

REPORT NUMBER: 214D-MGA-2001-008

**SAFETY COMPLIANCE TESTING FOR FMVSS 214
SIDE IMPACT PROTECTION**

**Volvo Cars of North America, Inc.
2001 Volvo S60 4 door
NHTSA NUMBER:C15901**

**PREPARED BY:
MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105**



January 31, 2001

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
400 SEVENTH STREET, SW, ROOM 6111 (NSA-30)
WASHINGTON, D.C. 20590**

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16. Abstract A 48/24 km/h 90° Moving Deformable Barrier side impact was conducted on the subject 2001 Volvo S60 4 door in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure No. TP-214D-05 Side Impact Protection for determination of FMVSS 214 compliance. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on January 31, 2001. The impact velocity of the Moving Deformable Barrier (MDB) was 53.3 kph, and the ambient temperature at the struck side (driver's) of the vehicle was 20°C. The target vehicle's maximum post test static crush was 263 mm at level 2. The test vehicle's occupant performance is as follows: <table style="margin-left: auto; margin-right: auto; border: none;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>DRIVER</u></th> <th style="text-align: center;"><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">26</td> <td style="text-align: center;">50</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">25</td> <td style="text-align: center;">52</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">37</td> <td style="text-align: center;">46</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">31</td> <td style="text-align: center;">49</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">55</td> <td style="text-align: center;">44</td> </tr> </tbody> </table>					<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	26	50	Left Lower Rib (LLR) Accel., g	25	52	Lower Spine (T ₁₂) Accel., g	37	46	Thoracic Trauma Index (TTI)	31	49	Pelvis (PEV) Accel., g	55	44
	<u>DRIVER</u>	<u>PASS.</u>																			
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Left Lower Rib (LLR) Accel., g	25	52																			
Lower Spine (T ₁₂) Accel., g	37	46																			
Thoracic Trauma Index (TTI)	31	49																			
Pelvis (PEV) Accel., g	55	44																			
The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.																					
17. Key Words Compliance Testing FMVSS 214D Side Impact Dummy (SID) Occupant Side Impact Protection		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NAD-52) 400 Seventh Street, S.W. Washington, D.C. 20590																			
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Test Procedure	1
2	Summary of Side Impact Test	2
3	Side Impact Dummy (SID) and Vehicle Test Data	4
4	Occupant and Vehicle Information	12
 <u>Data Sheet No.</u>		 <u>Page No.</u>
1	General Test and Vehicle Parameter Data	5
2	Test Vehicle Summary of Results	9
3	Moving Deformable Barrier (MDB) Summary of Results	10
4	Post Test Observations	11
5	SID Injury Criteria and Sensor Data	13
6	Vehicle Pre-Test and Post-Test Measurements	14
7	SID Longitudinal Clearance Dimensions	15
8	SID Lateral Clearance Dimensions	16
9	Vehicle Side Measurements	17
10	Vehicle Exterior Crush Profiles	18
11	Vehicle Damage Profile Distances	20
12	Deformable Barrier Honeycomb Face Static Crush	21
13	Vehicle Accelerometer Locations and Data Summary	22
14	MDB Accelerometer Locations and Data Summary	24
15	High Speed Camera Locations and Data	25
16	FMVSS 301 Fuel System Integrity Post Impact Data	26
17	FMVSS 301 Static Rollover Data Sheet	27
 <u>Appendix</u>		
A	Photographs	A
B	SID, Vehicle, and MDB Response Data	B
C	SID Configuration and Performance Verification Data	C
D	Test Equipment List and Calibration Information	D

SECTION 1

PURPOSE AND TEST PROCEDURE

1.1 PURPOSE

This Side Impact test is conducted as part of the FY' 2001 test program sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract No. DTNH22-97-C-11033. The purpose of this test was to evaluate side impact protection in a 2001 Volvo S60 4 door manufactured by Volvo Gothenburg Sweden.

1.2 TEST PROCEDURE

The side impact test was conducted in accordance with the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC), laboratory test procedure Side Impact Testing TP-214D-05, dated August 2, 1999 and the corresponding MGA Research Corporation Test Procedure MGA-NHTSA2. The procedures for receiving, inspection, testing, and reporting of test results are described in the test procedures and are not repeated in this report.

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

SECTION 2

SUMMARY OF SIDE IMPACT TEST

2.1 SUMMARY OF SIDE IMPACT TEST

A model year 2001 Volvo S60 4 door was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 53.3 km/h. The specified impact velocity range is from 52.1 to 53.7 km/h. The test (target) vehicle was stationary and positioned 63° to the line of forward motion. The weight of the vehicle as tested was 1699 kg and the test weight of the MDB was 1362 kg. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on January 31, 2001.

One (1) real-time motion picture camera and nine (9) high-speed motion picture cameras were used to document the impact event. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera. Camera locations and pertinent camera information are documented in the data sheets. Pre- and post-test photographs of the vehicle and Side Impact Dummies (SID's) can be found in Appendix A. Two 50th percentile adult male SID's were placed in the driver and left rear passenger designated seating positions according to instructions specified in the OVSC Laboratory Test Procedure dated August 2, 1999. Each SID was instrumented with accelerometers in the following locations:

- Left Upper Rib (LUR) uni-axial accelerometer (Y-axis primary and redundant)
- Left Lower Rib (LLR) uni-axial accelerometer (Y-axis primary and redundant)
- Lower Thoracic Spine (T12) uni-axial accelerometer (Y-axis primary and redundant)
- Pelvic (PEV) section uni-axial accelerometer (Y-axis primary and redundant)

The test vehicle was instrumented with twenty (20) structural accelerometers and the MDB was instrumented with five (5) accelerometers and two (2) contact switches on the bumper to compare left side to right side bumper impact timing. All data channels were recorded with a fully self contained on-board EME Data Acquisition System. The data was digitally sampled at 10,000 samples per second and processed per Appendix V of the Test Procedure.

2.2 GENERAL COMMENTS

The test vehicle sustained a maximum static crush of 263 mm at level 2, 1350 mm rearward of the left vertical impact point. The driver and passenger SID's, Serial Nos. 037 and 036 respectively, were calibrated just prior to this test. The SID's injury criteria is summarized as follows:

Measurements	Units	Driver	Passenger
Thoracic Trauma Index (TTI)	G's	31	49
Peak Pelvic G's (PEV)	G's	55	44

Test summaries and post-test observations are presented in Section 3. The vehicle, camera, and occupant measurements are presented in Section 4. Appendix A contains the still photograph prints. Appendix B contains the driver and passenger SID's, vehicle, and MDB response data traces. Appendix C contains the SID's configuration and performance verification data. Appendix D contains the test equipment information.

TEST NOTES

The following accelerometers were not used for this test:

Left Front Door on Centerline
Midrear of Left Front Door
Left Front Door Upper Centerline
Midrear of Left Rear door
Left Rear Door Upper Centerline
Rear Seat Track

SECTION 3

SIDE IMPACT DUMMY (SID) AND VEHICLE TEST DATA

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001

CONVERSION FACTORS USED IN THIS REPORT*

Quantity	Typical Application	Old Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	mile/h	km/h	1.609
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.573
Pressure	Tire Pressure	lbf/in ²	kPa	7.0
Volume	Liquid	gal	liter	3.785
Temperature	General Use	°F	°C	$=(t_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf/ft	Nm	1.355

*Based on the Recommended Practice in SAE J916, May 85

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001

TEST VEHICLE INFORMATION

Make	Volvo
Model	S60
Body Style	4 door
NHTSA No.	C15901
VIN	YV1RS61N212001858
Color	White
Delivery Date	1/8/01
Odometer Reading (mile)	191
Dealer	Wilde Volvo
Transmission	5 speed manual
Final Drive	Front
Number of Cylinders	5
Engine Displacement (L)	2.4
Engine Placement	Lateral

TEST VEHICLE OPTIONS

Front Airbags	yes
Side Airbags	yes
Power Windows	yes
Power Steering	yes
Power Door Locks	yes
Tilt Wheel	yes
Air Conditioning	yes
Power Brakes	yes
Disc Brakes, Front	yes
Disc Brakes, Rear	yes
Anti-lock Brakes	yes
AM/FM/Cassette	yes
Anti-theft System	yes
Cruise Control	yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Volvo Gothenburg Sweden
Date of Manufacture	9/00

