

REPORT NUMBER: TO6-MGA-2001-008

**ES-2 - FULL SCALE VEHICLE TESTS
NCAP LEFT SIDE IMPACT**

**General Motors
2002 Chevrolet Impala w/SAB**

**PREPARED BY:
MGA RESEARCH CORPORATION
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BURLINGTON, WI 53105**



October 19, 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 was conducted as part of Contract No. DTRS57-98-D-00041, task order 6, sponsored by the U.S. Department of Transportation, Volpe National Transportation System Center. The purpose of this test was to evaluate the response of the ES-2 dummies in a 2002 Chevrolet Impala 4 door when subjected to an NCAP left 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 2002 Chevrolet Impala 4 door was impacted on the left side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.6 kph (38.3 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on October 19, 2001. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies are included in Appendix A.

Two ES-2 side impact dummies were placed in the left front and left rear designated seating positions according to instructions specified in the FMVSS 214 Side Impact Laboratory Test Procedure which is dated August 2, 1999 and Evaluation of Eurosid-1 Positioning Procedure Appendix A dated February 5, 1997. The side impact event was documented by ten high speed cameras. Camera locations and other pertinent camera information can be found in this report.

Appendix B contains the vehicle and dummy response data traces. A summary of the 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 dummy positioning procedure used, Appendix F contains the ES-2 peak responses, and Appendix G contains the ES-2 sign conventions.

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

		Left Front	Left Rear
1) Head Performance Criteria			
<1000	T1 (msec)	Not calculated due to head impact with airbag	42.9
	T2 (msec)		142.8
	HPC		284
2) Thorax Performance criteria			
2.1) Chest Deflection < 42 mm	Upper Rib Deflection	23.7	4.0
	Mid Rib Deflection	19.8	1.1
	Lower Rib Deflection	15.6	8.0
2.2) Viscous Criteria < 1.0 (m/sec)	Upper Rib	0.24	0.04
	Mid Rib	0.16	0
	Lower Rib	0.13	-0.03
3) Abdominal Protection Criteria			
Sum < 2500 N	Front Abdominal Force	337	2098
	Mid Abdominal Force	410	1943
	Rear Abdominal Force	623	614
	Sum of Abdominal Force	1171	4566
4) Pelvis Performance Criteria			
< 6000 N	Pubic Symphysis Force	2078	4108

HIC		Left Front	Left Rear
	T1 (msec)	42.9	47.8
	T2 (msec)	53.2	60.4
	T2 - T1 (msec)	10.3	12.6
	HIC	307	284

Fir Filtered	Left Front	Left Rear
Upper Rib Y (g's)	66.3	56.0
Mid Rib Y (g's)	88.7	50.1
Lower Rib Y (g's)	63.8	80.8
Lower Spine Y (g's)	57.1	57.4
Pelvis Y (g's)	67.5	100.9
TTI (g's)	73	69

Contacts	Left Front	Left Rear
Head (msec)	41.1	42.9
Arm (msec)	15.6	23.9
Rib (msec)	13.9	32.4
Pelvis (msec)	21.8	20.3

TEST NOTES

A complete data set, including all ES-2 instrumentation, can be found by accessing the electronic data from the U.S. Department of Transportation.

The following load cell channel was found to be bad during pre test calibration and inspection:

Driver T-12 - MX

The passenger T12 load cell was not available for use during this test.

The following channels were not used to avoid interference with the restraint systems:

Left Upper B Post Y

Left Driver Seat Frame Y

Right Driver Seat Frame Y

The following channels had no valid data collected:

Left Lower B Post Y

Left Rear Door @ Mid Rib Y

Left Rear Door @ Pelvis Y

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

DATA SHEET NO. 1**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2002 Chevrolet Impala 4 doorTest Date: October 19, 2001**TEST VEHICLE INFORMATION**

Make	Chevrolet
Model	Impala
Body Style	4 door
VIN	2G1WH55K329118393
Color	Painted Orange
Odometer Reading	34
Transmission	Automatic
Final Drive	Front
Number of Cylinders	6
Engine Displacement	3.8
Engine Placement	lateral

TEST VEHICLE OPTIONS

Front Airbags	yes
Side Airbags	yes
Power Windows	yes
Power Steering	yes
Power Door Locks	yes
Tilt Wheel	yes
Air Conditioning	yes
Power Brakes	yes
Anti-lock Brakes	yes
AM/FM	yes
Cruise Control	yes

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors
Date of Manufacture	8/01

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	210	210
Cold Pressure (kPa)	210	210
Recommend Tire Size	P225/60R16	P225/60R16
Tire Size on Vehicle	P225/60R16	P225/60R16
Tire Manufacturer	Goodyear	Goodyear

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: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	495.8	296.2		549.3	401.0	
Right	kg	495.3	304.8		499.4	380.6	
Ratio	%	62.2	37.8		57.3	42.7	
Totals	kg	991.1	601.0	1592.1	1048.7	781.6	1830.3

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1592.1
Weight of 2 P572F Side Impact Dummies	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	79.8
Calculated Vehicle Target Weight (TVTW)	kg	1833.4

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	747	748	741	741	1061
As Tested	mm	734	739	695	707	1200
Fully Loaded	mm	729	744	696	709	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2810
Total Vehicle Length at Left Side	mm	4314
Total Vehicle Length at Centerline	mm	5058
Total Vehicle Length at Right Side	mm	4314
Weight of Ballast in Cargo Area	kg	0

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2810
Target Impact Point Aft of Front Axle	mm	465
Actual Impact Point Aft of Front Axle	mm	445

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

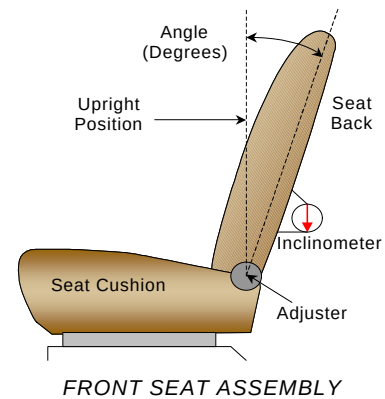
Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001

NORMAL DESIGN RIDING POSITION

Driver seat back angle: 26 deg. on seat back frame,
240 mm above seat pivot

Passenger seat back angle: non adjustable



SEAT FORE/AFT POSITIONS

Driver seat fore/aft total travel: 240 mm electric

Rear passenger seat fore/aft total travel: non adjustable

Driver seat fore/aft position: 120 mm

Rear passenger seat fore/aft position: non adjustable

SEAT BELT UPPER ANCHORAGE

The D ring was placed in the full up position.

STEERING COLUMN ADJUSTMENT

The steering column was placed in the mid position.

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	495.8	296.2		549.3	401.0	
Right	kg	495.3	304.8		499.4	380.6	
Weight Ratio	%	62.2	37.8		57.3	42.7	
Totals	kg	991.1	601.0	1592.1	1048.7	781.6	1830.3

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	294	265
Level 2	Occupant H-Point	mm	414	489
Level 3	Mid Door	mm	368	610
Level 4	Window Sill	mm	332	922
Level 5	Window Top	mm	211	1359
Level 2	Maximum Penetration	mm	414	489

INSTRUMENTATION

Left Front ES-2 Channels	70
Left Rear ES-2 Channels	66
Vehicle Structure Channels	28
MDB Channels	7
Total	171

DATA SHEET NO. 3**MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS**Impactor: FMVSS 214 Side Impact BarrierTest Date: October 19, 2001**MDB SPECIFICATIONS (mm)**

Measurement Description	Length
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2590
C.G. Location aft of Front Axle	1105

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	395.1	293.8	
Right	kg	385.7	287.4	
Ratio	%	57.3	42.7	
Totals	kg	780.8	581.2	1362.0

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 - 62.8	61.6
Trap No. 2 Velocity (Redundant)	km/h	61.1 - 62.8	61.5
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.2

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE (mm)

Vertical Location			From Centerline		Max. Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	164
B	Top of Bumper	533	800	Left	111
C	Mid Level	686	800	Left	142
D	Top of Stack	813	800	Left	170

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 4**POST TEST OBSERVATIONS**Test Vehicle: 2002 Chevrolet Impala 4 doorTest Date: October 19, 2001**TEST DUMMY INFORMATION AND CONTACT POINTS**

Description	Left Front	Left Rear
Dummy Type / Serial No.	ES-2/009	ES-2/010
Head Contact	side header, airbag	Side header, C post
Upper Torso Contact	airbag	door trim panel
Lower Torso Contact	door trim panel	door trim panel
Left Knee Contact	door trim panel	door trim panel
Right Knee Contact	left knee	left knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	remained closed	remained closed
Right Side Door Opening	remained closed	remained closed
Left Side Seat Movement	none	none
Left Side Seat Back Failure	none	none

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No failures
Sill Separation	None noted
Windshield Damage	Broke
Window Damage	Both left side broke
Other Notable Effects	None

AIRBAG DEPLOYMENT

	Driver	Right Front	Left Rear
Front	no	no	
Side	yes	no	

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	20 forward
Vertical Offset	mm	+/-20	0

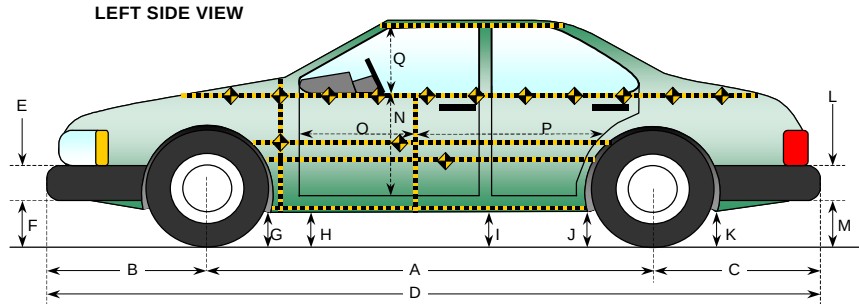
SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001



All Measurements in mm

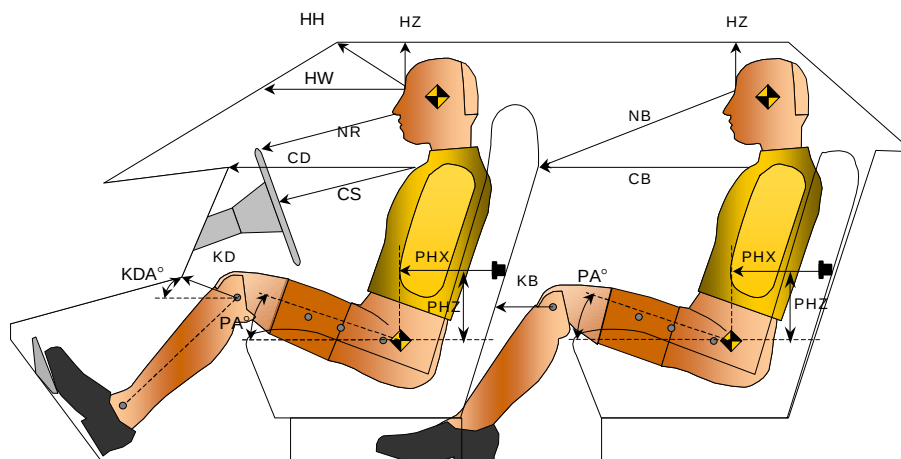
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2810	2734	-76
B	Front Axle to FSOV	1033	1029	-4
C	Rear Axle to RSOV	1215	1182	-33
D	Total Length at Centerline	5058	4945	-113
E	Front Bumper Thickness	199	199	0
F	Front Bumper Bottom to Ground	313	337	24
G	Sill Height at Front Wheel Well	166	147	-19
H	Sill Height at Front Door Leading Edge	189	190	1
I	Sill Height at "B" Pillar	178	166	-12
J1	Sill Height at Rear Wheel Well	152	160	8
J2	Pinch Weld Height at Rear Wheel Well	171	211	40
K	Sill Height Aft of Rear Wheel Well	204	203	-1
L	Rear Bumper Thickness	368	368	0
M	Rear Bumper Bottom to Ground	316	326	10
N	Sill Height to Window Bottom Sill	758	707	-51
O	Front Door Leading Edge to Impact CL	927	890	-37
P	Rear Door Trailing Edge to Impact CL	1129	964	-165
Q	Front Window Opening	431	420	-11
R	Right Side Length	4314	4332	18
S	Left Side Length	4314	4224	-90
T	Vehicle Width at "B" Post	1828	1518	-310

DATA SHEET NO. 6

ES-2 LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001



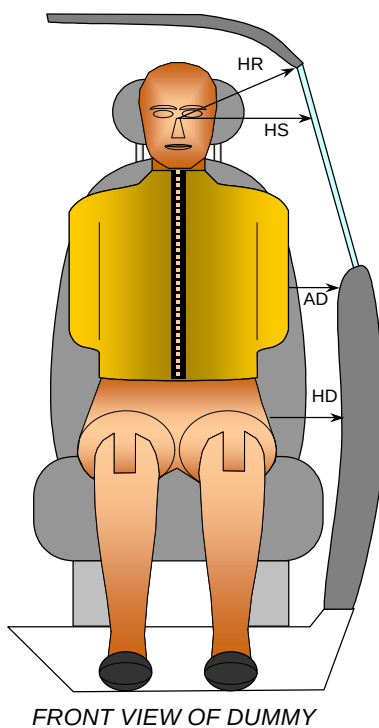
Driver Code	Pass. Code	Measurement Description	Left Front 009		Left Rear 010	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	356			
HW		Head to Windshield	592			
HZ	HZ	Head to Roof	159		136	
NR	NB	Nose to Rim/Nose to Seatback	430		634	
CD	CB	Chest to Dash or Seatback	529		546	
CS		Chest to Steering Wheel	326			
KDL	KBL	Left Knee to Dash or Seatback	214	0.0	223	0.0
KDR	KBR	Right Knee to Dash or Seatback	244	0.0	220	0.0
PA	PA	Pelvic Angle (Longitudinal)		22.0		24.1
PA	PA	Pelvic Angle (Lateral)		0.1		1.2
SA	SA	Spine Angle (Longitudinal)		26.7		30.5
SA	SA	Spine Angle (Lateral)		0.9		-0.6
PHX	PHX	H-Point to Striker (X-Axis)	220		299	
PHZ	PHZ	H-Point to Striker (Z-Axis)	111		285	

DATA SHEET NO. 7

ES-2 LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001



Code	Measurement Description	Units	Left Front 009	Left Rear 010
HR	Head to Side Header	mm	232	191
HS	Head to Side Window	mm	342	326
AD	Arm to Door	mm	99	89
HD	H-Point to Door	mm	194	152

DATA SHEET NO. 8

DUMMY POSITIONING

Test Vehicle: 2001 Chevrolet Impala 4 door

Test Date: October 19, 2001

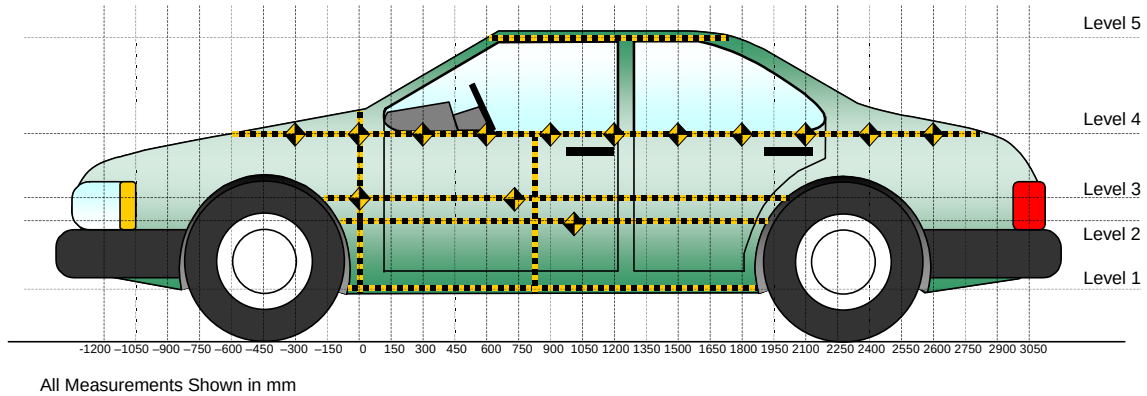
	Left Front S/N 009	Left Front S/N 009	Left Rear S/N 010	Left Rear S/N 010
	H-Point	Dummy	H-Point	Dummy
HP to Floor Z (mm)	137	143	109	104
HP to Hinge X (mm)	781	791	654	656
HP to Sill Y (mm)	167	173	173	183
HP to Striker X (mm)	360	361	501	507
HP to Dash X (mm)	596	598	556	559
HP to Header Z (mm)	764	758	783	787
H-POINT MACHINE (deg)				
Left Knee	130		137	
Right Knee	126		137	
Left Foot	125		142	
Right Foot	82		141	
Left Leg (mm)	142		109	
Right Leg (mm)	138		90	
Hip Angle	102		109	
Back Angle	27		28	

DATA SHEET NO. 9

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001



LEFT SIDE VIEW

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 Top	mm	1359
4	Window Sill	mm	922
3	Mid Door	mm	610
2	Occupant H-Point	mm	489
1	Axle Centerline Height (or Sill Top)	mm	265

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1050				315					333					18	
-900				293					321					28	
-750				276					313					37	
-600				262					308					46	
-450				254					306					52	
-300				250					309					59	
-150				248					317					69	
0	239	186	179	243		339	335	311	326		100	149	132	83	
150	243	189	181	243		408	437	420	369		165	248	239	126	
300	244	189	181	241		428	505	442	389		184	316	261	148	
450	244	188	180	239		449	533	464	429		205	345	284	190	
600	244	188	179	239		464	552	480	452		220	364	301	213	
750	244	186	178	239	447	477	573	496	477	563	233	387	318	238	116
900	243	185	177	235	443	490	587	510	504	583	247	402	333	269	140
1050	243	184	175	235	443	501	598	526	510	608	258	414	351	275	165
1200	244	184	175	235	444	538	576	543	556	641	294	392	368	321	197
1350	244	184	175	235	444	525	595	541	554	655	281	411	366	319	211
1500	244	183	175	231	447	502	597	535	563	618	258	414	360	332	171
1650	245	183	175	235	447	470	591	525	509	582	225	408	350	274	135
1800	243	183	176	236	448	406	529	503	436	553	163	346	327	200	105
1950		182	176	237	454		423	410	345	534		241	234	108	80
2100				237					263					26	
2250				244					316					72	
2400				262					306					44	
2550				263					303					40	
2700			190	276				226	310				36	34	
2850			210	292				240	325				30	33	
3000			230	310				257	338				27	28	
3150			254	331				275	354				21	23	

Reference plane is parallel to test vehicle longitudinal centerline.

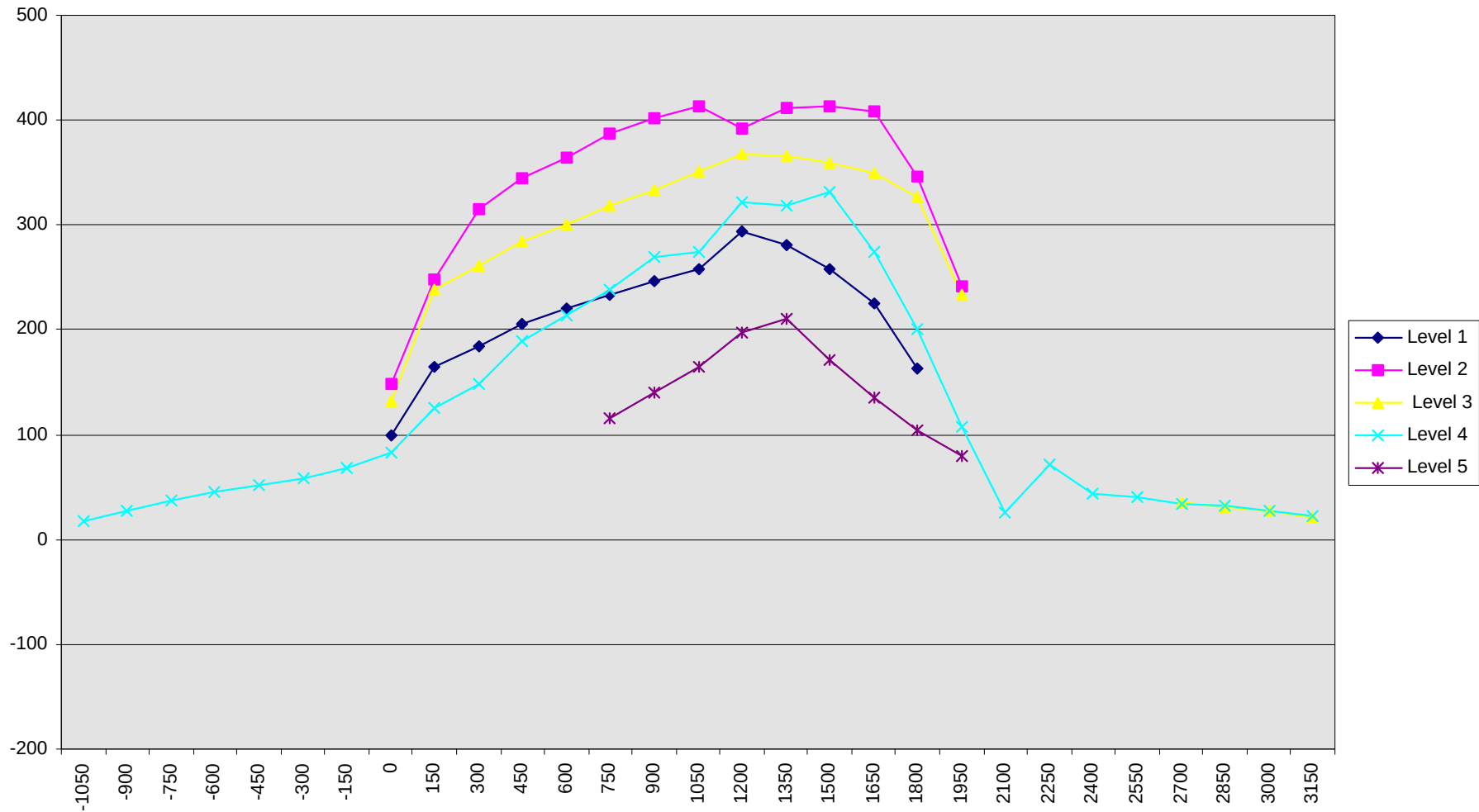
Given dimensions=Reference plane to car body.

DATA SHEET NO. 10...(continued)

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001

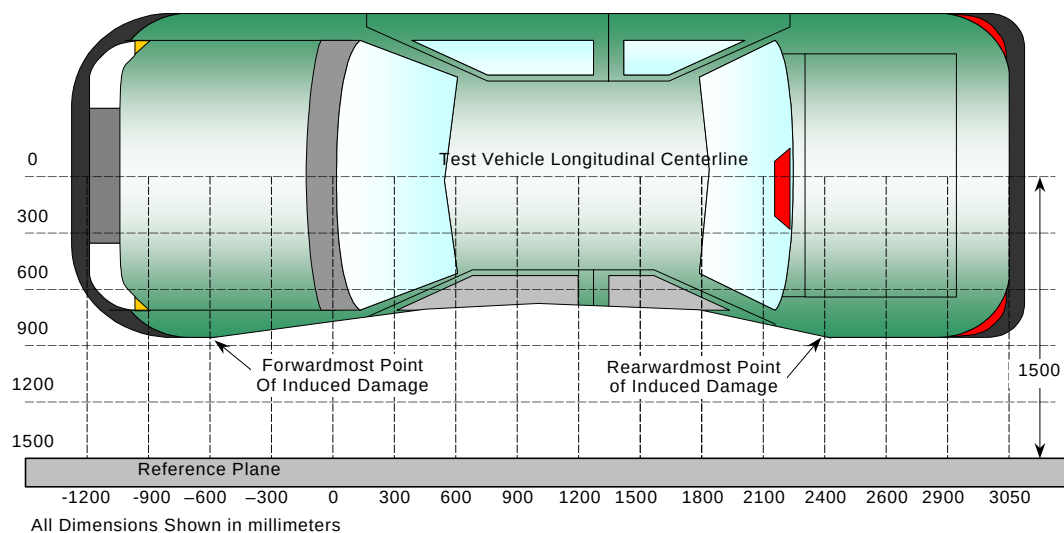


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001



TOP VIEW

Damage Profile Distances

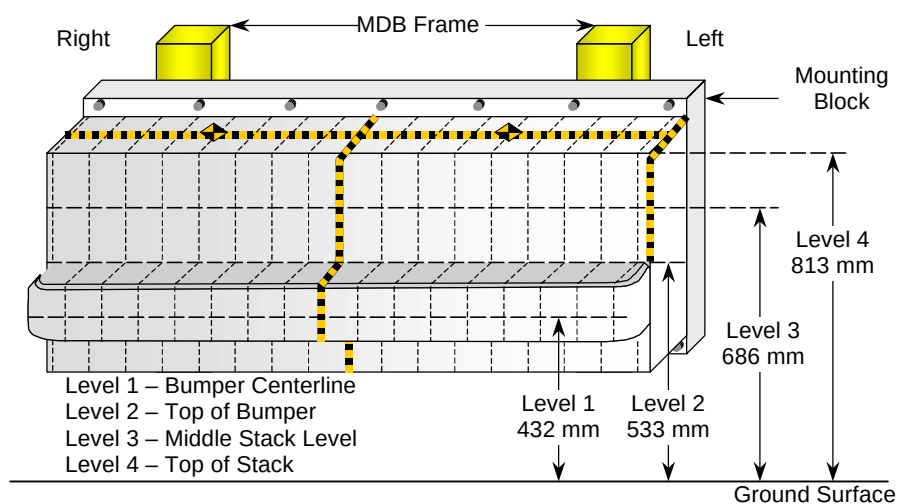
DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	3150 mm	4	339	354	15
2	2335 mm	4	249	309	60
3	1380 mm	2	184	593	409
4	600 mm	2	188	552	364
5	-210 mm	4	249	312	63
6	-1050 mm	4	318	333	15

DATA SHEET NO. 12

DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
4	92	41	10	2	8	22	44	44	28	32	40	45	57	70	62	86	170
3	30	8	-3	-7	-7	-1	17	17	10	11	18	23	33	51	61	83	142
2	40	30	40	40	40	45	43	19	22	35	50	60	65	76	80	80	111
1	95	81	69	65	66	83	78	67	60	60	58	74	79	86	100	131	164

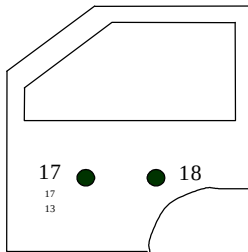
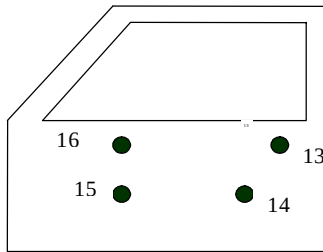
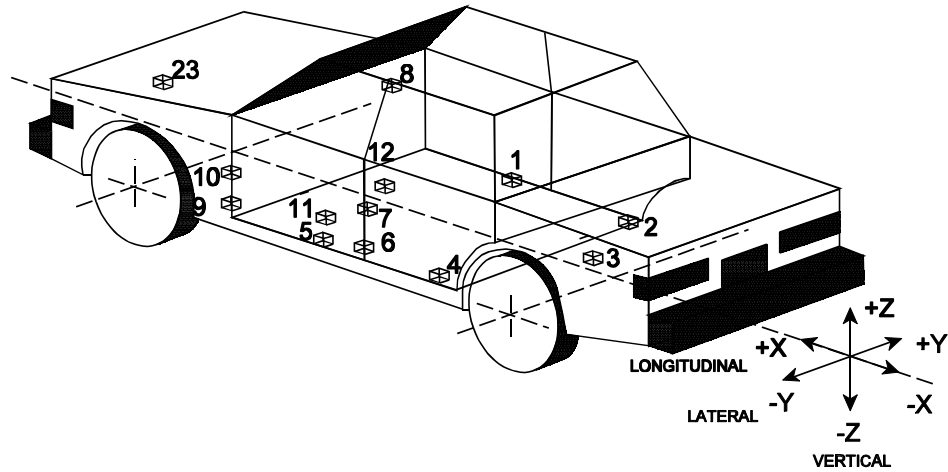
All Dimensions in mm

DATA SHEET NO. 13

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 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
12	Vehicle CG

No.	Location
13	Left Front Door @ Mid Rib
14	Left Front Door @ Pelvis
15	Left Front Door @ Knee
16	Left Front Door @ Arm
17	Left Rear Door @ Mid Rib
18	Left Rear Door @ Pelvis
19	Left Rear Door @ Knee
20	Left Rear Door @ Arm
21	Left Driver Seat Frame
22	Right Driver Seat Frame
23	Right Rear Occupant Compartment

DATA SHEET NO. 13...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001

VEHICLE ACCELEROMETER PEAK DATA

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	3.0	6.9	20.7	1.6	2.8	4.9	21.4
2	Right Side Sill at Rear Seat	3.5	5.6	22.1	2.5	3.7	5.1	22.2
3	Rear Floorpan Above Axle	1.8	8.0	20.4	1.6	4.9	4.8	21.1
4	Left Side Sill at Rear Door			43.9	19.5			
5	Left Side Sill at Front Door			51.1	15.1			
6	Left Lower B Post			NVD	NVD			
7	Left Mid B Post			116.7	61.1			
8	Left Upper B Post			**	**			
9	Left Lower A Post *			63.1	15.4			
10	Left Mid A Post			23.9	0.8			
11	Driver Left Seat Track			116.1	20.8			
12	Vehicle CG	7.0	2.9	33.2	5.2	16.3	12.0	35.2
13	Left Front Door @ Mid Rib			138.8	69.0			
14	Left Front Door @ Pelvis			281.0	178.9			
15	Left Front Door @ Knee			146.4	121.1			
16	Left Front Door @ Arm			182.3	73.2			
17	Left Rear Door @ Mid Rib			NVD	NVD			
18	Left Rear Door @ Pelvis			NVD	NVD			
19	Left Rear Door @ Knee			181.3	168.9			
20	Left Rear Door @ Arm			133.0	86.9			
21	Left Driver Seat Frame			**	**			
22	Right Driver Seat Frame			**	**			
23	Right Rear Occupant Compartment			22.4	1.3			

* No valid data after 60 msec

** Not used to avoid interference with restraint systems

DATA SHEET NO. 13...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001

VEHICLE ACCELEROMETER COORDINATES

Loc. No.	Description	Coordinates (mm)*		
		X	Y	Z
1	Right Side Sill at Front Seat	2746	717	234
2	Right Side Sill at Rear Seat	1639	714	239
3	Rear Floorpan Above Axle	1114	0	506
4	Left Side Sill at Rear Door	1626	-714	243
5	Left Side Sill at Front Door	2709	-717	234
6	Left Lower B Post	2357	-746	314
7	Left Mid B Post	2344	-788	946
8	Left Upper B Post	**	**	**
9	Left Lower A Post	3419	-718	304
10	Left Mid A Post	3438	-713	998
11	Driver Left Seat Track	2562	-534	292
12	Vehicle CG	2786	0	380
13	Left Front Door @ Mid Rib	2619	-779	937
14	Left Front Door @ Pelvis	2583	-777	634
15	Left Front Door @ Knee	3109	-776	699
16	Left Front Door @ Arm	2843	-775	933
17	Left Rear Door @ Mid Rib	1614	-776	988
18	Left Rear Door @ Pelvis	1711	-778	609
19	Left Rear Door @ Knee	2152	-778	697
20	Left Rear Door @ Arm	1924	-782	970
21	Left Driver Seat Frame	**	**	**
22	Right Driver Seat Frame	**	**	**
23	Right Rear Occupant Compartment	2079	364	323

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

** Not used to avoid interference with restraint systems

DATA SHEET NO. 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

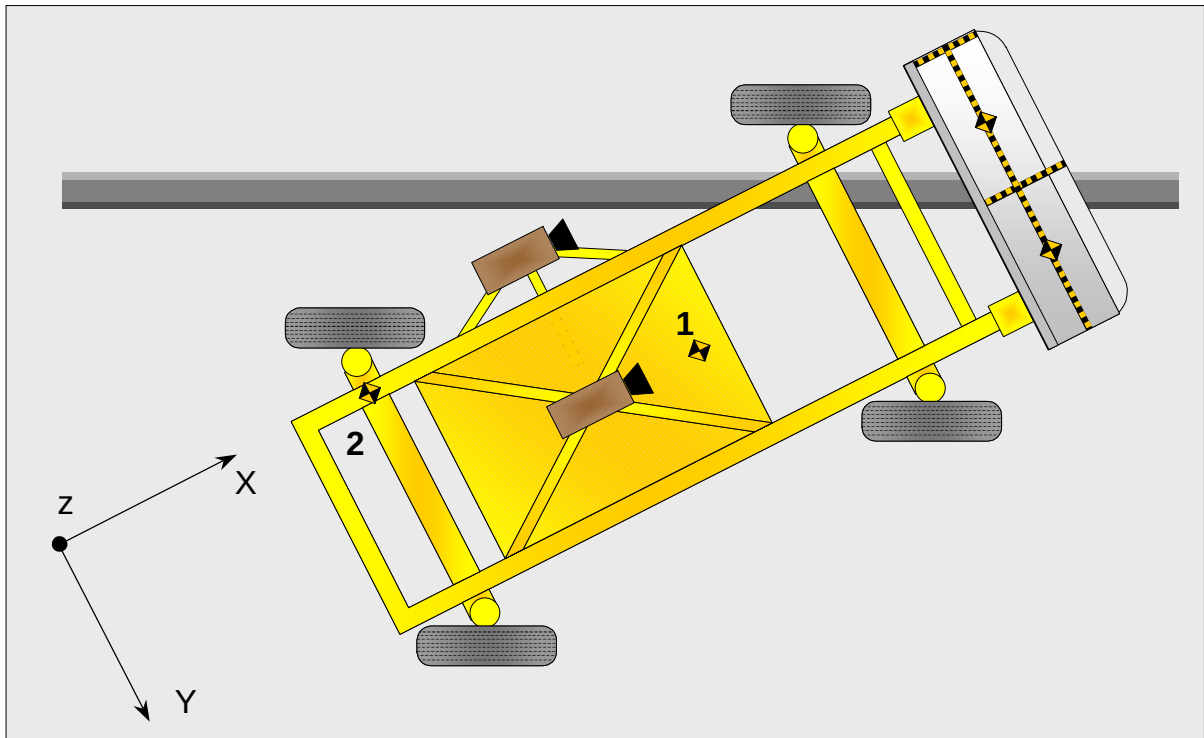
Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001

MDB ACCELEROMETER PEAK DATA AND LOCATIONS

Loc. No.	Accelerometer Location	Measurement (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	MDB CG	-1092	0	483	X	1.8	117	17.0	41
					Y	1.4	60	8.3	35
					Z	32.2	56	21.4	71
					RES	33.5	56		
2	MDB Rear	-2591	-625	622	X	1.8	122	21.8	34
					Y	8.7	28	2.0	198

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

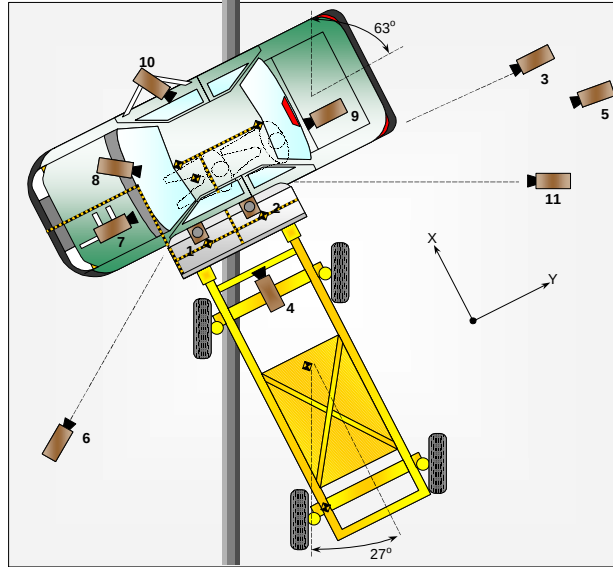


DATA SHEET NO. 15

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2002 Chevrolet Impala 4 door

Test Date: October 19, 2001



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	-160	930	5000	8	1053
2	Overhead Close-up	-750	-420	5000	50	1099
3	Right LoCam	-500	10600	1950	35	505
4	MDB Onboard, Centerline of Impact				13	909
5	MDB Impact				25	1005
6	Left Side Overall	-4040	-5200	2660	25	1015
7	Vehicle Onboard Front SID, Front				13	500
8	Vehicle Onboard Front SID, Hip to Door				13	500
9	Vehicle Onboard Rear SID, Rear				13	500
10	Vehicle Onboard Rear SID, Hip to Door				13	510
11	Real Time				13	32

Reference Points X - + Forward of Impact

Y - +Right of Impact

Z - + Up from Ground

APPENDIX A

PHOTOGRAPHS

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Photo No. A-1 - Pre-Test Front View of Test Vehicle

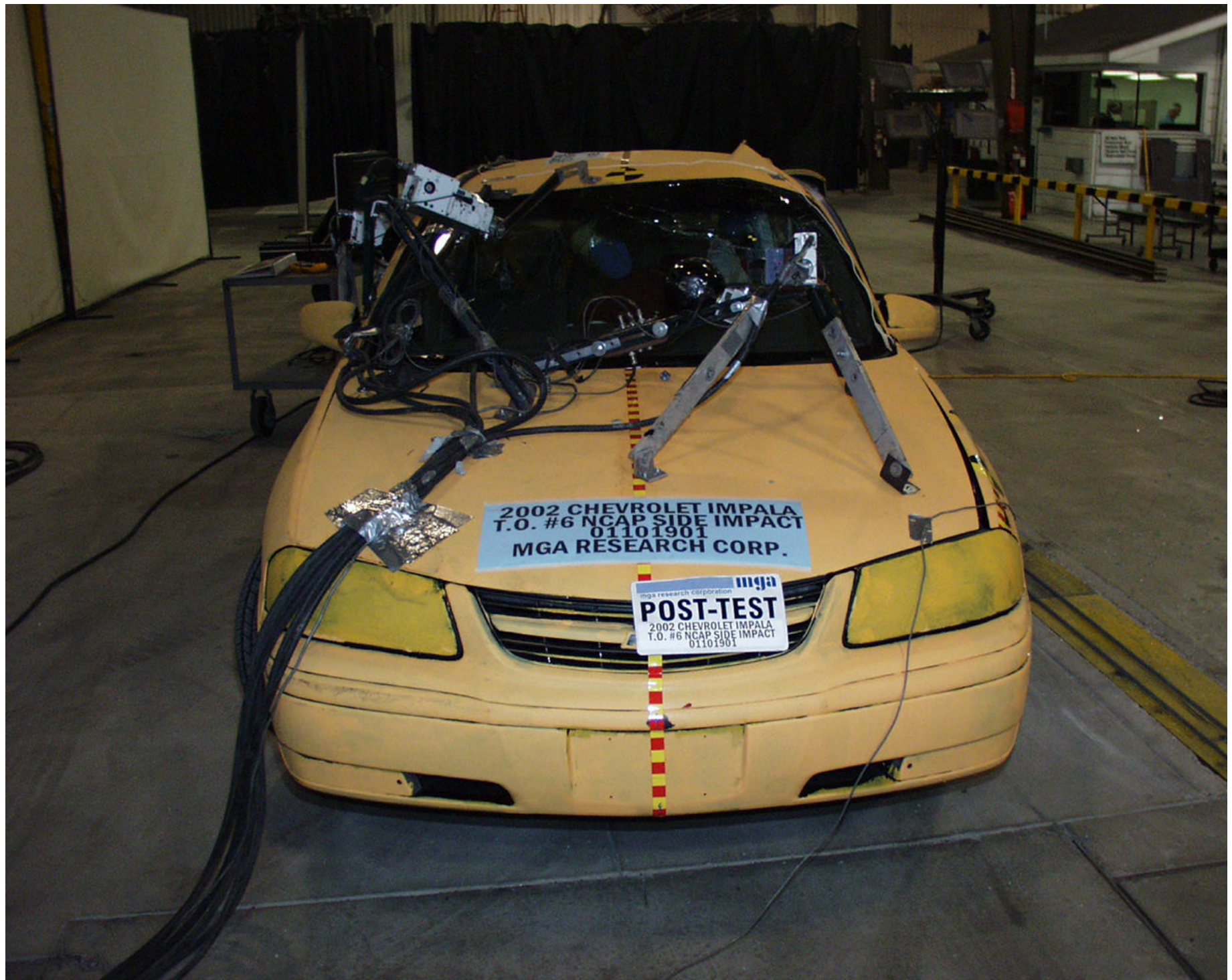


Photo No. A-2 - Post-Test Front View of Test Vehicle



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

A-6



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



Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)



Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)



Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View



Photo No. A-10 - Post-Test MDB and Vehicle (right side)



Photo No. A-11 - Post-Test MDB and Vehicle (left side)

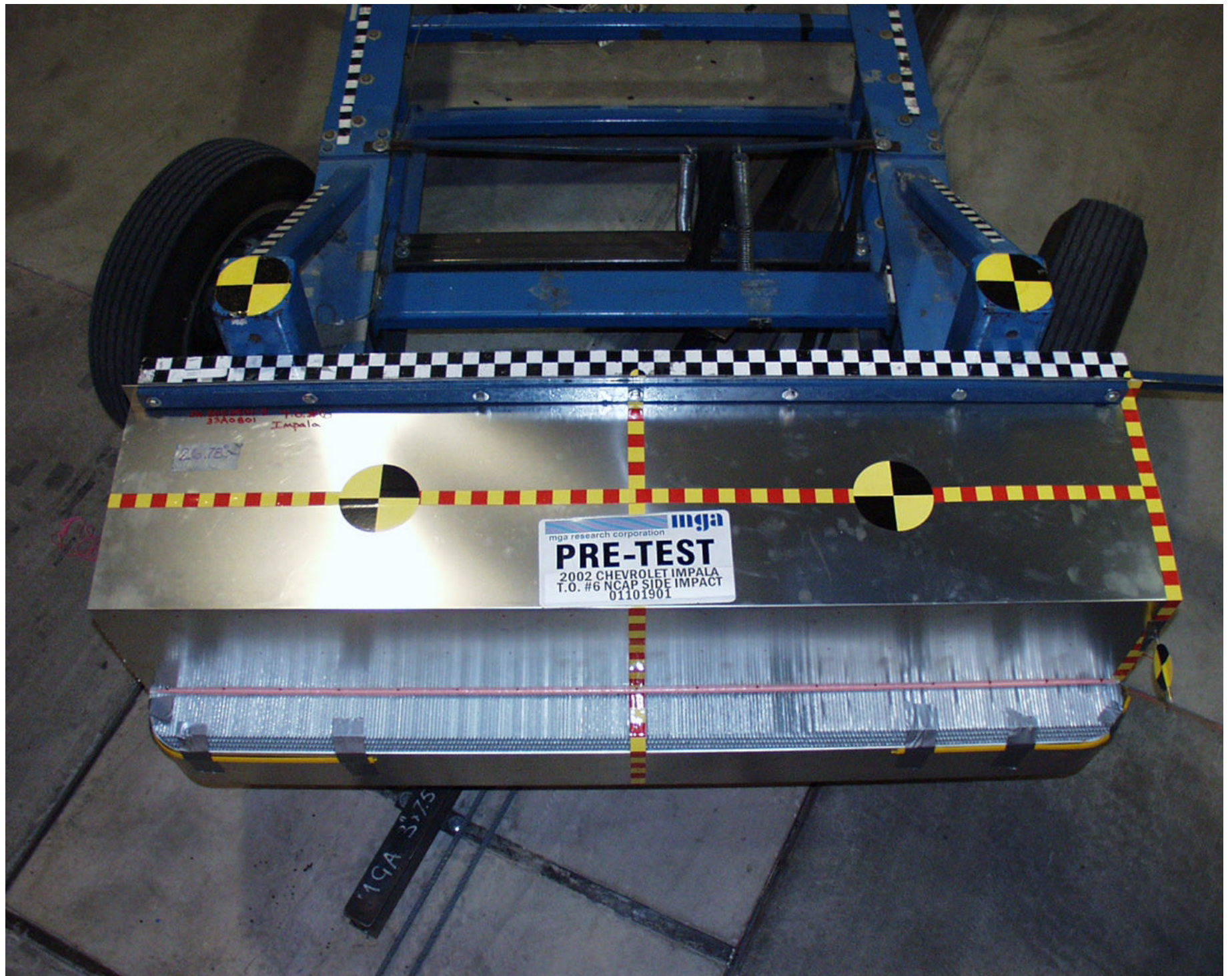


Photo No. A-12 - Pre-Test MDB Top View



Photo No. A-13 - Post-Test MDB Top View



Photo No. A-14 - Pre-Test MDB Front View

A-15

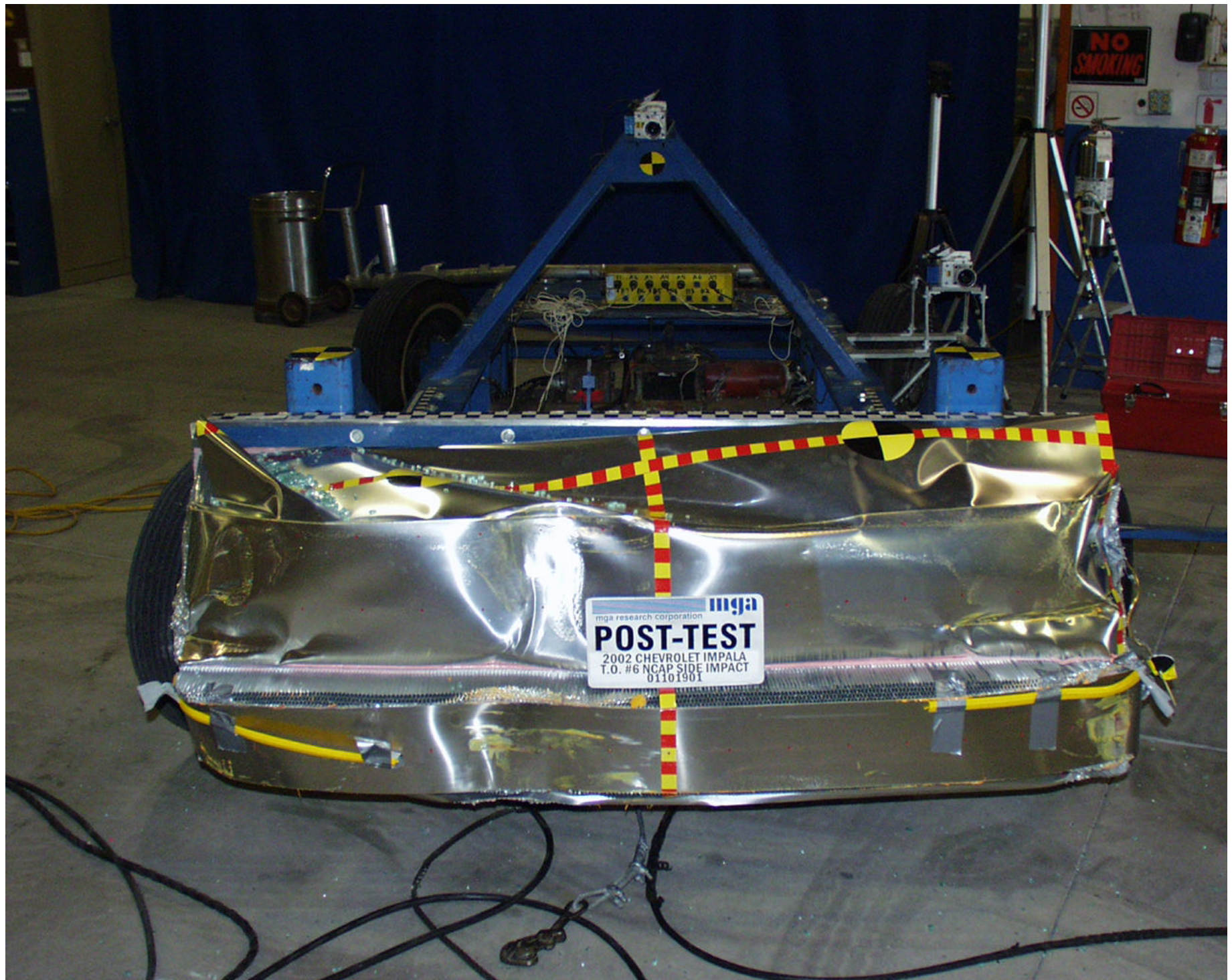


Photo No. A-15 - Post-Test MDB Front View



Photo No. A-16 - Pre-Test MDB Right Side View

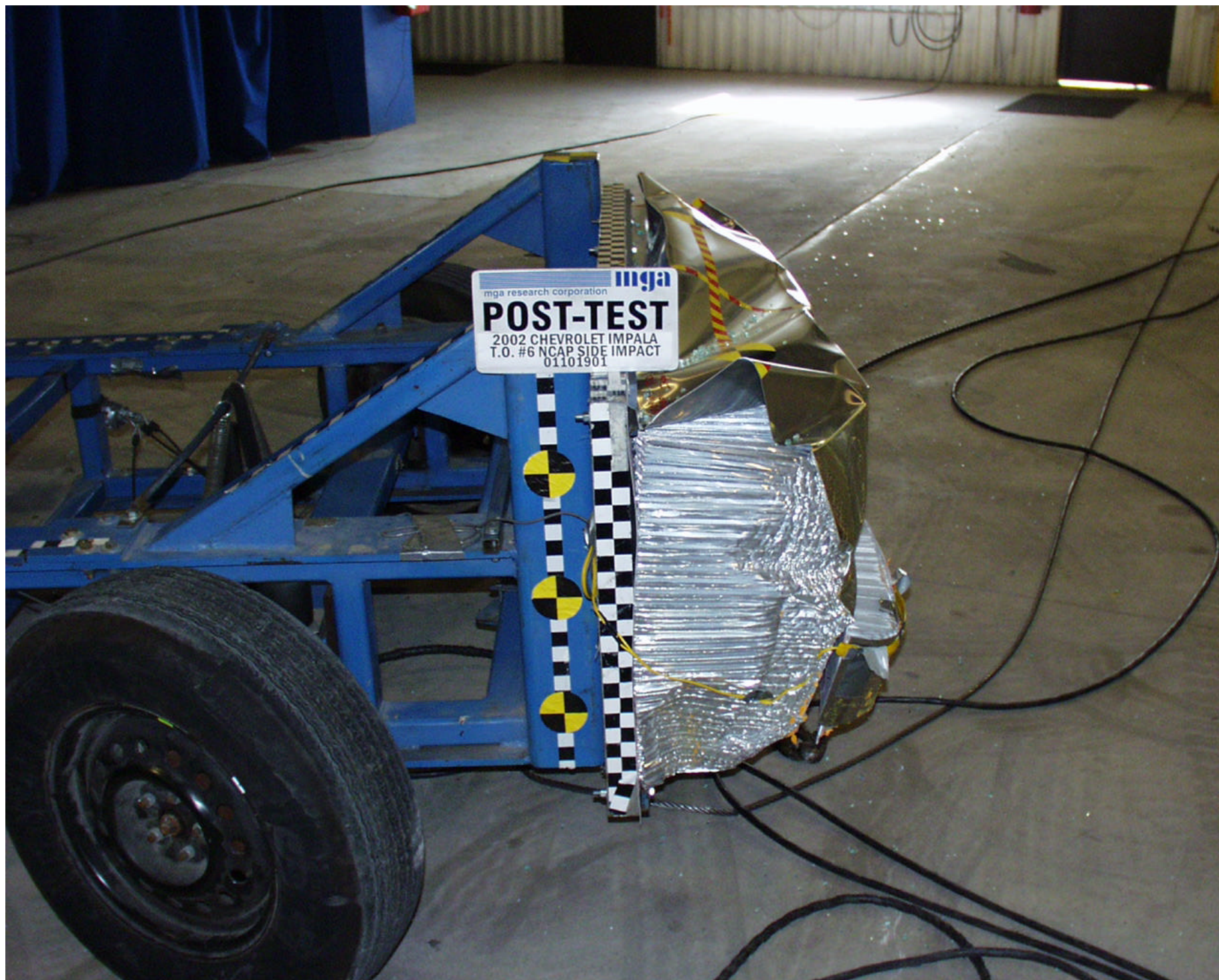


Photo No. A-17 - Post-Test MDB Right Side View



Photo No. A-18 - Pre-Test MDB Left Side View

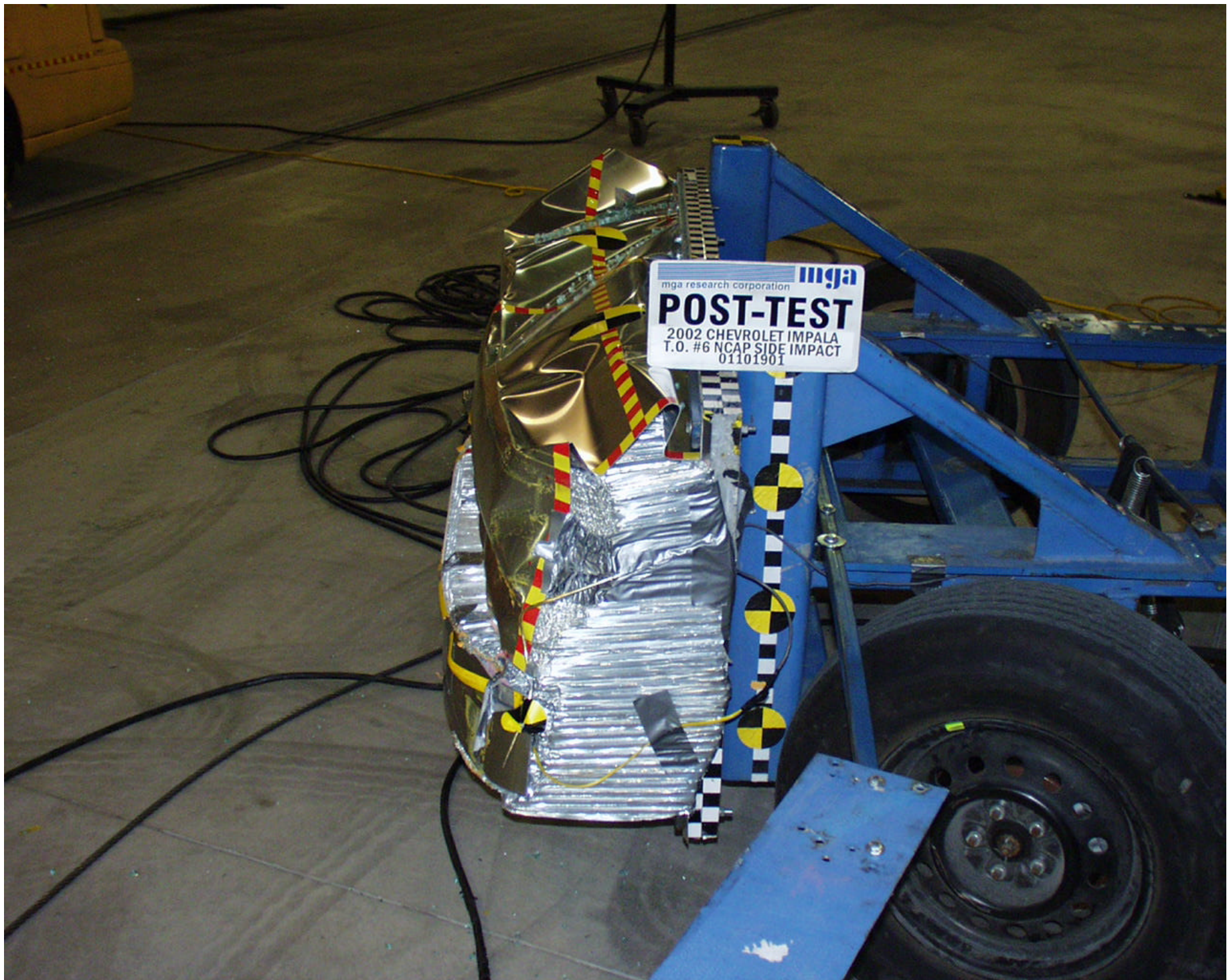


Photo No. A-19 - Post-Test MDB Left Side View



Photo No. A-20 - Pre-Test Driver Dummy Left Side View



Photo No. A-21 - Post-Test Driver Dummy Left Side View



Photo No. A-22 - Pre-Test Driver Dummy Left Side View (Door Open)



Photo No. A-23 - Pre-Test Driver Dummy Right Side View



Photo No. A-24 - Post-Test Driver Dummy Right Side View



Photo No. A-25 - Pre-Test Driver Dummy Shoulder and Door Top View



Photo No. A-26 - Post-Test Driver Dummy Shoulder and Door Top View



Photo No. A-27 - Pre-Test Passenger Dummy Left Side View

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Photo No. A-28 - Post-Test Passenger Dummy Left Side View



Photo No. A-29 - Pre-Test Passenger Dummy Left Side View (Door Open)



Photo No. A-30 - Pre-Test Passenger Dummy Right Side View



Photo No. A-31 - Post-Test Passenger Dummy Right Side View



Photo No. A-32 - Pre-Test Passenger Dummy Shoulder and Door Top View



Photo No. A-33 - Post-Test Passenger Dummy Shoulder and Door Top View



Photo No. A-34 - Post-Test Driver Dummy Contact



Photo No. A-35 - Post-Test Driver Dummy Lower Contact



Photo No. A-36 - Post-Test Passenger Head Contact

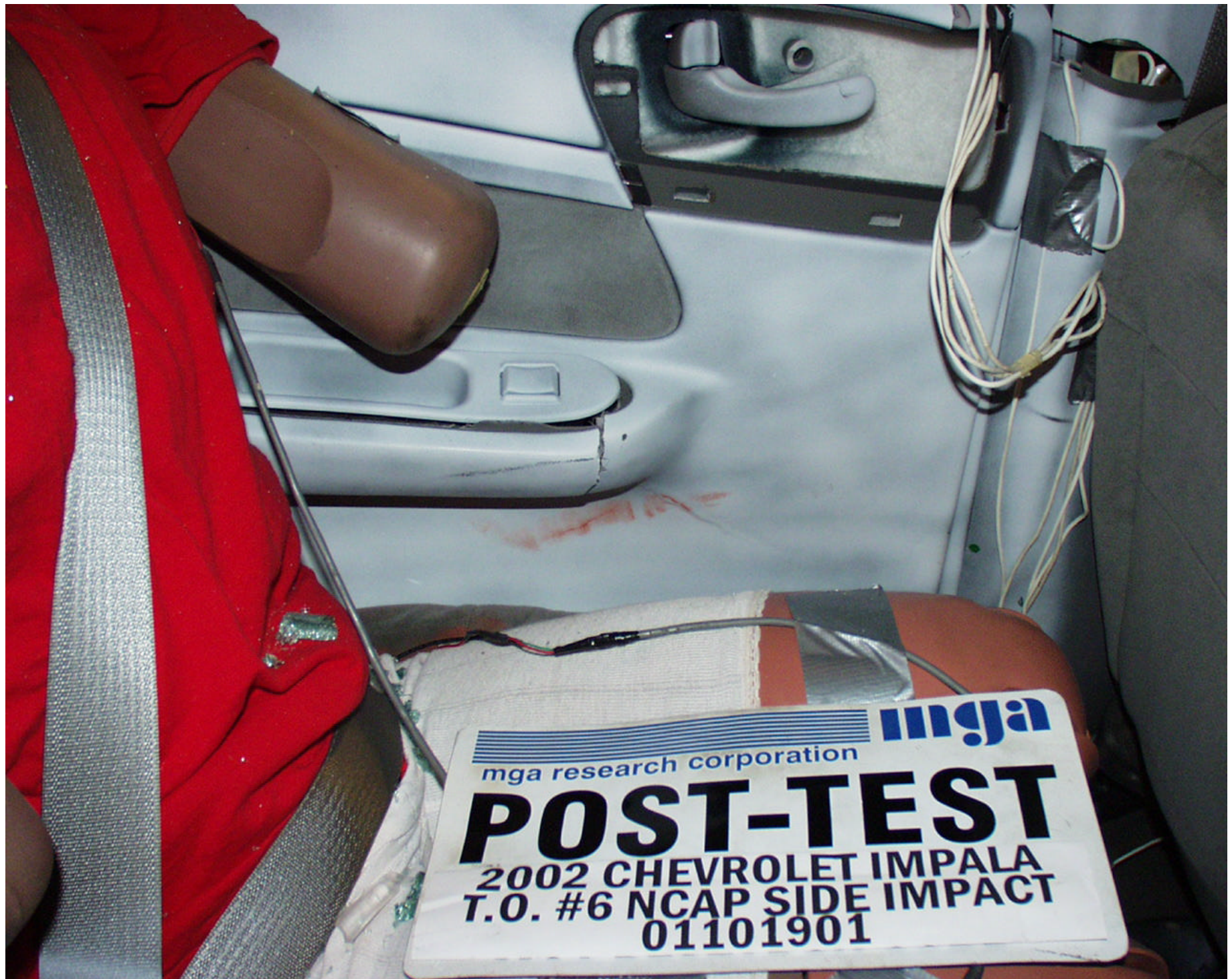


Photo No. A-37 - Post-Test Passenger Contact

A-38



Photo No. A-38 – Impact



Photo No. A-39 - Pre-Test Impact Point



Photo No. A-40 - Post-Test Impact Point



TIRE - LOADING INFORMATION

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

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.

2G1WH55K329118393

MODEL: WH19 WAF

	TIRE SIZE	SPEED RTG	COLD TIRE PRESSURE
FRT	P225/60R16	S	210KPA(30PSI)
RR	P225/60R16	S	210KPA(30PSI)
SPA	T125/70D16	M	420KPA(60PSI)

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

SEE OWNER'S MANUAL  FOR MORE INFORMATION.

Photo No. A-41 - Tire Placard

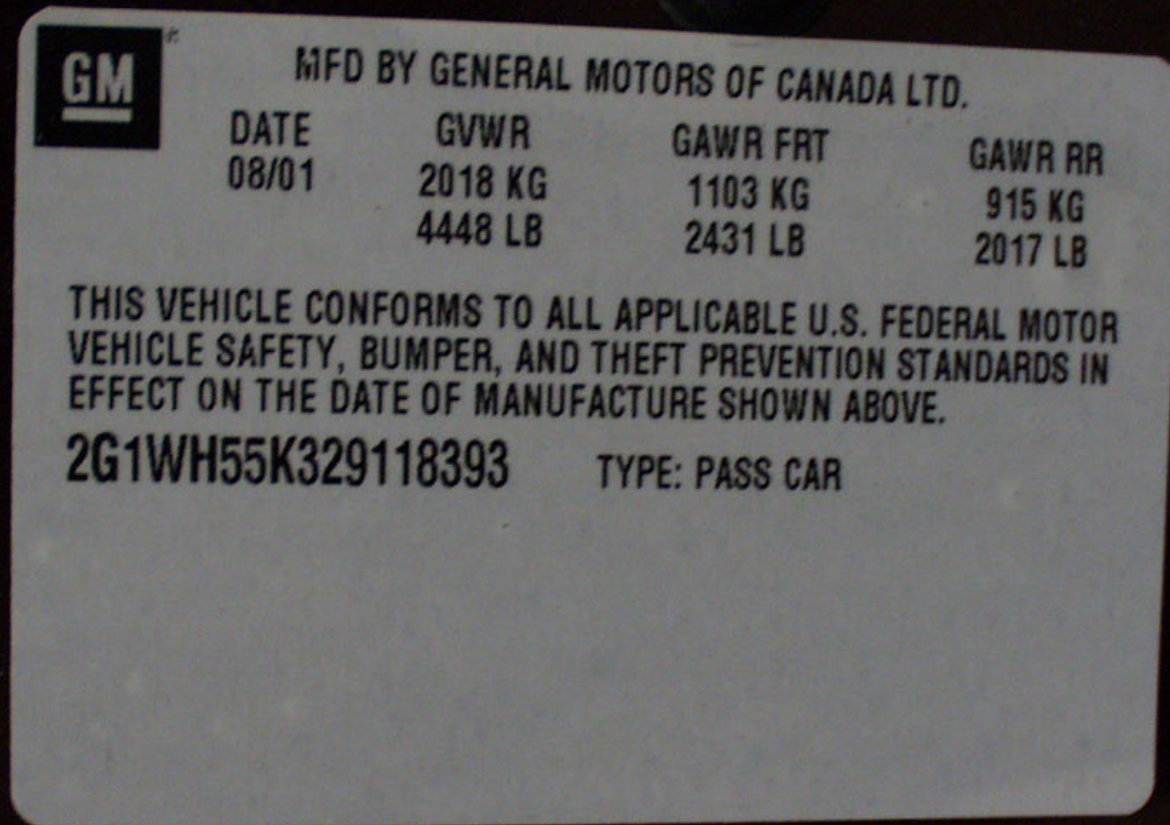


Photo No. A-42 - Vehicle Certification Label

APPENDIX B

ES-2, VEHICLE, AND MDB RESPONSE DATA

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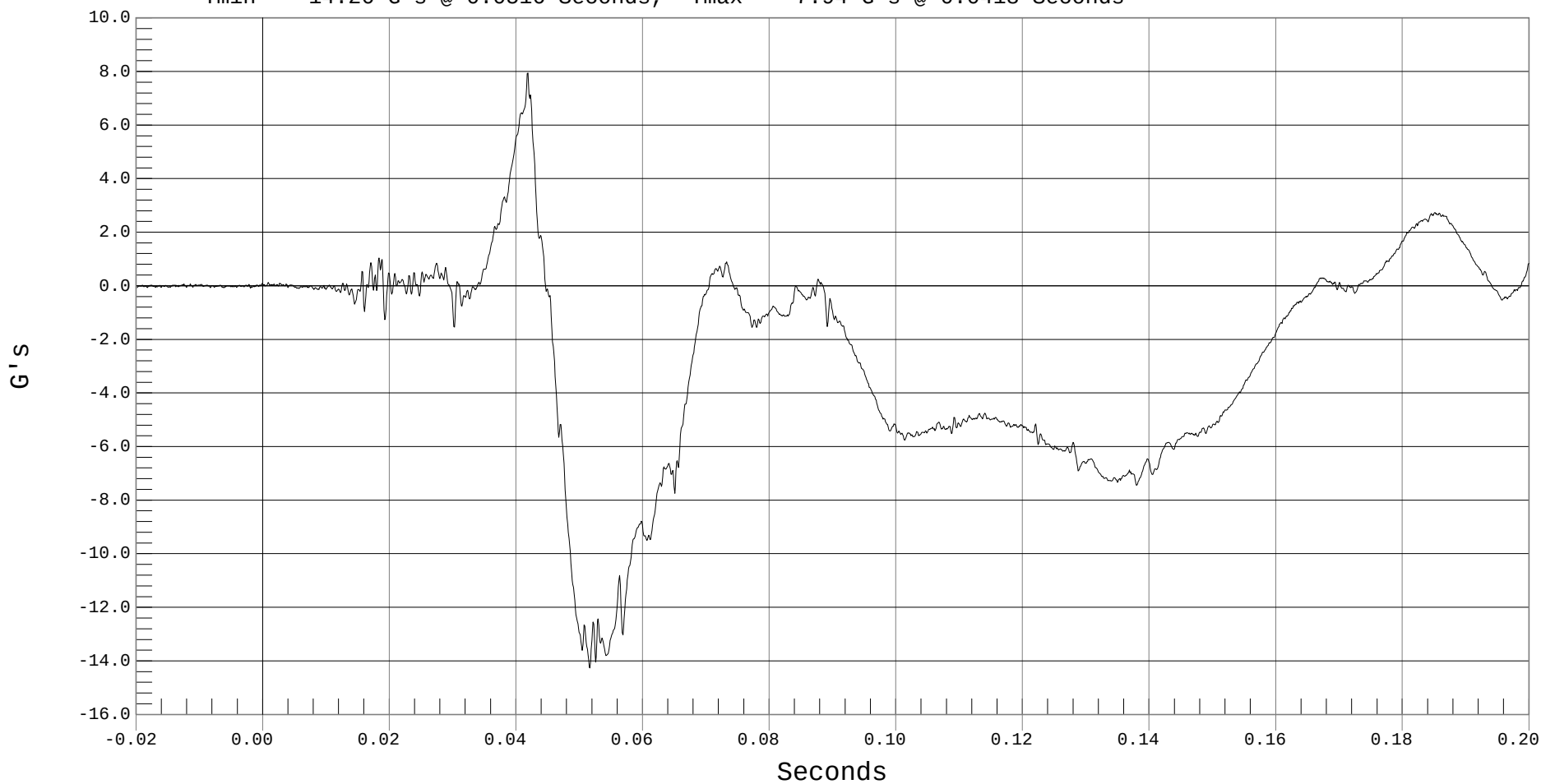
DRIVER HEAD CG X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD CG X, B01108AT.A01

Ymin = -14.26 G's @ 0.0516 Seconds, Ymax = 7.94 G's @ 0.0418 Seconds





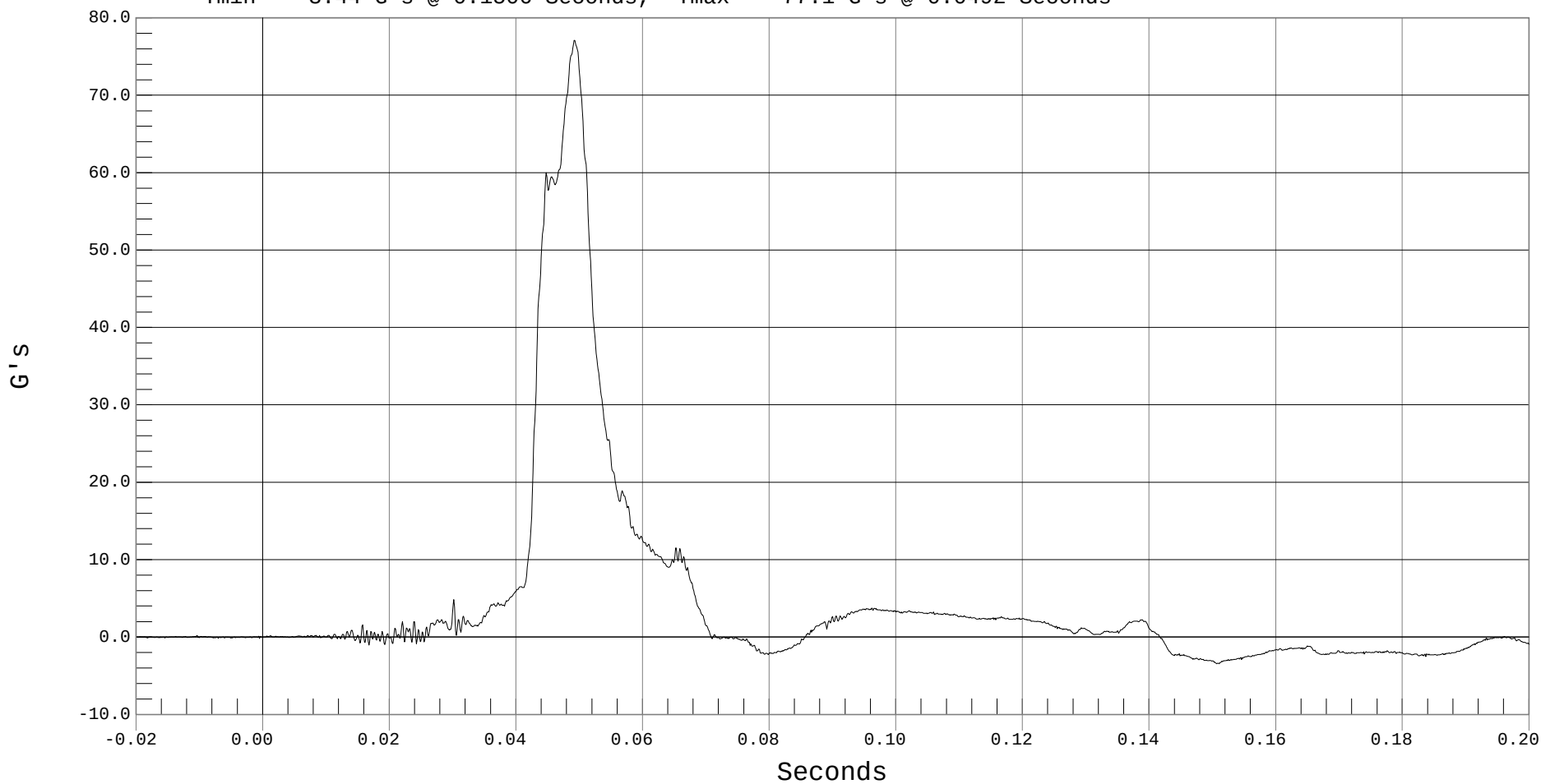
DRIVER HEAD CG Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD CG Y, B01108AT.A02

Ymin = -3.44 G's @ 0.1506 Seconds, Ymax = 77.1 G's @ 0.0492 Seconds





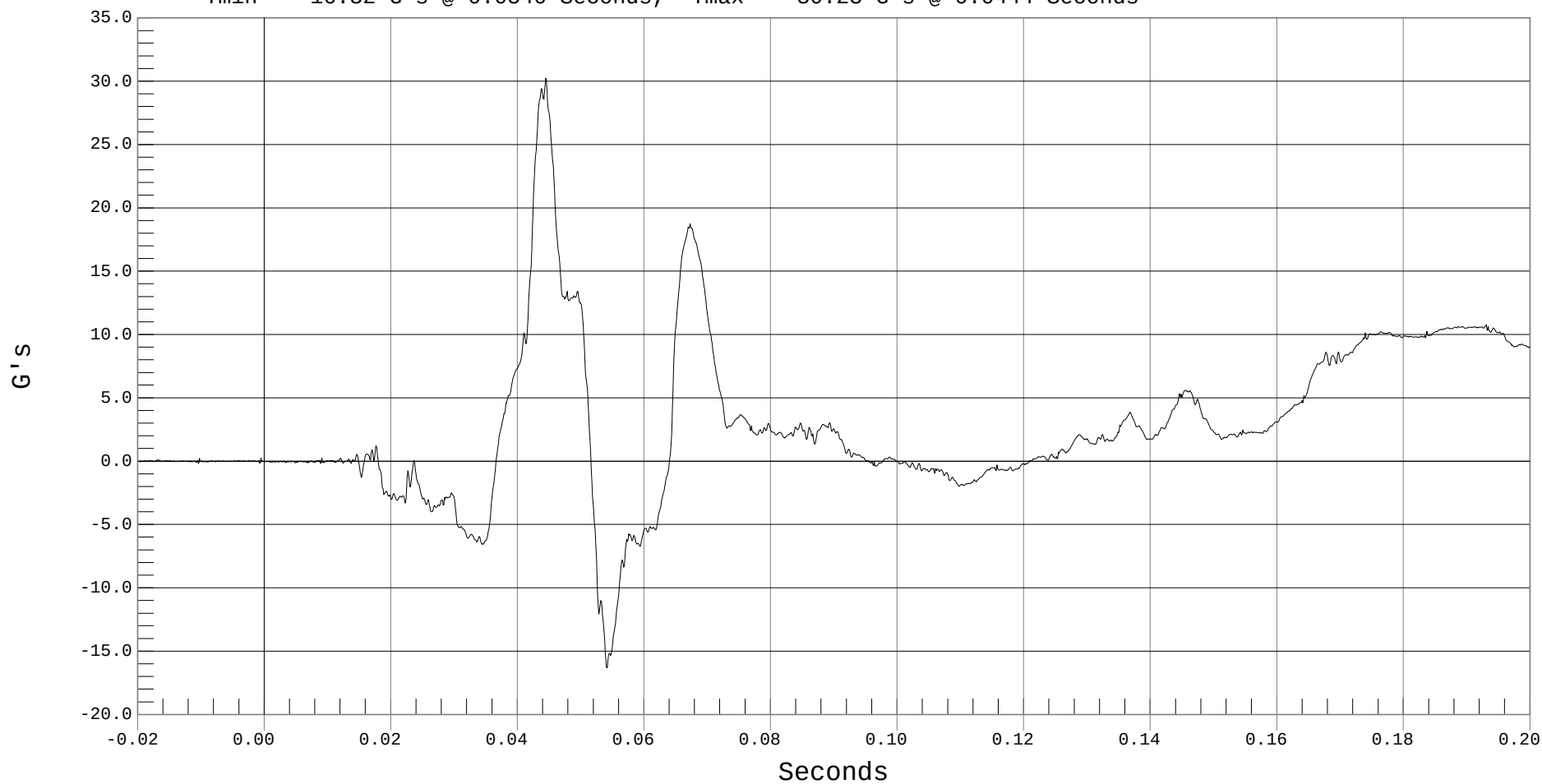
DRIVER HEAD CG Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD CG Z, B01108AT.A03

Ymin = -16.32 G's @ 0.0540 Seconds, Ymax = 30.23 G's @ 0.0444 Seconds





DRIVER HEAD CG RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

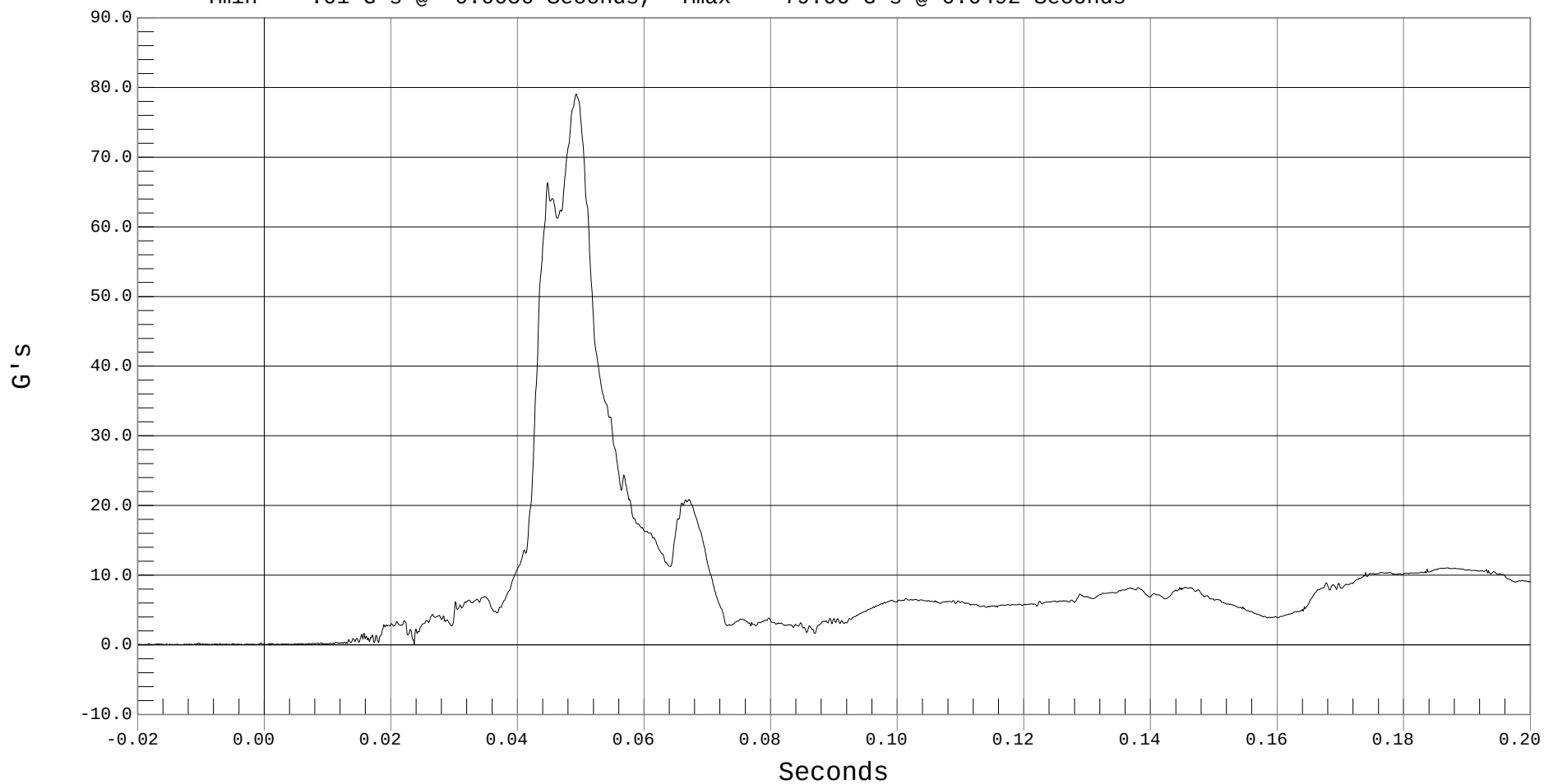
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 1000

— 1 DRIVER HEAD RESULTANT, B01108AV.A01

Ymin = .01 G's @ -0.0056 Seconds, Ymax = 79.06 G's @ 0.0492 Seconds





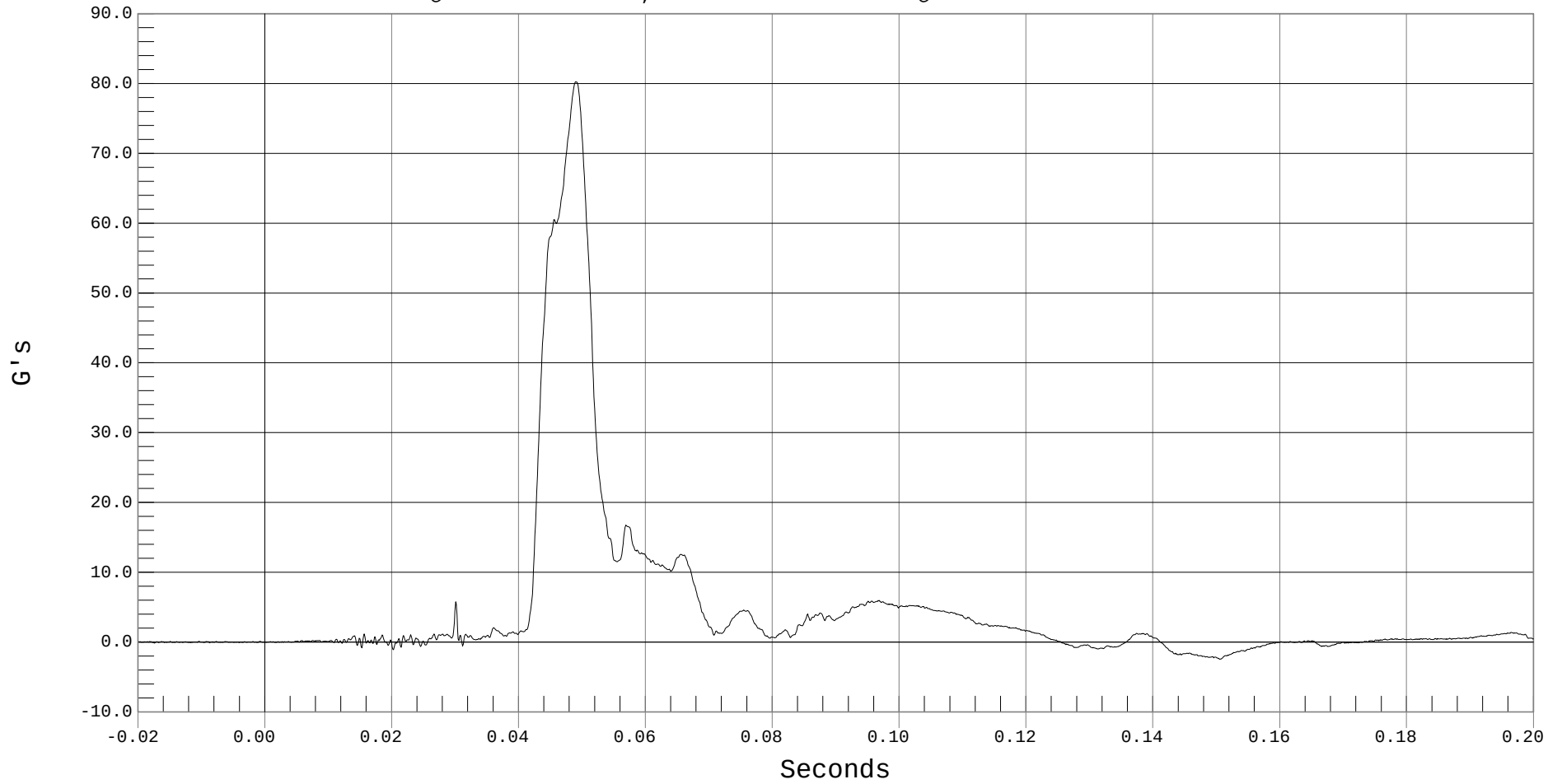
DRIVER HEAD FRONT Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD FRONT Y, B01108AT.A70

Ymin = -2.48 G's @ 0.1504 Seconds, Ymax = 80.27 G's @ 0.0489 Seconds





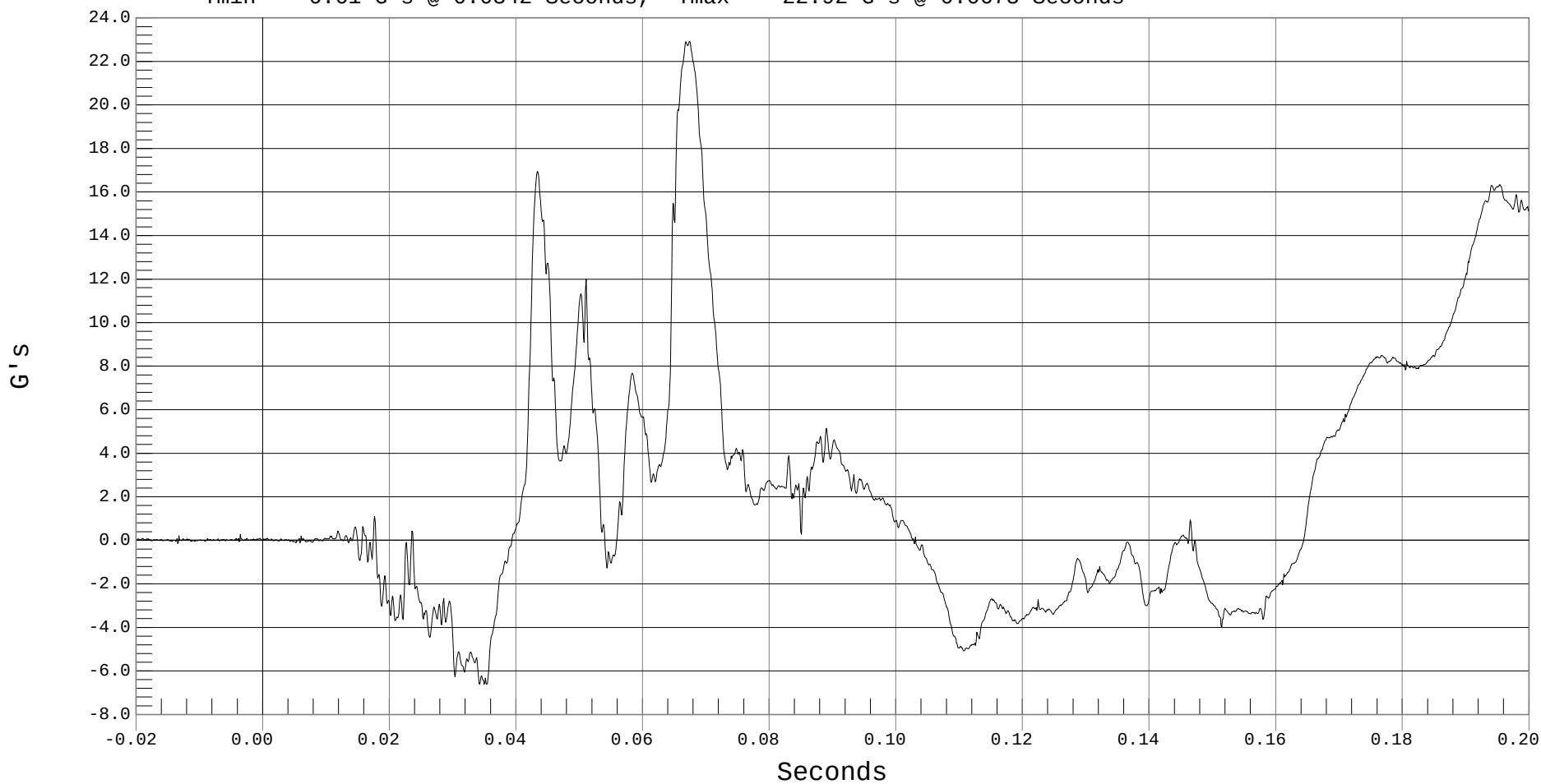
DRIVER HEAD FRONT Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD FRONT Z, B01108AT.A71

Ymin = -6.61 G's @ 0.0342 Seconds, Ymax = 22.92 G's @ 0.0673 Seconds





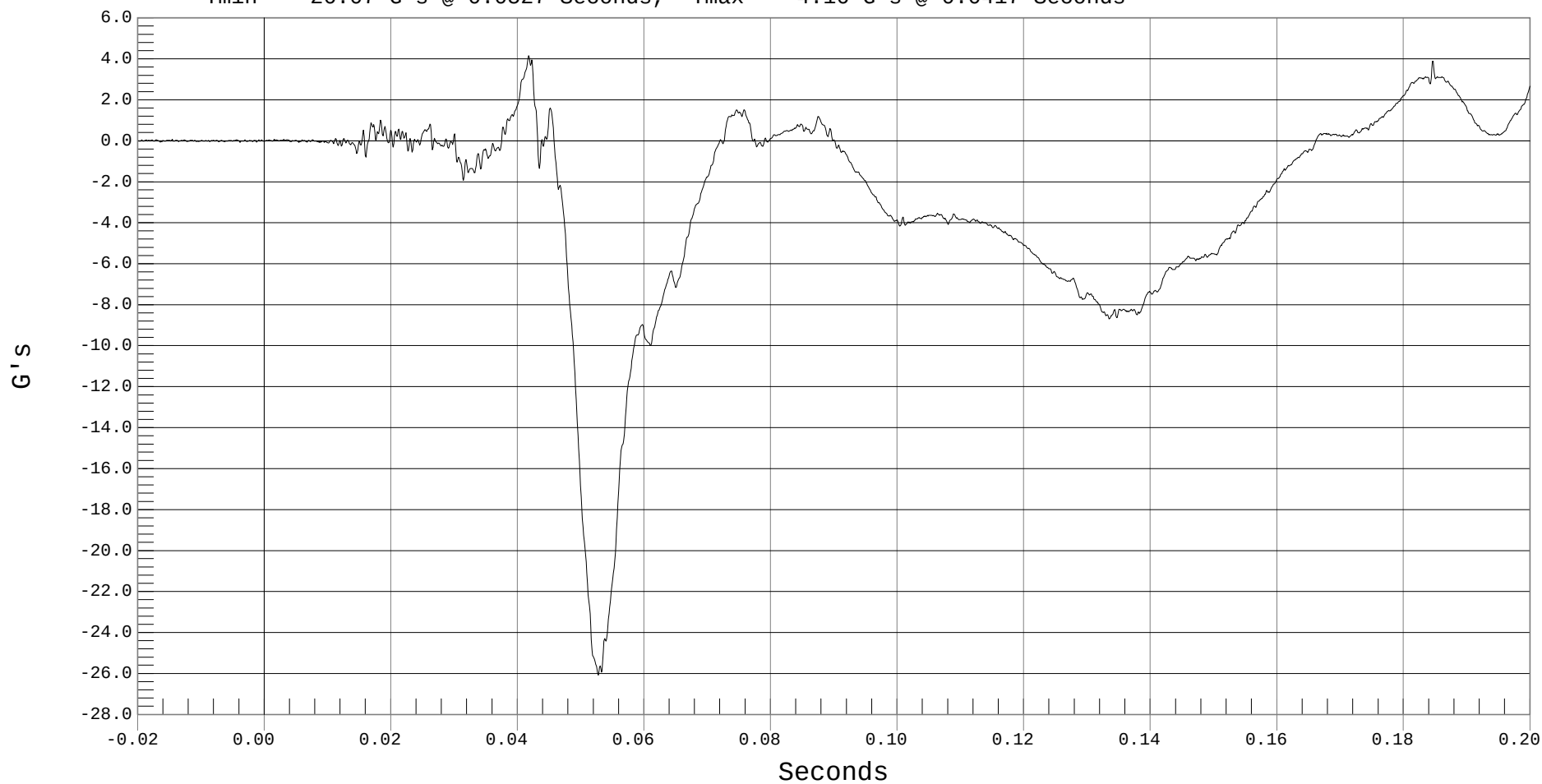
DRIVER HEAD LEFT X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD LEFT X, B01108AT.A72

Ymin = -26.07 G's @ 0.0527 Seconds, Ymax = 4.16 G's @ 0.0417 Seconds





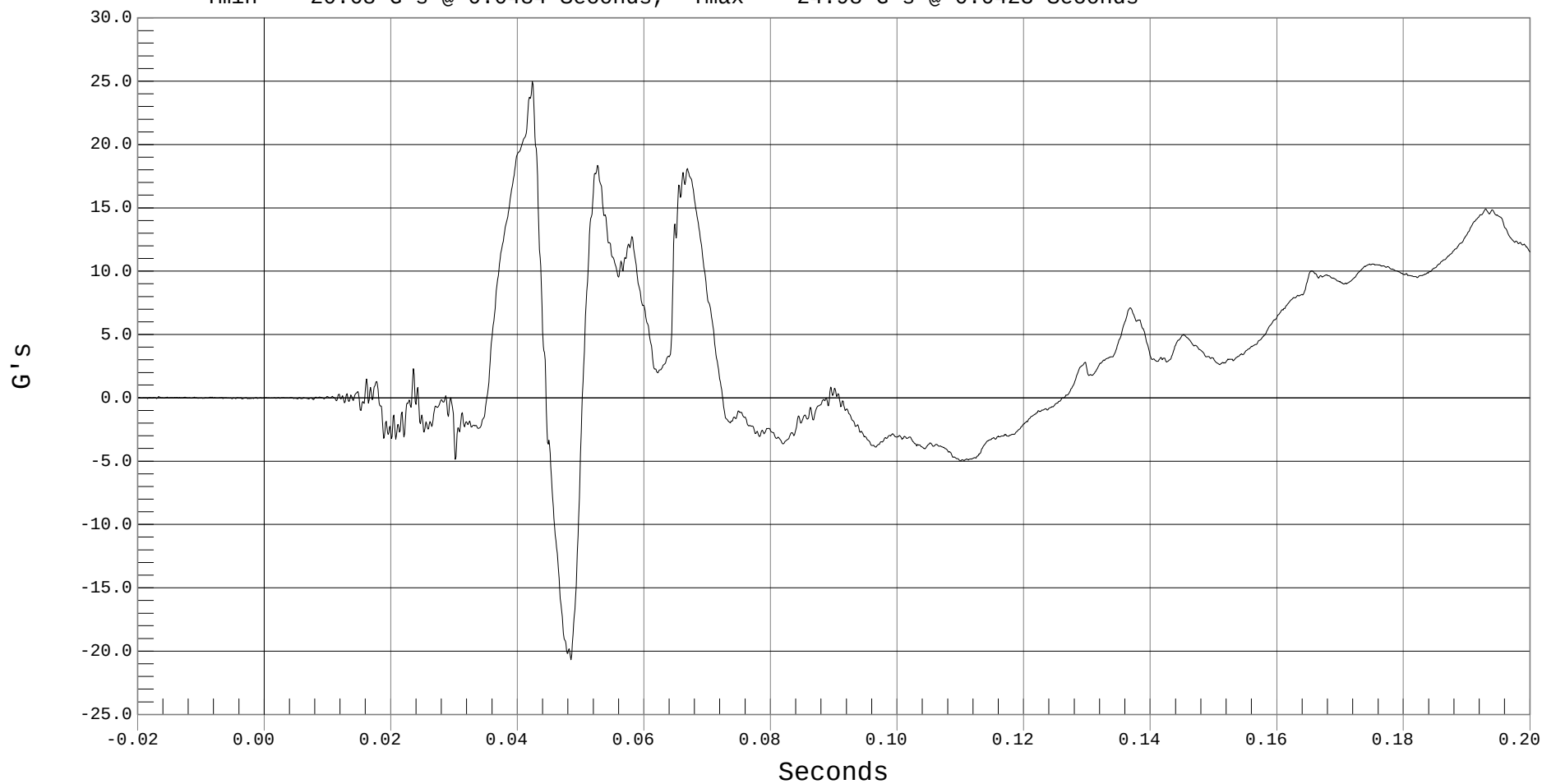
DRIVER HEAD LEFT Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD LEFT Z, B01108AT.A73

Ymin = -20.68 G's @ 0.0484 Seconds, Ymax = 24.98 G's @ 0.0423 Seconds





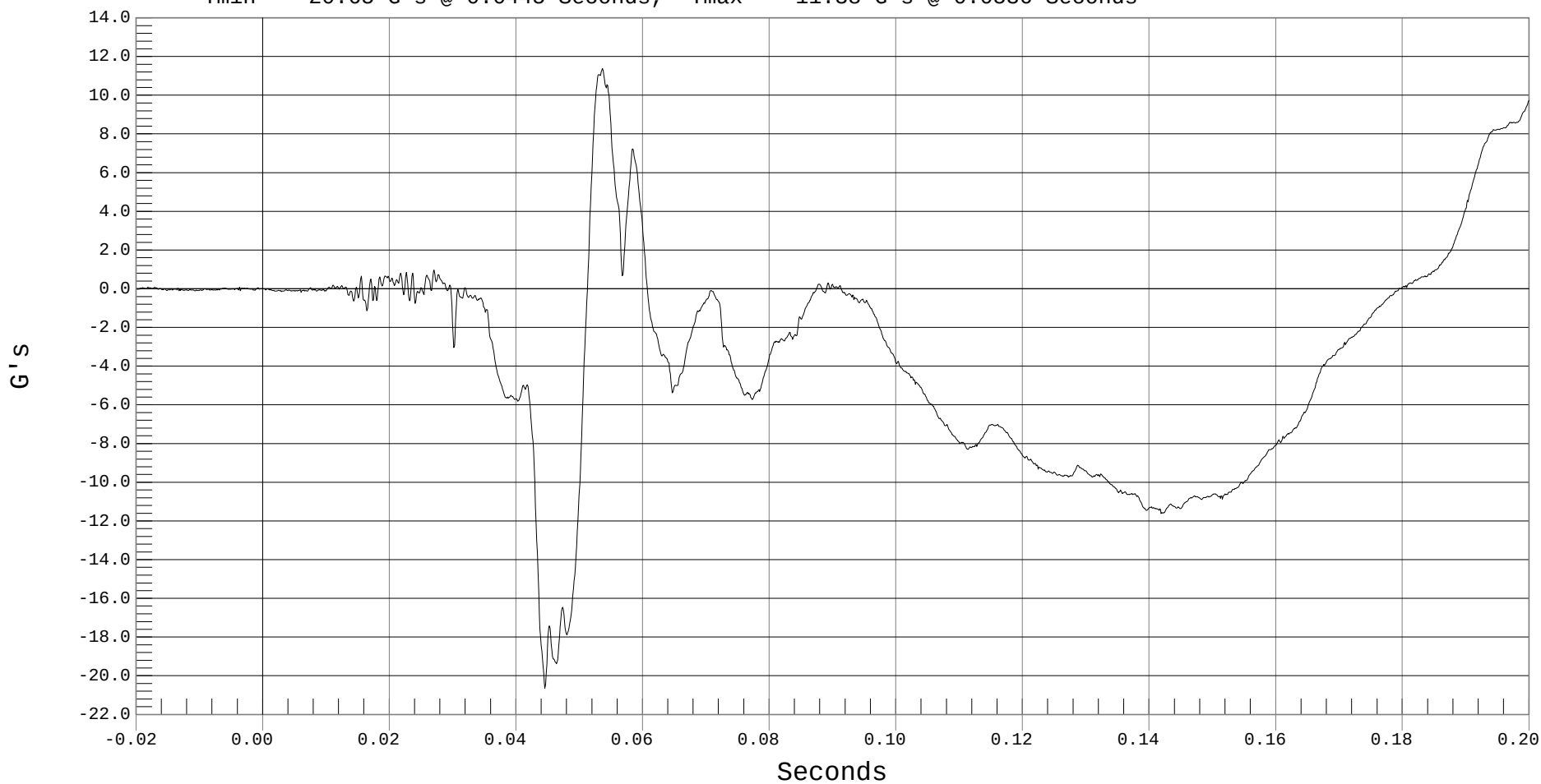
DRIVER HEAD TOP X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

1 DRIVER HEAD TOP X, B01108AT.A74

Ymin = -20.65 G's @ 0.0445 Seconds, Ymax = 11.38 G's @ 0.0536 Seconds





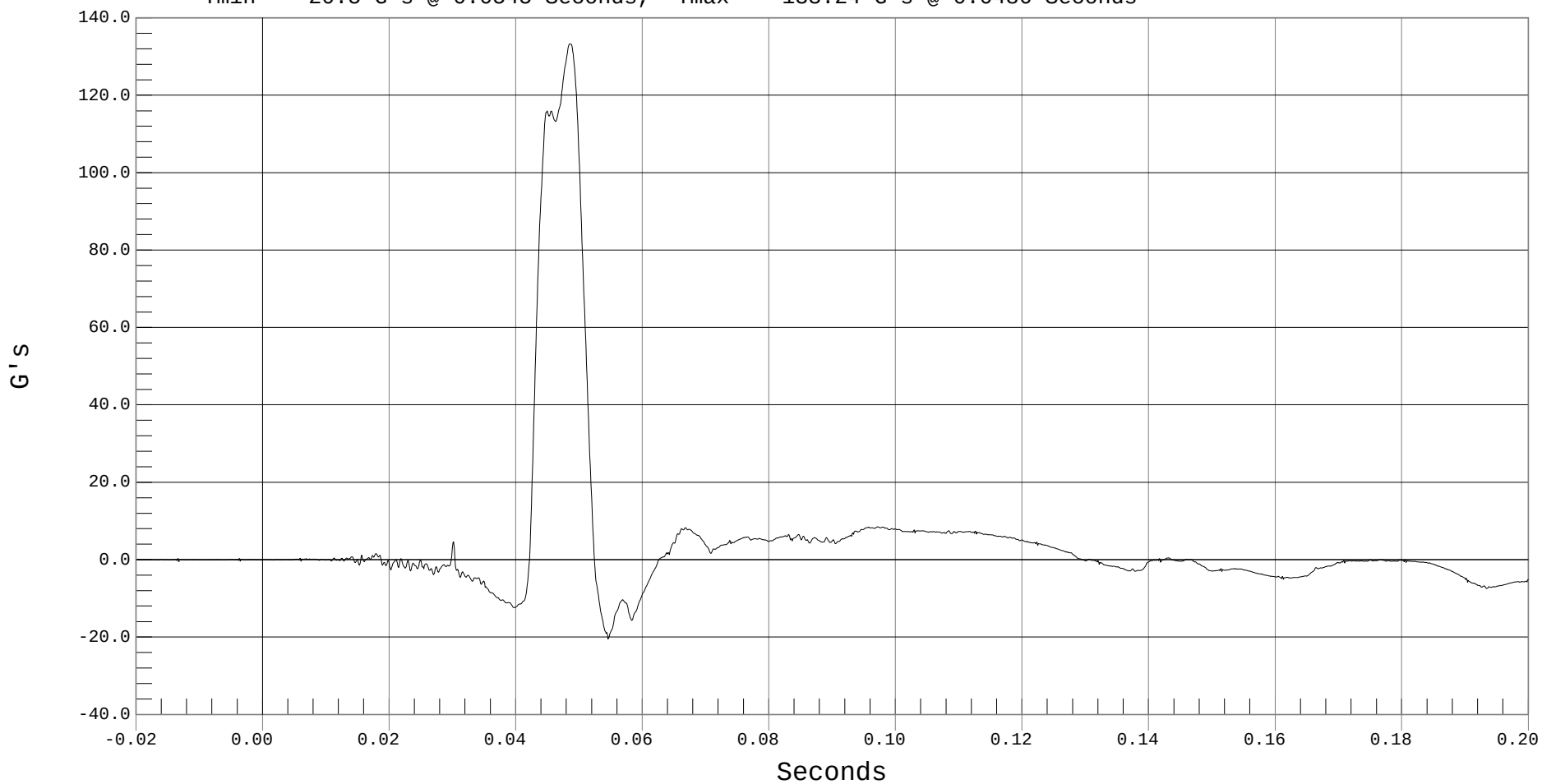
DRIVER HEAD TOP Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD TOP Y, B01108AT.A75

Ymin = -20.5 G's @ 0.0545 Seconds, Ymax = 133.24 G's @ 0.0486 Seconds





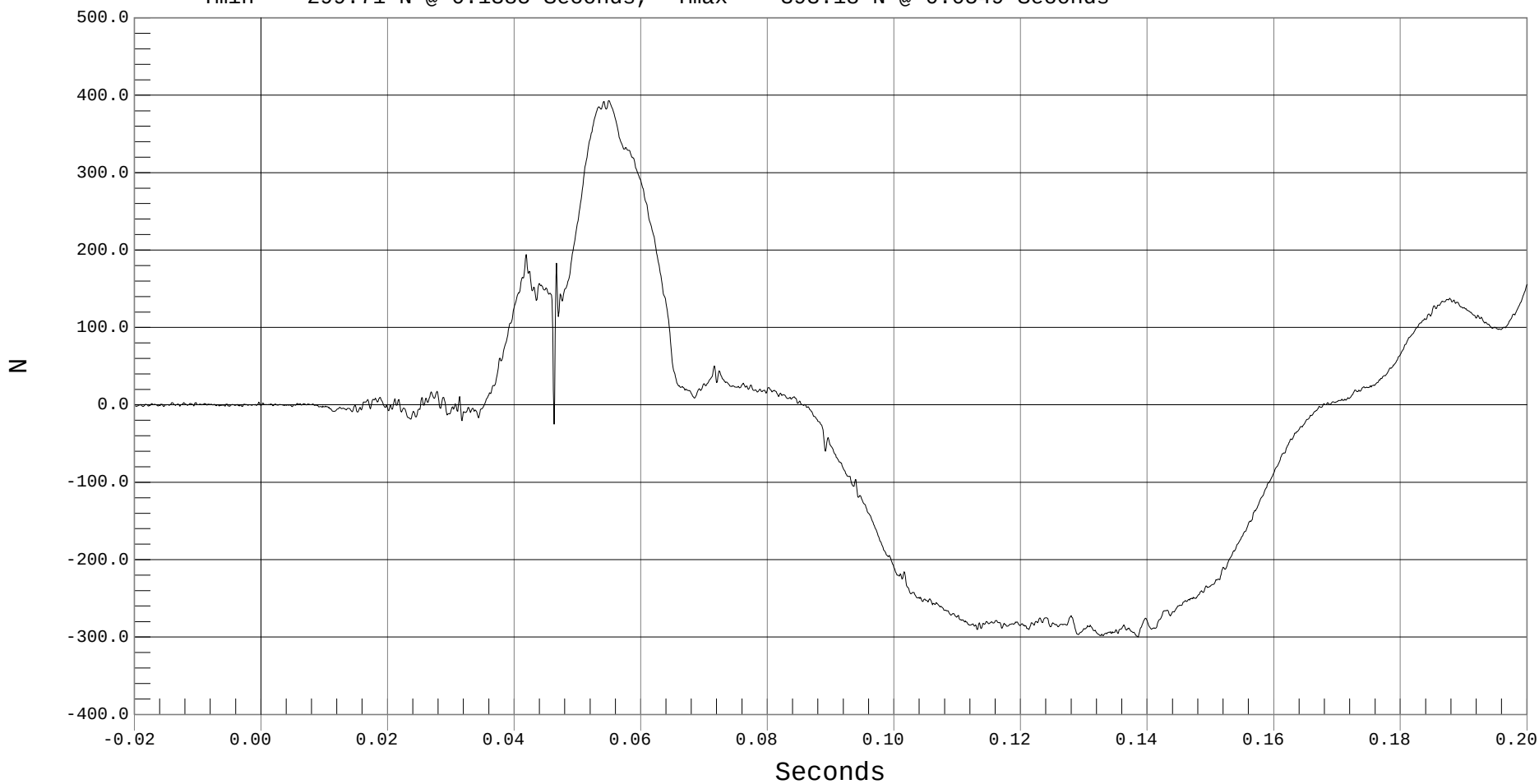
DRIVER UPPER NECK FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE X, B01108FT.F04

Ymin = -299.71 N @ 0.1385 Seconds, Ymax = 393.18 N @ 0.0549 Seconds





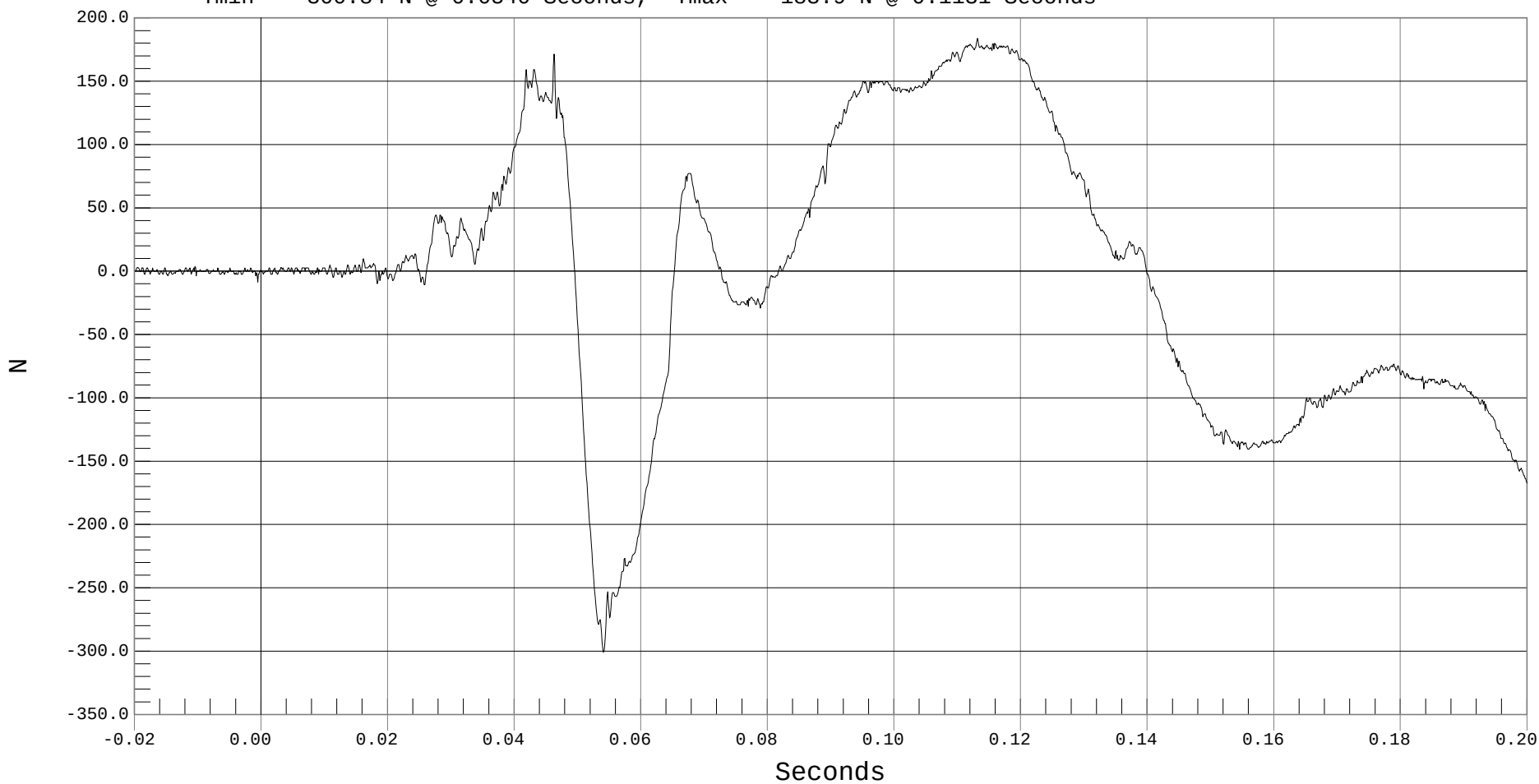
DRIVER UPPER NECK FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE Y, B01108FT.F05

Ymin = -300.84 N @ 0.0540 Seconds, Ymax = 183.9 N @ 0.1131 Seconds





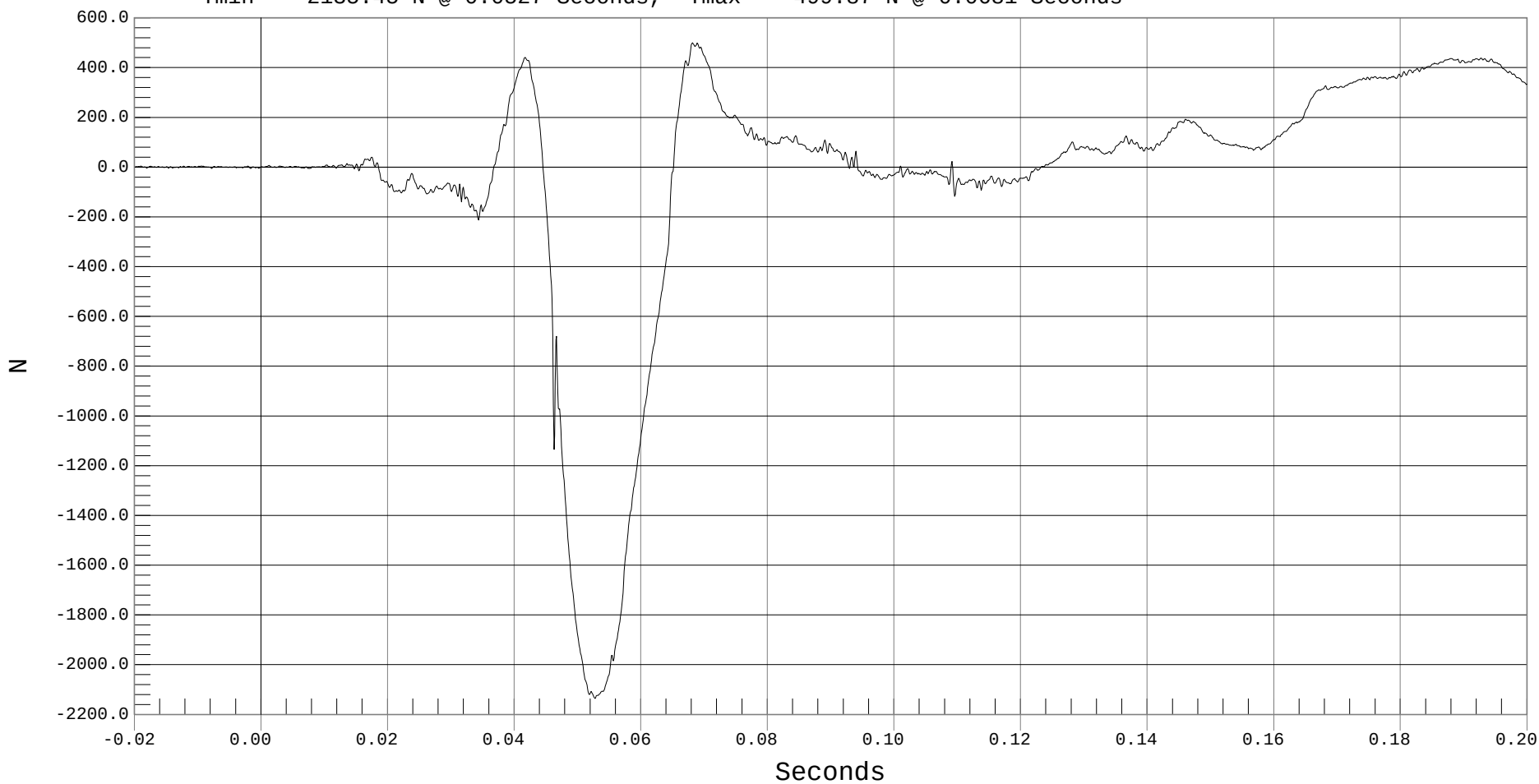
DRIVER UPPER NECK FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE Z, B01108FT.F06

Ymin = -2135.45 N @ 0.0527 Seconds, Ymax = 499.87 N @ 0.0681 Seconds





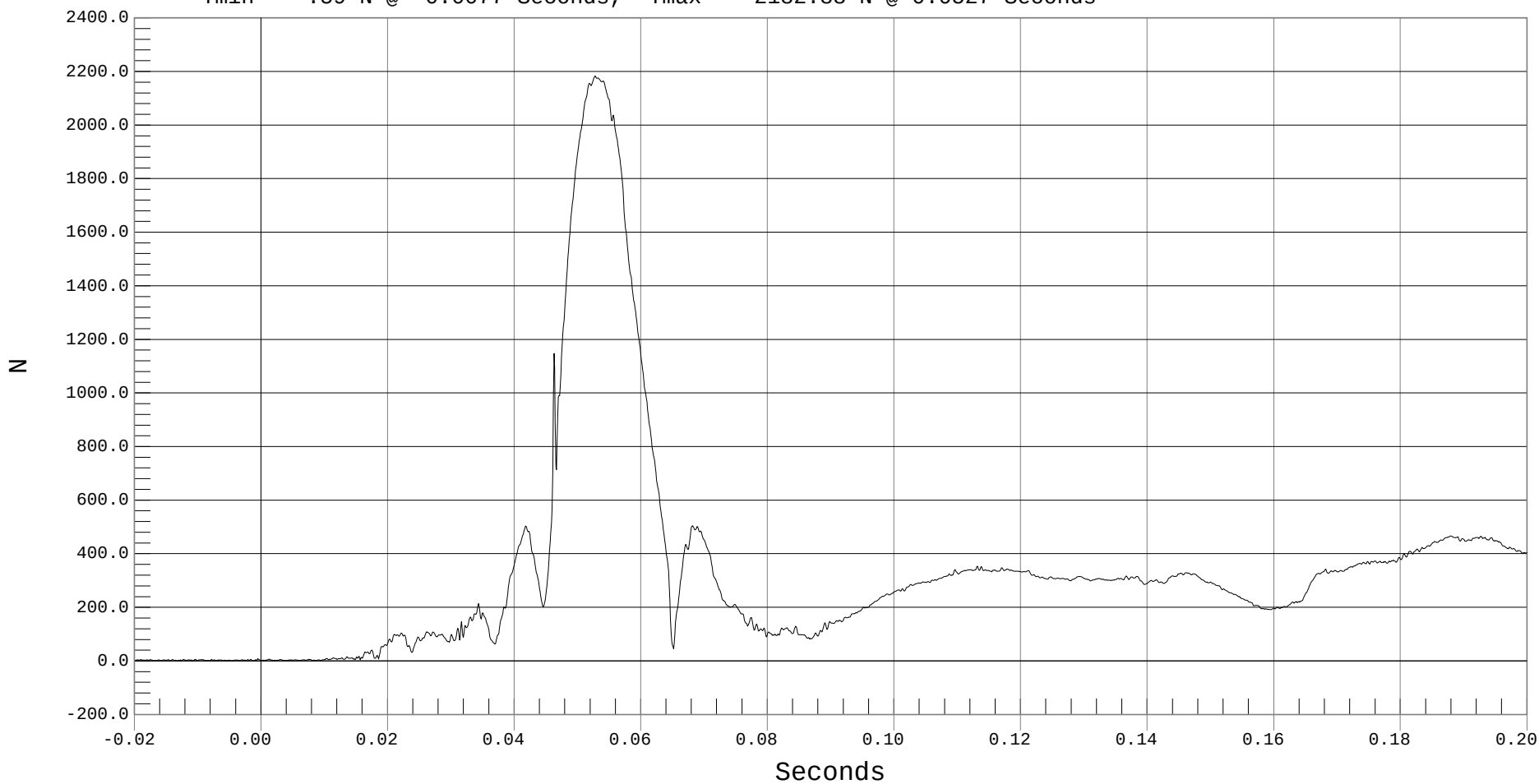
DRIVER UPPER NECK FORCE RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE RESULTANT, B01108FV.F04

Ymin = .59 N @ -0.0077 Seconds, Ymax = 2182.88 N @ 0.0527 Seconds





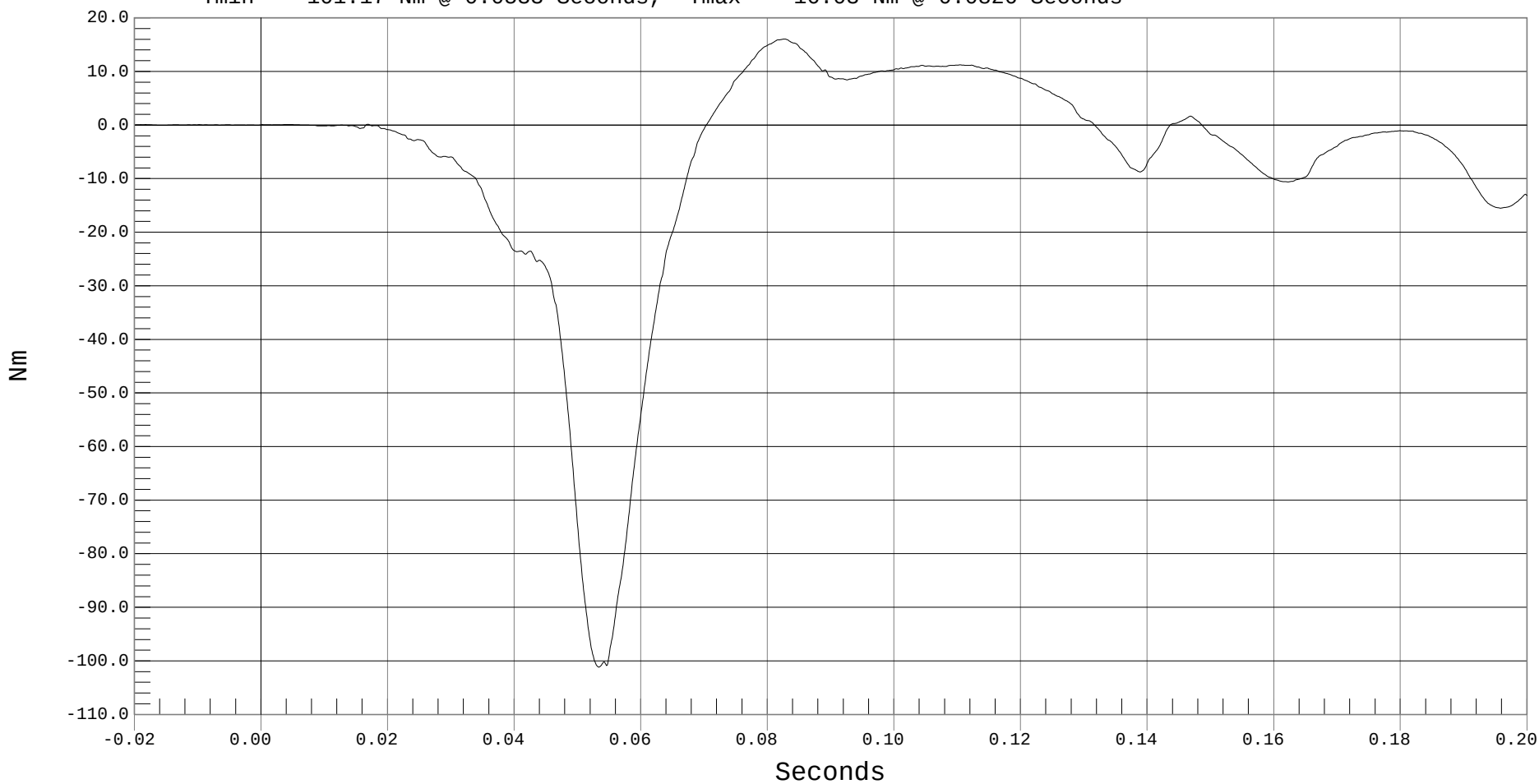
DRIVER UPPER NECK MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT X, B01108MF.M07

Ymin = -101.17 Nm @ 0.0533 Seconds, Ymax = 16.03 Nm @ 0.0826 Seconds





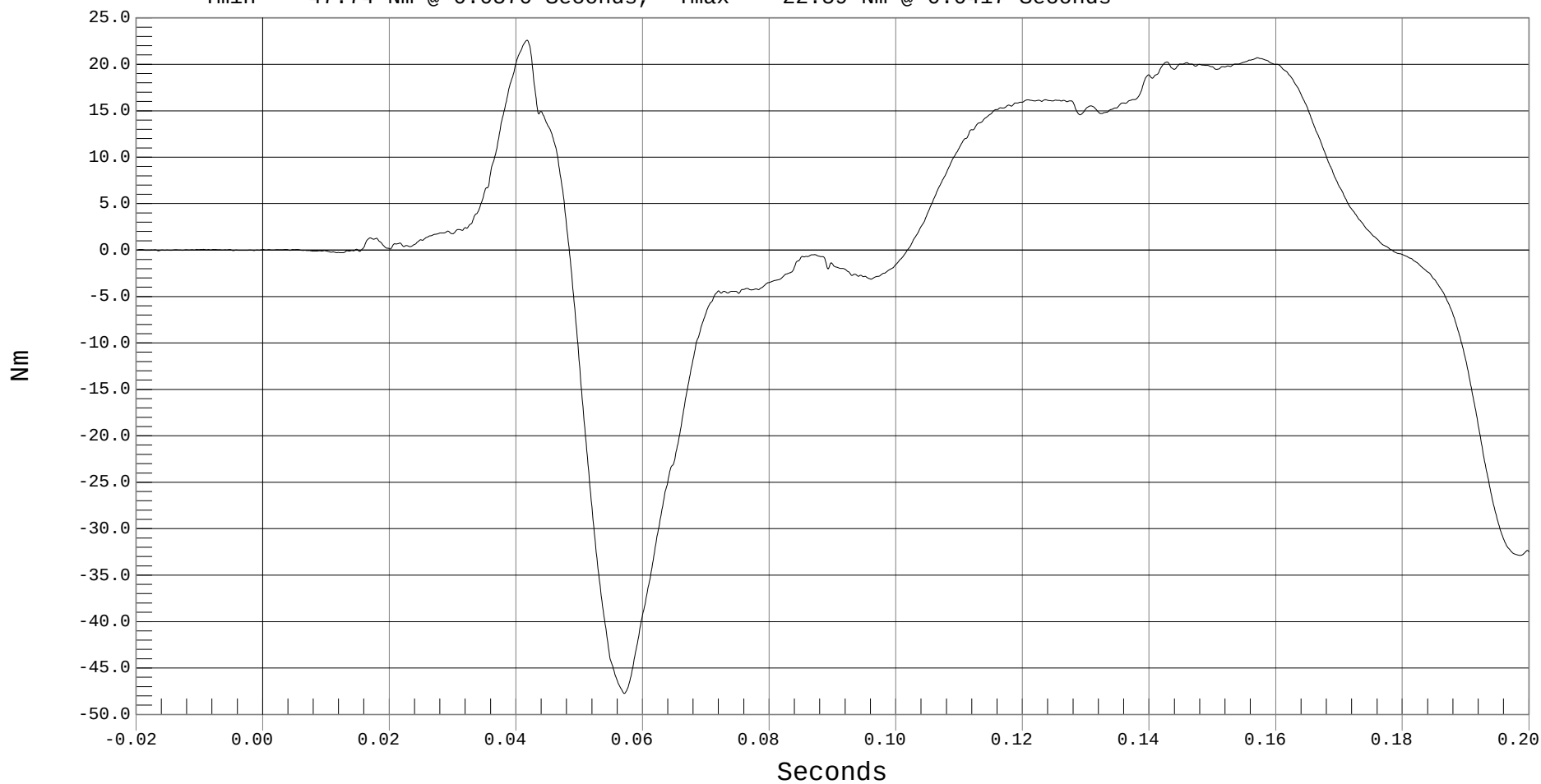
DRIVER UPPER NECK MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT Y, B01108MF.M08

Ymin = -47.74 Nm @ 0.0570 Seconds, Ymax = 22.59 Nm @ 0.0417 Seconds





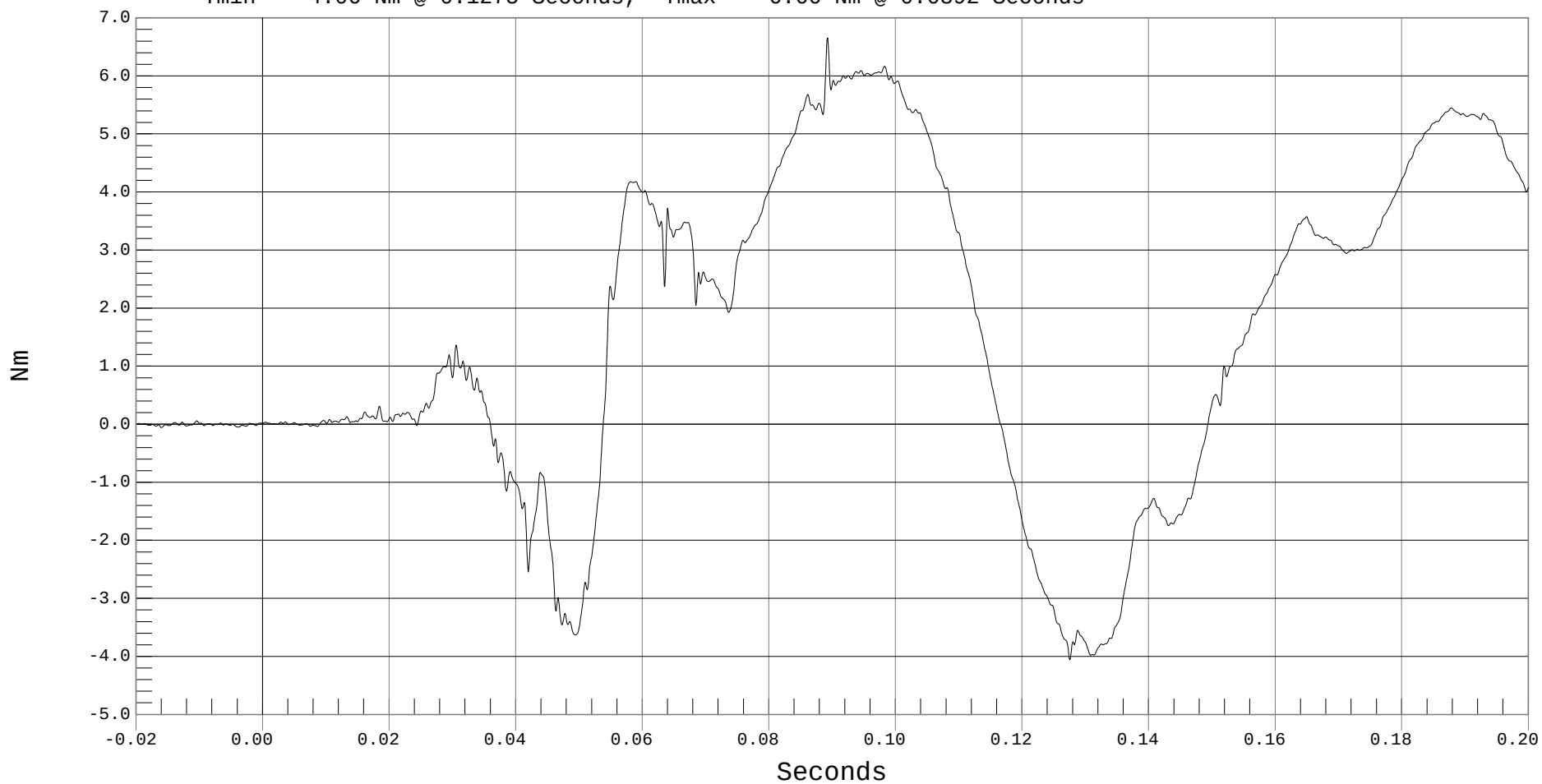
DRIVER UPPER NECK MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT Z, B01108MF.M09

Ymin = -4.06 Nm @ 0.1275 Seconds, Ymax = 6.66 Nm @ 0.0892 Seconds





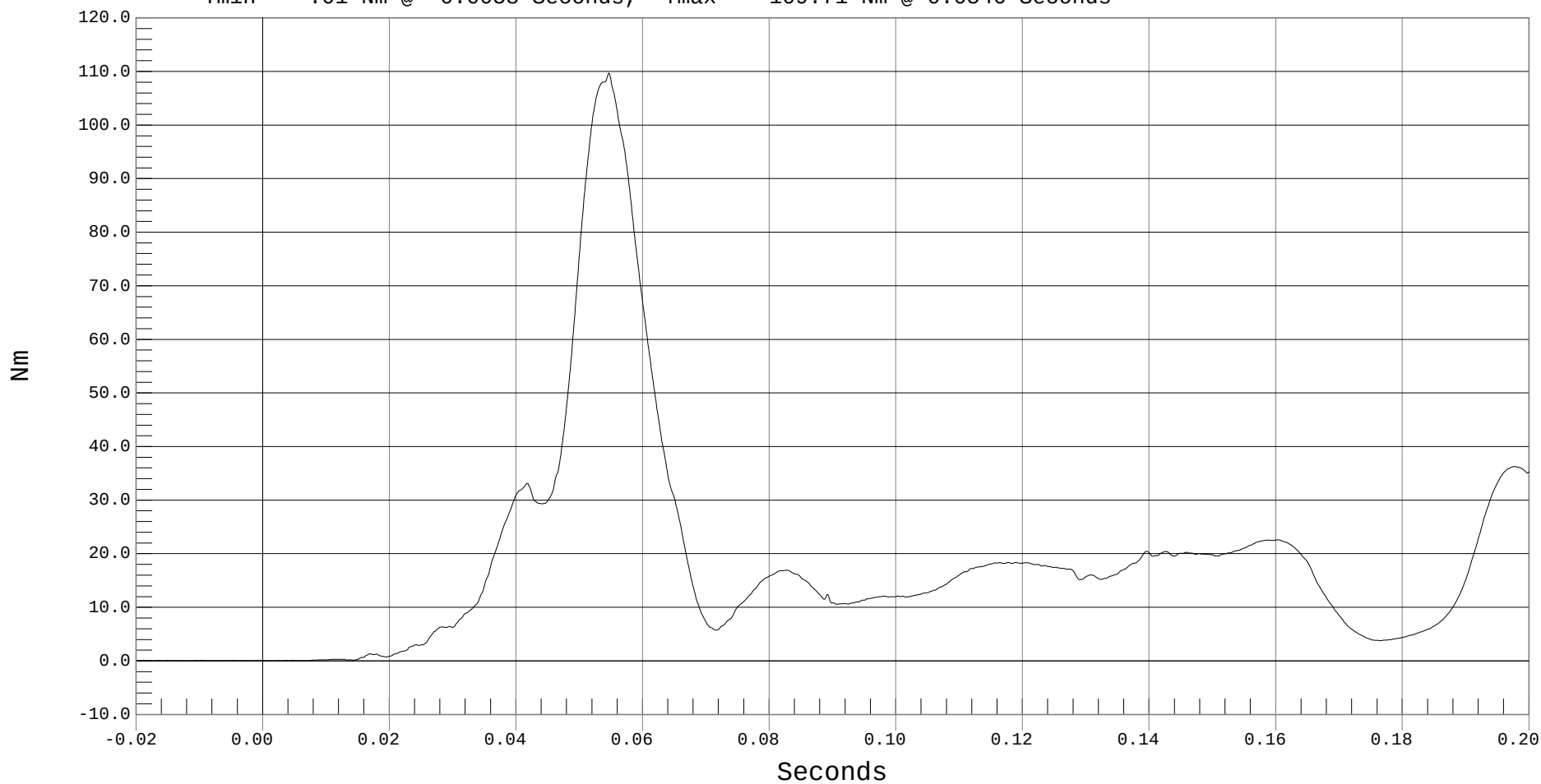
DRIVER UPPER NECK MOMENT RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT RESULTANT, B01108MV.M07

Ymin = .01 Nm @ -0.0058 Seconds, Ymax = 109.71 Nm @ 0.0546 Seconds





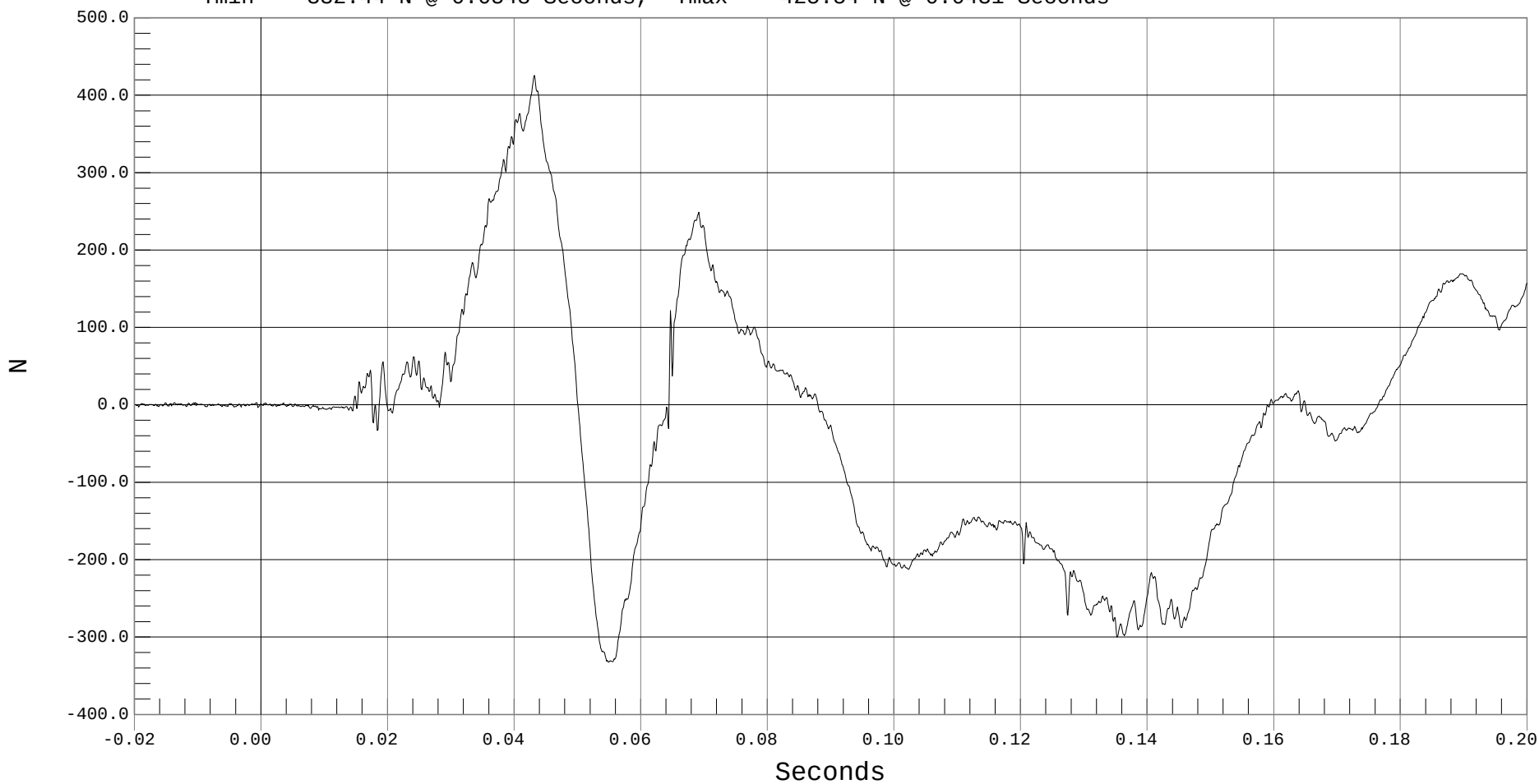
DRIVER LOWER NECK FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE X, B01108FT.F10

Ymin = -332.44 N @ 0.0548 Seconds, Ymax = 425.54 N @ 0.0431 Seconds





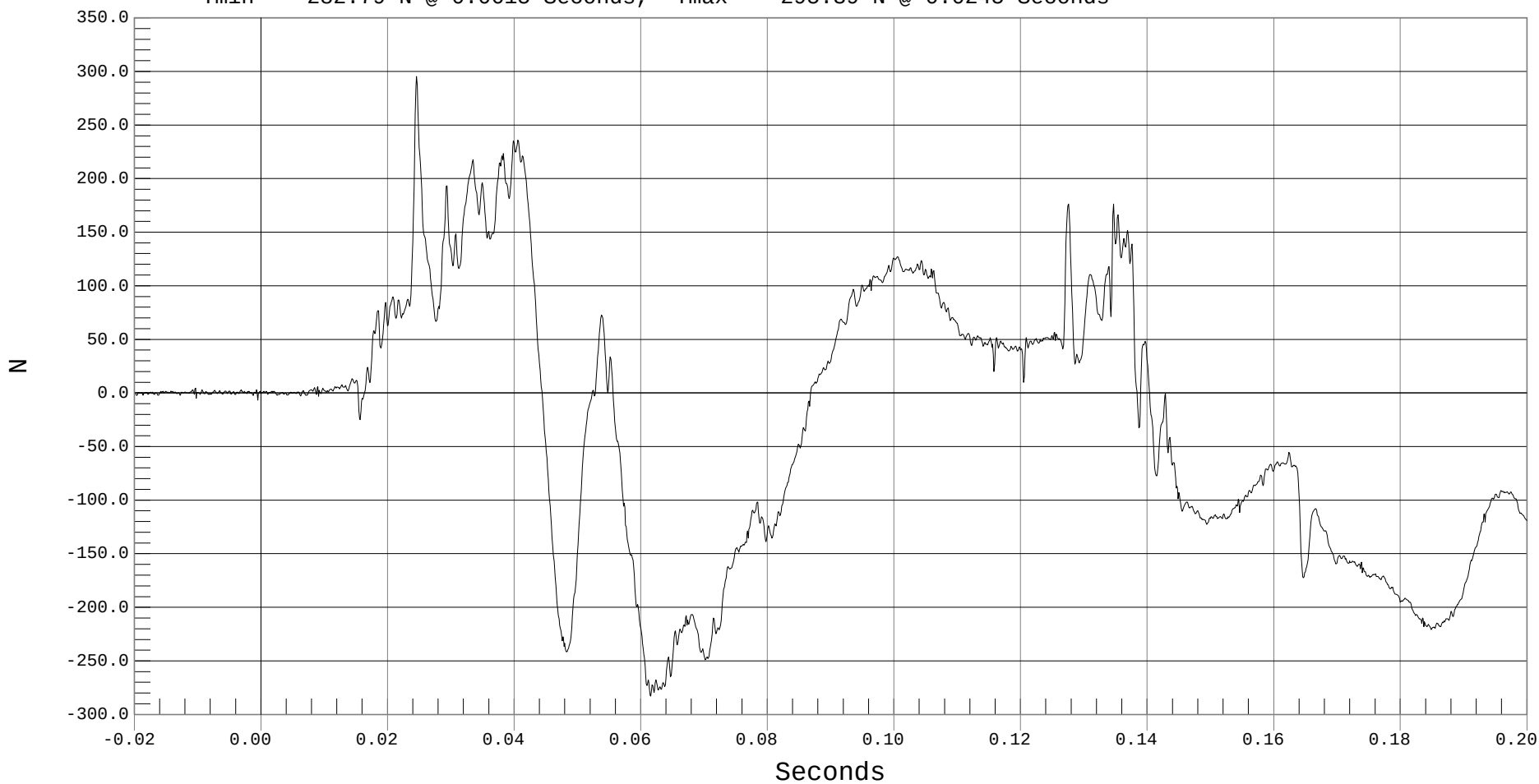
DRIVER LOWER NECK FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE Y, B01108FT.F11

Ymin = -282.79 N @ 0.0615 Seconds, Ymax = 295.39 N @ 0.0245 Seconds





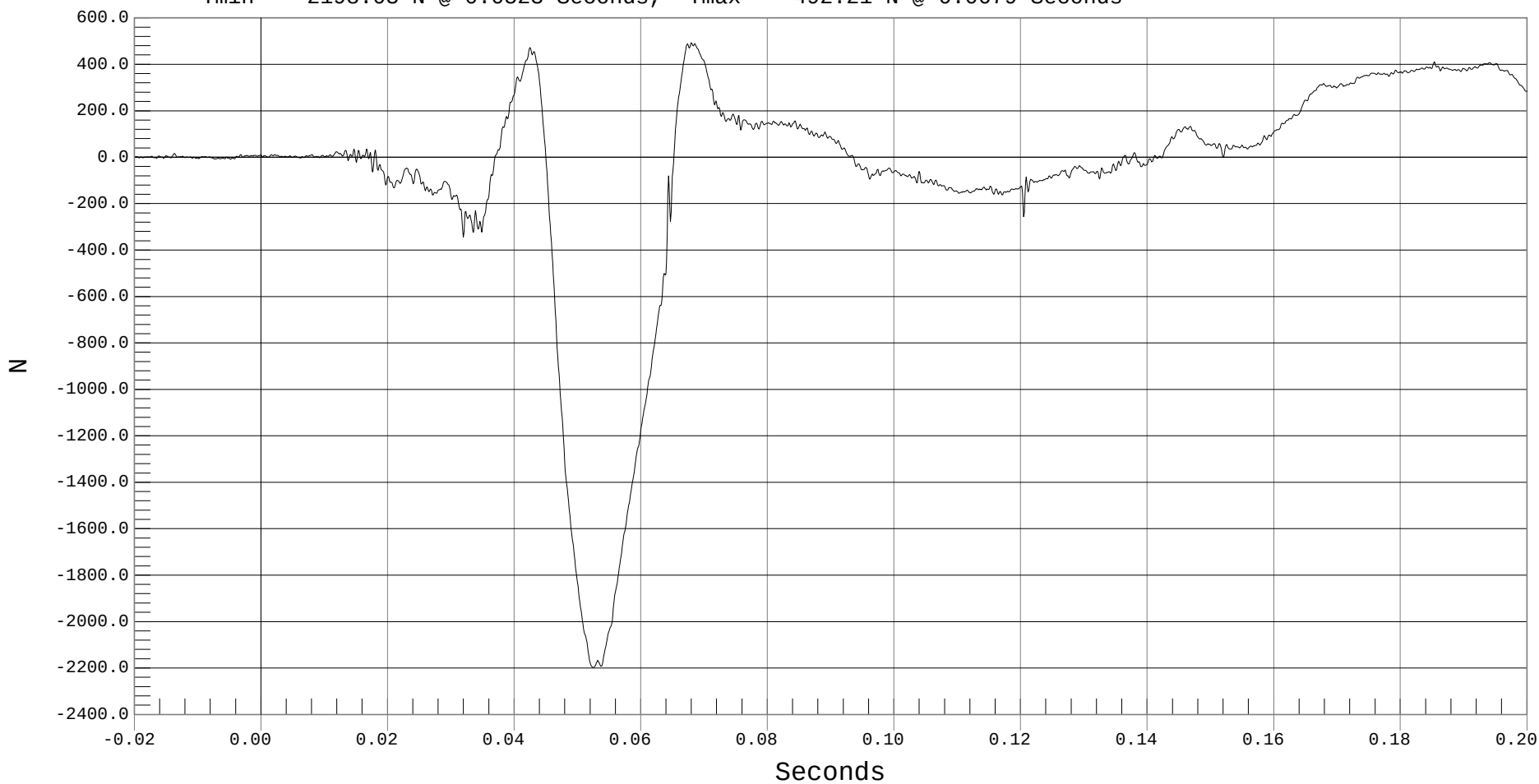
DRIVER LOWER NECK FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

1 DRIVER LOWER NECK FORCE Z, B01108FT.F12

Ymin = -2198.03 N @ 0.0523 Seconds, Ymax = 492.21 N @ 0.0679 Seconds





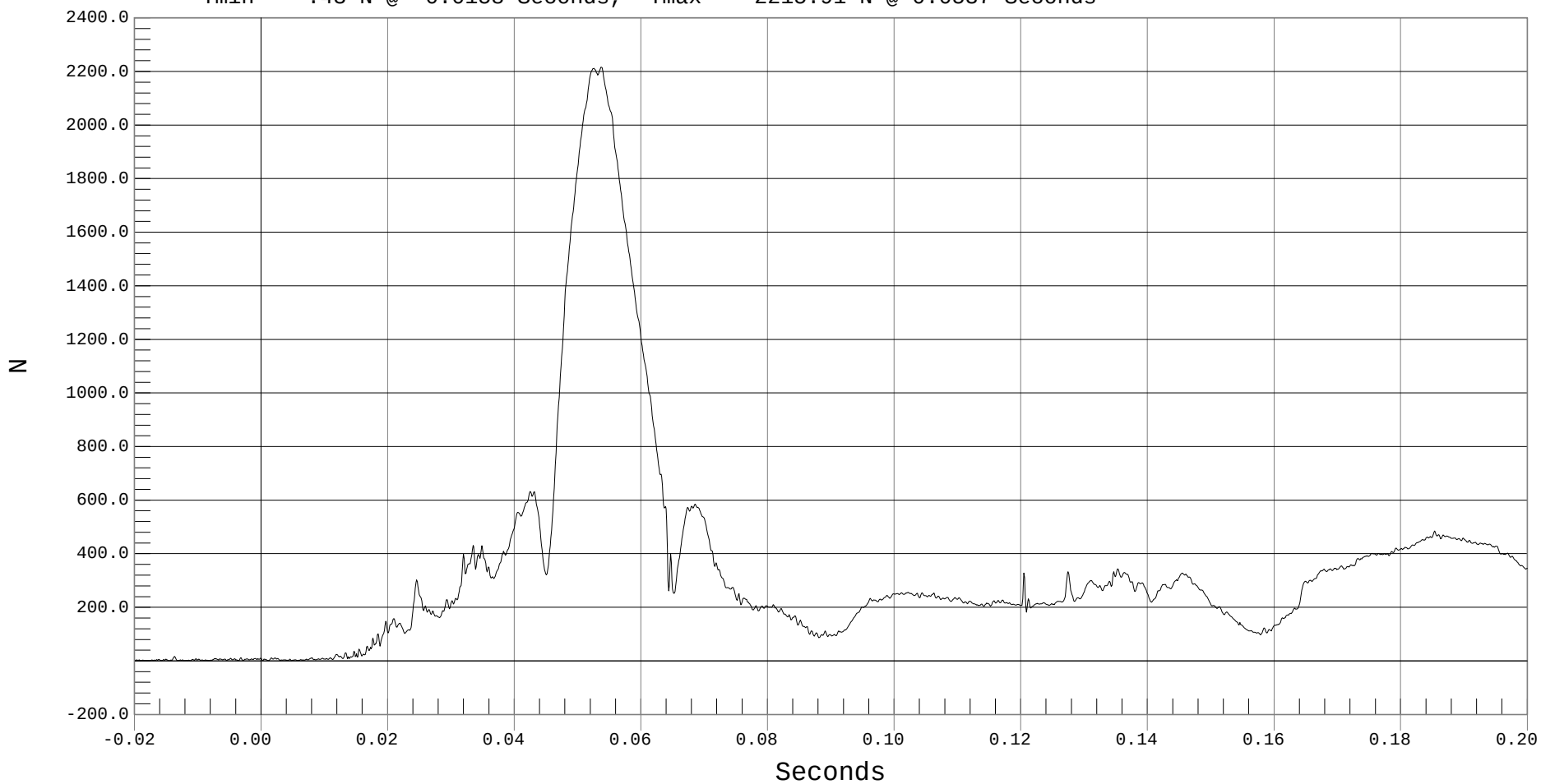
DRIVER LOWER NECK FORCE RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE RESULTANT, B01108FV.F10

Ymin = .43 N @ -0.0158 Seconds, Ymax = 2215.91 N @ 0.0537 Seconds





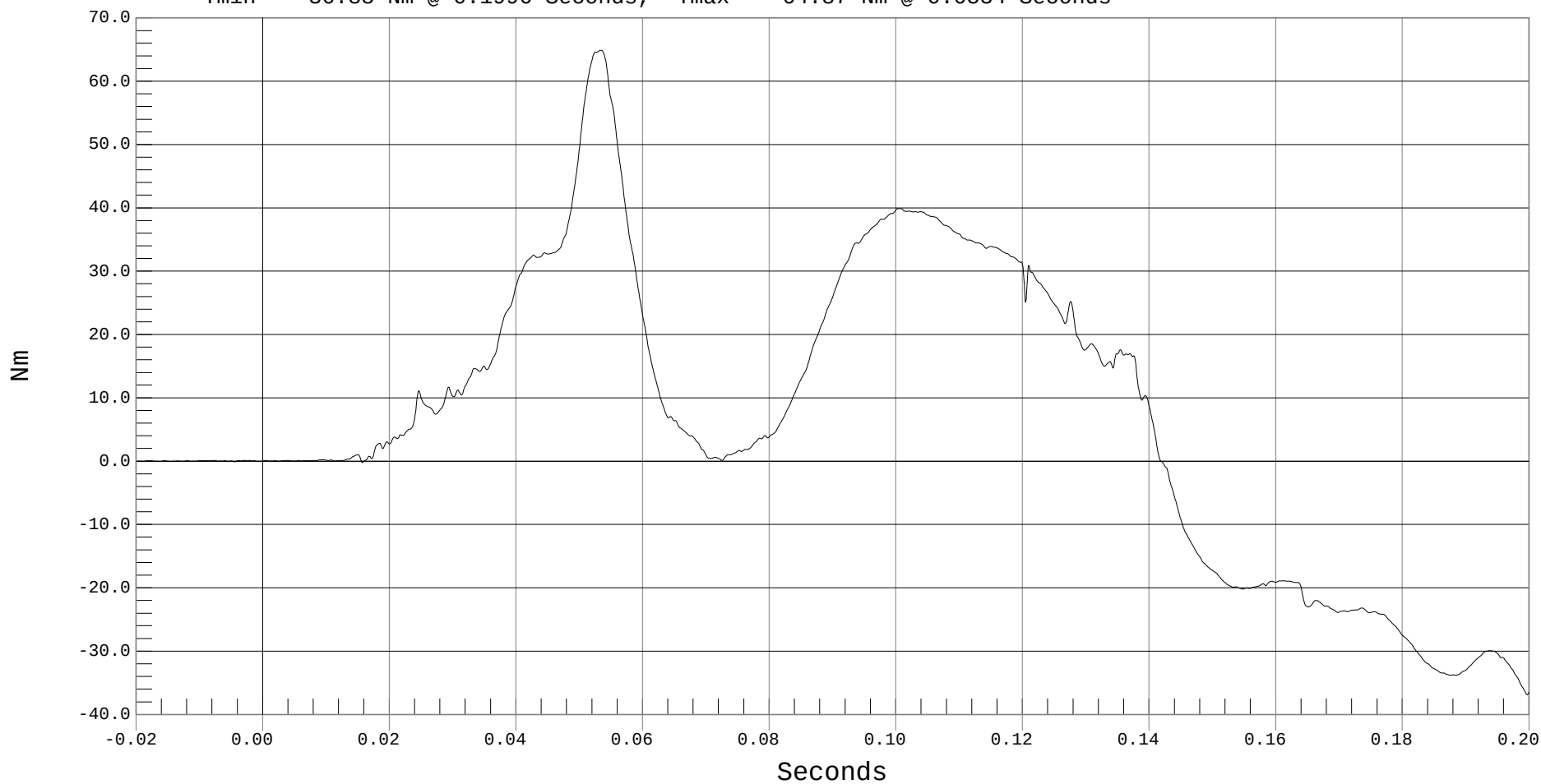
DRIVER LOWER NECK MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT X, B01108MF.M13

Ymin = -36.88 Nm @ 0.1996 Seconds, Ymax = 64.87 Nm @ 0.0534 Seconds





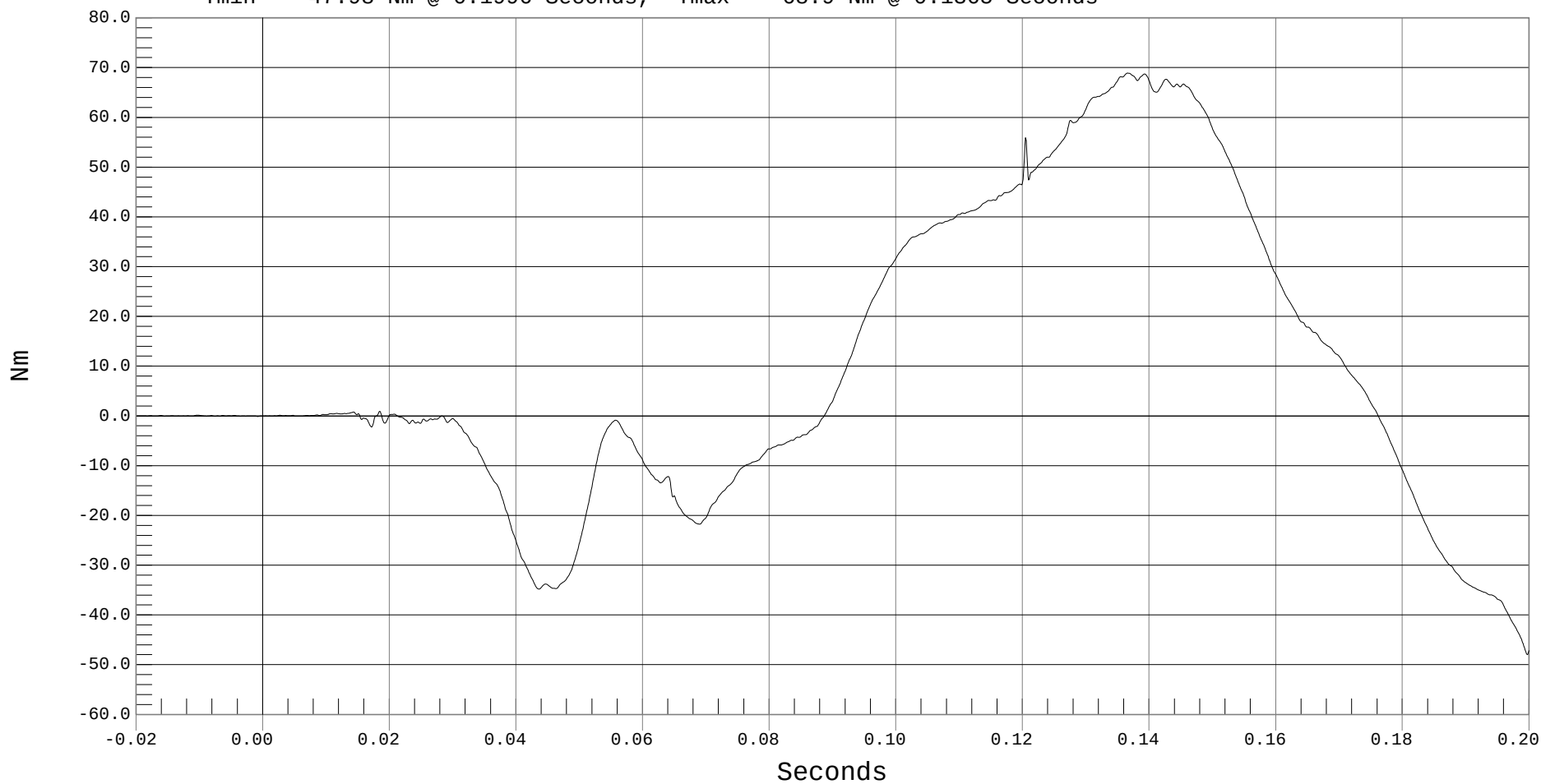
DRIVER LOWER NECK MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT Y, B01108MF.M14

Ymin = -47.98 Nm @ 0.1996 Seconds, Ymax = 68.9 Nm @ 0.1365 Seconds





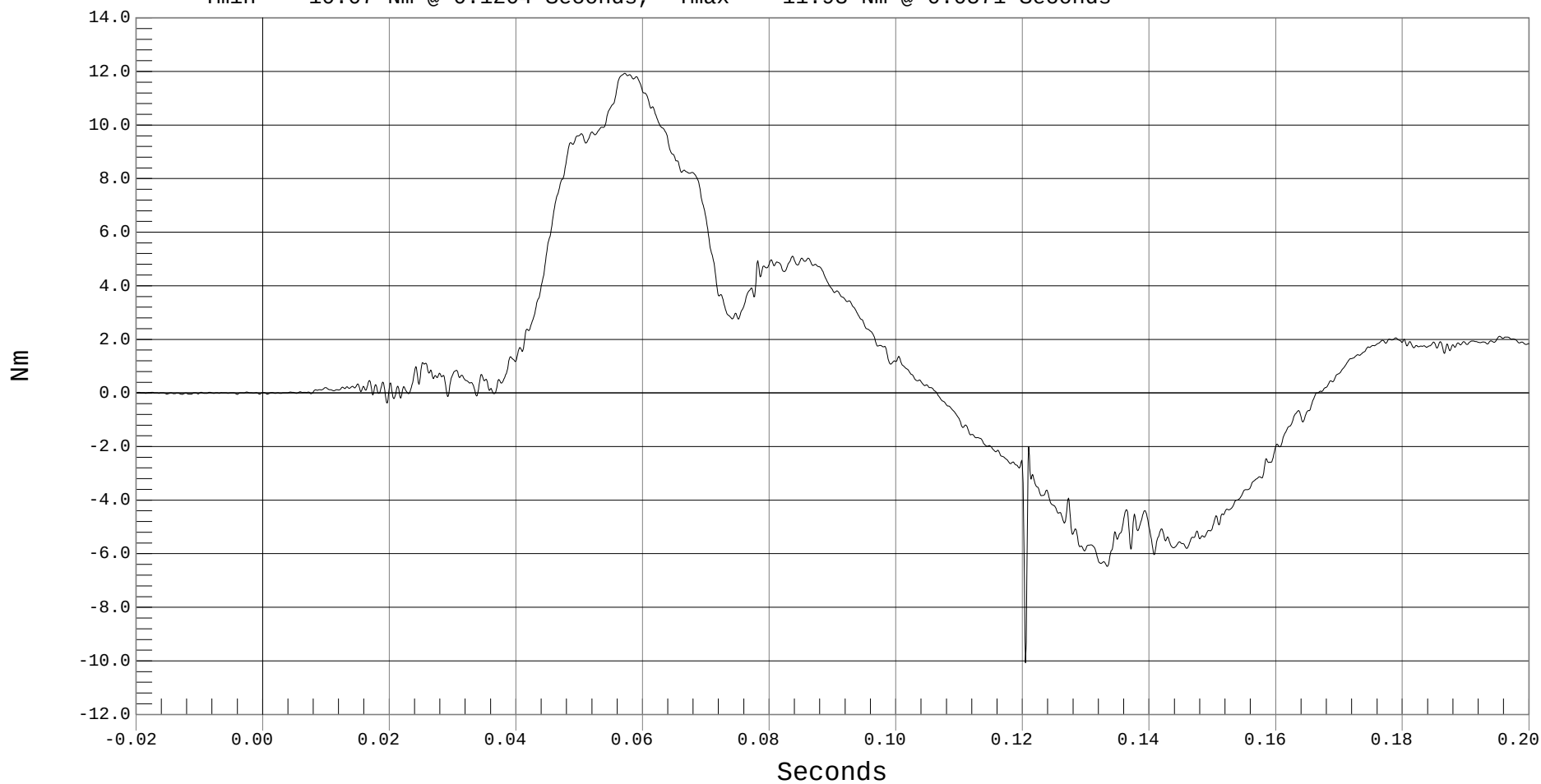
DRIVER LOWER NECK MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT Z, B01108MF.M15

Ymin = -10.07 Nm @ 0.1204 Seconds, Ymax = 11.93 Nm @ 0.0571 Seconds





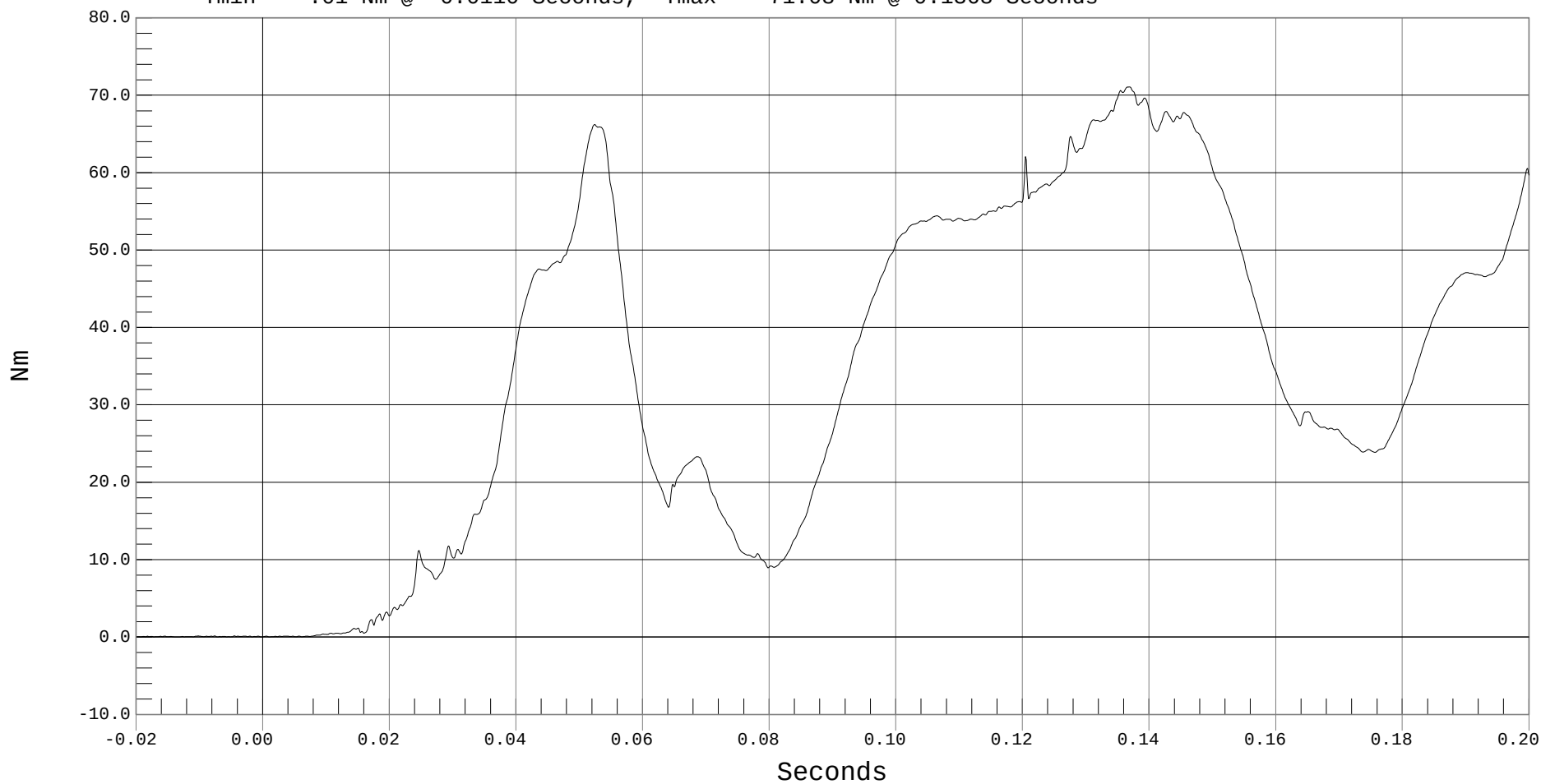
DRIVER LOWER NECK MOMENT RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT RESULTANT, B01108MV.M13

Ymin = .01 Nm @ -0.0110 Seconds, Ymax = 71.08 Nm @ 0.1368 Seconds





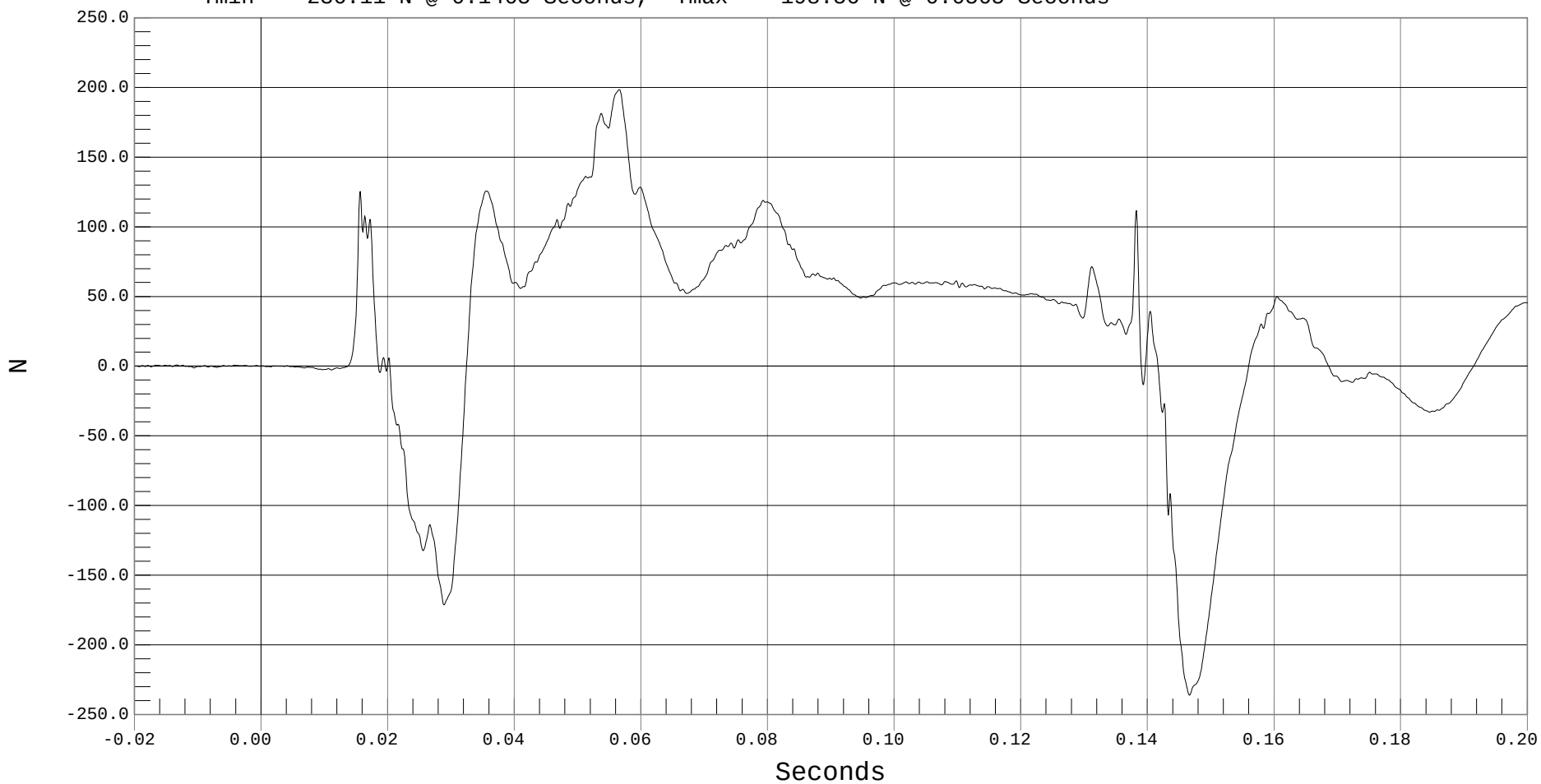
DRIVER SHOULDER FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER SHOULDER FORCE X, B01108FF.F16

