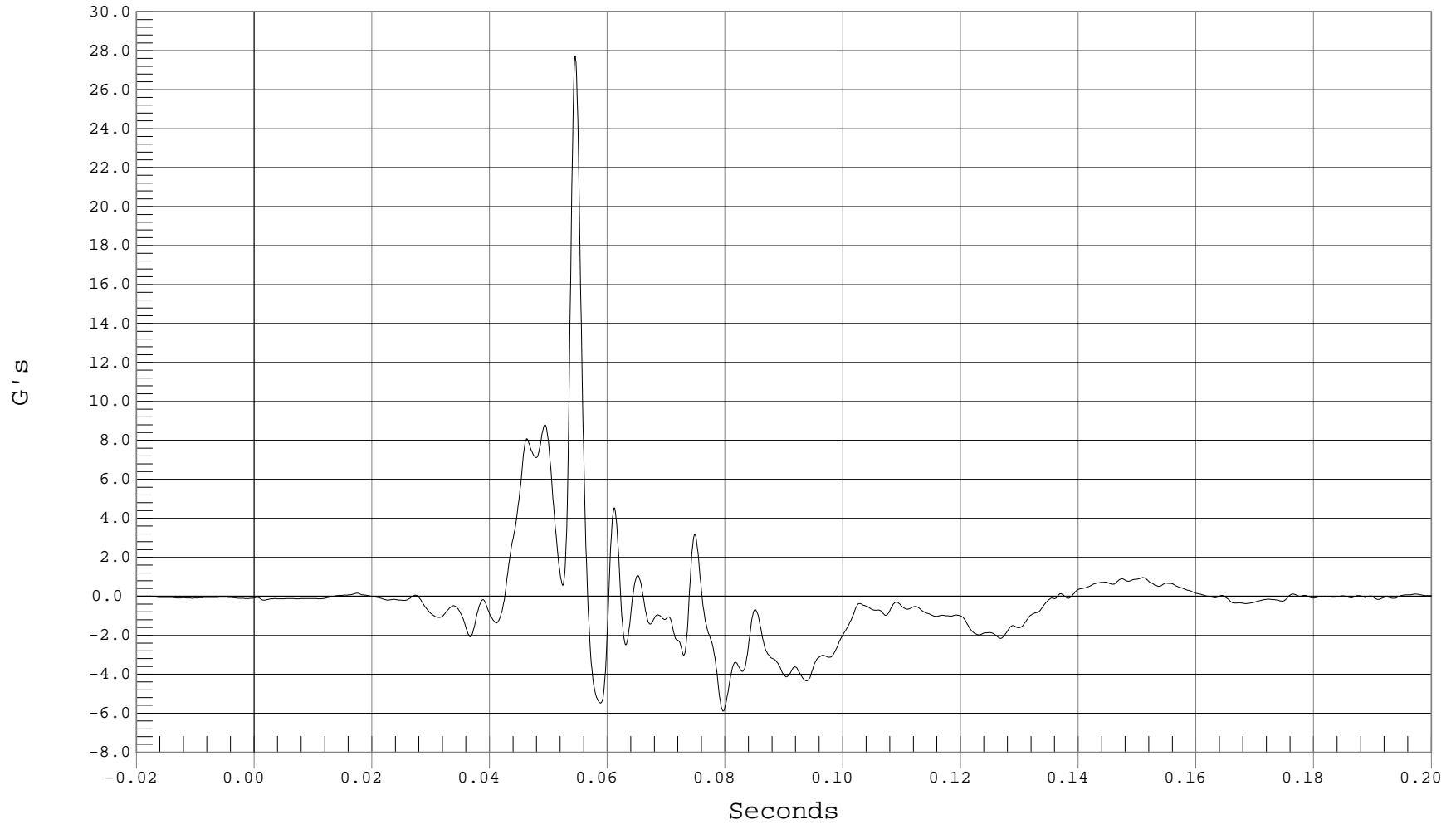
LOWER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE X, B02036AF.A11

Ymin = -5.9 G's @ 0.0796 Seconds, Ymax = 27.72 G's @ 0.0545 Seconds



B-19



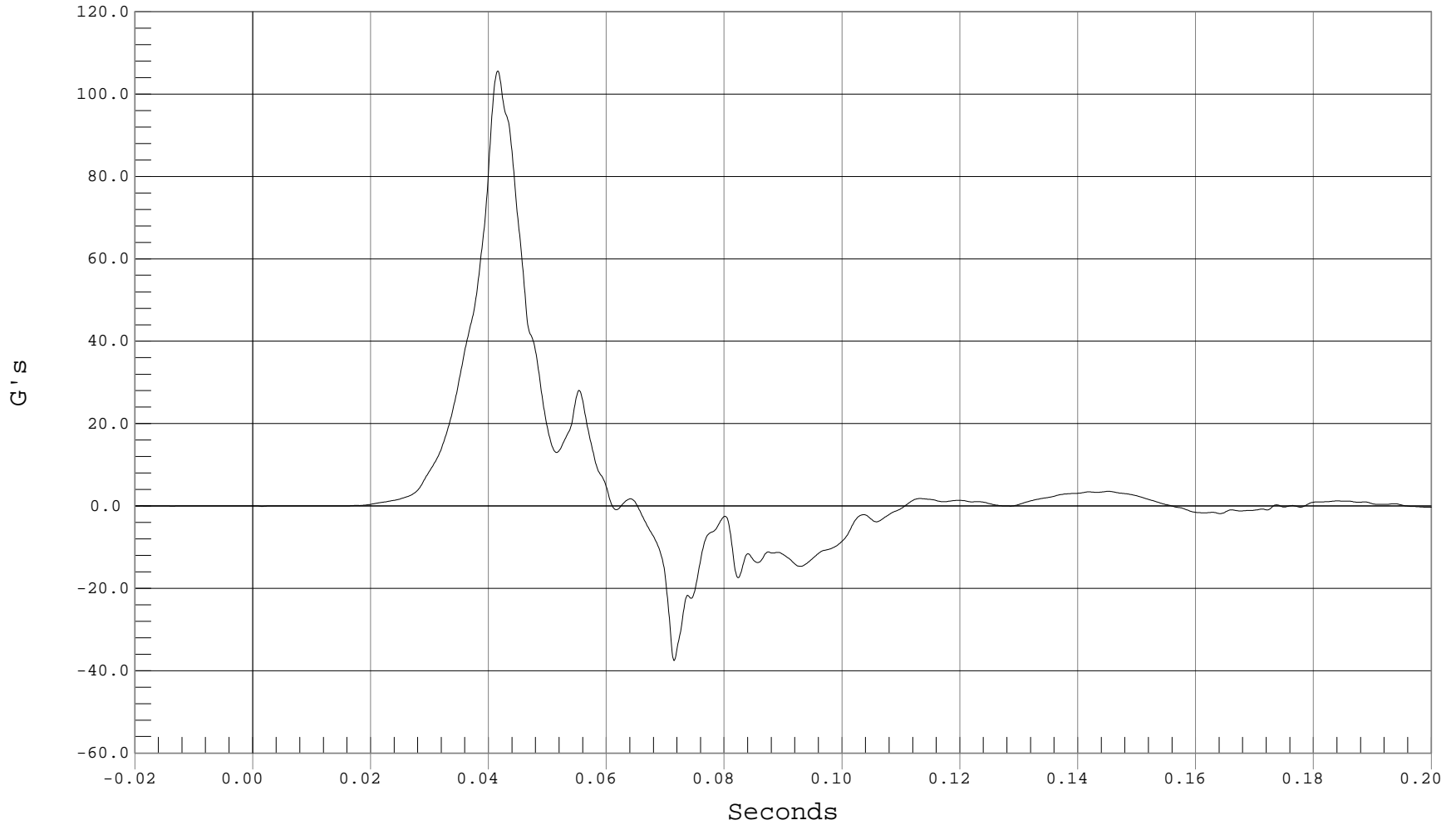
LOWER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE Y, B02036AF.A10

Ymin = -37.53 G's @ 0.0714 Seconds, Ymax = 105.61 G's @ 0.0415 Seconds



B-20



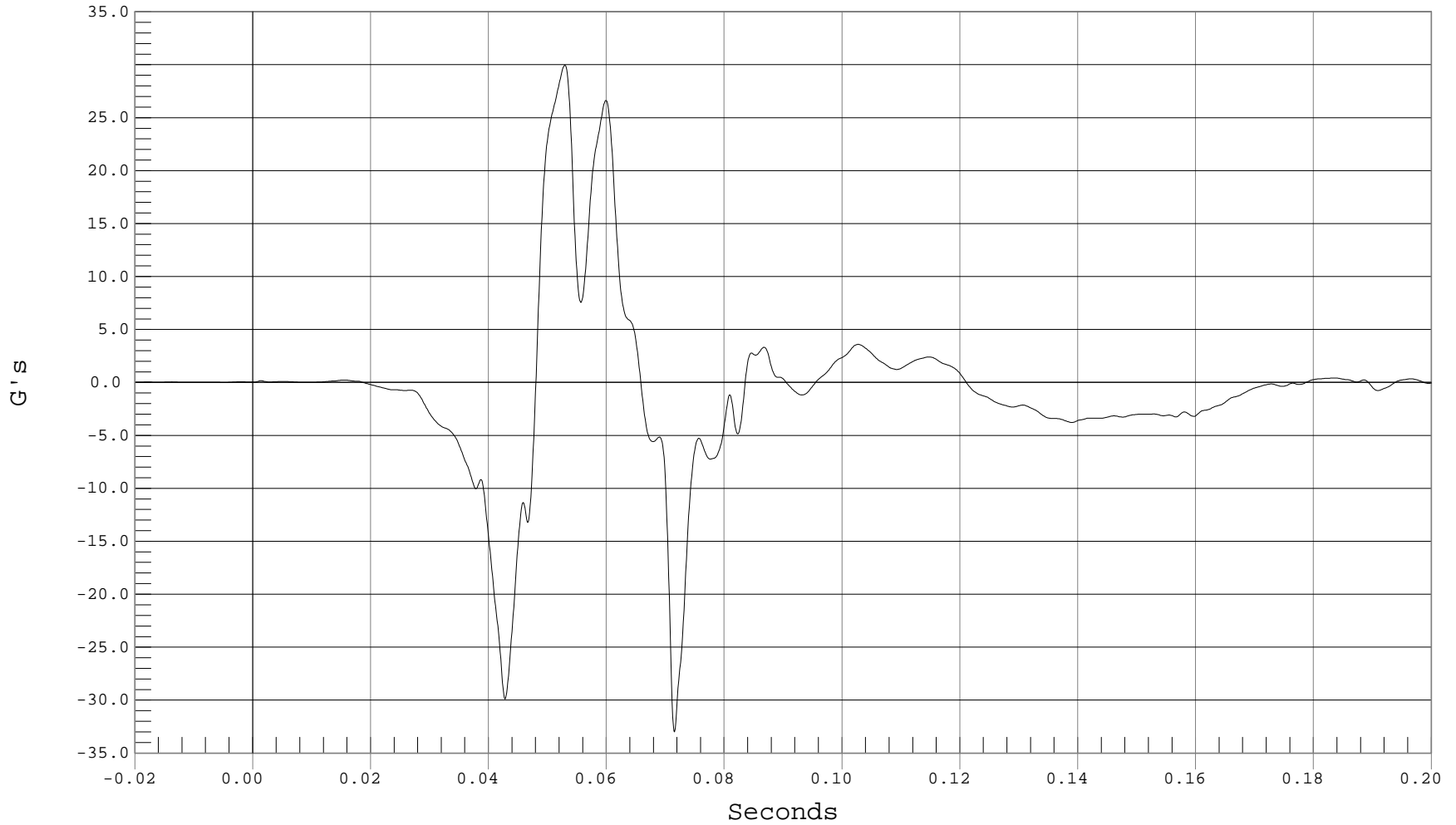
LOWER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE Z, B02036AF.A09

Ymin = -32.99 G's @ 0.0715 Seconds, Ymax = 29.94 G's @ 0.0529 Seconds



B-21



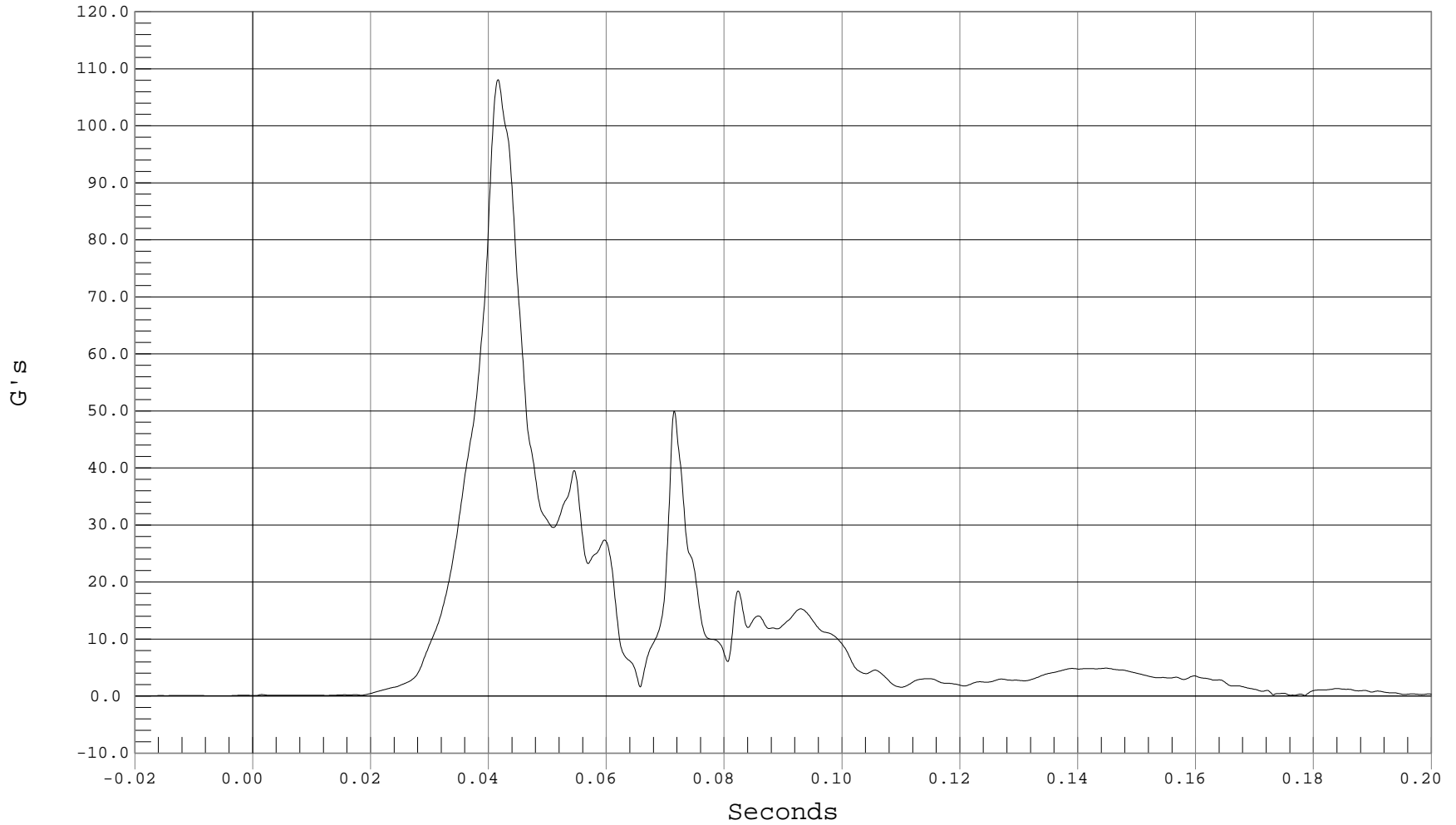
LOWER SPINE RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE RESULTANT, B02036AV.A09

Ymin = .04 G's @ -0.0199 Seconds, Ymax = 108.09 G's @ 0.0415 Seconds





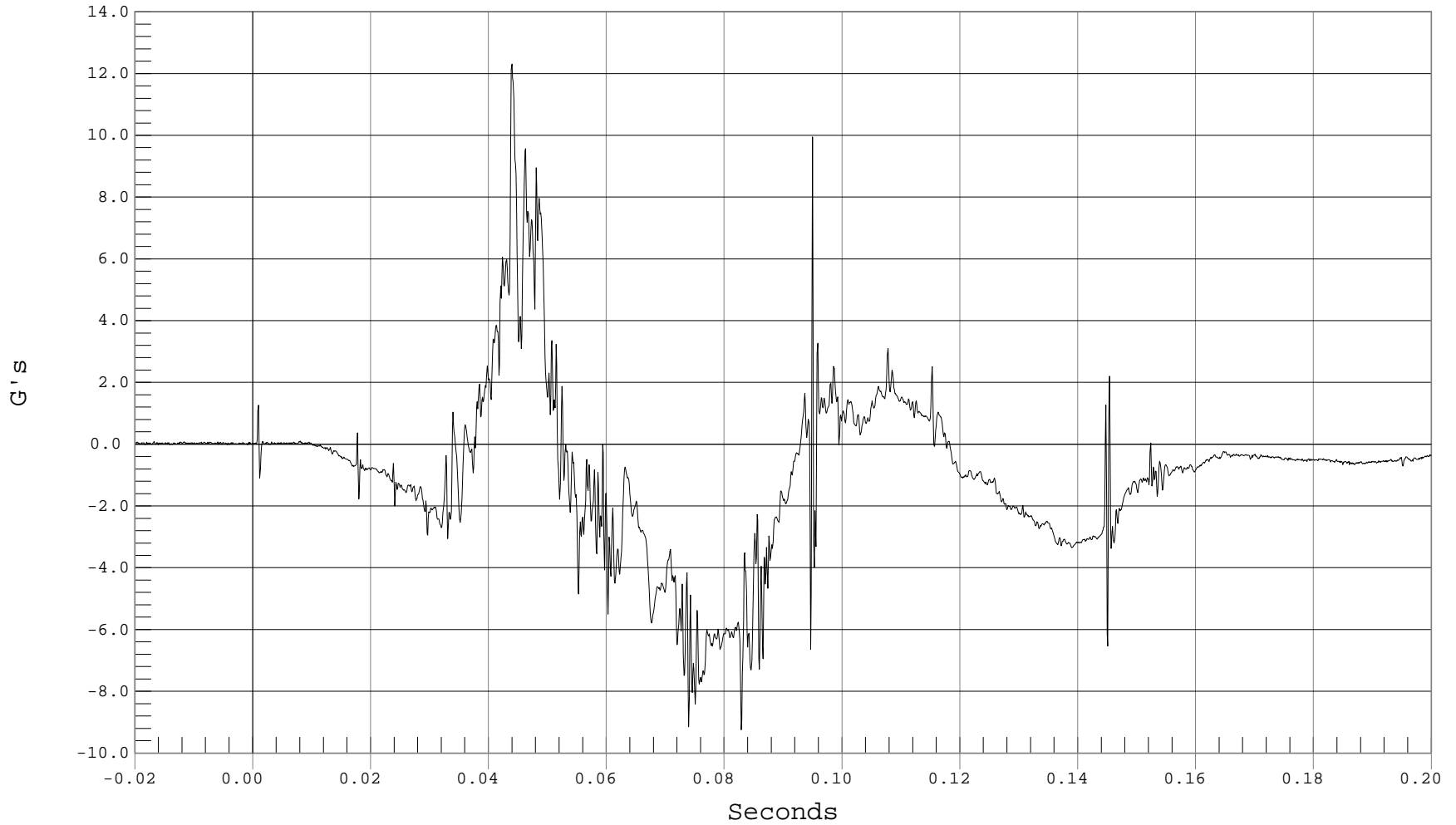
DRIVER PELVIS X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

— 1 DRIVER PELVIS X, B02036AT.A12

Ymin = -9.25 G's @ 0.0828 Seconds, Ymax = 12.3 G's @ 0.0439 Seconds





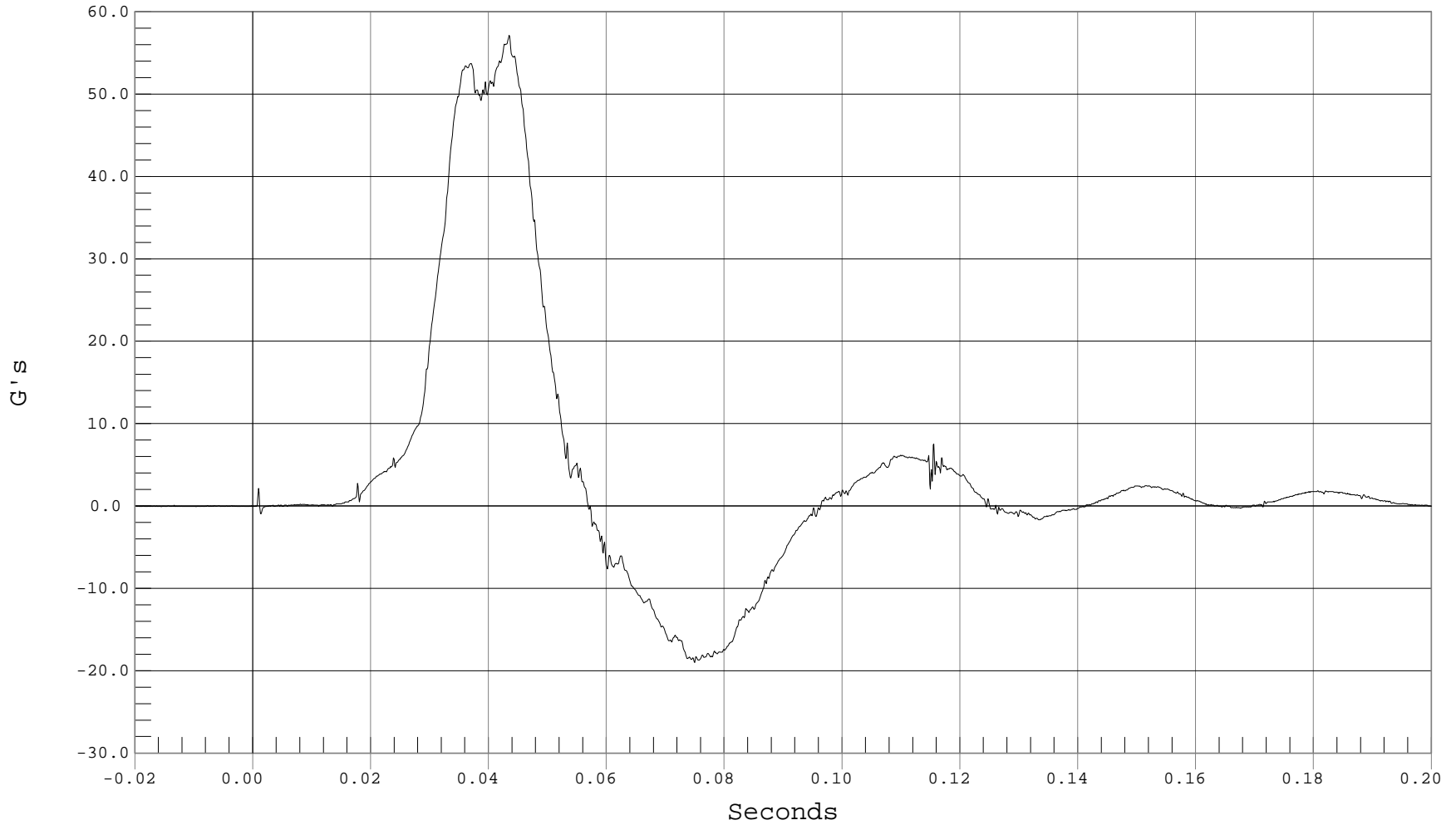
DRIVER PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Y, B02036AT.A13

Ymin = -19 G's @ 0.0749 Seconds, Ymax = 57.14 G's @ 0.0434 Seconds



B-24



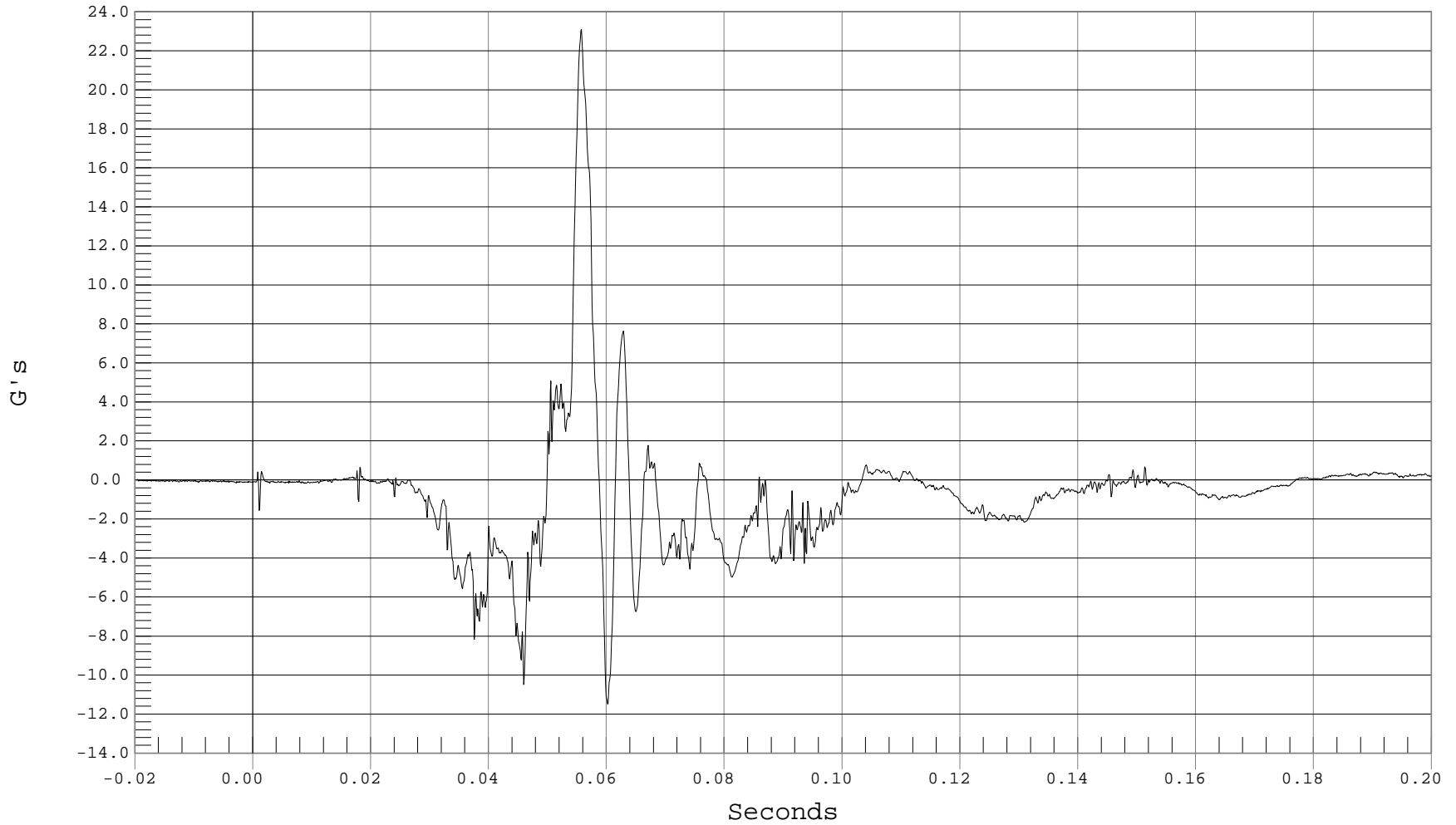
DRIVER PELVIS Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Z, B02036AT.A14

Ymin = -11.49 G's @ 0.0601 Seconds, Ymax = 23.09 G's @ 0.0557 Seconds



B-25



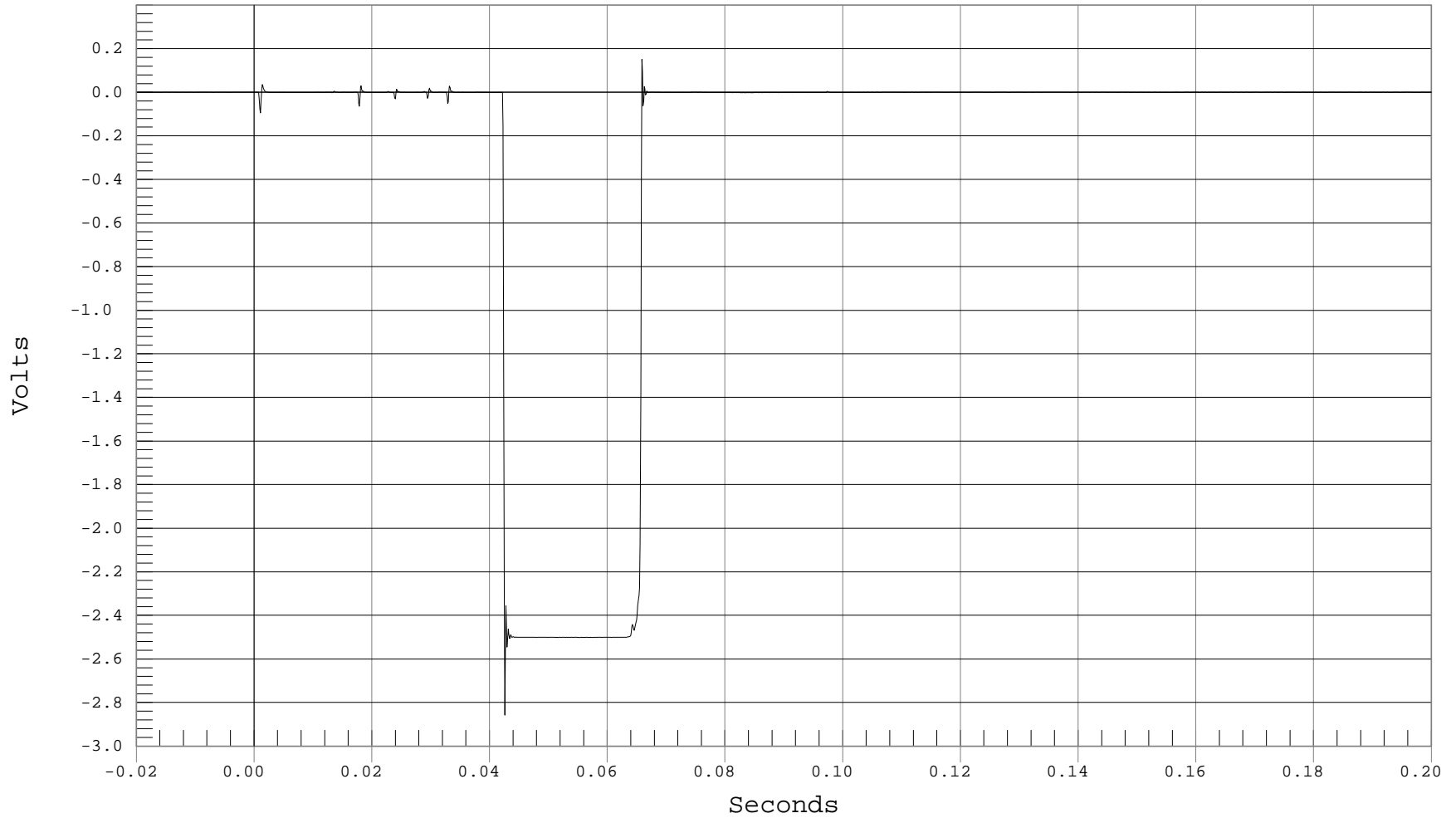
DRIVER RIB CONTACT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

1 DRIVER RIB CONTACT, B020360T.031

Ymin = -2.86 Volts @ 0.0425 Seconds, Ymax = .15 Volts @ 0.0658 Seconds





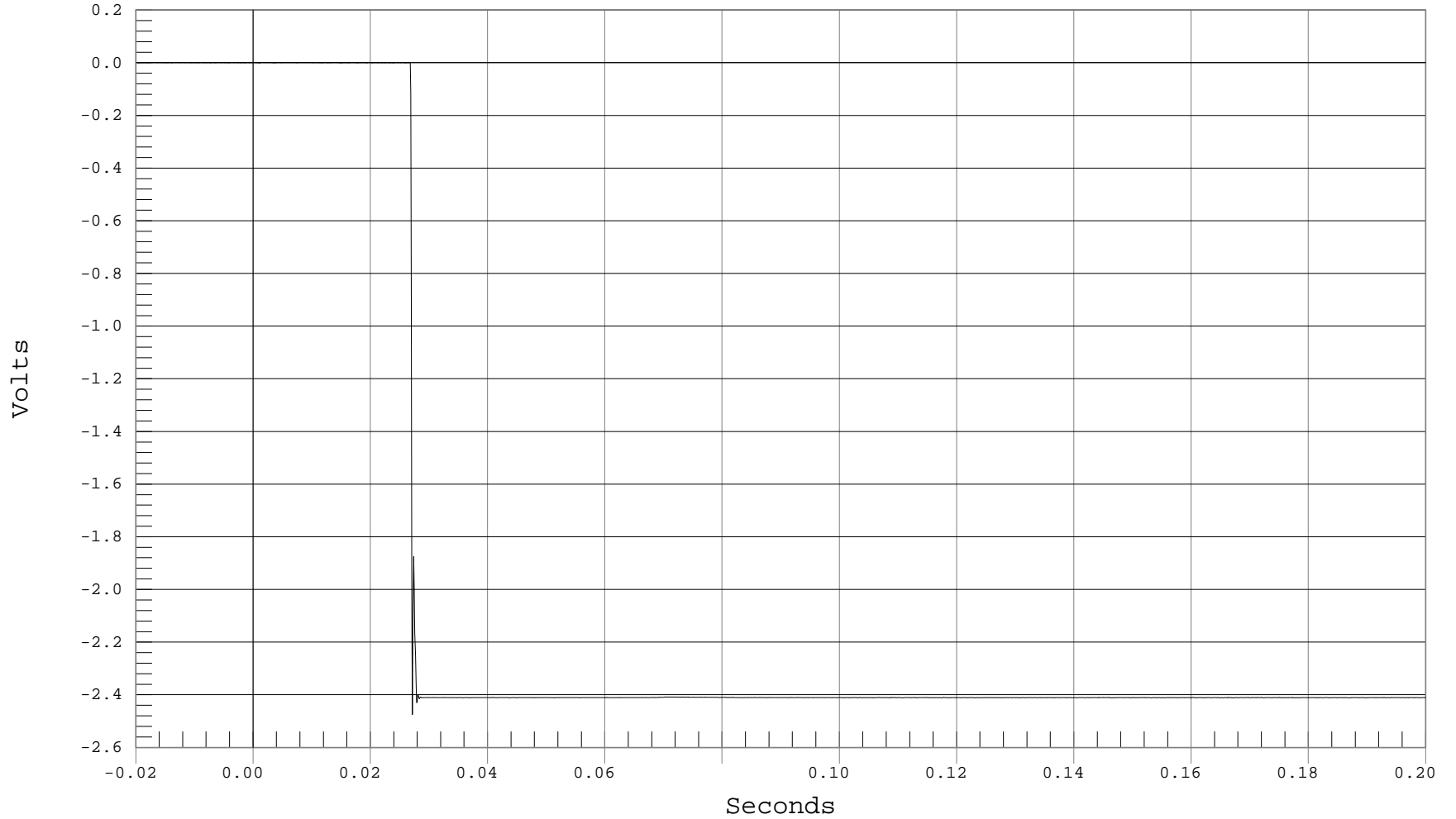
DRIVER PELVIS CONTACT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 1000

— 1 DRIVER PELVIS CONTACT, B020360T.O63

Ymin = -2.47 Volts @ 0.0271 Seconds, Ymax = 0 Volts @ 0.0015 Seconds





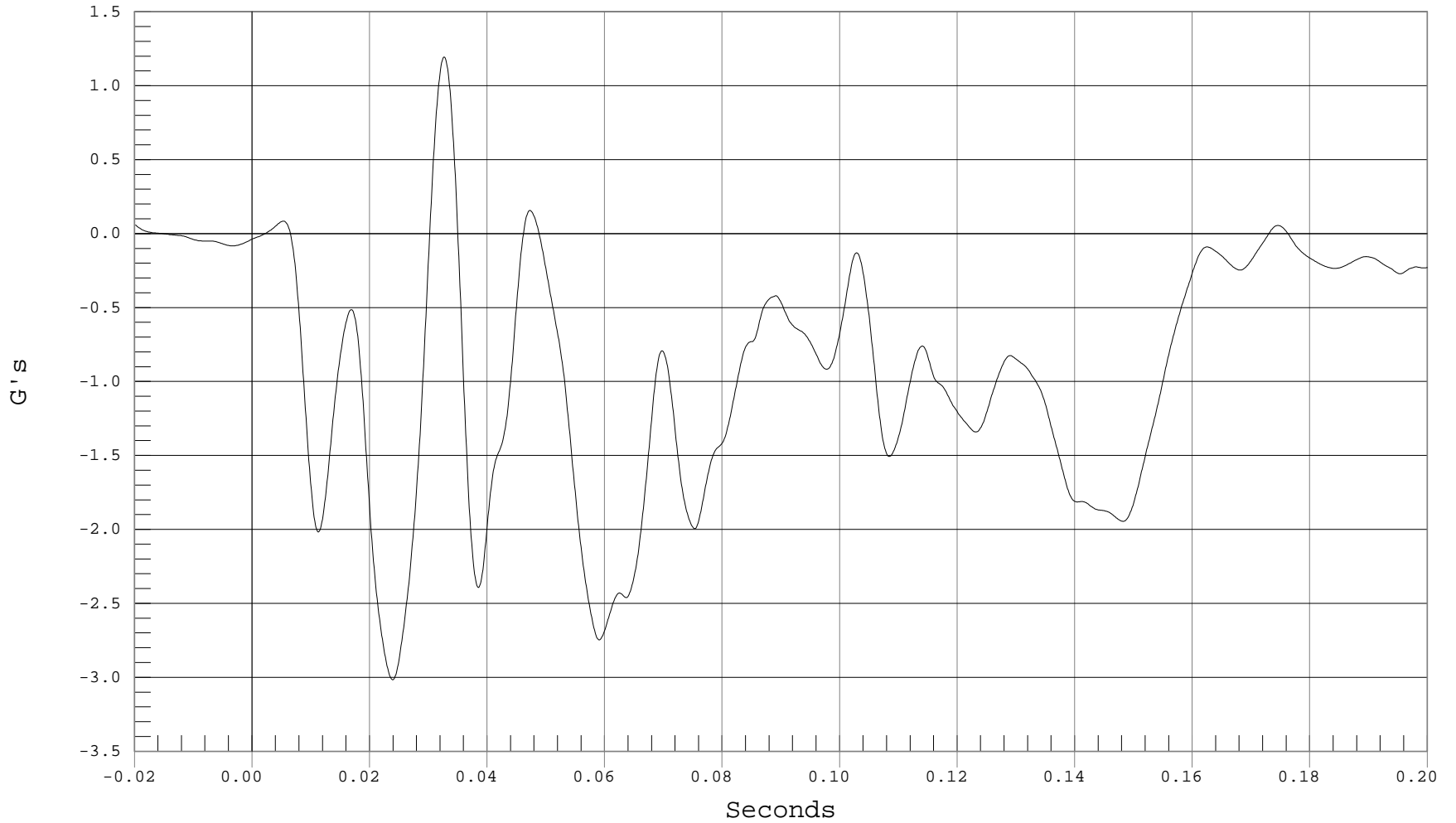
RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL X, B02036AF.A36

