

REPORT NUMBER: TO1-MGA-2001-003

**RIGID POLE SIDE IMPACT TESTS
1999 SAAB 9-5 4 DOOR W/SAB**

ES-2 DRIVER POSITION

**PREPARED BY:
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October 23, 2001

FINAL REPORT

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

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SECTION 1
PURPOSE AND TEST PROCEDURE

This Side Impact test is conducted as part of Contract No. DTRS57-98-D-00041, task order 1, sponsored by the U.S. Department of Transportation, Volpe National Transportation System Center. The purpose of this test is to evaluate the responses of the ES-2 dummy in a 1999 Saab 9-5, with side airbag, subjected to a rigid pole side impact.

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

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A rigid pole side impact test was performed on a model year 1999 Saab 9-5 4 door with side airbag. The subject vehicle was towed into a rigid pole at a velocity of 28.5 km/h. The specified impact velocity range is from 27.2 to 28.8 km/h. The test vehicle was positioned 90° to the line of forward motion. The weight of the vehicle as tested was 1698.7 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on October 23, 2001. Pre- and post-test photographs of the test vehicle and the dummies are included in Appendix A.

One ES-2 side impact dummy was placed in the left front designated seating position according to instructions specified in the FMVSS 201P Laboratory Test Procedure which is dated April 21, 2000 and Evaluation of Eurosid-1 Positioning Procedure Appendix A dated February 5, 1997. 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 ES-2 dummy positioning procedure used and Appendix F contains the ES-2 peak responses.

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

		Left Front
1) Head Performance Criteria - Not calculated due to head impact with airbag		
2) Thorax Performance Criteria		
2.1) Chest Deflection < 42 mm	Upper Rib Deflection	37.8
	Mid Rib Deflection	29.4
	Lower Rib Deflection	29.1
2.2) Viscous Criteria < 1.0 (m/sec)	Upper Rib	0.50
	Mid Rib	0.31
	Lower Rib	0.29
3) Abdominal Protection Criterion		
Sum < 2500 N	Front Abdominal Force	103
	Mid Abdominal Force	255
	Rear Abdominal Force	556
	Sum of Abdominal Force	849
4) Pelvis Performance Criterion		
< 6000 N	Pubic Symphysis Force	1733

HIC		Left Front
	T1 (msec)	42.8
	T2 (msec)	69.9
	T2 - T1 (msec)	27.1
	HIC	114

Fir Filtered	Left Front
Upper Rib Y (g's)	82.8
Mid Rib Y (g's)	70.8
Lower Rib Y (g's)	77.6
Lower Spine Y (g's)	39.8
Pelvis Y (g's)	41.7
TTI (g's)	61

Contacts	Left Front
Head (msec)	No direct contact
Arm (msec)	14.8
Rib (msec)	10.8
Pelvis (msec)	34.0

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 channels were found to be bad during pre test calibration and inspection:

Driver T-12 - MX

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

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001

TEST VEHICLE INFORMATION

Make	Saab
Model	9-5
Body Style	4 door
VIN	YS3E045E3X3071717
Color	Painted Orange
Odometer Reading	138
Transmission	5 speed manual
Final Drive	all wheel
Number of Cylinders	4
Engine Displacement	2.3 liters
Engine Placement	lateral

TEST VEHICLE OPTIONS

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Saab Automobile AB	GVWR (kg)	2030
Date of Manufacture	02/99	GAWR Front (kg)	1135
		GAWR Rear (kg)	1050

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	270	270
Cold Pressure (kPa)	220	220
Recommend Tire Size	P215/55VR16	P215/55VR16
Tire Size on Vehicle	P215/55VR16	P215/55VR16
Tire Manufacturer	Michelin	Michelin

Measured Parameter	Front	Rear	Third	Total
Type of Seats	bucket	bench		
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				421
Cargo Weight (RCLW) (kg)				77.1

DATA SHEET NO. 1...(continued)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 1999/Saab/9-5/4 doorTest Date: October 23, 2001**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	471.7	307.5		508.0	353.8	
Right	kg	472.7	296.7		509.4	327.5	
Ratio	%	61.0	39.0		59.9	40.1	
Totals	kg	944.4	604.2	1548.6	1017.4	681.3	1698.7

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1548.6
Weight of 1 P572F Side Impact Dummy	kg	80.7
Rated Cargo/Luggage Weight (RCLW)	kg	77.1
Vehicle Target Weight (TVTW)	kg	1706.4

TEST VEHICLE ATTITUDES

	Units	As Delivered	Fully Loaded	Ready for Test
Right Door Sill Angle	deg	0.8 ND	0.5 ND	0.5 ND
Left Door Sill Angle	deg	0.3 ND	0.1 ND	0.1 ND
Front Bumper Angle	deg	0.3 RD	0.0	0.1 RD
Rear Bumper Angle	deg	0.2 RD	0.0	0.1 RD

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

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2702
Total Vehicle Length at Left Side	mm	4074
Total Vehicle Length at Centerline	mm	4783
Total Vehicle Length at Right Side	mm	4074
Weight of Ballast in Cargo Area	kg	0
Amount of Water in Fuel Tank	liters	0

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Actual Impact Point	mm	8 rear

DATA SHEET NO. 1...(continued)

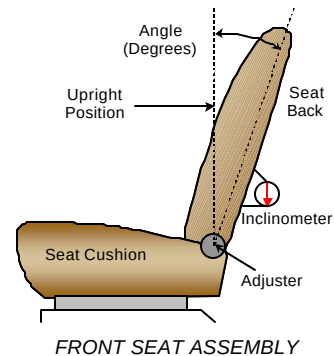
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001

NORMAL DESIGN RIDING POSITION

Driver seat back angle: 18 degrees initial (Adjusted forward
4.3 degrees to achieve 51 mm head
clearance)



SEAT FORE/AFT POSITIONS

The driver's seat is electrically operated.

Driver seat fore/aft total travel: 200 mm

Driver seat fore/aft position: 100 mm

SEAT BELT UPPER ANCHORAGE

The test vehicle "D" ring anchorage was not adjustable.

STEERING COLUMN ADJUSTMENT

The steering column was placed in the mid position of travel.

DATA SHEET NO. 2

POST TEST OBSERVATIONS

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Left Front
Dummy Type	ES-2/009
Head Contact	Side airbag, headrest
Upper Torso Contact	Side airbag
Lower Torso Contact	Door trim panel below armrest
Left Knee Contact	Door trim panel below armrest
Right Knee Contact	Left knee

POST TEST DOOR OPENING

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

POST TEST STRUCTURAL OBSERVATIONS

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

AIRBAG DEPLOYMENT

	Driver
Front	no
Side	yes
Curtain	

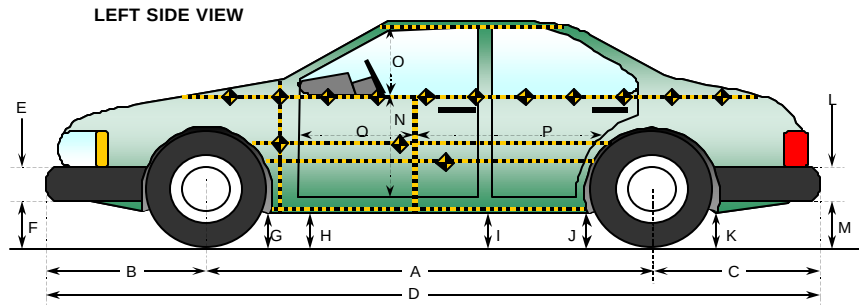
SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 3

VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001



All Measurements in mm

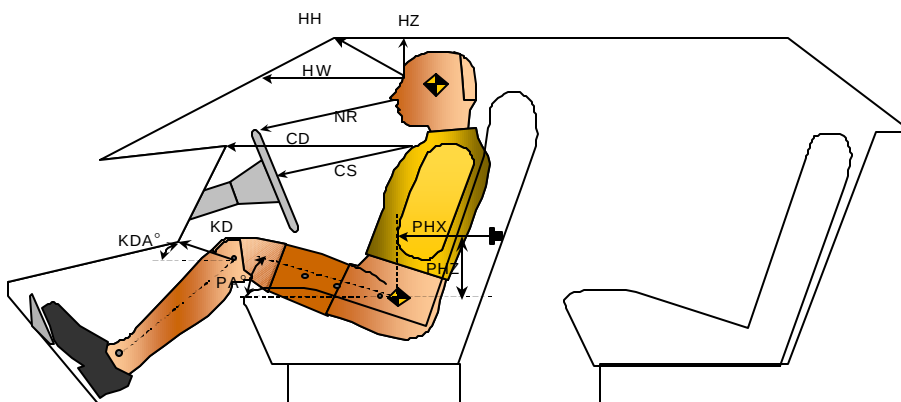
Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2702	2534	-168
B	Front Axle to FSOV	1003	1022	19
C	Rear Axle to RSOV	1078	1138	60
D	Total Length at Centerline	4783	4694	-89
E	Front Bumper Thickness	200	200	0
F	Front Bumper Bottom to Ground	323	324	1
G	Sill Height at Front Wheel Well	197	177	-20
H	Sill Height at Front Door Leading Edge	199	178	-21
I	Sill Height at "B" Pillar	226	234	8
J1	Sill Height at Rear Wheel Well	243	287	44
J2	Pinch Weld Height at Rear Wheel Well	236	276	40
K	Sill Height Aft of Rear Wheel Well	299	347	48
L	Rear Bumper Thickness	212	212	0
M	Rear Bumper Bottom to Ground	401	438	37
N	Sill Height to Window Bottom Sill	704	698	-6
O	Front Door Leading Edge to Impact CL	946	936	-10
P	Rear Door Trailing Edge to Impact CL	1011	1014	3
Q	Front Window Opening	469	424	-45
R	Right Side Length	4074	4089	15
S	Left Side Length	4074	3904	-170
T	Vehicle Width at "B" Post	1776	1564	-212

DATA SHEET NO. 4

ES-2 LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001



Driver Code	Measurement Description	Left Front	
		Length(mm)	Angle(°)
HH	Head to Header	353	
HW	Head to Windshield	552	
HZ	Head to Roof	164	
NR	Nose to Rim	437	
CD	Chest to Dash	534	
CS	Chest to Steering Wheel	335	
KDL	Left Knee to Dash	180	0.0
KDR	Right Knee to Dash	225	0.0
PA	Pelvic Angle (Longitudinal)		23.9
PA	Pelvic Angle (Lateral)		-0.1
SA	Spine Angle (Longitudinal)		22.0
SA	Spine Angle (Lateral)		0.0
PHX	H-Point to Striker (X-Axis)	212	
PHZ	H-Point to Striker (Z-Axis)	113	

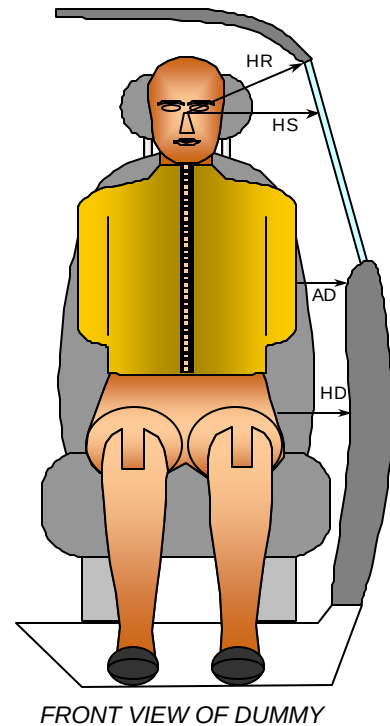
DATA SHEET NO. 5

ES-2 LATERAL CLEARANCE DIMENSIONS / CHILD DUMMY MEASUREMENTS

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001

Code	Measurement Description	Units	Left Front
HR	Head to Side Header	mm	186
HS	Head to Side Window	mm	309
AD	Arm to Door	mm	93
HD	H-Point to Door	mm	162



DATA SHEET NO. 6

DUMMY POSITIONING

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001

	Left Front		
	H-Point Machine	Dummy H Point	Dummy H Point after seat back adjustment
HP to Floor Z (mm)	121	130	125
HP to Hinge X (mm)	744	756	759
HP to Sill Y (mm)	186	186	186
HP to Striker X (mm)	347	354	359
HP to Dash X (mm)	595	599	599
HP to Header Z (mm)	775	770	780
H-POINT MACHINE (deg)			
Left Knee	139		
Right Knee	136		
Left Foot	102		
Right Foot	89		
Left Leg (mm)	146		
Right Leg (mm)	125		
Hip Angle	104		
Back Angle	25		

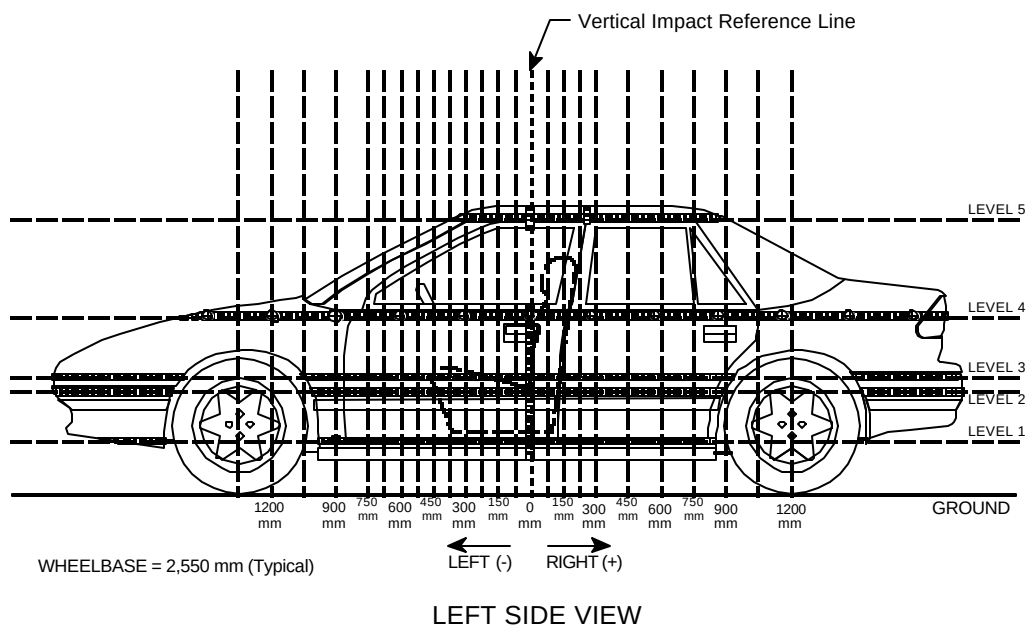
DATA SHEET NO. 7

VEHICLE SIDE MEASUREMENTS

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001

PRETEST AND POST TEST EXTERIOR PROFILE MEASUREMENTS



Measurements are taken with vehicle in the as tested condition.

Measurements along the vertical 0 mm.

Level	Measurement Description	Units	Height Above Ground
5	Window	mm	1403
4	Window Sill	mm	924
3	Mid Door	mm	617
2	Occupant H-Point	mm	560
1	Sill Top	mm	318

DATA SHEET NO. 8

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1950															
-1800				310					355					45	
-1650				289					344					55	
-1500				272					336					64	
-1350				261					333					72	
-1200				252					333					81	
-1050		208	208	246			300	299	338			92	91	92	
-900	240	208	207	243		329	315	310	347		89	107	103	104	
-825	242	207	205	241		376	341	337	356		134	134	132	115	
-750	244	207	203	240		401	367	362	371		157	160	159	131	
-675	245	206	202	240		424	392	389	382		179	186	187	142	
-600	246	204	201	240		445	418	415	425		199	214	214	185	
-525	248	204	200	239		470	445	446	471		222	241	246	232	
-450	249	204	200	239		496	474	481	516		247	270	281	277	
-375	250	203	199	238		532	508	518	558		282	305	319	320	
-300	251	203	199	239	475	569	555	561	599	652	318	352	362	360	177
-225	252	203	199	239	471	606	605	605	643	685	354	402	406	404	214
-150	252	203	199	240	470	660	660	660	685	719	408	457	461	445	249
-75	253	203	199	240	472	693	704	706	724	765	440	501	507	484	293
0	254	203	199	242	473	714	732	739	746	789	460	529	540	504	316
75	254	203	199	243	477	697	714	718	745	760	443	511	540	502	283
150	254	204	199	245	476	638	680	674	710	728	384	476	475	465	252
225	255	205	201	247	478	593	590	587	666	706	338	385	386	419	228
300	255	206	201	250	481	548	553	558	642	700	293	347	357	392	219
450	254	207	203	252	482	452	478	484	587	671	198	271	281	335	189
600	252	208	205	259	484	370	407	419	534	642	118	199	214	275	158
750	252	209	207	265	486	324	349	368	483	623	72	140	161	218	137
900	250	211	210	274	487	328	310	317	432	603	78	99	107	158	116
1050			206	282	492			302	395	591			96	113	99
1200				292	503				359	594				67	91
1350				302					383					81	
1500				315					382					67	
1650				330					386					56	
1800				347					387					40	
1950				363					408					45	
2100				383					419					36	

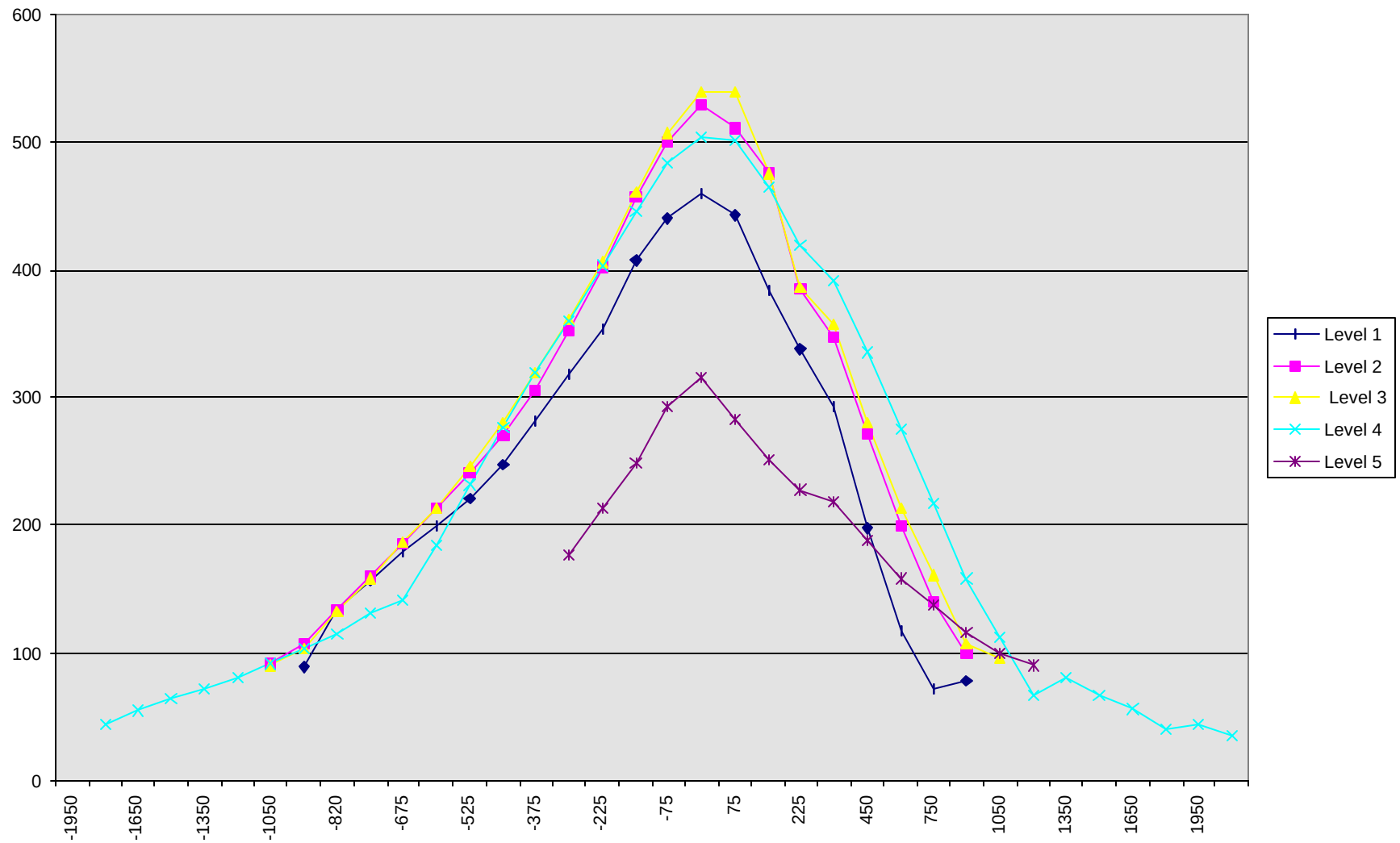
Reference plane is parallel to test vehicle longitudinal centerline

Given dimensions = Reference plane to car body

DATA SHEET NO. 8...(continued)

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 1999/Saab/9-5/4 door Test Date: October 23, 2001



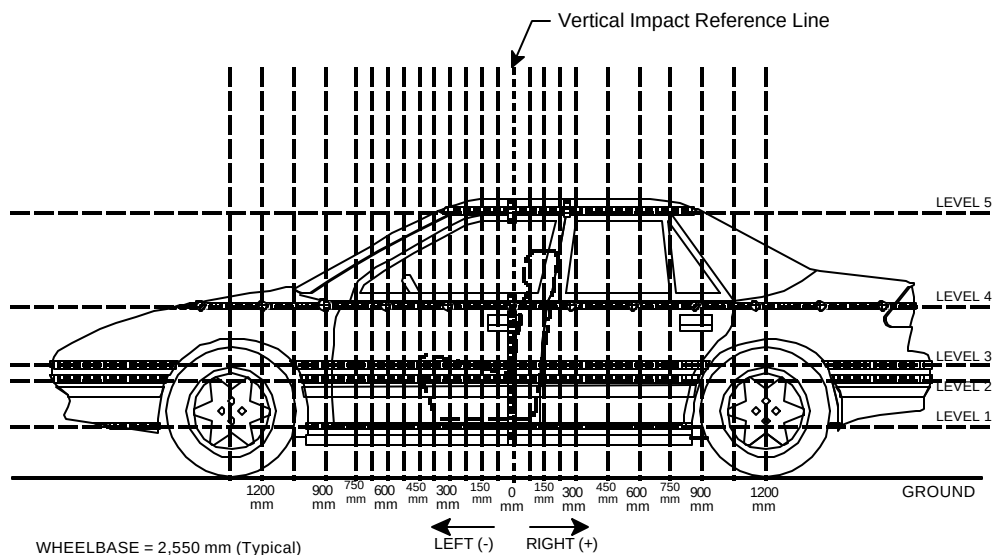
DATA SHEET NO. 9

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001

PRETEST AND POST TEST EXTERIOR PROFILE MEASUREMENTS



LEFT SIDE VIEW

Damage Profile Distances

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	2100 mm	4	383	419	36
2	1295 mm	4	298	376	78
3	483 mm	4	255	568	313
4	-220 mm	3	199	410	211
5	-1015 mm	4	245	340	95
6	-1800 mm	4	310	355	45

Reference plane is parallel to test vehicle longitudinal centerline

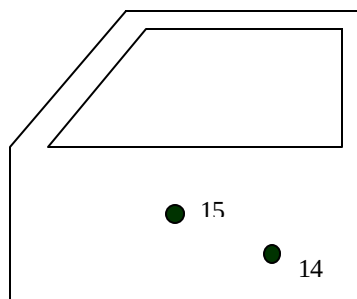
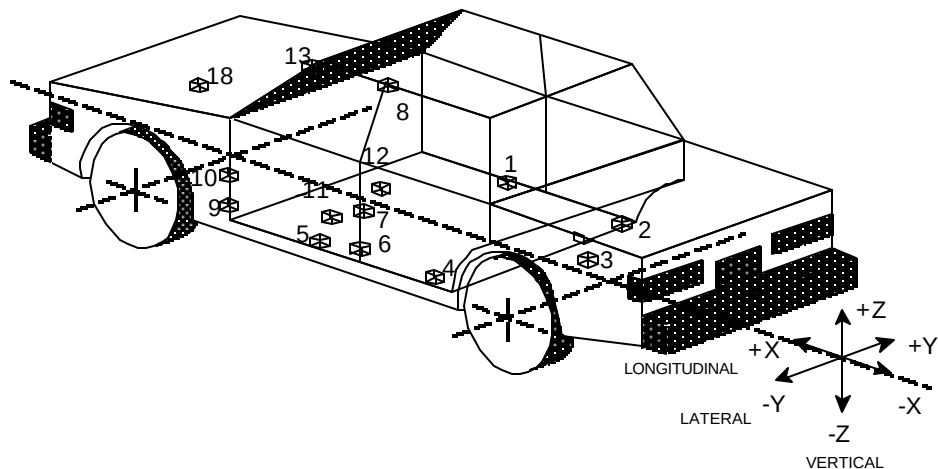
Given dimensions = Reference plane to car body

DATA SHEET NO. 10

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 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

No.	Location
10	Left Mid A Post
11	Driver Seat Track
12	Vehicle CG
13	Left A Pillar @ Roof
14	Left Front Door @ Pelvis
15	Left Front Door @ Arm
16	Left Driver Seat Frame
17	Right Driver Seat Frame
18	Lower Center Radiator Support

DATA SHEET NO. 10...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 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	2.5	2.1	10.7	0.2	6.8	3.4	11.0
2	Right Side Sill at Rear Seat	3.2	1.4	10.1	0.1	2.5	1.7	10.6
3	Rear Floorpan Above Axle	2.5	1.0	9.8	0.5	3.7	4.1	9.9
4	Left Side Sill at Rear Door			14.1	2.9			
5	Left Side Sill at Front Door *			32.4	6.6			
6	Left Lower B Post			30.2	1.3			
7	Left Mid B Post			**	**			
8	Left Upper B Post			39.9	14.2			
9	Left Lower A Post			10.3	0.2			
10	Left Mid A Post			12.3	0.7			
11	Driver Left Seat Track			55.2	20.8			
12	Vehicle CG	4.3	2.4	14.6	1.6	6.1	3.4	15.3
13	Left A Pillar @ Roof			35.5	1.9			
14	Left Front Door @ Pelvis			152.3	79.7			
15	Left Front Door @ Arm			75.7	39.5			
16	Left Driver Seat Frame			**	**			
17	Right Driver Seat Frame			**	**			
18	Lower Center Radiator Support	2.2	2.3	7.2	2.2	2.7	3.4	7.5

* No valid data after 100 msec.

** Not used to avoid interference with the restraint systems

DATA SHEET NO. 10...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001

VEHICLE ACCELEROMETER COORDINATES

Loc. No.	Description	Coordinates (mm)*		
		X	Y	Z
1	Right Side Sill at Front Seat	2492	675	227
2	Right Side Sill at Rear Seat	1872	675	244
3	Rear Floorpan Above Axle	1097	10	544
4	Left Side Sill at Rear Door	1488	-675	236
5	Left Side Sill at Front Door	2724	-675	219
6	Left Lower B Post	2178	-657	332
7	Left Mid B Post	**	**	**
8	Left Upper B Post	2129	-516	1384
9	Left Lower A Post	3267	-704	273
10	Left Mid A Post	3317	-788	903
11	Driver Left Seat Track	2333	-549	339
12	Vehicle CG	2817	90	339
13	Left A Pillar @ Roof	2707	-567	1275
14	Left Front Door @ Pelvis	2523	-764	658
15	Left Front Door @ Arm	2708	-757	832
16	Left Driver Seat Frame	**	**	**
17	Right Driver Seat Frame	**	**	**
18	Lower Center Radiator Support	4372	0	213

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

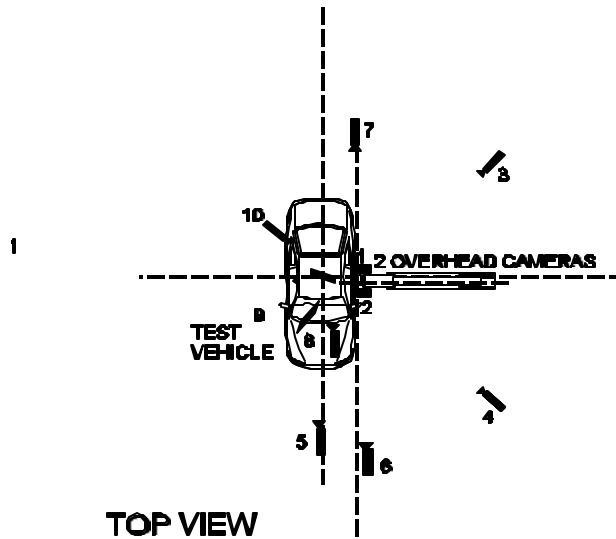
** Not used to avoid interference with seat restraints.

DATA SHEET NO. 11

HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 1999/Saab/9-5/4 door

Test Date: October 23, 2001



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	800	0	5000	8	1015
2	Overhead Close-up	600	0	5000	13	1005
3	Left Side 45° Rearward Pole View	6800	-1970	1430	50	1000
4	Left Side 45° Forward Pole View	5900	2000	1310	50	971
5	Real Time				13	32
6	Front Ground Level Vehicle/Pole Impact	7000	2600	1440	25	901
7	Rear Ground Level Vehicle/Pole Impact	8800	-2700	1410	25	1010
8	Test Vehicle Onboard Driver Hip				13	500
9	Test Vehicle Onboard Hood				13	510
10	Test Vehicle Onboard Driver Head Contact				13	513

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

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 Left Front View



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

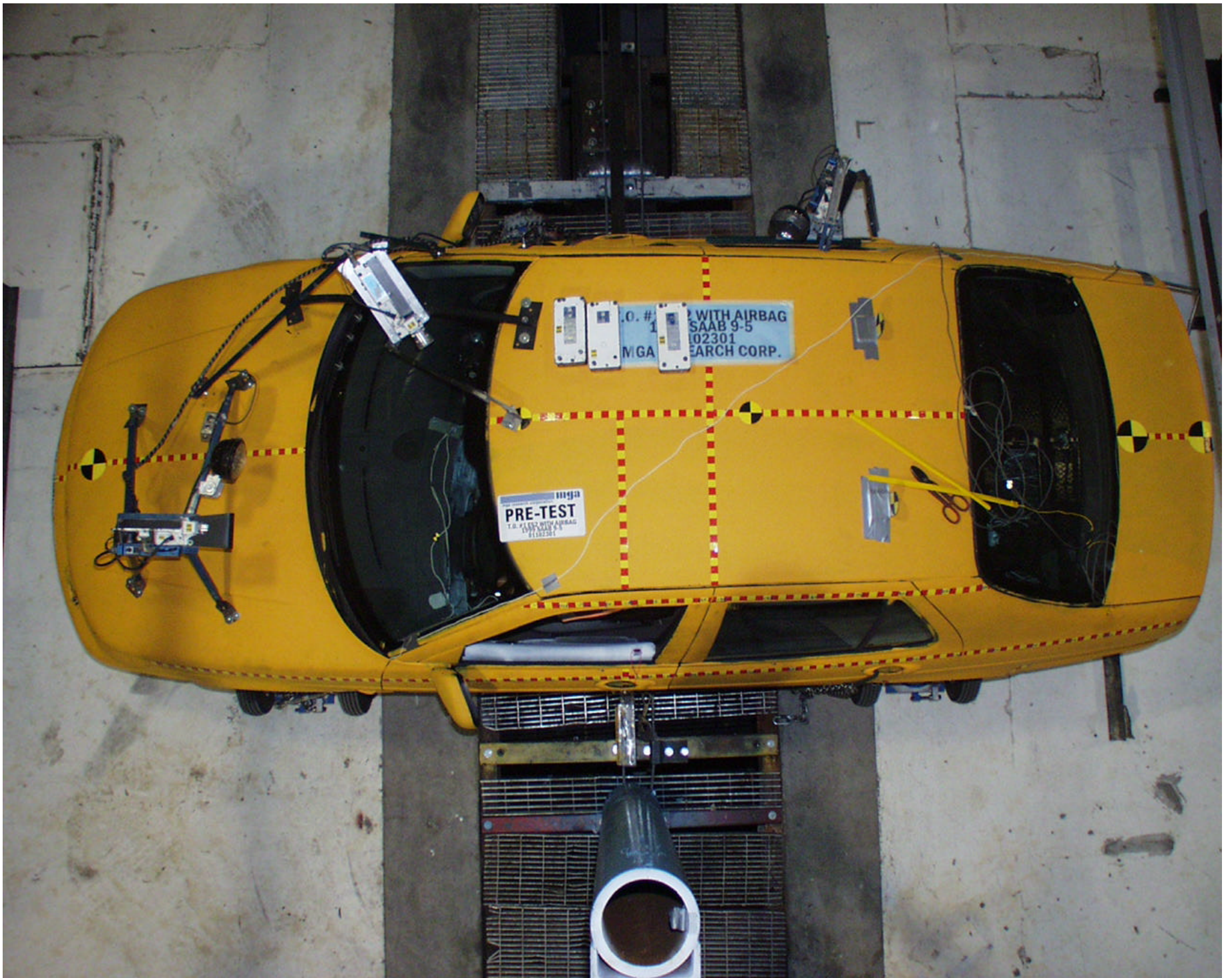


Photo No. A-9 - Pre-Test Overhead View

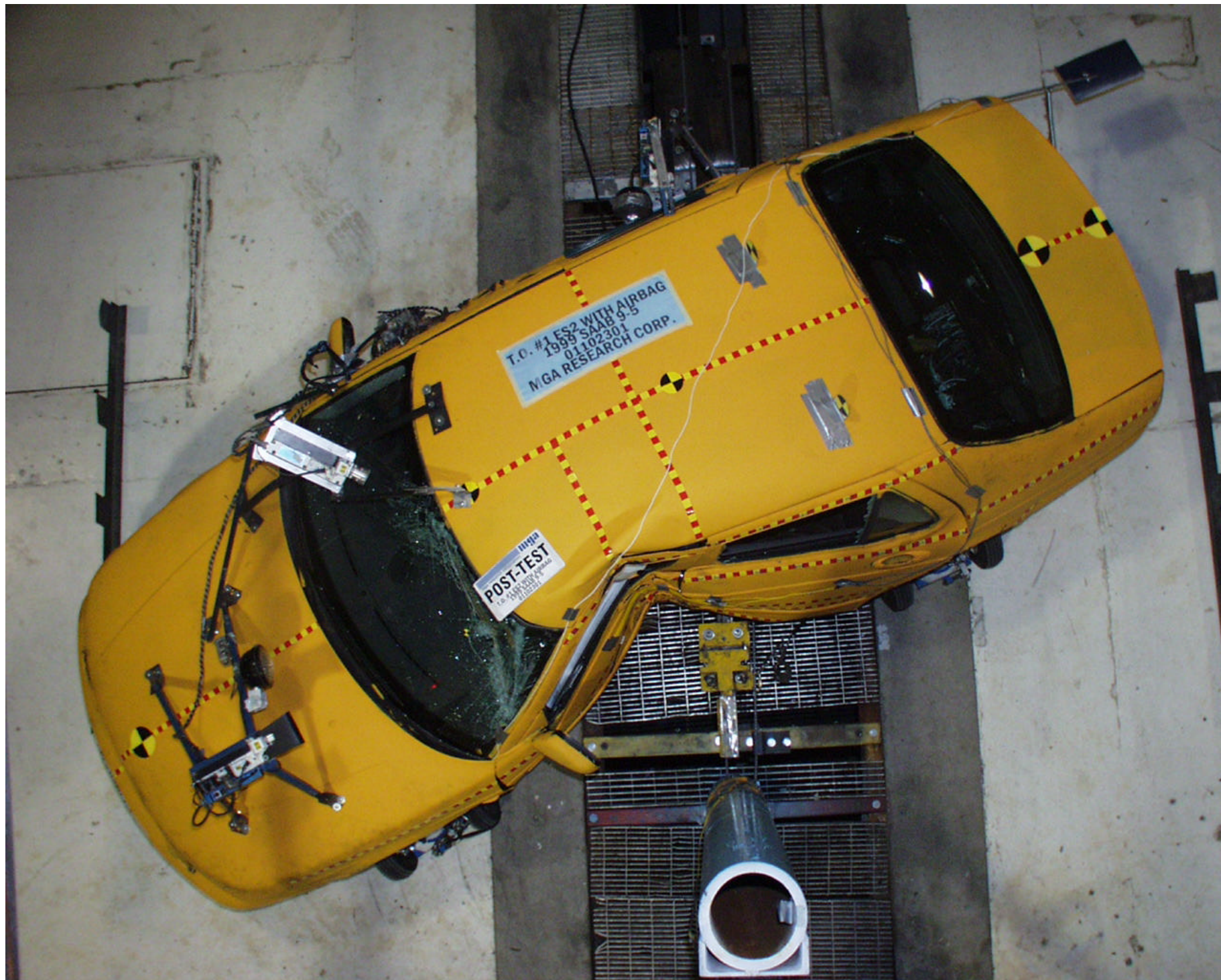


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Photo No. A-11 - Pre-Test Left Rear View



Photo No. A-12 - Post- Test Left Rear View



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

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



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



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



Photo No. A-18 - Pre-Test Driver Dummy Shoulder and Door Top View



Photo No. A-19 - Post-Test Impact Point on Vehicle

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Photo No. A-20 - Pre-Test Driver Dummy Windshield View

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Photo No. A-21 - Post-Test Driver Dummy Windshield View

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



Photo No. A-23 - Post-Test Driver Dummy Contact



Photo No. A-24 – Impact

1 - 3	32 psi	32
0-160 km/h	220 kPa	220
0-100 mph	2,2 Bar	2,2
4 - 5	32 psi	32
0-160 km/h	220 kPa	220
0-100 mph	2,2 Bar	2,2
4 - 5	39 psi	39
160-MAX km/h	270 kPa	270
100-MAX mph	2,7 Bar	2,7

60 psi
420 kPa
4,2 Bar

VEHICLE CAPACITY WEIGHT/
CHARGE UTILE
MAX 421 KG - 920 LBS
TYRE SIZE 215/55V R16
RIM SIZE 6,5 X 16

48 35 237

BODY COLOUR 257
TRIM COLOUR K04 CAR NO 71717
mfd by Saab Automobile AB

Photo No. A-25 - Tire Placard

DATE: G.V.W.R. G.A.W.R.FRONT G.A.W.R.REAR

02/99 2030 K0 1135 K0 1050 K0

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

YS3ED45E3X3071717



VIN YS3ED45E3X3071717 PASS. CAR

MFD BY SAAB AUTOMOBILE AB

47 25 412

APPENDIX B

VEHICLE AND ES-2 RESPONSE DATA

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* No Valid Data After Approximately 100 msec.



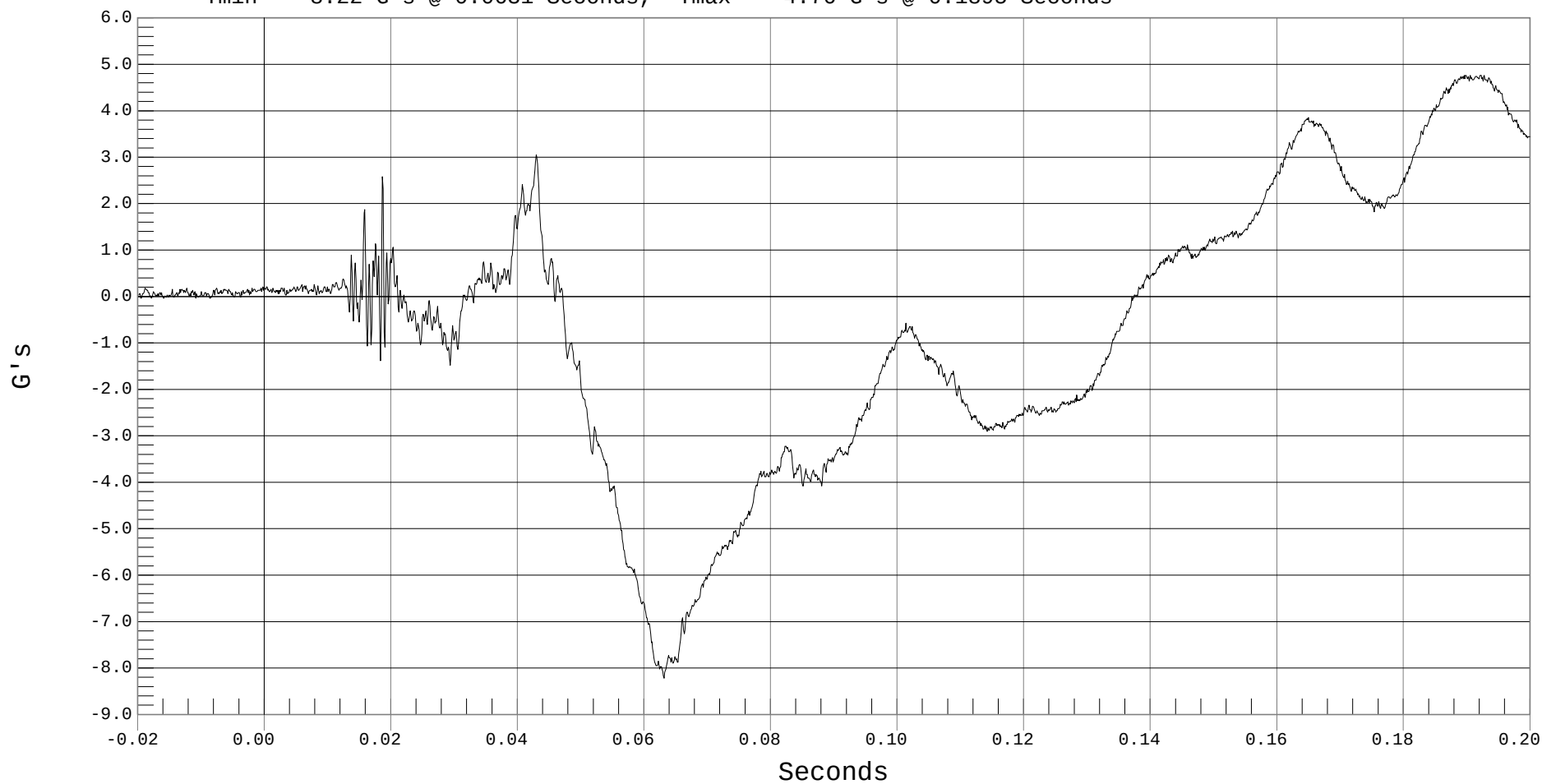
DRIVER HEAD X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER HEAD X, B01109AT.A01

Ymin = -8.22 G's @ 0.0631 Seconds, Ymax = 4.76 G's @ 0.1895 Seconds





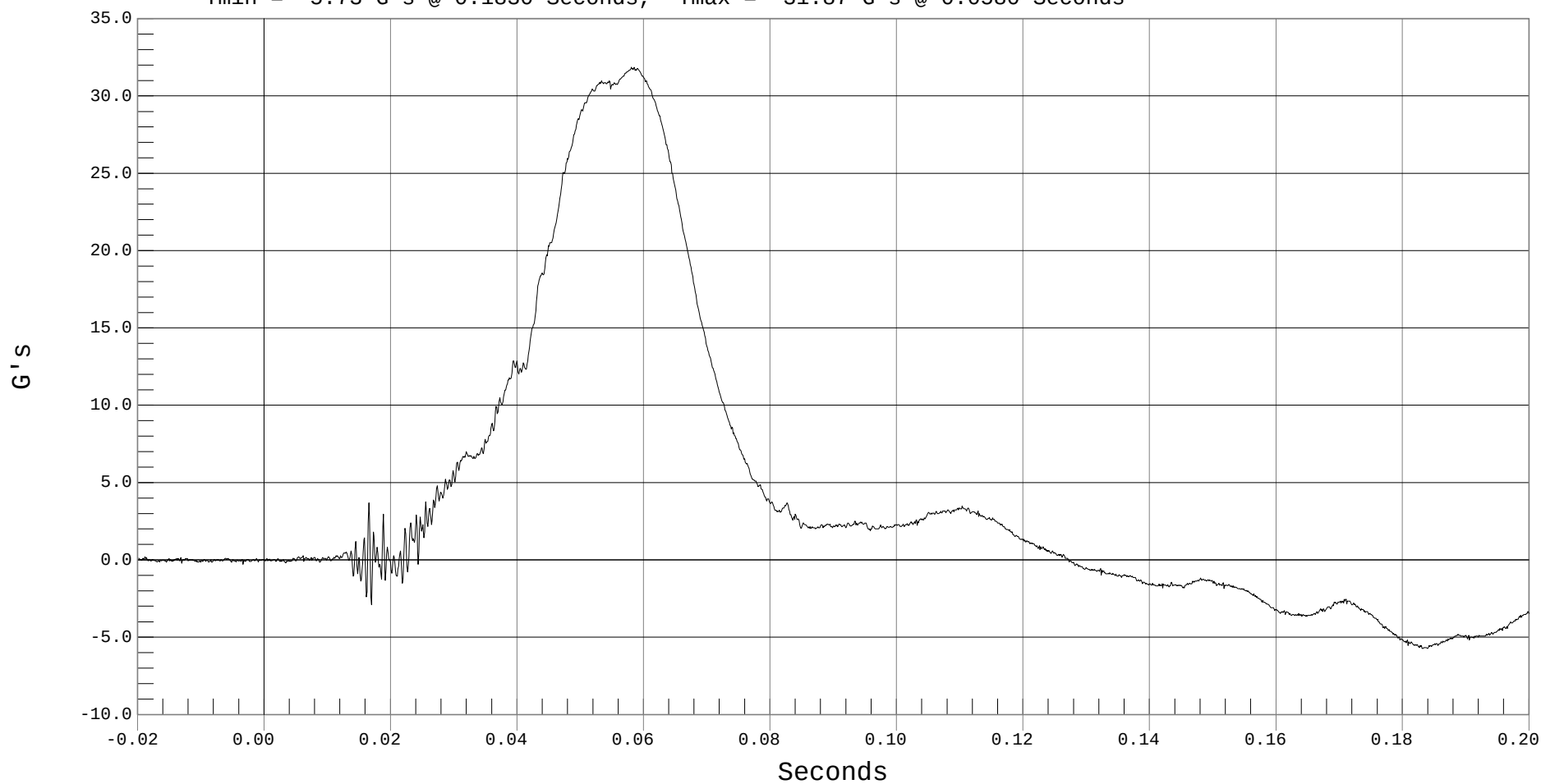
DRIVER HEAD Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

1 DRIVER HEAD Y, B01109AT.A02

Ymin = -5.73 G's @ 0.1830 Seconds, Ymax = 31.87 G's @ 0.0580 Seconds





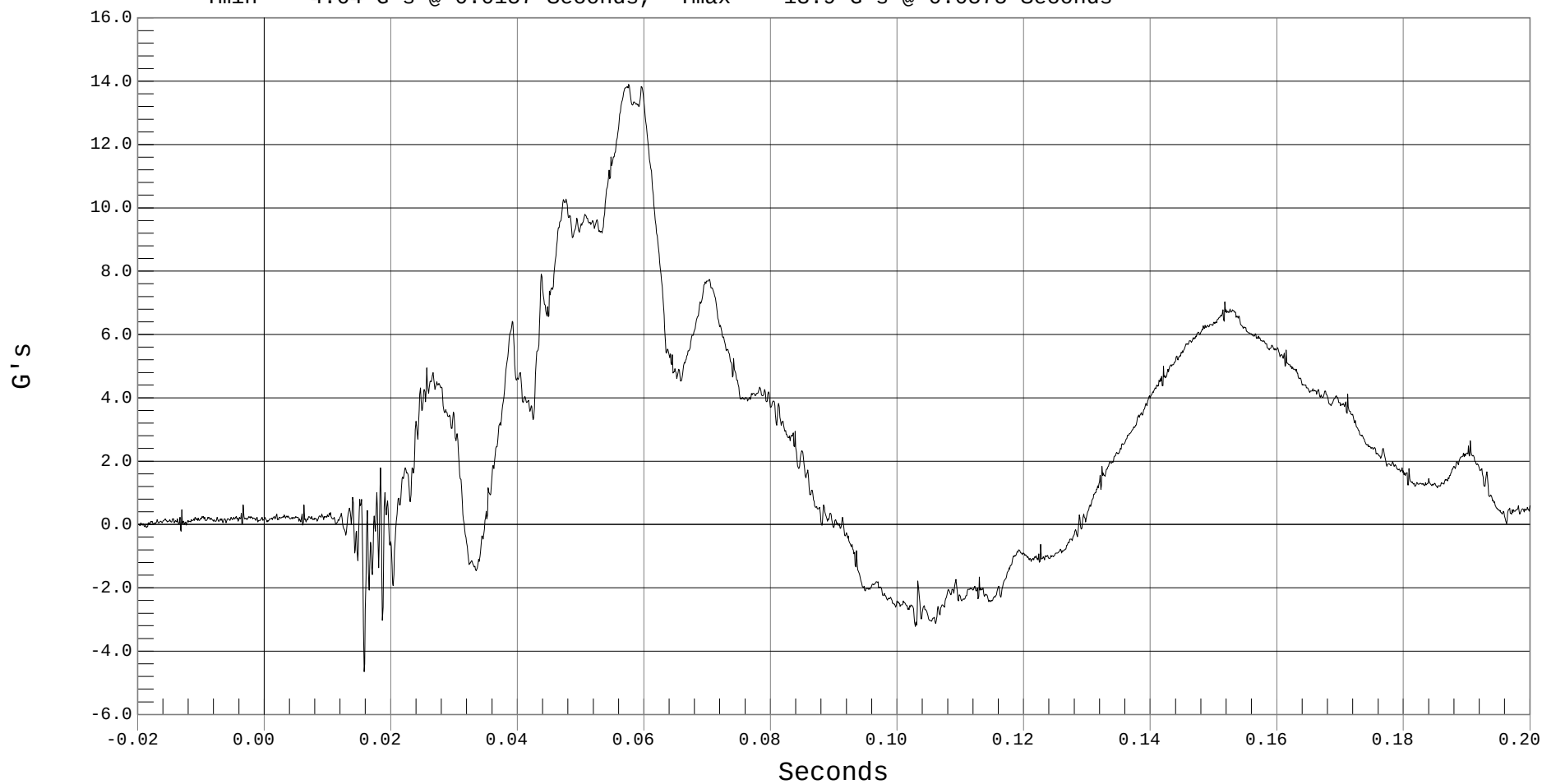
DRIVER HEAD Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER HEAD Z, B01109AT.A03

Ymin = -4.64 G's @ 0.0157 Seconds, Ymax = 13.9 G's @ 0.0575 Seconds





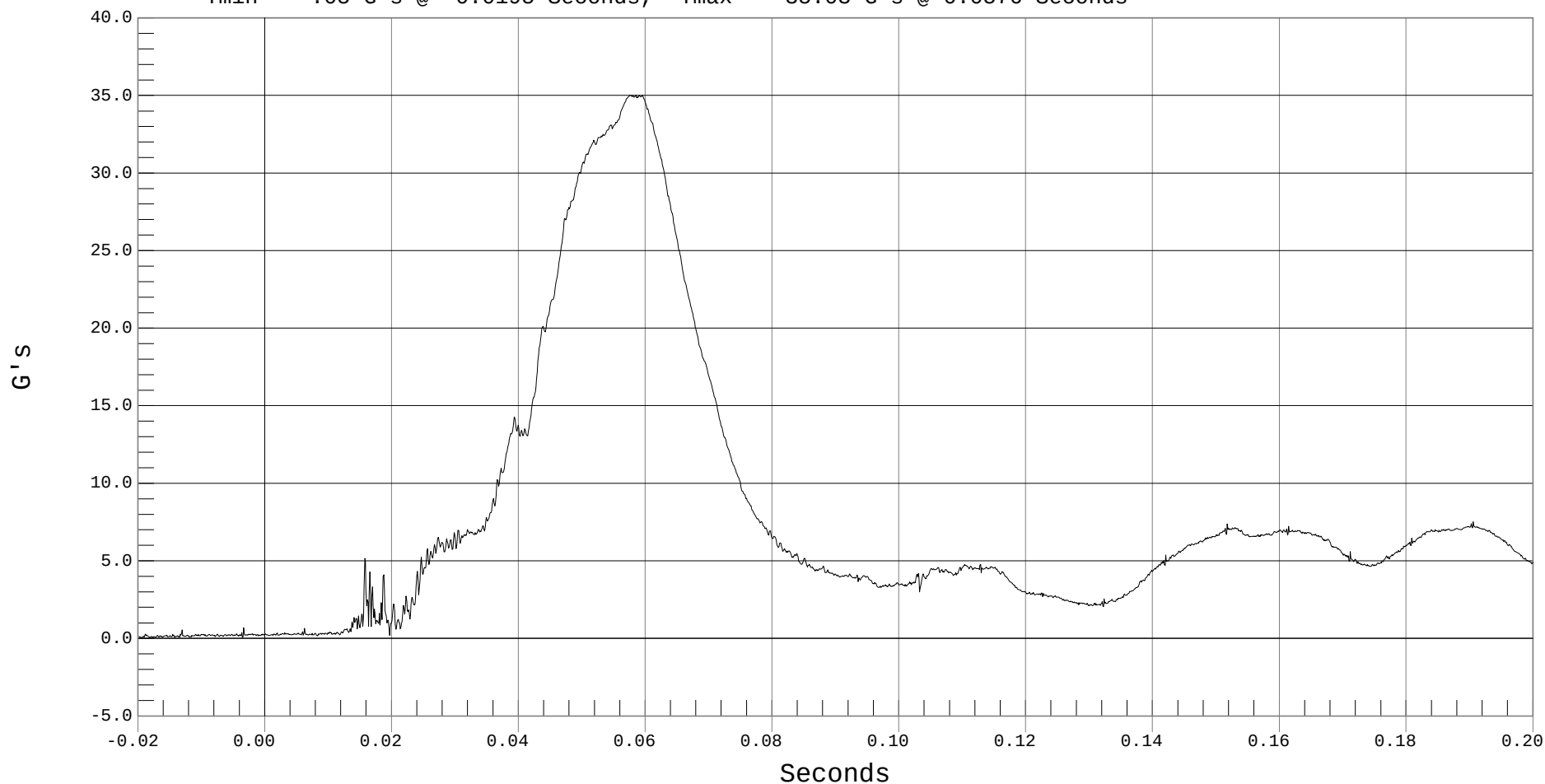
DRIVER HEAD RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER HEAD RESULTANT RESULTANT, B01109AV.A01

Ymin = .05 G's @ -0.0195 Seconds, Ymax = 35.03 G's @ 0.0576 Seconds





DRIVER HEAD FRONT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

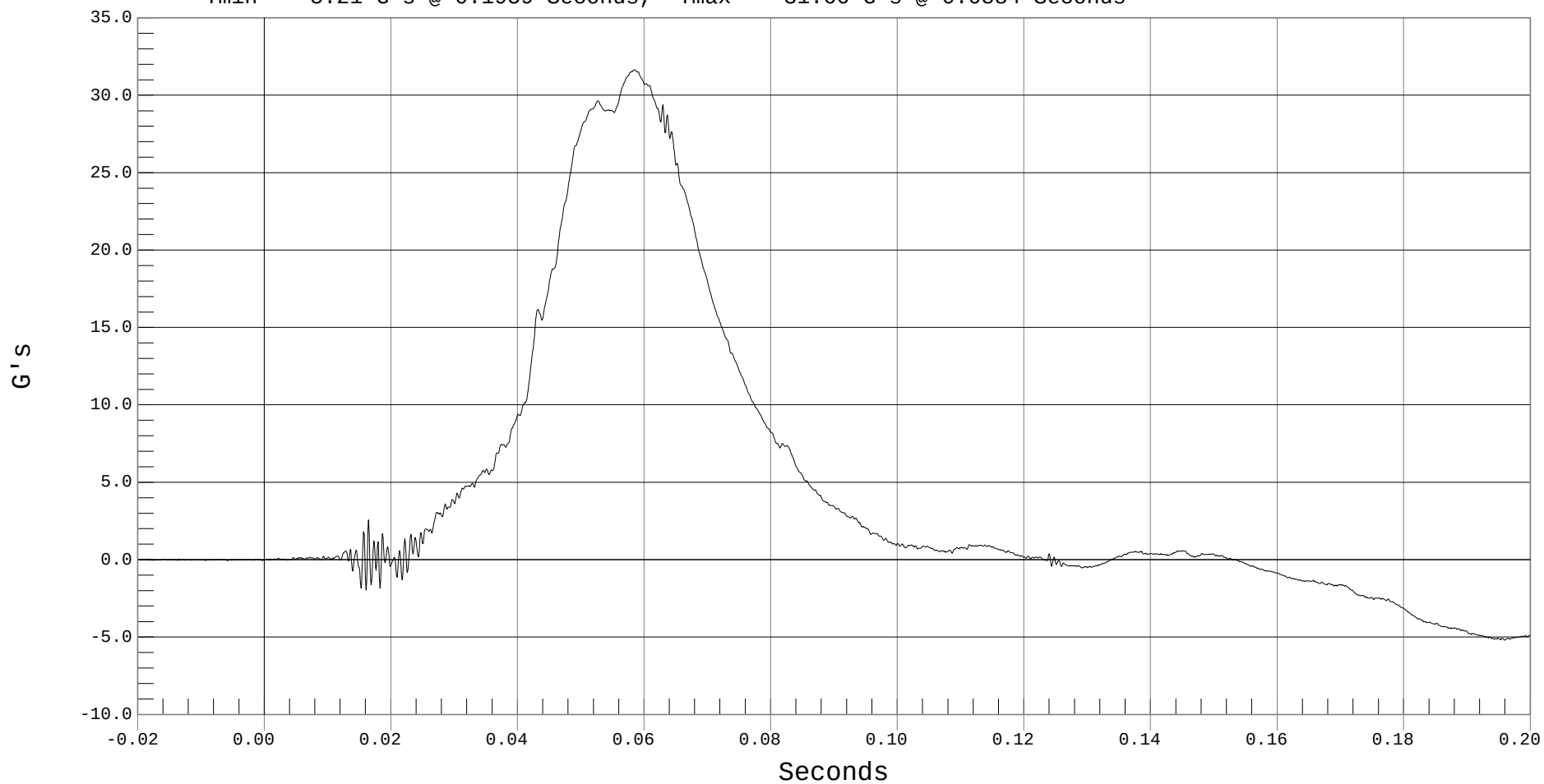
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 1000

1 DRIVER HEAD FRONT Y, B01109AT.A65

Ymin = -5.21 G's @ 0.1959 Seconds, Ymax = 31.66 G's @ 0.0584 Seconds





DRIVER HEAD FRONT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

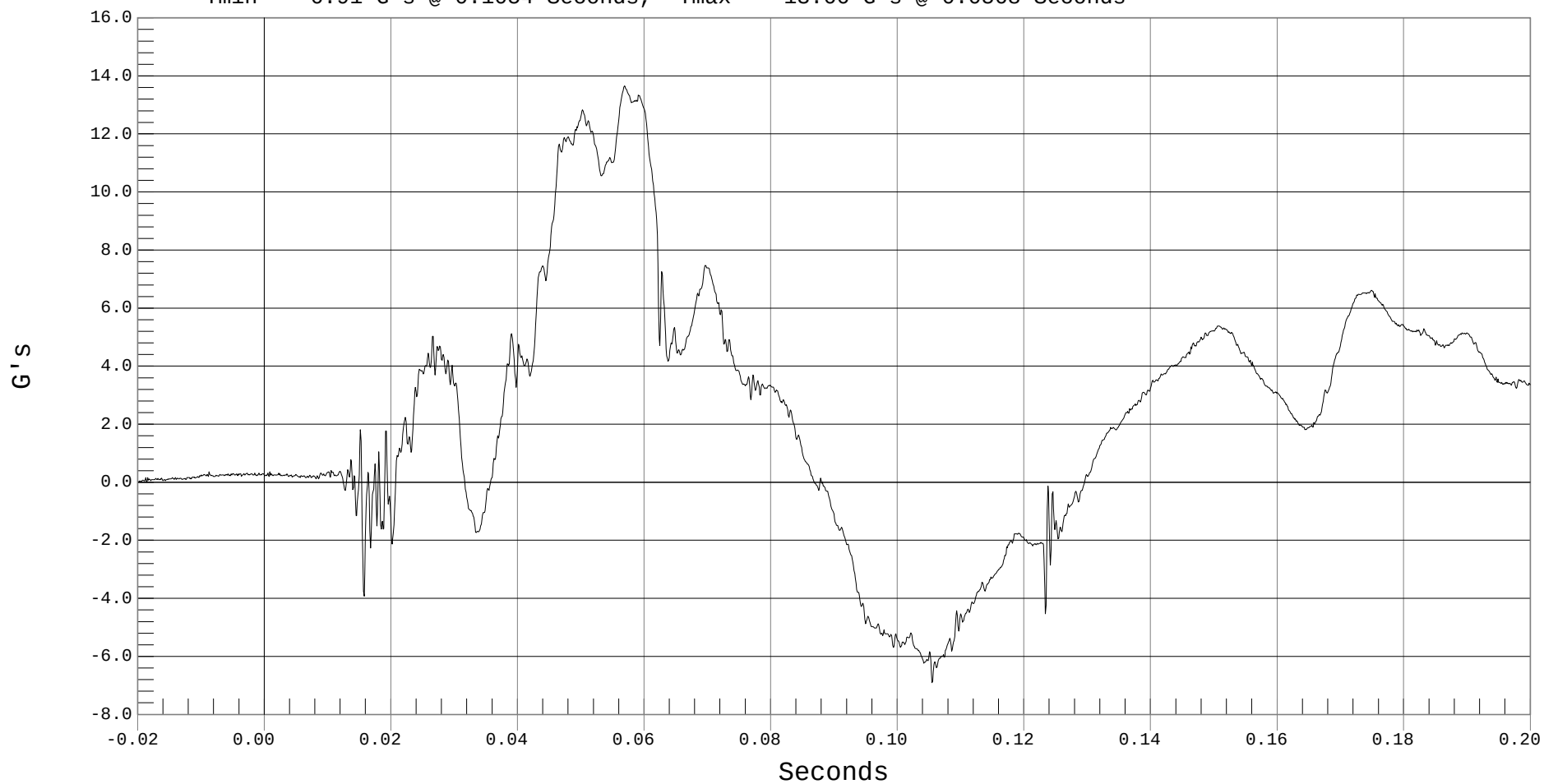
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 1000

— 1 DRIVER HEAD FRONT Z, B01109AT.A66

Ymin = -6.91 G's @ 0.1054 Seconds, Ymax = 13.66 G's @ 0.0568 Seconds





DRIVER HEAD LEFT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

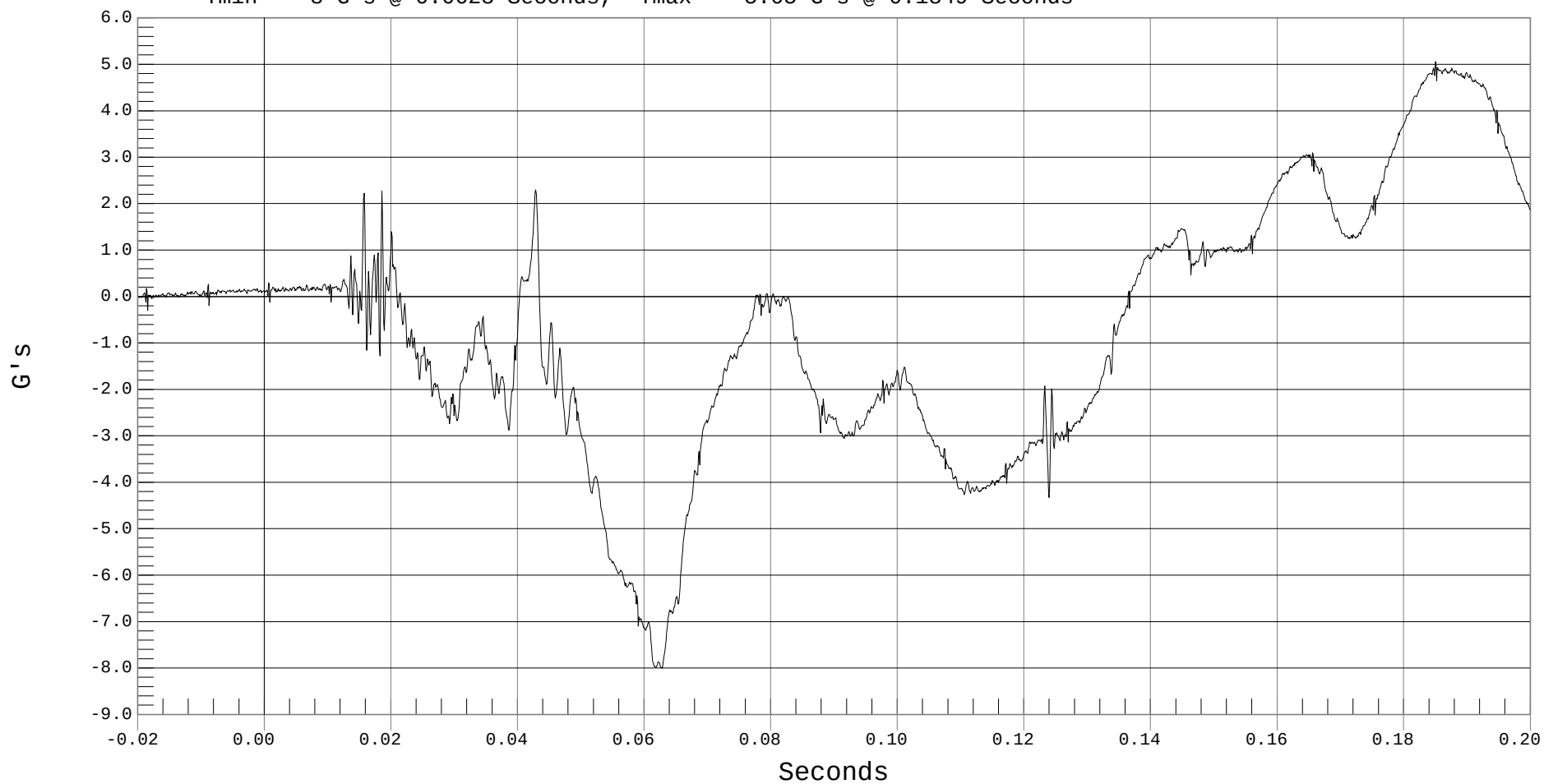
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 1000

— 1 DRIVER HEAD LEFT X, B01109AT.A67

Ymin = -8 G's @ 0.0628 Seconds, Ymax = 5.05 G's @ 0.1849 Seconds





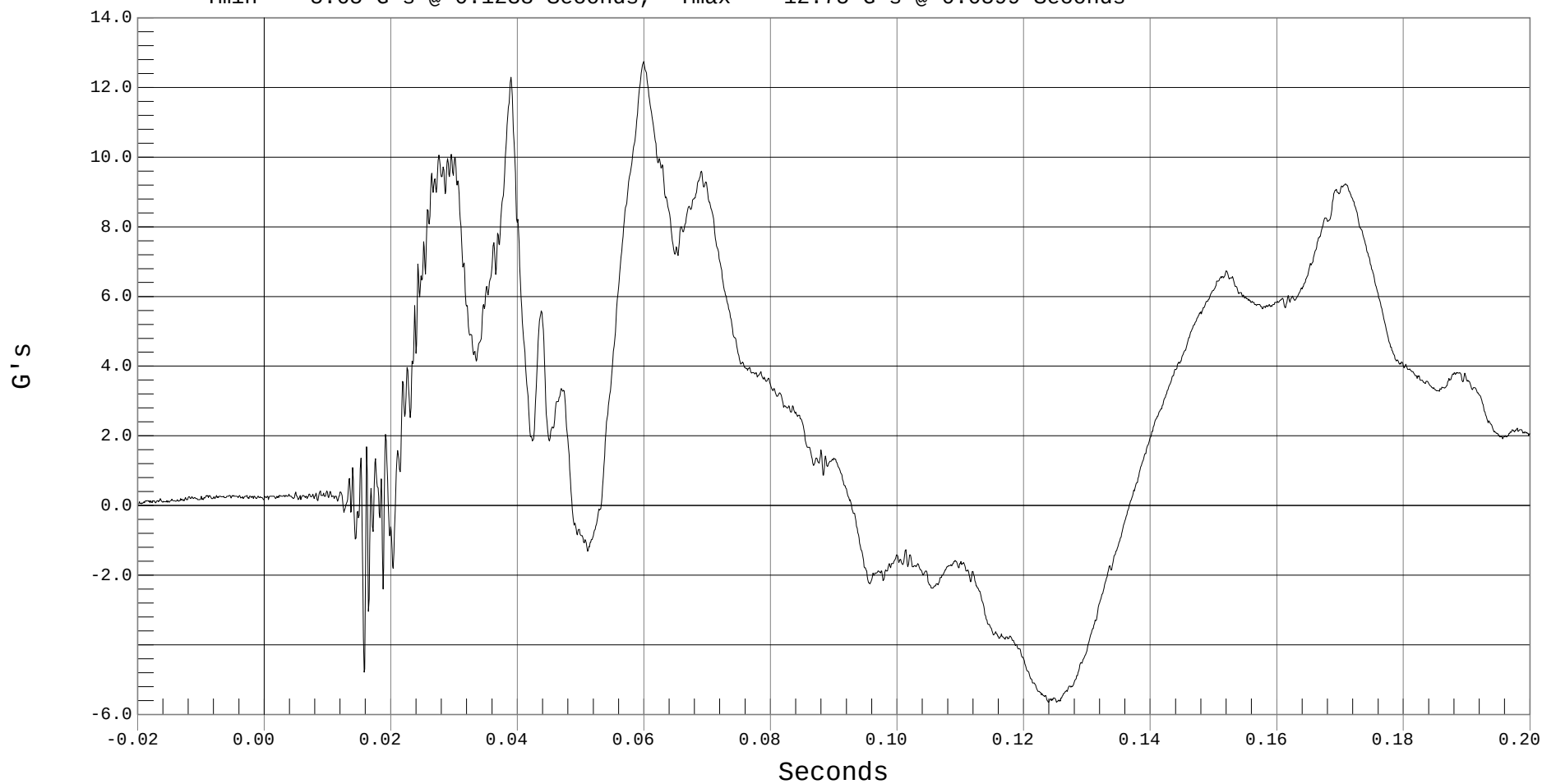
DRIVER HEAD LEFT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER HEAD LEFT Z, B01109AT.A68

Ymin = -5.65 G's @ 0.1238 Seconds, Ymax = 12.75 G's @ 0.0599 Seconds





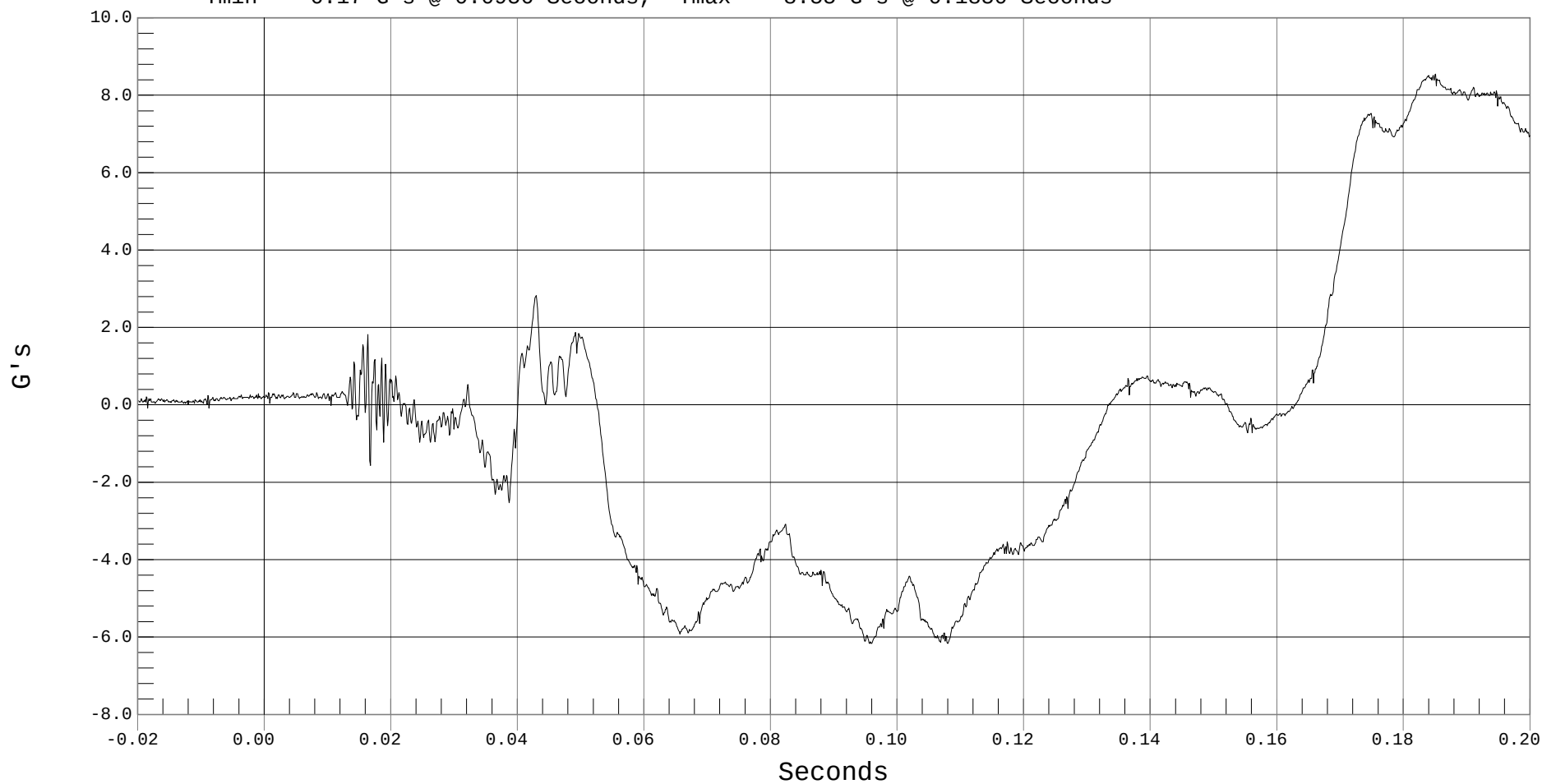
DRIVER HEAD TOP X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER HEAD TOP X, B01109AT.A69

Ymin = -6.17 G's @ 0.0956 Seconds, Ymax = 8.55 G's @ 0.1850 Seconds





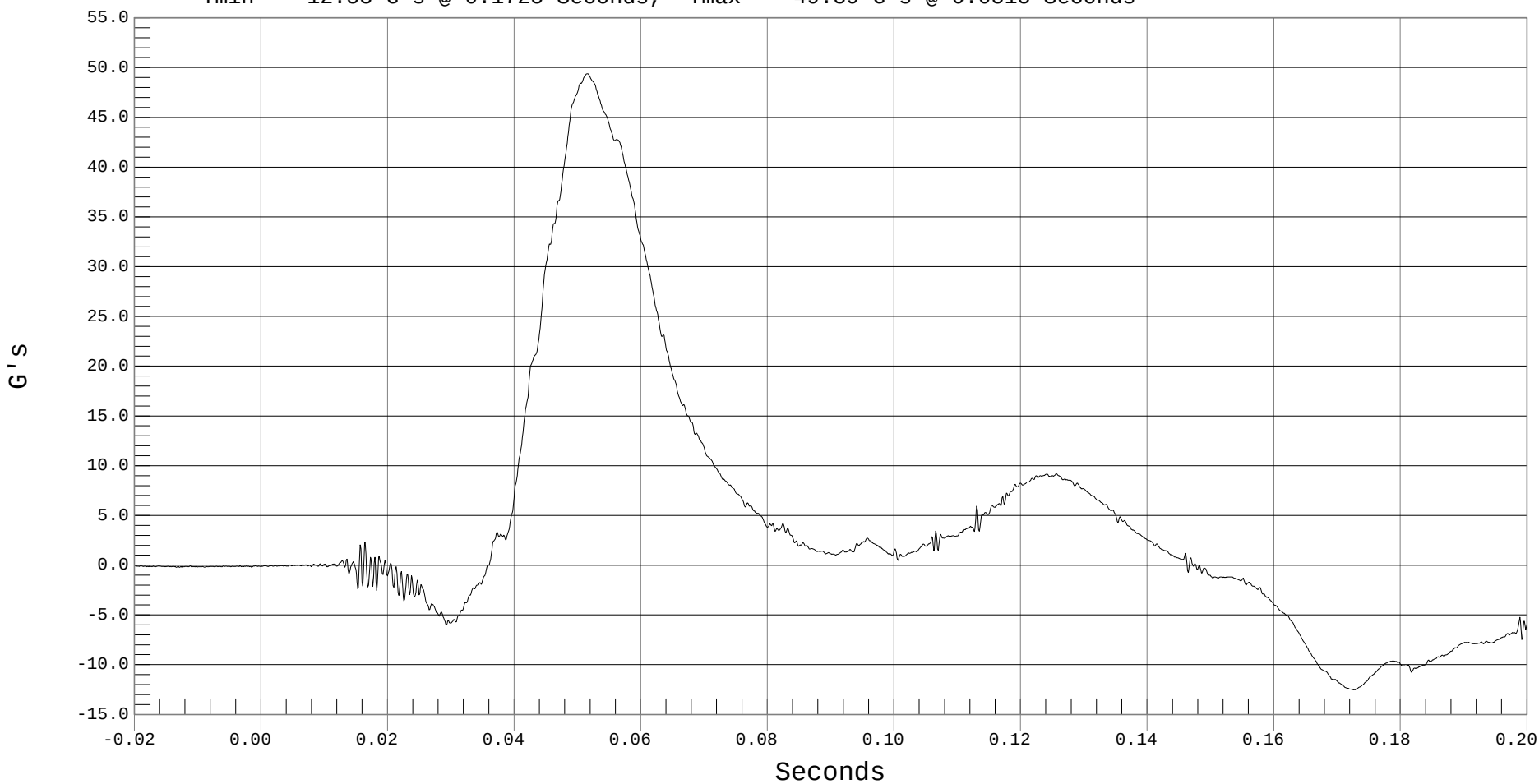
DRIVER HEAD TOP Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER HEAD TOP Y, B01109AT.A70

Ymin = -12.53 G's @ 0.1725 Seconds, Ymax = 49.39 G's @ 0.0515 Seconds





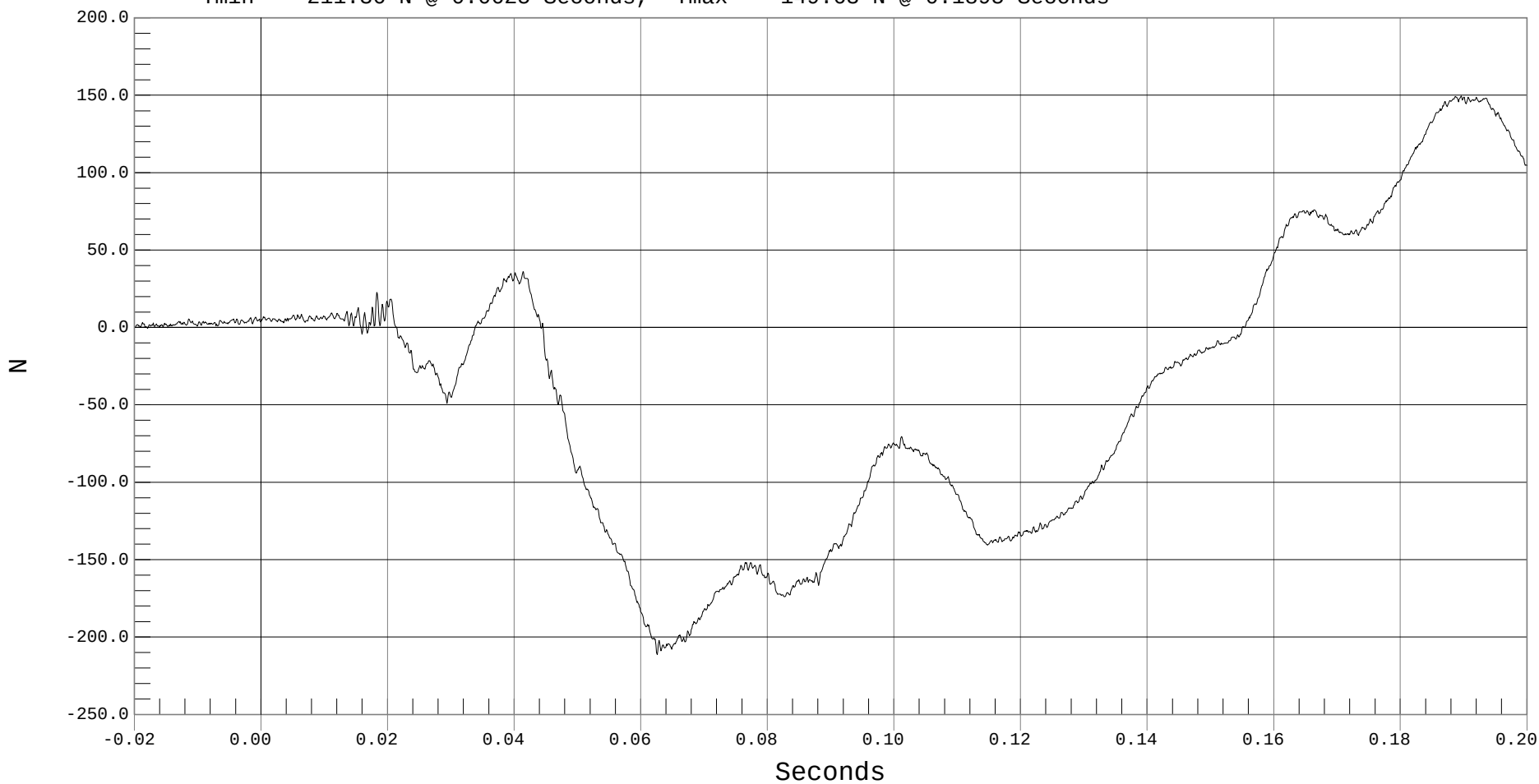
DRIVER UPPER NECK FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

1 DRIVER UPPER NECK FORCE X, B01109FT.F04

Ymin = -211.36 N @ 0.0625 Seconds, Ymax = 149.63 N @ 0.1895 Seconds





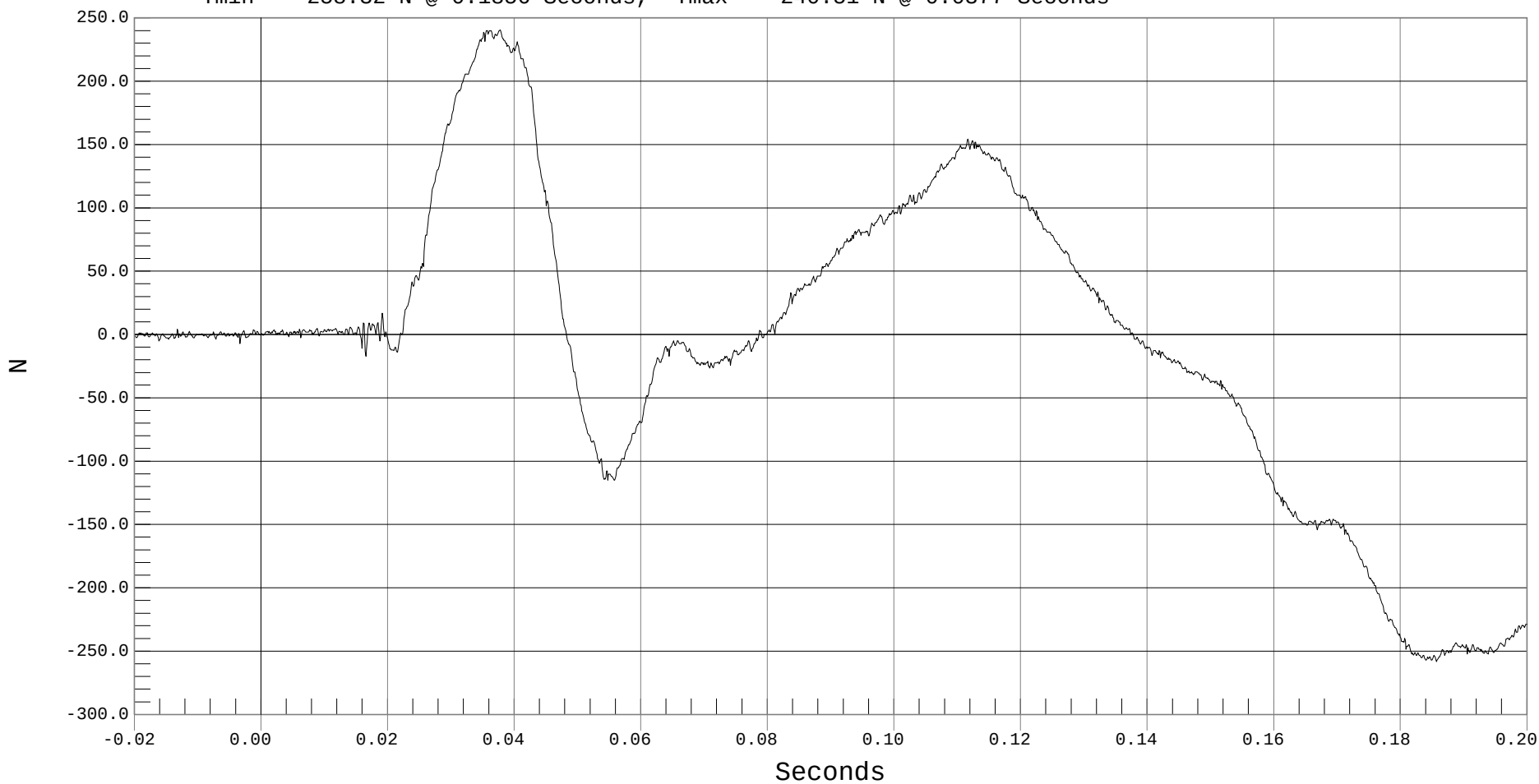
DRIVER UPPER NECK FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE Y, B01109FT.F05

Ymin = -258.32 N @ 0.1856 Seconds, Ymax = 240.51 N @ 0.0377 Seconds





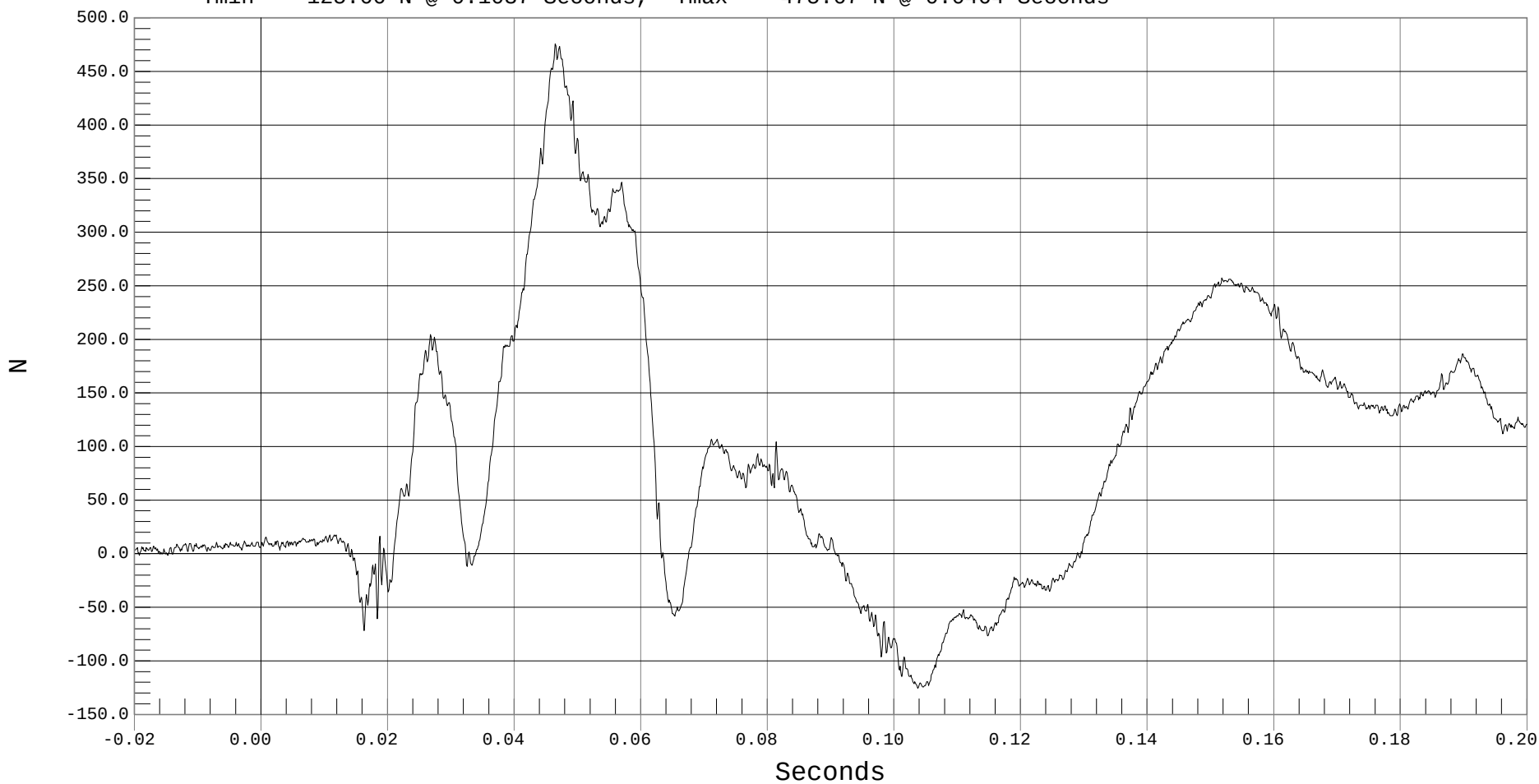
DRIVER UPPER NECK FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE Z, B01109FT.F06