Ymin = -236.11 N @ 0.1465 Seconds, Ymax = 198.56 N @ 0.0565 Seconds





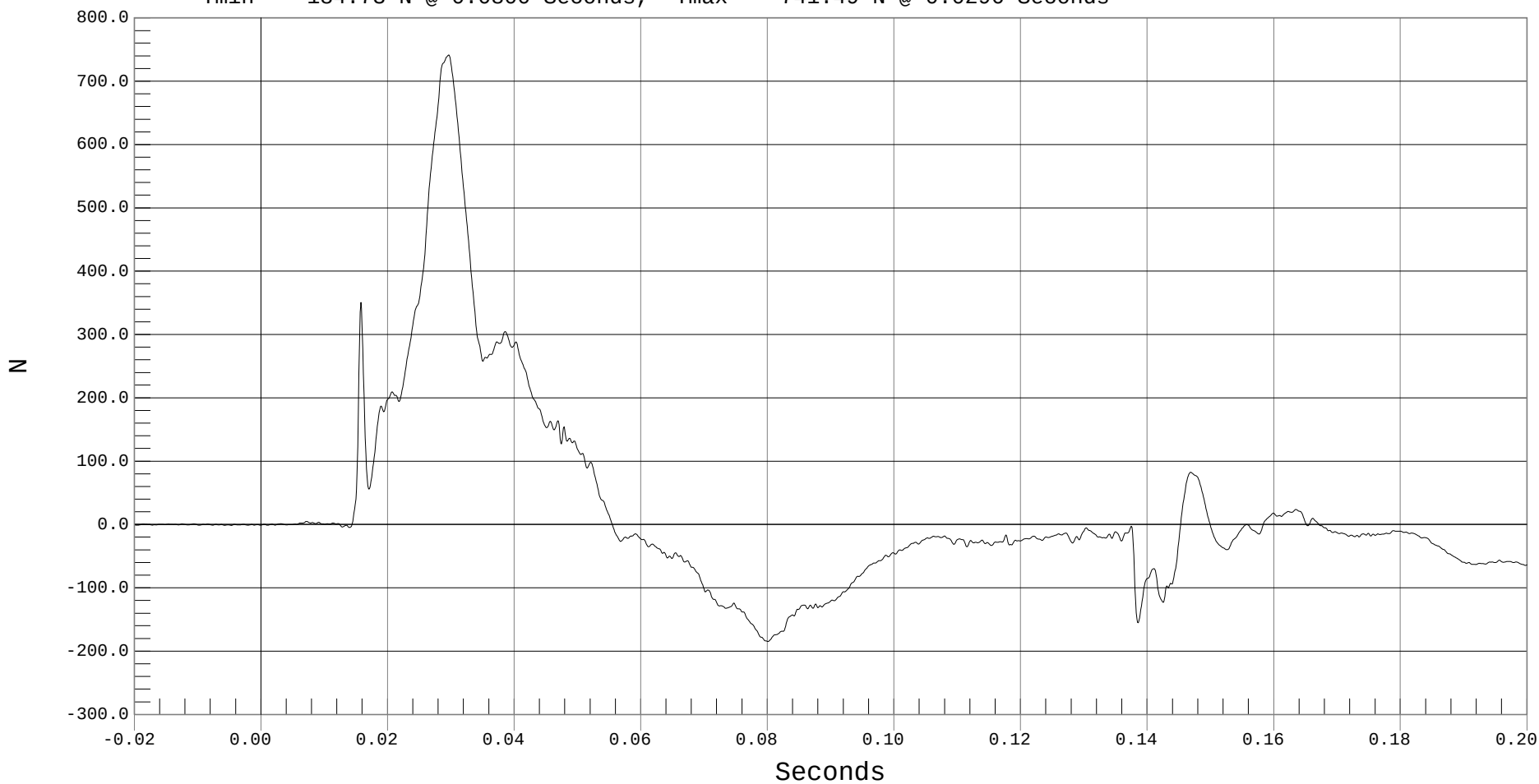
DRIVER SHOULDER FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER SHOULDER FORCE Y, B01108FF.F17

Ymin = -184.73 N @ 0.0800 Seconds, Ymax = 741.49 N @ 0.0296 Seconds





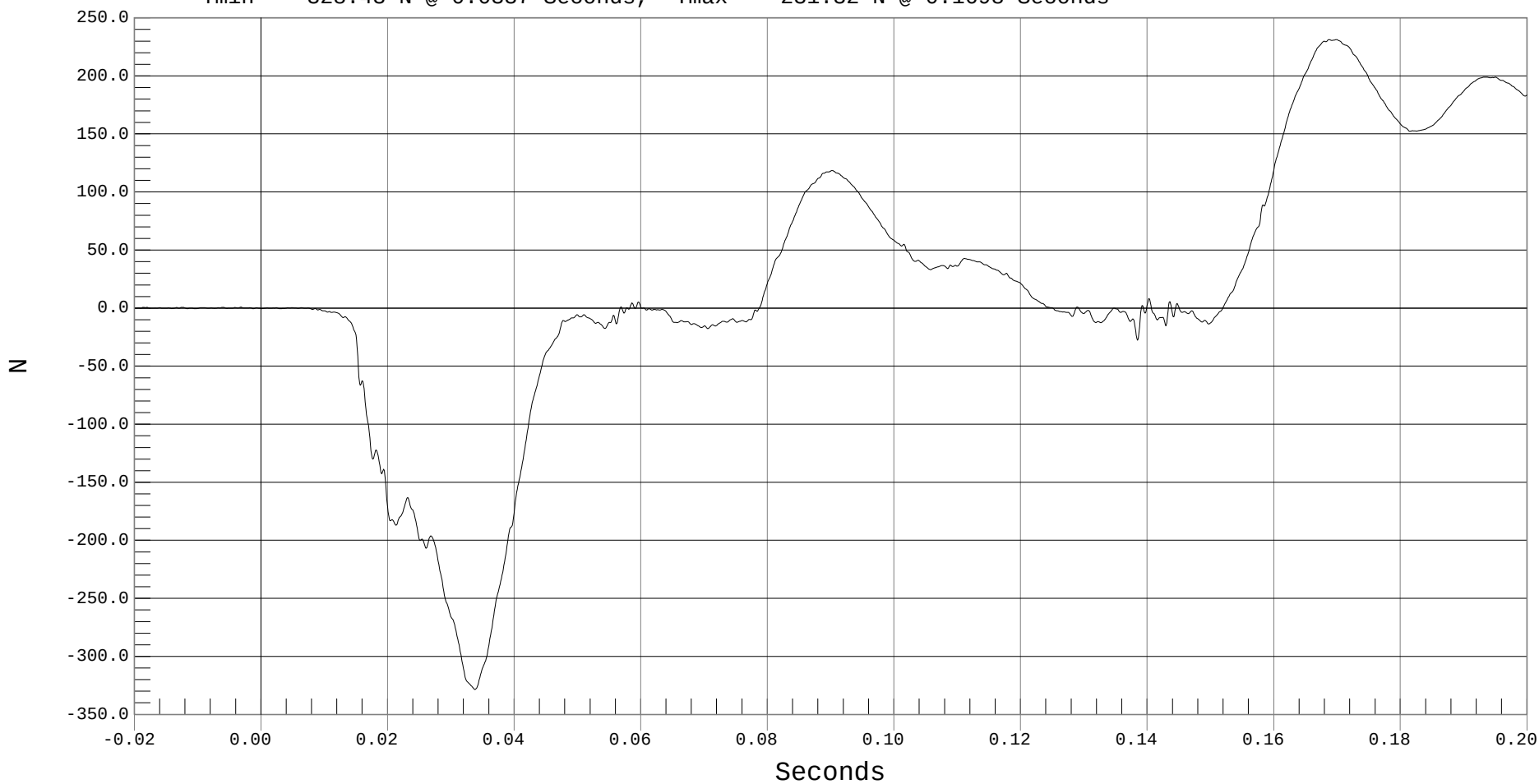
DRIVER SHOULDER FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER SHOULDER FORCE Z, B01108FF.F18

Ymin = -328.43 N @ 0.0337 Seconds, Ymax = 231.32 N @ 0.1698 Seconds





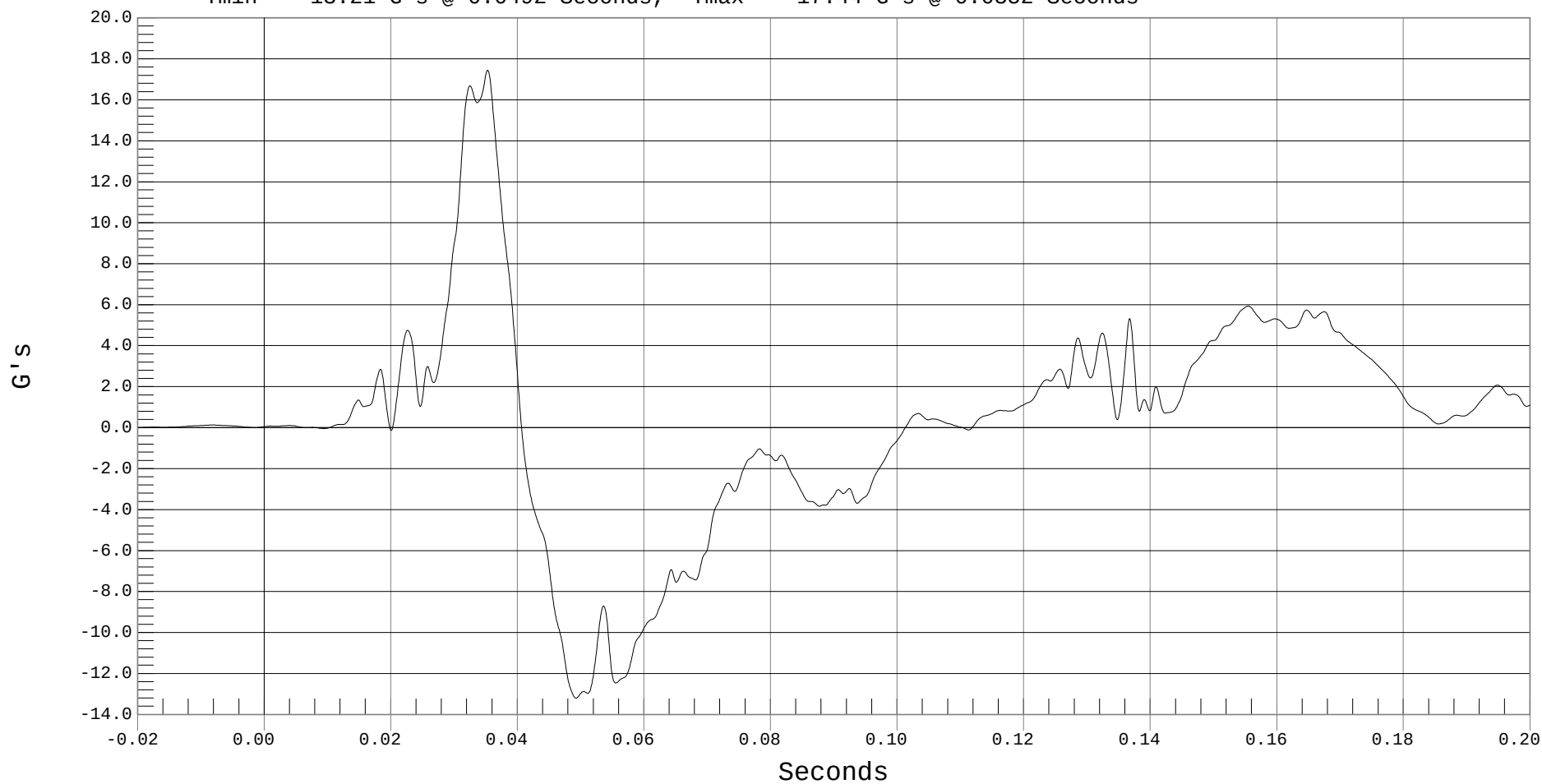
DRIVER UPPER SPINE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE X, B01108AF.A20

Ymin = -13.21 G's @ 0.0492 Seconds, Ymax = 17.44 G's @ 0.0352 Seconds





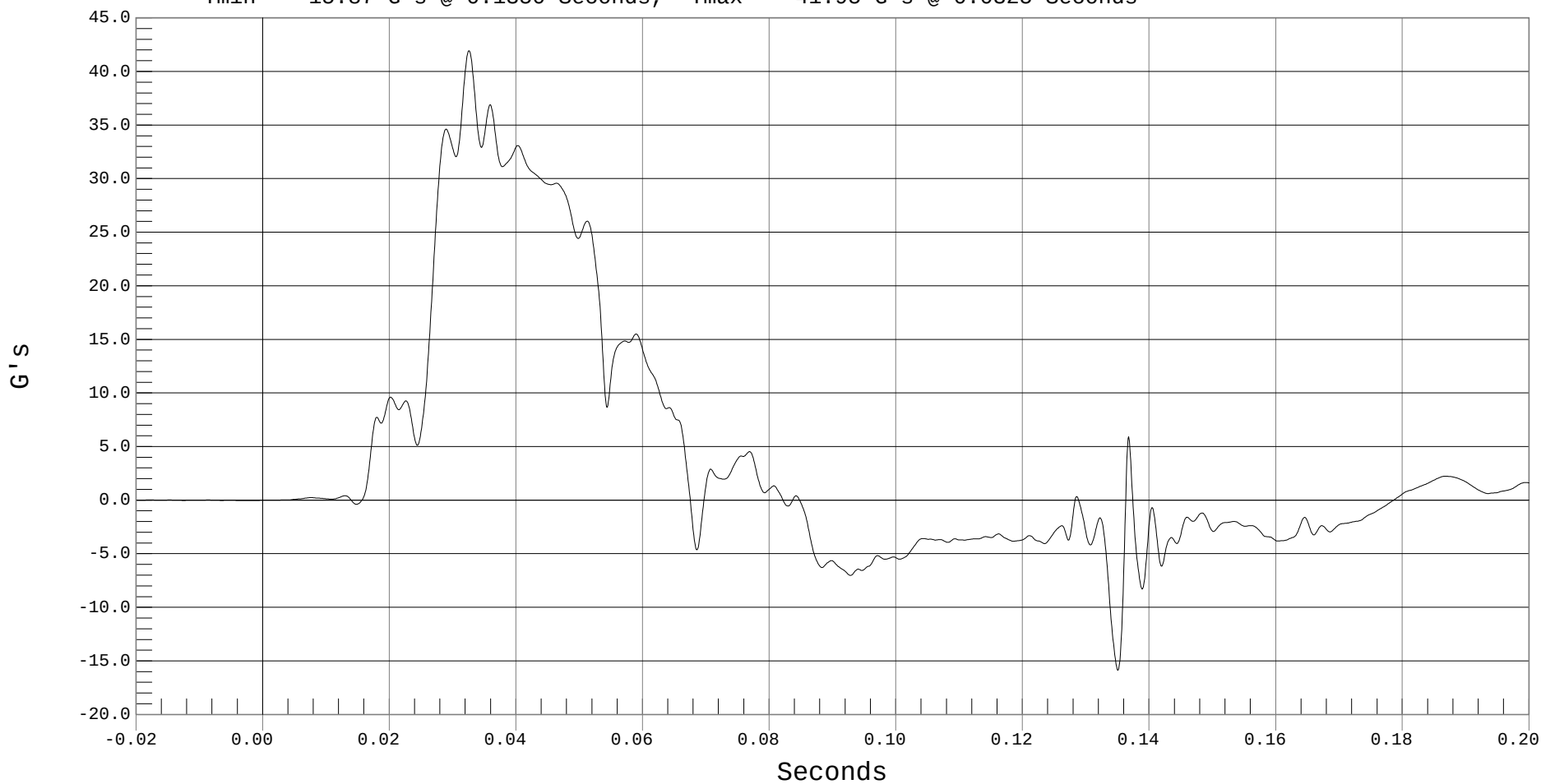
DRIVER UPPER SPINE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE Y, B01108AF.A21

Ymin = -15.87 G's @ 0.1350 Seconds, Ymax = 41.95 G's @ 0.0325 Seconds





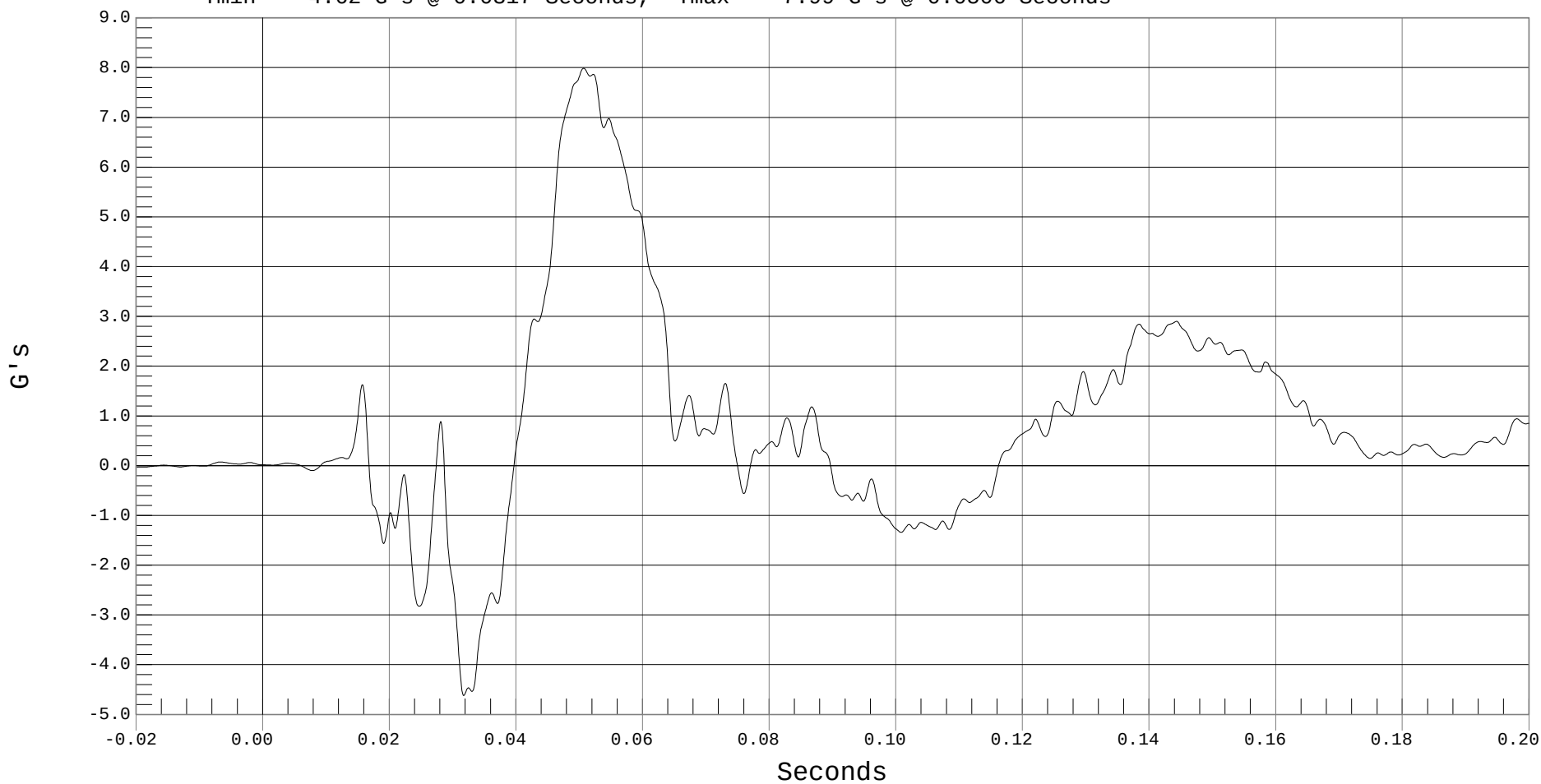
DRIVER UPPER SPINE Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE Z, B01108AF.A22

Ymin = -4.62 G's @ 0.0317 Seconds, Ymax = 7.99 G's @ 0.0506 Seconds





DRIVER UPPER SPINE RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

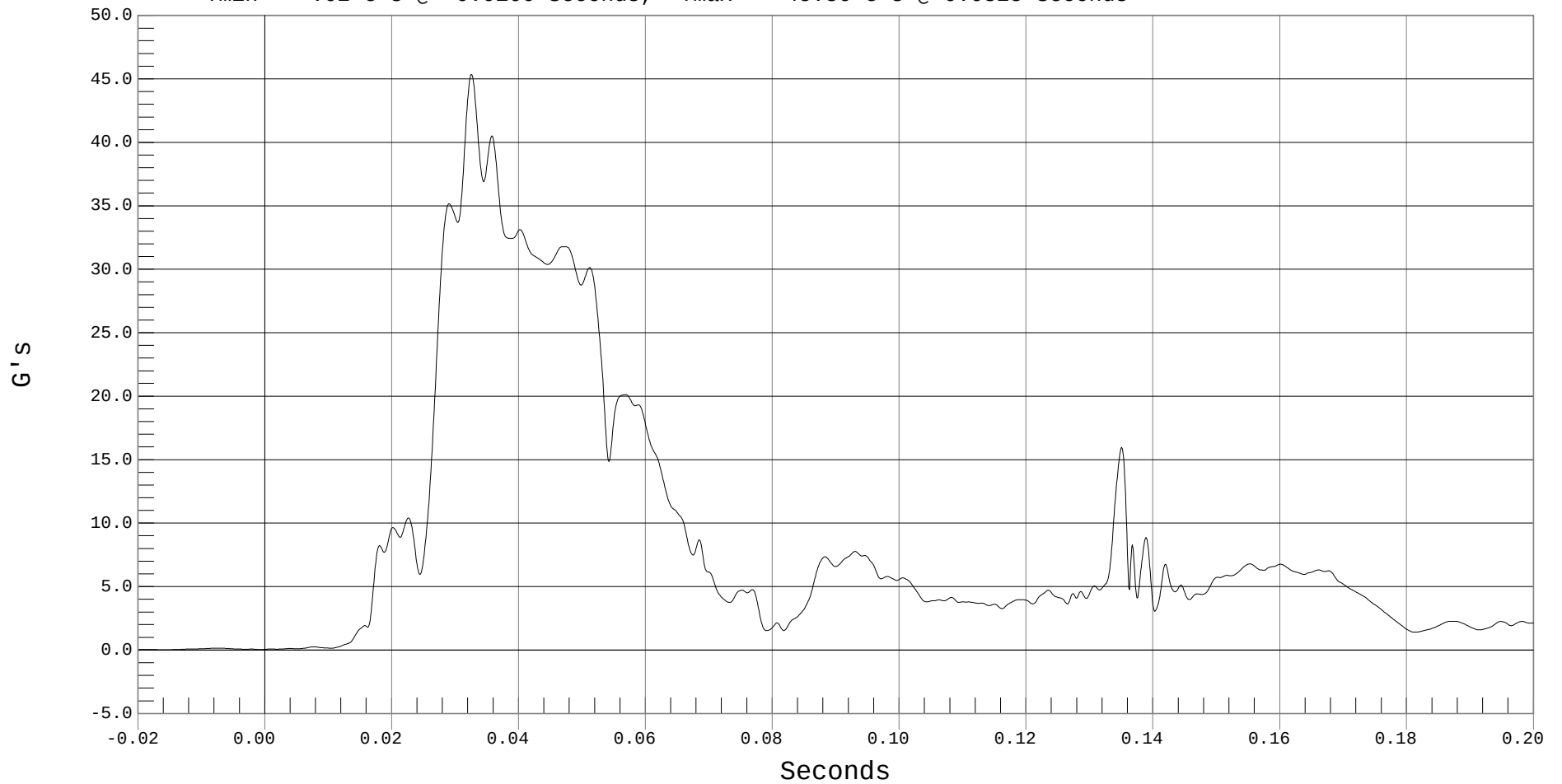
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 180

— 1 DRIVER UPPER SPINE RESULTANT, B01108AV.A20

Ymin = .02 G's @ -0.0166 Seconds, Ymax = 45.36 G's @ 0.0325 Seconds





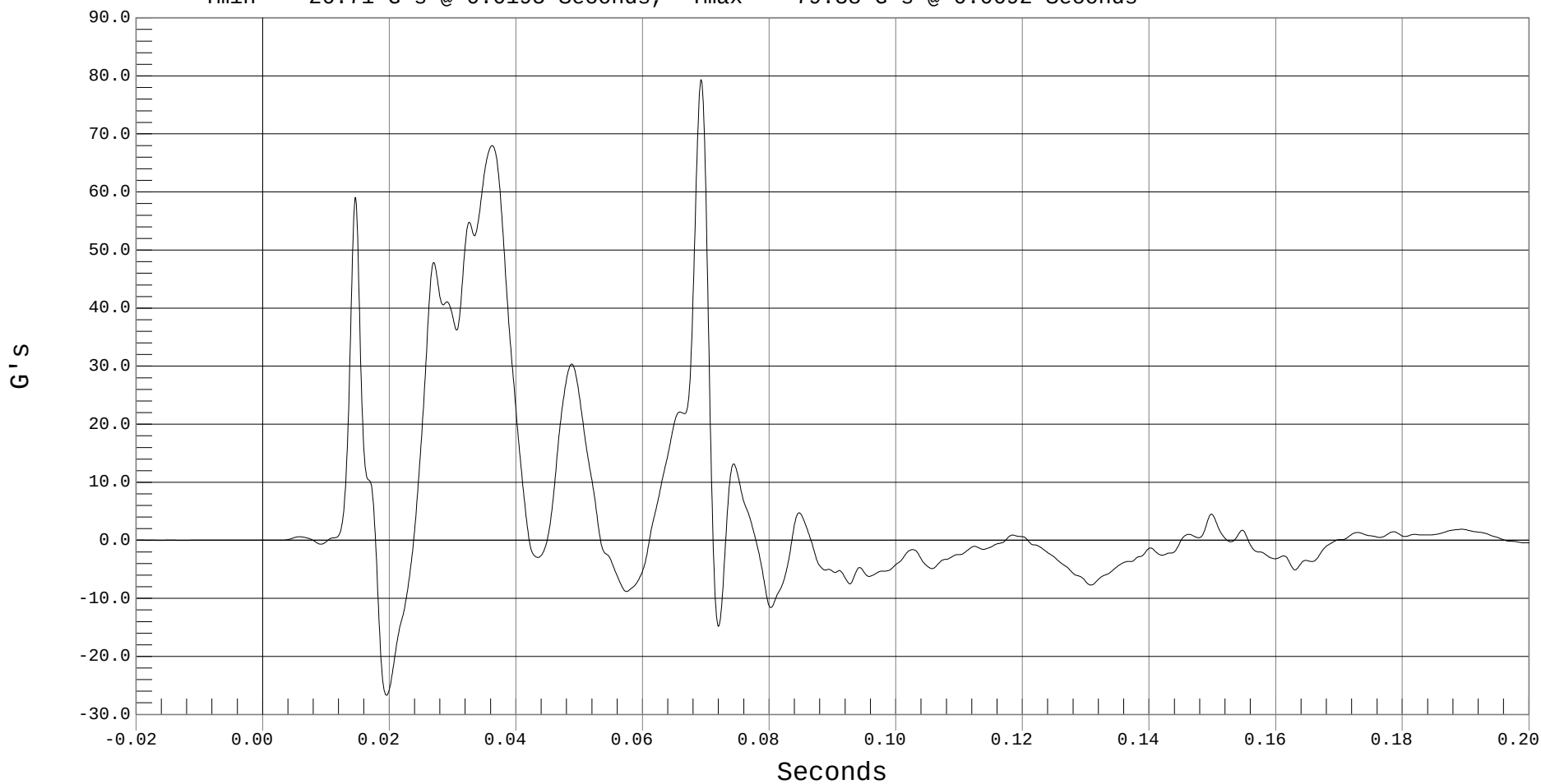
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER UPPER RIB Y, B01108AF.A23

Ymin = -26.71 G's @ 0.0195 Seconds, Ymax = 79.38 G's @ 0.0692 Seconds





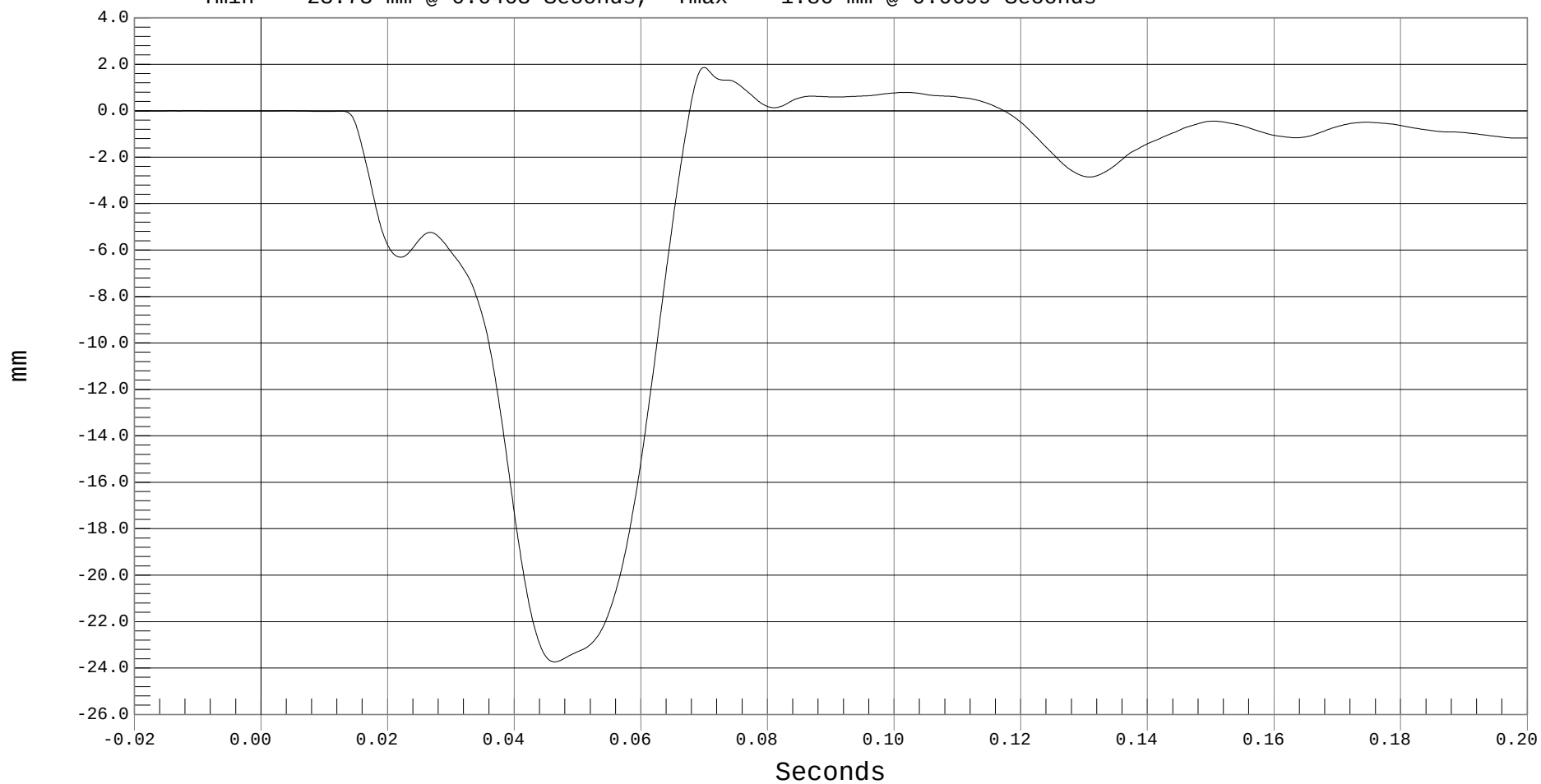
DRIVER UPPER RIB DISPLACEMENT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER UPPER RIB DISPLACEMENT, B01108DF.D26

Ymin = -23.73 mm @ 0.0463 Seconds, Ymax = 1.86 mm @ 0.0699 Seconds





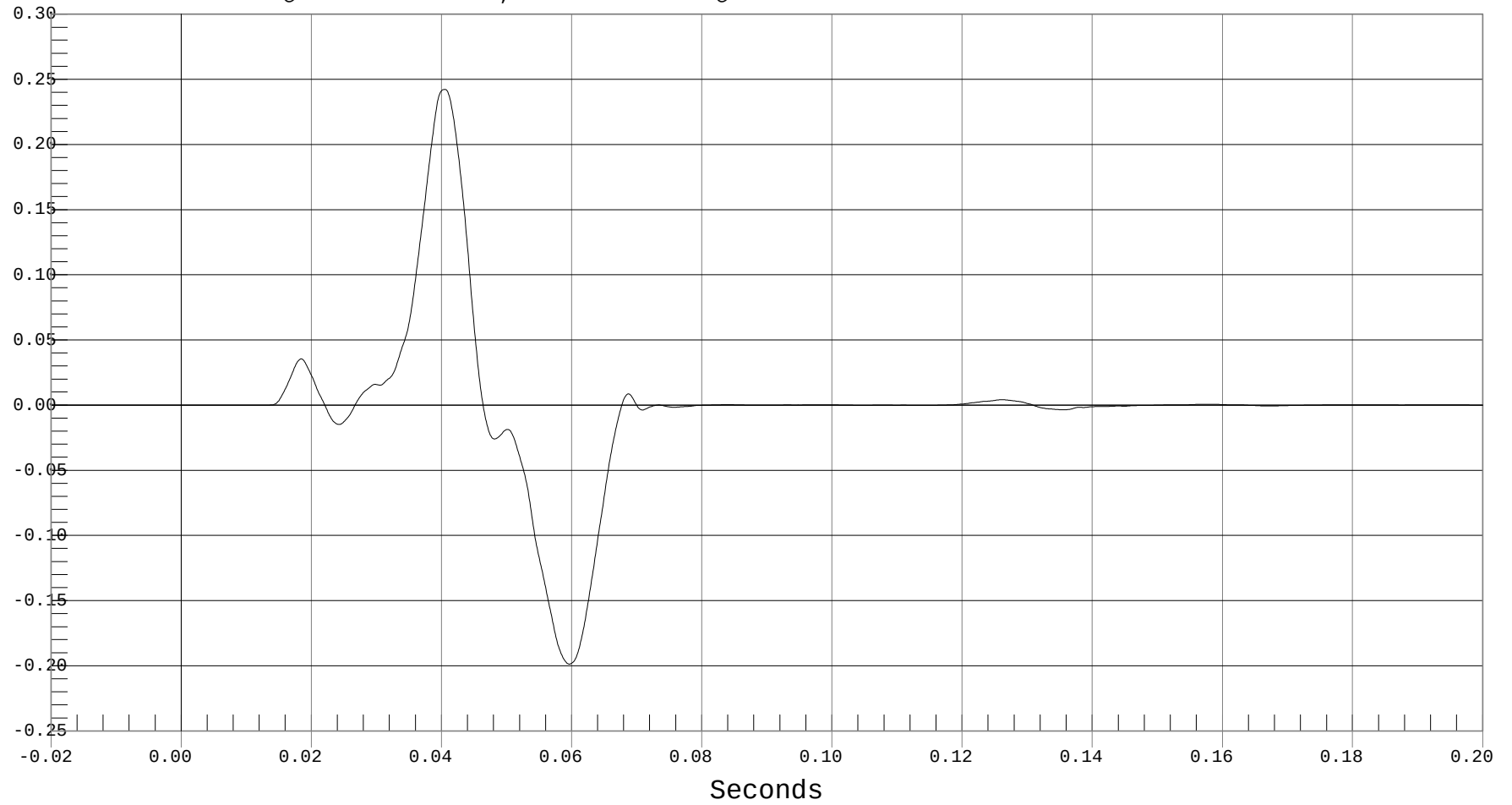
DRIVER UPPER RIB VISCOUS CRITERIA

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 Viscous Criterion, B01108DV.C26

Ymin = -.2 @ 0.0595 Seconds, Ymax = .24 @ 0.0404 Seconds





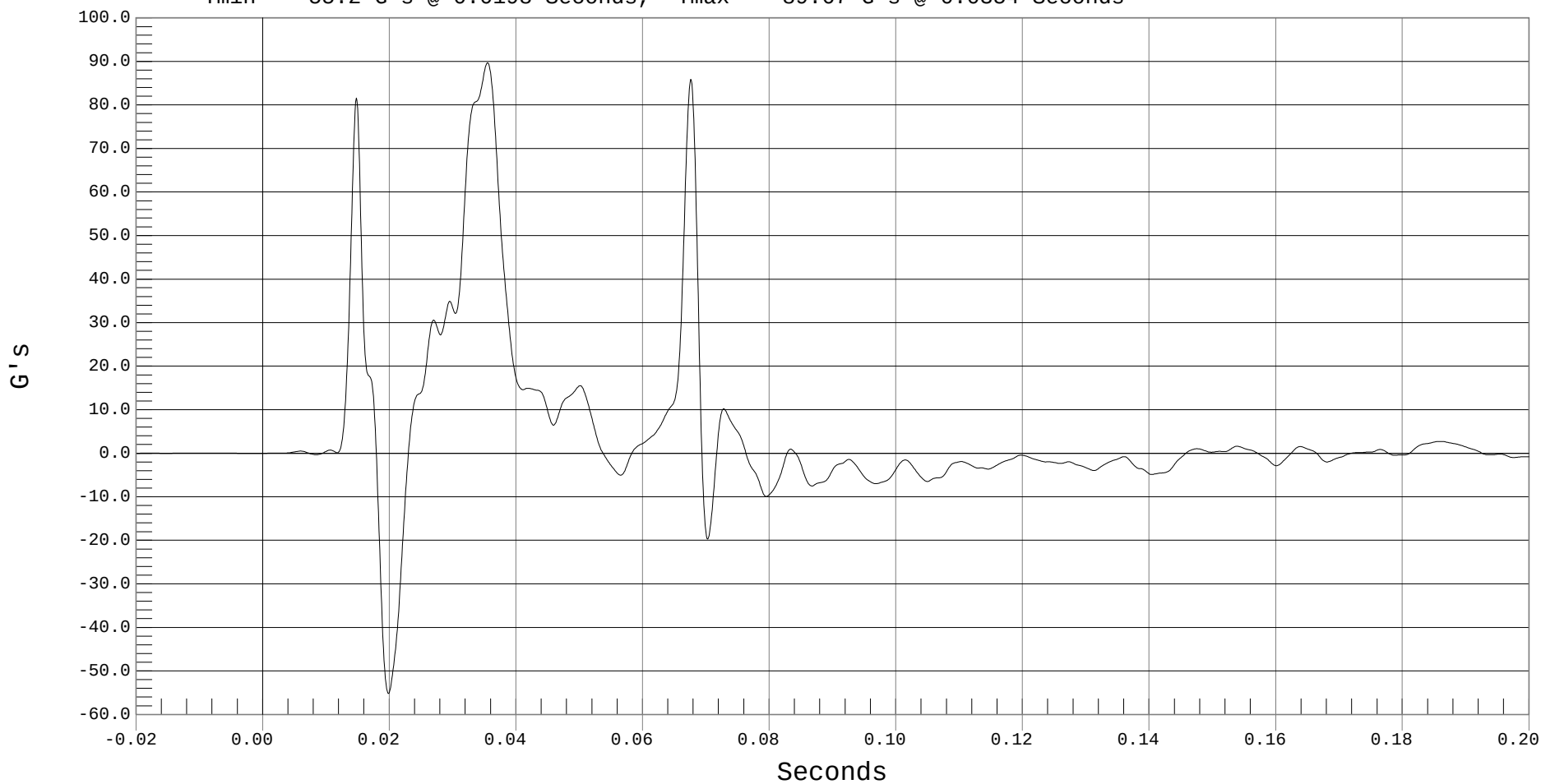
DRIVER MID RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER MID RIB Y, B01108AF.A24

Ymin = -55.2 G's @ 0.0198 Seconds, Ymax = 89.67 G's @ 0.0354 Seconds





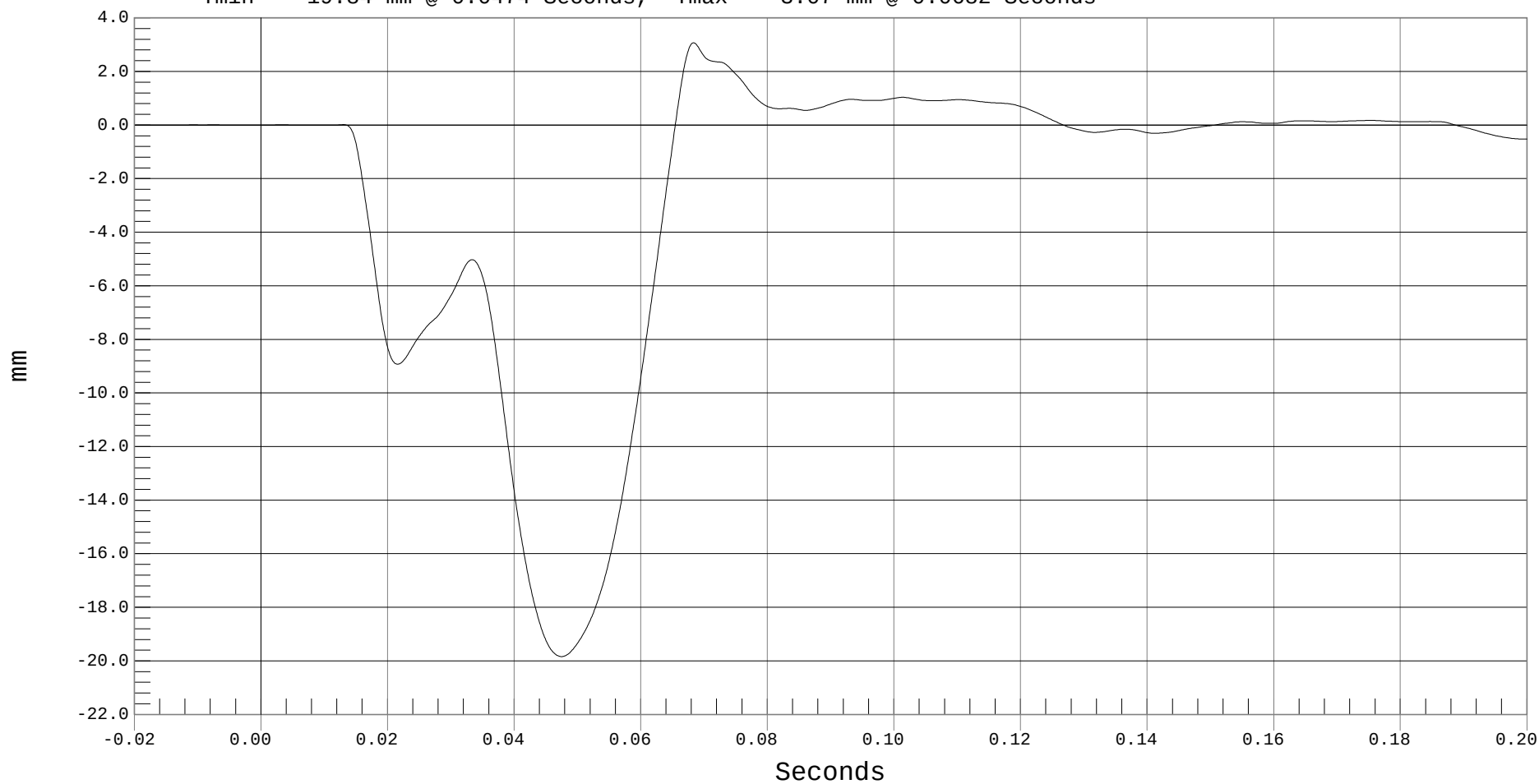
DRIVER MID RIB DISPLACEMENT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER MID RIB DISPLACEMENT, B01108DF.D27

Ymin = -19.84 mm @ 0.0474 Seconds, Ymax = 3.07 mm @ 0.0682 Seconds





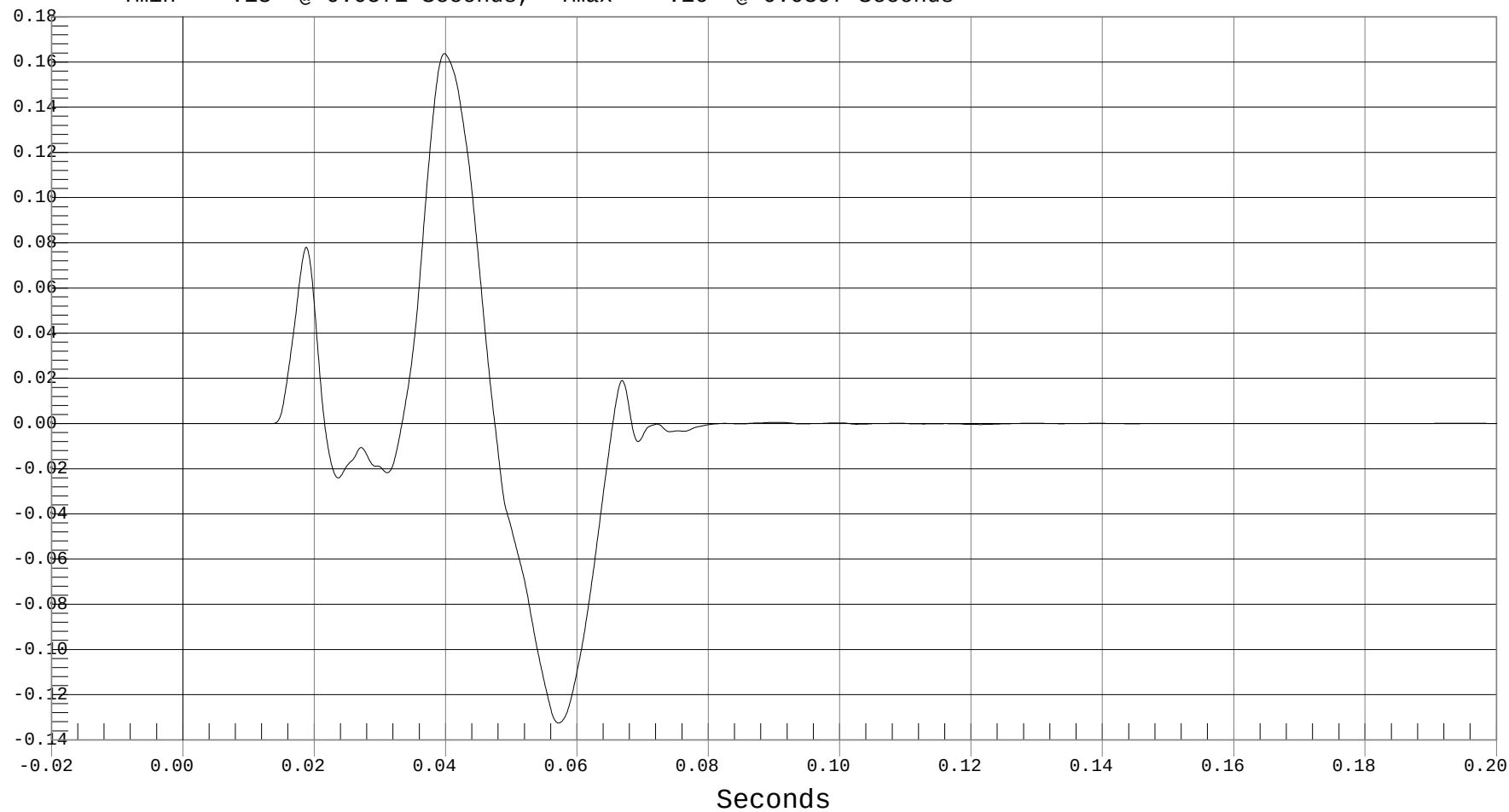
DRIVER MID RIB VISCOUS CRITERIA

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 Viscous Criterion, B01108DV.C27

Ymin = -.13 @ 0.0571 Seconds, Ymax = .16 @ 0.0397 Seconds





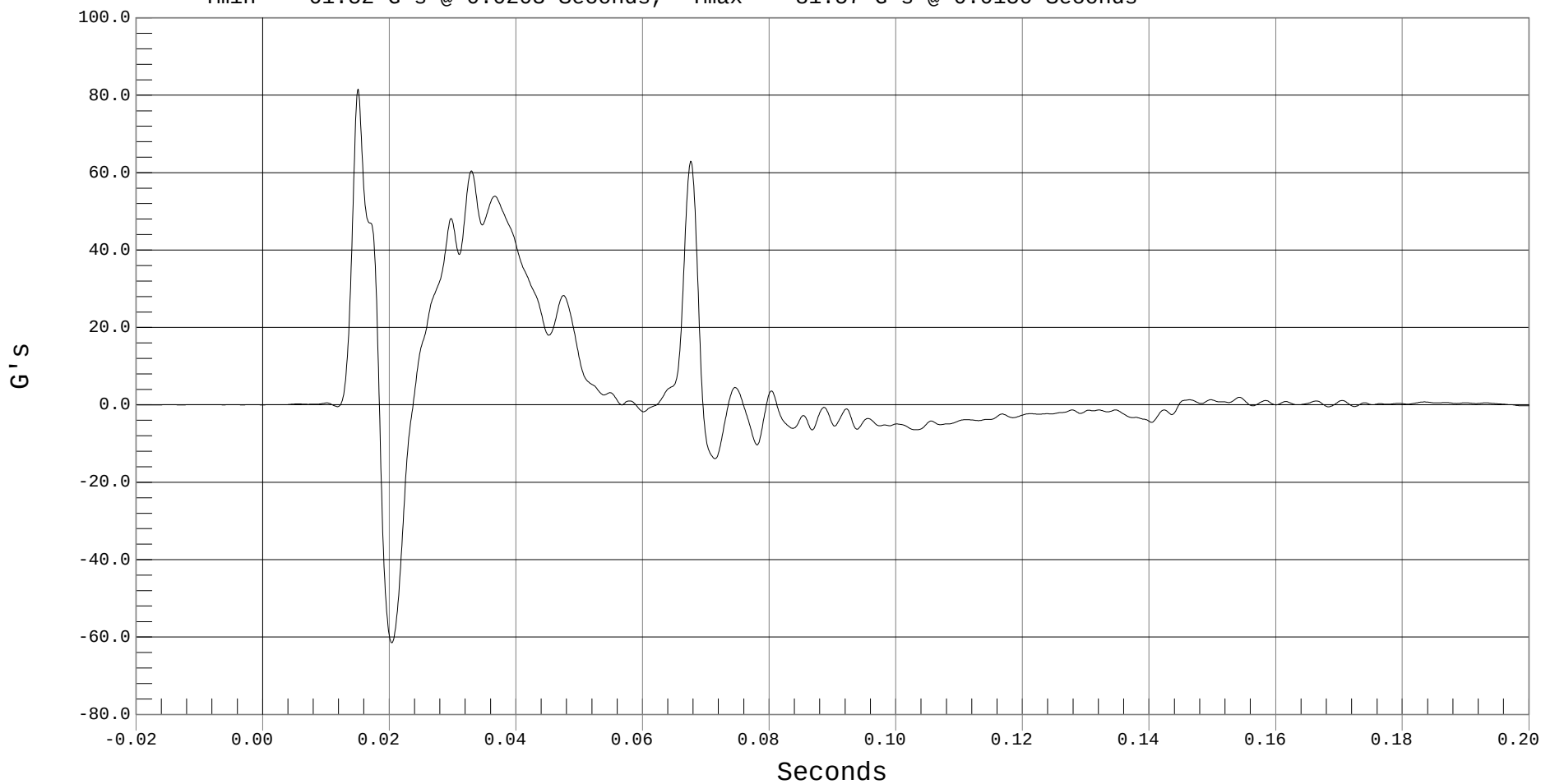
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER LOWER RIB Y, B01108AF.A25

Ymin = -61.52 G's @ 0.0203 Seconds, Ymax = 81.57 G's @ 0.0150 Seconds





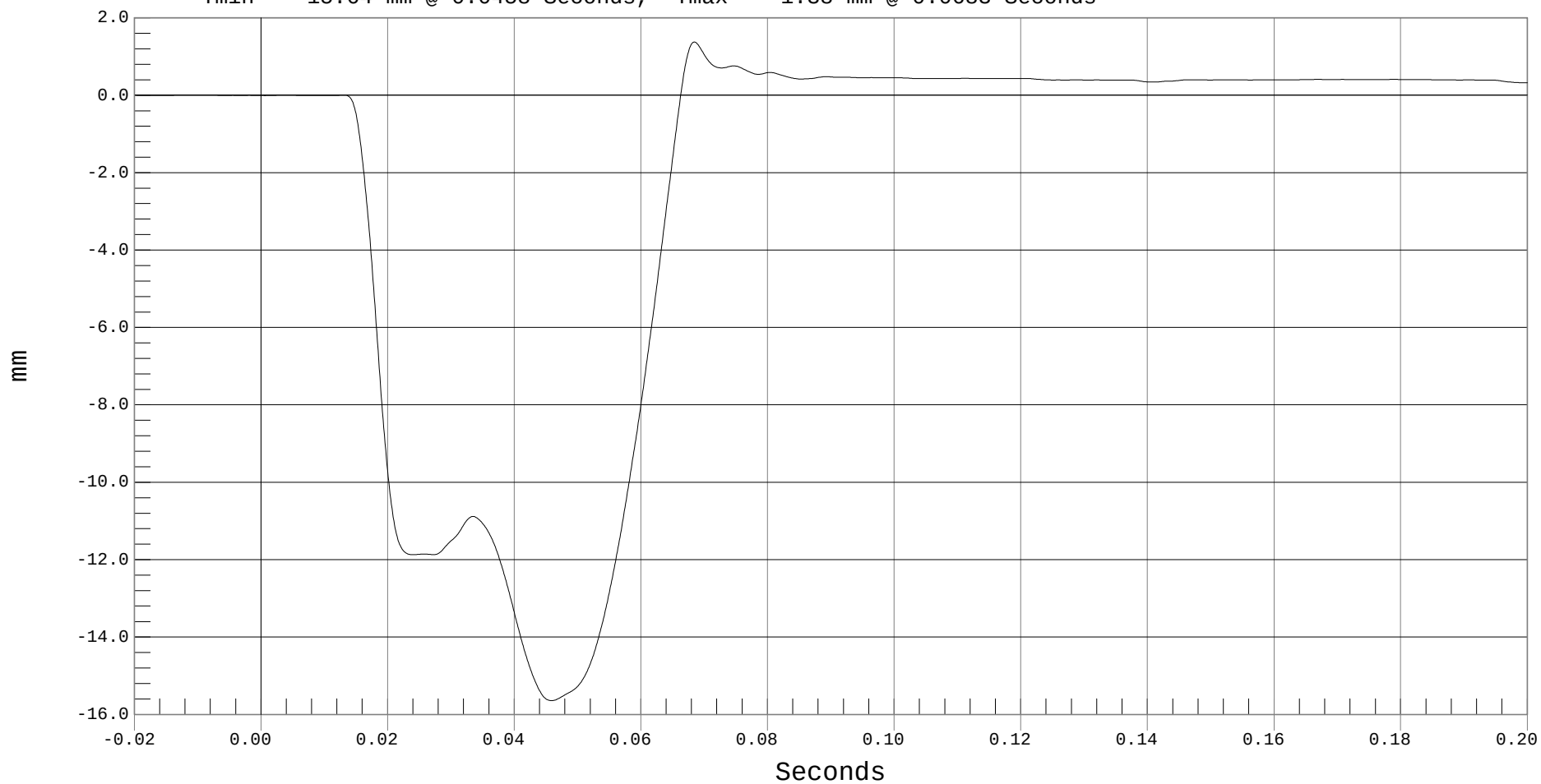
DRIVER LOWER RIB DISPLACEMENT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER LOWER RIB DISPLACEMENT, B01108DF.D28

Ymin = -15.64 mm @ 0.0458 Seconds, Ymax = 1.38 mm @ 0.0683 Seconds





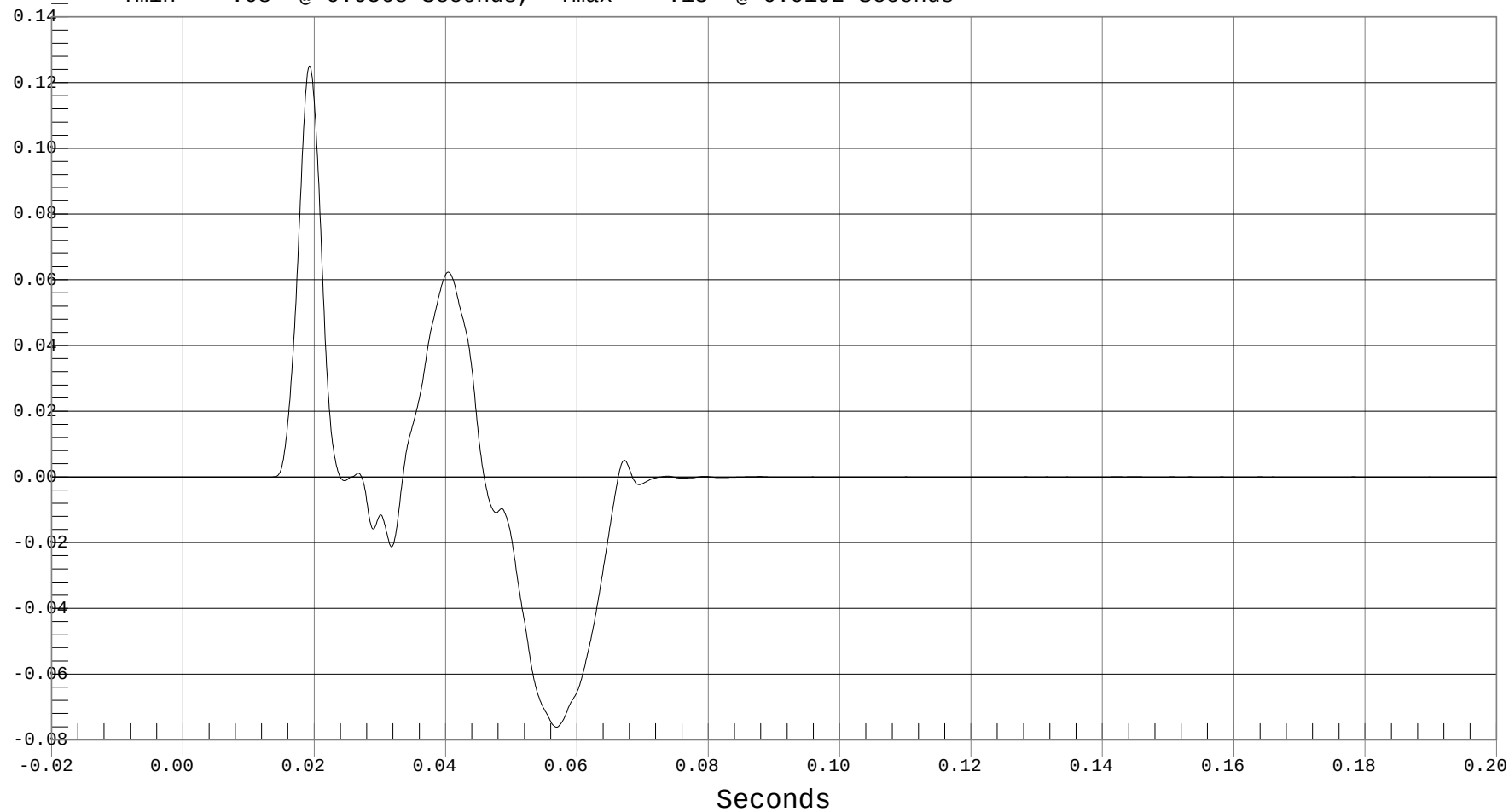
DRIVER LOWER RIB VISCOUS CRITERIA

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 Viscous Criterion, B01108DV.C28

Ymin = -.08 @ 0.0568 Seconds, Ymax = .13 @ 0.0192 Seconds





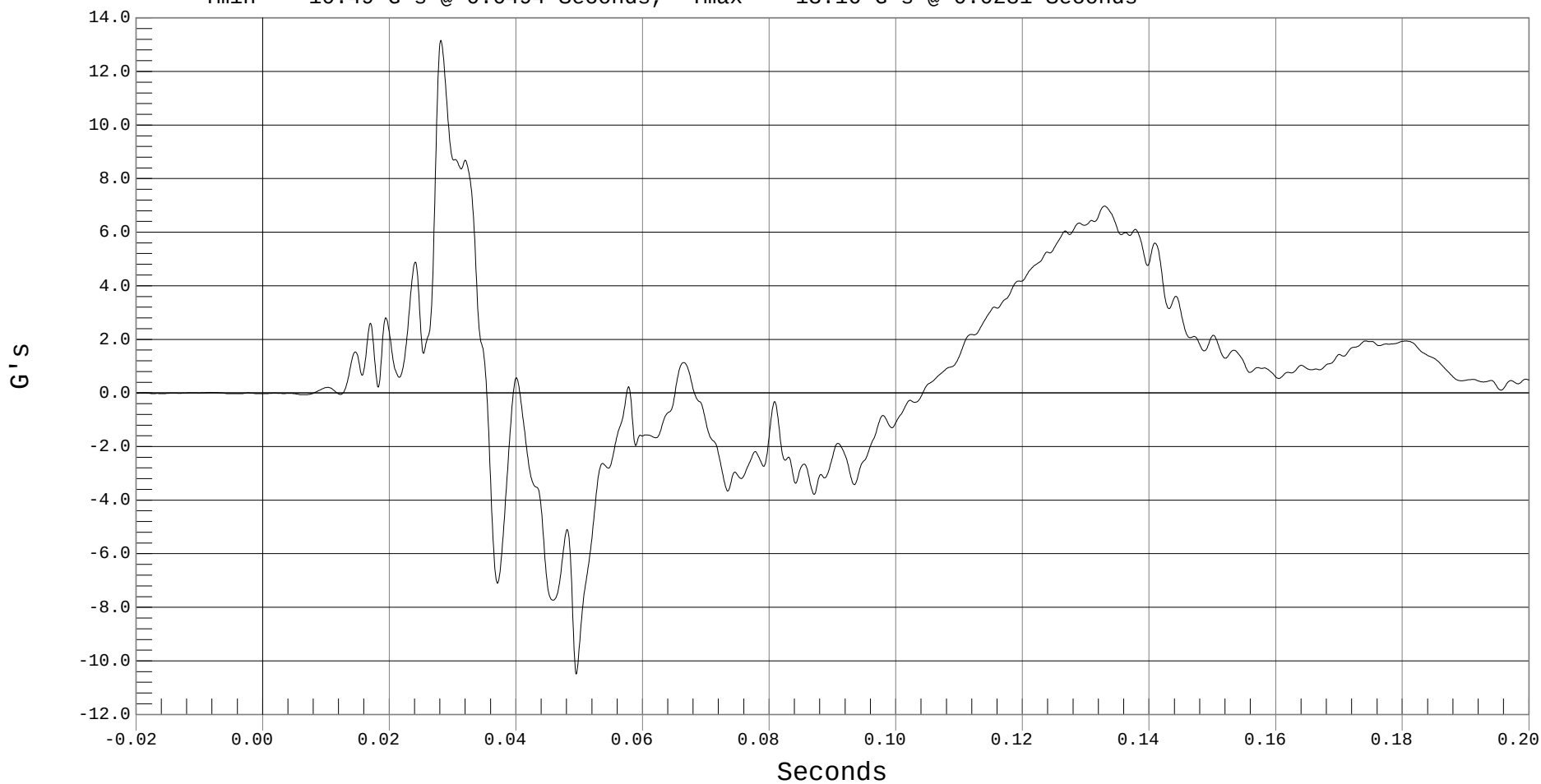
DRIVER LOWER SPINE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE X, B01108AF.A29

Ymin = -10.49 G's @ 0.0494 Seconds, Ymax = 13.16 G's @ 0.0281 Seconds





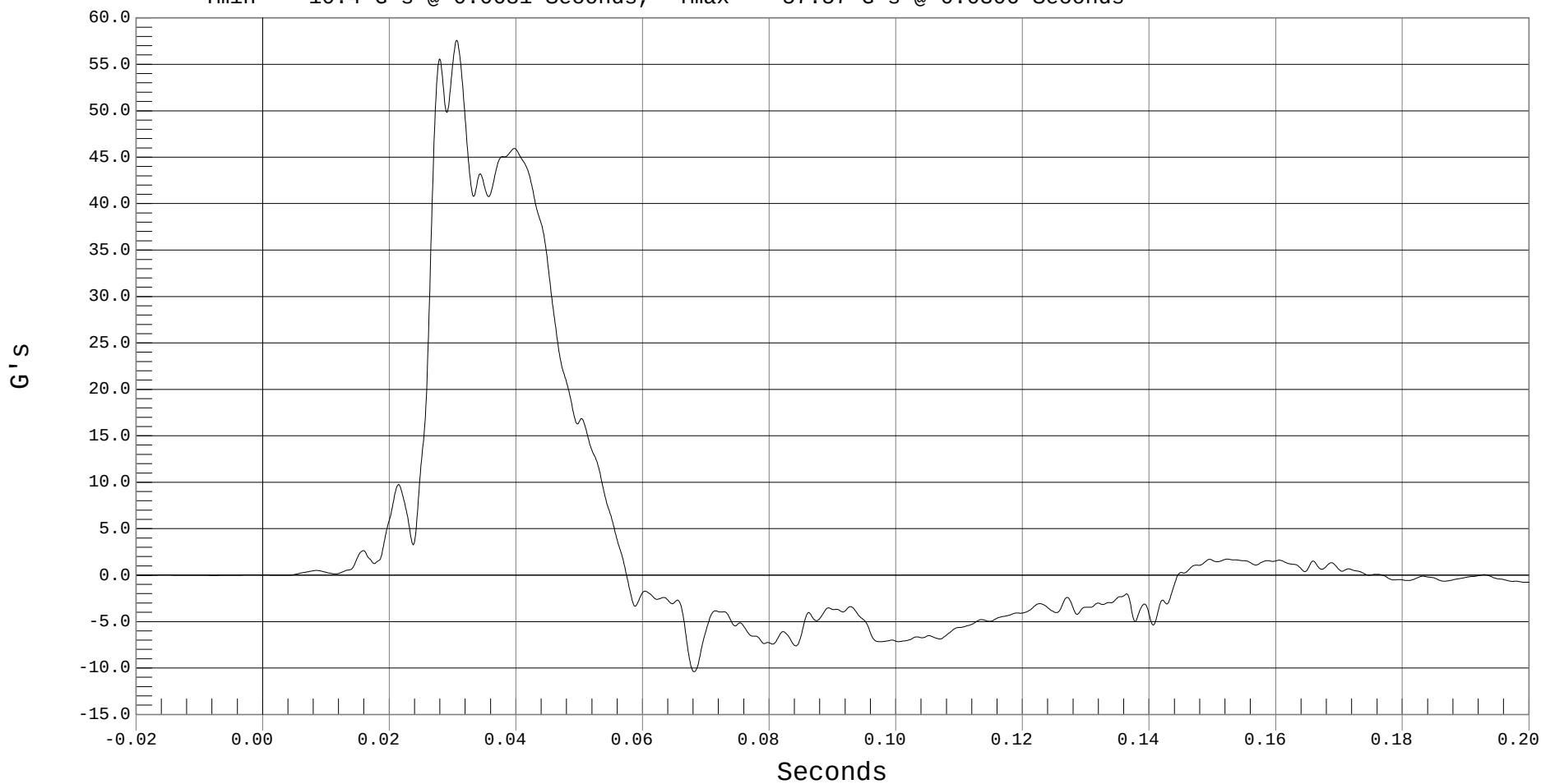
DRIVER LOWER SPINE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE Y, B01108AF.A30

Ymin = -10.4 G's @ 0.0681 Seconds, Ymax = 57.57 G's @ 0.0306 Seconds





DRIVER LOWER SPINE Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

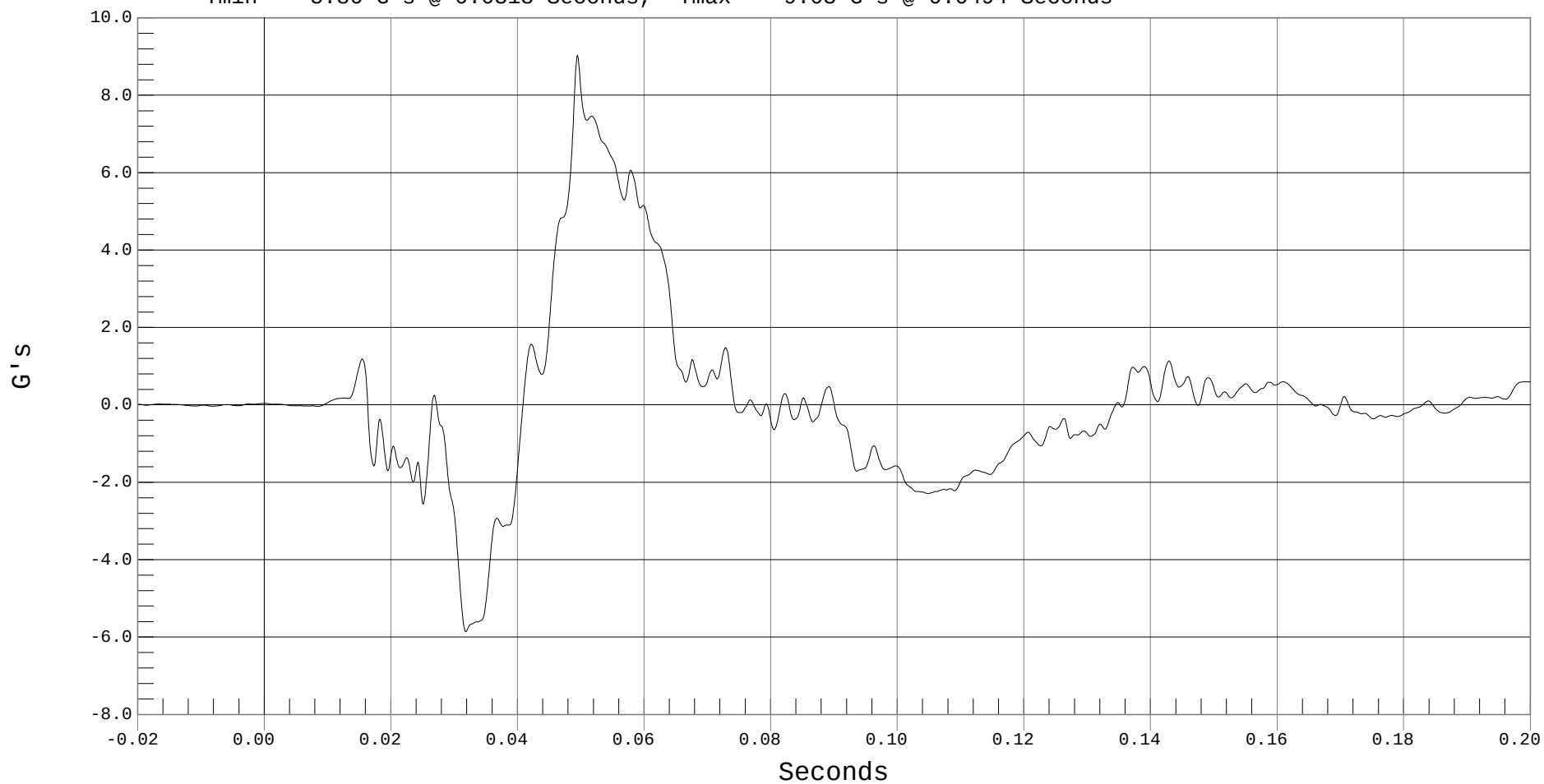
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 180

— 1 DRIVER LOWER SPINE Z, B01108AF.A31

Ymin = -5.86 G's @ 0.0318 Seconds, Ymax = 9.03 G's @ 0.0494 Seconds





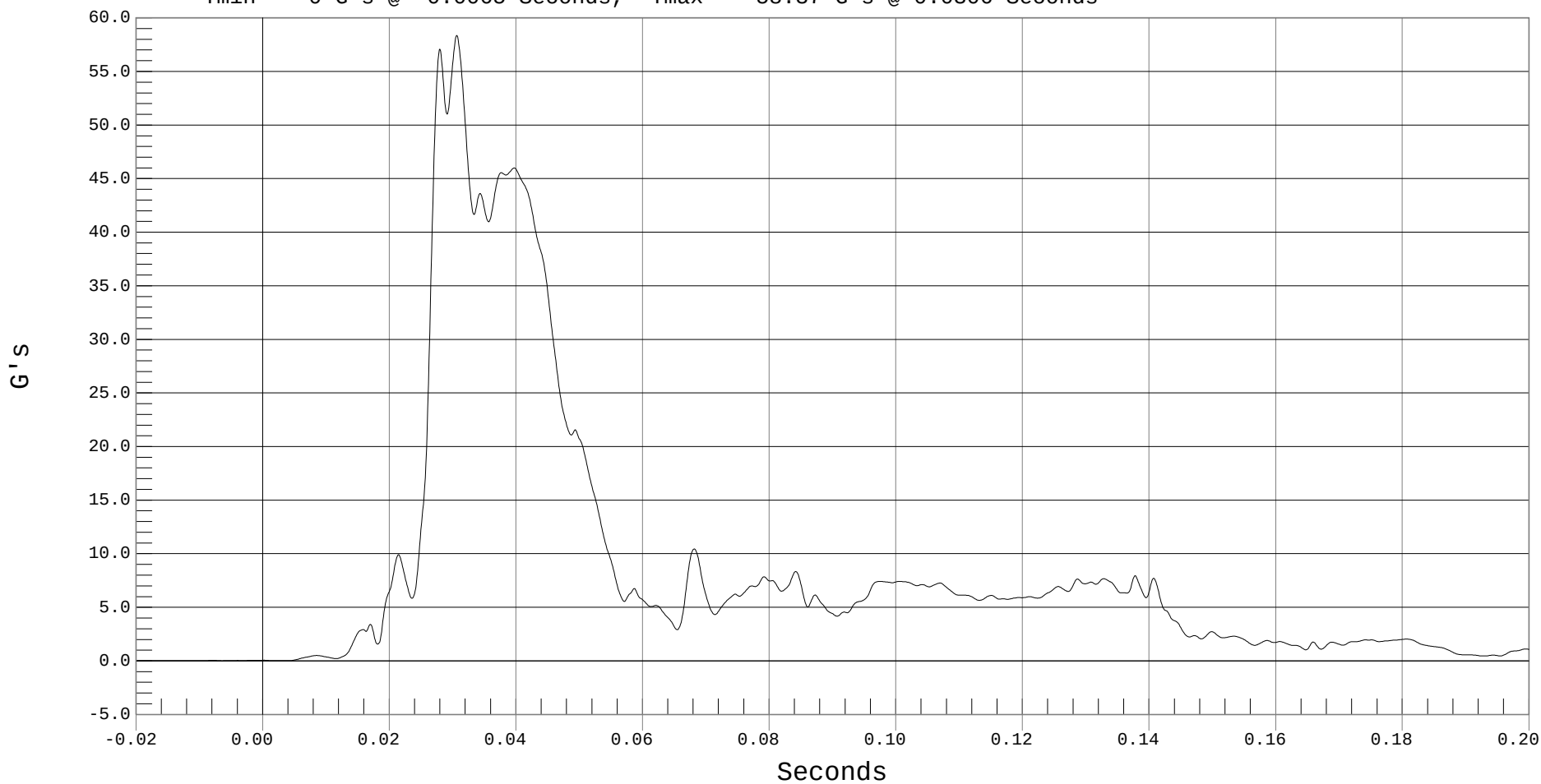
DRIVER LOWER SPINE RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE RESULTANT, B01108AV.A29

Ymin = 0 G's @ -0.0065 Seconds, Ymax = 58.37 G's @ 0.0306 Seconds





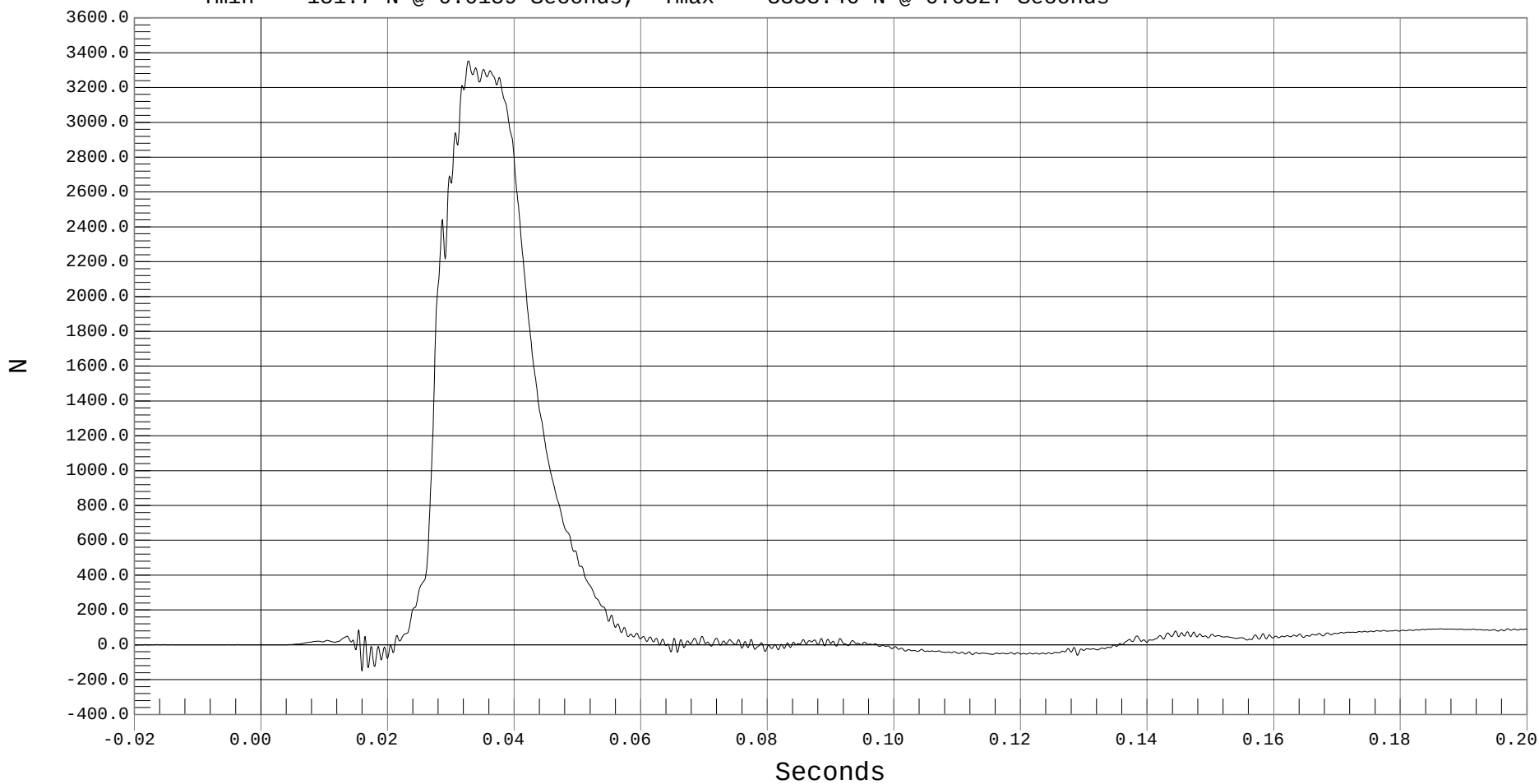
DRIVER TORSO FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER TORSO FORCE X, B01108FF.F33

Ymin = -151.7 N @ 0.0159 Seconds, Ymax = 3353.46 N @ 0.0327 Seconds





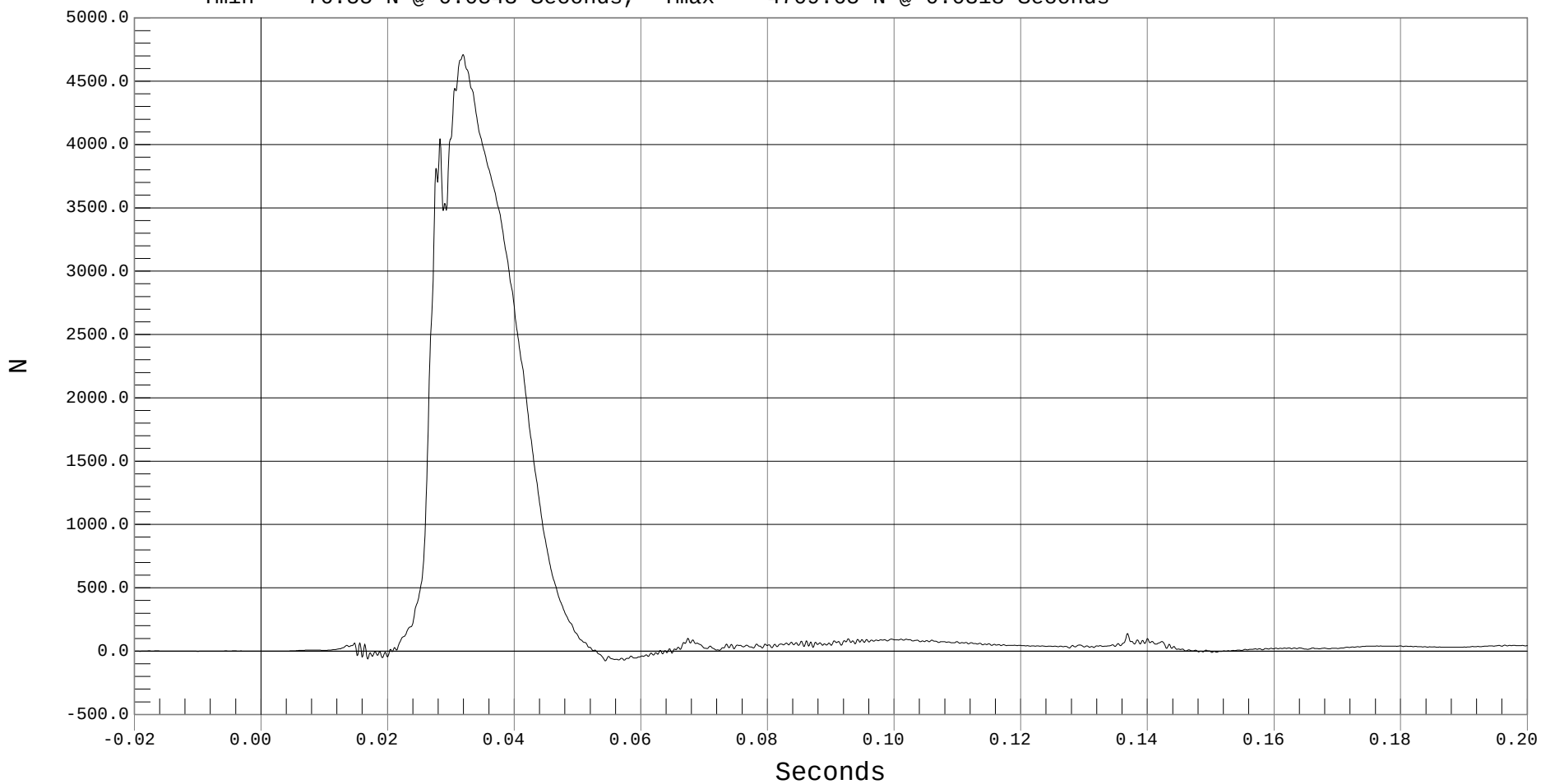
DRIVER TORSO FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER TORSO FORCE Y, B01108FF.F34

Ymin = -76.55 N @ 0.0543 Seconds, Ymax = 4709.65 N @ 0.0318 Seconds





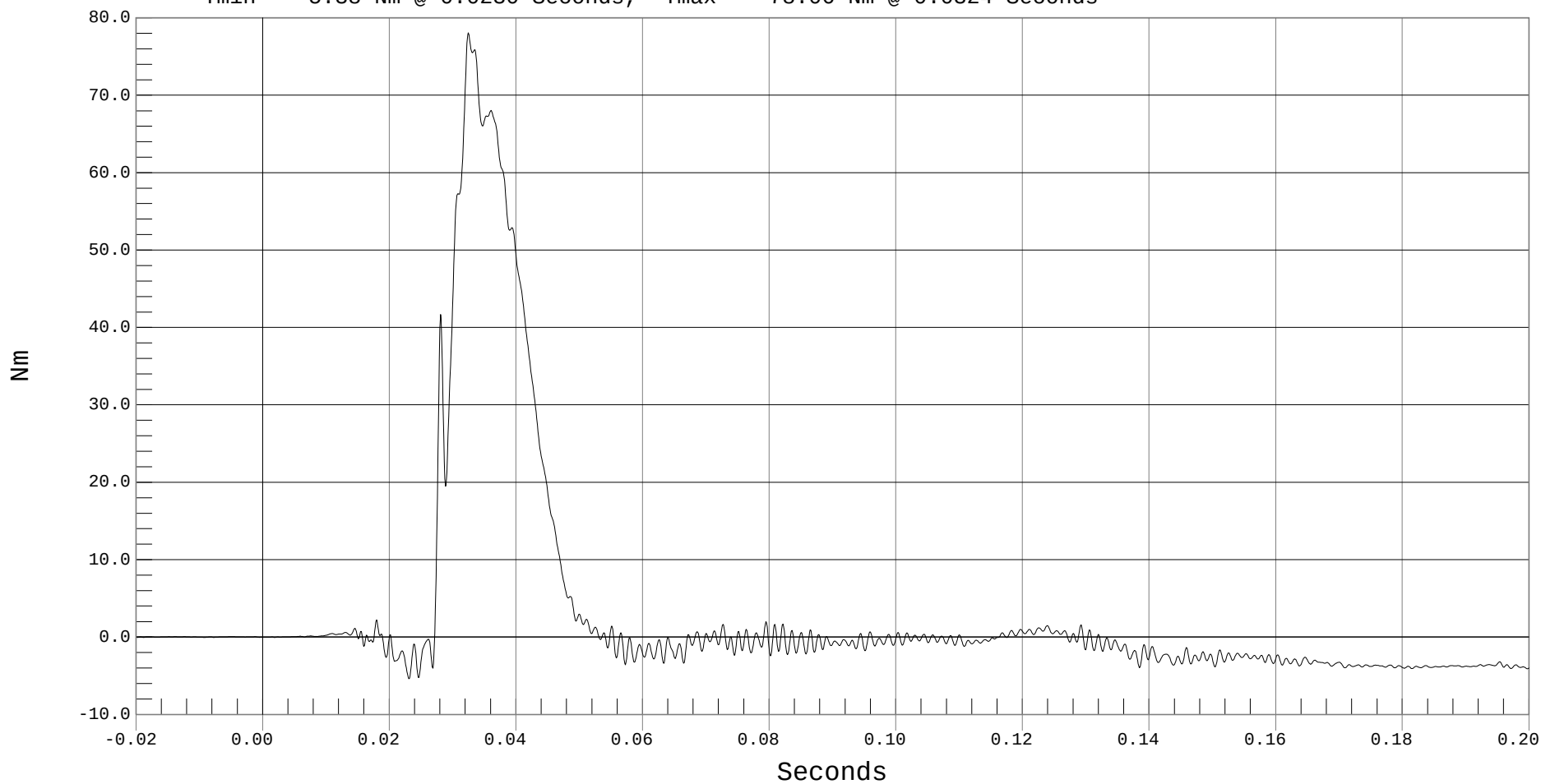
DRIVER TORSO MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER TORSO MOMENT Y, B01108MF.M35

Ymin = -5.38 Nm @ 0.0230 Seconds, Ymax = 78.06 Nm @ 0.0324 Seconds





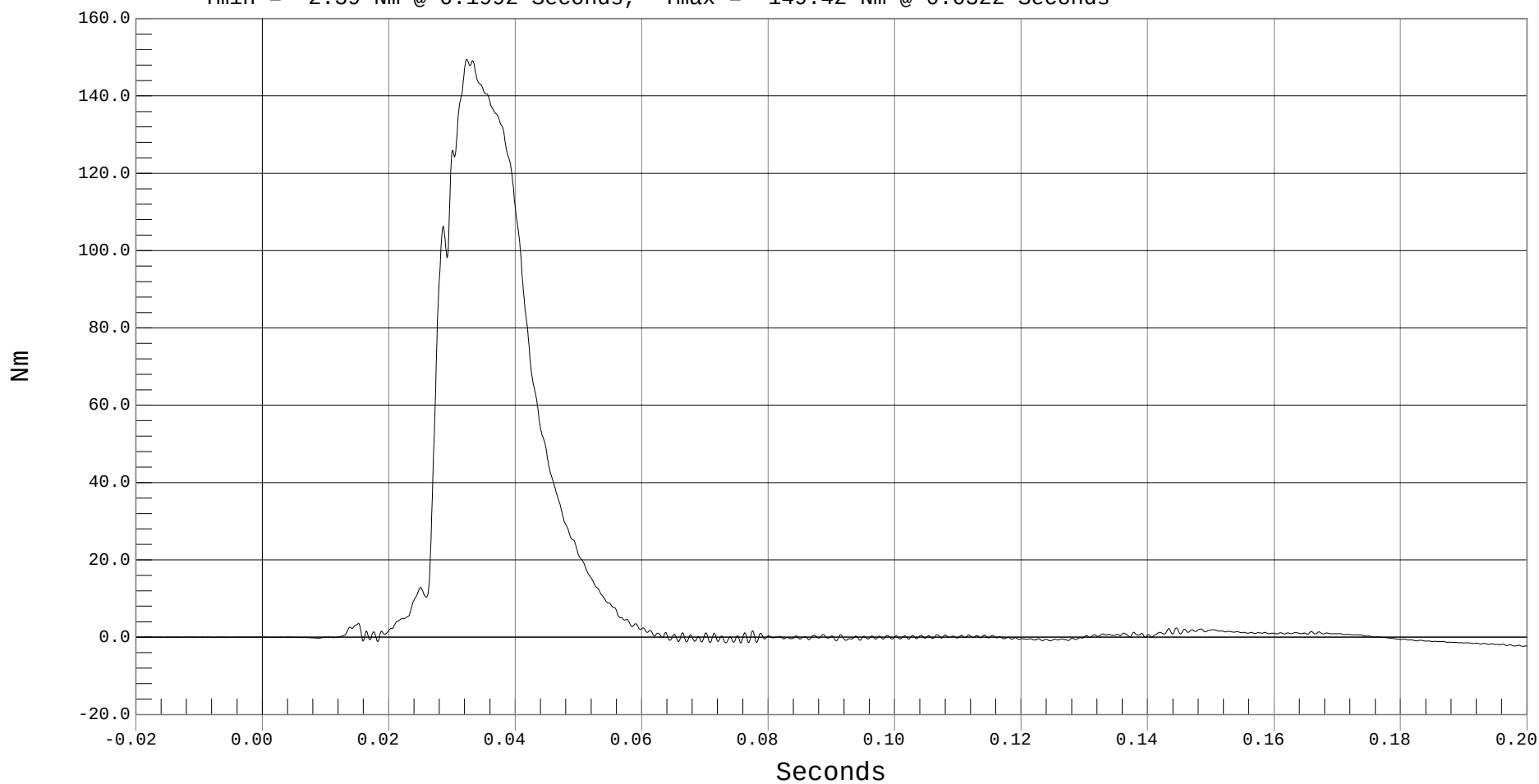
DRIVER TORSO MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER TORSO MOMENT Z, B01108MF.M36

Ymin = -2.39 Nm @ 0.1992 Seconds, Ymax = 149.42 Nm @ 0.0322 Seconds





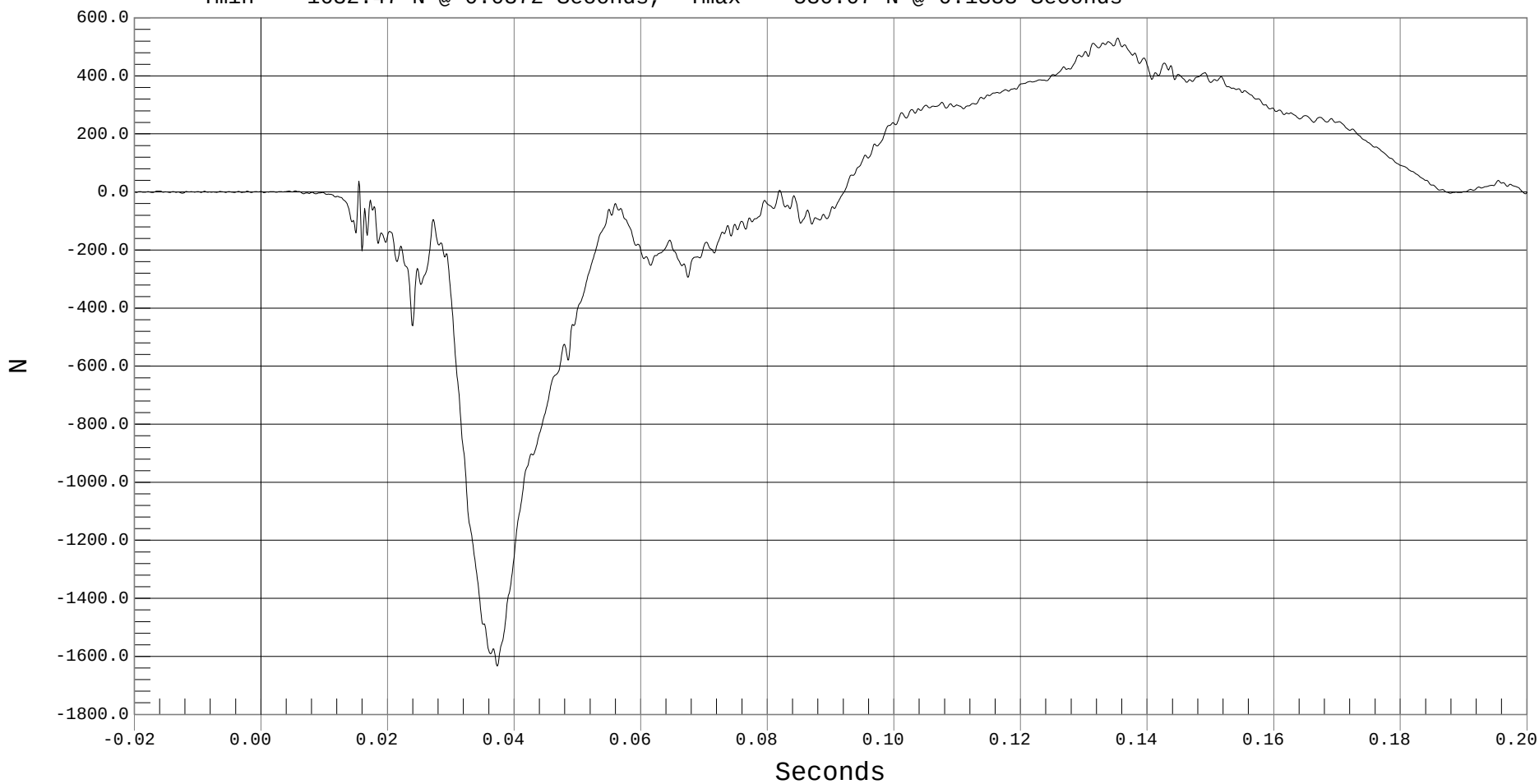
DRIVER T-12 FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER T-12 FORCE X, B01108FF.F37

Ymin = -1632.47 N @ 0.0372 Seconds, Ymax = 530.07 N @ 0.1353 Seconds





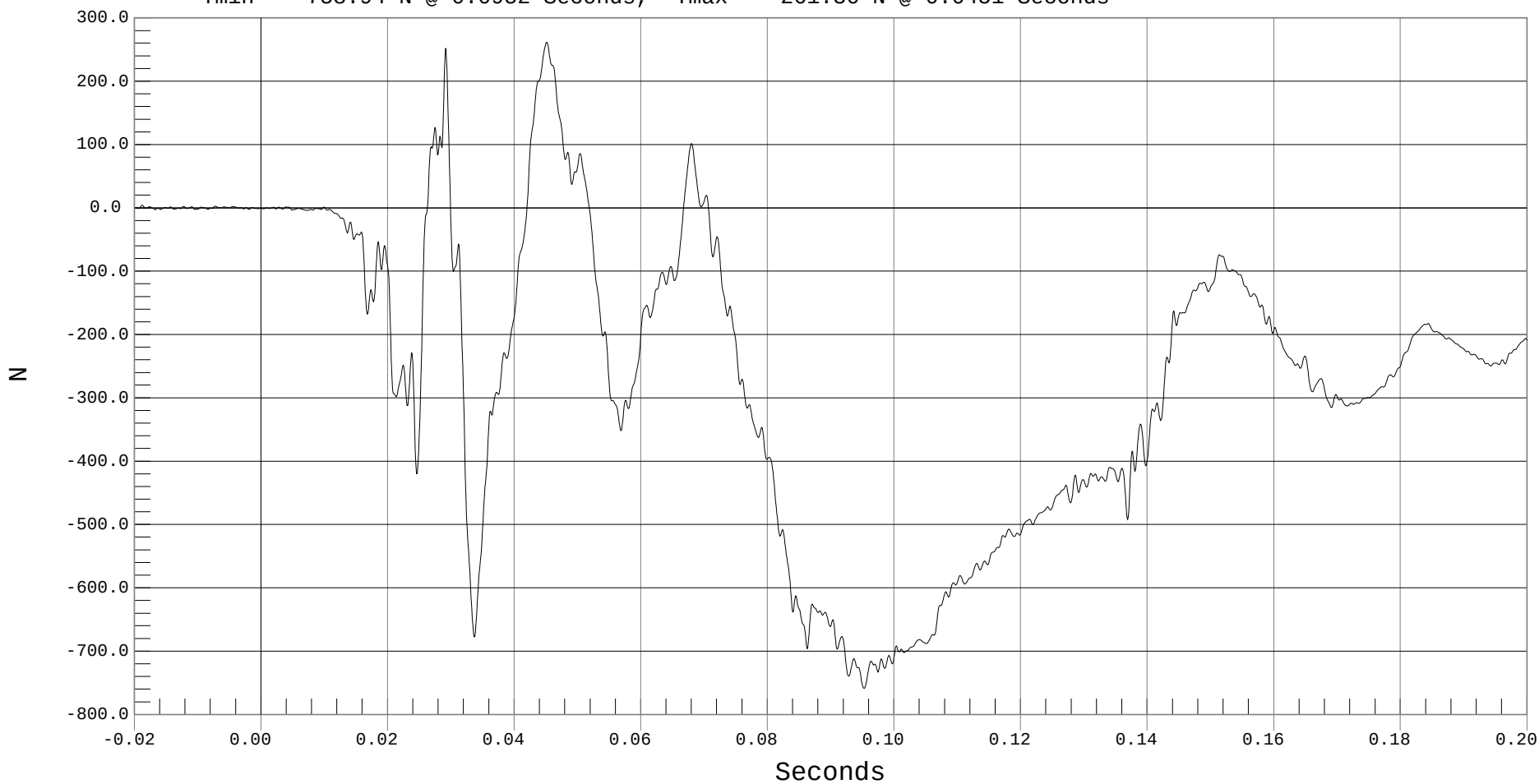
DRIVER T-12 FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

1 DRIVER T-12 Force Y, B01108MF.M40

Ymin = -758.94 N @ 0.0952 Seconds, Ymax = 261.36 N @ 0.0451 Seconds





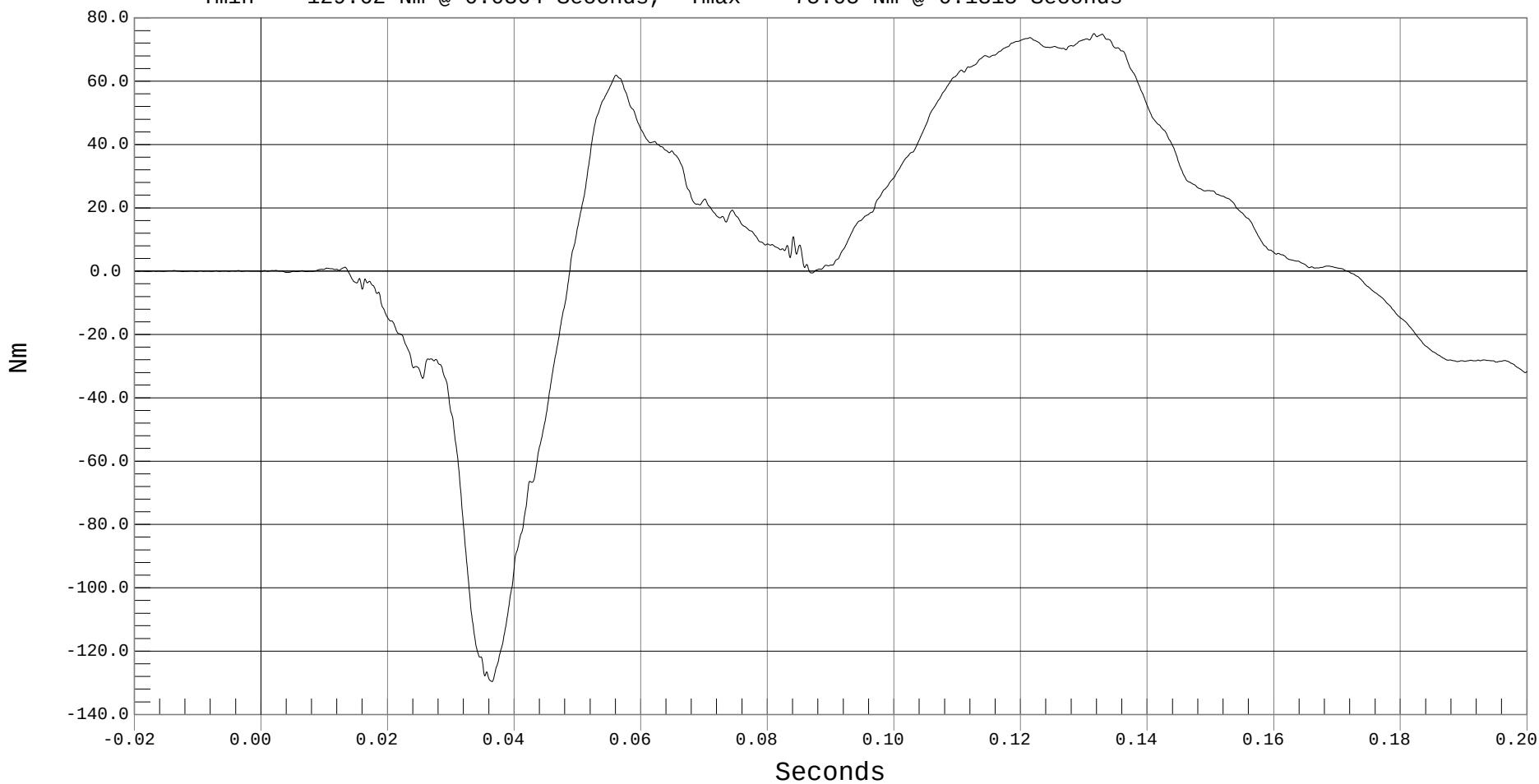
DRIVER T-12 MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER T-12 MomentY, B01108FF.F38

Ymin = -129.62 Nm @ 0.0364 Seconds, Ymax = 75.05 Nm @ 0.1315 Seconds





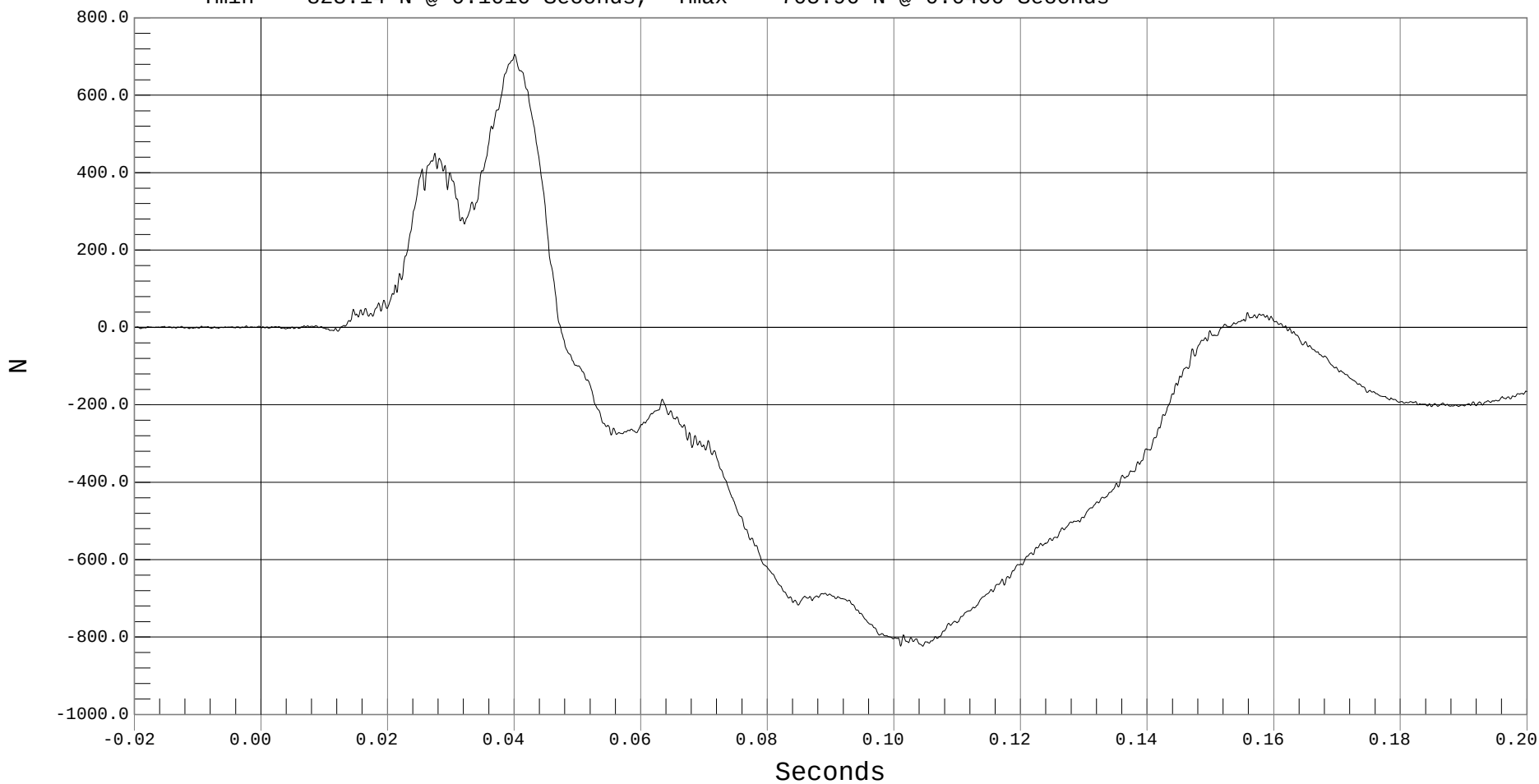
DRIVER LUMBAR FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER LUMBAR FORCE Y, B01108FT.F94

Ymin = -823.14 N @ 0.1010 Seconds, Ymax = 705.96 N @ 0.0400 Seconds





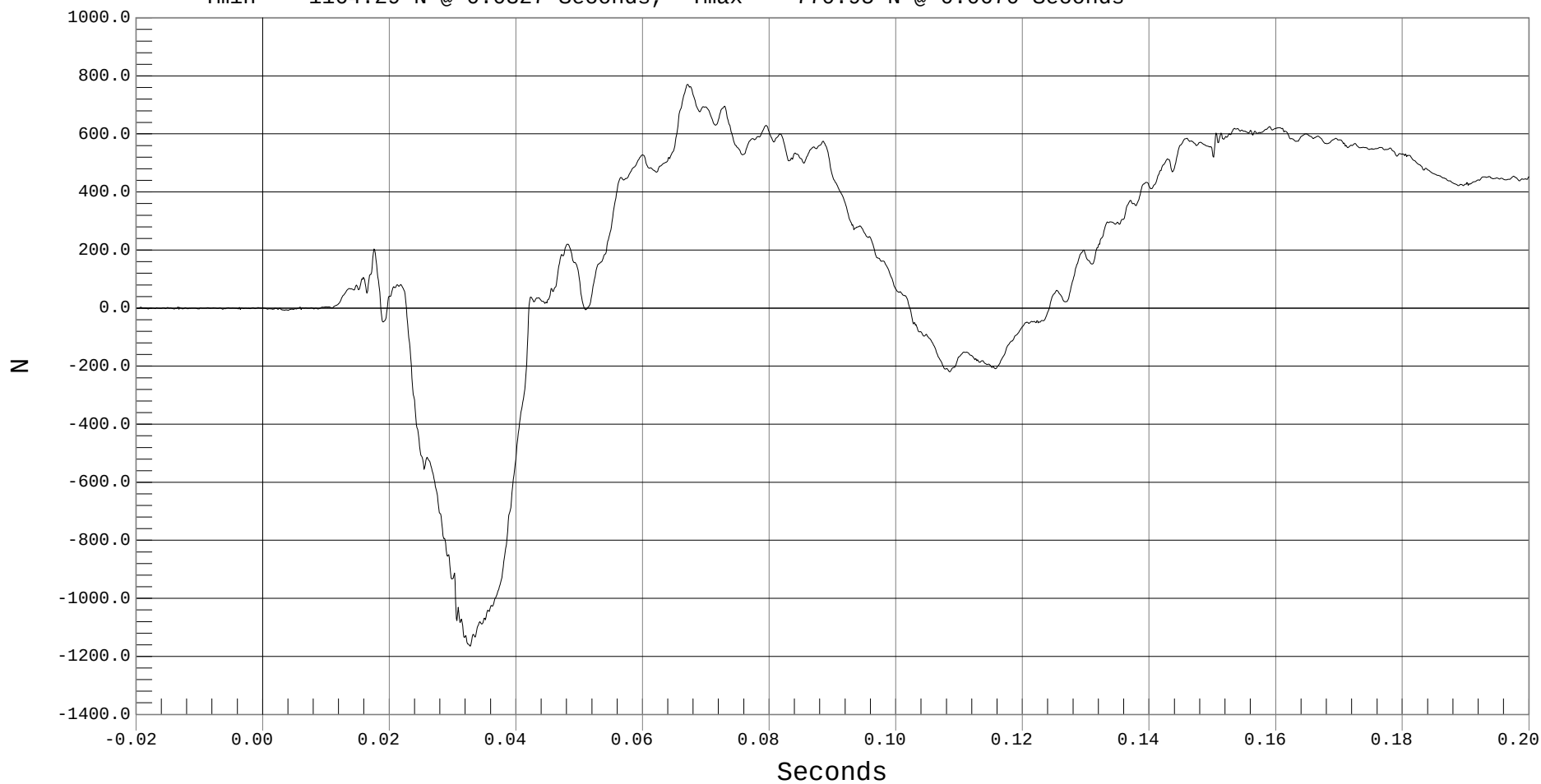
DRIVER LUMBAR FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

1 DRIVER LUMBAR FORCE Z, B01108FT.F95

Ymin = -1164.29 N @ 0.0327 Seconds, Ymax = 770.95 N @ 0.0670 Seconds





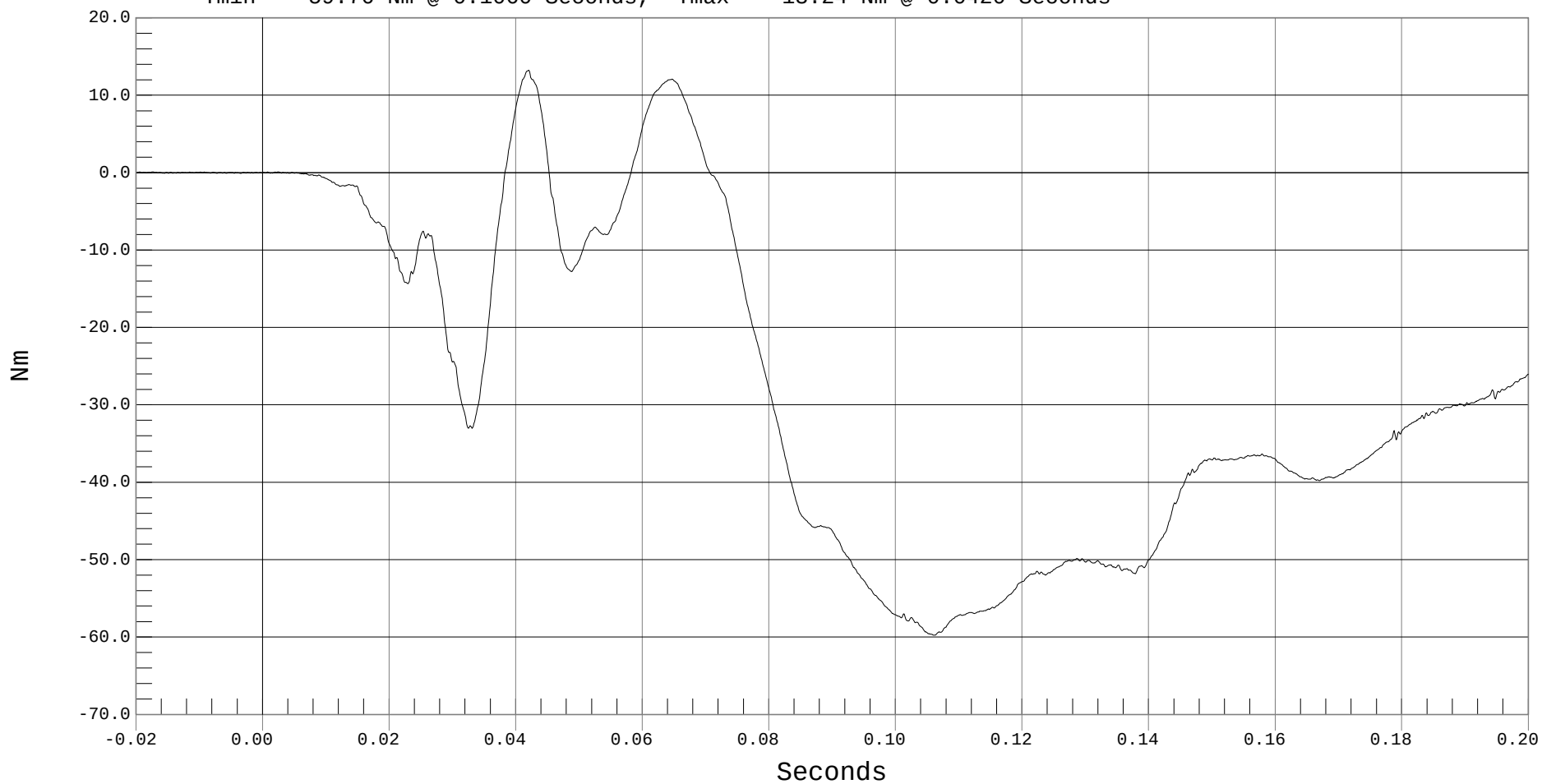
DRIVER LUMBAR MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER LUMBAR MOMENT X, B01108MT.M96

Ymin = -59.76 Nm @ 0.1060 Seconds, Ymax = 13.24 Nm @ 0.0420 Seconds





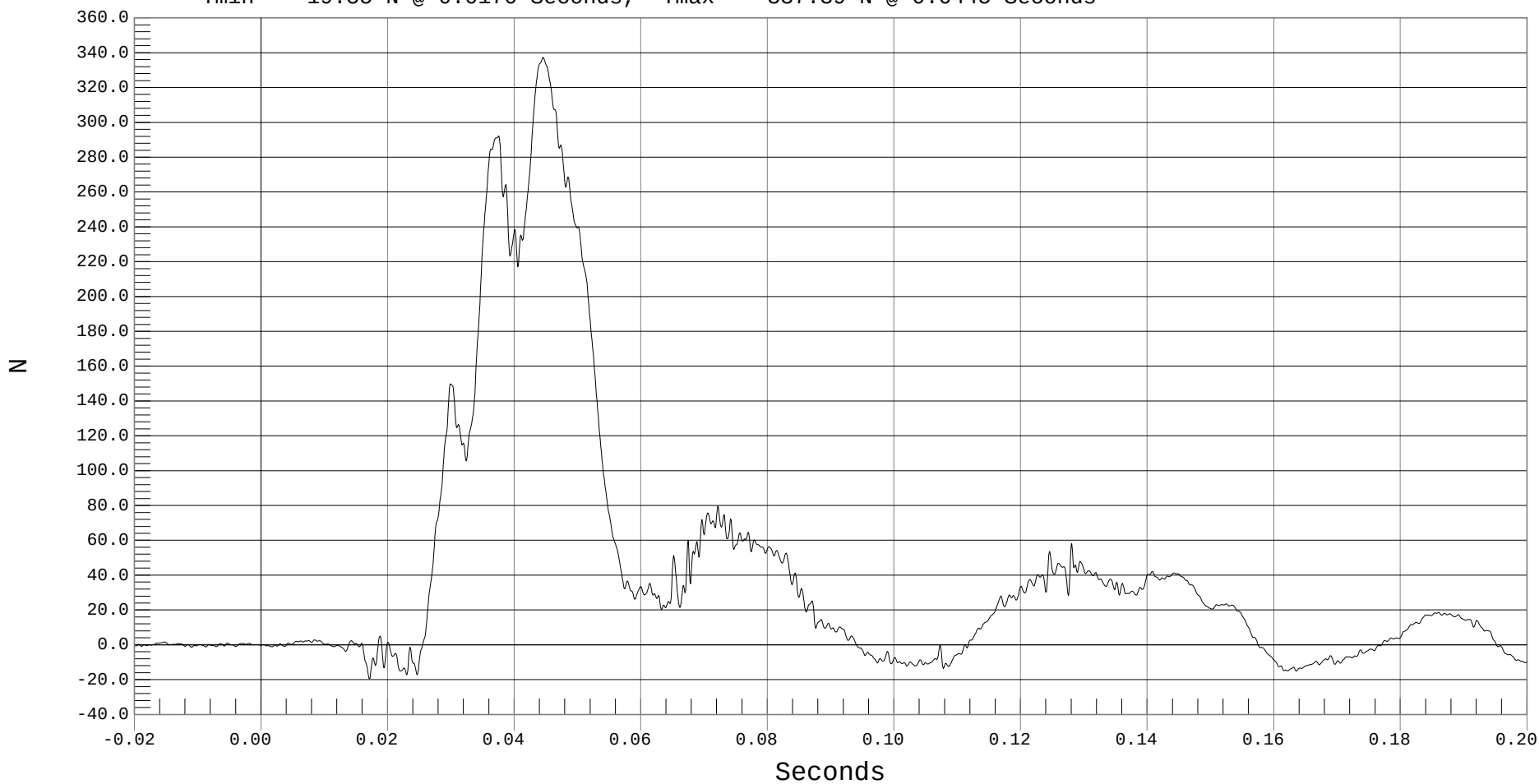
DRIVER ABDOMEN FRONT FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

1 DRIVER FRONT ABDOMEN FORCE, B01108FF.F41

Ymin = -19.55 N @ 0.0170 Seconds, Ymax = 337.39 N @ 0.0445 Seconds





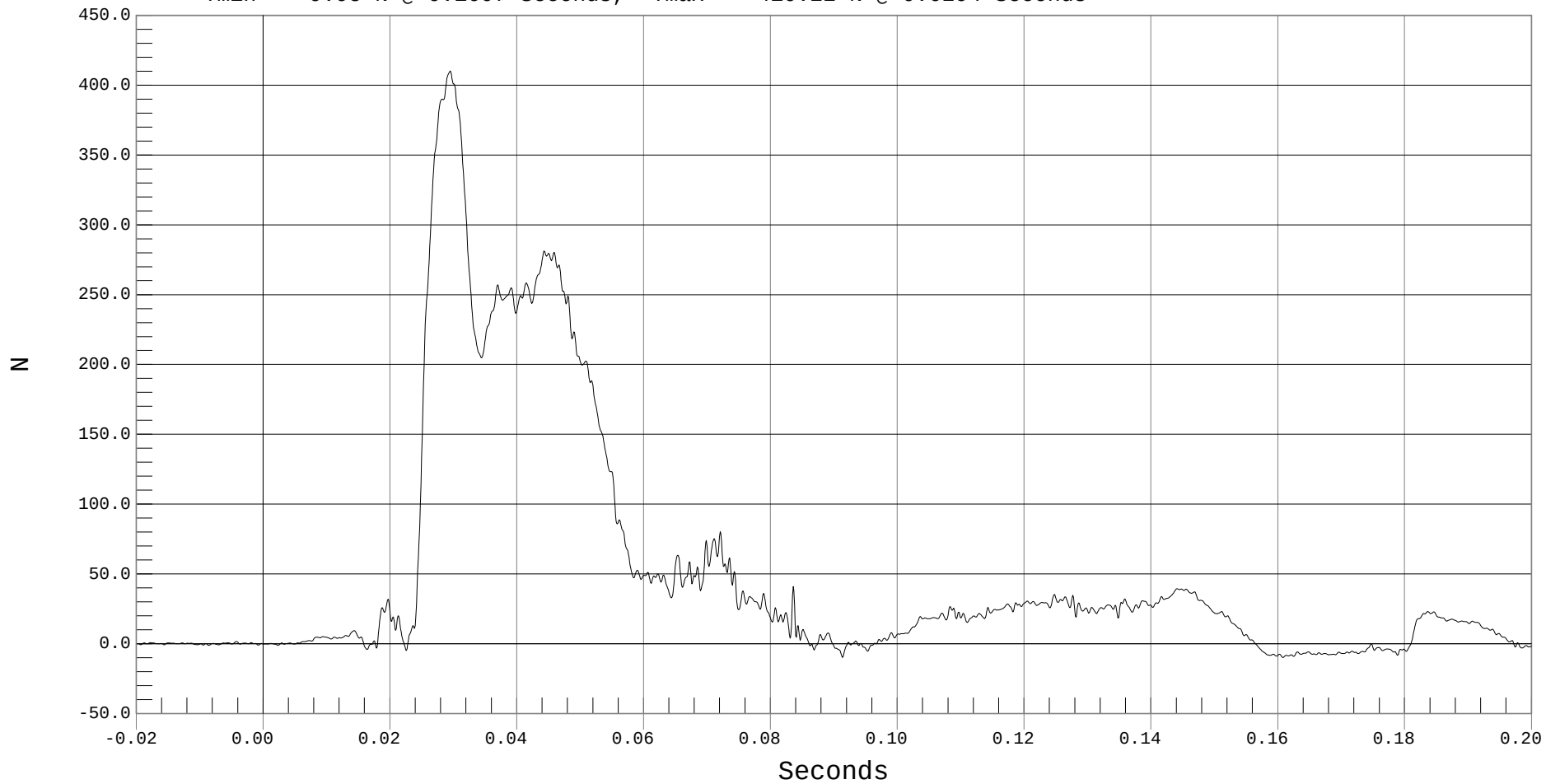
DRIVER ABDOMEN MID FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER MID ABDOMEN FORCE, B01108FF.F42

Ymin = -9.95 N @ 0.1607 Seconds, Ymax = 410.22 N @ 0.0294 Seconds





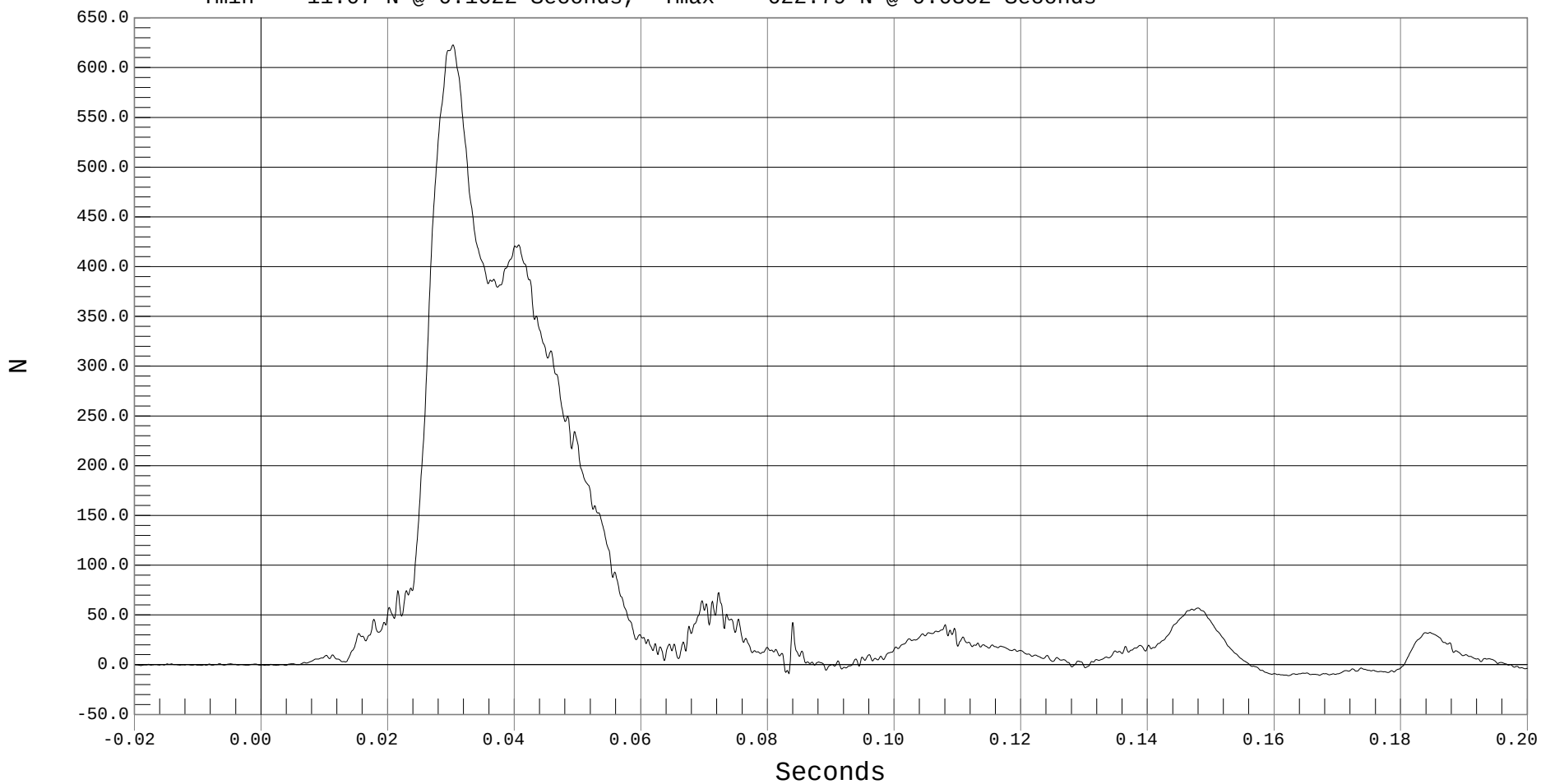
DRIVER ABDOMEN REAR FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER REAR ABDOMEN FORCE, B01108FF.F43

Ymin = -11.07 N @ 0.1622 Seconds, Ymax = 622.79 N @ 0.0302 Seconds





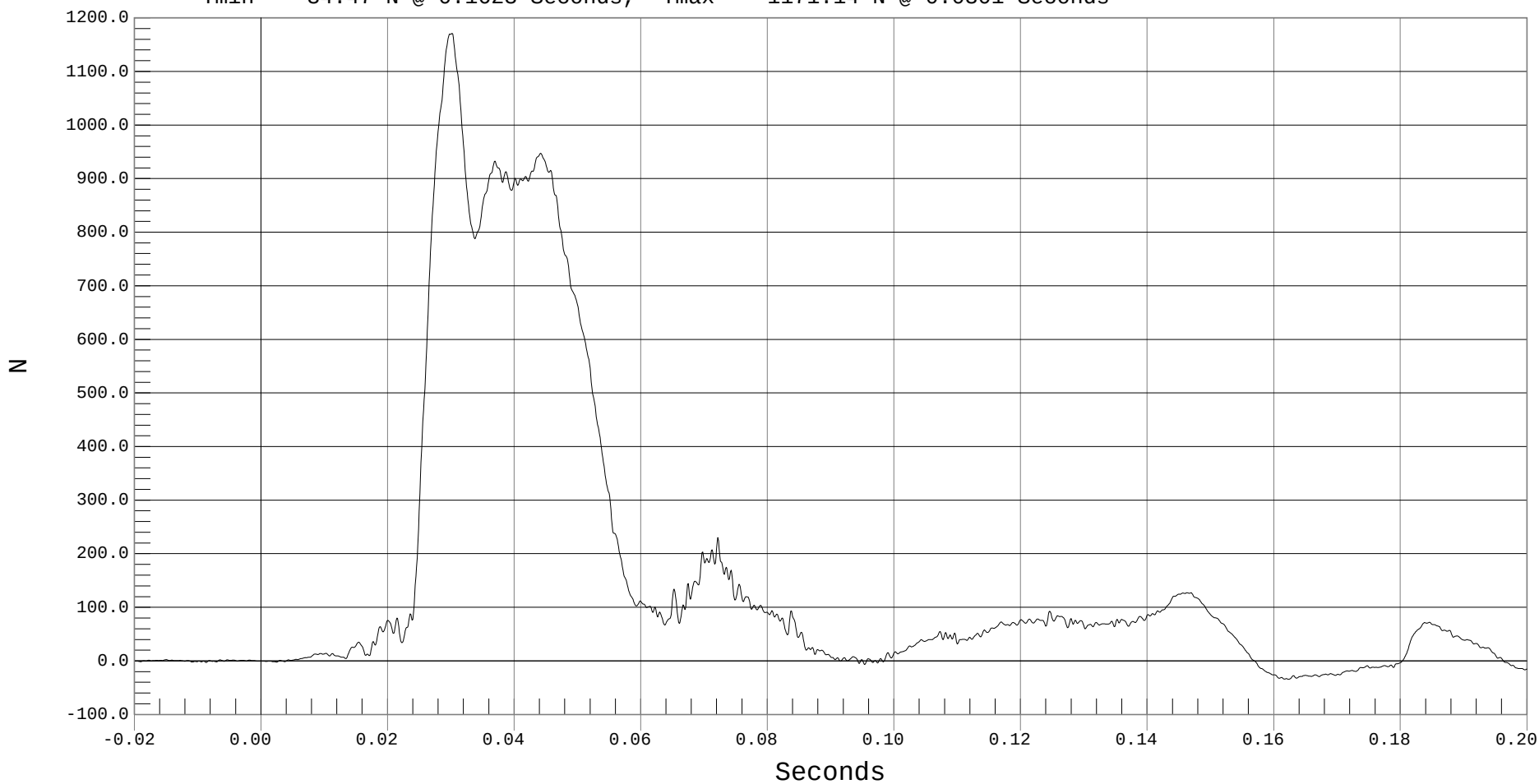
DRIVER SUMMED ABDOMEN FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER SUMMED ABDOMEN FORCE, B01108FU.F41

Ymin = -34.47 N @ 0.1623 Seconds, Ymax = 1171.14 N @ 0.0301 Seconds





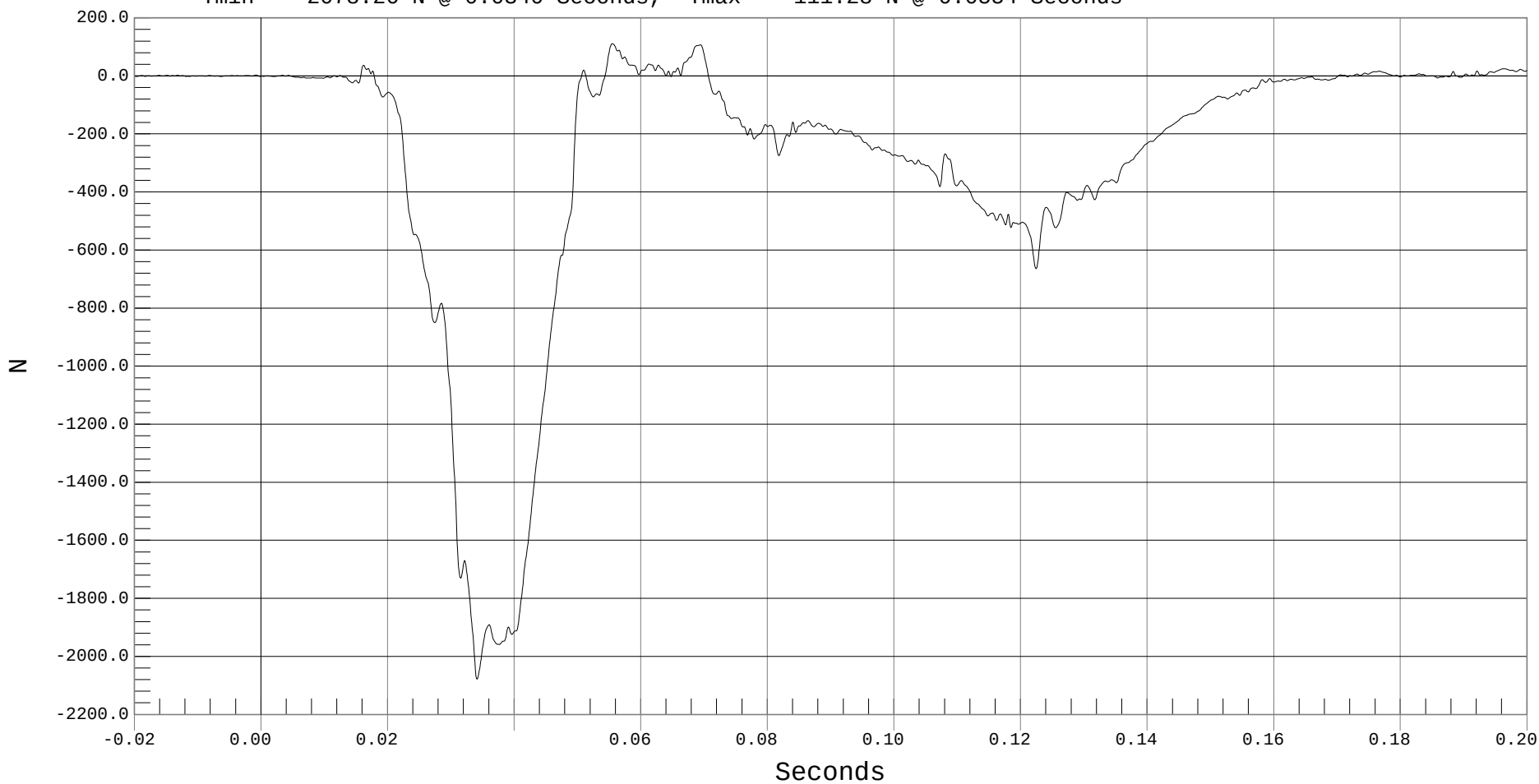
DRIVER PUBIC SYMPHYSIS FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER PUBIC SYMPHYSIS FORCE, B01108FF.F44

Ymin = -2078.26 N @ 0.0340 Seconds, Ymax = 111.28 N @ 0.0554 Seconds





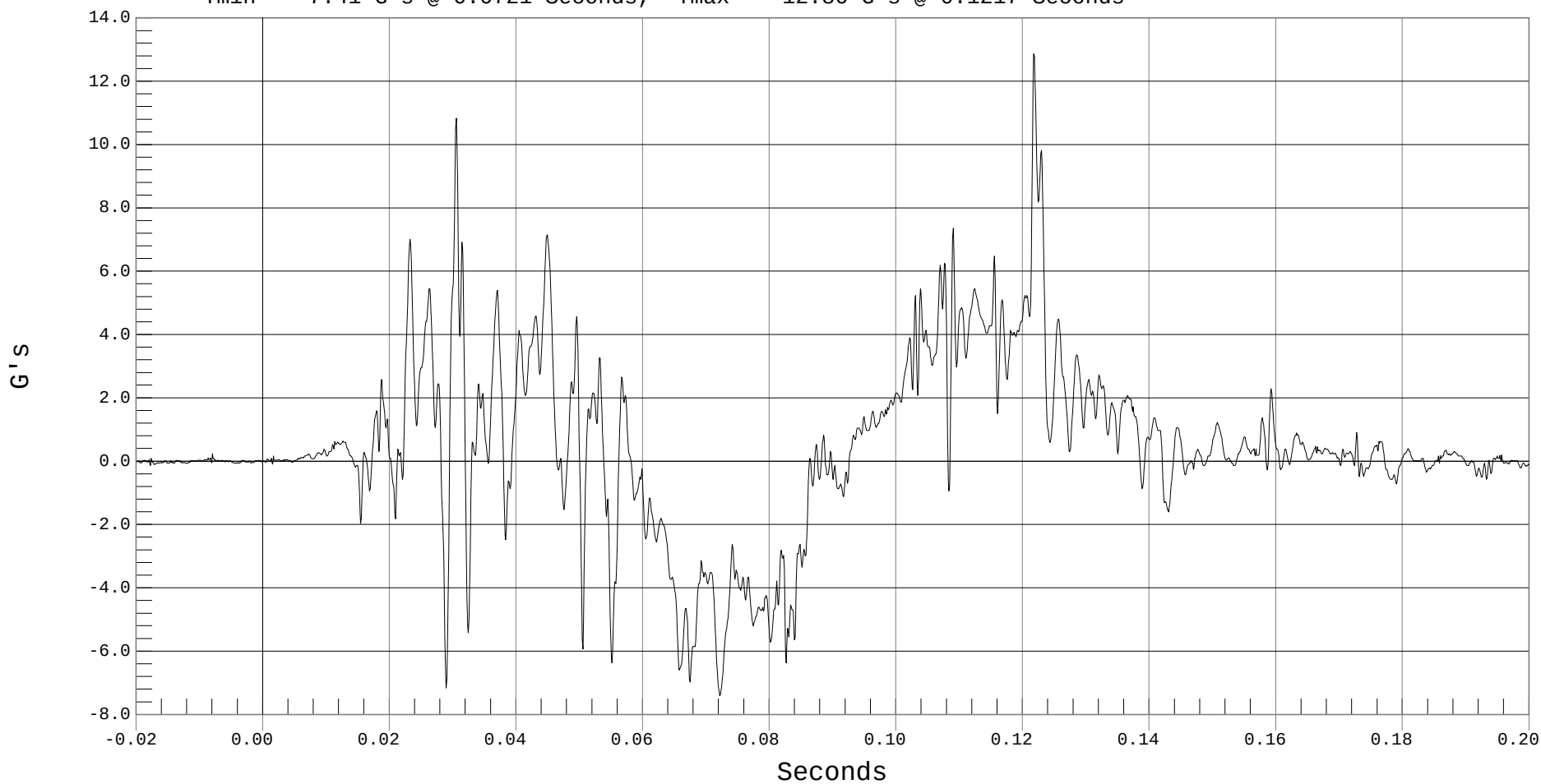
DRIVER PELVIS X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER PELVIS X, B01108AT.A45

Ymin = -7.41 G's @ 0.0721 Seconds, Ymax = 12.86 G's @ 0.1217 Seconds





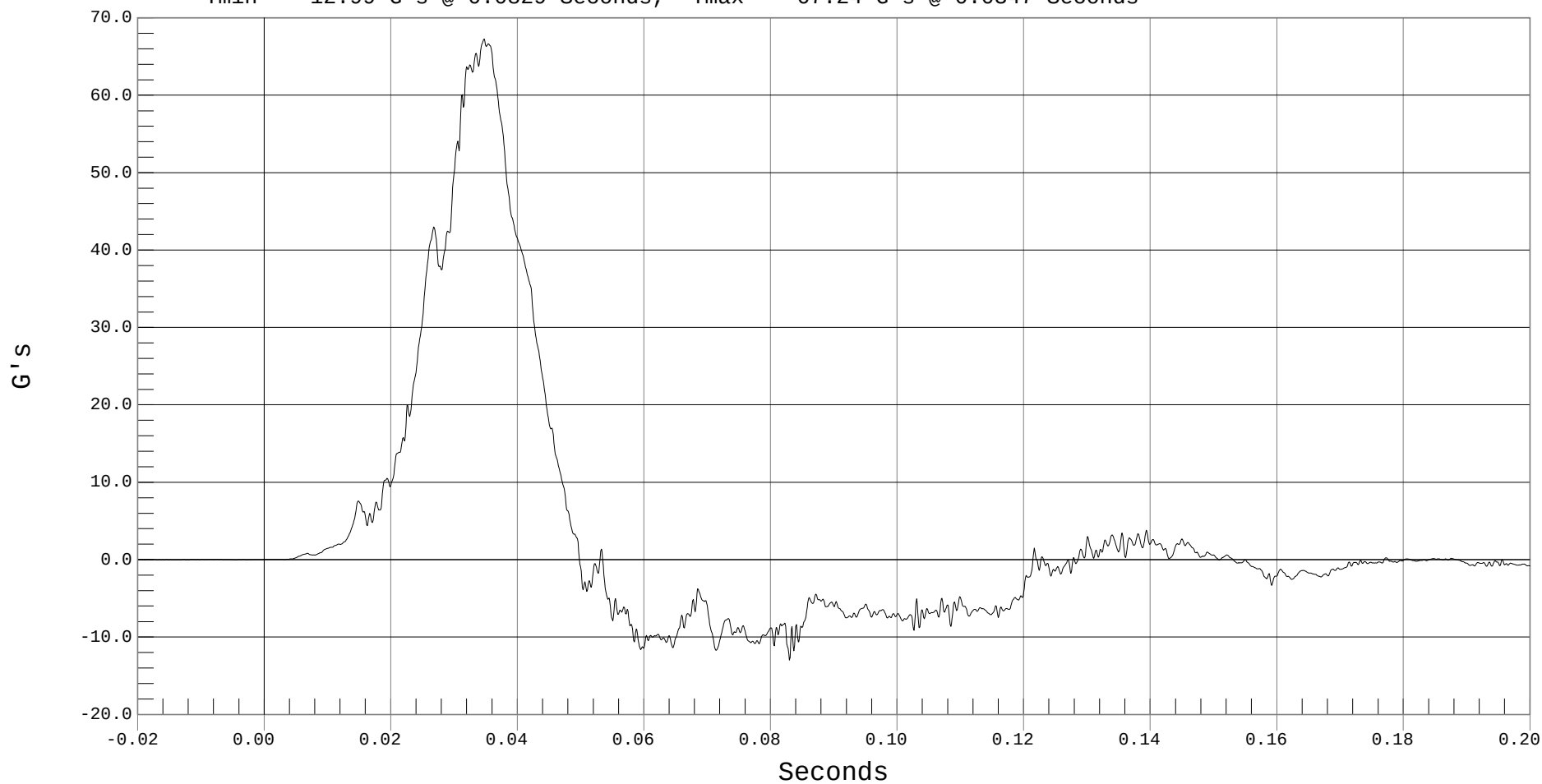
DRIVER PELVIS Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

1 DRIVER PELVIS Y, B01108AT.A46

Ymin = -12.99 G's @ 0.0829 Seconds, Ymax = 67.24 G's @ 0.0347 Seconds





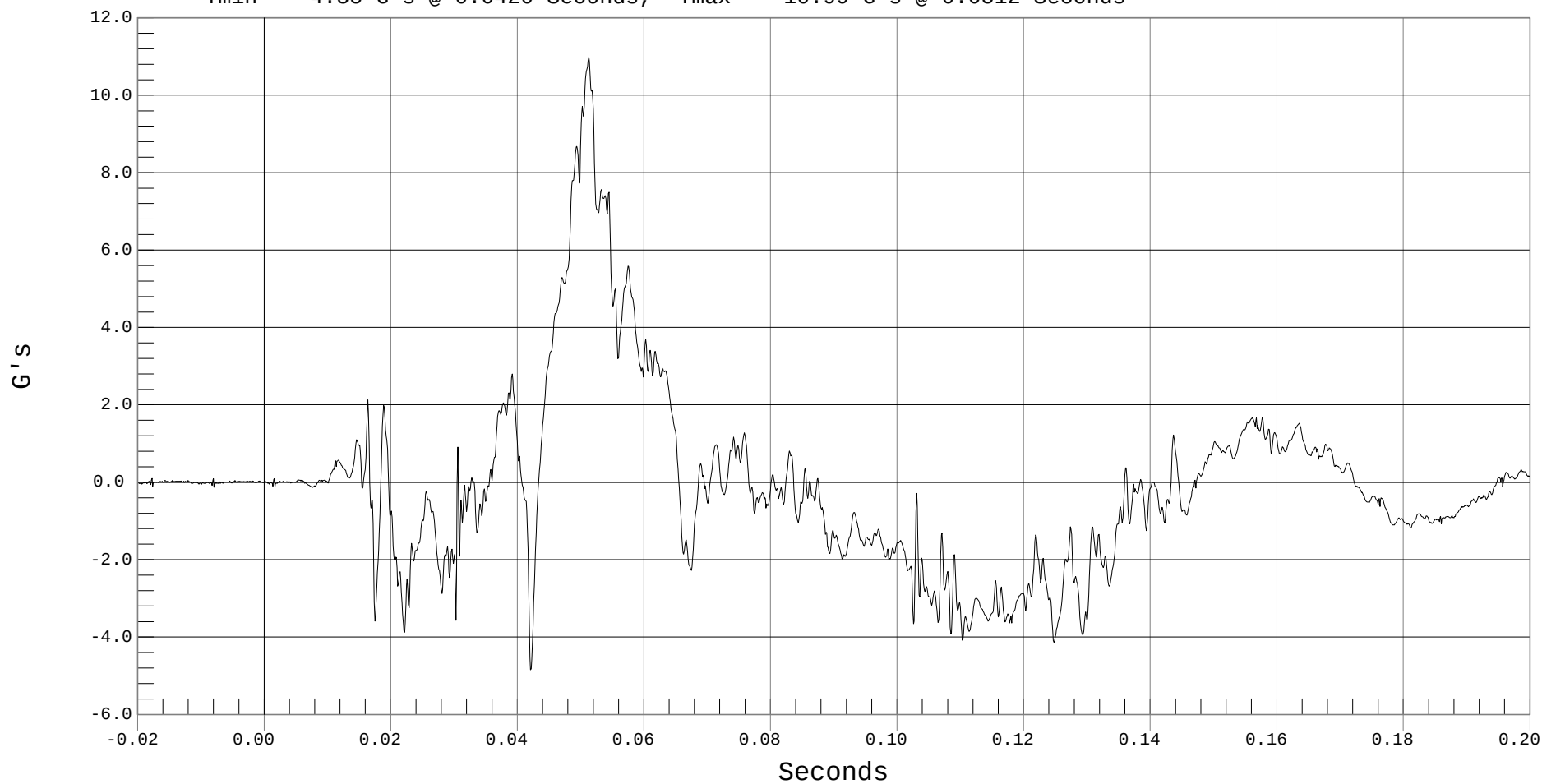
DRIVER PELVIS Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Z, B01108AT.A47

Ymin = -4.85 G's @ 0.0420 Seconds, Ymax = 10.99 G's @ 0.0512 Seconds





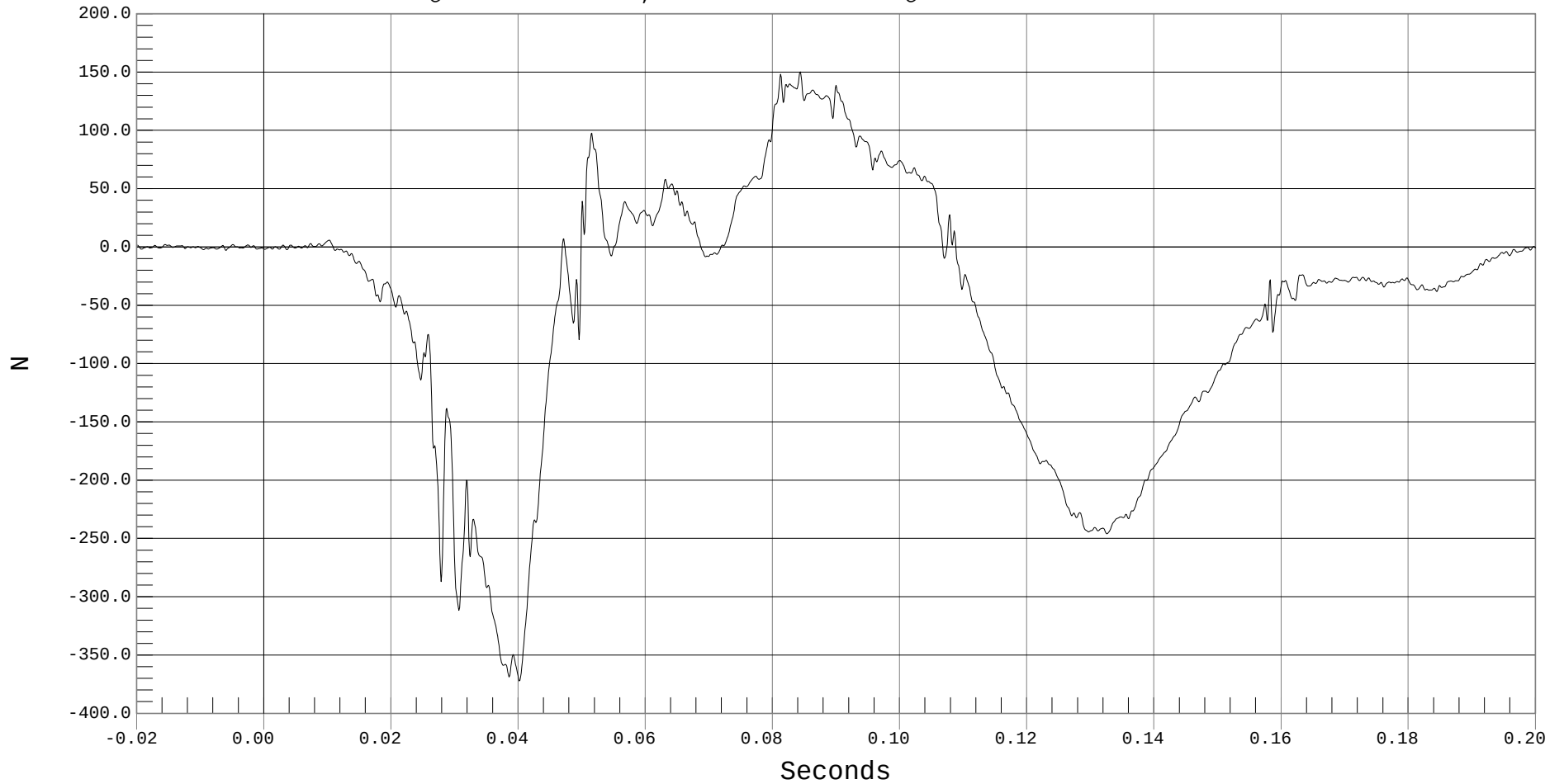
DRIVER LEFT FEMUR FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR FORCE X, B01108FF.F54

Ymin = -372.15 N @ 0.0401 Seconds, Ymax = 150.21 N @ 0.0843 Seconds





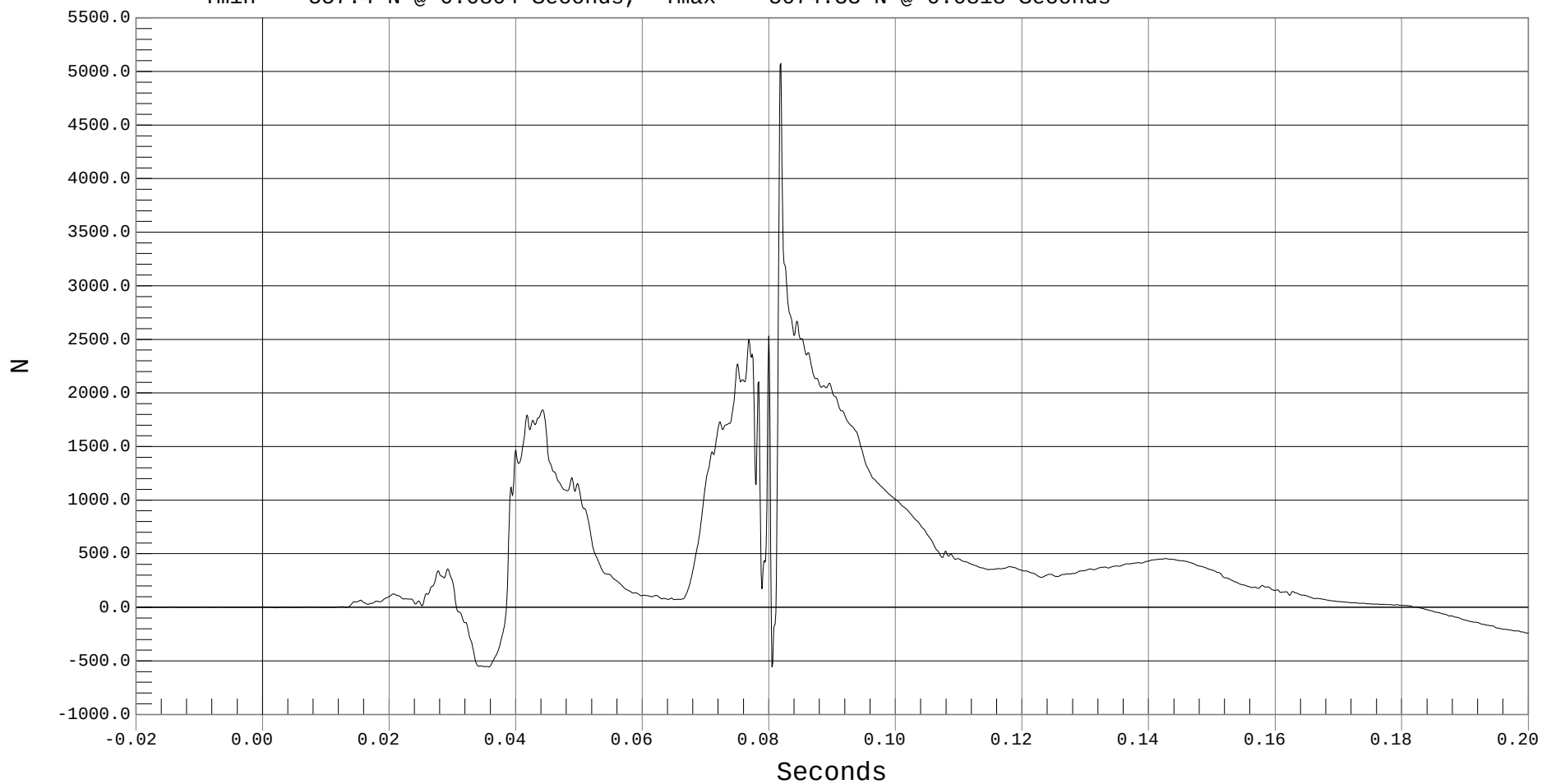
DRIVER LEFT FEMUR FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR FORCE Y, B01108FF.F55

Ymin = -557.4 N @ 0.0804 Seconds, Ymax = 5074.33 N @ 0.0818 Seconds





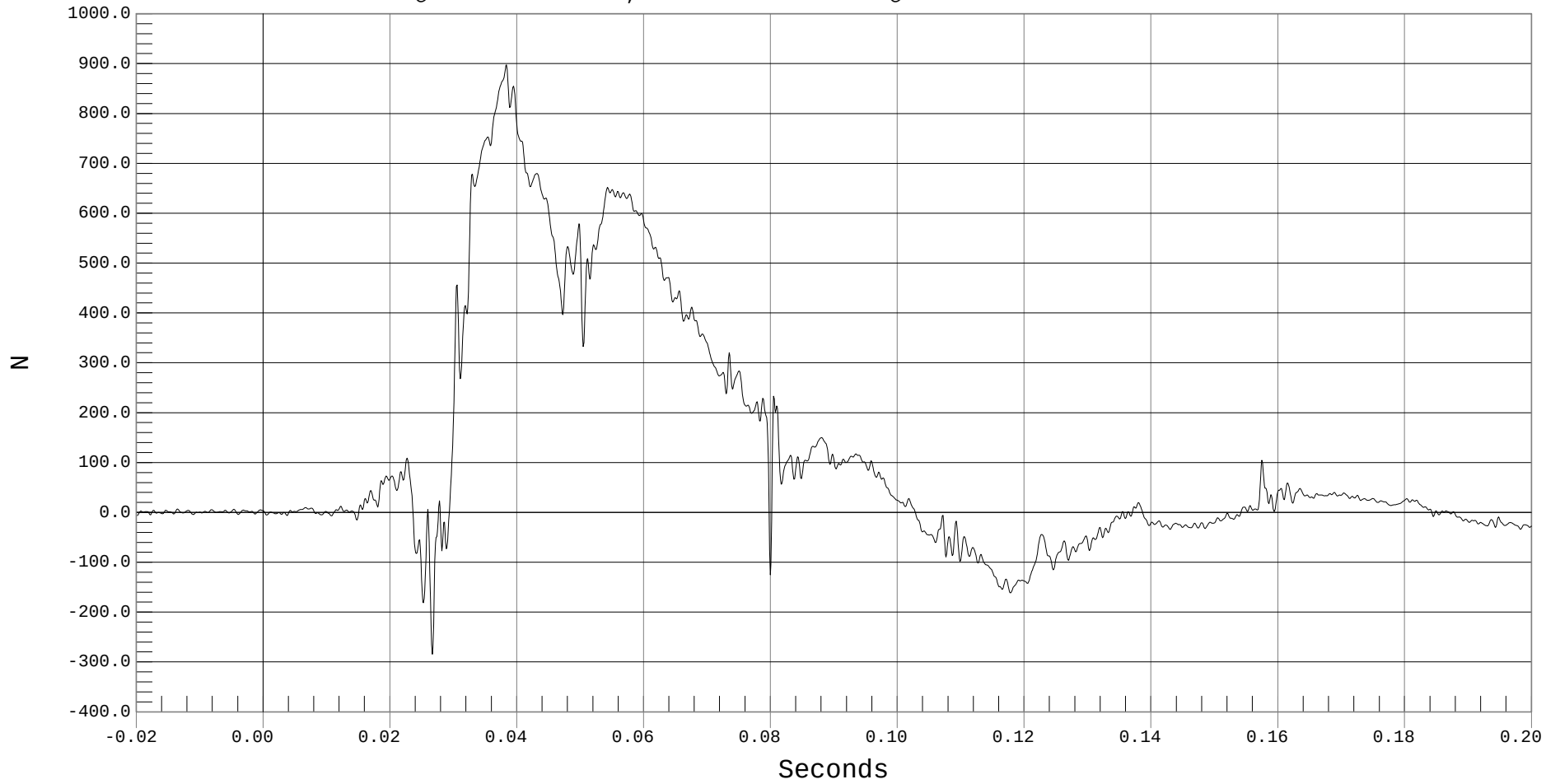
DRIVER LEFT FEMUR FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR FORCE Z, B01108FF.F56

Ymin = -284.5 N @ 0.0266 Seconds, Ymax = 897.66 N @ 0.0383 Seconds





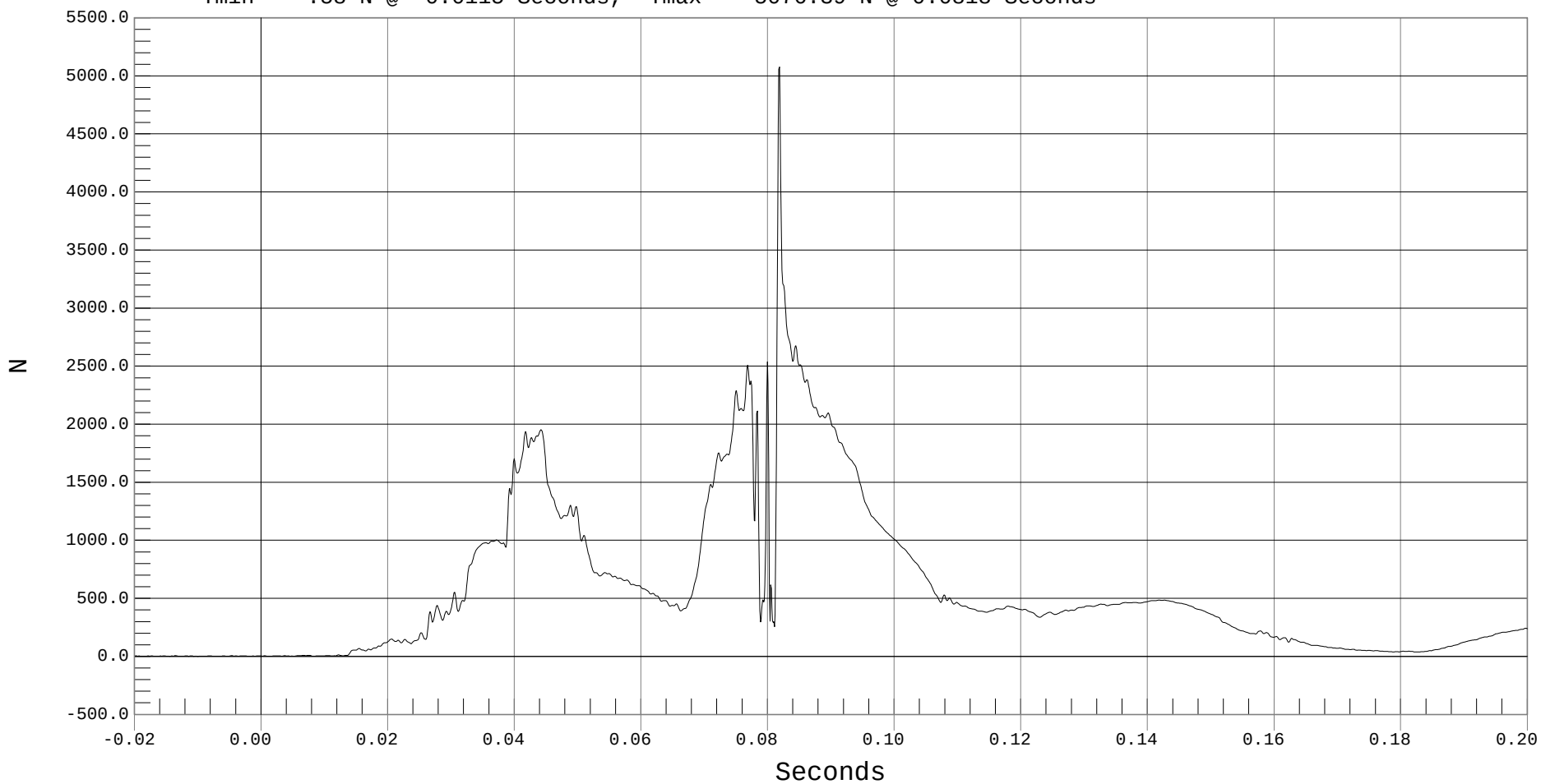
DRIVER LEFT FEMUR FORCE RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR FORCE RESULTANT, B01108FV.F54

Ymin = .58 N @ -0.0115 Seconds, Ymax = 5076.39 N @ 0.0818 Seconds





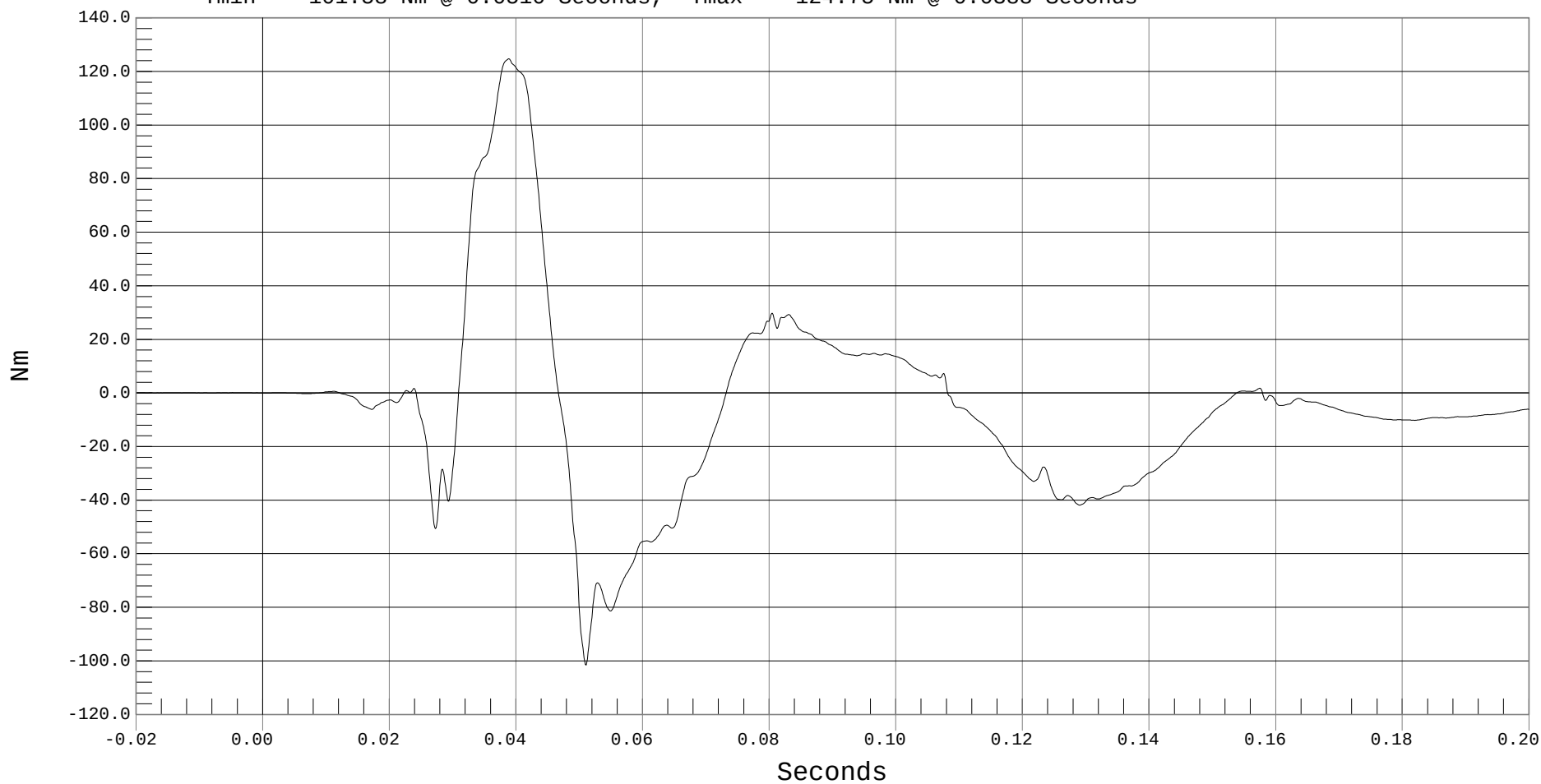
DRIVER LEFT FEMUR MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

1 DRIVER LEFT FEMUR MOMENT X, B01108MF.M57

Ymin = -101.58 Nm @ 0.0510 Seconds, Ymax = 124.75 Nm @ 0.0388 Seconds





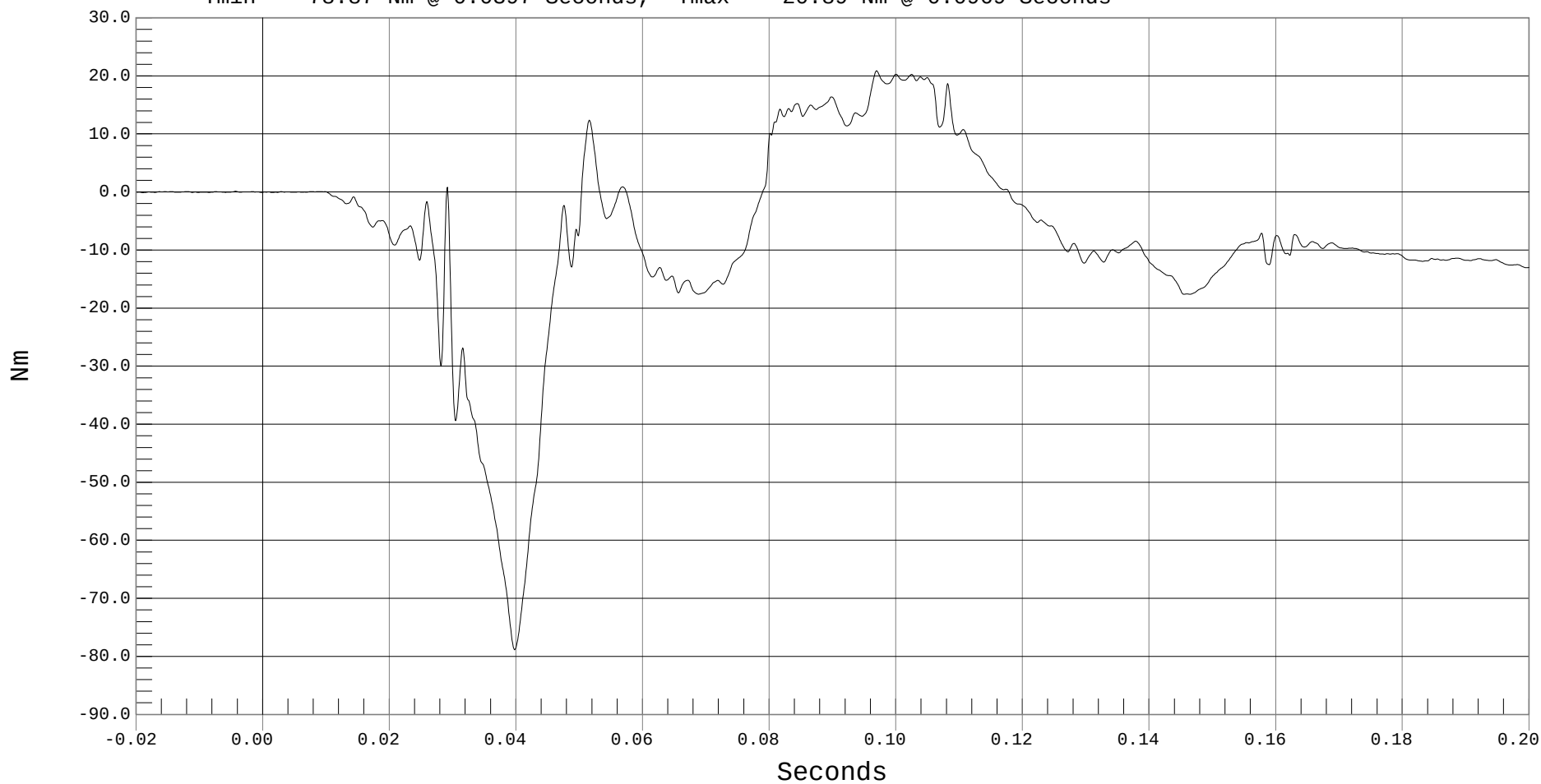
DRIVER LEFT FEMUR MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT Y, B01108MF.M58