Ymin = -3.02 G's @ 0.0239 Seconds, Ymax = 1.19 G's @ 0.0326 Seconds





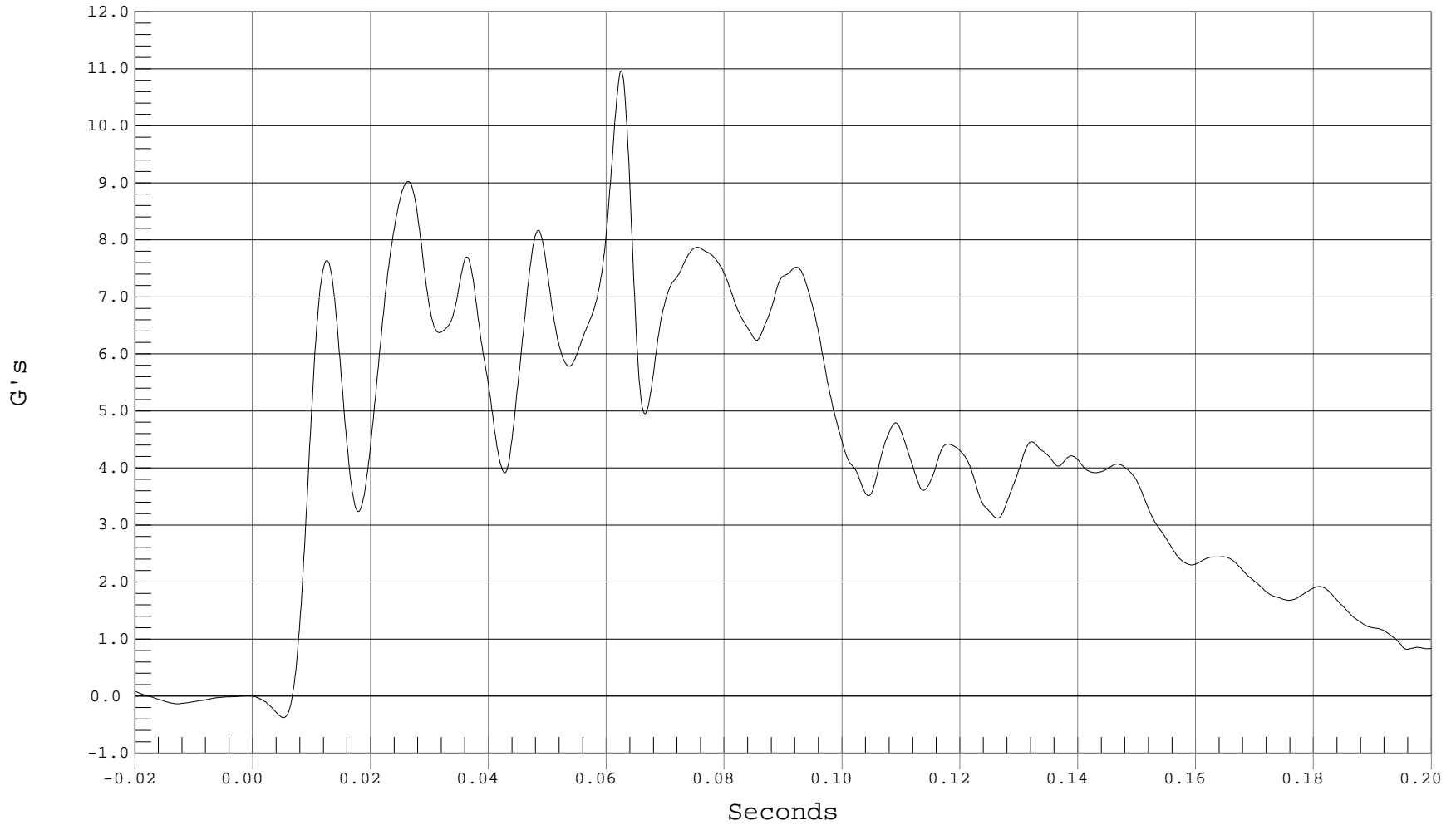
RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL Y, B02036AF.A37

Ymin = -0.38 G's @ 0.0051 Seconds, Ymax = 10.96 G's @ 0.0624 Seconds





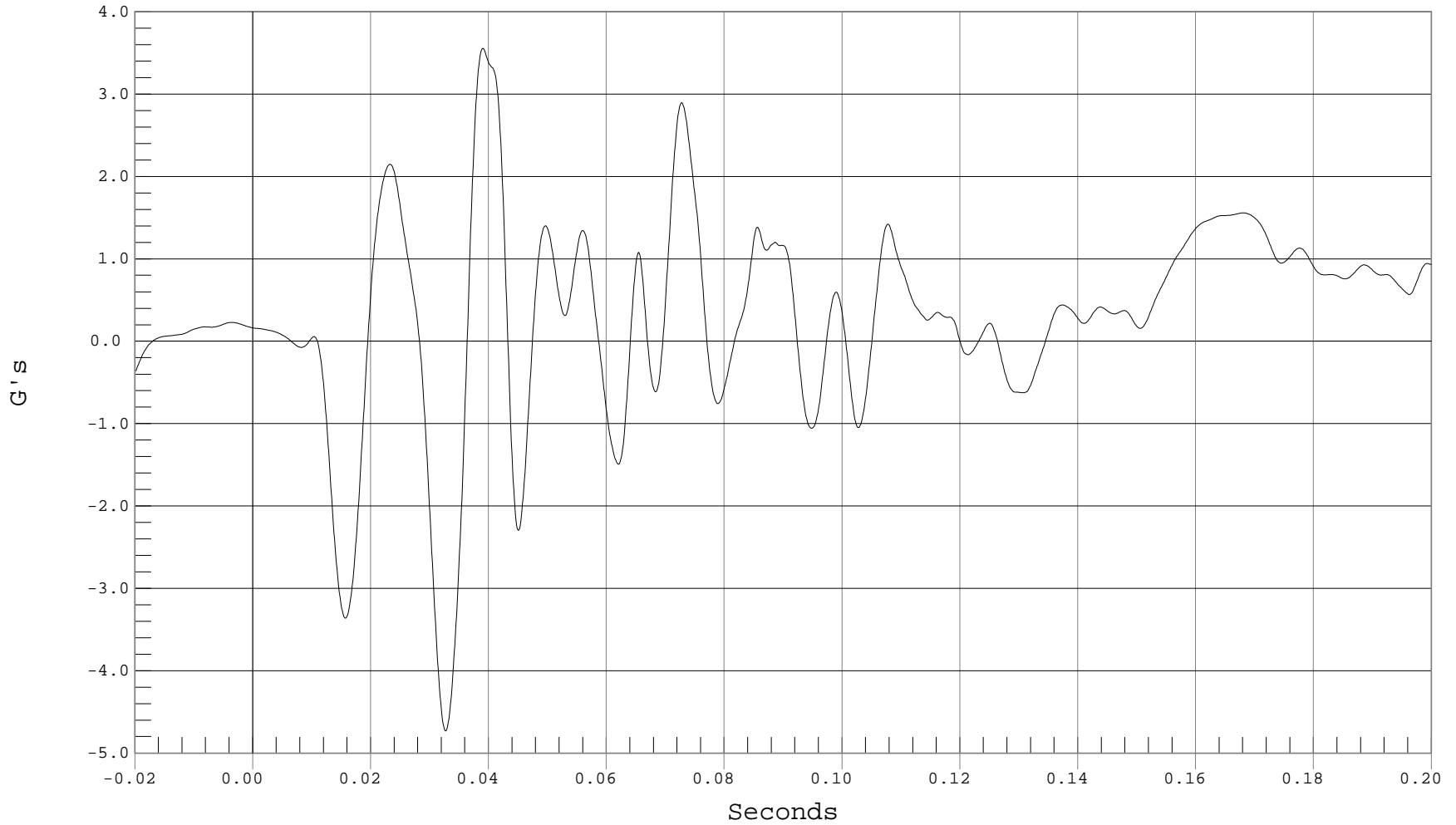
RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL Z, B02036AF.A38

Ymin = -4.73 G's @ 0.0326 Seconds, Ymax = 3.56 G's @ 0.0390 Seconds



B-30



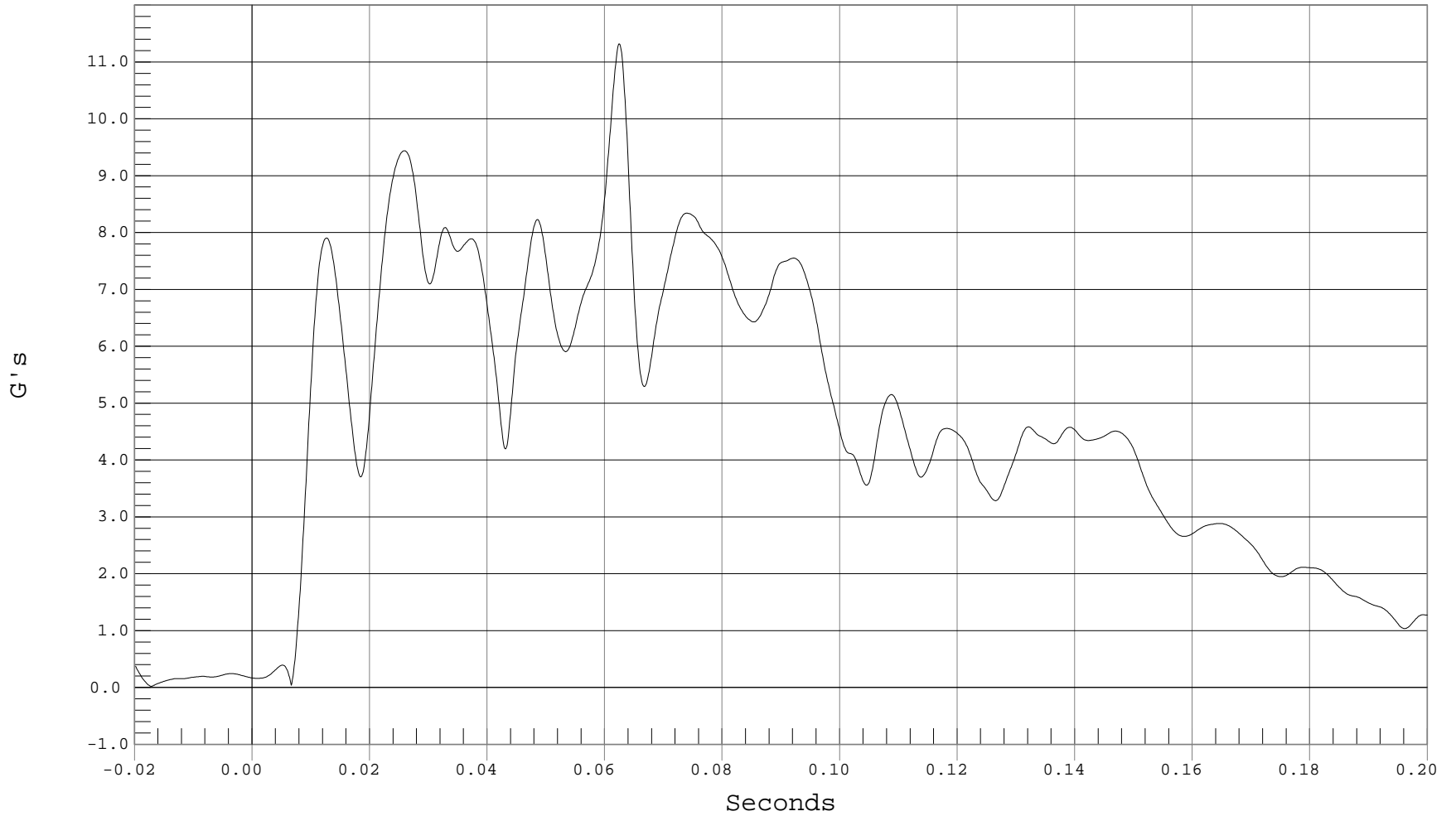
RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL RESULTANT ACCELERATION, B02036AV.A36

Ymin = .02 G's @ -0.0172 Seconds, Ymax = 11.32 G's @ 0.0624 Seconds



B-31



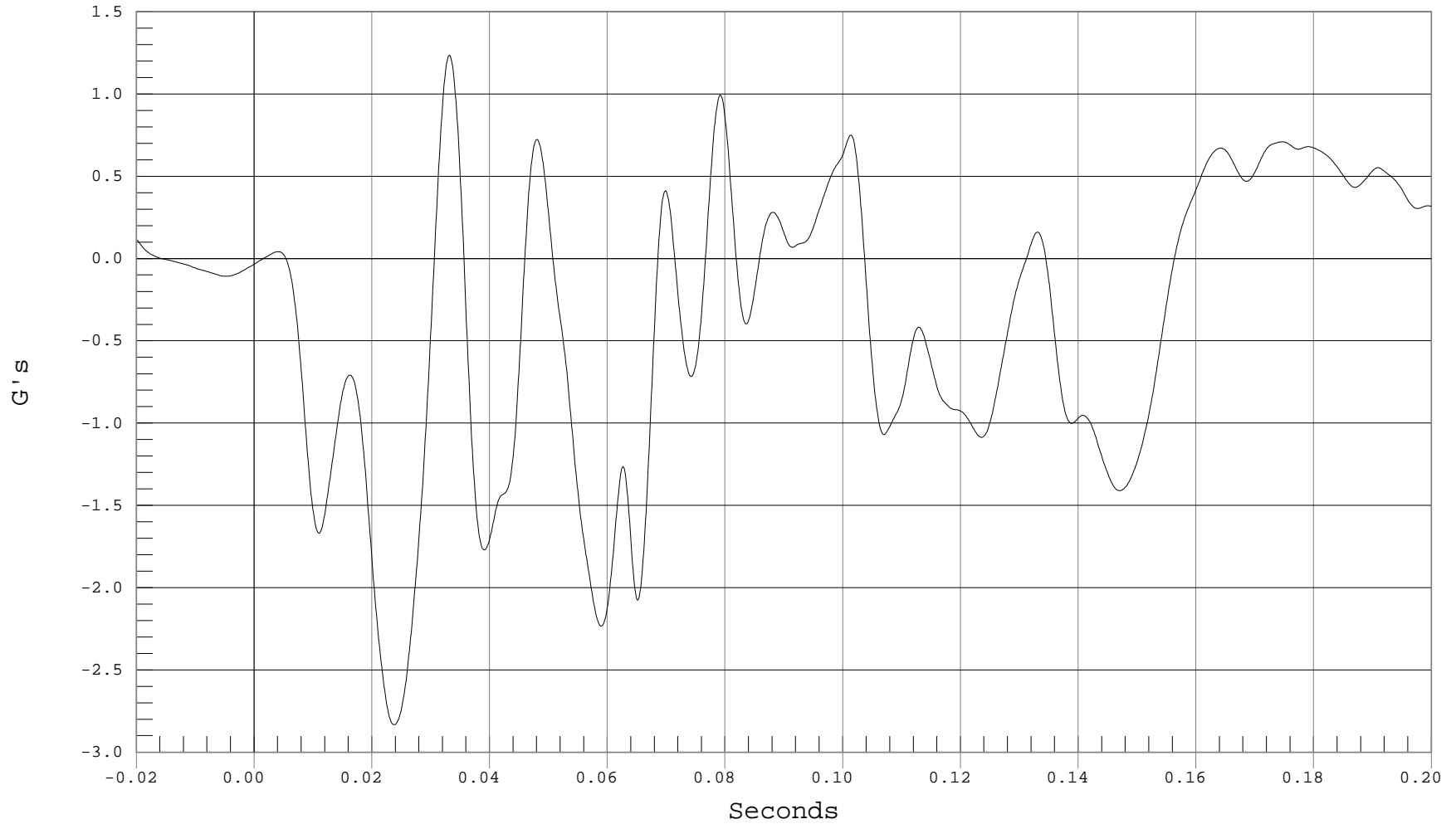
RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 RIGHT REAR SILL X, B02036AF.A39

Ymin = -2.83 G's @ 0.0237 Seconds, Ymax = 1.24 G's @ 0.0331 Seconds



B-32



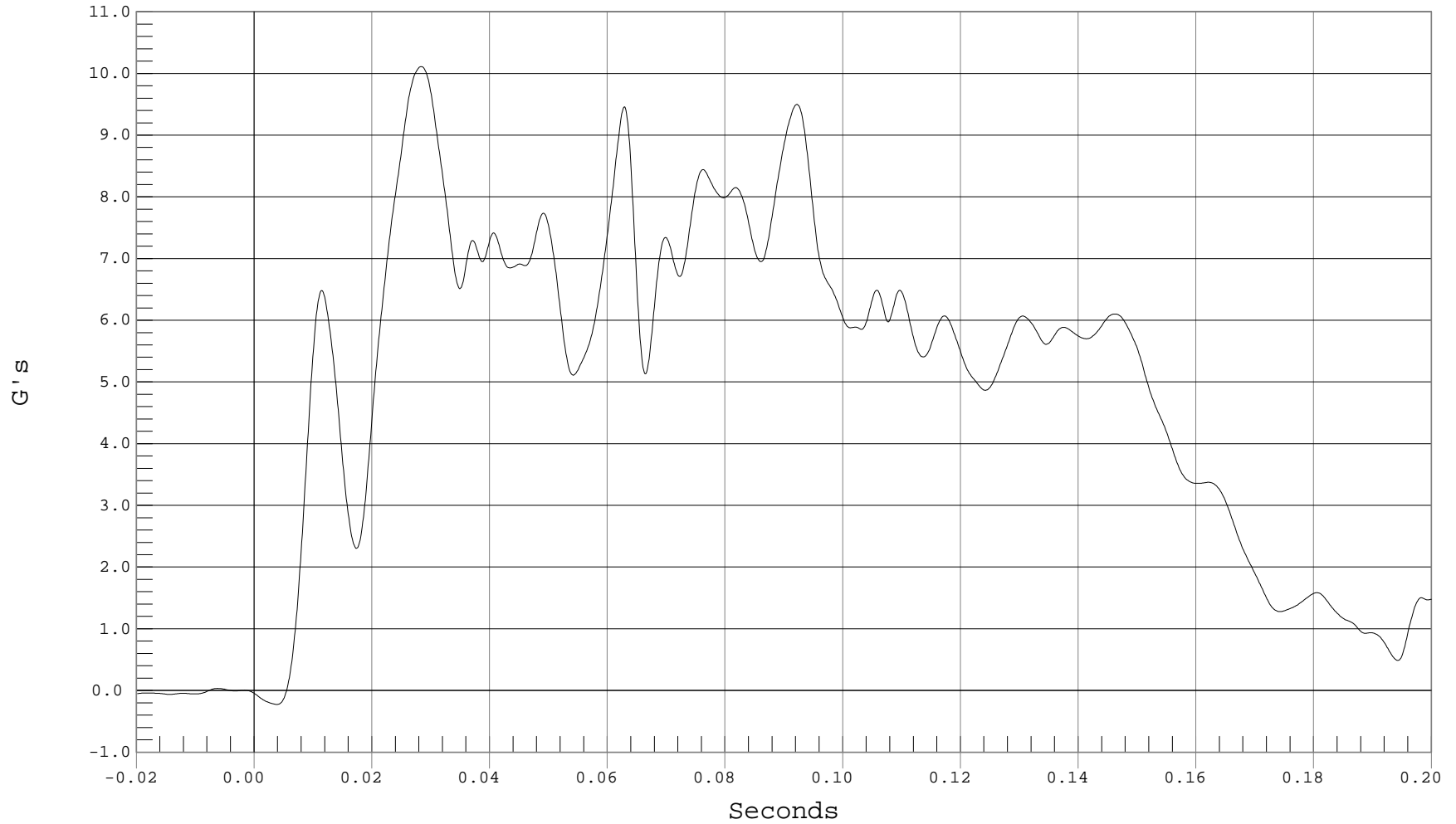
RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 RIGHT REAR SILL Y, B02036AF.A40

Ymin = -.23 G's @ 0.0038 Seconds, Ymax = 10.11 G's @ 0.0283 Seconds



B-33



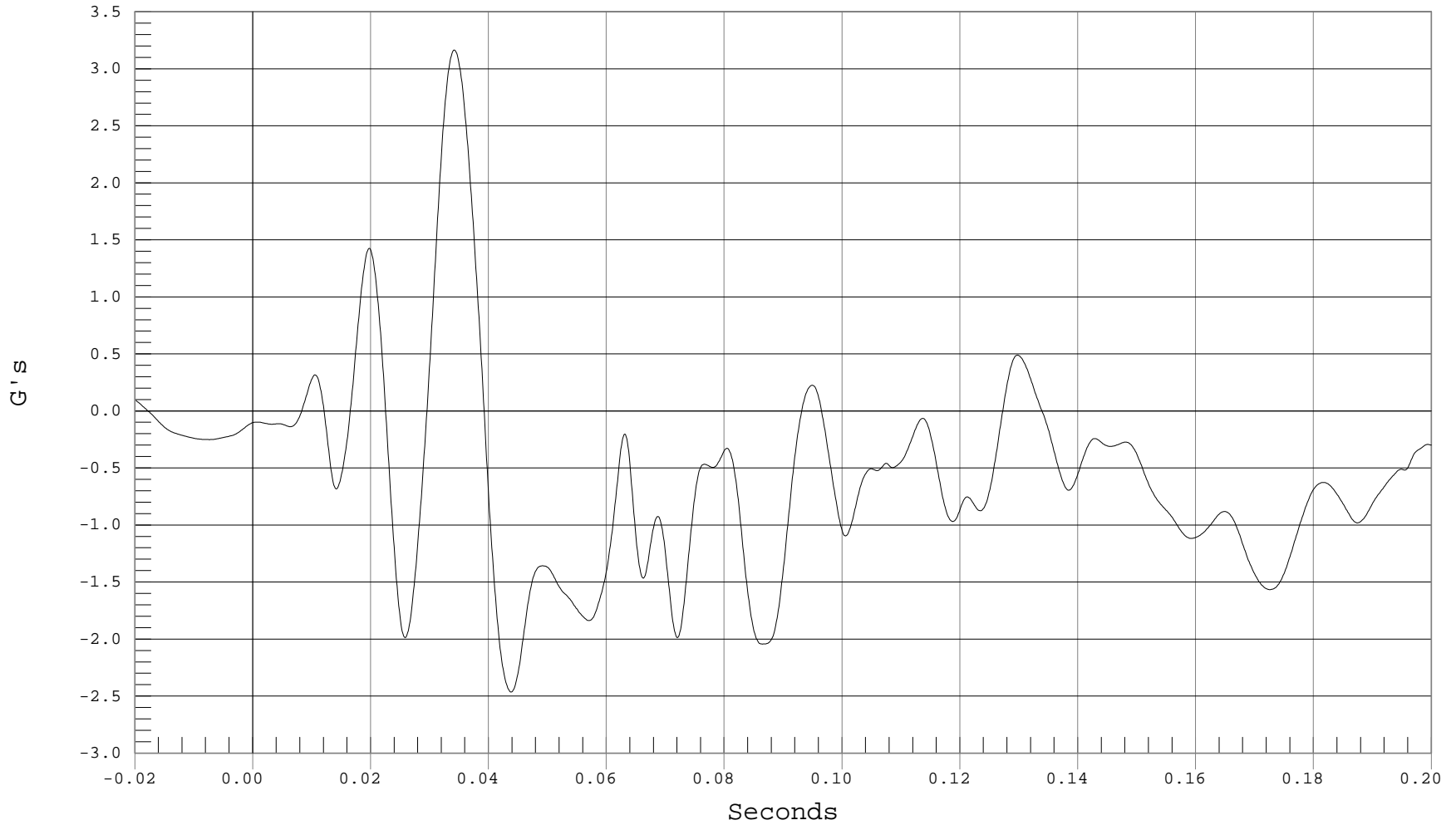
RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 RIGHT REAR SILL Z, B02036AF.A41

Ymin = -2.46 G's @ 0.0438 Seconds, Ymax = 3.16 G's @ 0.0341 Seconds



B-34



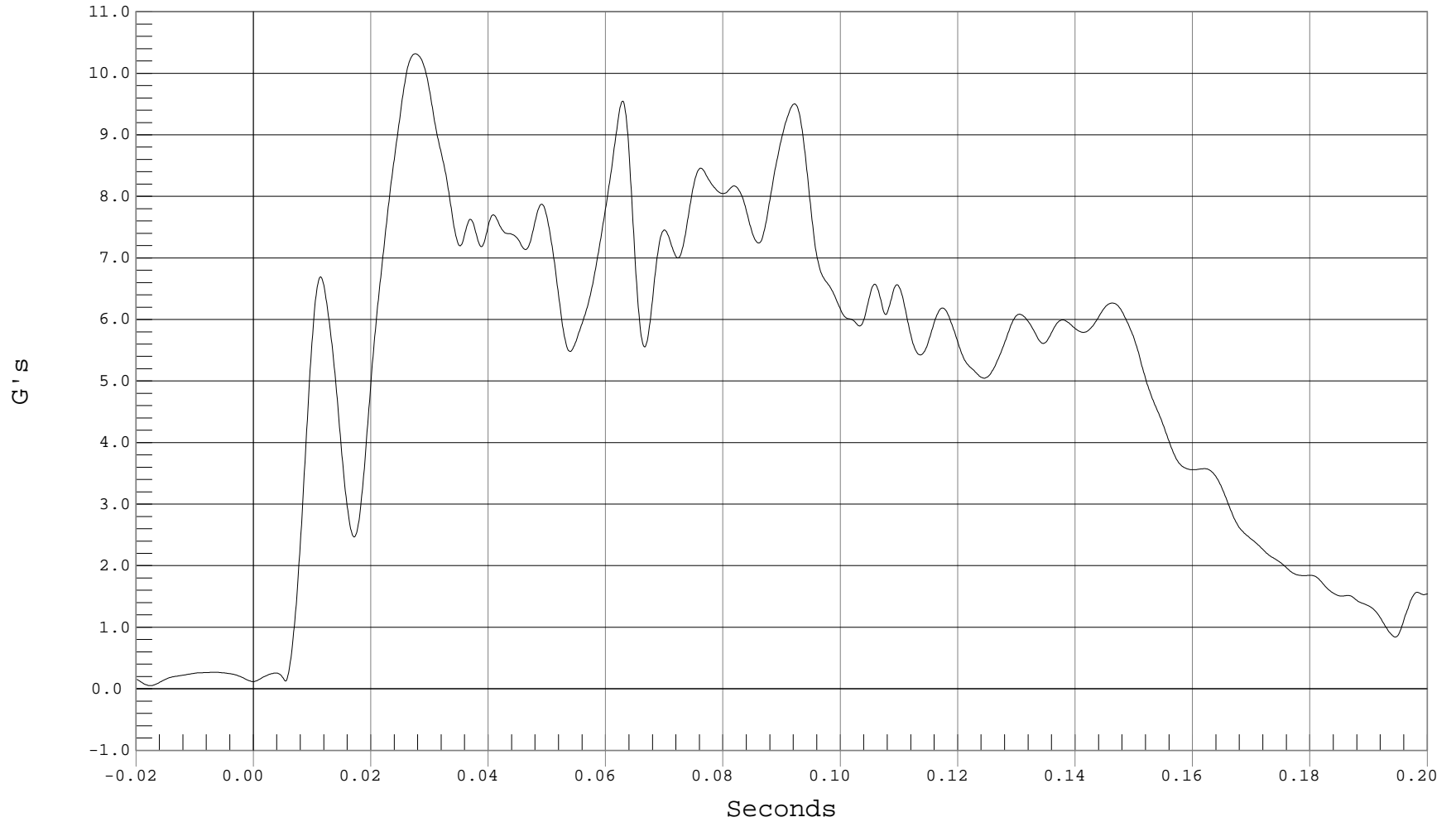
RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 RIGHT REAR SILL RESULTANT ACCELERATION, B02036AV.A39

Ymin = .05 G's @ -0.0177 Seconds, Ymax = 10.32 G's @ 0.0275 Seconds



B-35



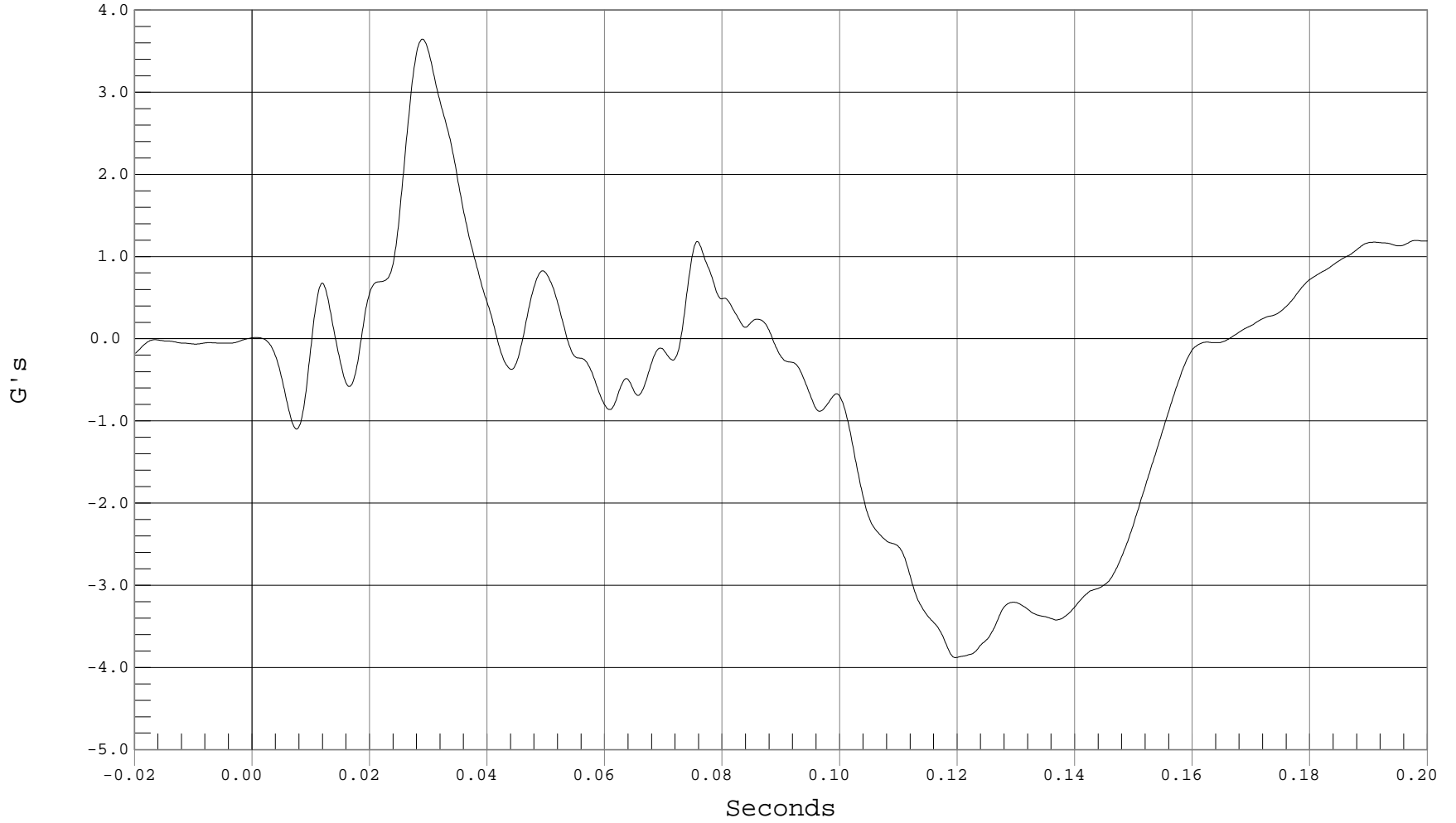
REAR FLOORPAN ABOVE AXLE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE X, B02036AF.A42

Ymin = -3.88 G's @ 0.1196 Seconds, Ymax = 3.65 G's @ 0.0289 Seconds



B-36



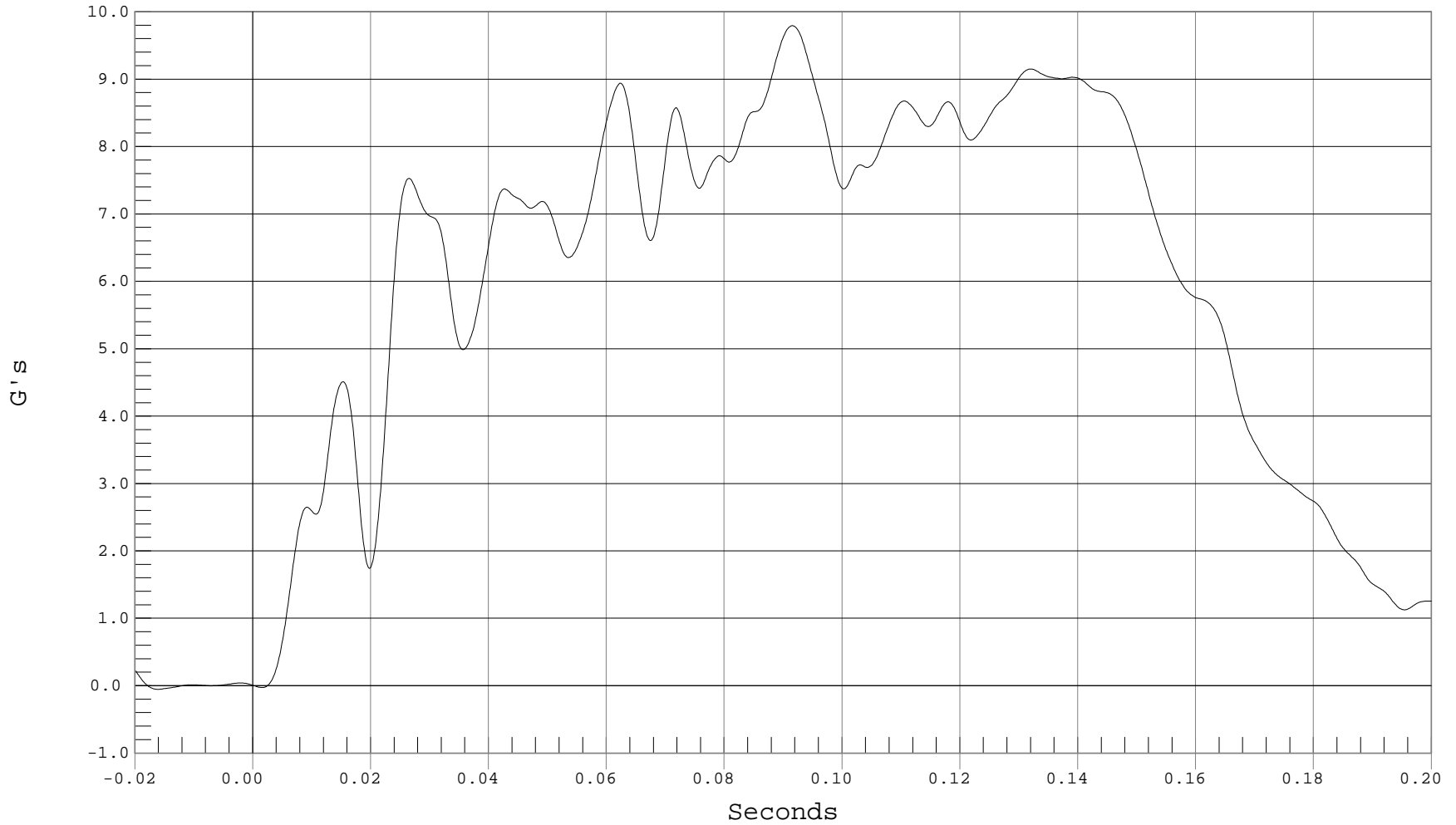
REAR FLOORPAN ABOVE AXLE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE Y, B02036AF.A43