Ymin = -125.66 N @ 0.1037 Seconds, Ymax = 475.67 N @ 0.0464 Seconds





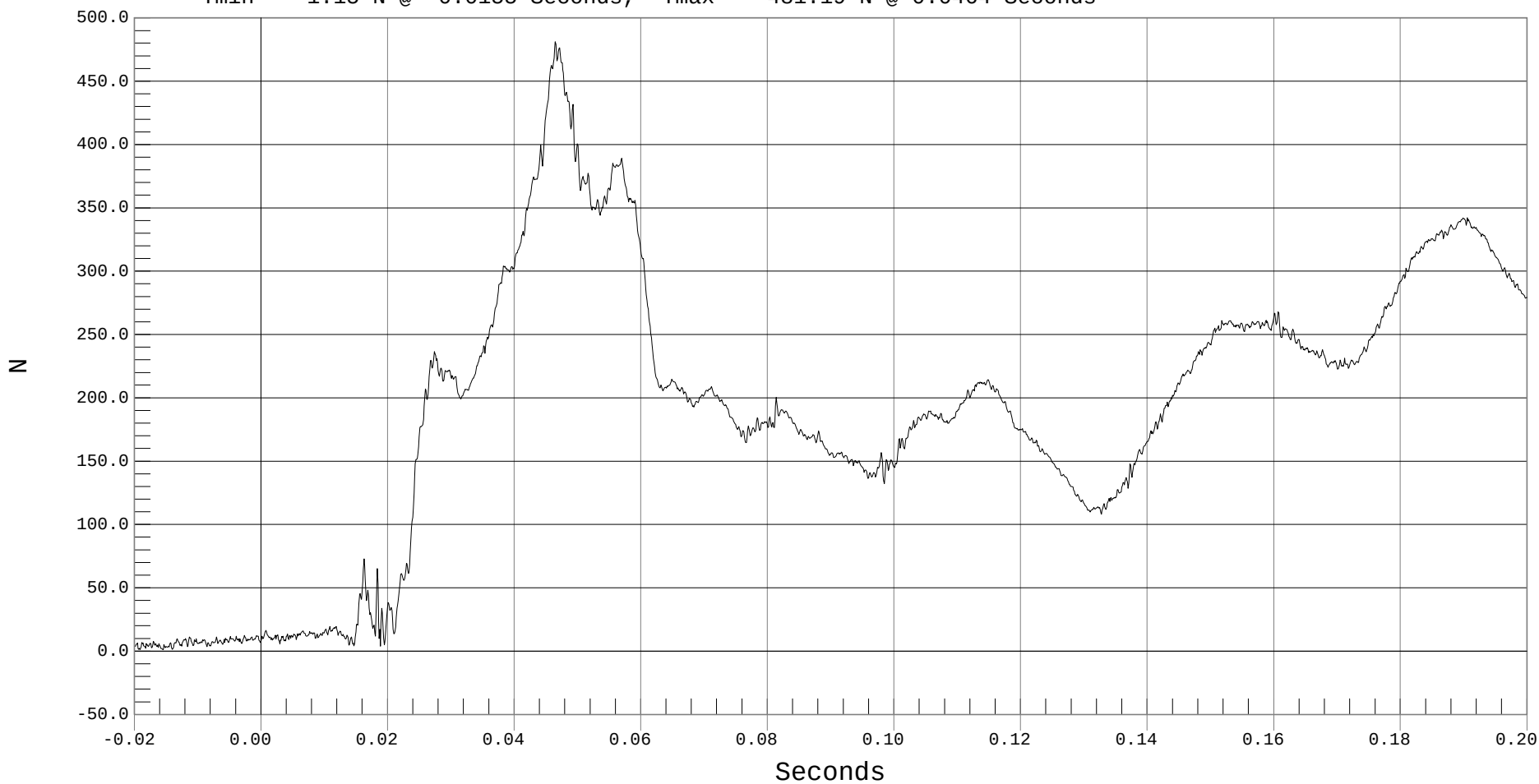
DRIVER UPPER NECK FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER UPPER NECK FORCE RESULTANT, B01109FV.F04

Ymin = 1.15 N @ -0.0155 Seconds, Ymax = 481.19 N @ 0.0464 Seconds





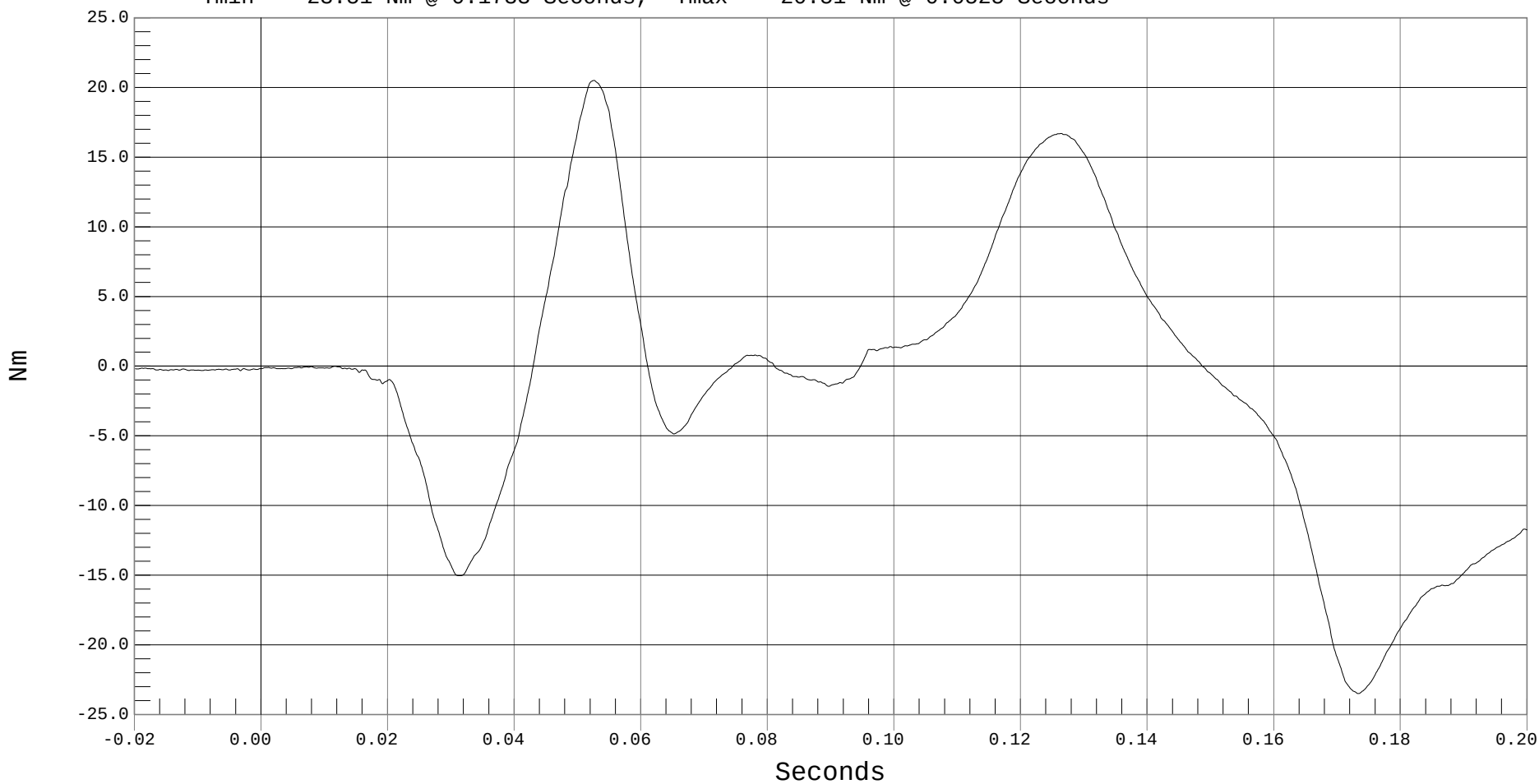
DRIVER UPPER NECK MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT X, B01109MF.M07

Ymin = -23.51 Nm @ 0.1733 Seconds, Ymax = 20.51 Nm @ 0.0525 Seconds





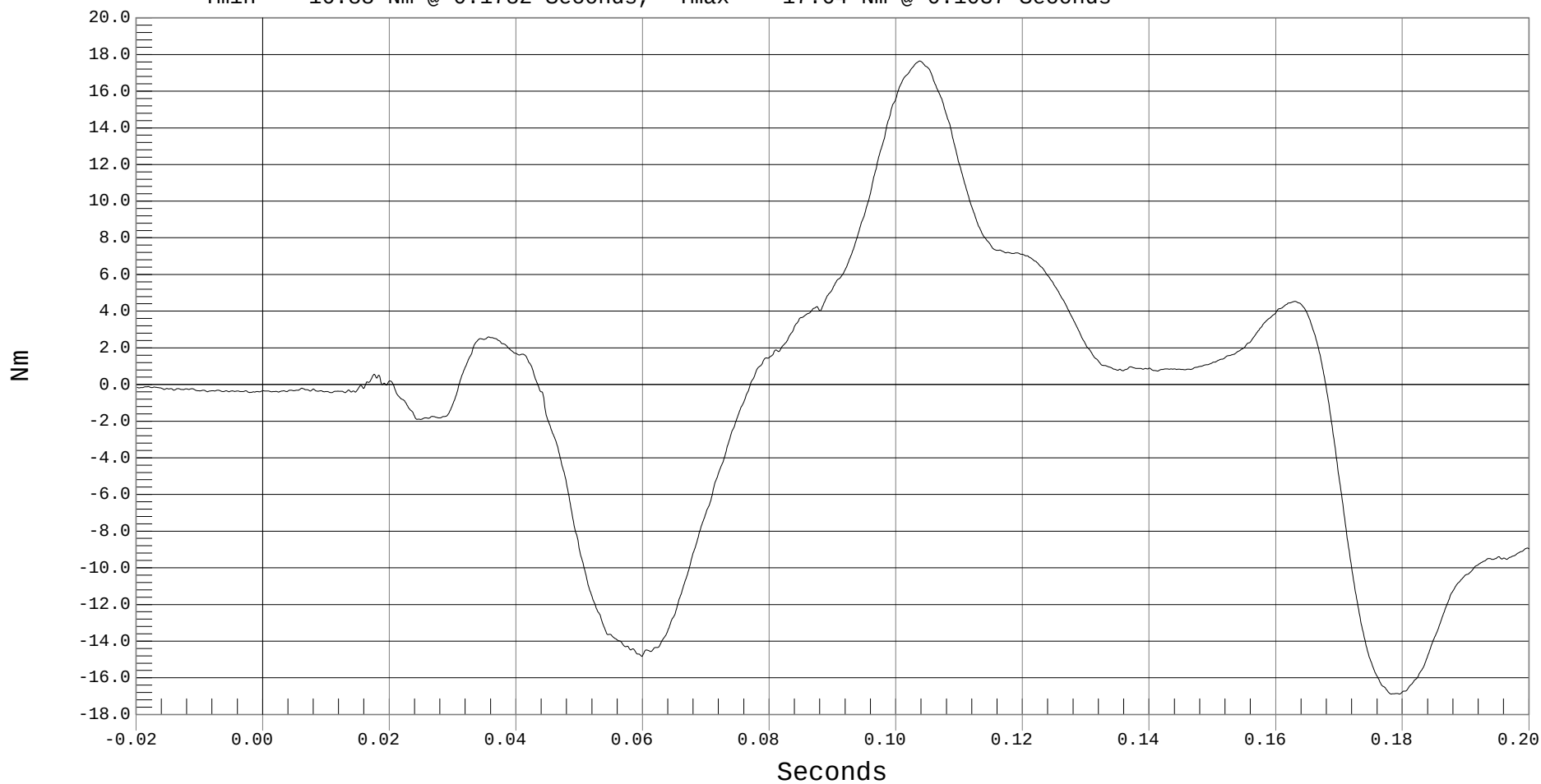
DRIVER UPPER NECK MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT Y, B01109MF.M08

Ymin = -16.88 Nm @ 0.1782 Seconds, Ymax = 17.64 Nm @ 0.1037 Seconds





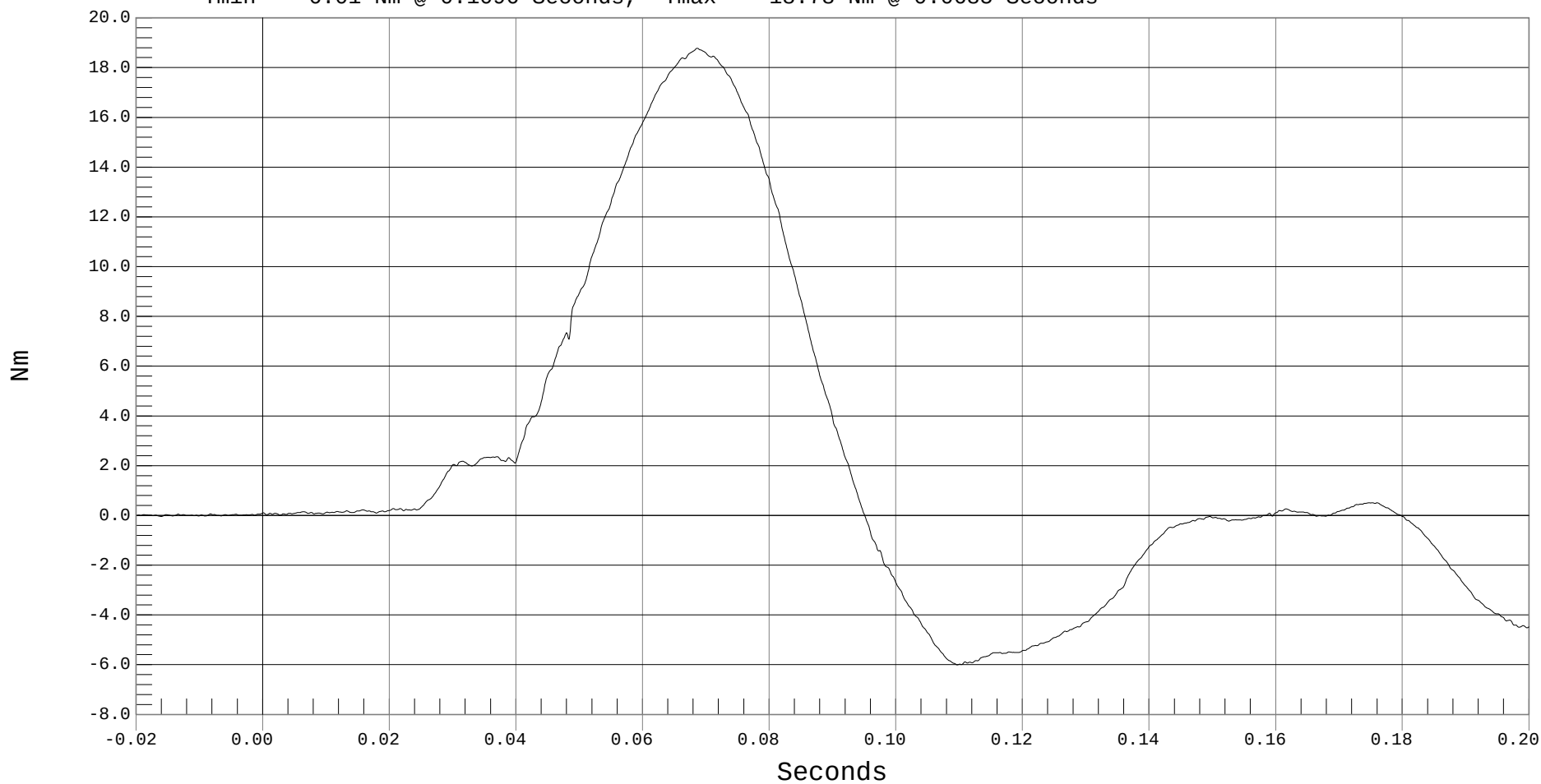
DRIVER UPPER NECK MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT Z, B01109MF.M09

Ymin = -6.01 Nm @ 0.1096 Seconds, Ymax = 18.78 Nm @ 0.0685 Seconds





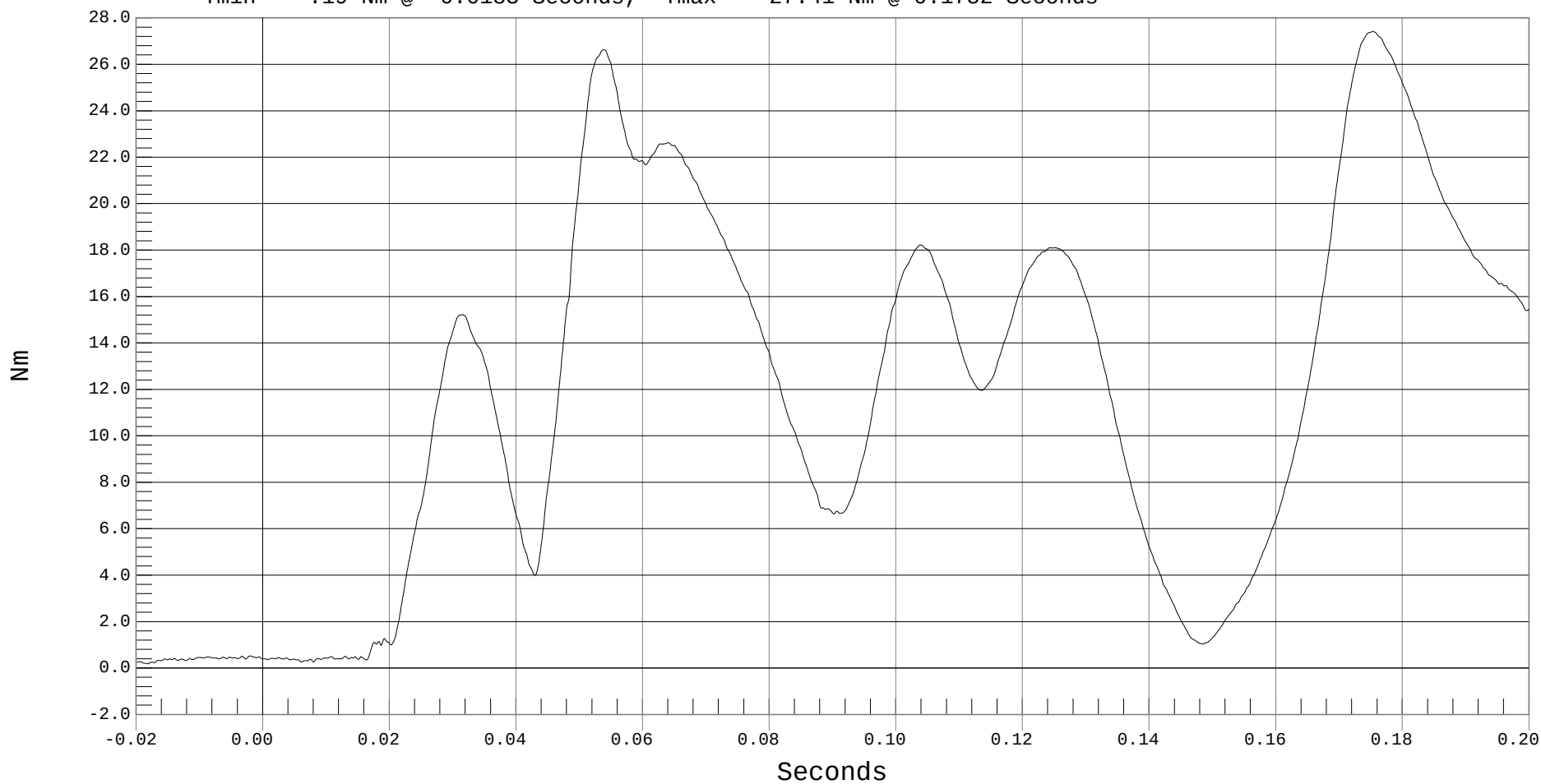
DRIVER UPPER NECK MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER UPPER NECK MOMENT RESULTANT, B01109MV.M07

Ymin = .19 Nm @ -0.0183 Seconds, Ymax = 27.41 Nm @ 0.1752 Seconds





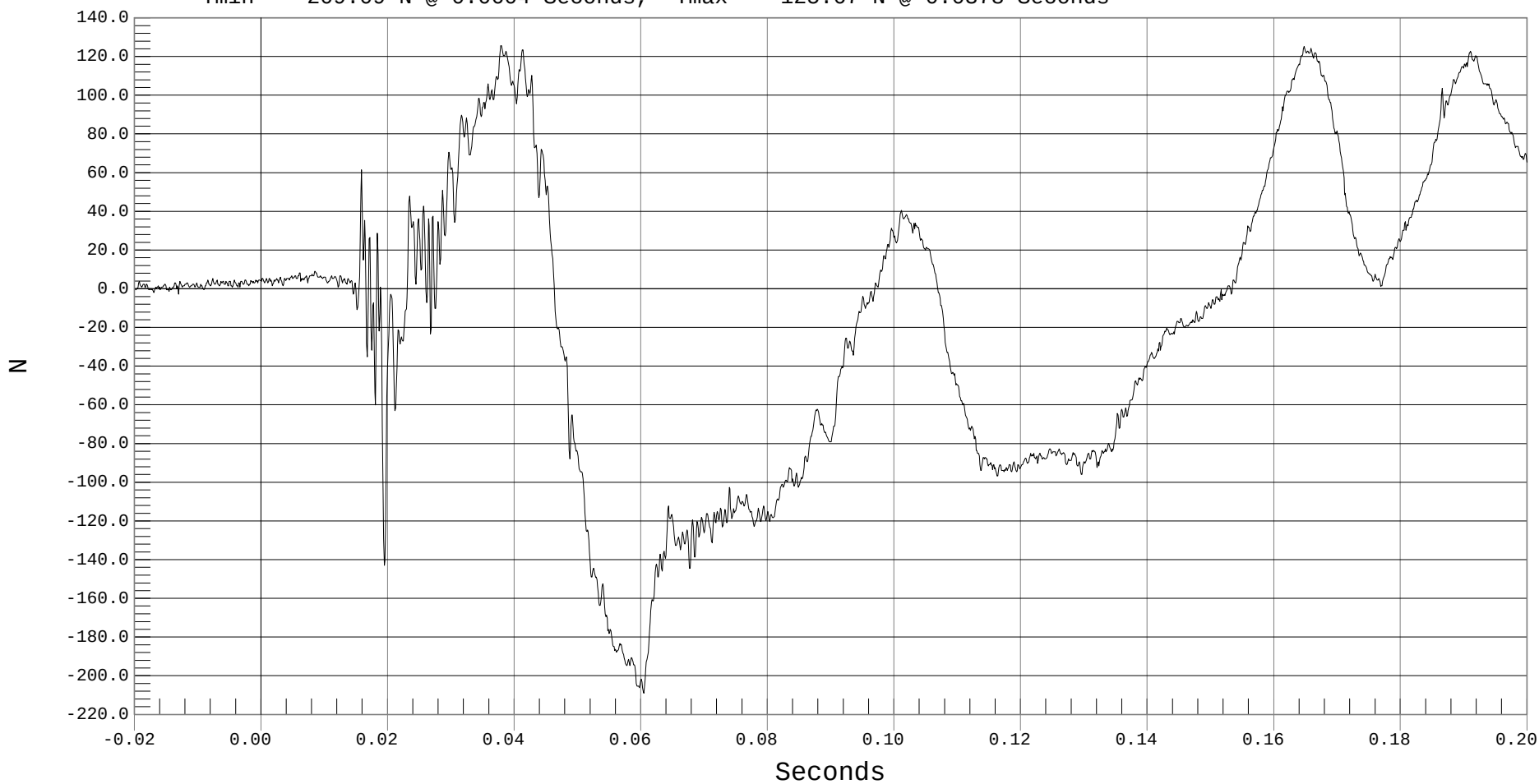
DRIVER LOWER NECK FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE X, B01109FT.F10

Ymin = -209.09 N @ 0.0604 Seconds, Ymax = 125.67 N @ 0.0378 Seconds





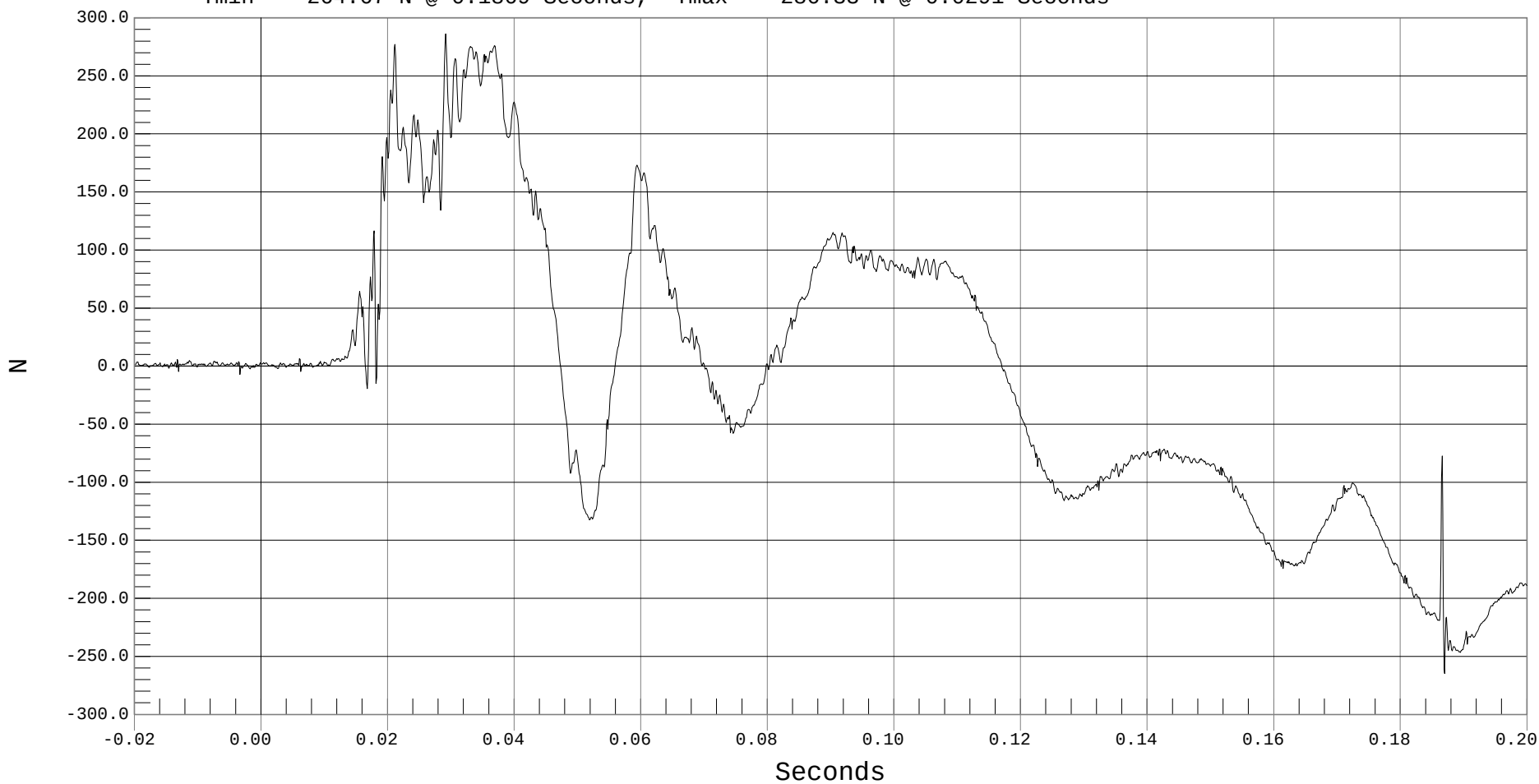
DRIVER LOWER NECK FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE Y, B01109FT.F11

Ymin = -264.67 N @ 0.1869 Seconds, Ymax = 286.33 N @ 0.0291 Seconds





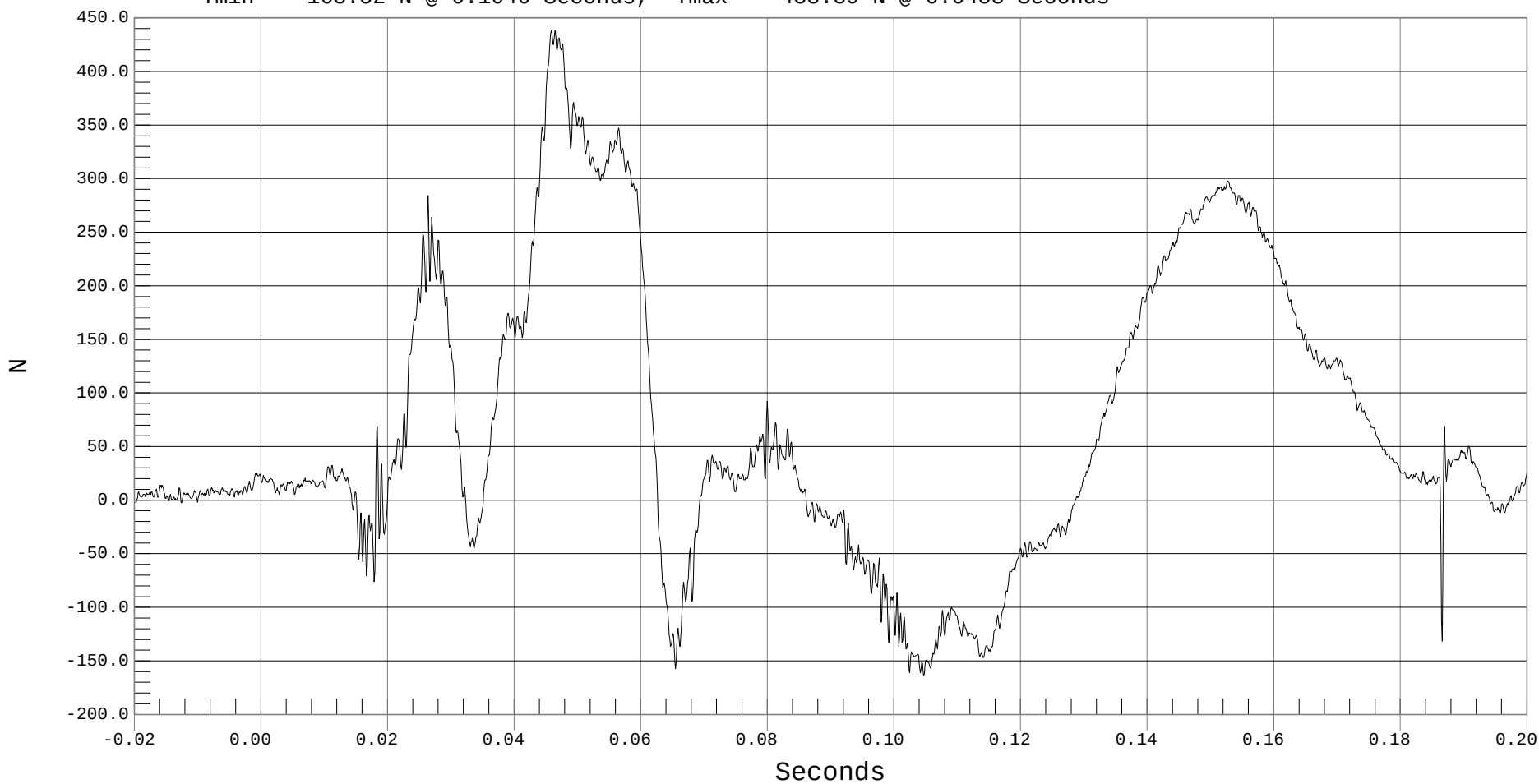
DRIVER LOWER NECK FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE Z, B01109FT.F12

Ymin = -163.52 N @ 0.1046 Seconds, Ymax = 438.39 N @ 0.0458 Seconds





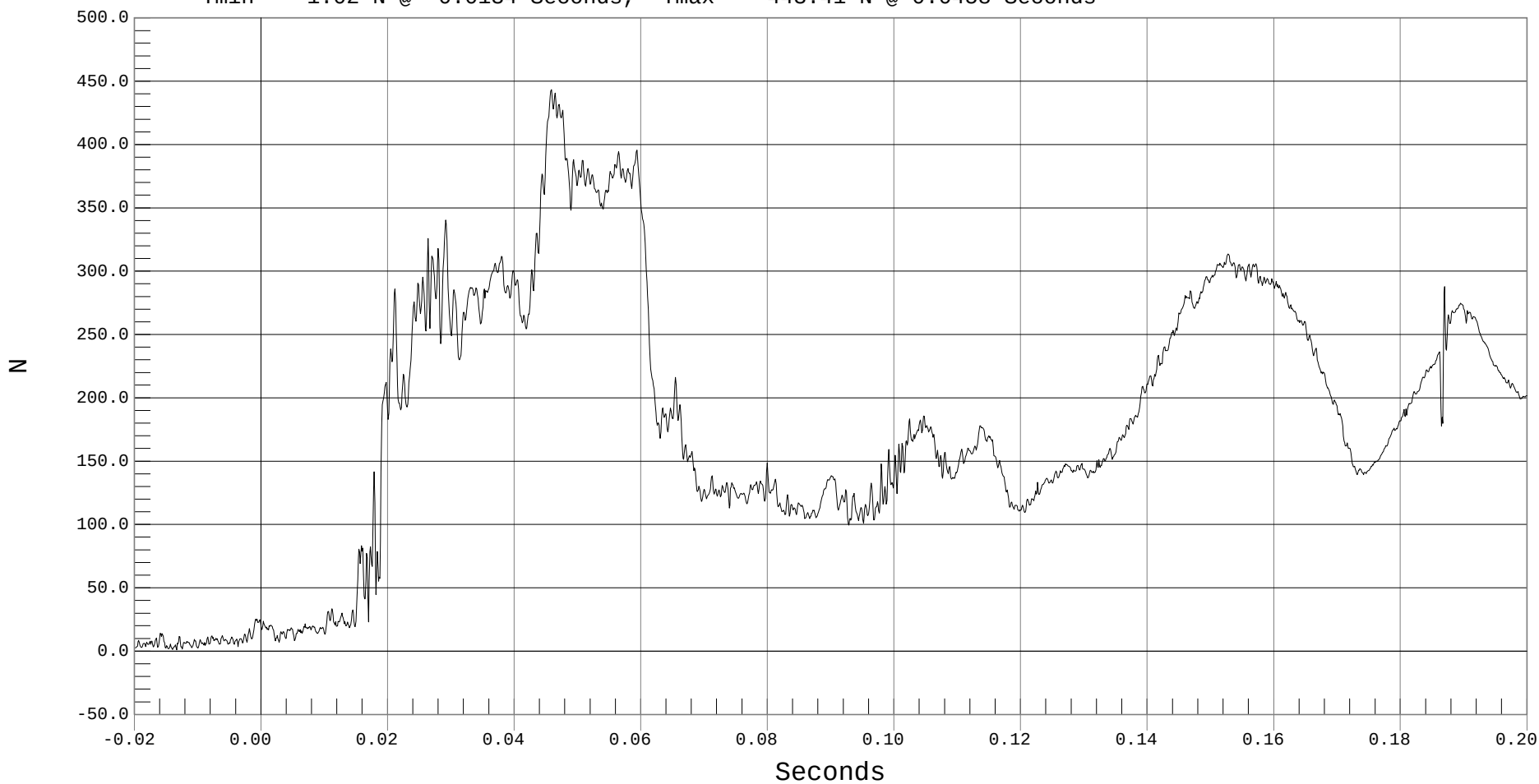
DRIVER LOWER NECK FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER LOWER NECK FORCE RESULTANT, B01109FV.F10

Ymin = 1.02 N @ -0.0134 Seconds, Ymax = 443.41 N @ 0.0458 Seconds





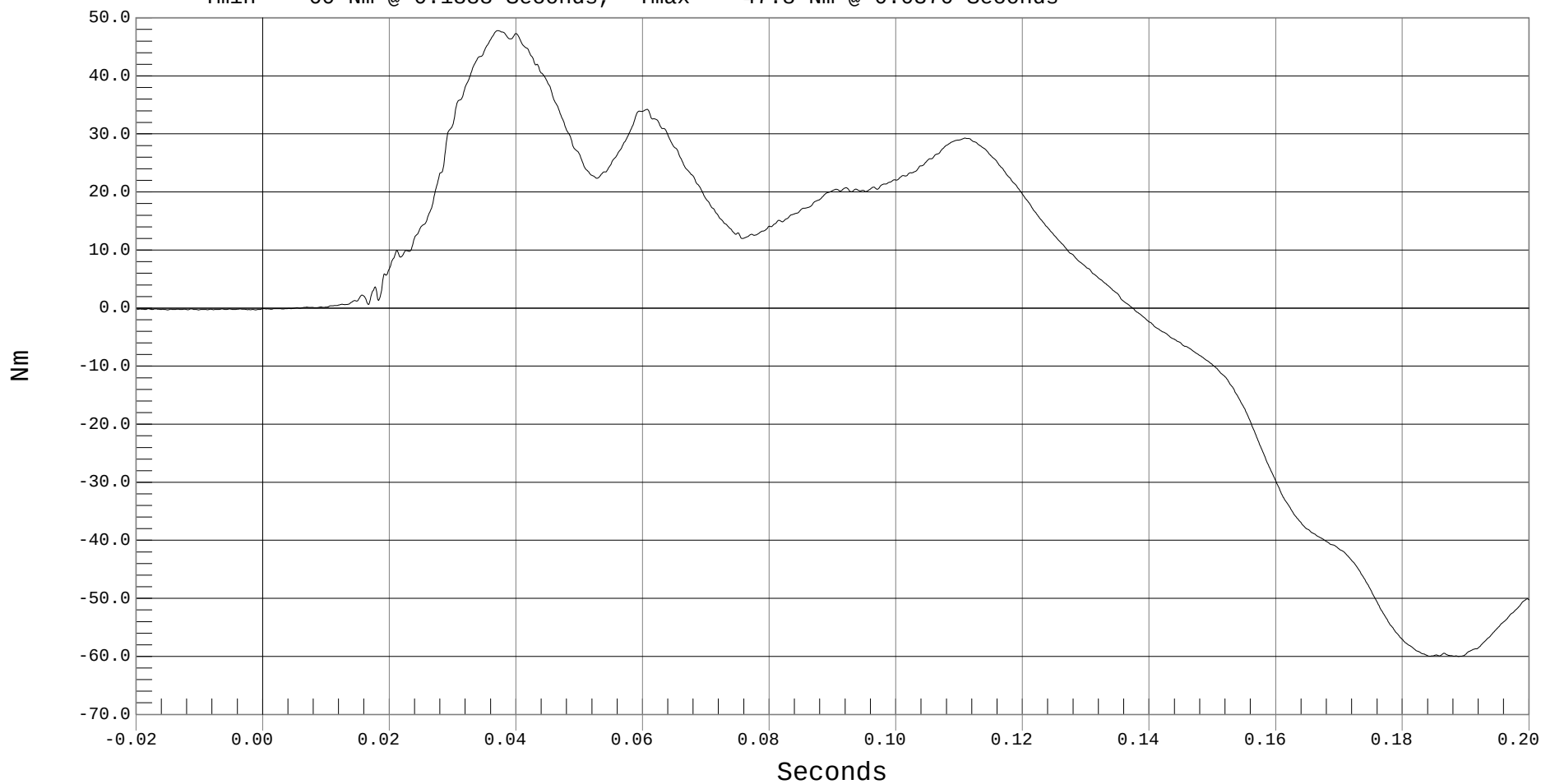
DRIVER LOWER NECK MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT X, B01109MF.M13

Ymin = -60 Nm @ 0.1888 Seconds, Ymax = 47.8 Nm @ 0.0370 Seconds





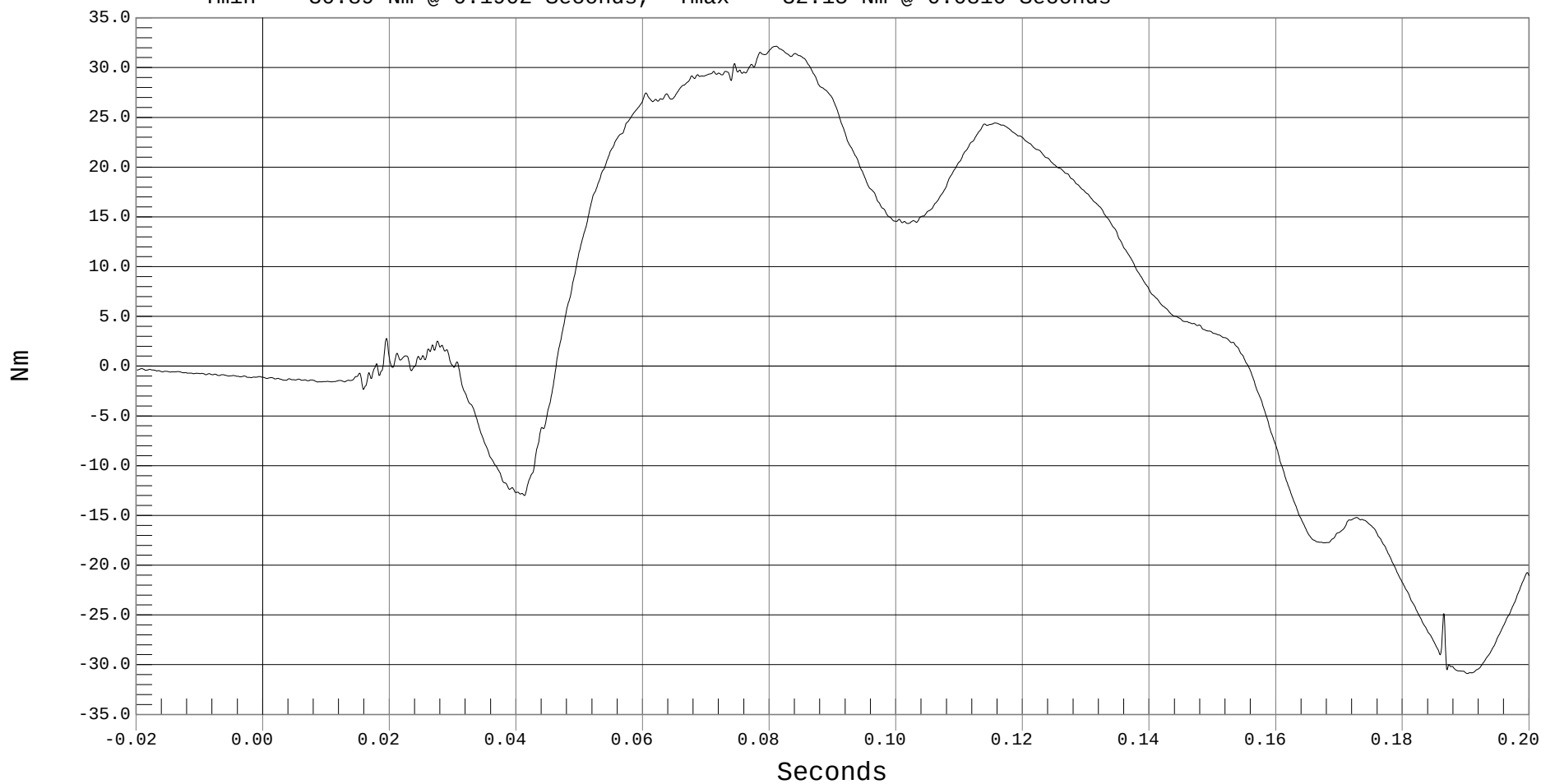
DRIVER LOWER NECK MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT Y, B01109MF.M14

Ymin = -30.89 Nm @ 0.1902 Seconds, Ymax = 32.15 Nm @ 0.0810 Seconds





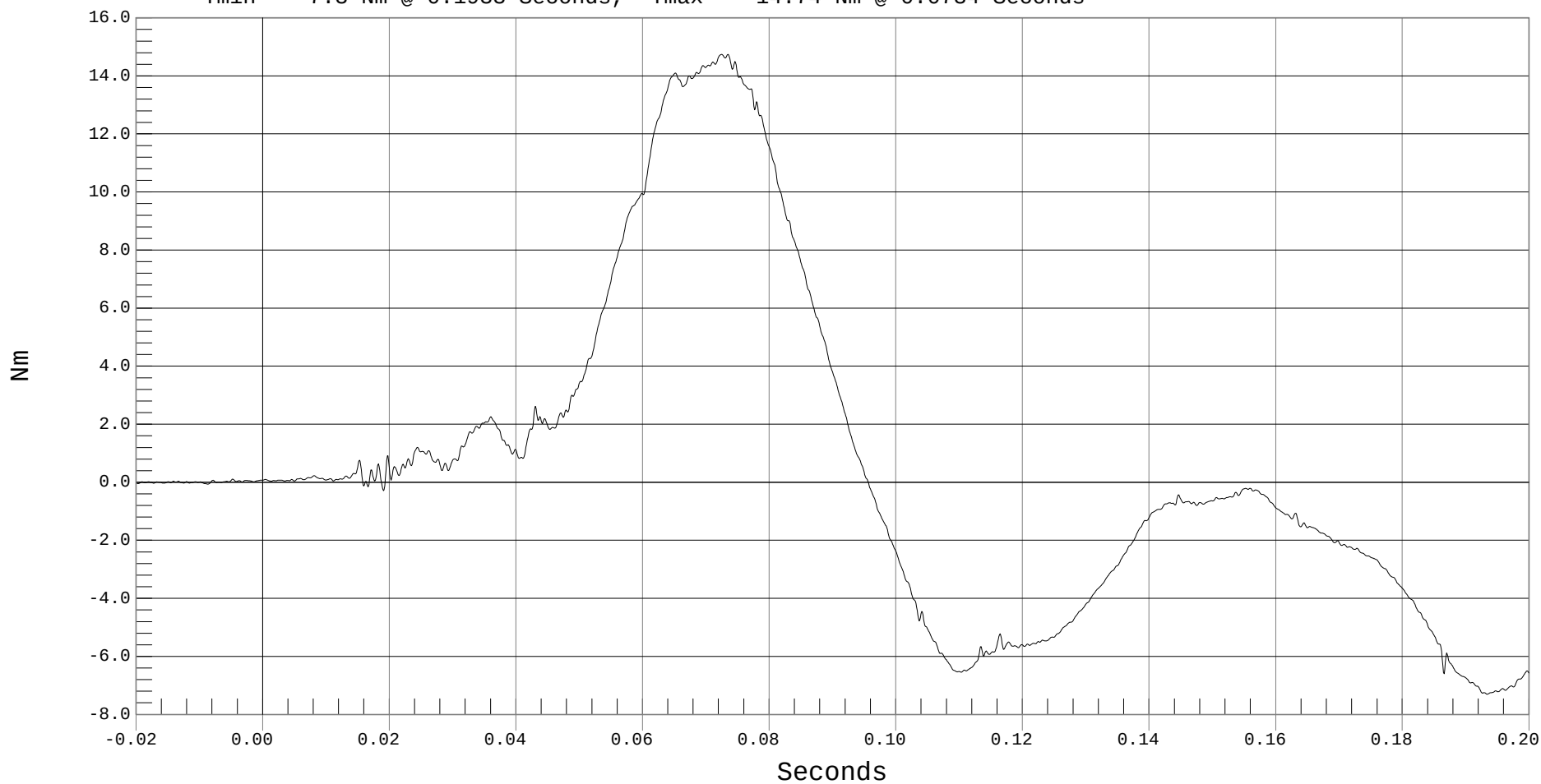
DRIVER LOWER NECK MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT Z, B01109MF.M15

Ymin = -7.3 Nm @ 0.1933 Seconds, Ymax = 14.74 Nm @ 0.0734 Seconds





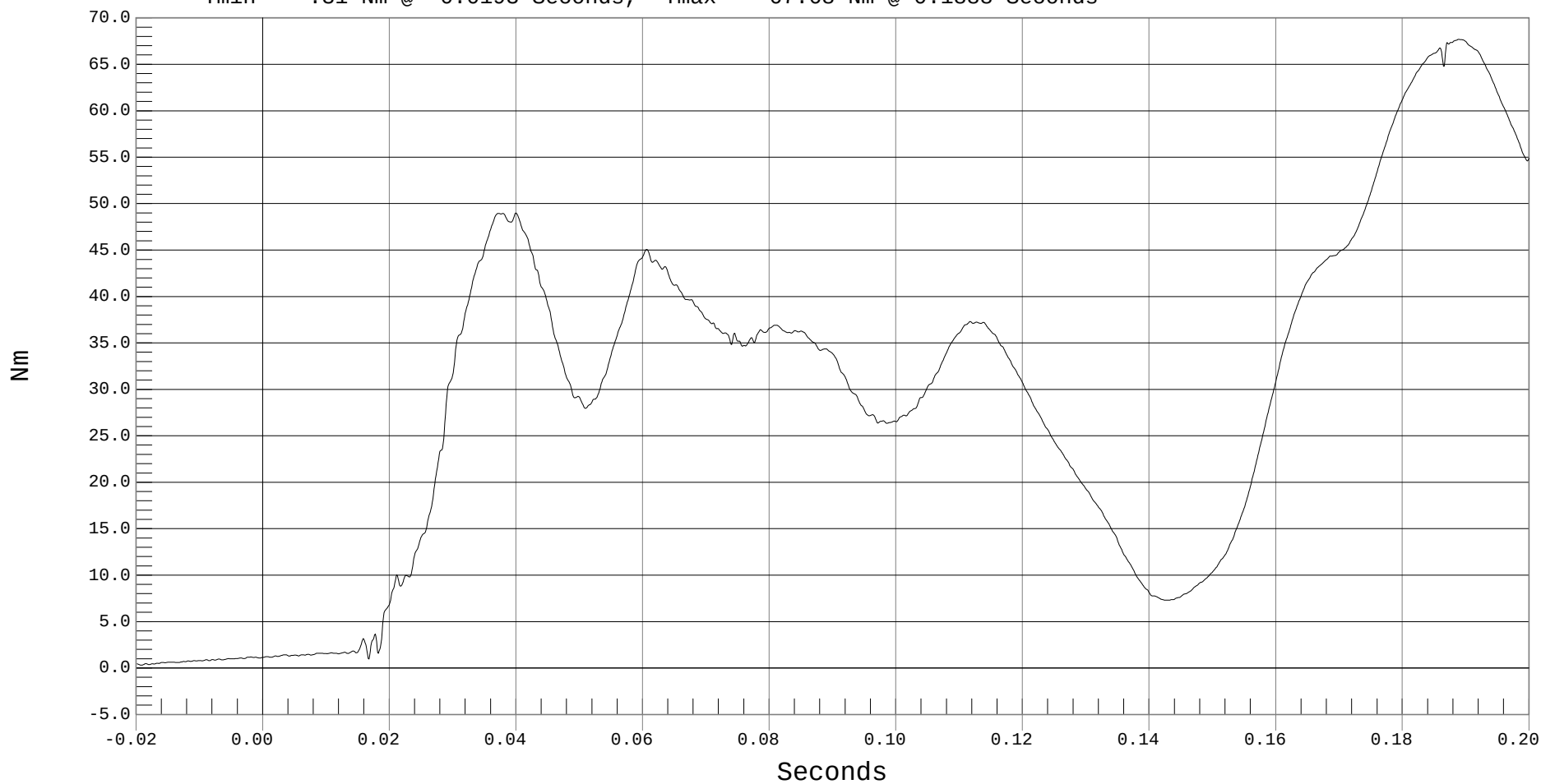
DRIVER LOWER NECK MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER LOWER NECK MOMENT RESULTANT, B01109MV.M13

Ymin = .31 Nm @ -0.0193 Seconds, Ymax = 67.68 Nm @ 0.1888 Seconds





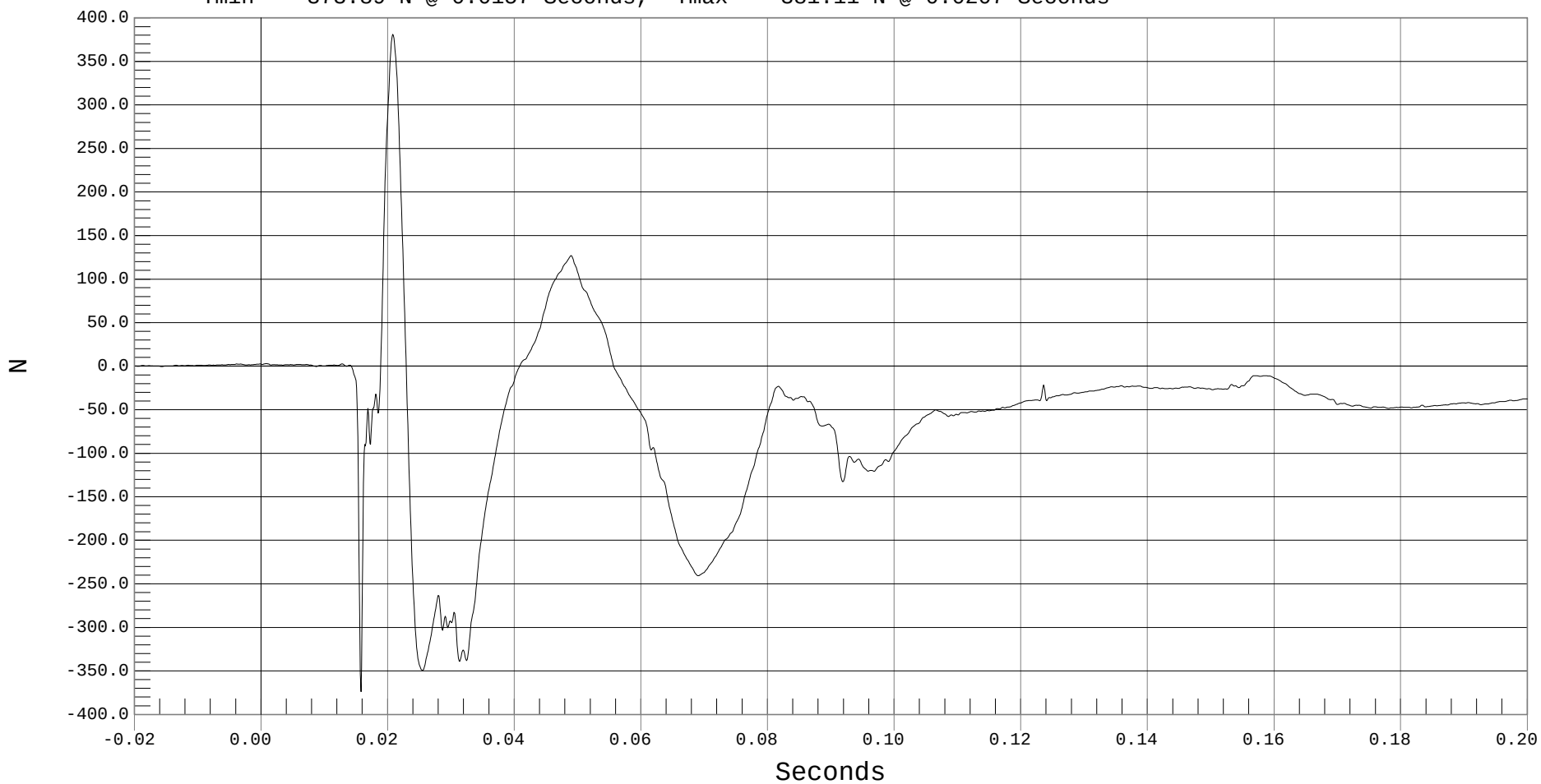
DRIVER SHOULDER FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER SHOULDER FORCE X, B01109FF.F16

Ymin = -373.89 N @ 0.0157 Seconds, Ymax = 381.11 N @ 0.0207 Seconds





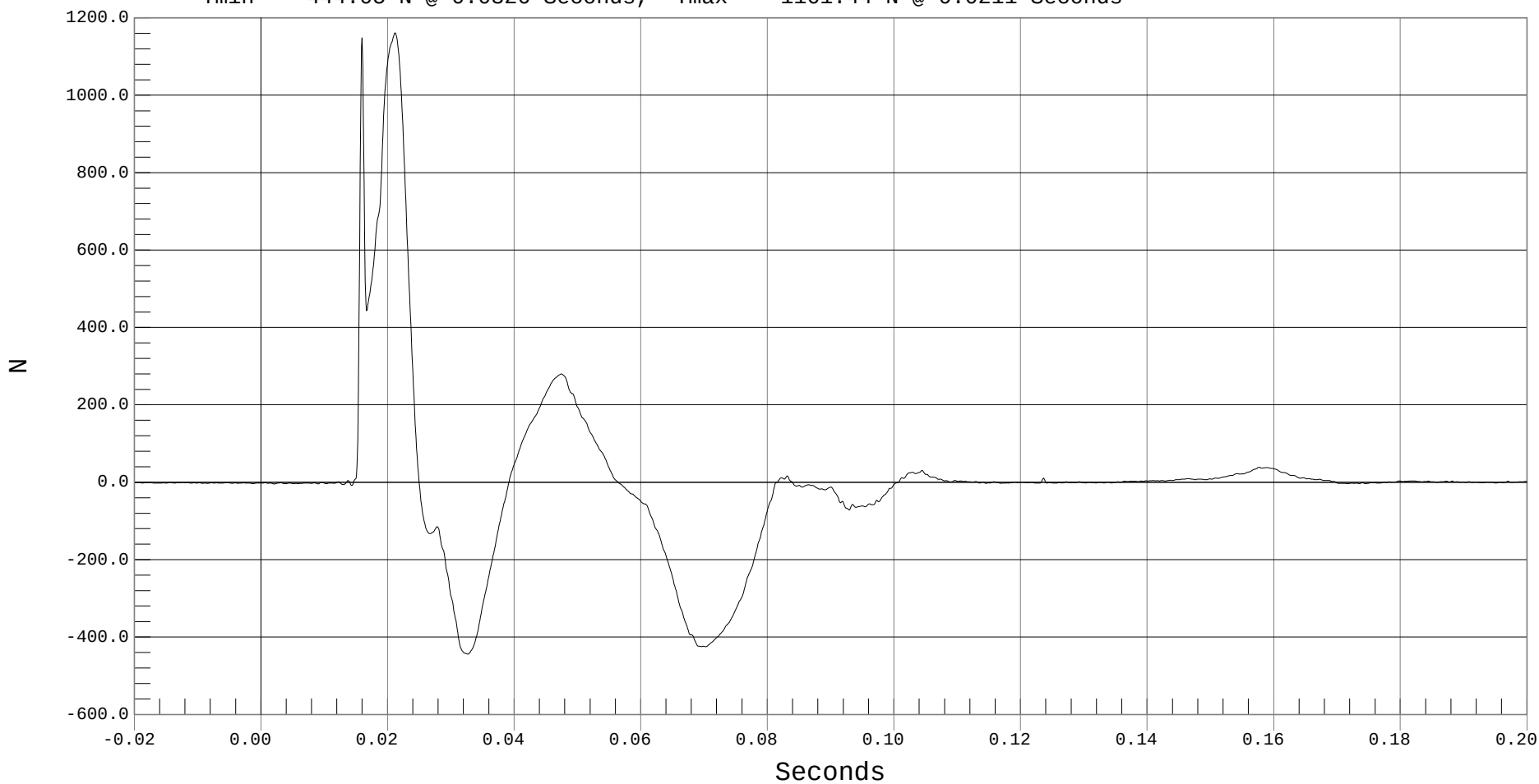
DRIVER SHOULDER FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

1 DRIVER SHOULDER FORCE Y, B01109FF.F17

Ymin = -444.05 N @ 0.0326 Seconds, Ymax = 1161.44 N @ 0.0211 Seconds





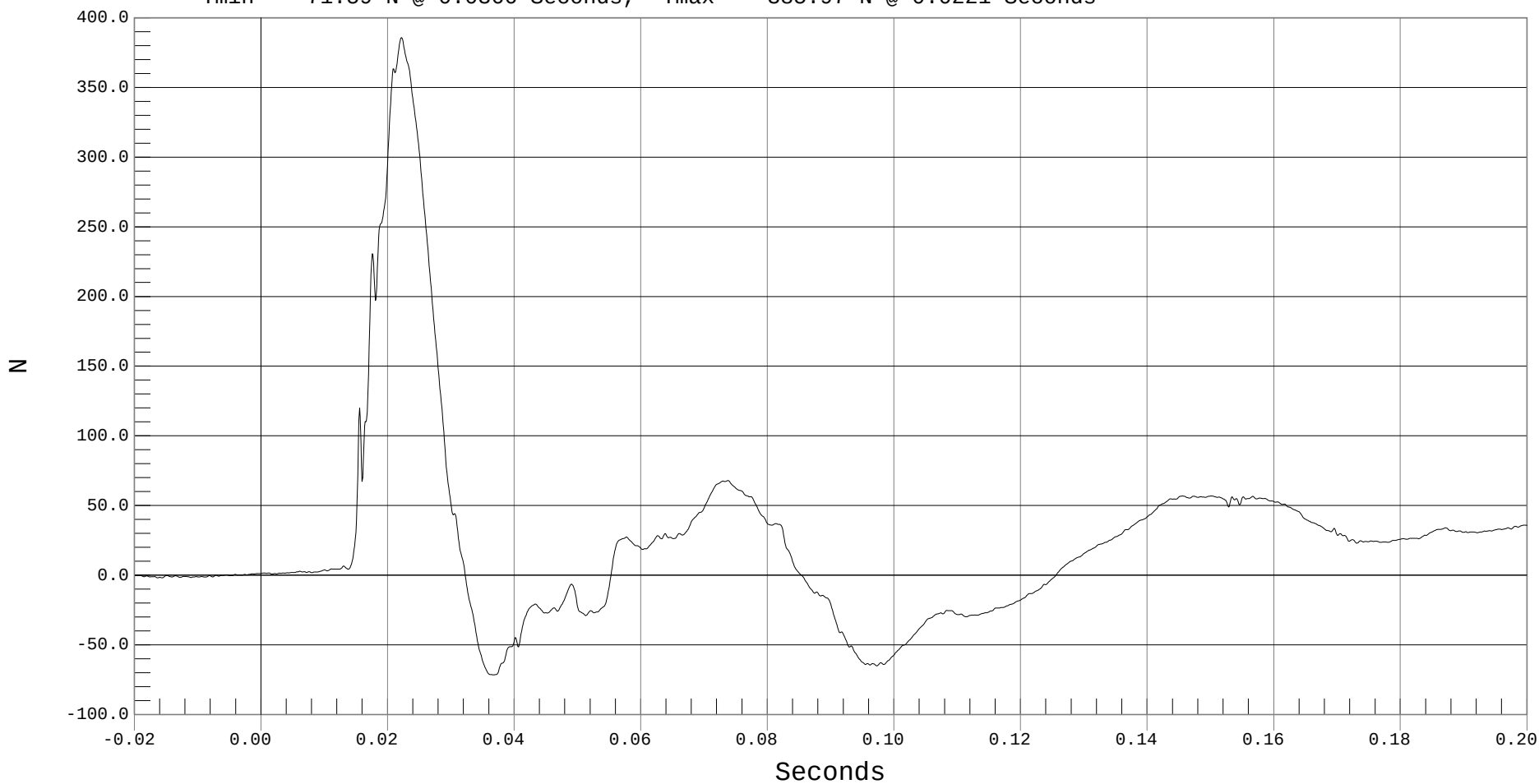
DRIVER SHOULDER FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER SHOULDER FORCE Z, B01109FF.F18

Ymin = -71.59 N @ 0.0366 Seconds, Ymax = 385.97 N @ 0.0221 Seconds





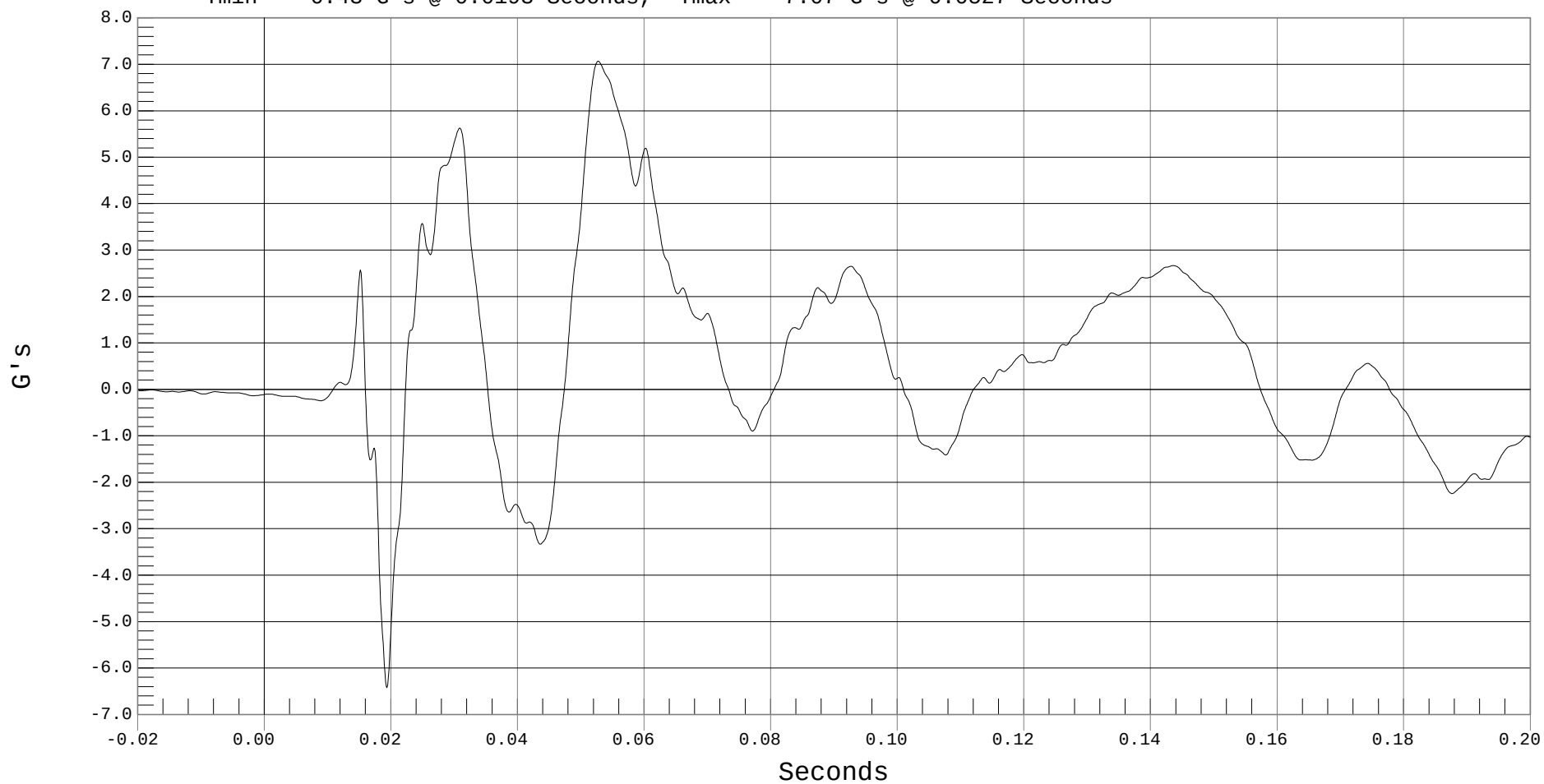
UPPER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE X, B01109AF.A20

Ymin = -6.43 G's @ 0.0193 Seconds, Ymax = 7.07 G's @ 0.0527 Seconds





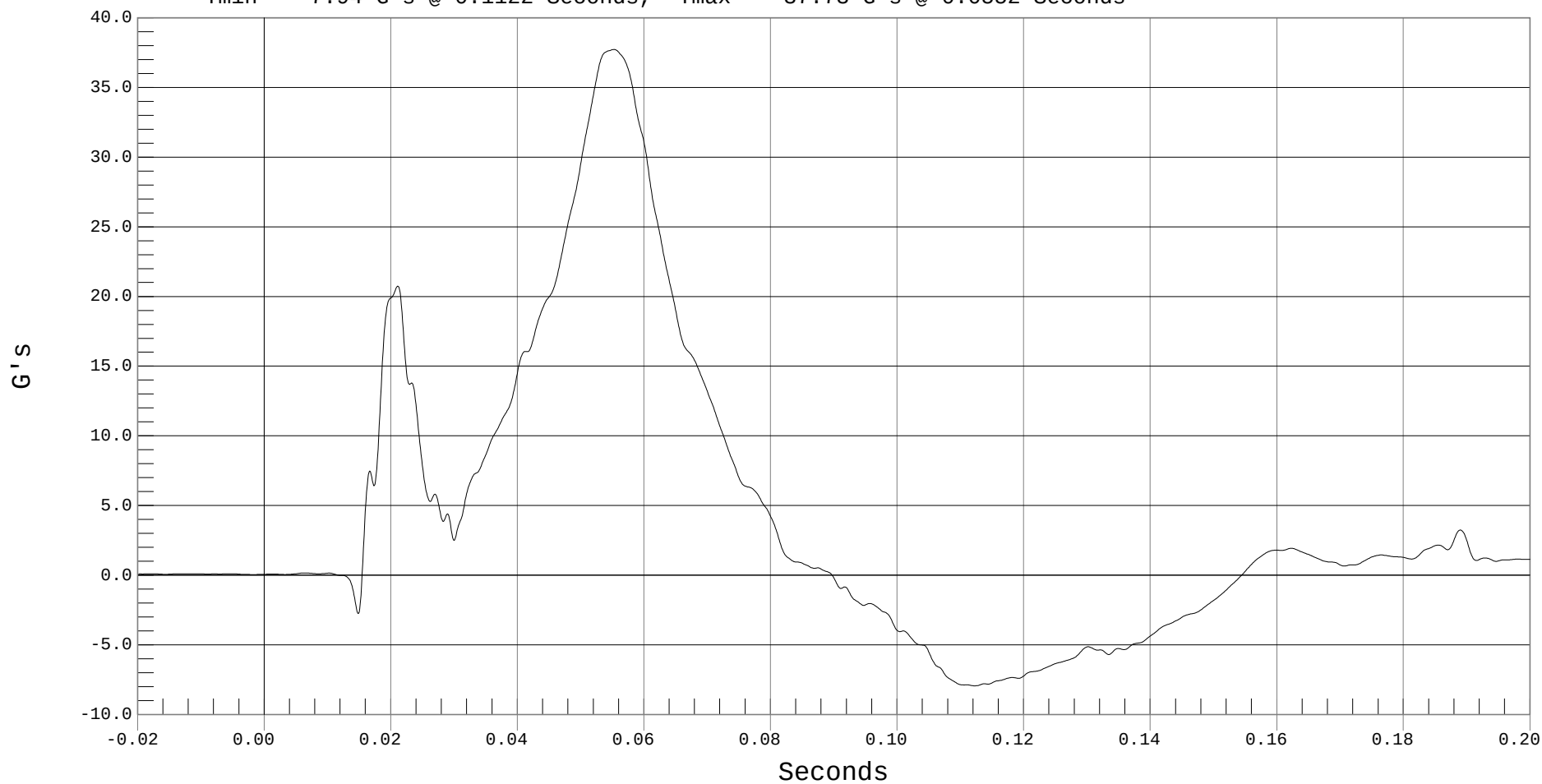
UPPER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE Y, B01109AF.A21

Ymin = -7.94 G's @ 0.1122 Seconds, Ymax = 37.73 G's @ 0.0552 Seconds





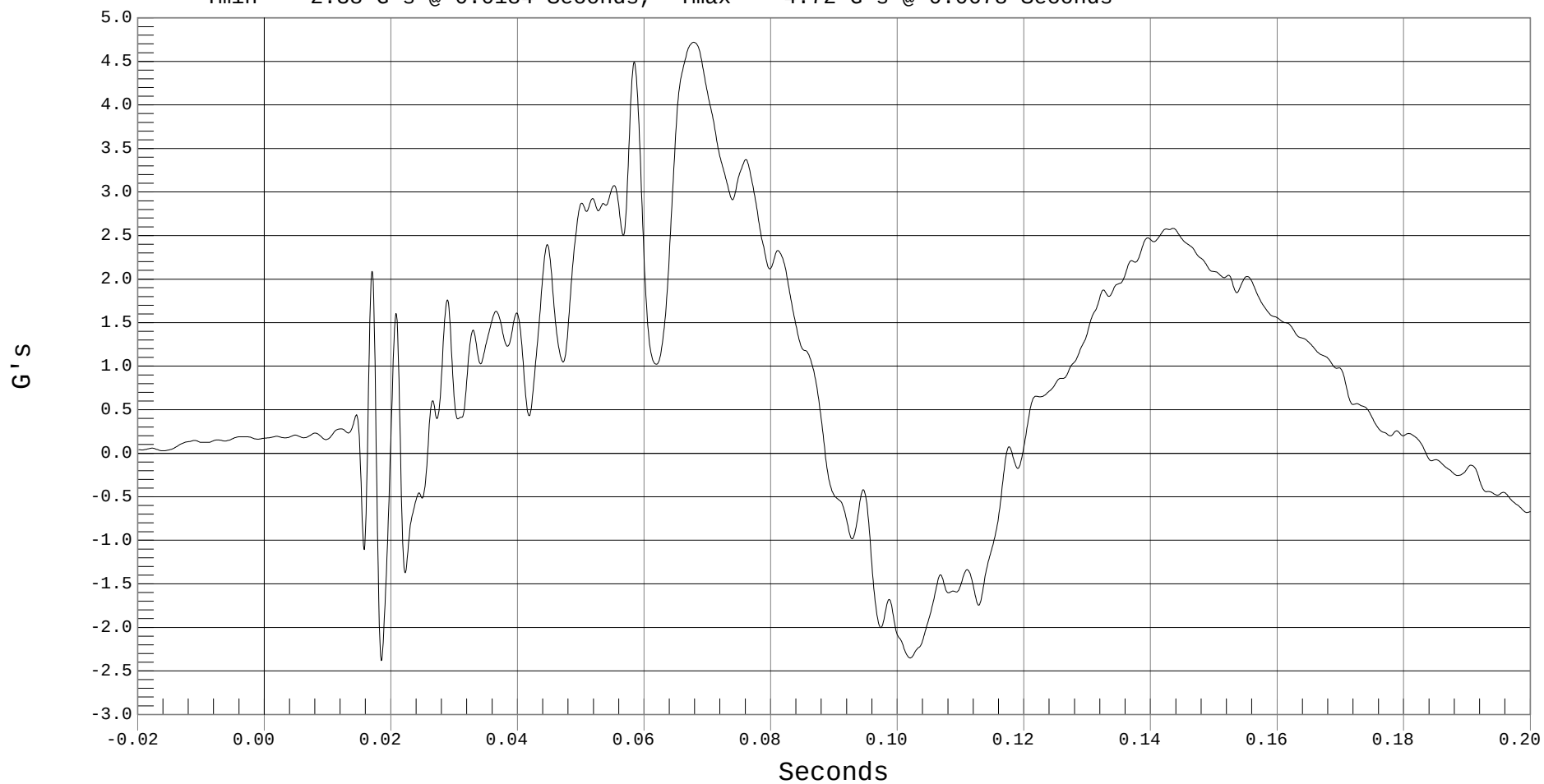
UPPER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE Z, B01109AF.A22

Ymin = -2.38 G's @ 0.0184 Seconds, Ymax = 4.72 G's @ 0.0678 Seconds





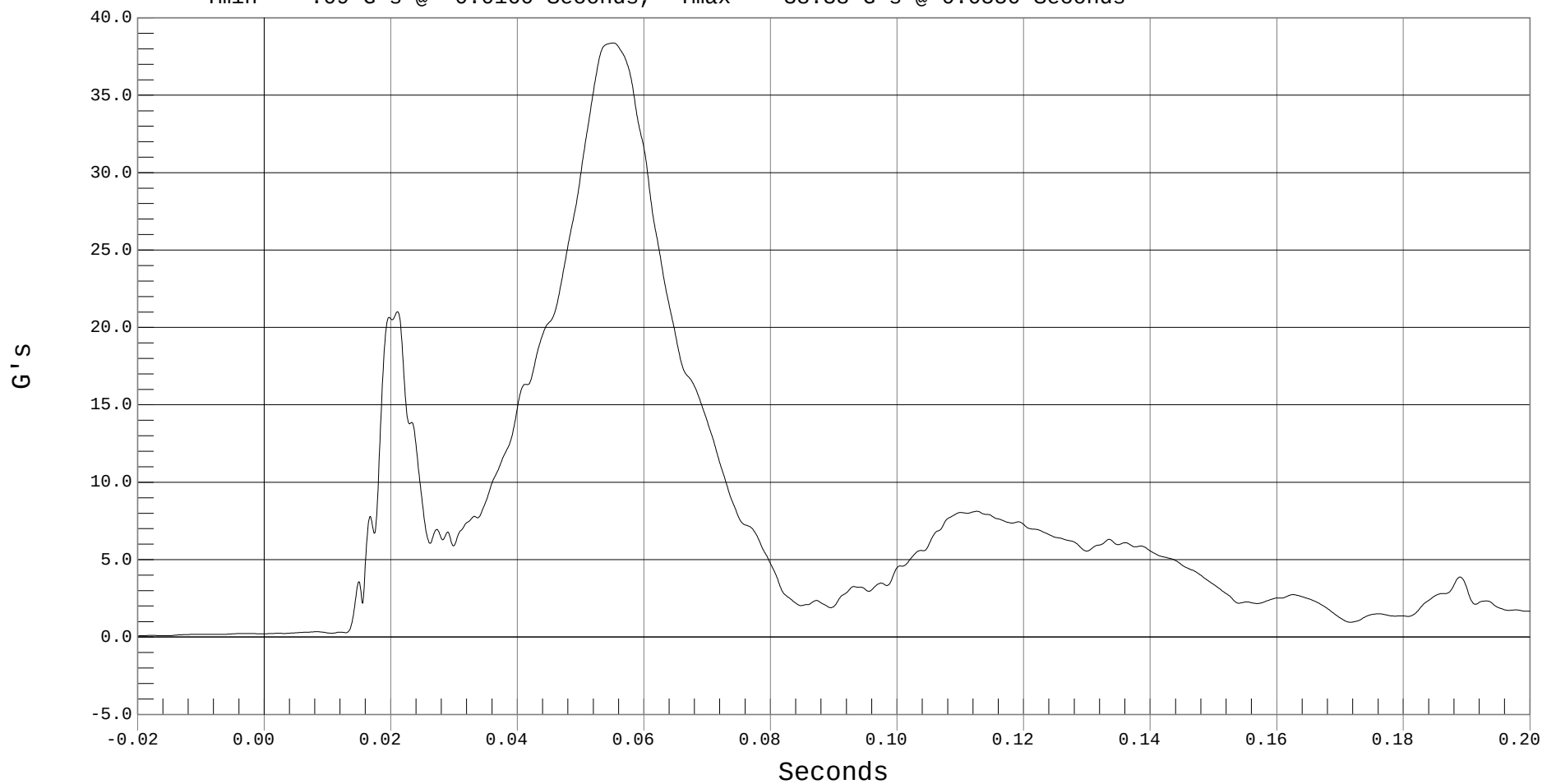
UPPER SPINE RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER UPPER SPINE RESULTANT, B01109AV.A20

Ymin = .09 G's @ -0.0160 Seconds, Ymax = 38.38 G's @ 0.0550 Seconds





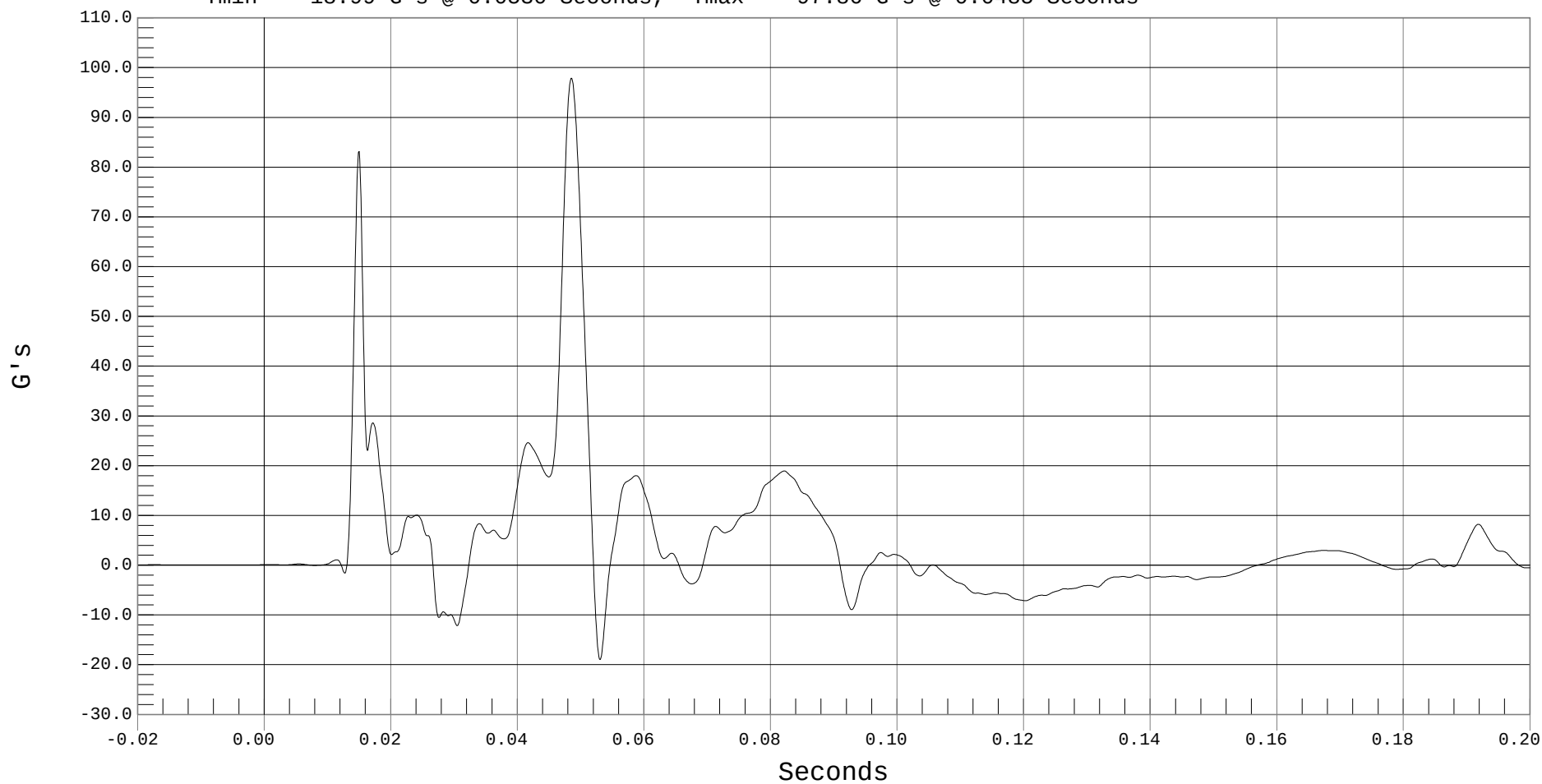
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

1 DRIVER UPPER RIB Y, B01109AF.A23

Ymin = -18.99 G's @ 0.0530 Seconds, Ymax = 97.86 G's @ 0.0485 Seconds





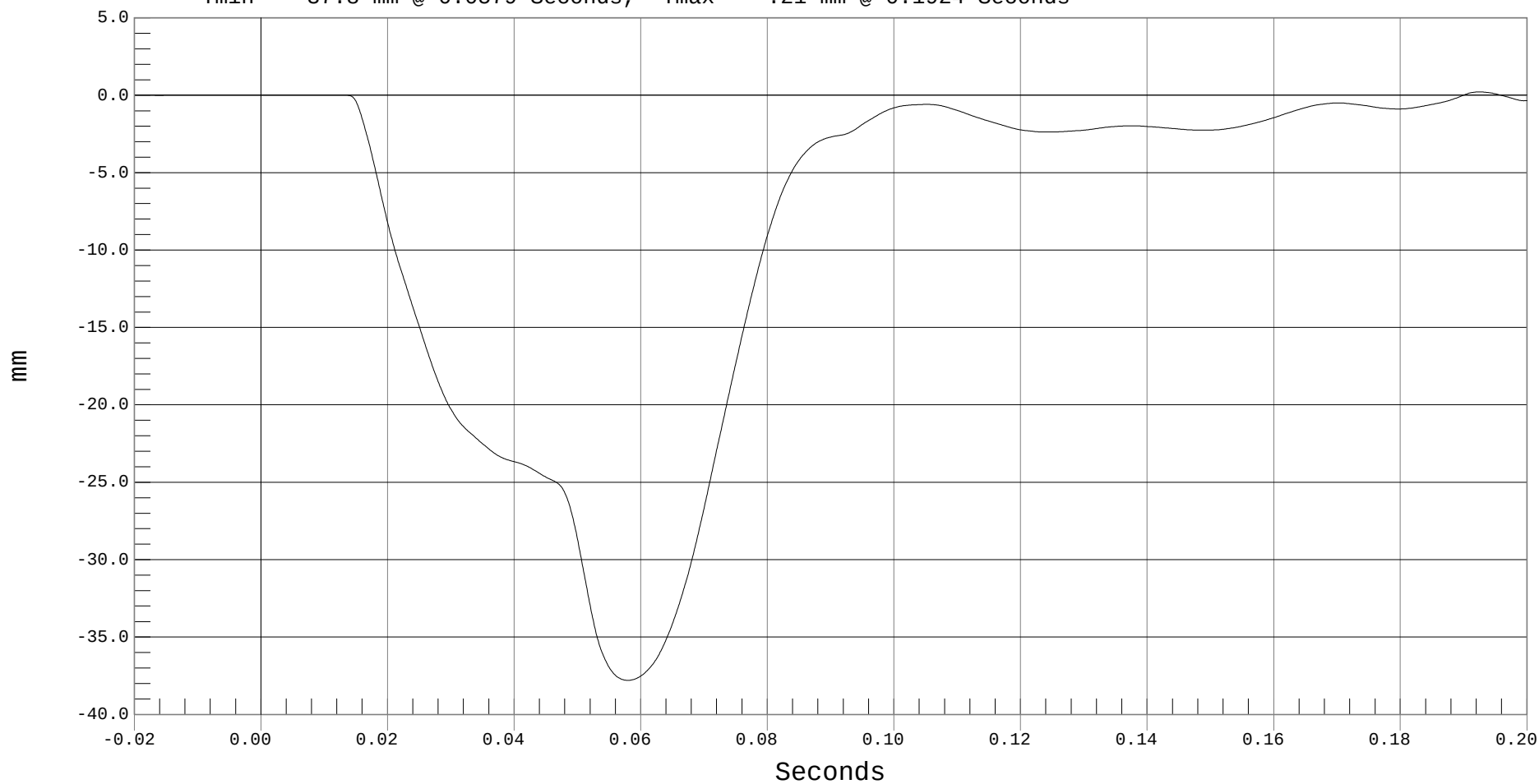
DRIVER UPPER RIB DISPLACEMENT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

1 DRIVER UPPER RIB DISPLACEMENT, B01109DF.D26

Ymin = -37.8 mm @ 0.0579 Seconds, Ymax = .21 mm @ 0.1924 Seconds





DRIVER UPPER RIB VISCOUS CRITERIA

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

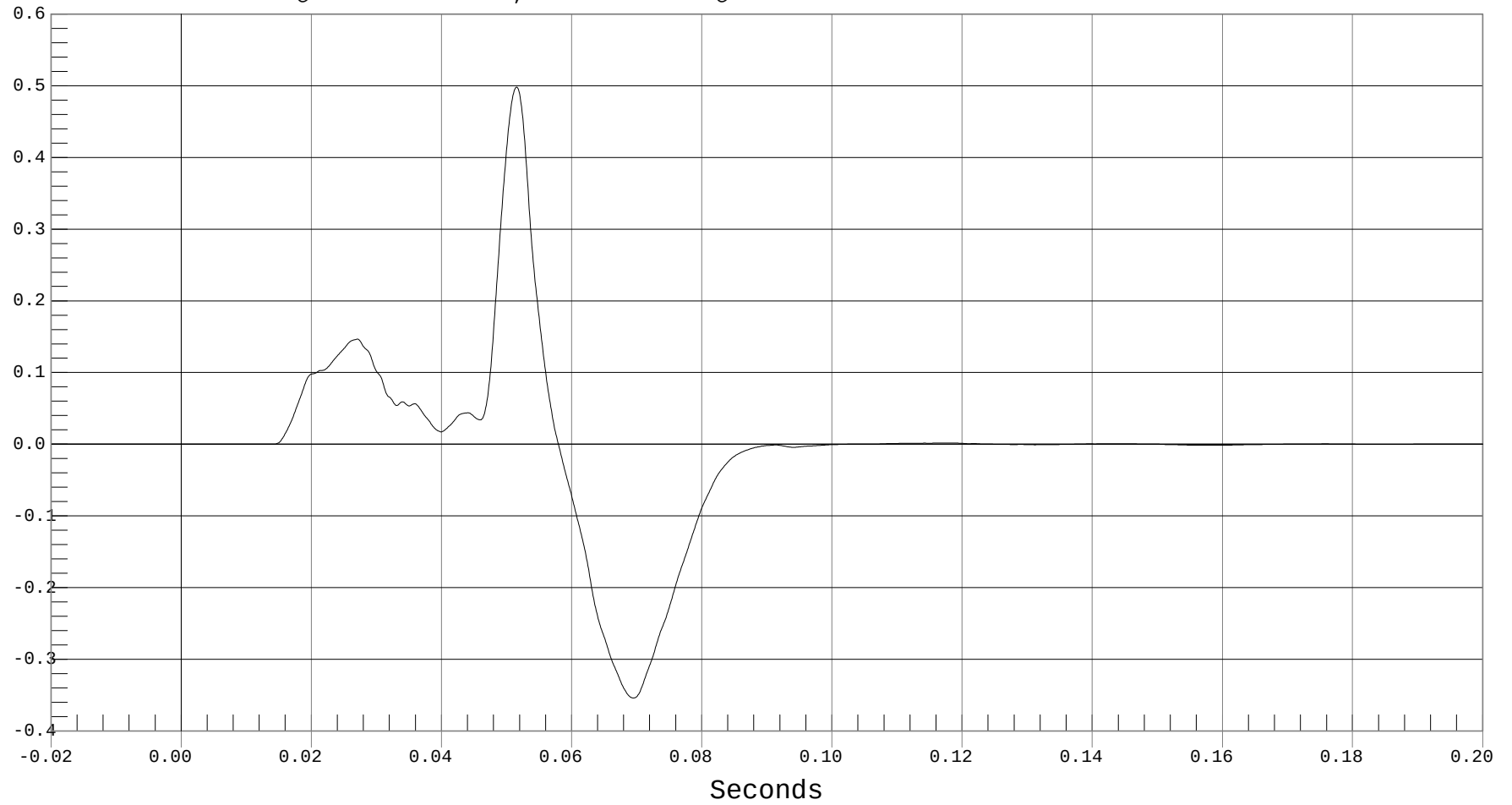
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 180

