

REPORT NUMBER: TO5-MGA-2001-004

**RIGID POLE SIDE IMPACT TESTS
2001 SATURN L200 WITH HEAD AIRBAG CURTAIN**

**ES-2 DRIVER POSITION
HYBRID III 6 YR. OLD LEFT REAR
HYBRID III 6 YR. OLD RIGHT REAR**

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August 8, 2001

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 5, 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, with the head airbag curtain, when subjected to a rigid pole side impact.

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 was performed on a model year 2001 Saturn L200 4 door with the head airbag curtain. The subject vehicle was towed into a rigid pole at a velocity of 28.3 km/h. The specified impact velocity range is from 27.2 to 28.8 km/h. The test vehicle was positioned 90° to the line of forward motion. The weight of the vehicle as tested was 1598.5 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on August 8, 2001. Pre- and post-test photographs of the test vehicle and the dummies are included in Appendix A.

One ES-2 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 and Evaluation of Eurosid-1 Positioning Procedure Appendix A dated February 5, 1997. A Hybrid III 6 year old dummy was placed in a Century Next Step Booster seat in the left rear outboard seating position. The dummy was not harnessed to the booster and the tether strap was not used. The vehicle lap and shoulder belt were used. A 6 year old Hybrid III dummy was placed in the right rear outboard seating position. The dummy was only restrained by the vehicle lap and shoulder belt. The side impact event was documented by eleven 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 side impact dummy (ES-2) 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 a copy of the ES-2 dummy positioning procedure used and Appendix F contains the ES-2 and child peak responses.

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

		Left Front
1) Head Performance Criteria		
< 1000	T1 (msec)	49.7
	T2 (msec)	68.0
	HPC	435
2) Thorax Performance Criteria		
2.1) Chest Deflection < 42 mm	Upper Rib Deflection	46.0
	Mid Rib Deflection	37.3
	Lower Rib Deflection	35.9
2.2) Viscous Criteria < 1.0 (m/sec)	Upper Rib	0.86
	Mid Rib	0.50
	Lower Rib	0.67
3) Abdominal Protection Criterion		
Sum < 2500 N	Front Abdominal Force	88.1
	Mid Abdominal Force	337.1
	Rear Abdominal Force	723.0
	Sum of Abdominal Force	1083.7
4) Pelvis Performance Criterion		
< 6000 N	Pubic Symphysis Force	1917.2

HIC		Left Front
	T1 (msec)	49.7
	T2 (msec)	68.0
	T2 - T1 (msec)	18.3
	HIC	435

Fir Filtered	Left Front
Upper Rib Y (g's)	106.0
Mid Rib Y (g's)	128.3
Lower Rib Y (g's)	133.9
Lower Spine Y (g's)	65.0
Pelvis Y (g's)	53.8
TTI (g's)	99

Contacts	Left Front
Head (msec)	19.2
Arm (msec)	27.1
Pelvis (msec)	23.4

TEST NOTES

SECTION 3
SIDE IMPACT DUMMY (ES-2) AND VEHICLE TEST DATA

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: August 8, 2001

TEST VEHICLE INFORMATION

Make	Saturn
Model	L200
Body Style	4 door
VIN	
Color	Painted Orange
Odometer Reading	
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)	1813
Date of Manufacture	05/01	GAWR Front (kg)	891
		GAWR Rear (kg)	922

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: August 8, 2001

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	450.0	397.8		431.4	359.7	
Right	kg	408.2	351.1		447.7	359.7	
Ratio	%	53.4	46.6		55.0	45.0	
Totals	kg	858.2	748.9	1607.1	879.1	719.4	1598.5

TARGET TEST WEIGHT CALCULATION

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

* Based on previous tests in this series.

TEST VEHICLE ATTITUDES

	Units	As Delivered	Fully Loaded	Ready for Test
Right Door Sill Angle	deg	0.5 ND	0.2 ND	0.3 ND
Left Door Sill Angle	deg	0.2 ND	0.1 NU	0.1 ND
Front Bumper Angle	deg	0.6 RD	0.2 LD	0.3 RD
Rear Bumper Angle	deg	0.1 RD	0.0	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	2702
Total Vehicle Length at Left Side	mm	4003
Total Vehicle Length at Centerline	mm	4809
Total Vehicle Length at Right Side	mm	4003
Weight of Ballast in Cargo Area	kg	0
Amount of Water in Fuel Tank	liters	5.7

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Actual Impact Point	mm	13 rear

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

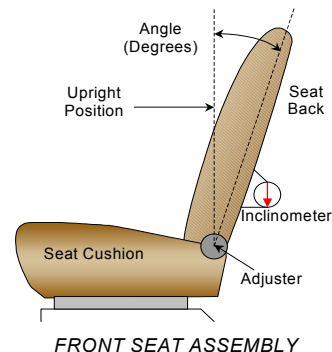
Test Vehicle: 2001/Saturn/L200/4 door

Test Date: August 8, 2001

NORMAL DESIGN RIDING POSITION

Driver seat back angle: 20.5 deg. on seat frame (adjusted forward 4.6 deg. to achieve head clearance)

Passenger seat back angle: non adjustable



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

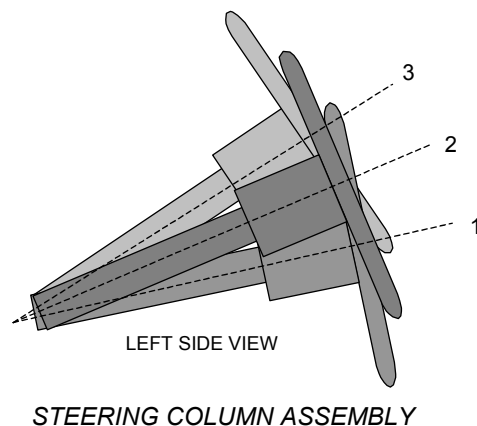
SEAT BELT UPPER ANCHORAGE

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 4 adjustment positions.

The column was set in the second position down from the top as one.



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

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: August 8, 2001

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Left Front	Left Rear	Right Rear
Dummy Type	ES-2	HIII 6 yr.	HIII 3 yr.
Head Contact	Head curtain airbag	Head to curtain airbag and window sill, left knee to door panel, left foot to B post	Head to child restraint
Upper Torso Contact	Window sill		
Lower Torso Contact	Armrest		
Left Knee Contact	Door trim panel		
Right Knee Contact	Left knee		

POST TEST DOOR OPENING

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

POST TEST STRUCTURAL OBSERVATIONS

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

AIRBAG DEPLOYMENT

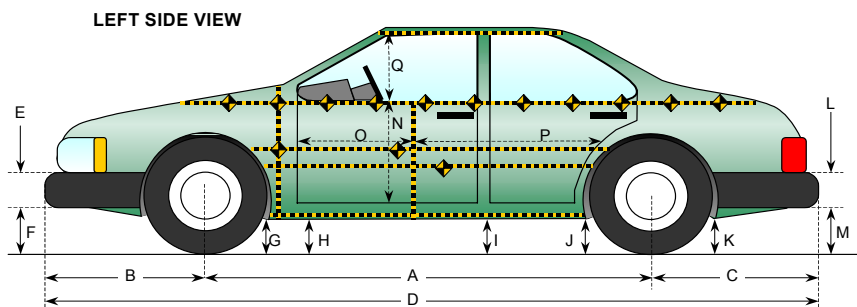
	Driver	Left Front	Left Rear
Front	no	no	
Side			
Curtain	yes	no	yes

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: August 8, 2001



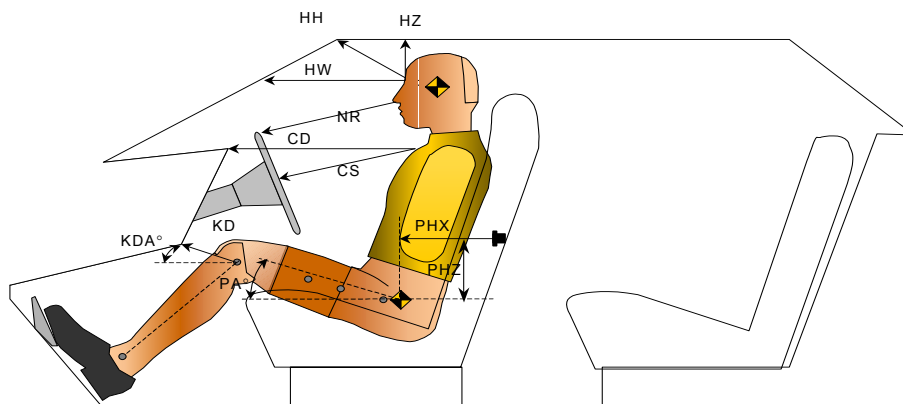
All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2702	2488	214
B	Front Axle to FSOV	985	1060	75
C	Rear Axle to RSOV	1122	1178	56
D	Total Length at Centerline	4809	4726	-83
E	Front Bumper Thickness	160	160	0
F	Front Bumper Bottom to Ground	380	398	18
G	Sill Height at Front Wheel Well	186	192	6
H	Sill Height at Front Door Leading Edge	194	209	15
I	Sill Height at "B" Pillar	209	170	-39
J1	Sill Height at Rear Wheel Well	214	275	61
J2	Pinch Weld Height at Rear Wheel Well	206	258	52
K	Sill Height Aft of Rear Wheel Well	249	300	51
L	Rear Bumper Thickness	230	230	0
M	Rear Bumper Bottom to Ground	428	475	47
N	Sill Height to Window Bottom Sill	612	626	14
O	Front Door Leading Edge to Impact CL	920	923	3
P	Rear Door Trailing Edge to Impact CL	1121	1095	-26
Q	Front Window Opening	462	435	-27
R	Right Side Length	4003	4207	204
S	Left Side Length	4003	3782	-221
T	Vehicle Width at "B" Post	1742	1376	-366

DATA SHEET NO. 4
ES-2 LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: August 8, 2001



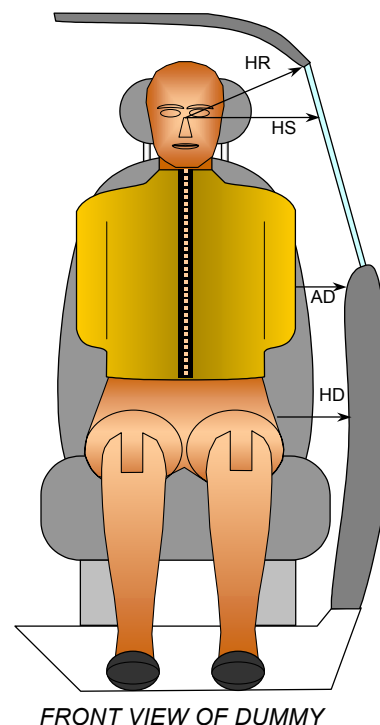
Driver Code	Measurement Description	Left Front	
		Length(mm)	Angle(°)
HH	Head to Header	298	
HW	Head to Windshield	484	
HZ	Head to Roof	163	
NR	Nose to Rim	434	
CD	Chest to Dash	515	
CS	Chest to Steering Wheel	337	
KDL	Left Knee to Dash	173	0.0
KDR	Right Knee to Dash	175	0.0
PA	Pelvic Angle (Longitudinal)		20.9
PA	Pelvic Angle (Lateral)		-0.1
SA	Spine Angle (Longitudinal)		20.8
SA	Spine Angle (Lateral)		-0.1
PHX	H-Point to Striker (X-Axis)	215	
PHZ	H-Point to Striker (Z-Axis)	164	

DATA SHEET NO. 5
ES-2 LATERAL CLEARANCE DIMENSIONS / CHILD DUMMY MEASUREMENTS

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: August 8, 2001

Code	Measurement Description	Units	Left Front
HR	Head to Side Header	mm	203
HS	Head to Side Window	mm	279
AD	Arm to Door	mm	84
HD	H-Point to Door	mm	114



FRONT VIEW OF DUMMY

CHILD DUMMY MEASUREMENTS

Measurement Description	Units	Left Rear	Right Rear
Head CG to Striker X	mm	142	59
Head CG to Striker Y	mm	303	340
Head CG to Striker Z	mm	231	80
Chest Center to Door	mm	294	332
Chest C/L to Chest C/L	mm	796	

DATA SHEET NO. 6

DUMMY POSITIONING

Test Vehicle: 2001/Saturn/L200/4 door

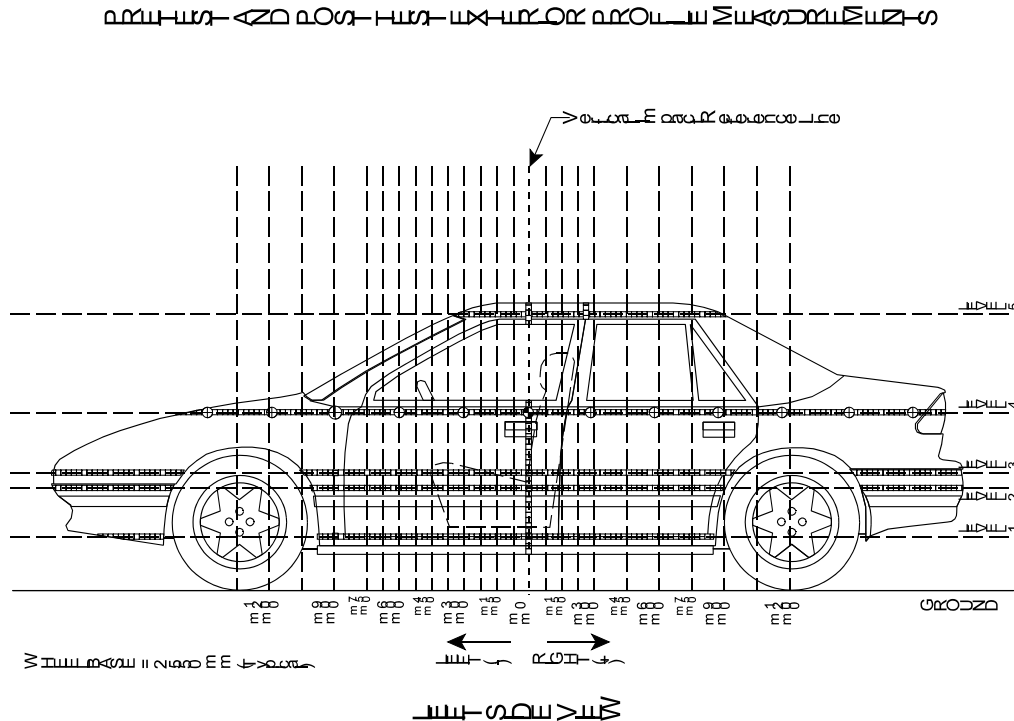
Test Date: August 8, 2001

	Left Front		
	H-Point Machine	Dummy H Point	Dummy H Point after seat back adjustment
HP to Floor Z (mm)	148	153	157
HP to Hinge X (mm)	745	742	720
HP to Sill Y (mm)	211	219	220
HP to Striker X (mm)	353	344	362
HP to Dash X (mm)	553	549	539
HP to Header Z (mm)	781	783	730
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: August 8, 2001

Measurements are taken with vehicle in the as tested condition.

Measurements along the vertical 800 mm.

Level	Measurement Description	Units	Height Above Ground
5	Window	mm	1340
4	Window Sill	mm	893
3	Mid Door	mm	657
2	Occupant H-Point	mm	492
1	Sill Top	mm	325

DATA SHEET NO. 8
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: August 8, 2001

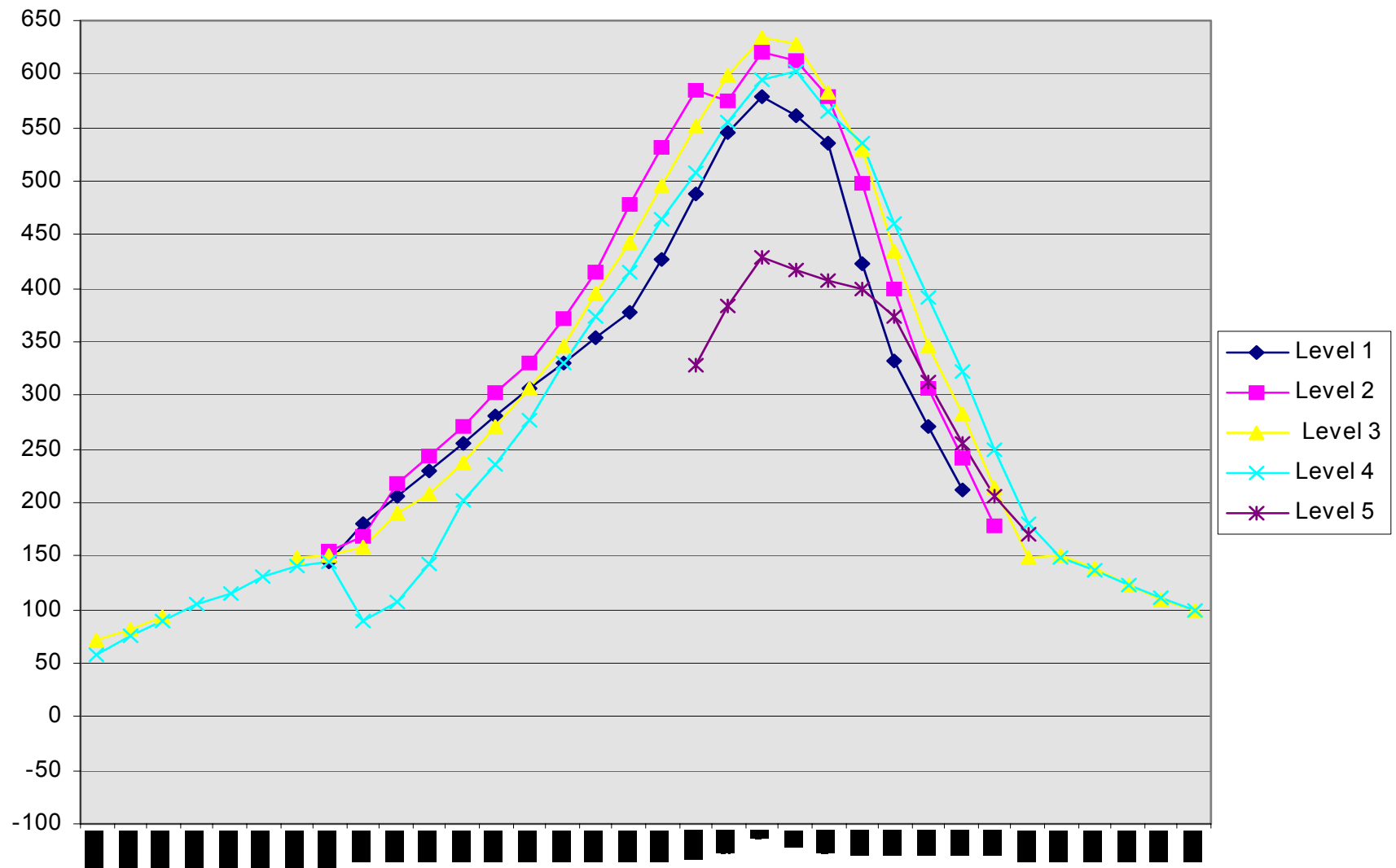
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-2100			443	503				515	560				72	57	
-1950			389	465				471	541				82	76	
-1800			348	444				442	533				94	89	
-1650				425					530					105	
-1500				417					532					115	
-1350				405					535					130	
-1200			317	398				466	539				149	141	
-1050	362	336	330	396		507	491	480	541		145	155	150	145	
-900	358	333	331	390		539	502	490	480		181	169	159	90	
-825	358	330	330	388		563	548	521	495		205	218	191	107	
-750	357	330	329	388		586	573	536	530		229	243	207	142	
-675	355	330	328	383		611	601	565	585		256	271	237	202	
-600	354	330	327	387		635	633	598	623		281	303	271	236	
-525	354	329	326	388		660	659	633	664		306	330	307	276	
-450	353	328	325	384		683	699	671	714		330	371	346	330	
-375	352	327	324	381		705	742	719	754		353	415	395	373	
-300	354	325	323	379		731	803	766	795		377	478	443	416	
-225	354	326	323	379		780	858	820	843		426	532	497	464	
-150	355	326	323	377	596	843	911	875	884	924	488	585	552	507	328
-75	354	325	322	375	590	899	900	921	930	974	545	575	599	555	384
0	353	325	322	374	586	932	946	957	969	1015	579	621	635	595	429
75	353	326	322	372	583	915	939	950	974	1000	562	613	628	602	417
150	350	327	322	370	581	885	905	905	936	988	535	578	583	566	407
300	352	327	321	370	580	775	826	850	905	980	423	499	529	535	400
450	353	327	320	369	580	686	726	755	830	954	333	399	435	461	374
600	353	325	320	368	582	625	632	667	760	895	272	307	347	392	313
750	352	323	321	368	584	564	565	603	690	840	212	242	282	322	256
900		324	324	373	589		502	538	622	794		178	214	249	205
1050			328	378	597			477	559	768			149	181	171
1200			328	383				479	532				151	149	
1350			332	393				470	529				138	136	
1500			349	402				472	526				123	124	
1650			365	418				475	529				110	111	
1800			383	433				482	532				99	99	

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

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

Test Vehicle: 2001/Saturn/L200/4 door

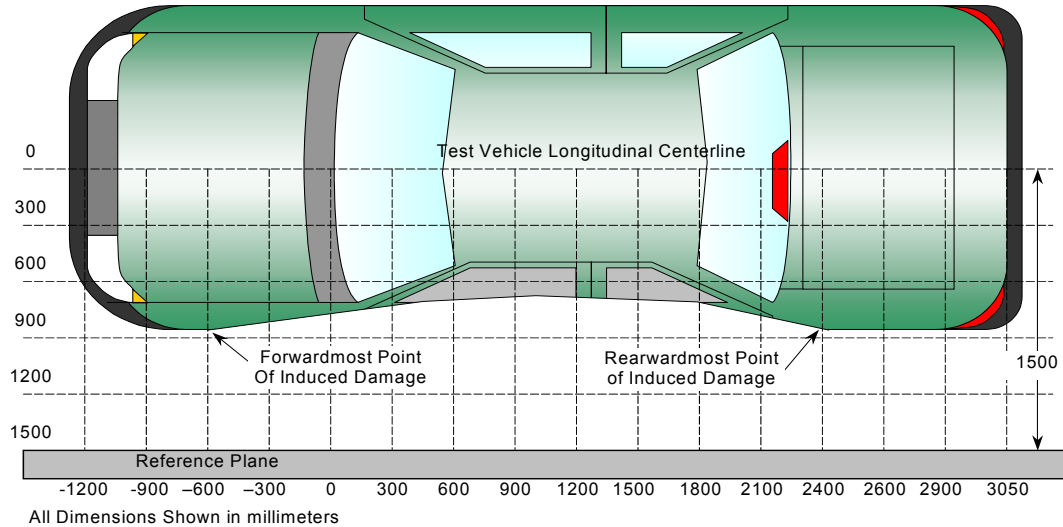
Test Date: August 8, 2001



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

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: August 8, 2001



TOP VIEW

Damag

e Profile Distances

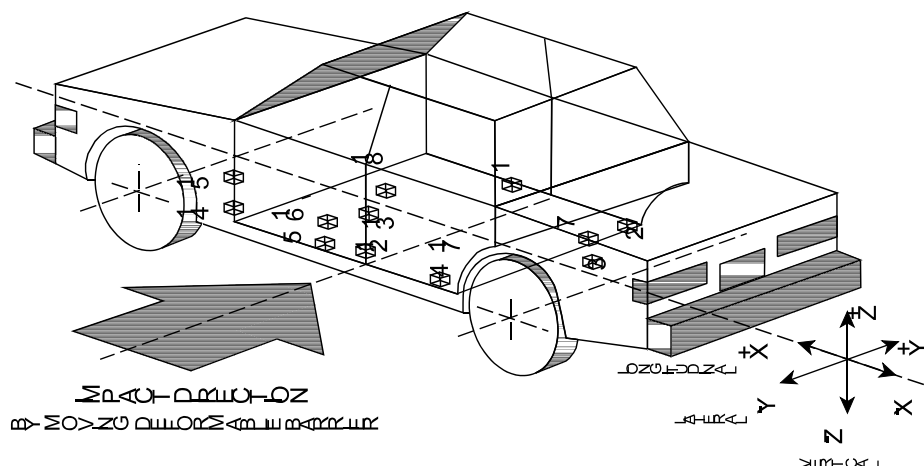
DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	1800 mm	3	383	482	99
2	1148 mm	3	328	478	150
3	480 mm	4	369	789	420
4	-458 mm	3	369	661	292
5	-1198 mm	3	317	456	139
6	-2100 mm	3	443	515	72

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: August 8, 2001



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 Rear Door @ Knee
17	Left Rear Door @ Pelvis
18	Child Seat @ Pelvis
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: August 8, 2001

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Long. (X) Maximums (g's) (CFC 60)		Lat.. (Y) Maximums (g's) (CFC 60)		Vert. (Z) Maximums (g's) (CFC 60)		Resultant (g's) (CFC 60)
		Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Max.
1	Right Side Sill at Front Seat	2.5	0.3	9.0	0.1	3.9	4.9	9.2
2	Right Side Sill at Rear Seat	2.8	0.5	10.3	0.0	3.8	1.4	11.2
3	Rear Floorpan Above Axle	3.5	2.4	8.6	0.2	4.9	5.0	9.9
4	Left Side Sill at Rear Door			19.5	0.6			
5	Left Side Sill at Front Door			24.2	3.6			
6	Left Lower B Post			103.8	7.0			
7	Left Mid B Post			79.6	10.0			
8	Left Upper B Post			**	**			
9	Left Lower A Post			19.1	15.7			
10	Left Mid A Post			8.6	1.8			
11	Driver Left Seat Track			92.1	23.7			
12	Vehicle CG	25.2	9.0	21.8	5.3	9.7	10.2	33.5
13	Left A Pillar @ Roof			**	**			
14	Left Front Door @ Pelvis			75.7	42.8			
15	Left Front Door @ Arm			78.2	22.9			
16	Left Rear Door @ Knee			40.8	41.9			
17	Left Rear Door @ Pelvis			38.6	15.2			
18	Child Seat @ Pelvis			20.5	0.2			
19	Left Driver Seat Frame			91.8	17.2			
20	Right Driver Seat Frame			86.5	28.1			
21	Lower Center Radiator Support	5.9	4.0	7.4	4.3	6.8	11.3	12.5

** Not used to avoid interference with the head curtain

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

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: August 8, 2001

VEHICLE ACCELEROMETER COORDINATES

Loc. No.	Description	Coordinates (mm)*		
		X	Y	Z
1	Right Side Sill at Front Seat	2475	692	226
2	Right Side Sill at Rear Seat	1601	692	227
3	Rear Floorpan Above Axle	1130	0	479
4	Left Side Sill at Rear Door	1881	-655	232
5	Left Side Sill at Front Door	2763	-655	228
6	Left Lower B Post	2142	-667	335
7	Left Mid B Post	2180	-725	904
8	Left Upper B Post	**	**	**
9	Left Lower A Post	3152	-716	448
10	Left Mid A Post	3186	-726	962
11	Driver Left Seat Track	2312	-571	333
12	Vehicle CG	2512	0	378
13	Left A Pillar @ Roof	**	**	**
14	Left Front Door @ Pelvis	2452	-750	580
15	Left Front Door @ Arm	2582	-752	880
16	Left Rear Door @ Knee	1719	-762	753
17	Left Rear Door @ Pelvis	1424	-744	802
18	Child Seat @ Pelvis	NR	NR	NR
19	Left Driver Seat Frame	2180	-577	657
20	Right Driver Seat Frame	2180	-168	657
21	Lower Center Radiator Support	4385	-15	216

Reference Points X - Rear Bumper (+ Forward)
 Y - Vehicle Centerline (+ to right)
 Z - Ground Level (+ up)

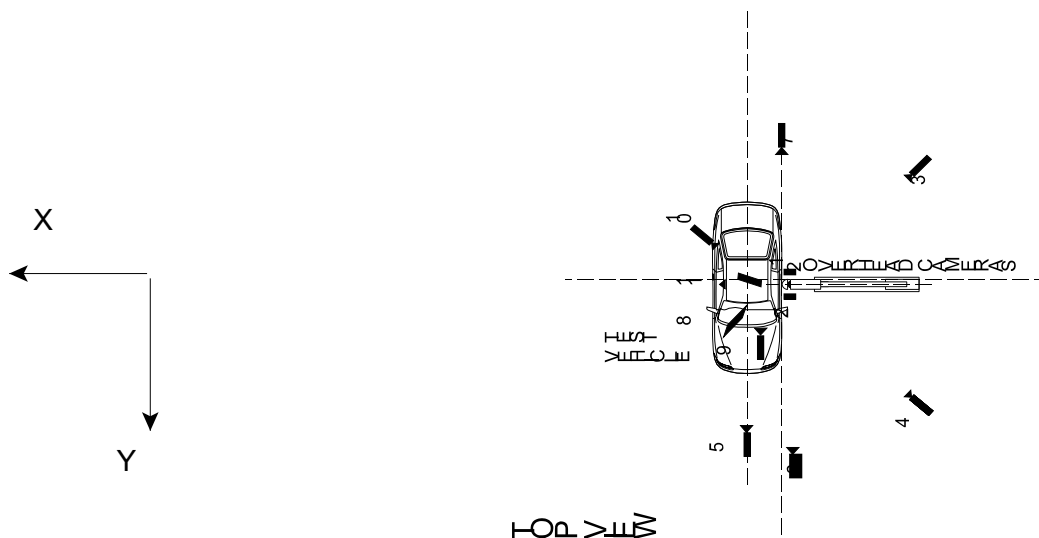
** Not used to avoid interference with the head curtain

NR - Not recorded

DATA SHEET NO. 11
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2001/Saturn/L200/4 door

Test Date: August 8, 2001



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	-580	0	5140	7.5	1010
2	Overhead Close-up	0	0	5140	13	1000
3	Left Side 45° Rearward Pole View	-4500	-7500	1490	50	1053
4	Left Side 45° Forward Pole View	-4150	6850	1460	50	1010
5	Real Time				13	32
6	Front Ground Level Vehicle/Pole Impact	-740	8540	1700	25	610
7	Rear Ground Level Vehicle/Pole Impact	770	-8510	1520	25	995
8	Test Vehicle Onboard Driver Hip				13	526
9	Test Vehicle Onboard Hood				13	226
10	Test Vehicle Onboard Driver Head Contact				13	336
11	Test Vehicle Onboard Child Dummies				8	303

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

**APPENDIX A
PHOTOGRAPHS**

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Photo No. A-2 - Post-Test Front View of Test Vehicle



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



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

A-5

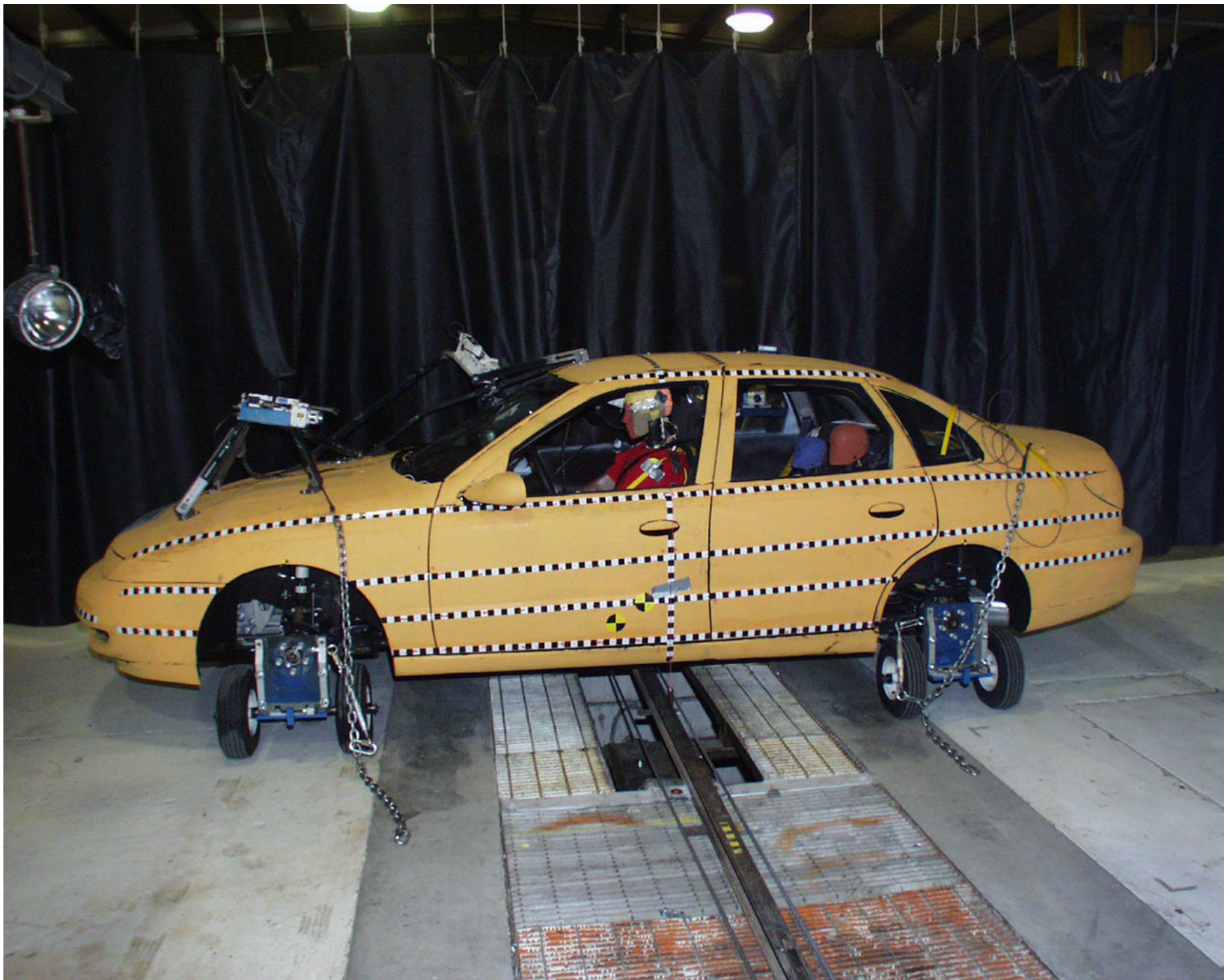


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle



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

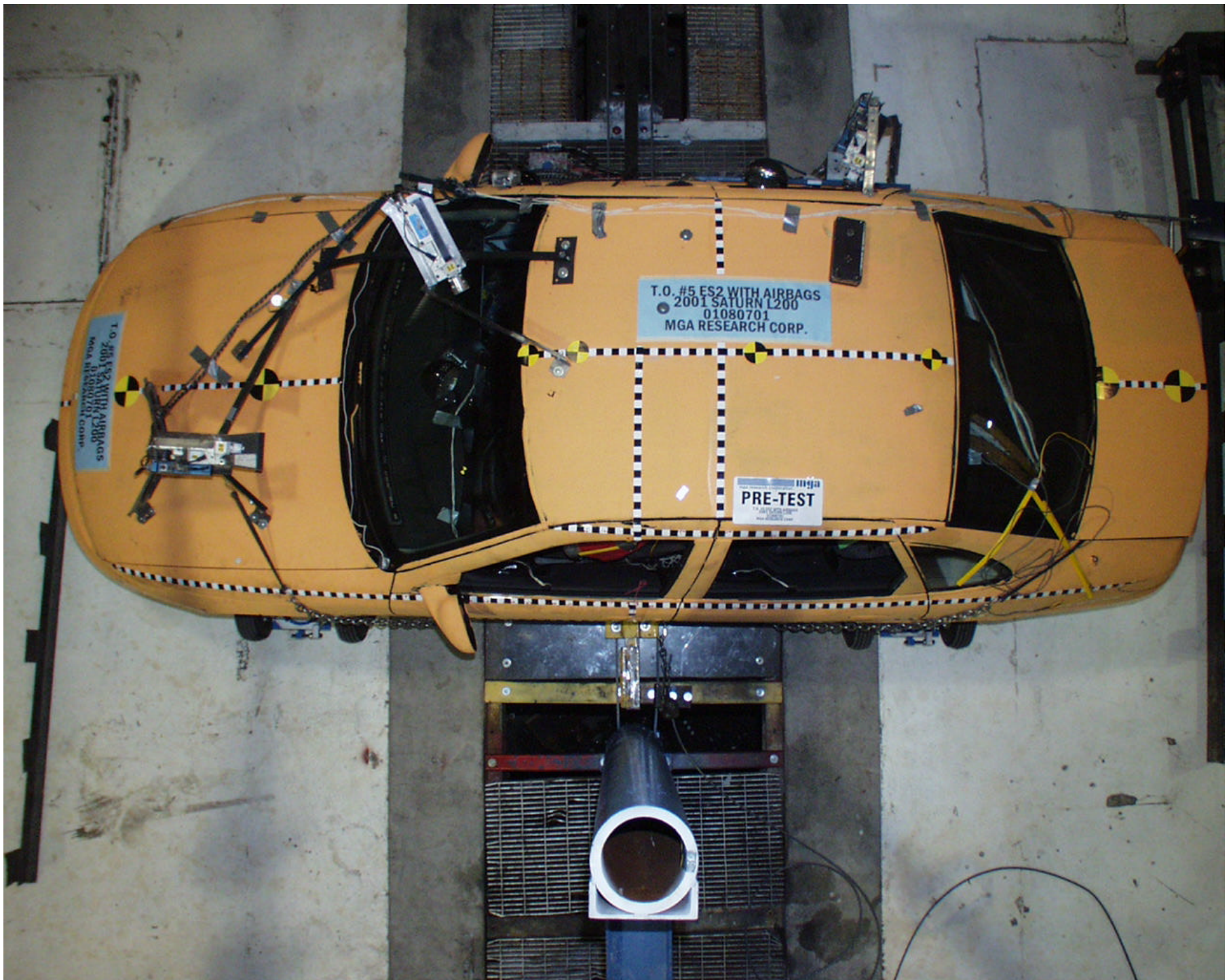


Photo No. A-9 - Pre-Test Overhead View

A-10

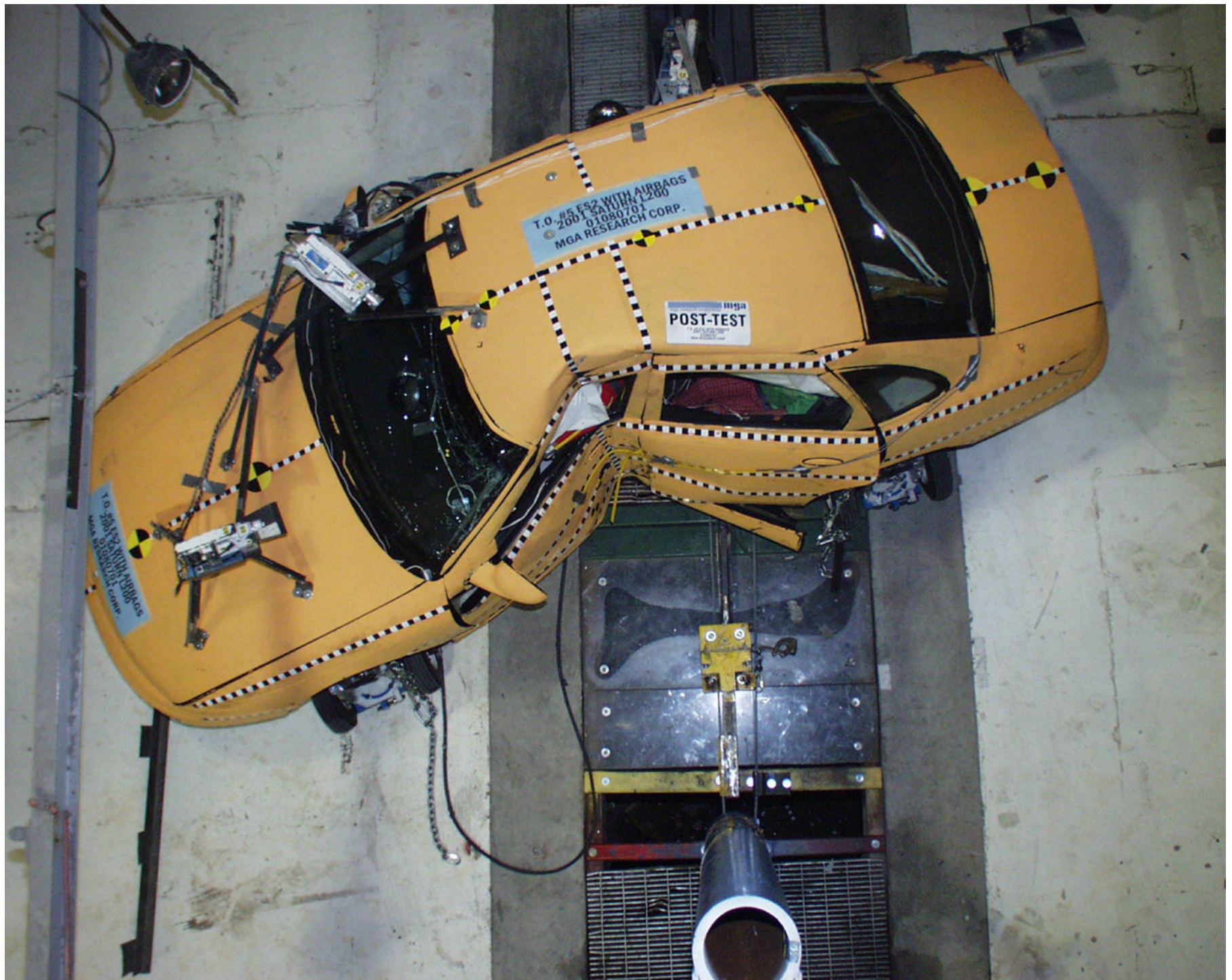


Photo No. A-10 - Post-Test Overhead View

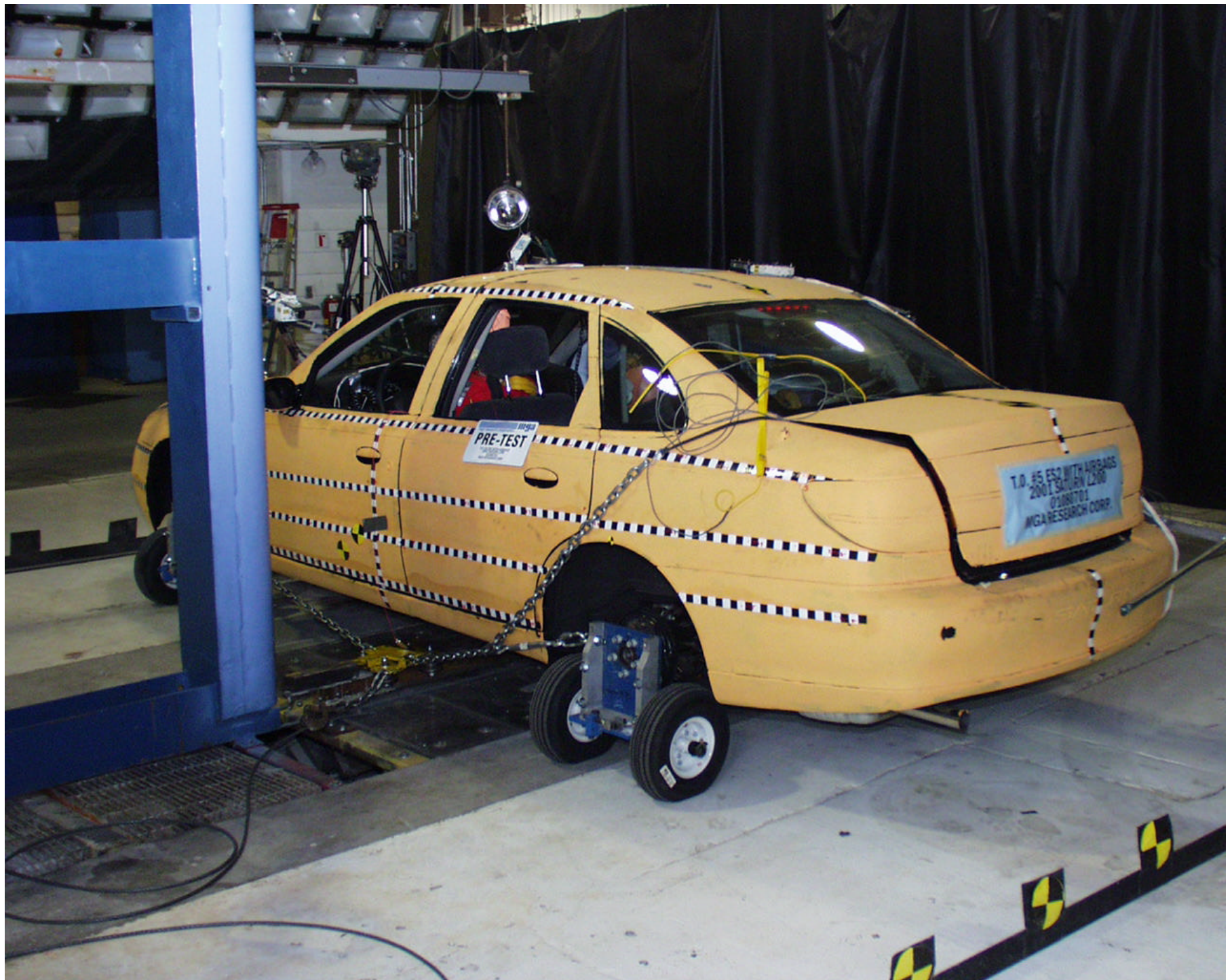


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Photo No. A-13 - Pre-Test Driver Dummy Right Side View

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Photo No. A-14 - Post-Test Driver Dummy Right Side View

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Photo No. A-15 - Pre-Test Driver Dummy Left Side View

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



Photo No. A-17 - Pre-Test Driver Dummy Left Side View (Door Open)



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Photo No. A-19 - Post-Test Driver Dummy Shoulder and Door Top View

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Photo No. A-22 - Pre-Test Left Rear Passenger Dummy Right Side View



Photo No. A-23 - Post-Test Left Rear Passenger Dummy Right Side View



Photo No. A-24 - Pre-Test Rear Passenger Dummies Left Side View (Door Open)



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Photo No. A-32 - Post-Test Left Rear Passenger Dummy Contact

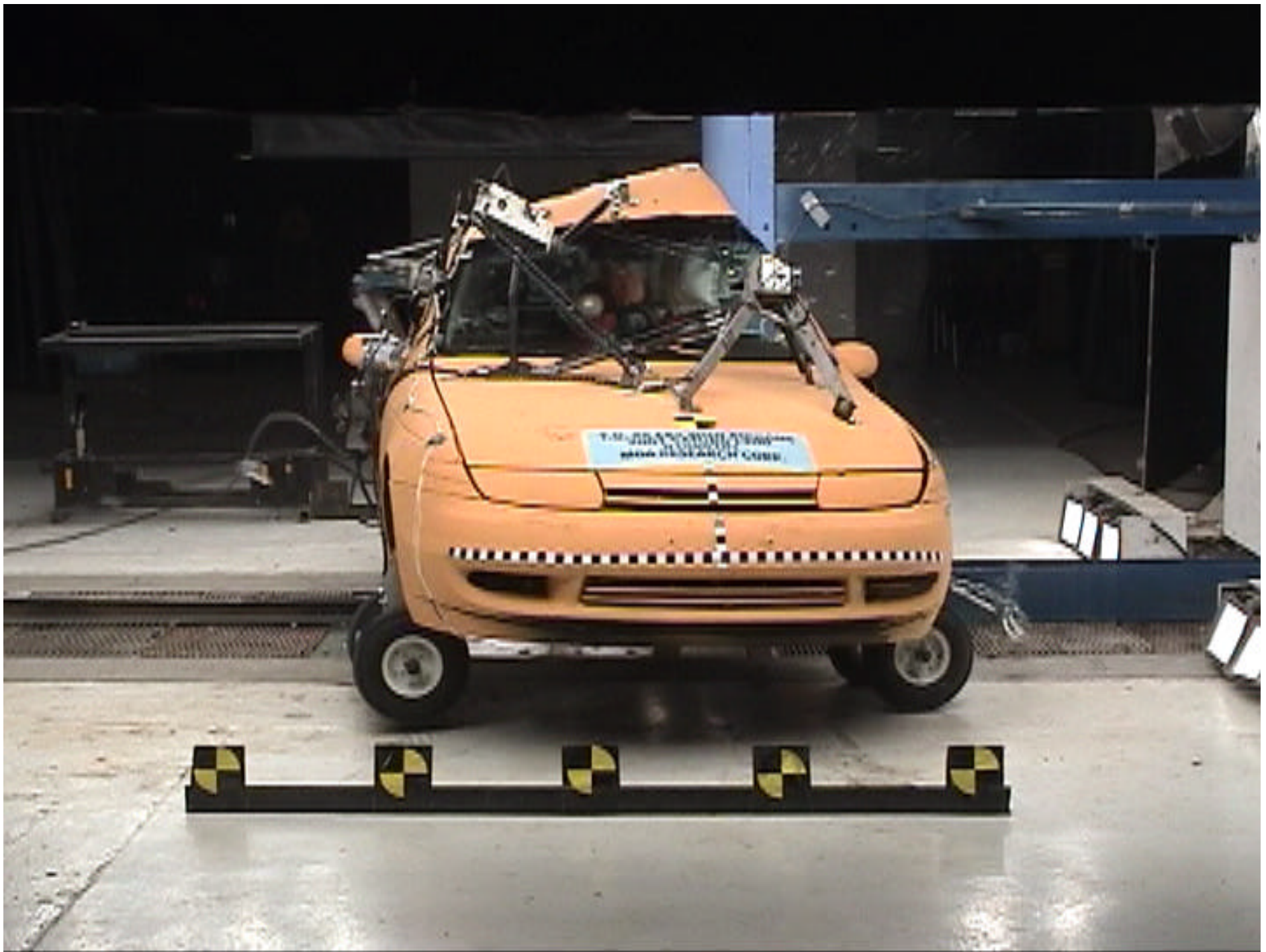


Photo No. A-33 – Impact

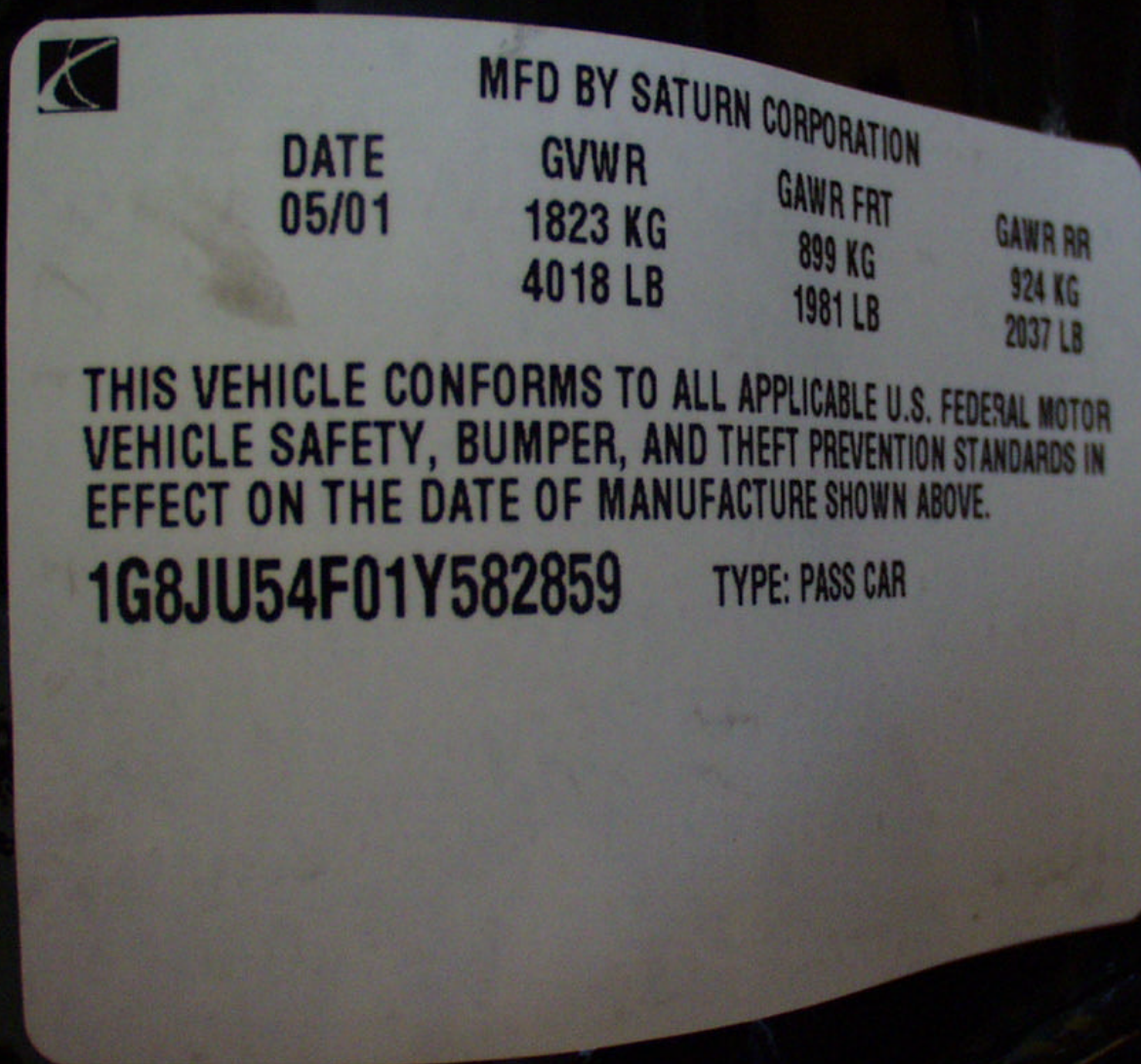


Photo No. A-34 - Vehicle Certification

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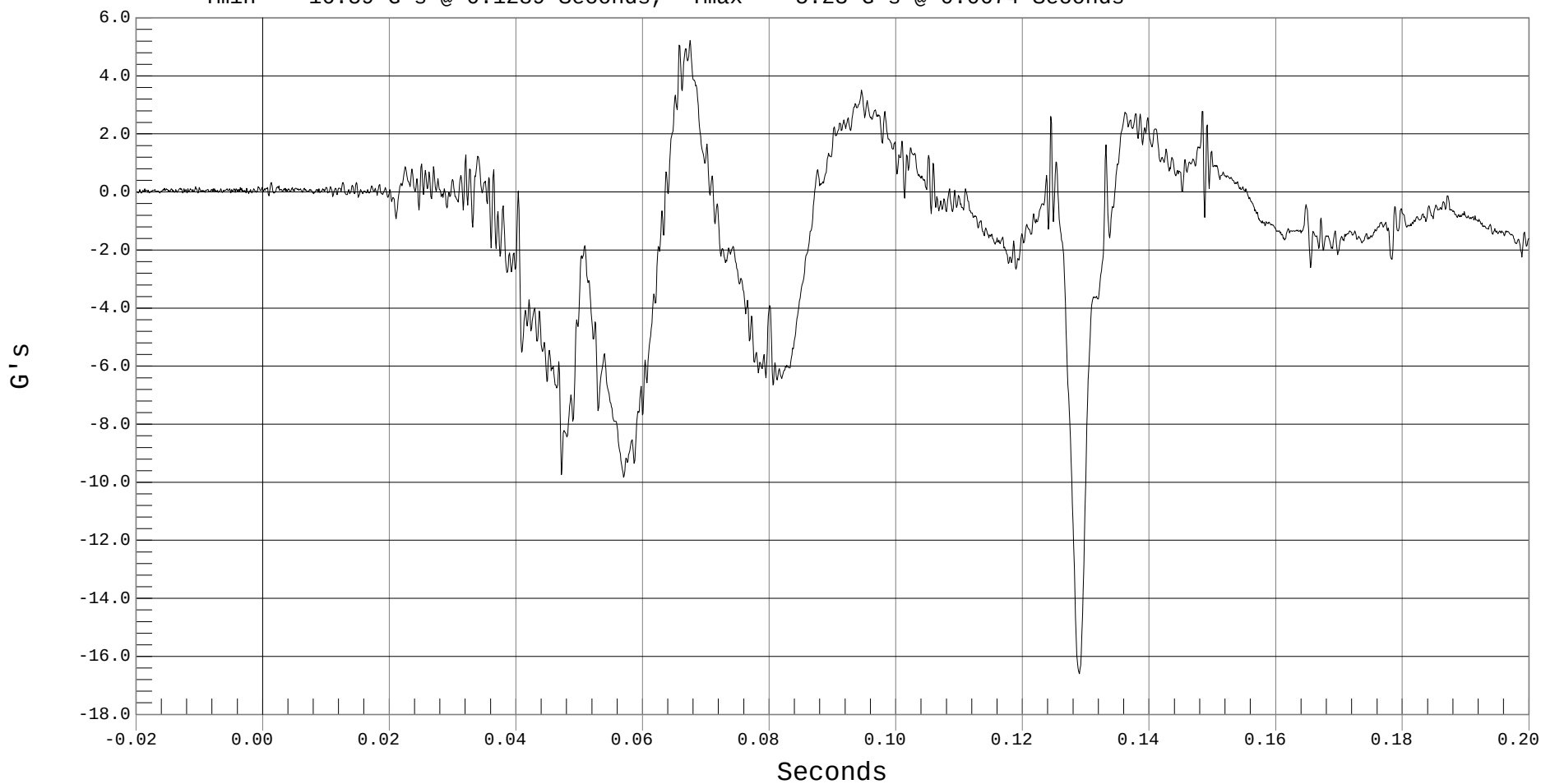
DRIVER HEAD X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

1 DRIVER HEAD X, B01085AT.A01

Ymin = -16.59 G's @ 0.1289 Seconds, Ymax = 5.23 G's @ 0.0674 Seconds





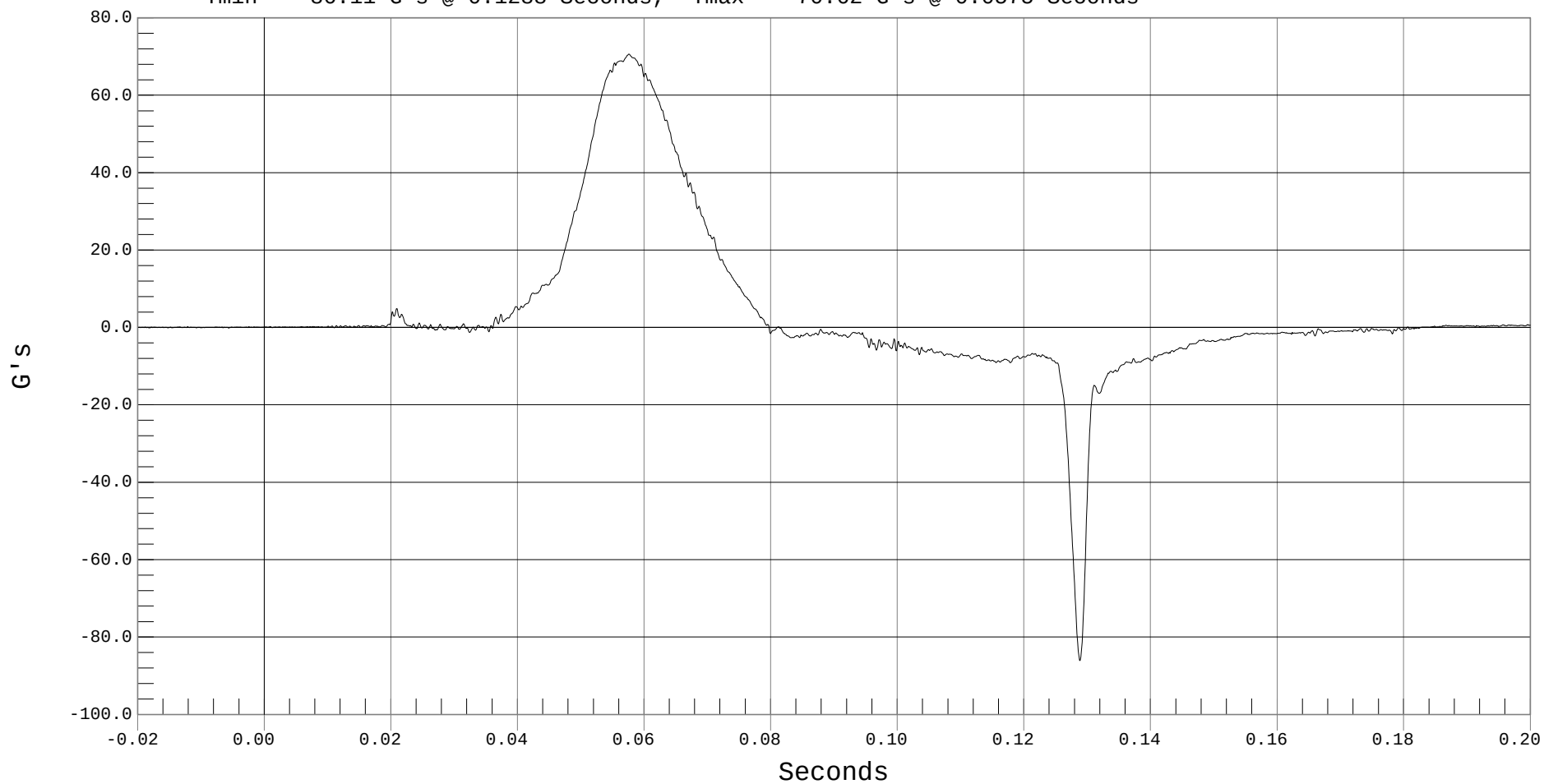
DRIVER HEAD Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

1 DRIVER HEAD Y, B01085AT.A02

Ymin = -86.11 G's @ 0.1288 Seconds, Ymax = 70.62 G's @ 0.0575 Seconds





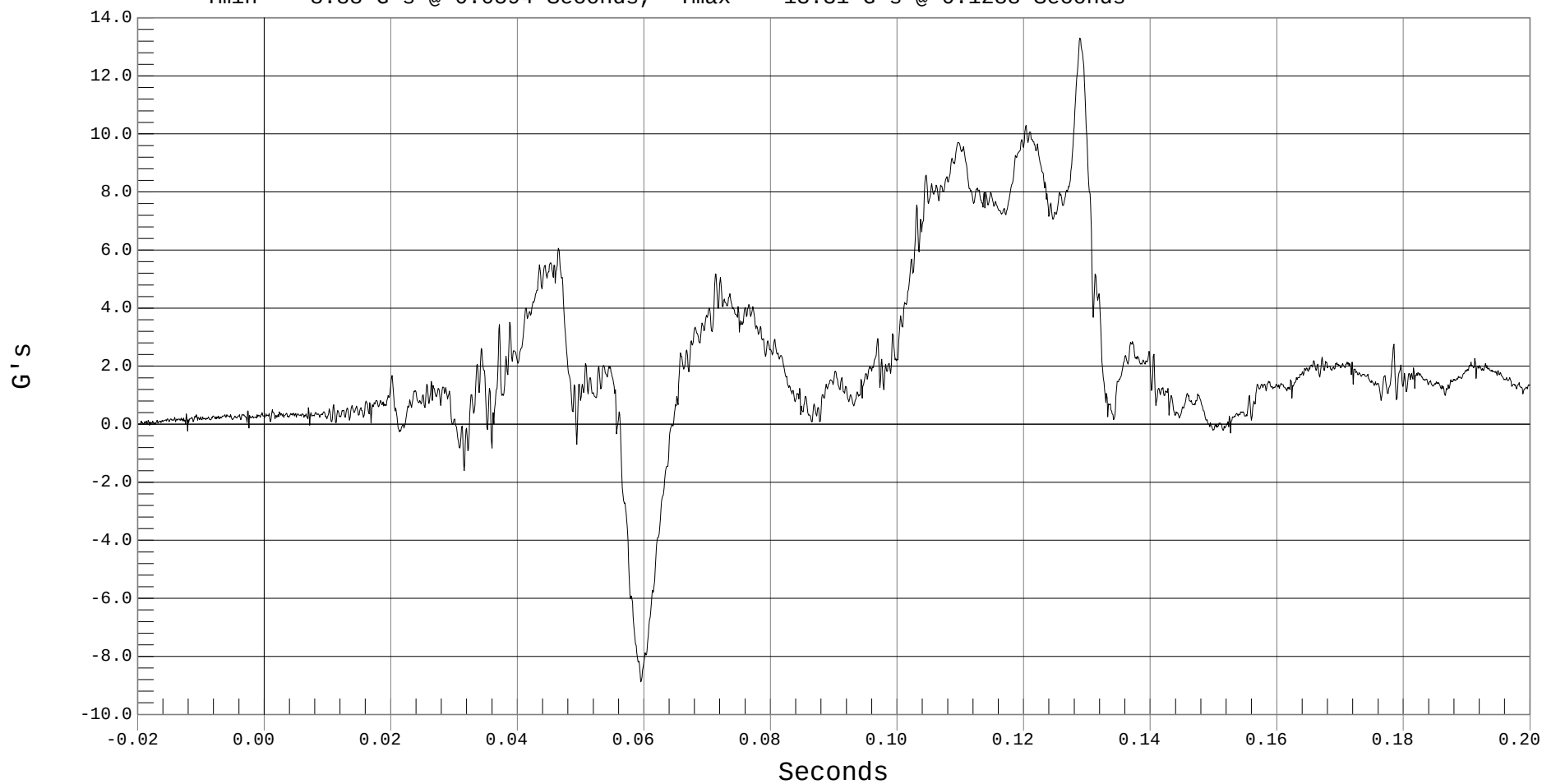
DRIVER HEAD Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER HEAD Z, B01085AT.A03

Ymin = -8.88 G's @ 0.0594 Seconds, Ymax = 13.31 G's @ 0.1288 Seconds





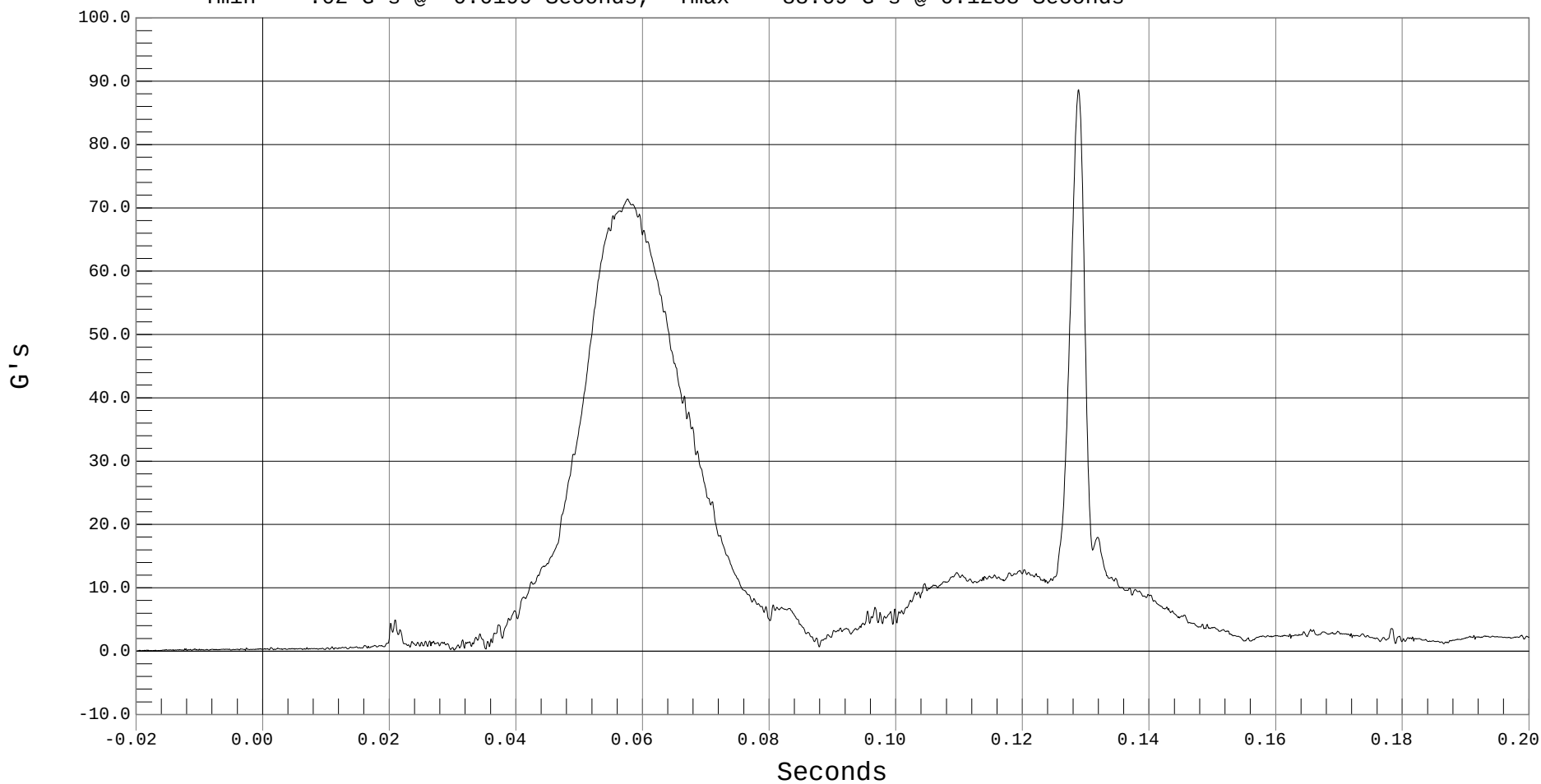
DRIVER HEAD RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER HEAD RESULTANT RESULTANT, B01085AV.A01

Ymin = .02 G's @ -0.0199 Seconds, Ymax = 88.69 G's @ 0.1288 Seconds





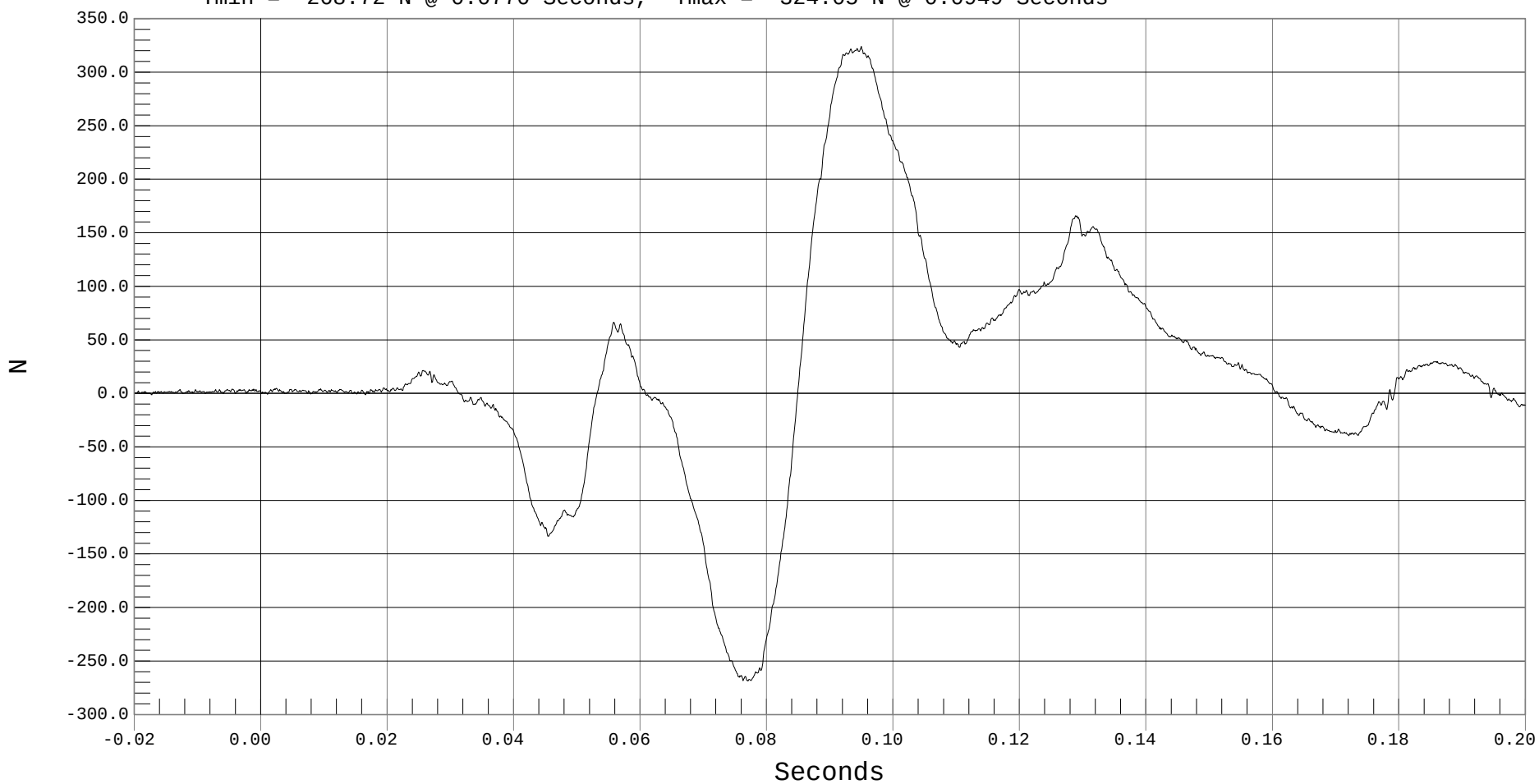
DRIVER UPPER NECK FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

1 DRIVER UPPER NECK FORCE X, B01085FT.F04

Ymin = -268.72 N @ 0.0770 Seconds, Ymax = 324.05 N @ 0.0949 Seconds





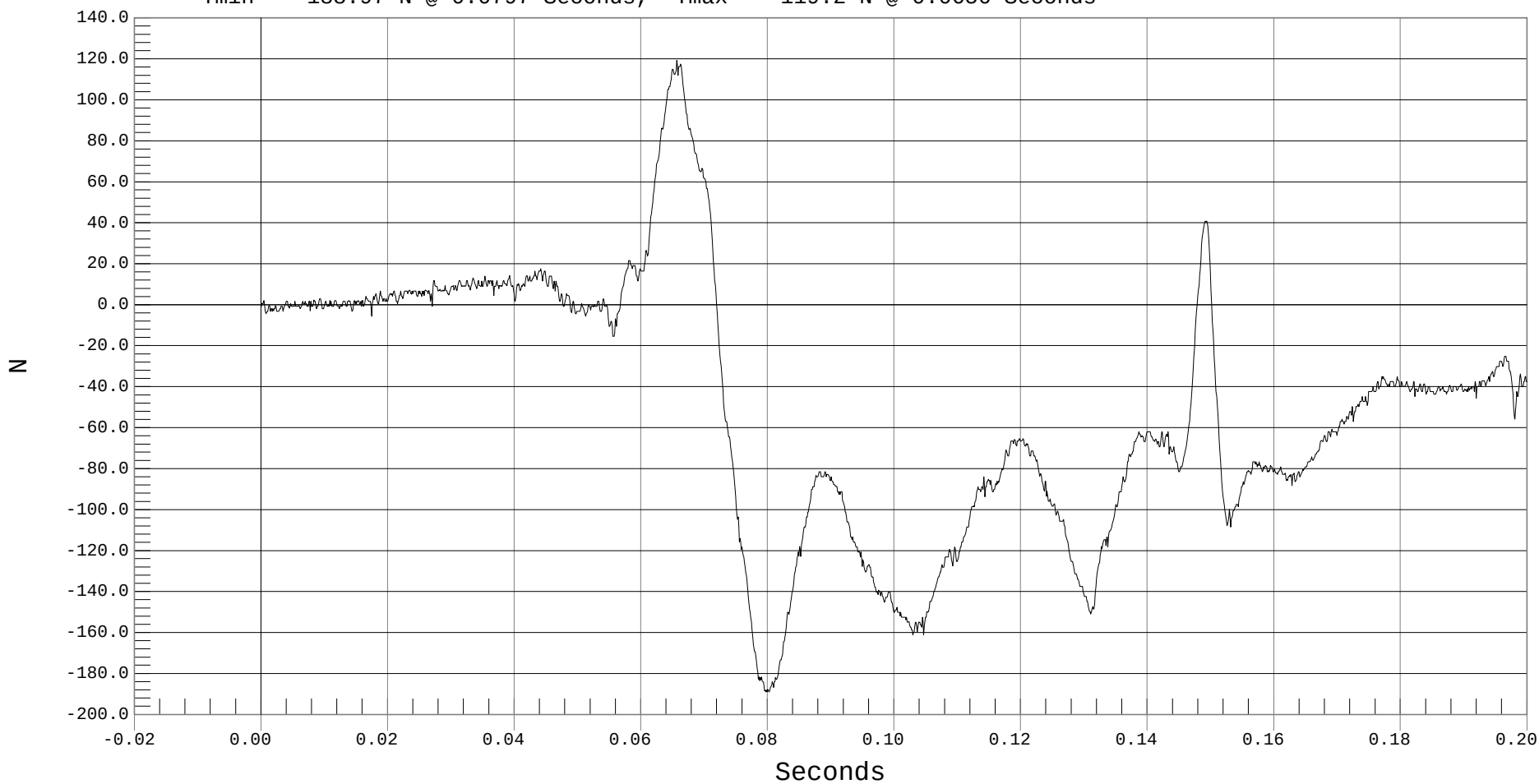
DRIVER UPPER NECK FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE Y, B01085FT.F05

Ymin = -188.97 N @ 0.0797 Seconds, Ymax = 119.2 N @ 0.0656 Seconds





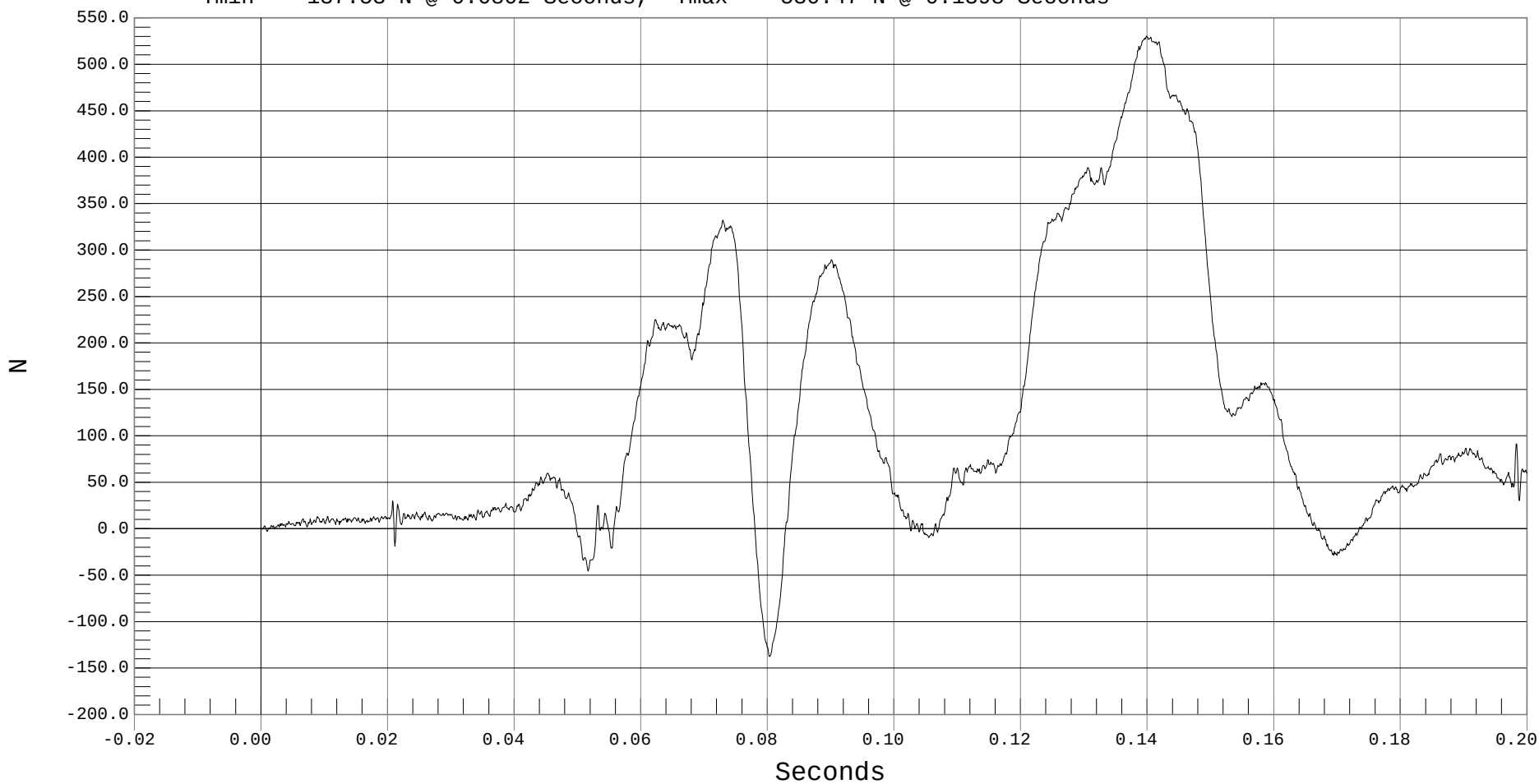
DRIVER UPPER NECK FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE Z, B01085FT.F06

Ymin = -137.53 N @ 0.0802 Seconds, Ymax = 530.47 N @ 0.1398 Seconds





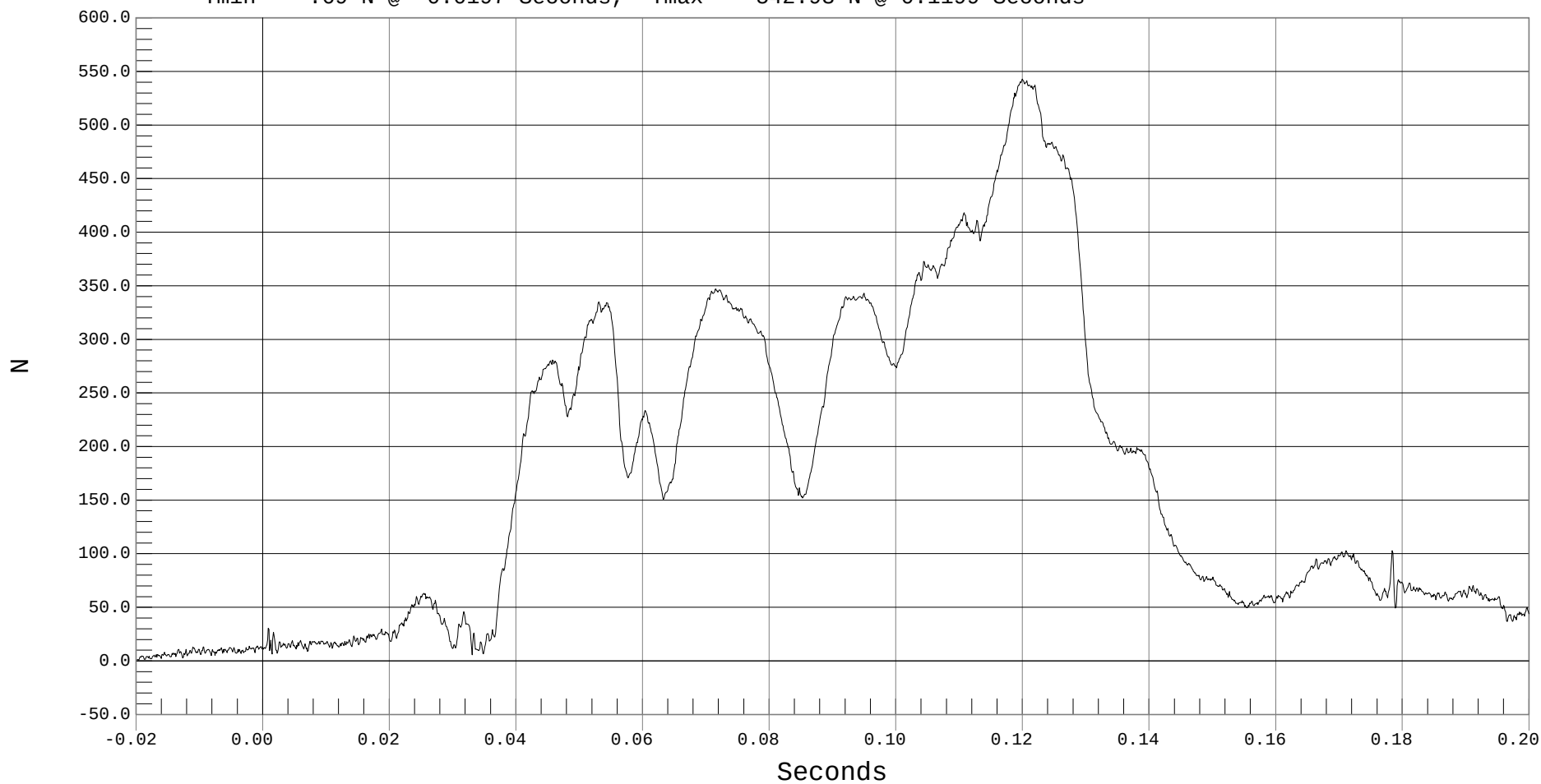
DRIVER UPPER NECK FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE RESULTANT, B01085FV.F04

Ymin = .69 N @ -0.0197 Seconds, Ymax = 542.93 N @ 0.1199 Seconds





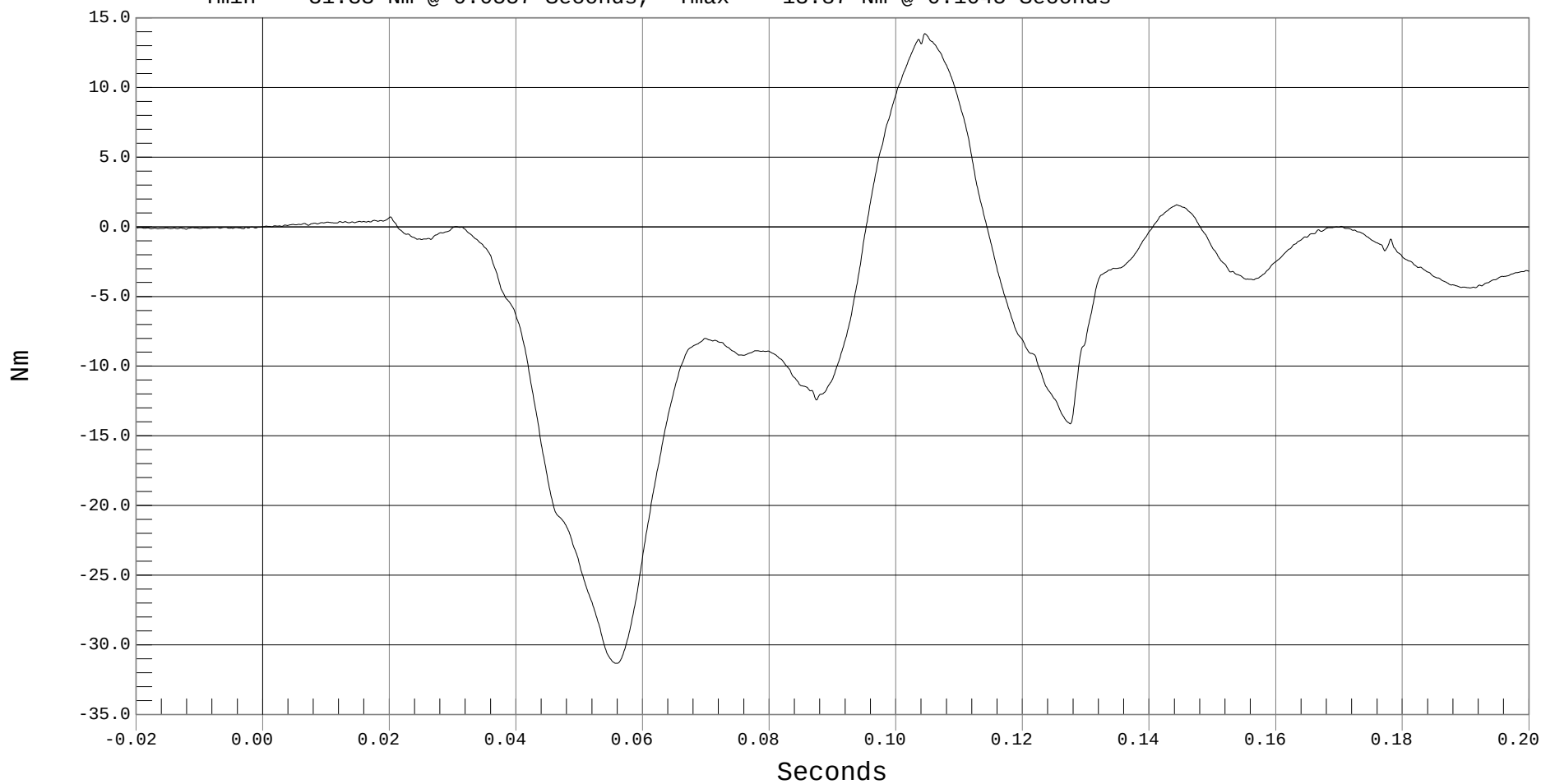
DRIVER UPPER NECK MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

1 DRIVER UPPER NECK MOMENT X, B01085MF.M07

Ymin = -31.33 Nm @ 0.0557 Seconds, Ymax = 13.87 Nm @ 0.1045 Seconds





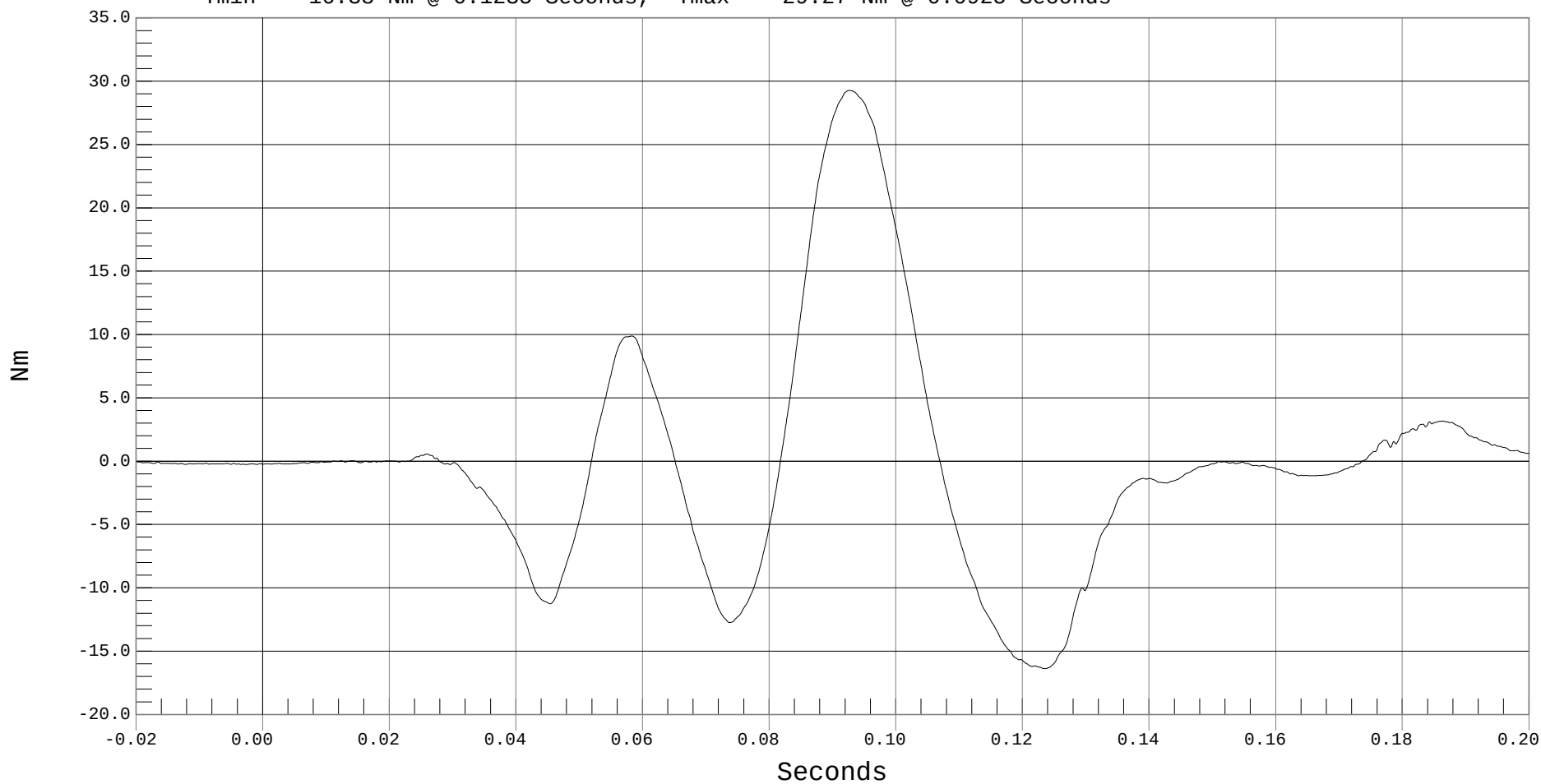
DRIVER UPPER NECK MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT Y, B01085MF.M08

Ymin = -16.38 Nm @ 0.1235 Seconds, Ymax = 29.27 Nm @ 0.0925 Seconds





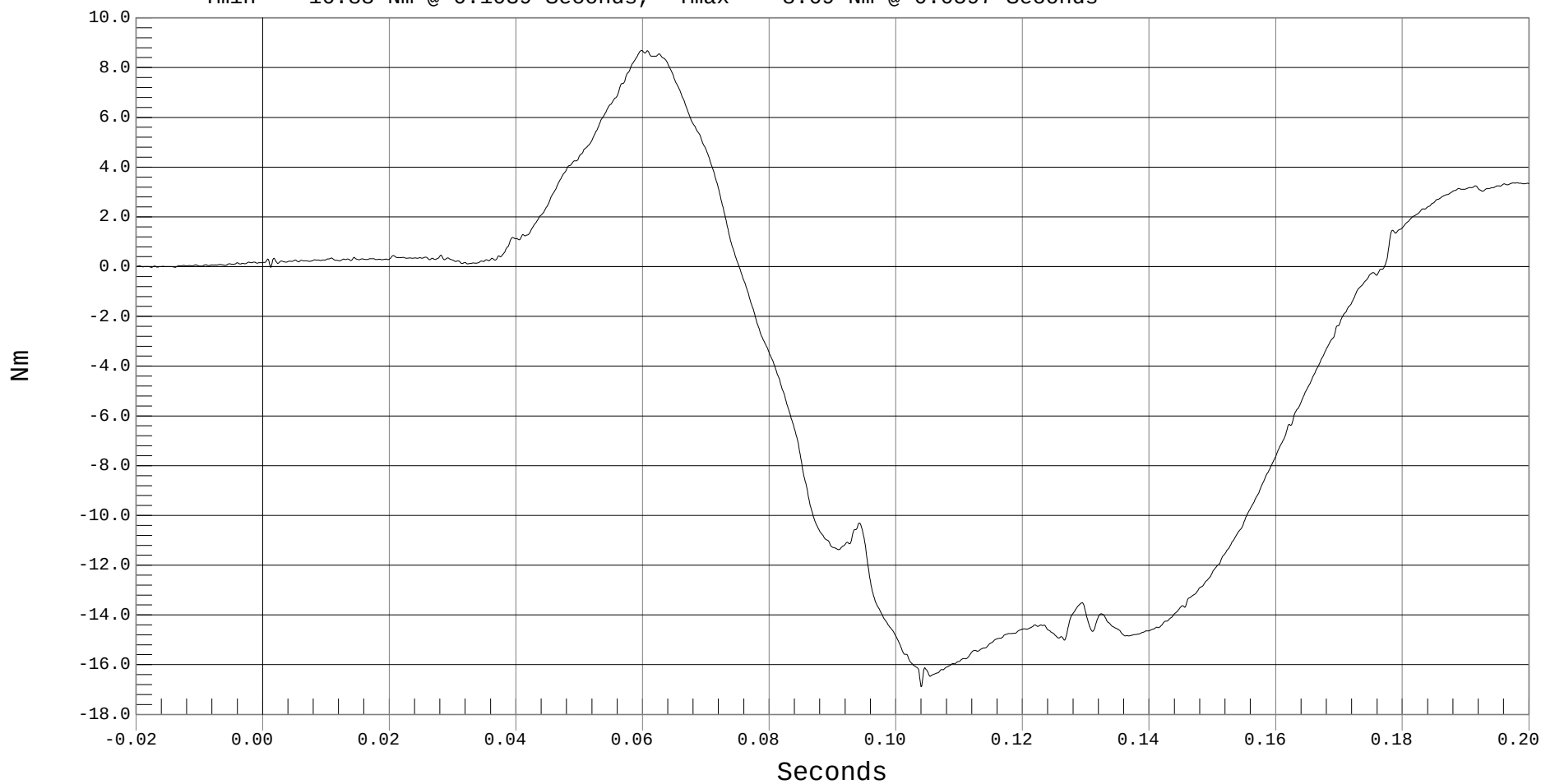
DRIVER UPPER NECK MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT Z, B01085MF.M09

Ymin = -16.88 Nm @ 0.1039 Seconds, Ymax = 8.69 Nm @ 0.0597 Seconds





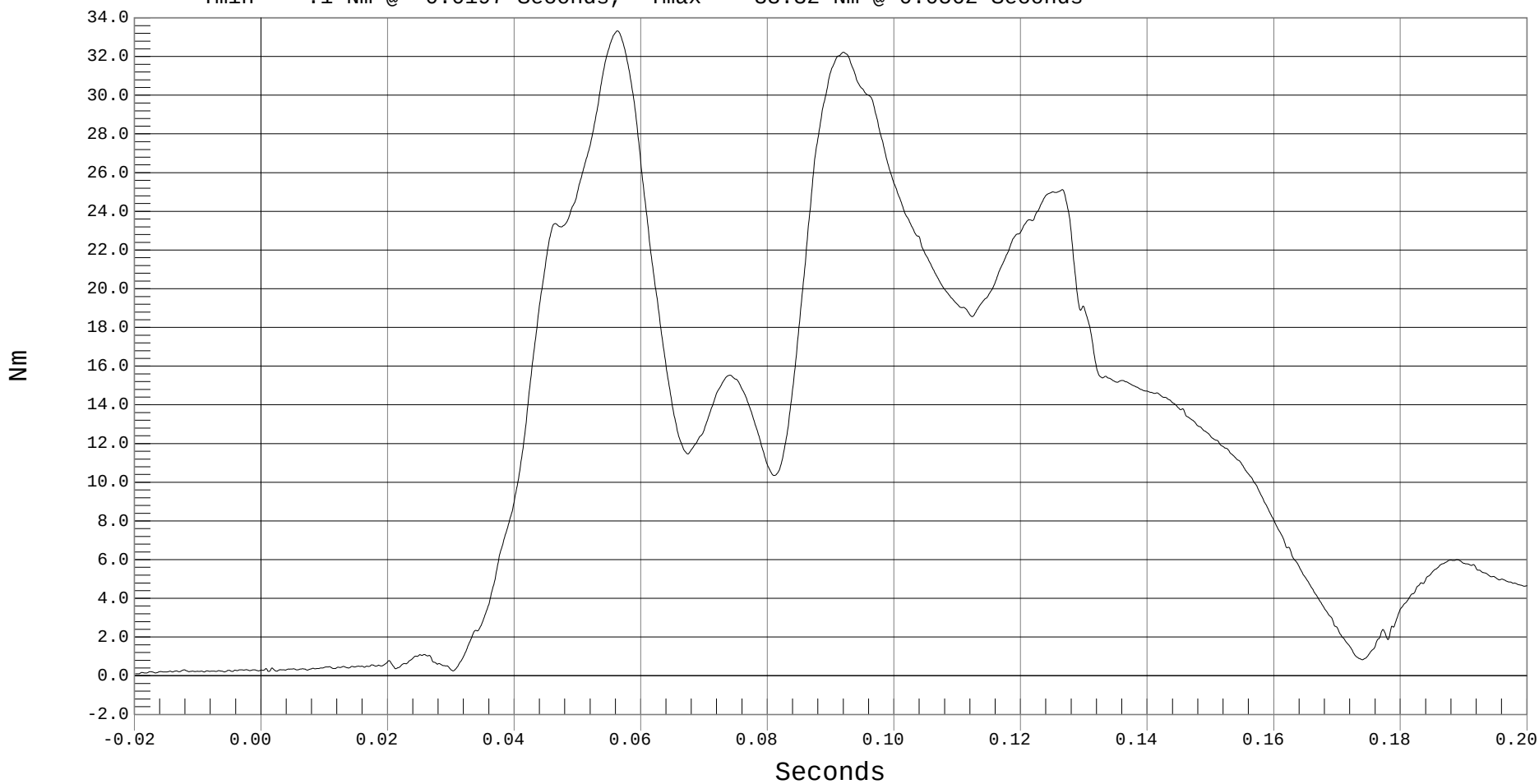
DRIVER UPPER NECK MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

1 DRIVER UPPER NECK MOMENT RESULTANT, B01085MV.M07

Ymin = .1 Nm @ -0.0197 Seconds, Ymax = 33.32 Nm @ 0.0562 Seconds





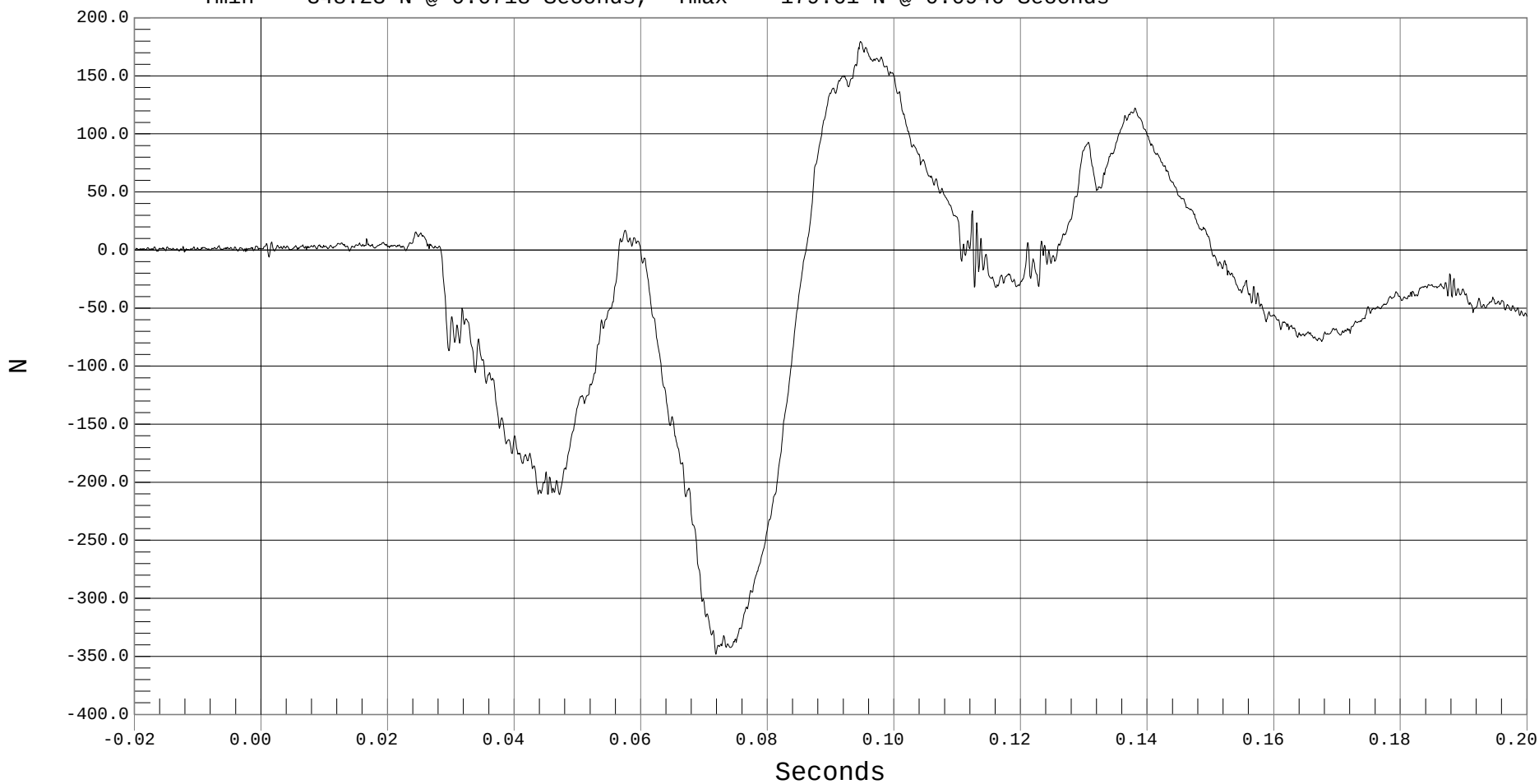
DRIVER LOWER NECK FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE X, B01085FT.F10

Ymin = -348.23 N @ 0.0718 Seconds, Ymax = 179.61 N @ 0.0946 Seconds





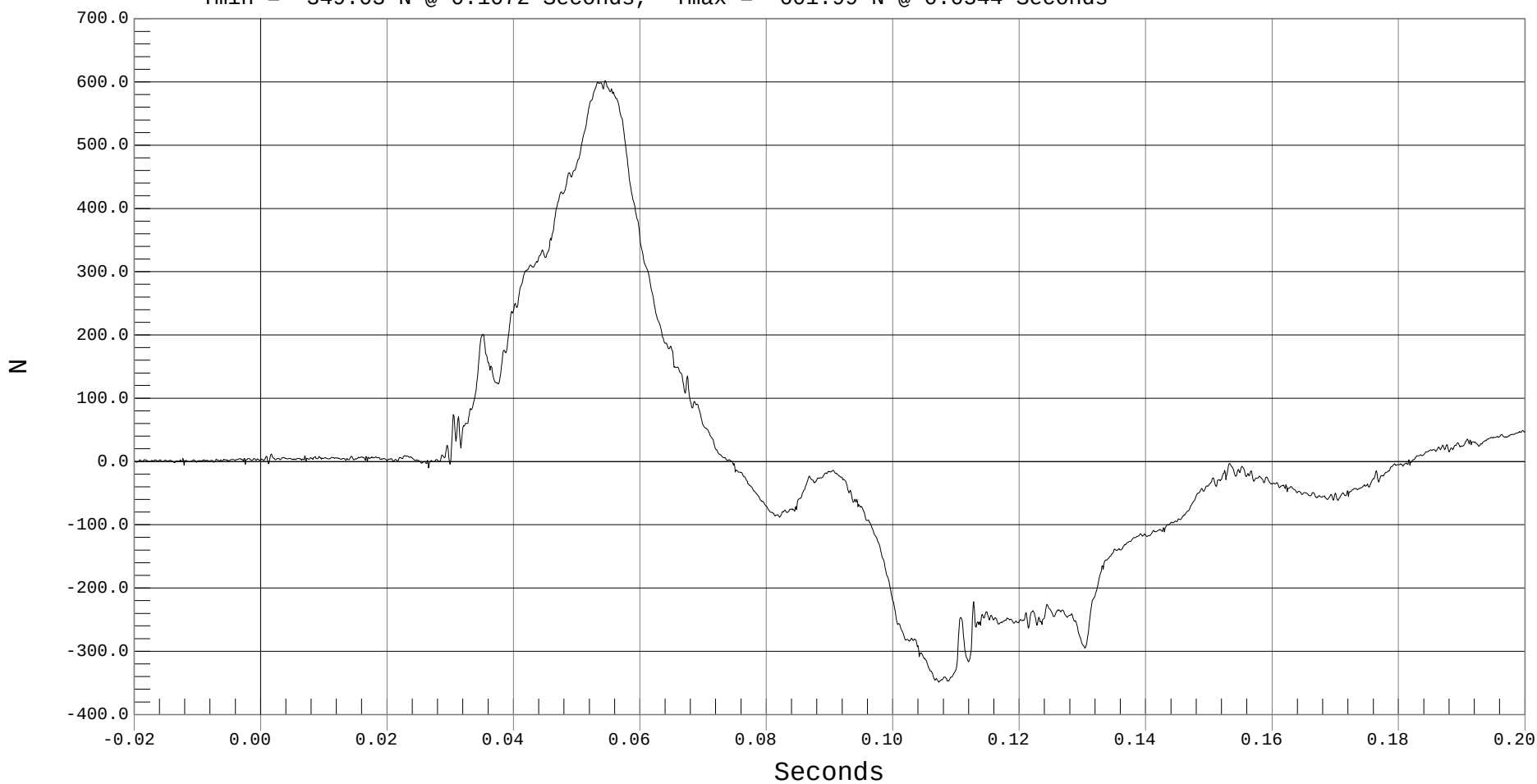
DRIVER LOWER NECK FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

1 DRIVER LOWER NECK FORCE Y, B01085FT.F11

Ymin = -349.03 N @ 0.1072 Seconds, Ymax = 601.99 N @ 0.0544 Seconds





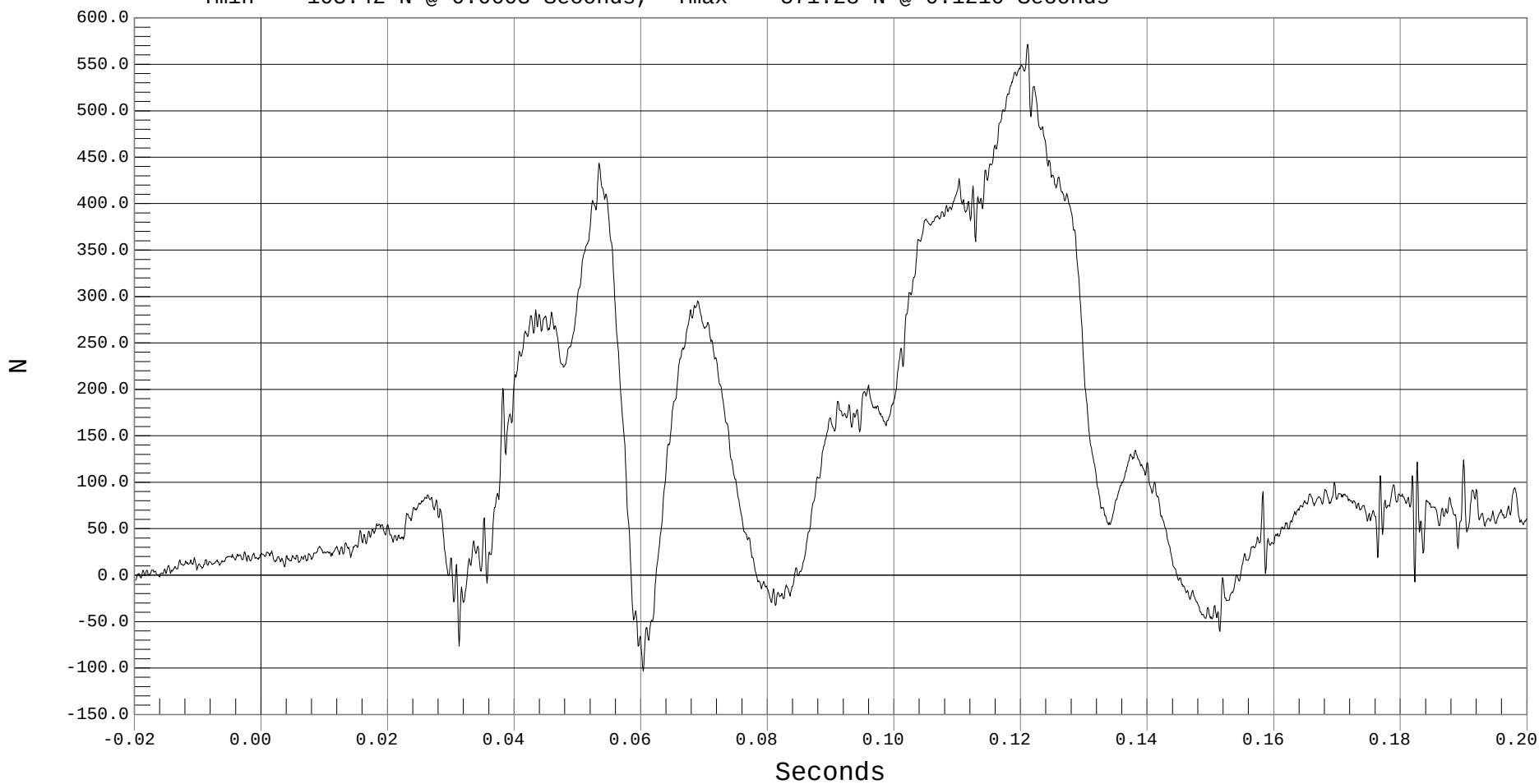
DRIVER LOWER NECK FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE Z, B01085FT.F12

Ymin = -103.42 N @ 0.0603 Seconds, Ymax = 571.28 N @ 0.1210 Seconds





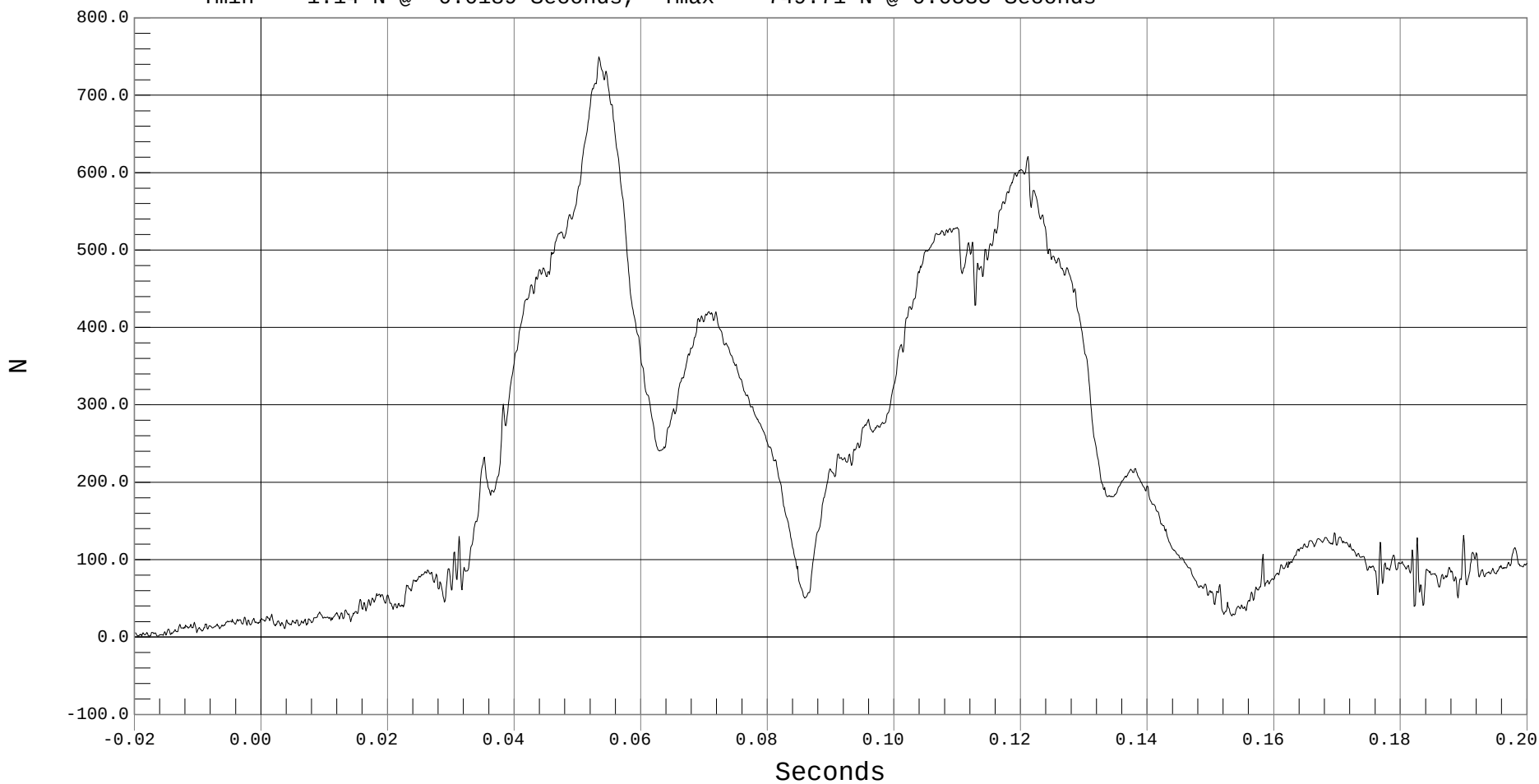
DRIVER LOWER NECK FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE RESULTANT, B01085FV.F10

Ymin = 1.14 N @ -0.0189 Seconds, Ymax = 749.71 N @ 0.0533 Seconds





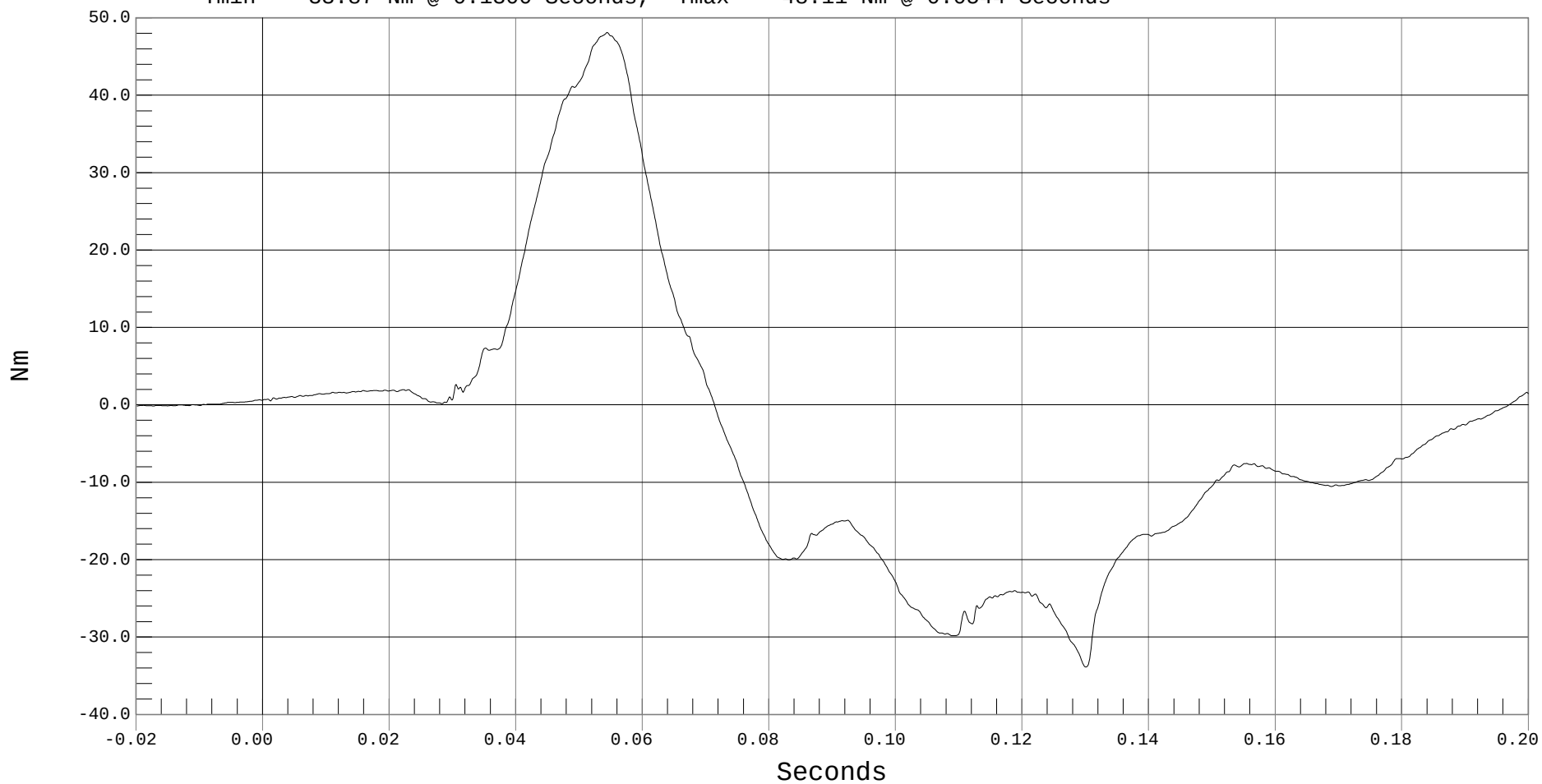
DRIVER LOWER NECK MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT X, B01085MF.M13

Ymin = -33.87 Nm @ 0.1300 Seconds, Ymax = 48.11 Nm @ 0.0544 Seconds





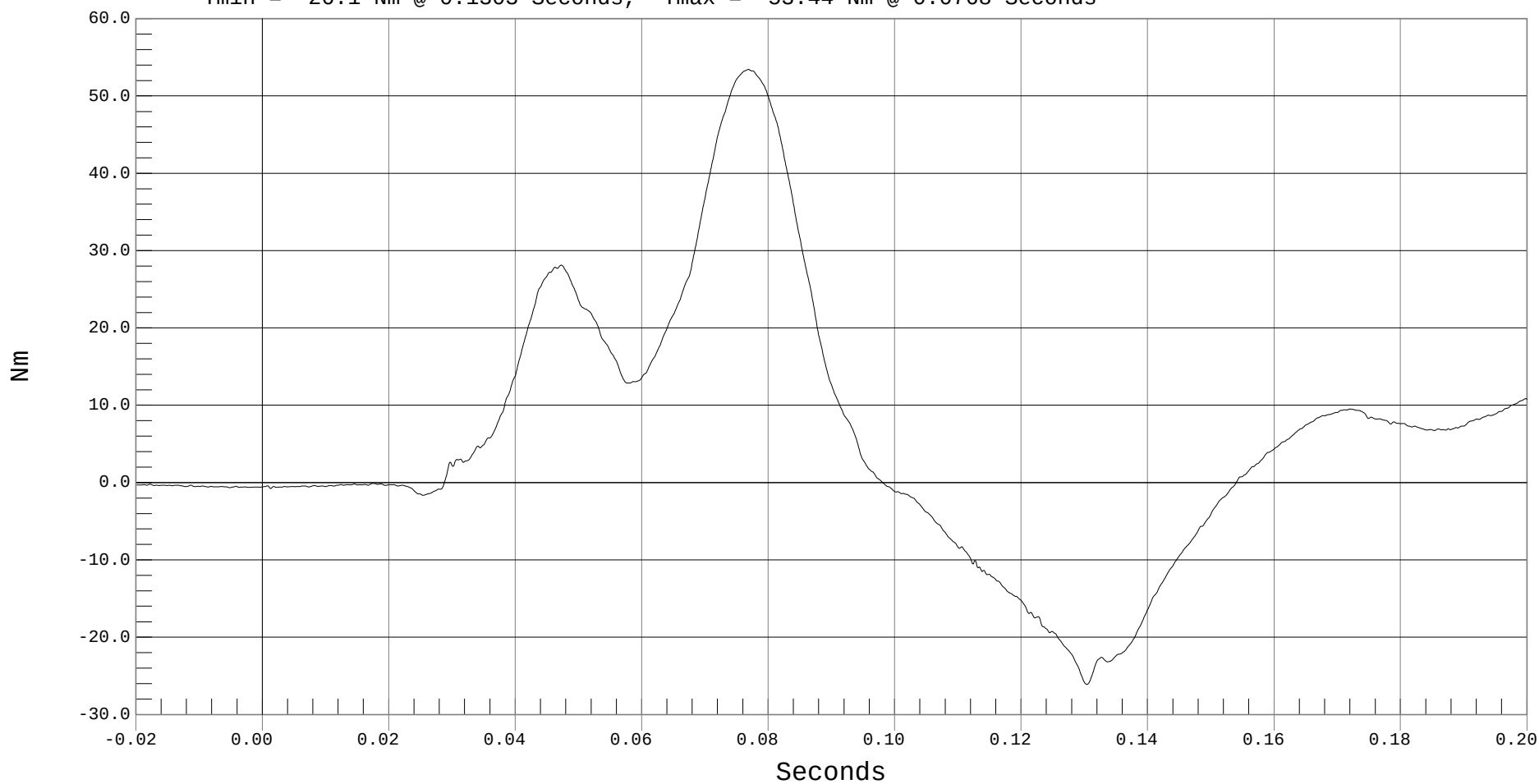
DRIVER LOWER NECK MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT Y, B01085MF.M14

Ymin = -26.1 Nm @ 0.1303 Seconds, Ymax = 53.44 Nm @ 0.0768 Seconds





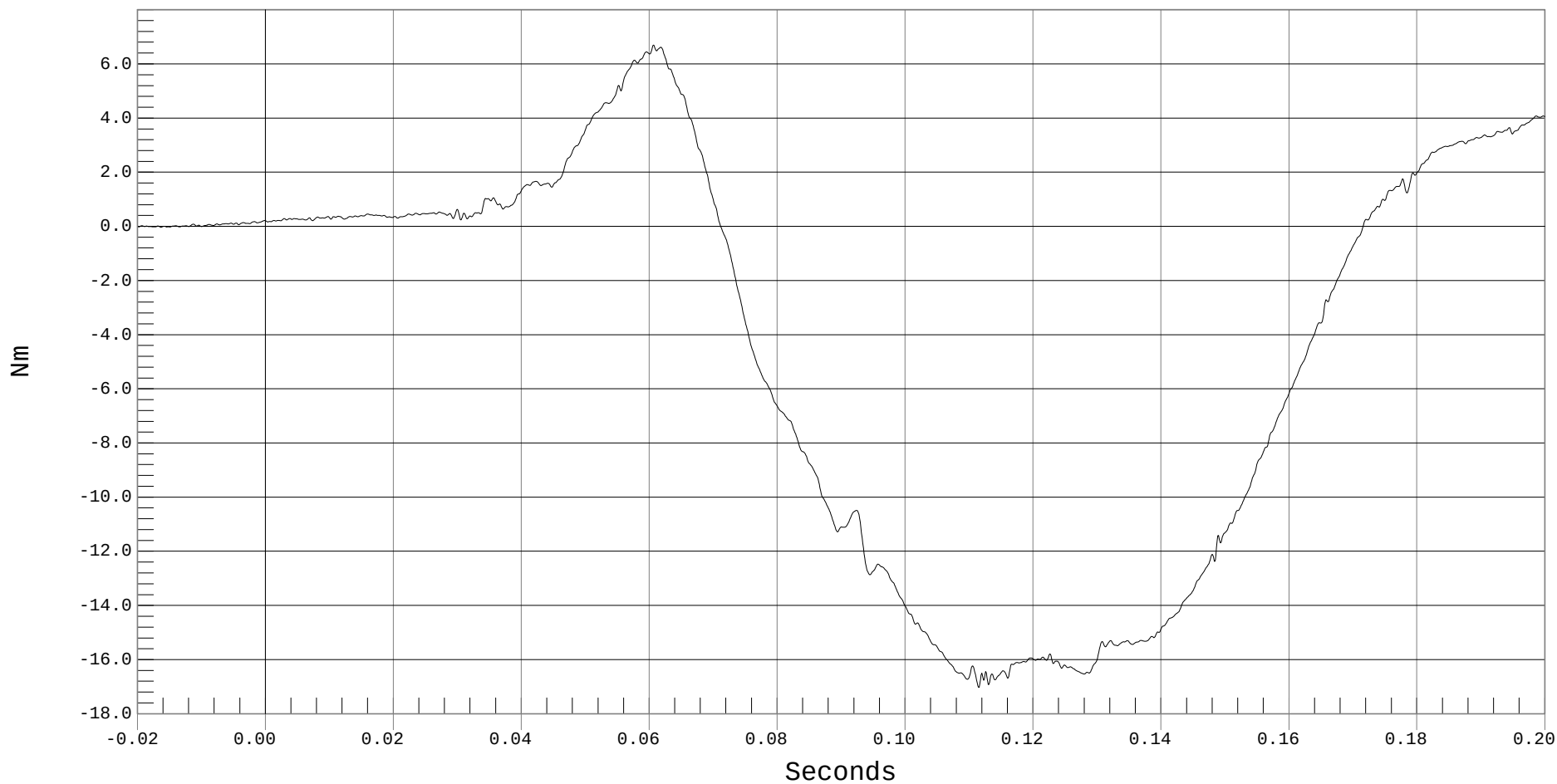
DRIVER LOWER NECK MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT Z, B01085MF.M15