Ymin = -.05 G's @ -0.0161 Seconds, Ymax = 9.79 G's @ 0.0915 Seconds





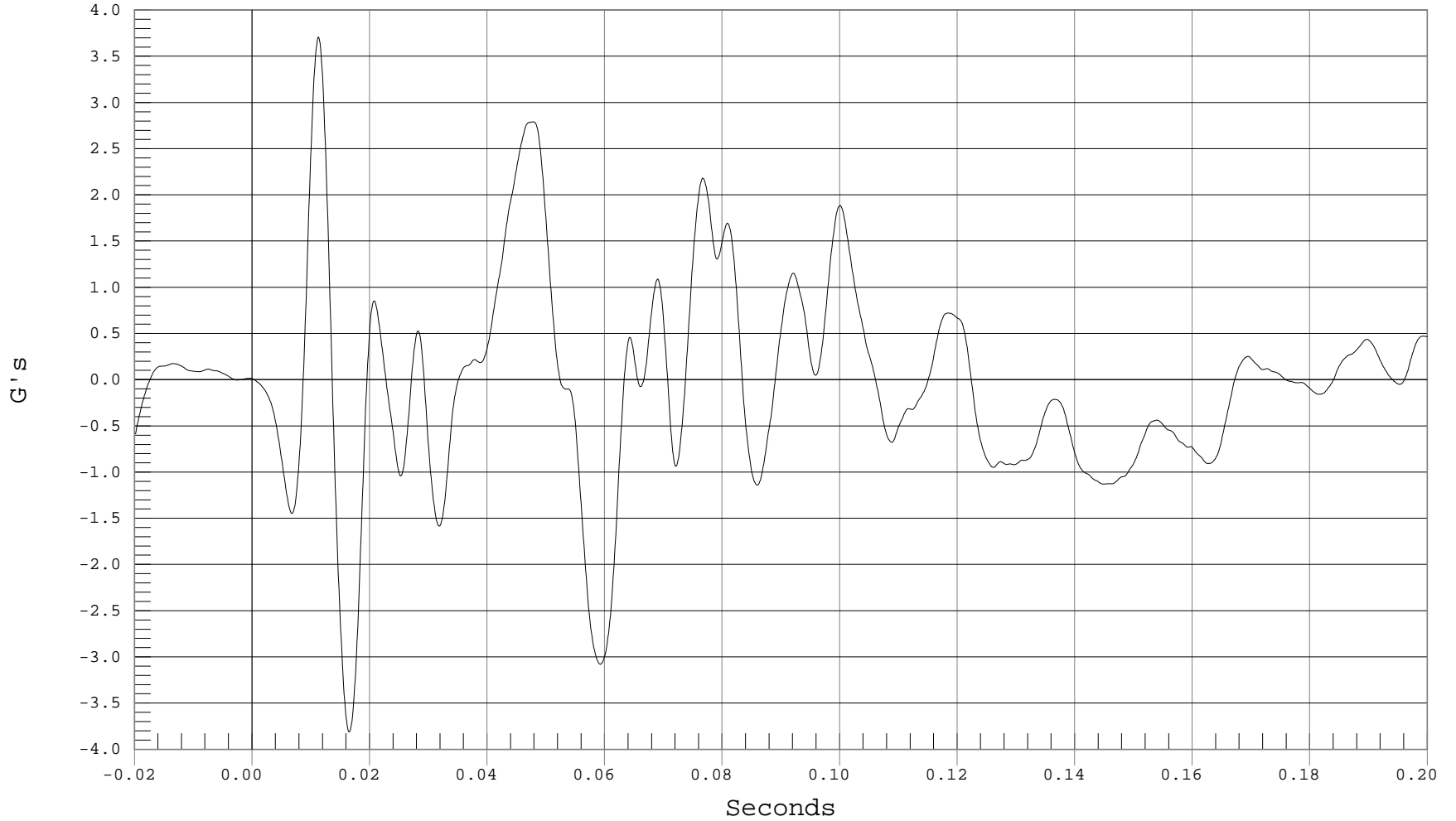
REAR FLOORPAN ABOVE AXLE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE Z, B02036AF.A44

Ymin = -3.81 G's @ 0.0164 Seconds, Ymax = 3.71 G's @ 0.0112 Seconds





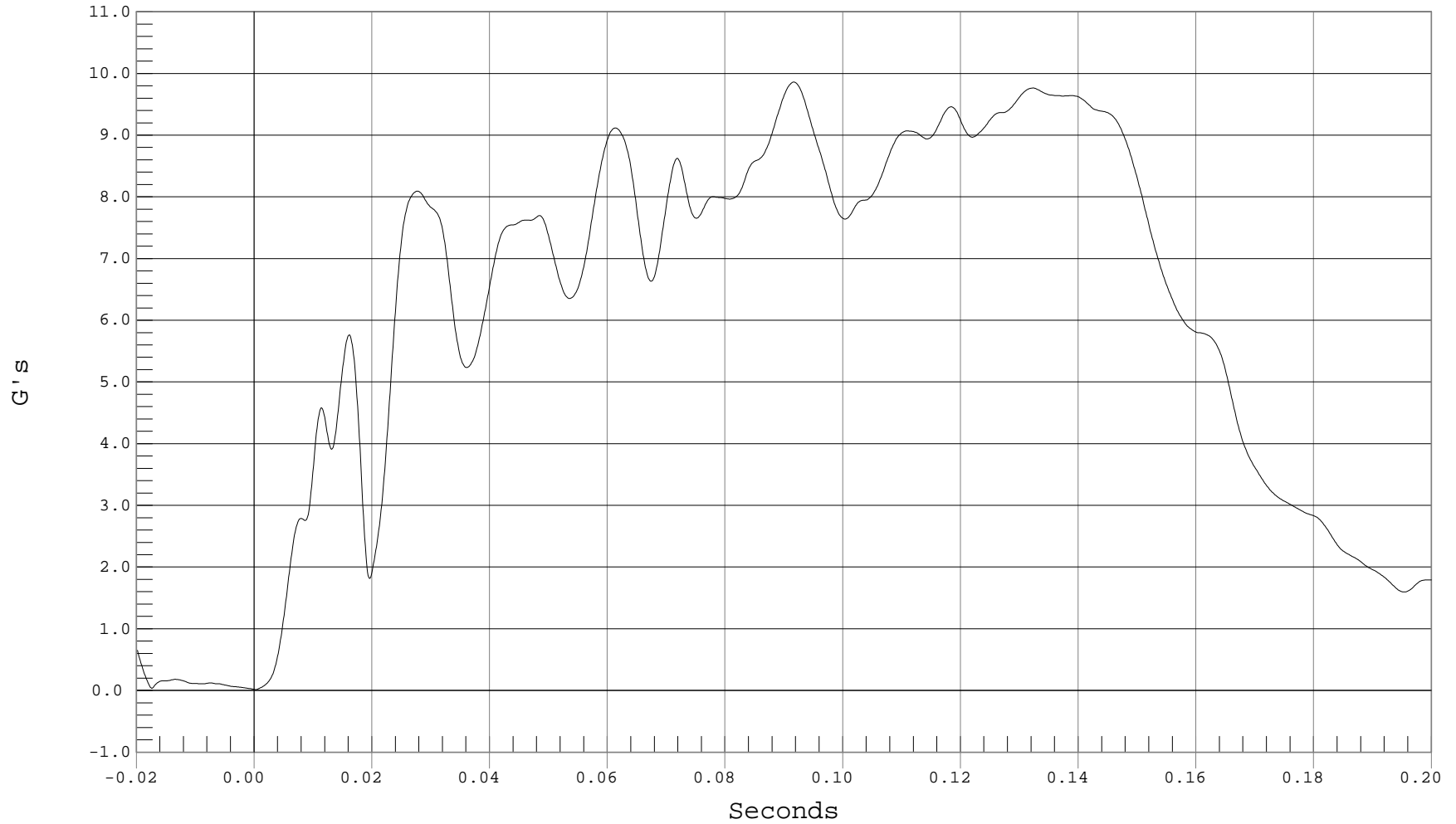
REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE ACCELERATION, B02036AV.A42

Ymin = .01 G's @ 0.0002 Seconds, Ymax = 9.86 G's @ 0.0916 Seconds





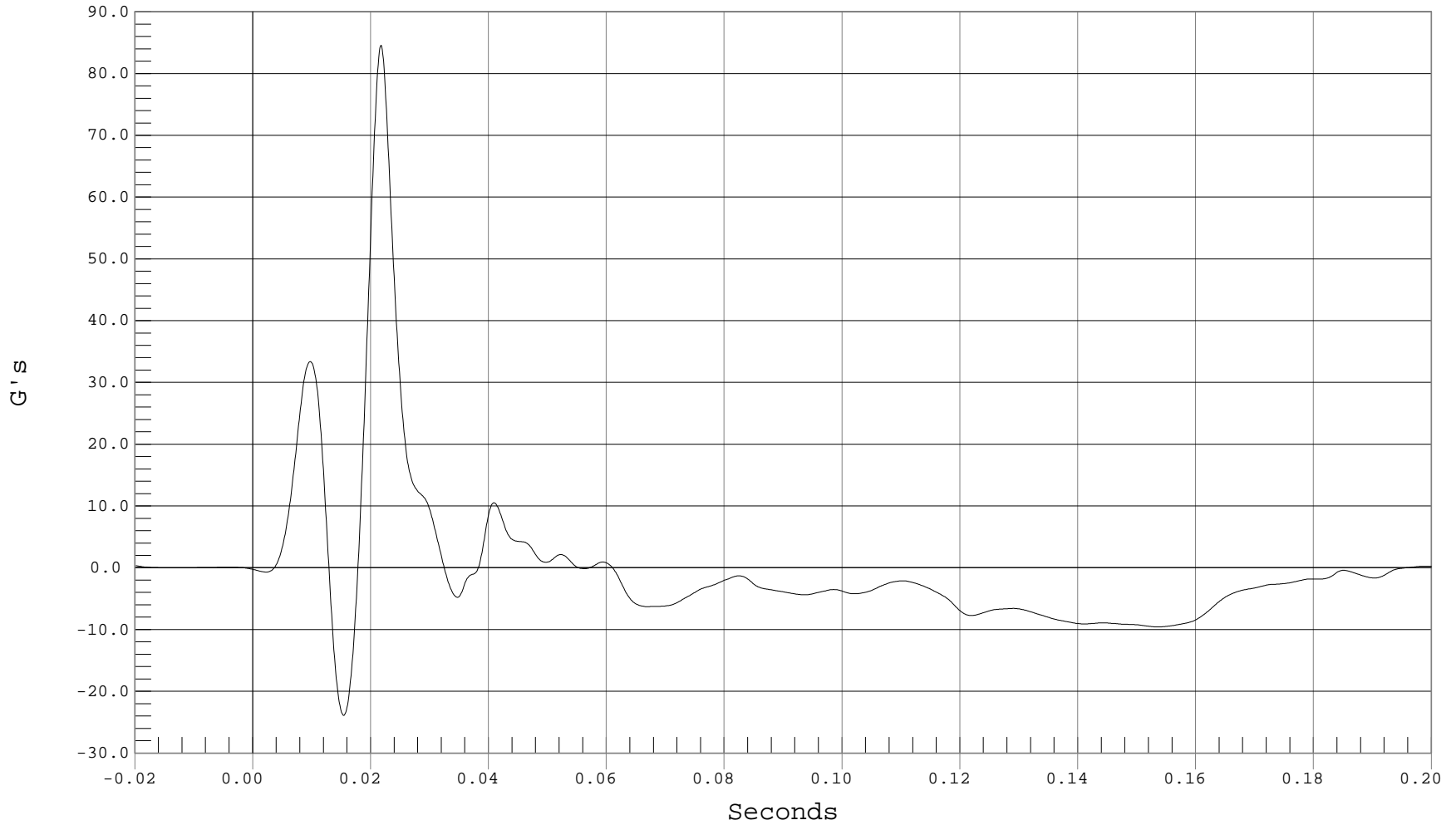
LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT FRONT SILL Y, B02036AF.A46

Ymin = -23.91 G's @ 0.0153 Seconds, Ymax = 84.59 G's @ 0.0217 Seconds



B-40



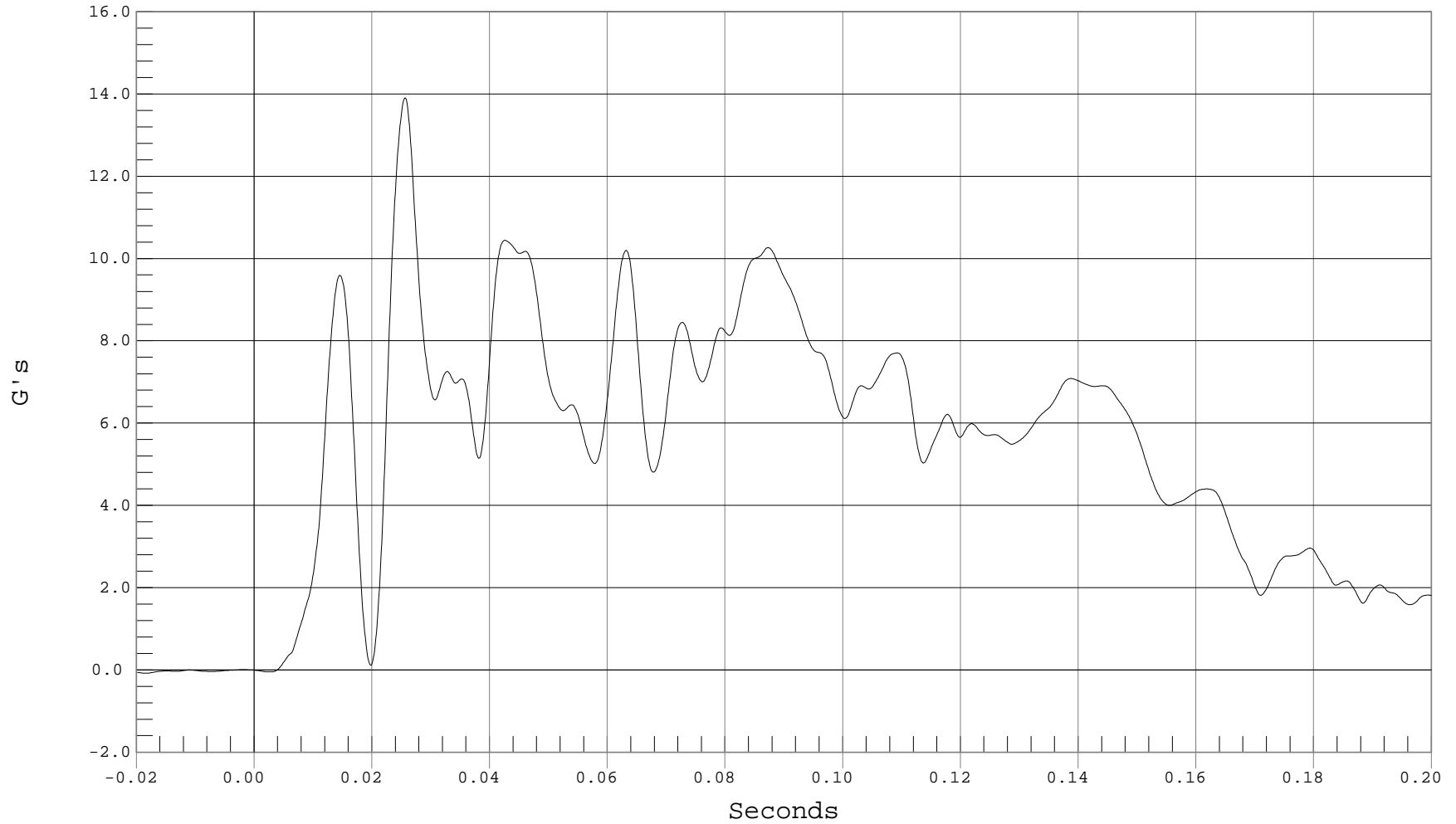
LEFT SIDE SILL AT REAR SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT REAR SILL Y, B02036AF.A45

Ymin = -.08 G's @ -0.0185 Seconds, Ymax = 13.91 G's @ 0.0256 Seconds



B-41



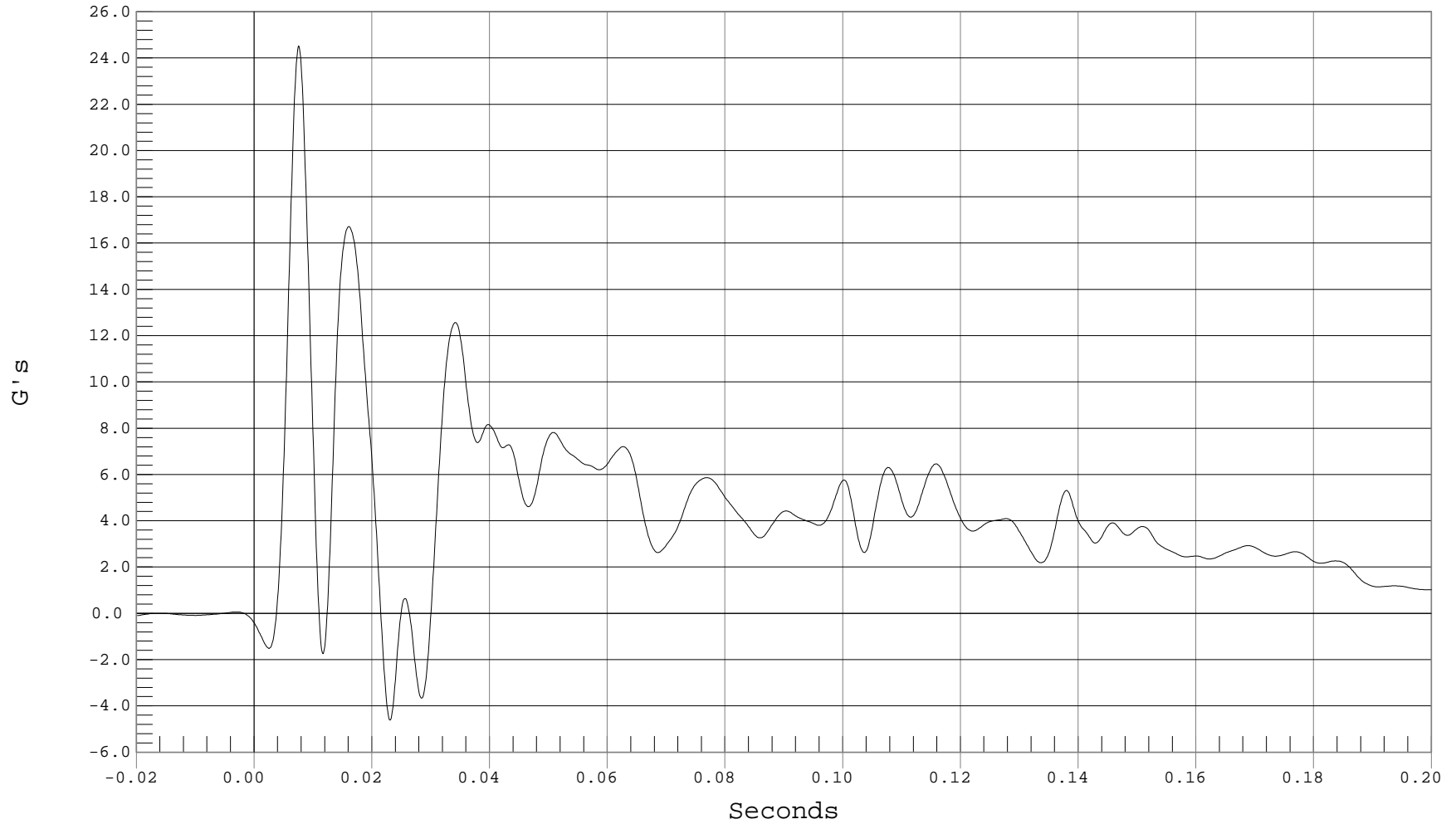
LEFT LOWER A-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT LOWER A-POST Y, B02036AF.A52

Ymin = -4.62 G's @ 0.0230 Seconds, Ymax = 24.53 G's @ 0.0075 Seconds



B-42



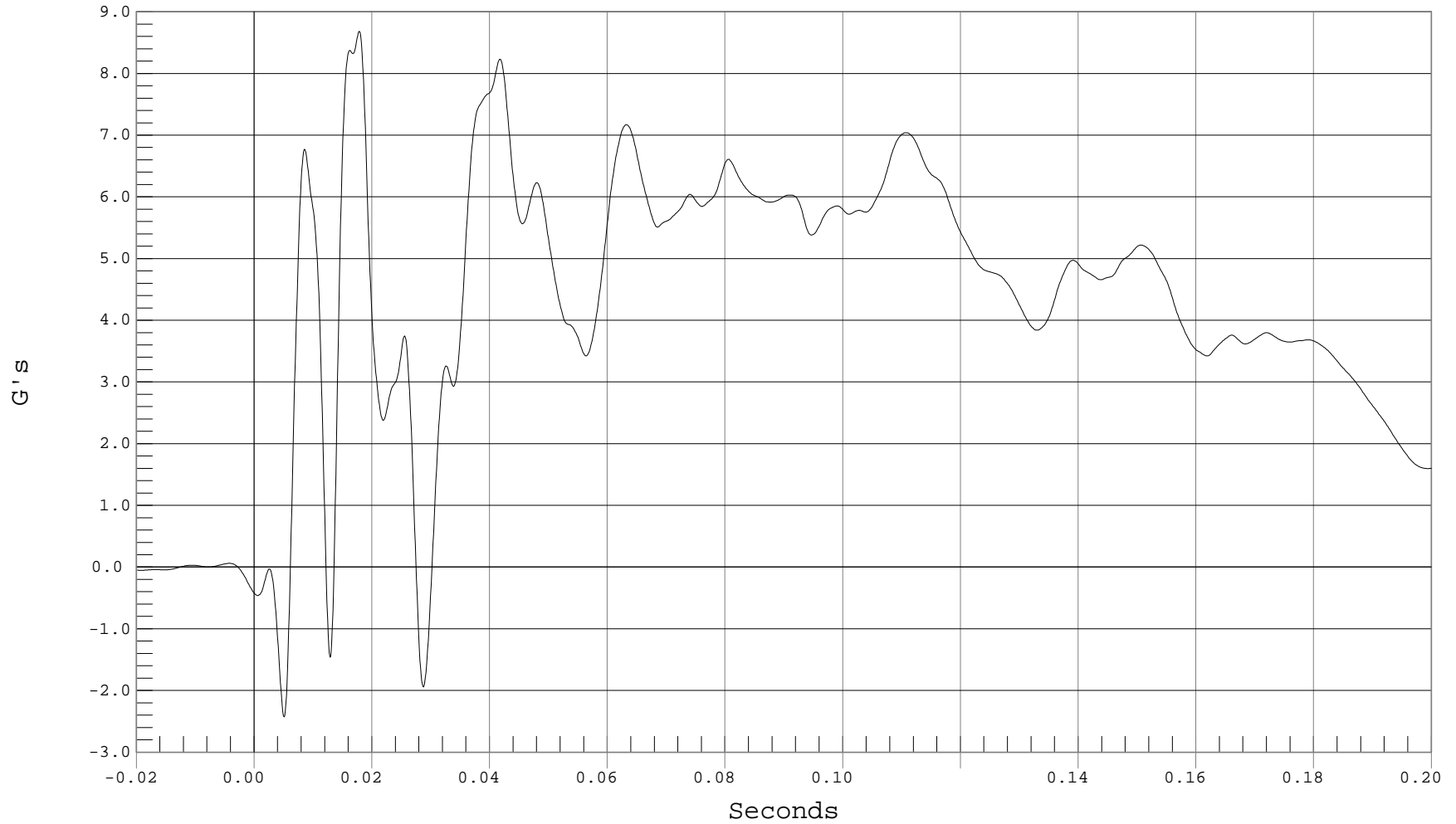
LEFT MID A-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT MID A-POST, B02036AF.A53

Ymin = -2.43 G's @ 0.0050 Seconds, Ymax = 8.68 G's @ 0.0178 Seconds



B-43



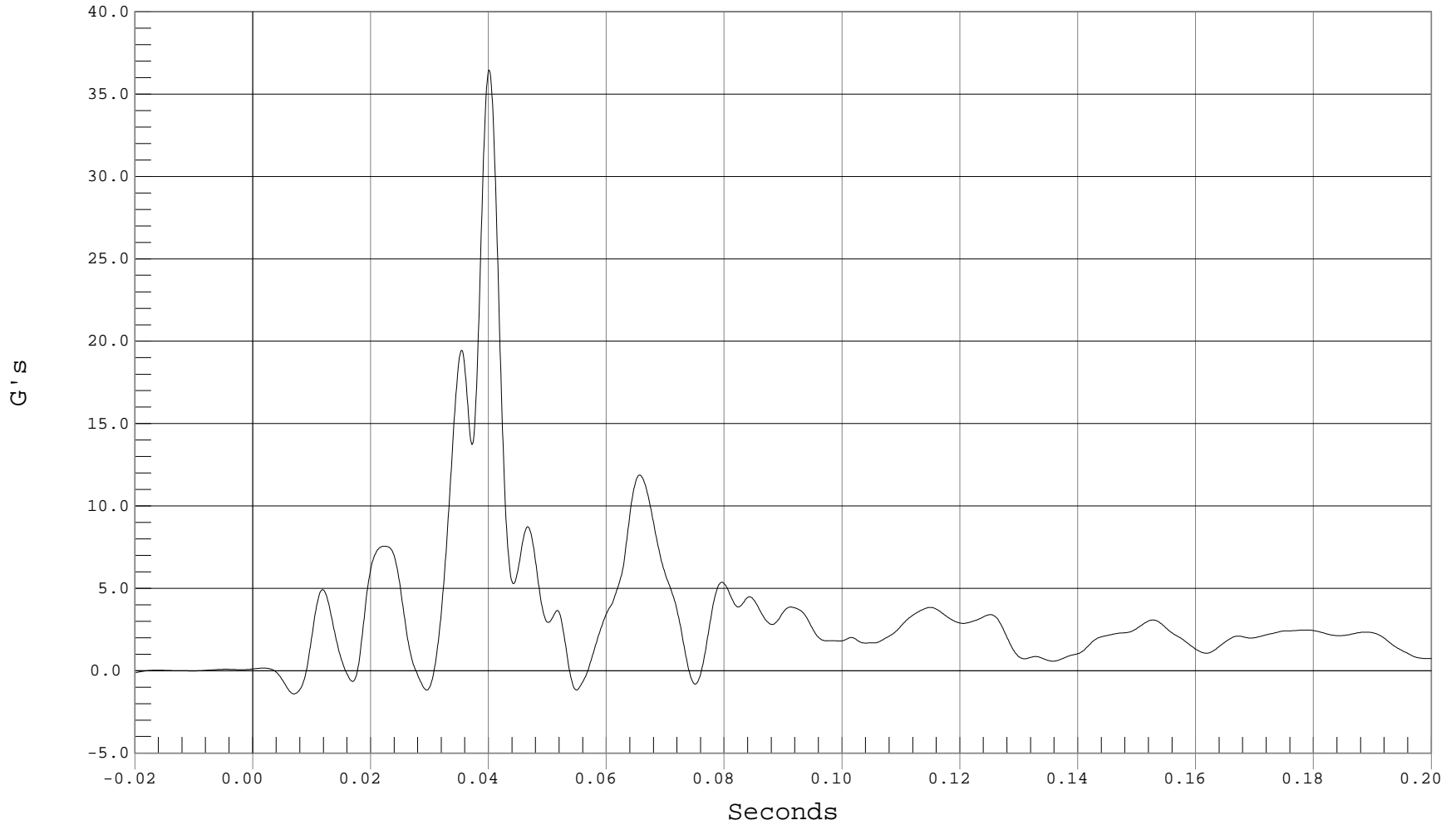
LEFT A-POST @ ROOF Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT A-PILLAR @ ROOF Y, B02036AF.A54

Ymin = -1.41 G's @ 0.0069 Seconds, Ymax = 36.48 G's @ 0.0400 Seconds



B-44



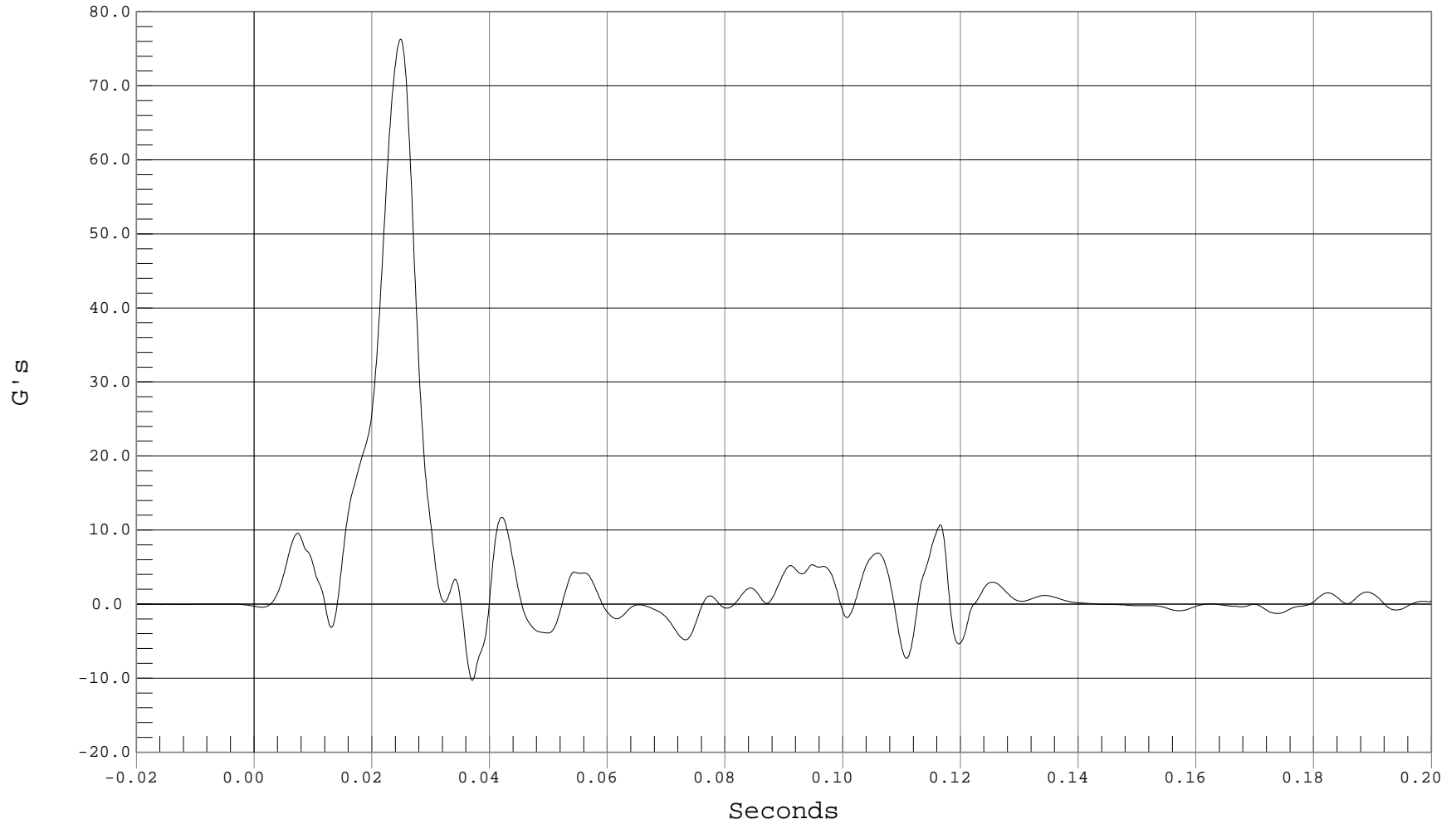
LEFT LOWER B-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT LOWER B-POST Y, B02036AF.A49

Ymin = -10.3 G's @ 0.0370 Seconds, Ymax = 76.31 G's @ 0.0248 Seconds



B-45



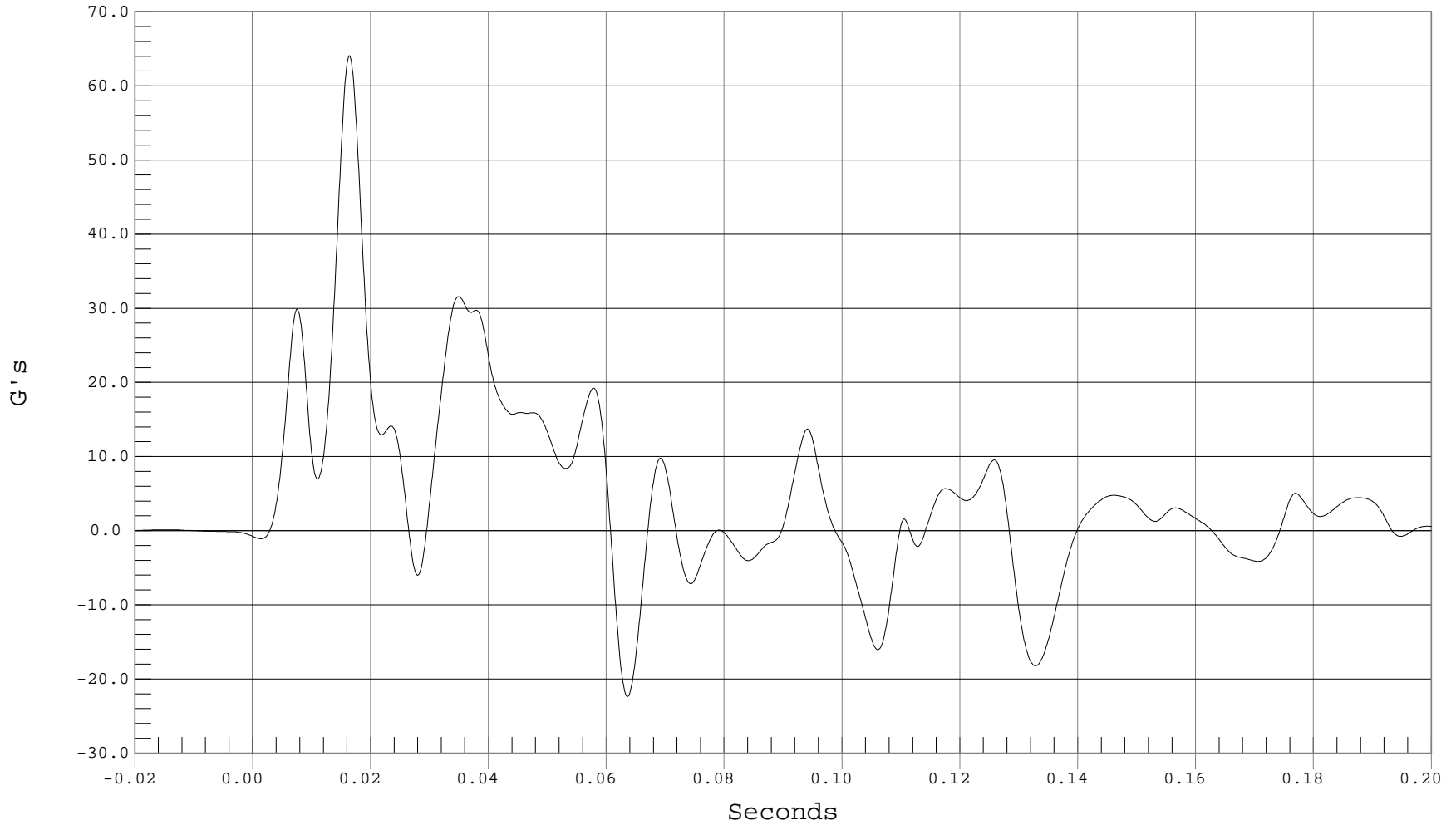
LEFT MID B-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT MID B-POST Y, B02036AF.A50

Ymin = -22.37 G's @ 0.0635 Seconds, Ymax = 64.09 G's @ 0.0163 Seconds



B-46



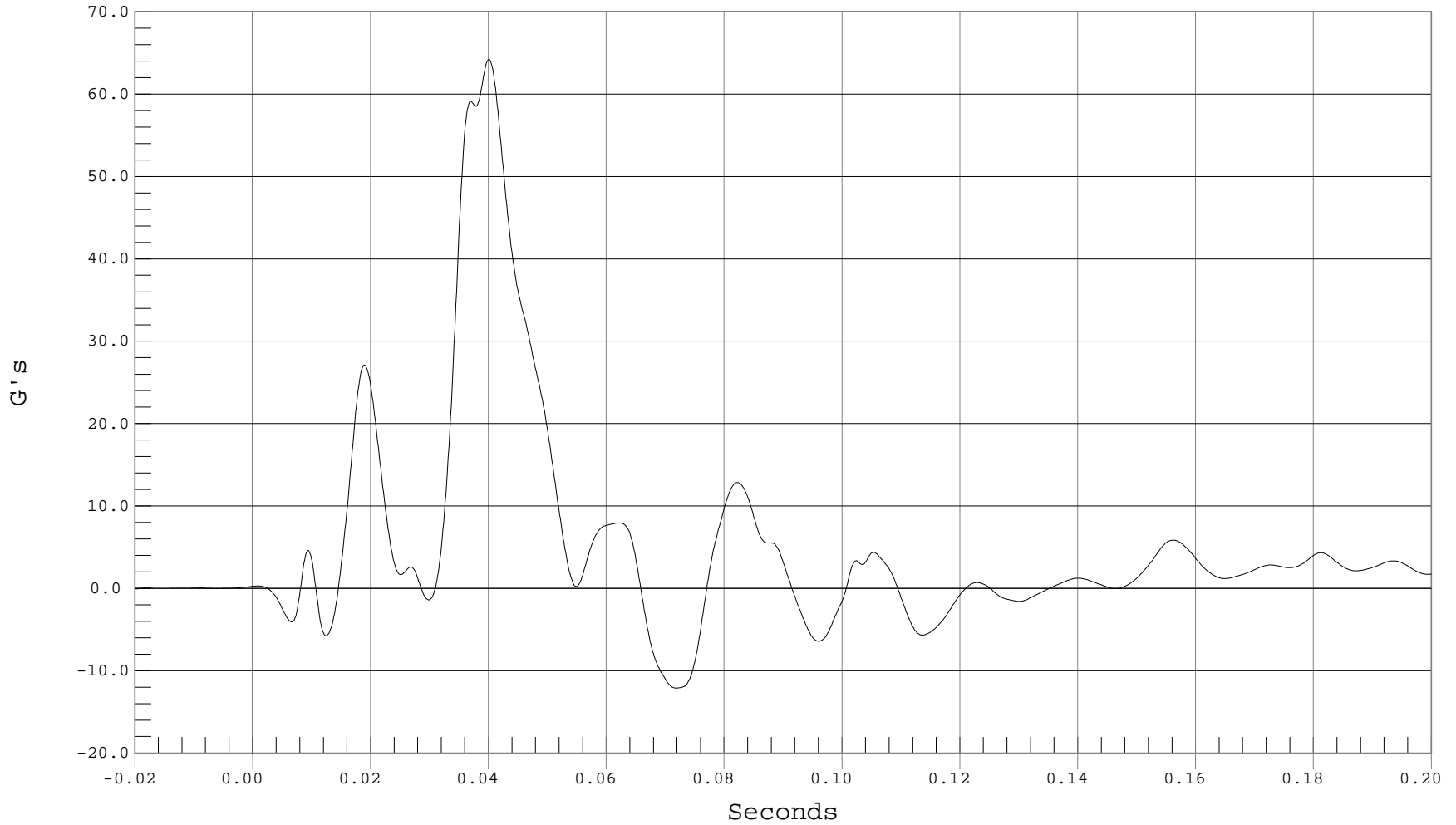
LEFT UPPER B-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT UPPER B-POST Y, B02036AF.A47