— 1 Viscous Criterion, B01109DV.C26

Ymin = -.35 @ 0.0694 Seconds, Ymax = .5 @ 0.0514 Seconds





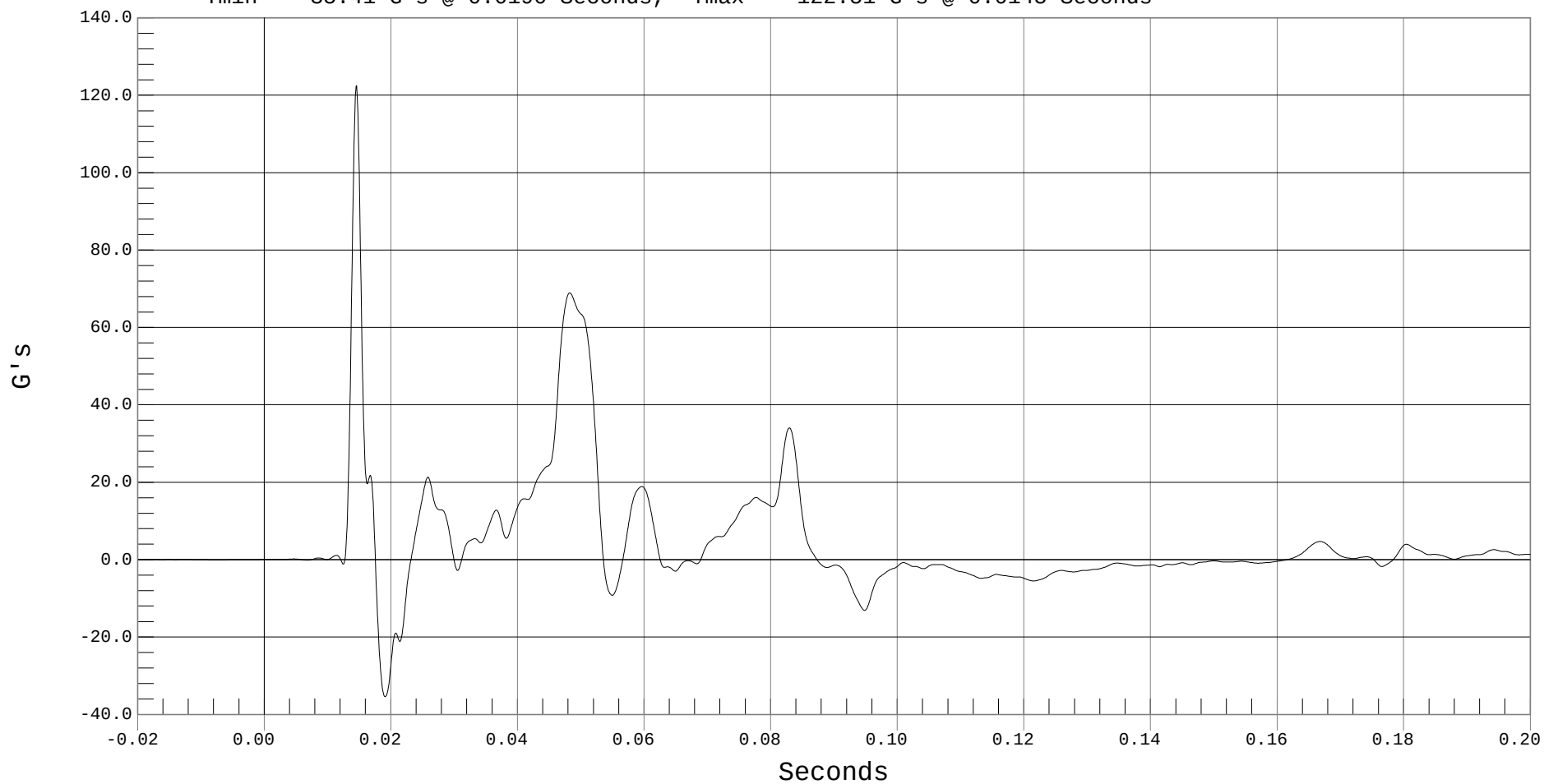
DRIVER MID RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER MID RIB Y, B01109AF.A24

Ymin = -35.41 G's @ 0.0190 Seconds, Ymax = 122.51 G's @ 0.0145 Seconds





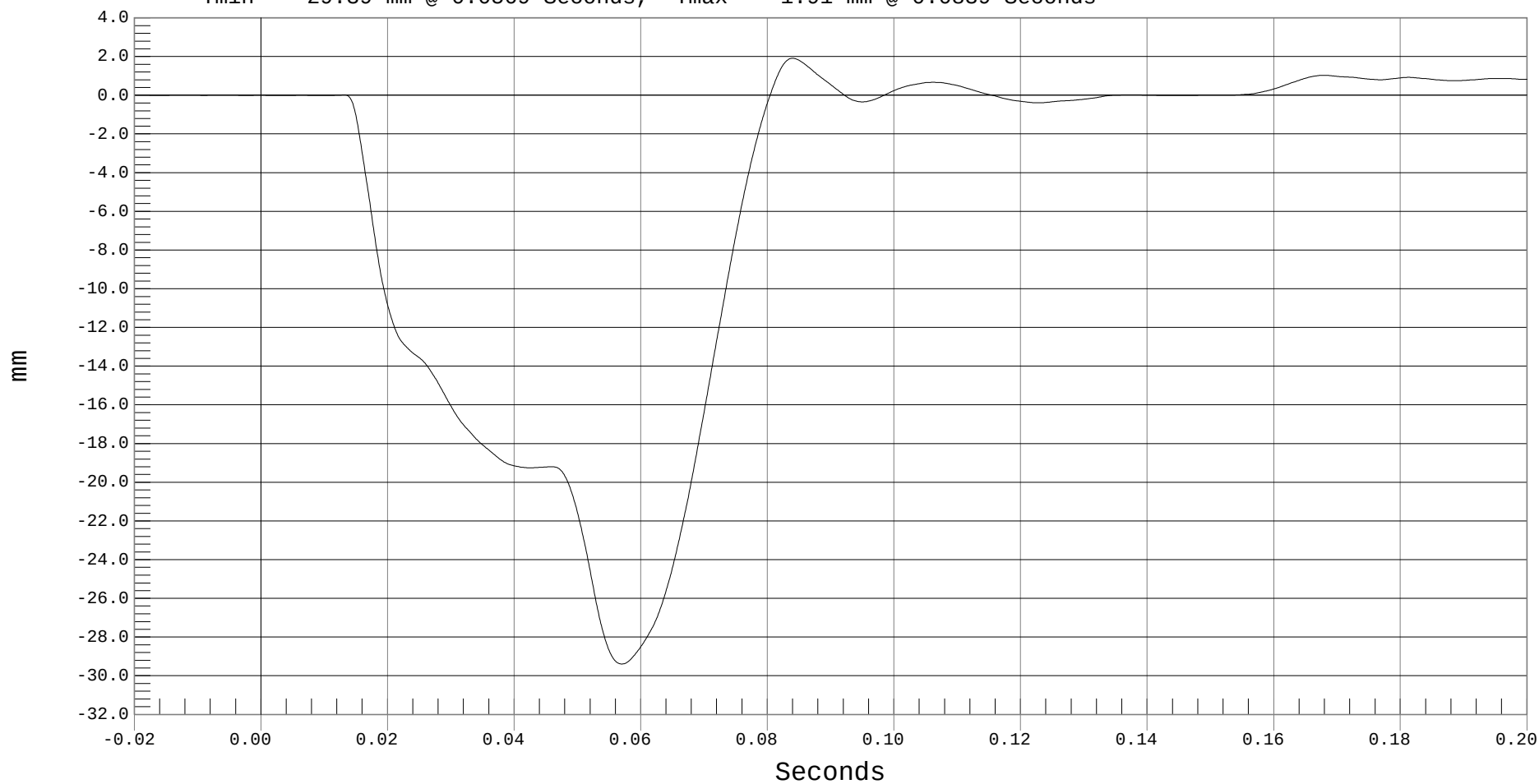
DRIVER MID RIB Y DISPLACEMENT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

1 DRIVER MID RIB DISPLACEMENT, B01109DF.D27

Ymin = -29.39 mm @ 0.0569 Seconds, Ymax = 1.91 mm @ 0.0839 Seconds





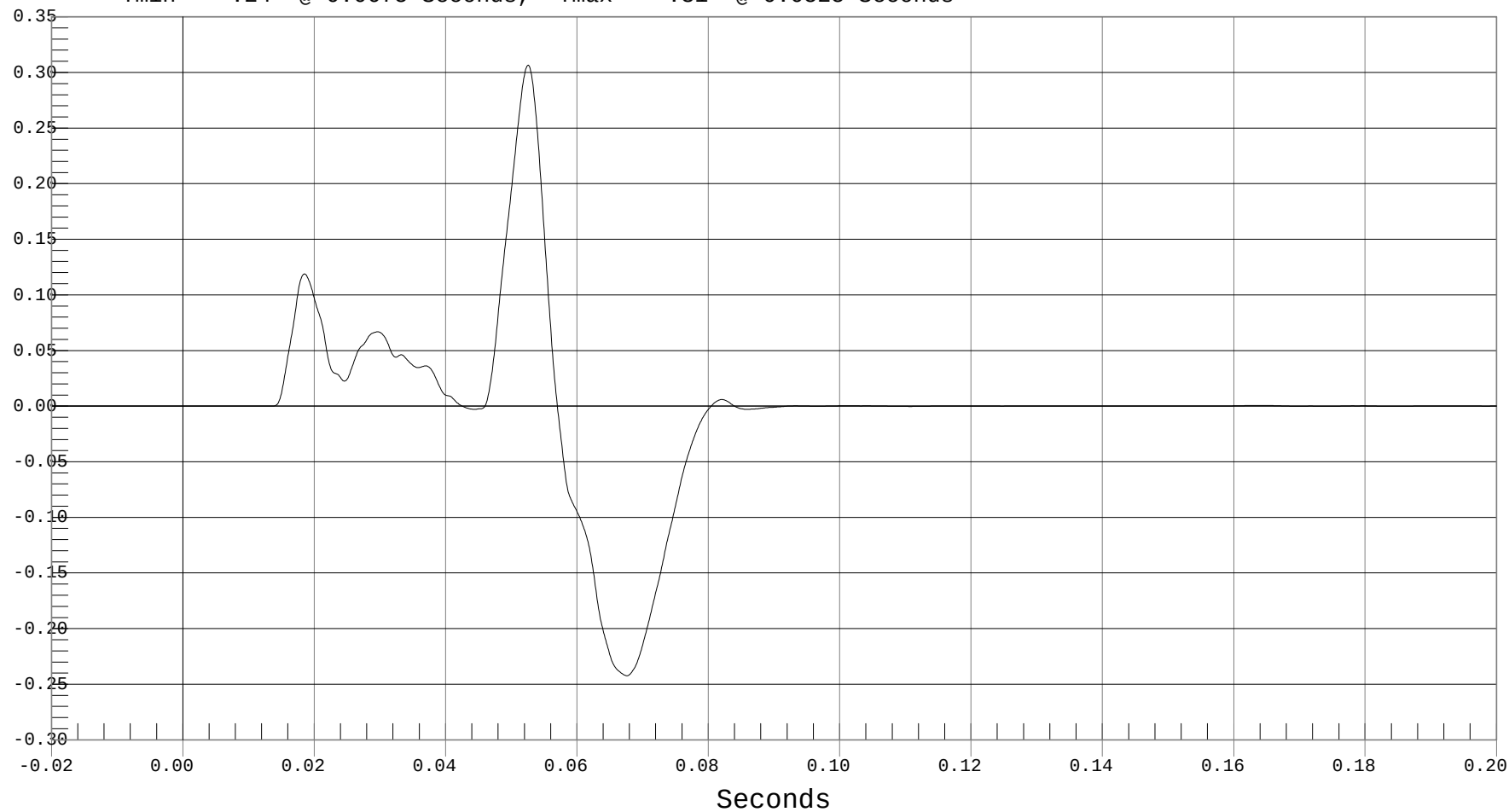
DRIVER MID RIB VISCOUS CRITERIA

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 Viscous Criterion, B01109DV.C27

Ymin = -.24 @ 0.0675 Seconds, Ymax = .31 @ 0.0525 Seconds





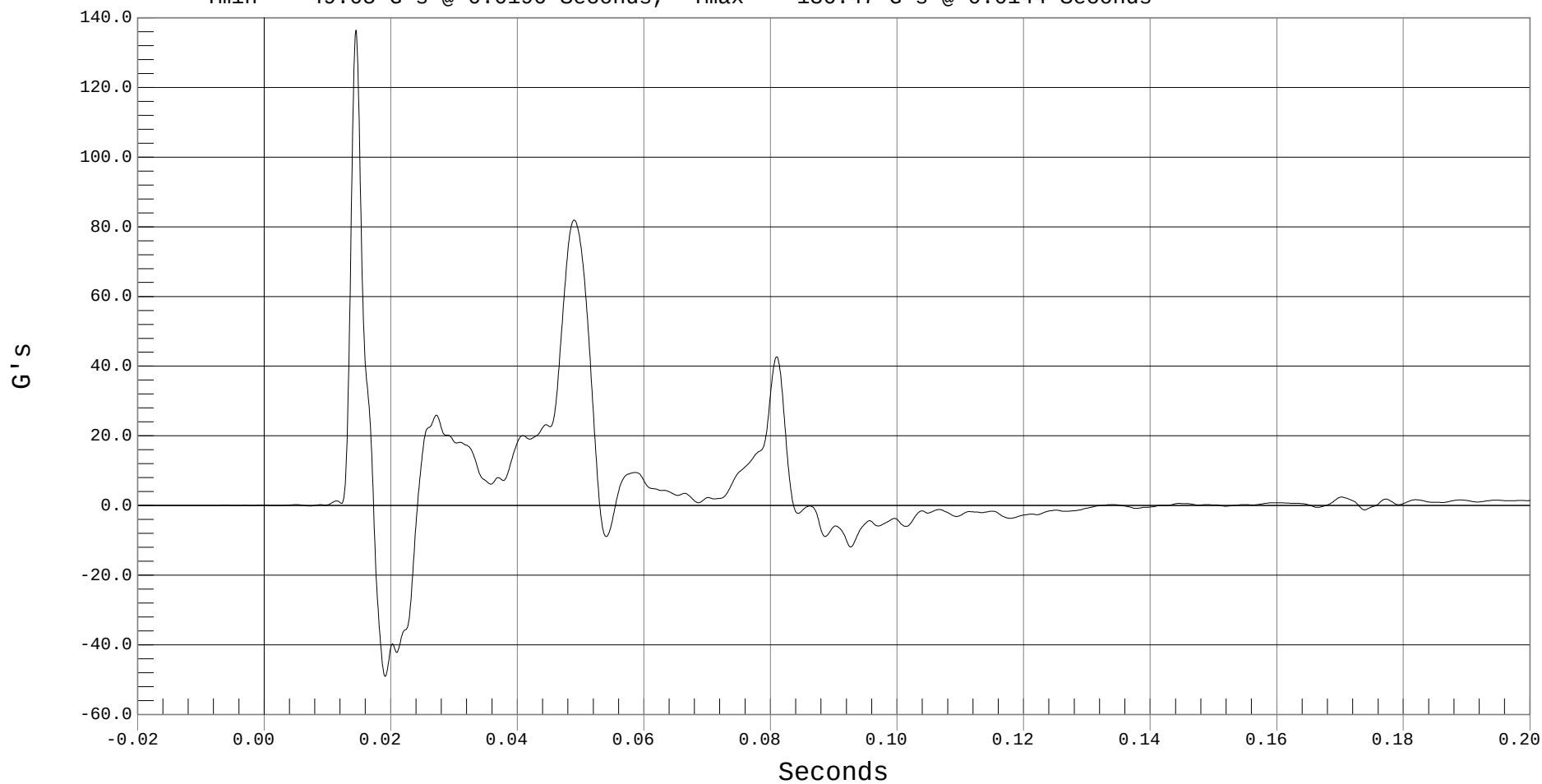
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER LOWER RIB Y, B01109AF.A25

Ymin = -49.05 G's @ 0.0190 Seconds, Ymax = 136.47 G's @ 0.0144 Seconds





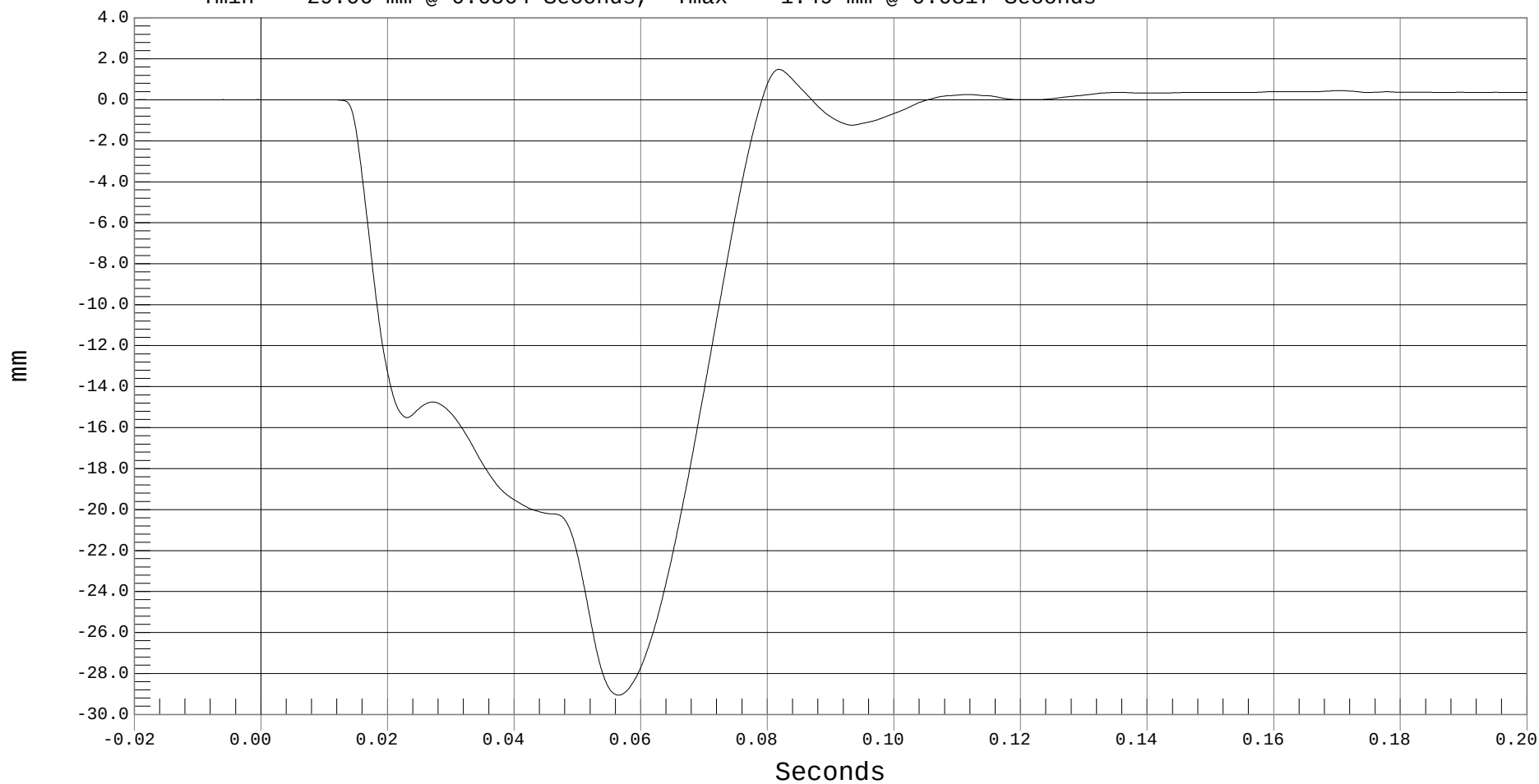
DRIVER LOWER RIB DISPLACEMENT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER LOWER RIB DISPLACEMENT, B01109DF.D28

Ymin = -29.06 mm @ 0.0564 Seconds, Ymax = 1.49 mm @ 0.0817 Seconds





DRIVER LOWER RIB VISCOUS CRITERIA

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

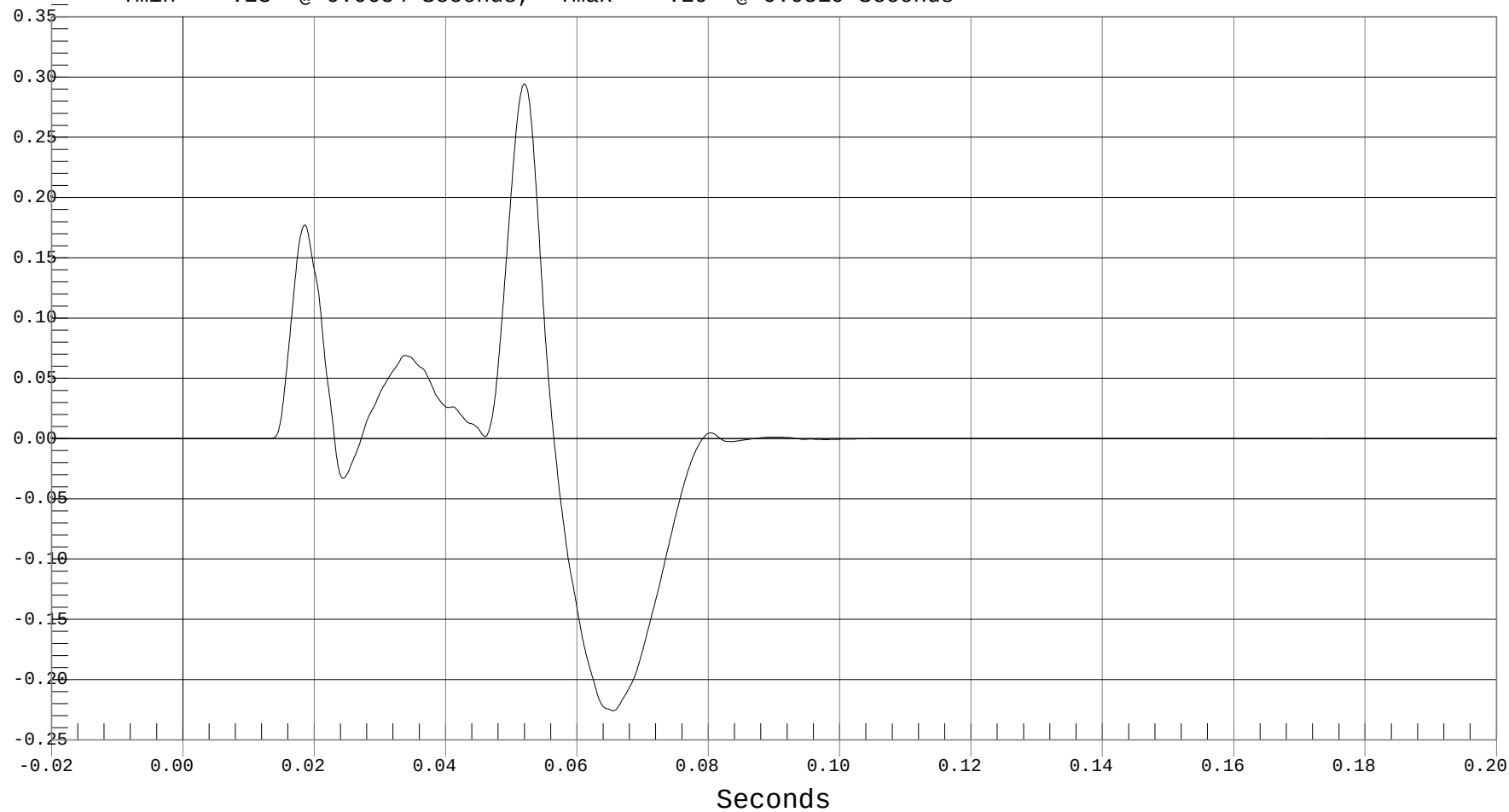
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 180

— 1 Viscous Criterion, B01109DV.C28

Ymin = -.23 @ 0.0654 Seconds, Ymax = .29 @ 0.0519 Seconds





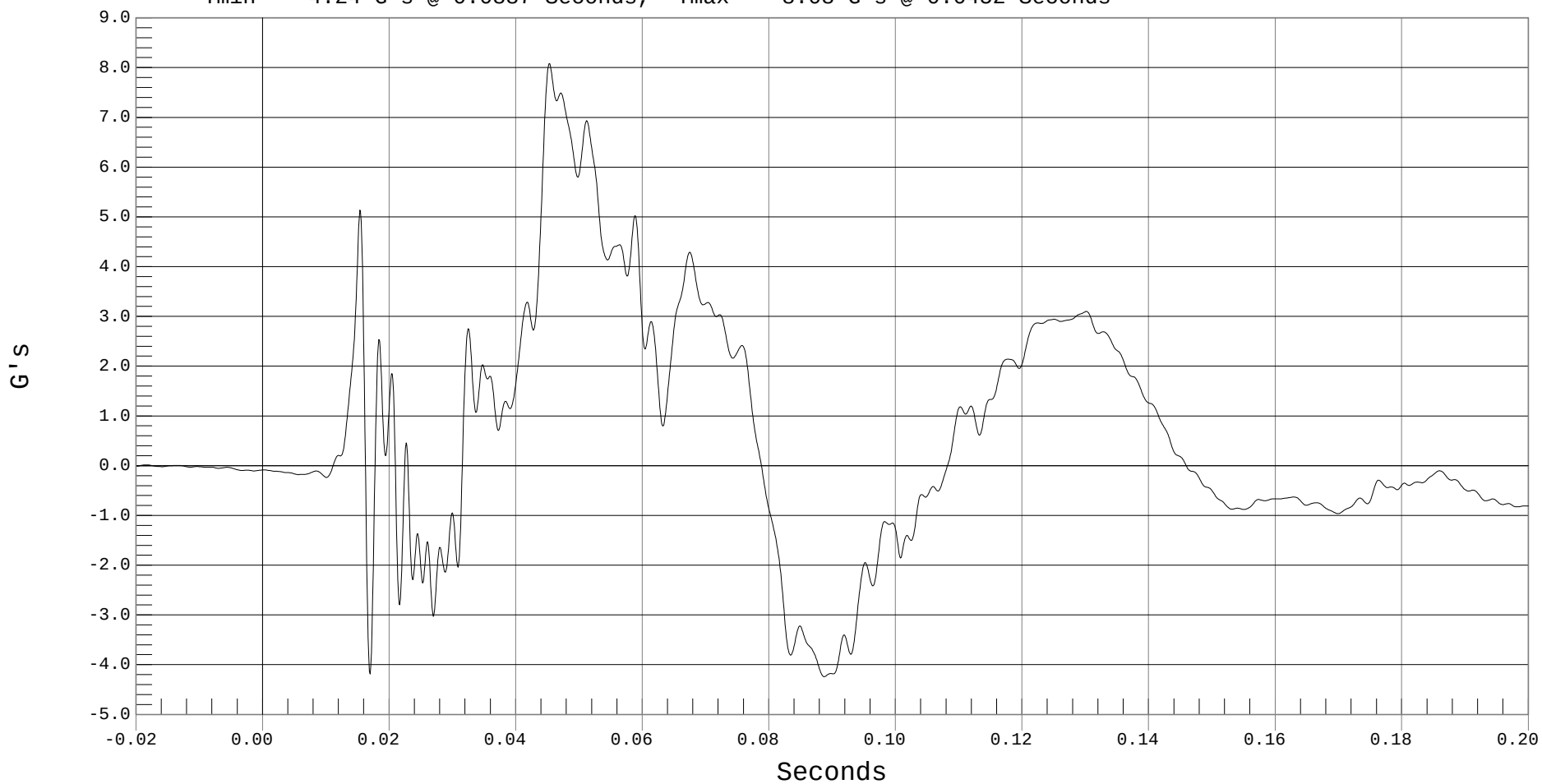
LOWER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE X, B01109AF.A29

Ymin = -4.24 G's @ 0.0887 Seconds, Ymax = 8.08 G's @ 0.0452 Seconds





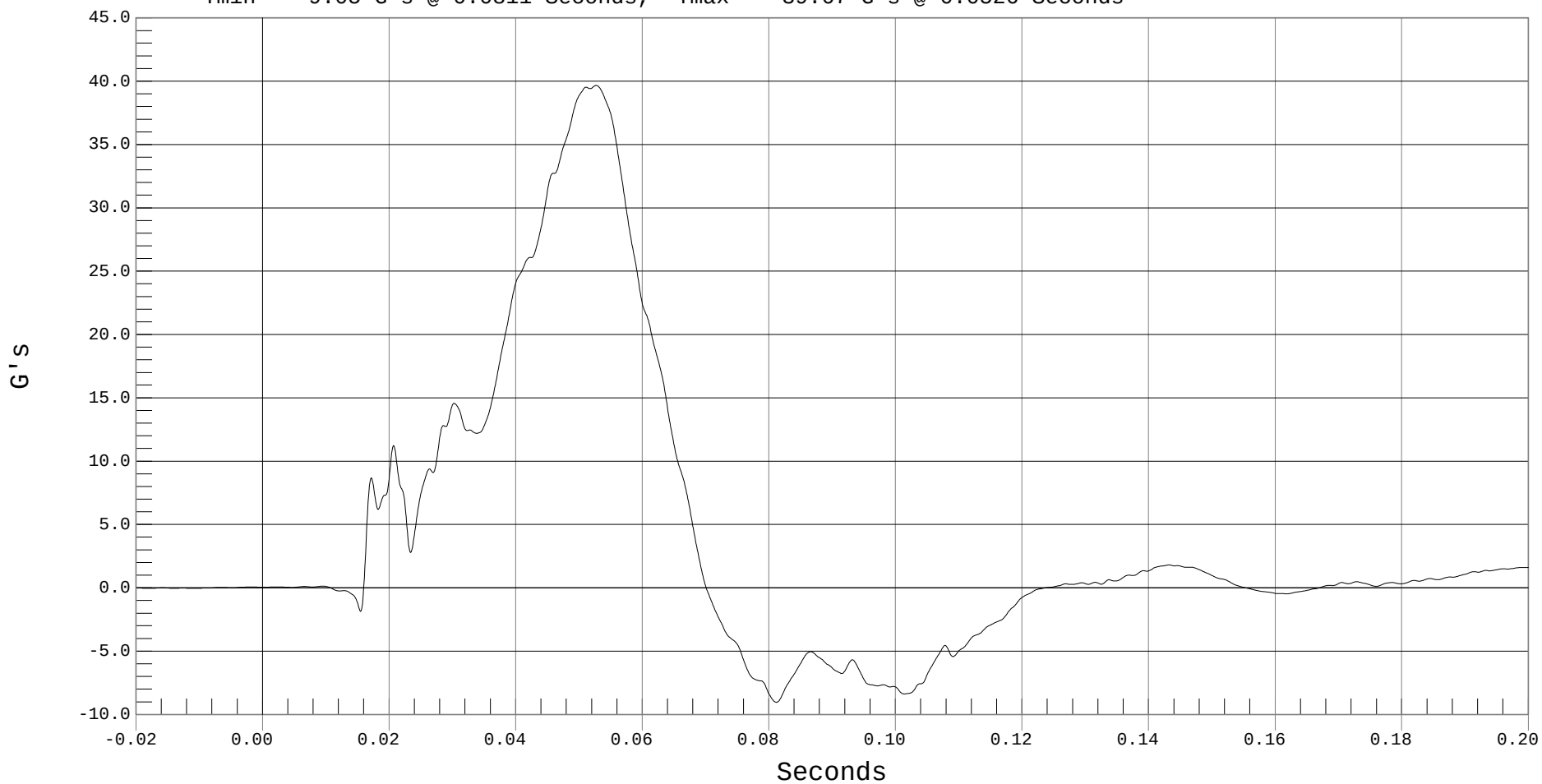
LOWER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE Y, B01109AF.A30

Ymin = -9.05 G's @ 0.0811 Seconds, Ymax = 39.67 G's @ 0.0526 Seconds





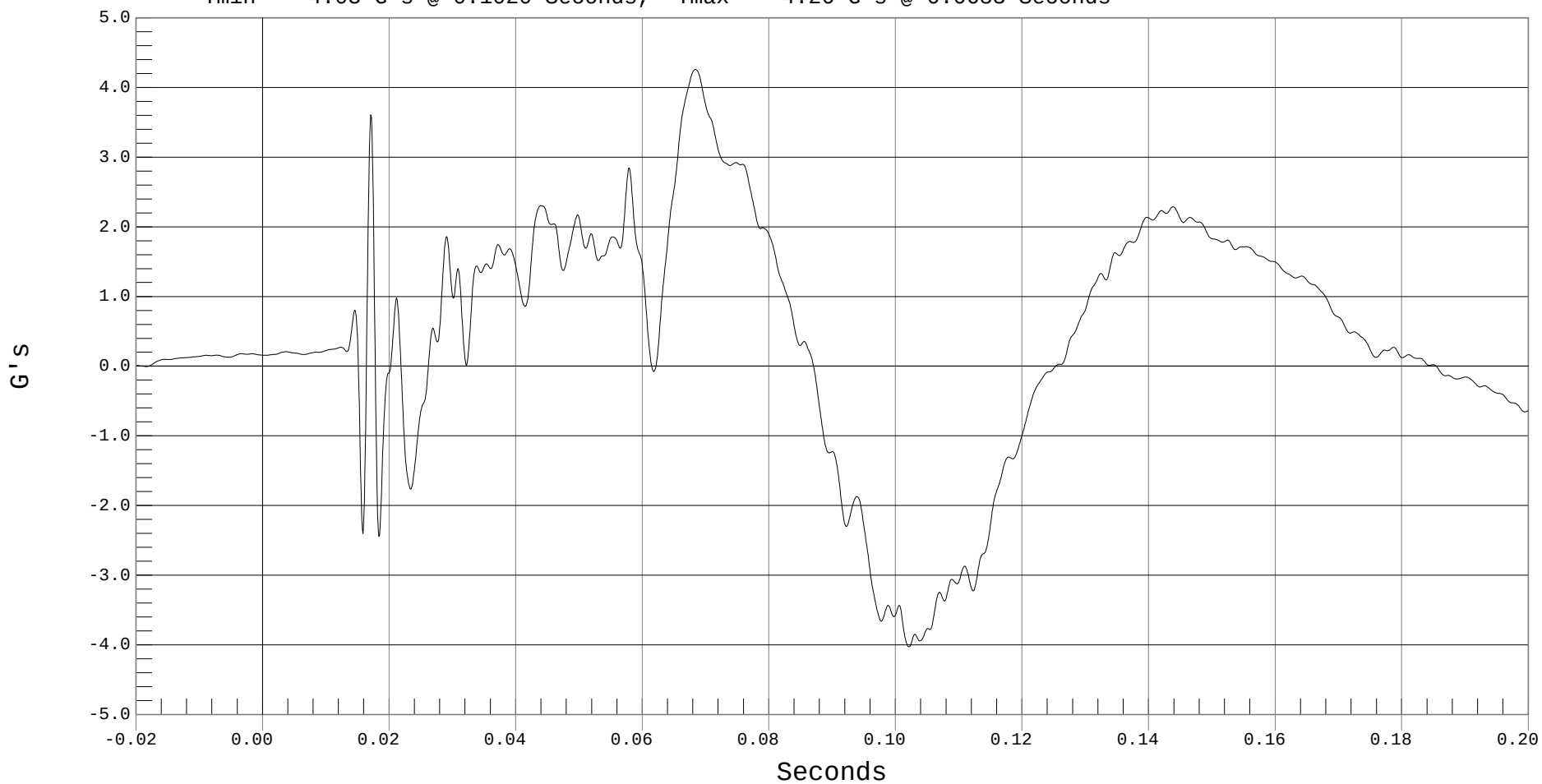
LOWER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE Z, B01109AF.A31

Ymin = -4.03 G's @ 0.1020 Seconds, Ymax = 4.26 G's @ 0.0683 Seconds





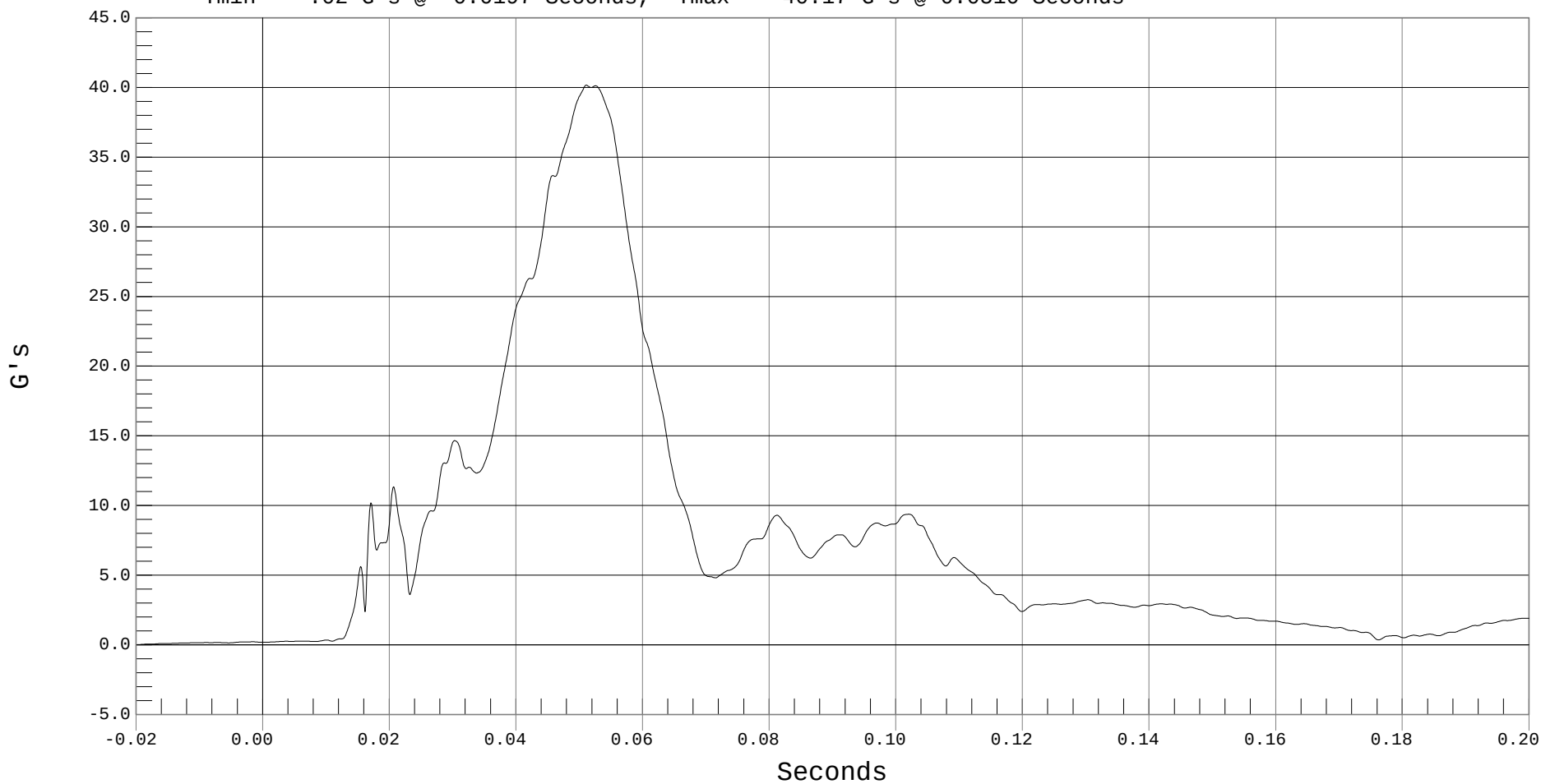
LOWER SPINE RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE RESULTANT, B01109AV.A29

Ymin = .02 G's @ -0.0197 Seconds, Ymax = 40.17 G's @ 0.0510 Seconds





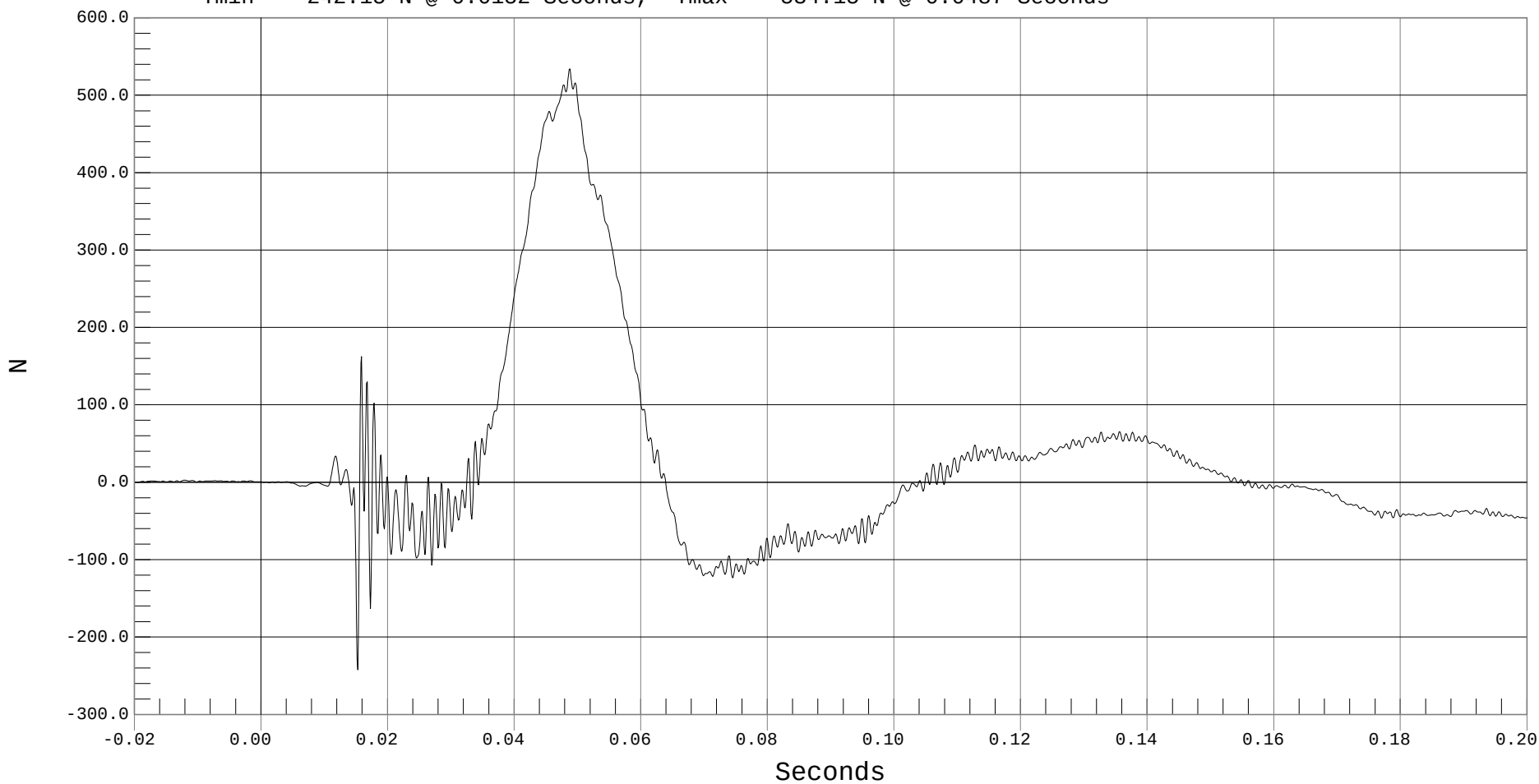
DRIVER TORSO FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER TORSO FORCE X, B01109FF.F33

Ymin = -242.15 N @ 0.0152 Seconds, Ymax = 534.15 N @ 0.0487 Seconds





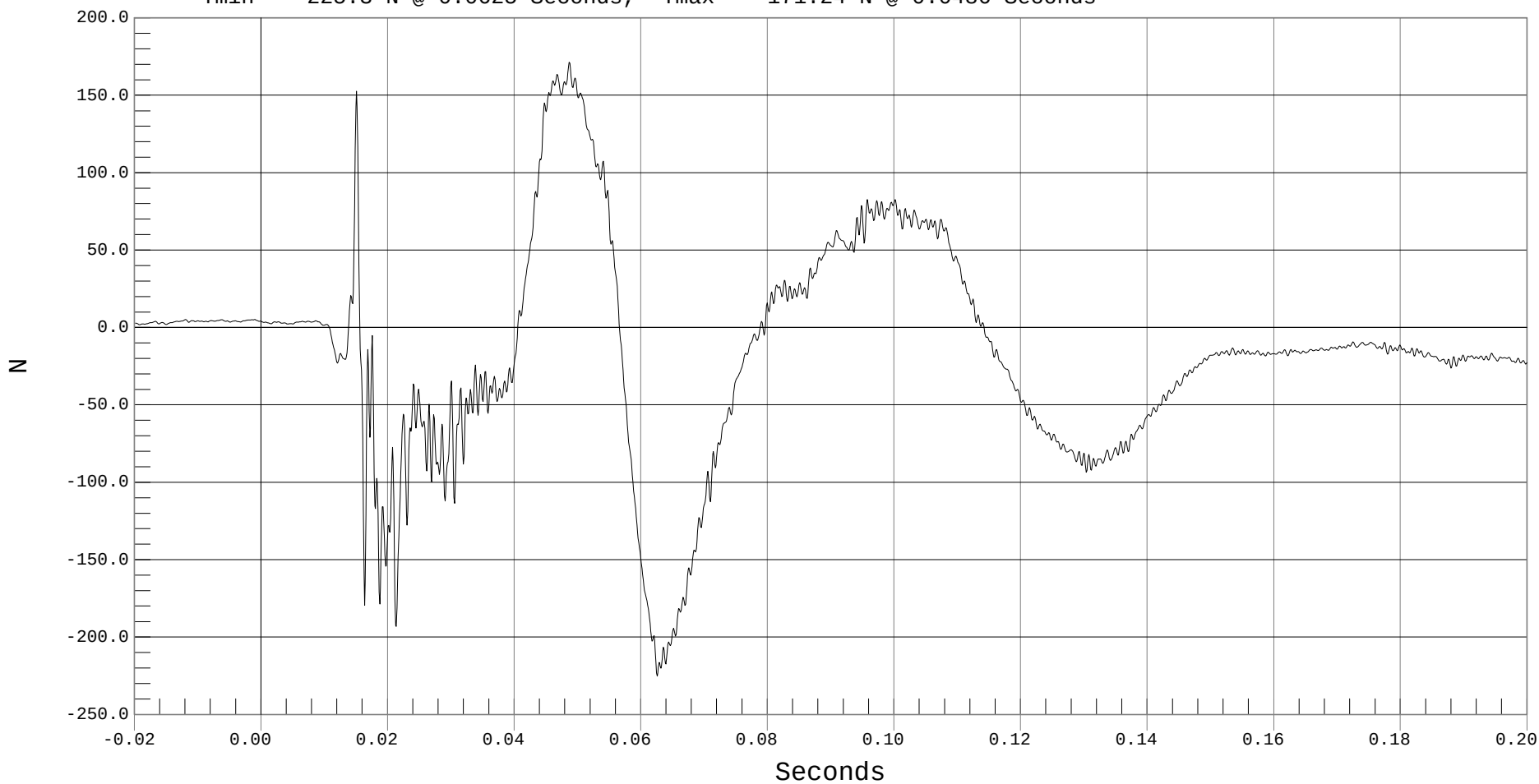
DRIVER TORSO FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER TORSO FORCE Y, B01109FF.F34

Ymin = -225.3 N @ 0.0625 Seconds, Ymax = 171.24 N @ 0.0486 Seconds





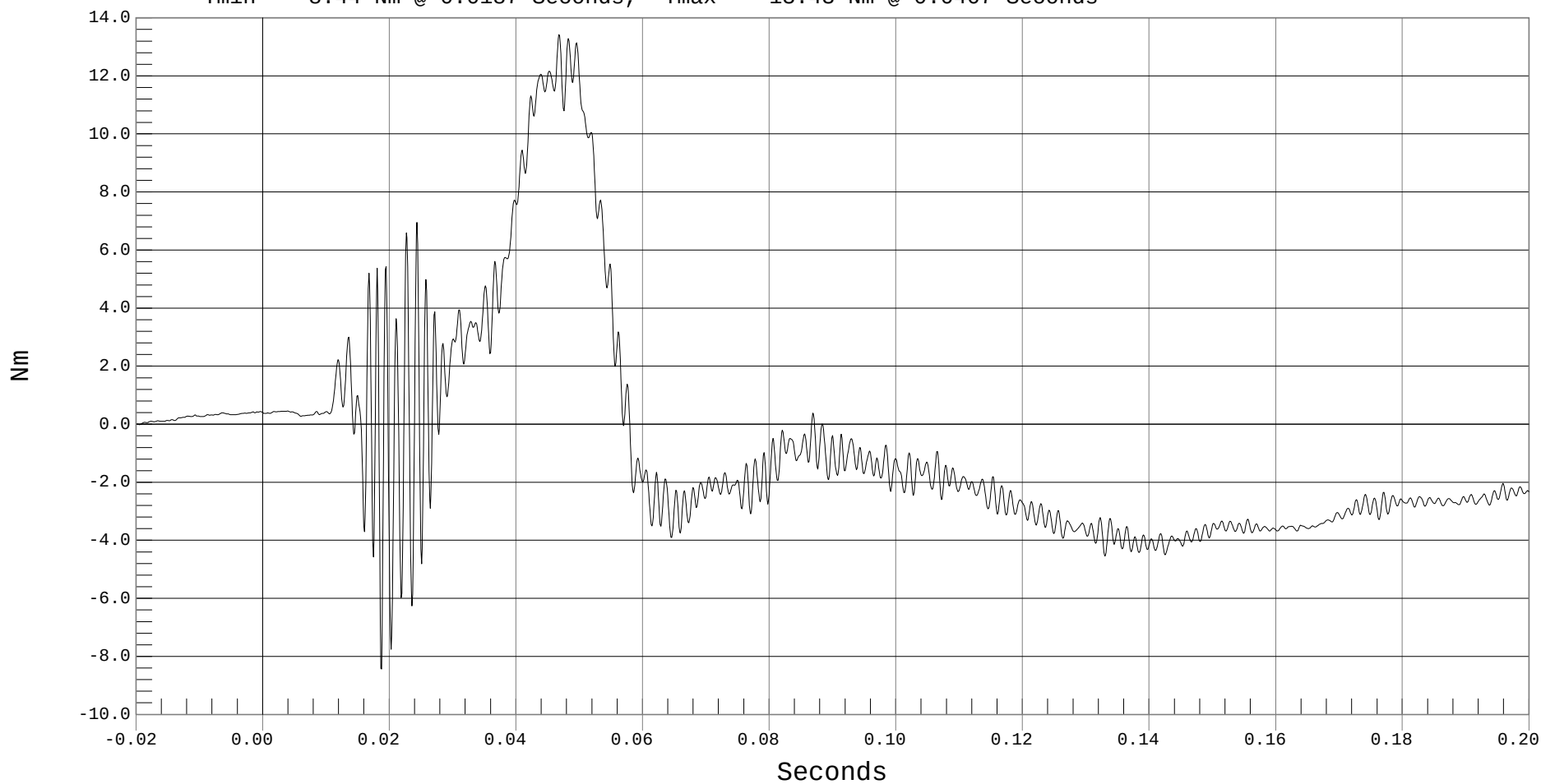
DRIVER TORSO MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER TORSO MOMENT Y, B01109MF.M35

Ymin = -8.44 Nm @ 0.0187 Seconds, Ymax = 13.43 Nm @ 0.0467 Seconds





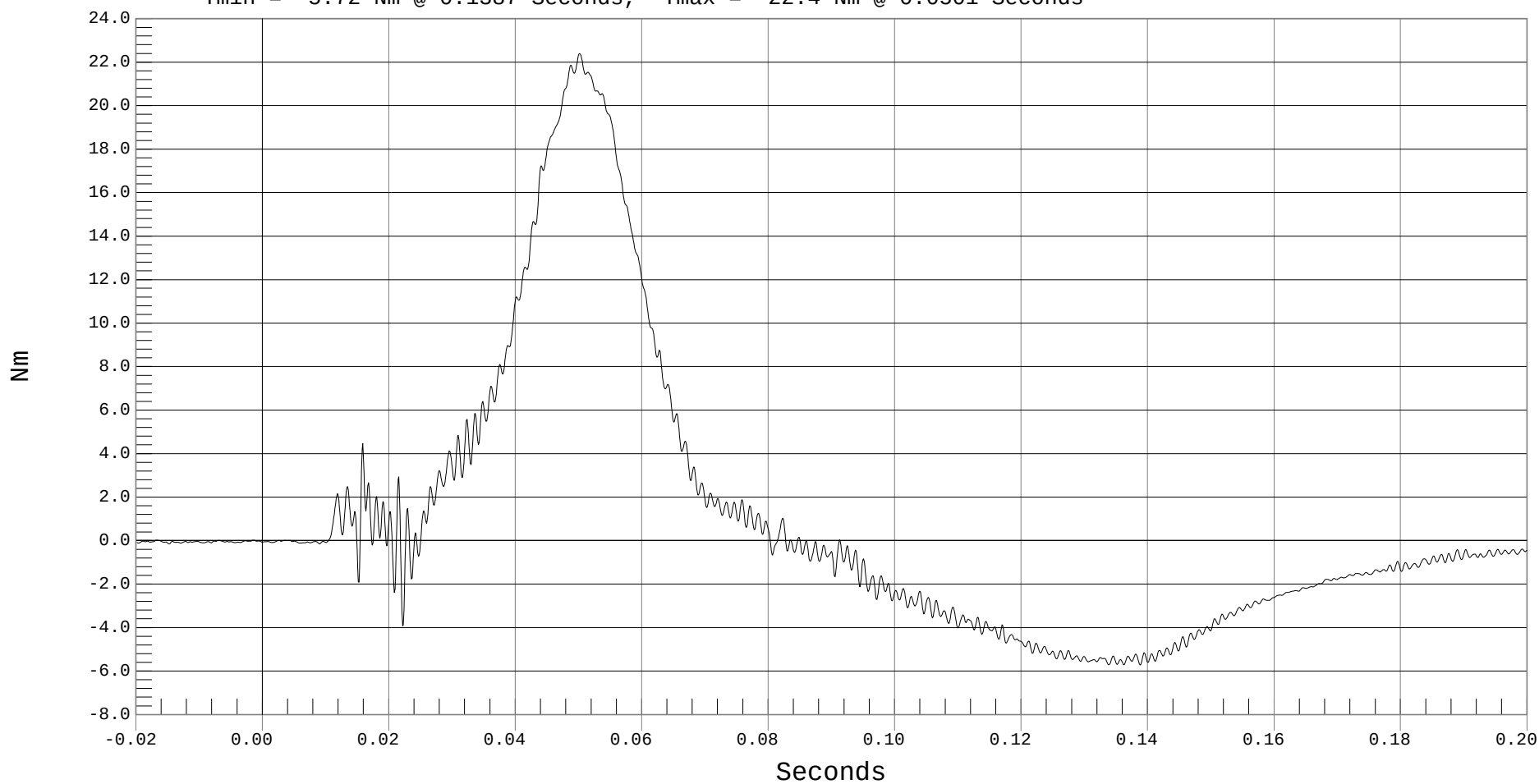
DRIVER TORSO MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

1 DRIVER TORSO MOMENT Z, B01109MF.M36

Ymin = -5.72 Nm @ 0.1387 Seconds, Ymax = 22.4 Nm @ 0.0501 Seconds





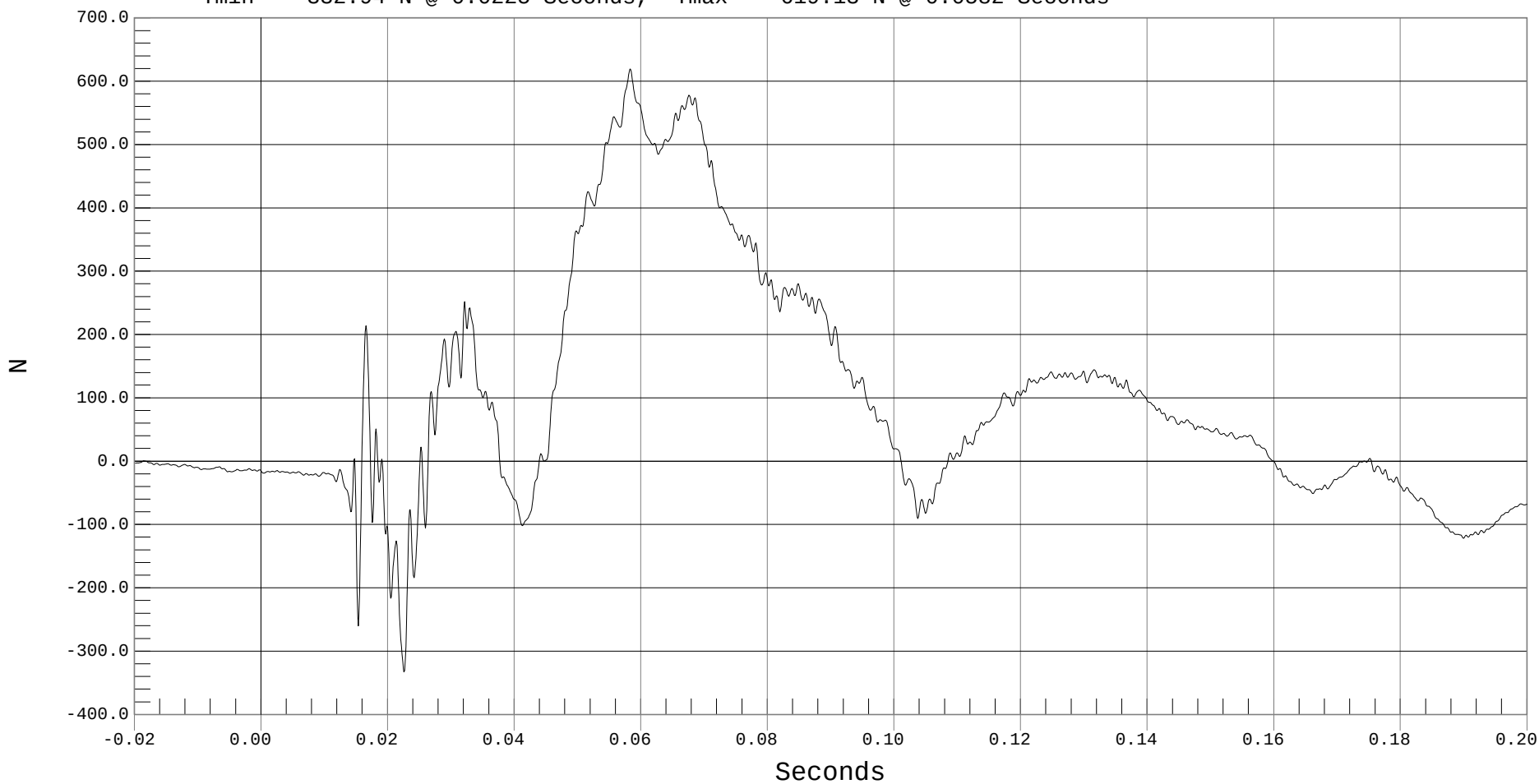
DRIVER T-12 FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

1 DRIVER T-12 FORCE X, B01109FF.F37

Ymin = -332.94 N @ 0.0225 Seconds, Ymax = 619.13 N @ 0.0582 Seconds





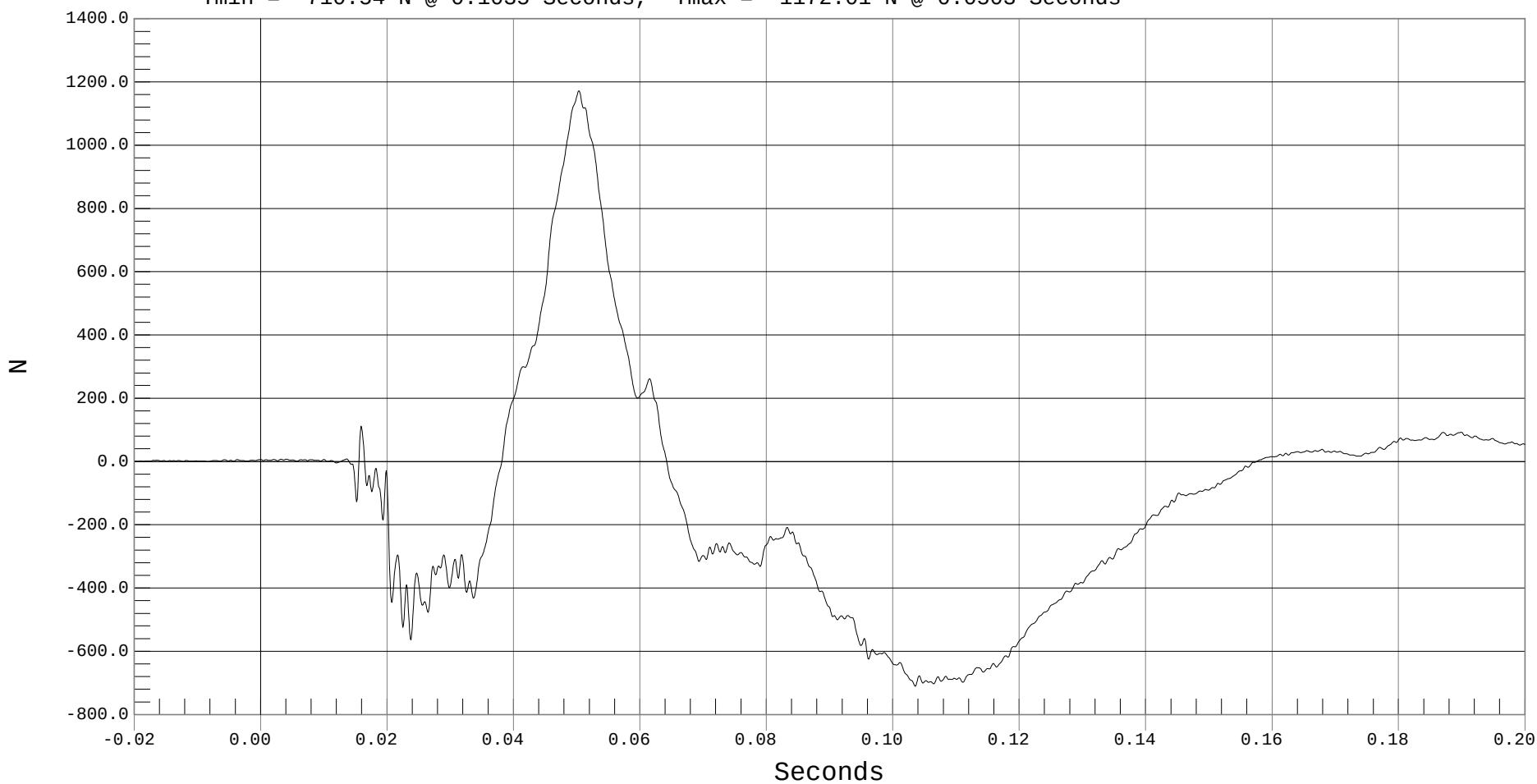
DRIVER T-12 FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

1 DRIVER T-12 FORCE Y, B01109FF.F38

Ymin = -710.54 N @ 0.1035 Seconds, Ymax = 1172.01 N @ 0.0503 Seconds





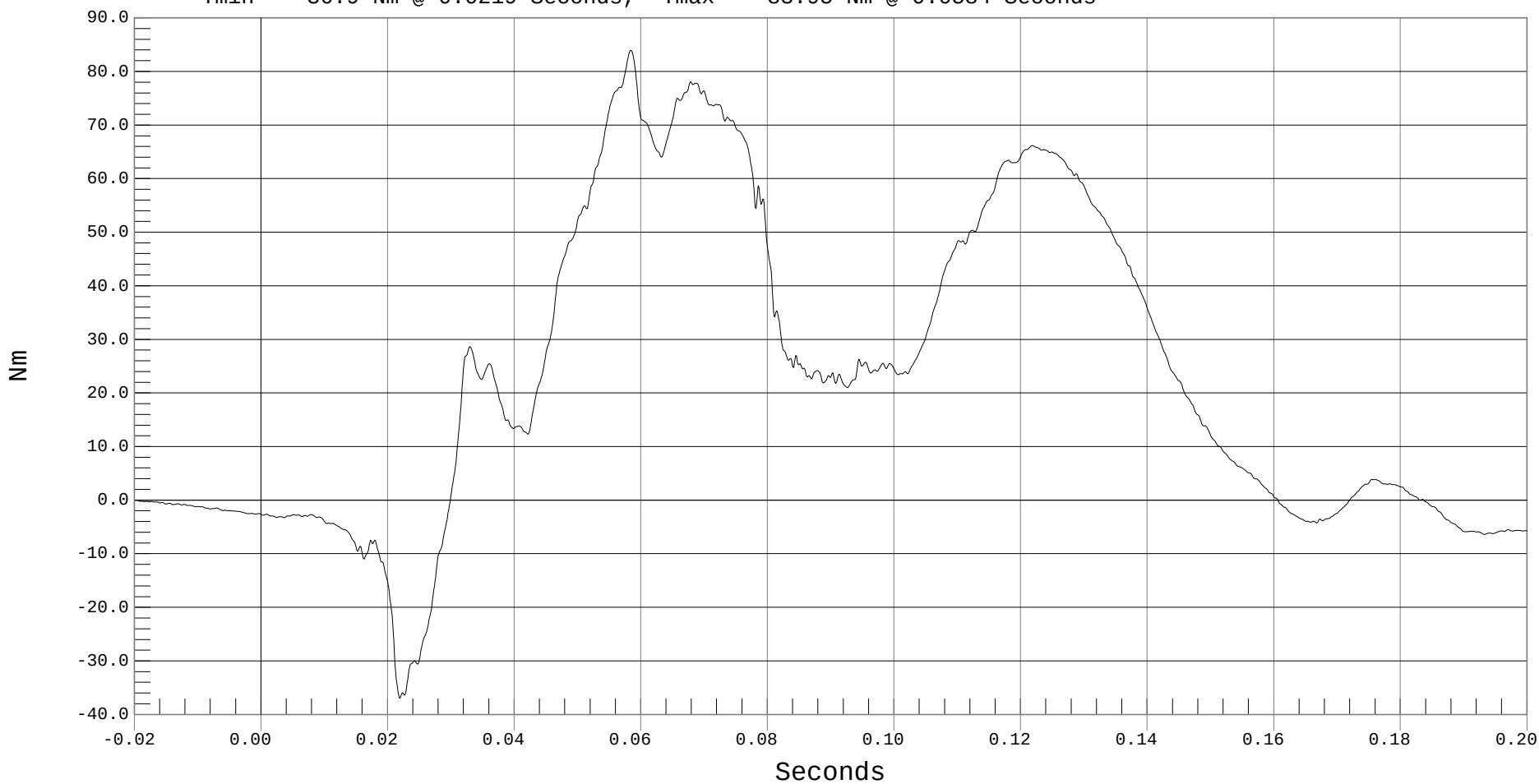
DRIVER T-12 MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER T-12 MOMENT Y, B01109MF.M40

Ymin = -36.9 Nm @ 0.0219 Seconds, Ymax = 83.95 Nm @ 0.0584 Seconds





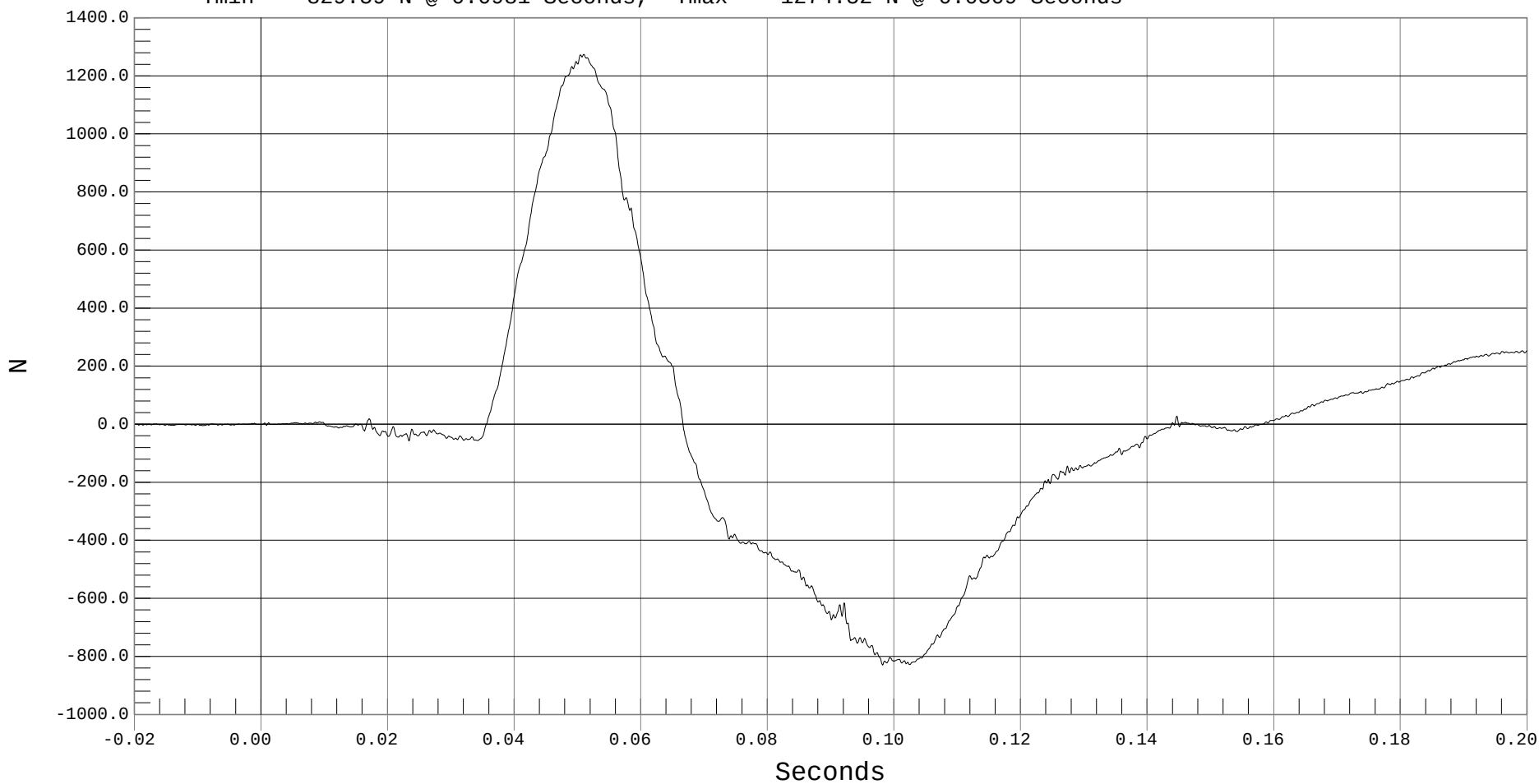
DRIVER LUMBAR FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

1 DRIVER LUMBAR FORCE Y, B01109FT.F60

Ymin = -829.59 N @ 0.0981 Seconds, Ymax = 1274.52 N @ 0.0509 Seconds





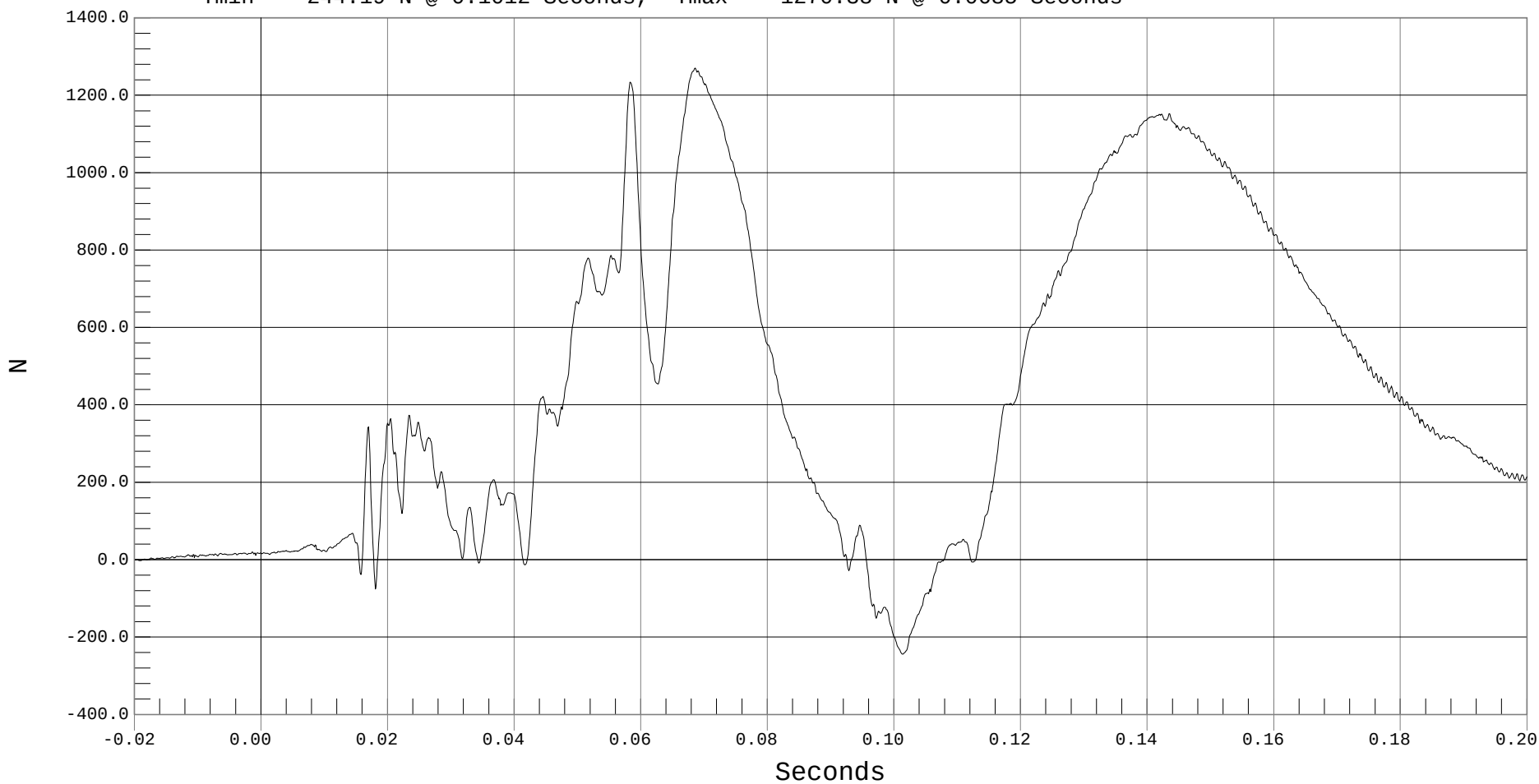
DRIVER LUMBAR FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

1 DRIVER LUMBAR FORCE Z, B01109FT.F61

Ymin = -244.19 N @ 0.1012 Seconds, Ymax = 1270.38 N @ 0.0685 Seconds





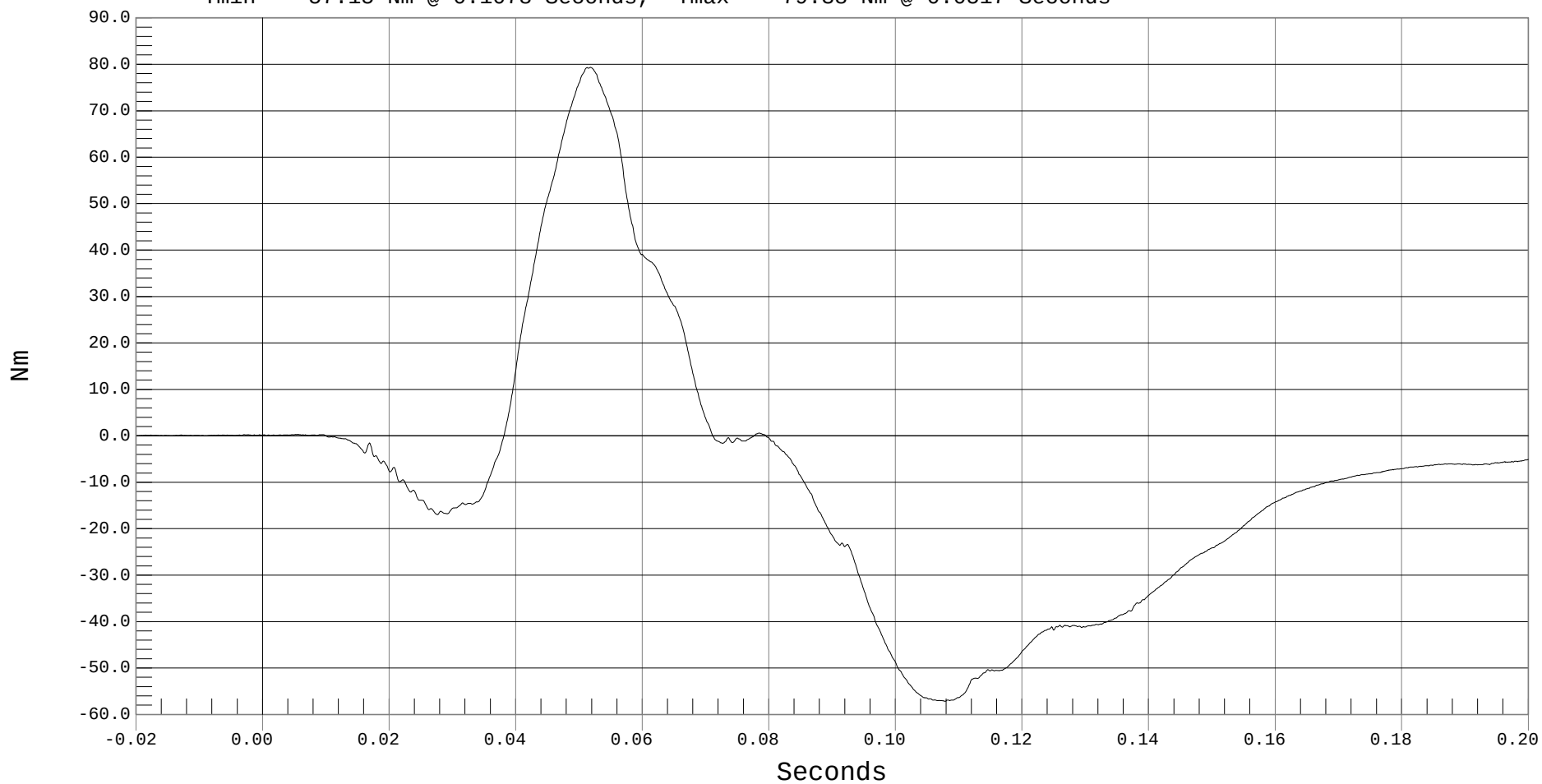
DRIVER LUMBAR MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER LUMBAR MOMENT X, B01109MT.M62

Ymin = -57.15 Nm @ 0.1078 Seconds, Ymax = 79.38 Nm @ 0.0517 Seconds





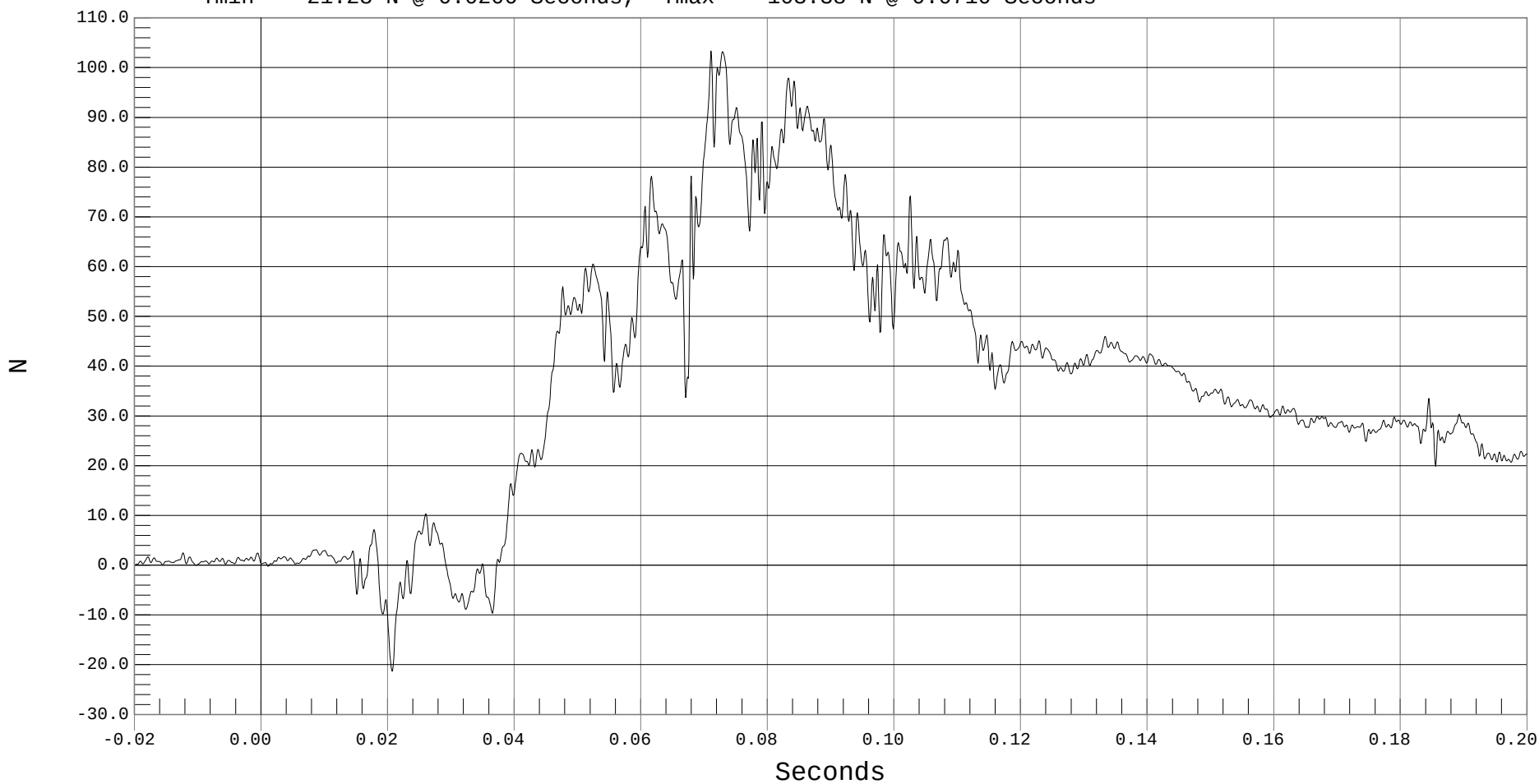
DRIVER ABDOMEN FRONT FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER FRONT ABDOMEN FORCE, B01109FF.F41

Ymin = -21.28 N @ 0.0206 Seconds, Ymax = 103.38 N @ 0.0710 Seconds





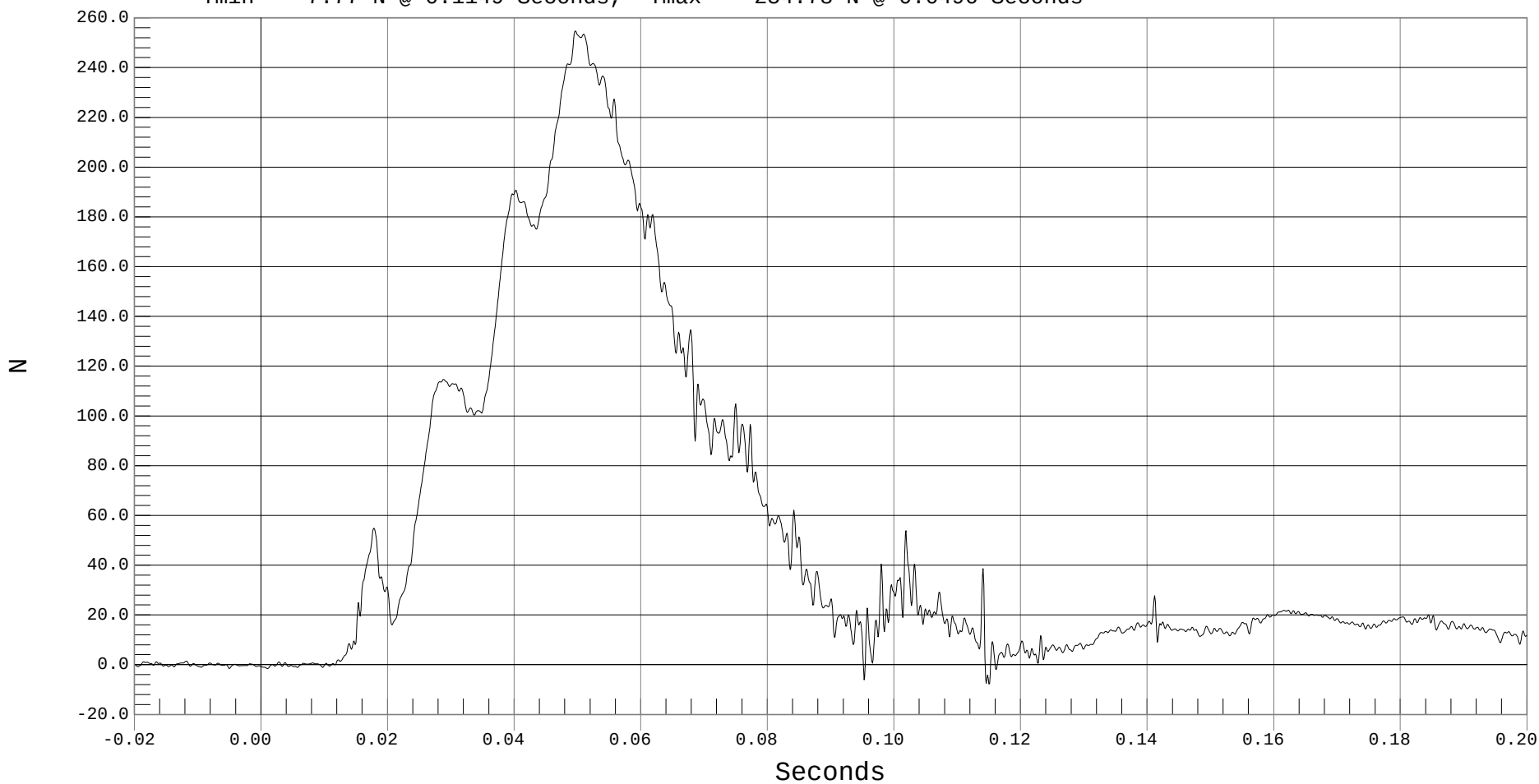
DRIVER ABDOMEN MID FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER MID ABDOMEN FORCE, B01109FF.F42

Ymin = -7.77 N @ 0.1149 Seconds, Ymax = 254.78 N @ 0.0496 Seconds





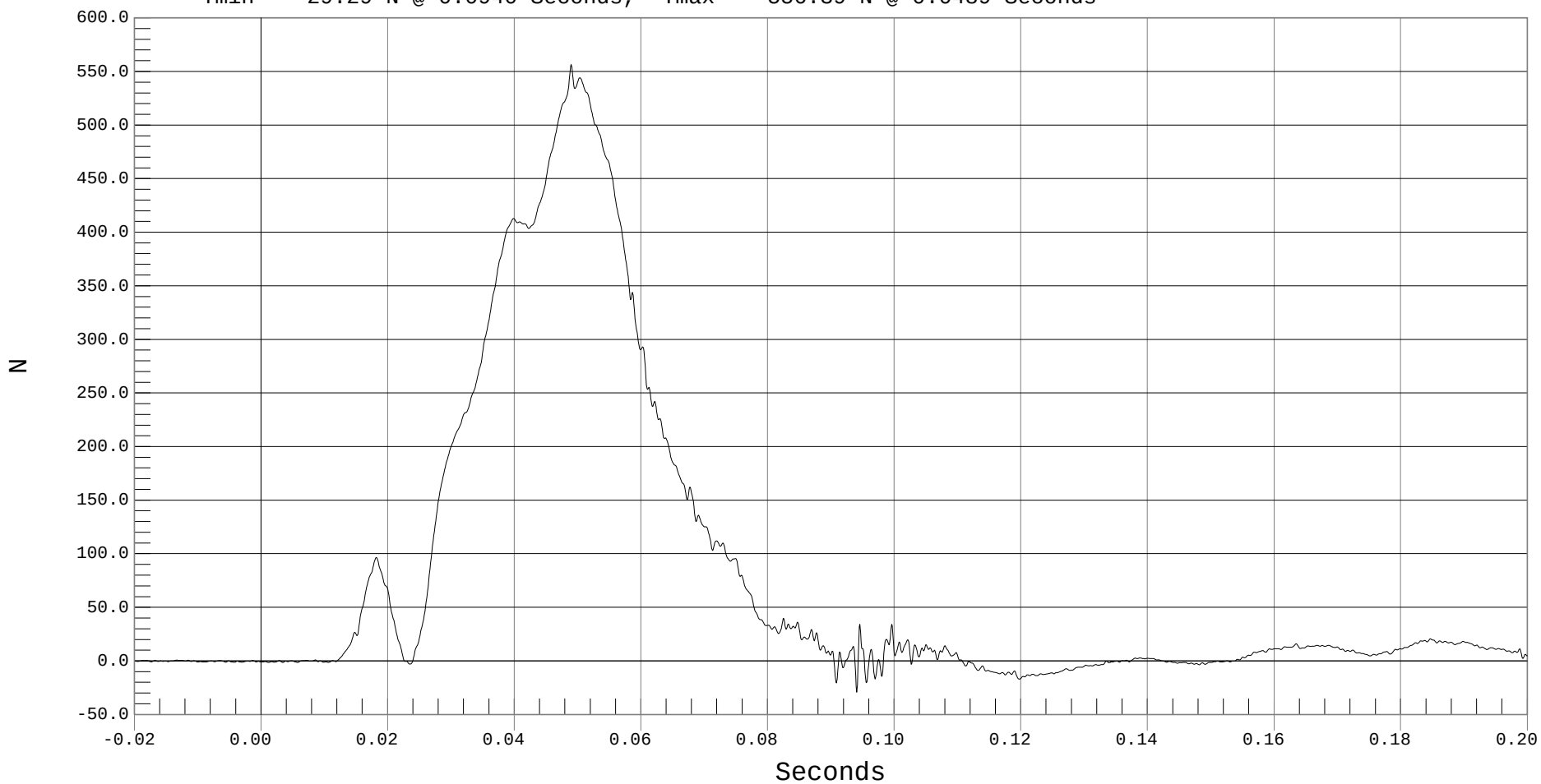
DRIVER ABDOMEN REAR FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER REAR ABDOMEN FORCE, B01109FF.F43