Ymin = -17.04 Nm @ 0.1114 Seconds, Ymax = 6.7 Nm @ 0.0606 Seconds





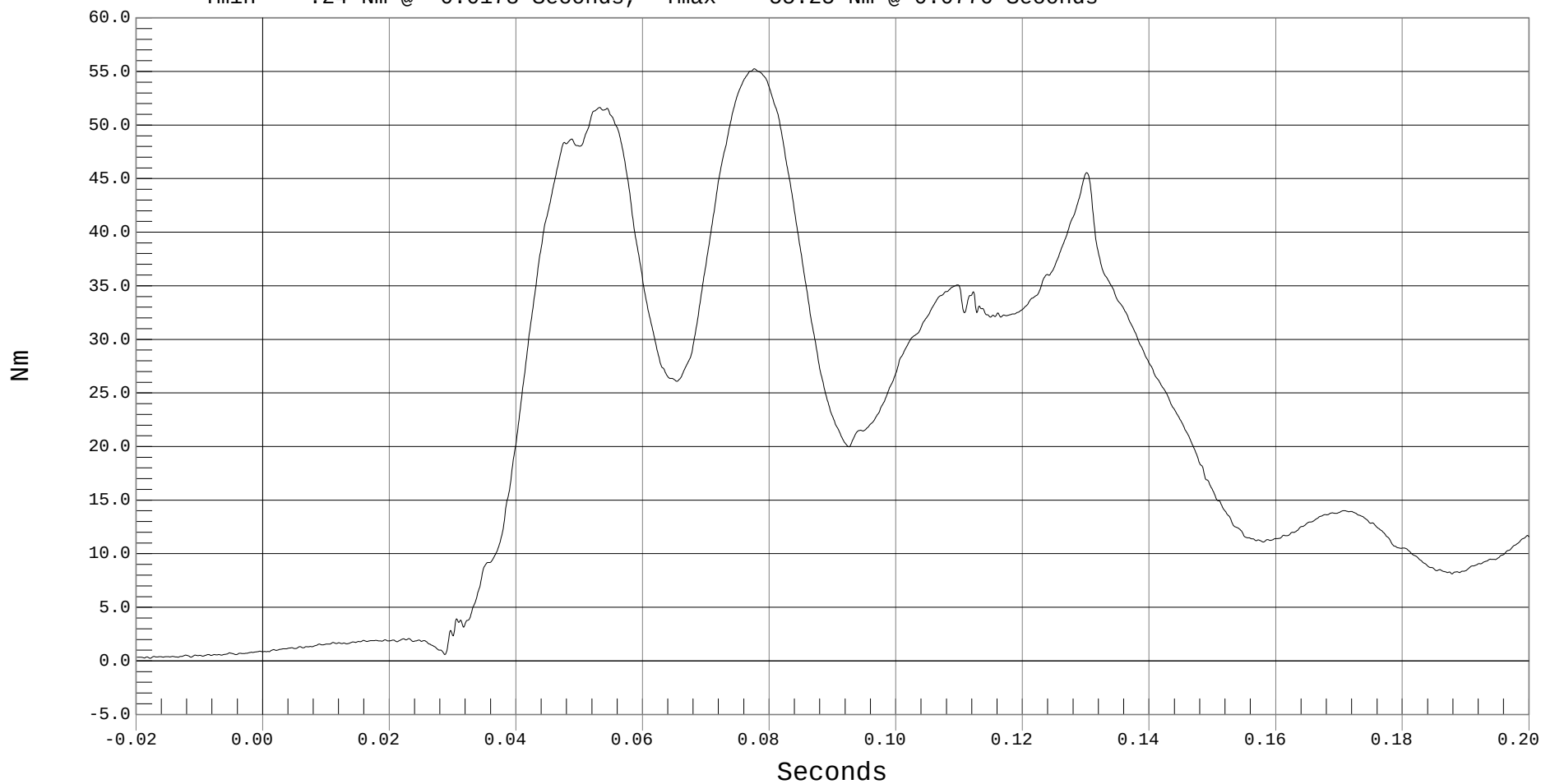
DRIVER LOWER NECK MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT RESULTANT, B01085MV.M13

Ymin = .24 Nm @ -0.0178 Seconds, Ymax = 55.25 Nm @ 0.0776 Seconds





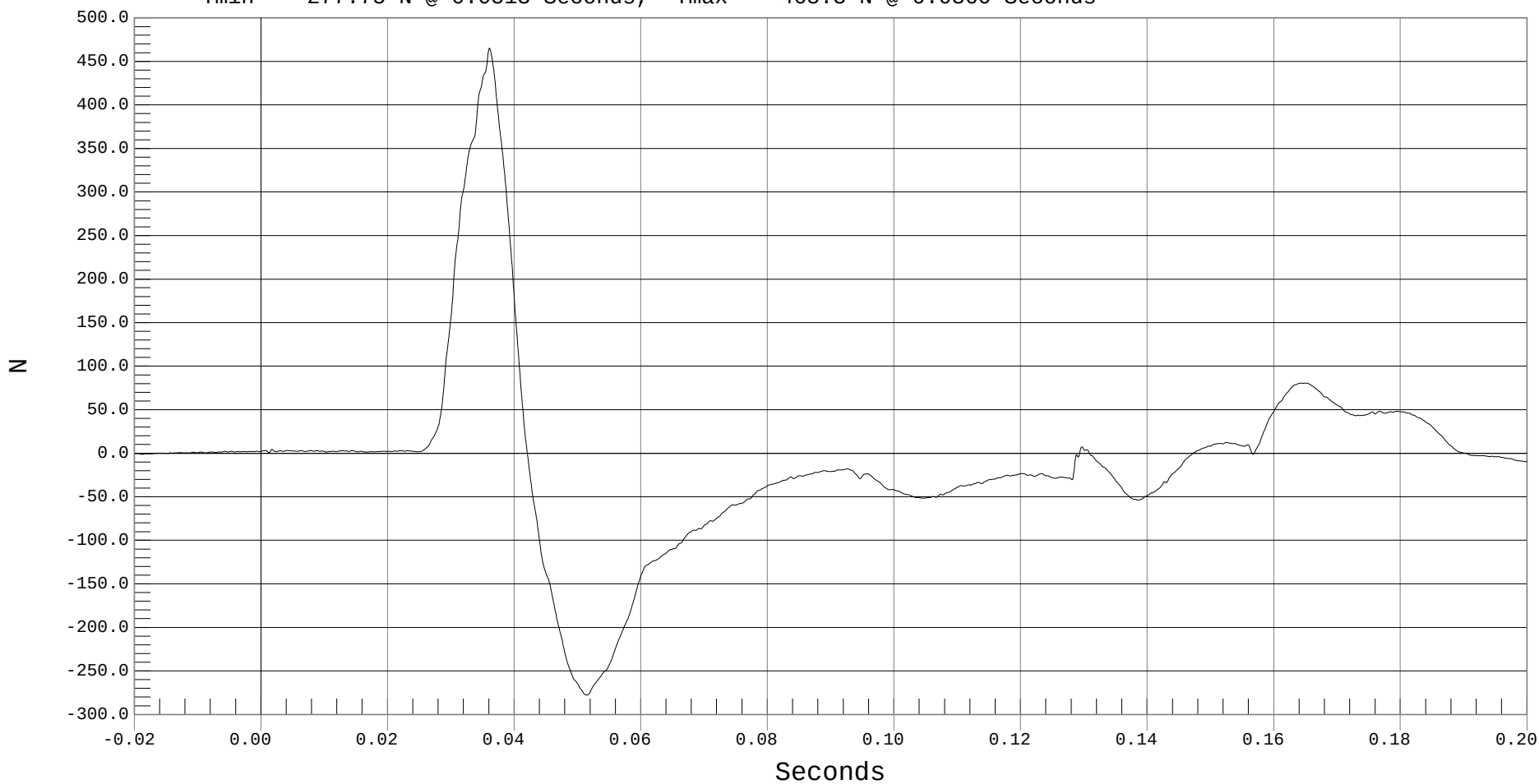
DRIVER SHOULDER FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

1 DRIVER SHOULDER FORCE X, B01085FF.F16

Ymin = -277.75 N @ 0.0513 Seconds, Ymax = 465.3 N @ 0.0360 Seconds





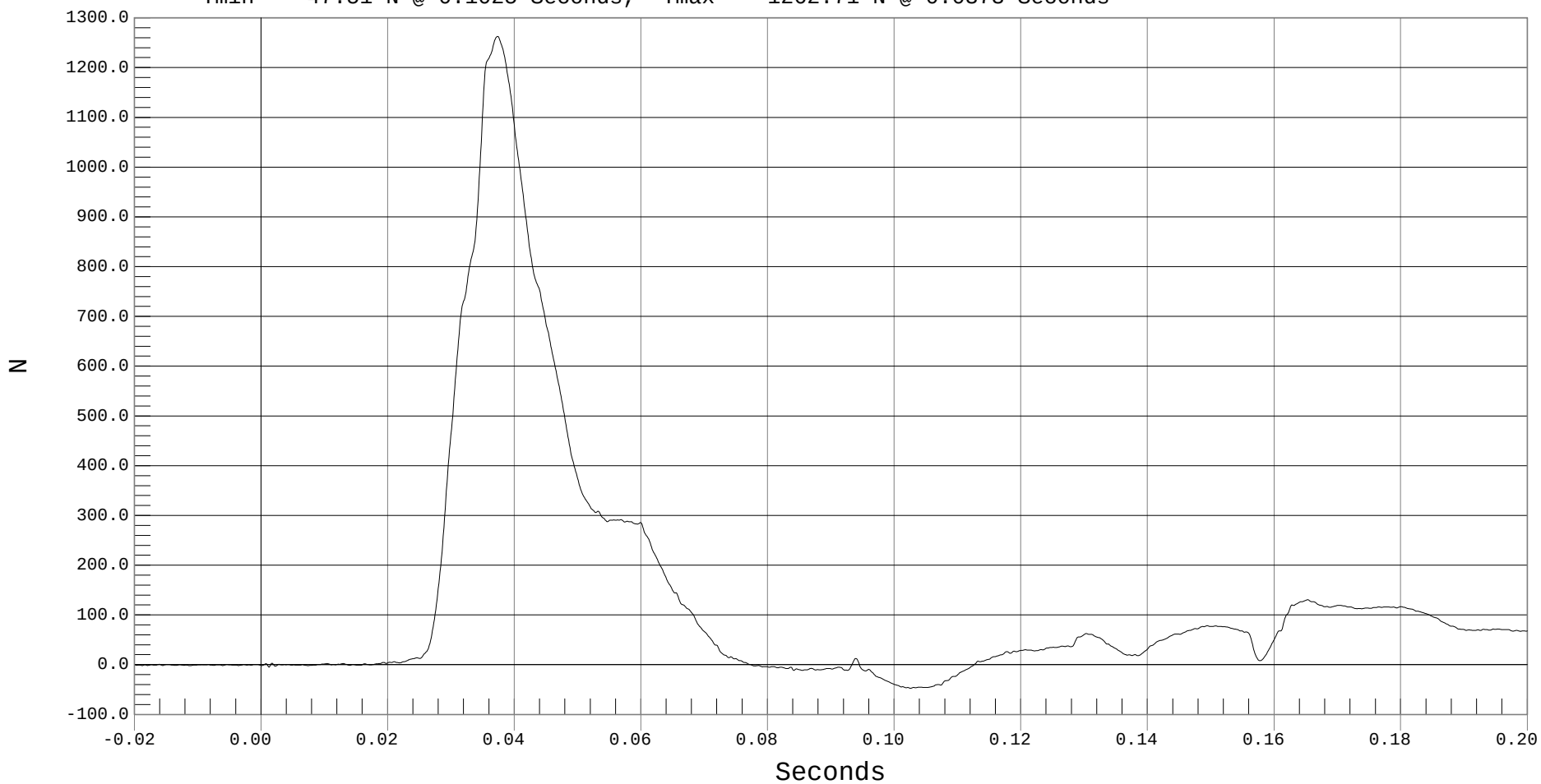
DRIVER SHOULDER FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER SHOULDER FORCE Y, B01085FF.F17

Ymin = -47.51 N @ 0.1025 Seconds, Ymax = 1262.71 N @ 0.0373 Seconds





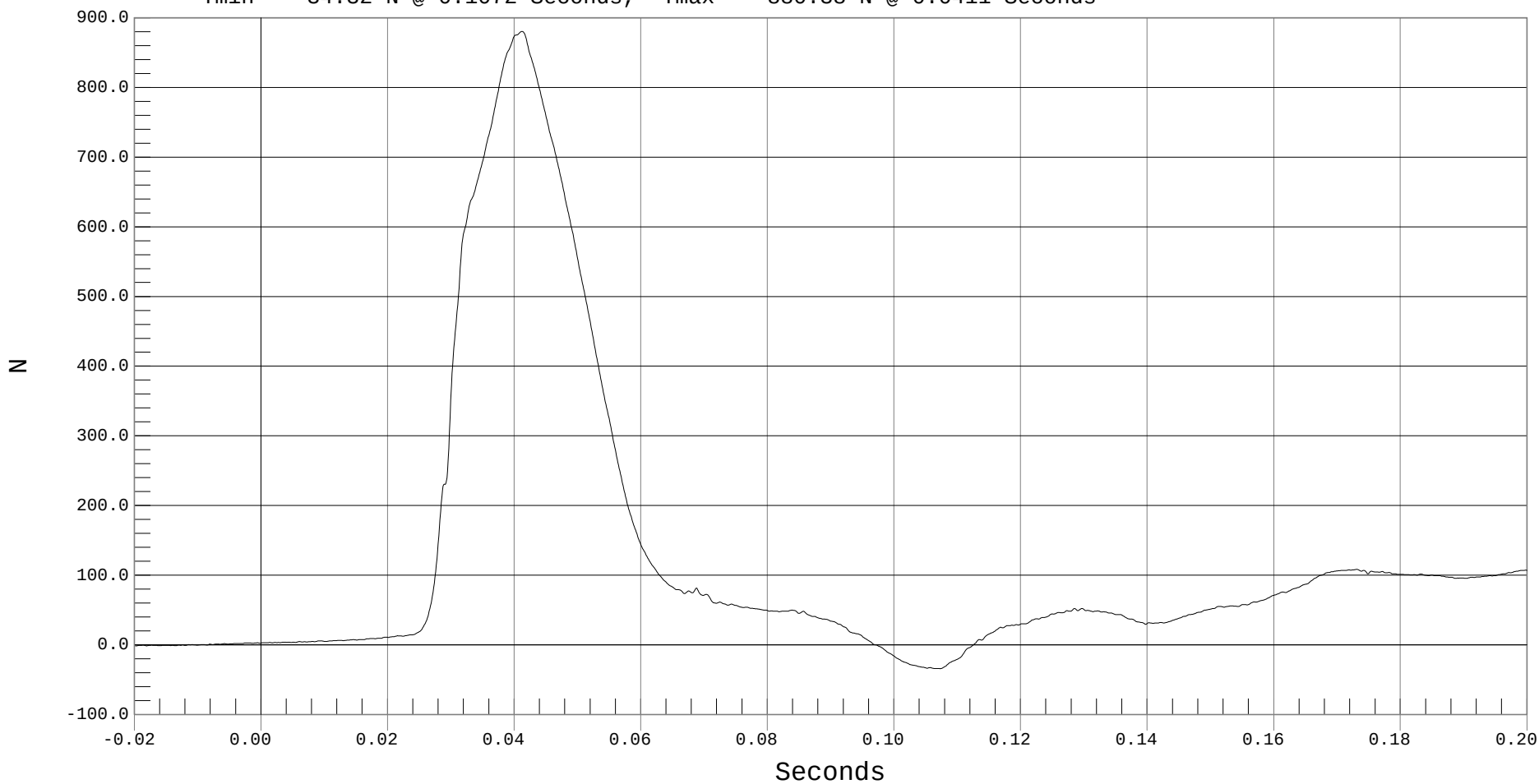
DRIVER SHOULDER FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER SHOULDER FORCE Z, B01085FF.F18

Ymin = -34.32 N @ 0.1072 Seconds, Ymax = 880.38 N @ 0.0411 Seconds





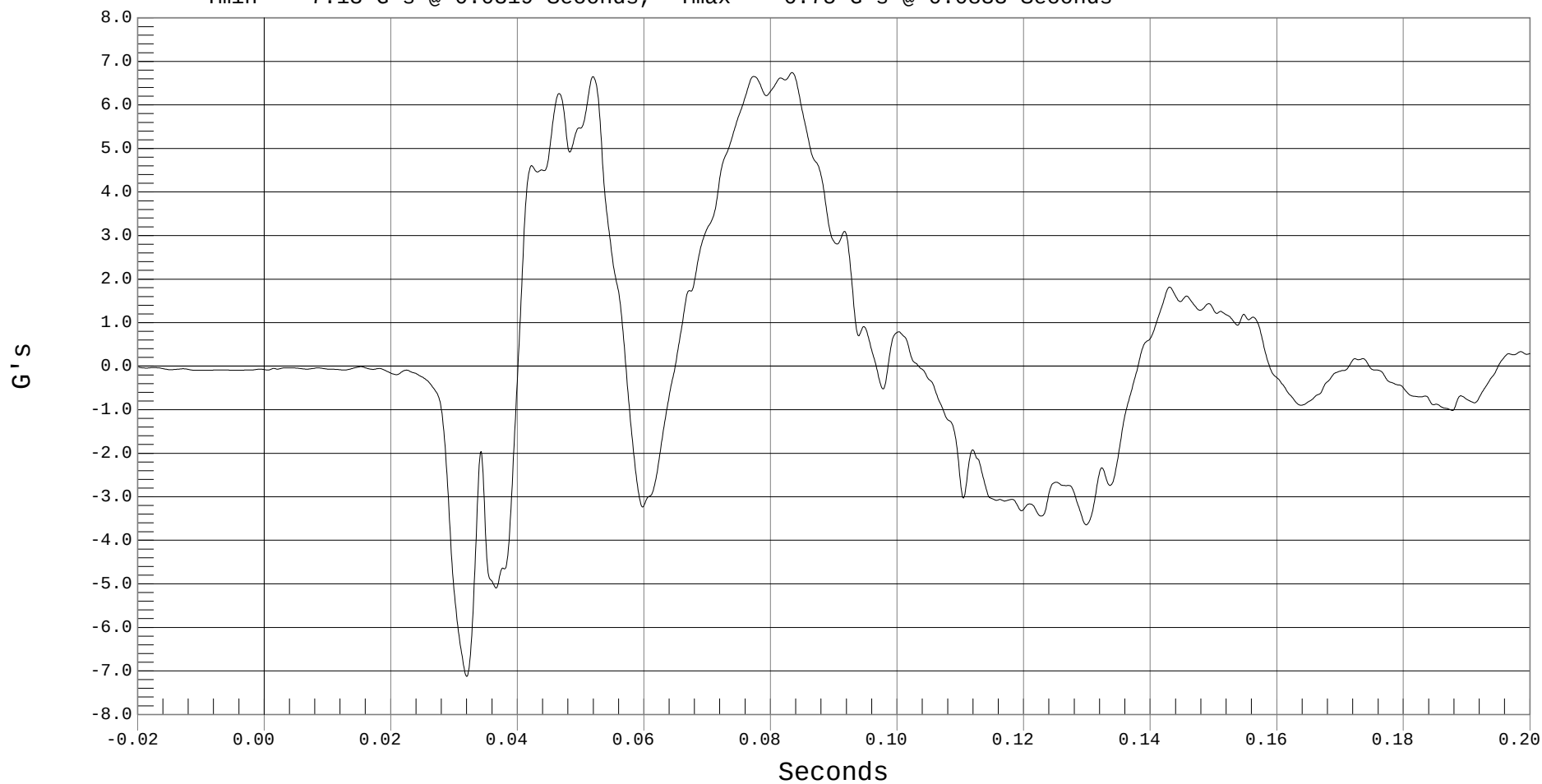
UPPER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE X, B01085AF.A20

Ymin = -7.13 G's @ 0.0319 Seconds, Ymax = 6.75 G's @ 0.0833 Seconds





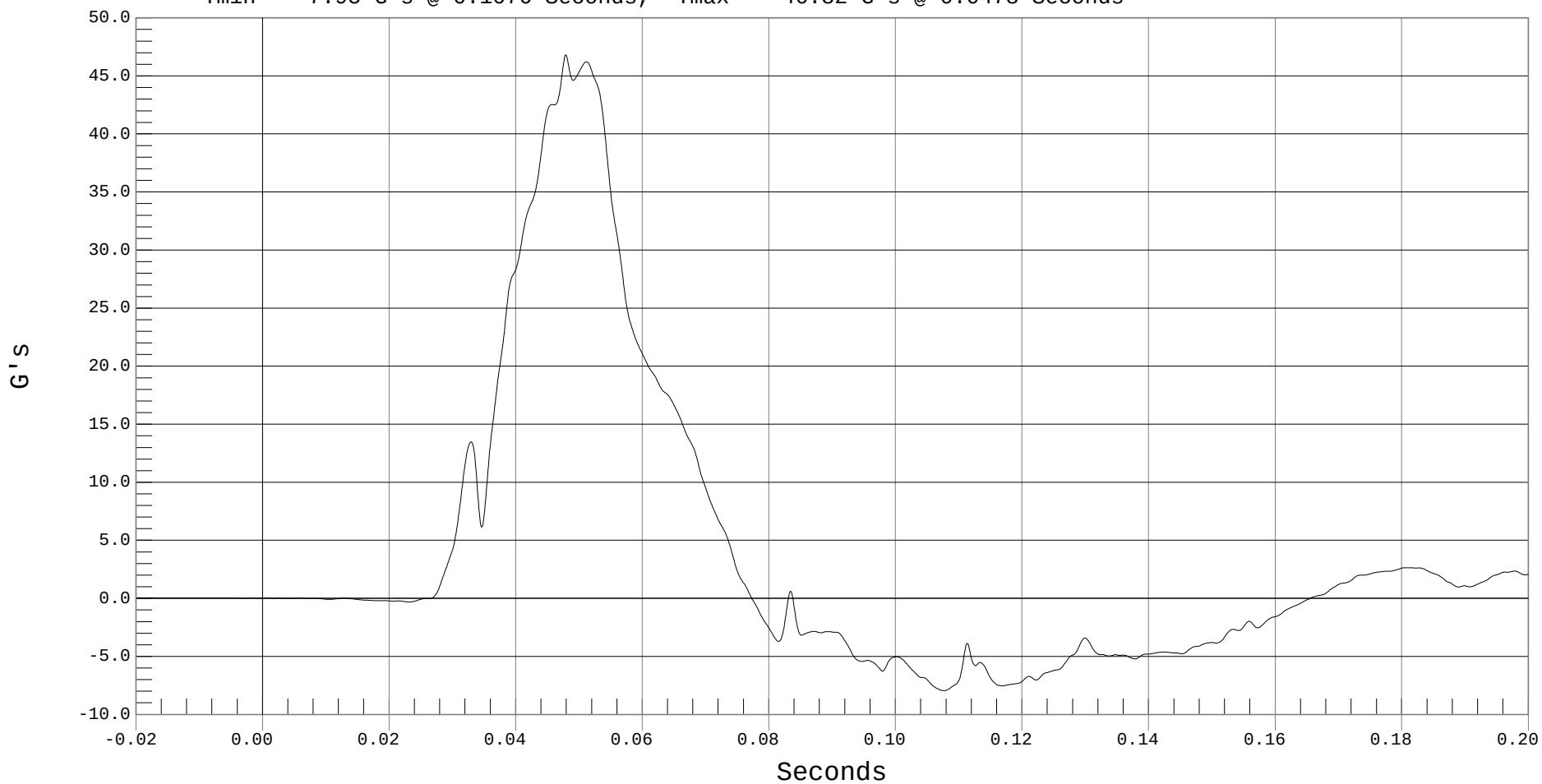
UPPER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE Y, B01085AF.A21

Ymin = -7.95 G's @ 0.1076 Seconds, Ymax = 46.82 G's @ 0.0478 Seconds





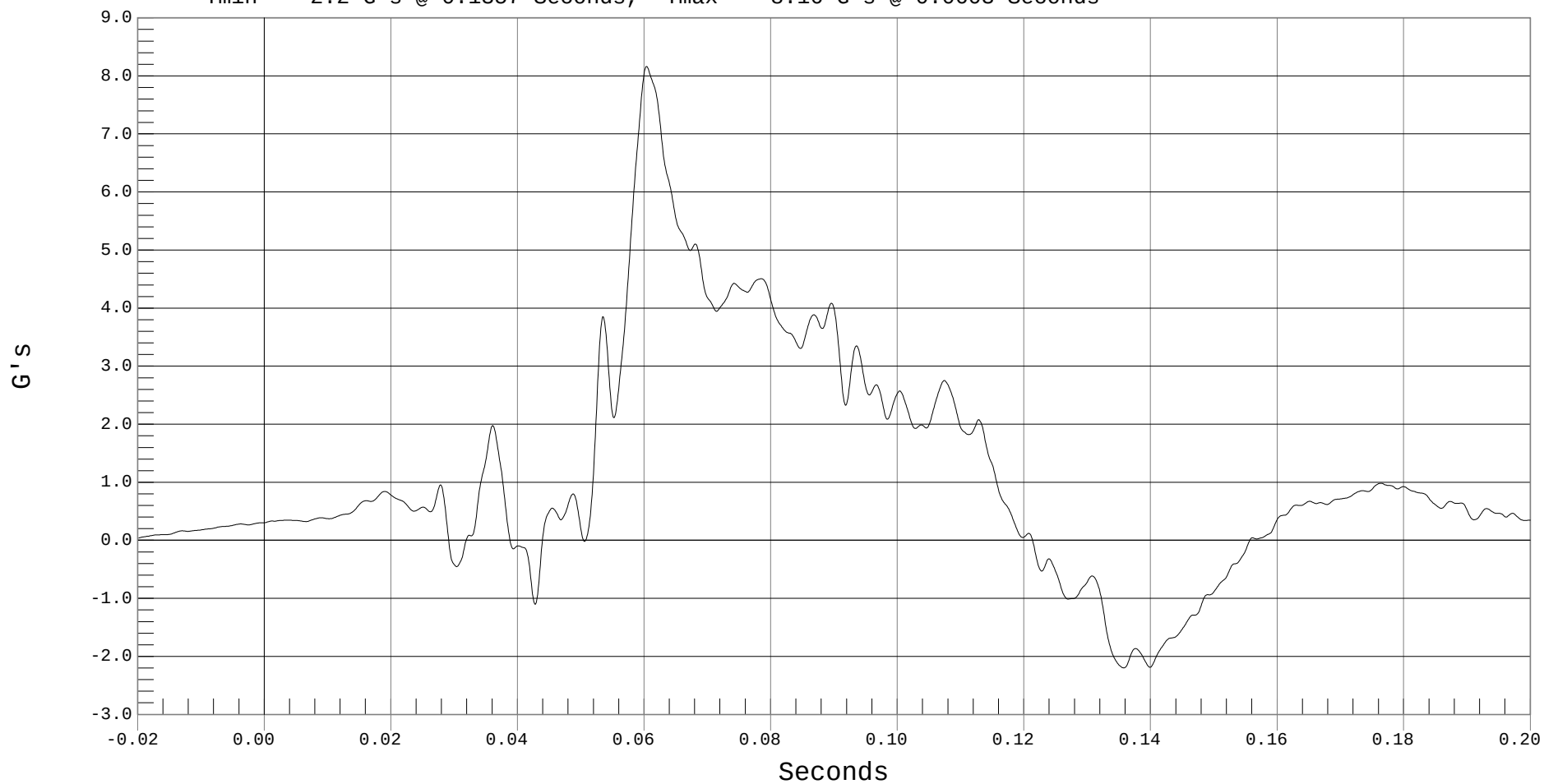
UPPER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE Z, B01085AF.A22

Ymin = -2.2 G's @ 0.1357 Seconds, Ymax = 8.16 G's @ 0.0603 Seconds





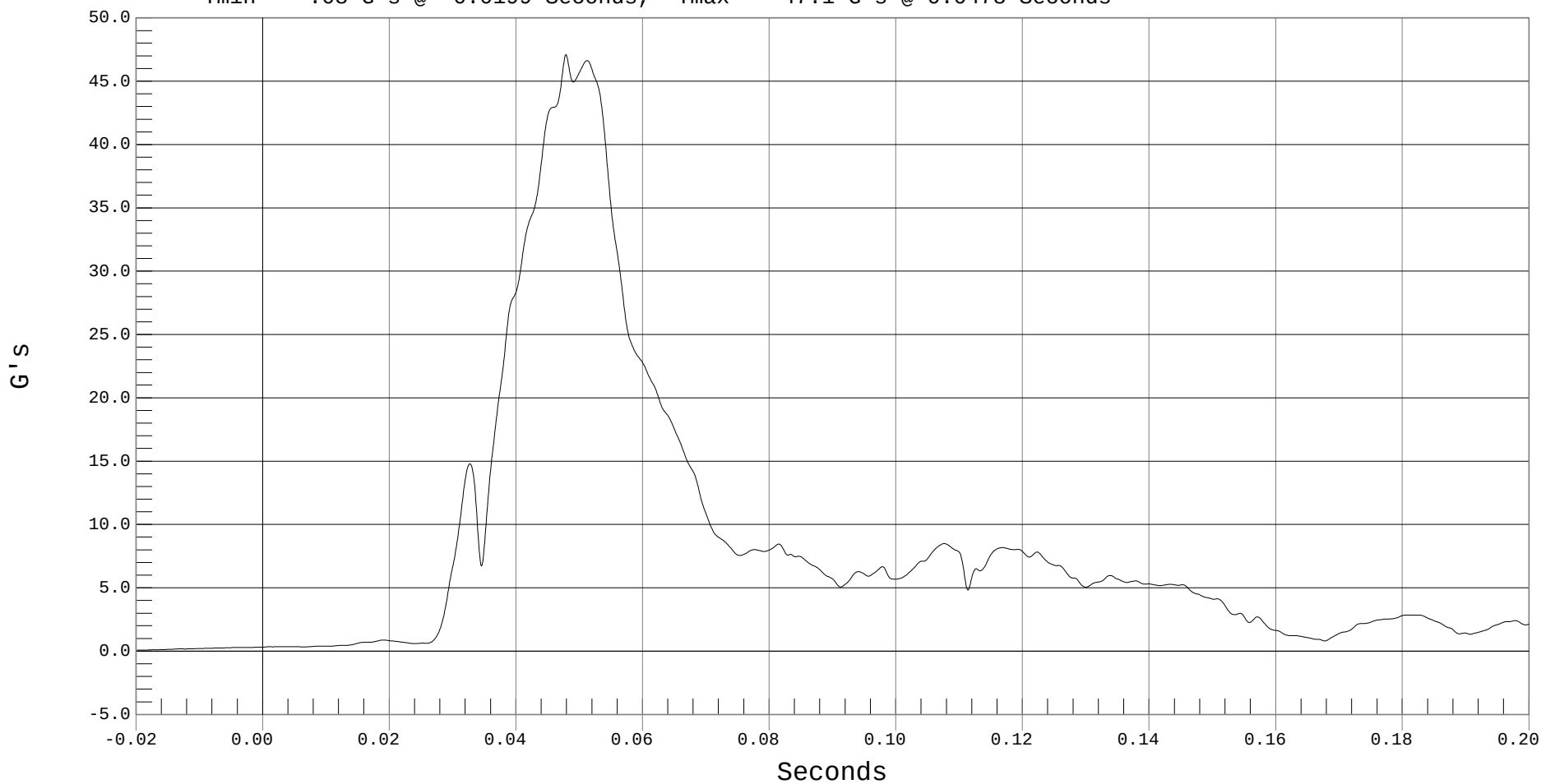
UPPER SPINE RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE RESULTANT, B01085AV.A20

Ymin = .08 G's @ -0.0199 Seconds, Ymax = 47.1 G's @ 0.0478 Seconds





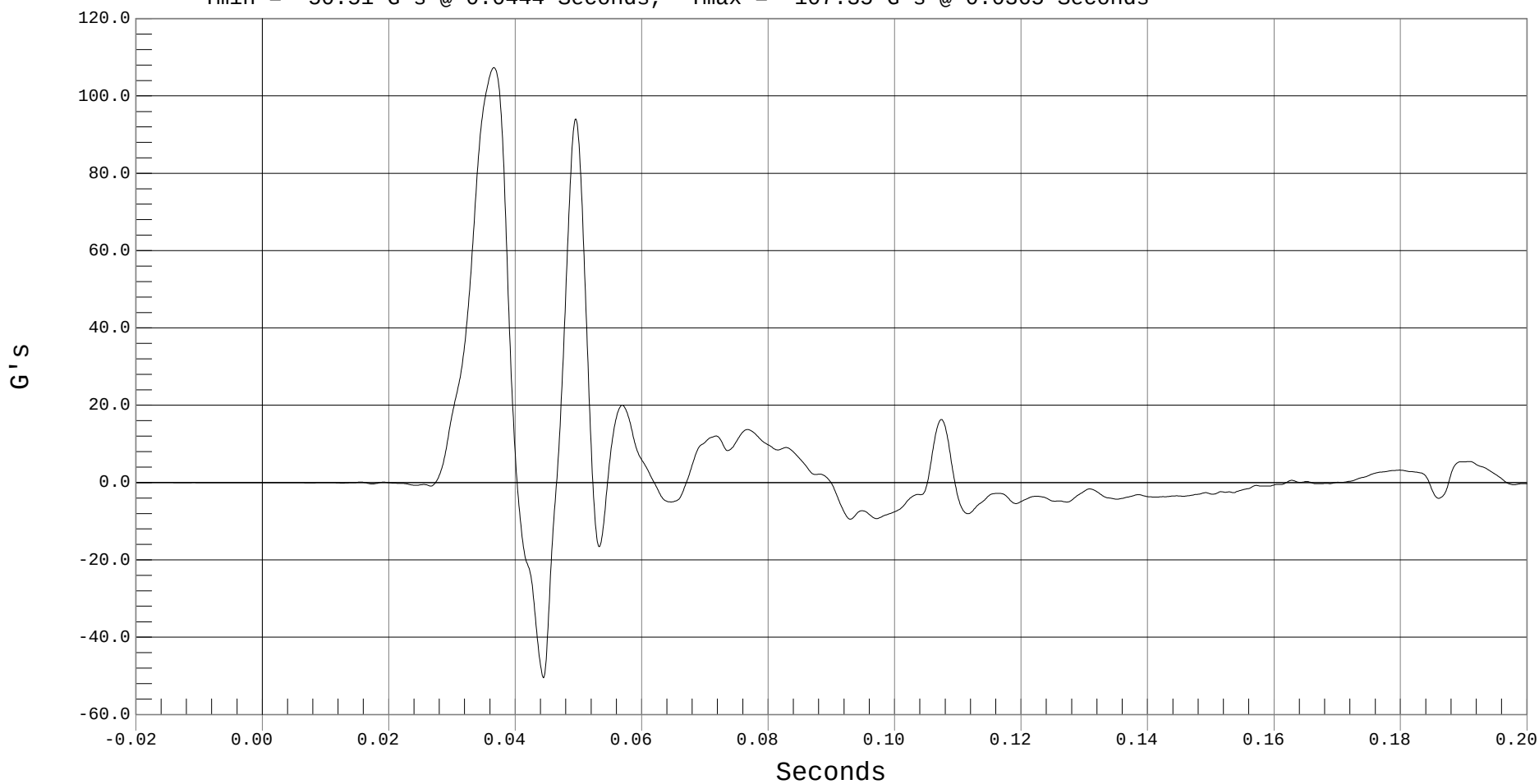
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER UPPER RIB Y, B01085AF.A23

Ymin = -50.51 G's @ 0.0444 Seconds, Ymax = 107.35 G's @ 0.0365 Seconds





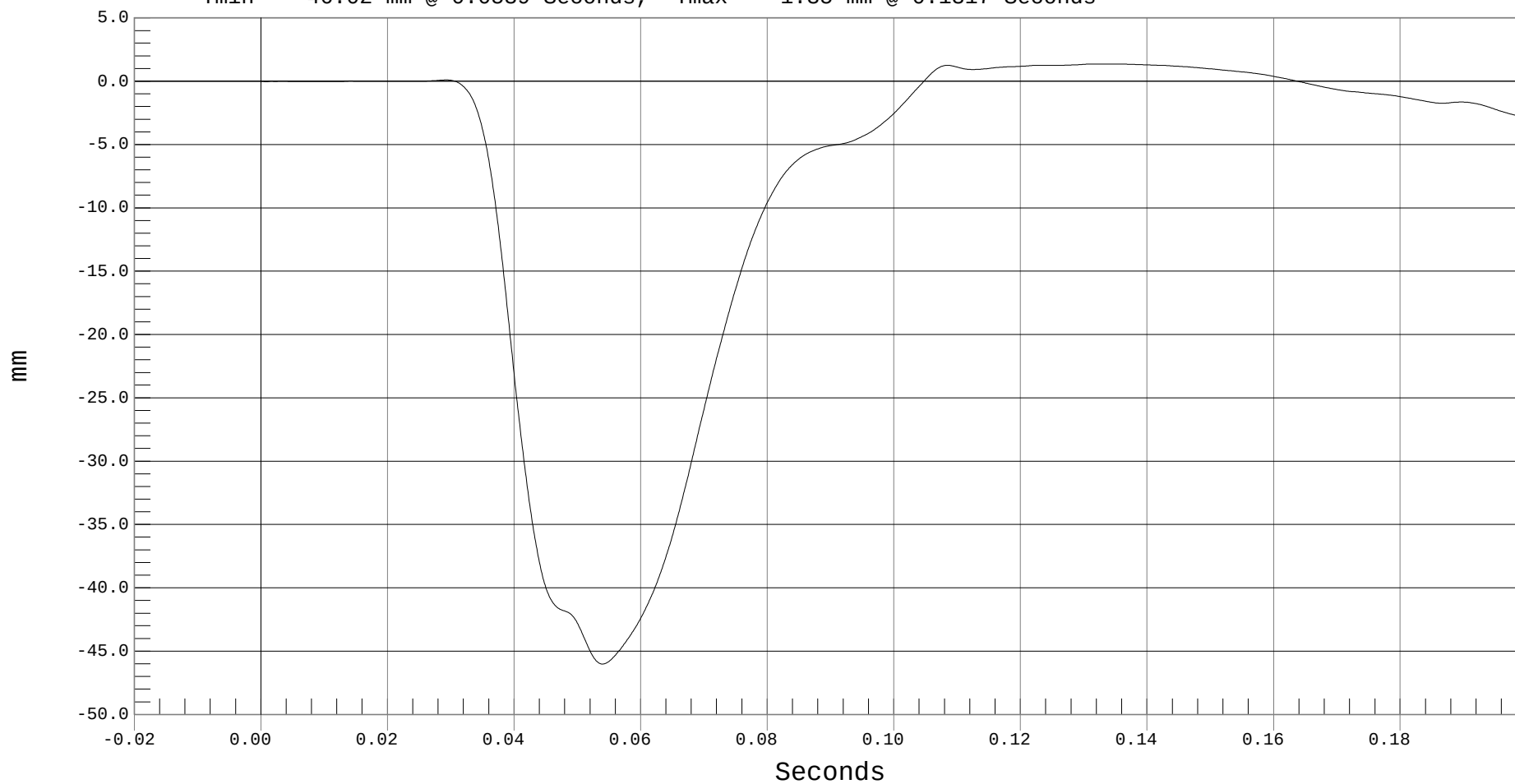
DRIVER UPPER RIB DISPLACEMENT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER UPPER RIB DISPLACEMENT, B01085DF.D26

Ymin = -46.02 mm @ 0.0539 Seconds, Ymax = 1.35 mm @ 0.1317 Seconds





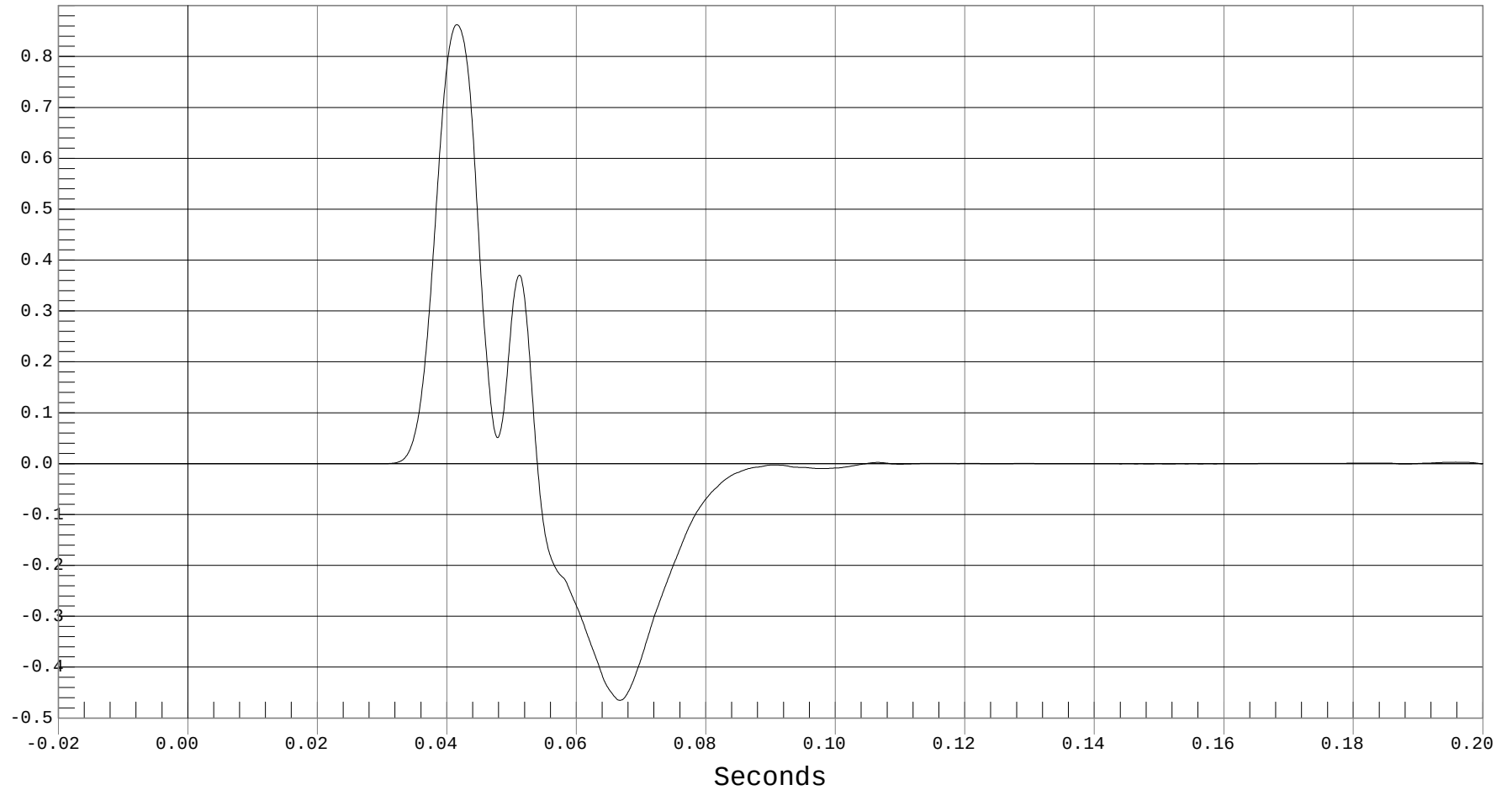
DRIVER UPPER RIB VISCOUS CRITERIA

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 Viscous Criterion, B01085DV.C26

Ymin = -.47 @ 0.0666 Seconds, Ymax = .86 @ 0.0415 Seconds





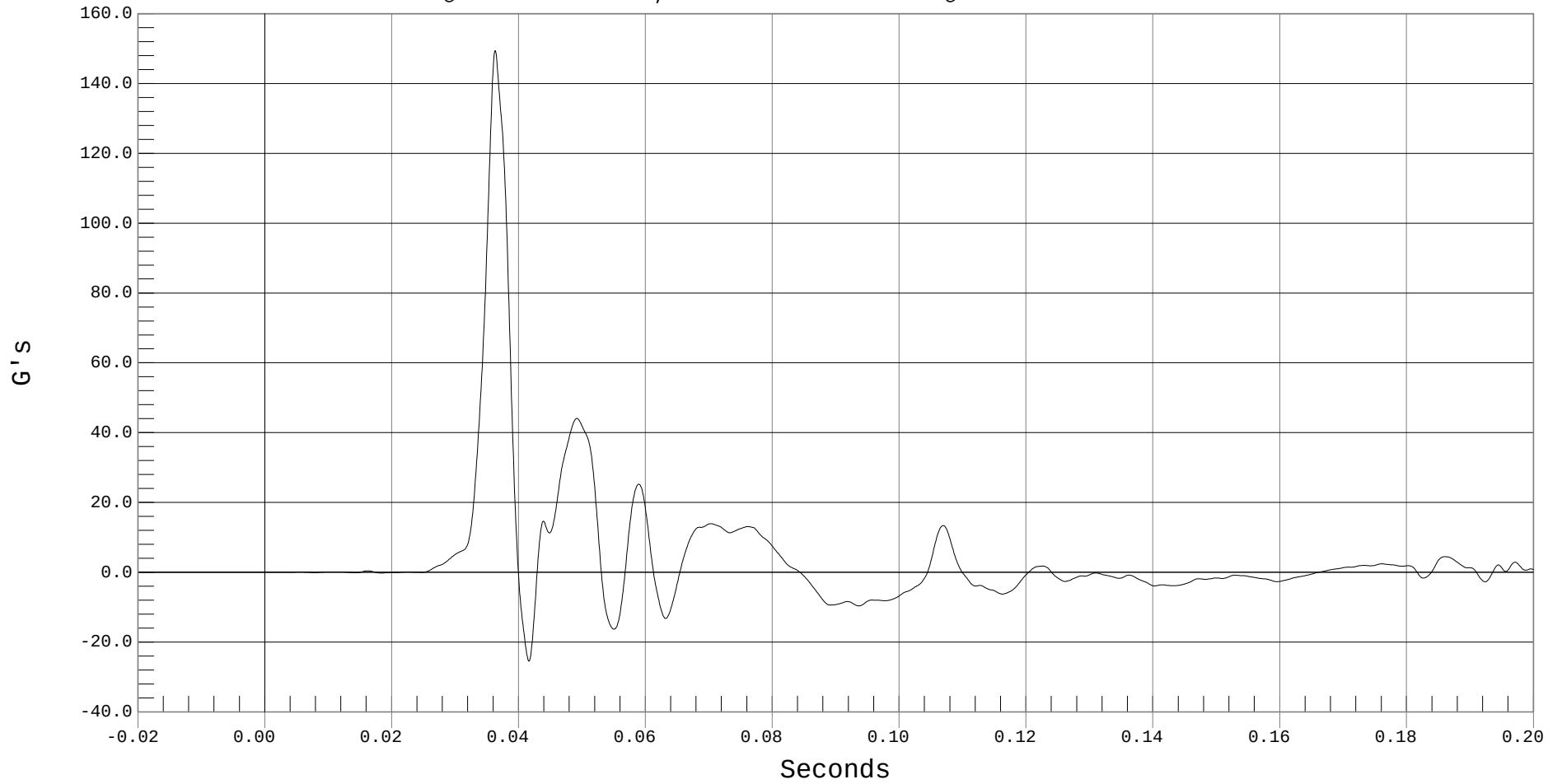
DRIVER MID RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER MID RIB Y, B01085AF.A24

Ymin = -25.46 G's @ 0.0415 Seconds, Ymax = 149.45 G's @ 0.0362 Seconds





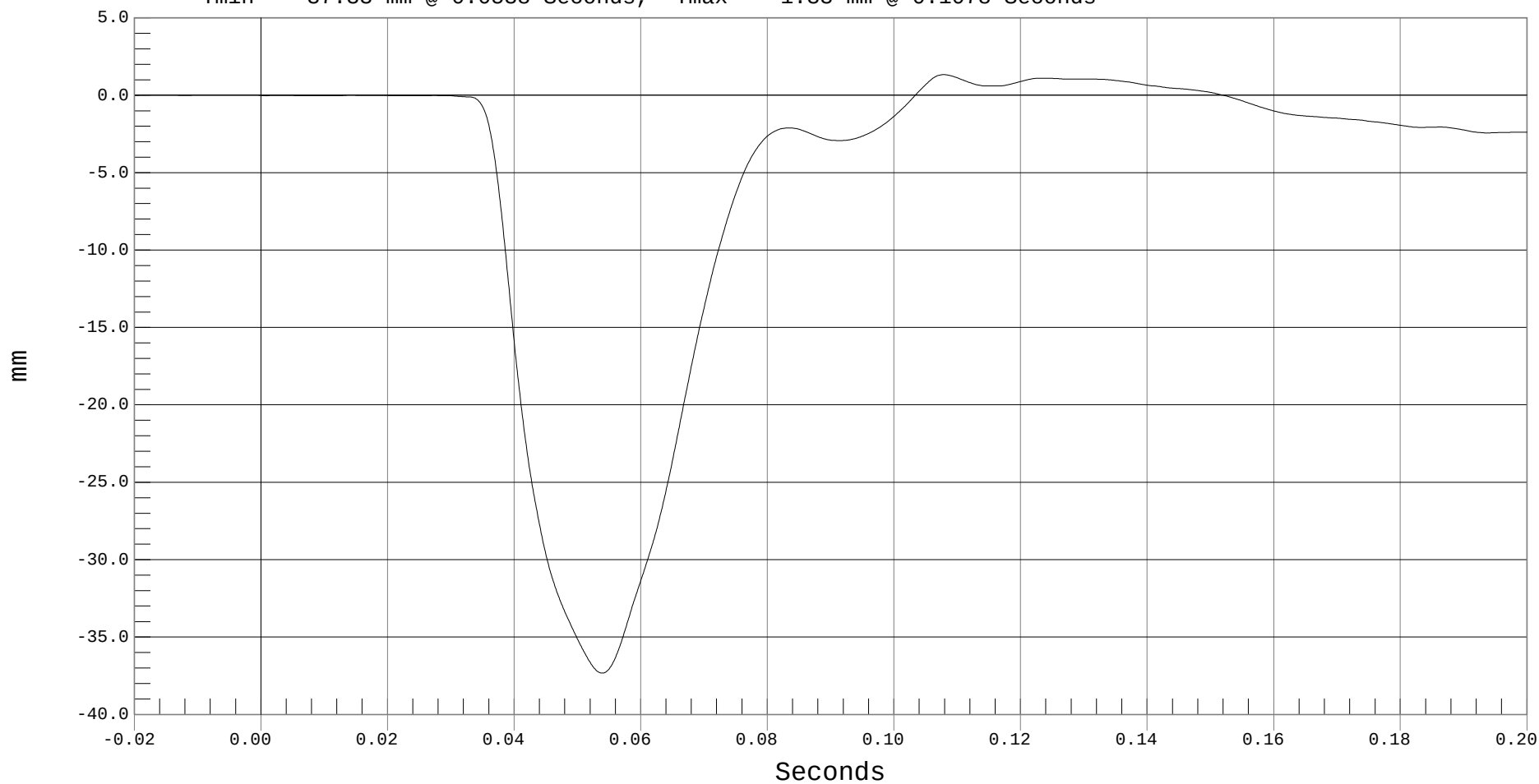
DRIVER MID RIB Y DISPLACEMENT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER MID RIB DISPLACEMENT, B01085DF.D27

Ymin = -37.33 mm @ 0.0538 Seconds, Ymax = 1.33 mm @ 0.1078 Seconds





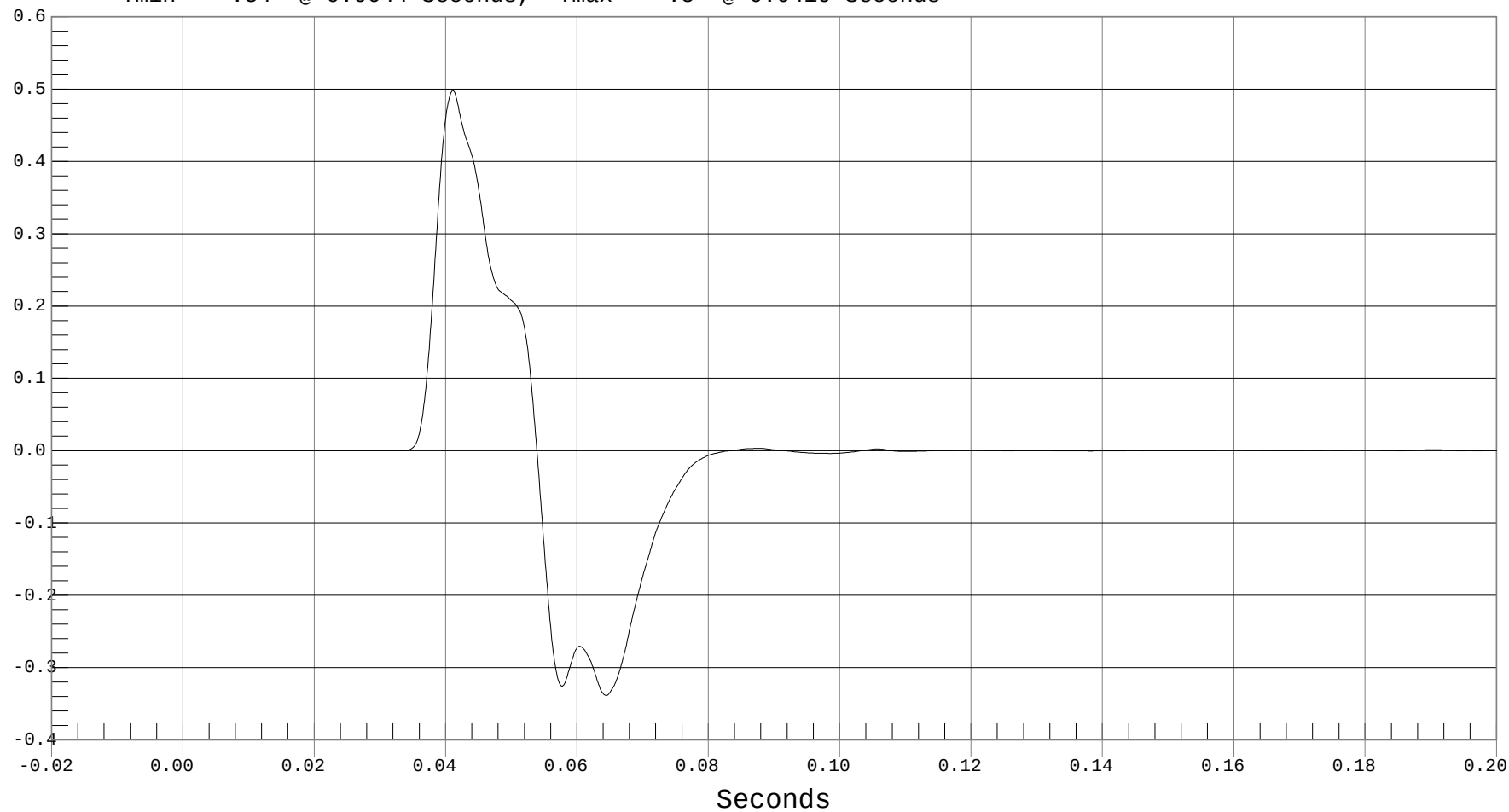
DRIVER MID RIB VISCOUS CRITERIA

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 Viscous Criterion, B01085DV.C27

Ymin = -.34 @ 0.0644 Seconds, Ymax = .5 @ 0.0410 Seconds





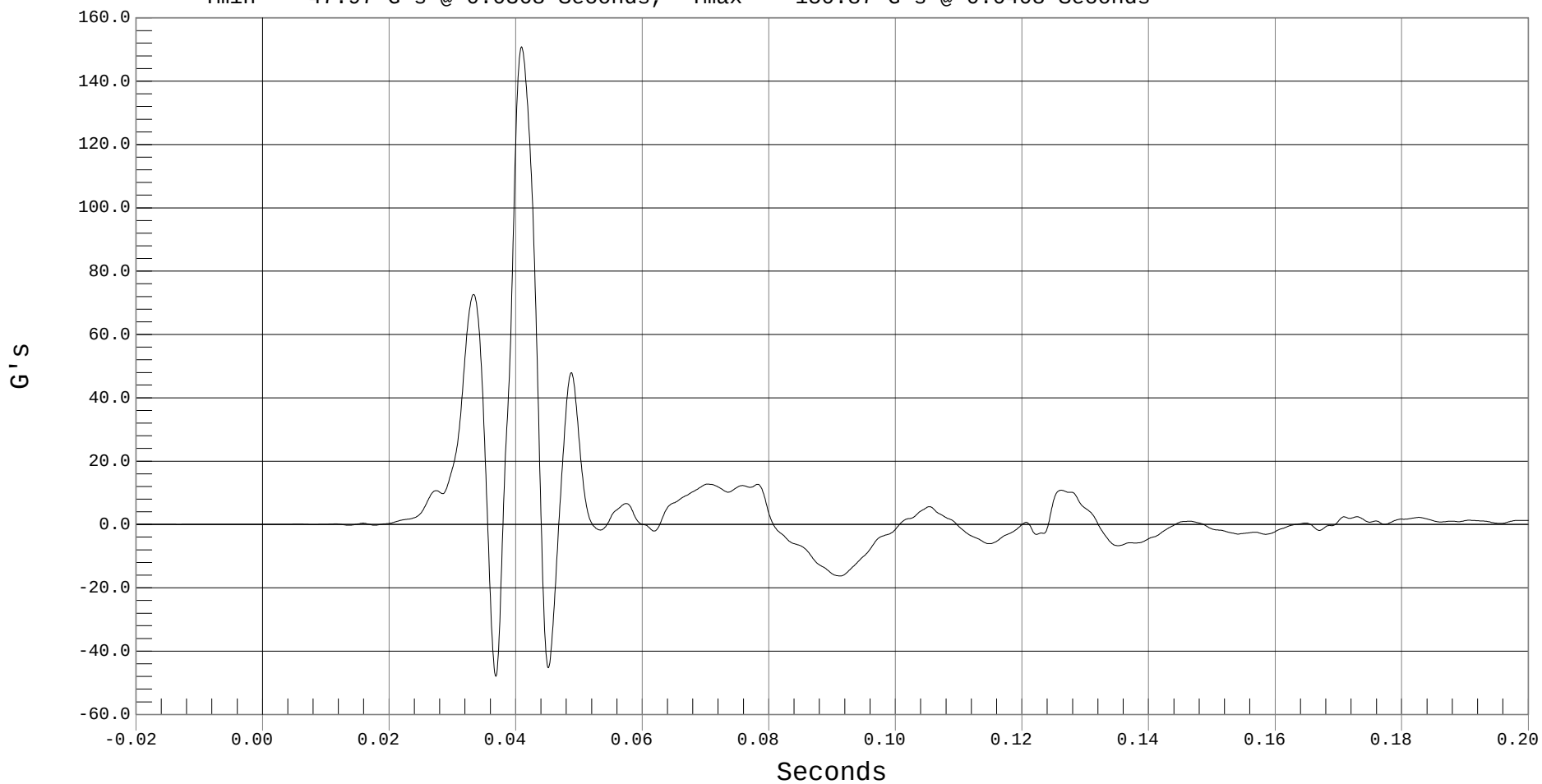
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

1 DRIVER LOWER RIB Y, B01085AF.A25

Ymin = -47.97 G's @ 0.0368 Seconds, Ymax = 150.87 G's @ 0.0408 Seconds





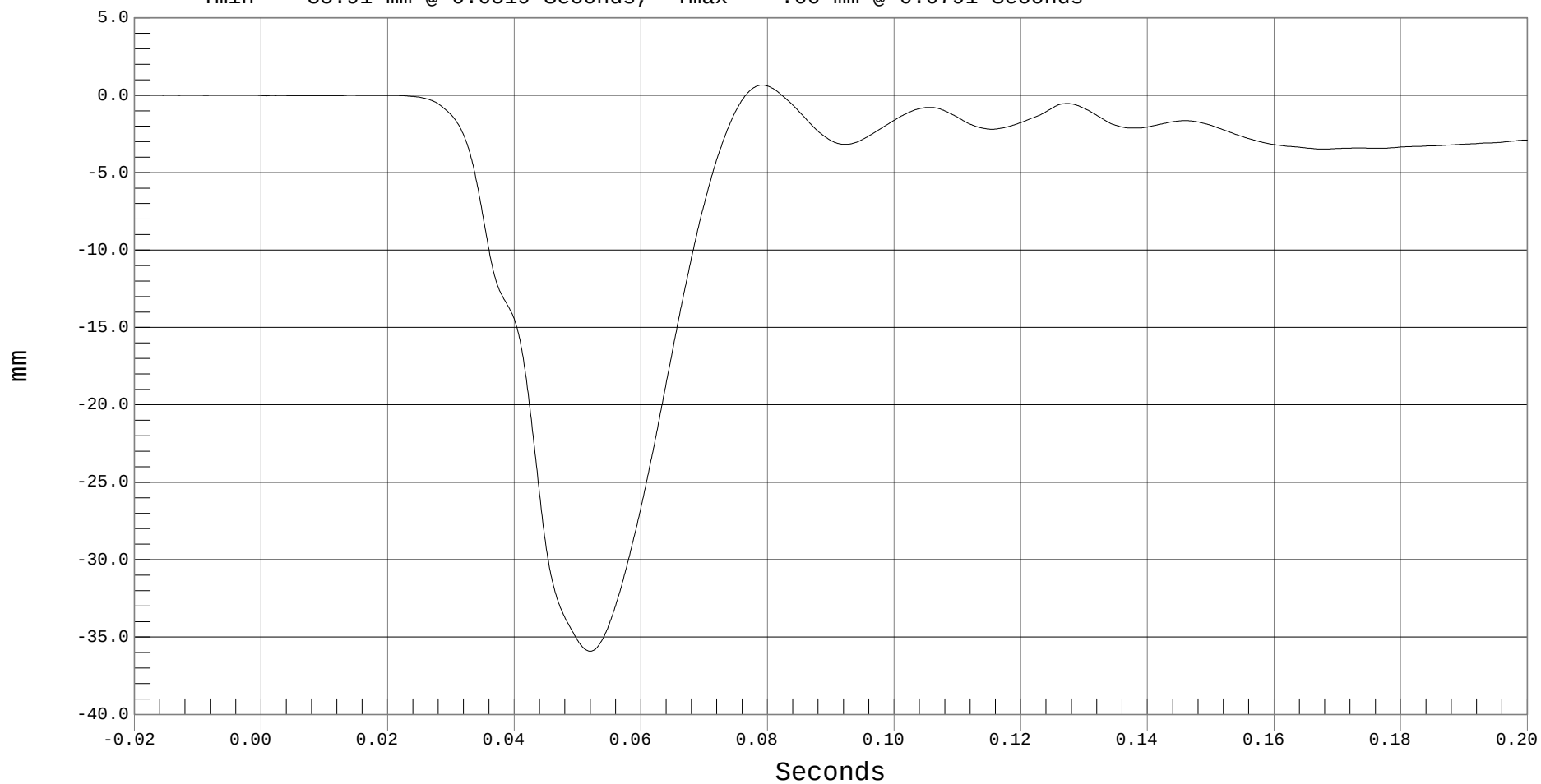
DRIVER LOWER RIB DISPLACEMENT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER LOWER RIB DISPLACEMENT, B01085DF.D28

Ymin = -35.91 mm @ 0.0519 Seconds, Ymax = .66 mm @ 0.0791 Seconds





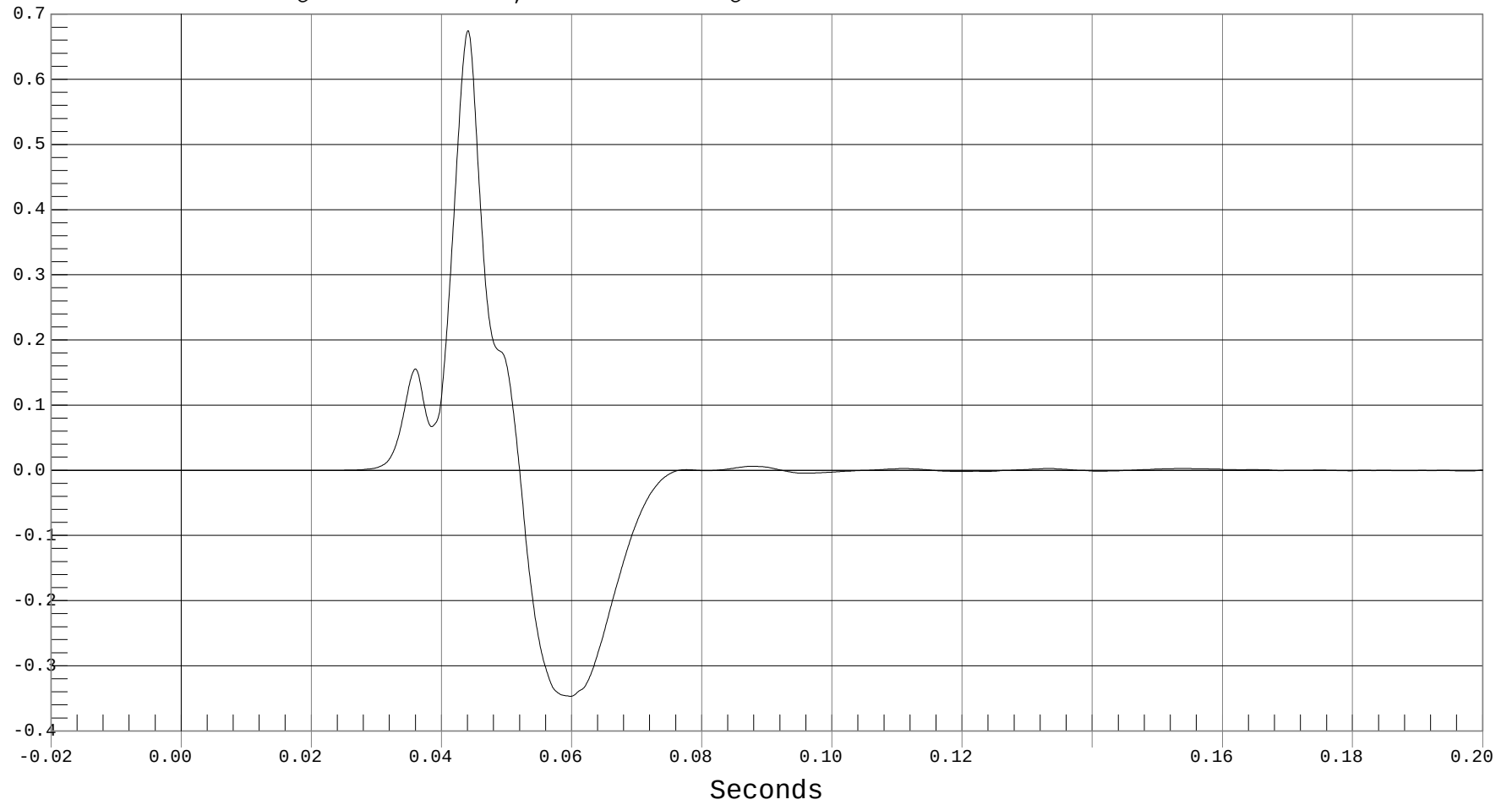
DRIVER LOWER RIB VISCOUS CRITERIA

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 Viscous Criterion, B01085DV.C28

Ymin = -.35 @ 0.0597 Seconds, Ymax = .67 @ 0.0440 Seconds





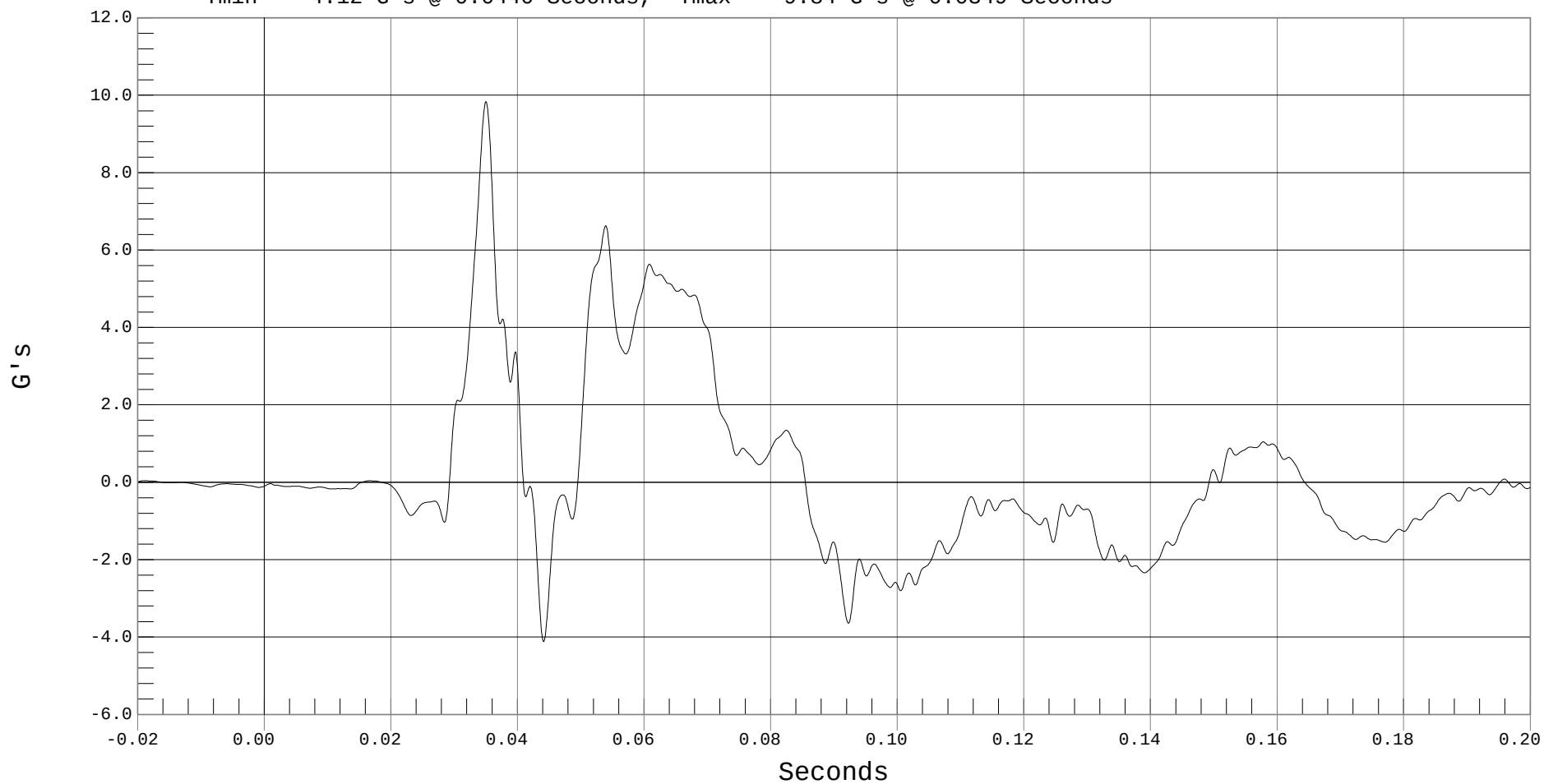
LOWER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE X, B01085AF.A29

Ymin = -4.12 G's @ 0.0440 Seconds, Ymax = 9.84 G's @ 0.0349 Seconds





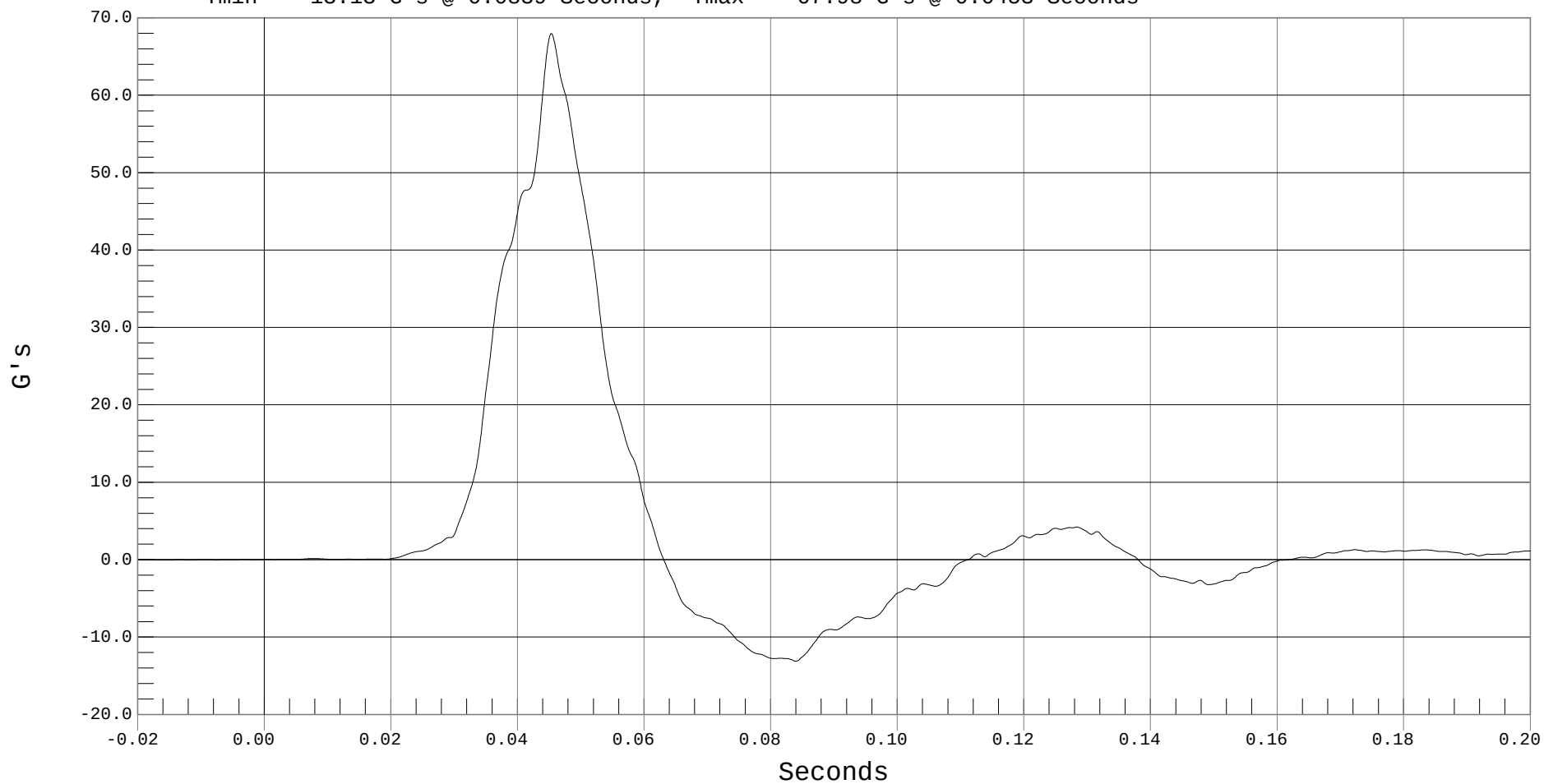
LOWER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE Y, B01085AF.A30

Ymin = -13.13 G's @ 0.0839 Seconds, Ymax = 67.98 G's @ 0.0453 Seconds





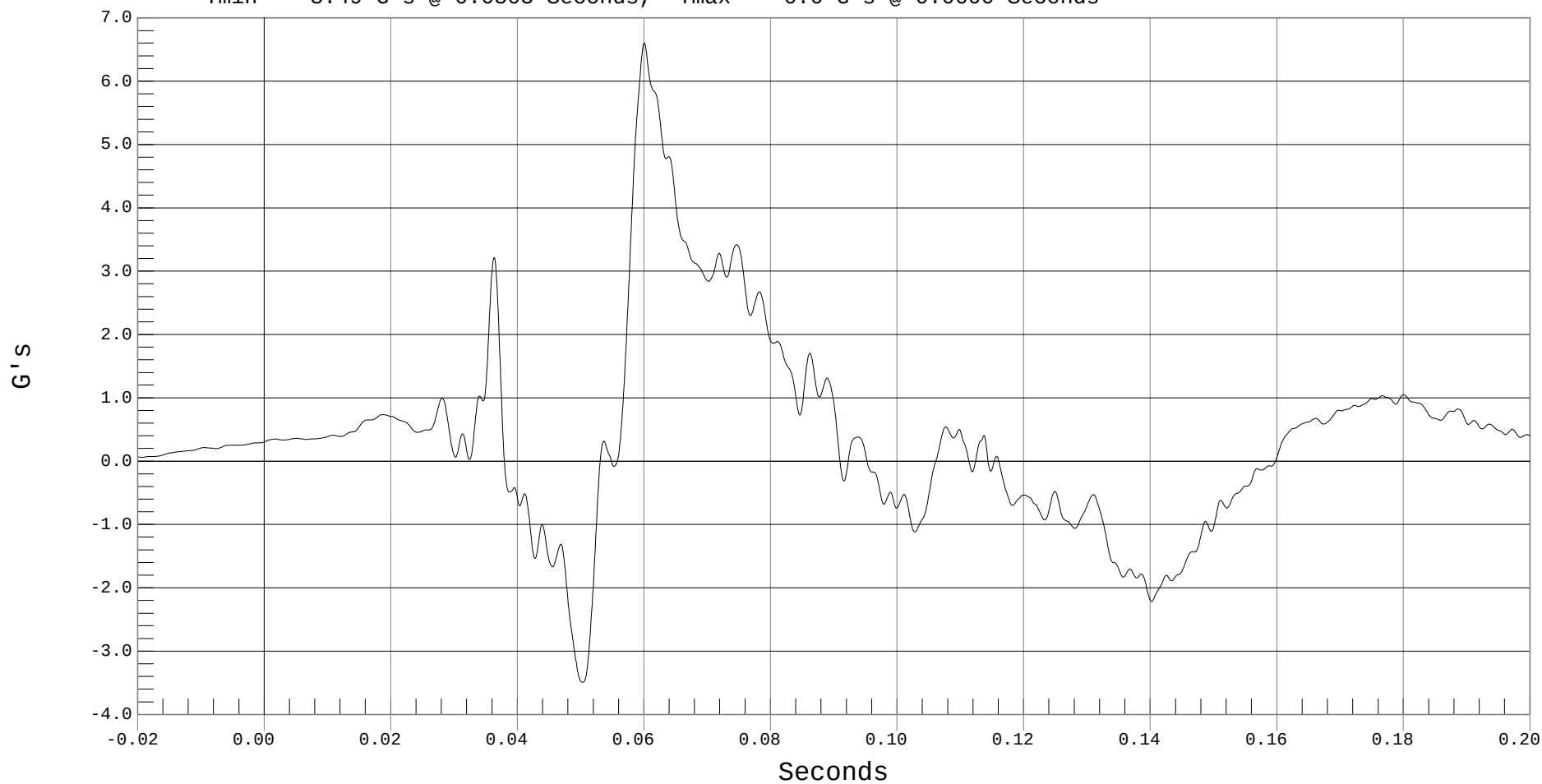
LOWER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE Z, B01085AF.A31

Ymin = -3.49 G's @ 0.0503 Seconds, Ymax = 6.6 G's @ 0.0600 Seconds





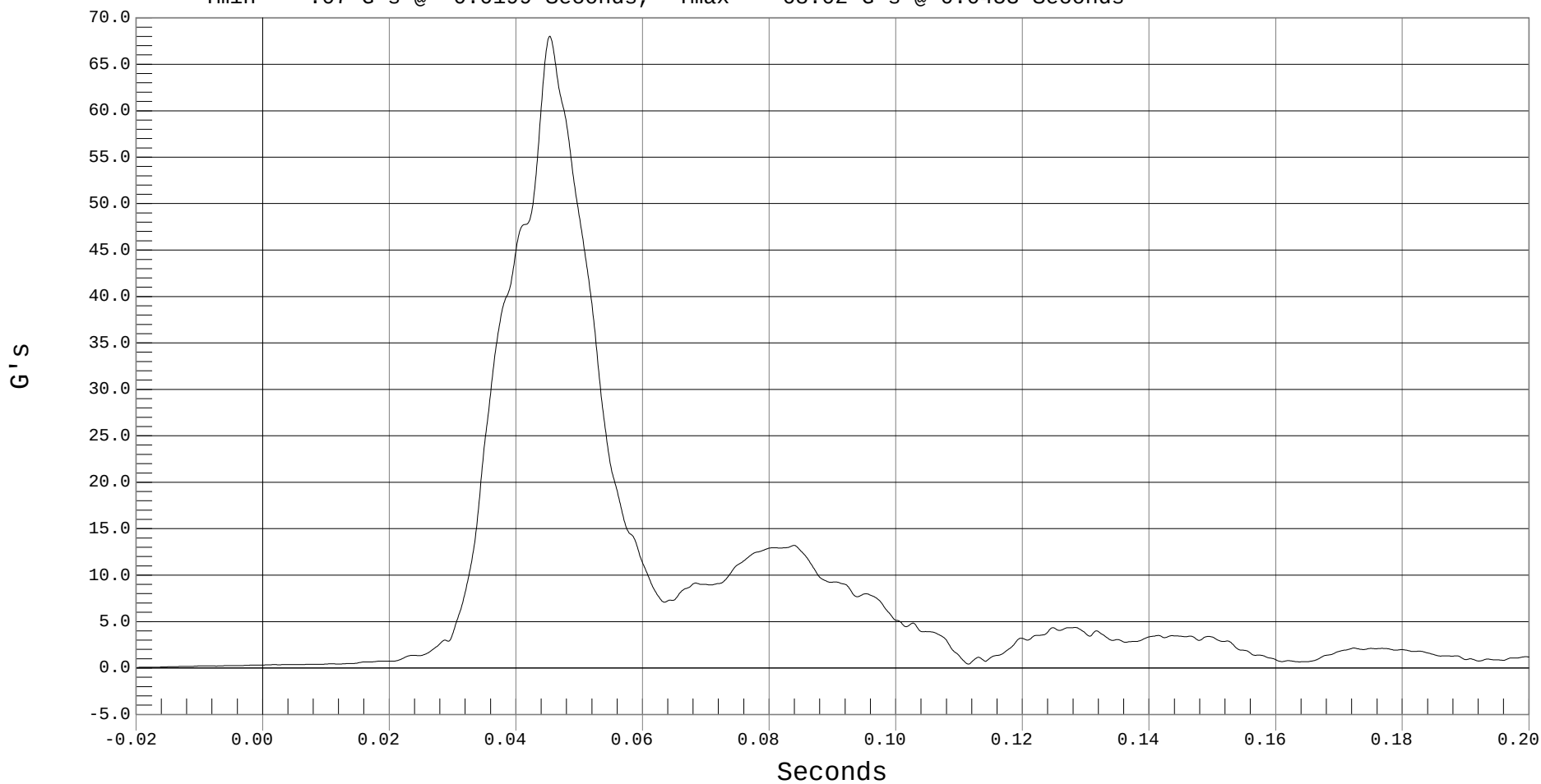
LOWER SPINE RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE RESULTANT, B01085AV.A29

Ymin = .07 G's @ -0.0199 Seconds, Ymax = 68.02 G's @ 0.0453 Seconds





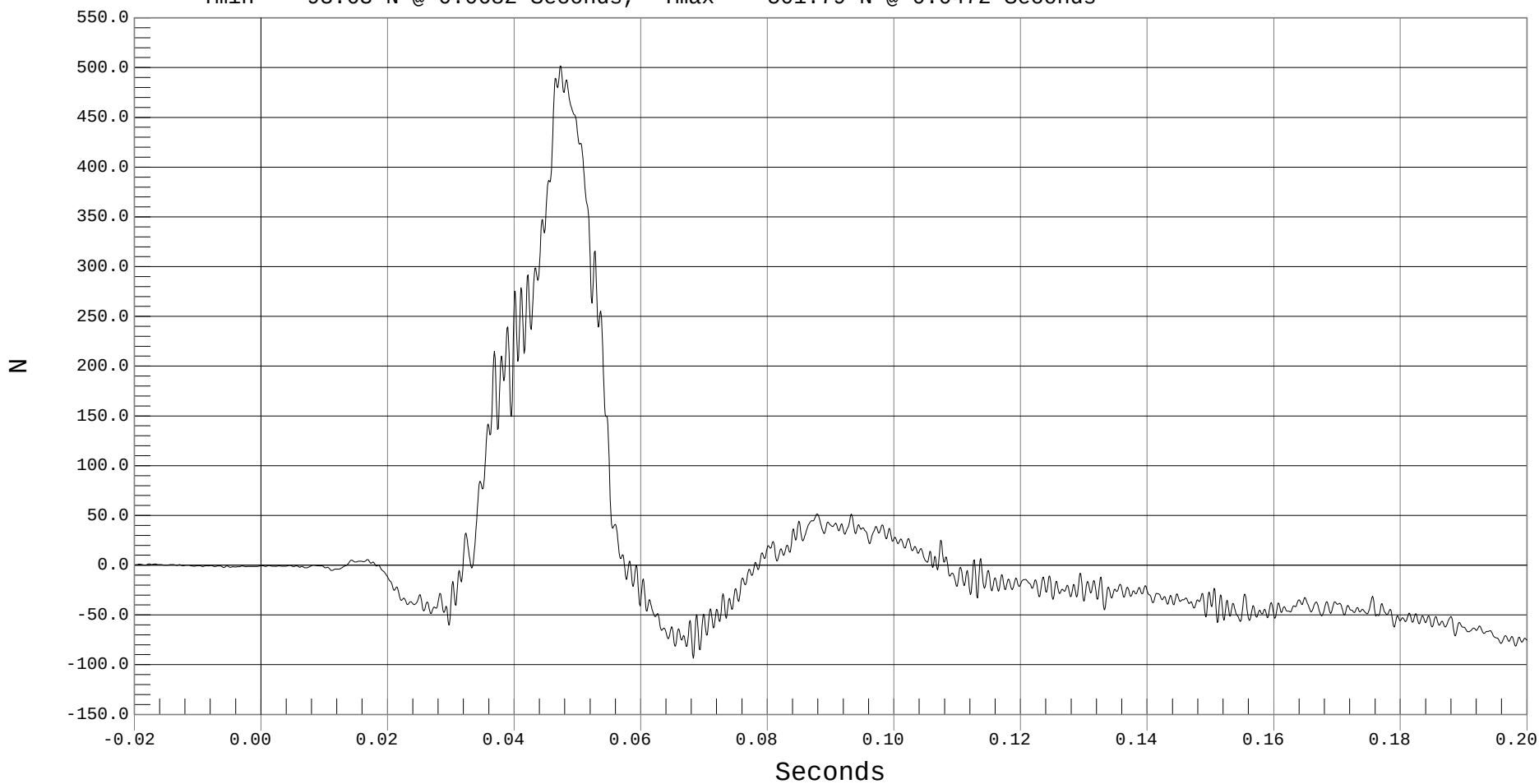
DRIVER TORSO FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER TORSO FORCE X, B01085FF.F33

Ymin = -93.63 N @ 0.0682 Seconds, Ymax = 501.79 N @ 0.0472 Seconds





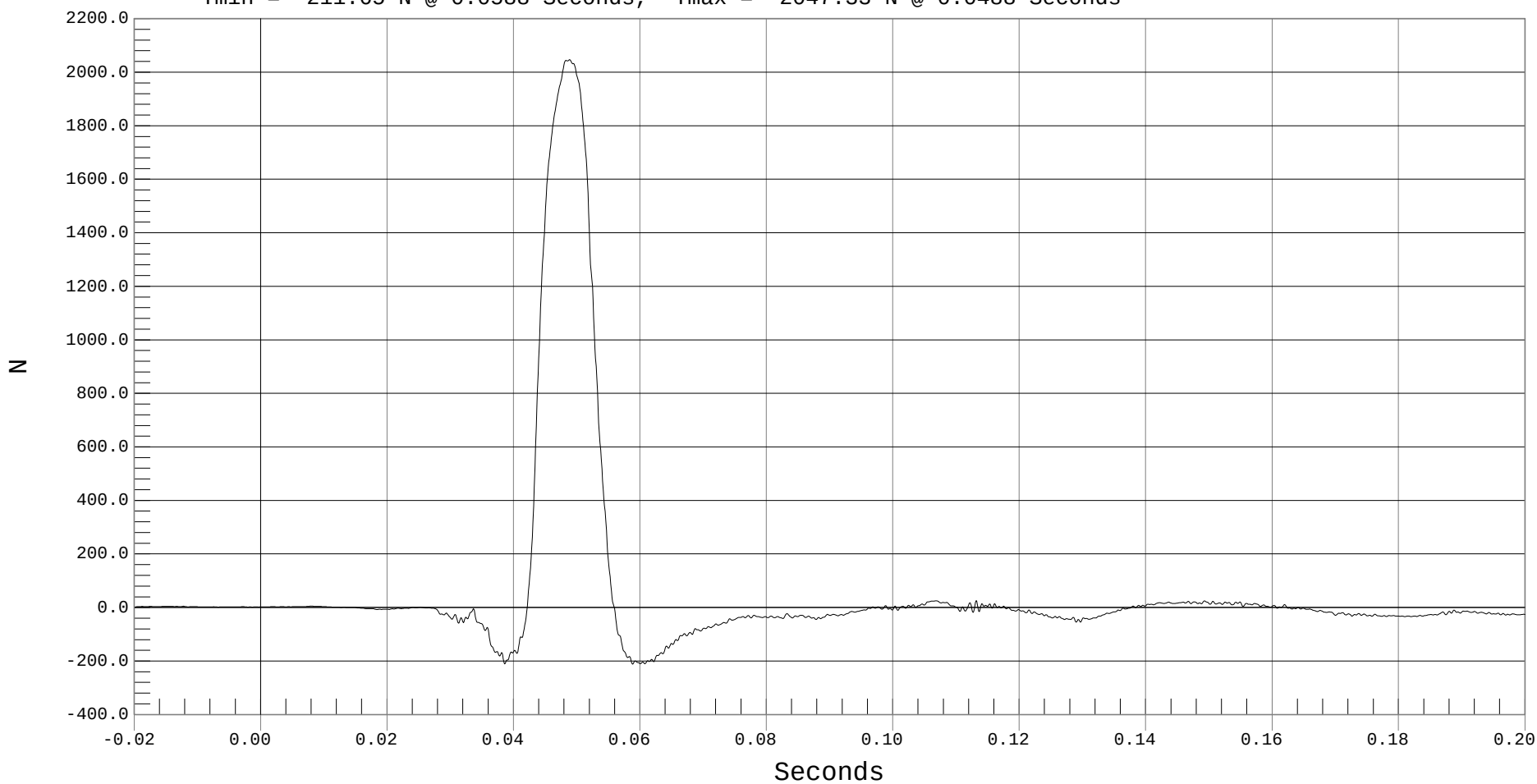
DRIVER TORSO FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER TORSO FORCE Y, B01085FF.F34

Ymin = -211.65 N @ 0.0588 Seconds, Ymax = 2047.33 N @ 0.0488 Seconds





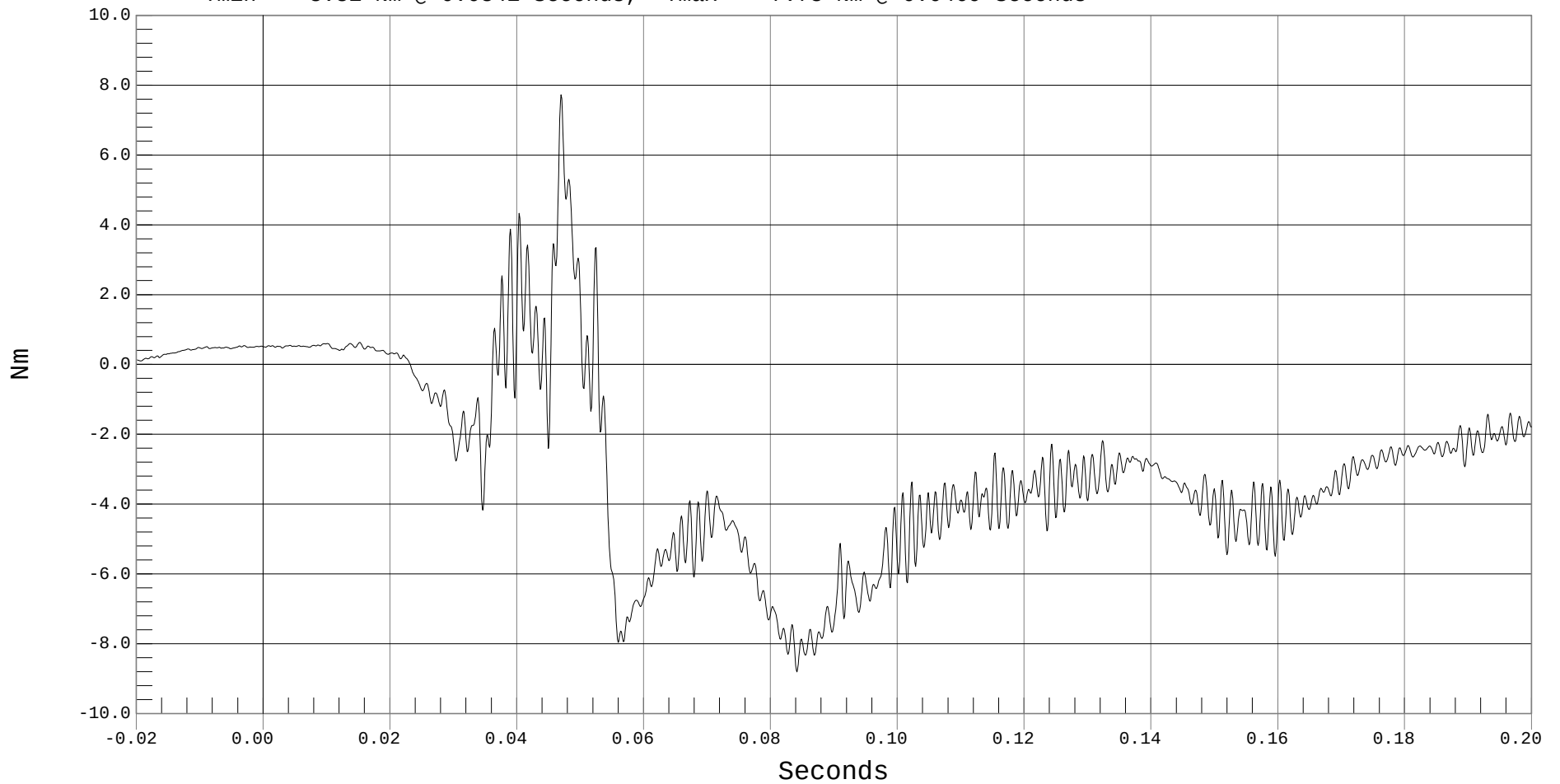
DRIVER TORSO MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER TORSO MOMENT Y, B01085MF.M35

Ymin = -8.81 Nm @ 0.0841 Seconds, Ymax = 7.73 Nm @ 0.0469 Seconds





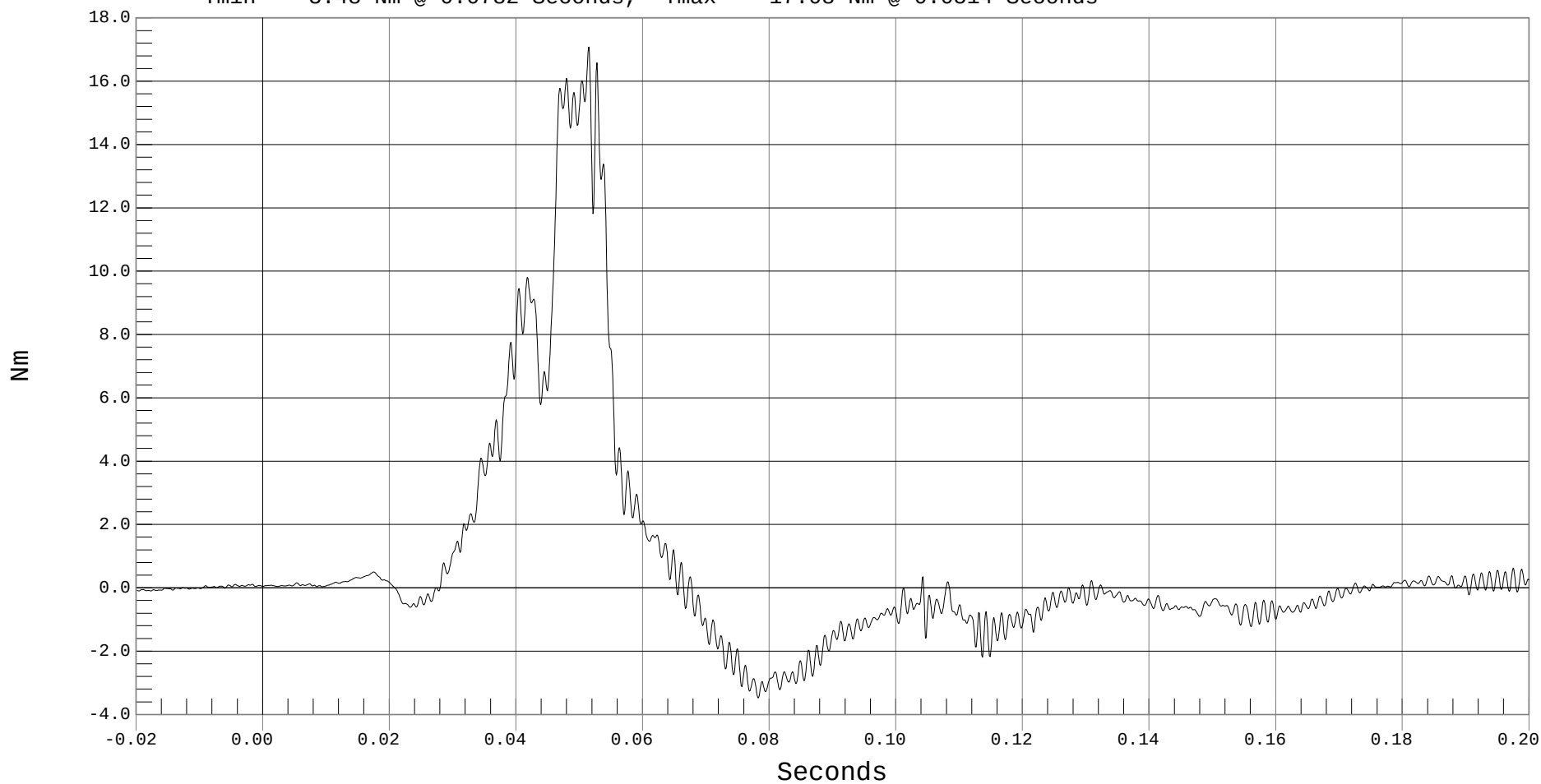
DRIVER TORSO MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER TORSO MOMENT Z, B01085MF.M36

Ymin = -3.48 Nm @ 0.0782 Seconds, Ymax = 17.08 Nm @ 0.0514 Seconds





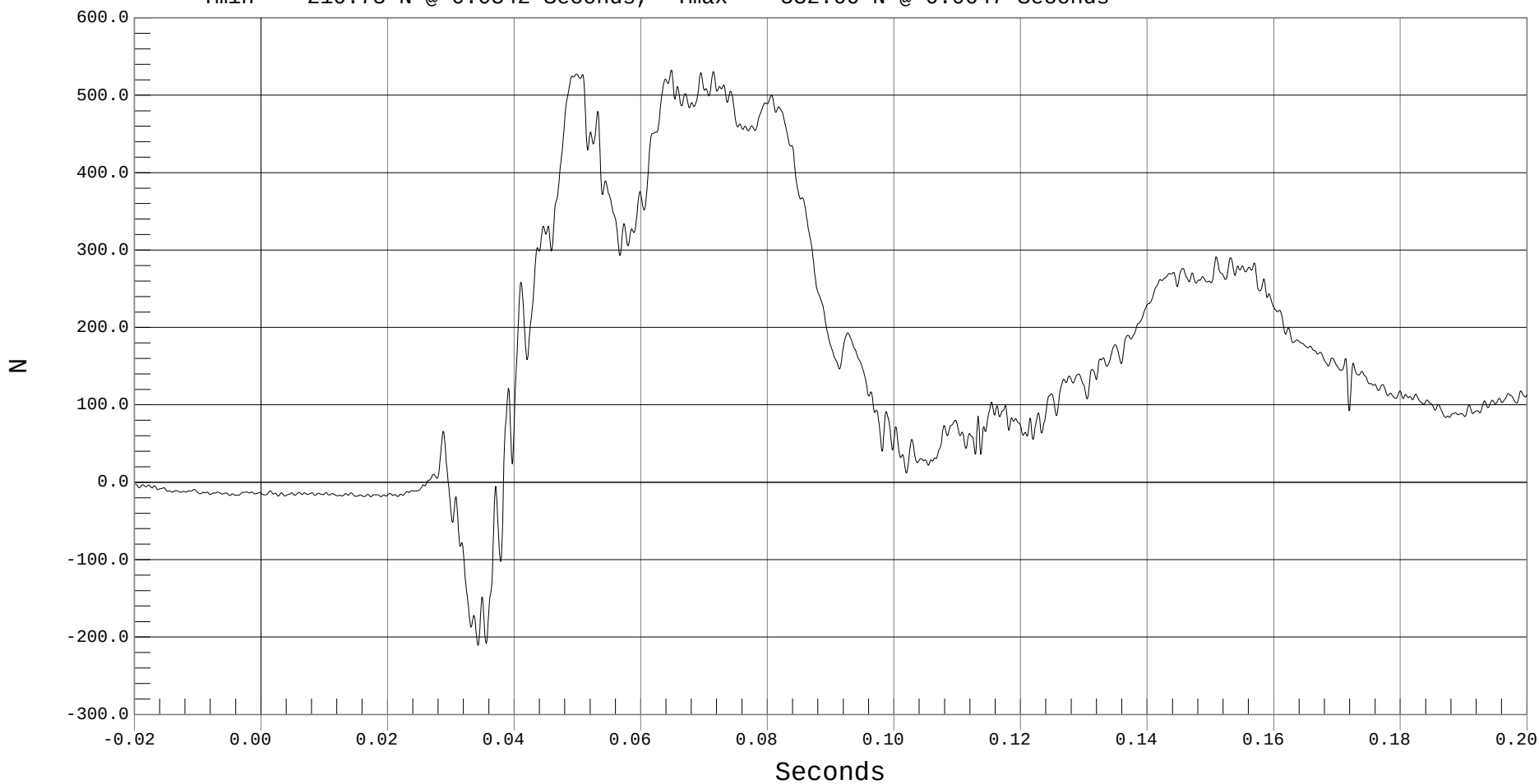
DRIVER T-12 FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER T-12 FORCE X, B01085FF.F37

Ymin = -210.73 N @ 0.0342 Seconds, Ymax = 532.66 N @ 0.0647 Seconds





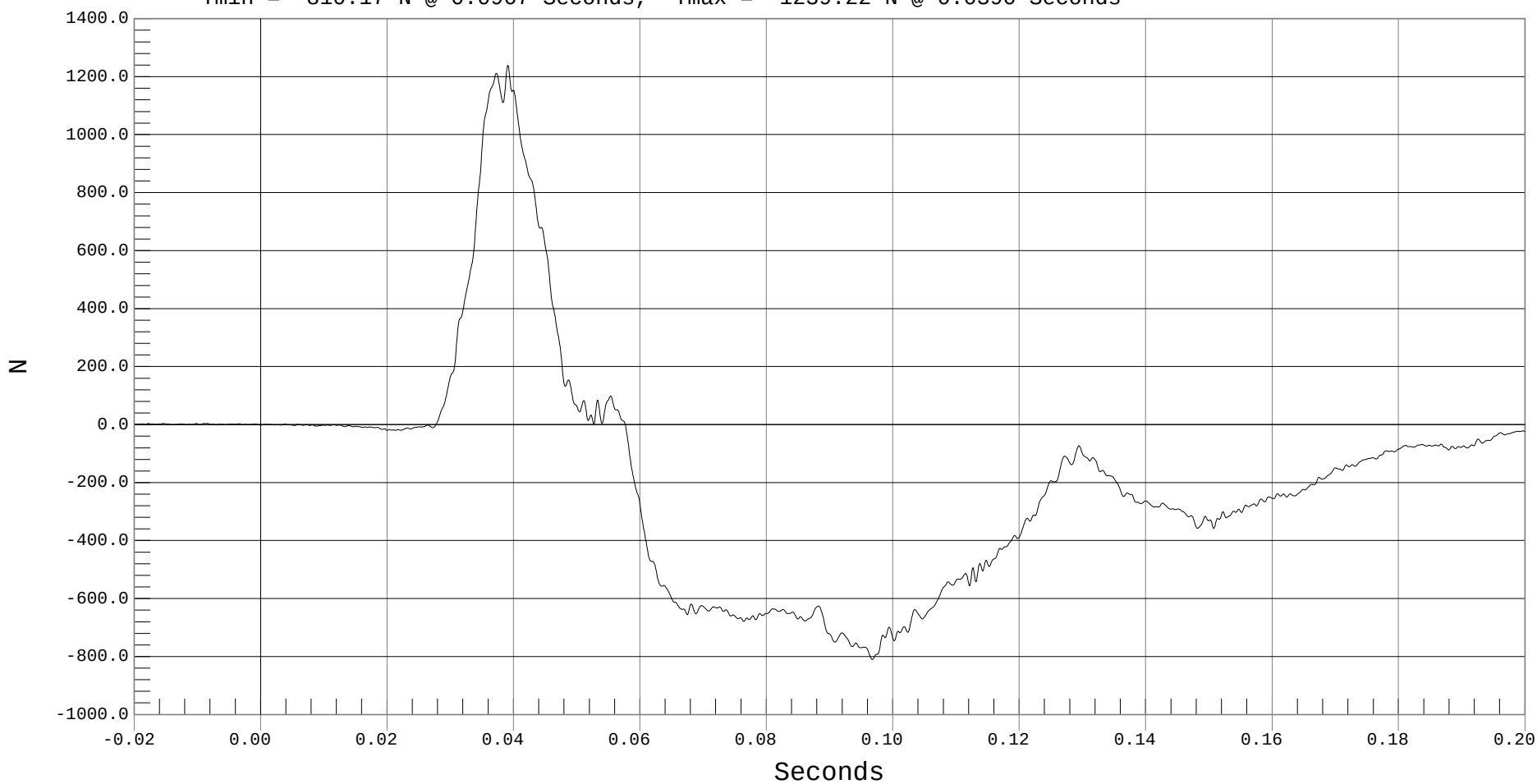
DRIVER T-12 FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

1 DRIVER T-12 FORCE Y, B01085FF.F38

Ymin = -810.17 N @ 0.0967 Seconds, Ymax = 1239.22 N @ 0.0390 Seconds





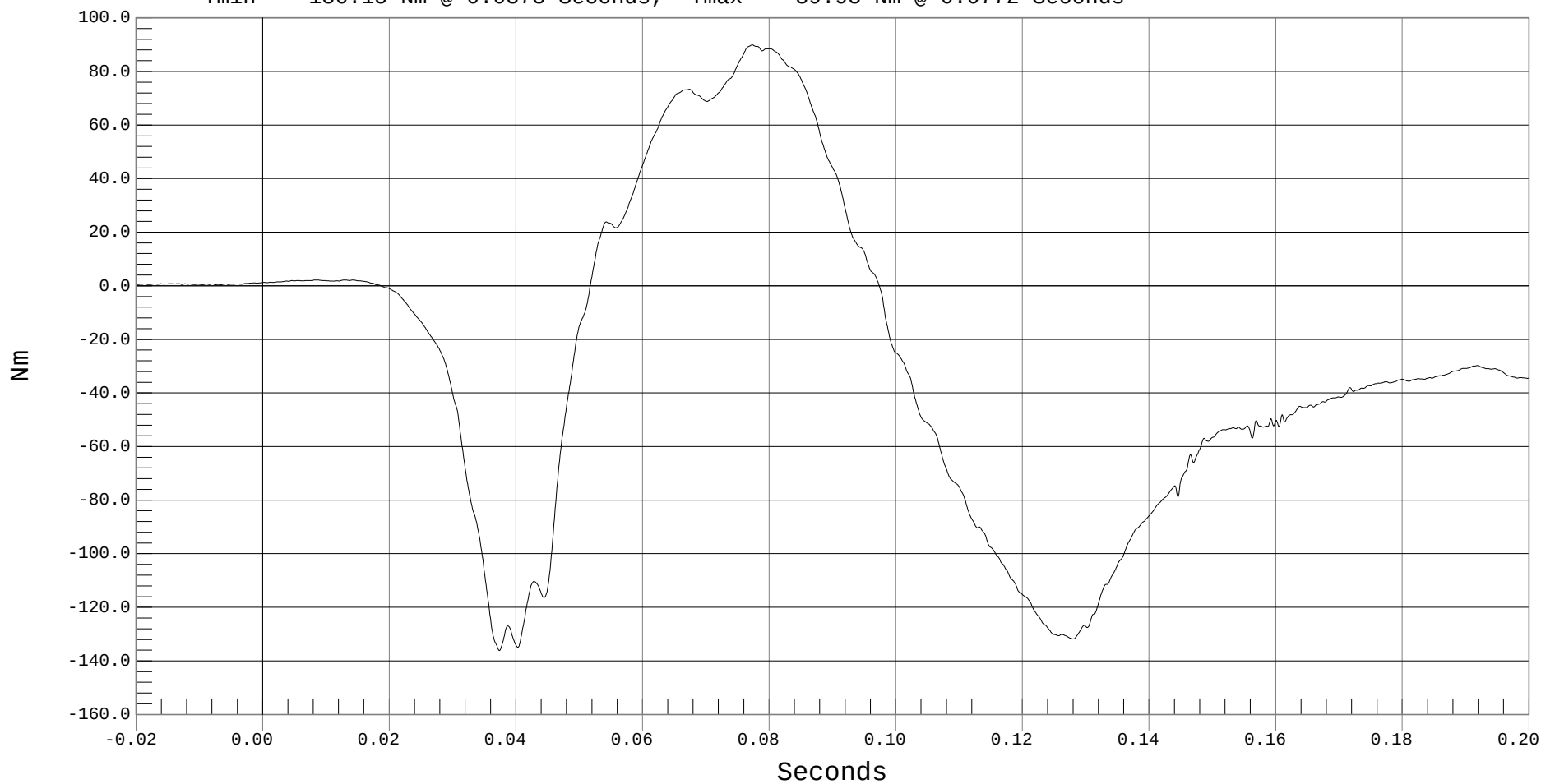
DRIVER T-12 MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER T-12 MOMENT X, B01085MF.M39

Ymin = -136.15 Nm @ 0.0373 Seconds, Ymax = 89.93 Nm @ 0.0772 Seconds





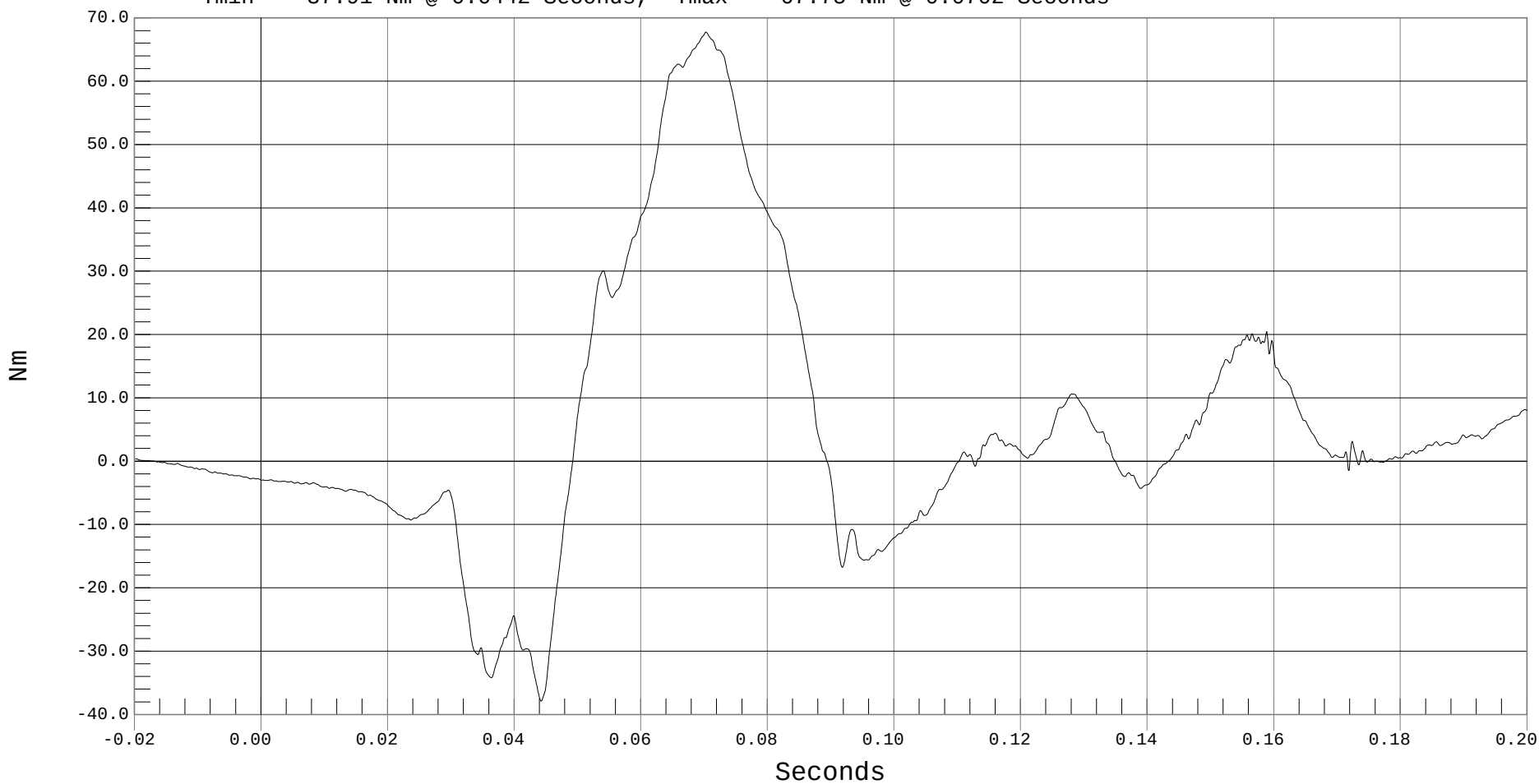
DRIVER T-12 MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER T-12 MOMENT Y, B01085MF.M40

Ymin = -37.91 Nm @ 0.0442 Seconds, Ymax = 67.75 Nm @ 0.0702 Seconds





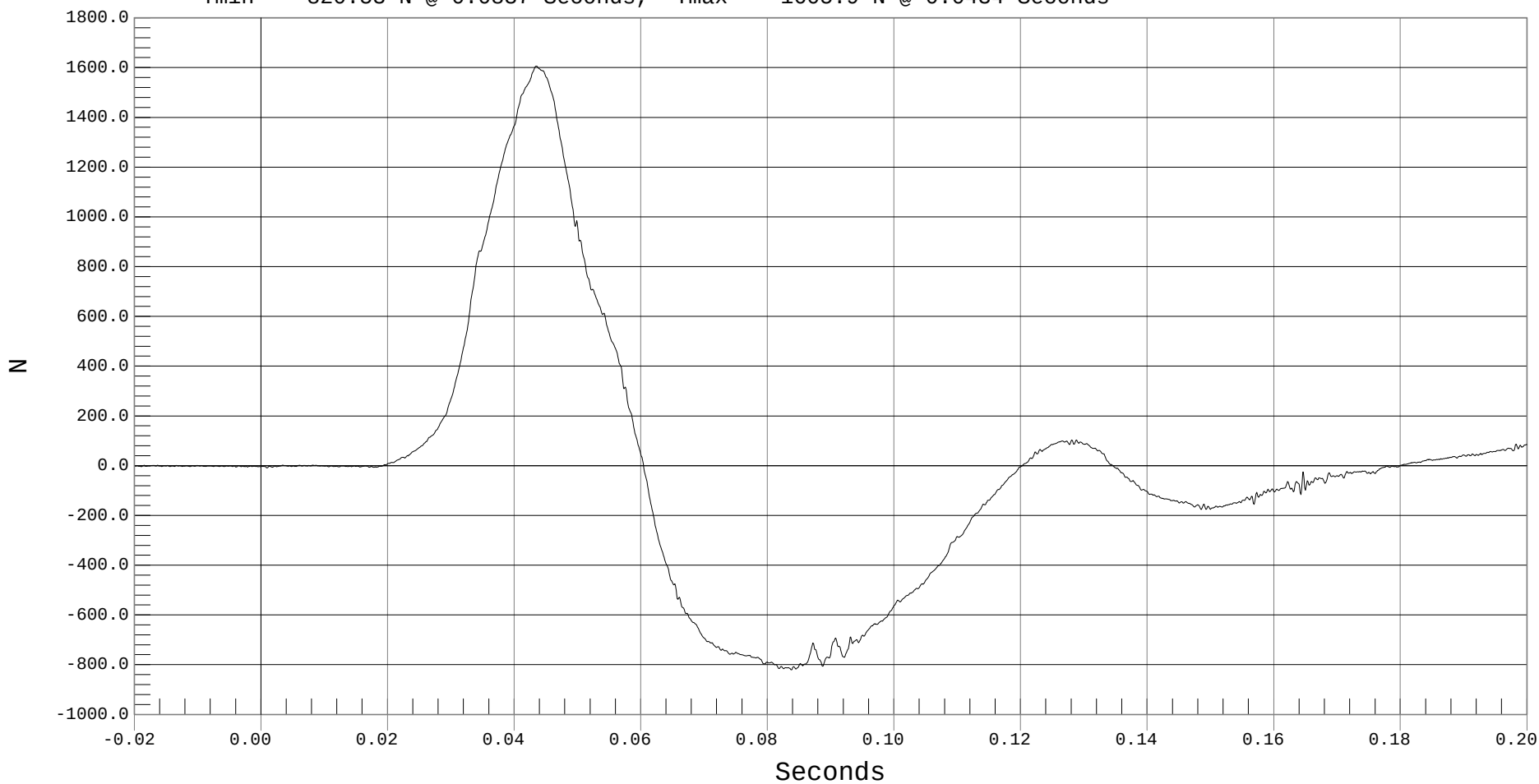
DRIVER LUMBAR FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER LUMBAR FORCE Y, B01085FT.F92

Ymin = -820.53 N @ 0.0837 Seconds, Ymax = 1605.9 N @ 0.0434 Seconds





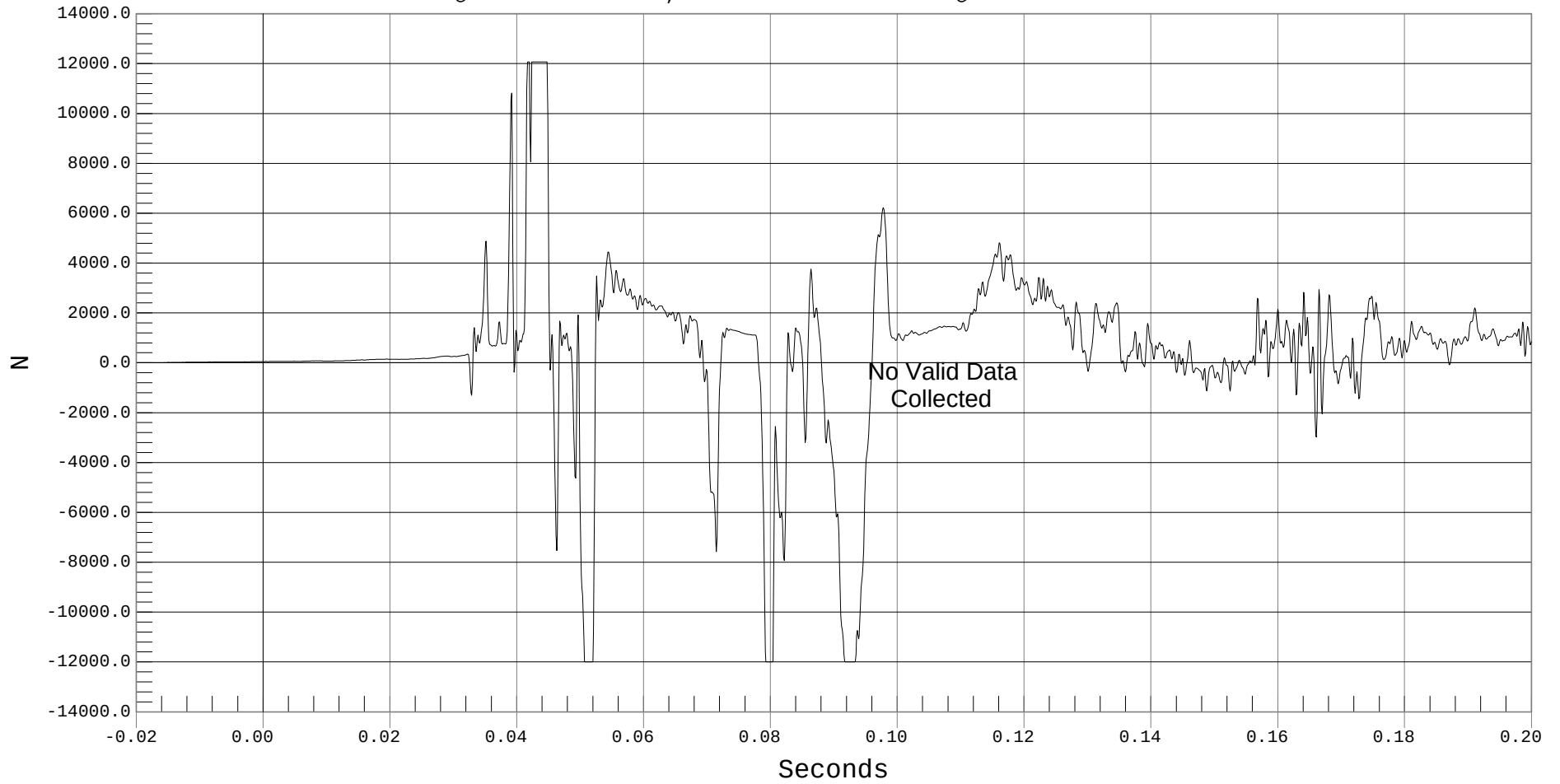
DRIVER LUMBAR FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER LUMBAR FORCE Z, B01085FT.F93

Ymin = -11992.53 N @ 0.0506 Seconds, Ymax = 12064.72 N @ 0.0416 Seconds





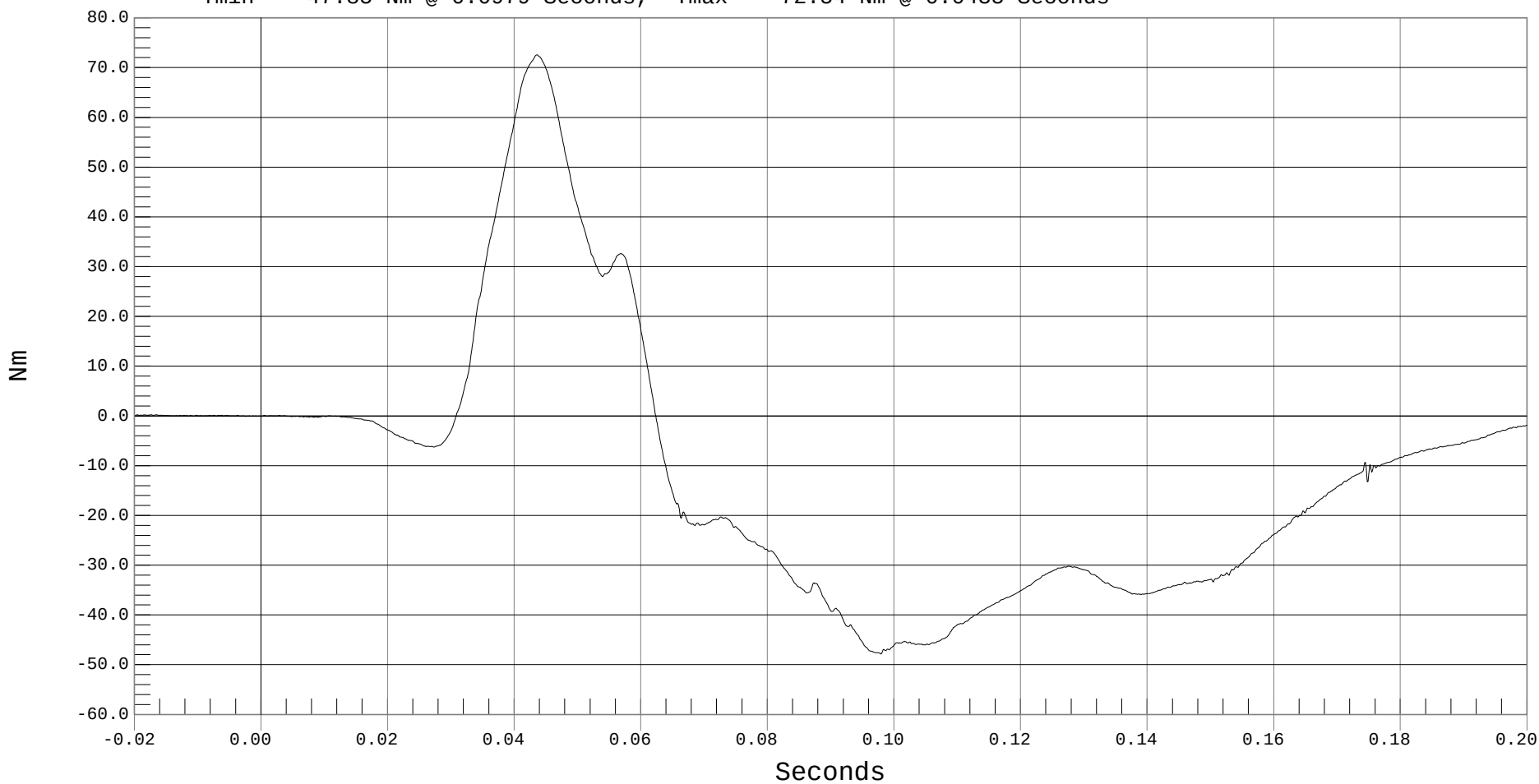
DRIVER LUMBAR MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER LUMBAR MOMENT X, B01085MT.M94