GVWR (kg)	1977.7
GAWR Front (kg)	1056.9
GAWR Rear (kg)	1007.0

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	266	266
Cold Pressure (kPa)	266	266
Recommend Tire Size	195/65R15	195/65R15
Tire Size on Vehicle	195/65R15	195/65R15
Tire Manufacturer	Michelin	Michelin

Measured Parameter	Front	Rear	Third	Total
Type of Seats	bucket	bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				403.7
Cargo Weight (RCLW) (kg)				63.5

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

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	433.6	313.0		481.3	400.5	
Right	kg	423.2	311.4		438.2	379.2	
Ratio	%	57.8	42.2		54.1	45.9	
Totals	kg	856.8	626.4	1483.2	919.5	779.7	1699.2

TARGET TEST WEIGHT CALCULATION*

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1483.2
Weight of 2 P572F Side Impact Dummies	kg	161.5
Rated Cargo/Luggage Weight (RCLW)	kg	63.5
Calculated Vehicle Target Weight (TVTW)	kg	1708.2

*Actual As Tested Weight (ATW) will be TVTW -5/-10 kg

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	683	686	699	697	1149
As Tested	mm	668	676	660	665	1248
Fully Loaded	mm	665	675	657	668	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2720
Total Vehicle Length at Left Side	mm	3800
Total Vehicle Length at Centerline	mm	4567
Total Vehicle Length at Right Side	mm	3802
Weight of Ballast in Cargo Area	kg	23.6
Amount of Stoddard Solvent in Fuel Tank	liters	65.5

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Test Vehicle Wheel Base	mm	2720
Target Impact Point Aft of Front Axle	mm	420
Actual Impact Point Aft of Front Axle	mm	415

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

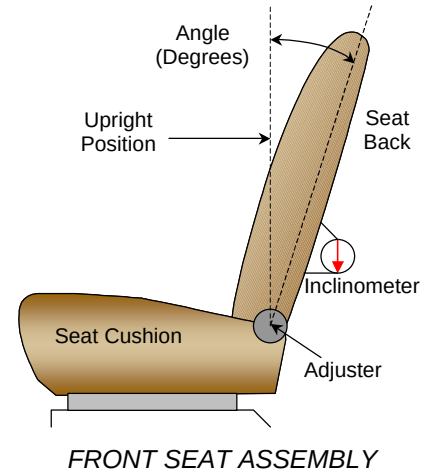
Test Vehicle: 2001/Volvo/S60/4 door
Test Program: FMVSS 214

NHTSA No.: C15901
Test Date: January 31, 2001

NORMAL DESIGN RIDING POSITION

The driver's seat back is positioned to the manufacturer's designated angle. The procedure for the seat is as follows: Press a bar against the centerline of the seat back. When the car attitude angle is 0 degrees, the angle of the seat back should be 19 degrees from the vertical. The rear passenger seat is fixed; no adjustments can be made.

Driver seat back angle: 19 degrees
Passenger seat back angle: fixed



SEAT FORE/AFT POSITIONS

The driver's seat is manually operated and the rear passenger seat has no adjustments. The fore/aft is set to the middle position for the driver's seat. The first detent is numbered "1".

Driver seat fore/aft total travel: 224 mm
Rear passenger seat fore/aft total travel: not adjustable
Driver seat fore/aft position: 9th detent rearward of 17 total; first as 1
Rear passenger seat fore/aft position: not adjustable

SEAT BELT UPPER ANCHORAGE

The test vehicle is equipped with a self-adjusting "D" ring anchorage for the driver's seat position.

DATA SHEET NO. 1...(continued)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001

FUEL TANK CAPACITY DATA

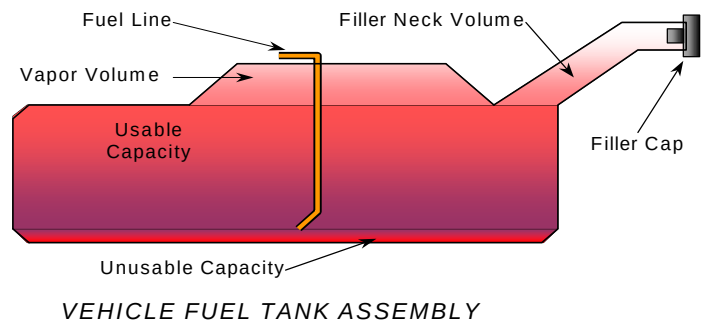
The "Usable Capacity" of the standard equipment fuel tank is: 70.0 liters

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

92-94% of "Usable Capacity" for certification to FMVSS 301 requirement: 64.4 to 65.8 liters

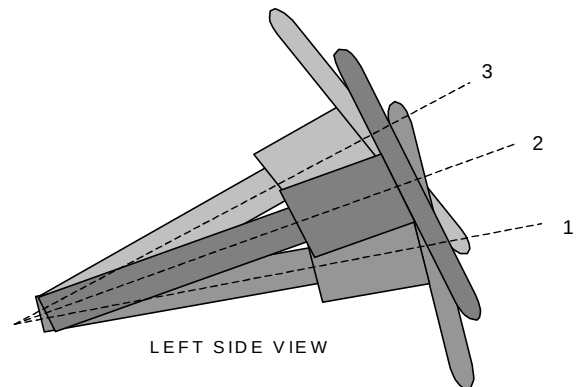
Actual amount of Stoddard solvent added to vehicle for certification test: 65.5 liters

The test vehicle is equipped with an electric fuel pump. The fuel filler door is located on the right rear fender.



STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes, when it is moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, and inclinometer is placed onto the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

Lowermost, position 3: 23.0°

Geometric center, position 2 : 24.1°

Uppermost, position 3: 25.3°

DATA SHEET NO. 2**TEST VEHICLE SUMMARY OF RESULTS**Test Vehicle: 2001/Volvo/S60/4 doorNHTSA No.: C15901Test Program: FMVSS 214Test Date: January 31, 2001**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	433.6	313.0		481.3	400.5	
Right	kg	423.2	313.4		438.2	379.2	
Weight Ratio	%	57.8	42.2		54.1	45.9	
Totals	kg	856.8	626.4	1483.2	919.5	779.7	1699.2

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
Level 1	Sill Top Height	mm	214	324
Level 2	Occupant H-Point	mm	263	461
Level 3	Mid Door	mm	224	631
Level 4	Window Sill	mm	132	913
Level 5	Window Top	mm	31	1315
N/A	Maximum Penetration	mm	263	461

INSTRUMENTATION

Driver SID Accelerometers	8
Passenger SID Accelerometers	8
Vehicle Structure Accelerometers	20
MDB Accelerometers	5
Total	41

DATA SHEET NO. 3**MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS**Test Vehicle: 2001/Volvo/S60/4 doorNHTSA No.: C15901Test Program: FMVSS 214Test Date: January 31, 2001**MDB SPECIFICATIONS (mm)**

Measurement Description	Length
Overall Width of Framework Carriage	1252
Overall Length Including Honeycomb Face	4115
Wheel base of Framework Carriage	2590
C.G. Location aft of Front Axle	1127

MDB WEIGHTS

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

SPEED AND IMPACT ANGLE DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	52.1 to 53.7	53.3
Trap No. 2 Velocity (Redundant)	km/h	52.1 to 53.7	53.2
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.3

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE (mm)

Vertical Location			From Centerline		Max. Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	432	800	Left	121
B	Top of Bumper	533	800	Left	91
C	Mid Level	686	700	Left	67
D	Top of Stack	813	800	Left	105

MDB INSTRUMENTATION AND CAMERAS

Accelerometers	5
Contact Switches	2
High Speed Cameras	2

DATA SHEET NO. 4

POST TEST OBSERVATIONS

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat SID	Rear Seat SID
Dummy Type / Serial No.	SID / 037	SID / 036
Head Contact	to inflatable curtain	to C post, inflatable curtain and headrest
Upper Torso Contact	to side airbag	to door panel
Lower Torso Contact	none noted	to door panel
Left Knee Contact	to door panel	to door panel
Right Knee Contact	to left knee	to left knee