Ymin = -78.87 Nm @ 0.0397 Seconds, Ymax = 20.89 Nm @ 0.0969 Seconds





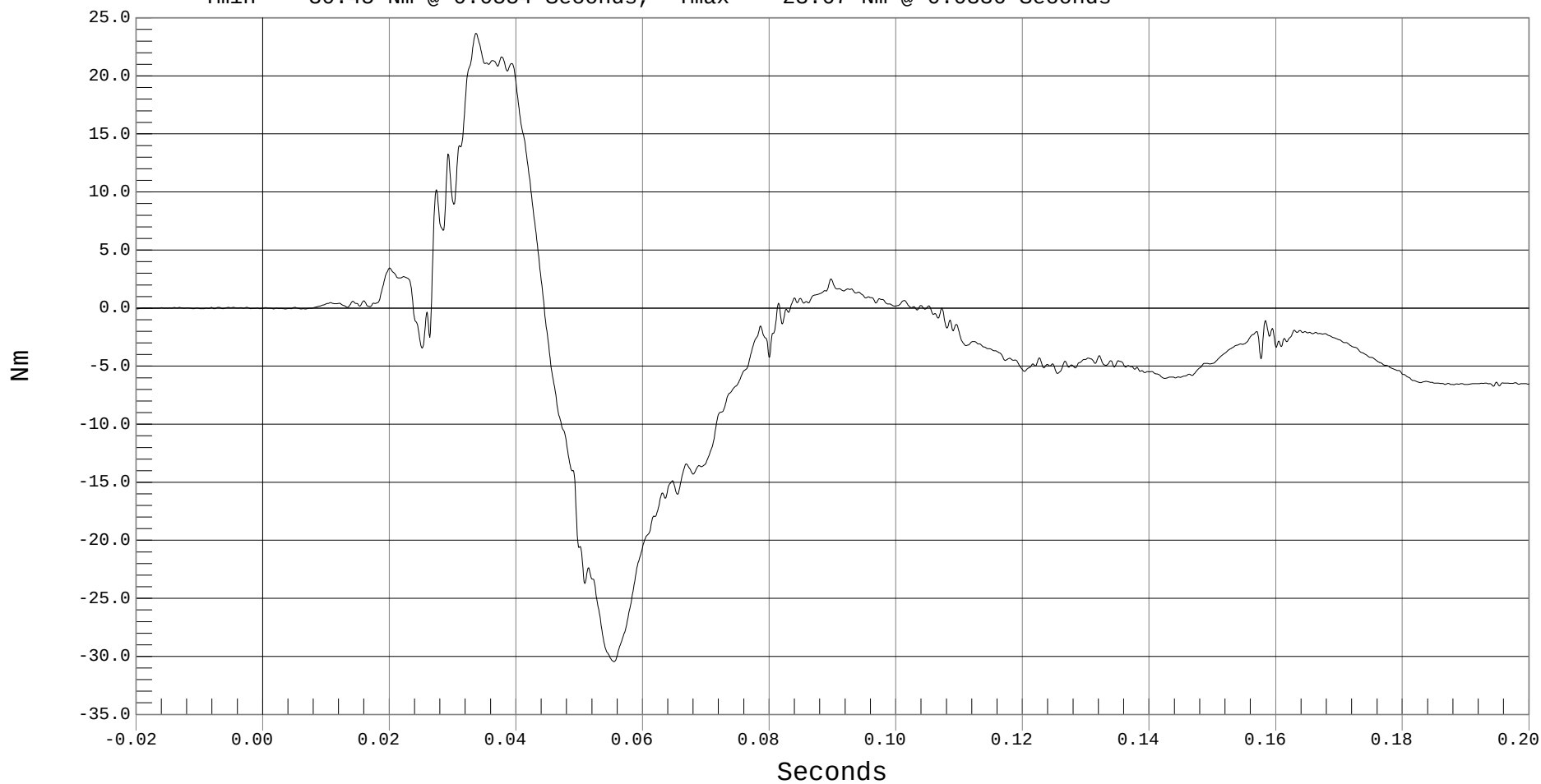
DRIVER LEFT FEMUR MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT Z, B01108MF.M59

Ymin = -30.45 Nm @ 0.0554 Seconds, Ymax = 23.67 Nm @ 0.0336 Seconds





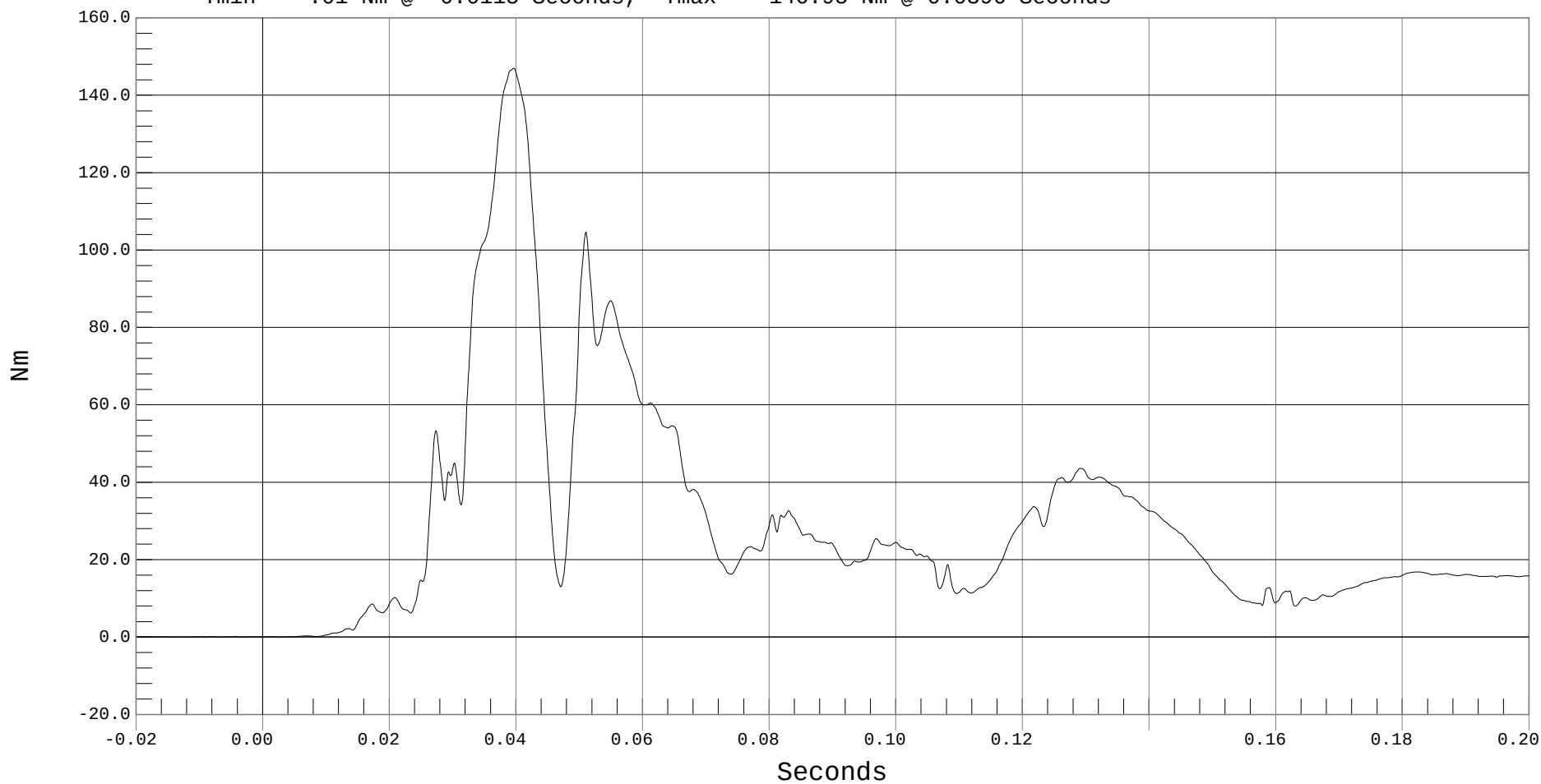
DRIVER LEFT FEMUR MOMENT RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT RESULTANT, B01108MV.M57

Ymin = .01 Nm @ -0.0115 Seconds, Ymax = 146.95 Nm @ 0.0396 Seconds





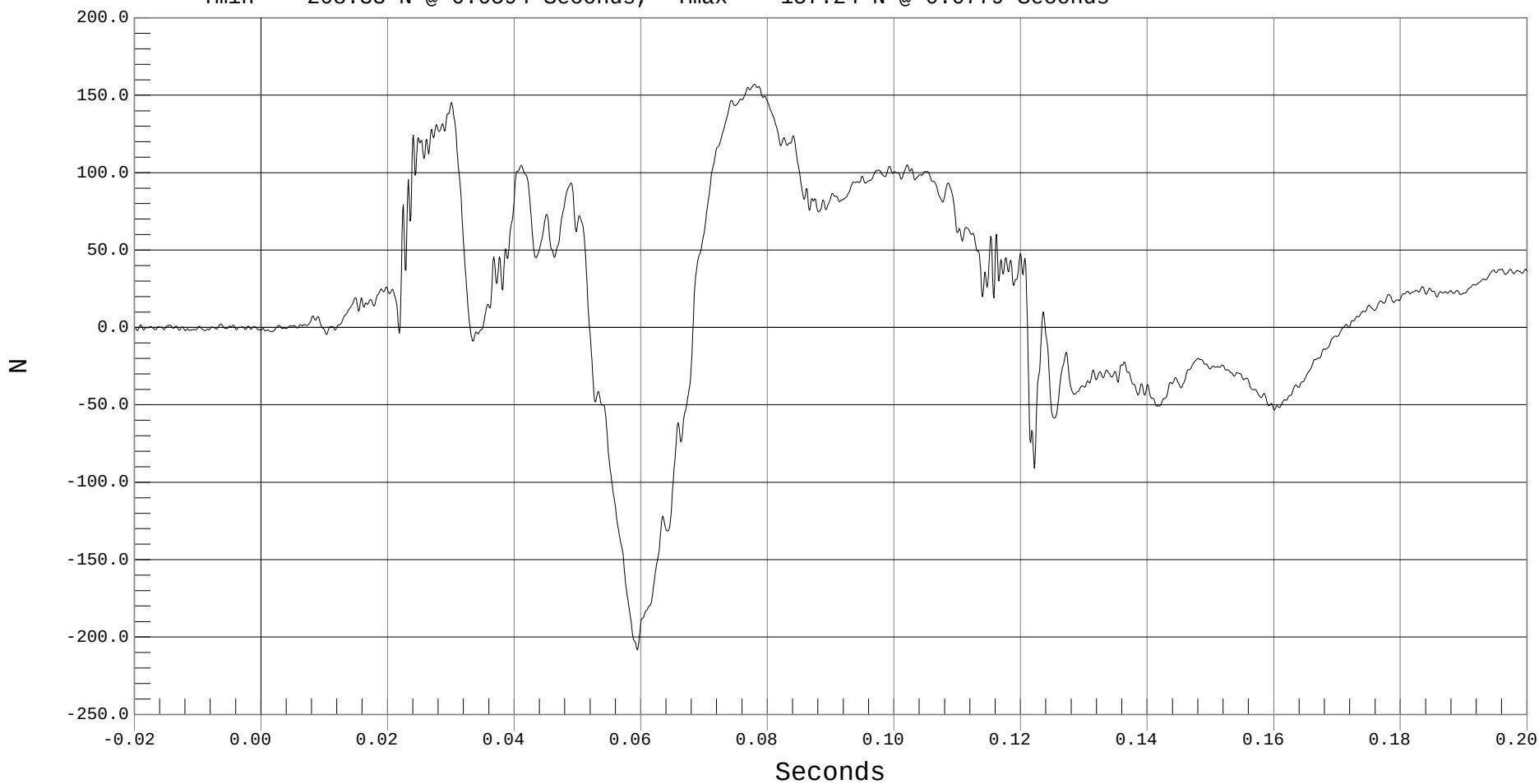
DRIVER RIGHT FEMUR FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE X, B01108FF.F48

Ymin = -208.33 N @ 0.0594 Seconds, Ymax = 157.24 N @ 0.0779 Seconds





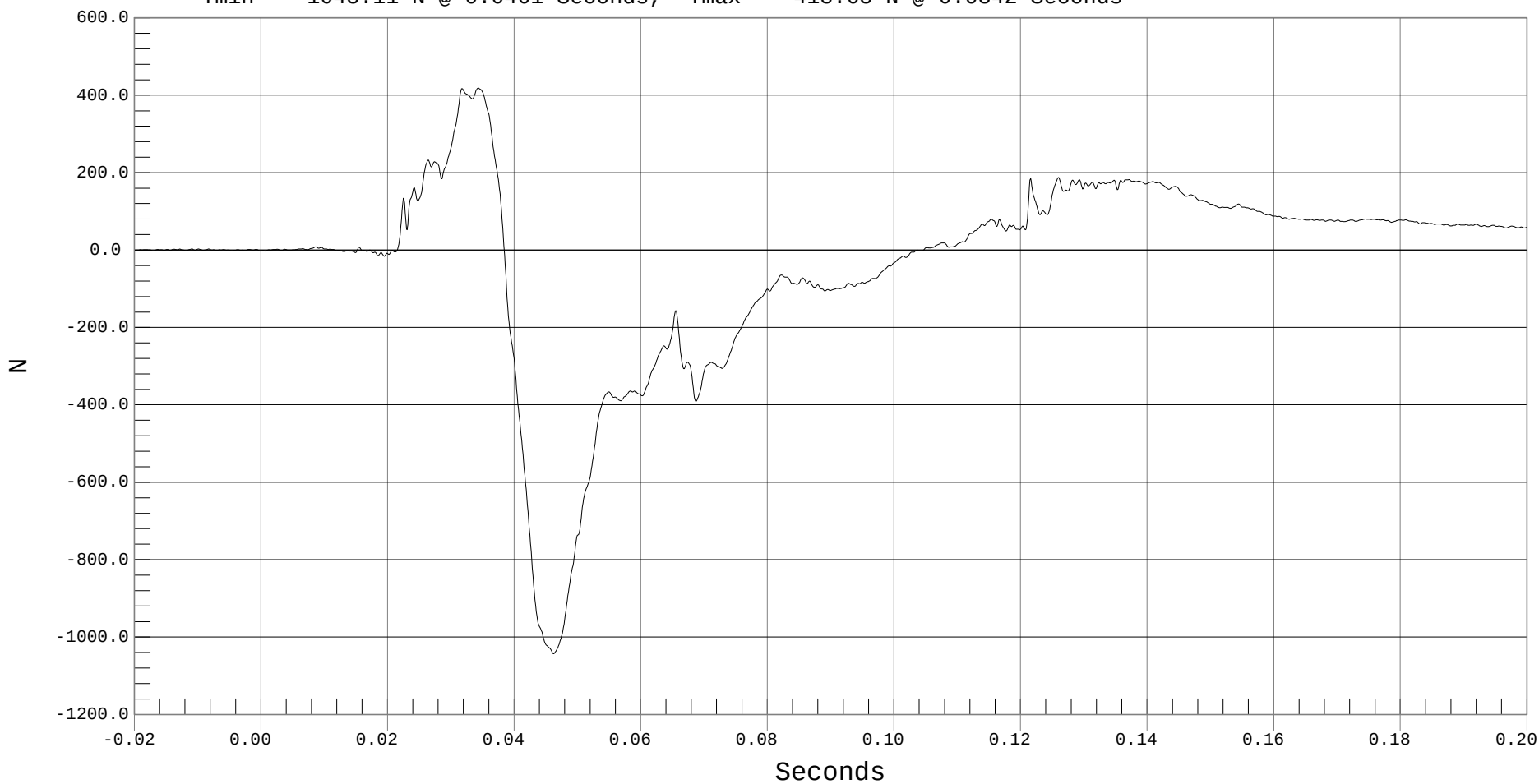
DRIVER RIGHT FEMUR FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE Y, B01108FF.F49

Ymin = -1043.11 N @ 0.0461 Seconds, Ymax = 418.63 N @ 0.0342 Seconds





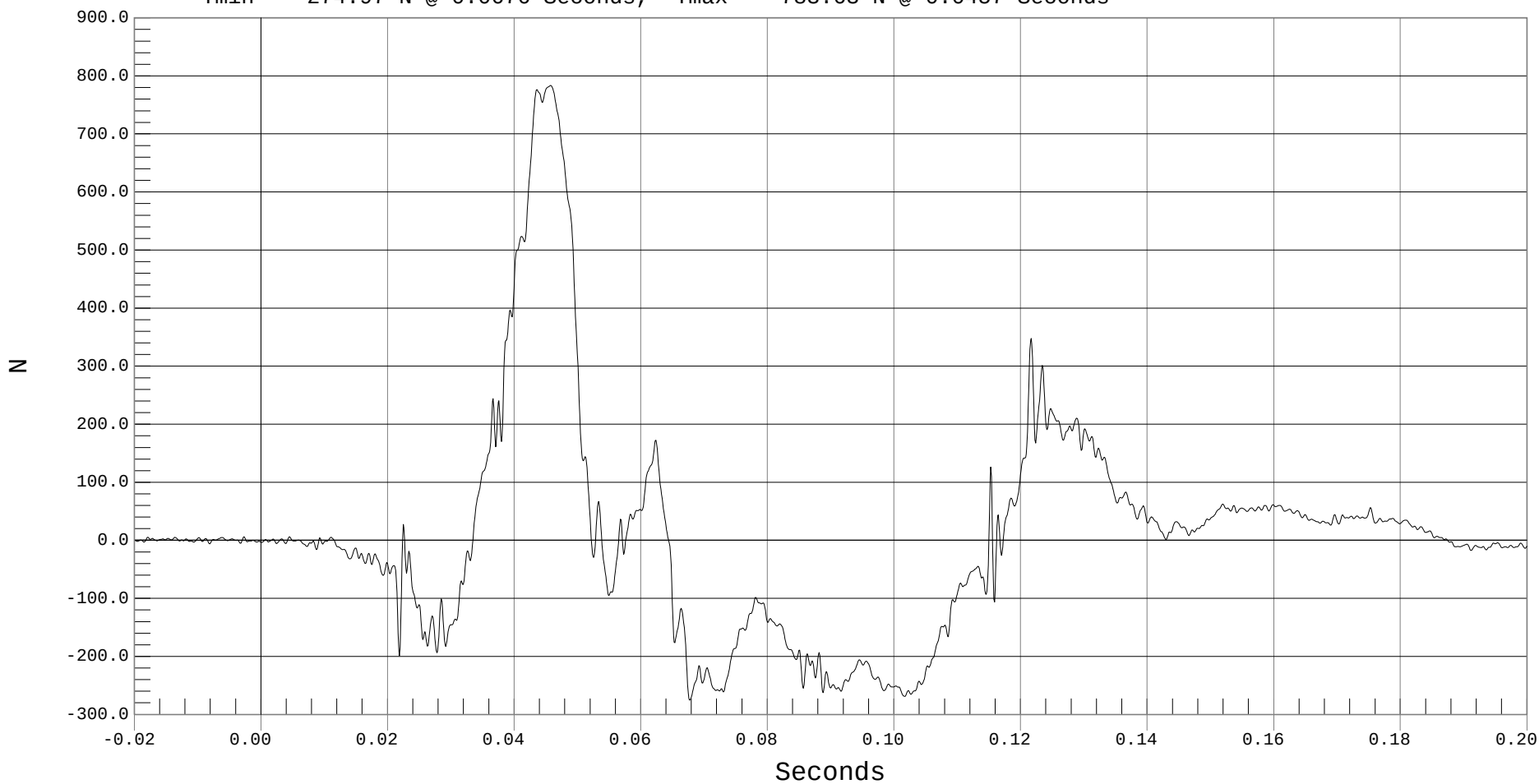
DRIVER RIGHT FEMUR FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE Z, B01108FF.F50

Ymin = -274.97 N @ 0.0676 Seconds, Ymax = 783.63 N @ 0.0457 Seconds





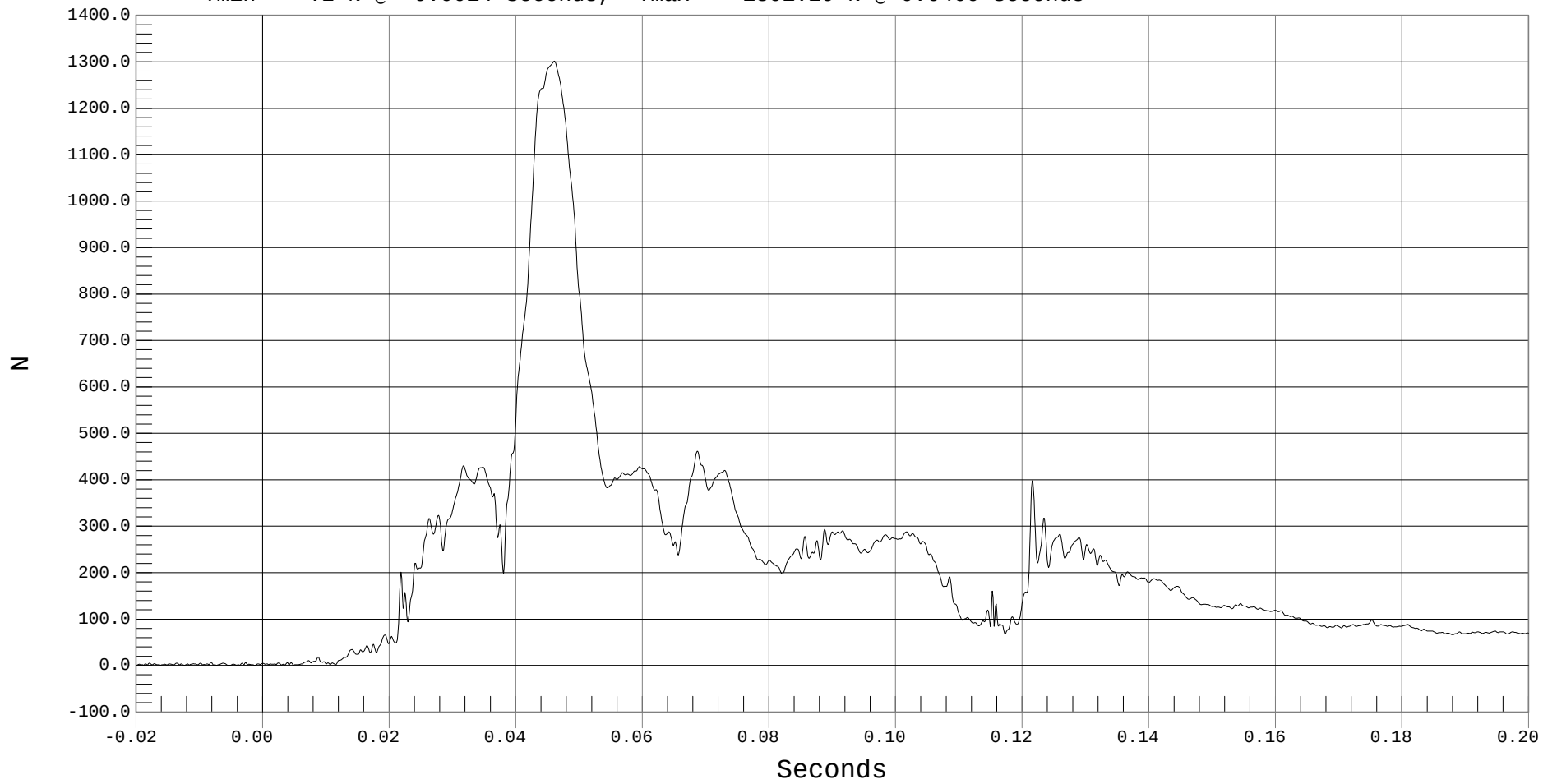
DRIVER RIGHT FEMUR FORCE RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE RESULTANT, B01108FV.F48

Ymin = .2 N @ -0.0014 Seconds, Ymax = 1301.29 N @ 0.0460 Seconds





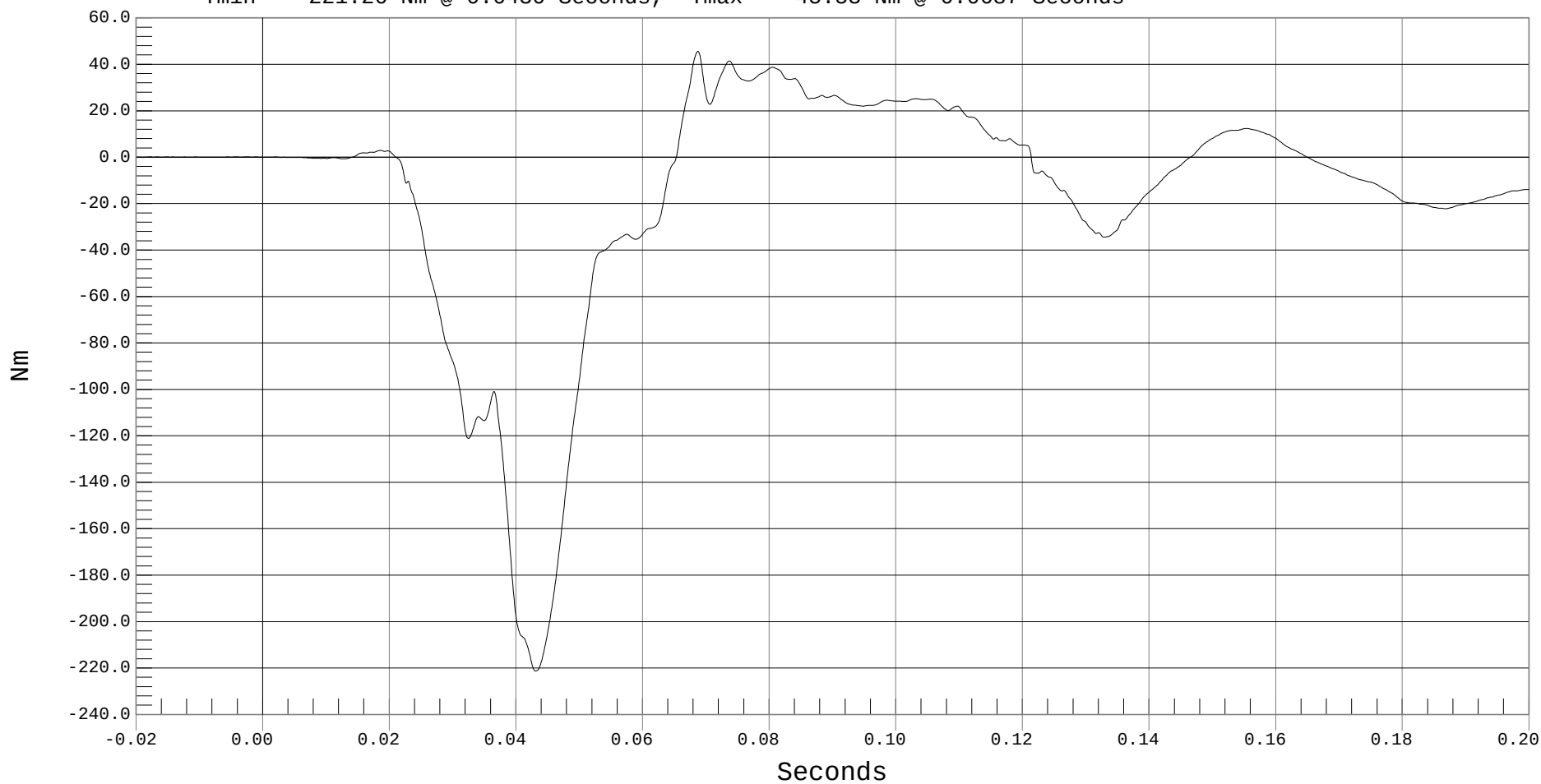
DRIVER RIGHT FEMUR MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

1 DRIVER RIGHT FEMUR MOMENT X, B01108MF.M51

Ymin = -221.26 Nm @ 0.0430 Seconds, Ymax = 45.53 Nm @ 0.0687 Seconds





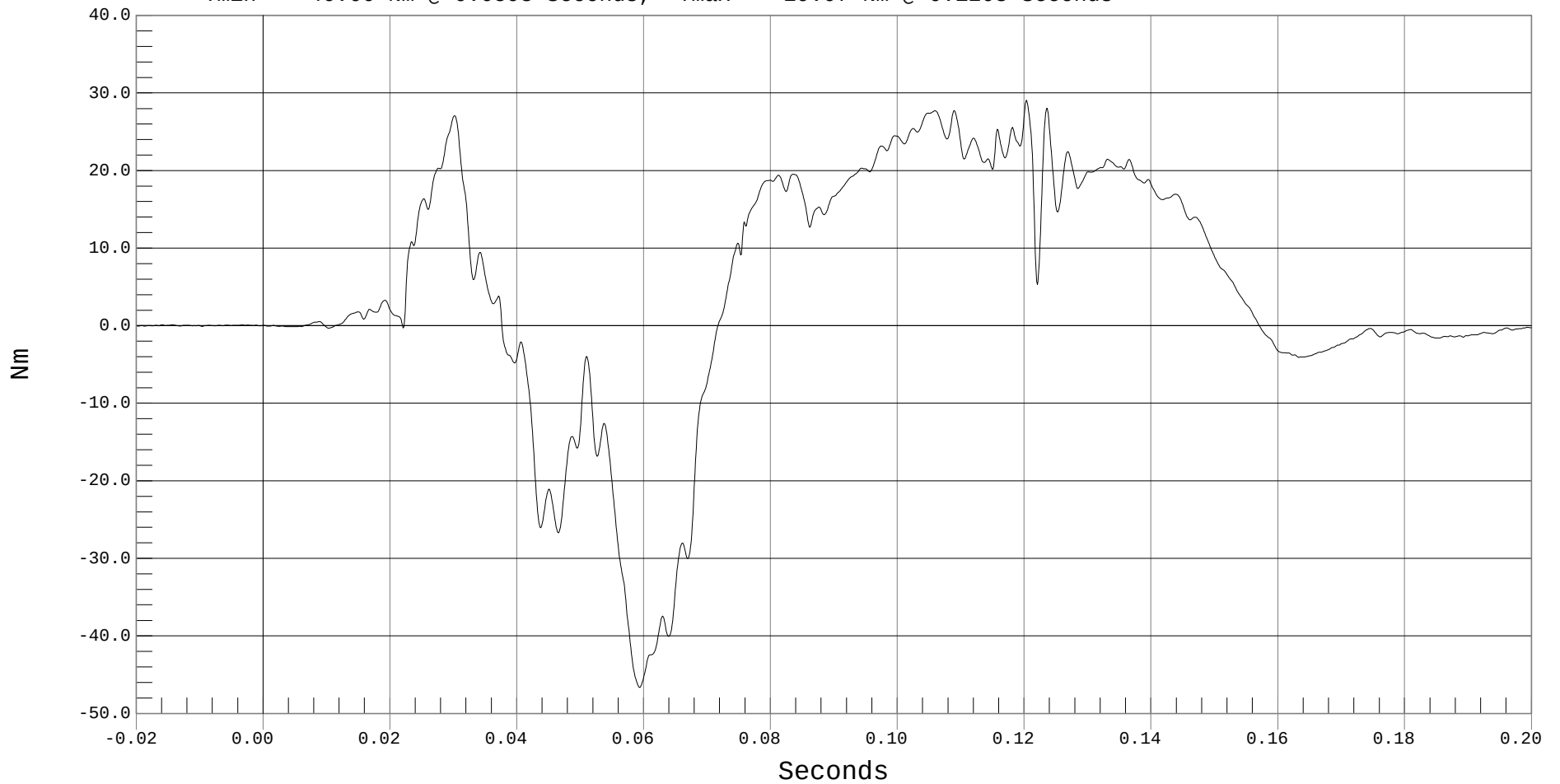
DRIVER RIGHT FEMUR MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR MOMENT Y, B01108MF.M52

Ymin = -46.66 Nm @ 0.0593 Seconds, Ymax = 29.07 Nm @ 0.1203 Seconds





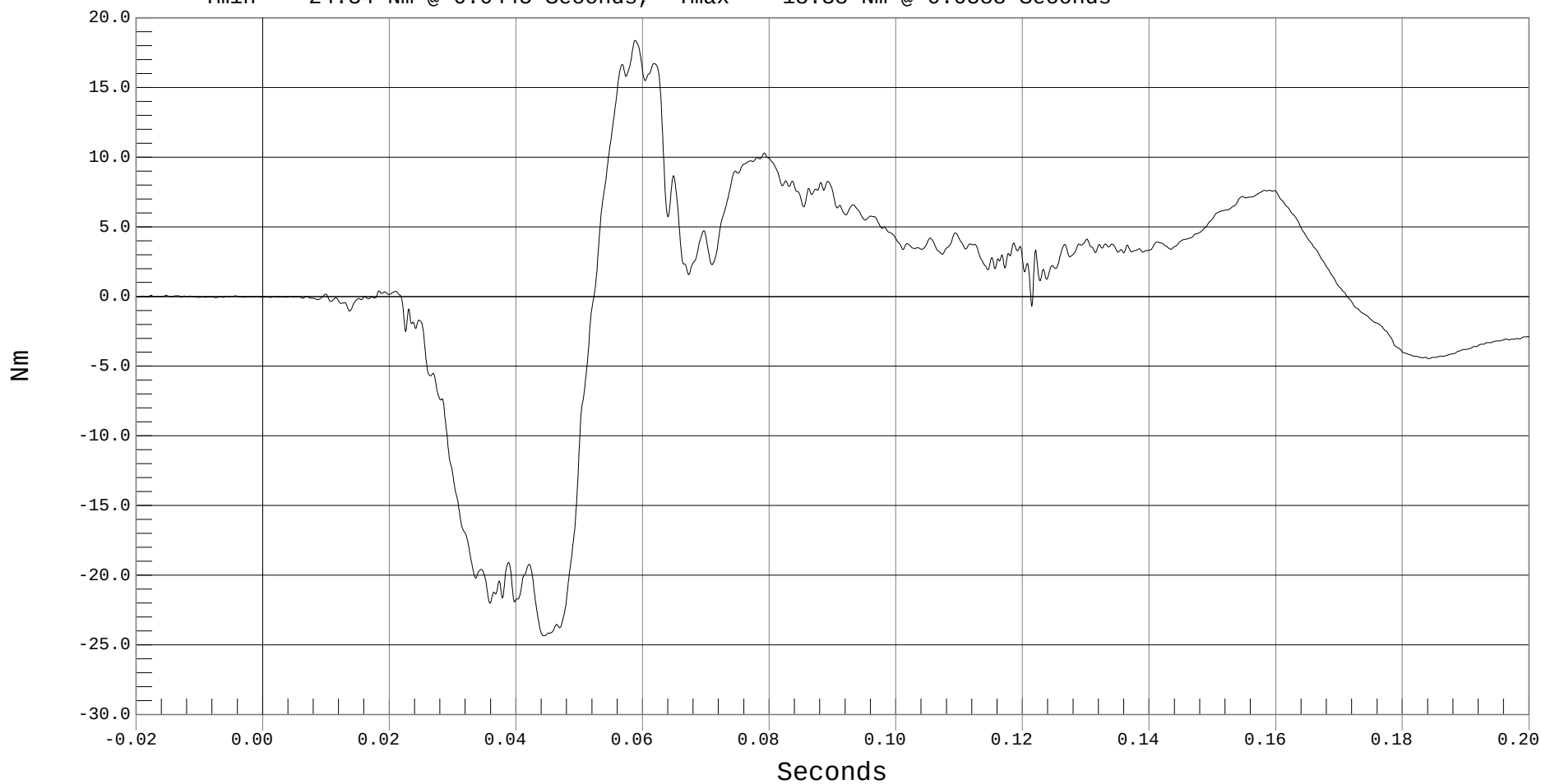
DRIVER RIGHT FEMUR MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR MOMENT Z, B01108MF.M53

Ymin = -24.34 Nm @ 0.0445 Seconds, Ymax = 18.38 Nm @ 0.0588 Seconds





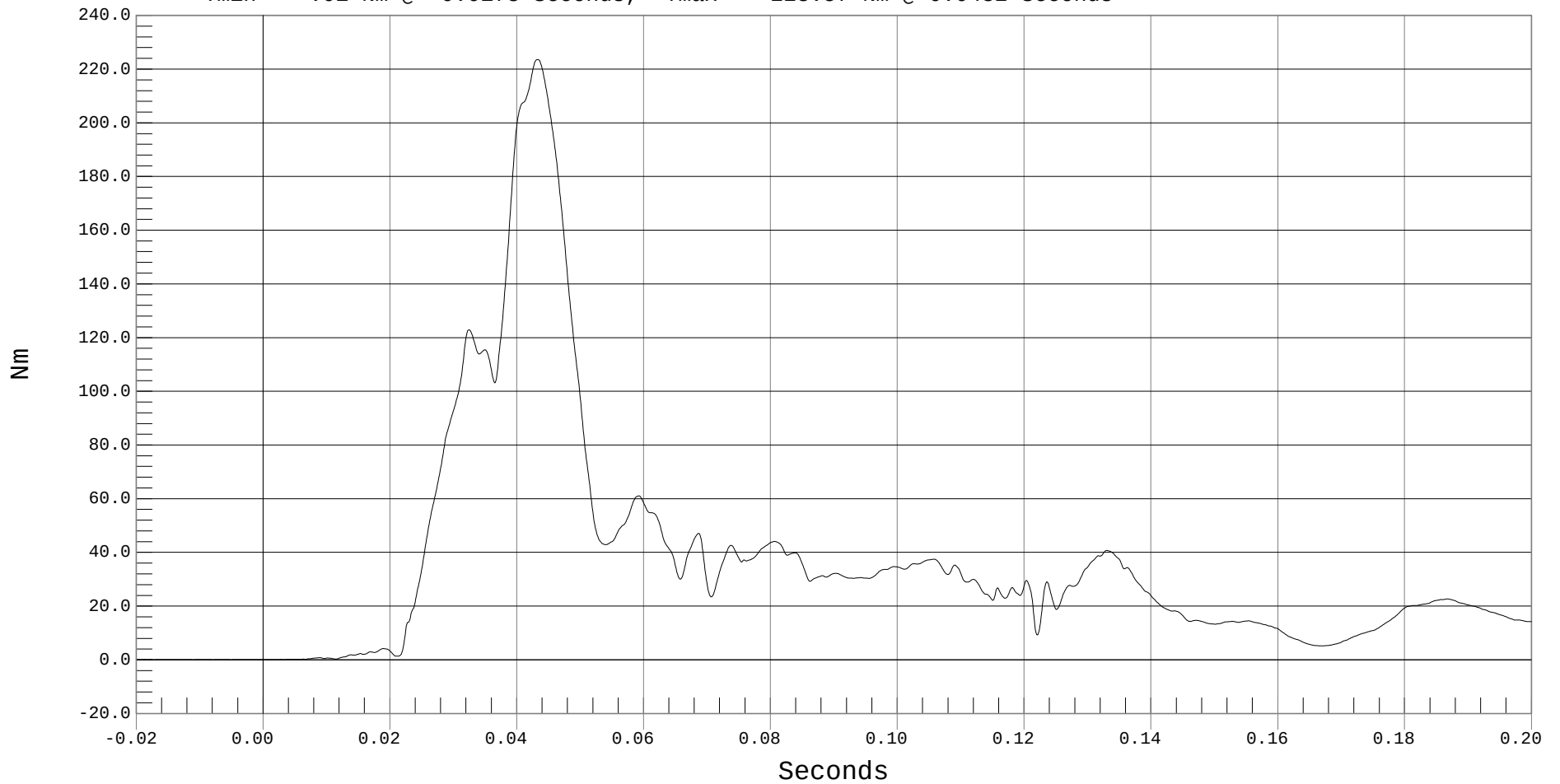
DRIVER RIGHT FEMUR MOMENT RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR MOMENT RESULTANT, B01108MV.M51

Ymin = .01 Nm @ -0.0173 Seconds, Ymax = 223.57 Nm @ 0.0432 Seconds





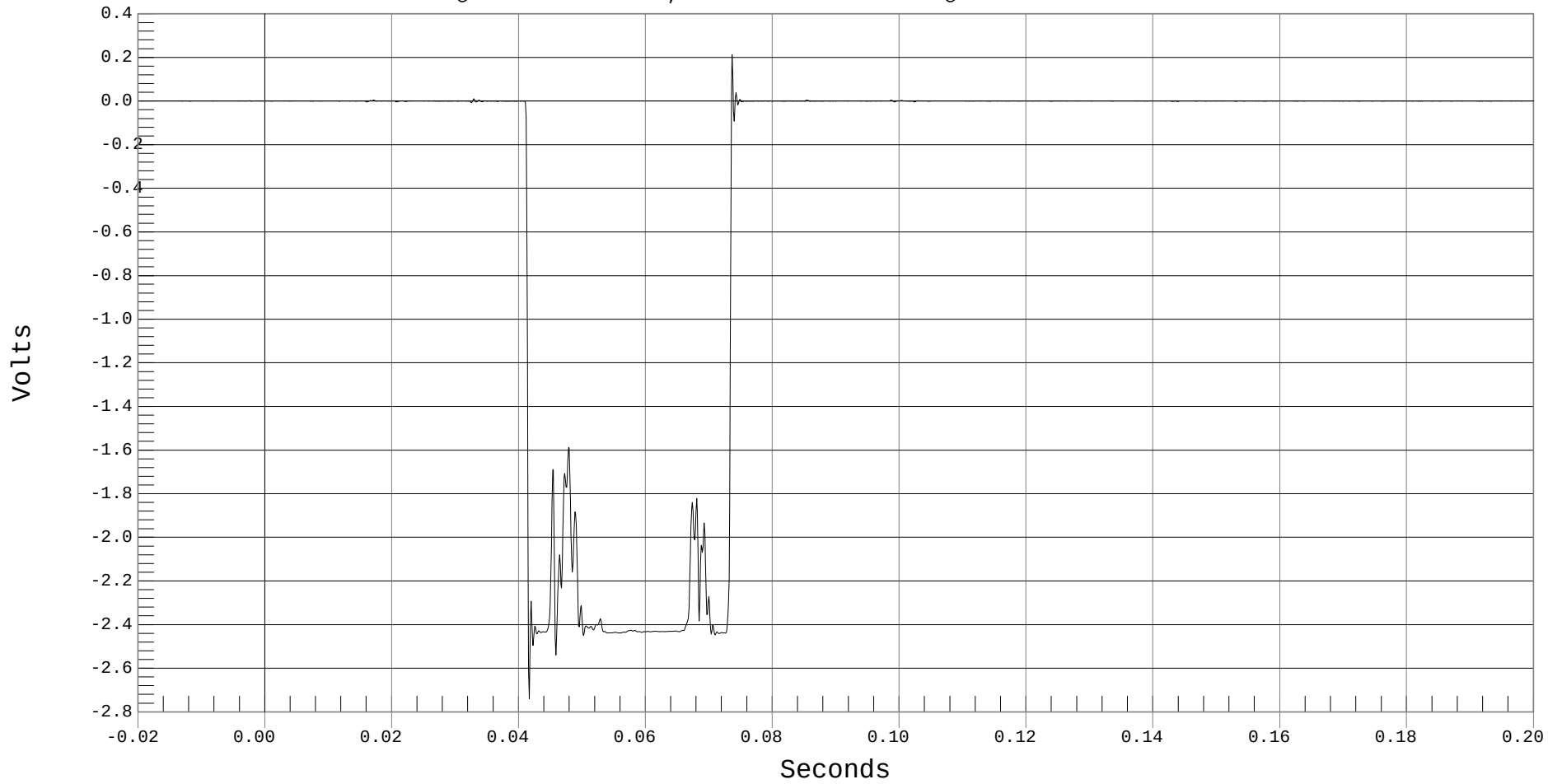
DRIVER HEAD CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER HEAD CONTACT, B011080T.071

Ymin = -2.74 Volts @ 0.0416 Seconds, Ymax = .21 Volts @ 0.0736 Seconds





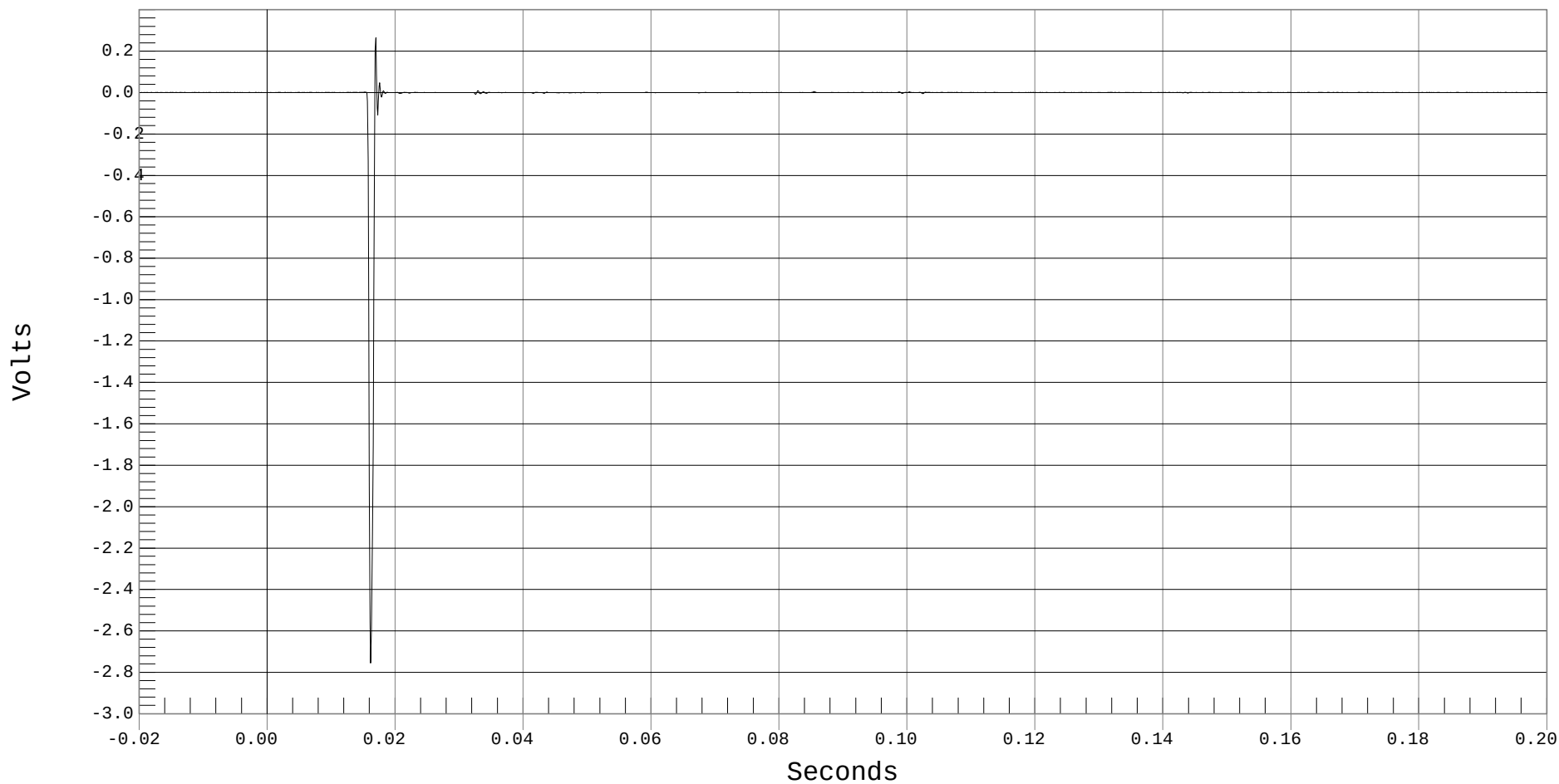
DRIVER ARM CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER ARM CONTACT, B011080T.072

Ymin = -2.75 Volts @ 0.0161 Seconds, Ymax = .26 Volts @ 0.0169 Seconds





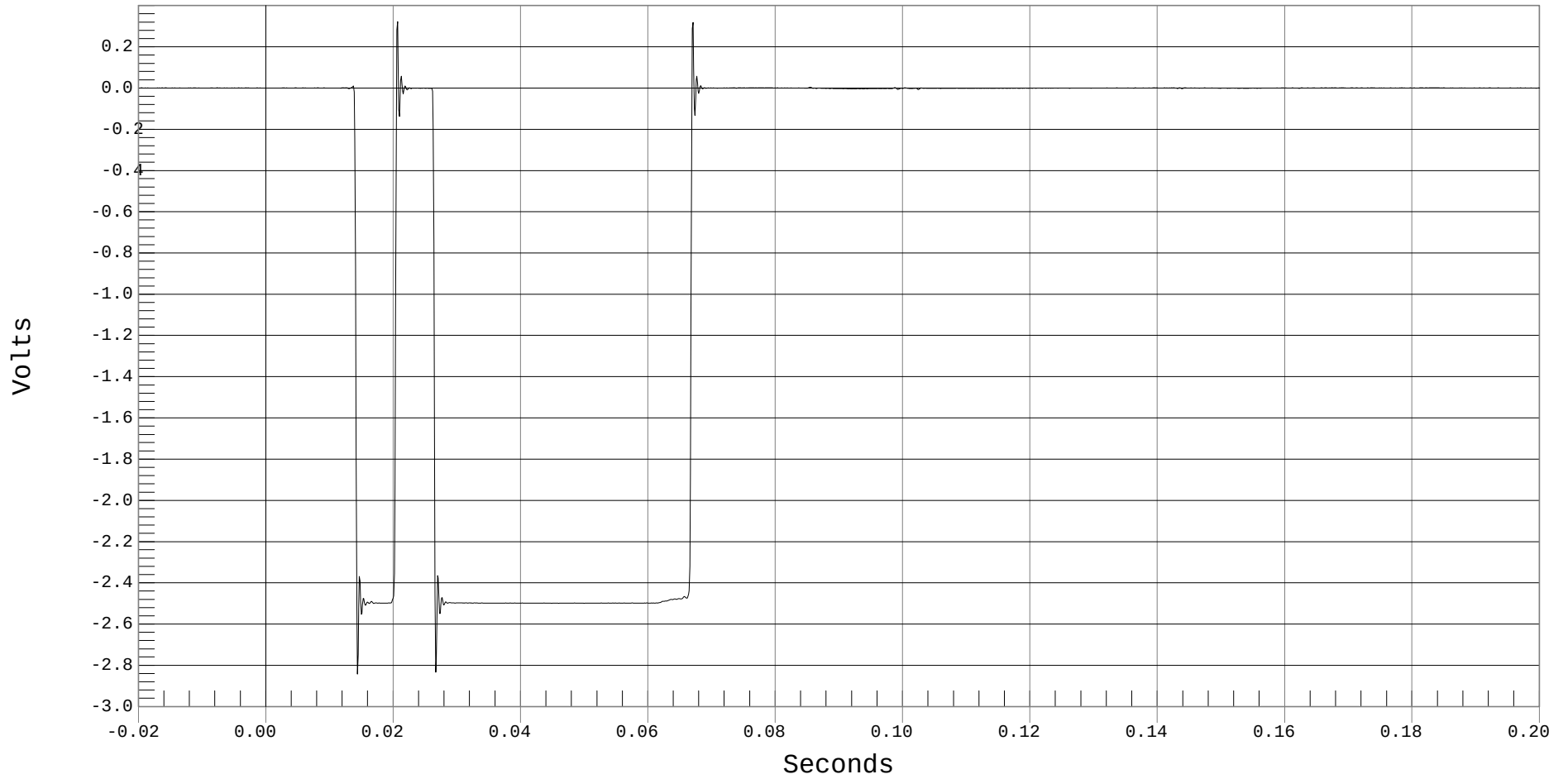
DRIVER RIB CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER RIB CONTACT, B011080T.073

Ymin = -2.84 Volts @ 0.0143 Seconds, Ymax = .32 Volts @ 0.0206 Seconds





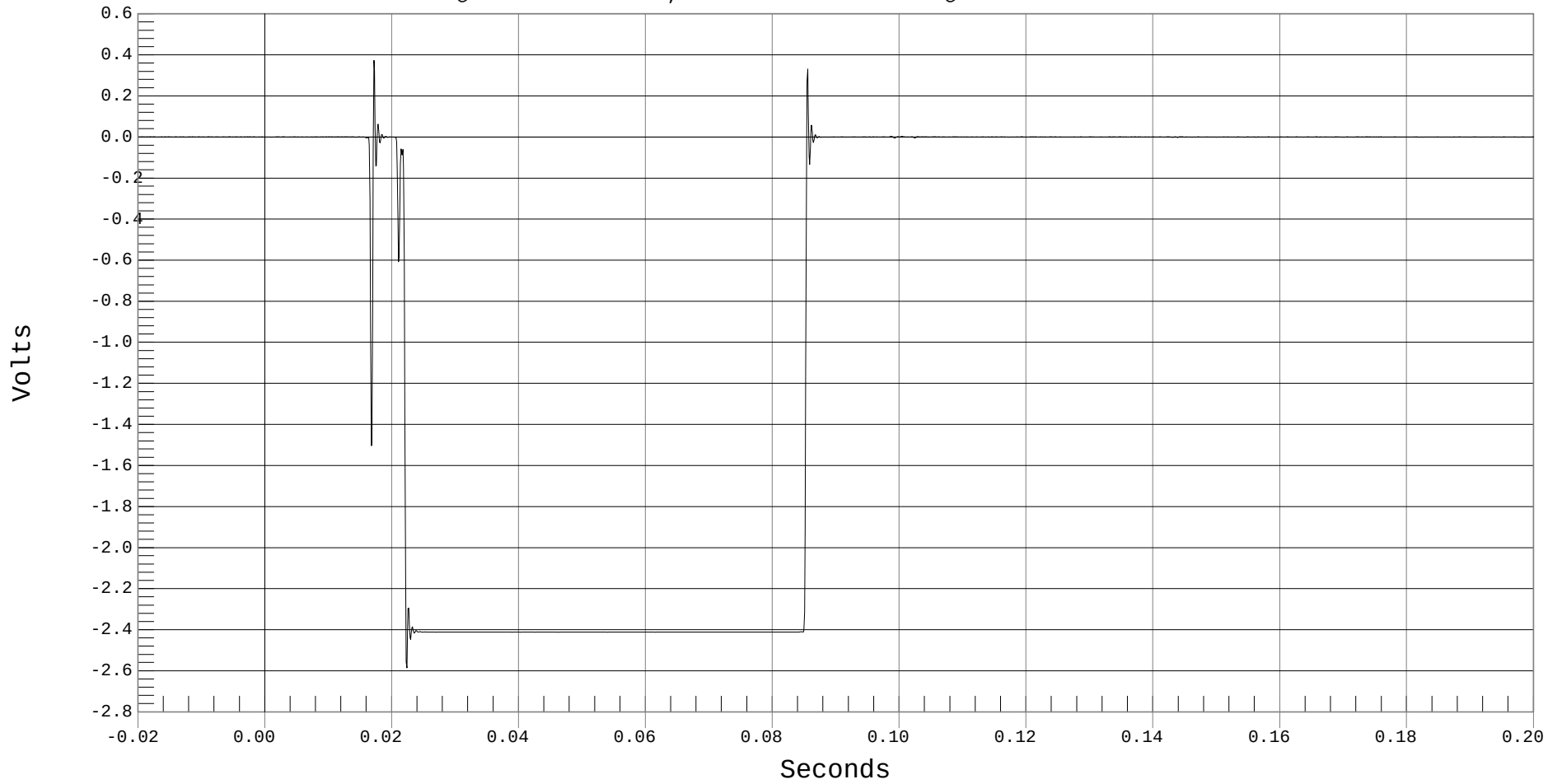
DRIVER PELVIS CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 DRIVER PELVIS CONTACT, B011080T.074

Ymin = -2.59 Volts @ 0.0223 Seconds, Ymax = .37 Volts @ 0.0171 Seconds





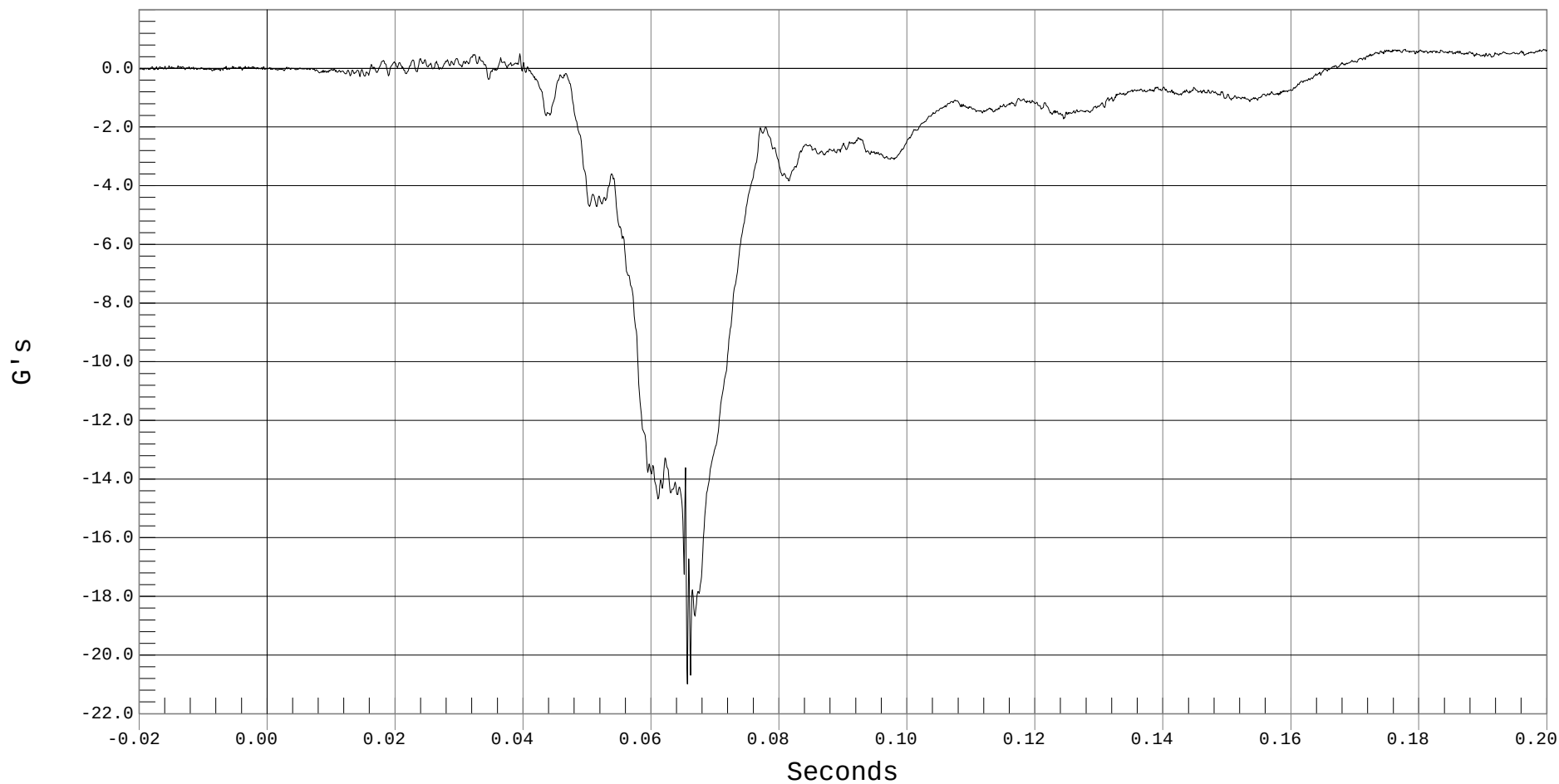
PASSENGER HEAD CG X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER HEAD CG X, B01108AT.A60

Ymin = -20.99 G's @ 0.0656 Seconds, Ymax = .65 G's @ 0.1778 Seconds





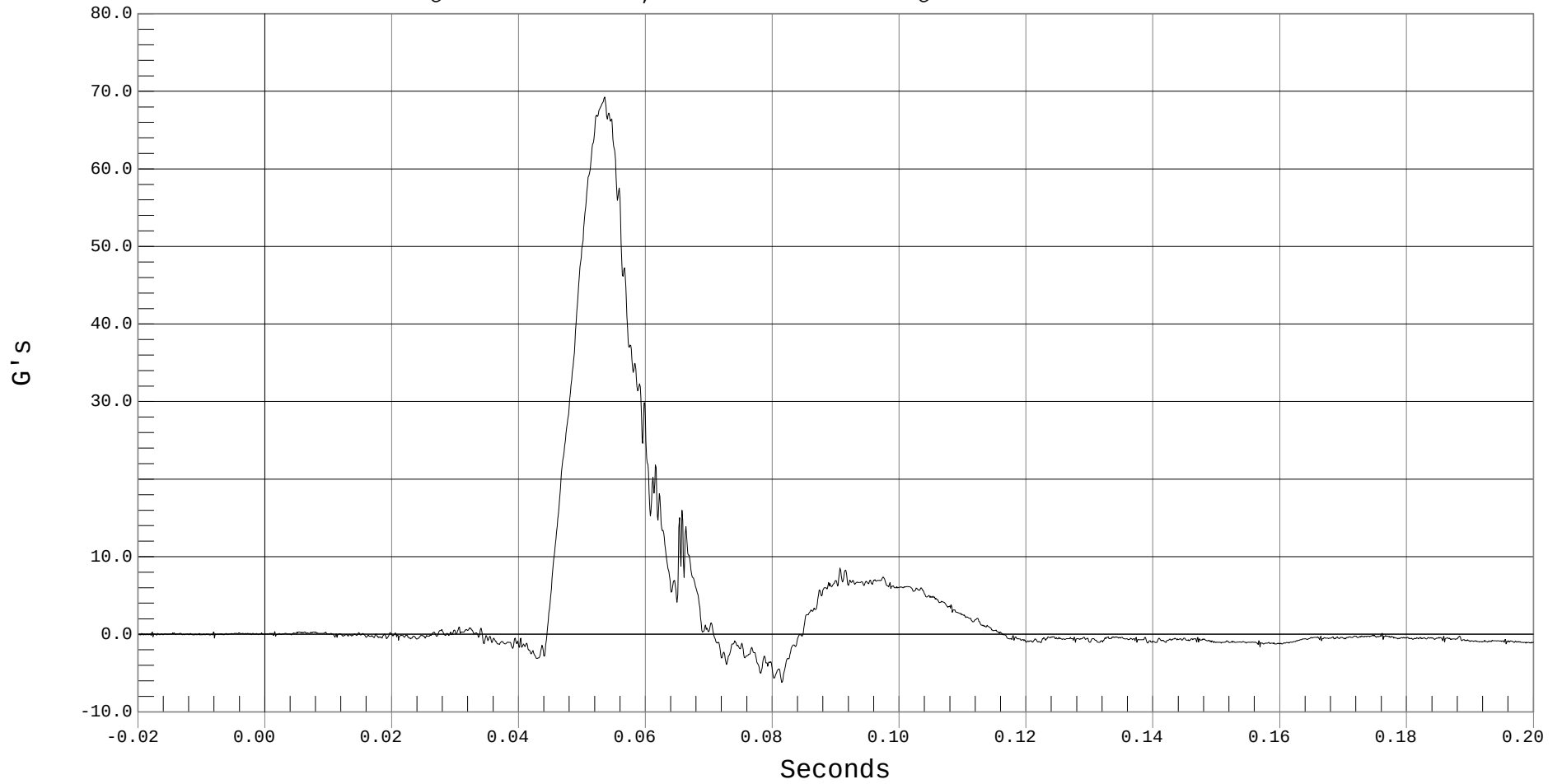
PASSENGER HEAD CG Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER HEAD CG Y, B01108AT.A61

Ymin = -6.22 G's @ 0.0814 Seconds, Ymax = 69.29 G's @ 0.0535 Seconds





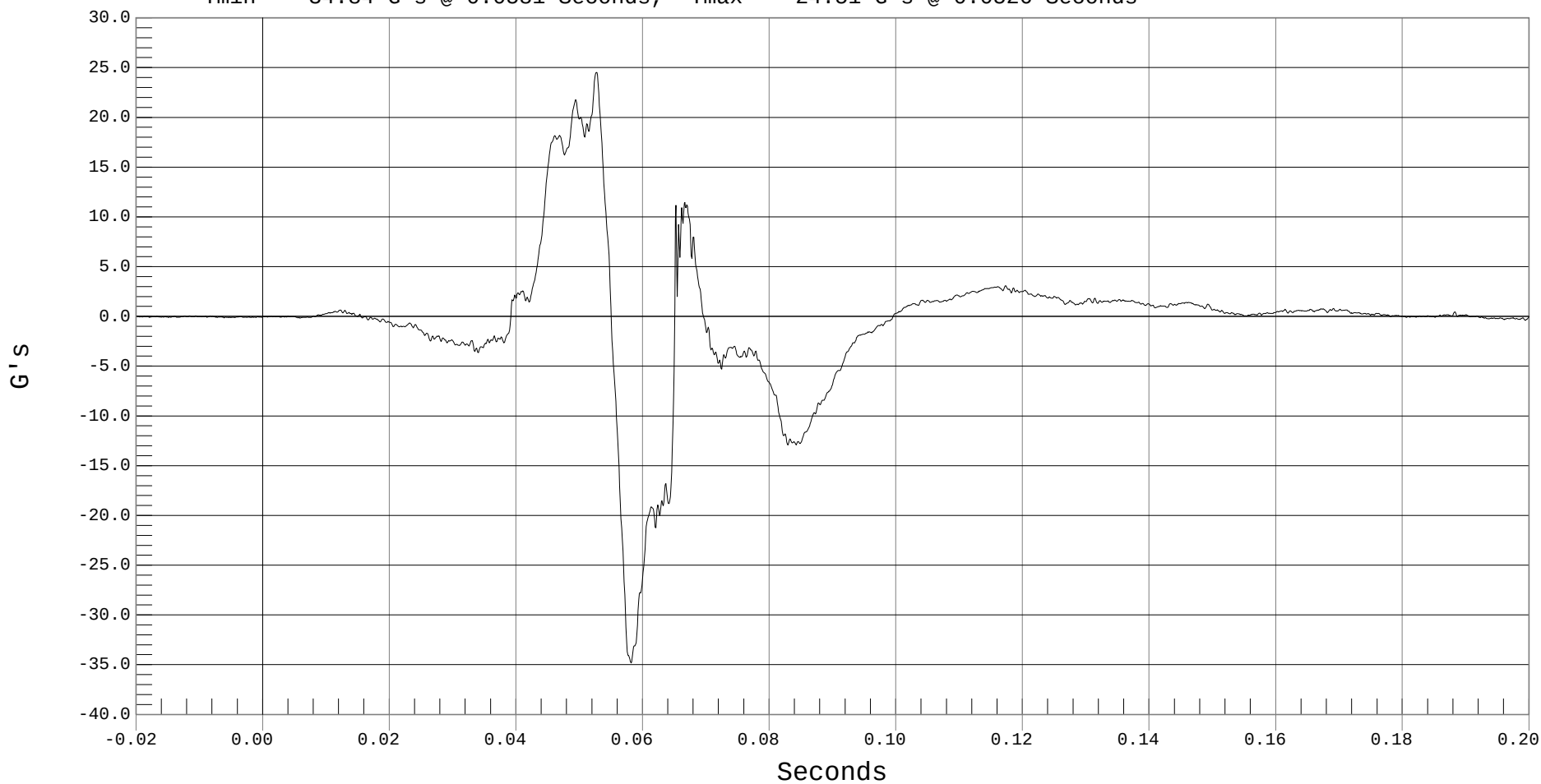
PASSENGER HEAD CG Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER HEAD CG Z, B01108AT.A62

Ymin = -34.84 G's @ 0.0581 Seconds, Ymax = 24.51 G's @ 0.0526 Seconds





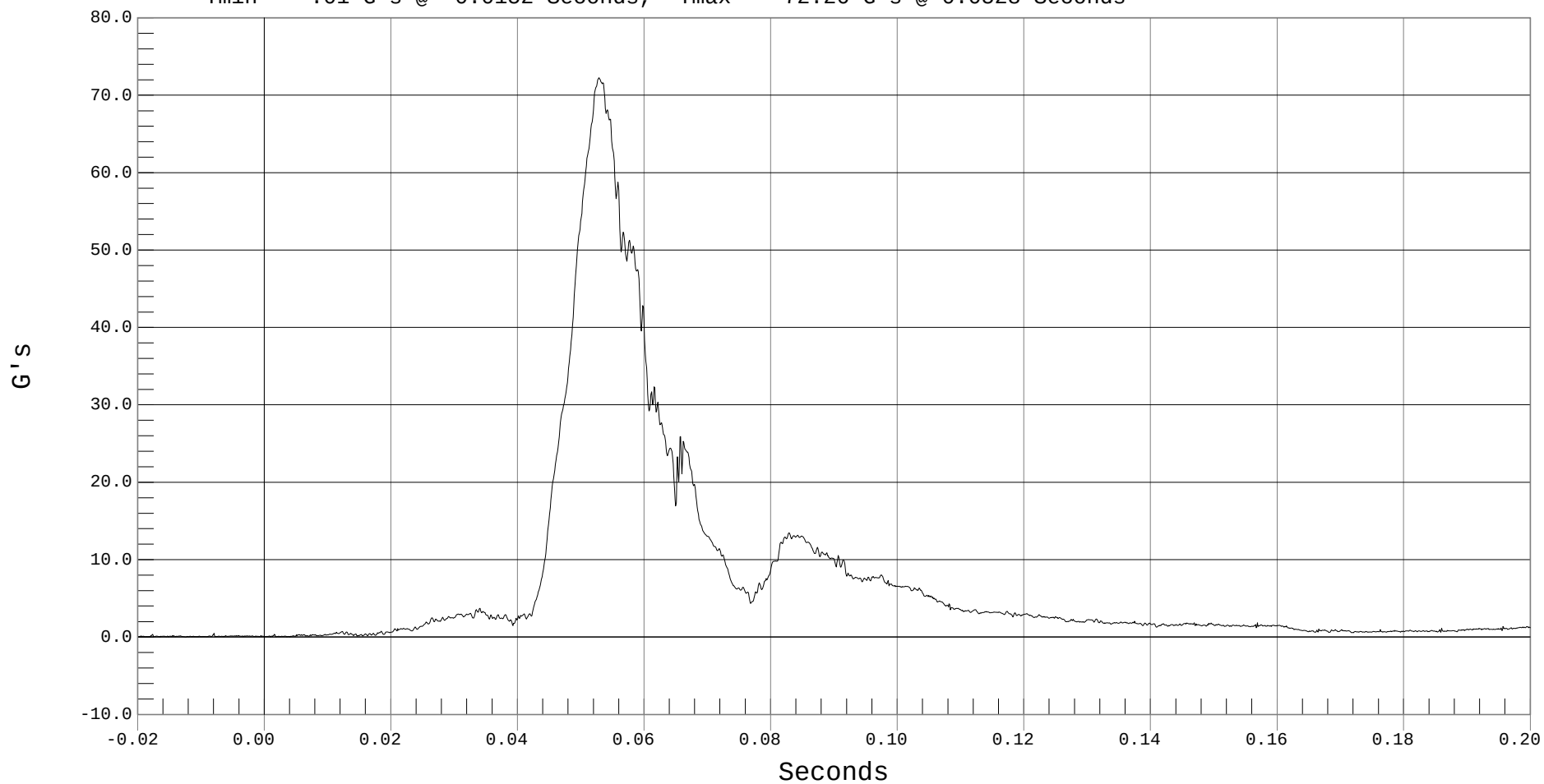
PASSENGER HEAD CG RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 PASSENGER HEAD RESULTANT, B01108AV.A60

Ymin = .01 G's @ -0.0152 Seconds, Ymax = 72.26 G's @ 0.0528 Seconds





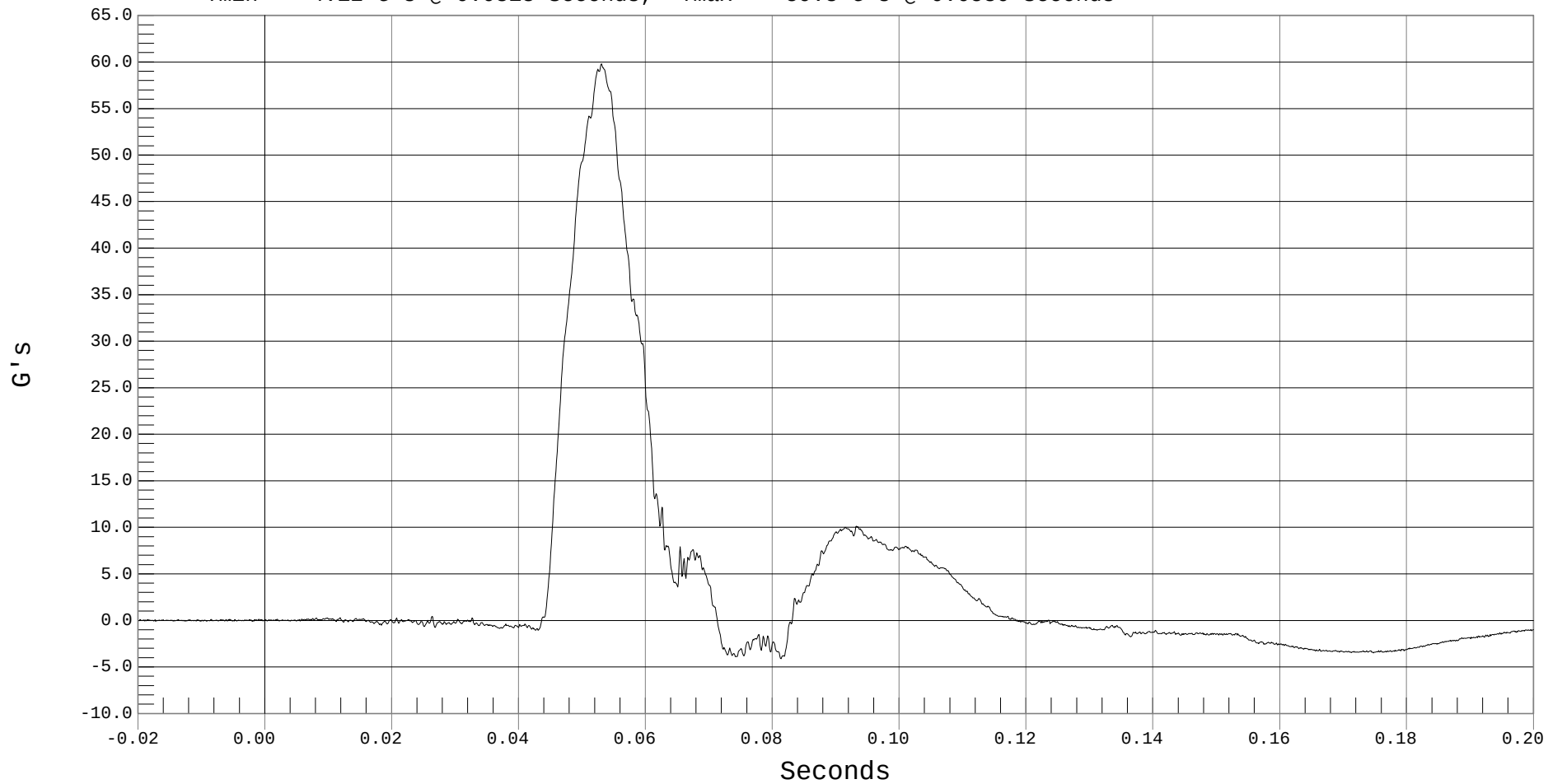
PASSENGER HEAD FRONT Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER HEAD FRONT Y, B01108AT.A65

Ymin = -4.12 G's @ 0.0813 Seconds, Ymax = 59.8 G's @ 0.0530 Seconds





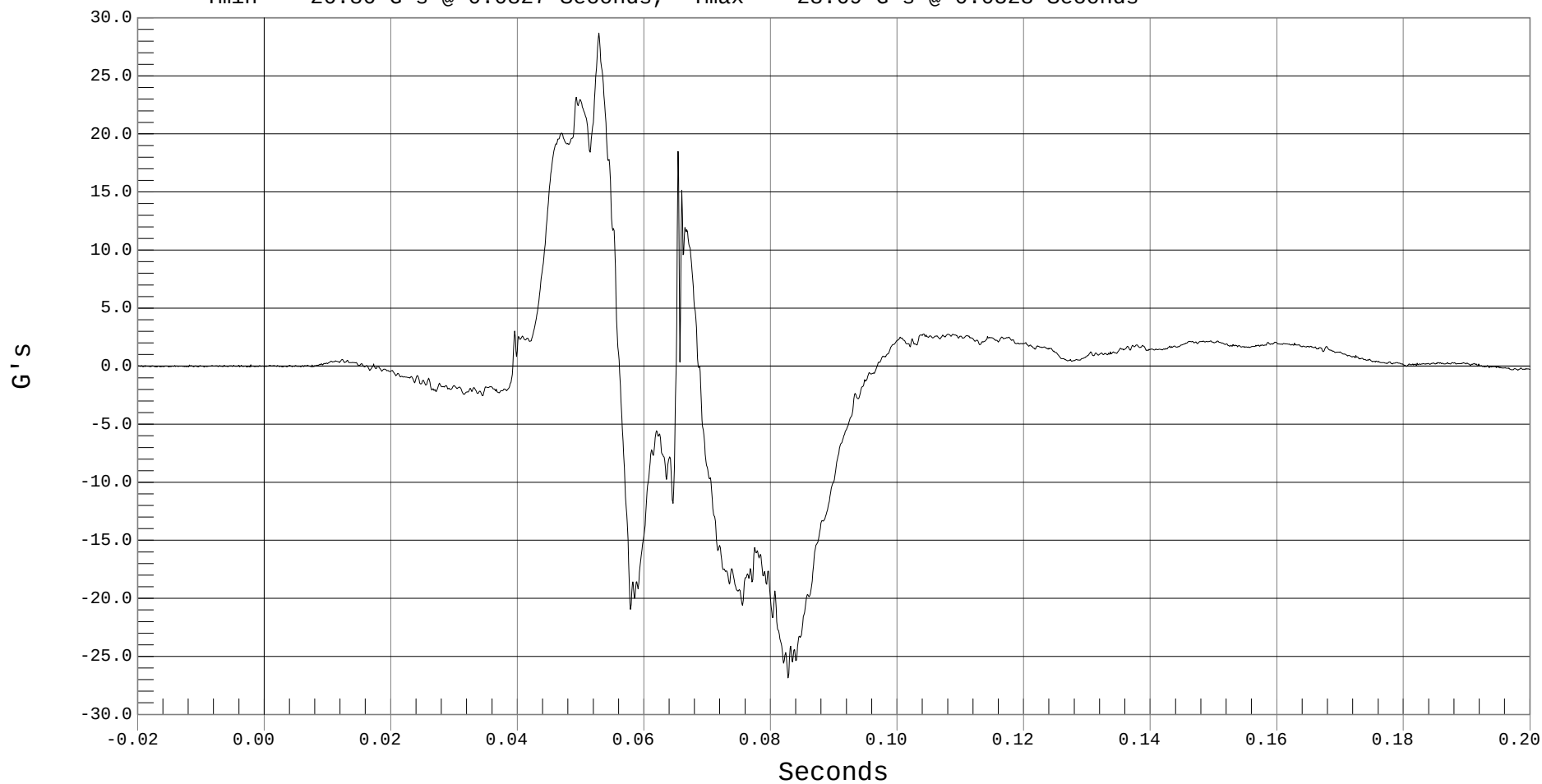
PASSENGER HEAD FRONT Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER HEAD FRONT Z, B01108AT.A66

Ymin = -26.86 G's @ 0.0827 Seconds, Ymax = 28.69 G's @ 0.0528 Seconds





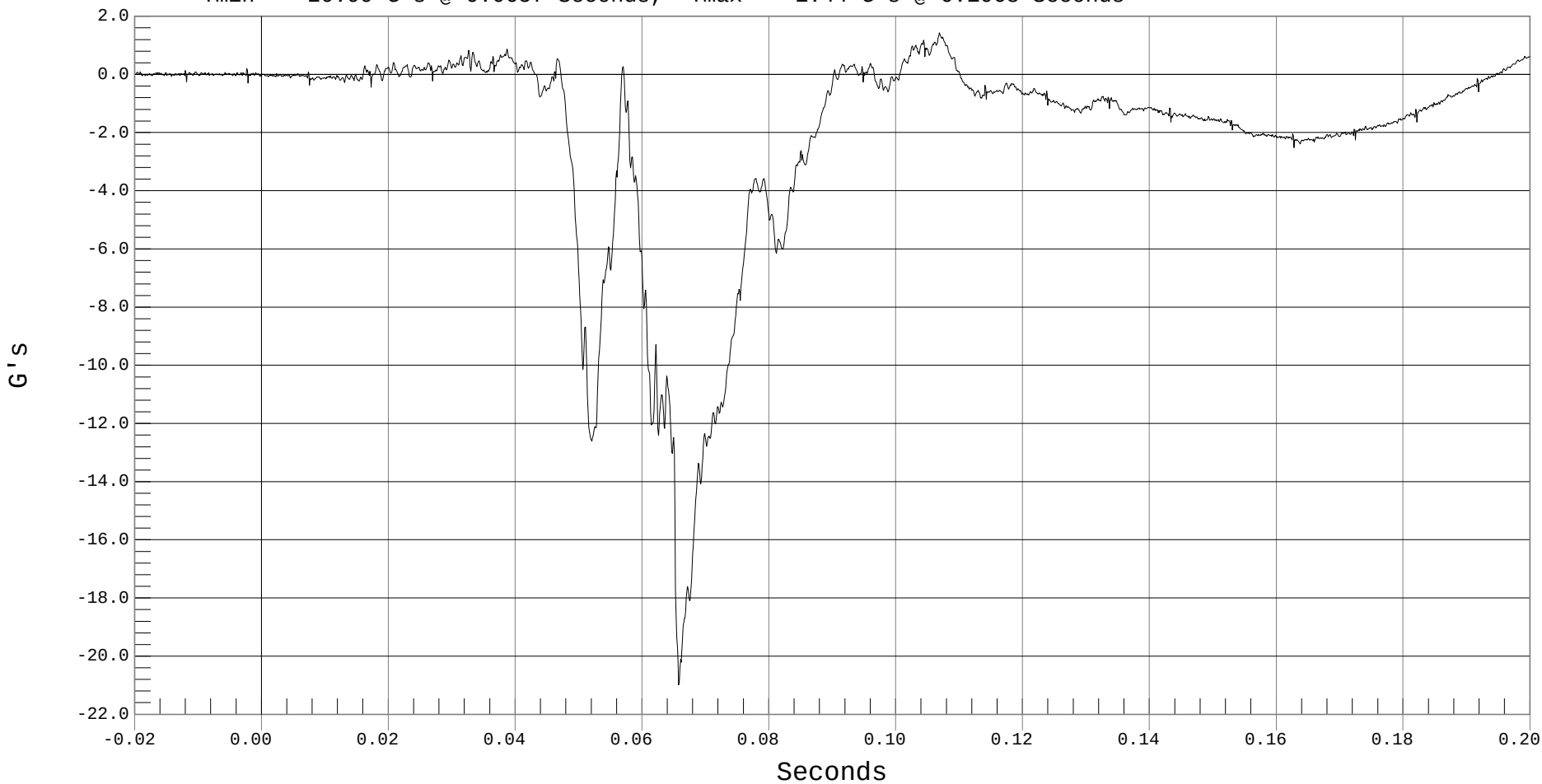
PASSENGER HEAD LEFT X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER HEAD LEFT X, B01108AT.A67

Ymin = -20.99 G's @ 0.0657 Seconds, Ymax = 1.44 G's @ 0.1068 Seconds





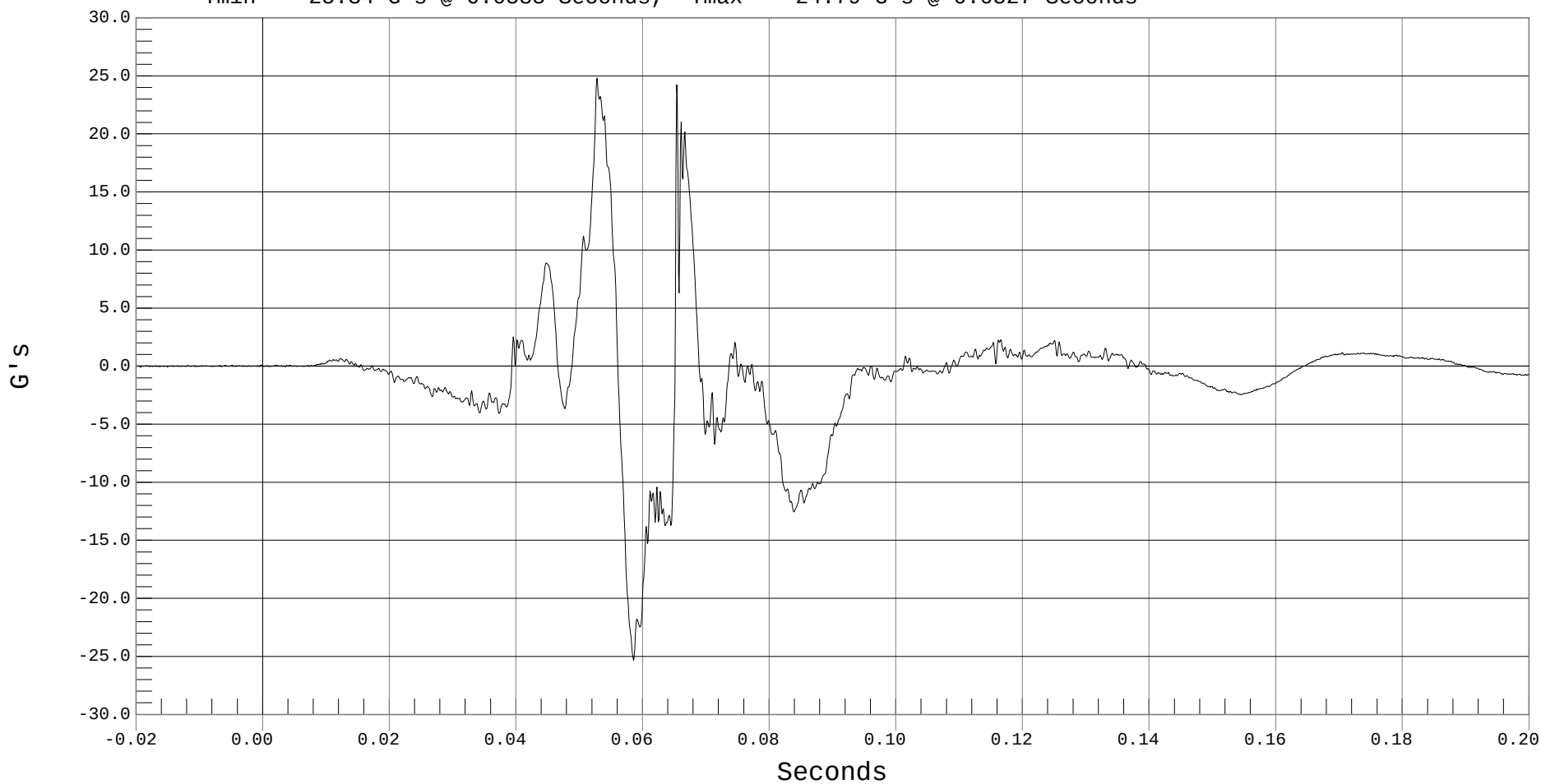
PASSENGER HEAD LEFT Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER HEAD LEFT Z, B01108AT.A68

Ymin = -25.34 G's @ 0.0585 Seconds, Ymax = 24.79 G's @ 0.0527 Seconds





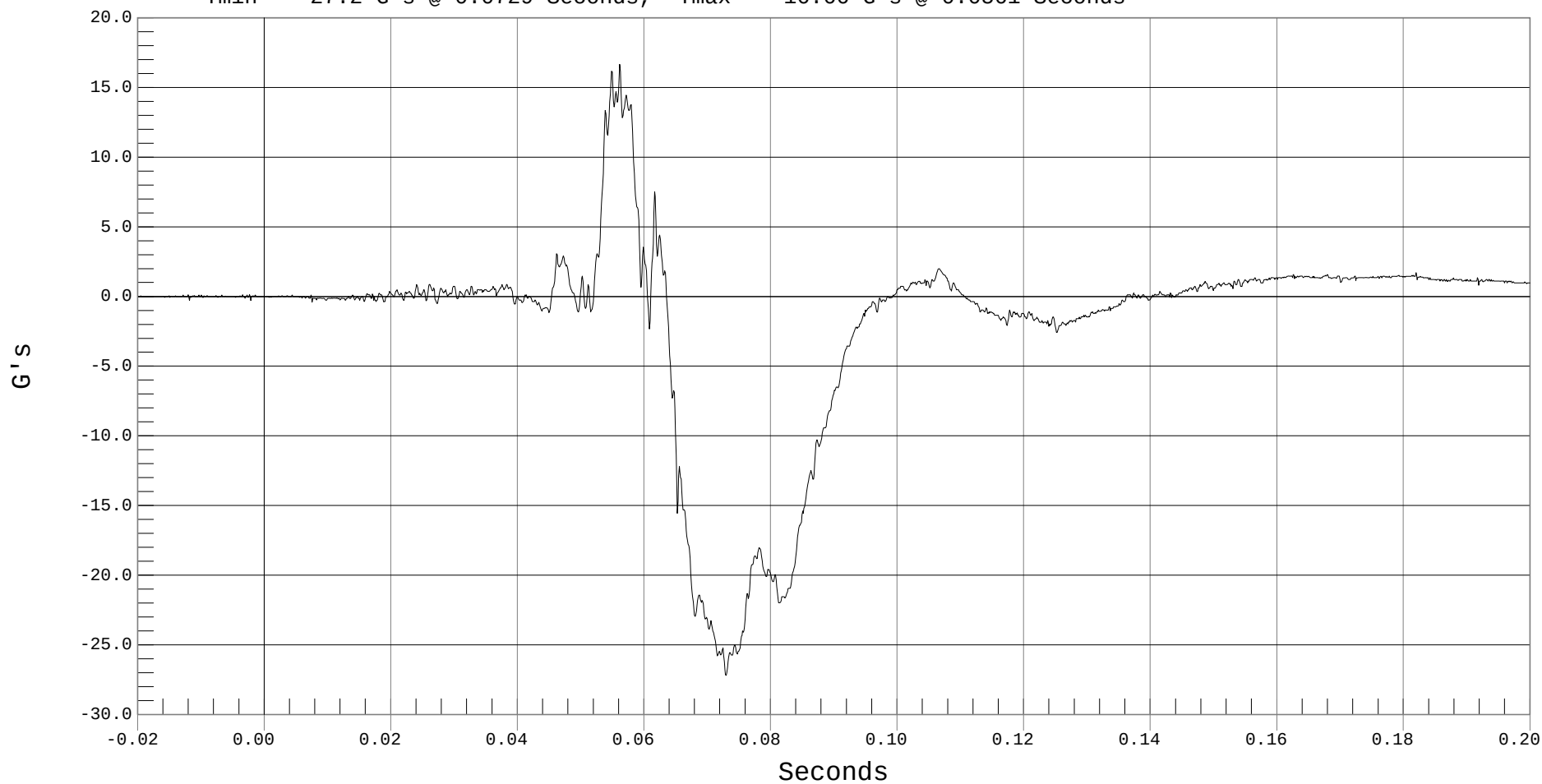
PASSENGER HEAD TOP X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER HEAD TOP X, B01108AT.A69

Ymin = -27.2 G's @ 0.0729 Seconds, Ymax = 16.66 G's @ 0.0561 Seconds





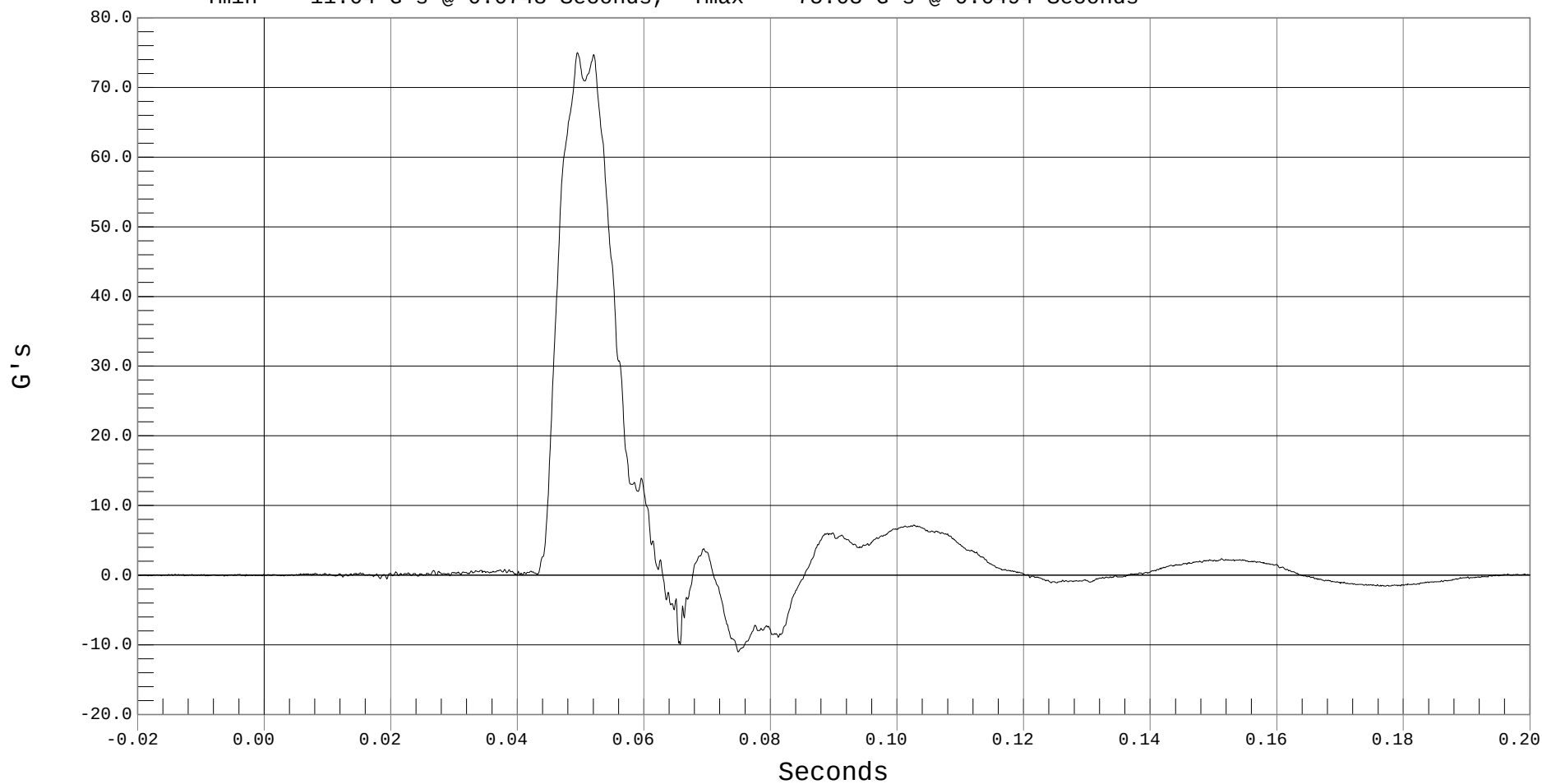
PASSENGER HEAD TOP Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENEGR HEAD TOP Y, B01108AT.A70

Ymin = -11.04 G's @ 0.0748 Seconds, Ymax = 75.03 G's @ 0.0494 Seconds





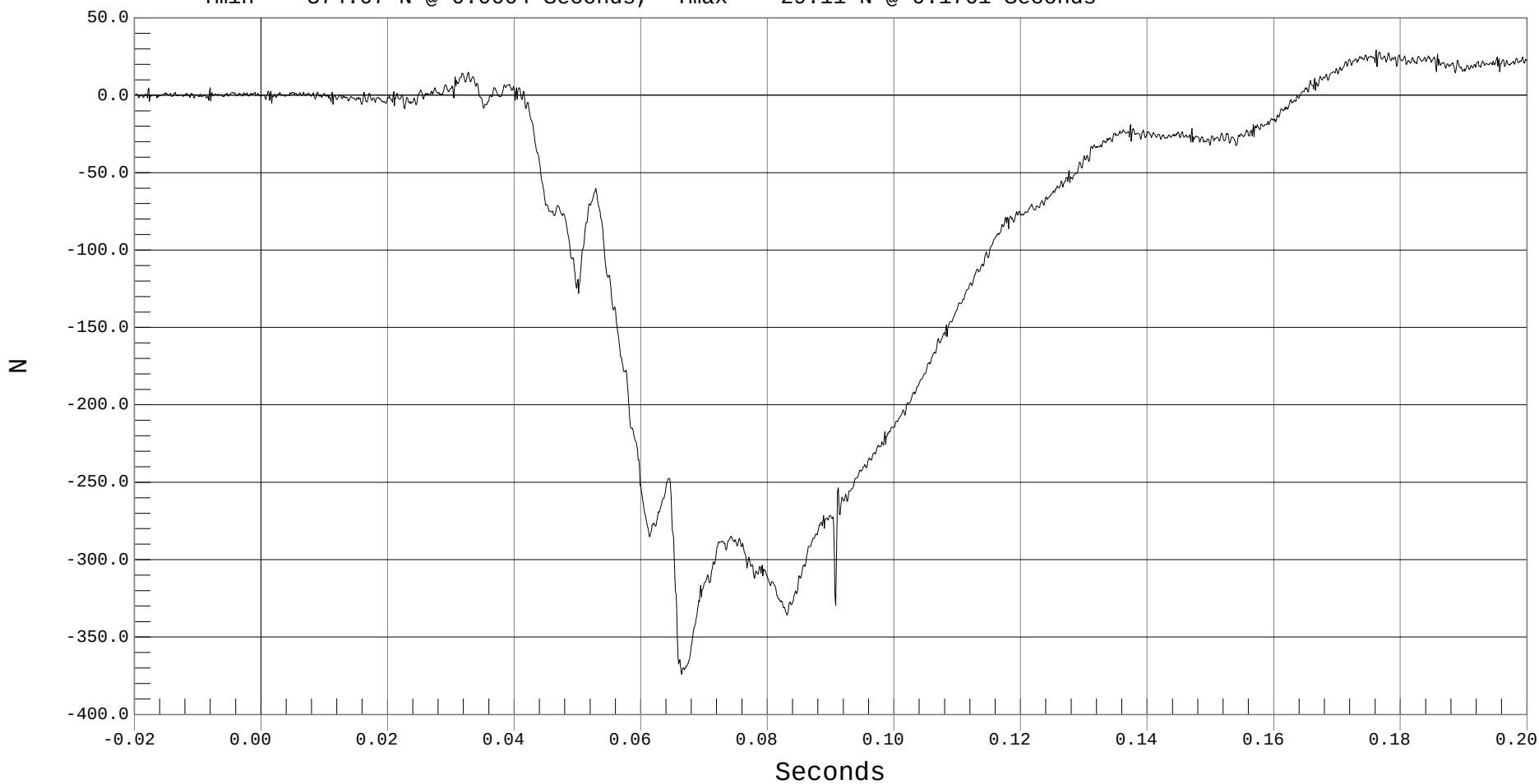
PASSENGER UPPER NECK FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER UPPER NECK FORCE X, B01108FT.F63

Ymin = -374.07 N @ 0.0664 Seconds, Ymax = 29.11 N @ 0.1761 Seconds





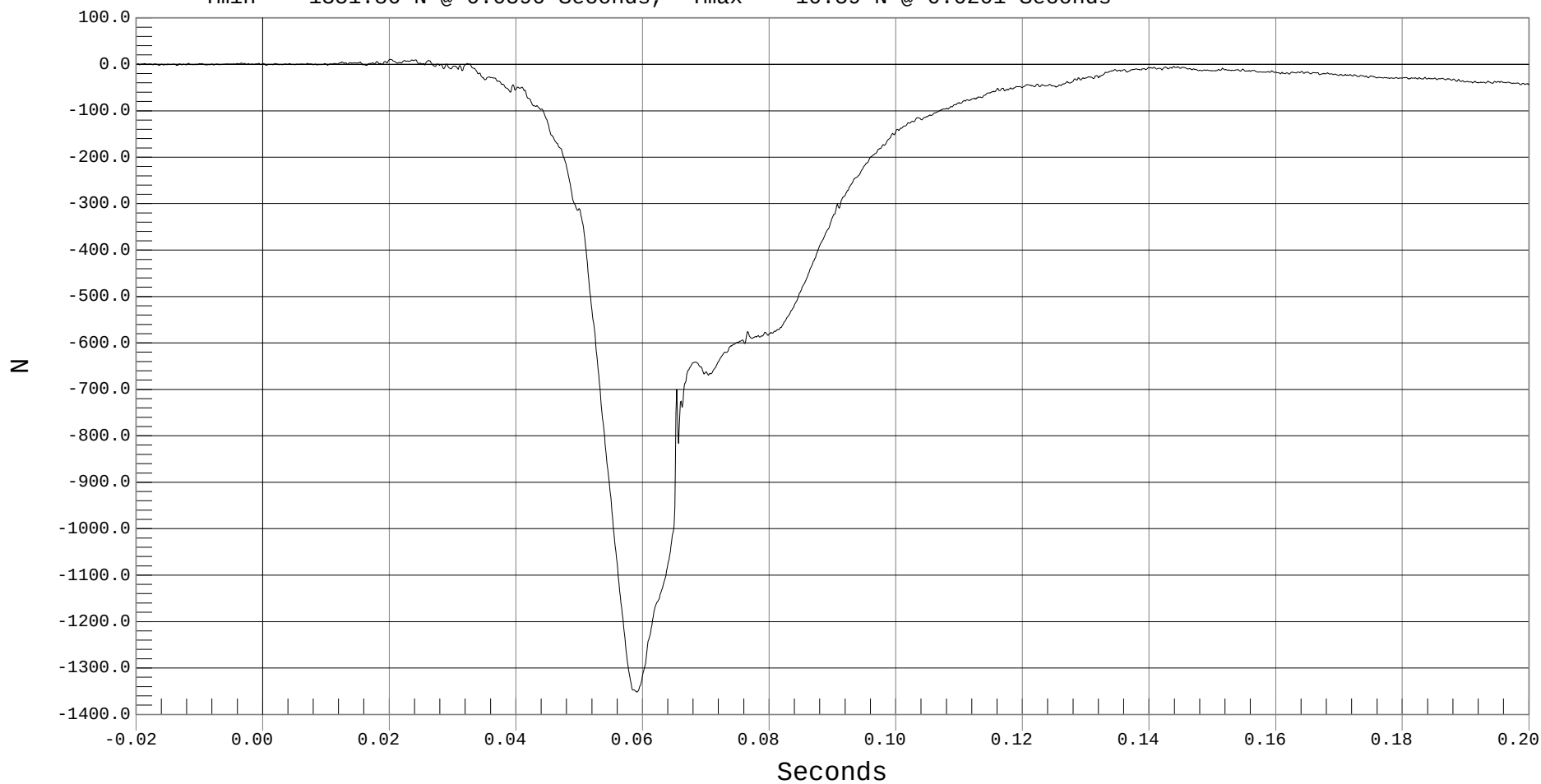
PASSENGER UPPER NECK FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

1 REAR PASSENGER UPPER NECK FORCE Y, B01108FT.F65

Ymin = -1351.86 N @ 0.0590 Seconds, Ymax = 10.59 N @ 0.0201 Seconds





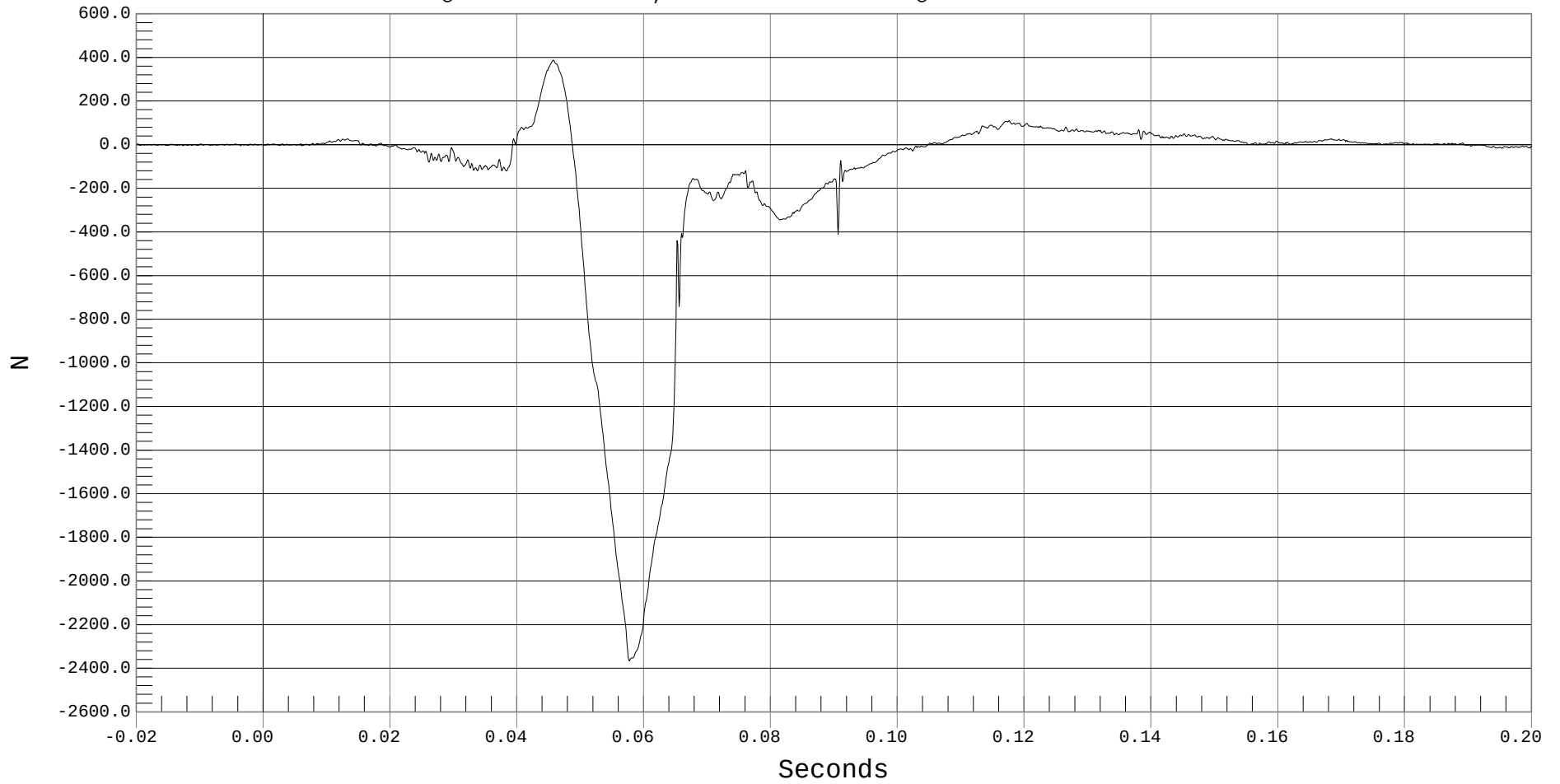
PASSENGER UPPER NECK FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

1 REAR PASSENGER UPPER NECK FORCE Z, B01108FT.F66

Ymin = -2367.04 N @ 0.0577 Seconds, Ymax = 386.97 N @ 0.0457 Seconds





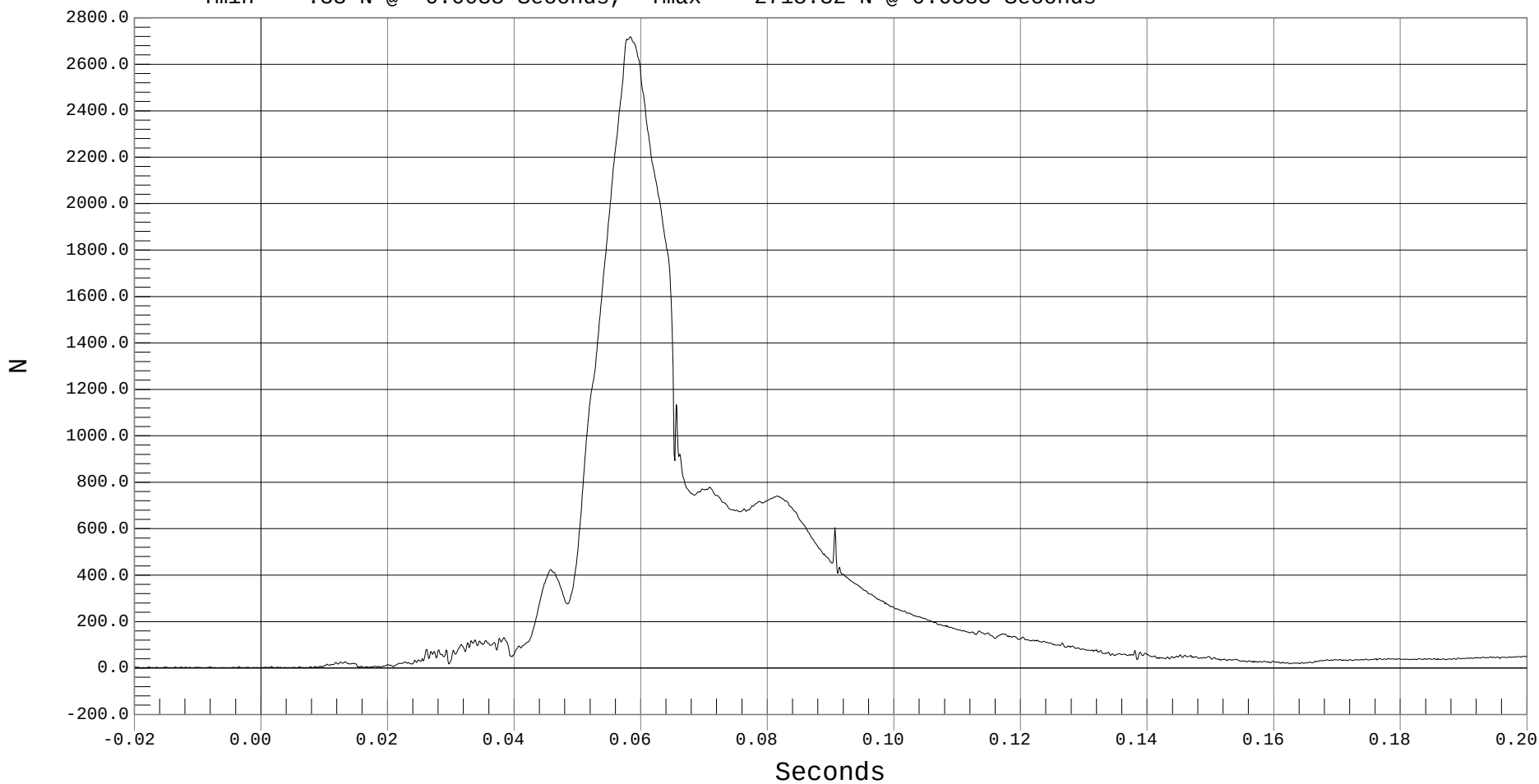
PASSENGER UPPER NECK FORCE RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 PASSENGER UPPER NECK FORCE RESULTANT, B01108FV.F63

Ymin = .33 N @ -0.0038 Seconds, Ymax = 2718.32 N @ 0.0583 Seconds





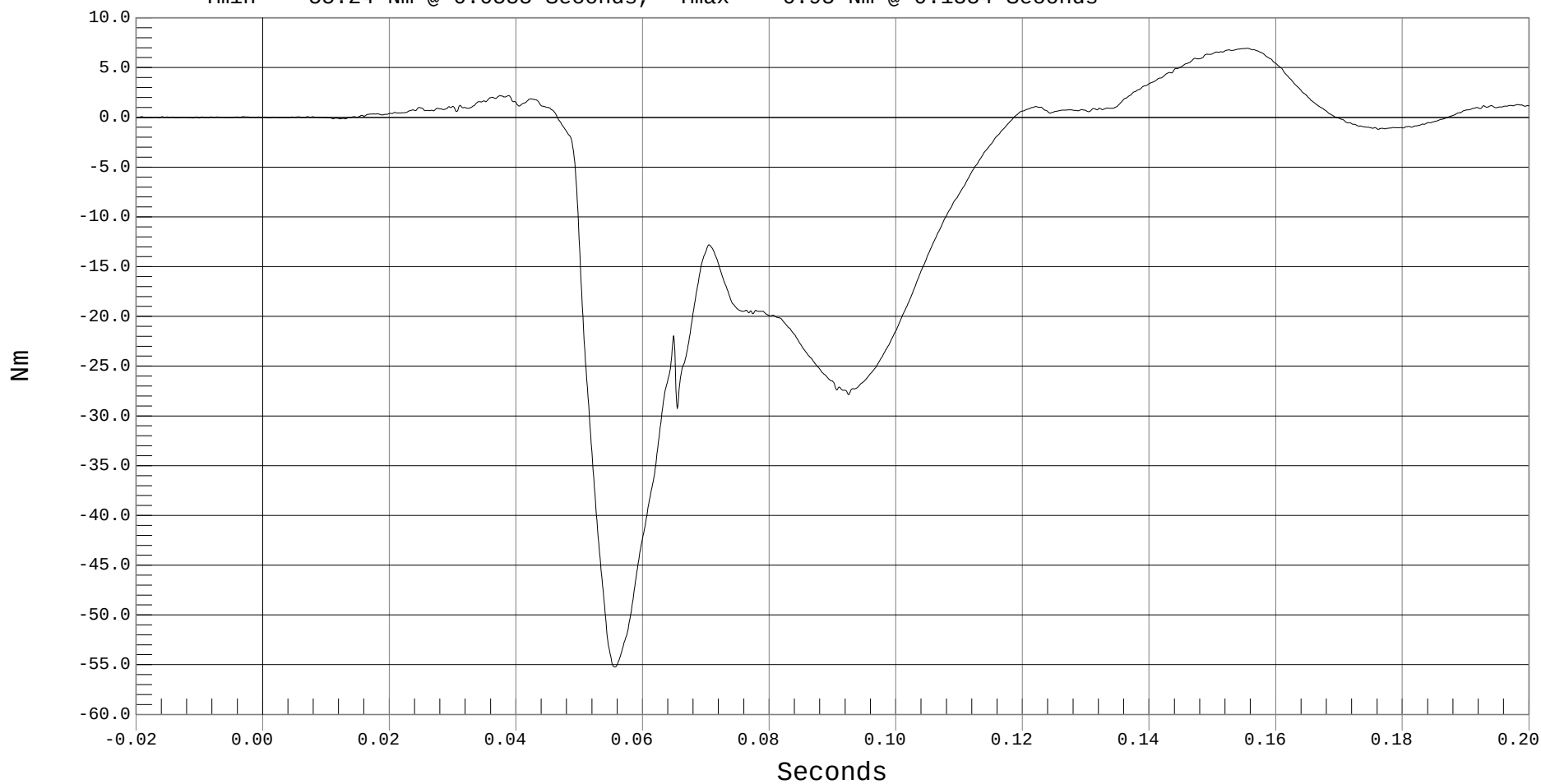
PASSENGER UPPER NECK MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER UPPER NECK MOMENT X, B01108MF.M67

Ymin = -55.24 Nm @ 0.0555 Seconds, Ymax = 6.95 Nm @ 0.1554 Seconds





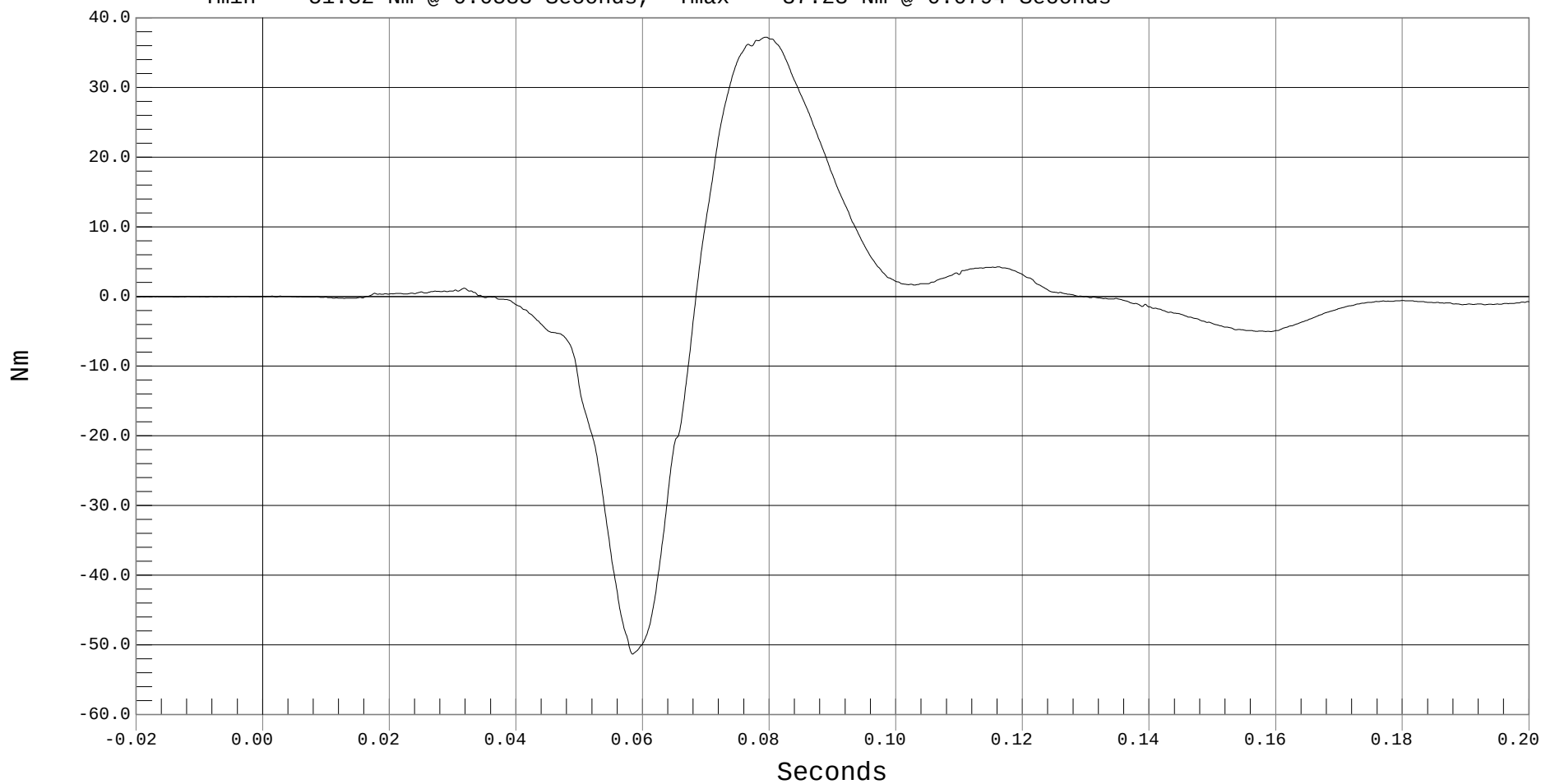
PASSENGER UPPER NECK MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER UPPER NECK MOMENT Y, B01108MF.M68

Ymin = -51.32 Nm @ 0.0583 Seconds, Ymax = 37.23 Nm @ 0.0794 Seconds





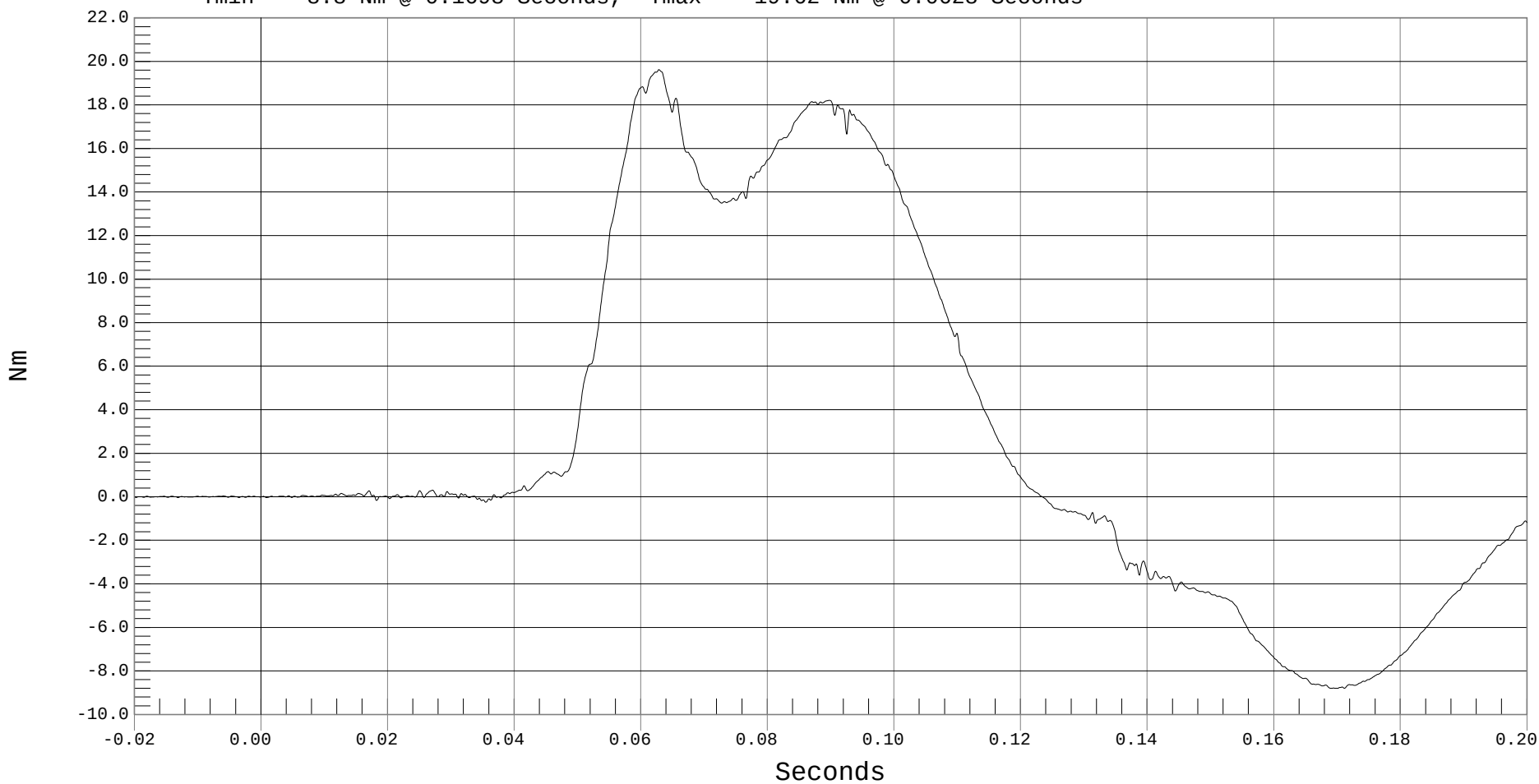
PASSENGER UPPER NECK MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER UPPER NECK MOMENT Z, B01108MF.M69

Ymin = -8.8 Nm @ 0.1698 Seconds, Ymax = 19.62 Nm @ 0.0628 Seconds





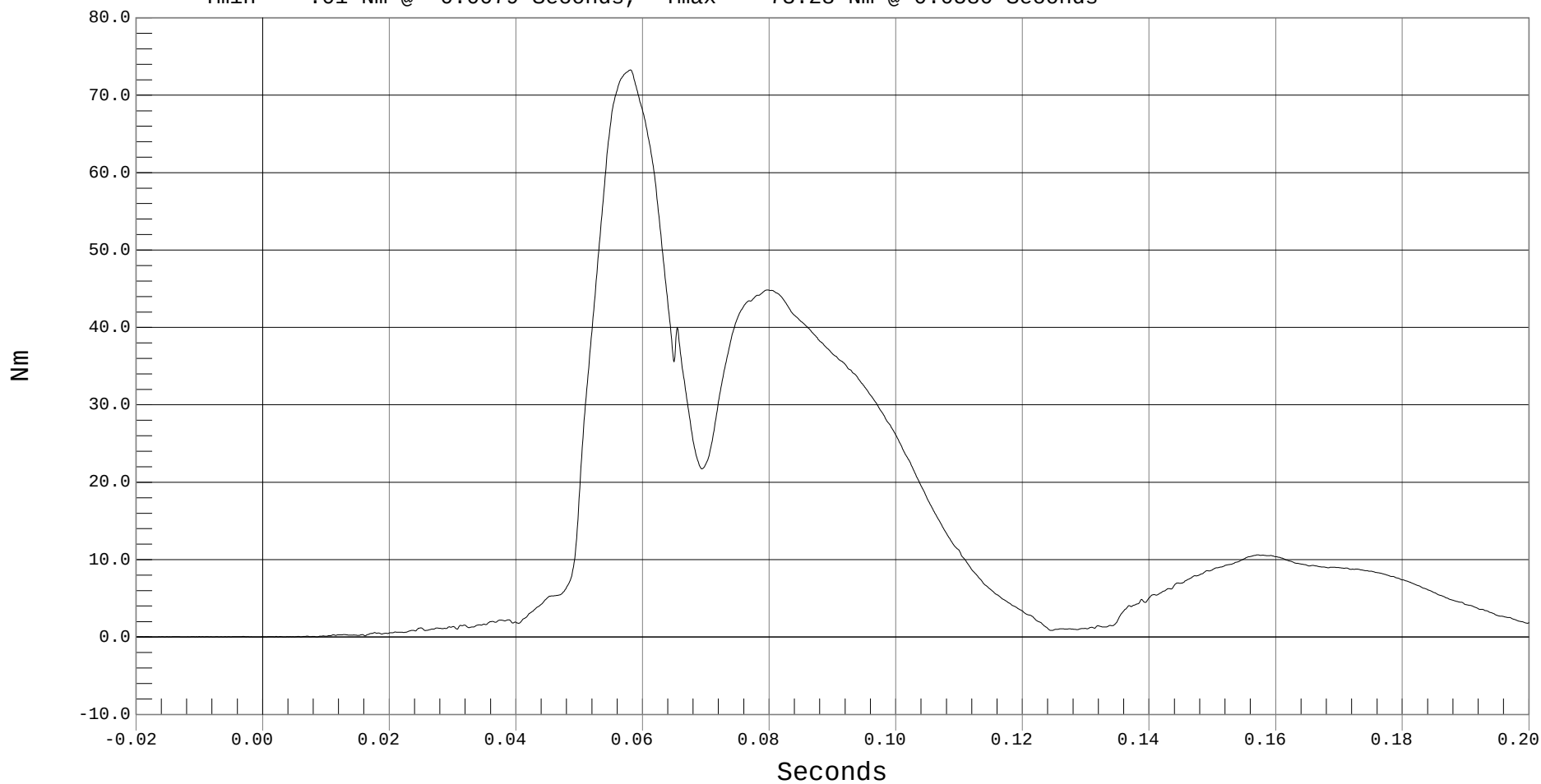
PASSENGER UPPER NECK MOMENT RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 PASSENGER UPPER NECK MOMENT RESULTANT, B01108MV.M67

Ymin = .01 Nm @ -0.0079 Seconds, Ymax = 73.28 Nm @ 0.0580 Seconds





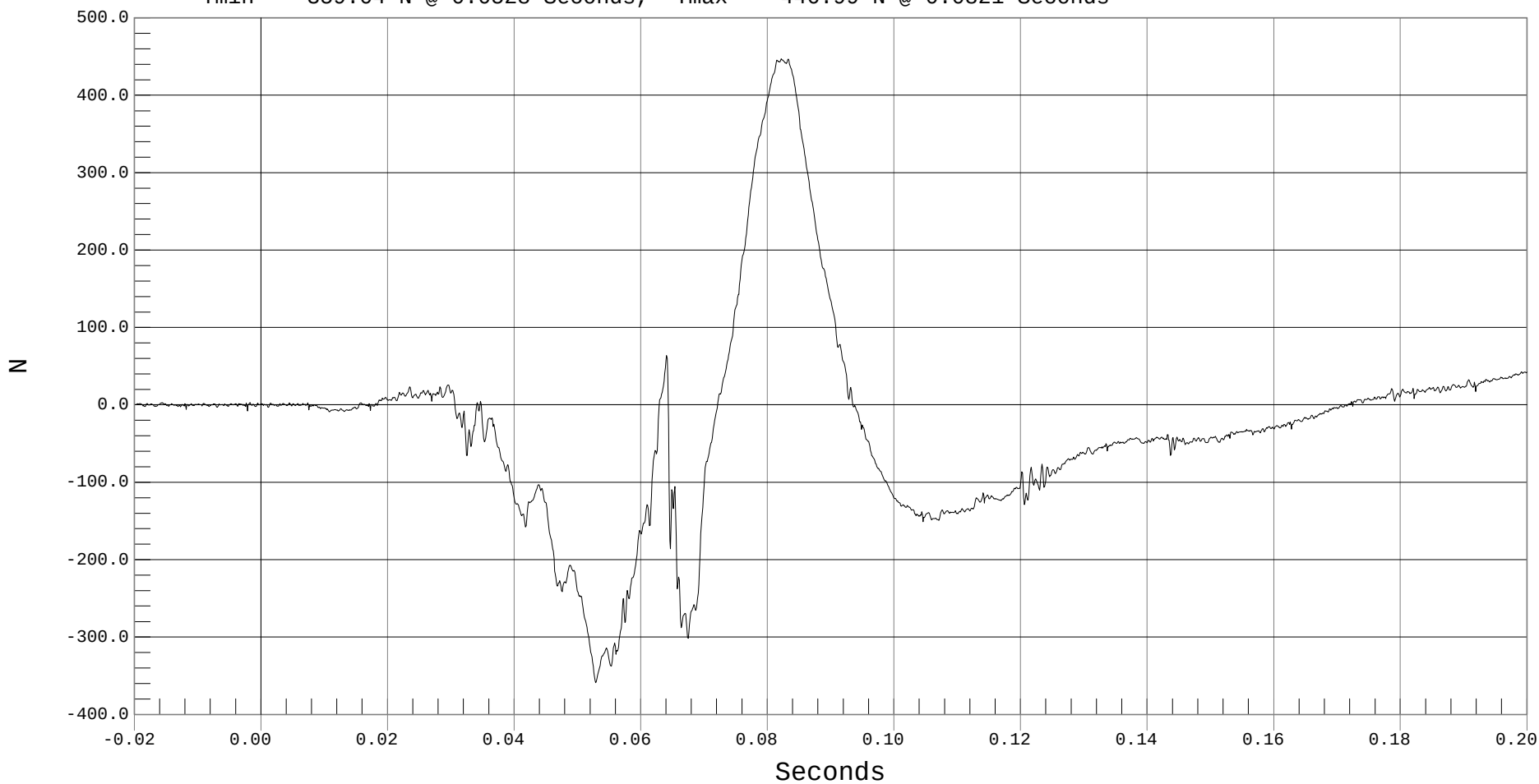
PASSENGER LOWER NECK FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER LOWER NECK FORCE X, B01108FT.F79

Ymin = -359.04 N @ 0.0528 Seconds, Ymax = 446.99 N @ 0.0821 Seconds





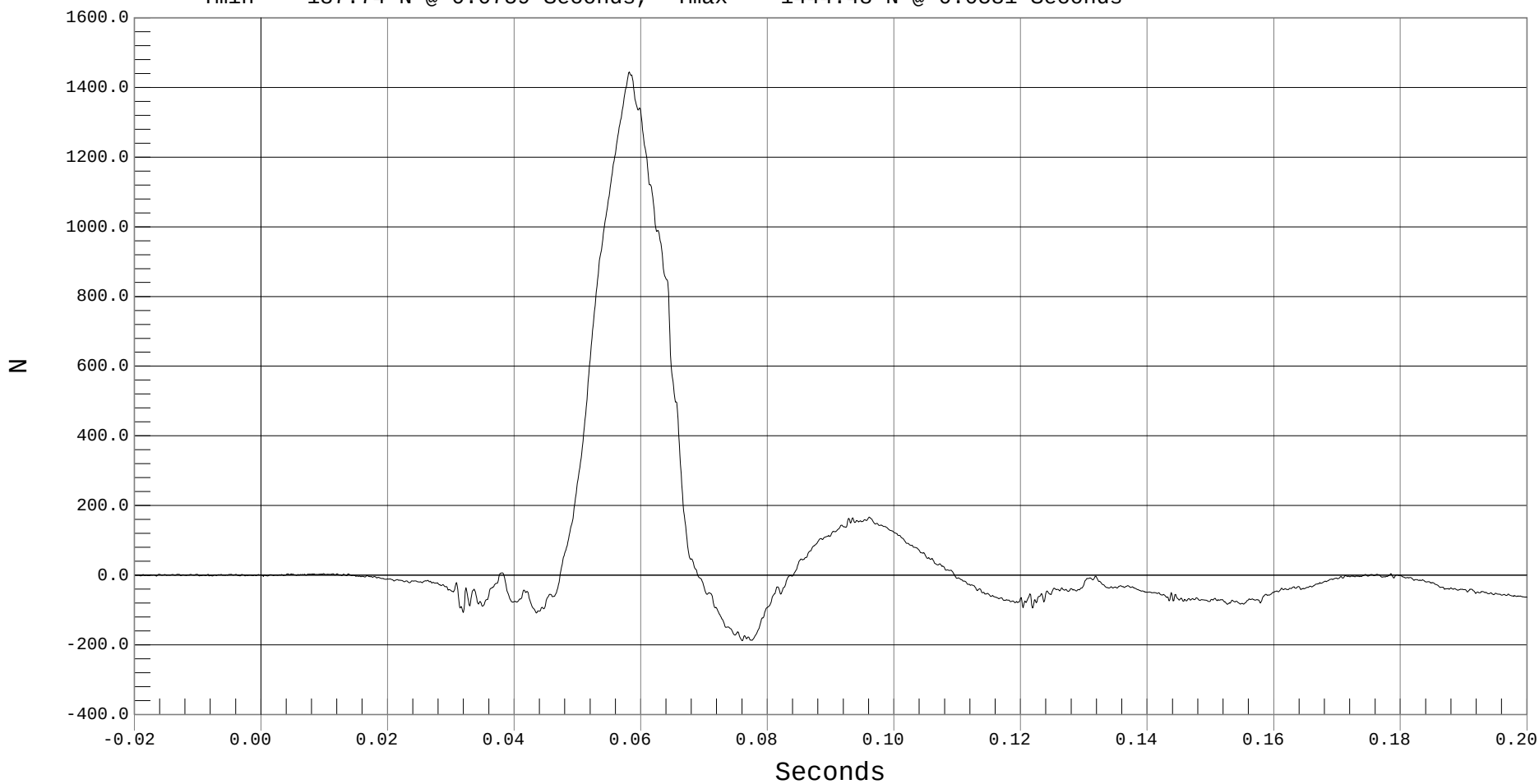
PASSENGER LOWER NECK FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER LOWER NECK FORCE Y, B01108FT.F80

Ymin = -187.74 N @ 0.0759 Seconds, Ymax = 1444.48 N @ 0.0581 Seconds





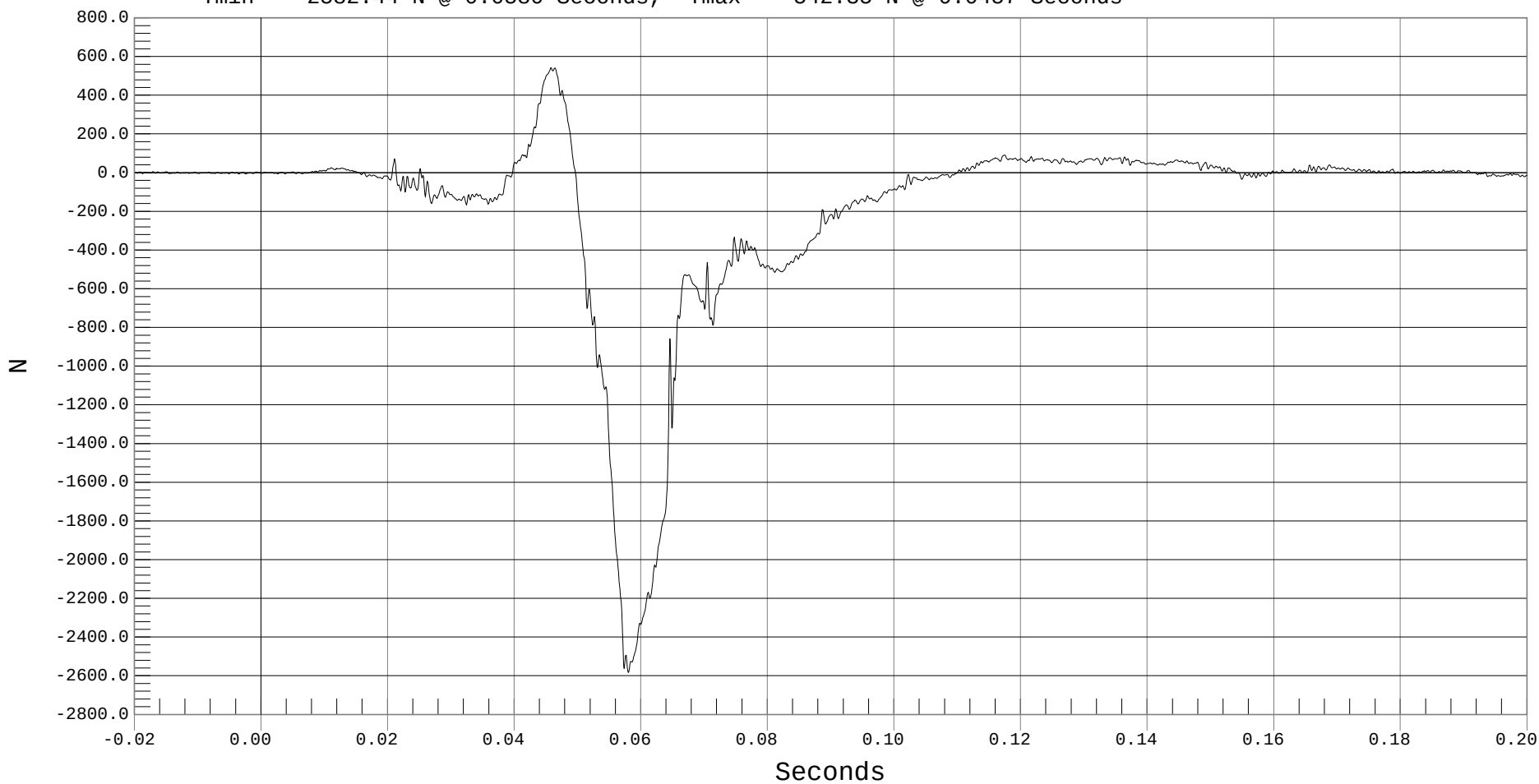
PASSENGER LOWER NECK FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER LOWER NECK FORCE Z, B01108FT.F81

Ymin = -2582.44 N @ 0.0580 Seconds, Ymax = 542.35 N @ 0.0457 Seconds





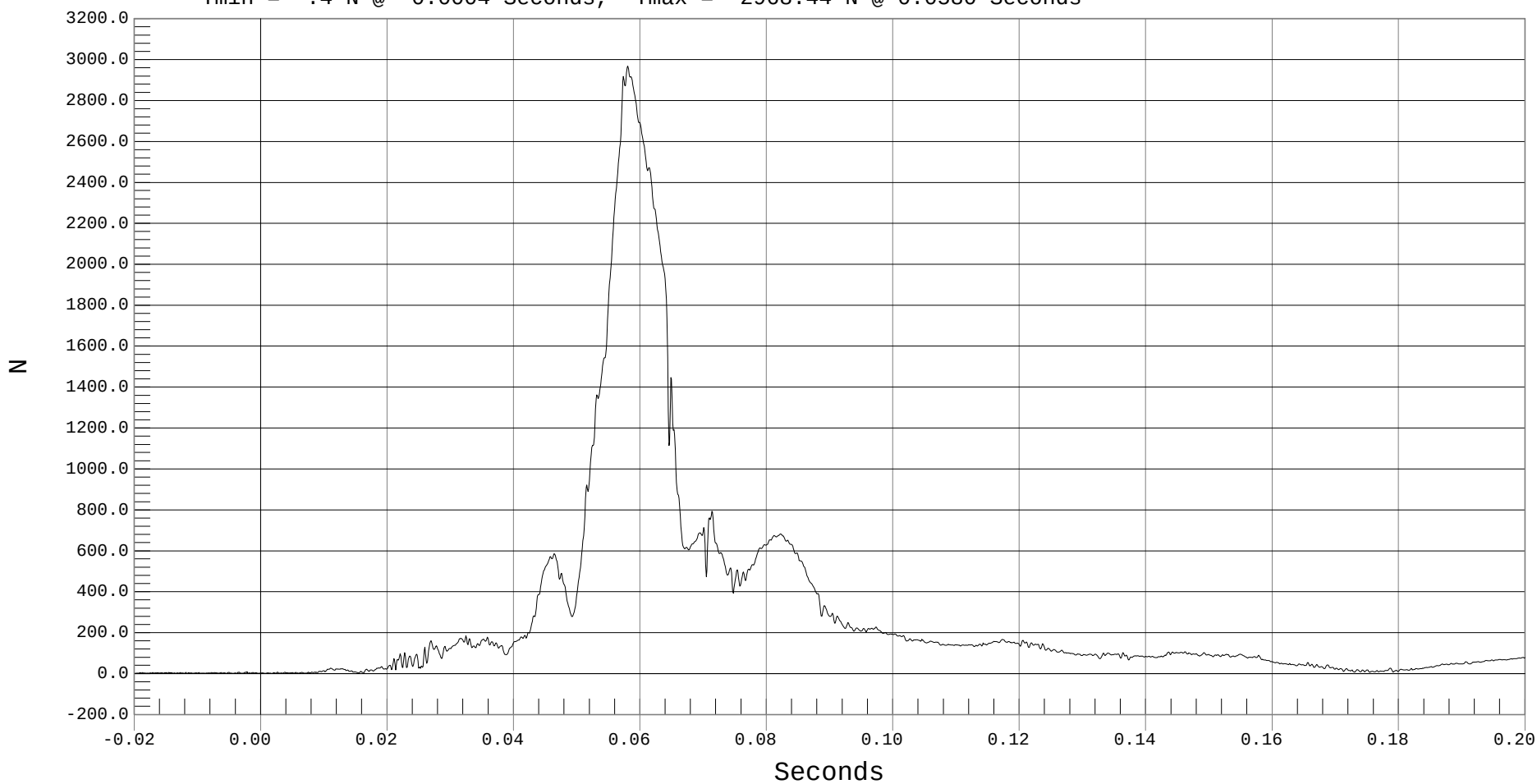
PASSENGER LOWER NECK FORCE RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 PASSENGER LOWER NECK FORCE RESULTANT, B01108FV.F79

Ymin = .4 N @ -0.0004 Seconds, Ymax = 2968.44 N @ 0.0580 Seconds





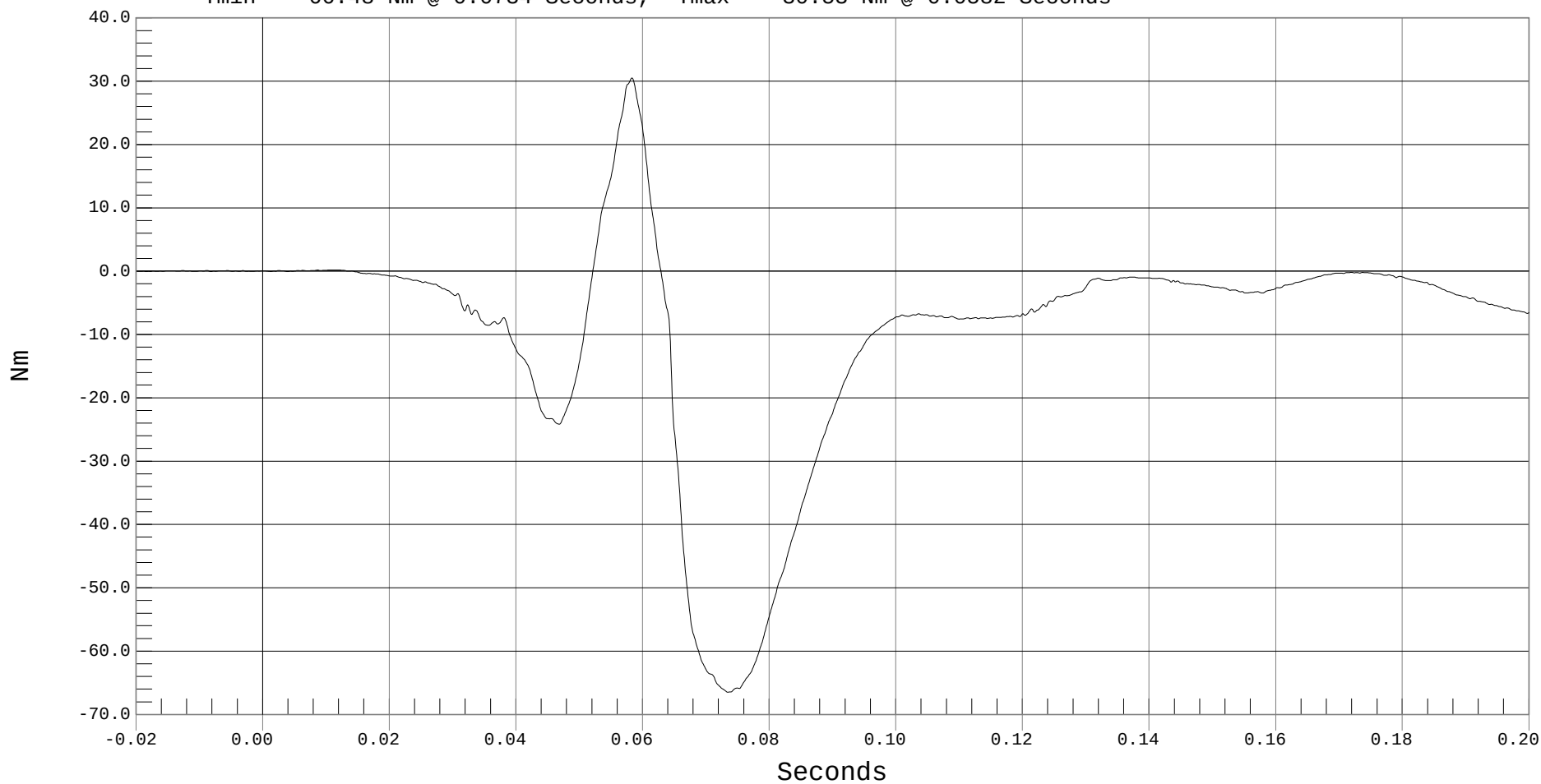
PASSENGER LOWER NECK MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER LOWER NECK MOMENT X, B01108MF.M82

Ymin = -66.48 Nm @ 0.0734 Seconds, Ymax = 30.53 Nm @ 0.0582 Seconds





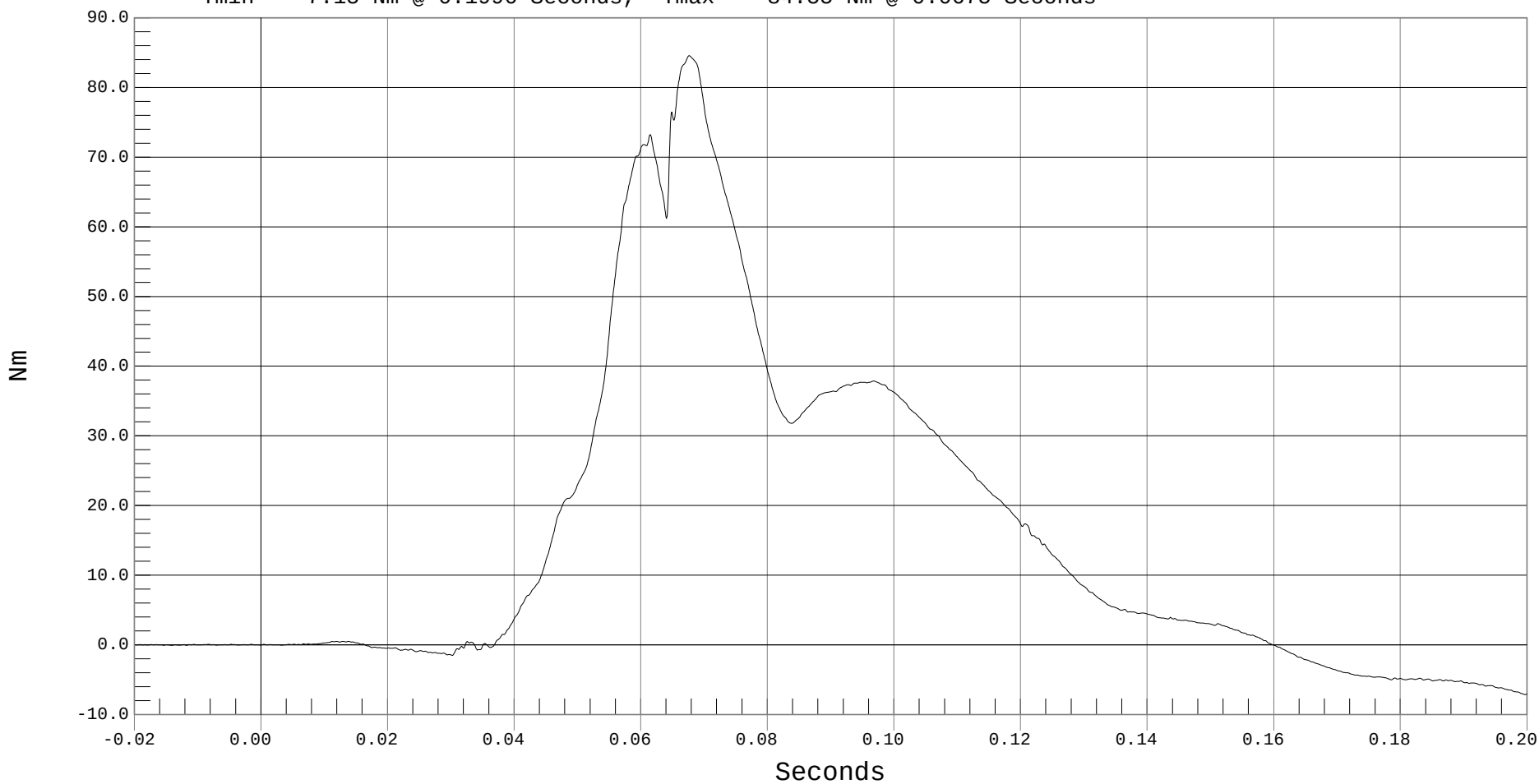
PASSENGER LOWER NECK MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER LOWER NECK MOMENT Y, B01108MF.M83

Ymin = -7.15 Nm @ 0.1996 Seconds, Ymax = 84.55 Nm @ 0.0675 Seconds





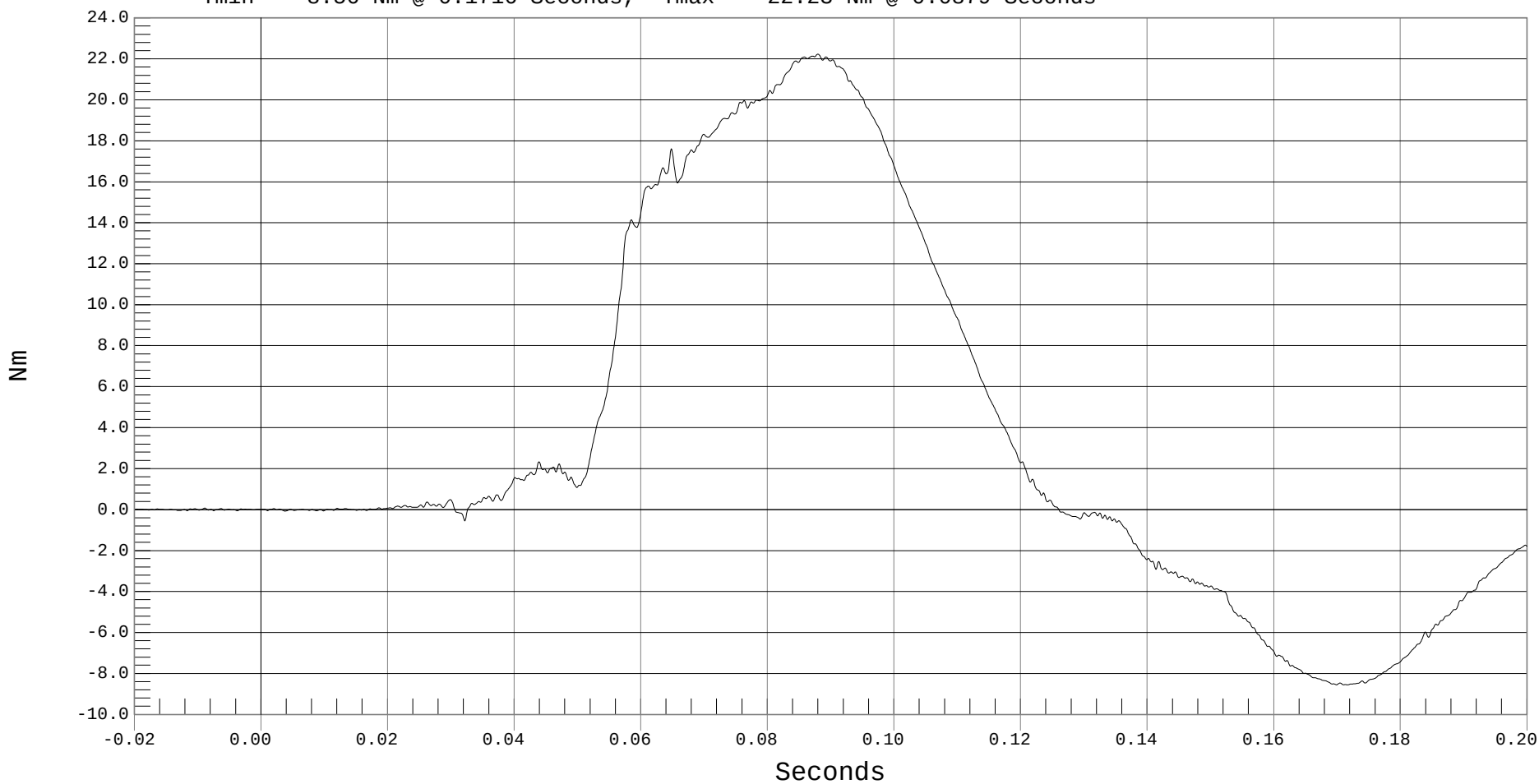
PASSENGER LOWER NECK MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER LOWER NECK MOMENT Z, B01108MF.M84

Ymin = -8.56 Nm @ 0.1716 Seconds, Ymax = 22.23 Nm @ 0.0879 Seconds





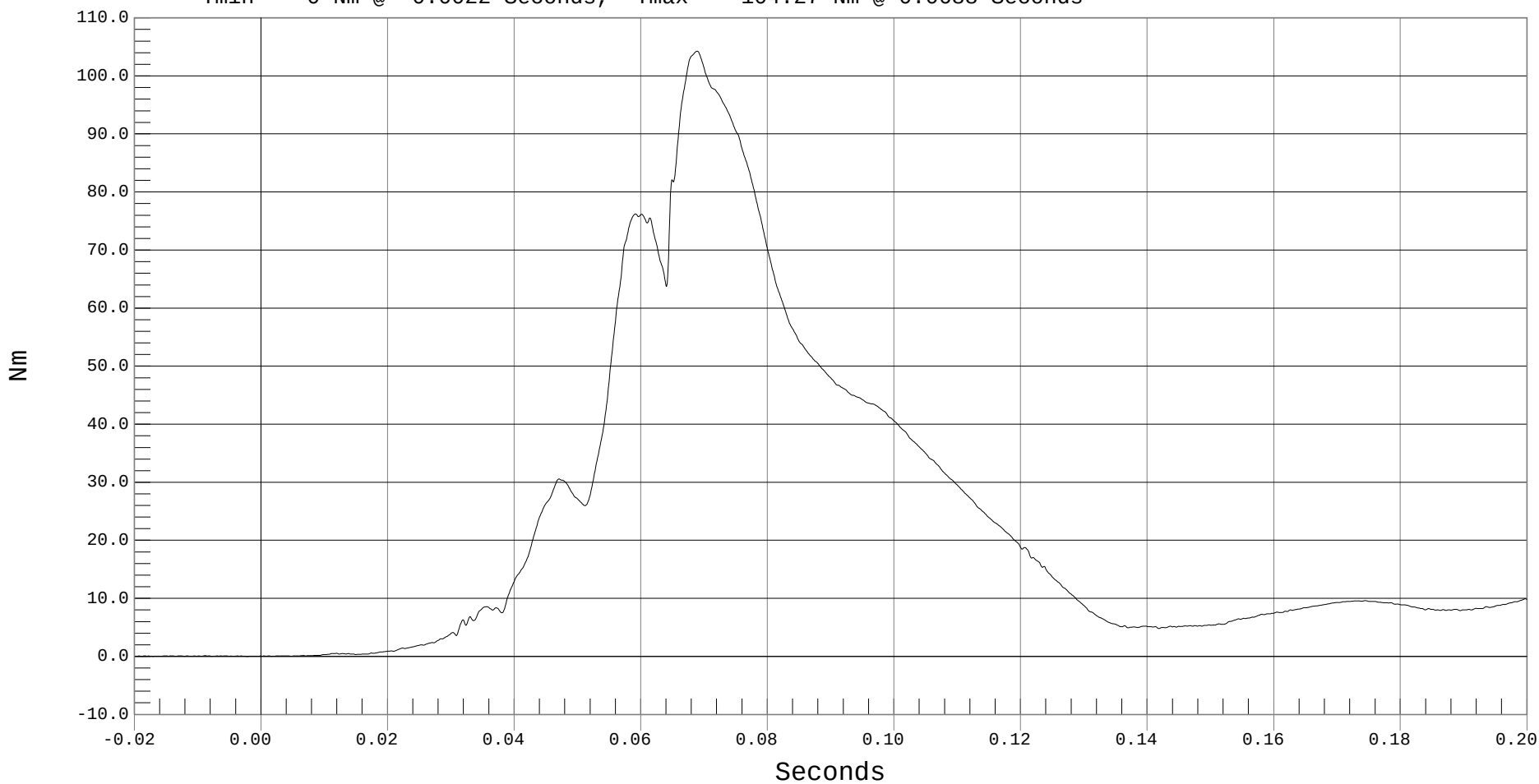
PASSENGER LOWER NECK MOMENT RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 PASSENGER LOWER NECK MOMENT RESULTANT, B01108MV.M82

Ymin = 0 Nm @ -0.0022 Seconds, Ymax = 104.27 Nm @ 0.0688 Seconds





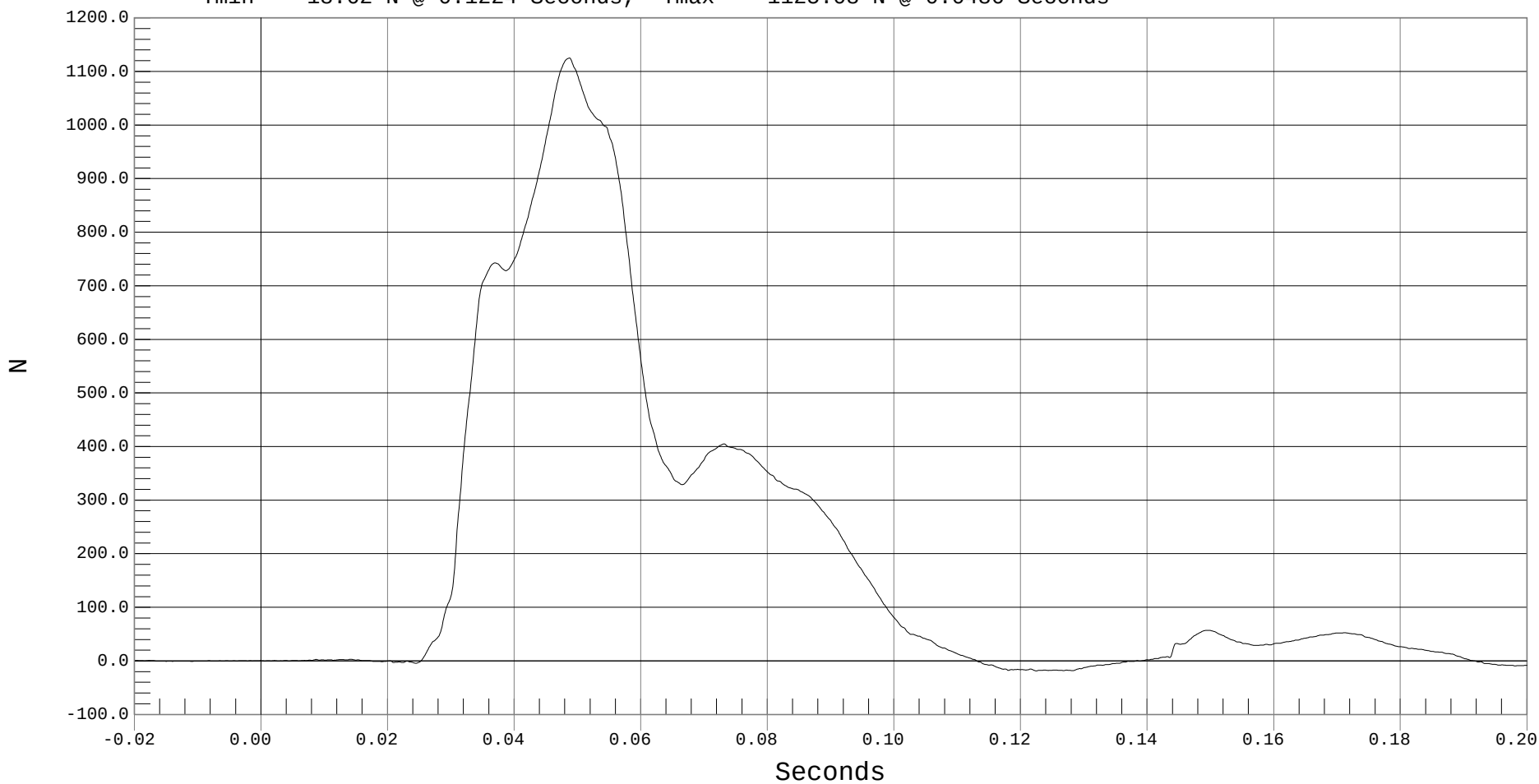
PASSENGER SHOULDER FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER SHOULDER FORCE X, B01108FF.F76

Ymin = -18.62 N @ 0.1224 Seconds, Ymax = 1125.08 N @ 0.0486 Seconds





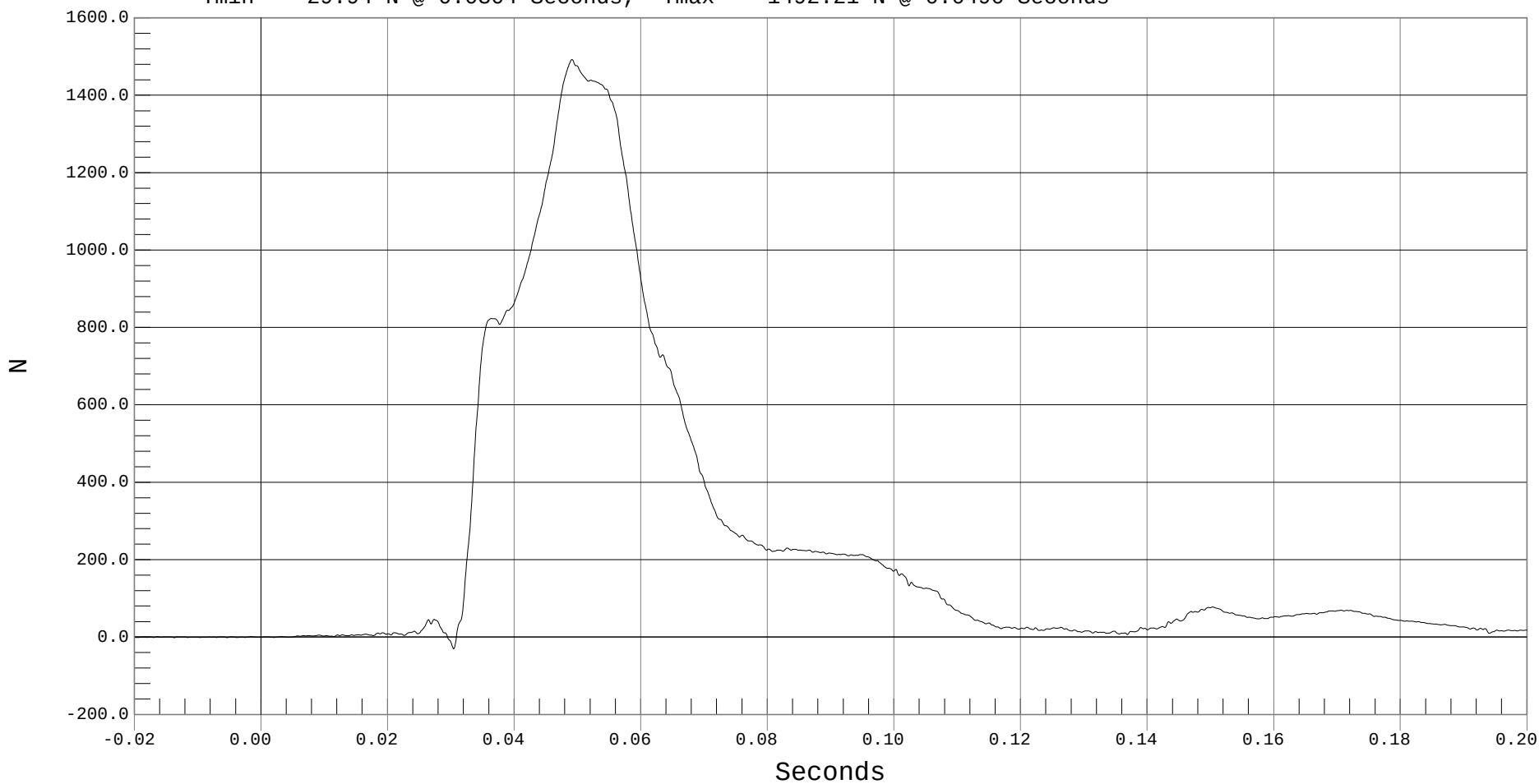
PASSENGER SHOULDER FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER SHOULDER FORCE Y, B01108FF.F77