Ymin = -12.1 G's @ 0.0717 Seconds, Ymax = 64.22 G's @ 0.0400 Seconds



B-47



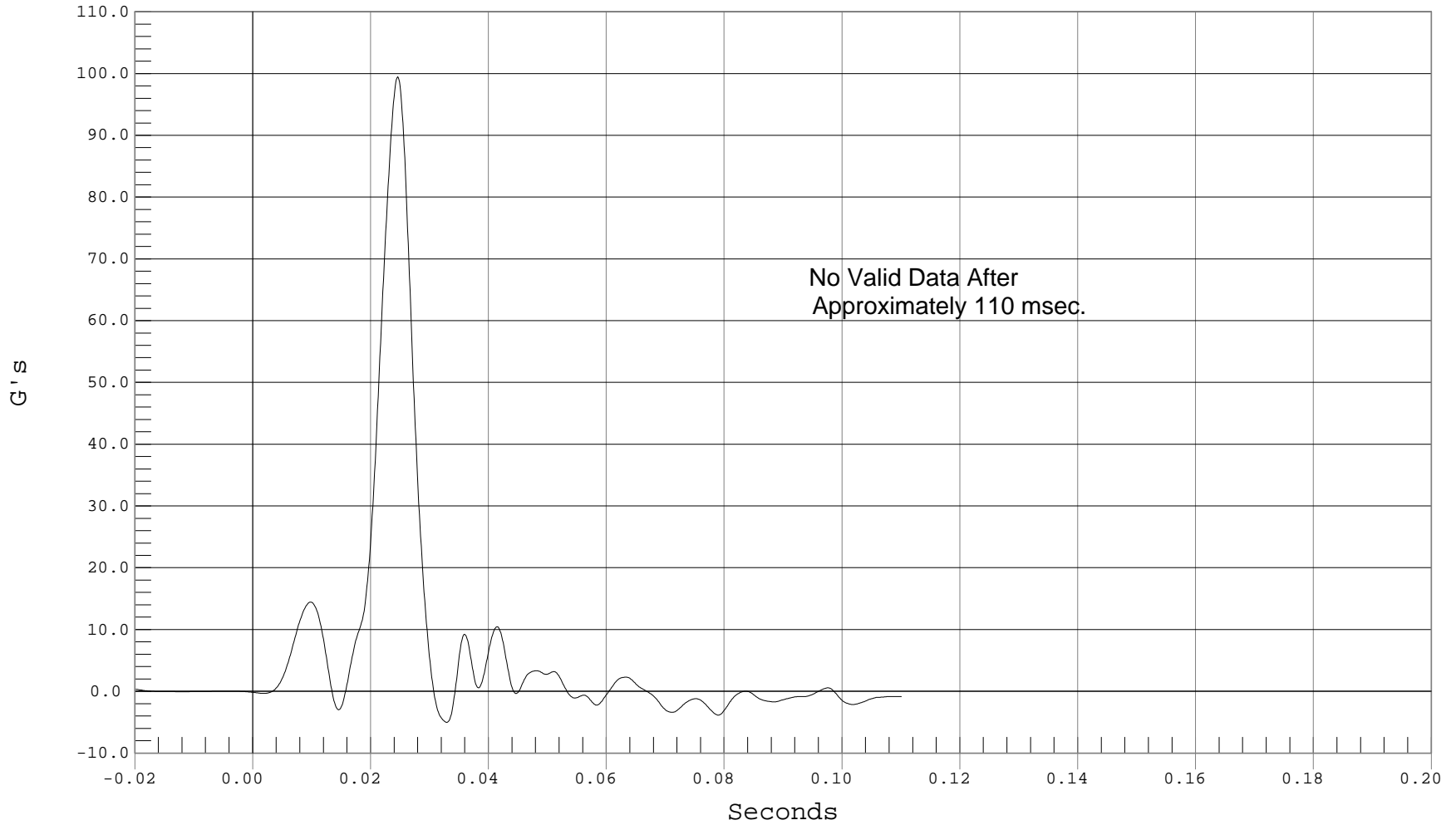
LEFT DRIVER SEAT TRACK Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 DRIVER SEAT TRACK Y, B02036AF.A51

Ymin = -5.03 G's @ 0.0328 Seconds, Ymax = 99.46 G's @ 0.0245 Seconds





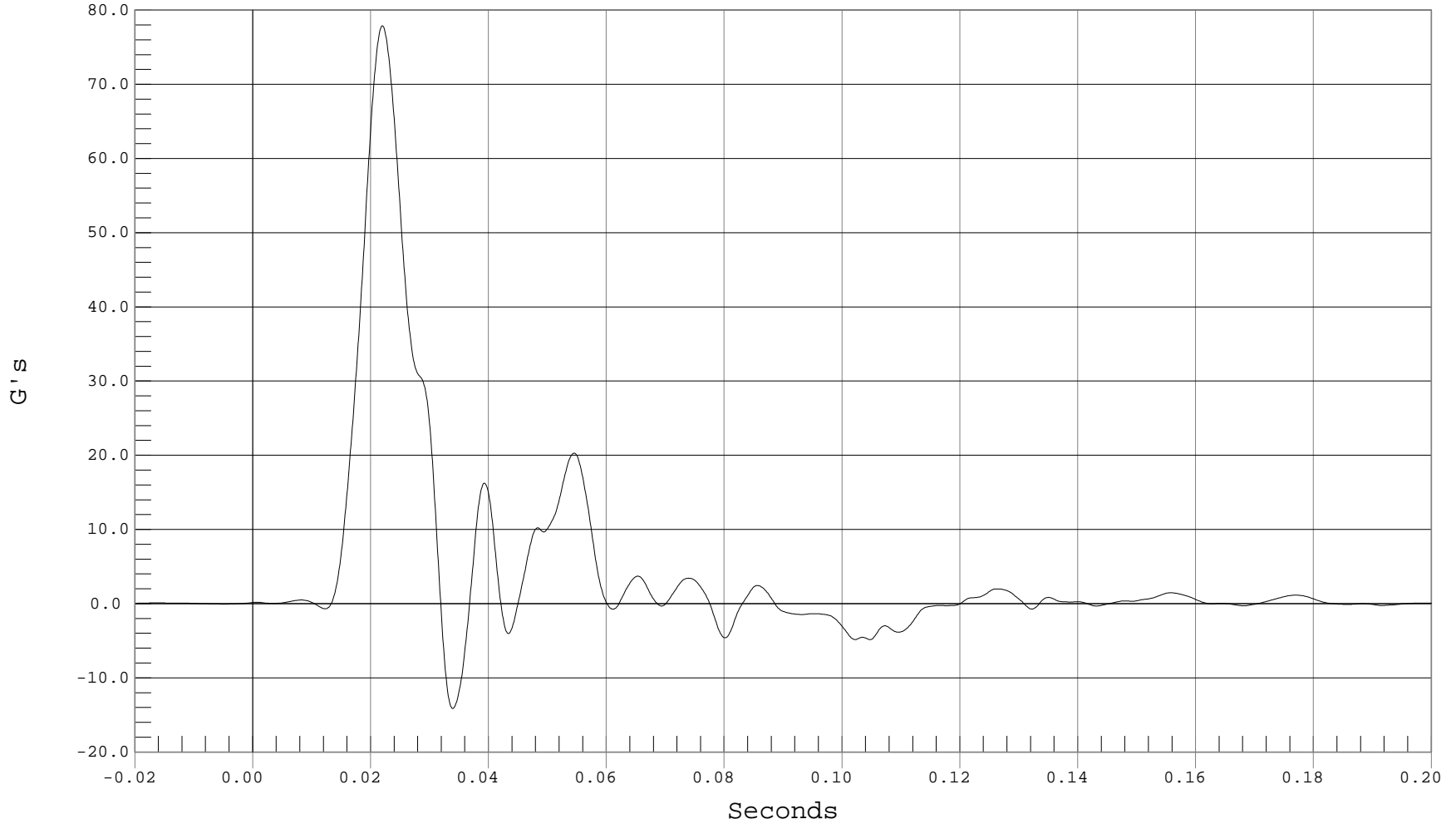
DRIVER LEFT SEAT FRAME Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT DRIVER SEAT FRAME Y, B02036AF.A29

Ymin = -14.13 G's @ 0.0338 Seconds, Ymax = 77.9 G's @ 0.0219 Seconds



B-49



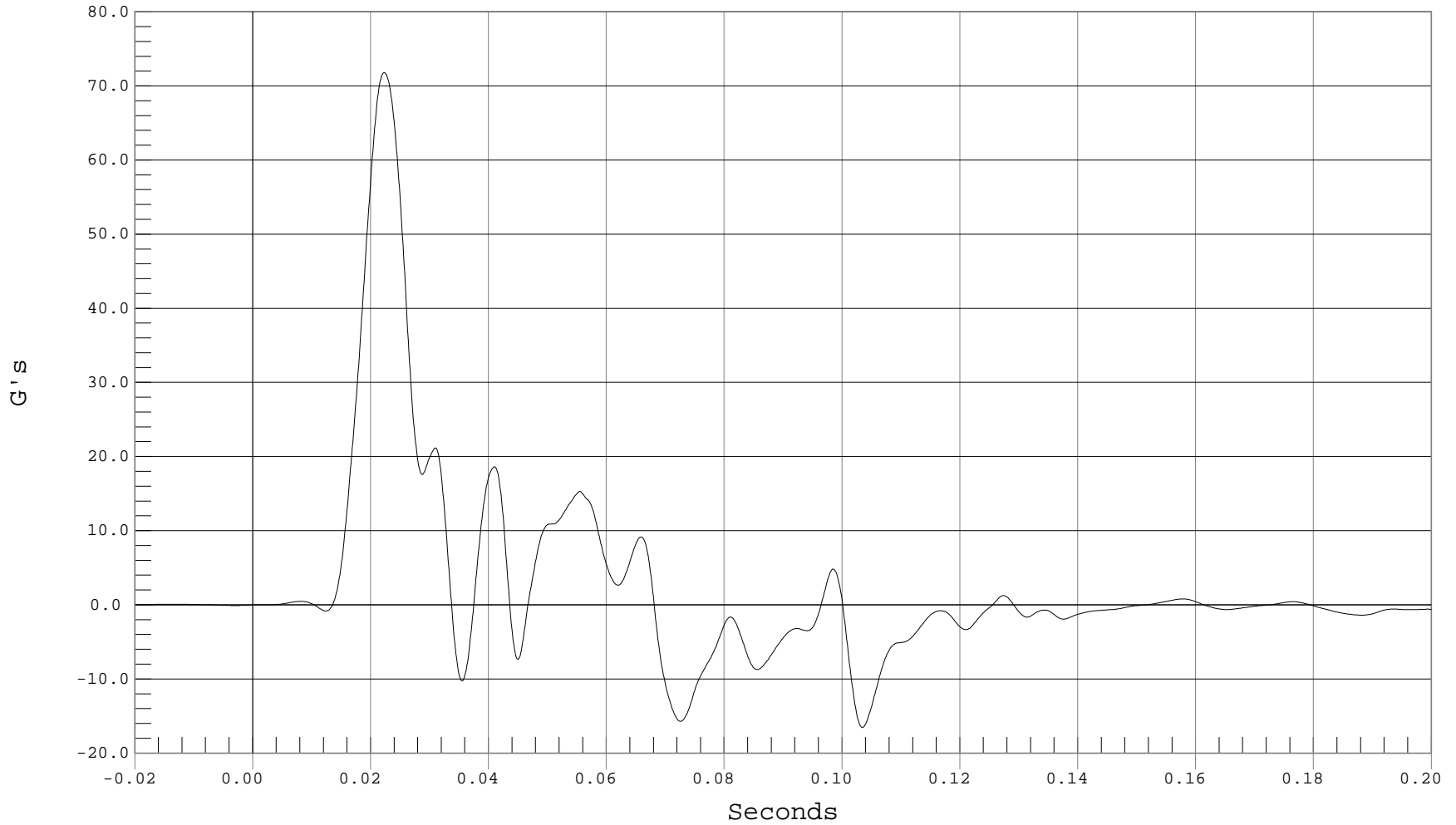
DRIVER RIGHT SEAT FRAME Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 RIGHT DRIVER SEAT FRAME Y, B02036AF.A30

Ymin = -16.56 G's @ 0.1034 Seconds, Ymax = 71.79 G's @ 0.0222 Seconds



B-50



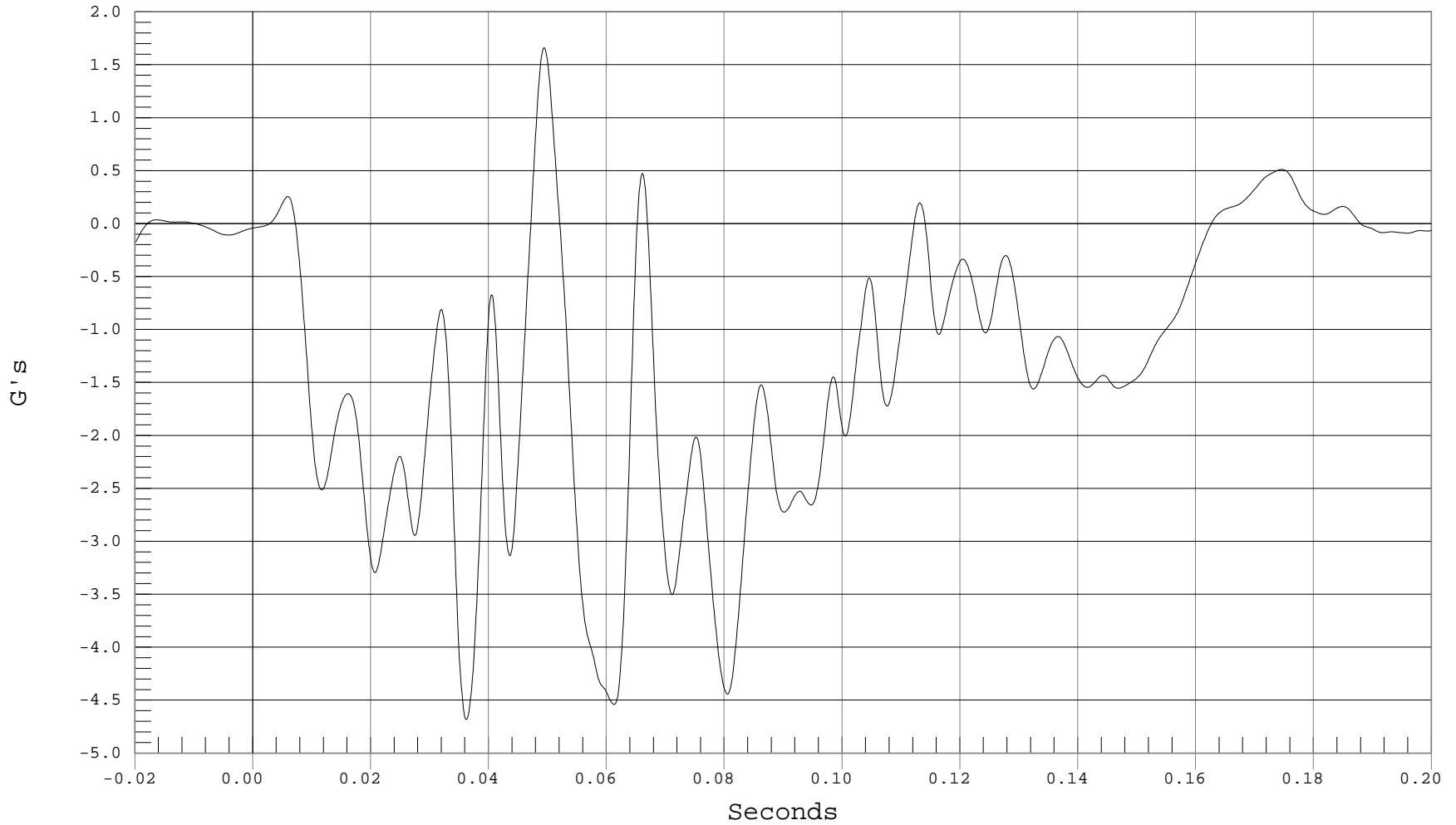
VEHICLE CG X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

1 VEHICLE CG X, B02036AF.A33

Ymin = -4.68 G's @ 0.0362 Seconds, Ymax = 1.66 G's @ 0.0494 Seconds



B-51



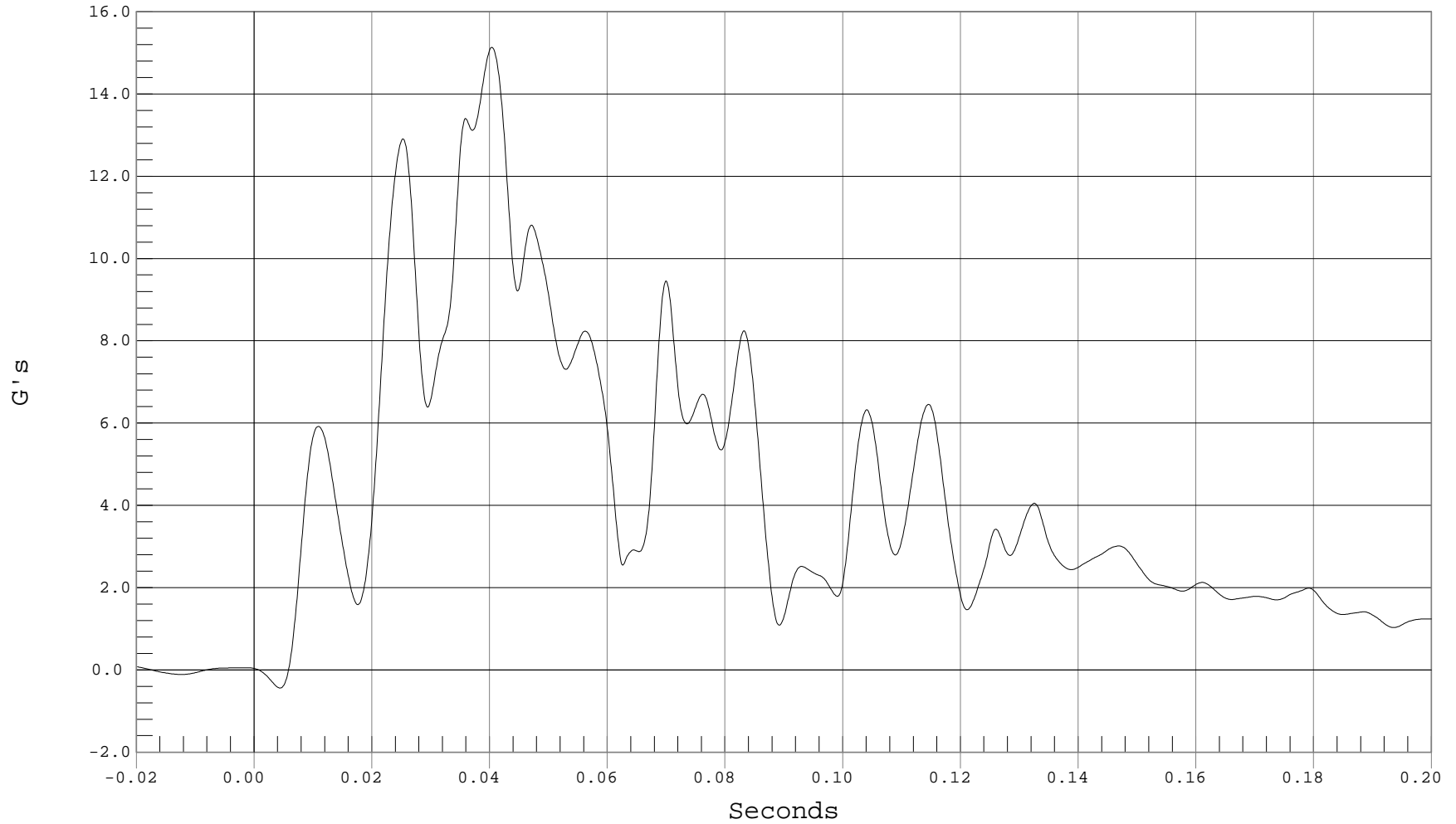
VEHICLE CG Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 VEHICLE CG Y, B02036AF.A34

Ymin = -.44 G's @ 0.0043 Seconds, Ymax = 15.14 G's @ 0.0403 Seconds





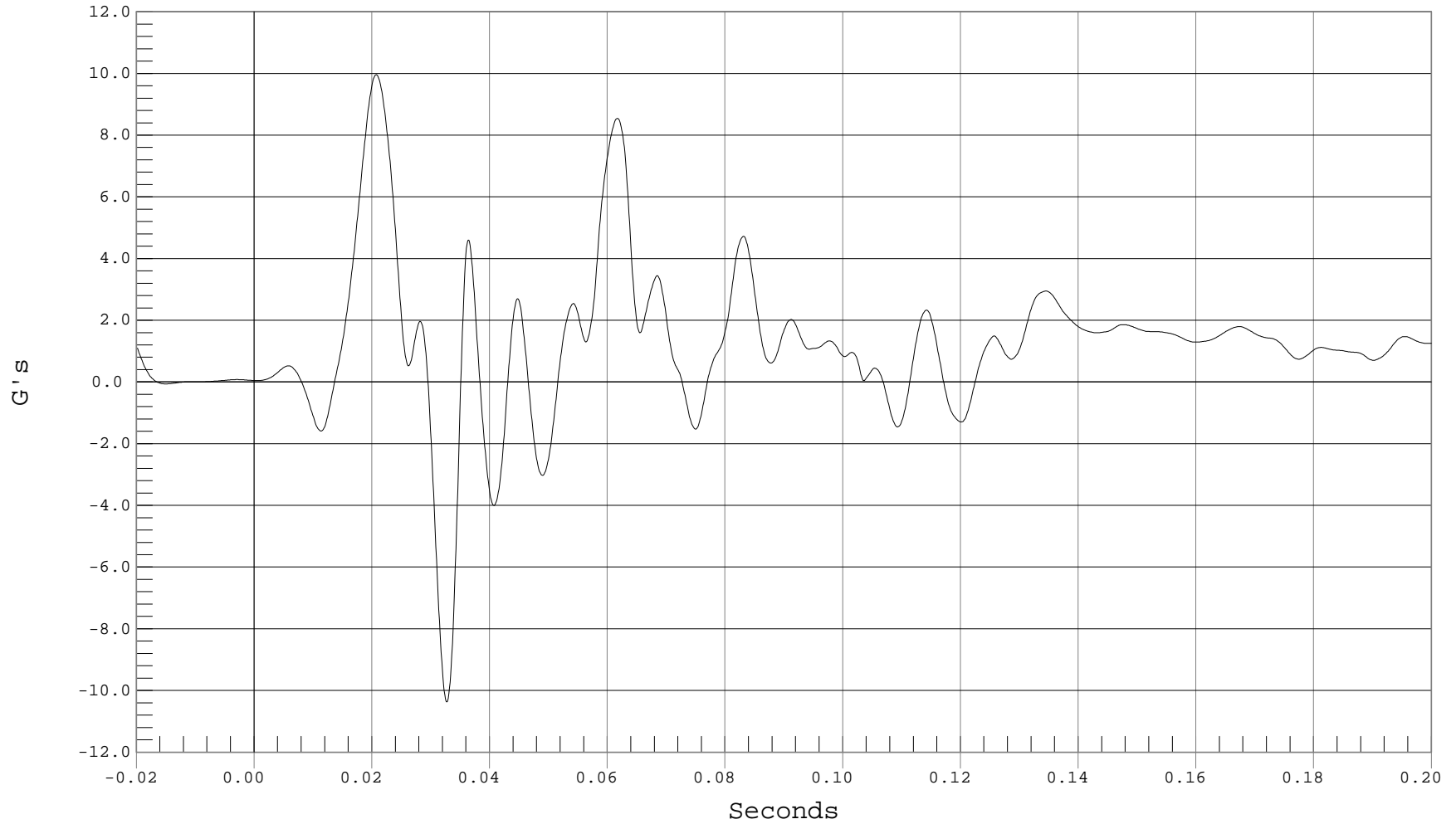
VEHICLE CG Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 VEHICLE CG Z, B02036AF.A35

Ymin = -10.37 G's @ 0.0326 Seconds, Ymax = 9.96 G's @ 0.0207 Seconds



B-53



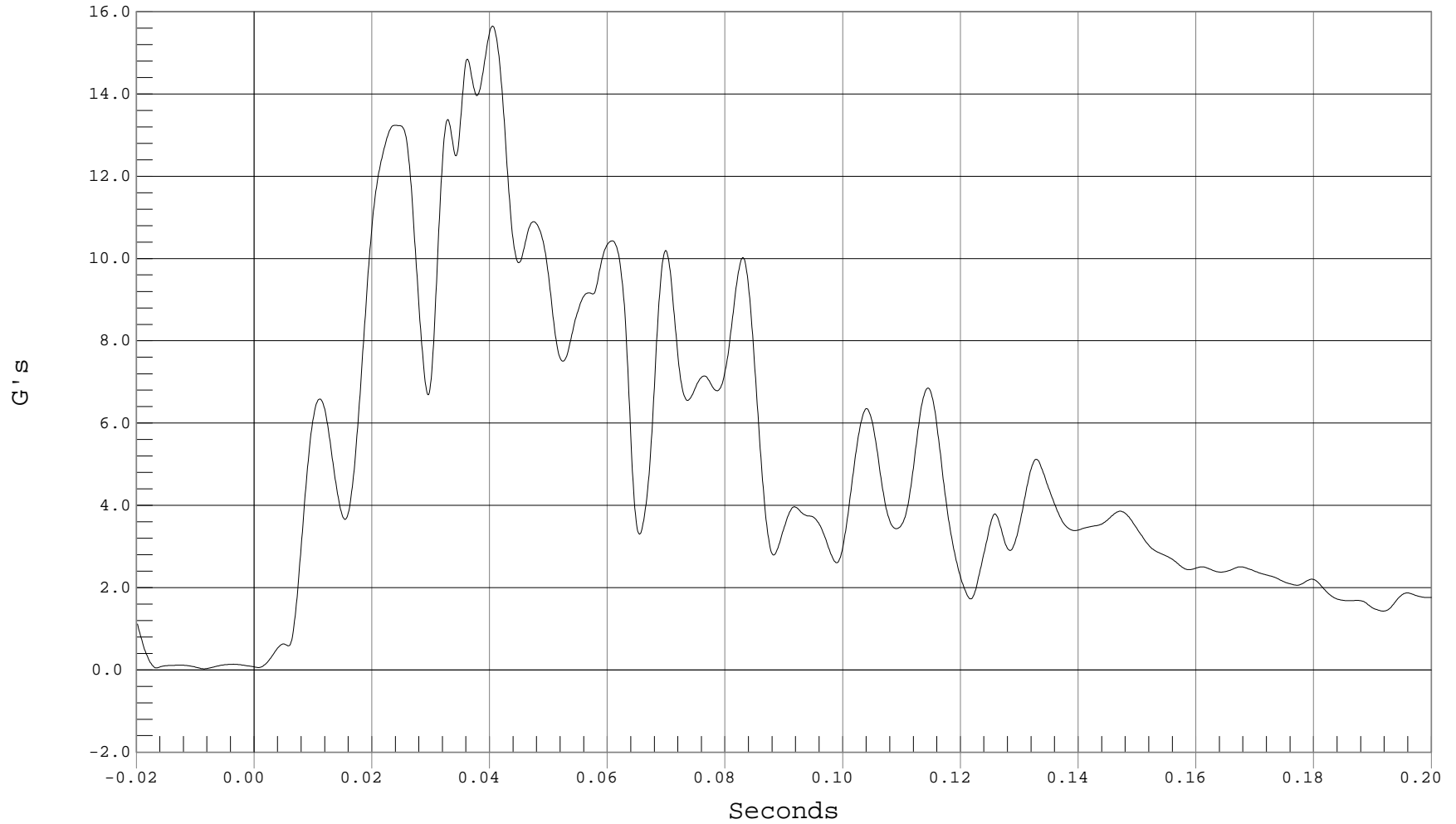
VEHICLE CG RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 VEHICLE CG RESULTANT ACCELERATION, B02036AV.A33

Ymin = .03 G's @ -0.0086 Seconds, Ymax = 15.65 G's @ 0.0404 Seconds



B-54



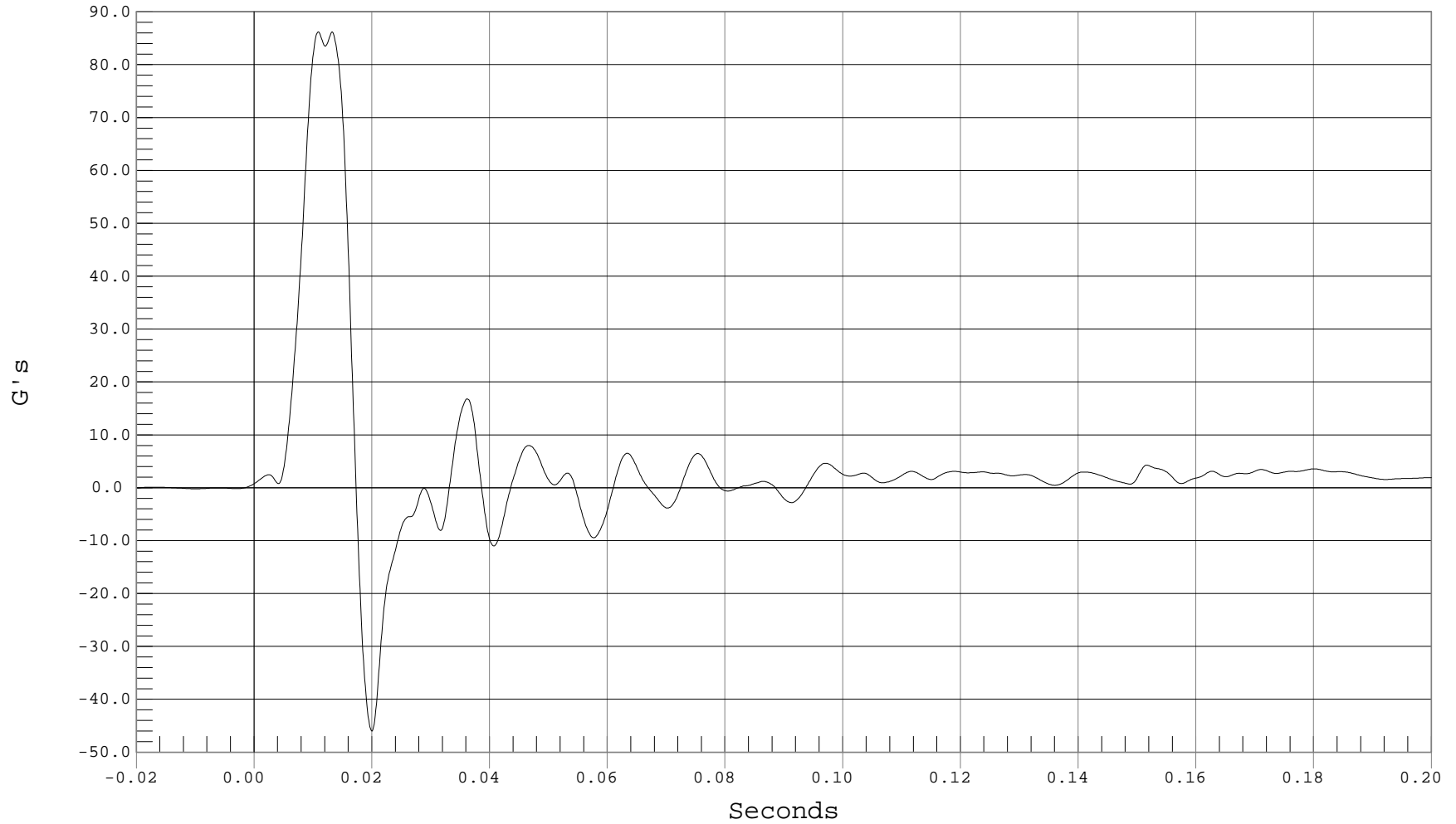
LEFT FRONT DOOR @ ARM Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT FRONT DOOR @ ARM Y, B02036AF.A26

Ymin = -46.03 G's @ 0.0199 Seconds, Ymax = 86.18 G's @ 0.0108 Seconds



B-55



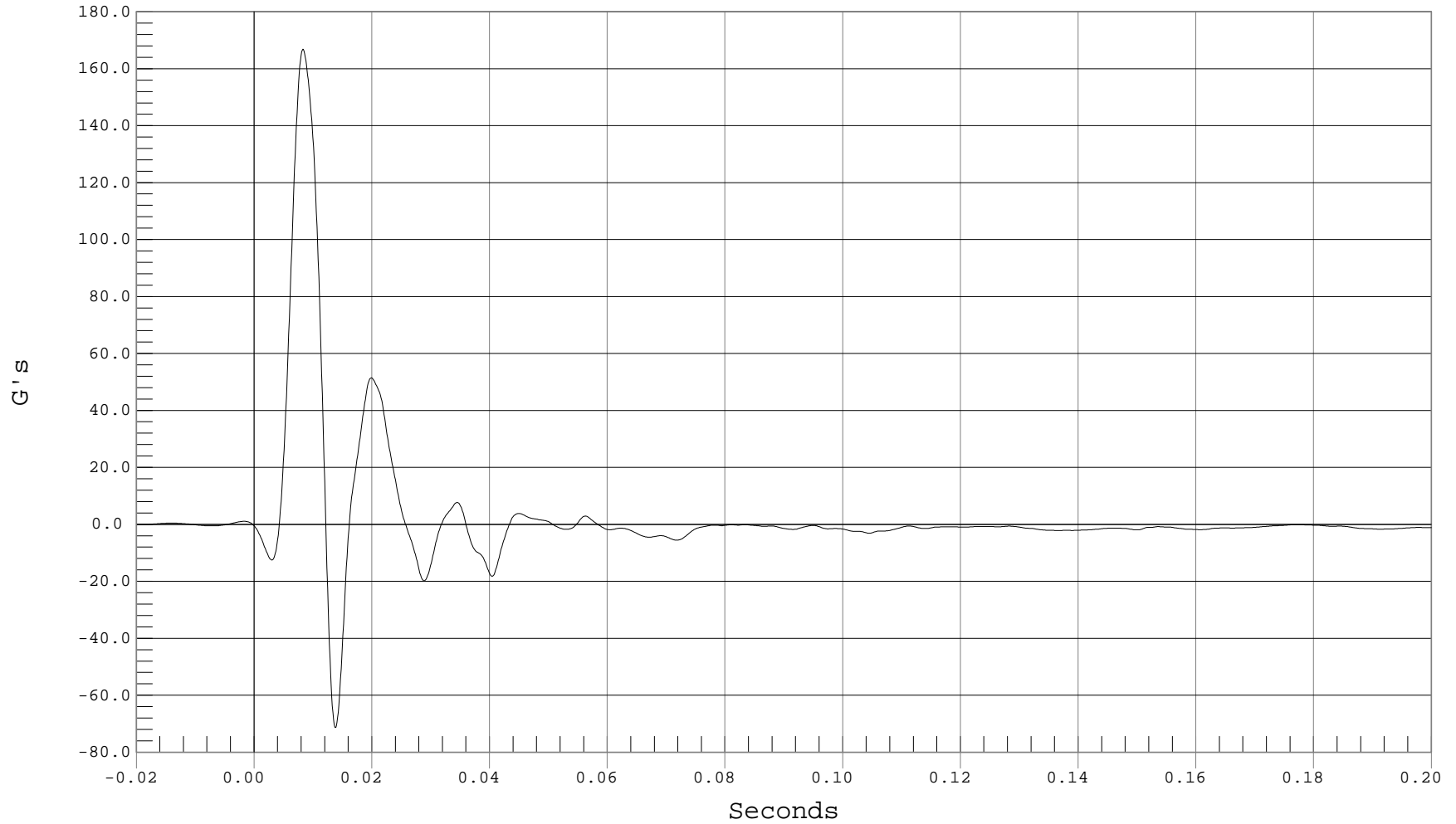
LEFT FRONT DOOR @ PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT FRONT DOOR @ PELVIS Y, B02036AF.A25