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Door Opening	remained closed	remained closed
Right Side Door Opening	remained closed	remained closed
Seat Movement	none	not adjustable
Seat Back Failure	none noted	fixed

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	no failure
Sill Separation	none noted
Windshield Damage	none
Window Damage	left rear door glass broken
Other Notable Effects	driver side inflatable curtain deployed

AIRBAG DEPLOYMENT

	Driver	Front Passenger	Rear Passenger
Front	no	no	
Side	yes	no	

MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	5 forward
Vertical Offset	mm	+/-20	4 down

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5

SID INJURY CRITERIA AND SENSOR DATA

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001

THORAX AND PELVIS PEAK ACCELERATIONS (FIR 100 Filtered)

Location	Axis	Units	Driver				Passenger			
			Max	Time	Min	Time	Max	Time	Min	Time
Upper Rib (LUR)	Y	G's	26.3	16	2.8	40	50.1	46	9.5	111
Upper Rib (LUR) (R)	Y	G's	26.0	16	3.3	41	50.6	46	9.1	111
Lower Rib (LLR)	Y	G's	24.8	18	4.2	86	52.3	46	11.4	111
Lower Rib (LLR) (R)	Y	G's	24.4	18	3.9	86	52.5	46	11.3	111
Lower Spine (T ₁₂)	Y	G's	36.7	31	5.9	63	46.3	49	7.4	71
Lower Spine (T ₁₂) (R)	Y	G's	36.6	40	6.4	64	46.0	48	7.8	71
Pelvis (PEV)	Y	G's	55.2	30	8.5	69	43.6	39	4.3	198
Pelvis (PEV) (R)	Y	G's	56.7	31	8.4	68	44.4	39	4.4	198

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

Location	Driver				Passenger			
	LUR	T ₁₂	TTI(g)	PEV(g)	LLR	T ₁₂	TTI(g)	PEV(g)
Rib, Spine, and Pelvis	26.3	36.7	31	55	52.3	46.3	49	44
Rib, Spine, and Pelvis (R)	26.0	36.6	31	57	52.5	46.0	49	44

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

DATA SHEET NO. 6

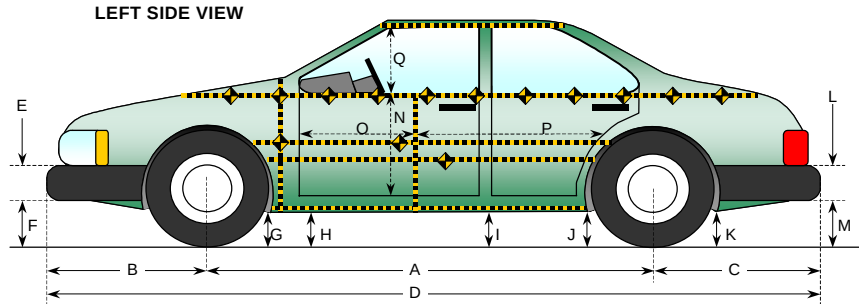
VEHICLE PRE-TEST AND POST-TEST MEASUREMENTS

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001



All Measurements in mm

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2720	2702	-18
B	Front Axle to FSOV	895	859	-36
C	Rear Axle to RSOV	952	976	24
D	Total Length at Centerline	4567	4537	-30
E	Front Bumper Thickness	142	142	0
F	Front Bumper Bottom to Ground	384	383	-1
G	Sill Height at Front Wheel Well	186	179	-7
H	Sill Height at Front Door Leading Edge	153	158	5
I	Sill Height at "B" Pillar	177	170	-7
J1	Sill Height at Rear Wheel Well	151	134	-17
J2	Pinch Weld Height at Rear Wheel Well	146	137	-9
K	Sill Height Aft of Rear Wheel Well	209	226	17
L	Rear Bumper Thickness	134	134	0
M	Rear Bumper Bottom to Ground	414	438	24
N	Sill Height to Window Bottom Sill	628	609	-19
O	Front Door Leading Edge to Impact CL	733	724	-9
P	Rear Door Trailing Edge to Impact CL	1218	1136	-82
Q	Front Window Opening	383	359	-24
R	Right Side Length	3802	3810	8
S	Left Side Length	3800	3765	-35
T	Vehicle Width at "B" Post	1798	1576	-222

DATA SHEET NO. 7

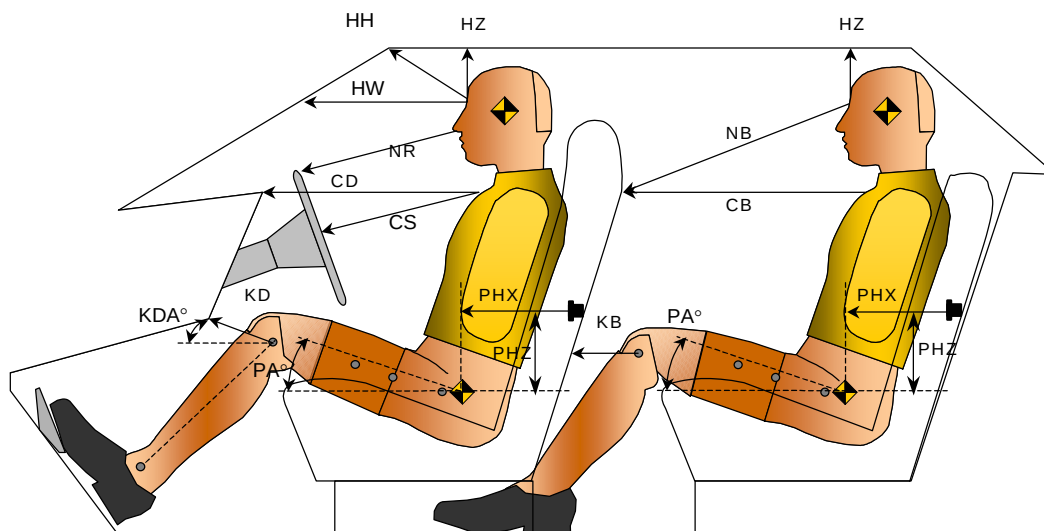
SID LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001



Driver Code	Pass. Code	Measurement Description	Driver		Passenger	
			Length(mm)	Angle(°)	Length(mm)	Angle(°)
HH		Head to Header	392			
HW		Head to Windshield	689			
HZ	HZ	Head to Roof	195		157	
NR	NB	Nose to Rim/Nose to Seatback	435		578	
CD	CB	Chest to Dash or Seatback	532		508	
CS		Chest to Steering Wheel	312			
KDL	KBL	Left Knee to Dash or Seatback	171	0.0	215	0.0
KDR	KBR	Right Knee to Dash or Seatback	189	0.0	221	0.0
PA	PA	Pelvic Angle		24.2		23.8
PHX	PHX	H-Point to Striker (X-Axis)	208		216	
PHZ	PHZ	H-Point to Striker (Z-Axis)	214		254	

DATA SHEET NO. 8

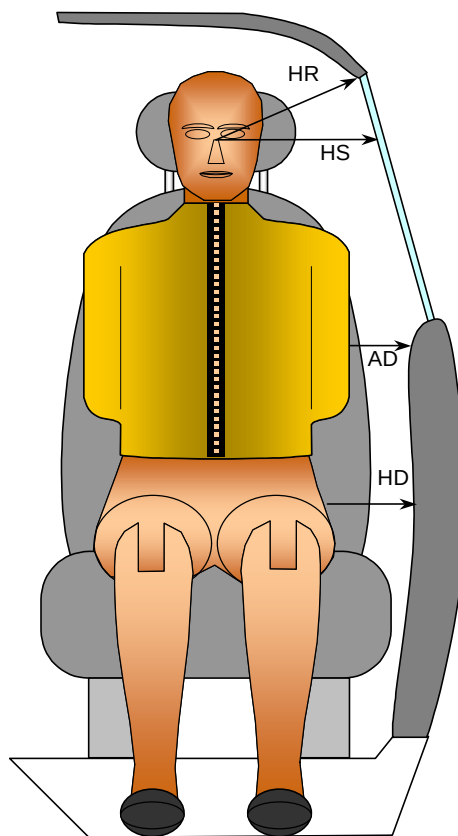
SID LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001