Ymin = -29.29 N @ 0.0940 Seconds, Ymax = 556.39 N @ 0.0489 Seconds





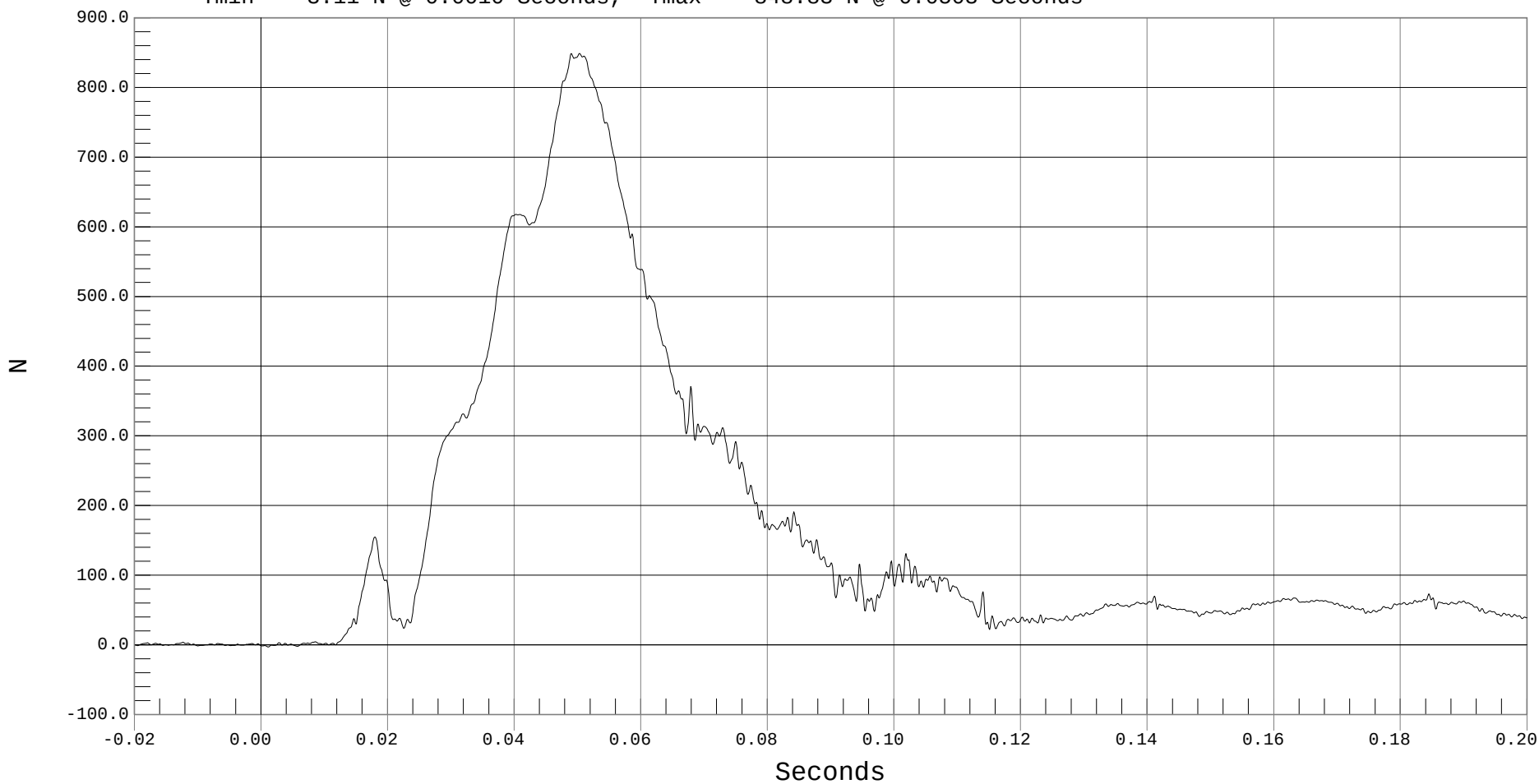
DRIVER SUMMED ABDOMEN FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER SUMMED ABDOMEN FORCE, B01109FU.F41

Ymin = -3.11 N @ 0.0010 Seconds, Ymax = 848.83 N @ 0.0503 Seconds





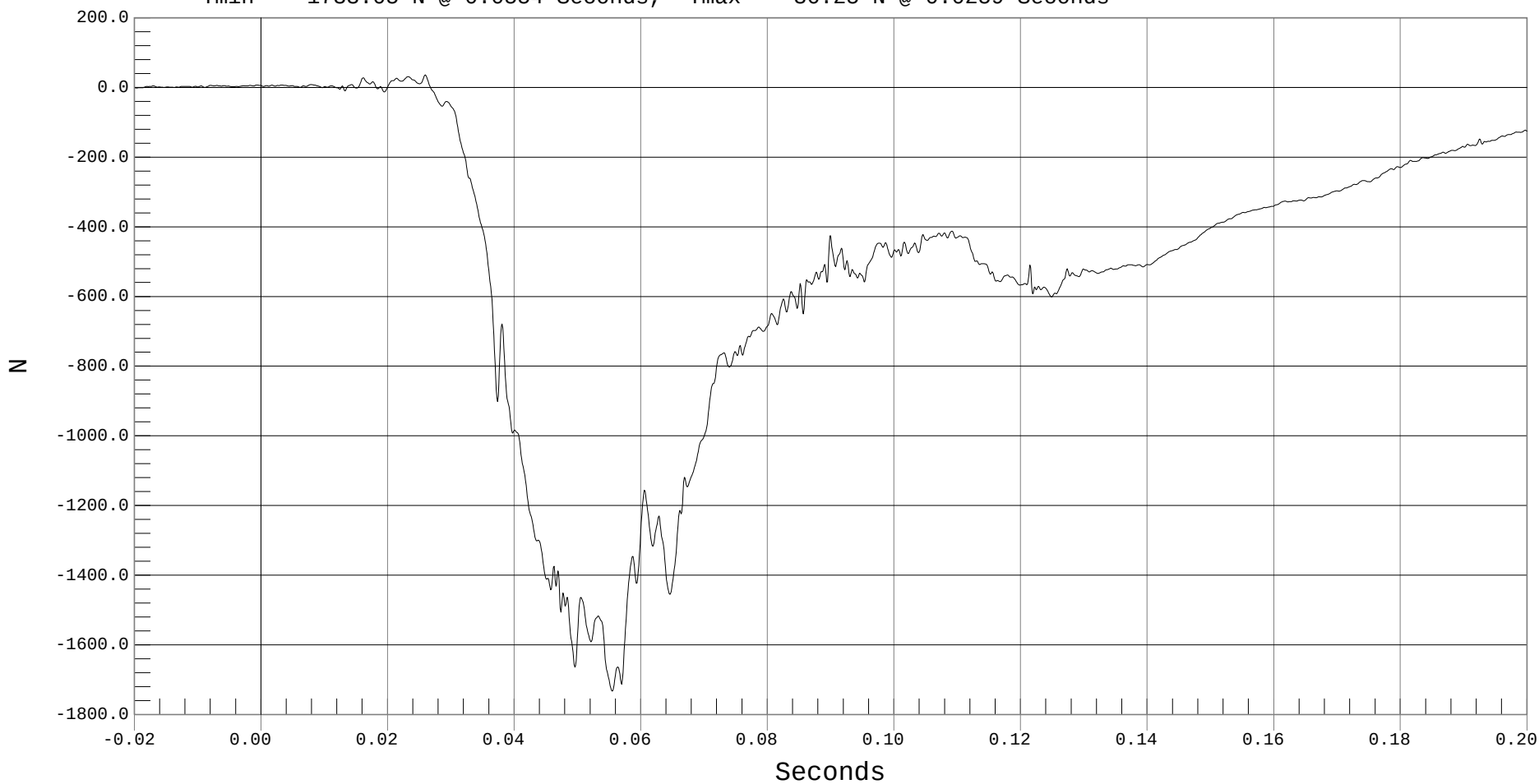
DRIVER PUBIC SYMPHYSIS FORCE

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER PUBIC SYMPHYSIS FORCE, B01109FF.F44

Ymin = -1733.05 N @ 0.0554 Seconds, Ymax = 36.25 N @ 0.0259 Seconds





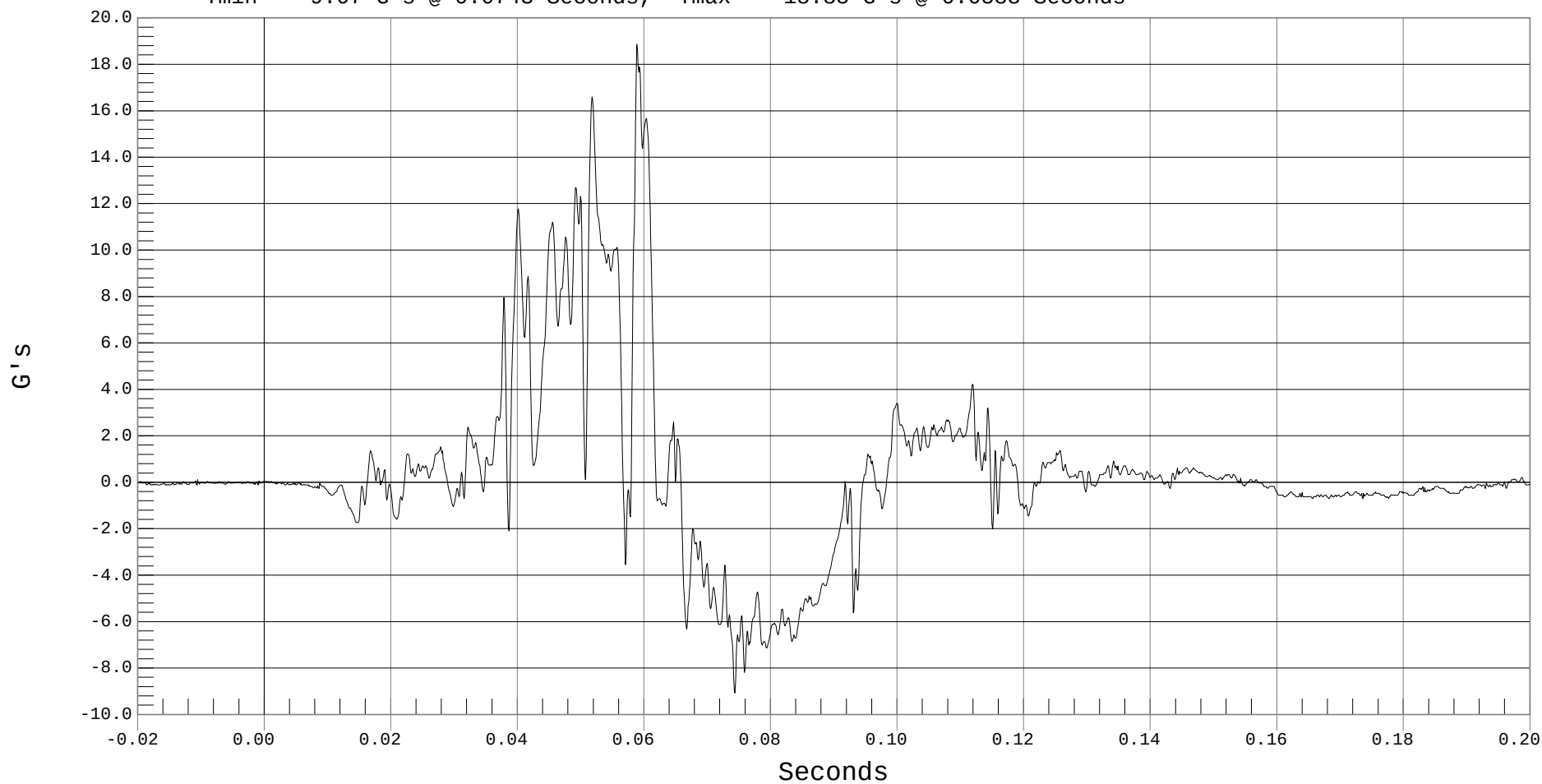
DRIVER PELVIS X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER PELVIS X, B01109AT.A45

Ymin = -9.07 G's @ 0.0743 Seconds, Ymax = 18.85 G's @ 0.0588 Seconds





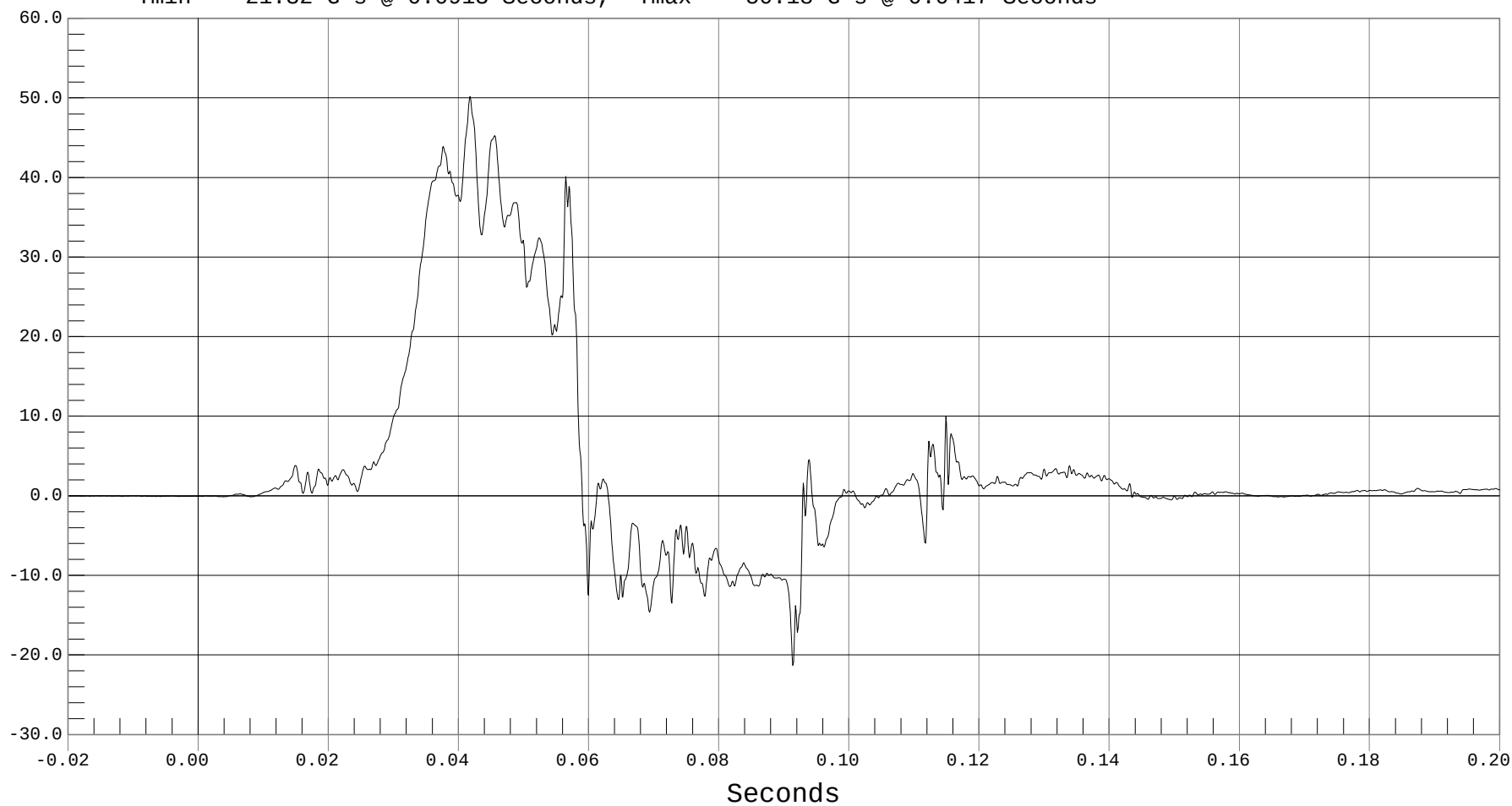
DRIVER PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Y, B01109AT.A46

Ymin = -21.32 G's @ 0.0913 Seconds, Ymax = 50.18 G's @ 0.0417 Seconds





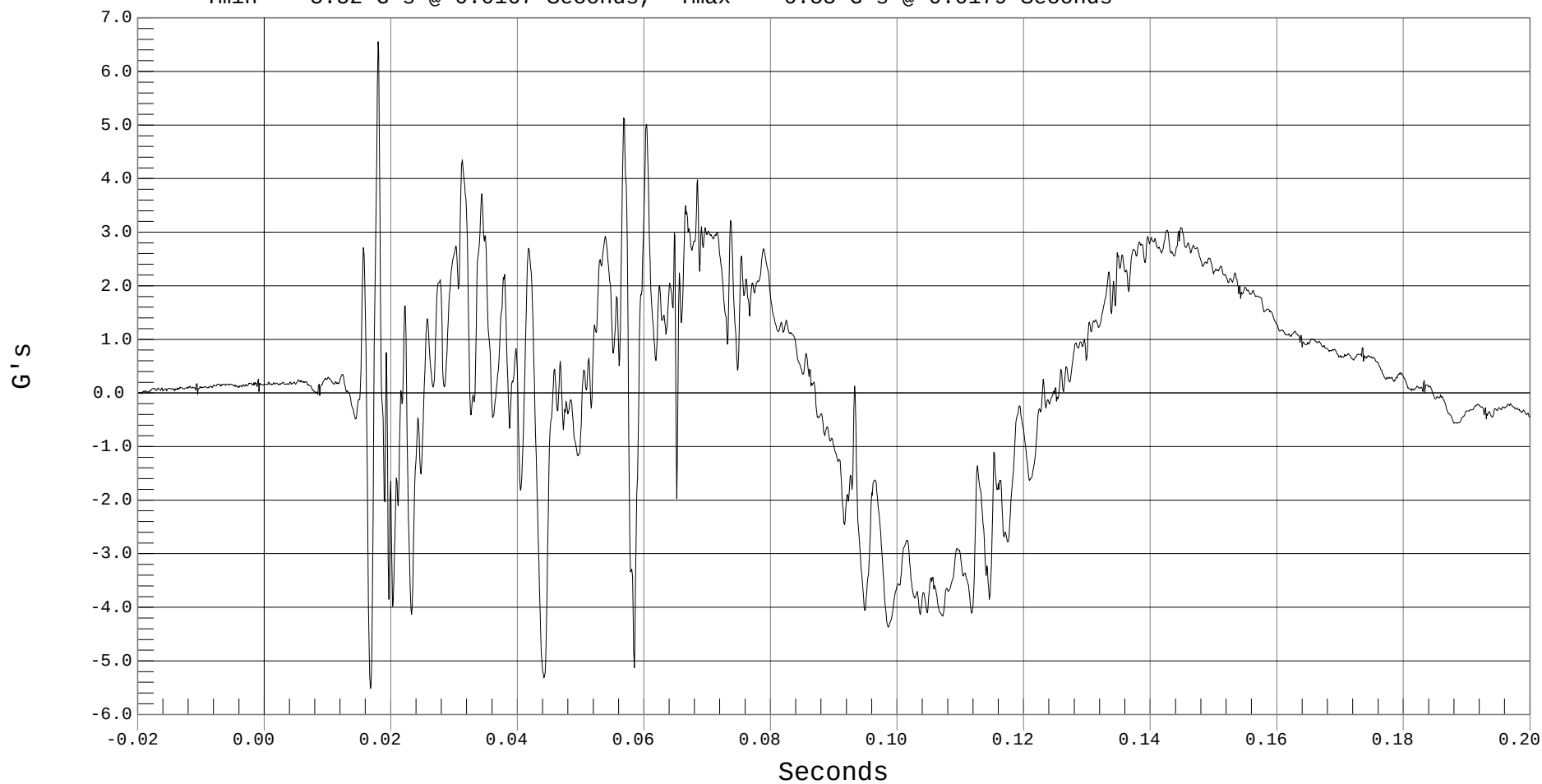
DRIVER PELVIS Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Z, B01109AT.A47

Ymin = -5.52 G's @ 0.0167 Seconds, Ymax = 6.55 G's @ 0.0179 Seconds





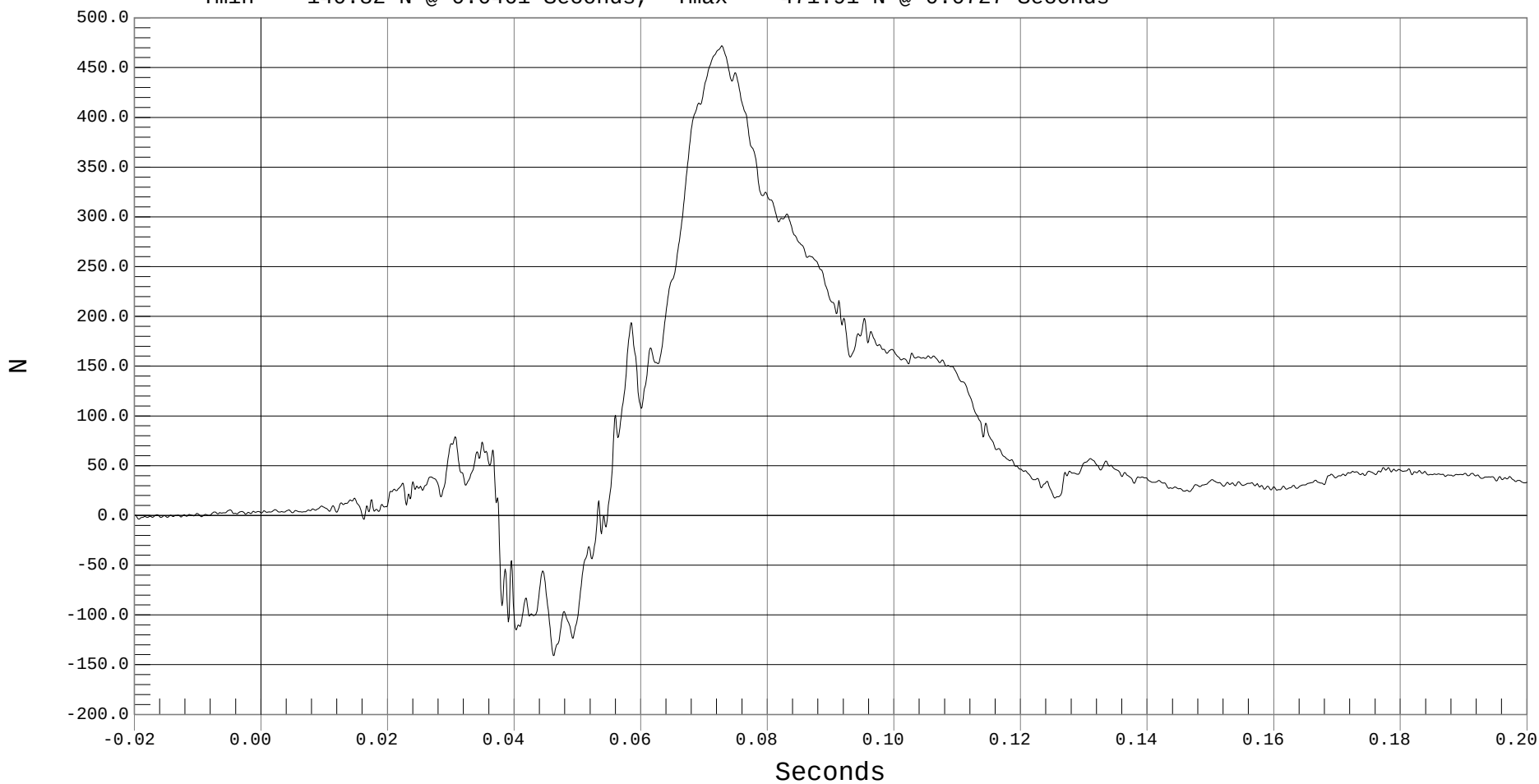
DRIVER LEFT FEMUR FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

1 DRIVER LEFT FEMUR FORCE X, B01109FF.F54

Ymin = -140.82 N @ 0.0461 Seconds, Ymax = 471.91 N @ 0.0727 Seconds





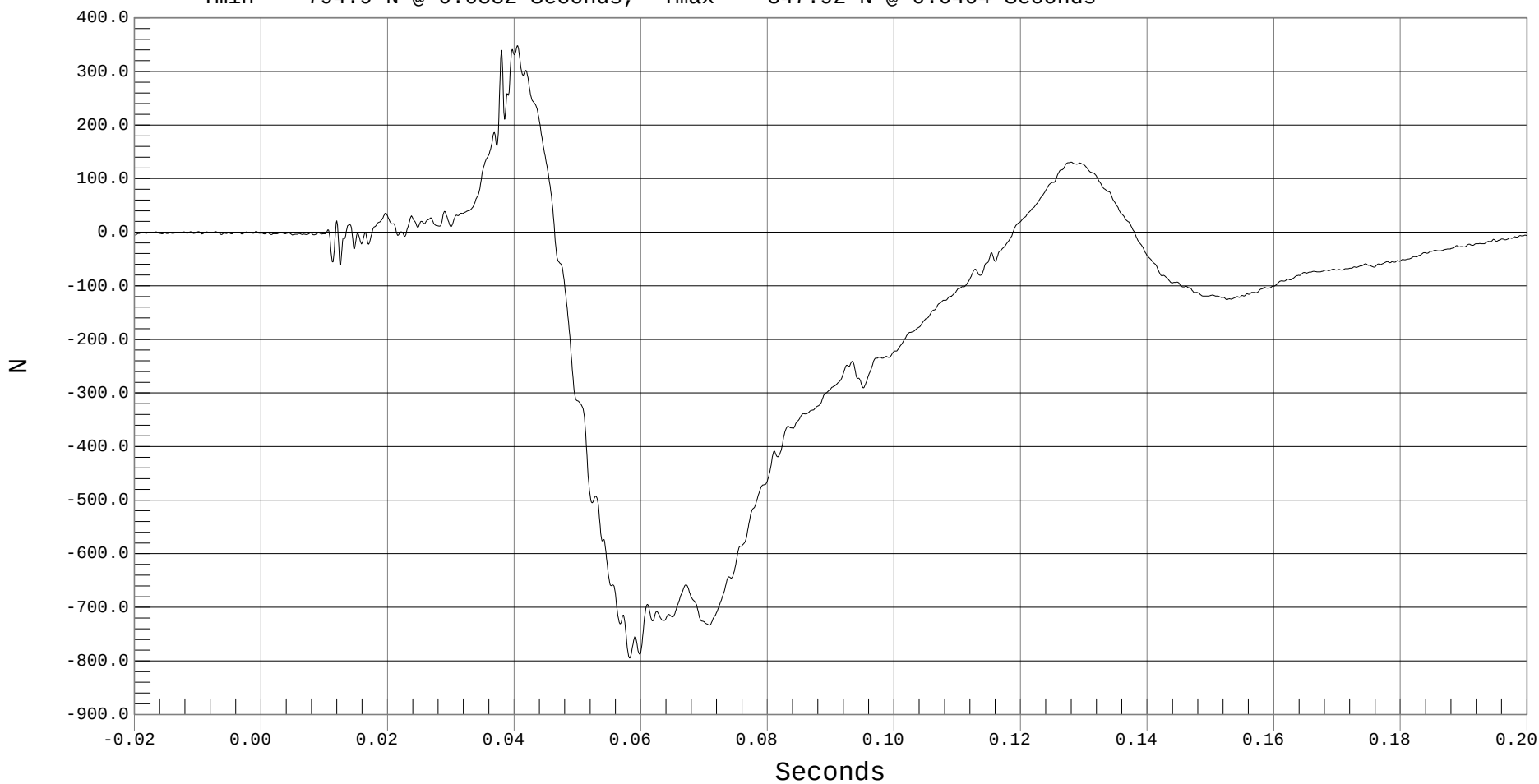
DRIVER LEFT FEMUR FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR FORCE Y, B01109FF.F55

Ymin = -794.9 N @ 0.0582 Seconds, Ymax = 347.92 N @ 0.0404 Seconds





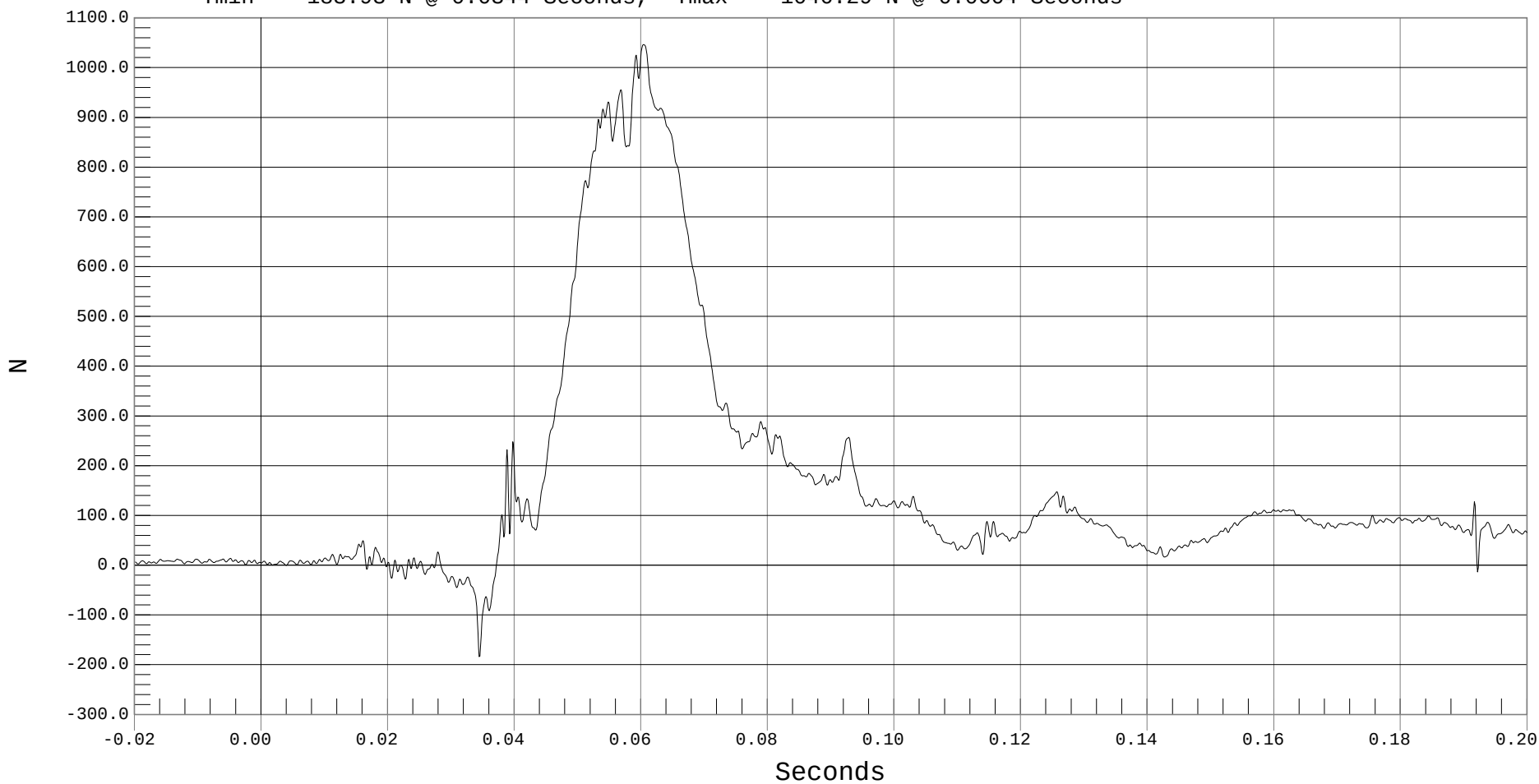
DRIVER LEFT FEMUR FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

1 DRIVER LEFT FEMUR FORCE Z, B01109FF.F56

Ymin = -183.93 N @ 0.0344 Seconds, Ymax = 1046.29 N @ 0.0604 Seconds





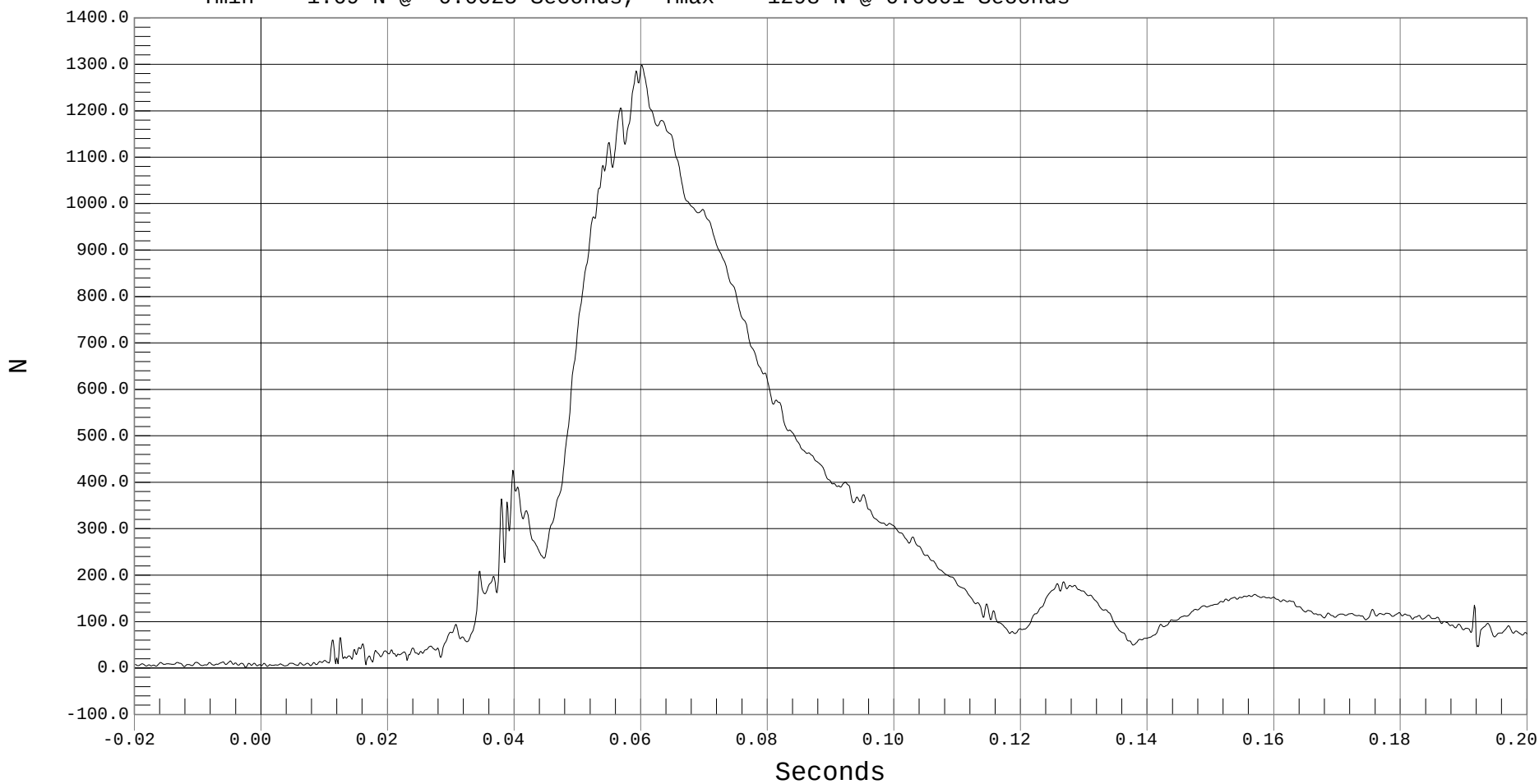
DRIVER LEFT FEMUR FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR FORCE RESULTANT, B01109FV.F54

Ymin = 1.69 N @ -0.0025 Seconds, Ymax = 1298 N @ 0.0601 Seconds





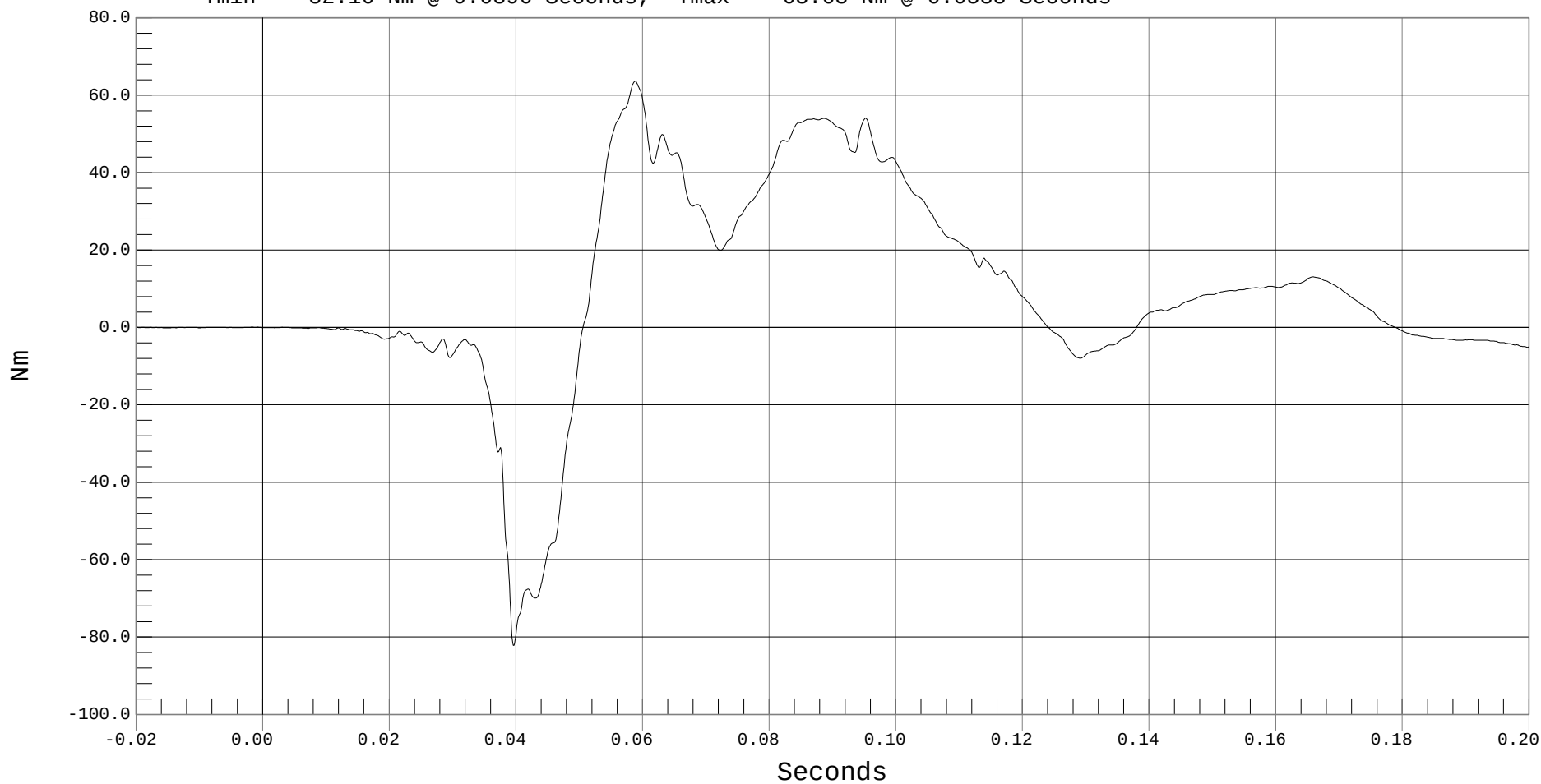
DRIVER LEFT FEMUR MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT X, B01109MF.M57

Ymin = -82.16 Nm @ 0.0396 Seconds, Ymax = 63.63 Nm @ 0.0588 Seconds





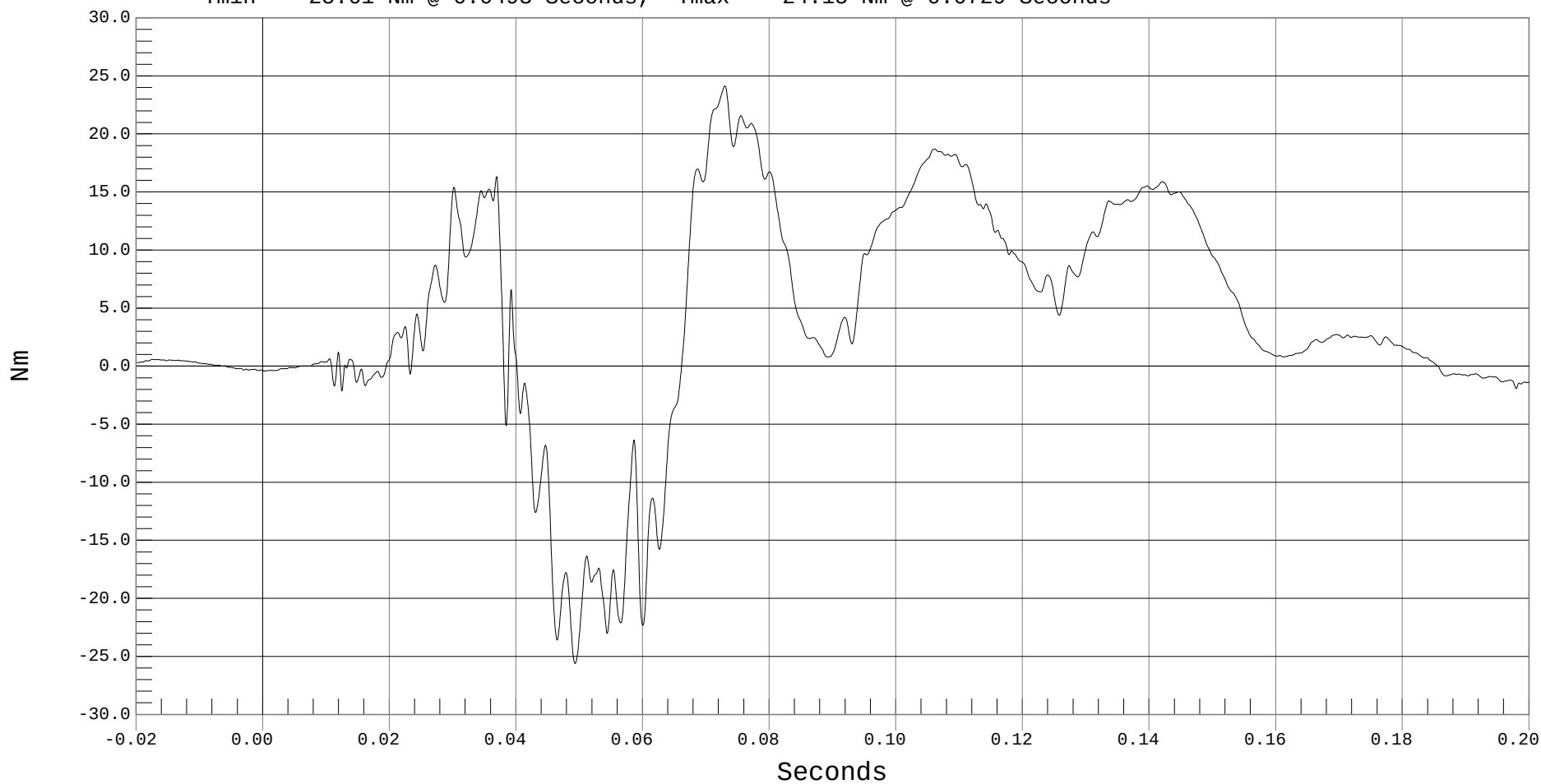
DRIVER LEFT FEMUR MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT Y, B01109MF.M58

Ymin = -25.61 Nm @ 0.0493 Seconds, Ymax = 24.15 Nm @ 0.0729 Seconds





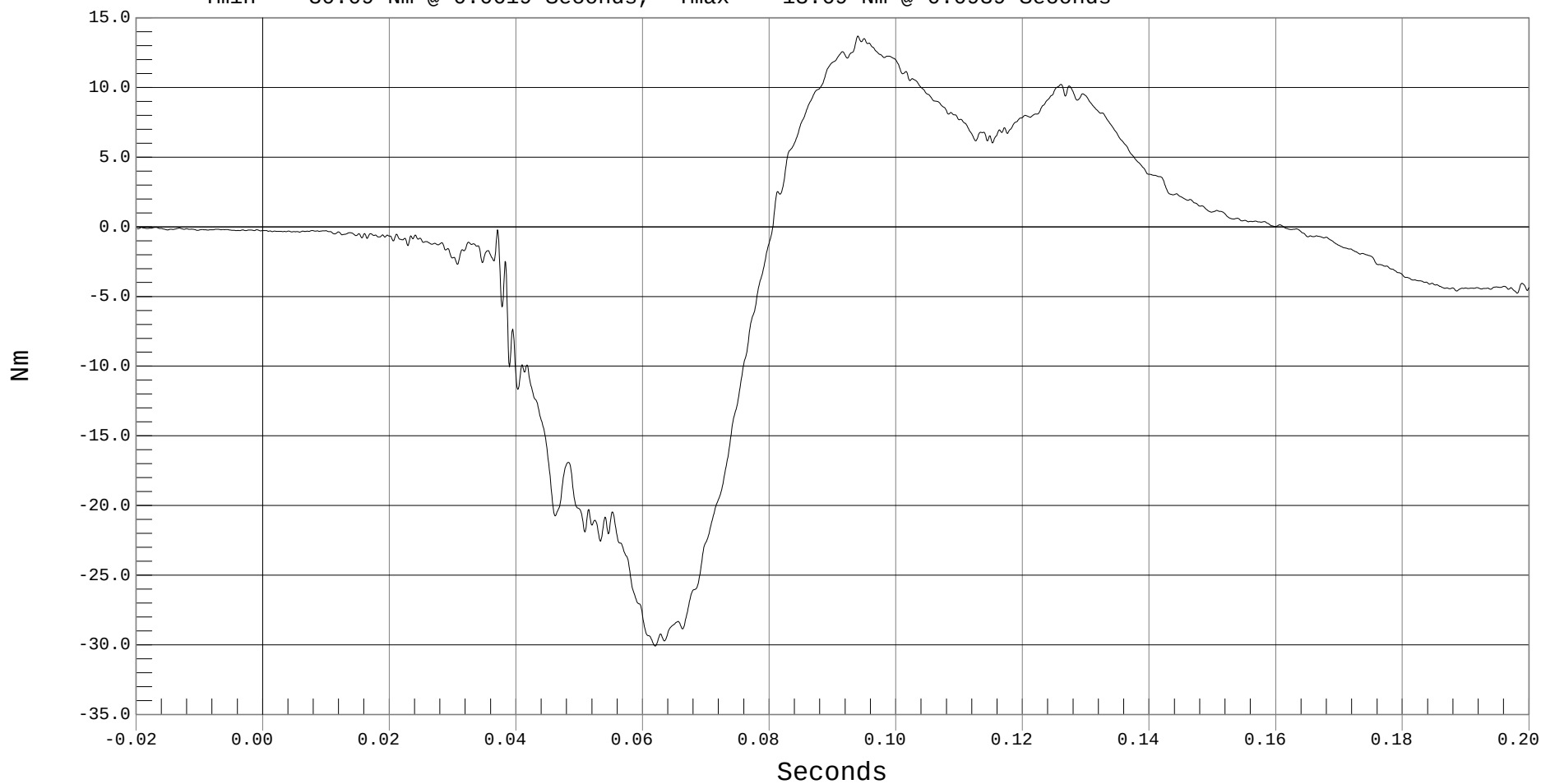
DRIVER LEFT FEMUR MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT Z, B01109MF.M59

Ymin = -30.09 Nm @ 0.0619 Seconds, Ymax = 13.69 Nm @ 0.0939 Seconds





DRIVER LEFT FEMUR MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

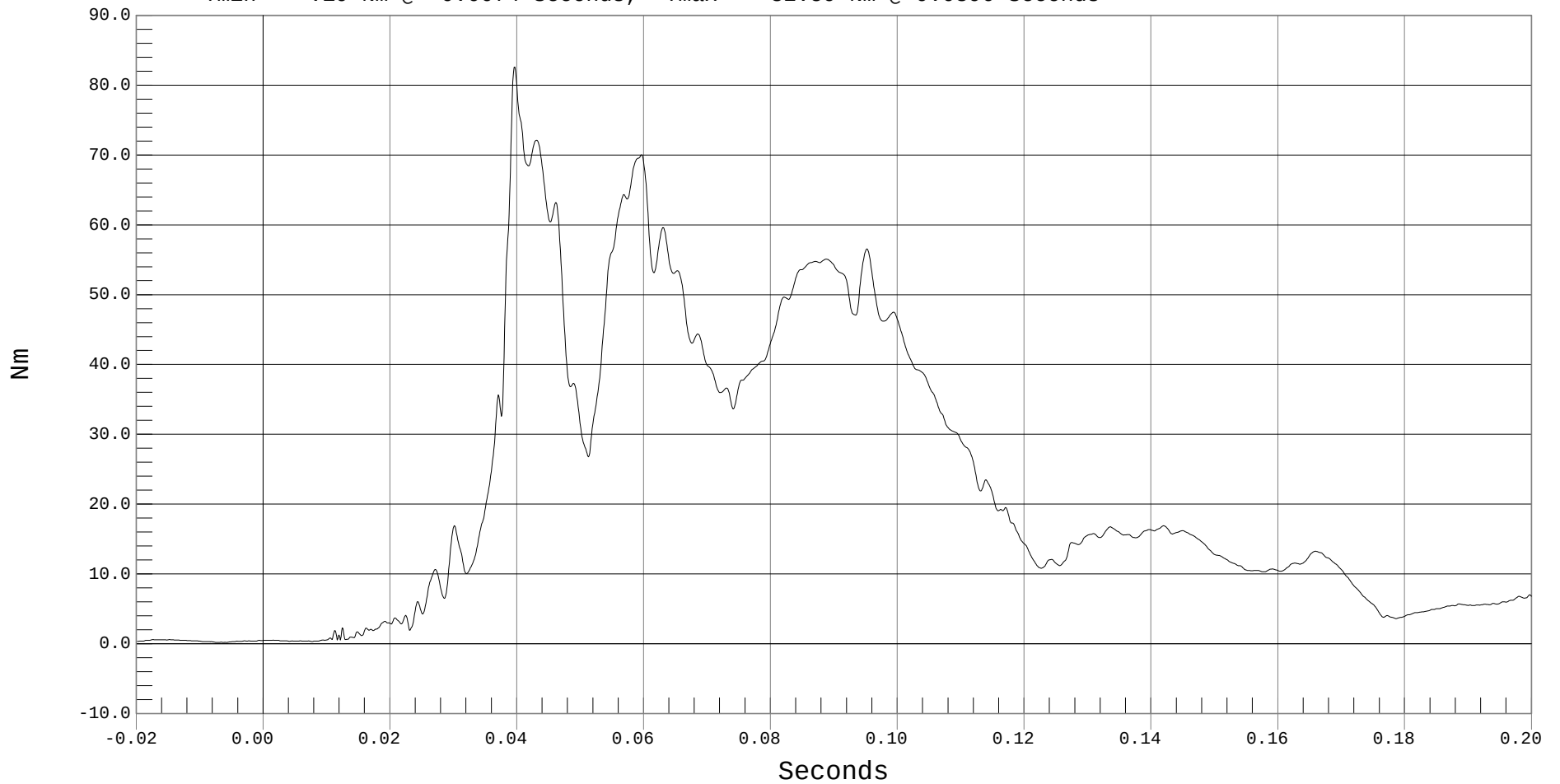
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 600

— 1 DRIVER LEFT FEMUR MOMENT RESULTANT, B01109MV.M57

Ymin = .19 Nm @ -0.0074 Seconds, Ymax = 82.59 Nm @ 0.0396 Seconds





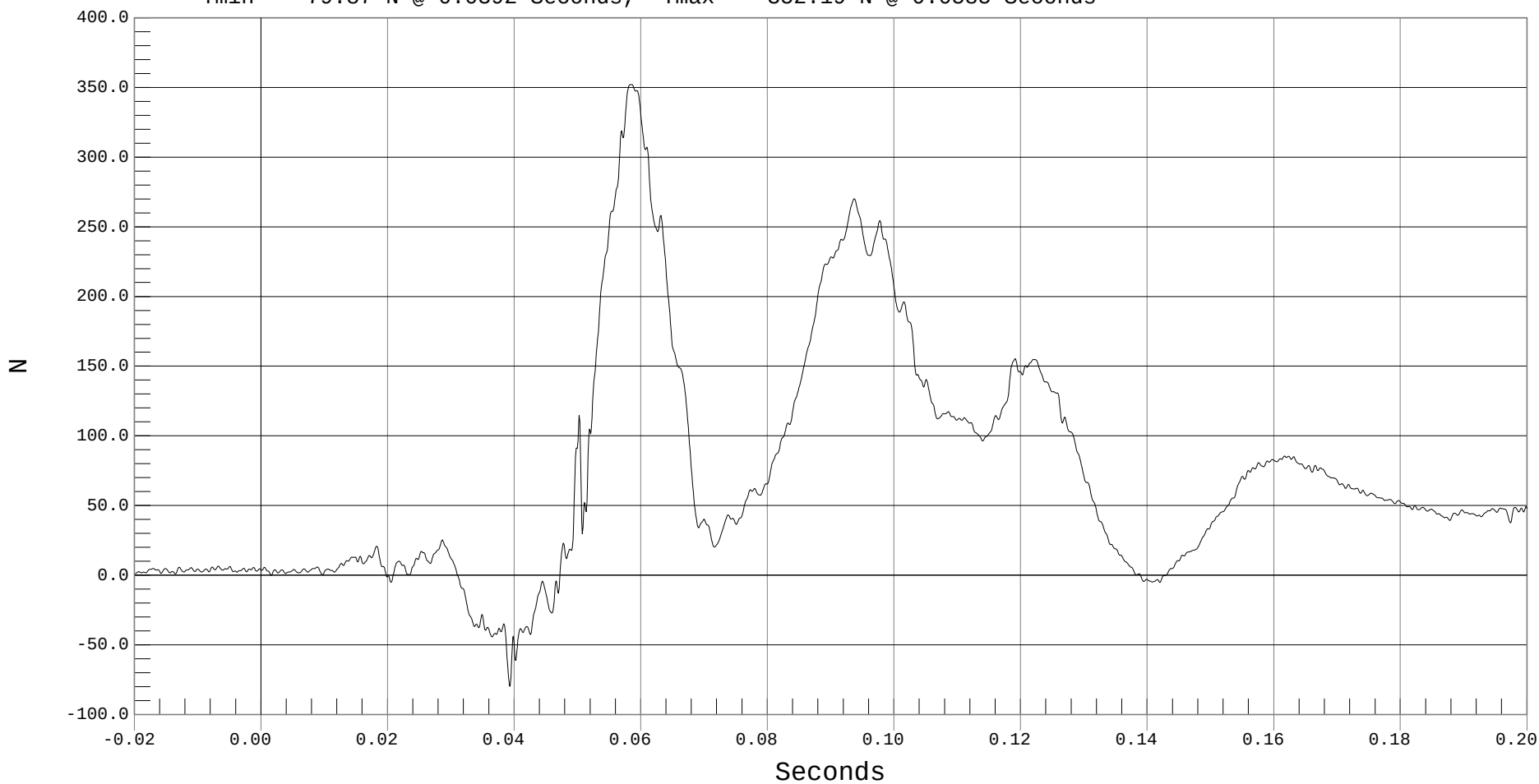
DRIVER RIGHT FEMUR FORCE X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE X, B01109FF.F48

Ymin = -79.87 N @ 0.0392 Seconds, Ymax = 352.19 N @ 0.0585 Seconds





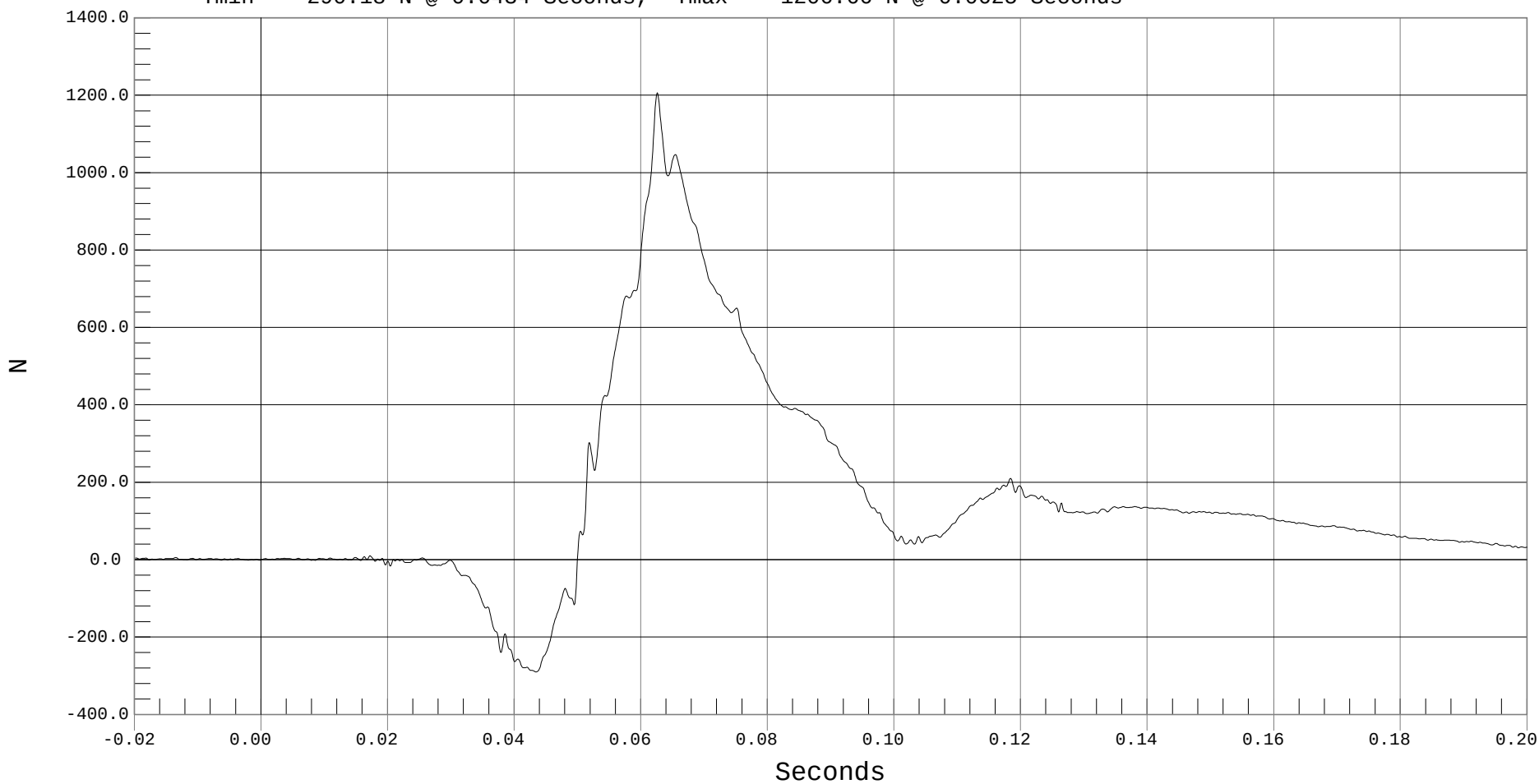
DRIVER RIGHT FEMUR FORCE Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE Y, B01109FF.F49

Ymin = -290.18 N @ 0.0434 Seconds, Ymax = 1206.66 N @ 0.0625 Seconds





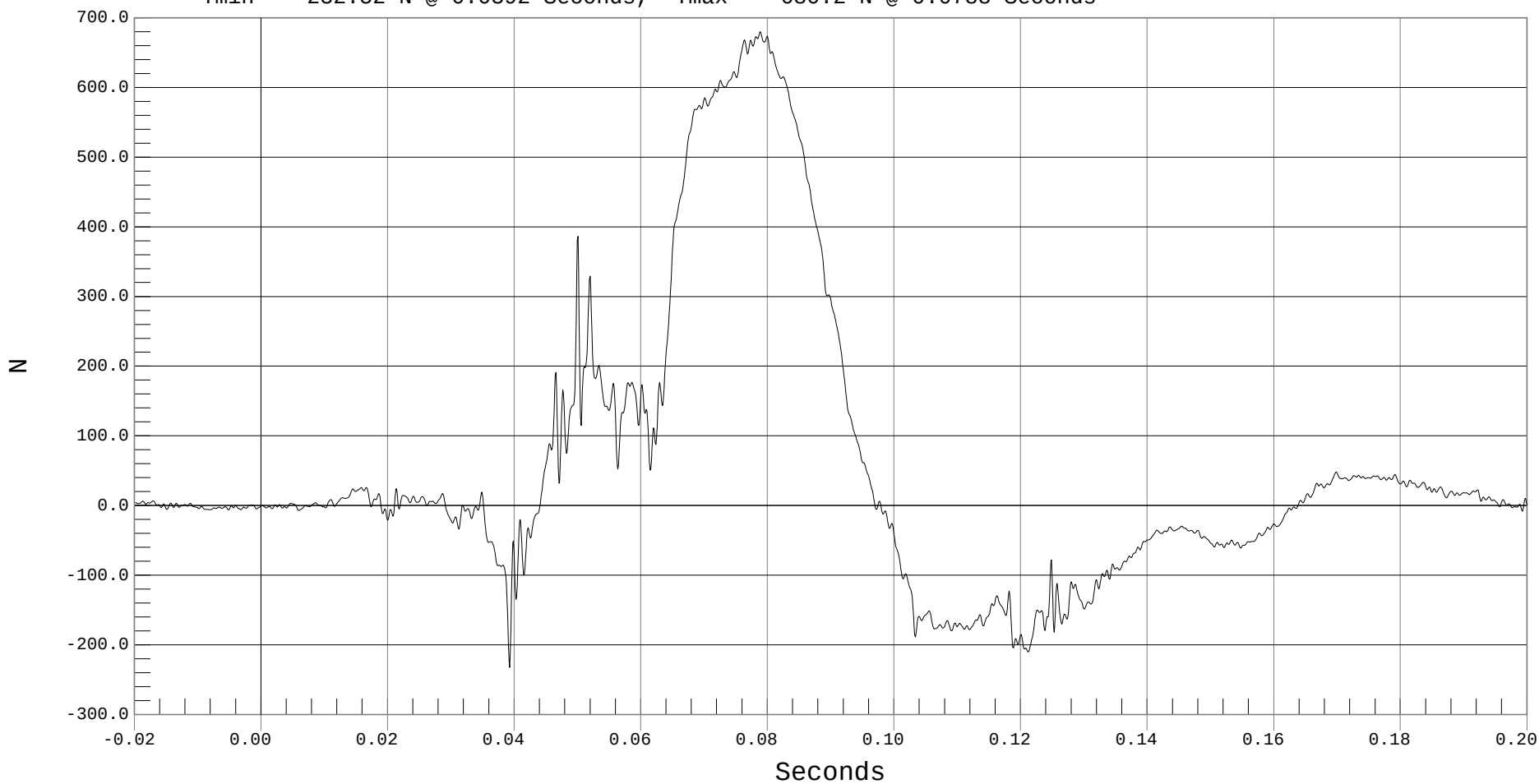
DRIVER RIGHT FEMUR FORCE Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE Z, B01109FF.F50

Ymin = -232.52 N @ 0.0392 Seconds, Ymax = 680.2 N @ 0.0788 Seconds





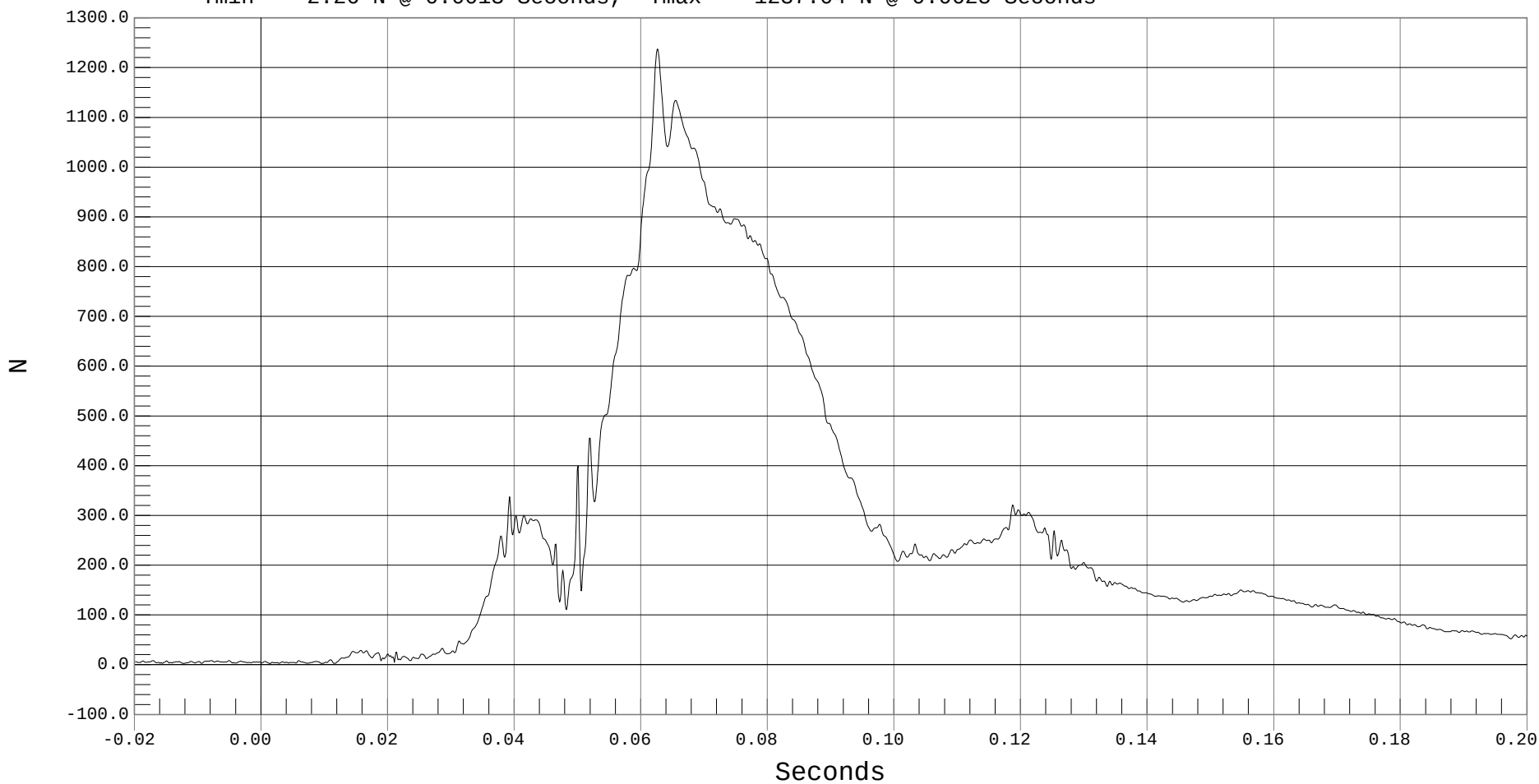
DRIVER RIGHT FEMUR FORCE RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR FORCE RESULTANT, B01109FV.F48

Ymin = 2.26 N @ 0.0013 Seconds, Ymax = 1237.04 N @ 0.0625 Seconds





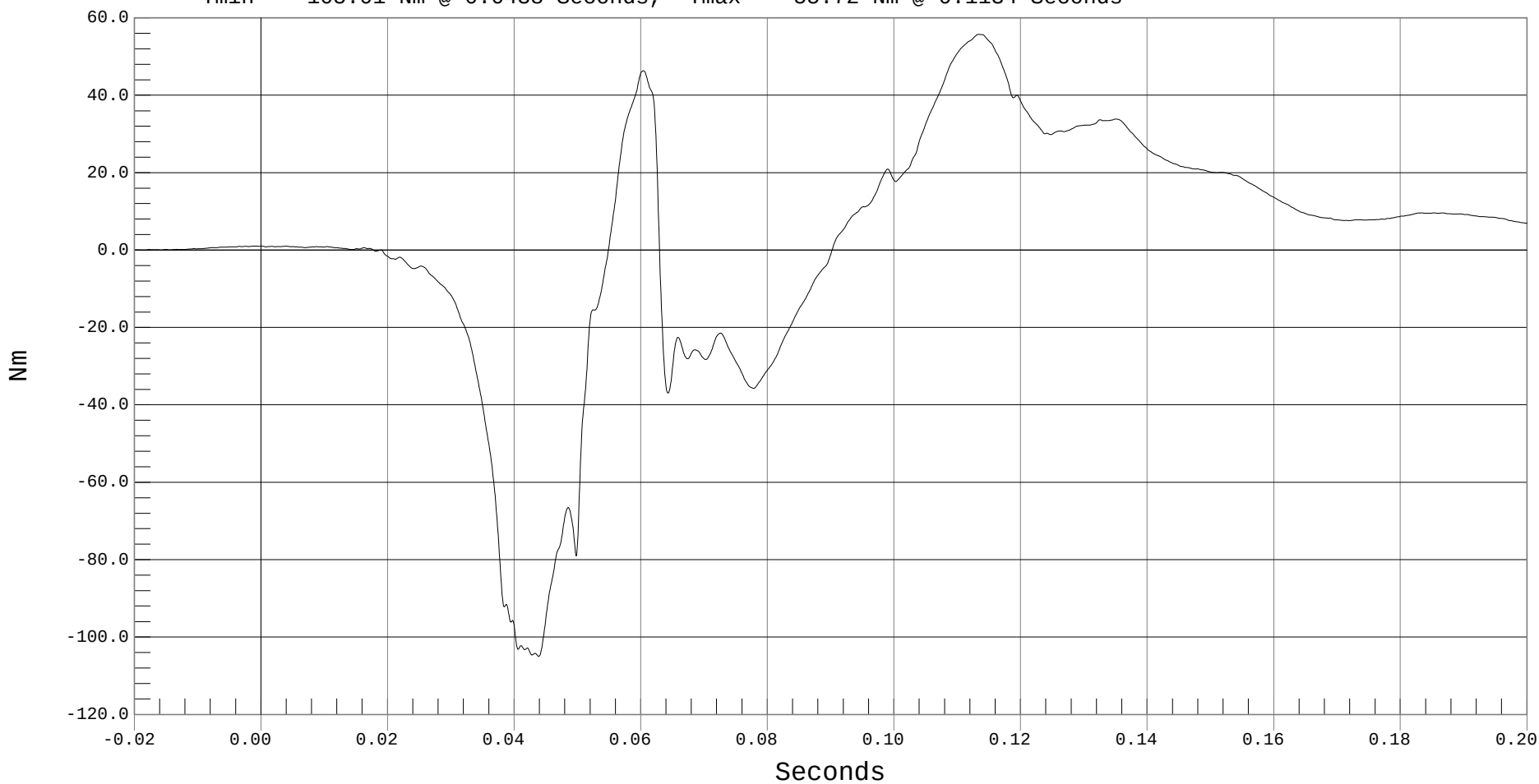
DRIVER RIGHT FEMUR MOMENT X

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

1 DRIVER RIGHT FEMUR MOMENT X, B01109MF.M51

Ymin = -105.01 Nm @ 0.0438 Seconds, Ymax = 55.72 Nm @ 0.1134 Seconds





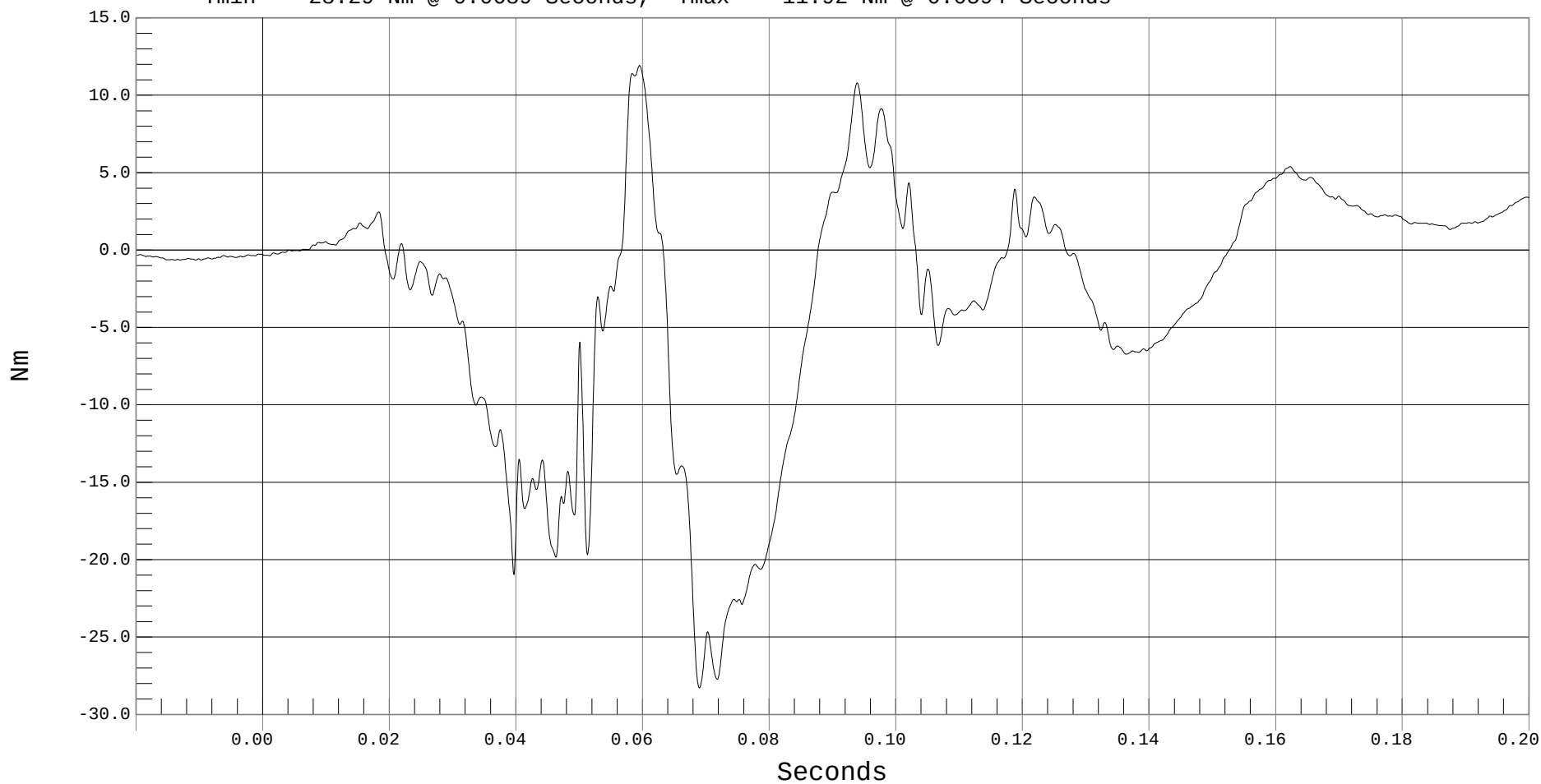
DRIVER RIGHT FEMUR MOMENT Y

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

— 1 DRIVER RIGHT FEMUR MOMENT Y, B01109MF.M52

Ymin = -28.29 Nm @ 0.0689 Seconds, Ymax = 11.92 Nm @ 0.0594 Seconds





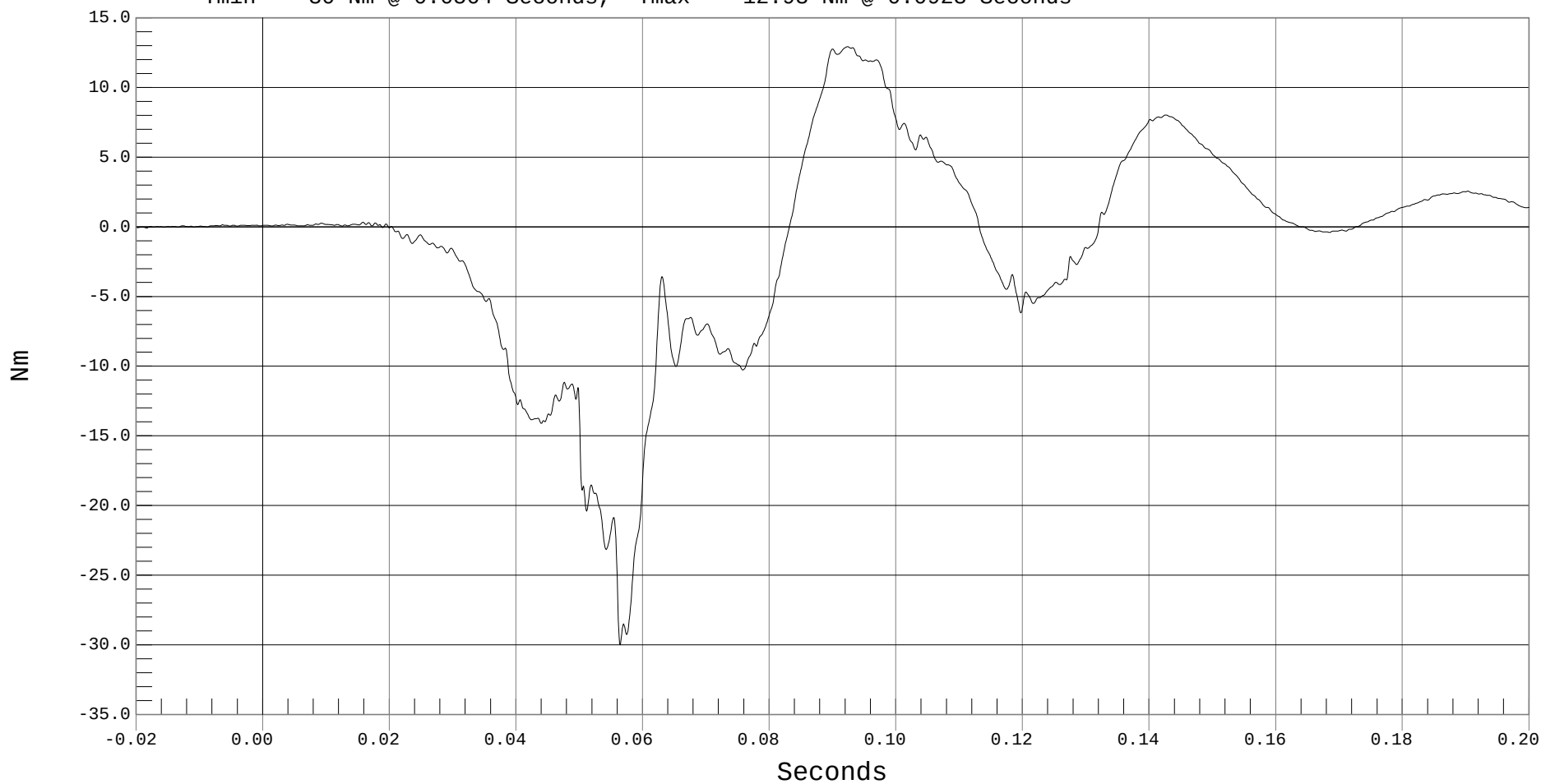
DRIVER RIGHT FEMUR MOMENT Z

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 600

1 DRIVER RIGHT FEMUR MOMENT Z, B01109MF.M53

Ymin = -30 Nm @ 0.0564 Seconds, Ymax = 12.93 Nm @ 0.0923 Seconds





DRIVER RIGHT FEMUR MOMENT RESULTANT

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

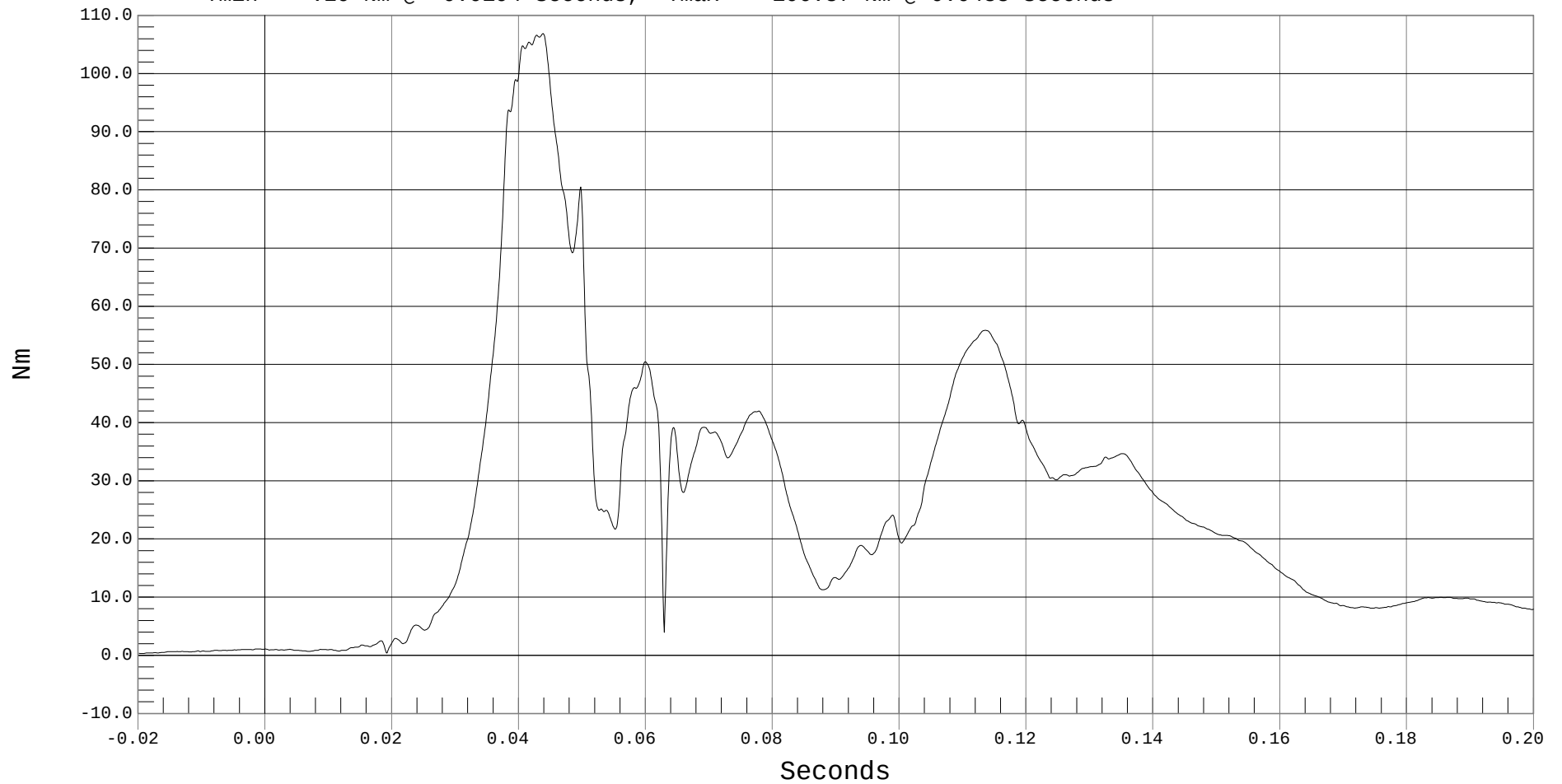
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 600

— 1 DRIVER RIGHT FEMUR MOMENT RESULTANT, B01109MV.M51

Ymin = .29 Nm @ -0.0194 Seconds, Ymax = 106.87 Nm @ 0.0438 Seconds





DRIVER ARM CONTACT

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

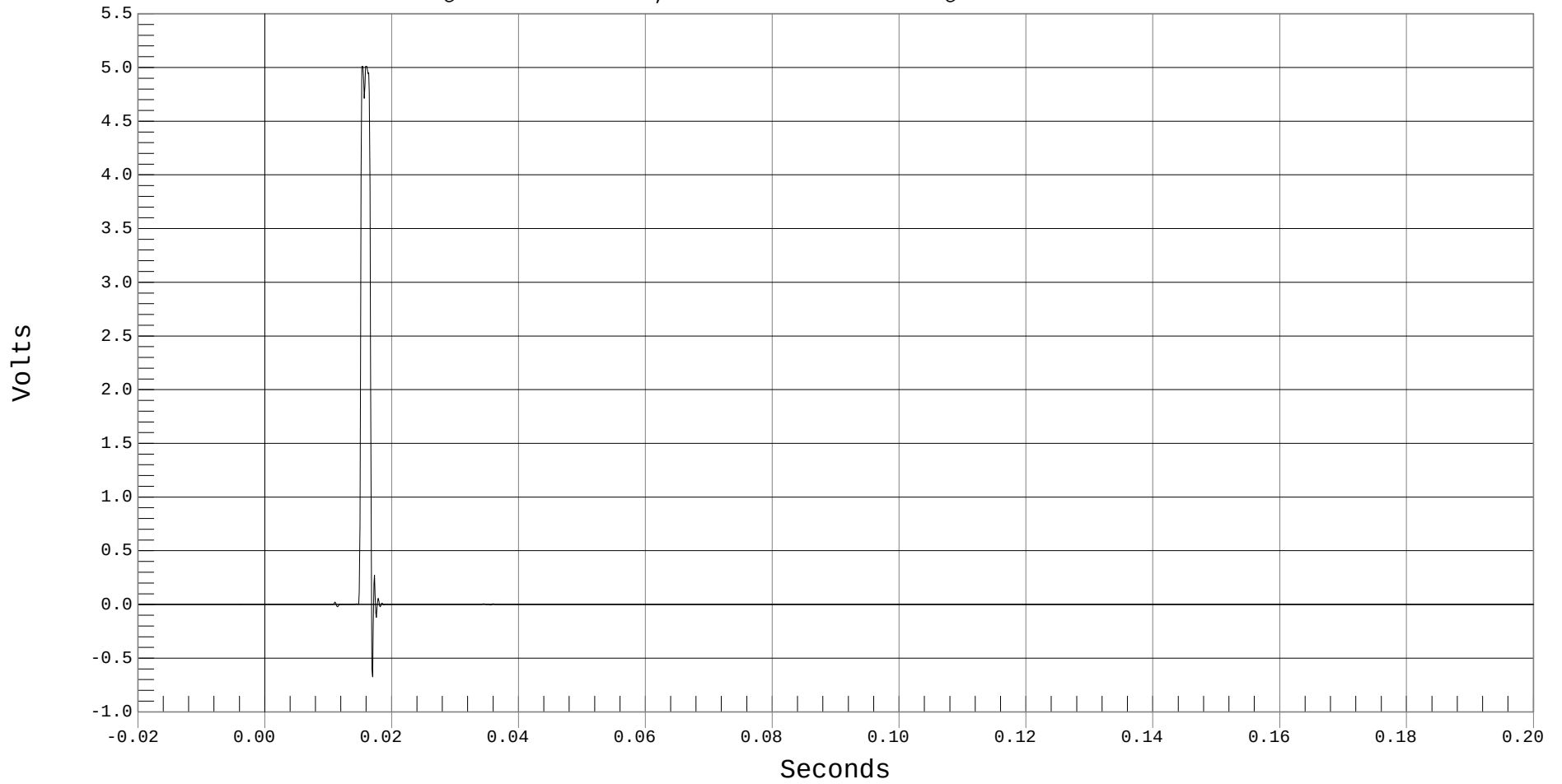
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 1000

— 1 DRIVER ARM CONTACT, B011090T.002

Ymin = -.67 Volts @ 0.0169 Seconds, Ymax = 5.01 Volts @ 0.0152 Seconds





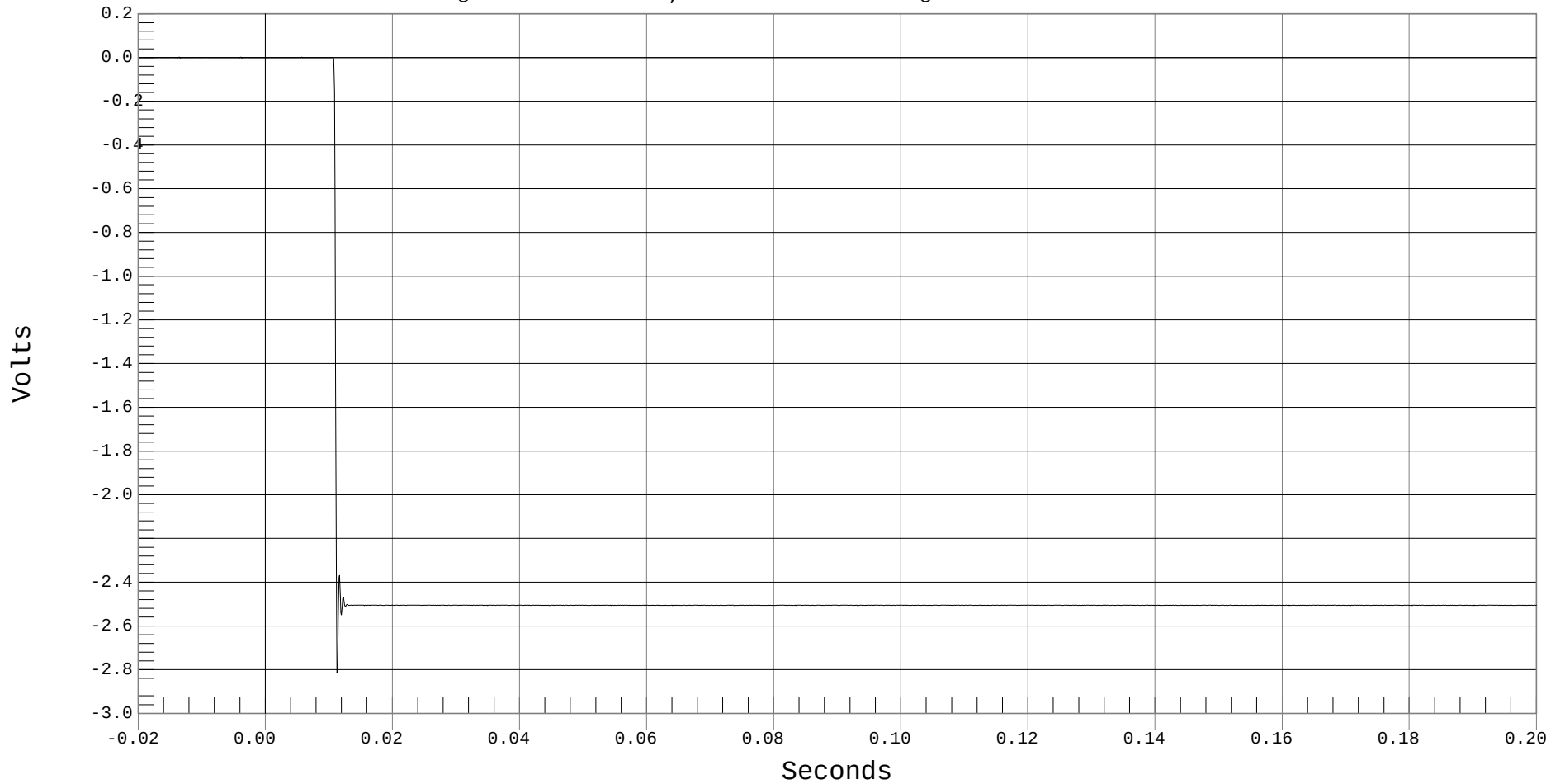
DRIVER RIB CONTACT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER RIB CONTACT, B011090T.003