Ymin = -71.36 G's @ 0.0137 Seconds, Ymax = 166.82 G's @ 0.0082 Seconds



B-56



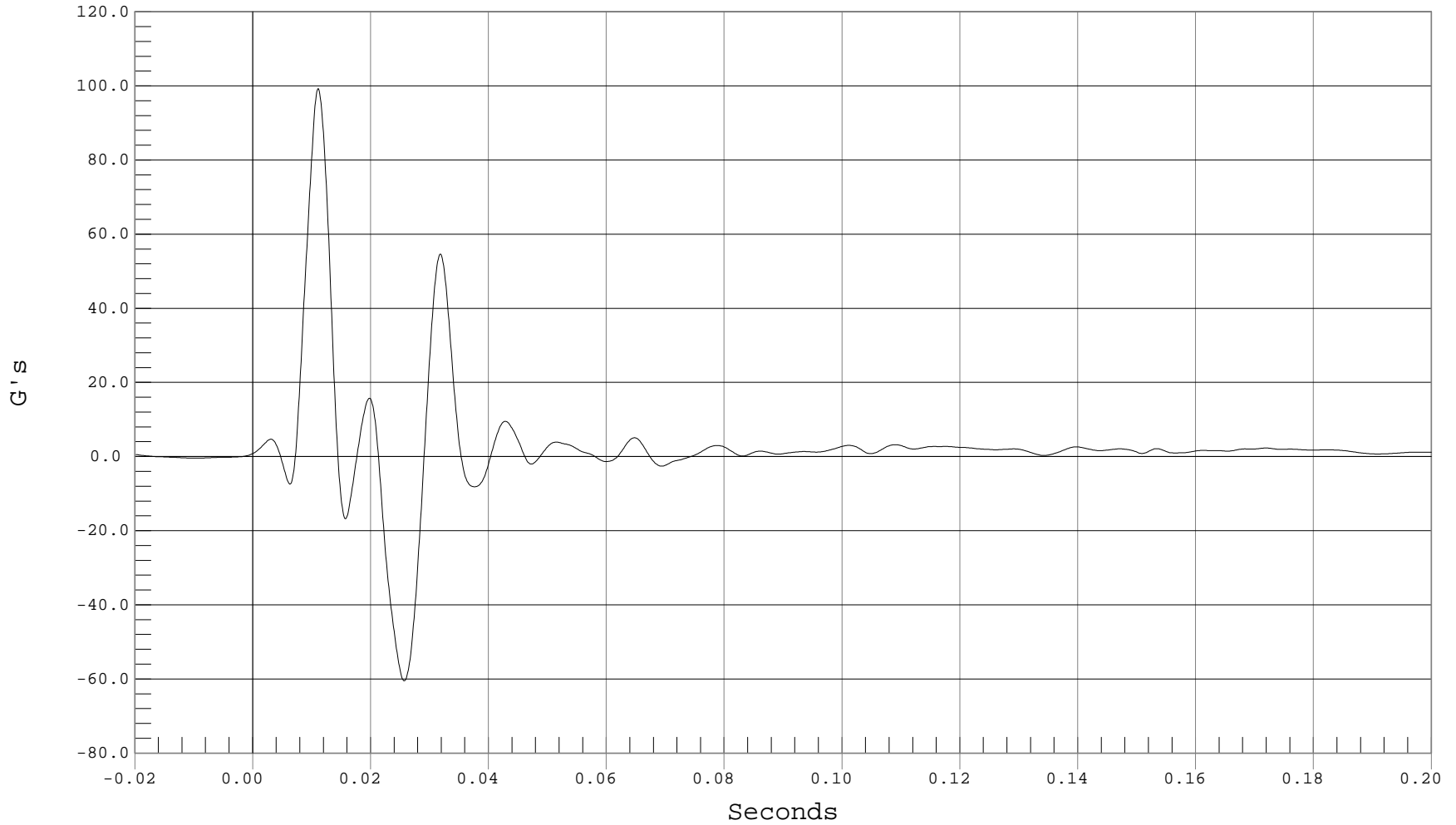
LEFT FRONT DOOR @ KNEE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT FRONT DOOR @ KNEE Y, B02036AF.A27

Ymin = -60.52 G's @ 0.0256 Seconds, Ymax = 99.3 G's @ 0.0110 Seconds



B-57



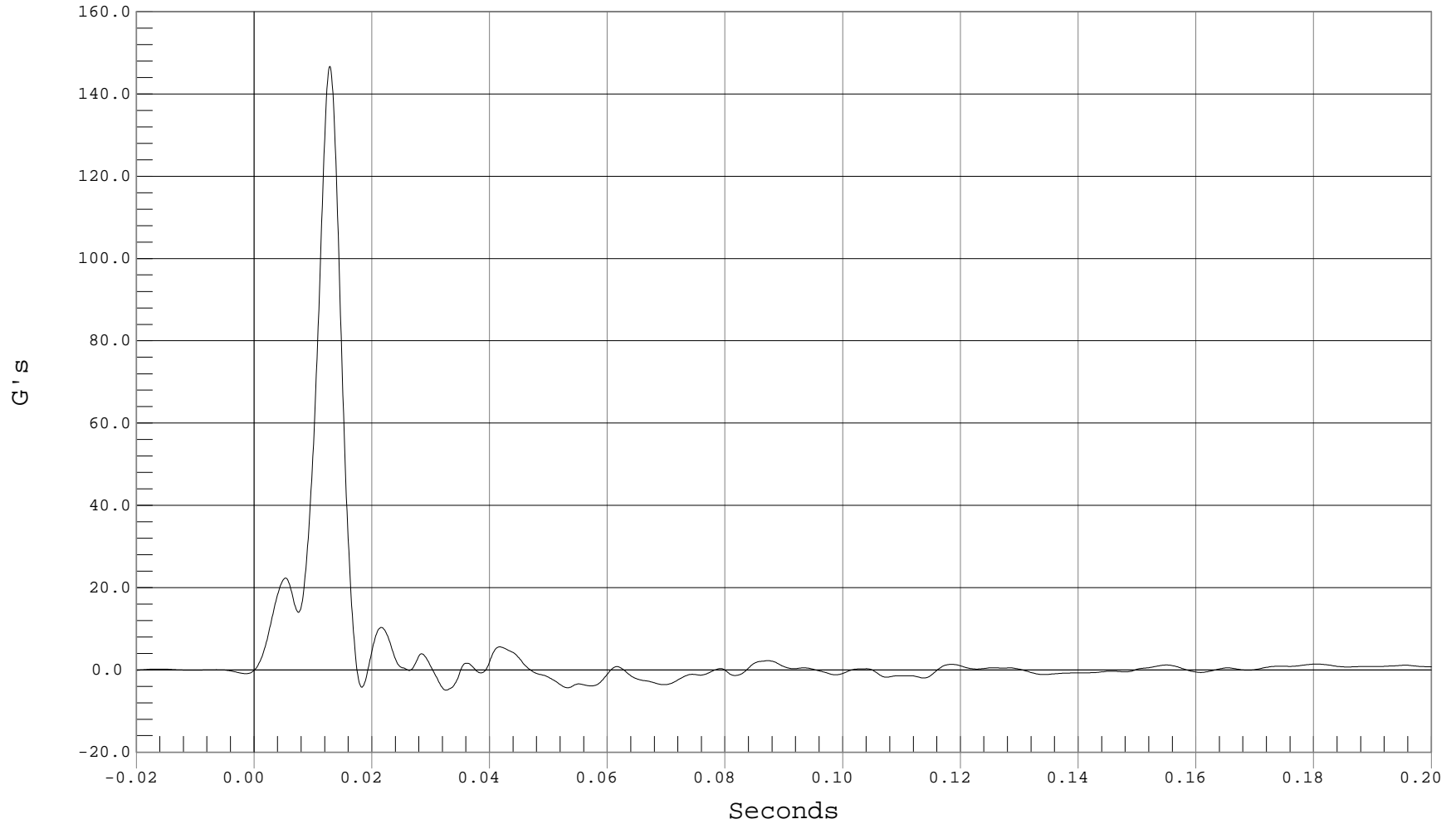
LEFT FRONT DOOR @ RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LEFT FRONT DOOR @ RIB Y, B02036AF.A28

Ymin = -4.93 G's @ 0.0325 Seconds, Ymax = 146.69 G's @ 0.0128 Seconds



B-58



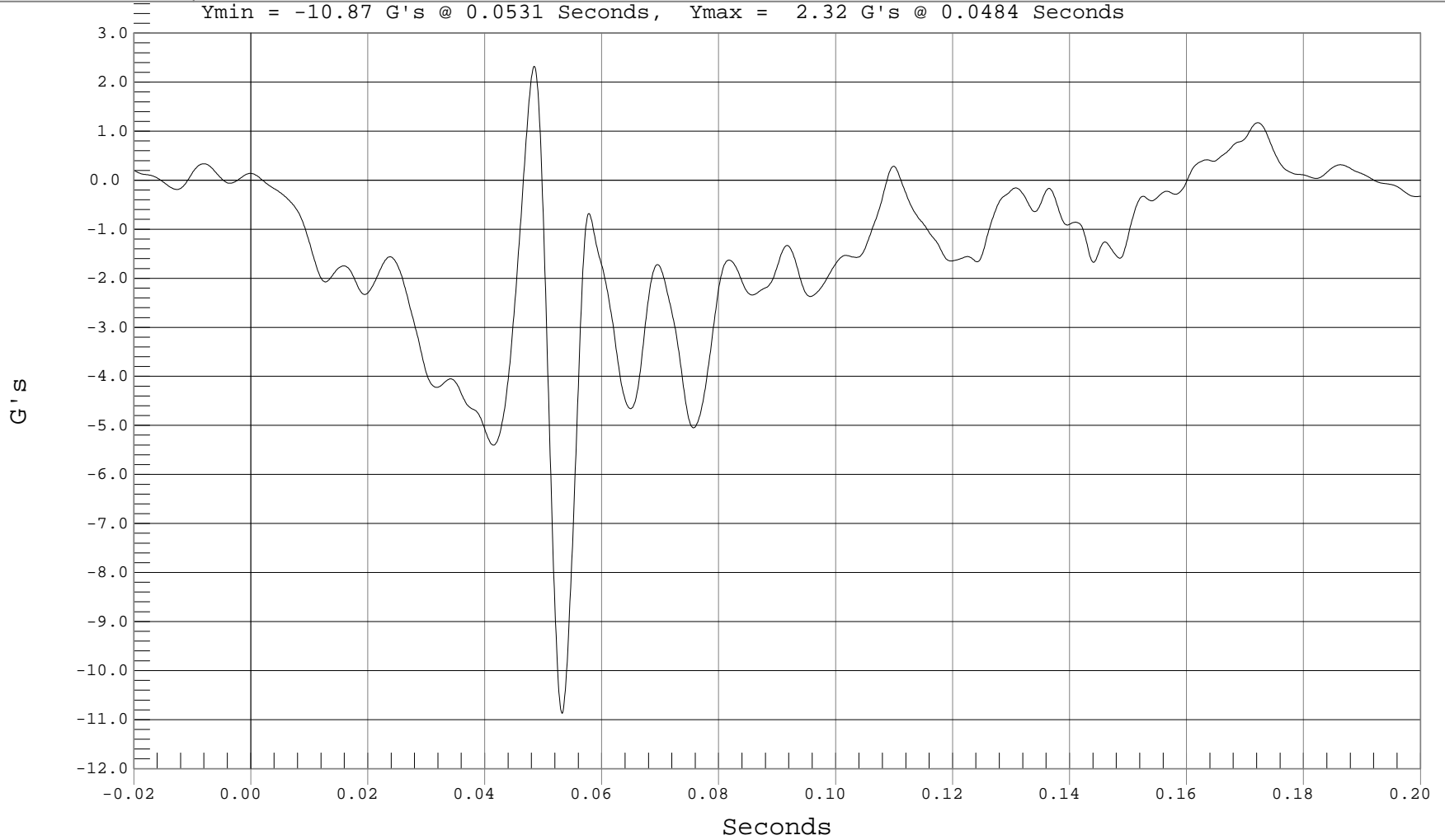
LOWER CENTER RADIATOR SUPPORT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LOWER CENTER RADIATOR SUPPORT X, B02036AF.A22

Ymin = -10.87 G's @ 0.0531 Seconds, Ymax = 2.32 G's @ 0.0484 Seconds



B-59



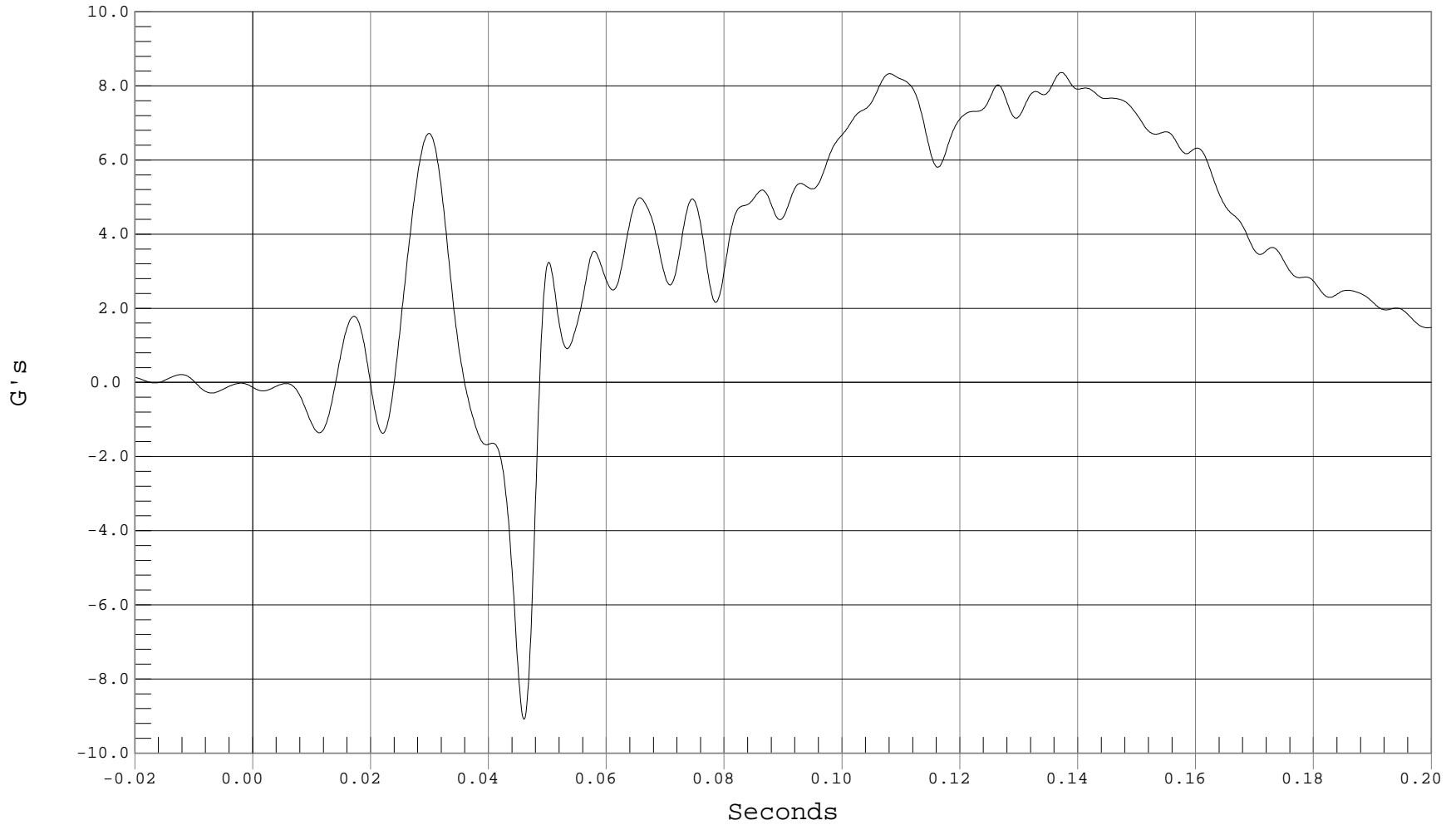
LOWER CENTER RADIATOR SUPPORT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LOWER CENTER RADIATOR SUPPORT Y, B02036AF.A23

Ymin = -9.09 G's @ 0.0459 Seconds, Ymax = 8.36 G's @ 0.1371 Seconds



B-60



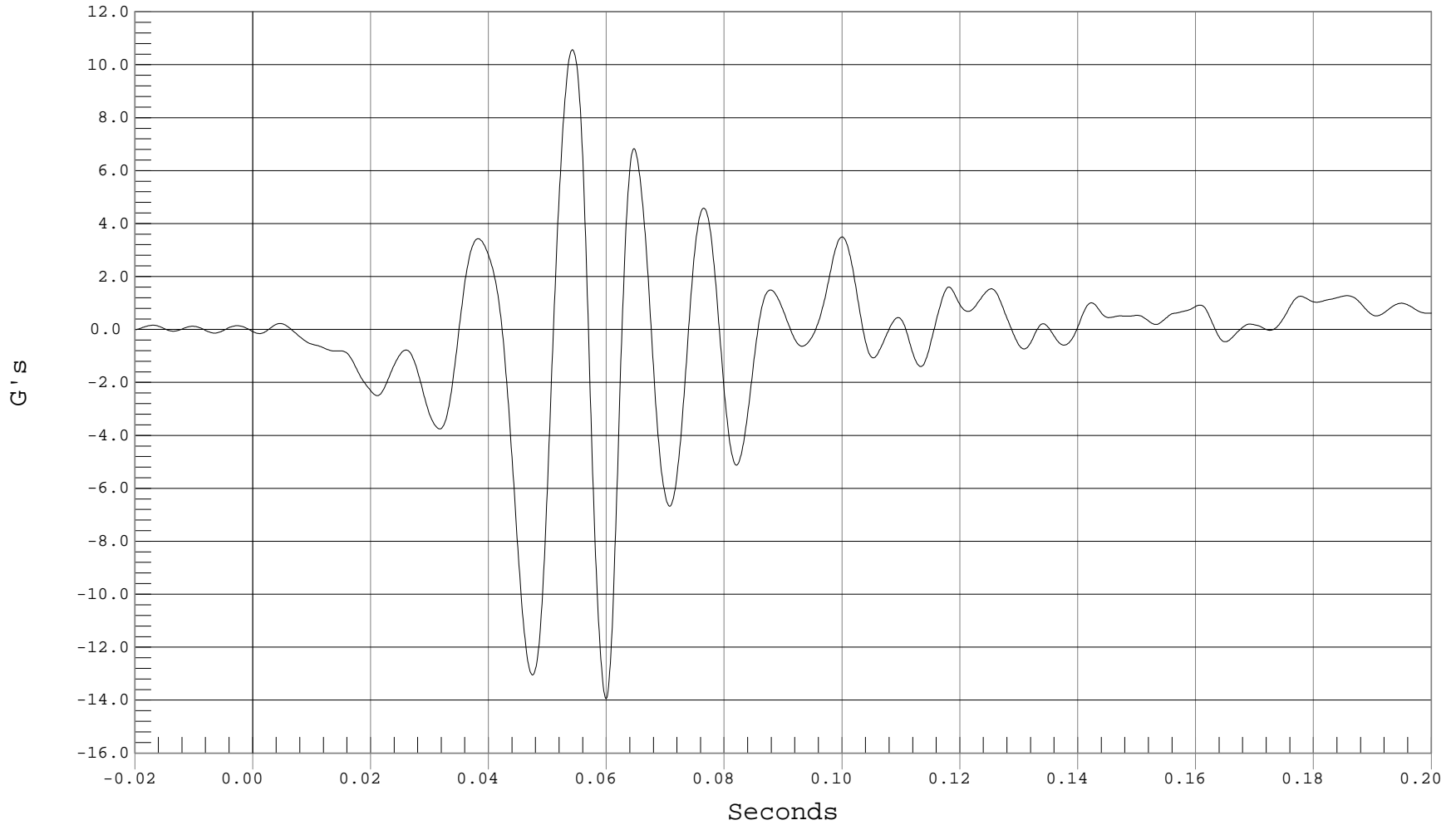
LOWER CENTER RADIATOR SUPPORT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LOWER CENTER RADIATOR SUPPORT Z, B02036AF.A24

Ymin = -13.94 G's @ 0.0599 Seconds, Ymax = 10.57 G's @ 0.0542 Seconds



B-61



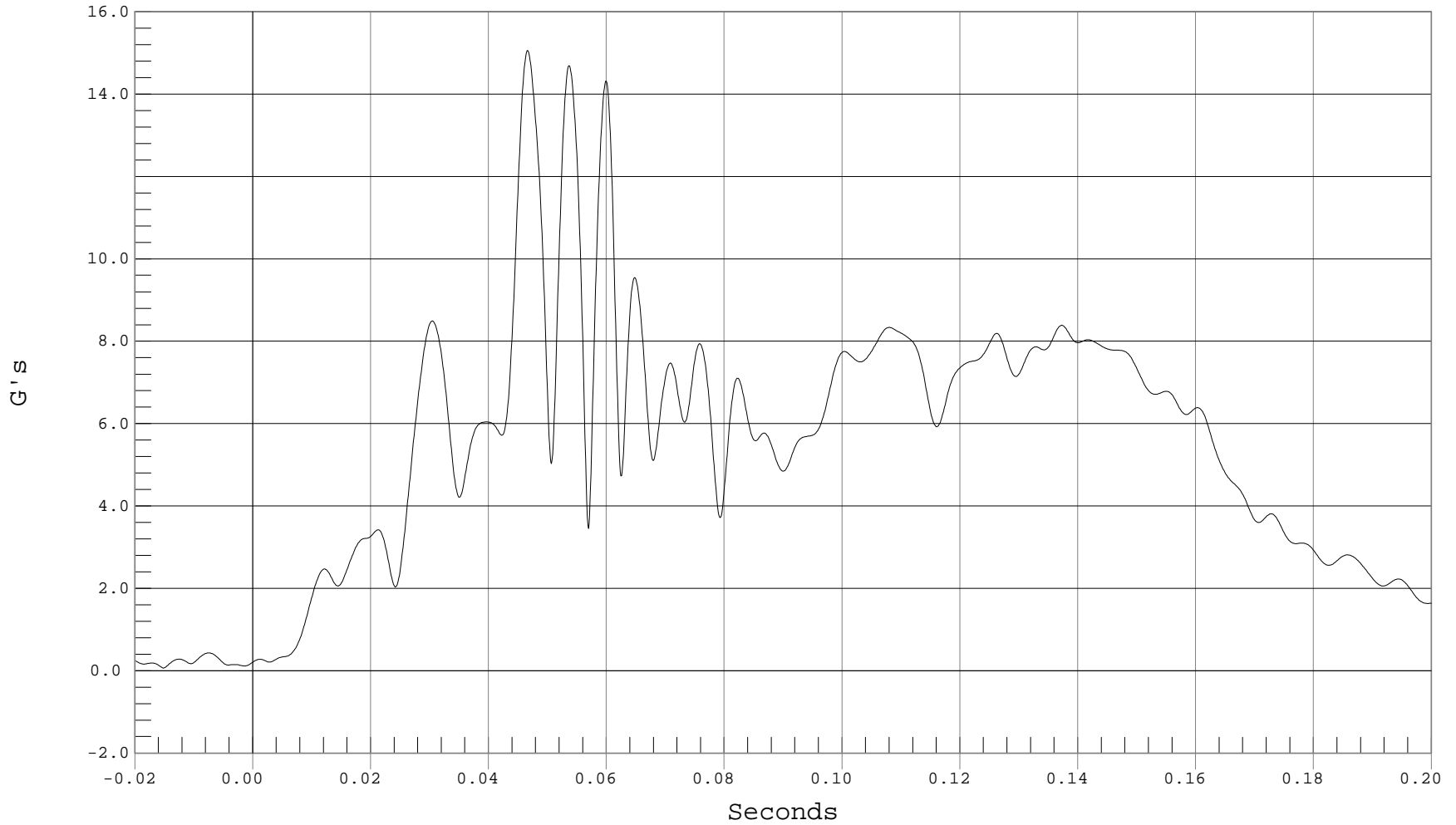
LOWER CENTER RADIATOR SUPPORT RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Filter Class: 60

— 1 LOWER RADIATOR SUPPORT RESULTANT ACCELERATION, B02036AV.A22

Ymin = .07 G's @ -0.0152 Seconds, Ymax = 15.06 G's @ 0.0465 Seconds



B-62



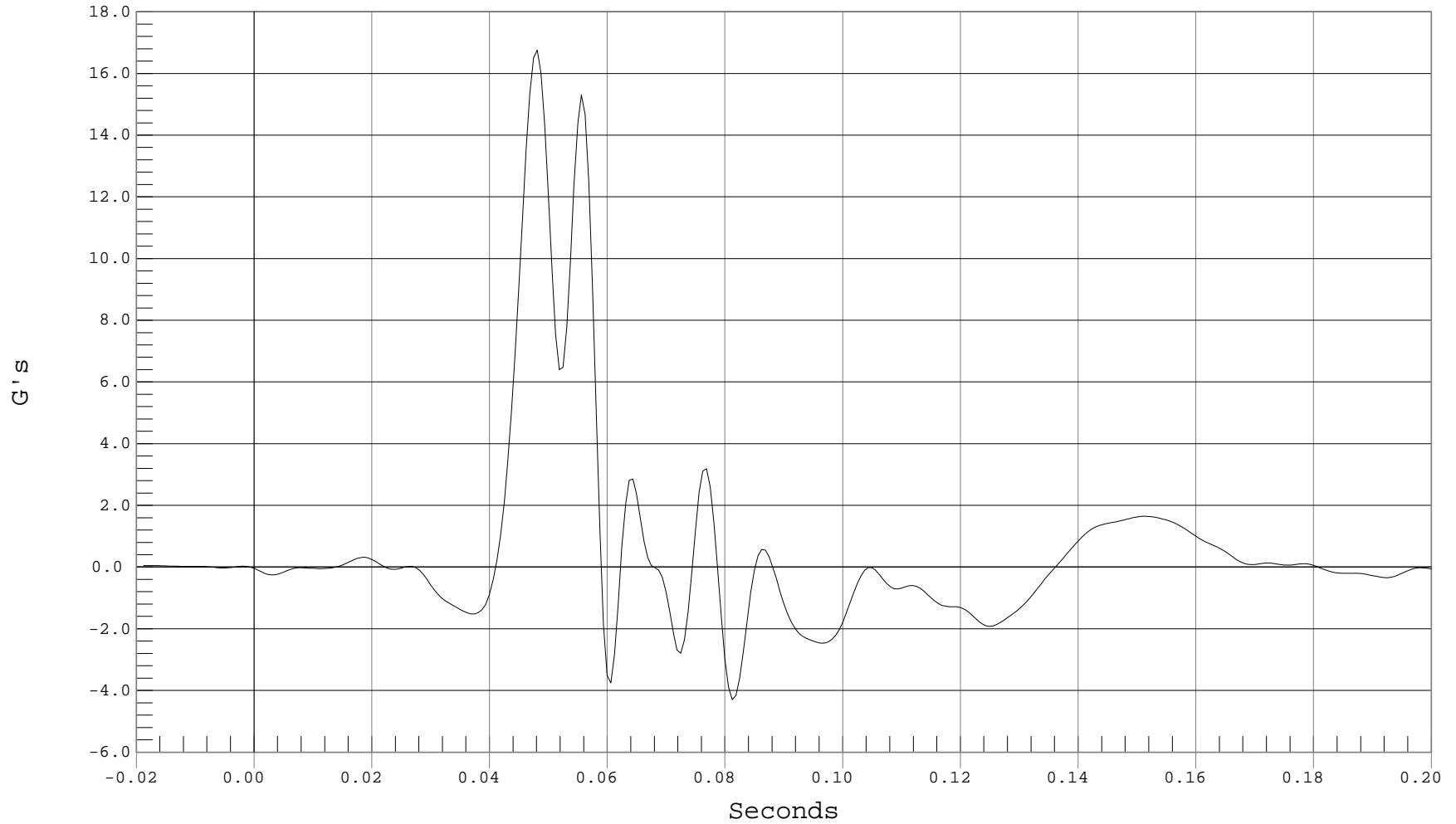
DRIVER UPPER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER UPPER SPINE X, B02036FI.R06

Ymin = -4.3 G's @ 0.0812 Seconds, Ymax = 16.76 G's @ 0.0480 Seconds



B-63



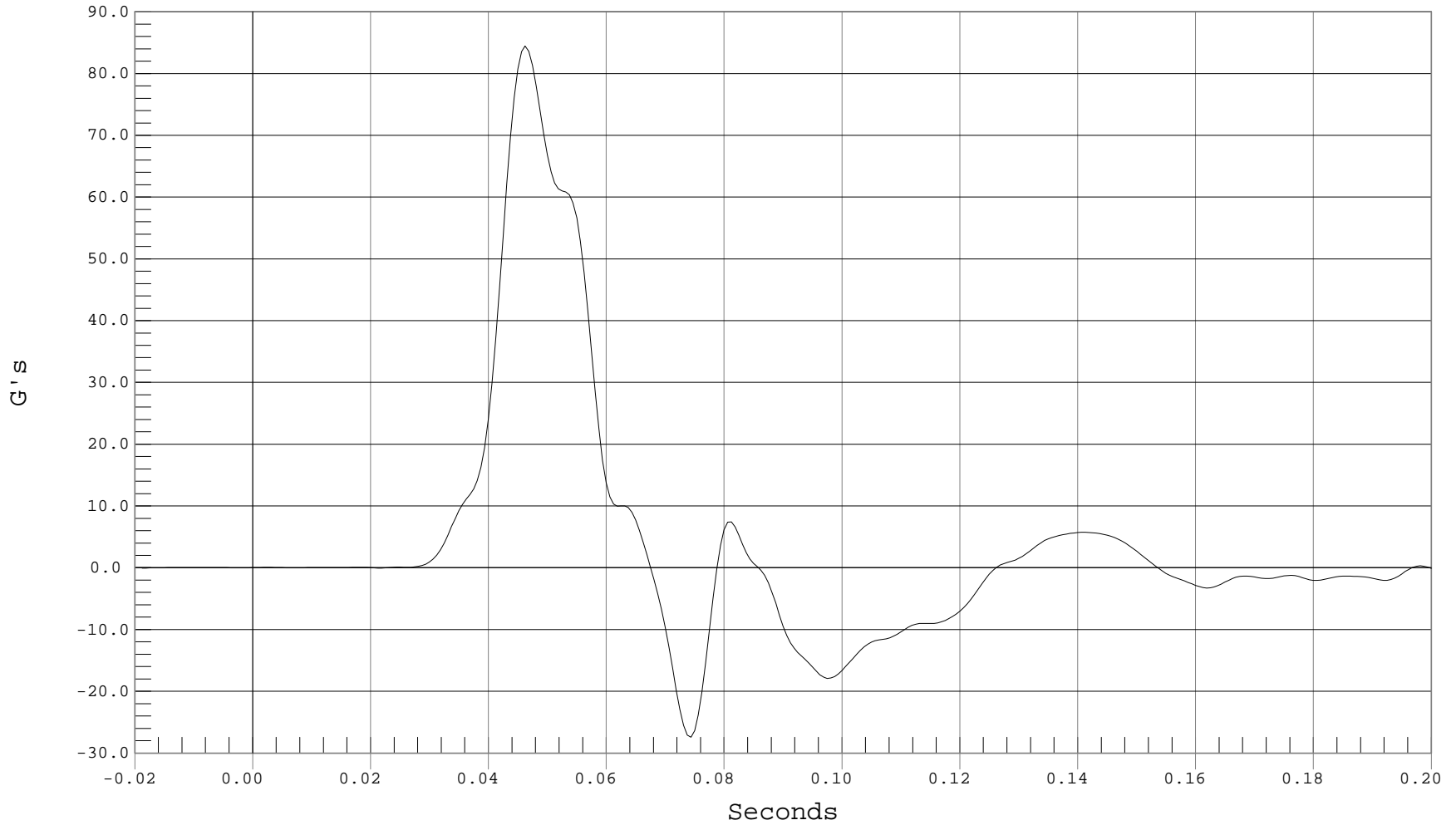
DRIVER UPPER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER UPPER SPINE Y, B02036FI.R07

Ymin = -27.44 G's @ 0.0743 Seconds, Ymax = 84.47 G's @ 0.0462 Seconds



B-64



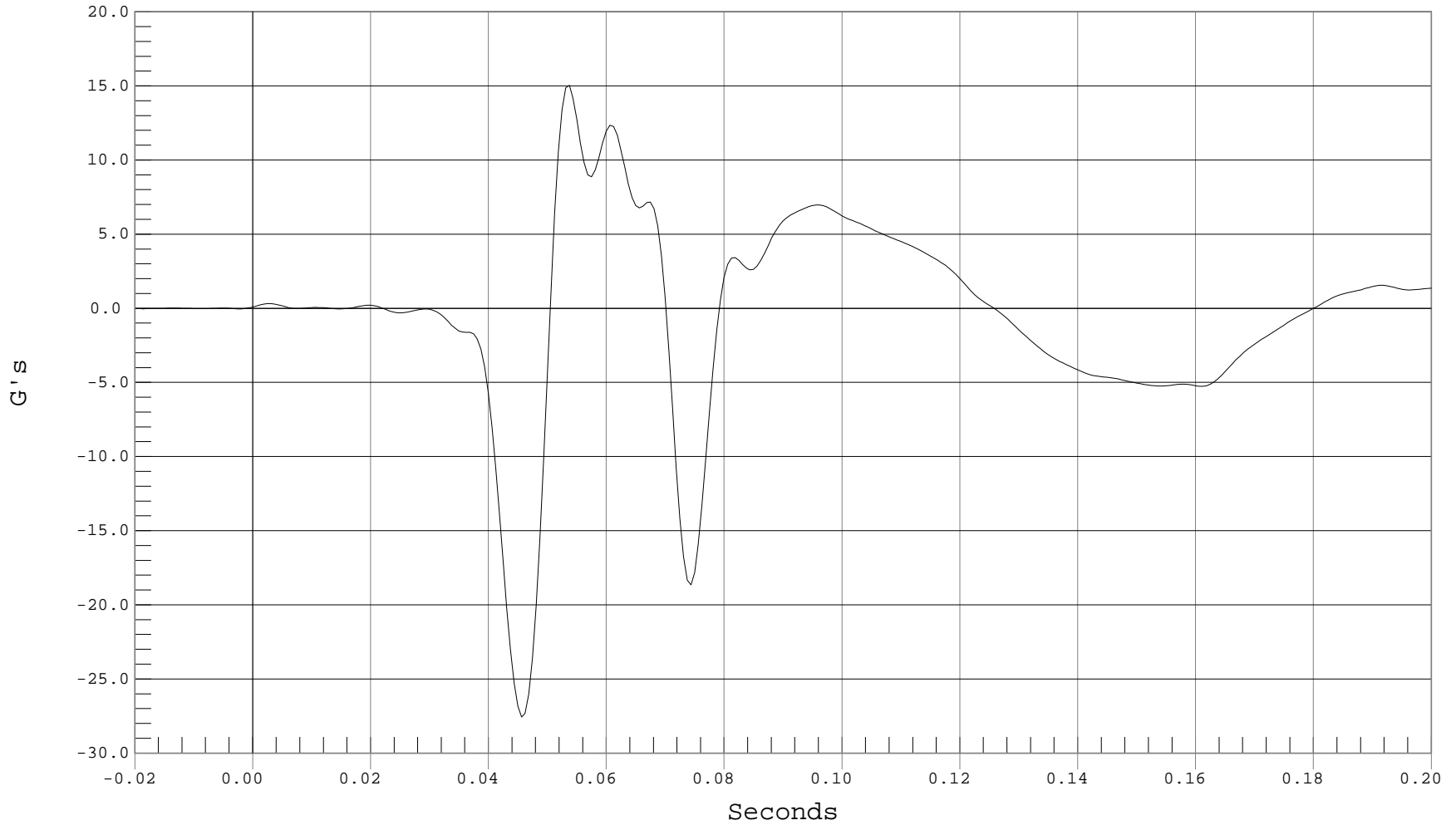
DRIVER UPPER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