FRONT VIEW OF DUMMY

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	236	189
HS	Head to Side Window	mm	332	333
AD	Arm to Door	mm	105	106
HD	H-Point to Door	mm	140	161

DATA SHEET NO. 9

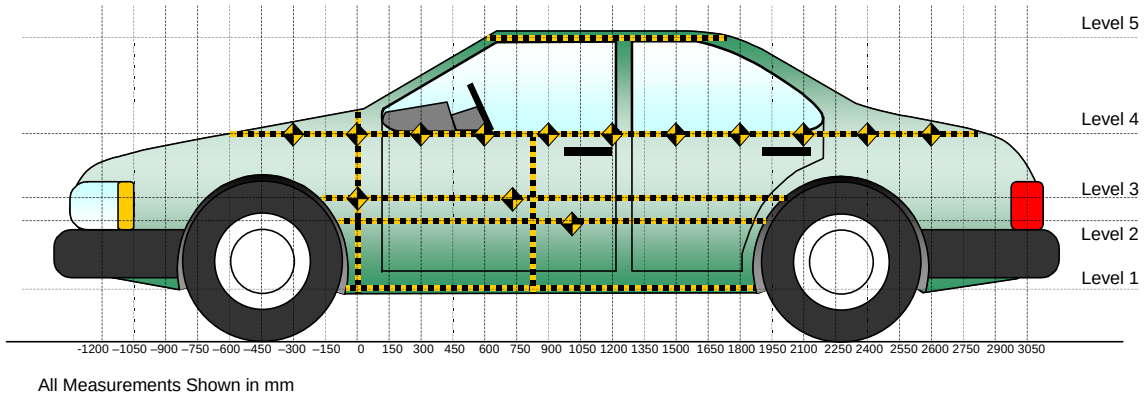
VEHICLE SIDE MEASUREMENTS

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001



LEFT SIDE VIEW

Measurements are taken with vehicle in the as tested condition.

Measurements along the vertical 800 mm.

All measurements below in mm.

Level	Measurement Description	Height Above Ground
5	Window	1315
4	Window Sill	913
3	Mid Door	631
2	Occupant H-Point	461
1	Sill Top	324

DATA SHEET NO. 10

VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900				371					365					-6	
-750				359					360					1	
-600				345					351					6	
-450				335					348					13	
-300				331					345					14	
-150			235	329				269	350				34	21	
0	263	241	239	325		315	316	302	353		52	75	63	28	
150	265	245	240	321		397	389	362	382		132	144	122	61	
300	266	241	242	316		420	446	416	385		154	205	174	69	
450	267	240	244	316		419	457	416	386		152	217	172	70	
600	270	240	246	314		431	462	410	388		161	222	164	74	
750	269	238	247	311	541	439	470	410	393	555	170	232	163	82	14
900	269	238	249	312	545	449	476	411	403	565	180	238	162	91	20
1050	268	239	250	310	549	451	483	417	412	574	183	244	167	102	25
1200	267	239	251	311	556	477	460	450	442	587	210	221	199	131	31
1350	266	240	250	312	558	480	503	448	444	586	214	263	198	132	28
1500	266	240	250	316	558	465	496	455	428	579	199	256	205	112	21
1650	266	241	246	321	558	446	487	470	410	573	180	246	224	89	15
1800	266	242	242	329	562	371	403	455	381	574	105	161	213	52	12
1950		242	240	339	559		350	355	353	568		108	115	14	9
2100			238	352	566			270	320	570			32	-32	4
2250			237	366				265	398				28	32	
2400			243	381				256	408				23	27	
2550			256	399				268	420				12	21	
2700			273	414				280	430				7	16	
2850			296	435				301	449				5	14	
3000				452					459					7	

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

DATA SHEET NO. 10...(continued)

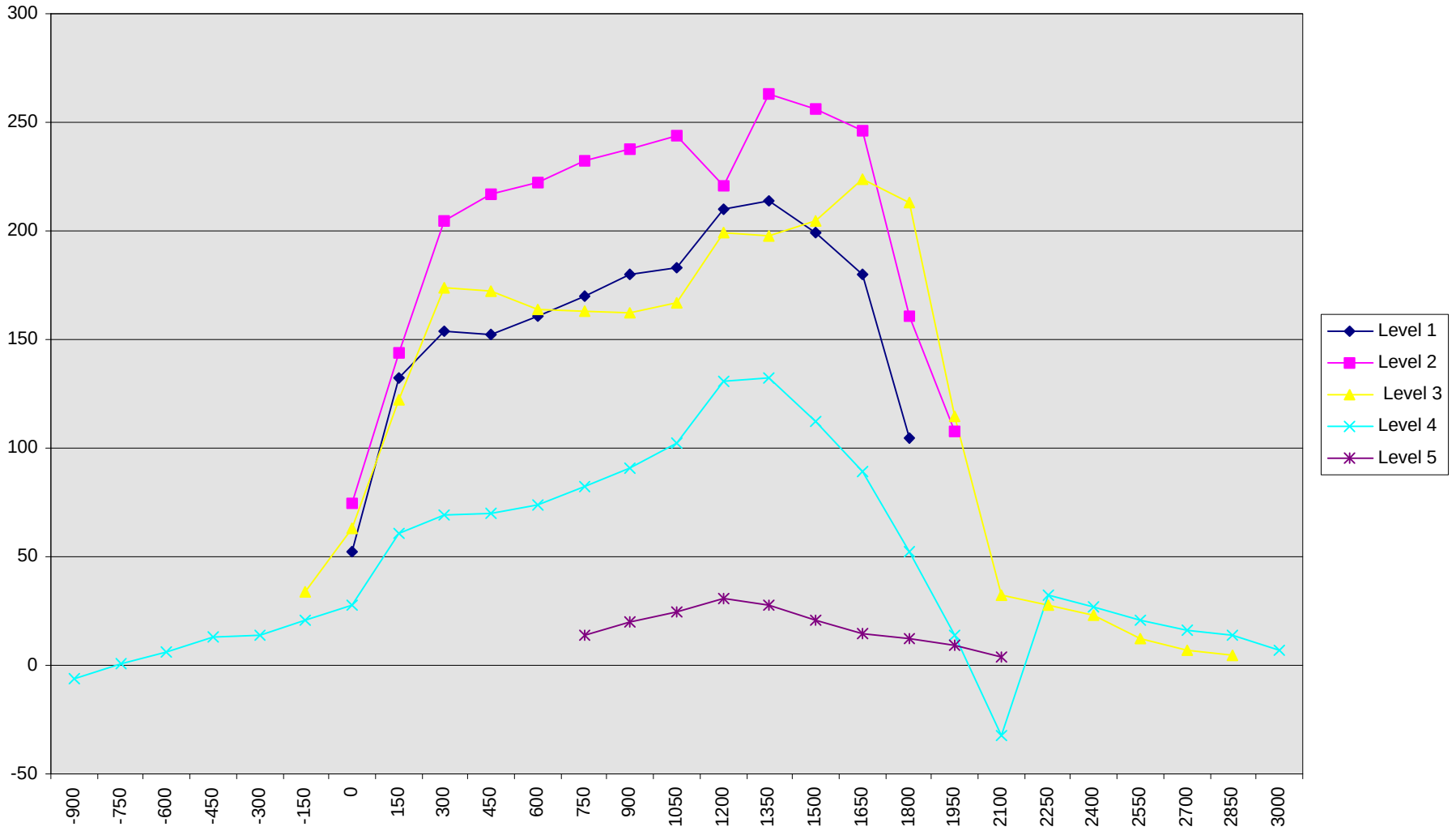
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001