Ymin = -29.94 N @ 0.0304 Seconds, Ymax = 1492.21 N @ 0.0490 Seconds





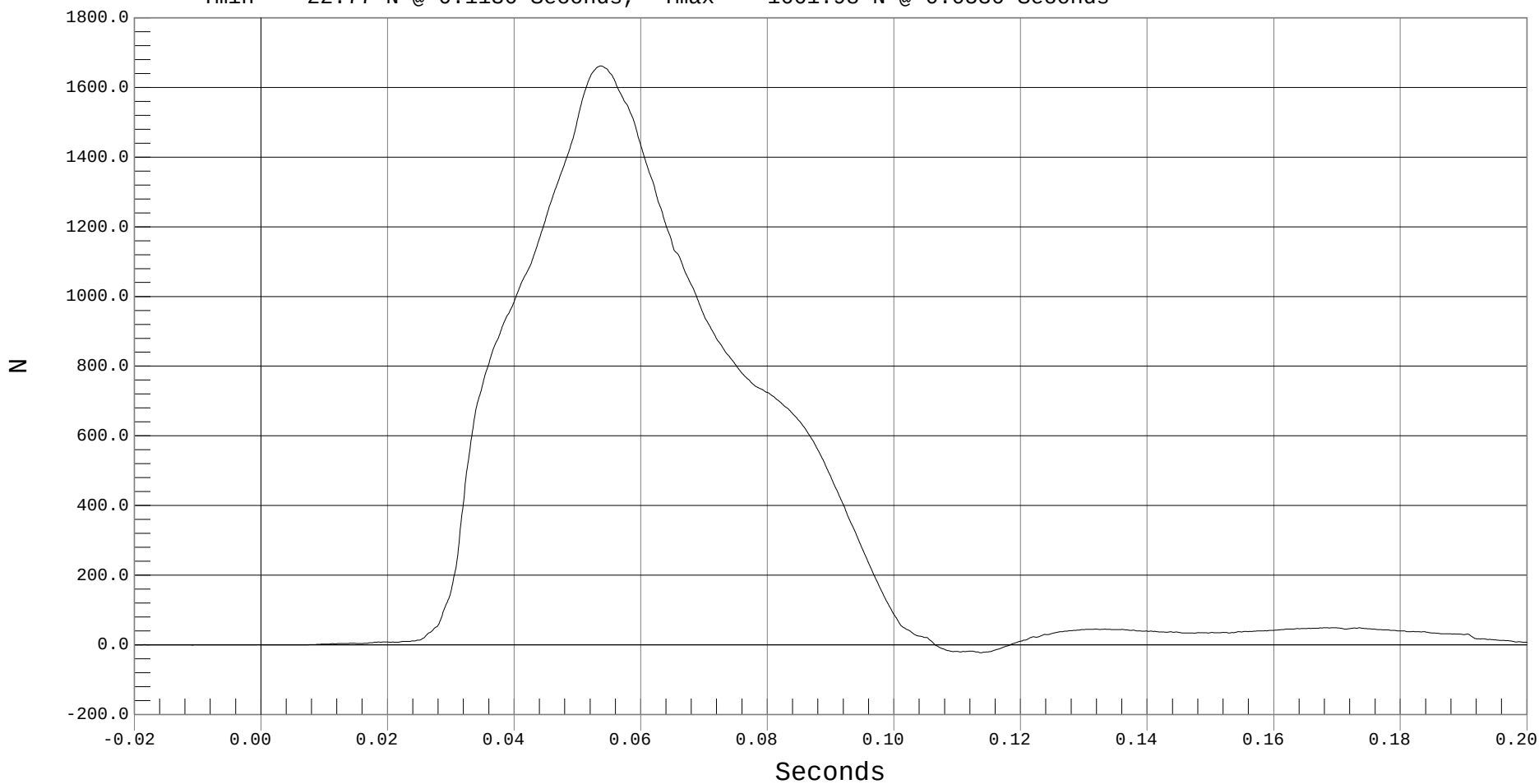
PASSENGER SHOULDER FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER SHOULDER FORCE Z, B01108FF.F78

Ymin = -22.77 N @ 0.1136 Seconds, Ymax = 1661.98 N @ 0.0536 Seconds





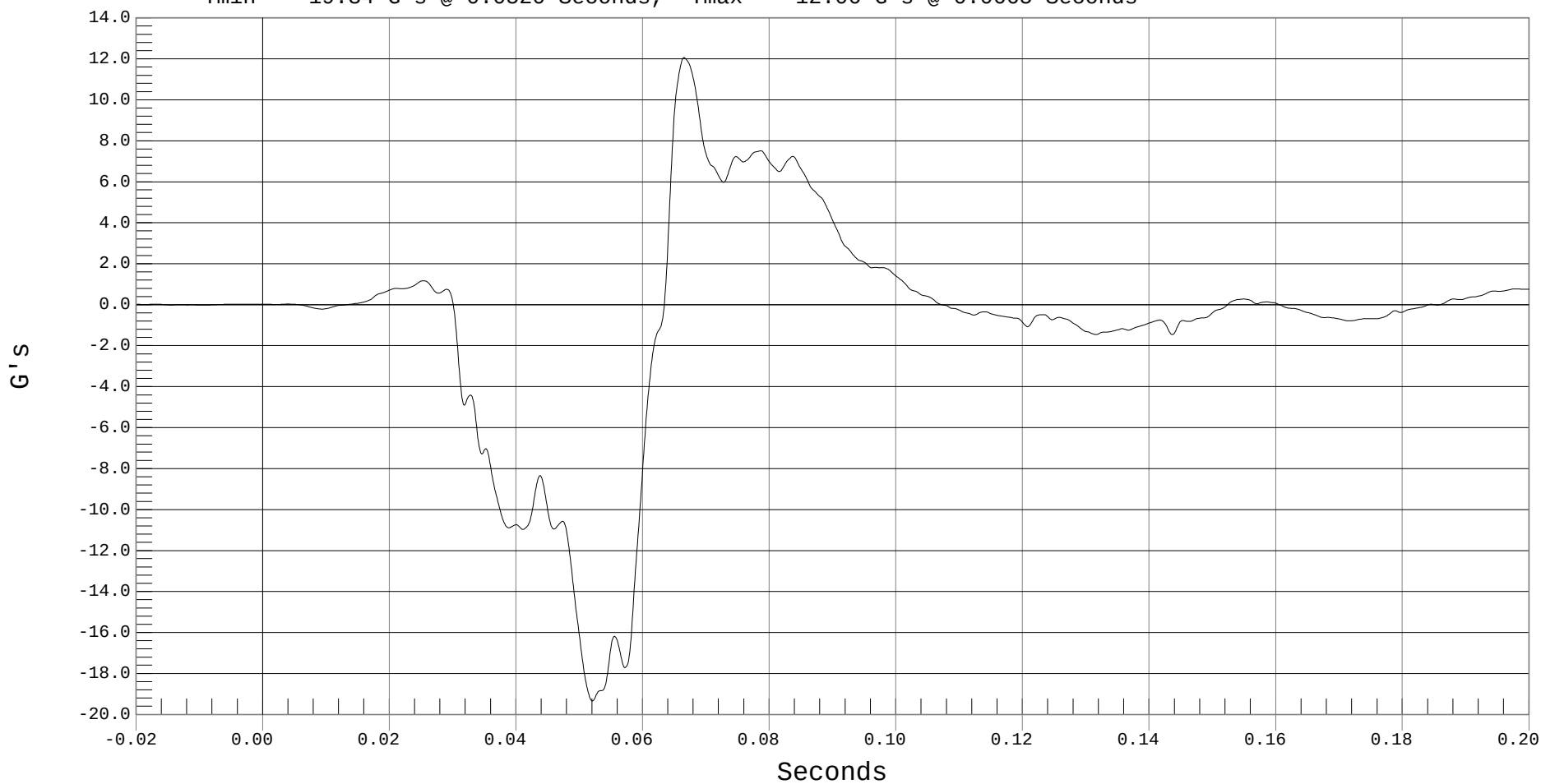
PASSENGER UPPER SPINE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER UPPER SPINE X, B01108AF.A80

Ymin = -19.34 G's @ 0.0520 Seconds, Ymax = 12.06 G's @ 0.0665 Seconds





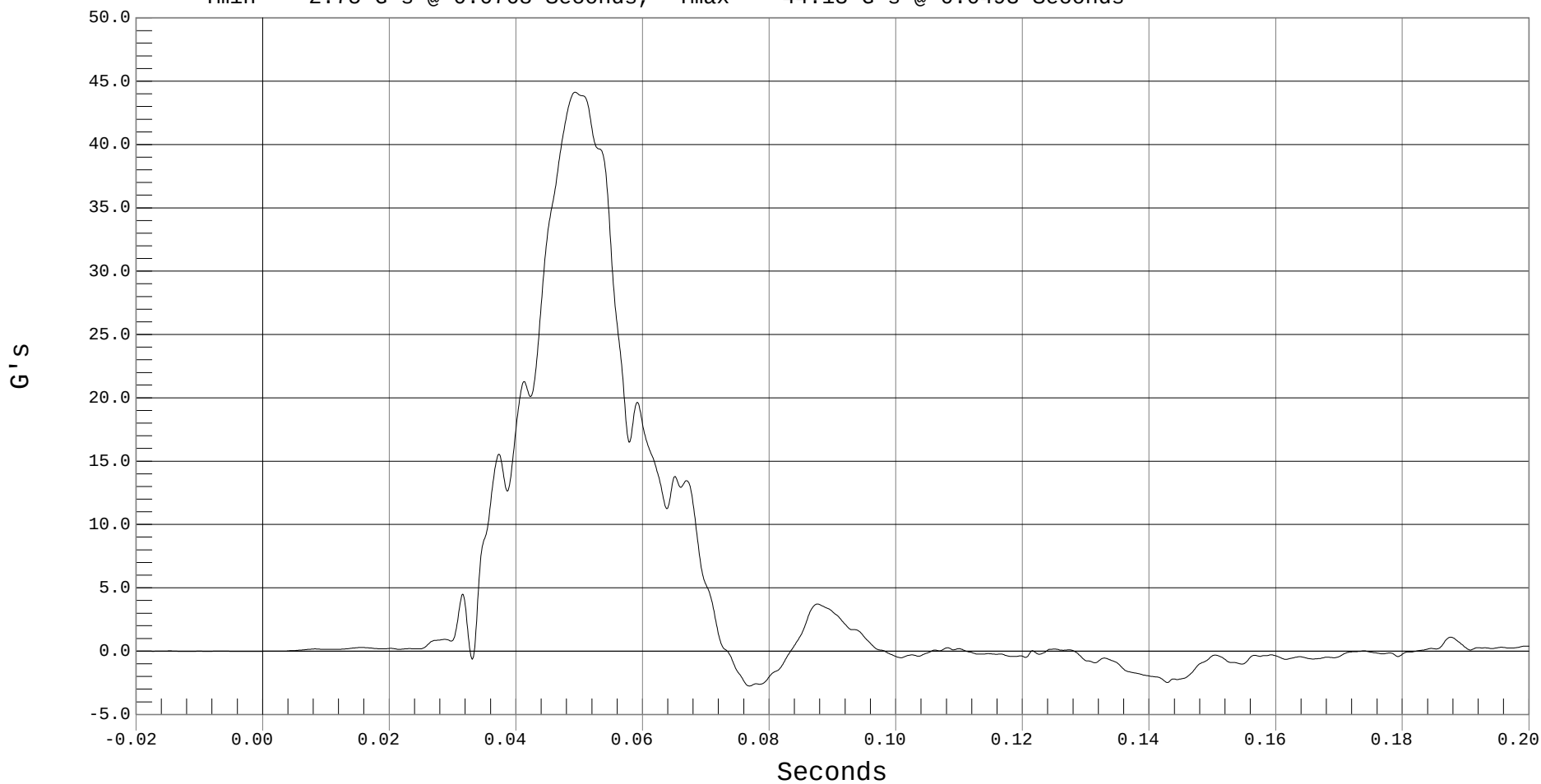
PASSENGER UPPER SPINE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER UPPER SPINE Y, B01108AF.A81

Ymin = -2.75 G's @ 0.0768 Seconds, Ymax = 44.13 G's @ 0.0493 Seconds





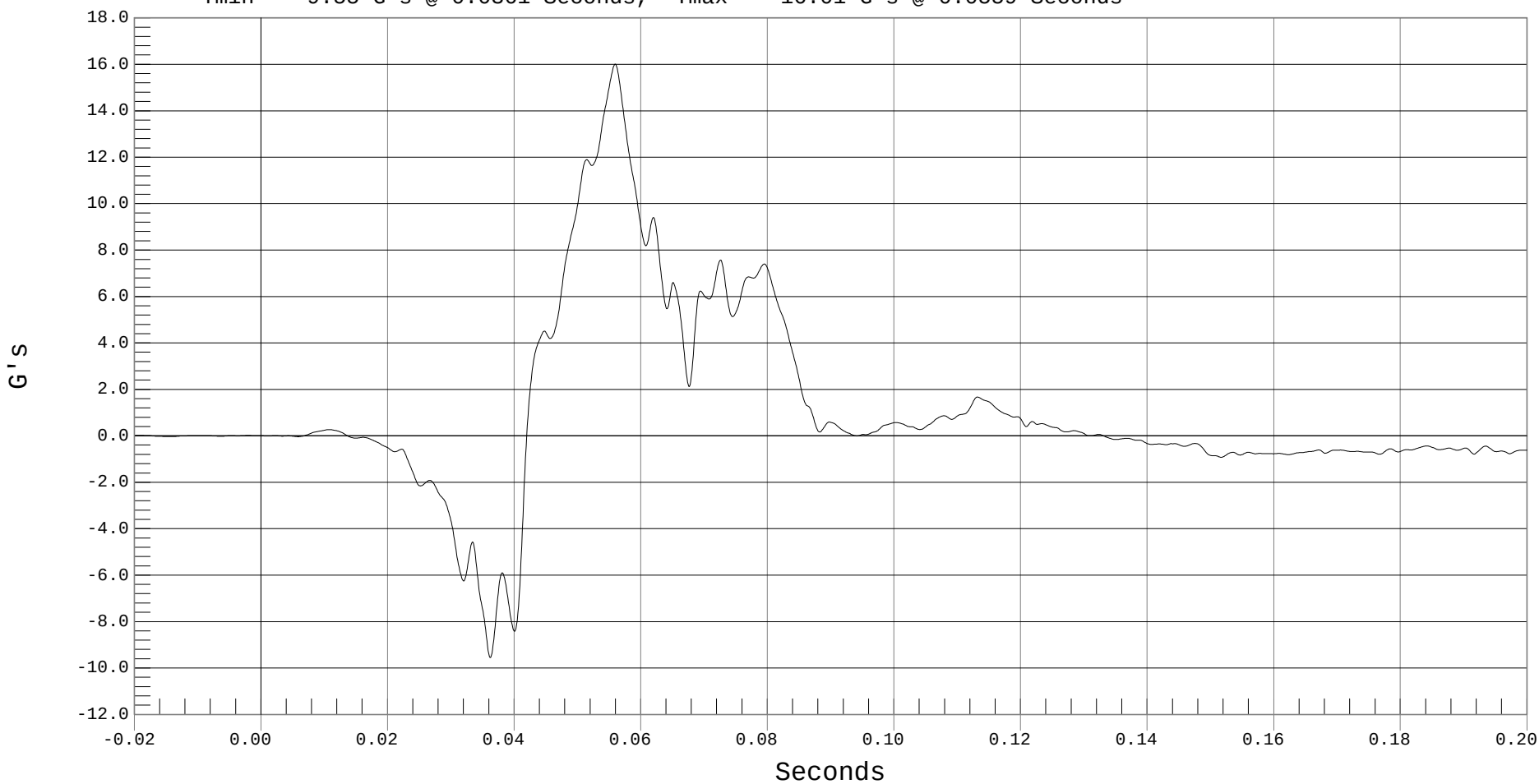
PASSENGER UPPER SPINE Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER UPPER SPINE Z, B01108AF.A82

Ymin = -9.55 G's @ 0.0361 Seconds, Ymax = 16.01 G's @ 0.0559 Seconds





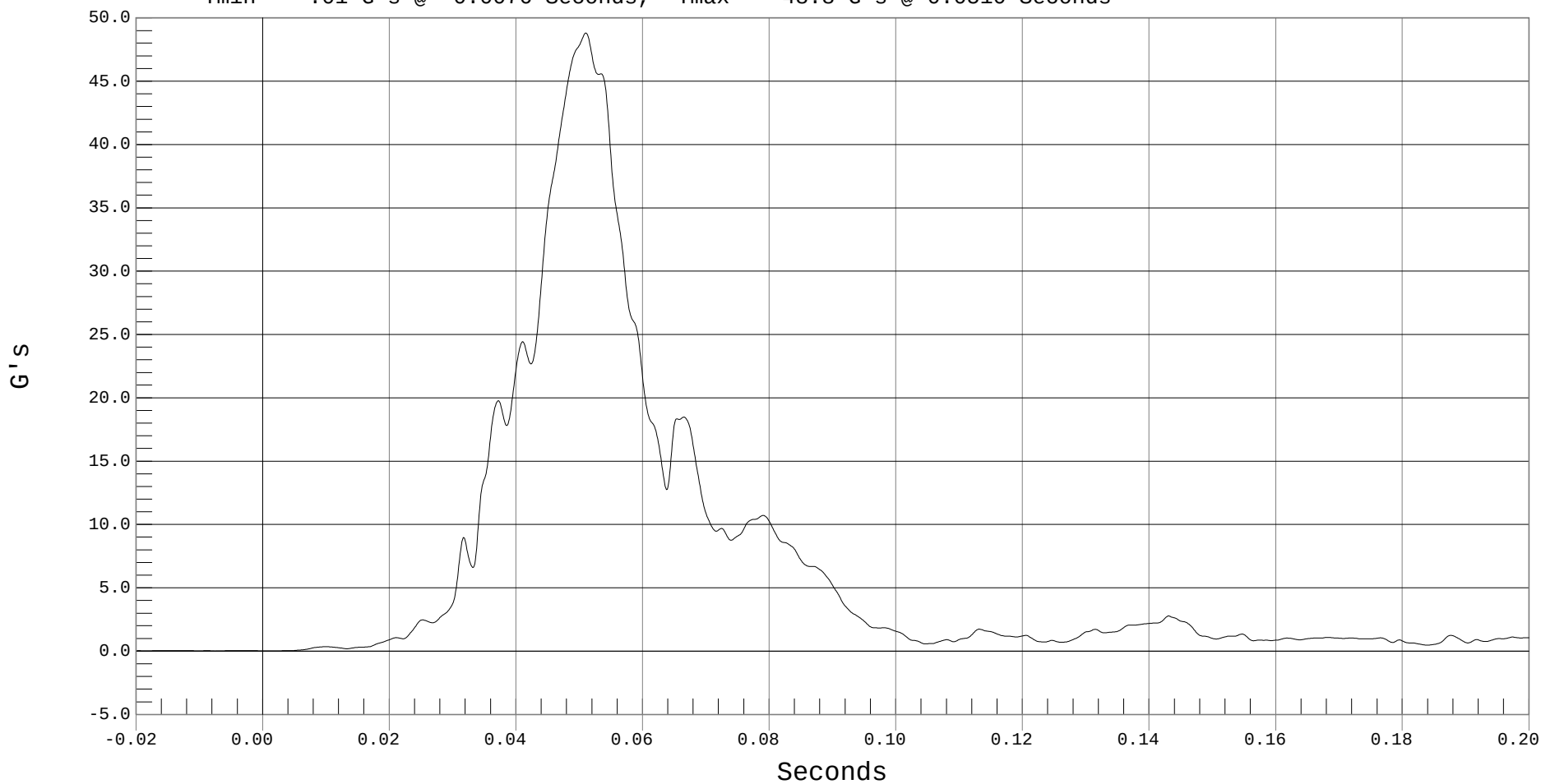
PASSENGER UPPER SPINE RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 PASSENGER UPPER SPINE RESULTANT, B01108AV.A80

Ymin = .01 G's @ -0.0076 Seconds, Ymax = 48.8 G's @ 0.0510 Seconds





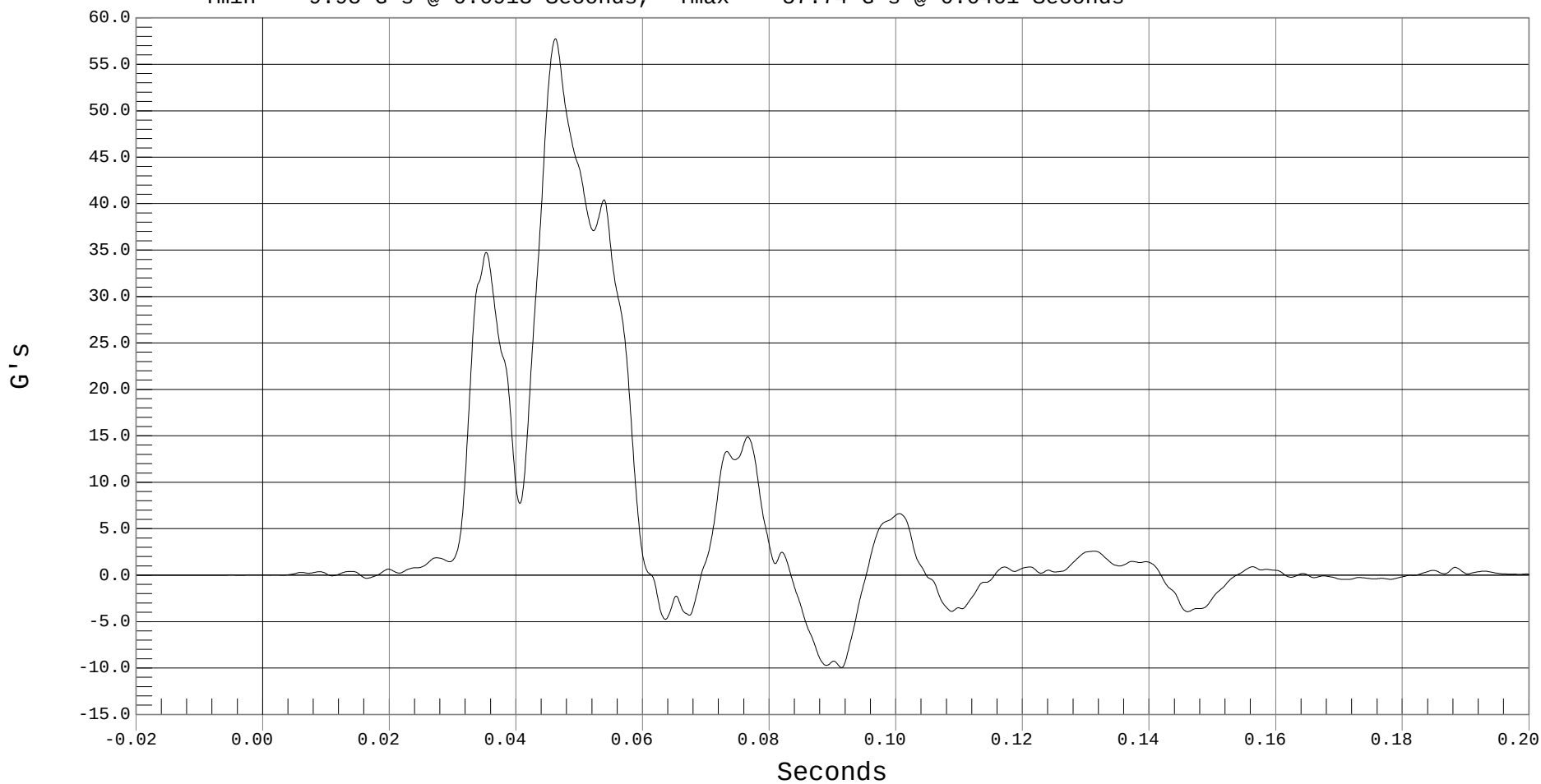
PASSENGER UPPER RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER UPPER RIB Y, B01108AF.A83

Ymin = -9.95 G's @ 0.0913 Seconds, Ymax = 57.74 G's @ 0.0461 Seconds





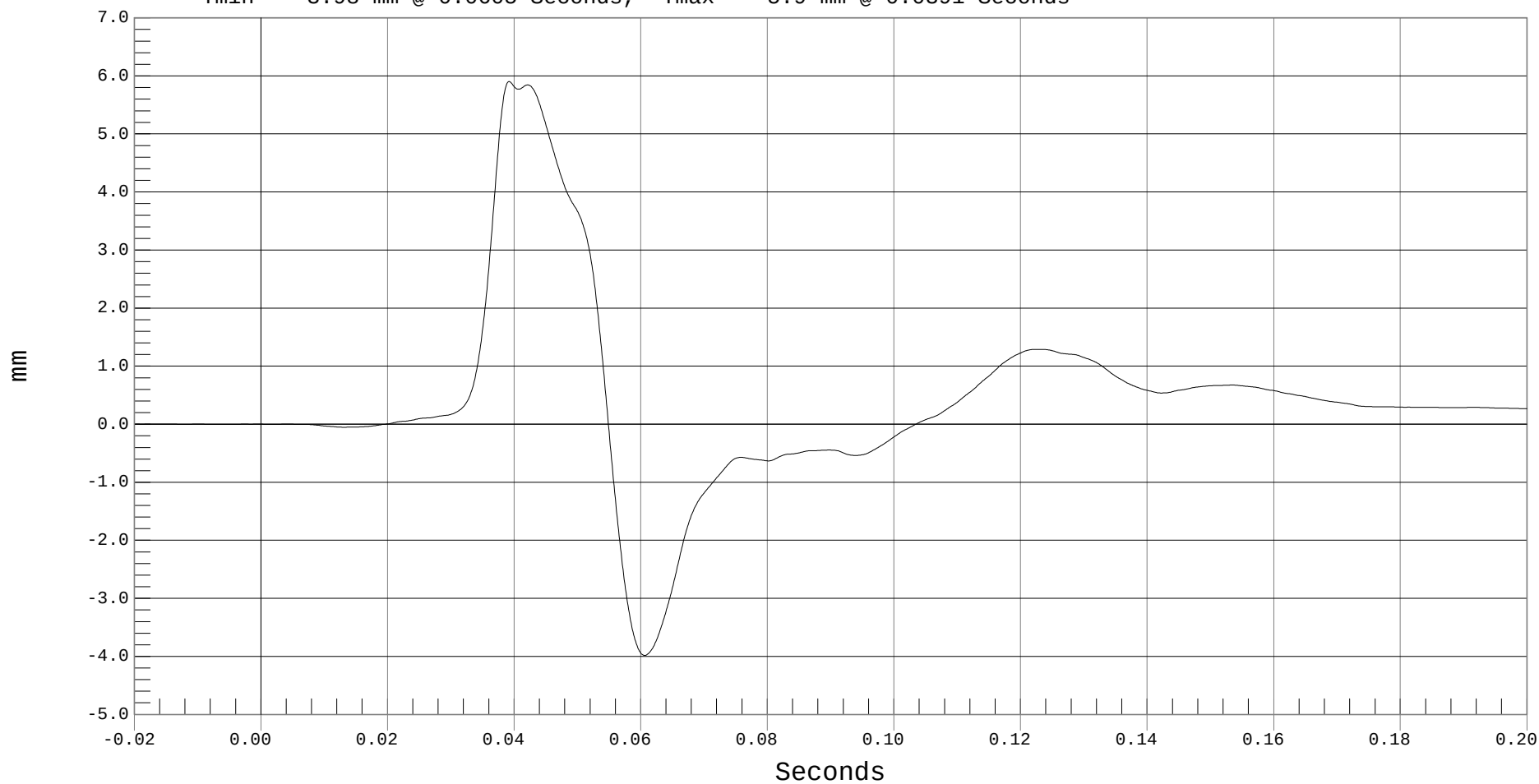
PASSENGER UPPER RIB DISPLACEMENT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER UPPER RIB DISPLACEMENT, B01108DF.D86

Ymin = -3.98 mm @ 0.0605 Seconds, Ymax = 5.9 mm @ 0.0391 Seconds





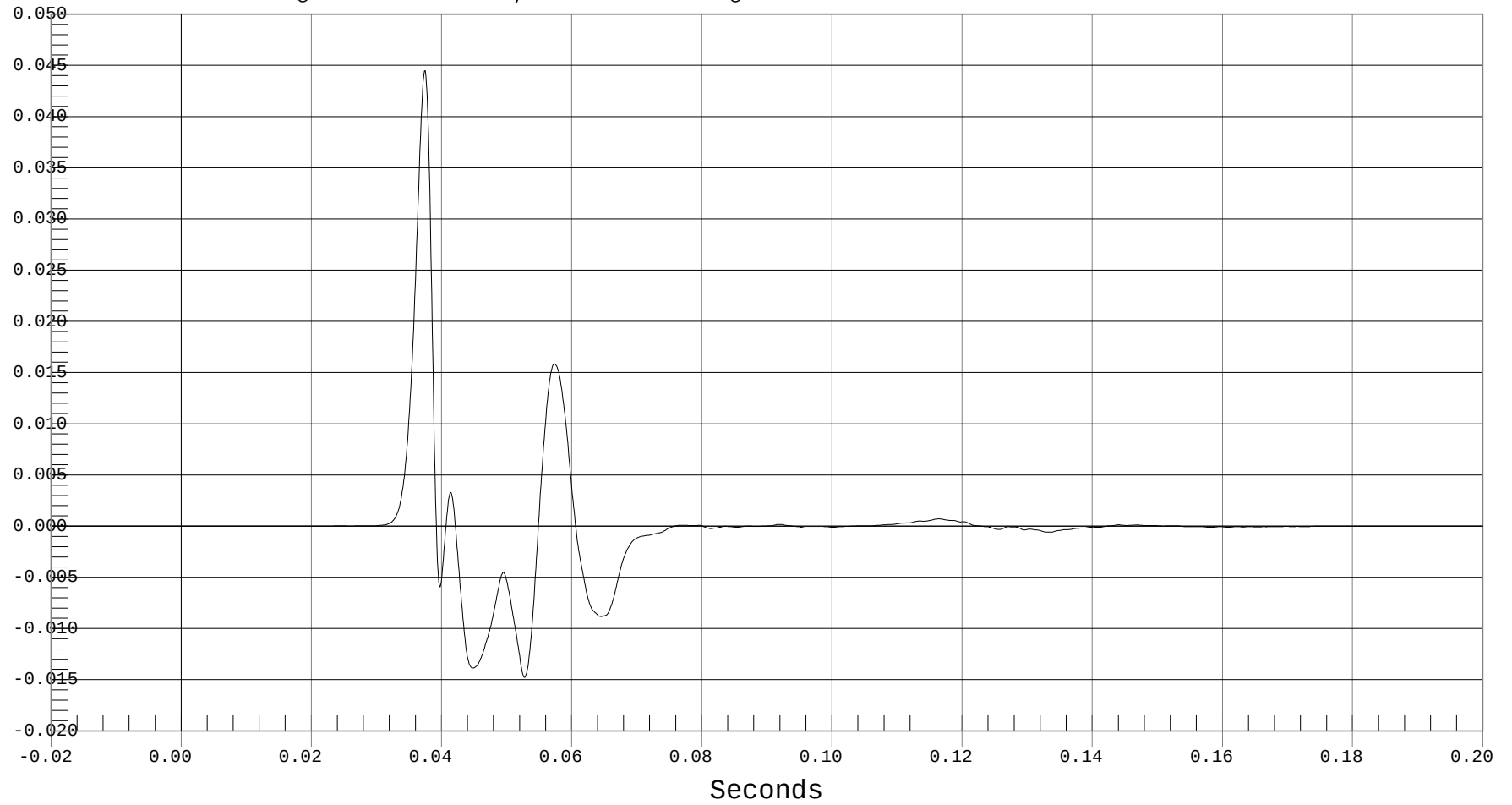
PASSENGER UPPER RIB VISCOUS CRITERIA

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 Viscous Criterion, B01108DV.C86

Ymin = -.01 @ 0.0527 Seconds, Ymax = .04 @ 0.0374 Seconds





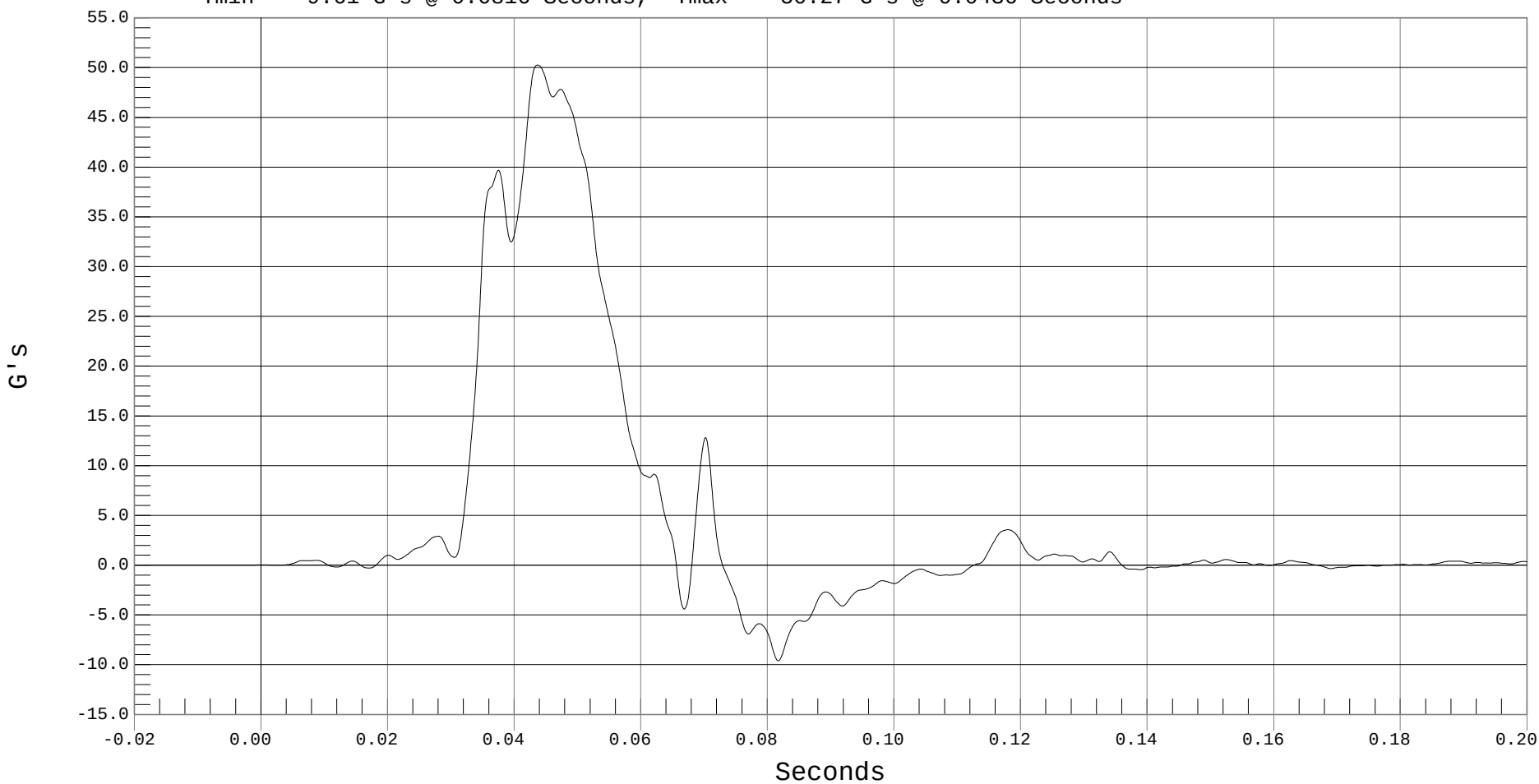
PASSENGER MID RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER MID RIB Y, B01108AF.A84

Ymin = -9.61 G's @ 0.0816 Seconds, Ymax = 50.27 G's @ 0.0436 Seconds



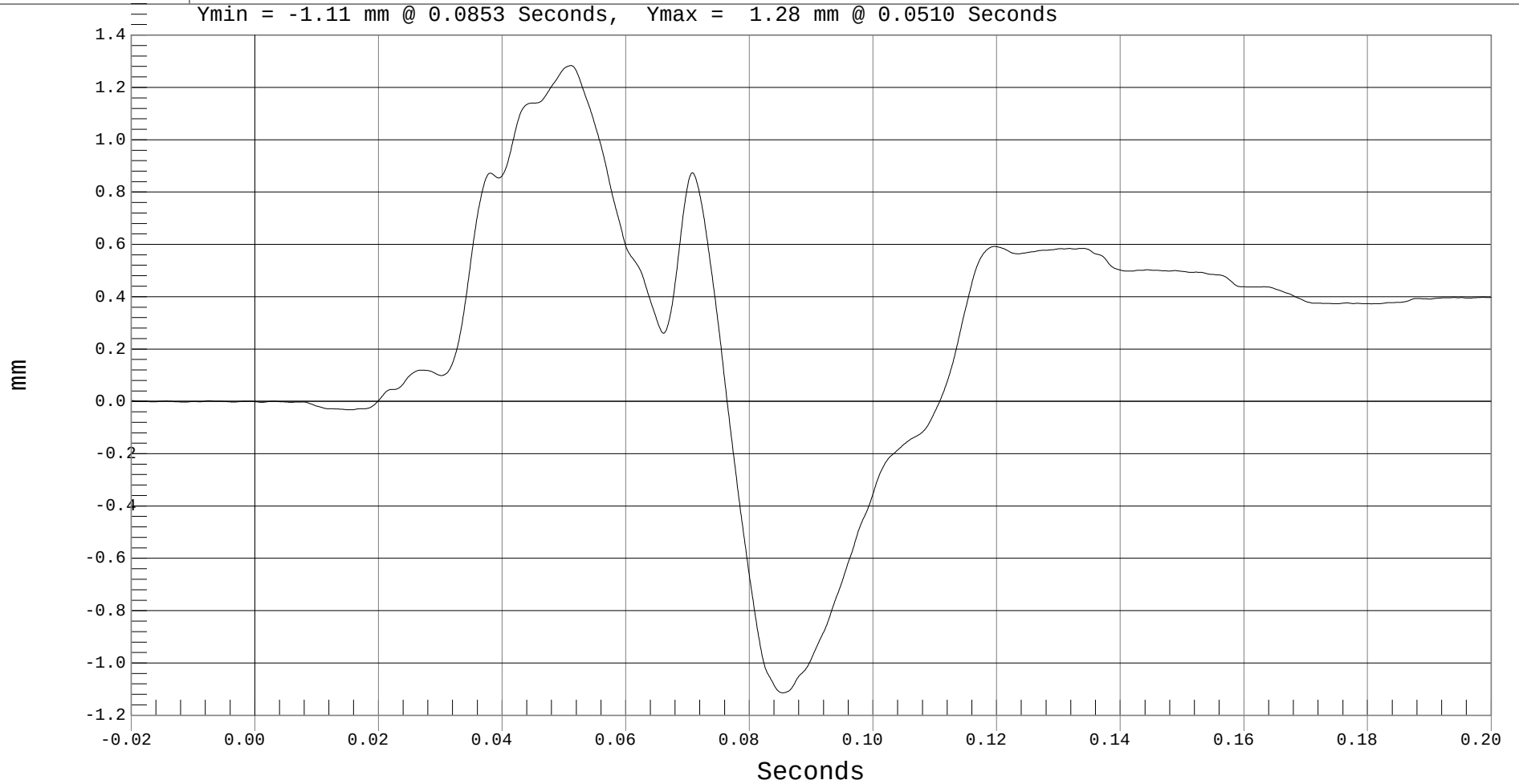


PASSENGER MID RIB DISPLACEMENT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER MID RIB DISPLACEMENT, B01108DF.D87





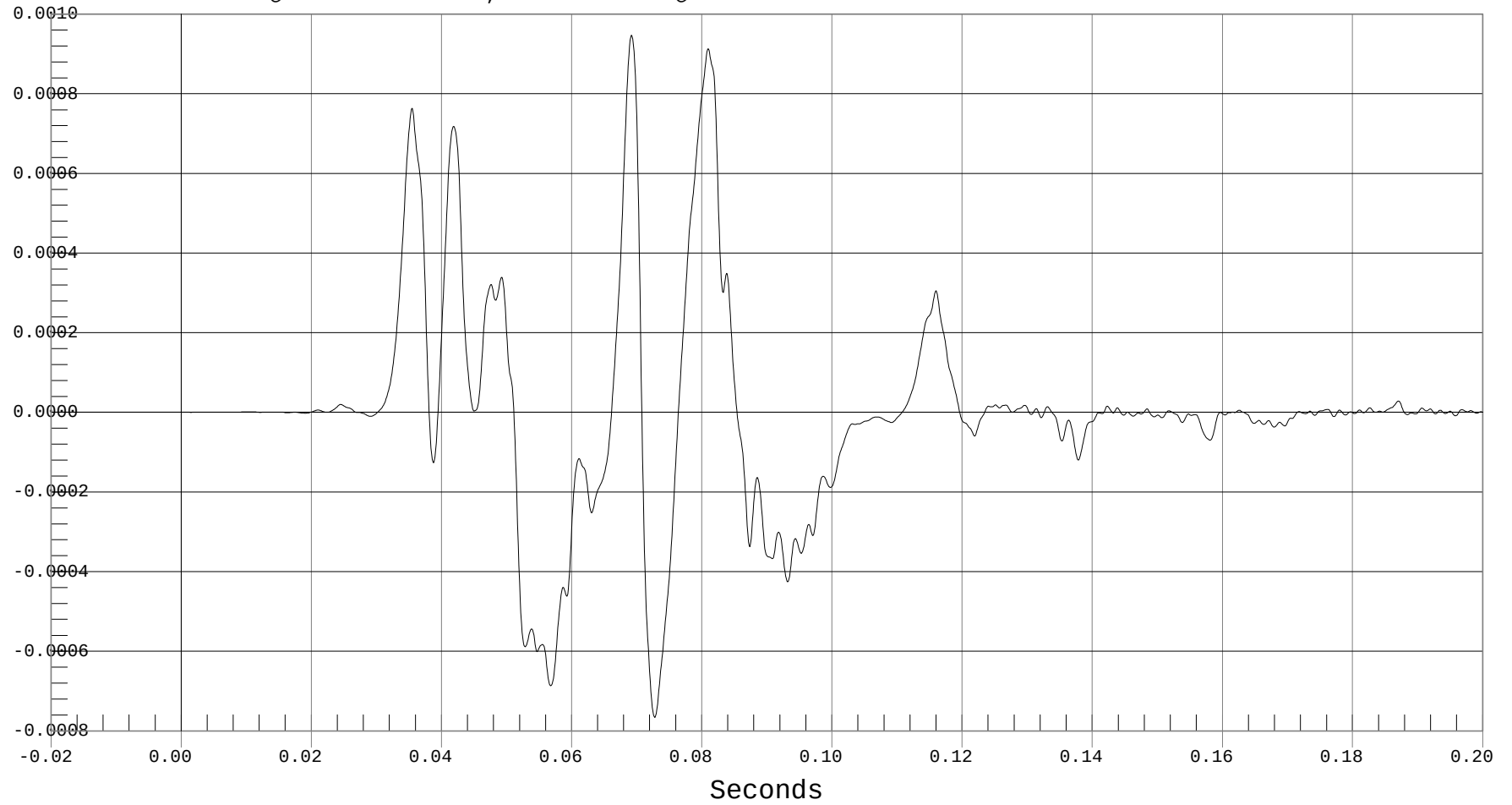
PASSENGER MID RIB VISCOUS CRITERIA

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 Viscous Criterion, B01108DV.C87

Ymin = 0 @ 0.0727 Seconds, Ymax = 0 @ 0.0691 Seconds





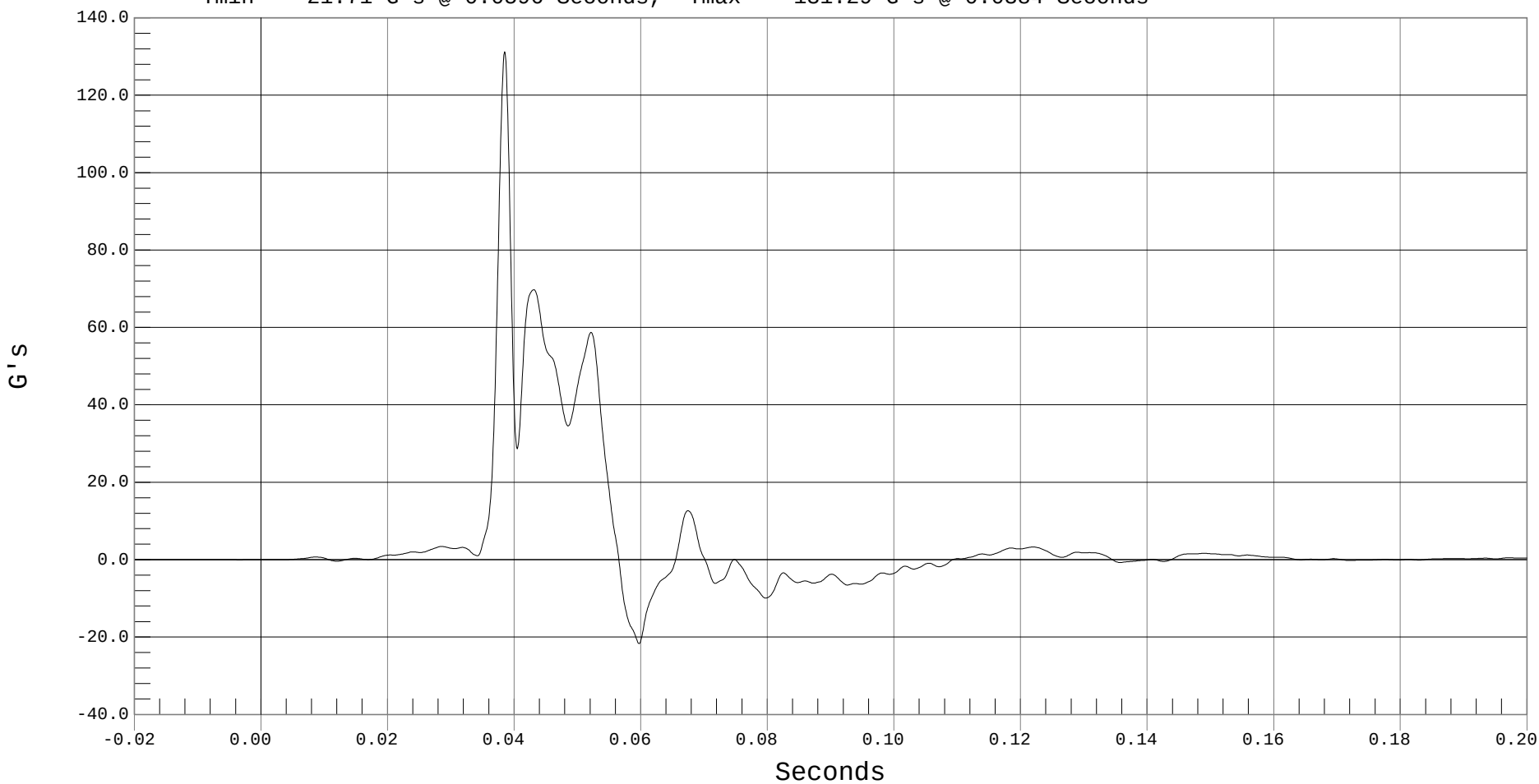
PASSENGER LOWER RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER LOWER RIB Y, B01108AF.A85

Ymin = -21.71 G's @ 0.0596 Seconds, Ymax = 131.29 G's @ 0.0384 Seconds





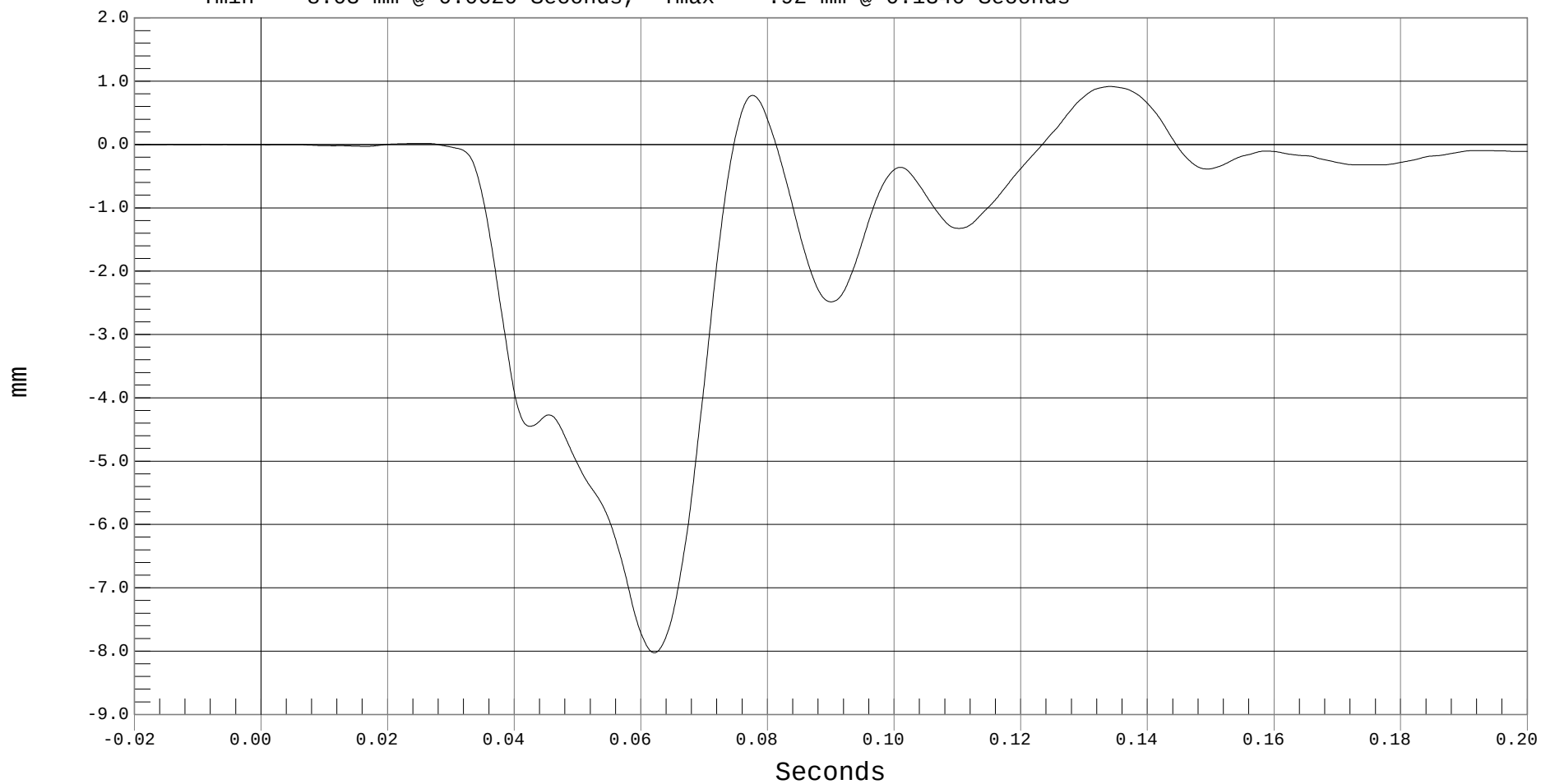
PASSENGER LOWER RIB DISPLACEMENT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER LOWER RIB DISPLACEMENT, B01108DF.D88

Ymin = -8.03 mm @ 0.0620 Seconds, Ymax = .92 mm @ 0.1340 Seconds





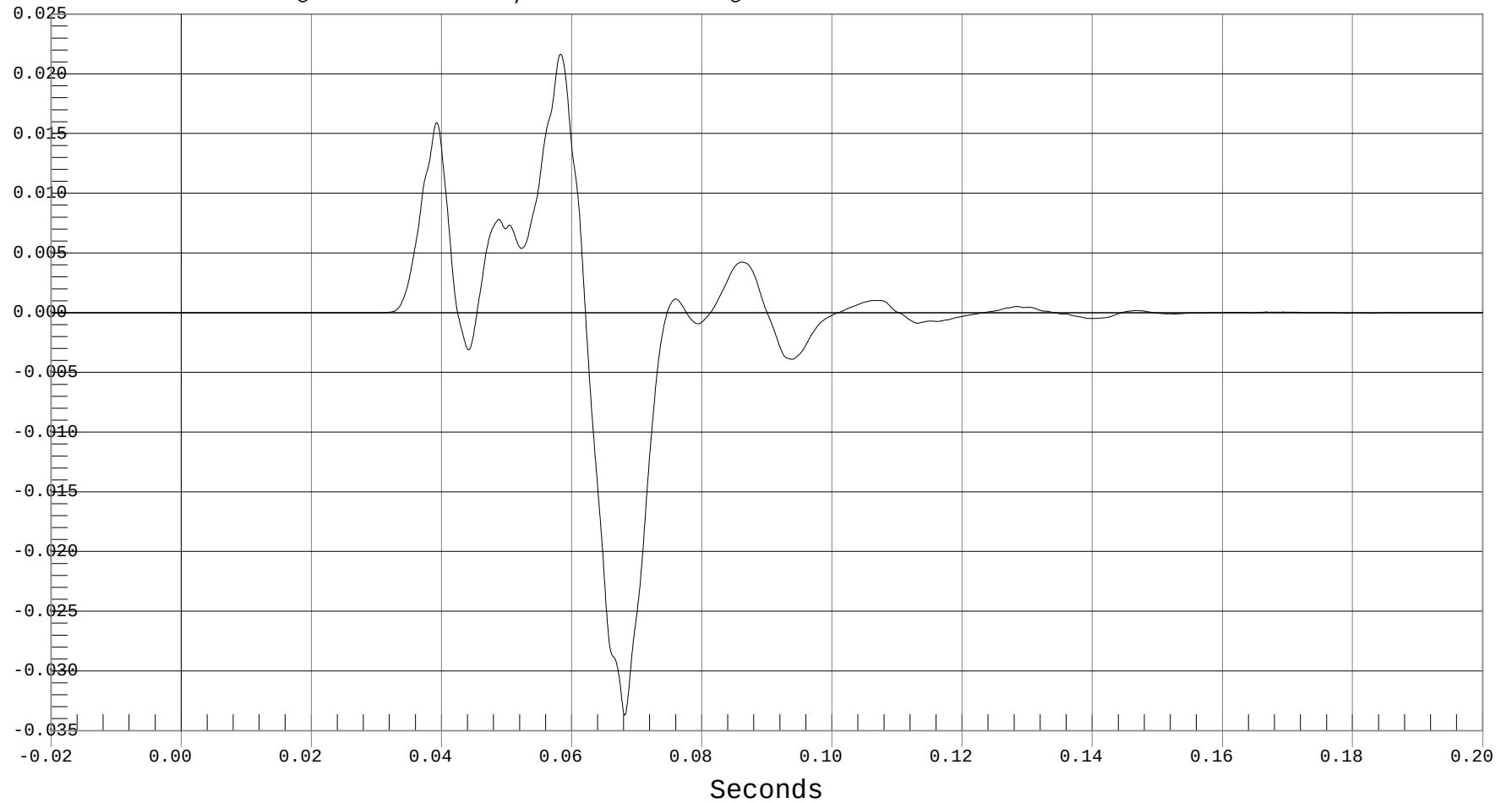
PASSENGER LOWER RIB Viscous CRITERIA

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 Viscous Criterion, B01108DV.C88

Ymin = -.03 @ 0.0681 Seconds, Ymax = .02 @ 0.0582 Seconds





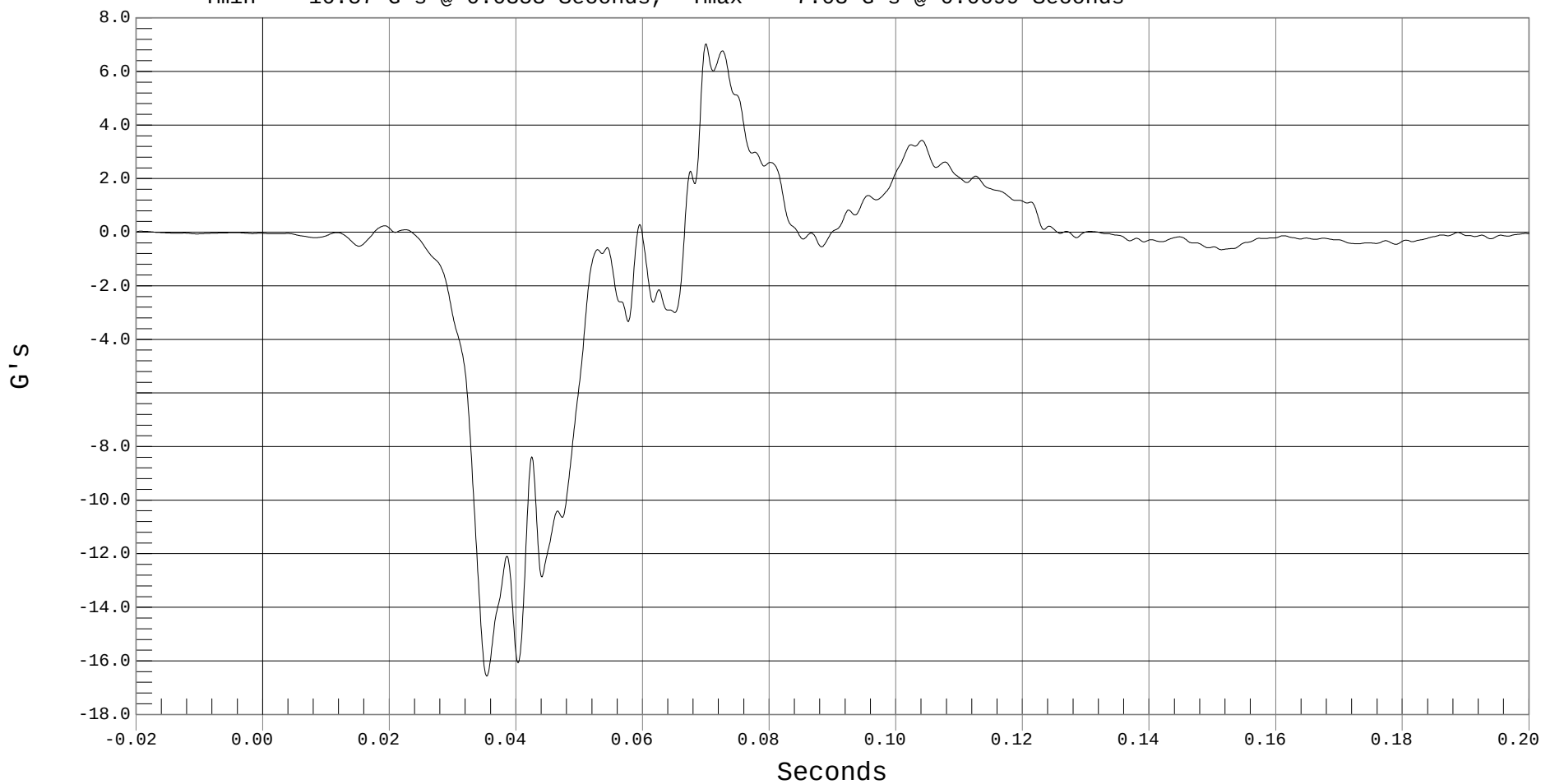
PASSENGER LOWER SPINE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER LOWER SPINE X, B01108AF.A89

Ymin = -16.57 G's @ 0.0353 Seconds, Ymax = 7.03 G's @ 0.0699 Seconds





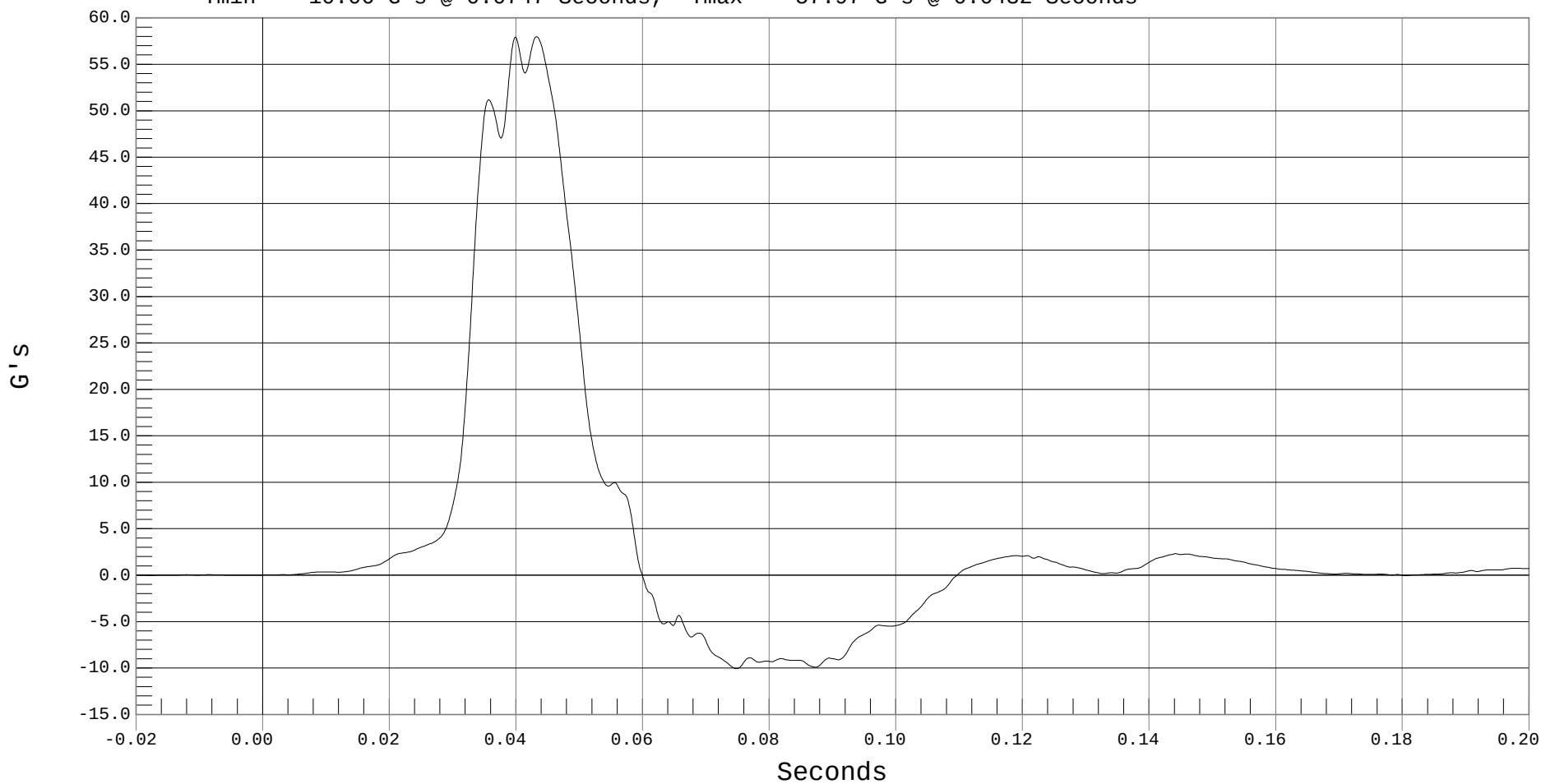
PASSENGER LOWER SPINE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER LOWER SPINE Y, B01108AF.A90

Ymin = -10.06 G's @ 0.0747 Seconds, Ymax = 57.97 G's @ 0.0432 Seconds





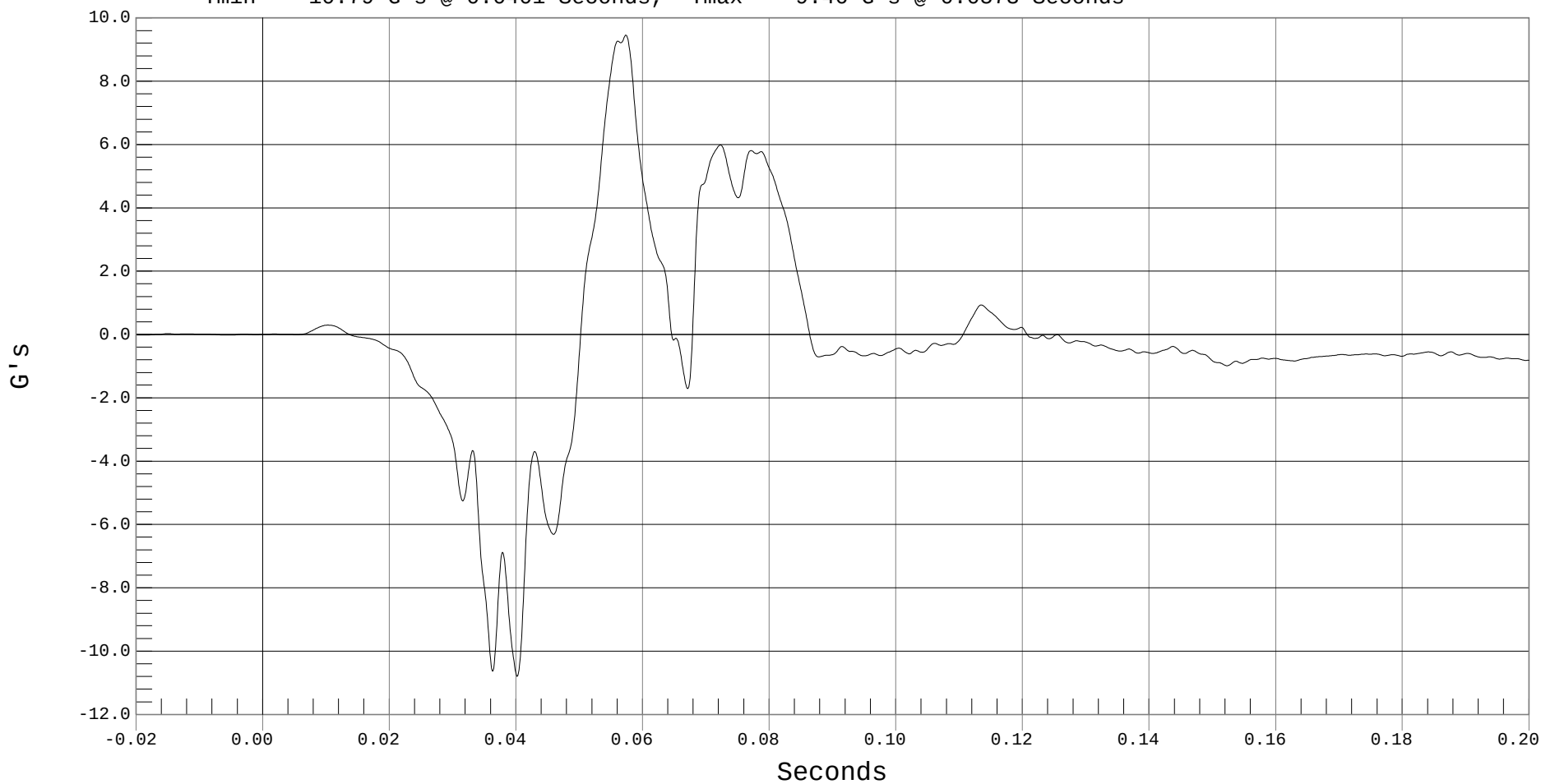
PASSENGER LOWER SPINE Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 REAR PASSENGER LOWER SPINE Z, B01108AF.A91

Ymin = -10.79 G's @ 0.0401 Seconds, Ymax = 9.46 G's @ 0.0573 Seconds





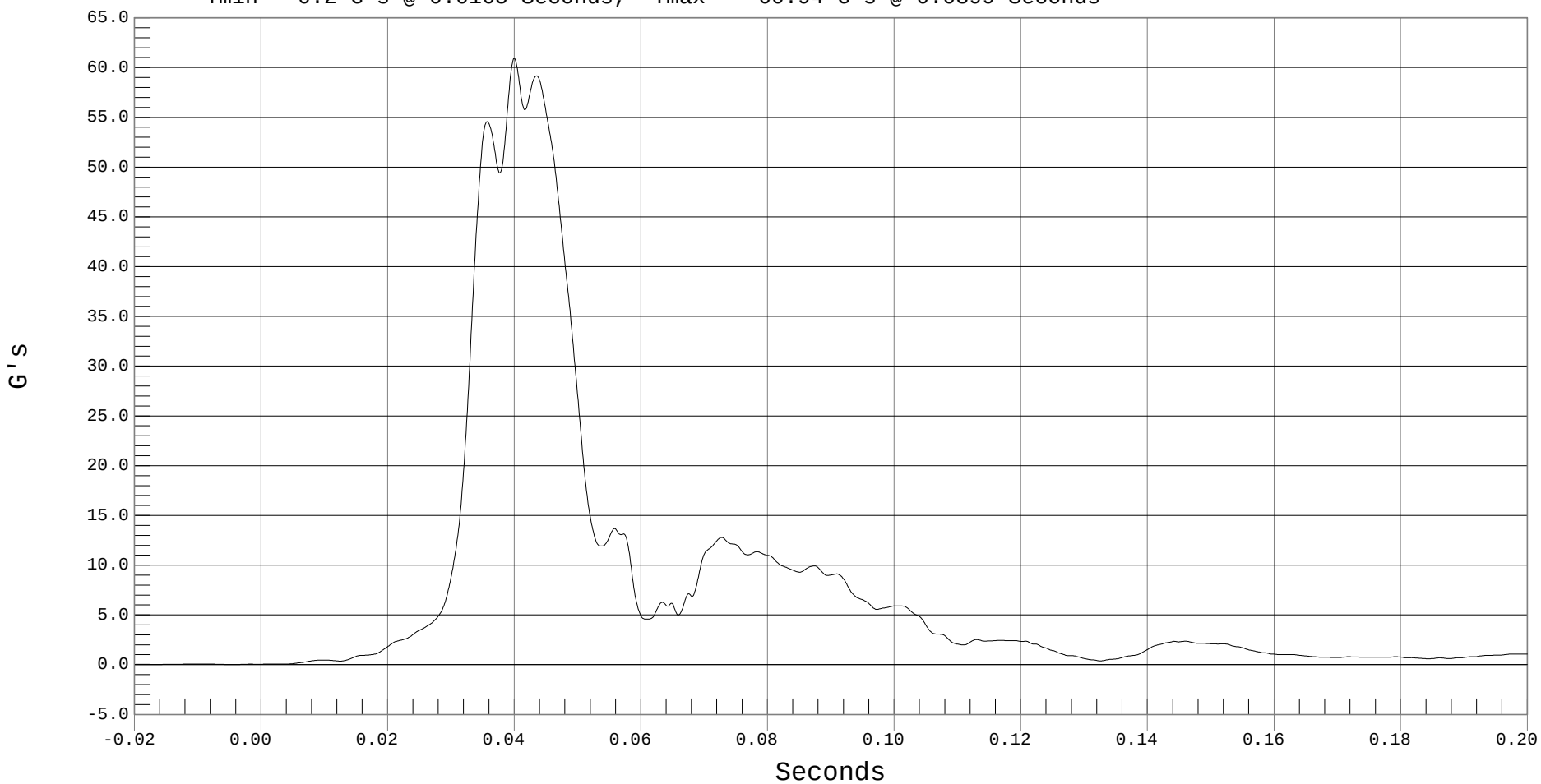
PASSENGER LOWER SPINE RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 180

— 1 PASSENGER LOWER SPINE RESULTANT, B01108AV.A89

Ymin = 0.2 G's @ 0.0165 Seconds, Ymax = 60.94 G's @ 0.0399 Seconds





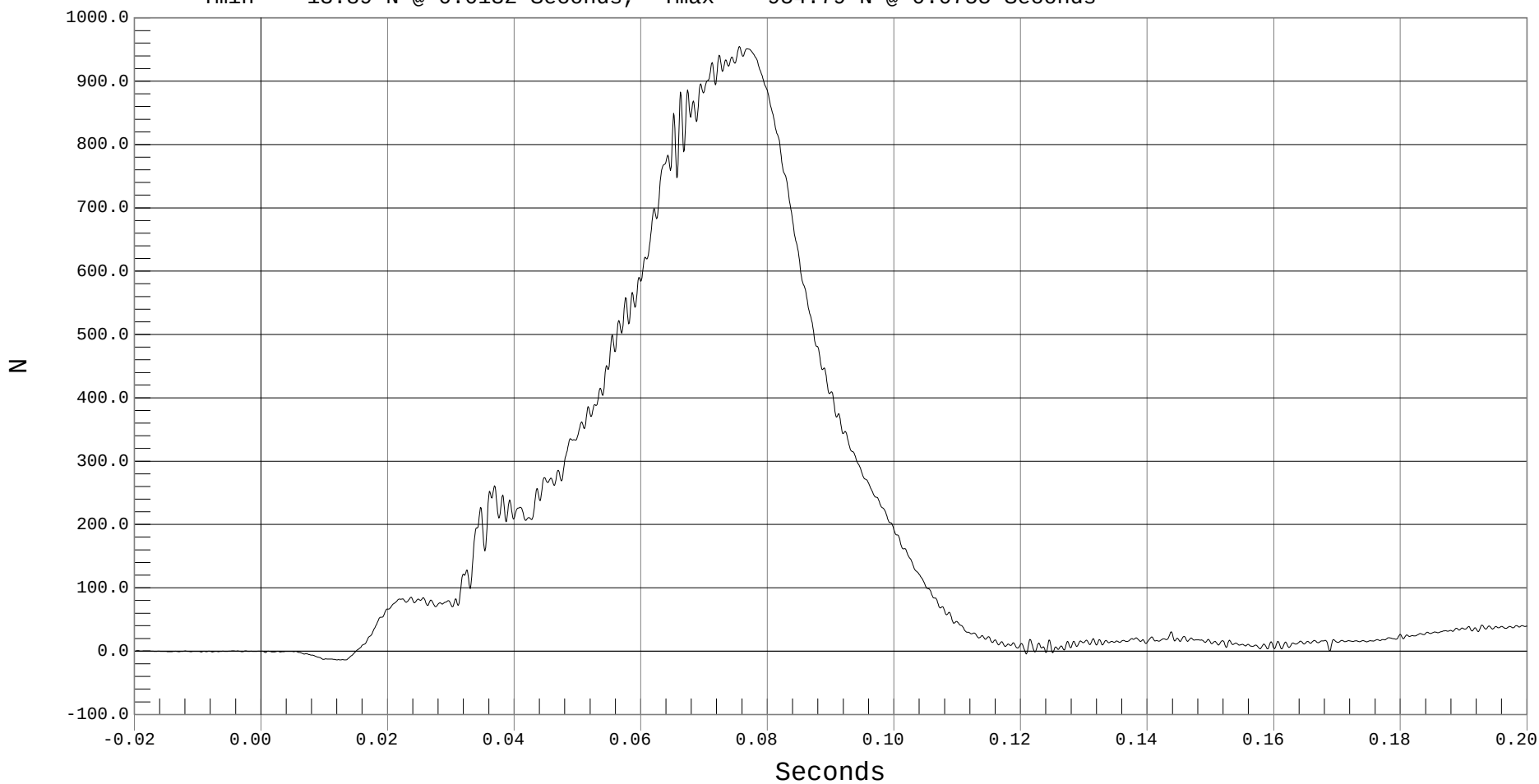
PASSENGER TORSO FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER TORSO FORCE X, B01108FF.F92

Ymin = -13.89 N @ 0.0132 Seconds, Ymax = 954.79 N @ 0.0755 Seconds





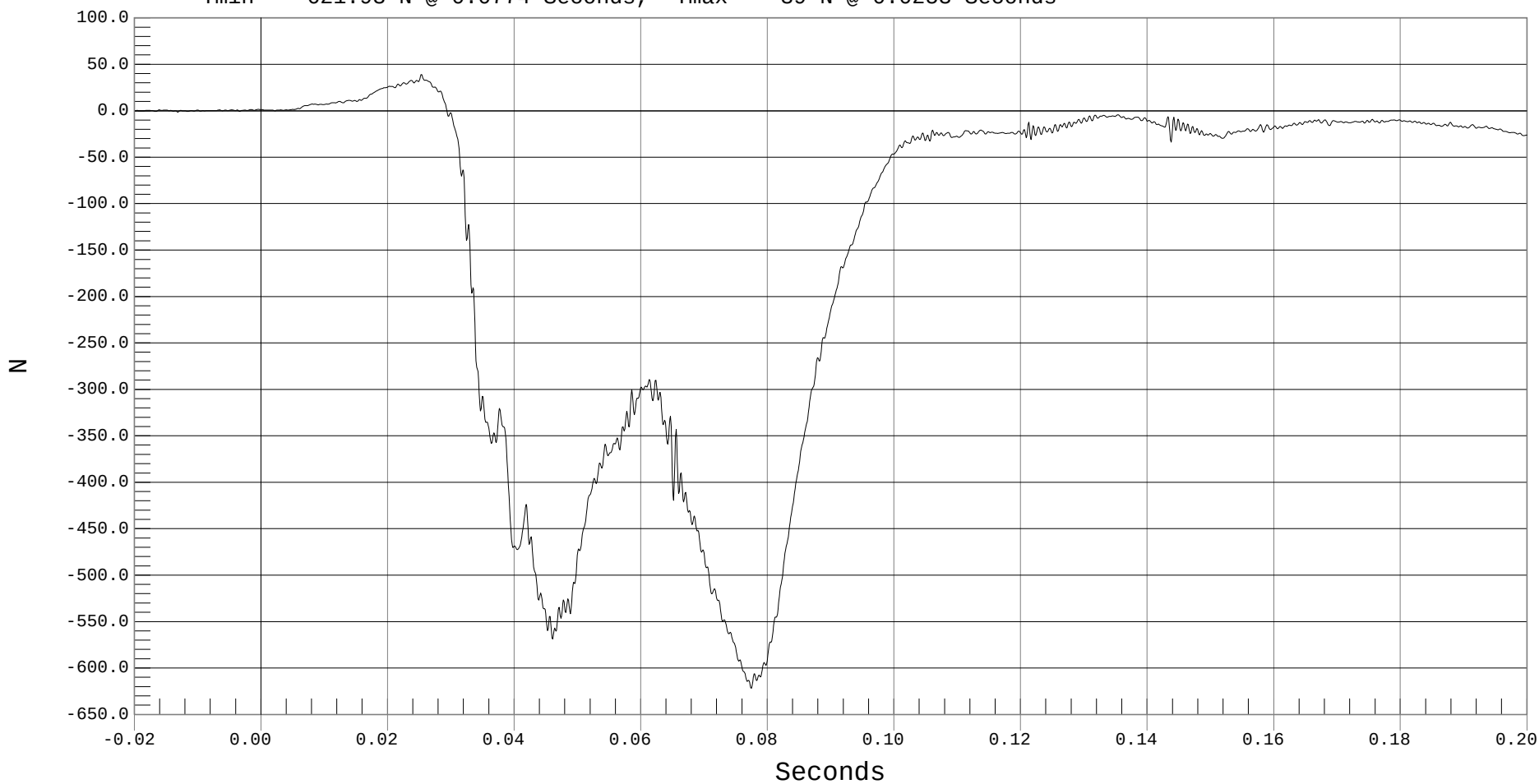
PASSENGER TORSO FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER TORSO FORCE Y, B01108FF.F93

Ymin = -621.93 N @ 0.0774 Seconds, Ymax = 39 N @ 0.0253 Seconds





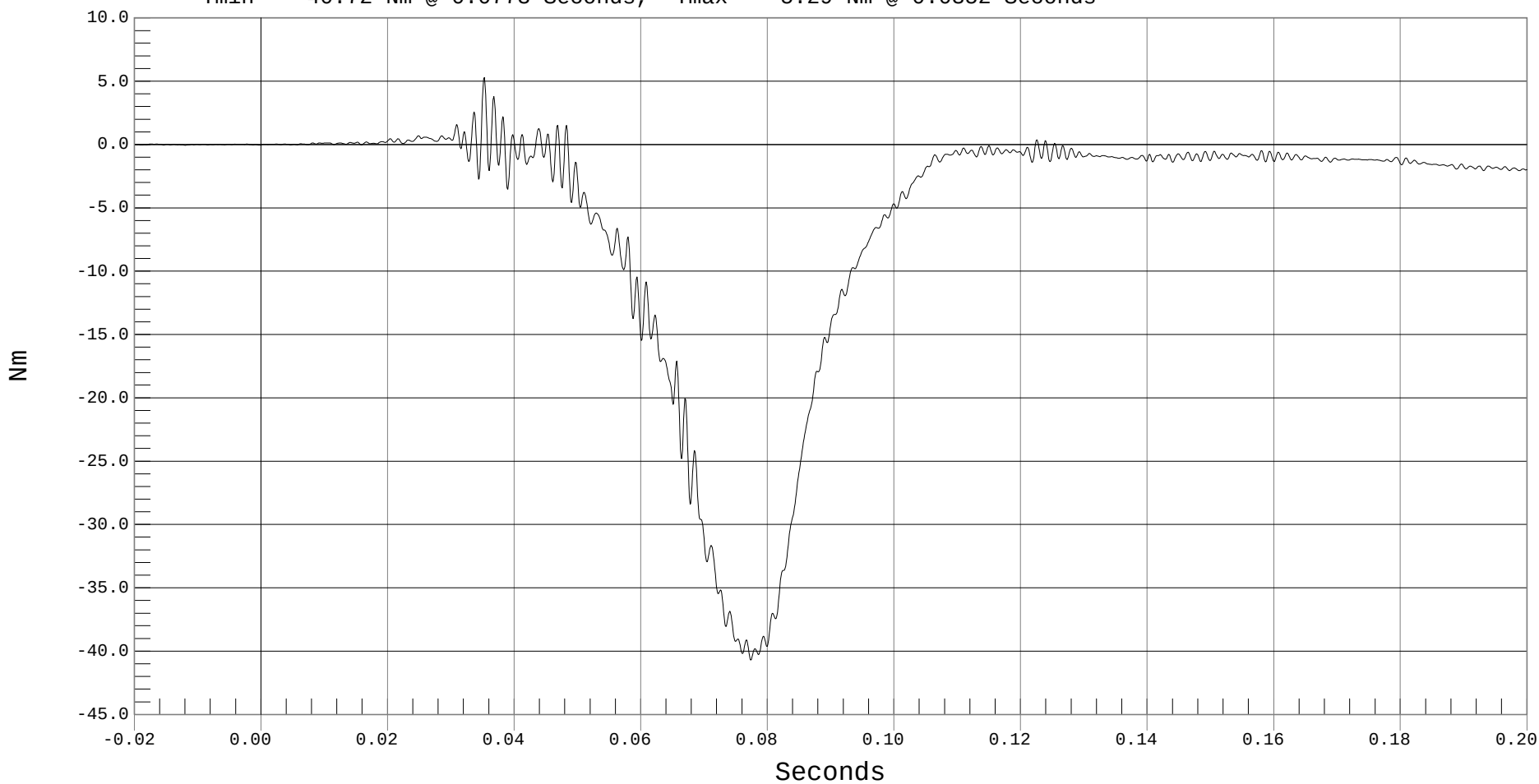
PASSENGER TORSO MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER TORSO MOMENT Y, B01108FF.F57

Ymin = -40.72 Nm @ 0.0773 Seconds, Ymax = 5.29 Nm @ 0.0352 Seconds





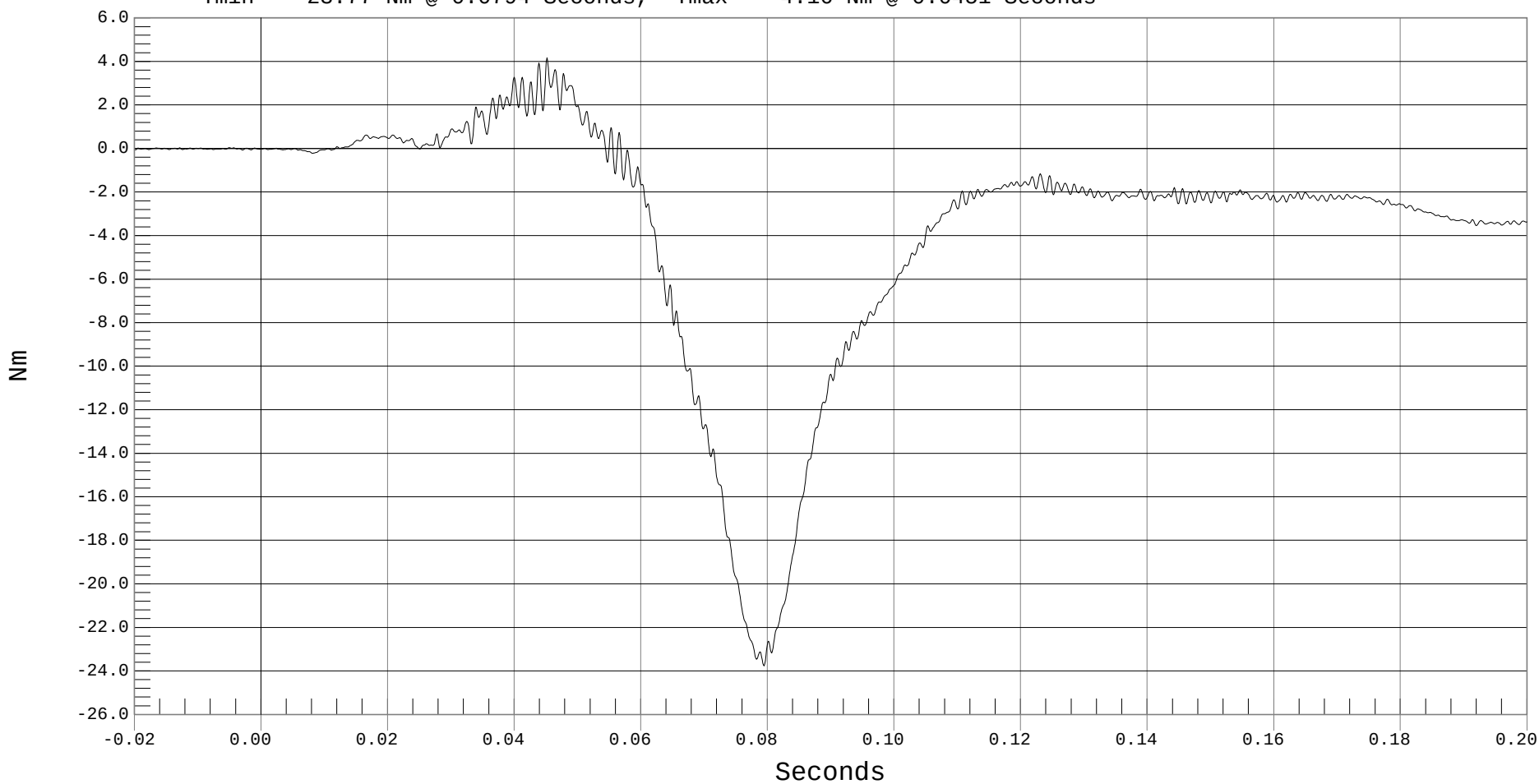
PASSENGER TORSO MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER TORSO MOMENT Z, B01108MF.M58

Ymin = -23.77 Nm @ 0.0794 Seconds, Ymax = 4.16 Nm @ 0.0451 Seconds





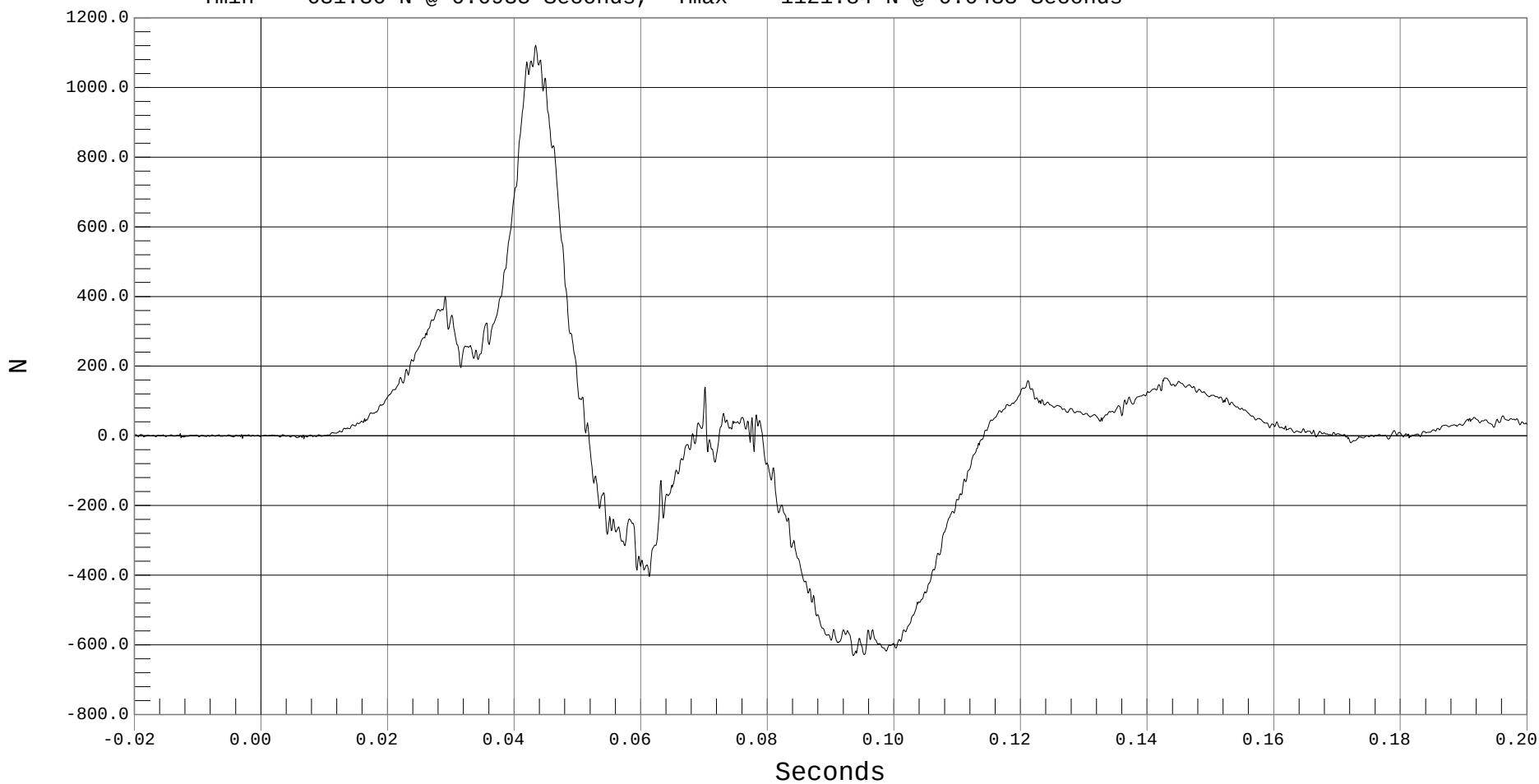
PASSENGER LUMBAR FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER LUMBAR FORCE Y, B01108FT.F59

Ymin = -631.36 N @ 0.0935 Seconds, Ymax = 1121.84 N @ 0.0433 Seconds



B-1335



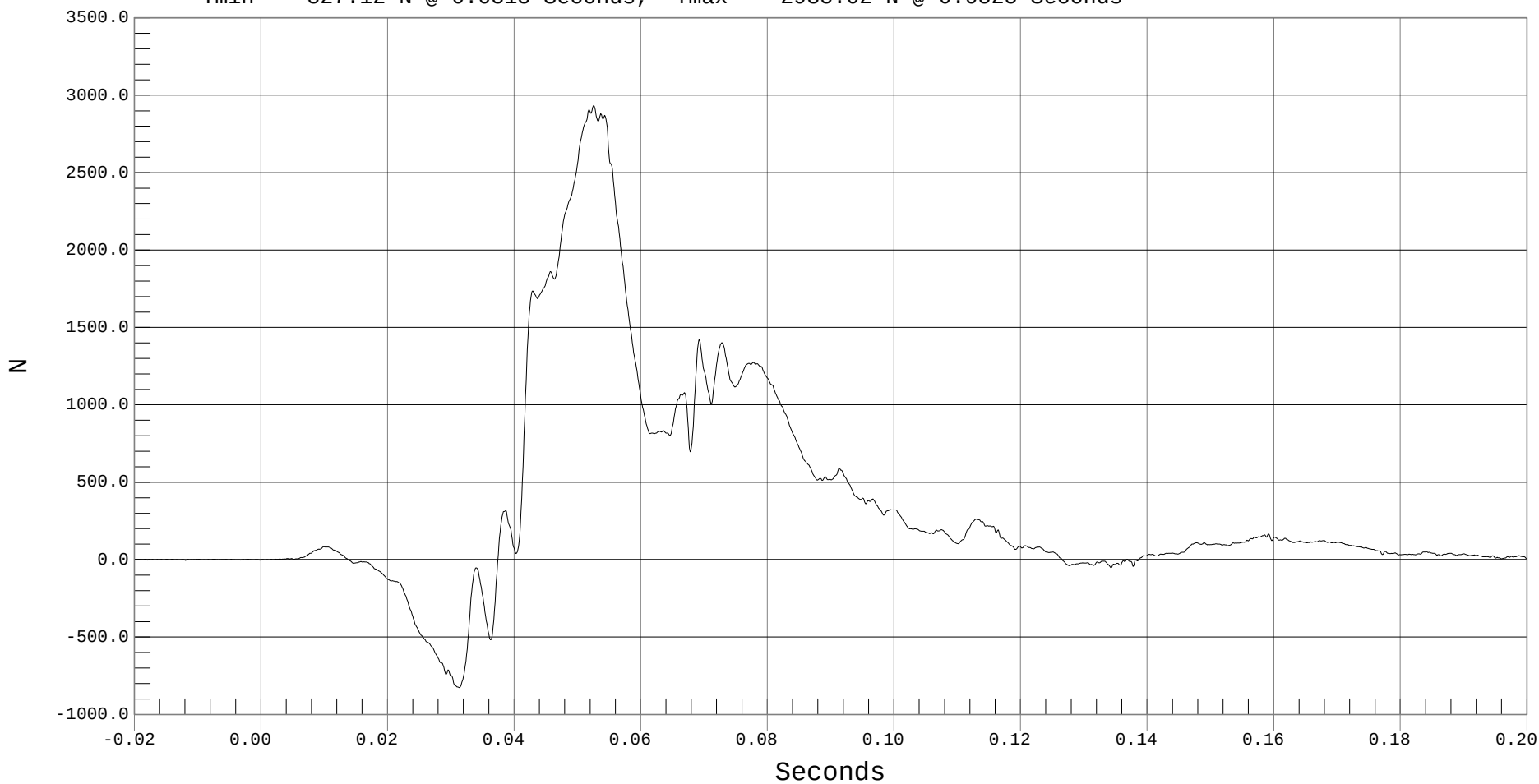
PASSENGER LUMBAR FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER LUMBAR FORCE Z, B01108FT.F60

Ymin = -827.12 N @ 0.0313 Seconds, Ymax = 2935.02 N @ 0.0525 Seconds





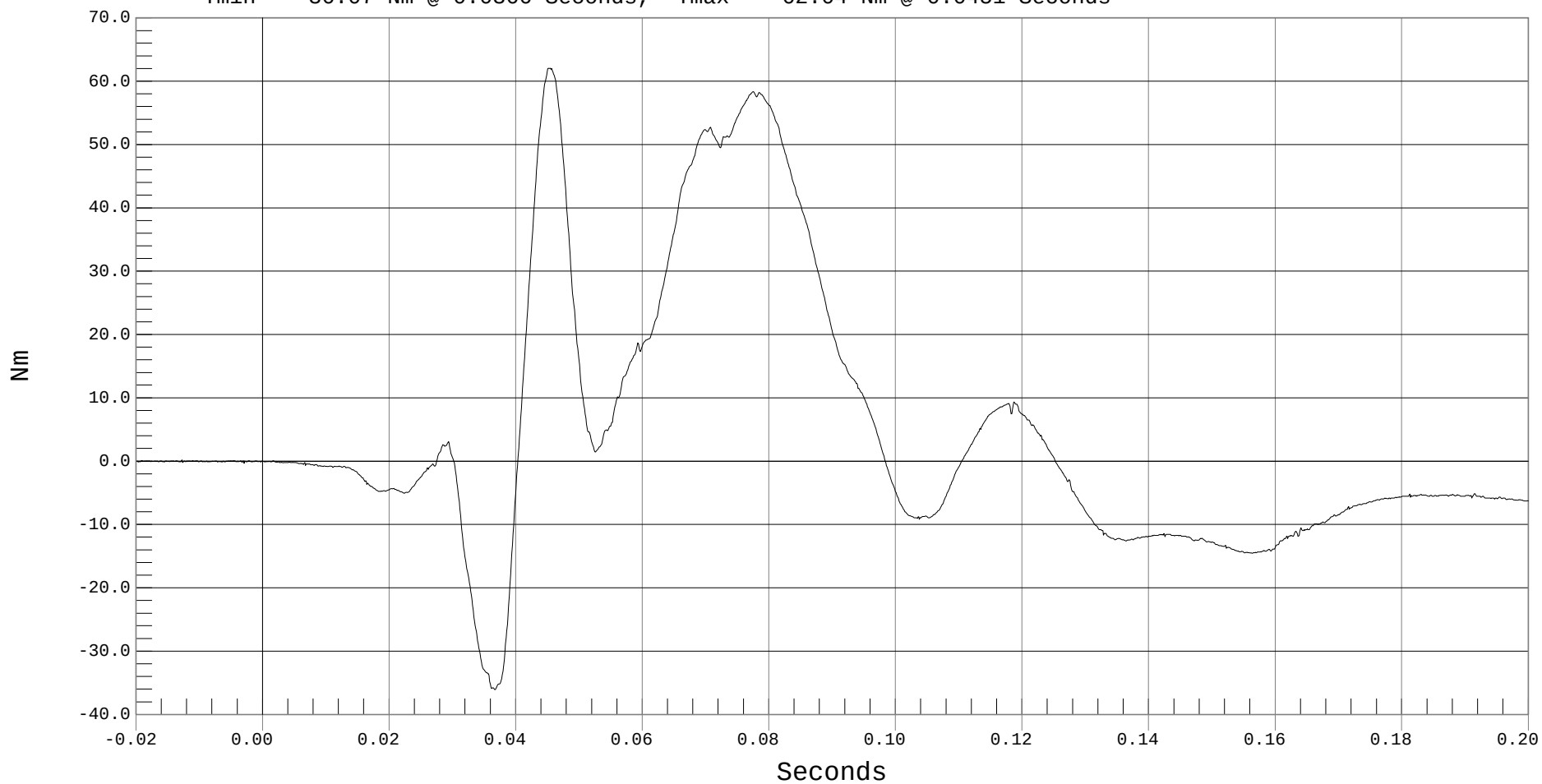
PASSENGER LUMBAR MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER LUMBAR MOMENT X, B01108MT.M61

Ymin = -36.07 Nm @ 0.0366 Seconds, Ymax = 62.04 Nm @ 0.0451 Seconds





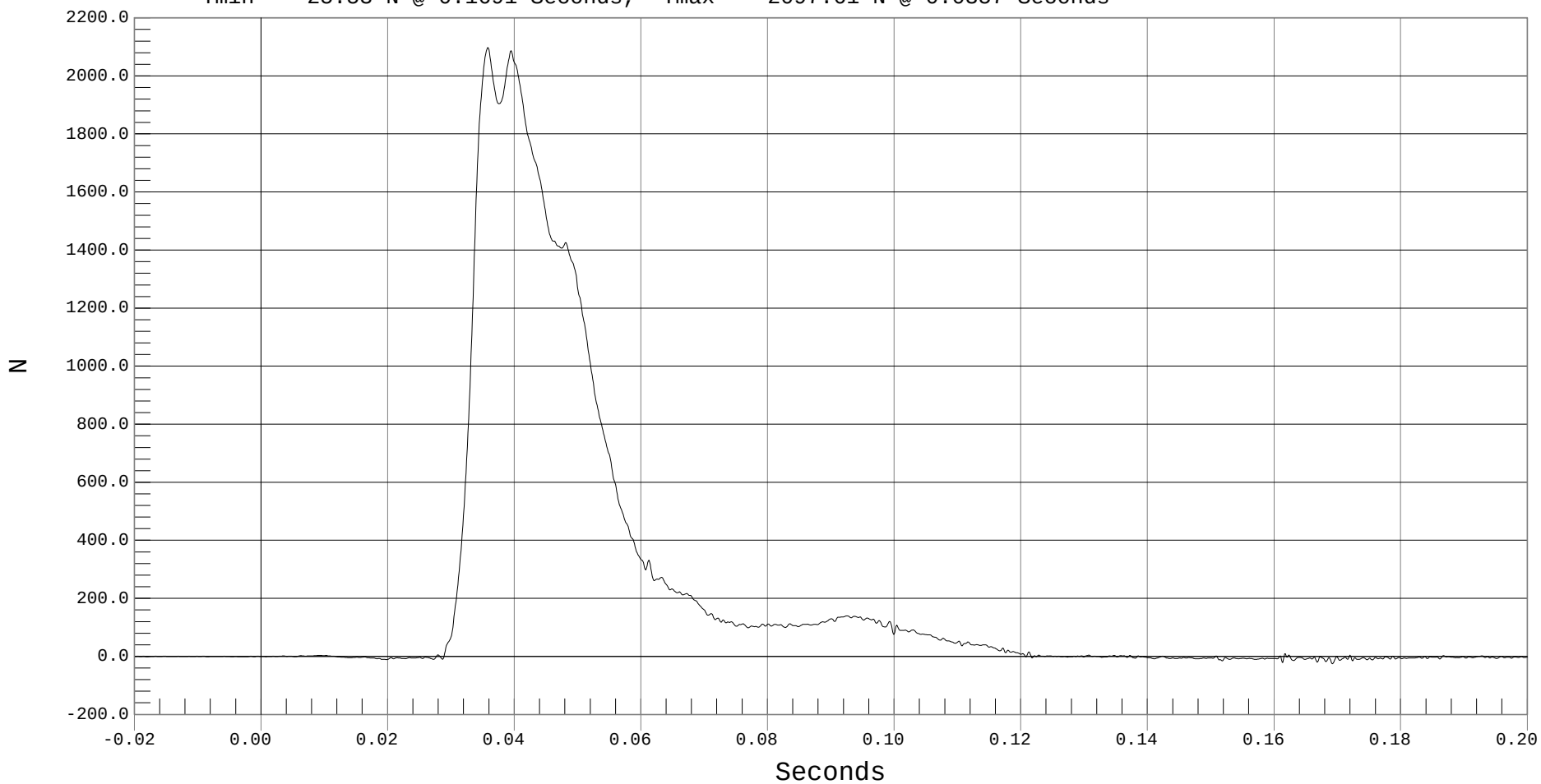
PASSENGER ABDOMEN FRONT FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER FRONT ABDOMEN FORCE, B01108FF.F06

Ymin = -25.53 N @ 0.1691 Seconds, Ymax = 2097.61 N @ 0.0357 Seconds





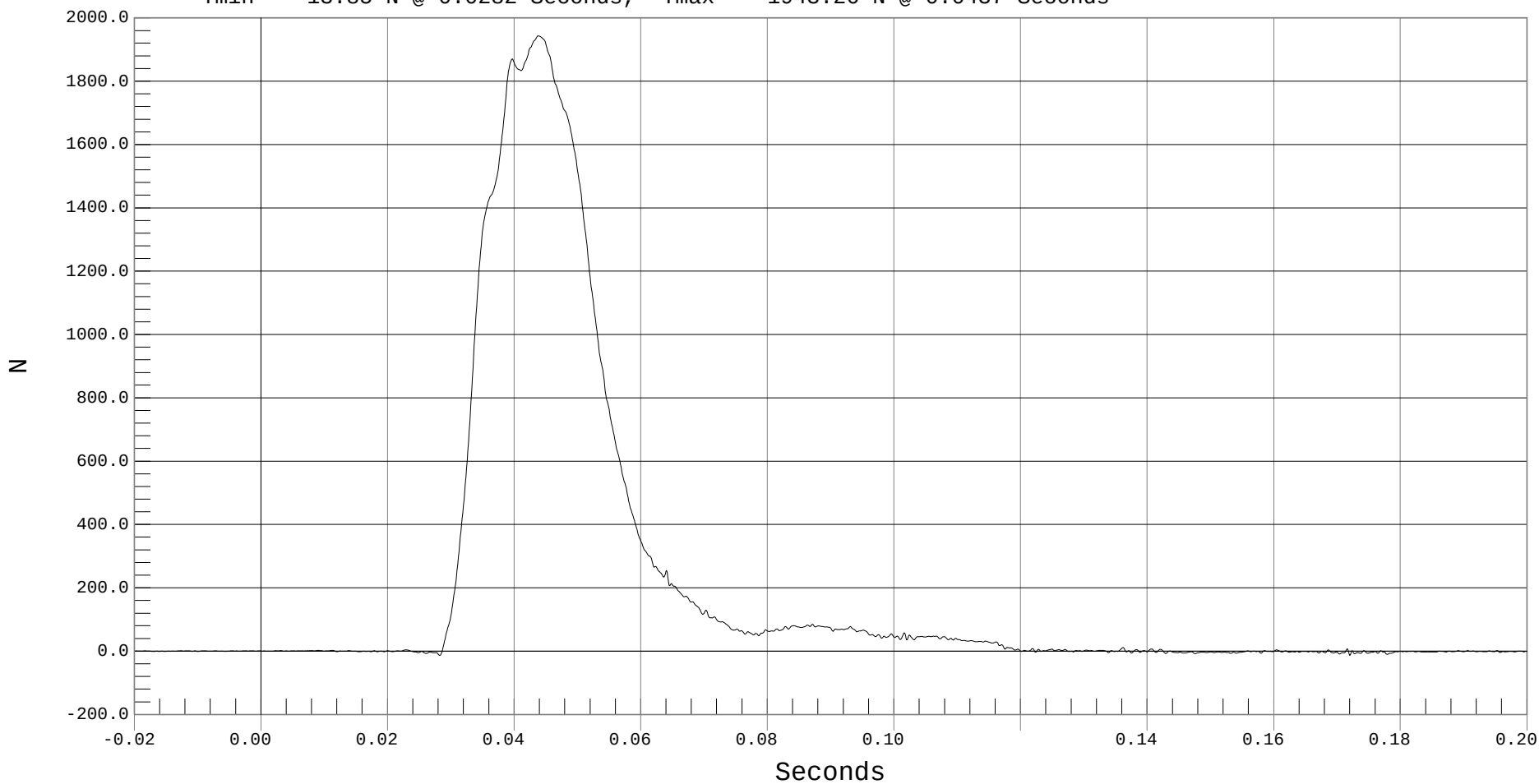
PASSENGER ABDOMEN MID FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER MID ABDOMEN FORCE, B01108FF.F07

Ymin = -13.85 N @ 0.0282 Seconds, Ymax = 1943.26 N @ 0.0437 Seconds





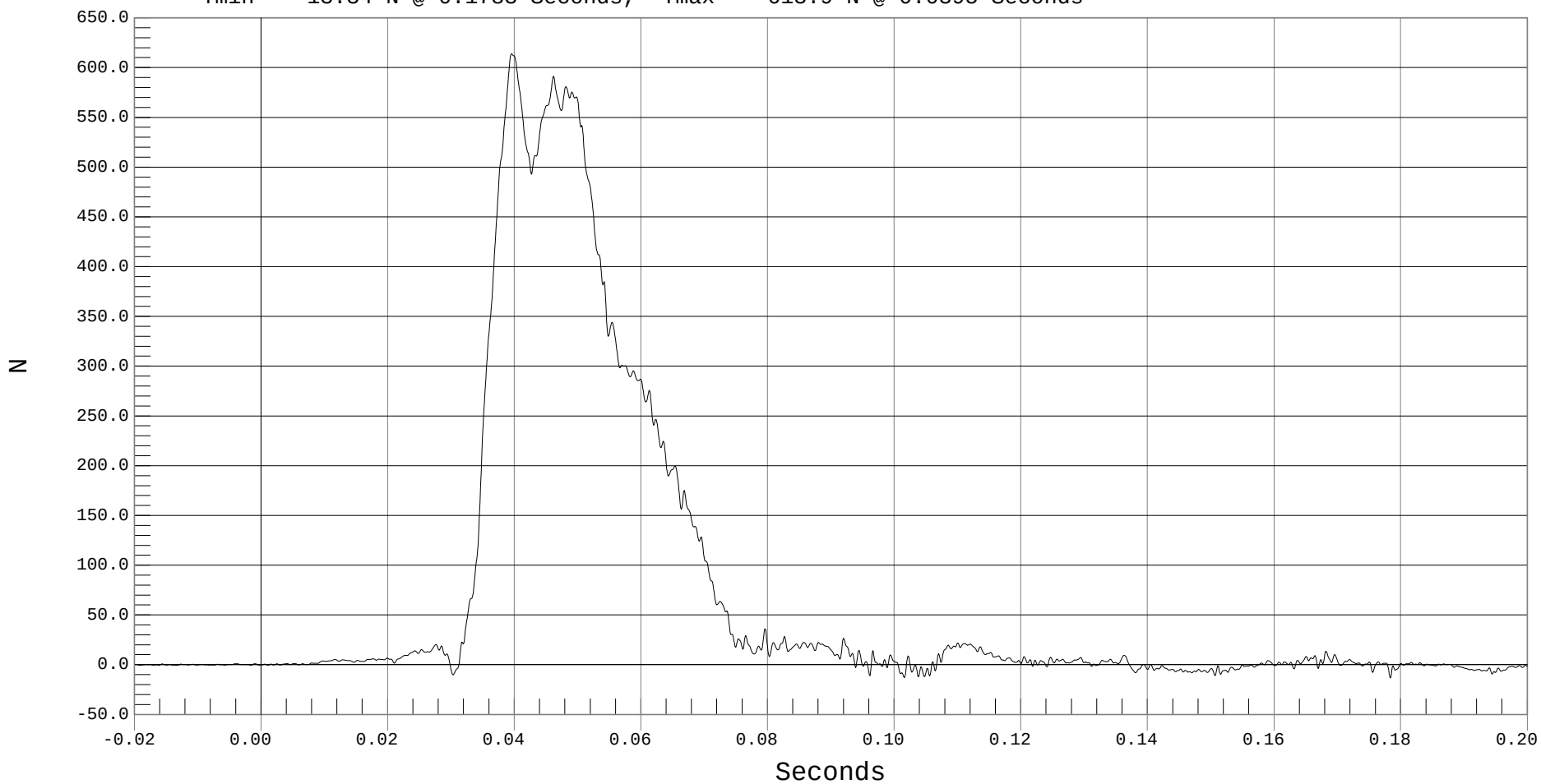
PASSENGER ABDOMEN REAR FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER REAR ABDOMEN FORCE, B01108FF.F08

Ymin = -13.34 N @ 0.1783 Seconds, Ymax = 613.9 N @ 0.0395 Seconds





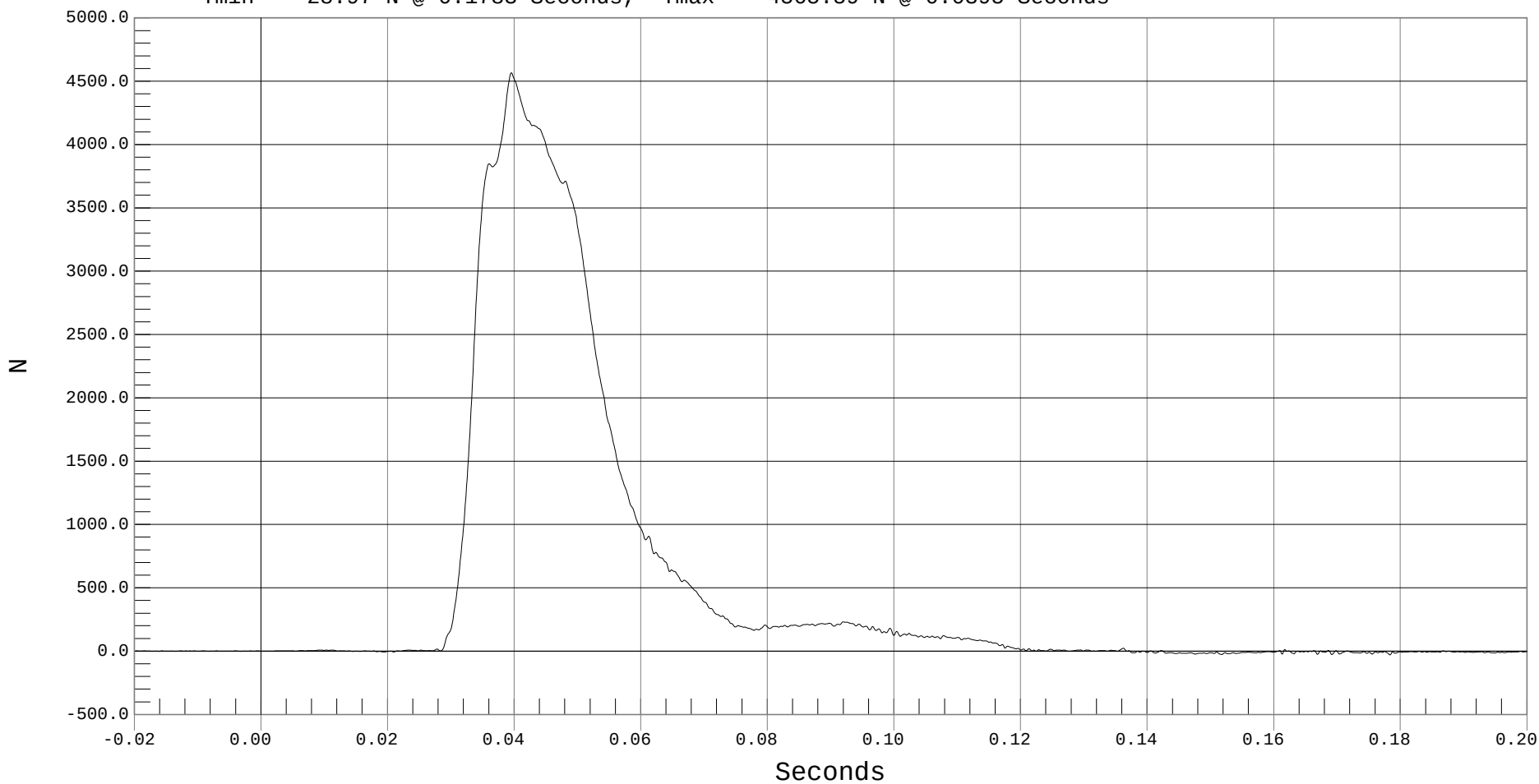
PASSENGER SUMMED ABDOMEN FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 PASSENGER SUMMED ABDOMEN FORCE, B01108FU.F06

Ymin = -28.97 N @ 0.1783 Seconds, Ymax = 4565.59 N @ 0.0395 Seconds





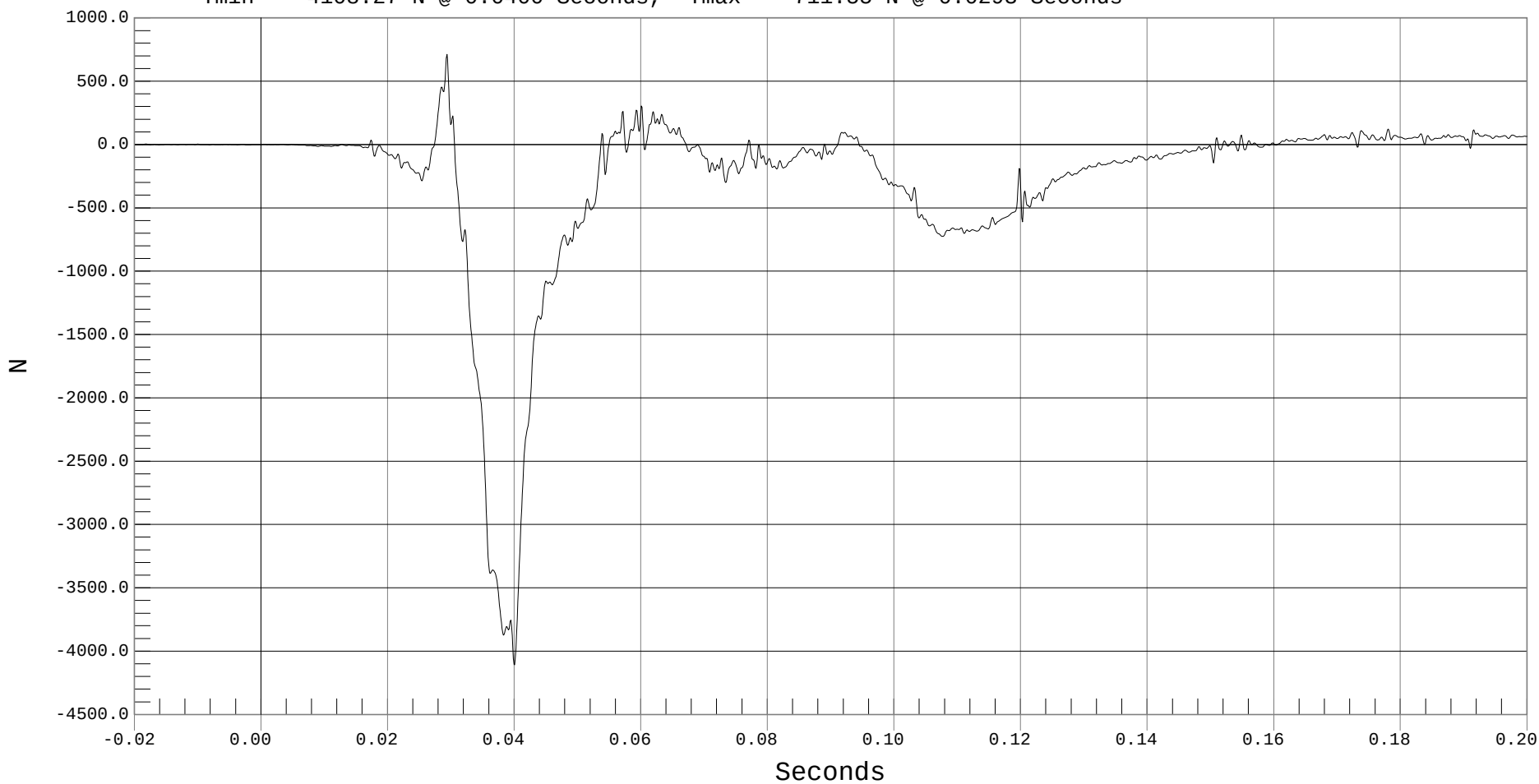
PASSENGER PUBIC SYMPHYSIS FORCE

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER PUBIC SYMPHYSIS FORC, B01108FF.F09

Ymin = -4108.27 N @ 0.0400 Seconds, Ymax = 711.55 N @ 0.0293 Seconds





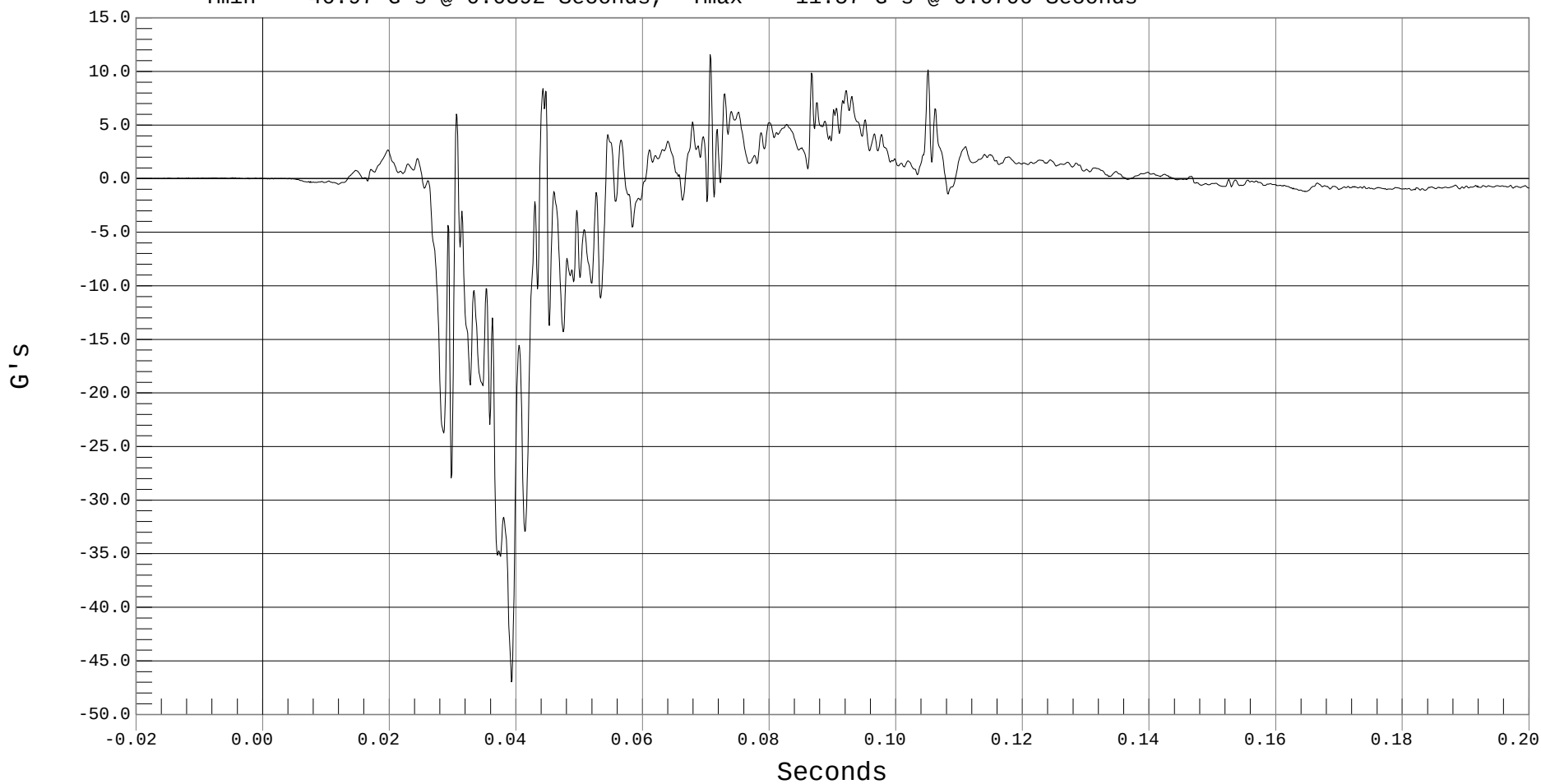
PASSENGER PELVIS X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER PELVIS X, B01108AT.A10

Ymin = -46.97 G's @ 0.0392 Seconds, Ymax = 11.57 G's @ 0.0706 Seconds





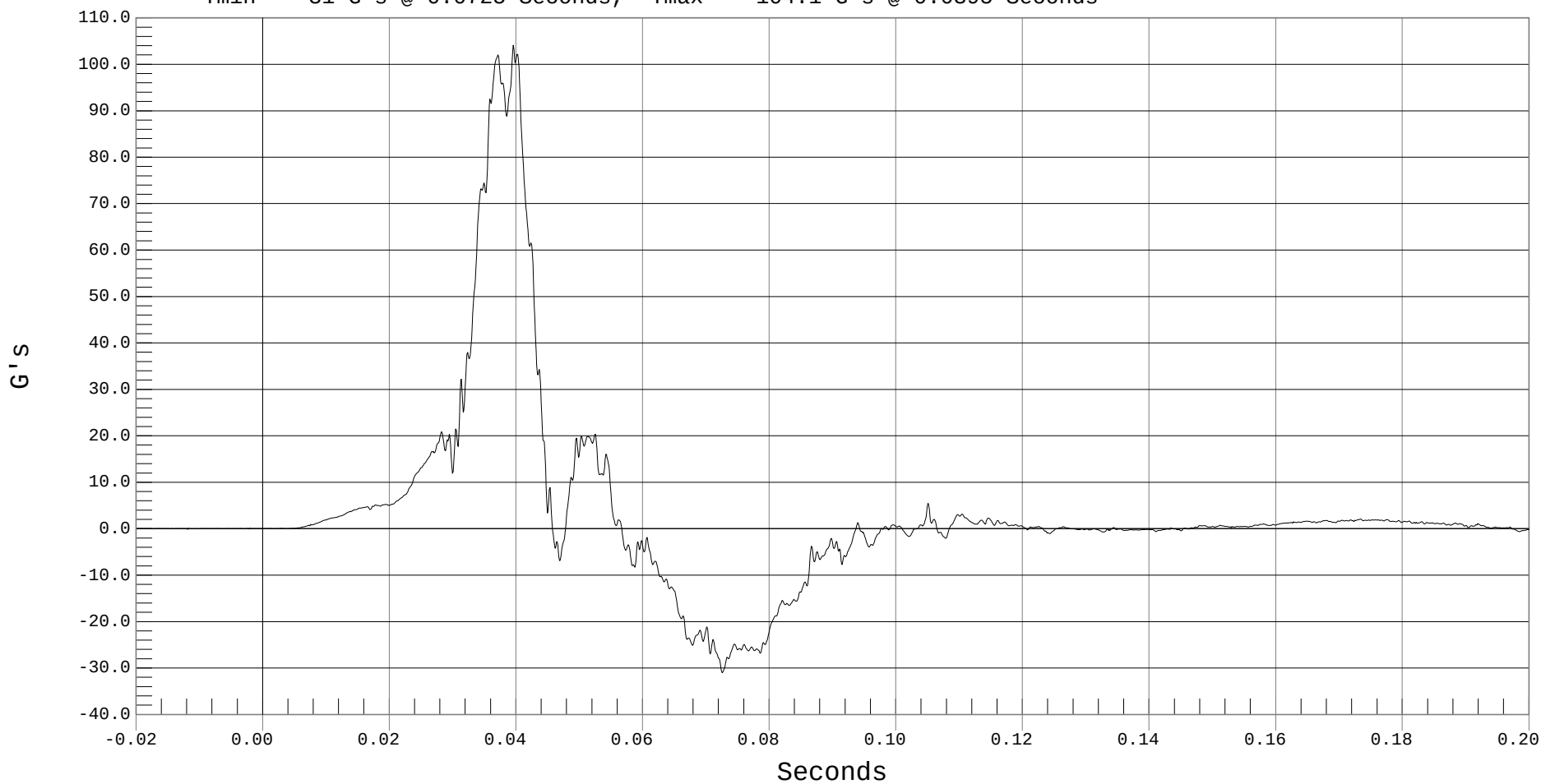
PASSENGER PELVIS Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER PELVIS Y, B01108AT.A11

Ymin = -31 G's @ 0.0725 Seconds, Ymax = 104.1 G's @ 0.0395 Seconds





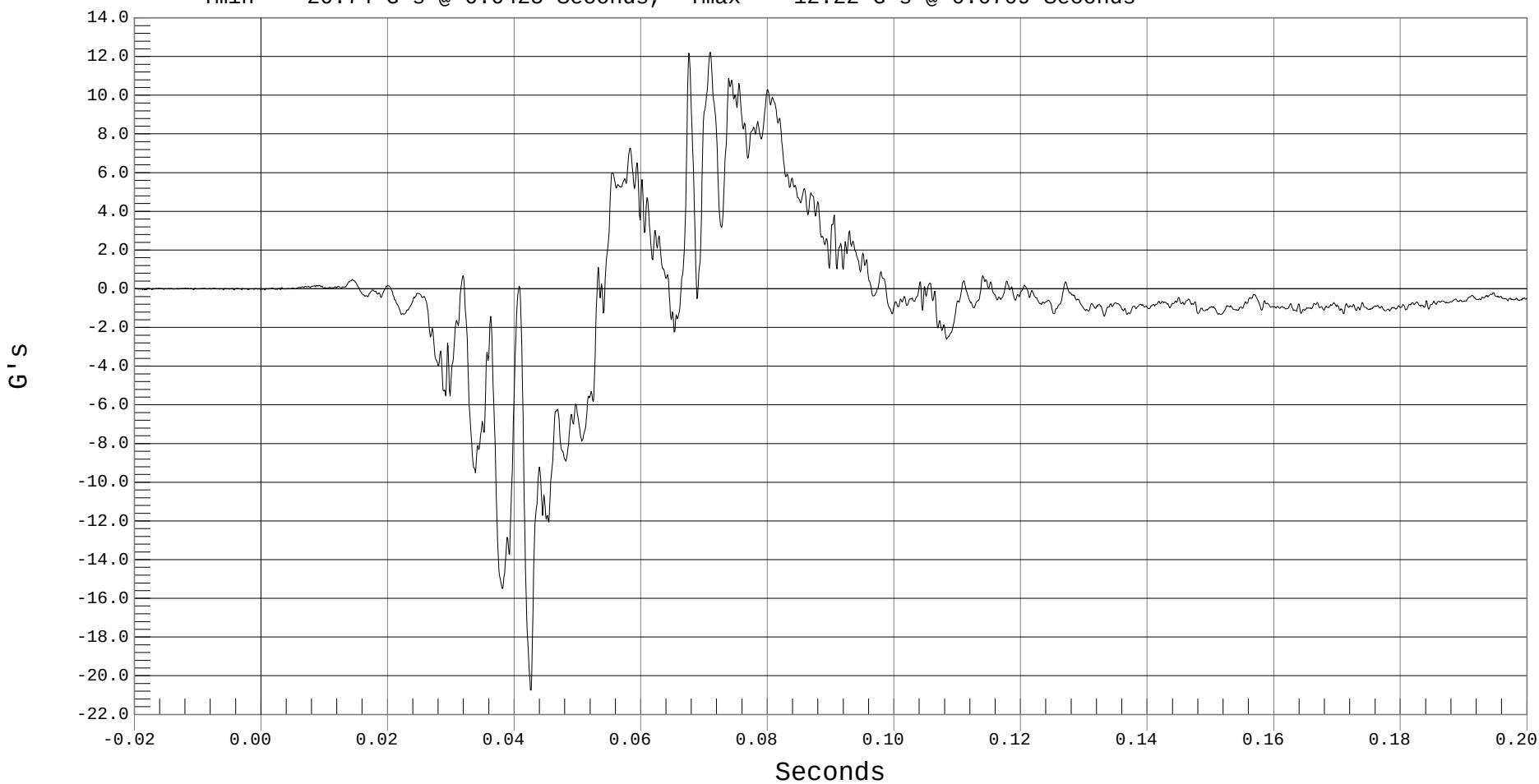
PASSENGER PELVIS Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER PELVIS Z, B01108AT.A12

Ymin = -20.74 G's @ 0.0425 Seconds, Ymax = 12.22 G's @ 0.0709 Seconds





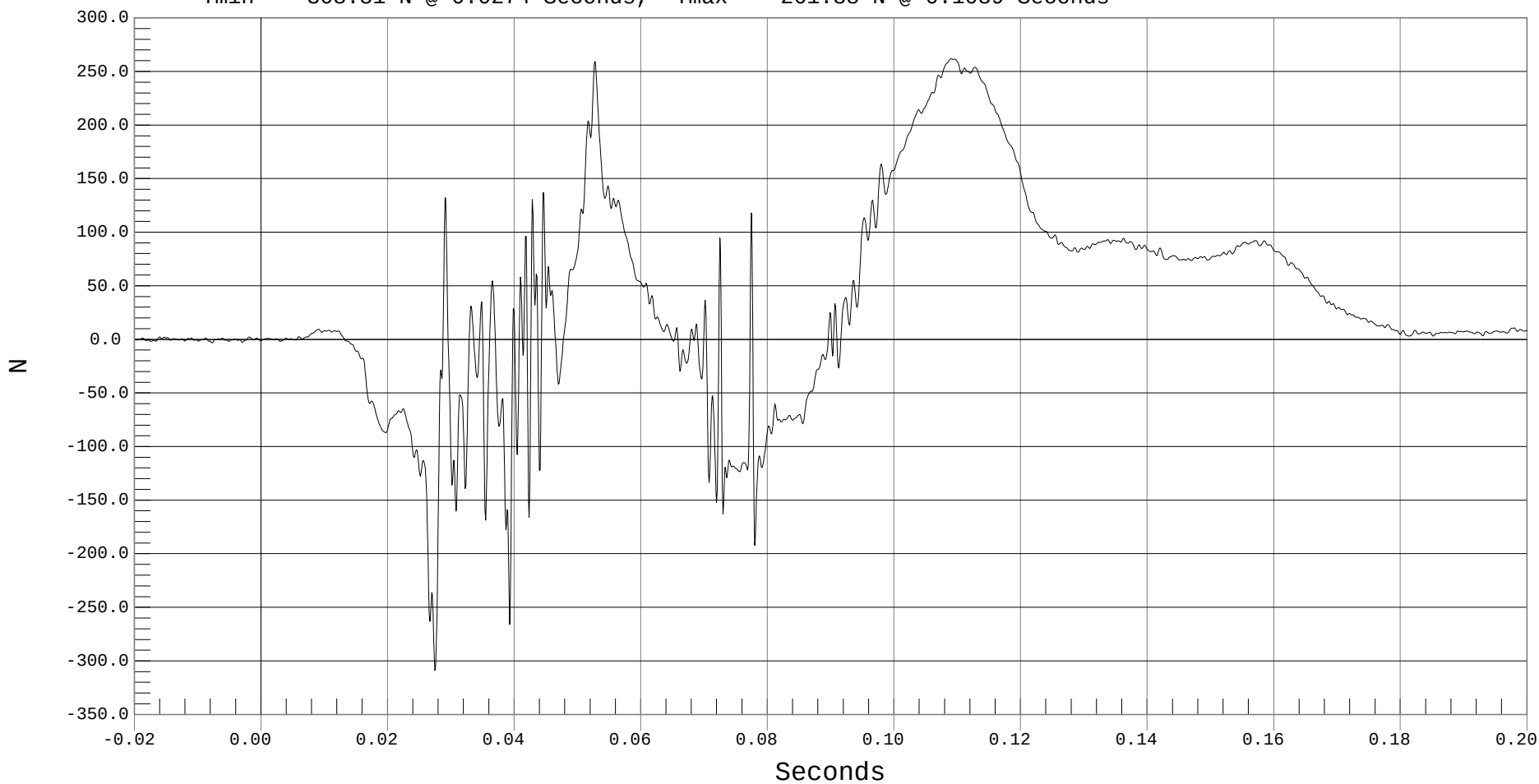
PASSENGER LEFT FEMUR FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER LEFT FEMUR FORCE X, B01108FF.F19

Ymin = -308.81 N @ 0.0274 Seconds, Ymax = 261.88 N @ 0.1089 Seconds





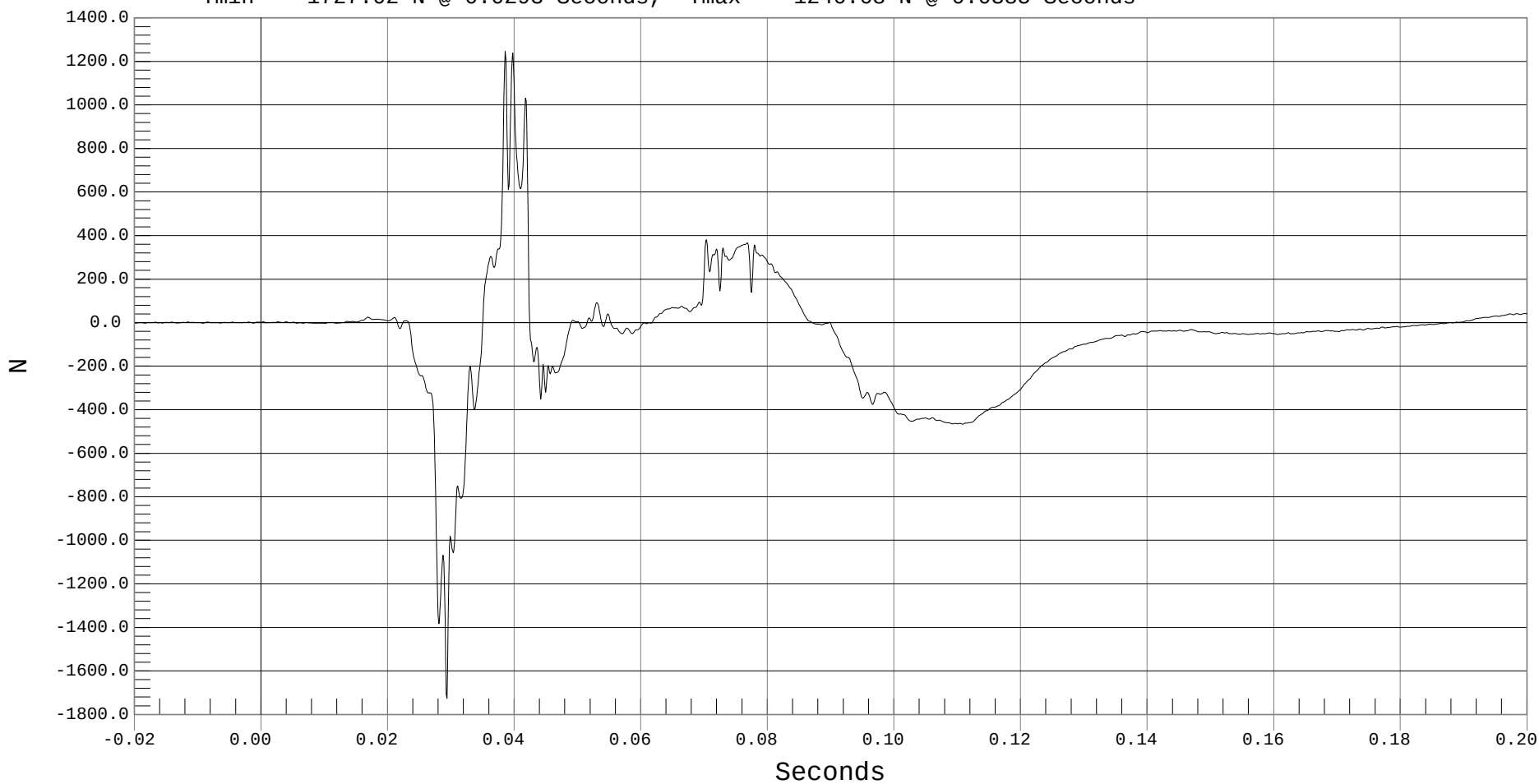
PASSENGER LEFT FEMUR FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER LEFT FEMUR FORCE Y, B01108FF.F20

Ymin = -1727.02 N @ 0.0293 Seconds, Ymax = 1246.68 N @ 0.0385 Seconds





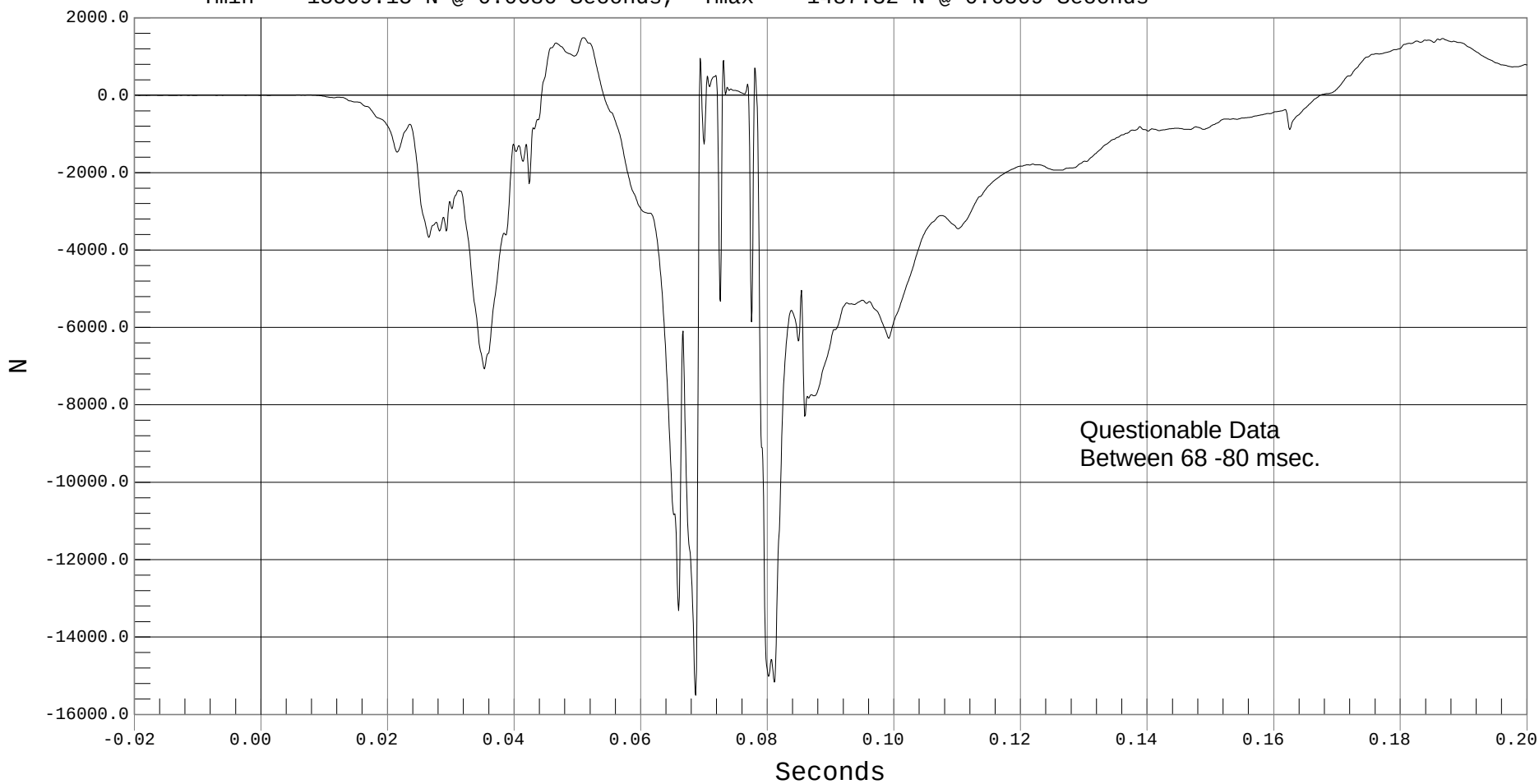
PASSENGER LEFT FEMUR FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER LEFT FEMUR FORCE Z, B01108FF.F21

Ymin = -15509.15 N @ 0.0686 Seconds, Ymax = 1487.32 N @ 0.0509 Seconds





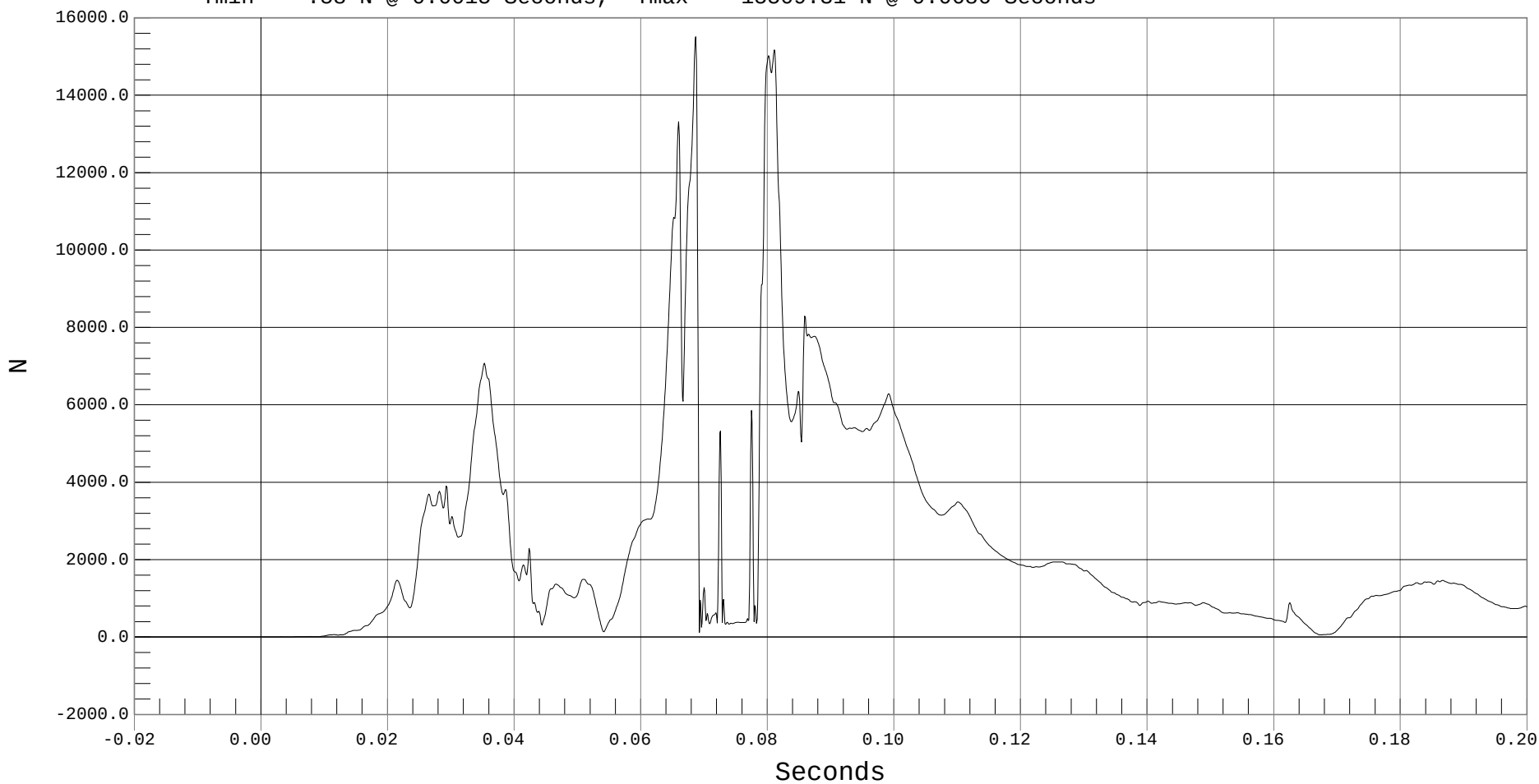
PASSENGER LEFT FEMUR FORCE RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 PASSENGER LEFT FEMUR FORCE RESULTANT, B01108FV.F19

Ymin = .58 N @ 0.0015 Seconds, Ymax = 15509.31 N @ 0.0686 Seconds





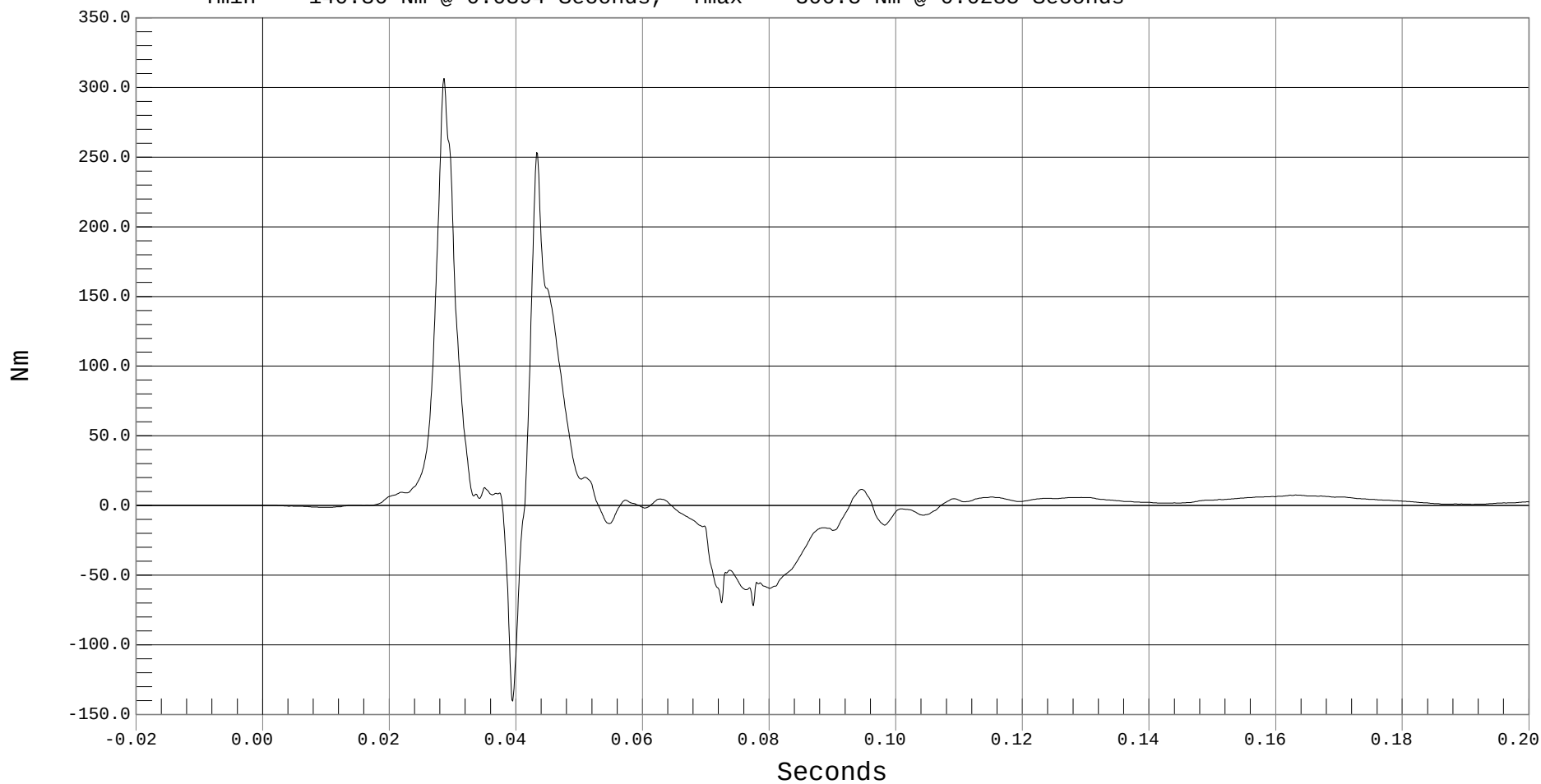
PASSENGER LEFT FEMUR MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER LEFT FEMUR MOMENT X, B01108FF.F22

Ymin = -140.36 Nm @ 0.0394 Seconds, Ymax = 306.5 Nm @ 0.0285 Seconds





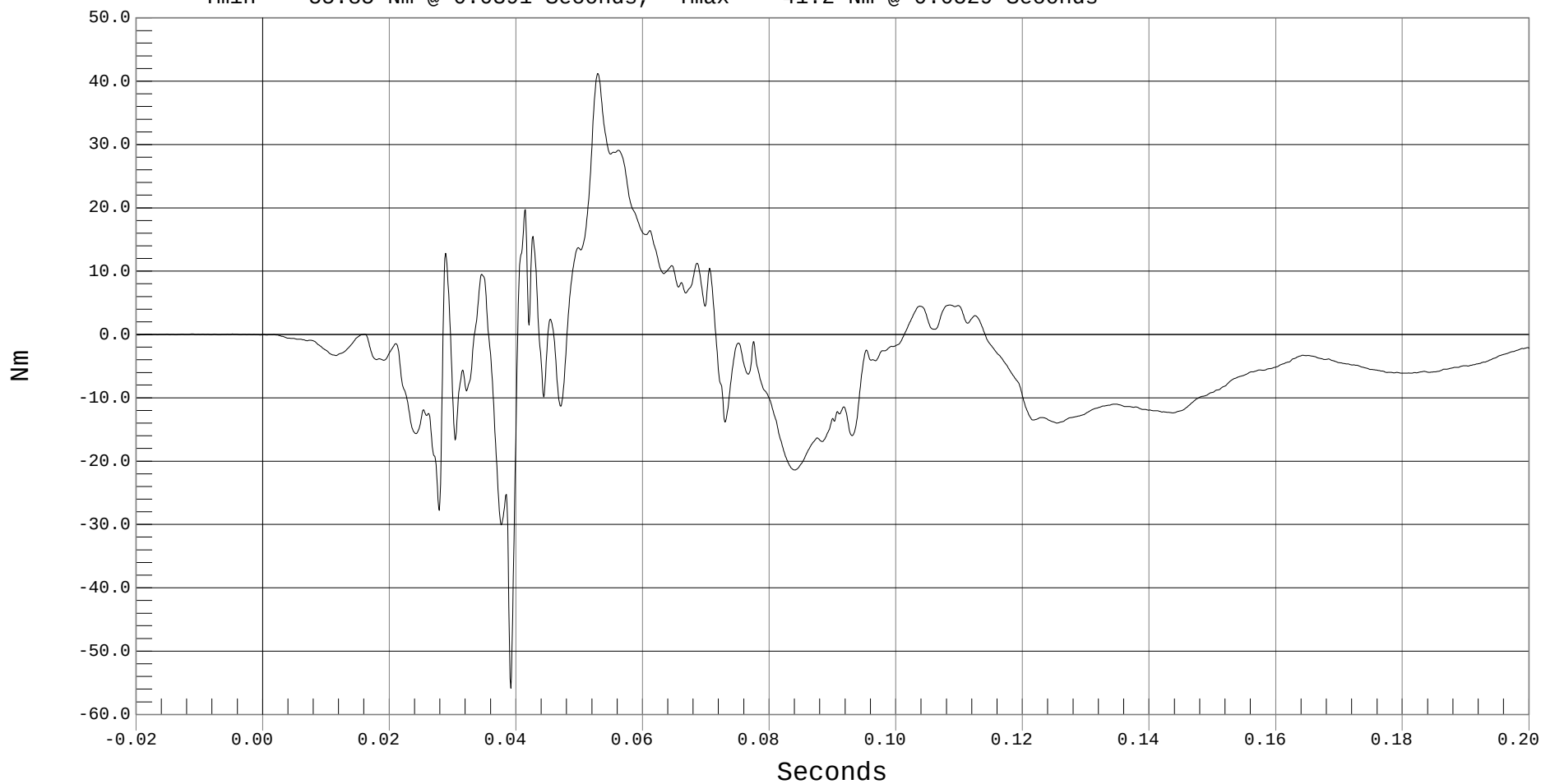
PASSENGER LEFT FEMUR MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER LEFT FEMUR MOMENT Y, B01108FF.F23

Ymin = -55.85 Nm @ 0.0391 Seconds, Ymax = 41.2 Nm @ 0.0529 Seconds





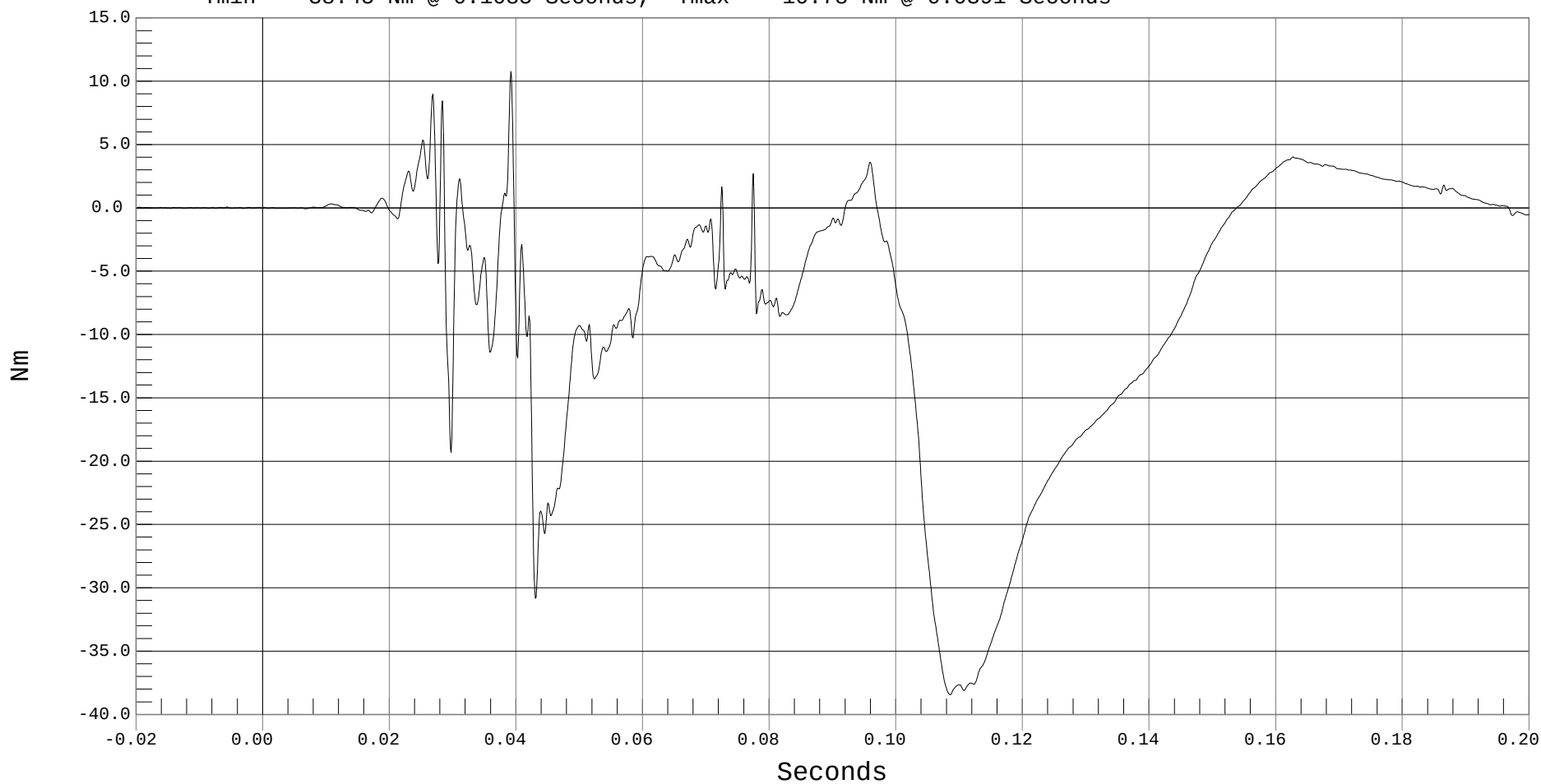
PASSENGER LEFT FEMUR MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

1 REAR PASSENGER LEFT FEMUR MOMENT Z, B01108FF.F24

Ymin = -38.45 Nm @ 0.1085 Seconds, Ymax = 10.78 Nm @ 0.0391 Seconds





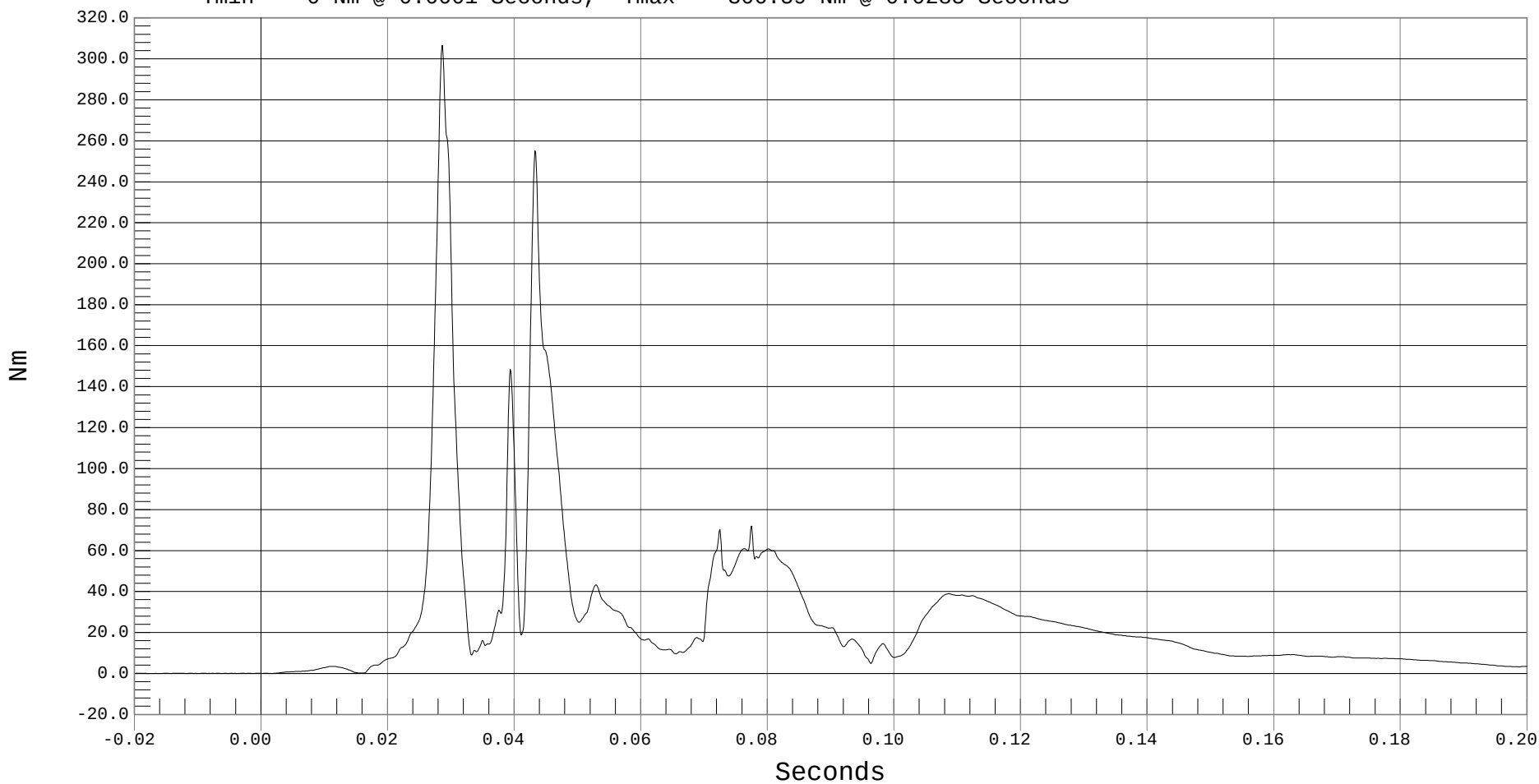
PASSENGER LEFT FEMUR MOMENT RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 PASSENGER LEFT FEMUR MOMENT RESULTANT, B01108FV.F22

Ymin = 0 Nm @ 0.0001 Seconds, Ymax = 306.59 Nm @ 0.0285 Seconds





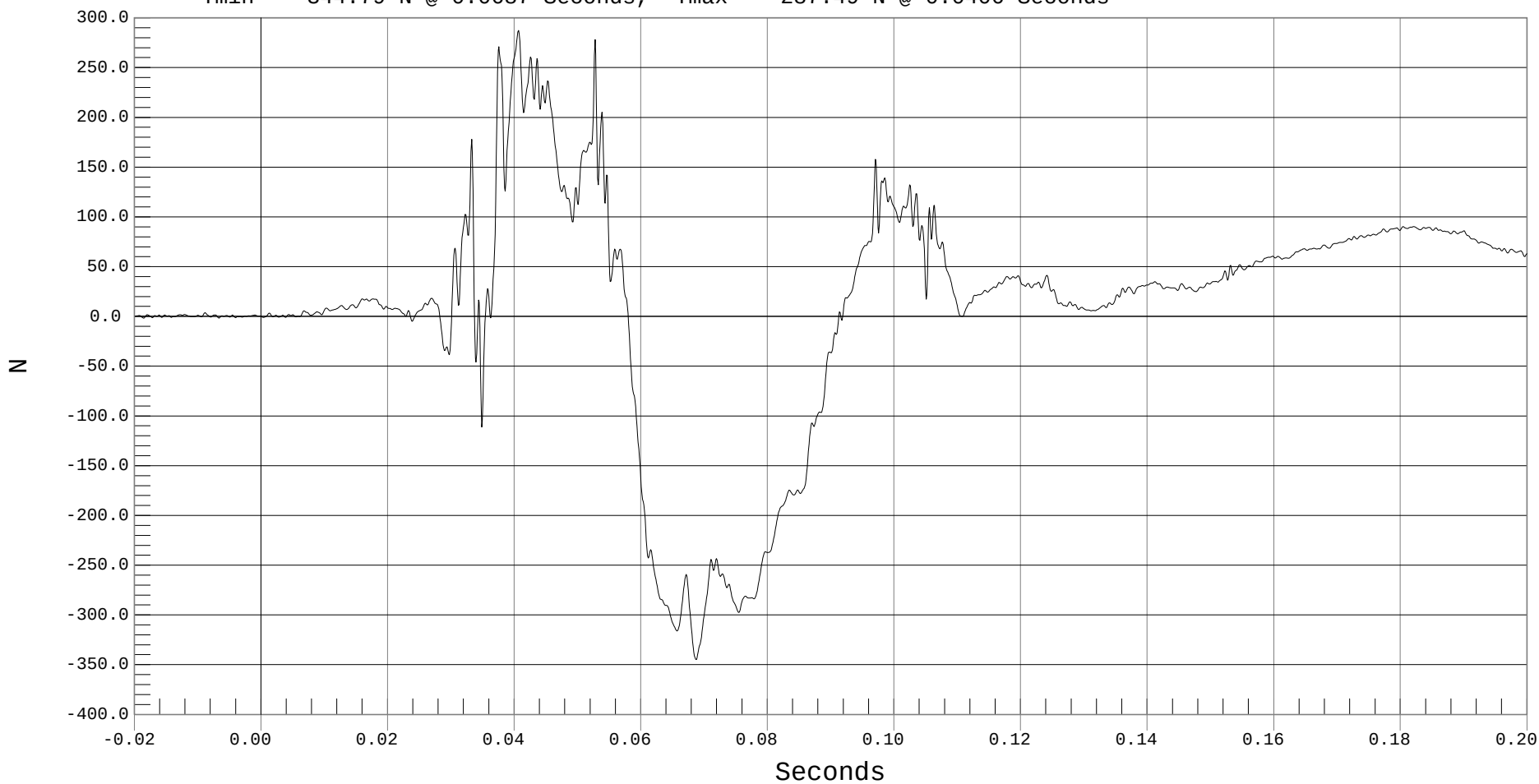
PASSENGER RIGHT FEMUR FORCE X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER RIGHT FEMUR FORCE X, B01108FF.F32

Ymin = -344.79 N @ 0.0687 Seconds, Ymax = 287.49 N @ 0.0406 Seconds





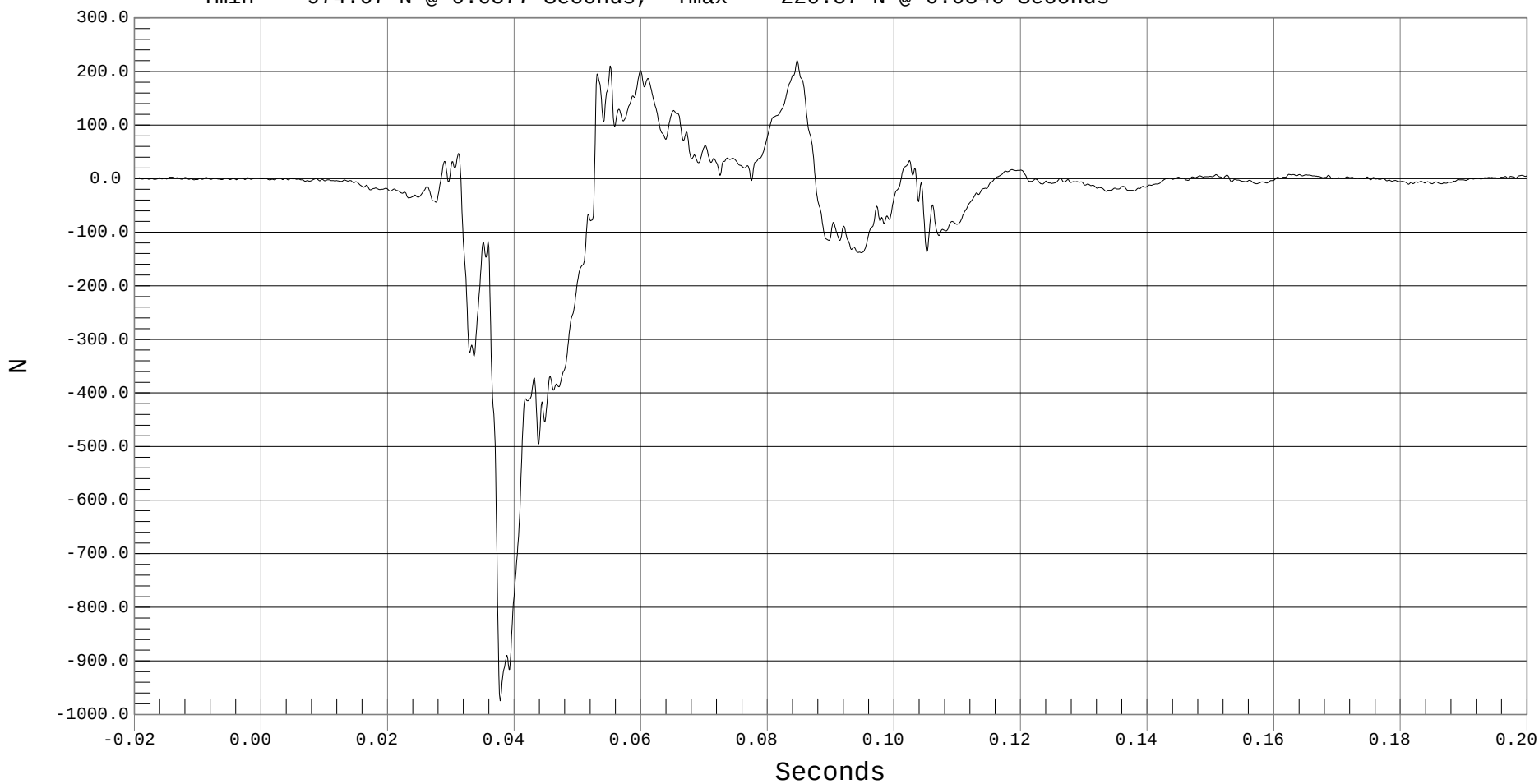
PASSENGER RIGHT FEMUR FORCE Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER RIGHT FEMUR FORCE Y, B01108FF.F14