Ymin = -2.82 Volts @ 0.0112 Seconds, Ymax = 0 Volts @ -0.0136 Seconds





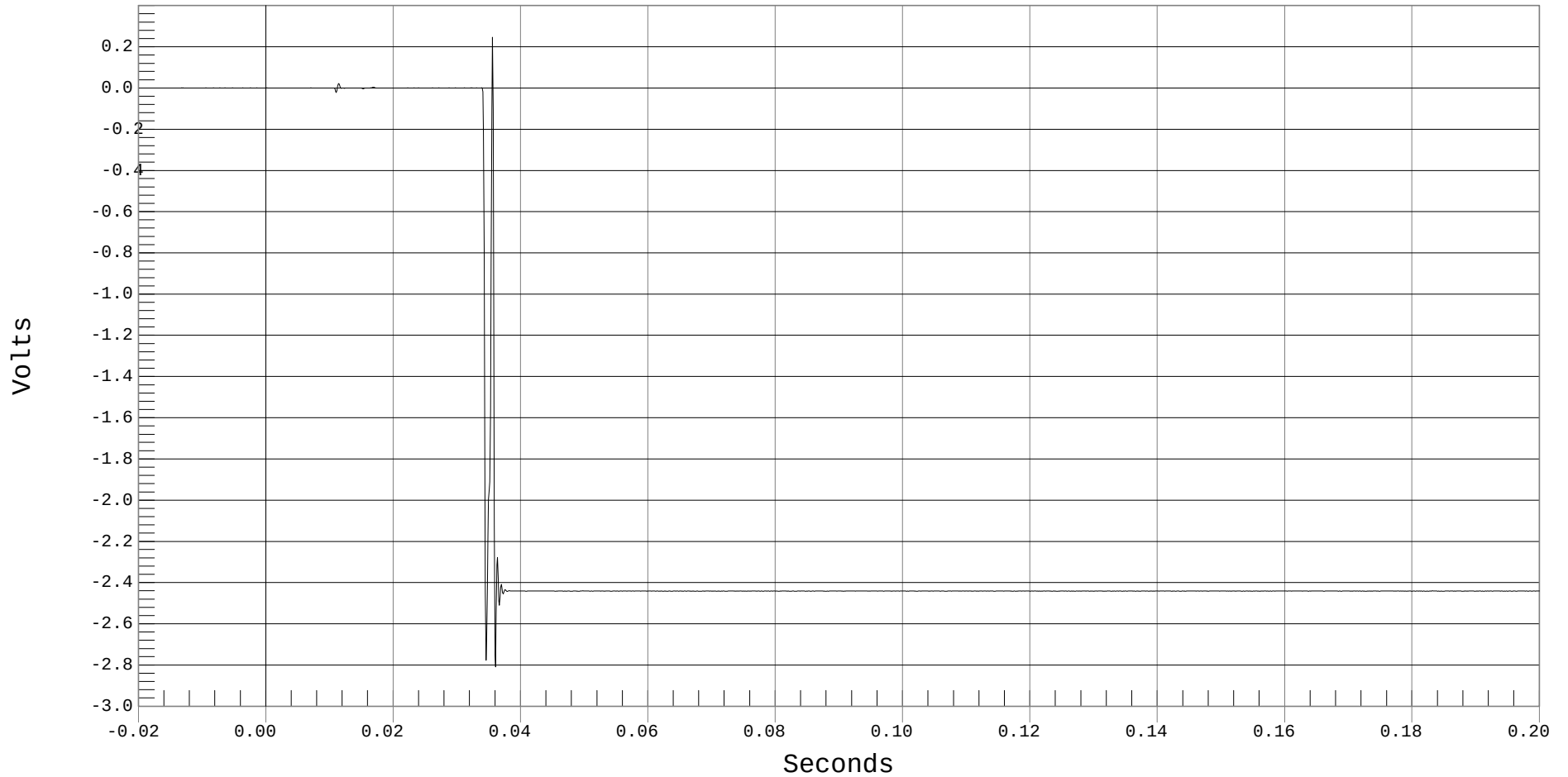
DRIVER PELVIS CONTACT

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 1000

— 1 DRIVER PELVIS CONTACT, B011090T.004

Ymin = -2.81 Volts @ 0.0360 Seconds, Ymax = .25 Volts @ 0.0355 Seconds





RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

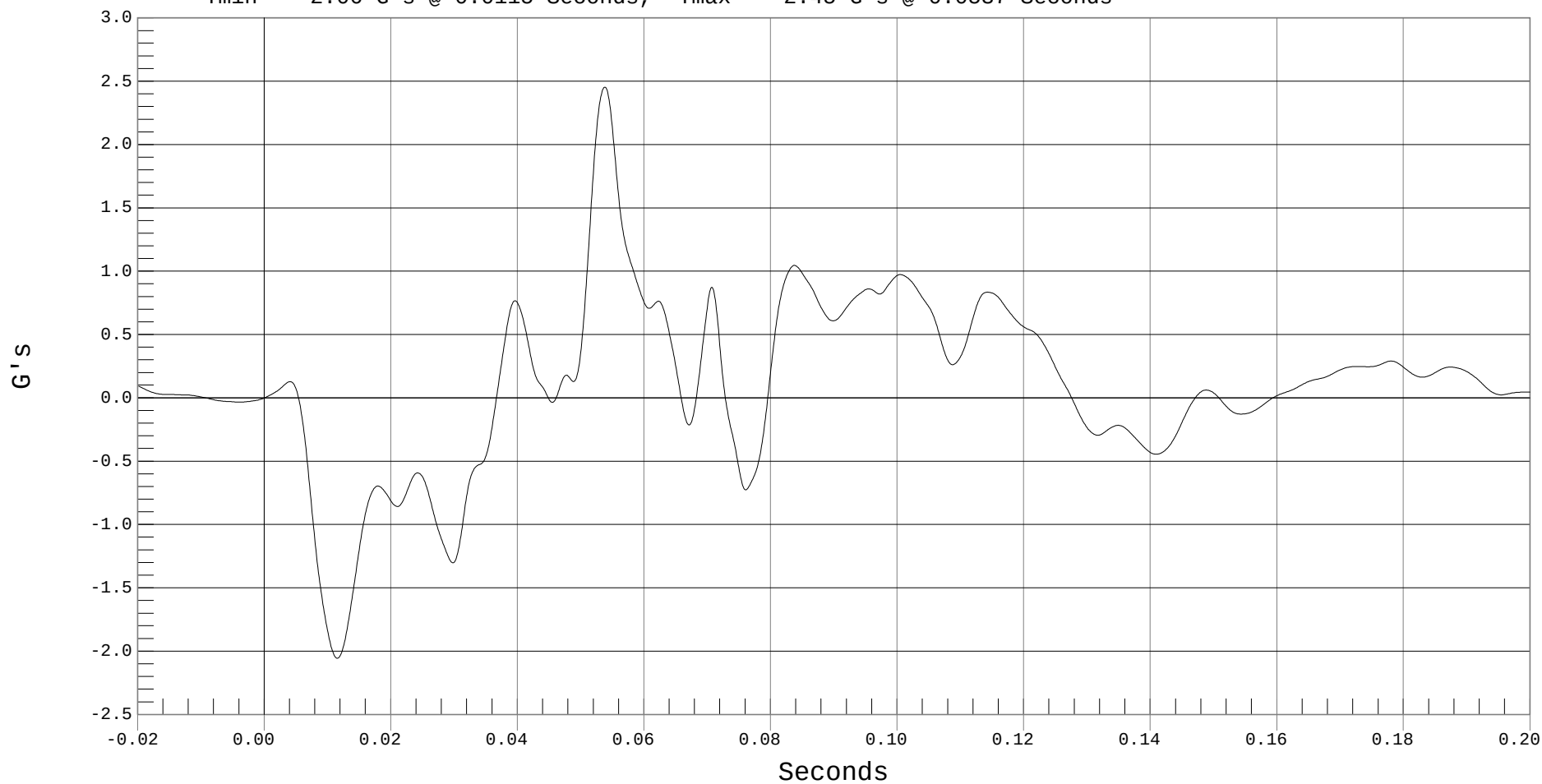
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 RIGHT FRONT SILL X, B01109AF.A71

Ymin = -2.06 G's @ 0.0115 Seconds, Ymax = 2.45 G's @ 0.0537 Seconds





RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

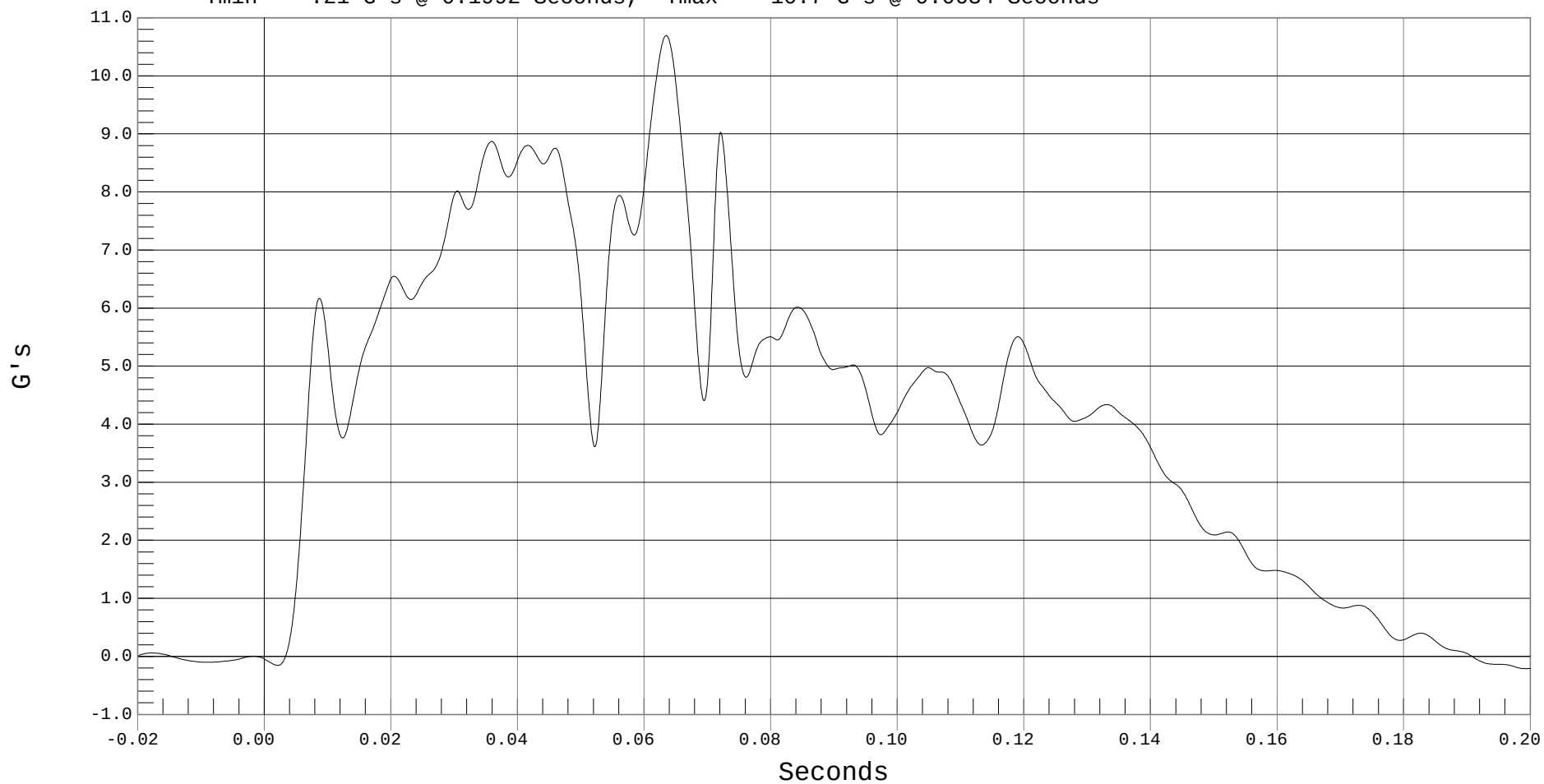
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 RIGHT FRONT SILL Y, B01109AF.A72

Ymin = -.21 G's @ 0.1992 Seconds, Ymax = 10.7 G's @ 0.0634 Seconds





RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

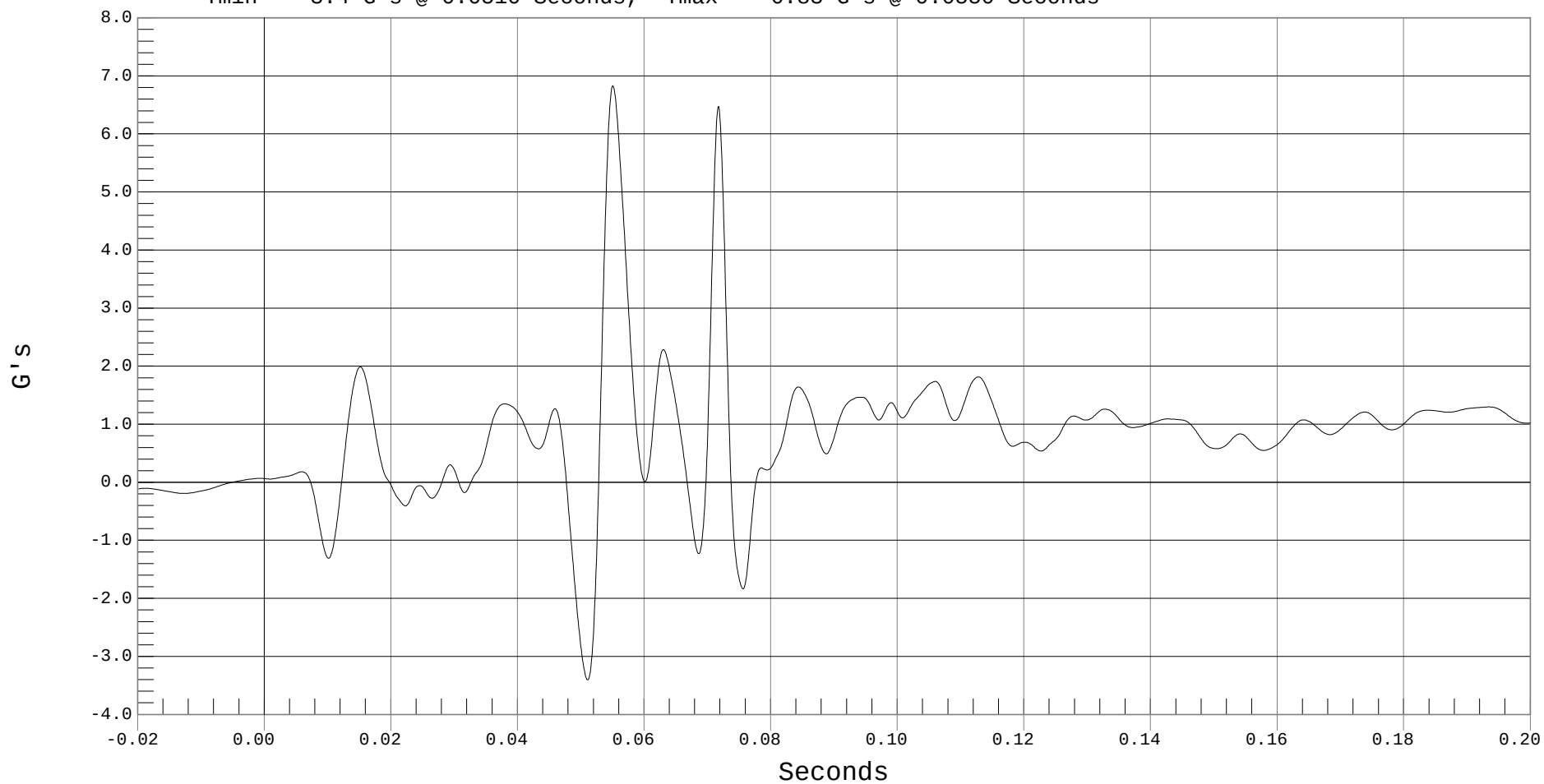
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 RIGHT FRONT SILL Z, B01109AF.A73

Ymin = -3.4 G's @ 0.0510 Seconds, Ymax = 6.83 G's @ 0.0550 Seconds





RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

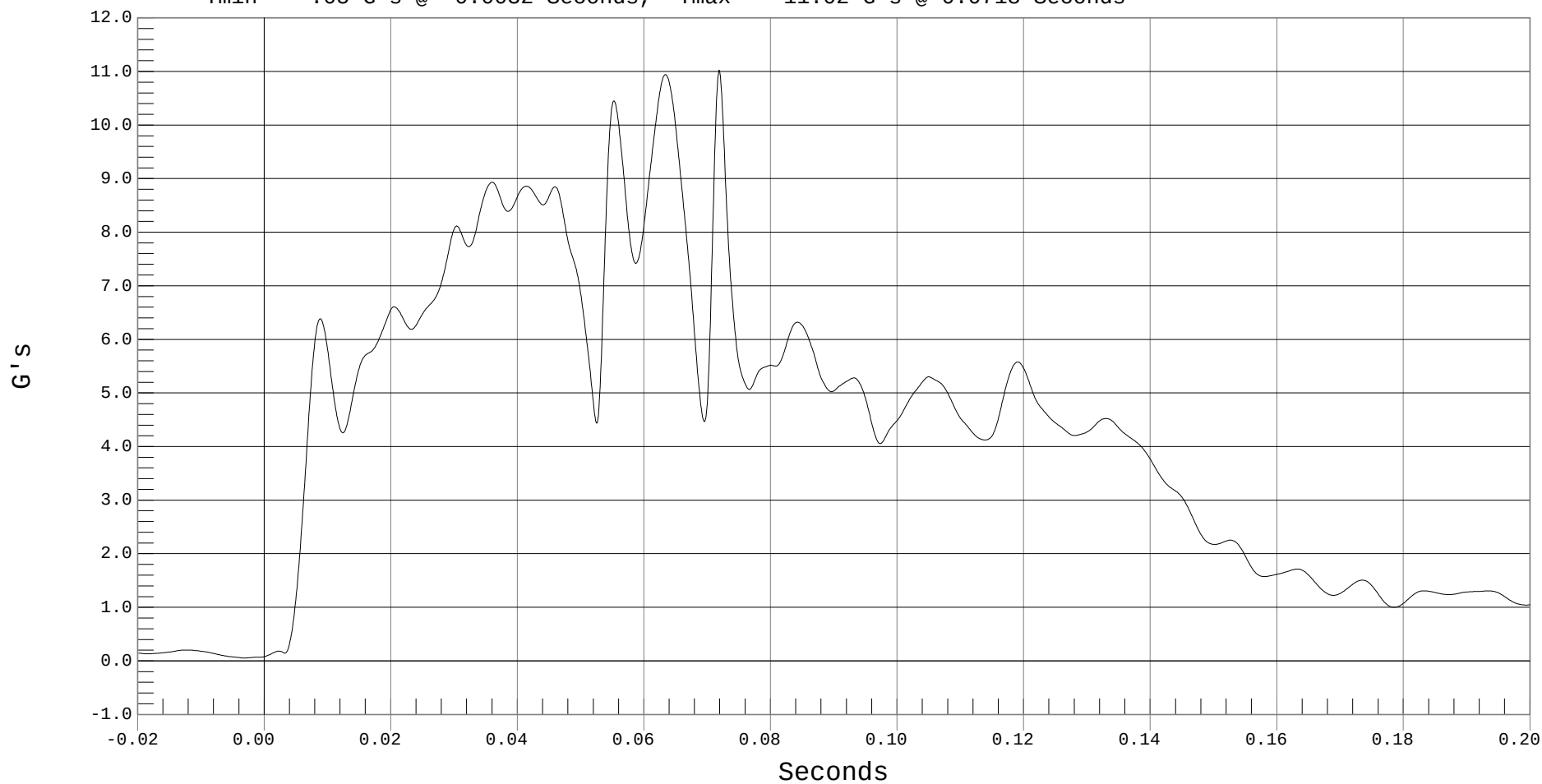
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 RIGHT FRONT SILL RESULTANT ACCELERATION, B01109AV.A71

Ymin = .05 G's @ -0.0032 Seconds, Ymax = 11.02 G's @ 0.0718 Seconds





RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

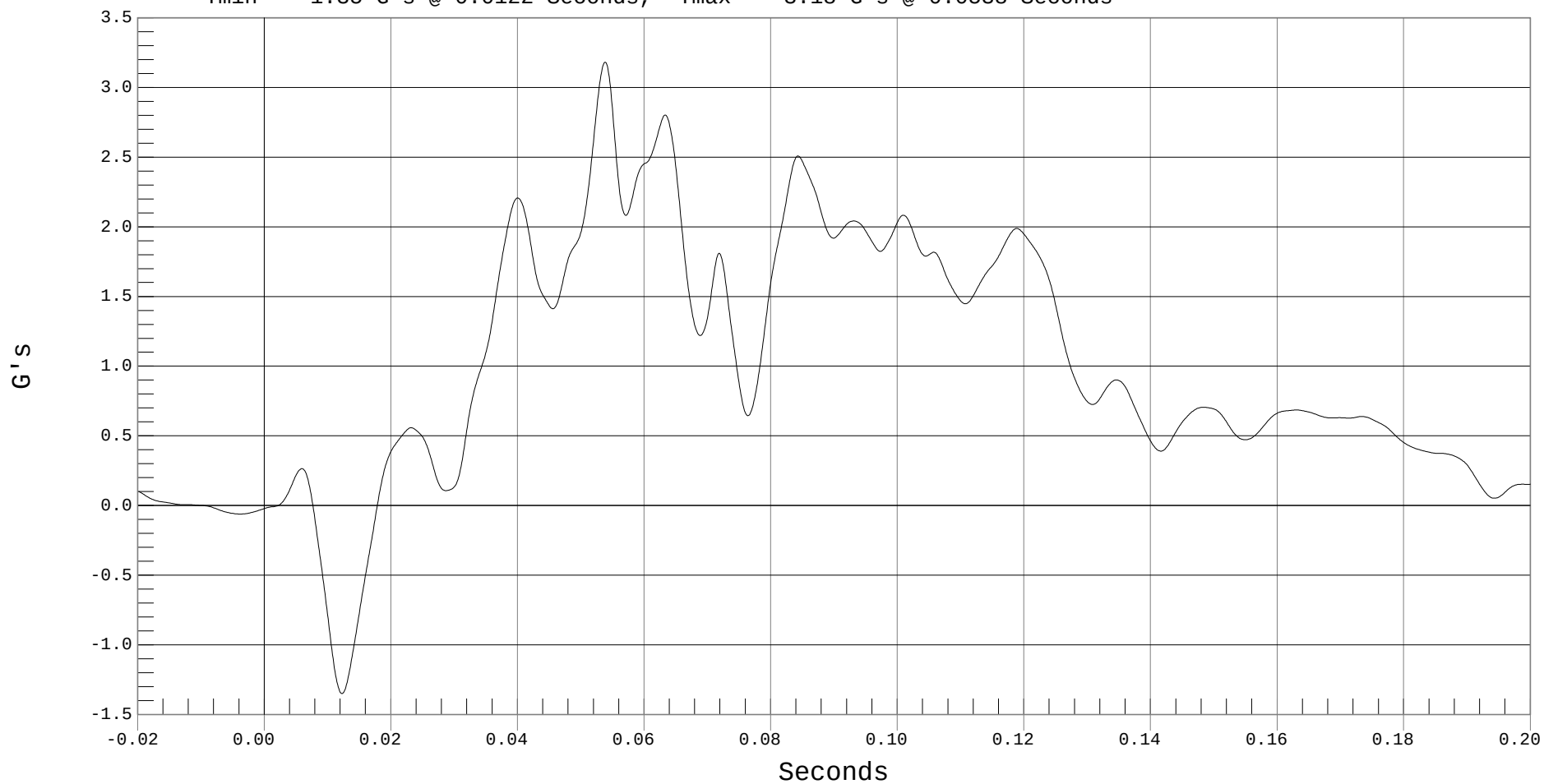
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 RIGHT REAR SILL X, B01109AF.A74

Ymin = -1.35 G's @ 0.0122 Seconds, Ymax = 3.18 G's @ 0.0538 Seconds





RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

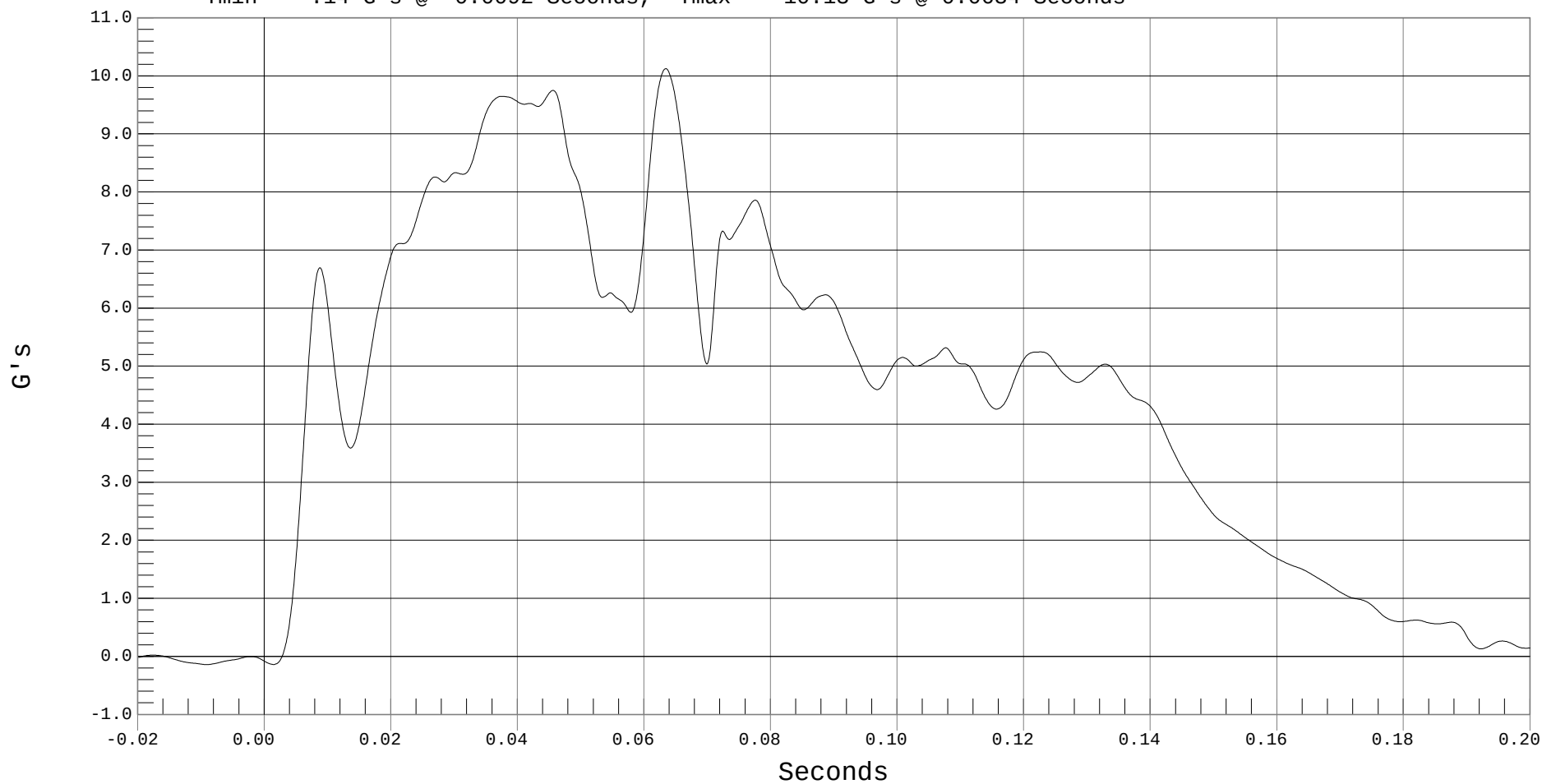
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 RIGHT REAR SILL Y, B01109AF.A75

Ymin = -.14 G's @ -0.0092 Seconds, Ymax = 10.13 G's @ 0.0634 Seconds





RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

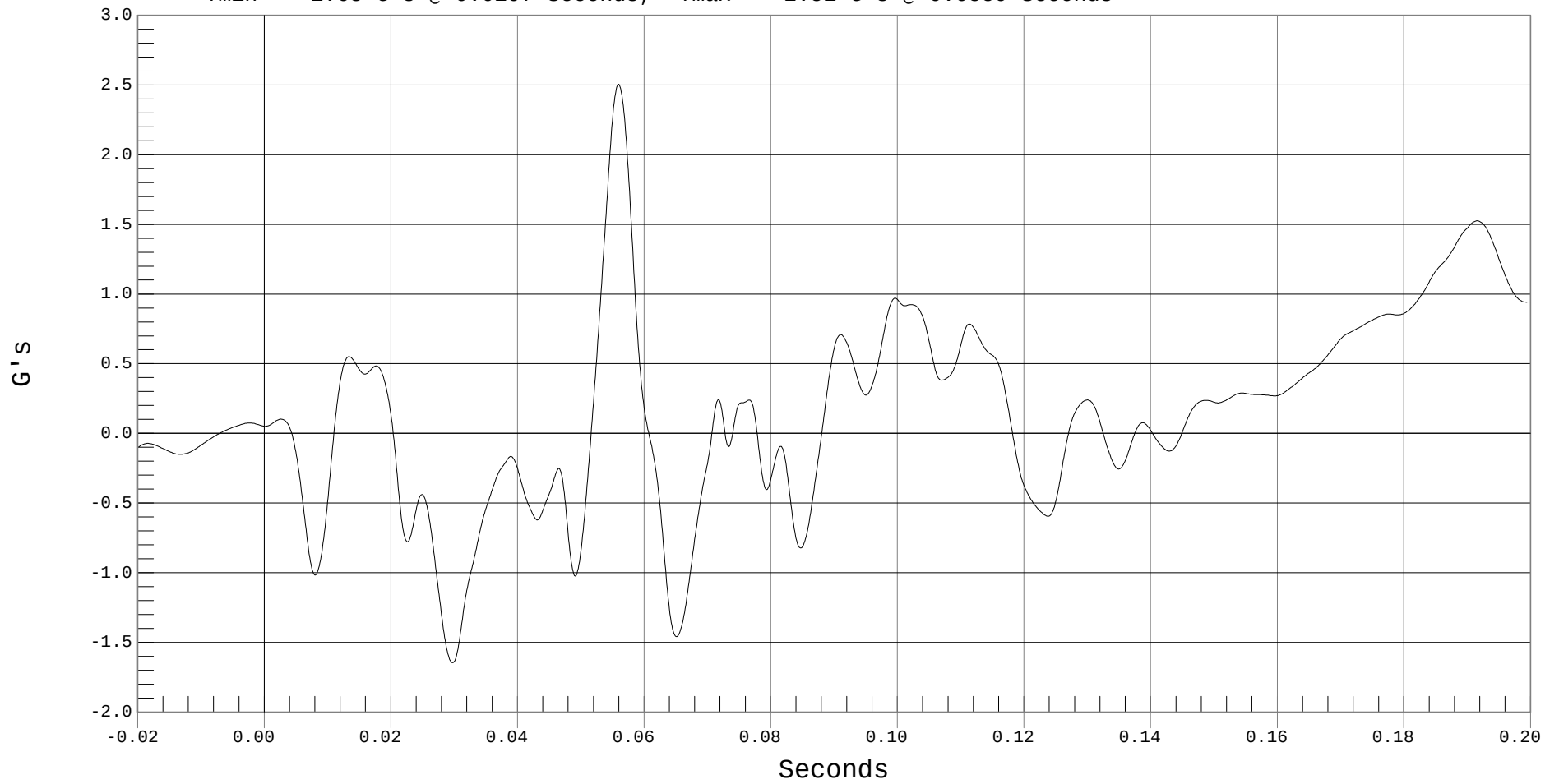
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 RIGHT REAR SILL Z, B01109AF.A76

Ymin = -1.65 G's @ 0.0297 Seconds, Ymax = 2.51 G's @ 0.0559 Seconds





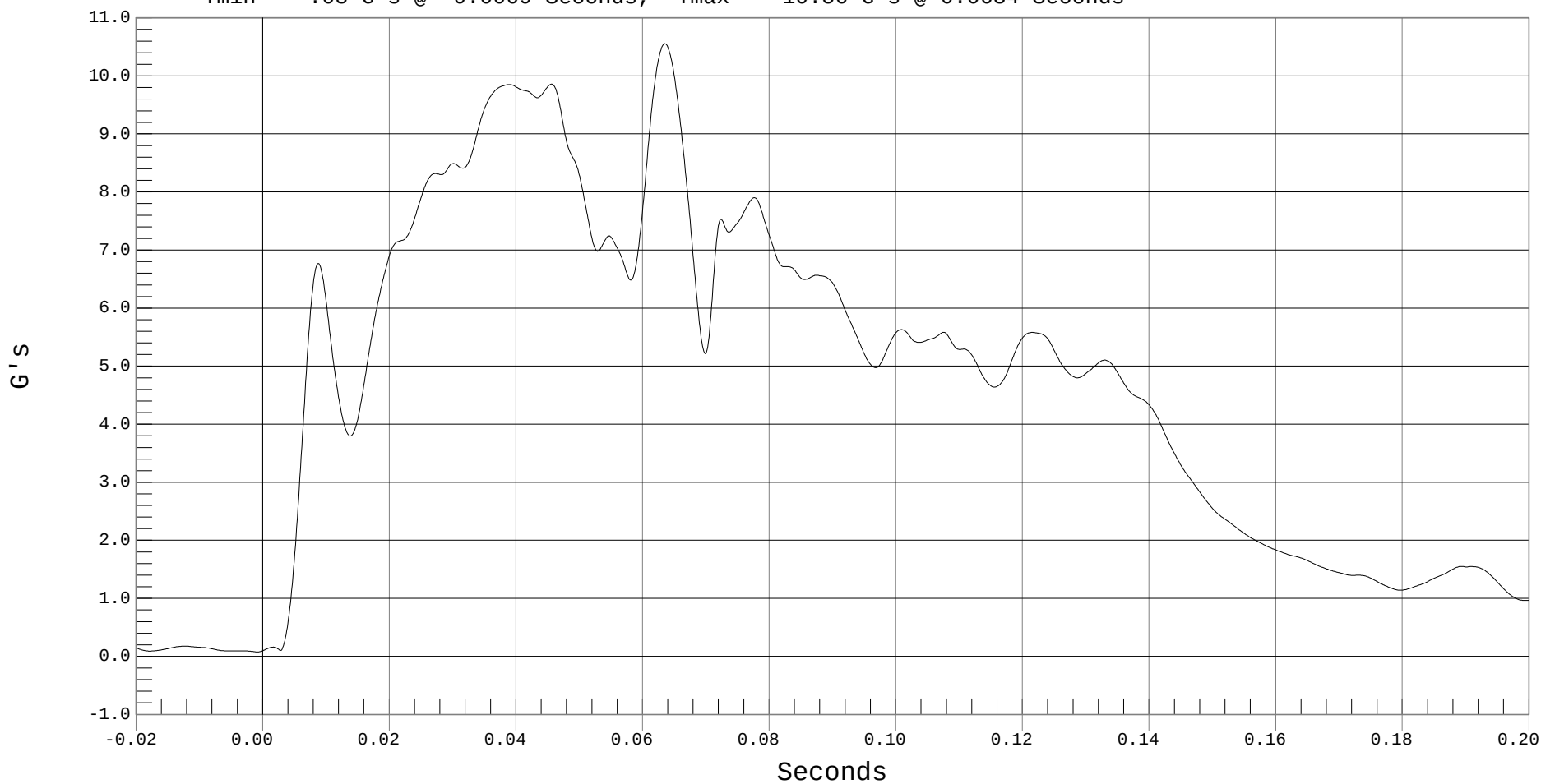
RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 60

— 1 RIGHT REAR SILL RESULTANT ACCELERATION, B01109AV.A74

Ymin = .08 G's @ -0.0009 Seconds, Ymax = 10.56 G's @ 0.0634 Seconds





REAR FLOORPAN ABOVE AXLE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

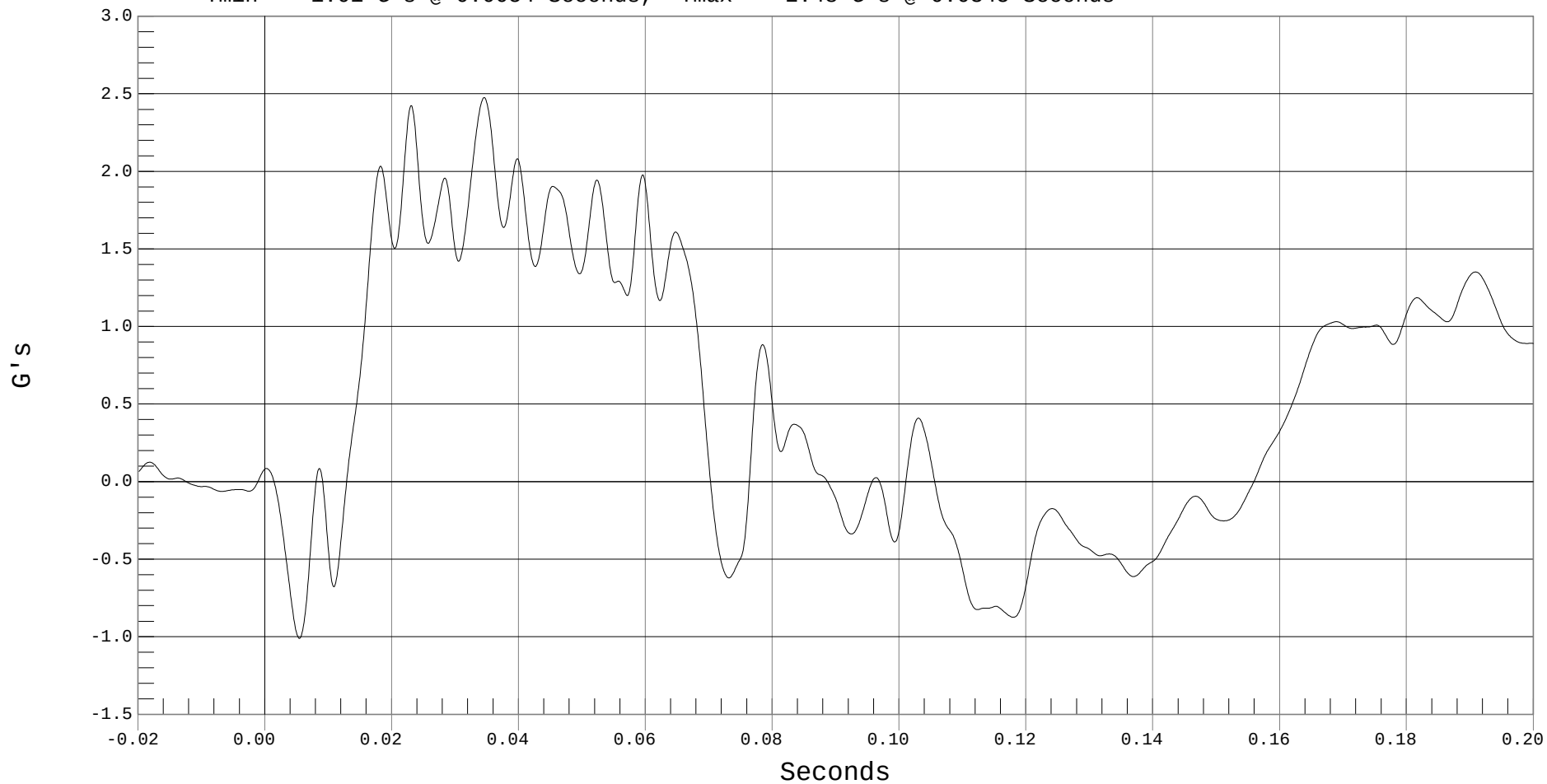
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 REAR FLOORPAN ABOVE AXLE X, B01109AF.A77

Ymin = -1.01 G's @ 0.0054 Seconds, Ymax = 2.48 G's @ 0.0345 Seconds





REAR FLOORPAN ABOVE AXLE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

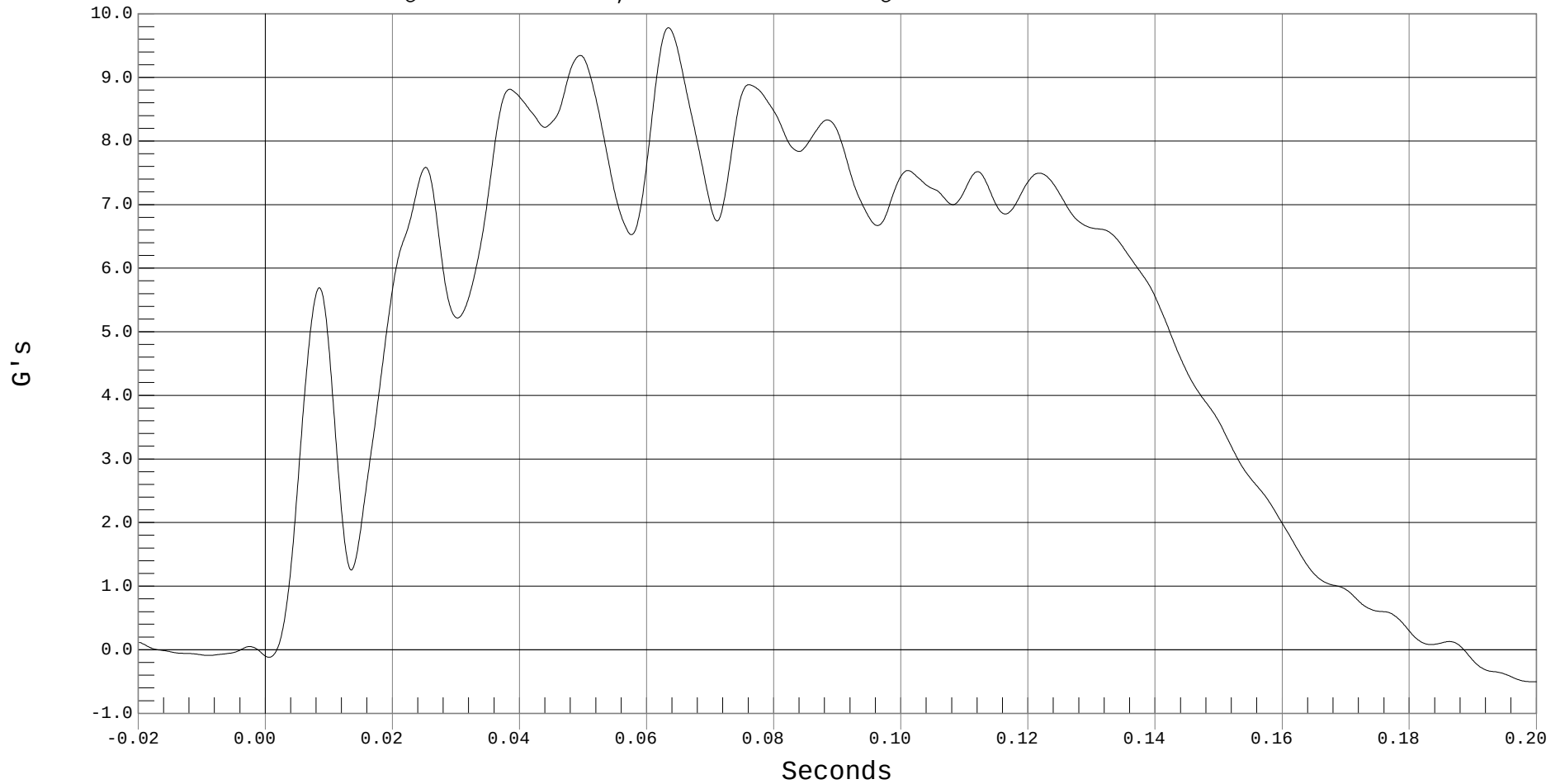
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

1 REAR FLOORPAN ABOVE AXLE Y, B01109AF.A78

Ymin = -0.5 G's @ 0.1992 Seconds, Ymax = 9.78 G's @ 0.0633 Seconds





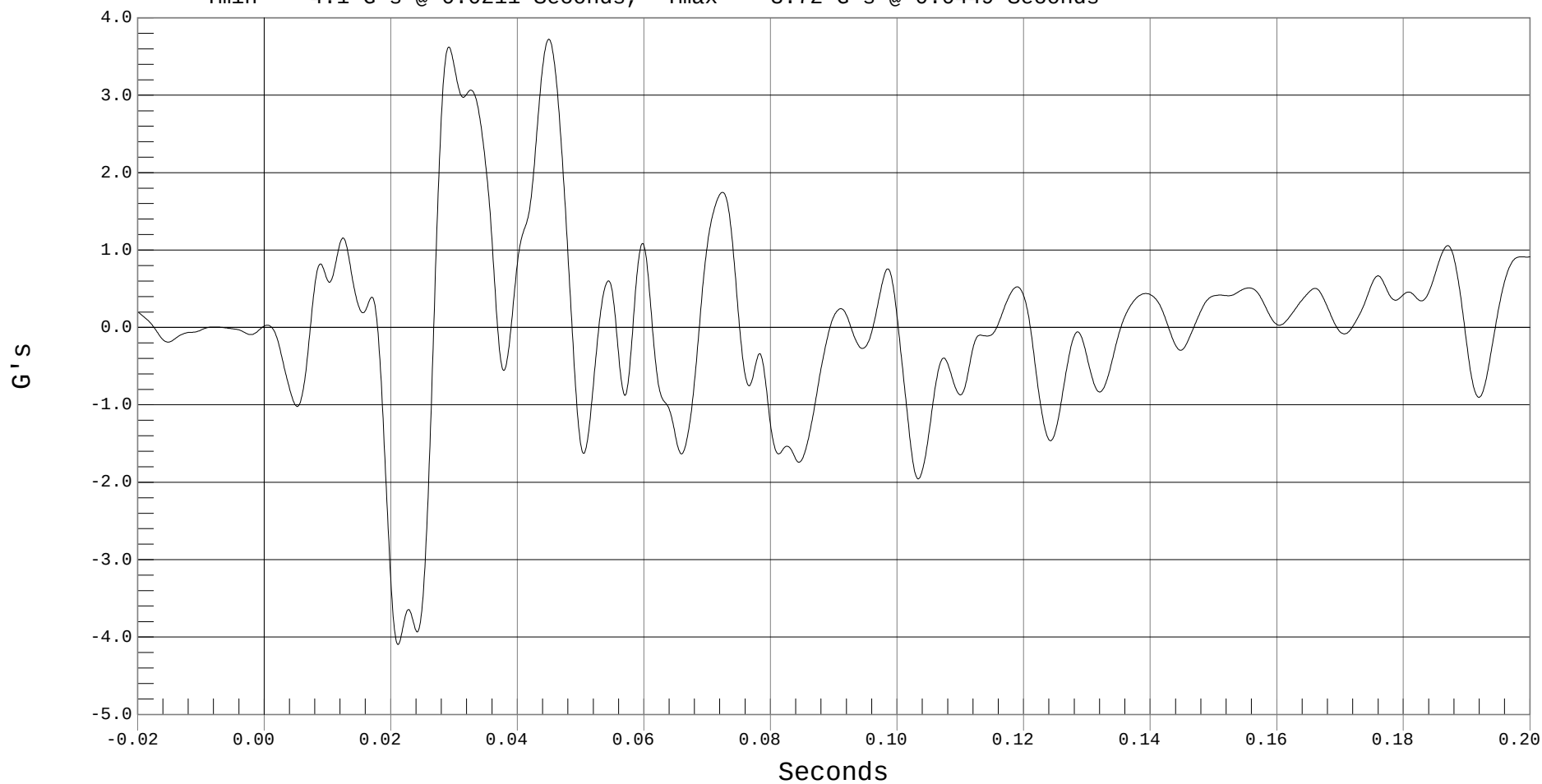
REAR FLOORPAN ABOVE AXLE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 60

1 REAR FLOORPAN ABOVE AXLE Z, B01109AF.A79

Ymin = -4.1 G's @ 0.0211 Seconds, Ymax = 3.72 G's @ 0.0449 Seconds





REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

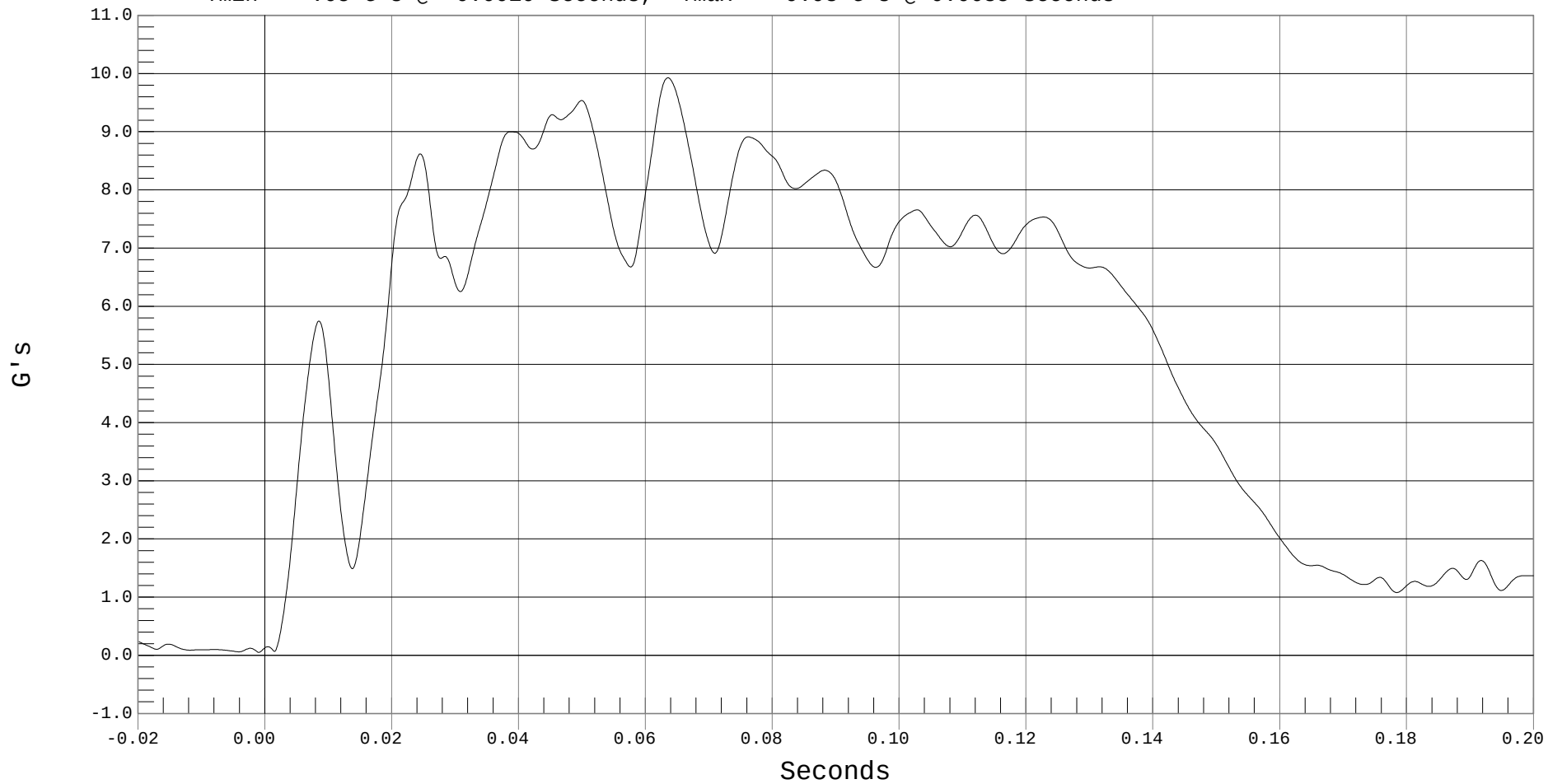
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 FLOORPAN @ REAR AXLE ACCELERATION, B01109AV.A77

Ymin = .05 G's @ -0.0010 Seconds, Ymax = 9.93 G's @ 0.0635 Seconds





LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

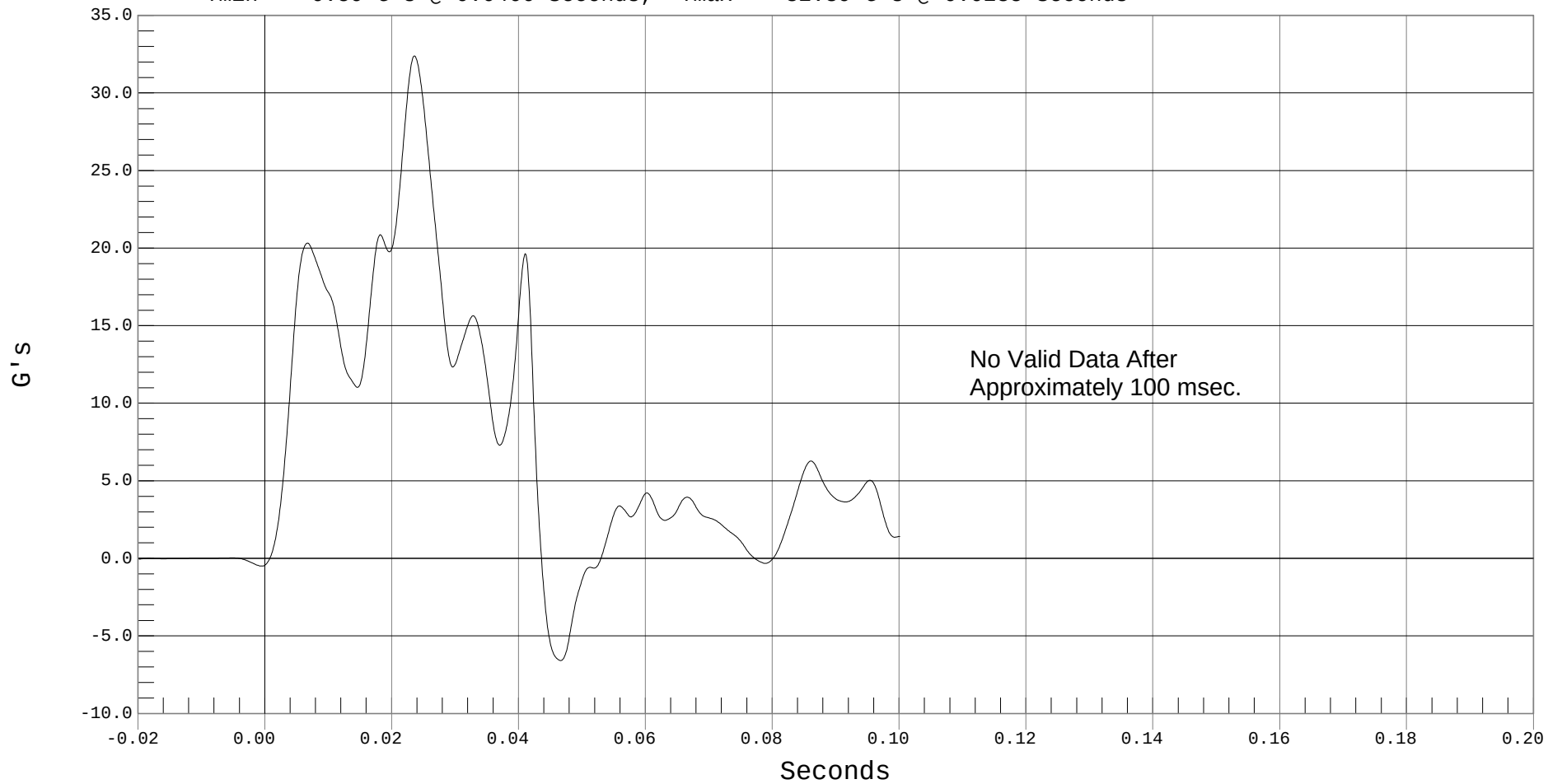
Test Date: 10-23-01

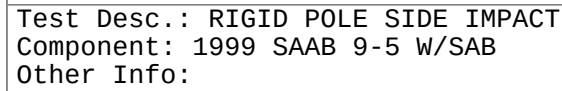
Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LEFT FRONT SILL Y, B01109AF.A81

Ymin = -6.59 G's @ 0.0466 Seconds, Ymax = 32.39 G's @ 0.0235 Seconds

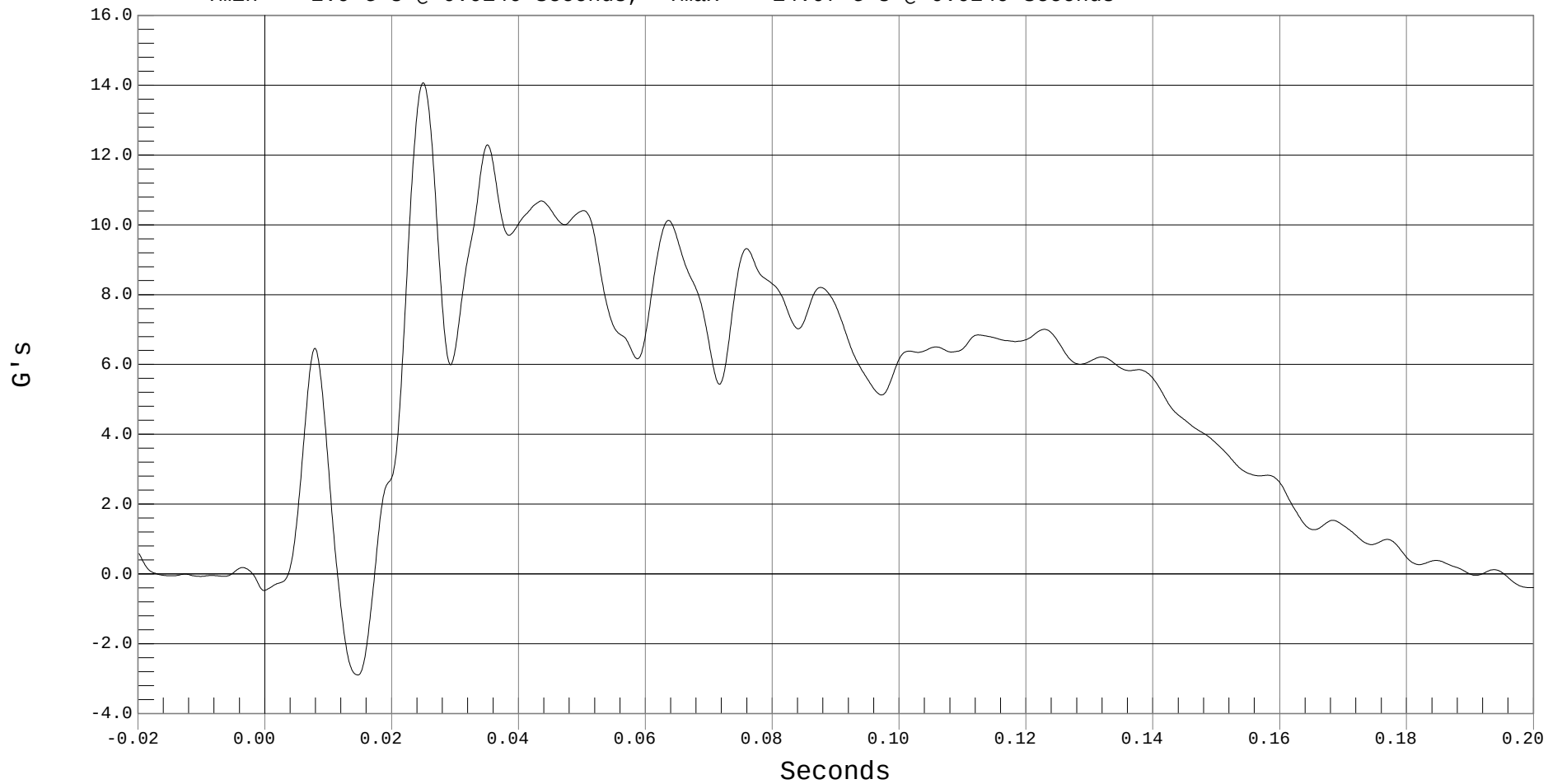




Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 60

1 LEFT REAR SILL Y, B01109AF.A80

Ymin = -2.9 G's @ 0.0146 Seconds, Ymax = 14.07 G's @ 0.0249 Seconds



B-97



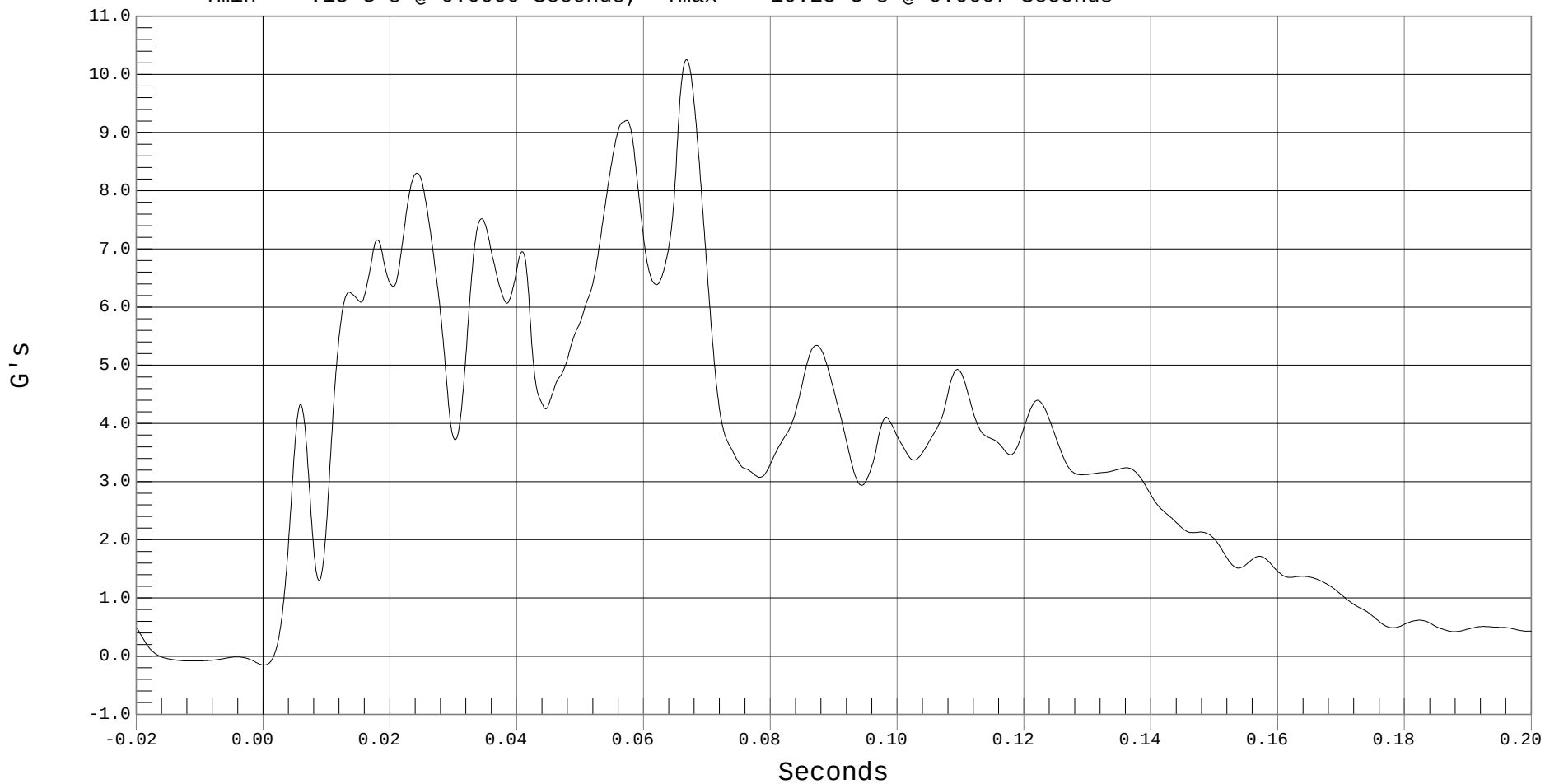
LEFT LOWER A-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 60

— 1 LEFT LOWER A-POST Y, B01109AF.A85

Ymin = -.15 G's @ 0.0000 Seconds, Ymax = 10.25 G's @ 0.0667 Seconds





LEFT MID A-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

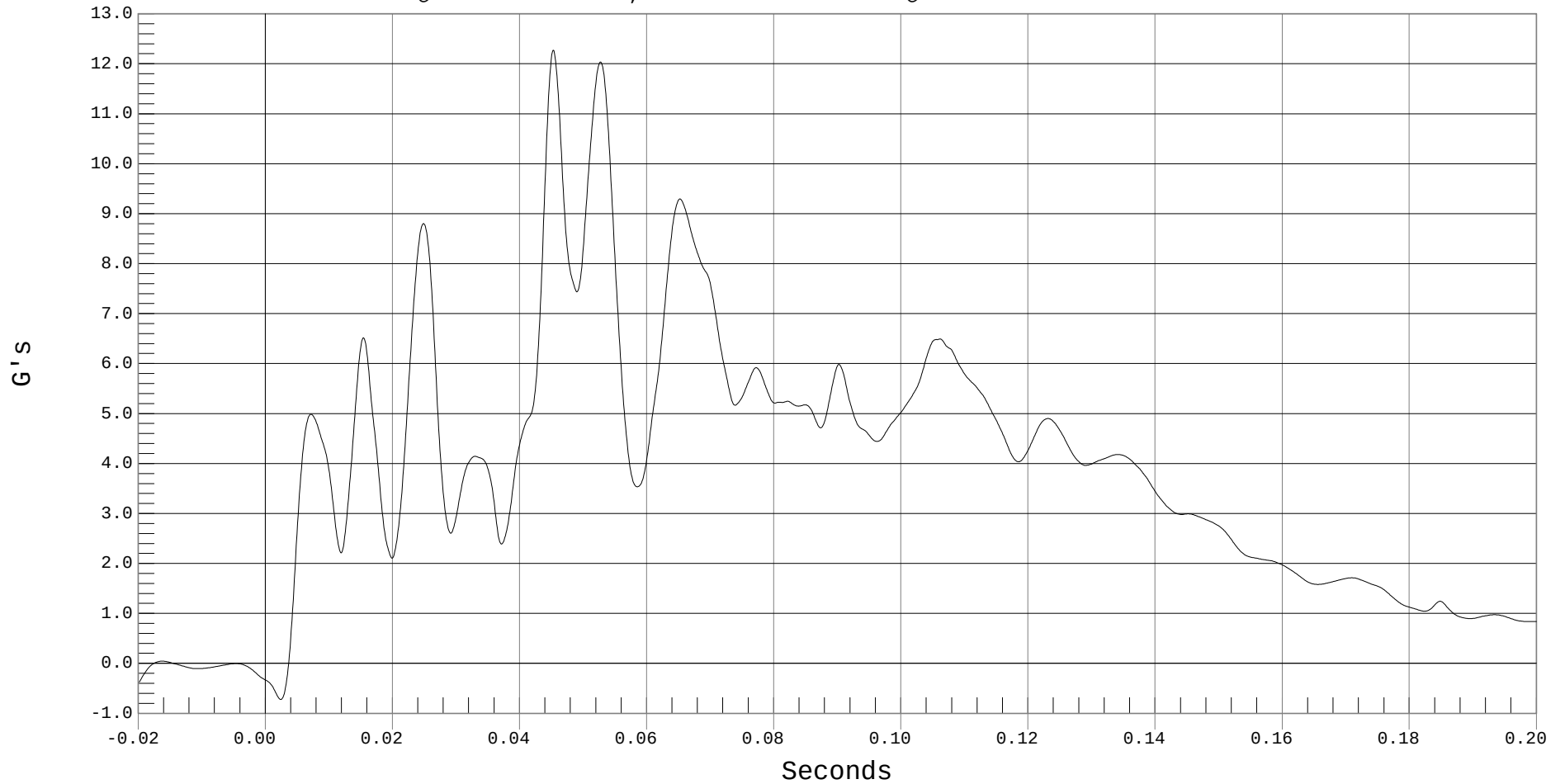
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LEFT MID A-POST Y, B01109AF.A86

Ymin = -.72 G's @ 0.0024 Seconds, Ymax = 12.27 G's @ 0.0452 Seconds





LEFT A-POST @ ROOF Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

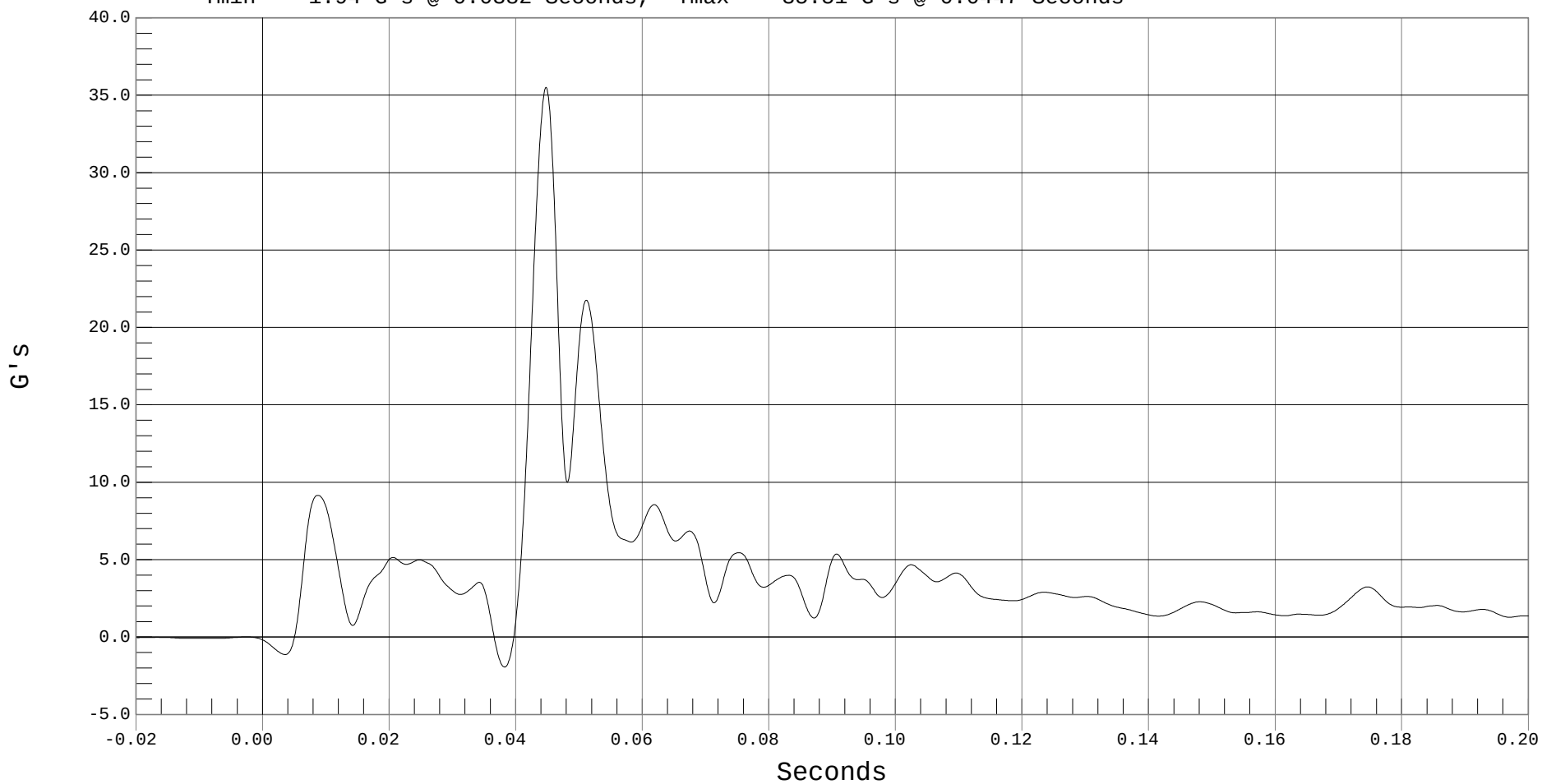
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LEFT A-PILLAR @ ROOF Y, B01109AF.A91

Ymin = -1.94 G's @ 0.0382 Seconds, Ymax = 35.51 G's @ 0.0447 Seconds





LEFT LOWER B-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

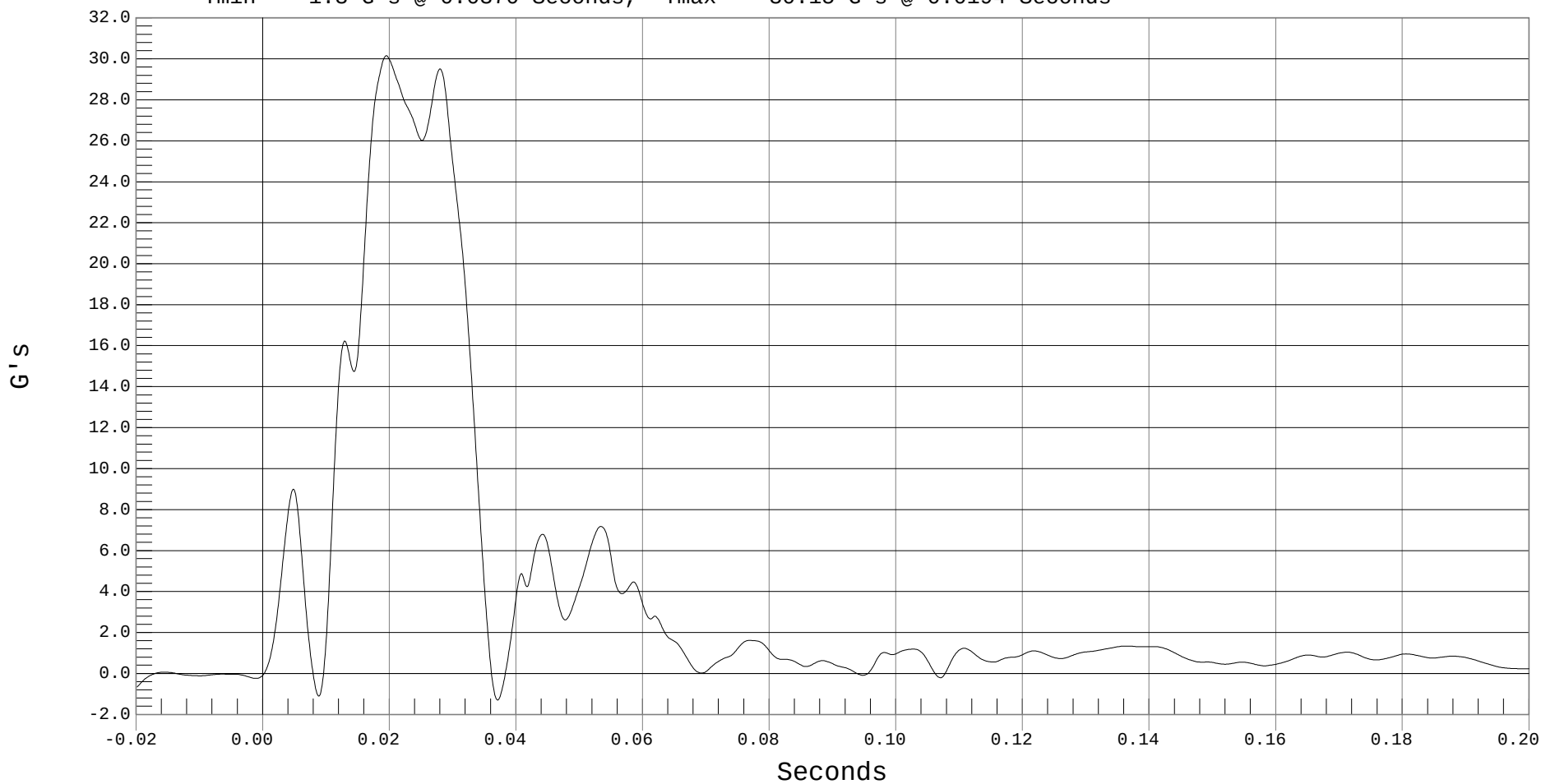
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LEFT LOWER B-POST Y, B01109AF.A82

Ymin = -1.3 G's @ 0.0370 Seconds, Ymax = 30.15 G's @ 0.0194 Seconds





LEFT UPPER B-POST Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

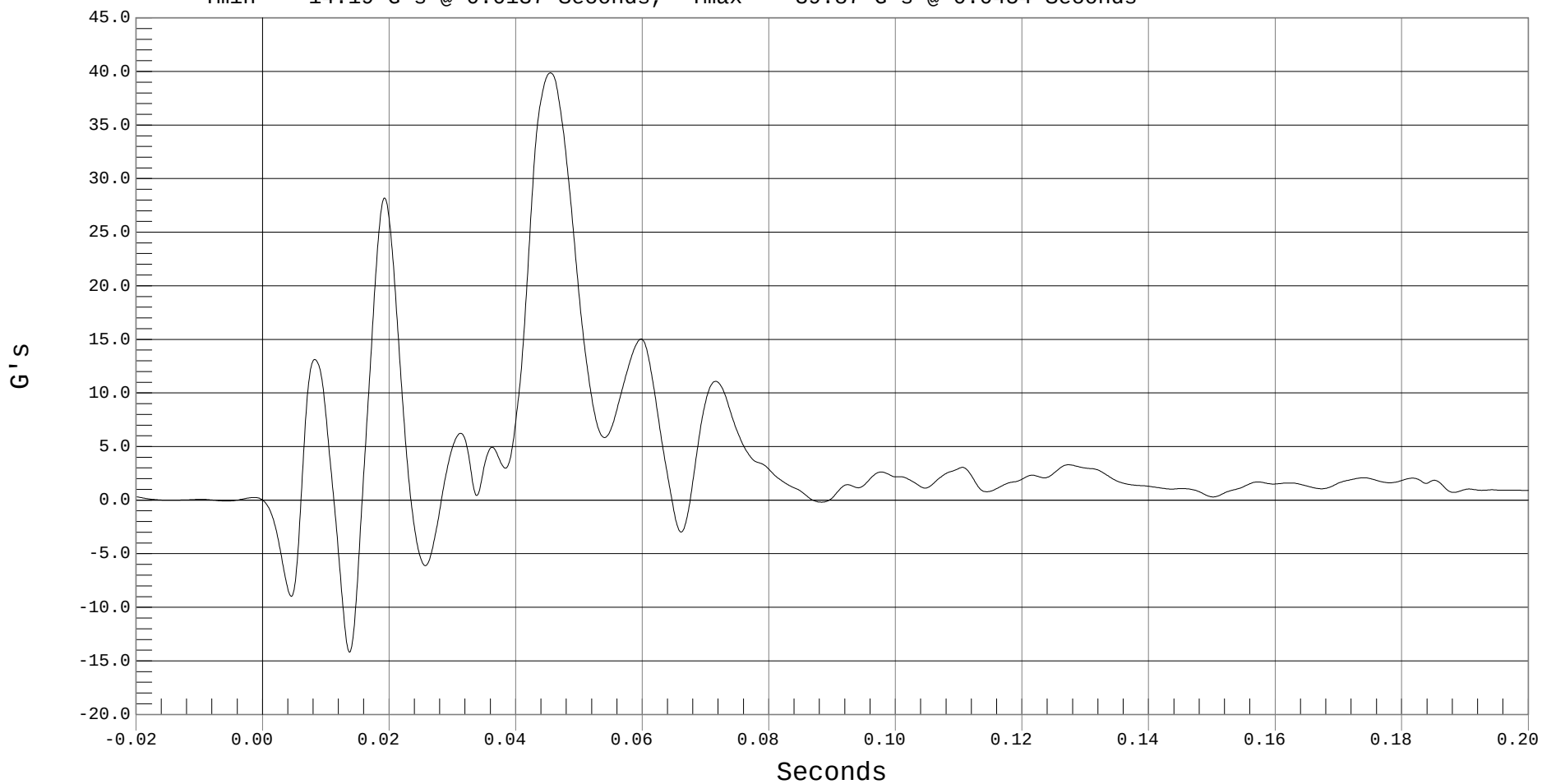
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LEFT UPPER B-POST Y, B01109AF.A84

Ymin = -14.19 G's @ 0.0137 Seconds, Ymax = 39.87 G's @ 0.0454 Seconds





LEFT DRIVER SEAT TRACK Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

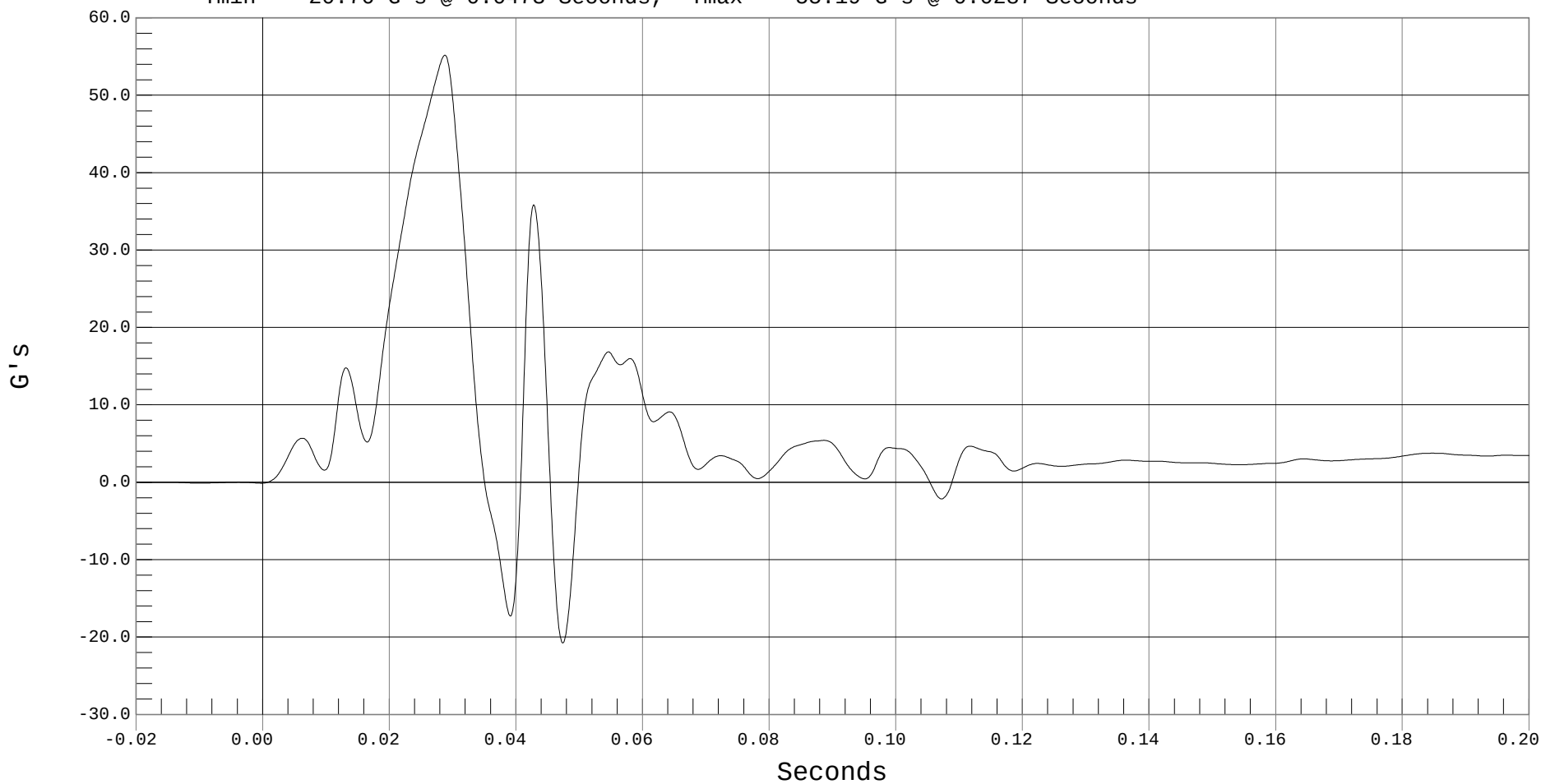
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 DRIVER LEFT SEAT TRACK Y, B01109AF.A87

Ymin = -20.76 G's @ 0.0473 Seconds, Ymax = 55.19 G's @ 0.0287 Seconds





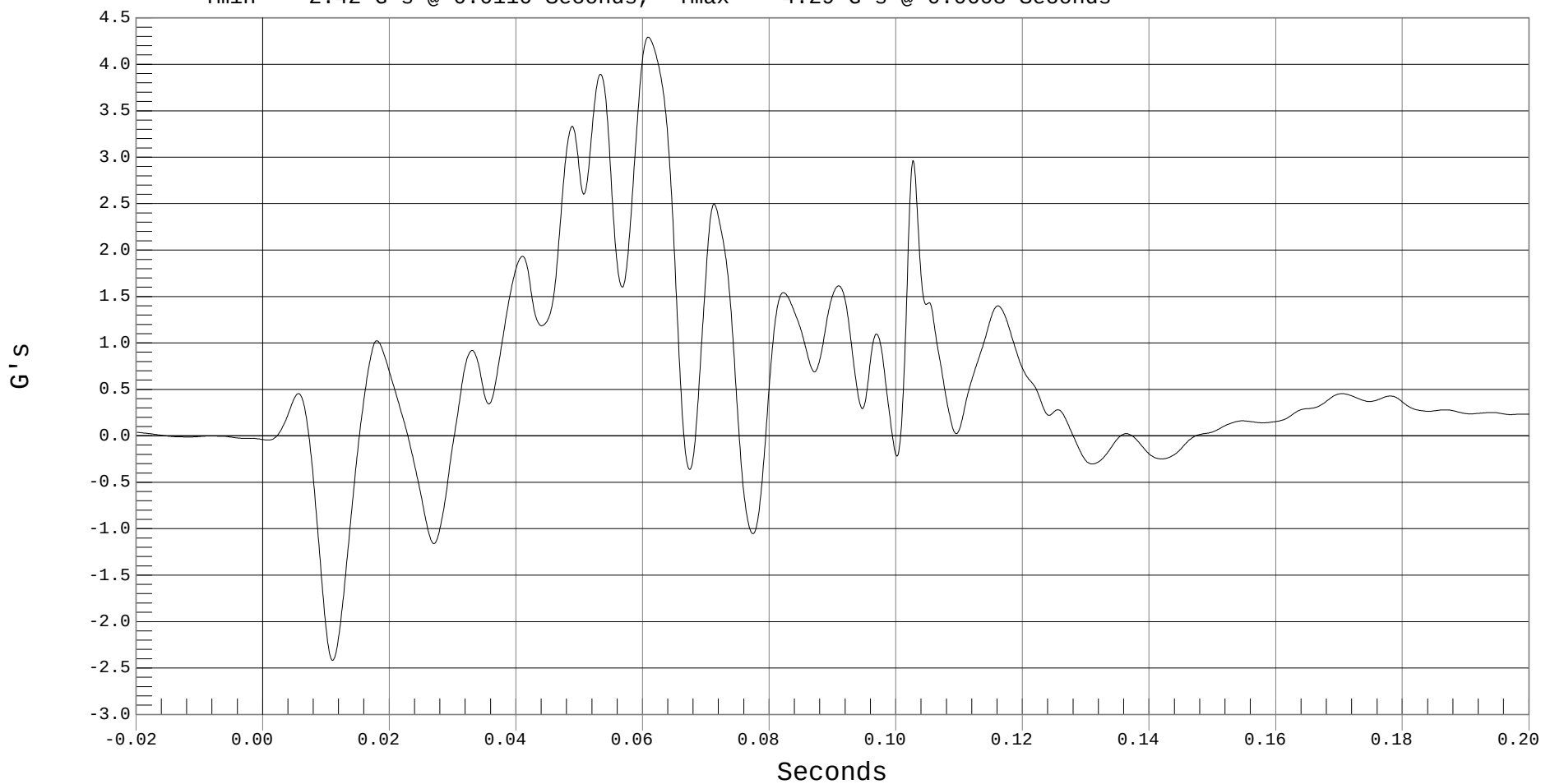
VEHICLE CG X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 60