DATA SHEET NO. 11

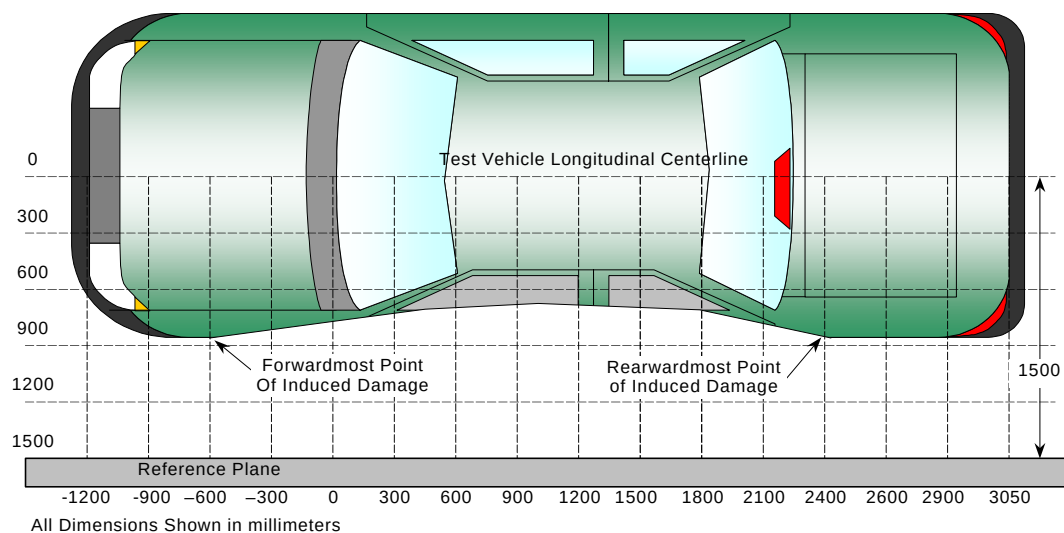
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001



TOP VIEW

Damage Profile Distances

DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max Static Crush (mm)
1	3000 mm	4	452	459	7
2	2292 mm	3	239	258	19
3	1479 mm	2	240	504	264
4	727 mm	2	243	477	234
5	-2 mm	4	325	352	27
6	-750 mm	4	360	359	-1

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

DATA SHEET NO. 12

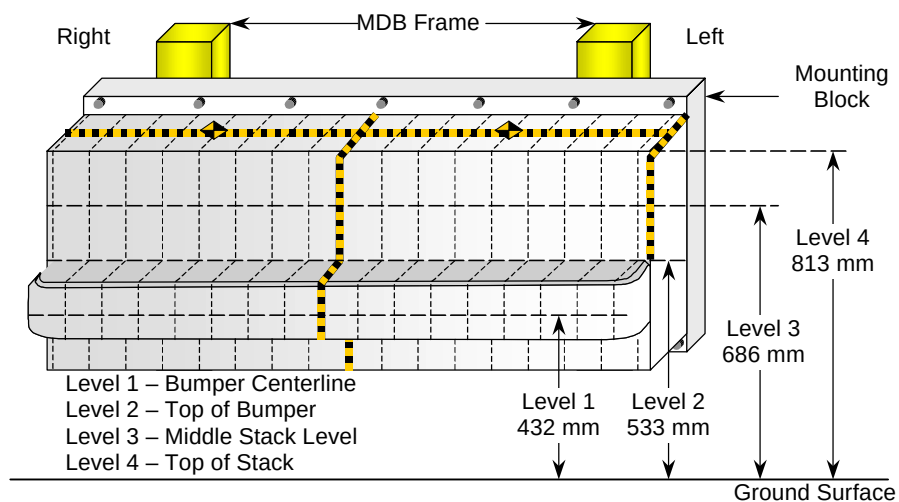
DEFORMABLE BARRIER HONEYCOMB FACE STATIC CRUSH

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001



DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C _L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	85	82	71	55	51	54	49	50	52	57	61	64	69	74	85	116	121
2	53	45	37	30	26	28	28	31	34	38	43	48	52	57	64	81	91
3	29	2	-1	1	4	8	7	8	9	14	23	28	31	35	43	67	66
4	91	47	14	0	6	24	20	17	11	11	14	21	30	46	67	91	105

All Dimensions in mm

DATA SHEET NO. 13

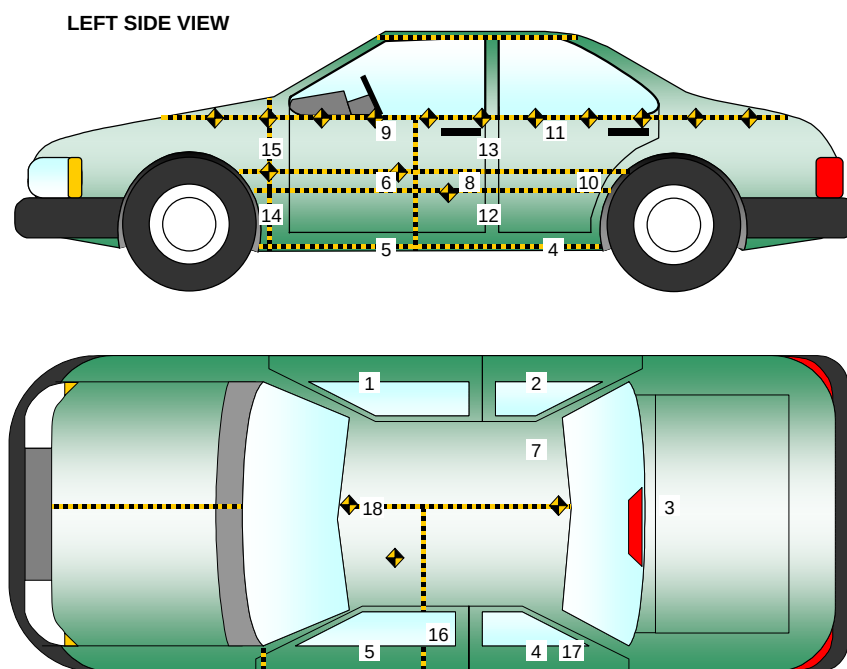
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001



No.	Location
1	Right Sill at Front Seat
2	Right Sill at Rear Seat
3	Rear Floorpan Above Axle
4	Left Sill at Rear Door
5	Left Sill at Front Door
6	Left Front Door Centerline
7	Right Rear Occupant Compartment
8	Left Front Door Mid-Rear
9	Left Front Door Upper Centerline

No.	Location
10	Left Rear Door Mid-Rear
11	Left Rear Door Upper Centerline
12	Left Lower B-Post
13	Left Middle B-Post
14	Left Lower A-Post
15	Left Middle A-Post
16	Front Seat Track
17	Rear Seat Track or Structure
18	Vehicle CG

DATA SHEET NO. 13...(continued)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001

VEHICLE ACCELEROMETER PEAK DATA AND PRE-TEST LOCATIONS

Loc. No.	Accelerometer Location	Measurements (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	Right Sill at Front Seat	2456	673	225	X	2.6	60	6.5	15
					Y	27.0	8	3.5	162
					Z	3.8	37	5.7	11
					RES	27.2	8		
2	Right Sill at Rear Seat	1370	700	220	X*	42.3	30	6.3	14
					Y	24.3	8	2.3	74
					Z	5.0	34	5.4	19
					RES	45.5	30		
3	Rear Floorpan Above Axle**	955	0	565	X	2.4	34	7.4	12
					Y	23.7	8	2.2	45
					Z	6.3	12	5.7	9
					RES	24.5	8		
4	Left Sill at Rear Door	2264	-700	214	Y	44.5	8	5.7	3
5	Left Sill at Front Door***	2455	-673	210	Y	57.5	5	3.3	13
7	Rear Occupant Compartment	1870	415	232	Y	23.8	7	2.3	74
12	B-Post Lower	2010	-740	372	Y	98.5	5	36.5	29
13	B-Post Middle	2028	-748	967	Y	83.5	13	29.8	47
14	A-Post Lower	3134	-750	418	Y	41.4	4	5.8	47
15	A-Post Middle	3159	-808	848	Y	31.0	3	14.3	97
16	Front Seat Track	2105	-558	195	Y	49.7	19	10.3	49
18	Vehicle CG	2695	0	172	X	1.8	79	15.2	17
					Y	33.5	22	14.2	17
					Z	9.5	18	11.7	11
					RES	34.6	22		

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

*Data spike at 30 msec.