Ymin = -974.67 N @ 0.0377 Seconds, Ymax = 220.57 N @ 0.0846 Seconds





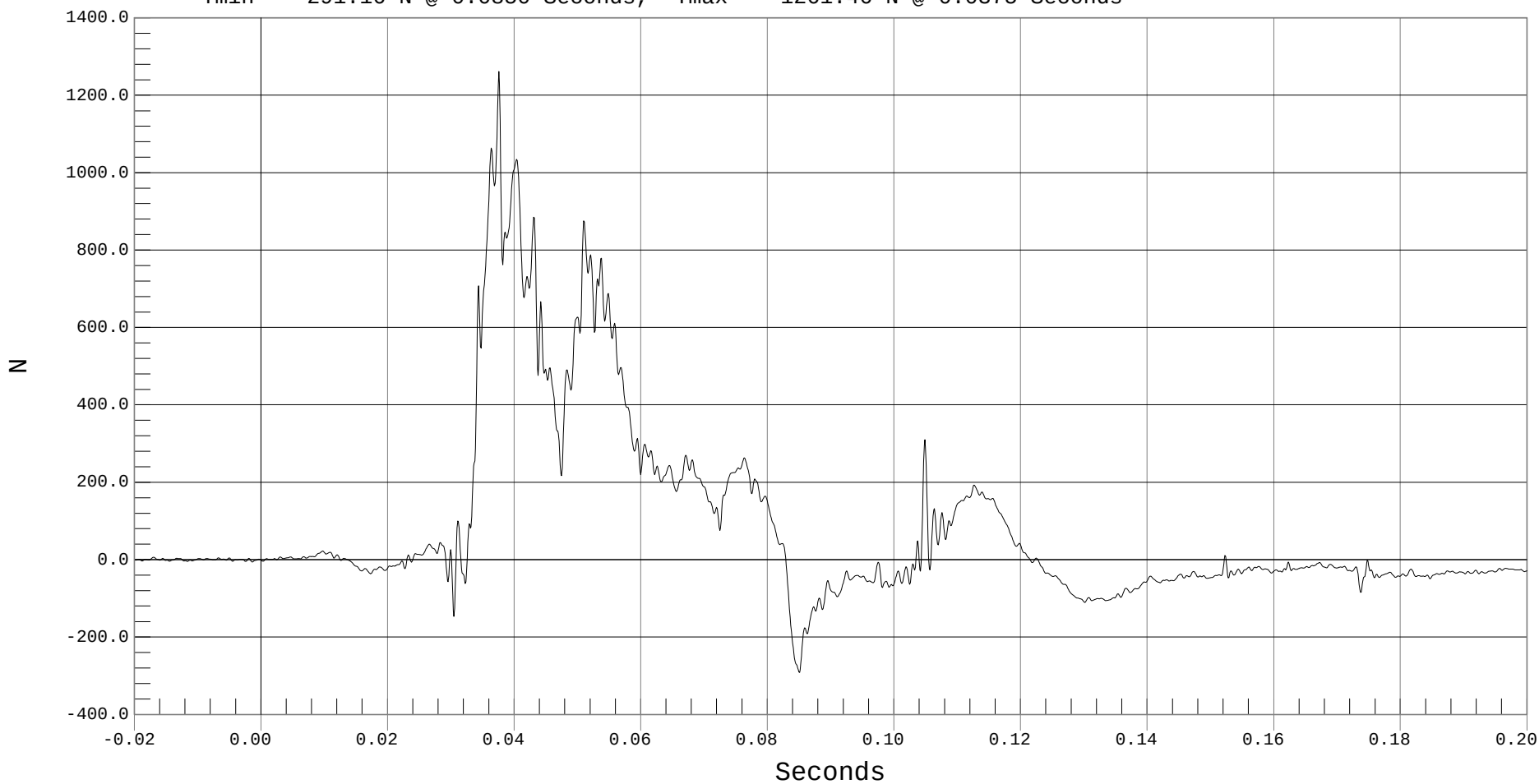
PASSENGER RIGHT FEMUR FORCE Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER RIGHT FEMUR FORCE Z, B01108FF.F15

Ymin = -291.16 N @ 0.0850 Seconds, Ymax = 1261.46 N @ 0.0375 Seconds





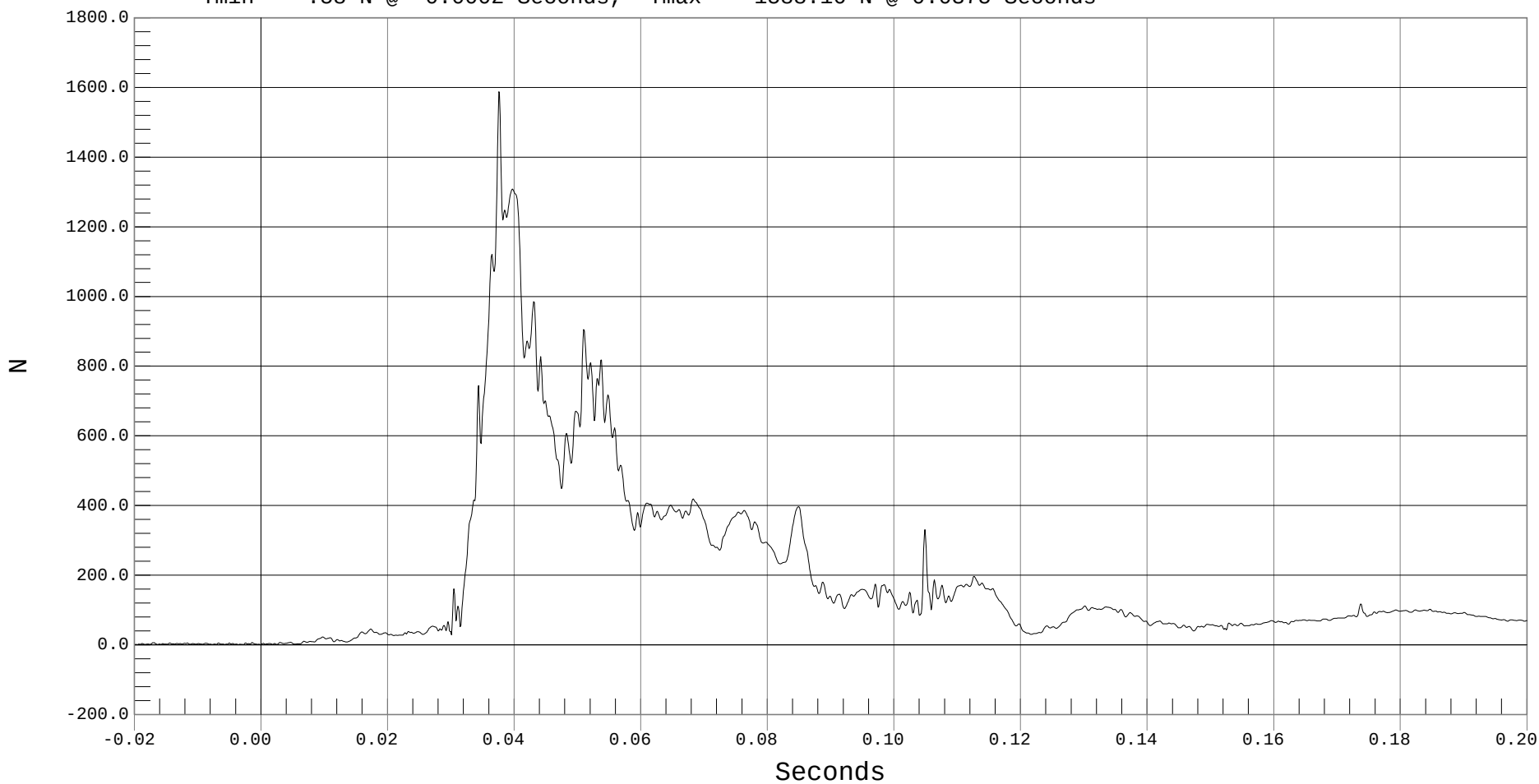
PASSENGER RIGHT FEMUR FORCE RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 PASSENGER RIGHT FEMUR FORCE RESULTANT, B01108FV.F14

Ymin = .58 N @ -0.0002 Seconds, Ymax = 1588.16 N @ 0.0375 Seconds





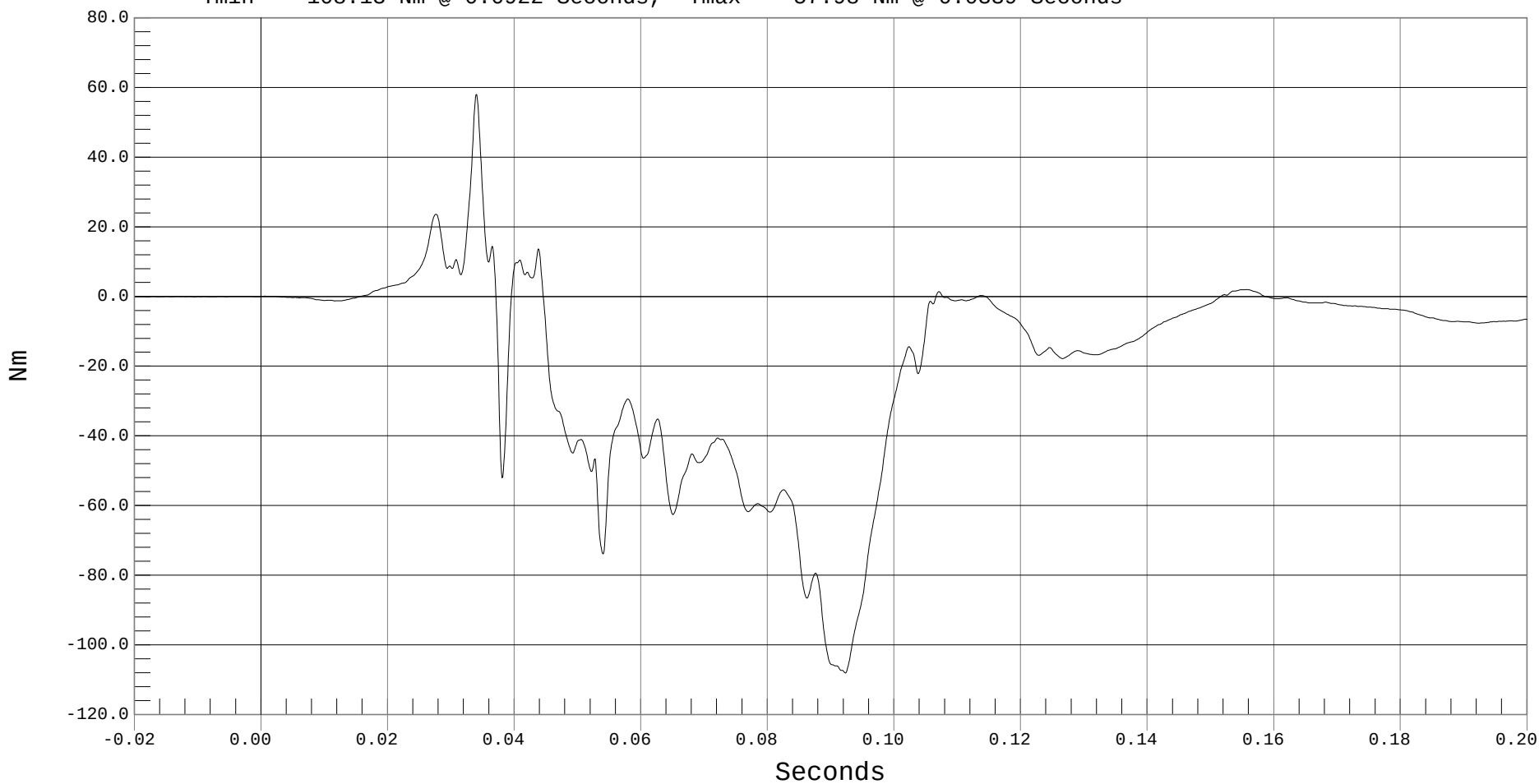
PASSENGER RIGHT FEMUR MOMENT X

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER RIGHT FEMUR MOMENT X, B01108FF.F16

Ymin = -108.13 Nm @ 0.0922 Seconds, Ymax = 57.98 Nm @ 0.0339 Seconds





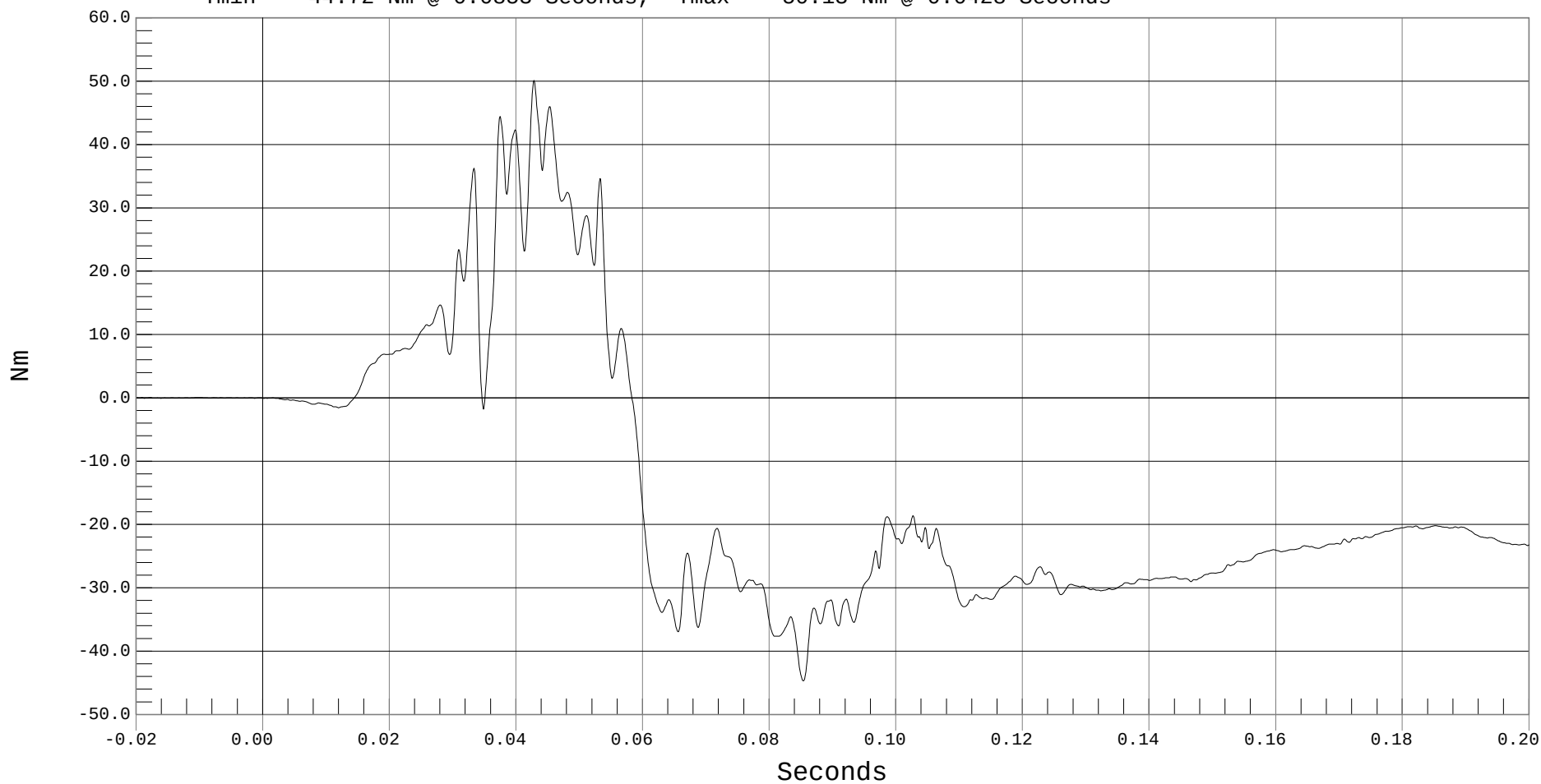
PASSENGER RIGHT FEMUR MOMENT Y

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER RIGHT FEMUR MOMENT Y, B01108FF.F17

Ymin = -44.72 Nm @ 0.0853 Seconds, Ymax = 50.13 Nm @ 0.0428 Seconds





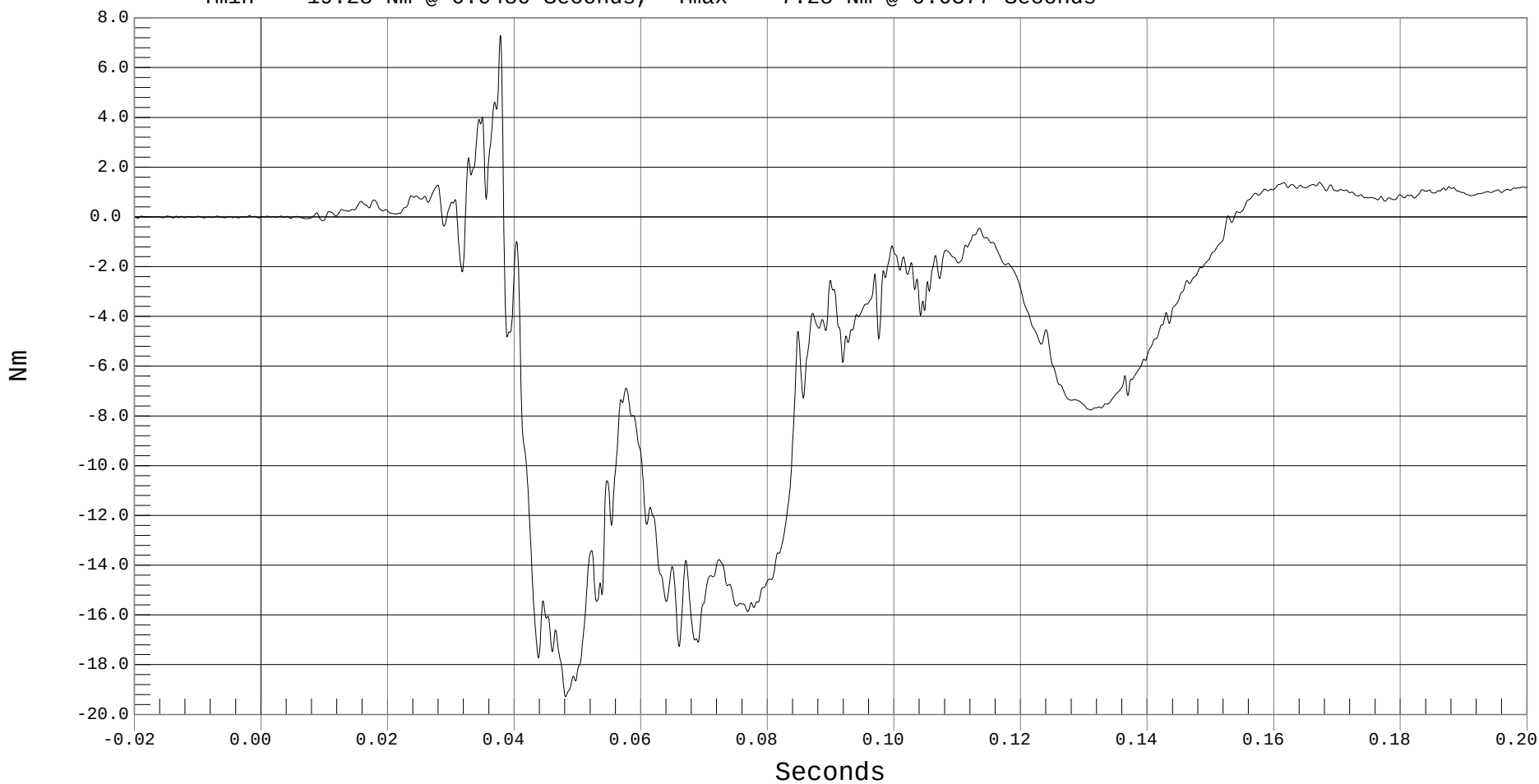
PASSENGER RIGHT FEMUR MOMENT Z

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 REAR PASSENGER RIGHT FEMUR MOMENT Z, B01108FF.F18

Ymin = -19.28 Nm @ 0.0480 Seconds, Ymax = 7.28 Nm @ 0.0377 Seconds





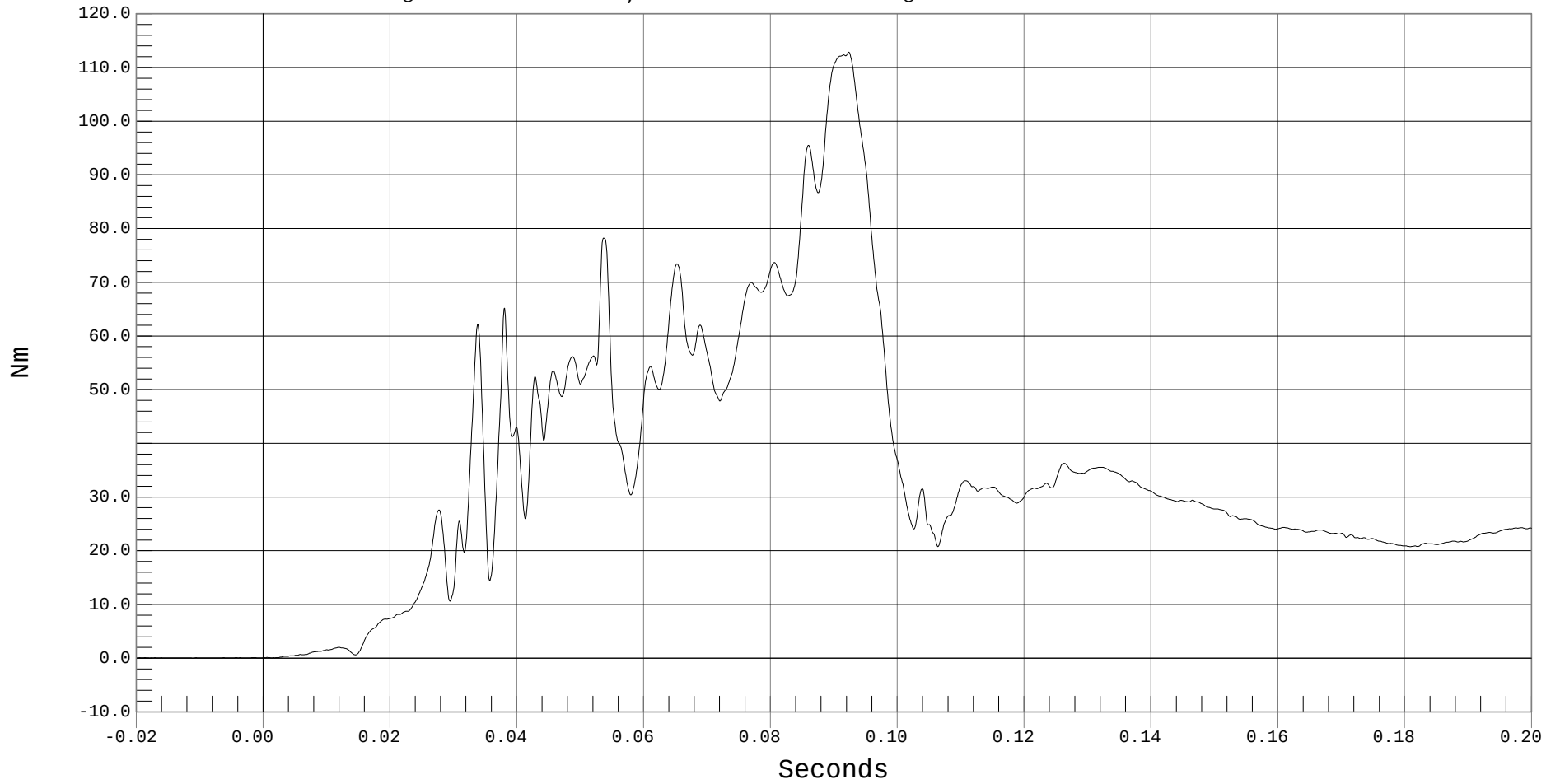
PASSENGER RIGHT FEMUR MOMENT RESULTANT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 600

— 1 PASSENGER RIGHT FEMUR MOMENT RESULTANT, B01108FV.F16

Ymin = .01 Nm @ -0.0180 Seconds, Ymax = 112.87 Nm @ 0.0923 Seconds





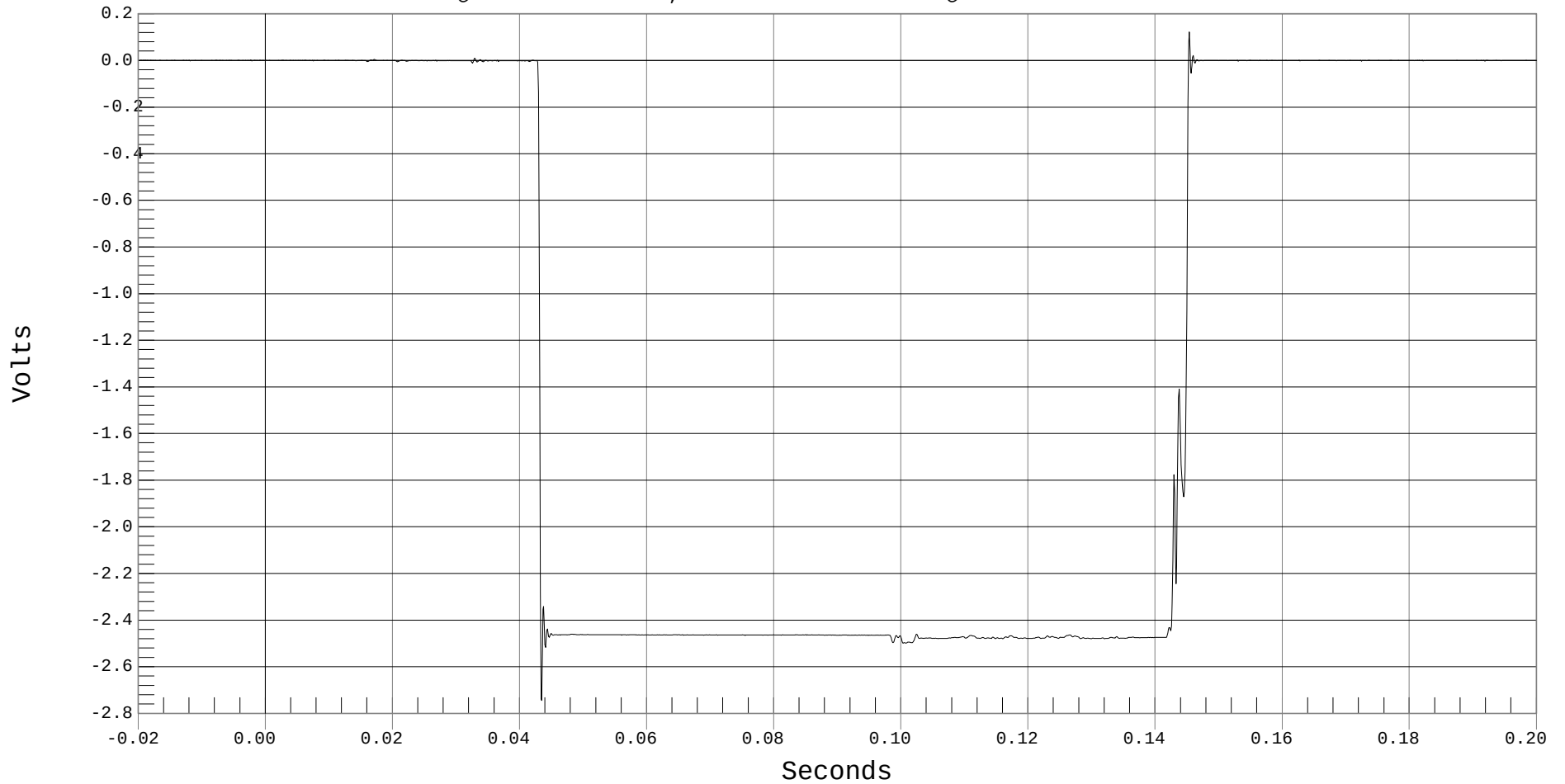
PASSENGER HEAD CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER HEAD CONTACT, B011080T.075

Ymin = -2.74 Volts @ 0.0434 Seconds, Ymax = .12 Volts @ 0.1453 Seconds





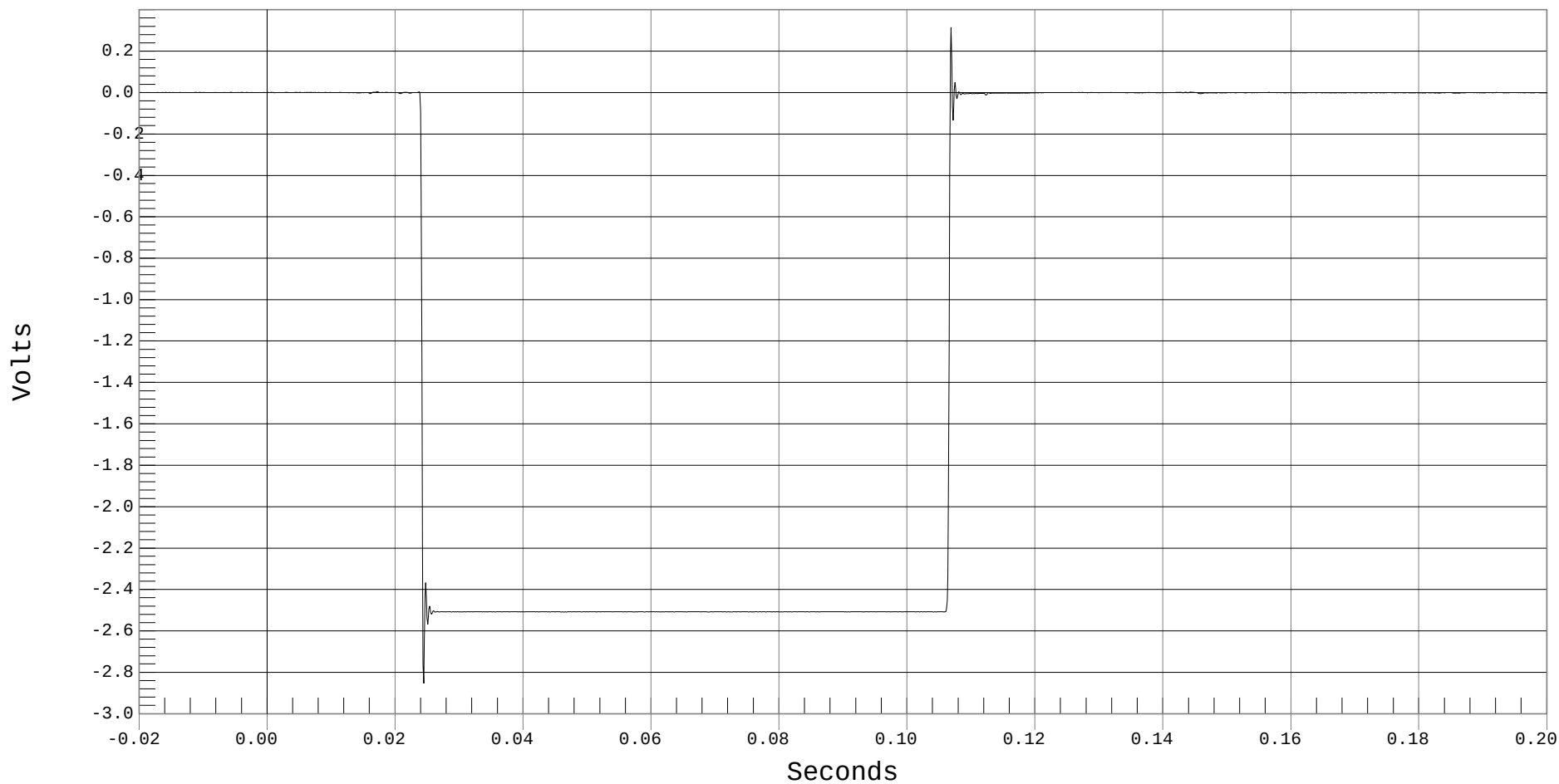
PASSENGER ARM CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER ARM CONTACT, B011080T.076

Ymin = -2.85 Volts @ 0.0244 Seconds, Ymax = .31 Volts @ 0.1068 Seconds





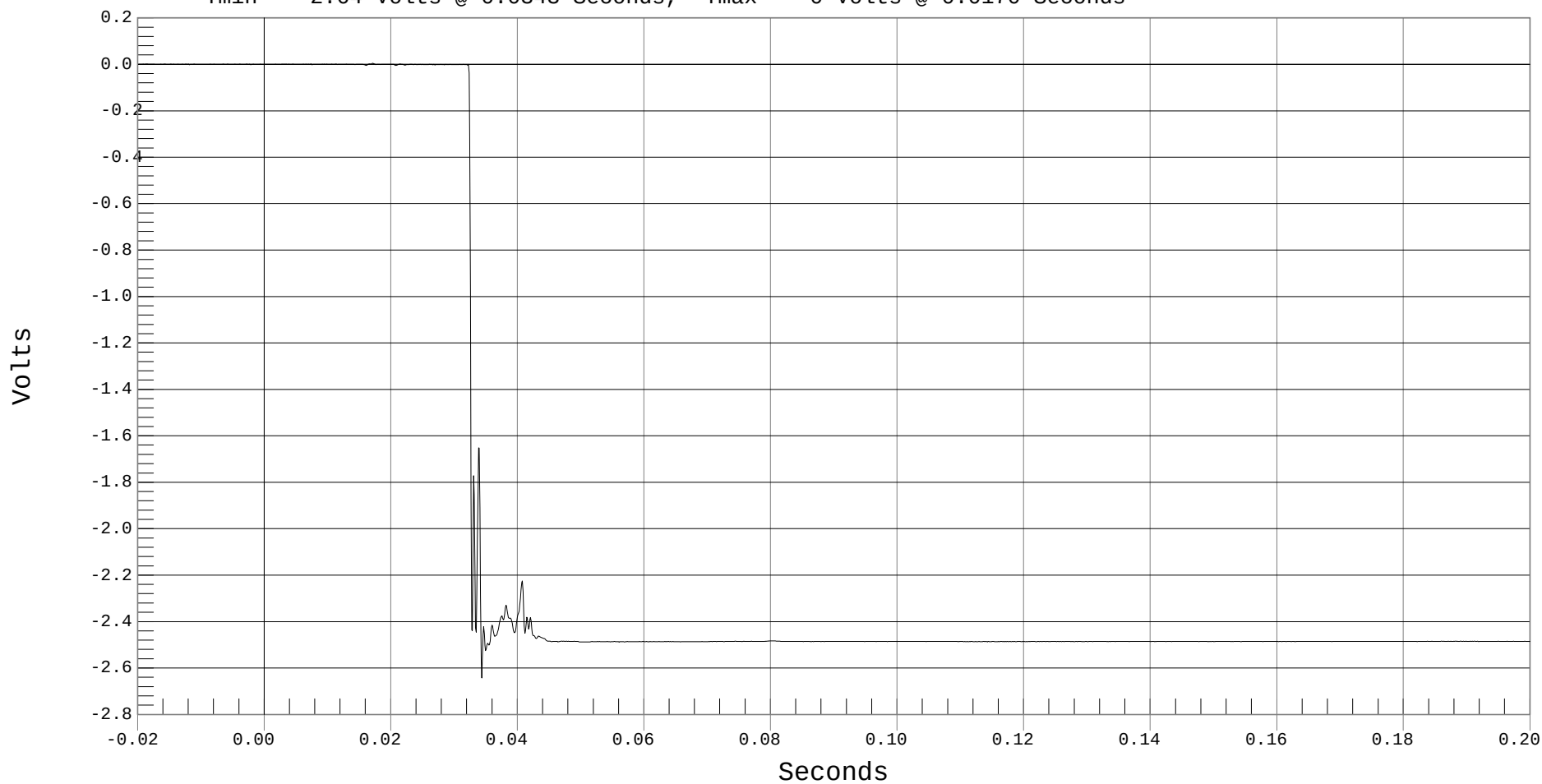
PASSENGER RIB CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER RIB CONTACT, B011080T.077

Ymin = -2.64 Volts @ 0.0343 Seconds, Ymax = 0 Volts @ 0.0170 Seconds





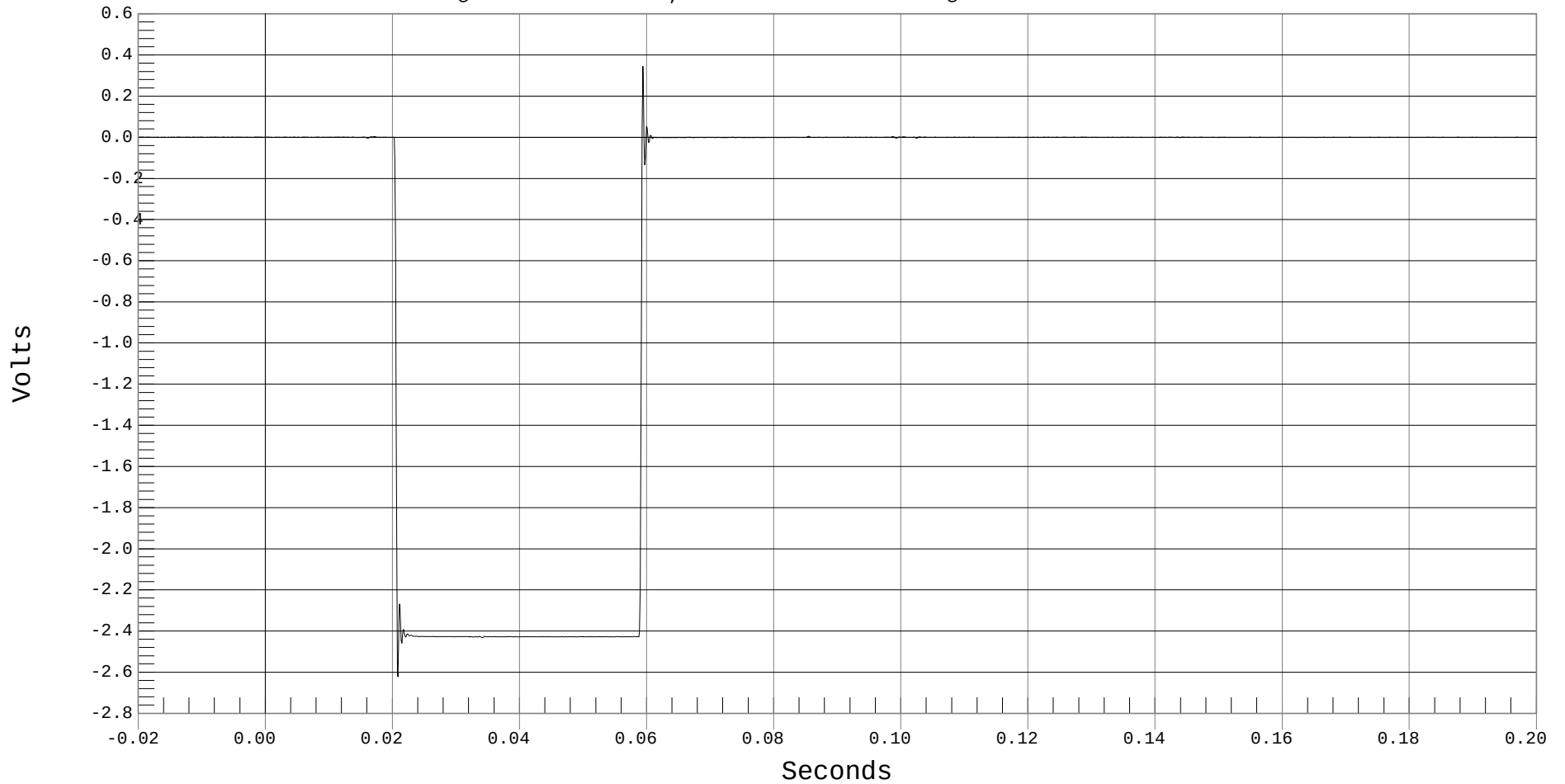
PASSENGER PELVIS CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 REAR PASSENGER PELVIS CONTACT, B011080T.078

Ymin = -2.62 Volts @ 0.0208 Seconds, Ymax = .35 Volts @ 0.0593 Seconds





RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

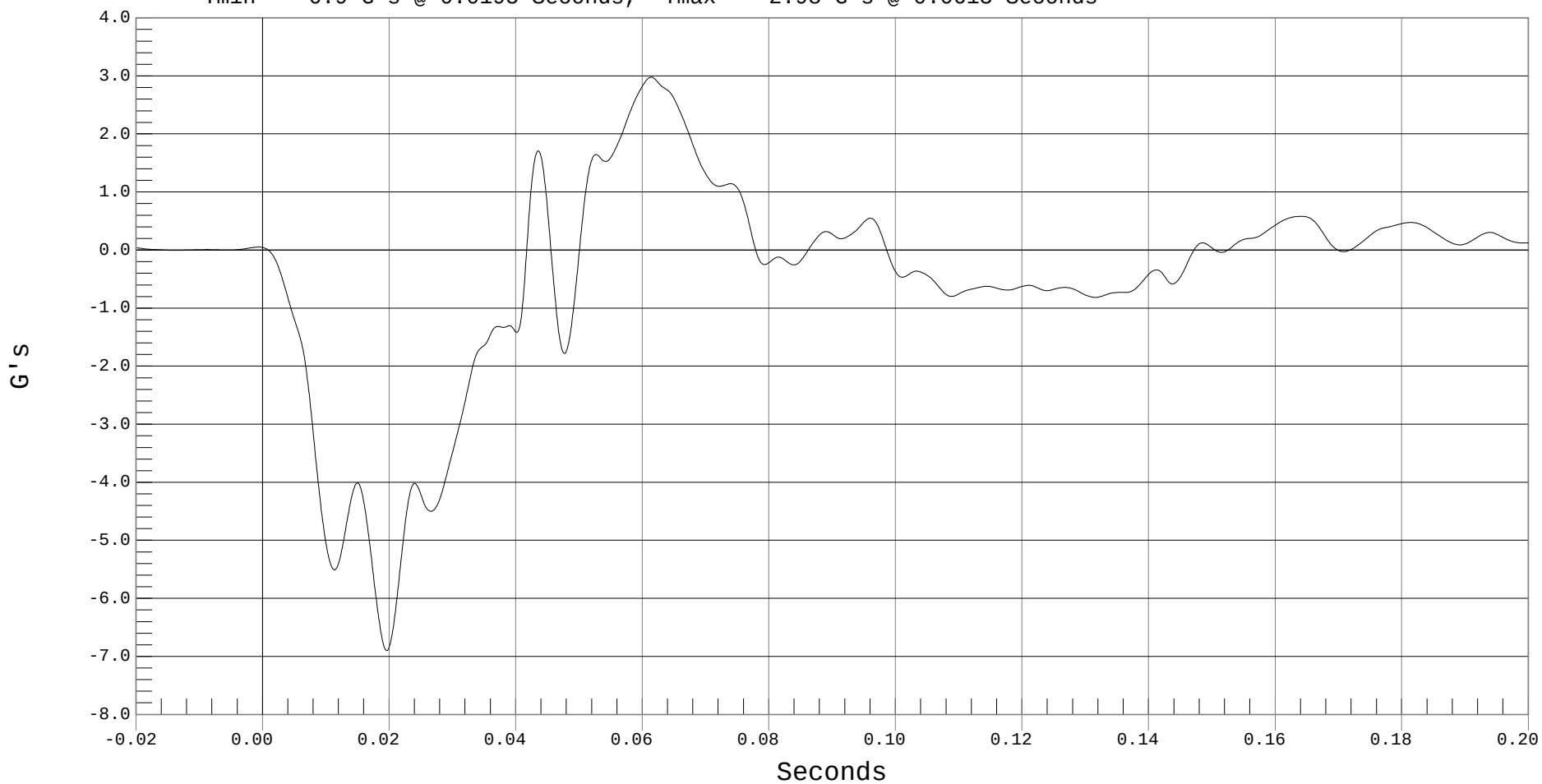
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 RIGHT FRONT SILL X, B01108AF.A25

Ymin = -6.9 G's @ 0.0195 Seconds, Ymax = 2.98 G's @ 0.0613 Seconds





RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

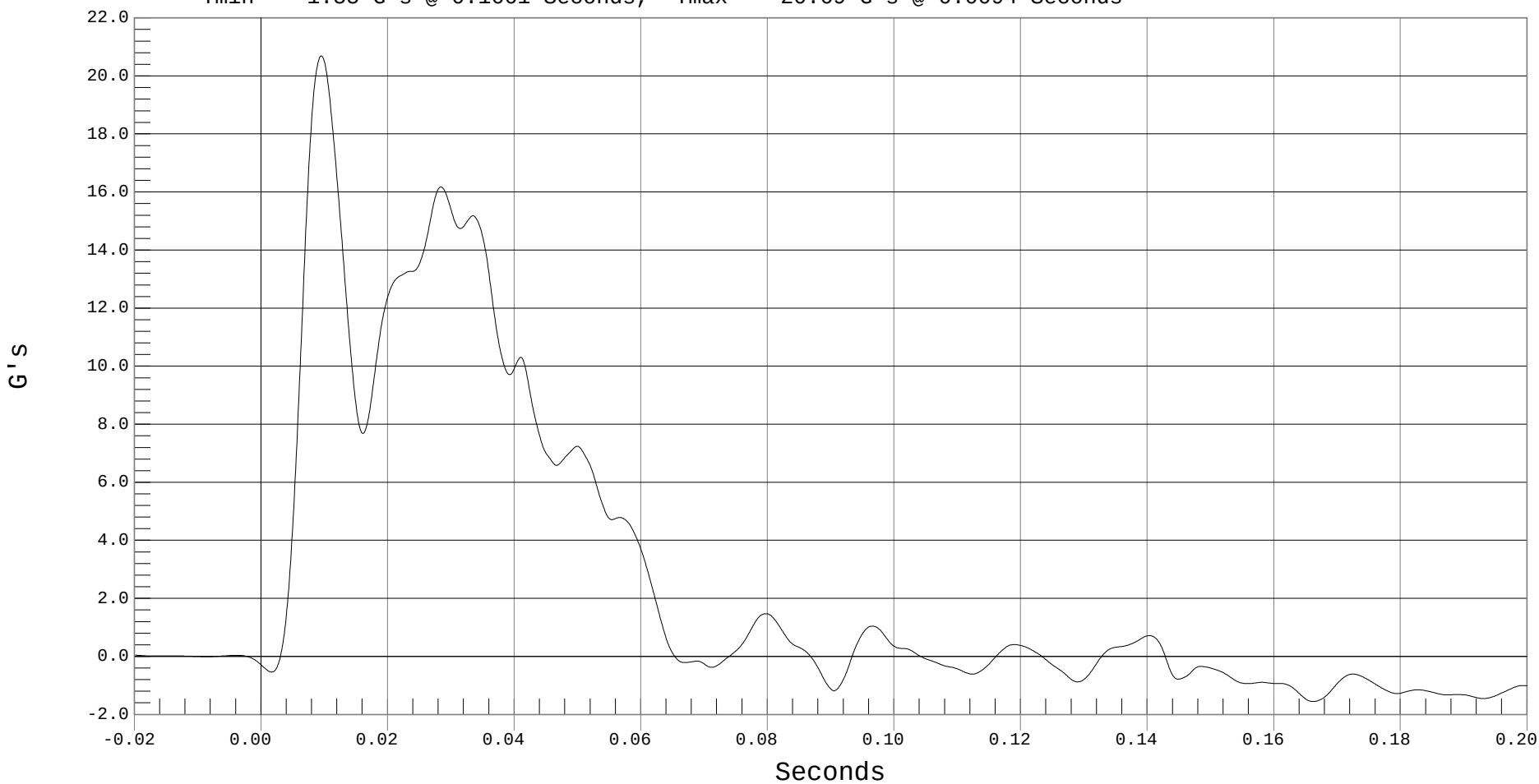
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 RIGHT FRONT SILL Y, B01108AF.A26

Ymin = -1.55 G's @ 0.1661 Seconds, Ymax = 20.69 G's @ 0.0094 Seconds





RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

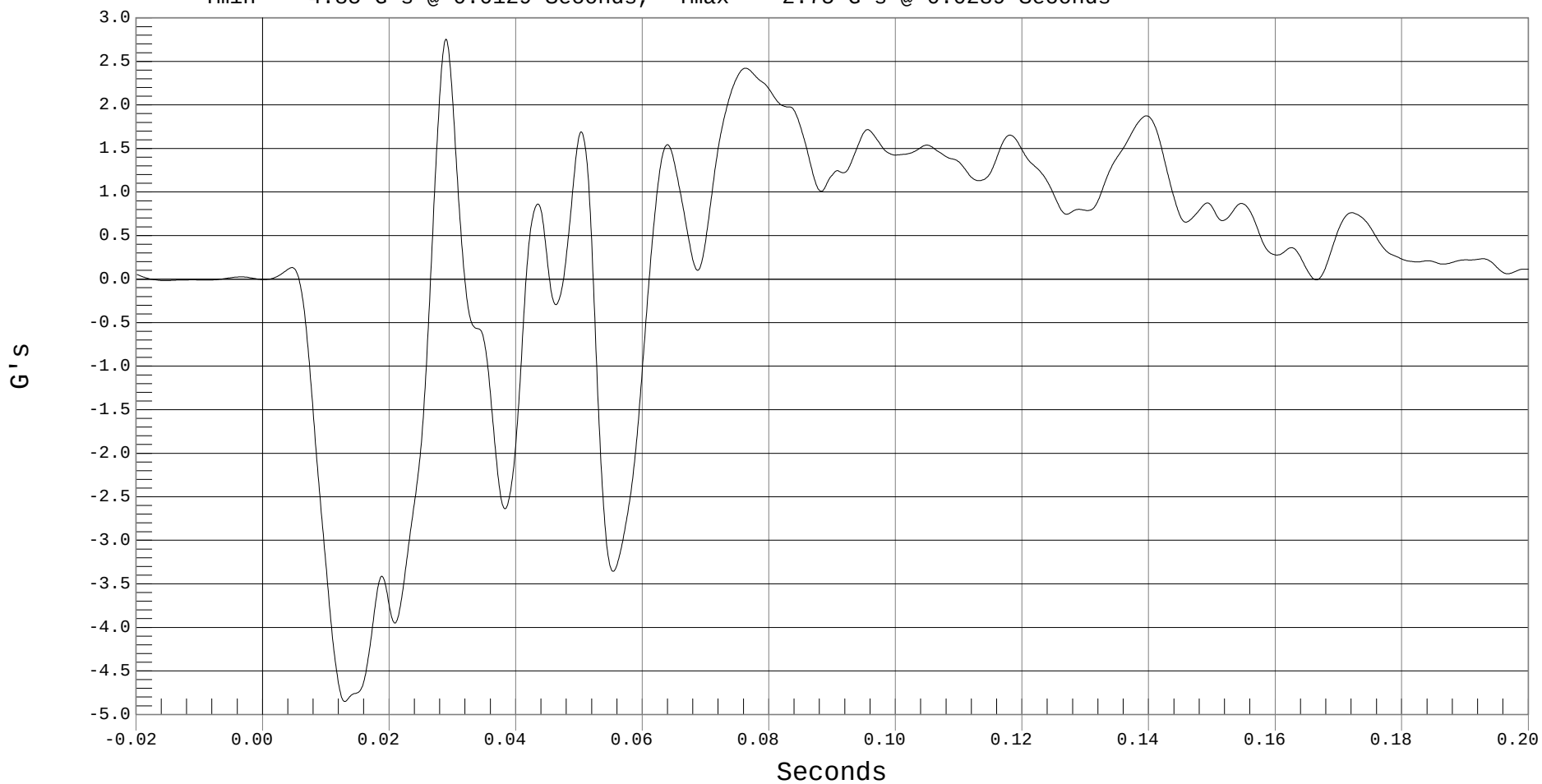
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 RIGHT FRONT SILL Z, B01108AF.A27

Ymin = -4.85 G's @ 0.0129 Seconds, Ymax = 2.75 G's @ 0.0289 Seconds





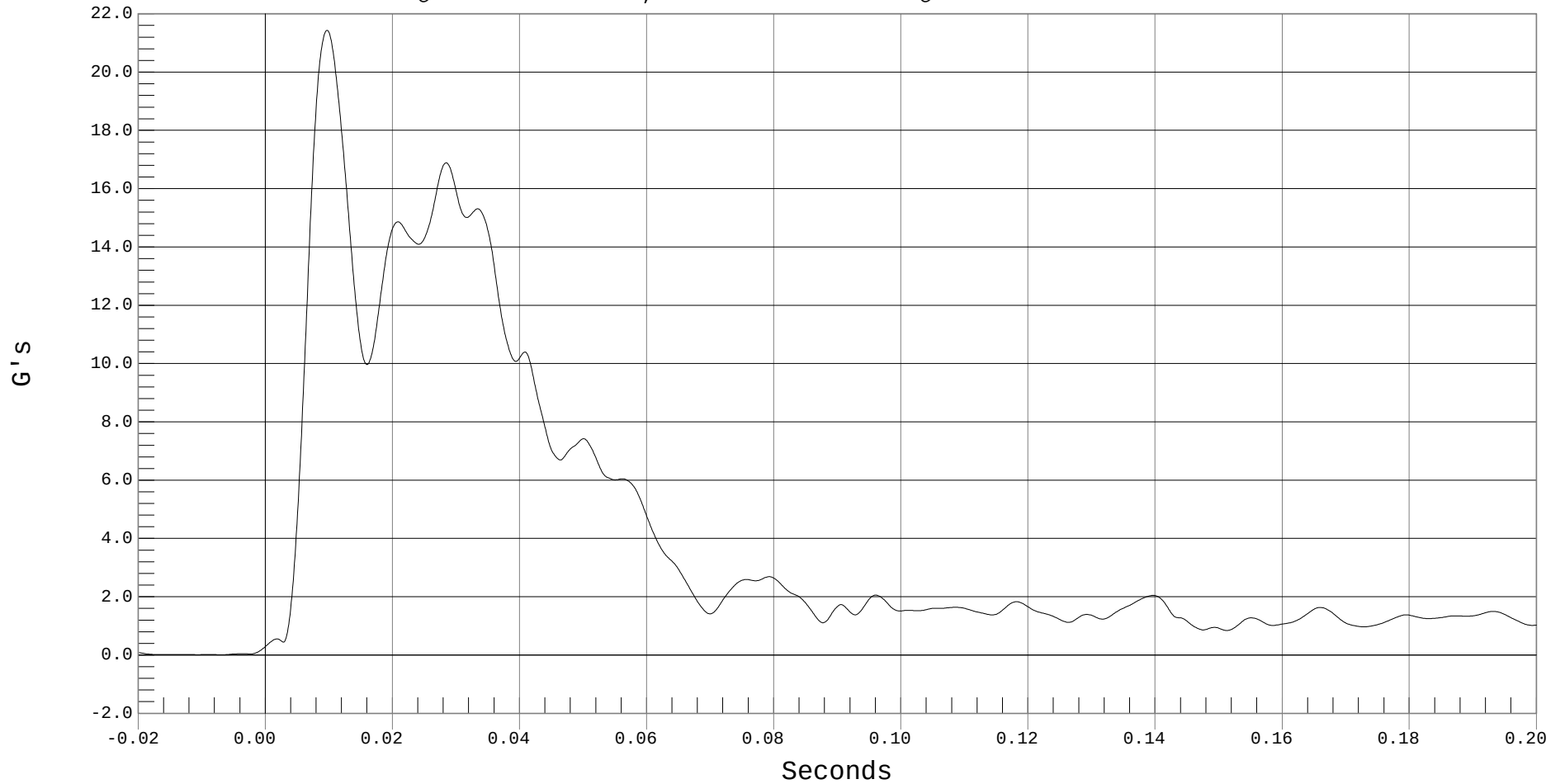
RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL RESULTANT ACCELERATION, B01108AV.A25

Ymin = .01 G's @ -0.0069 Seconds, Ymax = 21.44 G's @ 0.0096 Seconds





RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

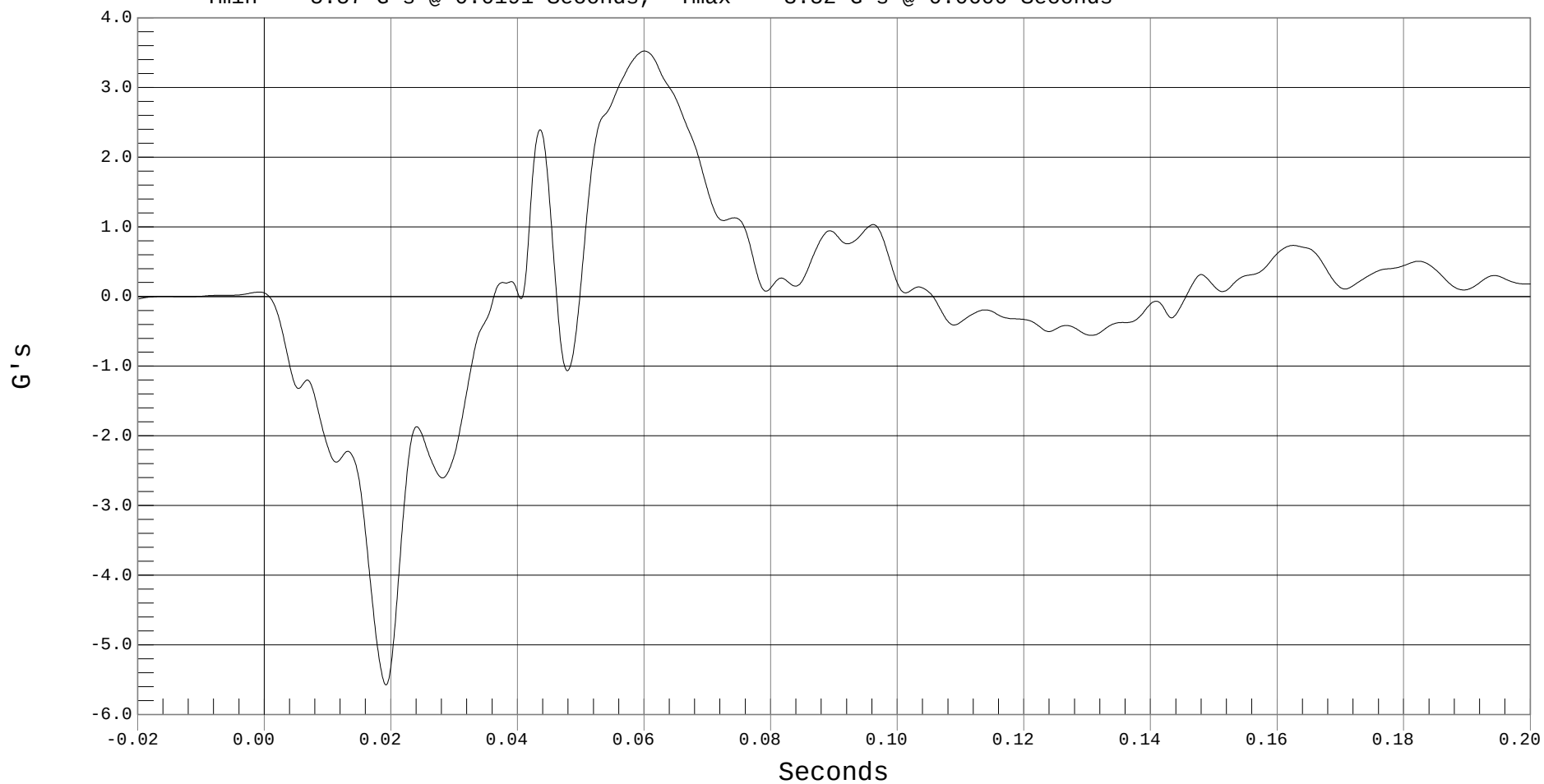
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 RIGHT REAR SILL X, B01108AF.A28

Ymin = -5.57 G's @ 0.0191 Seconds, Ymax = 3.52 G's @ 0.0600 Seconds





RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

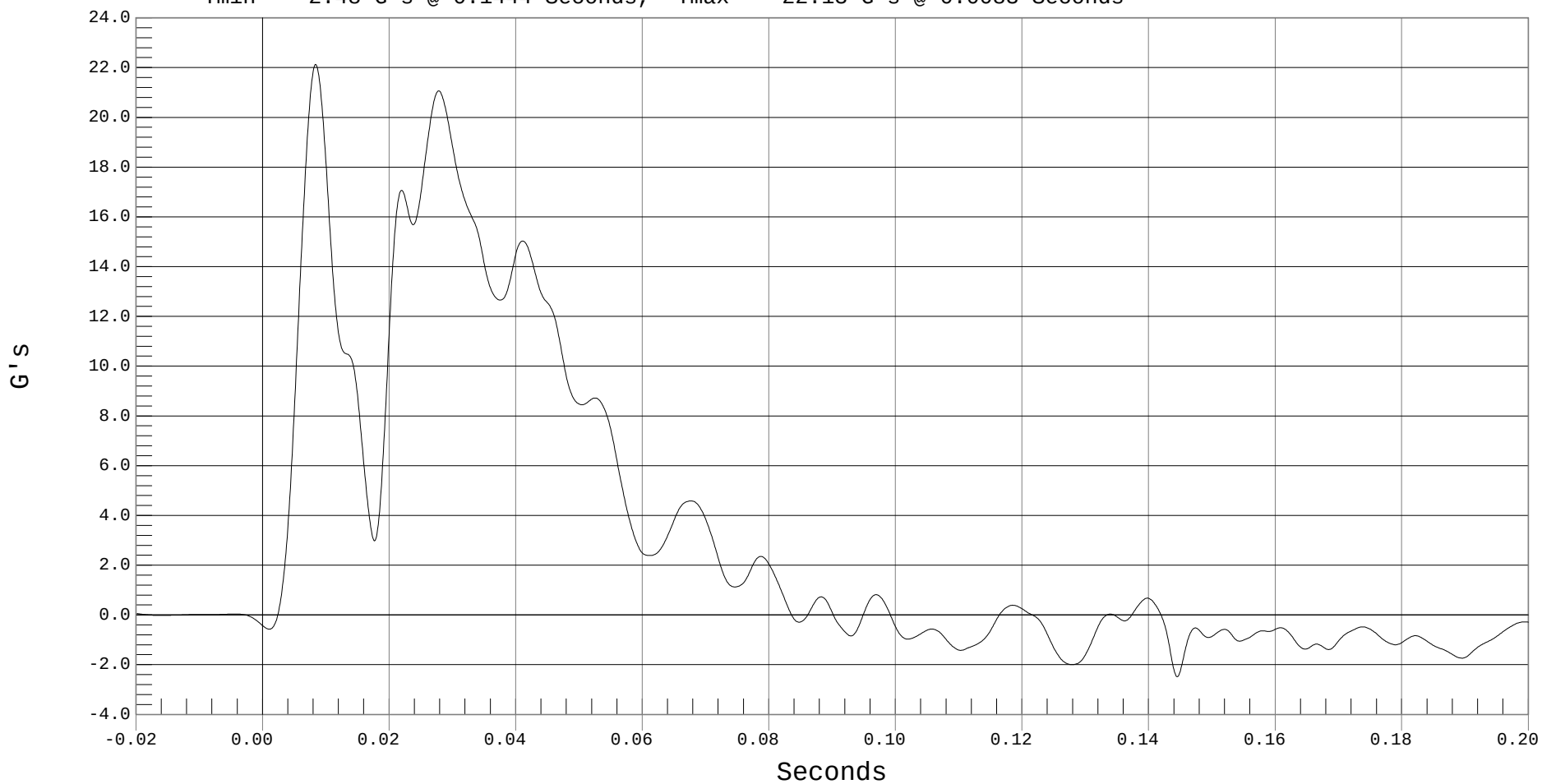
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 RIGHT REAR SILL Y, B01108AF.A29

Ymin = -2.48 G's @ 0.1444 Seconds, Ymax = 22.13 G's @ 0.0083 Seconds





RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

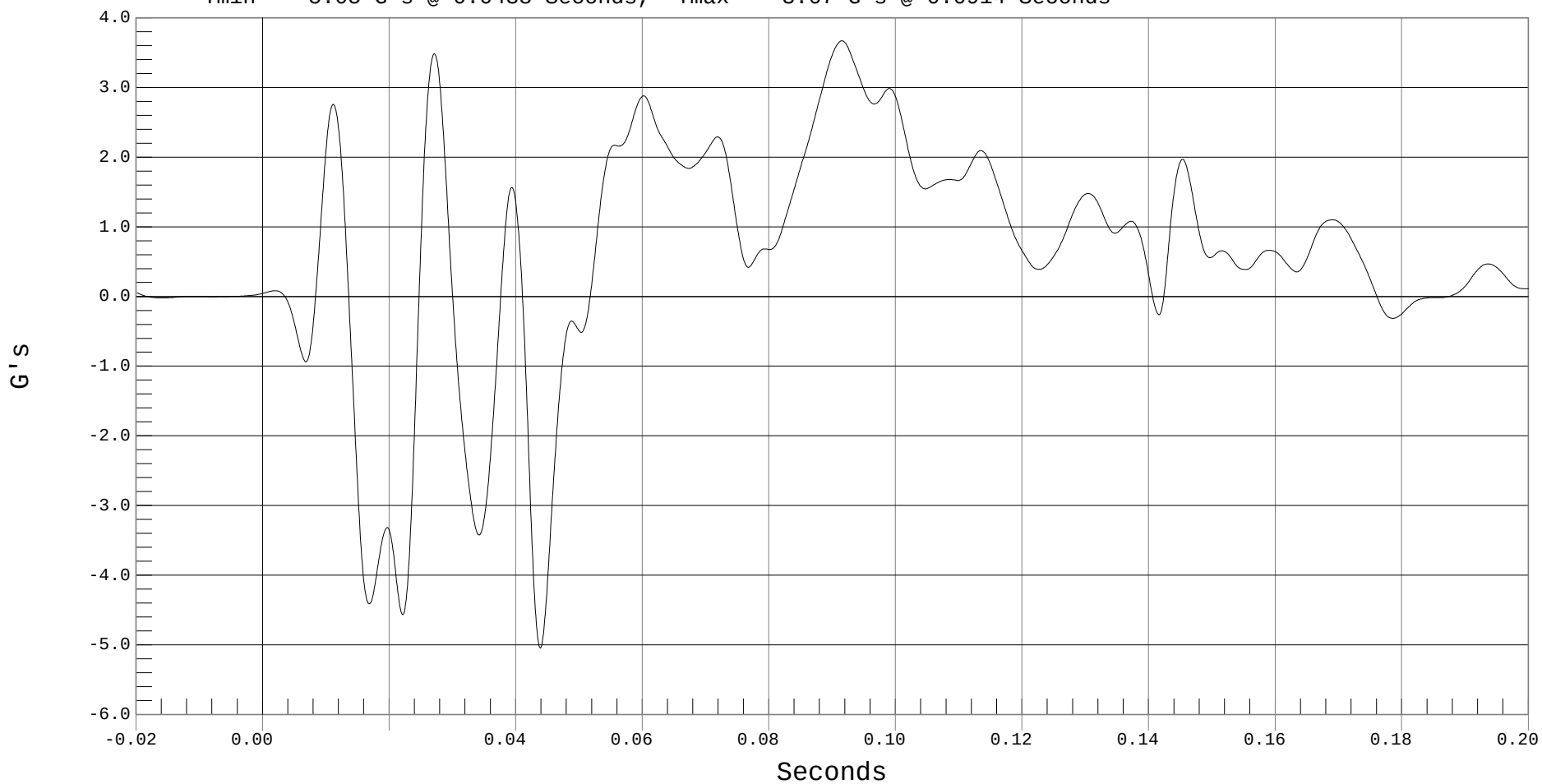
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 RIGHT REAR SILL Z, B01108AF.A30

Ymin = -5.05 G's @ 0.0438 Seconds, Ymax = 3.67 G's @ 0.0914 Seconds





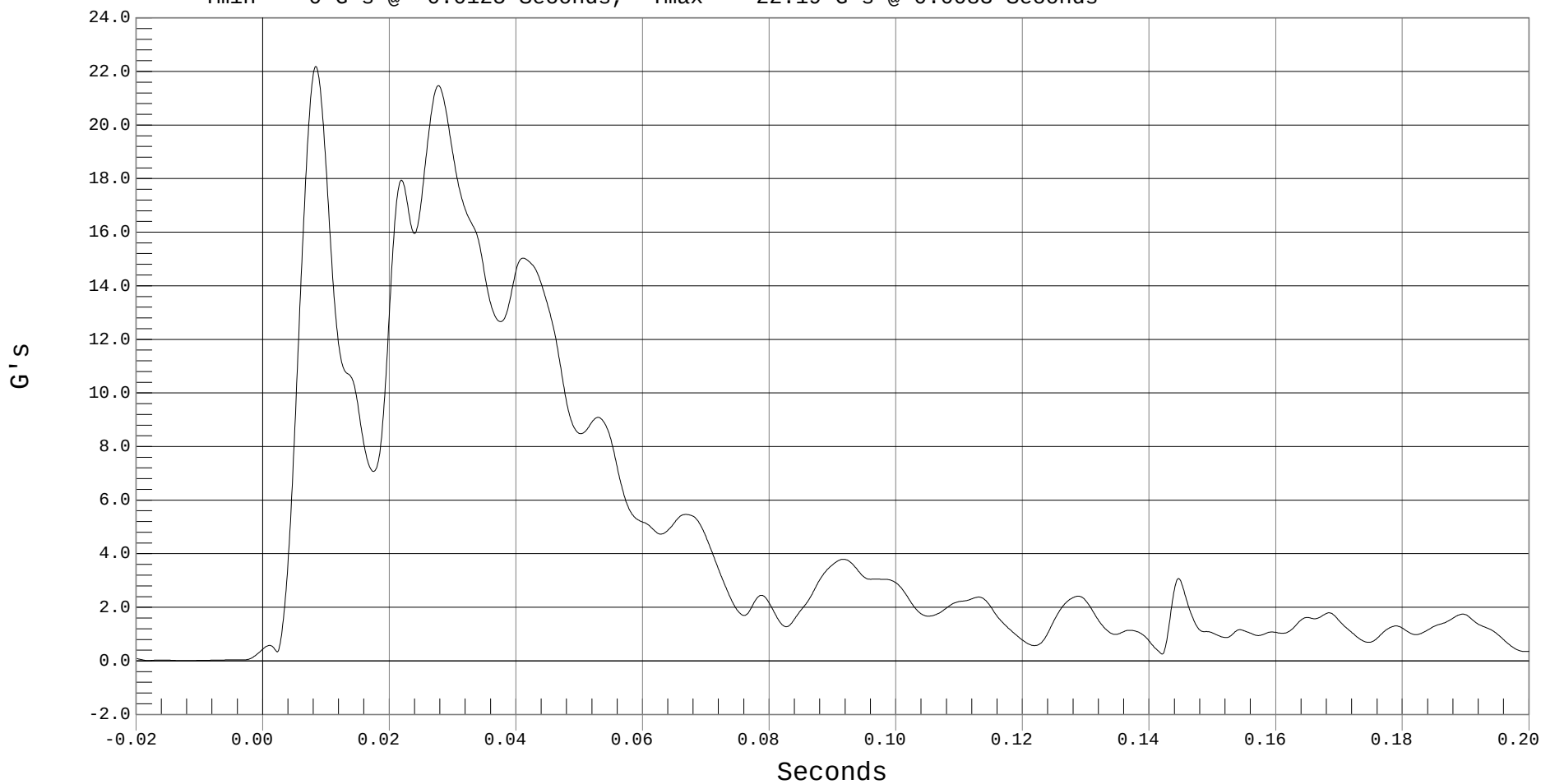
RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 RIGHT REAR SILL RESULTANT ACCELERATION, B01108AV.A28

Ymin = 0 G's @ -0.0125 Seconds, Ymax = 22.19 G's @ 0.0083 Seconds





REAR FLOORPAN ABOVE AXLE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

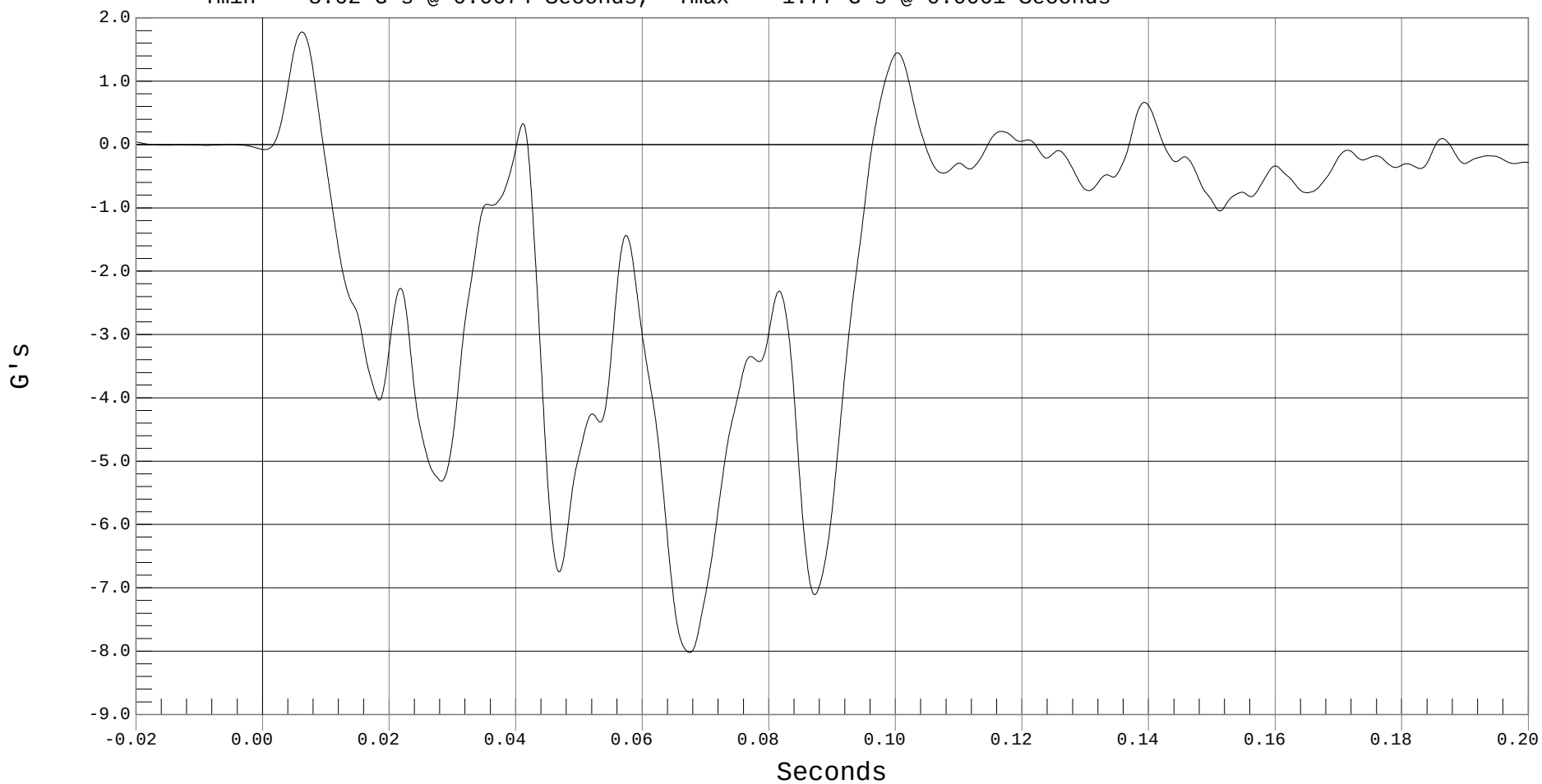
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 FLOORPAN @ REAR AXLE X, B01108AF.A34

Ymin = -8.02 G's @ 0.0674 Seconds, Ymax = 1.77 G's @ 0.0061 Seconds





REAR FLOORPAN ABOVE AXLE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

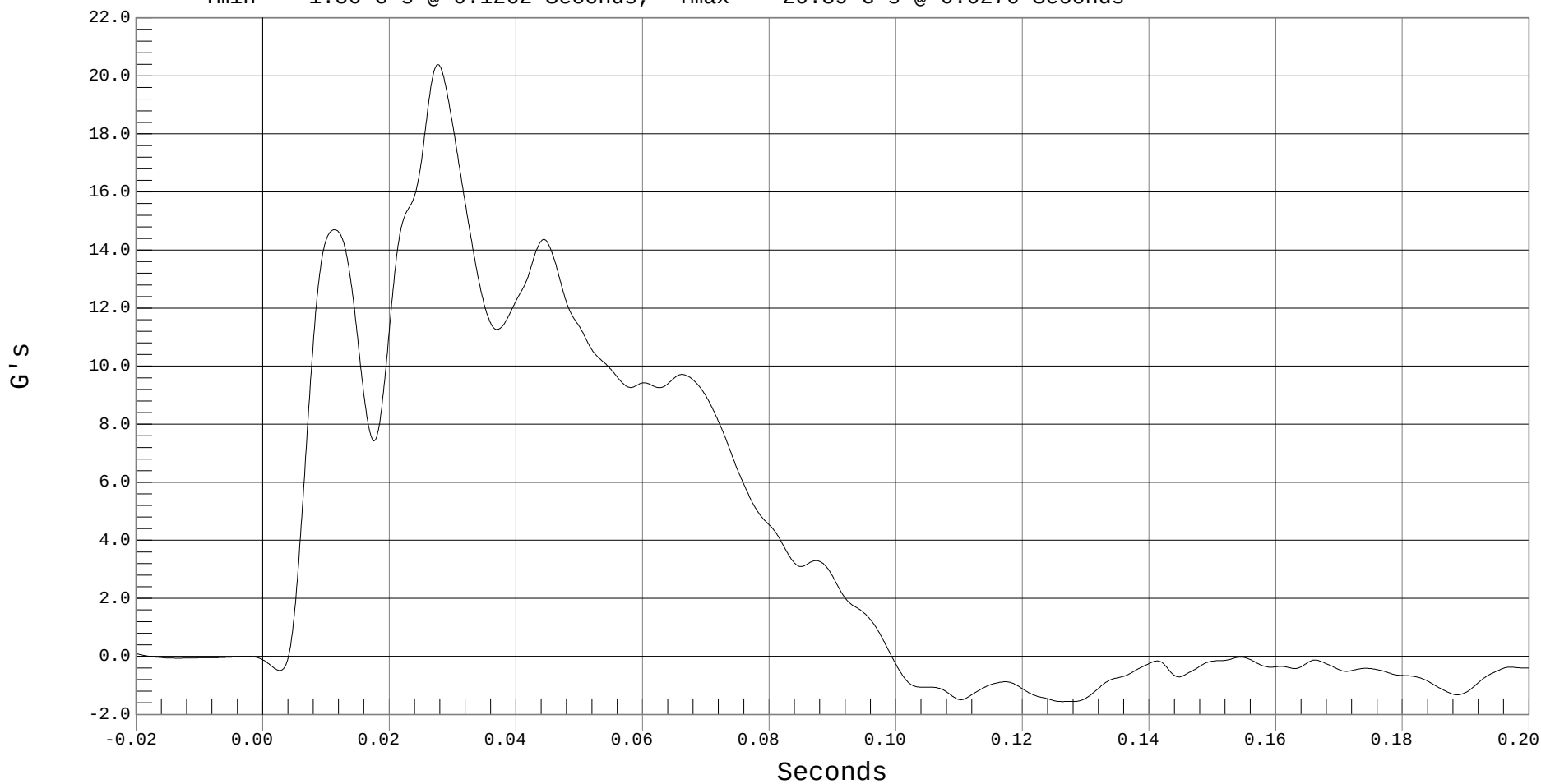
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 FLOORPAN @ REAR AXLE Y, B01108AF.A35

Ymin = -1.56 G's @ 0.1262 Seconds, Ymax = 20.39 G's @ 0.0276 Seconds





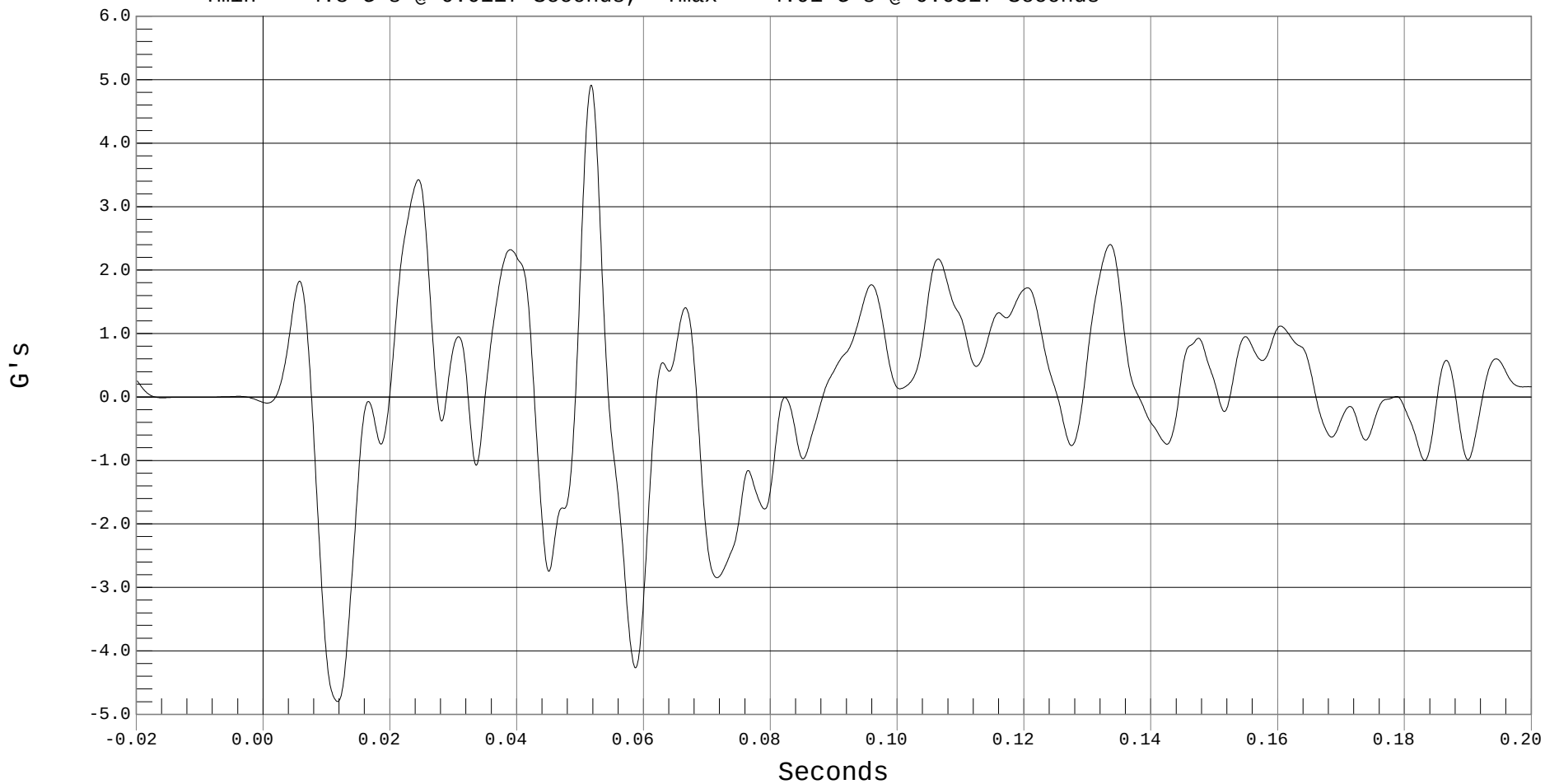
REAR FLOORPAN ABOVE AXLE Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE Z, B01108AF.A36

Ymin = -4.8 G's @ 0.0117 Seconds, Ymax = 4.91 G's @ 0.0517 Seconds





REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

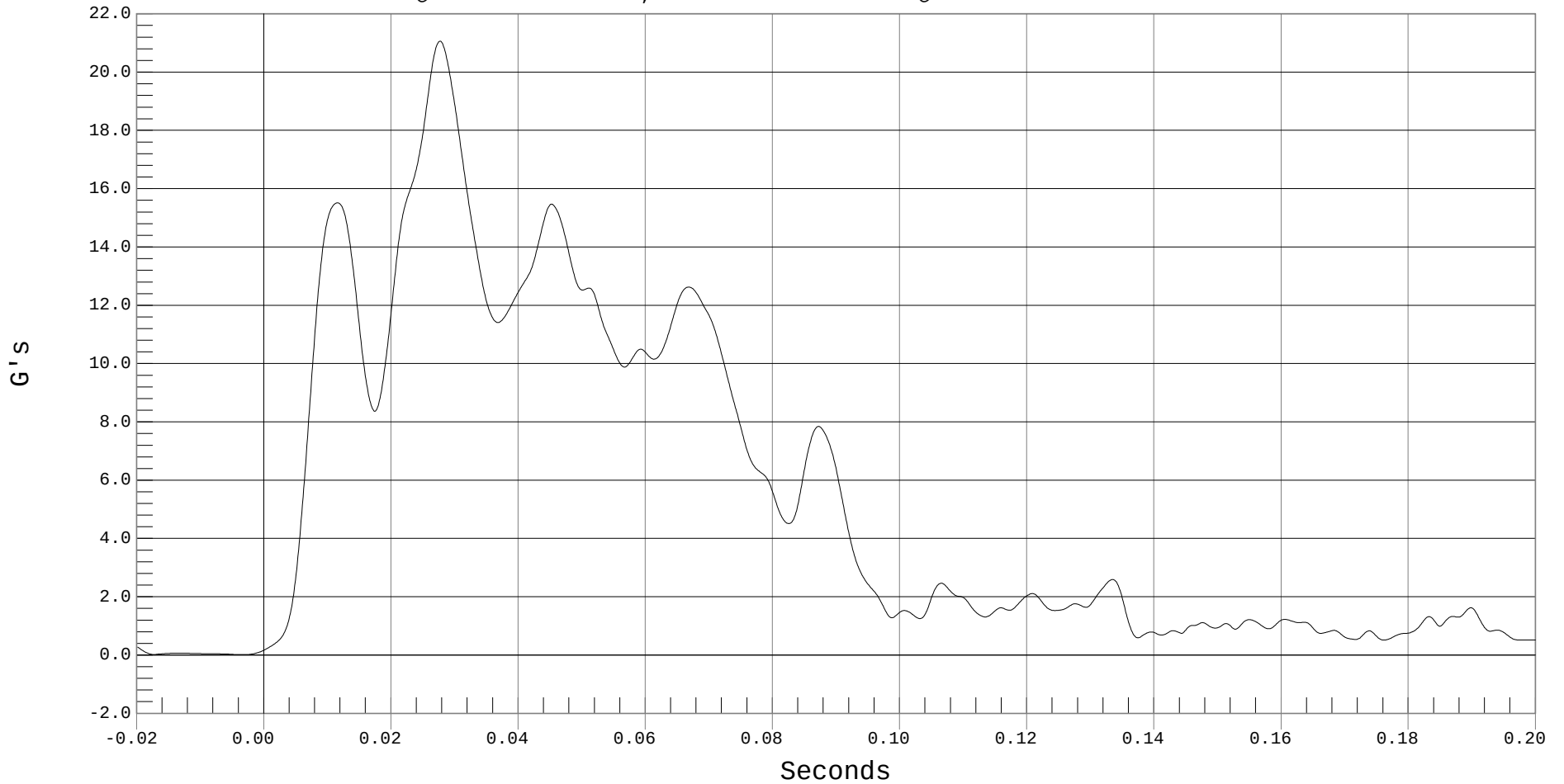
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 FLOORPAN @ REAR AXLE ACCELERATION, B01108AV.A34

Ymin = .01 G's @ -0.0034 Seconds, Ymax = 21.06 G's @ 0.0276 Seconds





LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

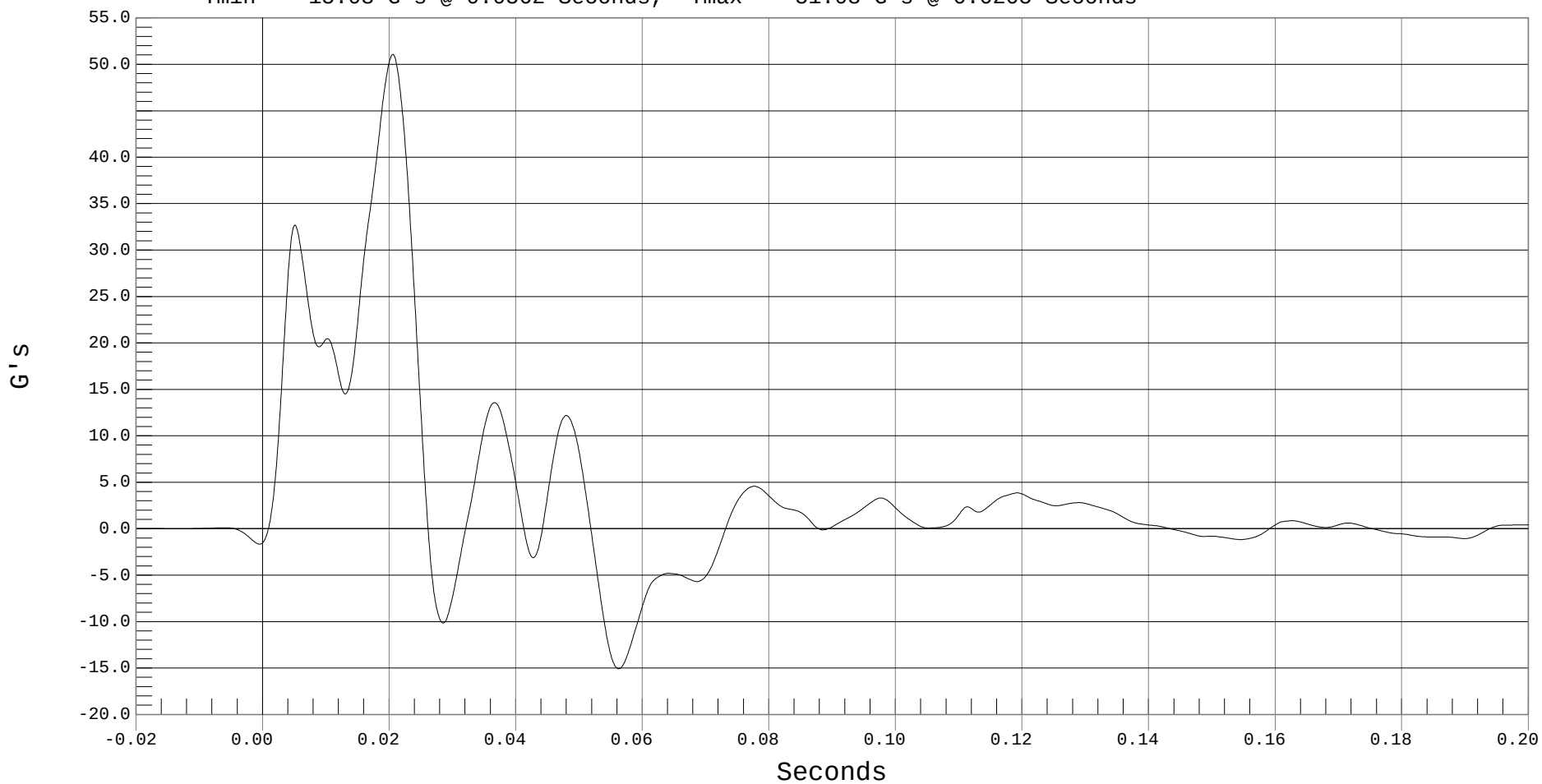
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 LEFT FRONT SILL Y, B01108AF.A31

Ymin = -15.08 G's @ 0.0562 Seconds, Ymax = 51.08 G's @ 0.0205 Seconds





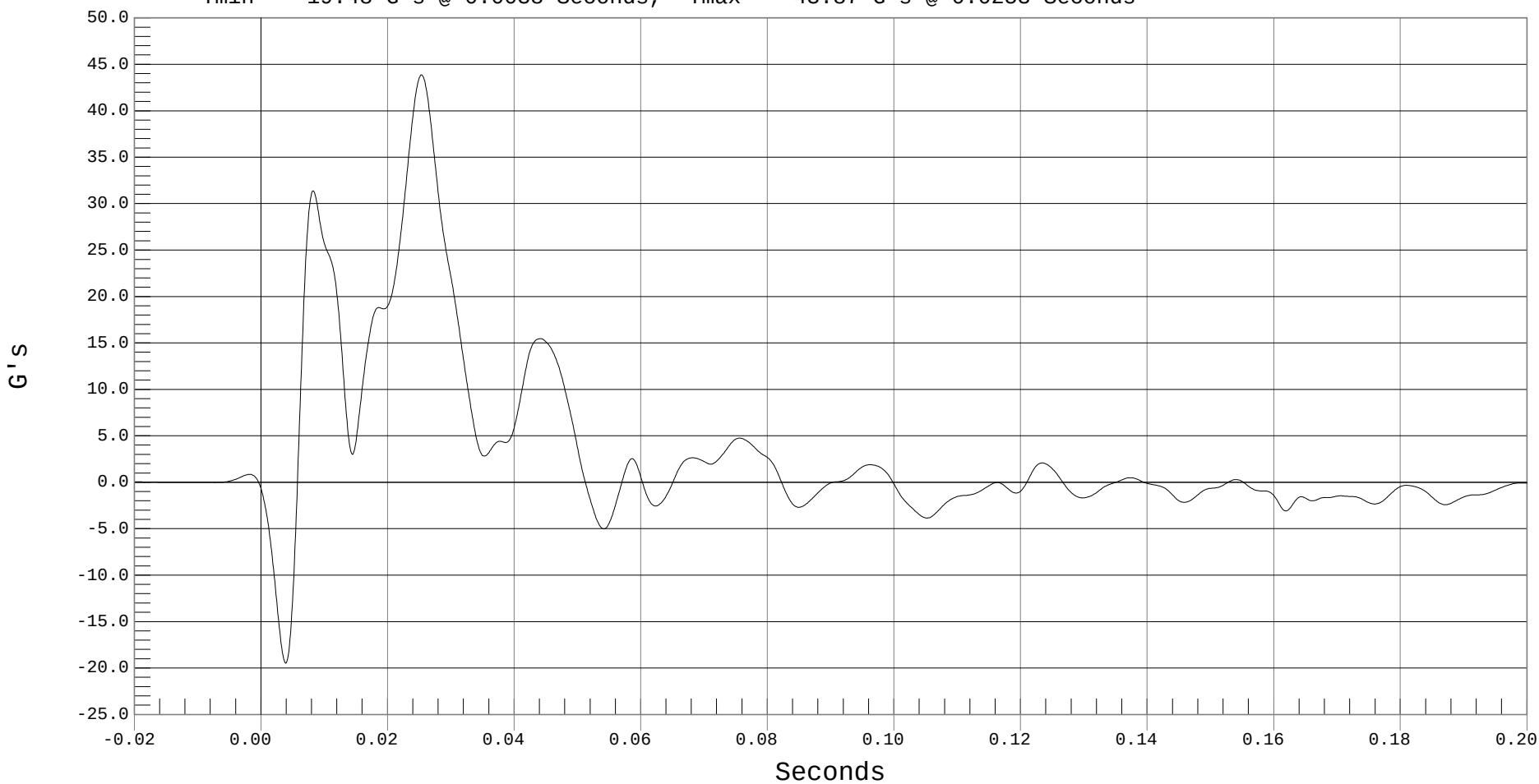
LEFT SIDE SILL AT REAR SEAT Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 LEFT REAR SILL Y, B01108AF.A33

Ymin = -19.48 G's @ 0.0038 Seconds, Ymax = 43.87 G's @ 0.0253 Seconds





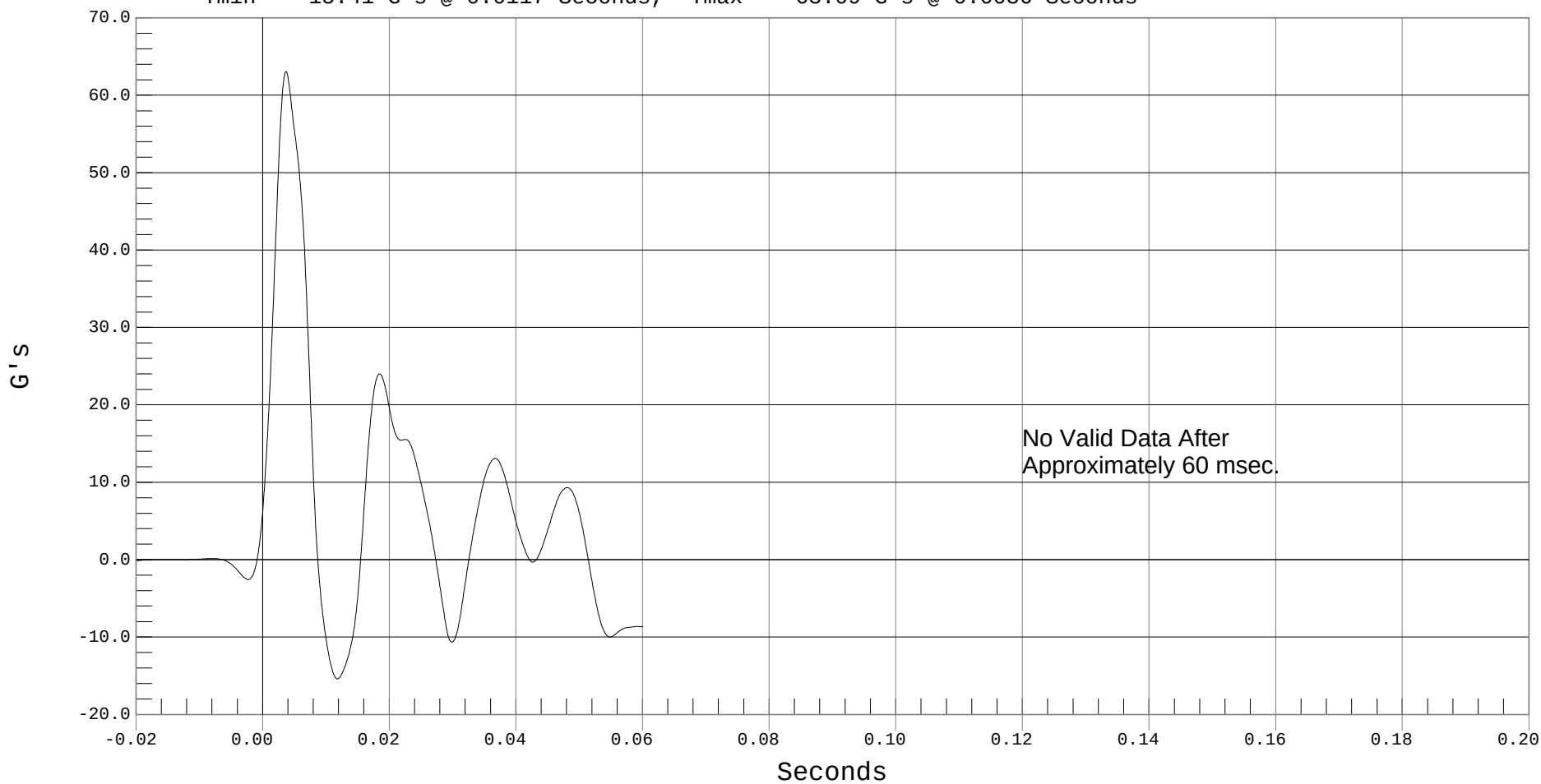
LEFT LOWER A-POST Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 LEFT LOWER A-POST Y, B01108AF.A38

Ymin = -15.41 G's @ 0.0117 Seconds, Ymax = 63.09 G's @ 0.0036 Seconds





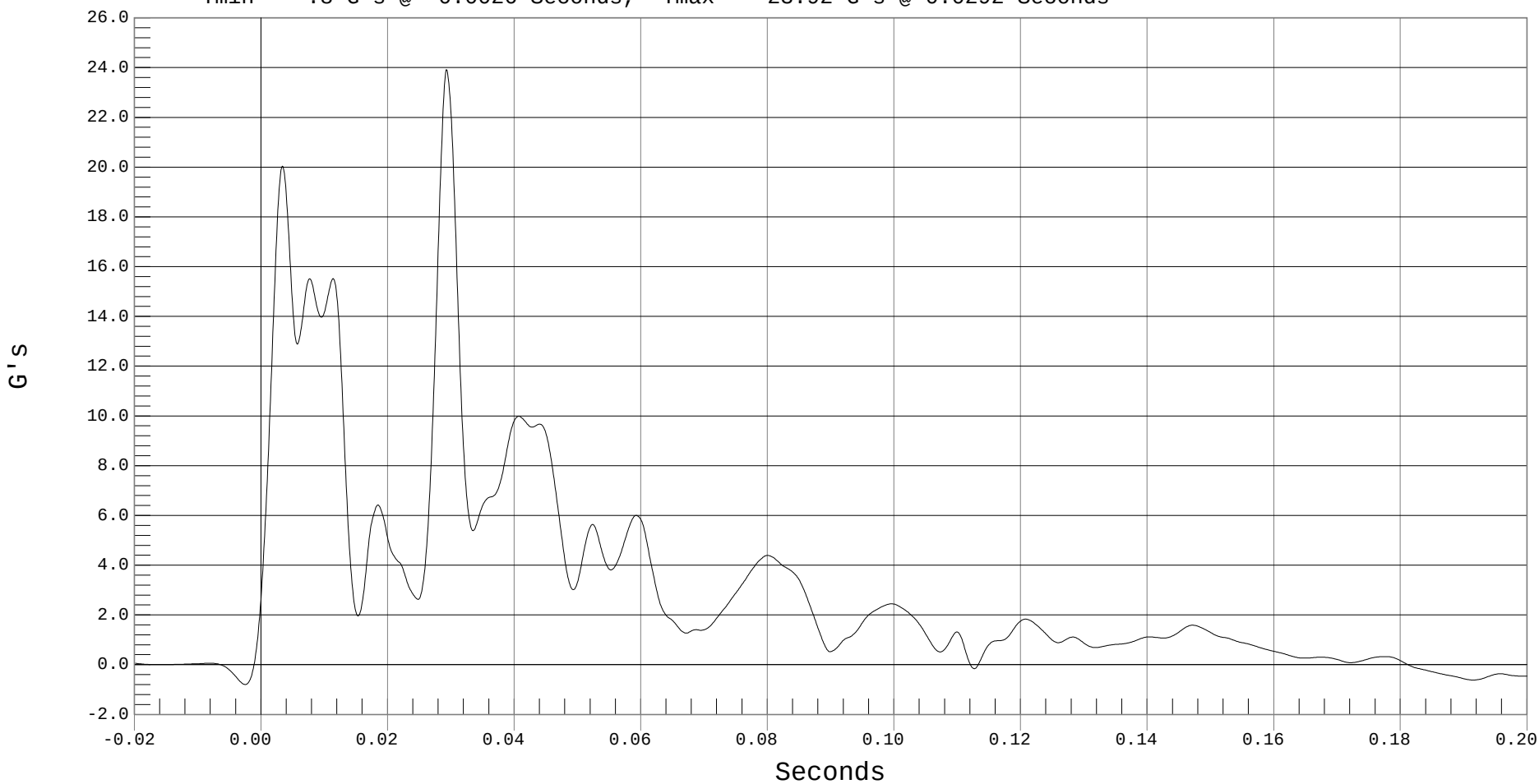
LEFT MID A-POST Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 LEFT MID A-POST Y, B01108AF.A37

Ymin = -0.8 G's @ -0.0026 Seconds, Ymax = 23.92 G's @ 0.0292 Seconds





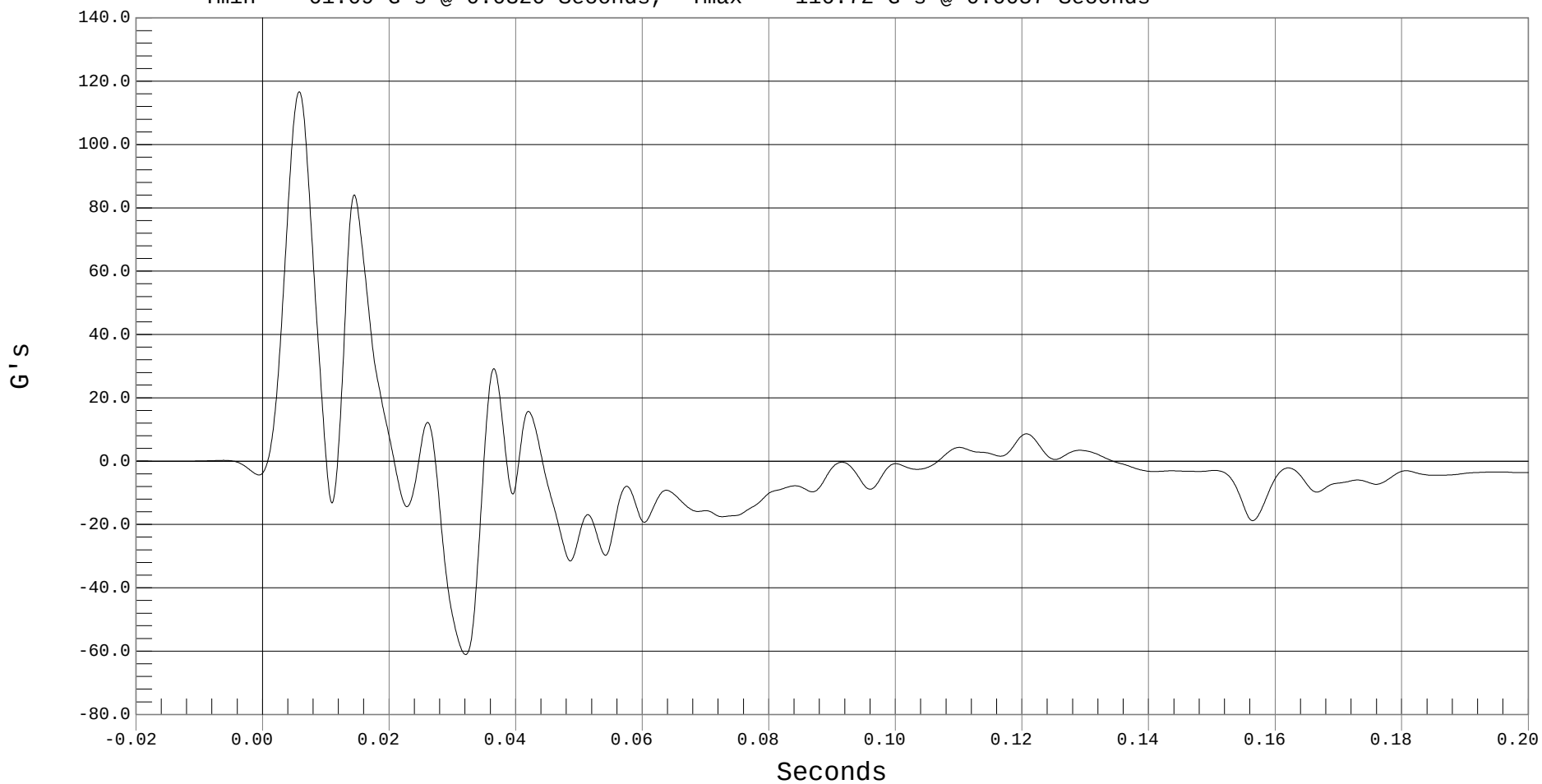
LEFT MID B-POST Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 LEFT MID B-POST Y, B01108AF.A40

Ymin = -61.09 G's @ 0.0320 Seconds, Ymax = 116.72 G's @ 0.0057 Seconds





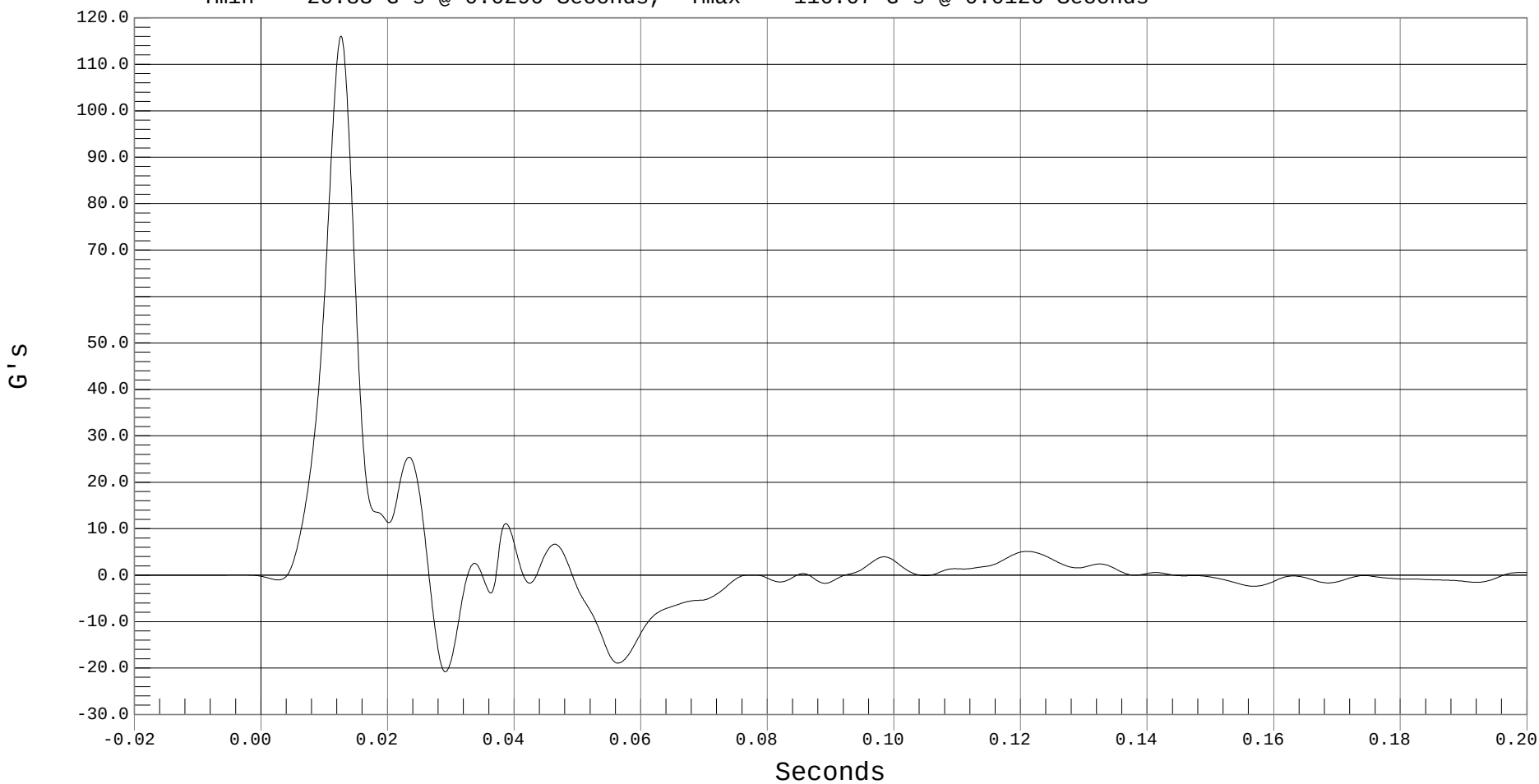
LEFT DRIVER SEAT TRACK Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 DRIVER LEFT SEAT TRACK Y, B01108AF.A42

Ymin = -20.83 G's @ 0.0290 Seconds, Ymax = 116.07 G's @ 0.0126 Seconds





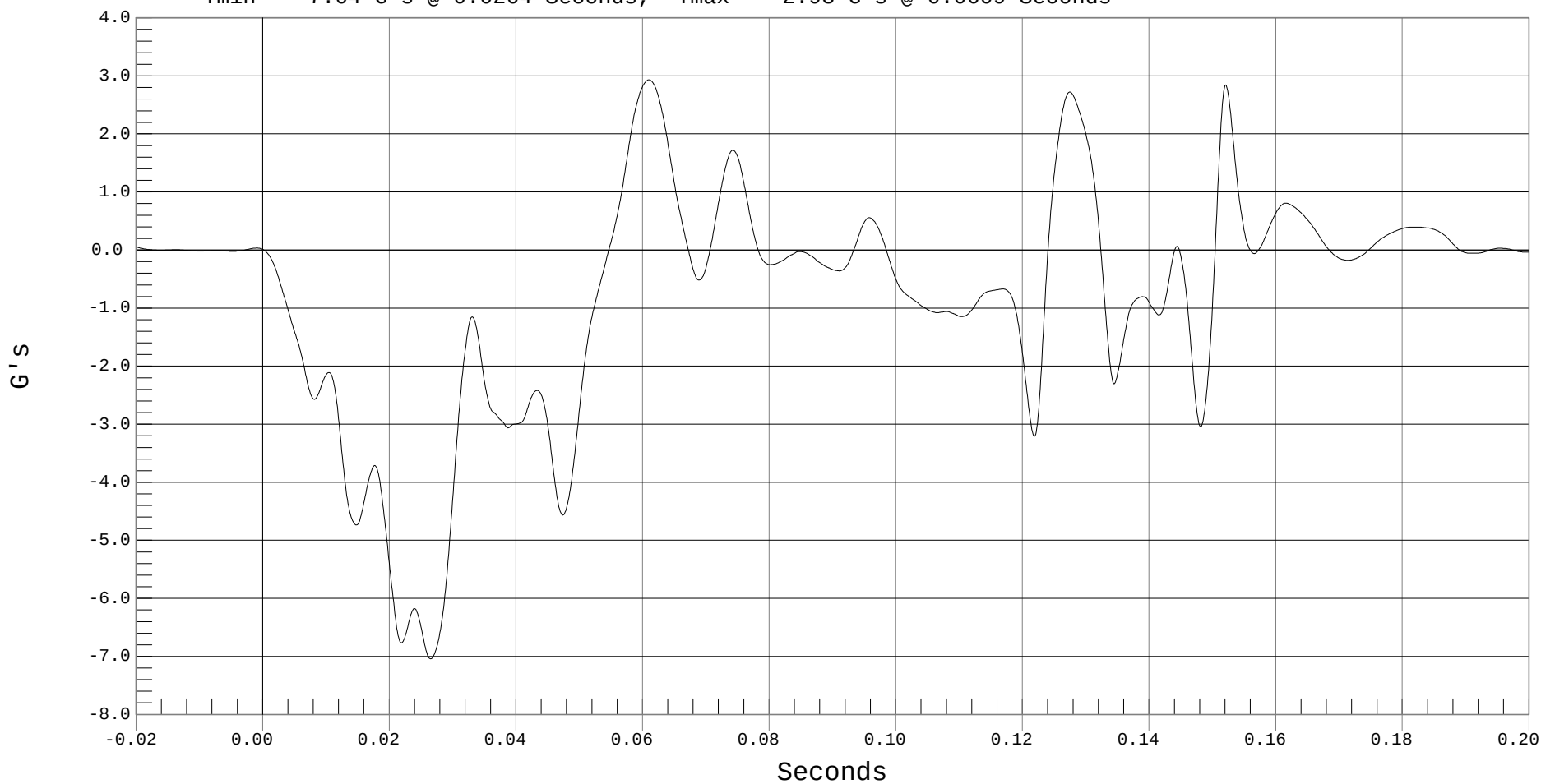
VEHICLE CG X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 VEHICLE CG X, B01108AF.A44

Ymin = -7.04 G's @ 0.0264 Seconds, Ymax = 2.93 G's @ 0.0609 Seconds





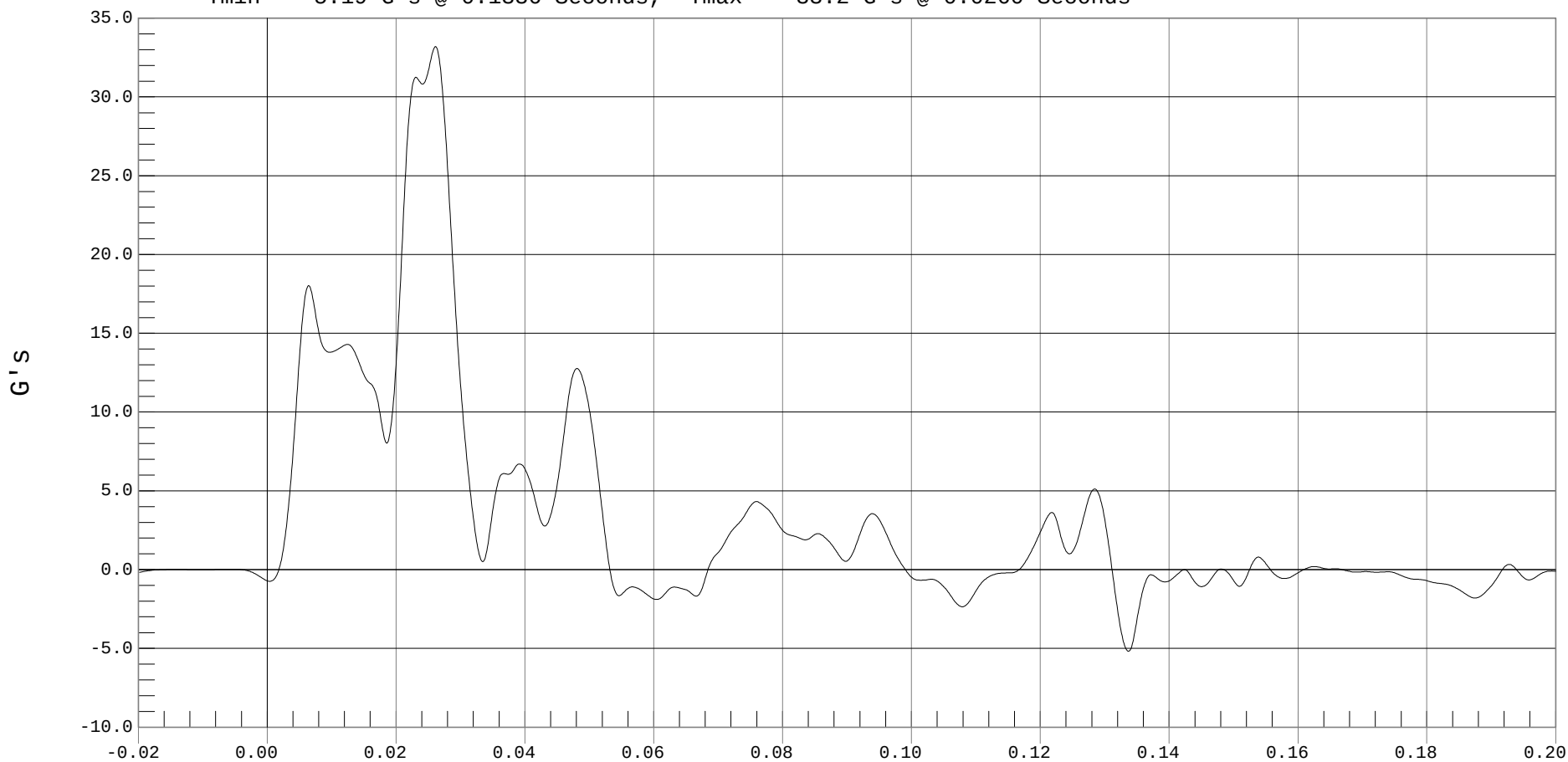
VEHICLE CG Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 VEHICLE CG Y, B01108AF.A45

Ymin = -5.19 G's @ 0.1336 Seconds, Ymax = 33.2 G's @ 0.0260 Seconds





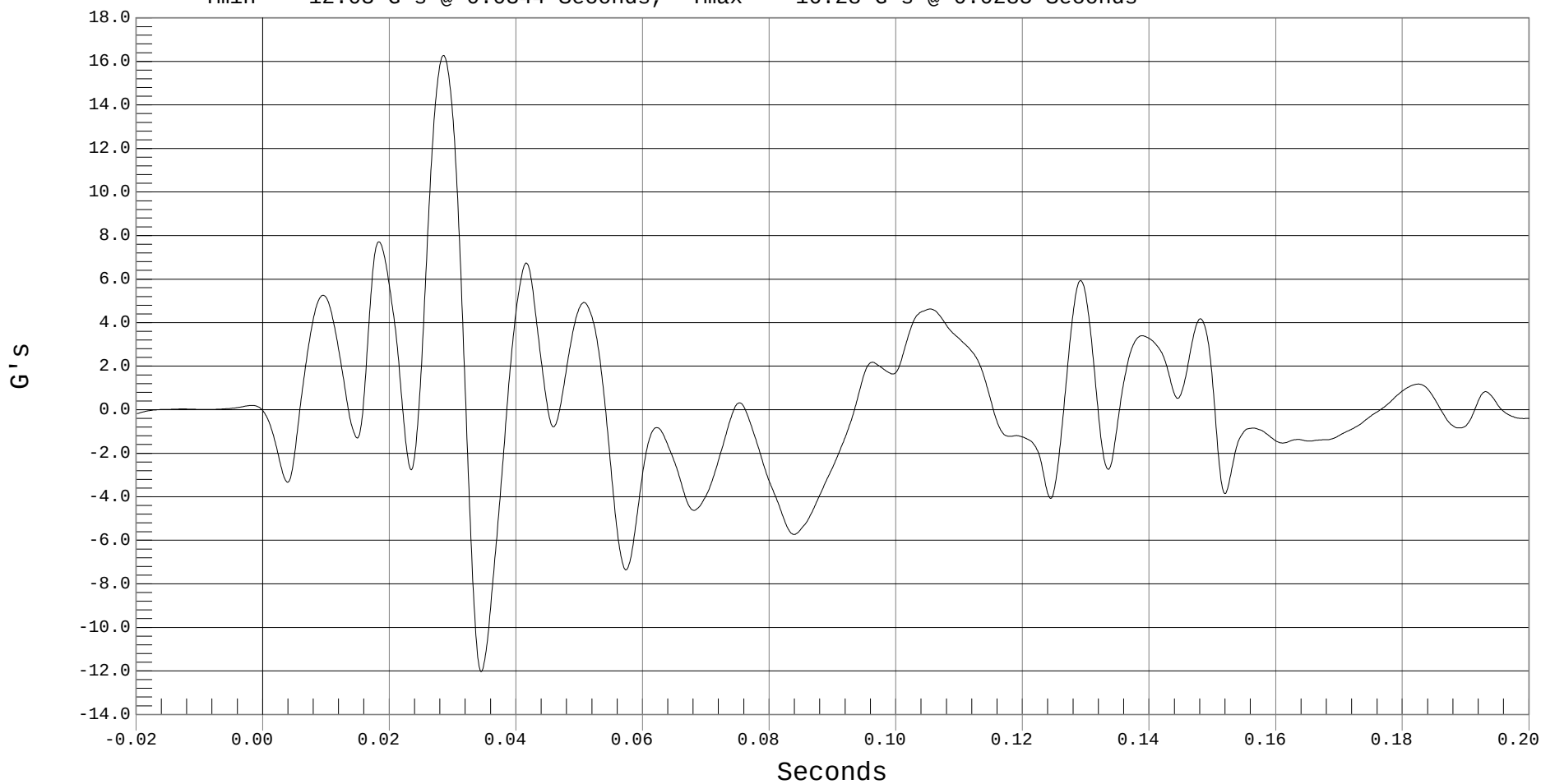
VEHICLE CG Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 VEHICLE CG Z, B01108AF.A46

Ymin = -12.03 G's @ 0.0344 Seconds, Ymax = 16.28 G's @ 0.0285 Seconds





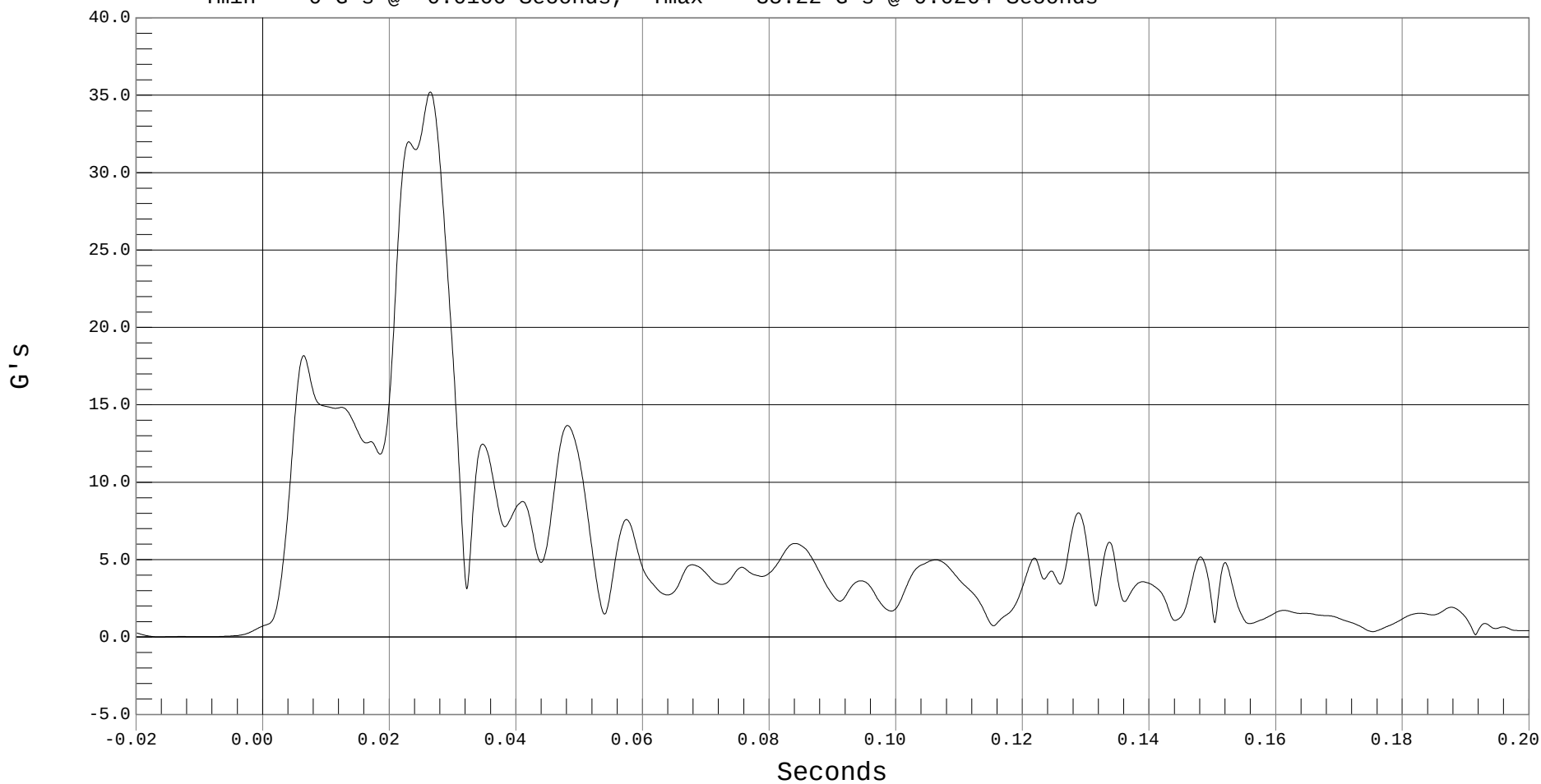
VEHICLE CG RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 VEHICLE CG RESULTANT ACCELERATION, B01108AV.A44

Ymin = 0 G's @ -0.0166 Seconds, Ymax = 35.22 G's @ 0.0264 Seconds





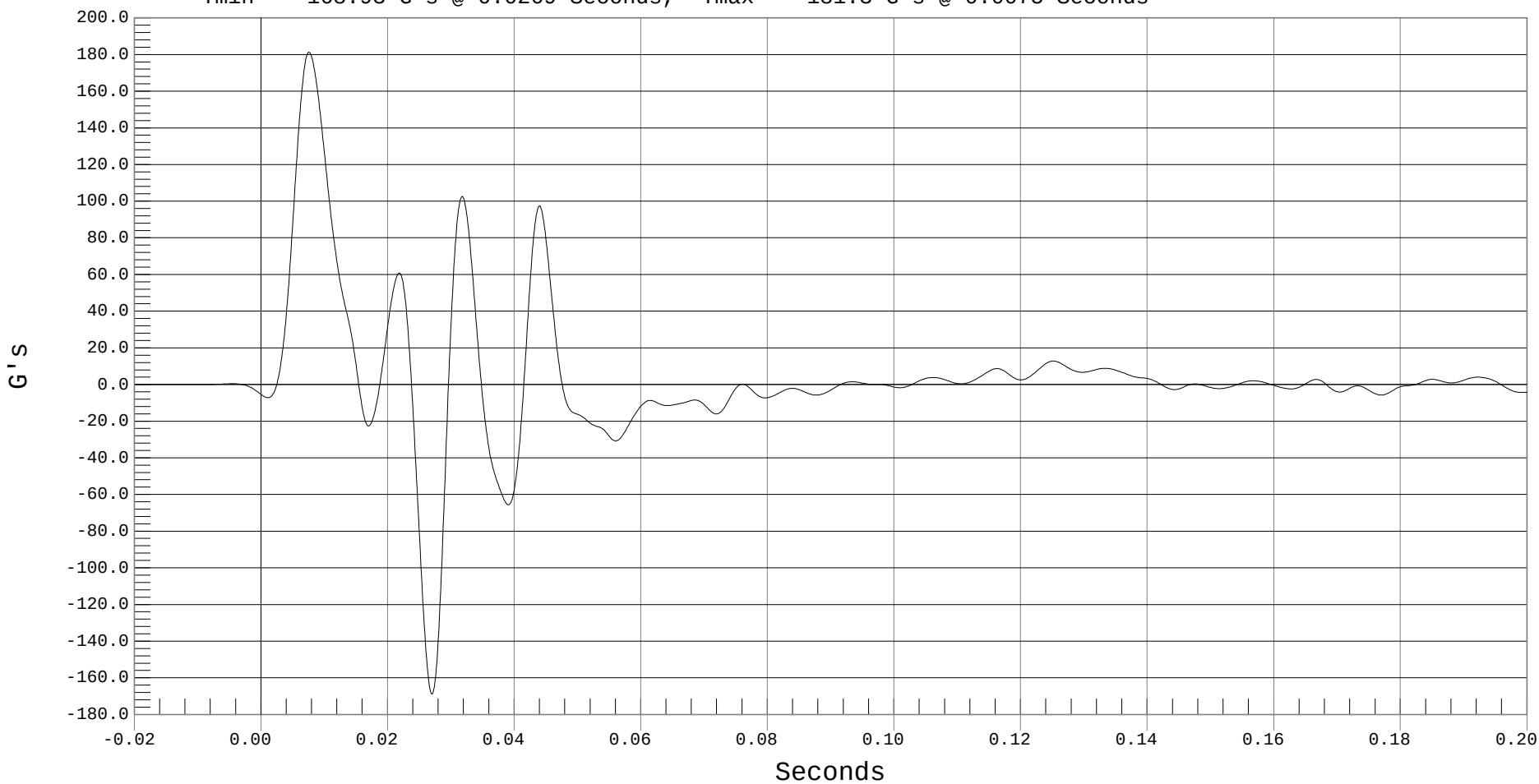
LEFT REAR DOOR @ KNEE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 LEFT REAR DOOR @ KNEE Y, B01108AF.A49

Ymin = -168.93 G's @ 0.0269 Seconds, Ymax = 181.3 G's @ 0.0075 Seconds





LEFT REAR DOOR @ ARM Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

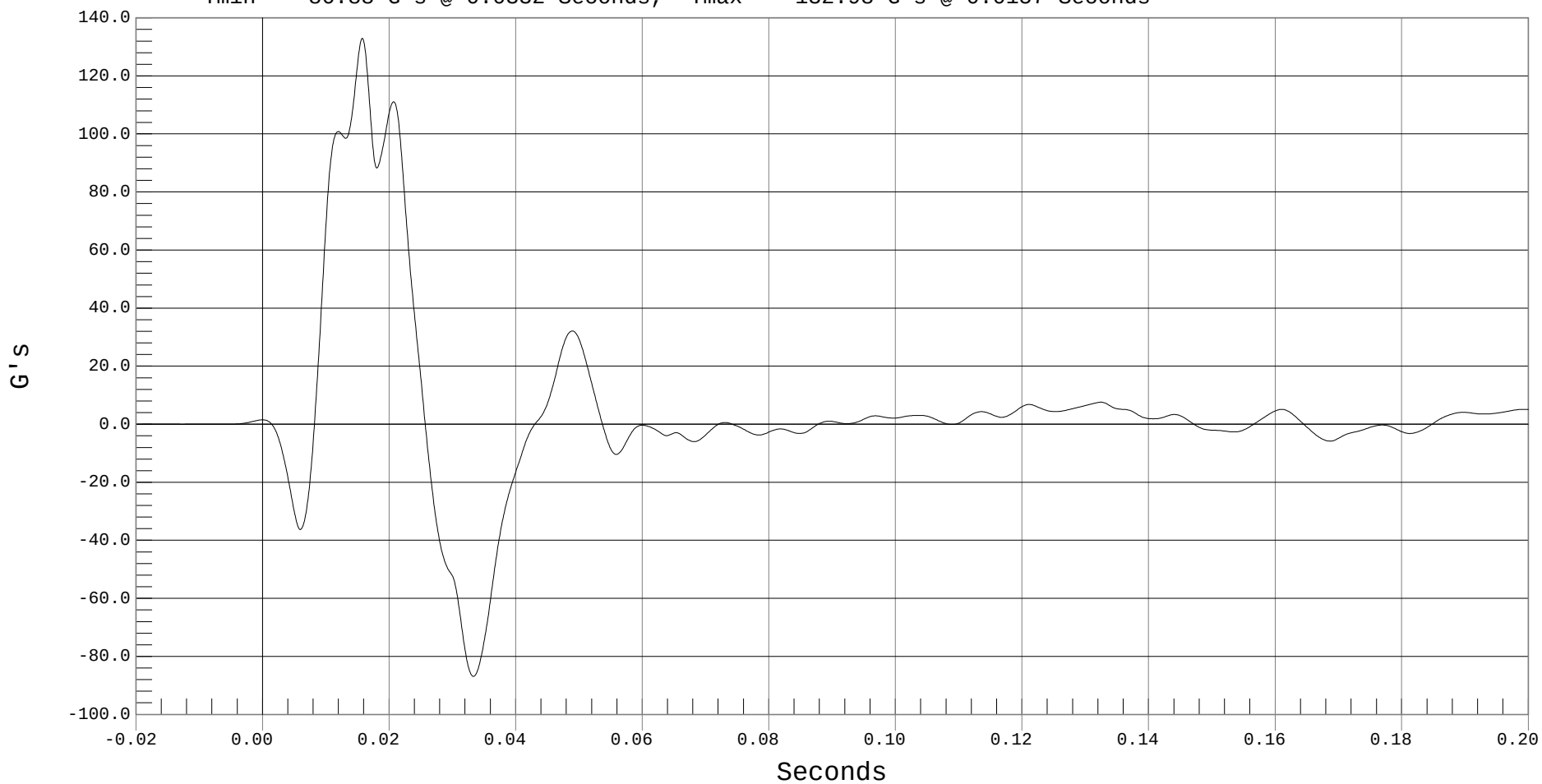
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 LEFT REAR DOOR @ ARM Y, B01108AF.A50

Ymin = -86.88 G's @ 0.0332 Seconds, Ymax = 132.98 G's @ 0.0157 Seconds





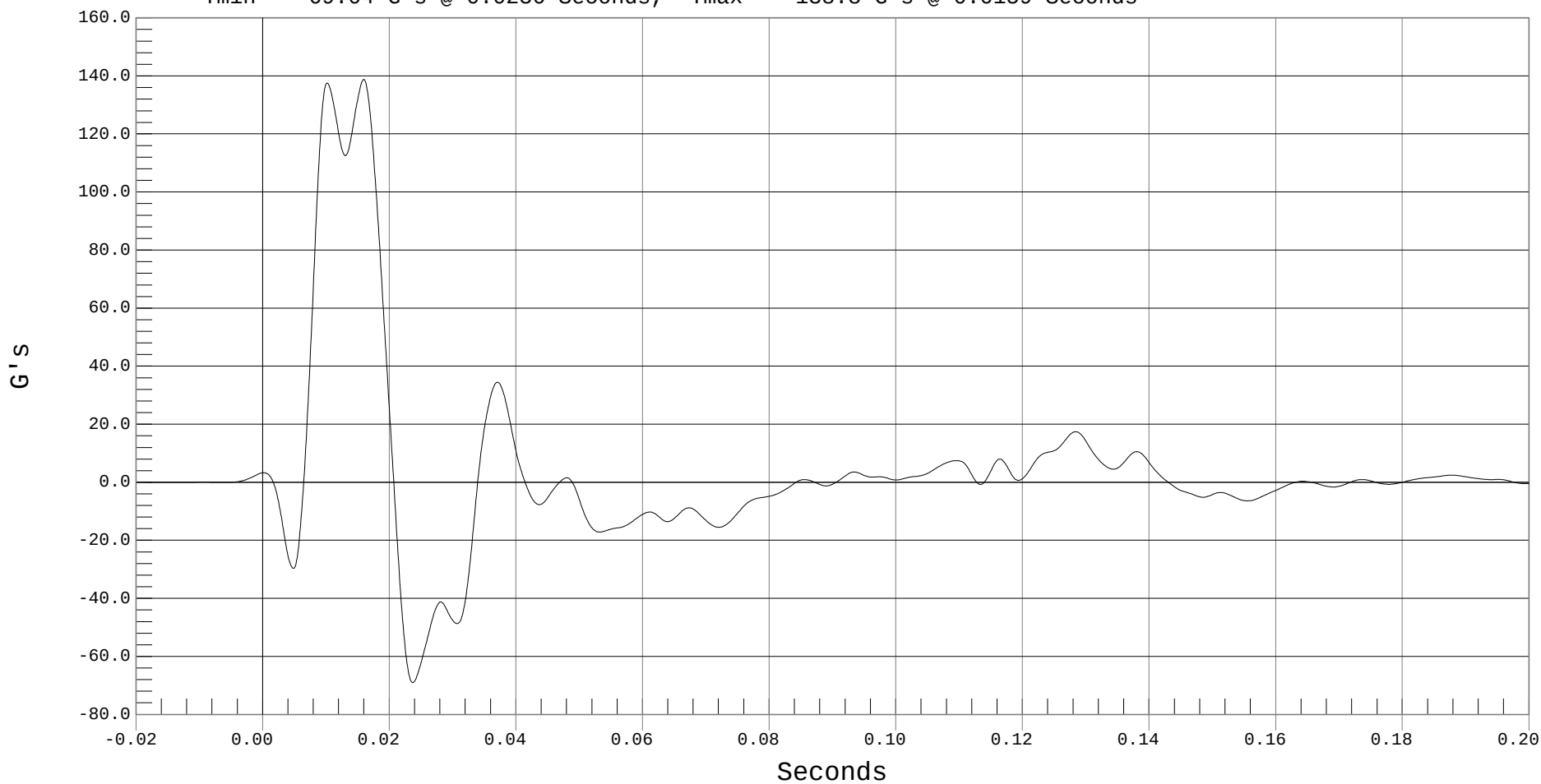
LEFT FRONT DOOR @ MID RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 LEFT FRONT DOOR @ MID RIB, B01108AF.A51

Ymin = -69.04 G's @ 0.0236 Seconds, Ymax = 138.8 G's @ 0.0159 Seconds





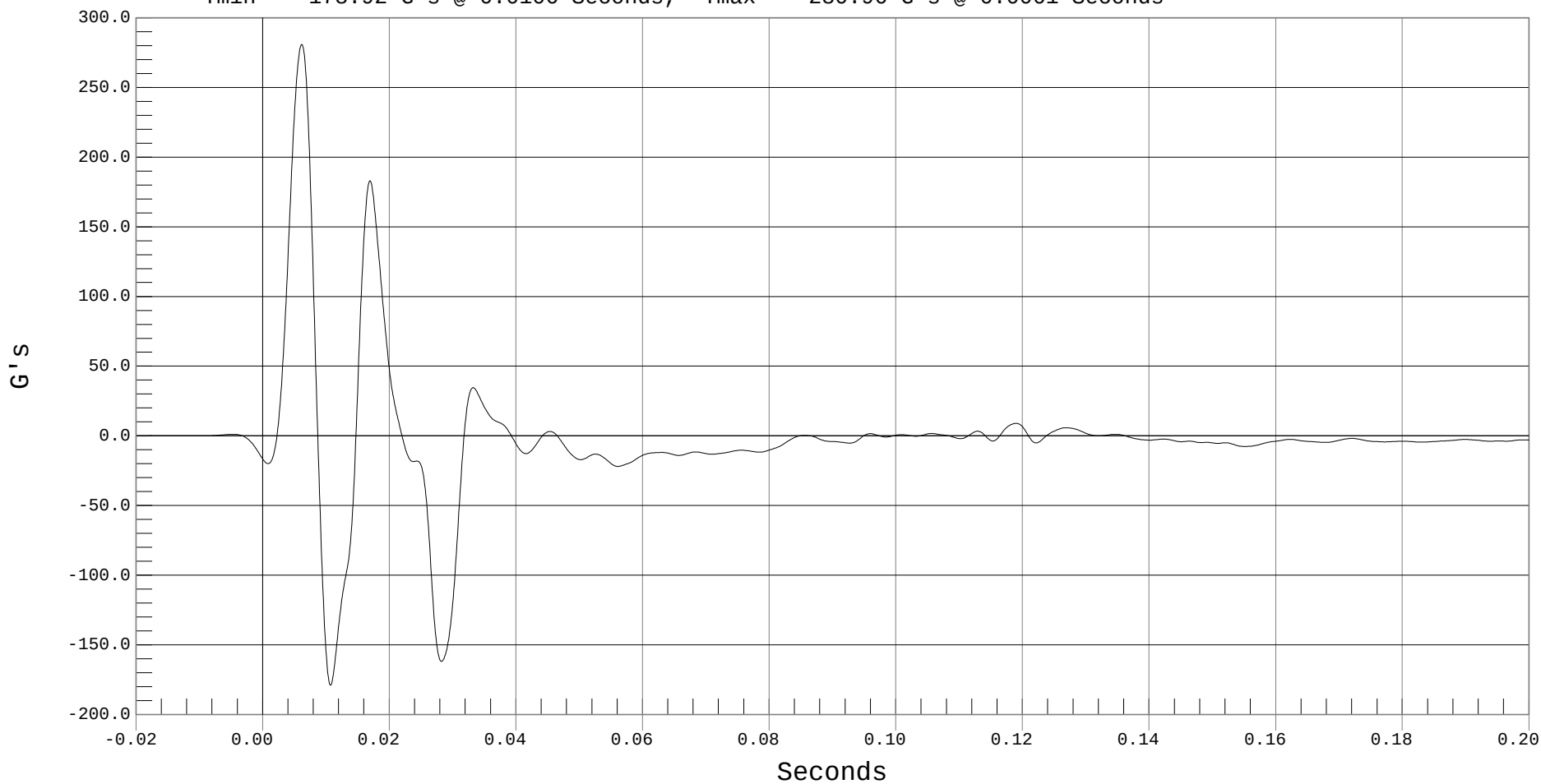
LEFT FRONT DOOR @ PELVIS Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 LEFT FRONT DOOR @ PELVIS, B01108AF.A52

Ymin = -178.92 G's @ 0.0106 Seconds, Ymax = 280.96 G's @ 0.0061 Seconds





LEFT FRONT DOOR @ KNEE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

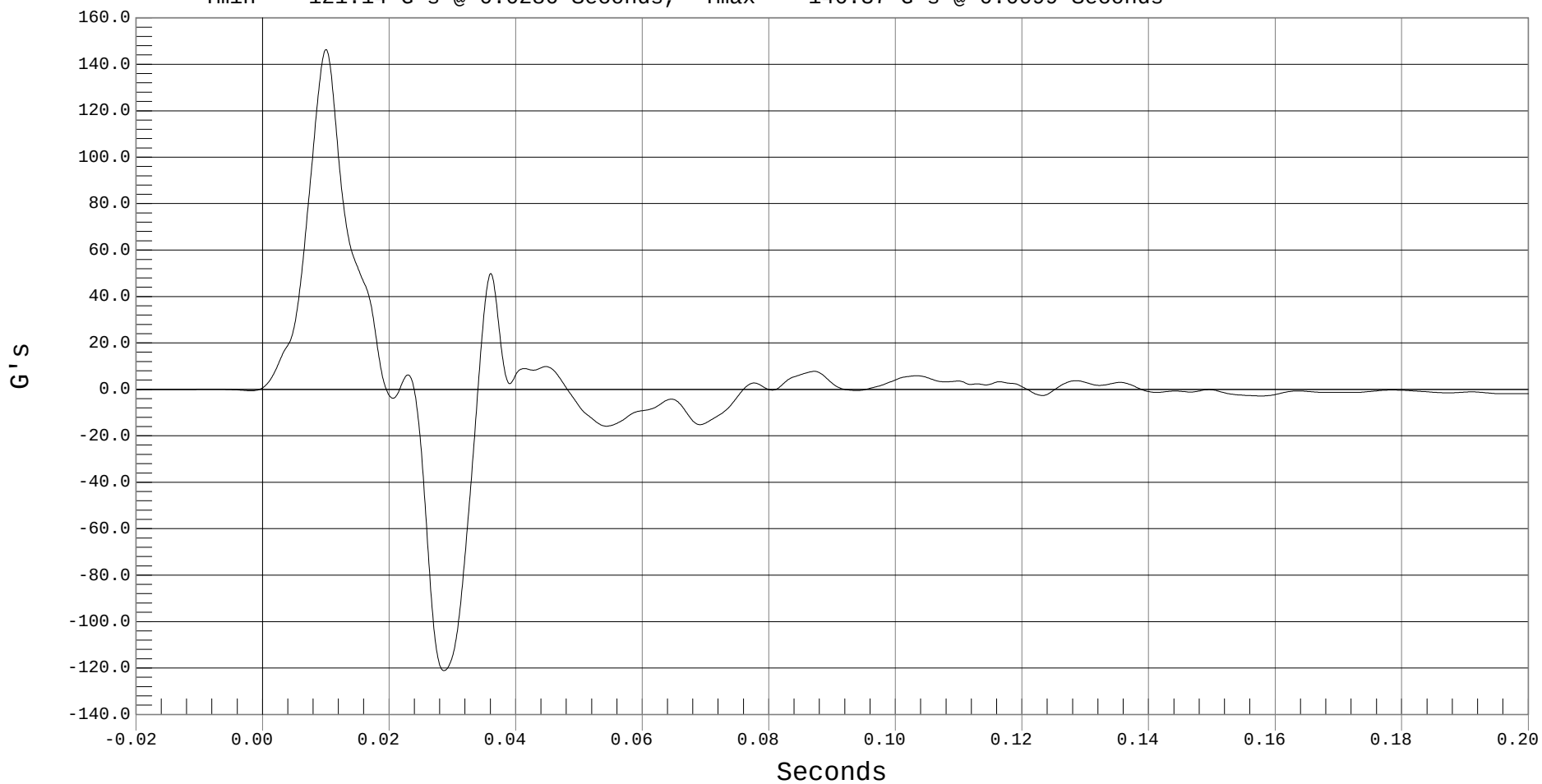
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 LEFT FRONT DOOR @ KNEE, B01108AF.A53

Ymin = -121.14 G's @ 0.0286 Seconds, Ymax = 146.37 G's @ 0.0099 Seconds





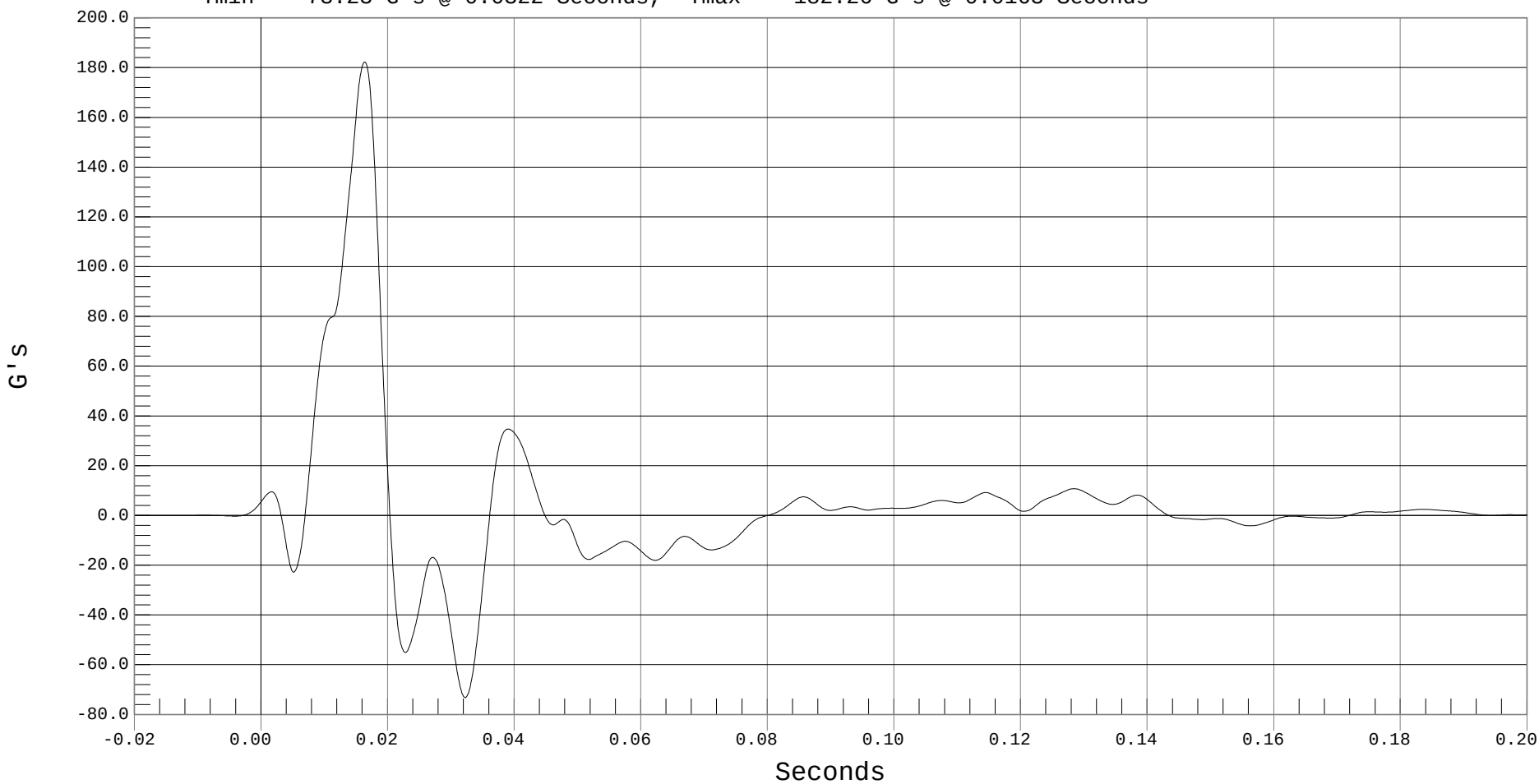
LEFT FRONT DOOR @ ARM Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 LEFT FRONT DOOR @ ARM, B01108AF.A54

Ymin = -73.23 G's @ 0.0322 Seconds, Ymax = 182.26 G's @ 0.0163 Seconds





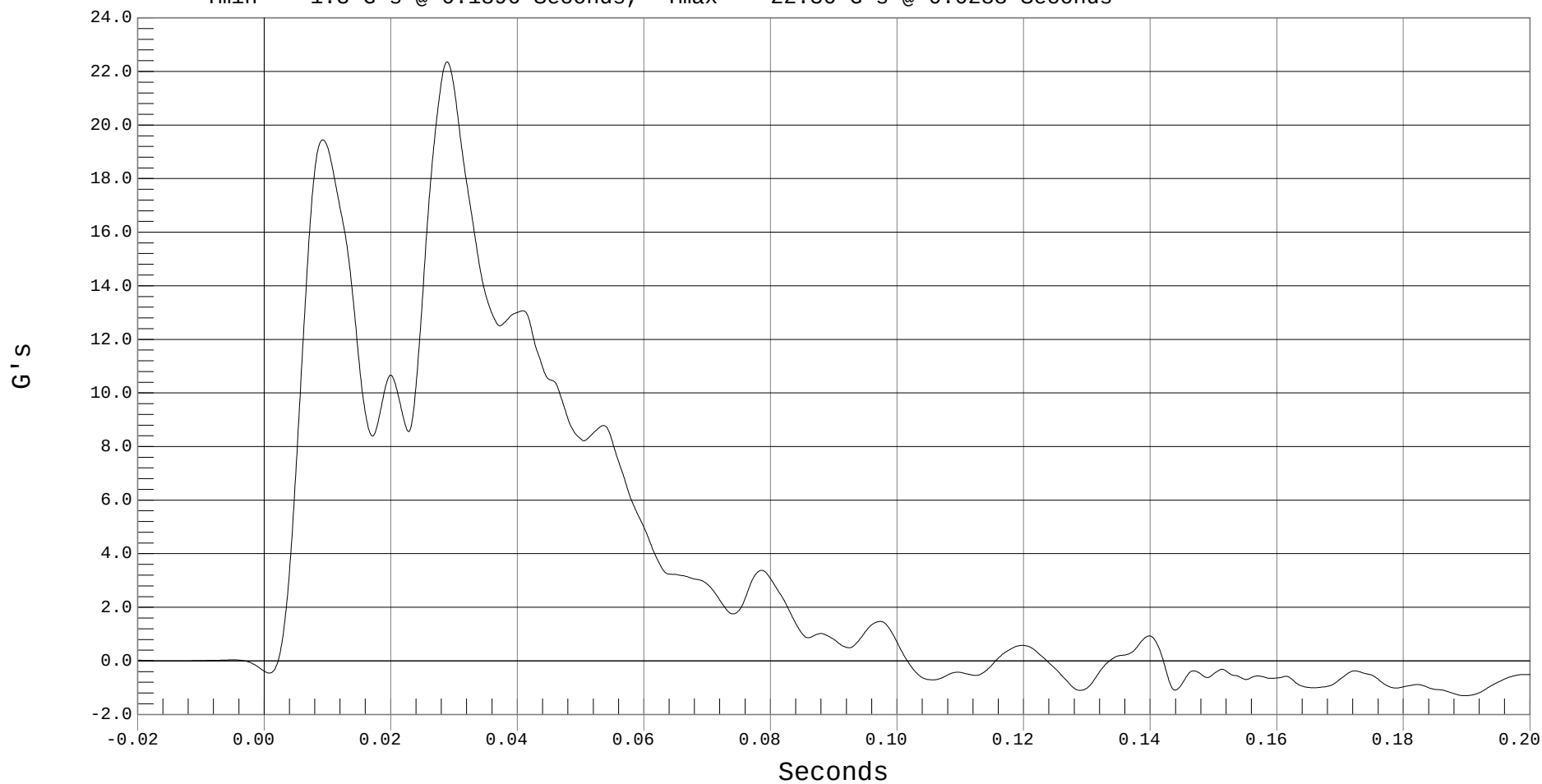
RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 RIGHT REAR OCC. COMPARTMENT Y, B01108AF.A62

Ymin = -1.3 G's @ 0.1896 Seconds, Ymax = 22.36 G's @ 0.0288 Seconds





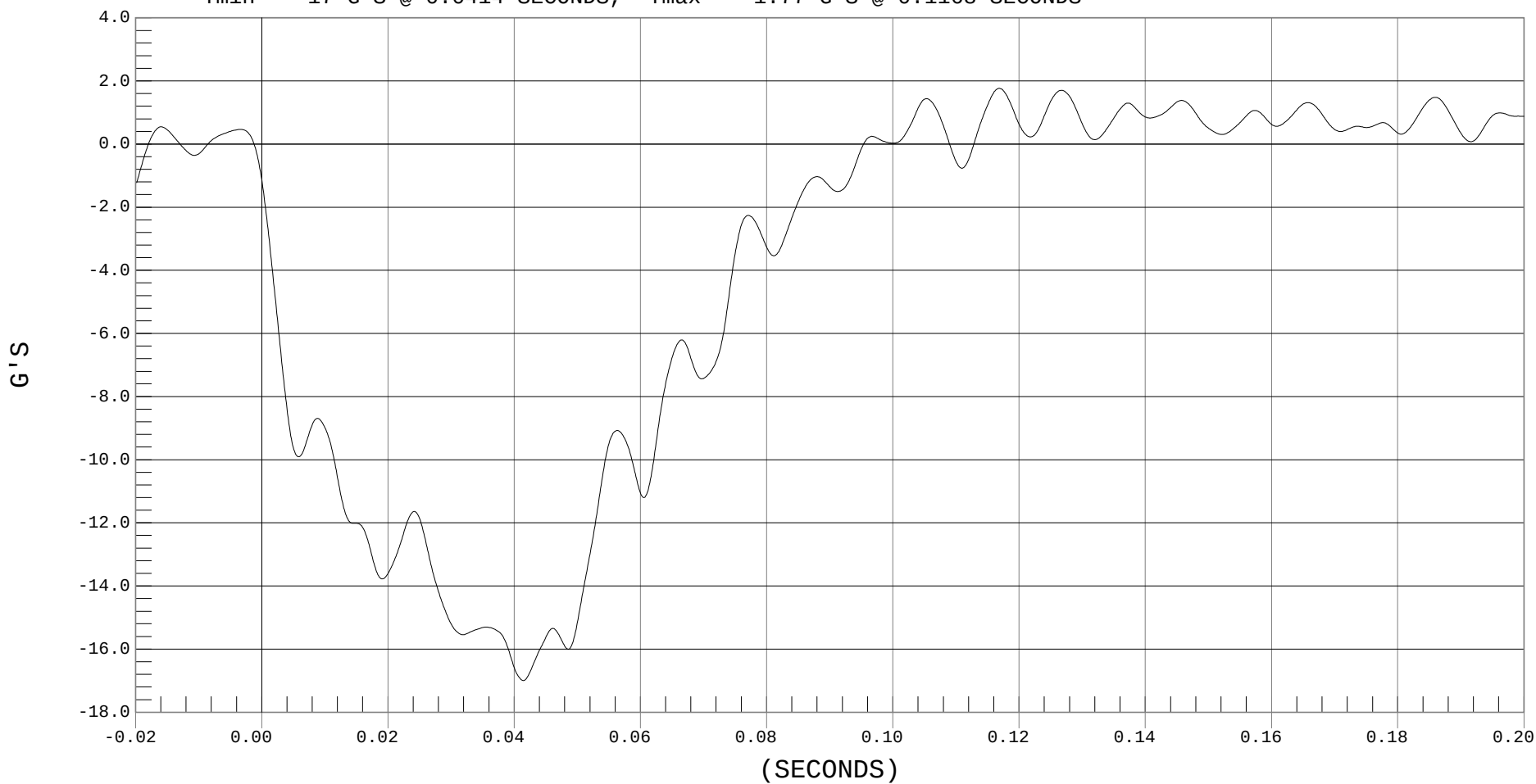
MOVING BARRIER CG X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 CART CG X ACCELERATION, B01108AF.A07

Ymin = -17 G'S @ 0.0414 SECONDS, Ymax = 1.77 G'S @ 0.1168 SECONDS





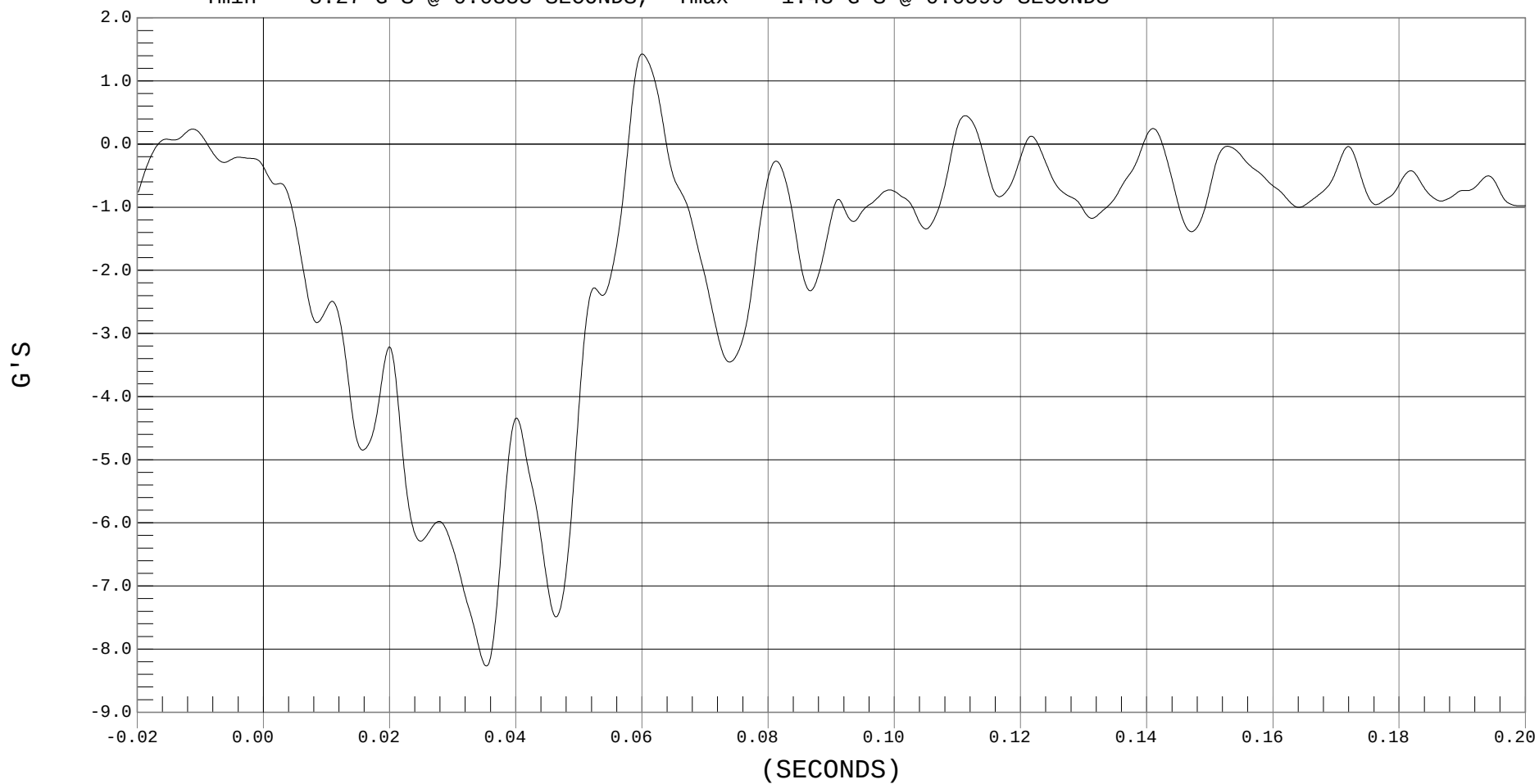
MOVING BARRIER CG Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 CART CG Y ACCELERATION, B01108AF.A03

Ymin = -8.27 G'S @ 0.0353 SECONDS, Ymax = 1.43 G'S @ 0.0599 SECONDS





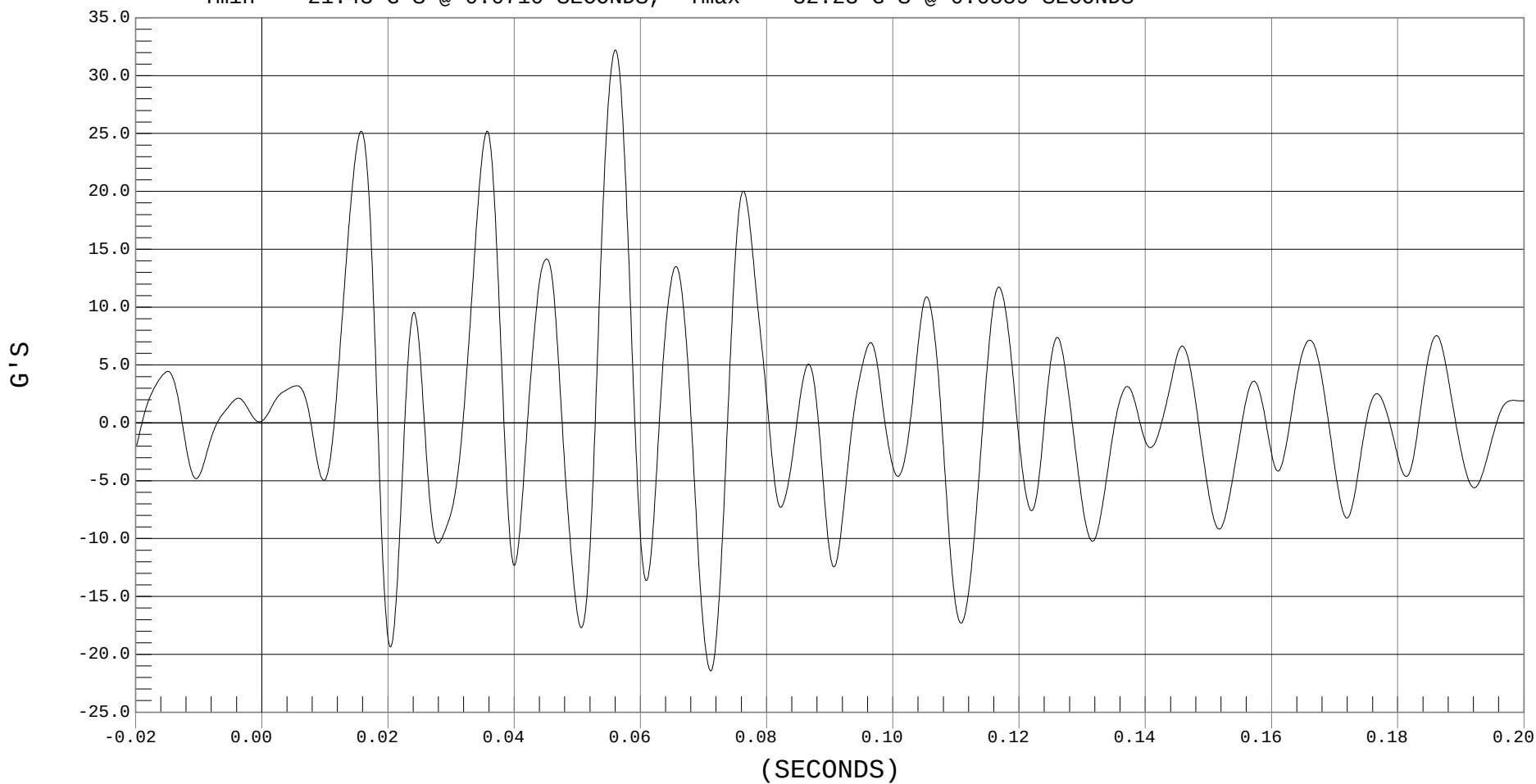
MOVING BARRIER CG Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 CART CG Z ACCELERATION, B01108AF.A04

Ymin = -21.43 G'S @ 0.0710 SECONDS, Ymax = 32.23 G'S @ 0.0559 SECONDS





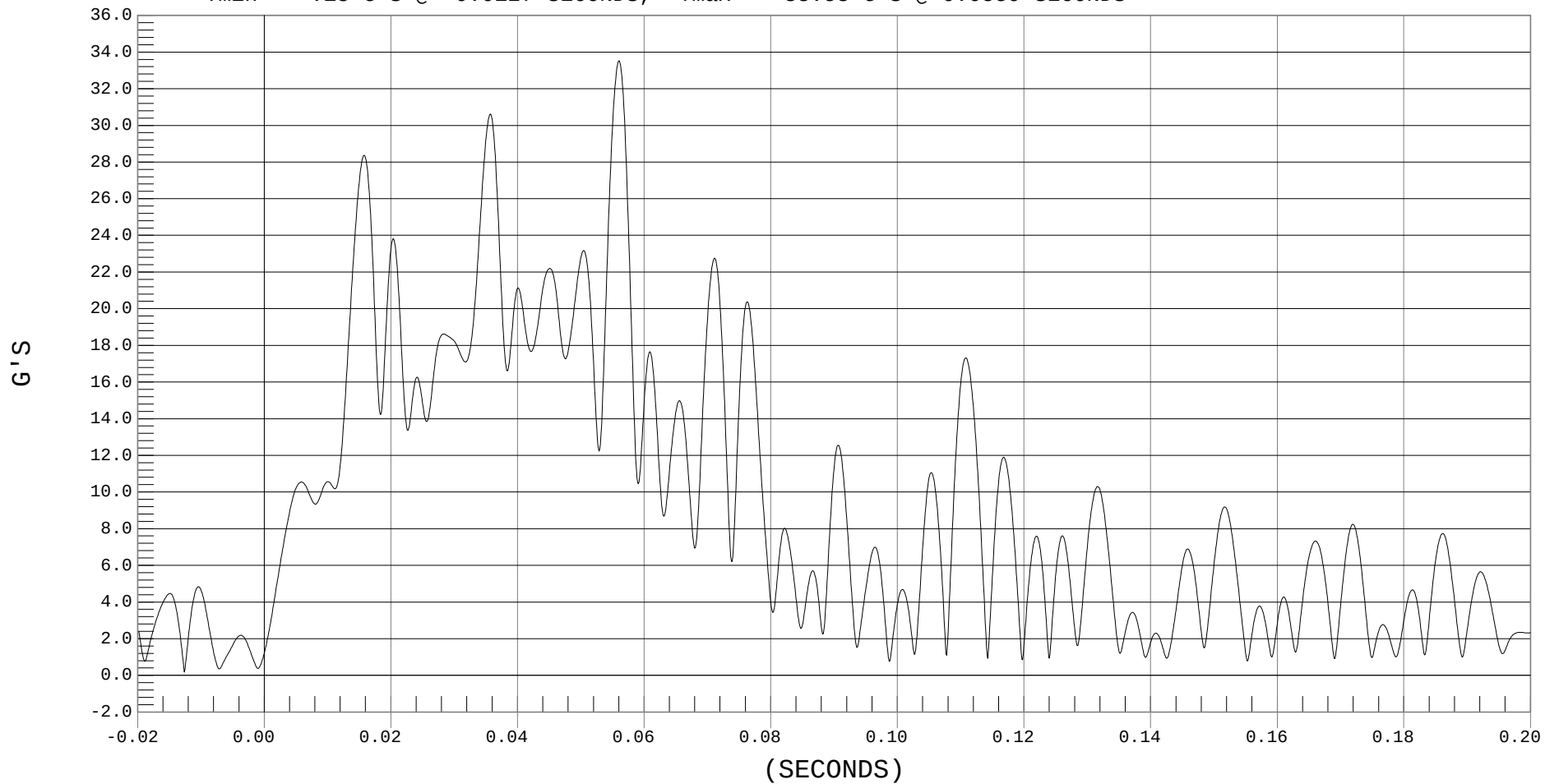
MOVING BARRIER CG RESULTANT ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 60