1 DRIVER UPPER SPINE Z, B02036FI.R08

Ymin = -27.56 G's @ 0.0455 Seconds, Ymax = 15.03 G's @ 0.0537 Seconds



B-65



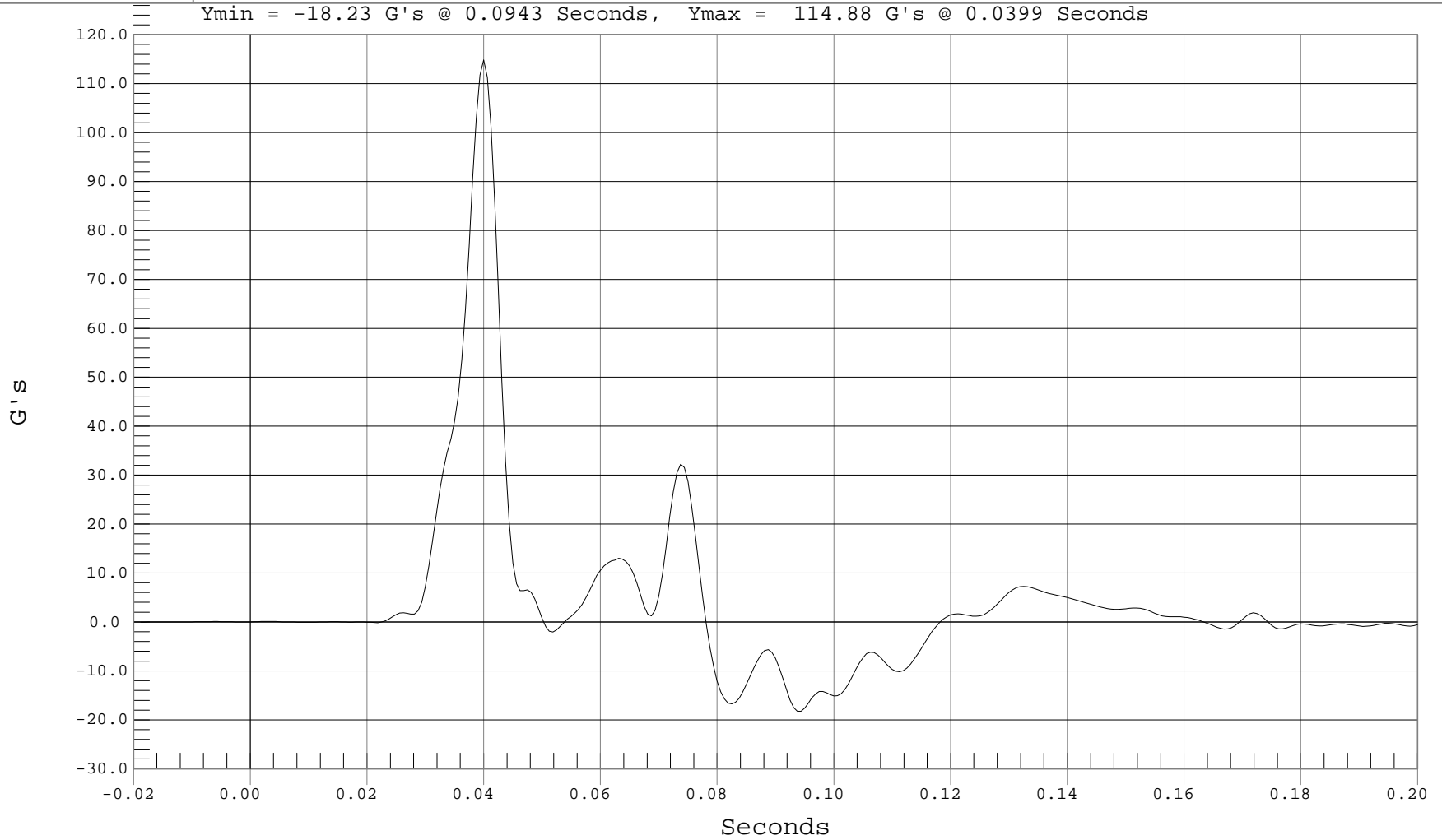
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER UPPER RIB Y, B02036FI.R04

Ymin = -18.23 G's @ 0.0943 Seconds, Ymax = 114.88 G's @ 0.0399 Seconds



B-66



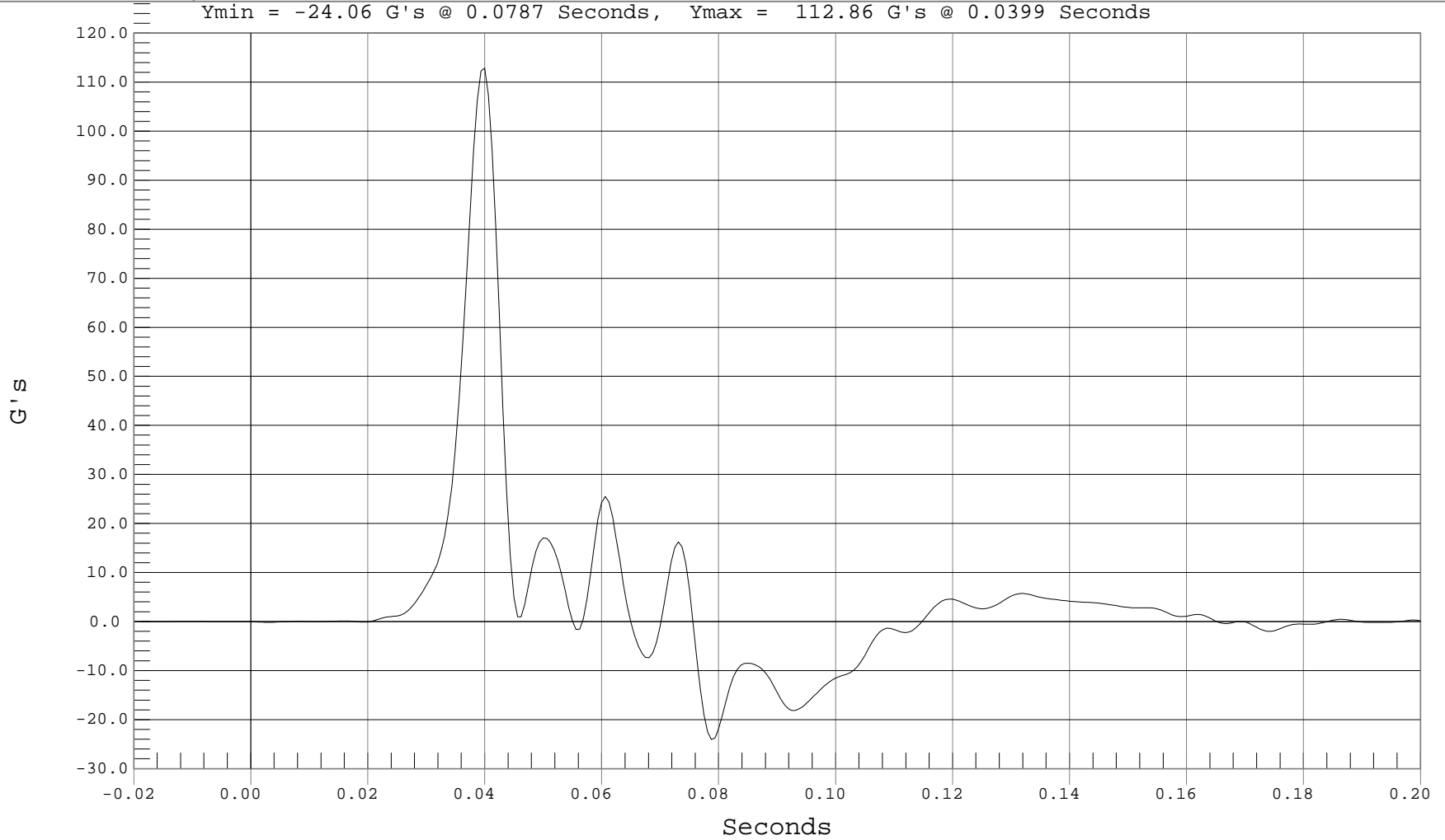
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER LOWER RIB Y, B02036FI.R05

Ymin = -24.06 G's @ 0.0787 Seconds, Ymax = 112.86 G's @ 0.0399 Seconds



B-67



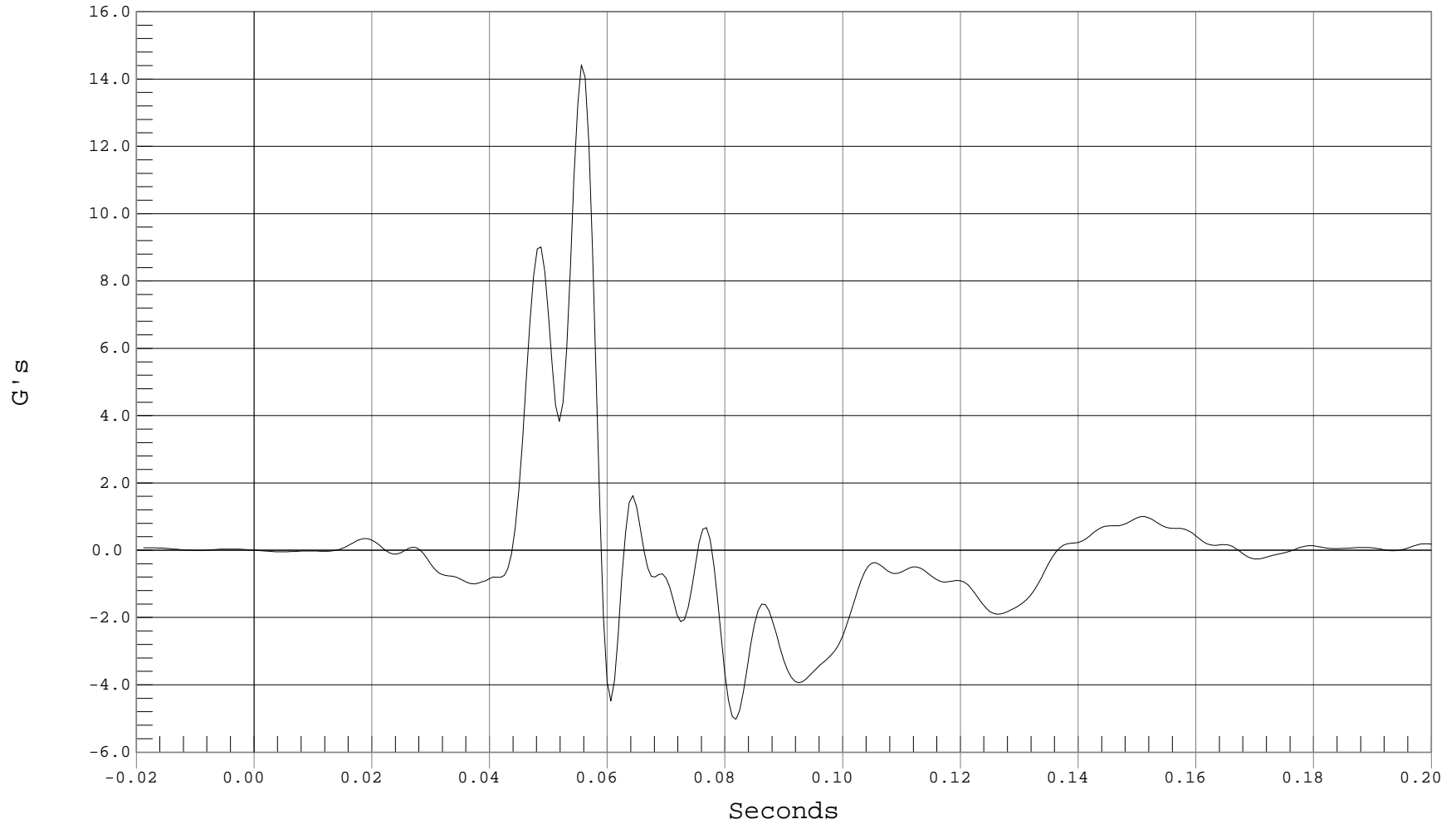
DRIVER LOWER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE X, B02036FI.R11

Ymin = -5.03 G's @ 0.0818 Seconds, Ymax = 14.42 G's @ 0.0555 Seconds



B-68



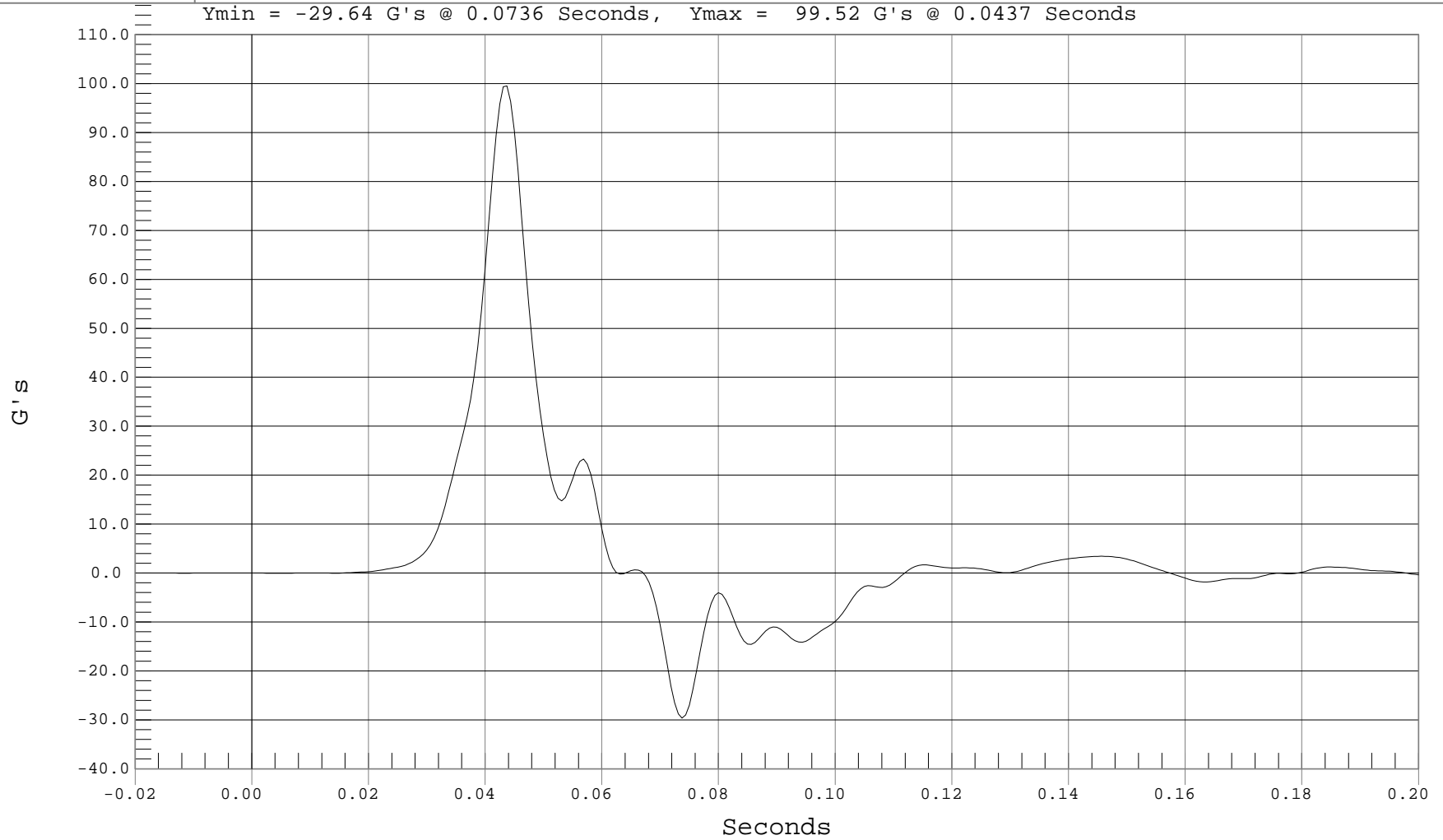
DRIVER LOWER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE Y, B02036FI.R10

Ymin = -29.64 G's @ 0.0736 Seconds, Ymax = 99.52 G's @ 0.0437 Seconds



B-69



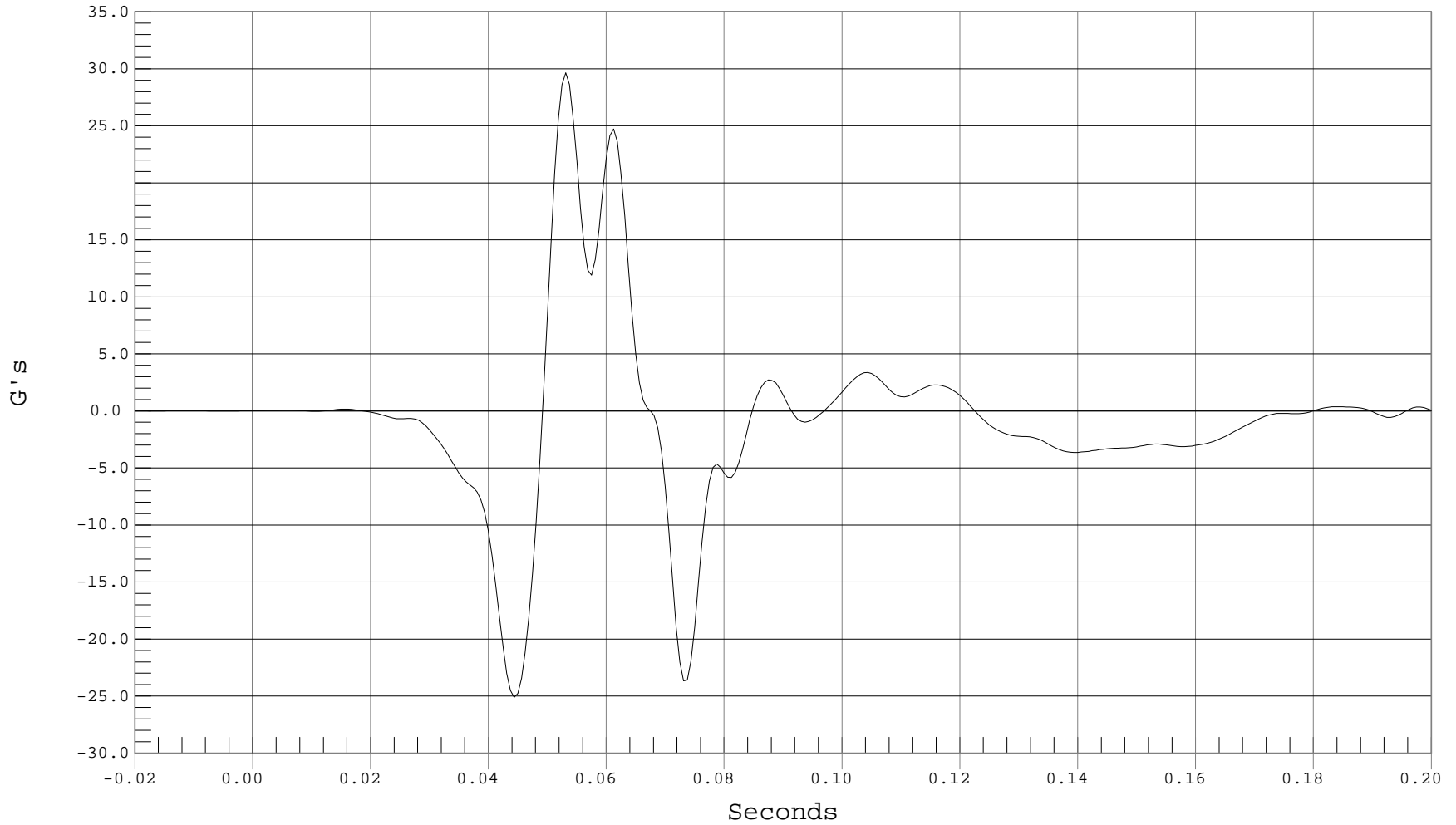
DRIVER LOWER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE Z, B02036FI.R09

Ymin = -25.12 G's @ 0.0443 Seconds, Ymax = 29.65 G's @ 0.0530 Seconds



B-70



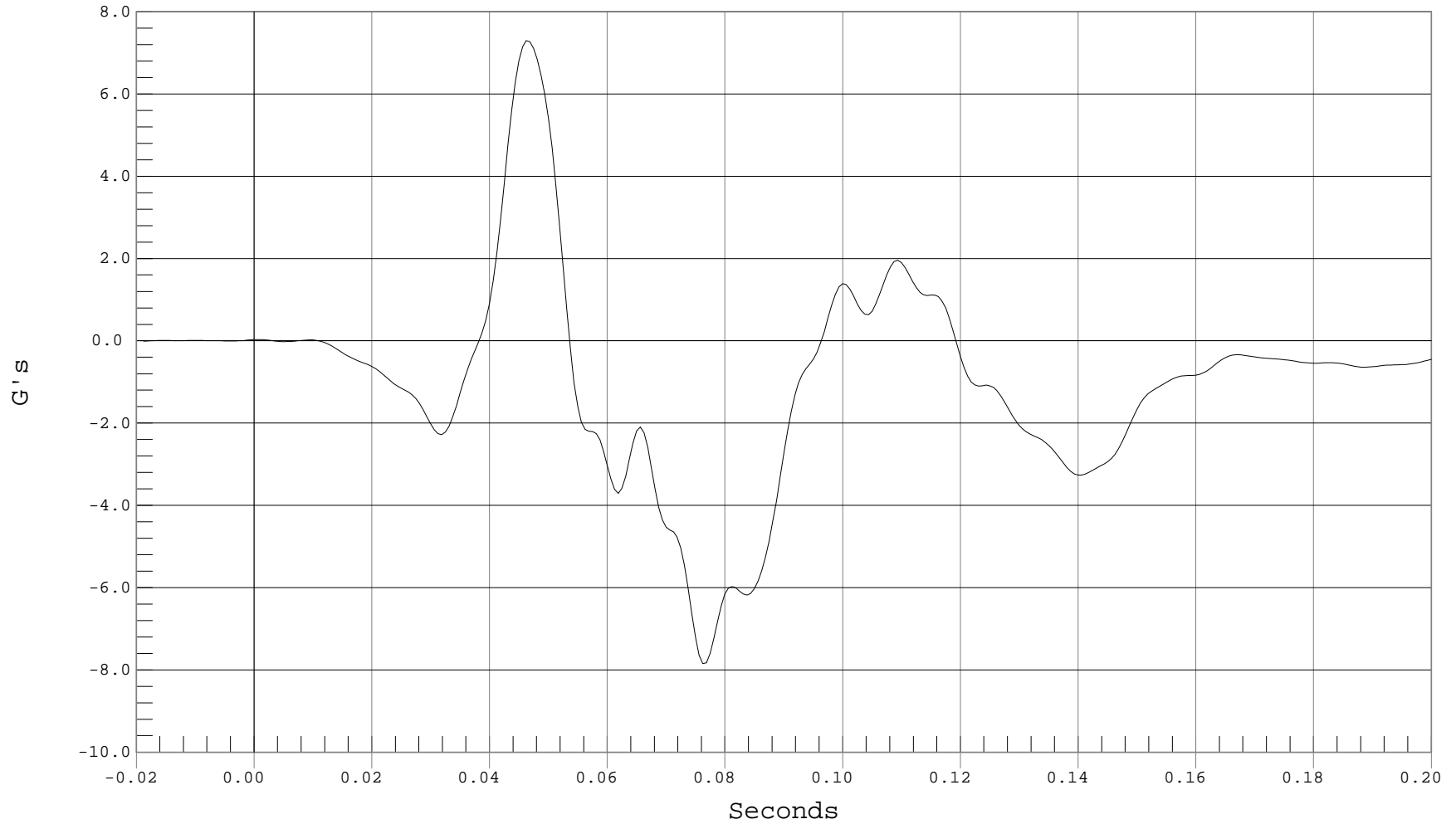
DRIVER PELVIS X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER PELVIS X, B02036FI.R12

Ymin = -7.85 G's @ 0.0762 Seconds, Ymax = 7.29 G's @ 0.0462 Seconds



B-71



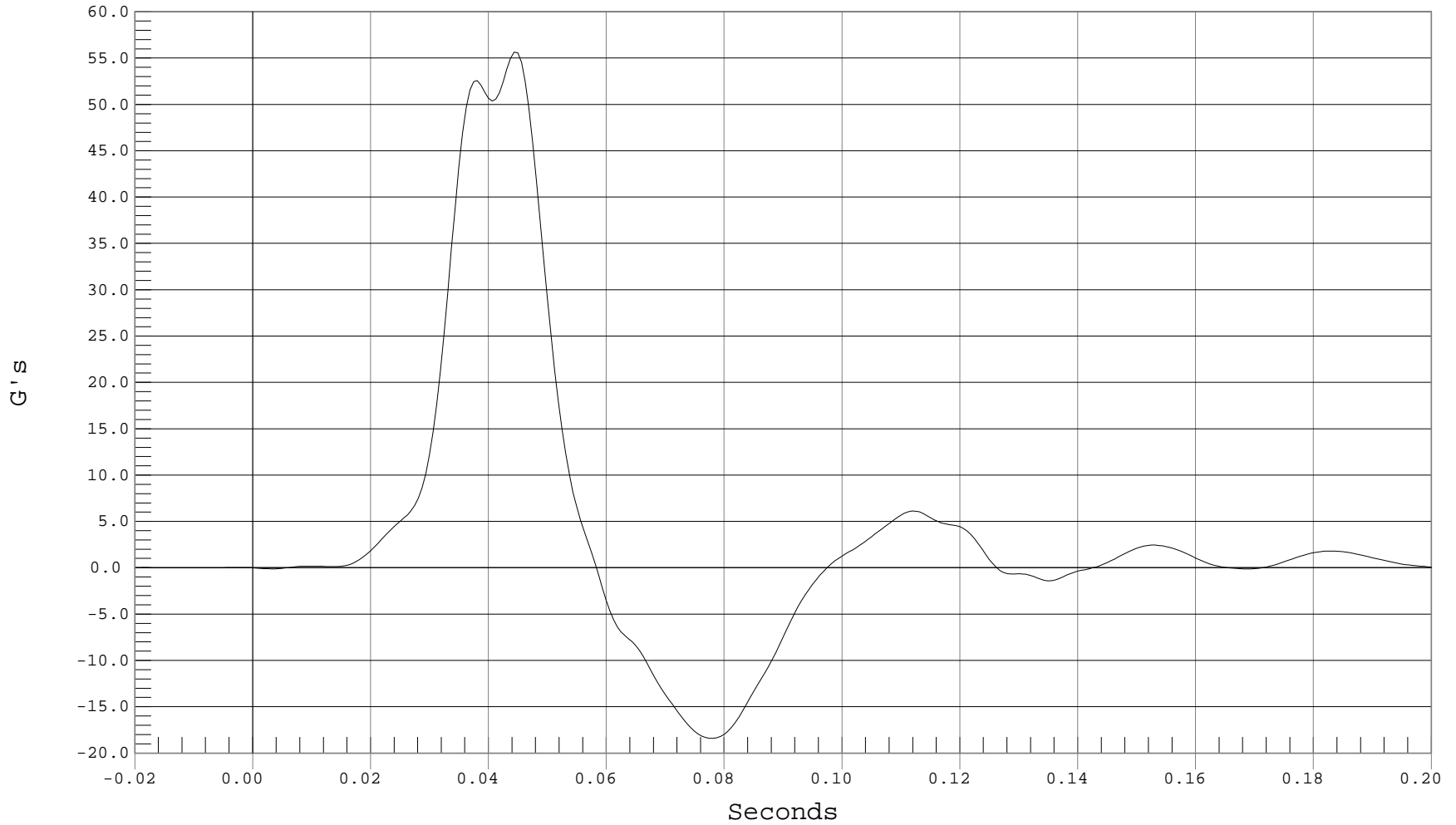
DRIVER PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER PELVIS Y, B02036FI.R13

Ymin = -18.41 G's @ 0.0780 Seconds, Ymax = 55.63 G's @ 0.0443 Seconds



B-72



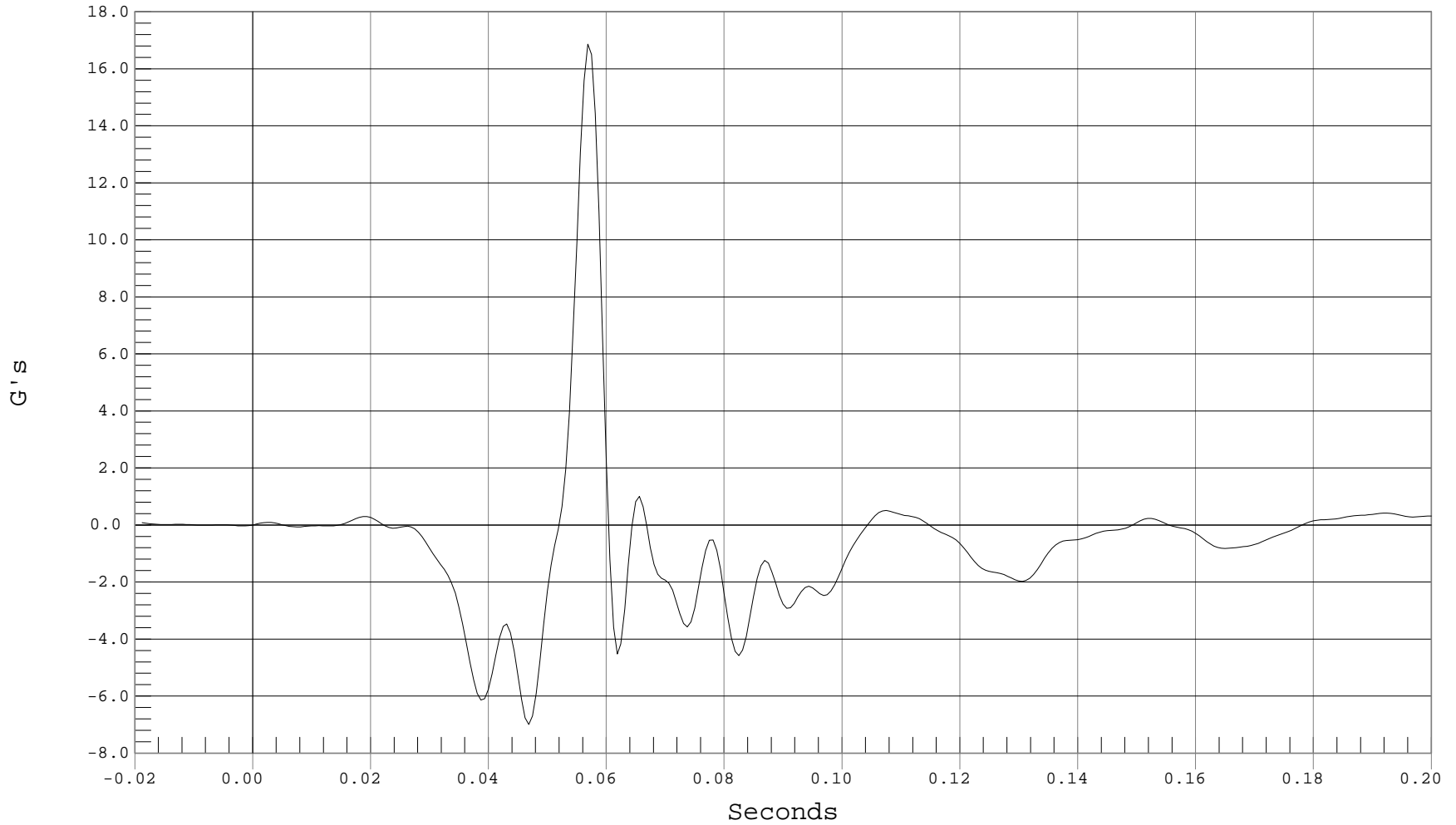
DRIVER PELVIS Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 4 DOOR

Test Date: 05-06-02
Speed: 20.0 MPH, 32.2 KPH
Fir Filtered

— 1 DRIVER PELVIS Z, B02036FI.R14

Ymin = -6.99 G's @ 0.0468 Seconds, Ymax = 16.86 G's @ 0.0568 Seconds



APPENDIX C
SID/HIII CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CERTIFICATION DATA

Dummy Serial Number: 049

Calibration Test Results Summary

Dummy Serial Number: 049

Pre-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

MGA RESEARCH CORPORATION
HEAD DROP TEST (LATERAL)
SIDE IMPACT DUMMY (SID)

Date: 4/15/02

Dummy Serial Number: 049

Test Number: D02581

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.9
Relative Humidity (%)	10 – 70	50
Peak Resultant Acceleration	120 – 150 g's	131
Is Resultant Curve Unimodal	within 15% of peak	Yes
Peak Longitudinal Acceleration	± 15 g's	-9

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

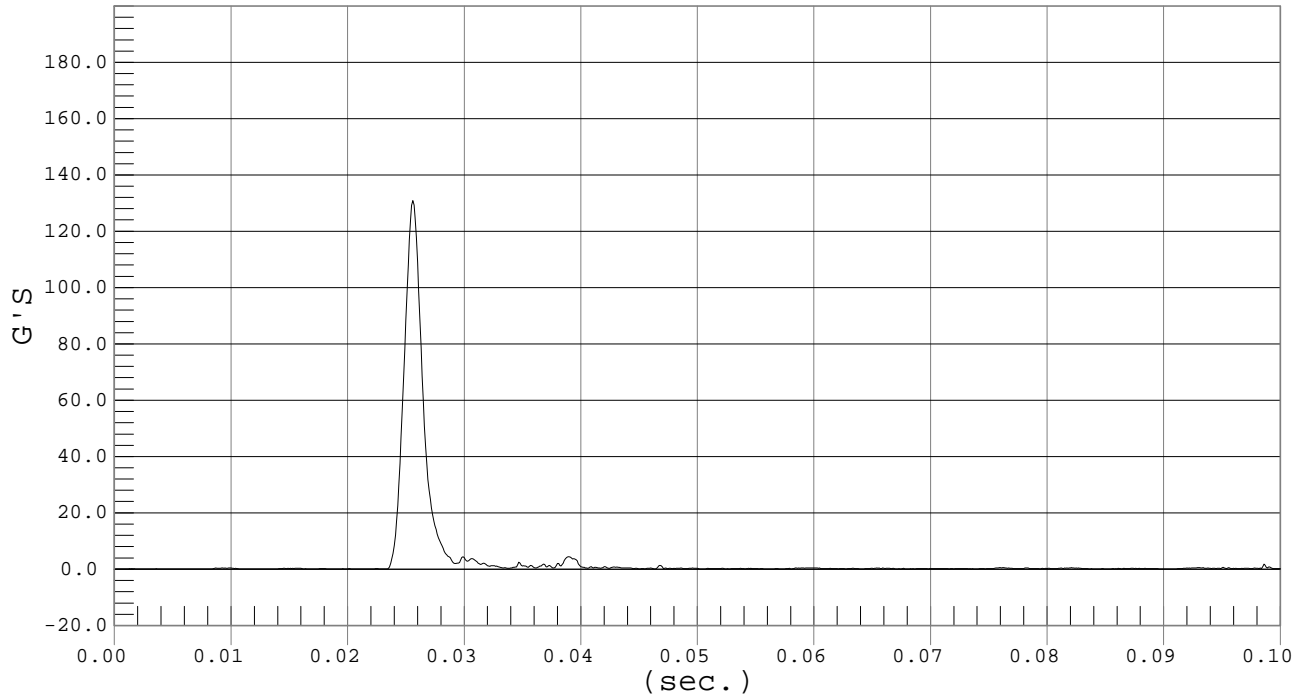


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy # 049

Test Date: 04-15-02
Speed: 0.0 fps, 0.00 M/s

Ymin = .09 G'S @ 0.0001 sec., Ymax = 130.88 G'S @ 0.0255 sec.

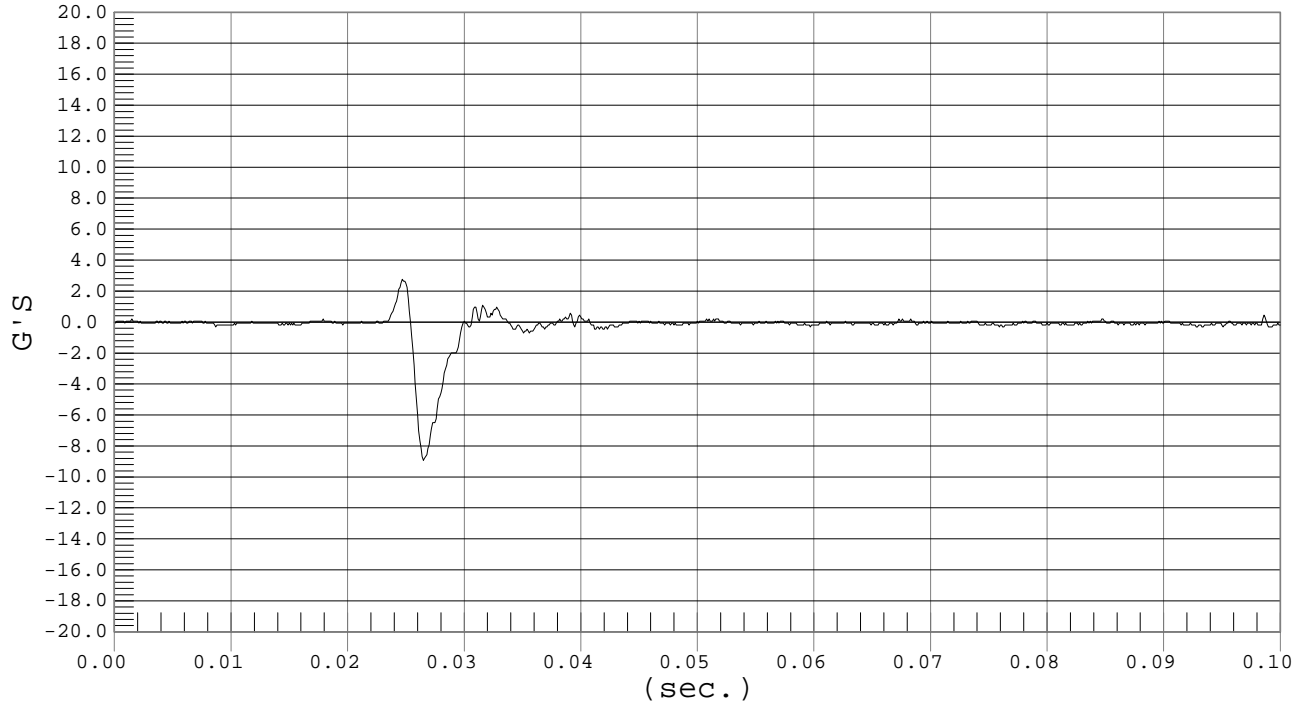


PEAK LONGITUDINAL ACCELERATION

Test Desc.: Head Drop
Component: Dummy # 049

Test Date: 04-15-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -8.94 G'S @ 0.0264 sec., Ymax = 2.76 G'S @ 0.0246 sec.