Ymin = -47.85 Nm @ 0.0979 Seconds, Ymax = 72.54 Nm @ 0.0435 Seconds



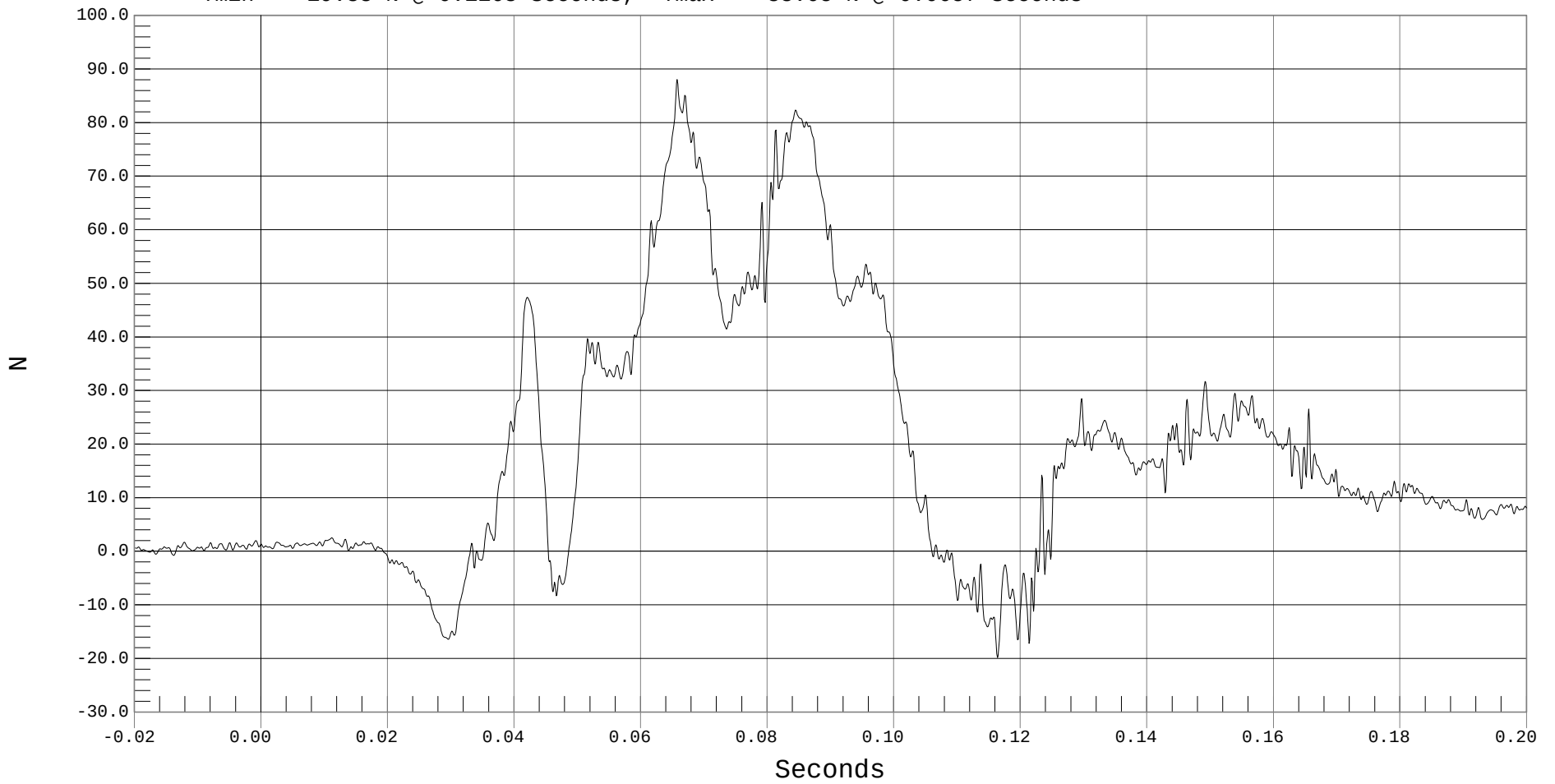


DRIVER ABDOMEN FRONT FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

Ymin = -19.88 N @ 0.1163 Seconds, Ymax = 88.05 N @ 0.0657 Seconds





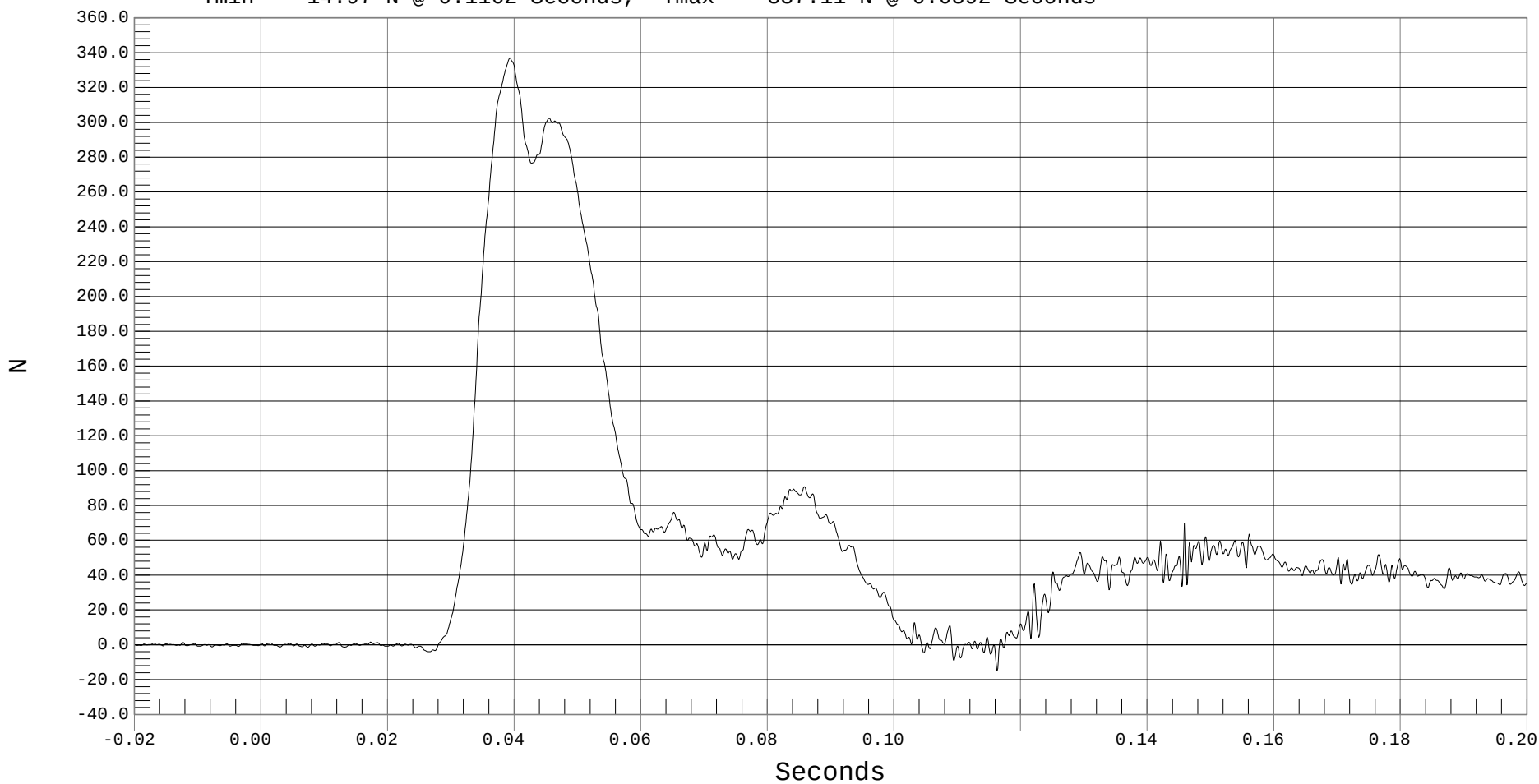
DRIVER ABDOMEN MID FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER MID ABDOMEN FORCE, B01085FF.F42

Ymin = -14.97 N @ 0.1162 Seconds, Ymax = 337.11 N @ 0.0392 Seconds





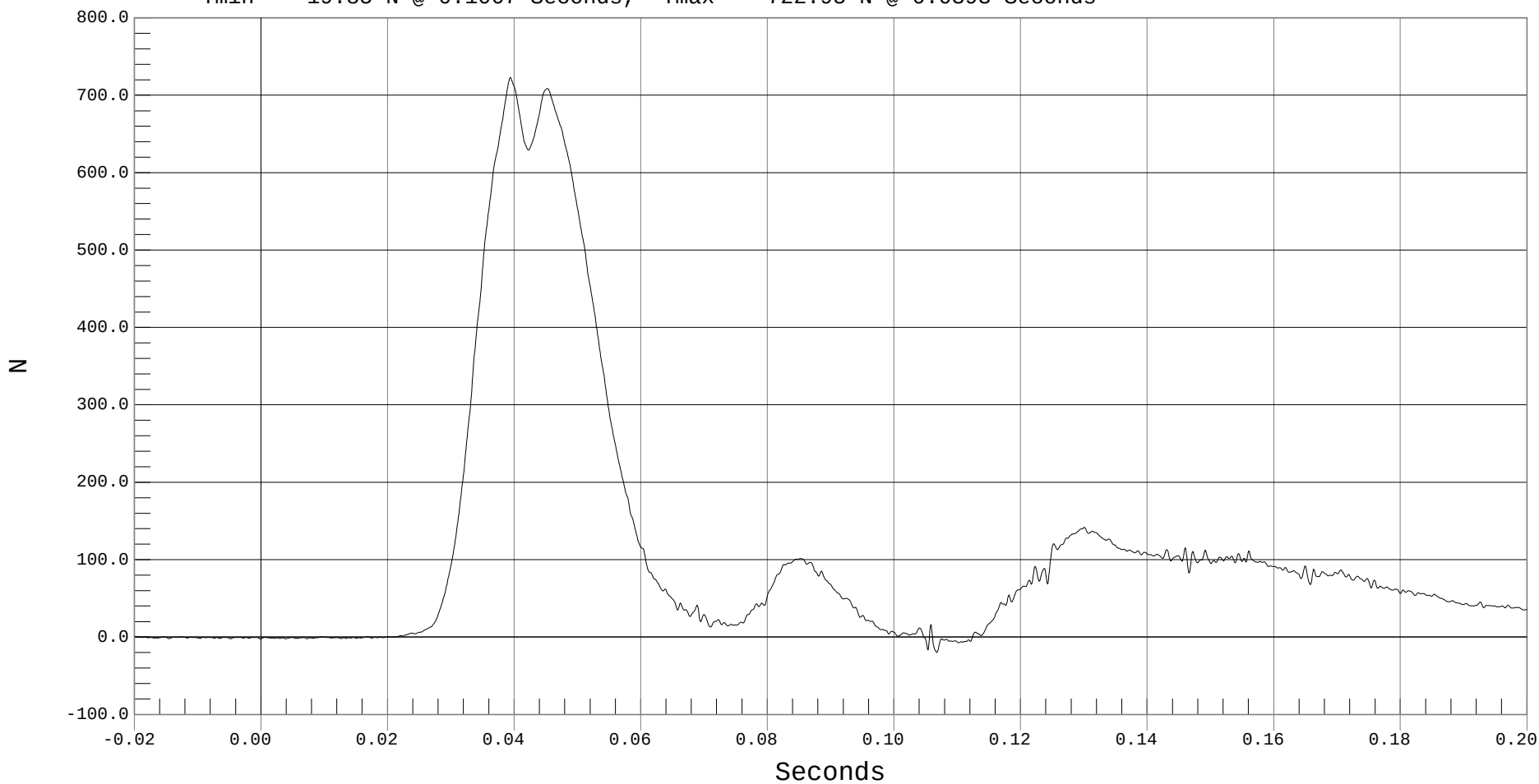
DRIVER ABDOMEN REAR FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER REAR ABDOMEN FORCE, B01085FF.F43

Ymin = -19.85 N @ 0.1067 Seconds, Ymax = 722.95 N @ 0.0393 Seconds





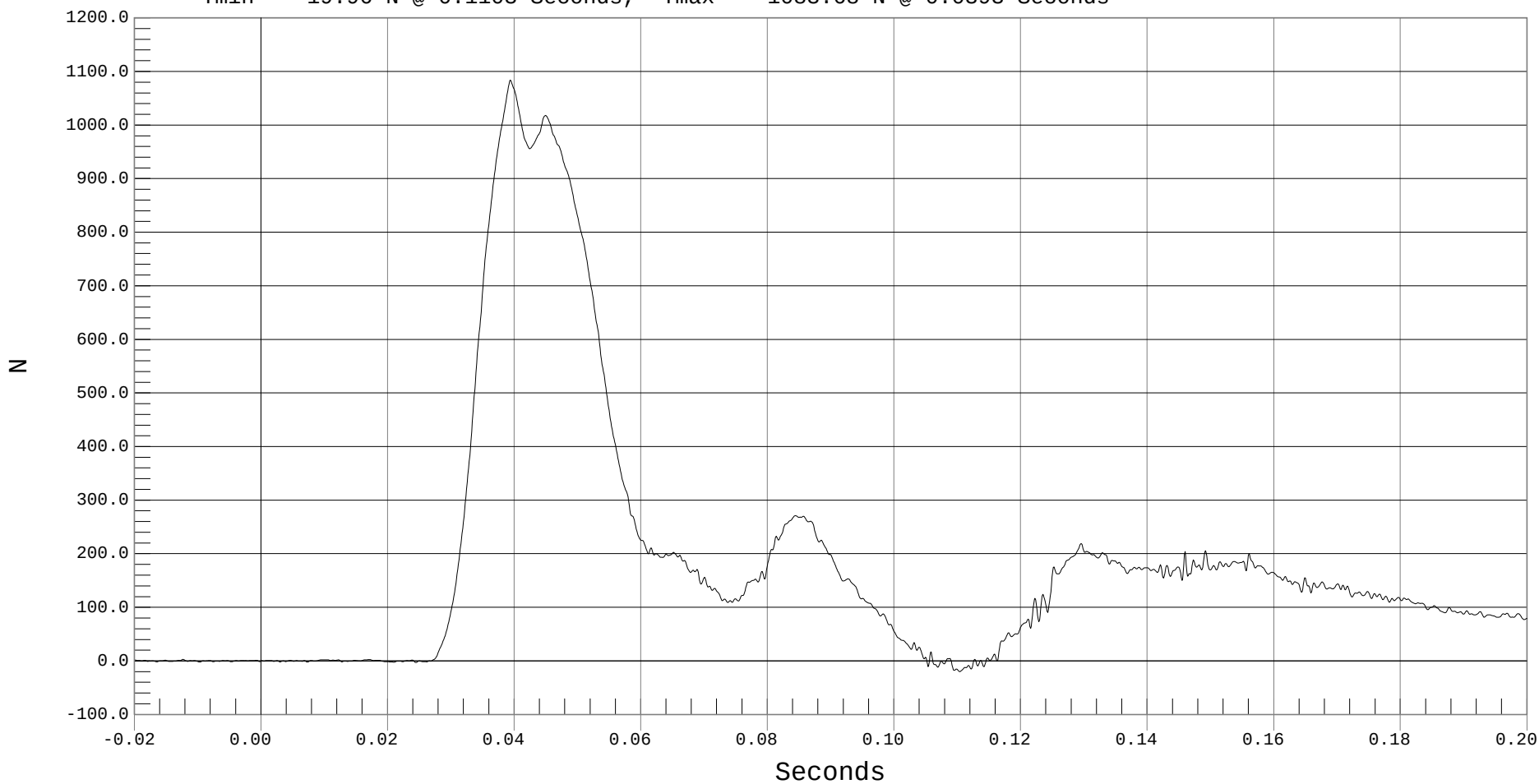
DRIVER SUMMED ABDOMEN FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER SUMMED ABDOMEN FORCE, B01085FU.F41

Ymin = -19.96 N @ 0.1103 Seconds, Ymax = 1083.68 N @ 0.0393 Seconds





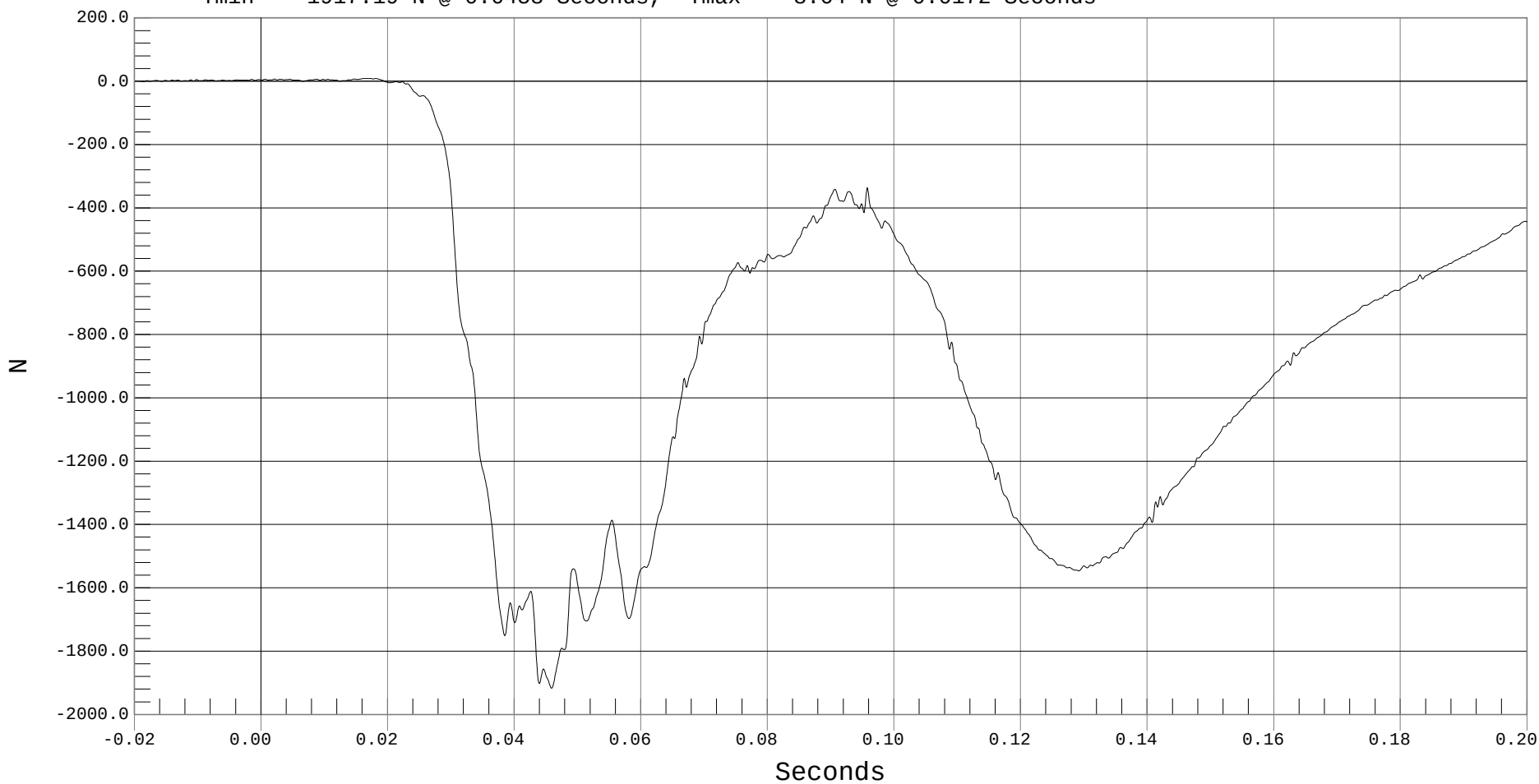
DRIVER PUBIC SYMPHYSIS FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER PUBIC SYMPHYSIS FORCE, B01085FF.F44

Ymin = -1917.19 N @ 0.0458 Seconds, Ymax = 8.64 N @ 0.0172 Seconds





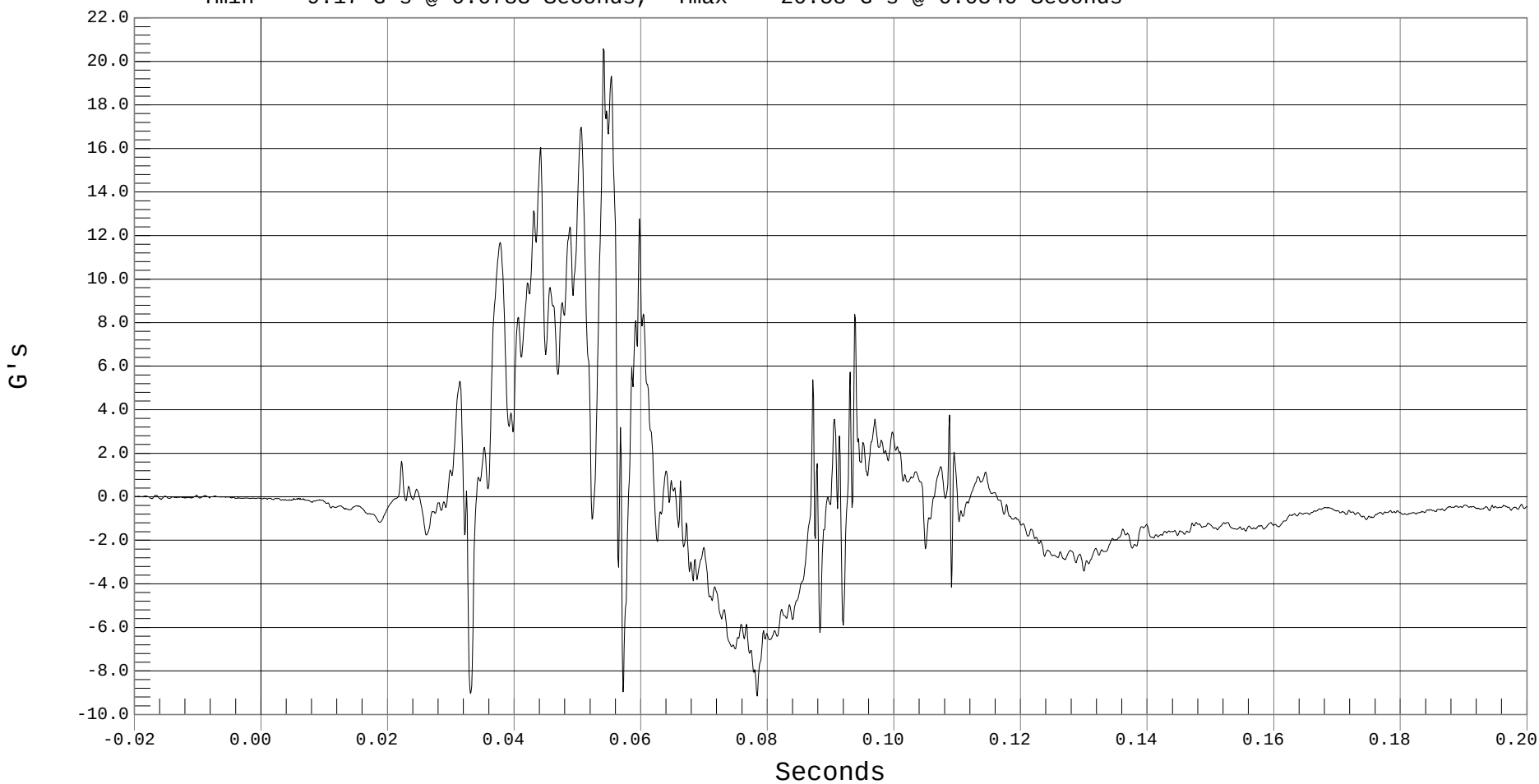
DRIVER PELVIS X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS X, B01085AT.A46

Ymin = -9.17 G's @ 0.0783 Seconds, Ymax = 20.58 G's @ 0.0540 Seconds





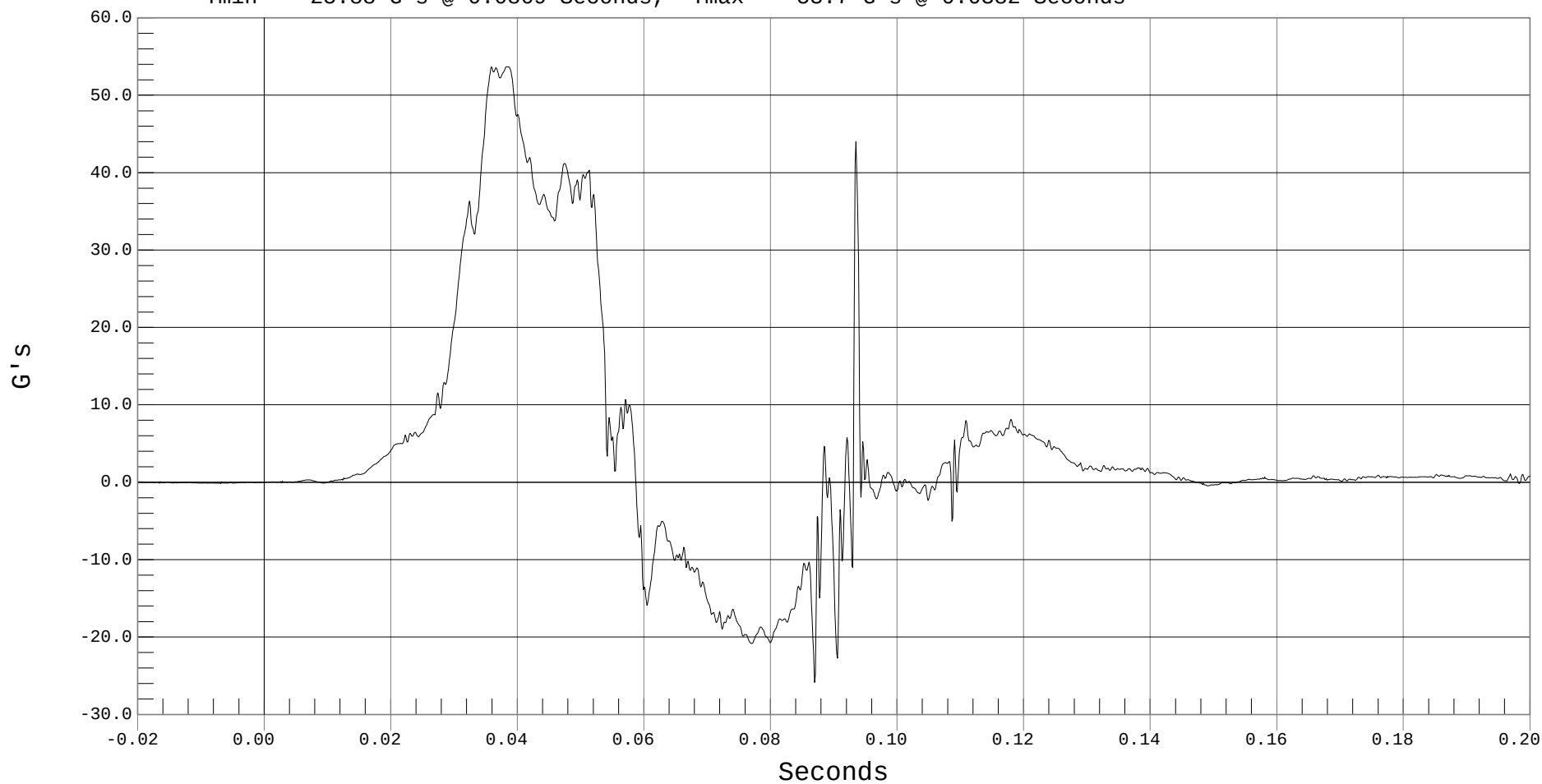
DRIVER PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Y, B01085AT.A45

Ymin = -25.88 G's @ 0.0869 Seconds, Ymax = 53.7 G's @ 0.0382 Seconds





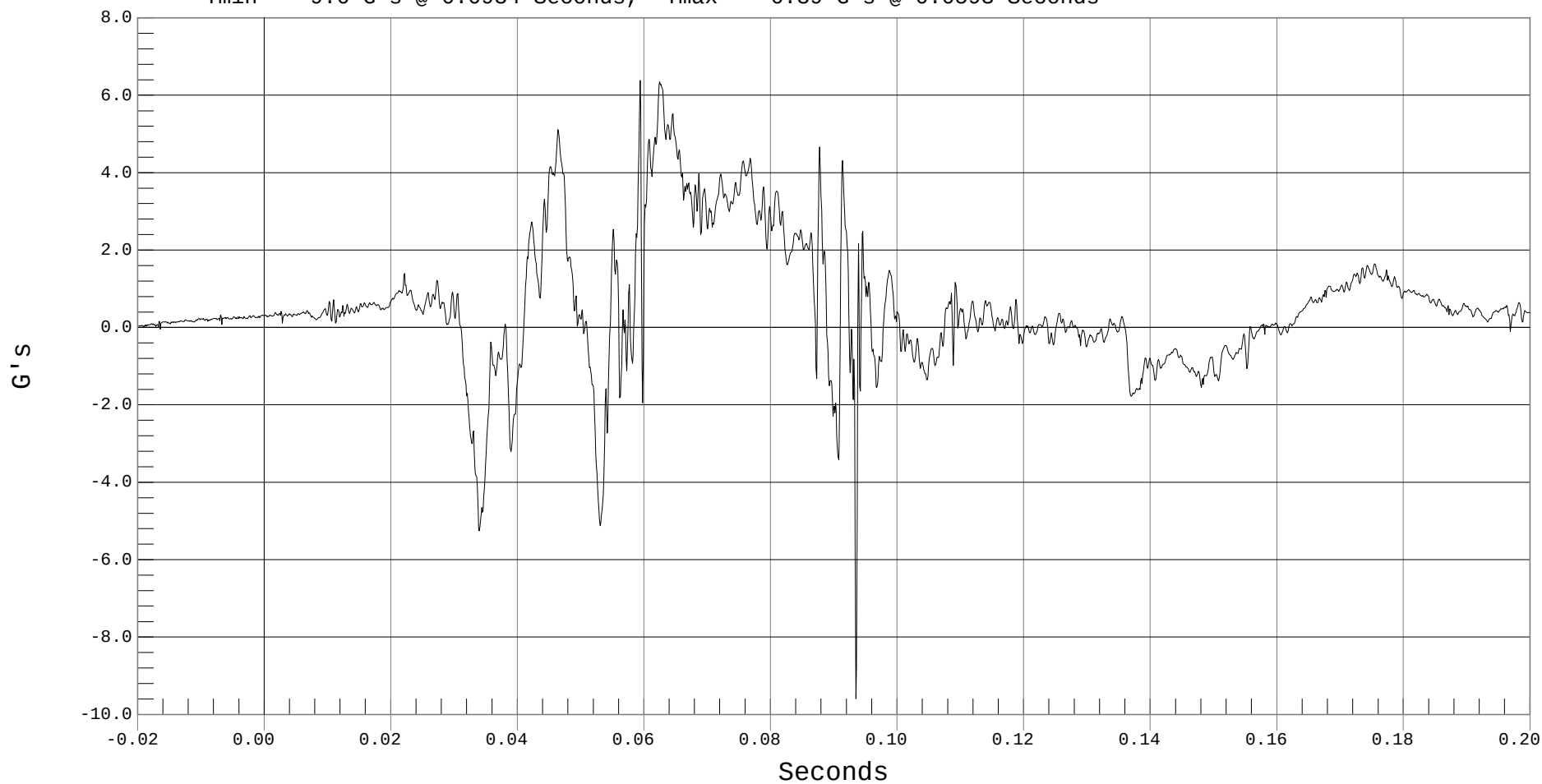
DRIVER PELVIS Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Z, B01085AT.A47

Ymin = -9.6 G's @ 0.0934 Seconds, Ymax = 6.39 G's @ 0.0593 Seconds





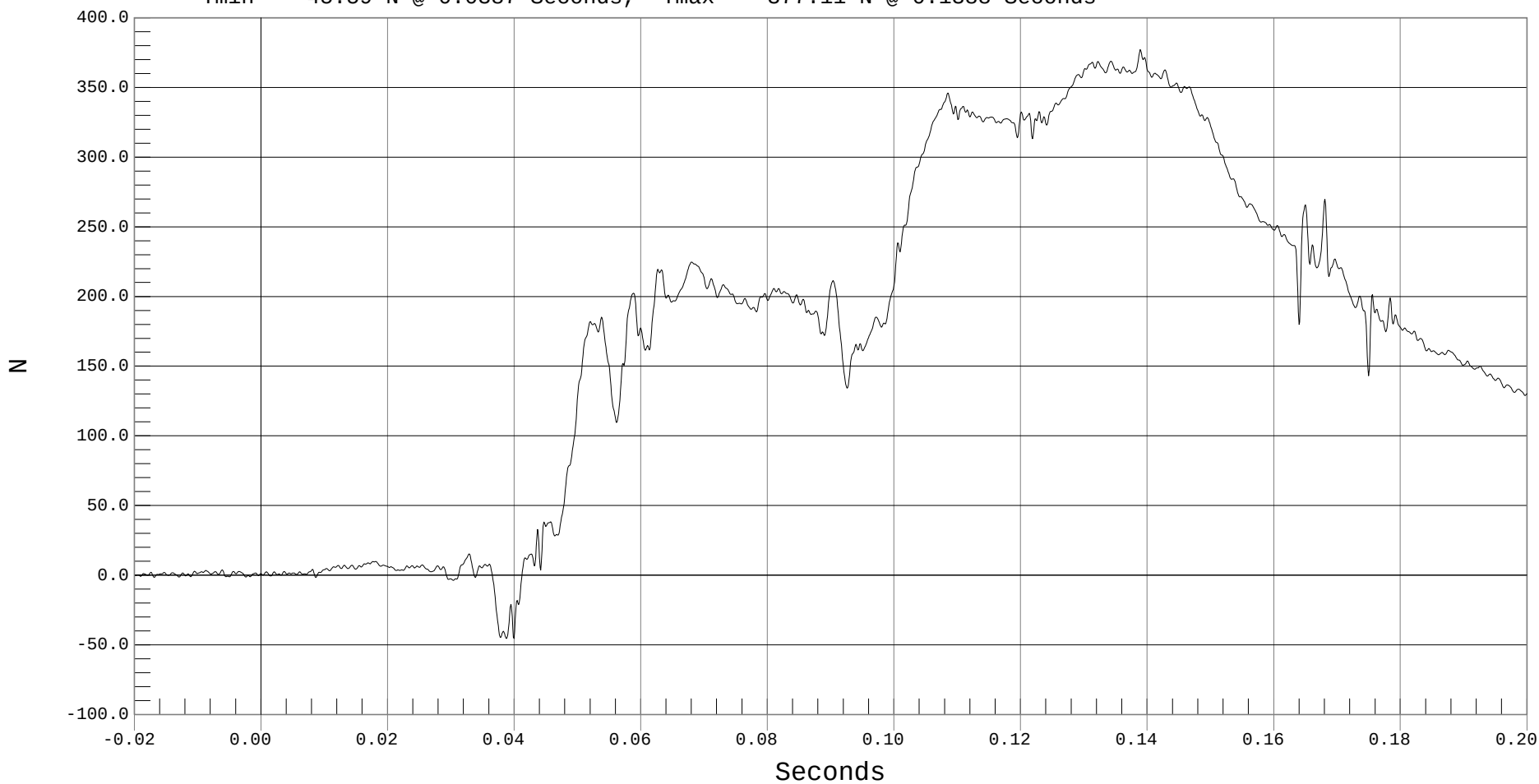
DRIVER LEFT FEMUR FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR FORCE X, B01085FF.F54

Ymin = -45.59 N @ 0.0387 Seconds, Ymax = 377.11 N @ 0.1388 Seconds





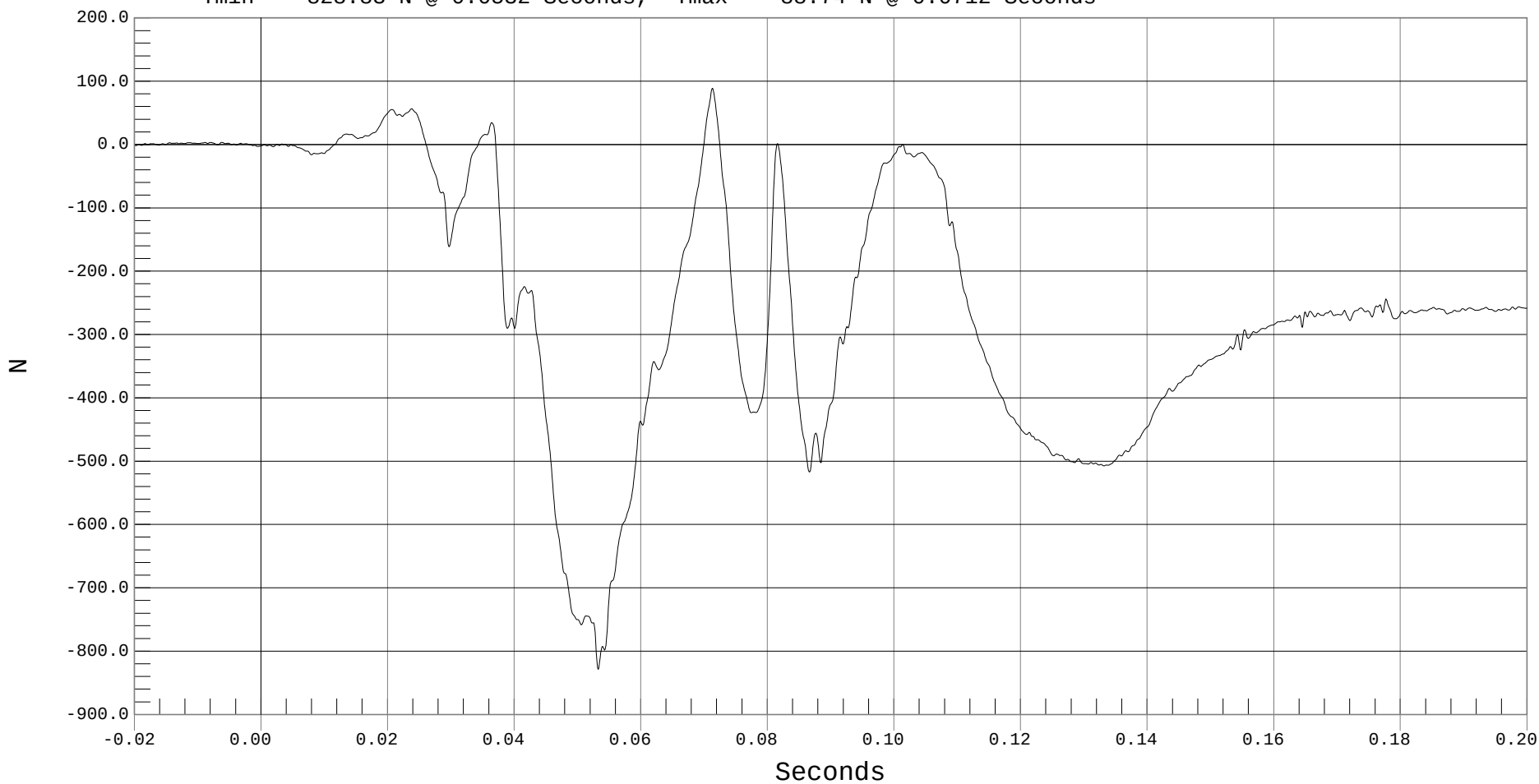
DRIVER LEFT FEMUR FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR FORCE Y, B01085FF.F55

Ymin = -828.83 N @ 0.0532 Seconds, Ymax = 88.74 N @ 0.0712 Seconds





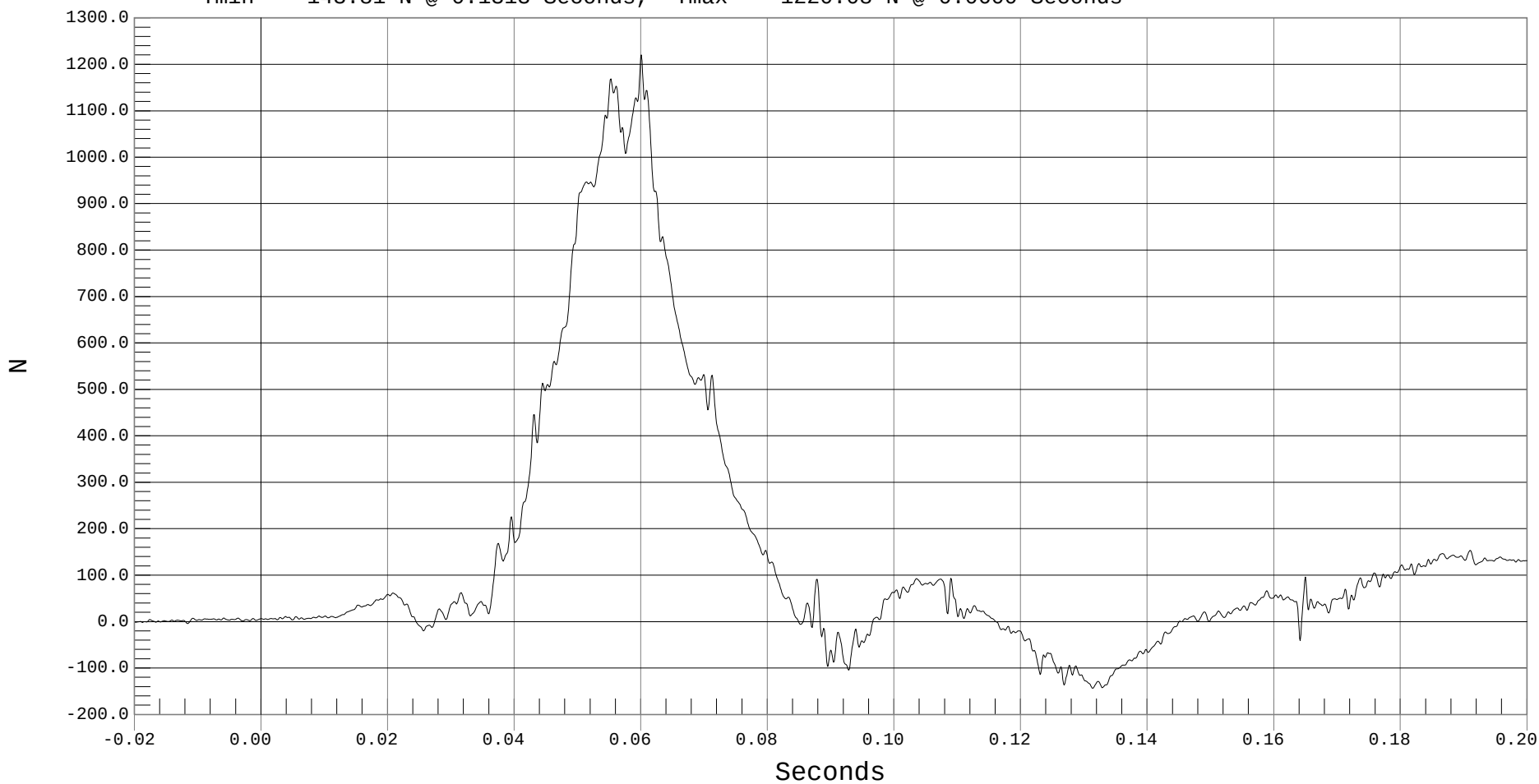
DRIVER LEFT FEMUR FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

1 DRIVER LEFT FEMUR FORCE Z, B01085FF.F56

Ymin = -143.81 N @ 0.1313 Seconds, Ymax = 1220.08 N @ 0.0600 Seconds





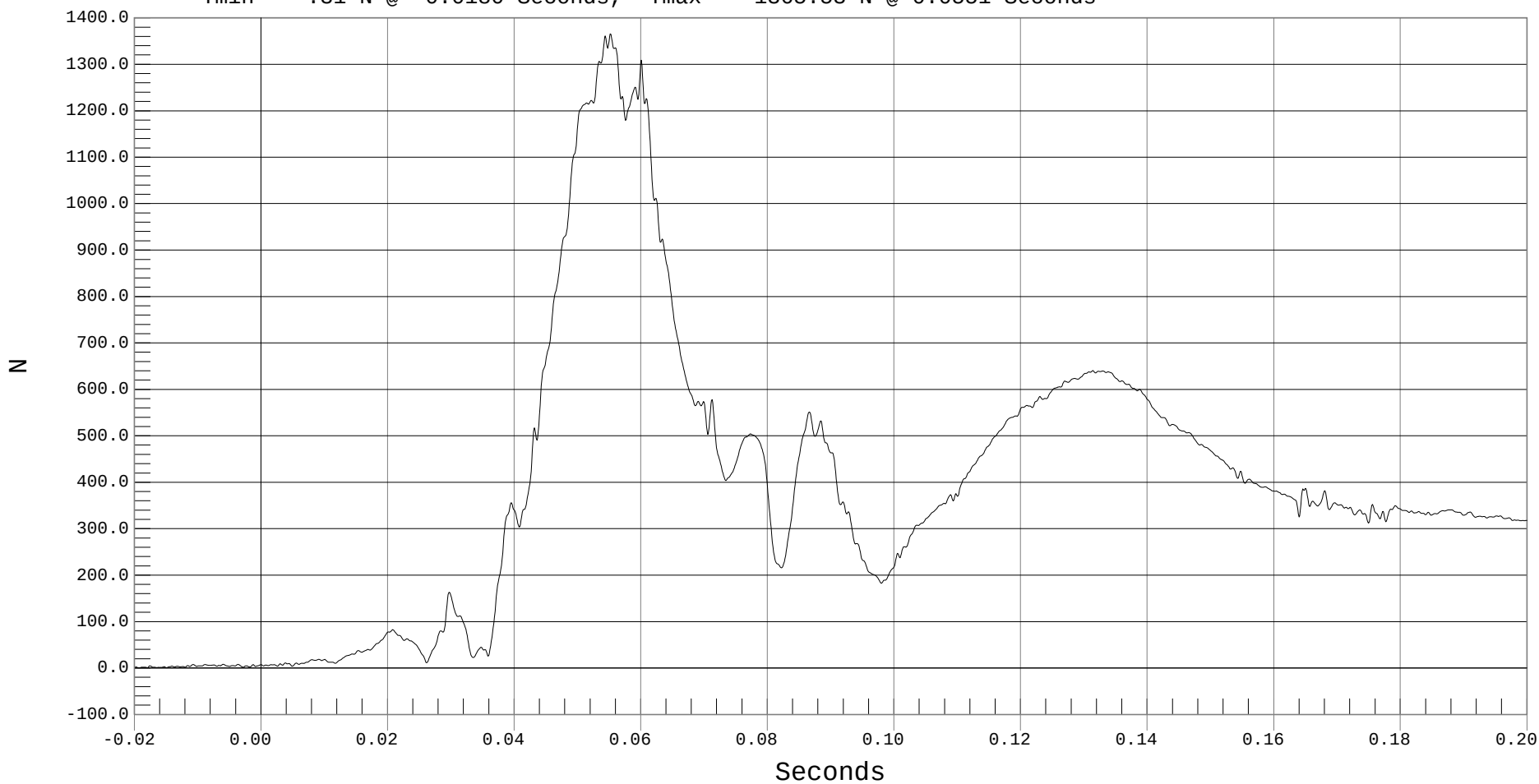
DRIVER LEFT FEMUR FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR FORCE RESULTANT, B01085FV.F54

Ymin = .31 N @ -0.0180 Seconds, Ymax = 1365.53 N @ 0.0551 Seconds





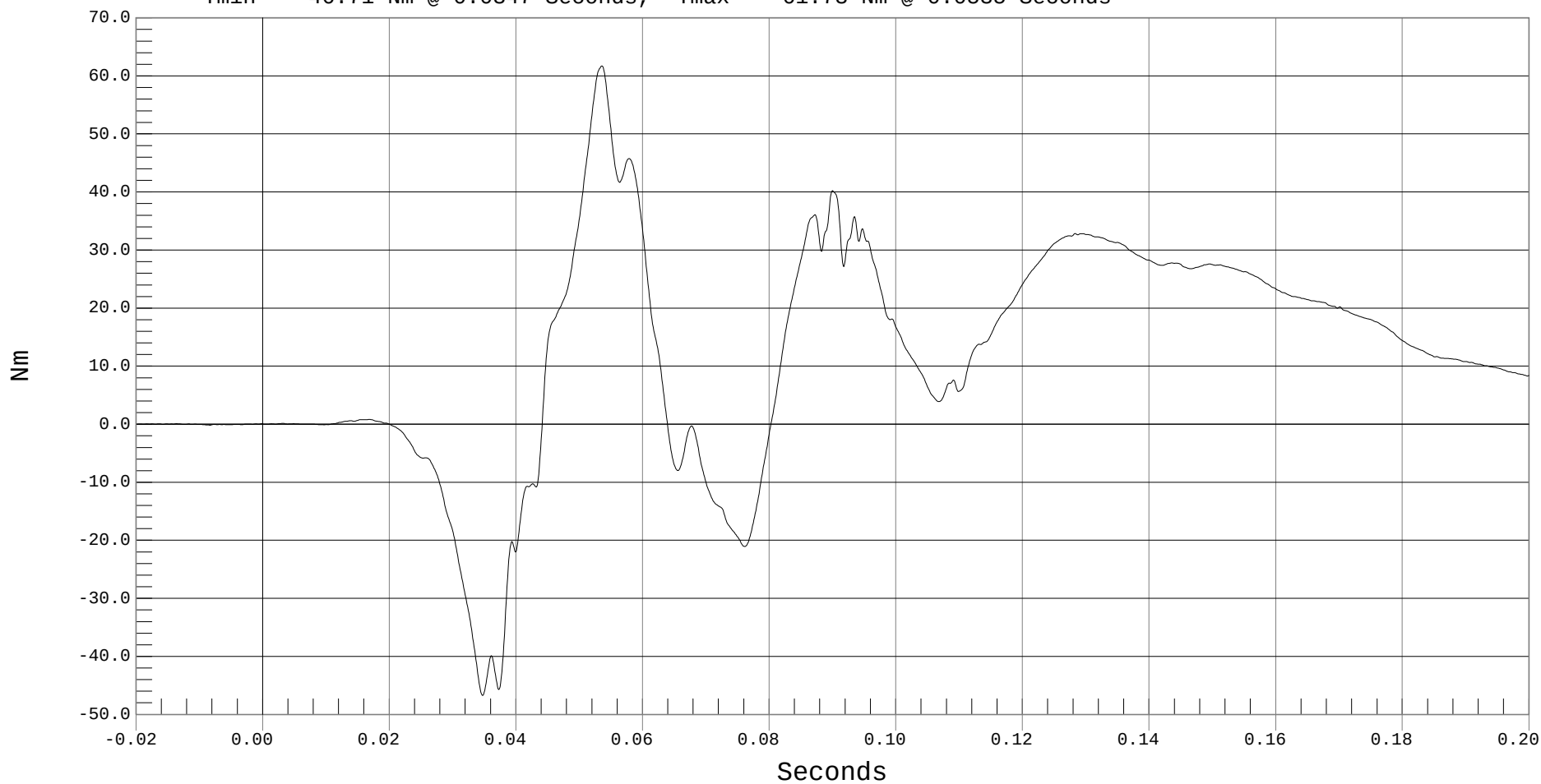
DRIVER LEFT FEMUR MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT X, B01085MF.M57

Ymin = -46.71 Nm @ 0.0347 Seconds, Ymax = 61.73 Nm @ 0.0535 Seconds





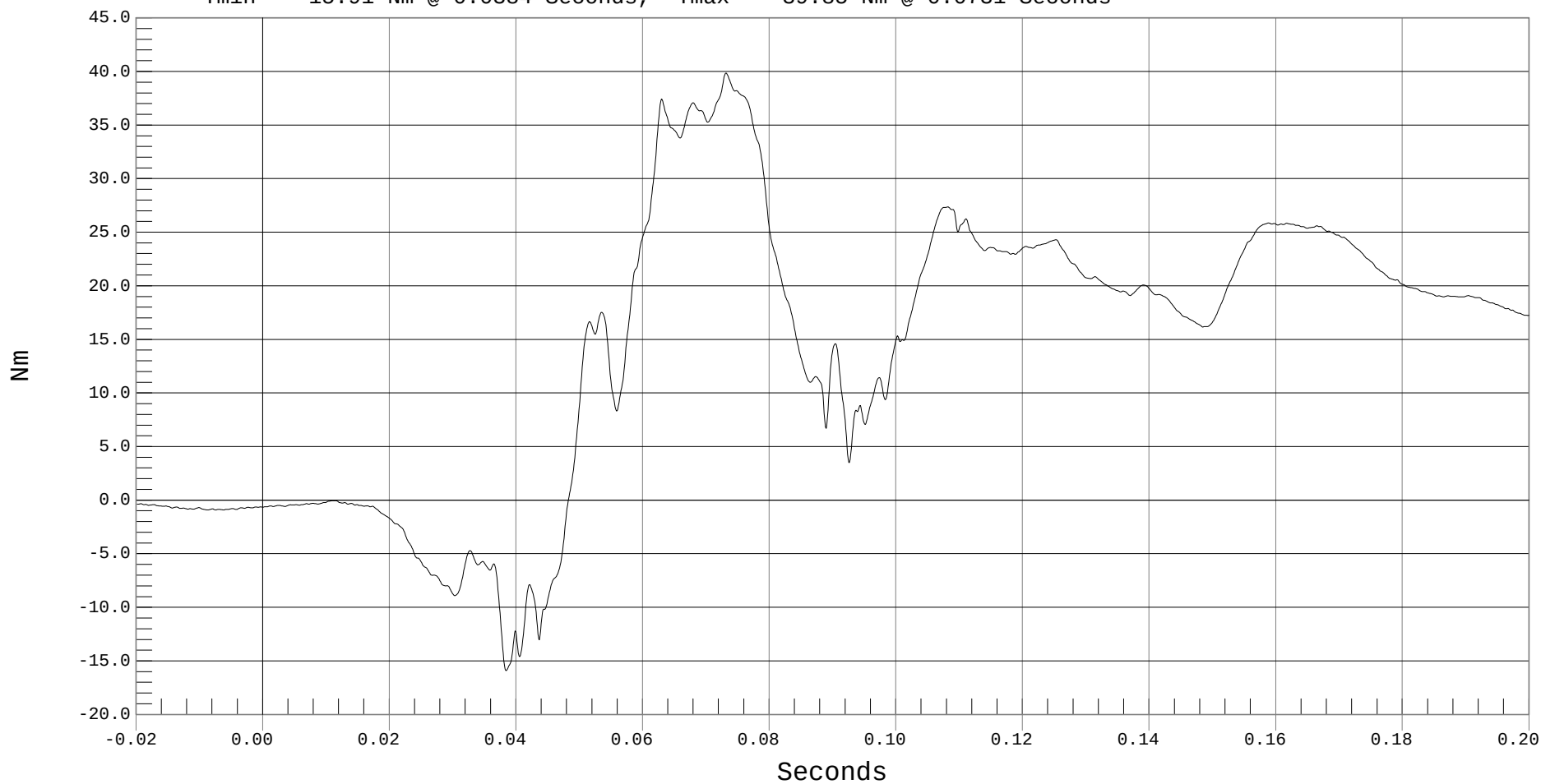
DRIVER LEFT FEMUR MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT Y, B01085MF.M58

Ymin = -15.91 Nm @ 0.0384 Seconds, Ymax = 39.85 Nm @ 0.0731 Seconds





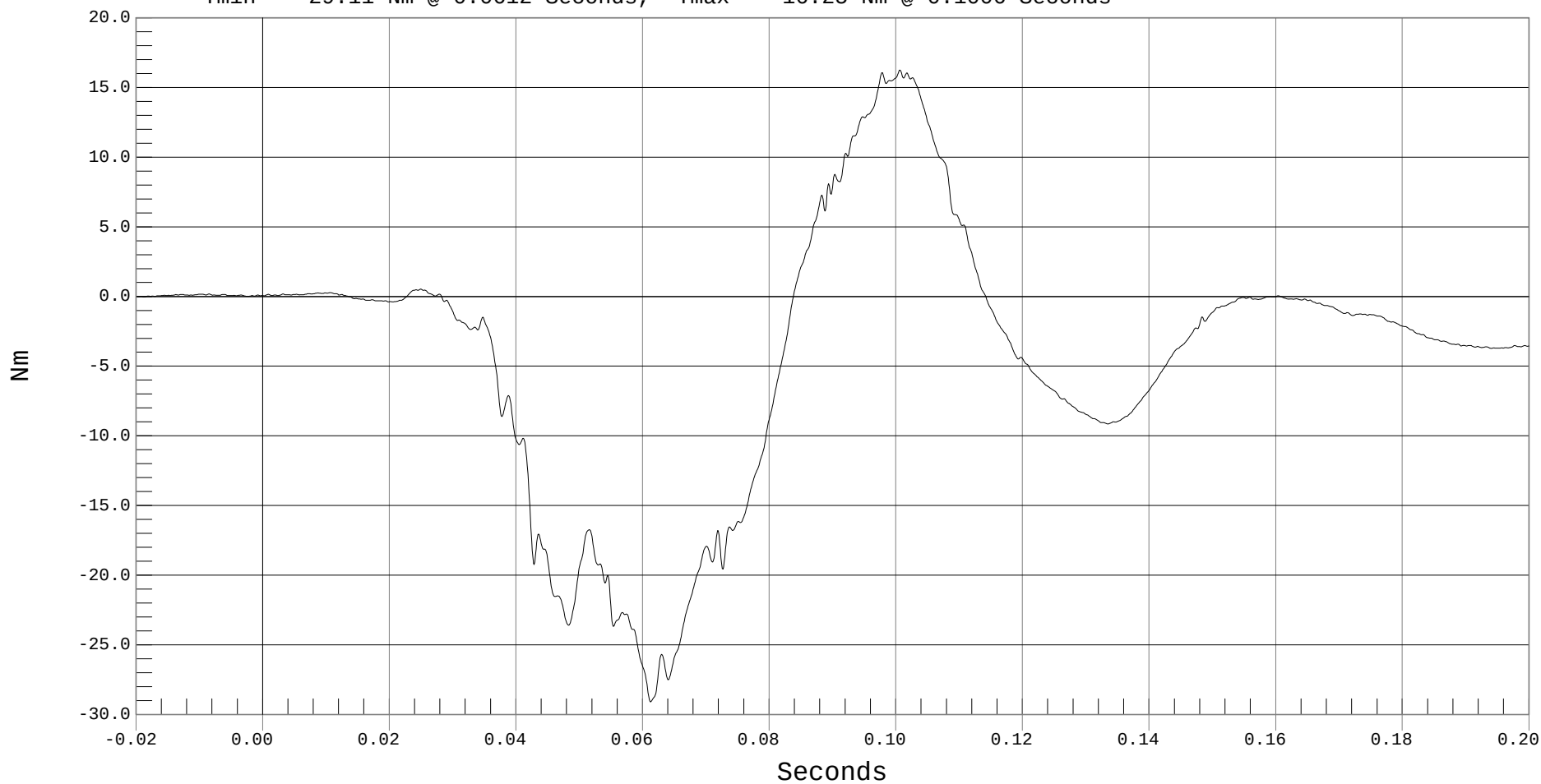
DRIVER LEFT FEMUR MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT Z, B01085MF.M59

Ymin = -29.11 Nm @ 0.0612 Seconds, Ymax = 16.25 Nm @ 0.1006 Seconds





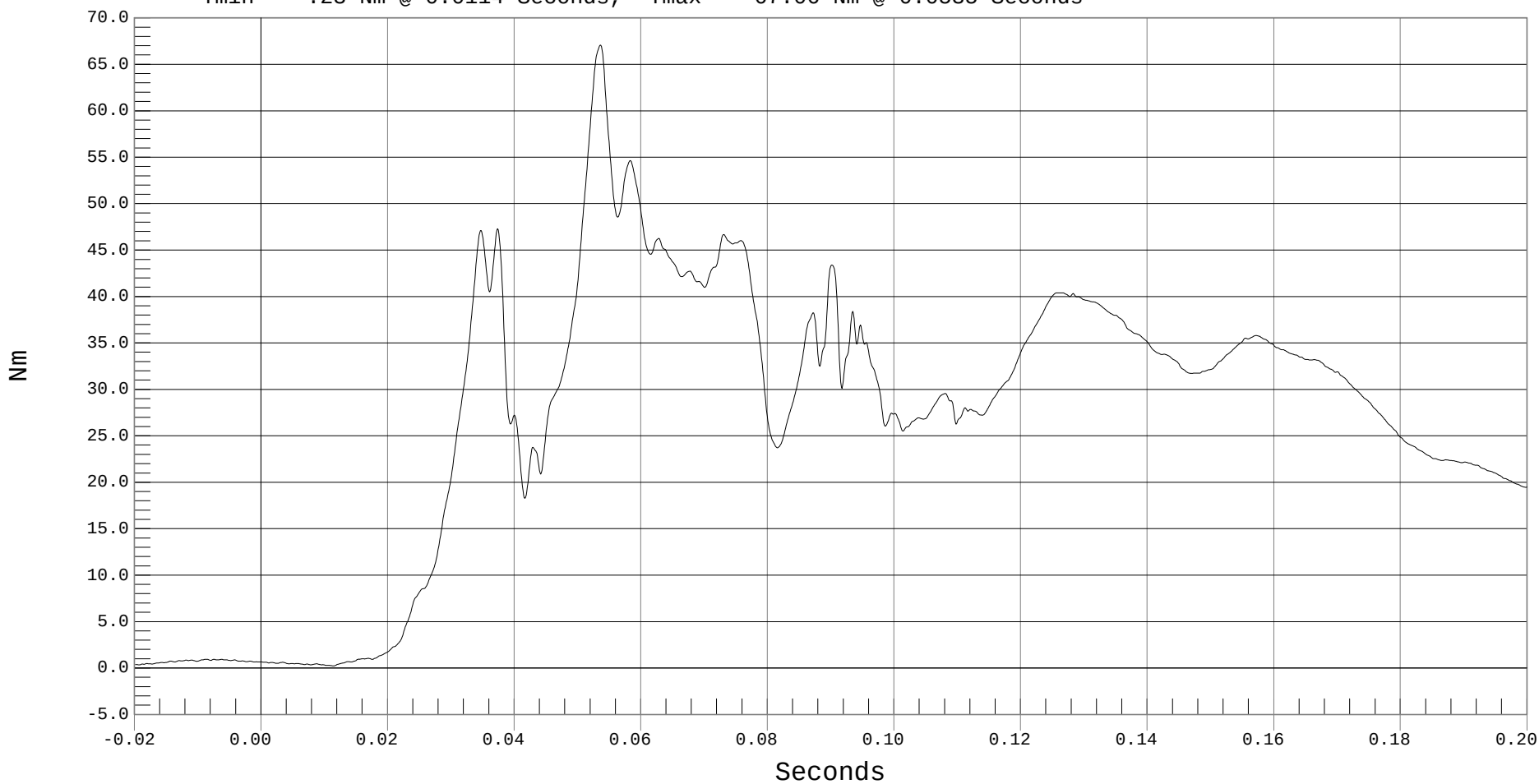
DRIVER LEFT FEMUR MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT RESULTANT, B01085MV.M57

Ymin = .23 Nm @ 0.0114 Seconds, Ymax = 67.06 Nm @ 0.0535 Seconds





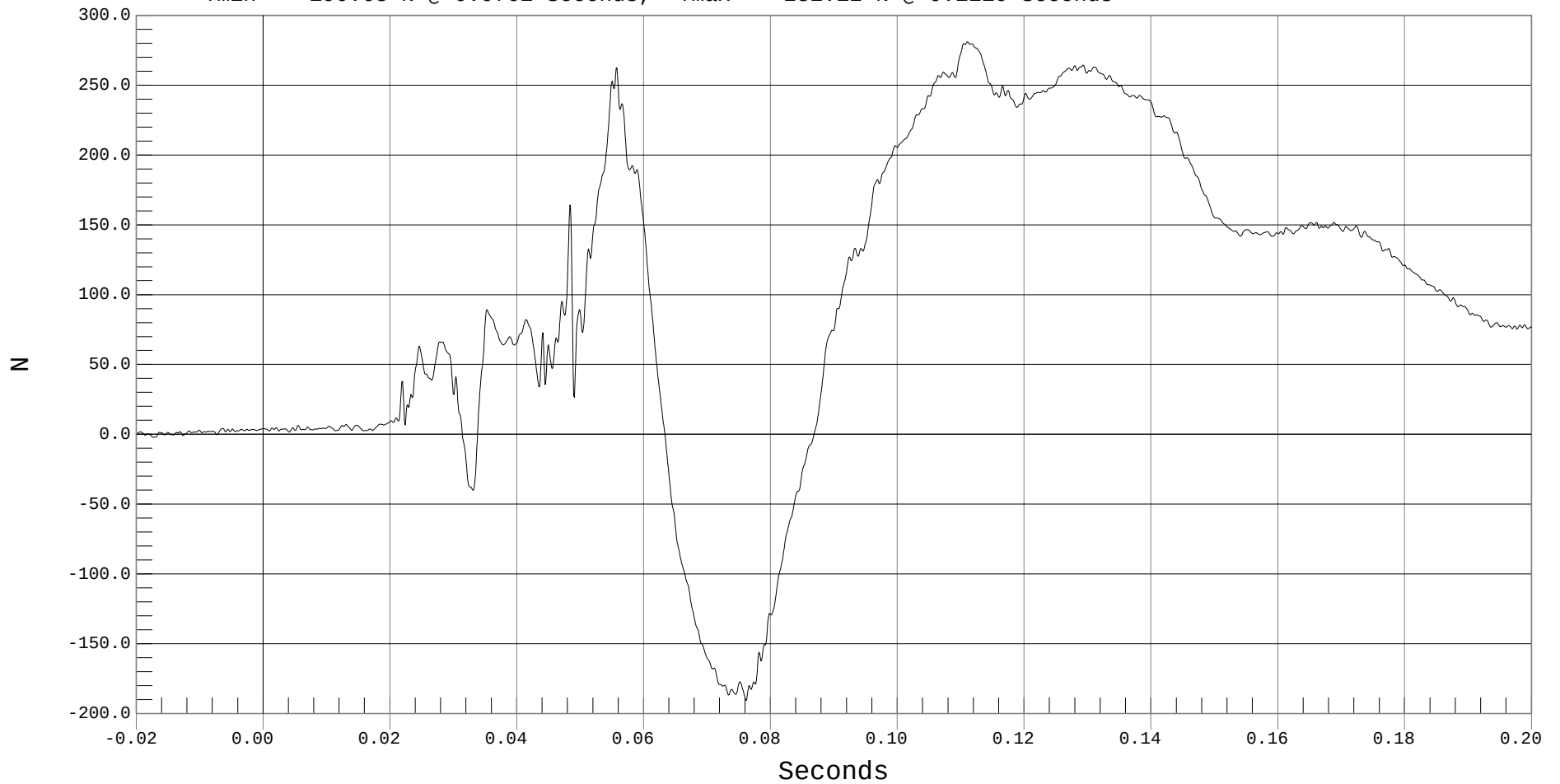
DRIVER RIGHT FEMUR FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

1 DRIVER RIGHT FEMUR FORCE X, B01085FF.F48

Ymin = -190.63 N @ 0.0761 Seconds, Ymax = 281.12 N @ 0.1110 Seconds





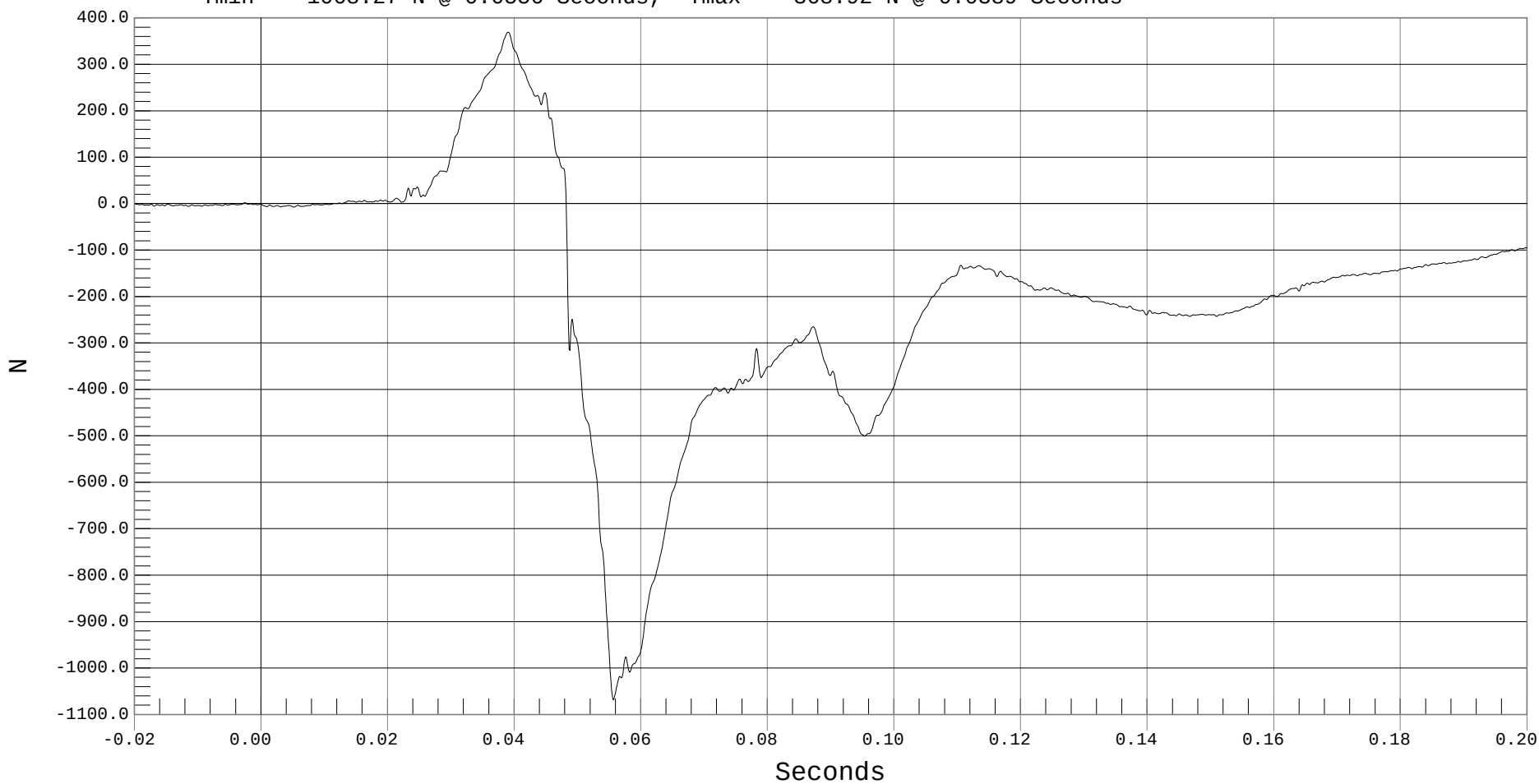
DRIVER RIGHT FEMUR FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE Y, B01085FF.F49

Ymin = -1068.27 N @ 0.0556 Seconds, Ymax = 368.92 N @ 0.0389 Seconds





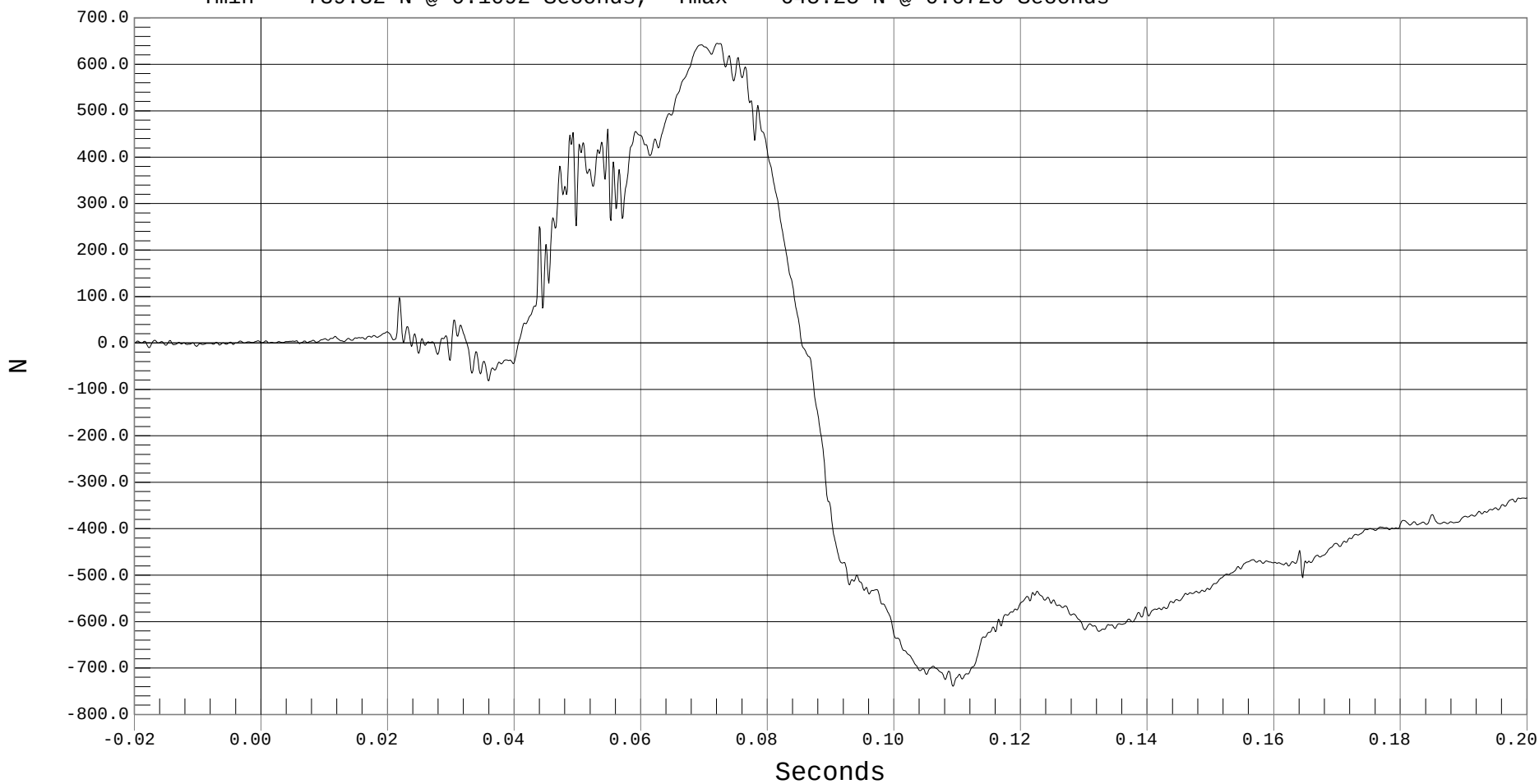
DRIVER RIGHT FEMUR FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE Z, B01085FF.F50

Ymin = -739.32 N @ 0.1092 Seconds, Ymax = 645.25 N @ 0.0720 Seconds





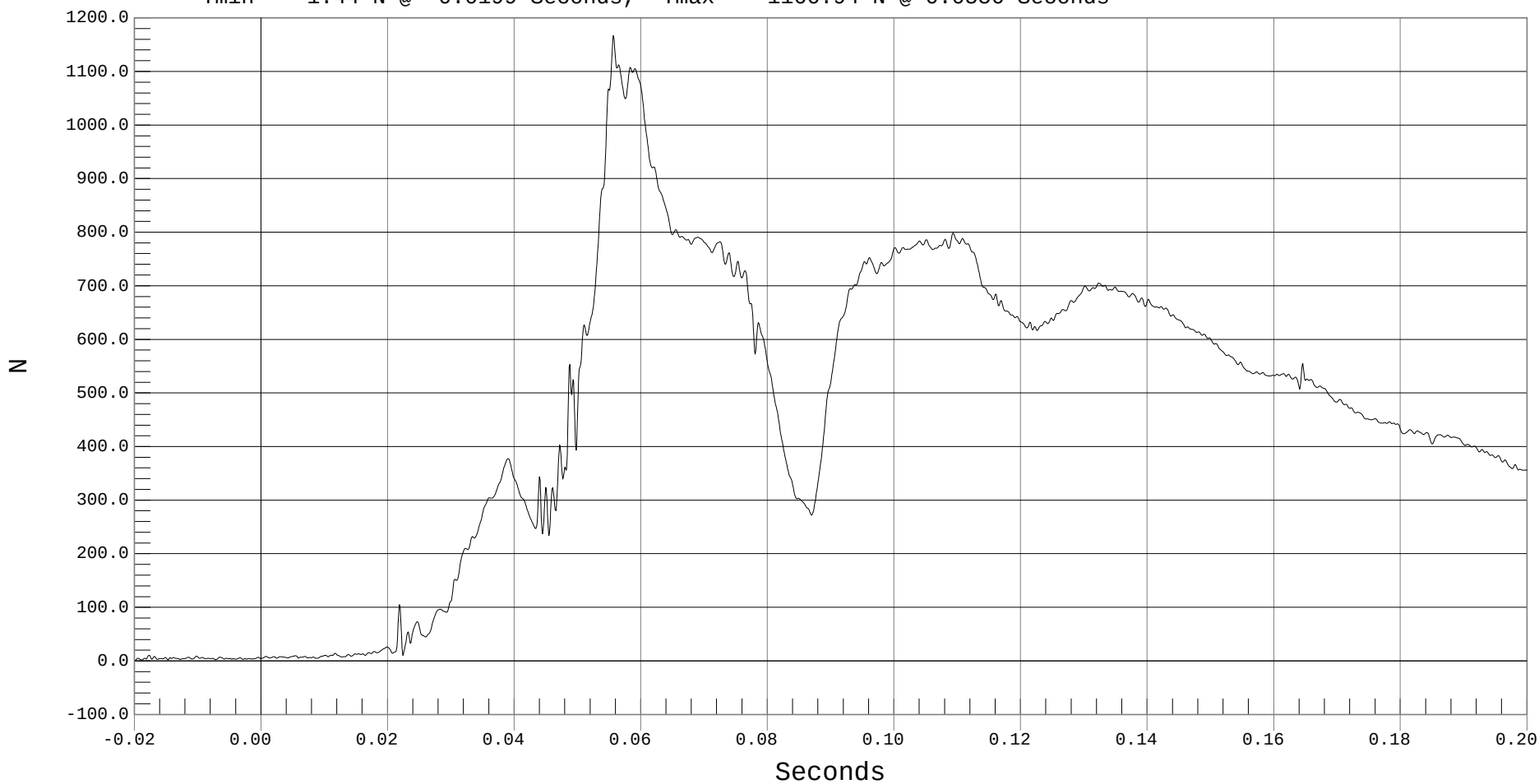
DRIVER RIGHT FEMUR FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE RESULTANT, B01085FV.F48

Ymin = 1.44 N @ -0.0199 Seconds, Ymax = 1166.94 N @ 0.0556 Seconds





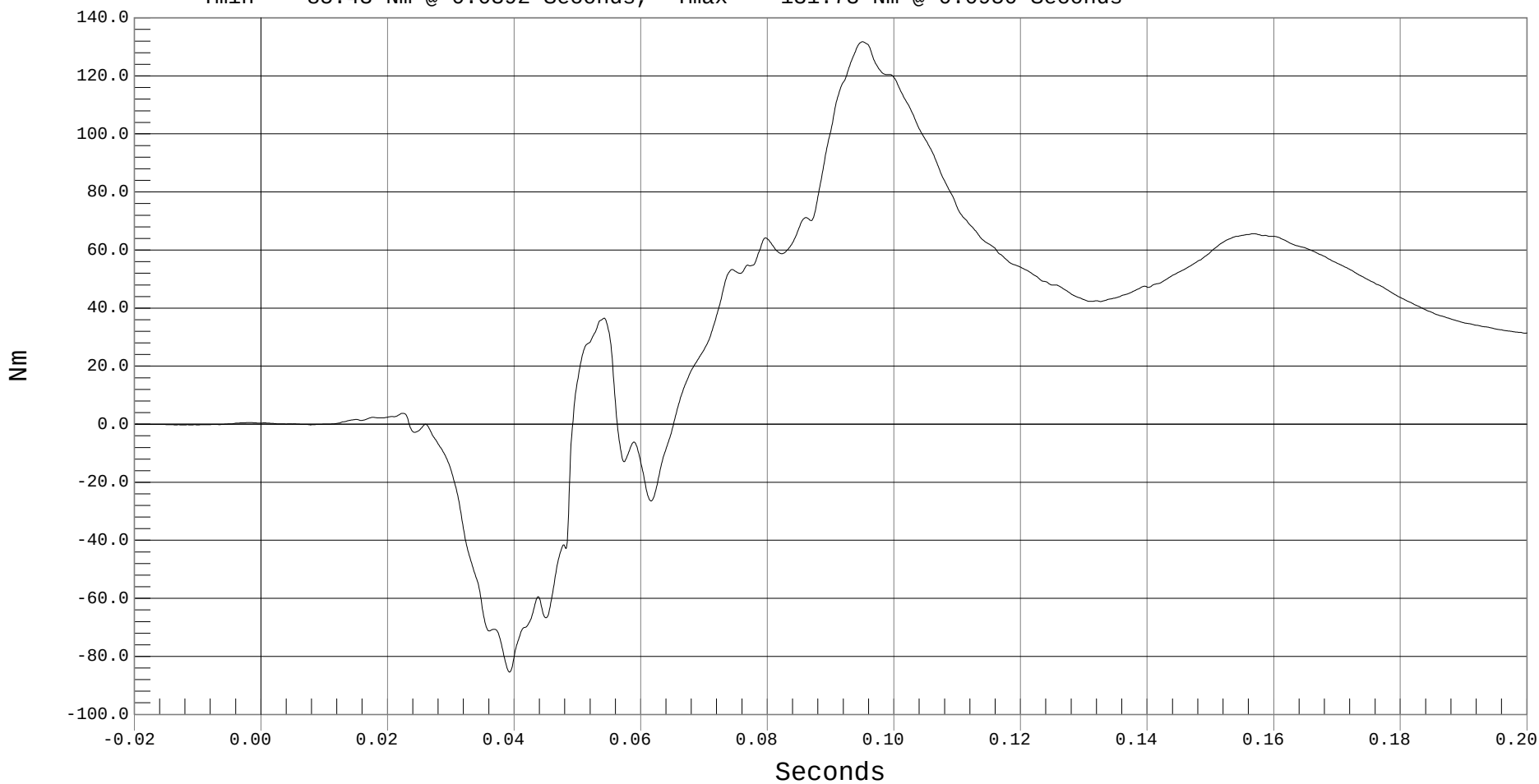
DRIVER RIGHT FEMUR MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR MOMENT X, B01085MF.M51

Ymin = -85.43 Nm @ 0.0392 Seconds, Ymax = 131.73 Nm @ 0.0950 Seconds





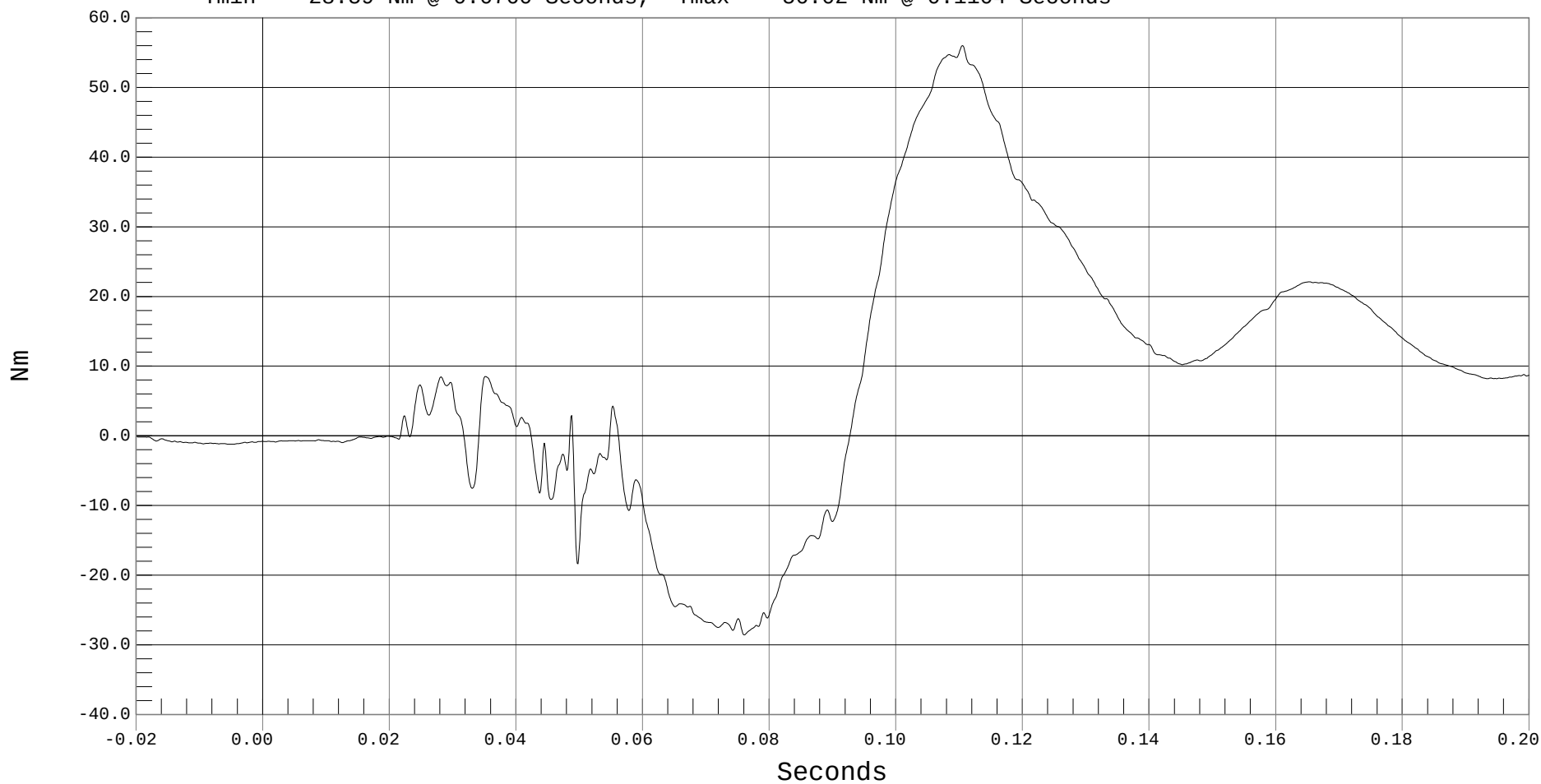
DRIVER RIGHT FEMUR MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR MOMENT Y, B01085MF.M52

Ymin = -28.59 Nm @ 0.0760 Seconds, Ymax = 56.02 Nm @ 0.1104 Seconds





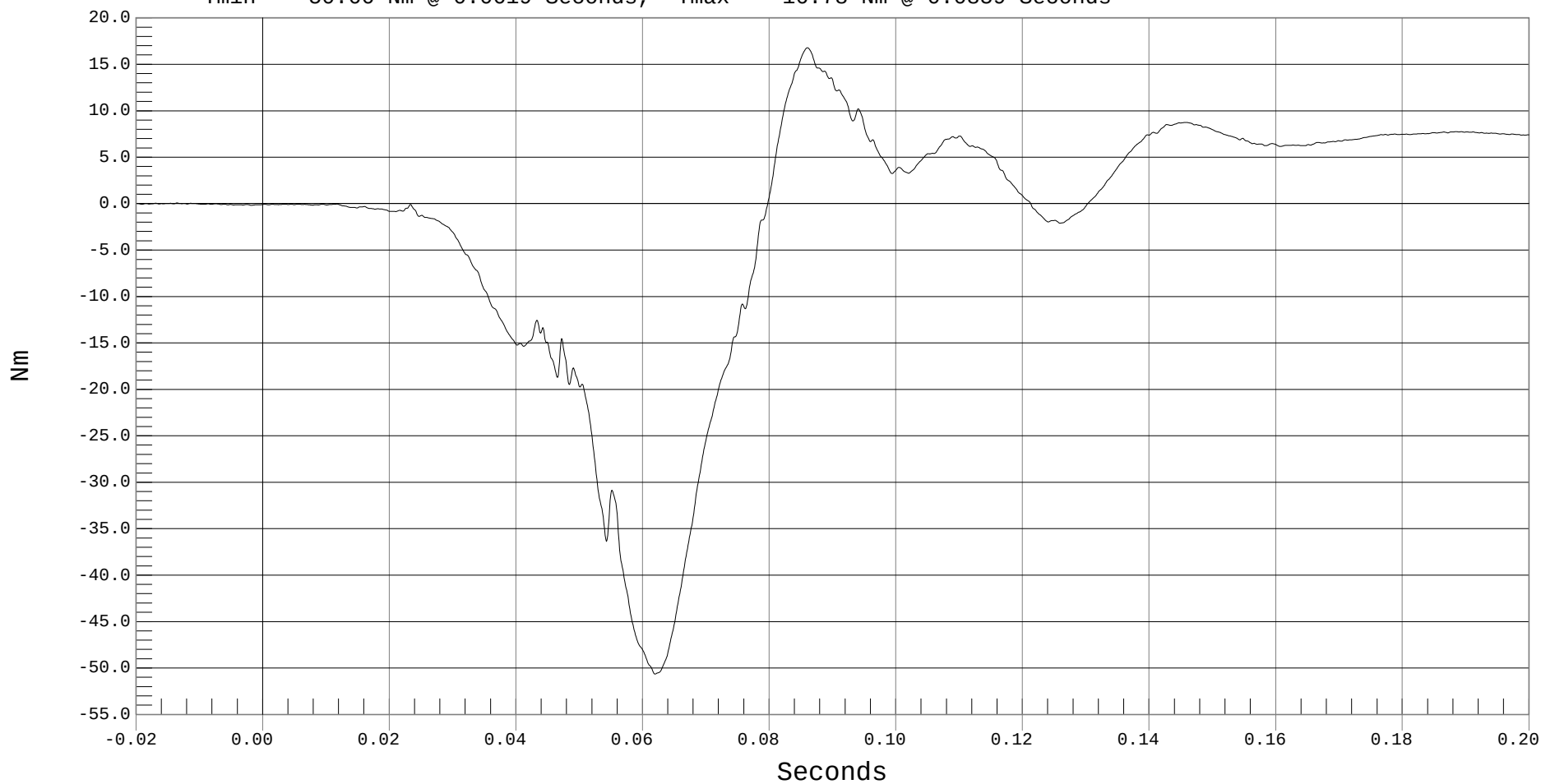
DRIVER RIGHT FEMUR MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR MOMENT Z, B01085MF.M53

Ymin = -50.66 Nm @ 0.0619 Seconds, Ymax = 16.78 Nm @ 0.0859 Seconds





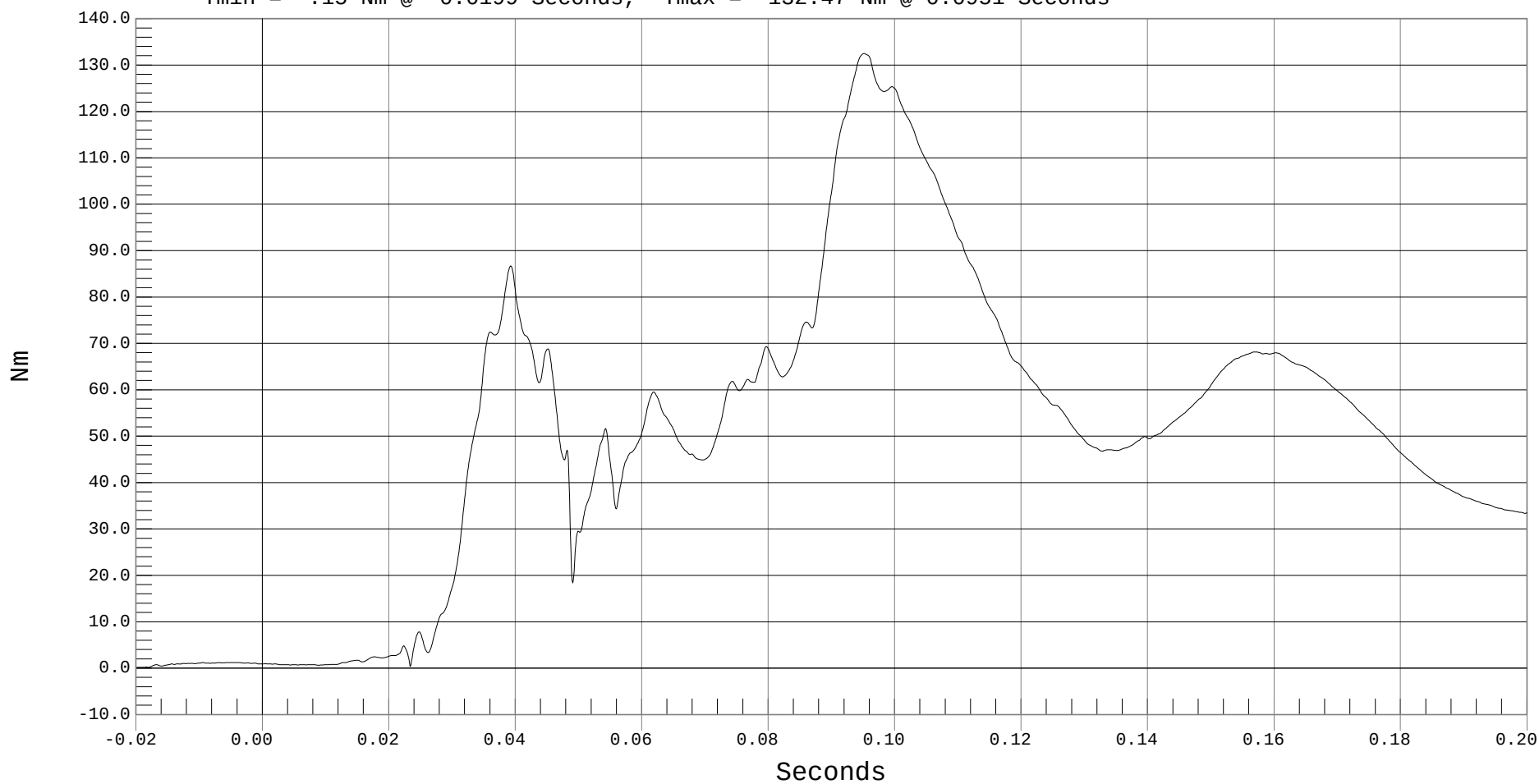
DRIVER RIGHT FEMUR MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR MOMENT RESULTANT, B01085MV.M51

Ymin = .15 Nm @ -0.0199 Seconds, Ymax = 132.47 Nm @ 0.0951 Seconds





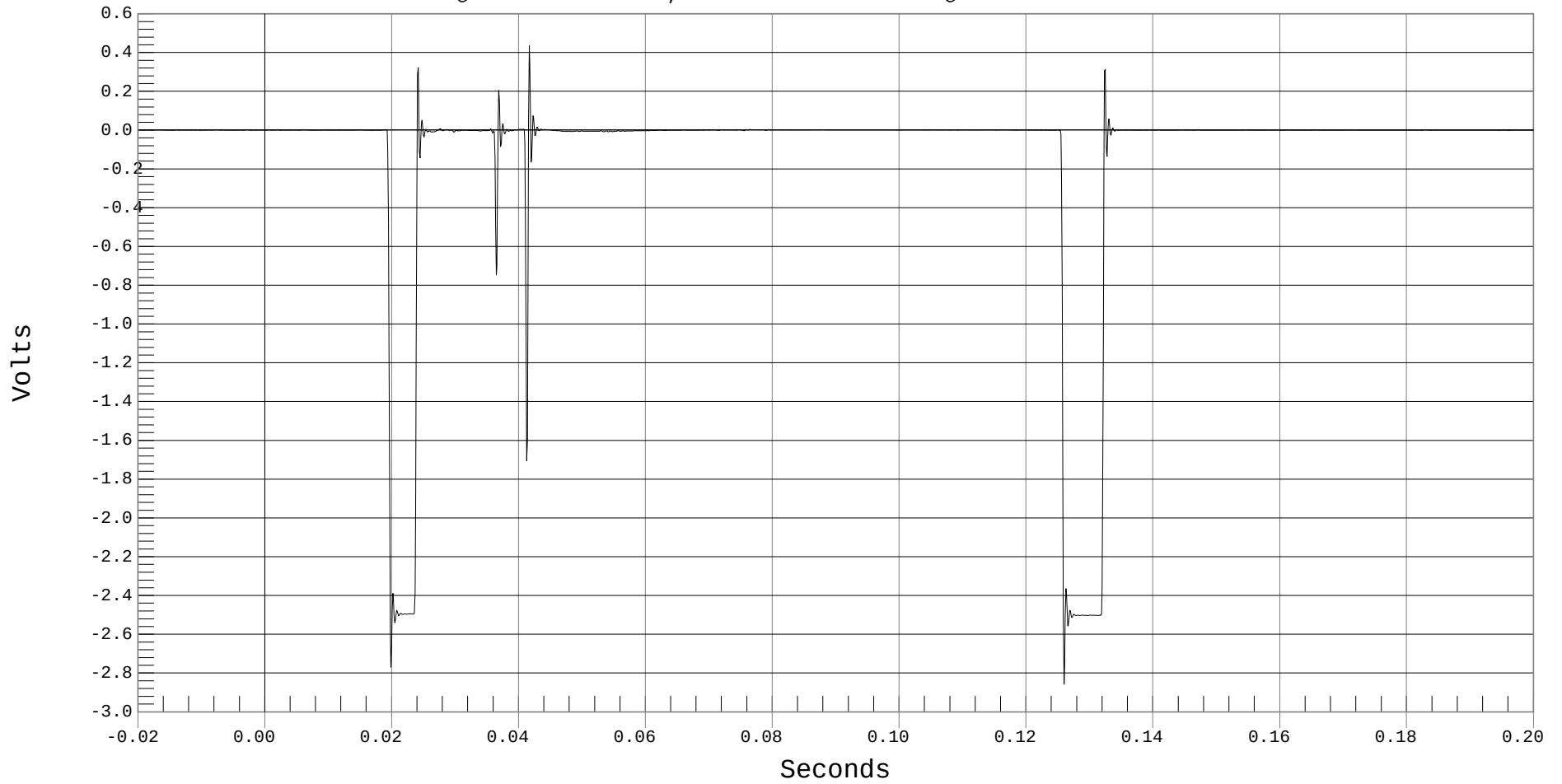
DRIVER HEAD CONTACT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER HEAD CONTACT, B010850T.017

Ymin = -2.86 Volts @ 0.1259 Seconds, Ymax = .43 Volts @ 0.0416 Seconds





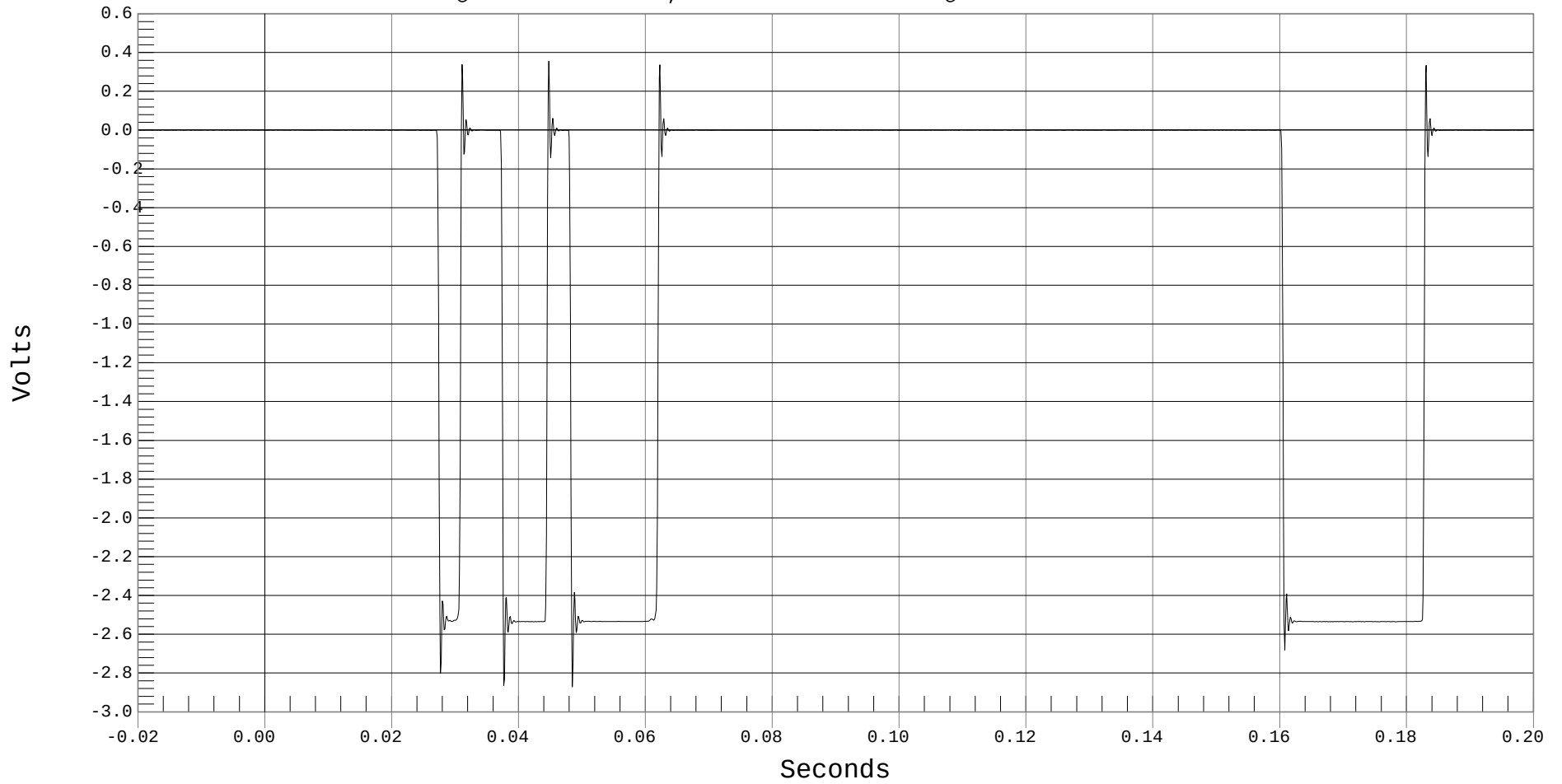
DRIVER ARM CONTACT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

1 DRIVER ARM CONTACT, B010850T.018

Ymin = -2.87 Volts @ 0.0484 Seconds, Ymax = .36 Volts @ 0.0447 Seconds





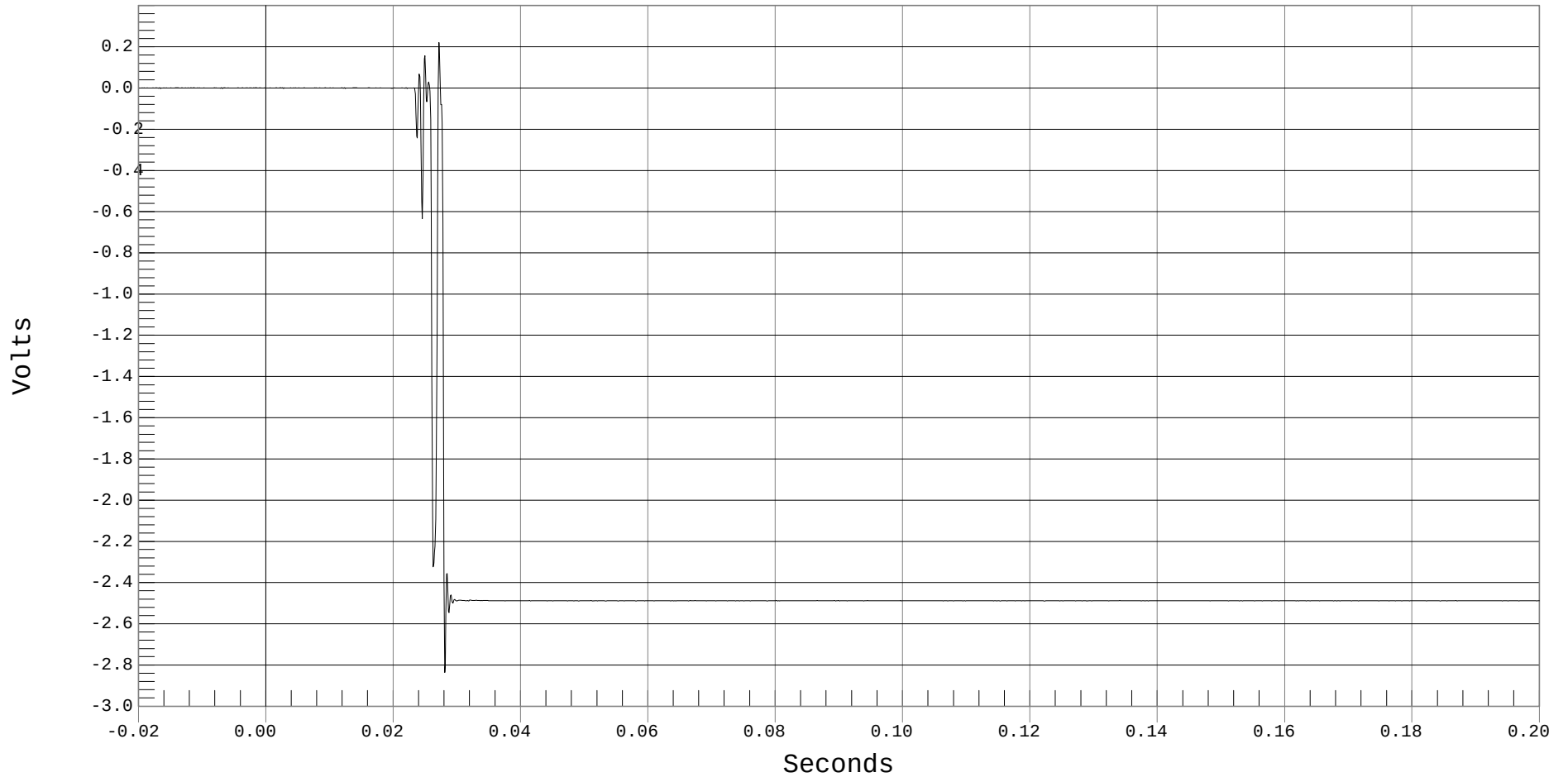
DRIVER PELVIS CONTACT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS CONTACT, B010850T.019

Ymin = -2.84 Volts @ 0.0280 Seconds, Ymax = .22 Volts @ 0.0271 Seconds





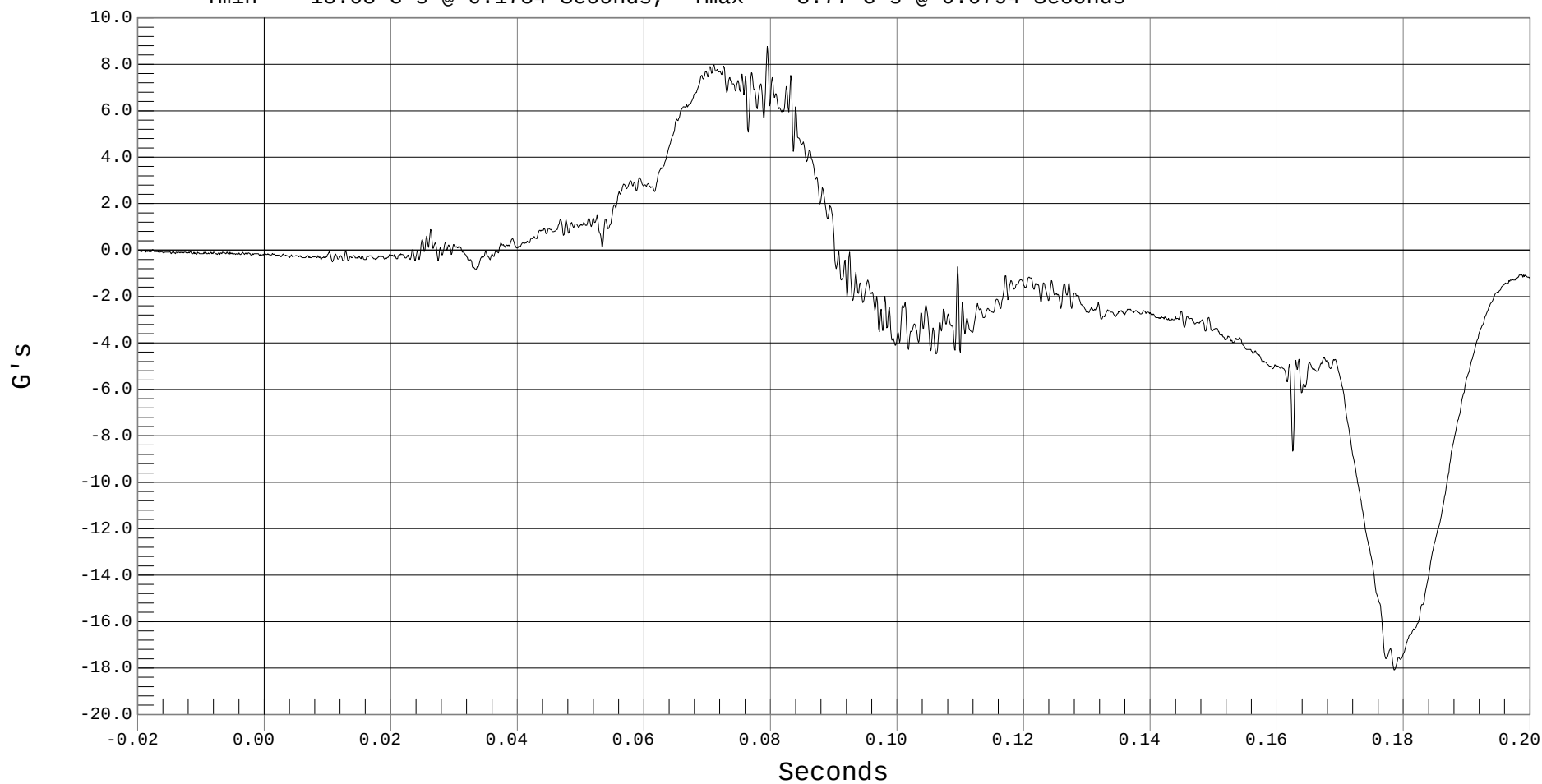
LEFT REAR HEAD X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD HEAD X, B01085AT.A60

Ymin = -18.08 G's @ 0.1784 Seconds, Ymax = 8.77 G's @ 0.0794 Seconds





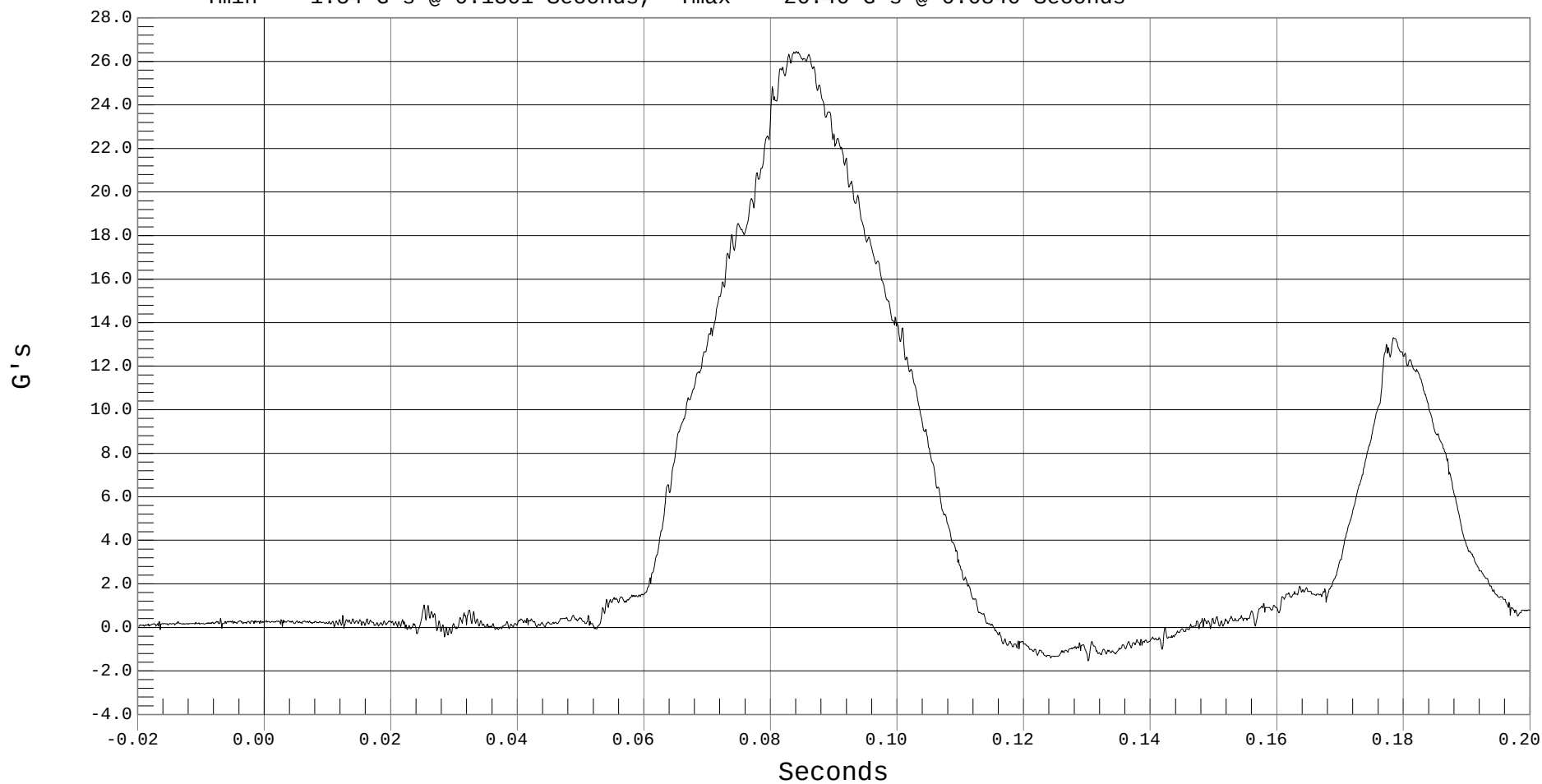
LEFT REAR HEAD Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD HEAD Y, B01085AT.A61

Ymin = -1.54 G's @ 0.1301 Seconds, Ymax = 26.46 G's @ 0.0840 Seconds





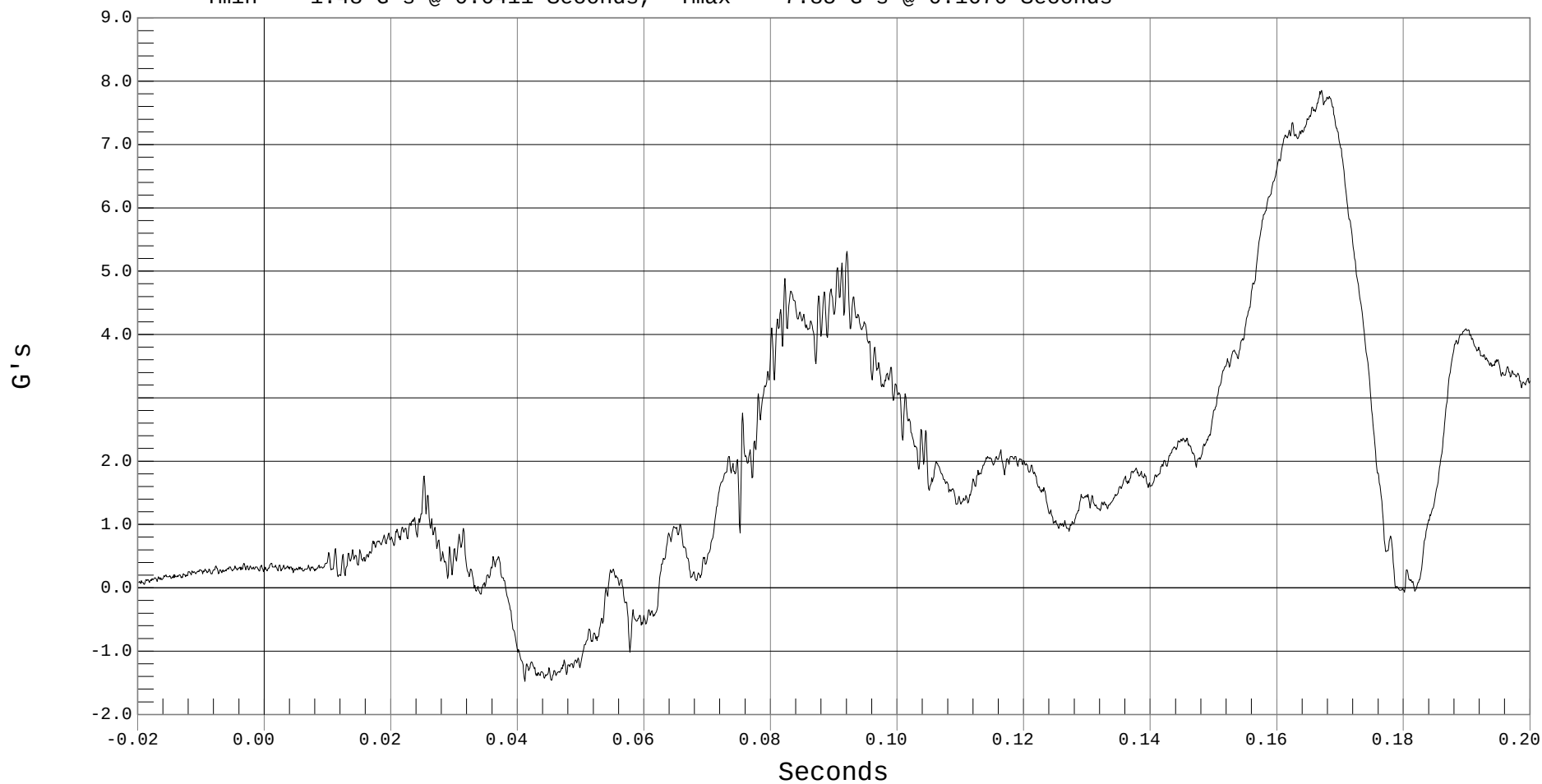
LEFT REAR HEAD Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD HEAD Z, B01085AT.A62

Ymin = -1.48 G's @ 0.0411 Seconds, Ymax = 7.85 G's @ 0.1670 Seconds





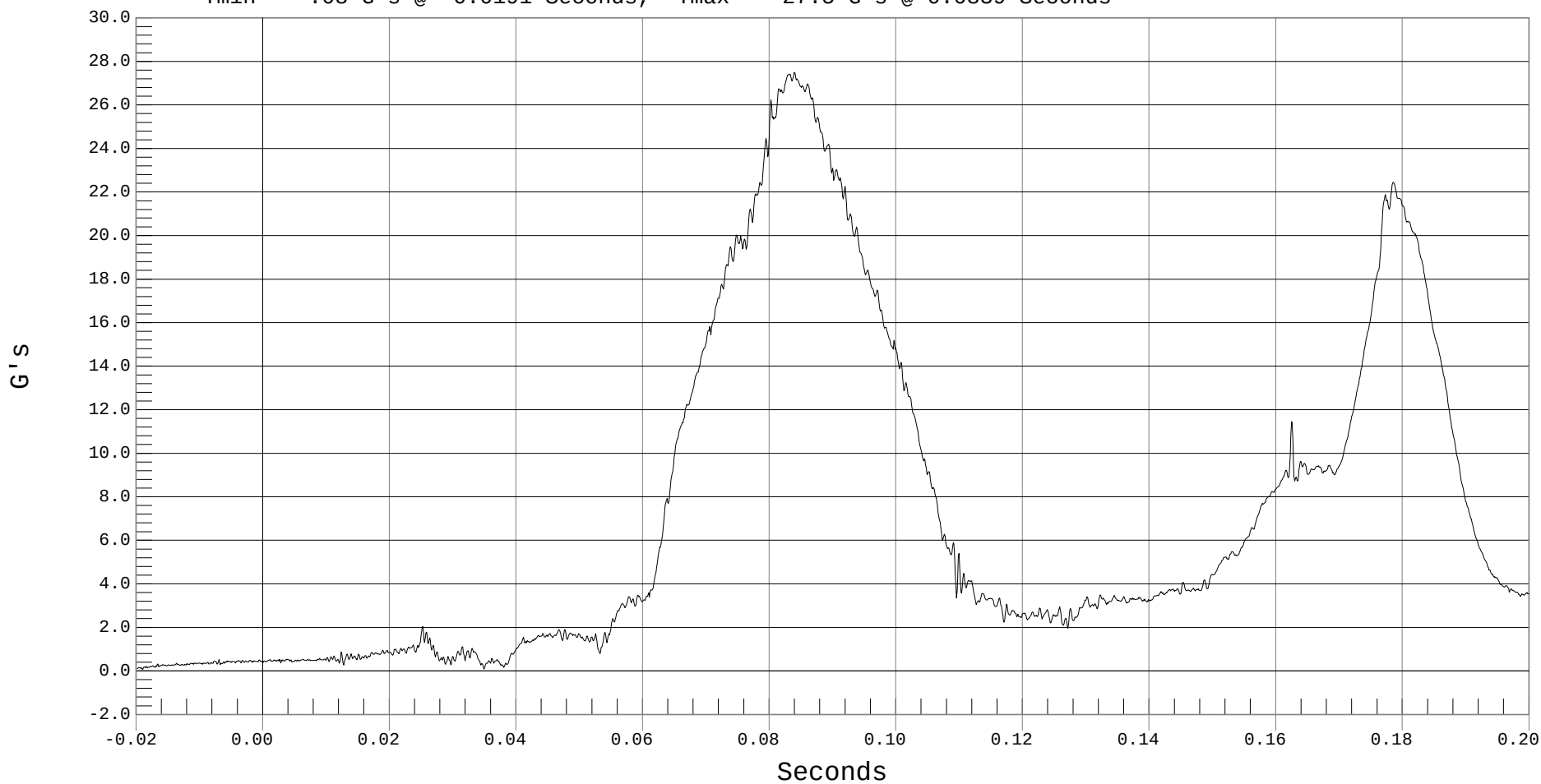
LEFT REAR HEAD RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR HEAD RESULTANT, B01085AV.A60

Ymin = .08 G's @ -0.0191 Seconds, Ymax = 27.5 G's @ 0.0839 Seconds





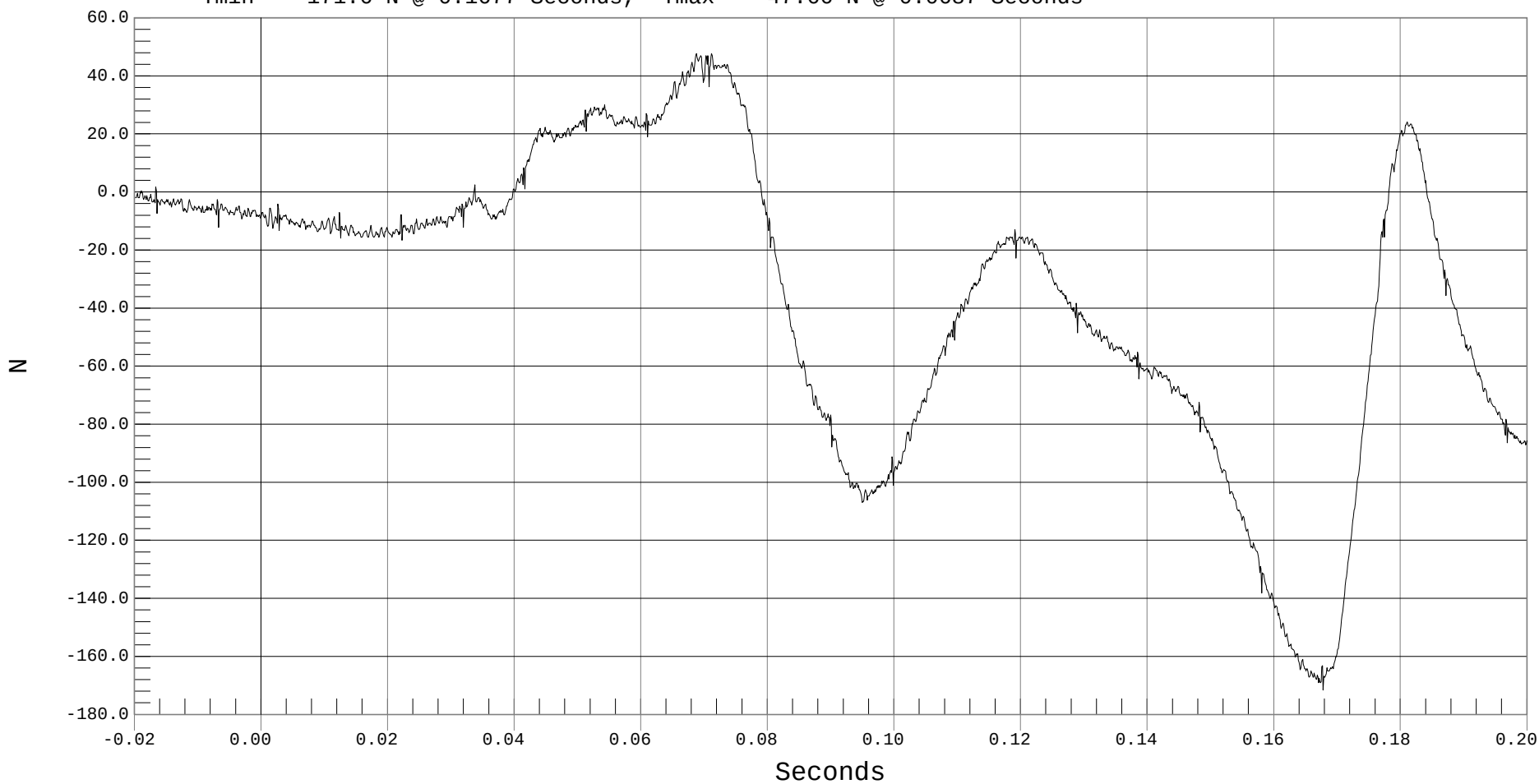
LEFT REAR UPPER NECK FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD UPPER NECK FORCE X, B01085FT.F63

Ymin = -171.6 N @ 0.1677 Seconds, Ymax = 47.66 N @ 0.0687 Seconds





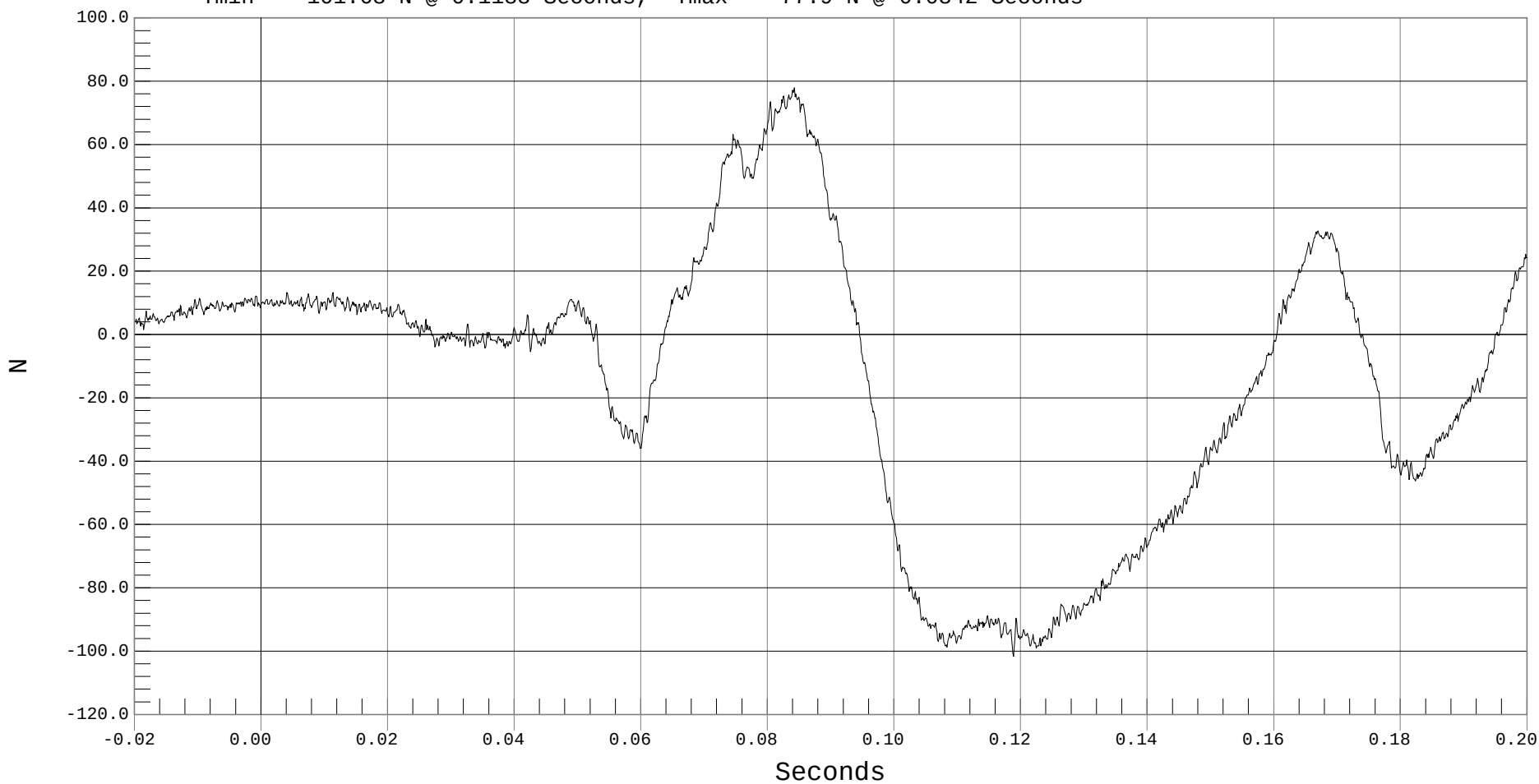
LEFT REAR UPPER NECK FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD UPPER NECK FORCE Y, B01085FT.F65