— 1 MOVING BARRIER CG RESULTANT ACCELERATION, B01108AV.A03

Ymin = .18 G'S @ -0.0127 SECONDS, Ymax = 33.53 G'S @ 0.0559 SECONDS





MOVING BARRIER REAR AXLE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

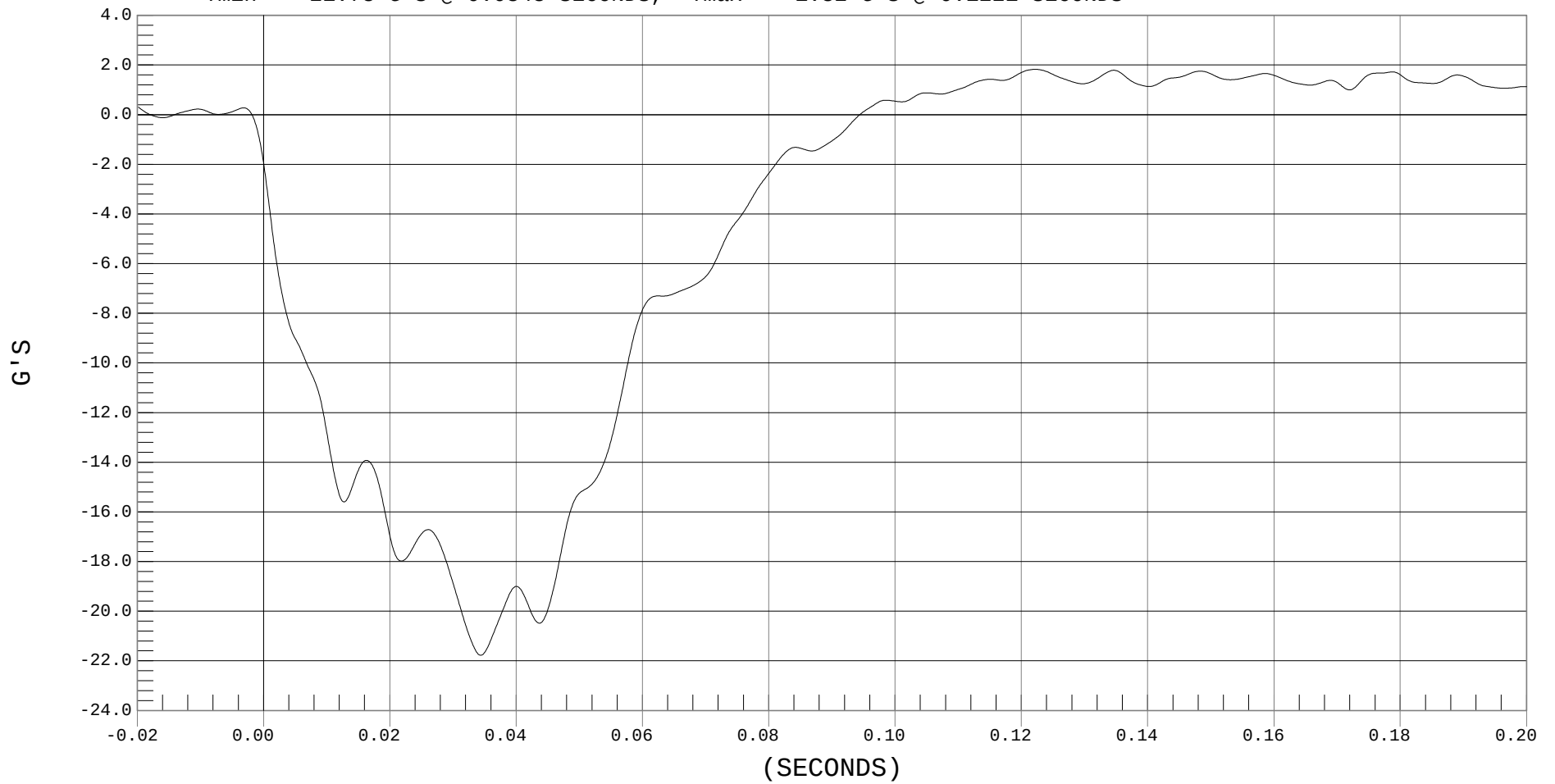
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 CART REAR AXLE X ACCELERATION, B01108AF.A05

Ymin = -21.78 G'S @ 0.0343 SECONDS, Ymax = 1.82 G'S @ 0.1221 SECONDS





MOVING BARRIER REAR AXLE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT

Component: 2002 CHEVROLET IMPALA

Other Info:

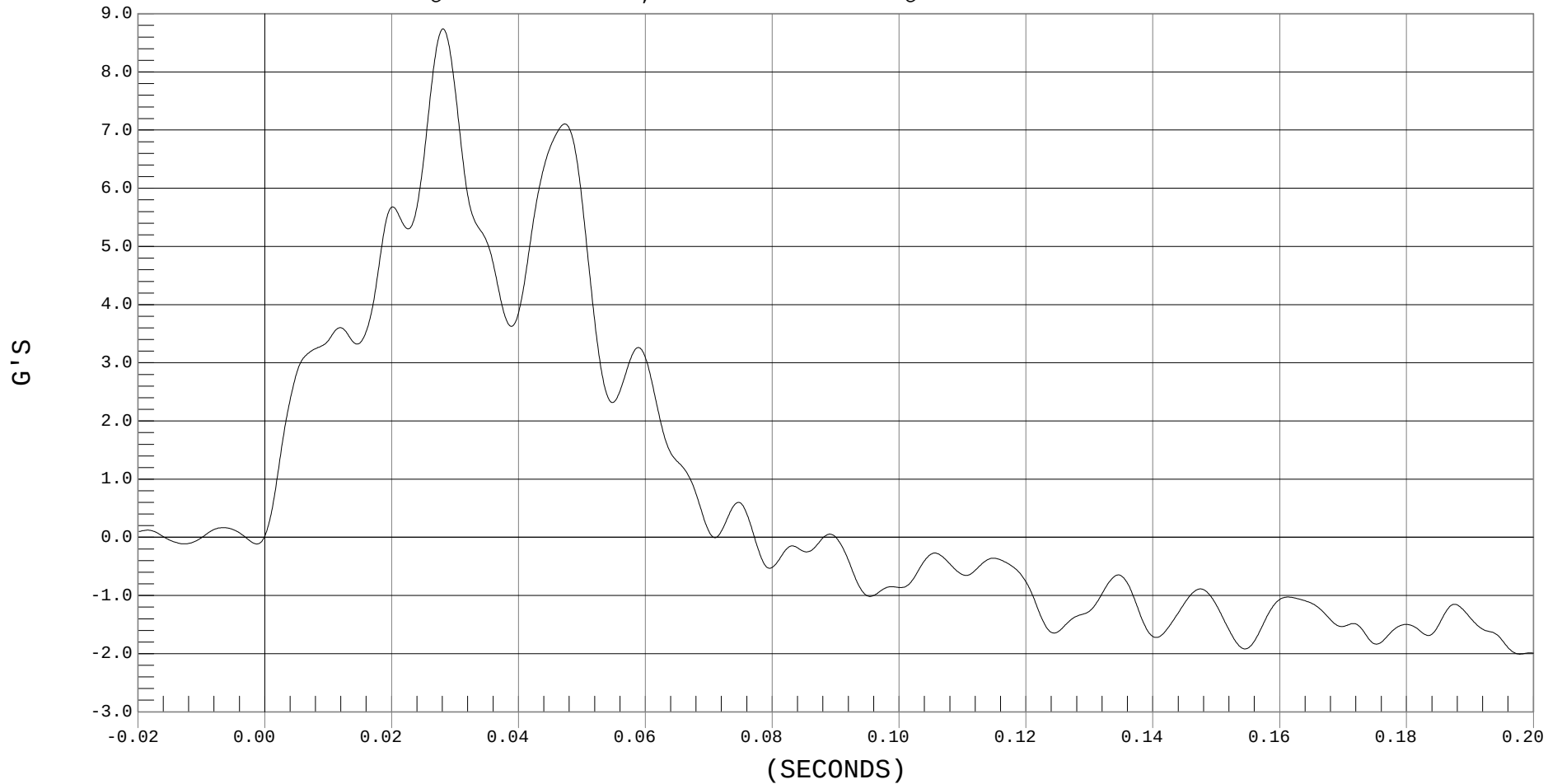
Test Date: 10-19-01

Speed: 38.3 MPH, 61.6 KPH

Filter Class: 60

— 1 CART REAR AXLE Y ACCELERATION, B01108AF.A06

Ymin = -2.01 G'S @ 0.1978 SECONDS, Ymax = 8.74 G'S @ 0.0280 SECONDS





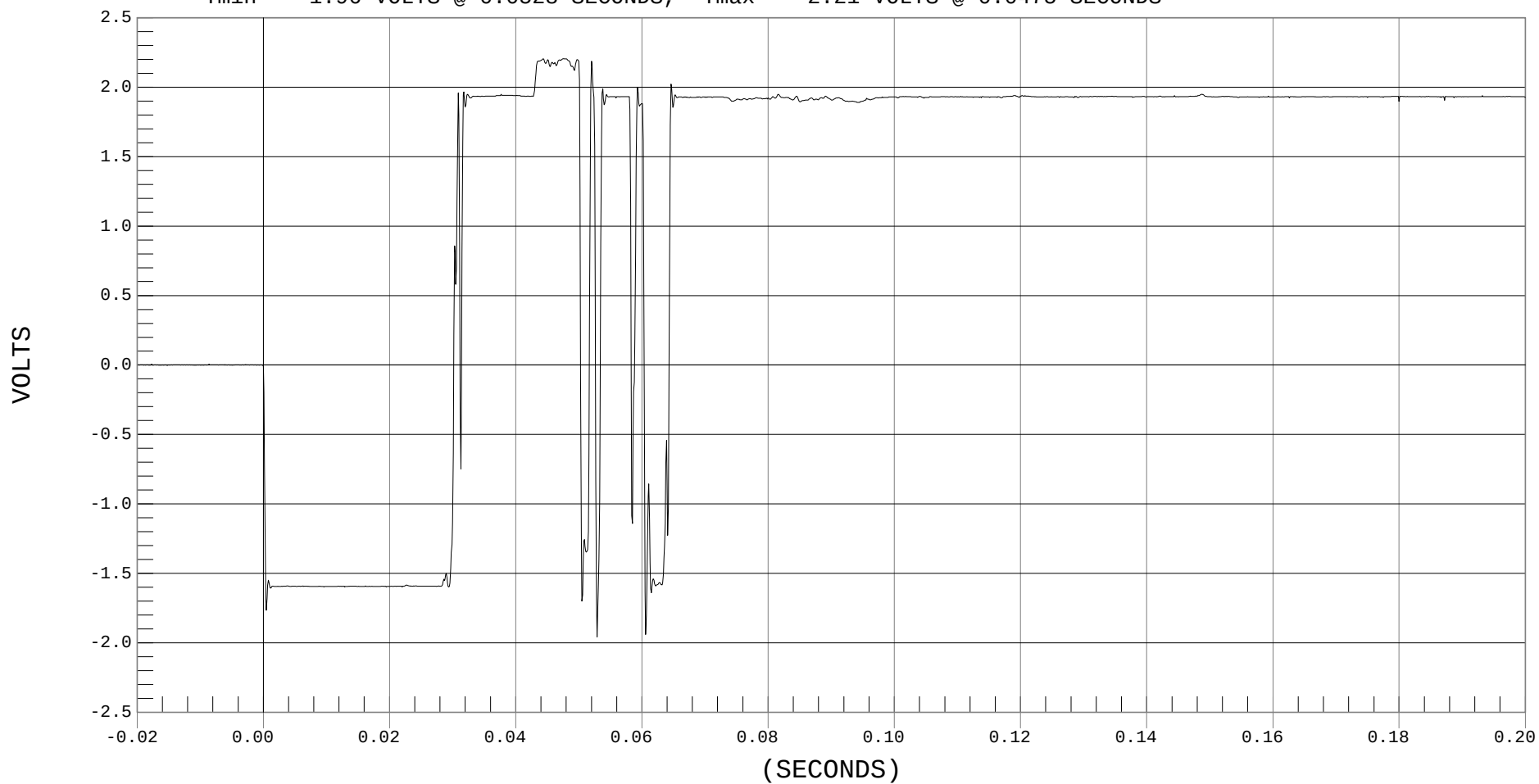
LEFT BARRIER CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 LEFT CONTACT, B011080T.010

Ymin = -1.96 VOLTS @ 0.0528 SECONDS, Ymax = 2.21 VOLTS @ 0.0475 SECONDS





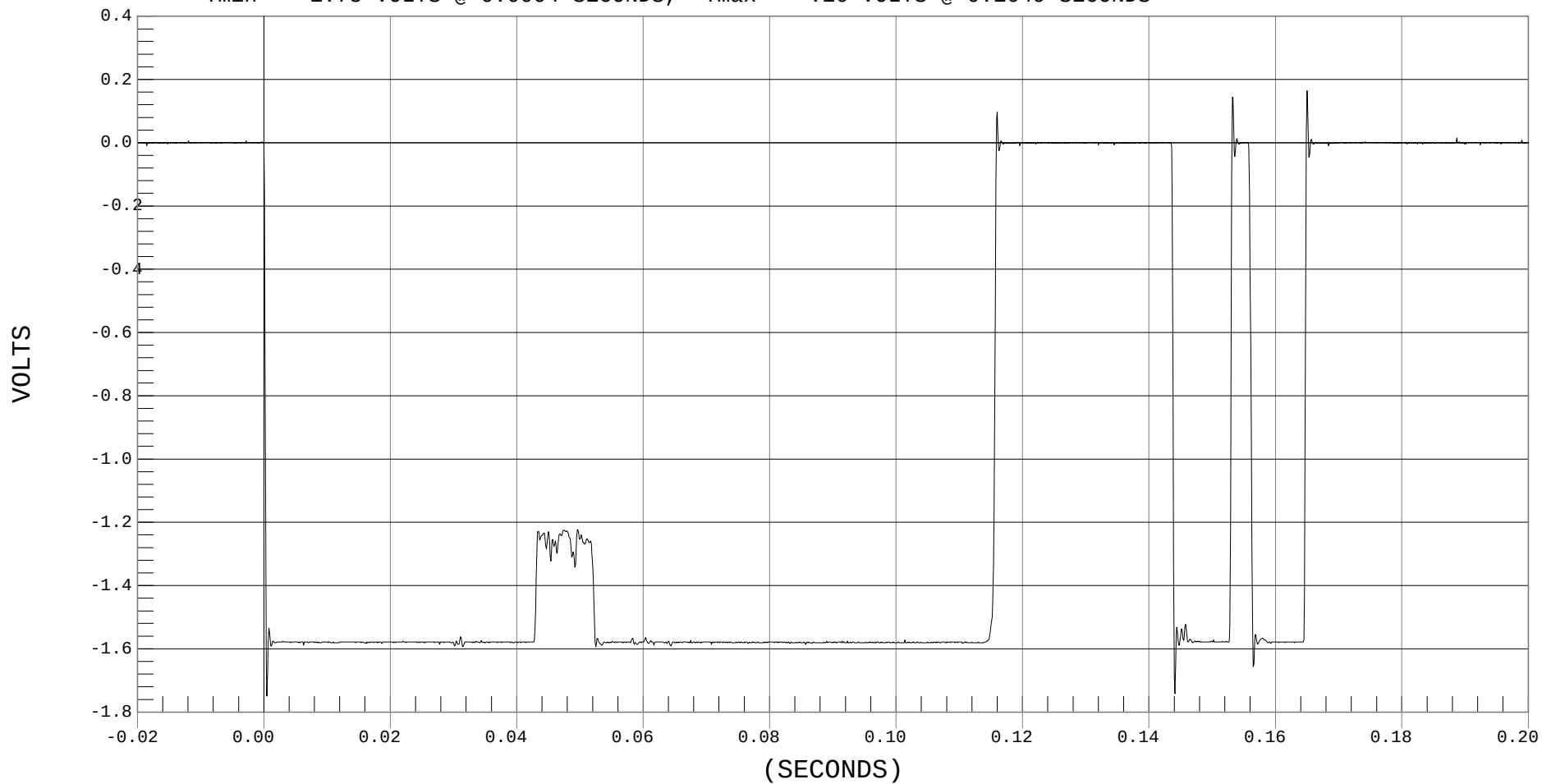
RIGHT BARRIER CONTACT

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Filter Class: 1000

— 1 RIGHT CONTACT, B011080T.009

Ymin = -1.75 VOLTS @ 0.0004 SECONDS, Ymax = .16 VOLTS @ 0.1649 SECONDS





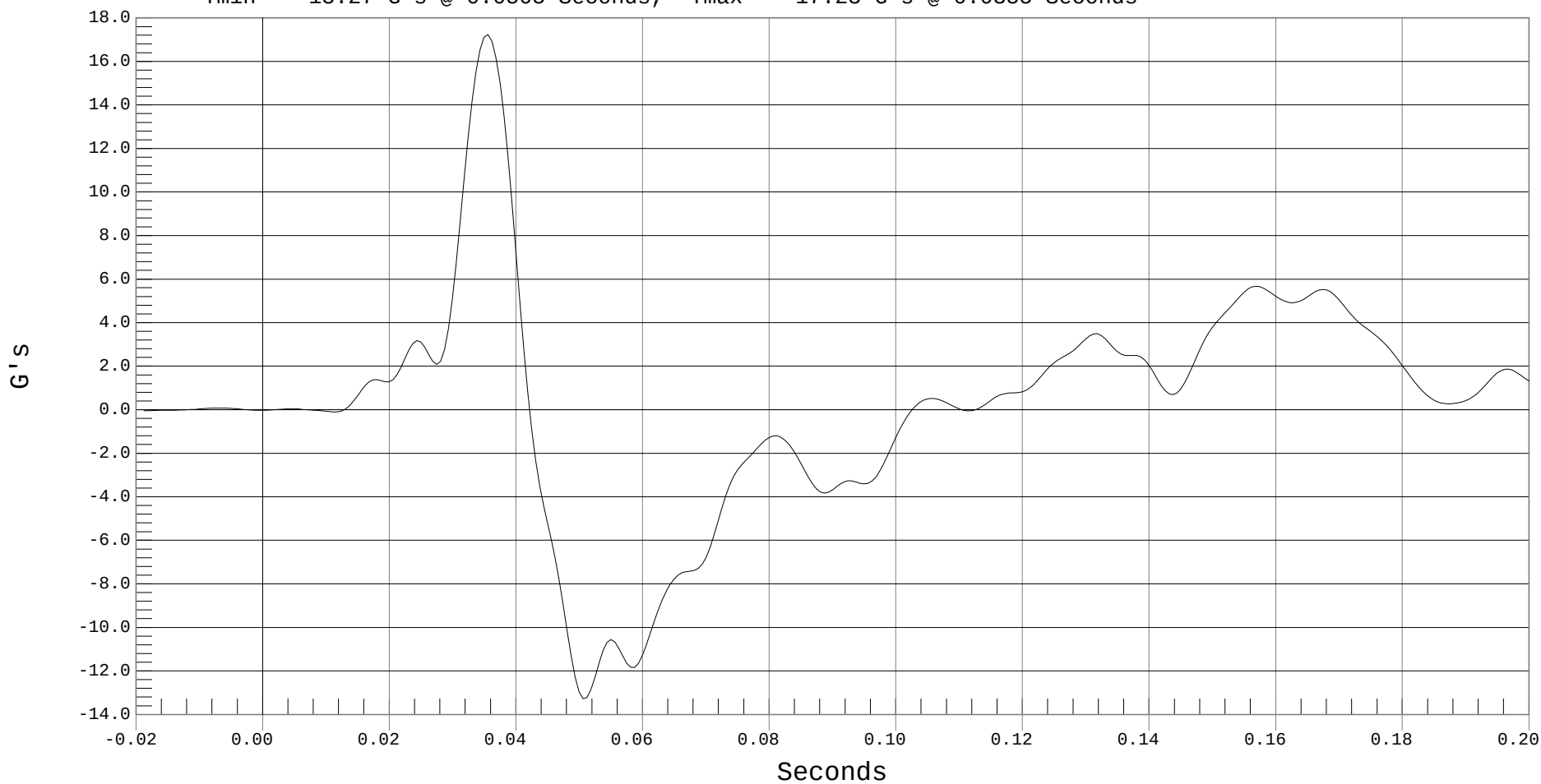
DRIVER UPPER SPINE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER UPPER SPINE X, B01108FI.R20

Ymin = -13.27 G's @ 0.0505 Seconds, Ymax = 17.23 G's @ 0.0355 Seconds





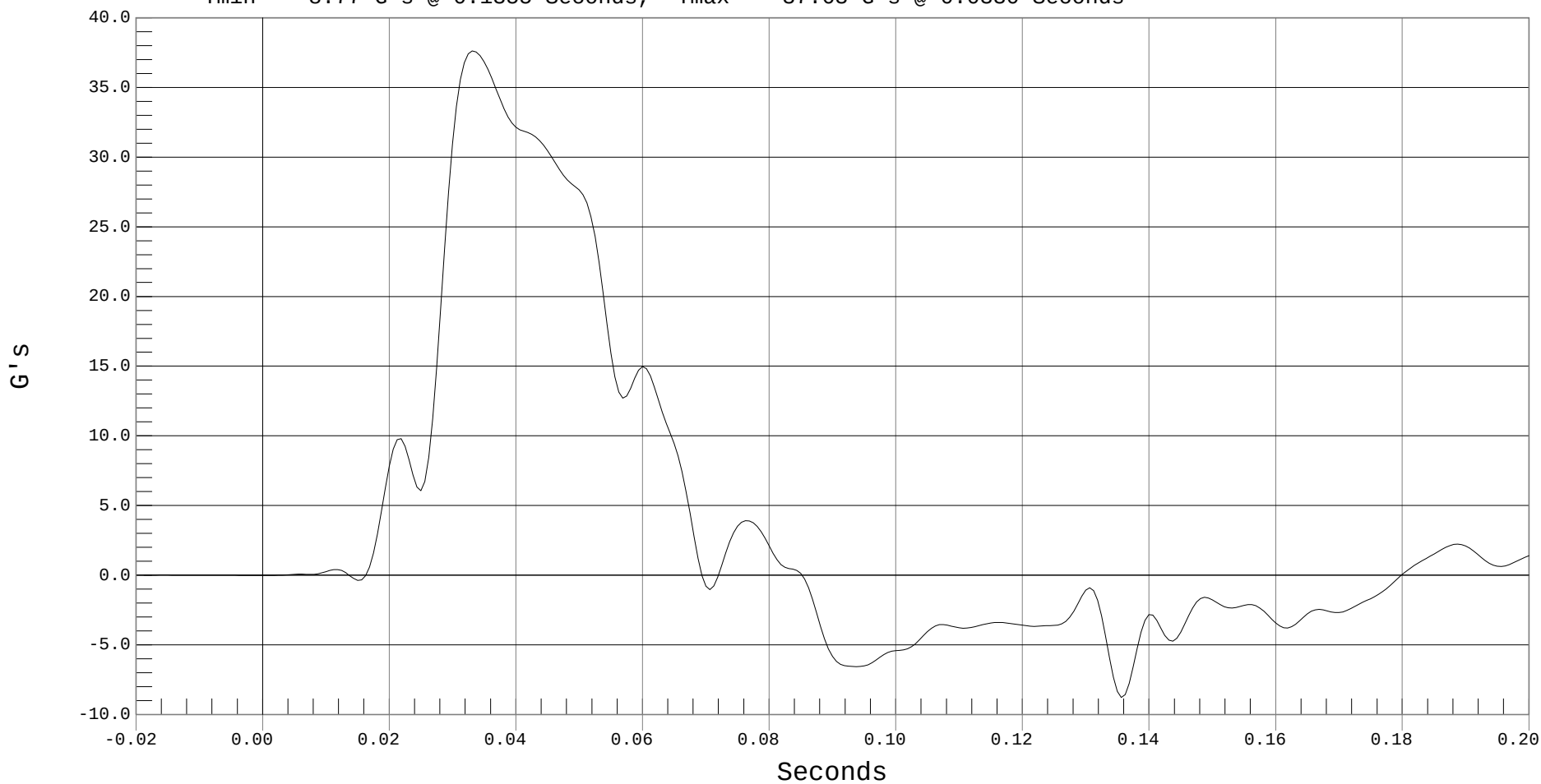
DRIVER UPPER SPINE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER UPPER SPINE Y, B01108FI.R21

Ymin = -8.77 G's @ 0.1355 Seconds, Ymax = 37.63 G's @ 0.0330 Seconds





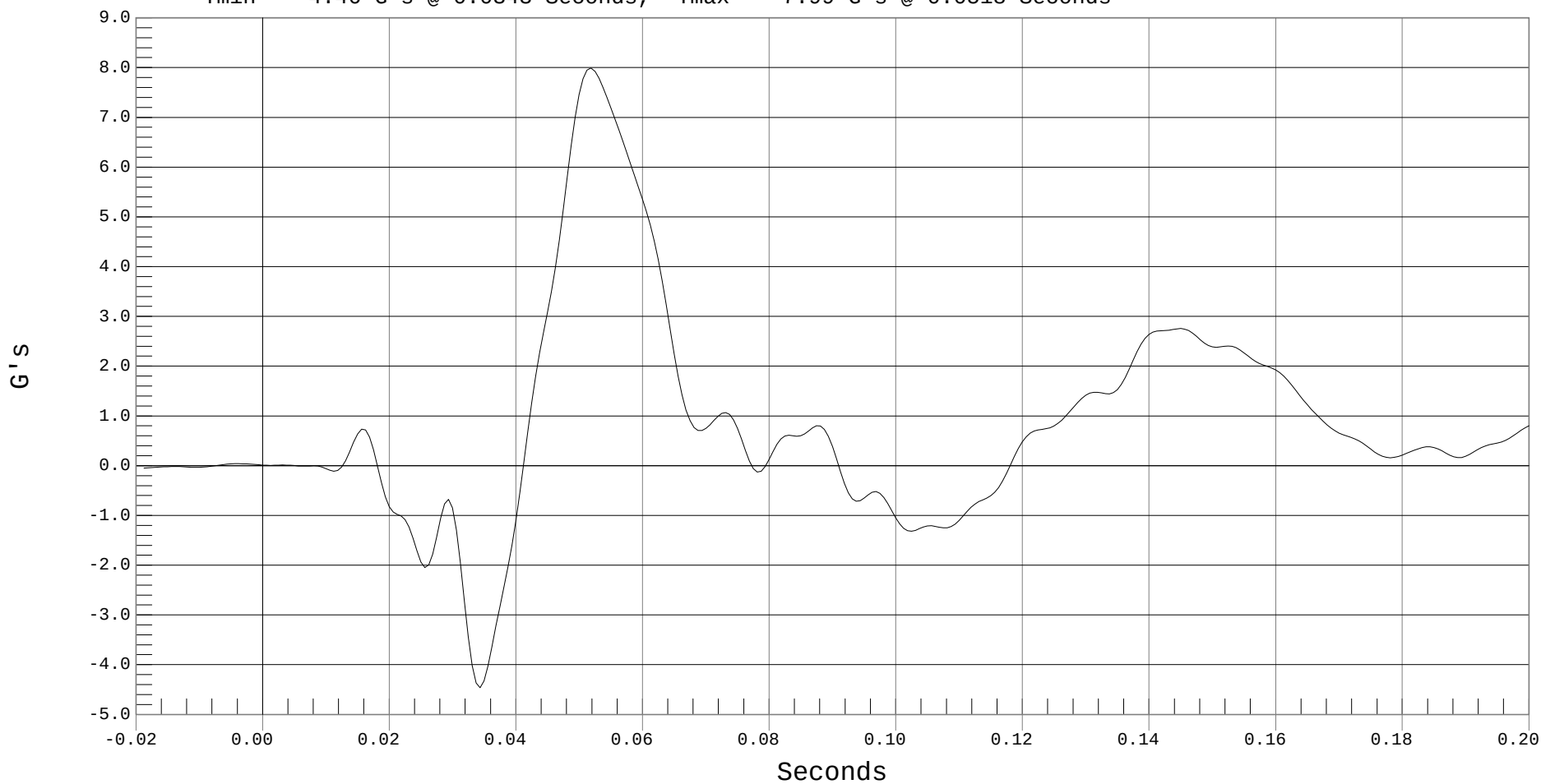
DRIVER UPPER SPINE Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER UPPER SPINE Z, B01108FI.R22

Ymin = -4.46 G's @ 0.0343 Seconds, Ymax = 7.99 G's @ 0.0518 Seconds





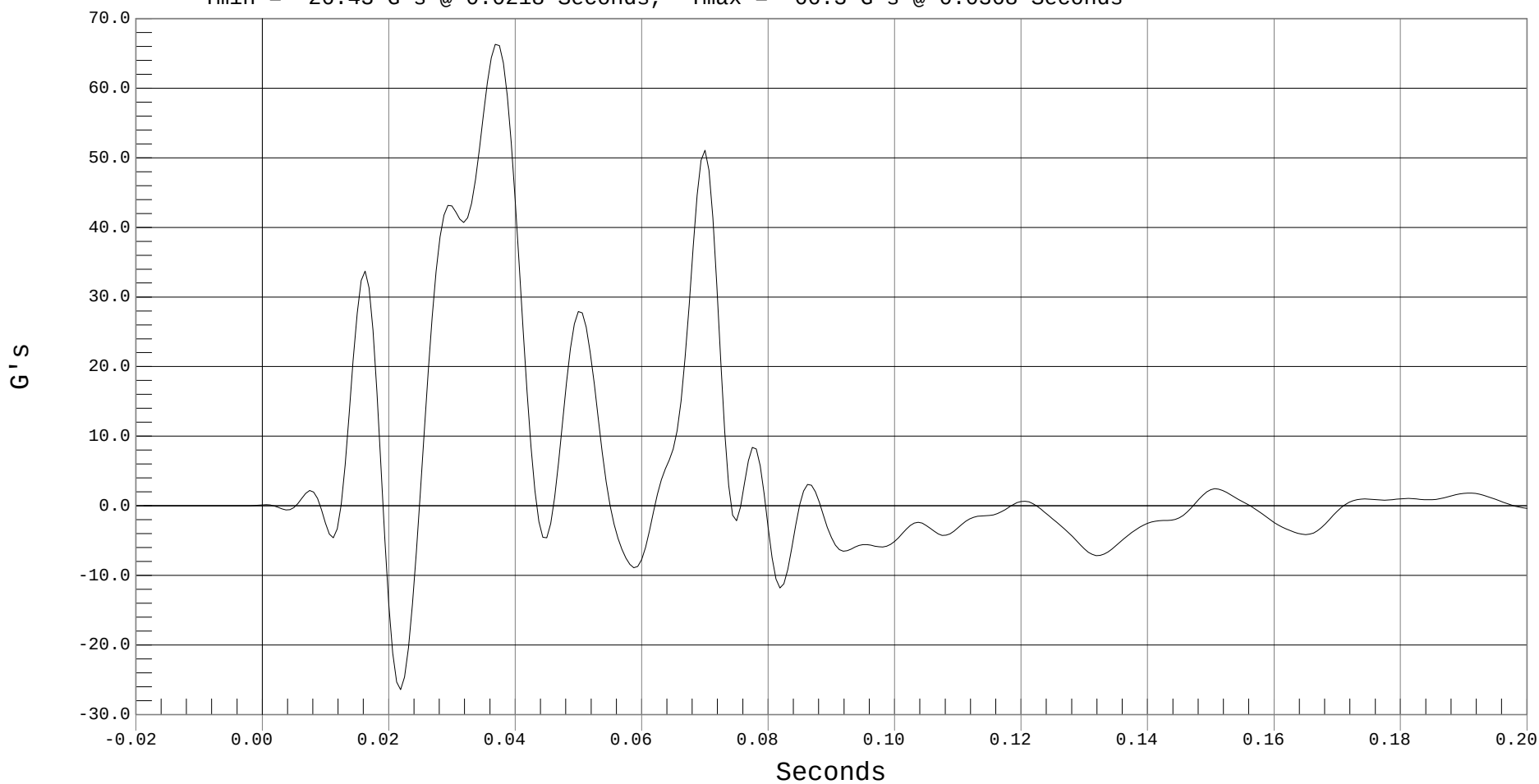
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER UPPER RIB Y, B01108FI.R23

Ymin = -26.43 G's @ 0.0218 Seconds, Ymax = 66.3 G's @ 0.0368 Seconds





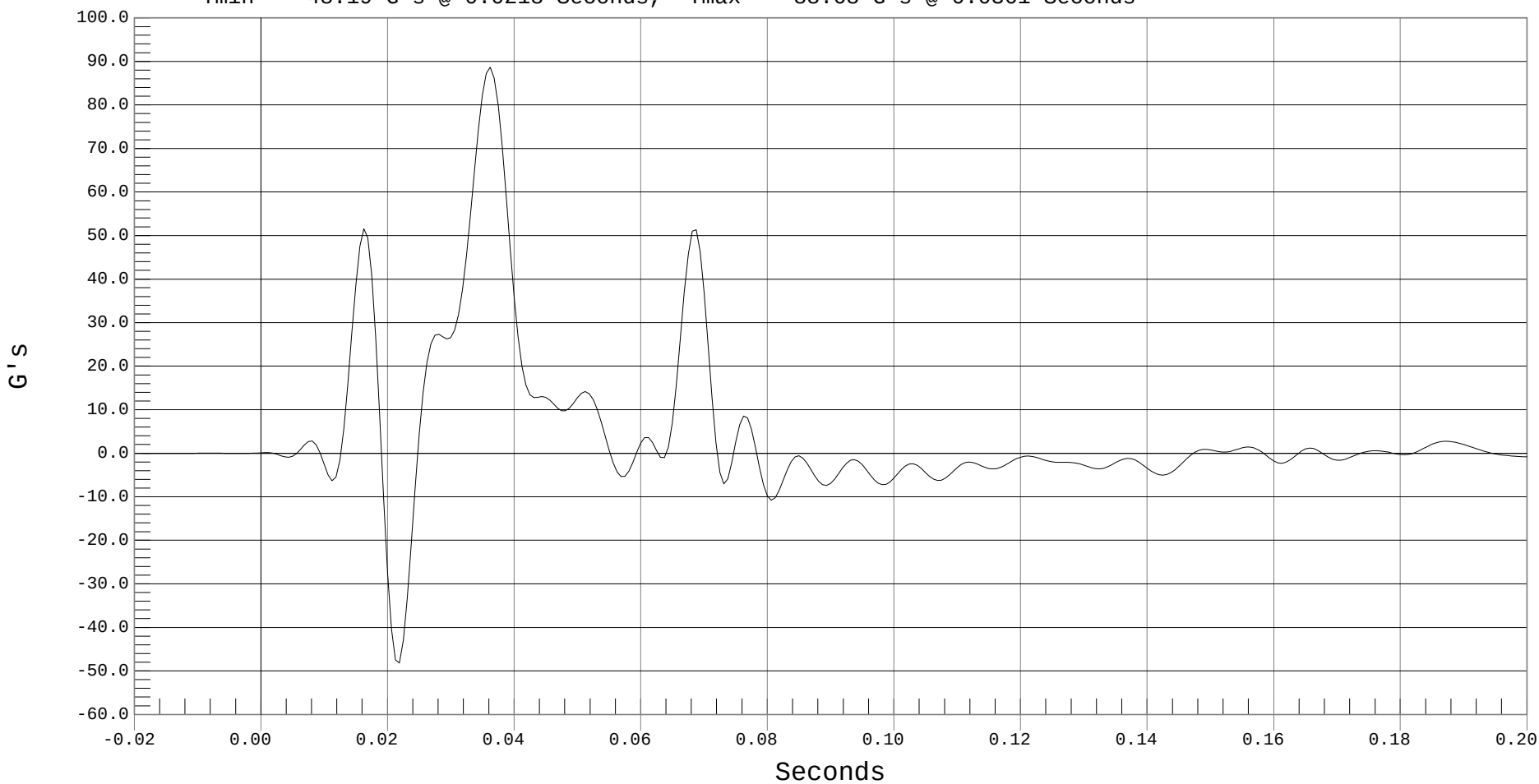
DRIVER MID RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER MID RIB Y, B01108FI.R24

Ymin = -48.19 G's @ 0.0218 Seconds, Ymax = 88.68 G's @ 0.0361 Seconds





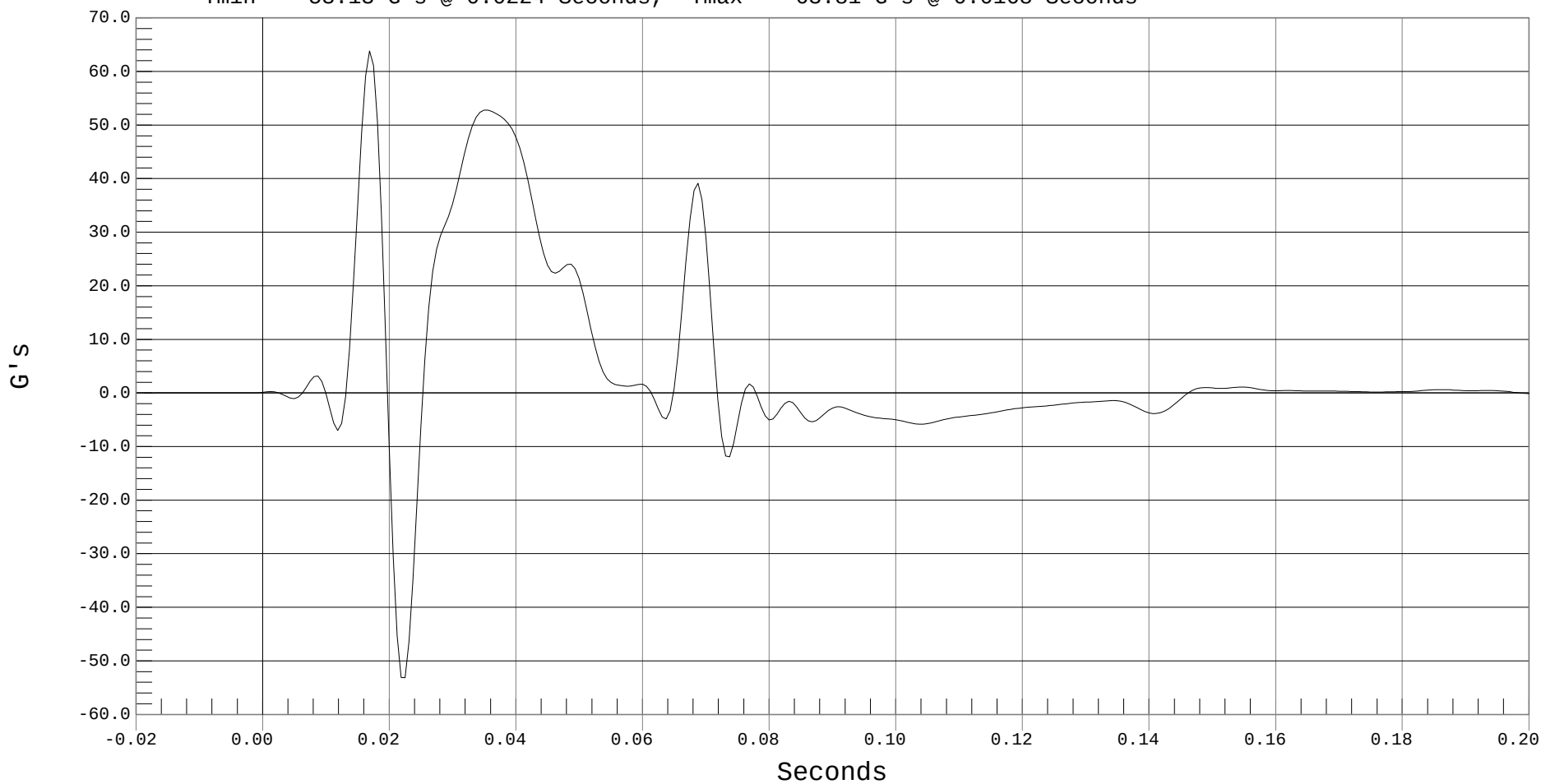
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER LOWER RIB Y, B01108FI.R25

Ymin = -53.13 G's @ 0.0224 Seconds, Ymax = 63.81 G's @ 0.0168 Seconds





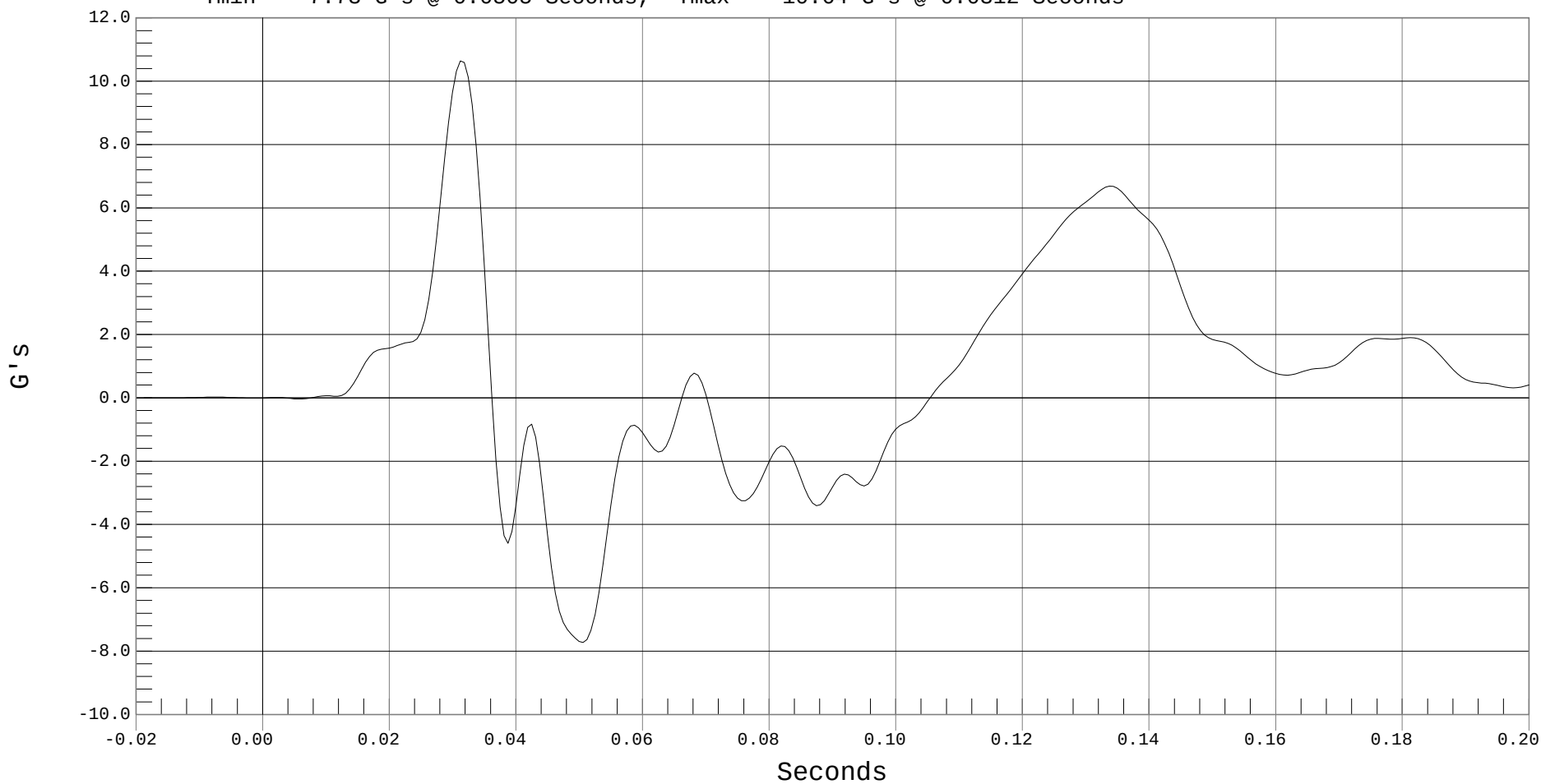
DRIVER LOWER SPINE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE X, B01108FI.R29

Ymin = -7.73 G's @ 0.0505 Seconds, Ymax = 10.64 G's @ 0.0312 Seconds





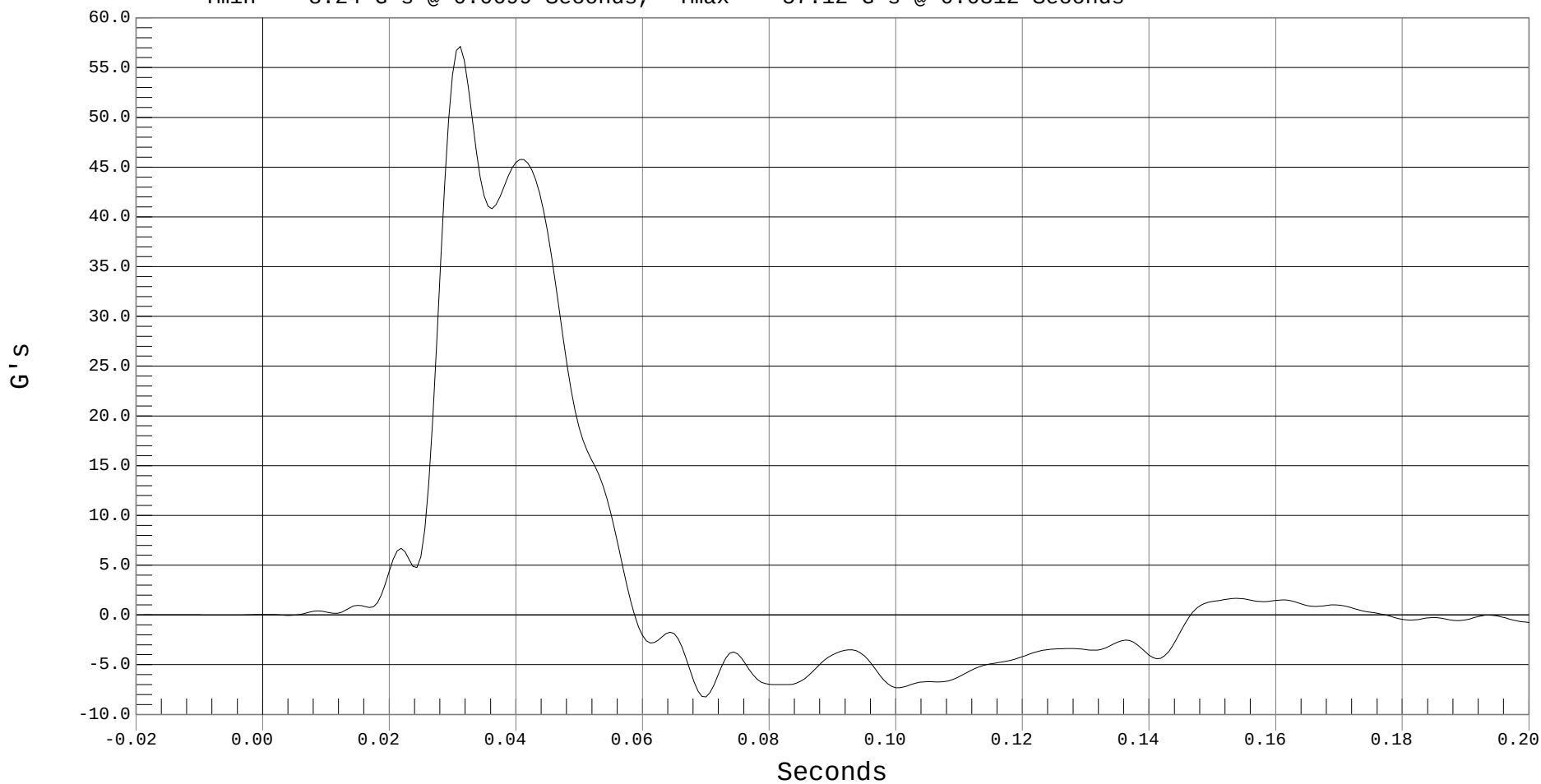
DRIVER LOWER SPINE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE Y, B01108FI.R30

Ymin = -8.24 G's @ 0.0699 Seconds, Ymax = 57.12 G's @ 0.0312 Seconds





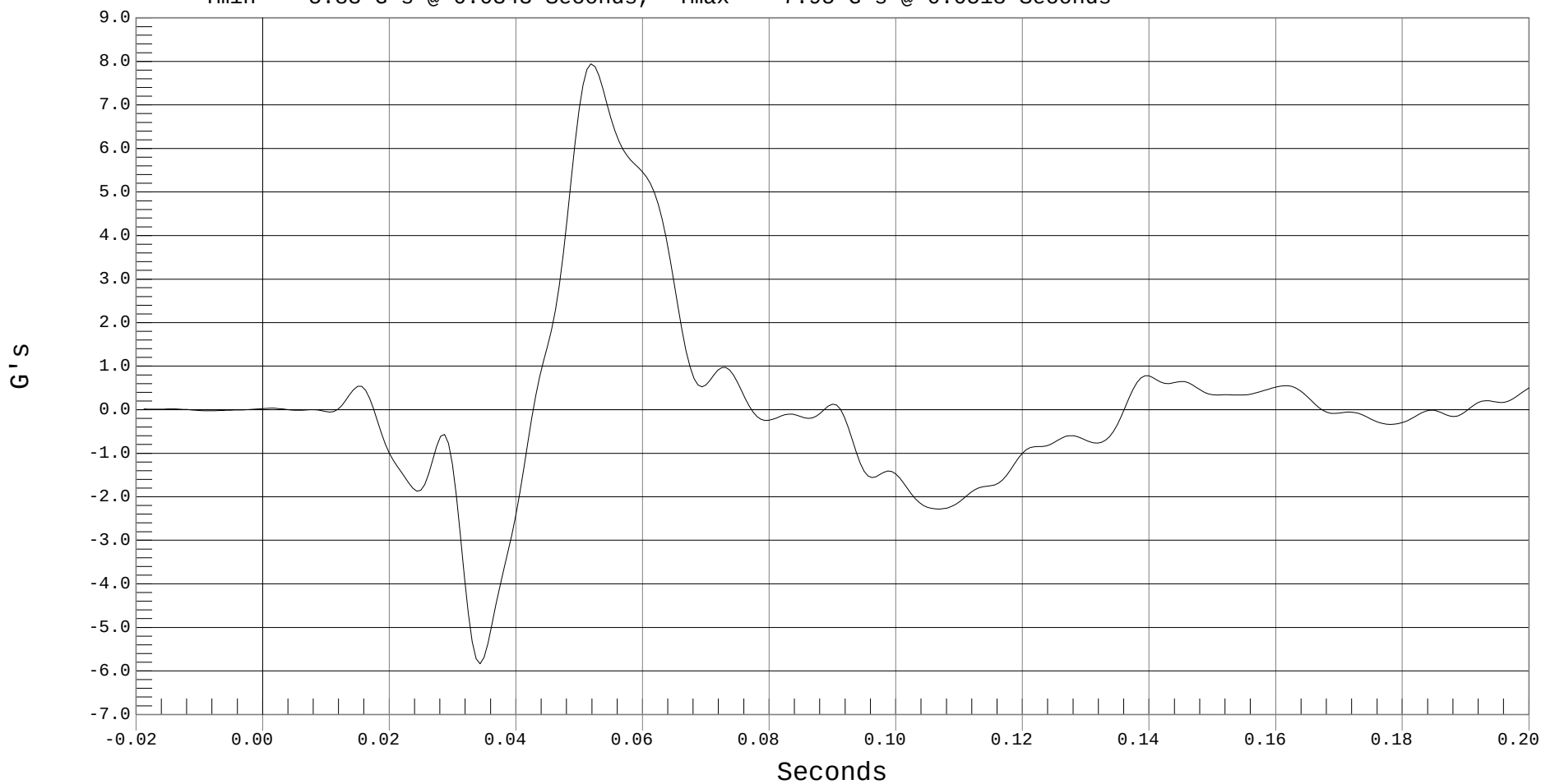
DRIVER LOWER SPINE Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE Z, B01108FI.R31

Ymin = -5.83 G's @ 0.0343 Seconds, Ymax = 7.95 G's @ 0.0518 Seconds



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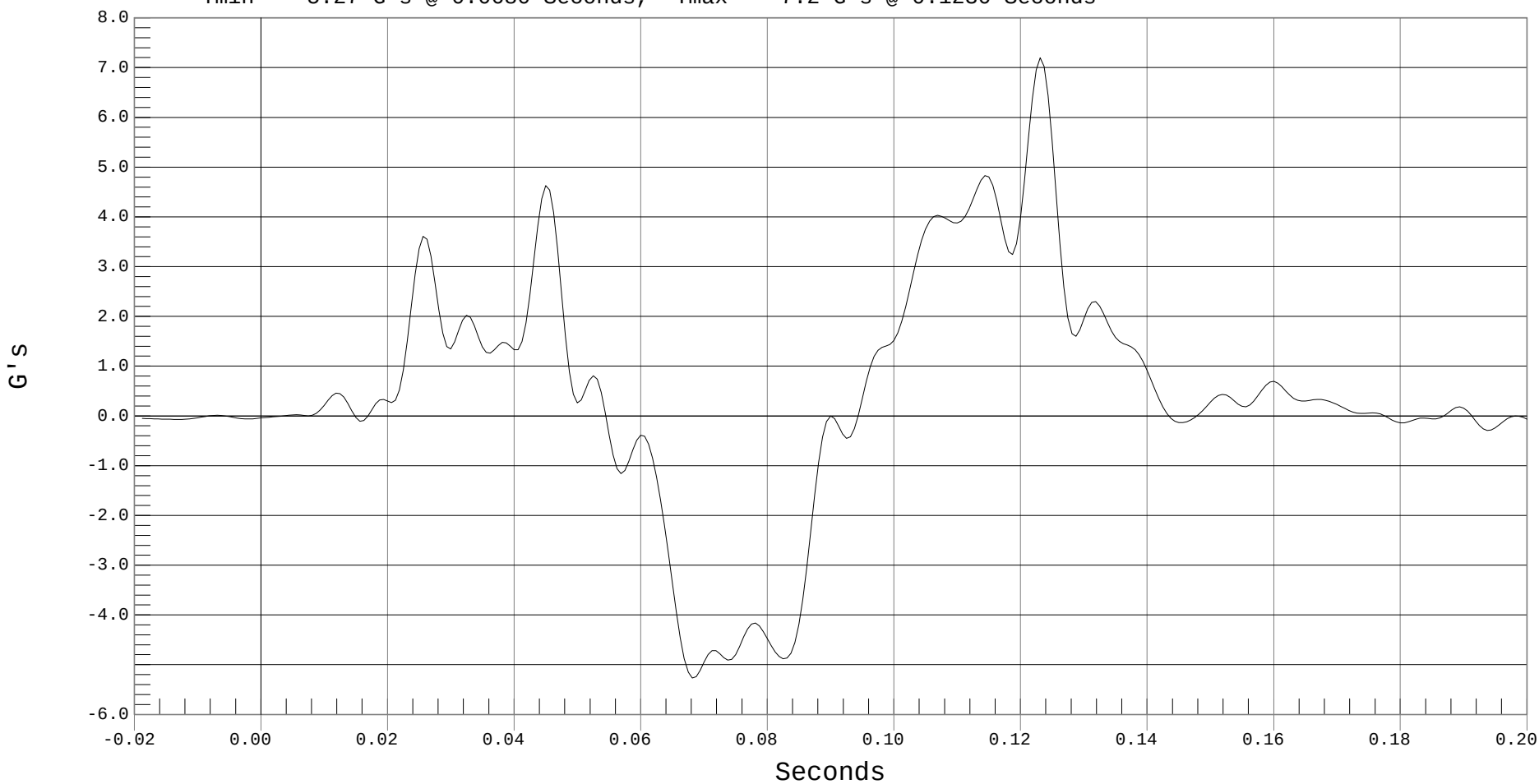
DRIVER PELVIS X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER PELVIS X, B01108FI.R45

Ymin = -5.27 G's @ 0.0680 Seconds, Ymax = 7.2 G's @ 0.1230 Seconds





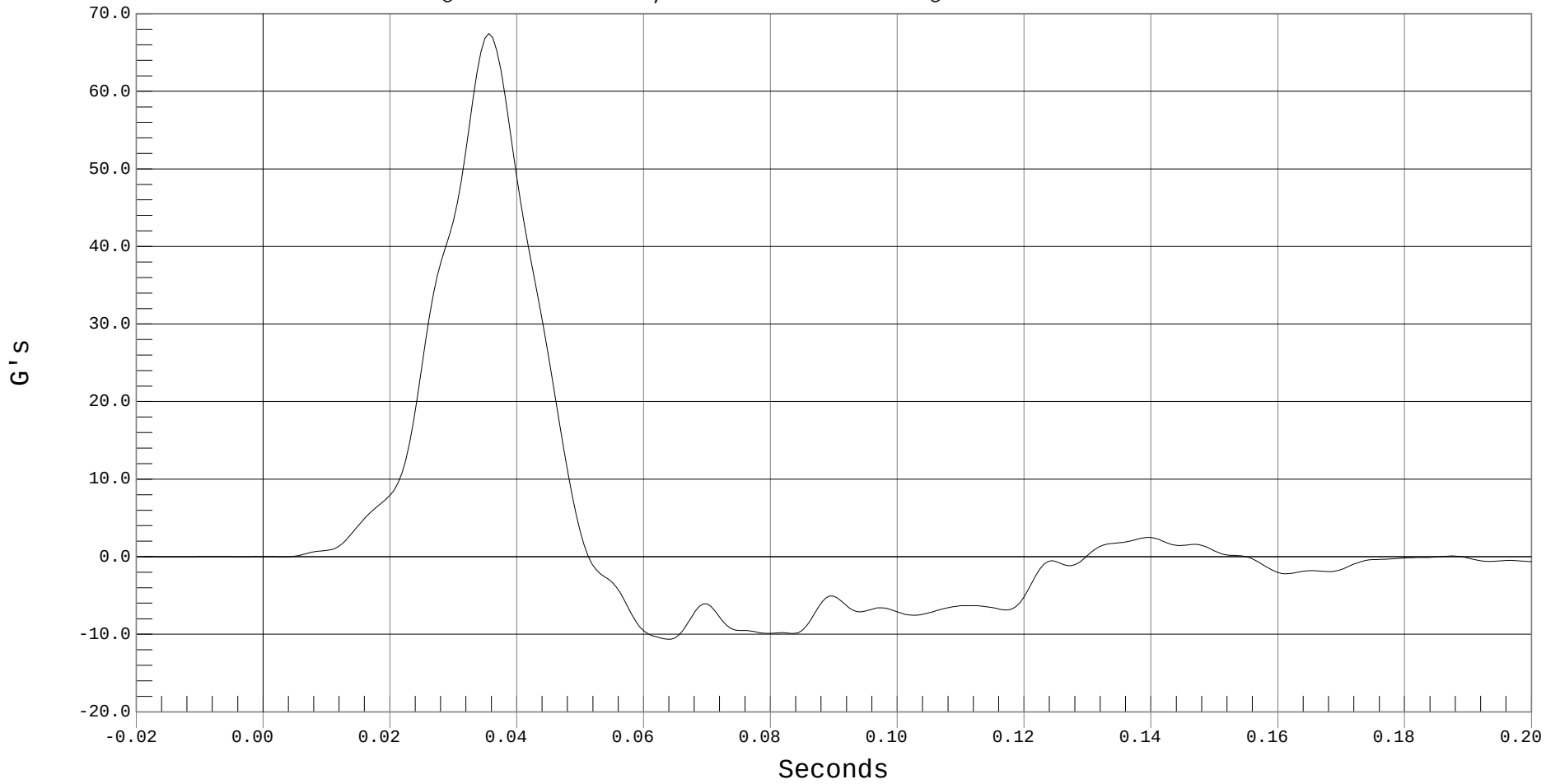
DRIVER PELVIS Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER PELVIS Y, B01108FI.R46

Ymin = -10.64 G's @ 0.0637 Seconds, Ymax = 67.45 G's @ 0.0355 Seconds





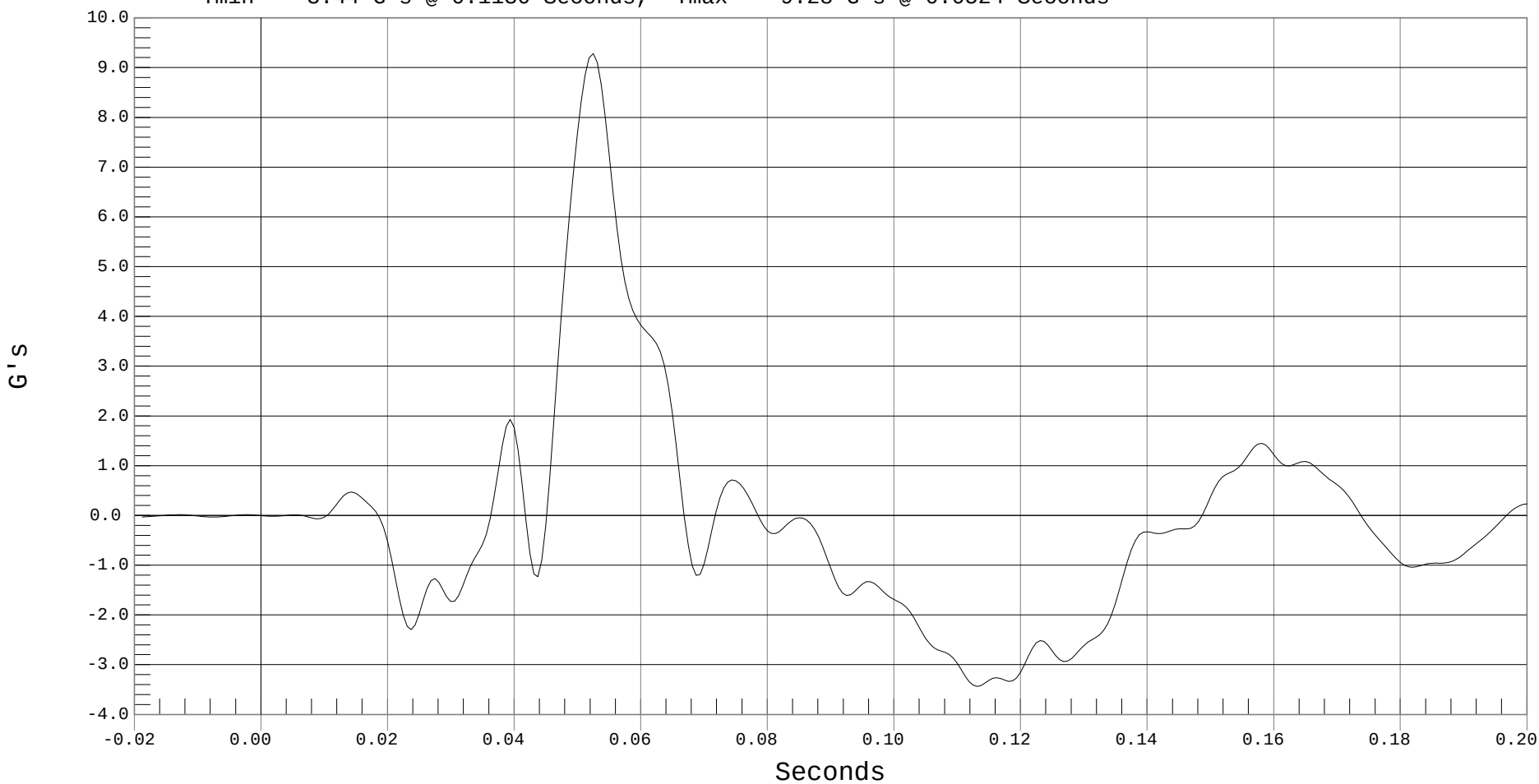
DRIVER PELVIS Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 DRIVER PELVIS Z, B01108FI.R47

Ymin = -3.44 G's @ 0.1130 Seconds, Ymax = 9.28 G's @ 0.0524 Seconds





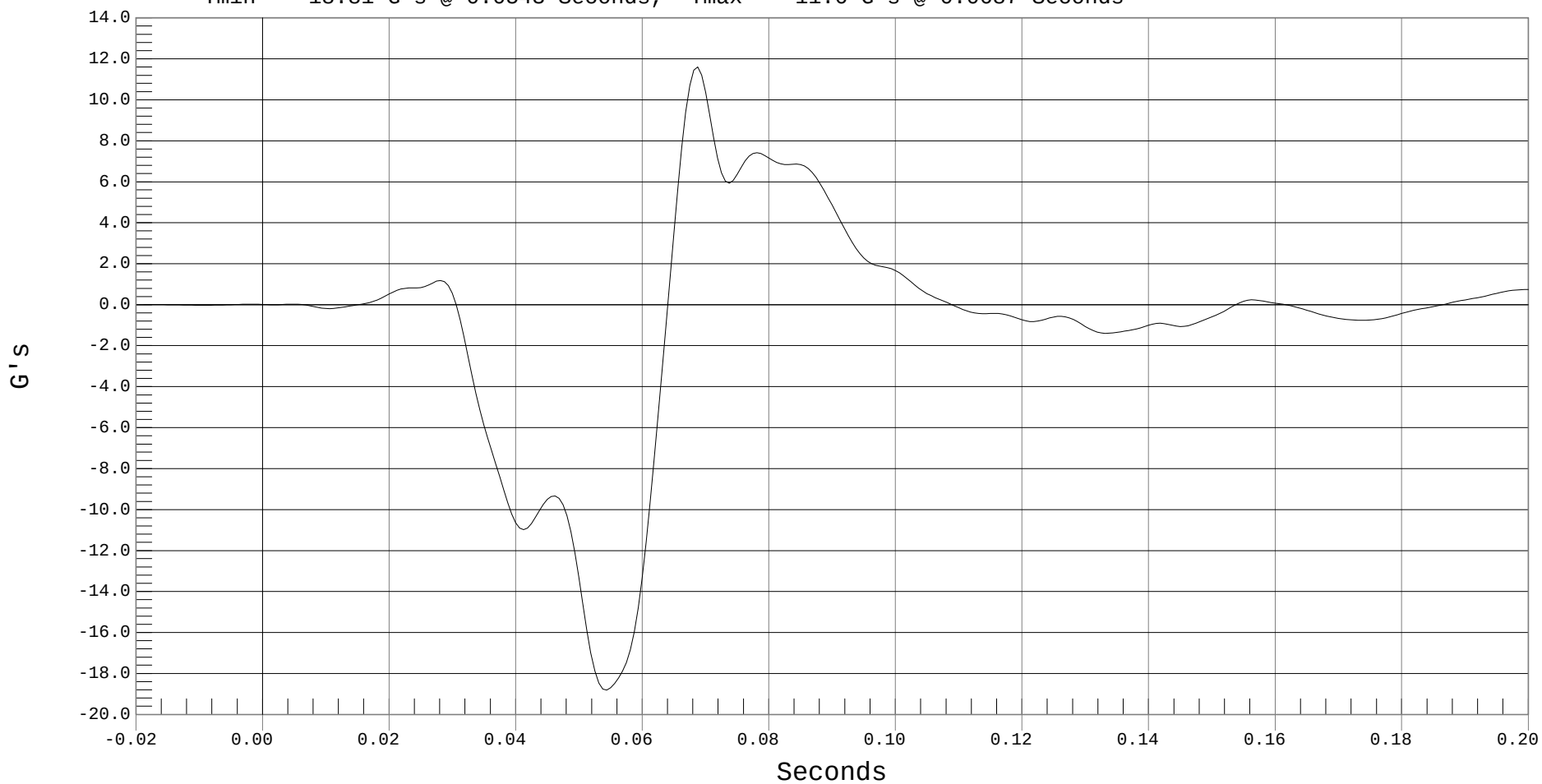
PASSENGER UPPER SPINE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER UPPER SPINE X, B01108FI.R80

Ymin = -18.81 G's @ 0.0543 Seconds, Ymax = 11.6 G's @ 0.0687 Seconds





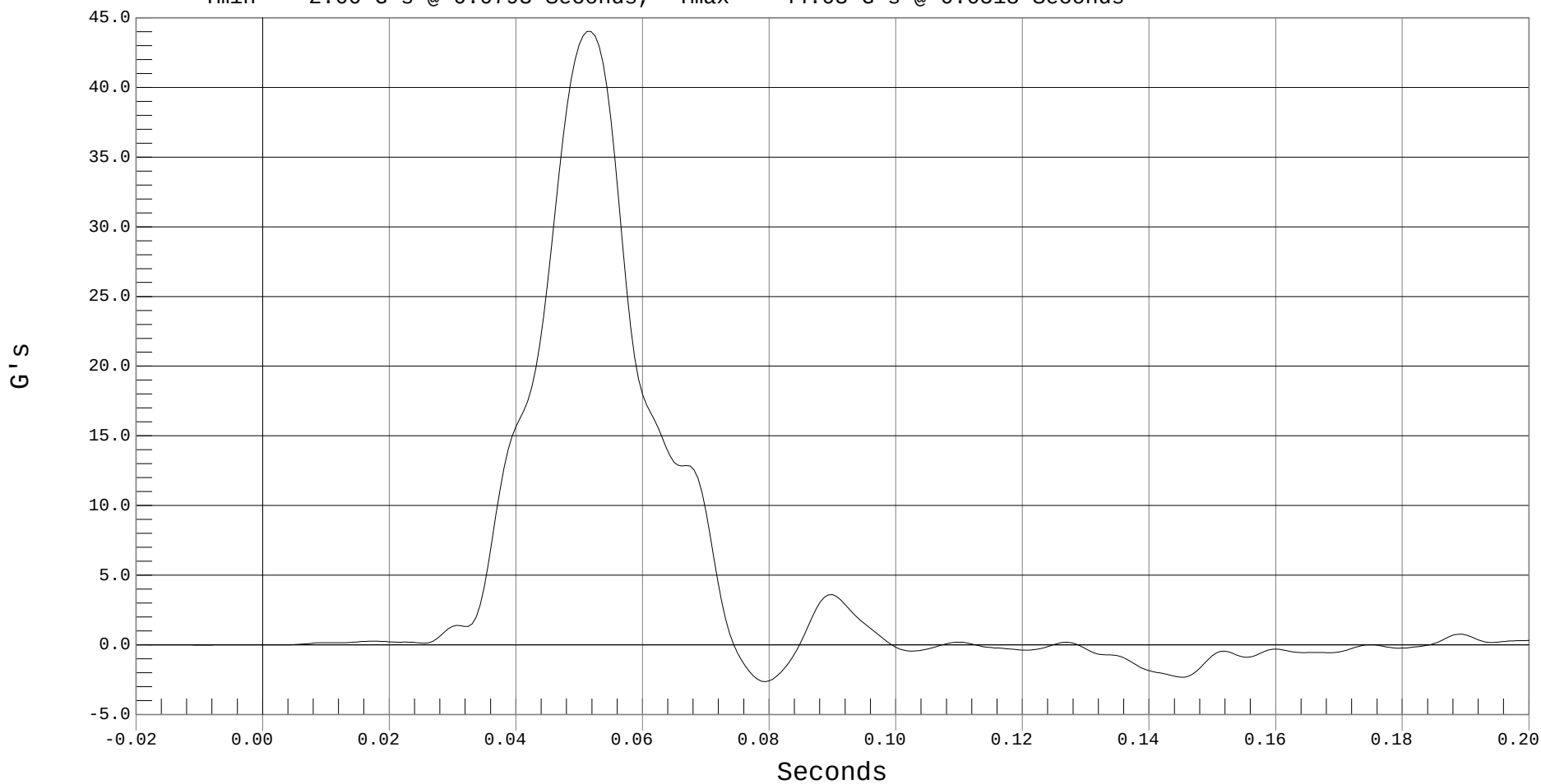
PASSENGER UPPER SPINE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER UPPER SPINE Y, B01108FI.R81

Ymin = -2.66 G's @ 0.0793 Seconds, Ymax = 44.03 G's @ 0.0518 Seconds





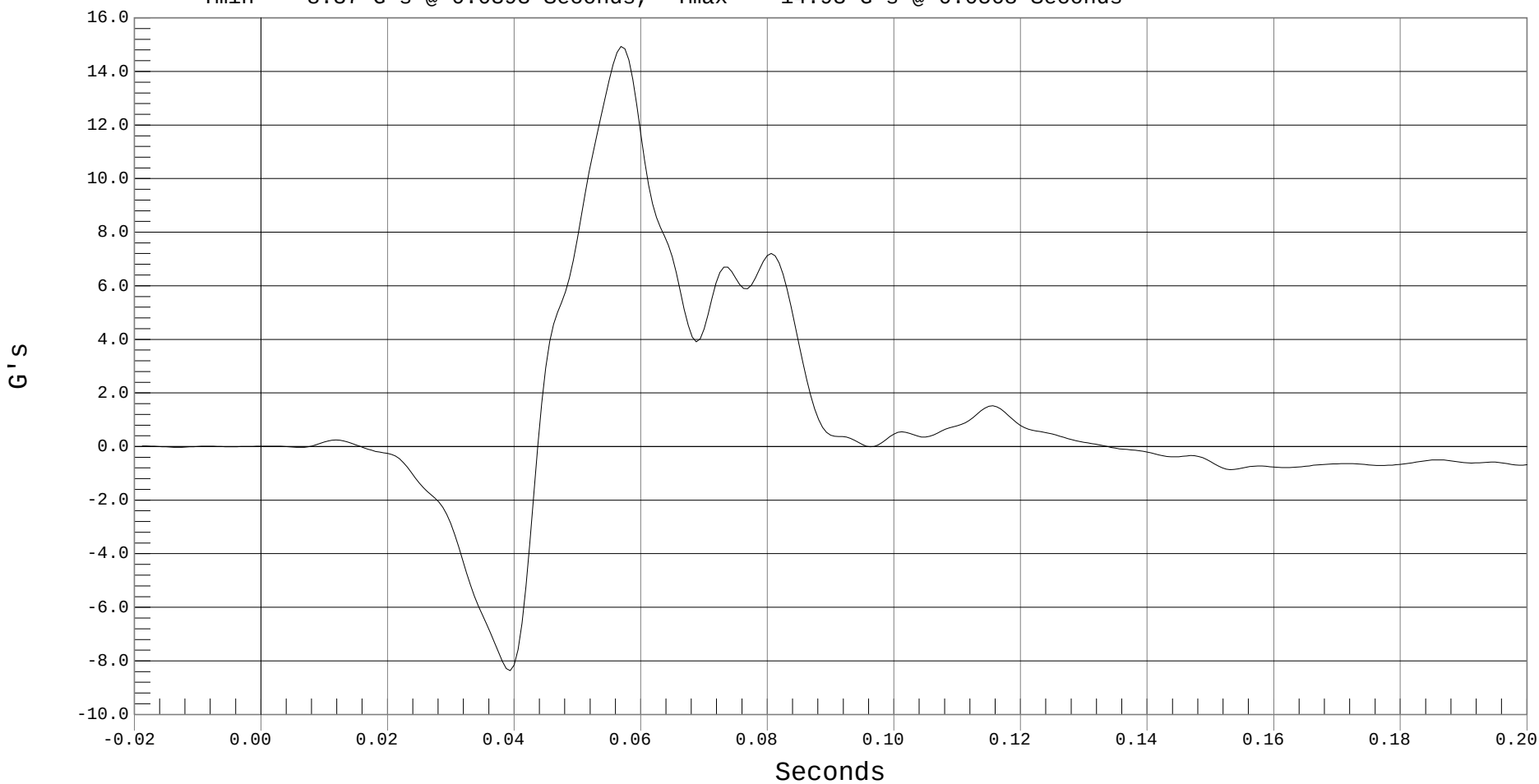
PASSENGER UPPER SPINE Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER UPPER SPINE Z, B01108FI.R82

Ymin = -8.37 G's @ 0.0393 Seconds, Ymax = 14.93 G's @ 0.0568 Seconds





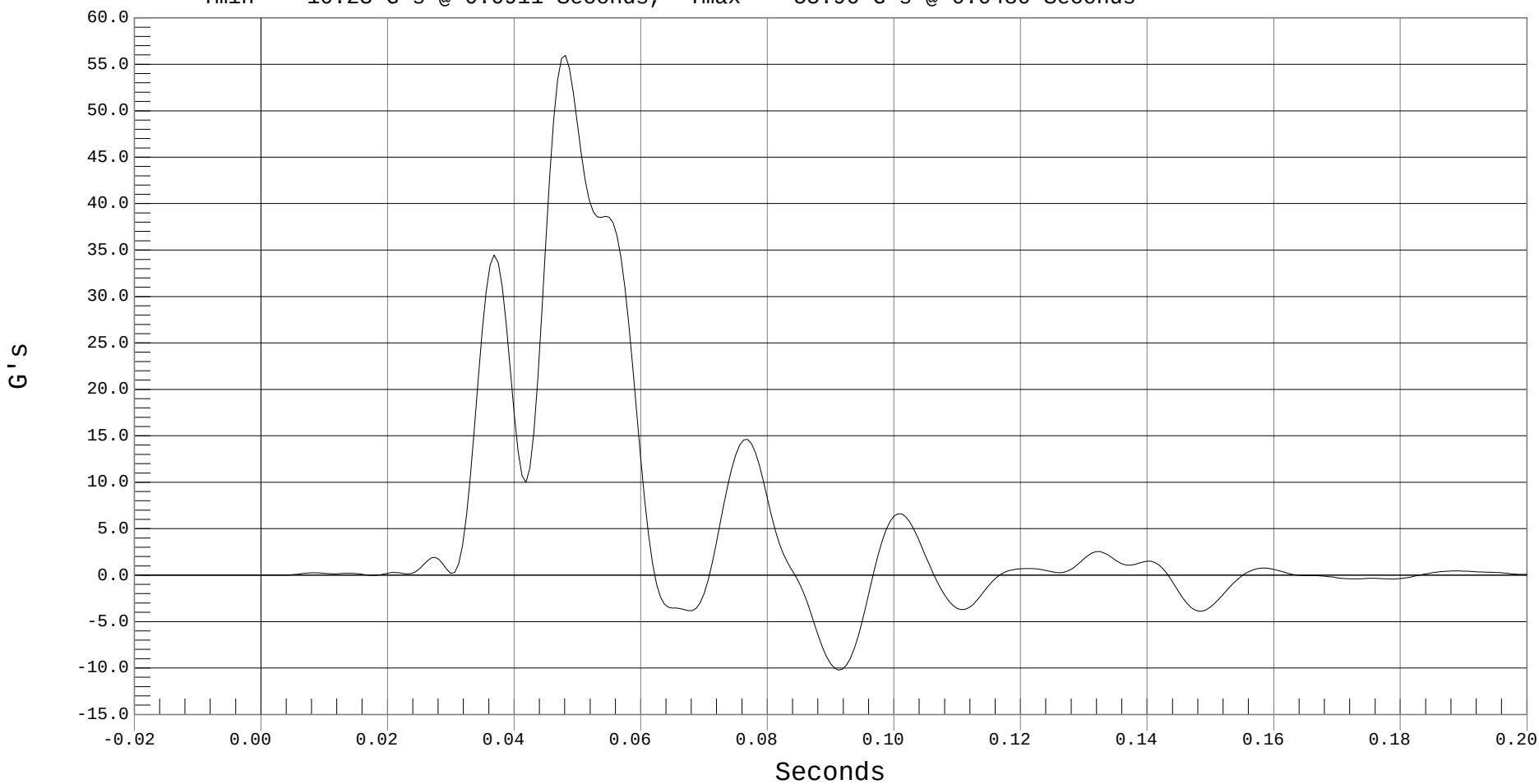
PASSENGER UPPER RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER UPPER RIB Y, B01108FI.R83

Ymin = -10.23 G's @ 0.0911 Seconds, Ymax = 55.96 G's @ 0.0480 Seconds





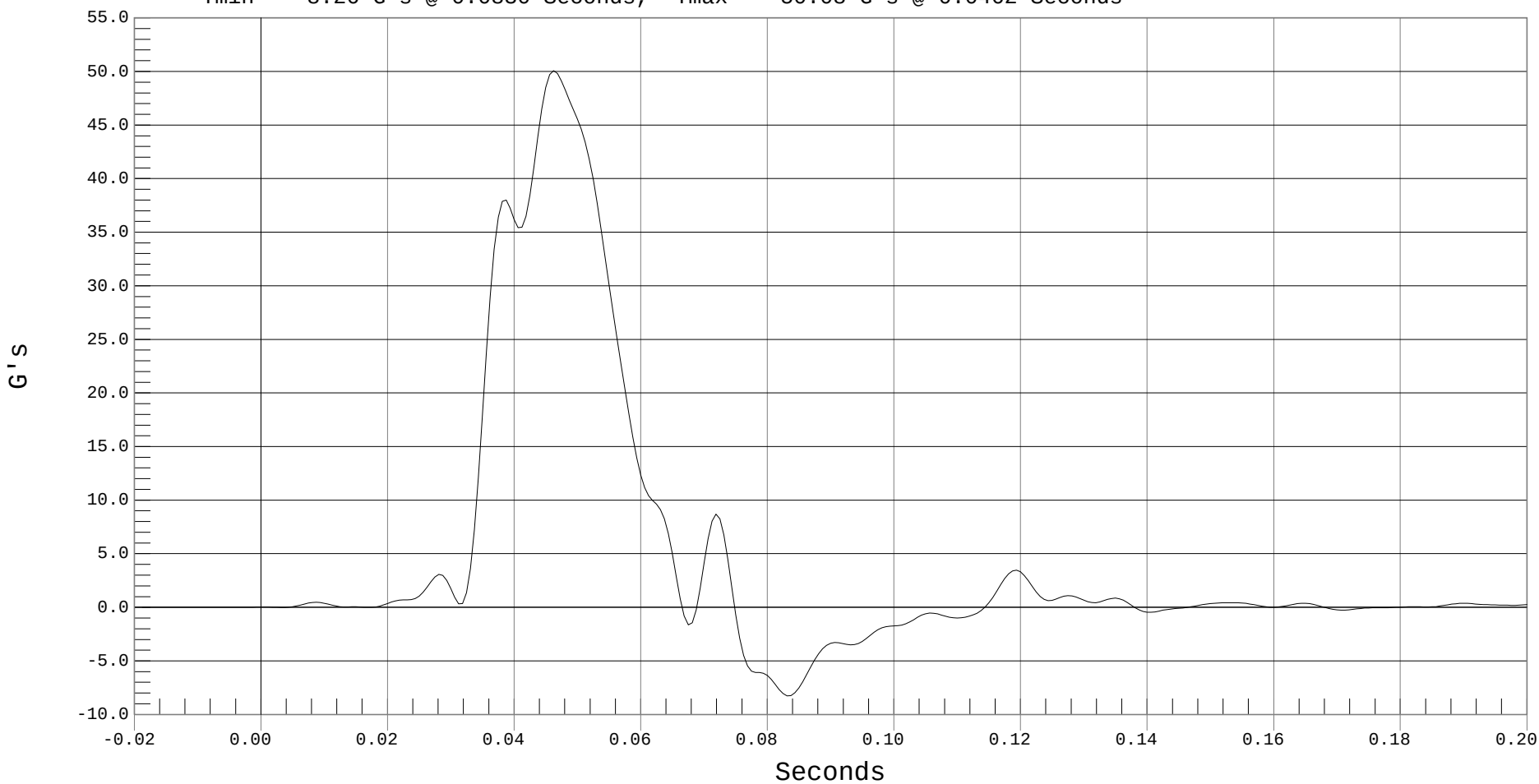
PASSENGER MID RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER MID RIB Y, B01108FI.R84

Ymin = -8.26 G's @ 0.0830 Seconds, Ymax = 50.08 G's @ 0.0462 Seconds





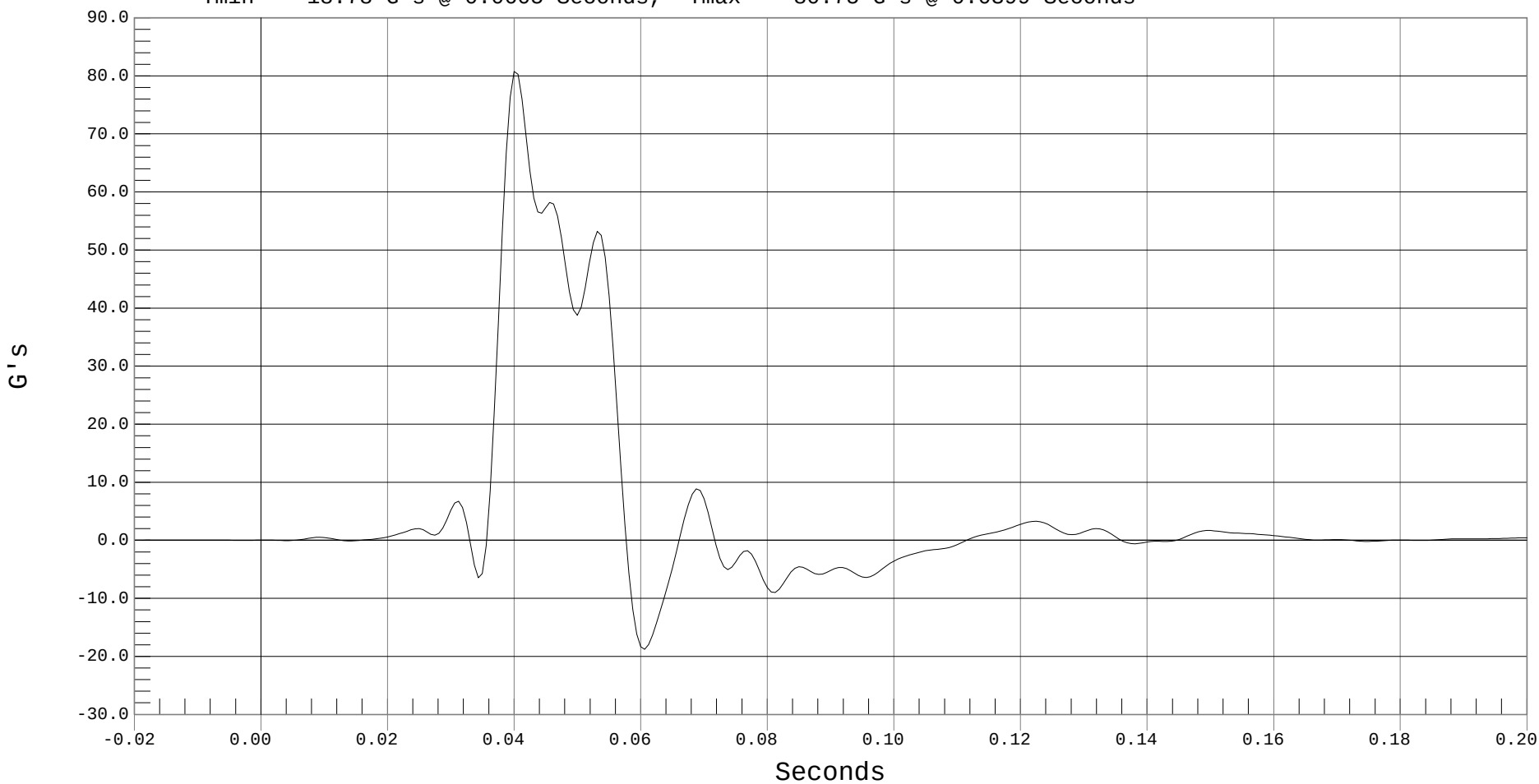
PASSENGER LOWER RIB Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER LOWER RIB Y, B01108FI.R85

Ymin = -18.78 G's @ 0.0605 Seconds, Ymax = 80.75 G's @ 0.0399 Seconds





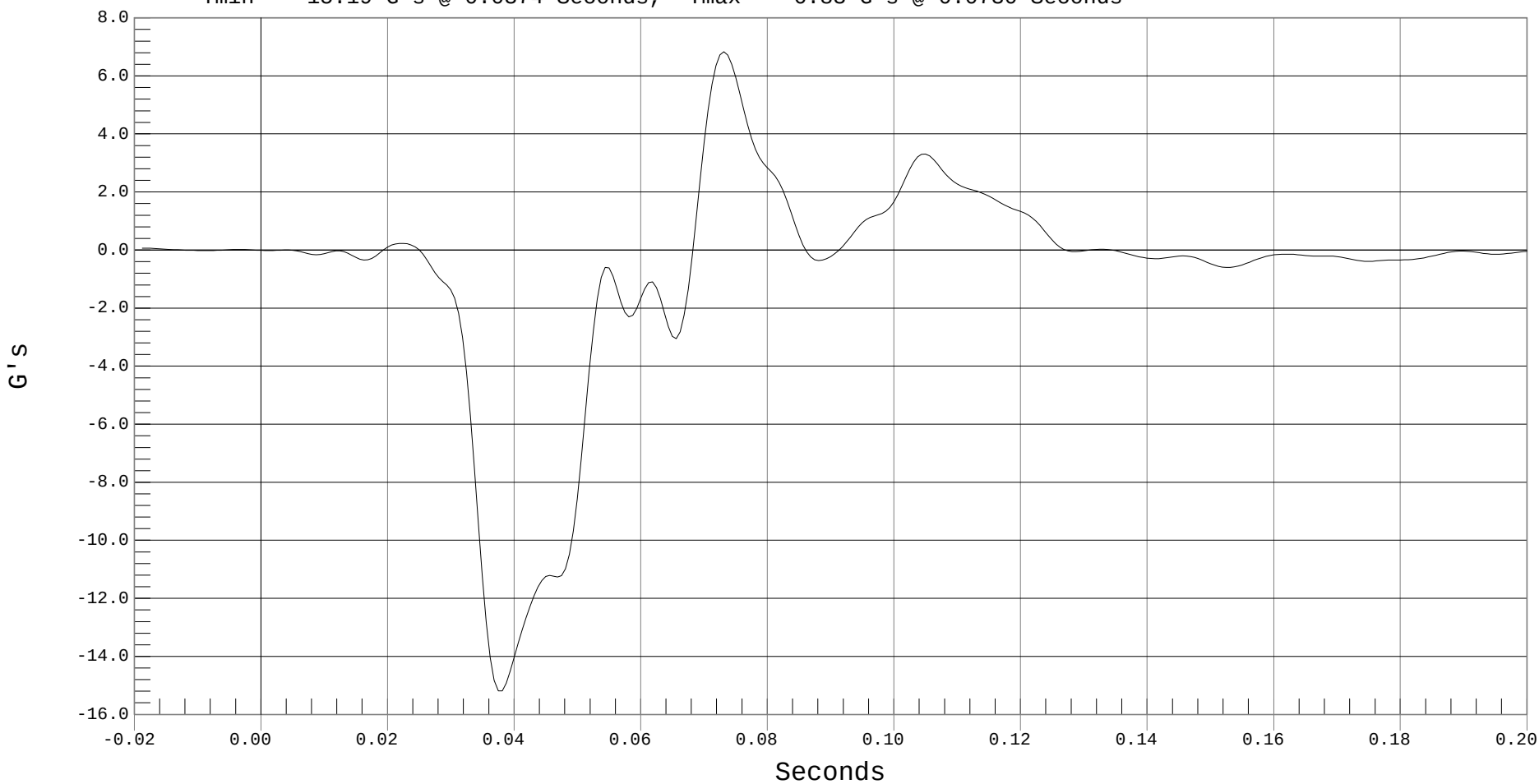
PASSENGER LOWER SPINE X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER LOWER SPINE X, B01108FI.R89

Ymin = -15.19 G's @ 0.0374 Seconds, Ymax = 6.83 G's @ 0.0730 Seconds





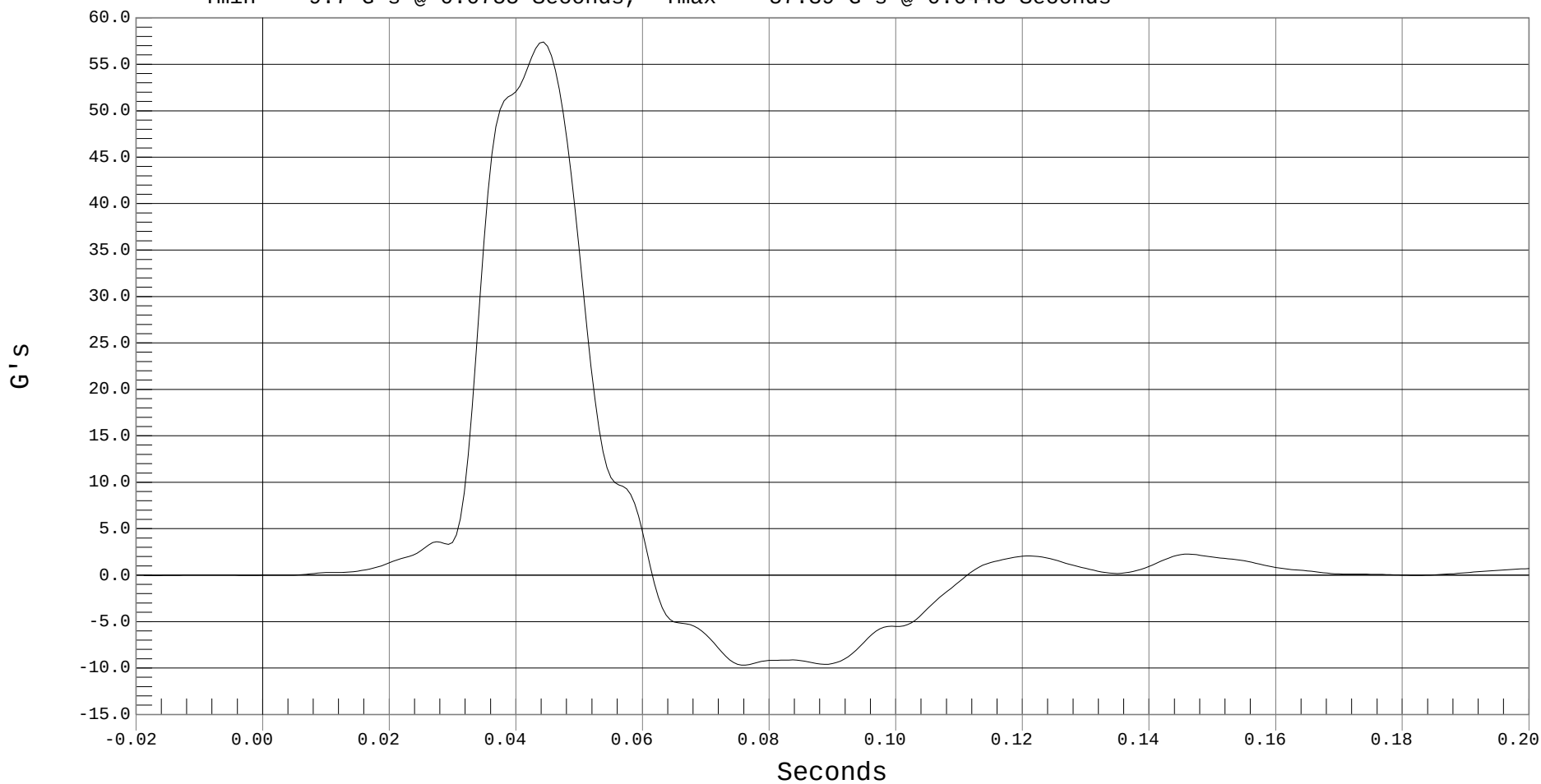
PASSENGER LOWER SPINE Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER LOWER SPINE Y, B01108FI.R90

Ymin = -9.7 G's @ 0.0755 Seconds, Ymax = 57.39 G's @ 0.0443 Seconds





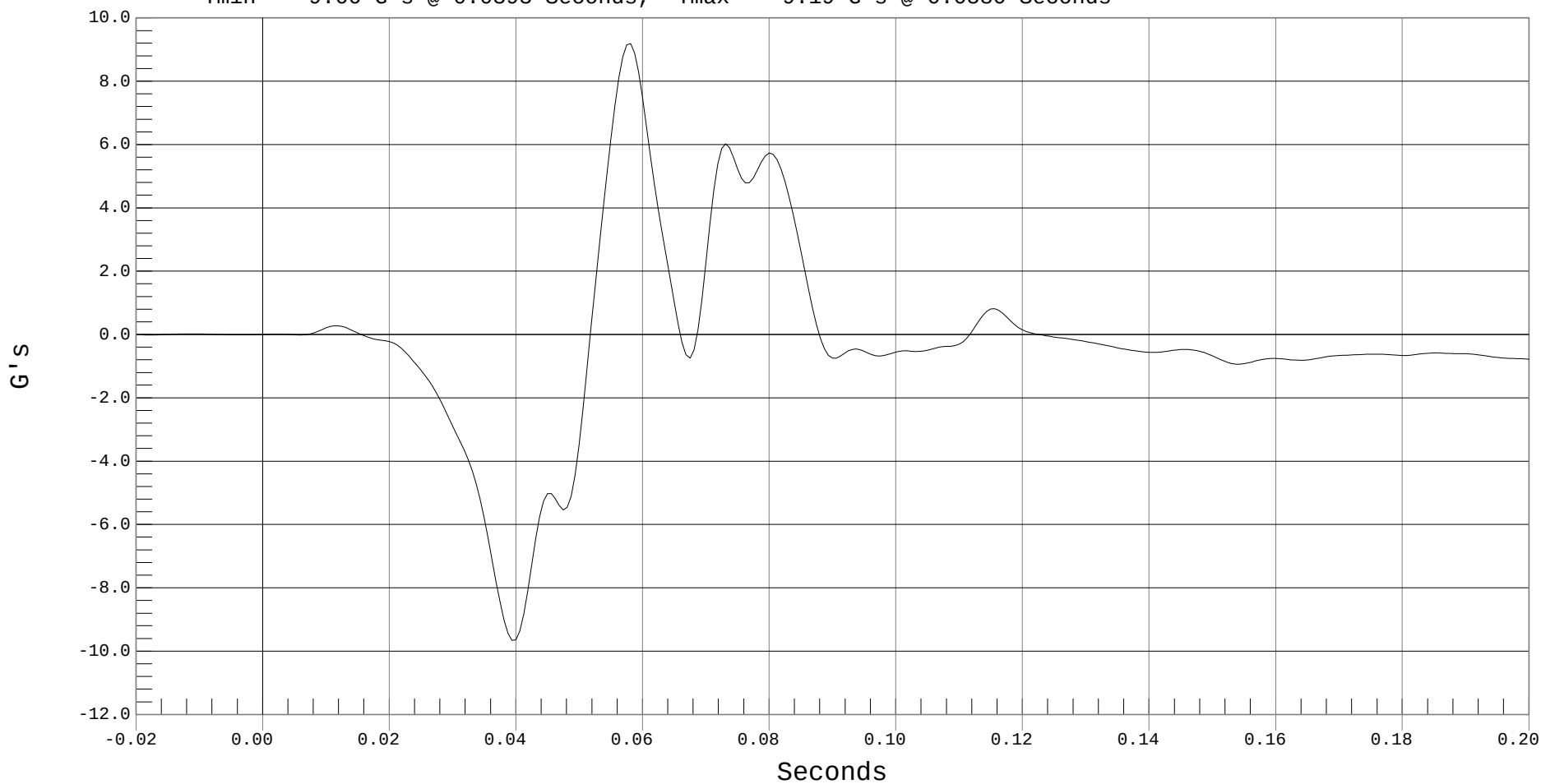
PASSENGER LOWER SPINE Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER LOWER SPINE Z, B01108FI.R91

Ymin = -9.66 G's @ 0.0393 Seconds, Ymax = 9.19 G's @ 0.0580 Seconds





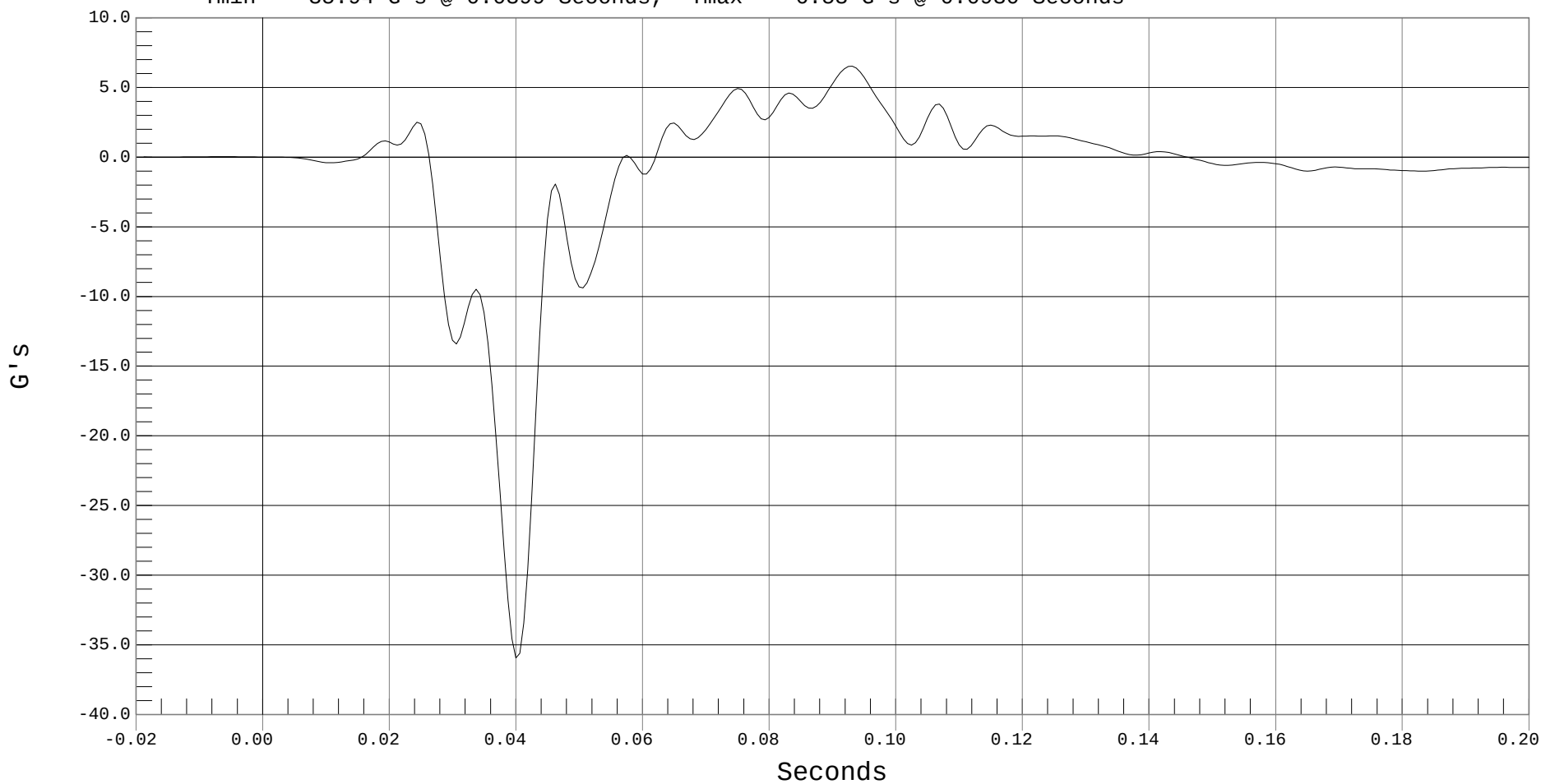
PASSENGER PELVIS X ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER PELVIS X, B01108FI.R10

Ymin = -35.94 G's @ 0.0399 Seconds, Ymax = 6.53 G's @ 0.0930 Seconds





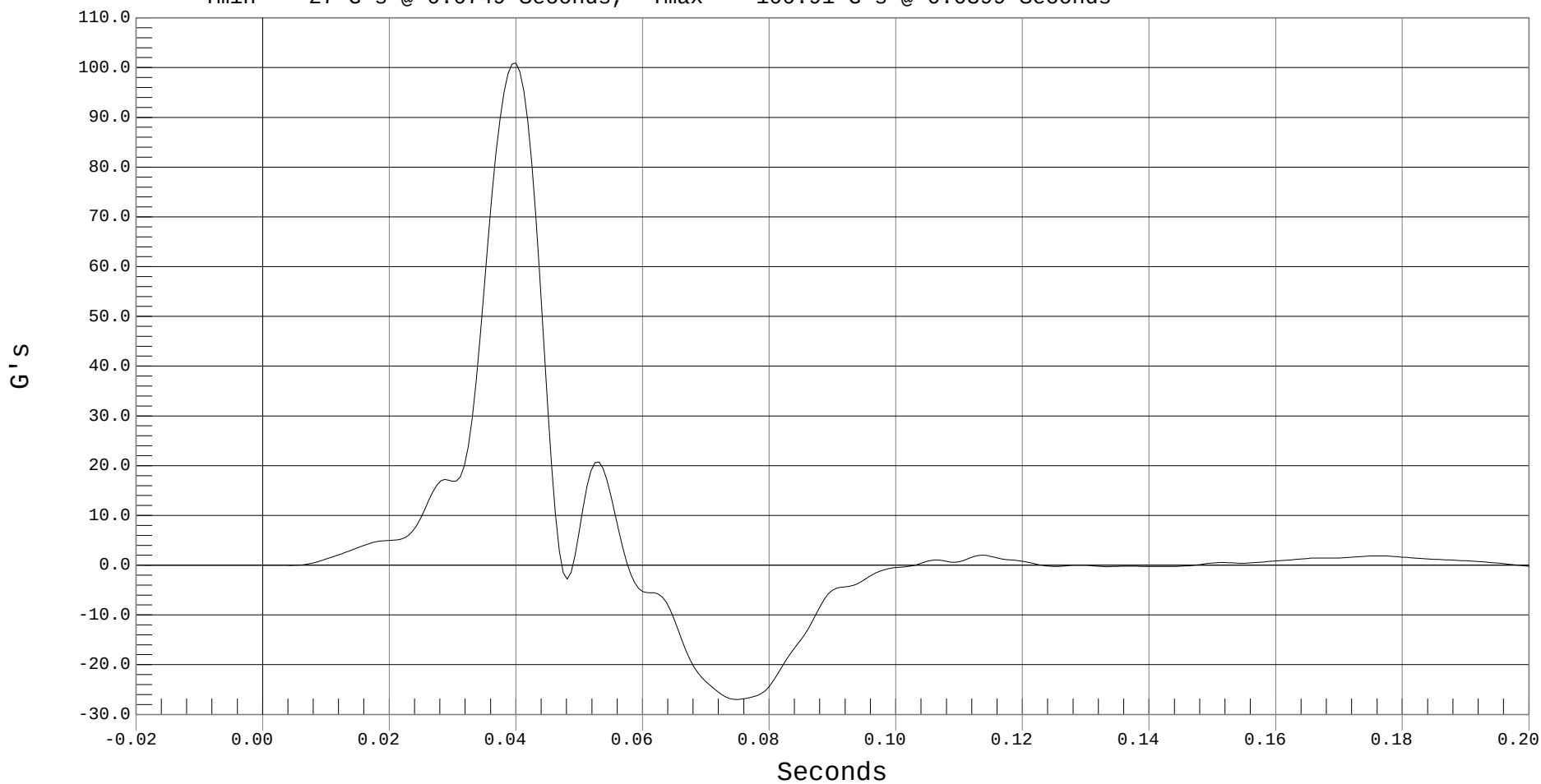
PASSENGER PELVIS Y ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER PELVIS Y, B01108FI.R11

Ymin = -27 G's @ 0.0749 Seconds, Ymax = 100.91 G's @ 0.0399 Seconds





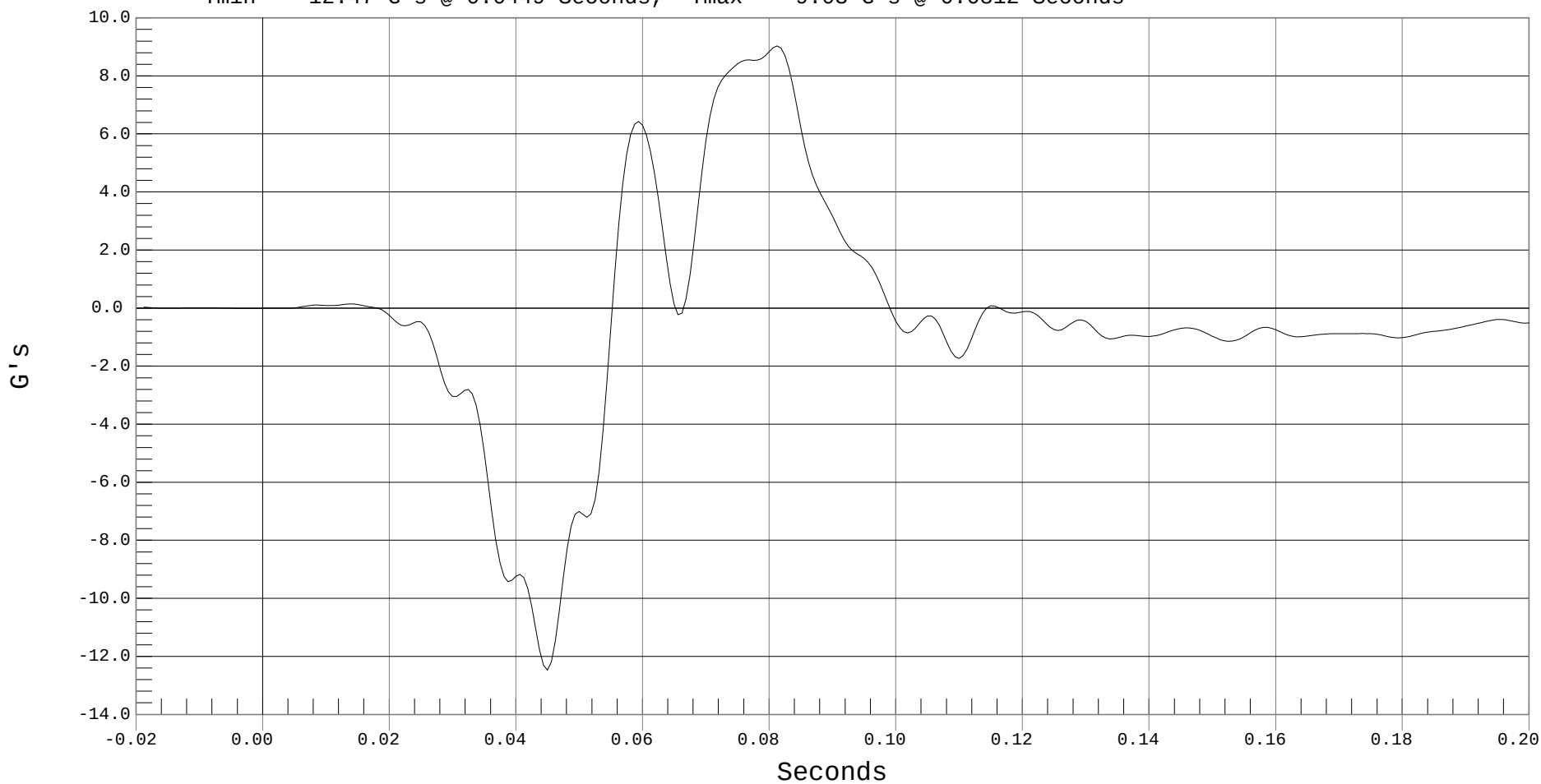
PASSENGER PELVIS Z ACCELERATION

Test Desc.: NCAP LEFT SIDE IMPACT
Component: 2002 CHEVROLET IMPALA
Other Info:

Test Date: 10-19-01
Speed: 38.3 MPH, 61.6 KPH
Fir Filtered

— 1 REAR PASSENGER PELVIS Z, B01108FI.R12

Ymin = -12.47 G's @ 0.0449 Seconds, Ymax = 9.03 G's @ 0.0812 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: 10/15/01

Dummy Serial Number: 009

Test Number: D011481

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.5
Relative Humidity (%)	10 – 70	36
Peak Resultant Acceleration	100 – 150 g's	143
Time of Max. Res. Acceleration		22.6 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



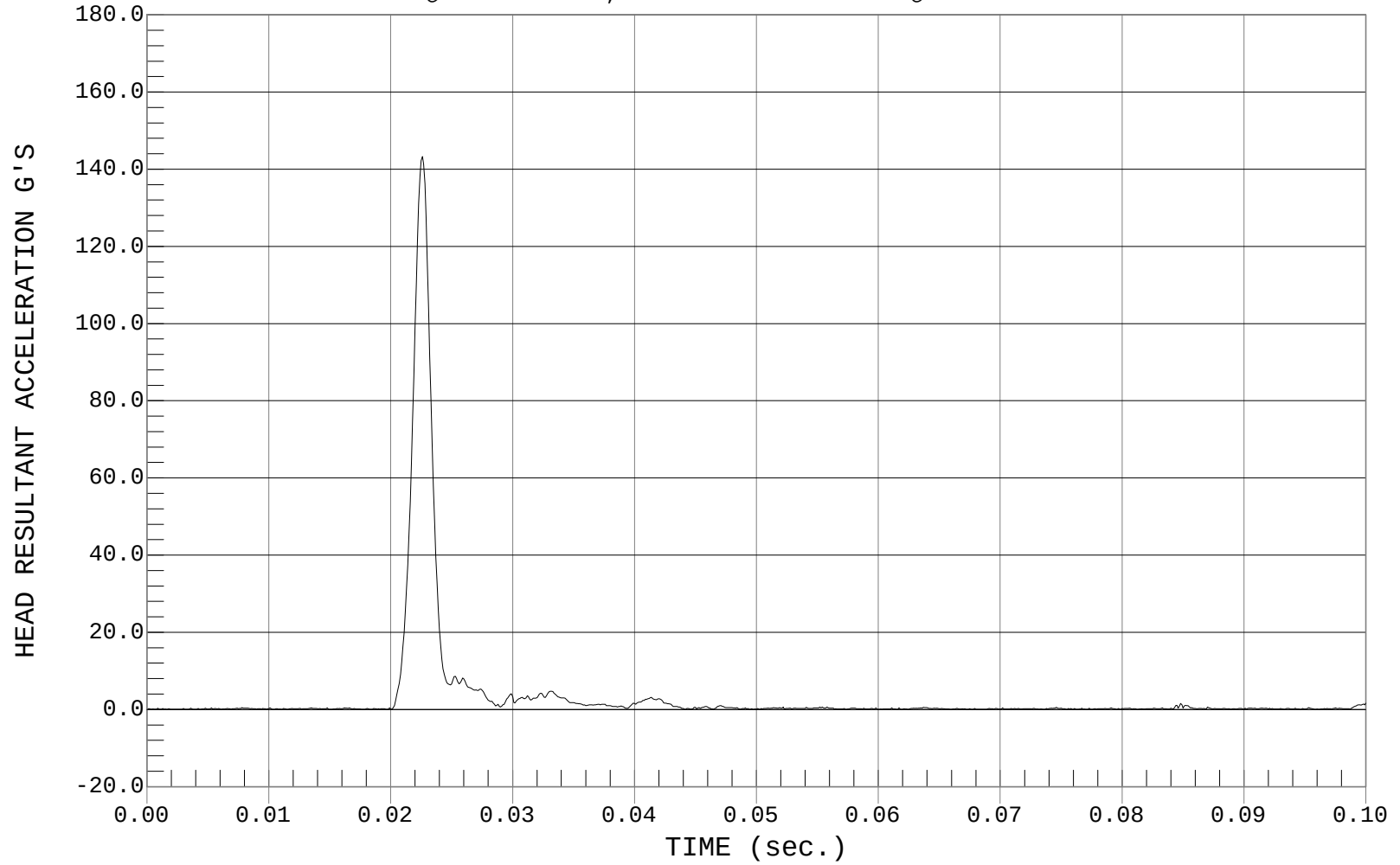
PEAK RESULTANT ACCELERATION

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

Test Date: 10-15-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01481AV.A01

Ymin = .1 G'S @ 0.0014 sec., Ymax = 143.29 G'S @ 0.0226 sec.



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
EUROSID 2 DUMMY

Date: 10/15/01

Dummy Serial Number: 009

Test Number: D011482

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.5
Relative Humidity (%)		10 – 70	36
Pendulum Speed		3.3 - 3.5	3.4
Pendulum Deceleration	3 msec	ˆ.25 - ˆ.53 m/sec	-.33
	8 msec	ˆ1.59 - ˆ2.04 m/sec	-1.70
	14 msec	ˆ3.20 - ˆ3.85 m/sec	-3.34
Maximum Flexion Angle		49.0 – 59.0 deg	57.3
Time of Max. Flexion Angle		54.0 – 66.0 ms	59.3
Maximum Angle Theta (A)		32.0 – 37.0 deg	34.8
Time of Max. Theta (A)		53.0 – 63.0 ms	59.0
Maximum Angle Theta (B)		29.94 – 32.44 deg	30.73
Time of Max. Theta (B)		54.0 – 64.0 ms	59.0

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

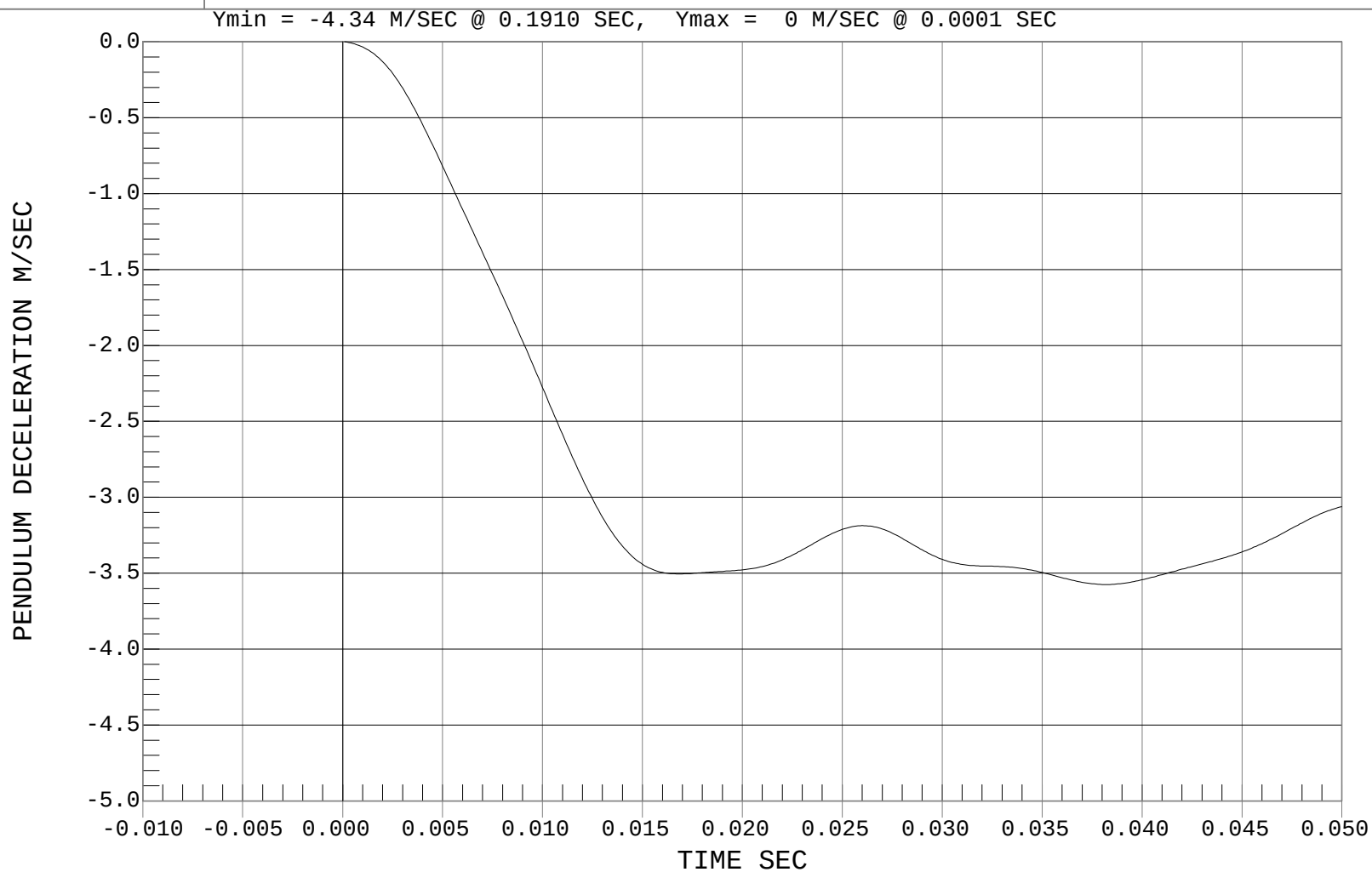


PENDULUM DECELERATION

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

Test Date: 10-15-01
Speed: 11.28 FT/SEC, 3.44 M/SEC

— 1 PENDULUM DECELERATION, D01482AI.V04





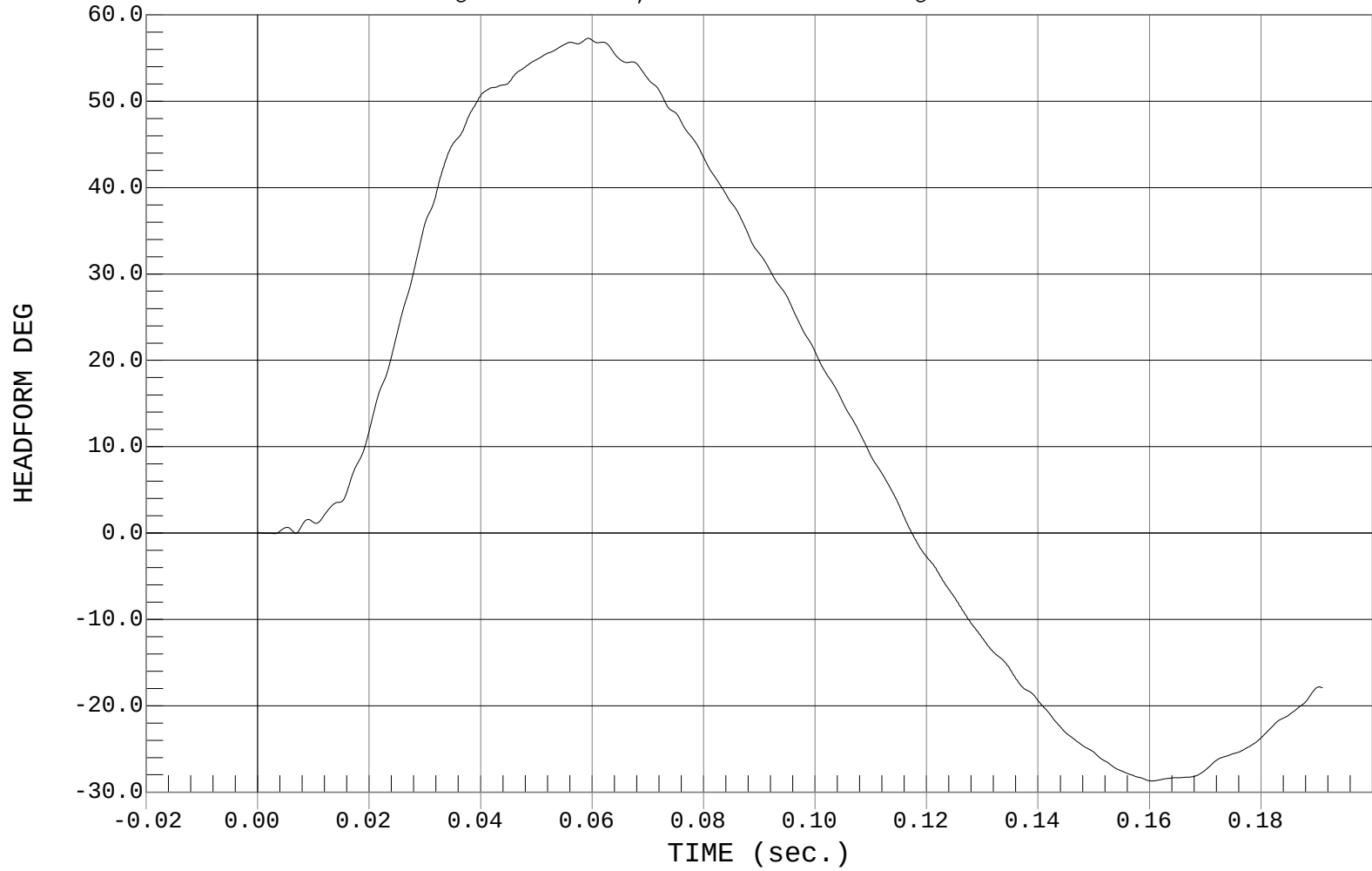
FLEXION ANGLE

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

Test Date: 10-15-01
Speed: 11.28 FT/SEC, 3.44 M/SEC

— 1 HEADFORM, D01482DT.D08

Ymin = -28.7 DEG @ 0.1604 sec., Ymax = 57.3 DEG @ 0.0593 sec.





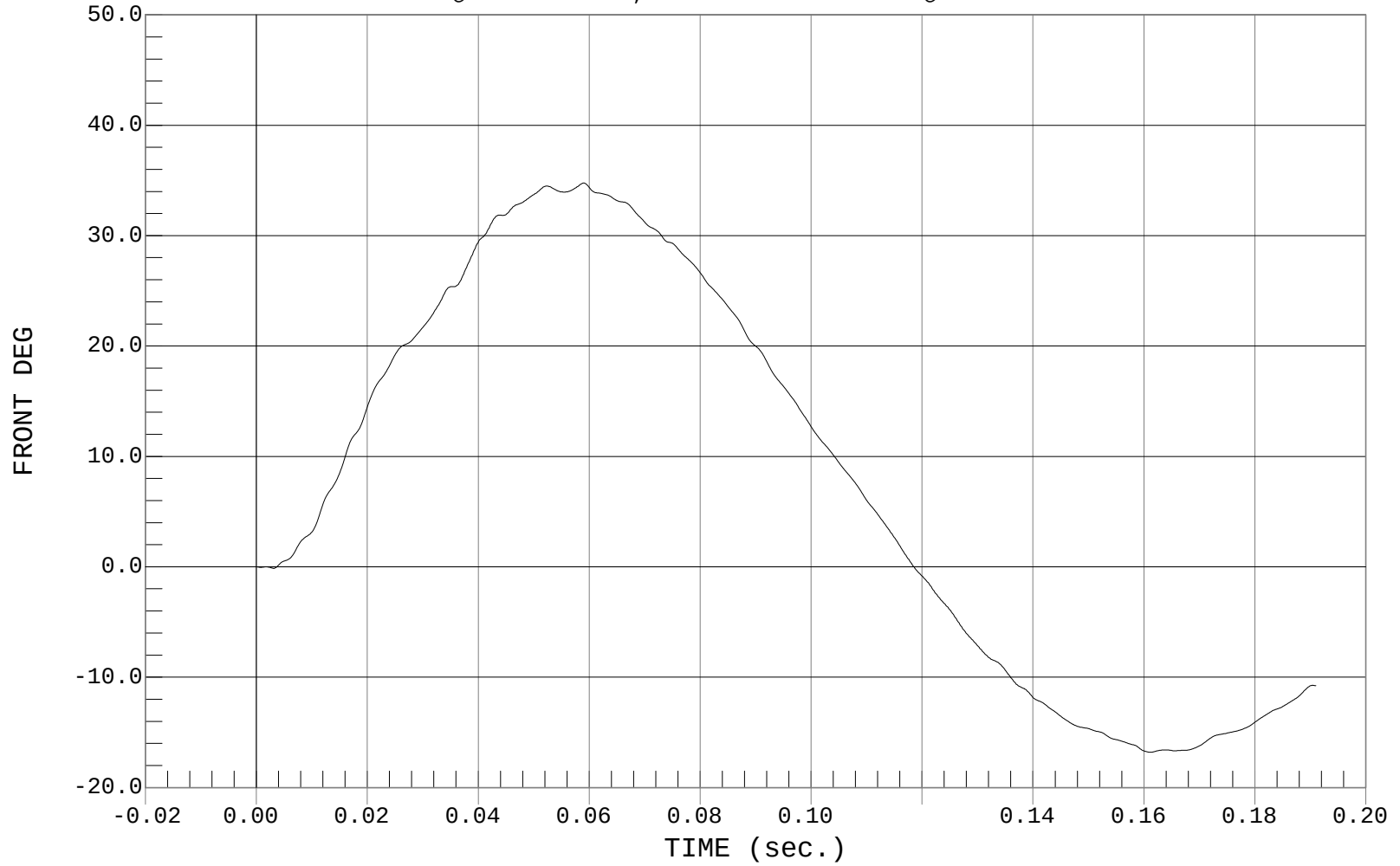
THETA A

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

Test Date: 10-15-01
Speed: 11.28 FT/SEC, 3.44 M/SEC

— 1 FRONT, D01482DT.D05

Ymin = -16.8 DEG @ 0.1612 sec., Ymax = 34.77 DEG @ 0.0590 sec.



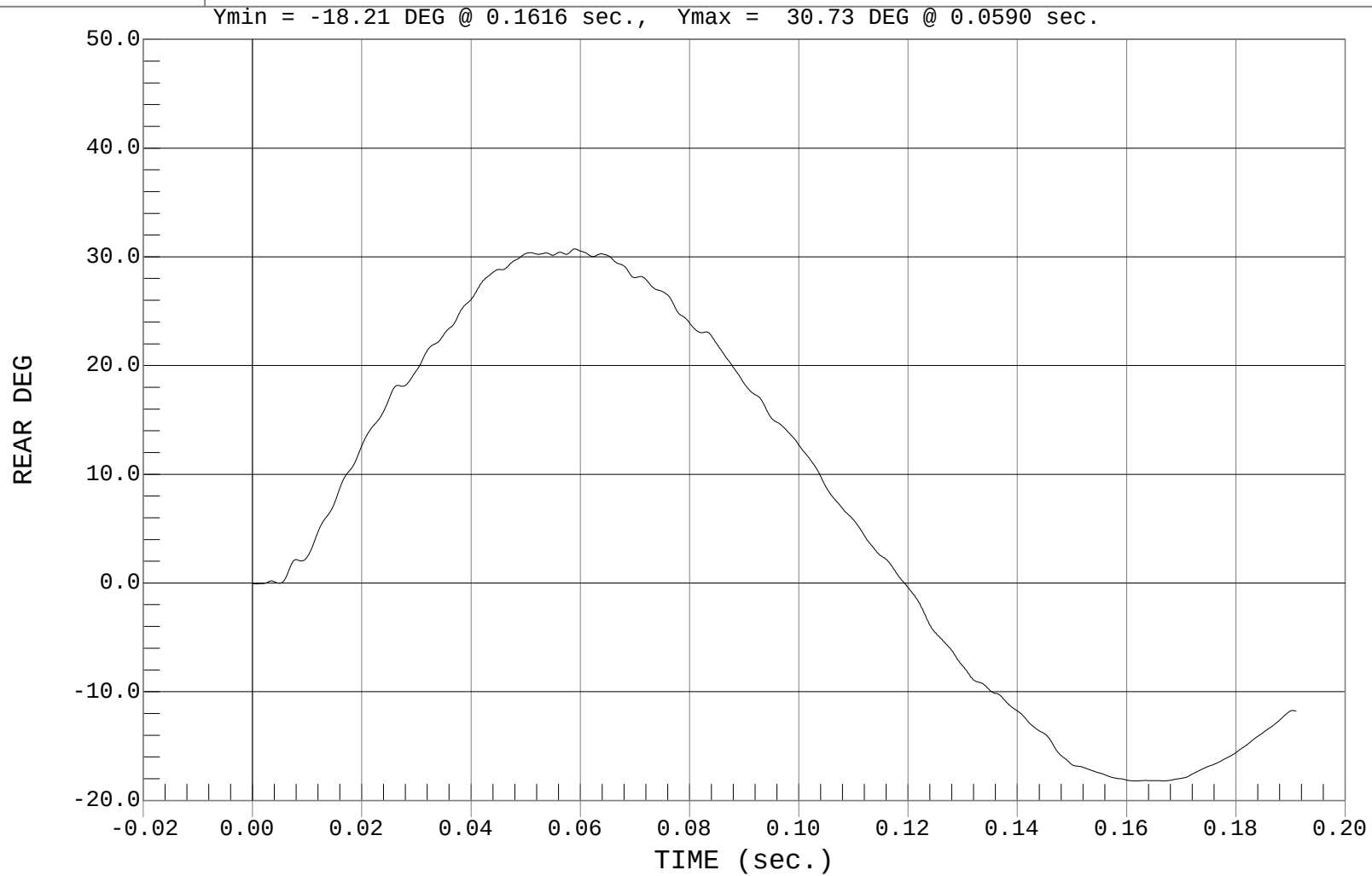


THETA B

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

Test Date: 10-15-01
Speed: 11.28 FT/SEC, 3.44 M/SEC

— 1 REAR, D01482DT.D06



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
EUROSID 2 DUMMY

Date: 10/15/01

Dummy Serial Number: 009

Test Number: D011483

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.2
Relative Humidity (%)	10 – 70	39
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	9.2
Time of Max. Pendulum Acceleration		25.9 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



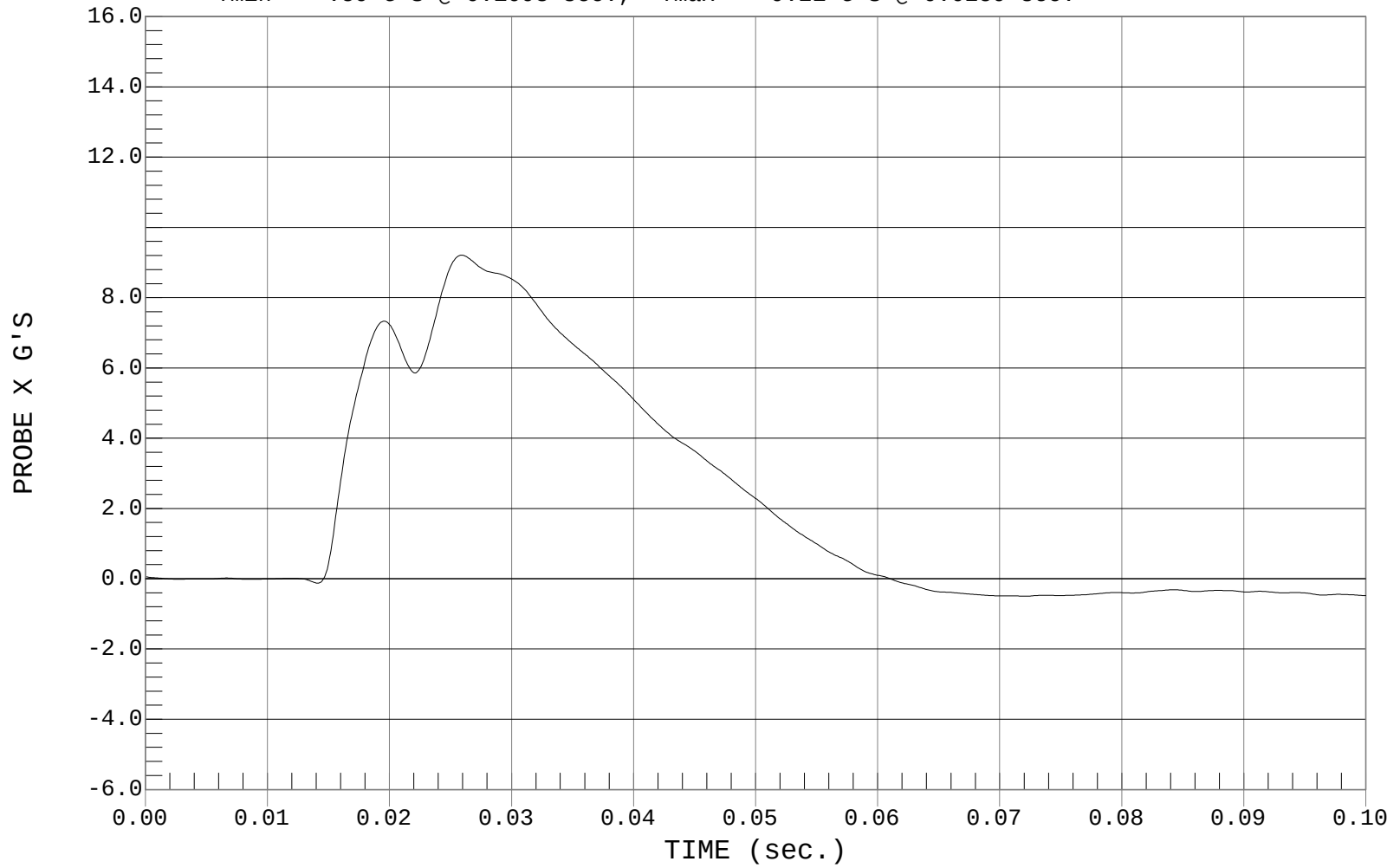
SHOULDER ACCELERATION

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

Test Date: 10-15-01
Speed: 14.15 FT/SEC, 4.31 M/SEC

1 PROBE X, D01483AF.A01

Ymin = -.59 G'S @ 0.1093 sec., Ymax = 9.21 G'S @ 0.0259 sec.



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

Date: 10/15/01
Dummy Serial Number: 009
Test Number: D011484/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.3
Relative Humidity (%)	10 – 70	36
Displacement at 2 m/s	23.5 – 27.5 mm	26.3
Displacement at 3 m/s	36.0 – 40.0 mm	38.8
Displacement at 4 m/s	46.0 – 51.0 mm	48.7

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.3
Relative Humidity (%)	10 – 70	36
Displacement at 2 m/s	23.5 – 27.5 mm	26.0
Displacement at 3 m/s	36.0 – 40.0 mm	38.6
Displacement at 4 m/s	46.0 – 51.0 mm	50.0

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.4
Relative Humidity (%)	10 – 70	36
Displacement at 2 m/s	23.5 – 27.5 mm	26.0
Displacement at 3 m/s	36.0 – 40.0 mm	38.6
Displacement at 4 m/s	46.0 – 51.0 mm	49.9

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



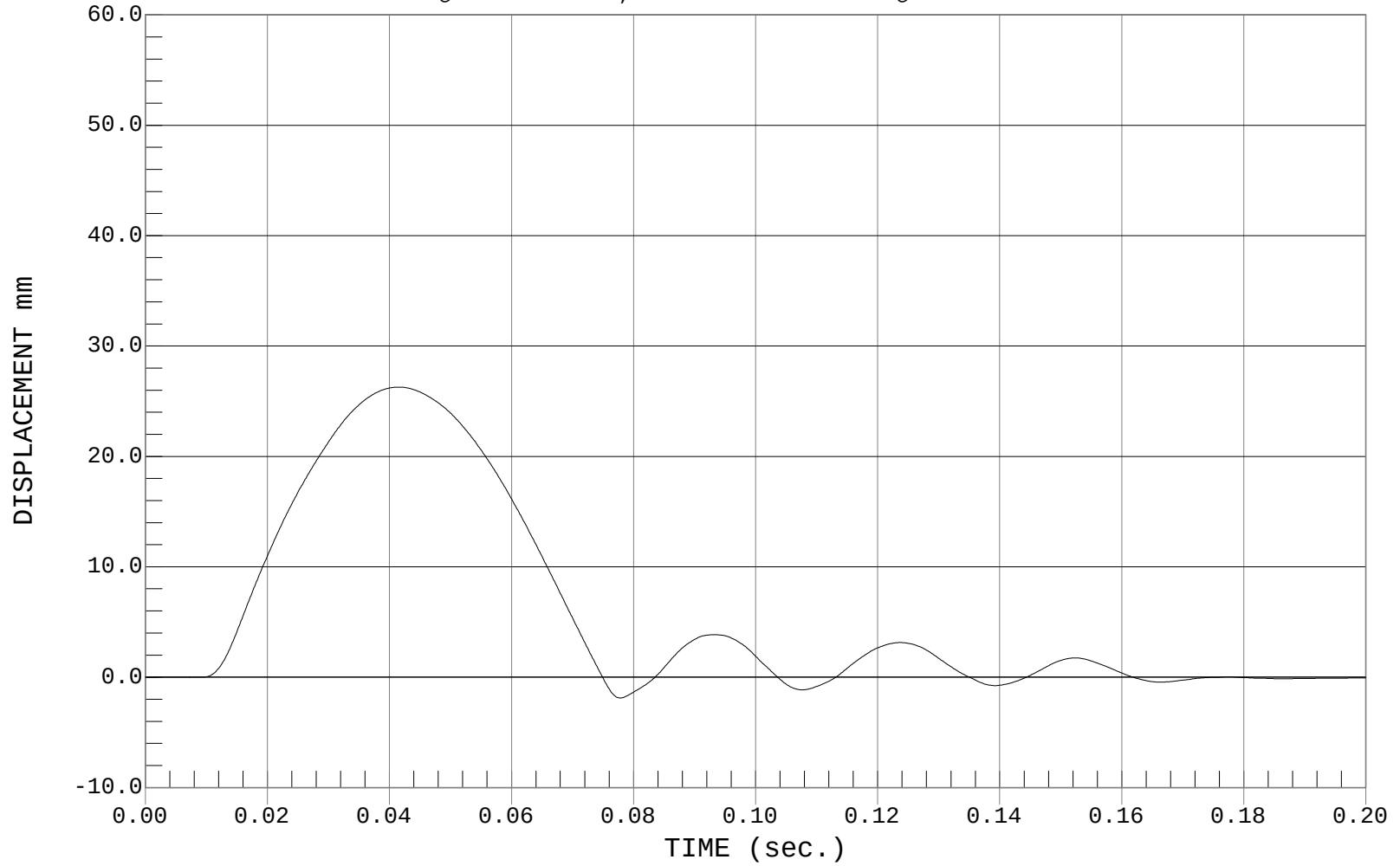
UPPER RIB DISPLACEMENT

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

Test Date: 10-15-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01484DF.D05

Ymin = -1.89 mm @ 0.0778 sec., Ymax = 26.28 mm @ 0.0416 sec.





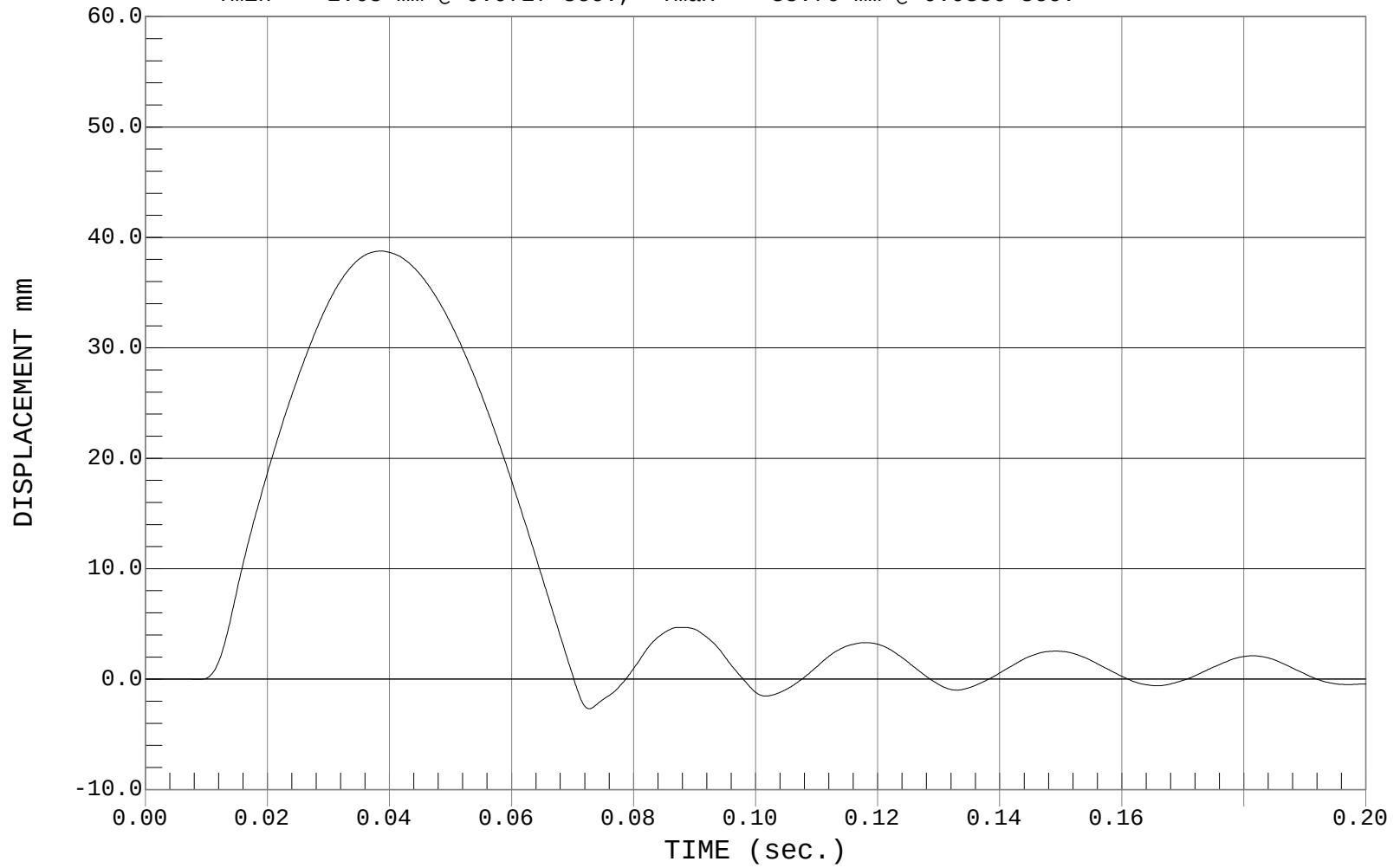
UPPER RIB DISPLACEMENT

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

Test Date: 10-15-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01484DF.D06

Ymin = -2.68 mm @ 0.0727 sec., Ymax = 38.76 mm @ 0.0386 sec.





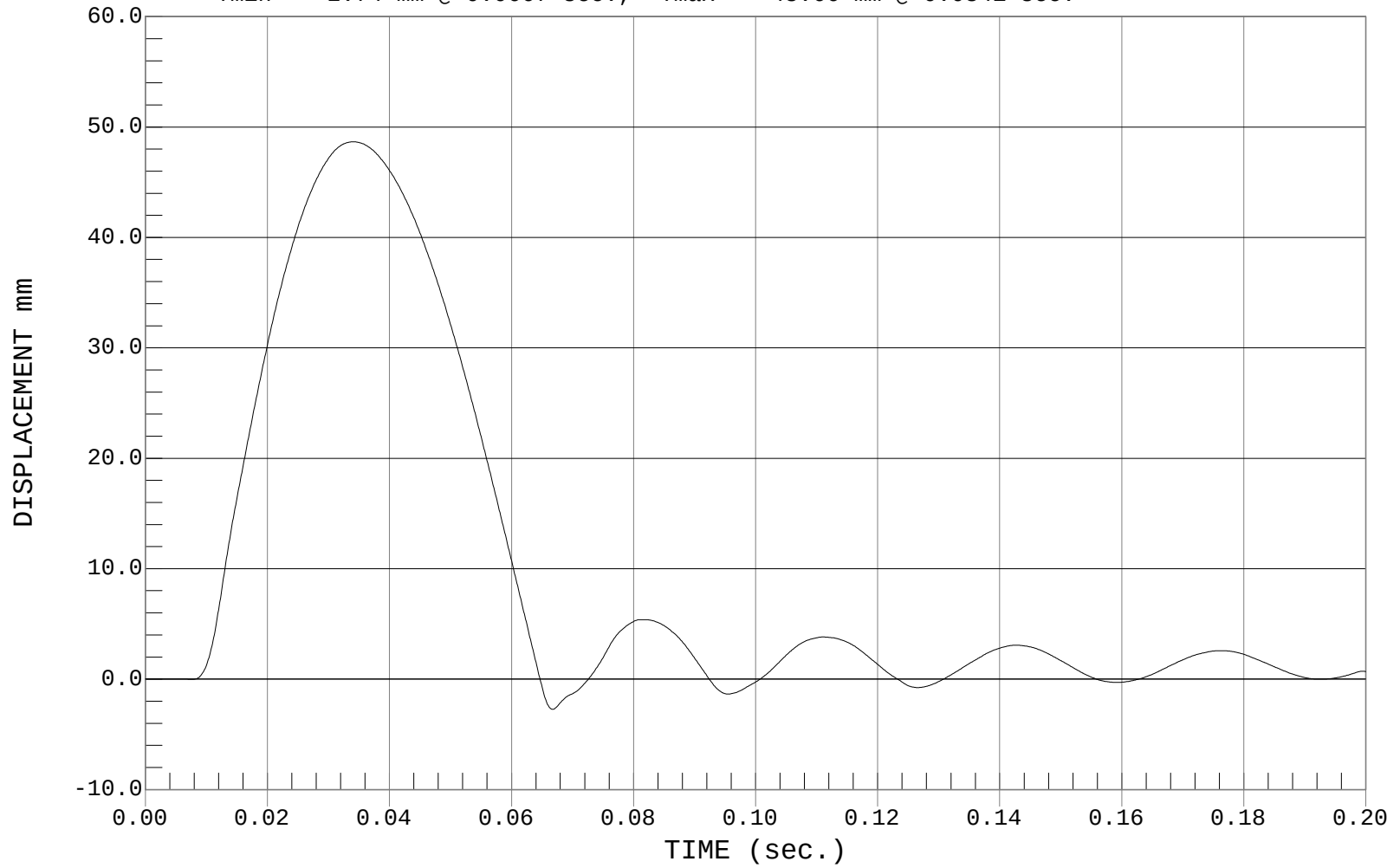
UPPER RIB DISPLACEMENT

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

Test Date: 10-15-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01484DF.D07

Ymin = -2.74 mm @ 0.0667 sec., Ymax = 48.66 mm @ 0.0341 sec.





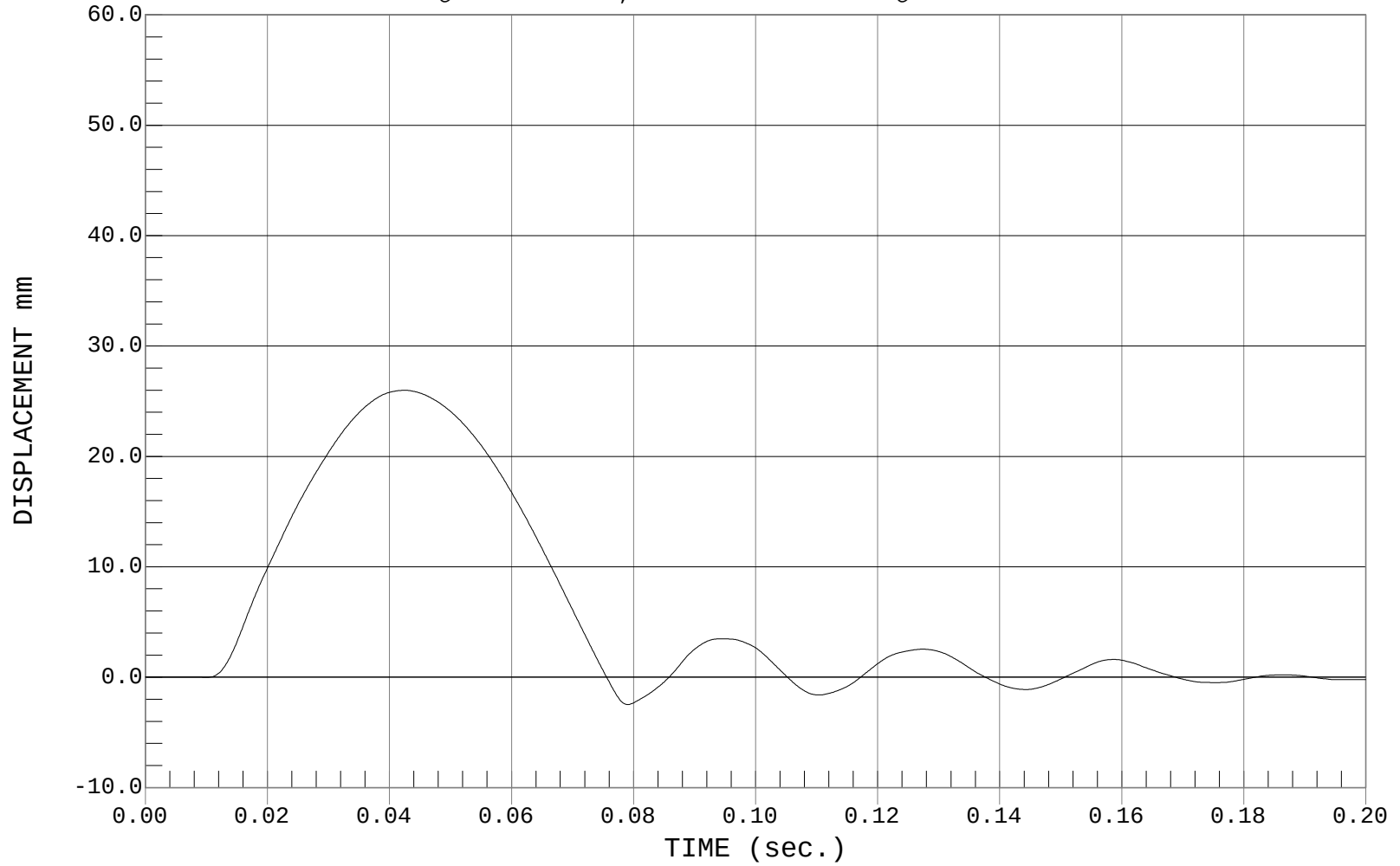
MIDDLE RIB DISPLACEMENT

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

Test Date: 10-15-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01485DF.D05

Ymin = -2.48 mm @ 0.0790 sec., Ymax = 25.99 mm @ 0.0425 sec.





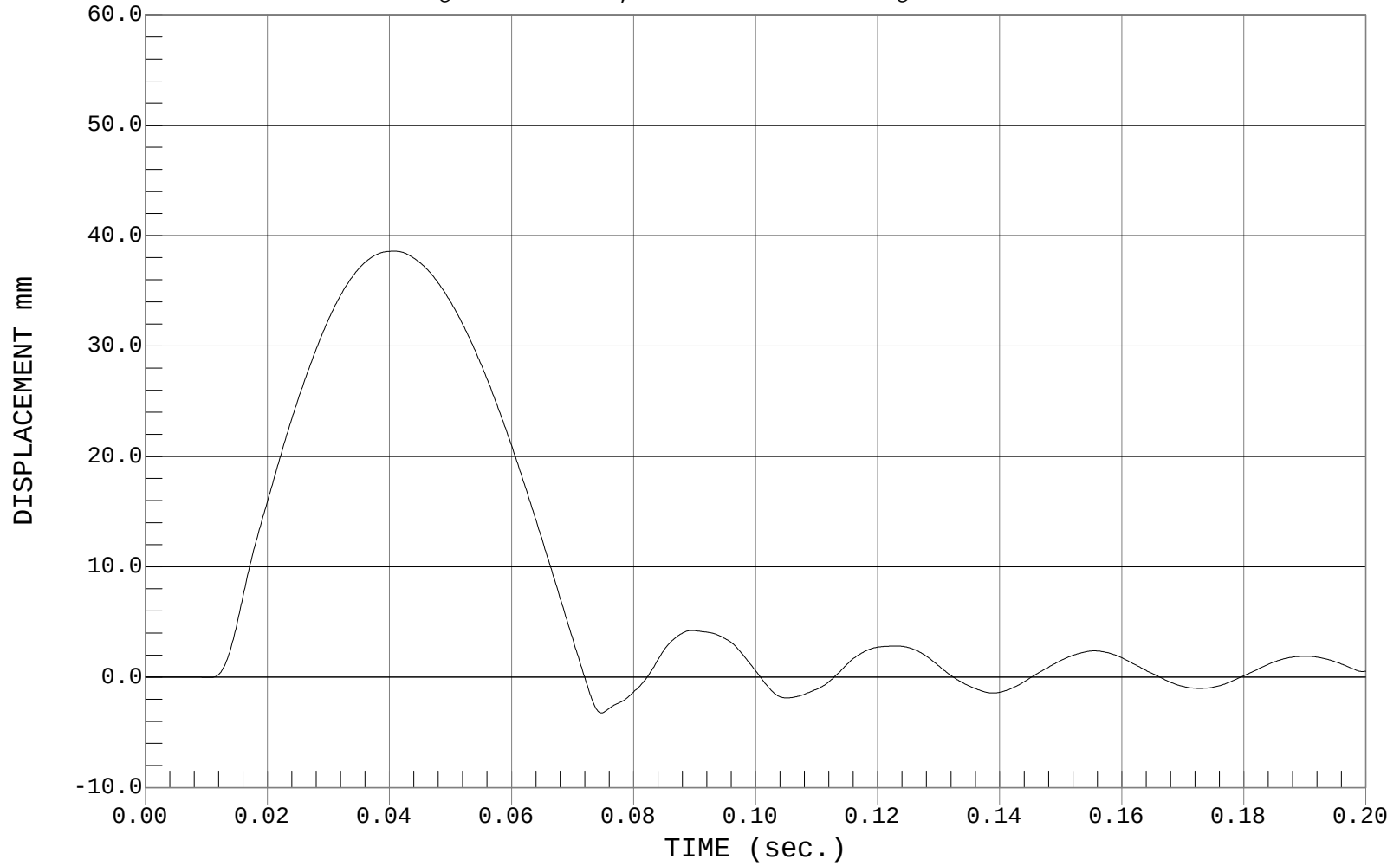
MIDDLE RIB DISPLACEMENT

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

Test Date: 10-15-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01485DF.D06

Ymin = -3.23 mm @ 0.0747 sec., Ymax = 38.59 mm @ 0.0408 sec.





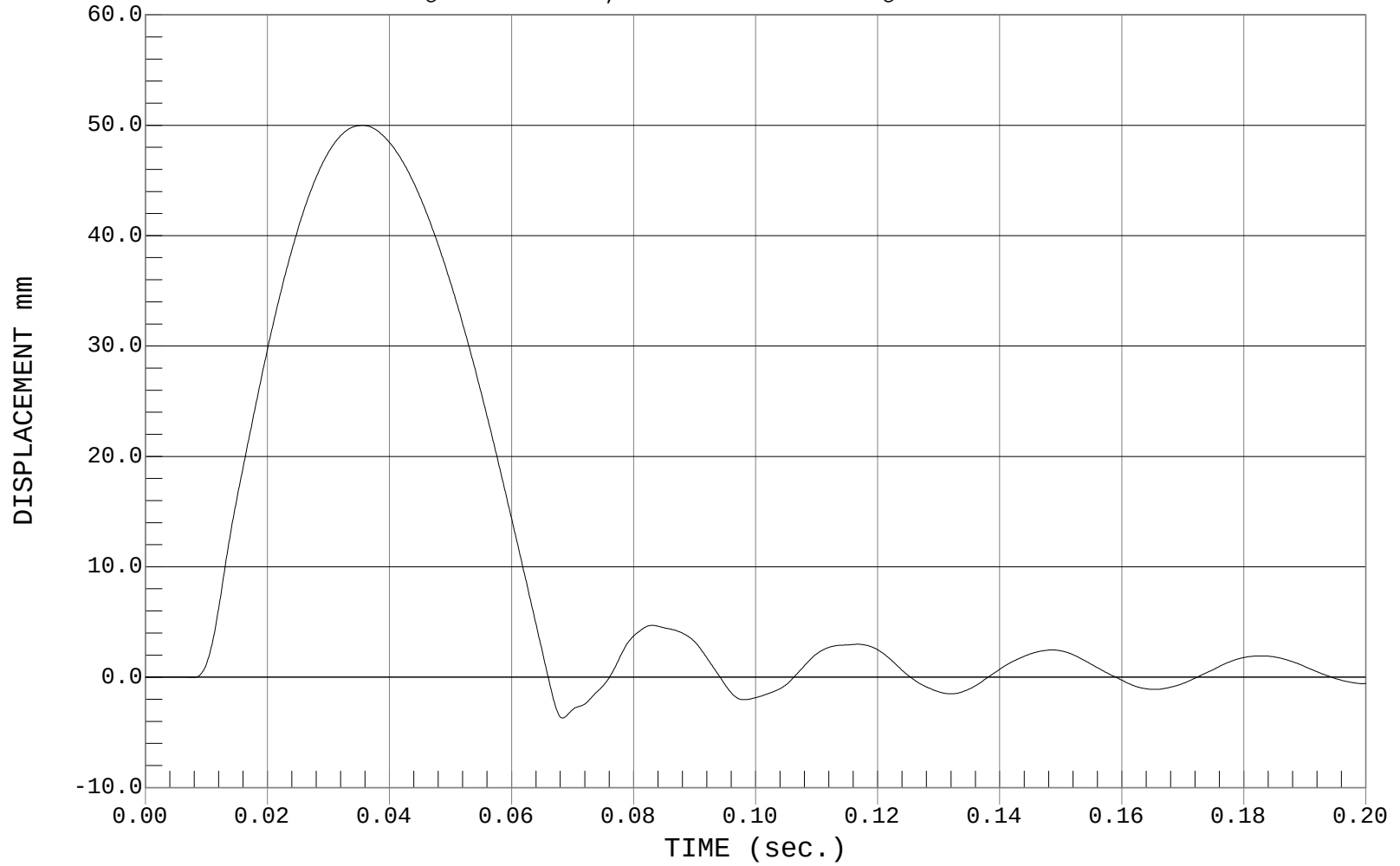
MIDDLE RIB DISPLACEMENT

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

Test Date: 10-15-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01485DF.D07

Ymin = -3.7 mm @ 0.0684 sec., Ymax = 49.98 mm @ 0.0357 sec.





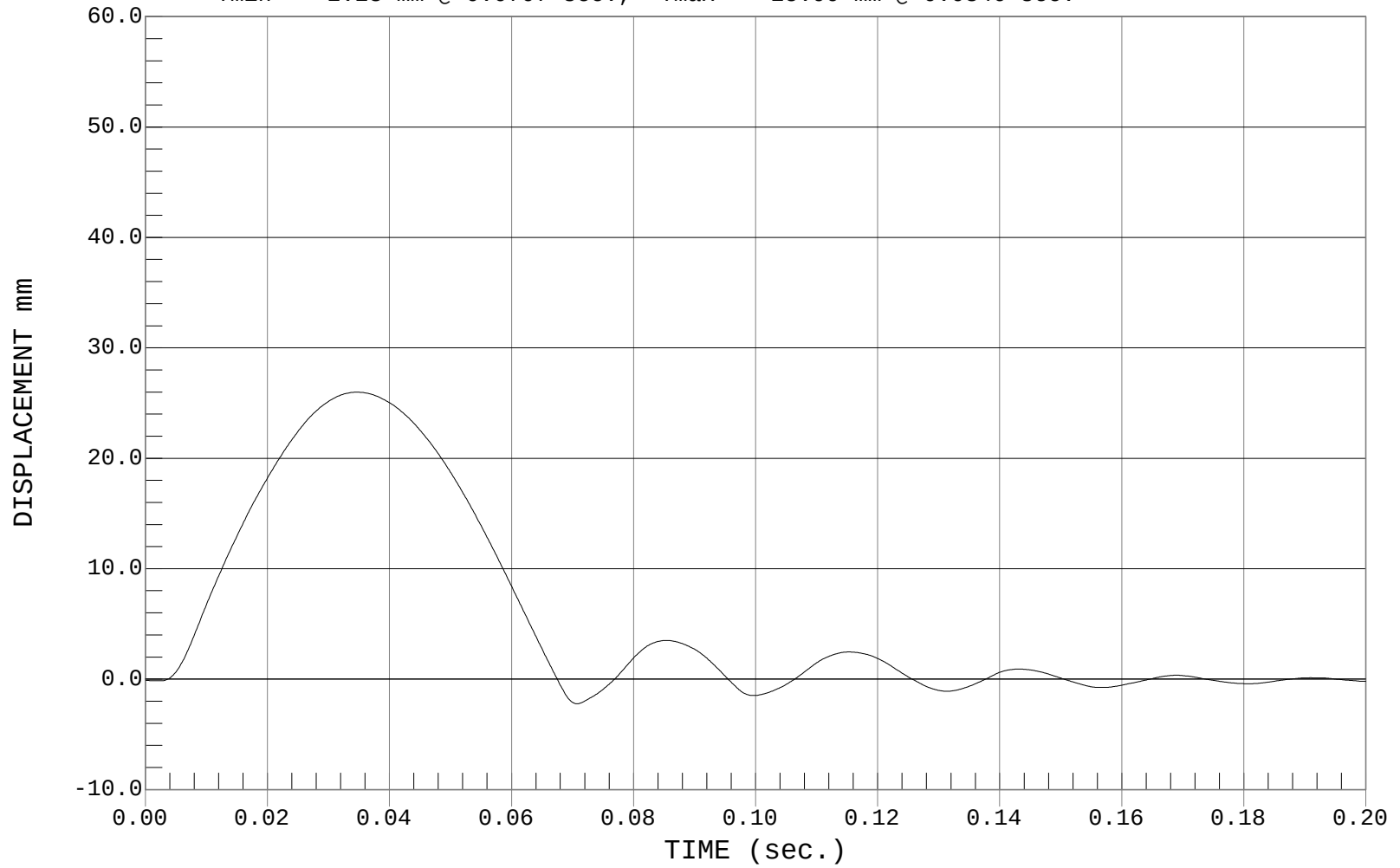
LOWER RIB DISPLACEMENT

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

Test Date: 10-15-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01486DF.D05

Ymin = -2.23 mm @ 0.0707 sec., Ymax = 25.99 mm @ 0.0346 sec.





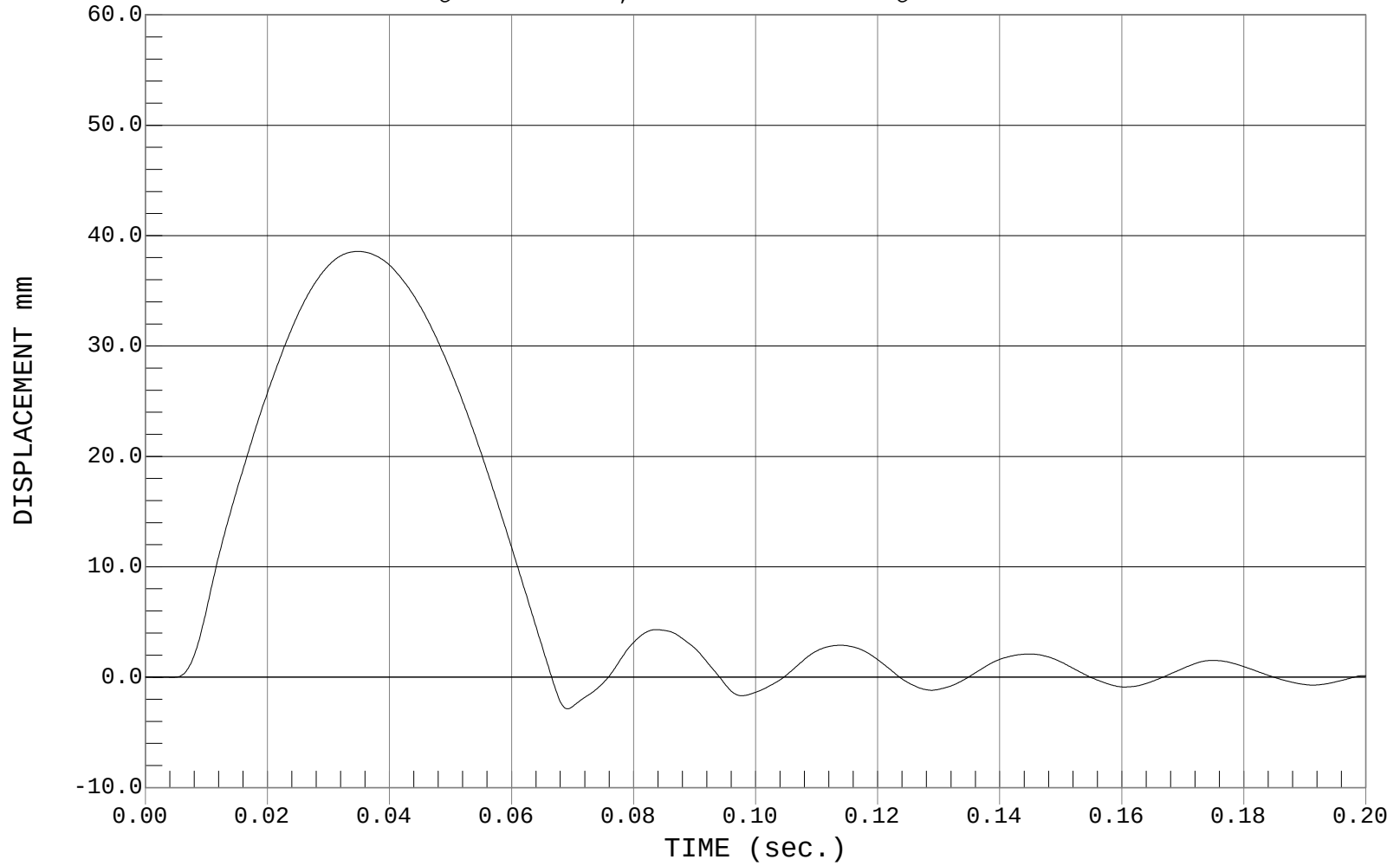
LOWER RIB DISPLACEMENT

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

Test Date: 10-15-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01486DF.D06

Ymin = -2.87 mm @ 0.0692 sec., Ymax = 38.57 mm @ 0.0349 sec.