— 1 VEHICLE CG X, B01109AF.A88

Ymin = -2.42 G's @ 0.0110 Seconds, Ymax = 4.29 G's @ 0.0608 Seconds





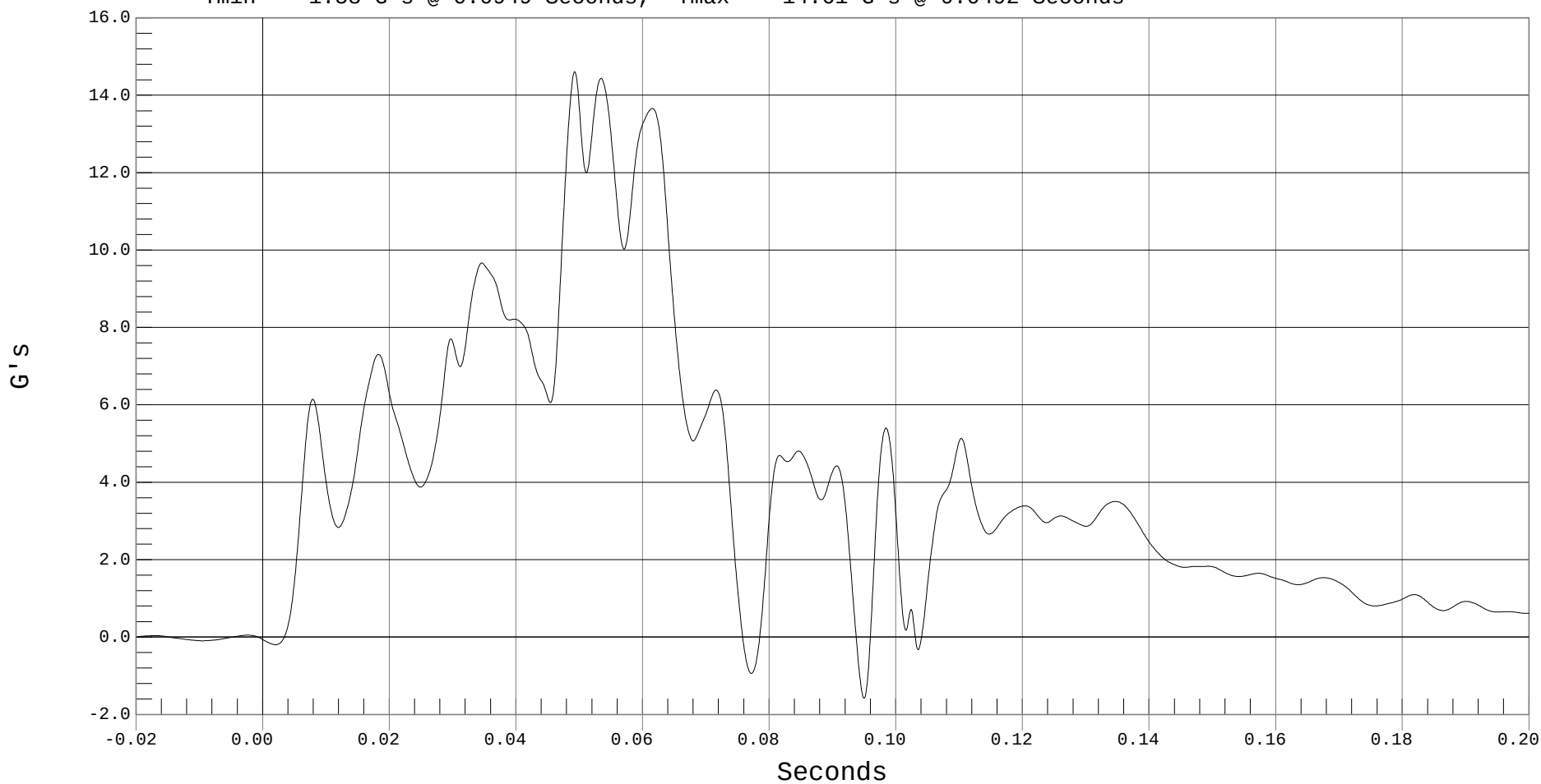
VEHICLE CG Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 60

— 1 VEHICLE CG Y, B01109AF.A89

Ymin = -1.58 G's @ 0.0949 Seconds, Ymax = 14.61 G's @ 0.0492 Seconds





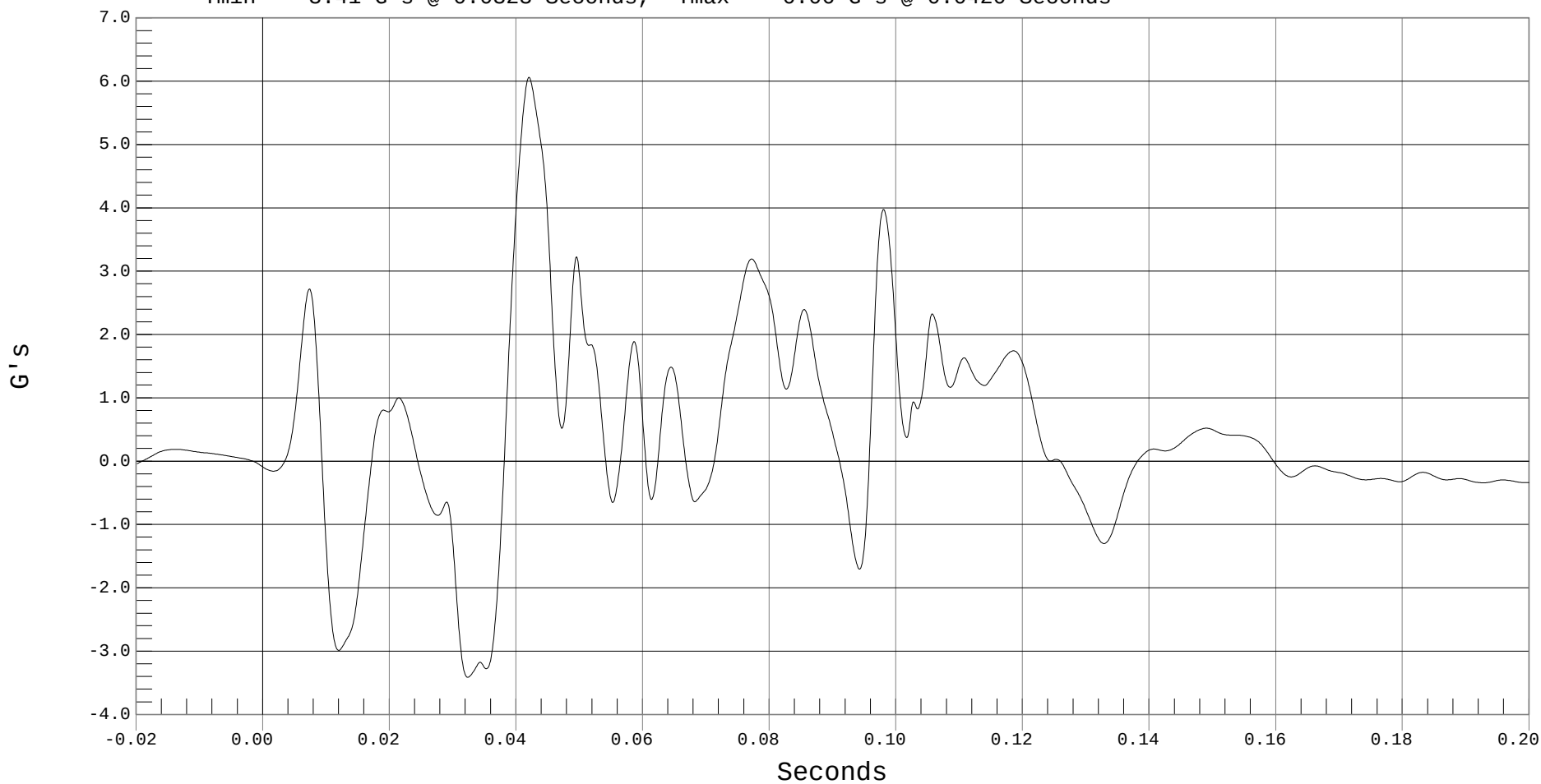
VEHICLE CG Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 60

— 1 VEHICLE CG Z, B01109AF.A90

Ymin = -3.41 G's @ 0.0323 Seconds, Ymax = 6.06 G's @ 0.0420 Seconds





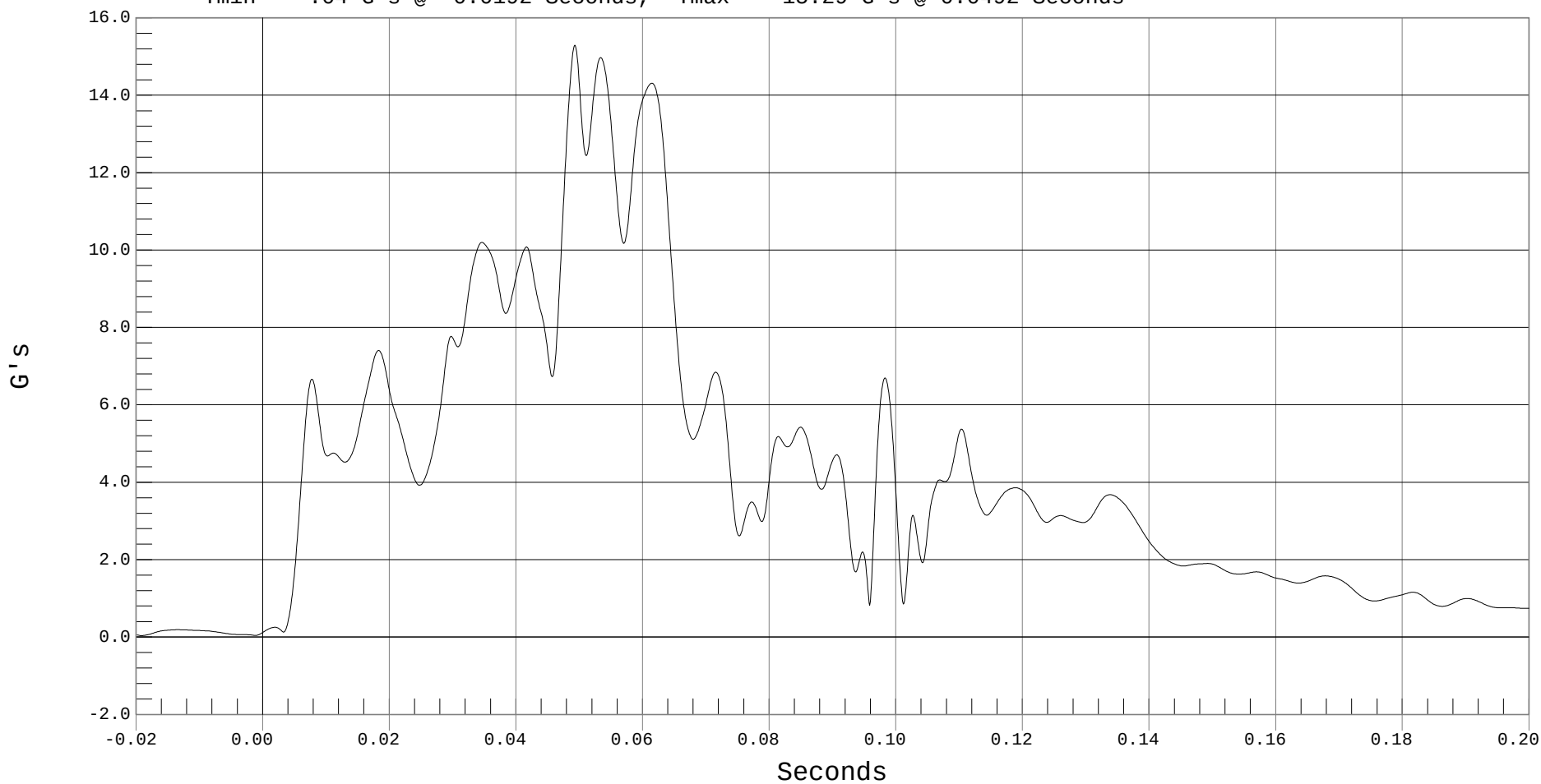
VEHICLE CG RESULTANT ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Filter Class: 60

— 1 VEHICLE CG RESULTANT ACCELERATION, B01109AV.A88

Ymin = .04 G's @ -0.0192 Seconds, Ymax = 15.29 G's @ 0.0492 Seconds





LEFT FRONT DOOR @ PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

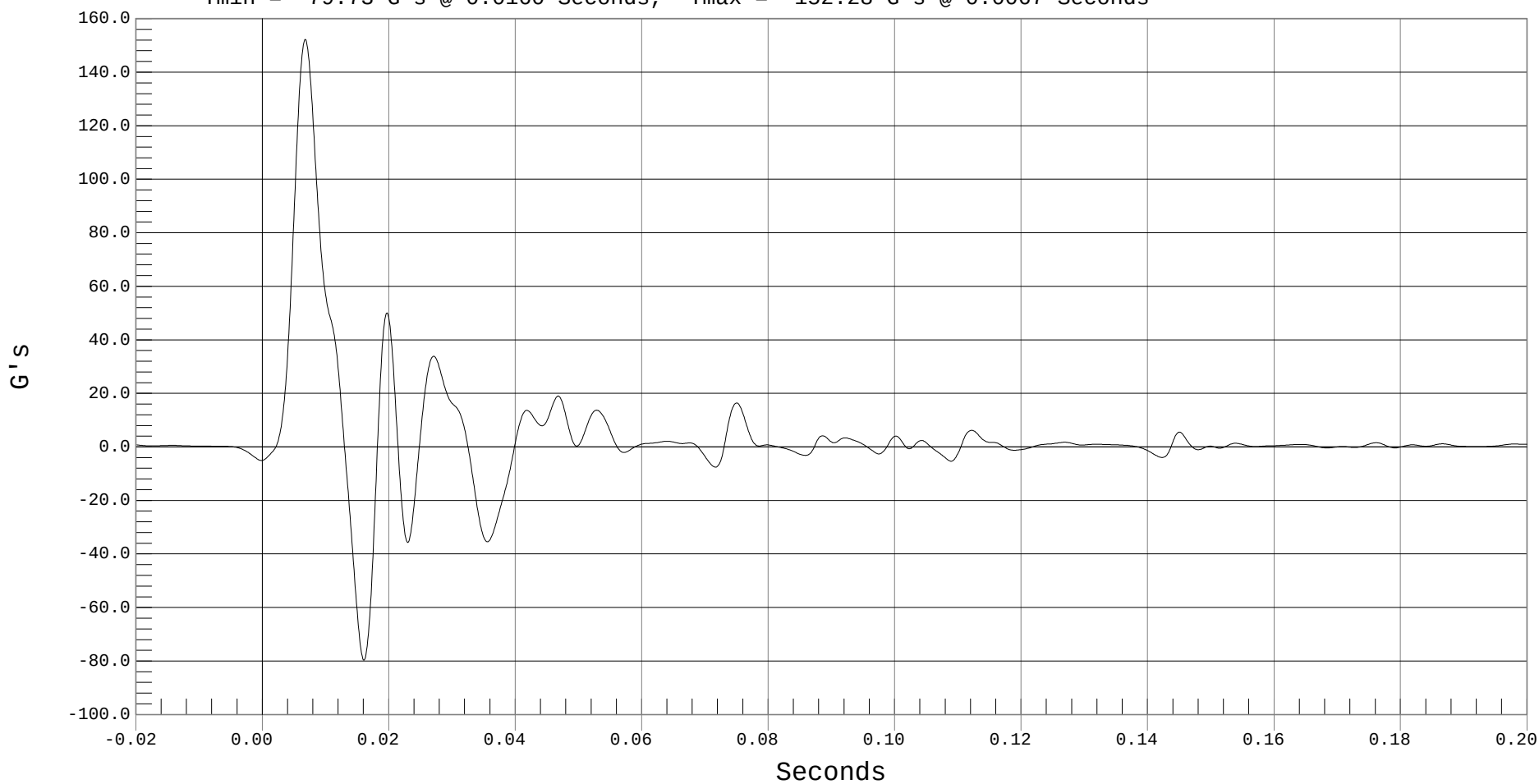
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LEFT FRONT DOOR @ PELVIS, B01109AF.A92

Ymin = -79.73 G's @ 0.0160 Seconds, Ymax = 152.28 G's @ 0.0067 Seconds





LEFT FRONT DOOR @ ARM Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

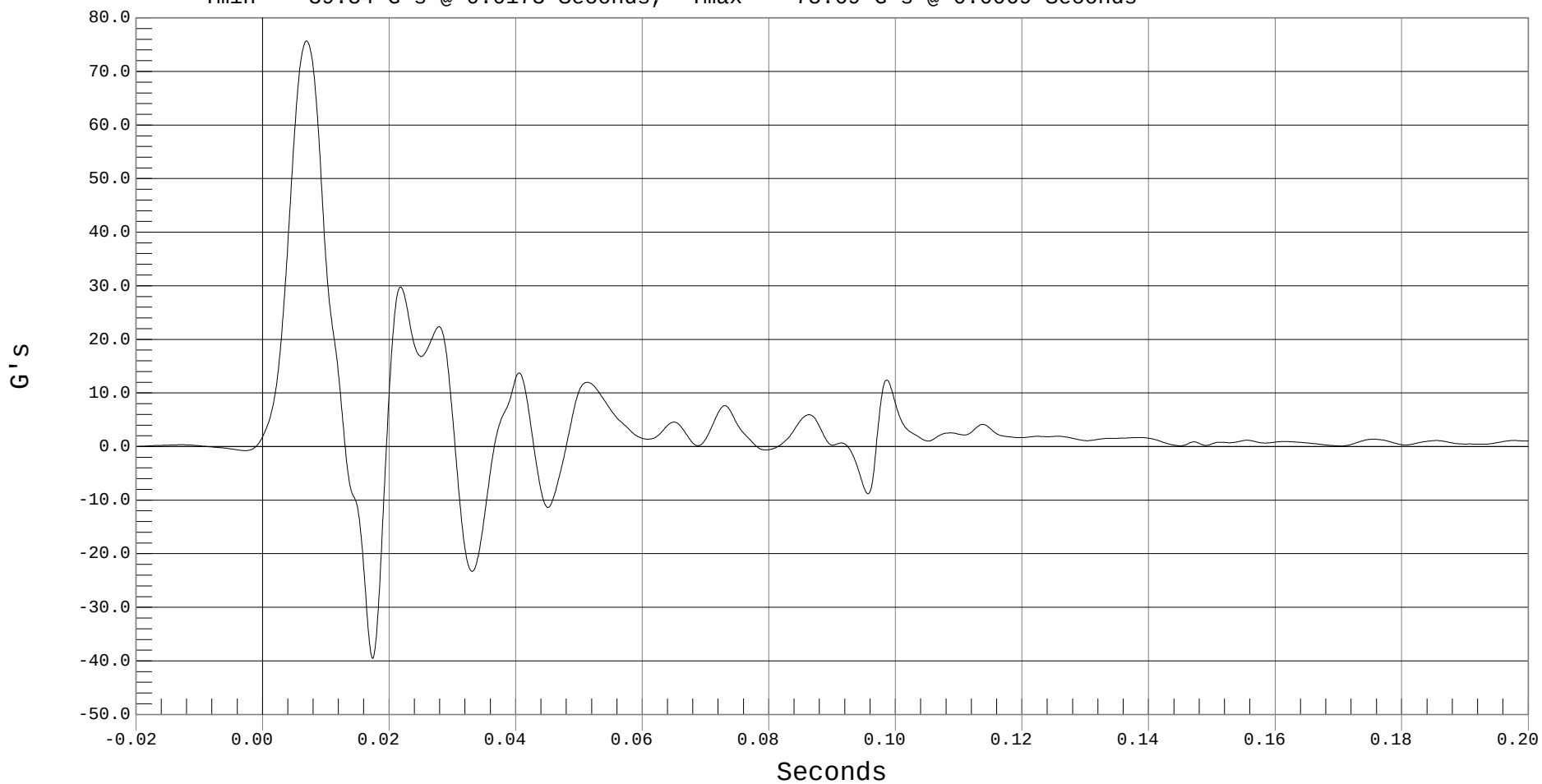
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LEFT FRONT DOOR @ ARM, B01109AF.A93

Ymin = -39.54 G's @ 0.0173 Seconds, Ymax = 75.69 G's @ 0.0069 Seconds





LOWER CENTER RADIATOR SUPPORT X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

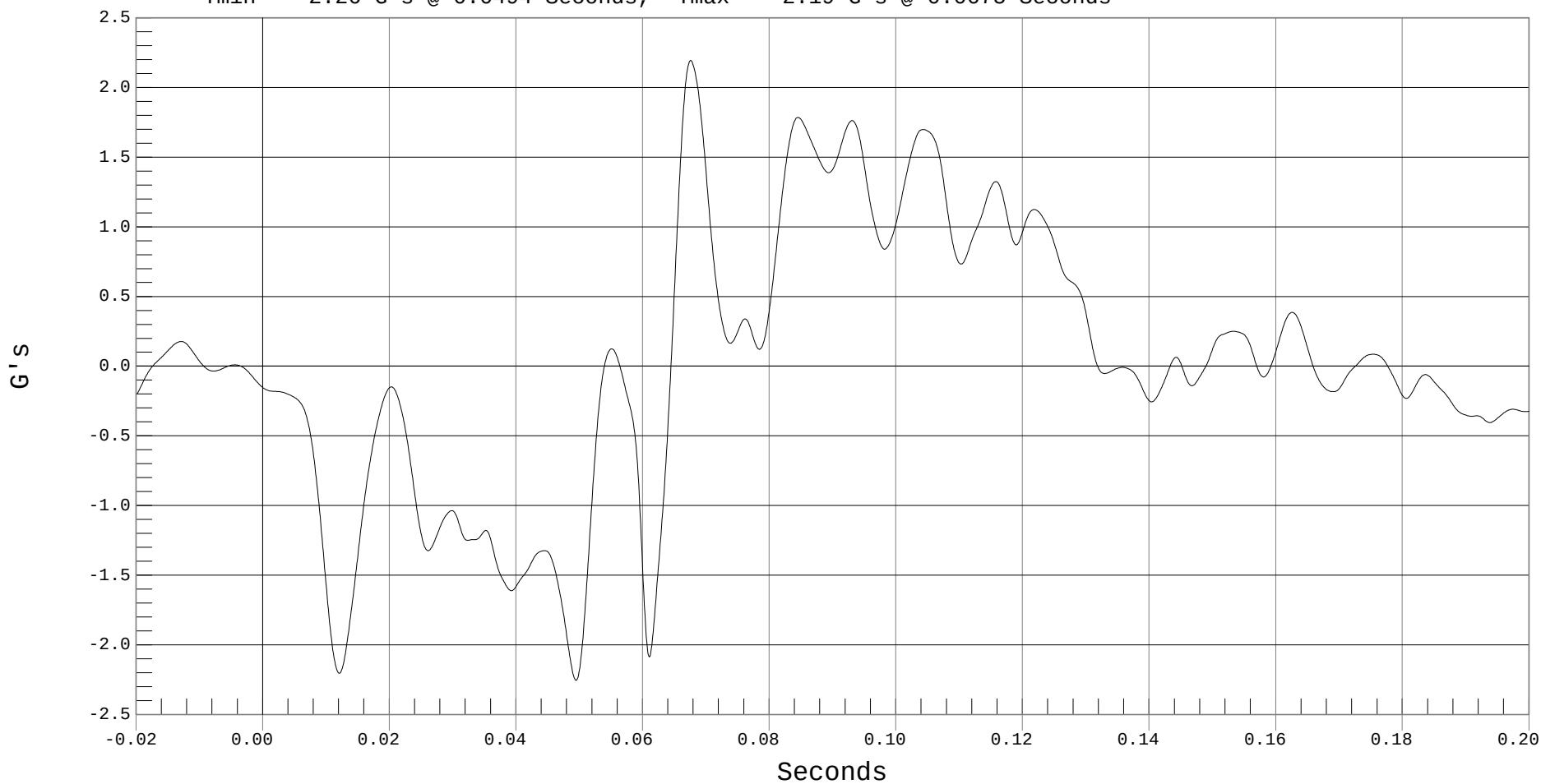
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LOWER CENTER RADIATOR SUPPORT X, B01109AF.A94

Ymin = -2.26 G's @ 0.0494 Seconds, Ymax = 2.19 G's @ 0.0675 Seconds





LOWER CENTER RADIATOR SUPPORT Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

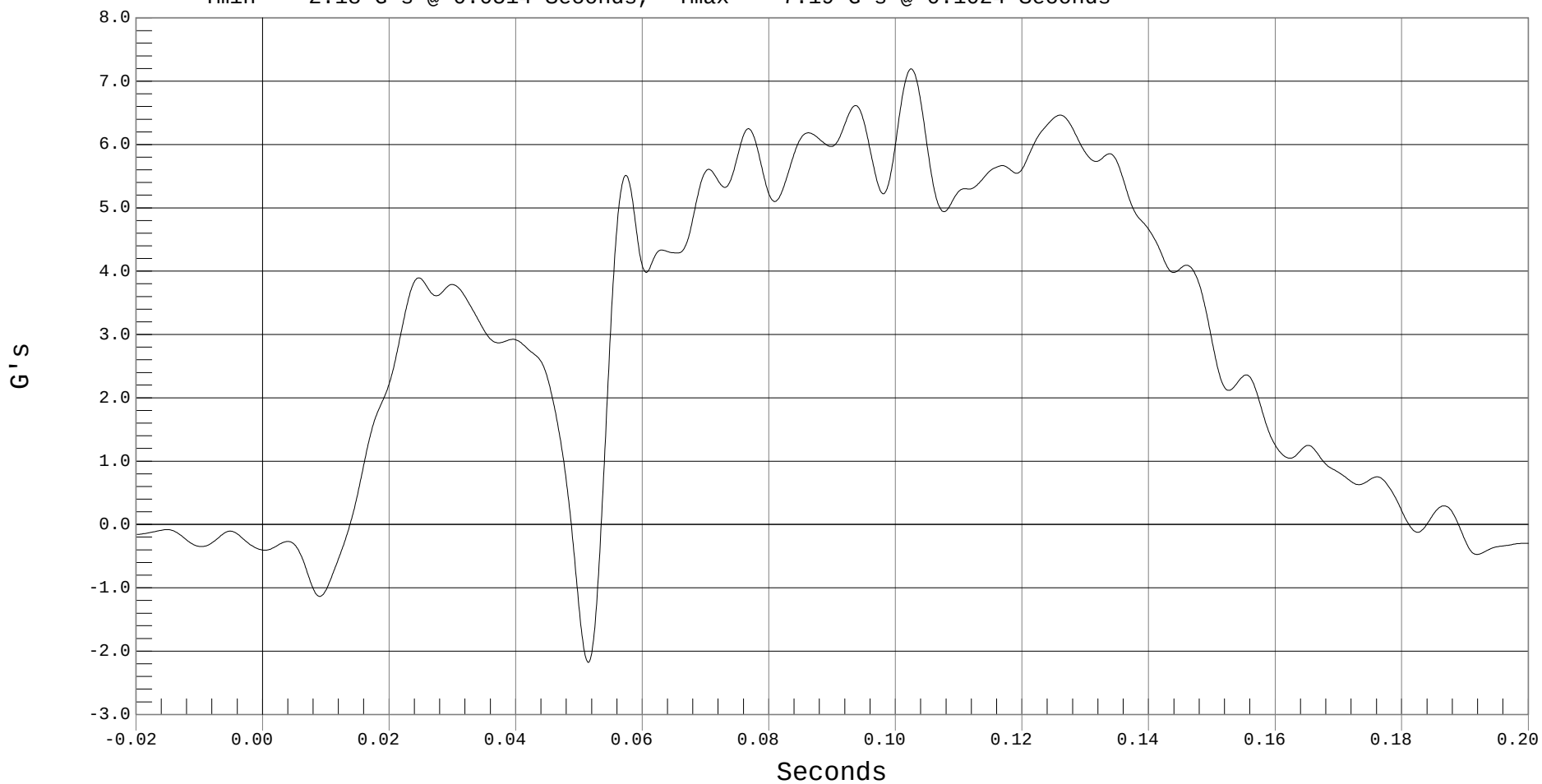
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LOWER CENTER RADIATOR SUPPORT Y, B01109AF.A95

Ymin = -2.18 G's @ 0.0514 Seconds, Ymax = 7.19 G's @ 0.1024 Seconds





LOWER CENTER RADIATOR SUPPORT Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

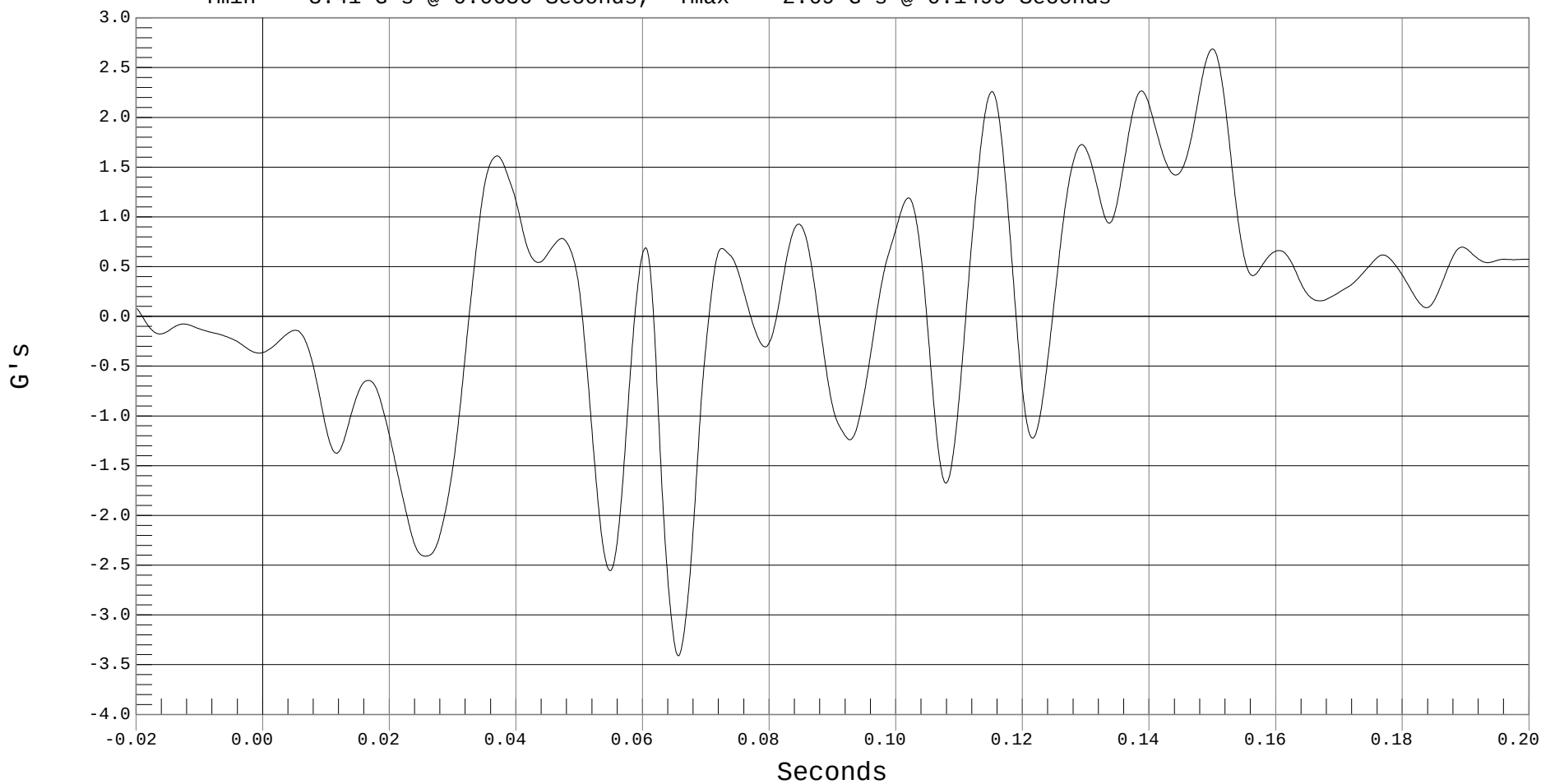
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Filter Class: 60

— 1 LOWER CENTER RADIATOR SUPPORT Z, B01109AF.A96

Ymin = -3.41 G's @ 0.0656 Seconds, Ymax = 2.69 G's @ 0.1499 Seconds





DRIVER UPPER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

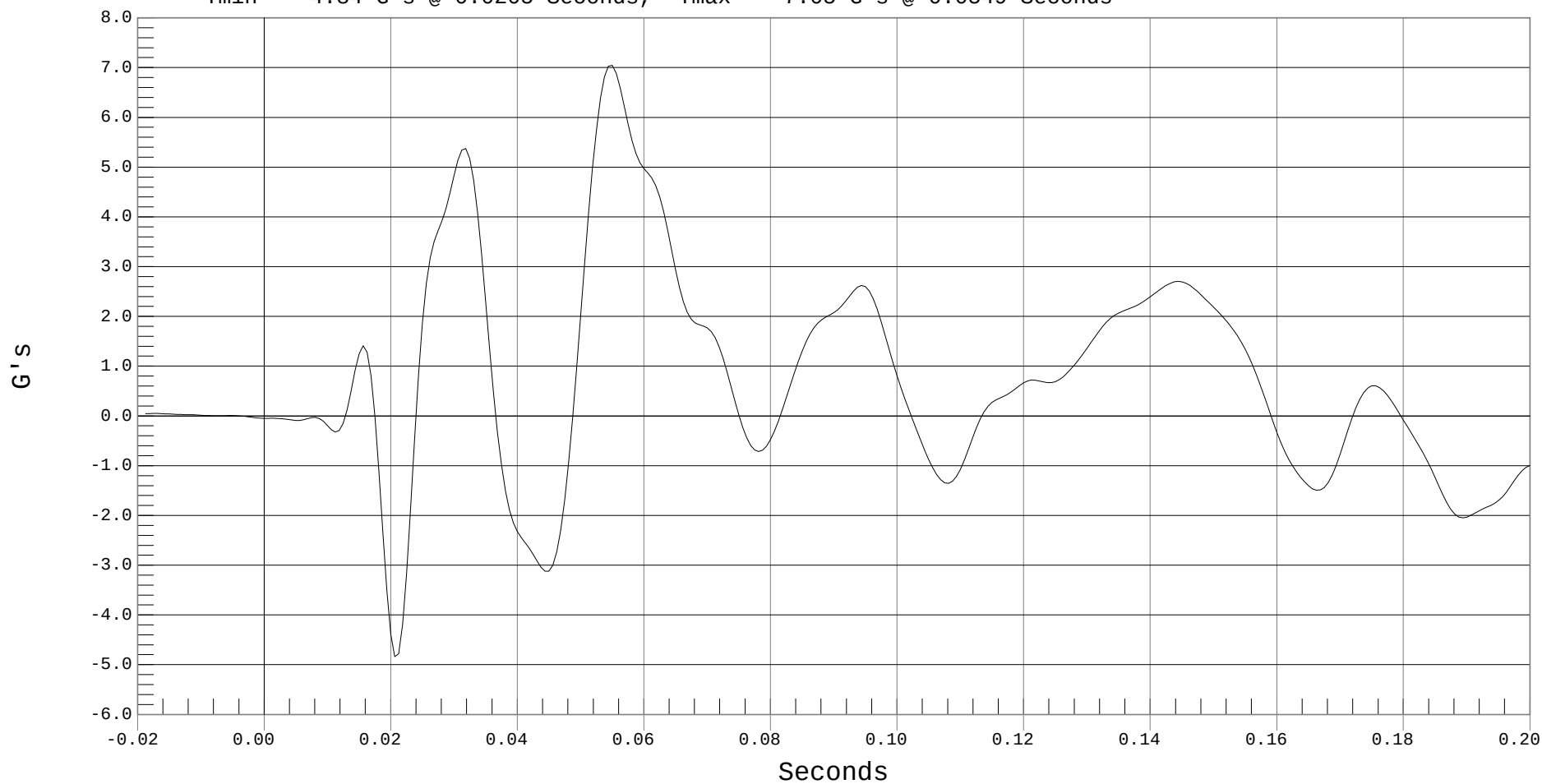
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Fir Filtered

— 1 DRIVER UPPER SPINE X, B01109FI.R20

Ymin = -4.84 G's @ 0.0205 Seconds, Ymax = 7.05 G's @ 0.0549 Seconds





DRIVER UPPER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

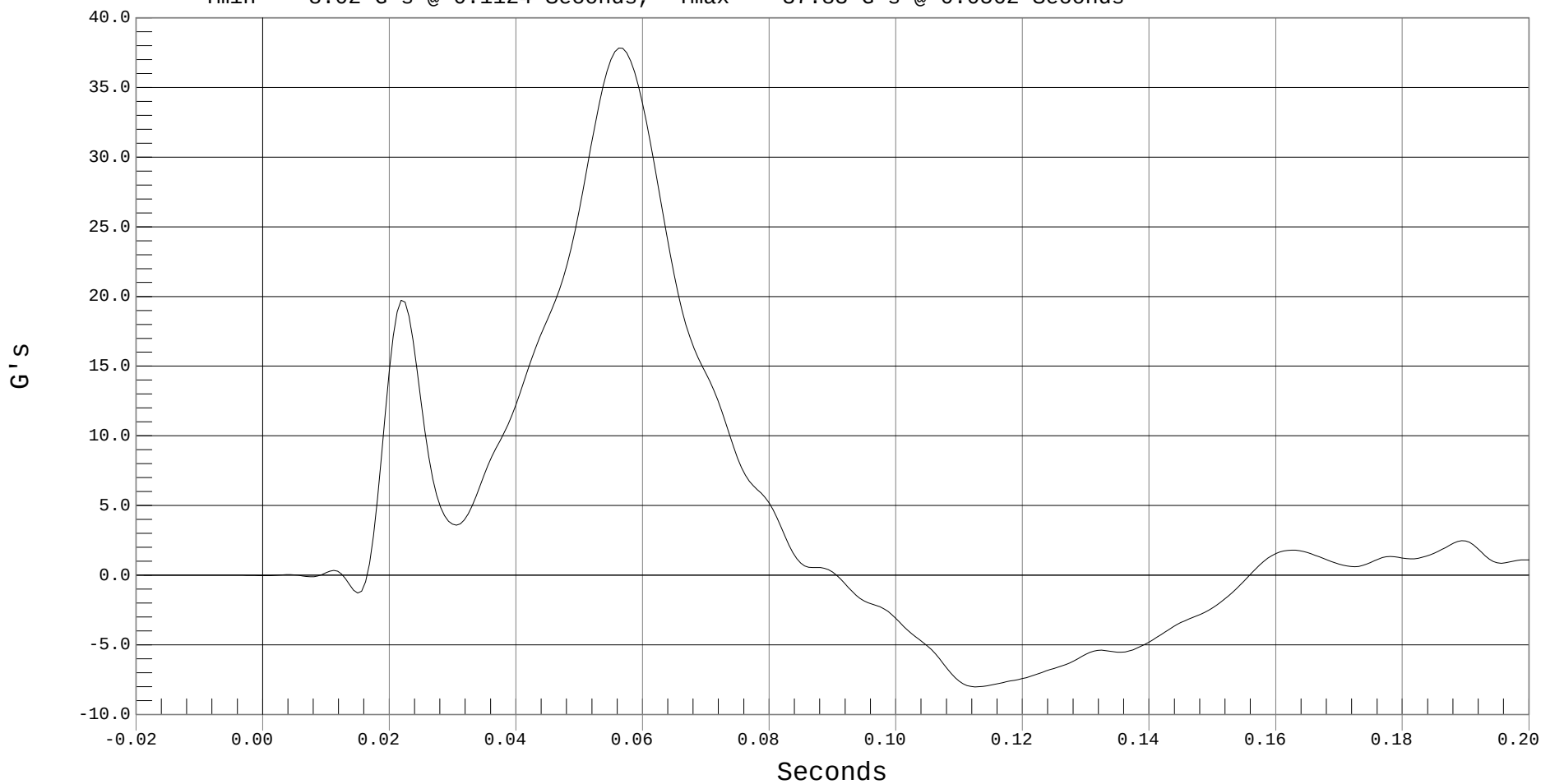
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Fir Filtered

— 1 DRIVER UPPER SPINE Y, B01109FI.R21

Ymin = -8.02 G's @ 0.1124 Seconds, Ymax = 37.83 G's @ 0.0562 Seconds





DRIVER UPPER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

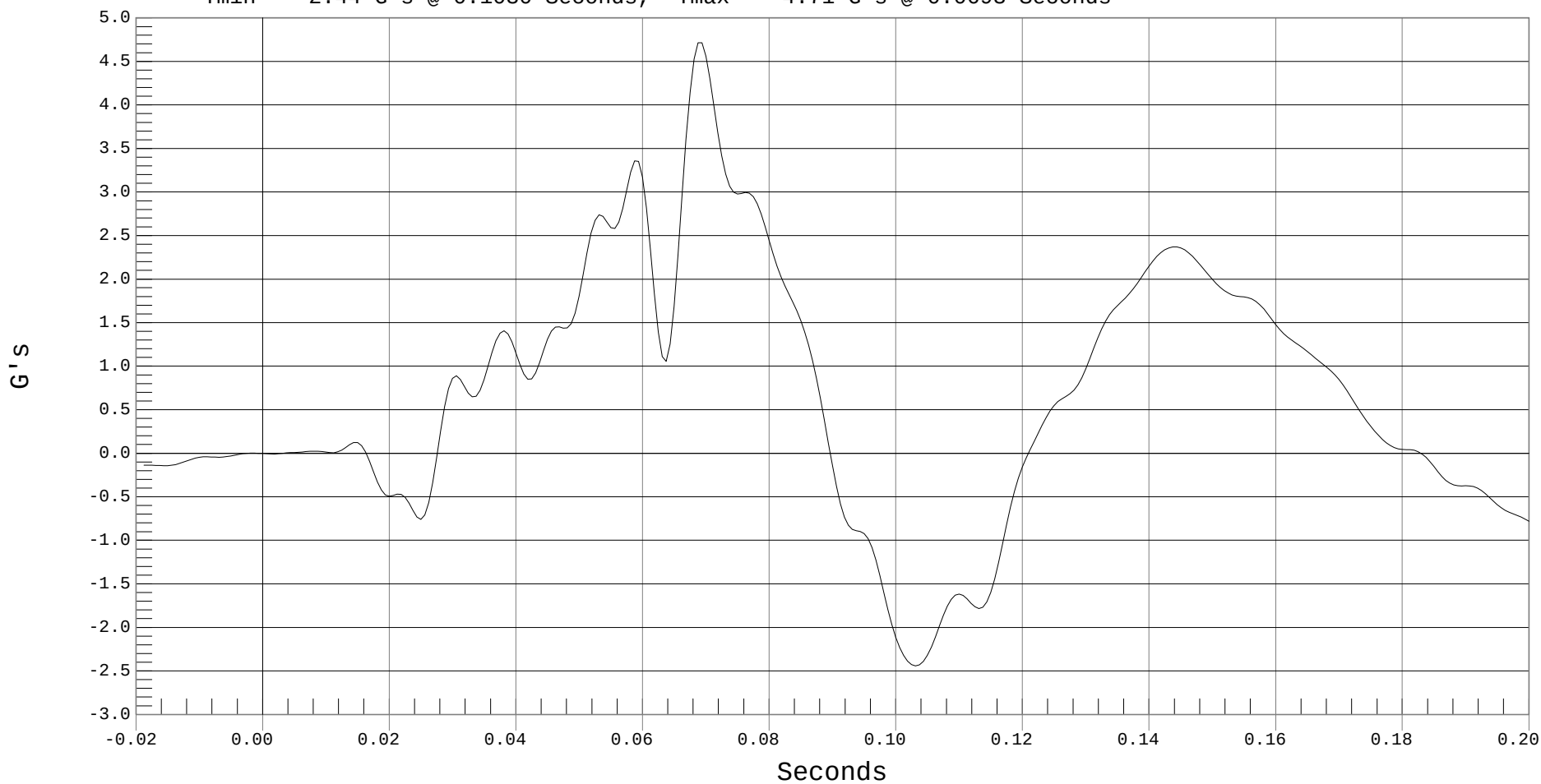
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Fir Filtered

— 1 DRIVER UPPER SPINE Z, B01109FI.R22

Ymin = -2.44 G's @ 0.1030 Seconds, Ymax = 4.71 G's @ 0.0693 Seconds





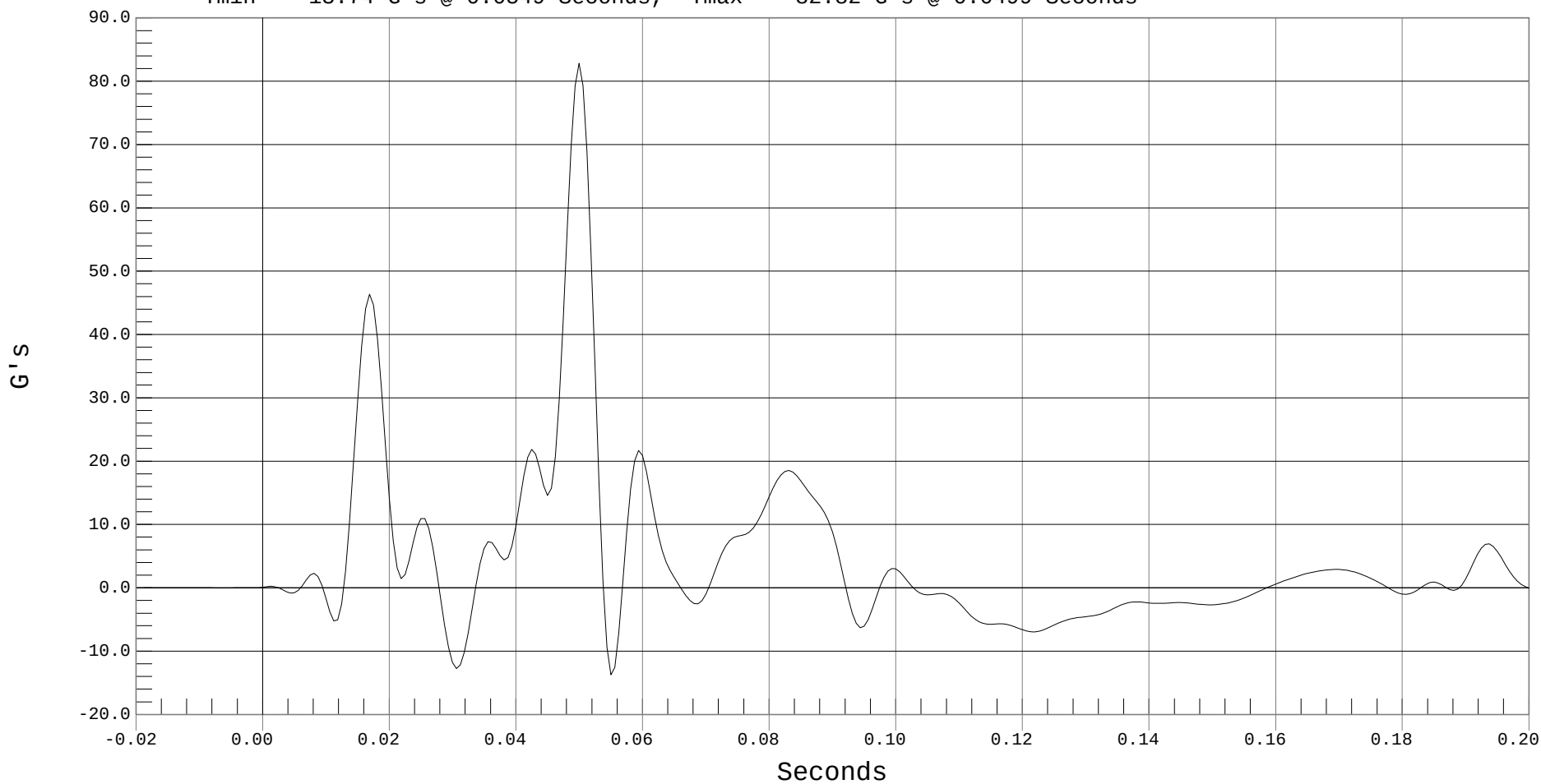
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Fir Filtered

— 1 DRIVER UPPER RIB Y, B01109FI.R23

Ymin = -13.74 G's @ 0.0549 Seconds, Ymax = 82.82 G's @ 0.0499 Seconds





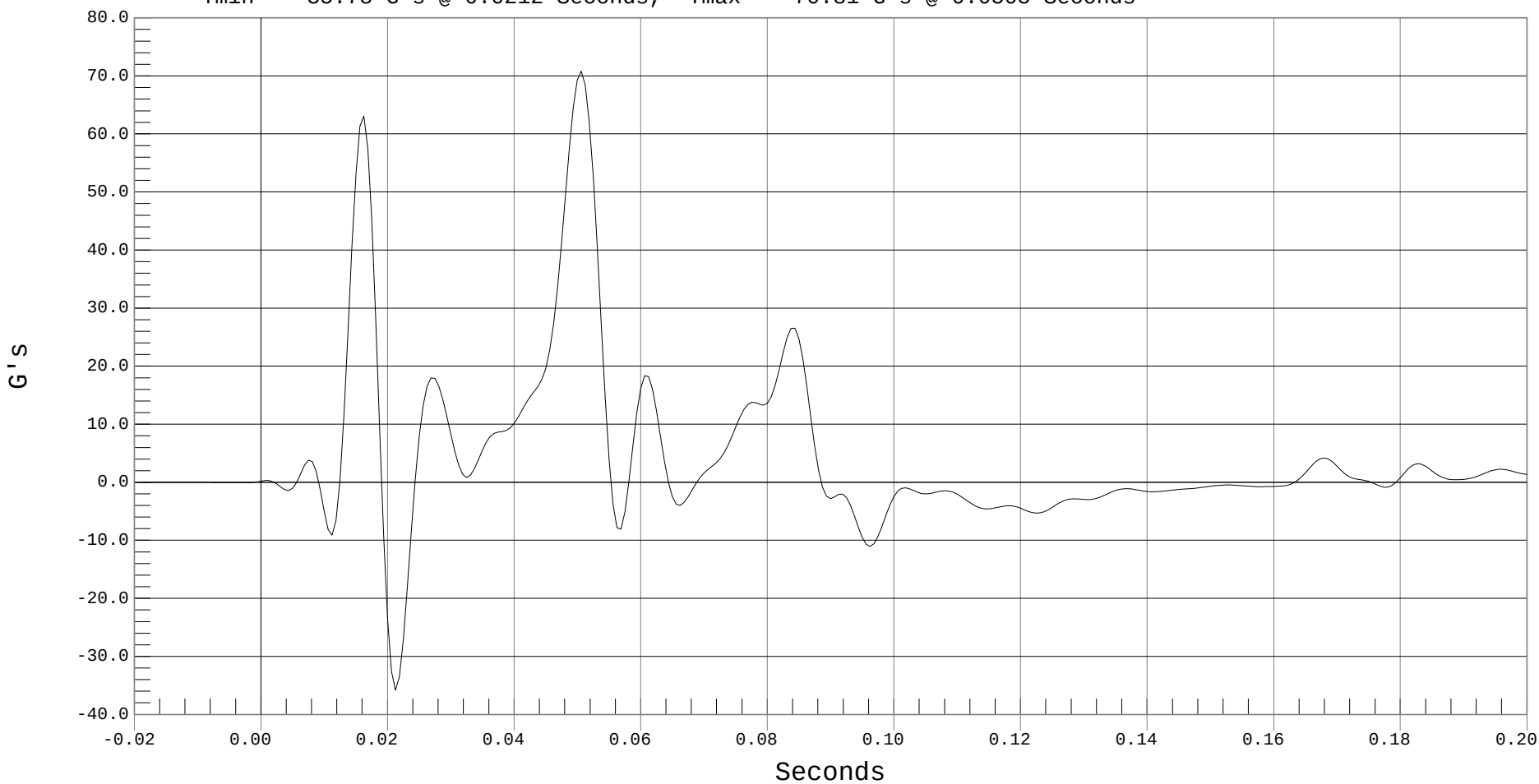
DRIVER MID RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Fir Filtered

— 1 DRIVER MID RIB Y, B01109FI.R24

Ymin = -35.78 G's @ 0.0212 Seconds, Ymax = 70.81 G's @ 0.0505 Seconds





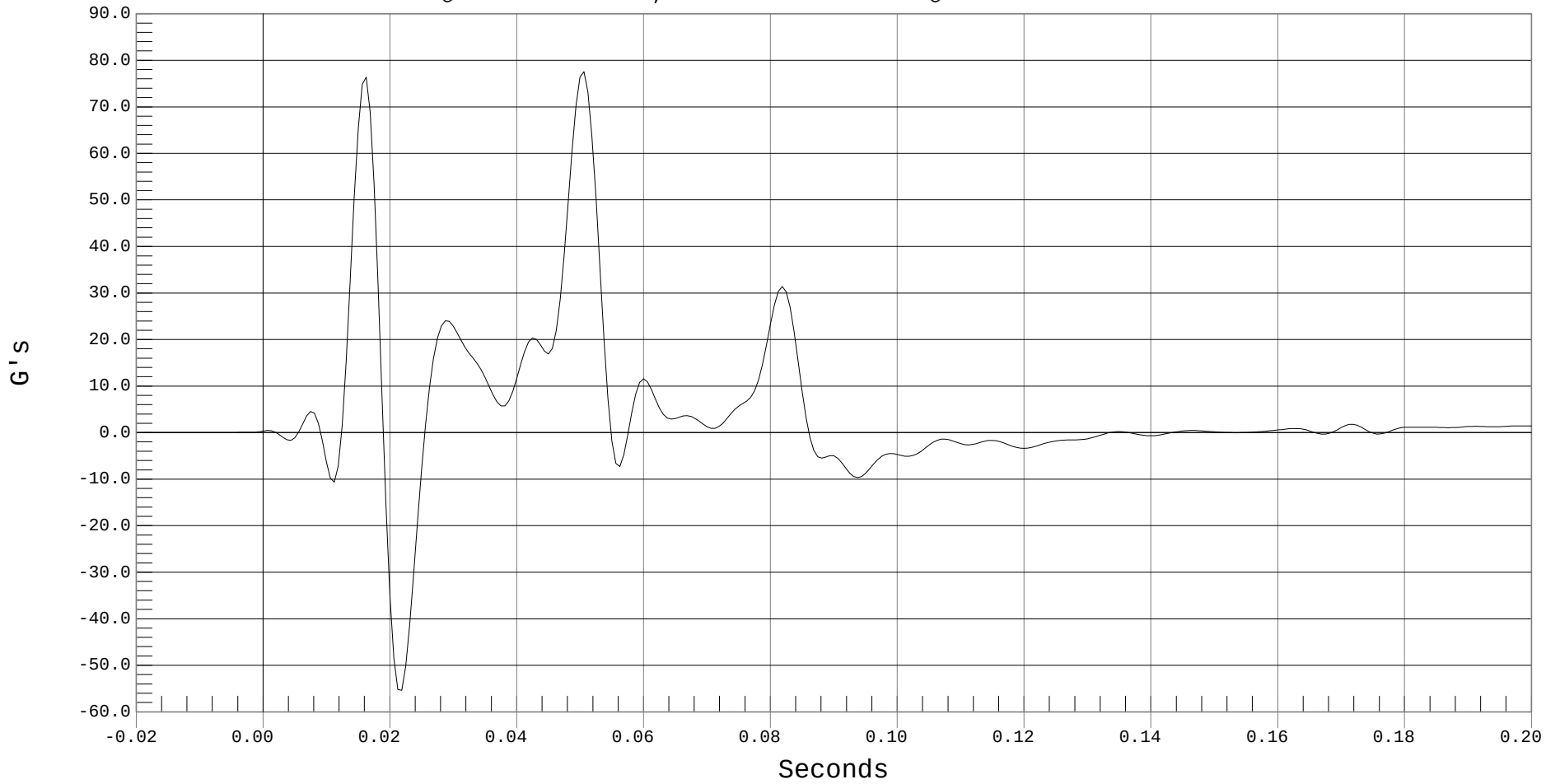
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Fir Filtered

— 1 DRIVER LOWER RIB Y, B01109FI.R25

Ymin = -55.37 G's @ 0.0218 Seconds, Ymax = 77.57 G's @ 0.0505 Seconds





DRIVER LOWER SPINE X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

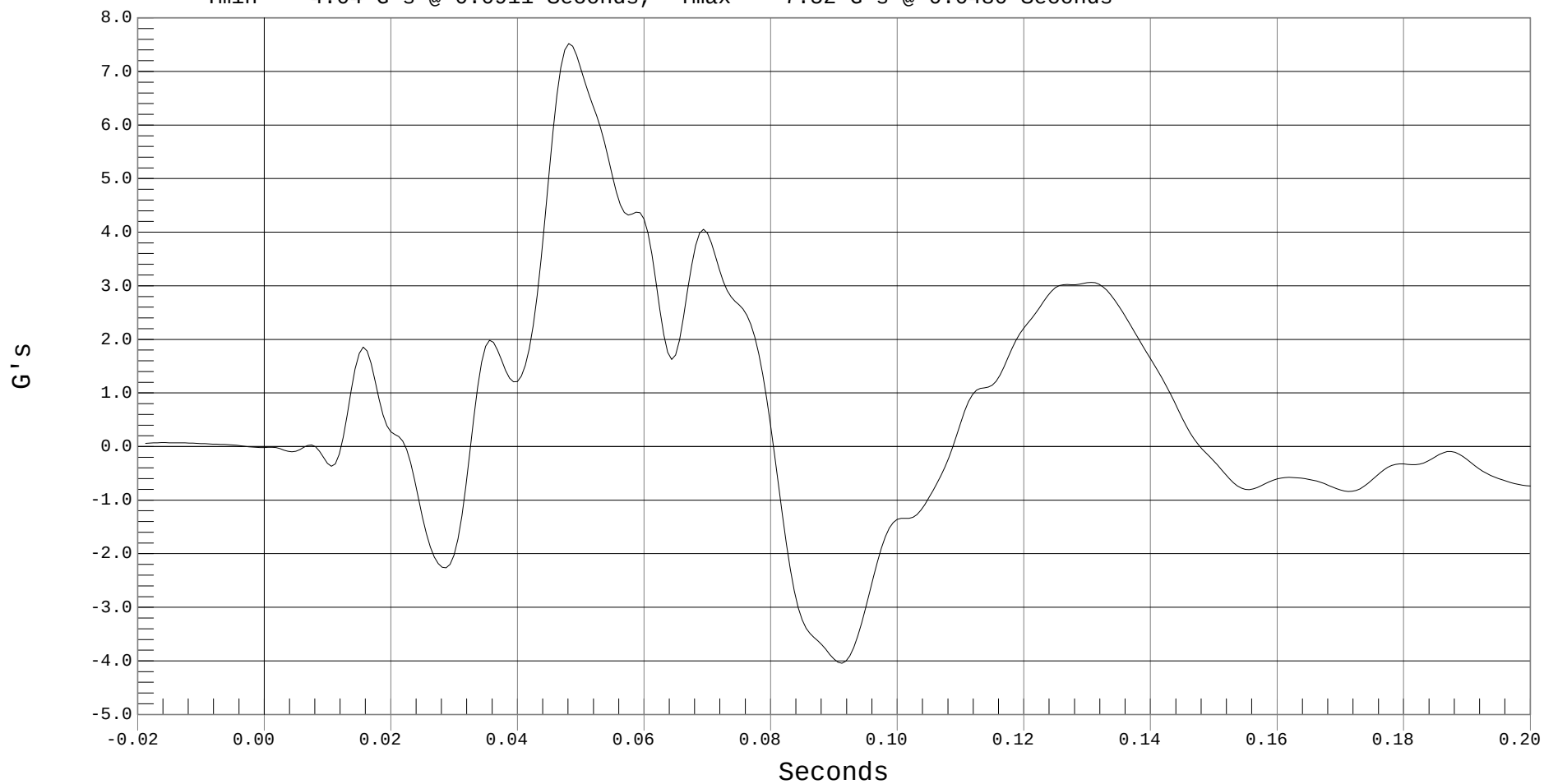
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Fir Filtered

— 1 DRIVER LOWER SPINE X, B01109FI.R29

Ymin = -4.04 G's @ 0.0911 Seconds, Ymax = 7.52 G's @ 0.0480 Seconds





DRIVER LOWER SPINE Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

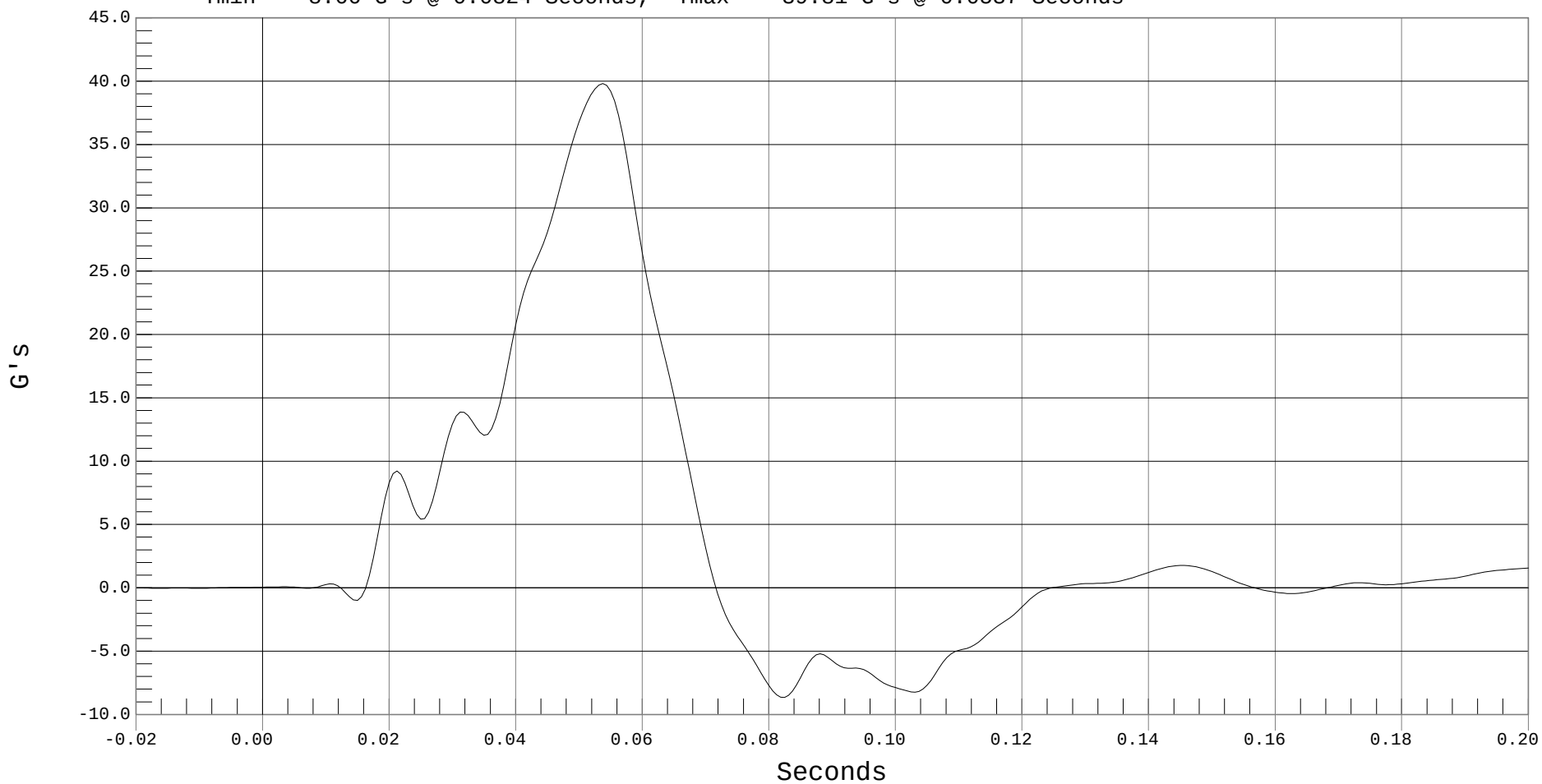
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Fir Filtered

— 1 DRIVER LOWER SPINE Y, B01109FI.R30

Ymin = -8.66 G's @ 0.0824 Seconds, Ymax = 39.81 G's @ 0.0537 Seconds





DRIVER LOWER SPINE Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT

Component: 1999 SAAB 9-5 W/SAB

Other Info:

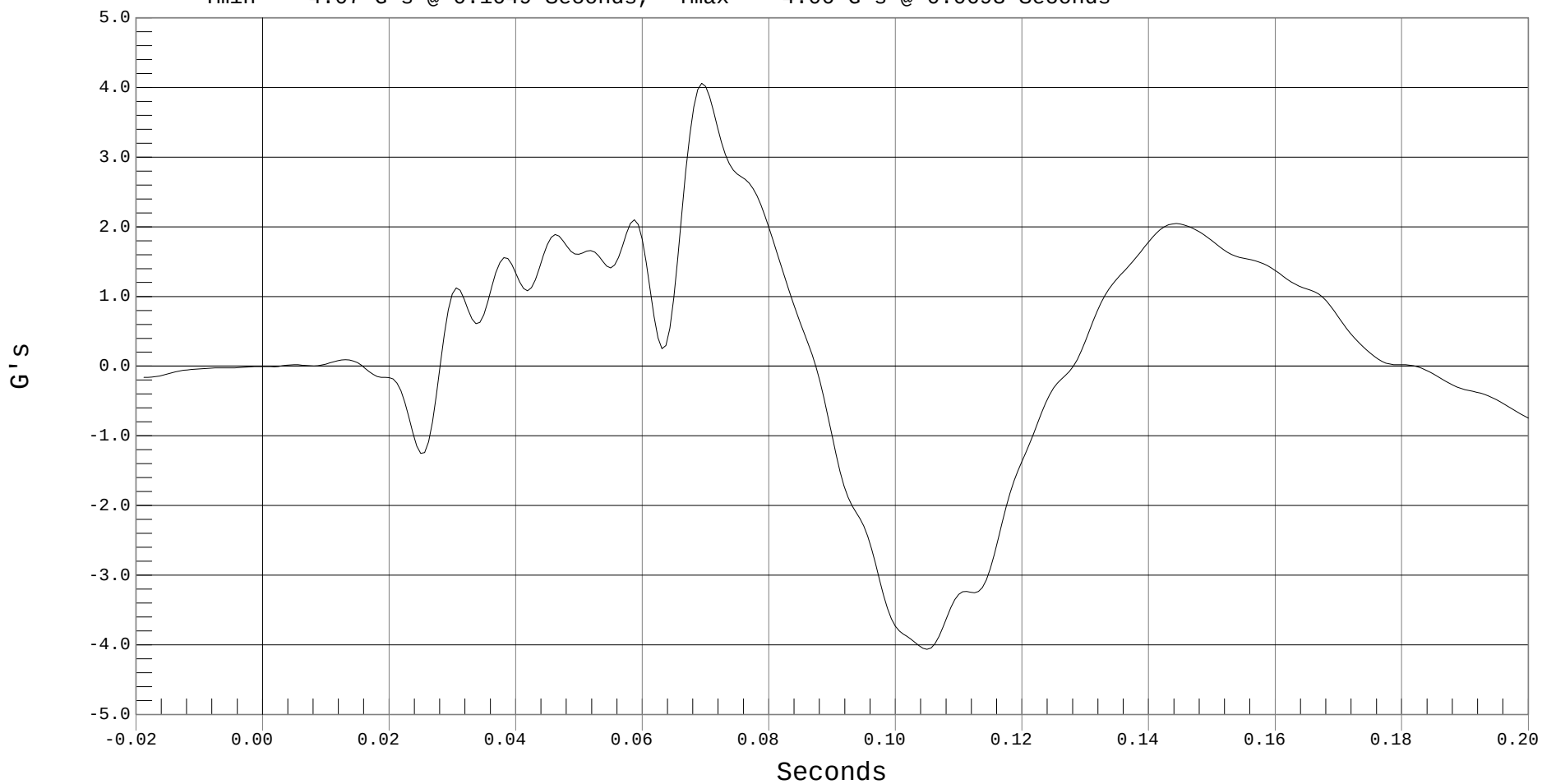
Test Date: 10-23-01

Speed: 17.7 MPH, 28.5 KPH

Fir Filtered

— 1 DRIVER LOWER SPINE Z, B01109FI.R31

Ymin = -4.07 G's @ 0.1049 Seconds, Ymax = 4.06 G's @ 0.0693 Seconds





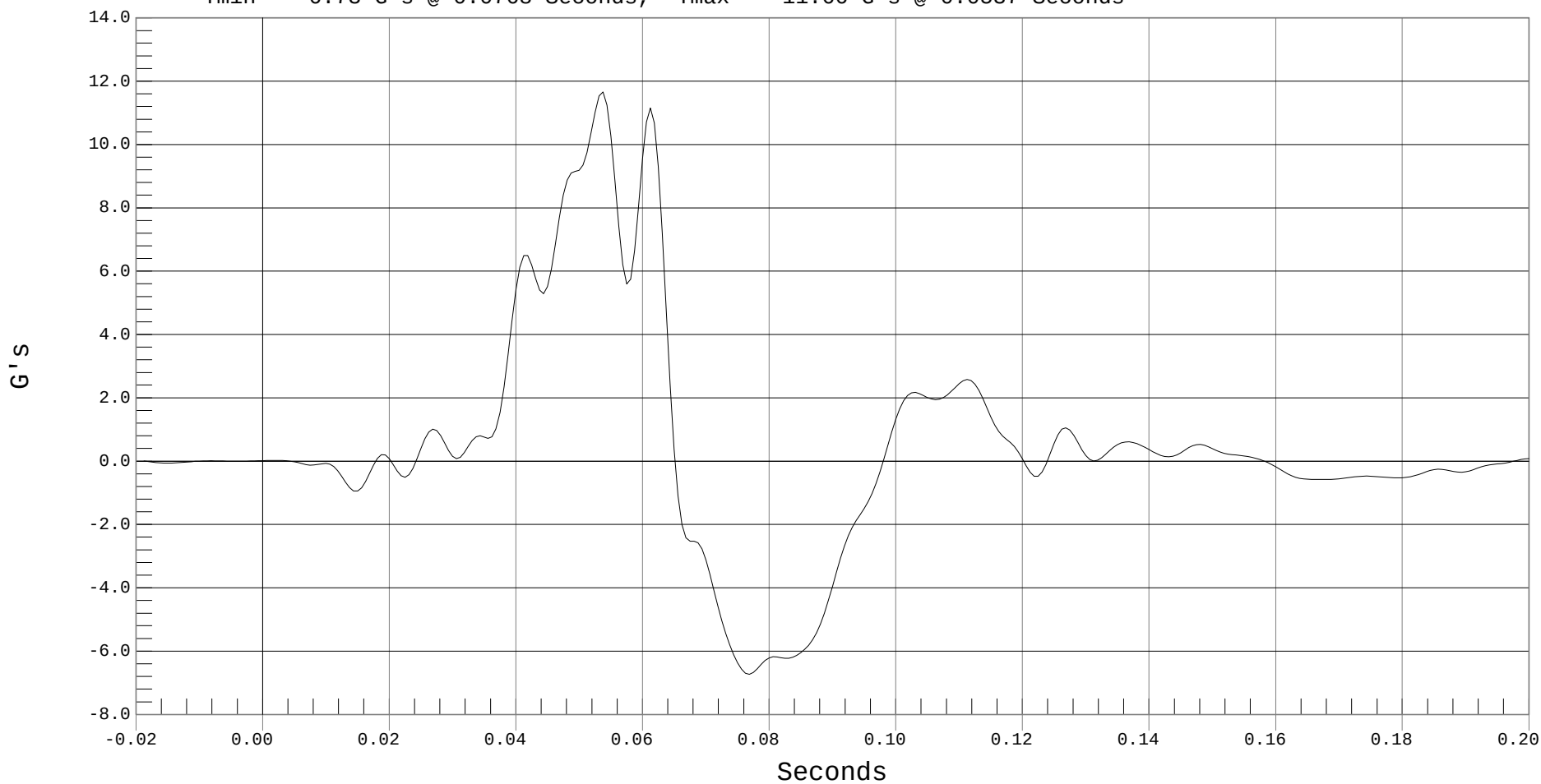
DRIVER PELVIS X ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Fir Filtered

1 DRIVER PELVIS X, B01109FI.R45

Ymin = -6.73 G's @ 0.0768 Seconds, Ymax = 11.66 G's @ 0.0537 Seconds





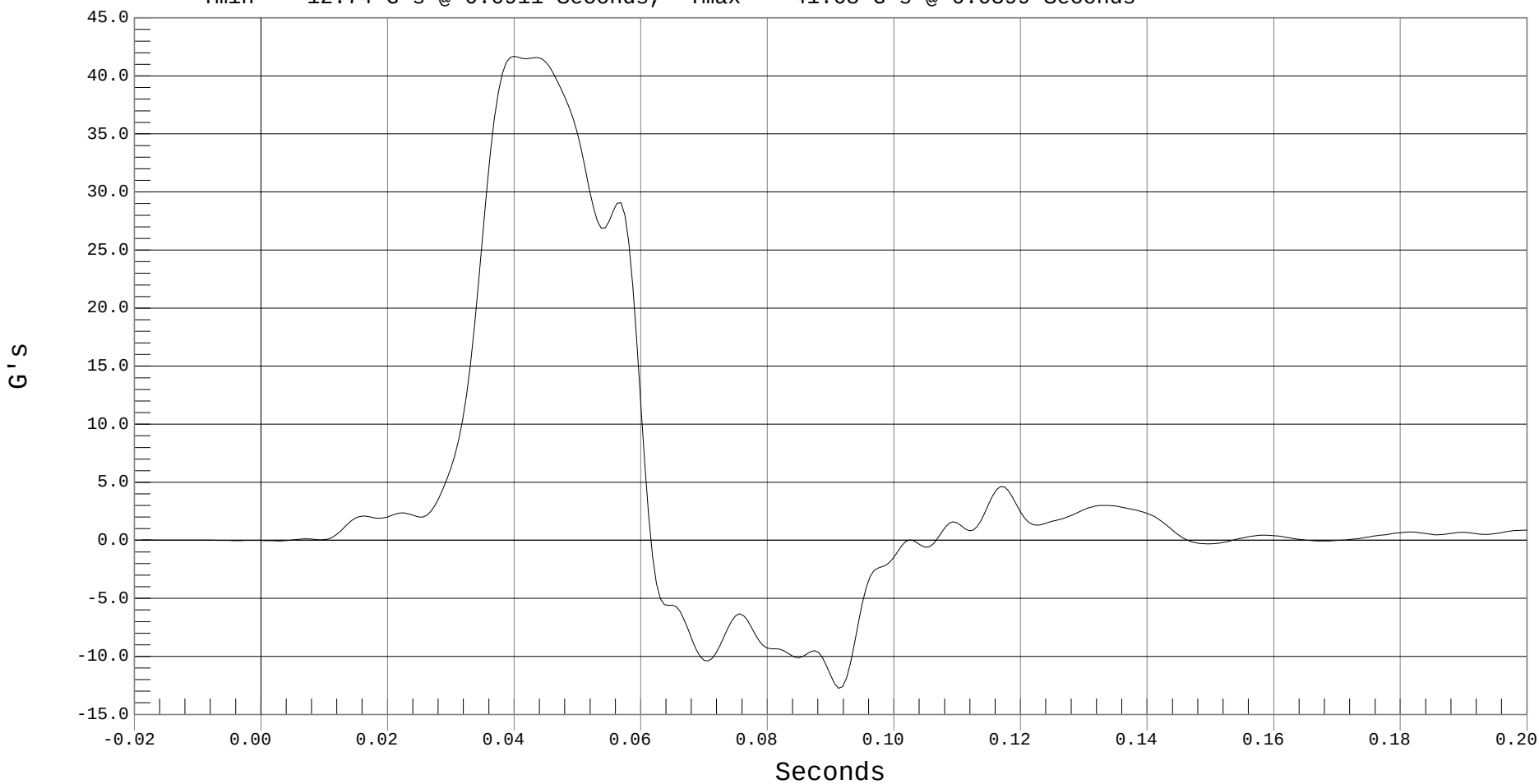
DRIVER PELVIS Y ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Fir Filtered

— 1 DRIVER PELVIS Y, B01109FI.R46

Ymin = -12.74 G's @ 0.0911 Seconds, Ymax = 41.68 G's @ 0.0399 Seconds





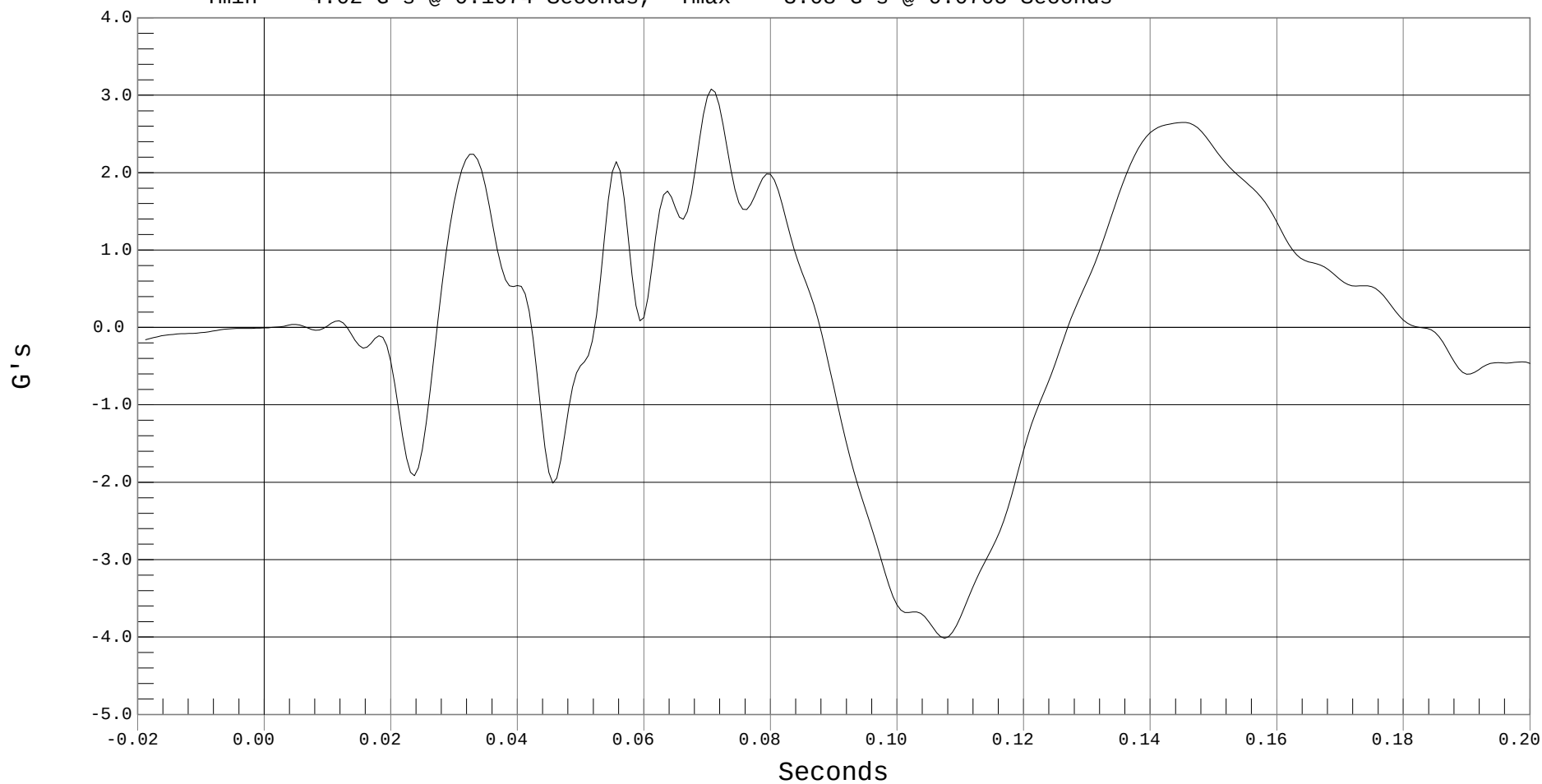
DRIVER PELVIS Z ACCELERATION

Test Desc.: RIGID POLE SIDE IMPACT
Component: 1999 SAAB 9-5 W/SAB
Other Info:

Test Date: 10-23-01
Speed: 17.7 MPH, 28.5 KPH
Fir Filtered

— 1 DRIVER PELVIS Z, B01109FI.R47

Ymin = -4.02 G's @ 0.1074 Seconds, Ymax = 3.08 G's @ 0.0705 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: 10/22/01

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: _____



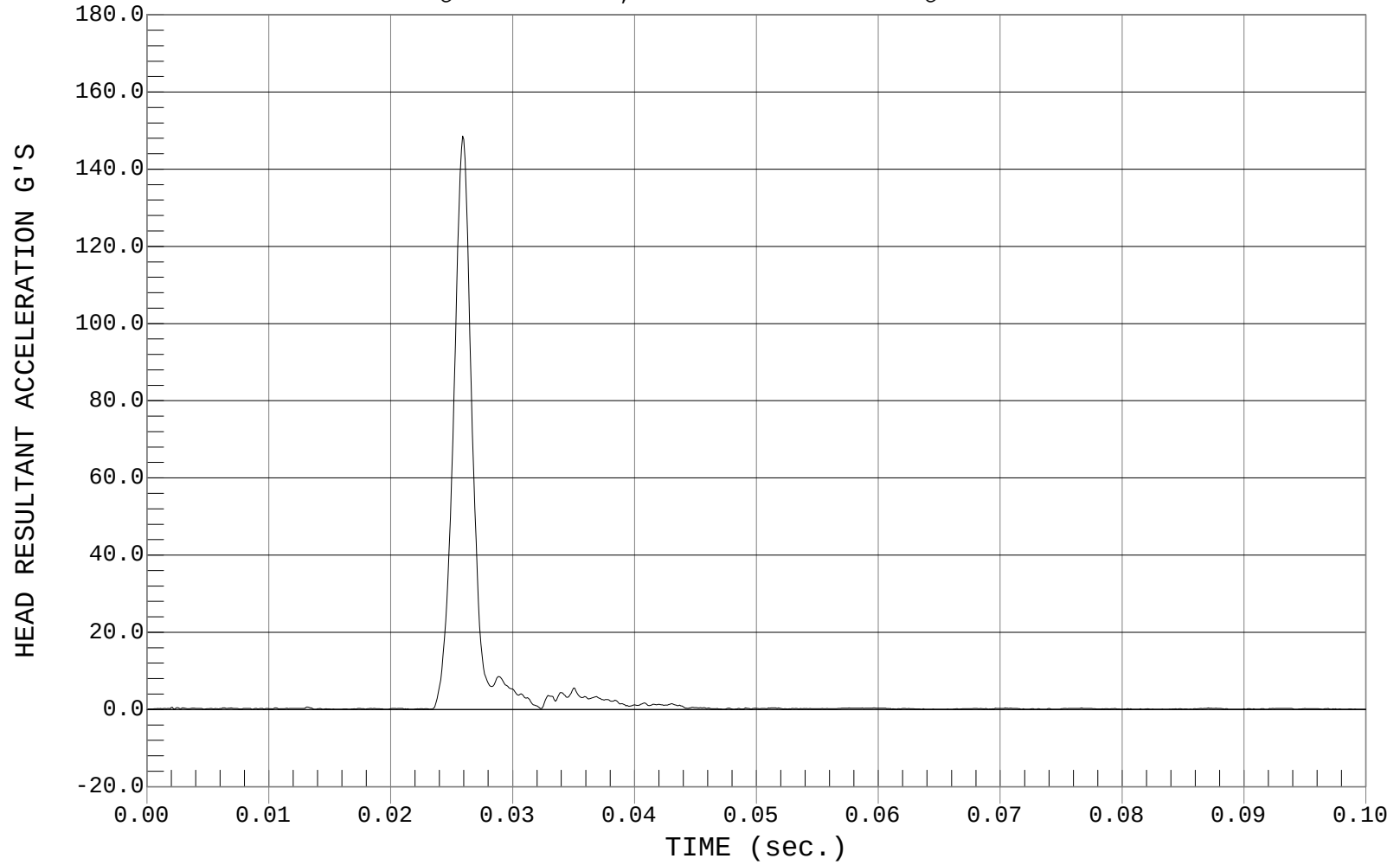
PEAK RESULTANT ACCELERATION

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: _____

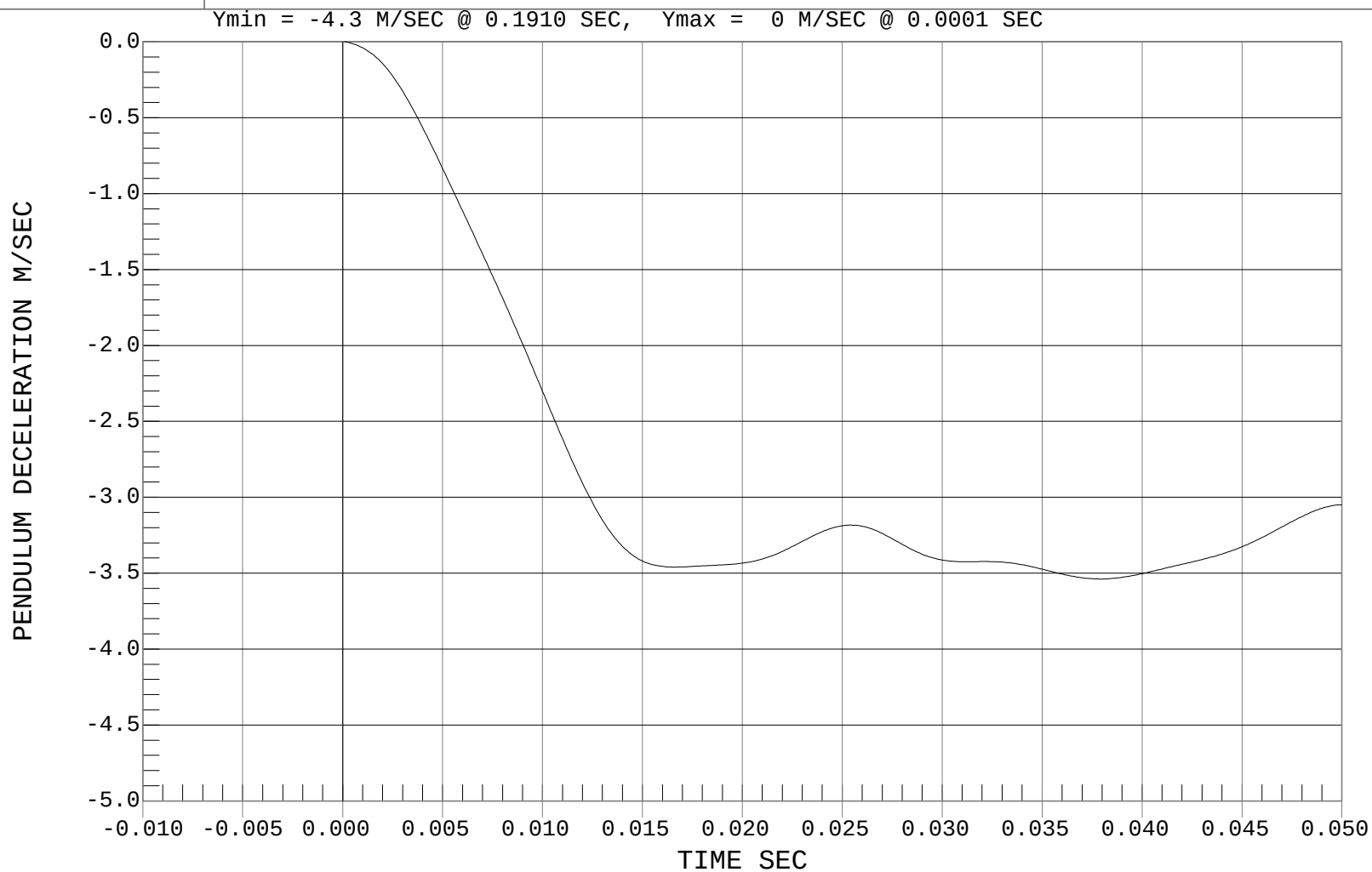


PENDULUM DECELERATION

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





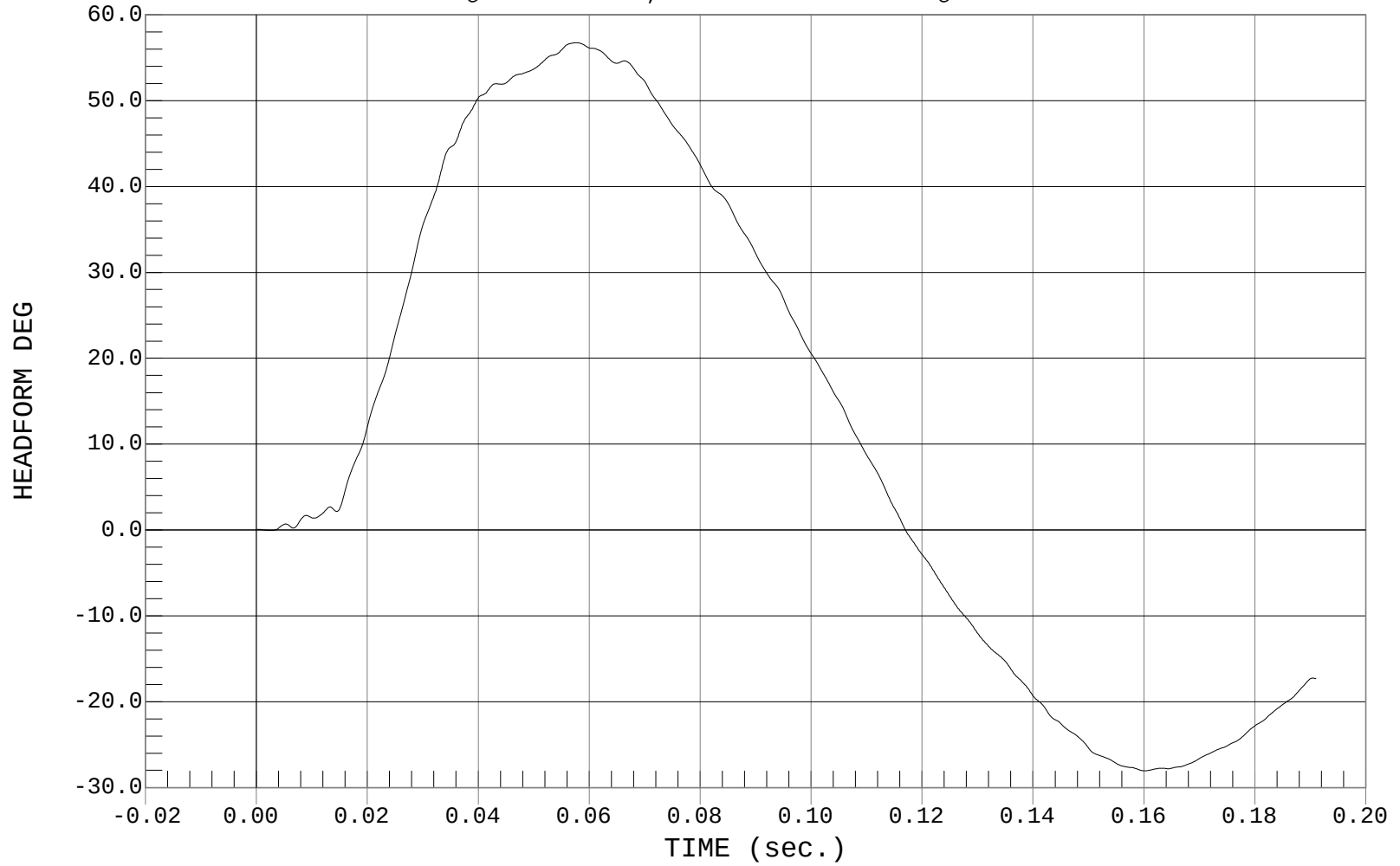
FLEXION ANGLE

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.