Ymin = -101.68 N @ 0.1188 Seconds, Ymax = 77.9 N @ 0.0842 Seconds





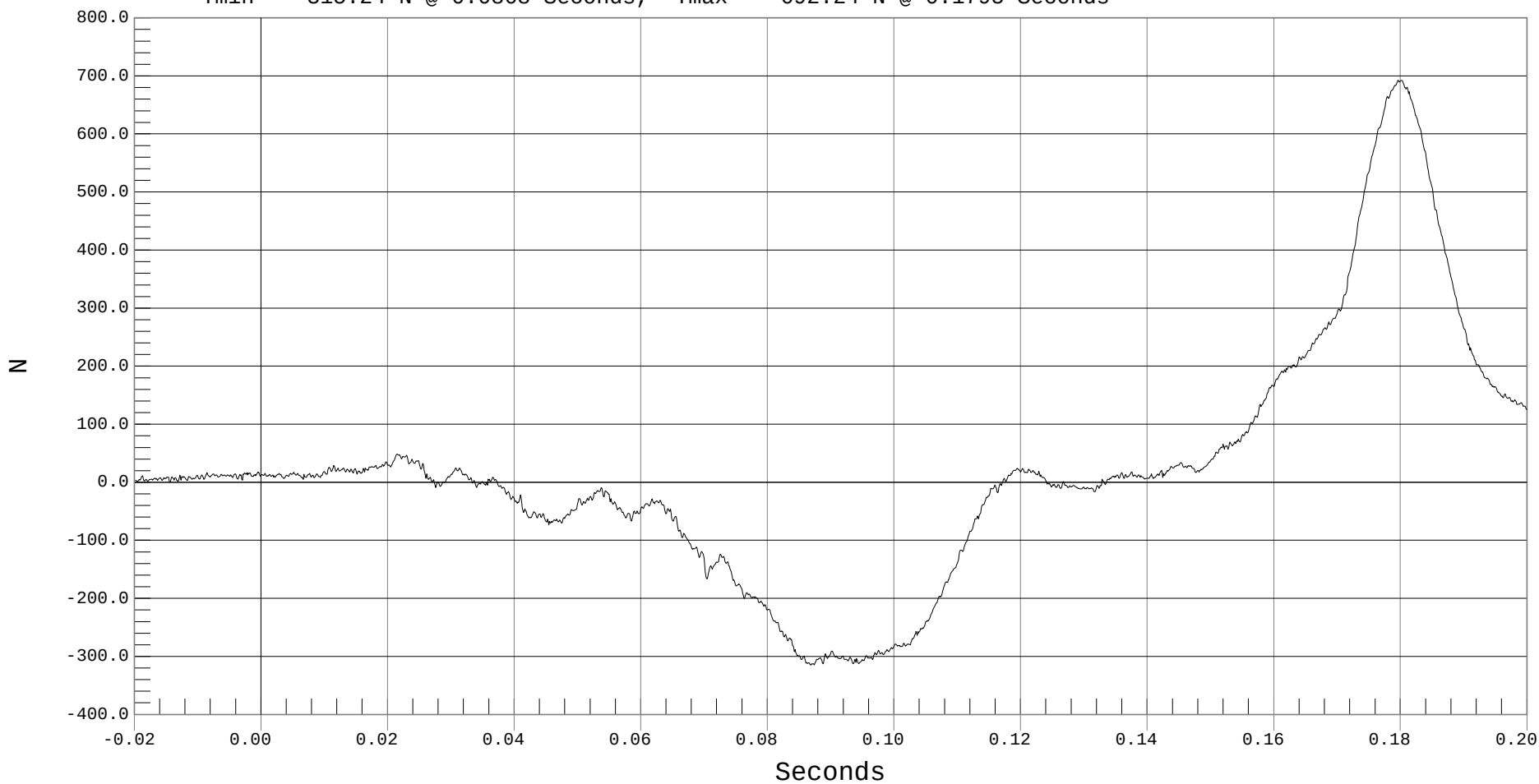
LEFT REAR UPPER NECK FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD UPPER NECK FORCE Z, B01085FT.F66

Ymin = -315.24 N @ 0.0868 Seconds, Ymax = 692.24 N @ 0.1795 Seconds





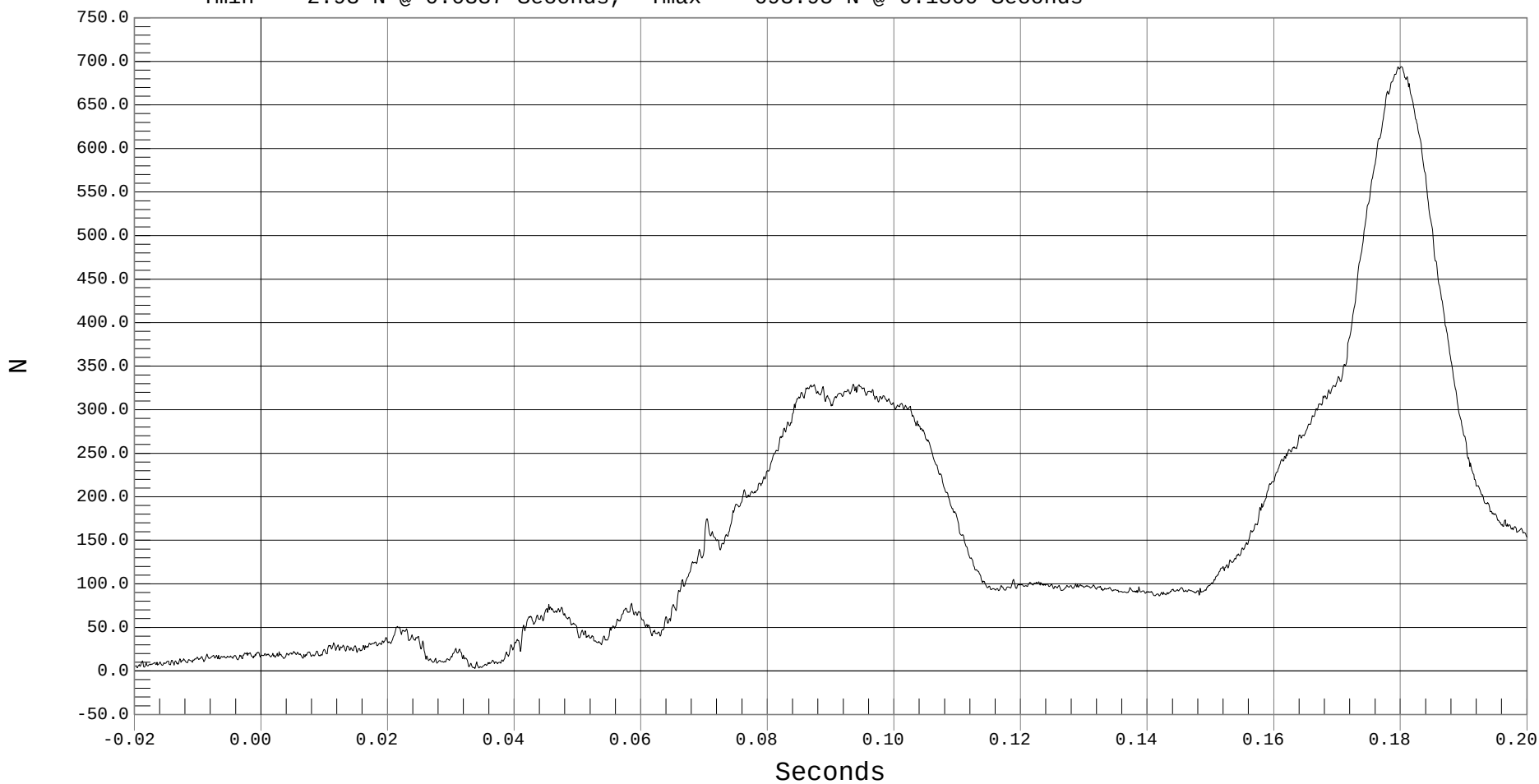
LEFT REAR UPPER NECK FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR UPPER NECK FORCE RESULTANT, B01085FV.F63

Ymin = 2.93 N @ 0.0337 Seconds, Ymax = 693.95 N @ 0.1800 Seconds





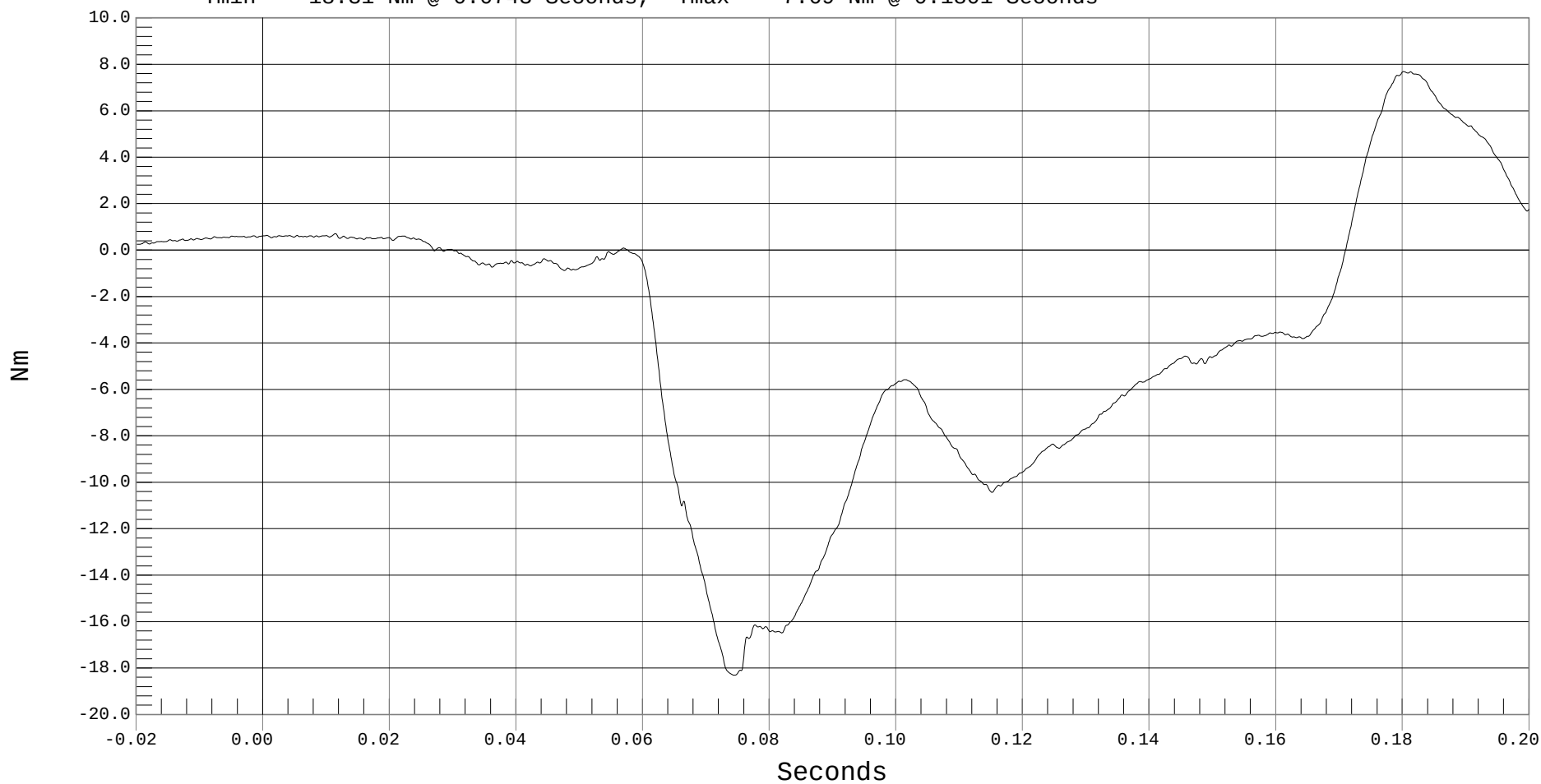
LEFT REAR UPPER NECK MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 LEFT REAR CHILD UPPER NECK MOMENT X, B01085MF.M67

Ymin = -18.31 Nm @ 0.0743 Seconds, Ymax = 7.69 Nm @ 0.1801 Seconds





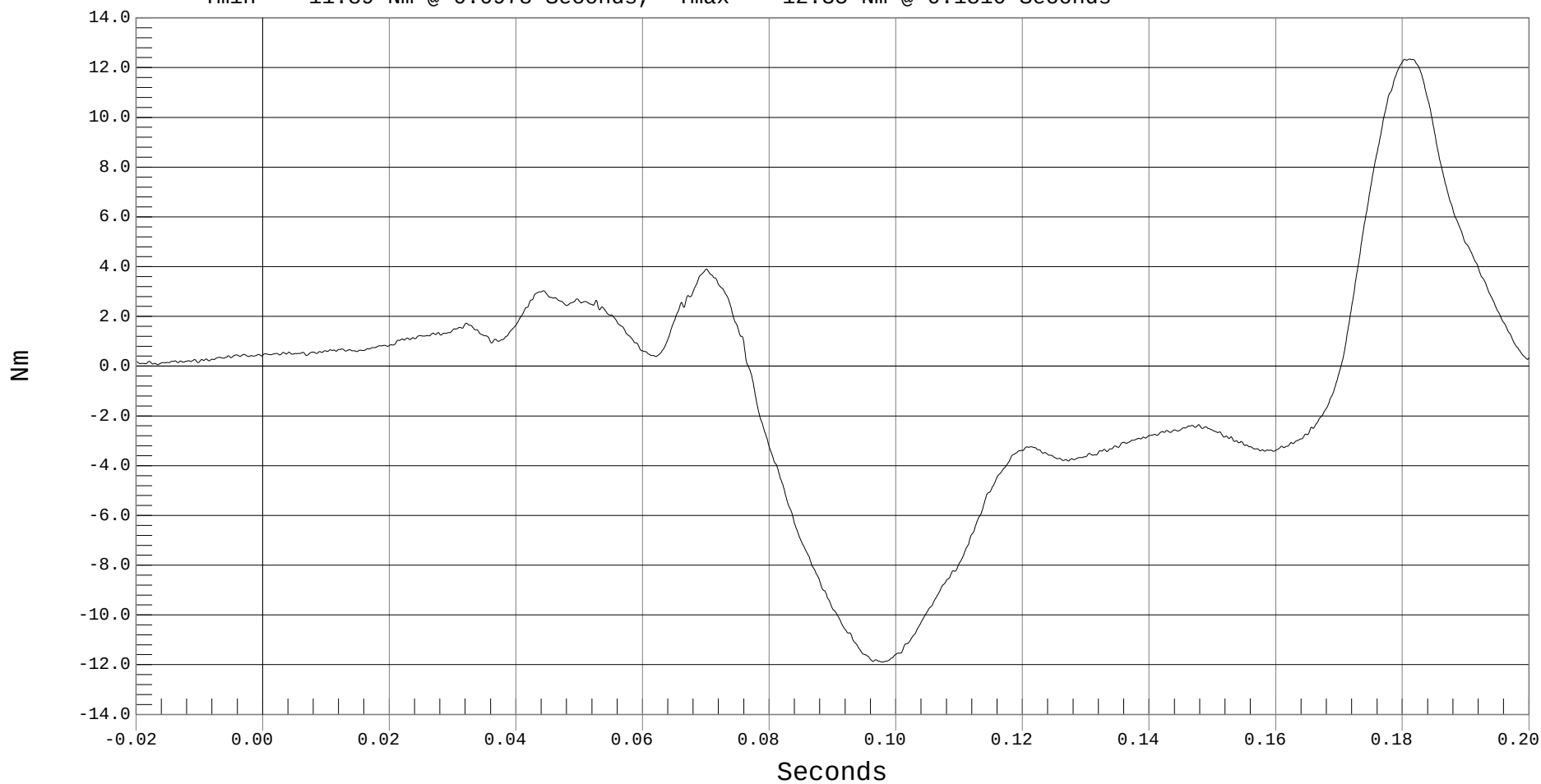
LEFT REAR UPPER NECK MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 LEFT REAR CHILD UPPER NECK MOMENT Y, B01085MF.M68

Ymin = -11.89 Nm @ 0.0978 Seconds, Ymax = 12.35 Nm @ 0.1810 Seconds





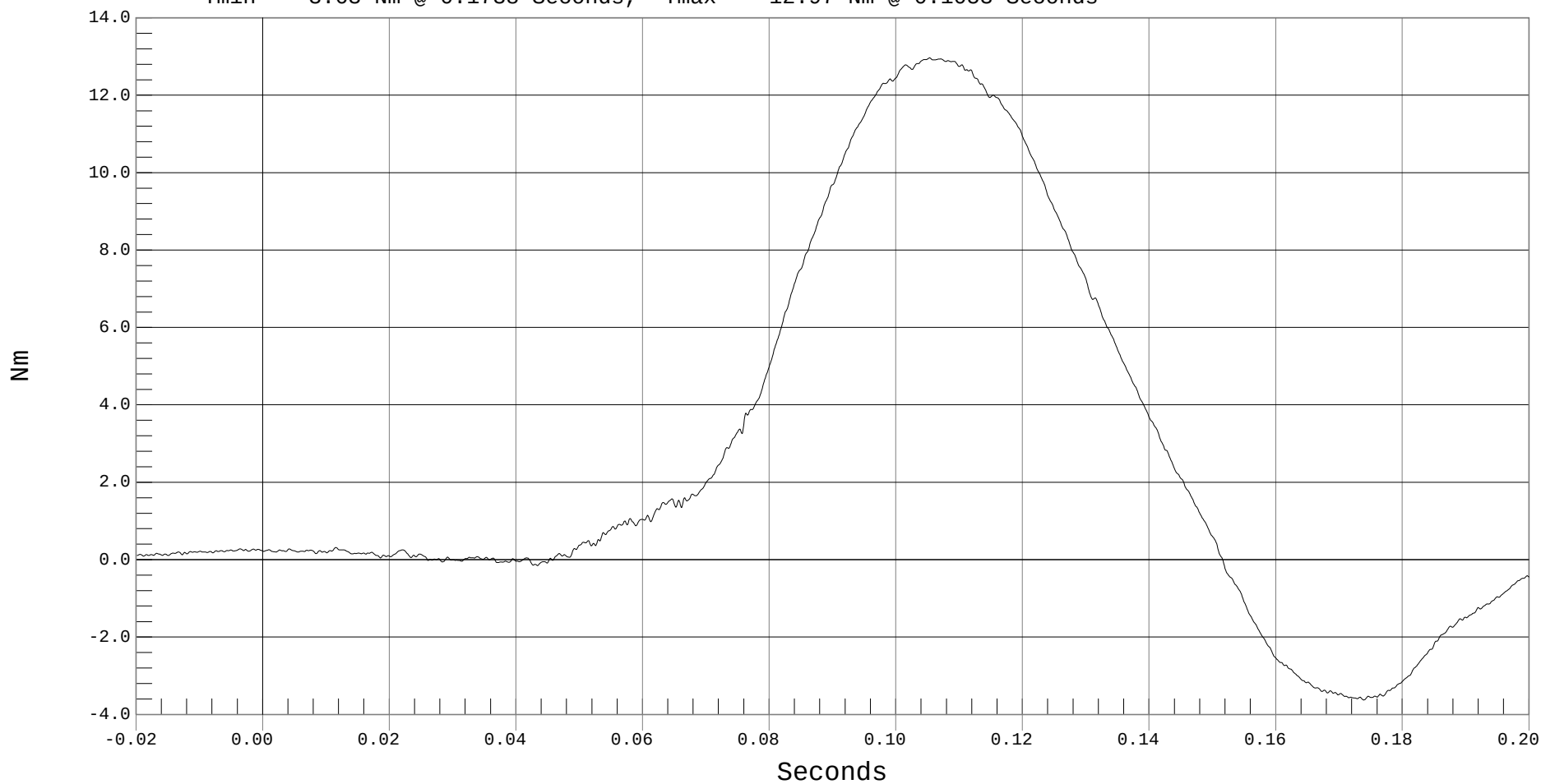
LEFT REAR UPPER NECK MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 LEFT REAR CHILD UPPER NECK MOMENT Z, B01085MF.M69

Ymin = -3.63 Nm @ 0.1738 Seconds, Ymax = 12.97 Nm @ 0.1053 Seconds





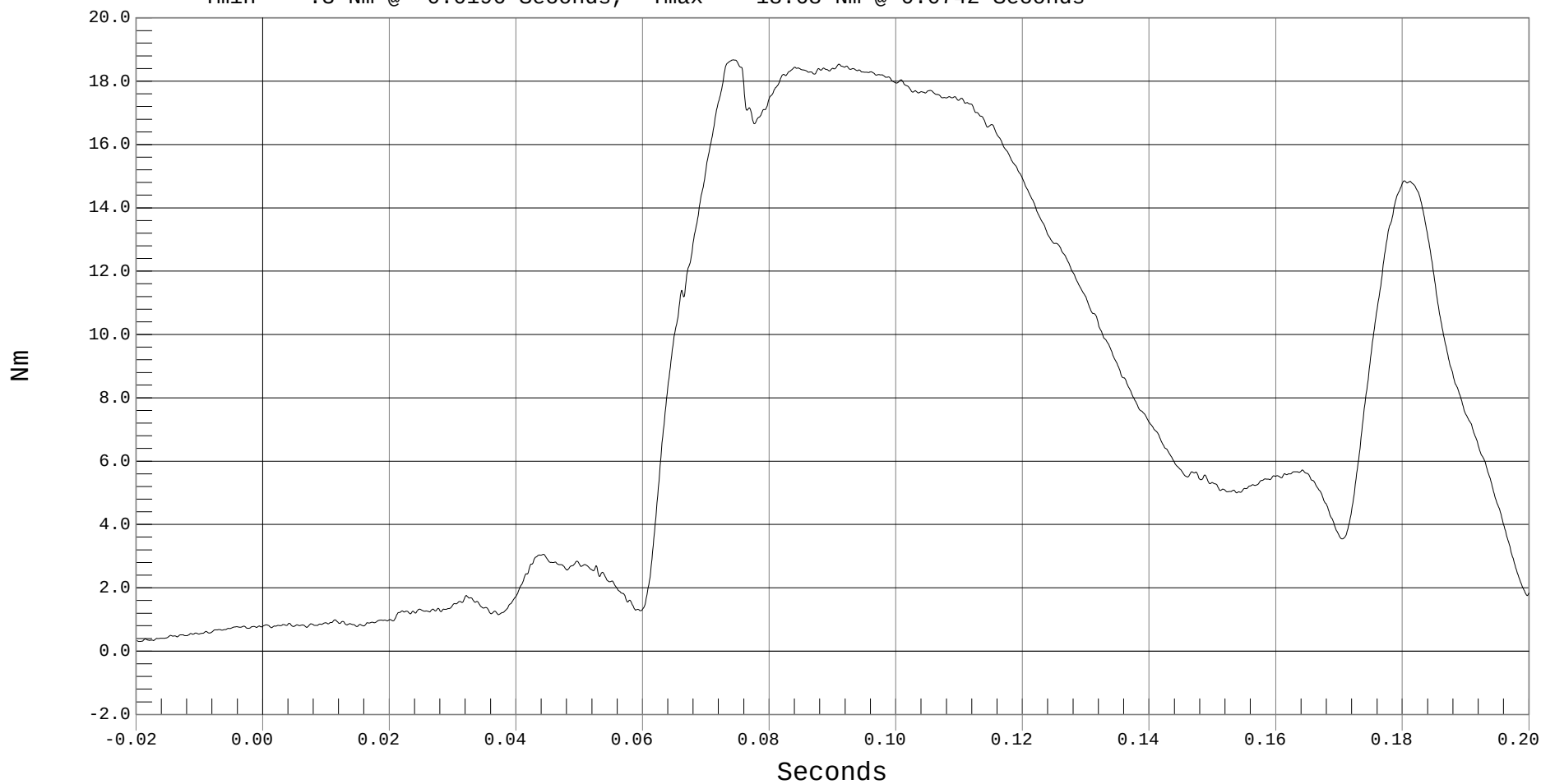
LEFT REAR UPPER NECK MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 LEFT REAR UPPER NECK MOMENT RESULTANT, B01085MV.M67

Ymin = .3 Nm @ -0.0196 Seconds, Ymax = 18.68 Nm @ 0.0742 Seconds





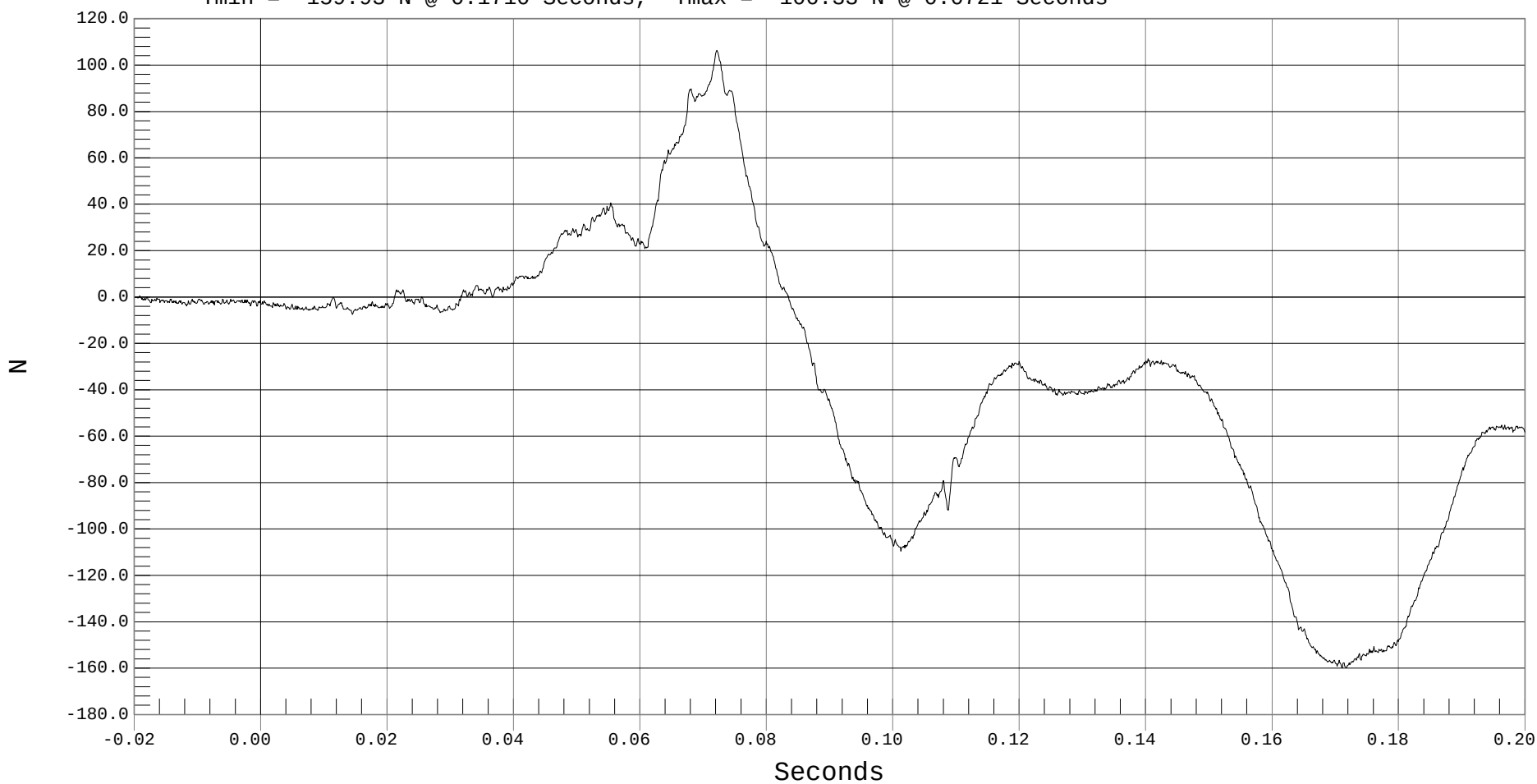
LEFT REAR LOWER NECK FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD LOWER NECK FORCE X, B01085FT.F70

Ymin = -159.93 N @ 0.1710 Seconds, Ymax = 106.33 N @ 0.0721 Seconds





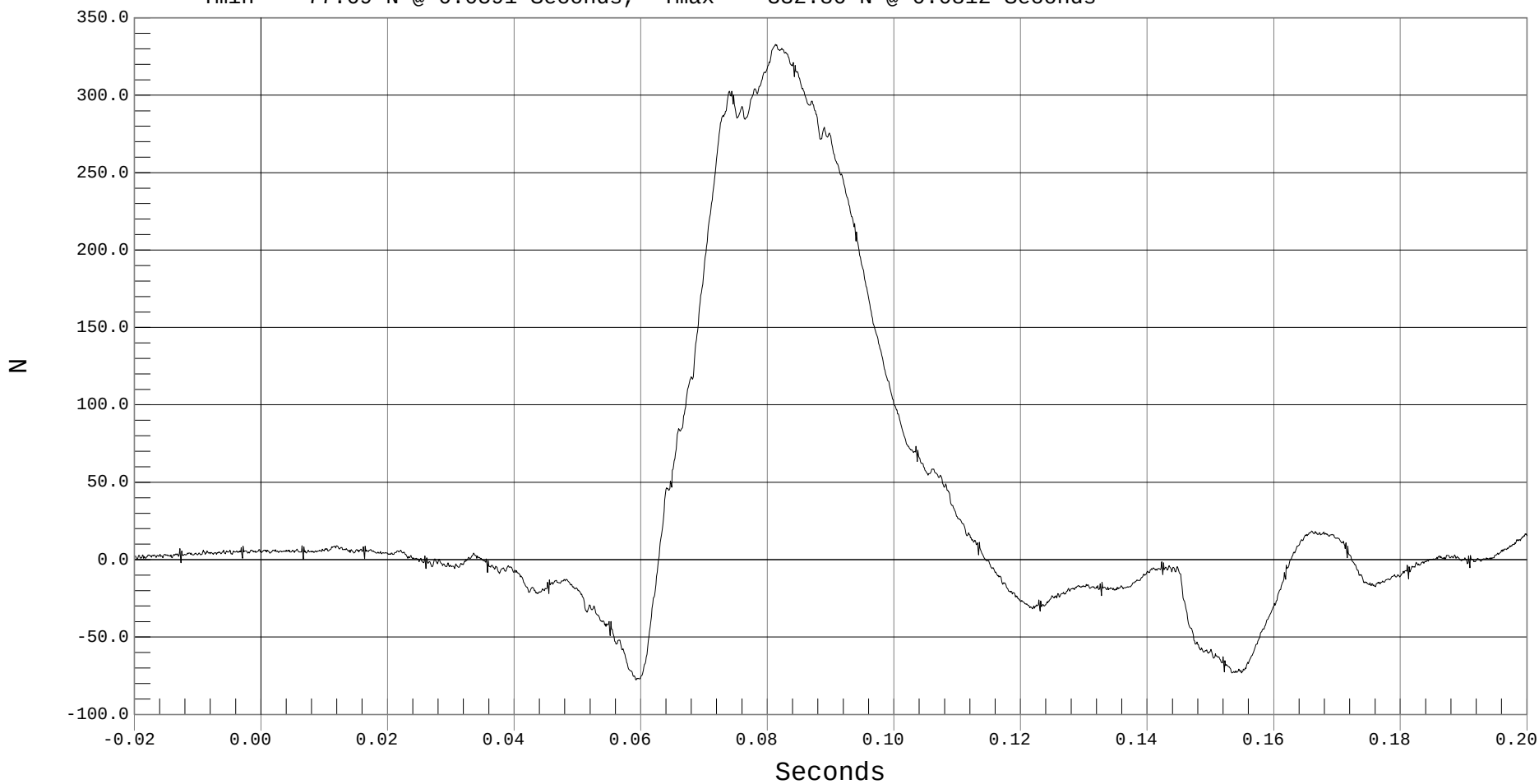
LEFT REAR LOWER NECK FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD LOWER NECK FORCE Y, B01085FT.F71

Ymin = -77.69 N @ 0.0591 Seconds, Ymax = 332.86 N @ 0.0812 Seconds





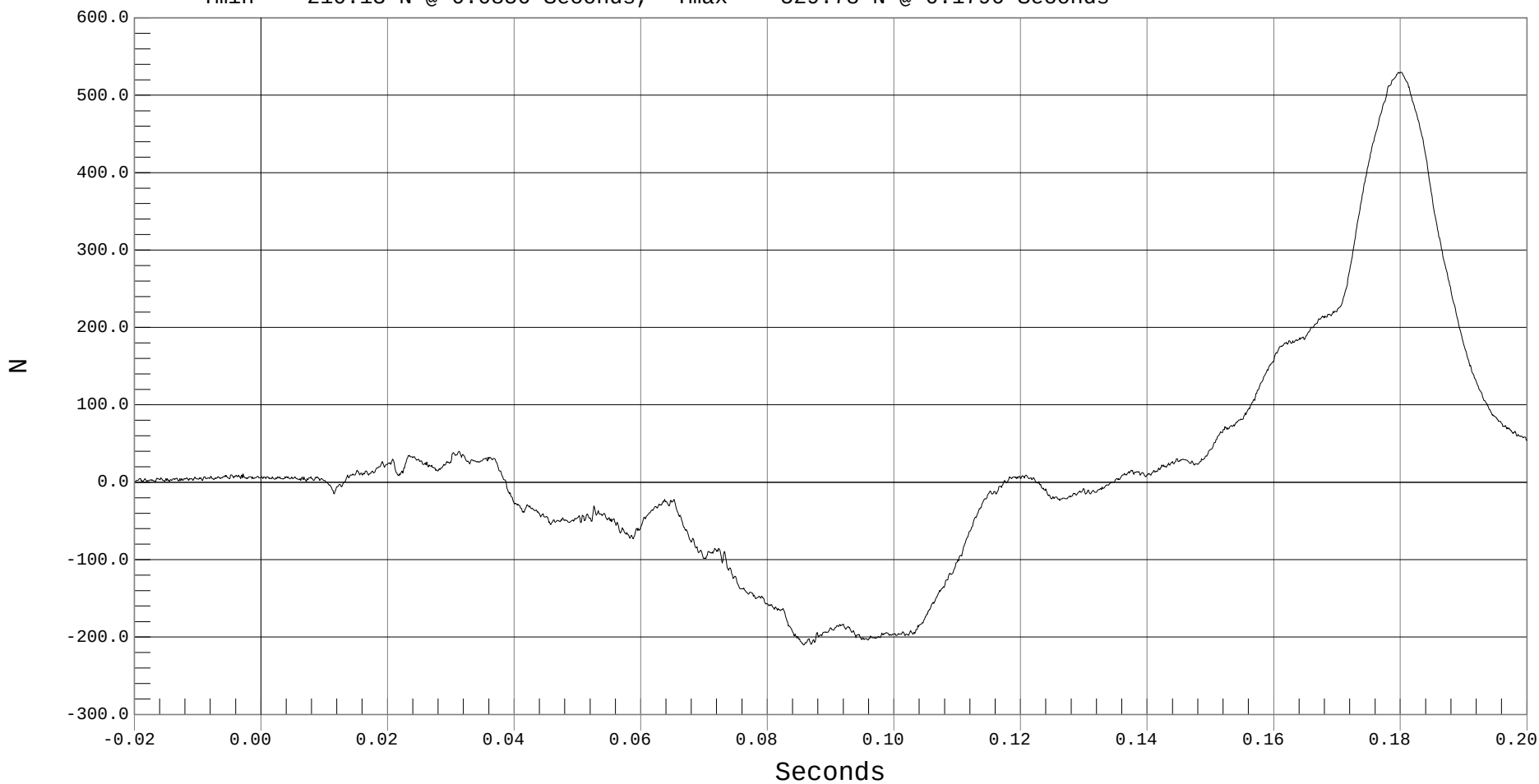
LEFT REAR LOWER NECK FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD LOWER NECK FORCE Z, B01085FT.F72

Ymin = -210.13 N @ 0.0856 Seconds, Ymax = 529.78 N @ 0.1796 Seconds





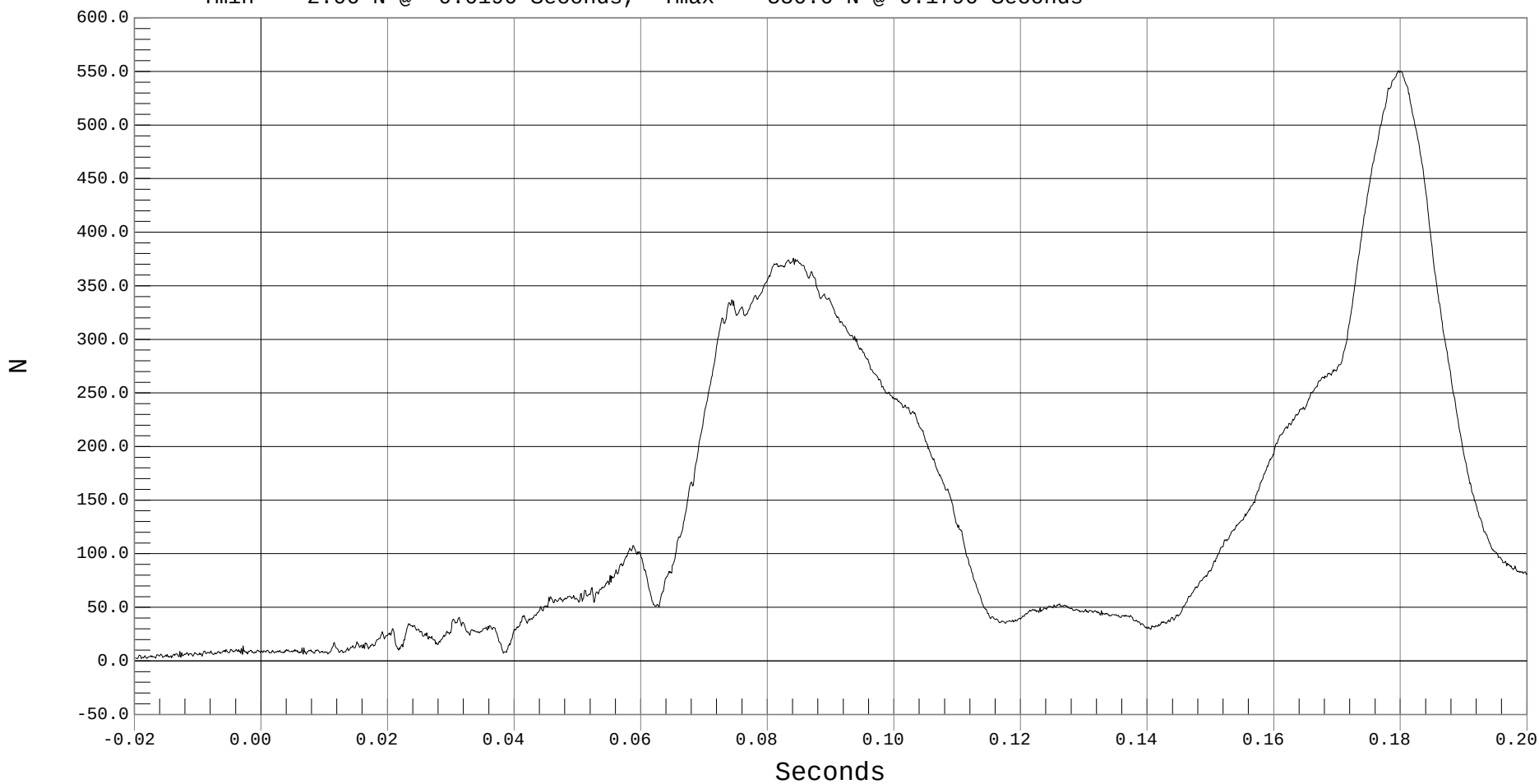
LEFT REAR LOWER NECK FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR LOWER NECK FORCE RESULTANT, B01085FV.F70

Ymin = 2.06 N @ -0.0190 Seconds, Ymax = 550.6 N @ 0.1796 Seconds





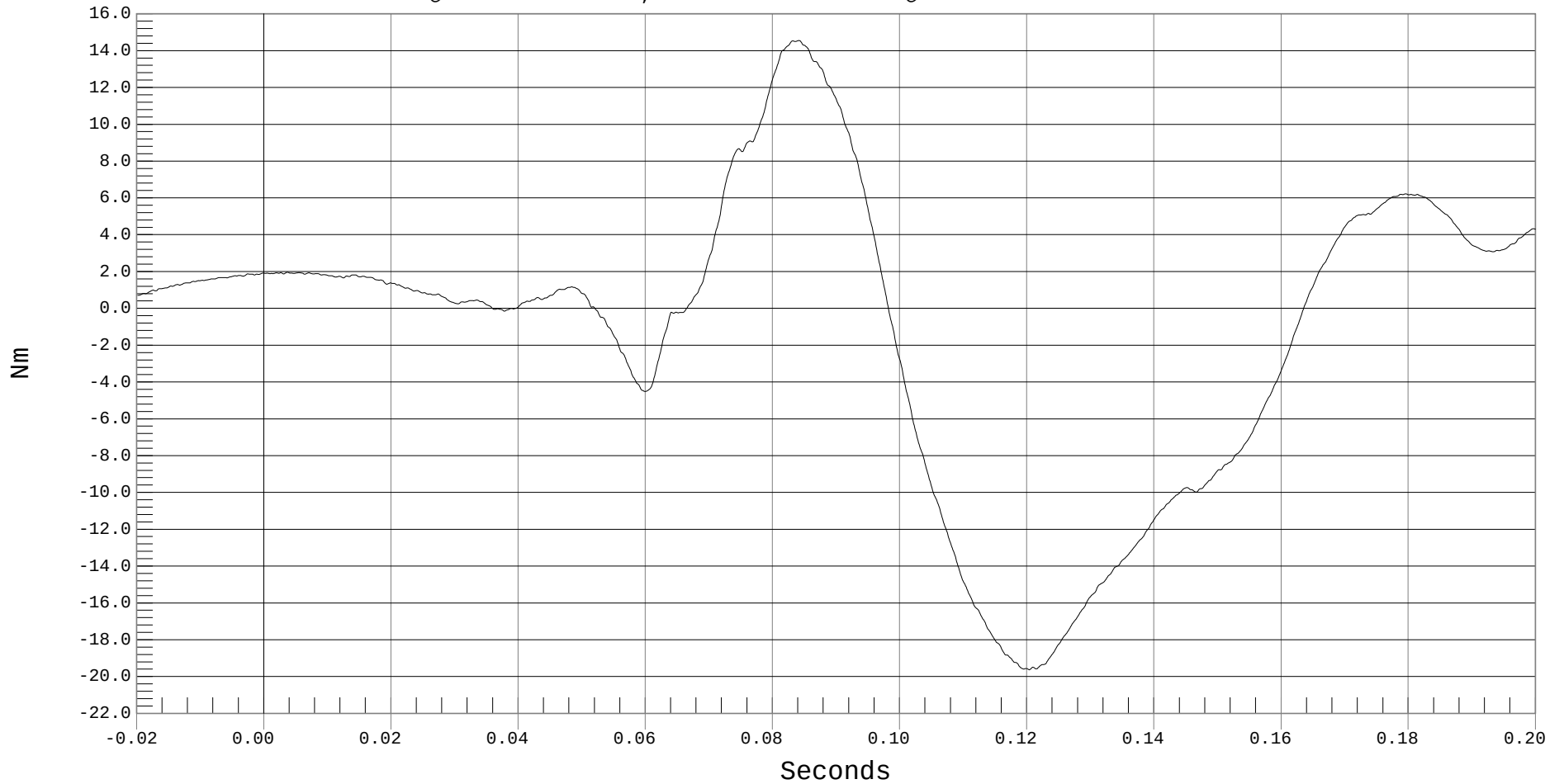
LEFT REAR LOWER NECK MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 LEFT REAR CHILD LOWER NECK MOMENT X, B01085MF.M73

Ymin = -19.63 Nm @ 0.1203 Seconds, Ymax = 14.55 Nm @ 0.0841 Seconds





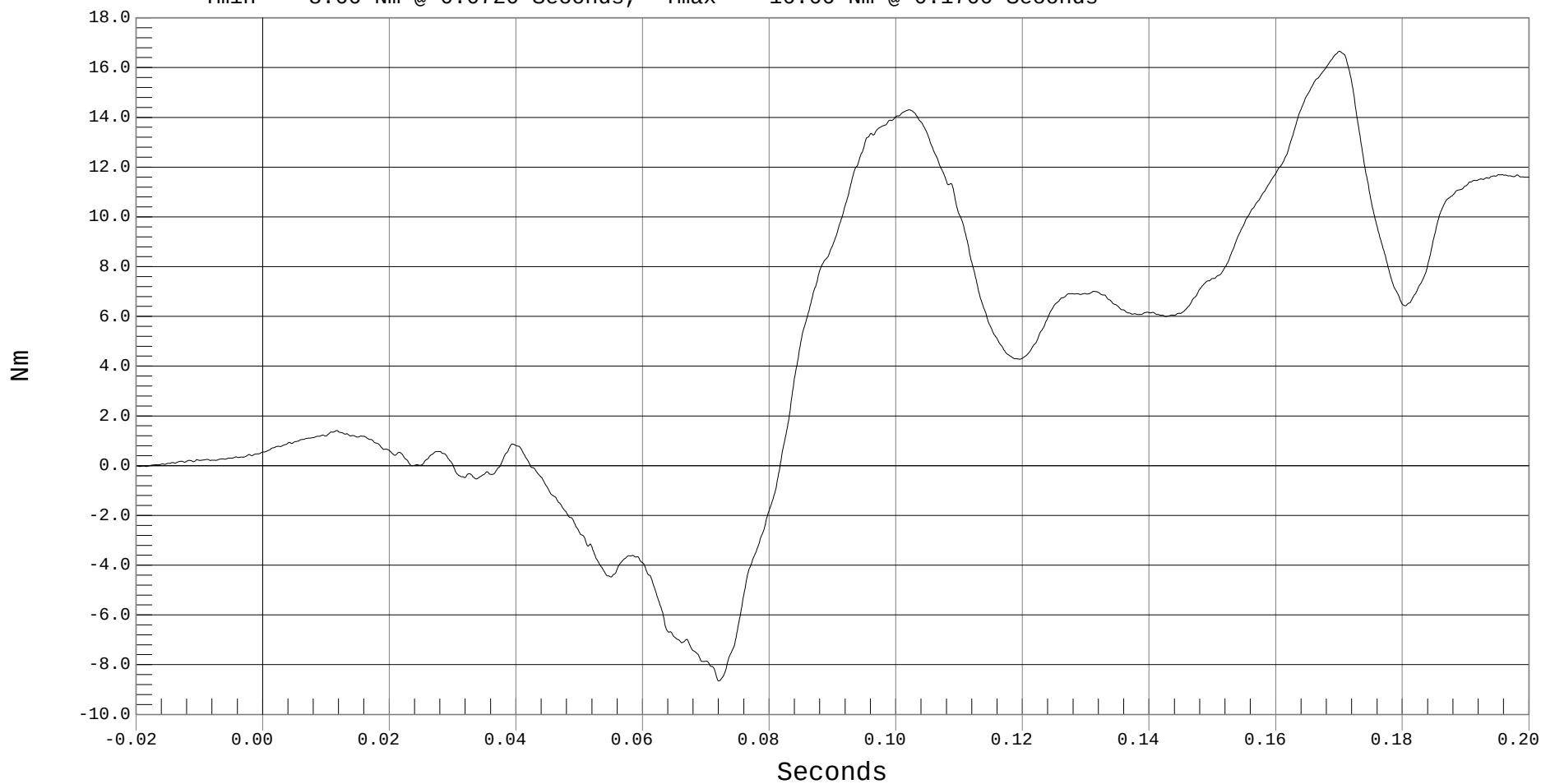
LEFT REAR LOWER NECK MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 LEFT REAR CHILD LOWER NECK MOMENT Y, B01085MF.M74

Ymin = -8.66 Nm @ 0.0720 Seconds, Ymax = 16.66 Nm @ 0.1700 Seconds





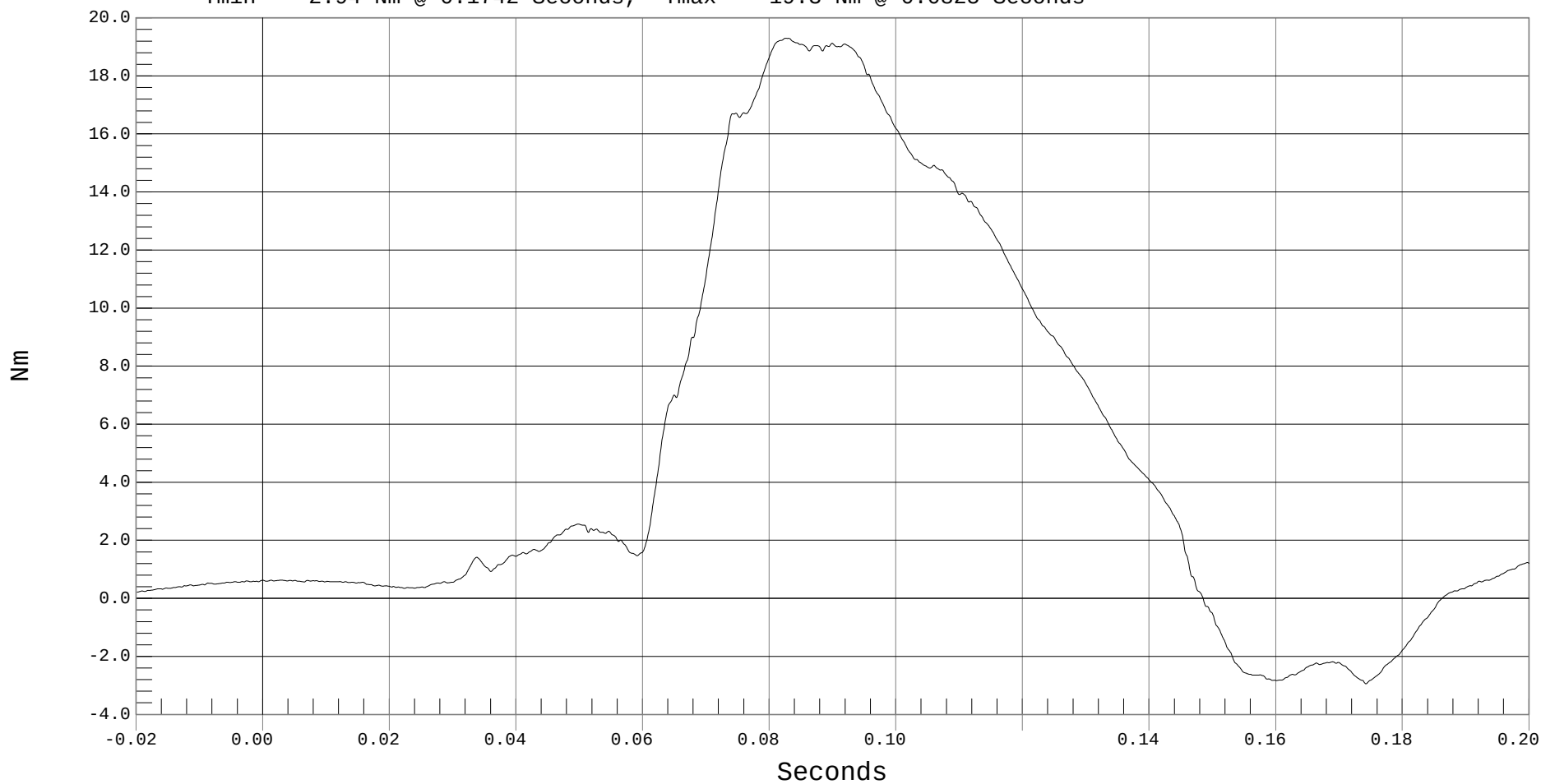
LEFT REAR LOWER NECK MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 LEFT REAR CHILD LOWER NECK MOMENT Z, B01085MF.M75

Ymin = -2.94 Nm @ 0.1742 Seconds, Ymax = 19.3 Nm @ 0.0825 Seconds





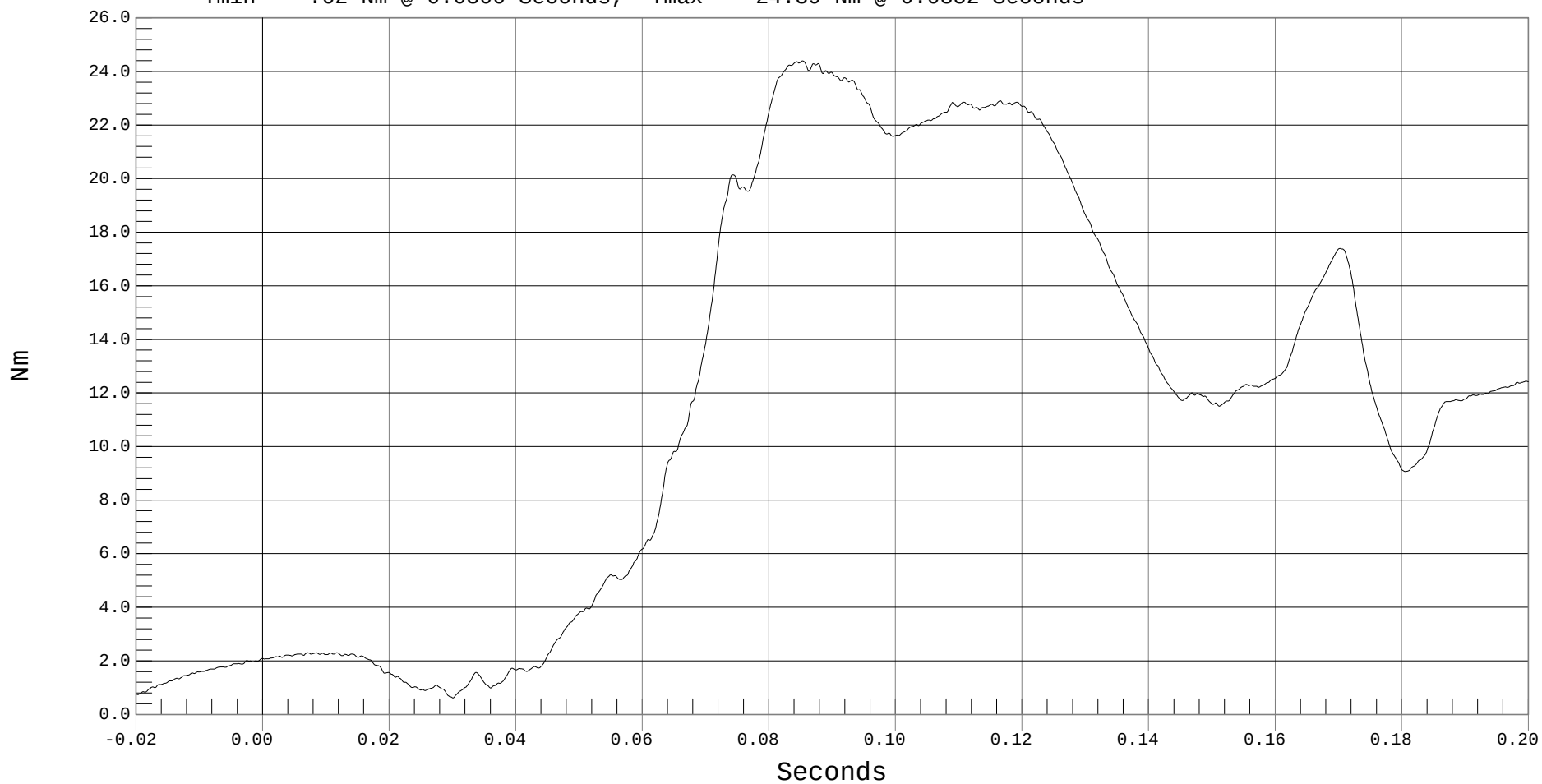
LEFT REAR LOWER NECK MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 LEFT REAR LOWER NECK MOMENT RESULTANT, B01085MV.M73

Ymin = .62 Nm @ 0.0300 Seconds, Ymax = 24.39 Nm @ 0.0852 Seconds





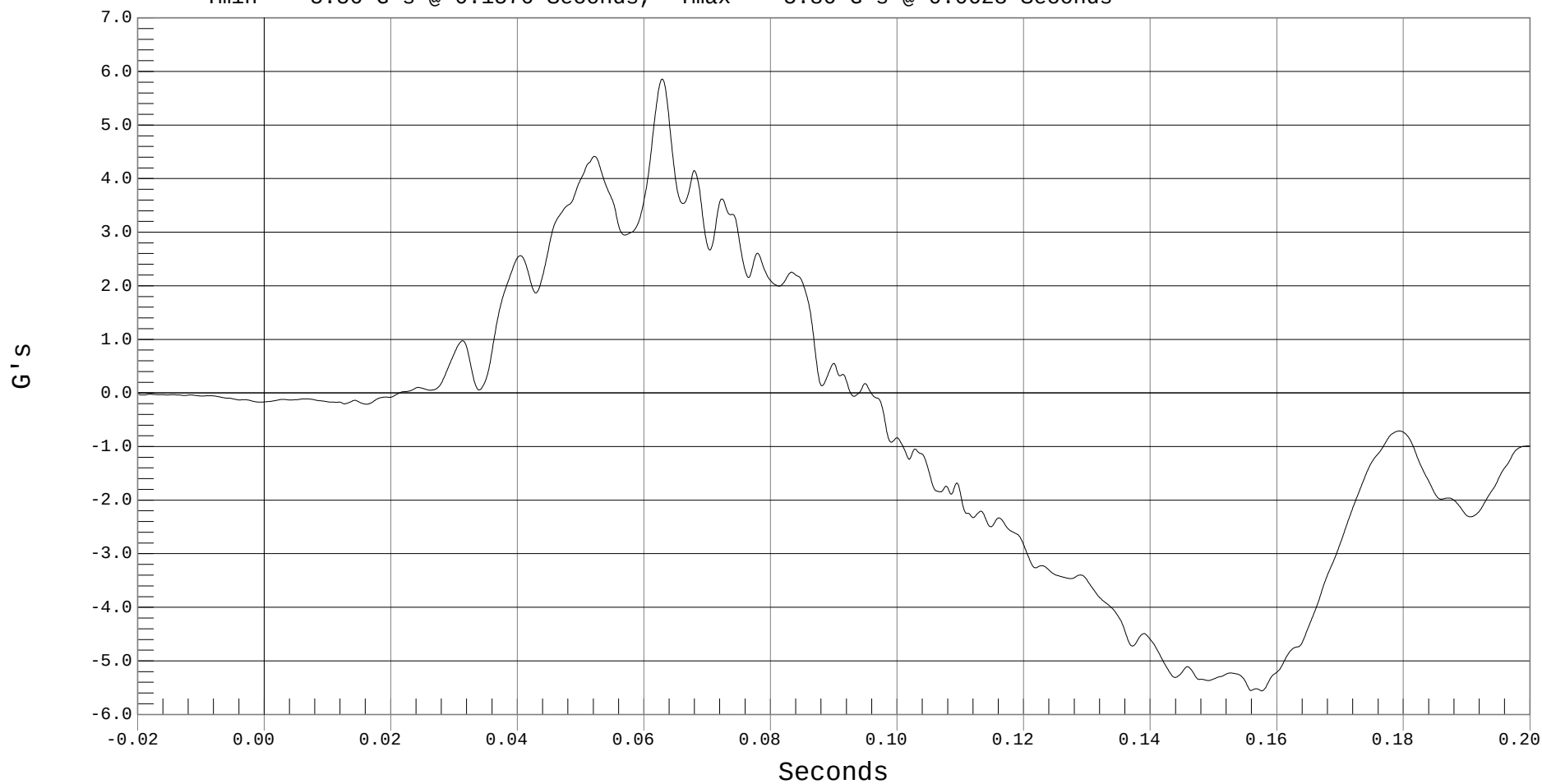
LEFT REAR CHEST X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 LEFT REAR CHILD CHEST X, B01085AF.A76

Ymin = -5.56 G's @ 0.1576 Seconds, Ymax = 5.86 G's @ 0.0628 Seconds





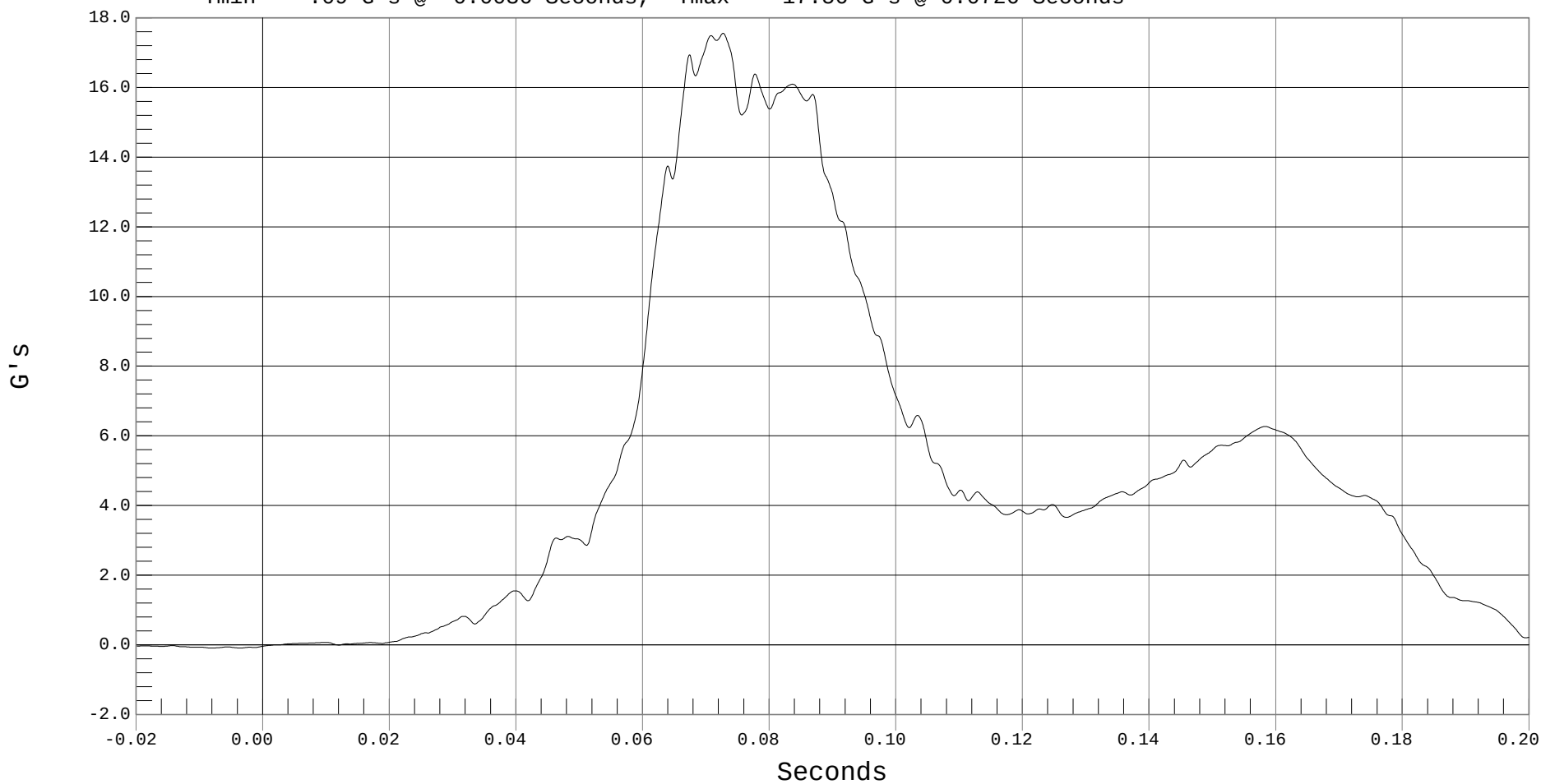
LEFT REAR CHEST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 LEFT REAR CHILD CHEST Y, B01085AF.A77

Ymin = -.09 G's @ -0.0036 Seconds, Ymax = 17.56 G's @ 0.0726 Seconds





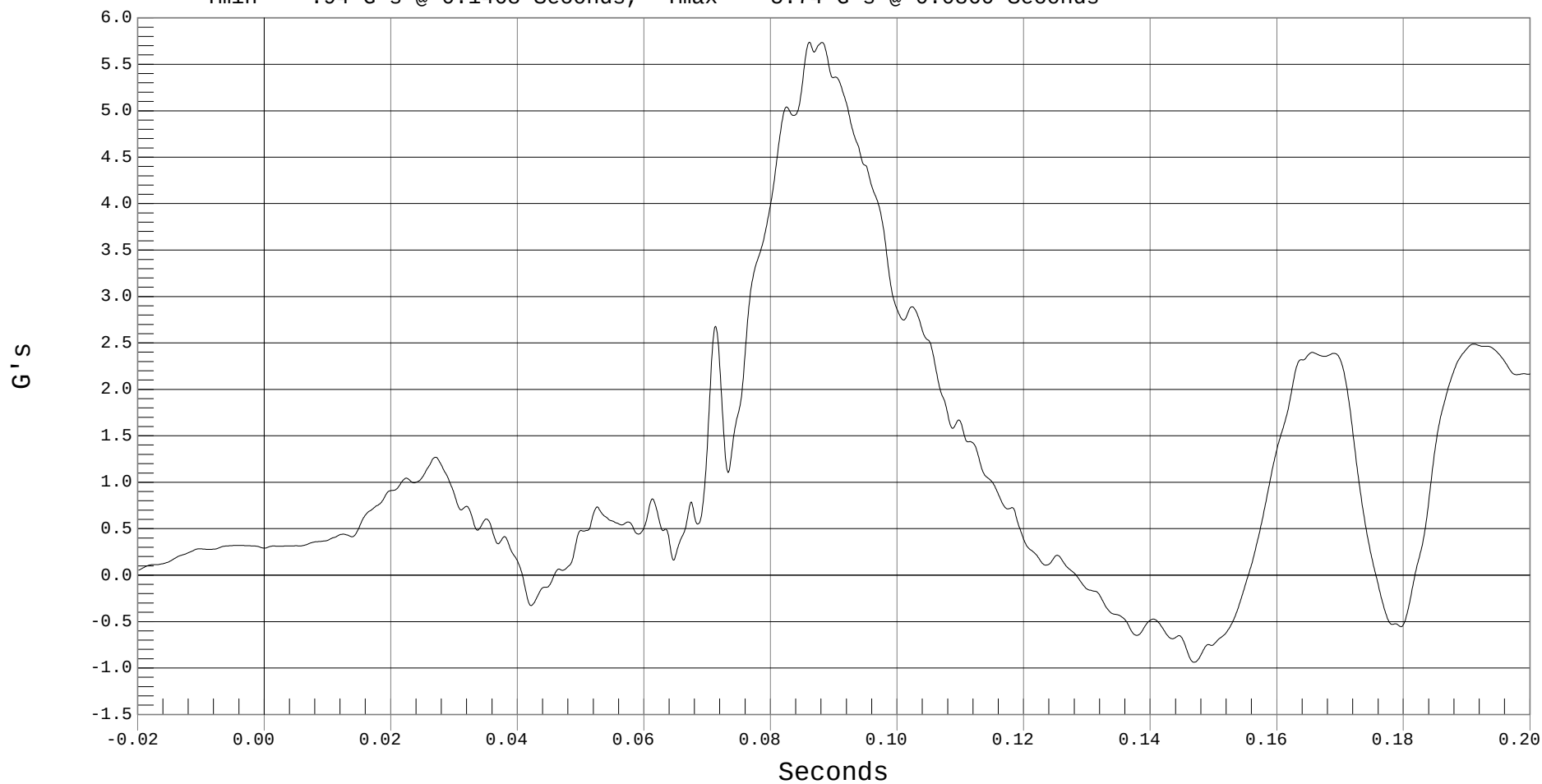
LEFT REAR CHEST Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 LEFT REAR CHILD CHEST Z, B01085AF.A78

Ymin = -.94 G's @ 0.1468 Seconds, Ymax = 5.74 G's @ 0.0860 Seconds





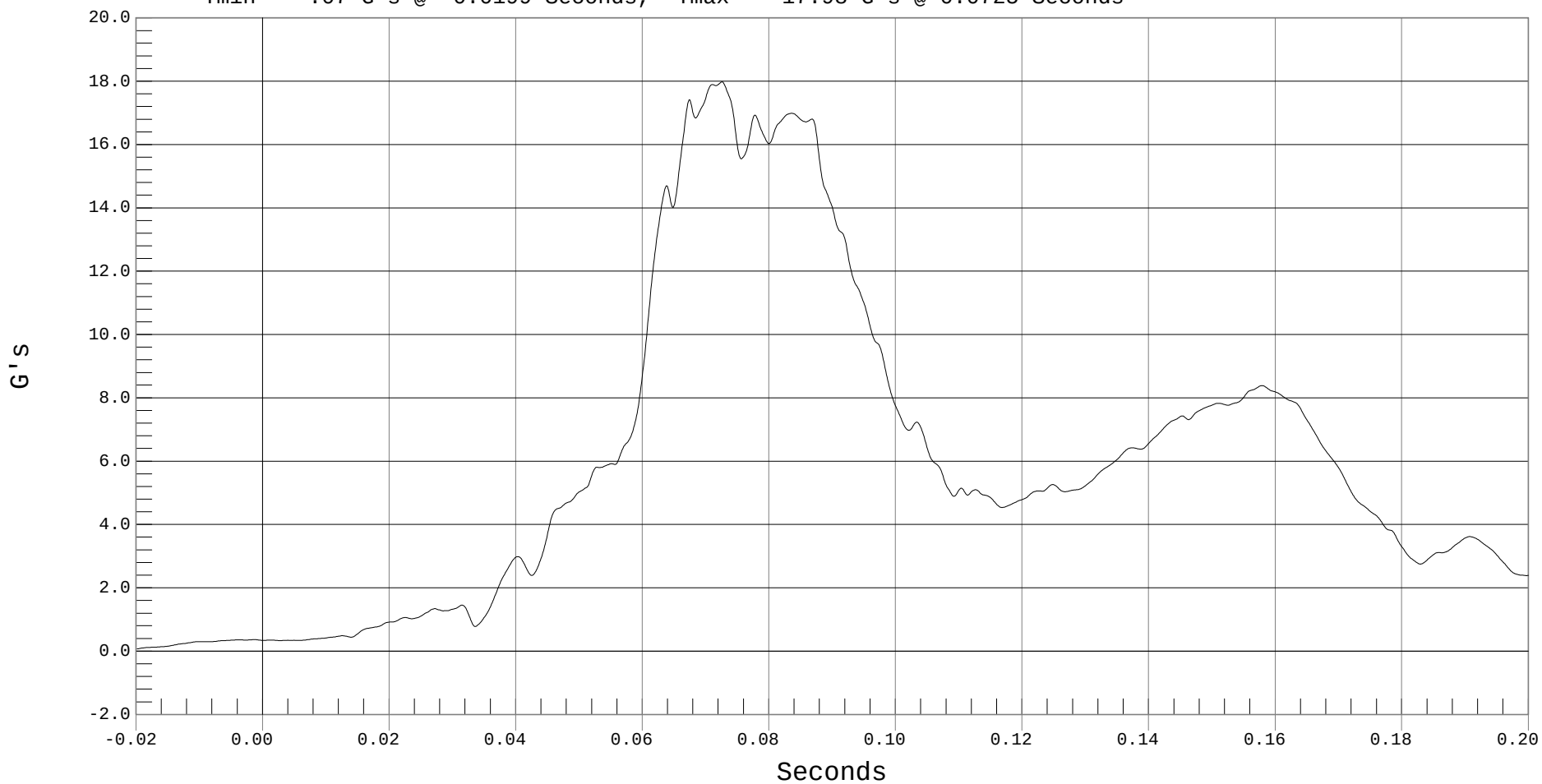
LEFT REAR CHEST RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 LEFT REAR CHEST RESULTANT, B01085AV.A76

Ymin = .07 G's @ -0.0199 Seconds, Ymax = 17.98 G's @ 0.0725 Seconds





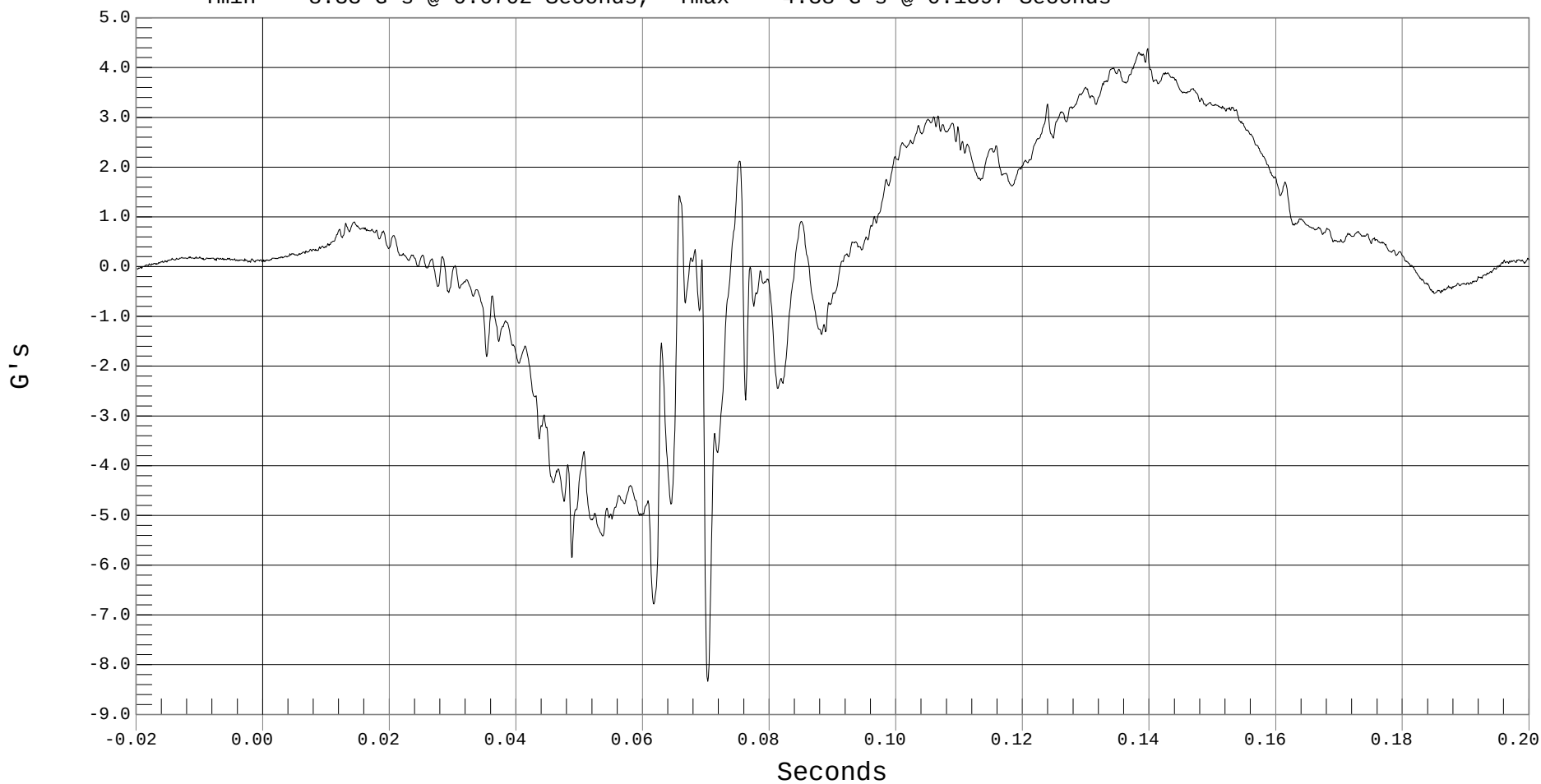
LEFT REAR PELVIS X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD PELVIS X, B01085AT.A80

Ymin = -8.33 G's @ 0.0702 Seconds, Ymax = 4.38 G's @ 0.1397 Seconds





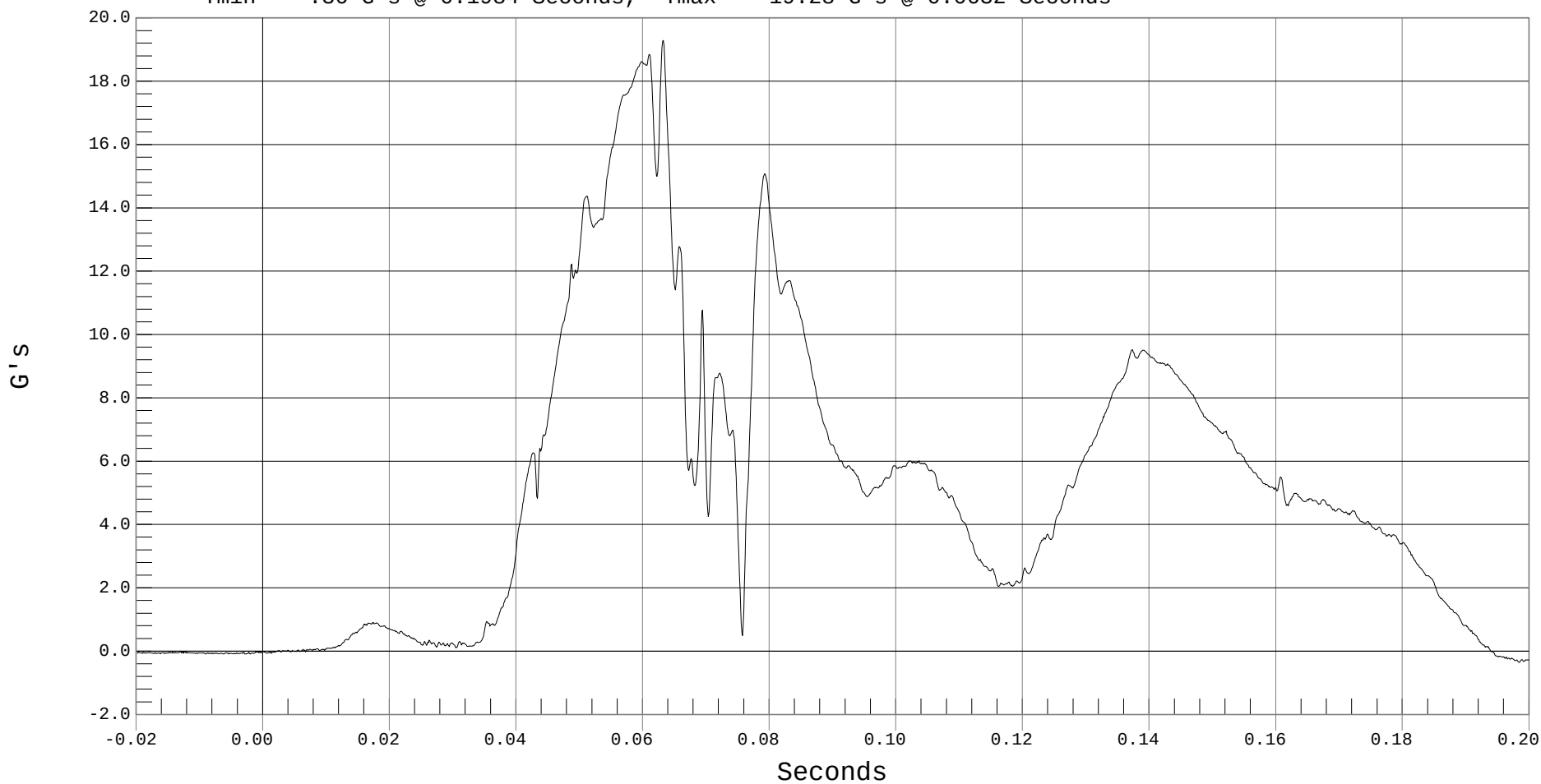
LEFT REAR PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD PELVIS Y, B01085AT.A81

Ymin = -.36 G's @ 0.1984 Seconds, Ymax = 19.28 G's @ 0.0632 Seconds





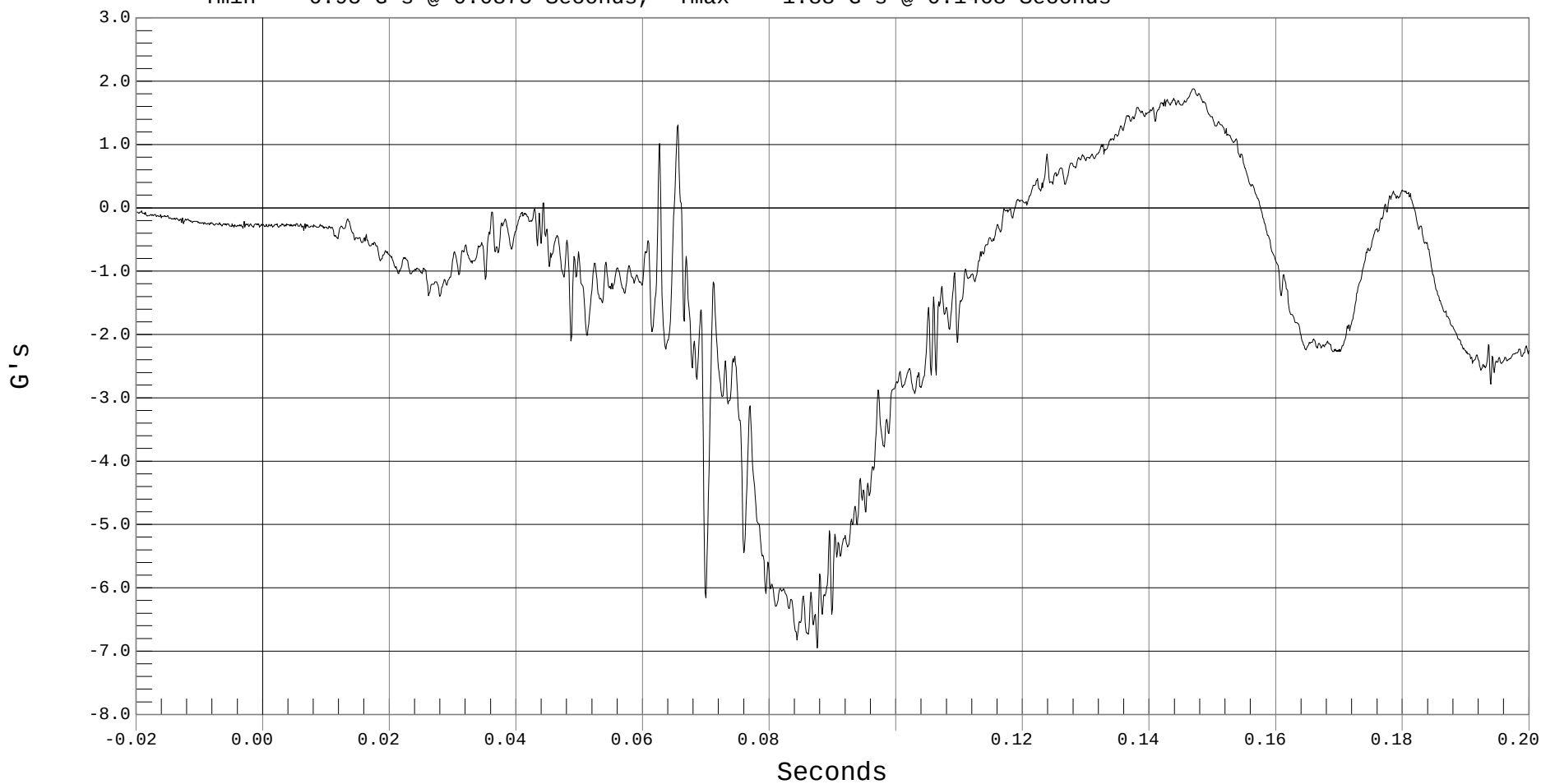
LEFT REAR PELVIS Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 LEFT REAR CHILD PELVIS Z, B01085AT.A82

Ymin = -6.95 G's @ 0.0875 Seconds, Ymax = 1.88 G's @ 0.1468 Seconds





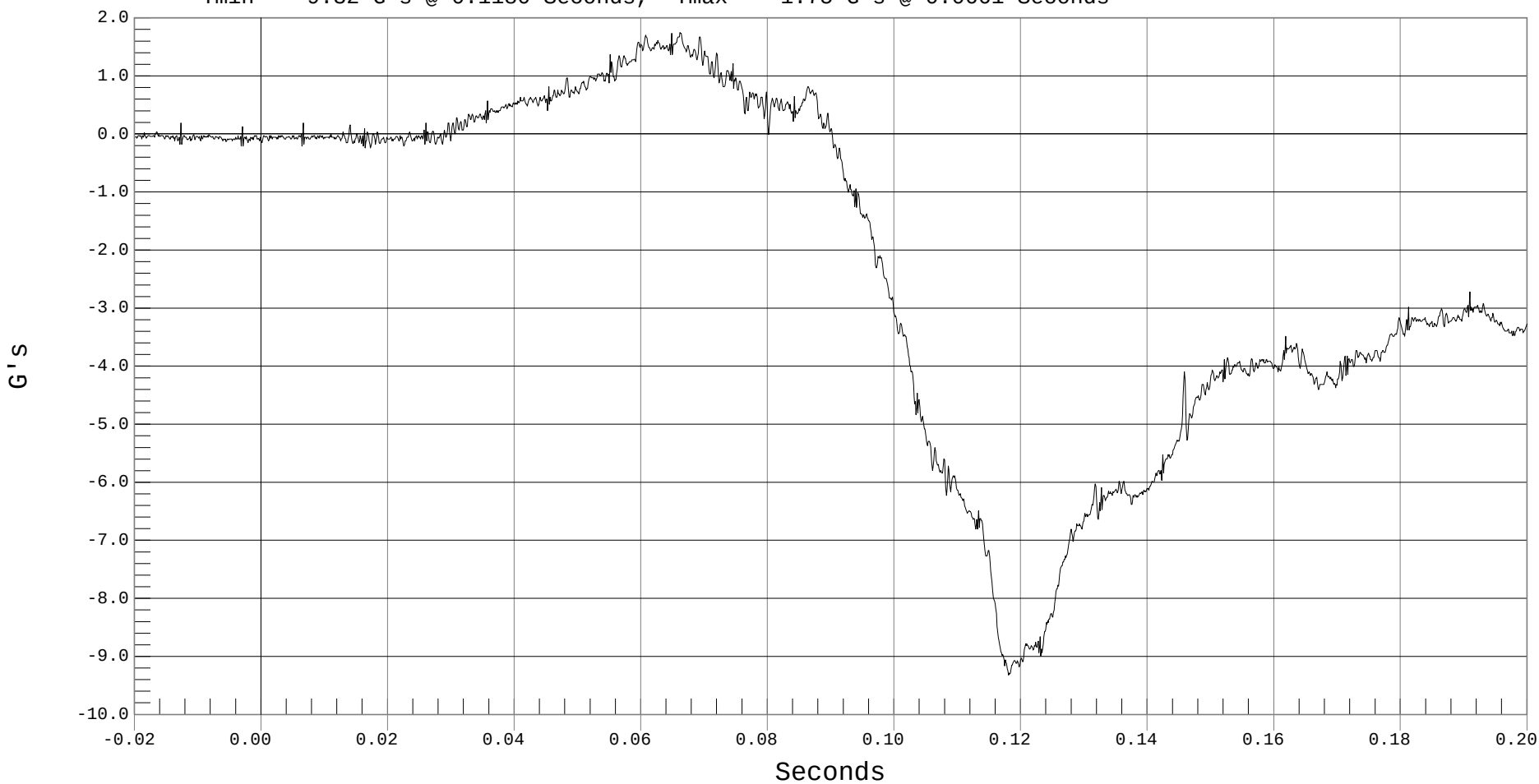
RIGHT REAR HEAD X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR CHILD HEAD X, B01085AT.A83

Ymin = -9.32 G's @ 0.1180 Seconds, Ymax = 1.75 G's @ 0.0661 Seconds





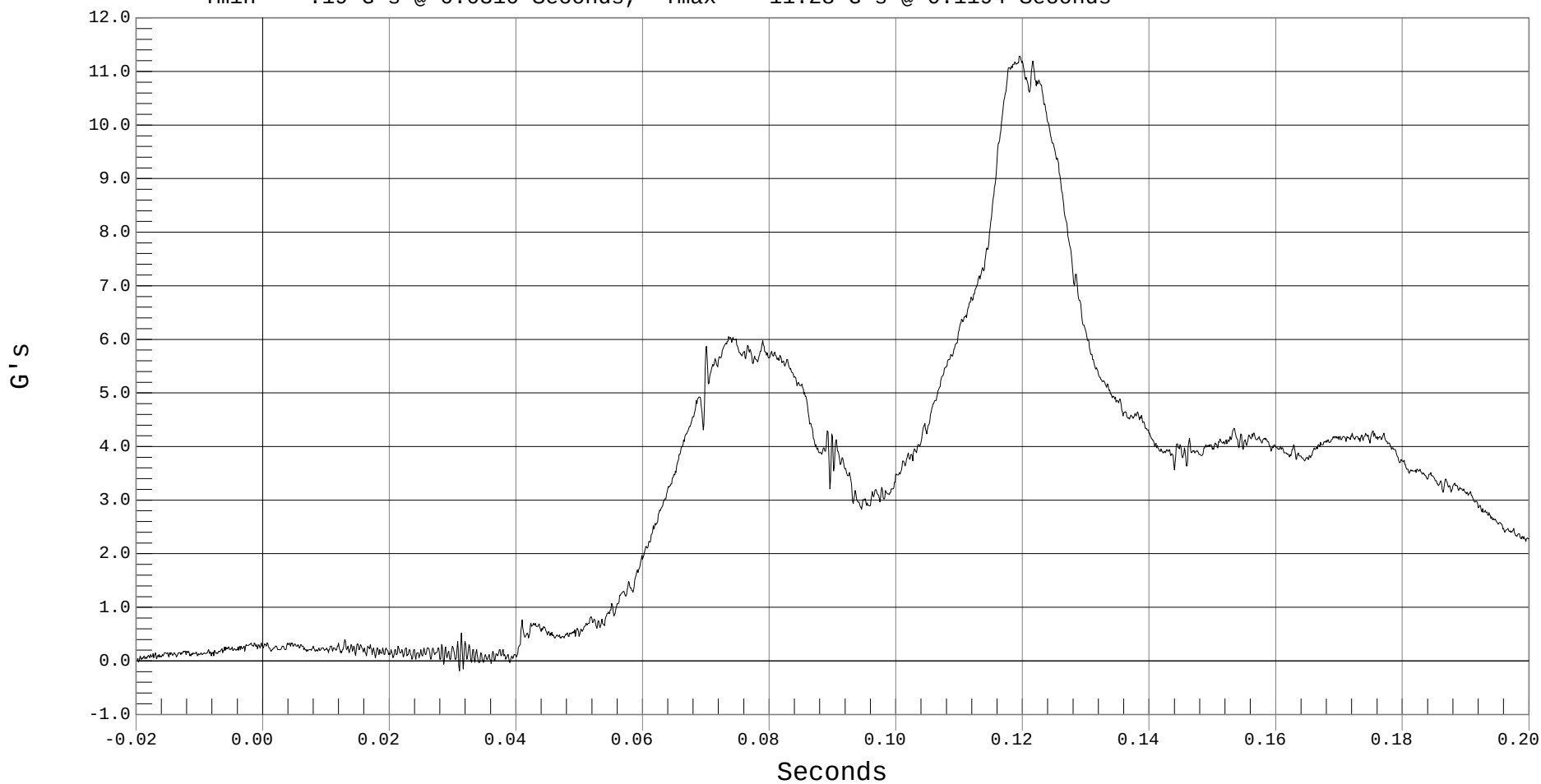
RIGHT REAR HEAD Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR CHILD HEAD Y, B01085AT.A84

Ymin = -.19 G's @ 0.0310 Seconds, Ymax = 11.28 G's @ 0.1194 Seconds





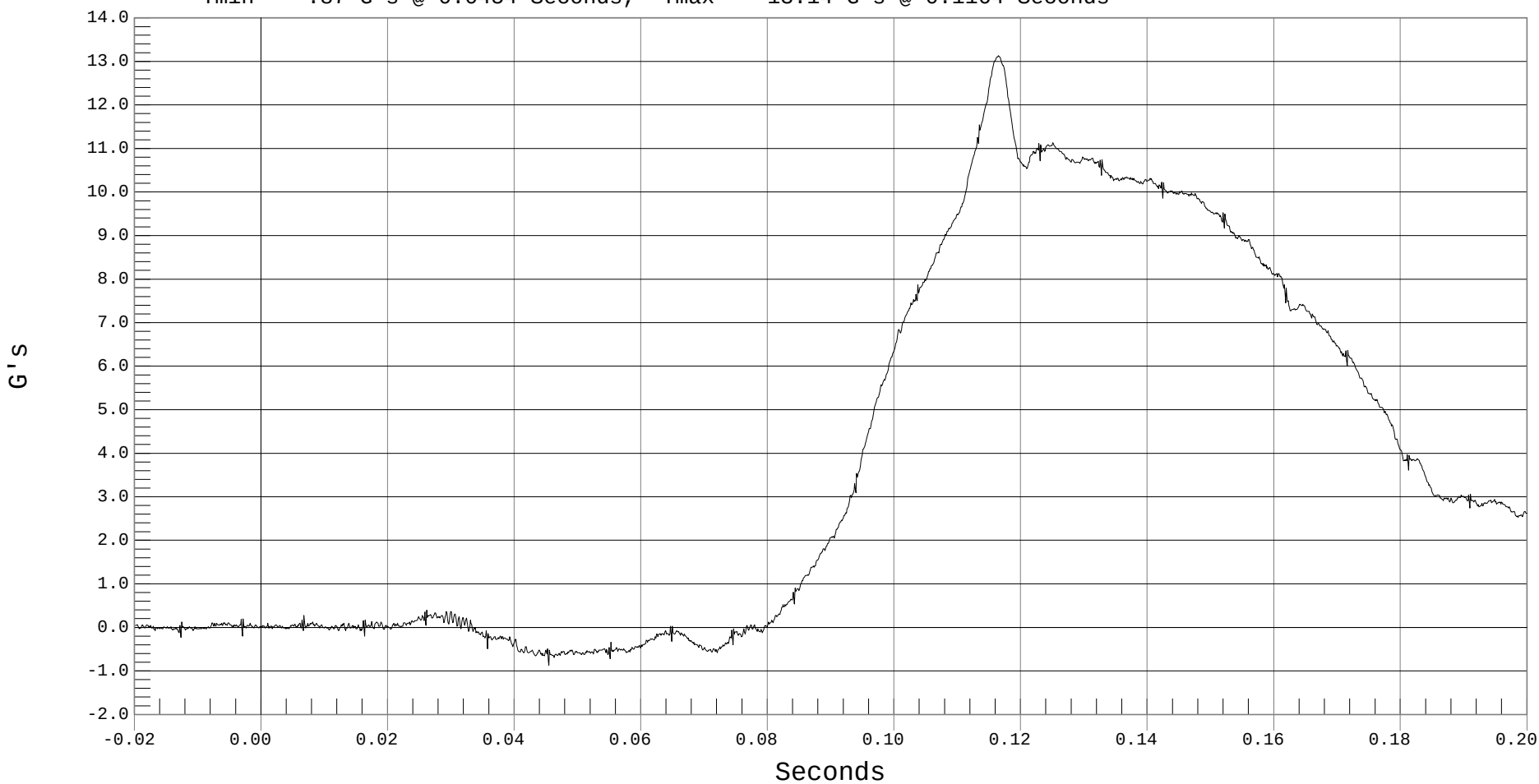
RIGHT REAR HEAD Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR CHILD HEAD Z, B01085AT.A85

Ymin = -.87 G's @ 0.0454 Seconds, Ymax = 13.14 G's @ 0.1164 Seconds





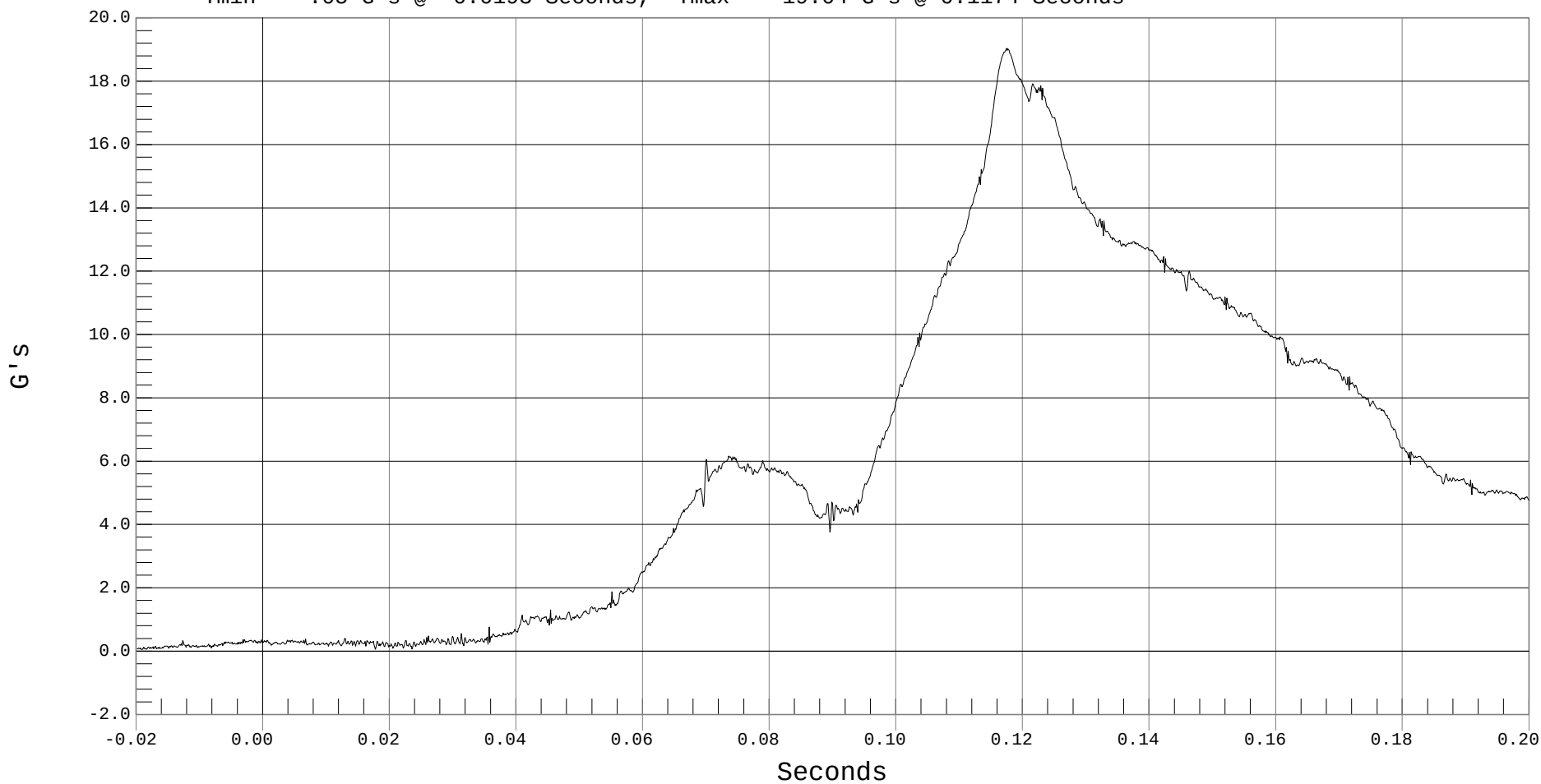
RIGHT REAR HEAD RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR HEAD RESULTANT, B01085AV.A83

Ymin = .05 G's @ -0.0193 Seconds, Ymax = 19.04 G's @ 0.1174 Seconds





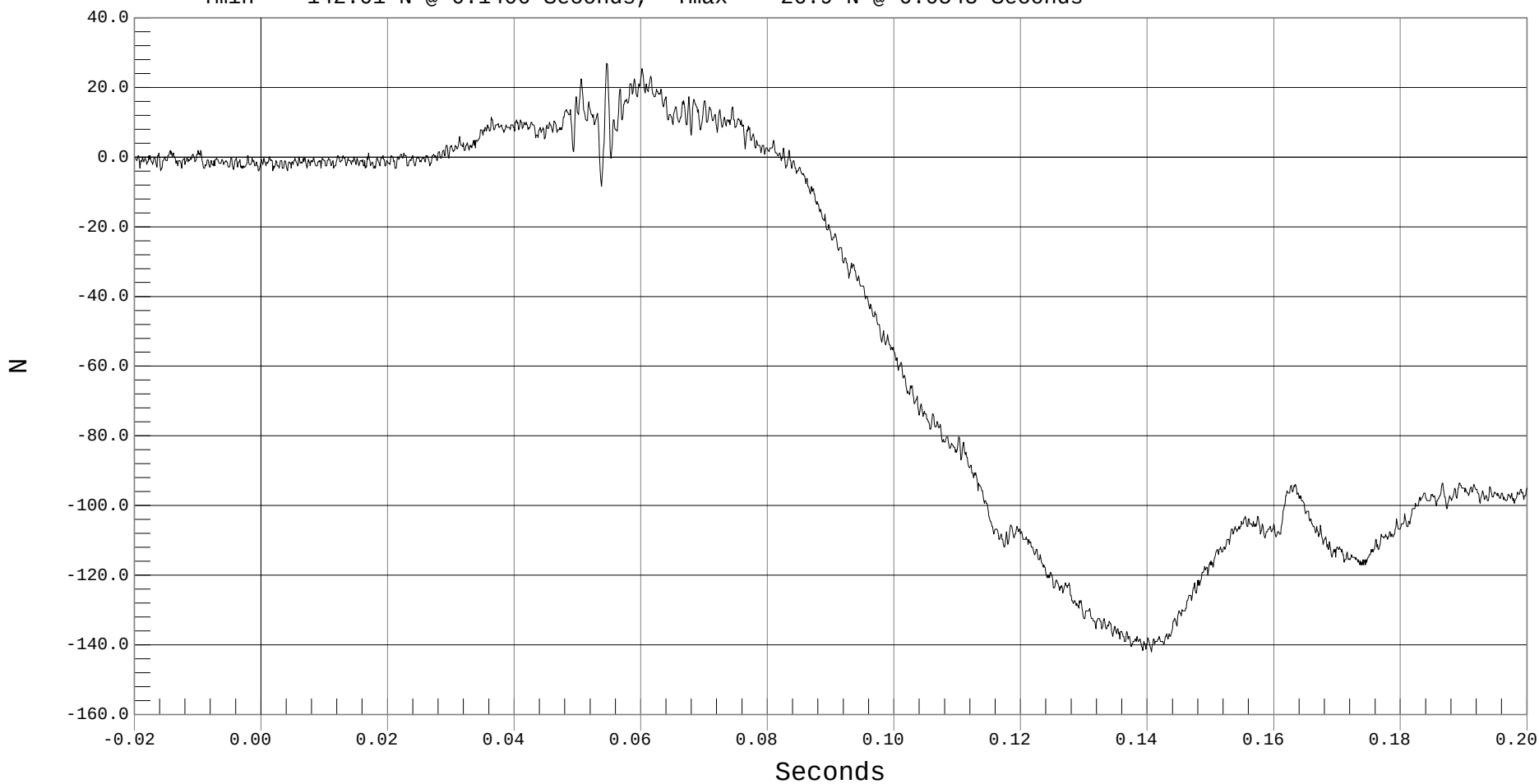
RIGHT REAR UPPER NECK FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR CHILD UPPER NECK FORCE X, B01085FT.F86

Ymin = -142.01 N @ 0.1406 Seconds, Ymax = 26.9 N @ 0.0545 Seconds





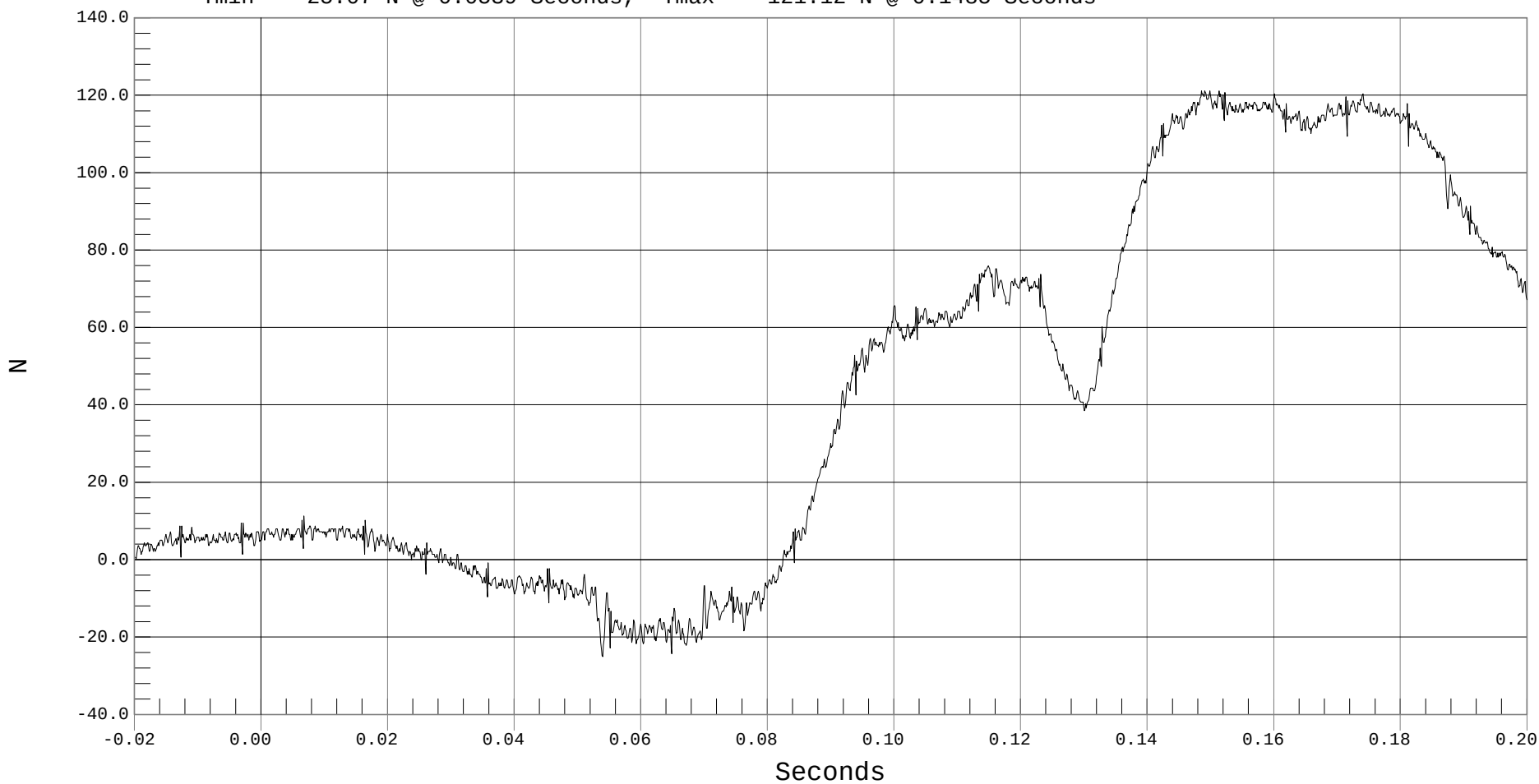
RIGHT REAR UPPER NECK FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR CHILD UPPER NECK FORCE Y, B01085FT.F87

Ymin = -25.07 N @ 0.0539 Seconds, Ymax = 121.12 N @ 0.1485 Seconds





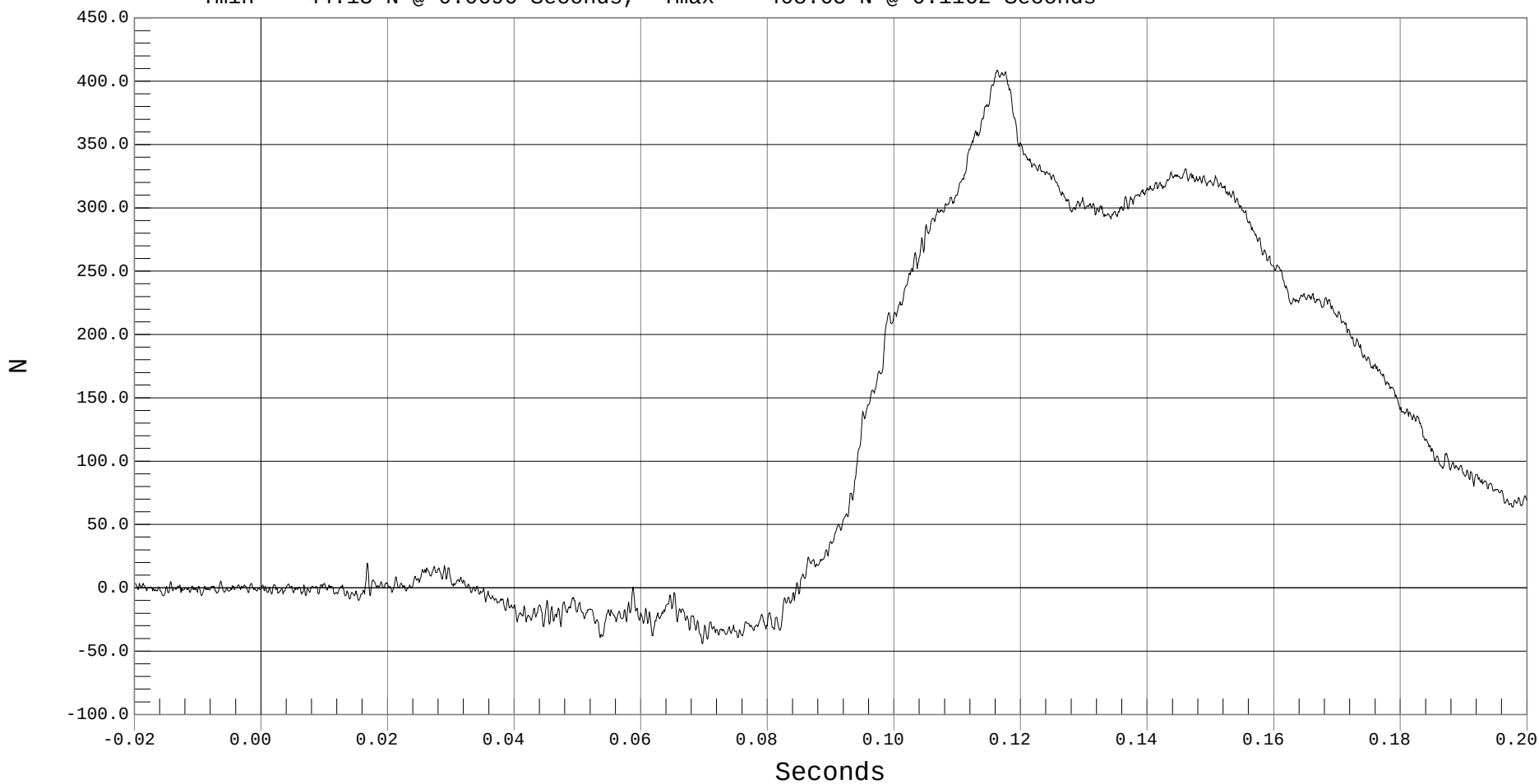
RIGHT REAR UPPER NECK FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR CHILD UPPER NECK FORCE Z, B01085FT.F88

Ymin = -44.13 N @ 0.0696 Seconds, Ymax = 408.65 N @ 0.1162 Seconds





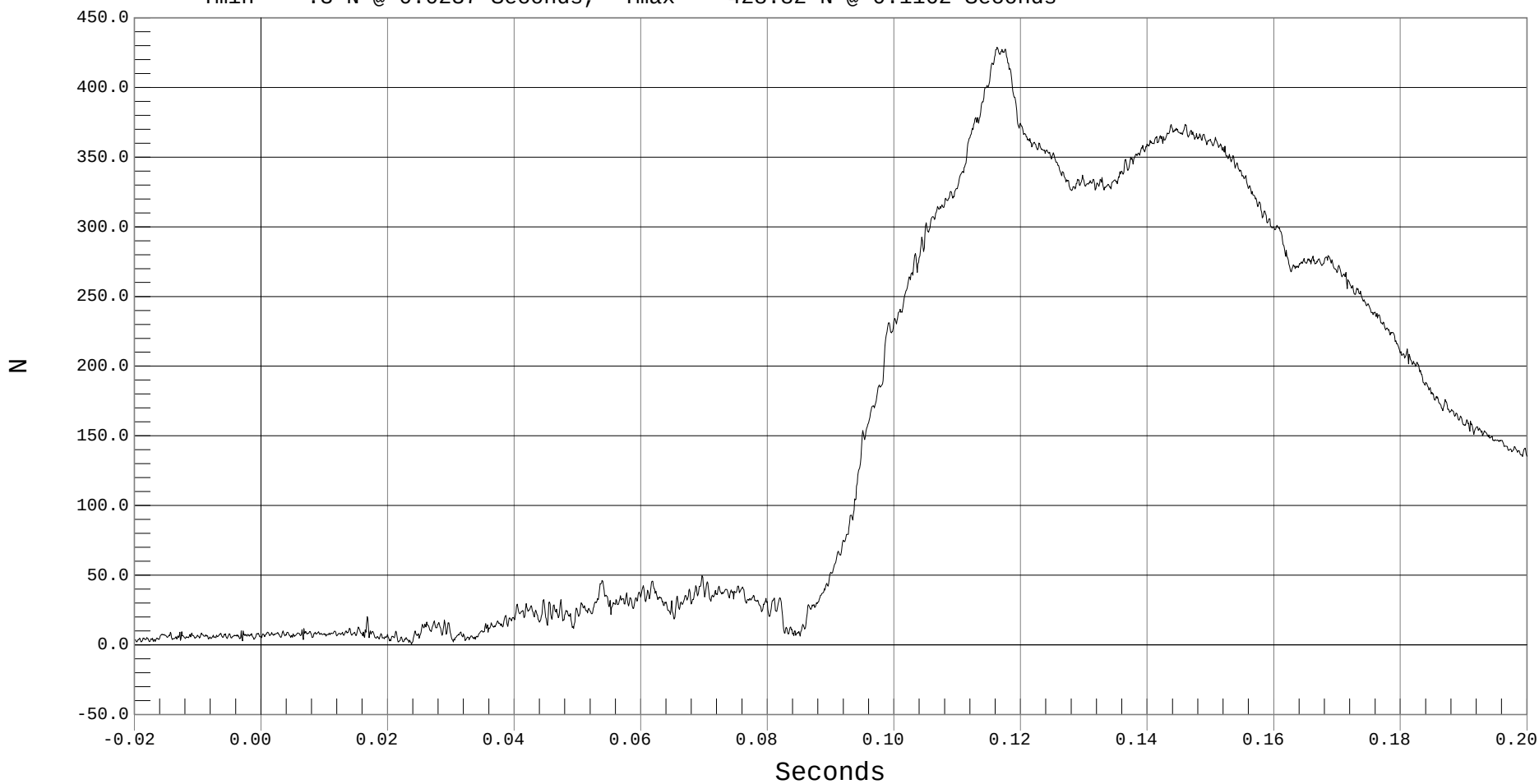
RIGHT REAR UPPER NECK FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR UPPER NECK FORCE RESULTANT, B01085FV.F86

Ymin = .3 N @ 0.0237 Seconds, Ymax = 428.82 N @ 0.1162 Seconds





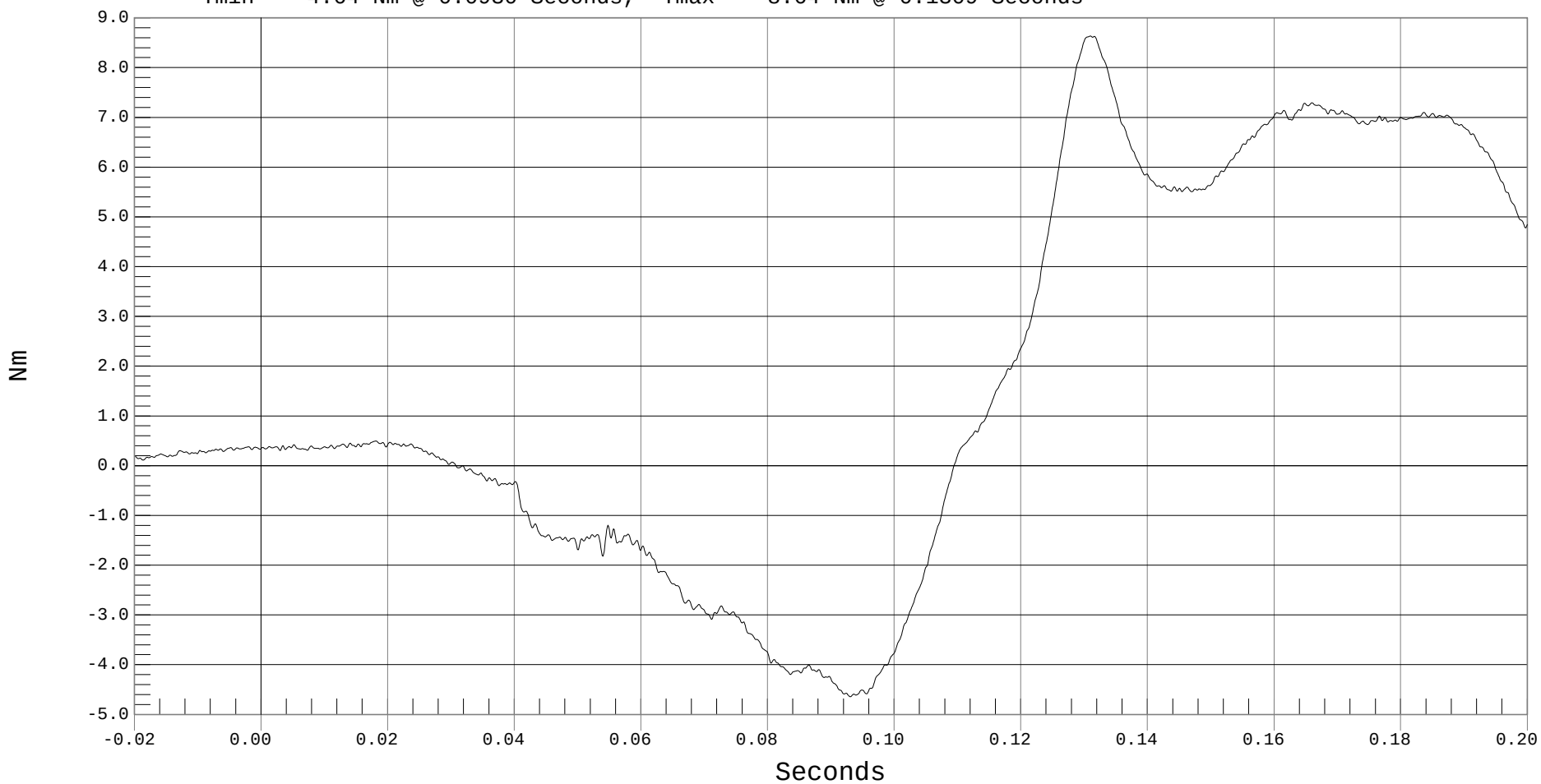
RIGHT REAR UPPER NECK MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 RIGHT REAR CHILD UPPER NECK MOMENT, B01085MF.M89

Ymin = -4.64 Nm @ 0.0930 Seconds, Ymax = 8.64 Nm @ 0.1309 Seconds





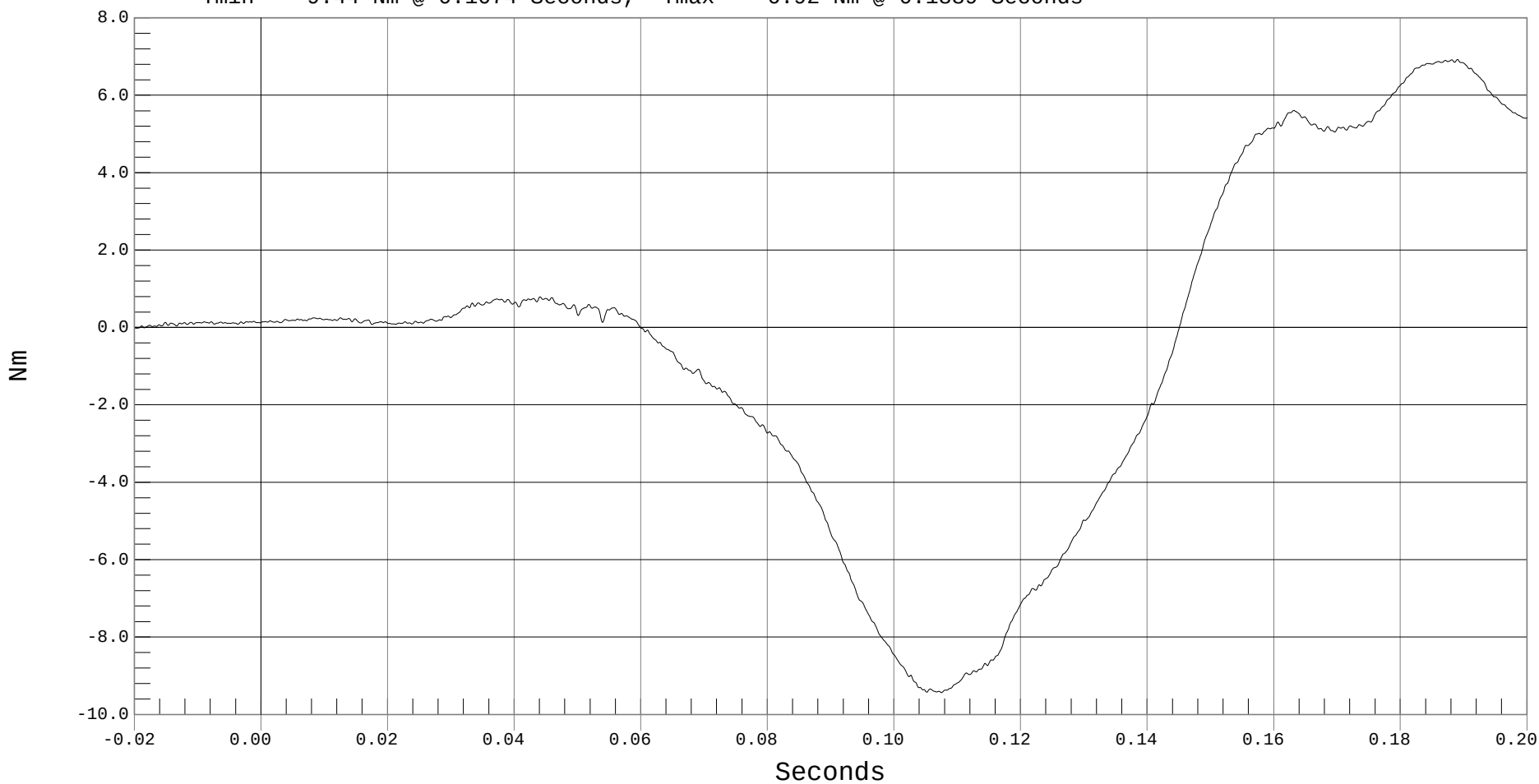
RIGHT REAR UPPER NECK MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 RIGHT REAR CHILD UPPER NECK MOMENT, B01085MF.M90

Ymin = -9.44 Nm @ 0.1074 Seconds, Ymax = 6.92 Nm @ 0.1889 Seconds





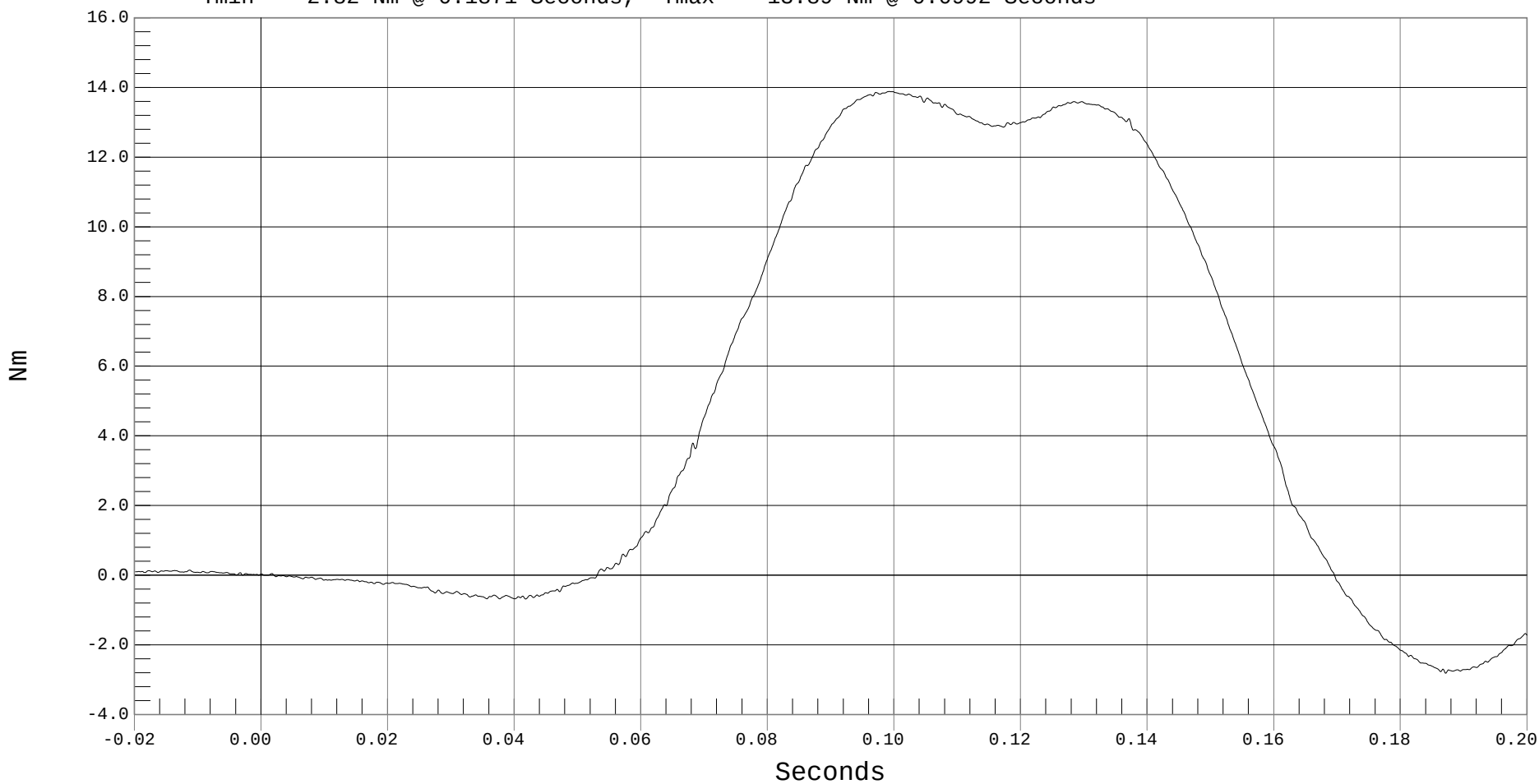
RIGHT REAR UPPER NECK MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 RIGHT REAR CHILD UPPER NECK MOMENT, B01085MF.M91

Ymin = -2.82 Nm @ 0.1871 Seconds, Ymax = 13.89 Nm @ 0.0992 Seconds





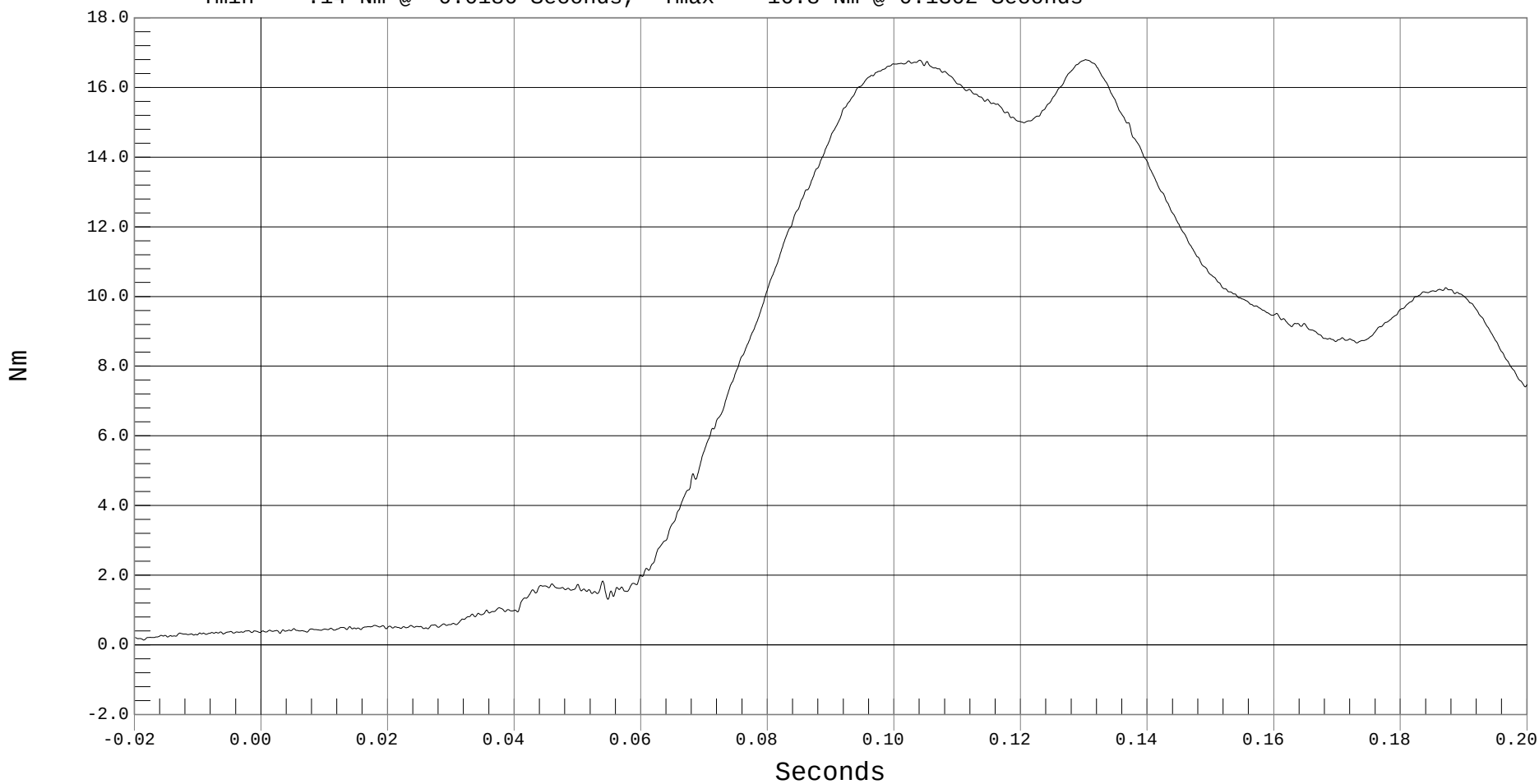
RIGHT REAR UPPER NECK MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 600