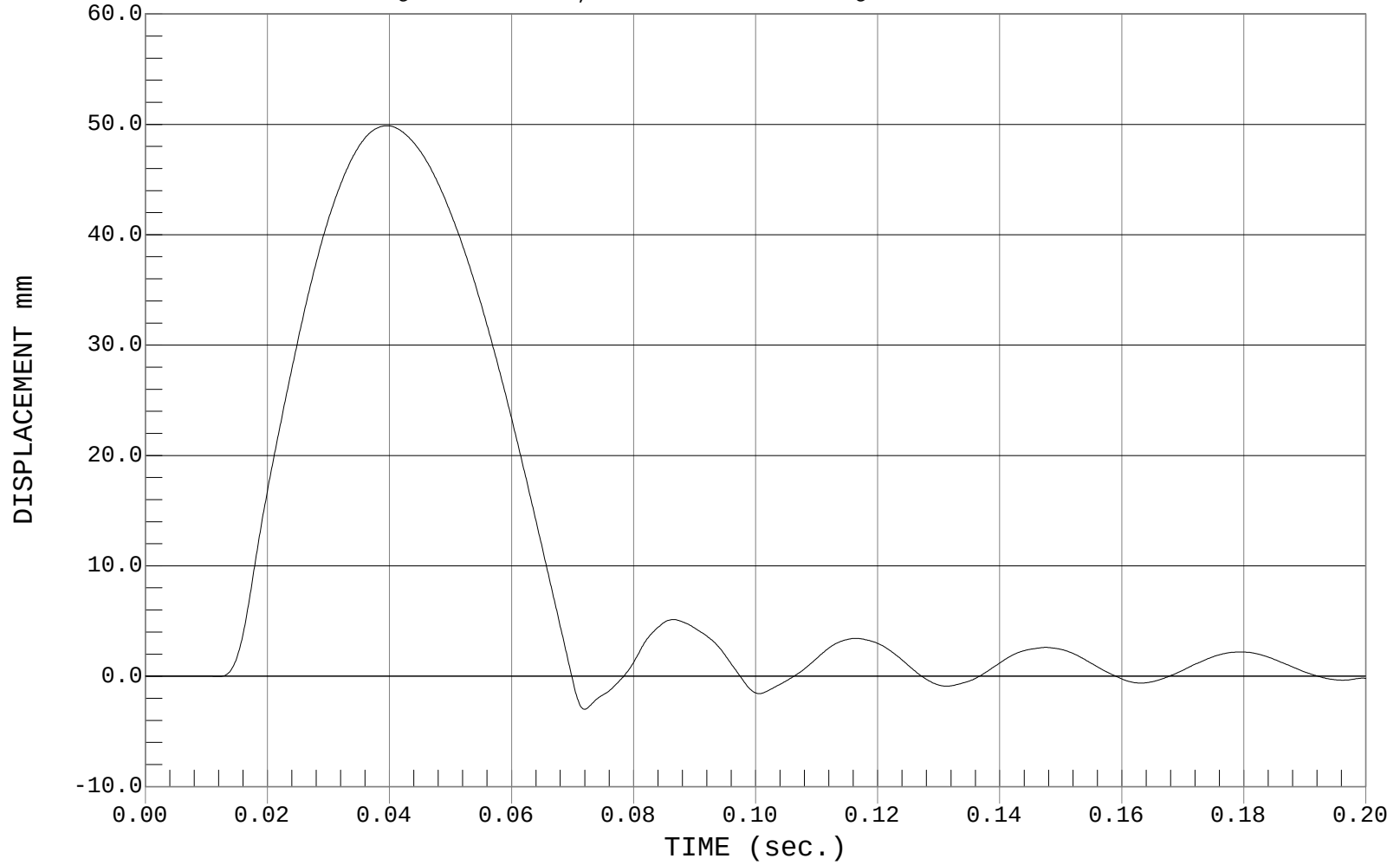
LOWER RIB DISPLACEMENT

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

Test Date: 10-15-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01486DF.D07

Ymin = -3 mm @ 0.0720 sec., Ymax = 49.87 mm @ 0.0396 sec.



MGA RESEARCH CORPORATION
ABDOMEN TEST
EUROSID 2 DUMMY

Date: 10/15/01

Dummy Serial Number: 009

Test Number: D011487

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.3
Relative Humidity (%)	10 – 70	39
Probe Speed (m/s)	3.90 – 4.10	3.97
Maximum Impact Force	4.00 – 4.80 kN	4.68
Time of Maximum Force	10.60 – 13.00 ms	11.20
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.29
Time of Max. Total Force	10.00 – 12.30 ms	10.80

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



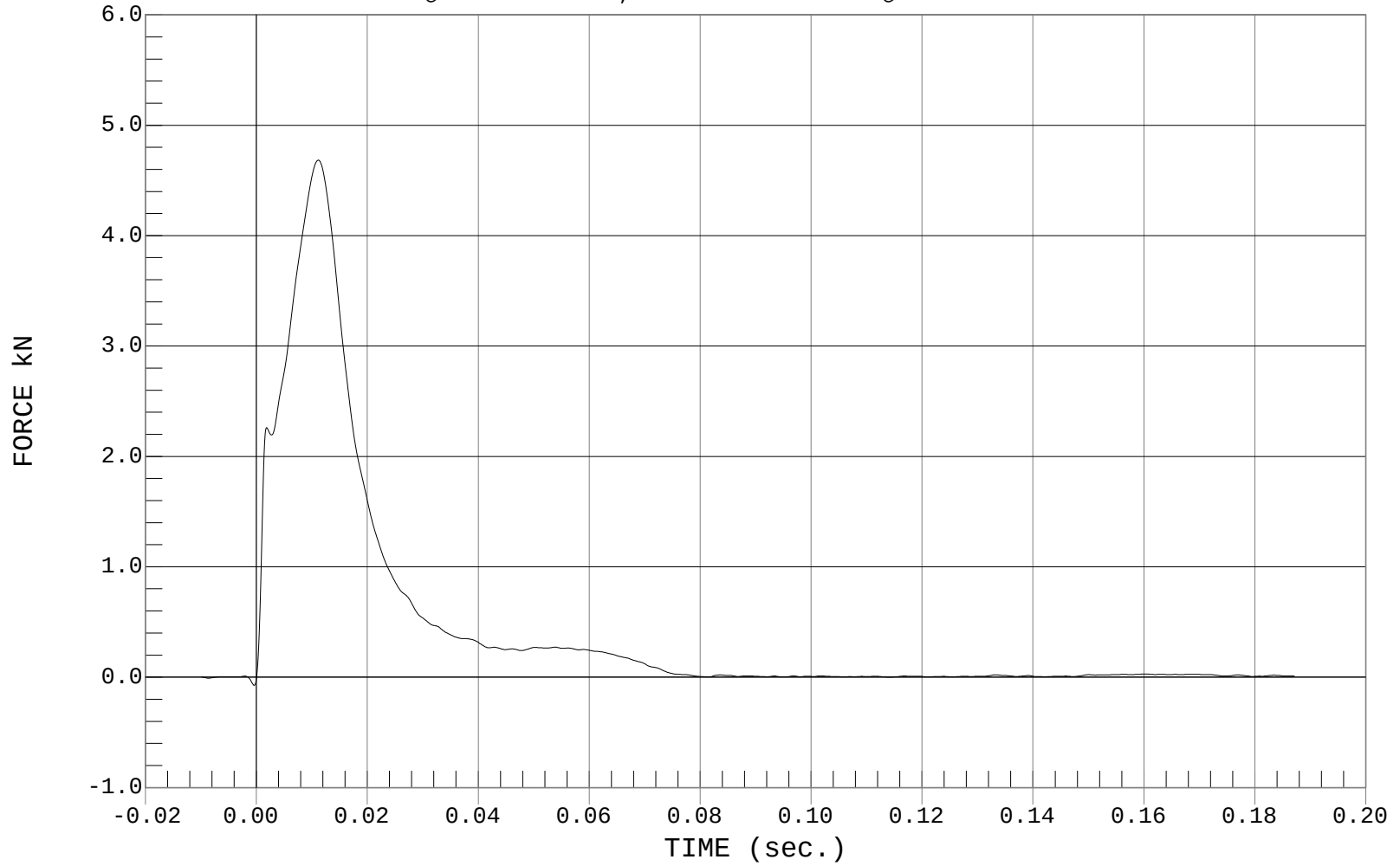
IMPACTOR FORCE

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

Test Date: 10-15-01
Speed: 13.02 FT/SEC, 3.97 M/SEC

— 1 FORCE, D01487FT.F01

Ymin = -.07 kN @ -0.0004 sec., Ymax = 4.68 kN @ 0.0112 sec.





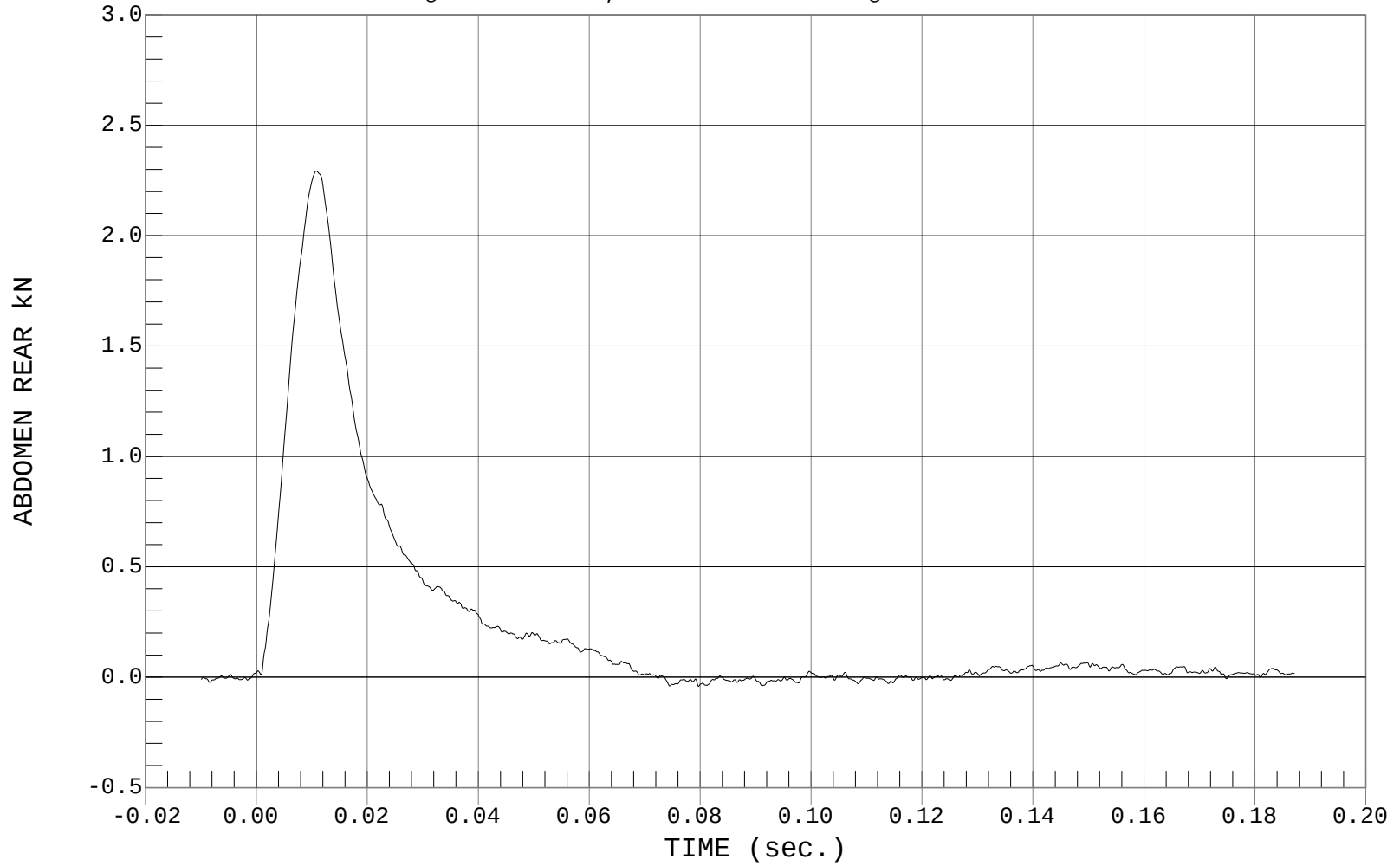
ABDOMEN FORCE

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

Test Date: 10-15-01
Speed: 13.02 FT/SEC, 3.97 M/SEC

— 1 ABDOMEN REAR, D01487FT.F02

Ymin = -.04 kN @ 0.0797 sec., Ymax = 2.29 kN @ 0.0108 sec.



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
EUROSID 2 DUMMY

Date: 10/15/01

Dummy Serial Number: 009

Test Number: D011488

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.5
Relative Humidity (%)		10 – 70	36
Pendulum Speed		5.95 – 6.15	6.10
Pendulum Deceleration	10 msec	2.46 - 1.59 m/sec	-2.04
	20 msec	5.25 - 4.07 m/sec	-4.63
	25 msec	6.64 - 5.3 m/sec	-5.77
	30 msec	≥ -6.5 m/sec	-6.2
Maximum Flexion Angle		45.0 – 55.0 deg	50.6
Time of Max. Flexion Angle		39.0 – 53.0 ms	45.1
Maximum Angle Theta (A)		31.0 – 35.0 deg	32.7
Time of Max. Theta (A)		44.0 – 52.0 ms	45.6
Maximum Angle Theta (B)		28.16 – 30.66 deg	28.87
Time of Max. Theta (B)		44.0 – 52.0 ms	47.2

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



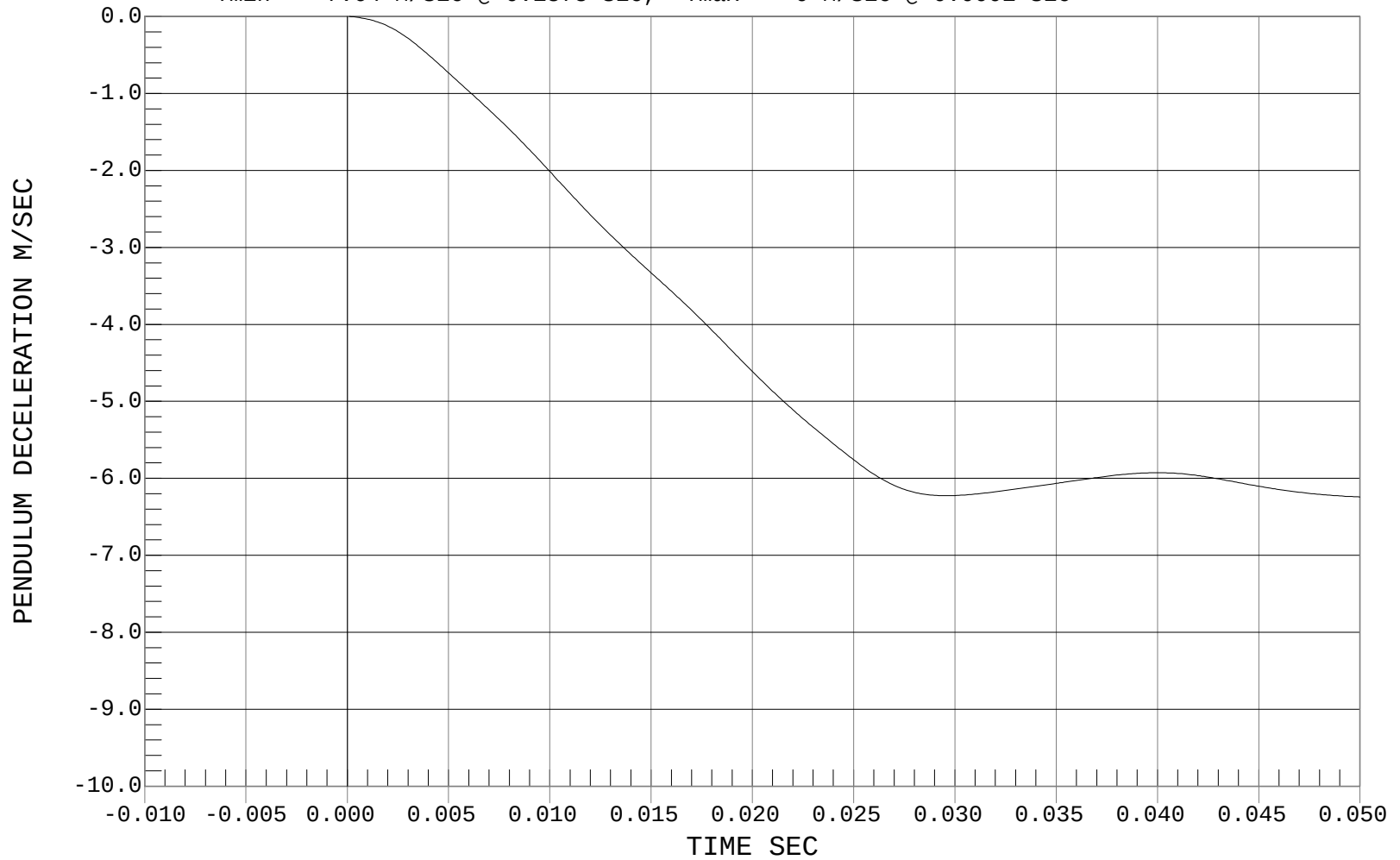
PENDULUM DECELERATION

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

Test Date: 10-15-01
Speed: 20.01 FT/SEC, 6.10 M/SEC

— 1 PENDULUM DECELERATION, D01488AI.V04

Ymin = -7.64 M/SEC @ 0.1378 SEC, Ymax = 0 M/SEC @ 0.0001 SEC





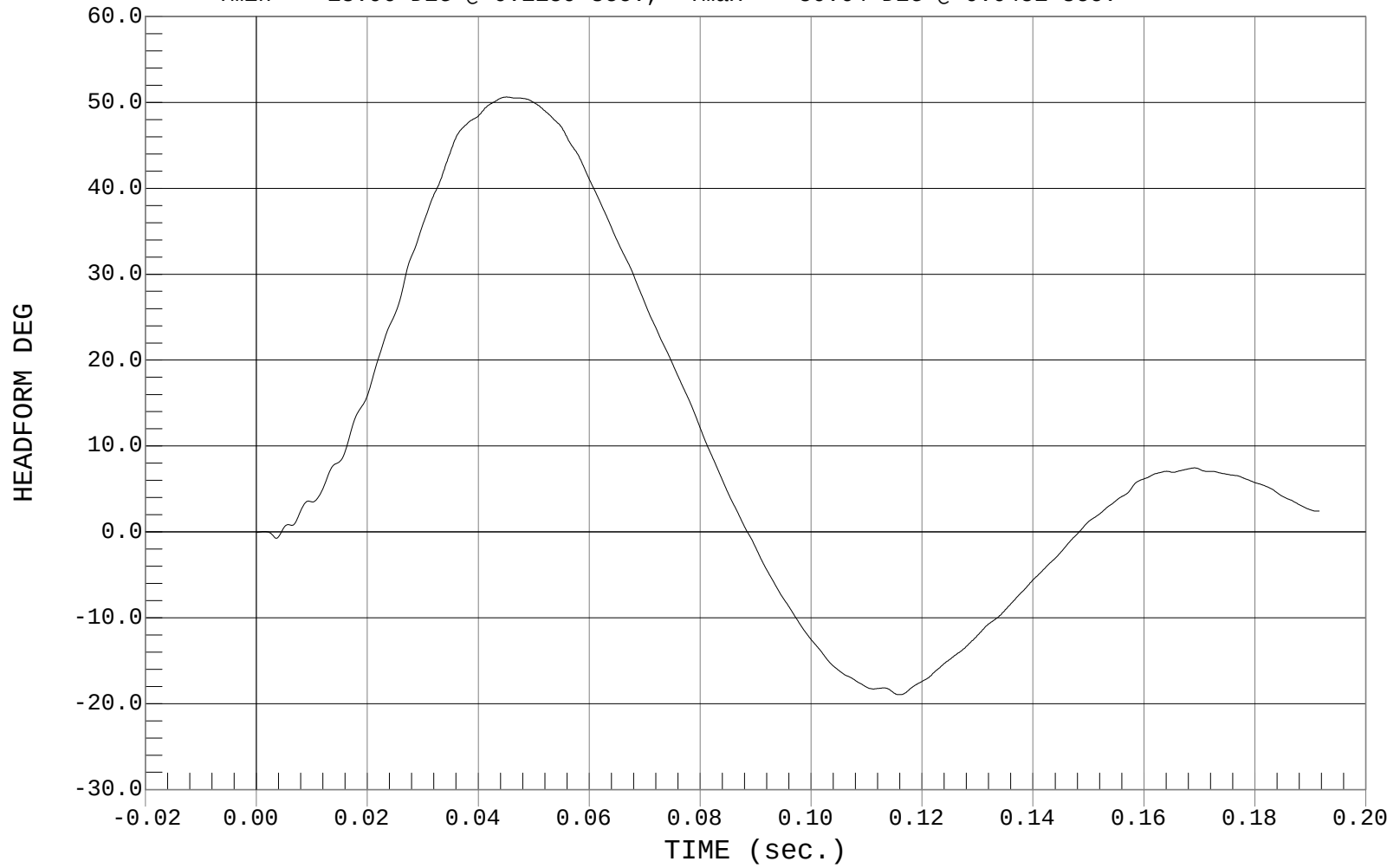
FLEXION ANGLE

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

Test Date: 10-15-01
Speed: 20.01 FT/SEC, 6.10 M/SEC

— 1 HEADFORM, D01488DT.D08

Ymin = -18.96 DEG @ 0.1159 sec., Ymax = 50.64 DEG @ 0.0451 sec.





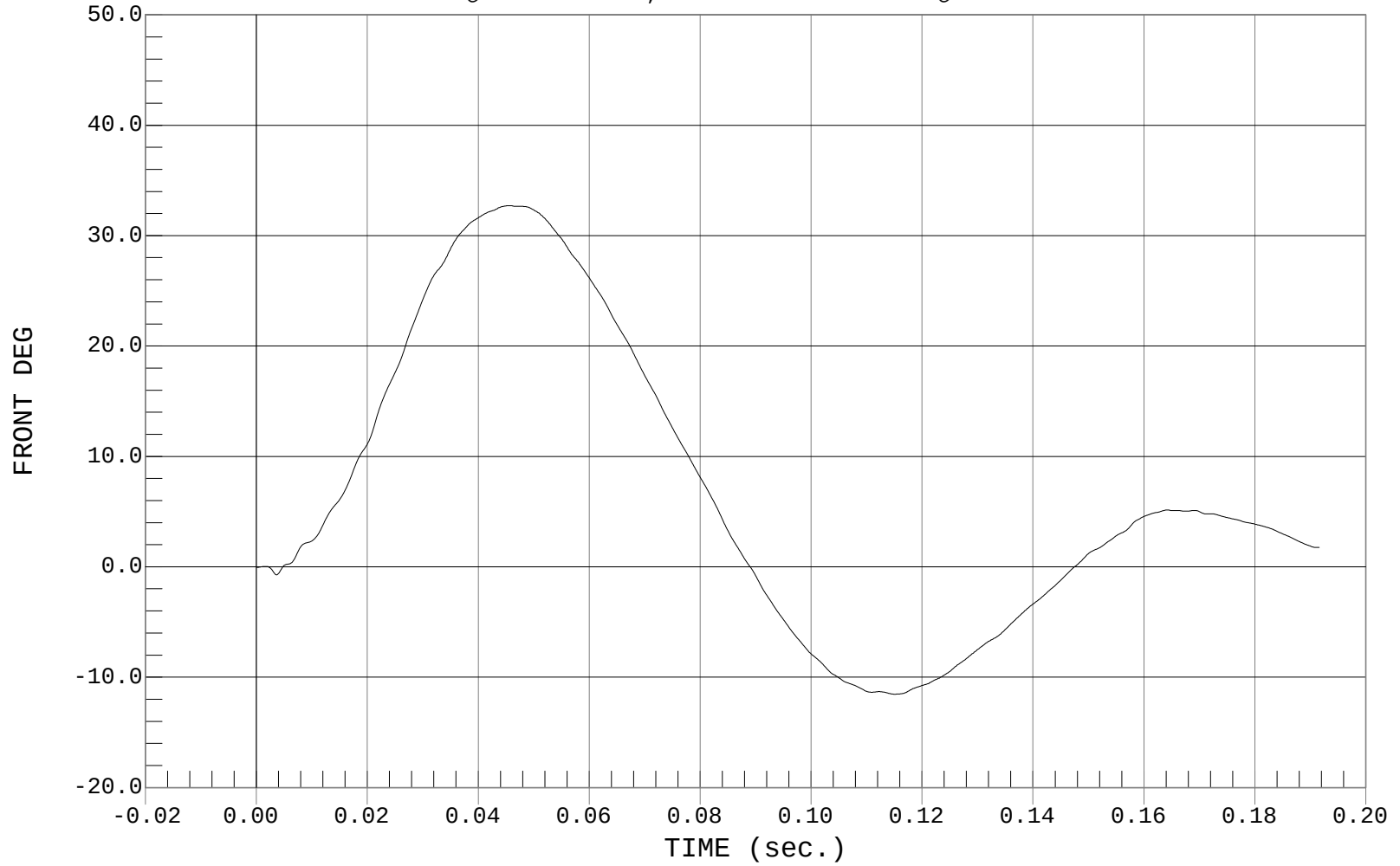
THETA A

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

Test Date: 10-15-01
Speed: 20.01 FT/SEC, 6.10 M/SEC

— 1 FRONT, D01488DT.D05

Ymin = -11.55 DEG @ 0.1151 sec., Ymax = 32.72 DEG @ 0.0456 sec.





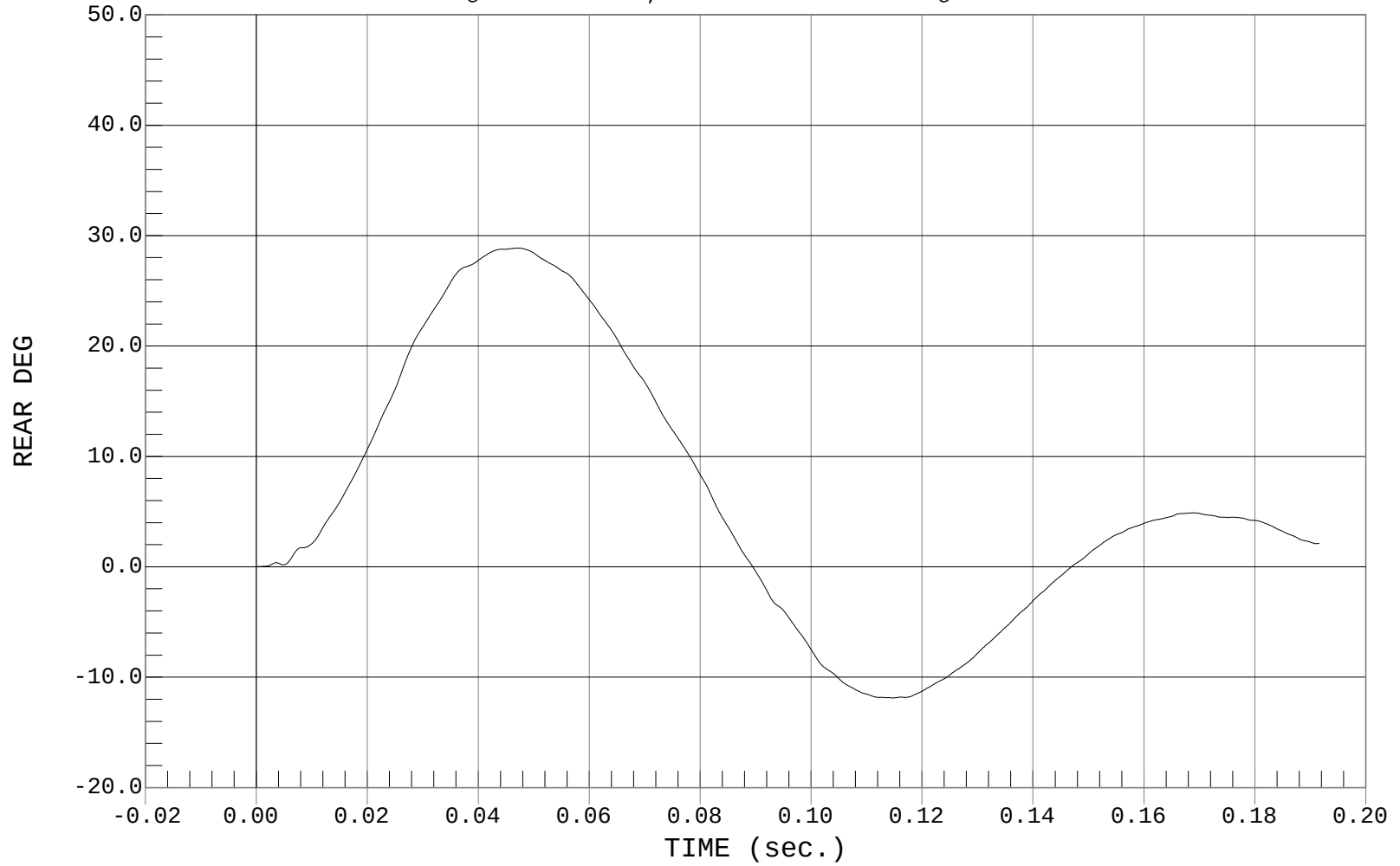
THETA B

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

Test Date: 10-15-01
Speed: 20.01 FT/SEC, 6.10 M/SEC

— 1 REAR, D01488DT.D06

Ymin = -11.88 DEG @ 0.1147 sec., Ymax = 28.87 DEG @ 0.0472 sec.



MGA RESEARCH CORPORATION
PELVIS TEST
EUROSID 2 DUMMY

Date: 10/15/01

Dummy Serial Number: 009

Test Number: D011489

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.2
Relative Humidity (%)	10 – 70	39
Pendulum Speed	6.20 – 6.30 m/s	6.25
Maximum Impactor Force	9.80 – 12.20 kN	11.22
Time of Max. Impactor Force	9.50 – 12.50 ms	10.90
Maximum Pubic Force	2.65 – 3.35 kN	3.32
Time of Max. Pubic Force	10.00 – 13.00 ms	11.90

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



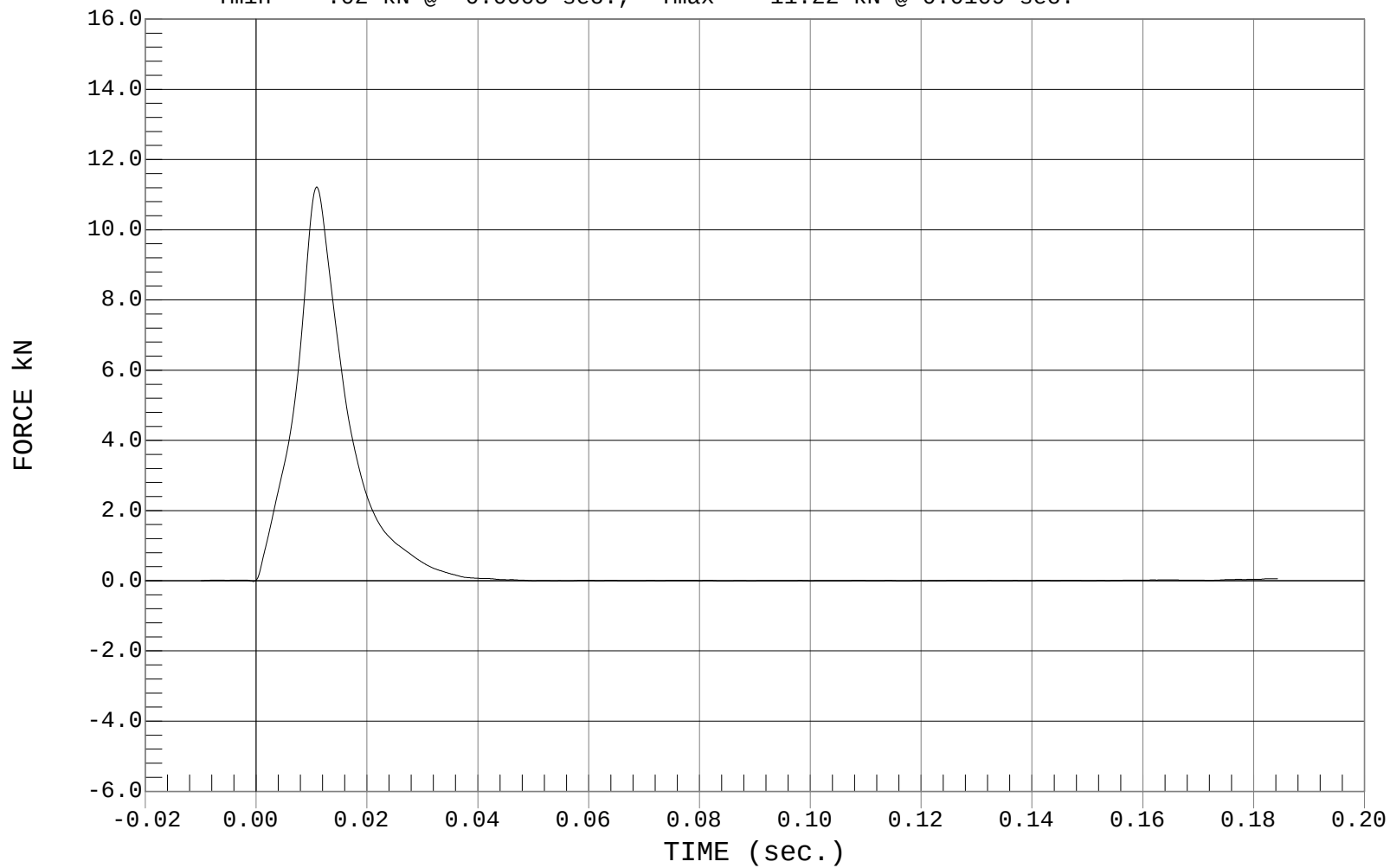
IMPACTOR FORCE

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

Test Date: 10-15-01
Speed: 20.52 FT/SEC, 6.25 M/SEC

— 1 FORCE, D01489FT.F01

Ymin = -.02 kN @ -0.0005 sec., Ymax = 11.22 kN @ 0.0109 sec.





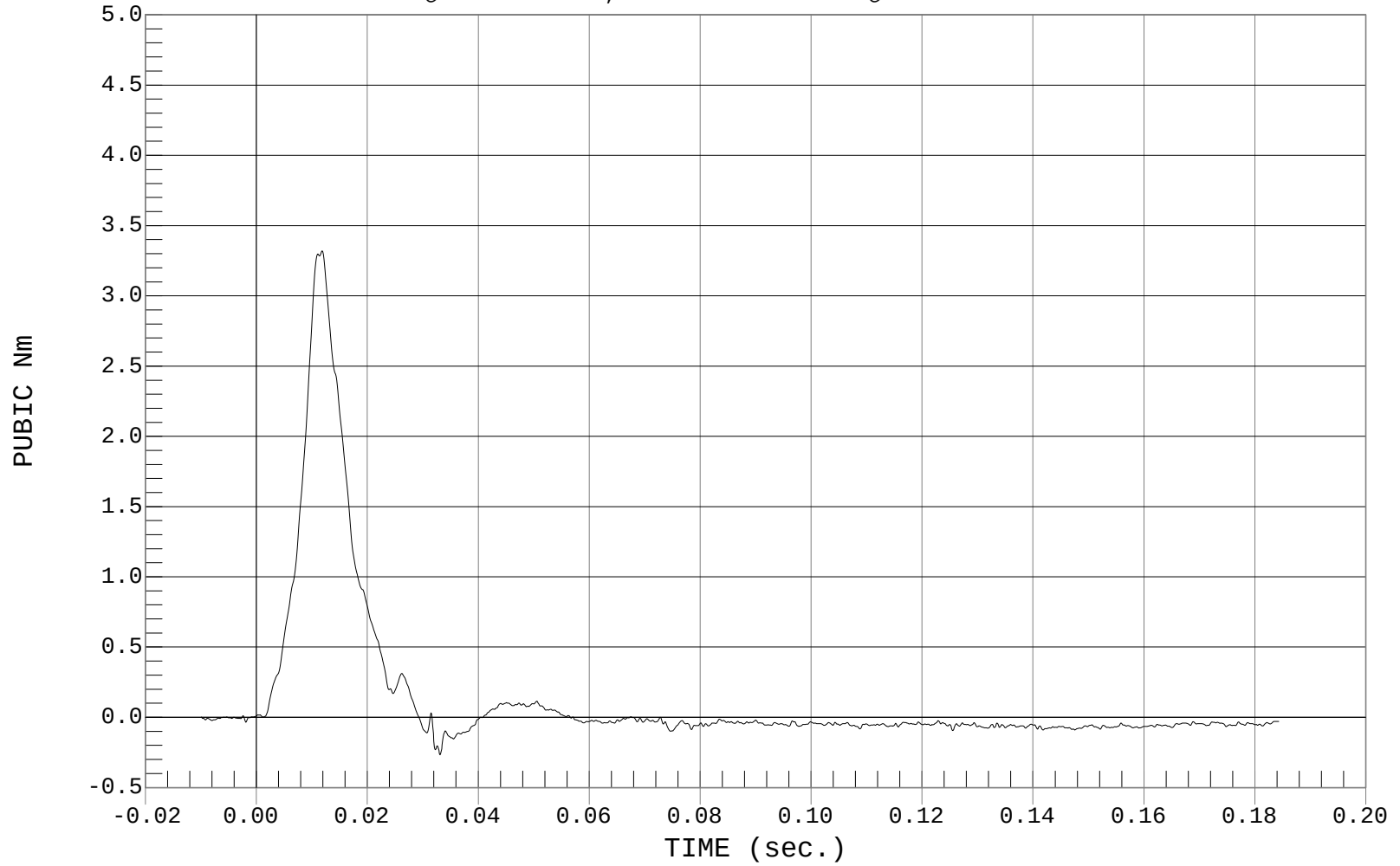
PUBIC FORCE

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

Test Date: 10-15-01
Speed: 20.52 FT/SEC, 6.25 M/SEC

— 1 PUBIC, D01489FT.F02

Ymin = -.27 Nm @ 0.0331 sec., Ymax = 3.32 Nm @ 0.0119 sec.



CERTIFICATION DATA

Dummy Serial Number: 010

Calibration Test Results Summary

Dummy Serial Number: 010

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: 10/17/01

Dummy Serial Number: 010

Test Number: D011501

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.3
Relative Humidity (%)	10 – 70	29
Peak Resultant Acceleration	100 – 150 g's	141
Time of Max. Res. Acceleration		24.8 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



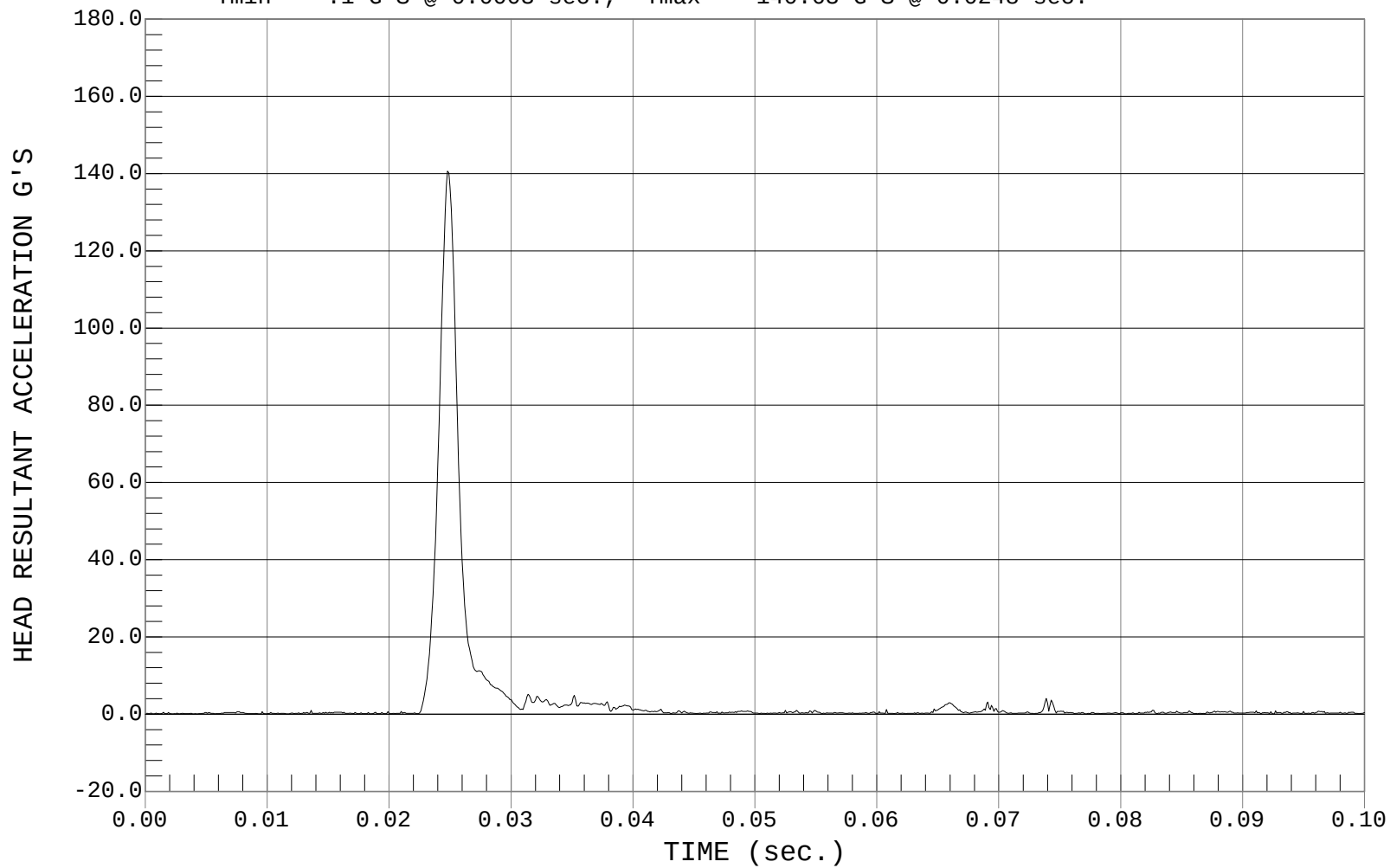
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy # 010

Test Date: 10-17-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01501AV.A01

Ymin = .1 G'S @ 0.0003 sec., Ymax = 140.63 G'S @ 0.0248 sec.



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
EUROSID 2 DUMMY

Date: 10/18/01

Dummy Serial Number: 010

Test Number: D011502

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.4
Relative Humidity (%)		10 – 70	29
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	-1.71
	14 msec	~3.20 - ~3.85 m/sec	-3.35
Maximum Flexion Angle		49.0 – 59.0 deg	58.6
Time of Max. Flexion Angle		54.0 – 66.0 ms	59.1
Maximum Angle Theta (A)		32.0 – 37.0 deg	35.3
Time of Max. Theta (A)		53.0 – 63.0 ms	58.9
Maximum Angle Theta (B)		30.34 – 32.84 deg	30.99
Time of Max. Theta (B)		54.0 – 64.0 ms	59.7

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



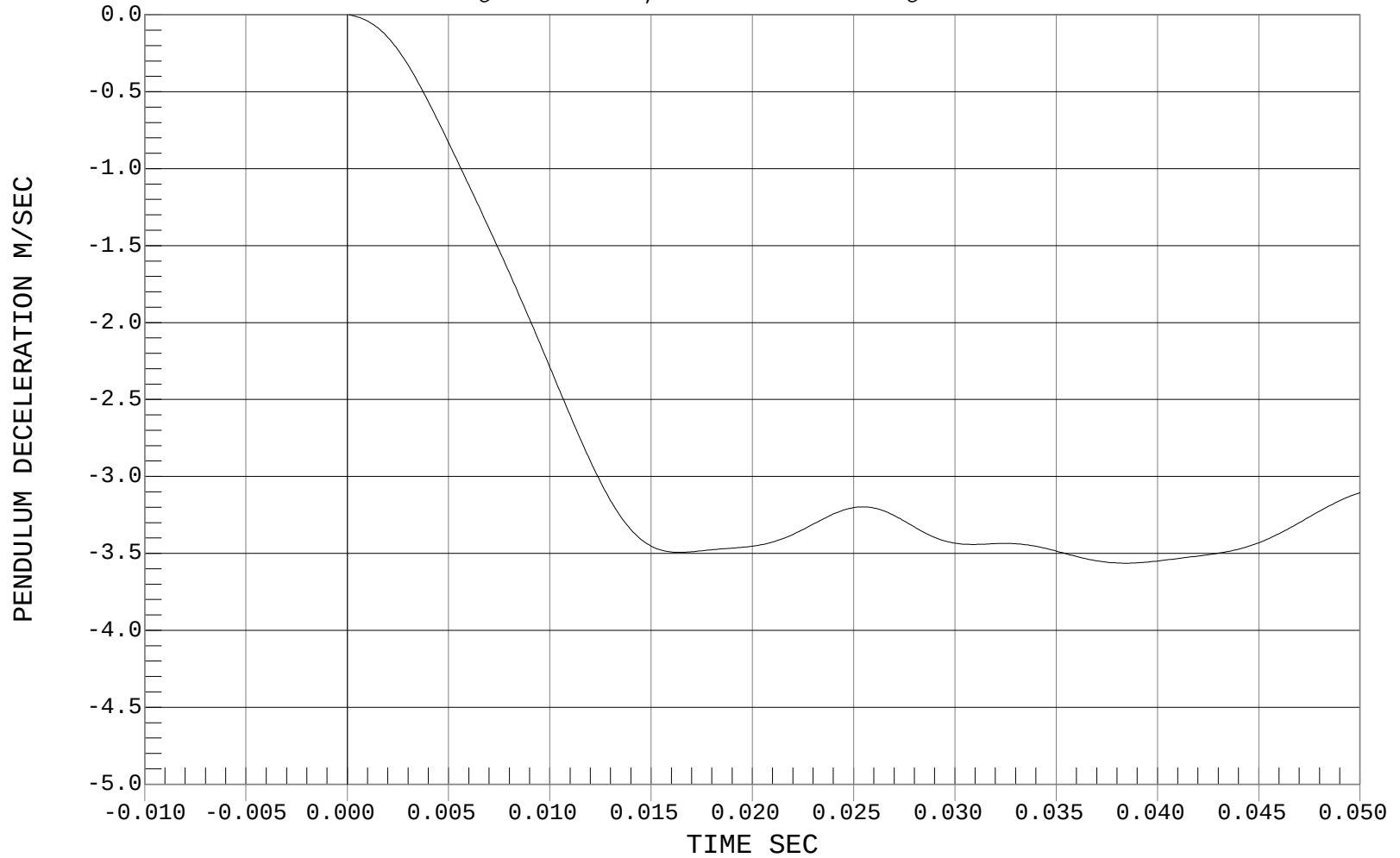
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy # 010

Test Date: 10-18-01
Speed: 11.04 FT/SEC, 3.36 M/SEC

— 1 PENDULUM DECELERATION, D01502AI.V04

Ymin = -4.47 M/SEC @ 0.01916 SEC, Ymax = 0 M/SEC @ 0.0001 SEC





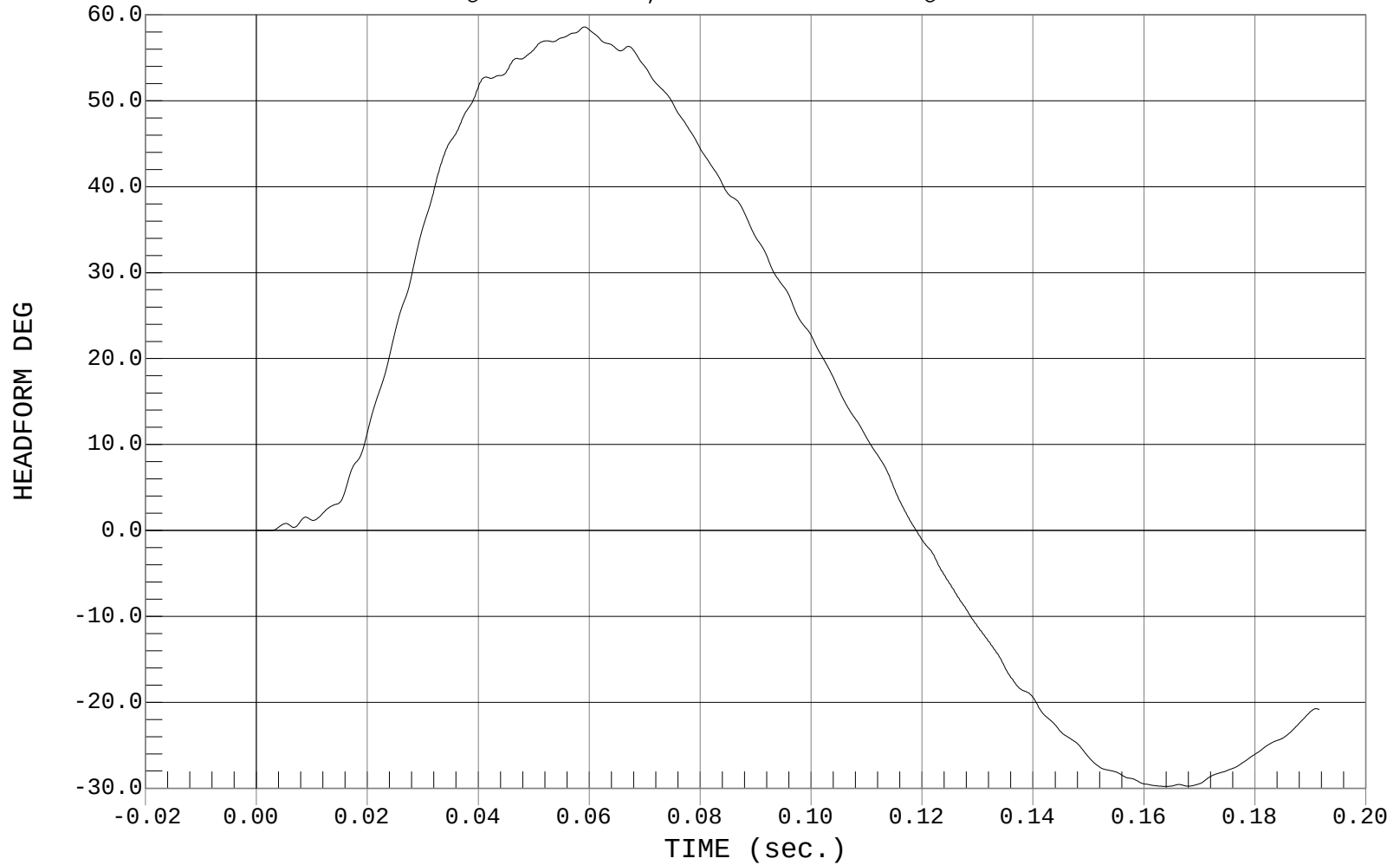
FLEXION ANGLE

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy # 010

Test Date: 10-18-01
Speed: 11.04 FT/SEC, 3.36 M/SEC

— 1 HEADFORM, D01502DT.D08

Ymin = -29.79 DEG @ 0.1638 sec., Ymax = 58.6 DEG @ 0.0591 sec.





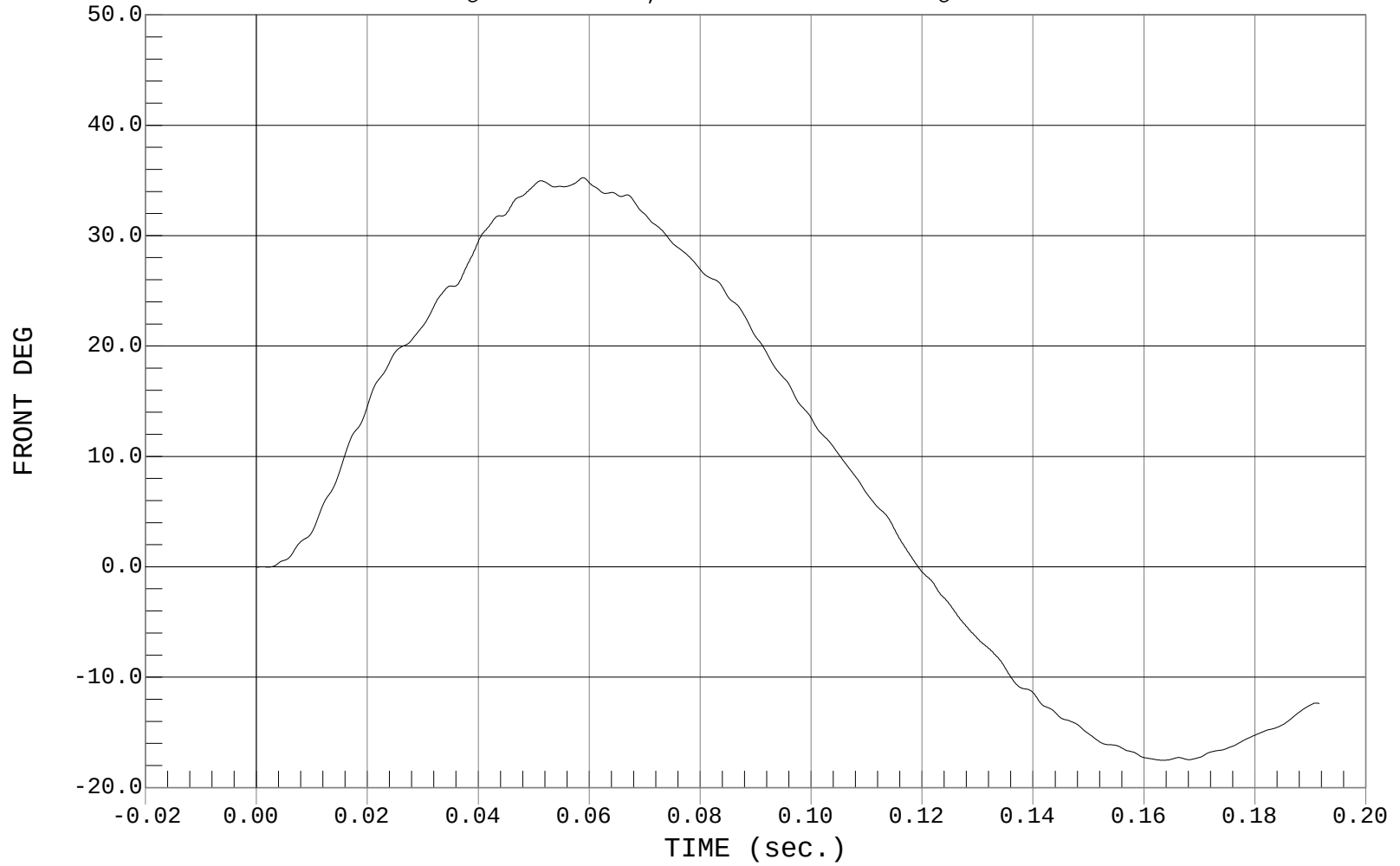
THETA A

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy # 010

Test Date: 10-18-01
Speed: 11.04 FT/SEC, 3.36 M/SEC

— 1 FRONT, D01502DT.D05

Ymin = -17.53 DEG @ 0.1635 sec., Ymax = 35.25 DEG @ 0.0589 sec.





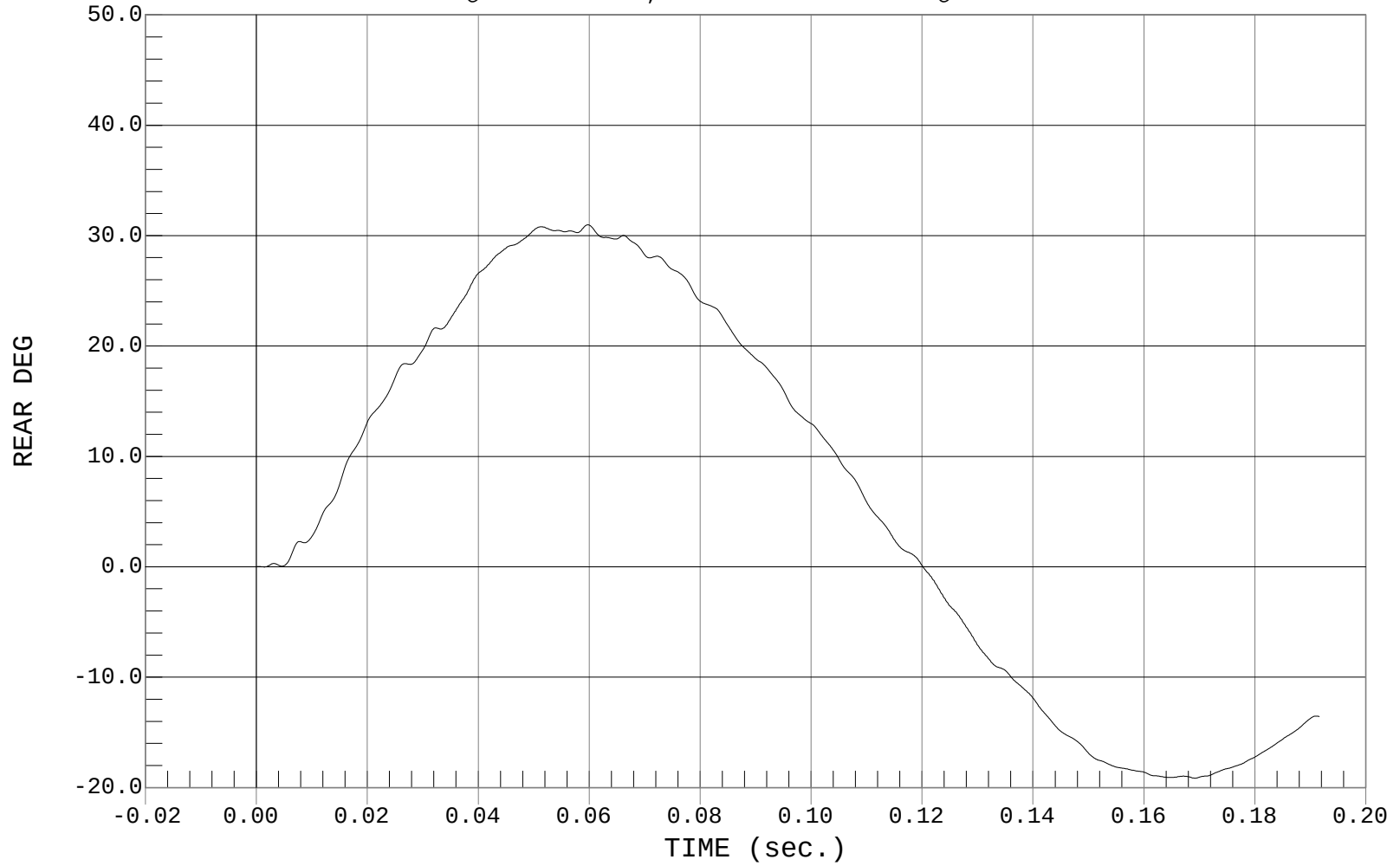
THETA B

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy # 010

Test Date: 10-18-01
Speed: 11.04 FT/SEC, 3.36 M/SEC

— 1 REAR, D01502DT.D06

Ymin = -19.15 DEG @ 0.1692 sec., Ymax = 30.99 DEG @ 0.0597 sec.



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
EUROSID 2 DUMMY

Date: 10/18/01

Dummy Serial Number: 010

Test Number: D011503

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.9
Relative Humidity (%)	10 – 70	31
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	9.1
Time of Max. Pendulum Acceleration		25.3 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



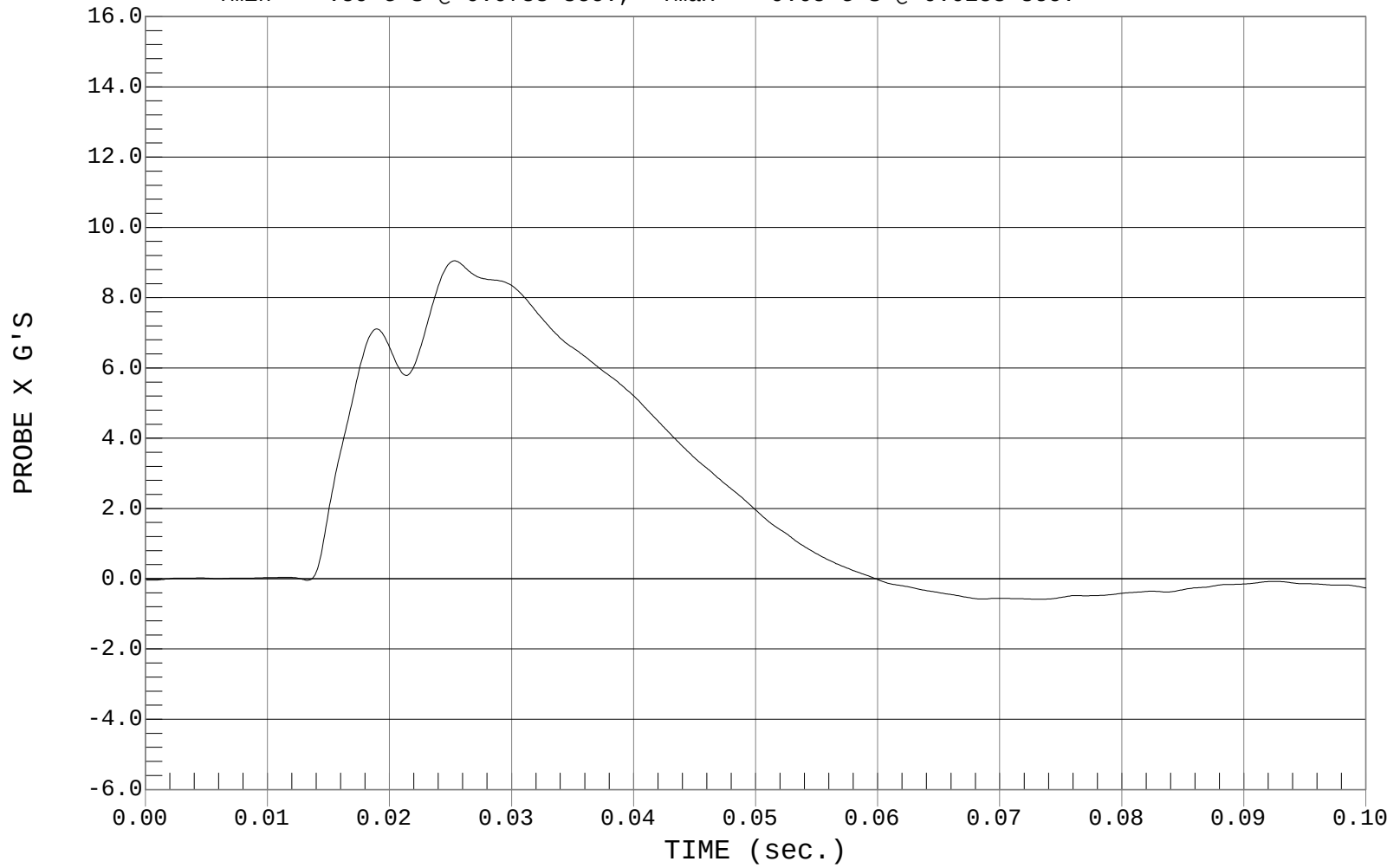
SHOULDER ACCELERATION

Test Desc.: Dummy Calibration - Shoulder Impact
Component: Dummy #010

Test Date: 10-18-01
Speed: 14.10 FT/SEC, 4.30 M/SEC

— 1 PROBE X, D01503AF.A01

Ymin = -.59 G'S @ 0.0733 sec., Ymax = 9.05 G'S @ 0.0253 sec.



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

Date: 10/16/01
Dummy Serial Number: 010
Test Number: D011504/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.3
Relative Humidity (%)	10 – 70	31
Displacement at 2 m/s	23.5 – 27.5 mm	24.7
Displacement at 3 m/s	36.0 – 40.0 mm	39.1
Displacement at 4 m/s	46.0 – 51.0 mm	49.7

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.3
Relative Humidity (%)	10 – 70	31
Displacement at 2 m/s	23.5 – 27.5 mm	25.0
Displacement at 3 m/s	36.0 – 40.0 mm	37.7
Displacement at 4 m/s	46.0 – 51.0 mm	49.8

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.3
Relative Humidity (%)	10 – 70	31
Displacement at 2 m/s	23.5 – 27.5 mm	23.6
Displacement at 3 m/s	36.0 – 40.0 mm	37.5
Displacement at 4 m/s	46.0 – 51.0 mm	49.4

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



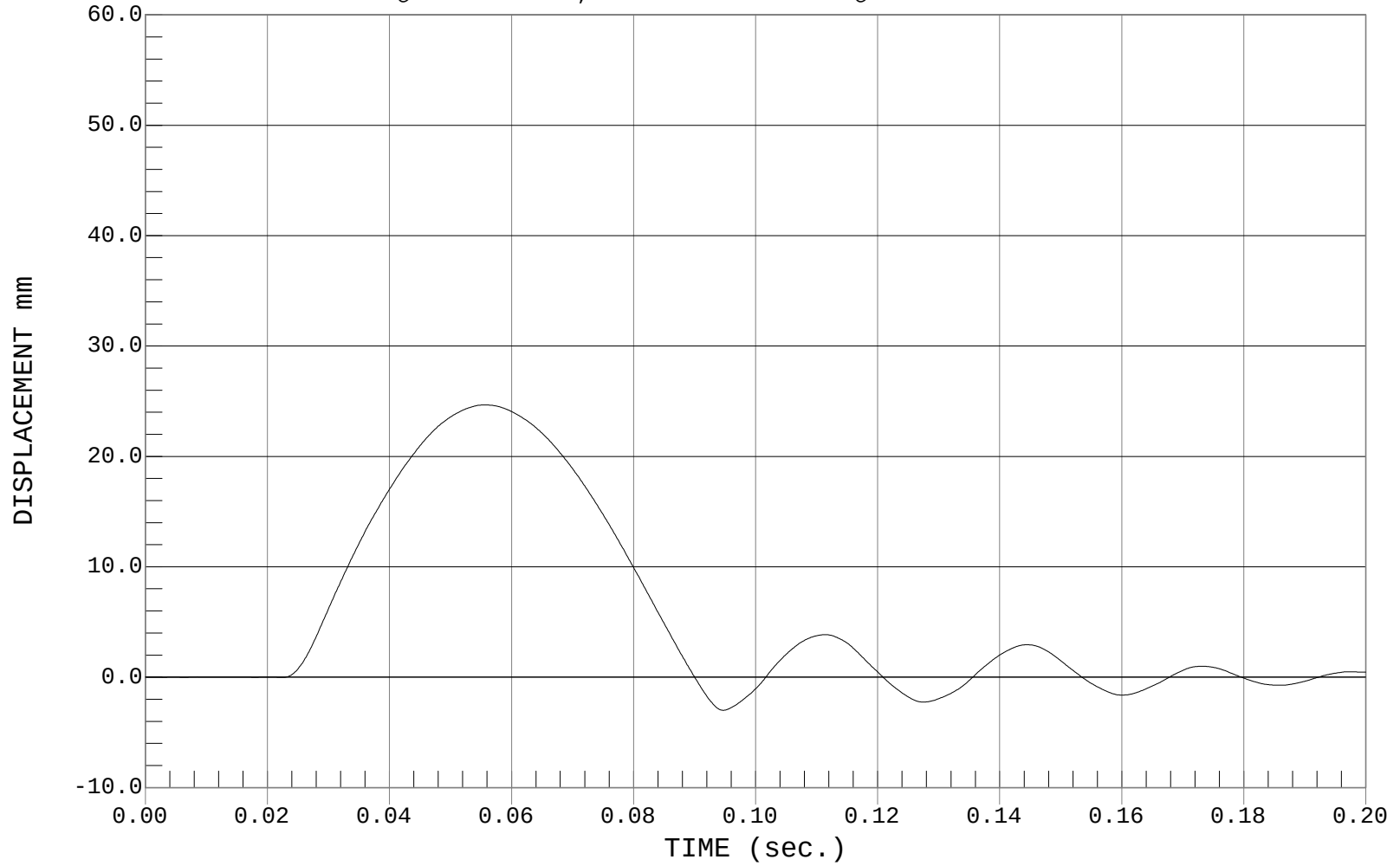
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy # 010

Test Date: 10-16-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01504DF.D05

Ymin = -3 mm @ 0.0947 sec., Ymax = 24.67 mm @ 0.0556 sec.





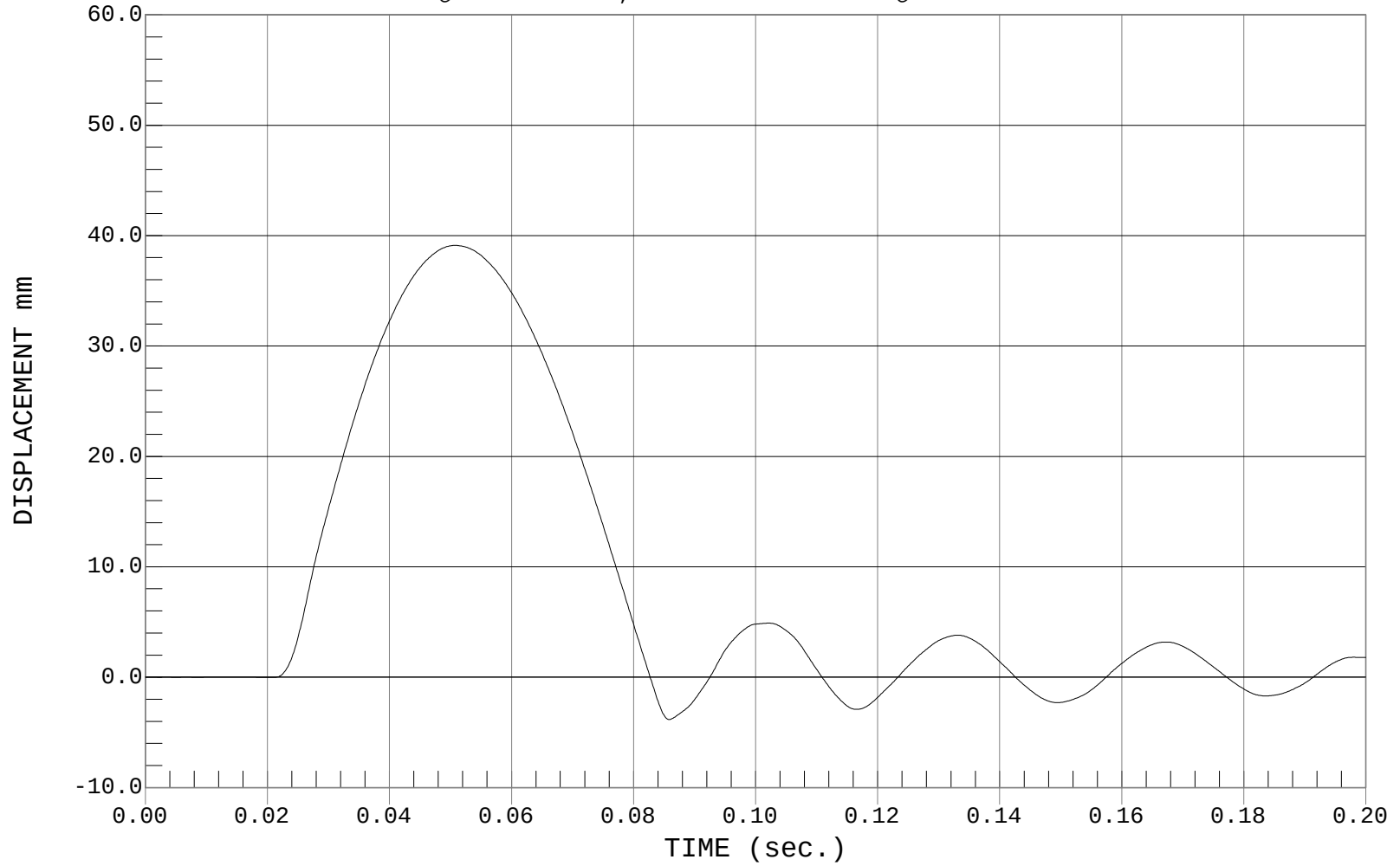
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy # 010

Test Date: 10-16-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01504DF.D06

Ymin = -3.83 mm @ 0.0859 sec., Ymax = 39.12 mm @ 0.0508 sec.





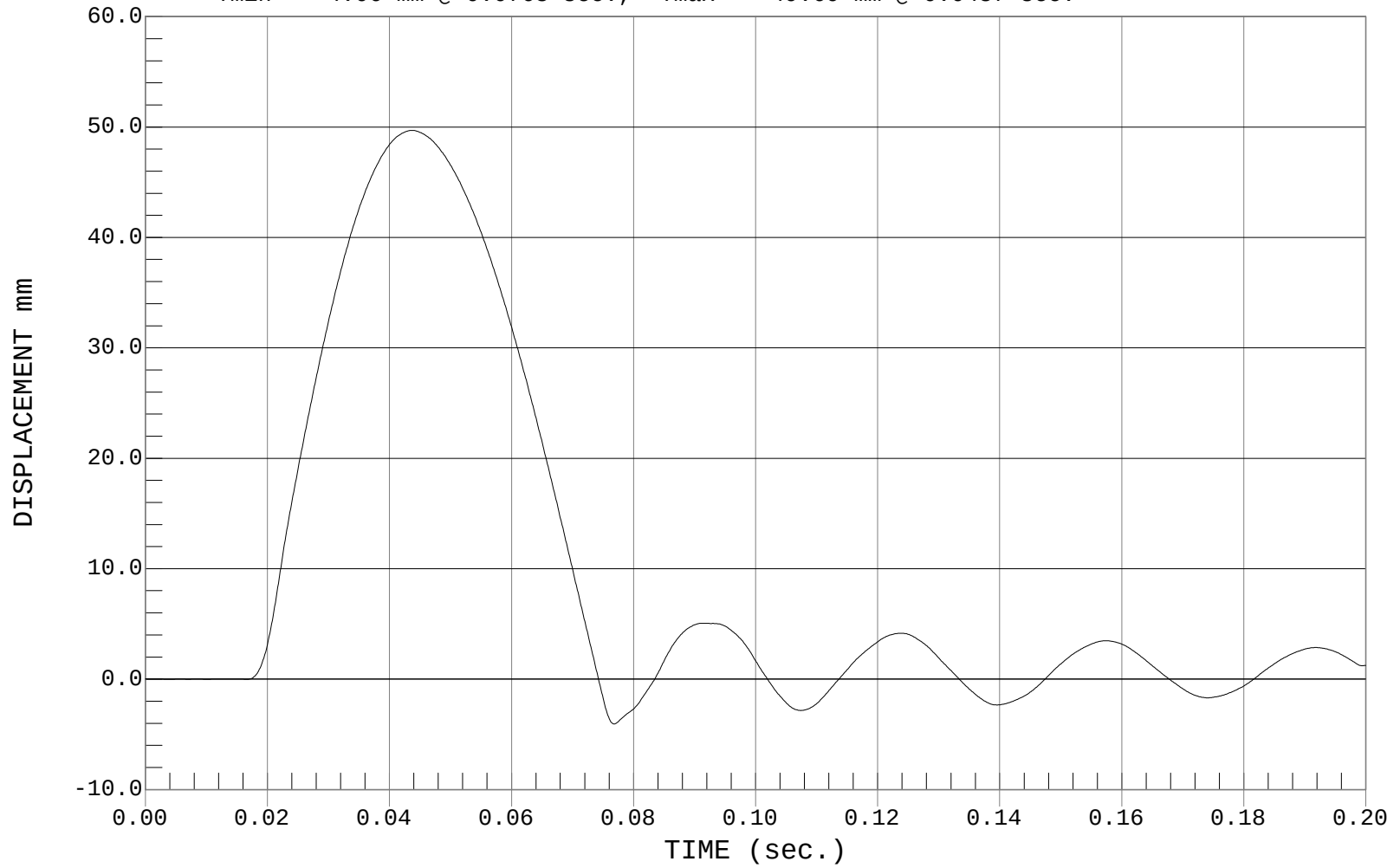
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy # 010

Test Date: 10-16-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01504DF.D07

Ymin = -4.06 mm @ 0.0768 sec., Ymax = 49.69 mm @ 0.0437 sec.





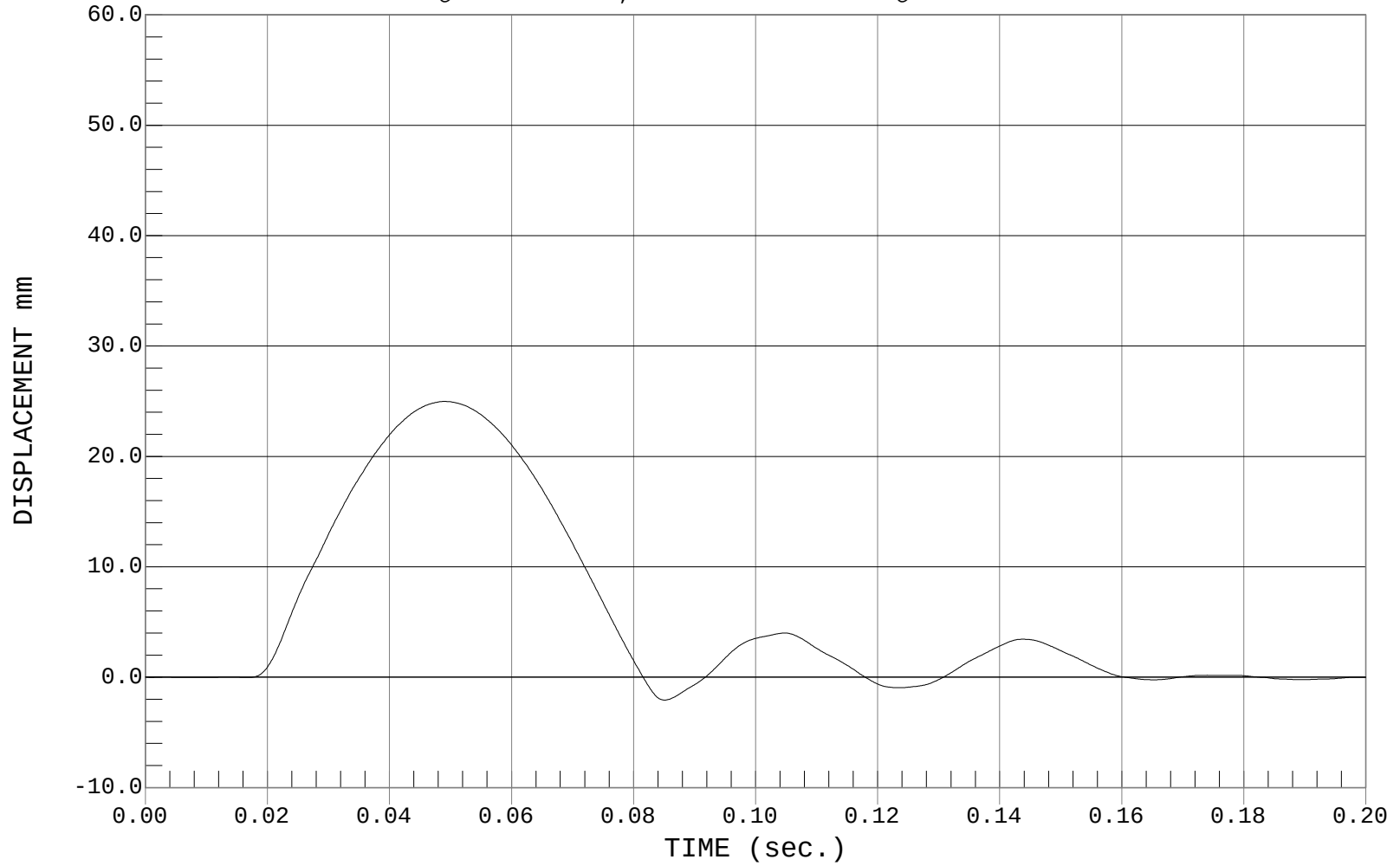
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy # 010

Test Date: 10-16-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01505DF.D05

Ymin = -2.07 mm @ 0.0851 sec., Ymax = 24.98 mm @ 0.0490 sec.





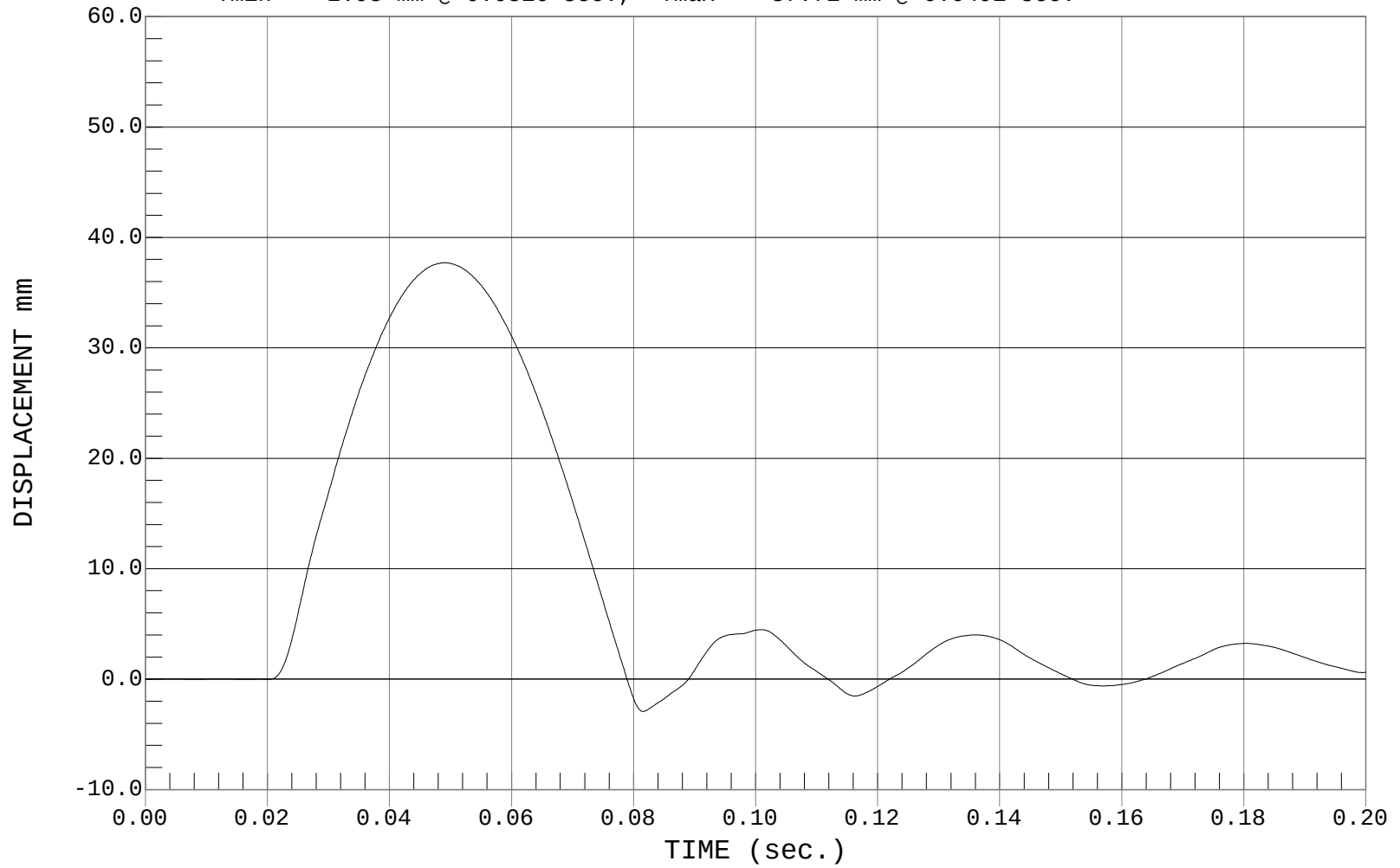
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy # 010

Test Date: 10-16-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01505DF.D06

Ymin = -2.93 mm @ 0.0816 sec., Ymax = 37.71 mm @ 0.0491 sec.





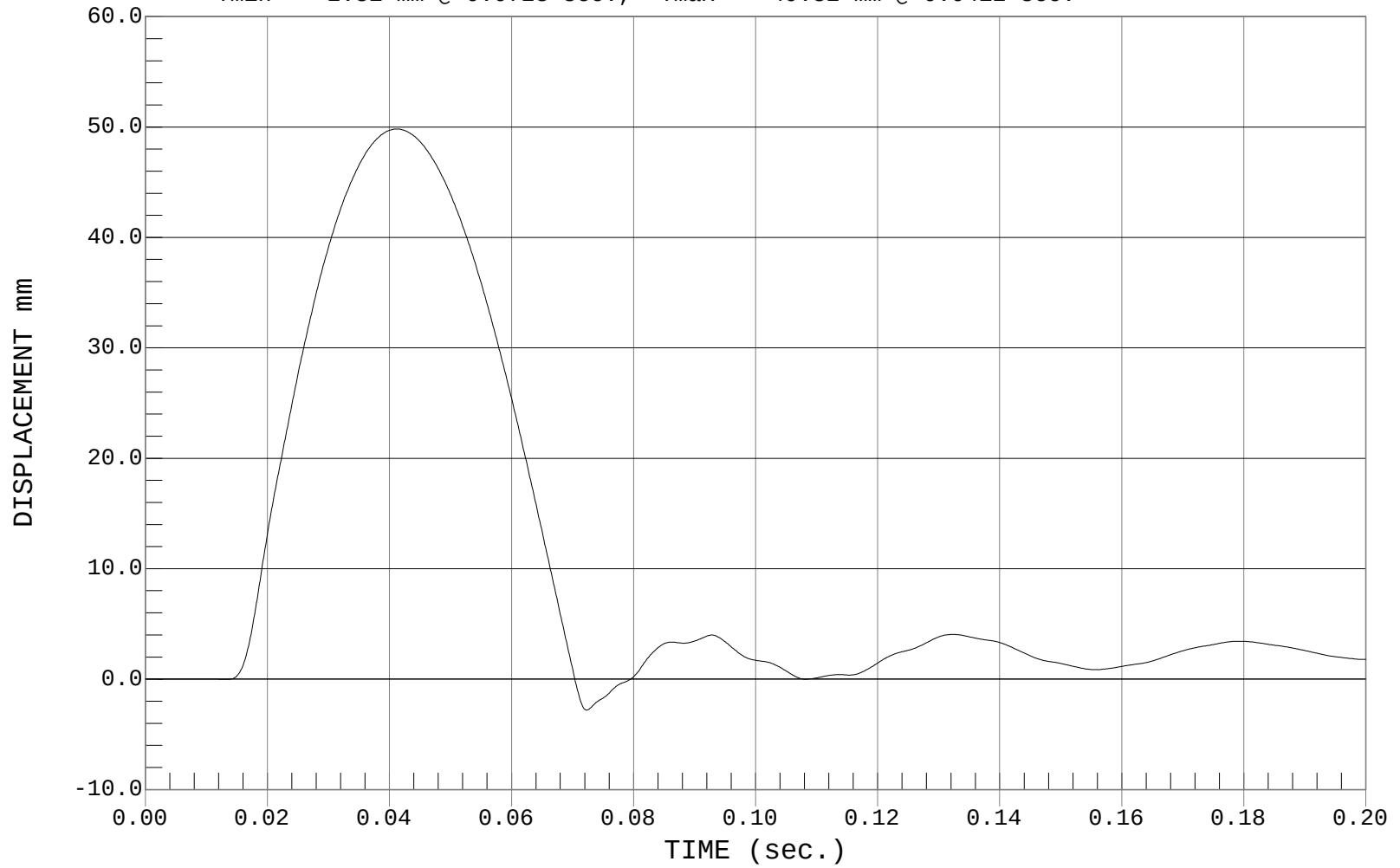
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy # 010

Test Date: 10-16-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01505DF.D07

Ymin = -2.81 mm @ 0.0723 sec., Ymax = 49.82 mm @ 0.0412 sec.





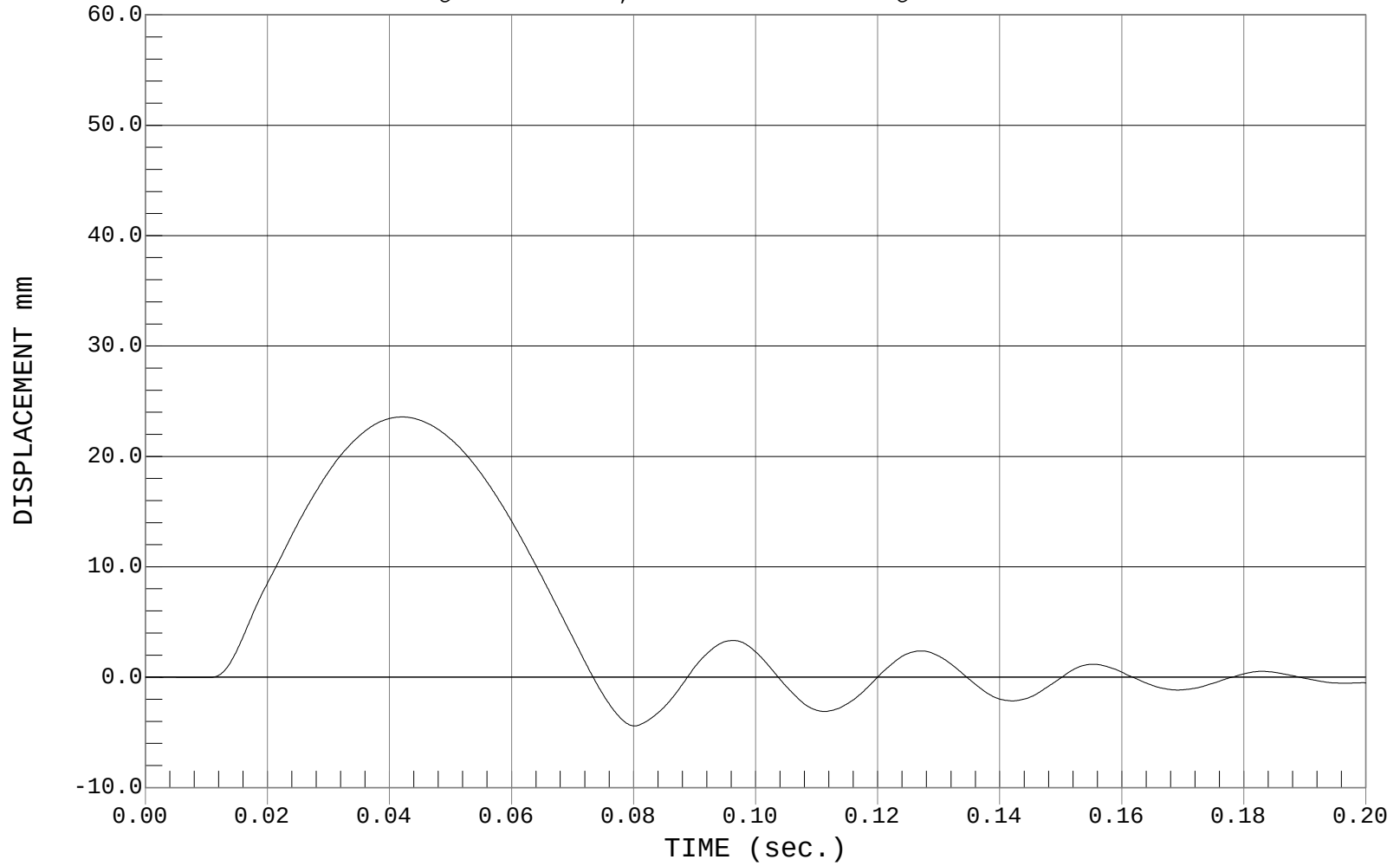
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy # 010

Test Date: 10-16-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01506DF.D05

Ymin = -4.42 mm @ 0.0802 sec., Ymax = 23.57 mm @ 0.0421 sec.





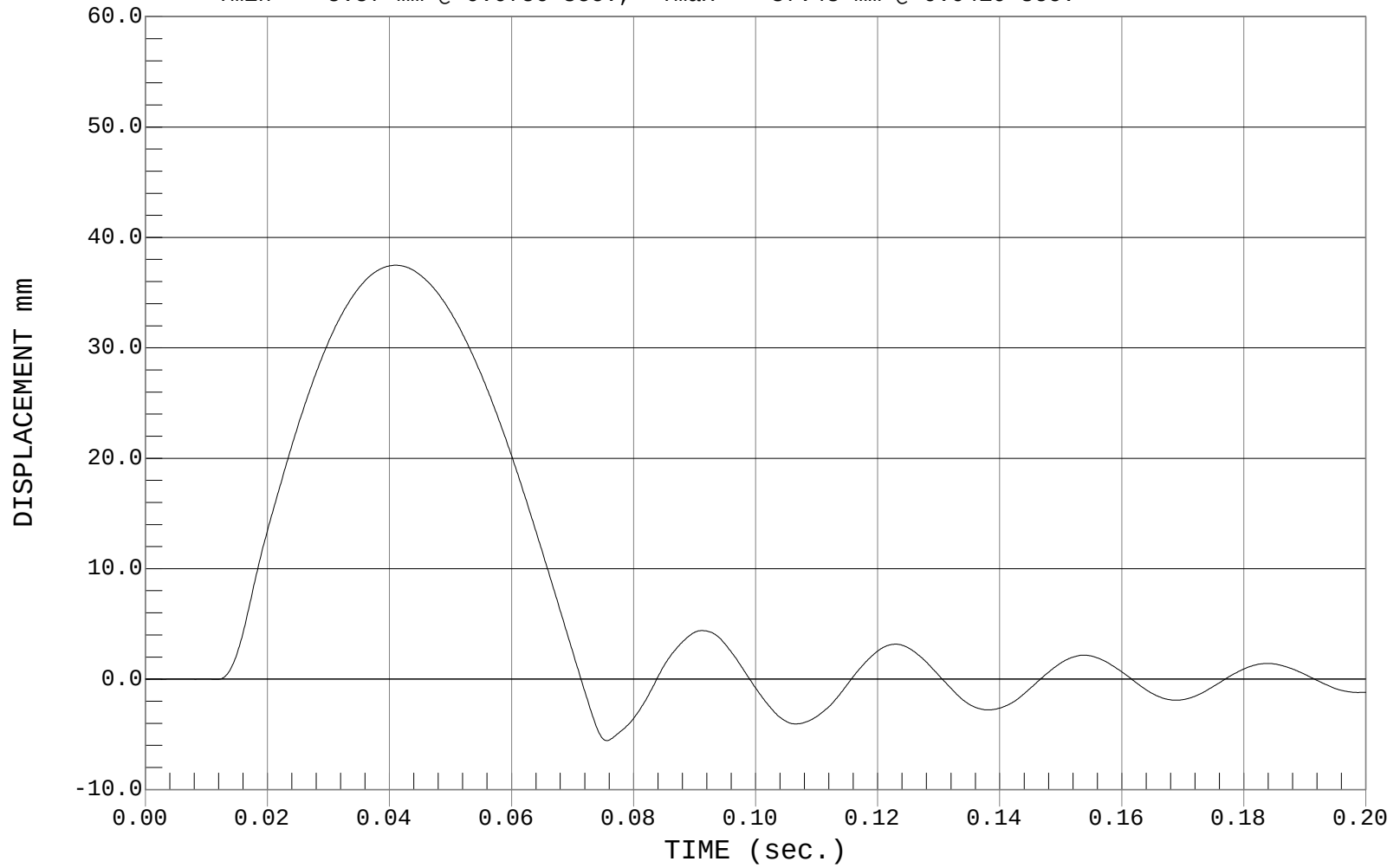
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy # 010

Test Date: 10-16-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01506DF.D06

Ymin = -5.57 mm @ 0.0756 sec., Ymax = 37.48 mm @ 0.0410 sec.





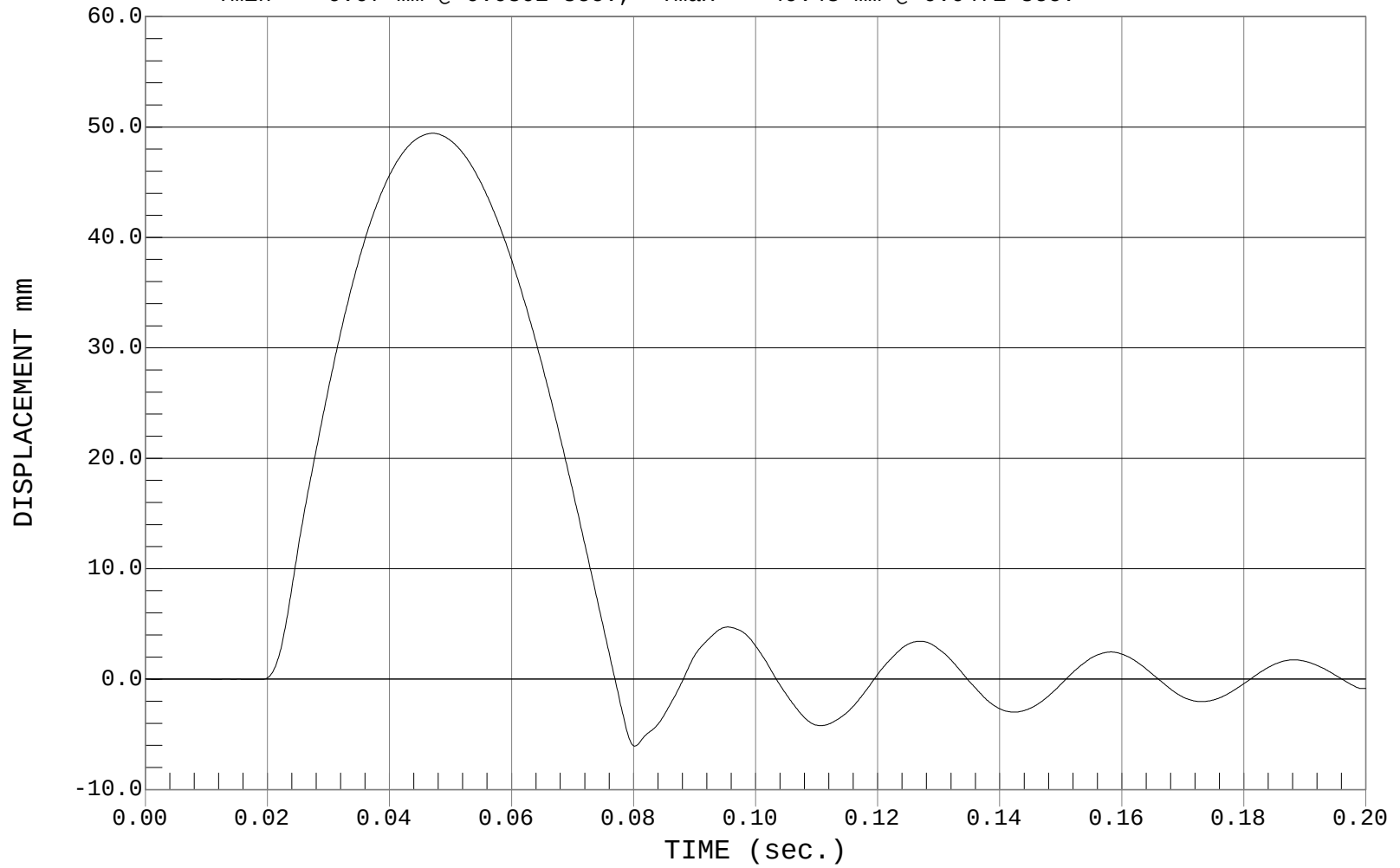
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy # 010

Test Date: 10-16-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01506DF.D07

Ymin = -6.07 mm @ 0.0802 sec., Ymax = 49.43 mm @ 0.0471 sec.



MGA RESEARCH CORPORATION
ABDOMEN TEST
EUROSID 2 DUMMY

Date: 10/18/01

Dummy Serial Number: 010

Test Number: D011507

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.7
Relative Humidity (%)	10 – 70	31
Probe Speed (m/s)	3.90 – 4.10	4.00
Maximum Impact Force	4.00 – 4.80 kN	4.78
Time of Maximum Force	10.60 – 13.00 ms	12.20
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.20
Time of Max. Total Force	10.00 – 12.30 ms	11.90

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



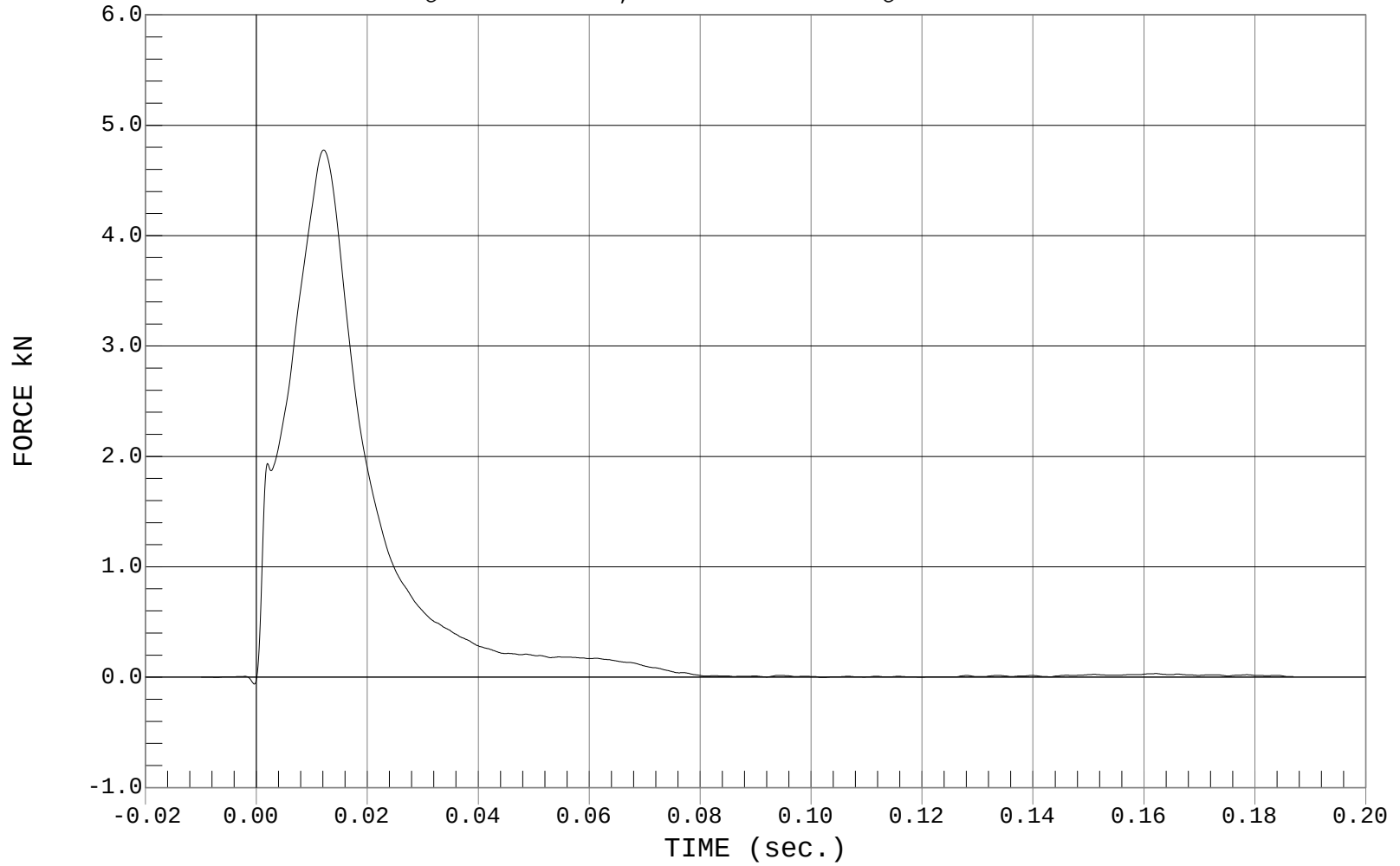
IMPACTOR FORCE

Test Desc.: Dummy Calibration - Abdomen Impact
Component: Dummy #010

Test Date: 10-18-01
Speed: 13.11 FT/SEC, 4.00 M/SEC

— 1 FORCE, D01507FT.F01

Ymin = -.06 kN @ -0.0004 sec., Ymax = 4.78 kN @ 0.0122 sec.





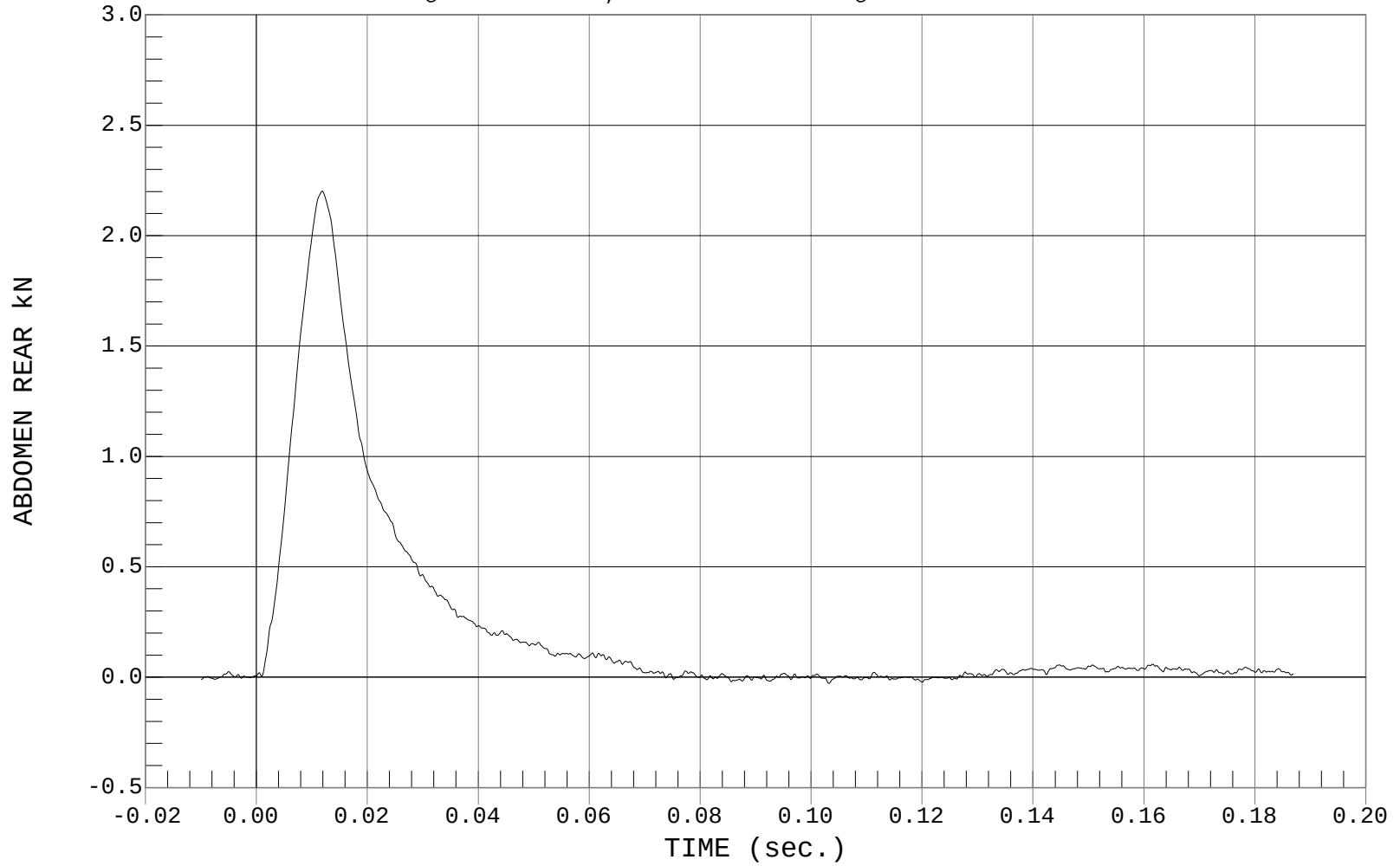
ABDOMEN FORCE

Test Desc.: Dummy Calibration - Abdomen Impact
Component: Dummy #010

Test Date: 10-18-01
Speed: 13.11 FT/SEC, 4.00 M/SEC

— 1 ABDOMEN REAR, D01507FT.F02

Ymin = -.03 kN @ 0.1032 sec., Ymax = 2.2 kN @ 0.0119 sec.



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
EUROSID 2 DUMMY

Date: 10/18/01

Dummy Serial Number: 010

Test Number: D011508

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.0
Relative Humidity (%)		10 – 70	29
Pendulum Speed		5.95 – 6.15	6.08
Pendulum Deceleration	10 msec	2.46 - 1.59 m/sec	-1.91
	20 msec	5.25 - 4.07 m/sec	-4.34
	25 msec	6.64 - 5.3 m/sec	-5.42
	30 msec	≥ -6.5 m/sec	-6.1
Maximum Flexion Angle		45.0 – 55.0 deg	54.6
Time of Max. Flexion Angle		39.0 – 53.0 ms	50.8
Maximum Angle Theta (A)		31.0 – 35.0 deg	34.5
Time of Max. Theta (A)		44.0 – 52.0 ms	50.9
Maximum Angle Theta (B)		29.60 – 32.10 deg	30.45
Time of Max. Theta (B)		44.0 – 52.0 ms	51.4

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



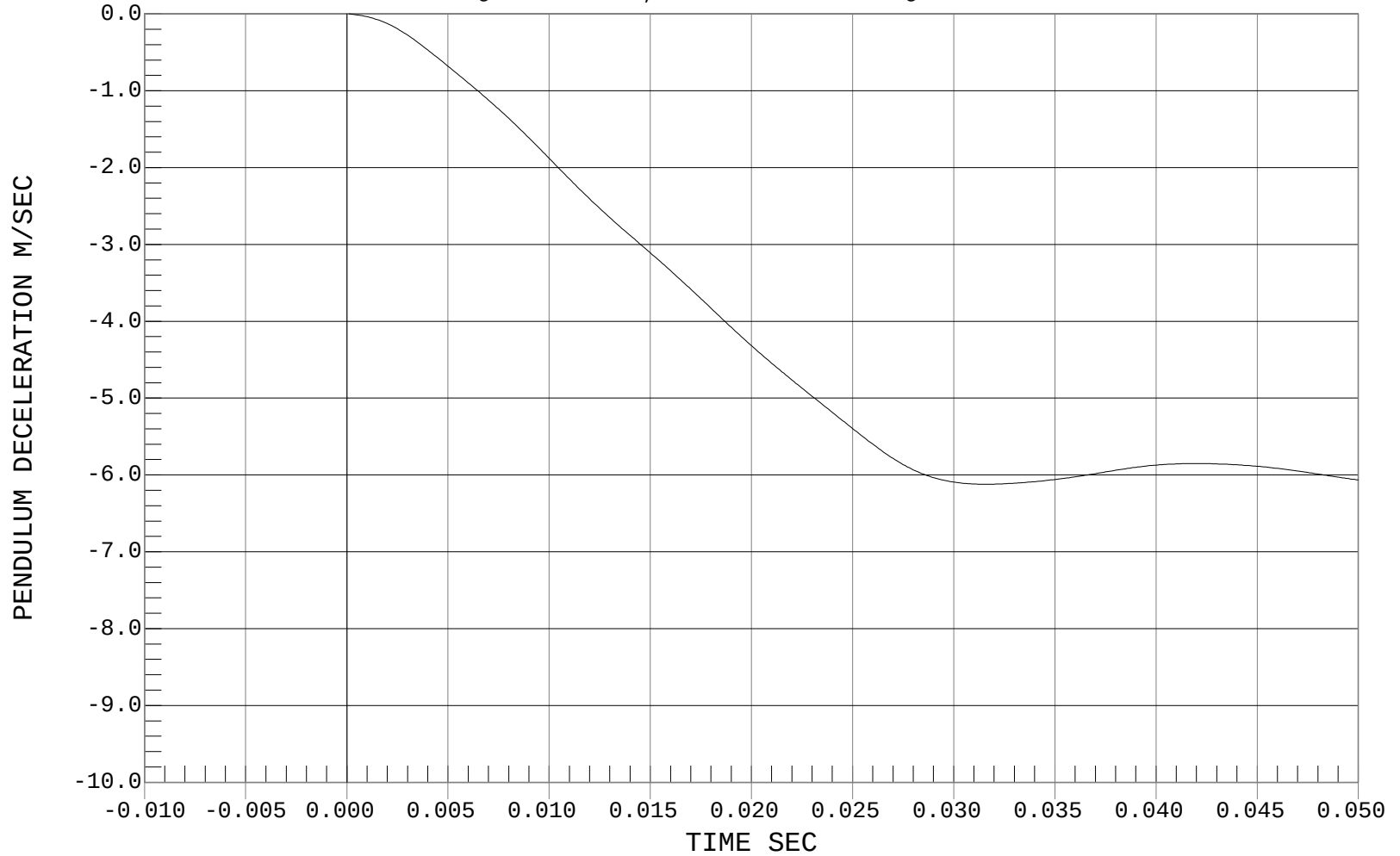
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy # 010

Test Date: 10-18-01
Speed: 19.96 FT/SEC, 6.08 M/SEC

— 1 PENDULUM DECELERATION, D01508AI.V04

Ymin = -7.53 M/SEC @ 0.1471 SEC, Ymax = 0 M/SEC @ 0.0001 SEC





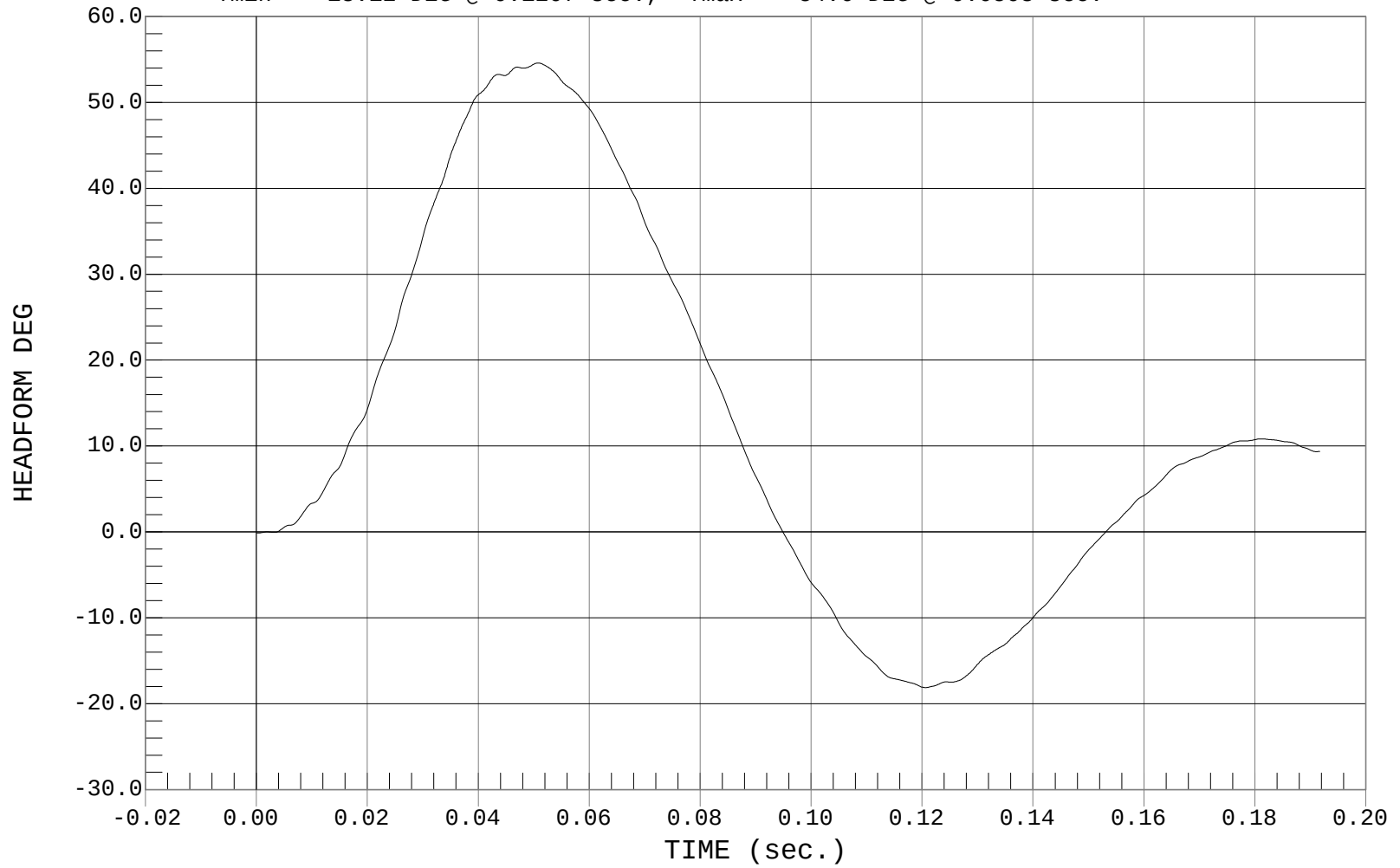
FLEXION ANGLE

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy # 010

Test Date: 10-18-01
Speed: 19.96 FT/SEC, 6.08 M/SEC

— 1 HEADFORM, D01508DT.D08

Ymin = -18.12 DEG @ 0.1207 sec., Ymax = 54.6 DEG @ 0.0508 sec.





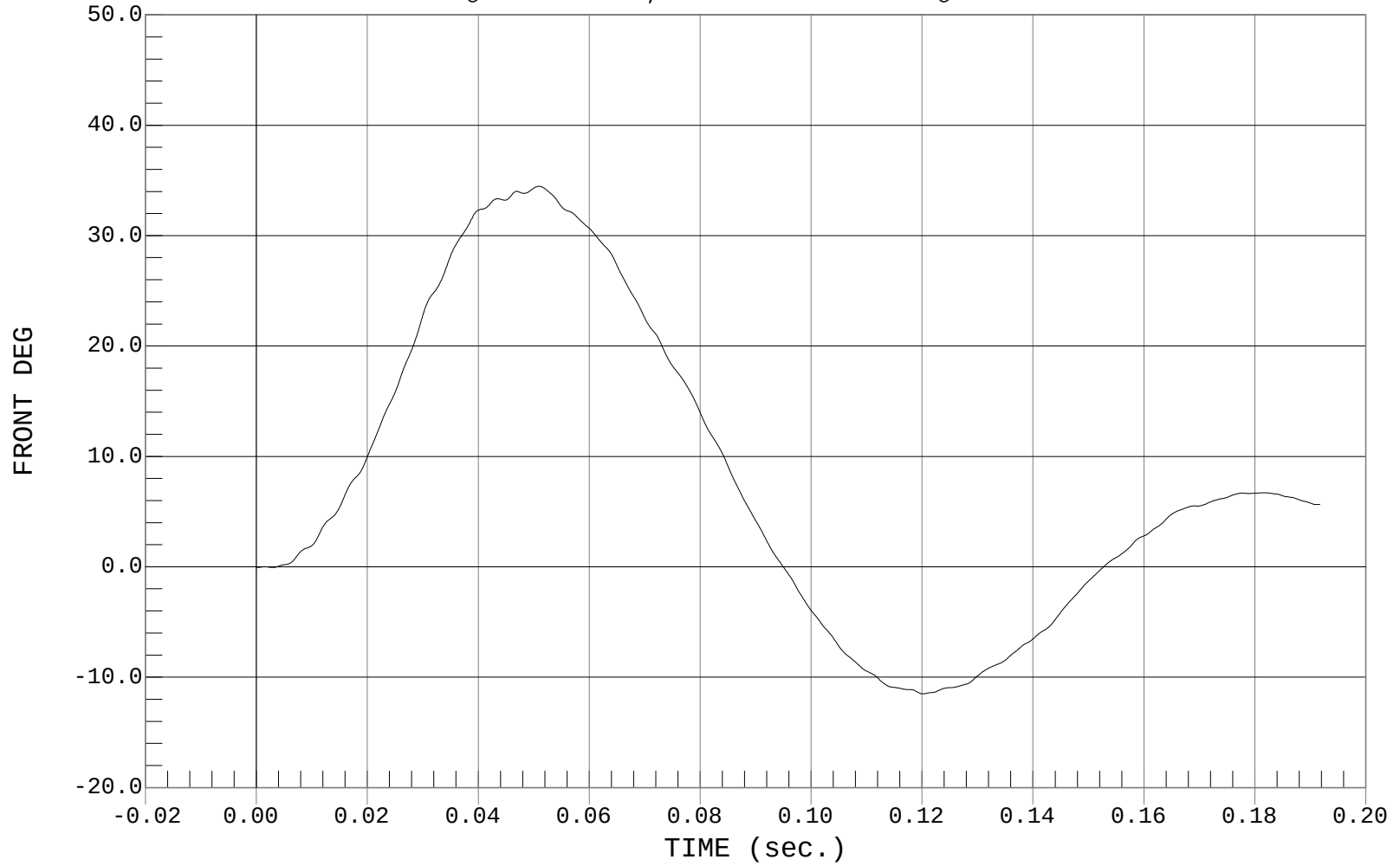
THETA A

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy # 010

Test Date: 10-18-01
Speed: 19.96 FT/SEC, 6.08 M/SEC

— 1 FRONT, D01508DT.D05

Ymin = -11.51 DEG @ 0.1201 sec., Ymax = 34.47 DEG @ 0.0509 sec.





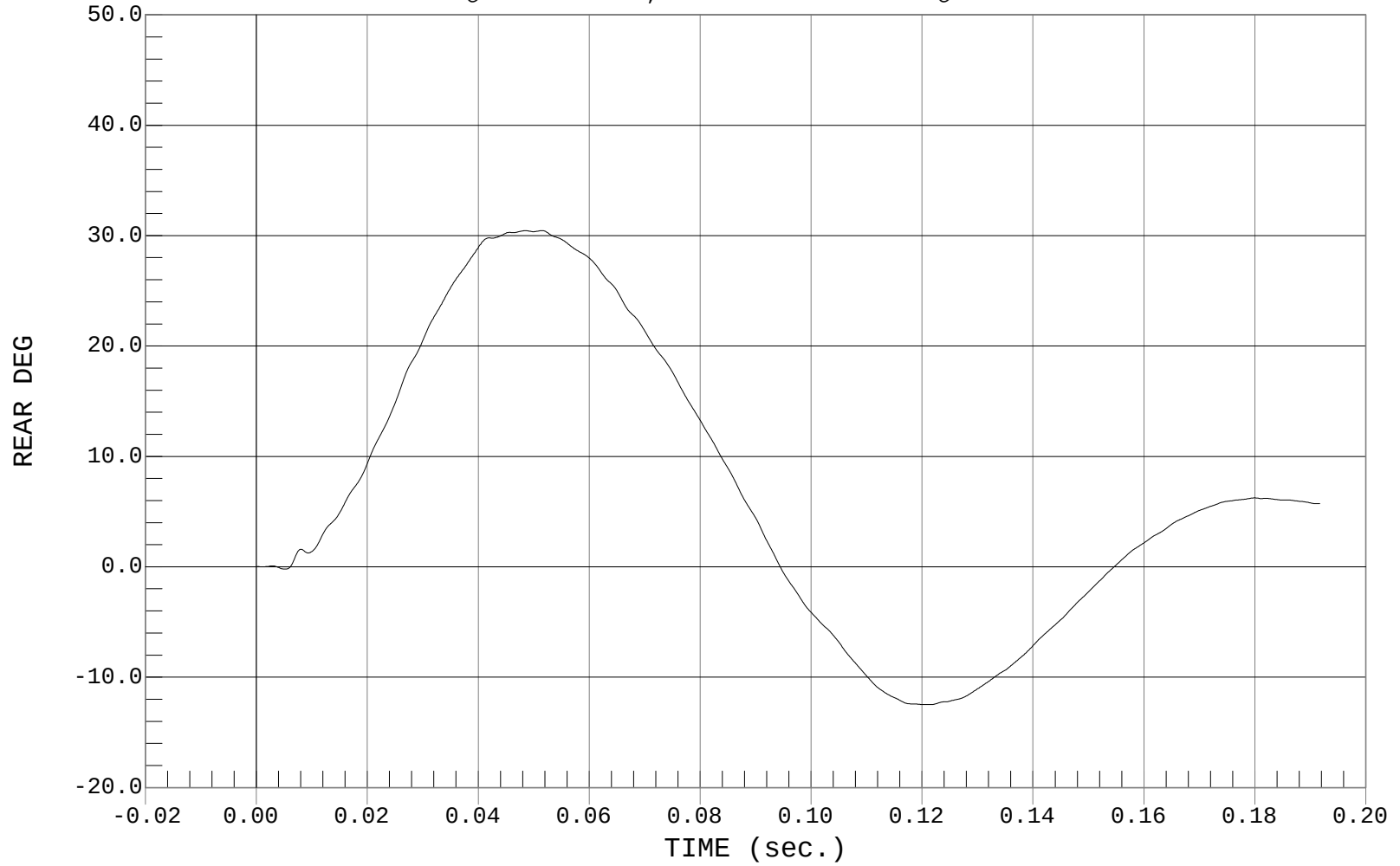
THETA B

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy # 010

Test Date: 10-18-01
Speed: 19.96 FT/SEC, 6.08 M/SEC

1 REAR, D01508DT.D06

Ymin = -12.48 DEG @ 0.1204 sec., Ymax = 30.45 DEG @ 0.0514 sec.



MGA RESEARCH CORPORATION
PELVIS TEST
EUROSID 2 DUMMY

Date: 10/18/01

Dummy Serial Number: 010

Test Number: D011509

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.9
Relative Humidity (%)	10 – 70	31
Pendulum Speed	6.20 – 6.30 m/s	6.27
Maximum Impactor Force	9.80 – 12.20 kN	10.95
Time of Max. Impactor Force	9.50 – 12.50 ms	12.10
Maximum Pubic Force	2.65 – 3.35 kN	3.32
Time of Max. Pubic Force	10.00 – 13.00 ms	12.20

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



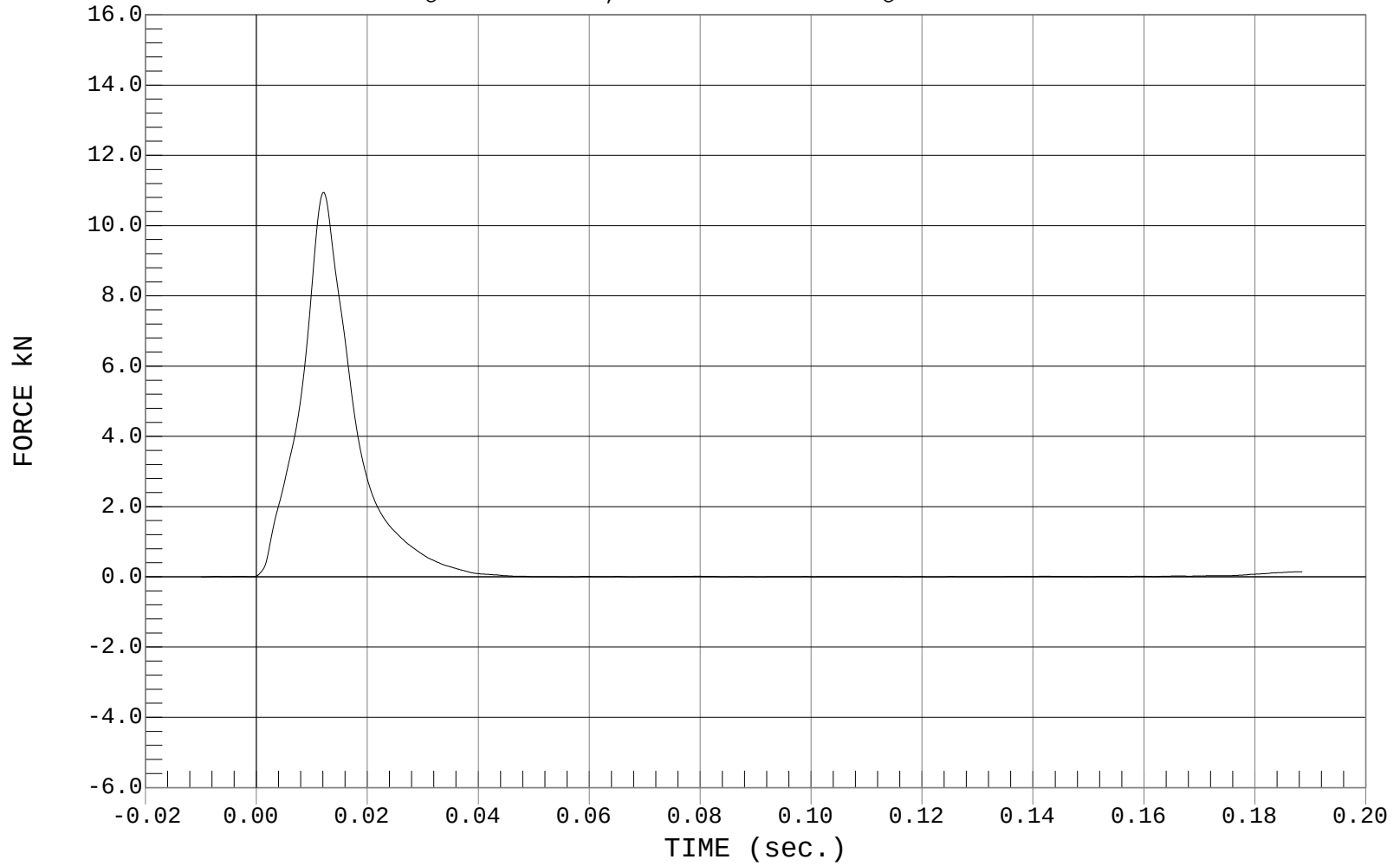
IMPACTOR FORCE

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #010

Test Date: 10-18-01
Speed: 20.57 FT/SEC, 6.27 M/SEC

— 1 FORCE, D01509FT.F01

Ymin = -.01 kN @ 0.1172 sec., Ymax = 10.95 kN @ 0.0121 sec.





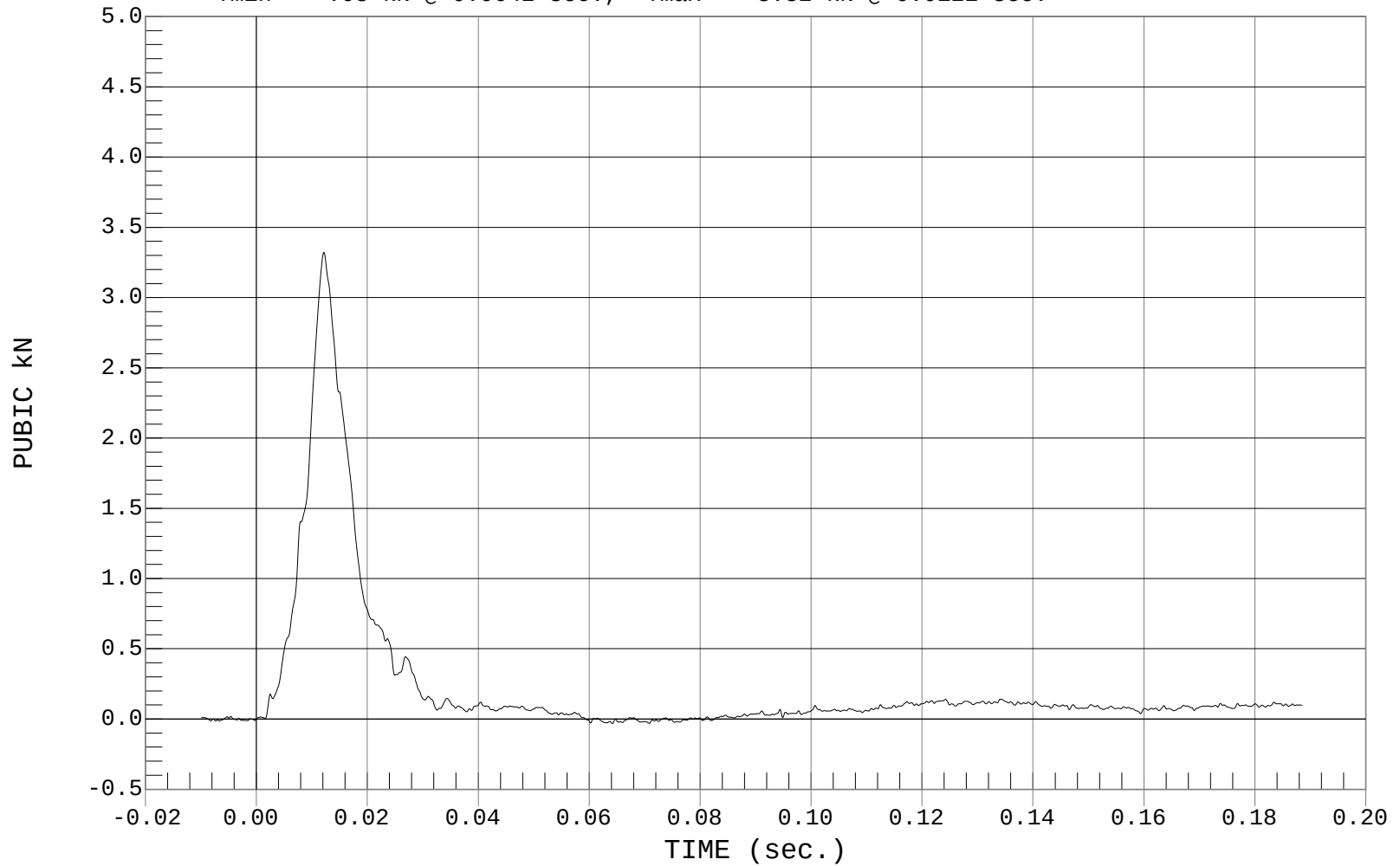
PUBIC FORCE

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #010

Test Date: 10-18-01
Speed: 20.57 FT/SEC, 6.27 M/SEC

— 1 PUBIC, D01509FT.F02

Ymin = -.03 kN @ 0.0642 sec., Ymax = 3.32 kN @ 0.0122 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: 10/22/01

Dummy Serial Number: 009

Test Number: D011511

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.5
Relative Humidity (%)	10 – 70	39
Peak Resultant Acceleration	100 – 150 g's	149
Time of Max. Res. Acceleration		25.9 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



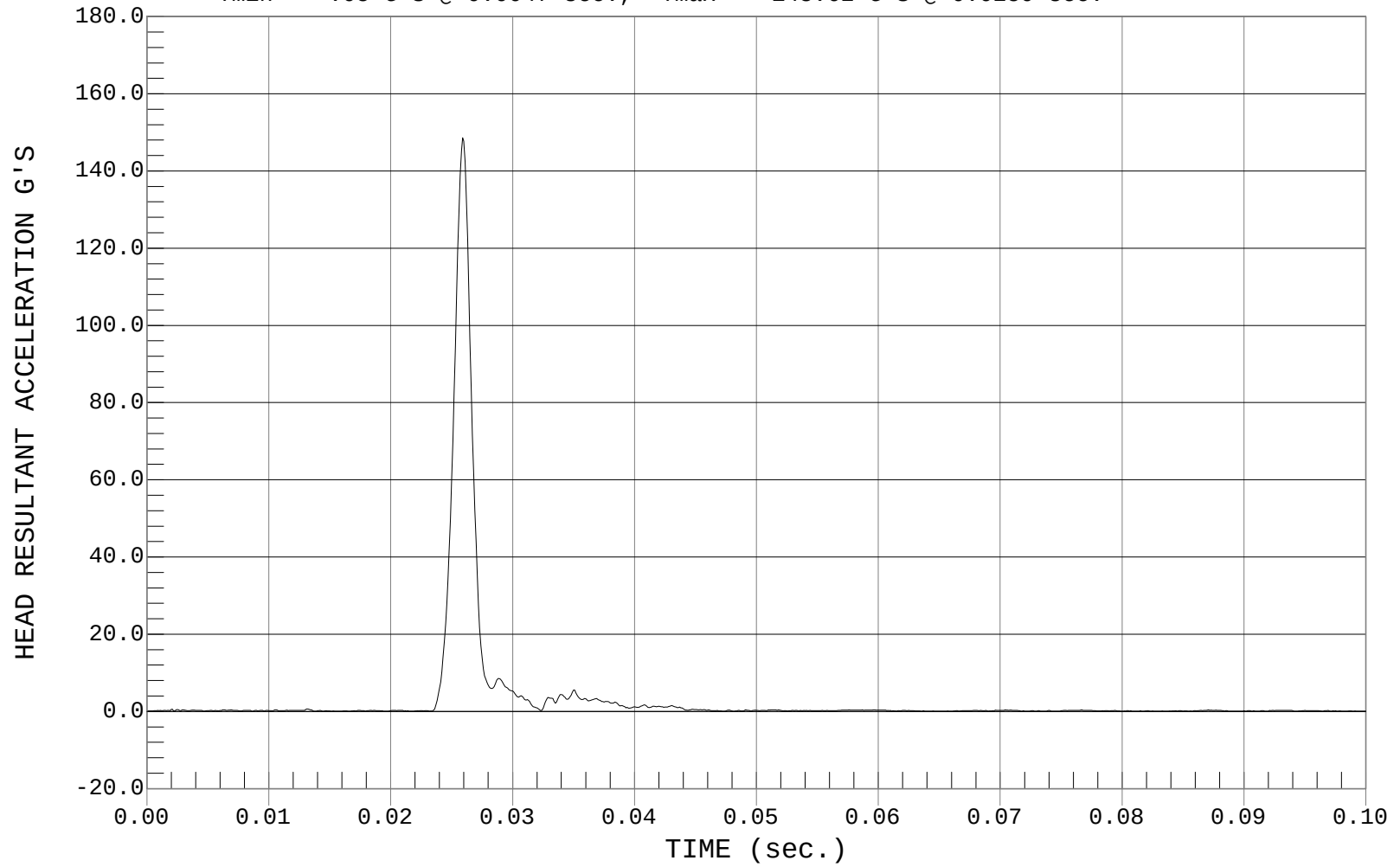
PEAK RESULTANT ACCELERATION

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

Test Date: 10-22-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01511AV.A01

Ymin = .05 G'S @ 0.0047 sec., Ymax = 148.62 G'S @ 0.0259 sec.



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
EUROSID 2 DUMMY

Date: 10/22/01

Dummy Serial Number: 009

Test Number: D011512

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.5
Relative Humidity (%)		10 – 70	42
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	-1.72
	14 msec	~3.20 - ~3.85 m/sec	-3.34
Maximum Flexion Angle		49.0 – 59.0 deg	56.8
Time of Max. Flexion Angle		54.0 – 66.0 ms	57.6
Maximum Angle Theta (A)		32.0 – 37.0 deg	34.2
Time of Max. Theta (A)		53.0 – 63.0 ms	58.2
Maximum Angle Theta (B)		29.45 – 31.95 deg	30.73
Time of Max. Theta (B)		54.0 – 64.0 ms	57.5

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



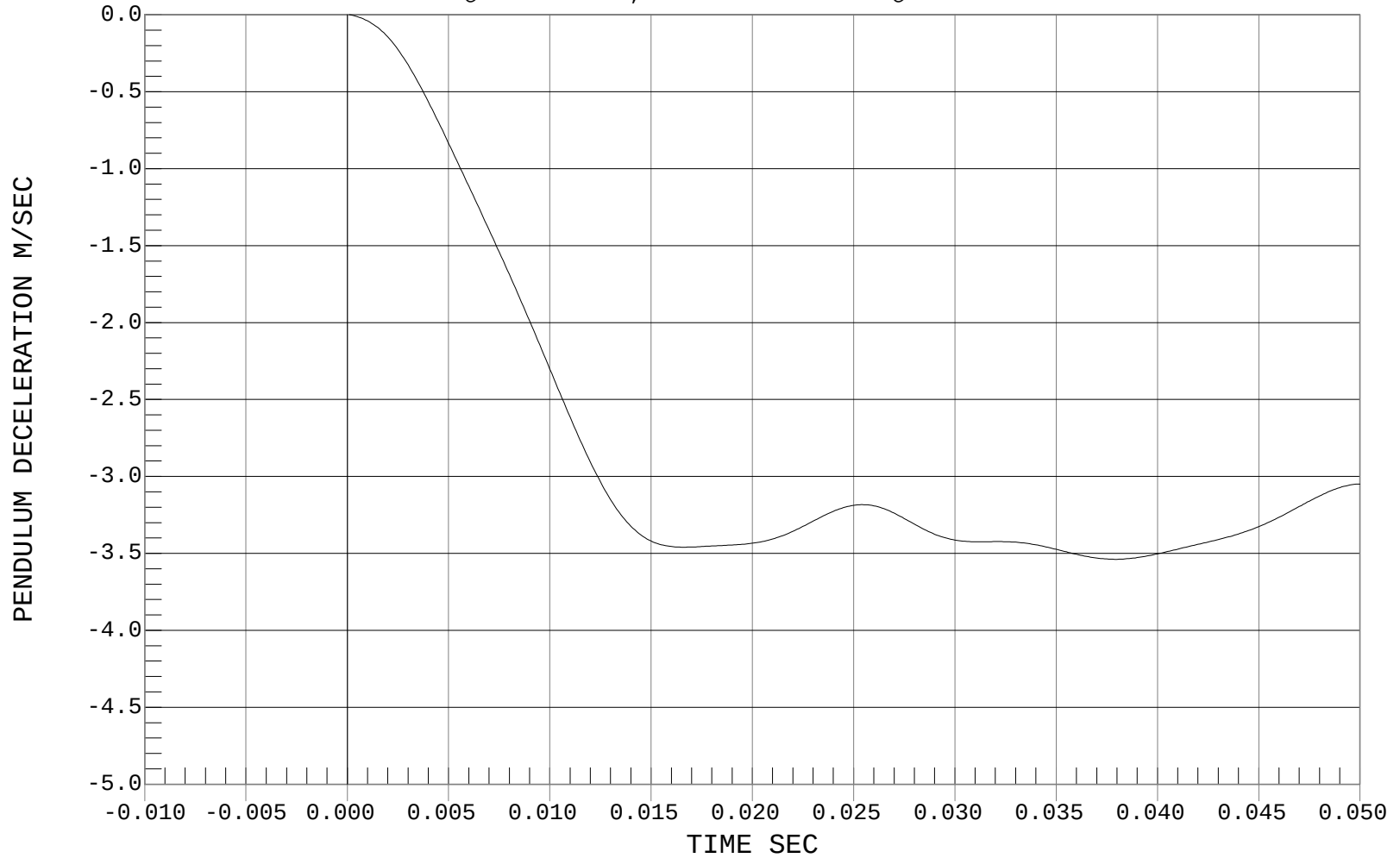
PENDULUM DECELERATION

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

Test Date: 10-22-01
Speed: 11.10 FT/SEC, 3.38 M/SEC

— 1 PENDULUM DECELERATION, D01512AI.V04

Ymin = -4.3 M/SEC @ 0.01910 SEC, Ymax = 0 M/SEC @ 0.00001 SEC





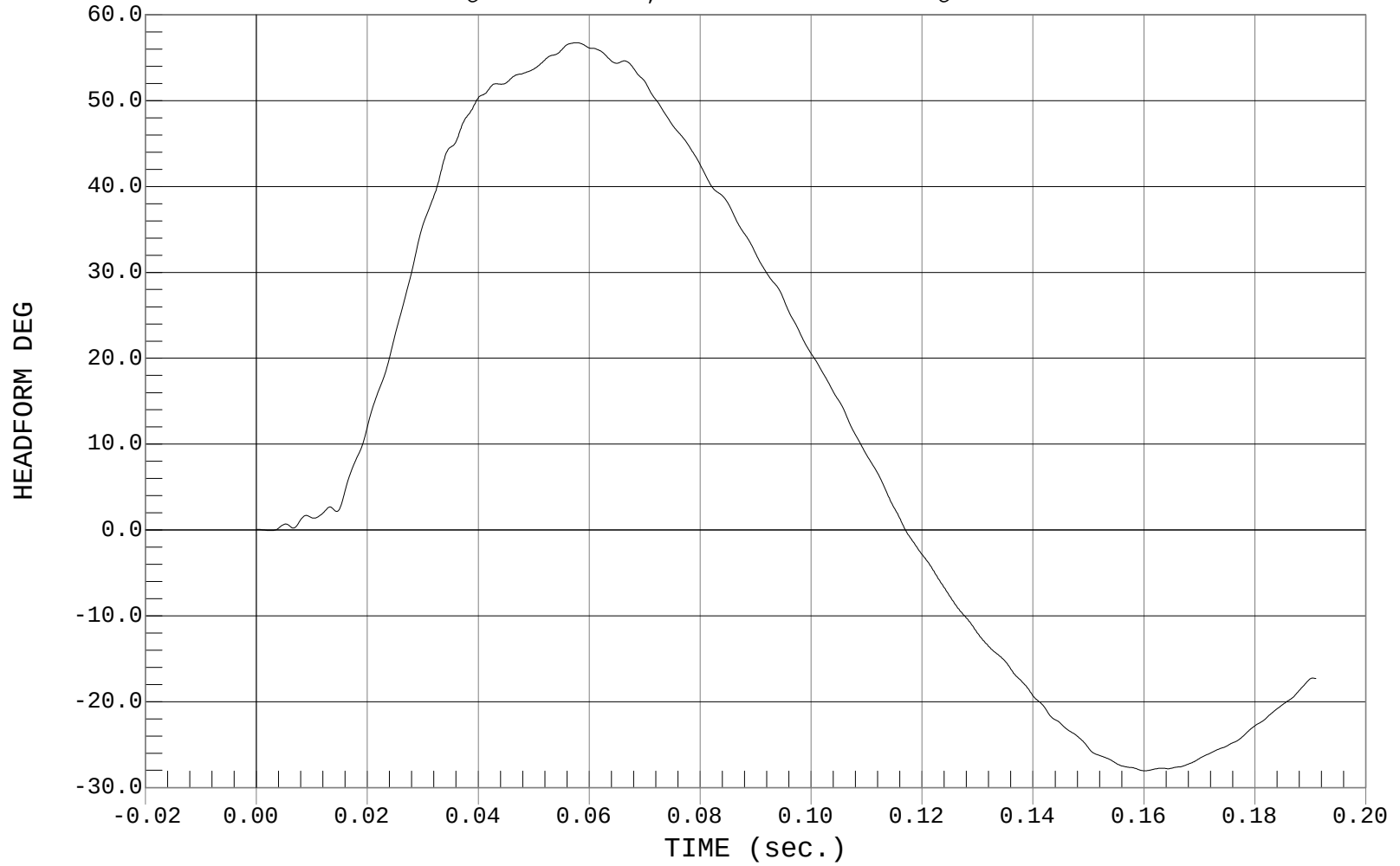
FLEXION ANGLE

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

Test Date: 10-22-01
Speed: 11.10 FT/SEC, 3.38 M/SEC

— 1 HEADFORM, D01512DT.D08

Ymin = -28.03 DEG @ 0.1602 sec., Ymax = 56.77 DEG @ 0.0576 sec.





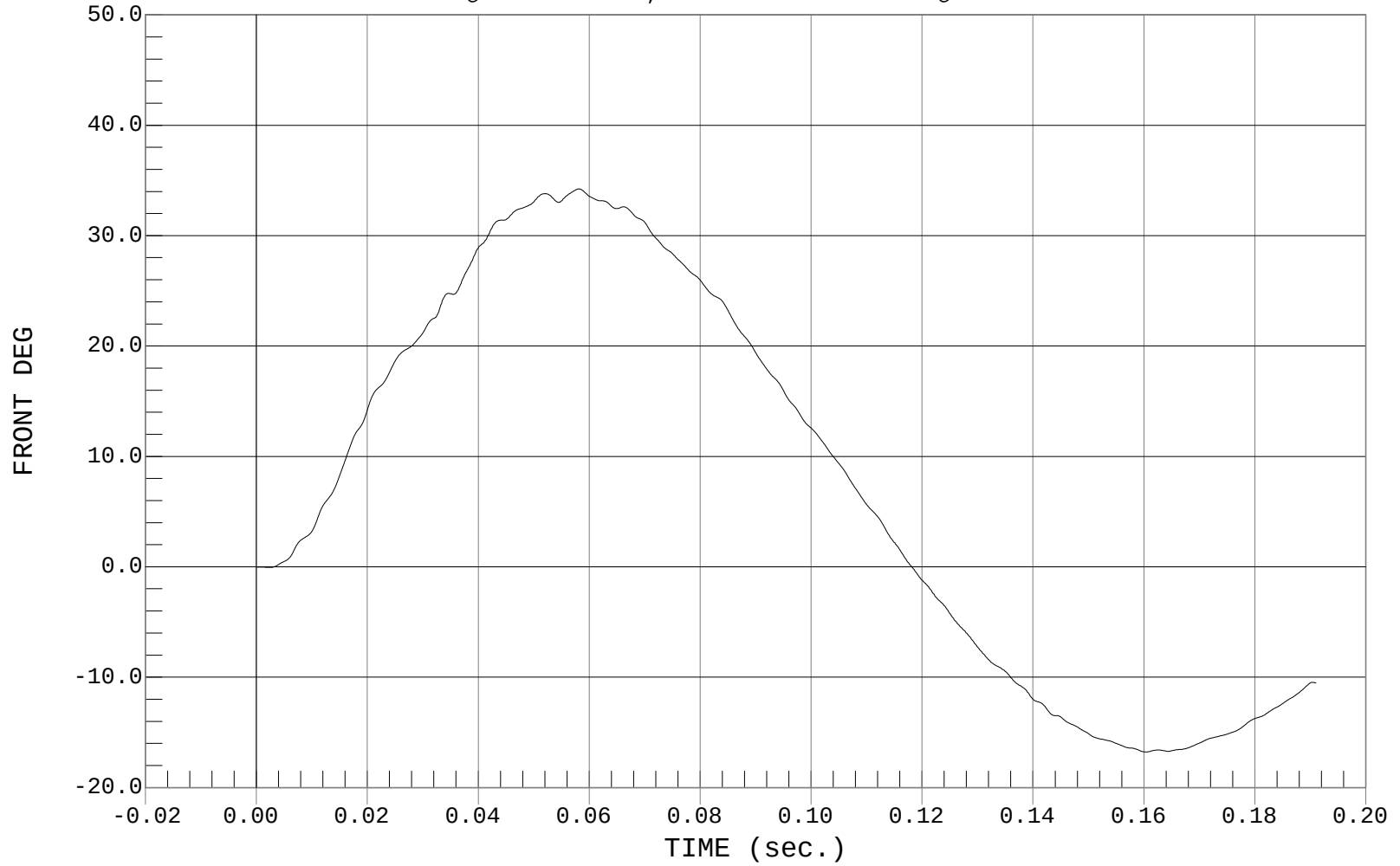
THETA A

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

Test Date: 10-22-01
Speed: 11.10 FT/SEC, 3.38 M/SEC

— 1 FRONT, D01512DT.D05

Ymin = -16.77 DEG @ 0.1604 sec., Ymax = 34.23 DEG @ 0.0582 sec.





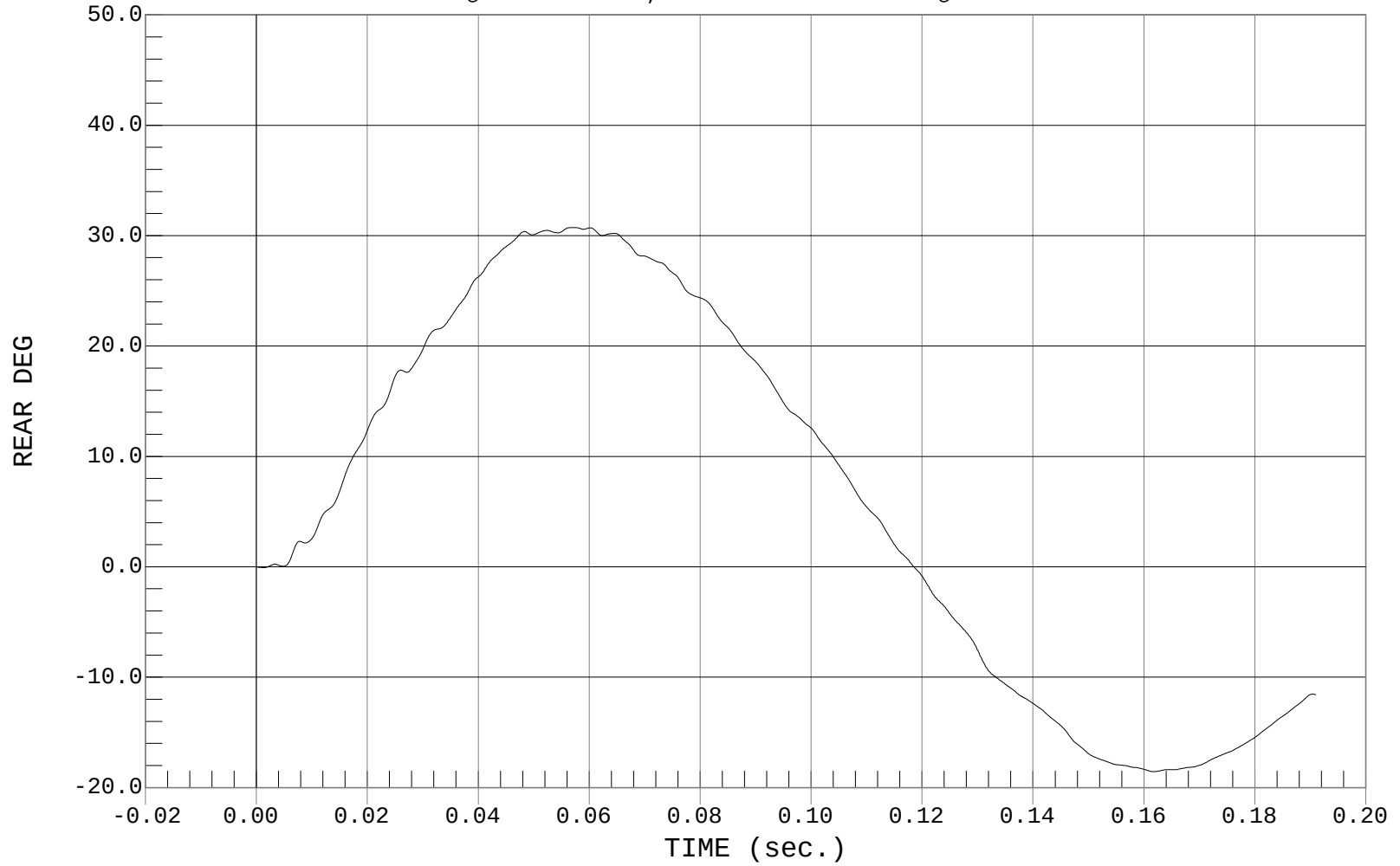
THETA B

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

Test Date: 10-22-01
Speed: 11.10 FT/SEC, 3.38 M/SEC

— 1 REAR, D01512DT.D06

Ymin = -18.57 DEG @ 0.1616 sec., Ymax = 30.73 DEG @ 0.0575 sec.



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
EUROSID 2 DUMMY

Date: 10/22/01

Dummy Serial Number: 009

Test Number: D011513

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.8
Relative Humidity (%)	10 – 70	45
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	9.2
Time of Max. Pendulum Acceleration		22.7 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



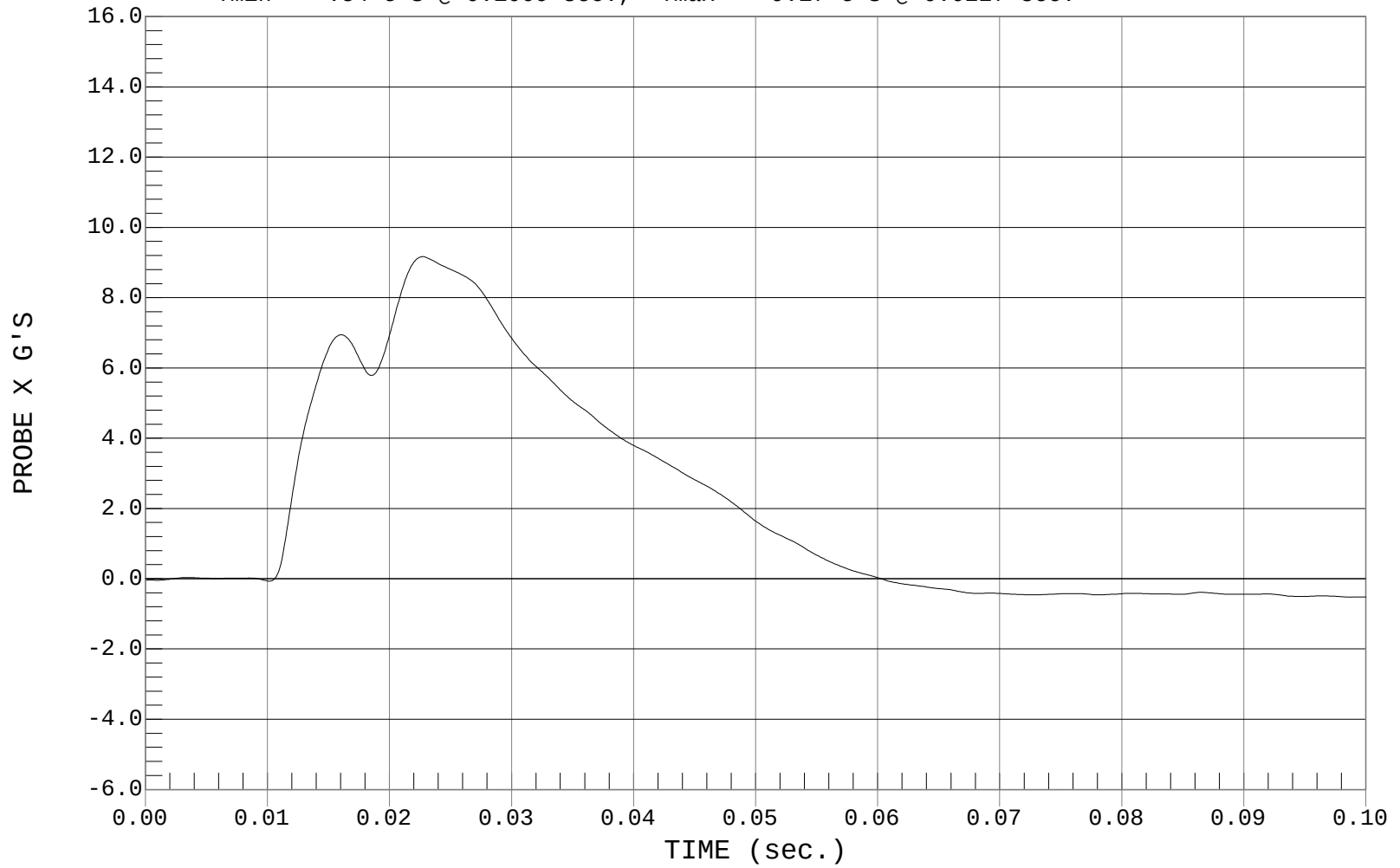
SHOULDER ACCELERATION

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

Test Date: 10-22-01
Speed: 14.21 FT/SEC, 4.33 M/SEC

1 PROBE X, D01513AF.A01

Ymin = -.54 G'S @ 0.1009 sec., Ymax = 9.17 G'S @ 0.0227 sec.



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

Date: 10/22/01
Dummy Serial Number: 009
Test Number: D011514/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.6
Relative Humidity (%)	10 – 70	40
Displacement at 2 m/s	23.5 – 27.5 mm	26.4
Displacement at 3 m/s	36.0 – 40.0 mm	38.7
Displacement at 4 m/s	46.0 – 51.0 mm	48.5

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.6
Relative Humidity (%)	10 – 70	40
Displacement at 2 m/s	23.5 – 27.5 mm	27.0
Displacement at 3 m/s	36.0 – 40.0 mm	39.7
Displacement at 4 m/s	46.0 – 51.0 mm	50.7

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.7
Relative Humidity (%)	10 – 70	40
Displacement at 2 m/s	23.5 – 27.5 mm	25.6
Displacement at 3 m/s	36.0 – 40.0 mm	38.9
Displacement at 4 m/s	46.0 – 51.0 mm	46.6

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



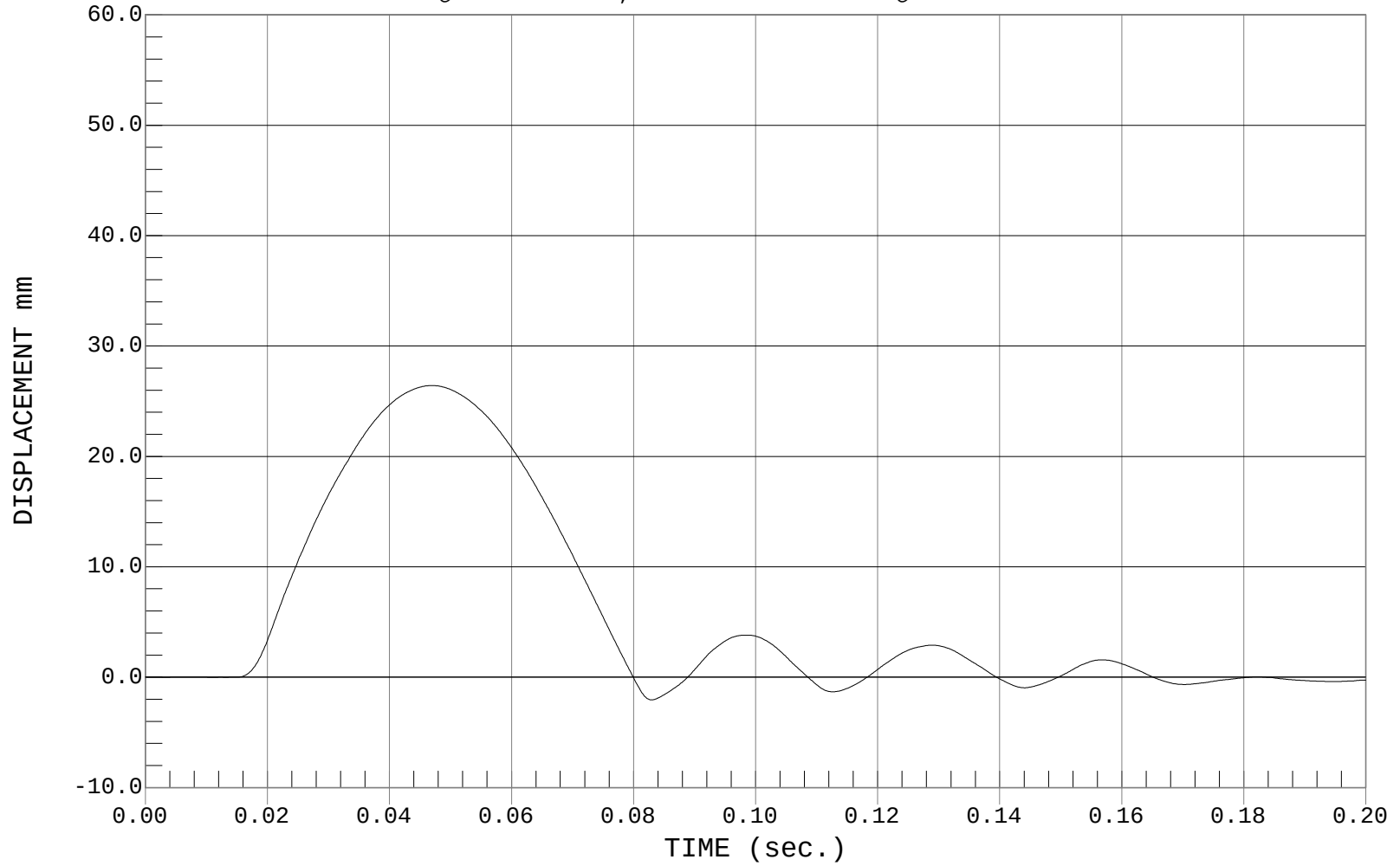
UPPER RIB DISPLACEMENT

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

Test Date: 10-22-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01514DF.D05

Ymin = -2.06 mm @ 0.0829 sec., Ymax = 26.42 mm @ 0.0470 sec.





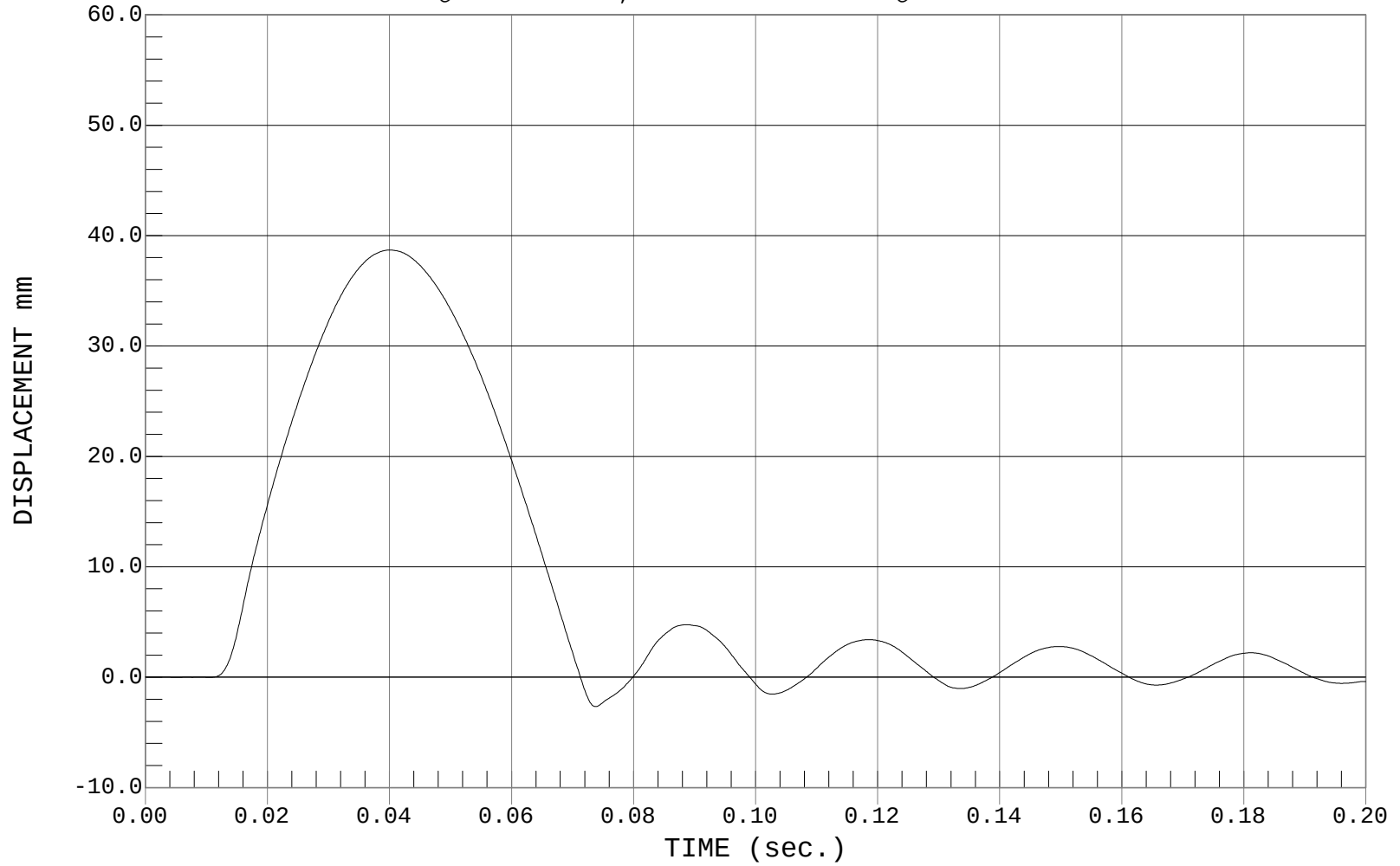
UPPER RIB DISPLACEMENT

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

Test Date: 10-22-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01514DF.D06

Ymin = -2.67 mm @ 0.0738 sec., Ymax = 38.69 mm @ 0.0401 sec.





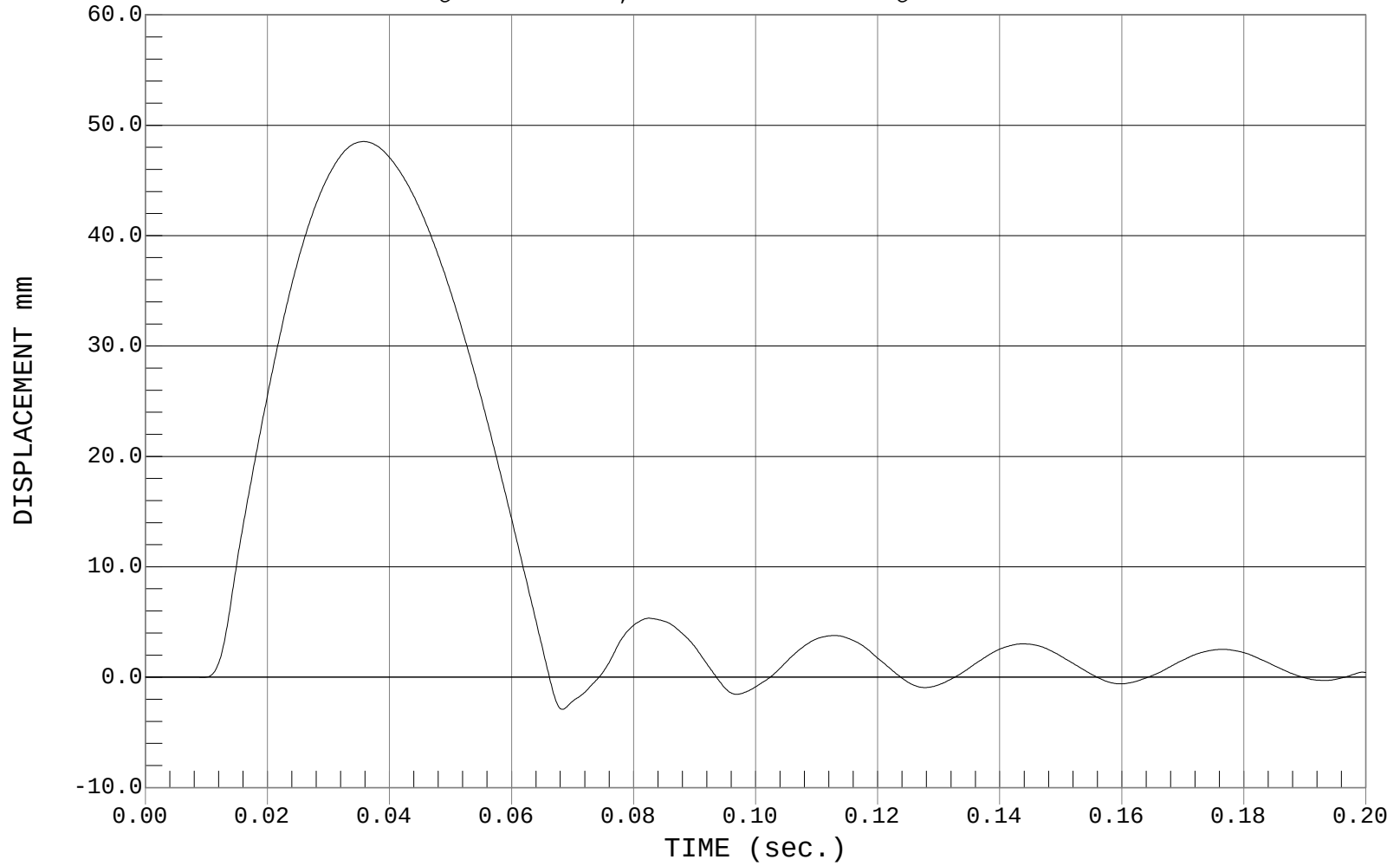
UPPER RIB DISPLACEMENT

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

Test Date: 10-22-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01514DF.D07

Ymin = -2.91 mm @ 0.0683 sec., Ymax = 48.52 mm @ 0.0358 sec.