**No valid data collected after 52 msec.

***No valid data collected after 30 msec.

DATA SHEET NO. 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

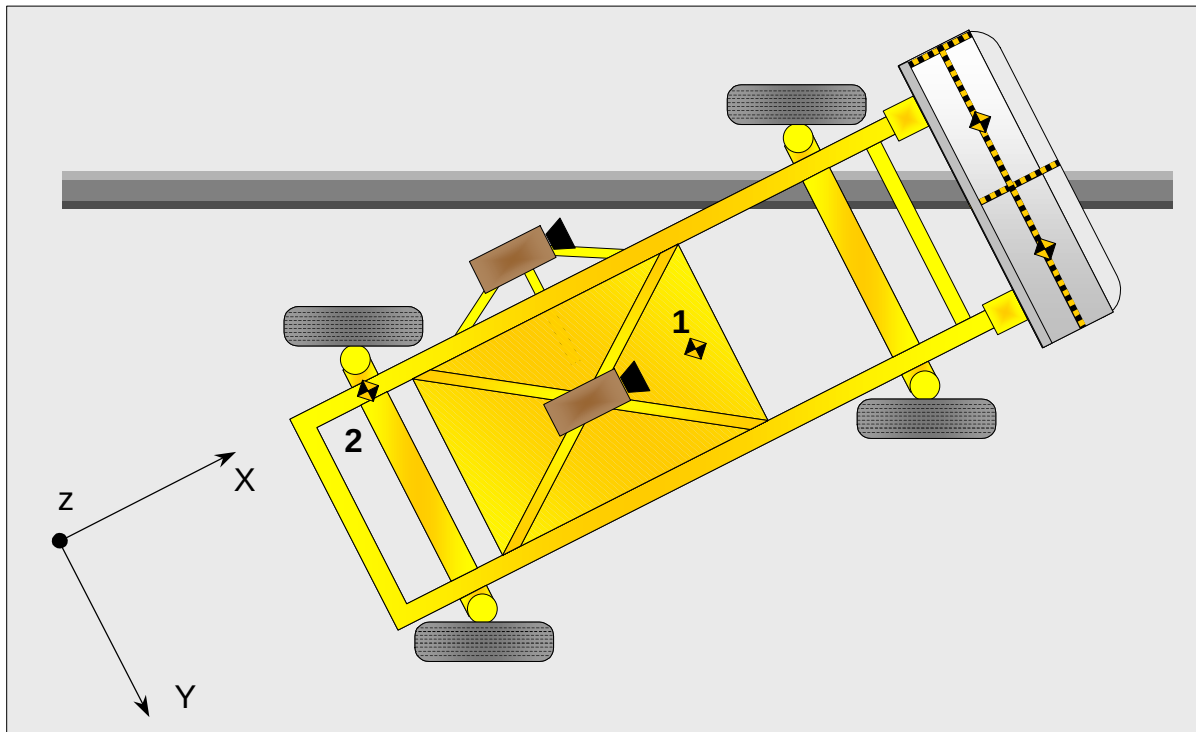
Test Program: FMVSS 214

Test Date: January 31, 2001

MDB ACCELEROMETER PEAK DATA AND LOCATIONS

Loc. No.	Accelerometer Location	Measurement (mm)			Peak Values (G's)				
		X	Y	Z	Axis	Max	Time	Min	Time
1	MDB CG	-1092	0	483	X	1.3	89	18.2	40
					Y	0.4	67	7.5	18
					Z	14.5	56	13.9	23
					RES	21.9	34		
2	MDB Rear	-2591	-625	622	X	1.6	120	22.4	36
					Y	6.7	23	1.8	150

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



DATA SHEET NO. 15

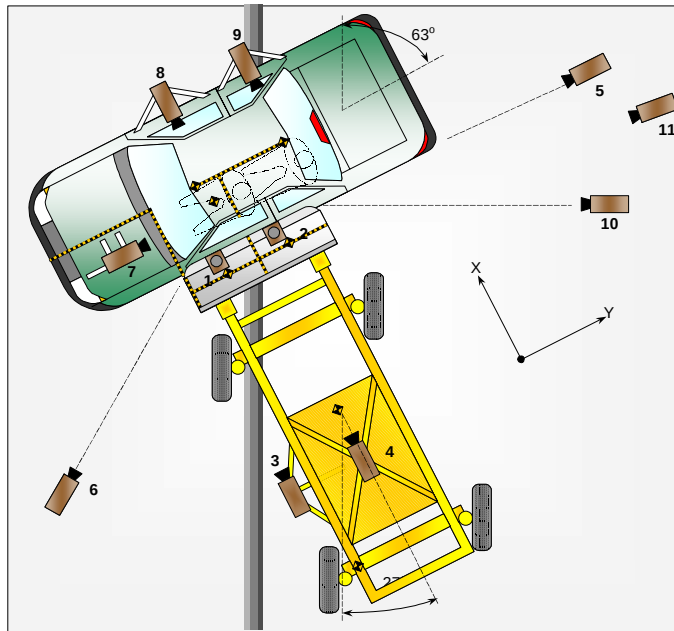
HIGH SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001



No.	Camera View	Location (mm)			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Overhead Overall	-100	1170	5000	8	913
2	Overhead Close-up	-600	-220	5000	13	952
3	MDB Onboard, Impact Point Close-up				35	*
4	MDB Onboard, Centerline of Impact				13	1031
5	Right Side, Ground Level, Overall	-800	10200	1850	25	943
6	Left Side, Ground Level, Overall	-420	-1740	1720	13	1015
7	Vehicle Onboard Front SID, Front				13	1020
8	Vehicle Onboard Front SID, Side				8	1000
9	Vehicle Onboard Rear SID, Side				13	1005
10	Real Time Coverage				10	24

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

* Camera did not run.

DATA SHEET NO. 16

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

Test Program: FMVSS 214

Test Date: January 31, 2001

Test Time: 2:30 p.m.

Temperature at Time of Impact: 21 °C

Stoddard Solvent Spillage Measurements

- A. From impact until vehicle motion ceases: 0 oz.
(Maximum Allowable = 1 ounce)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum Allowable = 5 ounces)
- C. For the following 25 minutes: 0 oz.
(Maximum Allowable = 1 oz./minute)
- D. Spillage Details: None

DATA SHEET NO. 17

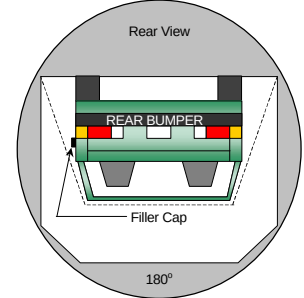
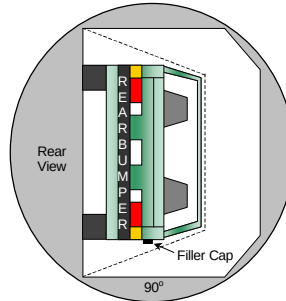
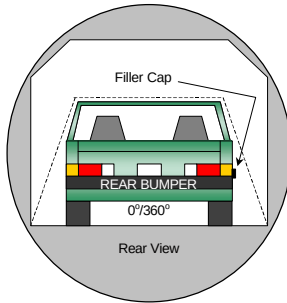
FMVSS 301 STATIC ROLLOVER DATA SHEET

Test Vehicle: 2001/Volvo/S60/4 door

NHTSA No.: C15901

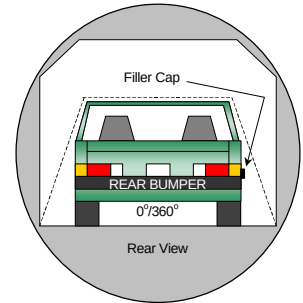
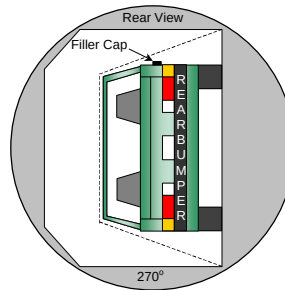
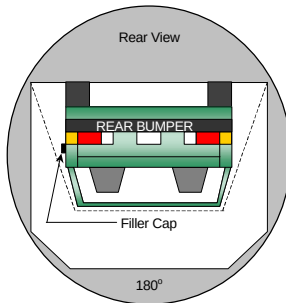
Test Program: FMVSS 214