— 1 RIGHT REAR UPPER NECK MOMENT RESULTANT, B01085MV.M89

Ymin = .14 Nm @ -0.0186 Seconds, Ymax = 16.8 Nm @ 0.1302 Seconds





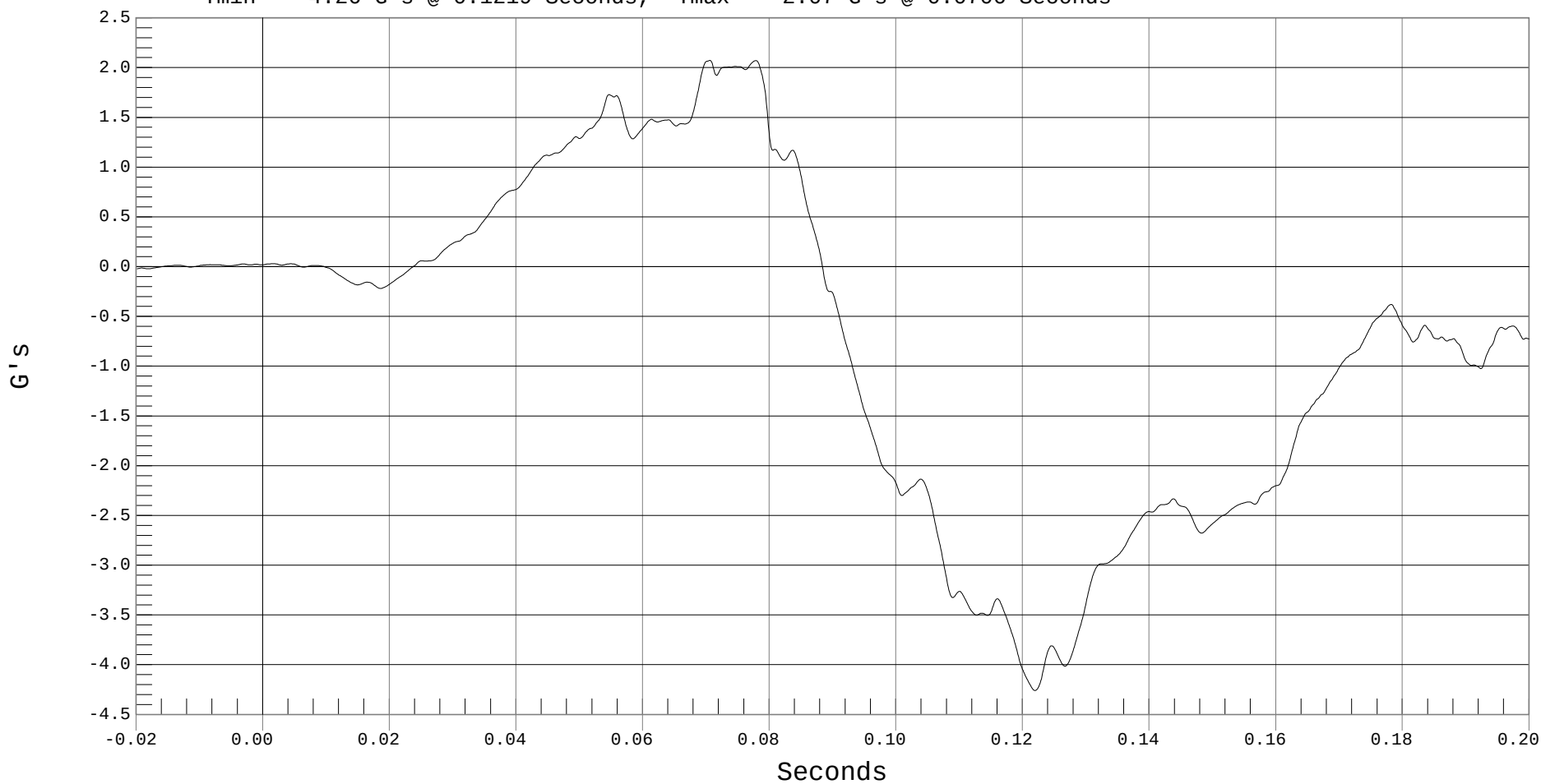
RIGHT REAR CHEST X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 RIGHT REAR CHILD CHEST X, B01085AF.A02

Ymin = -4.26 G's @ 0.1219 Seconds, Ymax = 2.07 G's @ 0.0706 Seconds





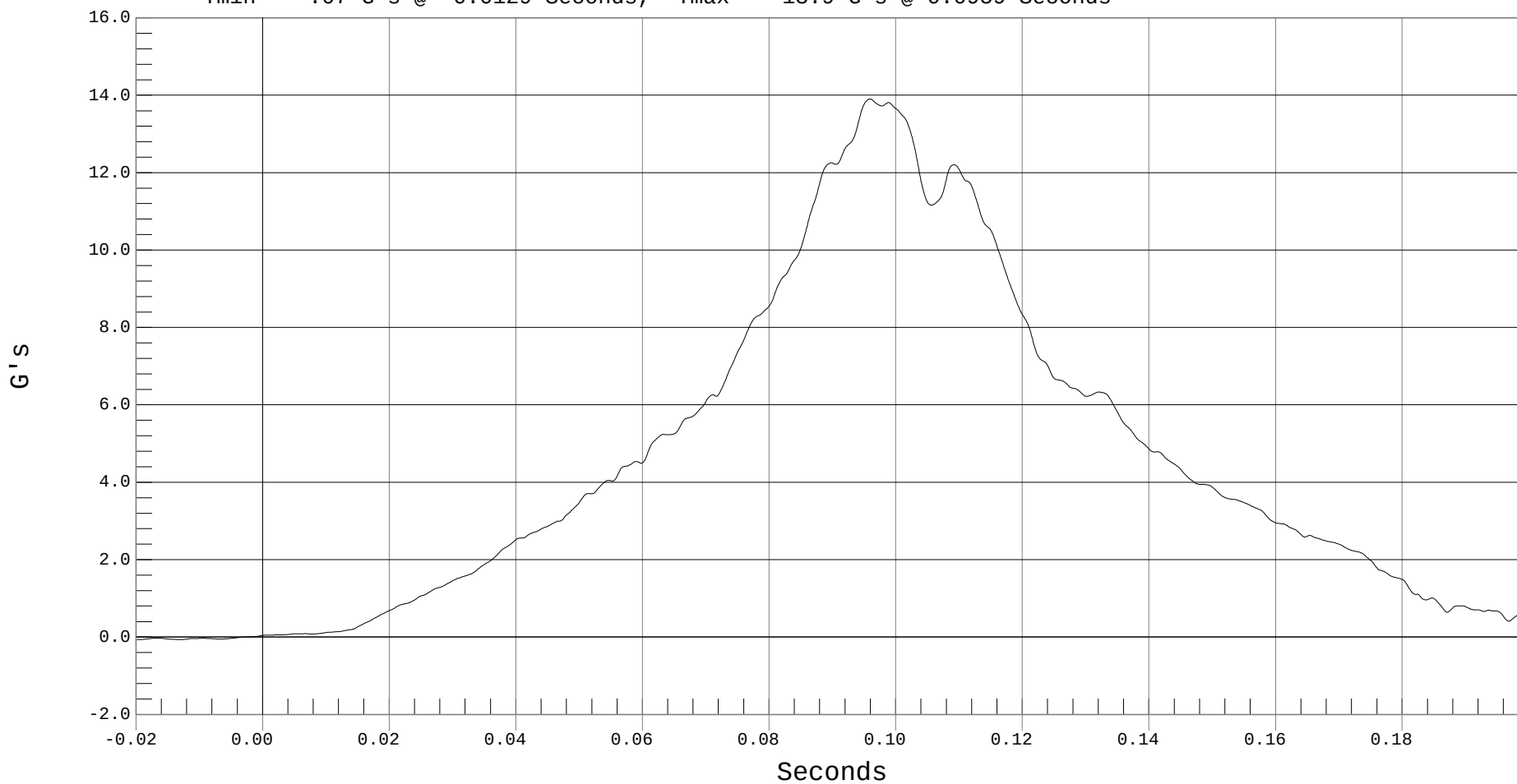
RIGHT REAR CHEST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 RIGHT REAR CHILD CHEST Y, B01085AF.A03

Ymin = -.07 G's @ -0.0129 Seconds, Ymax = 13.9 G's @ 0.0959 Seconds





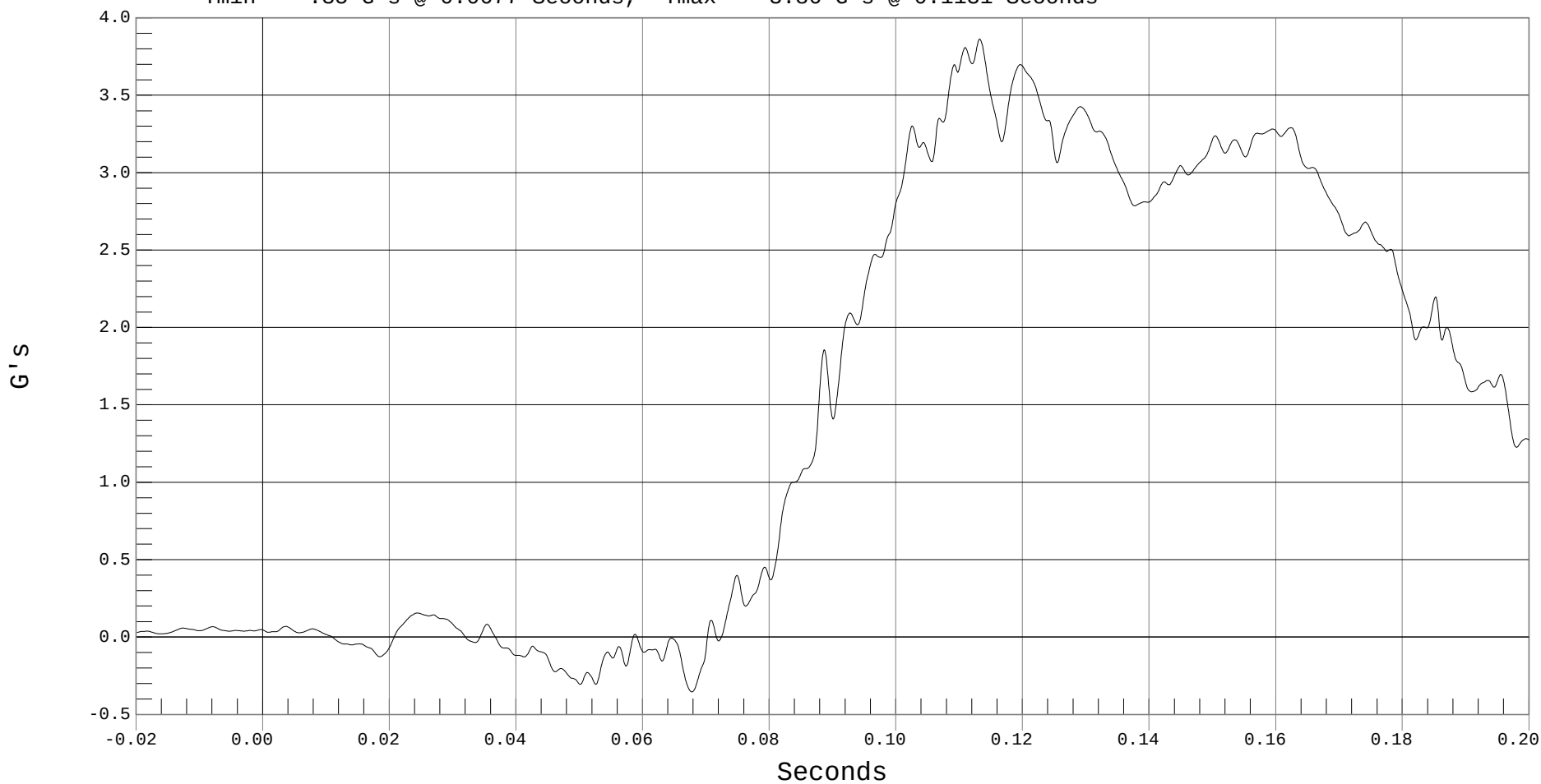
RIGHT REAR CHEST Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 RIGHT REAR CHILD CHEST Z, B01085AF.A04

Ymin = -.35 G's @ 0.0677 Seconds, Ymax = 3.86 G's @ 0.1131 Seconds





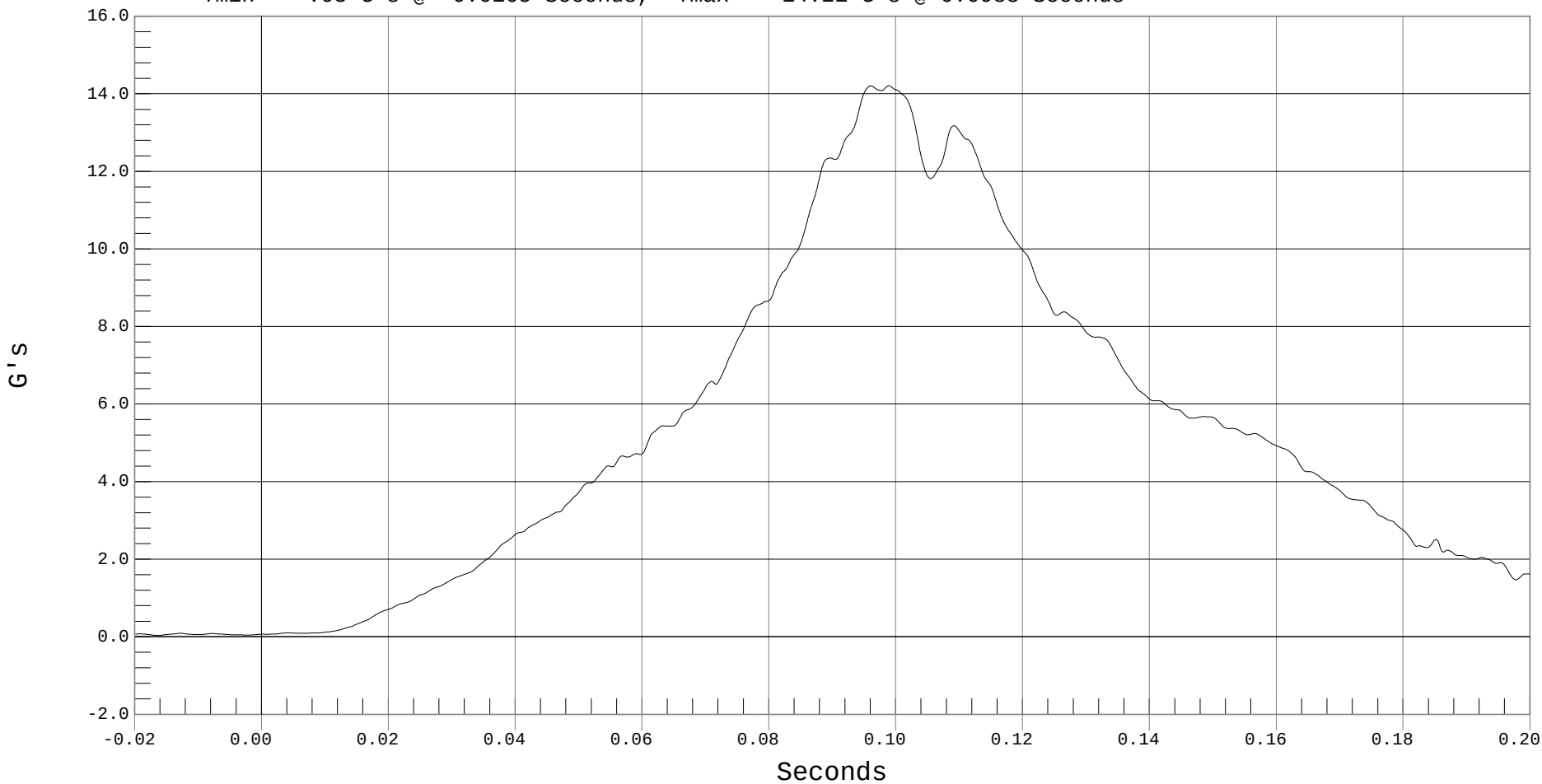
RIGHT REAR CHEST RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 180

— 1 RIGHT REAR CHEST RESULTANT, B01085AV.A02

Ymin = .03 G's @ -0.0165 Seconds, Ymax = 14.21 G's @ 0.0988 Seconds





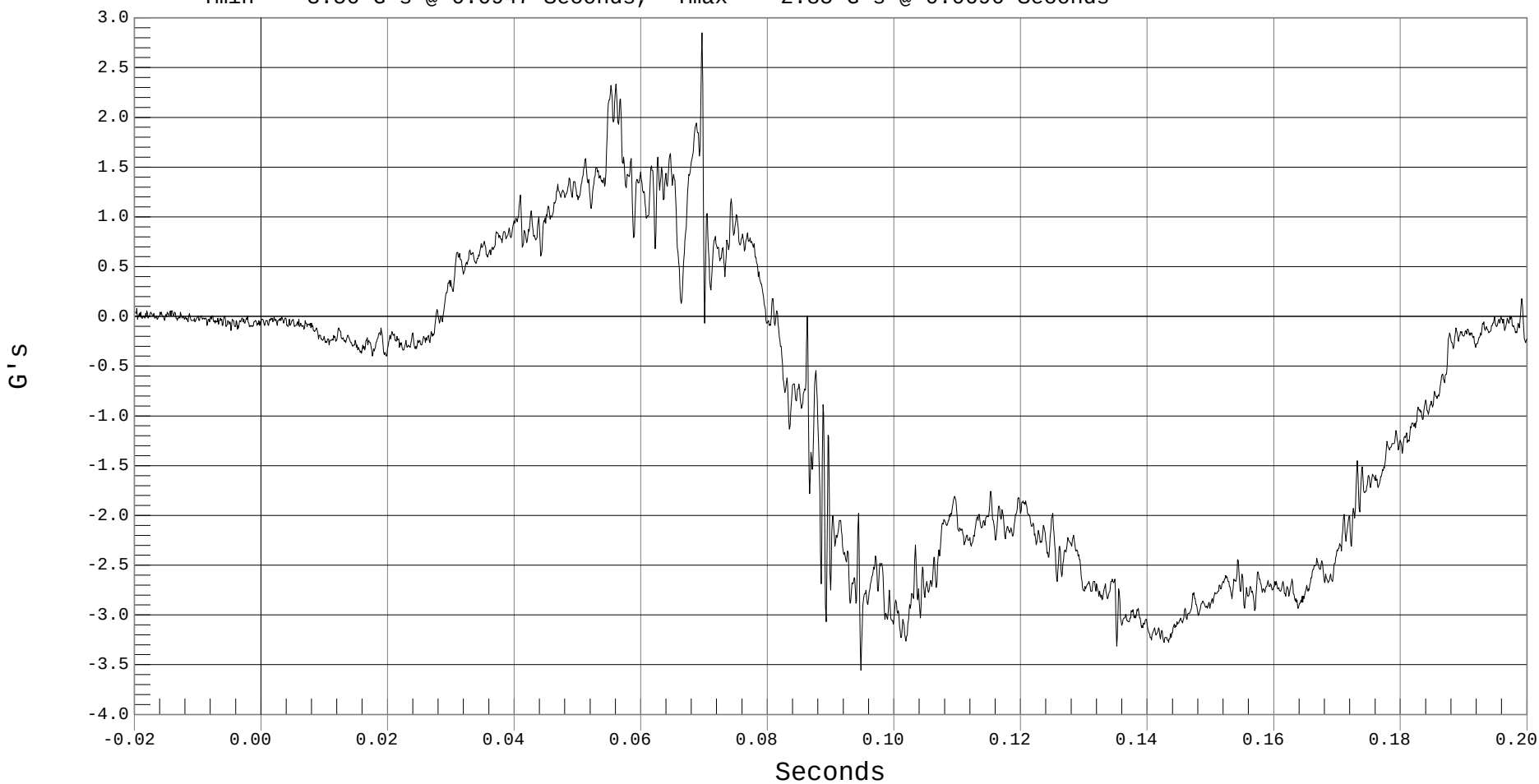
RIGHT REAR PELVIS X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR CHILD PELVIS X, B01085AT.A06

Ymin = -3.56 G's @ 0.0947 Seconds, Ymax = 2.85 G's @ 0.0696 Seconds





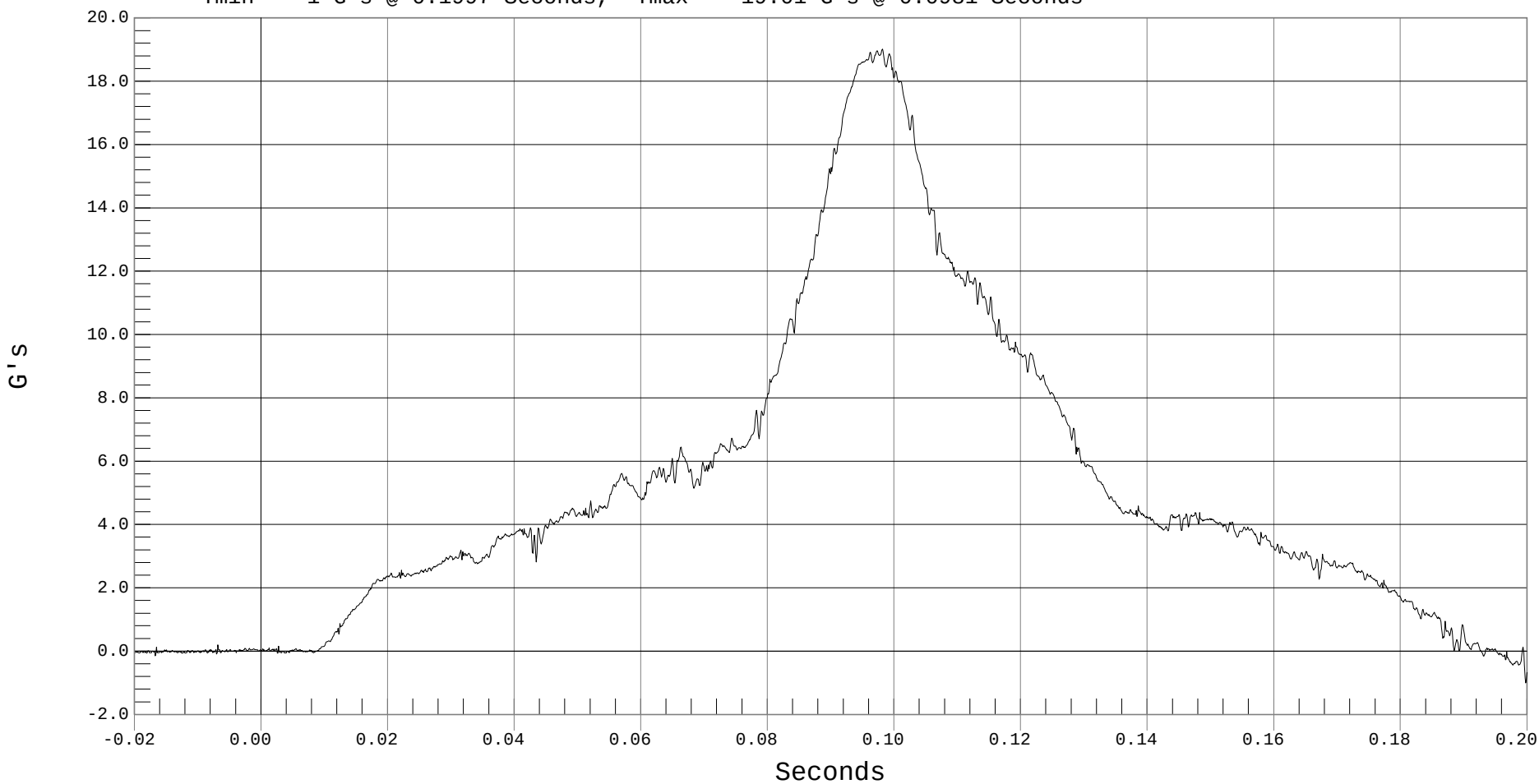
RIGHT REAR PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR CHILD PELVIS Y, B01085AT.A07

Ymin = -1 G's @ 0.1997 Seconds, Ymax = 19.01 G's @ 0.0981 Seconds





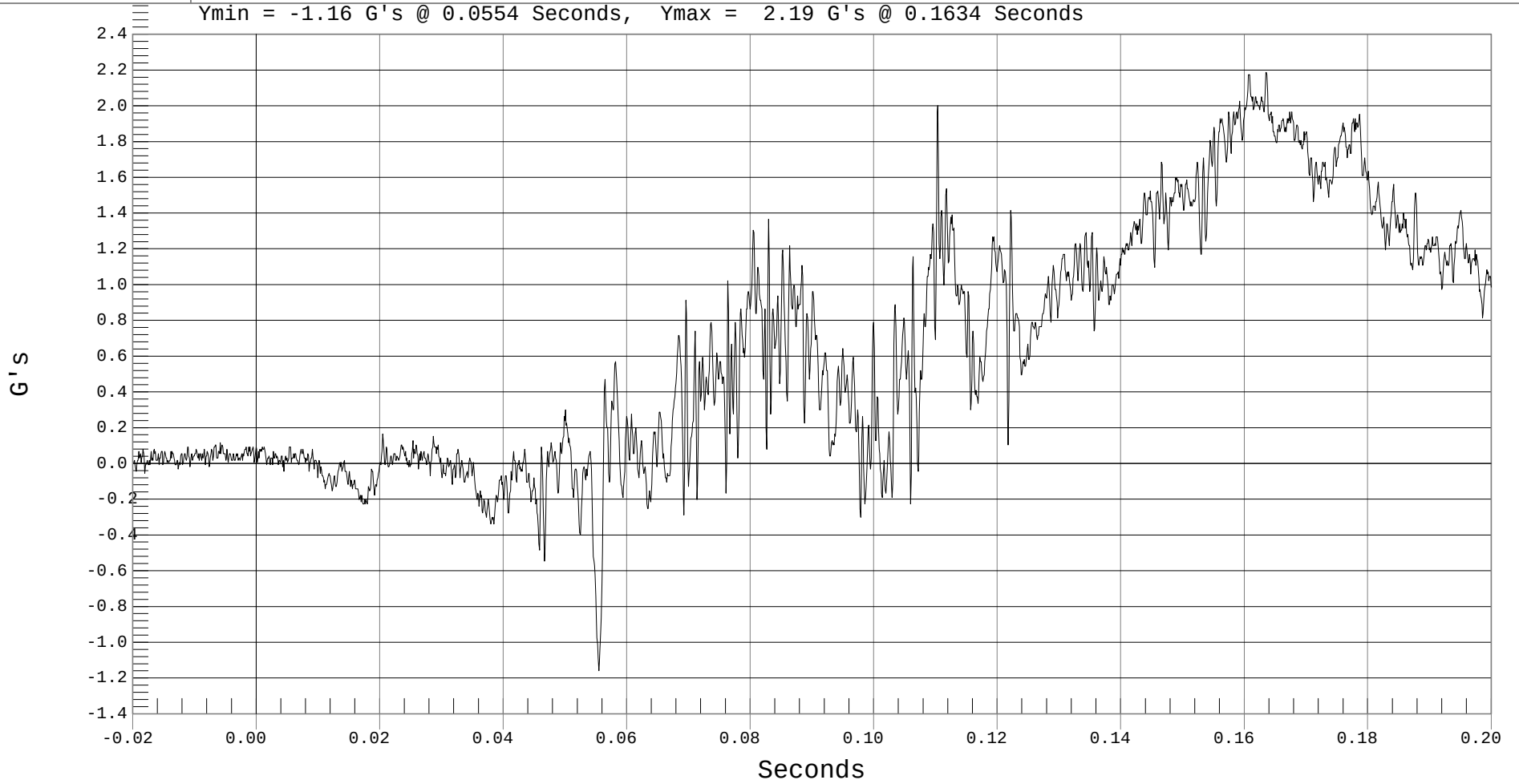
RIGHT REAR PELVIS Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 1000

— 1 RIGHT REAR CHILD PELVIS Z, B01085AT.A08

Ymin = -1.16 G's @ 0.0554 Seconds, Ymax = 2.19 G's @ 0.1634 Seconds





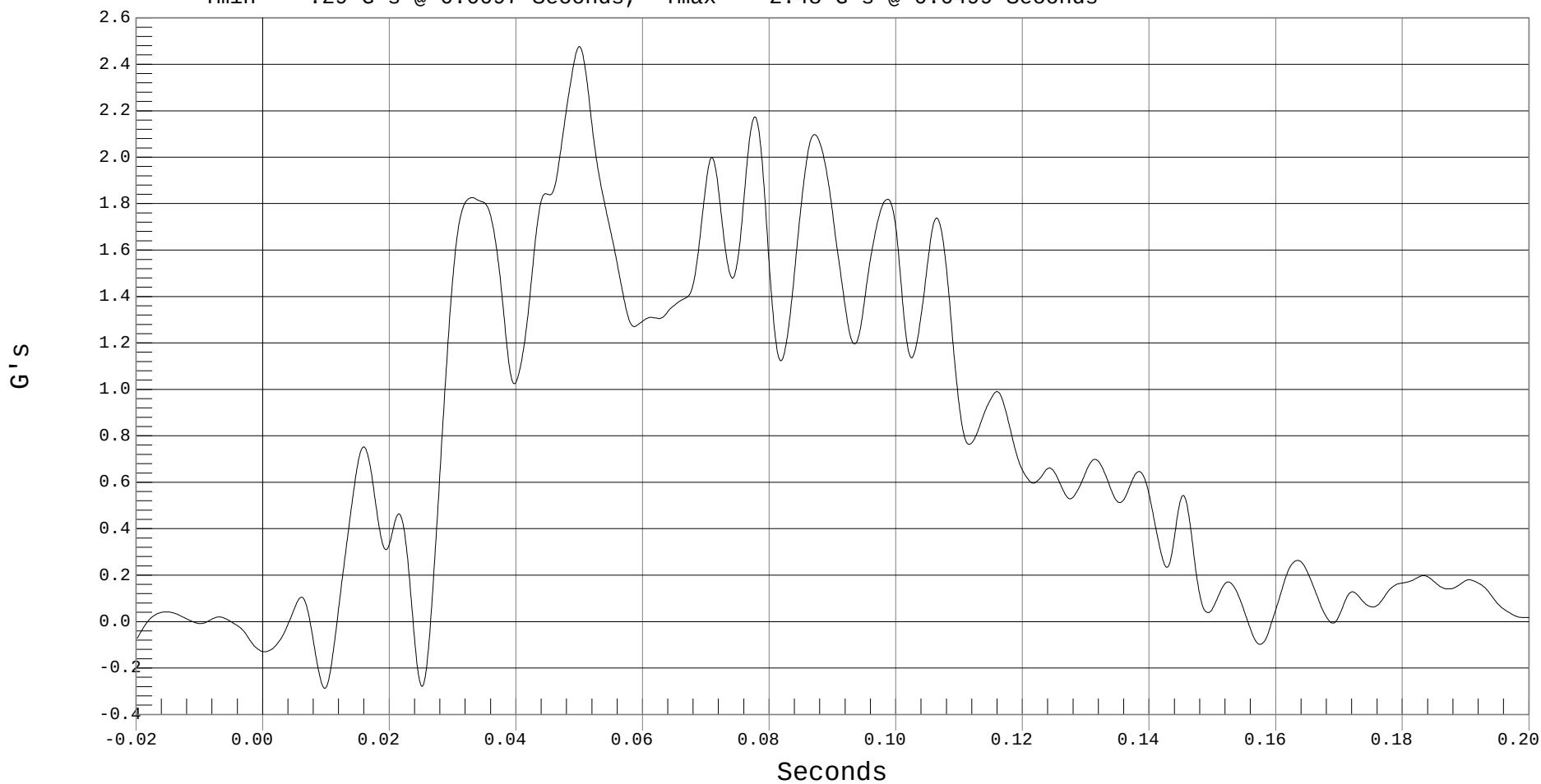
RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL X, B01085AF.A25

Ymin = -.29 G's @ 0.0097 Seconds, Ymax = 2.48 G's @ 0.0499 Seconds





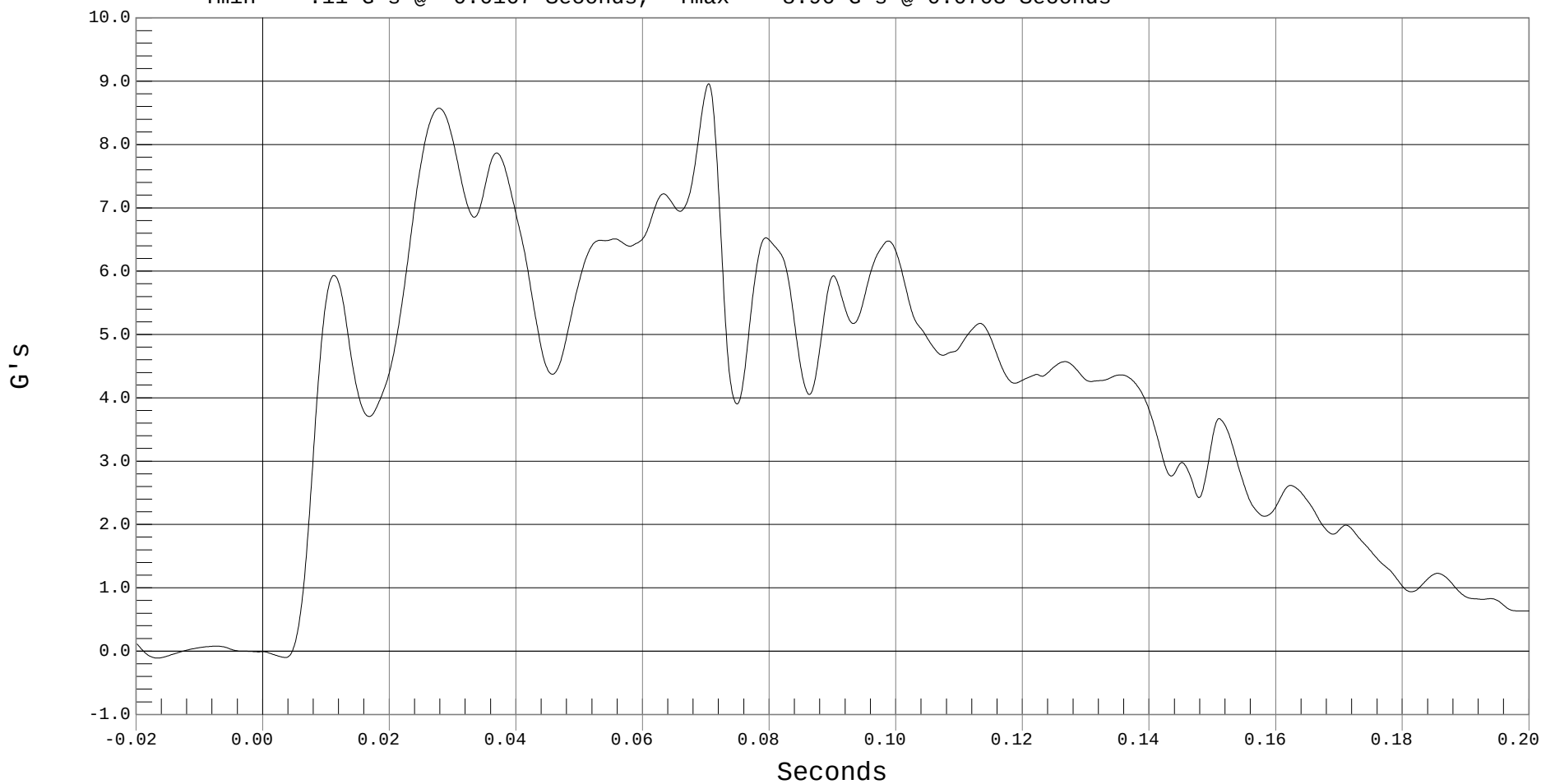
RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL Y, B01085AF.A26

Ymin = -.11 G's @ -0.0167 Seconds, Ymax = 8.96 G's @ 0.0703 Seconds





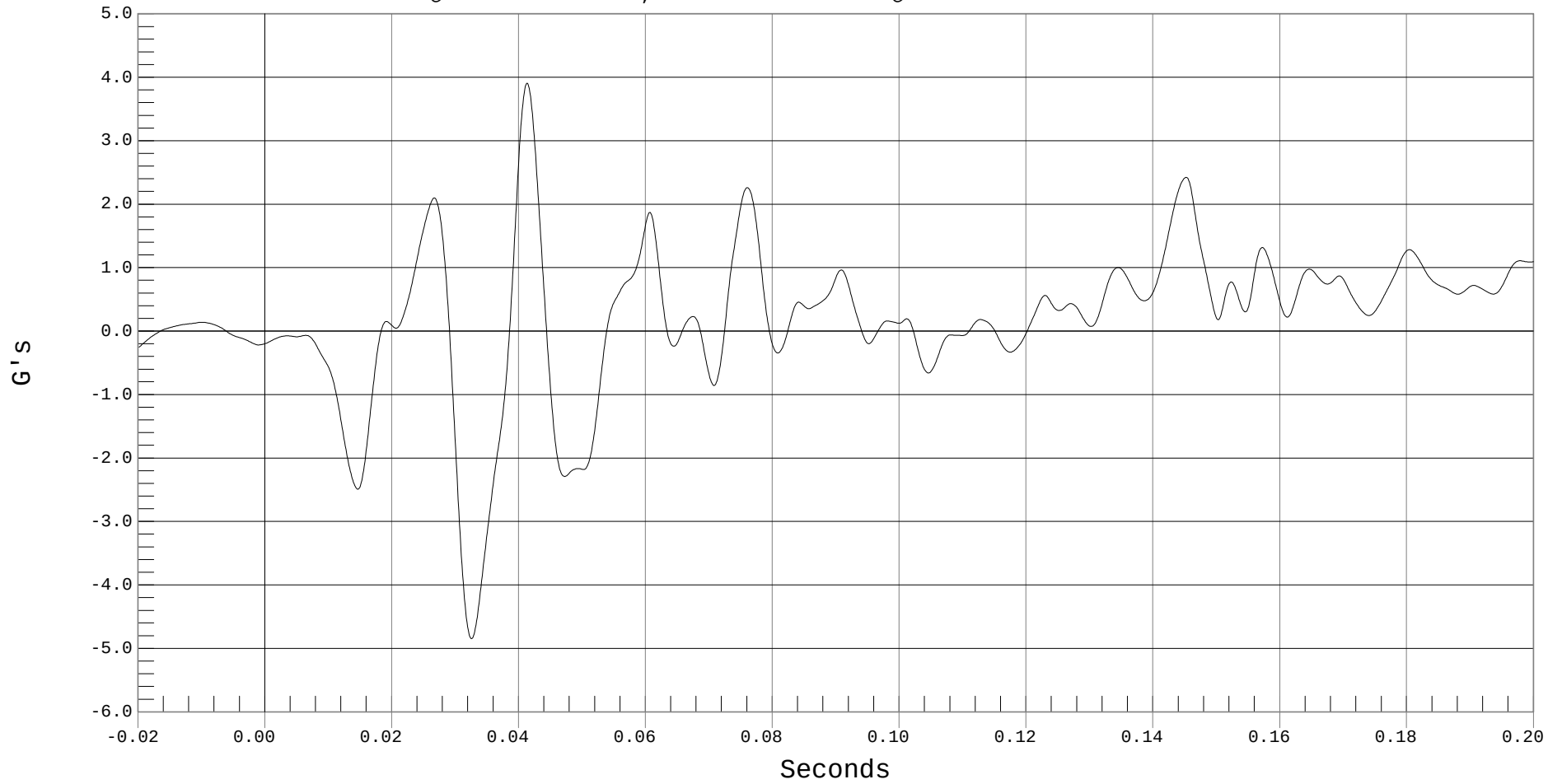
RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL Z, B01085AF.A27

Ymin = -4.85 G's @ 0.0325 Seconds, Ymax = 3.9 G's @ 0.0413 Seconds





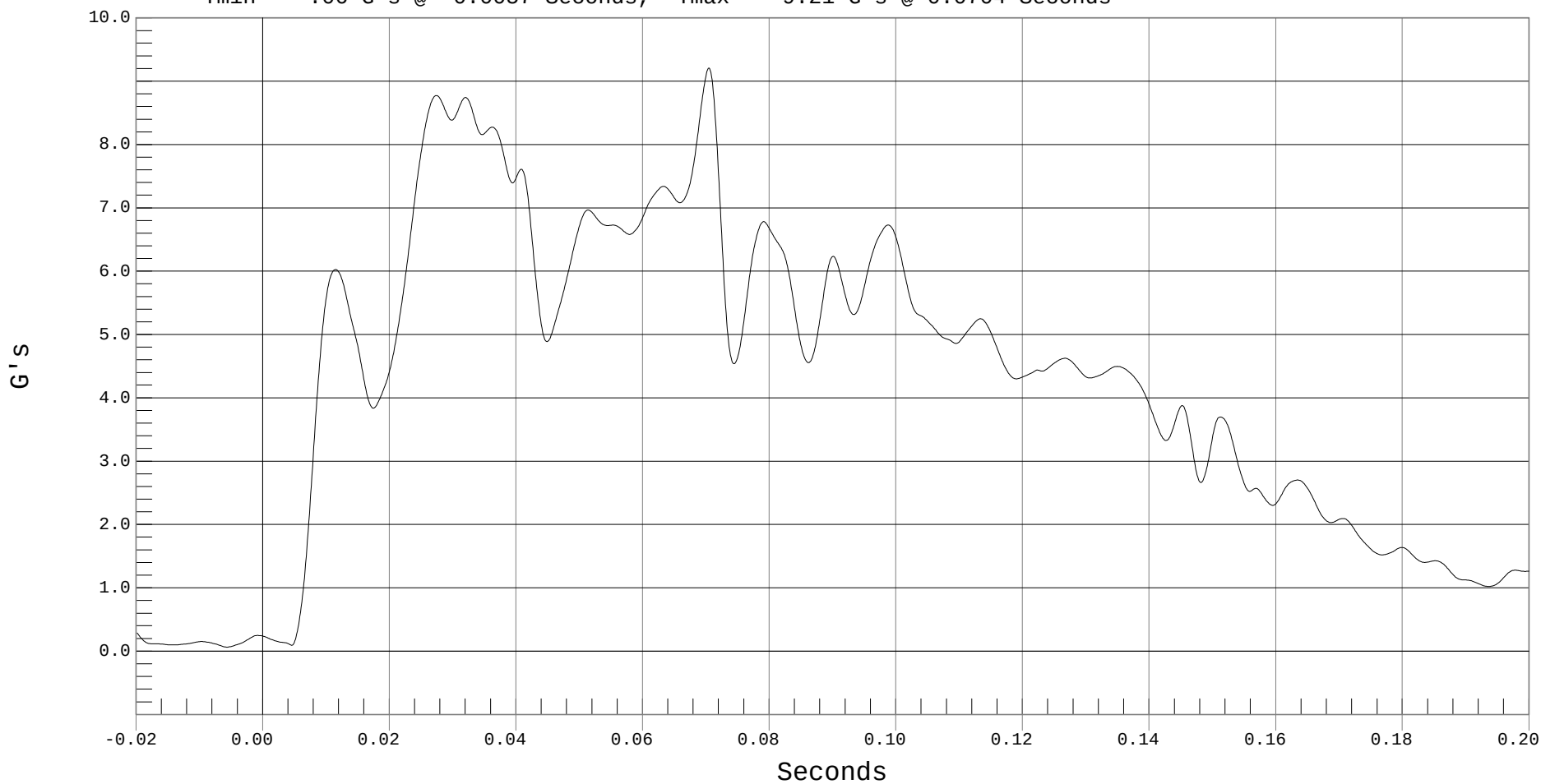
RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL RESULTANT ACCELERATION, B01085AV.A25

Ymin = .06 G's @ -0.0057 Seconds, Ymax = 9.21 G's @ 0.0704 Seconds





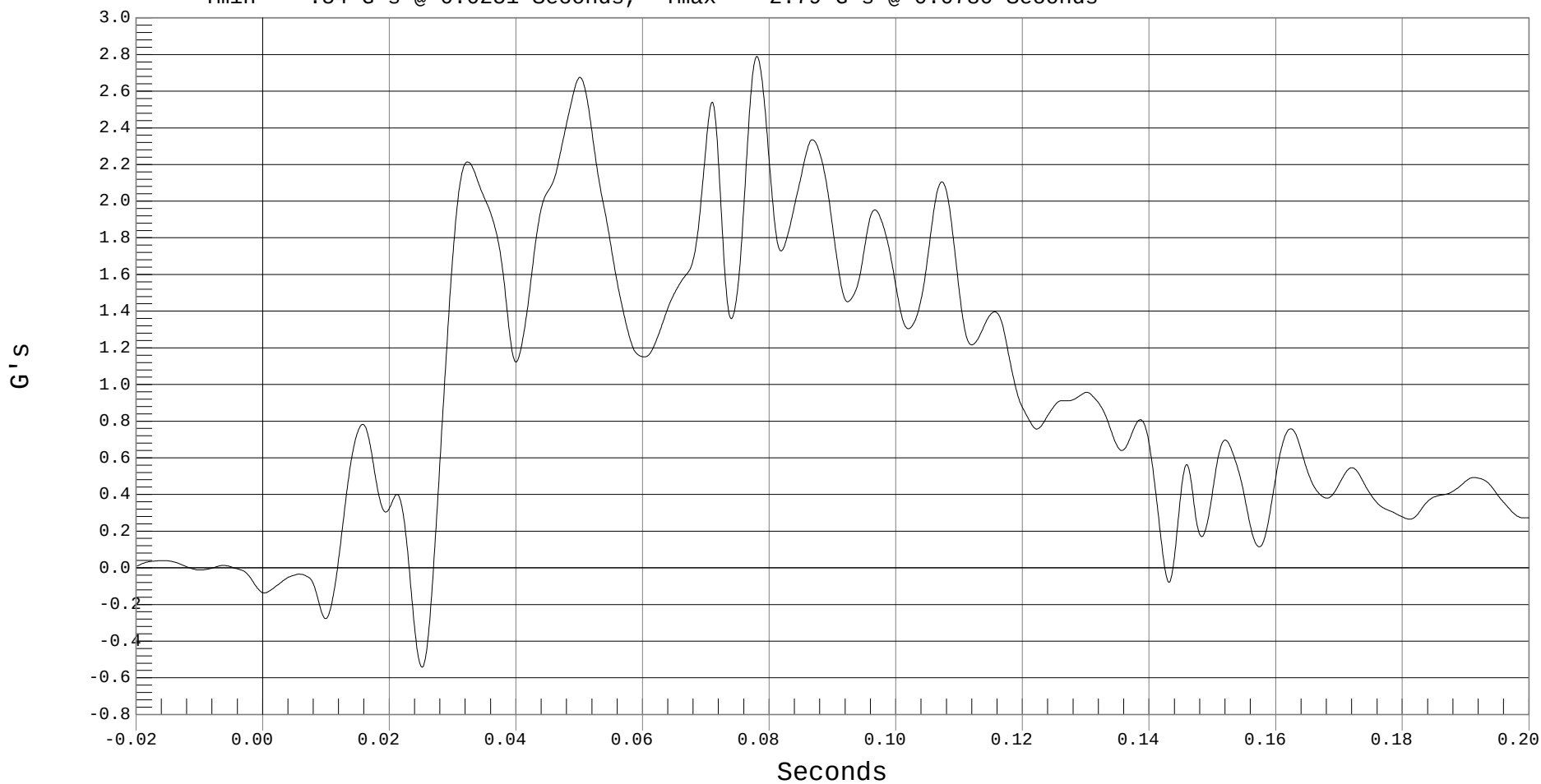
RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 RIGHT REAR SILL X, B01085AF.A28

Ymin = -.54 G's @ 0.0251 Seconds, Ymax = 2.79 G's @ 0.0780 Seconds





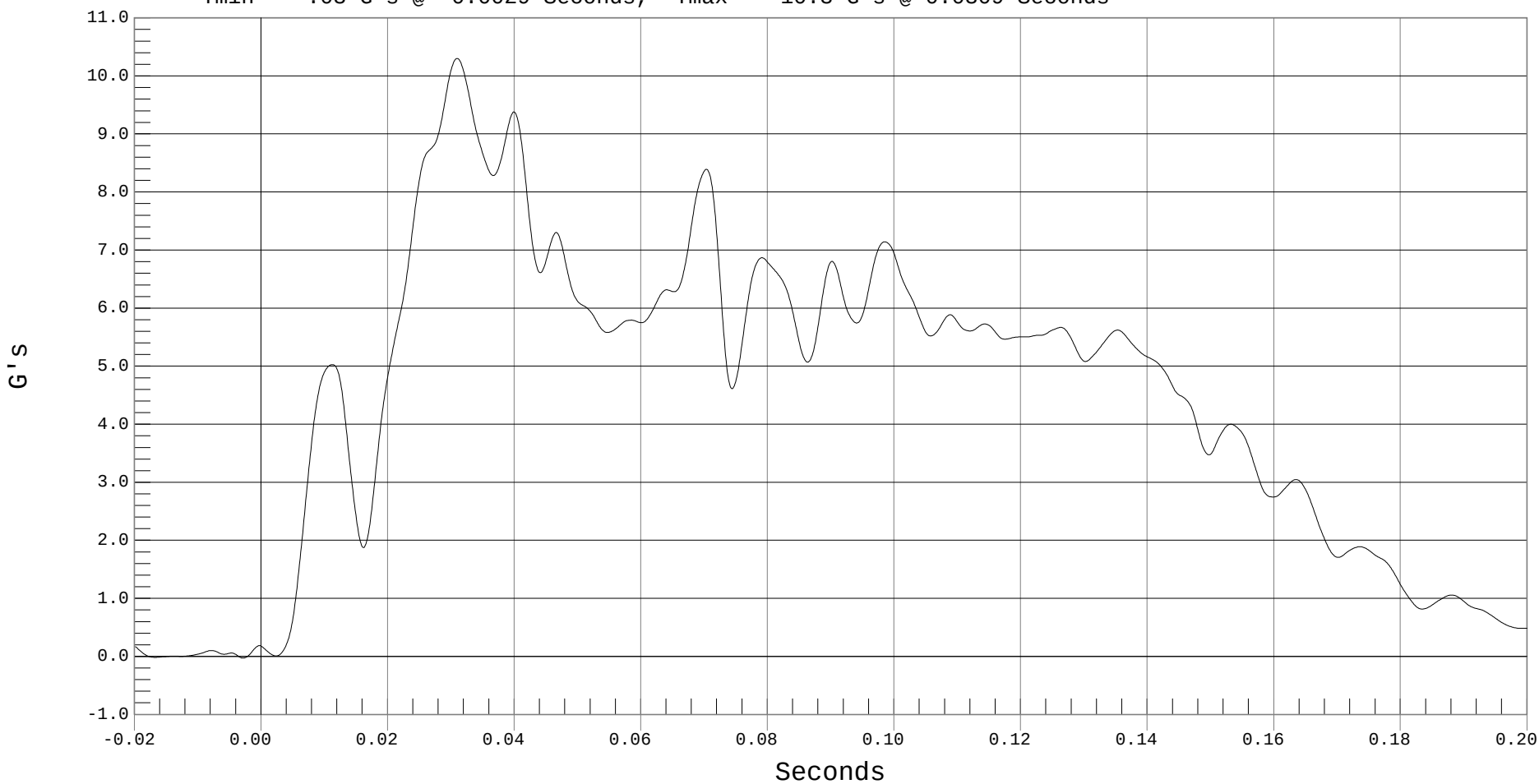
RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 RIGHT REAR SILL Y, B01085AF.A29

Ymin = -.03 G's @ -0.0029 Seconds, Ymax = 10.3 G's @ 0.0309 Seconds





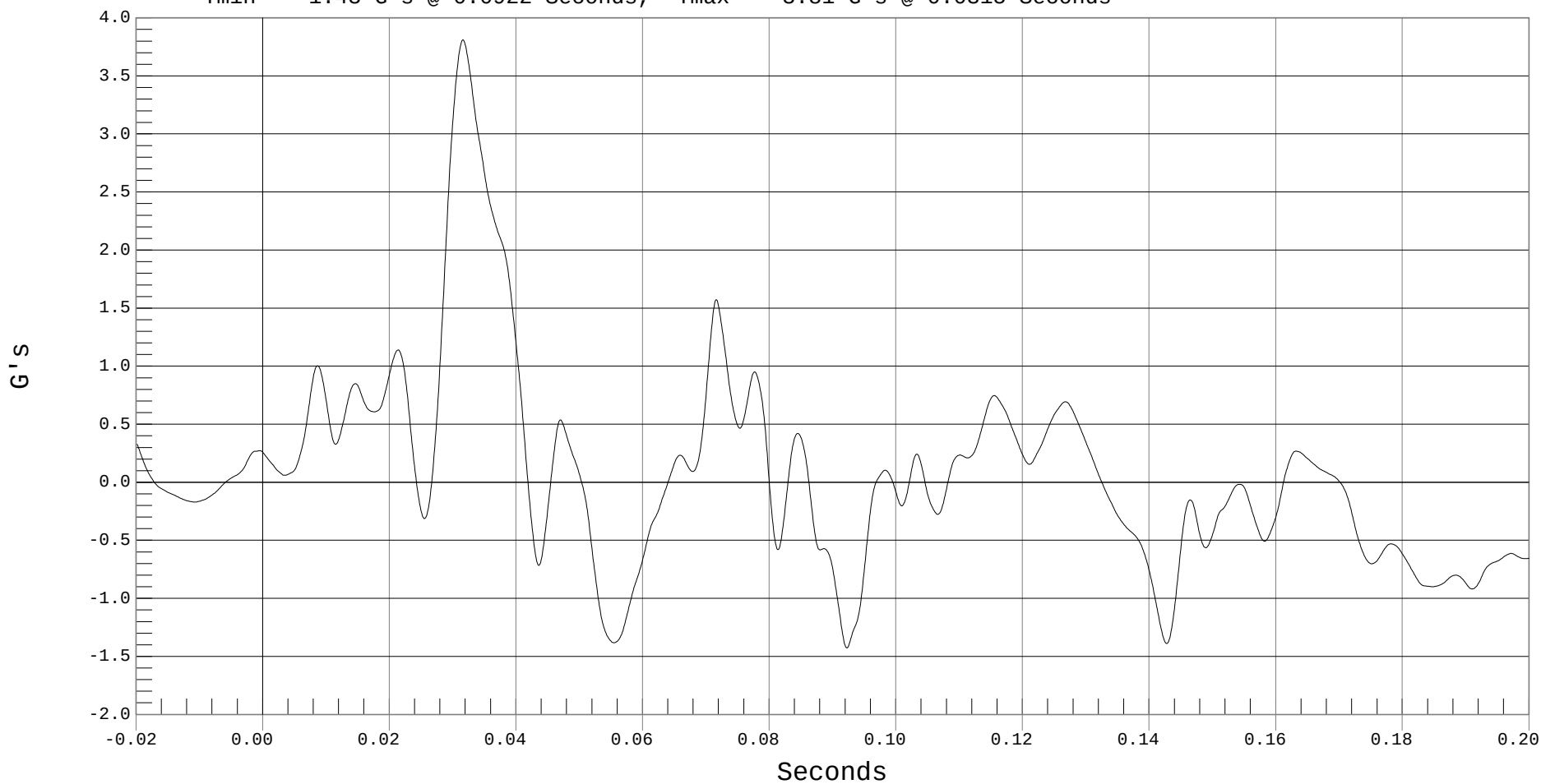
RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 RIGHT REAR SILL Z, B01085AF.A30

Ymin = -1.43 G's @ 0.0922 Seconds, Ymax = 3.81 G's @ 0.0315 Seconds





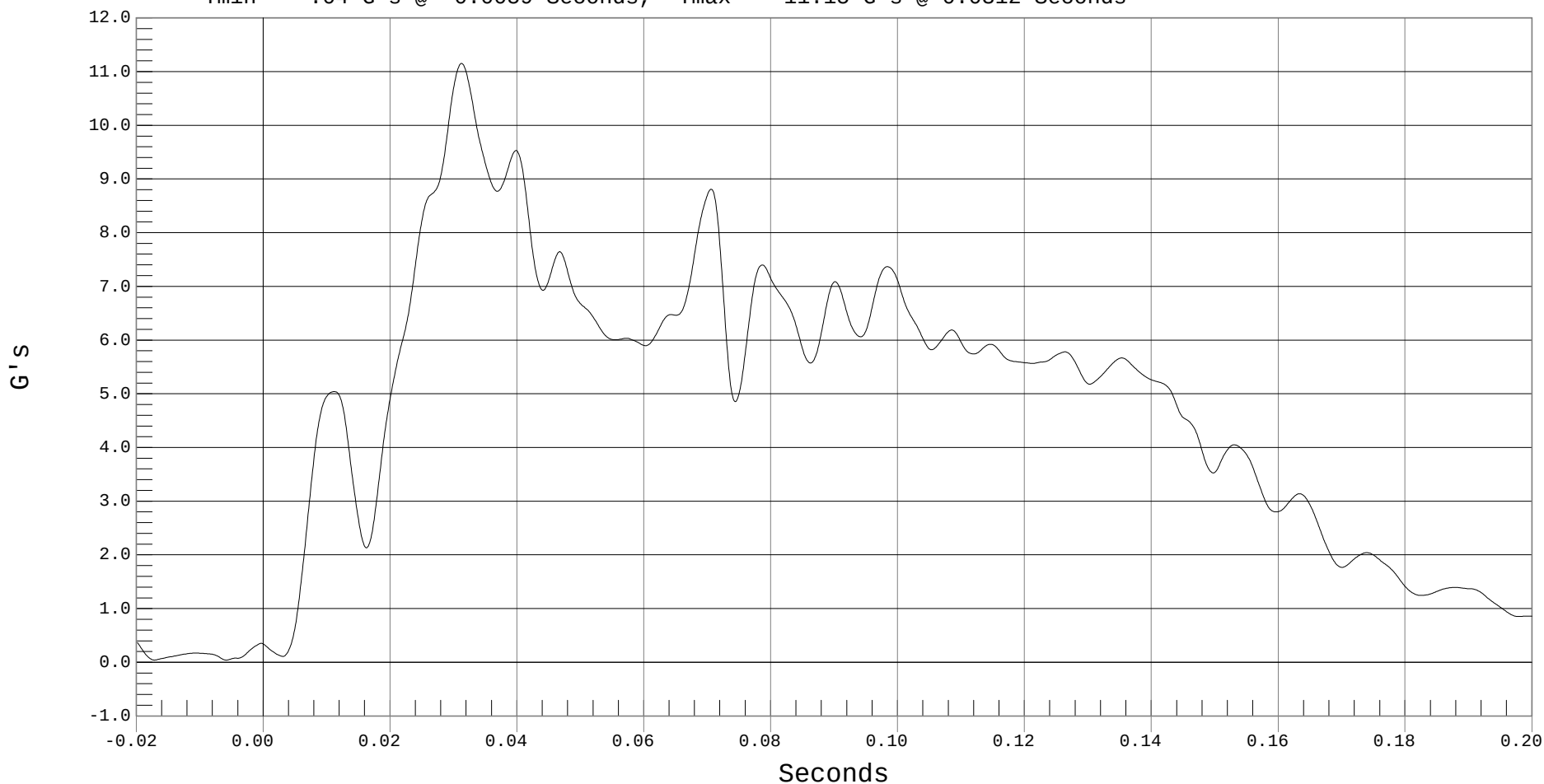
RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 RIGHT REAR SILL RESULTANT ACCELERATION, B01085AV.A28

Ymin = .04 G's @ -0.0059 Seconds, Ymax = 11.15 G's @ 0.0312 Seconds





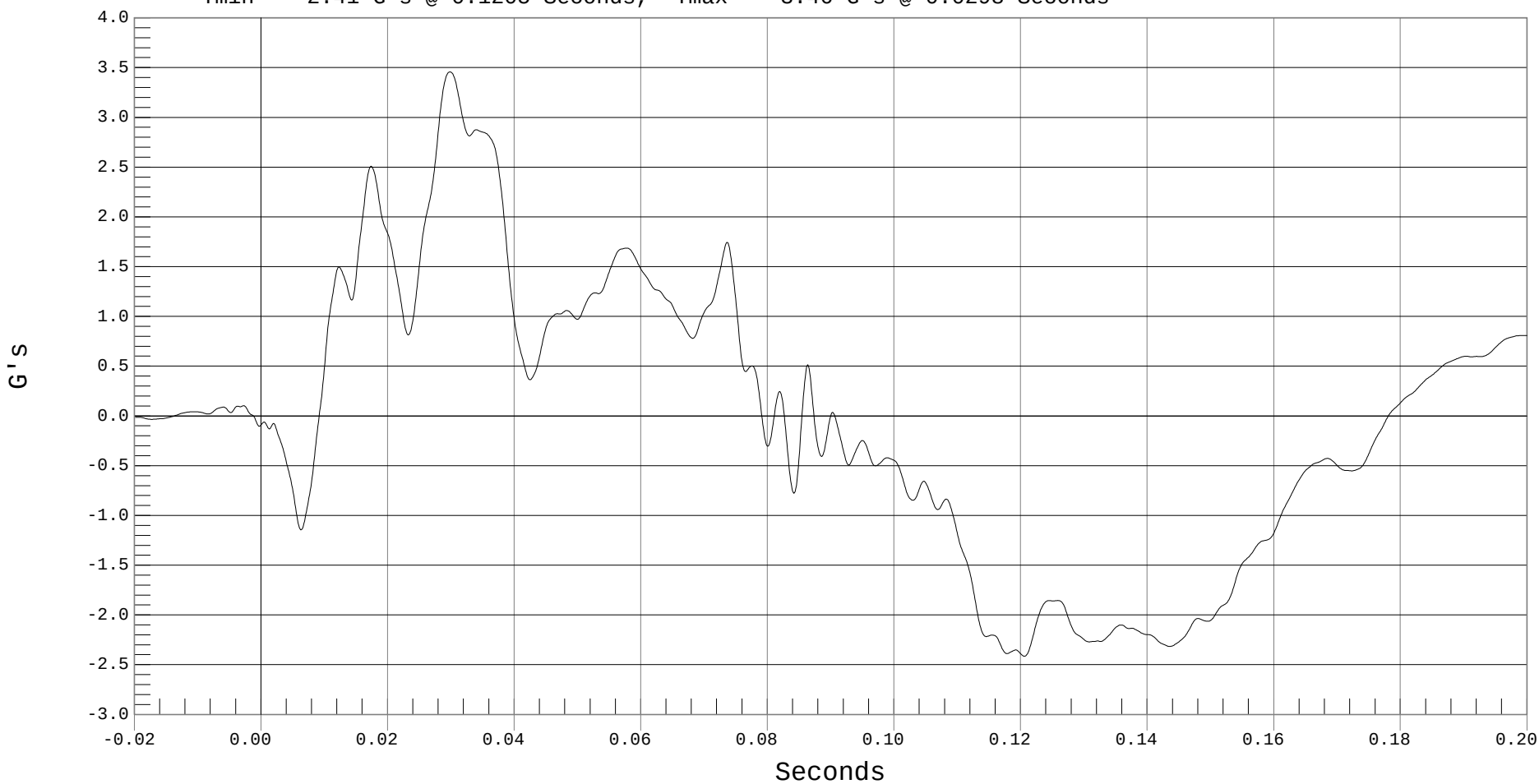
REAR FLOORPAN ABOVE AXLE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE X, B01085AF.A34

Ymin = -2.41 G's @ 0.1205 Seconds, Ymax = 3.46 G's @ 0.0298 Seconds





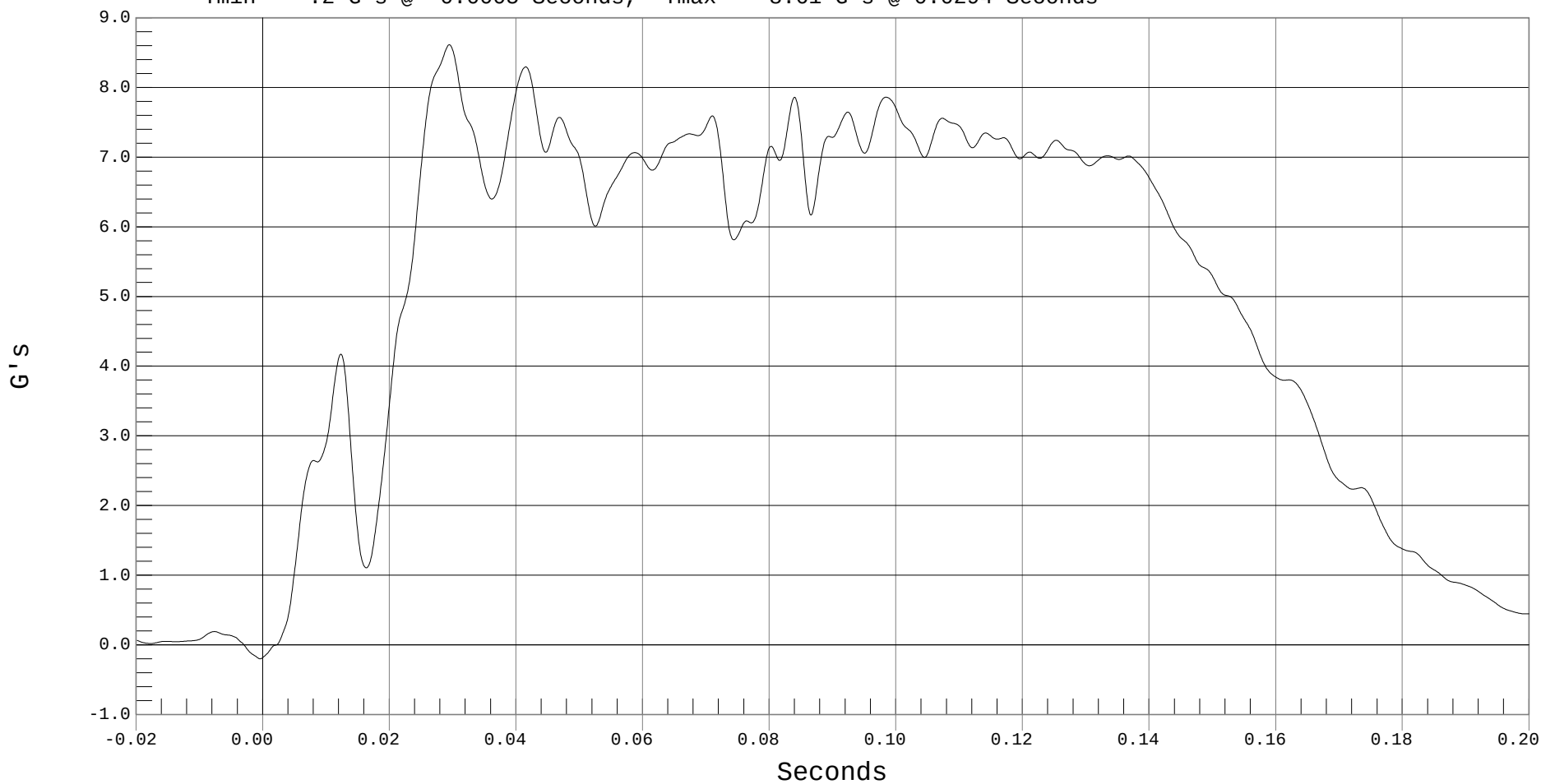
REAR FLOORPAN ABOVE AXLE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE Y, B01085AF.A35

Ymin = -.2 G's @ -0.0005 Seconds, Ymax = 8.61 G's @ 0.0294 Seconds





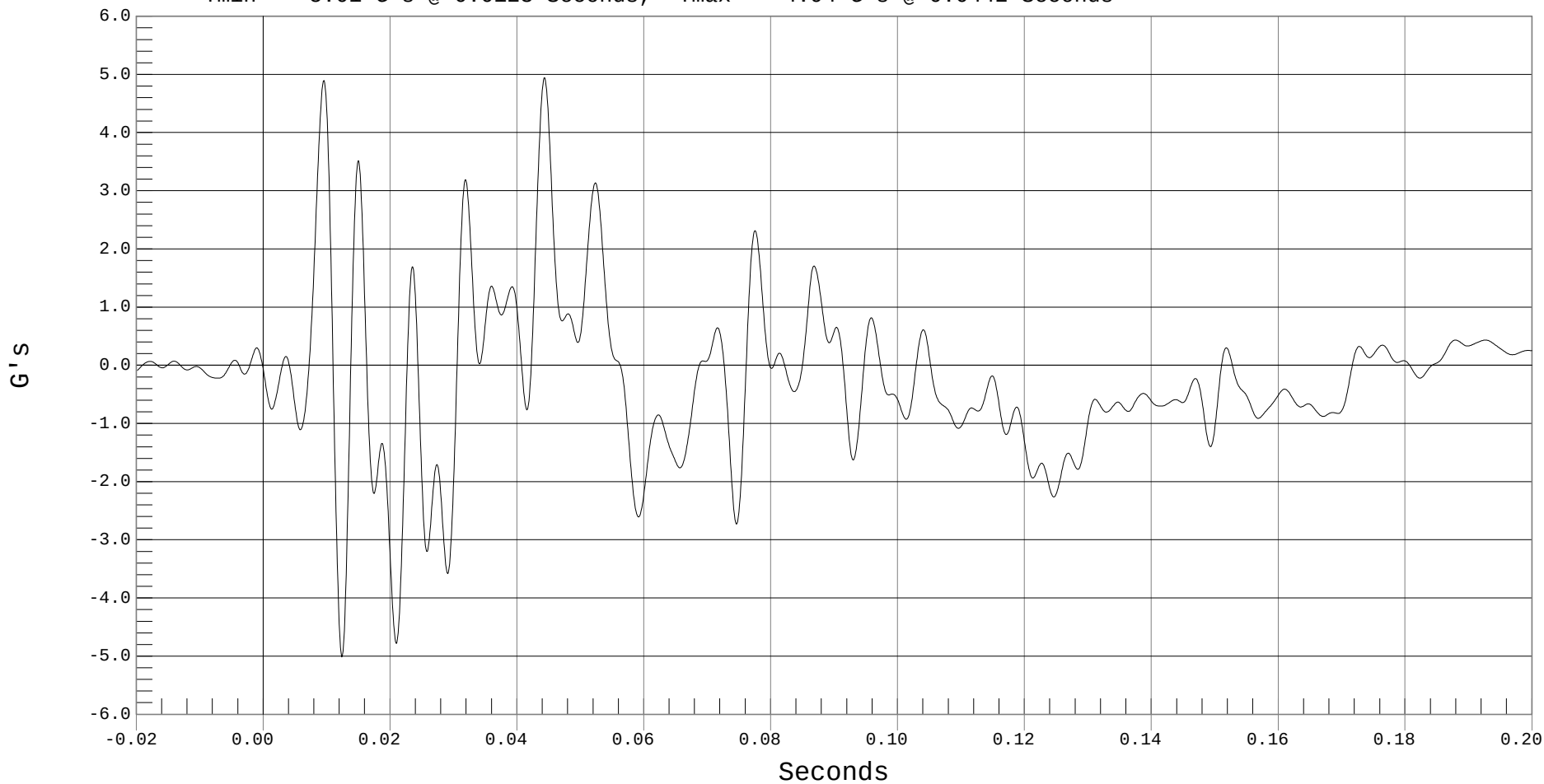
REAR FLOORPAN ABOVE AXLE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE Z, B01085AF.A36

Ymin = -5.01 G's @ 0.0123 Seconds, Ymax = 4.94 G's @ 0.0442 Seconds





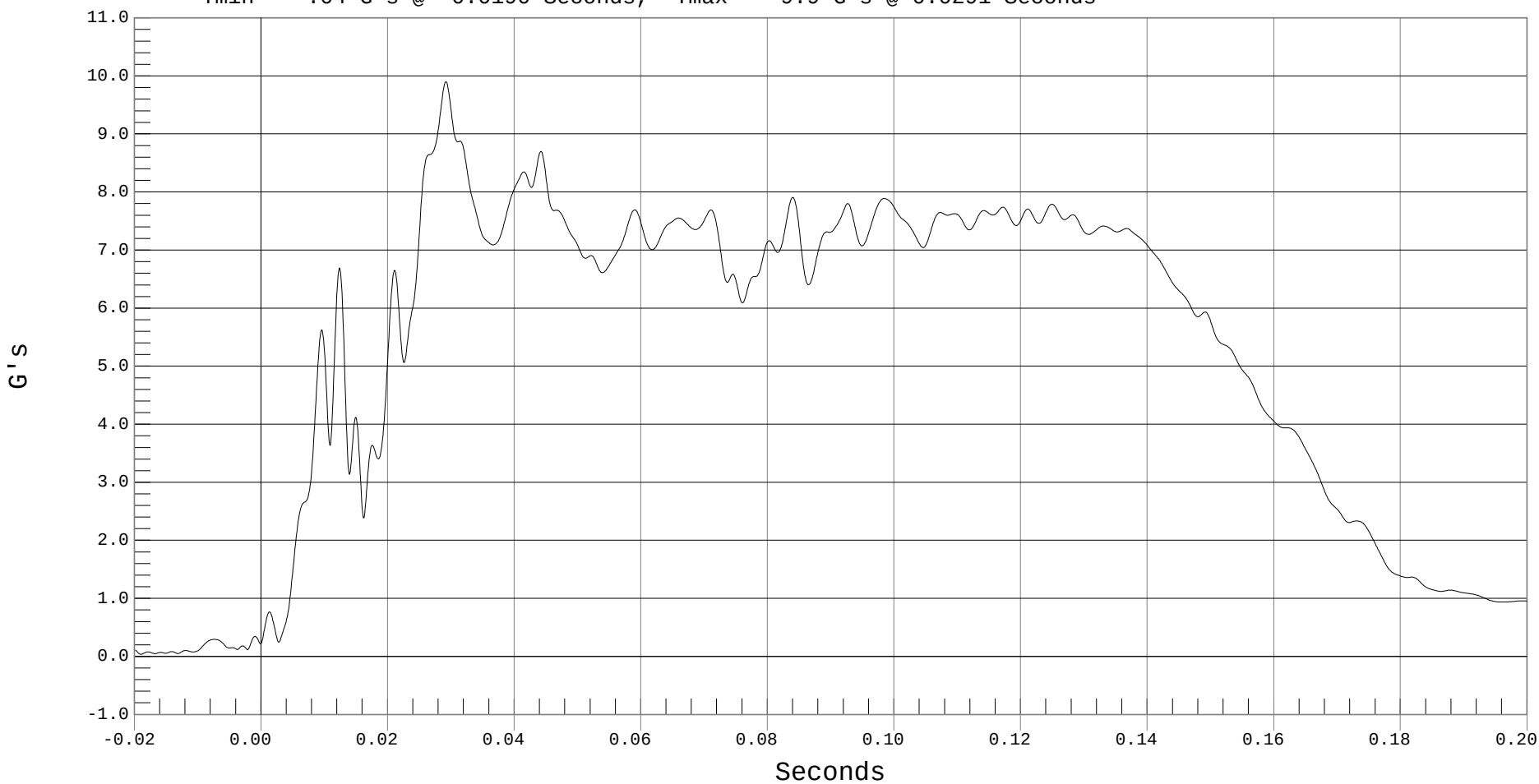
REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE ACCELERATION, B01085AV.A34

Ymin = .04 G's @ -0.0190 Seconds, Ymax = 9.9 G's @ 0.0291 Seconds





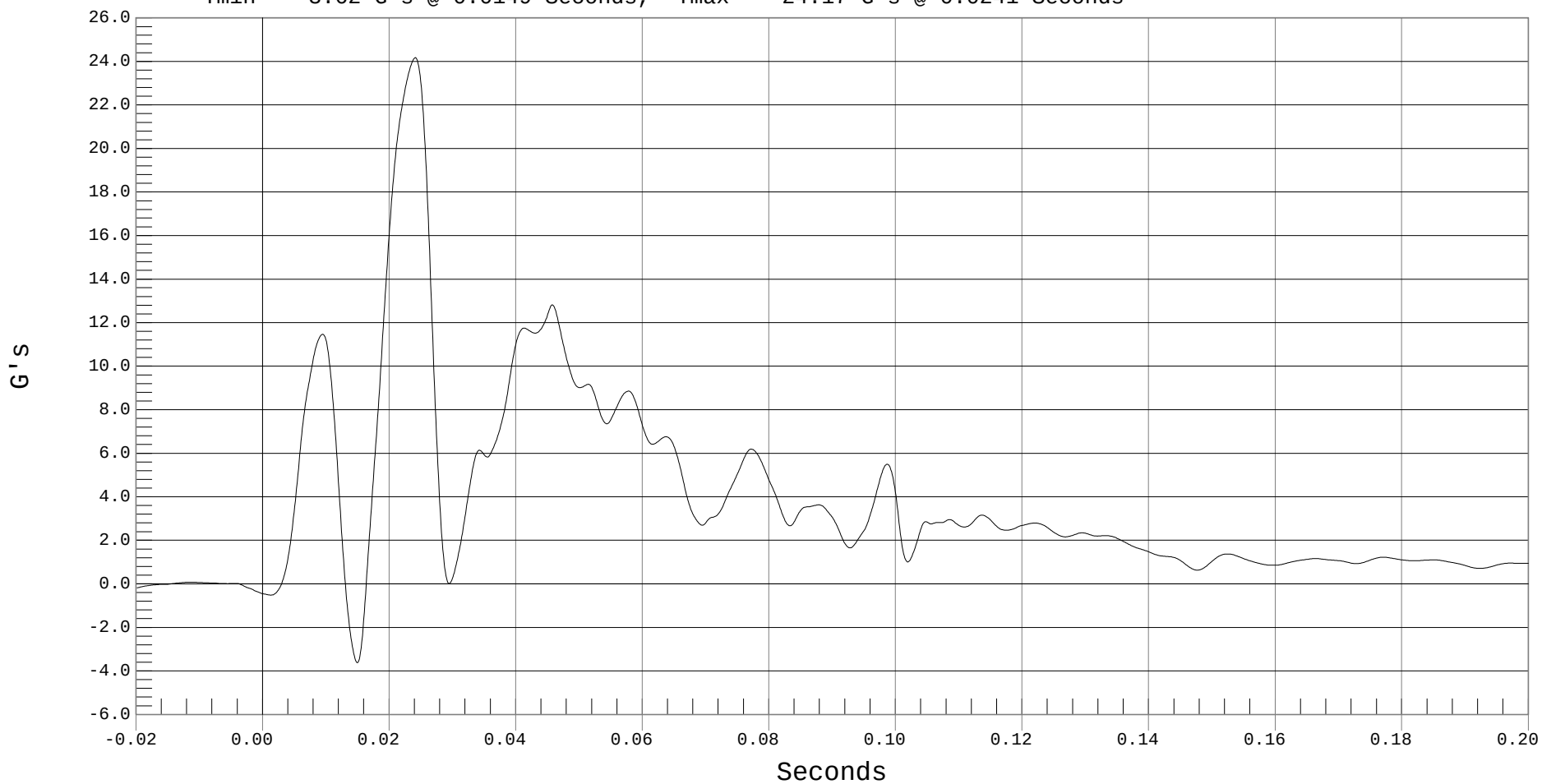
LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LEFT FRONT SILL Y, B01085AF.A31

Ymin = -3.62 G's @ 0.0149 Seconds, Ymax = 24.17 G's @ 0.0241 Seconds





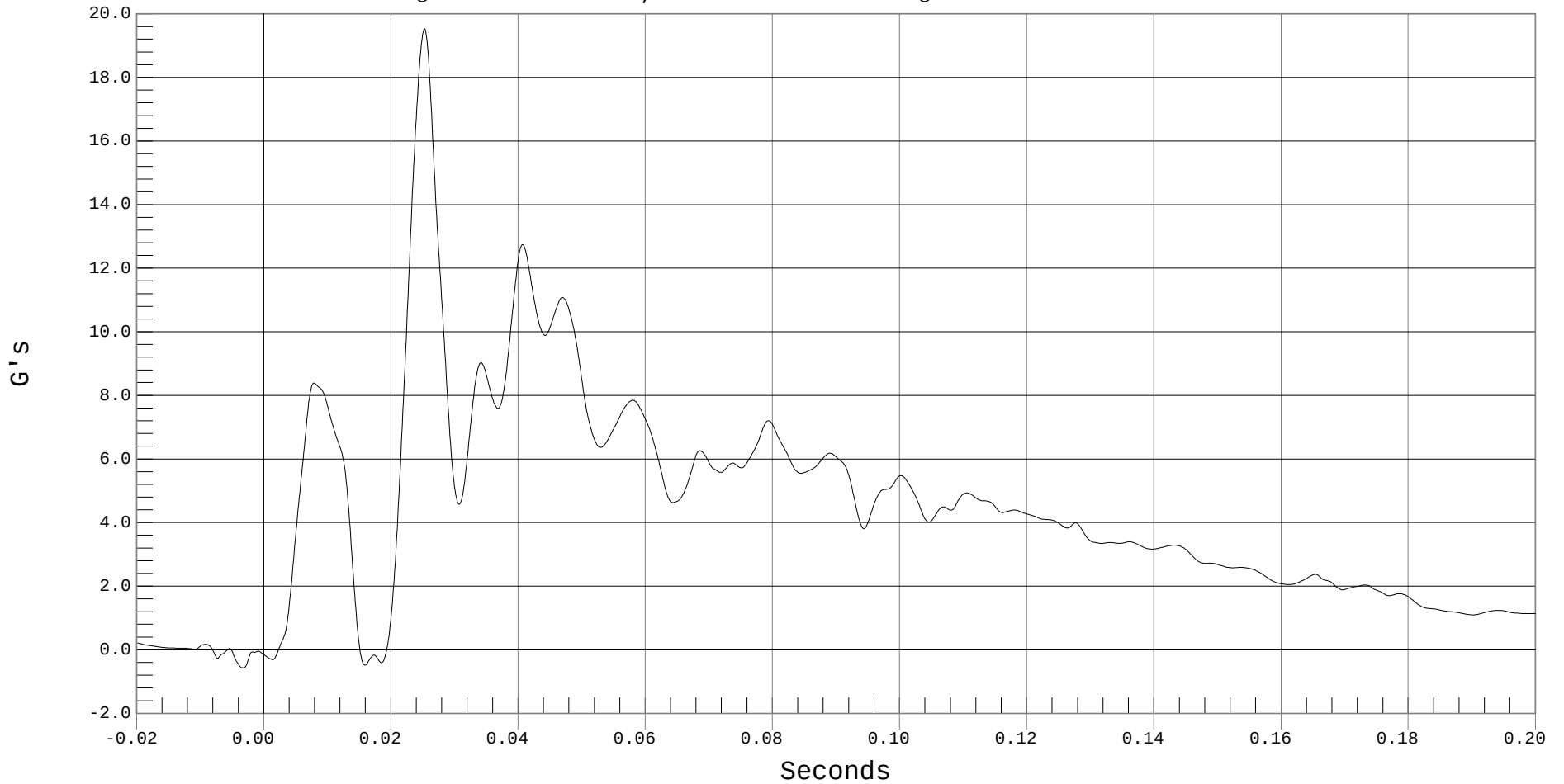
LEFT SIDE SILL AT REAR SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LEFT REAR SILL Y, B01085AF.A33

Ymin = -.57 G's @ -0.0035 Seconds, Ymax = 19.54 G's @ 0.0252 Seconds





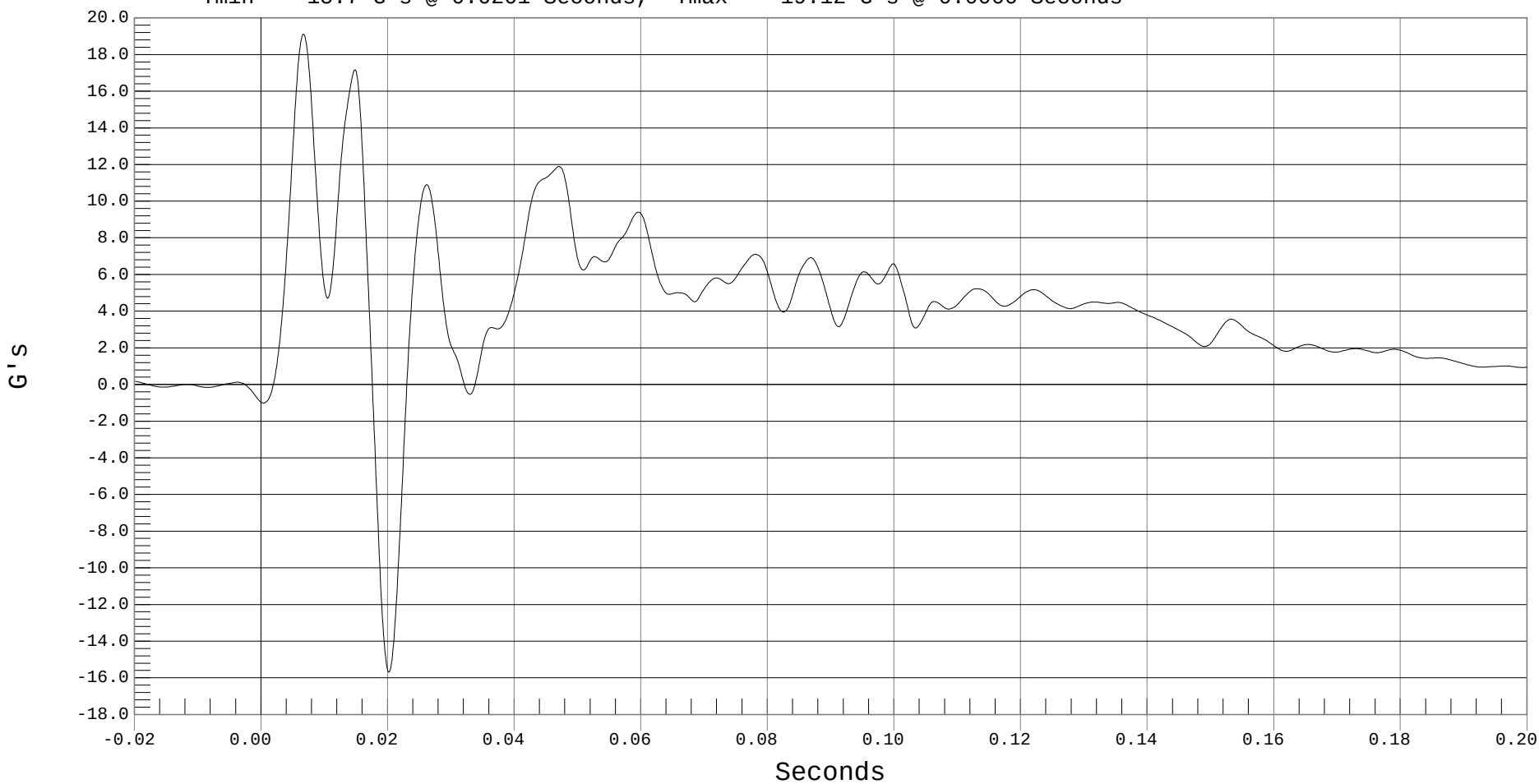
LEFT LOWER A-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LEFT LOWER A-POST Y, B01085AF.A38

Ymin = -15.7 G's @ 0.0201 Seconds, Ymax = 19.12 G's @ 0.0066 Seconds





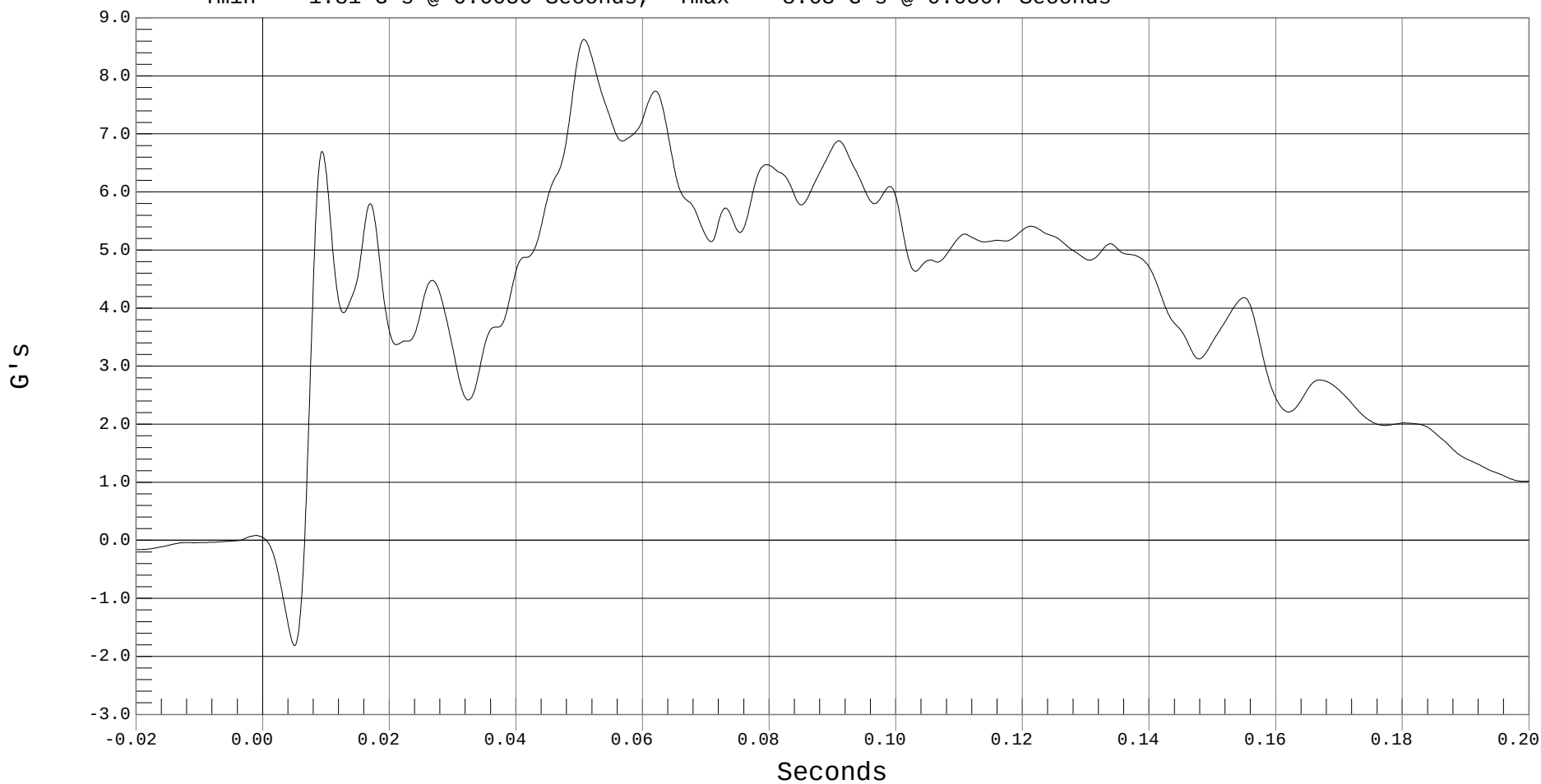
LEFT MID A-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LEFT MID A-POST Y, B01085AF.A37

Ymin = -1.81 G's @ 0.0050 Seconds, Ymax = 8.63 G's @ 0.0507 Seconds





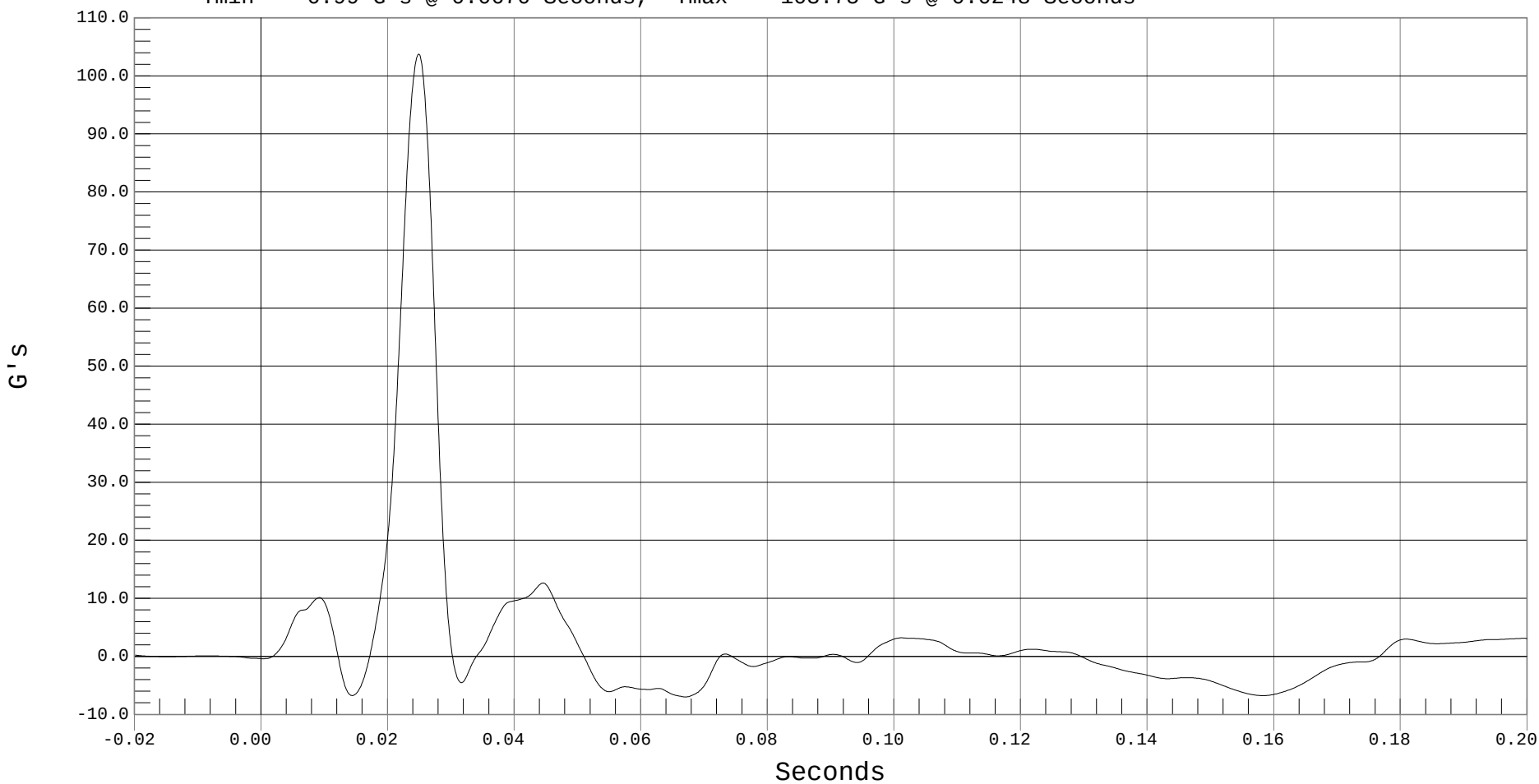
LEFT LOWER B-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LOWER B-POST Y, B01085AF.A39

Ymin = -6.99 G's @ 0.0670 Seconds, Ymax = 103.75 G's @ 0.0248 Seconds





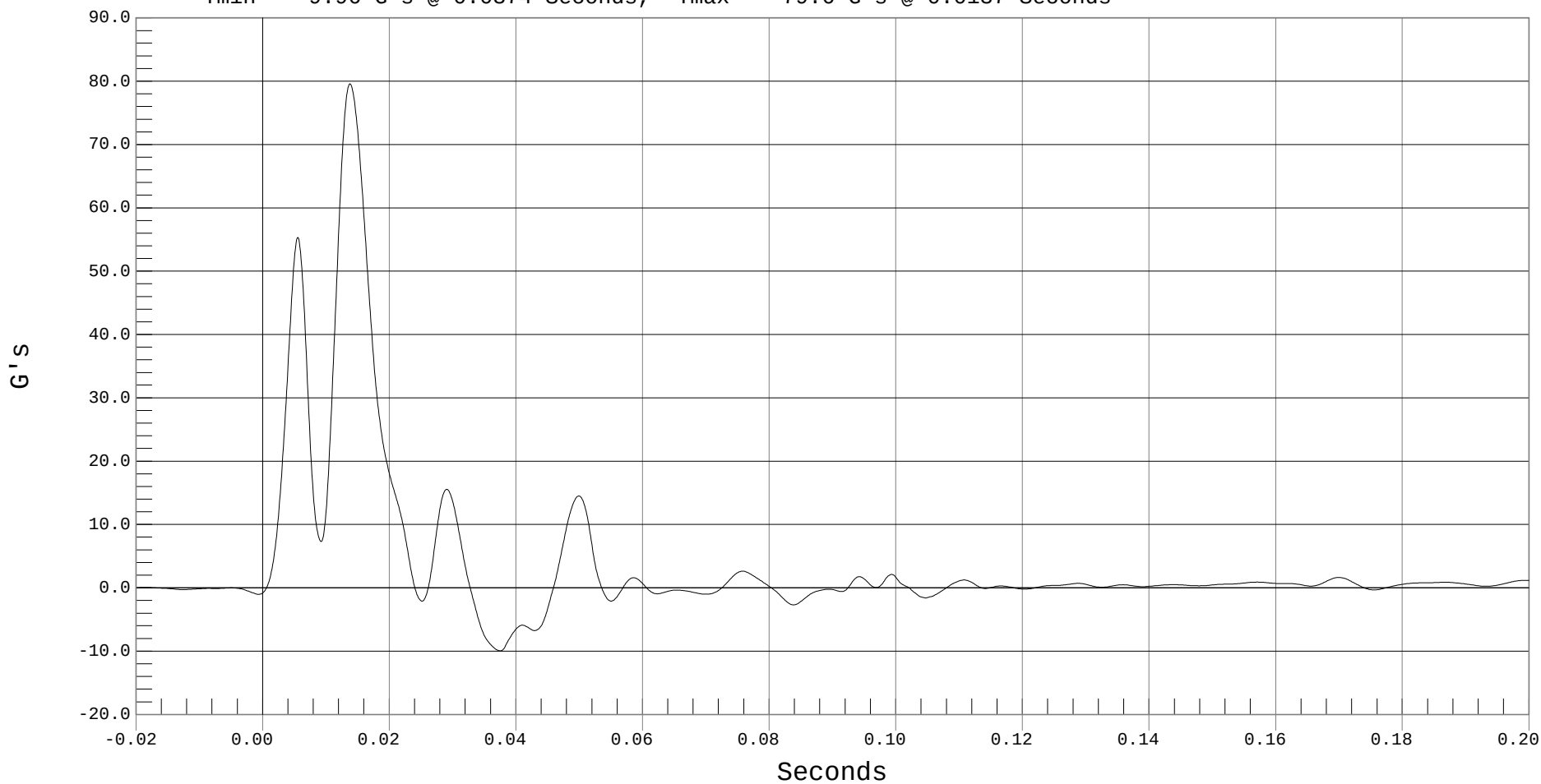
LEFT MID B-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LEFT MID B-POST Y, B01085AF.A40

Ymin = -9.96 G's @ 0.0374 Seconds, Ymax = 79.6 G's @ 0.0137 Seconds





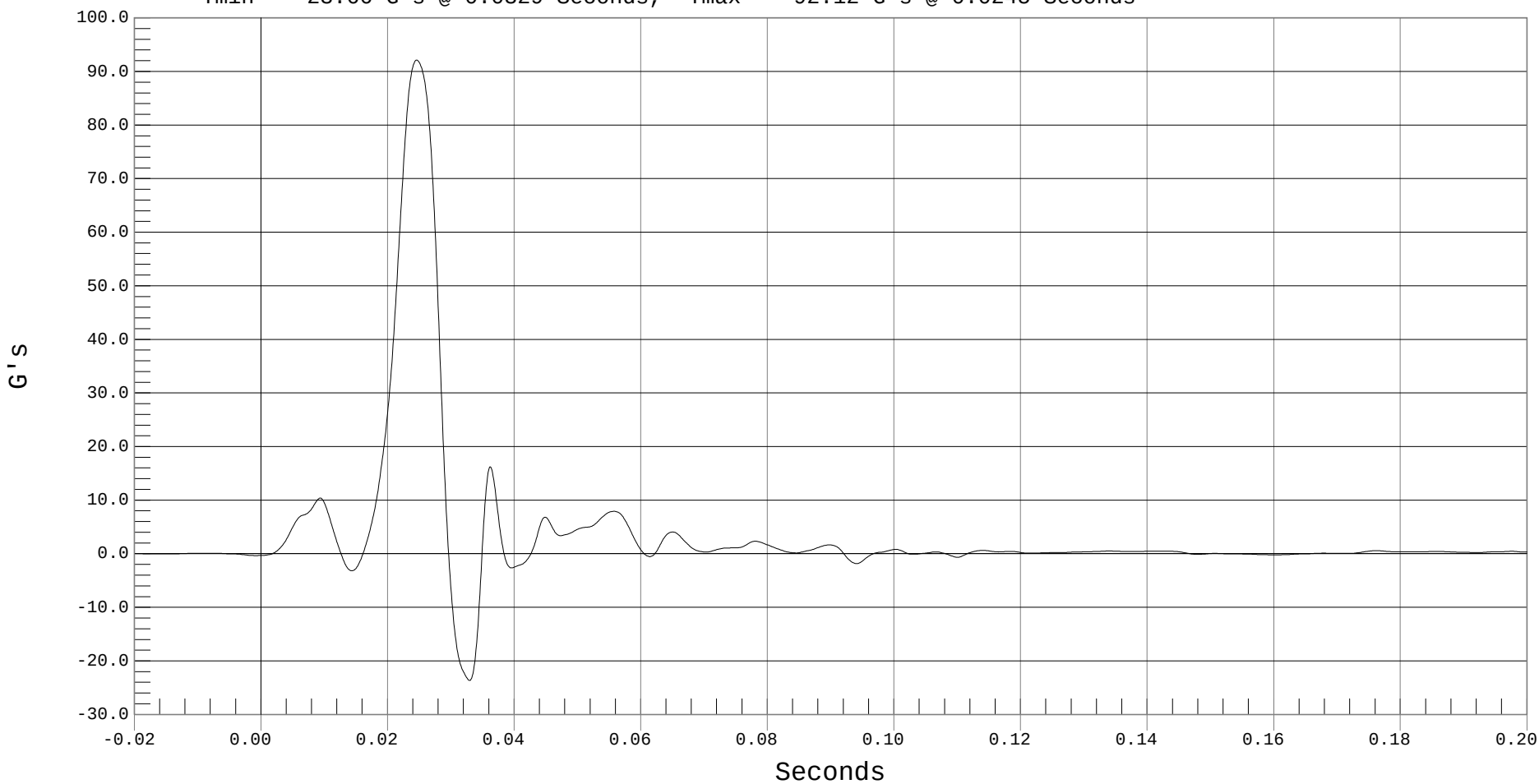
LEFT DRIVER SEAT TRACK Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 DRIVER LEFT SEAT TRACK Y, B01085AF.A42

Ymin = -23.66 G's @ 0.0329 Seconds, Ymax = 92.12 G's @ 0.0245 Seconds





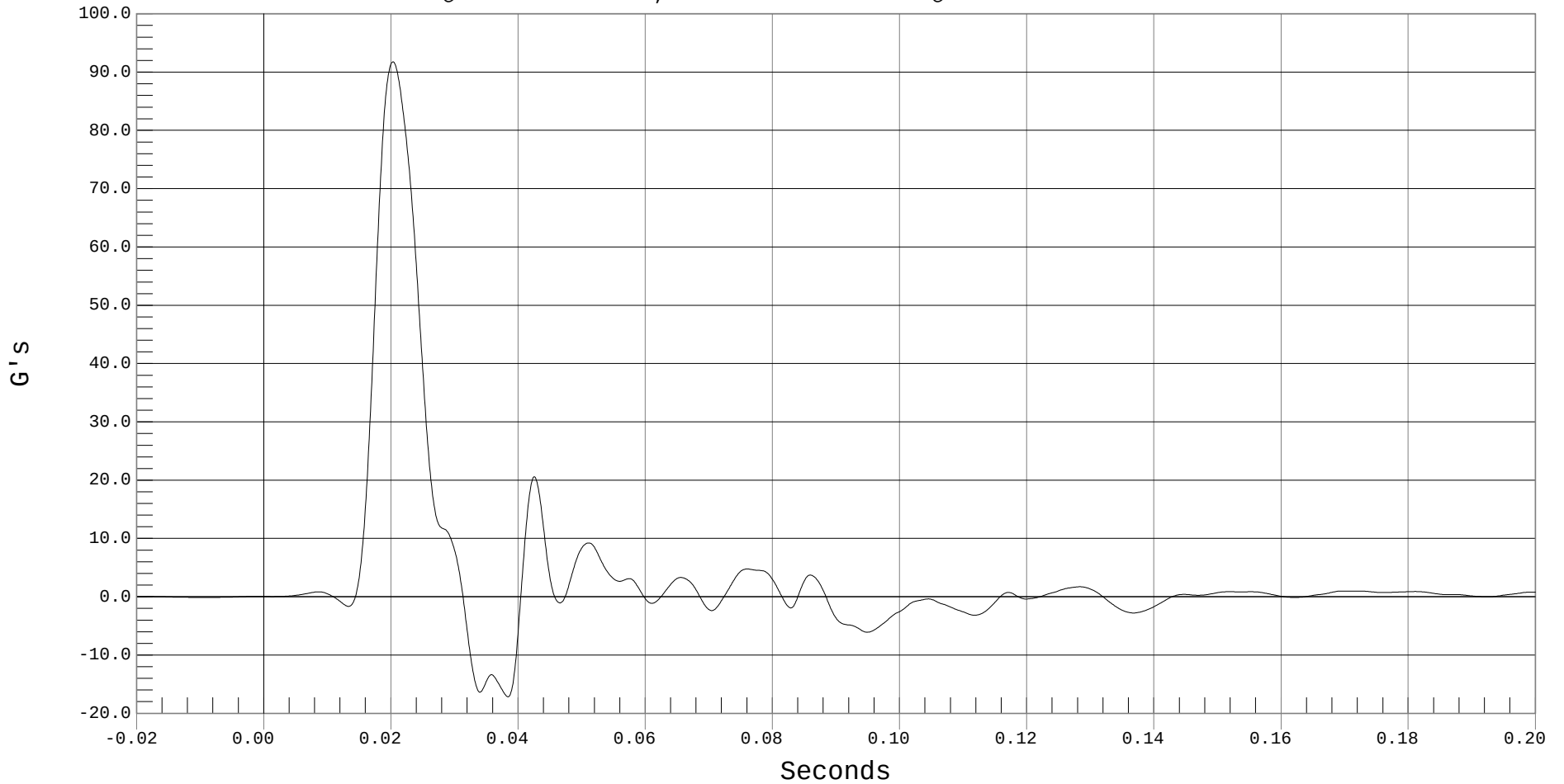
DRIVER LEFT SEAT FRAME Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 DRIVER LEFT SEAT FRAME Y, B01085AF.A55

Ymin = -17.17 G's @ 0.0383 Seconds, Ymax = 91.76 G's @ 0.0202 Seconds





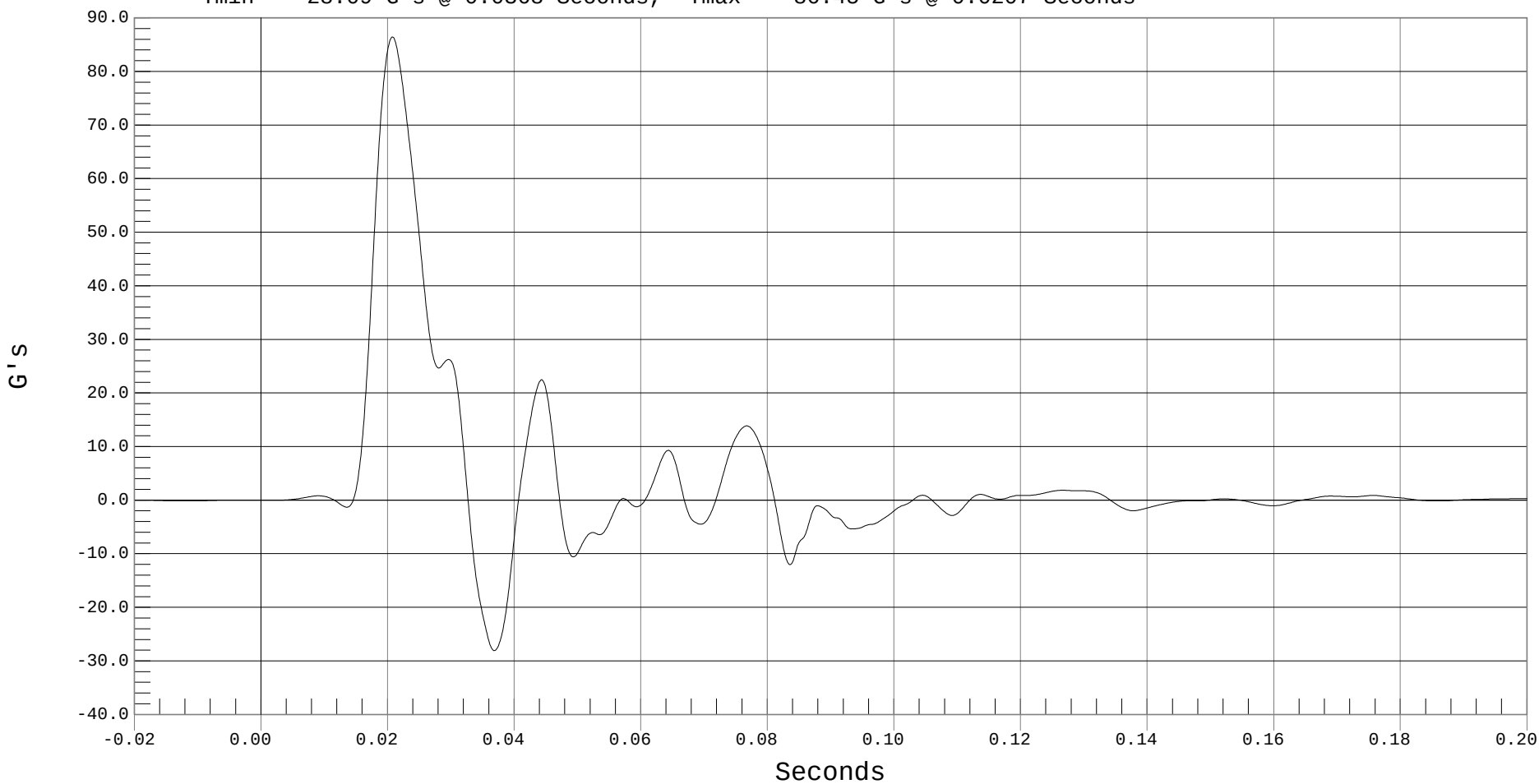
DRIVER RIGHT SEAT FRAME Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 DRIVER RIGHT SEAT FRAME Y, B01085AF.A61

Ymin = -28.09 G's @ 0.0368 Seconds, Ymax = 86.45 G's @ 0.0207 Seconds





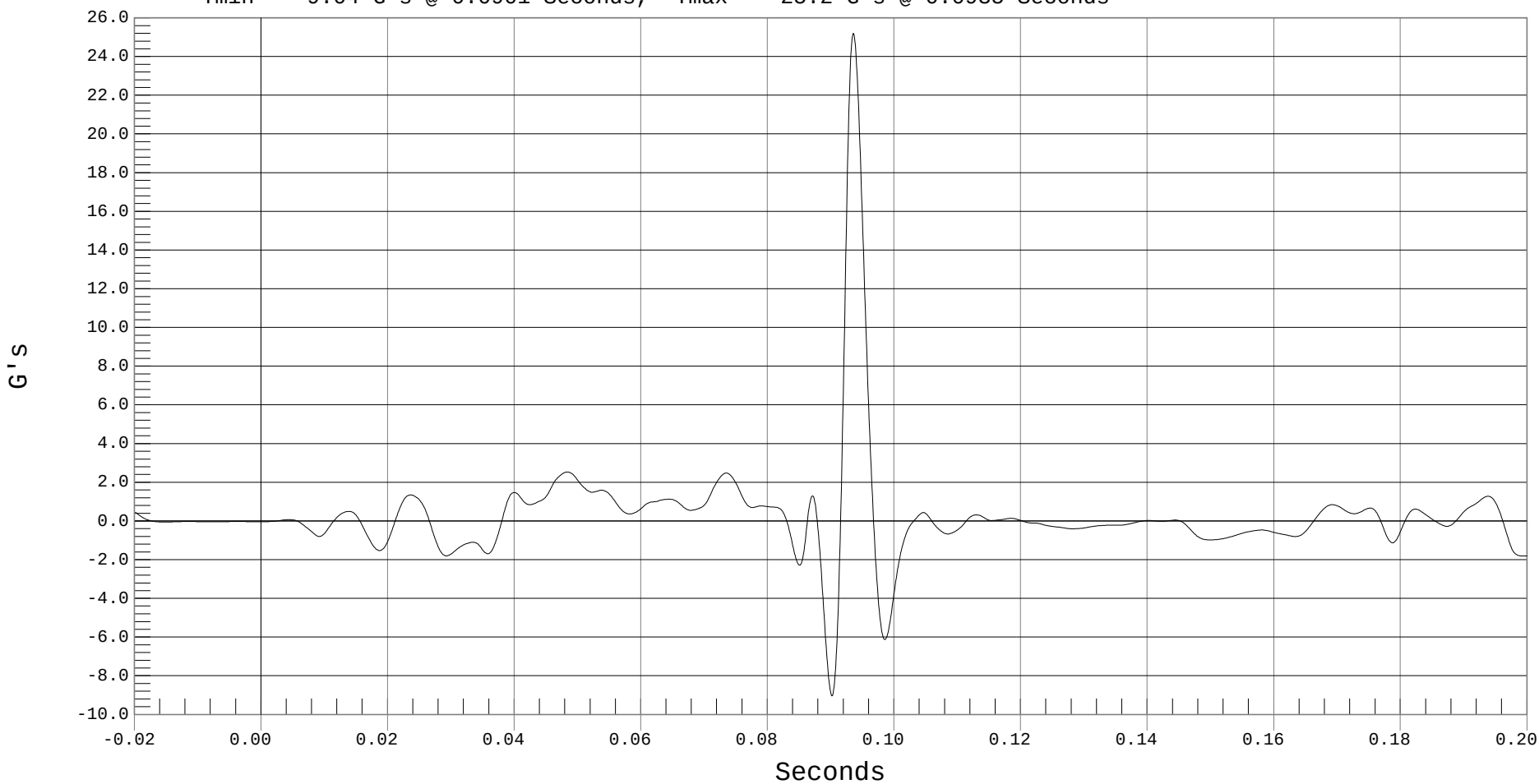
VEHICLE CG X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 VEHICLE CG X, B01085AF.A44

Ymin = -9.04 G's @ 0.0901 Seconds, Ymax = 25.2 G's @ 0.0935 Seconds





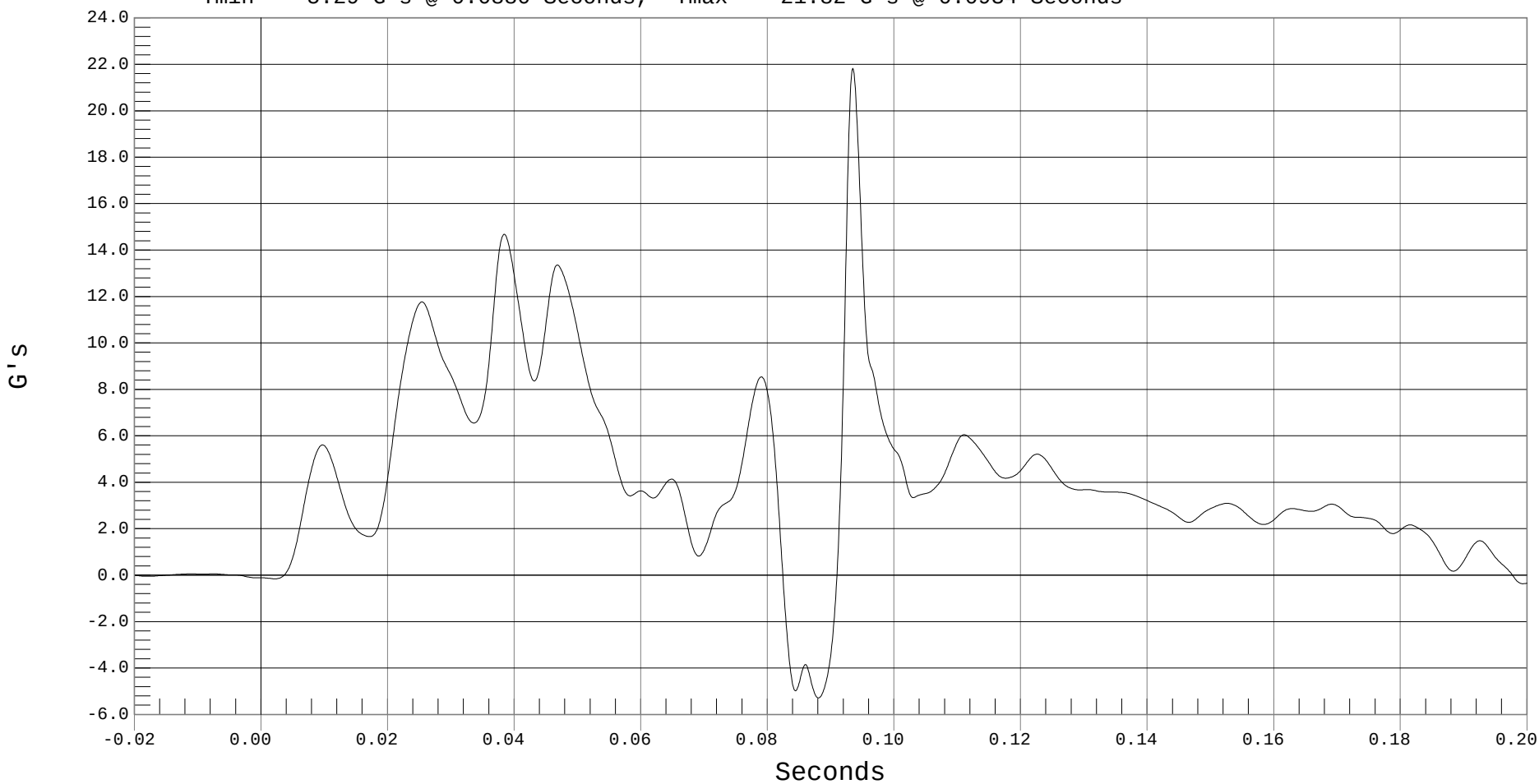
VEHICLE CG Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 VEHICLE CG Y, B01085AF.A45

Ymin = -5.29 G's @ 0.0880 Seconds, Ymax = 21.82 G's @ 0.0934 Seconds





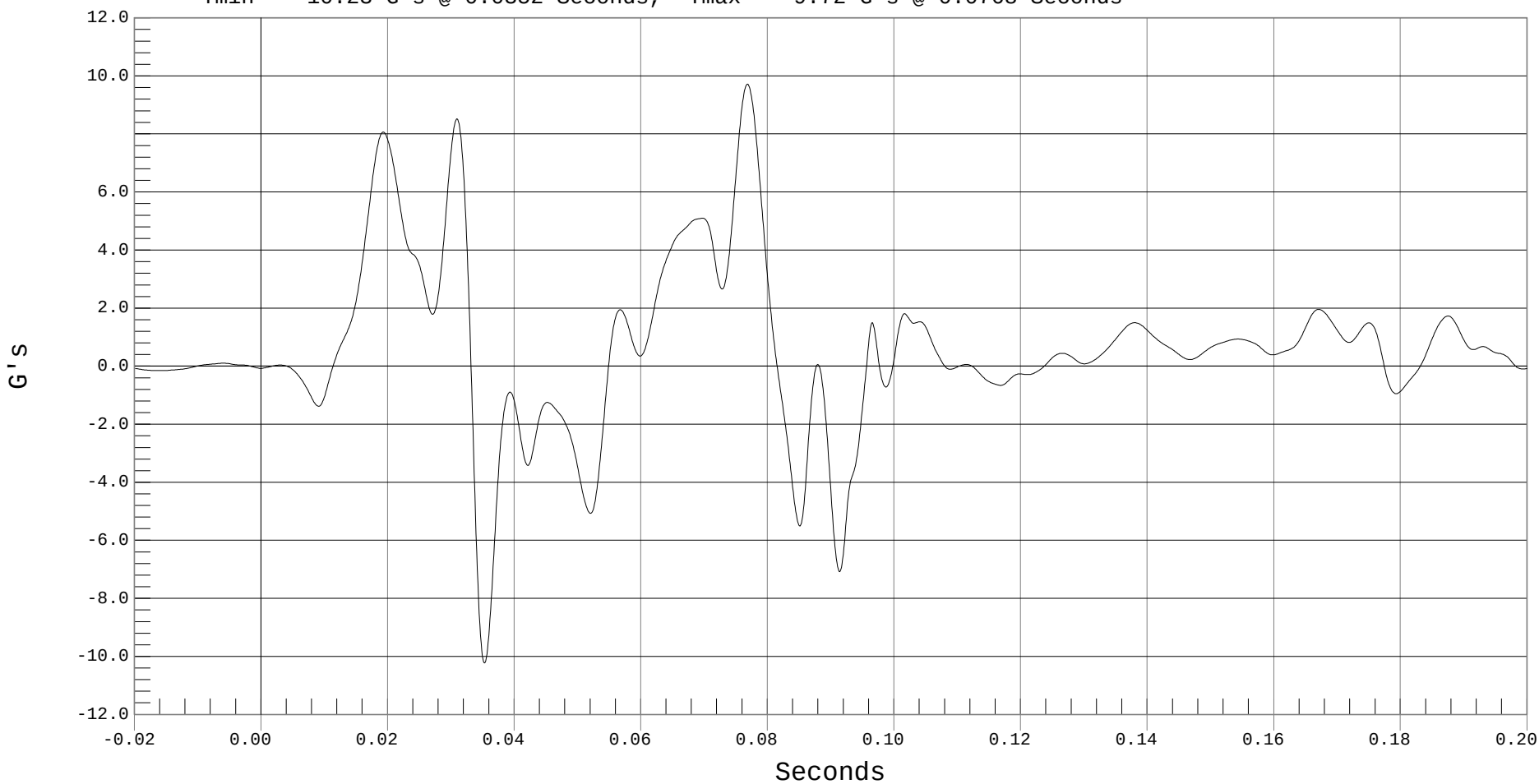
VEHICLE CG Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 VEHICLE CG Z, B01085AF.A46

Ymin = -10.23 G's @ 0.0352 Seconds, Ymax = 9.72 G's @ 0.0768 Seconds





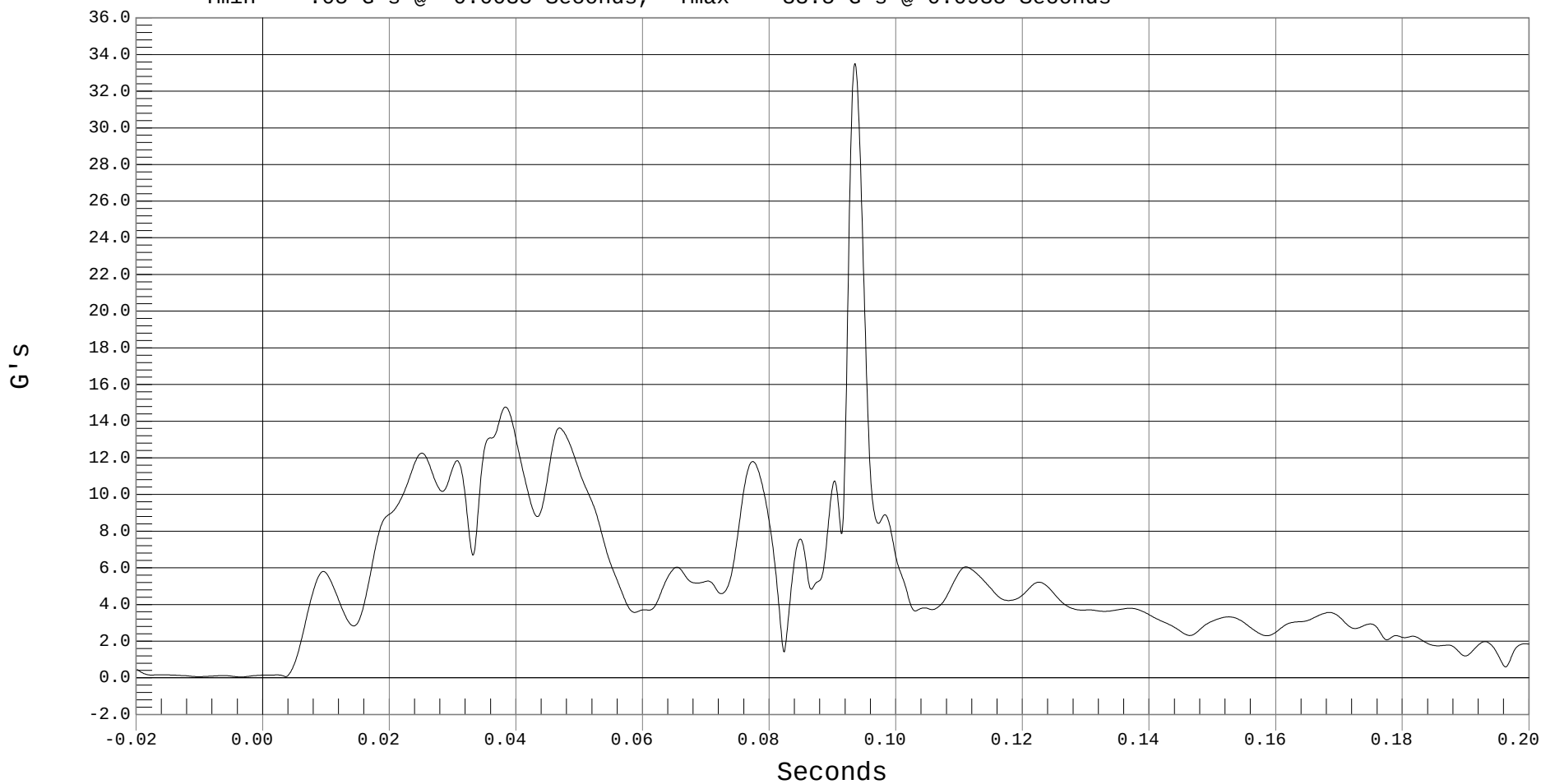
VEHICLE CG RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 VEHICLE CG RESULTANT ACCELERATION, B01085AV.A44