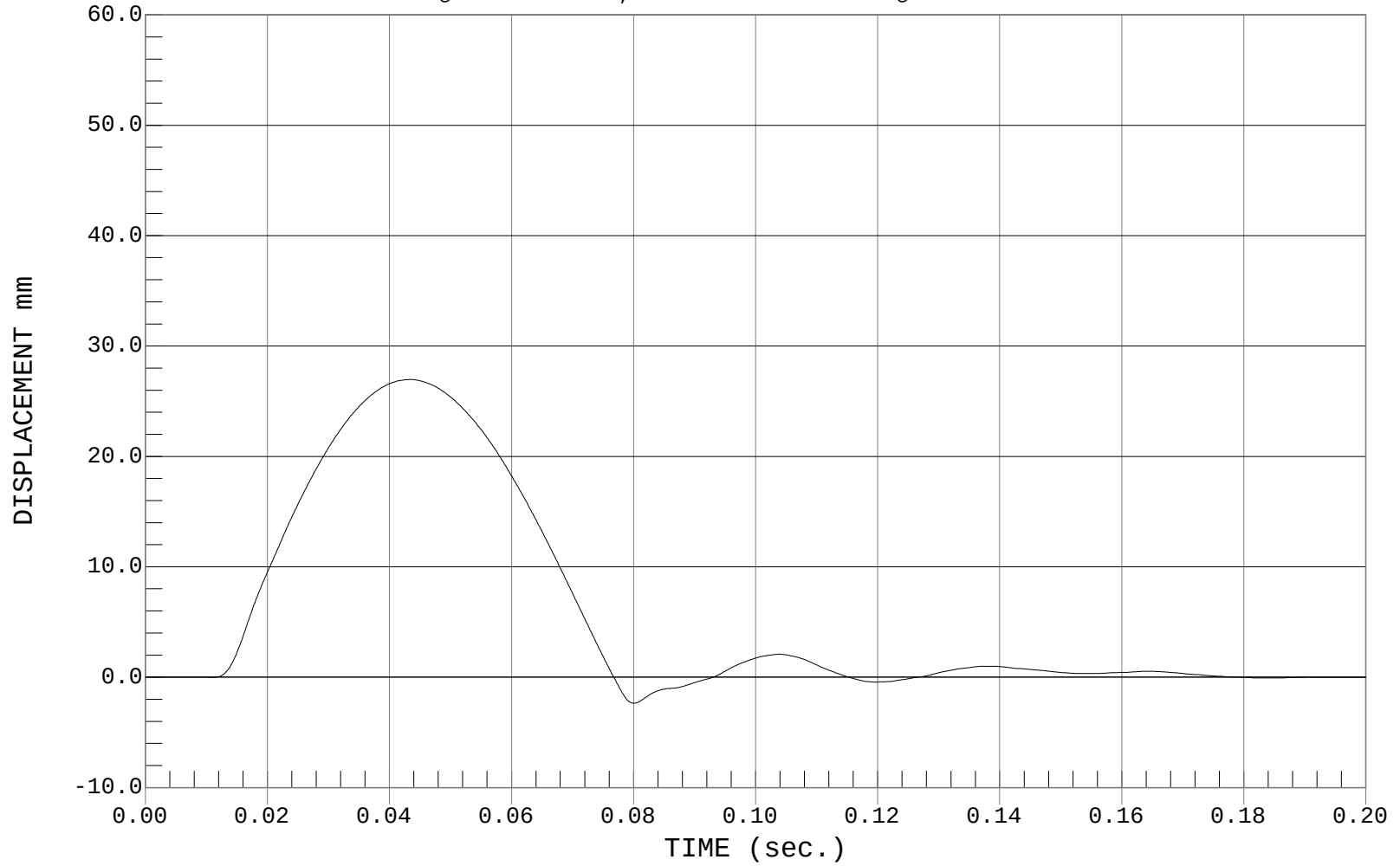
MIDDLE RIB DISPLACEMENT

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

Test Date: 10-22-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01515DF.D05

Ymin = -2.36 mm @ 0.0800 sec., Ymax = 26.96 mm @ 0.0435 sec.





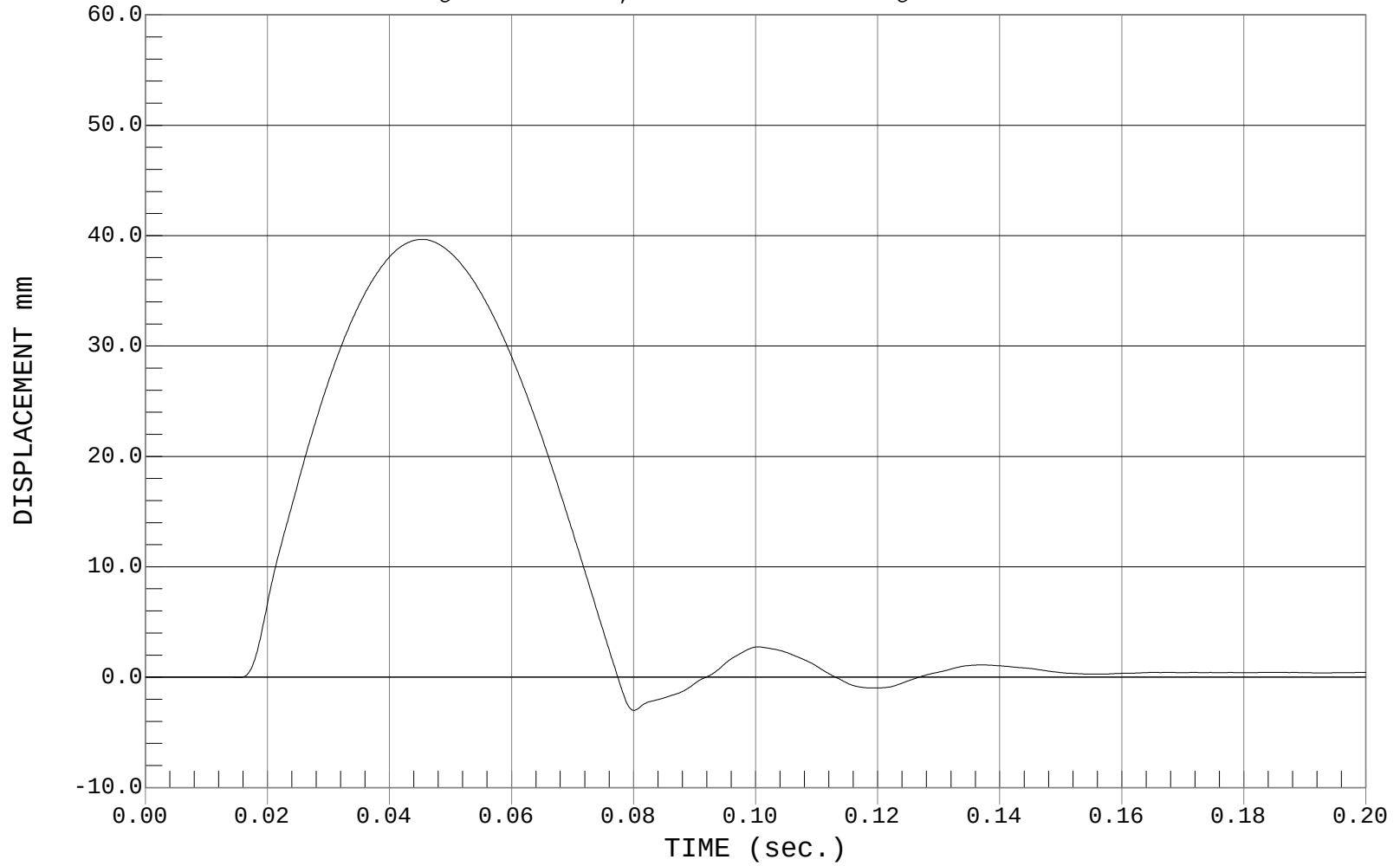
MIDDLE RIB DISPLACEMENT

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

Test Date: 10-22-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01515DF.D06

Ymin = -3.01 mm @ 0.0800 sec., Ymax = 39.66 mm @ 0.0455 sec.





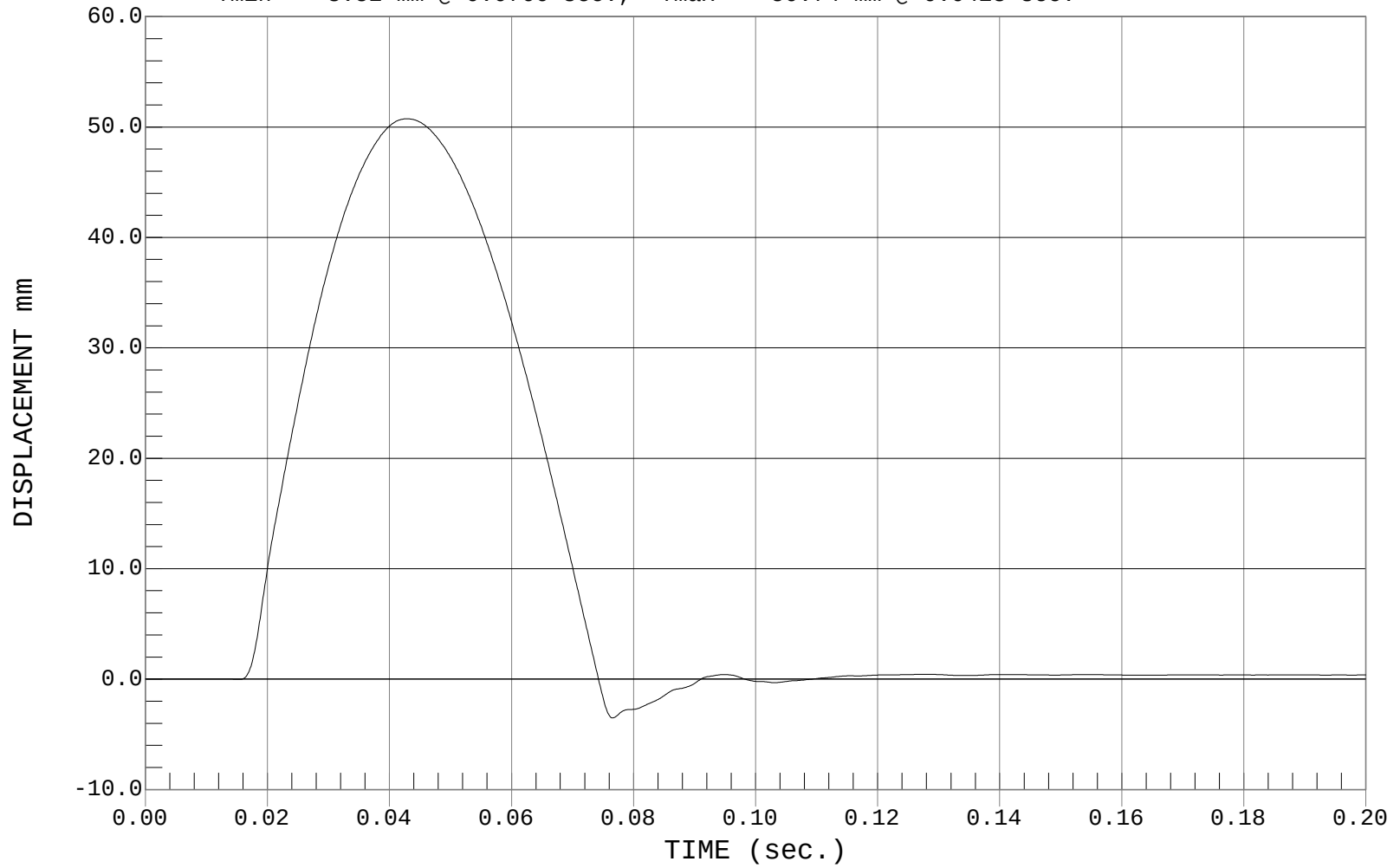
MIDDLE RIB DISPLACEMENT

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

Test Date: 10-22-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01515DF.D07

Ymin = -3.52 mm @ 0.0766 sec., Ymax = 50.74 mm @ 0.0428 sec.





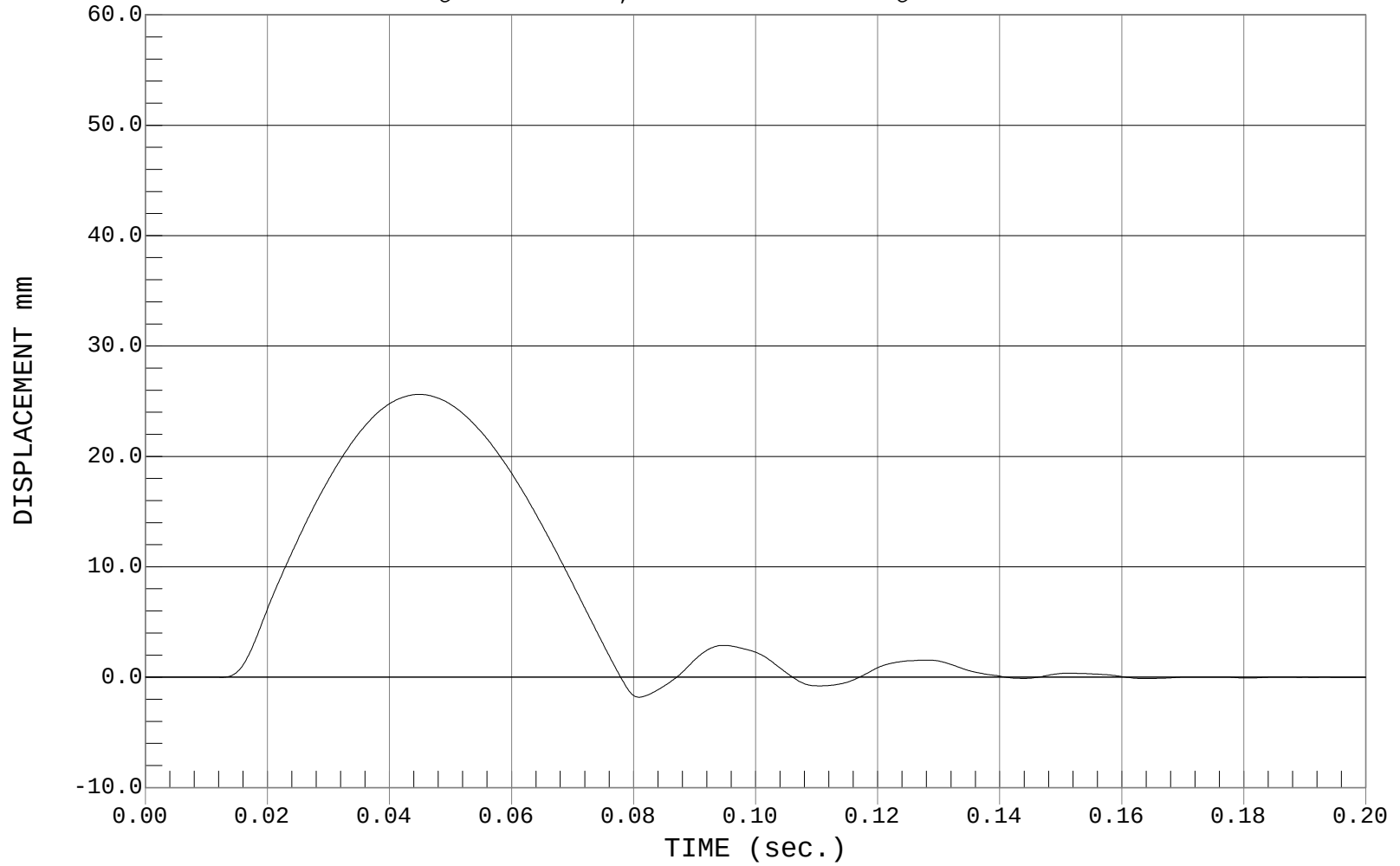
LOWER RIB DISPLACEMENT

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

Test Date: 10-22-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01516DF.D05

Ymin = -1.82 mm @ 0.0809 sec., Ymax = 25.62 mm @ 0.0449 sec.





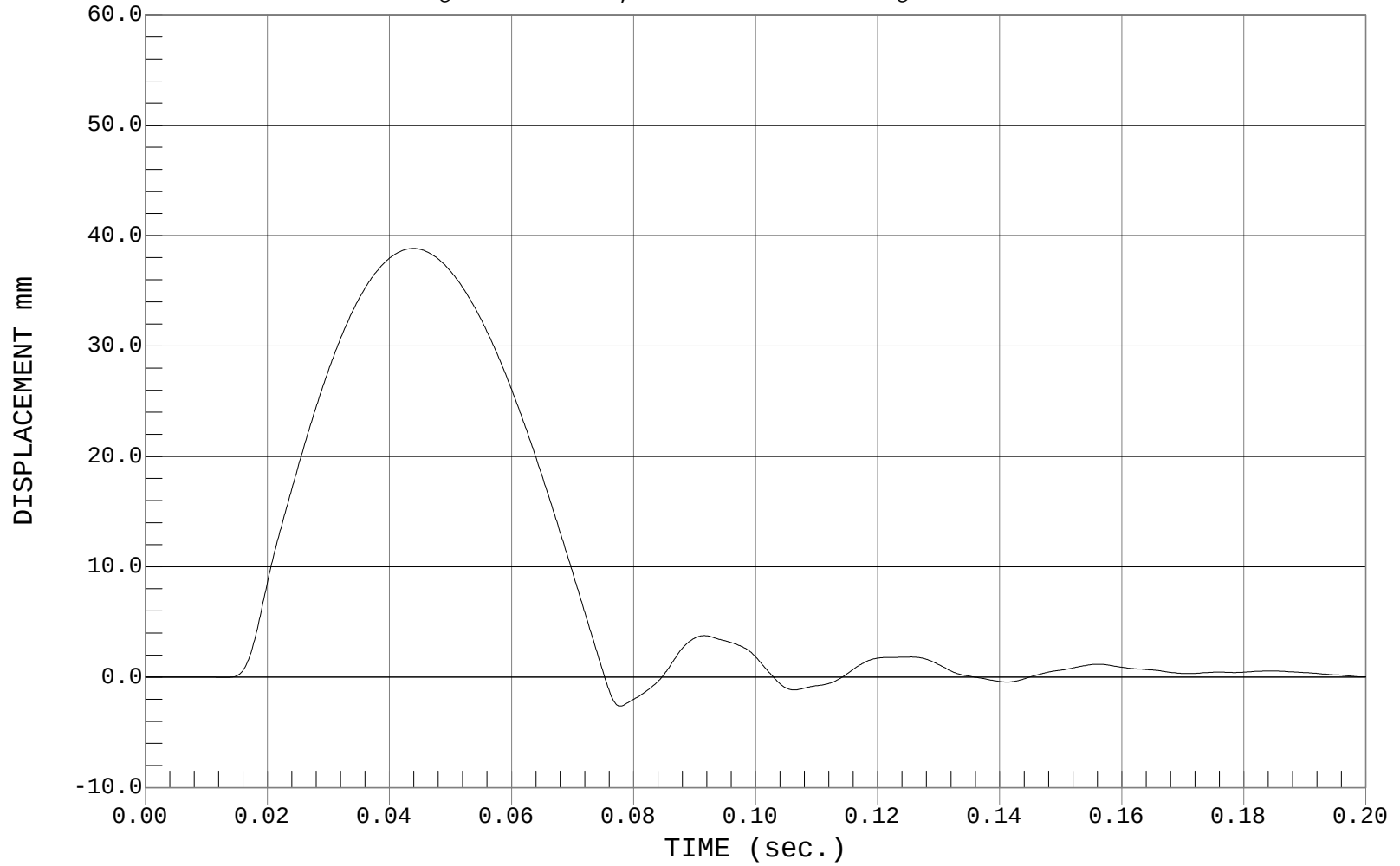
LOWER RIB DISPLACEMENT

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

Test Date: 10-22-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01516DF.D06

Ymin = -2.62 mm @ 0.0778 sec., Ymax = 38.85 mm @ 0.0439 sec.





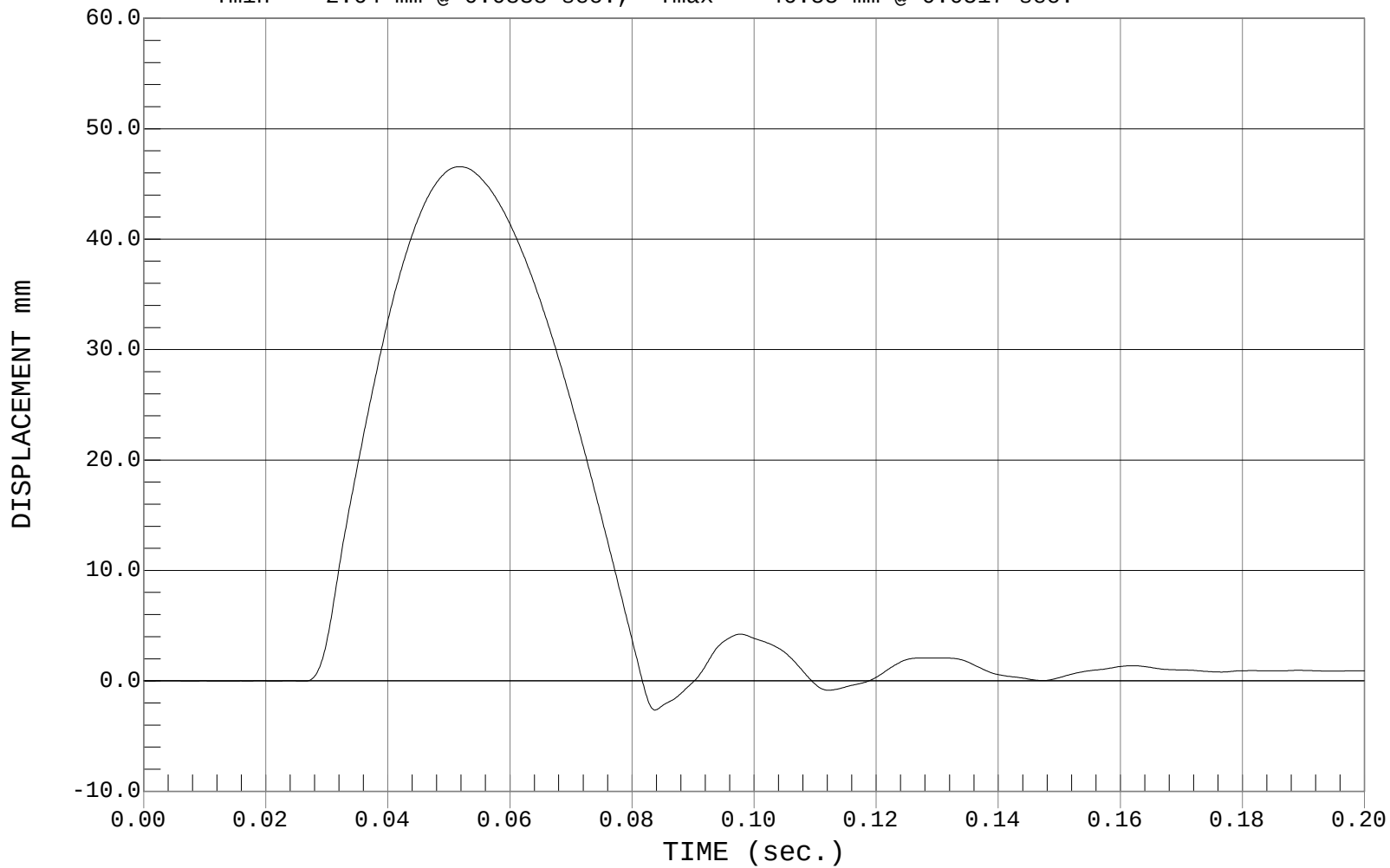
LOWER RIB DISPLACEMENT

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

Test Date: 10-22-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01516DF.D07

Ymin = -2.64 mm @ 0.0838 sec., Ymax = 46.55 mm @ 0.0517 sec.



MGA RESEARCH CORPORATION
ABDOMEN TEST
EUROSID 2 DUMMY

Date: 10/22/01

Dummy Serial Number: 009

Test Number: D011517

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.8
Relative Humidity (%)	10 – 70	46
Probe Speed (m/s)	3.90 – 4.10	4.00
Maximum Impact Force	4.00 – 4.80 kN	4.65
Time of Maximum Force	10.60 – 13.00 ms	10.70
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.35
Time of Max. Total Force	10.00 – 12.30 ms	10.30

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



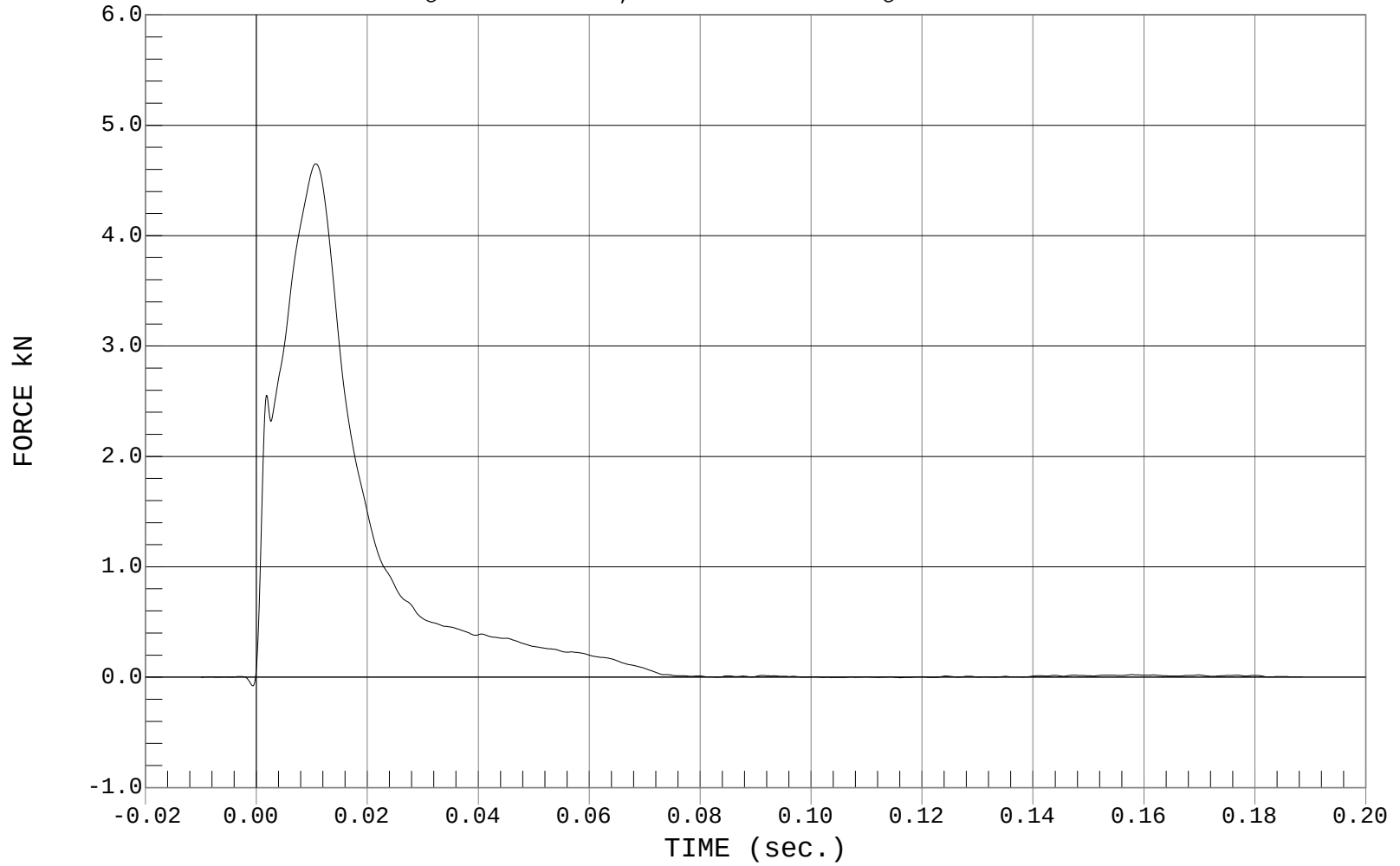
IMPACTOR FORCE

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

Test Date: 10-22-01
Speed: 13.13 FT/SEC, 4.00 M/SEC

— 1 FORCE, D01517FT.F01

Ymin = -.08 kN @ -0.0006 sec., Ymax = 4.65 kN @ 0.0107 sec.





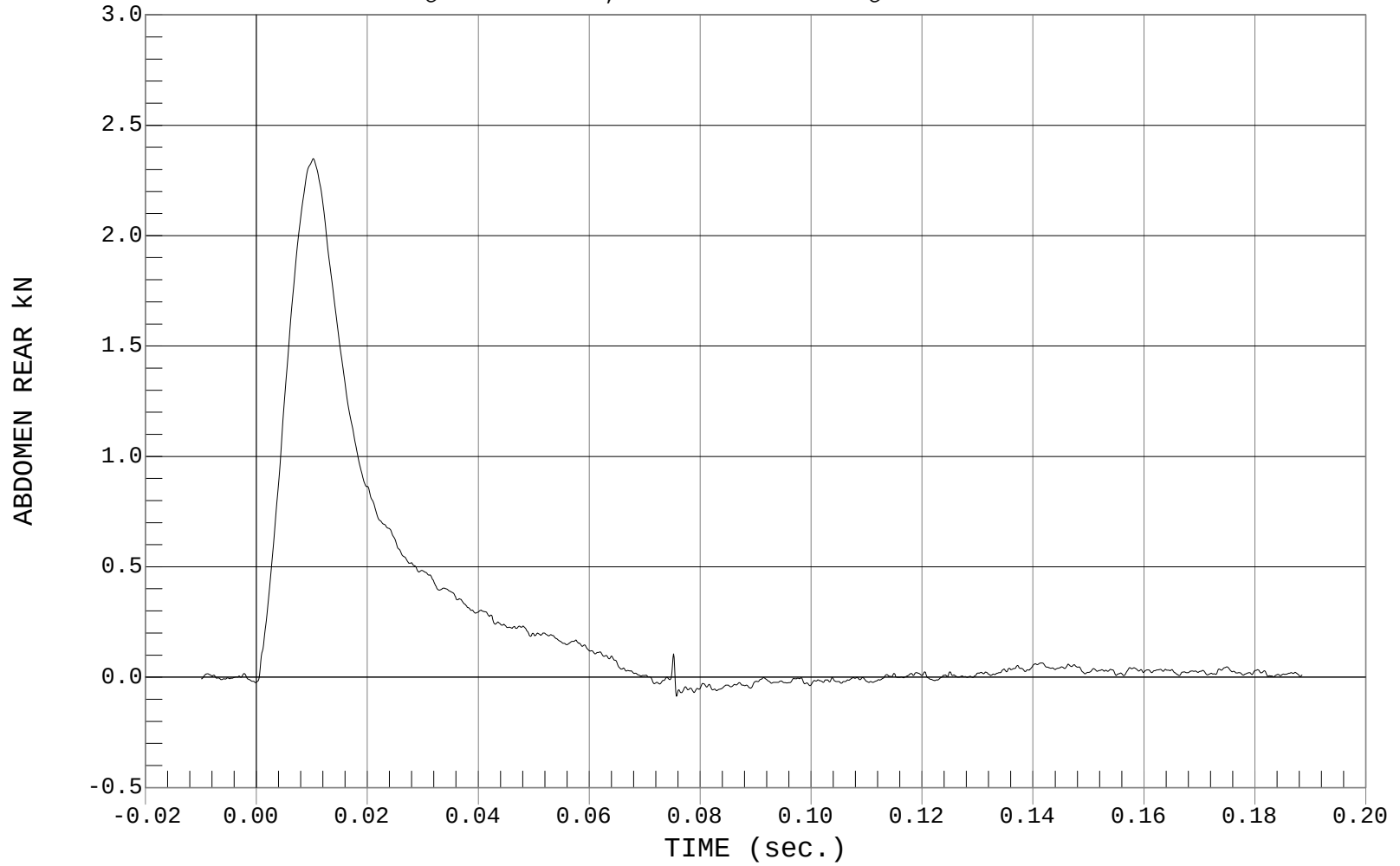
ABDOMEN FORCE

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

Test Date: 10-22-01
Speed: 13.13 FT/SEC, 4.00 M/SEC

— 1 ABDOMEN REAR, D01517FT.F02

Ymin = -.09 kN @ 0.0757 sec., Ymax = 2.35 kN @ 0.0103 sec.



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
EUROSID 2 DUMMY

Date: 10/22/01

Dummy Serial Number: 009

Test Number: D011518

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.5
Relative Humidity (%)		10 – 70	42
Pendulum Speed		5.95 – 6.15	6.07
Pendulum Deceleration	10 msec	2.46 - 1.59 m/sec	-1.84
	20 msec	5.25 - 4.07 m/sec	-4.21
	25 msec	6.64 - 5.30 m/sec	-5.31
	30 msec	≥ -6.5 m/sec	-6.1
Maximum Flexion Angle		45.0 – 55.0 deg	54.4
Time of Max. Flexion Angle		39.0 – 53.0 ms	48.2
Maximum Angle Theta (A)		31.0 – 35.0 deg	34.3
Time of Max. Theta (A)		44.0 – 52.0 ms	47.7
Maximum Angle Theta (B)		29.44 – 31.94 deg	30.31
Time of Max. Theta (B)		44.0 – 52.0 ms	49.5

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

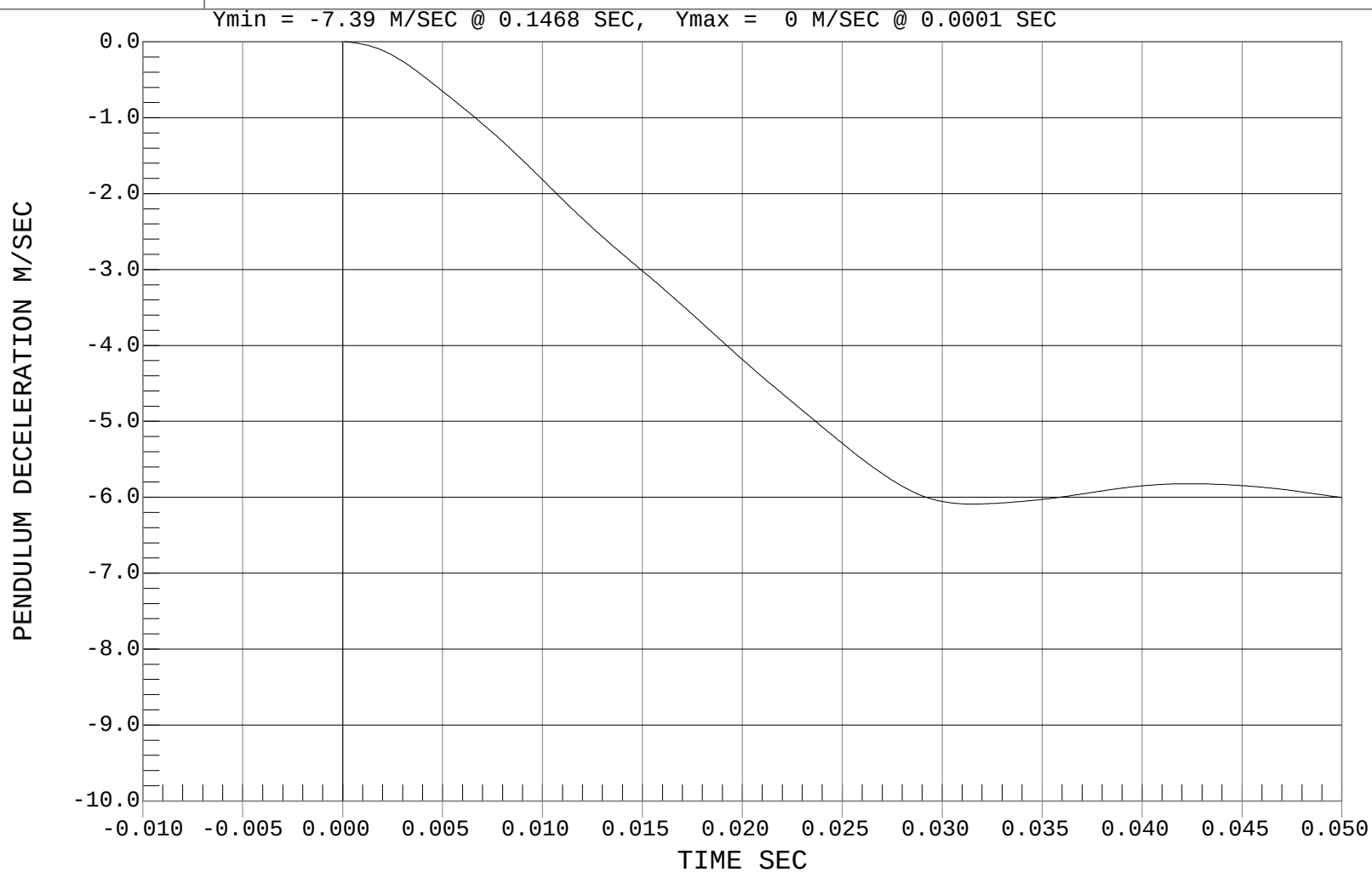


PENDULUM DECELERATION

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

Test Date: 10-22-01
Speed: 19.91 FT/SEC, 6.07 M/SEC

— 1 PENDULUM DECELERATION, D01518AI.V04





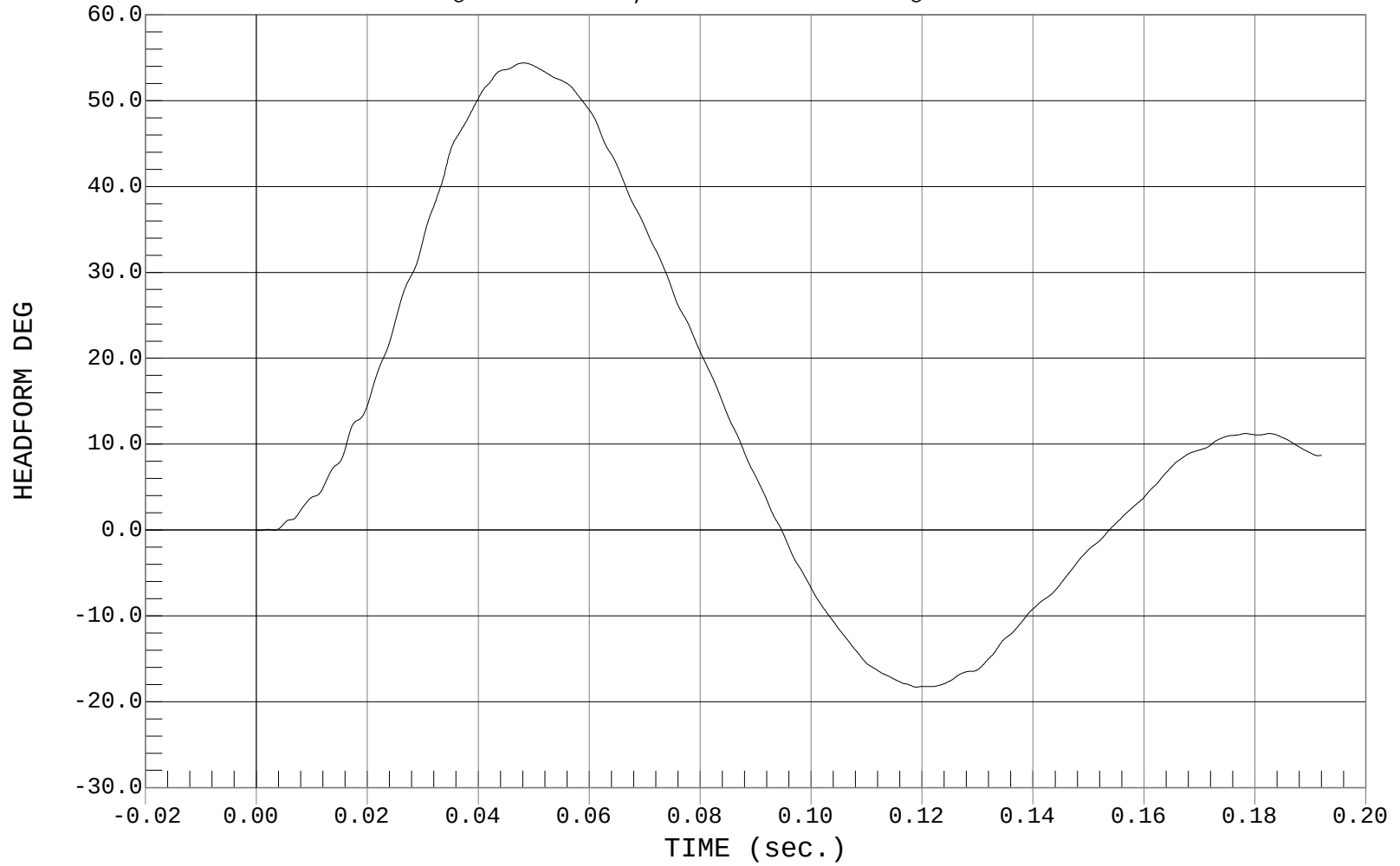
FLEXION ANGLE

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

Test Date: 10-22-01
Speed: 19.91 FT/SEC, 6.07 M/SEC

— 1 HEADFORM, D01518DT.D08

Ymin = -18.3 DEG @ 0.1189 sec., Ymax = 54.4 DEG @ 0.0482 sec.





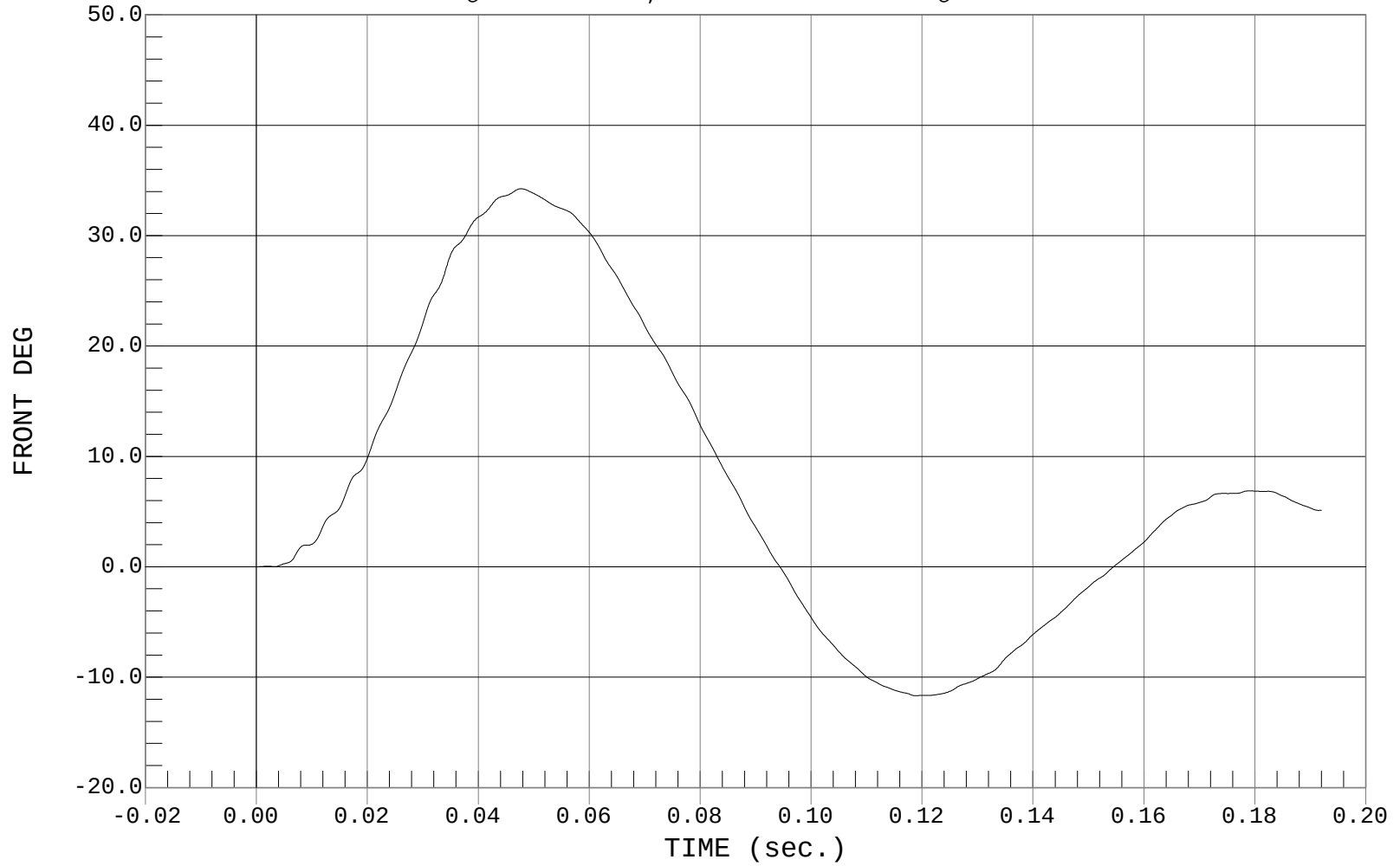
THETA A

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

Test Date: 10-22-01
Speed: 19.91 FT/SEC, 6.07 M/SEC

— 1 FRONT, D01518DT.D05

Ymin = -11.69 DEG @ 0.1188 sec., Ymax = 34.25 DEG @ 0.0477 sec.





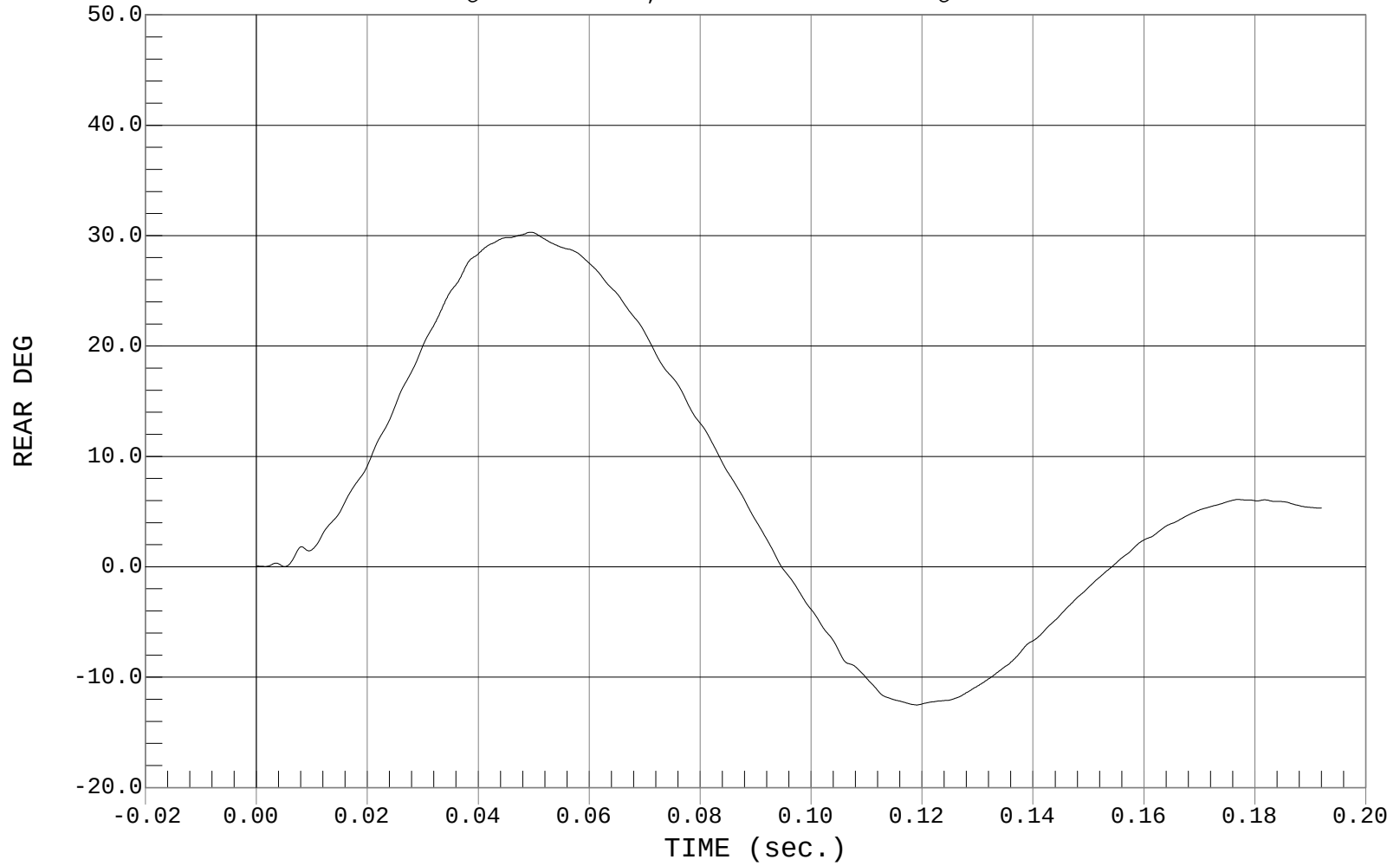
THETA B

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

Test Date: 10-22-01
Speed: 19.91 FT/SEC, 6.07 M/SEC

— 1 REAR, D01518DT.D06

Ymin = -12.51 DEG @ 0.1191 sec., Ymax = 30.31 DEG @ 0.0495 sec.



MGA RESEARCH CORPORATION
PELVIS TEST
EUROSID 2 DUMMY

Date: 10/22/01

Dummy Serial Number: 009

Test Number: D011519

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.8
Relative Humidity (%)	10 – 70	45
Pendulum Speed	6.20 – 6.30 m/s	6.26
Maximum Impactor Force	9.80 – 12.20 kN	10.76
Time of Max. Impactor Force	9.50 – 12.50 ms	11.40
Maximum Pubic Force	2.65 – 3.35 kN	3.32
Time of Max. Pubic Force	10.00 – 13.00 ms	12.20

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



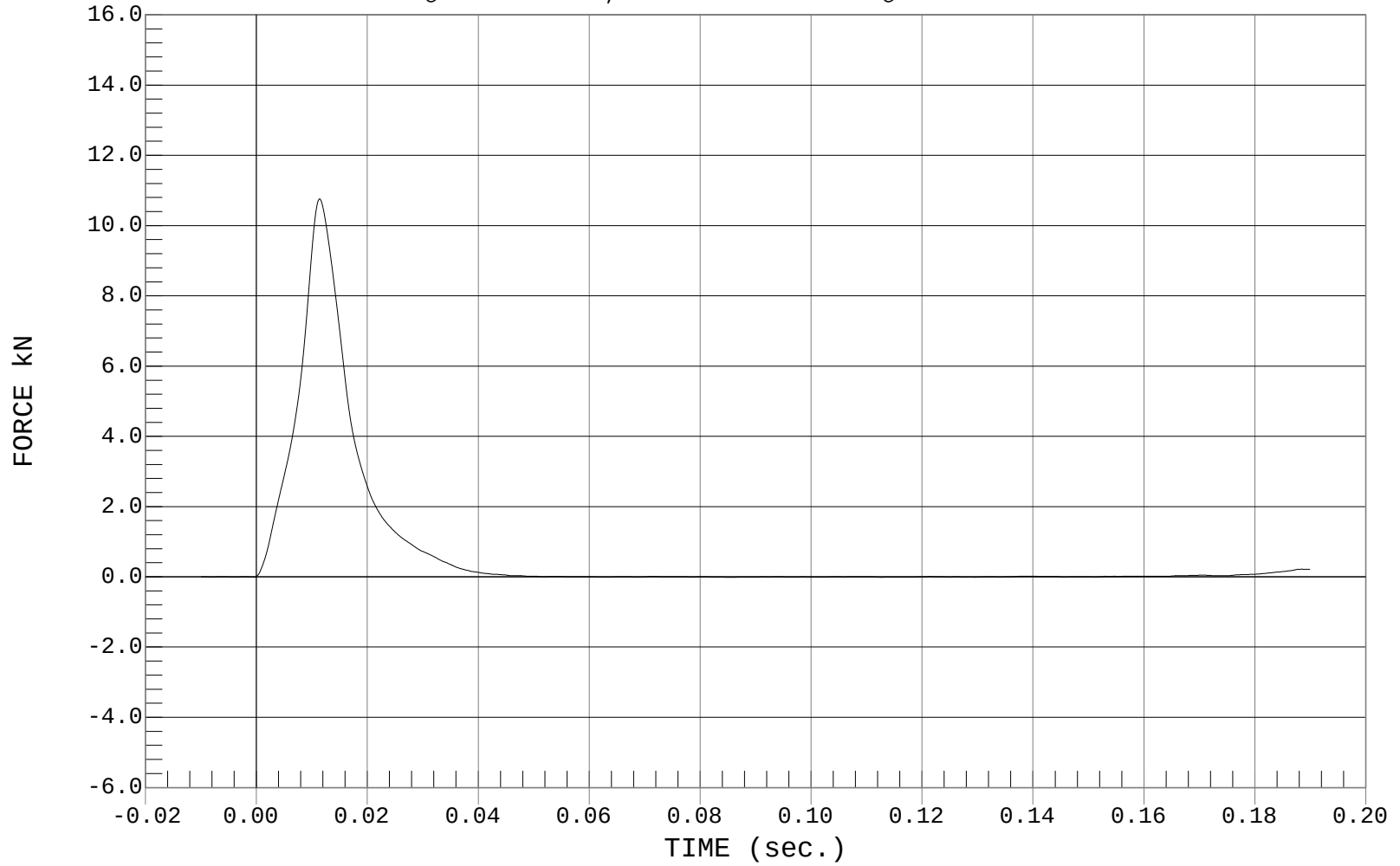
IMPACTOR FORCE

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

Test Date: 10-22-01
Speed: 20.53 FT/SEC, 6.26 M/SEC

— 1 FORCE, D01519FT.F01

Ymin = -.01 kN @ 0.0859 sec., Ymax = 10.76 kN @ 0.0114 sec.





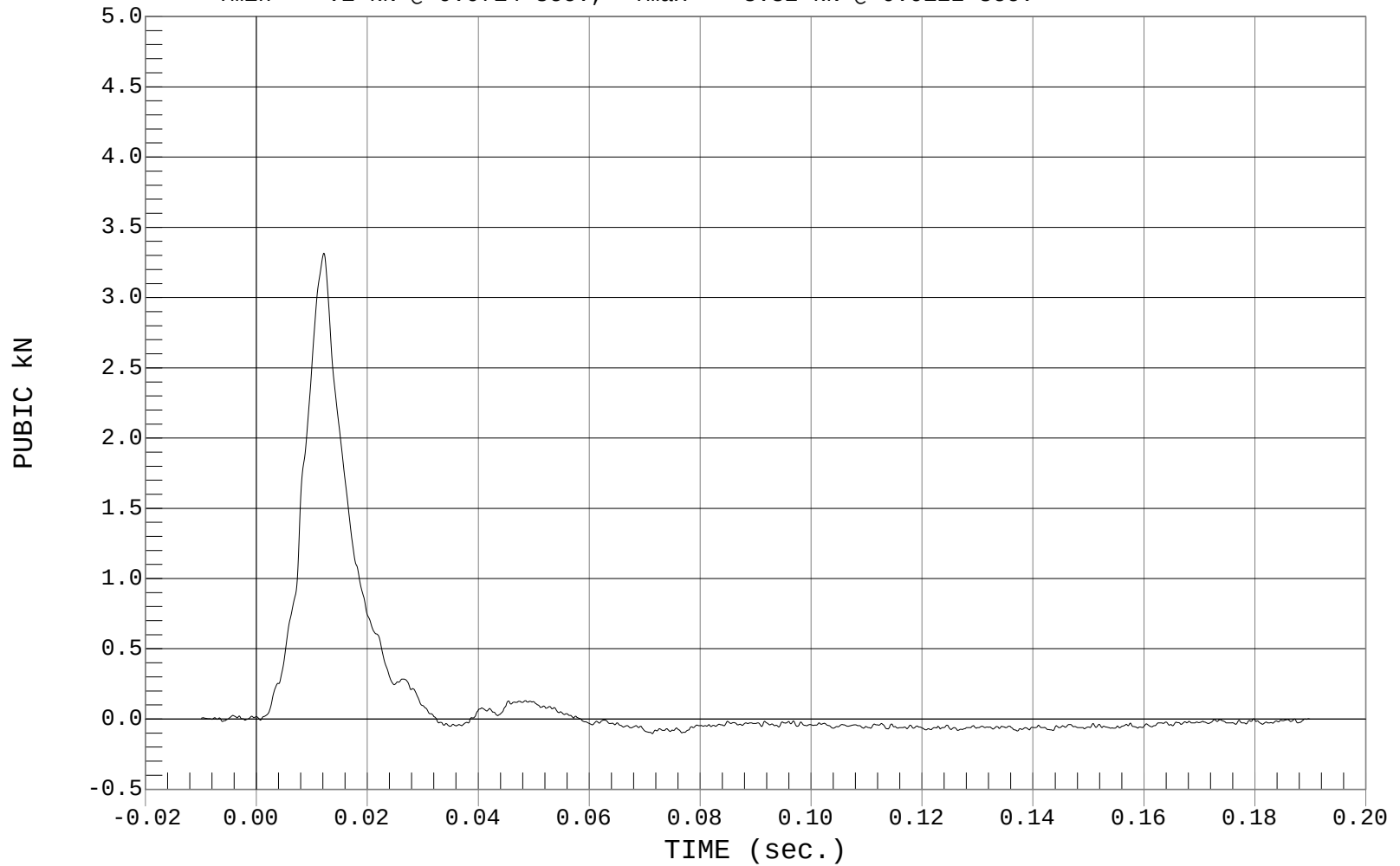
PUBIC FORCE

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

Test Date: 10-22-01
Speed: 20.53 FT/SEC, 6.26 M/SEC

— 1 PUBIC, D01519FT.F02

Ymin = -.1 kN @ 0.0714 sec., Ymax = 3.32 kN @ 0.0122 sec.



CERTIFICATION DATA

Dummy Serial Number: 010

Calibration Test Results Summary

Dummy Serial Number: 010

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: 10/24/01

Dummy Serial Number: 010

Test Number: D011521

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.1
Relative Humidity (%)	10 – 70	57
Peak Resultant Acceleration	100 – 150 g's	141
Time of Max. Res. Acceleration		24.4 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



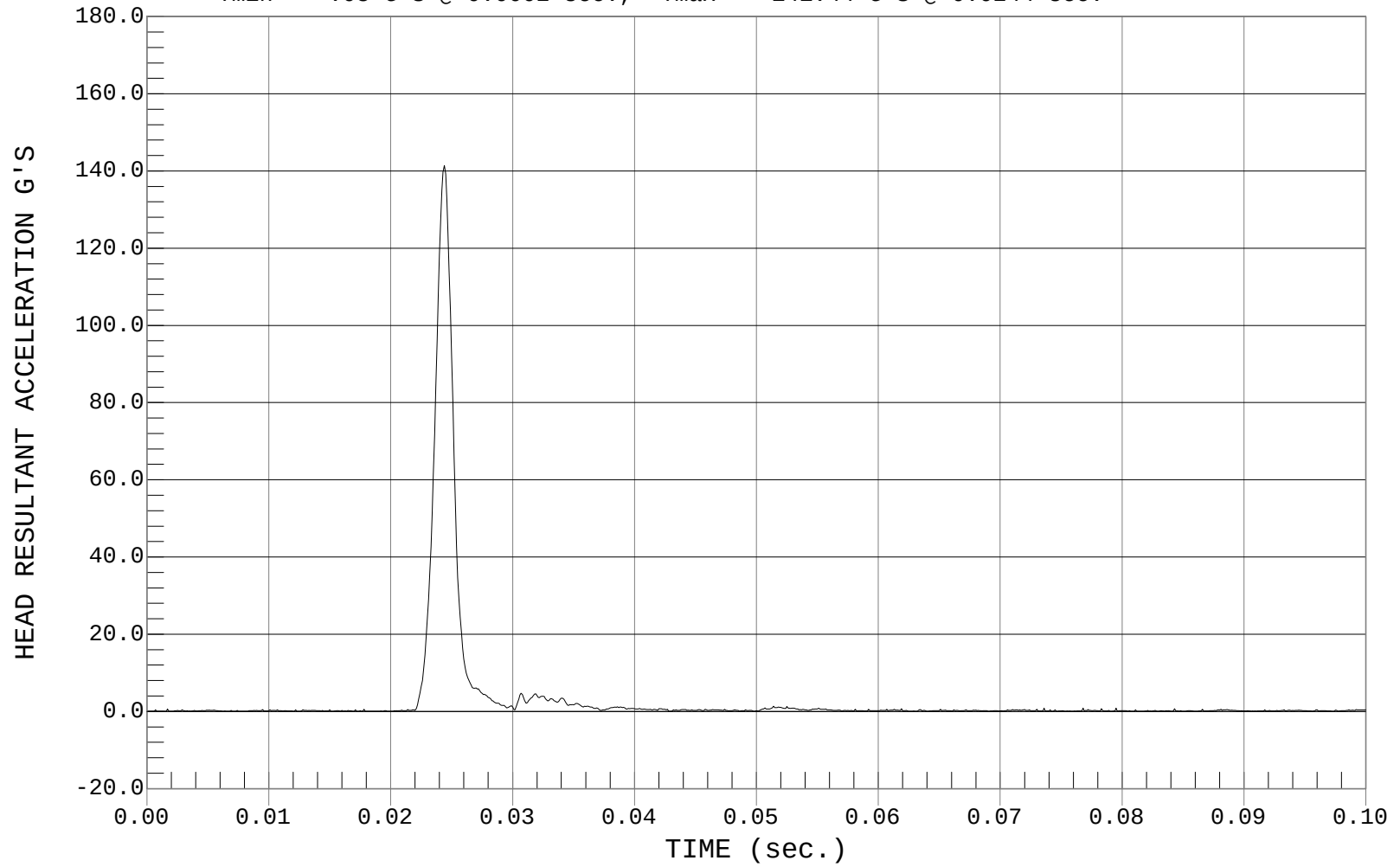
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #010

Test Date: 10-24-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01521AV.A01

Ymin = .08 G'S @ 0.0002 sec., Ymax = 141.44 G'S @ 0.0244 sec.



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
EUROSID 2 DUMMY

Date: 10/24/01

Dummy Serial Number: 010

Test Number: D011522

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.2
Relative Humidity (%)		10 – 70	58
Pendulum Speed		3.3 - 3.5	3.3
Pendulum Deceleration	3 msec	ˆ.25 - ˆ.53 m/sec	-.32
	8 msec	ˆ1.59 - ˆ2.04 m/sec	-1.66
	14 msec	ˆ3.20 - ˆ3.85 m/sec	-3.29
Maximum Flexion Angle		49.0 – 59.0 deg	58.3
Time of Max. Flexion Angle		54.0 – 66.0 ms	60.8
Maximum Angle Theta (A)		32.0 – 37.0 deg	35.3
Time of Max. Theta (A)		53.0 – 63.0 ms	61.0
Maximum Angle Theta (B)		30.34 – 32.84 deg	31.14
Time of Max. Theta (B)		54.0 – 64.0 ms	61.1

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



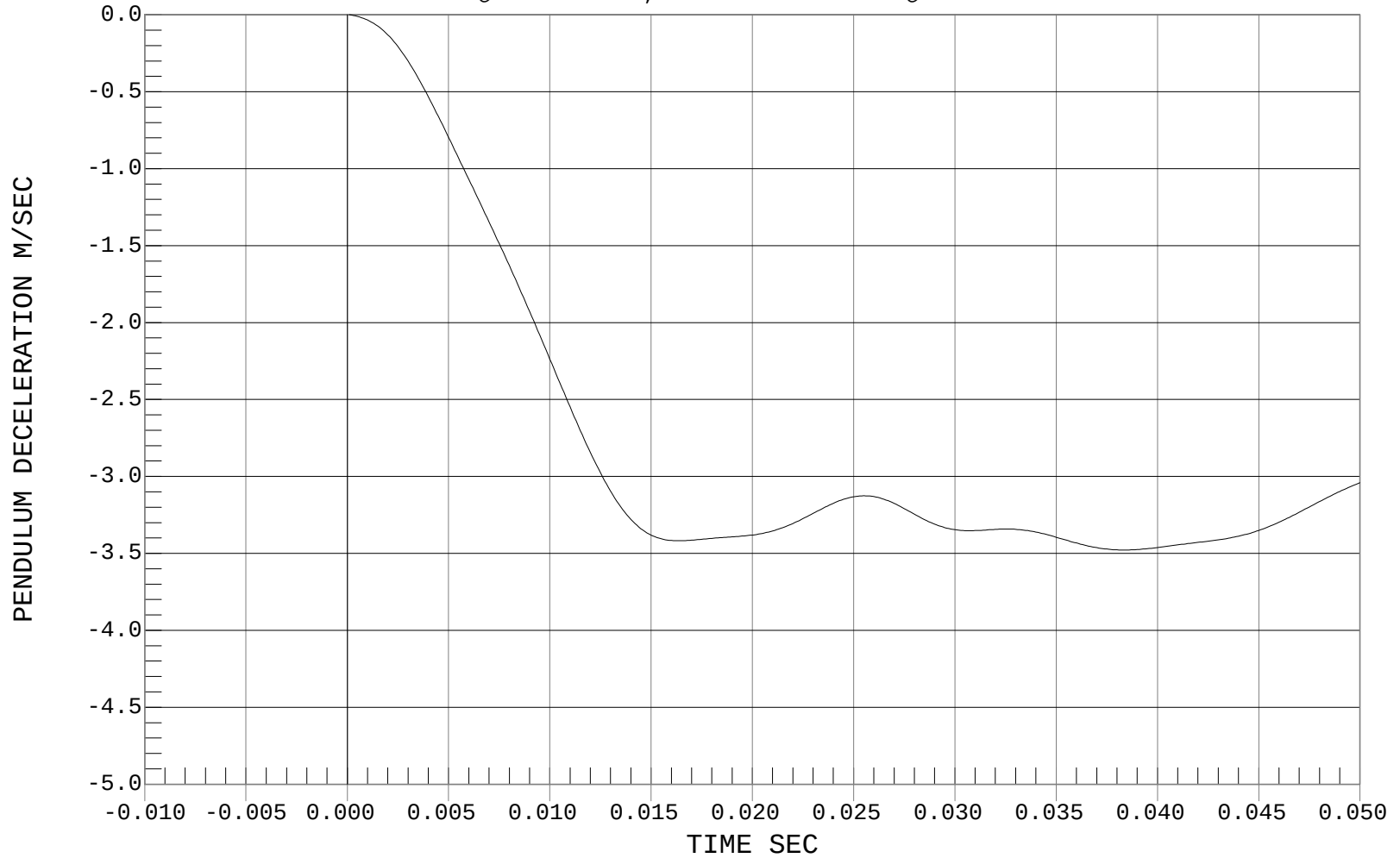
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #010

Test Date: 10-24-01
Speed: 10.95 FT/SEC, 3.34 M/SEC

— 1 PENDULUM DECELERATION, D01522AI.V04

Ymin = -4.17 M/SEC @ 0.1903 SEC, Ymax = 0 M/SEC @ 0.0001 SEC





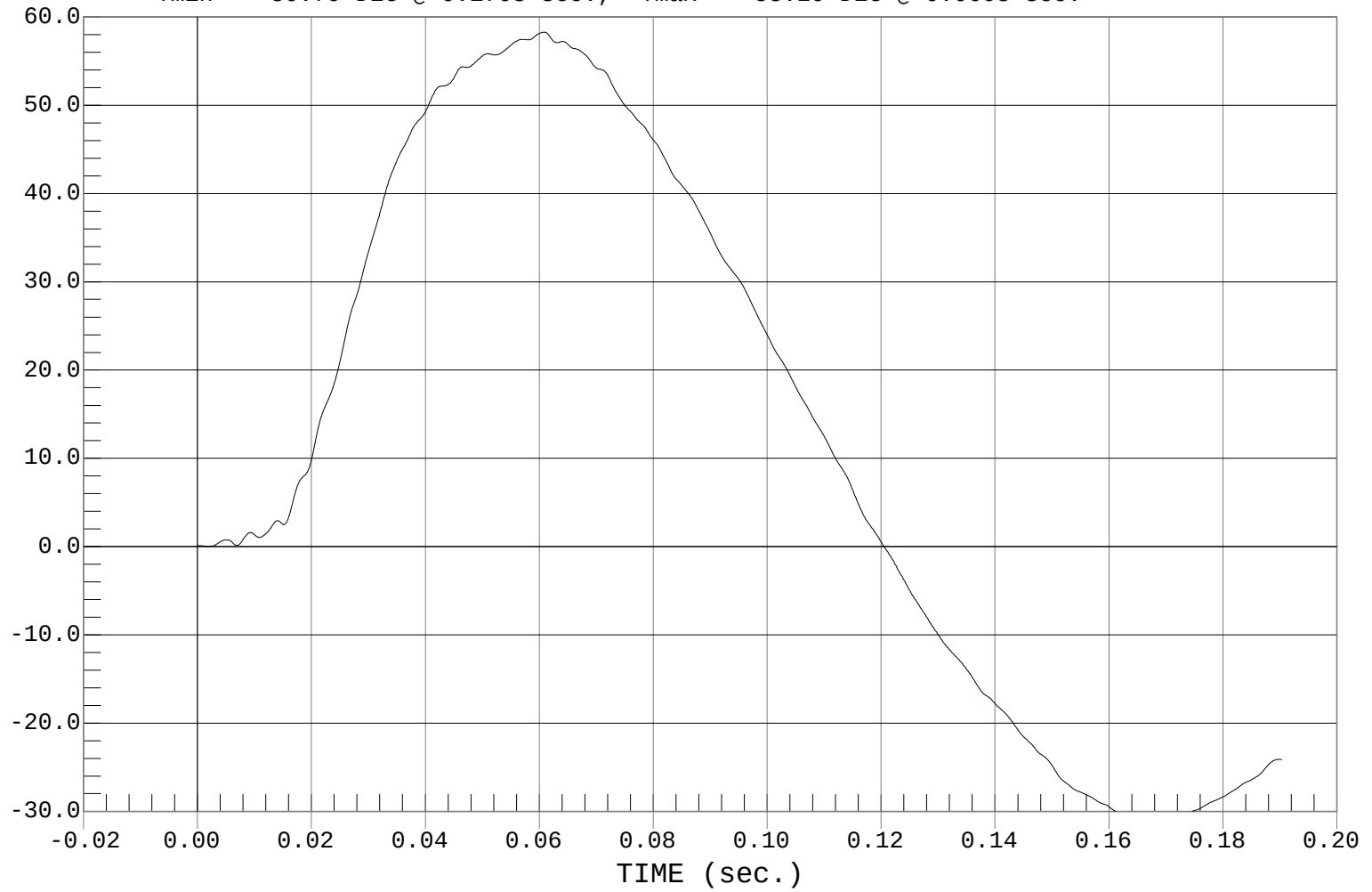
FLEXION ANGLE

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #010

Test Date: 10-24-01
Speed: 10.95 FT/SEC, 3.34 M/SEC

— 1 HEADFORM, D01522DT.D08

Ymin = -30.79 DEG @ 0.1703 sec., Ymax = 58.29 DEG @ 0.0608 sec.





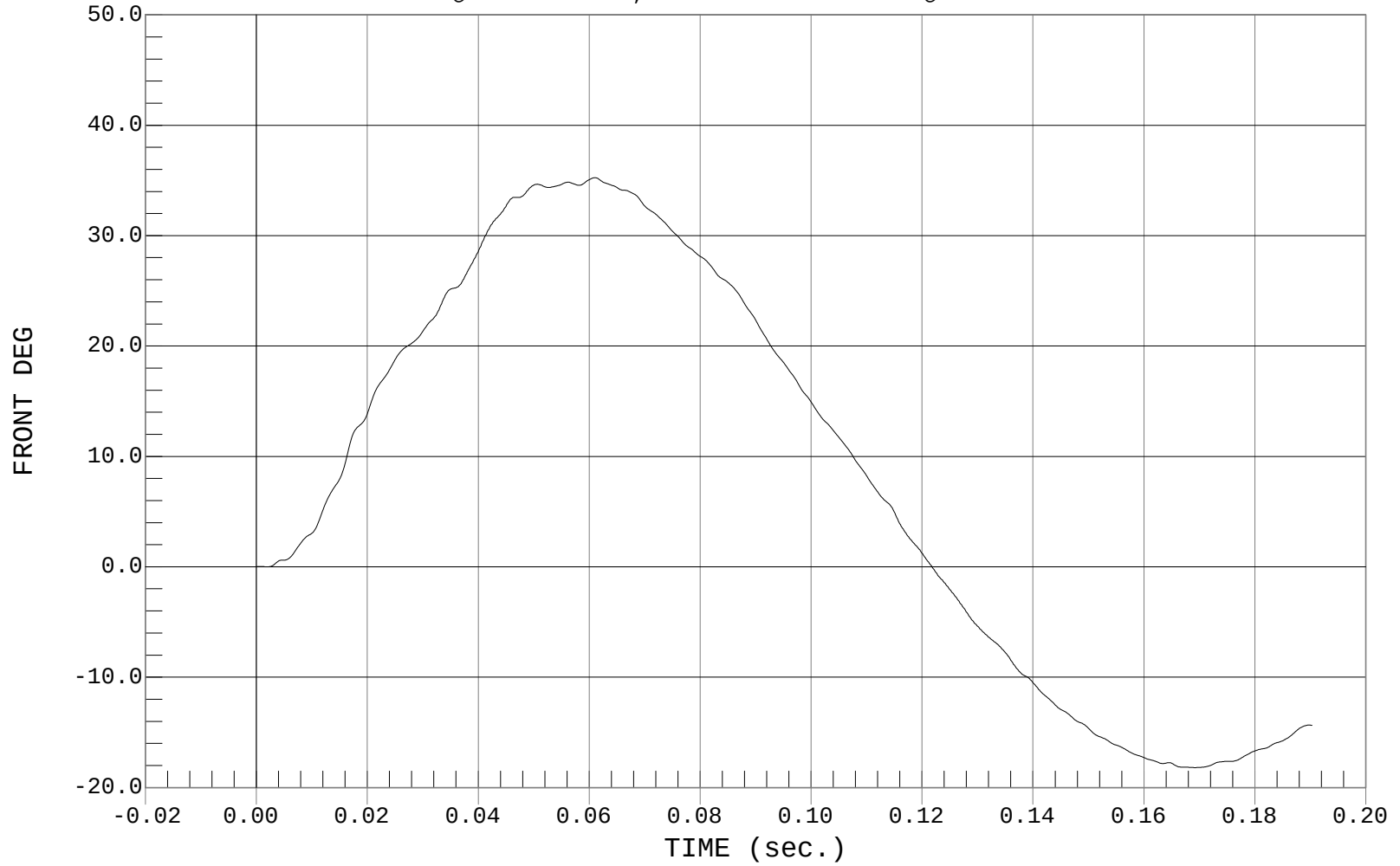
THETA A

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #010

Test Date: 10-24-01
Speed: 10.95 FT/SEC, 3.34 M/SEC

— 1 FRONT, D01522DT.D05

Ymin = -18.2 DEG @ 0.1692 sec., Ymax = 35.25 DEG @ 0.0610 sec.





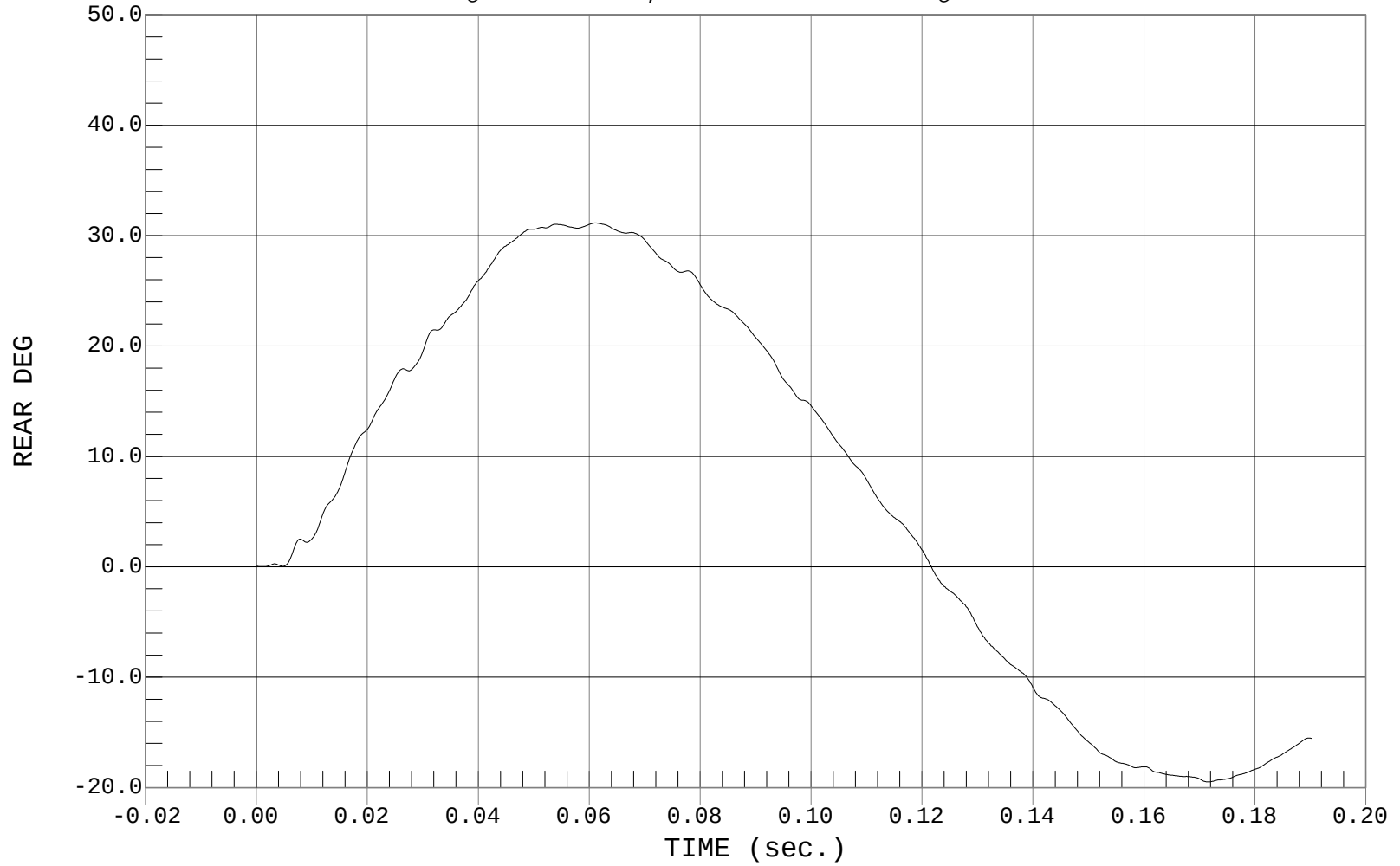
THETA B

Test Desc.: Dummy Calibration - Neck Bending
Component: Dummy #010

Test Date: 10-24-01
Speed: 10.95 FT/SEC, 3.34 M/SEC

1 REAR, D01522DT.D06

Ymin = -19.49 DEG @ 0.1716 sec., Ymax = 31.14 DEG @ 0.0611 sec.



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
EUROSID 2 DUMMY

Date: 10/24/01

Dummy Serial Number: 010

Test Number: D011523

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.0
Relative Humidity (%)	10 – 70	57
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		23.3 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



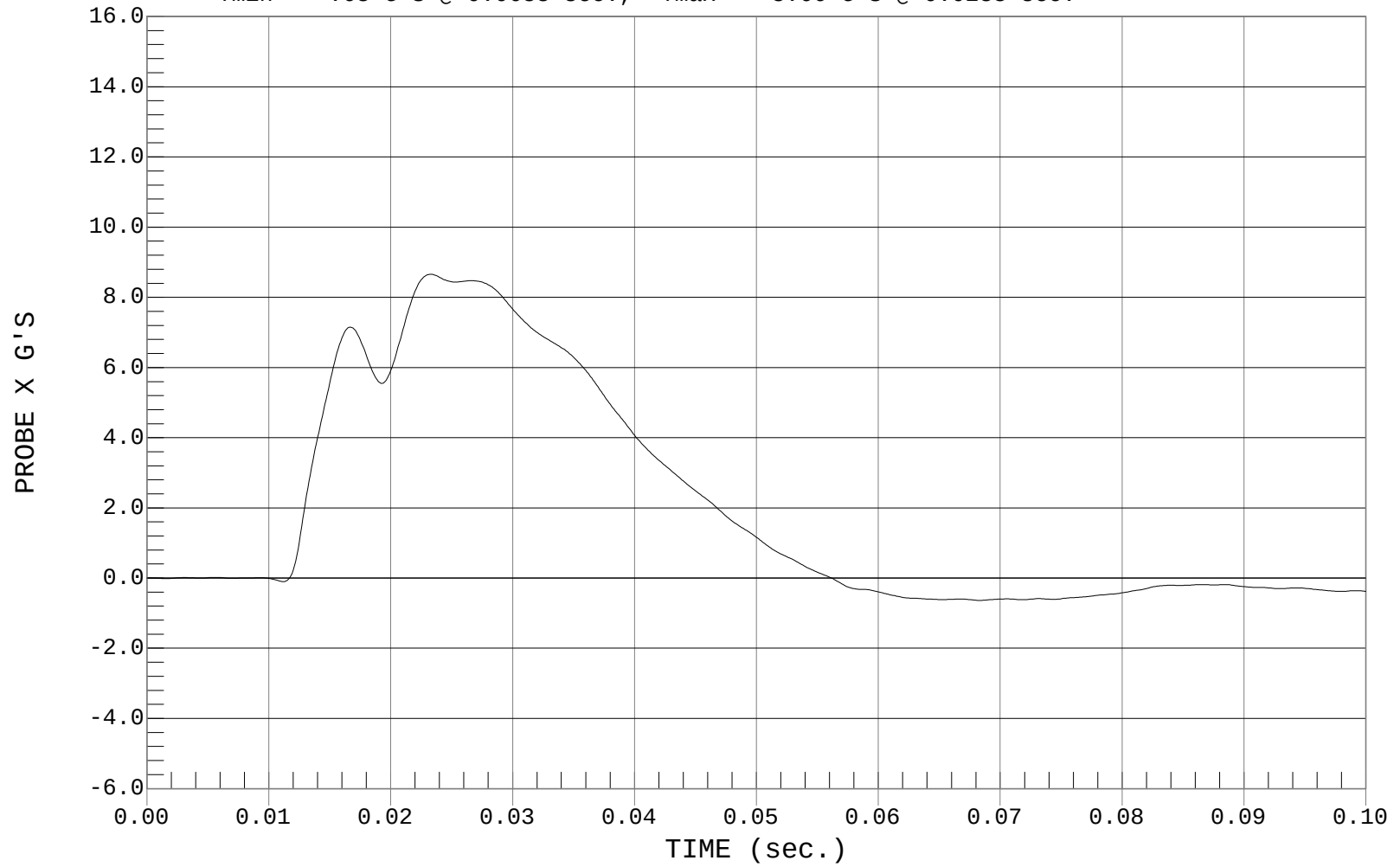
SHOULDER ACCELERATION

Test Desc.: Dummy Calibration - Shoulder Impact
Component: Dummy #010

Test Date: 10-24-01
Speed: 14.08 FT/SEC, 4.29 M/SEC

— 1 PROBE X, D01523AF.A01

Ymin = -0.63 G'S @ 0.0683 sec., Ymax = 8.66 G'S @ 0.0233 sec.



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

Date: 10/22/01
Dummy Serial Number: 010
Test Number: D011524/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.3
Relative Humidity (%)	10 – 70	51
Displacement at 2 m/s	23.5 – 27.5 mm	24.2
Displacement at 3 m/s	36.0 – 40.0 mm	37.6
Displacement at 4 m/s	46.0 – 51.0 mm	49.3

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.4
Relative Humidity (%)	10 – 70	51
Displacement at 2 m/s	23.5 – 27.5 mm	26.1
Displacement at 3 m/s	36.0 – 40.0 mm	38.6
Displacement at 4 m/s	46.0 – 51.0 mm	50.2

LOWER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.5
Relative Humidity (%)	10 – 70	52
Displacement at 2 m/s	23.5 – 27.5 mm	25.6
Displacement at 3 m/s	36.0 – 40.0 mm	39.6
Displacement at 4 m/s	46.0 – 51.0 mm	50.1

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



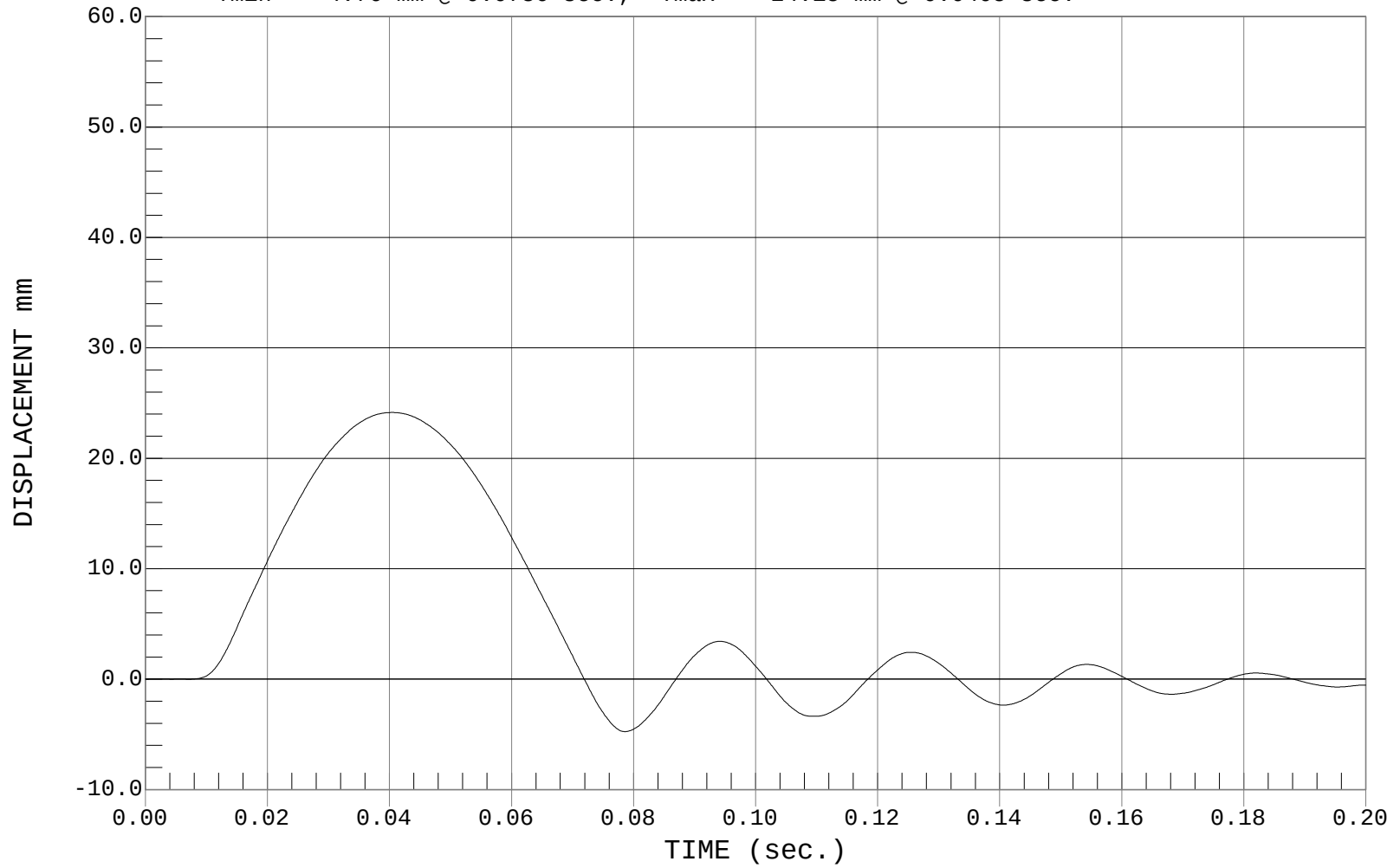
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #010

Test Date: 10-22-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01524DF.D05

Ymin = -4.76 mm @ 0.0786 sec., Ymax = 24.15 mm @ 0.0405 sec.





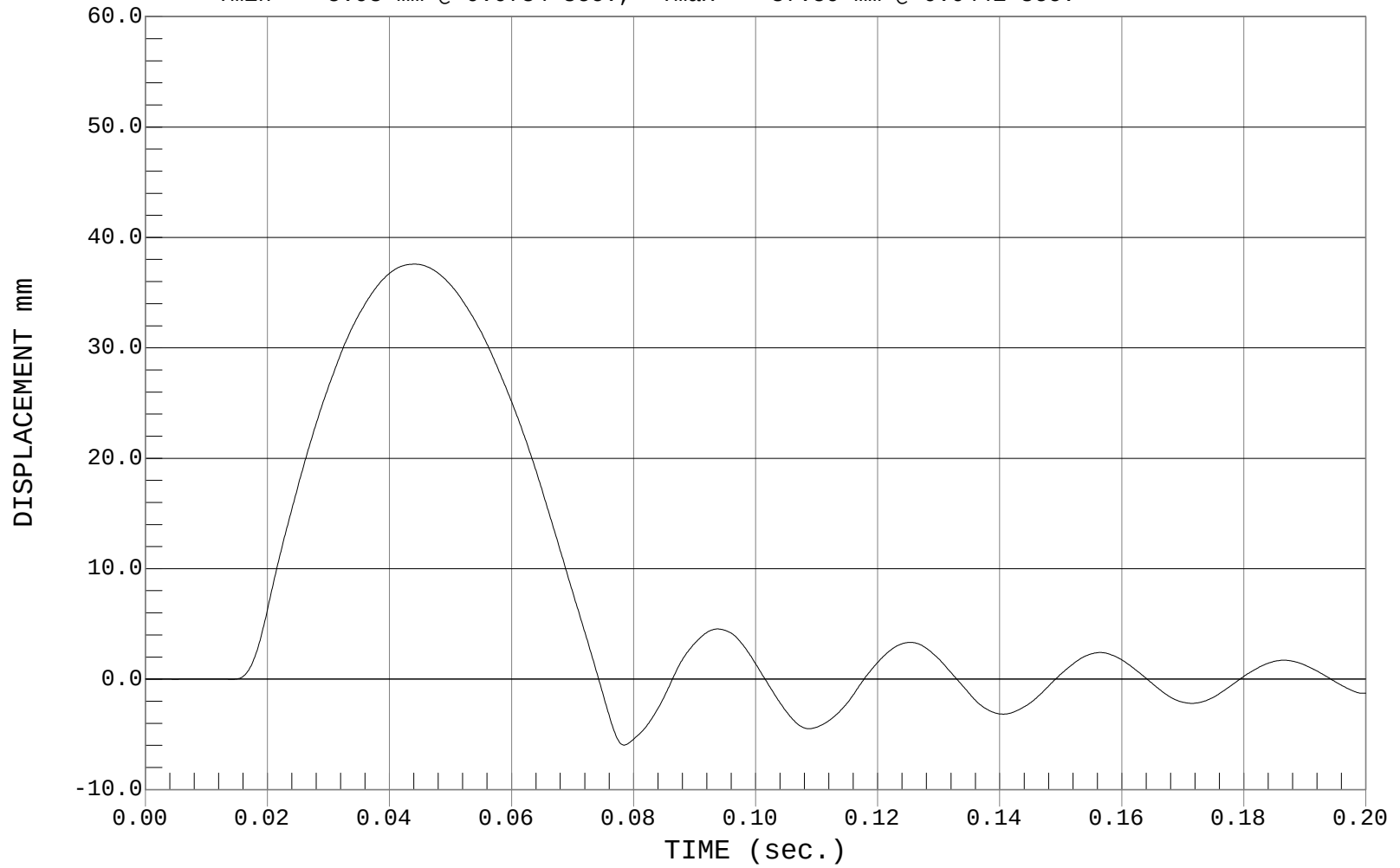
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #010

Test Date: 10-22-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01524DF.D06

Ymin = -5.98 mm @ 0.0784 sec., Ymax = 37.59 mm @ 0.0441 sec.





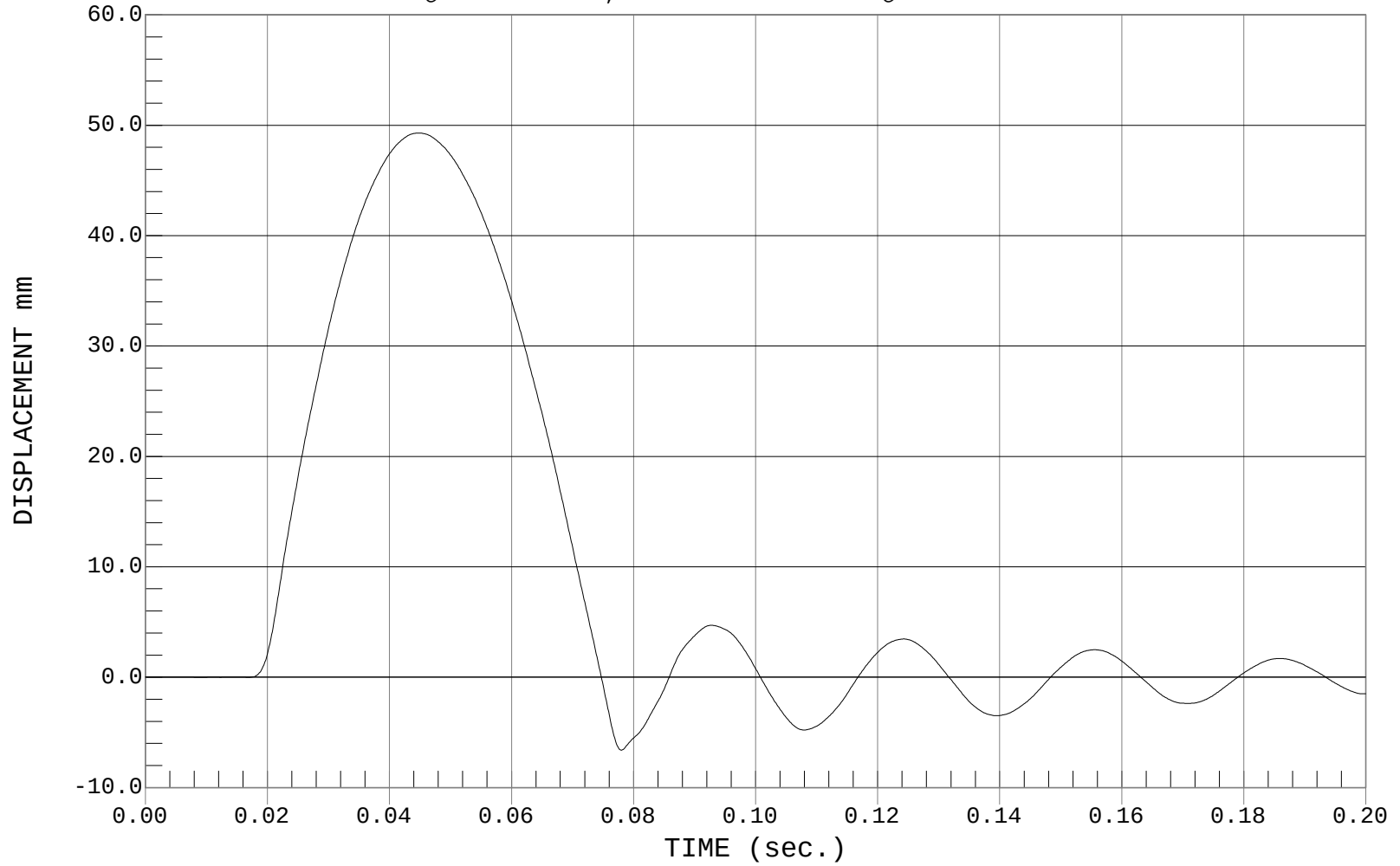
UPPER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #010

Test Date: 10-22-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01524DF.D07

Ymin = -6.6 mm @ 0.0780 sec., Ymax = 49.29 mm @ 0.0448 sec.





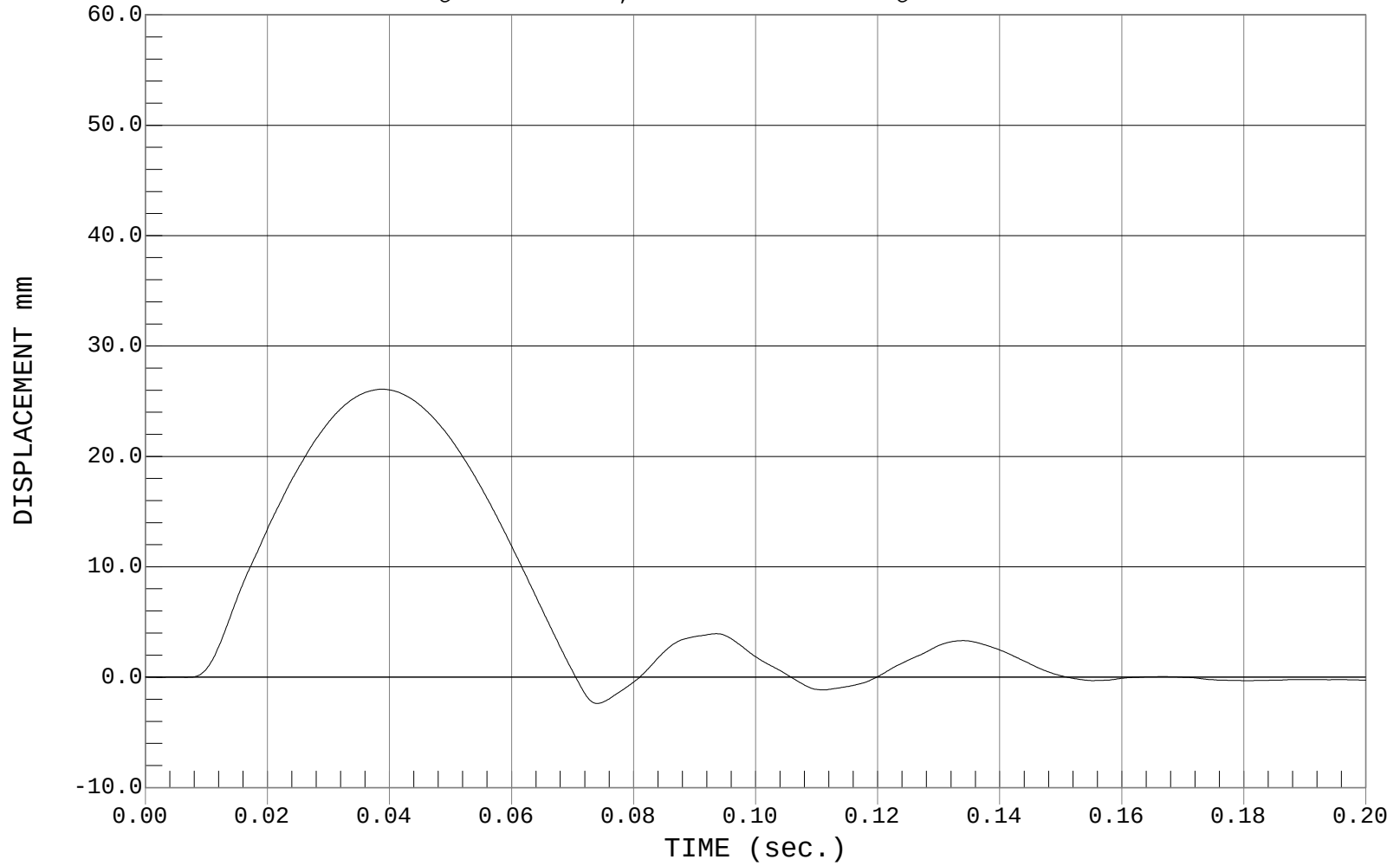
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #010

Test Date: 10-22-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01525DF.D05

Ymin = -2.38 mm @ 0.0740 sec., Ymax = 26.08 mm @ 0.0387 sec.





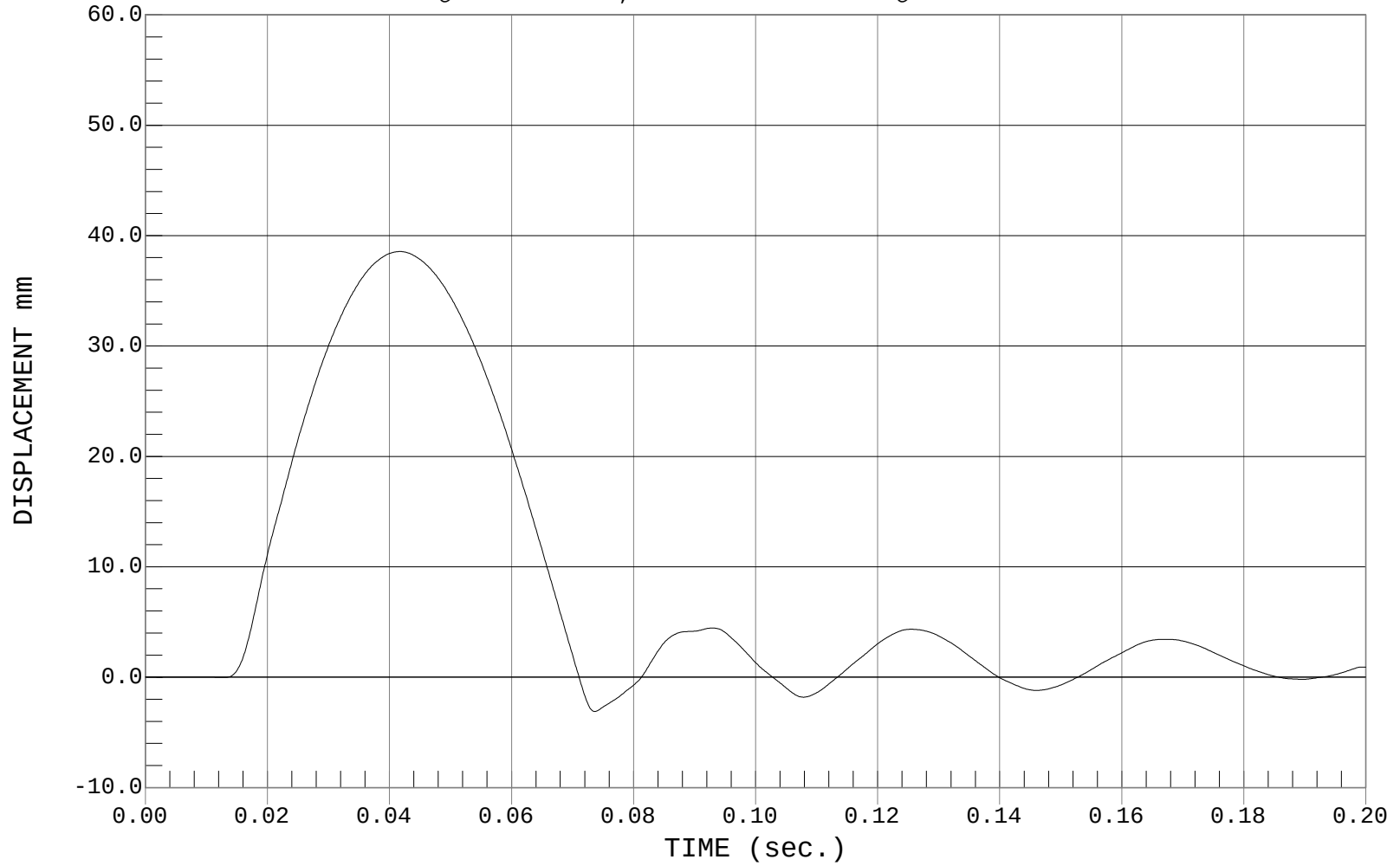
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #010

Test Date: 10-22-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01525DF.D06

Ymin = -3.11 mm @ 0.0736 sec., Ymax = 38.56 mm @ 0.0417 sec.





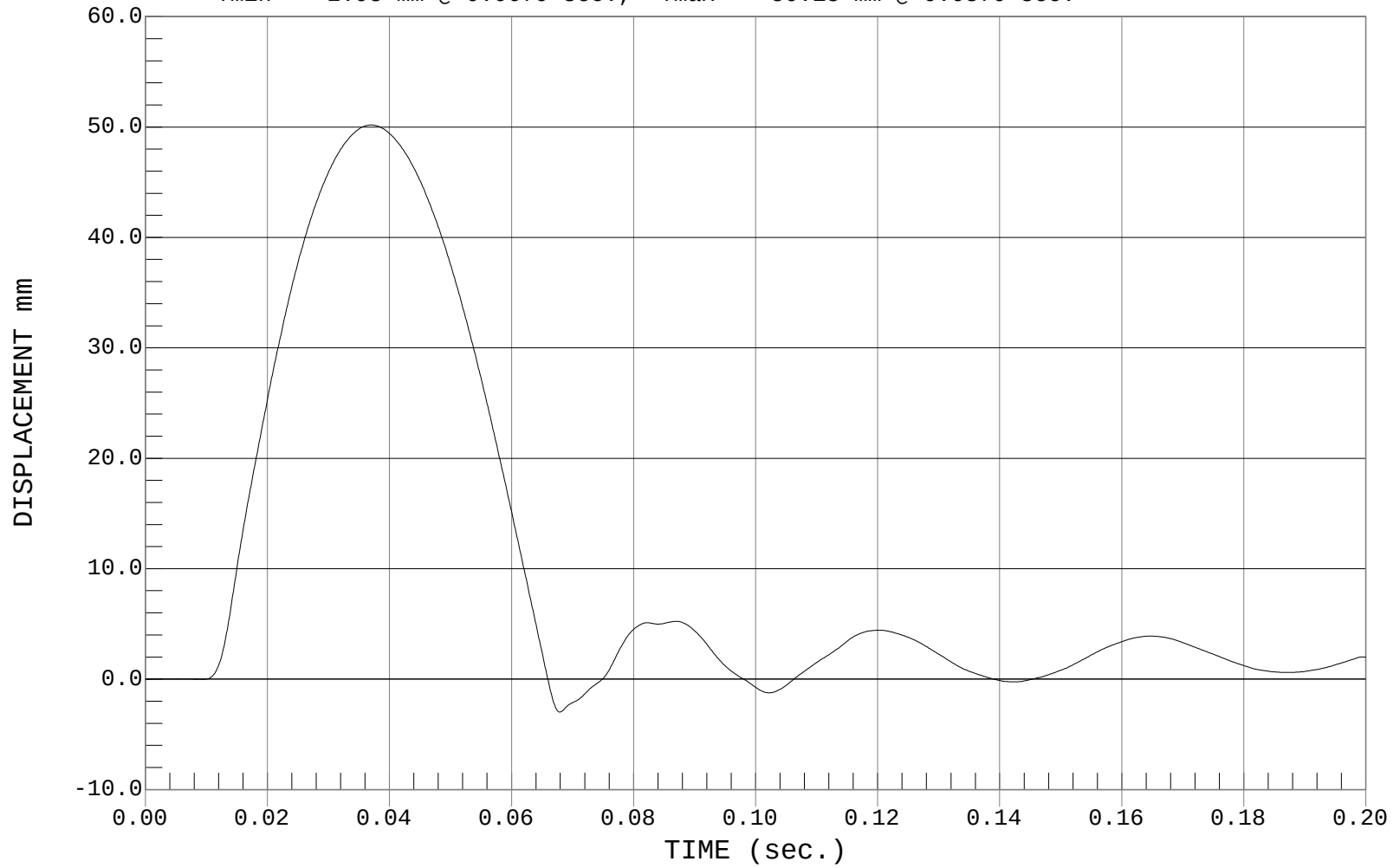
MIDDLE RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #010

Test Date: 10-22-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01525DF.D07

Ymin = -2.98 mm @ 0.0679 sec., Ymax = 50.18 mm @ 0.0370 sec.





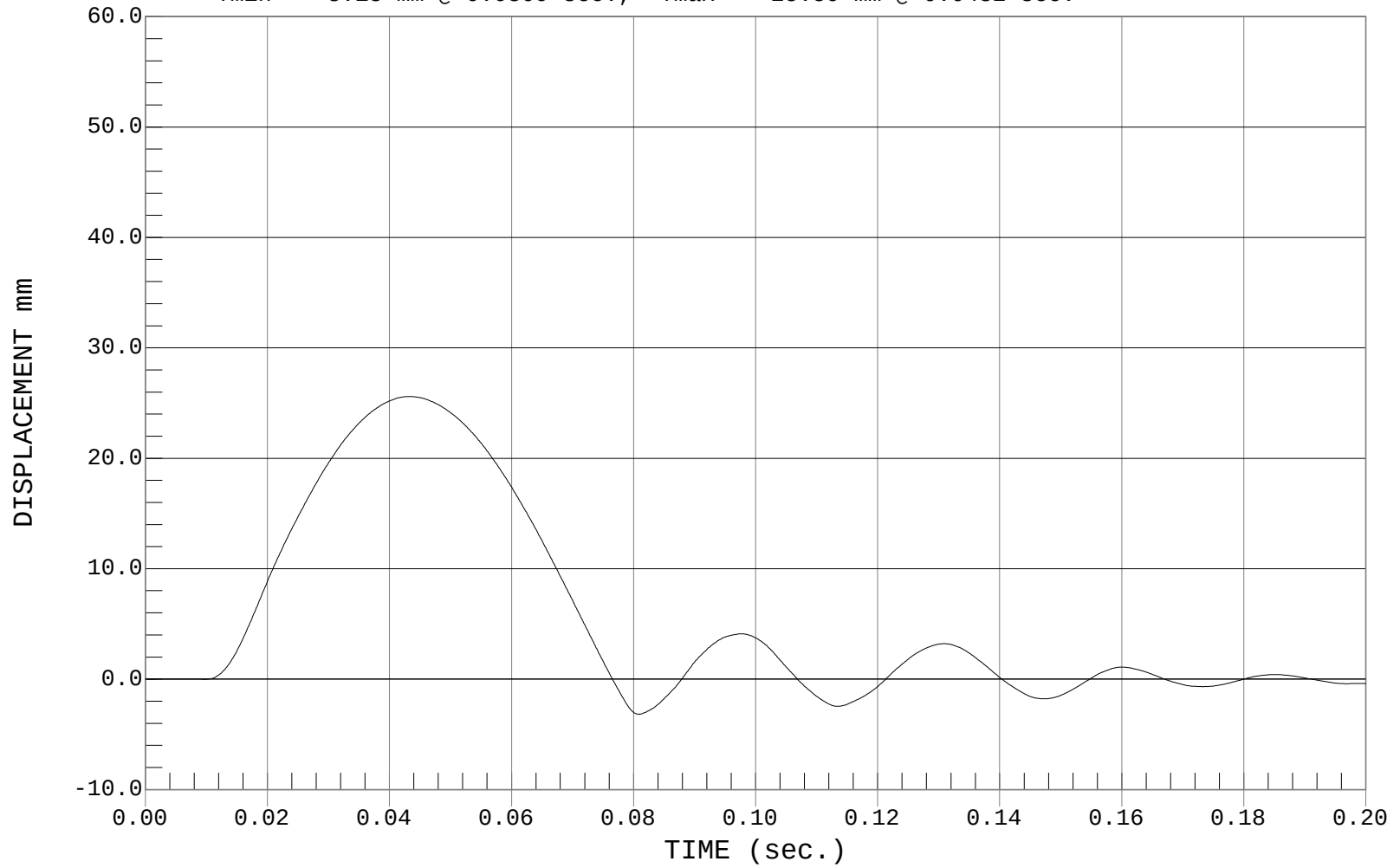
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #010

Test Date: 10-22-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01526DF.D05

Ymin = -3.18 mm @ 0.0809 sec., Ymax = 25.59 mm @ 0.0432 sec.





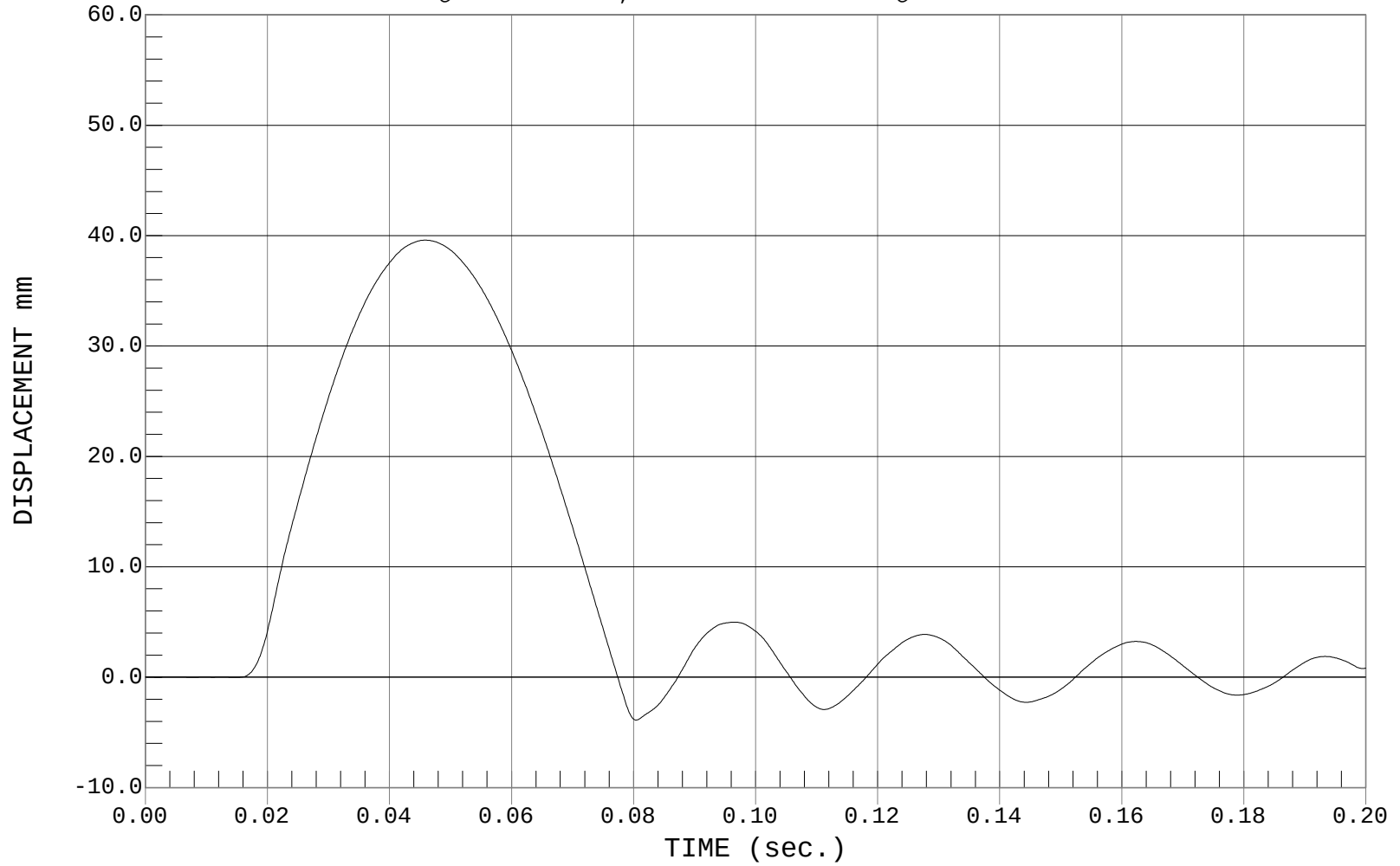
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #010

Test Date: 10-22-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01526DF.D06

Ymin = -3.89 mm @ 0.0804 sec., Ymax = 39.59 mm @ 0.0459 sec.





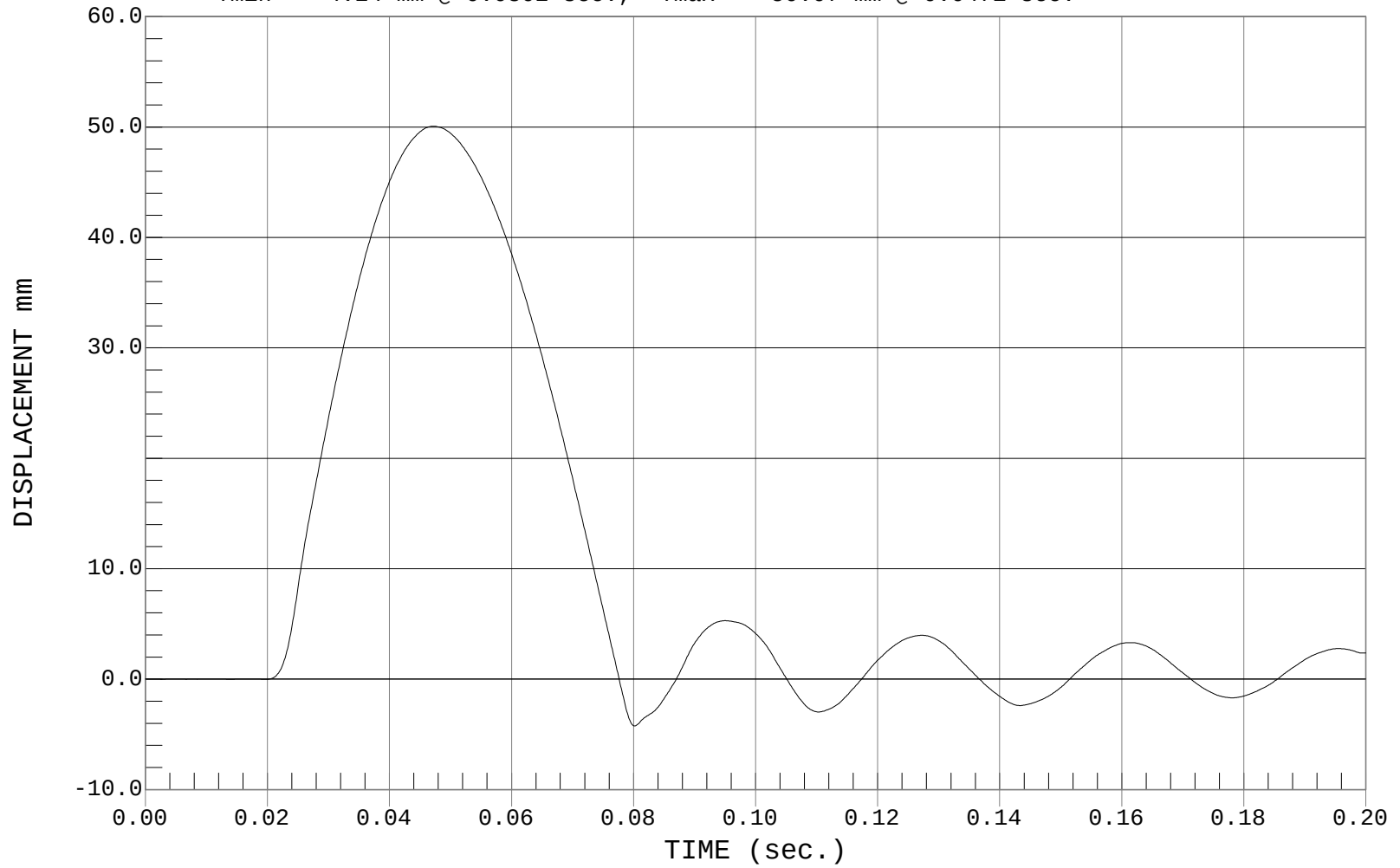
LOWER RIB DISPLACEMENT

Test Desc.: Dummy Calibration - Rib Module
Component: Dummy #010

Test Date: 10-22-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01526DF.D07

Ymin = -4.24 mm @ 0.0802 sec., Ymax = 50.07 mm @ 0.0471 sec.



MGA RESEARCH CORPORATION
ABDOMEN TEST
EUROSID 2 DUMMY

Date: 10/24/01

Dummy Serial Number: 010

Test Number: D011527

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.0
Relative Humidity (%)	10 – 70	56
Probe Speed (m/s)	3.90 – 4.10	3.99
Maximum Impact Force	4.00 – 4.80 kN	4.77
Time of Maximum Force	10.60 – 13.00 ms	12.70
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.26
Time of Max. Total Force	10.00 – 12.30 ms	11.8

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



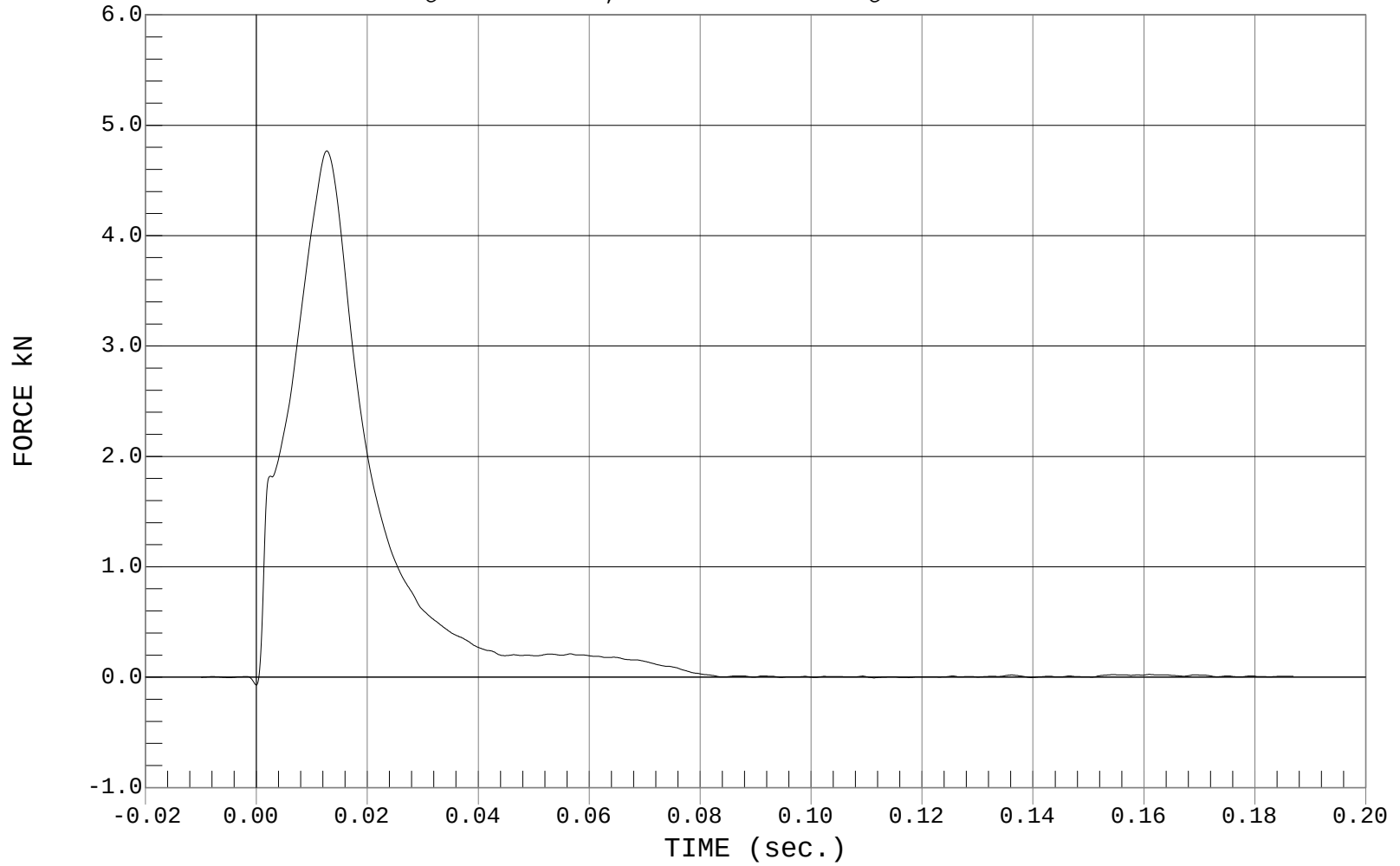
IMPACTOR FORCE

Test Desc.: Dummy Calibration - Abdomen Impact
Component: Dummy #010

Test Date: 10-24-01
Speed: 13.10 FT/SEC, 3.99 M/SEC

— 1 FORCE, D01527FT.F01

Ymin = -.07 kN @ 0.0000 sec., Ymax = 4.77 kN @ 0.0127 sec.





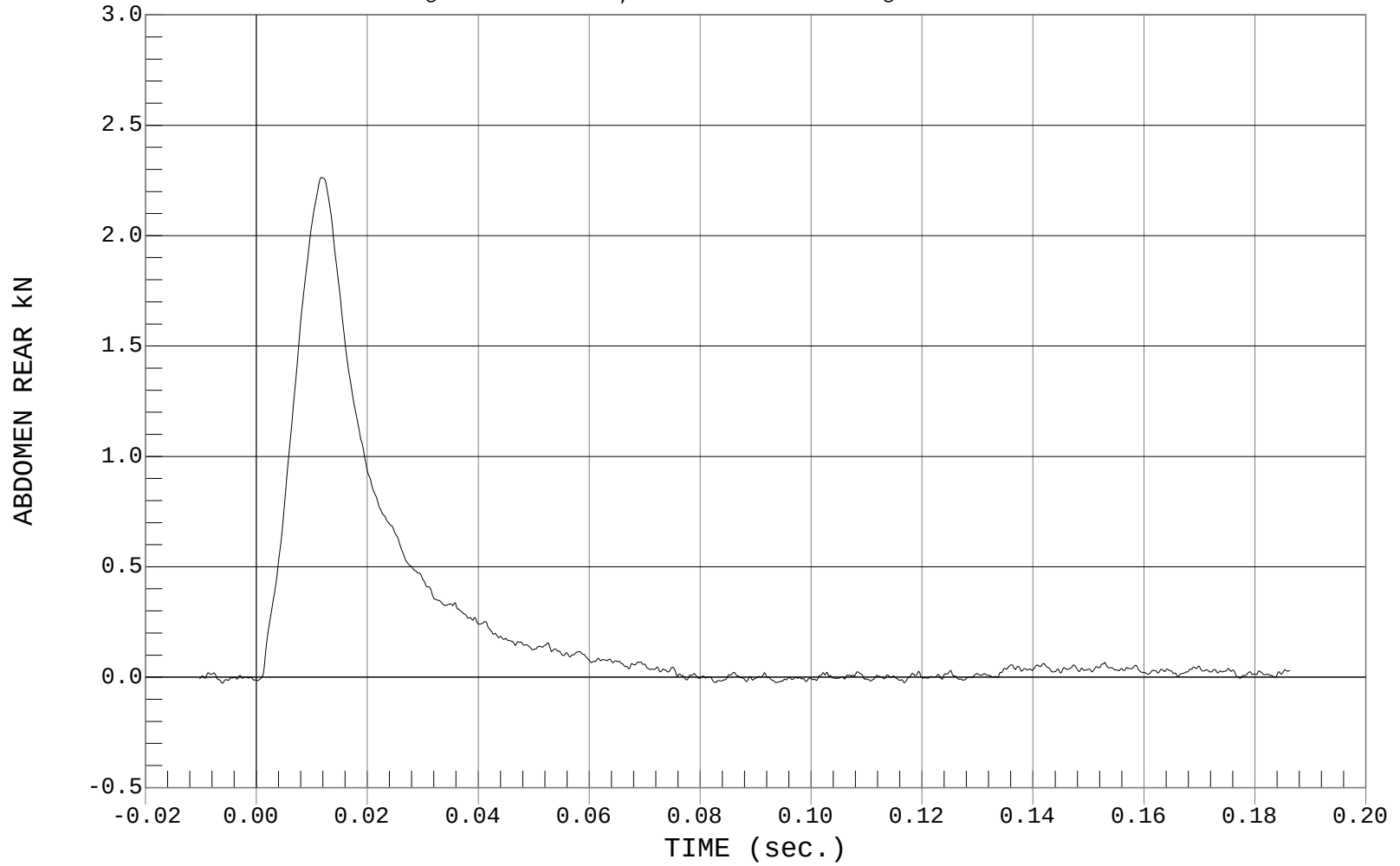
ABDOMEN FORCE

Test Desc.: Dummy Calibration - Abdomen Impact
Component: Dummy #010

Test Date: 10-24-01
Speed: 13.10 FT/SEC, 3.99 M/SEC

— 1 ABDOMEN REAR, D01527FT.F02

Ymin = -.03 kN @ -0.0061 sec., Ymax = 2.26 kN @ 0.0118 sec.



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
EUROSID 2 DUMMY

Date: 10/24/01

Dummy Serial Number: 010

Test Number: D011528

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.1
Relative Humidity (%)		10 – 70	58
Pendulum Speed		5.95 – 6.15	5.99
Pendulum Deceleration	10 msec	2.46 - 1.59 m/sec	-1.96
	20 msec	5.25 - 4.07 m/sec	-4.42
	25 msec	6.64 - 5.3 m/sec	-5.52
	30 msec	≥ -6.5 m/sec	-6.1
Maximum Flexion Angle		45.0 – 55.0 deg	52.4
Time of Max. Flexion Angle		39.0 – 53.0 ms	44.6
Maximum Angle Theta (A)		31.0 – 35.0 deg	32.8
Time of Max. Theta (A)		44.0 – 52.0 ms	44.6
Maximum Angle Theta (B)		28.24 – 30.74 deg	29.11
Time of Max. Theta (B)		44.0 – 52.0 ms	46.0

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



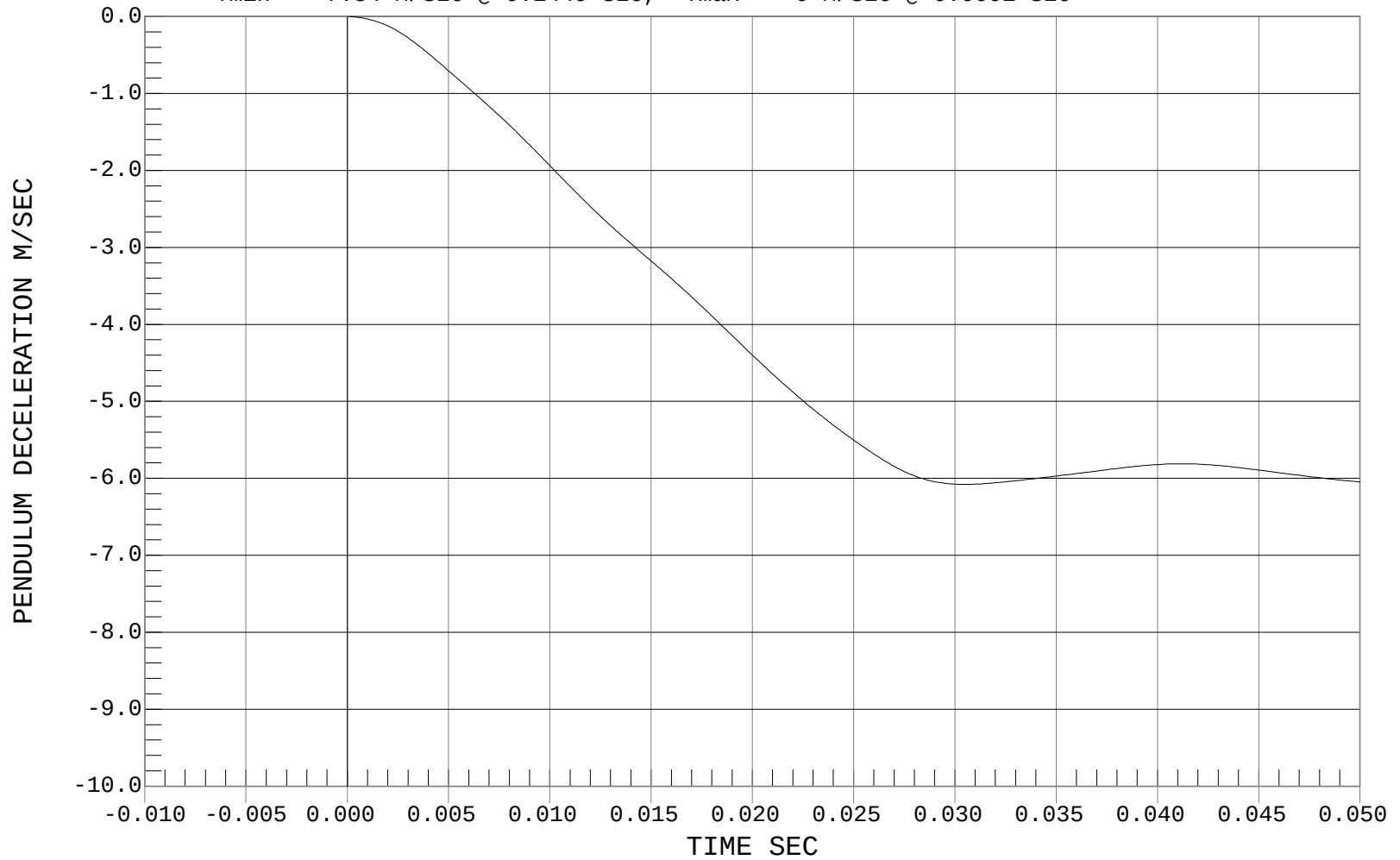
PENDULUM DECELERATION

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy #010

Test Date: 10-24-01
Speed: 19.64 FT/SEC, 5.99 M/SEC

— 1 PENDULUM DECELERATION, D01528AI.V04

Ymin = -7.34 M/SEC @ 0.1449 SEC, Ymax = 0 M/SEC @ 0.0001 SEC





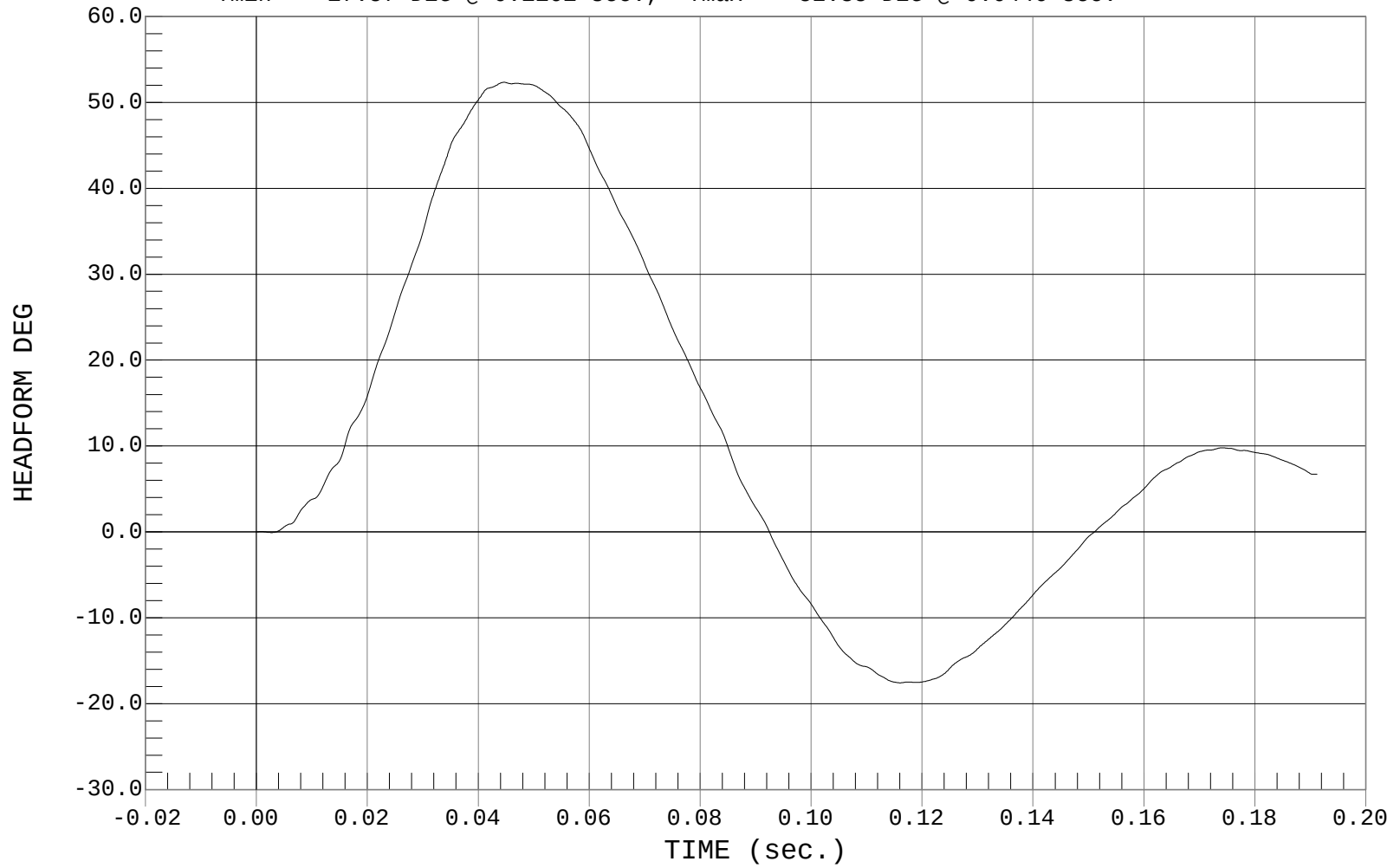
FLEXION ANGLE

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy #010

Test Date: 10-24-01
Speed: 19.64 FT/SEC, 5.99 M/SEC

— 1 HEADFORM, D01528DT.D08

Ymin = -17.57 DEG @ 0.1161 sec., Ymax = 52.35 DEG @ 0.0446 sec.





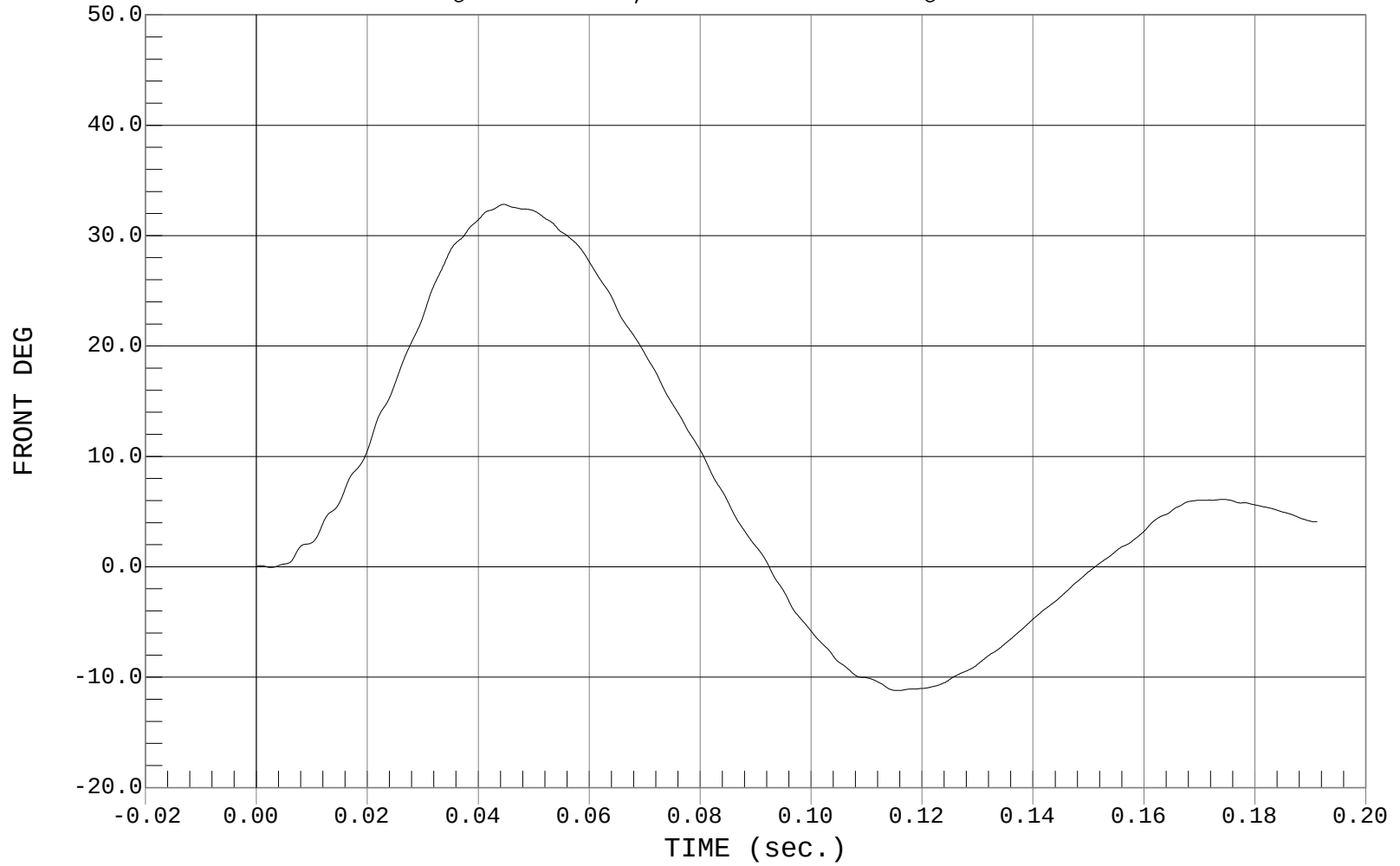
THETA A

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy #010

Test Date: 10-24-01
Speed: 19.64 FT/SEC, 5.99 M/SEC

— 1 FRONT, D01528DT.D05

Ymin = -11.2 DEG @ 0.1156 sec., Ymax = 32.83 DEG @ 0.0446 sec.





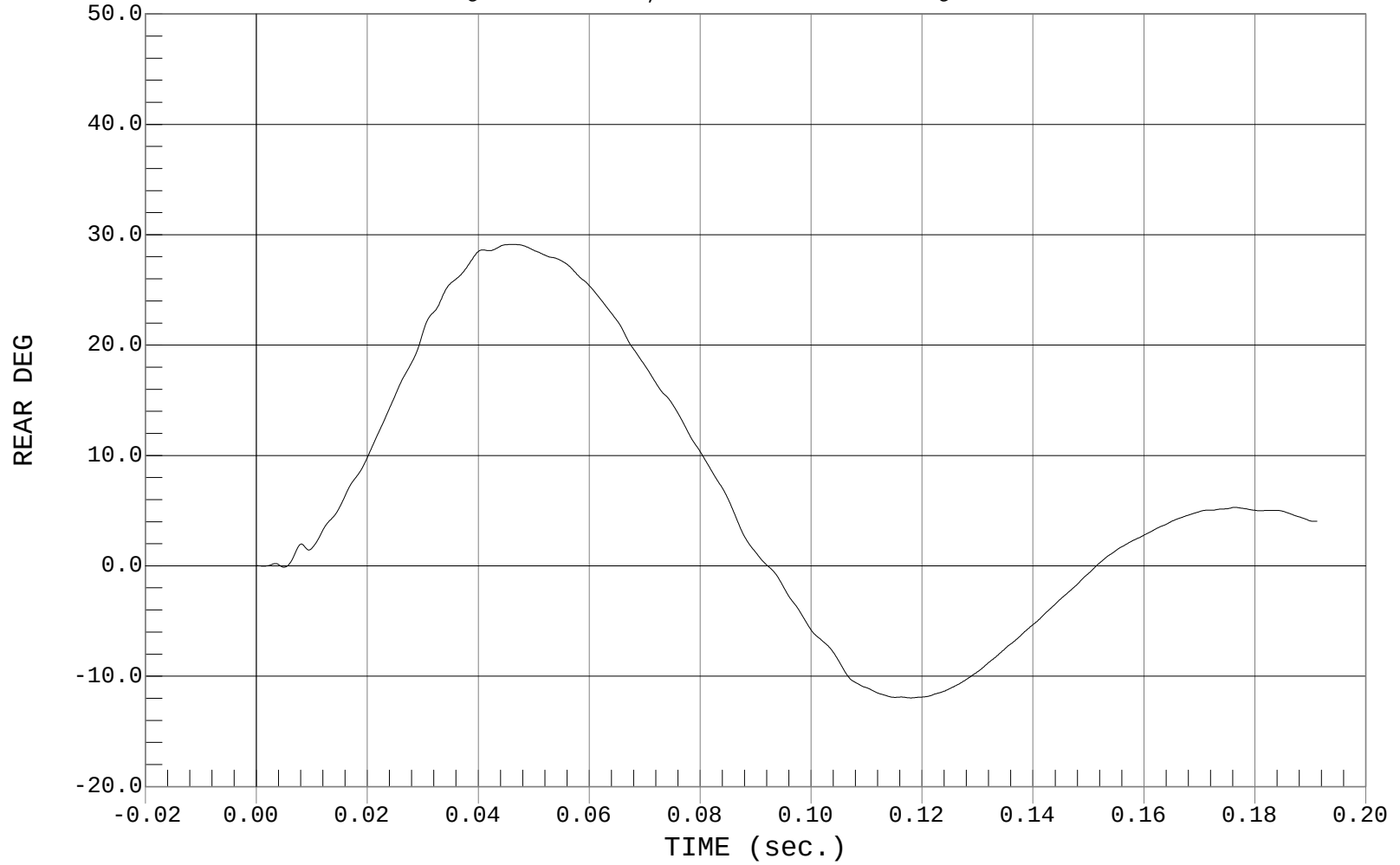
THETA B

Test Desc.: Dummy Calibration - Lumbar Flexion
Component: Dummy #010

Test Date: 10-24-01
Speed: 19.64 FT/SEC, 5.99 M/SEC

— 1 REAR, D01528DT.D06

Ymin = -11.96 DEG @ 0.1180 sec., Ymax = 29.11 DEG @ 0.0460 sec.



MGA RESEARCH CORPORATION
PELVIS TEST
EUROSID 2 DUMMY

Date: 10/24/01

Dummy Serial Number: 010

Test Number: D011529

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.0
Relative Humidity (%)	10 – 70	56
Pendulum Speed	6.20 – 6.30 m/s	6.24
Maximum Impactor Force	9.80 – 12.20 kN	11.10
Time of Max. Impactor Force	9.50 – 12.50 ms	11.20
Maximum Pubic Force	2.65 – 3.35 kN	3.34
Time of Max. Pubic Force	10.00 – 13.00 ms	11.60

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



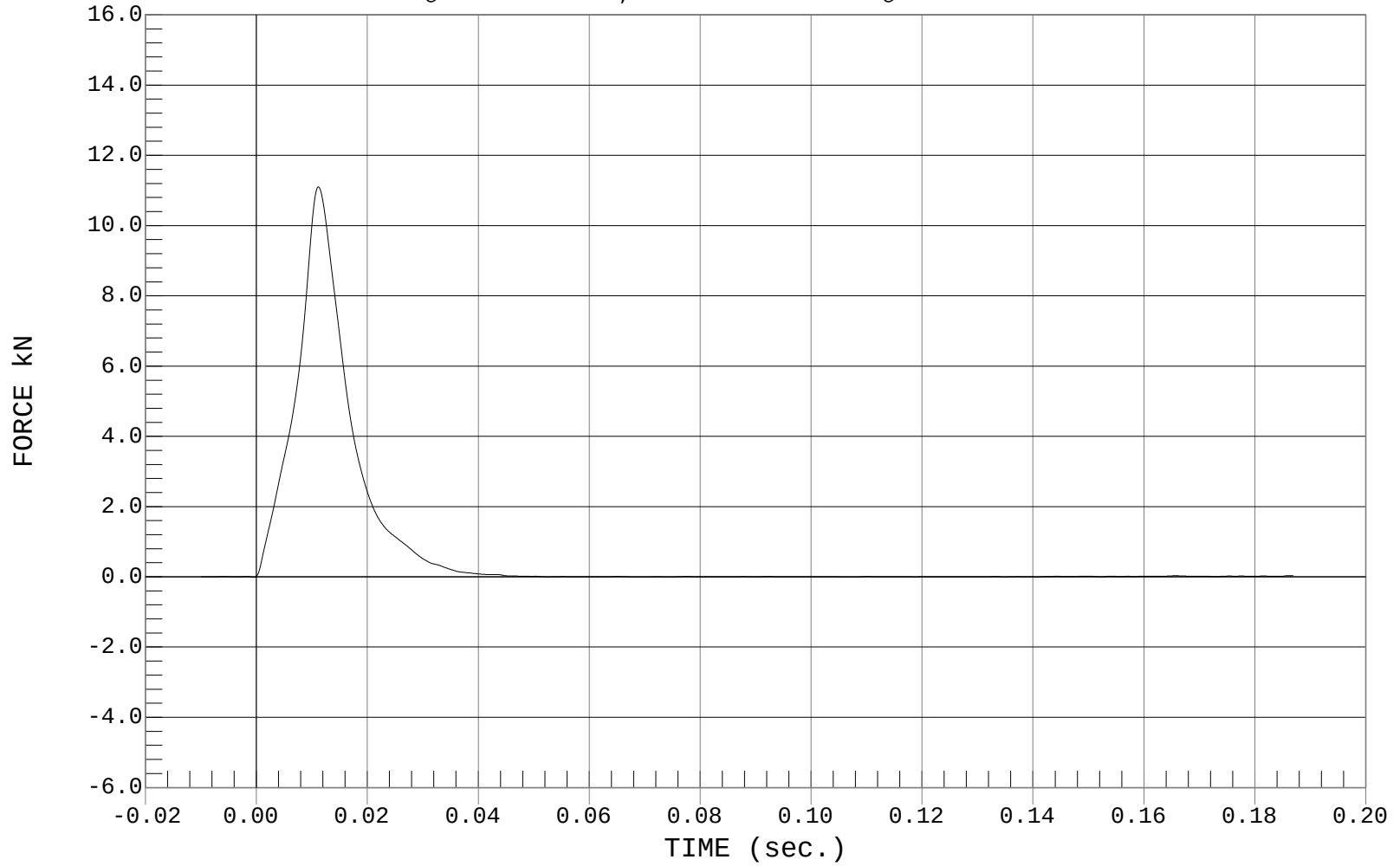
IMPACTOR FORCE

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #010

Test Date: 10-24-01
Speed: 20.47 FT/SEC, 6.24 M/SEC

— 1 FORCE, D01529FT.F01

Ymin = -.01 kN @ -0.0005 sec., Ymax = 11.1 kN @ 0.0112 sec.





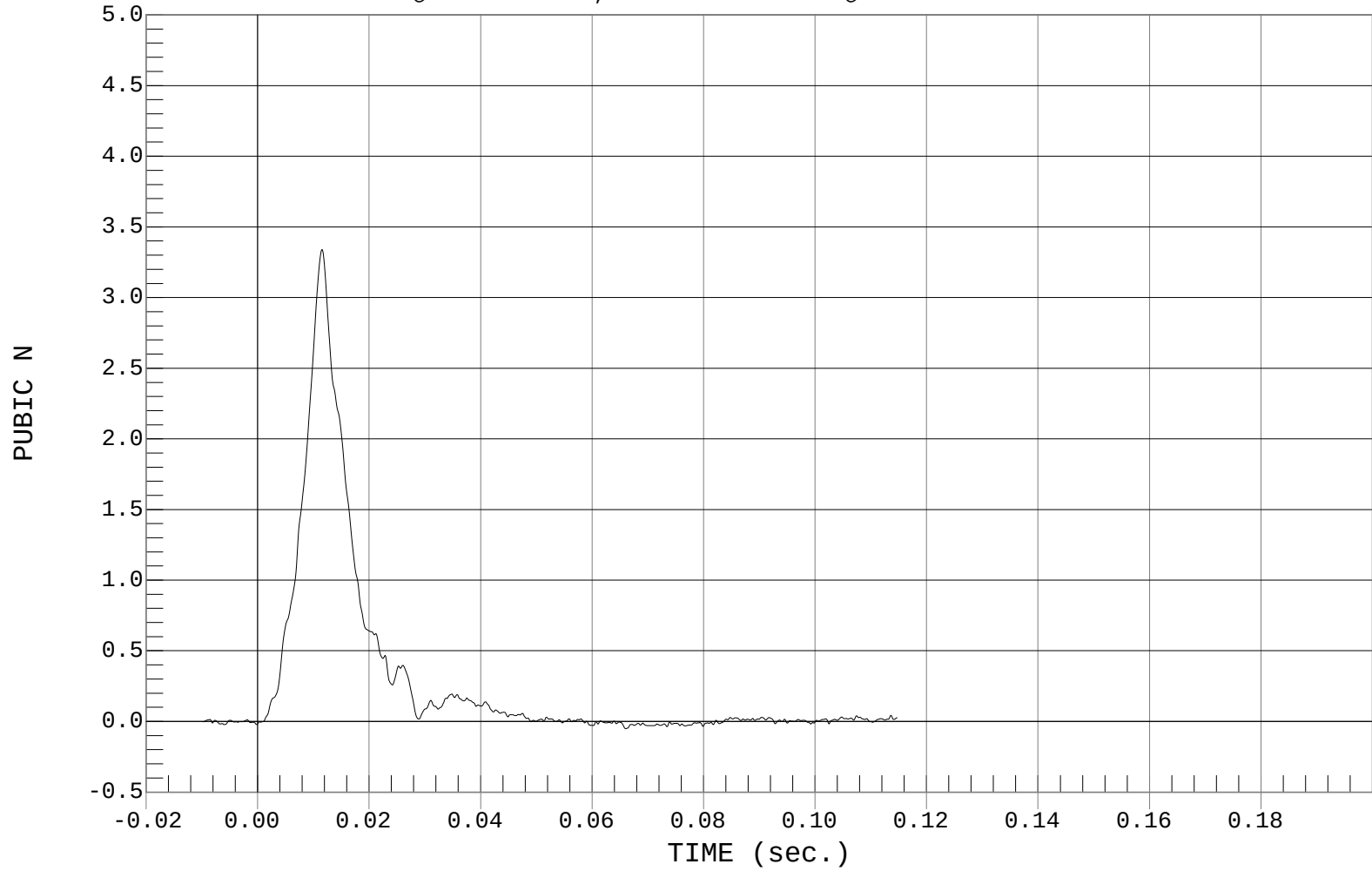
PUBIC FORCE

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #010

Test Date: 10-24-01
Speed: 20.47 FT/SEC, 6.24 M/SEC

— 1 PUBIC, D01529FT.F02

Ymin = -.05 N @ 0.0660 sec., Ymax = 3.34 N @ 0.0116 sec.



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	J14006	Endevco	10/2/01
Head Y Accelerometer	J13628	Endevco	10/2/01
Head Z Accelerometer	J13652	Endevco	10/2/01
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	J10730	Endevco	10/2/01
Upper Spine Y Accelerometer	J11014	Endevco	10/2/01
Upper Spine Z Accelerometer	J11625	Endevco	10/2/01
Upper Rib Y Accelerometer	AGRW3	Endevco	6/20/01
Mid Rib Y Accelerometer	AHY71	Endevco	6/20/01
Lower Rib Y Accelerometer	AMPY0	Endevco	6/20/01
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	J13927	Endevco	10/2/01
Lower Spine Y Accelerometer	J13941	Endevco	10/2/01
Lower Spine Z Accelerometer	J13984	Endevco	10/2/01
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	AHTF1	Endevco	10/2/01
Pelvis Y Accelerometer	AJ9D6	Endevco	10/2/01
Pelvis Z Accelerometer	AJ9D8	Endevco	10/2/01
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 (Continued)

	INSTRUMENTS FOR LEFT REAR DUMMY NO. 010		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X Accelerometer	J20392	Endevco	5/31/01
Head Y Accelerometer	ALDD6	Endevco	5/31/01
Head Z Accelerometer	AGT18	Endevco	5/31/01
Upper Neck Load Cell	106	FTSS	3/27/01
Lower Neck Load Cell	111	FTSS	5/8/01
Shoulder Force Load Cell	120	FTSS	4/24/01
Upper Spine X Accelerometer	AN8D5	Endevco	7/3/01
Upper Spine Y Accelerometer	J13709	Endevco	7/3/01
Upper Spine Z Accelerometer	AN8D2	Endevco	7/3/01
Upper Rib Y Accelerometer	J13653	Endevco	6/20/01
Mid Rib Y Accelerometer	J13649	Endevco	6/20/01
Lower Rib Y Accelerometer	J13713	Endevco	6/20/01
Upper Rib Displacement	010	Honeywell	5/22/01
Mid Rib Displacement	010	Honeywell	5/22/01
Lower Rib Displacement	010	Honeywell	5/22/01
Lower Spine X Accelerometer	AH1F9	Endevco	8/21/01
Lower Spine Y Accelerometer	AH0F0	Endevco	8/21/01
Lower Spine Z Accelerometer	AH097	Endevco	8/21/01
Torso Load Cell	123	FTSS	4/12/01
Front Abdomen Load Cell	119	FTSS	4/26/01
Mid Abdomen Load Cell	120	FTSS	4/26/01
Rear Abdomen Load Cell	121	FTSS	4/26/01
Pubic Symphysis Load Cell	113	Denton	3/29/01
Pelvis X Accelerometer	AH0C3	Endevco	8/30/01
Pelvis Y Accelerometer	AHT12	Endevco	8/30/01
Pelvis Z Accelerometer	AHTN3	Endevco	8/30/01
Right Femur Load Cell	137	FTSS	4/18/01
Left Femur Load Cell	138	FTSS	4/18/01
Lumbar Load Cell	105	FTSS	5/7/01

DUMMY AND VEHICLE CALIBRATION DATA (Continued)

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	D11-F01	Entran	5/30/01
Moving Barrier CG Y	J10-E18	Entran	8/21/01
Moving Barrier CG Z	125-J09	Entran	5/25/01
Moving Barrier Rear Axle X	E03-H06	Entran	6/7/01
Moving Barrier Rear Axle Y	F11-G09	Entran	9/27/01
Left Mid A-Post Y	I12-F01	Entran	10/10/01
Left Lower A-Post Y	I12-F09	Entran	10/10/01
Left Mid B-Post Y	I12-F02	Entran	10/10/01
Left Lower B-Post Y	L15-G21	Entran	6/25/01
Rear Floorpan Above Axle X	G01-J02	Entran	8/21/01
Rear Floorpan Above Axle Y	I14-D13	Entran	8/21/01
Rear Floorpan Above Axle Z	C25-A25	Entran	8/21/01
Driver Seat Track Y	D11-F09	Entran	5/31/01
Right Side Sill at Front Seat X	F04-N15	Entran	6/25/01
Right Side Sill at Front Seat Y	F04-N09	Entran	6/22/01
Right Side Sill at Front Seat Z	H14-N12	Entran	9/12/01
Right Side Sill at Rear Seat X	J10-E03	Entran	6/19/01
Right Side Sill at Rear Seat Y	G13-F10	Entran	6/1/01
Right Side Sill at Rear Seat Z	K19-A11	Entran	8/21/01
Left Side Sill at Front Seat Y	I12-F13	Entran	10/10/01
Left Side Sill at Rear Seat Y	I12-F07	Entran	10/10/01
Vehicle CG X	E13-D06	Entran	8/8/01
Vehicle CG Y	F04-N04	Entran	6/22/01
Vehicle CG Z	I12-F05	Entran	10/10/01

DUMMY AND VEHICLE CALIBRATION DATA (Continued)

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Front Door @ Mid Rib	I12-F03	Entran	10/10/01
Left Front Door @ Pelvis	I12-F11	Entran	10/10/01
Left Front Door @ Knee	I12-F12	Entran	10/10/01
Left Front Door @ Arm	I25-F12	Entran	10/10/01
Left Rear Door @ Mid Rib	E03-H02	Entran	6/6/01
Left Rear Door @ Pelvis	D11-F11	Entran	5/31/01
Left Rear Door @ Knee	I12-F10	Entran	10/10/01
Left Rear Door @ Arm	I25-F12	Entran	6/25/01
Right Rear Occupant Compartment	G03-N07	Entran	7/30/01

Note: All Endevco accelerometers are Model No. 7264-2000

All Entran accelerometers are Model No. EGE-72

APPENDIX E

PROCEDURE 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

DRIVER (ES-2) PEAK RESPONSE TABLE

Location	Peak Values				
				2002 Impala 10/19/01	
	Class	Axis	Units	Peak	Time
Head	1000	X	G	-14.3	52
	1000	Y	G	77.1	49
	1000	Z	G	30.2	44
	1000	RES	G	79.1	49
Head Injury Criteria (HIC)				307	
t1				42.9	
t2				53.2	
Upper Neck Force	1000	X	N	393	55
	1000	Y	N	-301	54
	1000	Z	N	-2135	53
	1000	RES	N	2183	53
Upper Neck Moment	600	X	Nm	-101.2	53
	600	Y	Nm	-47.7	57
	600	Z	Nm	6.7	89
	600	RES	Nm	109.7	55
Lower Neck Force	1000	X	N	425	43
	1000	Y	N	295	25
	1000	Z	N	-2198	52
	1000	RES	N	2216	54
Lower Neck Moment	600	X	Nm	64.9	53
	600	Y	Nm	68.9	137
	600	Z	Nm	11.9	57
	600	RES	Nm	71.1	137
Shoulder Force	1000	X	N	-236	147
	1000	Y	N	741	30
	1000	Z	N	-328	34

DRIVER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values				
				2002 Impala 10/19/01	
	Class	Axis	Units	Peak	Time
Upper Spine	180	X	G	17.4	35
	180	Y	G	42.0	33
	180	Z	G	8.0	51
	180	Res	G	45.4	33
Lower Spine	180	X	G	13.2	28
	180	Y	G	57.6	31
	180	Z	G	9.0	49
	180	Res	G	58.4	31
Upper Rib	180	Y	G	79.4	69
Mid Rib	180	Y	G	89.7	35
Lower Rib	180	Y	G	81.6	15
Upper Rib Deflection	180	Y	mm	23.7	46
Mid Rib Deflection	180	Y	mm	19.8	47
Lower Rib Deflection	180	Y	mm	15.6	46
Upper Rib VC	180	Y	m/sec	0.24	40
Mid Rib VC	180	Y	m/sec	0.16	40
Lower Rib VC	180	Y	m/sec	0.13	19
Torso Force	600	X	N	3353	33
	600	Y	N	4710	32
Torso Moment	600	Y	Nm	78.1	32
	600	Z	Nm	149.4	32
T12 Force	600	X	N	-1632	37
	600	Y	N	-759	95
T12 Moment	600	X	Nm	not collected	
	600	Y	Nm	-129.6	36

DRIVER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values				
				2002 Impala 10/19/01	
	Class	Axis	Units	Peak	Time
Abdomen Front Force	600	Y	N	337	45
Abdomen Mid Force	600	Y	N	410	29
Abdomen Rear Force	600	Y	N	623	30
Abdomen Summed Force	600	Y	N	1171	30
Pubic Symphysis Force	600	Y	N	2078	34
Right Femur Force	600	X	N	-208	59
	600	Y	N	-1043	46
	600	Z	N	-784	46
	600	RES	N	1301	46
Right Femur Moment	600	X	Nm	-221.3	43
	600	Y	Nm	-46.7	59
	600	Z	Nm	-24.3	45
	600	RES	Nm	223.6	43
Left Femur Force	600	X	N	-372	40
	600	Y	N	5074	82
	600	Z	N	898	39
	600	RES	N	5076	82
Left Femur Moment	600	X	Nm	124.8	39
	600	Y	Nm	-78.9	40
	600	Z	Nm	-30.5	55
	600	RES	Nm	147.0	40
Pelvis	1000	X	G	12.9	122
	1000	Y	G	67.2	35
	1000	Z	G	11.0	51

PASSENGER (ES-2) PEAK RESPONSE TABLE

Location	Peak Values				
				2002 Impala 10/19/01	
	Class	Axis	Units	Peak	Time
Head	1000	X	G	-21.0	66
	1000	Y	G	69.3	54
	1000	Z	G	-34.8	58
	1000	RES	G	72.3	53
Head Injury Criteria (HIC)				284	
T1				47.8	
T2				60.4	
Upper Neck Force	1000	X	N	-374	66
	1000	Y	N	-1352	59
	1000	Z	N	-2367	58
	1000	RES	N	2718	58
Upper Neck Moment	600	X	Nm	-55.2	56
	600	Y	Nm	-51.3	58
	600	Z	Nm	19.6	63
	600	RES	Nm	73.3	58
Lower Neck Force	1000	X	N	447	82
	1000	Y	N	1444	58
	1000	Z	N	-2582	58
	1000	RES	N	2968	58
Lower Neck Moment	600	X	Nm	-66.5	73
	600	Y	Nm	84.6	68
	600	Z	Nm	22.2	88
	600	RES	Nm	104.3	69
Shoulder Force	1000	X	N	1125	49
	1000	Y	N	1492	49
	1000	Z	N	1662	54

PASSENGER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values				
				2002 Impala 10/19/01	
	Class	Axis	Units	Peak	Time
Upper Spine	180	X	G	-19.3	52
	180	Y	G	44.1	49
	180	Z	G	16.0	56
	180	Res	G	48.8	51
Lower Spine	180	X	G	-16.6	35
	180	Y	G	58.0	43
	180	Z	G	-10.8	40
	180	Res	G	60.9	40
Upper Rib	180	Y	G	57.7	46
Mid Rib	180	Y	G	50.3	44
Lower Rib	180	Y	G	131.3	38
Upper Rib Deflection	180	Y	mm	4.0	61
Mid Rib Deflection	180	Y	mm	1.1	85
Lower Rib Deflection	180	Y	mm	8.0	62
Upper Rib VC	180	Y	m/sec	0.04	37
Mid Rib VC	180	Y	m/sec	0.00	0
Lower Rib VC	180	Y	m/sec	-0.03	68
Torso Force	600	X	N	955	76
	600	Y	N	-622	77
Torso Moment	600	Y	Nm	-40.7	77
	600	Z	Nm	-23.8	79
T12 Force	600	X	N	no load cell	
	600	Y	N		
T12 Moment	600	X	Nm	no load cell	
	600	Y	Nm		

PASSENGER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values				
				2002 Impala 10/19/01	
	Class	Axis	Units	Peak	Time
Abdomen Front Force	600	Y	N	2098	36
Abdomen Mid Force	600	Y	N	1943	44
Abdomen Rear Force	600	Y	N	614	40
Abdomen Summed Force	600	Y	N	4566	40
Pubic Symphysis Force	600	Y	N	-4108	40
Right Femur Force	600	X	N	-345	69
	600	Y	N	-975	38
	600	Z	N	1261	38
	600	RES	N	1588	38
Right Femur Moment	600	X	Nm	-108.1	92
	600	Y	Nm	50.1	43
	600	Z	Nm	-19.3	48
	600	RES	Nm	-112.9	92
Left Femur Force	600	X	N	-309	27
	600	Y	N	-1727	29
	600	Z	N	-15509	69
	600	RES	N	15509	69
Left Femur Moment	600	X	Nm	306.5	29
	600	Y	Nm	-55.9	39
	600	Z	Nm	-38.5	109
	600	RES	Nm	-306.6	29
Pelvis	1000	X	G	-47.0	39
	1000	Y	G	104.1	40
	1000	Z	G	-20.7	43

APPENDIX G

ES-2 POLARITY CHECKLIST

ES-2 POLARITY CHECKLIST

Location	Channel	Dummy Manipulation	Polarity
Upper Neck	Fx	Head Rearward, Chest Forward	+
	Fy	Head Leftward, Chest Rightward	+
	Fz	Head Upward, Chest Downward	+
	Mx	Left Ear Toward Left Shoulder	+
	My	Chin Toward Sternum	+
	Mz	Chin Toward Left Shoulder	+
Lower Neck	Fx	Head Rearward, Chest Forward	+
	Fy	Head Leftward, Chest Rightward	+
	Fz	Head Upward, Chest Downward	+
	Mx	Left Ear Toward Left Shoulder	+
	My	Chin Toward Sternum	+
	Mz	Chin Toward Left Shoulder	+
Shoulder	Fx	Shoulder Forward, Chest Rearward	+
	Fy	Shoulder Rightward, Chest Leftward	+
	Fz	Shoulder Downward, Chest Upward	+
Torso Back Plate	Fx	Push Backplate in the +X Direction	+
	Fy	Push Backplate to the Right (+Y)	+
	My	Push Bottom Half and Pull Top Half of Backplate	+
	Mz	Push Left Half and Pull Right Half of Backplate	+
Thorax Upper Rib	Dy	Push Rib Rightward	+
Thorax Mid Rib	Dy	Push Rib Rightward	+
Thorax Lower Rib	Dy	Push Rib Rightward	+
Pubic Load	Fy	Right H-Point Pad Leftward, Left Pad Rightward	(-)
T12 Load	Fx	Chest Rearward, Pelvis Forward	+
	Fy	Chest Leftward, Pelvis Rightward	+
	Mx	Left Shoulder Toward Left Hip	+
	My	Sternum Toward Front of Legs	+
Left Illiac Load	Fy	Left Illiac Rightward, Chest Leftward	+

ES-2 POLARITY CHECKLIST (CONTINUED)

Location	Channel	Dummy Manipulation	Polarity
Ant. Ab. Load	Fy	Left Side of Abdomen Rightward, Chest Leftward	+
Mid Ab. Load	Fy	Left Side of Abdomen Rightward, Chest Leftward	+
Post. Ab. Load	Fy	Left Side of Abdomen Rightward, Chest Leftward	+
Left Upper Leg Load	Fx	Knee Upward, Upper Femur Downward	+
	Fy	Knee Rightward, Upper Femur Leftward	+
	Fz	Knee Forward, Pelvis Rearward	+
	Mx	Knee Leftward, Hold Upper Femur in Place	+
	My	Knee Upward, Hold Upper Femur in Place	+
	Mz	Tibia Leftward, Hold Pelvis in Place	+
Lumbar Spine	Fx	Knee Upward, Upper Femur Downward	+
	Fy	Knee Rightward, Upper Femur Leftward	+
	Fz	Knee Forward, Pelvis Rearward	+
	Mx	Knee Leftward, Hold Upper Femur in Place	+
	My	Knee Upward, Hold Upper Femur in Place	+
	Mz	Tibia Leftward, Hold Pelvis in Place	+