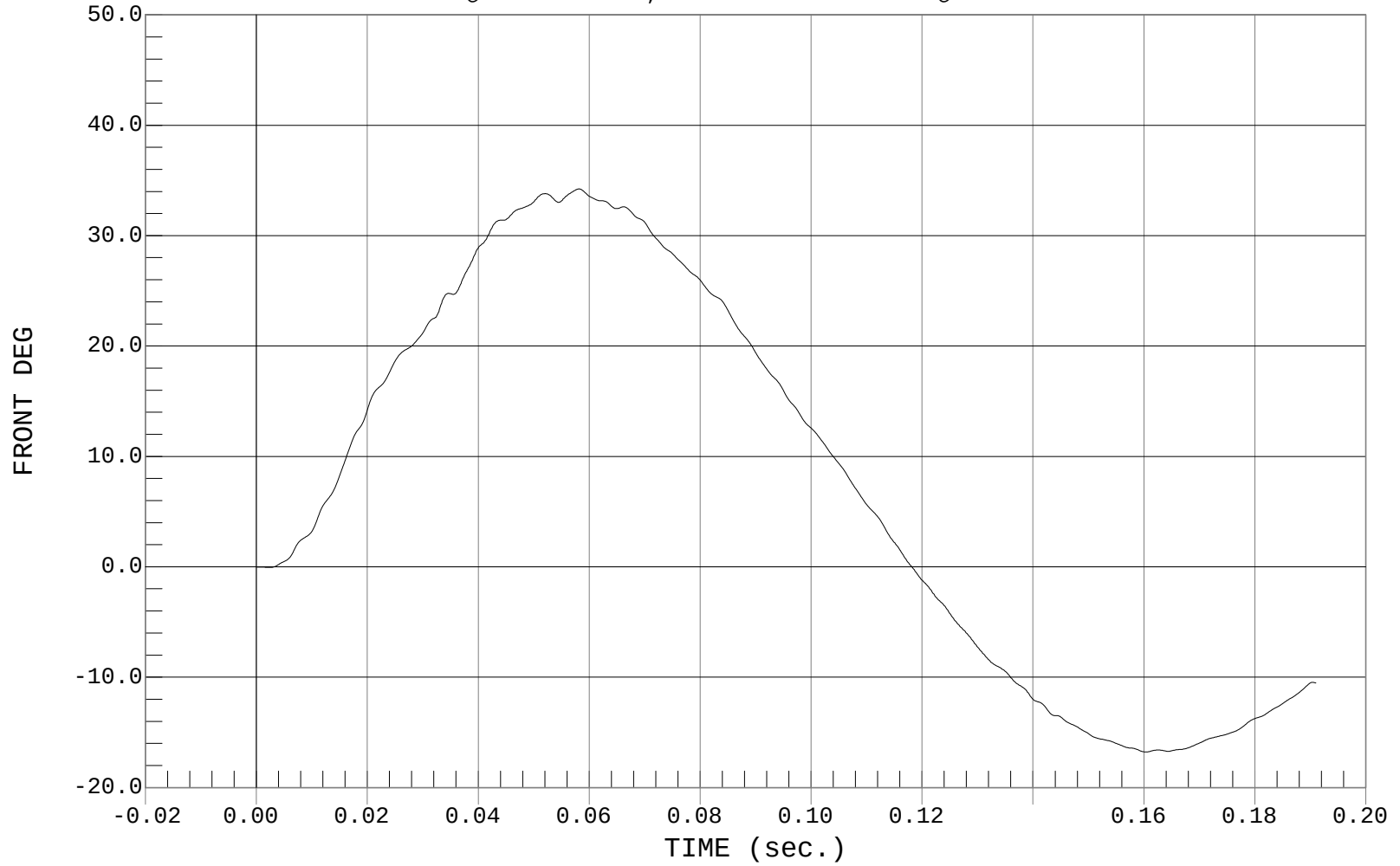
THETA A

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.





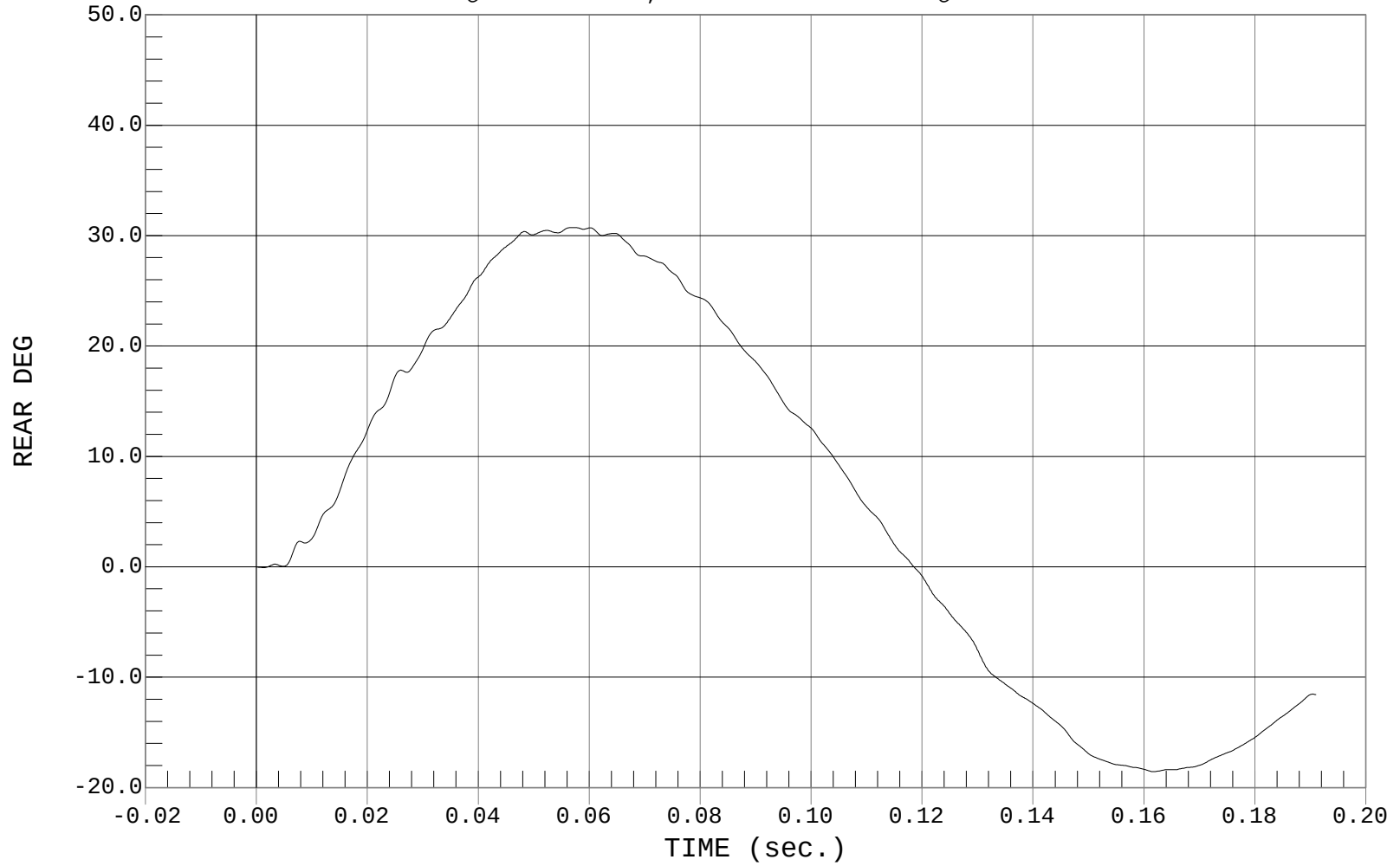
THETA B

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: _____



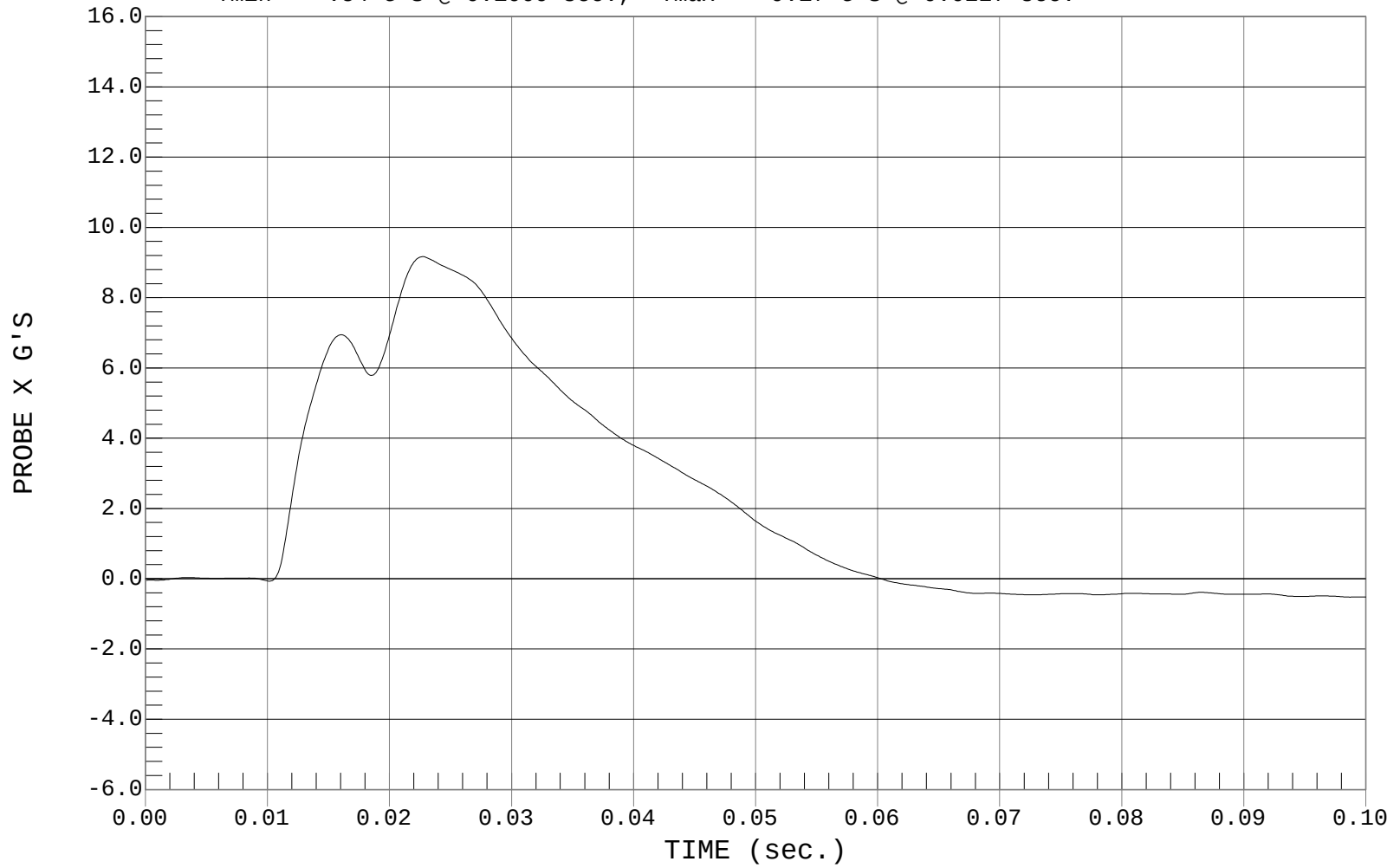
SHOULDER ACCELERATION

Test Desc.: Dummy Calibration - Shoulder 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: _____



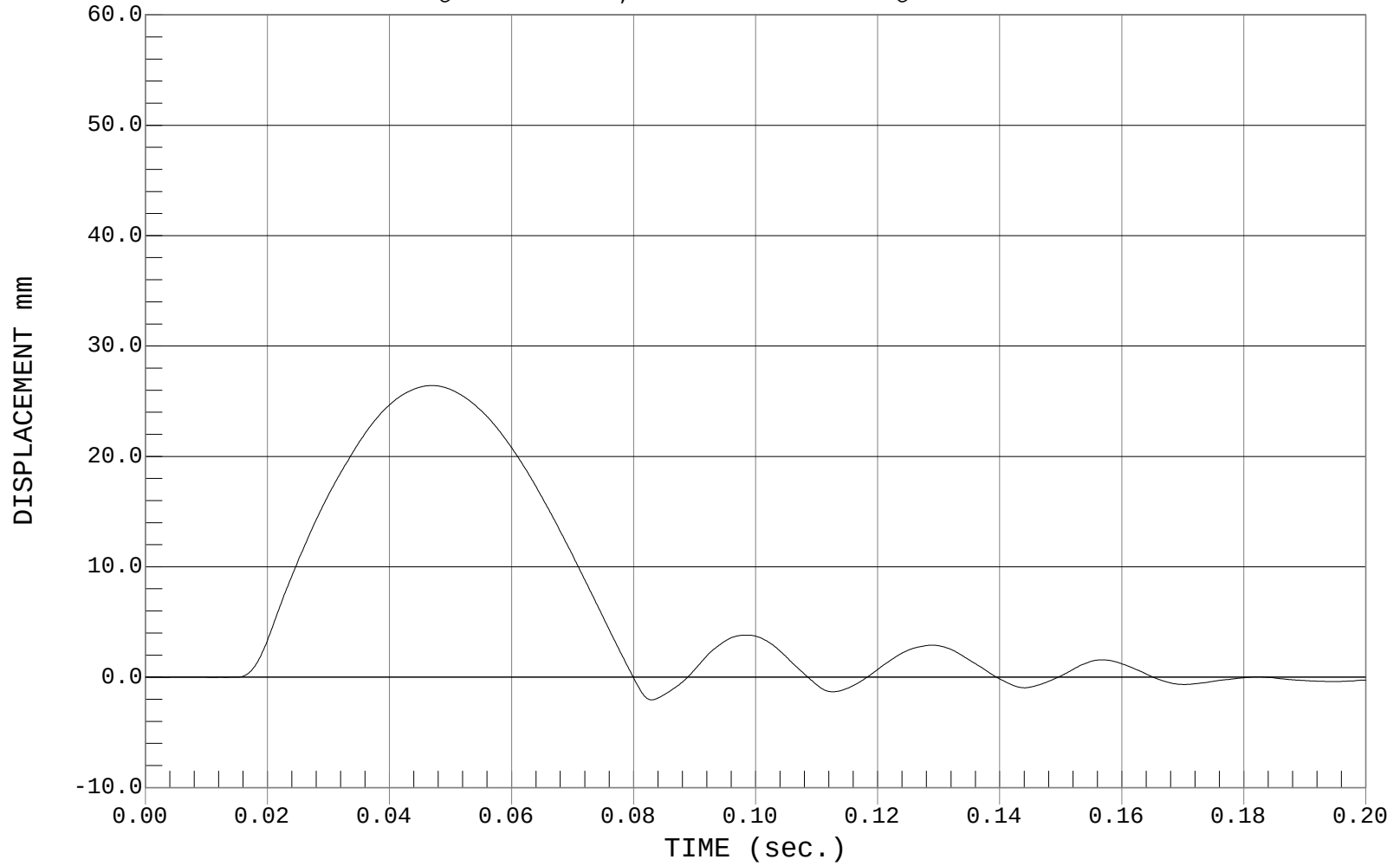
UPPER RIB DISPLACEMENT

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.





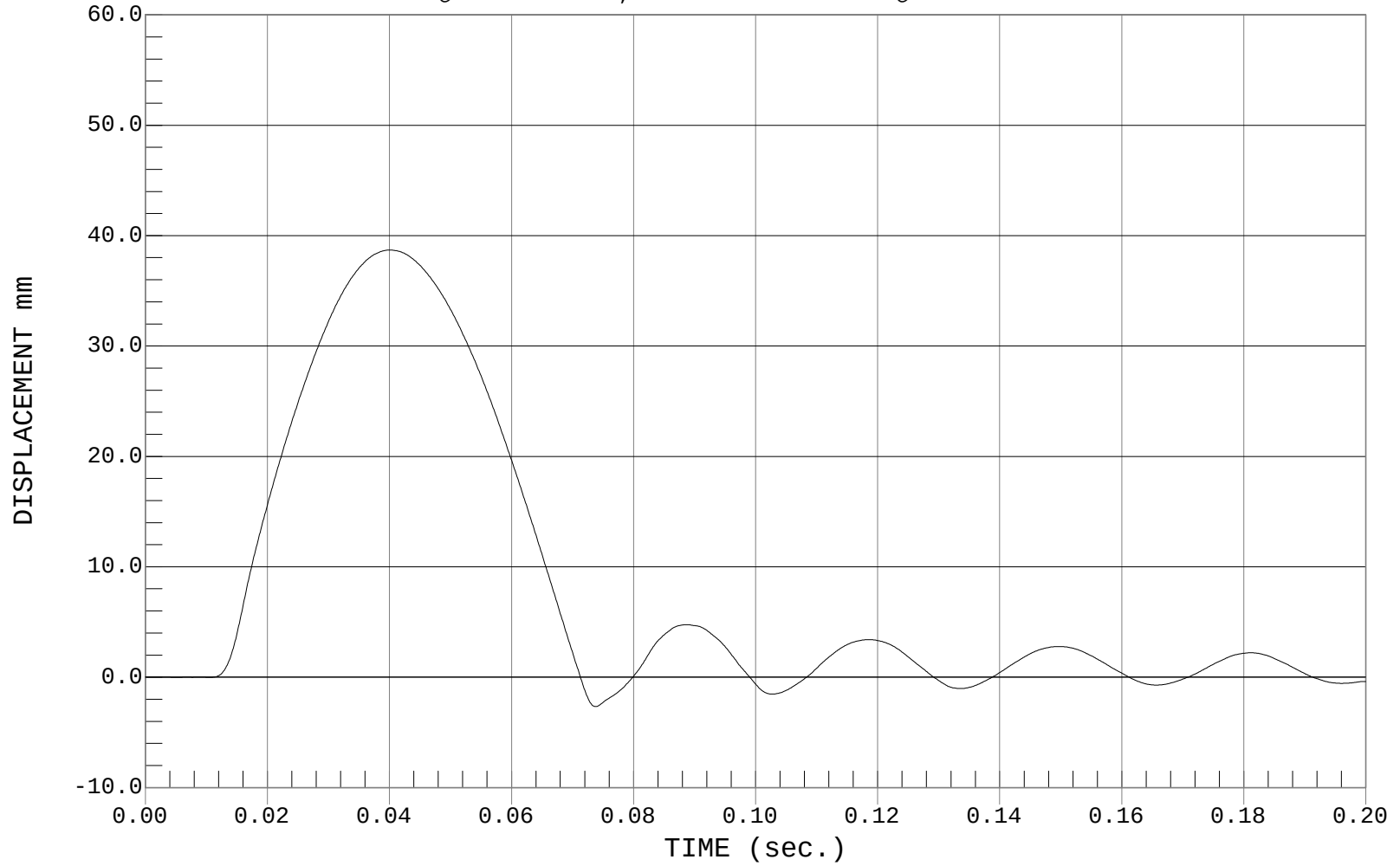
UPPER RIB DISPLACEMENT

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.





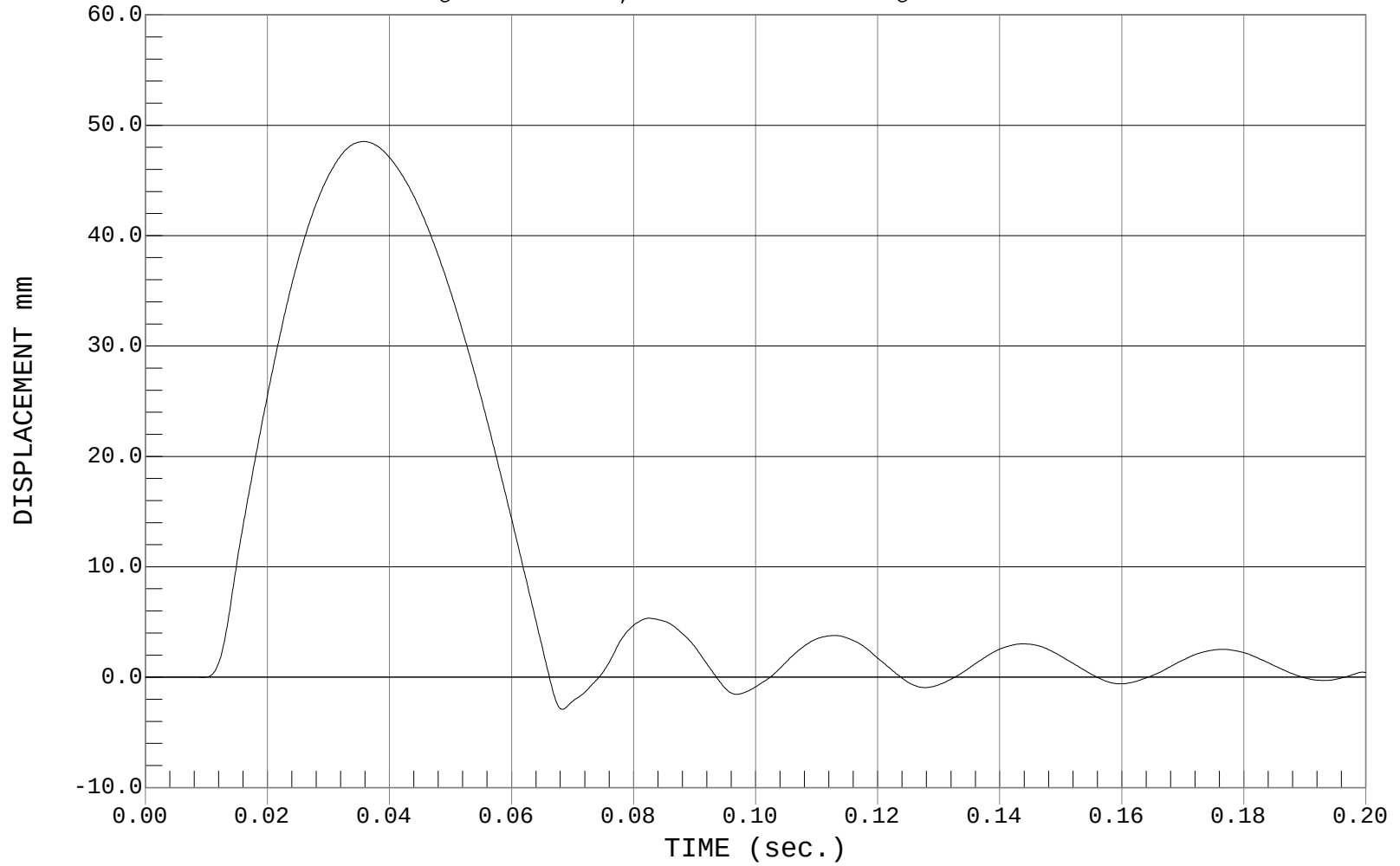
UPPER RIB DISPLACEMENT

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.





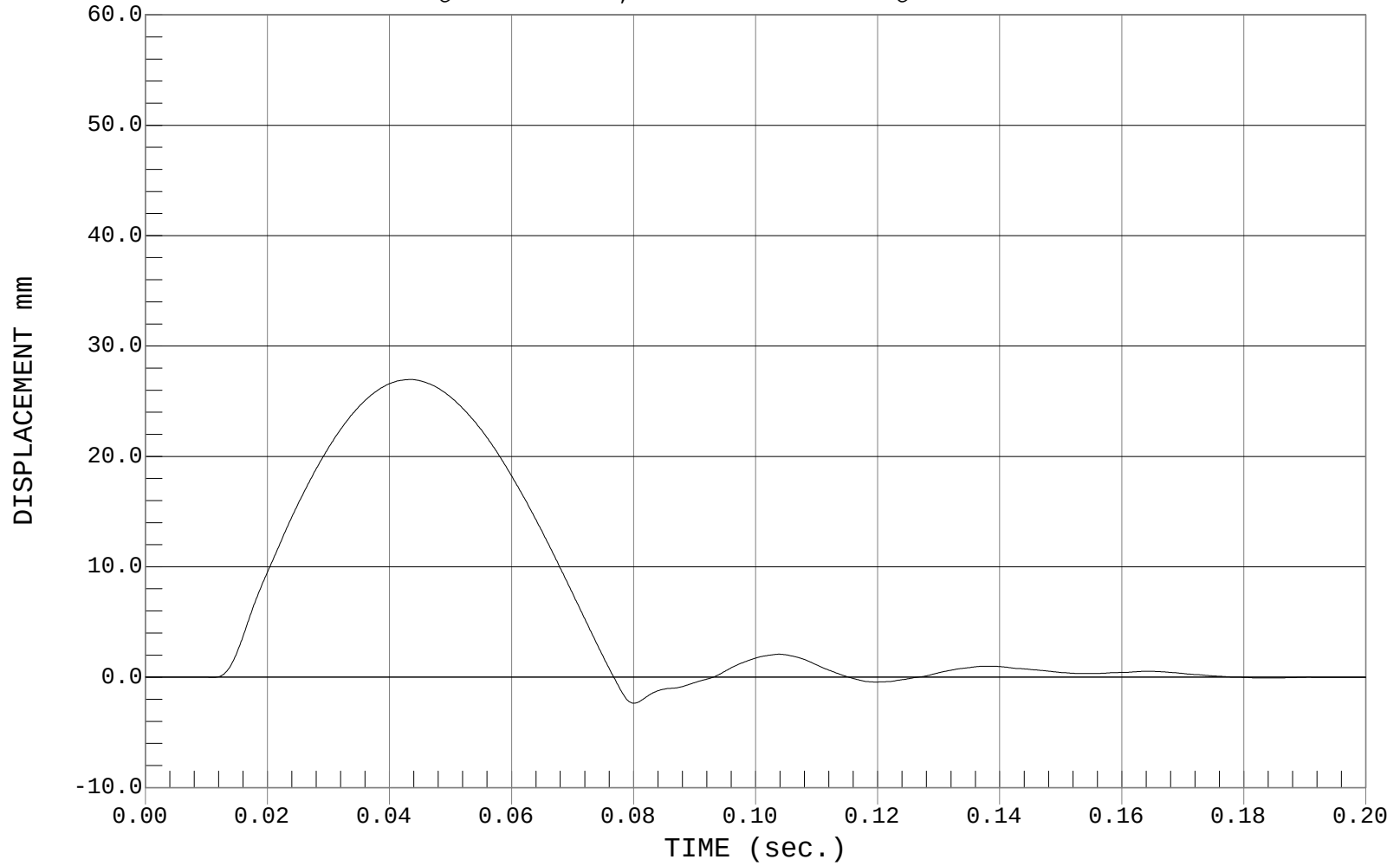
MIDDLE RIB DISPLACEMENT

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.





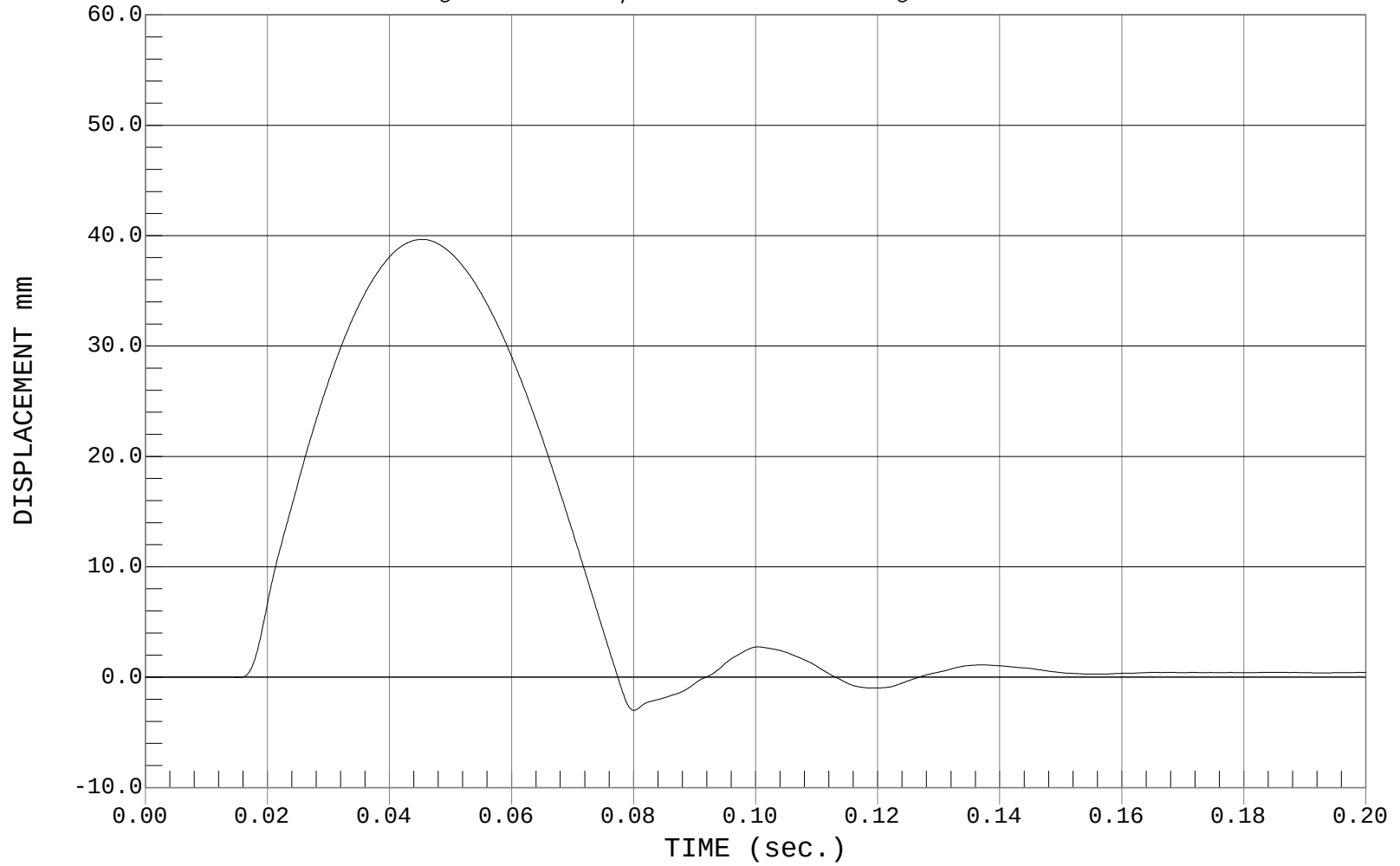
MIDDLE RIB DISPLACEMENT

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.





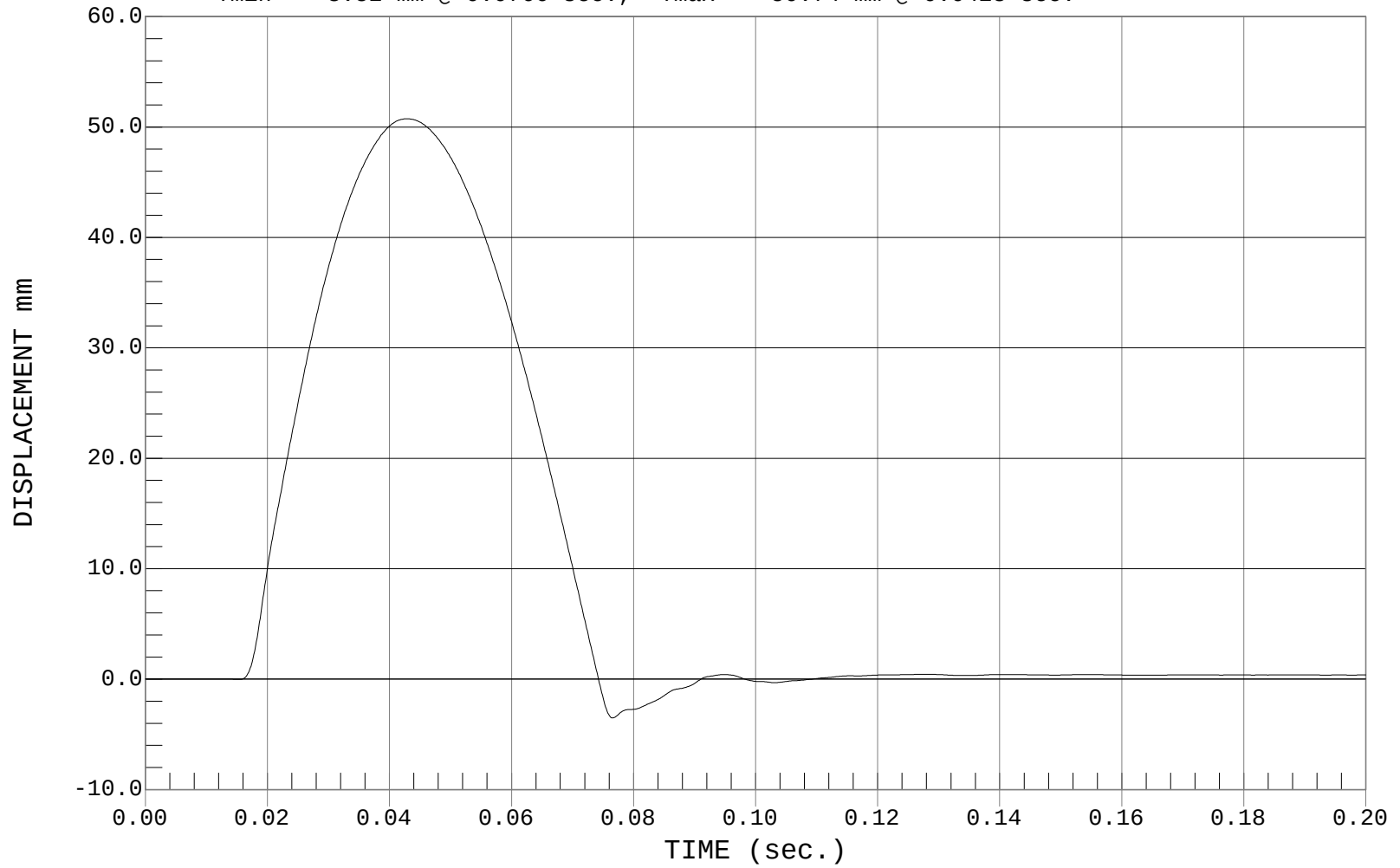
MIDDLE RIB DISPLACEMENT

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.





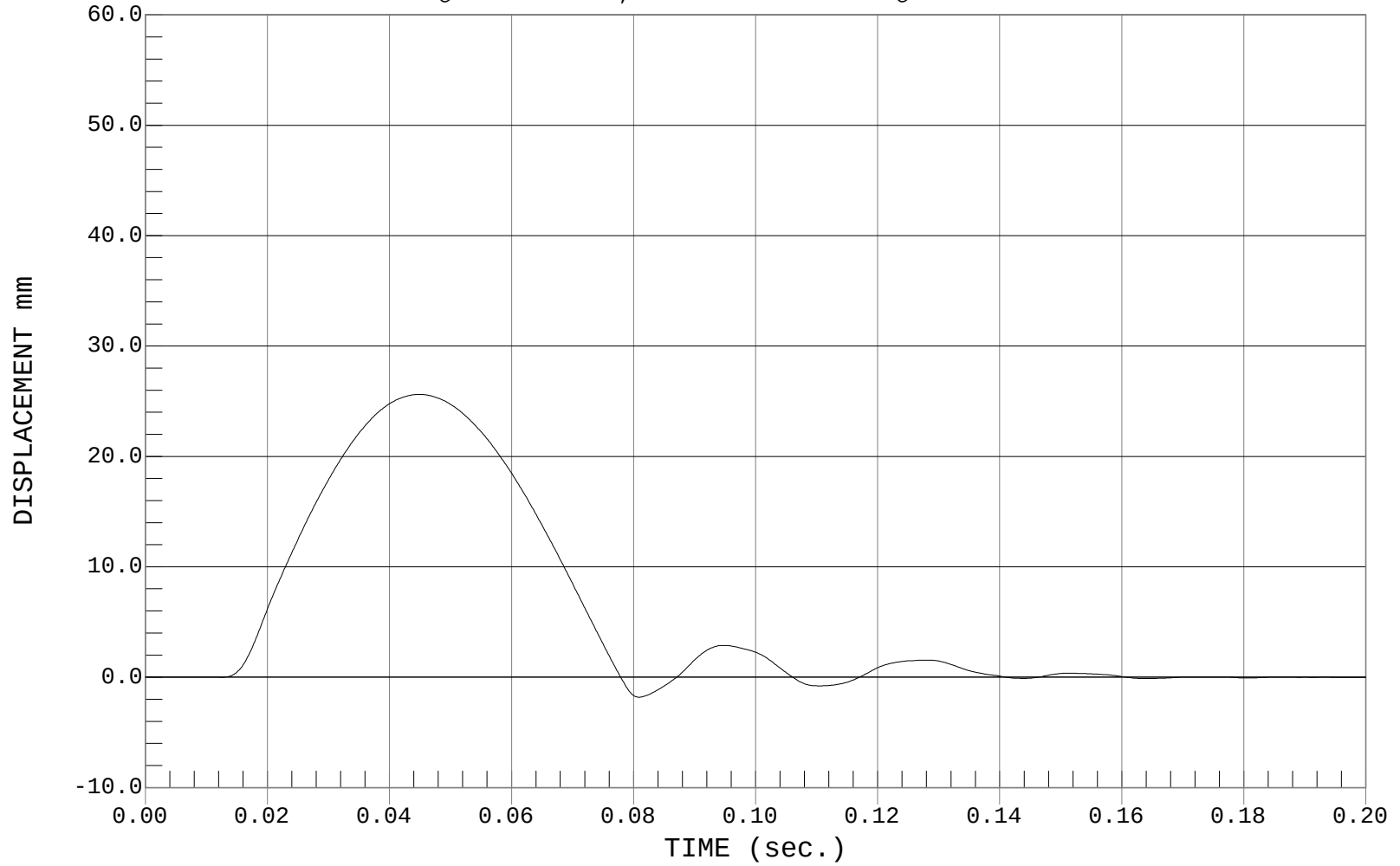
LOWER RIB DISPLACEMENT

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.





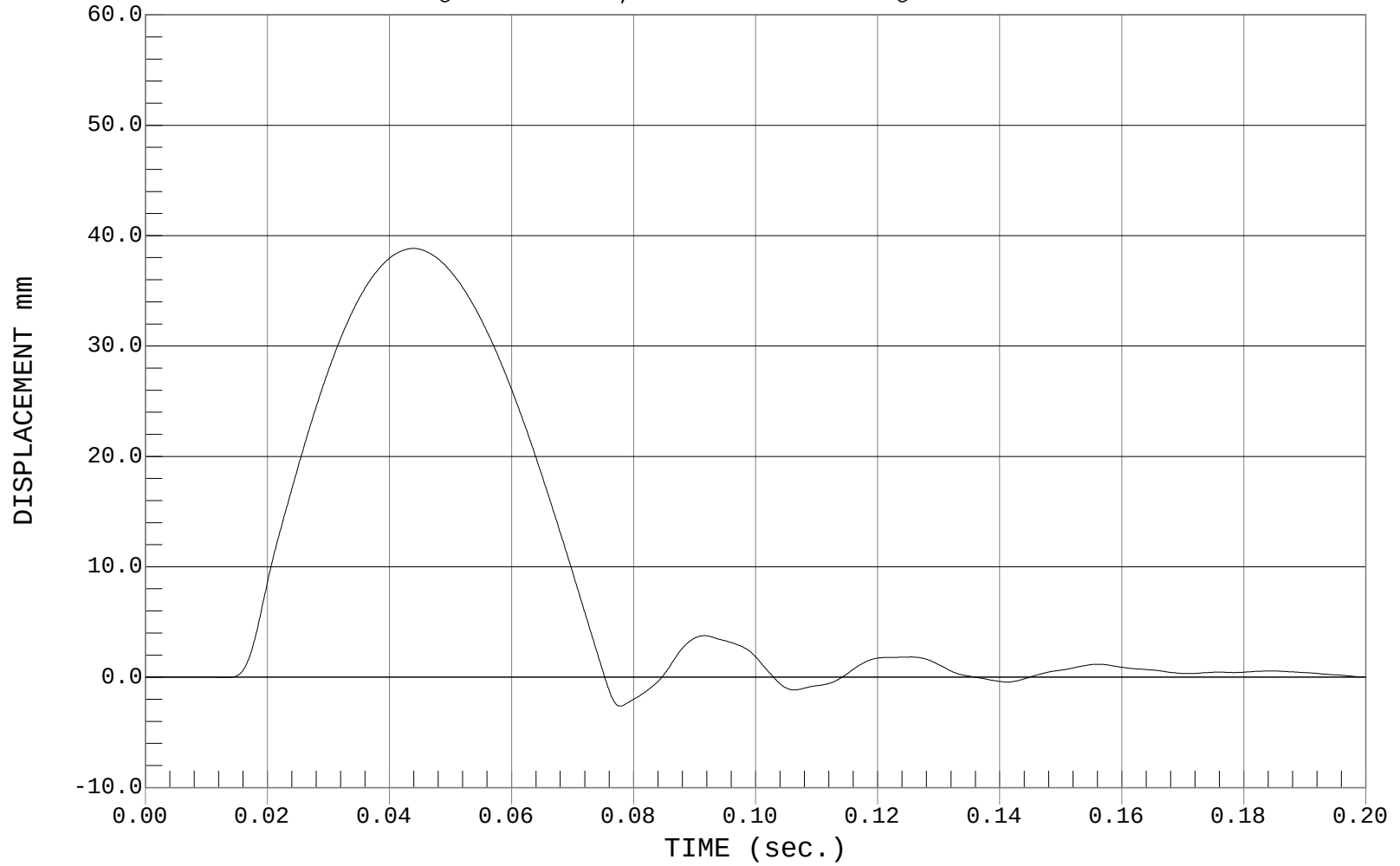
LOWER RIB DISPLACEMENT

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.





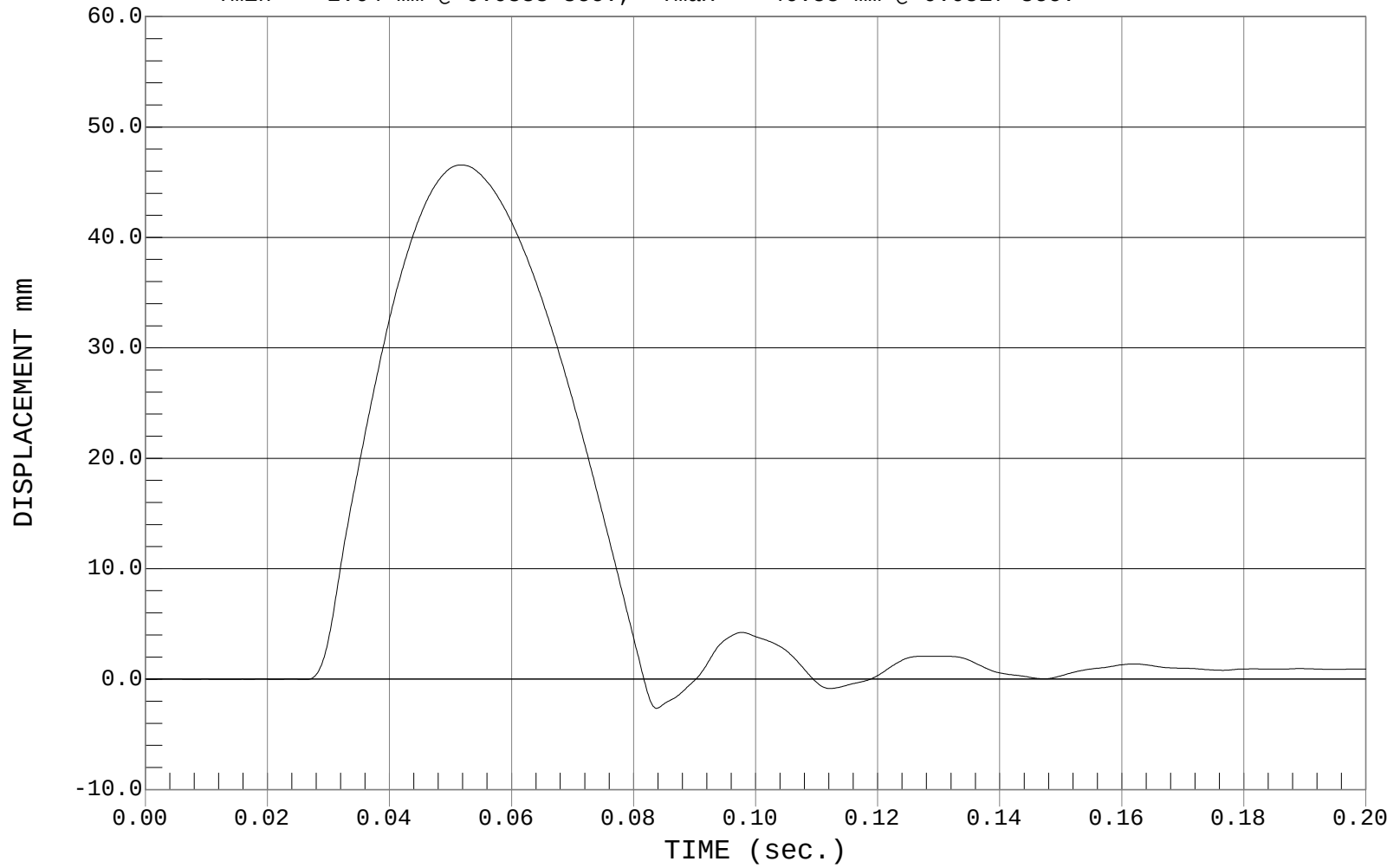
LOWER RIB DISPLACEMENT

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: _____



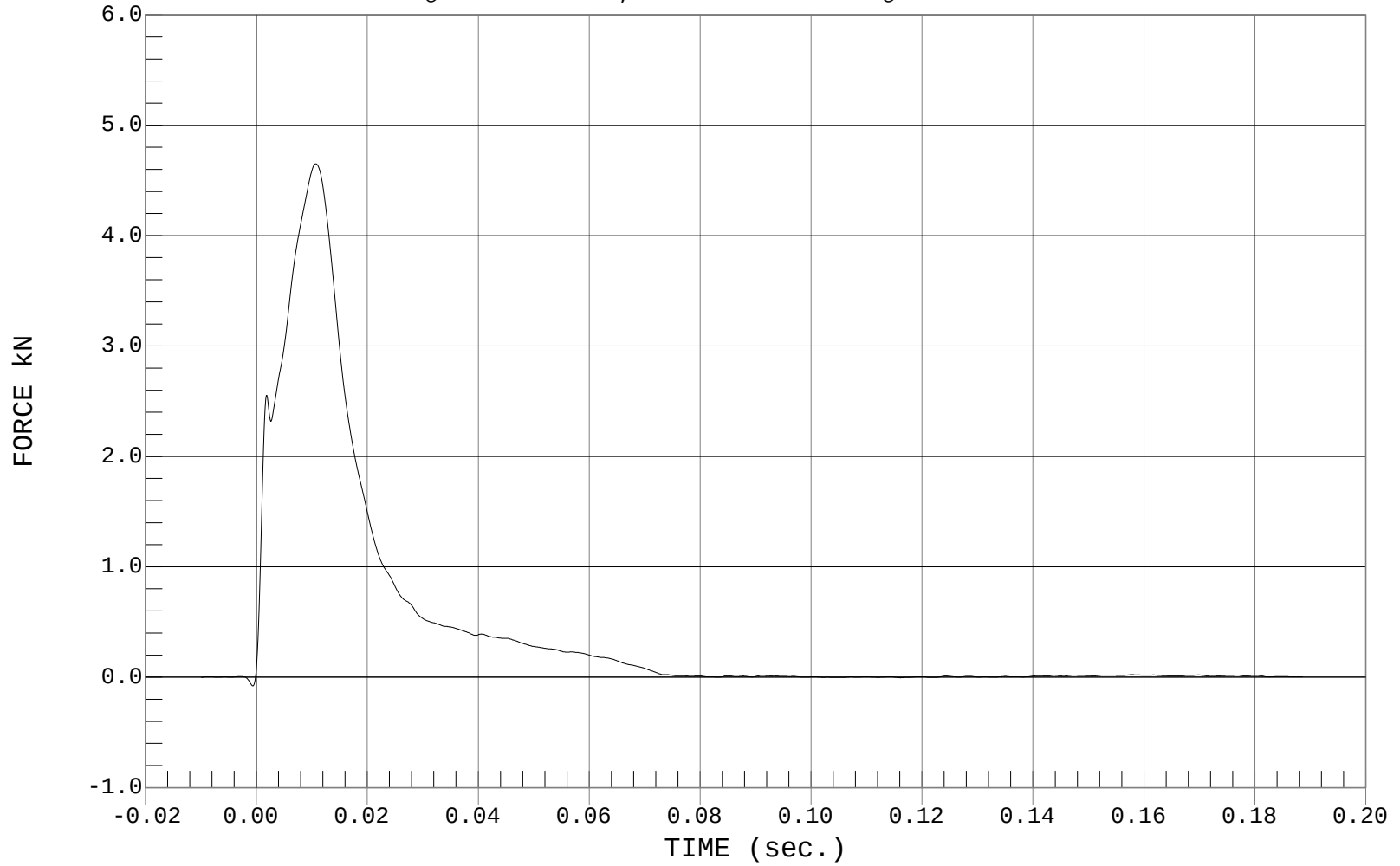
IMPACTOR FORCE

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.





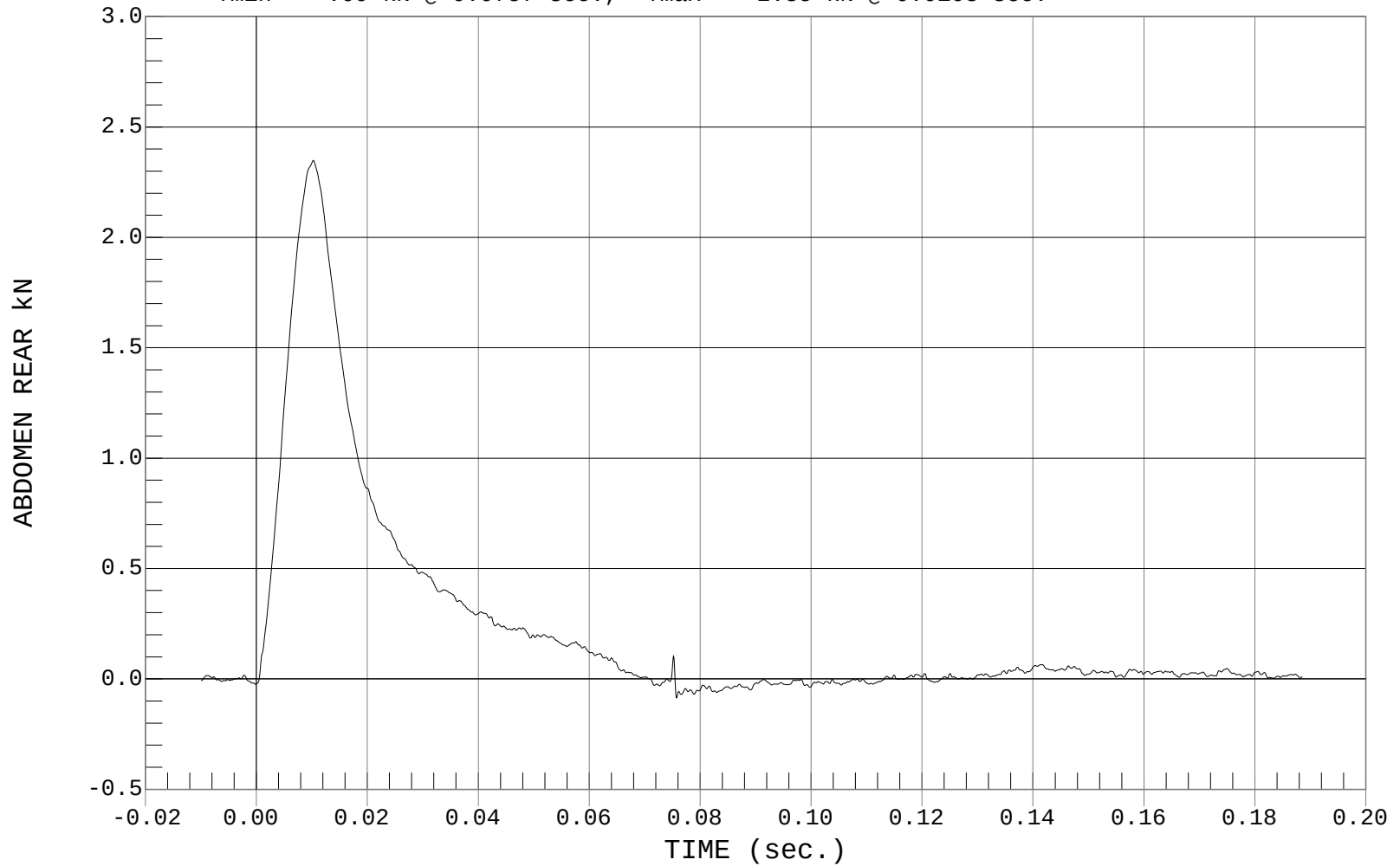
ABDOMEN FORCE

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 - 5.3 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: _____



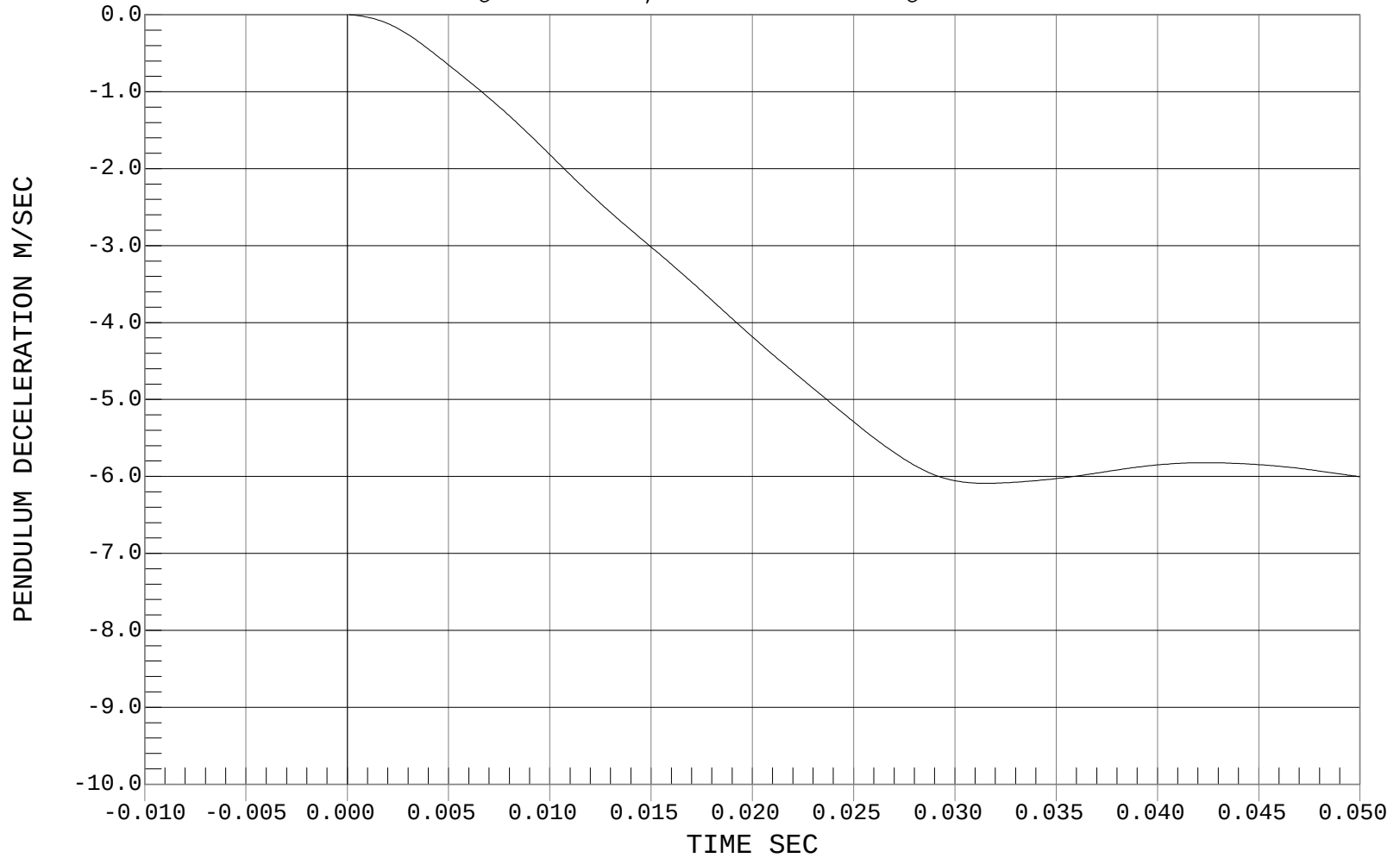
PENDULUM DECELERATION

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

Ymin = -7.39 M/SEC @ 0.1468 SEC, Ymax = 0 M/SEC @ 0.0001 SEC





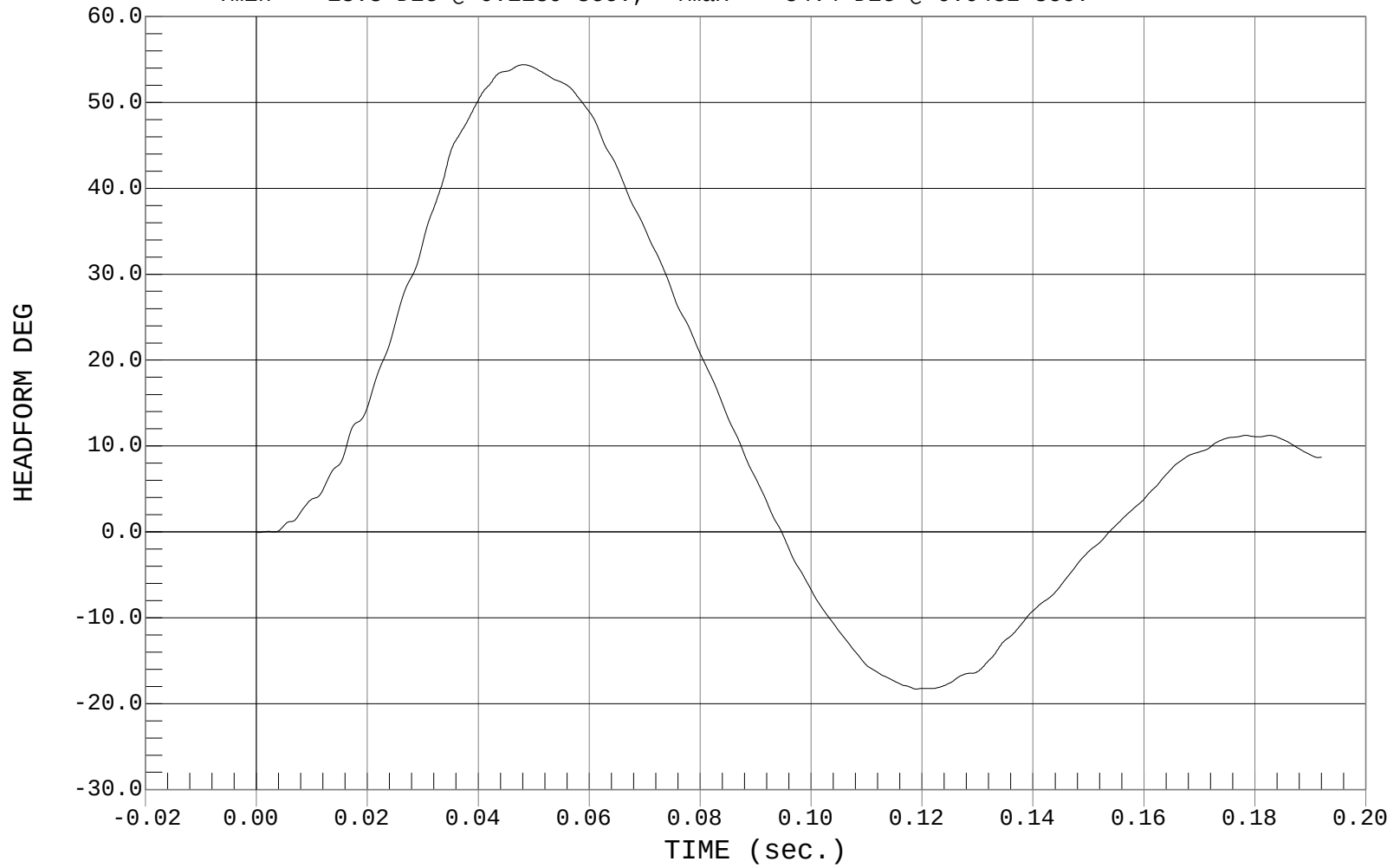
FLEXION ANGLE

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.





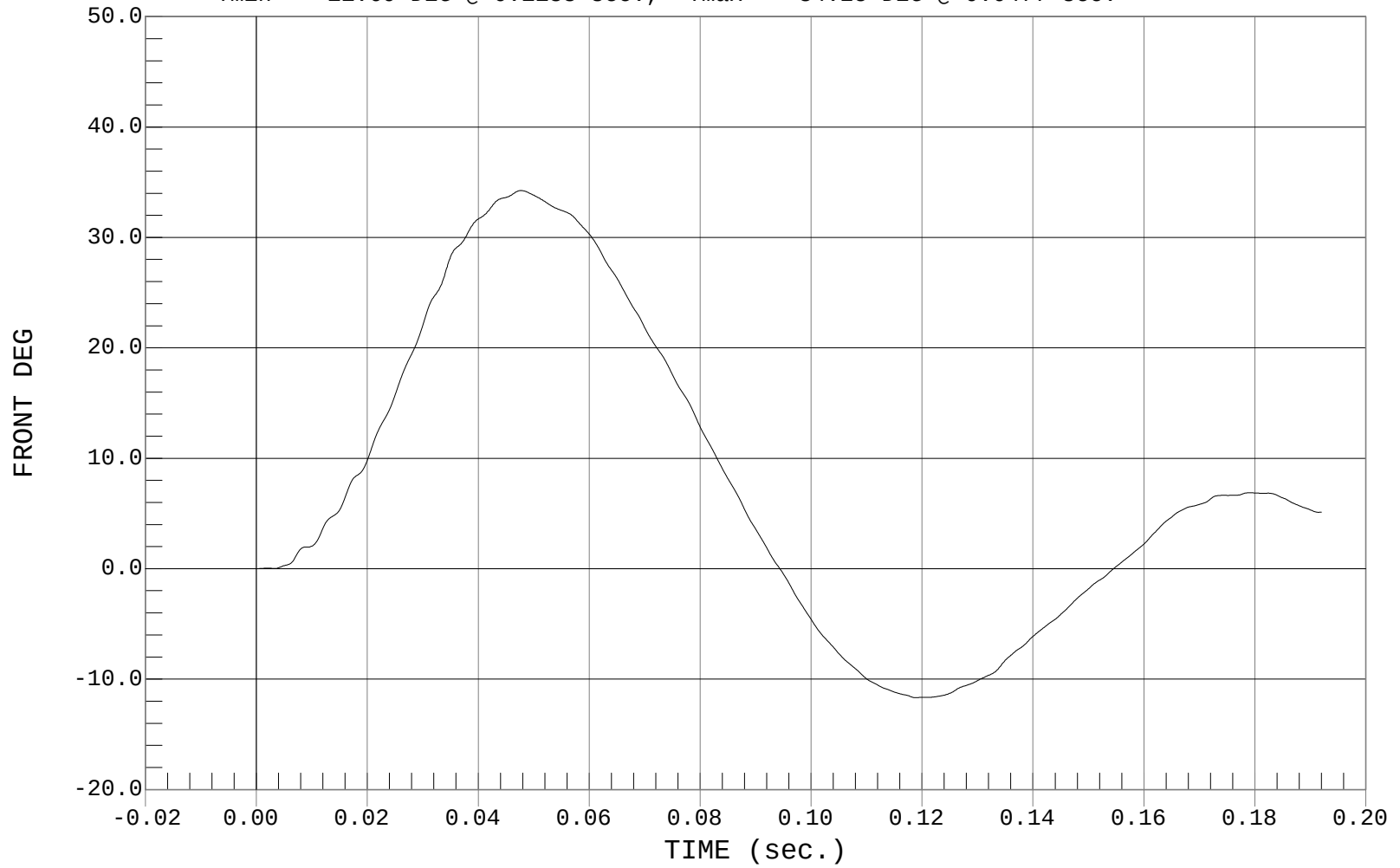
THETA A

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.





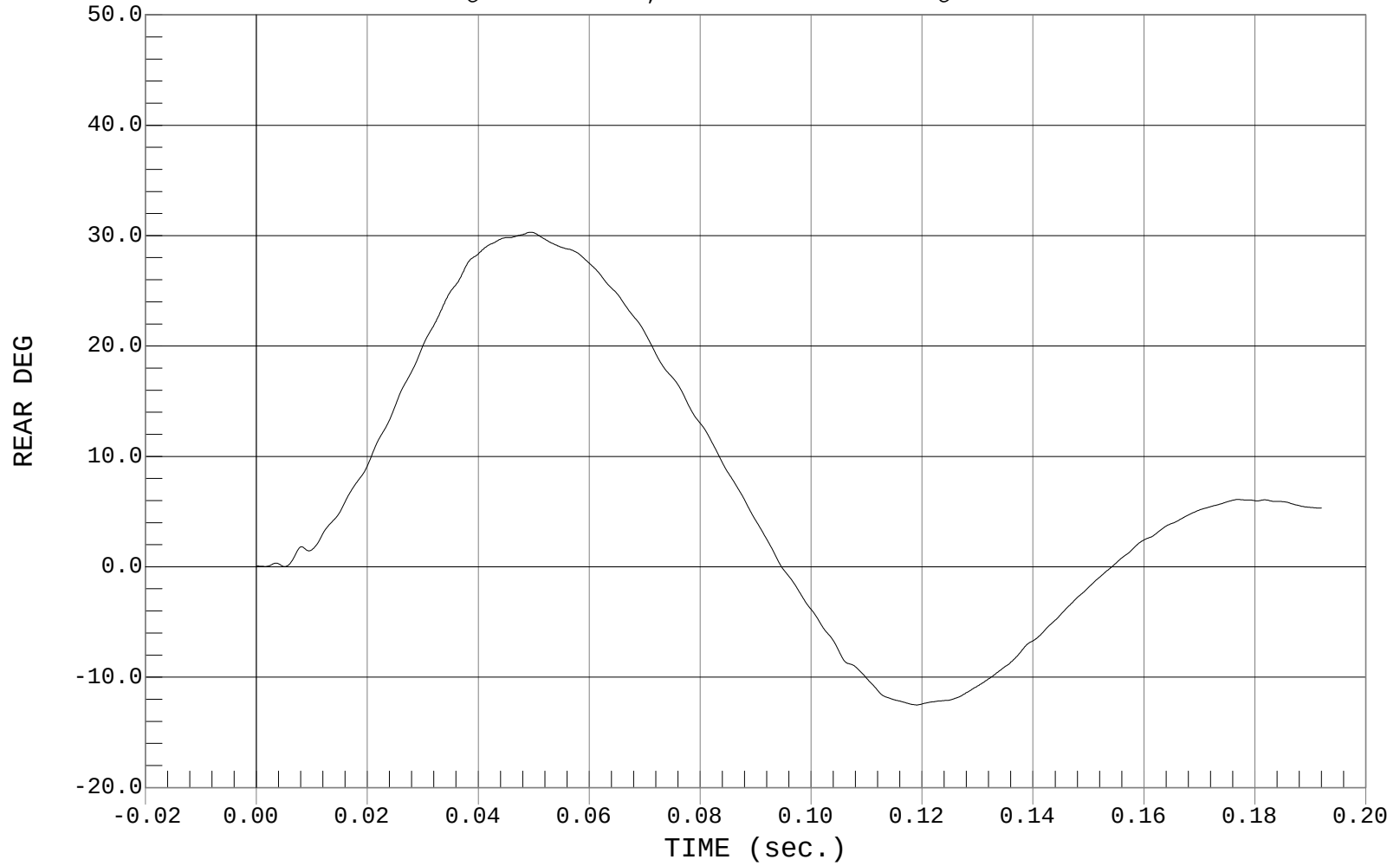
THETA B

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: _____



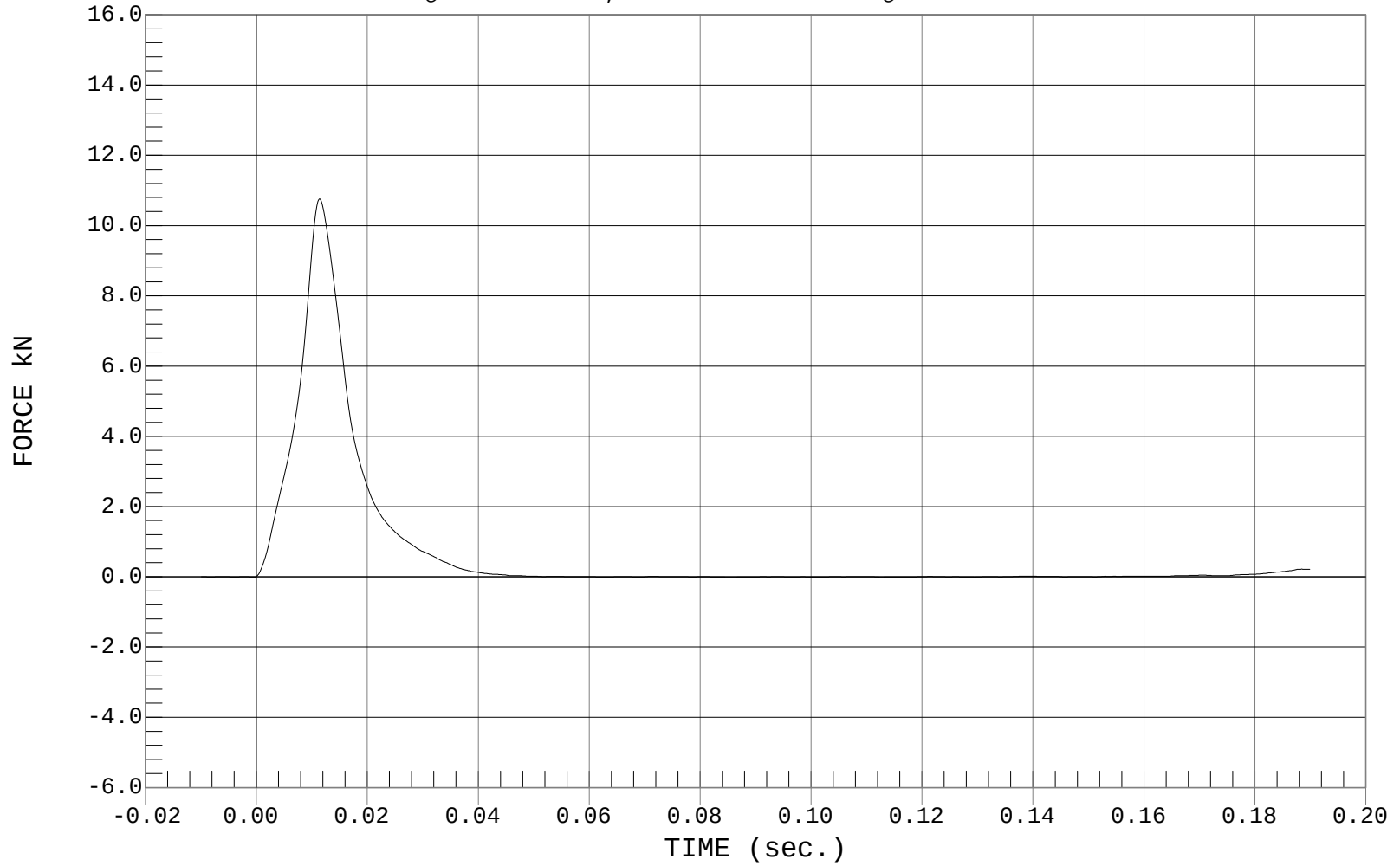
IMPACTOR FORCE

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.





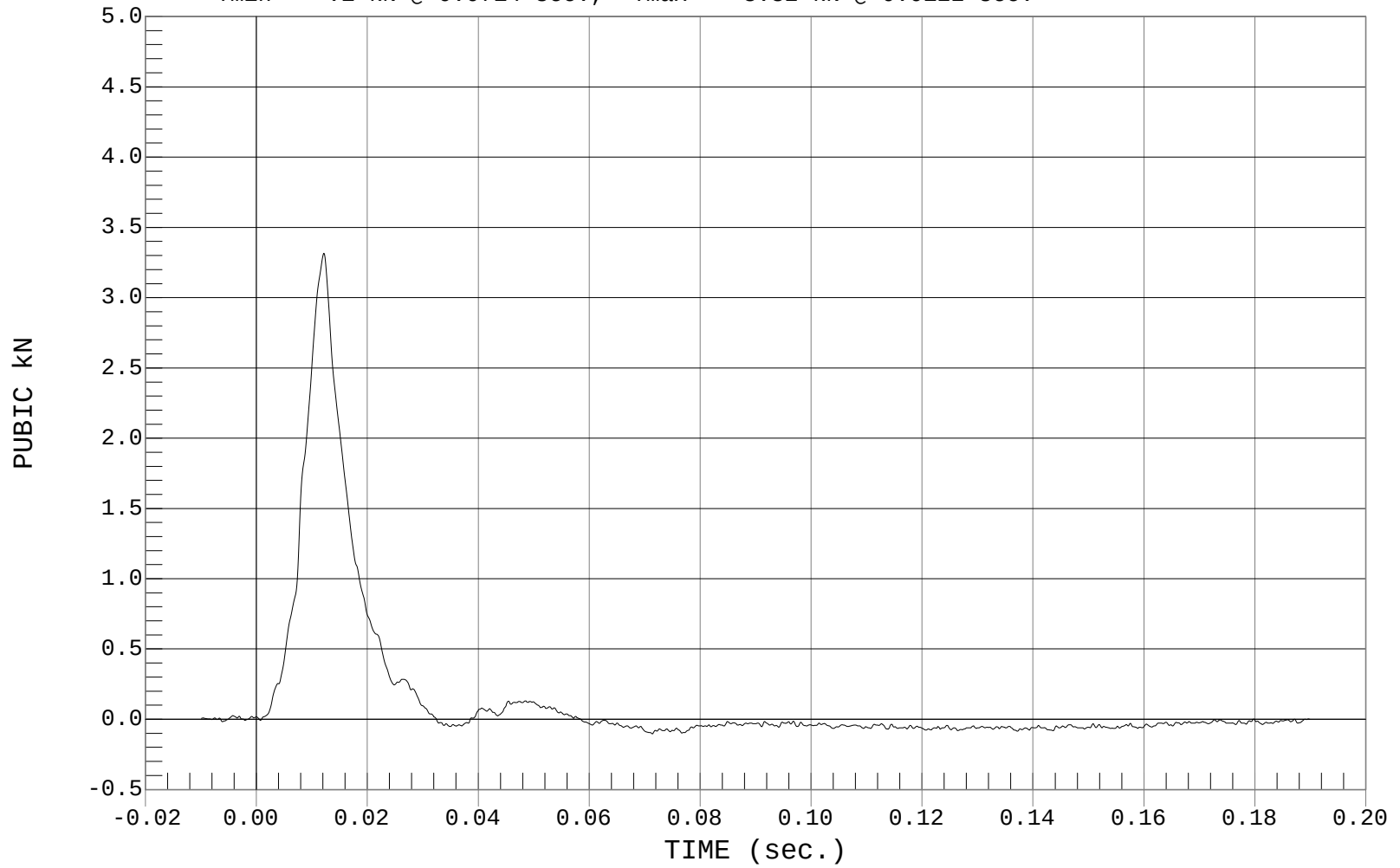
PUBIC FORCE

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: 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: 10/24/01

Dummy Serial Number: 009

Test Number: D011551

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.2
Relative Humidity (%)	10 – 70	59
Peak Resultant Acceleration	100 – 150 g's	137
Time of Max. Res. Acceleration		24.7 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



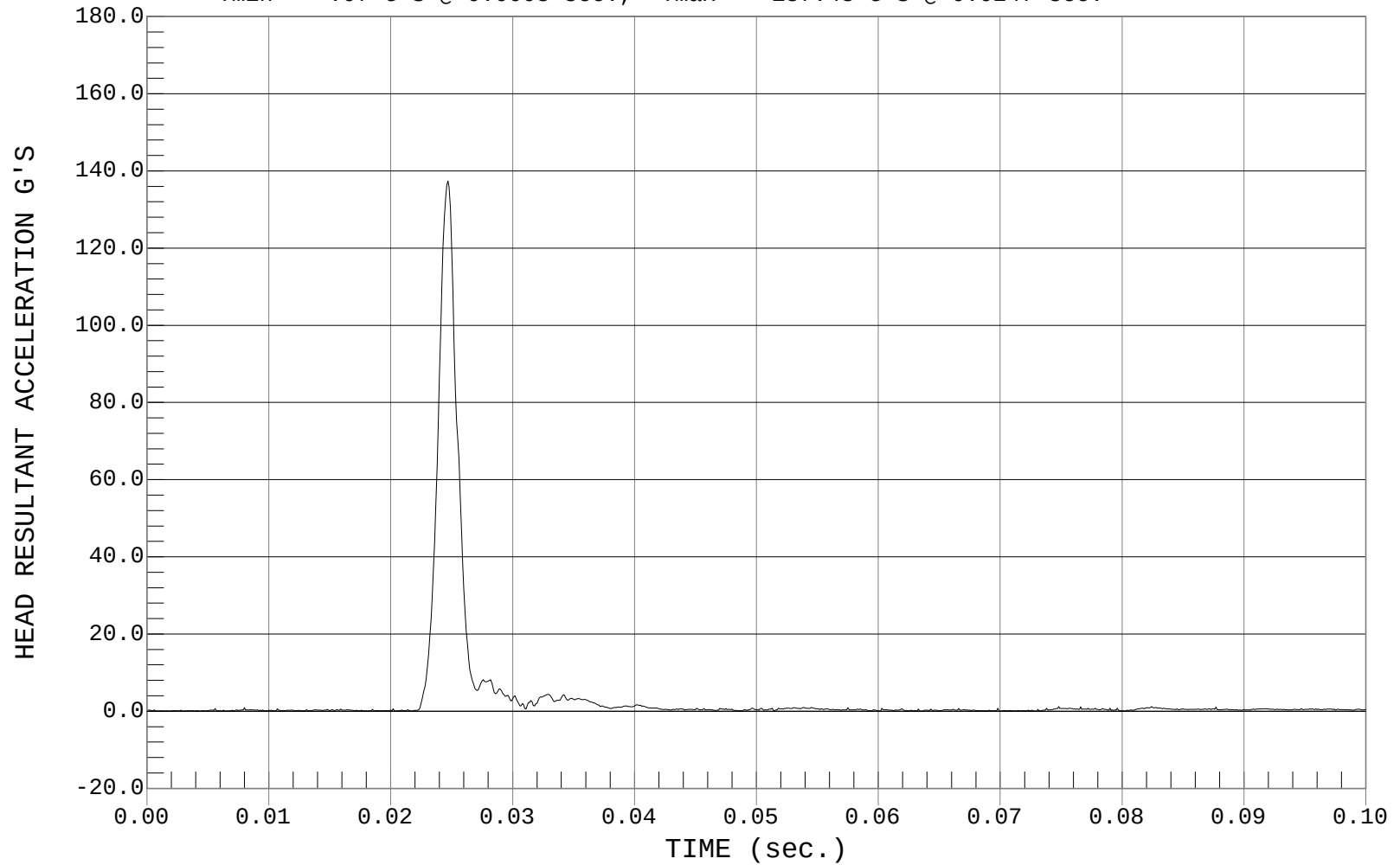
PEAK RESULTANT ACCELERATION

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

Test Date: 10-24-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01551AV.A01

Ymin = .07 G'S @ 0.0008 sec., Ymax = 137.43 G'S @ 0.0247 sec.



MGA RESEARCH CORPORATION
NECK PENDULUM TEST
EUROSID 2 DUMMY

Date: 10/24/01

Dummy Serial Number: 009

Test Number: D011552

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.1
Relative Humidity (%)		10 – 70	58
Pendulum Speed		3.3 - 3.5	3.4
Pendulum Deceleration	3 msec	1.25 - 1.53 m/sec	-.35
	8 msec	1.59 - 2.04 m/sec	-1.67
	14 msec	3.20 - 3.85 m/sec	-3.30
Maximum Flexion Angle		49.0 – 59.0 deg	56.4
Time of Max. Flexion Angle		54.0 – 66.0 ms	59.6
Maximum Angle Theta (A)		32.0 – 37.0 deg	34.8
Time of Max. Theta (A)		53.0 – 63.0 ms	57.8
Maximum Angle Theta (B)		29.94 – 32.44 deg	30.93
Time of Max. Theta (B)		54.0 – 64.0 ms	57.1

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

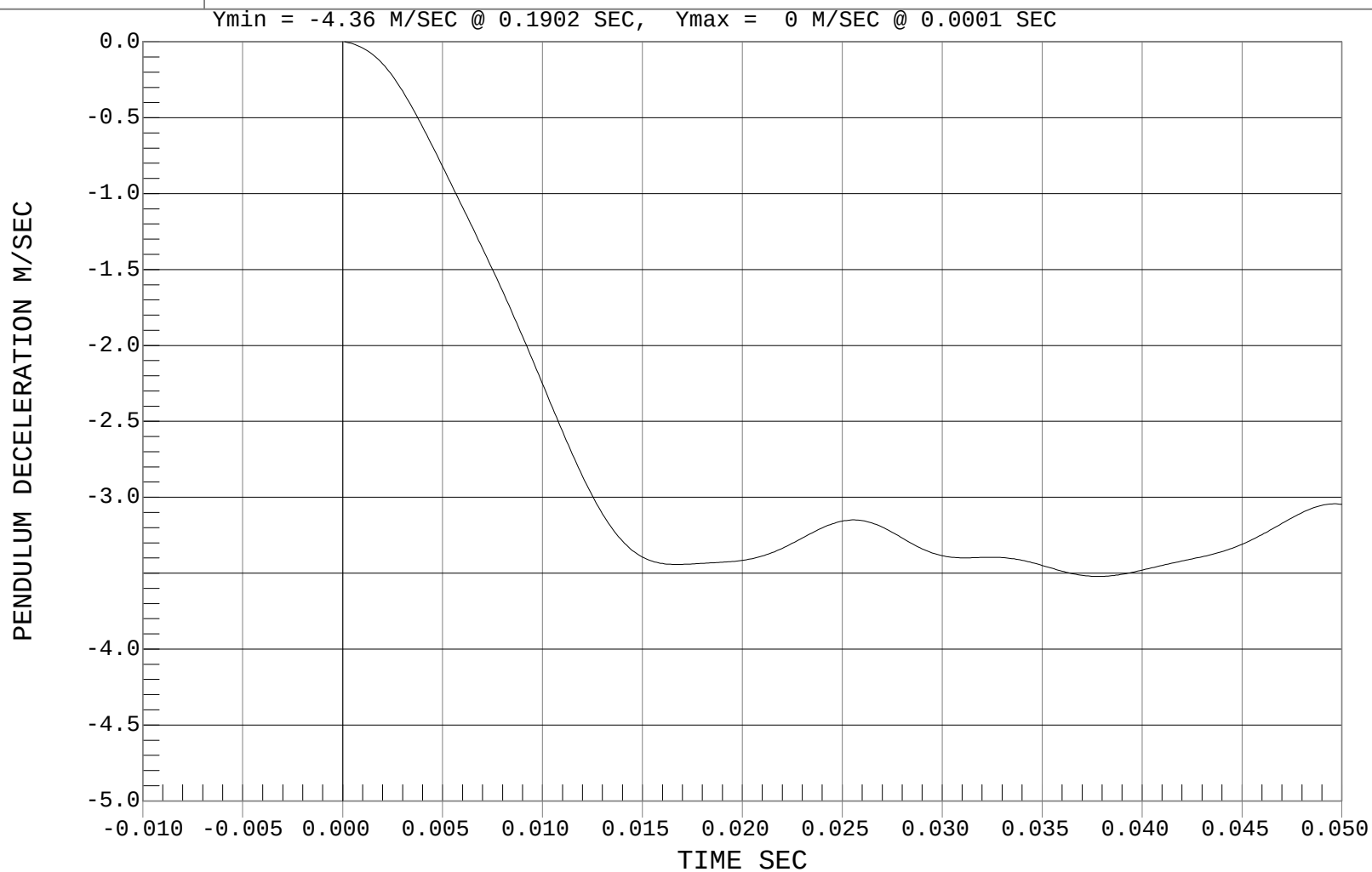


PENDULUM DECELERATION

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

Test Date: 10-24-01
Speed: 11.00 FT/SEC, 3.35 M/SEC

— 1 PENDULUM DECELERATION, D01552AI.V04





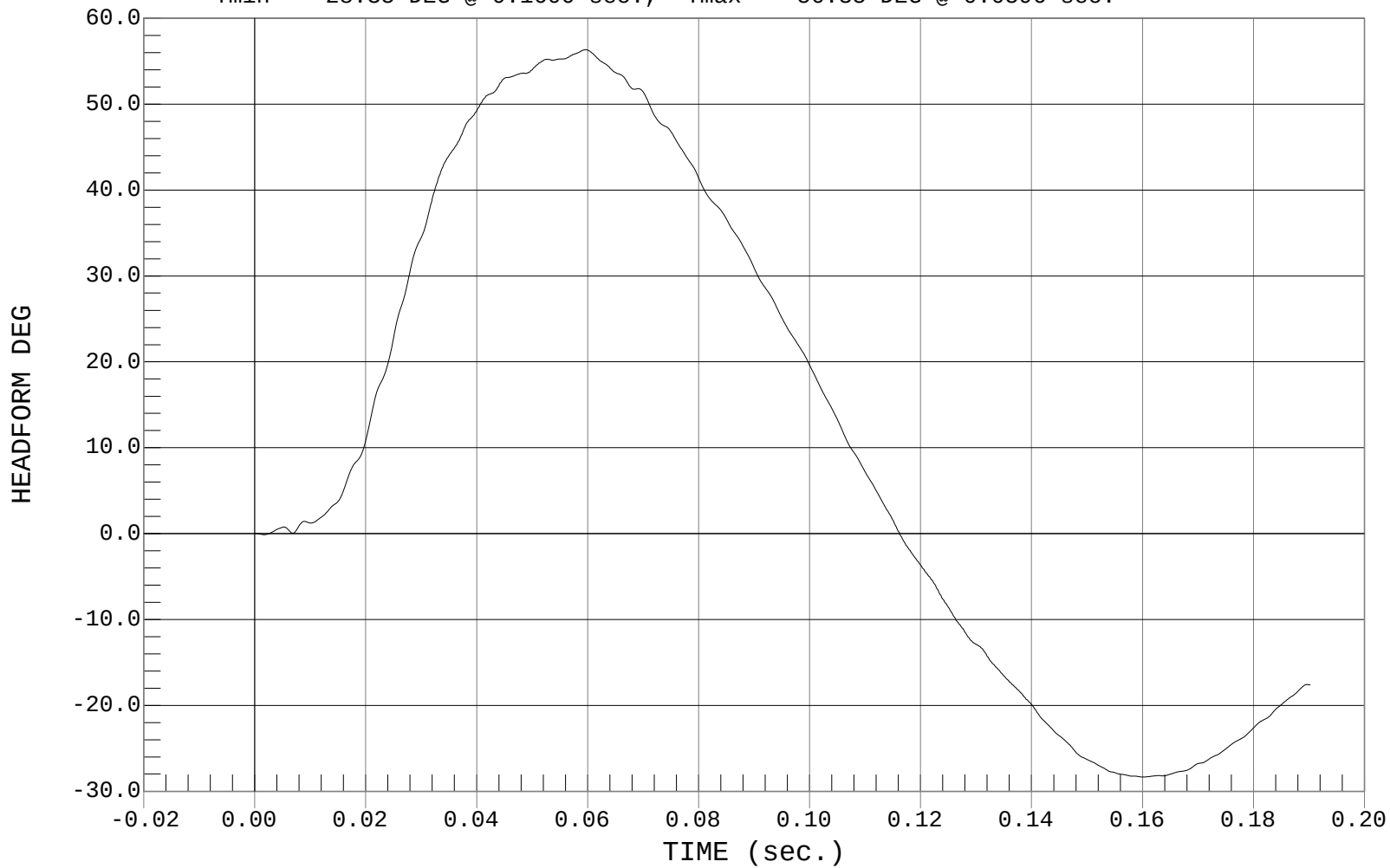
FLEXION ANGLE

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

Test Date: 10-24-01
Speed: 11.00 FT/SEC, 3.35 M/SEC

— 1 HEADFORM, D01552DT.D08

Ymin = -28.35 DEG @ 0.1600 sec., Ymax = 56.35 DEG @ 0.0596 sec.