Ymin = .05 G's @ -0.0035 Seconds, Ymax = 33.5 G's @ 0.0935 Seconds





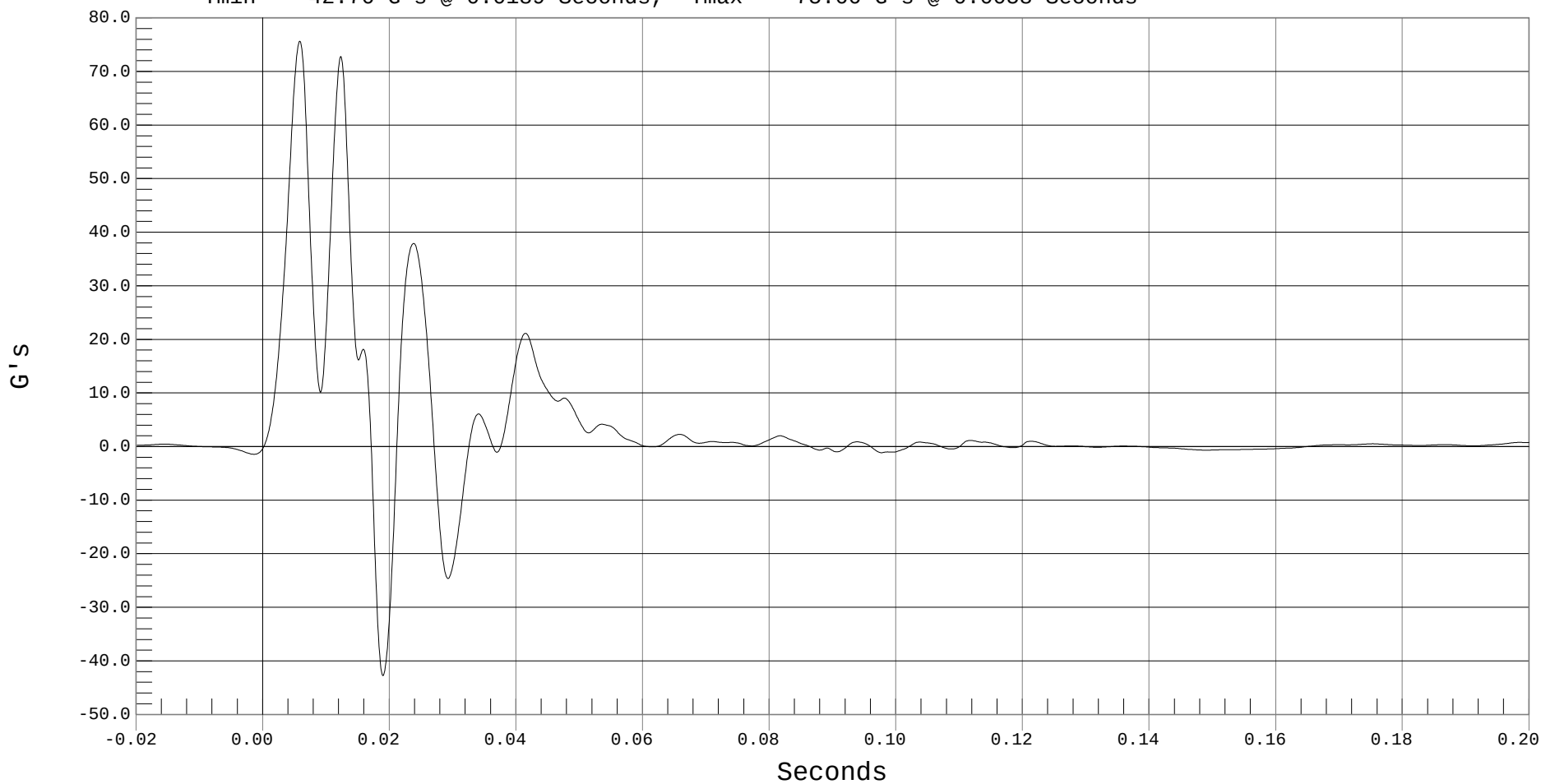
LEFT FRONT DOOR @ PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LEFT FRONT DOOR @ PELVIS Y, B01085AF.A48

Ymin = -42.76 G's @ 0.0189 Seconds, Ymax = 75.66 G's @ 0.0058 Seconds





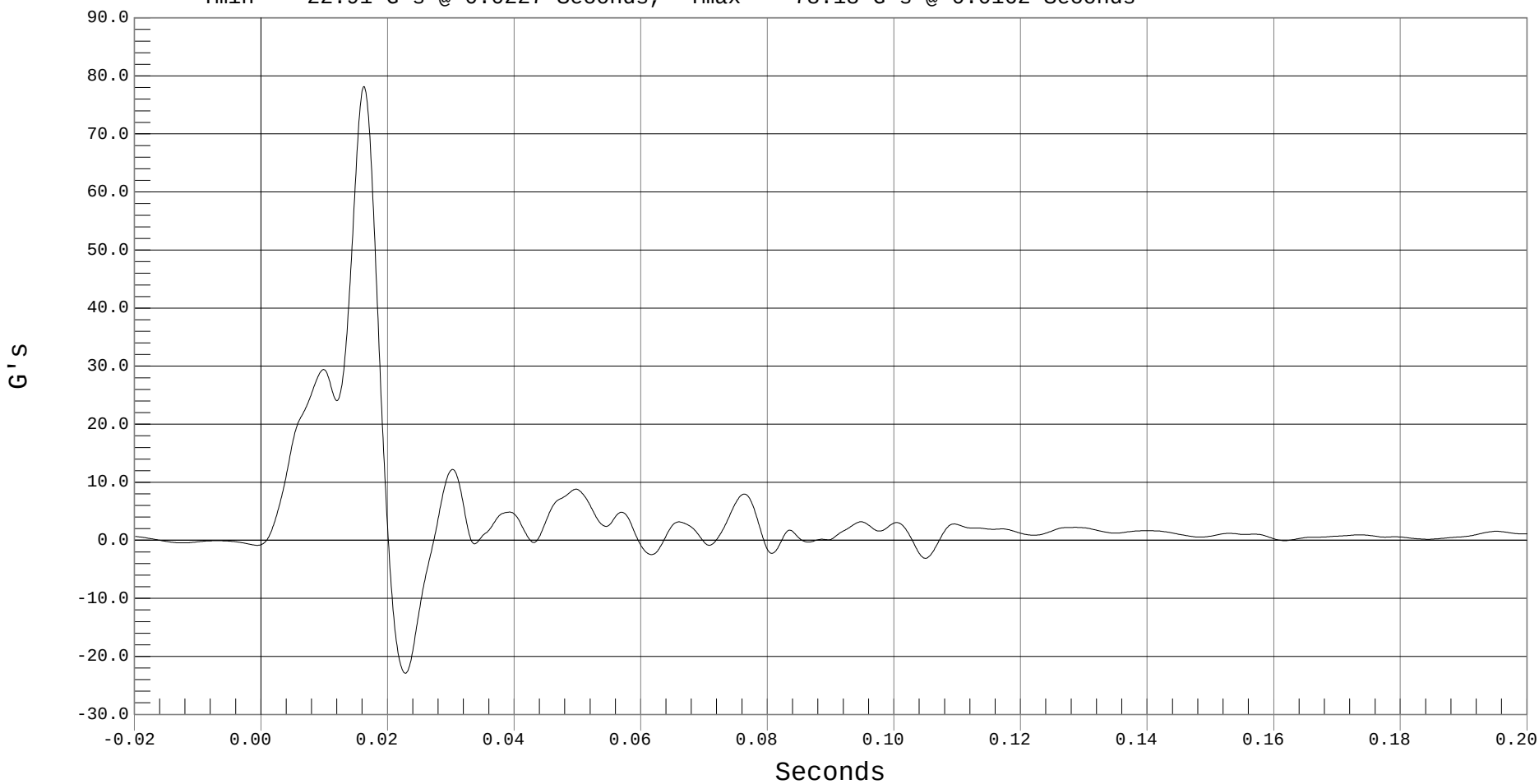
LEFT FRONT DOOR @ ARM Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LEFT FRONT DOOR @ ARM Y, B01085AF.A50

Ymin = -22.91 G's @ 0.0227 Seconds, Ymax = 78.18 G's @ 0.0162 Seconds





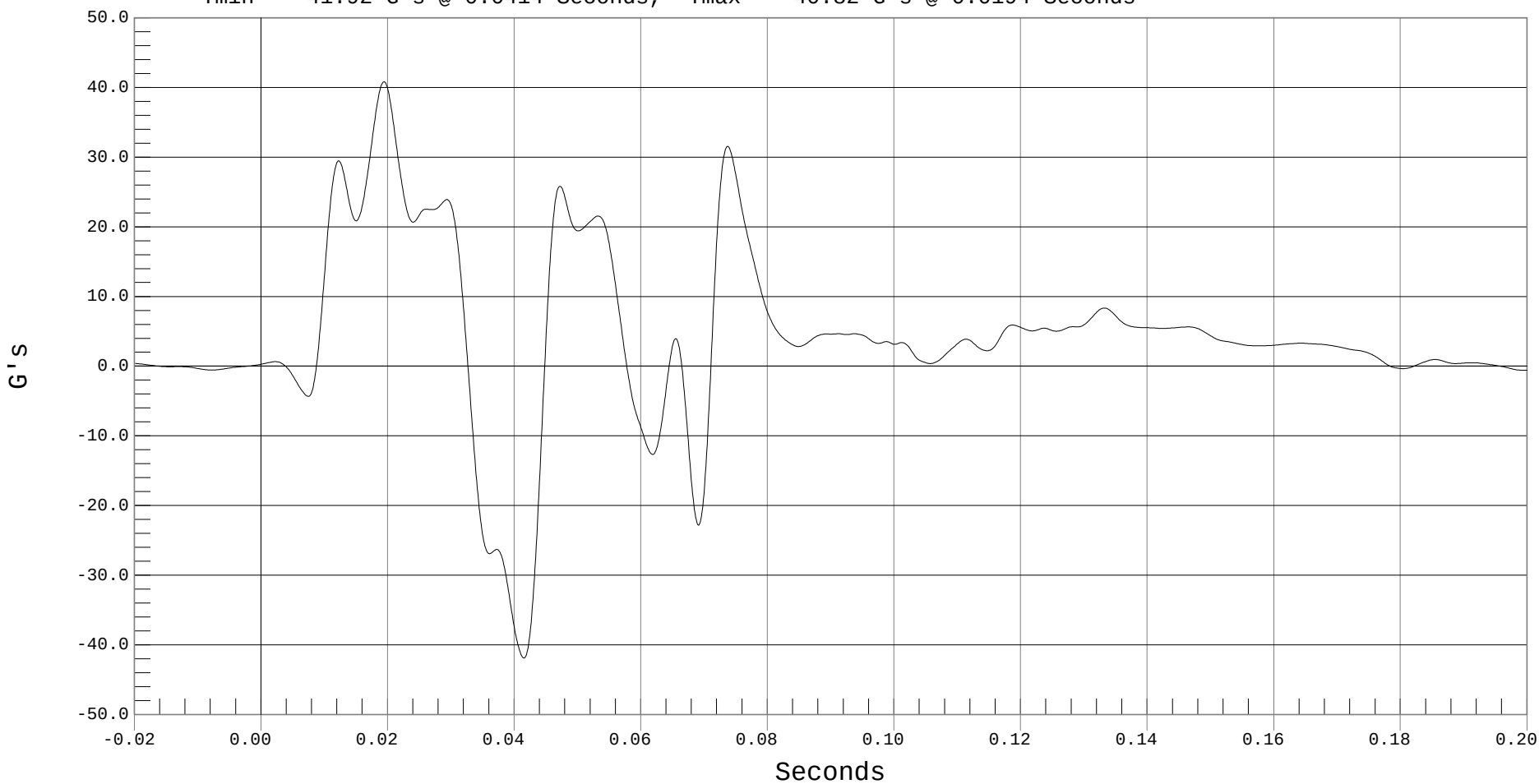
LEFT REAR DOOR @ KNEE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LEFT REAR DOOR @ FRONT OF CAR SEAT, B01085AF.A51

Ymin = -41.92 G's @ 0.0414 Seconds, Ymax = 40.82 G's @ 0.0194 Seconds





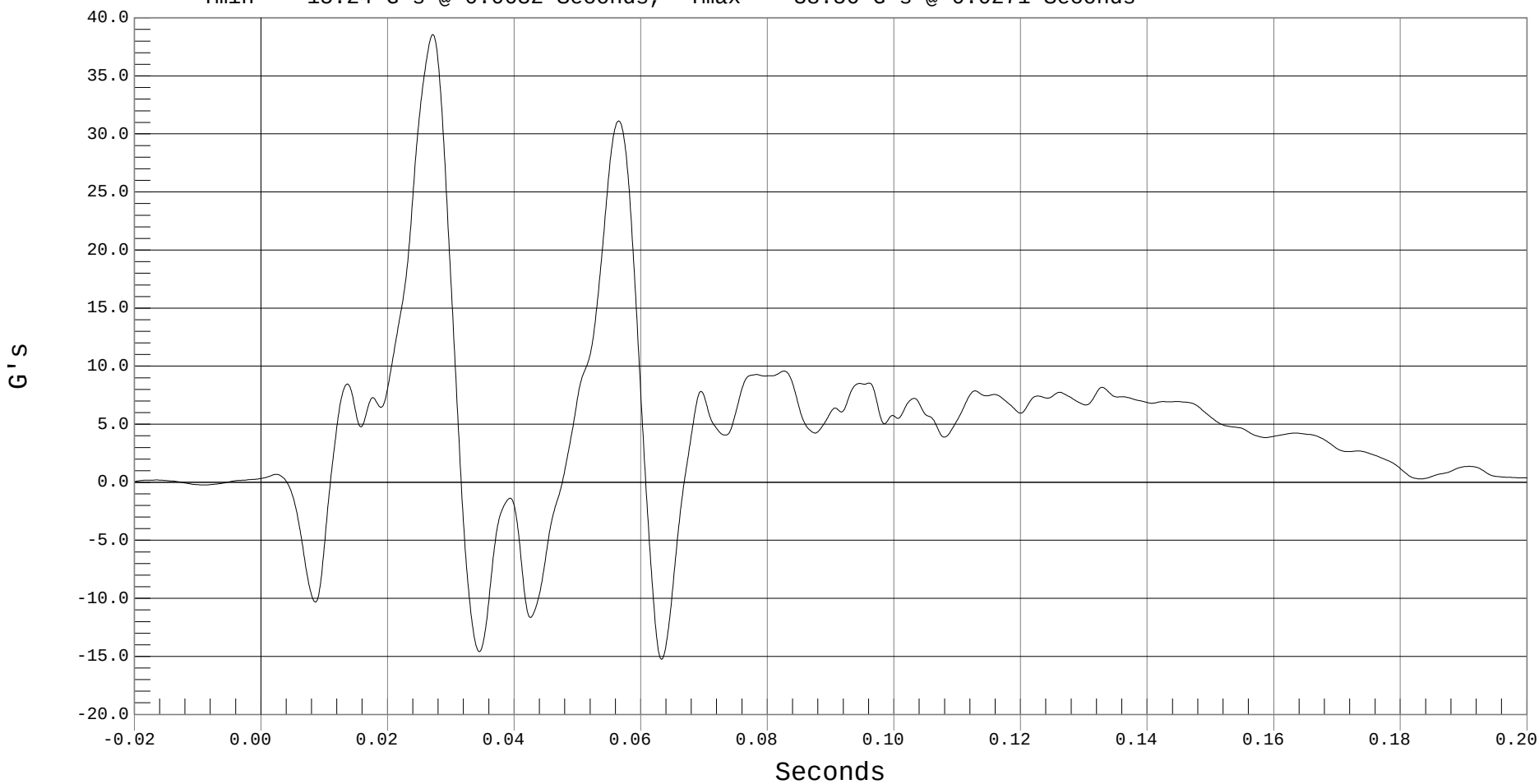
LEFT REAR DOOR @ PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LEFT REAR DOOR @ REAR OF CAR SEAT Y, B01085AF.A52

Ymin = -15.24 G's @ 0.0632 Seconds, Ymax = 38.56 G's @ 0.0271 Seconds





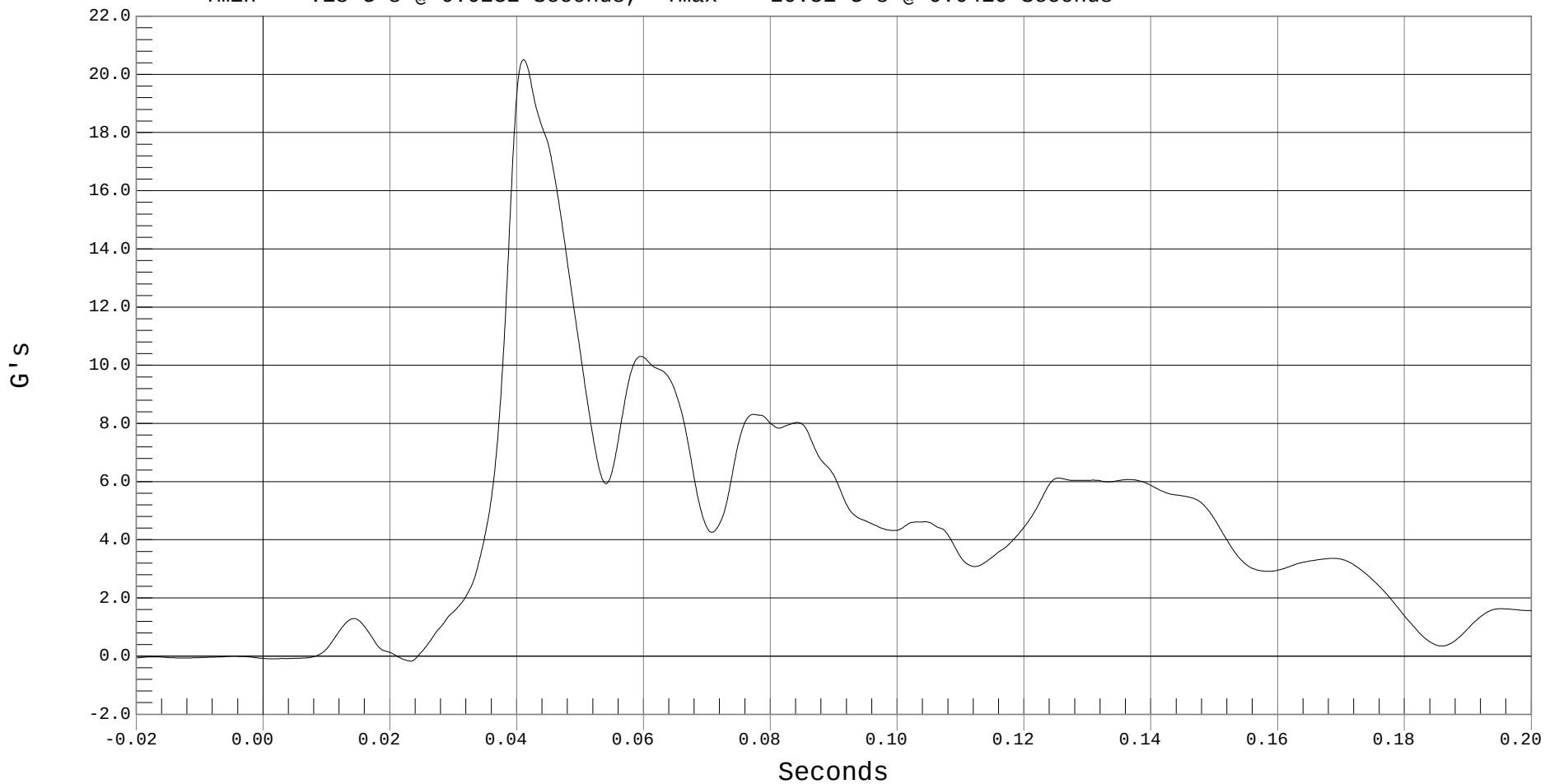
CHILD SEAT @ PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 RIGHT SIDE OF CHILD SEAT @ PELVIS Y, B01085AF.A54

Ymin = -.18 G's @ 0.0232 Seconds, Ymax = 20.51 G's @ 0.0410 Seconds





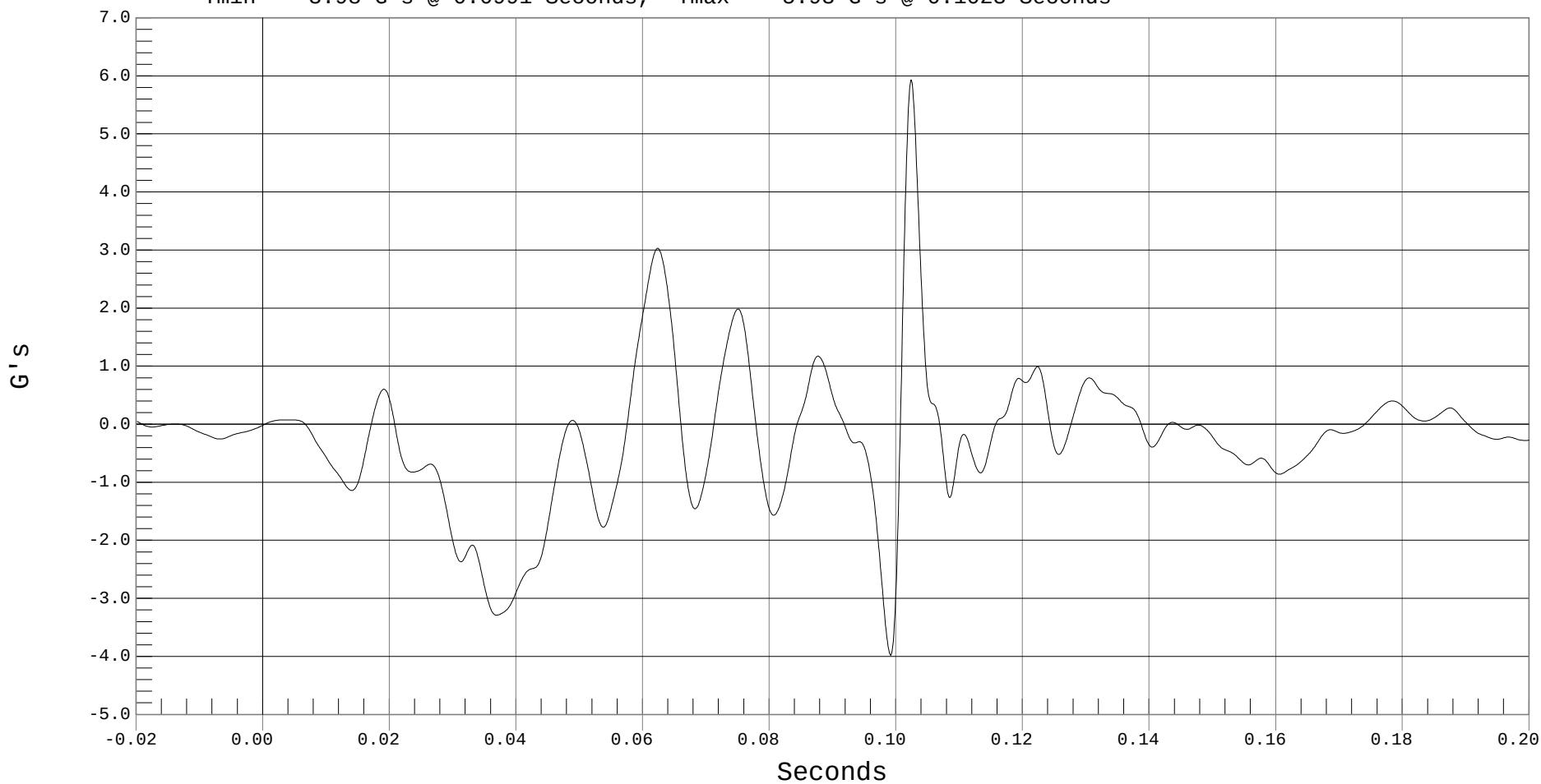
LOWER CENTER RADIATOR SUPPORT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LOWER CENTER RADIATOR SUPPORT X, B01085AF.A62

Ymin = -3.98 G's @ 0.0991 Seconds, Ymax = 5.93 G's @ 0.1023 Seconds





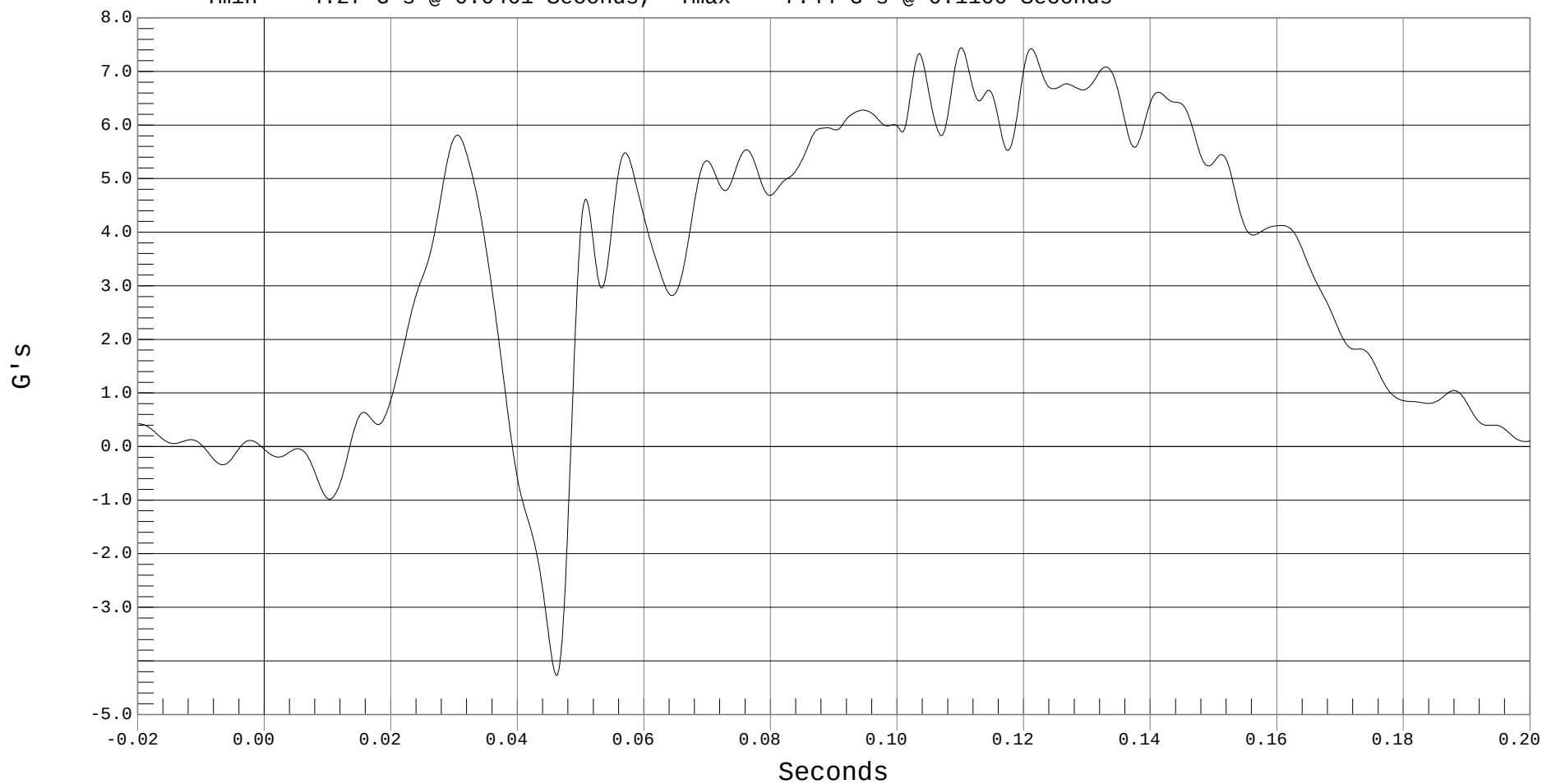
LOWER CENTER RADIATOR SUPPORT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LOWER CENTER RADIATOR SUPPORT Y, B01085AF.A63

Ymin = -4.27 G's @ 0.0461 Seconds, Ymax = 7.44 G's @ 0.1100 Seconds





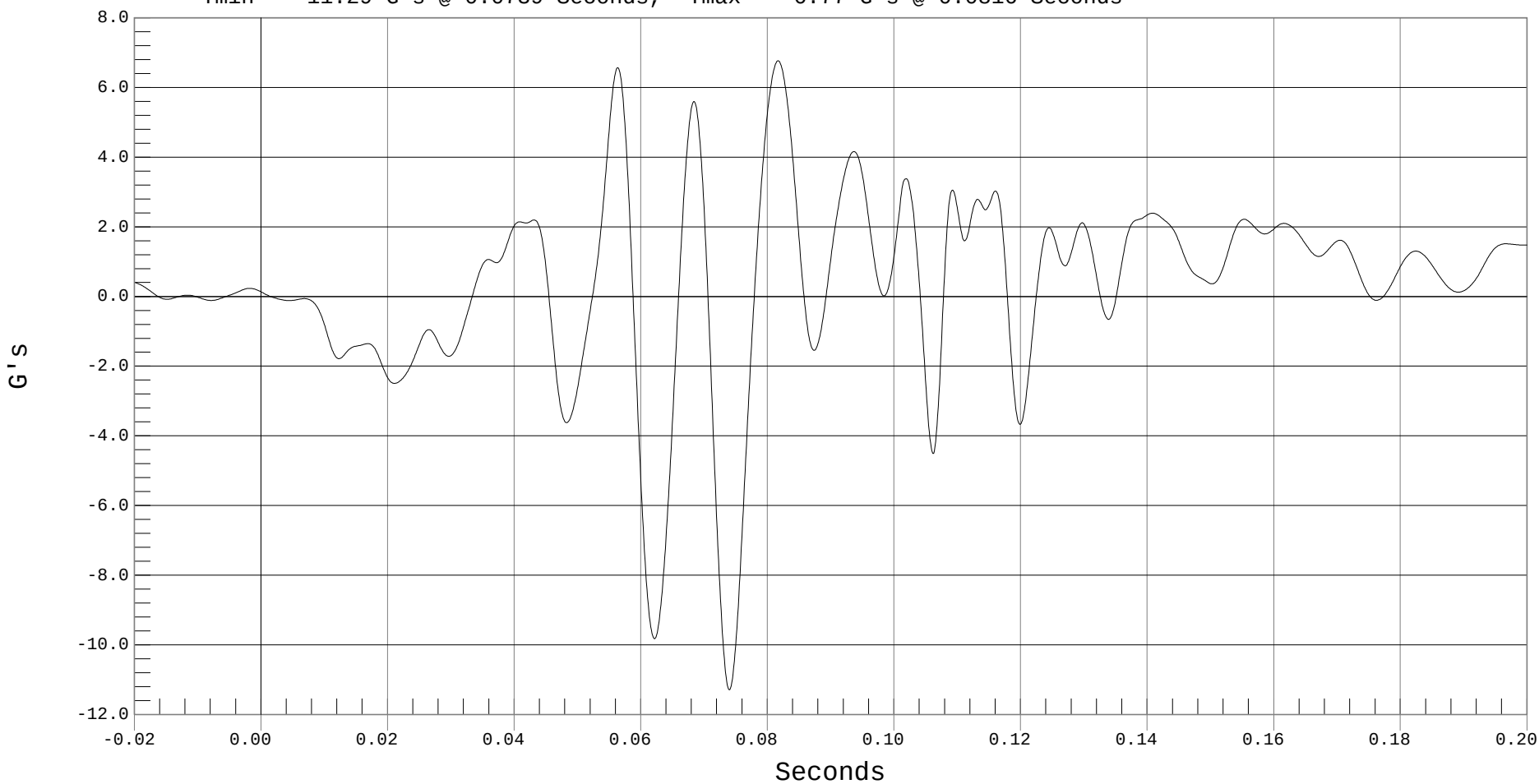
LOWER CENTER RADIATOR SUPPORT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Filter Class: 60

— 1 LOWER CENTER RADIATOR SUPPORT Z, B01085AF.A64

Ymin = -11.29 G's @ 0.0739 Seconds, Ymax = 6.77 G's @ 0.0816 Seconds





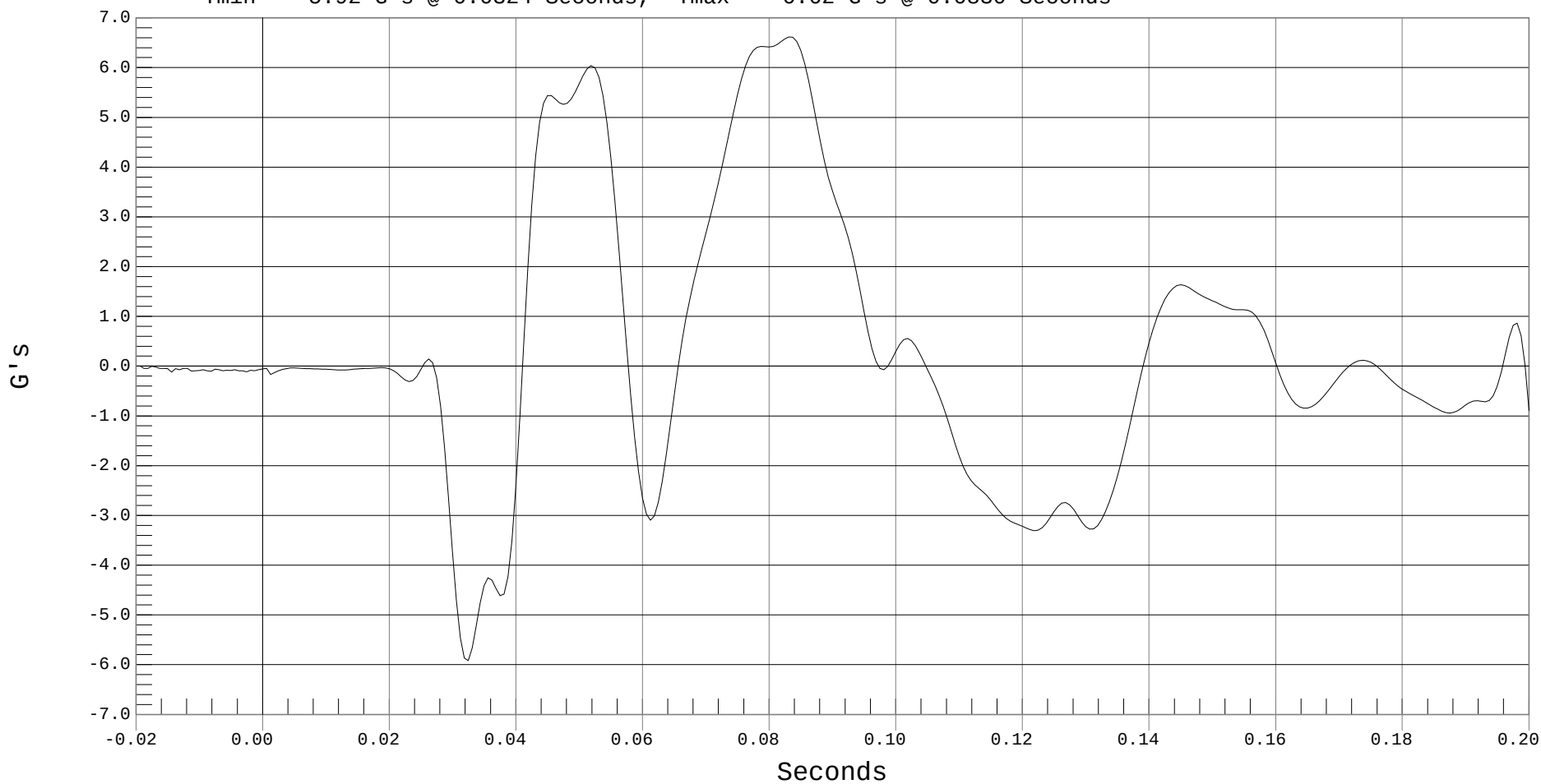
DRIVER UPPER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER UPPER SPINE X, B01085FI.R20

Ymin = -5.92 G's @ 0.0324 Seconds, Ymax = 6.62 G's @ 0.0830 Seconds





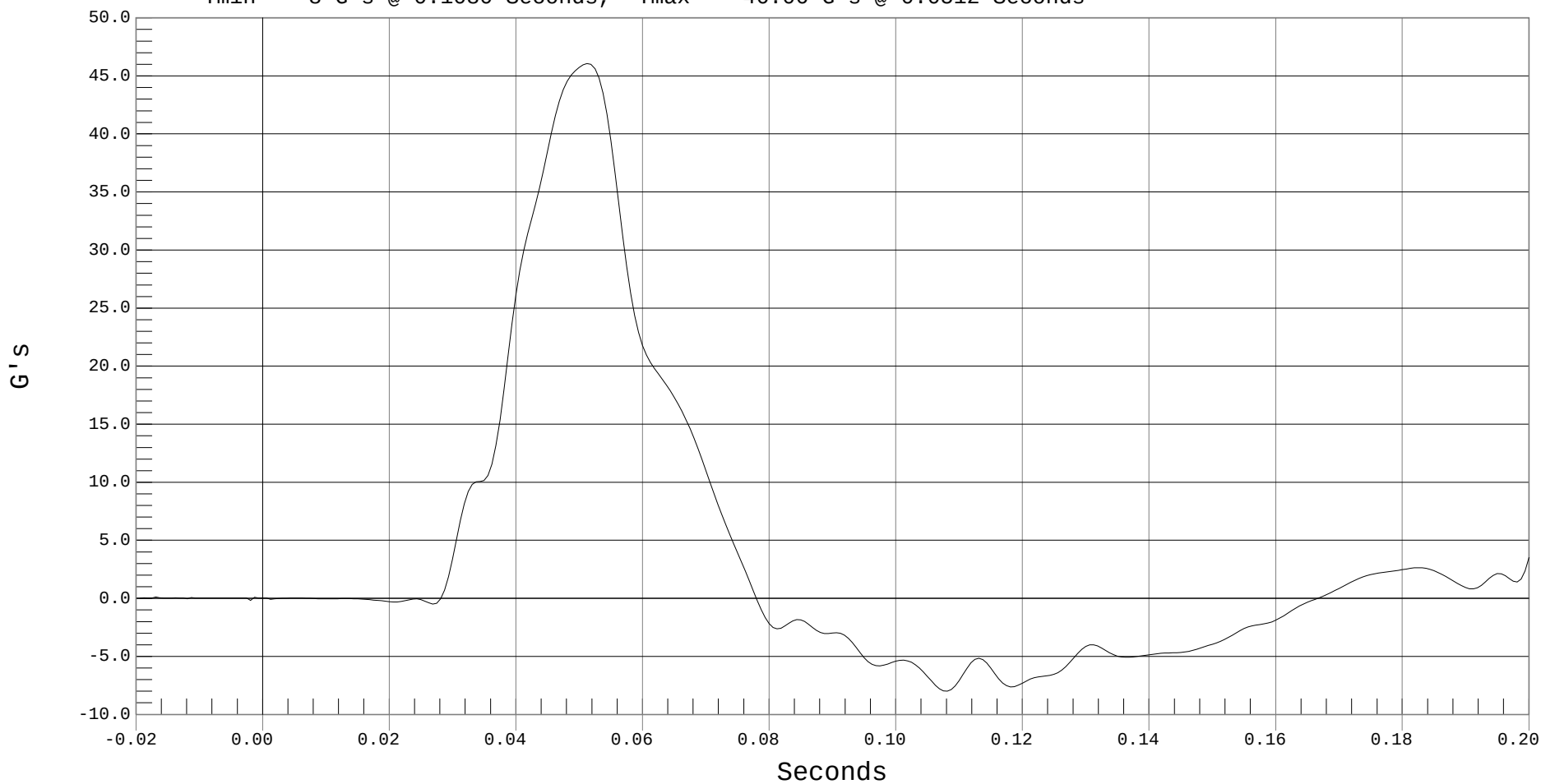
DRIVER UPPER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER UPPER SPINE Y, B01085FI.R21

Ymin = -8 G's @ 0.1080 Seconds, Ymax = 46.06 G's @ 0.0512 Seconds





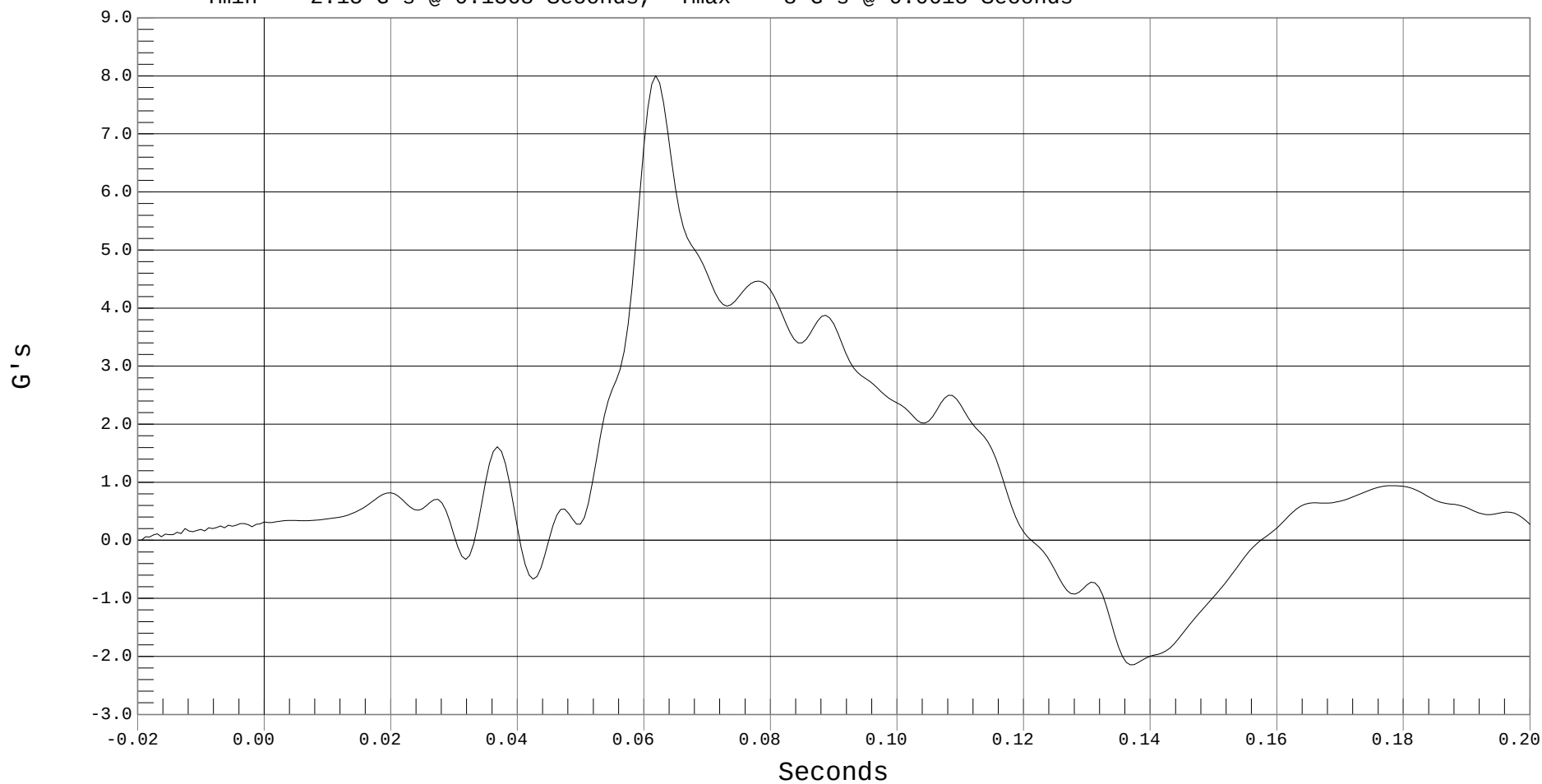
DRIVER UPPER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER UPPER SPINE Z, B01085FI.R22

Ymin = -2.15 G's @ 0.1368 Seconds, Ymax = 8 G's @ 0.0618 Seconds





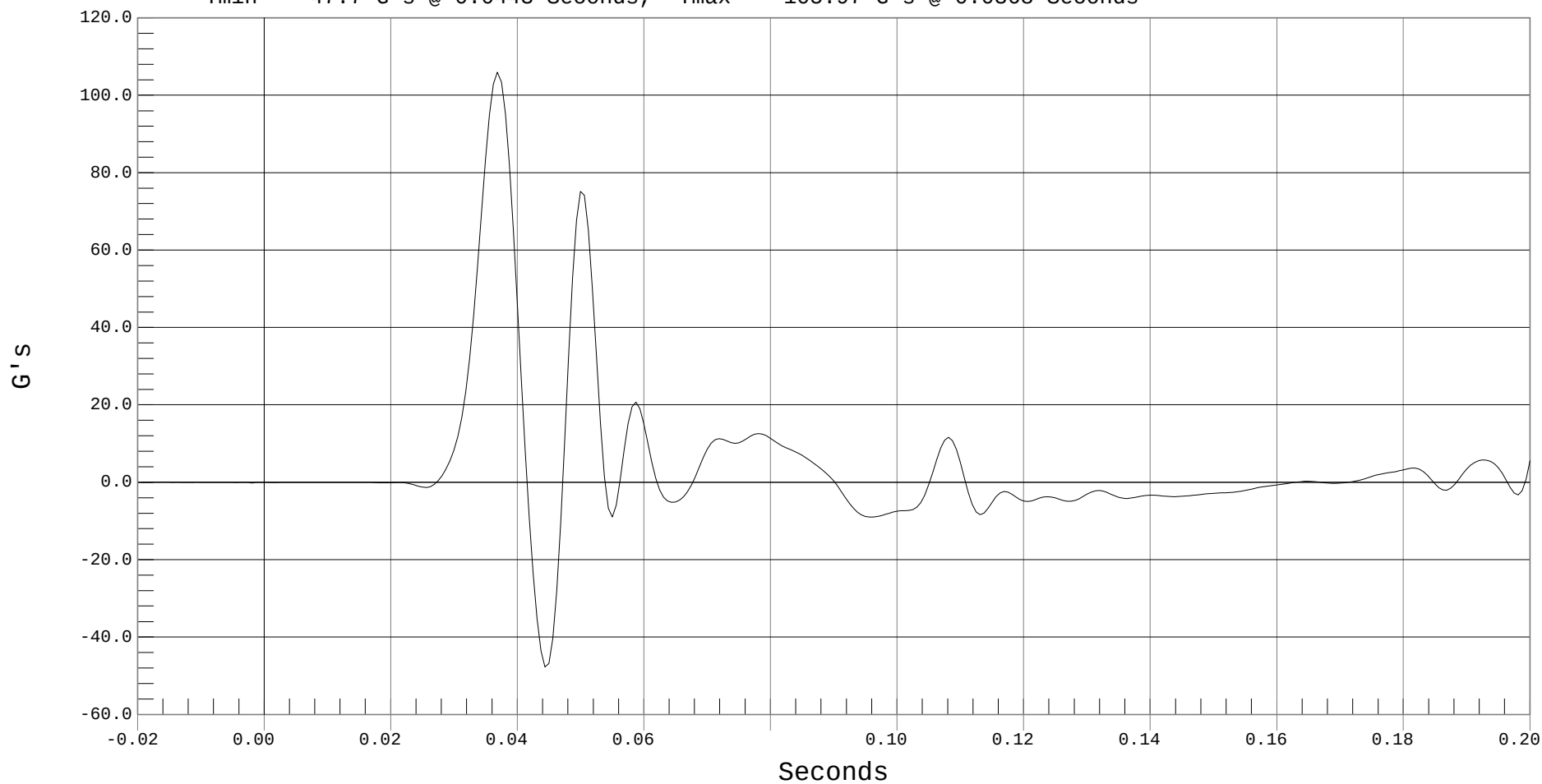
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER UPPER RIB Y, B01085FI.R23

Ymin = -47.7 G's @ 0.0443 Seconds, Ymax = 105.97 G's @ 0.0368 Seconds





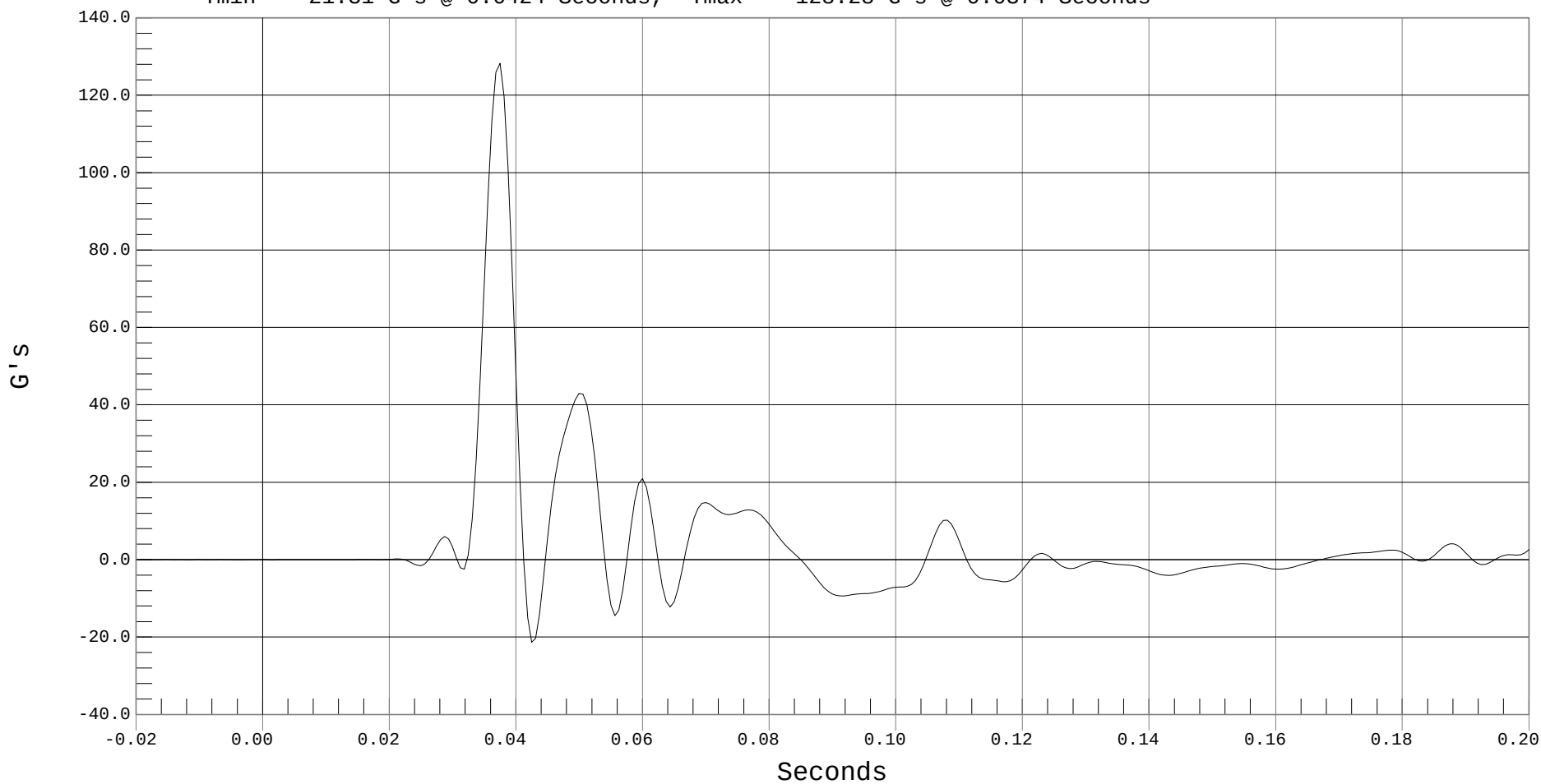
DRIVER MID RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER MID RIB Y, B01085FI.R24

Ymin = -21.31 G's @ 0.0424 Seconds, Ymax = 128.28 G's @ 0.0374 Seconds





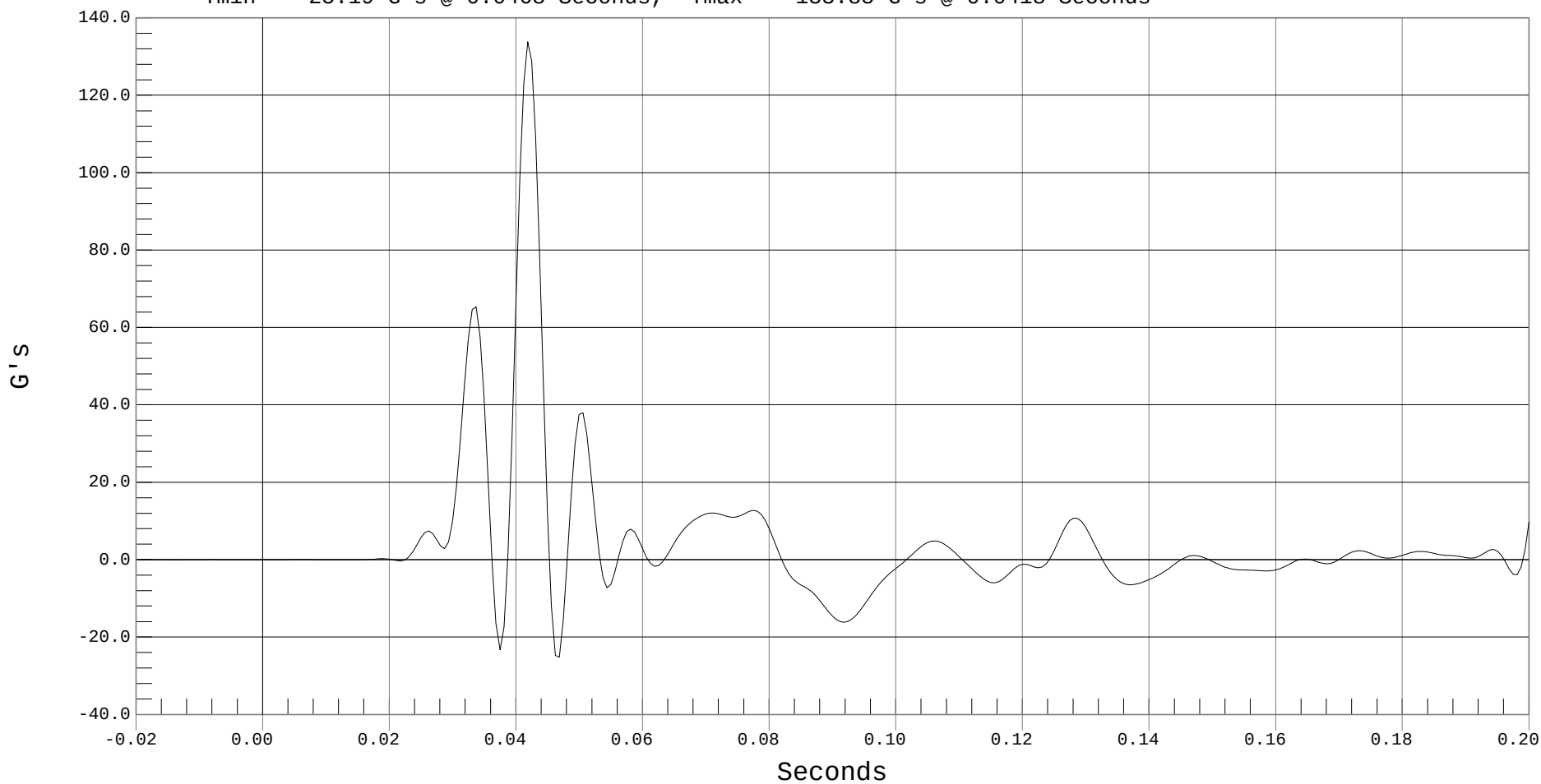
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER LOWER RIB Y, B01085FI.R25

Ymin = -25.19 G's @ 0.0468 Seconds, Ymax = 133.85 G's @ 0.0418 Seconds





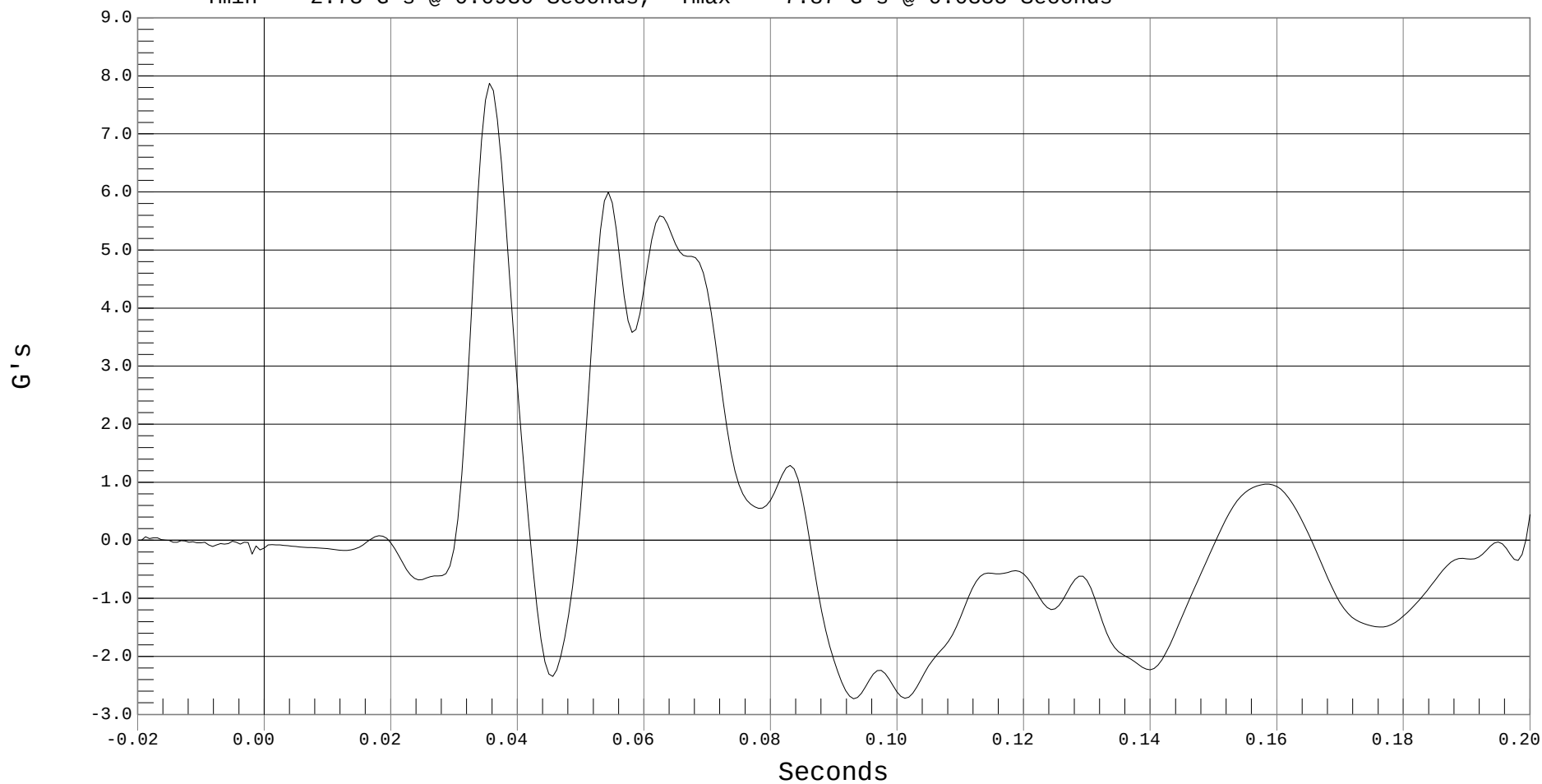
DRIVER LOWER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE X, B01085FI.R29

Ymin = -2.73 G's @ 0.0930 Seconds, Ymax = 7.87 G's @ 0.0355 Seconds





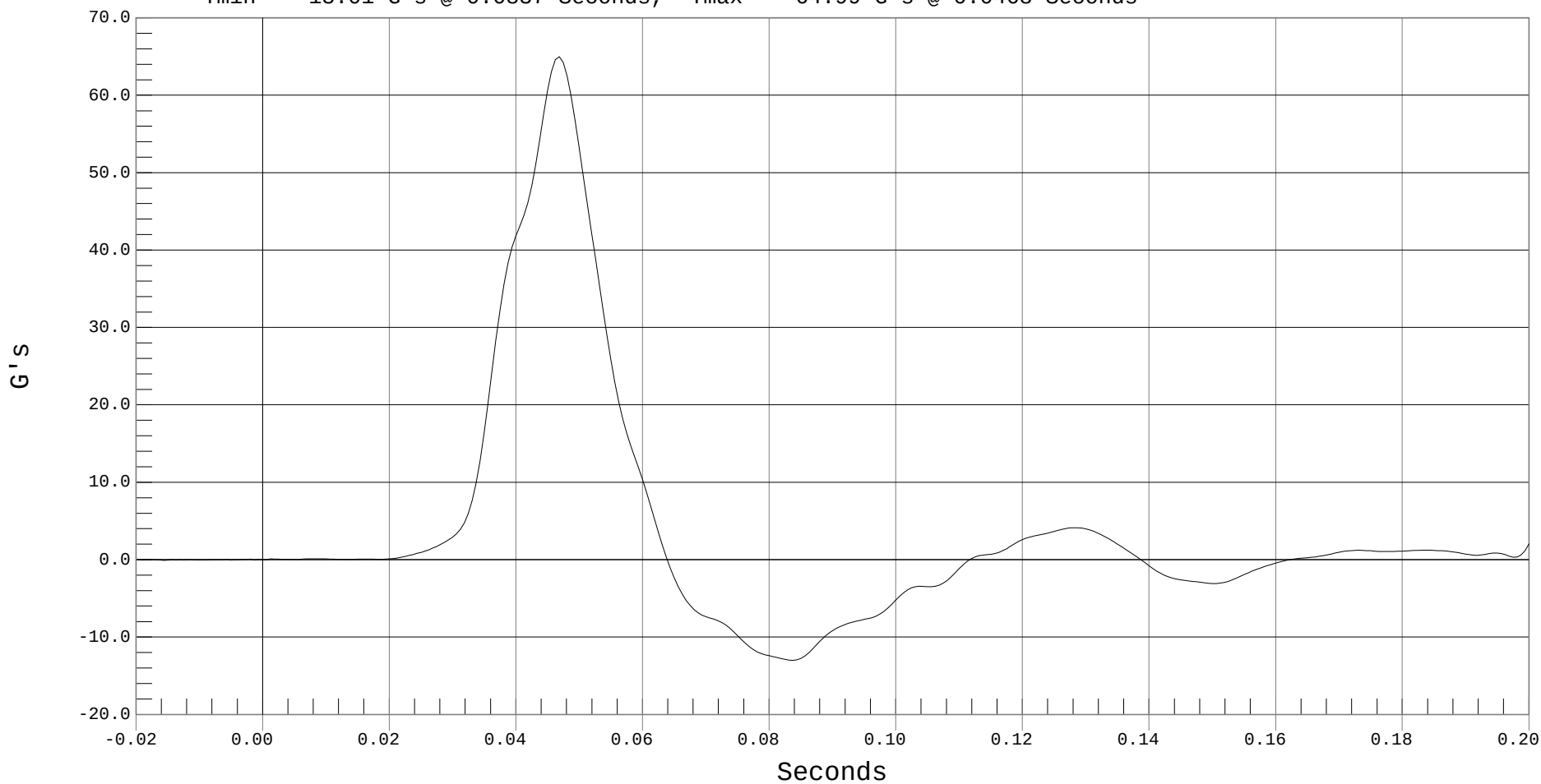
DRIVER LOWER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE Y, B01085FI.R30

Ymin = -13.01 G's @ 0.0837 Seconds, Ymax = 64.99 G's @ 0.0468 Seconds





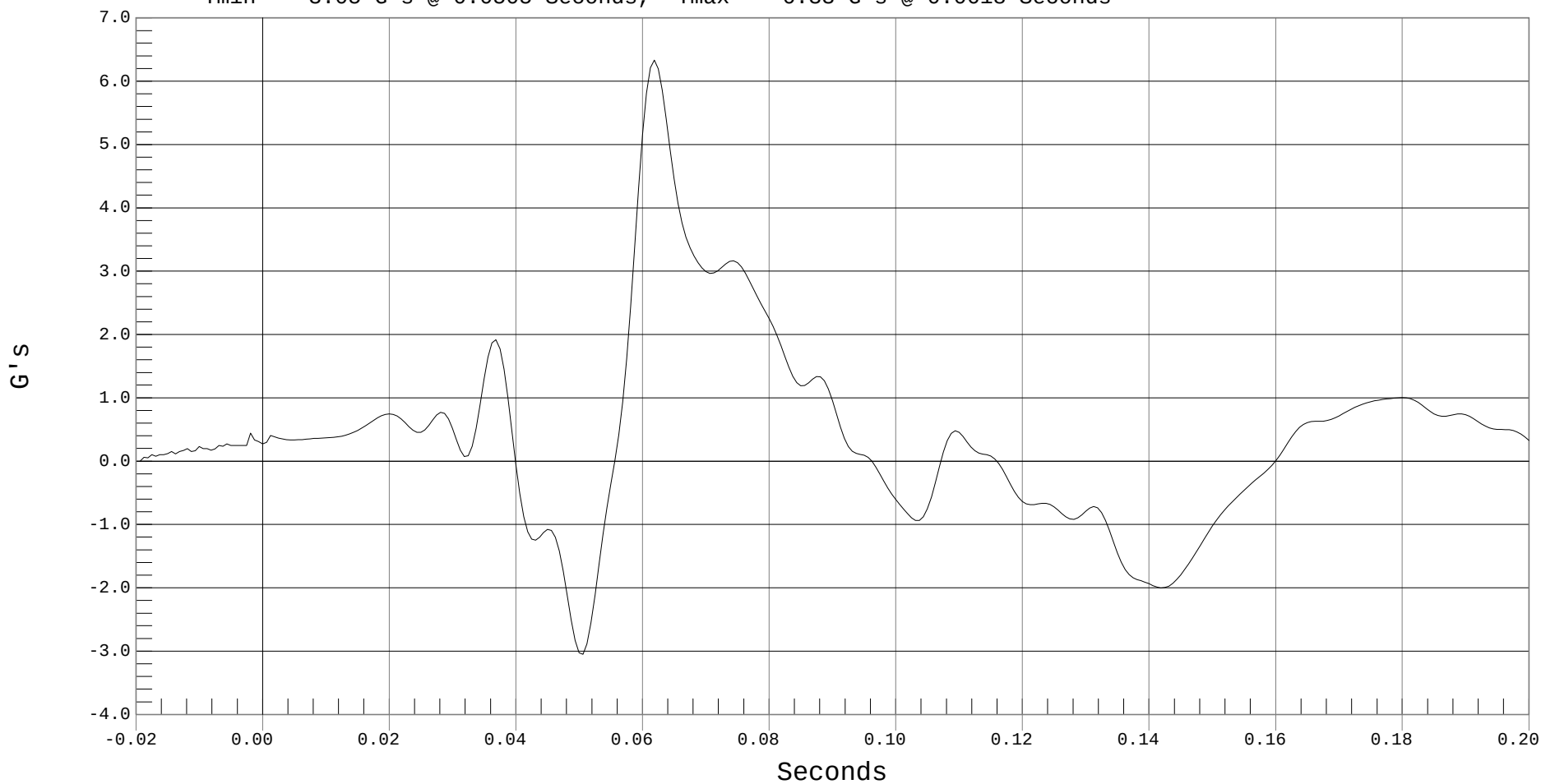
DRIVER LOWER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE Z, B01085FI.R31

Ymin = -3.05 G's @ 0.0505 Seconds, Ymax = 6.33 G's @ 0.0618 Seconds





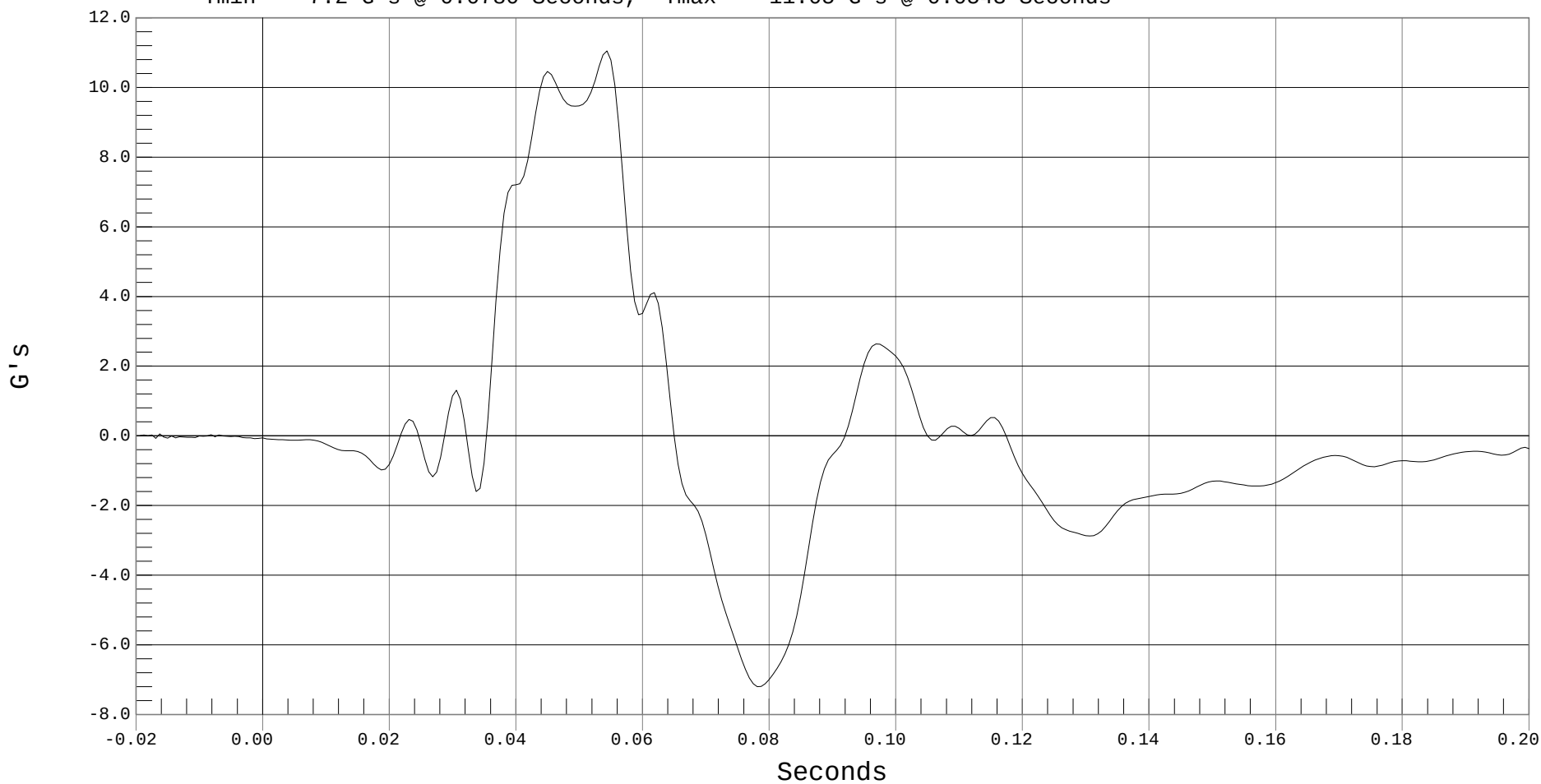
DRIVER PELVIS X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER PELVIS X, B01085FI.R46

Ymin = -7.2 G's @ 0.0780 Seconds, Ymax = 11.05 G's @ 0.0543 Seconds





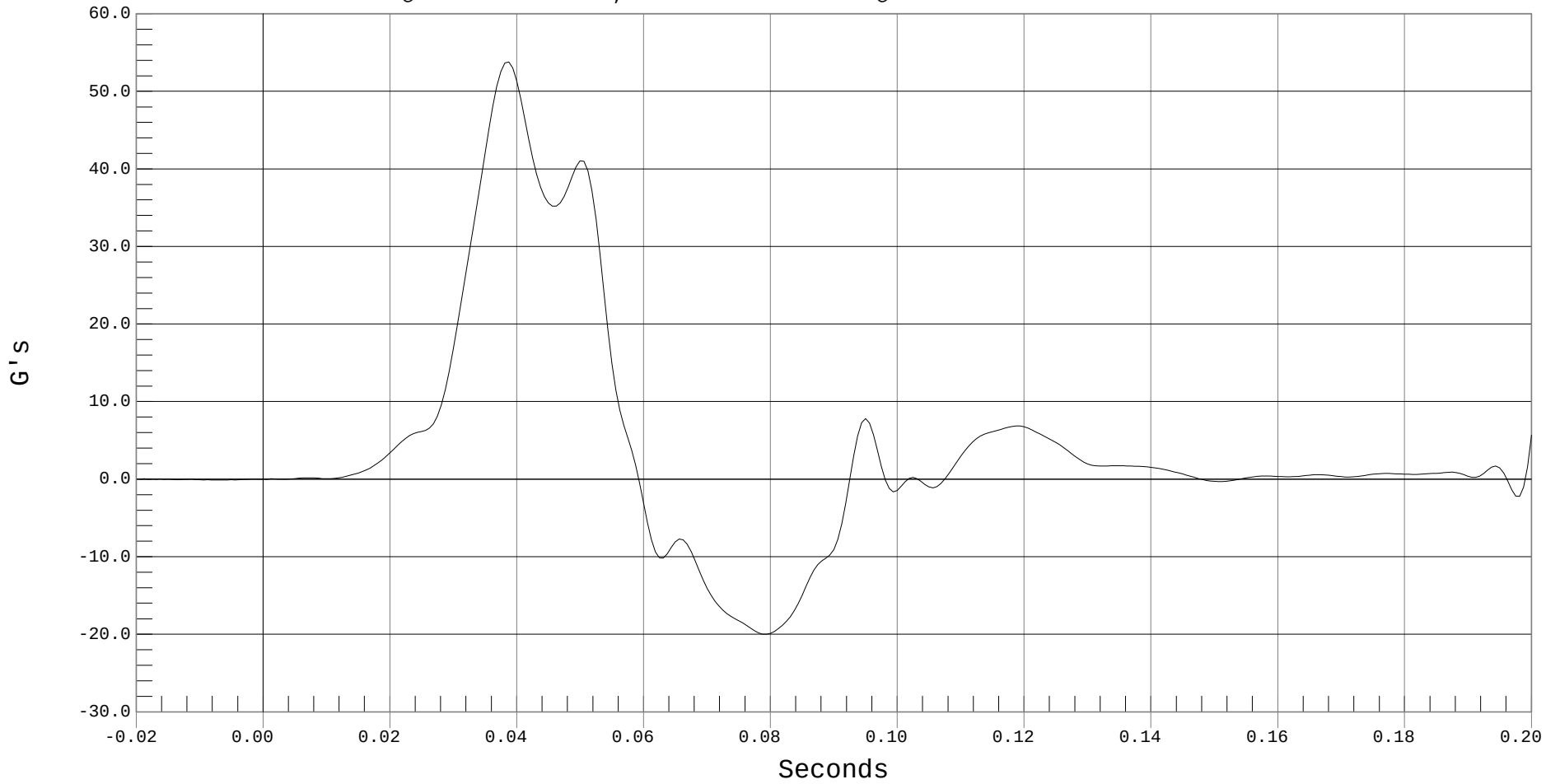
DRIVER PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER PELVIS Y, B01085FI.R45

Ymin = -20 G's @ 0.0793 Seconds, Ymax = 53.8 G's @ 0.0387 Seconds





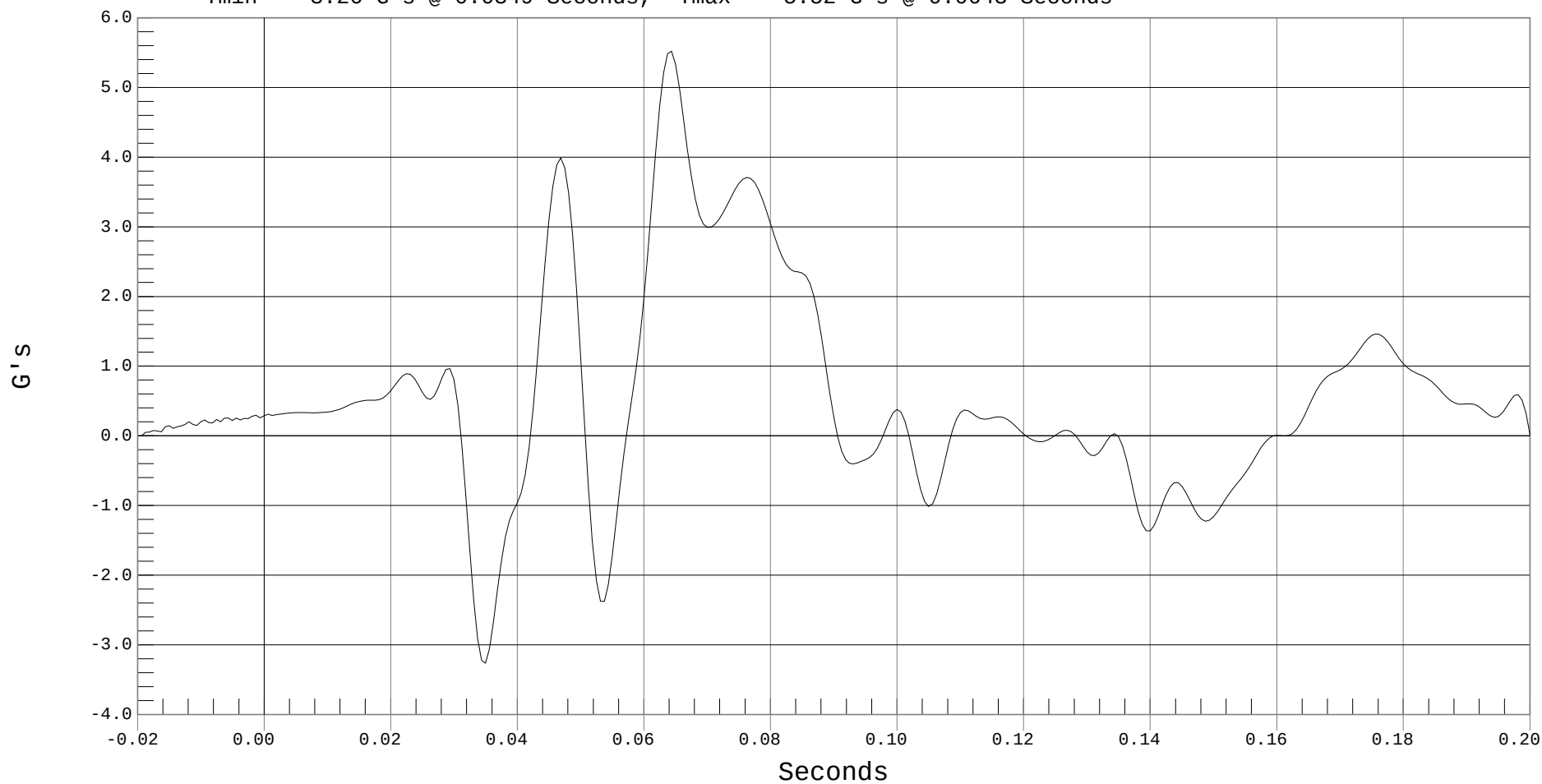
DRIVER PELVIS Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 2001 SATURN L200 (W/HEAD CURTAIN)
Other Info:

Test Date: 08-08-01
Speed: 17.6 MPH, 28.3 KPH
Fir Filtered

— 1 DRIVER PELVIS Z, B01085FI.R47

Ymin = -3.26 G's @ 0.0349 Seconds, Ymax = 5.52 G's @ 0.0643 Seconds



APPENDIX C
ES-2 CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CERTIFICATION DATA

Dummy Serial Number: 009

Calibration Test Results Summary

Dummy Serial Number: 009

Pre-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Rib Tests:	All ribs passed all impact test requirements.
Abdomen Test:	The abdomen passed all impact test requirements.
Lumbar Spine Test:	The lumbar spine passed all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

MGA RESEARCH CORPORATION
HEAD DROP TEST
EUROSID 2 DUMMY

Date: 8/5/01
Dummy Serial Number: 009
Test Number: D011131

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	20.7
Relative Humidity (%)	10 – 70	55
Peak Resultant Acceleration	100 – 150 g's	136
Time of Max. Res. Acceleration		24.9 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



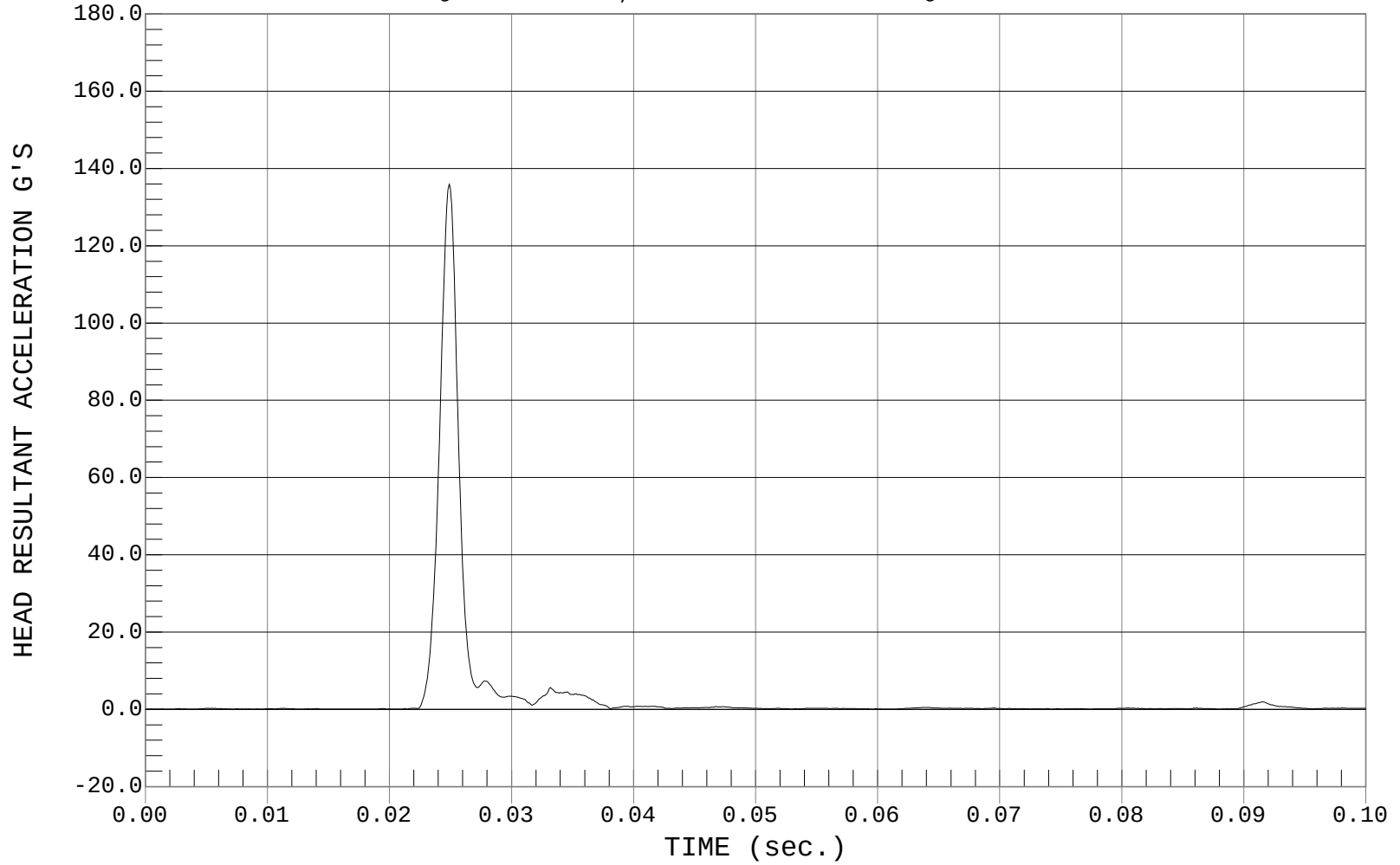
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #009

Test Date: 08-05-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01131AV.A01

Ymin = .04 G'S @ 0.0009 sec., Ymax = 136.01 G'S @ 0.0249 sec.



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
EUROSID 2 DUMMY

Date: 8/5/01
Dummy Serial Number: 009
Test Number: D011132

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18 – 22	20.6
Relative Humidity (%)		10 – 70	53
Pendulum Speed		3.3 - 3.5	3.4
Pendulum Deceleration	3 msec	ˆ.25 - ˆ.53 m/sec	-.35
	8 msec	ˆ1.59 - ˆ2.04 m/sec	-1.71
	14 msec	ˆ3.20 - ˆ3.85 m/sec	-3.36
Maximum Flexion Angle		49.0 – 59.0 deg	53.3
Time of Max. Flexion Angle		54.0 – 66.0 ms	56.6
Maximum Angle Theta (A)		32.0 – 37.0 deg	32.5
Time of Max. Theta (A)		53.0 – 63.0 ms	56.5
Maximum Angle Theta (B)		28.08 – 30.58 deg	29.18
Time of Max. Theta (B)		54.0 – 64.0 ms	55.6

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

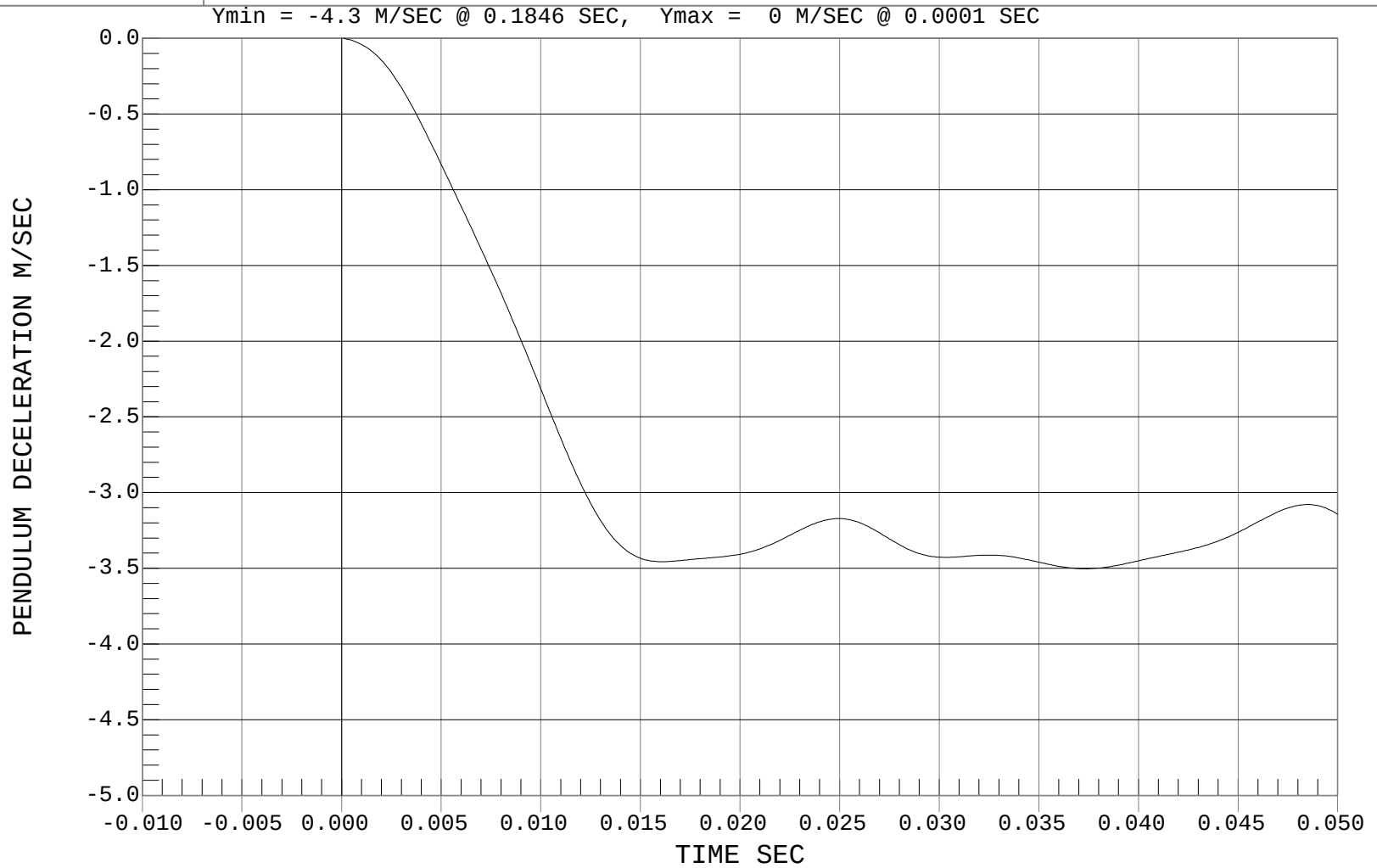


PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #009

Test Date: 08-05-01
Speed: 11.12 FT/SEC, 3.39 M/SEC

— 1 PENDULUM DECELERATION, D01132AI.V04





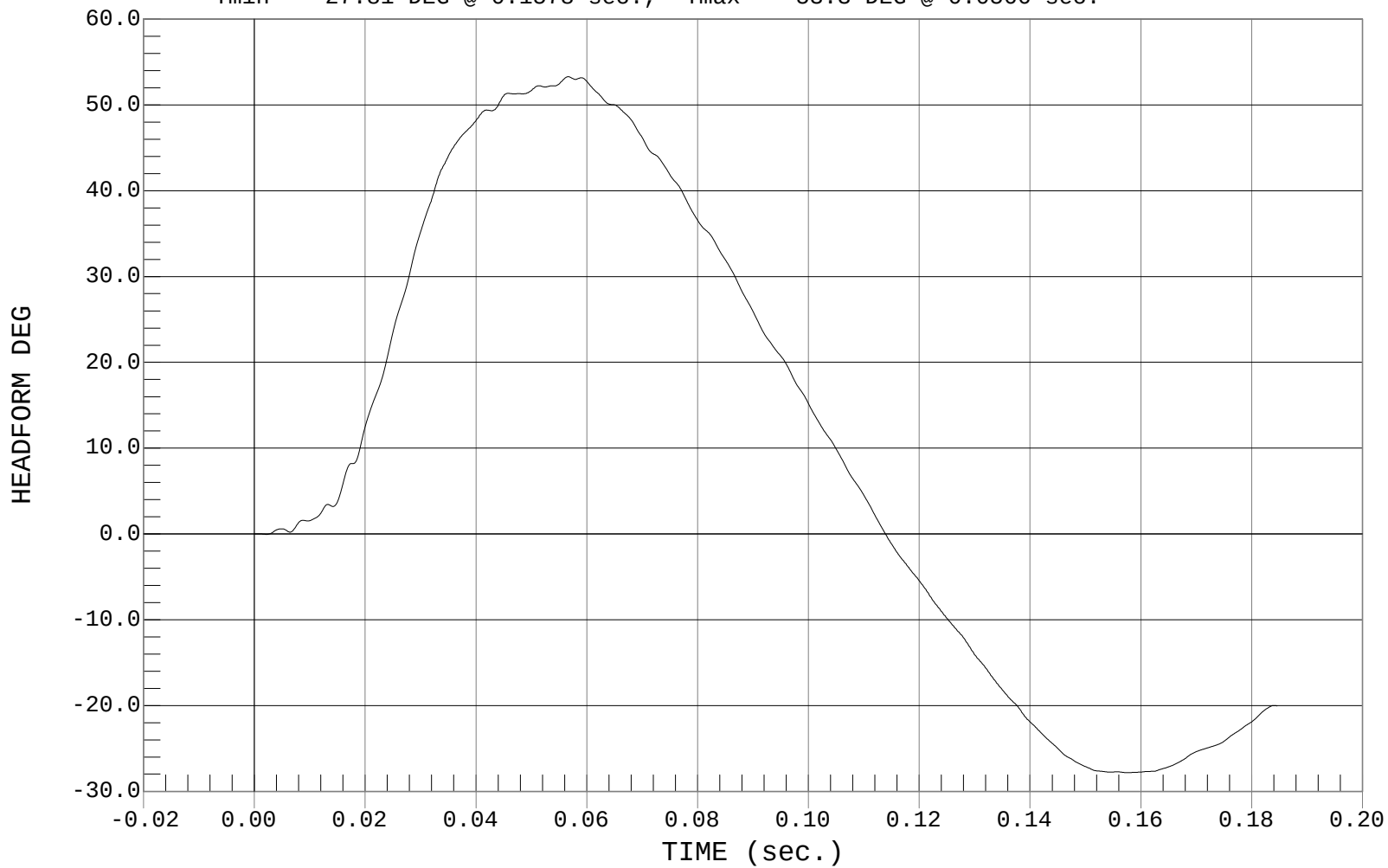
FLEXION ANGLE

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #009

Test Date: 08-05-01
Speed: 11.12 FT/SEC, 3.39 M/SEC

— 1 HEADFORM, D01132DT.D08

Ymin = -27.81 DEG @ 0.1578 sec., Ymax = 53.3 DEG @ 0.0566 sec.





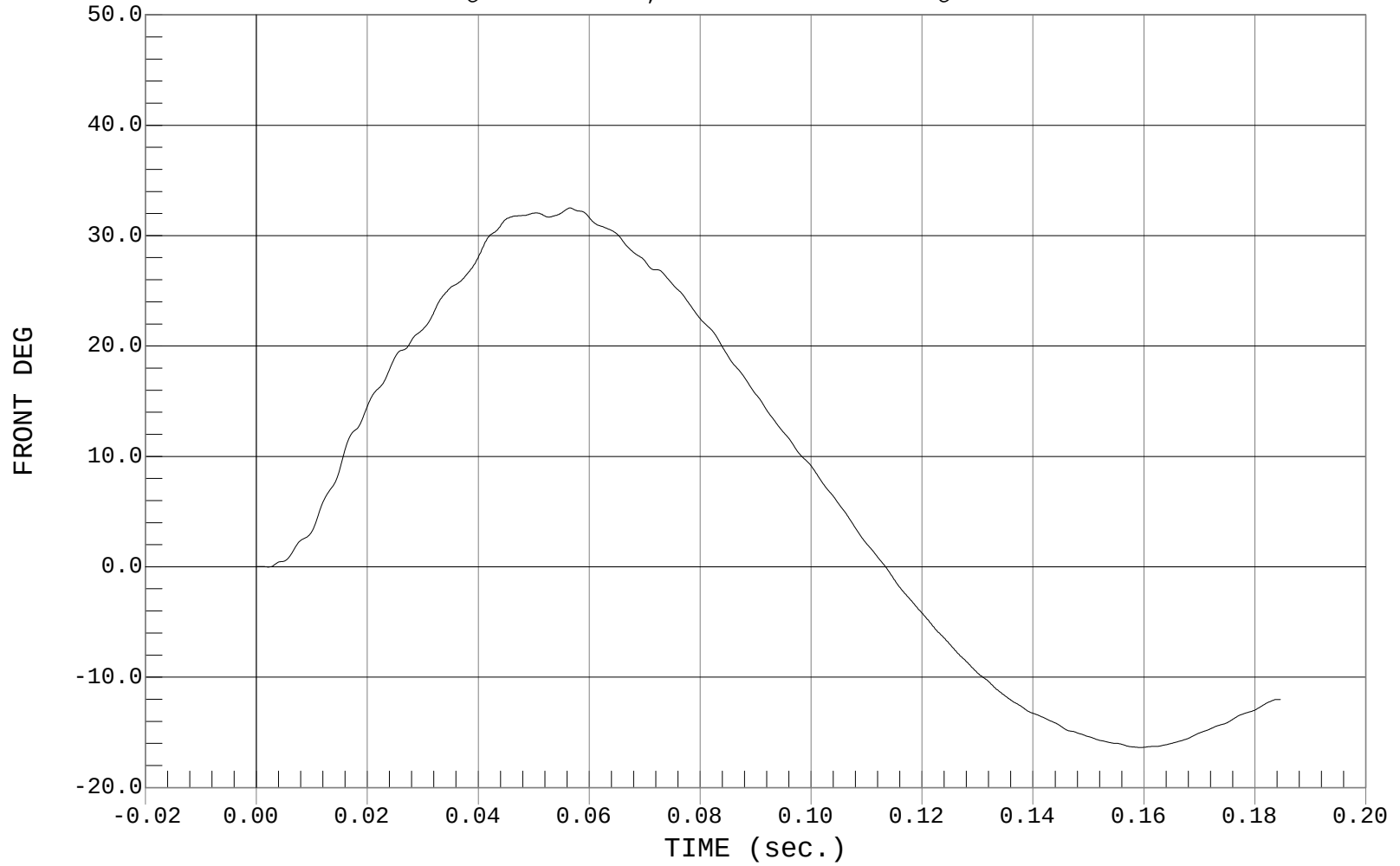
THETA A

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #009

Test Date: 08-05-01
Speed: 11.12 FT/SEC, 3.39 M/SEC

— 1 FRONT, D01132DT.D05

Ymin = -16.36 DEG @ 0.1594 sec., Ymax = 32.51 DEG @ 0.0565 sec.



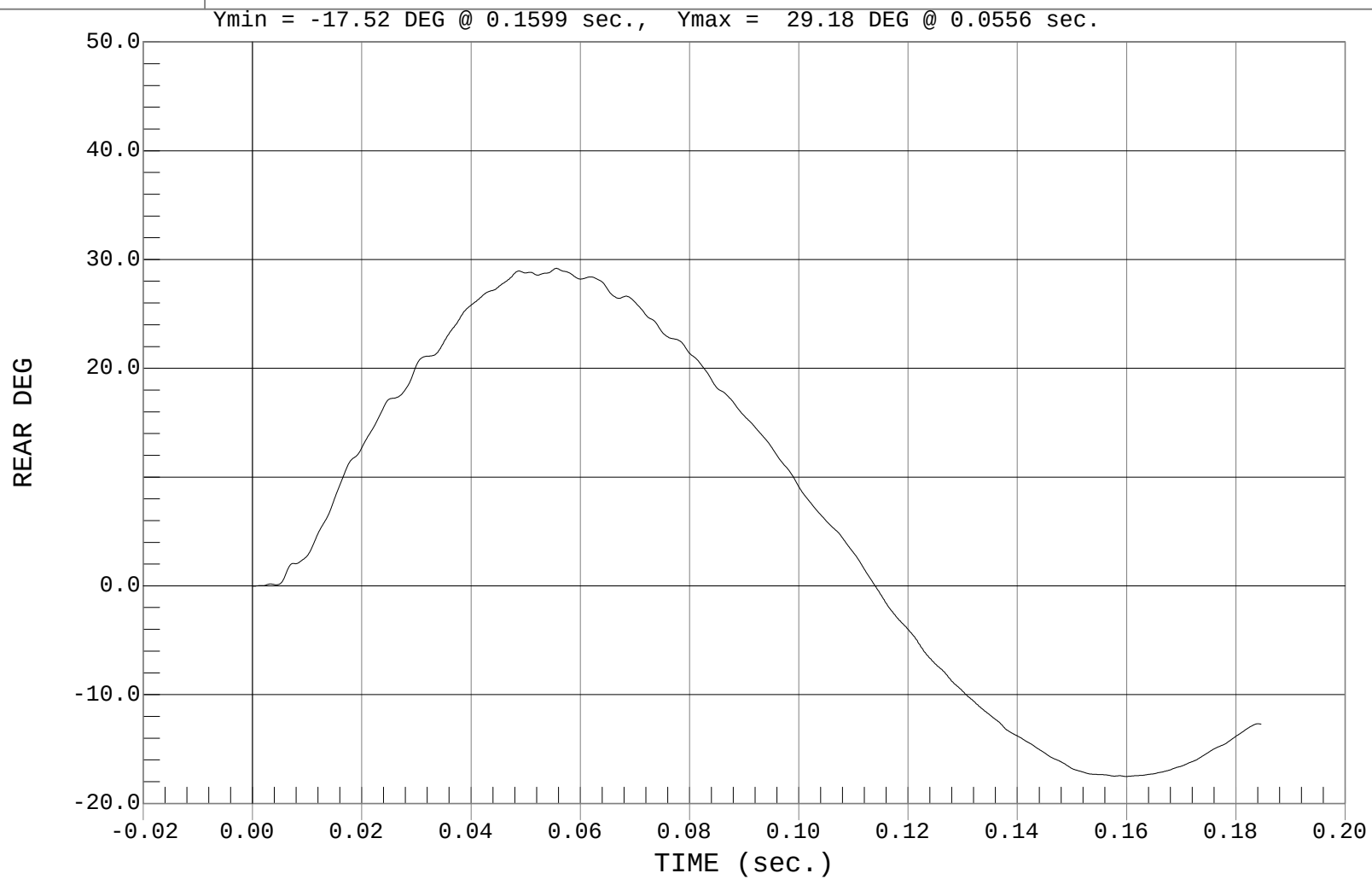


THETA B

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #009

Test Date: 08-05-01
Speed: 11.12 FT/SEC, 3.39 M/SEC

— 1 REAR, D01132DT.D06



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
EUROSID 2 DUMMY

Date: 8/7/01
Dummy Serial Number: 009
Test Number: D011133

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21.9
Relative Humidity (%)	10 – 70	62
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	8.7
Time of Max. Pendulum Acceleration		22.7 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



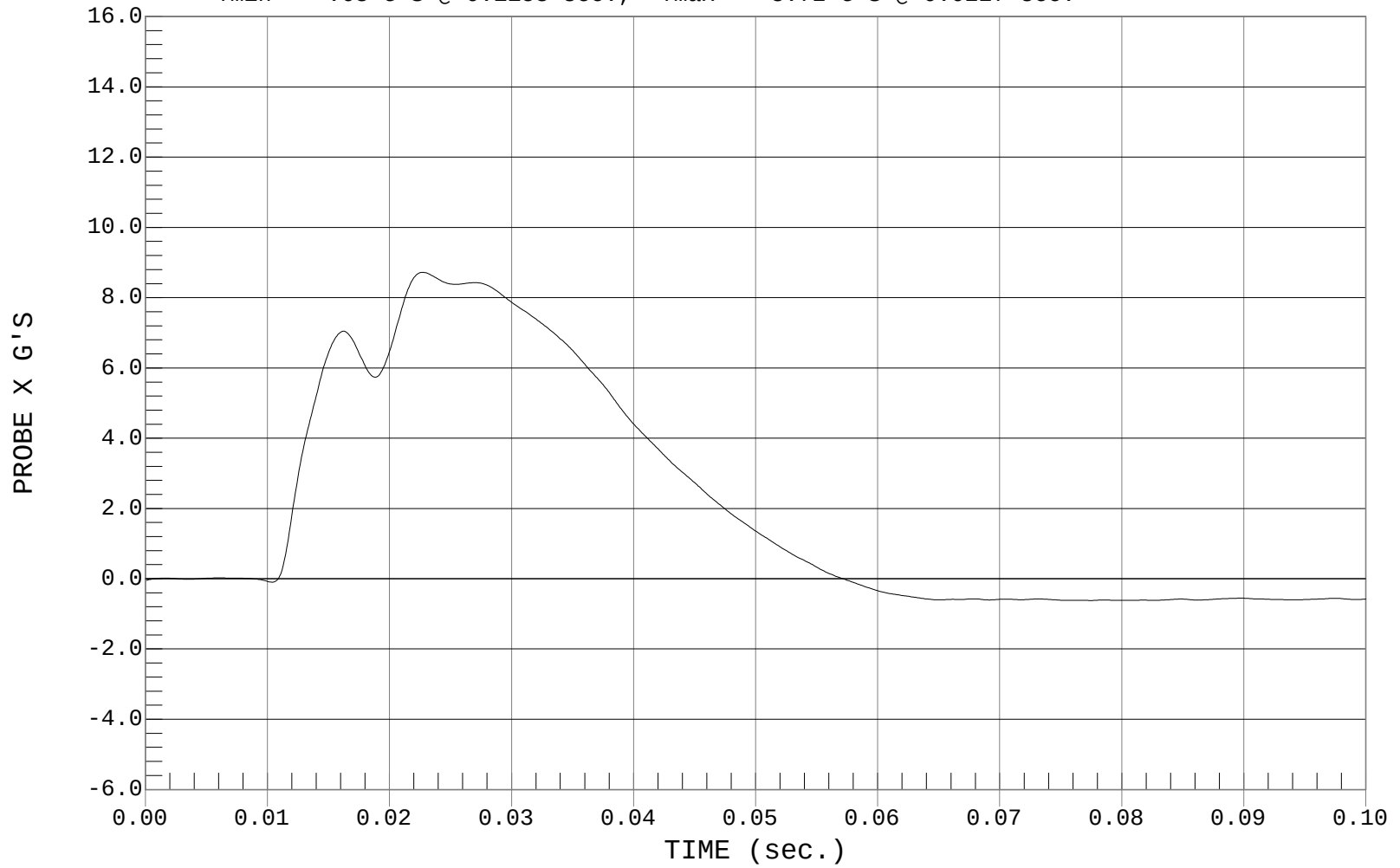
SHOULDER ACCELERATION

Test Desc.: Dummy Calibration - Shoulder Impact
Component: Dummy #009

Test Date: 08-07-01
Speed: 14.11 FT/SEC, 4.30 M/SEC

— 1 PROBE X, D01133AF.A01

Ymin = -.63 G'S @ 0.1153 sec., Ymax = 8.72 G'S @ 0.0227 sec.



MGA RESEARCH CORPORATION
UPPER/MIDDLE/LOWER RIB TESTS
SIDE IMPACT DUMMY (SID)

Date: 8/5/01
Dummy Serial Number: 009
Test Number: D011134/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.9
Relative Humidity (%)	10 – 70	55
Displacement at 2 m/s	23.5 – 27.5 mm	24.6
Displacement at 3 m/s	36.0 – 40.0 mm	38.5
Displacement at 4 m/s	46.0 – 51.0 mm	50.3

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.9
Relative Humidity (%)	10 – 70	55
Displacement at 2 m/s	23.5 – 27.5 mm	25.4
Displacement at 3 m/s	36.0 – 40.0 mm	38.7
Displacement at 4 m/s	46.0 – 51.0 mm	49.5

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.9
Relative Humidity (%)	10 – 70	55
Displacement at 2 m/s	23.5 – 27.5 mm	25.2
Displacement at 3 m/s	36.0 – 40.0 mm	38.5
Displacement at 4 m/s	46.0 – 51.0 mm	49.8

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



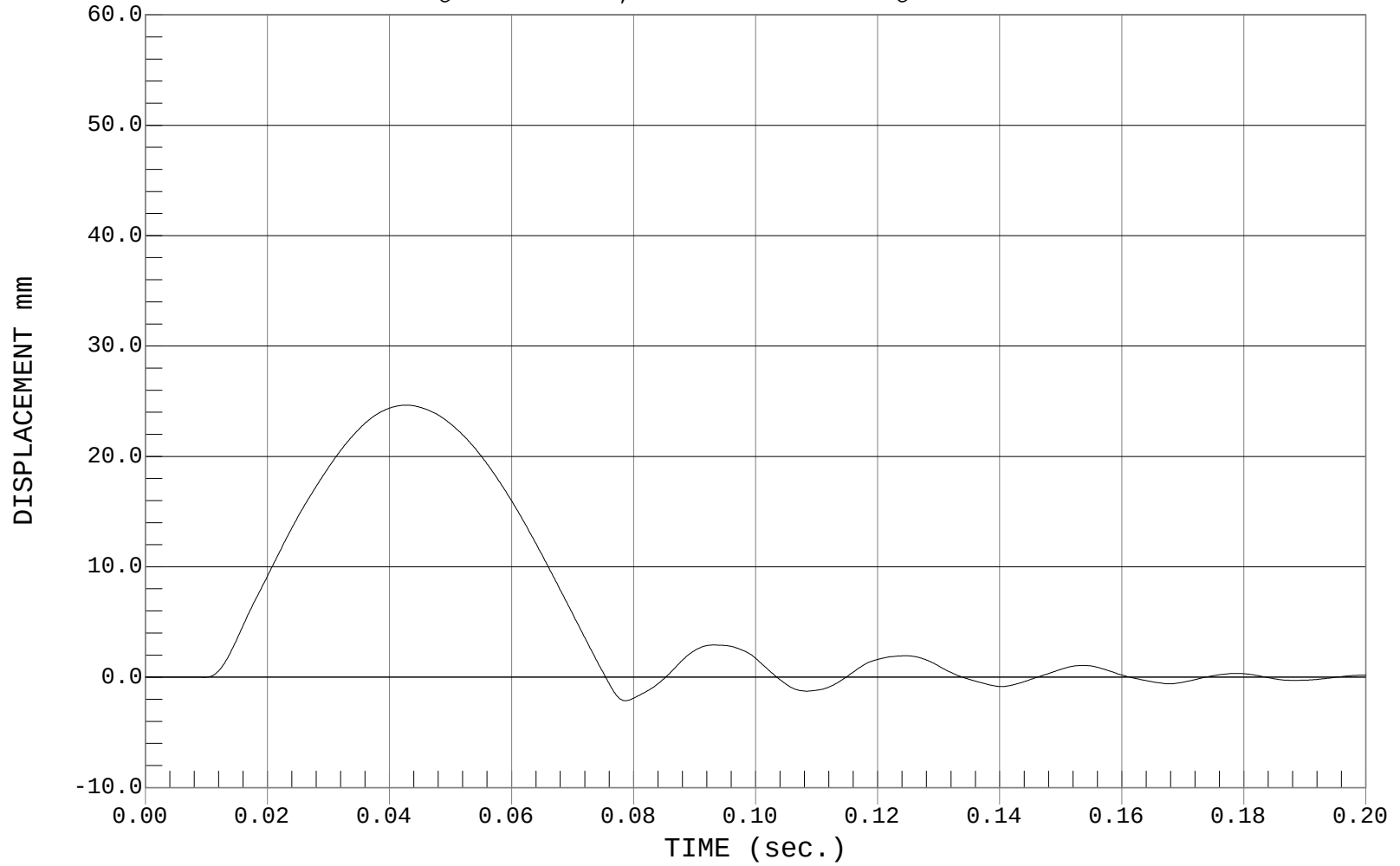
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-05-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01134DF.D05

Ymin = -2.13 mm @ 0.0787 sec., Ymax = 24.64 mm @ 0.0428 sec.





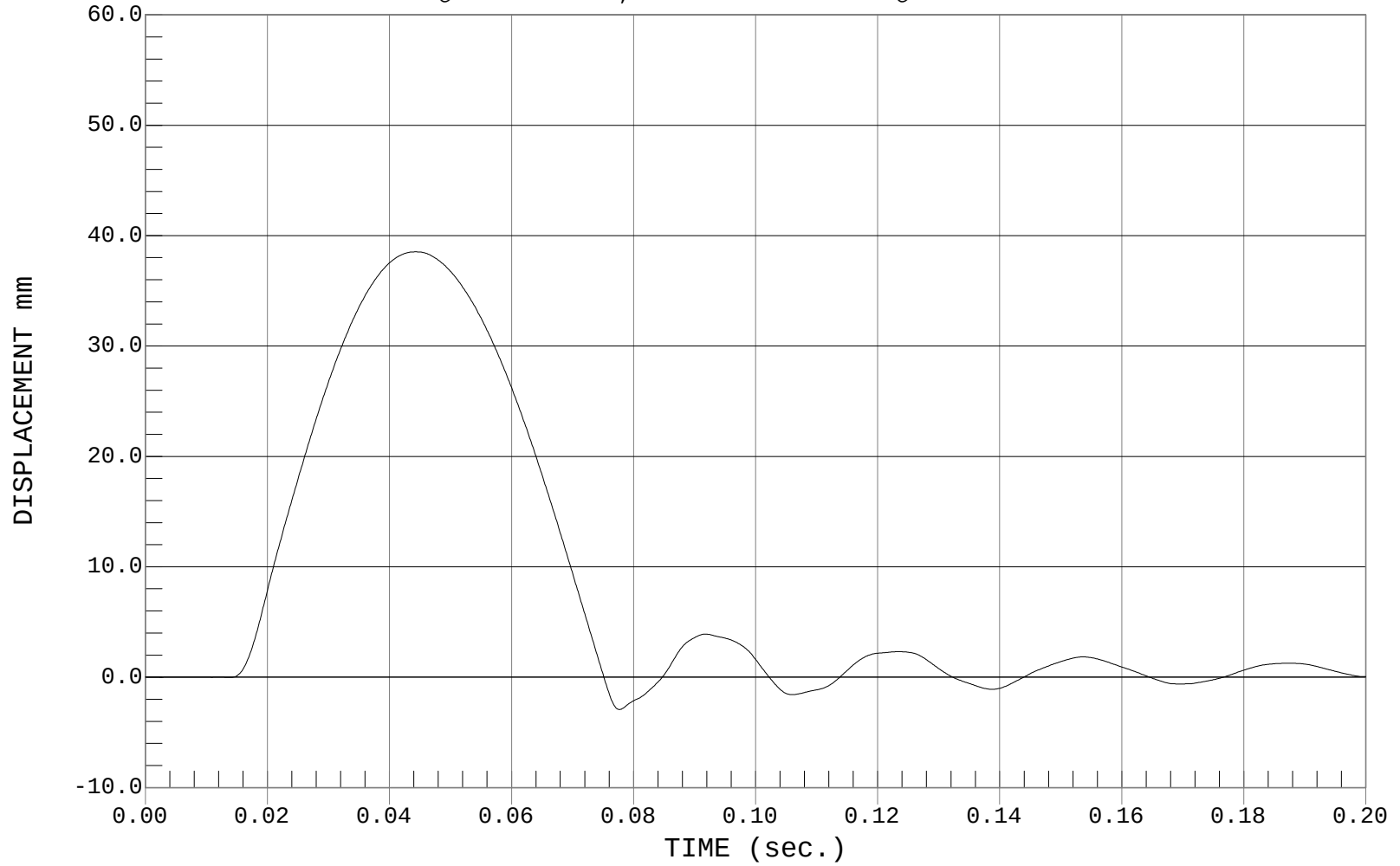
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-05-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01134DF.D06

Ymin = -2.94 mm @ 0.0777 sec., Ymax = 38.53 mm @ 0.0443 sec.





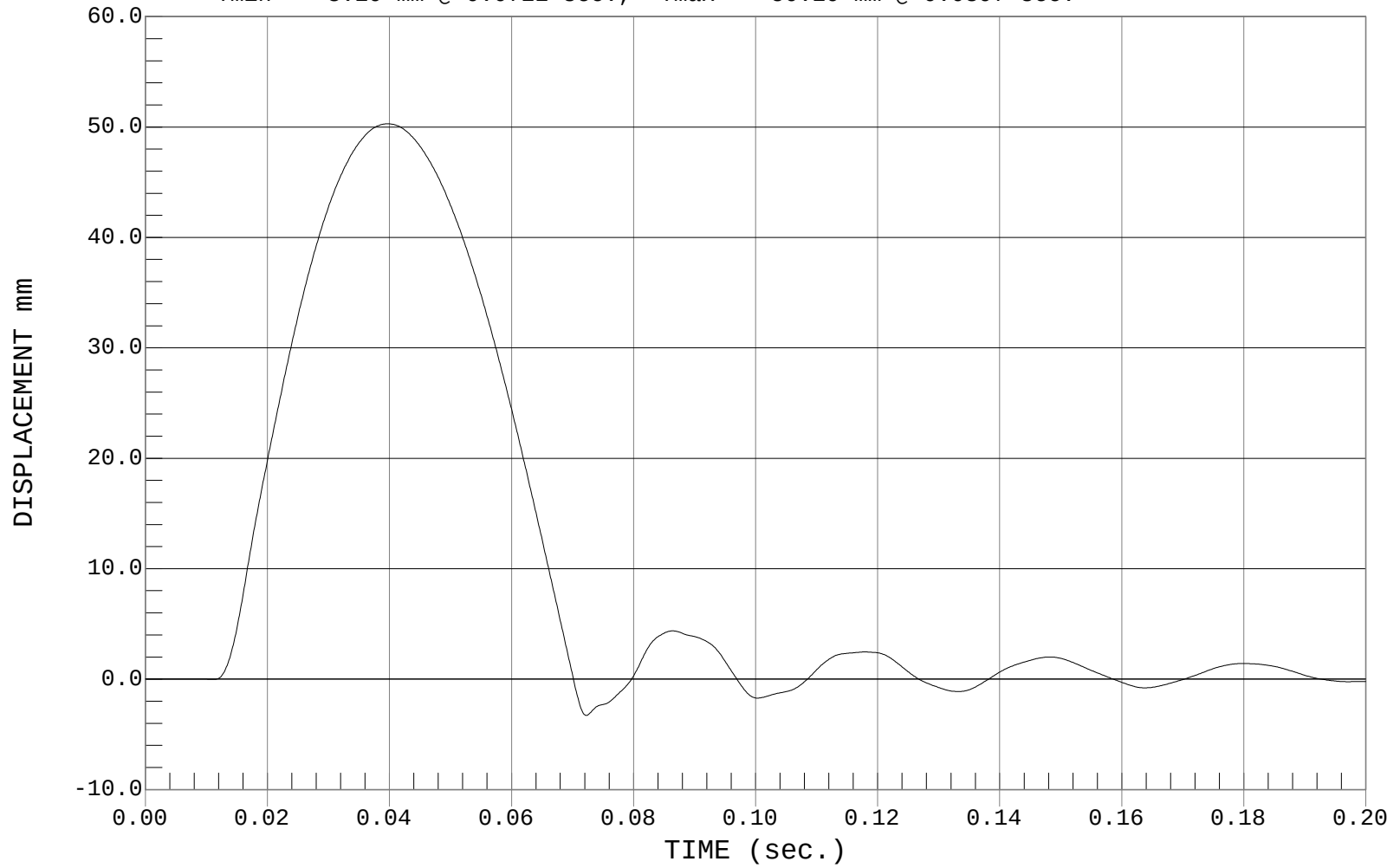
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-05-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01134DF.D07

Ymin = -3.29 mm @ 0.0722 sec., Ymax = 50.29 mm @ 0.0397 sec.





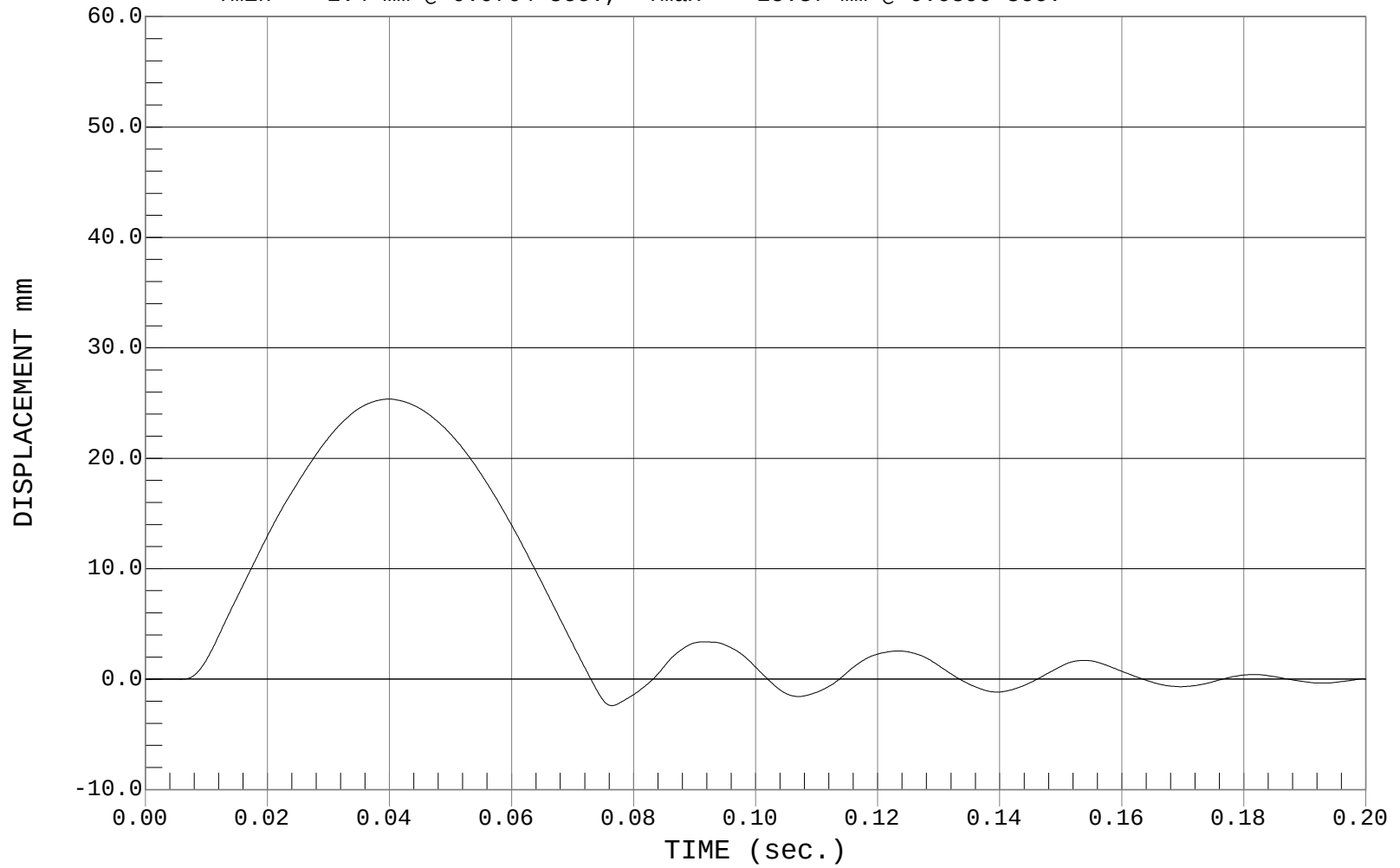
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-05-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01135DF.D05

Ymin = -2.4 mm @ 0.0764 sec., Ymax = 25.37 mm @ 0.0399 sec.





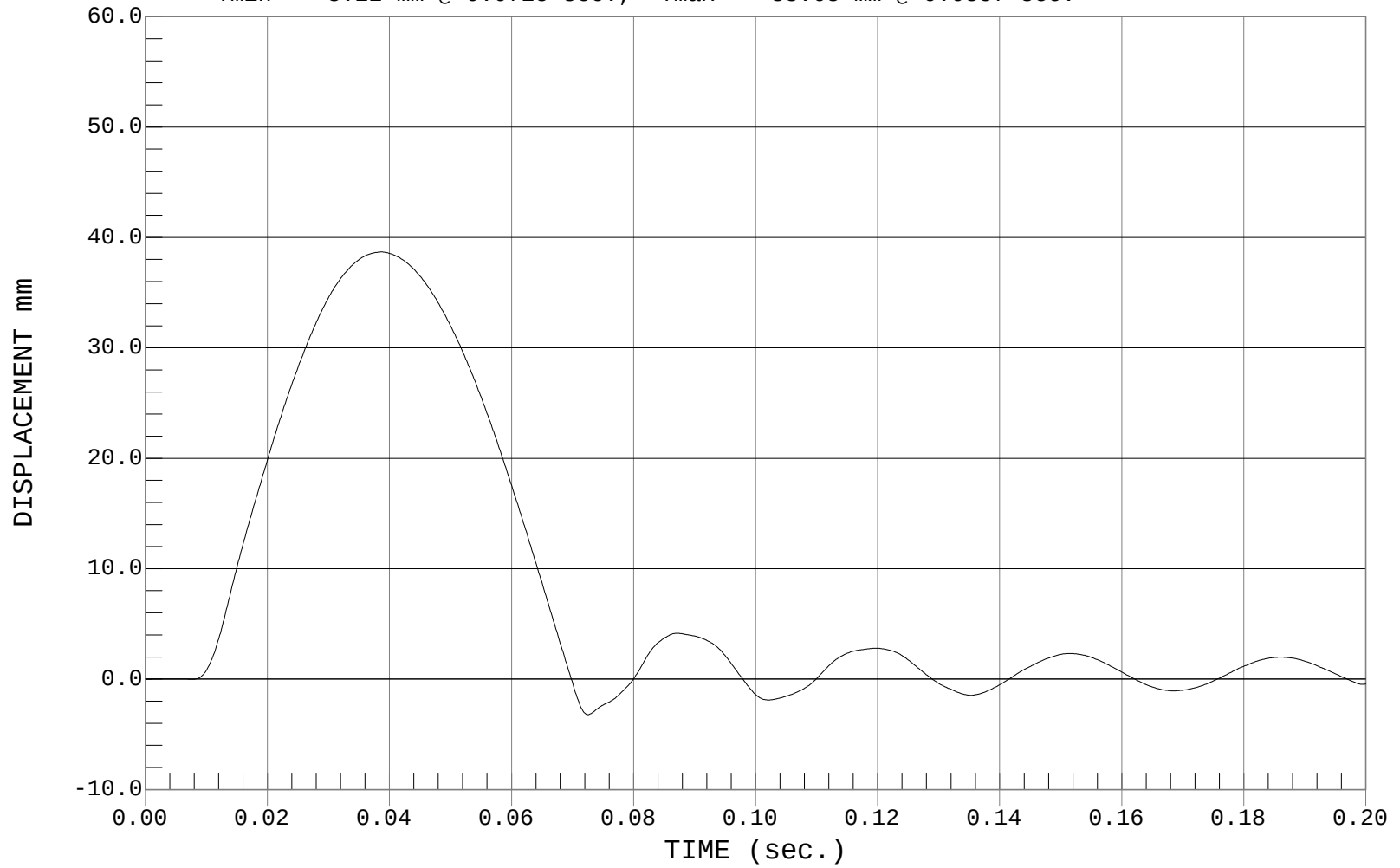
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-05-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01135DF.D06

Ymin = -3.22 mm @ 0.0725 sec., Ymax = 38.68 mm @ 0.0387 sec.





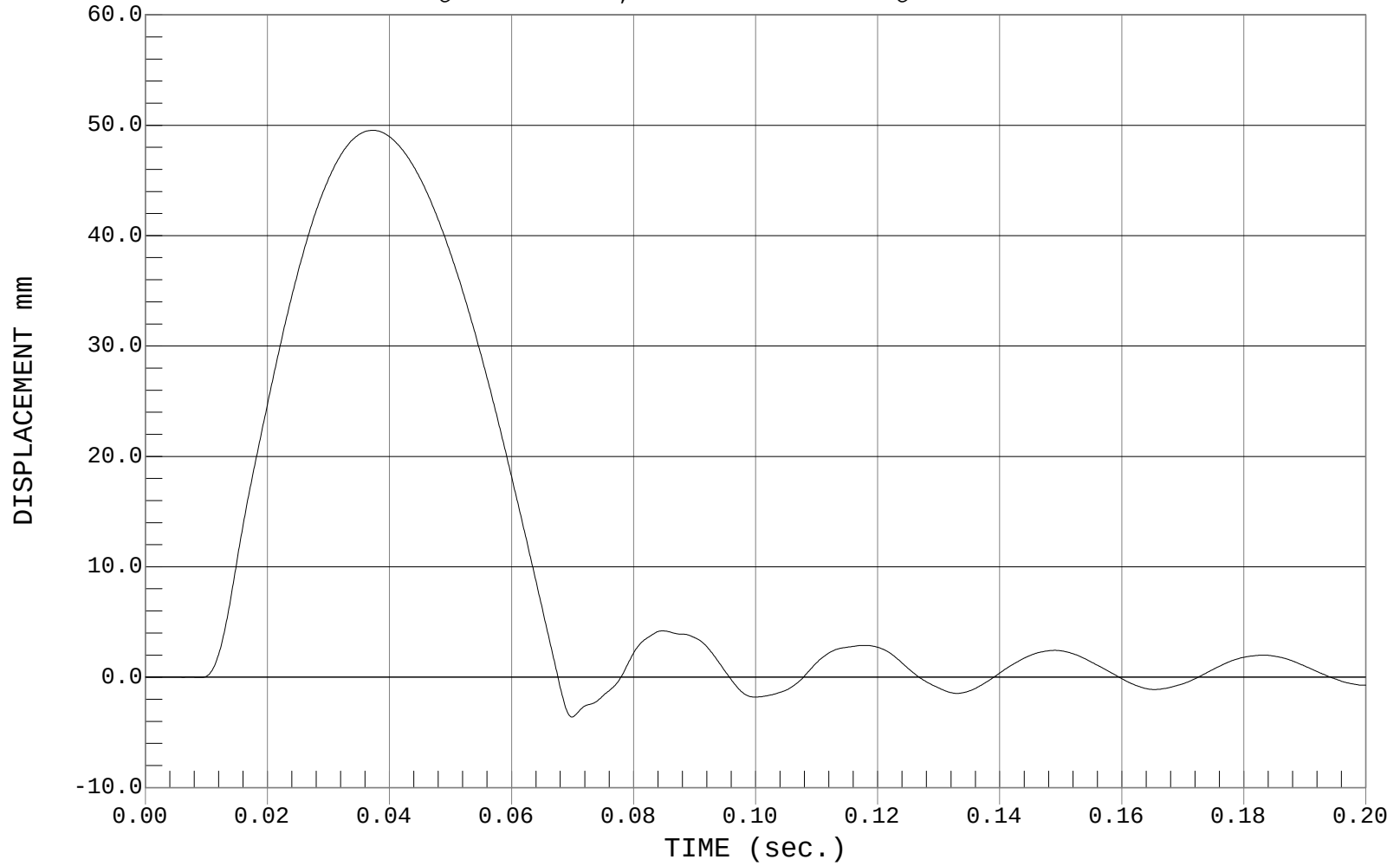
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-05-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01135DF.D07

Ymin = -3.61 mm @ 0.0699 sec., Ymax = 49.54 mm @ 0.0373 sec.