Test Date: January 31, 2001



0° TO 90°

90° TO 180°



180° TO 270°

270° TO 360°

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum)
3. Details of Stoddard Solvent spillage locations:

Rollover Test Phase	Rotation Time (sec.)	Hold Time (sec.)	Spillage (oz.)
0° TO 90°	165	300	0
90° TO 180°	150	300	0
180° TO 270°	141	300	0
270° TO 360°	154	300	0

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

	<u>Page No.</u>
Photo No. A-1 - Pre-Test Front View of Test Vehicle	A-1
Photo No. A-2 - Post-Test Front View of Test Vehicle	A-2
Photo No. A-3 - Pre-Test Rear View of Test Vehicle	A-3
Photo No. A-4 - Post-Test Rear View of Test Vehicle	A-4
Photo No. A-5 - Pre-Test Left Side View of Test Vehicle	A-5
Photo No. A-6 - Post-Test Left Side View of Test Vehicle	A-6
Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)	A-7
Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)	A-8
Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View	A-9
Photo No. A-10 - Post-Test MDB and Vehicle (left side)	A-10
Photo No. A-11 - Post-Test MDB and Vehicle (right side)	A-11
Photo No. A-12 - Post-Test MDB and Vehicle Overhead View	A-12
Photo No. A-13 - Pre-Test MDB Top View	A-13
Photo No. A-14 - Post-Test MDB Top View	A-14
Photo No. A-15 - Pre-Test MDB Front View	A-15
Photo No. A-16 - Post-Test MDB Front View	A-16
Photo No. A-17 - Pre-Test MDB Right Side View	A-17
Photo No. A-18 - Post-Test MDB Right Side View	A-18
Photo No. A-19 - Pre-Test MDB Left Side View	A-19
Photo No. A-20 - Post-Test MDB Left Side View	A-20
Photo No. A-21 - Pre-Test Driver Dummy Right Side View	A-21
Photo No. A-22 - Post-Test Driver Dummy Right Side View	A-22
Photo No. A-23 - Pre-Test Driver Dummy Left Side View	A-23
Photo No. A-24 - Post-Test Driver Dummy Left Side View	A-24
Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)	A-25
Photo No. A-26 - Pre-Test Driver Dummy Shoulder and Door Top View	A-26
Photo No. A-27 - Post-Test Driver Dummy Shoulder and Door Top View	A-27
Photo No. A-28 - Post-Test Driver Dummy Contact	A-28
Photo No. A-29 - Post-Test Driver Dummy Head Contact	A-29
Photo No. A-30 - Pre-Test Passenger Dummy Right Side View	A-30
Photo No. A-31 - Post-Test Passenger Dummy Right Side View	A-31
Photo No. A-32 - Pre-Test Passenger Dummy Left Side View	A-32
Photo No. A-33 - Post-Test Passenger Dummy Left Side View	A-33

TABLE OF PHOTOGRAPHS

	<u>Page No.</u>
Photo No. A-34 - Pre-Test Passenger Dummy Left Side View (Door Open)	A-34
Photo No. A-35 - Pre-Test Passenger Dummy Shoulder and Door Top View	A-35
Photo No. A-36 - Post-Test Passenger Dummy Shoulder and Door Top View	A-36
Photo No. A-37 - Post-Test Passenger Dummy Contact	A-37
Photo No. A-38 - Post-Test Passenger Dummy Head Contact	A-38
Photo No. A-39 - Pre-Test Left Front Impact Point on Vehicle	A-39
Photo No. A-40 - Post-Test Left Front Impact Point on Vehicle	A-40
Photo No. A-41 - Impact	A-41
Photo No. A-42 - Vehicle Certification Label	A-42
Photo No. A-43 - Tire Placard	A-43
Photo No. A-44 - Rollover 90°	A-44
Photo No. A-45 - Rollover 180°	A-45
Photo No. A-46 - Rollover 270°	A-46
Photo No. A-47 - Rollover 360°	A-47
Photo No. A-48 - Left Front Attitude Point	A-48
Photo No. A-49 - Right Front Attitude Point	A-49
Photo No. A-50 - Left Rear Attitude Point	A-50
Photo No. A-51 - Right Rear Attitude Point	A-51