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
SIDE IMPACT DUMMY (SID)

Date: 4/16/02

Dummy Serial Number: 049

Test Number: D02589

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.9 – 25.5	21.2
Relative Humidity (%)		10 – 70	54
Impact Velocity		6.89 – 7.13 ms	7.10
Pendulum Deceleration	10 ms	1.96 – 2.55 ms	2.32
	20 ms	4.12 – 5.10 ms	4.54
	30 ms	5.73 – 7.01 ms	6.38
	40 – 70 ms	6.27 – 7.64 ms	6.95
Midsaggital Plane Max Rotation		66° - 82°	70
Head Rotation Peak to Zero – Decay Time		58 – 67 ms	60
Max. M _x at Occipital Condyles		73 – 88 Nm.	79
M _x Peak to Zero – Decay Time		49 – 64 ms	54
M _x Peak to Max. Head Rotation		2 – 16 ms	12

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

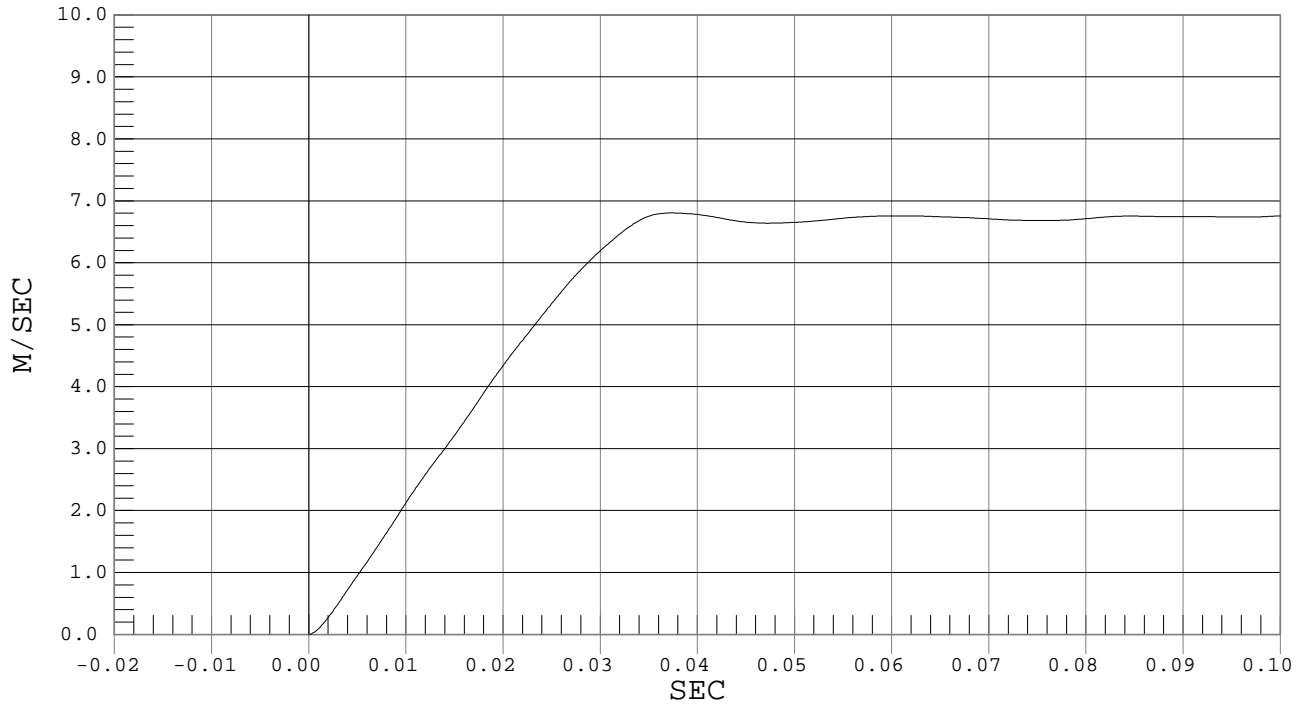


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy # 049

Test Date: 04-16-02
Speed: 23.3 fps, 7.10 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 8.39 M/SEC @ 0.1907 SEC

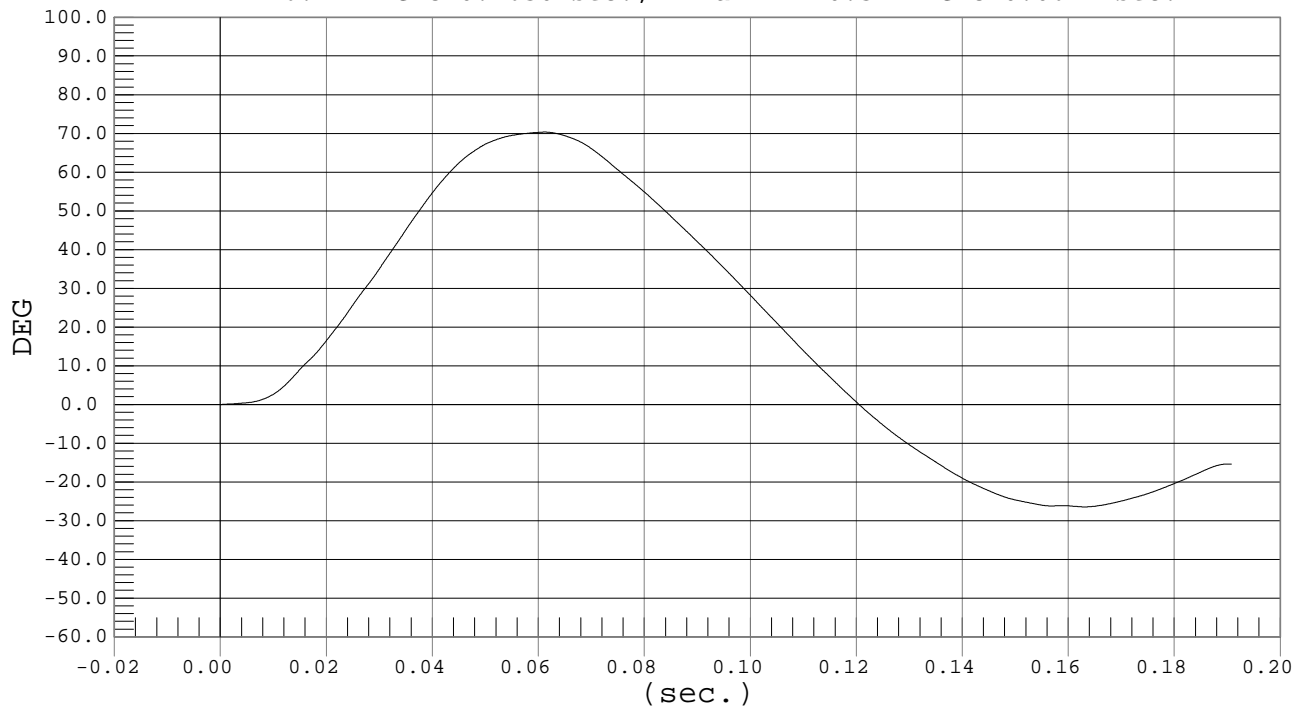


NECK ROTATION

Test Desc.: Neck Bending
Component: Dummy # 049

Test Date: 04-16-02
Speed: 23.3 fps, 7.10 M/s

Ymin = -26.44 DEG @ 0.1630 sec., Ymax = 70.34 DEG @ 0.0611 sec.



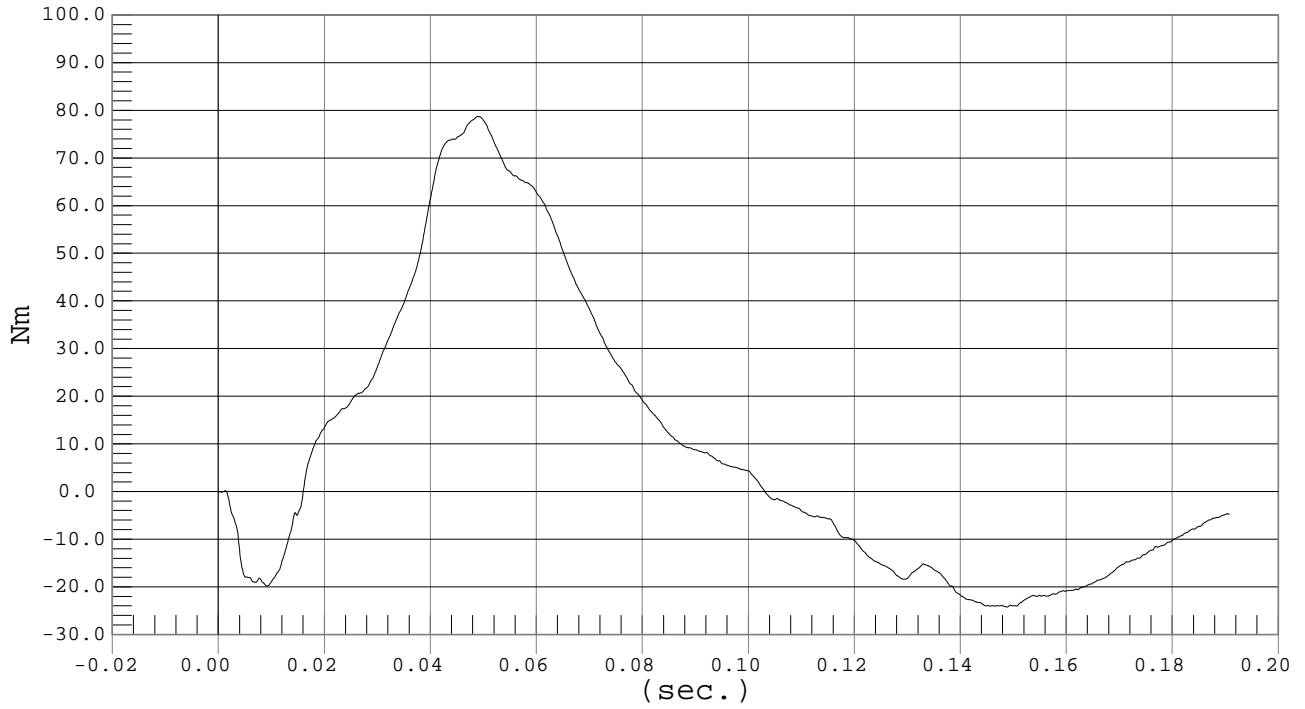


Test Desc.: Neck Bending
Component: Dummy # 049

OCCIPITAL MOMENT

Test Date: 04-16-02
Speed: 23.3 fps, 7.10 M/s

Ymin = -24.23 Nm @ 0.1488 sec., Ymax = 78.7 Nm @ 0.0489 sec.



MGA RESEARCH CORPORATION
THORAX IMPACT TEST
SIDE IMPACT DUMMY (SID)

Date: 4/12/02

Dummy Serial Number: 049

Test Number: D02582

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.8
Relative Humidity (%)	10 – 70	38
Probe Speed (m/s)	4.27 – 4.33	4.27
Upper Rib (g's)	37 – 46	39
Lower Rib (g's)	37 – 46	42
Lower Spine (g's)	15 - 22	20

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

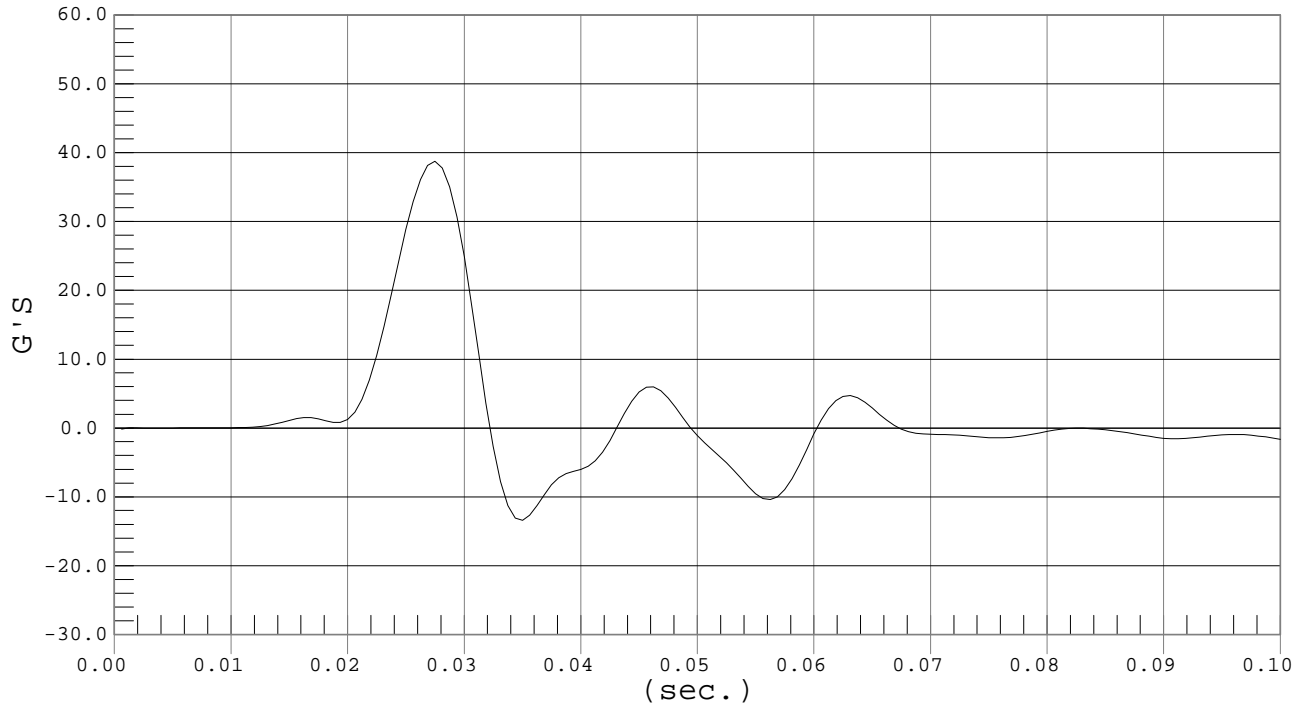


UPPER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 04-12-02
Speed: 14.0 fps, 4.27 M/s

Ymin = -13.42 G'S @ 0.0349 sec., Ymax = 38.75 G'S @ 0.0274 sec.

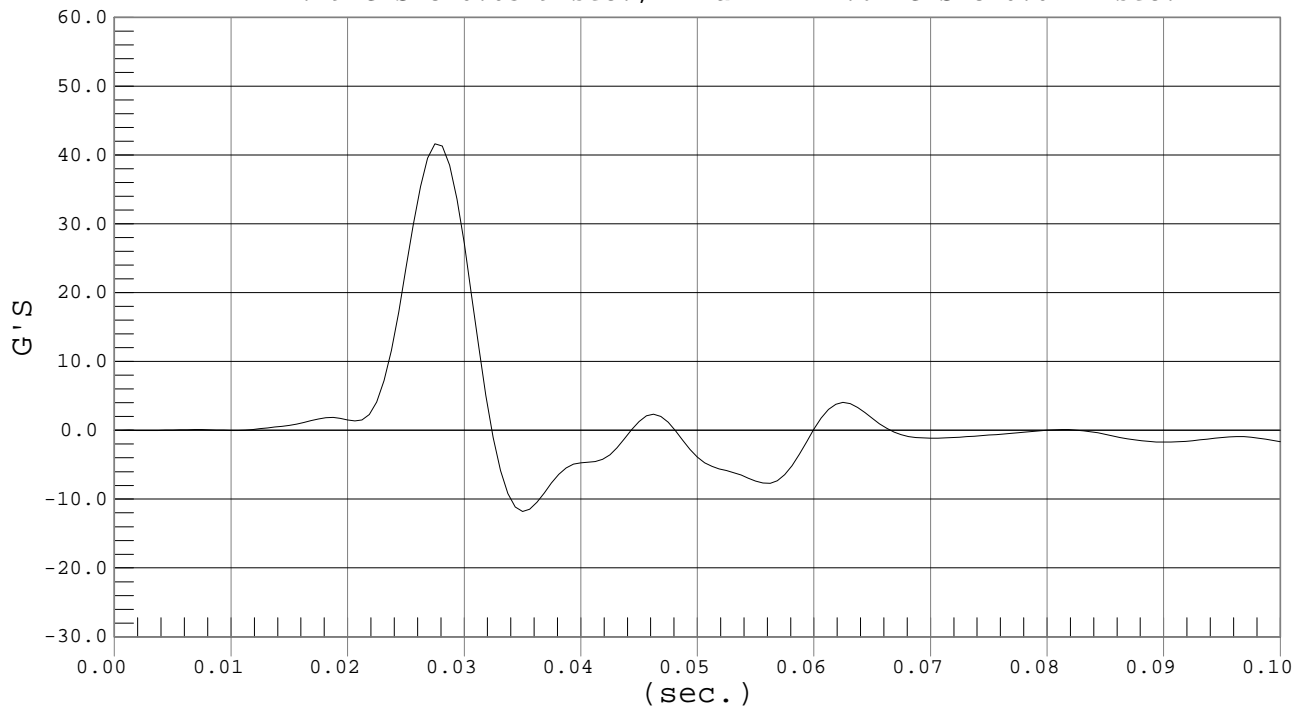


LOWER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 04-12-02
Speed: 14.0 fps, 4.27 M/s

Ymin = -11.79 G'S @ 0.0349 sec., Ymax = 41.62 G'S @ 0.0274 sec.



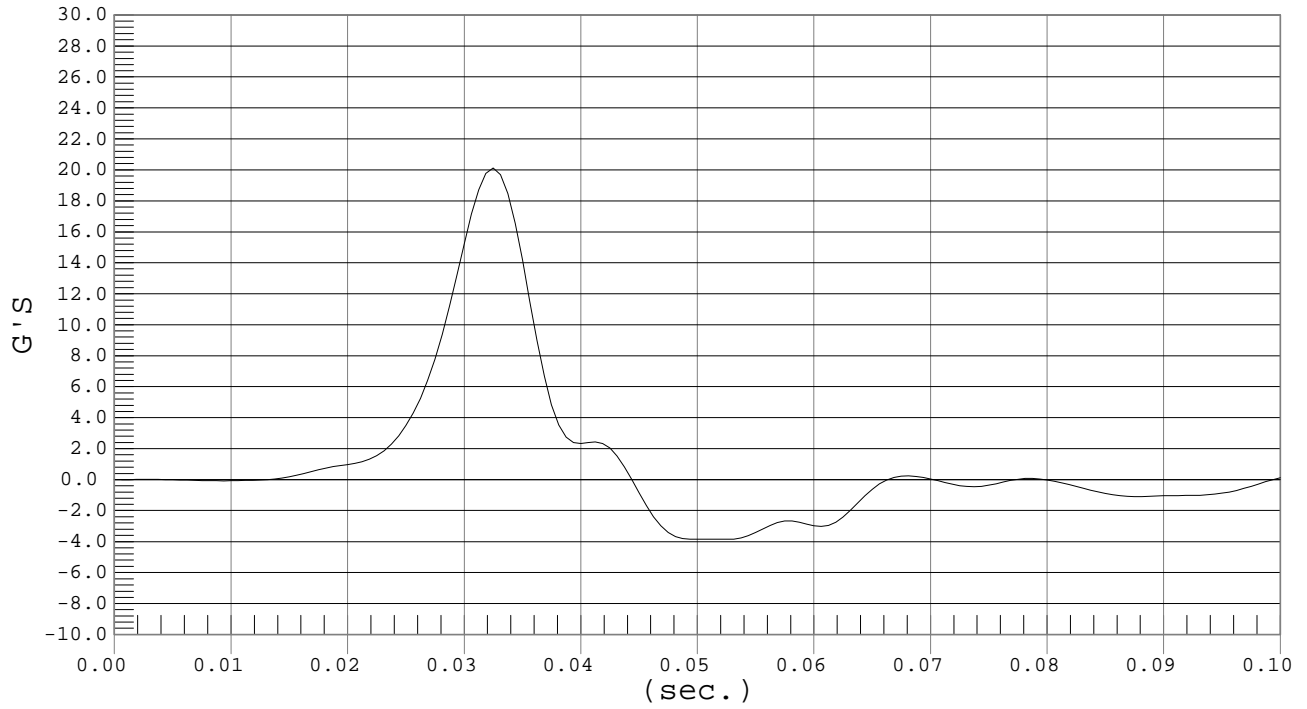


LOWER SPINE ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 04-12-02
Speed: 14.0 fps, 4.27 M/s

Ymin = -3.86 G'S @ 0.0493 sec., Ymax = 20.12 G'S @ 0.0324 sec.



MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SIDE IMPACT DUMMY (SID)

Date: 4/12/02

Dummy Serial Number: 049

Test Number: D02583

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.8
Relative Humidity (%)	10 – 70	38
Probe Speed (m/s)	4.27 – 4.33	4.27
Pelvis Acceleration (g's)	40 – 60	50

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

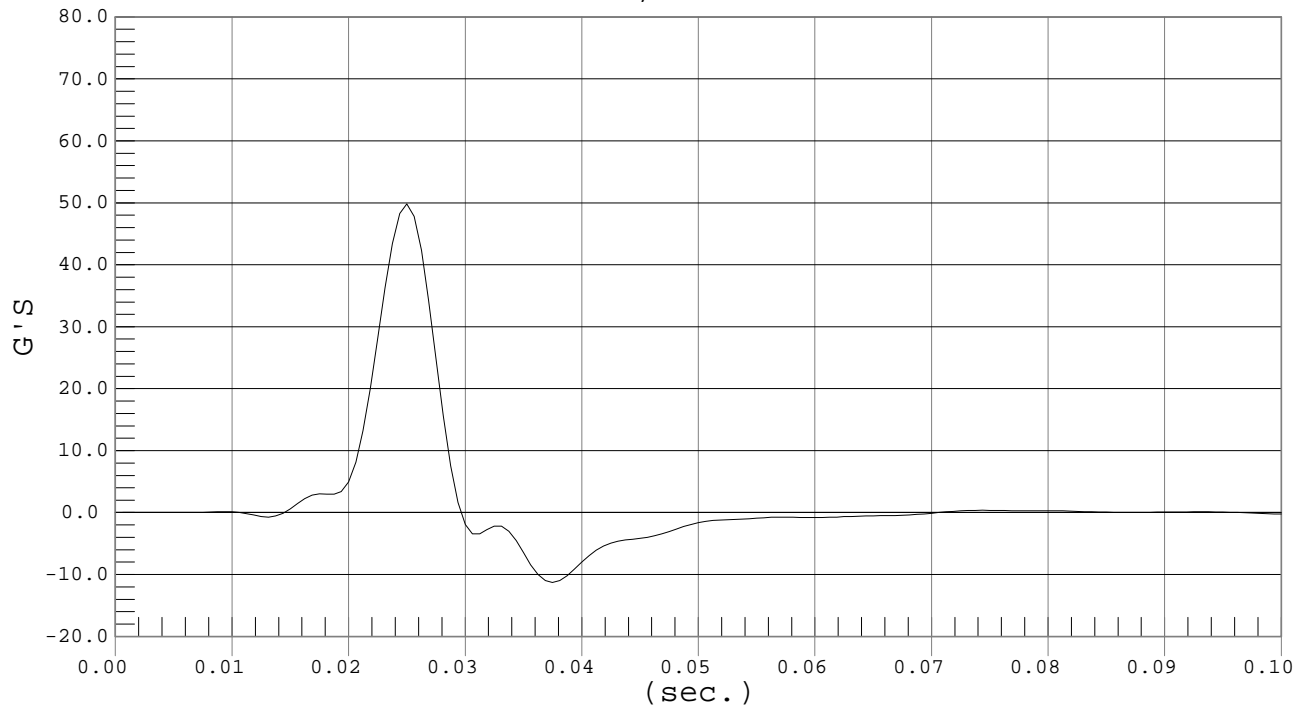


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #049

Test Date: 04-12-02
Speed: 14.0 fps, 4.27 M/s

Ymin = -11.29 G'S @ 0.0374 sec., Ymax = 49.84 G'S @ 0.0249 sec.



MGA RESEARCH CORPORATION
ABDOMINAL COMPRESSION TEST (PRELOAD = 10 LBS)
SIDE IMPACT DUMMY (SID)

Date: 4/12/02

Dummy Serial Number: 049

Test Number: D02584

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	22.6
Relative Humidity (%)	10 – 70	38
Force @ 12.7 mm	104 – 162	136
Force @ 19 mm	163 – 222	187
Force @ 25.4 mm	222 – 280	250
Force @ 33 mm	325 - 391	345

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

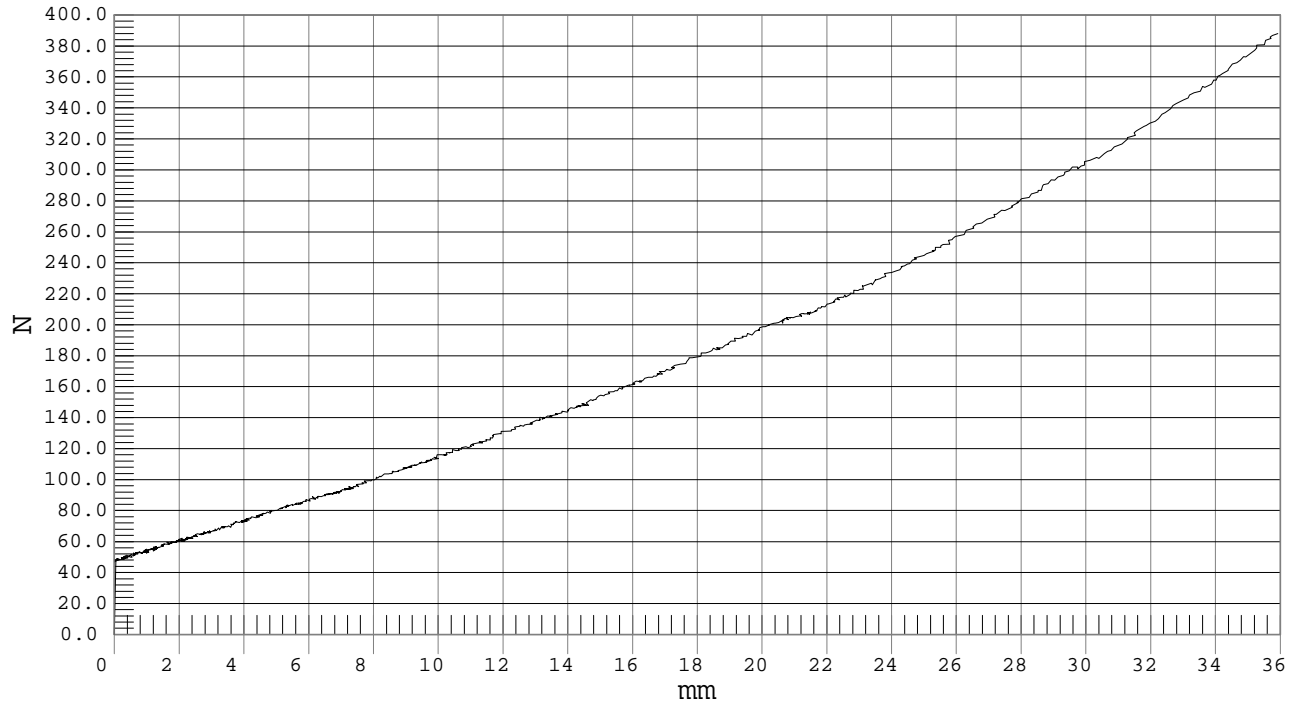


ABDOMEN COMPRESSION

Test Desc.: ABDOMEN COMPRESSION
Component: DUMMY # 049

Test Date: 04-12-02
Speed: 0.0 fps, 0.00 M/s

Ymin = 0 N @ -0.0001 mm, Ymax = 448.45 N @ 40.0842 mm



MGA RESEARCH CORPORATION
LUMBAR FLEXION TEST
SIDE IMPACT DUMMY (SID)

Date: 4/12/02

Dummy Serial Number: 049

Test Number: D02585

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	22.4
Relative Humidity (%)	10 – 70	41
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	115.7
Force @ 30°	151.2 – 204.6	180.1
Force @ 40°	204.6 – 258.0	244.5
Return Angle	12° maximum	4

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

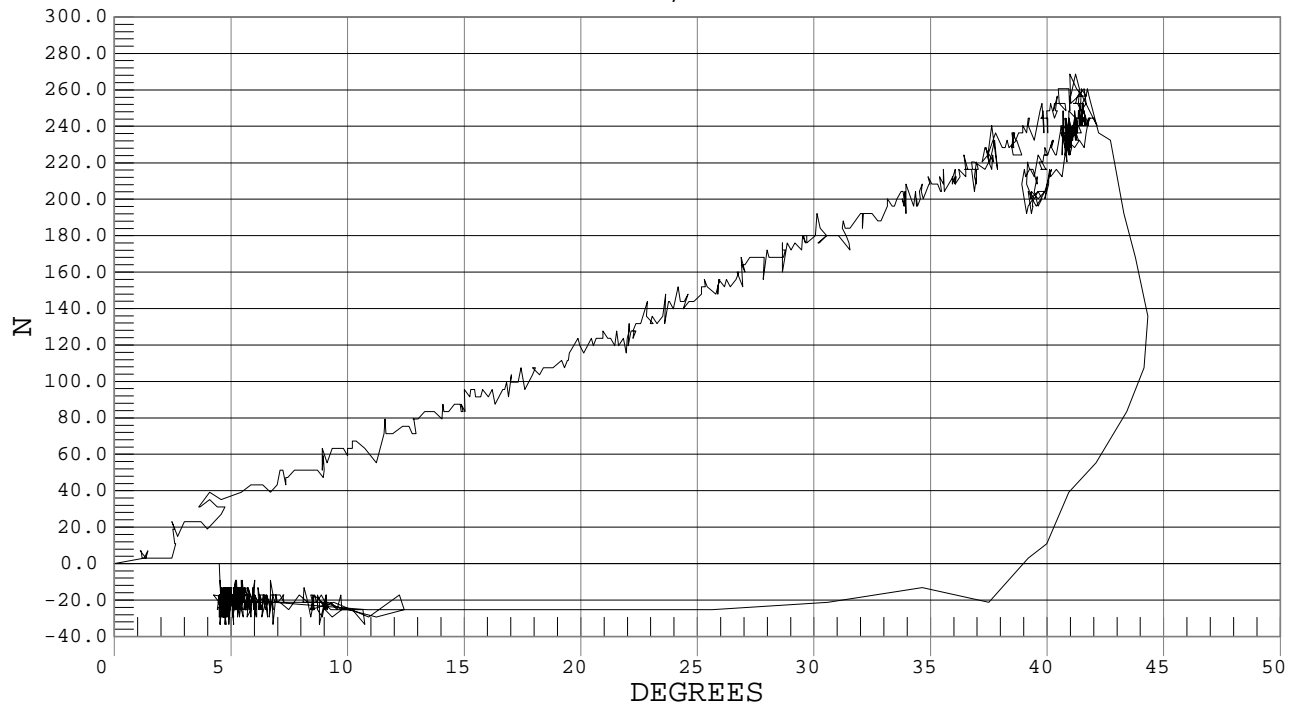


LUMBAR FLEXION

Test Desc.: LUMBAR FLEXION
Component: DUMMY # 049

Test Date: 04-12-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -33.29 N @ 10.7397 DEGREES, Ymax = 268.63 N @ 41.2255 DEGREES



DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Dummy Serial Number: 049

Inspected By: Tim Michnay

Date: 4/16/02

<u>Part</u>	<u>Items Checked</u>	<u>Comments</u>
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure	OK
Sternum	visual	OK
Lumbar spine	visual	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual	OK
Knees	visual	OK
Lower legs	visual, range of motion	OK
Ankles	visual, range of motion	OK
Feet	visual, range of motion	OK
Joints	1 to 2 g range	OK
Other		

Notes (include component/problem/action/reason):

CERTIFICATION DATA

Dummy Serial Number:049

Calibration Test Results Summary

Dummy Serial Number: 049

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all pendulum test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion Test:	The lumbar passed all flexion test requirements.

MGA RESEARCH CORPORATION
HEAD DROP TEST (LATERAL)
SIDE IMPACT DUMMY (SID)

Date: 5/28/02

Dummy Serial Number: 049

Test Number: D02691

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.6
Relative Humidity (%)	10 – 70	46
Peak Resultant Acceleration	120 – 150 g's	129
Is Resultant Curve Unimodal	within 15% of peak	Yes
Peak Longitudinal Acceleration	± 15 g's	-13

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

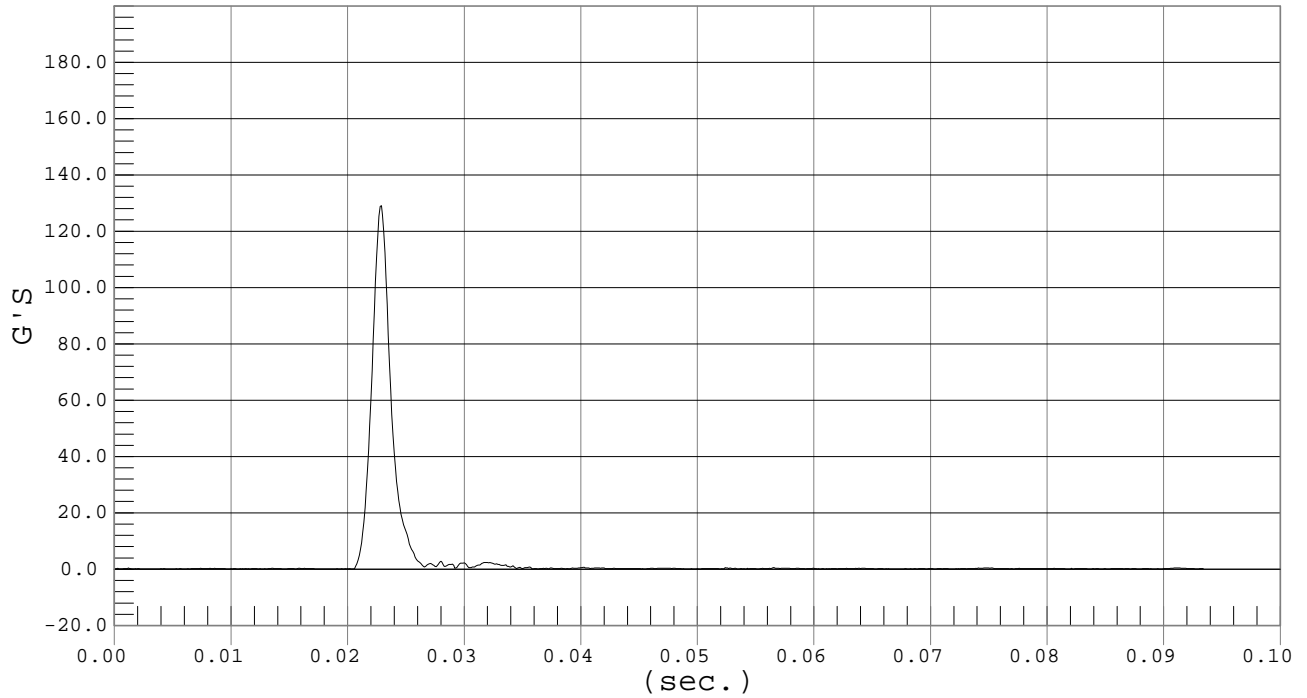


PEAK RESULTANT ACCELERATION

Test Desc.: Head Drop
Component: Dummy #049

Test Date: 05-28-02
Speed: 0.0 fps, 0.00 M/s

Ymin = .06 G'S @ 0.0022 sec., Ymax = 129.11 G'S @ 0.0228 sec.

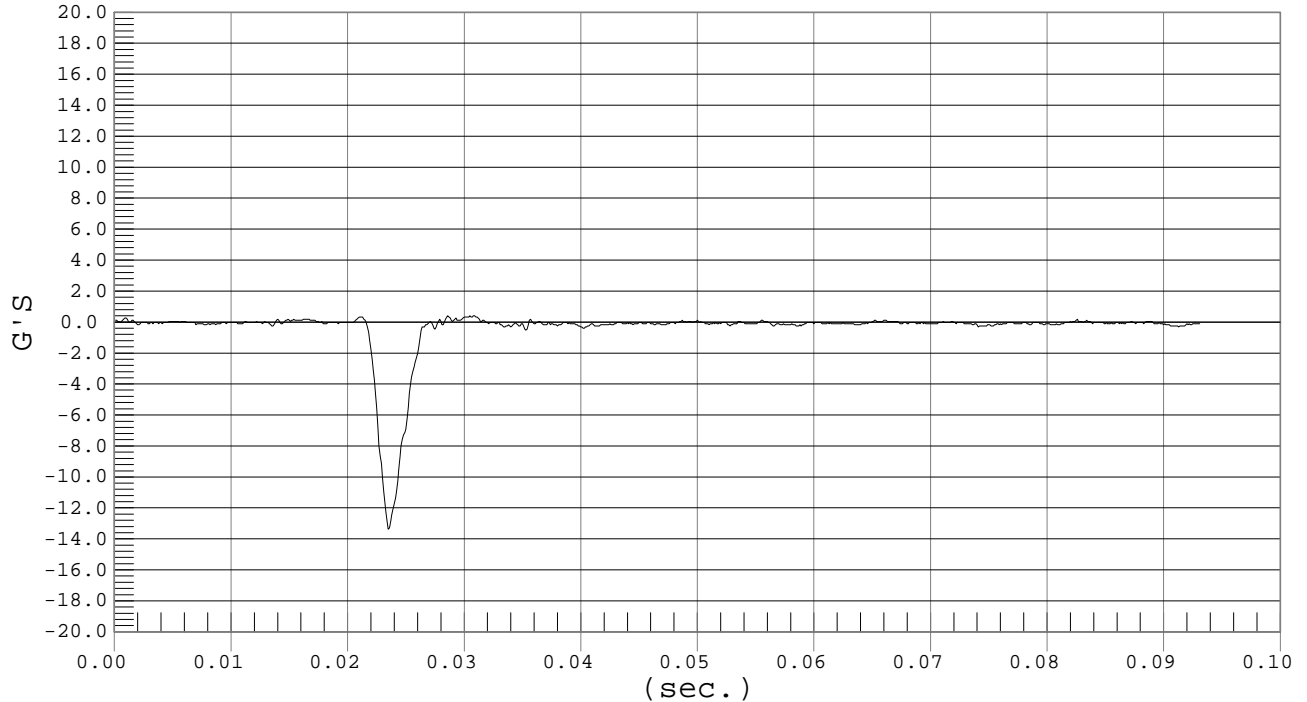


PEAK LONGITUDINAL ACCELARATION

Test Desc.: Head Drop
Component: Dummy #049

Test Date: 05-28-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -13.37 G'S @ 0.0234 sec., Ymax = .4 G'S @ 0.0285 sec.