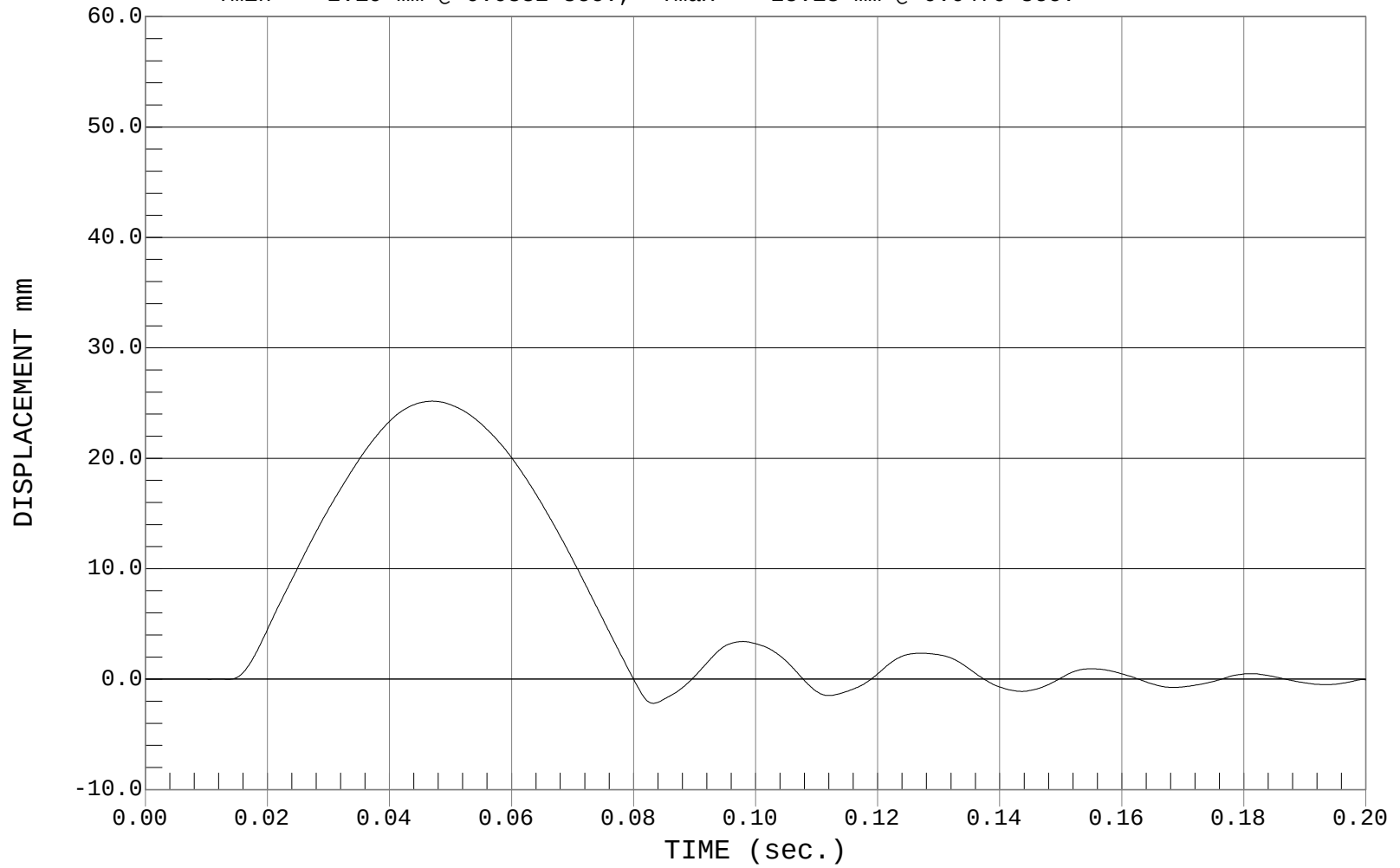
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-05-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01136DF.D05

Ymin = -2.19 mm @ 0.0832 sec., Ymax = 25.18 mm @ 0.0470 sec.





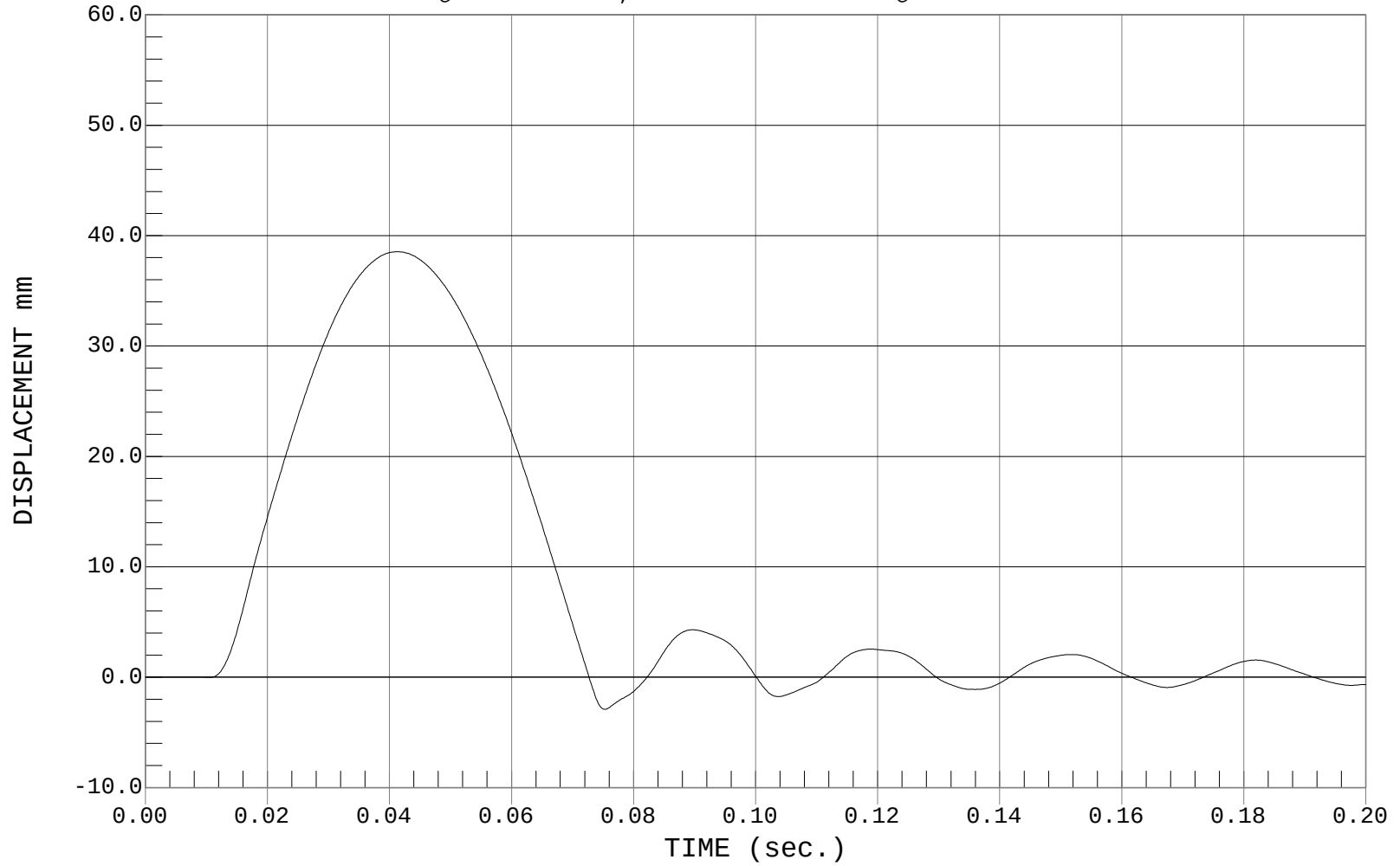
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-05-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01136DF.D06

Ymin = -2.91 mm @ 0.0753 sec., Ymax = 38.54 mm @ 0.0413 sec.





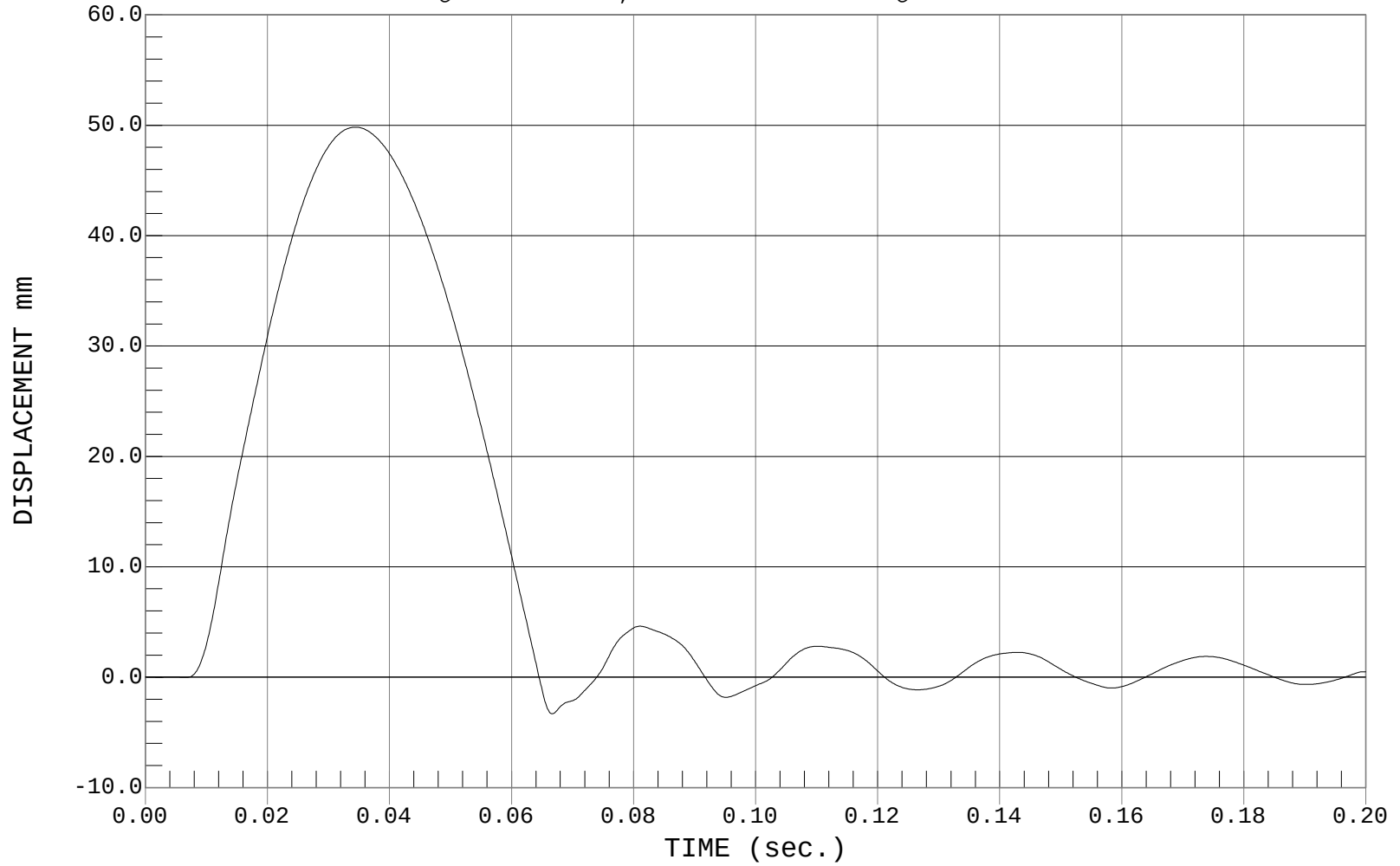
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-05-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01136DF.D07

Ymin = -3.32 mm @ 0.0667 sec., Ymax = 49.82 mm @ 0.0344 sec.



MGA RESEARCH CORPORATION
ABDOMEN TEST
EUROSID 2 DUMMY

Date: 8/7/01
Dummy Serial Number: 009
Test Number: D011137

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21.9
Relative Humidity (%)	10 – 70	62
Probe Speed (m/s)	3.90 – 4.10	3.95
Maximum Impact Force	4.00 – 4.80 kN	4.31
Time of Maximum Force	10.60 – 13.00 ms	11.60
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.30
Time of Max. Total Force	10.00 – 12.30 ms	11.00

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



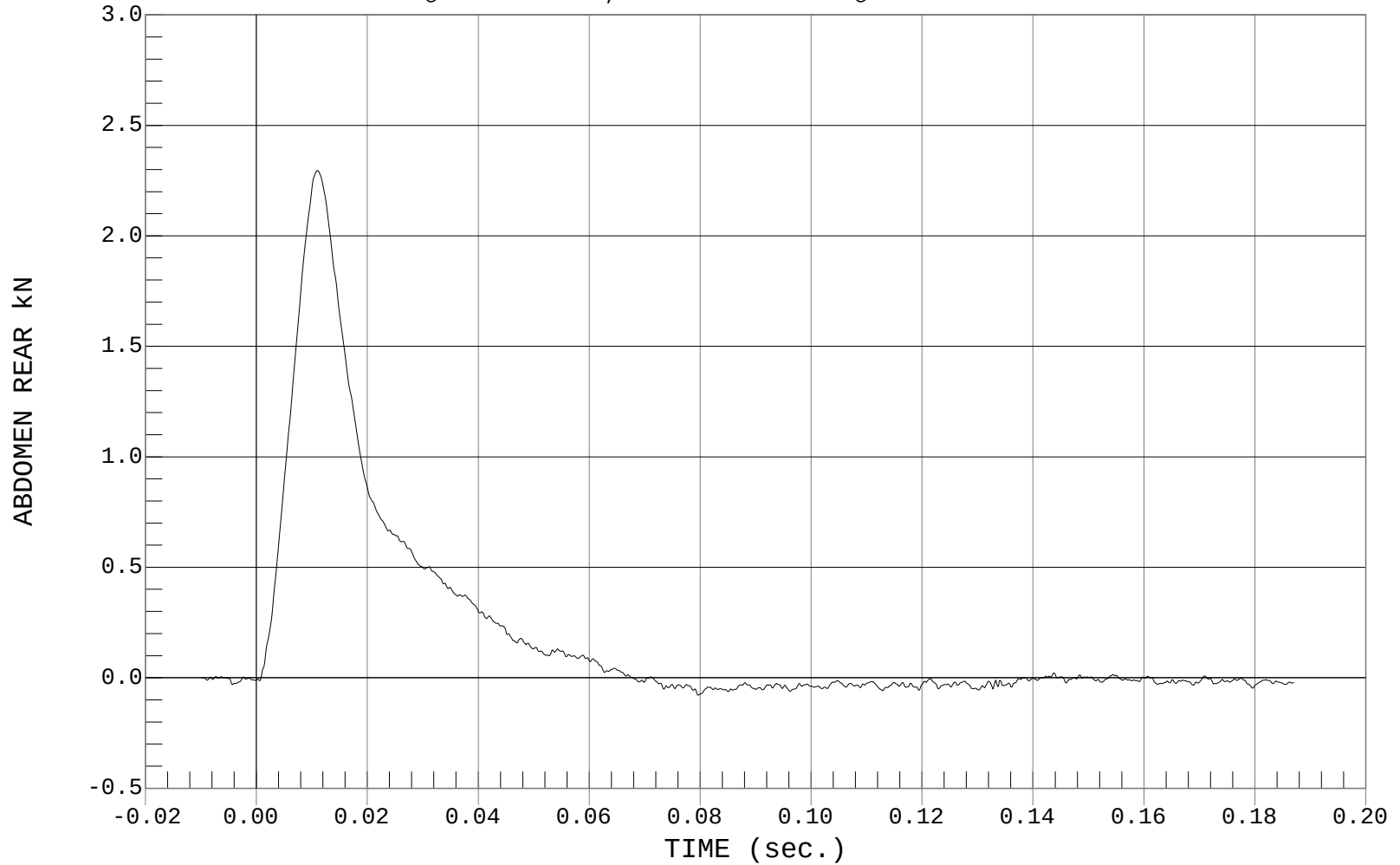
ABDOMEN FORCE

Test Desc.: Dummy Calibration - Abdomen Impact
Component: Dummy #009

Test Date: 08-07-01
Speed: 12.95 FT/SEC, 3.95 M/SEC

— 1 ABDOMEN REAR, D01137FT.F02

Ymin = -.08 kN @ 0.0796 sec., Ymax = 2.3 kN @ 0.0110 sec.





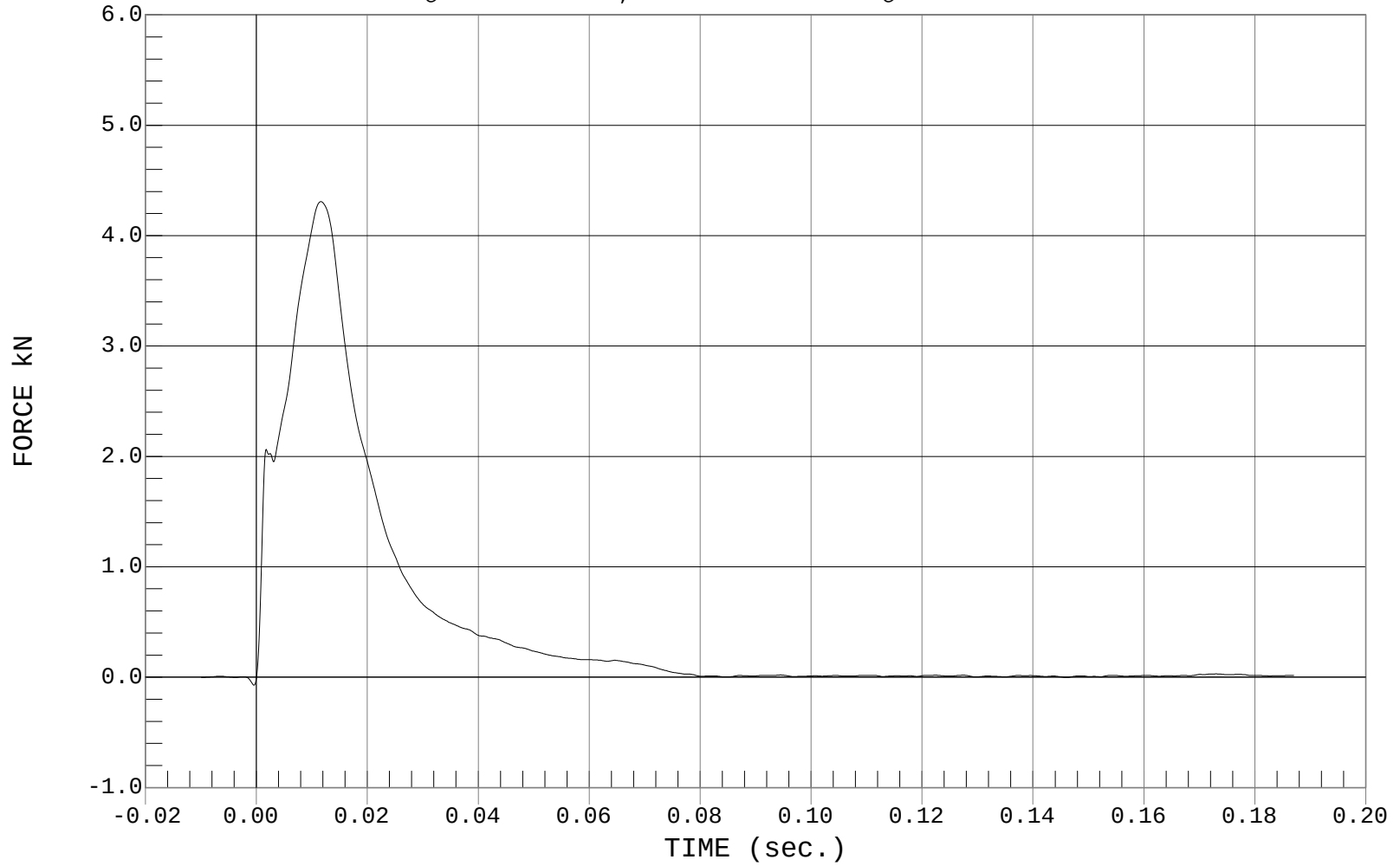
IMPACTOR FORCE

Test Desc.: Dummy Calibration - Abdomen Impact
Component: Dummy #009

Test Date: 08-07-01
Speed: 12.95 FT/SEC, 3.95 M/SEC

— 1 FORCE, D01137FT.F01

Ymin = -.07 kN @ -0.0004 sec., Ymax = 4.31 kN @ 0.0116 sec.



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
EUROSID 2 DUMMY

Date: 8/5/01
Dummy Serial Number: 009
Test Number: D011138

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18 – 22	20.9
Relative Humidity (%)		10 – 70	55
Pendulum Speed		5.95 – 6.15	6.09
Pendulum Deceleration	10 msec	$\bar{2}.46 - \bar{1}.59$ m/sec	-1.84
	20 msec	$\bar{5}.25 - \bar{4}.07$ m/sec	-4.25
	25 msec	$\bar{6}.64 - \bar{5}.3$ m/sec	-5.34
	30 msec	≥ -6.5 m/sec	-6.08
Maximum Flexion Angle		45.0 – 55.0 deg	50.7
Time of Max. Flexion Angle		39.0 – 53.0 ms	45.0
Maximum Angle Theta (A)		31.0 – 35.0 deg	32.1
Time of Max. Theta (A)		44.0 – 52.0 ms	45.1
Maximum Angle Theta (B)		27.68– 30.18 deg	28.18
Time of Max. Theta (B)		44.0 – 52.0 ms	45.3

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



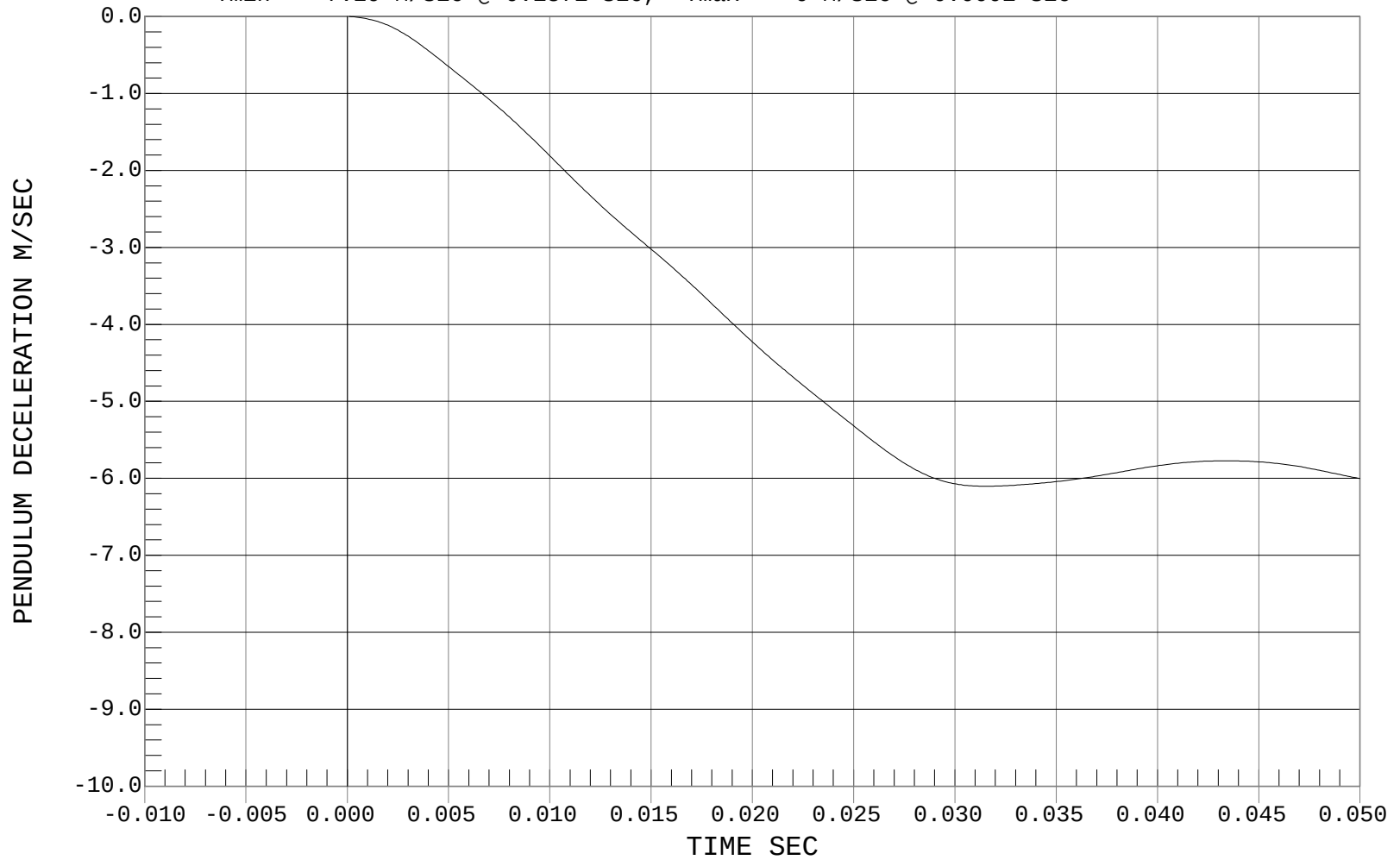
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy #009

Test Date: 08-05-01
Speed: 19.97 FT/SEC, 6.09 M/SEC

— 1 PENDULUM DECELERATION, D01138AI.V04

Ymin = -7.29 M/SEC @ 0.1371 SEC, Ymax = 0 M/SEC @ 0.0001 SEC





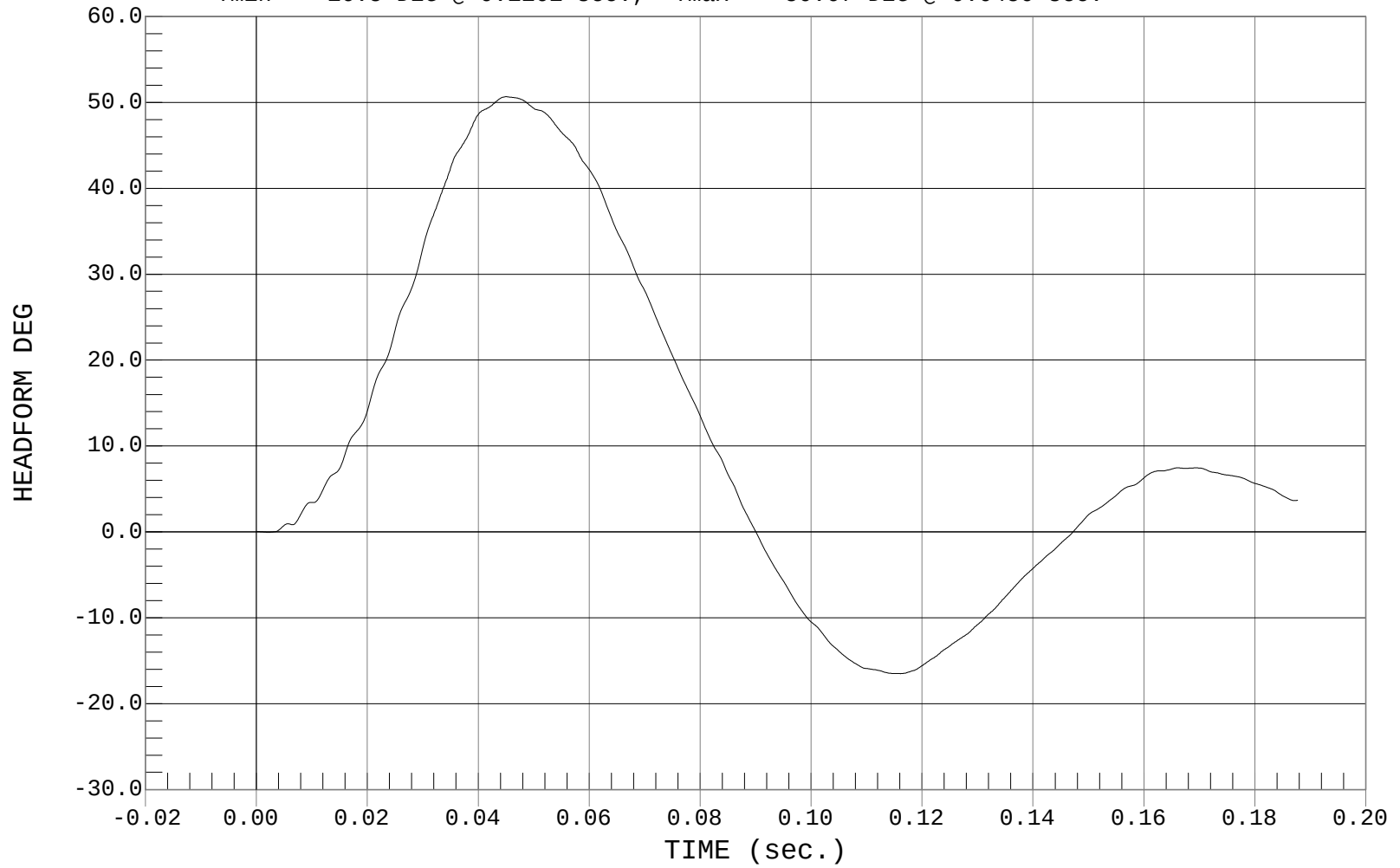
FLEXION ANGLE

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy #009

Test Date: 08-05-01
Speed: 19.97 FT/SEC, 6.09 M/SEC

— 1 HEADFORM, D01138DT.D08

Ymin = -16.5 DEG @ 0.1161 sec., Ymax = 50.67 DEG @ 0.0450 sec.





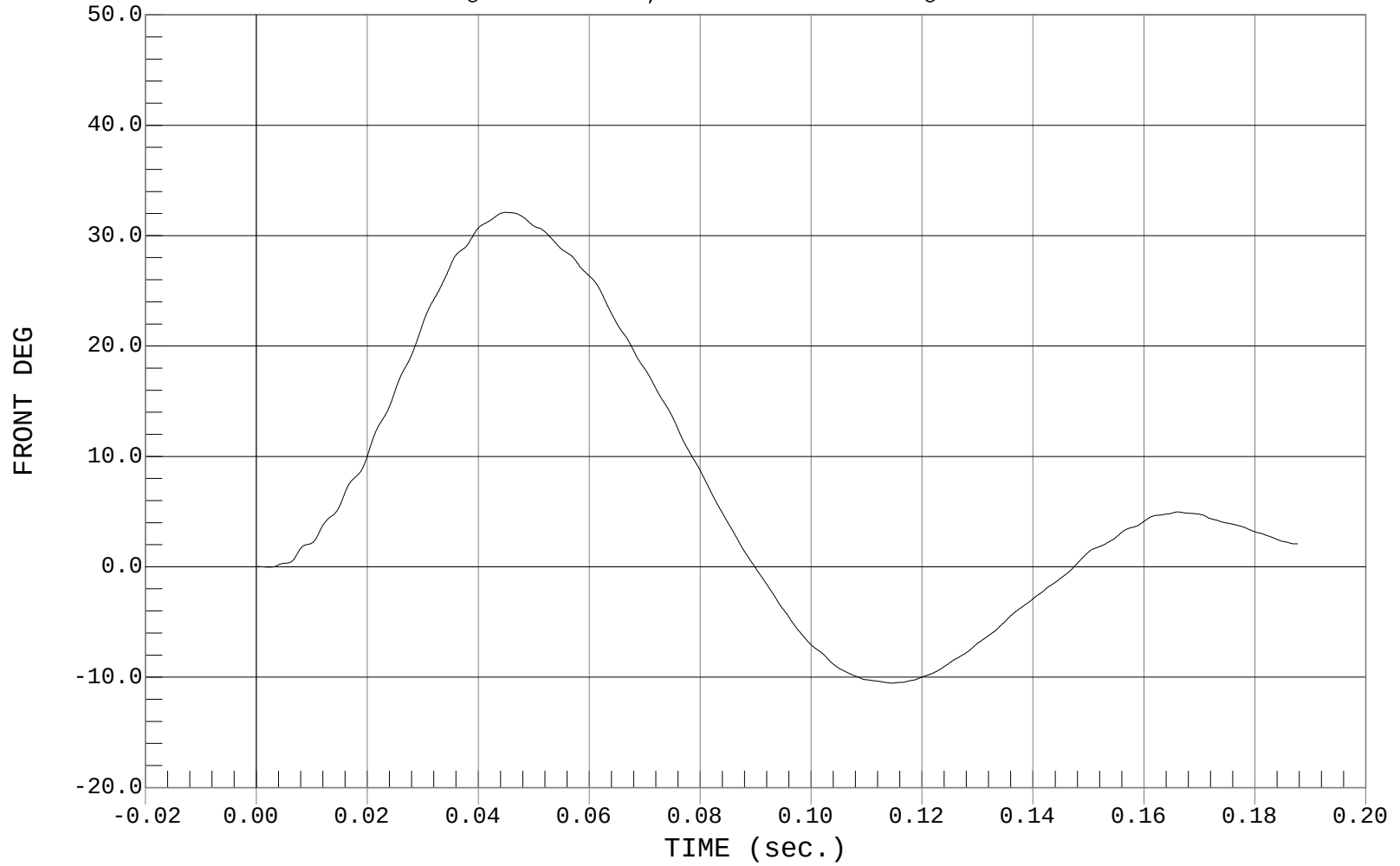
THETA A

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy #009

Test Date: 08-05-01
Speed: 19.97 FT/SEC, 6.09 M/SEC

— 1 FRONT, D01138DT.D05

Ymin = -10.54 DEG @ 0.1146 sec., Ymax = 32.1 DEG @ 0.0451 sec.





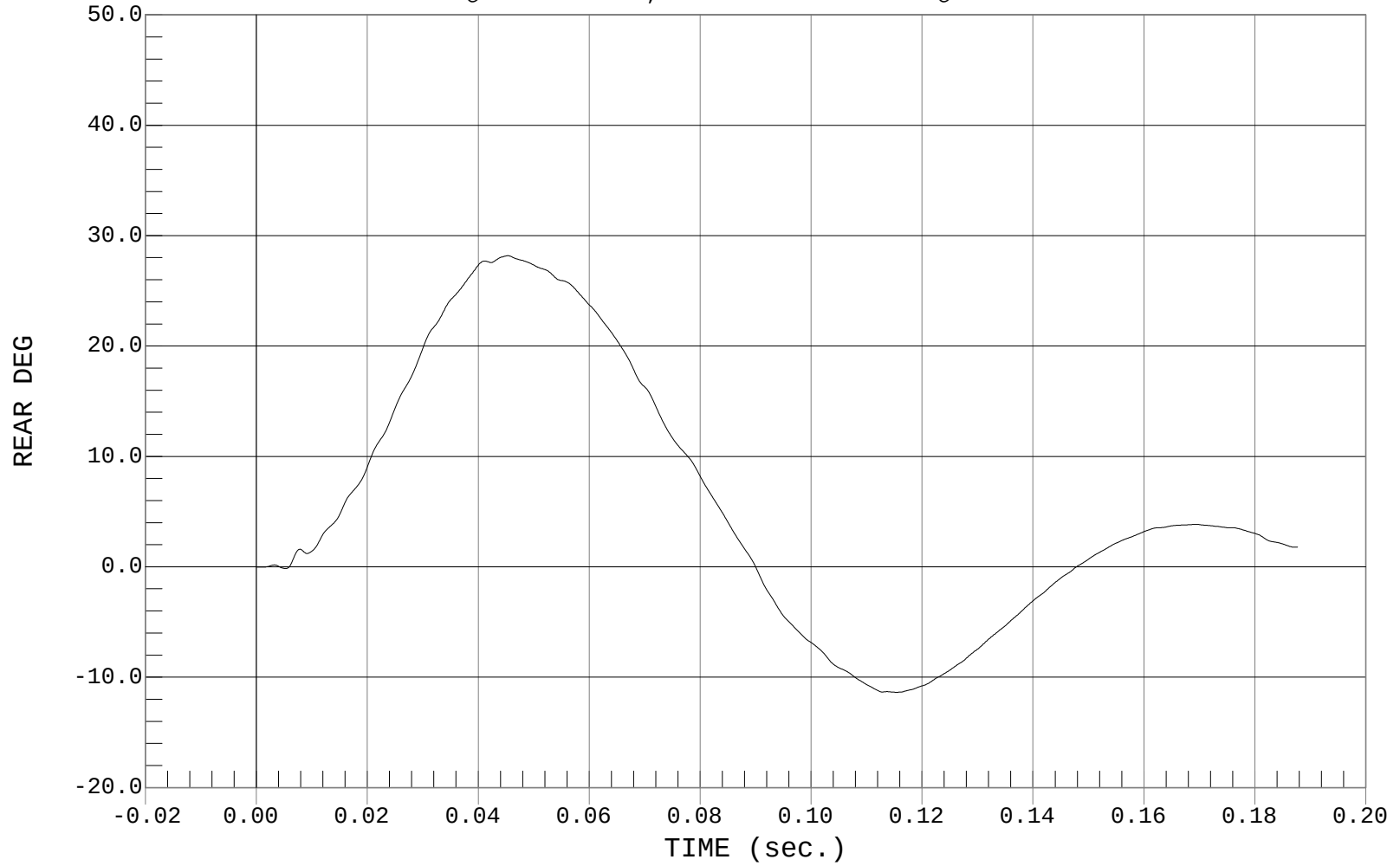
THETA B

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy #009

Test Date: 08-05-01
Speed: 19.97 FT/SEC, 6.09 M/SEC

— 1 REAR, D01138DT.D06

Ymin = -11.37 DEG @ 0.1154 sec., Ymax = 28.18 DEG @ 0.0453 sec.



MGA RESEARCH CORPORATION
PELVIS TEST
EUROSID 2 DUMMY

Date: 8/7/01
Dummy Serial Number: 009
Test Number: D011139

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	22.0
Relative Humidity (%)	10 – 70	63
Pendulum Speed	6.20 – 6.30 m/s	6.23
Maximum Impactor Force	9.80 – 12.20 kN	10.83
Time of Max. Impactor Force	9.50 – 12.50 ms	11.60
Maximum Pubic Force	2.65 – 3.35 kN	3.22
Time of Max. Pubic Force	10.00 – 13.00 ms	12.40

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



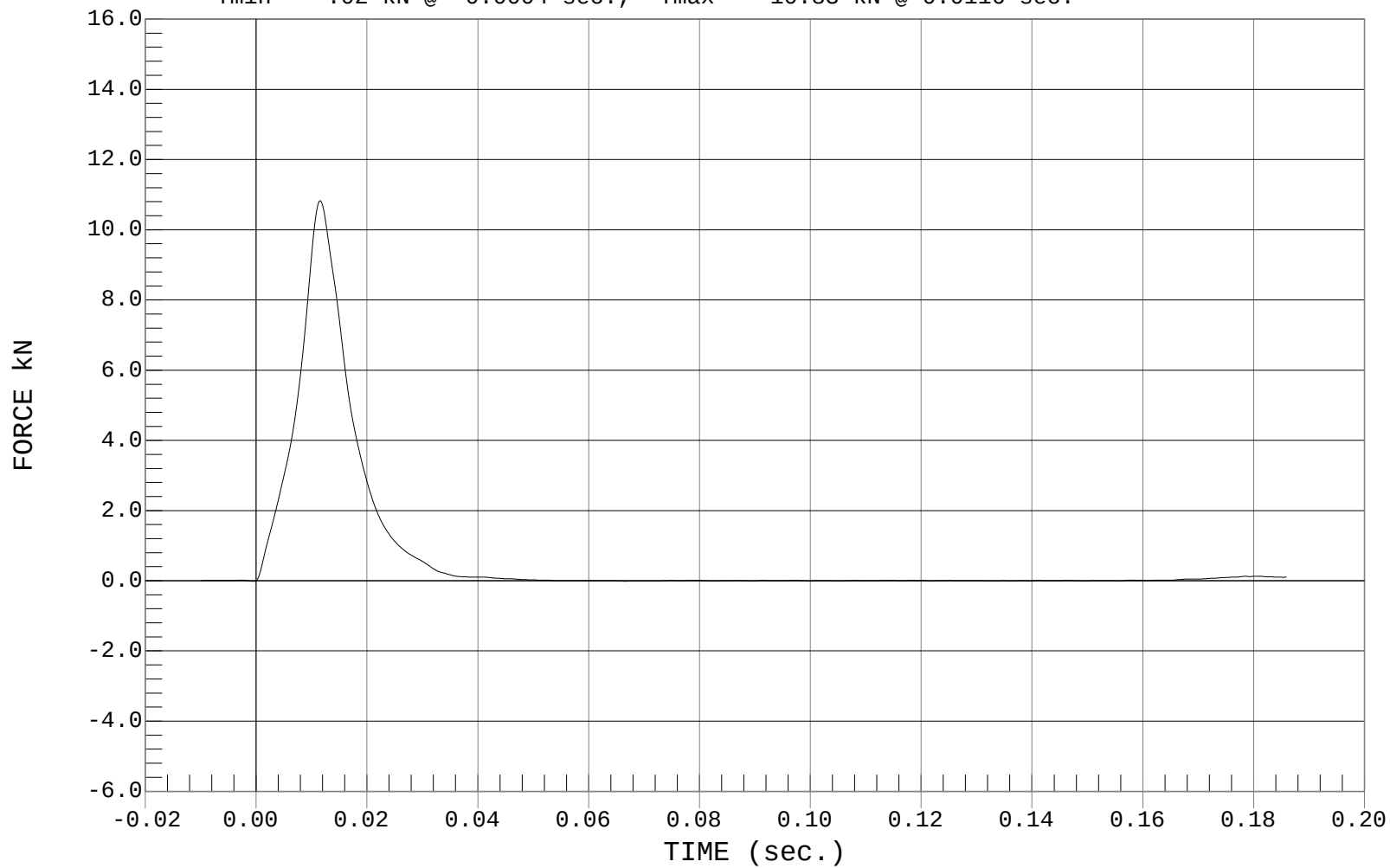
IMPACTOR FORCE

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #009

Test Date: 08-07-01
Speed: 20.43 FT/SEC, 6.23 M/SEC

— 1 FORCE, D01139FT.F01

Ymin = -.02 kN @ -0.0004 sec., Ymax = 10.83 kN @ 0.0116 sec.





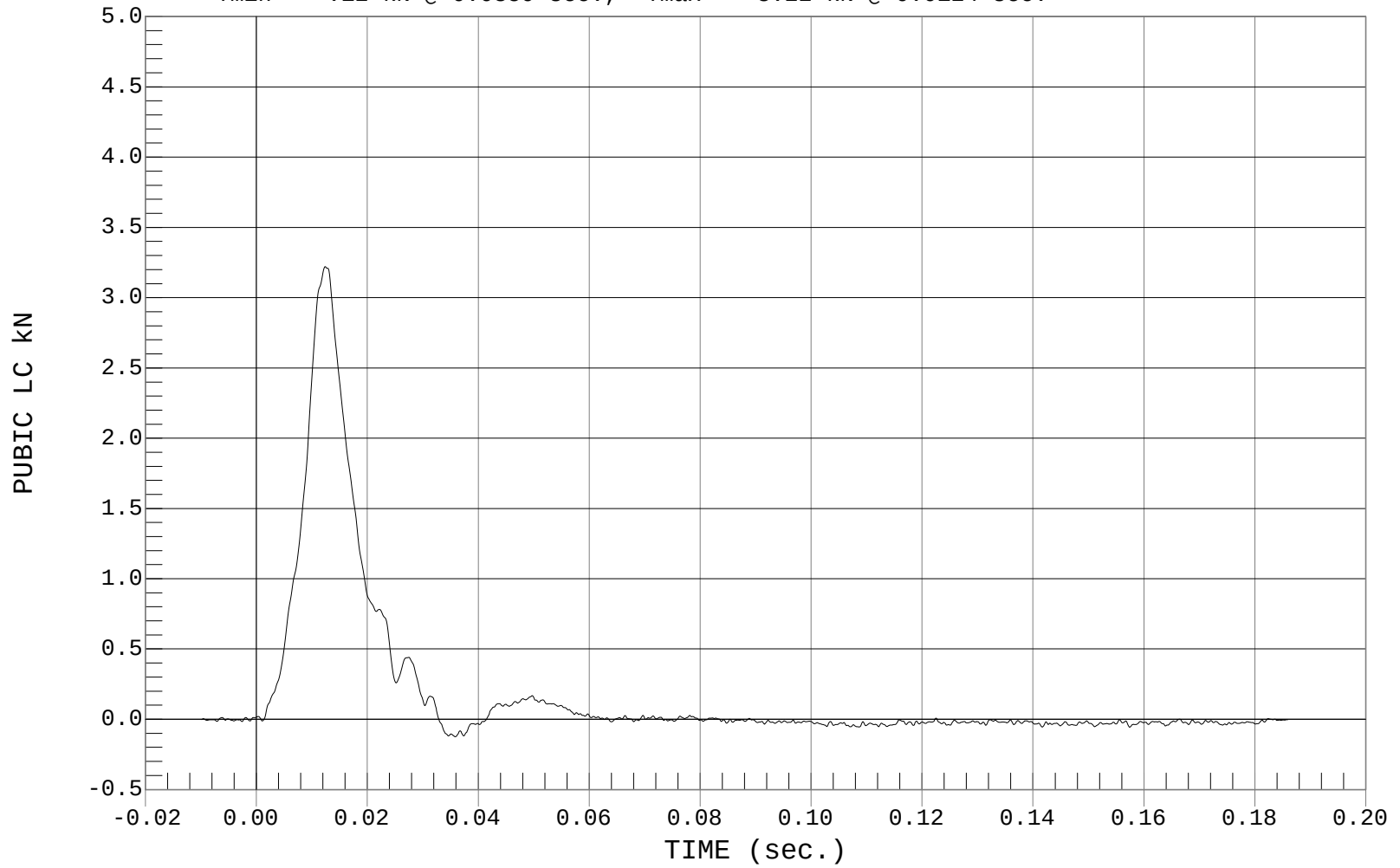
PUBIC FORCE

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #009

Test Date: 08-07-01
Speed: 20.43 FT/SEC, 6.23 M/SEC

— 1 PUBIC LC, D01139FT.F02

Ymin = -.12 kN @ 0.0359 sec., Ymax = 3.22 kN @ 0.0124 sec.



CERTIFICATION DATA

Dummy Serial Number: 009

Calibration Test Results Summary

Dummy Serial Number: 009

Post-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Pendulum Test:	The neck passed all impact test requirements.
Shoulder Impact Test:	The shoulder passed all impact test requirements.
Rib Tests:	All ribs passed all impact test requirements.
Abdomen Test:	The abdomen passed all impact test requirements.
Lumbar Spine Test:	The lumbar spine passed all impact test requirements.
Pelvis Test:	The pelvis passed all impact test requirements.

MGA RESEARCH CORPORATION
HEAD DROP TEST
EUROSID 2 DUMMY

Date: 8/13/01
Dummy Serial Number: 009
Test Number: D011151

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21.1
Relative Humidity (%)	10 – 70	52
Peak Resultant Acceleration	100 – 150 g's	139
Time of Max. Res. Acceleration		24.4 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



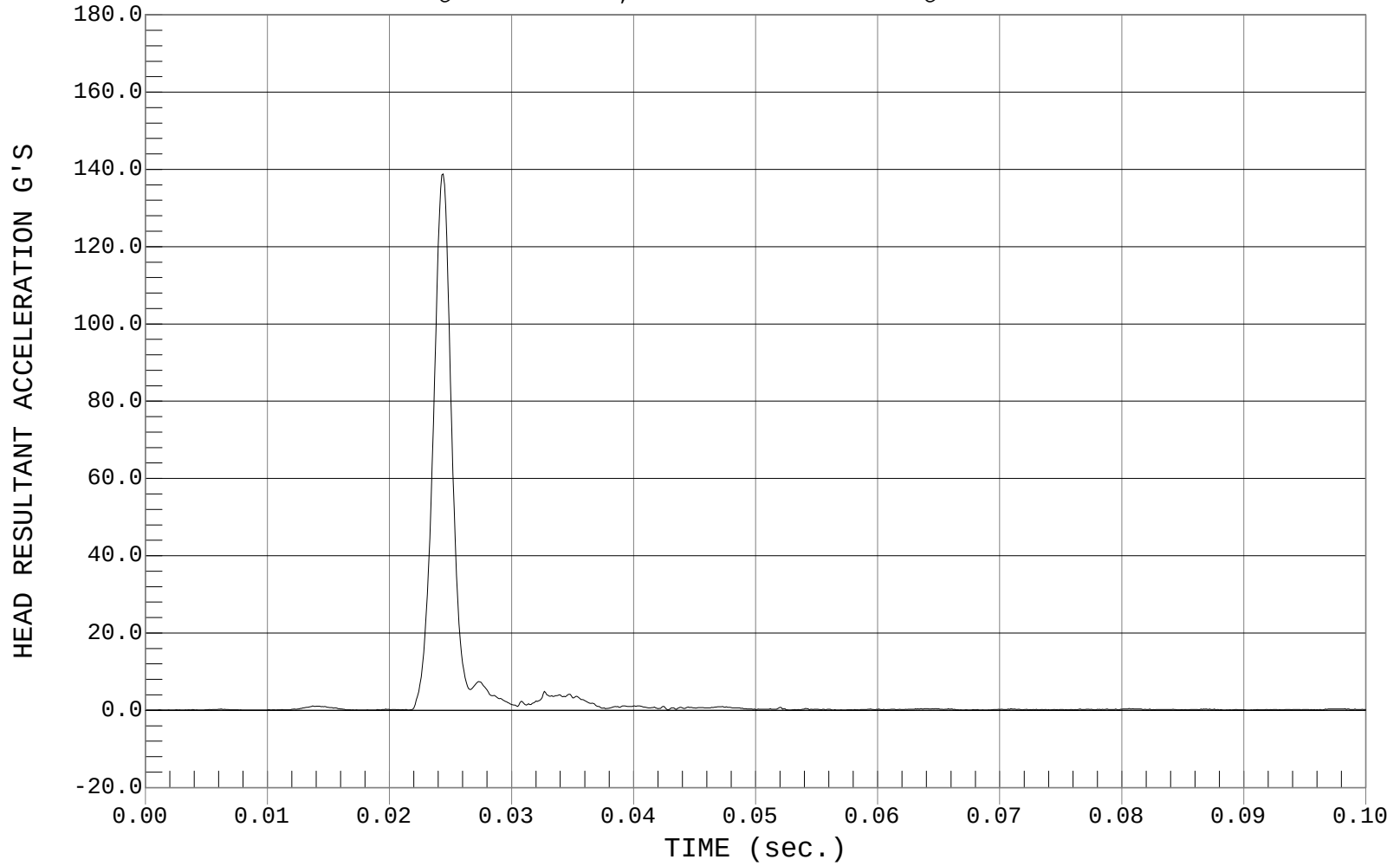
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #009

Test Date: 08-13-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01151AV.A01

Ymin = .05 G'S @ 0.0001 sec., Ymax = 138.87 G'S @ 0.0244 sec.



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
EUROSID 2 DUMMY

Date: 8/13/01
Dummy Serial Number: 09
Test Number: D011152

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18 – 22	21.1
Relative Humidity (%)		10 – 70	51
Pendulum Speed		3.3 - 3.5	3.4
Pendulum Deceleration	3 msec	~.25 - ~.53 m/sec	-.35
	8 msec	~1.59 - ~2.04 m/sec	-1.70
	14 msec	~3.20 - ~3.85 m/sec	-3.35
Maximum Flexion Angle		49.0 – 59.0 deg	56.8
Time of Max. Flexion Angle		54.0 – 66.0 ms	57.8
Maximum Angle Theta (A)		32.0 – 37.0 deg	34.4
Time of Max. Theta (A)		53.0 – 63.0 ms	57.4
Maximum Angle Theta (B)		29.61 – 32.11deg	30.54
Time of Max. Theta (B)		54.0 – 64.0 ms	57.1

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

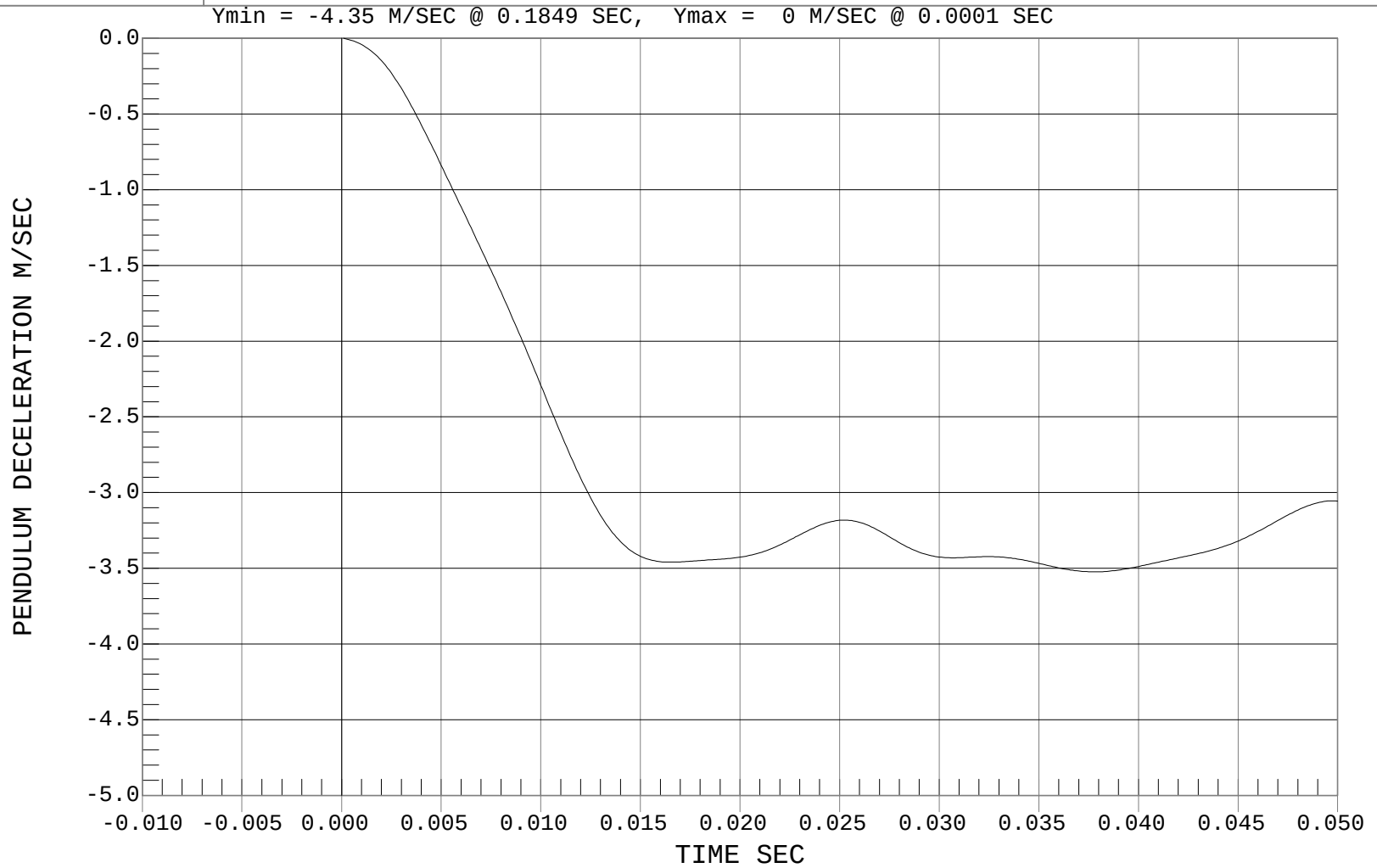


PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #009

Test Date: 08-13-01
Speed: 11.14 FT/SEC, 3.39 M/SEC

— 1 PENDULUM DECELERATION, D01152AI.V04





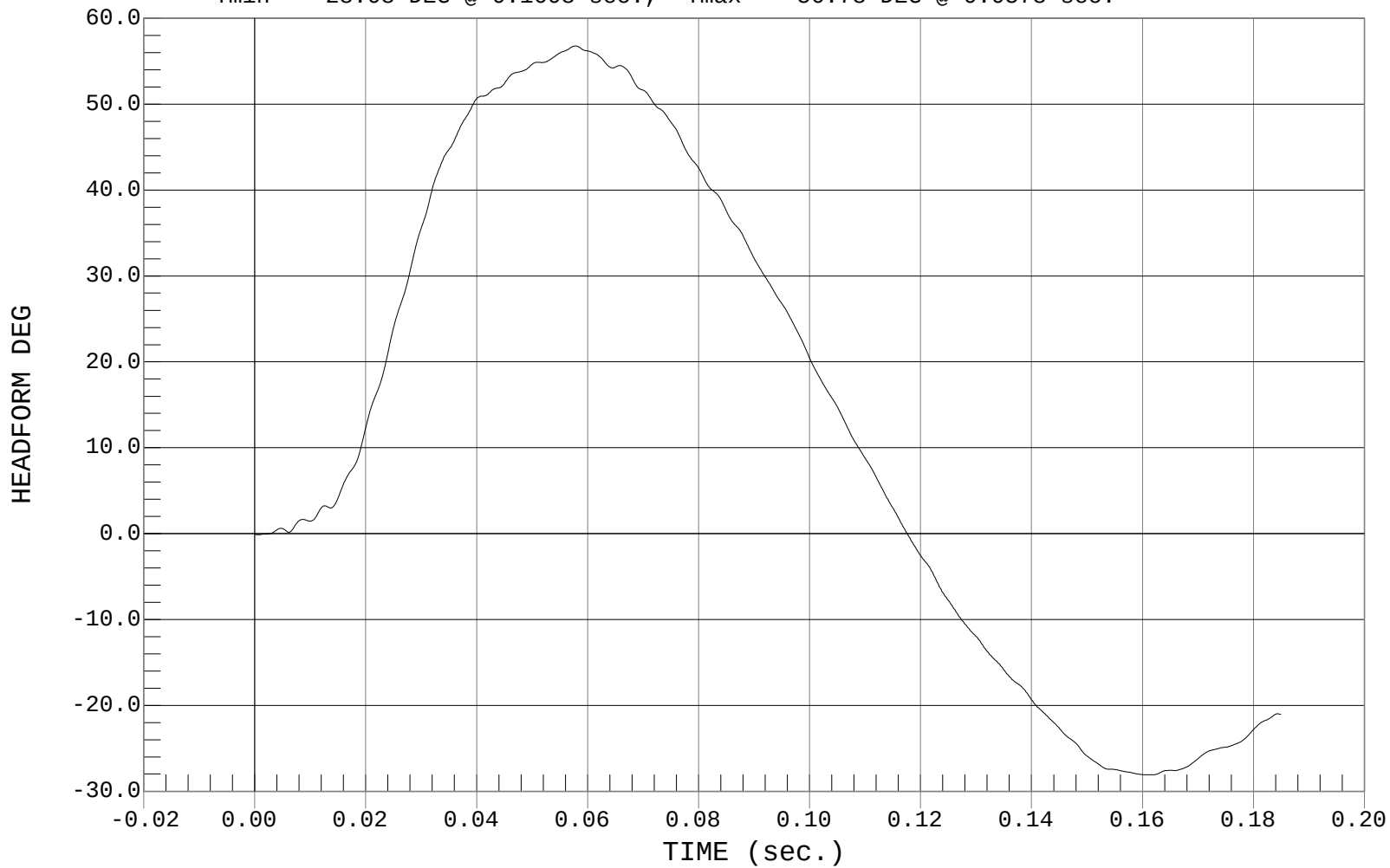
FLEXION ANGLE

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #009

Test Date: 08-13-01
Speed: 11.14 FT/SEC, 3.39 M/SEC

— 1 HEADFORM, D01152DT.D08

Ymin = -28.08 DEG @ 0.1608 sec., Ymax = 56.78 DEG @ 0.0578 sec.





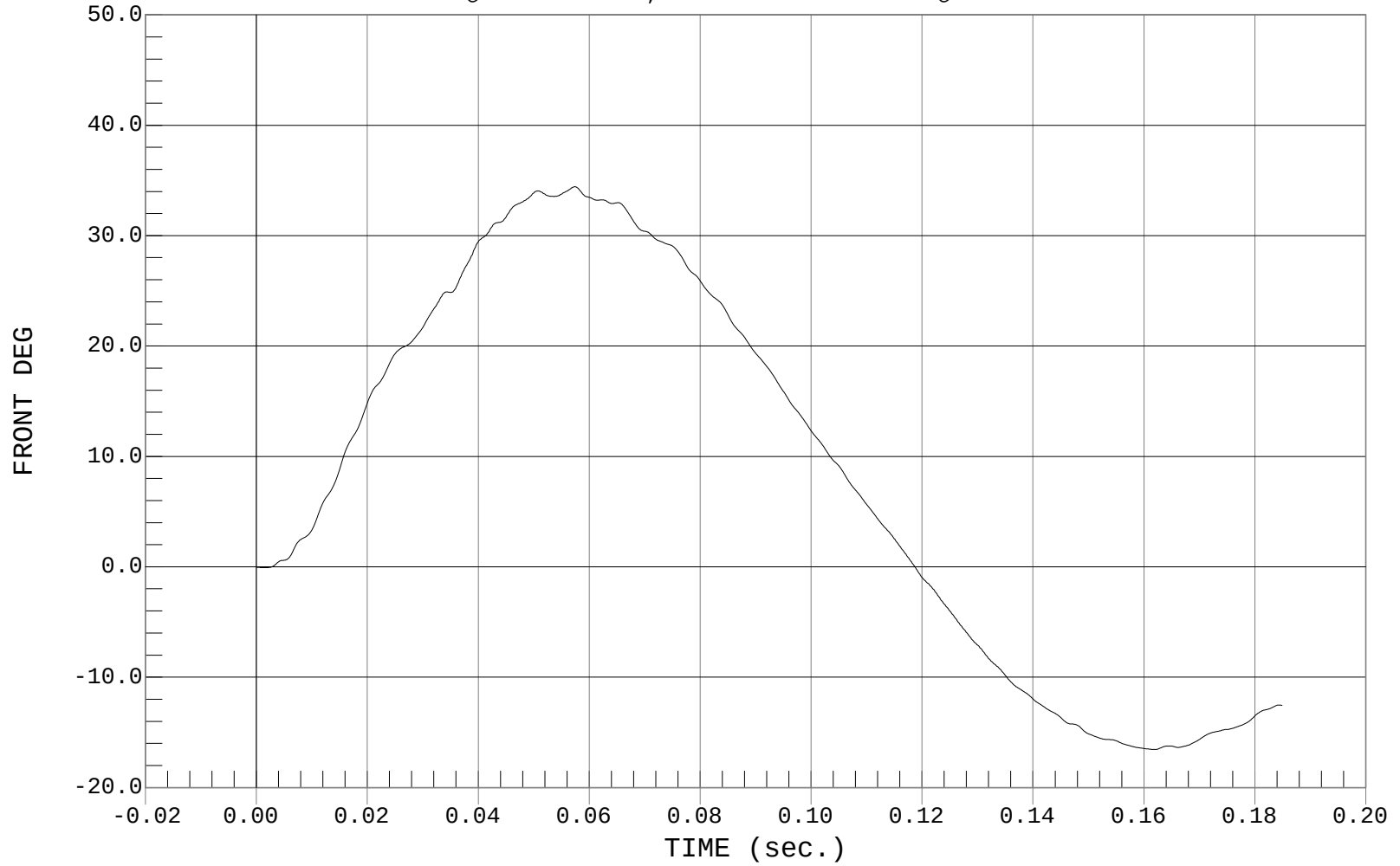
THETA A

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #009

Test Date: 08-13-01
Speed: 11.14 FT/SEC, 3.39 M/SEC

— 1 FRONT, D01152DT.D05

Ymin = -16.55 DEG @ 0.1619 sec., Ymax = 34.43 DEG @ 0.0574 sec.





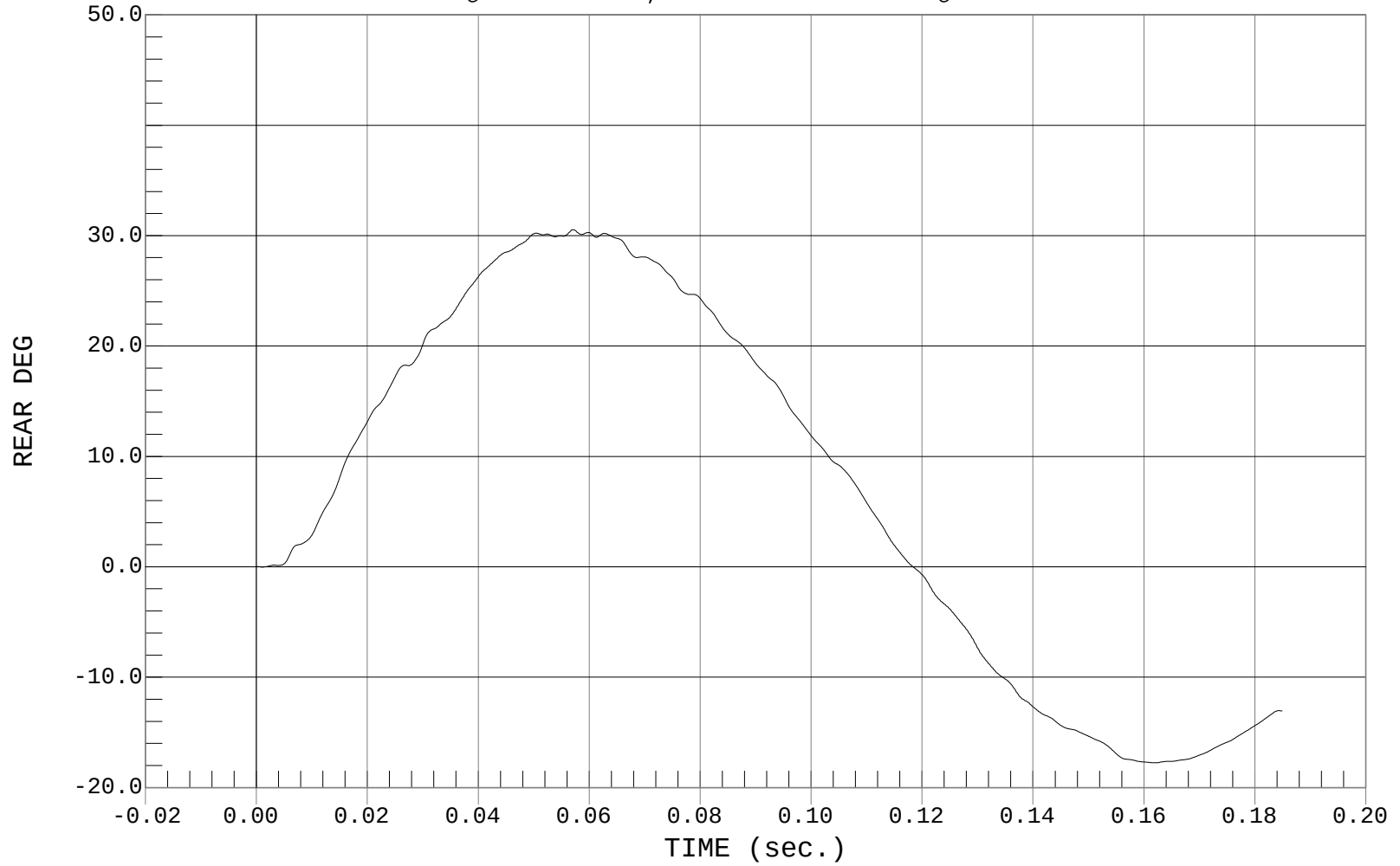
THETA B

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #009

Test Date: 08-13-01
Speed: 11.14 FT/SEC, 3.39 M/SEC

— 1 REAR, D01152DT.D06

Ymin = -17.75 DEG @ 0.1621 sec., Ymax = 30.54 DEG @ 0.0571 sec.



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
EUROSID 2 DUMMY

Date: 8/14/01
Dummy Serial Number: 009
Test Number: D011153

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21.5
Relative Humidity (%)	10 – 70	44
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	9.7
Time of Max. Pendulum Acceleration		23.0 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



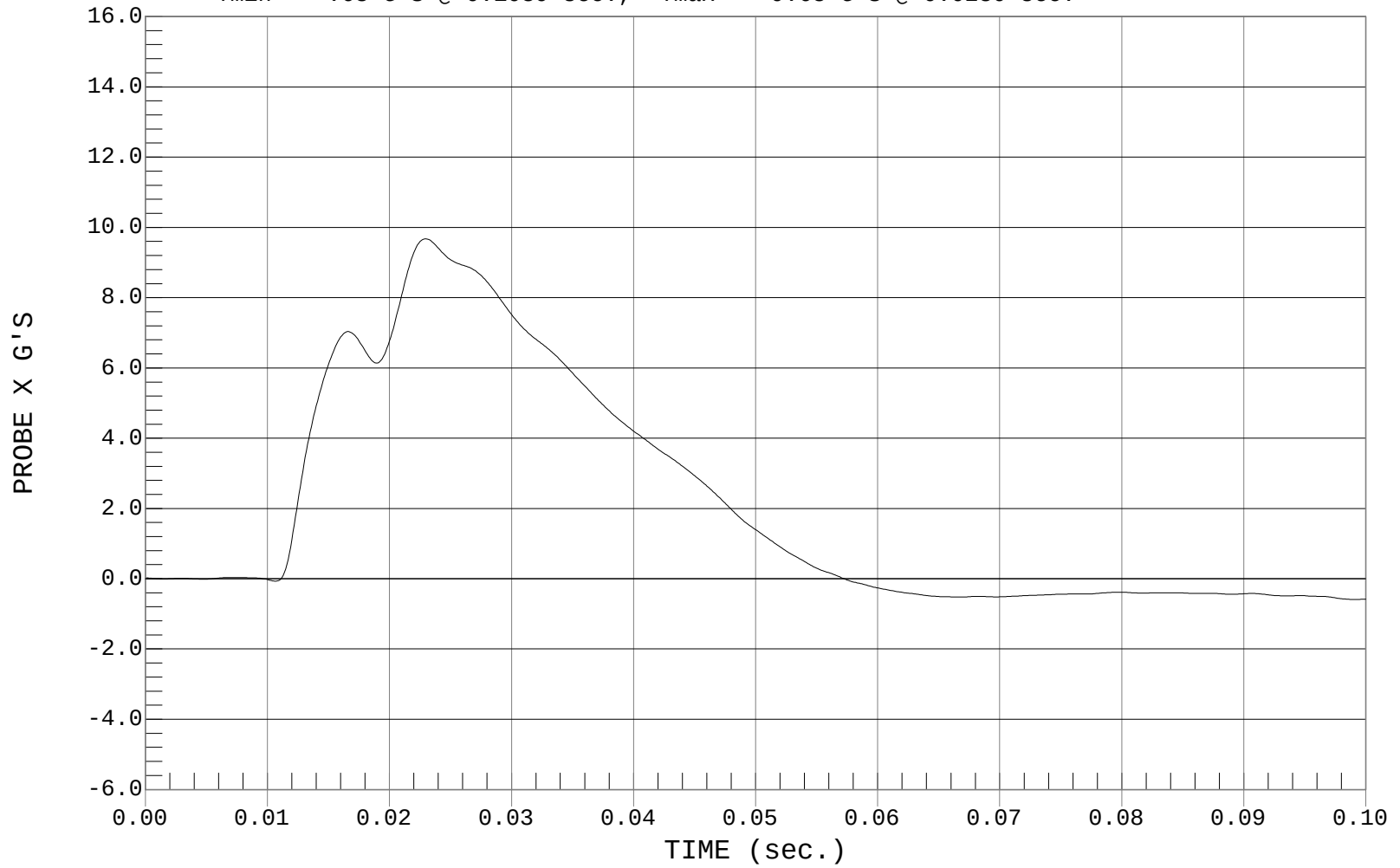
SHOULDER ACCELERATION

Test Desc.: Dummy Calibration - Shoulder Impact
Component: Dummy #009

Test Date: 08-14-01
Speed: 14.03 FT/SEC, 4.28 M/SEC

— 1 PROBE X, D01153AF.A01

Ymin = -.63 G'S @ 0.1039 sec., Ymax = 9.68 G'S @ 0.0230 sec.



MGA RESEARCH CORPORATION
UPPER/MIDDLE/LOWER RIB TESTS
SIDE IMPACT DUMMY (SID)

Date: 8/14/01
Dummy Serial Number: 009
Test Number: D011154/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.8
Relative Humidity (%)	10 – 70	44
Displacement at 2 m/s	23.5 – 27.5 mm	24.9
Displacement at 3 m/s	36.0 – 40.0 mm	38.0
Displacement at 4 m/s	46.0 – 51.0 mm	50.4

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.8
Relative Humidity (%)	10 – 70	44
Displacement at 2 m/s	23.5 – 27.5 mm	25.5
Displacement at 3 m/s	36.0 – 40.0 mm	38.3
Displacement at 4 m/s	46.0 – 51.0 mm	49.4

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.8
Relative Humidity (%)	10 – 70	44
Displacement at 2 m/s	23.5 – 27.5 mm	25.2
Displacement at 3 m/s	36.0 – 40.0 mm	38.5
Displacement at 4 m/s	46.0 – 51.0 mm	50.0

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



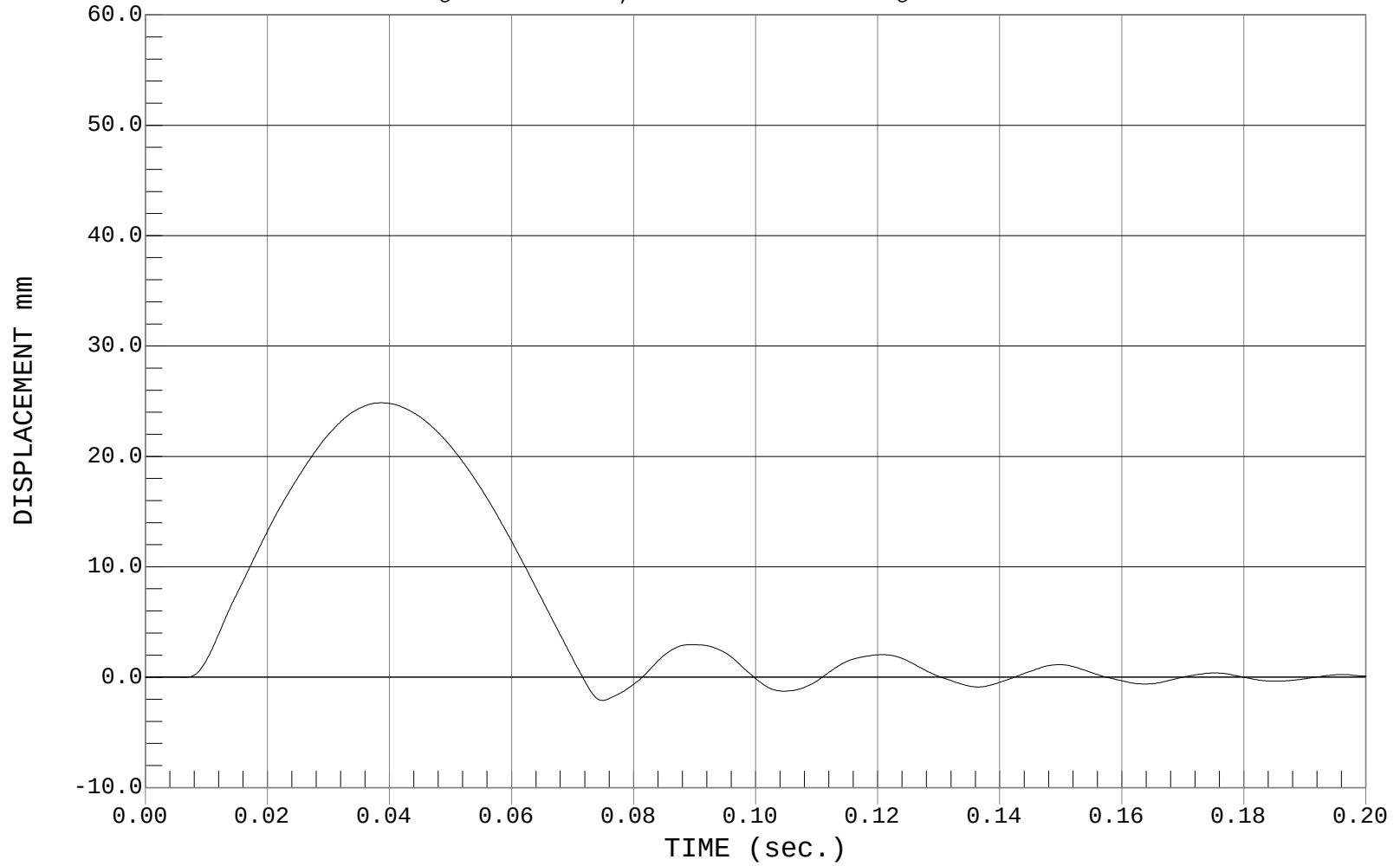
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-14-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01154DF.D05

Ymin = -2.11 mm @ 0.0749 sec., Ymax = 24.85 mm @ 0.0386 sec.





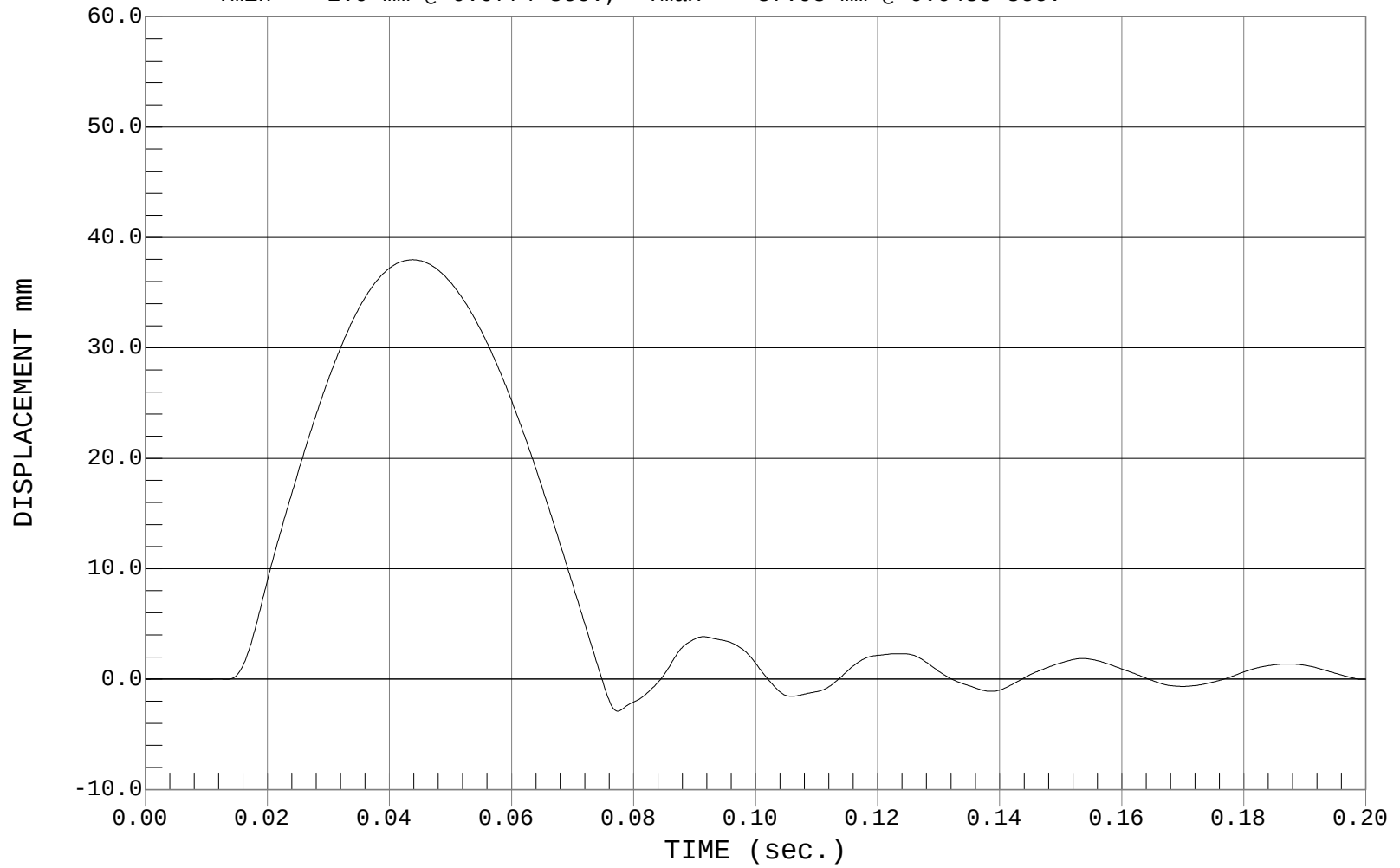
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-14-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01154DF.D06

Ymin = -2.9 mm @ 0.0774 sec., Ymax = 37.98 mm @ 0.0438 sec.





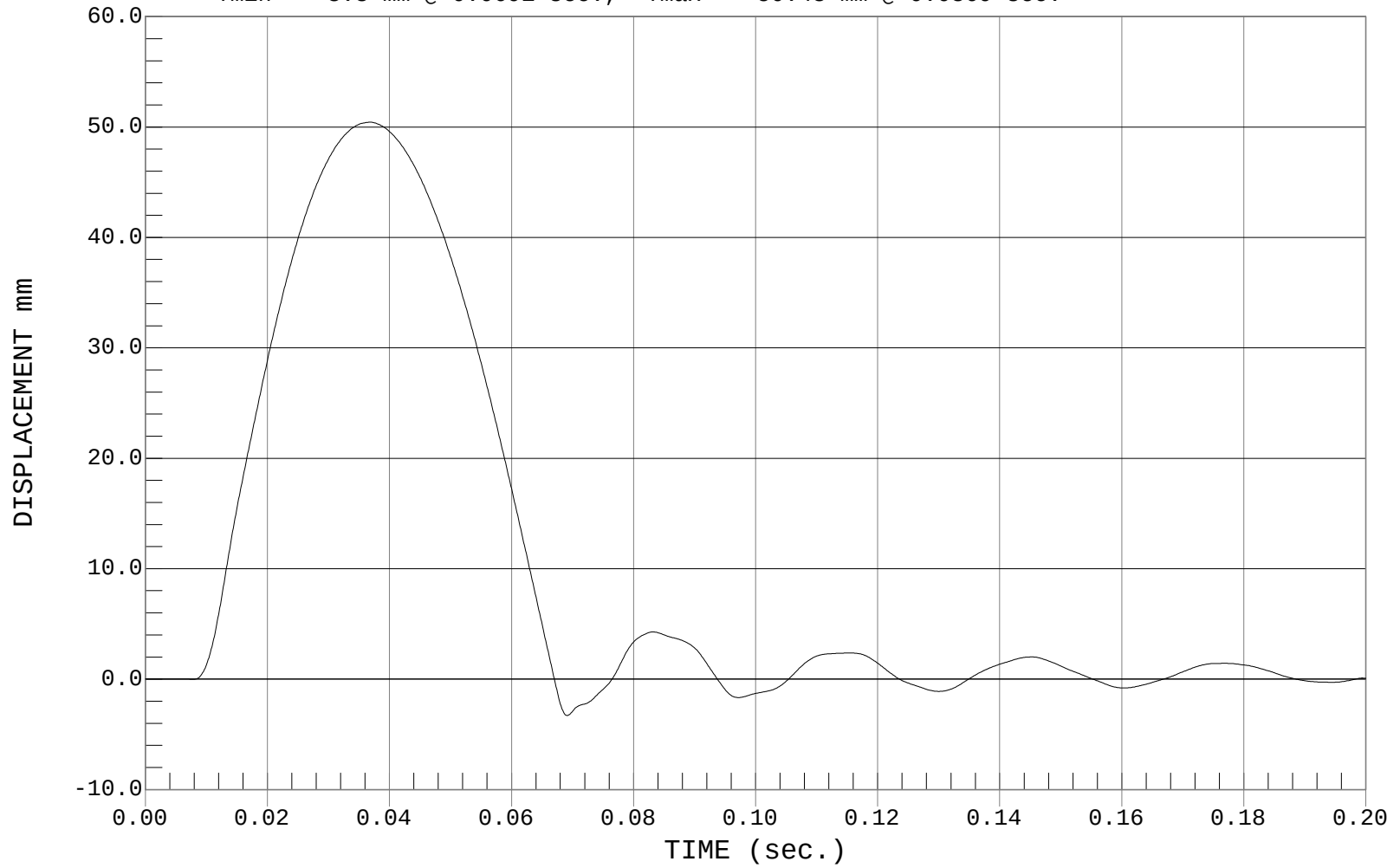
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-14-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01154DF.D07

Ymin = -3.3 mm @ 0.0691 sec., Ymax = 50.43 mm @ 0.0369 sec.





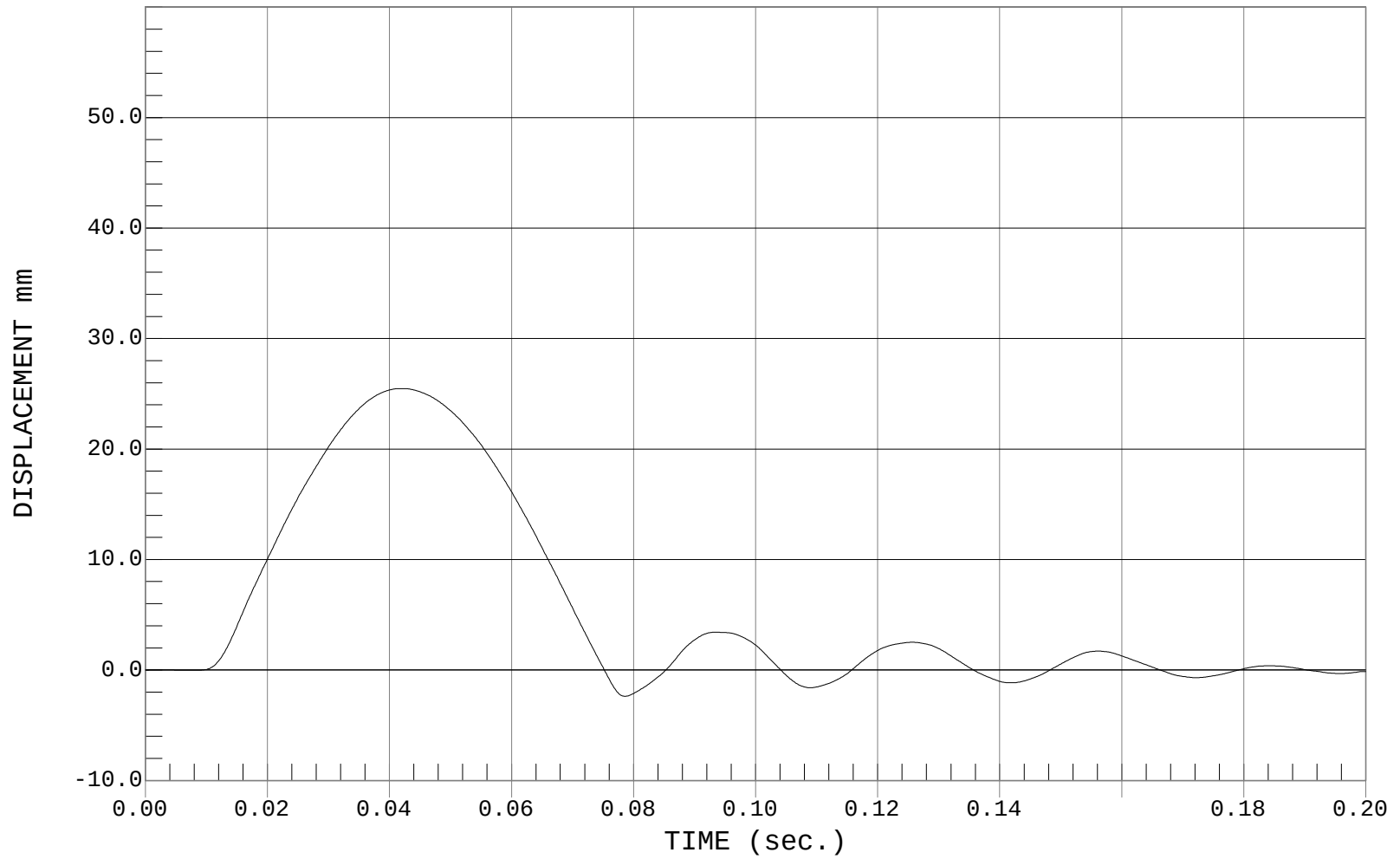
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-14-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01155DF.D05

Ymin = -2.38 mm @ 0.0786 sec., Ymax = 25.48 mm @ 0.0420 sec.





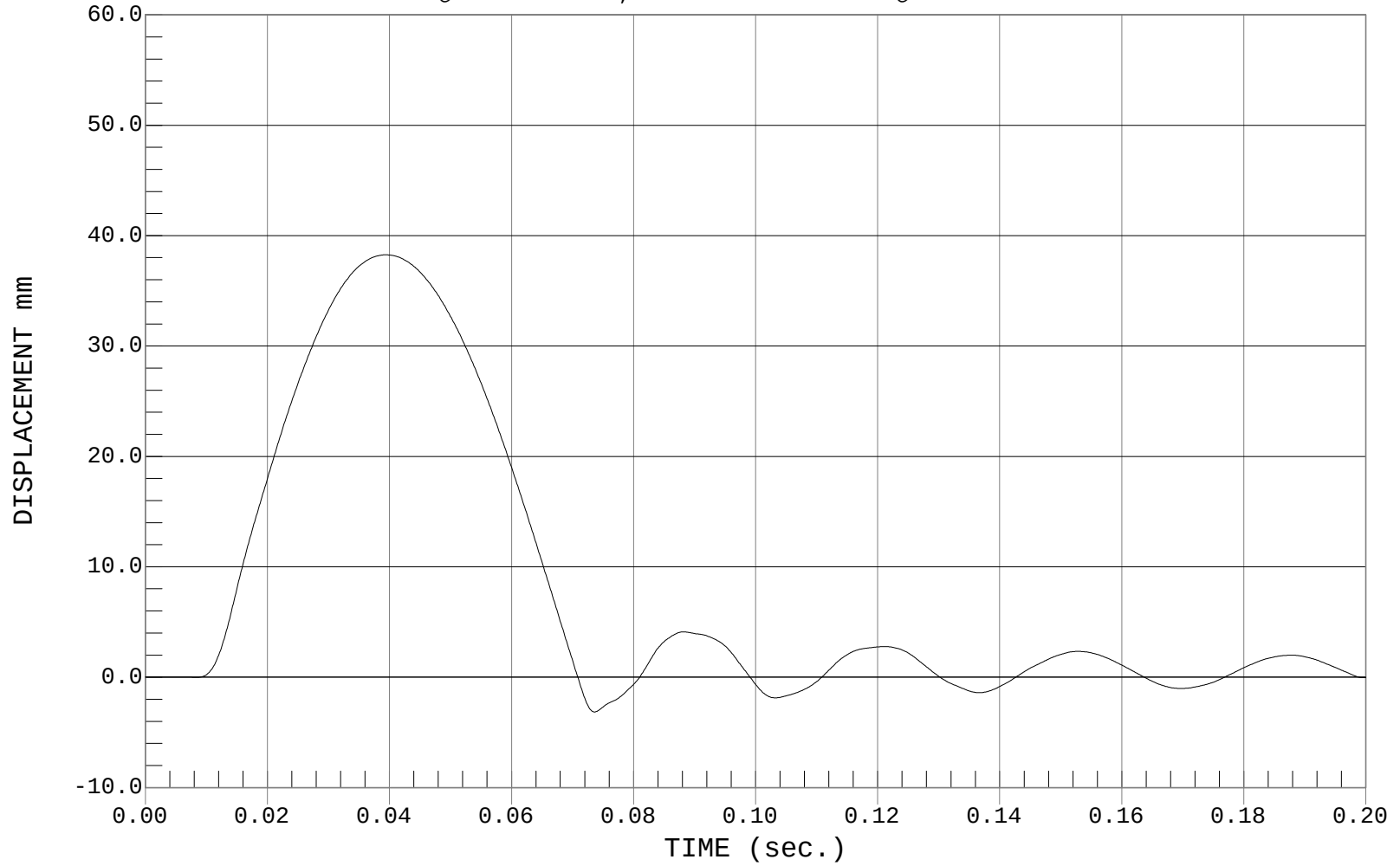
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-14-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01155DF.D06

Ymin = -3.15 mm @ 0.0736 sec., Ymax = 38.26 mm @ 0.0393 sec.



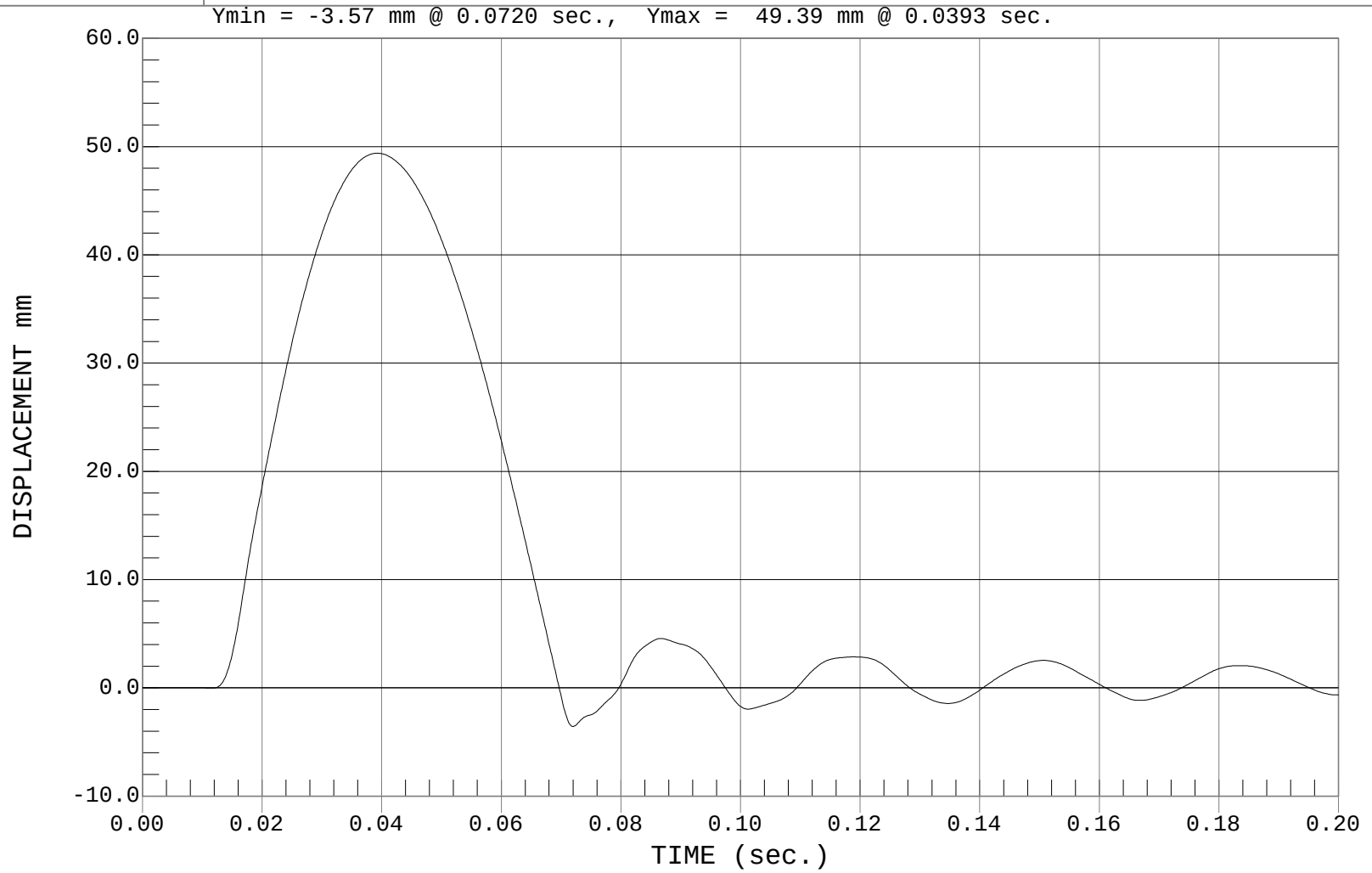


MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-14-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01155DF.D07



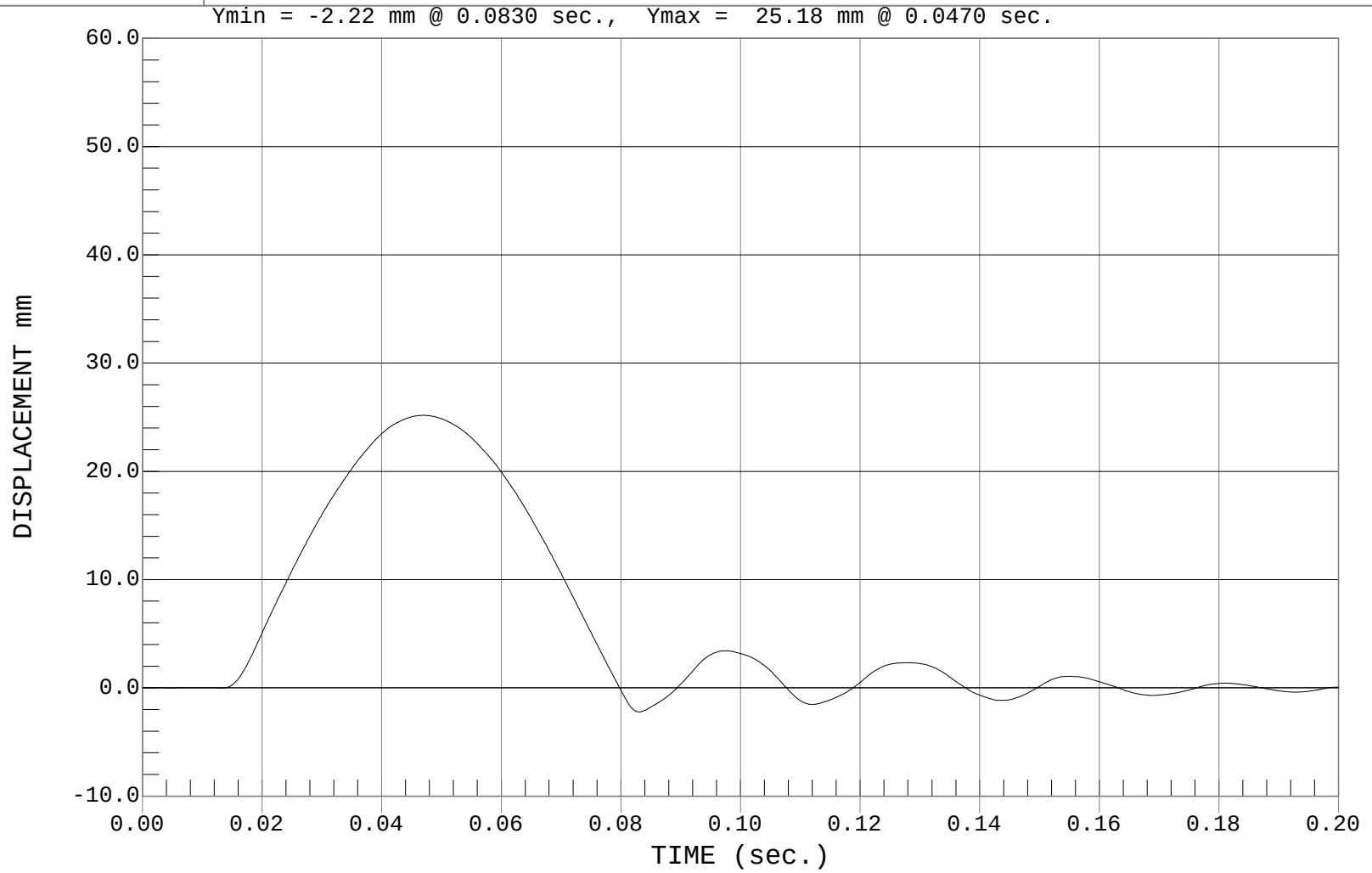


LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-14-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01156DF.D05





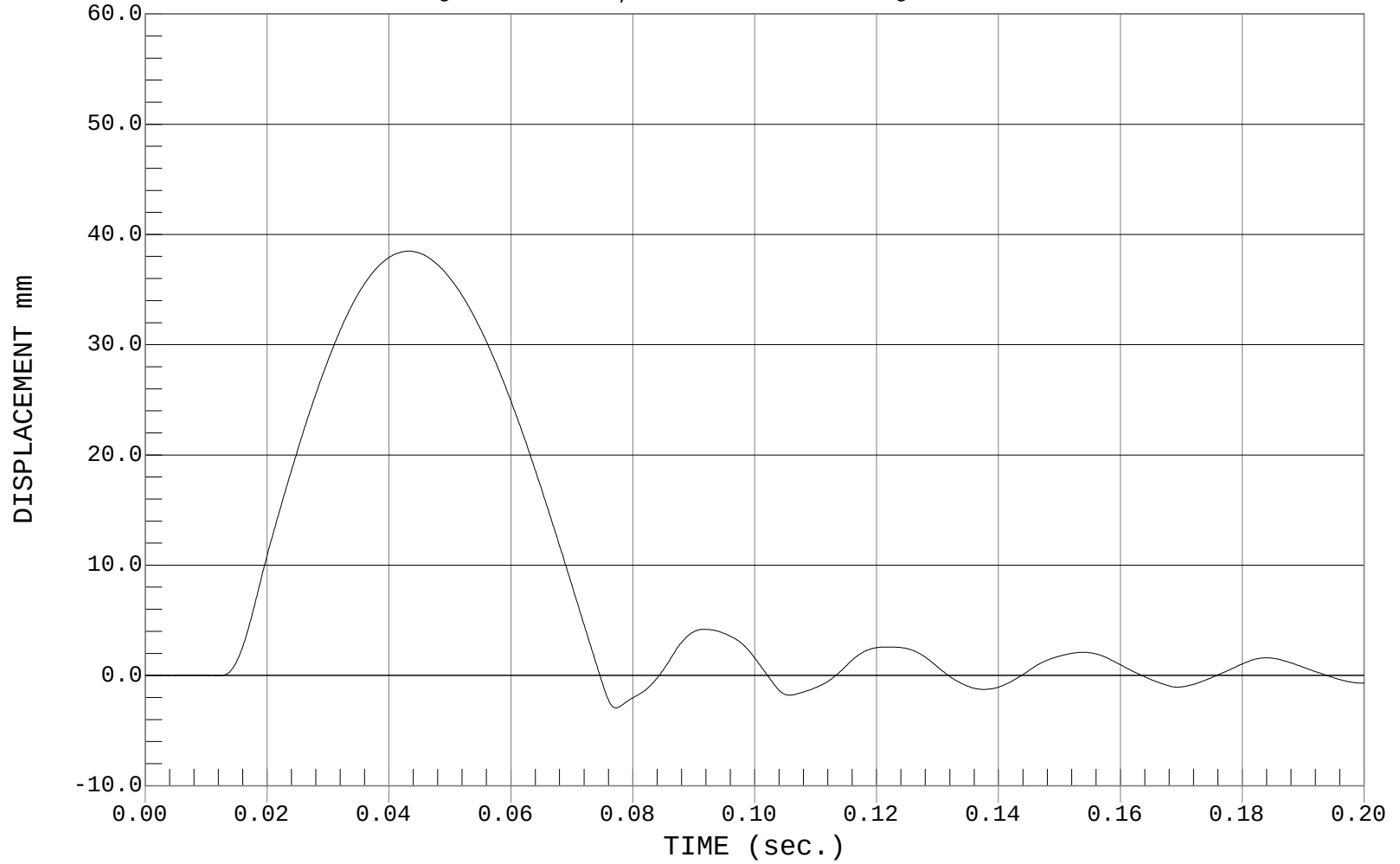
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-14-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01156DF.D06

Ymin = -2.95 mm @ 0.0772 sec., Ymax = 38.49 mm @ 0.0433 sec.





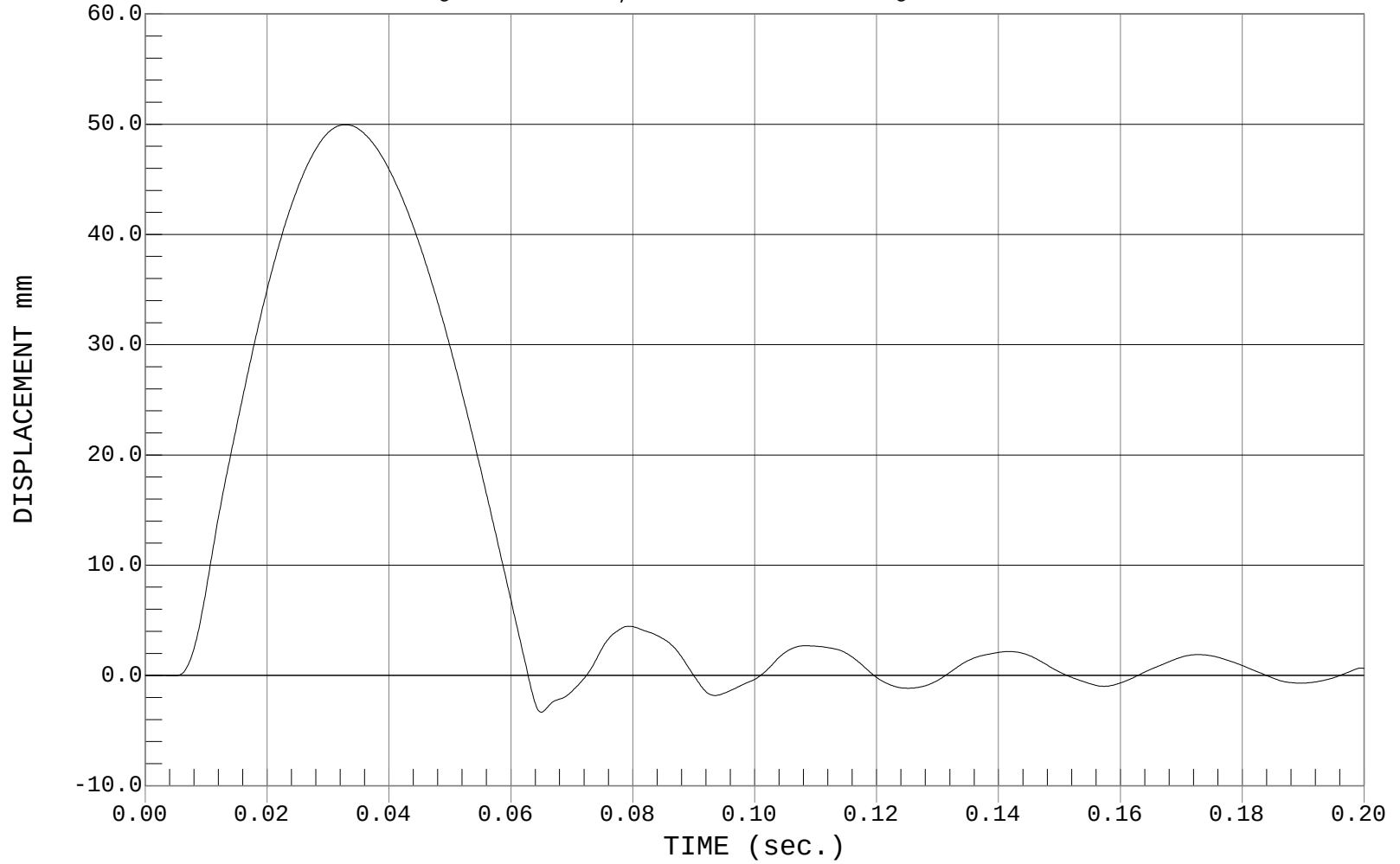
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #009

Test Date: 08-14-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01156DF.D07

Ymin = -3.34 mm @ 0.0650 sec., Ymax = 49.95 mm @ 0.0328 sec.



MGA RESEARCH CORPORATION
ABDOMEN TEST
EUROSID 2 DUMMY

Date: 8/14/01
Dummy Serial Number: 009
Test Number: D011157

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21.5
Relative Humidity (%)	10 – 70	43
Probe Speed (m/s)	3.90 – 4.10	3.96
Maximum Impact Force	4.00 – 4.80 kN	4.76
Time of Maximum Force	10.60 – 13.00 ms	11.60
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.21
Time of Max. Total Force	10.00 – 12.30 ms	11.20

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



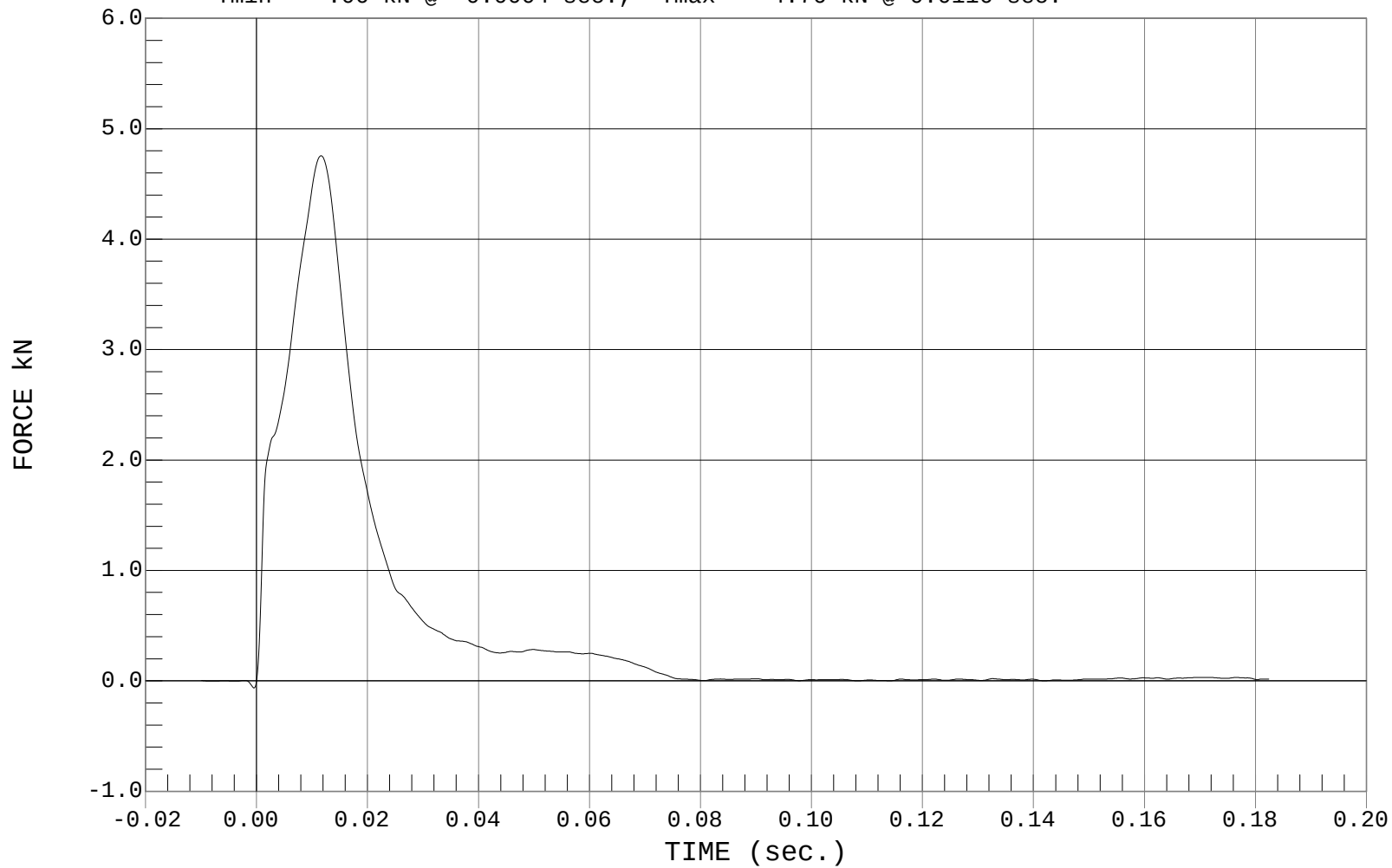
IMPACTOR FORCE

Test Desc.: Dummy Calibration - Abdomen Impact
Component: Dummy #009

Test Date: 08-14-01
Speed: 13.00 FT/SEC, 3.96 M/SEC

— 1 FORCE, D01157FT.F01

Ymin = -.06 kN @ -0.0004 sec., Ymax = 4.76 kN @ 0.0116 sec.





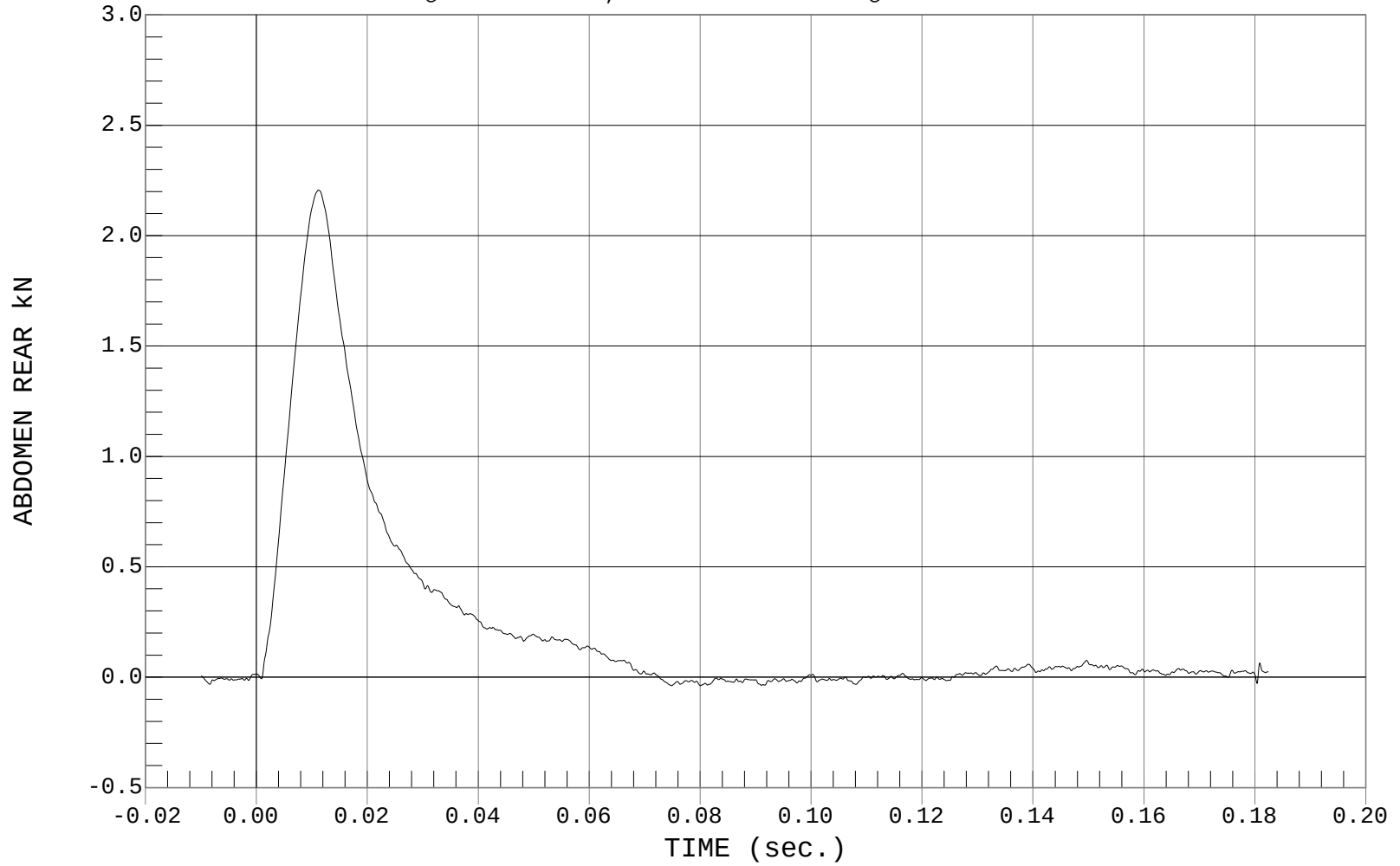
ABDOMEN FORCE

Test Desc.: Dummy Calibration - Abdomen Impact
Component: Dummy #009

Test Date: 08-14-01
Speed: 13.00 FT/SEC, 3.96 M/SEC

— 1 ABDOMEN REAR, D01157FT.F02

Ymin = -.04 kN @ 0.0749 sec., Ymax = 2.21 kN @ 0.0112 sec.



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
EUROSID 2 DUMMY

Date: 8/13/01
Dummy Serial Number: 009
Test Number: D011158

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18 – 22	21.1
Relative Humidity (%)		10 – 70	41
Pendulum Speed		5.95 – 6.15	6.12
Pendulum Deceleration	10 msec	$\bar{2}.46 - \bar{1}.59$ m/sec	-1.84
	20 msec	$\bar{5}.25 - \bar{4}.07$ m/sec	-4.24
	25 msec	$\bar{6}.64 - \bar{5}.3$ m/sec	-5.31
	30 msec	≥ -6.5 m/sec	-6.11
Maximum Flexion Angle		45.0 – 55.0 deg	50.6
Time of Max. Flexion Angle		39.0 – 53.0 ms	47.0
Maximum Angle Theta (A)		31.0 – 35.0 deg	32.3
Time of Max. Theta (A)		44.0 – 52.0 ms	47.0
Maximum Angle Theta (B)		27.84– 30.34 deg	28.51
Time of Max. Theta (B)		44.0 – 52.0 ms	46.3

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

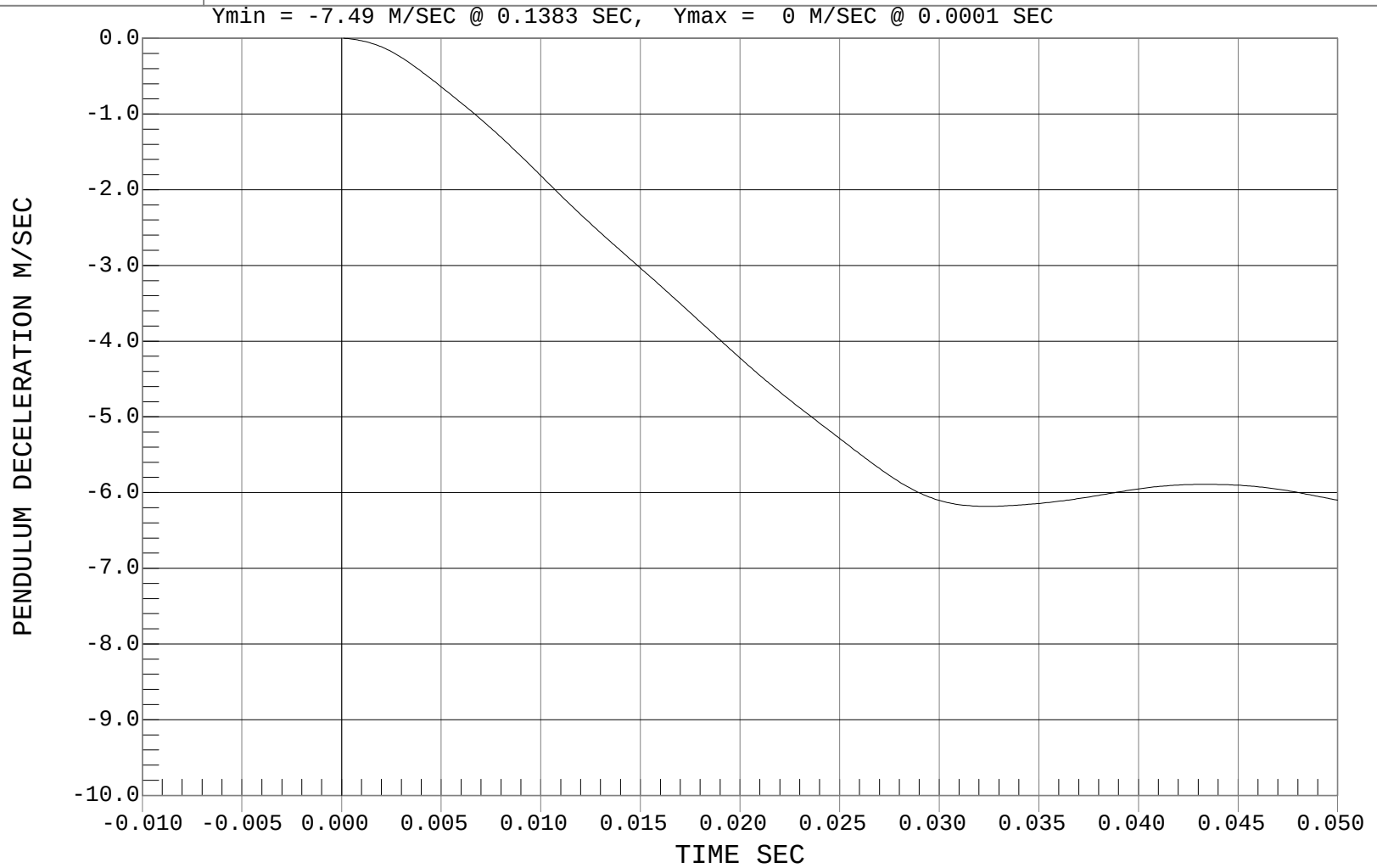


PENDULUM DECELERATION

Test Desc.: Dummy Calibration -
Component: Dummy #009

Test Date: 08-13-01
Speed: 20.07 FT/SEC, 6.12 M/SEC

— 1 PENDULUM DECELERATION, D01158AI.V04





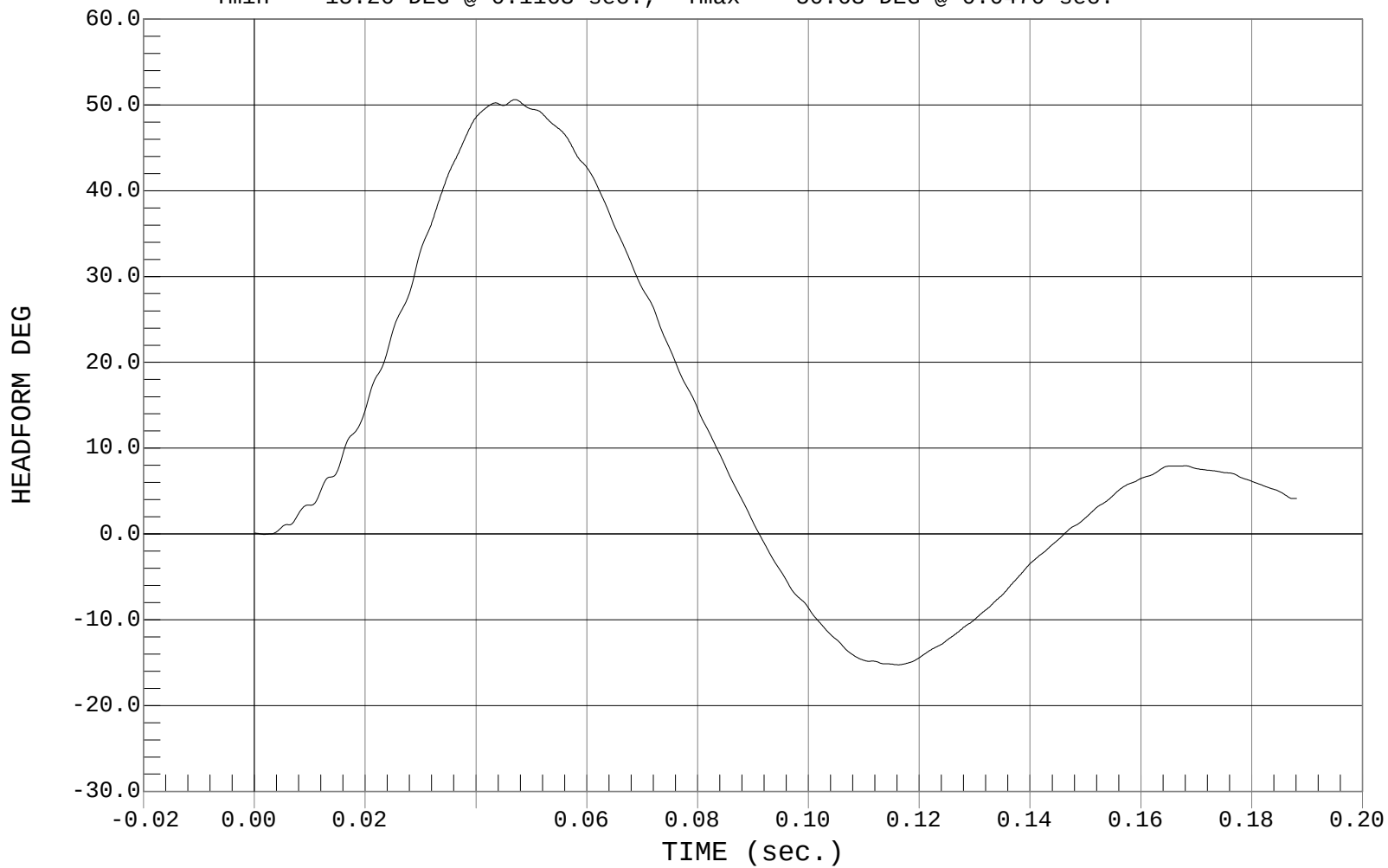
FLEXION ANGLE

Test Desc.: Dummy Calibration -
Component: Dummy #009

Test Date: 08-13-01
Speed: 20.07 FT/SEC, 6.12 M/SEC

— 1 HEADFORM, D01158DT.D08

Ymin = -15.26 DEG @ 0.1163 sec., Ymax = 50.63 DEG @ 0.0470 sec.





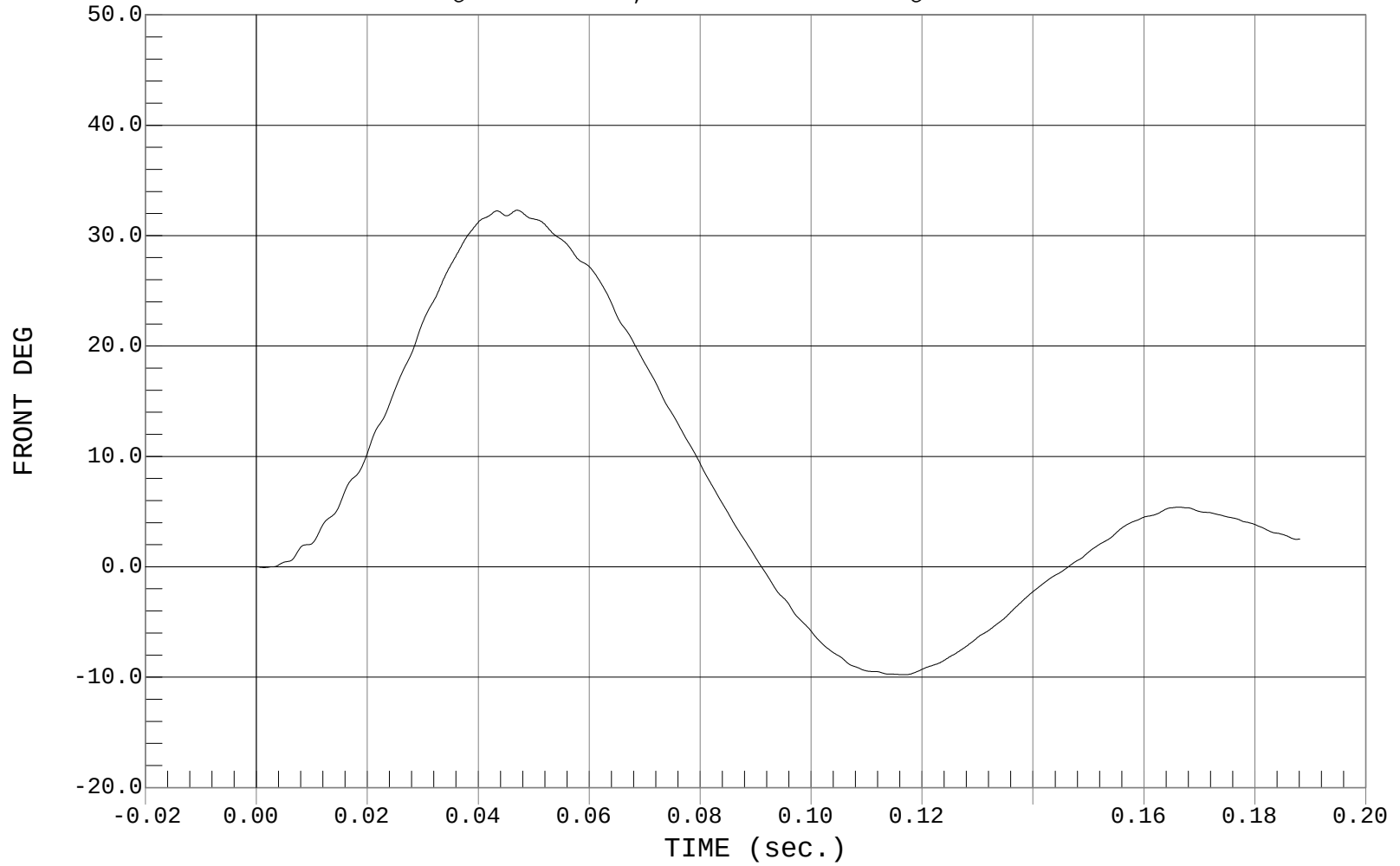
THETA A

Test Desc.: Dummy Calibration -
Component: Dummy #009

Test Date: 08-13-01
Speed: 20.07 FT/SEC, 6.12 M/SEC

— 1 FRONT, D01158DT.D05

Ymin = -9.78 DEG @ 0.1169 sec., Ymax = 32.3 DEG @ 0.0470 sec.