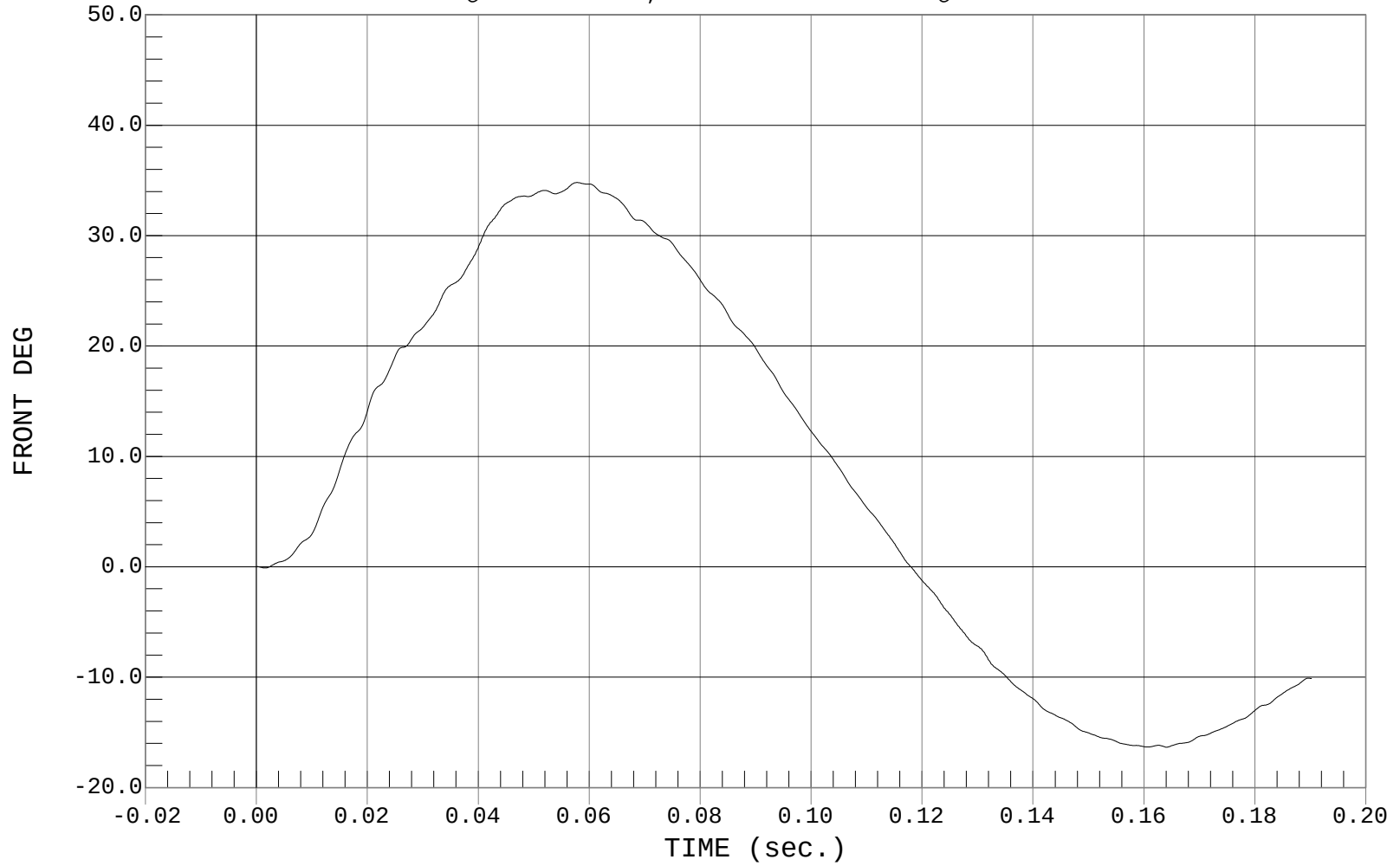
THETA A

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

Test Date: 10-24-01
Speed: 11.00 FT/SEC, 3.35 M/SEC

— 1 FRONT, D01552DT.D05

Ymin = -16.35 DEG @ 0.1641 sec., Ymax = 34.81 DEG @ 0.0578 sec.





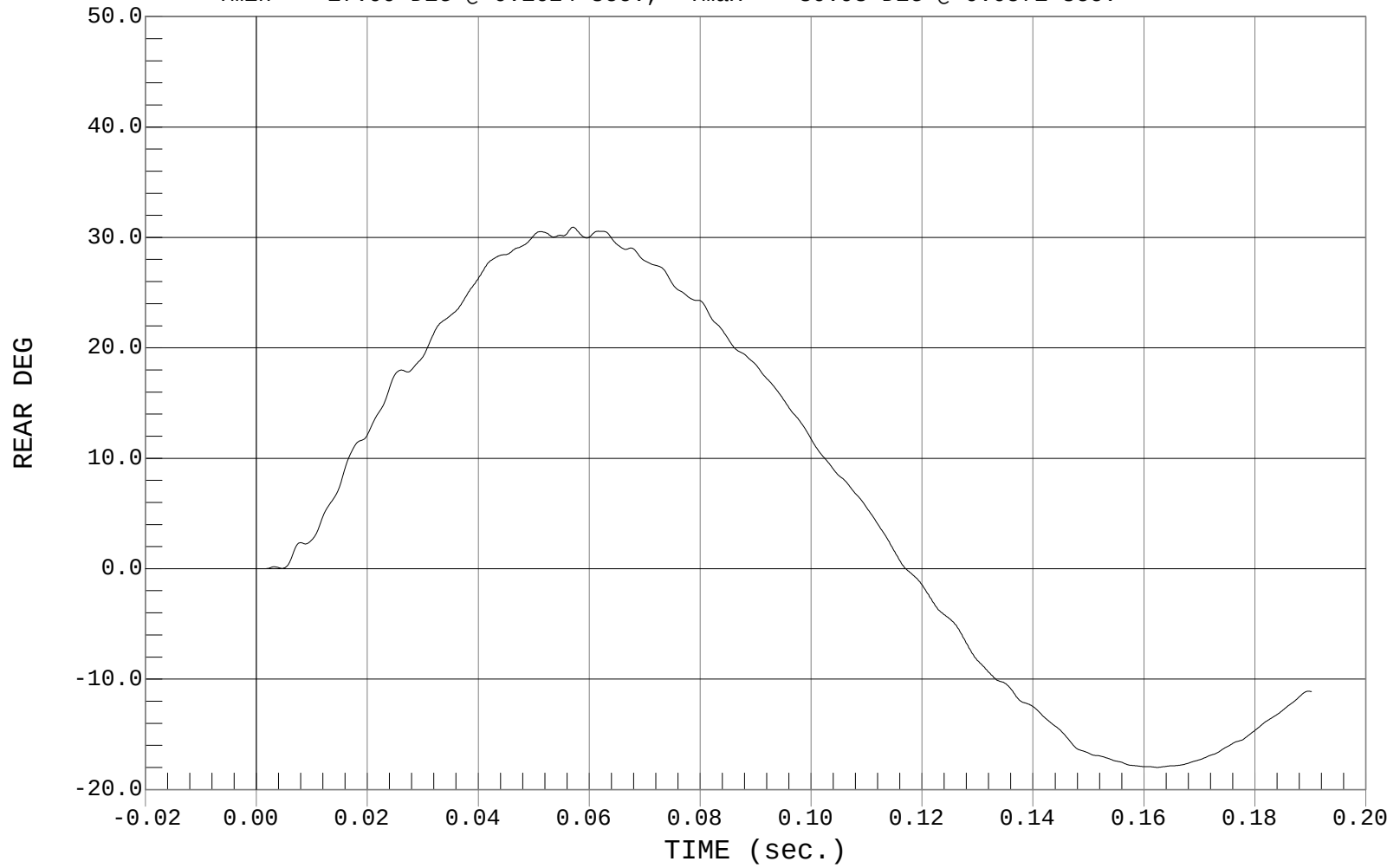
THETA B

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

Test Date: 10-24-01
Speed: 11.00 FT/SEC, 3.35 M/SEC

— 1 REAR, D01552DT.D06

Ymin = -17.99 DEG @ 0.1624 sec., Ymax = 30.93 DEG @ 0.0571 sec.



MGA RESEARCH CORPORATION
SHOULDER IMPACT TEST
EUROSID 2 DUMMY

Date: 10/25/01

Dummy Serial Number: 009

Test Number: D011553

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.0
Relative Humidity (%)	10 – 70	27
Pendulum Speed	4.2 – 4.4 m/s	4.3
Max. Resultant Acceleration	7.5 – 10.5 g's	10.2
Time of Max. Pendulum Acceleration		27.9 msec

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



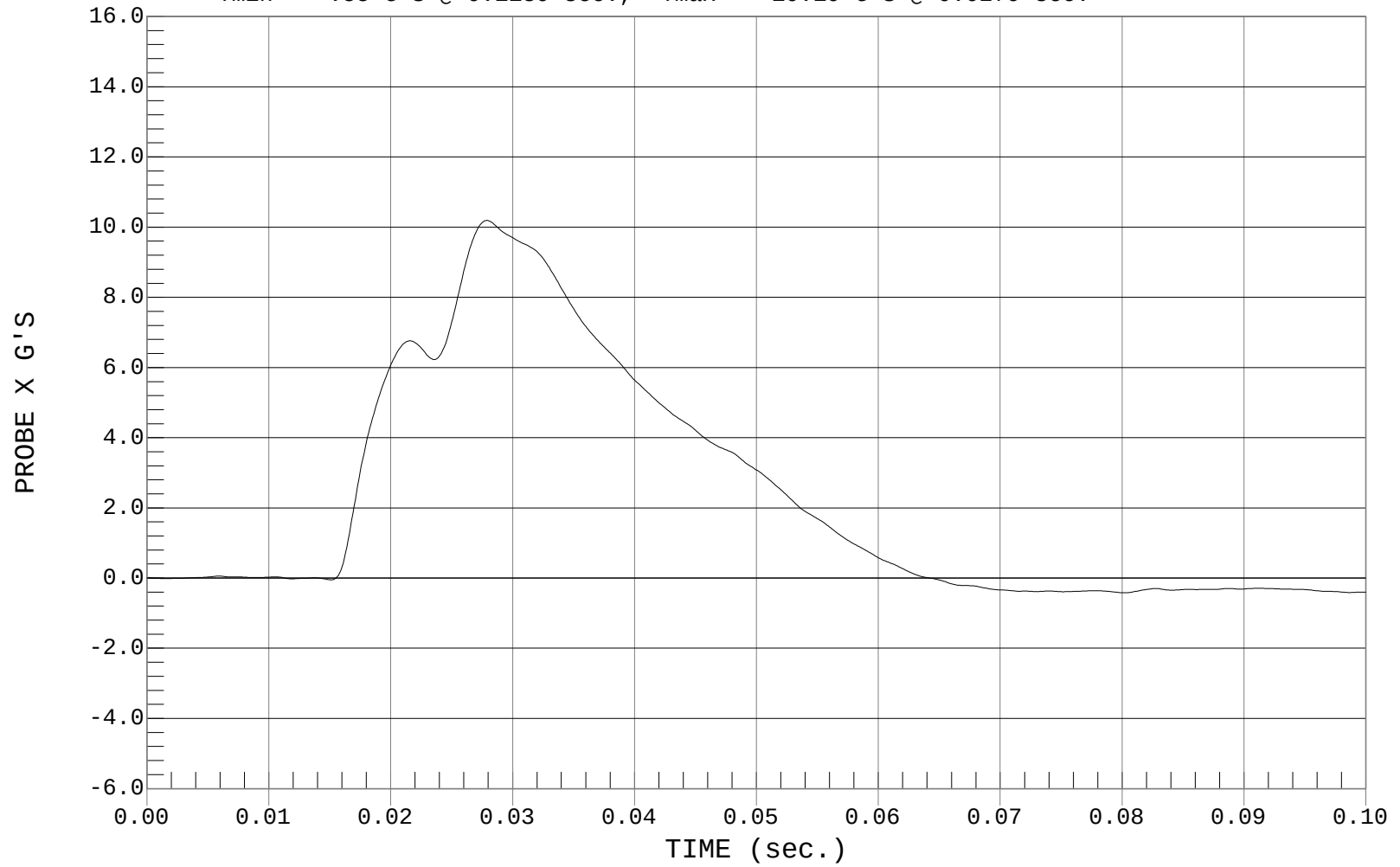
SHOULDER ACCELERATION

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

Test Date: 10-25-01
Speed: 14.01 FT/SEC, 4.27 M/SEC

— 1 PROBE X, D01553AF.A01

Ymin = -.55 G'S @ 0.1139 sec., Ymax = 10.19 G'S @ 0.0279 sec.



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

Date: 10/23/01
Dummy Serial Number: 009
Test Number: D011554/5/6

UPPER RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.6
Relative Humidity (%)	10 – 70	45
Displacement at 2 m/s	23.5 – 27.5 mm	25.4
Displacement at 3 m/s	36.0 – 40.0 mm	39.3
Displacement at 4 m/s	46.0 – 51.0 mm	49.5

MIDDLE RIB - TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.6
Relative Humidity (%)	10 – 70	45
Displacement at 2 m/s	23.5 – 27.5 mm	26.1
Displacement at 3 m/s	36.0 – 40.0 mm	39.7
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	21.6
Relative Humidity (%)	10 – 70	45
Displacement at 2 m/s	23.5 – 27.5 mm	24.6
Displacement at 3 m/s	36.0 – 40.0 mm	38.8
Displacement at 4 m/s	46.0 – 51.0 mm	48.7

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



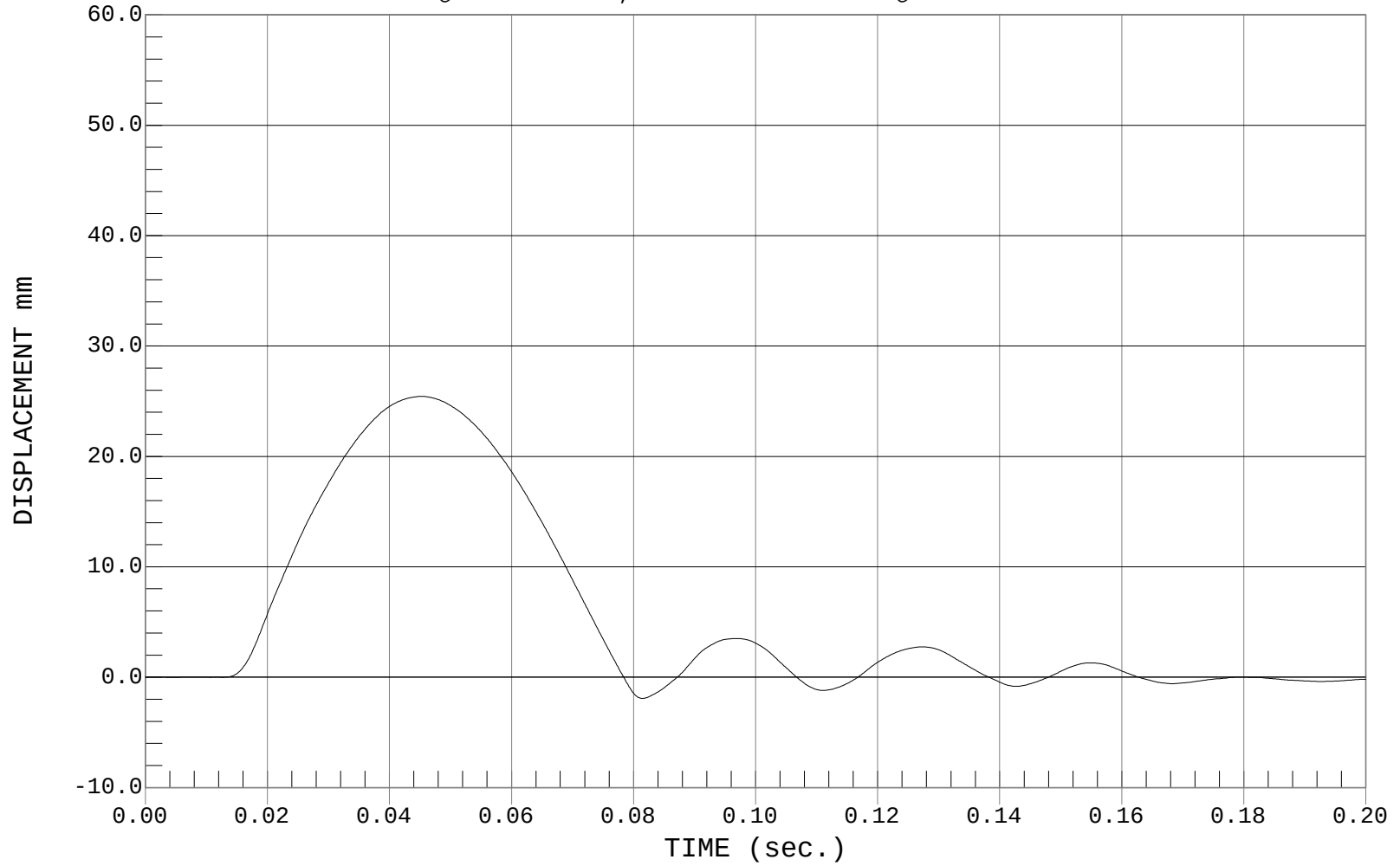
UPPER RIB DISPLACEMENT

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

Test Date: 10-23-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

1 DISPLACEMENT, D01554DF.D05

Ymin = -1.92 mm @ 0.0815 sec., Ymax = 25.44 mm @ 0.0453 sec.





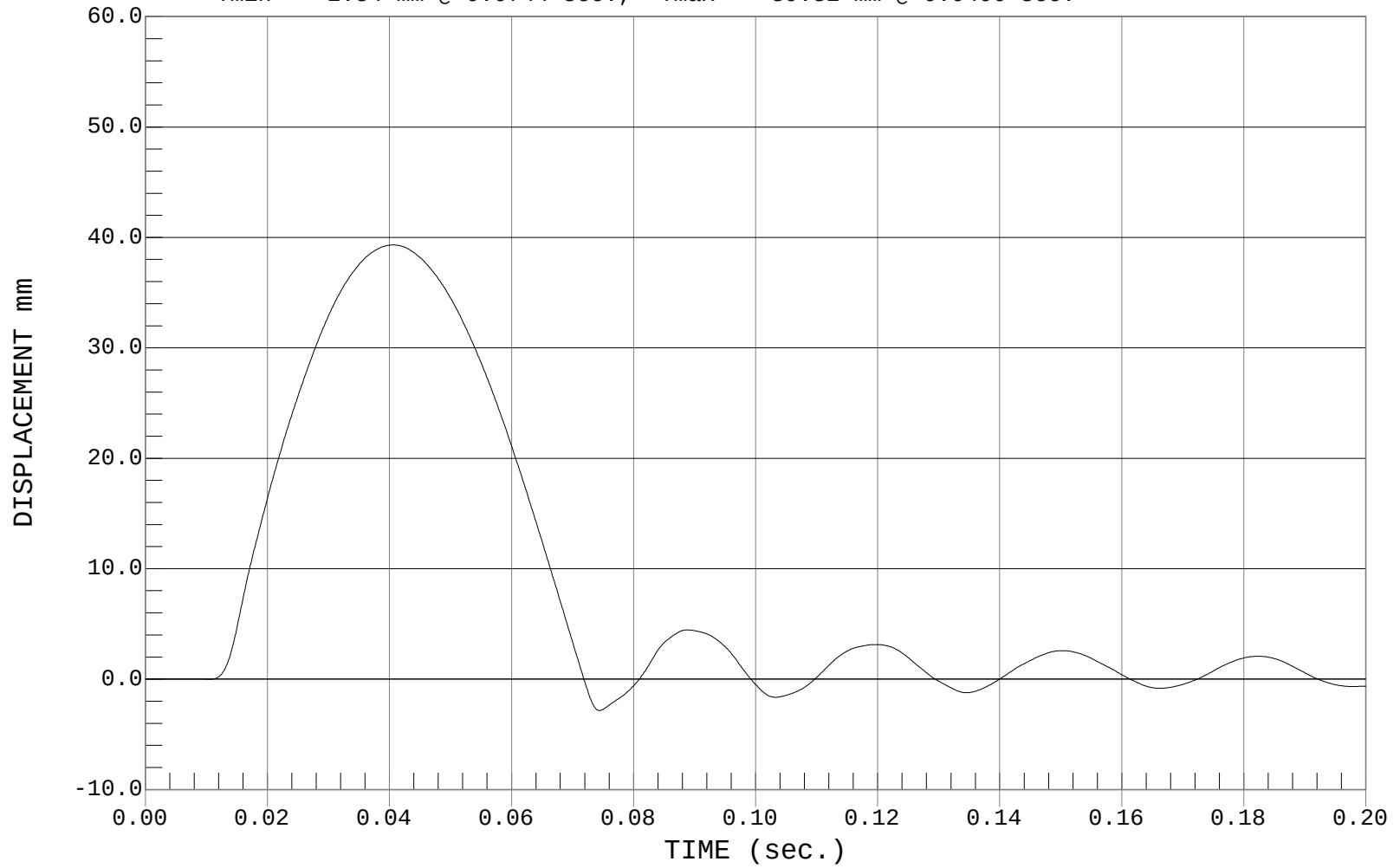
UPPER RIB DISPLACEMENT

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

Test Date: 10-23-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01554DF.D06

Ymin = -2.84 mm @ 0.0744 sec., Ymax = 39.32 mm @ 0.0406 sec.





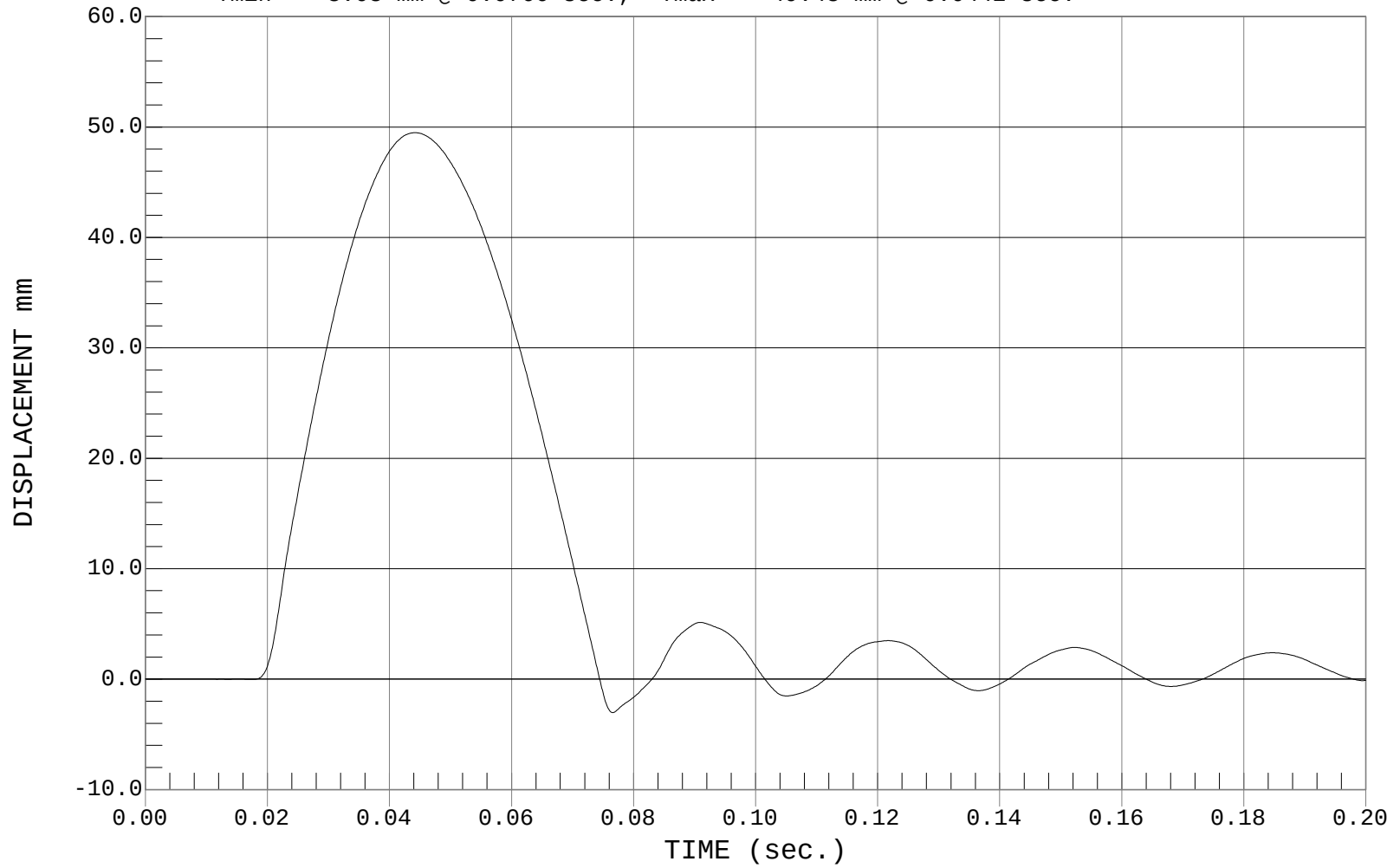
UPPER RIB DISPLACEMENT

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

Test Date: 10-23-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01554DF.D07

Ymin = -3.03 mm @ 0.0766 sec., Ymax = 49.48 mm @ 0.0442 sec.





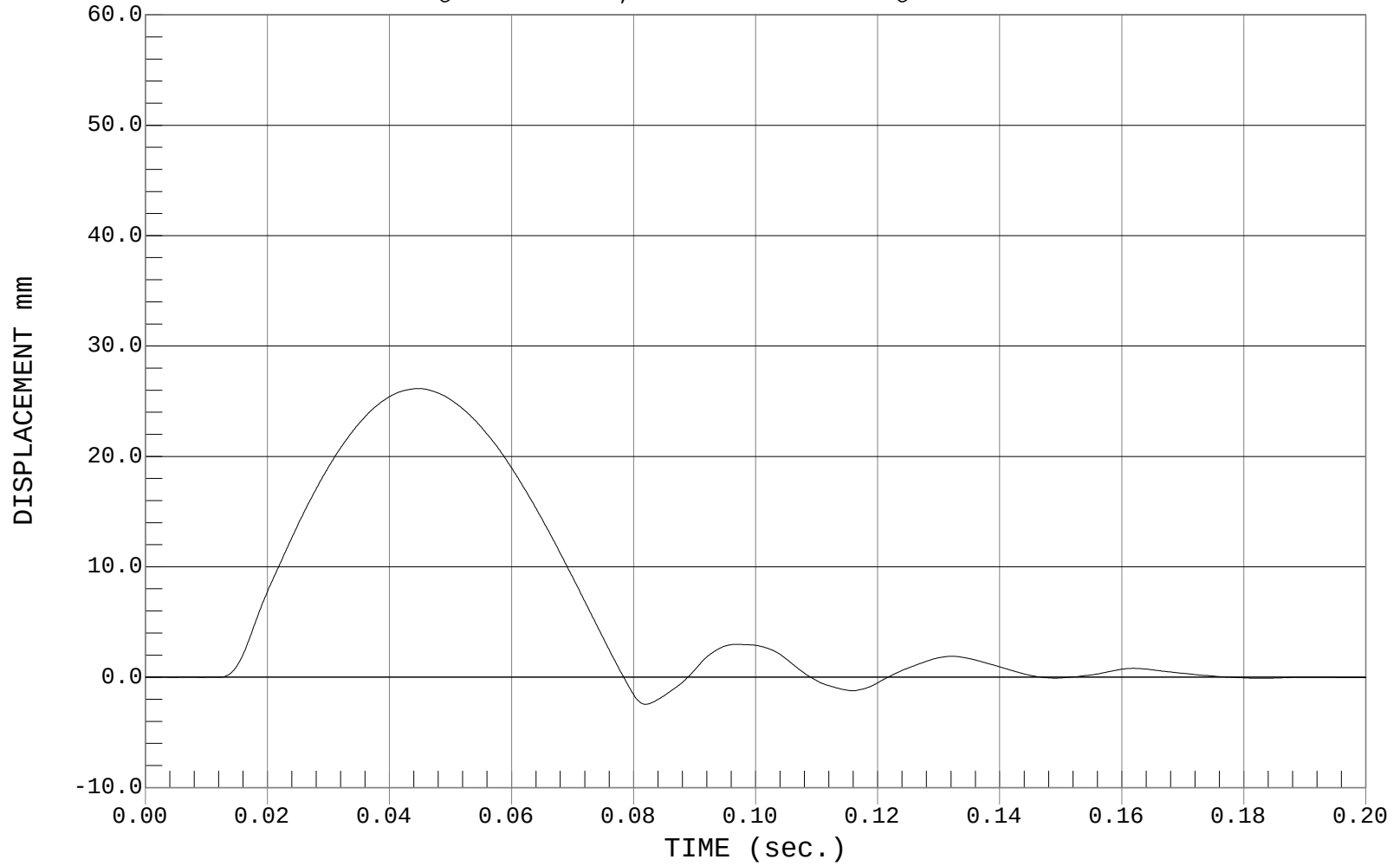
MIDDLE RIB DISPLACEMENT

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

Test Date: 10-23-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01555DF.D05

Ymin = -2.46 mm @ 0.0820 sec., Ymax = 26.14 mm @ 0.0447 sec.





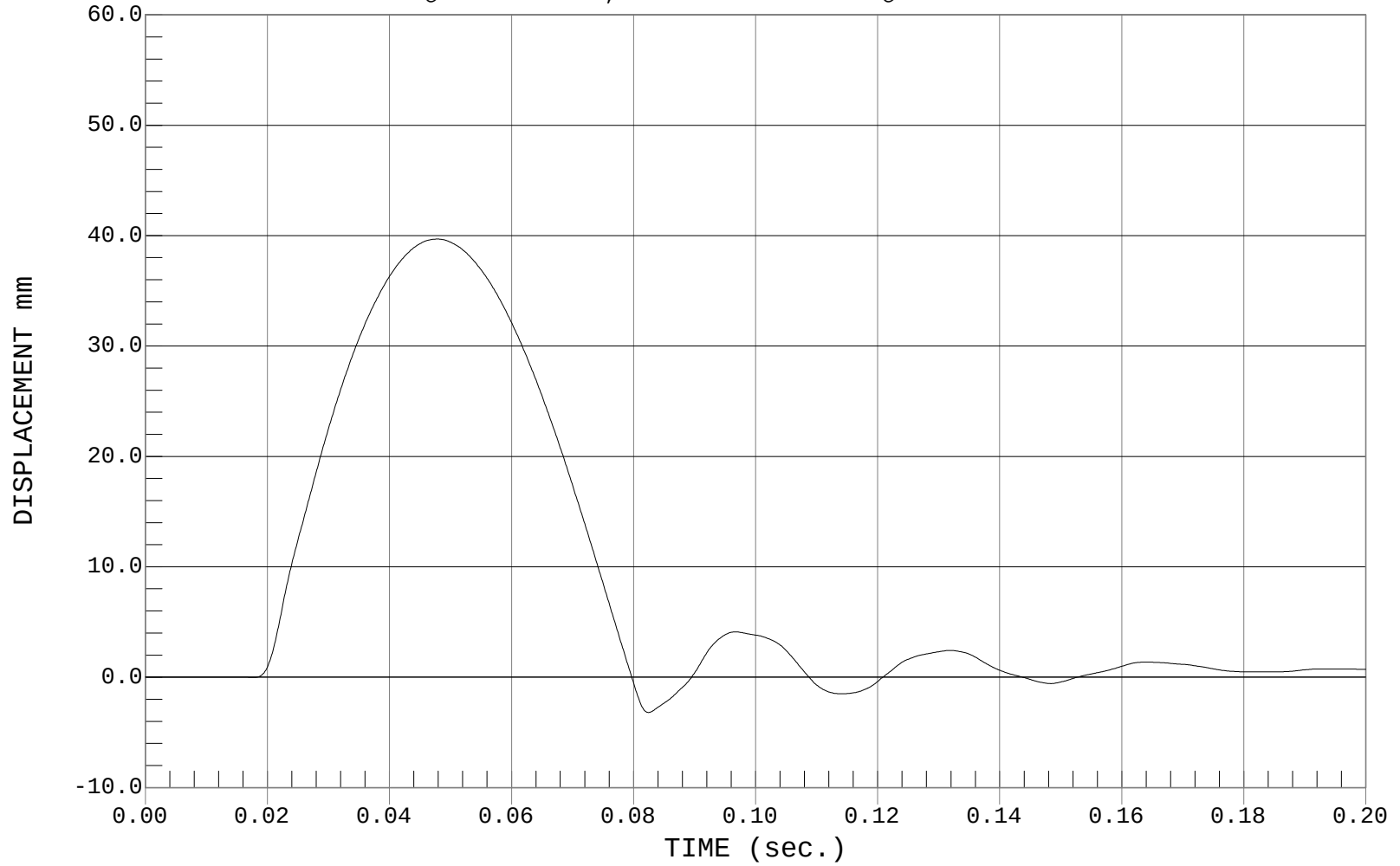
MIDDLE RIB DISPLACEMENT

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

Test Date: 10-23-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01555DF.D06

Ymin = -3.2 mm @ 0.0824 sec., Ymax = 39.69 mm @ 0.0478 sec.





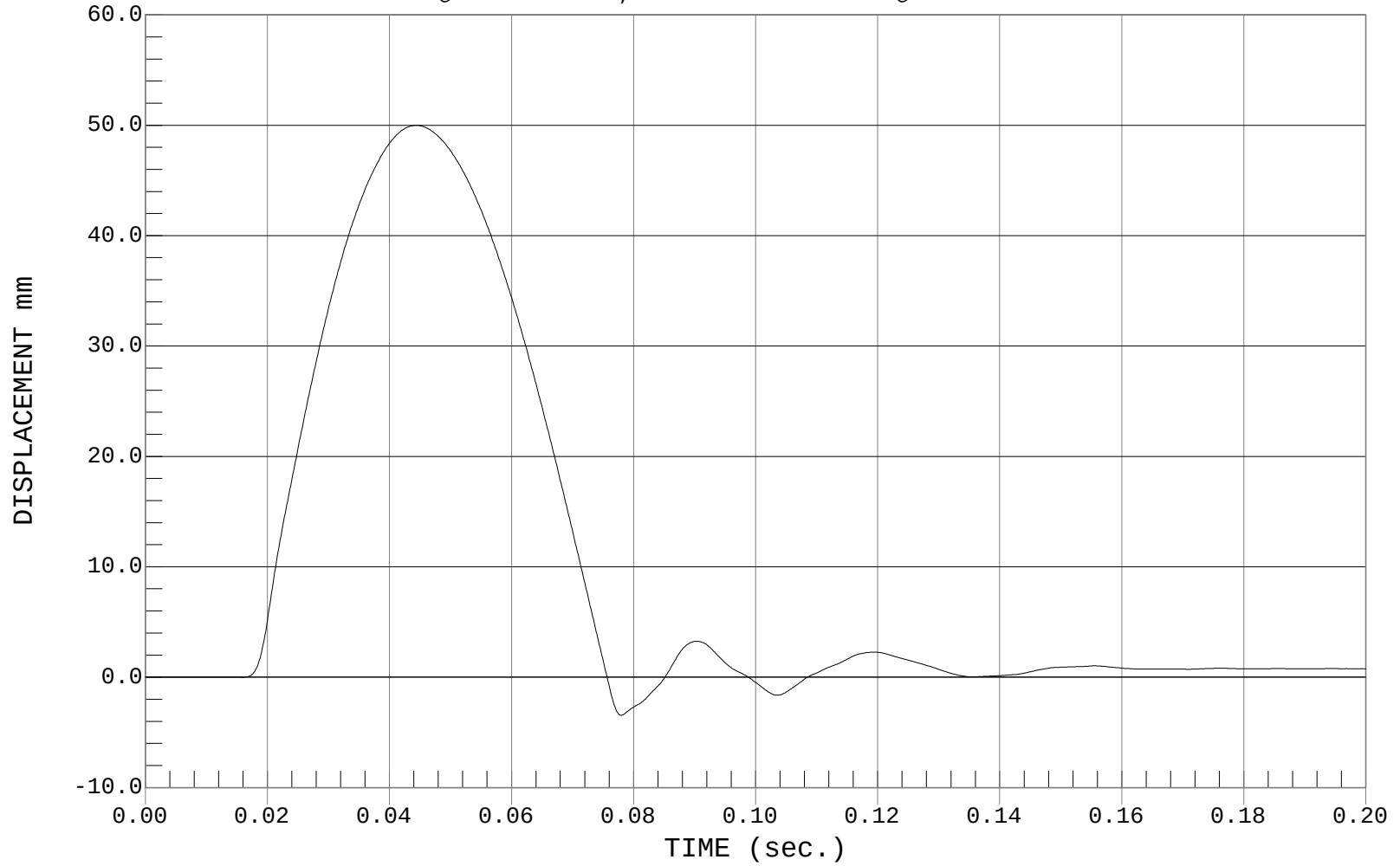
MIDDLE RIB DISPLACEMENT

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

Test Date: 10-23-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01555DF.D07

Ymin = -3.45 mm @ 0.0780 sec., Ymax = 49.99 mm @ 0.0444 sec.





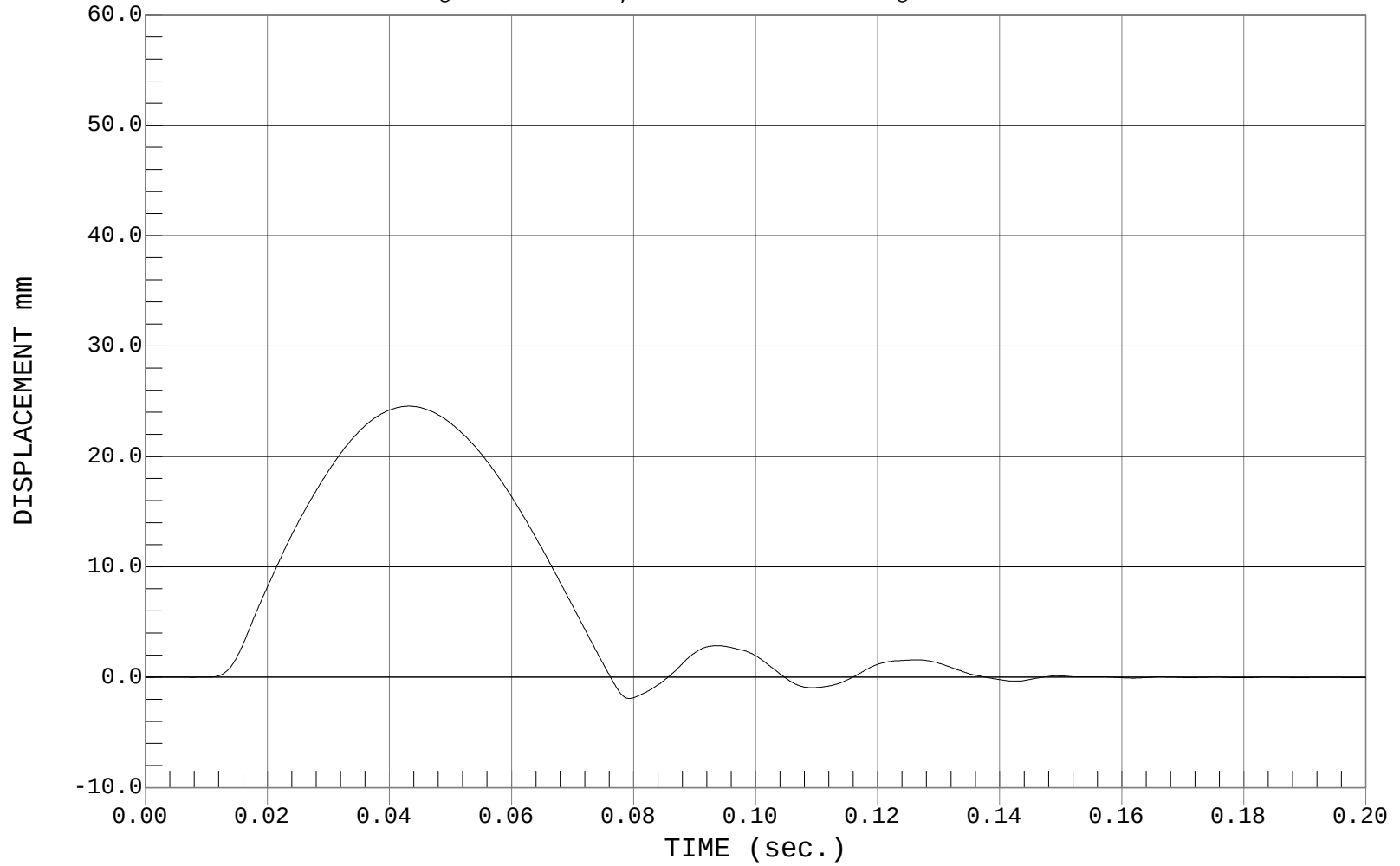
LOWER RIB DISPLACEMENT

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

Test Date: 10-23-01
Speed: 6.56 FT/SEC, 2.00 M/SEC

— 1 DISPLACEMENT, D01556DF.D05

Ymin = -1.93 mm @ 0.0793 sec., Ymax = 24.55 mm @ 0.0432 sec.





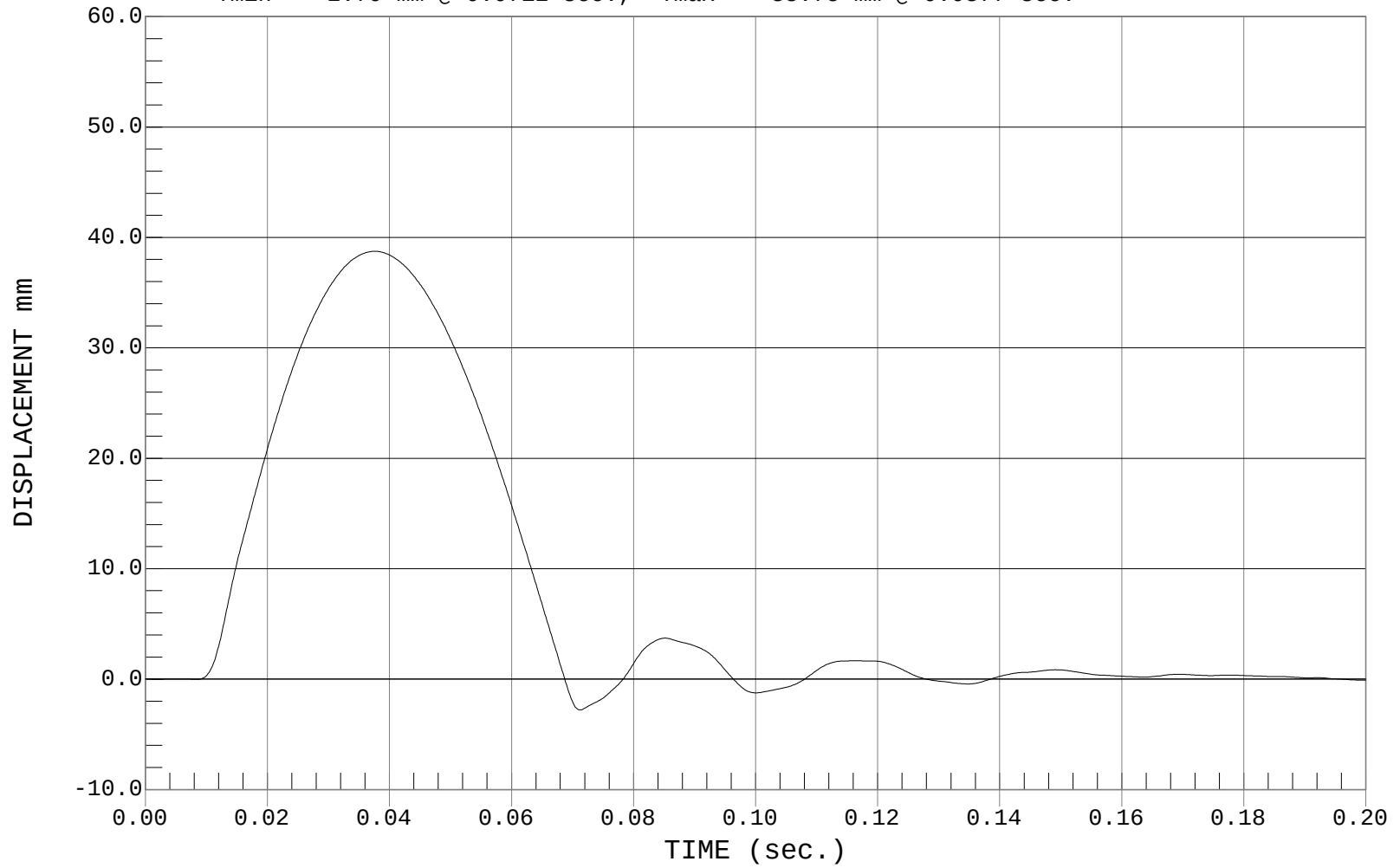
LOWER RIB DISPLACEMENT

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

Test Date: 10-23-01
Speed: 9.84 FT/SEC, 3.00 M/SEC

— 1 DISPLACEMENT, D01556DF.D06

Ymin = -2.79 mm @ 0.0712 sec., Ymax = 38.75 mm @ 0.0377 sec.





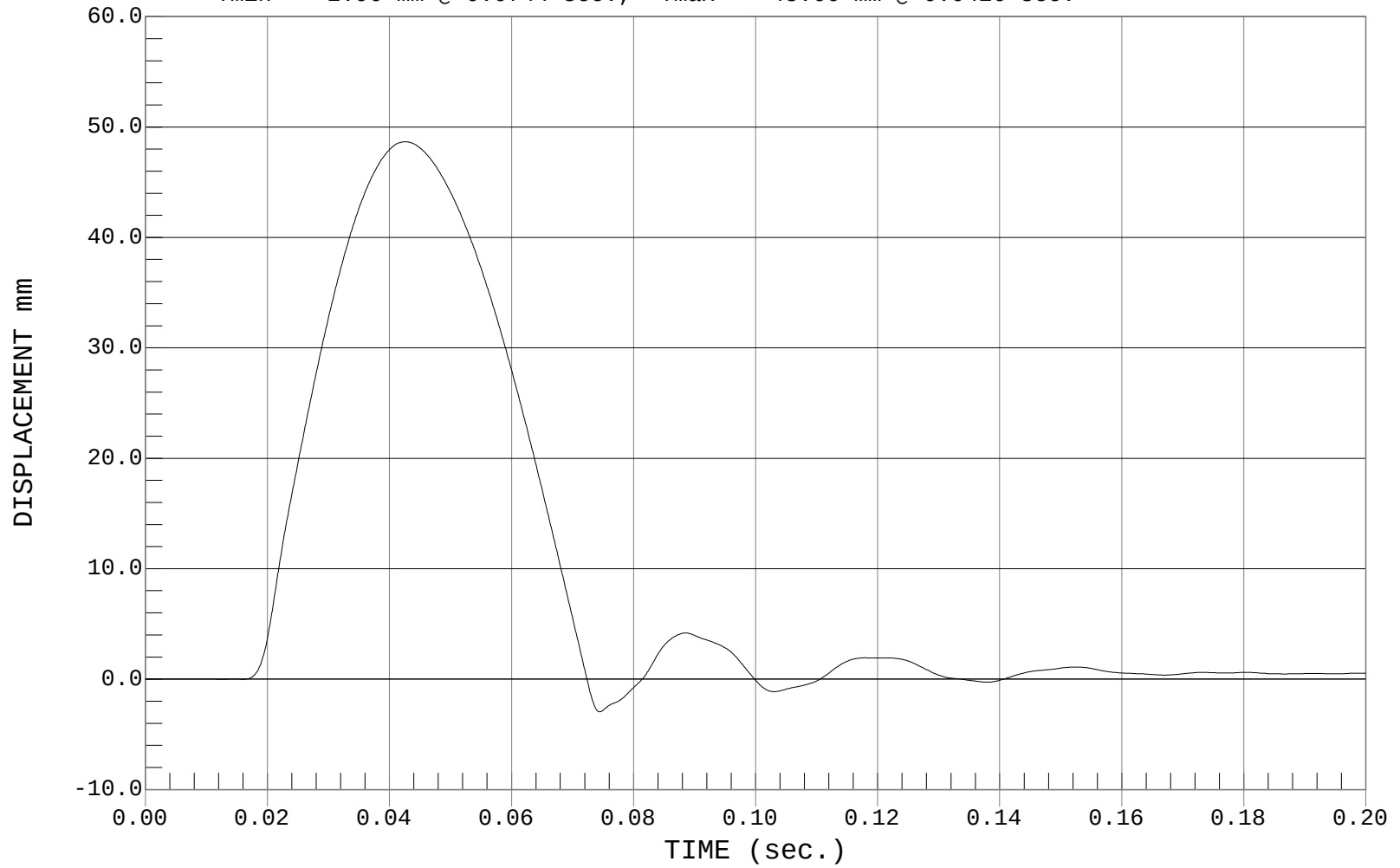
LOWER RIB DISPLACEMENT

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

Test Date: 10-23-01
Speed: 13.12 FT/SEC, 4.00 M/SEC

— 1 DISPLACEMENT, D01556DF.D07

Ymin = -2.96 mm @ 0.0744 sec., Ymax = 48.66 mm @ 0.0426 sec.



MGA RESEARCH CORPORATION
ABDOMEN TEST
EUROSID 2 DUMMY

Date: 10/25/01

Dummy Serial Number: 009

Test Number: D011557

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.0
Relative Humidity (%)	10 – 70	28
Probe Speed (m/s)	3.90 – 4.10	3.99
Maximum Impact Force	4.00 – 4.80 kN	4.70
Time of Maximum Force	10.60 – 13.00 ms	11.10
Maximum Total Abdomen Force	2.20 – 2.70 kN	2.21
Time of Max. Total Force	10.00 – 12.30 ms	10.70

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



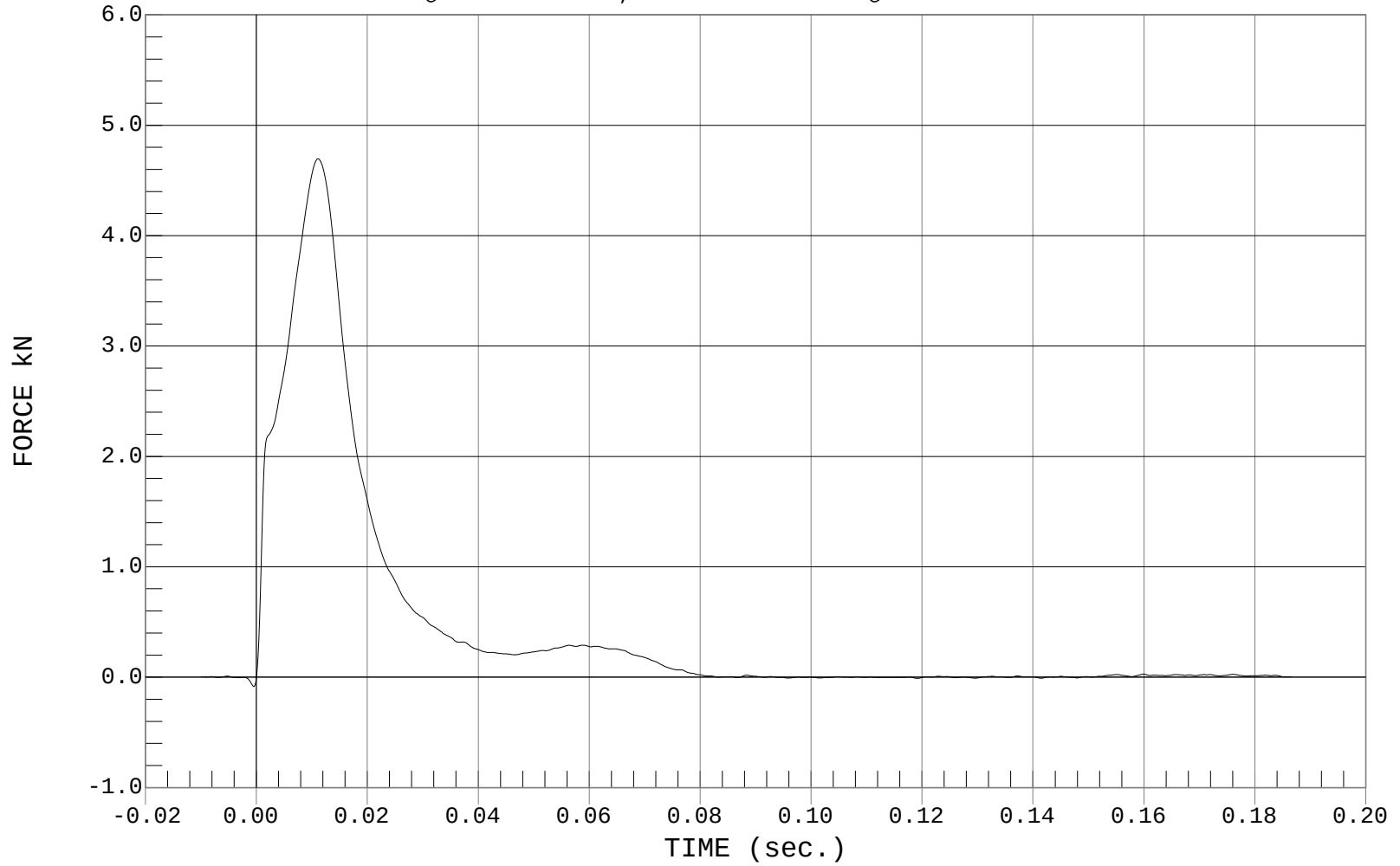
IMPACTOR FORCE

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

Test Date: 10-25-01
Speed: 13.08 FT/SEC, 3.99 M/SEC

— 1 FORCE, D01557FT.F01

Ymin = -.08 kN @ -0.0005 sec., Ymax = 4.7 kN @ 0.0111 sec.





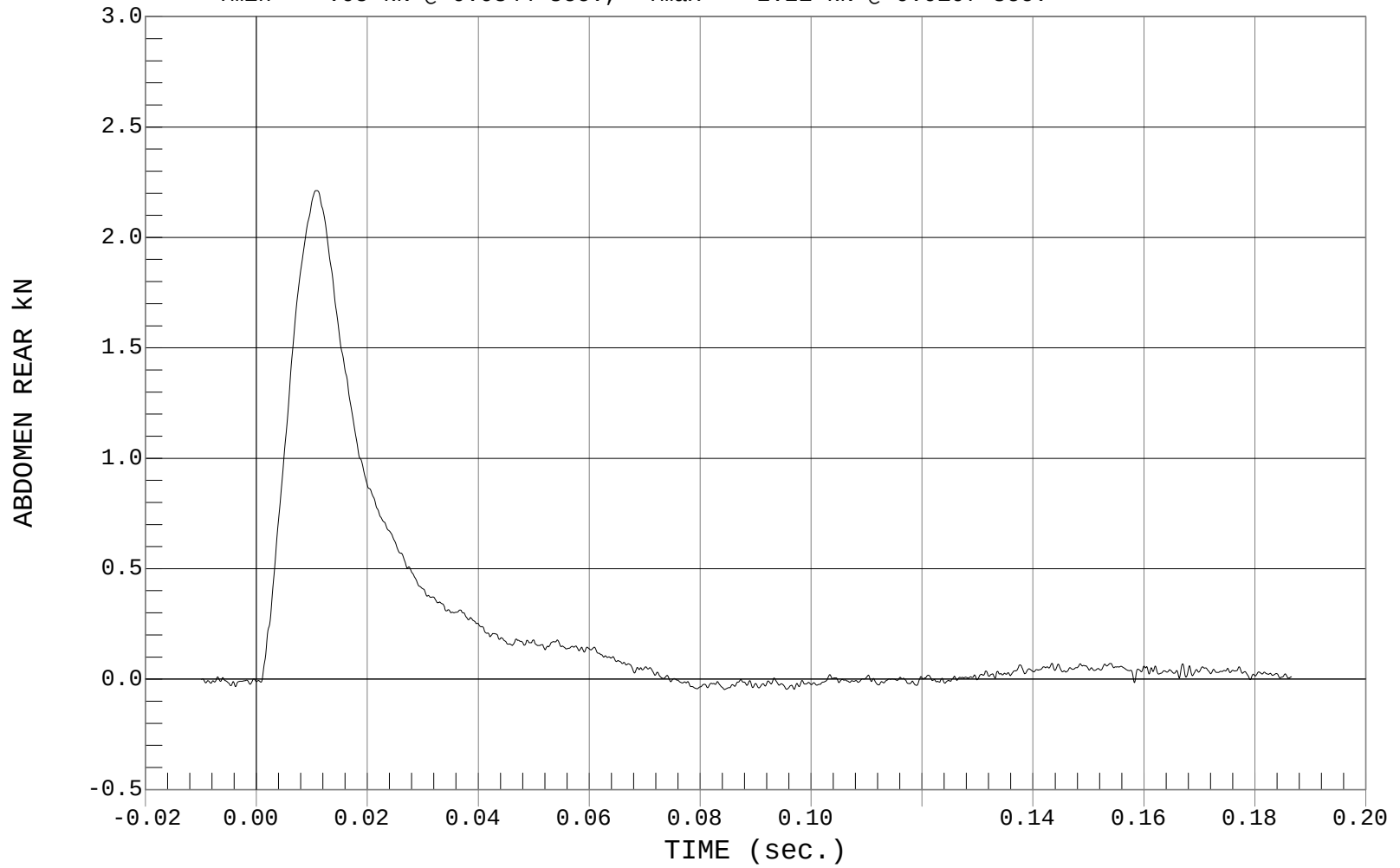
ABDOMEN FORCE

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

Test Date: 10-25-01
Speed: 13.08 FT/SEC, 3.99 M/SEC

— 1 ABDOMEN REAR, D01557FT.F02

Ymin = -.05 kN @ 0.0844 sec., Ymax = 2.21 kN @ 0.0107 sec.



MGA RESEARCH CORPORATION
LUMBAR SPINE TEST
EUROSID 2 DUMMY

Date: 10/24/01

Dummy Serial Number: 009

Test Number: D011558

TEST PARAMETER		SPECIFICATION	TEST RESULTS
Temperature (°C)		18.0 – 22.0	21.1
Relative Humidity (%)		10 – 70	58
Pendulum Speed		5.95 – 6.15	5.98
Pendulum Deceleration	10 msec	2.46 - 1.59 m/sec	-1.98
	20 msec	5.25 - 4.07 m/sec	-4.40
	25 msec	6.64 - 5.3 m/sec	-5.47
	30 msec	≥ -6.5 m/sec	-6.1
Maximum Flexion Angle		45.0 – 55.0 deg	50.5
Time of Max. Flexion Angle		39.0 – 53.0 ms	44.7
Maximum Angle Theta (A)		31.0 – 35.0 deg	32.8
Time of Max. Theta (A)		44.0 – 52.0 ms	44.7
Maximum Angle Theta (B)		28.24 – 30.74 deg	28.66
Time of Max. Theta (B)		44.0 – 52.0 ms	46.3

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____

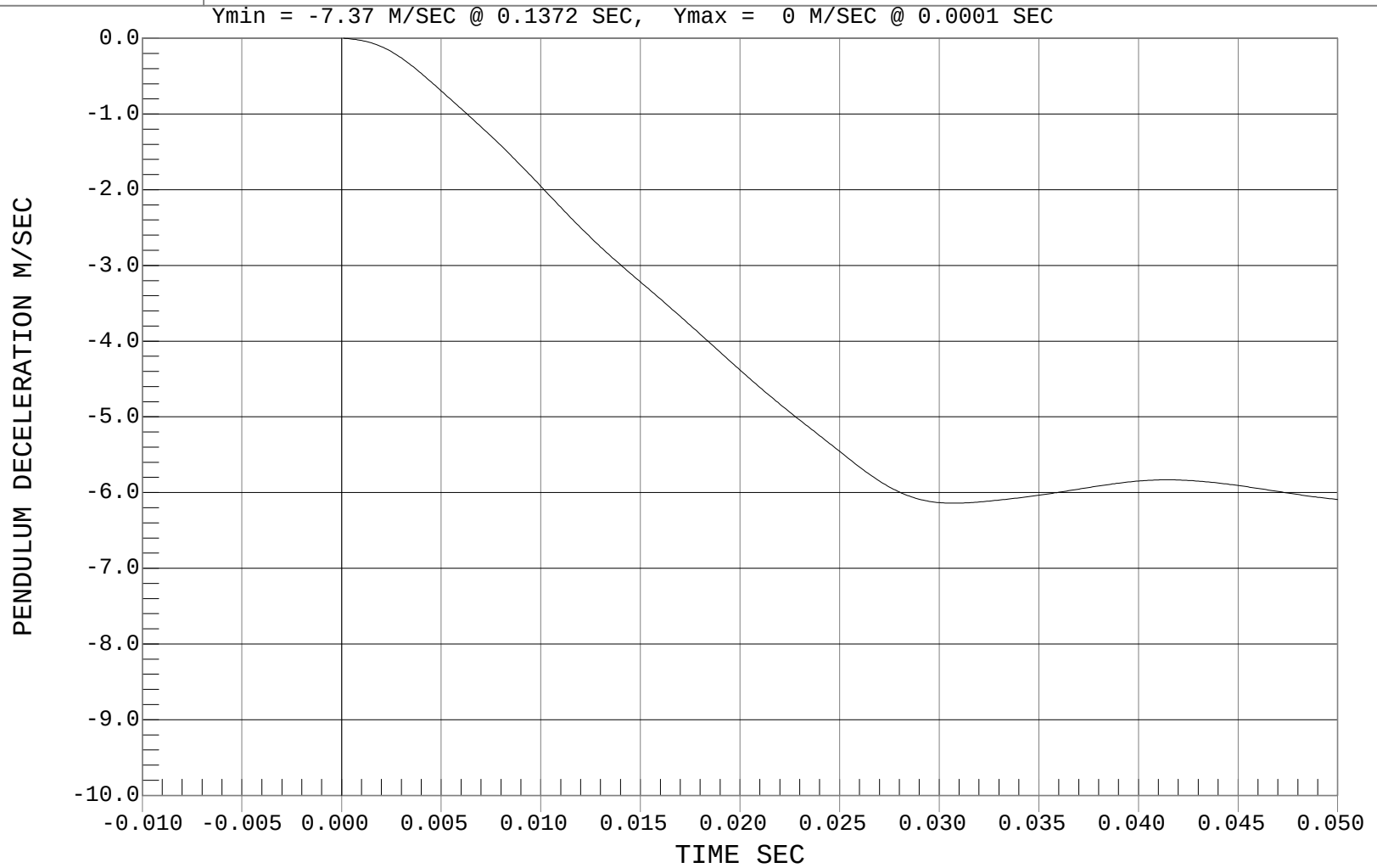


PENDULUM DECELERATION

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

Test Date: 10-24-01
Speed: 19.63 FT/SEC, 5.98 M/SEC

— 1 PENDULUM DECELERATION, D01558AI.V04





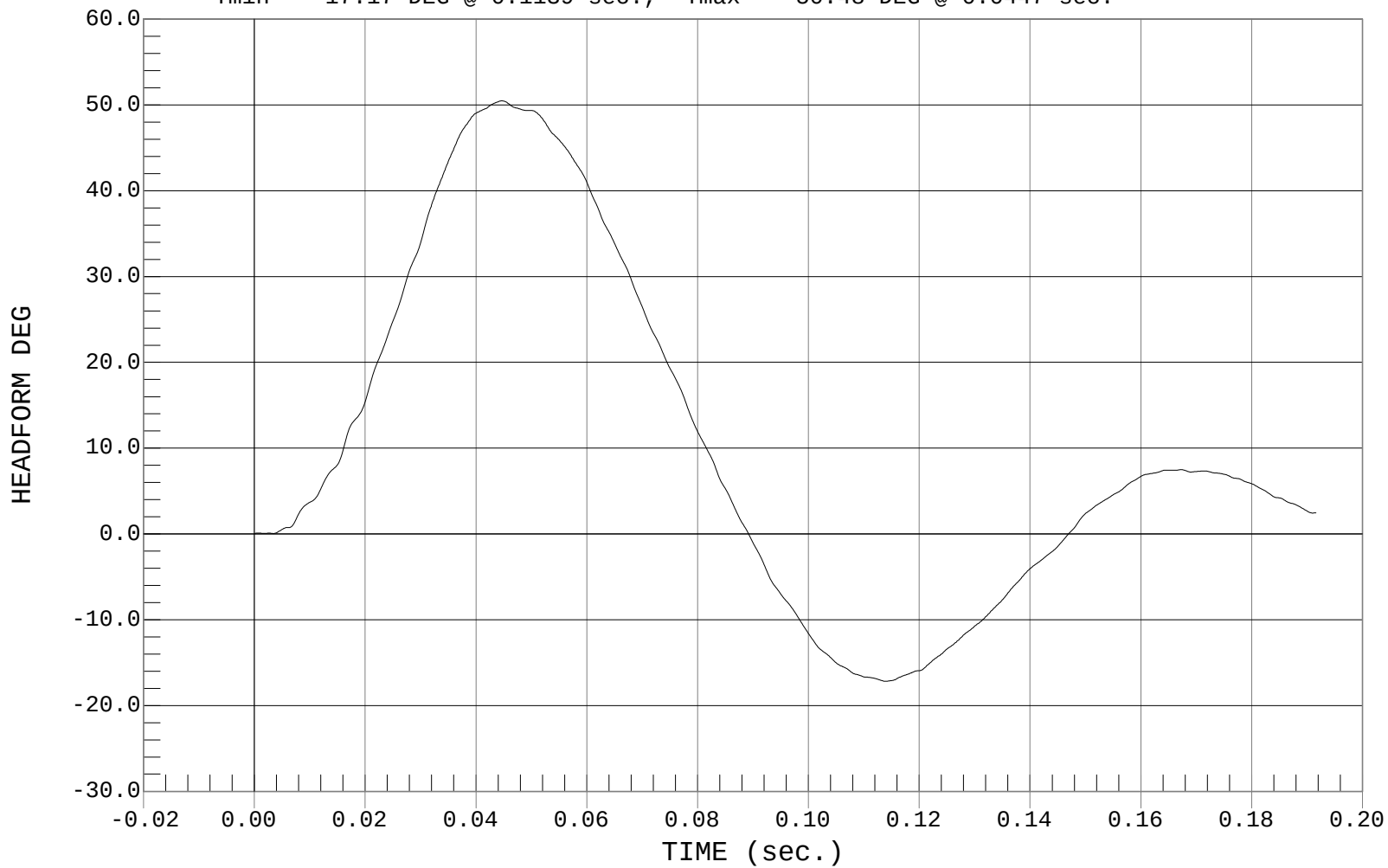
FLEXION ANGLE

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

Test Date: 10-24-01
Speed: 19.63 FT/SEC, 5.98 M/SEC

— 1 HEADFORM, D01558DT.D08

Ymin = -17.17 DEG @ 0.1139 sec., Ymax = 50.48 DEG @ 0.0447 sec.





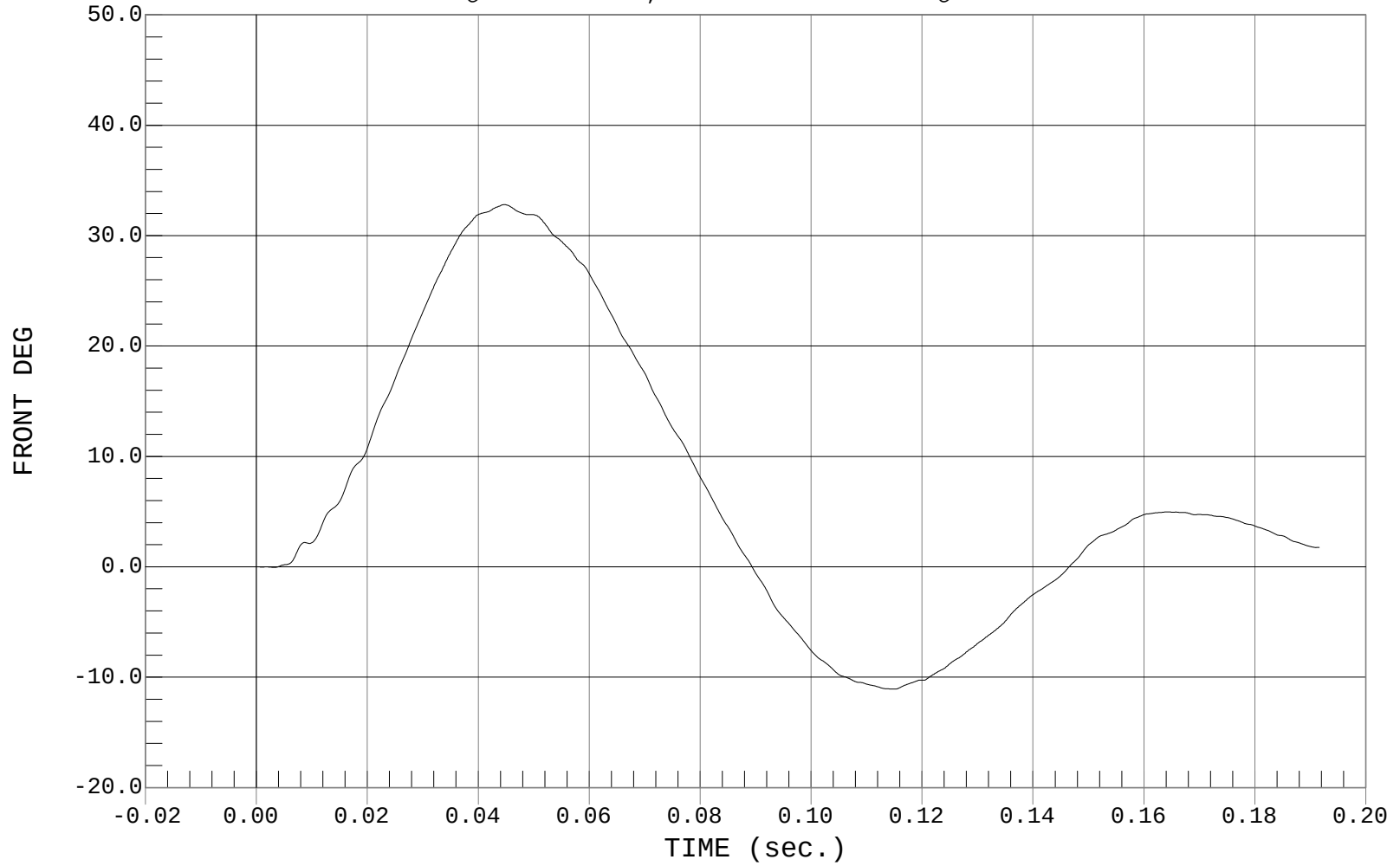
THETA A

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

Test Date: 10-24-01
Speed: 19.63 FT/SEC, 5.98 M/SEC

— 1 FRONT, D01558DT.D05

Ymin = -11.08 DEG @ 0.1151 sec., Ymax = 32.81 DEG @ 0.0447 sec.





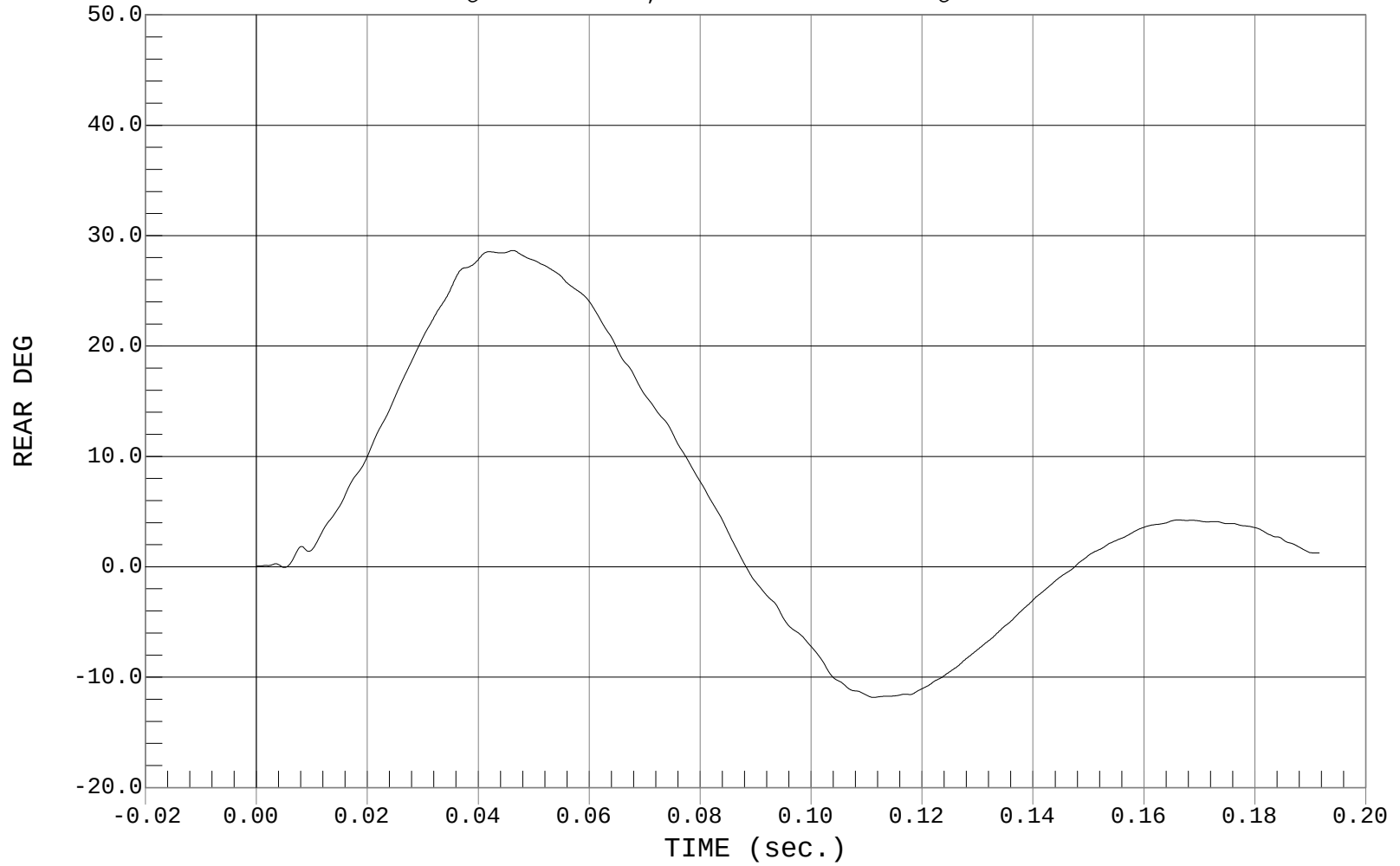
THETA B

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

Test Date: 10-24-01
Speed: 19.63 FT/SEC, 5.98 M/SEC

— 1 REAR, D01558DT.D06

Ymin = -11.83 DEG @ 0.1113 sec., Ymax = 28.66 DEG @ 0.0463 sec.



MGA RESEARCH CORPORATION
PELVIS TEST
EUROSID 2 DUMMY

Date: 10/25/01

Dummy Serial Number: 009

Test Number: D011559

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.0 – 22.0	21.0
Relative Humidity (%)	10 – 70	27
Pendulum Speed	6.20 – 6.30 m/s	6.22
Maximum Impactor Force	9.80 – 12.20 kN	10.78
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	11.90

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



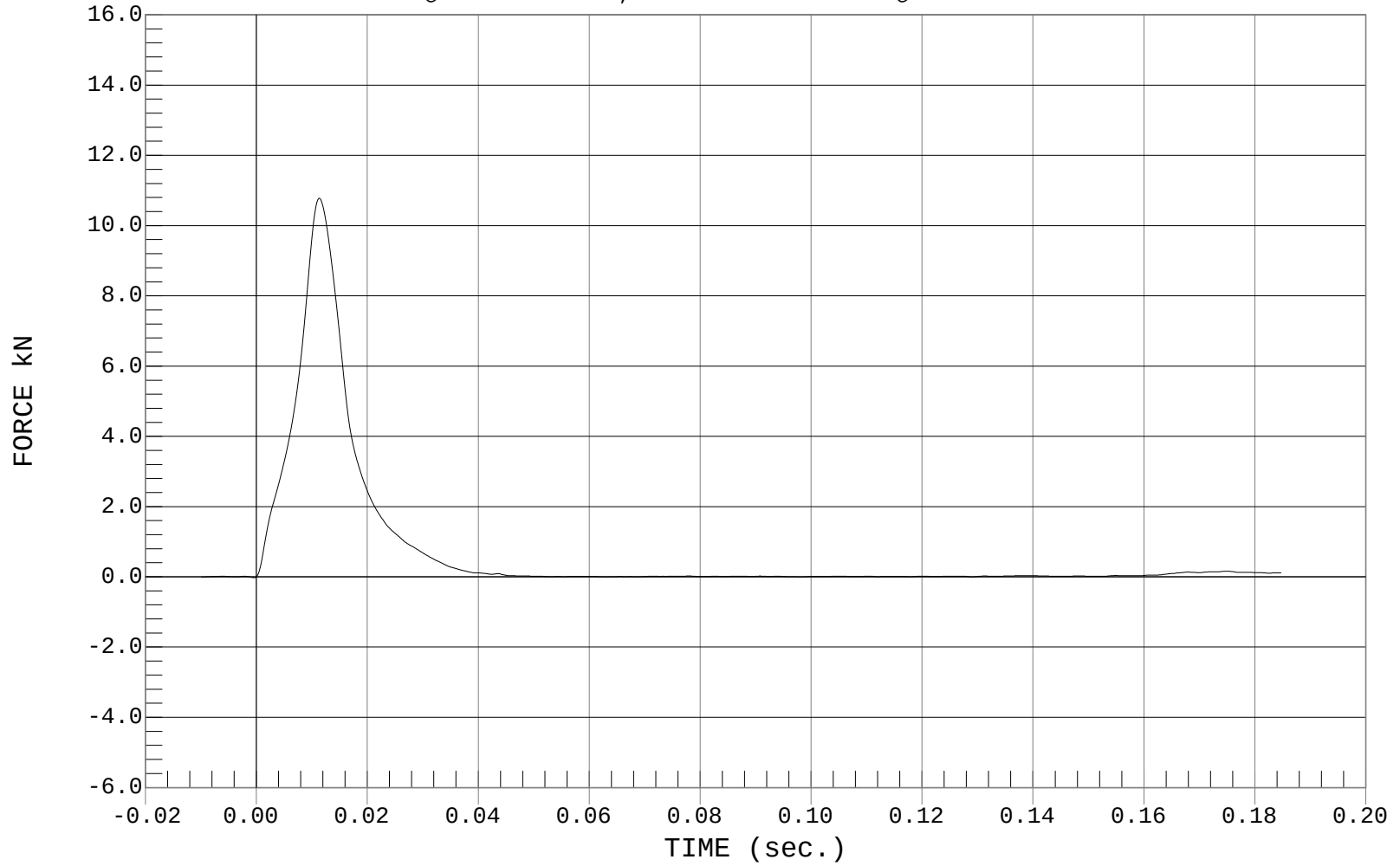
IMPACTOR FORCE

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

Test Date: 10-25-01
Speed: 20.42 FT/SEC, 6.22 M/SEC

— 1 FORCE, D01559FT.F01

Ymin = -.03 kN @ -0.0004 sec., Ymax = 10.78 kN @ 0.0114 sec.





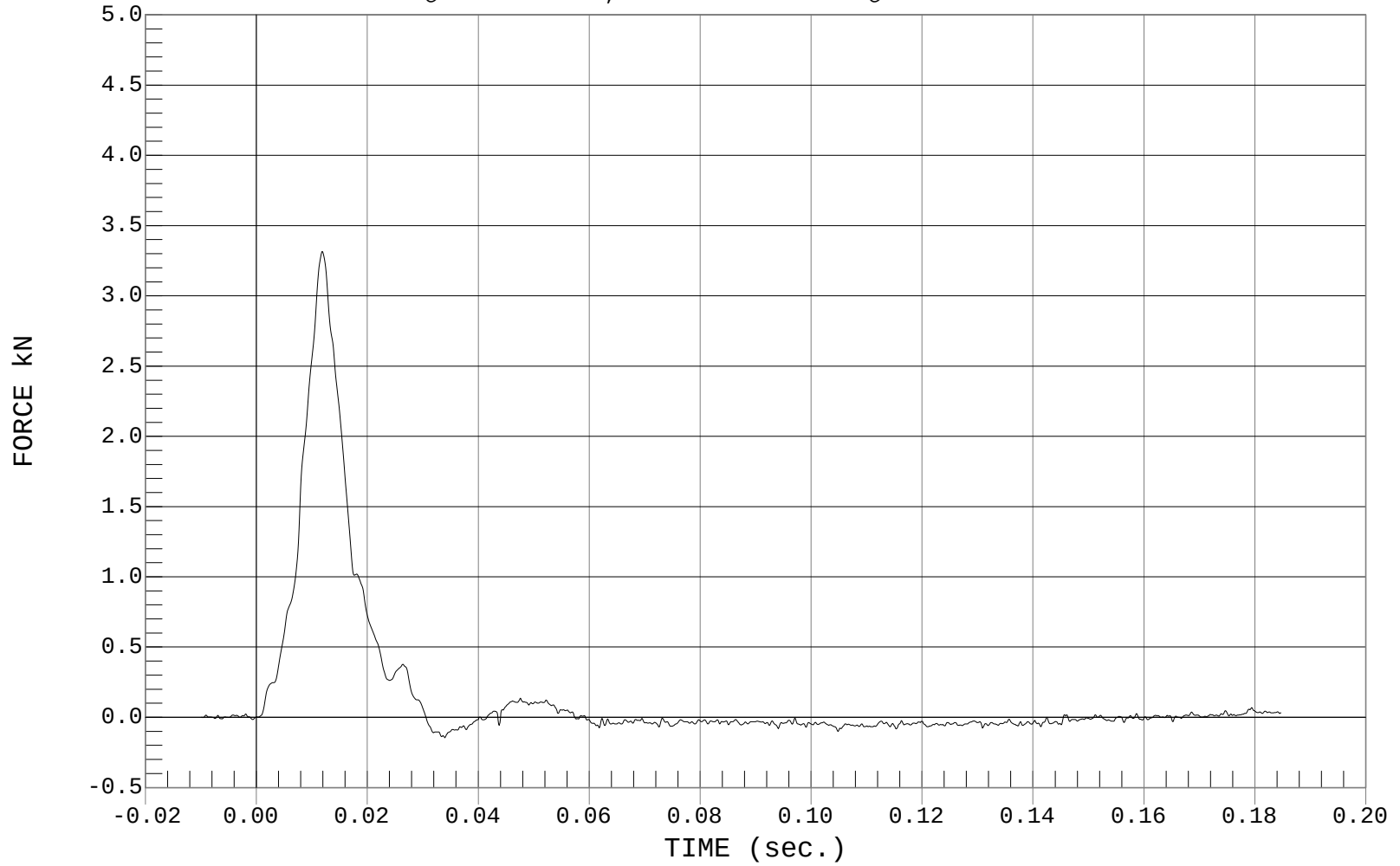
PUBIC FORCE

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

Test Date: 10-25-01
Speed: 20.42 FT/SEC, 6.22 M/SEC

— 1 FORCE, D01559FT.F02

Ymin = -.14 kN @ 0.0340 sec., Ymax = 3.32 kN @ 0.0119 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
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VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Mid A-Post Y	H14-N06	Entran	9/12/01
Left Lower A-Post Y	H14-N13	Entran	9/12/01
Left Upper B-Post Y	F12-G01	Entran	9/27/01
Left Lower B-Post Y	E23-R11	Entran	9/27/01
Rear Floorpan Above Axle X	E10-F20	Entran	5/25/01
Rear Floorpan Above Axle Y	F12-G03	Entran	5/25/01
Rear Floorpan Above Axle Z	I18-E14	Entran	5/25/01
Driver Seat Track Y	H14-N02	Entran	9/12/01
Right Side Sill at Front Seat X	G03-N05	Entran	8/7/01
Right Side Sill at Front Seat Y	D11-F10	Entran	5/30/01
Right Side Sill at Front Seat Z	G03-N16	Entran	8/7/01
Right Side Sill at Rear Seat X	G13-F18	Entran	4/4/01
Right Side Sill at Rear Seat Y	G13-F16	Entran	4/4/01
Right Side Sill at Rear Seat Z	G13-F03	Entran	4/4/01
Left Side Sill at Front Seat Y	G03-N08	Entran	9/27/01
Left Side Sill at Rear Seat Y	H07-F06	Entran	9/27/01
Vehicle CG X	H14-N01	Entran	9/12/01
Vehicle CG Y	H14-N14	Entran	9/12/01
Vehicle CG Z	H14-N03	Entran	9/12/01
Left Front Door @ Pelvis Y	J04-F10	Entran	8/29/01
Left Front Door @ End of Arm Y	J10-E12	Entran	9/27/01
Lower Center Radiator Support X	H14-N07	Entran	9/12/01
Lower Center Radiator Support Y	H14-N11	Entran	9/12/01
Lower Center Radiator Support Z	H14-N10	Entran	9/12/01

Note: All Endevco accelerometers are Model No. 7264-2000

All Entran accelerometers are Model No. EGE-72

APPENDIX E

PROCEDURE USED FOR ES-2 POSITIONING

Installation of the Side Impact Dummy (recommended practice)

1. GENERAL

- 1.1 The dummy to be used for the following installation procedure is described in Annex 6 to this regulation.
- 1.2 Adjust the knee joints so that they just support the leg when it is extended horizontally (1 to 2 g).
- 1.3 Clothe the dummy in form fitting cotton stretch mid-calf length pants. Each foot is equipped with a shoe.

2. INSTALLATION

- 2.1 Place the dummy in the outboard front seat of the impact side as described in the test specifications.
- 2.2 The mid-sagittal plane of the dummy shall coincide with the centerplane of the occupant (as determined according to Annex 3, paragraph 2.8) with a tolerance of 2°.
- 2.3 The pelvis of the dummy shall be positioned according to the following:
 - 2.3.1 The pelvis pitch angle shall be 20.0° +/- 2.5°.
 - 2.3.2 A line passing through the dummy H-points shall pass through an imaginary circle in the mid-sagittal plane of the dummy. This circle has a radius of 10 mm and is located 20 mm horizontally forward and 5 mm vertically above the reference H-point, determined by the 3D H-point machine.
- 2.4 The upper torso of the dummy shall be positioned according to the following:
 - 2.4.1 The upper torso shall be bent forward and then laid back against the seat back. The shoulder of the dummy shall be set fully rearward.
 - 2.4.2 The torso reference line pitch angle shall be 25.0° +/- 2.5°. The torso reference line is defined as the thoracic spine center line.
- 2.5 The arms shall be positioned in such as 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				
				2001 Saab 9-5 10/23/01	
	Class	Axis	Units	Peak	Time
Head	1000	X	G	-8.2	63
	1000	Y	G	31.9	58
	1000	Z	G	13.9	58
	1000	RES	G	35.0	58
Head Injury Criteria (HIC)				114	
t1				42.8	
t2				69.9	
Upper Neck Force	1000	X	N	-211	63
	1000	Y	N	258	186
	1000	Z	N	476	46
	1000	RES	N	481	46
Upper Neck Moment	600	X	Nm	-23.5	173
	600	Y	Nm	17.6	104
	600	Z	Nm	18.8	69
	600	RES	Nm	27.4	175
Lower Neck Force	1000	X	N	-209	60
	1000	Y	N	286	29
	1000	Z	N	438	46
	1000	RES	N	443	46
Lower Neck Moment	600	X	Nm	-60.0	189
	600	Y	Nm	32.2	81
	600	Z	Nm	14.7	73
	600	RES	Nm	67.7	189
Shoulder Force	1000	X	N	381	21
	1000	Y	N	1161	21
	1000	Z	N	386	22

DRIVER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values				
				2001 Saab 9-5 10/23/01	
	Class	Axis	Units	Peak	Time
Upper Spine	180	X	G	7.1	53
	180	Y	G	37.7	55
	180	Z	G	4.7	68
	180	Res	G	38.4	55
Lower Spine	180	X	G	8.1	45
	180	Y	G	39.7	53
	180	Z	G	4.3	68
	180	Res	G	40.2	51
Upper Rib	180	Y	G	97.9	49
Mid Rib	180	Y	G	122.5	15
Lower Rib	180	Y	G	136.5	14
Upper Rib Deflection	180	Y	mm	-37.8	58
Mid Rib Deflection	180	Y	mm	-29.4	57
Lower Rib Deflection	180	Y	mm	-29.1	56
Upper Rib VC	180	Y	m/sec	0.50	51
Mid Rib VC	180	Y	m/sec	0.31	53
Lower Rib VC	180	Y	m/sec	0.29	52
Torso Force	600	X	N	534	49
	600	Y	N	-225	63
Torso Moment	600	Y	Nm	13.4	47
	600	Z	Nm	22.4	50
T12 Force	600	X	N	619	58
	600	Y	N	1172	50
T12 Moment	600	X	Nm	not collected	
	600	Y	Nm	84.0	58

DRIVER (ES-2) PEAK RESPONSE TABLE (CONTINUED)

Location	Peak Values				
				2001 Saab 9-5 10/23/01	
	Class	Axis	Units	Peak	Time
Abdomen Front Force	600	Y	N	103	71
Abdomen Mid Force	600	Y	N	255	50
Abdomen Rear Force	600	Y	N	556	49
Abdomen Summed Force	600	Y	N	849	50
Pubic Symphysis Force	600	Y	N	-1733	55
Right Femur Force	600	X	N	352	59
	600	Y	N	1207	63
	600	Z	N	680	79
	600	RES	N	1237	63
Right Femur Moment	600	X	Nm	-105.0	44
	600	Y	Nm	-28.3	69
	600	Z	Nm	-30.0	56
	600	RES	Nm	106.9	44
Left Femur Force	600	X	N	472	73
	600	Y	N	-795	58
	600	Z	N	1046	60
	600	RES	N	1298	60
Left Femur Moment	600	X	Nm	-82.2	40
	600	Y	Nm	-25.6	49
	600	Z	Nm	-30.1	62
	600	RES	Nm	82.6	40
Pelvis	1000	X	G	18.9	59
	1000	Y	G	50.2	42
	1000	Z	G	6.6	18