MGA RESEARCH CORPORATION
 NECK PENDULUM TEST
 SIDE IMPACT DUMMY (SID)

Date: 5/28/02

Dummy Serial Number: 049

Test Number: D02699

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.9 – 25.5	21.8
Relative Humidity (%)		10 - 70	48
Impact Velocity		6.89 – 7.13	6.98
Pendulum Deceleration	10 ms	1.96 – 2.55	2.10
	20 ms	4.12 – 5.10	4.46
	30 ms	5.73 – 7.01	6.34
	40 – 70 ms	6.27 – 7.64	6.73
Midsaggital Plane Max Rotation		66 – 82	70
Head Rotation Peak to Zero – Decay Time		58 – 67	60
Max. M _x at Occipital Condyles		73 – 88	74
M _x Peak to Zero – Decay Time		49 – 64	54
M _x Peak to Max. Head Rotation		2 - 16	10

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

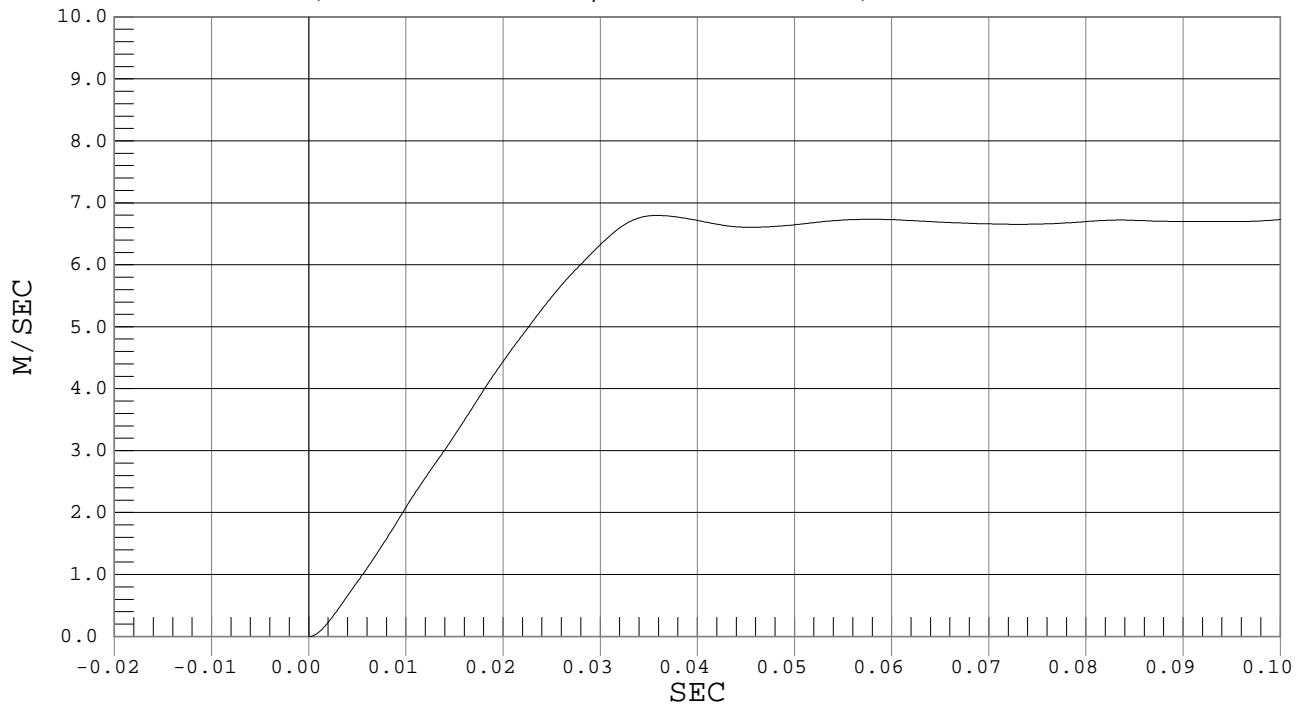


PENDULUM DECELERATION

Test Desc.: Neck Bending
Component: Dummy #049

Test Date: 05-28-02
Speed: 22.9 fps, 6.98 M/s

Ymin = 0 M/SEC @ 0.0000 SEC, Ymax = 8.31 M/SEC @ 0.1922 SEC

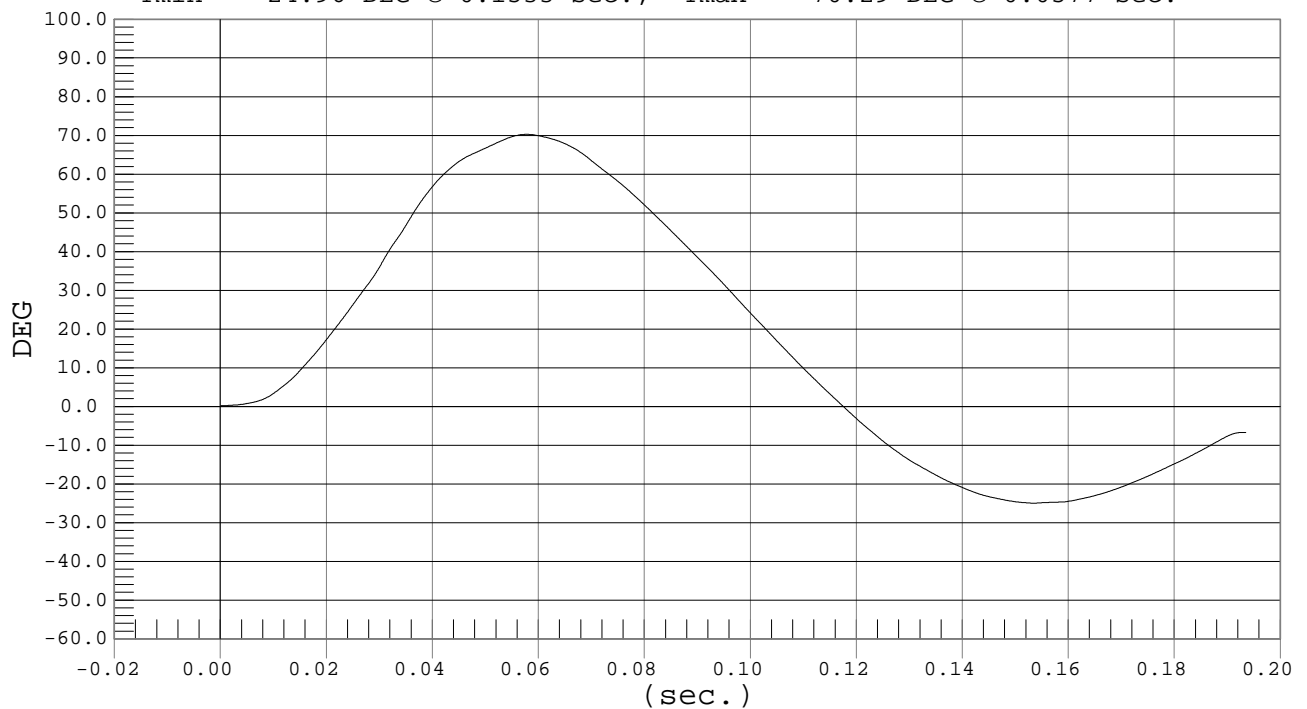


NECK ROTATION

Test Desc.: Neck Bending
Component: Dummy #049

Test Date: 05-28-02
Speed: 22.9 fps, 6.98 M/s

Ymin = -24.96 DEG @ 0.1533 sec., Ymax = 70.29 DEG @ 0.0577 sec.



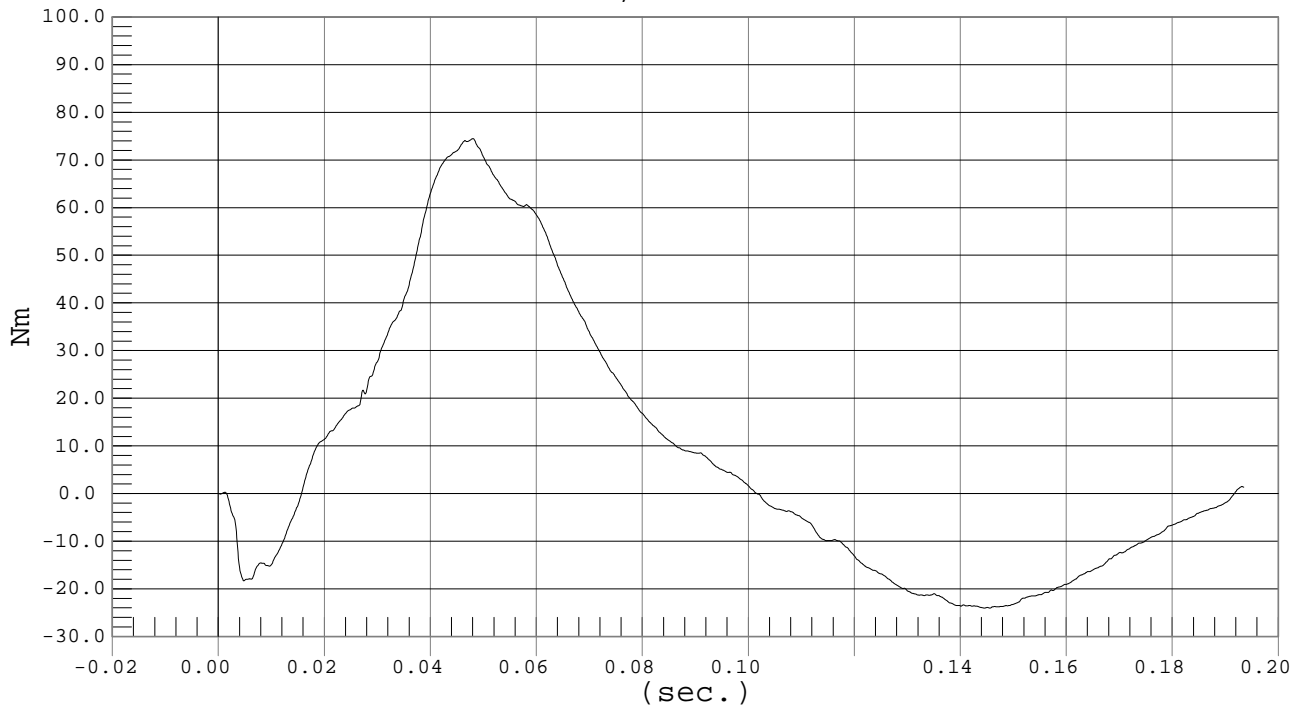


Test Desc.: Neck Bending
Component: Dummy #049

OCCIPITAL MOMENT

Test Date: 05-28-02
Speed: 22.9 fps, 6.98 M/s

Ymin = -24.05 Nm @ 0.1455 sec., Ymax = 74.47 Nm @ 0.0480 sec.



MGA RESEARCH CORPORATION
THORAX IMPACT TEST
SIDE IMPACT DUMMY (SID)

Date: 5/22/02

Dummy Serial Number: 049

Test Number: D02692

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.9
Relative Humidity (%)	10 – 70	28
Probe Speed (m/s)	4.27 – 4.33	4.28
Upper Rib (g's)	37 – 46	38
Lower Rib (g's)	37 – 46	39
Lower Spine (g's)	15 - 22	18

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

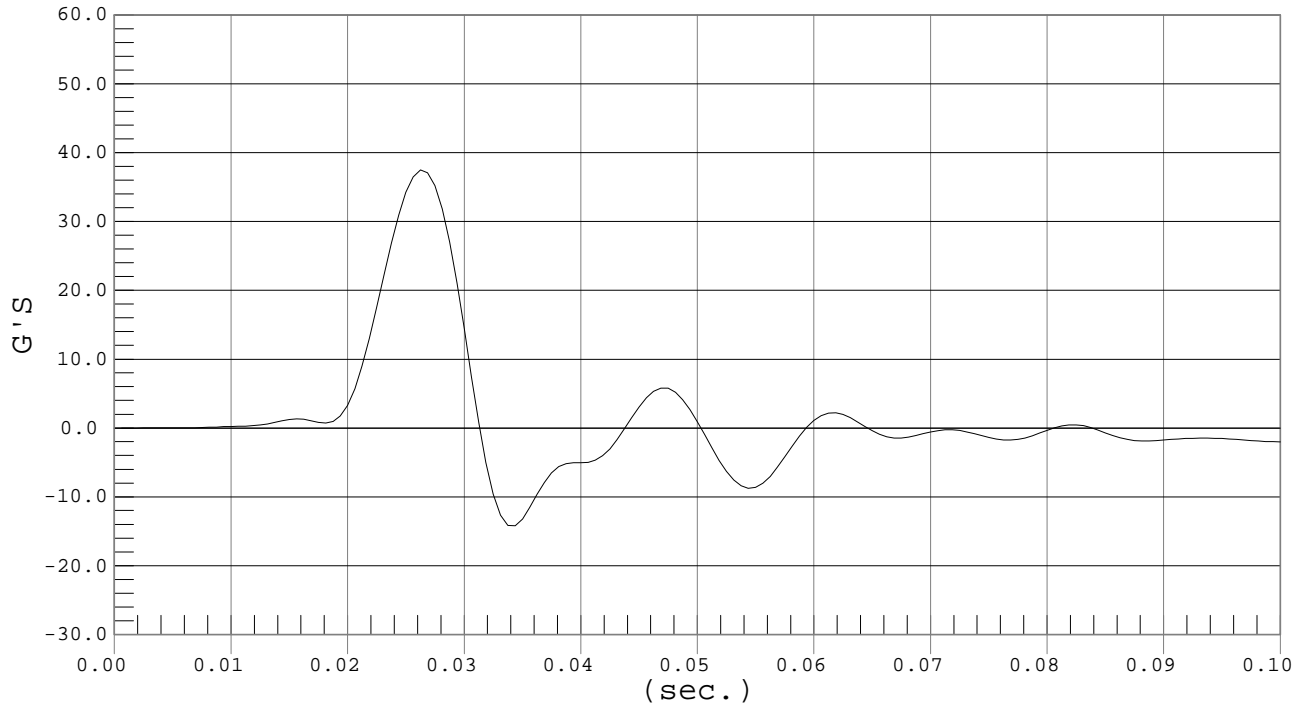


UPPER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 05-22-02
Speed: 14.0 fps, 4.28 M/s

Ymin = -14.21 G'S @ 0.0343 sec., Ymax = 37.5 G'S @ 0.0262 sec.

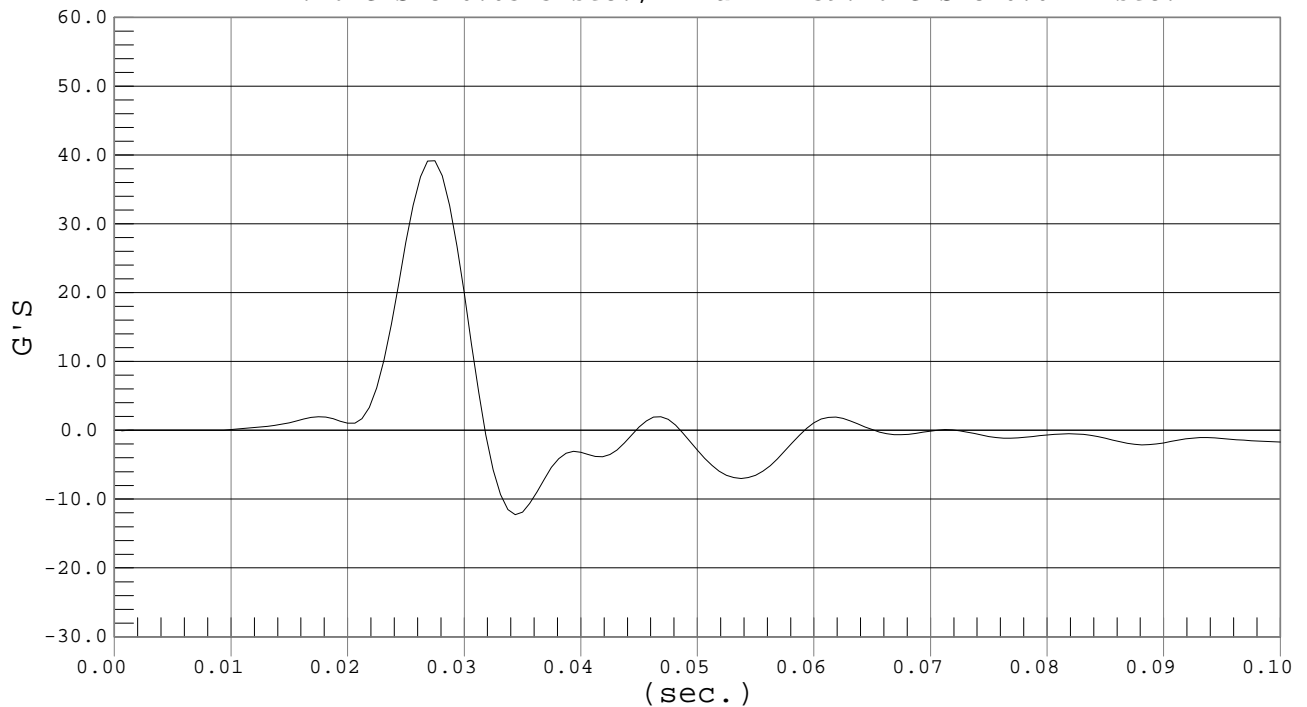


LOWER RIB ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 05-22-02
Speed: 14.0 fps, 4.28 M/s

Ymin = -12.26 G'S @ 0.0343 sec., Ymax = 39.16 G'S @ 0.0274 sec.



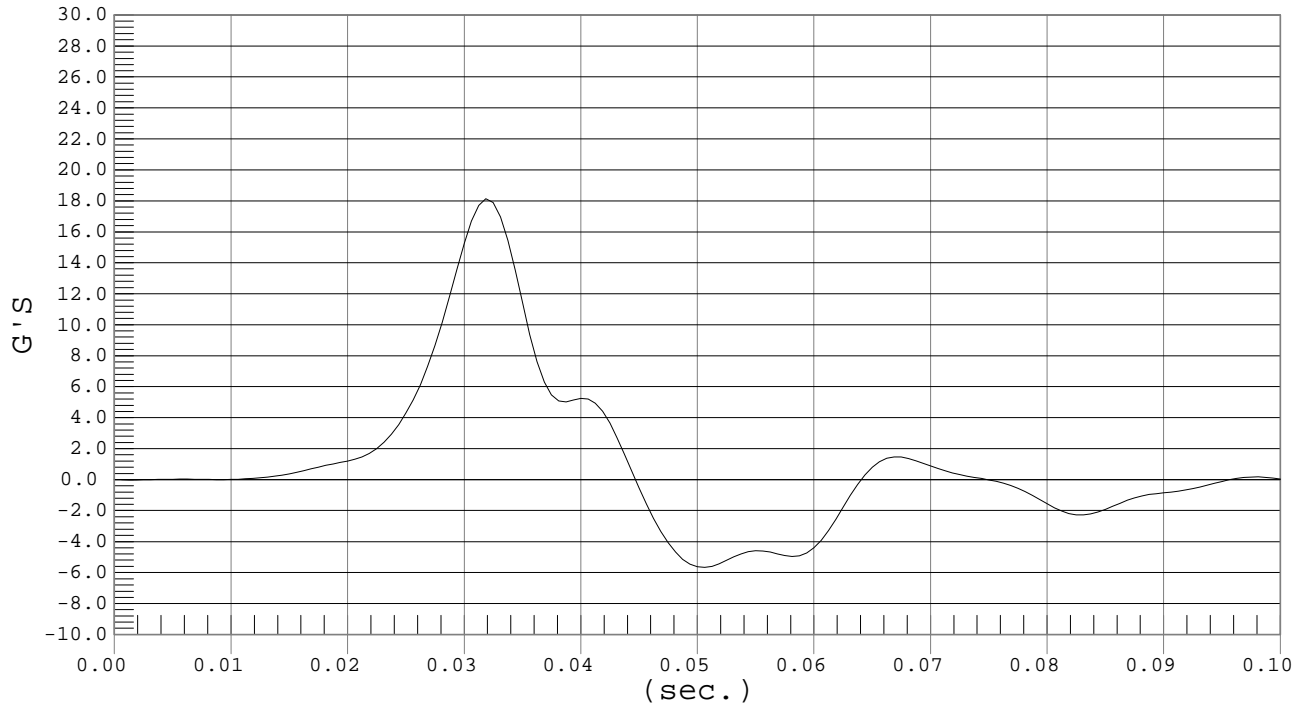


LOWER SPINE ACCELERATION

Test Desc.: Thorax Impact
Component: Dummy #049

Test Date: 05-22-02
Speed: 14.0 fps, 4.28 M/s

Ymin = -5.67 G'S @ 0.0505 sec., Ymax = 18.13 G'S @ 0.0318 sec.



MGA RESEARCH CORPORATION
PELVIS IMPACT TEST
SIDE IMPACT DUMMY (SID)

Date: 5/22/02

Dummy Serial Number: 049

Test Number: D02693

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.9
Relative Humidity (%)	10 – 70	28
Probe Speed (m/s)	4.27 – 4.33	4.29
Pelvis Acceleration (g's)	40 – 60	46

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

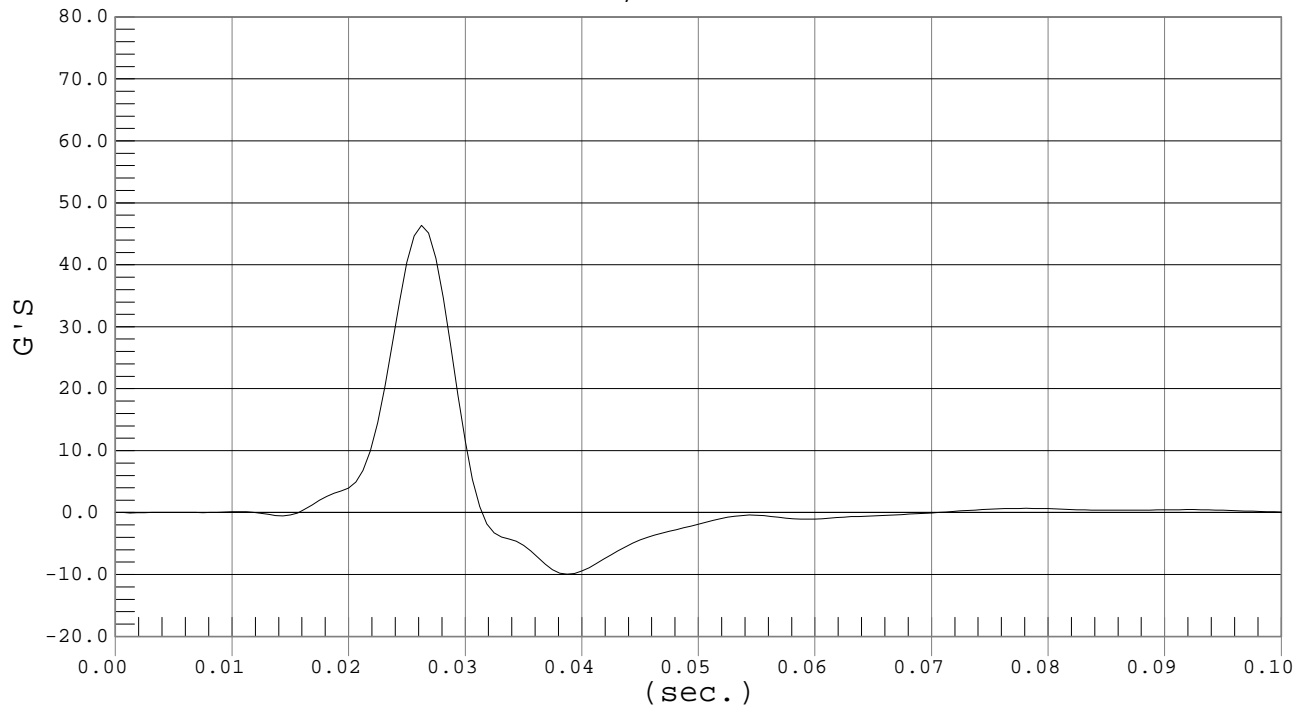


PELVIS ACCELERATION

Test Desc.: Pelvis Impact
Component: Dummy #049

Test Date: 05-22-02
Speed: 14.1 fps, 4.29 M/s

Ymin = -9.96 G'S @ 0.0387 sec., Ymax = 46.36 G'S @ 0.0262 sec.



MGA RESEARCH CORPORATION
ABDOMINAL COMPRESSION TEST (PRELOAD = 10 LBS)
SIDE IMPACT DUMMY (SID)

Date: 5/28/02
Dummy Serial Number: 049
Test Number: D02694

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.9
Relative Humidity (%)	10 – 70	47
Force @ 12.7 mm	104 – 162	142
Force @ 19 mm	163 – 222	201
Force @ 25.4 mm	222 – 280	269
Force @ 33 mm	325 - 391	367

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

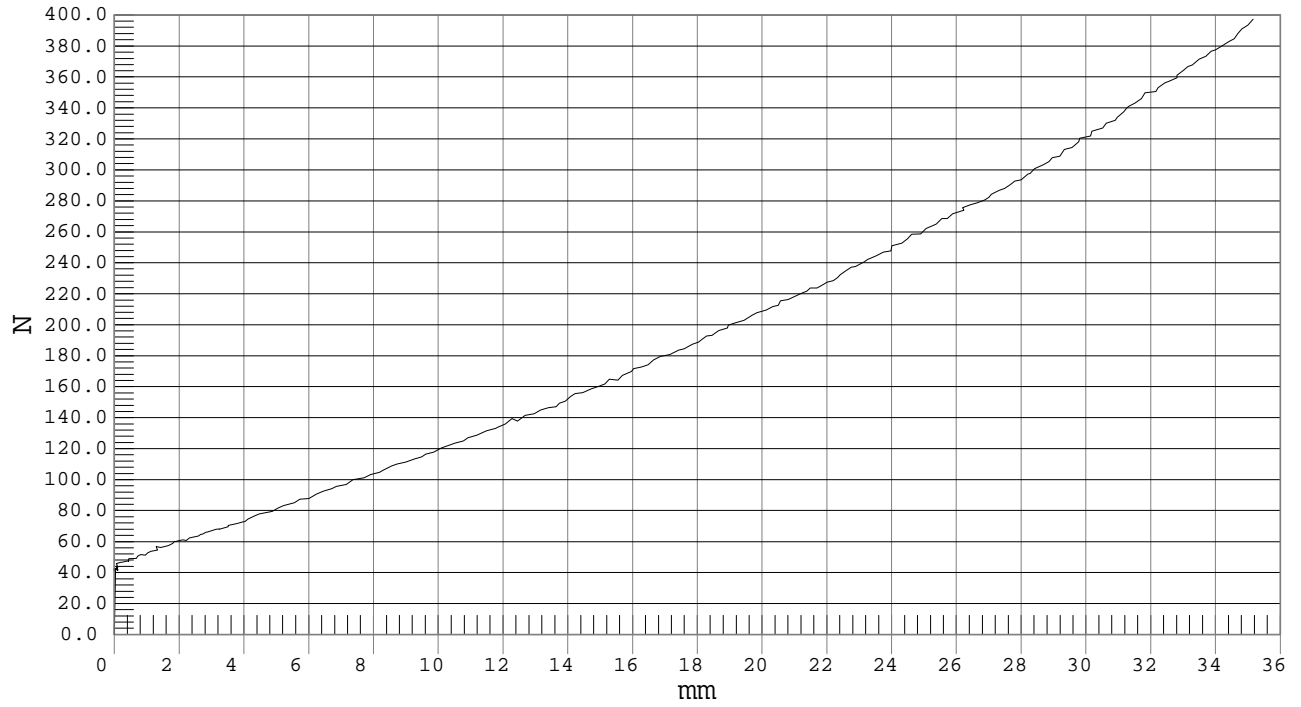


ABDOMEN COMPRESSION

Test Desc.: ABDOMEN COMPRESSION
Component: DUMMY # 049

Test Date: 05-28-02
Speed: 0.0 fps, 0.00 M/s

Ymin = 0 N @ -0.0001 mm, Ymax = 555.38 N @ 43.8609 mm



MGA RESEARCH CORPORATION
LUMBAR FLEXION TEST
SIDE IMPACT DUMMY (SID)

Date: 5/28/02

Dummy Serial Number: 049

Test Number: D02695

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.9
Relative Humidity (%)	10 – 70	47
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	112.9
Force @ 30°	151.2 – 204.6	189.4
Force @ 40°	204.6 – 258.0	241.7
Return Angle	12° maximum	3

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

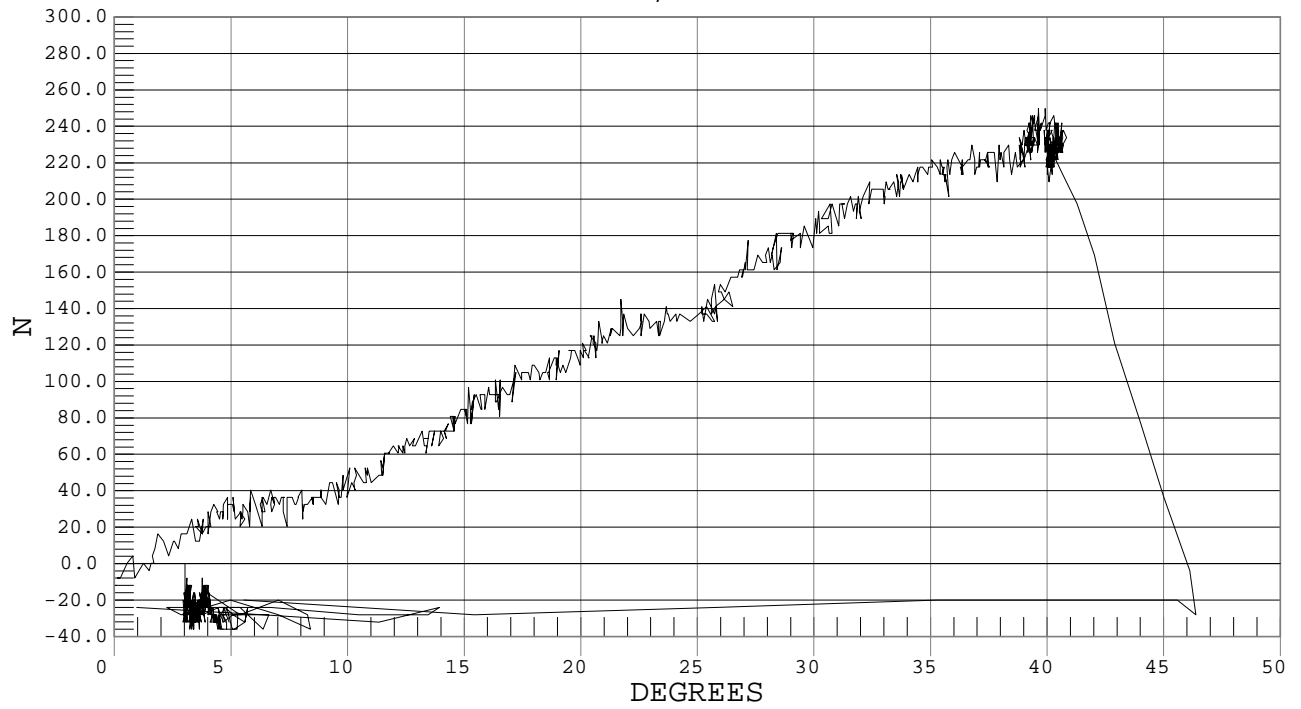


LUMBAR FLEXION

Test Desc.: LUMBAR FLEXION
Component: DUMMY # 049

Test Date: 05-28-02
Speed: 0.0 fps, 0.00 M/s

Ymin = -48.12 N @ 4.6395 DEGREES, Ymax = 249.8 N @ 39.6341 DEGREES



DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Dummy Serial Number: 049

Inspected By: Tim Michnay

Date: 5/28/02

<u>Part</u>	<u>Items Checked</u>	<u>Comments</u>
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure	OK
Sternum	visual	OK
Lumbar spine	visual	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual	OK
Knees	visual	OK
Lower legs	visual, range of motion	OK
Ankles	visual, range of motion	OK
Feet	visual, range of motion	OK
Joints	1 to 2 g range	OK
Other		

Notes (include component/problem/action/reason):

APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR LEFT FRONT DUMMY NO. 049		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	AHRP6	Endevco	1/8/02
Head Y Accelerometer	AP170	Endevco	1/8/02
Head Z Accelerometer	AP2G9	Endevco	1/8/02
Upper Neck Load Cell	606	Denton	12/20/01
Upper Spine X Accelerometer	AMRR4	Endevco	2/11/02
Upper Spine Y Accelerometer	AJ417	Endevco	1/21/02
Upper Spine Z Accelerometer	ALCR0	Endevco	2/11/02
Upper Rib Y Accelerometer	AGTM8	Endevco	1/8/02
Lower Rib Y Accelerometer	AN8D5	Endevco	1/8/02
Lower Spine X Accelerometer	J14027	Endevco	4/9/02
Lower Spine Y Accelerometer	AK972	Endevco	1/7/02
Lower Spine Z Accelerometer	J13884	Endevco	4/9/02
Pelvis X Accelerometer	ANAM1	Endevco	4/9/02
Pelvis Y Accelerometer	AGRW3	Endevco	1/8/02
Pelvis Z Accelerometer	ANAN7	Endevco	4/9/02

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left A-Post @ Roof Y	K21-N22	Entran	1/17/02
Left Mid A-Post Y	K21-N19	Entran	1/17/02
Left Lower A-Post Y	K21-N28	Entran	1/17/02
Left Upper B-Post Y	K21-N20	Entran	1/17/02
Left Mid B-Post Y	K11-G07	Entran	3/6/02
Left Lower B-Post Y	A08-A09	Entran	3/6/02
Rear Floorpan Above Axle X	F07-A14	Entran	3/1/02
Rear Floorpan Above Axle Y	E03-H24	Entran	3/1/02
Rear Floorpan Above Axle Z	G03-N11	Entran	3/1/02
Driver Seat Track Y	G13-F10	Entran	1/16/02
Driver Left Seat Frame	K21-N17	Entran	12/17/01
Driver Right Seat Frame	E03-H09	Entran	3/8/02
Right Side Sill at Front Seat X	K21-N15	Entran	3/1/02
Right Side Sill at Front Seat Y	K21-N18	Entran	1/17/02
Right Side Sill at Front Seat Z	G13-F02	Entran	3/1/02
Right Side Sill at Rear Seat X	A08-A13	Entran	3/1/02
Right Side Sill at Rear Seat Y	G03-N15	Entran	3/1/02
Right Side Sill at Rear Seat Z	G03-N02	Entran	3/1/02
Left Side Sill at Front Seat Y	K21-N24	Entran	1/17/02
Left Side Sill at Rear Seat Y	K21-N06	Entran	12/11/01
Vehicle CG X	I25-F07	Entran	1/14/02
Vehicle CG Y	I25-F08	Entran	1/16/02
Vehicle CG Z	F04-N06	Entran	3/1/02
Left Front Door @ Pelvis Y	K21-N07	Entran	12/11/01
Left Front Door @ End of Arm Y	E03-H14	Entran	3/6/02
Left Front Door @ Rib Y	K21-N01	Entran	12/11/01
Left Front Door @ Knee Y	K21-N08	Entran	12/11/01
Lower Center Radiator Support X	G03-N12	Entran	3/8/02
Lower Center Radiator Support Y	G03-N14	Entran	3/8/02
Lower Center Radiator Support Z	H14-N09	Entran	3/8/02

APPENDIX E
DUMMY PEAK RESPONSES

DRIVER PEAK RESPONSE TABLE

Location	Peak Values				
				2001 Saturn L200 5/6/02	
	Class	Axis	Units	Peak	Time
Head	1000	X	G	-283.1	54
	1000	Y	G	702.8	54
	1000	Z	G	405.9	54
	1000	RES	G	825.3	54
Head Injury Criteria (HIC)				7493	
t1				53.4	
t2				54.1	
Upper Neck Force	1000	X	N	1260	54
	1000	Y	N	1400	54
	1000	Z	N	4635	54
	1000	RES	N	4726	54
Upper Neck Moment	600	X	Nm	-96.4	55
	600	Y	Nm	-33.2	49
	600	Z	Nm	-19.3	143
	600	RES	Nm	96.6	55
Lower Neck Force	1000	X	N		
	1000	Y	N		
	1000	Z	N		
	1000	RES	N		
Lower Neck Moment	600	X	Nm		
	600	Y	Nm		
	600	Z	Nm		
	600	RES	Nm		
Shoulder Force	600	X	N		
	600	Y	N		
	600	Z	N		

DRIVER PEAK RESPONSE TABLE (continued)

Location	Peak Values				
				2001 Saturn L200 5/6/02	
	Class	Axis	Units	Peak	Time
Upper Spine	180	X	G	29.5	54
	180	Y	G	90.7	45
	180	Z	G	-27.1	44
	180	Res	G	95.2	45
Lower Spine	180	X	G	27.7	55
	180	Y	G	105.6	42
	180	Z	G	-33.0	72
	180	Res	G	108.1	42
Upper Rib	180	Y	G	122.6	39
Mid Rib	180	Y	G		
Lower Rib	180	Y	G	118.2	39
Upper Rib Deflection	180	Y	mm		
Mid Rib Deflection	180	Y	mm		
Lower Rib Deflection	180	Y	mm		
Upper Rib VC	180	Y	m/sec		
Mid Rib VC	180	Y	m/sec		
Lower Rib VC	180	Y	m/sec		
Torso Force	600	X	N		
	600	Y	N		
Torso Moment	600	Y	Nm		
	600	Z	Nm		
T12 Force	600	X	N		
	600	Y	N		
T12 Moment	600	X	Nm		
	600	Y	Nm		
Pelvis	1000	X		12.3	44
	1000	Y		57.1	43
	1000	Z		23.1	56