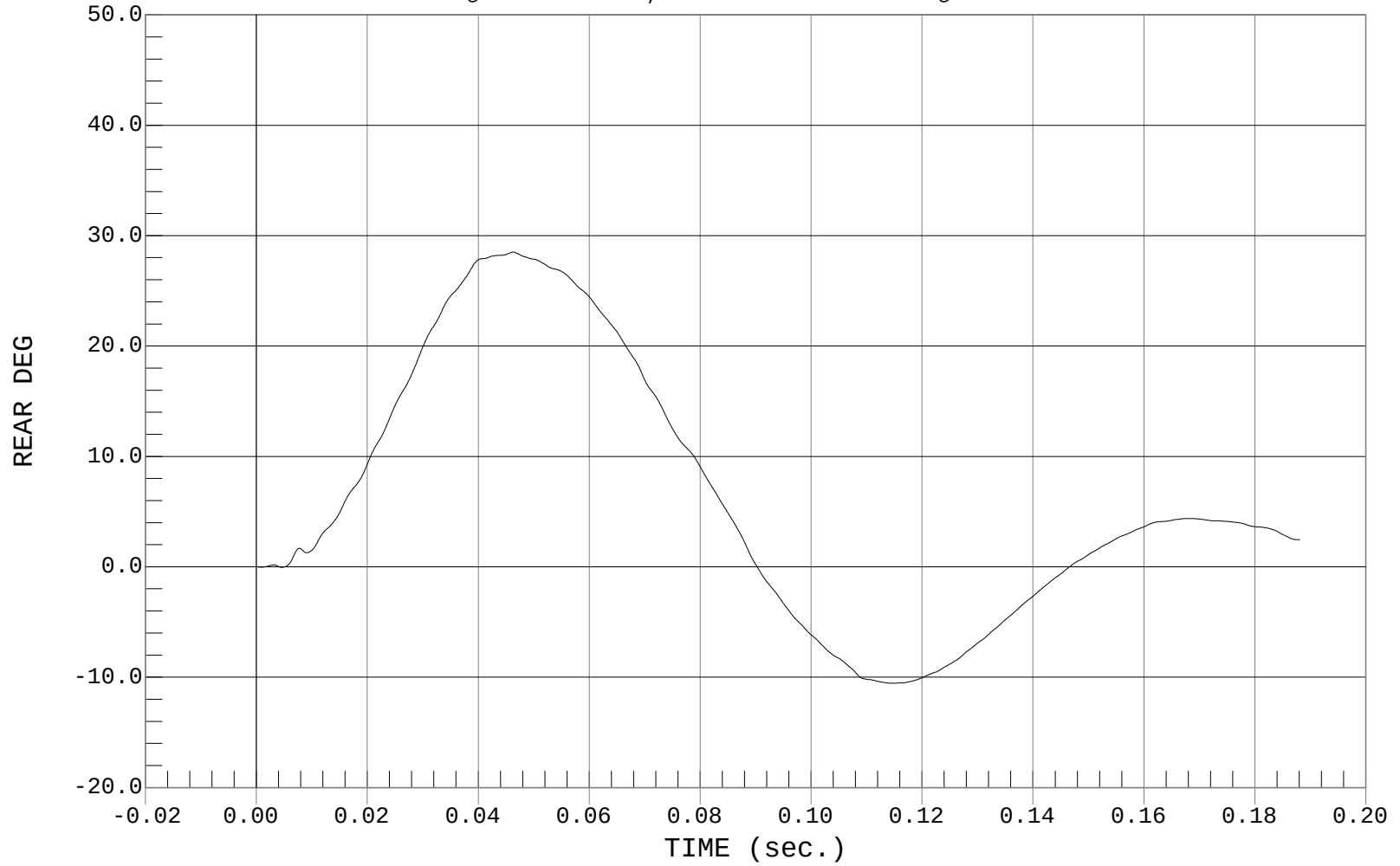
THETA B

Test Desc.: Dummy Calibration -
Component: Dummy #009

Test Date: 08-13-01
Speed: 20.07 FT/SEC, 6.12 M/SEC

— 1 REAR, D01158DT.D06

Ymin = -10.54 DEG @ 0.1151 sec., Ymax = 28.51 DEG @ 0.0463 sec.



MGA RESEARCH CORPORATION
PELVIS TEST
EUROSID 2 DUMMY

Date: 8/14/01
Dummy Serial Number: 009
Test Number: D011159

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18 – 22	21.6
Relative Humidity (%)	10 – 70	44
Pendulum Speed	6.20 – 6.30 m/s	6.26
Maximum Impactor Force	9.80 – 12.20 kN	11.08
Time of Max. Impactor Force	9.50 – 12.50 ms	11.20
Maximum Pubic Force	2.65 – 3.35 kN	3.30
Time of Max. Pubic Force	10.00 – 13.00 ms	11.80

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



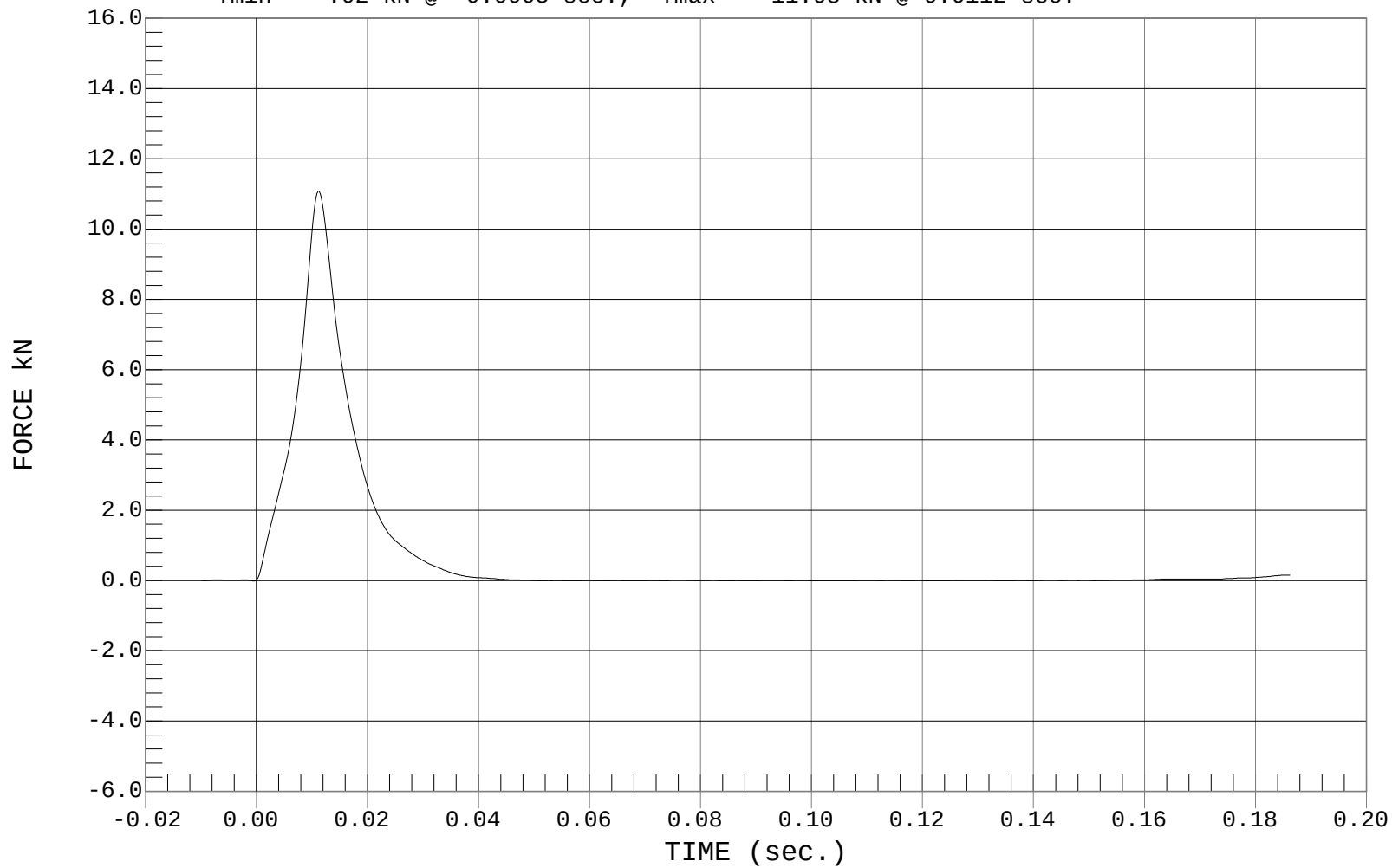
IMPACTOR FORCE

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #009

Test Date: 08-14-01
Speed: 20.53 FT/SEC, 6.26 M/SEC

— 1 FORCE, D01159FT.F01

Ymin = -.02 kN @ -0.0005 sec., Ymax = 11.08 kN @ 0.0112 sec.





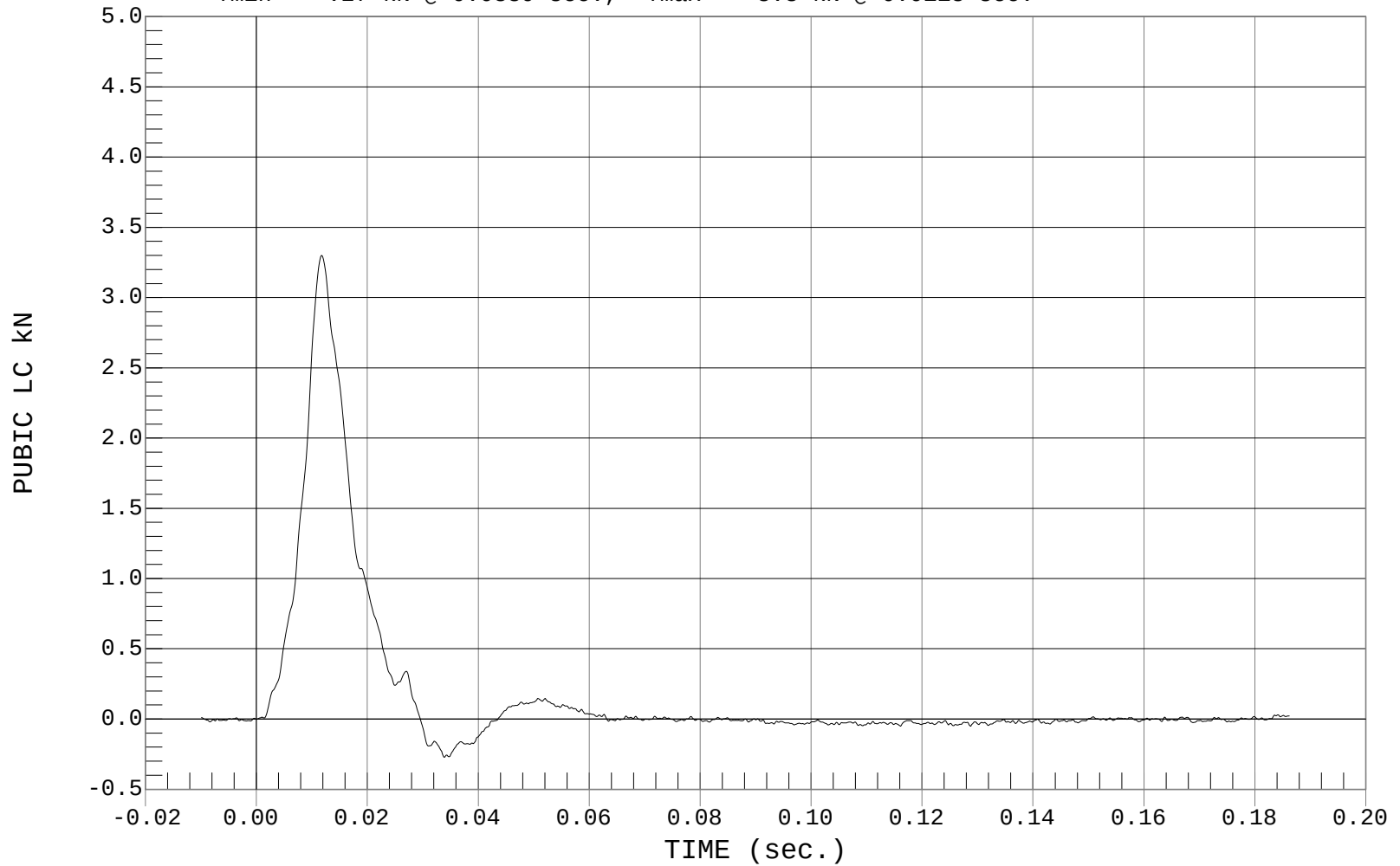
PUBIC FORCE

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #009

Test Date: 08-14-01
Speed: 20.53 FT/SEC, 6.26 M/SEC

— 1 PUBIC LC, D01159FT.F02

Ymin = -.27 kN @ 0.0339 sec., Ymax = 3.3 kN @ 0.0118 sec.



CERTIFICATION DATA

Dummy Serial Number: 144c

Calibration Test Results Summary

Dummy Serial Number: 144c

Pre-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Flexion Test:	The neck passed all flexion test requirements.
Neck Extension Test:	The neck passes all extension test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Knee Impact Tests:	Both knees passed all impact test requirements.
Torso Flexion Test:	The torso passed all flexion test requirements.

MGA RESEARCH CORPORATION

HEAD DROP TEST

HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 144c

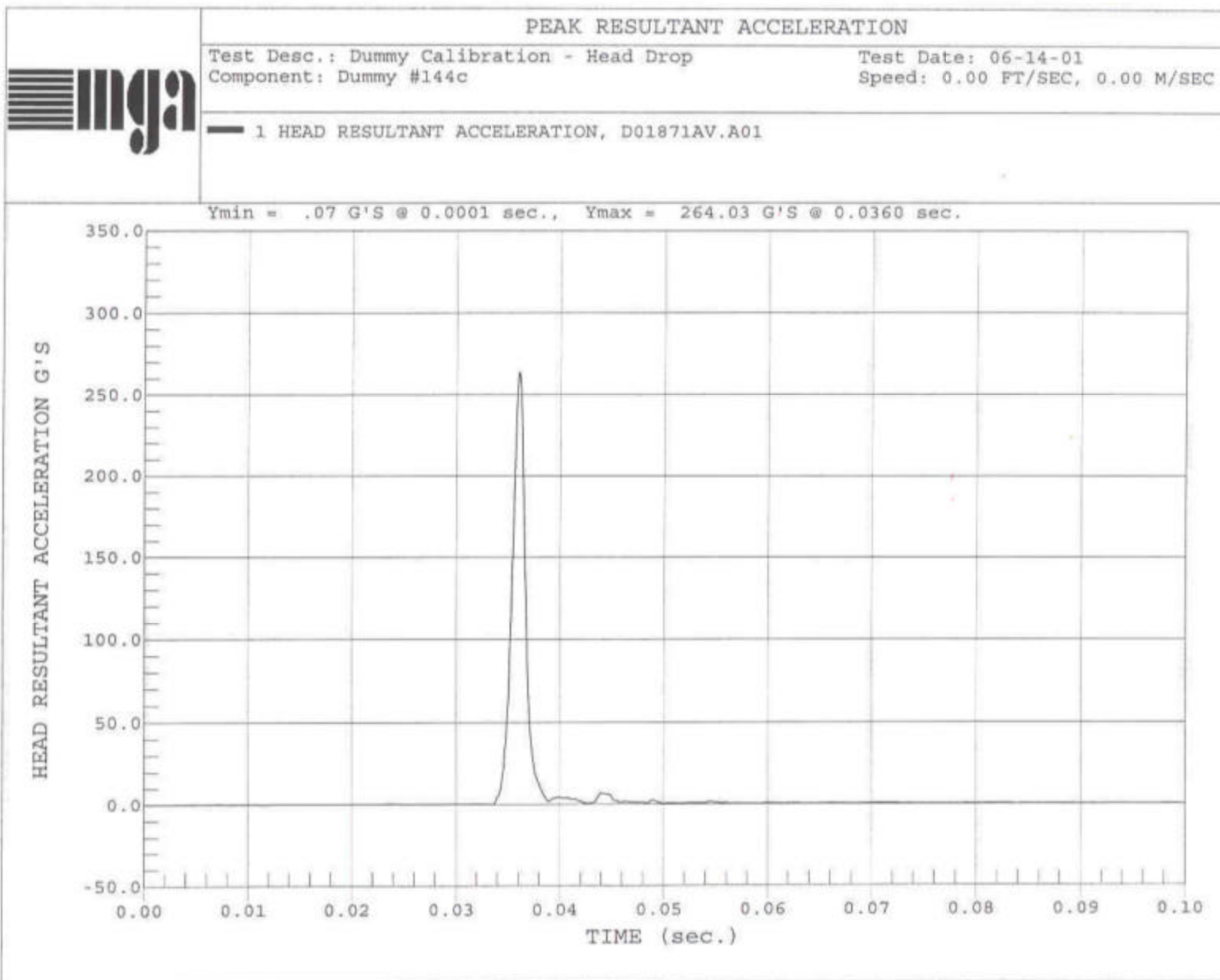
Test Number: D01871

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.6	21.2
Relative Humidity (%)	10 – 70	55
Peak Resultant Acceleration	245 – 300 g's	264
Peak Lateral Acceleration	± 15 g's	-13
Is Acceleration Curve Unimodal	within 10% of peak	Yes

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____





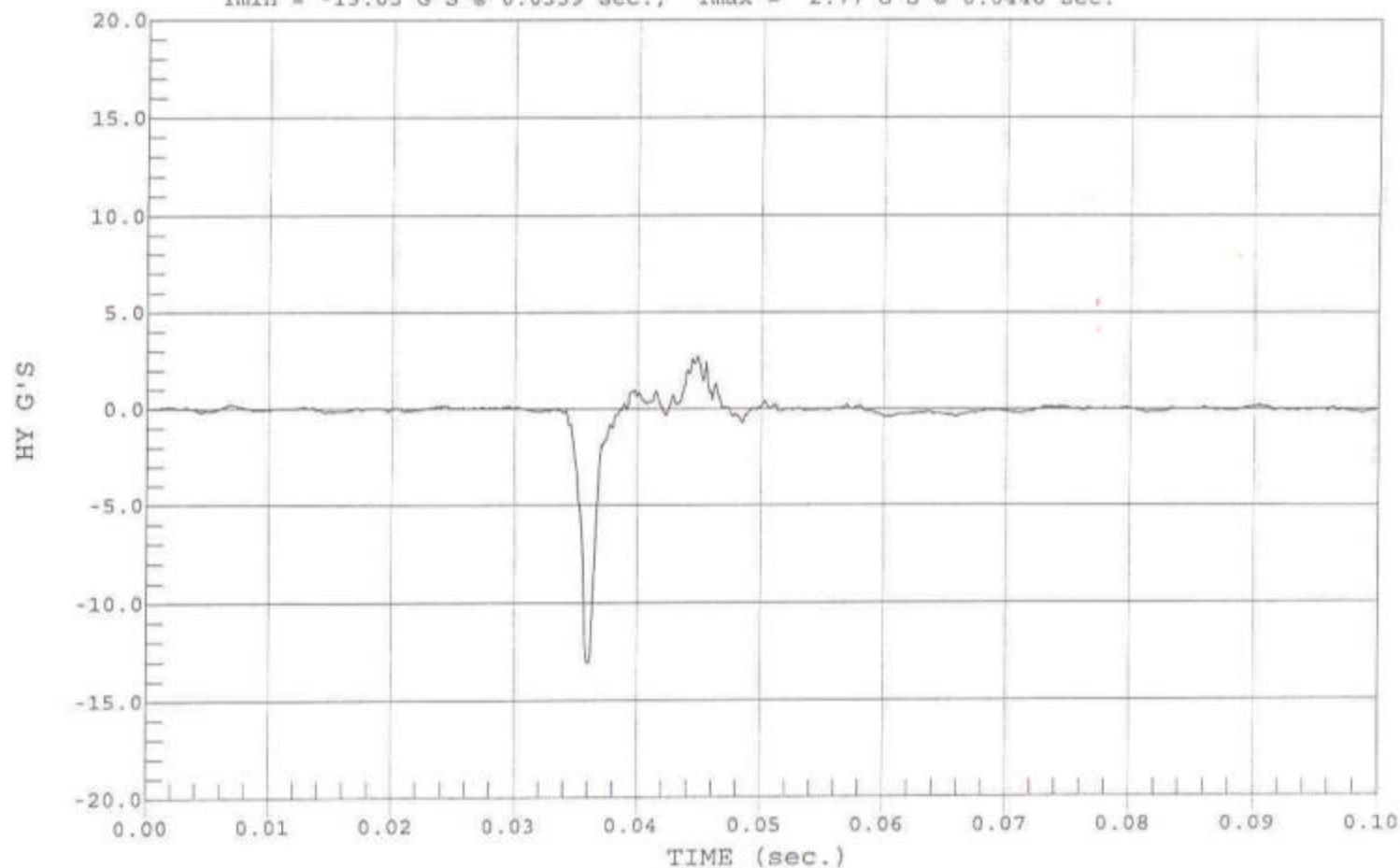
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #144c

Test Date: 06-14-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HY, D01871AR.A02

Ymin = -13.05 G'S @ 0.0359 sec., Ymax = 2.77 G'S @ 0.0448 sec.



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 144c

Test Number: D01872

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		20.6-22.2	21.5
Relative Humidity (%)		10 – 70	57
Pendulum Speed		4.83 - 5.07 m/sec	5.01
Pendulum Deceleration	10 msec	1.2 -1.6 m/sec	1.6
	20 msec	2.4 -3.4 m/sec	3.1
	30 msec	3.8 -5.0 m/sec	4.4
D Plane Rotation	Max	74 – 92 deg	87
Moment About Occipital Condyle within Deflection Corridor	Max	27-33 Nm	29
Positive Moment Time Curve Decay to 5 Nm		103 – 123 ms from Time Zero	113

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



PENDULUM DECELERATION

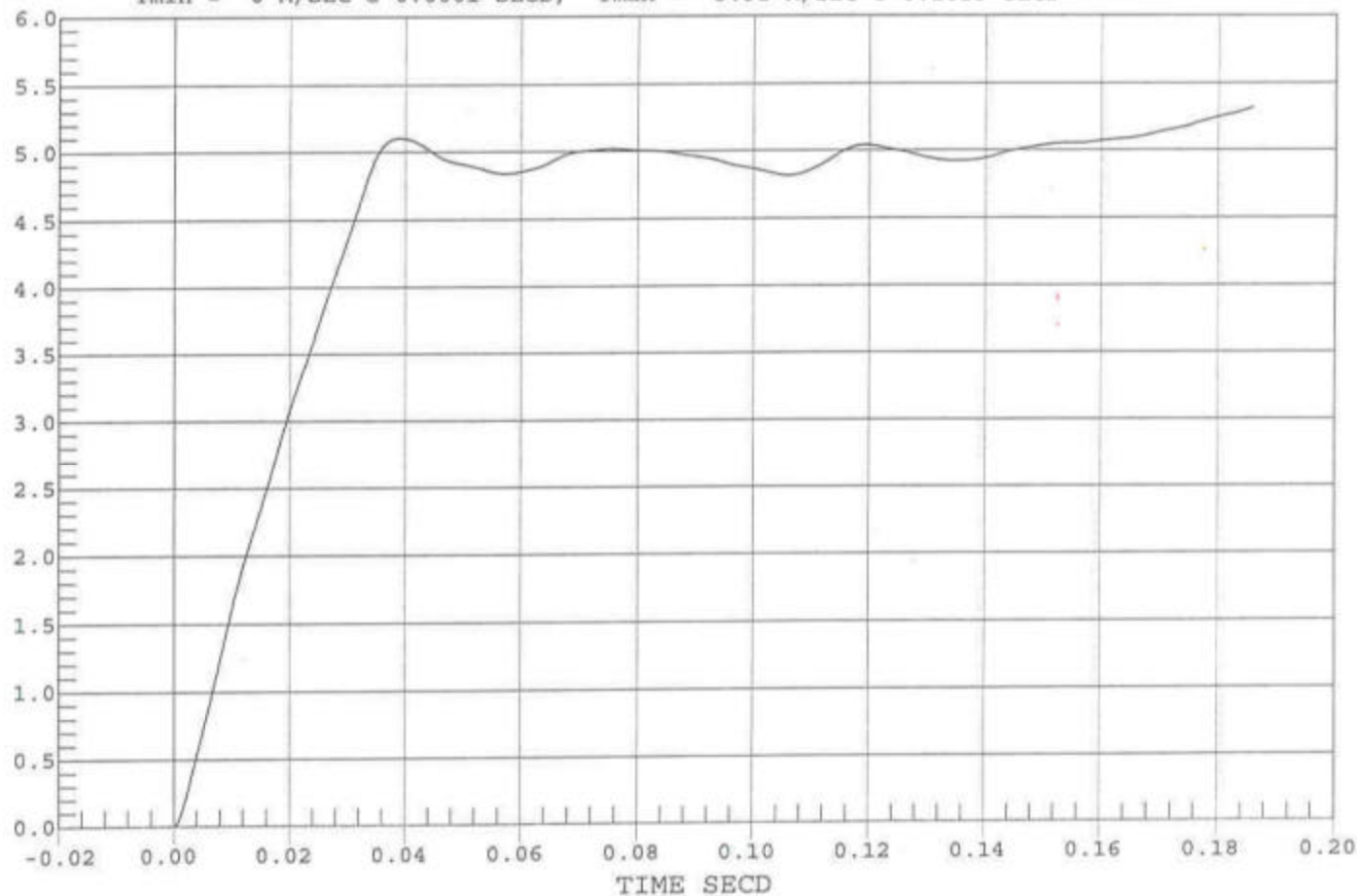
Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #144c

Test Date: 06-14-01
Speed: 16.44 FT/SEC, 5.01 M/SEC

— 1 PENDULUM DECELERATION, D01872AI.V04

Ymin = 0 M/SEC @ 0.0001 SECD, Ymax = 5.32 M/SEC @ 0.1859 SECD

PENDULUM DECELERATION M/SEC



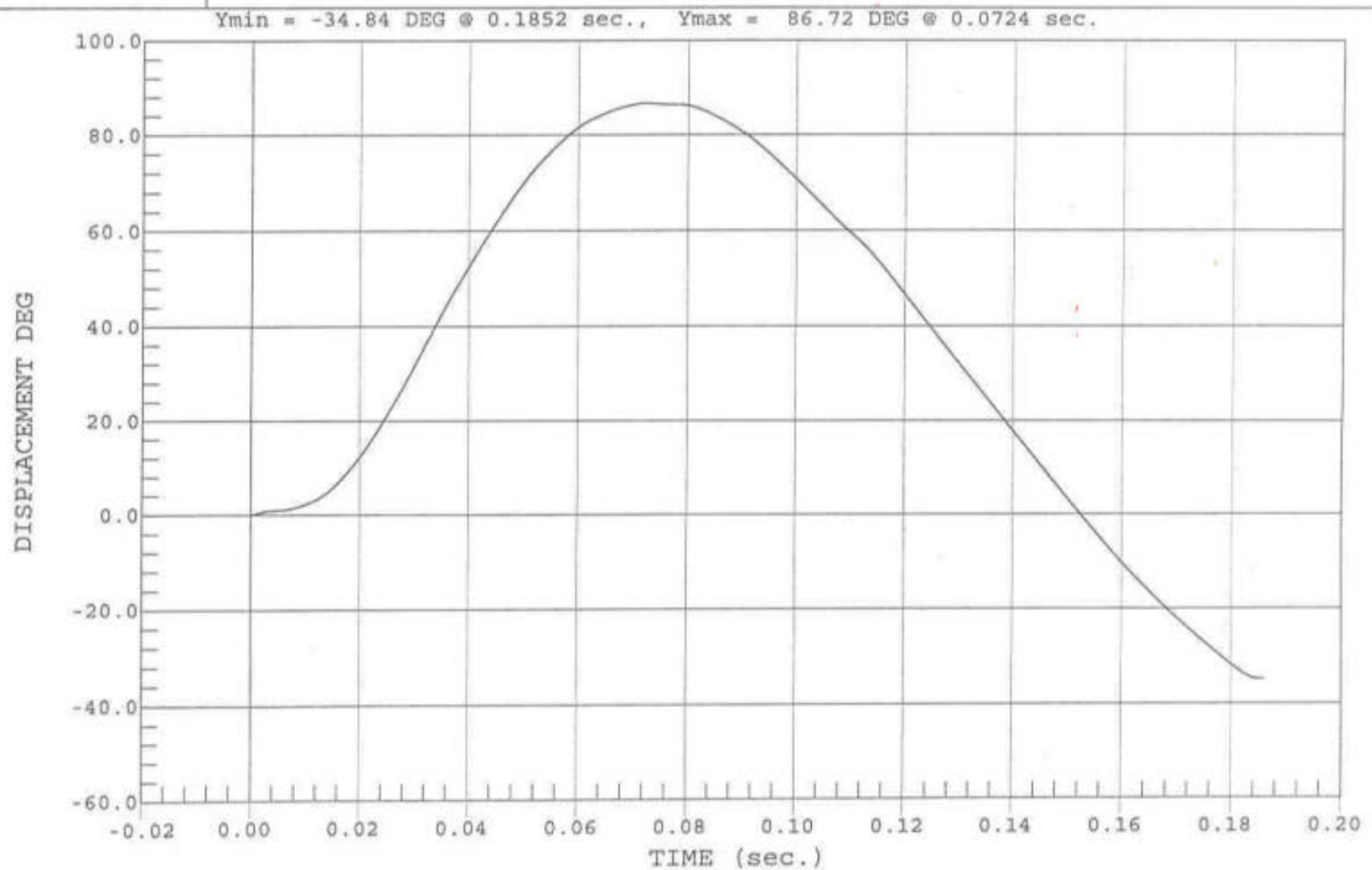


NECK ROTATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #144c

Test Date: 06-14-01
Speed: 16.44 FT/SEC, 5.01 M/SEC

— 1 DISPLACEMENT, D01872DU.D05





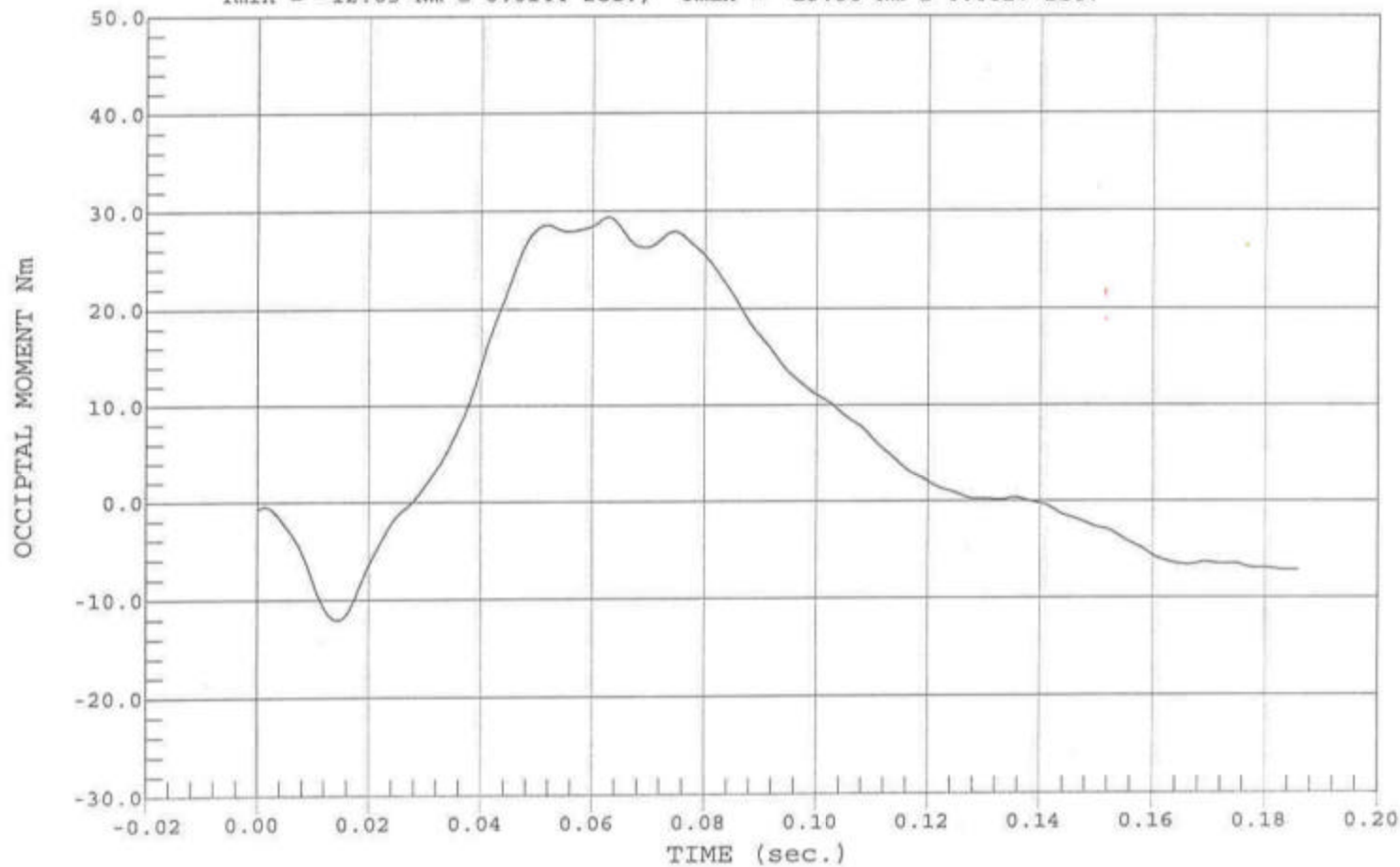
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #144c

Test Date: 06-14-01
Speed: 16.44 FT/SEC, 5.01 M/SEC

— 1 OCCIPITAL MOMENT, D01872NK.MNT

Ymin = -12.03 Nm @ 0.0144 sec., Ymax = 29.38 Nm @ 0.0627 sec.



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 144c

Test Number: D01873

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		20.6 – 22.2	21.5
Relative Humidity (%)		10 – 70	57
Pendulum Speed		4.18 – 4.42	4.34
Pendulum Deceleration	10 msec	1.0 – 1.4 m/sec	1.3
	20 msec	2.2 – 3.0 m/sec	2.5
	30 msec	3.2 – 4.2 m/sec	3.6
D Plane Rotation	Max	85 – 103 deg.	87
Moment About Occipital Condyle in Deflection Corridor	Min	-19- -24 Nm	-23
Negative Moment Time Curve Decay to –5 Nm		123 – 147 ms	127

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



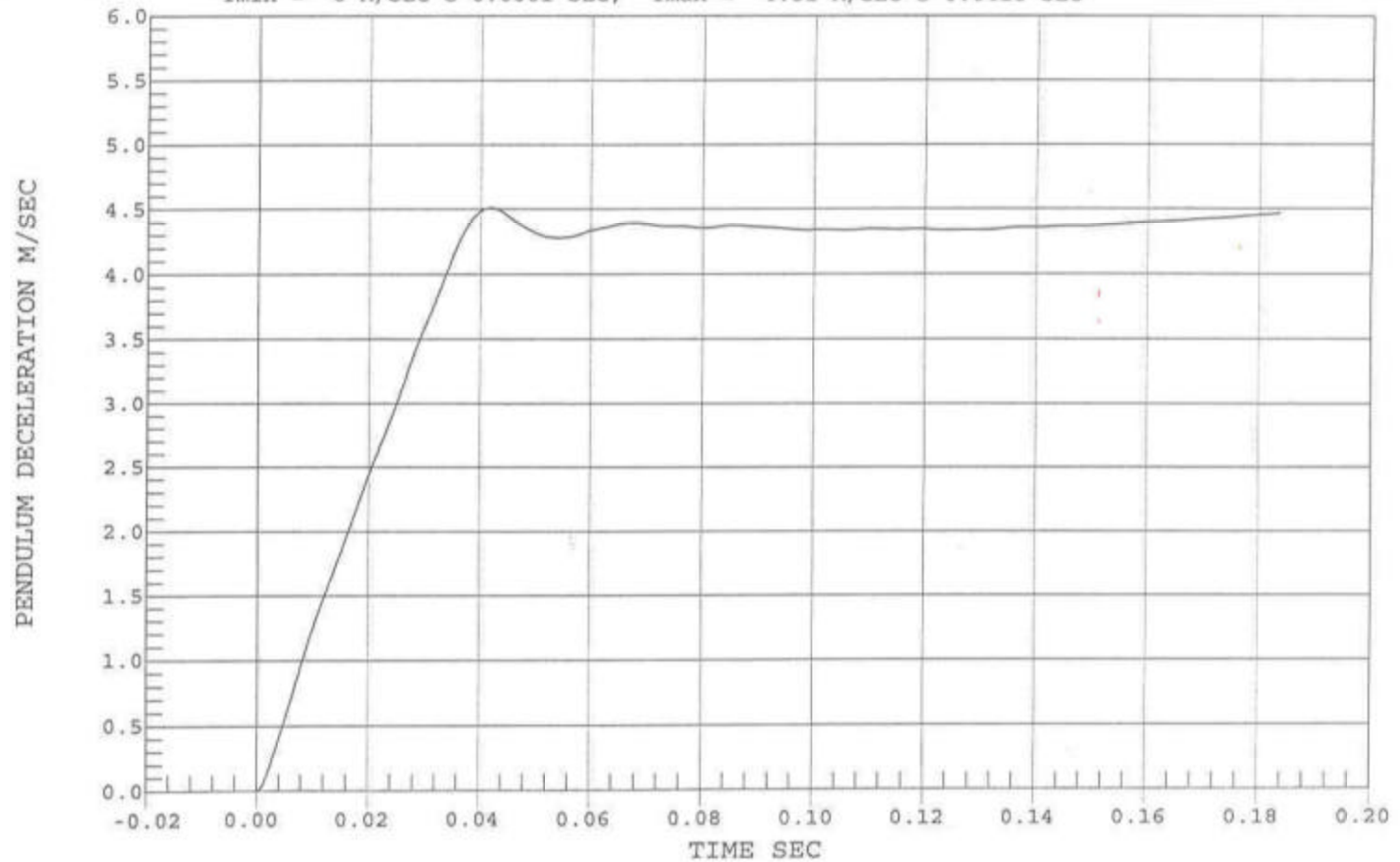
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #144c

Test Date: 06-14-01
Speed: 14.25 FT/SEC, 4.34 M/SEC

— 1 PENDULUM DECELERATION, D01873AI.V04

Ymin = 0 M/SEC @ 0.0001 SEC, Ymax = 4.51 M/SEC @ 0.0418 SEC





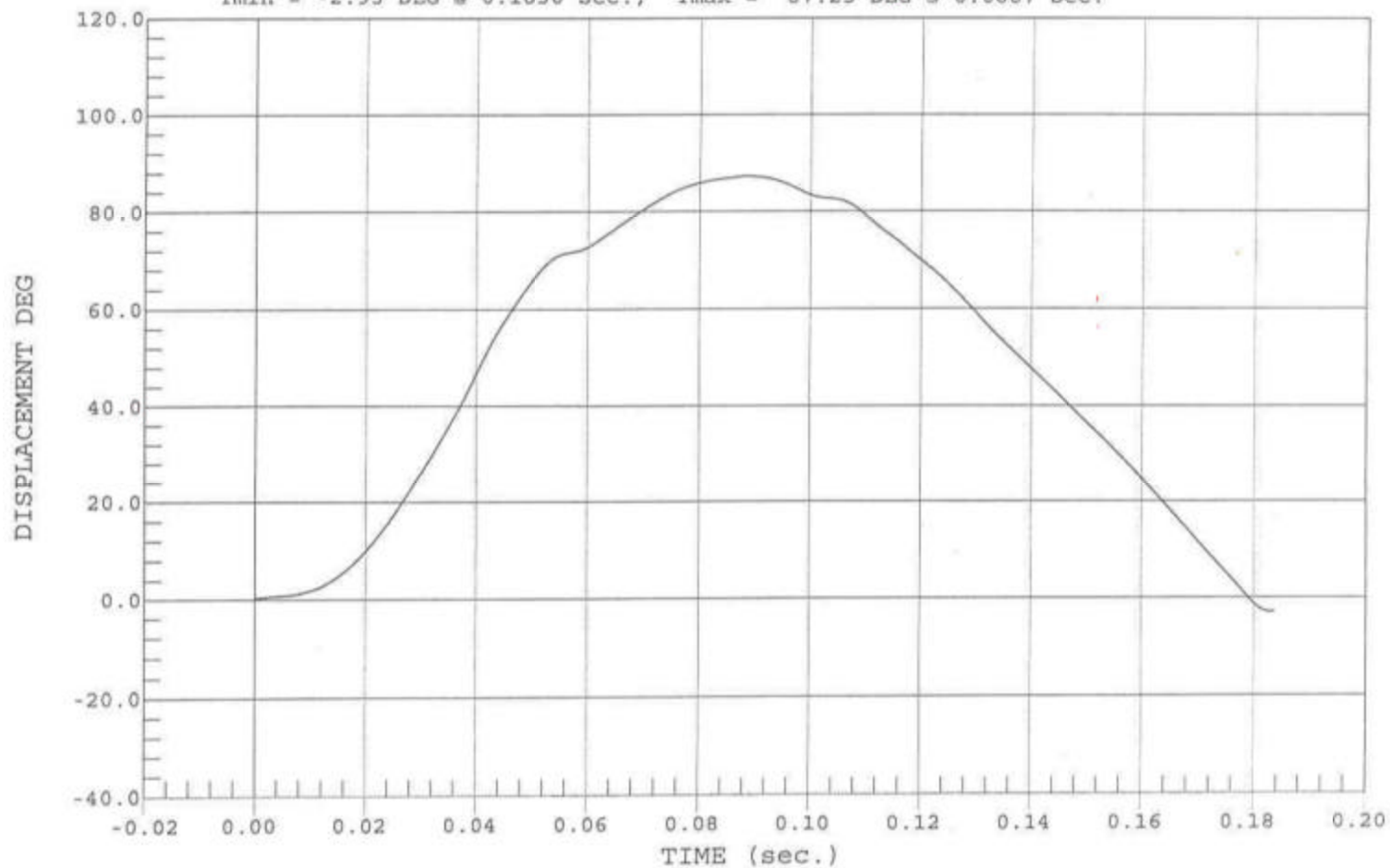
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #144c

Test Date: 06-14-01
Speed: 14.25 FT/SEC, 4.34 M/SEC

— 1 DISPLACEMENT, D01873DU.D05

Ymin = -2.93 DEG @ 0.1830 sec., Ymax = 87.25 DEG @ 0.0887 sec.





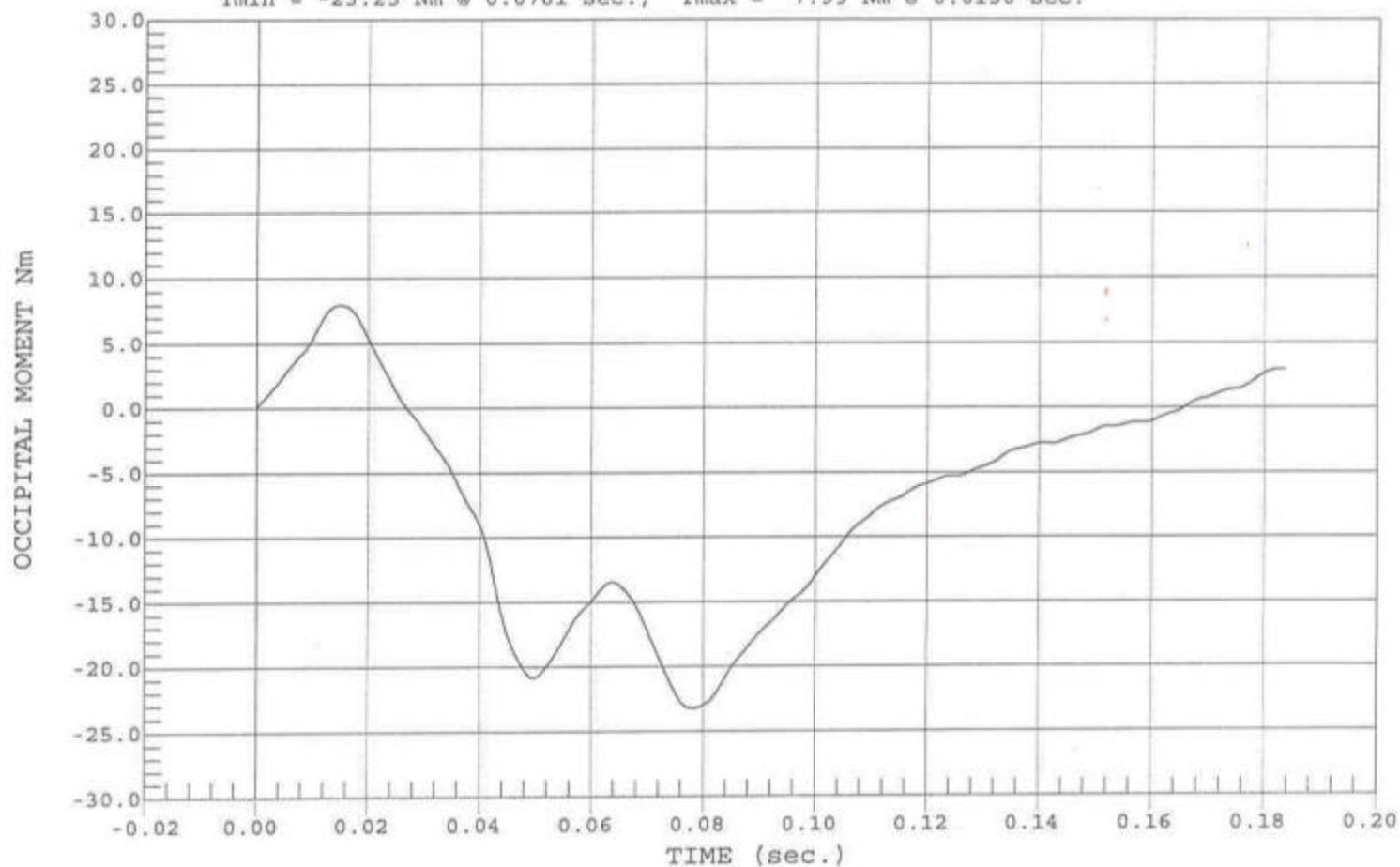
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #144c

Test Date: 06-14-01
Speed: 14.25 FT/SEC, 4.34 M/SEC

— 1 OCCIPITAL MOMENT, D01873NK.MNT

Ymin = -23.25 Nm @ 0.0781 sec., Ymax = 7.99 Nm @ 0.0150 sec.



MGA RESEARCH CORPORATION
THORAX IMPACT TEST
HYBRID III 6 Year Old

Date: 6/18/01

Dummy Serial Number: 144c

Test Number: D01874

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6 – 22.2	21.6
Relative Humidity (%)	10 – 70	56
Probe Speed	6.59 – 6.83 m/sec	6.69
Peak Deflection	38 – 46 mm	40
Peak Resistive Force within Deflection Corridor	1.15 – 1.38 Kn	1.19
Internal Hysteresis	65 – 85%	76
Peak Force 12.5 mm – 38 mm	< 105% of Peak Force in Deflection Corridor	102

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



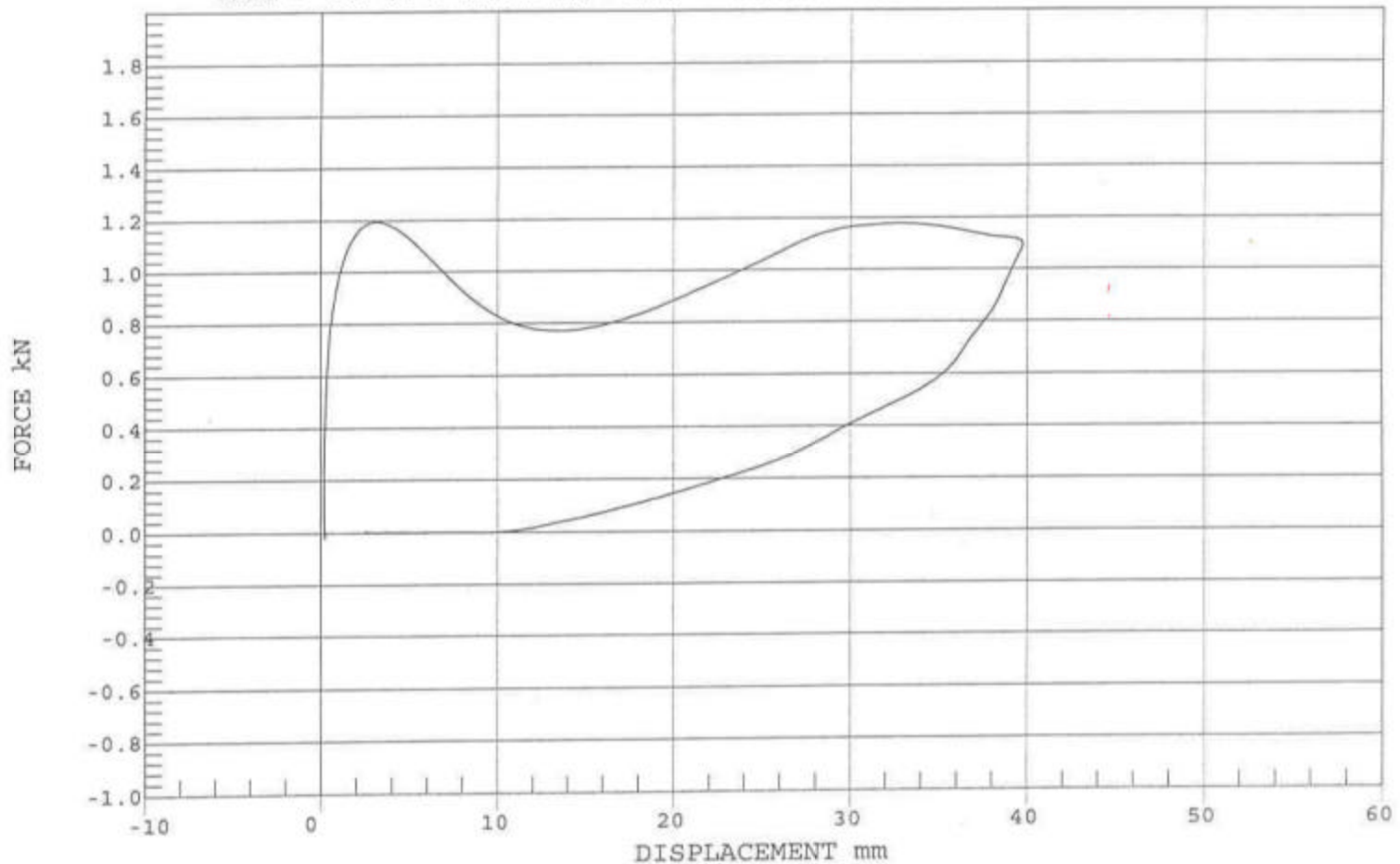
THORAX IMPACT

Test Desc.: Dummy Calibration - Chest Impact
Component: Dummy #144c

Test Date: 06-18-01
Speed: 21.95 FT/SEC, 6.69 M/SEC

— 1 FORCE, D01874CH.FVD

Ymin = -.02 kN @ 0.2328 mm, Ymax = 1.19 kN @ 3.1743 mm



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 144c

Test Number: D01877

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.6	21.6
Relative Humidity (%)	10 – 70	54
Initial Angle (deg)	0 – 22°	8
Return Angle (deg)	0 – 8°	6
Force @ 45°	147 – 200 N	173

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 144c

Test Number: D01875

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.6	21.6
Relative Humidity (%)	10 – 70	54
Probe Speed	2.07 – 2.13 m/sec	2.12
Maximum Force	2.0 – 3.0 kN	2.2

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



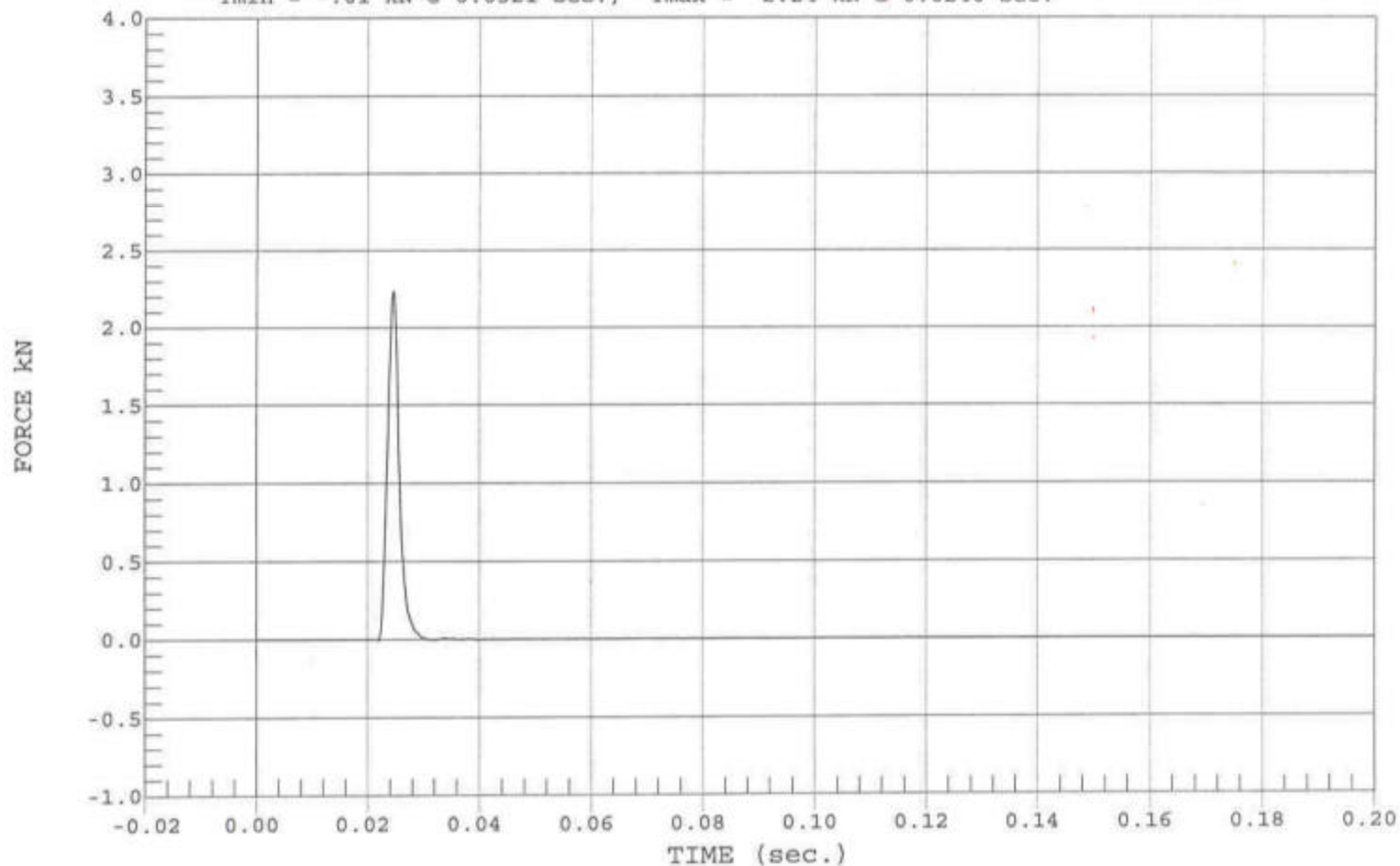
RIGHT KNEE IMPACT

Test Desc.: Dummy Calibration - Right Knee Impact
Component: Dummy #144C

Test Date: 06-14-01
Speed: 6.95 FT/SEC, 2.12 M/SEC

— 1 FORCE, D01875FF.F09

Ymin = -.01 kN @ 0.0321 sec., Ymax = 2.24 kN @ 0.0246 sec.



MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 144c

Test Number: D01876

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.6	21.6
Relative Humidity (%)	10 – 70	57
Probe Speed	2.07 – 2.13 m/sec	2.12
Maximum Force	2.0 – 3.0 kN	2.3

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



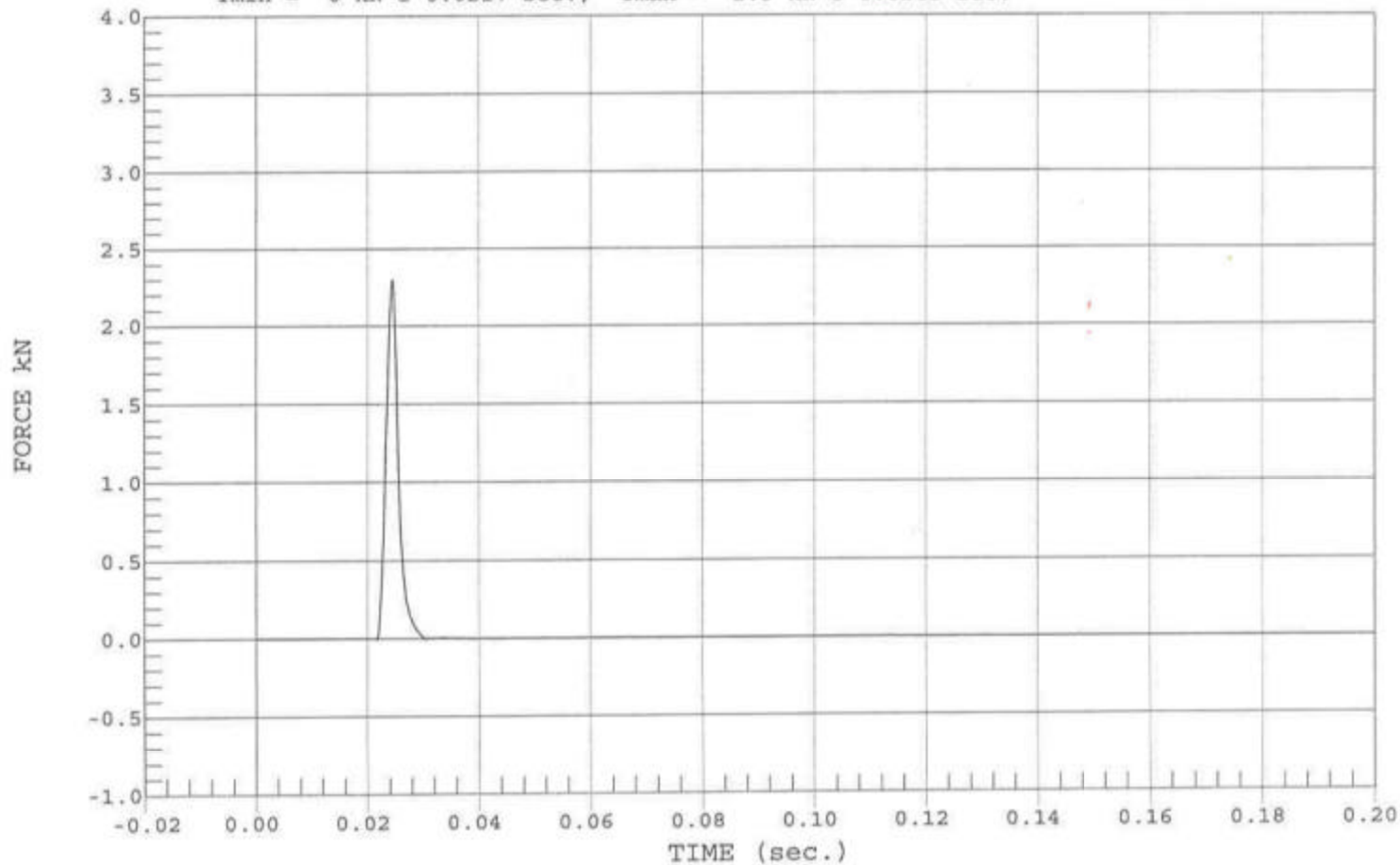
LEFT KNEE IMPACT

Test Desc.: Dummy Calibration - Left Knee Impact
Component: Dummy #144C

Test Date: 06-14-01
Speed: 6.96 FT/SEC, 2.12 M/SEC

— 1 FORCE, D01876FF.F09

Ymin = 0 kN @ 0.0217 sec., Ymax = 2.3 kN @ 0.0245 sec.



DUMMY INSPECTION CHECKLIST

Type: Hybrid III 6 Year Old

Dummy Serial Number: 144c

Inspected By: Tim Michnay

Date: 6/18/01

<u>Part</u>	<u>Items Checked</u>	<u>Comments</u>
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual, cable torque, nodding blocks	OK
Clavicles	visual, bumpers, range of motion	OK
Arms/Hands	visual, bumpers, range of motion	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure, stiffeners	OK
Sternum	visual, bumpers	OK
Lumbar spine	visual, cable torque	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual, load cell bolts	OK
Knees	visual, stops, inserts, sliders	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: 111

Calibration Test Results Summary

Dummy Serial Number: 111

Pre-Test Calibration

Head Drop Test:	The head passed all drop test requirements.
Neck Flexion Test:	The neck passed all flexion test requirements.
Neck Extension Test:	The neck passes all extension test requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Knee Impact Tests:	Both knees passed all impact test requirements.
Torso Flexion Test:	The torso passed all flexion test requirements.

MGA RESEARCH CORPORATION
HEAD DROP TEST
HYBRID III 6 Year Old

Date: 6/14/01
Dummy Serial Number: 111
Test Number: D01861

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.6	21.2
Relative Humidity (%)	10 – 70	55
Peak Resultant Acceleration	245 – 300 g's	270
Peak Lateral Acceleration	± 15 g's	-3
Is Acceleration Curve Unimodal	within 10% of peak	Yes

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



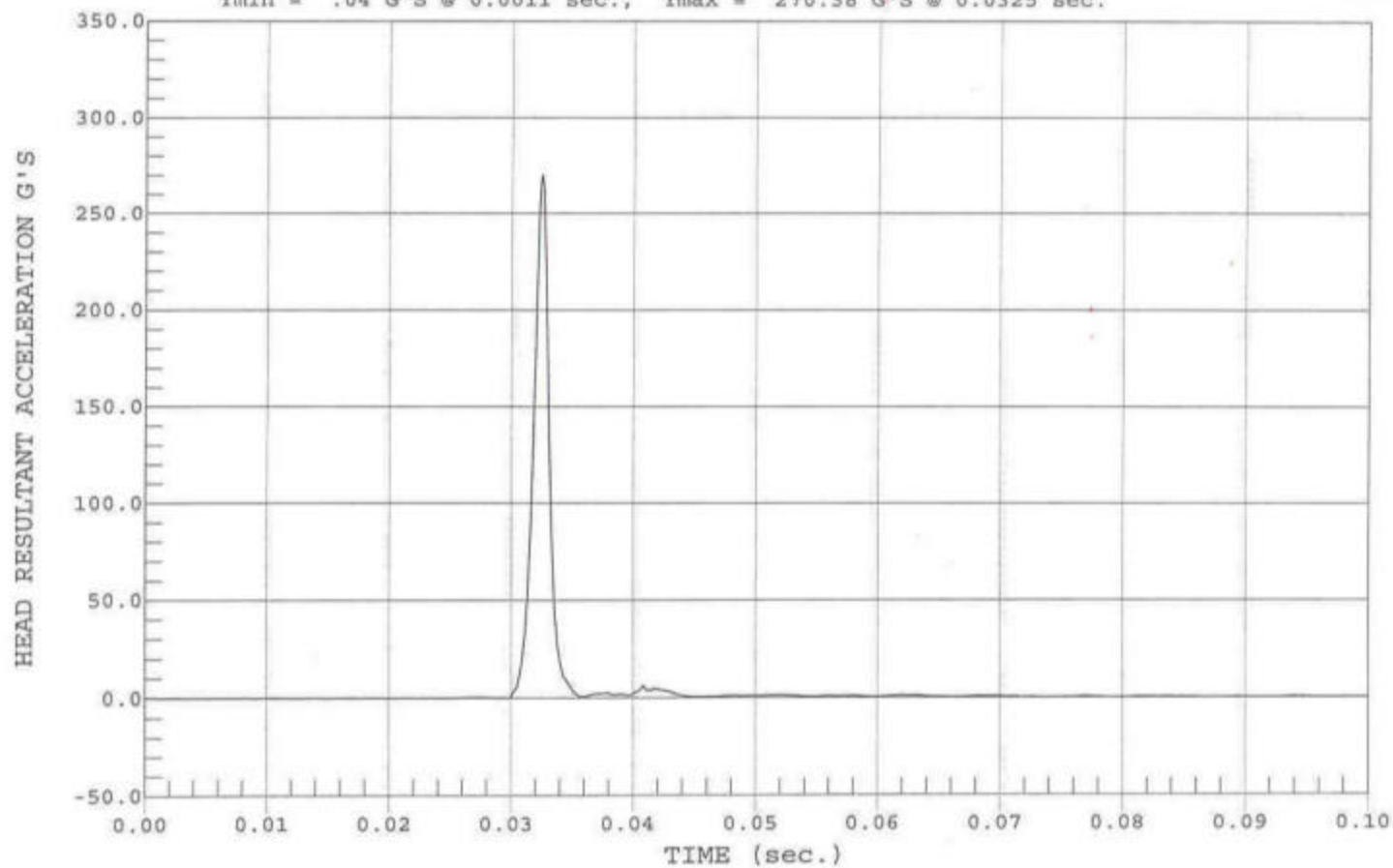
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #111

Test Date: 06-14-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01861AV.A01

Ymin = .04 G'S @ 0.0011 sec., Ymax = 270.38 G'S @ 0.0325 sec.





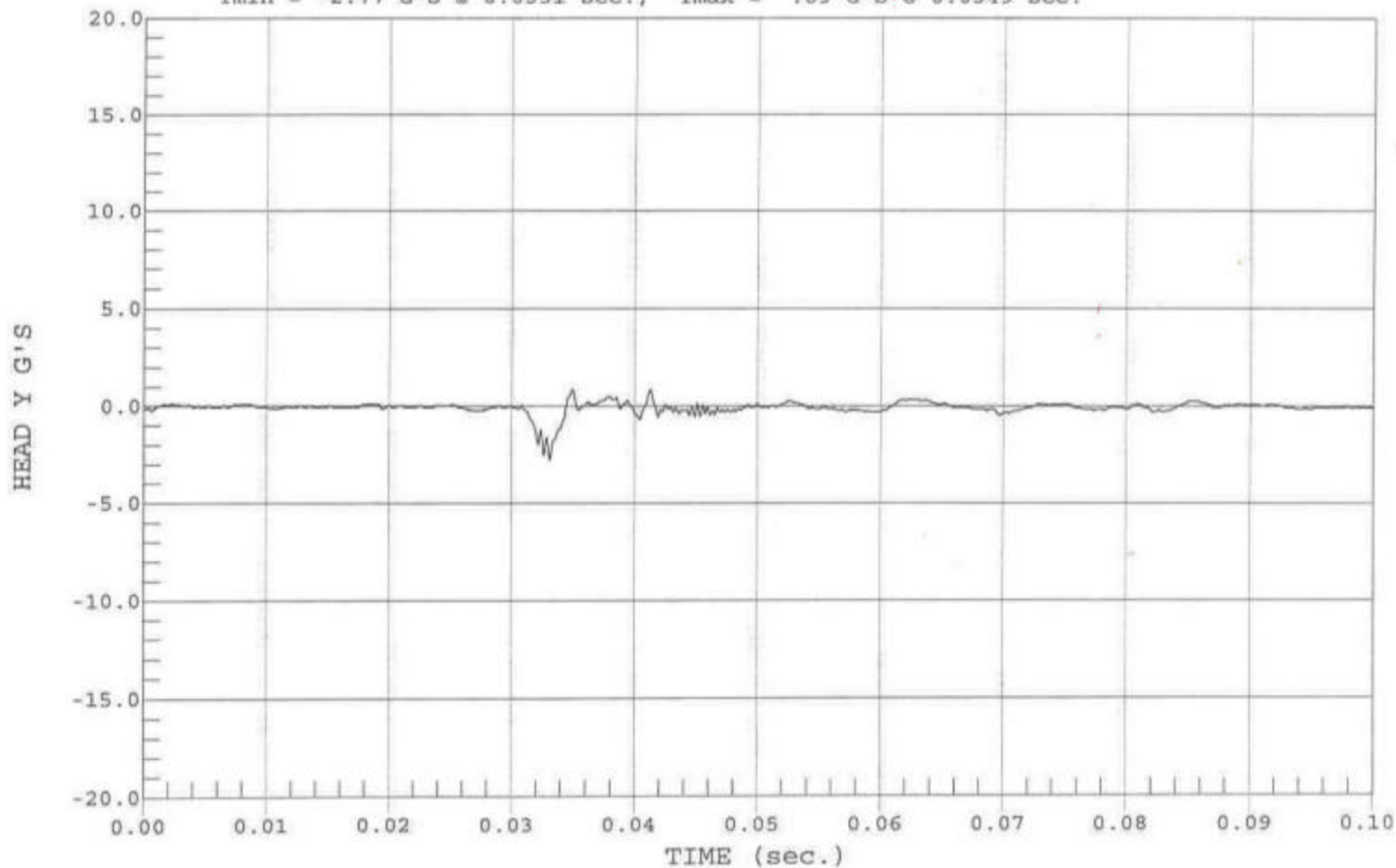
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #111

Test Date: 08-08-00
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01861AR.A02

Ymin = -2.77 G'S @ 0.0331 sec., Ymax = .89 G'S @ 0.0349 sec.



MGA RESEARCH CORPORATION
NECK FLEXION TEST
HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 111

Test Number: D01862

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		20.6-22.2	21.5
Relative Humidity (%)		10 – 70	57
Pendulum Speed		4.83 - 5.07 m/sec	4.98
Pendulum Deceleration	10 msec	1.2 -1.6 m/sec	1.6
	20 msec	2.4 -3.4 m/sec	3.1
	30 msec	3.8 -5.0 m/sec	4.3
D Plane Rotation	Max	74 – 92 deg	80
Moment About Occipital Condyle within Deflection Corridor	Max	27-33 Nm	31
Positive Moment Time Curve Decay to 5 Nm		103 – 123 ms from Time Zero	110

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



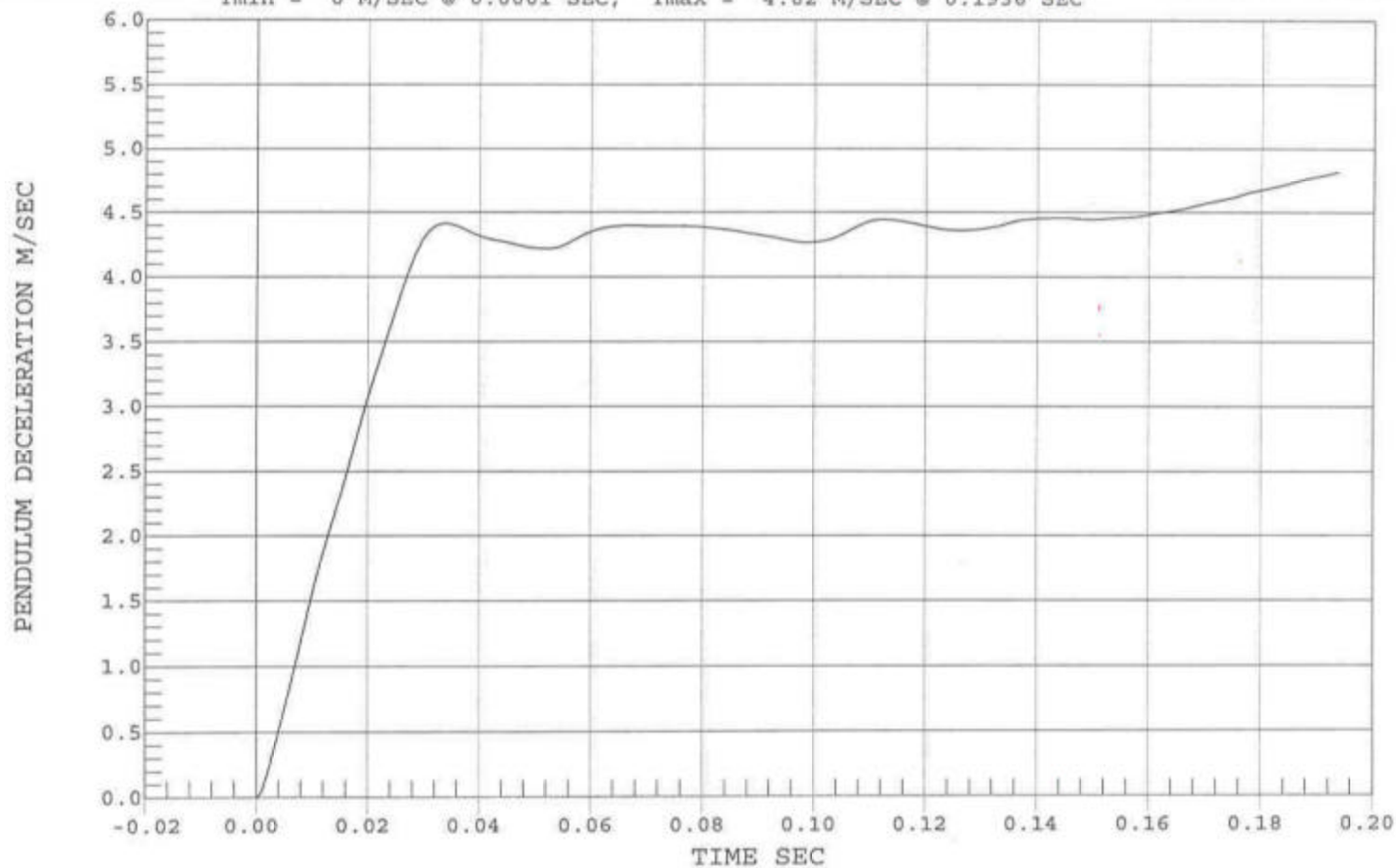
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #111

Test Date: 06-14-01
Speed: 16.33 FT/SEC, 4.98 M/SEC

— 1 PENDULUM DECELERATION, D01862AI.V04

Ymin = 0 M/SEC @ 0.0001 SEC, Ymax = 4.82 M/SEC @ 0.1936 SEC





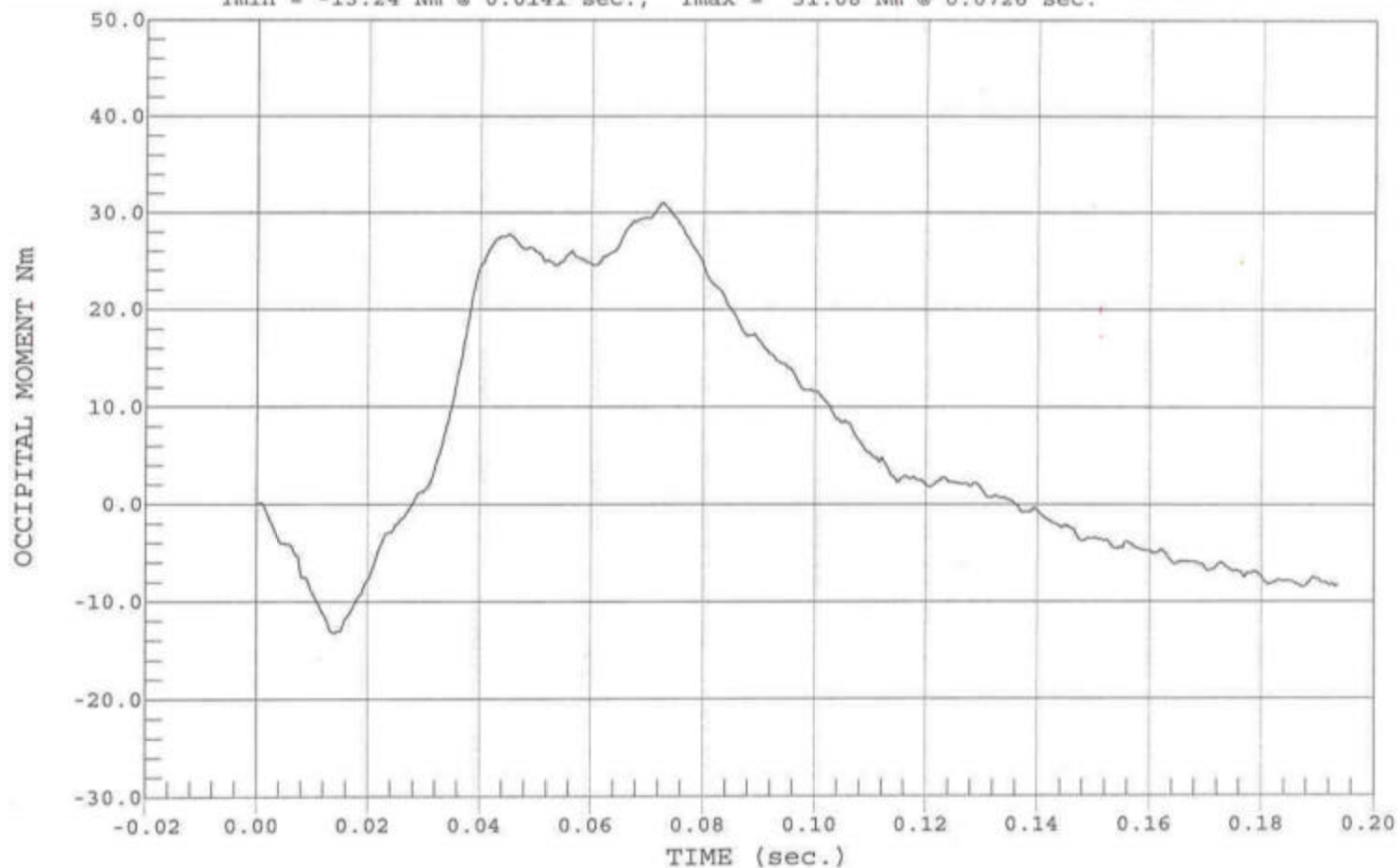
OCCIPITAL MOMENT

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #111

Test Date: 06-14-01
Speed: 16.33 FT/SEC, 4.98 M/SEC

— 1 OCCIPITAL MOMENT, D01862NK.MNT

Ymin = -13.24 Nm @ 0.0141 sec., Ymax = 31.08 Nm @ 0.0726 sec.





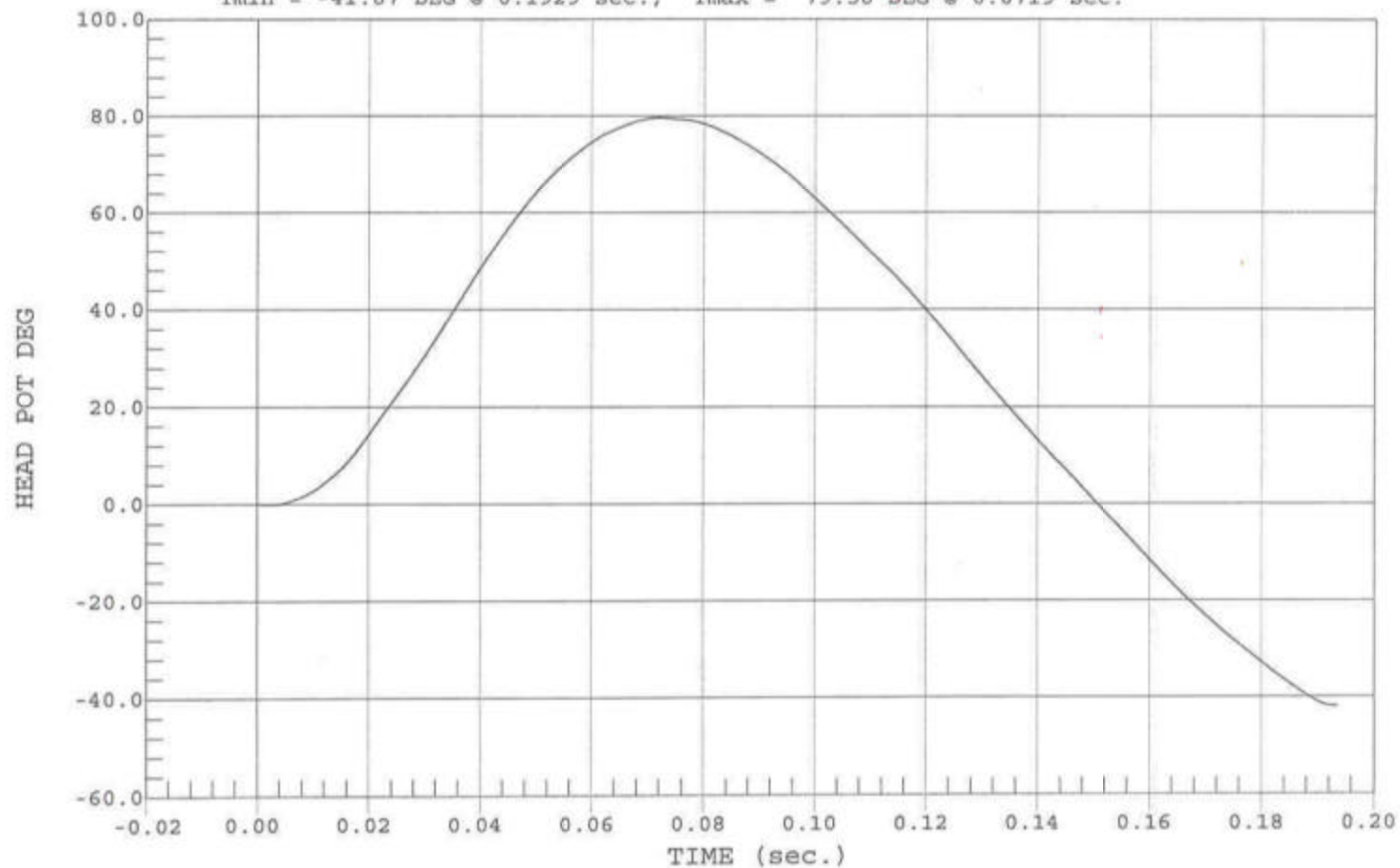
NECK ROTATION

Test Desc.: Dummy Calibration - Neck Flexion
Component: Dummy #111

Test Date: 06-14-01
Speed: 16.33 FT/SEC, 4.98 M/SEC

— 1 HEAD POT, D01862DU.D05

Ymin = -41.87 DEG @ 0.1929 sec., Ymax = 79.58 DEG @ 0.0719 sec.



MGA RESEARCH CORPORATION
NECK EXTENSION TEST
HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 111

Test Number: D01863

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		20.6 – 22.2	21.5
Relative Humidity (%)		10 – 70	57
Pendulum Speed		4.18 – 4.42	4.33
Pendulum Deceleration	10 msec	1.0 – 1.4 m/sec	1.3
	20 msec	2.2 – 3.0 m/sec	2.8
	30 msec	3.2 – 4.2 m/sec	4.1
D Plane Rotation	Max	85 – 103 deg.	93
Moment About Occipital Condyle in Deflection Corridor	Min	-19- -24 Nm	-22
Negative Moment Time Curve Decay to –5 Nm		123 – 147 ms	134

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



PENDULUM DECELERATION

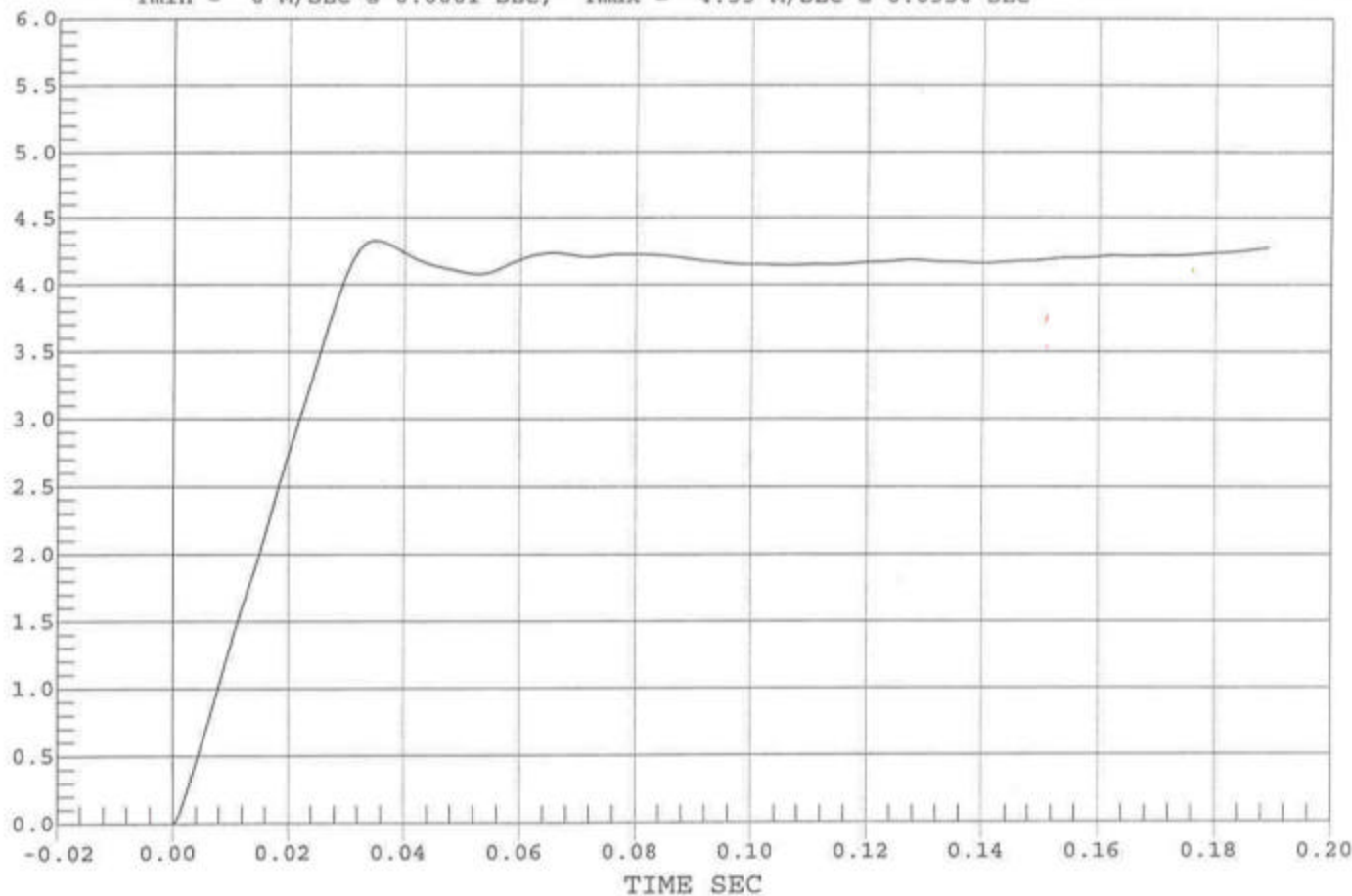
Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #111

Test Date: 06-14-01
Speed: 14.19 FT/SEC, 4.33 M/SEC

— 1 PENDULUM DECELERATION, D01863AI.V04

Ymin = 0 M/SEC @ 0.0001 SEC, Ymax = 4.33 M/SEC @ 0.0350 SEC

PENDULUM DECELERATION M/SEC





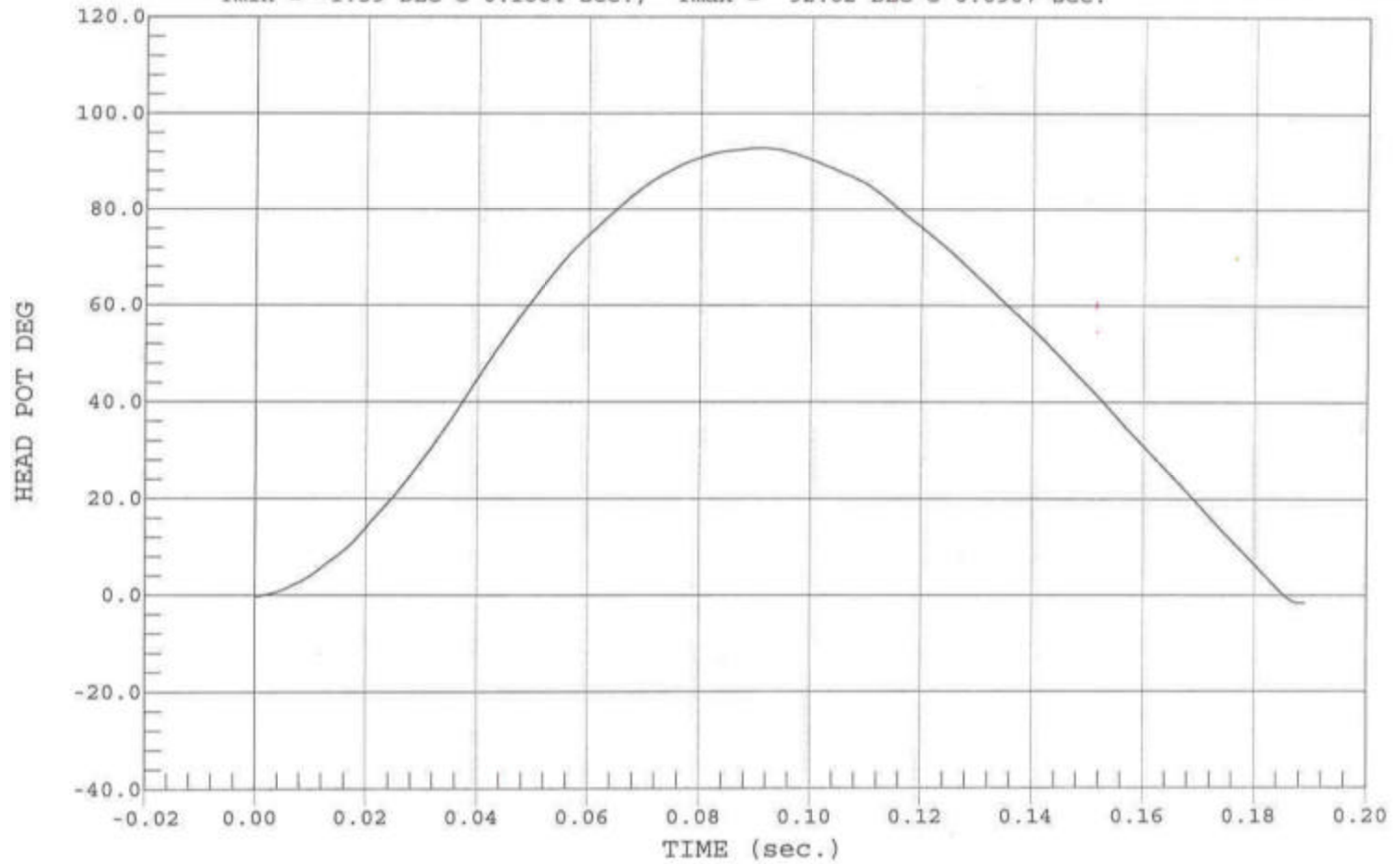
NECK ROTATION

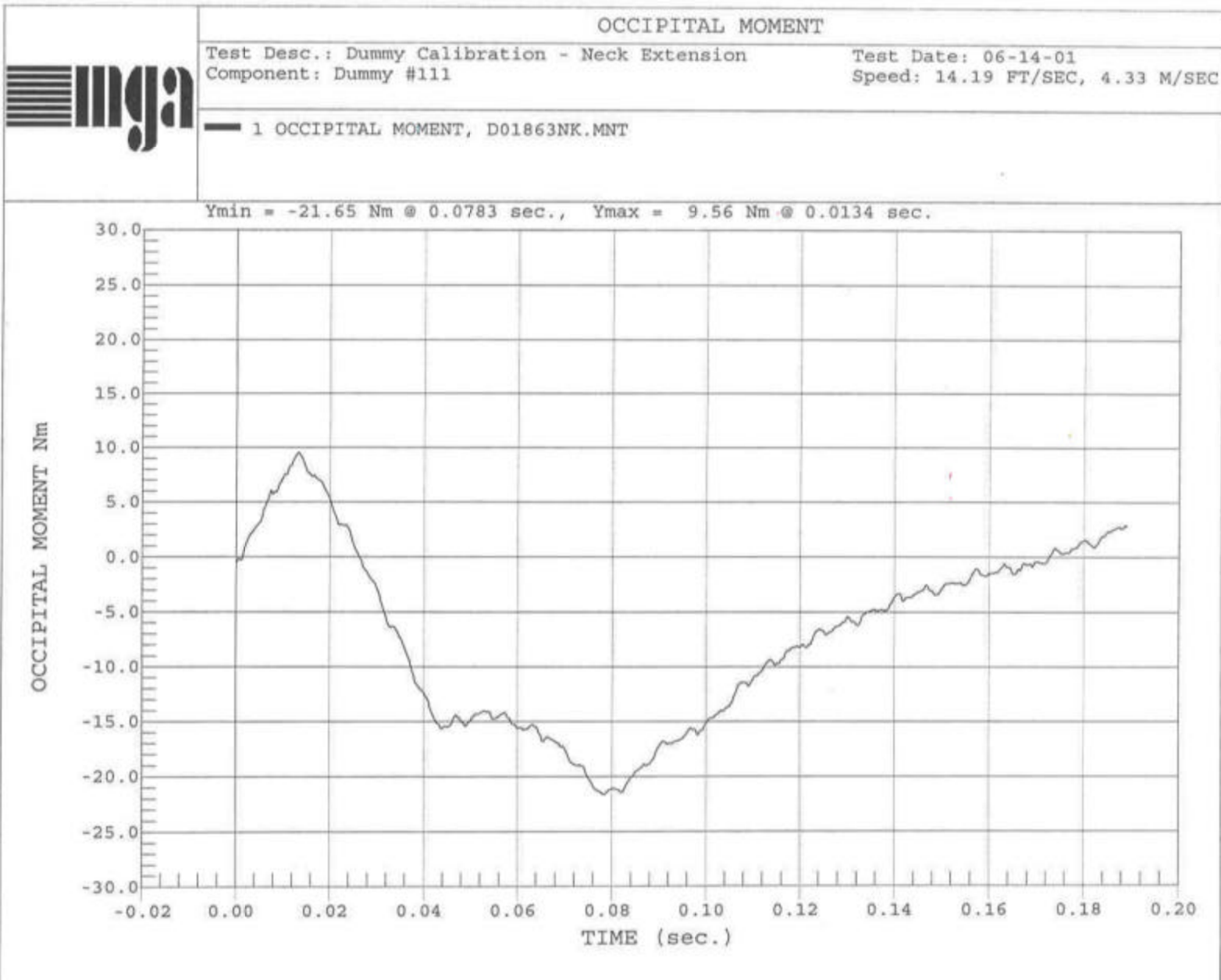
Test Desc.: Dummy Calibration - Neck Extension
Component: Dummy #111

Test Date: 06-14-01
Speed: 14.19 FT/SEC, 4.33 M/SEC

— 1 HEAD POT, D01863DU.D05

Ymin = -1.59 DEG @ 0.1884 sec., Ymax = 92.82 DEG @ 0.0907 sec.





MGA RESEARCH CORPORATION
THORAX IMPACT TEST
HYBRID III 6 Year Old

Date: 6/18/01

Dummy Serial Number: 111

Test Number: D01864

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	20.6 – 22.2	21.6
Relative Humidity (%)	10 – 70	56
Probe Speed	6.59 – 6.83 m/sec	6.69
Peak Deflection	38 – 46 mm	40
Peak Resistive Force within Deflection Corridor	1.15 – 1.38 Kn	1.24
Internal Hysteresis	65 – 85%	75
Peak Force 12.5 mm – 38 mm	< 105% of Peak Force in Deflection Corridor	103

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



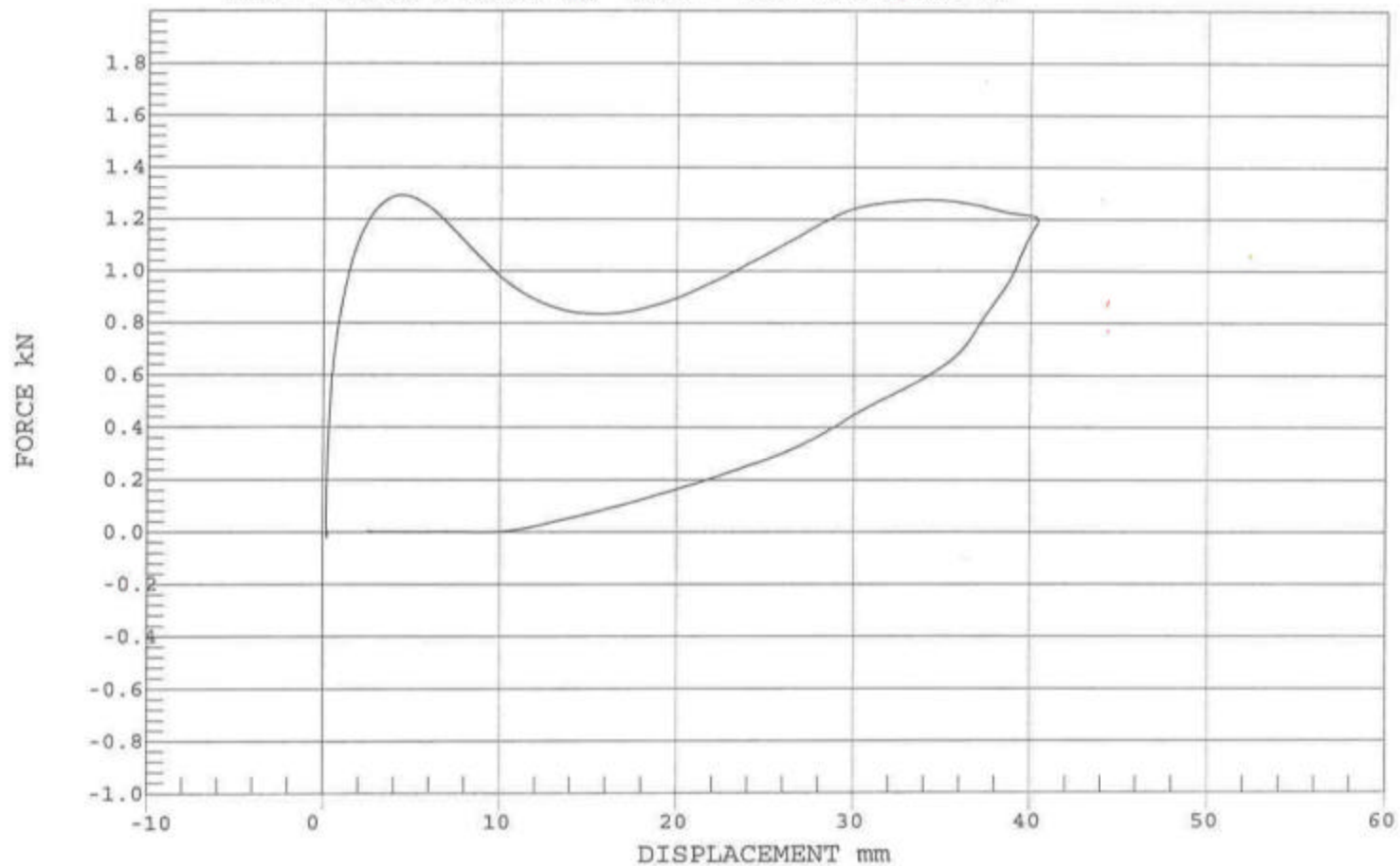
THORAX IMPACT

Test Desc.: Dummy Calibration - Chest Impact
Component: Dummy #111

Test Date: 06-18-01
Speed: 21.95 FT/SEC, 6.69 M/SEC

— 1 FORCE, D01864CH.FVD

Ymin = -.02 kN @ 0.2303 mm, Ymax = 1.29 kN @ 4.4005 mm



MGA RESEARCH CORPORATION
TORSO FLEXION TEST
HYBRID III 6 Year Old

Date: 6/18/01

Dummy Serial Number: 111

Test Number: D01867

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.6	21.7
Relative Humidity (%)	10 – 70	55
Initial Angle (deg)	0 – 22°	7
Return Angle (deg)	0 – 8°	6
Force @ 45°	147 – 200 N	163

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

MGA RESEARCH CORPORATION
RIGHT KNEE IMPACT TEST
HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 111

Test Number: D01865

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.6	21.6
Relative Humidity (%)	10 – 70	54
Probe Speed	2.07 – 2.13 m/sec	2.12
Maximum Force	2.0 – 3.0 kN	2.29

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



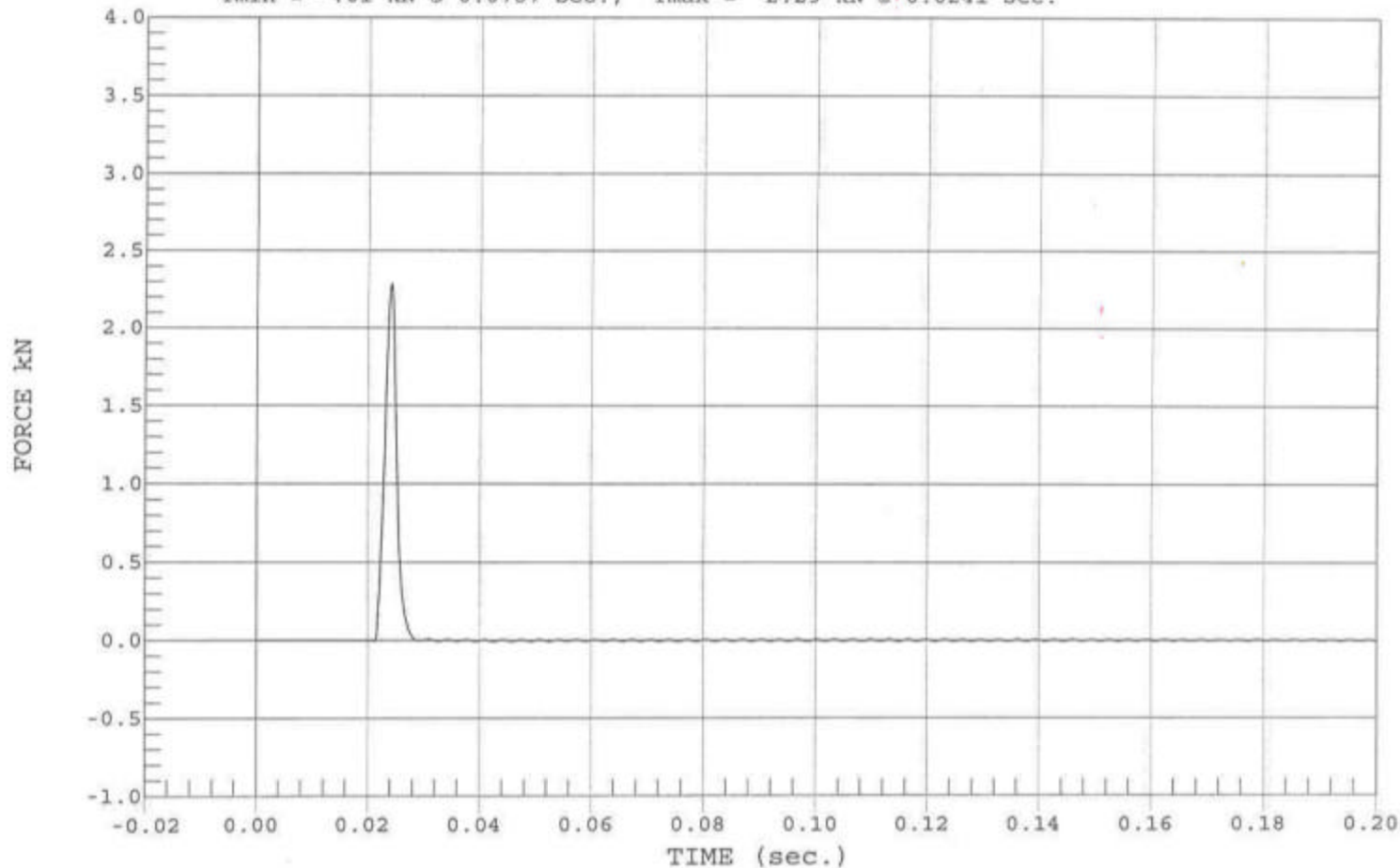
RIGHT KNEE IMPACT

Test Desc.: Dummy Calibration - Right Knee Impact
Component: Dummy #111

Test Date: 06-14-01
Speed: 6.97 FT/SEC, 2.12 M/SEC

— 1 FORCE, D01865FF.F09

Ymin = -.01 kN @ 0.0787 sec., Ymax = 2.29 kN @ 0.0241 sec.



MGA RESEARCH CORPORATION
LEFT KNEE IMPACT TEST
HYBRID III 6 Year Old

Date: 6/14/01

Dummy Serial Number: 111

Test Number: D01866

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.6	21.6
Relative Humidity (%)	10 – 70	54
Probe Speed	2.07 – 2.13 m/sec	2.12
Maximum Force	2.0 – 3.0 kN	2.4

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



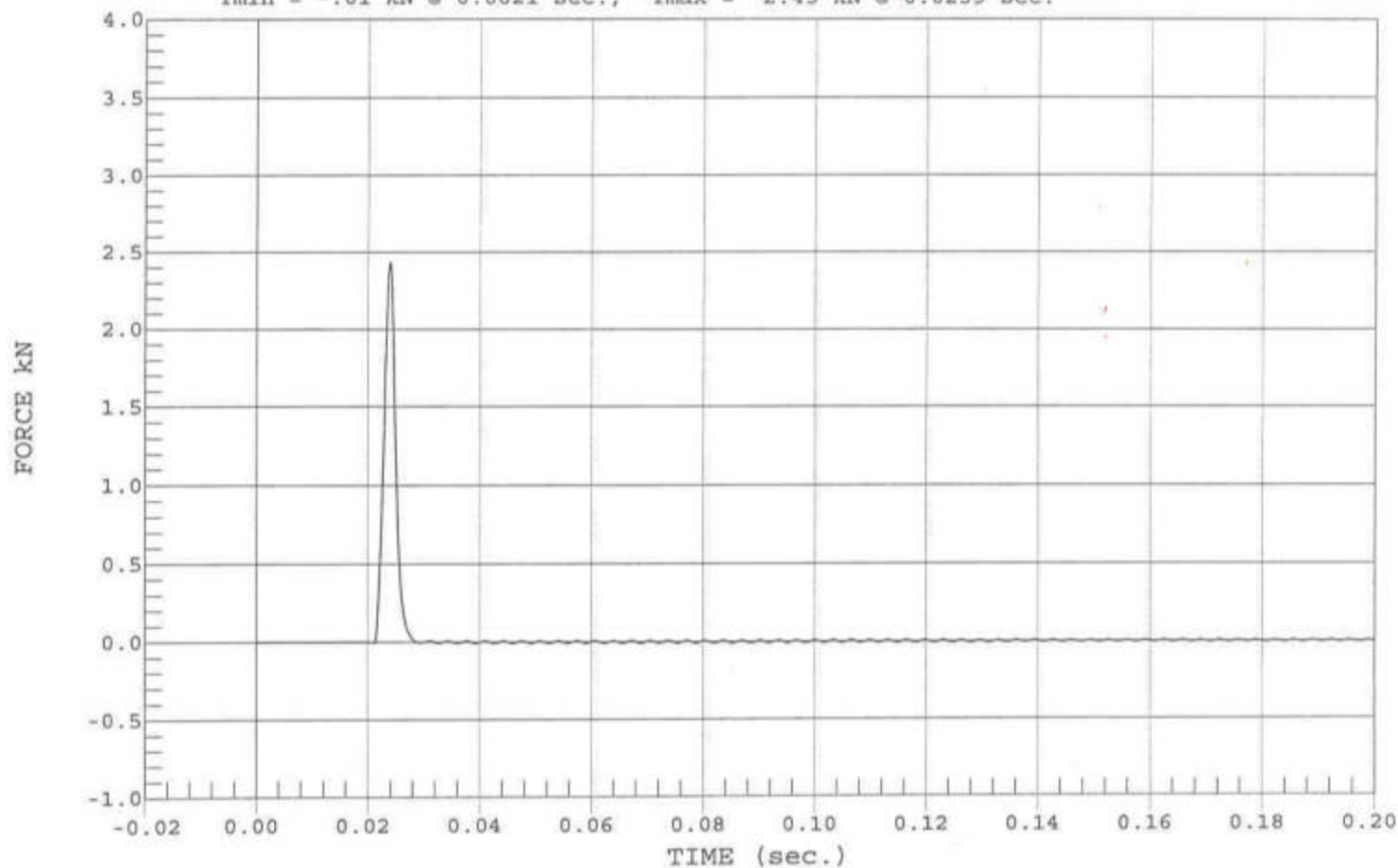
LEFT KNEE IMPACT

Test Desc.: Dummy Calibration - Left Knee Impact
Component: Dummy #111

Test Date: 06-14-01
Speed: 6.97 FT/SEC, 2.12 M/SEC

— 1 FORCE, D01866FF.F09

Ymin = -.01 kN @ 0.0821 sec., Ymax = 2.43 kN @ 0.0239 sec.



DUMMY INSPECTION CHECKLIST

Type: Hybrid III 6 Year Old

Dummy Serial Number: 111

Inspected By: Tim Michnay

Date: 6/18/01

<u>Part</u>	<u>Items Checked</u>	<u>Comments</u>
Skin	visual inspection	OK
Head	visual, ballast, accelerometer mount	OK
Neck	visual, cable torque, nodding blocks	OK
Clavicles	visual, bumpers, range of motion	OK
Arms/Hands	visual, bumpers, range of motion	OK
Spine box	visual, ballast, weldment, accelerometer mount	OK
Rib cage	visual, measure, stiffeners	OK
Sternum	visual, bumpers	OK
Lumbar spine	visual, cable torque	OK
Abdomen	visual	OK
Pelvis	visual, palpate, accelerometer mount	OK
Upper legs	visual, load cell bolts	OK
Knees	visual, stops, inserts, sliders	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. 009		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	J11014	Endevco	3/28/01
Head Y Accelerometer	J11625	Endevco	3/28/01
Head Z Accelerometer	J10730	Endevco	3/28/01
Upper Neck Load Cell	105	FTSS	4/30/01
Lower Neck Load Cell	110	FTSS	5/4/01
Shoulder Force Load Cell	119	FTSS	4/24/01
Upper Spine X Accelerometer	J13941	Endevco	3/20/01
Upper Spine Y Accelerometer	J13984	Endevco	3/20/01
Upper Spine Z Accelerometer	J13927	Endevco	3/28/01
Upper Rib Y Accelerometer	AJ9Y3	Endevco	3/28/01
Mid Rib Y Accelerometer	ANAM1	Endevco	3/28/01
Lower Rib Y Accelerometer	ANAN7	Endevco	3/28/01
Upper Rib Displacement	009	Honeywell	5/22/01
Mid Rib Displacement	009	Honeywell	5/22/01
Lower Rib Displacement	009	Honeywell	5/22/01
Lower Spine X Accelerometer	ALFP1	Endevco	5/30/01
Lower Spine Y Accelerometer	AP179	Endevco	5/30/01
Lower Spine Z Accelerometer	AHTY4	Endevco	5/30/01
Torso Load Cell	122	FTSS	4/12/01
T-12 Load Cell	102	FTSS	3/27/01
Front Abdomen Load Cell	122	FTSS	4/26/01
Mid Abdomen Load Cell	123	FTSS	4/26/01
Rear Abdomen Load Cell	124	FTSS	4/26/01
Pubic Symphysis Load Cell	115	Denton	3/29/01
Pelvis X Accelerometer	J13772	Endevco	2/21/01
Pelvis Y Accelerometer	J14008	Endevco	2/21/01
Pelvis Z Accelerometer	J14028	Endevco	2/21/01
Right Femur Load Cell	135	FTSS	4/18/01
Left Femur Load Cell	136	FTSS	4/19/01
Lumbar Load Cell	104	FTSS	4/24/01

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR RIGHT REAR DUMMY NO. 144		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AMTL6	Endevco	6/14/01
Head Y	ALC37	Endevco	6/14/01
Head Z	AMTG3	Endevco	6/14/01
Upper Neck Load Cell	274	FTSS	1/4/01
Lower Neck Load Cell	139	FTSS	11/28/00
Chest X	J20965	Endevco	6/14/01
Chest Y	J22055	Endevco	6/14/01
Chest Z	J22107	Endevco	6/14/01
Pelvis X	J13990	Endevco	6/14/01
Pelvis Y	J13631	Endevco	6/14/01
Pelvis Z	J13930	Endevco	6/14/01

	INSTRUMENTS FOR LEFT REAR DUMMY 111		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	J11014	Endevco	3/28/01
Head Y	J11625	Endevco	3/28/01
Head Z	J10730	Endevco	3/28/01
Upper Neck Load Cell	252	Denton	3/23/01
Chest X	J21970	Endevco	5/31/01
Chest Y	J22033	Endevco	5/31/01
Chest Z	J21691	Endevco	5/31/01
Pelvis X	J13941	Endevco	3/20/01
Pelvis Y	J13984	Endevco	3/20/01
Pelvis Z	J13927	Endevco	3/20/01

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Mid A-Post Y	I14-D18	Entran	5/31/01
Left Lower A-Post Y	I25-F01	Entran	6/19/01
Left Mid B-Post Y	F04-N10	Entran	6/22/01
Left Lower B-Post Y	E03-H17	Entran	6/7/01
Rear Floorpan Above Axle X	F04-N15	Entran	6/25/01
Rear Floorpan Above Axle Y	MGA045	Entran	3/21/01
Rear Floorpan Above Axle Z	F04-N09	Entran	6/22/01
Driver Seat Track Y	I25-F10	Entran	6/11/01
Driver Left Seat Frame	E03-H09	Entran	6/6/01
Driver Right Seat Frame	D11-F14	Entran	5/30/01
Right Side Sill at Front Seat X	E10-F20	Entran	5/25/01
Right Side Sill at Front Seat Y	I18-E14	Entran	5/25/01
Right Side Sill at Front Seat Z	F12-G03	Entran	5/25/01
Right Side Sill at Rear Seat X	I25-F07	Entran	6/11/01
Right Side Sill at Rear Seat Y	I25-F08	Entran	6/11/01
Right Side Sill at Rear Seat Z	I25-F09	Entran	6/11/01
Left Side Sill at Front Seat Y	E03-H24	Entran	6/7/01
Left Side Sill at Rear Seat Y	I25-F12	Entran	6/25/01
Vehicle CG X	F04-N14	Entran	6/22/01
Vehicle CG Y	F04-N06	Entran	6/22/01
Vehicle CG Z	F04-N08	Entran	6/22/01
Left Front Door @ Pelvis Y	I25-F15	Entran	6/11/01
Left Front Door @ End of Arm Y	G13-F10	Entran	6/1/01
Left Rear Door @ Knee	D05-R16	Entran	2/7/01
Left Rear Door @ Pelvis	D11-F11	Entran	5/31/01
Child Seat @ Pelvis	L15-G21	Entran	6/25/01
Lower Center Radiator Support X	E03-H14	Entran	6/7/01
Lower Center Radiator Support Y	D11-F06	Entran	5/30/01
Lower Center Radiator Support Z	D11-F05	Entran	5/30/01

Note: All Endevco accelerometers are Model No. 7264-2000

All Entran accelerometers are Model No. EGE-72

APPENDIX E
PROCEDURE USED FOR ES-2 POSITIONING

Installation of the Side Impact Dummy (recommended practice)

1. GENERAL

- 1.1 The dummy to be used for the following installation procedure is described in Annex 6 to this regulation.
- 1.2 Adjust the knee joints so that they just support the leg when it is extended horizontally (1 to 2 g).
- 1.3 Clothe the dummy in form fitting cotton stretch mid-calf length pants. Each foot is equipped with a shoe.

2. INSTALLATION

- 2.1 Place the dummy in the outboard front seat of the impact side as described in the test specifications.
- 2.2 The mid-sagittal plane of the dummy shall coincide with the centerplane of the occupant (as determined according to Annex 3, paragraph 2.8) with a tolerance of 2°.
- 2.3 The pelvis of the dummy shall be positioned according to the following:
 - 2.3.1 The pelvis pitch angle shall be 20.0° +/- 2.5°.
 - 2.3.2 A line passing through the dummy H-points shall pass through an imaginary circle in the mid-sagittal plane of the dummy. This circle has a radius of 10 mm and is located 20 mm horizontally forward and 5 mm vertically above the reference H-point, determined by the 3D H-point machine.
- 2.4 The upper torso of the dummy shall be positioned according to the following:
 - 2.4.1 The upper torso shall be bent forward and then laid back against the seat back. The shoulder of the dummy shall be set fully rearward.
 - 2.4.2 The torso reference line pitch angle shall be 25.0° +/- 2.5°. The torso reference line is defined as the thoracic spine center line.
- 2.5 The arms shall be positioned in such a way that the angle between the projection of the arm centerline on the mid-sagittal plane of the dummy and the torso reference line is 40° +/- 5°.

- 2.6 For the driver's seating position, without inducing pelvis or torso movement, place the right foot of the dummy on the undepressed accelerator pedal with the heel resting as far forward as possible on the floorpan. Set the left foot perpendicular to the lower leg with the heel resting on the floorpan in the same lateral line as the right heel. Set the knees of the dummy such that their outside surfaces are 150 ± 10 mm from the plane of symmetry of the dummy. If possible, within these constraints, place the thighs of the dummy in contact with the seat cushion.
- 2.7 For other seating positions, without inducing pelvis or torso movement, place the heels of the dummy as far forward as possible on the floorpan without compressing the seat cushion more than the compression due to the weight of the leg. Set the knees of the dummy such that their outside surfaces are 150 ± 10 mm from the plane of symmetry of the dummy.

APPENDIX F
ES-2 PEAK RESPONSES

ES-2 PEAK RESPONSE COMPARISON TABLE

Location	Peak Values (G's)						
	Class	Axis	Units	Saturn 7/10 201P ES-2		Saturn 8/8 201P ES-2	
				Peak	Time (msec)	Peak	Time (msec)
Head	1000	X	G	32.7	60	-16.6	129
	1000	Y	G	835.2	60	-86.1	129
	1000	Z	G	145.2	60	13.3	129
	1000	RES	G	846.1	60	88.7	129
Head Injury Criteria (HIC)				9004		435	
time 1 msec				59.2		49.7	
time 2 msec				60.0		68.0	
				-172.4	72	324.1	95
Upper Neck Force	1000	X	N	-1706	60	189	60
	1000	Y	N	-1642	62	-531	120
	1000	Z	N	1942	60	543	120
	1000	RES	N	-47	62	-31	56
Upper Neck Moment	600	X	Nm	28.5	98	29.3	93
	600	Y	Nm	-15.0	161	-16.9	104
	600	Z	Nm	48.3	62	33.3	56
	600	RES	Nm	-287.3	71	-348.2	72
Lower Neck Force	1000	X	N	835	60	602	54
	1000	Y	N	-1700	63	571	121
	1000	Z	N	1734	63	750	53
Lower Neck Moment	600	X	Nm	NVD		48.1	54
	600	Y	Nm			53.4	77
	600	Z	Nm			-17.0	111
	600	RES	Nm			55.3	78
Shoulder Force	1000	X	N	-540	37	465	36
	1000	Y	N	1195	37	1263	37
	1000	Z	N	-787	41	880	41
	1000	RES	N				

ES-2 PEAK RESPONSE COMPARISON TABLE

Location	Peak Values (G's)						
	Class	Axis	Units	Saturn 7/10 201P ES-2		Saturn 8/8 201P ES-2	
				Peak	Time (msec)	Peak	Time (msec)
Upper Spine	180	X	G	-11.7	62	-7.1	32
	180	Y	G	44.8	51	46.8	48
	180	Z	G	13.3	61	8.2	60
	180	RES	G	44.9	51	47.1	48
Lower Spine	180	X	G	8.0	38	9.8	35
	180	Y	G	58.3	48	68.0	45
	180	Z	G	12.1	61	6.6	60
	180	RES	G	58.3	48	68.0	45
Upper Rib	180	Y	G	105.3	37	107.4	37
Mid Rib	180	Y	G	140.0	38	149.5	36
Lower Rib	180	Y	G	185.6	49	150.9	41
Upper Rib Deflection	180	Y	mm	-44.8	58	-46.0	54
Mid Rib Deflection	180	Y	mm	-35.4	57	-37.3	54
Lower Rib Deflection	180	Y	mm	-33.5	43	35.9	52
Upper Rib VC	180	Y	msec	0.8	44	0.9	42
Mid Rib VC	180	Y	msec	0.5	43	0.5	41
Lower Rib VC	180	Y	msec	0.6	28	0.7	44
Torso Force	600	X	N	723	50	502	47
	600	Y	N	1774	52	2047	49
Torso Moment	600	Y	Nm	20.7	49	-8.8	84
	600	Z	Nm	30.6	50	17.1	51
T12 Force	600	X	N	455	73	533	65
	600	Y	N	-841	97	1239	39
T12 Moment	600	X	Nm	106.7	85	-136.2	37
	600	Y	Nm	-79.5	46	67.8	70

ES-2 PEAK RESPONSE COMPARISON TABLE

Location	Peak Values (G's)						
	Class	Axis	Units	Saturn 7/10 201P ES-2		Saturn 8/8 201P ES-2	
				Peak	Time (msec)	Peak	Time (msec)
Abdomen Front Force	600	Y	N	78	55	88	66
Abdomen Mid Force	600	Y	N	330	48	337	39
Abdomen Rear Force	600	Y	N	659	47	723	39
Abdomen Summed Force	600	Y	N	1022	47	1084	39
Pubic Symphysis Force	600	Y	N	-1559	48	-1917	46
Right Femur Force	600	X	N	293	113	281	111
	600	Y	N	-802	60	-1068	56
	600	Z	N	626	70	-739	109
	600	RES	N	900	60	1167	56
Right Femur Moment	600	X	Nm	116.3	101	131.7	95
	600	Y	Nm	51.7	104	56.0	110
	600	Z	Nm	-38.1	67	-50.7	62
	600	RES	Nm	127.2	101	132.5	95
Left Femur Force	600	X	N	515	120	377	139
	600	Y	N	-894	59	-829	53
	600	Z	N	1012	61	1220	60
	600	RES	N	1331	58	1366	55
Left Femur Moment	600	X	Nm	-57.3	66	61.7	54
	600	Y	Nm	29.2	119	39.9	73
	600	Z	Nm	-38.4	66	-29.1	61
	600	RES	Nm	69.0	66	67.1	54
Pelvis	1000	X	G	17.6	57	20.6	54
	1000	Y	G	48.8	40	53.7	38
	1000	Z	G	11.7	63	-9.6	93

ES-2 PEAK RESPONSE COMPARISON TABLE

Location	Peak Values (G's)						
	Class	Axis	Units	Saturn 7/10 201P ES-2		Saturn 8/8 201P ES-2	
				Peak	Time (msec)	Peak	Time (msec)
Upper Spine			G (fir)	82		84	
Lower Spine			G (fir)	110		114	
Upper Rib			G (fir)	224		203	
Mid Rib			G (fir)	305		279	
Lower Rib			G (fir)	1598.5		1598.5	
Pelvis			G (fir)	43.5	52	46.1	51
TTI			G (fir)	56.6	49	65.0	47
Impact Speed			kph	95.2	37	106.0	37

Child PEAK RESPONSE COMPARISON TABLE

Location	Peak Values (G's)																		
	Class	Axis	Units	Saturn 7/10 Left Rear HIII 6 yr 201P		Saturn 7/10 Right Rear HIII 3 yr 201P		Saturn 7/13 Left Rear HIII 6 yr 201P		Saturn 7/13 Right Rear HIII 6 yr 201P		Saturn 8/8 Left Rear HIII 6 yr 201P		Saturn 8/8 Right Rear HIII 6yr 201P		Saturn 8/9 Left Rear HIII 6 yr 201P		Saturn 8/9 Right Rear Q3 201P	
				Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time
Head	1000	X	G	-19.8	116	-6.6	147	21.0	83	-7.7	159	-18.1	178	-9.3	118	-21.4	108	-10.7	144
	1000	Y	G	22.6	130	20.4	120	40.9	87	15.6	113	26.5	84	11.3	119	33.8	104	25.4	113
	1000	Z	G	11.6	107	12.8	117	27.1	83	17.9	114	7.9	167	13.1	116	16.2	105	15.5	116
	1000	RES	G	28.2	114	24.1	119	47.2	83	23.8	114	27.5	84	19.0	117	41.7	105	29.3	114
Head Injury Criteria (HIC)				46		52		87		54		65		30		89		63	
time 1 msec				90.4		106.6		81.5		105.5		66.8		107.9		98.0		108.9	
time 2 msec				126.4		142.6		93.9		141.5		102.5		143.9		112.2		144.9	
Upper Neck Force	1000	X	N	352	116	-44	131	-317	92	-142	139	-172	168	-142	141	253	116	-212	134
	1000	Y	N	-213	136	312	119	215	80	-278	139	-102	119	121	149	178	76	-167	138
	1000	Z	N	-615	116	312	116	386	92	851	115	692	180	409	116	-574	118	-629	139
	1000	RES	N	737.8	116	437.7	117	508.5	92	855.6	115	694.0	180	428.8	116	627.1	118	676.5	139
Upper Neck Moment	600	X	m	25.6	116	50.3	120	23.4	106	18.3	118	-18.3	74	8.6	131	24.7	116	16.9	138
	600	Y	m	15.3	120	9.4	166	-27.6	92	6.5	112	12.4	181	-9.4	107	13.0	117	5.5	183
	600	Z	m	15.0	130	7.2	141	20.5	102	12.4	139	13.0	105	13.9	99	12.0	144	5.7	125
	600	RES	m	31.4	116	50.5	120	33.5	92	20.0	118	18.7	74	16.8	130	28.3	116	17.4	138

CHILD PEAK RESPONSE COMPARISON TABLE

Location	Peak Values (G's)																						
	Class	Axis	Units	Saturn 7/10 Left Rear HIII 6 yr 201P		Saturn 7/10 Right Rear HIII 3 yr 201P		Saturn 7/13 Left Rear HIII 6 yr 201P		Saturn 7/13 Right Rear HIII 6 yr 201P		Saturn 8/8 Left Rear HIII 6 yr 201P		Saturn 8/8 Right Rear HIII 6yr 201P		Saturn 8/9 Left Rear HIII 6 yr 201P		Saturn 8/9 Right Rear Q3 201P					
				Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time				
Lower Neck Force	1000	X	N	56	70	176	132	161	116	NA		-160	171	NA		97	101	-229	140				
	1000	Y	N	215	107	284	119	-434	83			333	81			401	116	219	110				
	1000	Z	N	-430	139	289	117	526	92			530	180			-410	118	-438	139				
	1000	RES	N	452	118	421	120	669	92			551	180			554	116	527	139				
Lower Neck Moment	600	X	m	44.9	90	-13.4	123	48.9	96			NA				-19.6	120	NA		42.4	86	27.8	129
	600	Y	m	-18.1	106	-4.9	155	27.3	82							16.7	170			-12.4	124	14.6	140
	600	Z	m	15.7	126	-9.4	136	-26.7	98							19.3	83			11.9	70	8.1	128
	600	RES	m	49.7	90	14.9	124	56.2	83							24.4	85			44.1	85	29.6	129
Rib Deflection	180		mm																				
Chest	180	X	G	-7.1	118	-4.9	123	-7.0	95	-2.9	156	5.8	63	-4.3	122	-13.1	109	-7.2	118				
	180	Y	G	21.7	117	12.2	109	21.1	71	15.5	94	17.6	73	13.9	96	17.1	104	15.6	133				
	180	Z	G	7.5	117	5.4	121	6.4	91	6.9	138	5.7	86	3.9	113	6.6	119	6.2	122				
	180	RES	G	23.3	117	12.8	109	21.5	72	16.2	92	18.0	73	14.2	99	20.0	106	17.3	133				
Pelvis	1000	X	G	-7.5	76	-4.5	165	-5.9	53	-5.6	81	-8.3	70	-3.6	95	9.9	115	-4.3	142				
	1000	Y	G	18.2	86	12.1	83	25.7	65	19.9	81	19.3	63	19.0	98	16.8	83	16.2	101				
	1000	Z	G	6.2	117	4.4	122	-6.6	95	7.4	168	-7.0	88	2.2	163	-8.5	119	5.3	121				

CHILD PEAK RESPONSE COMPARISON TABLE

Location	Peak Values (G's)																		
	Class	Axis	Units	Saturn 7/10		Saturn 7/10		Saturn 7/13		Saturn 7/13		Saturn 8/8		Saturn 8/8		Saturn 8/9		Saturn 8/9	
				Left Rear		Right Rear		Left Rear		Right Rear		Left Rear		Right Rear		Left Rear		Right Rear	
				HIII 6 yr 201P		HIII 3 yr 201P		HIII 6 yr 201P		HIII 6 yr 201P		HIII 6 yr 201P		HIII 6 yr 201P		HIII 6 yr 201P		Q3 201P	
				Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time	Peak	Time
Head to Striker		X		88		96		134		138		142		59		106		138	
		Y		351		375		325		296		303		340		329		343	
		Z		128		190		238		248		231		80		116		191	