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



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



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



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

A-5



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

A-6



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



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



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



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



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



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

A-12



Photo No. A-12 - Post-Test MDB and Vehicle Overhead View

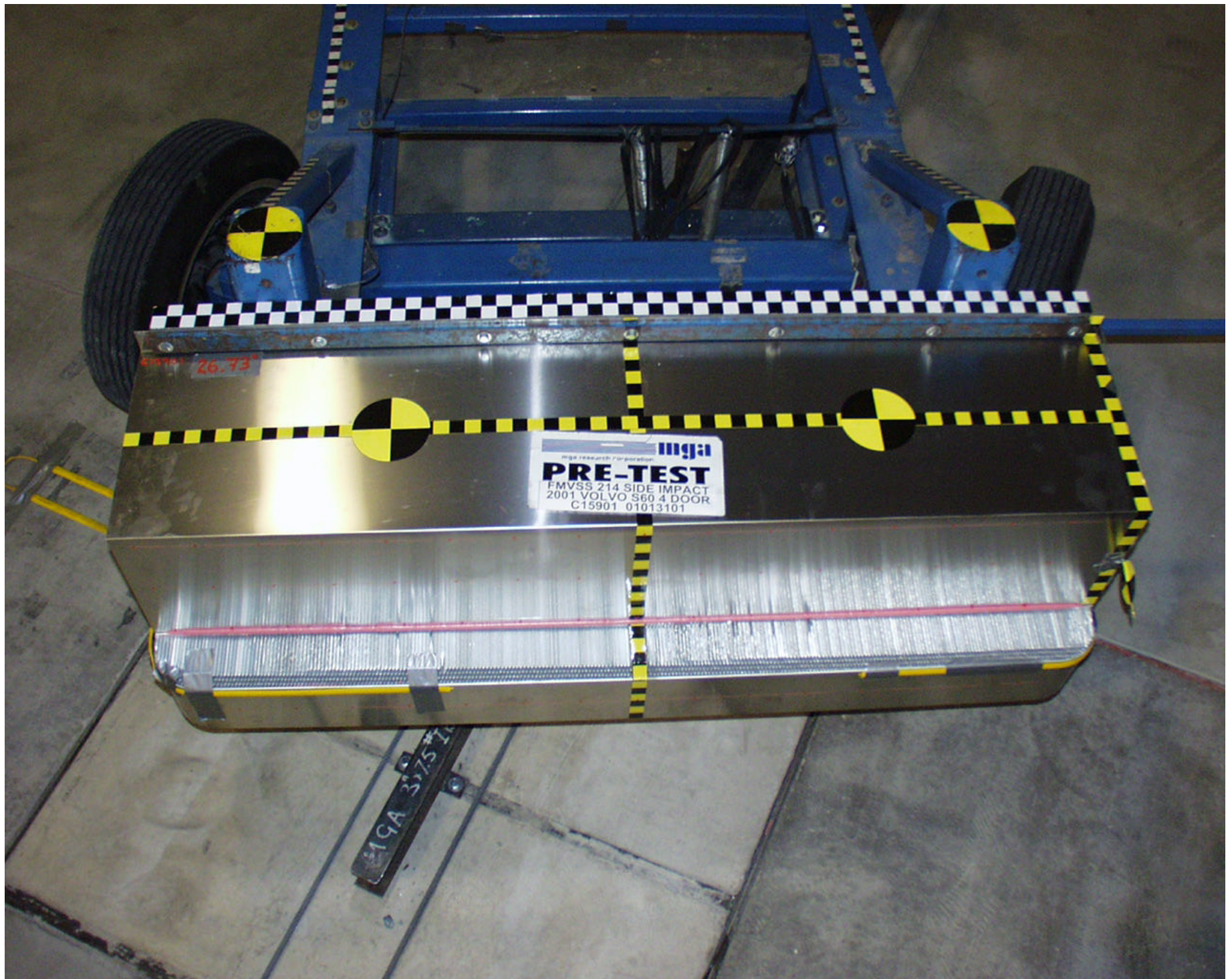


Photo No. A-13 - Pre-Test MDB Top View

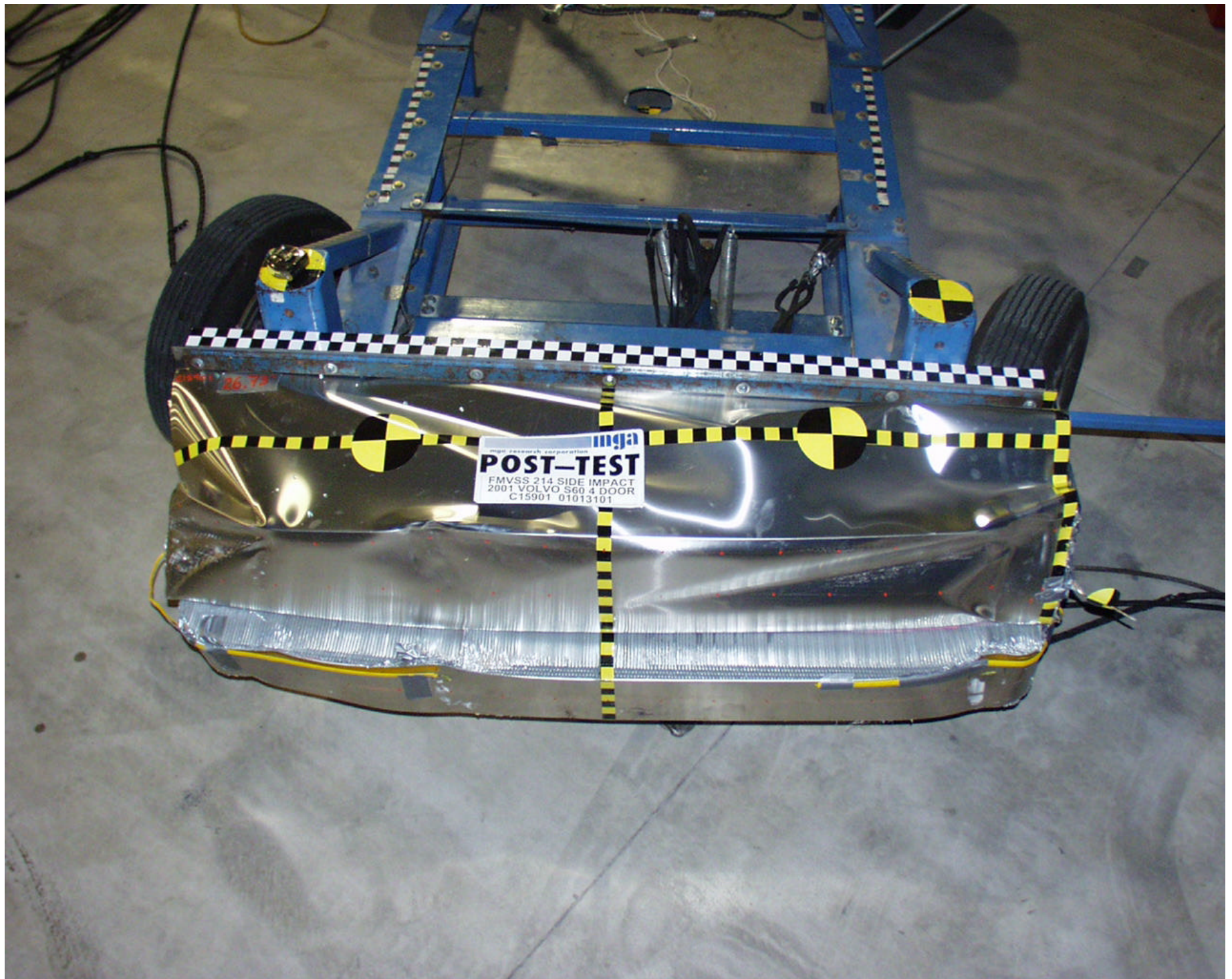


Photo No. A-14 - Post-Test MDB Top View

A-15

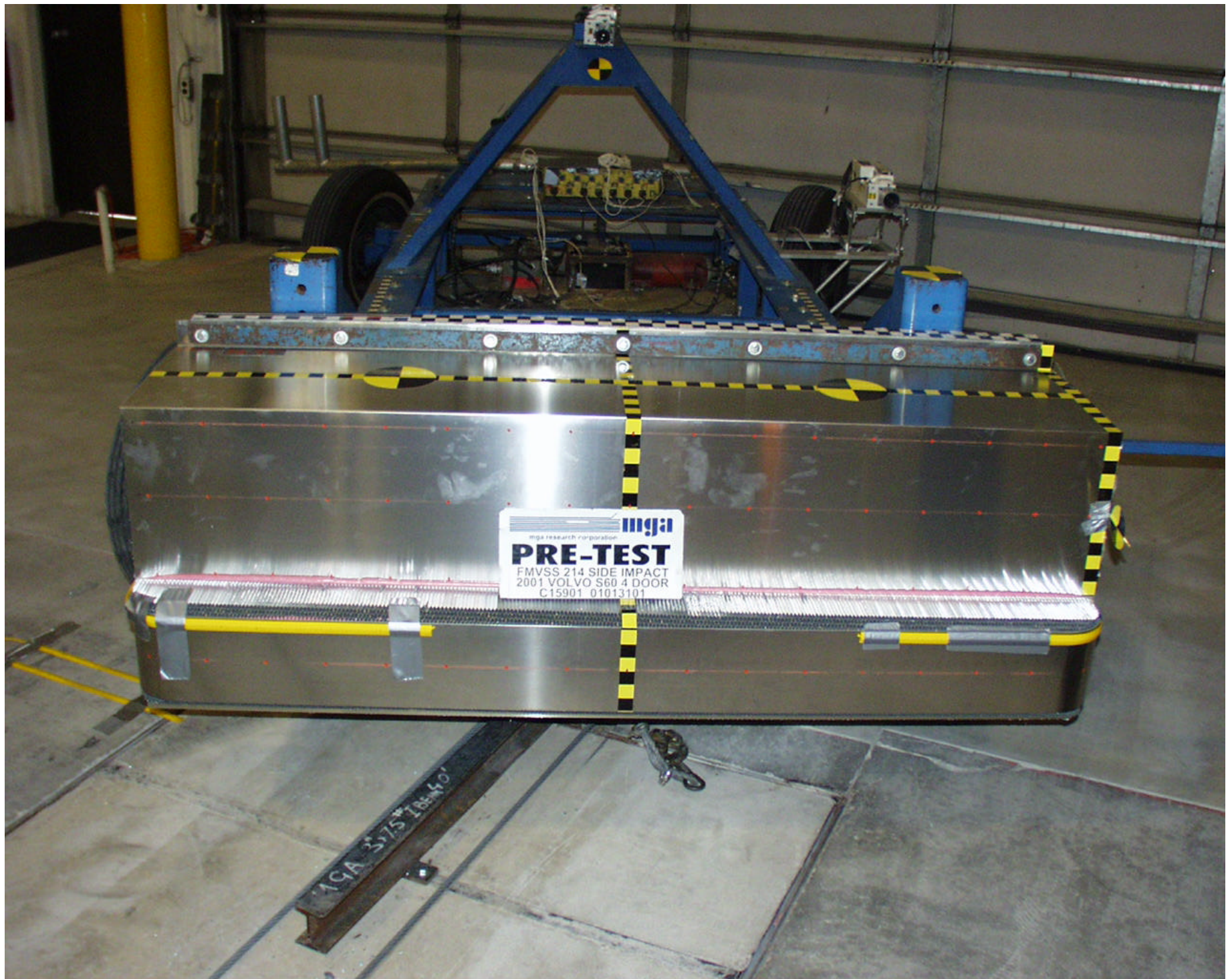


Photo No. A-15 - Pre-Test MDB Front View

A-16



Photo No. A-16 - Post-Test MDB Front View



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

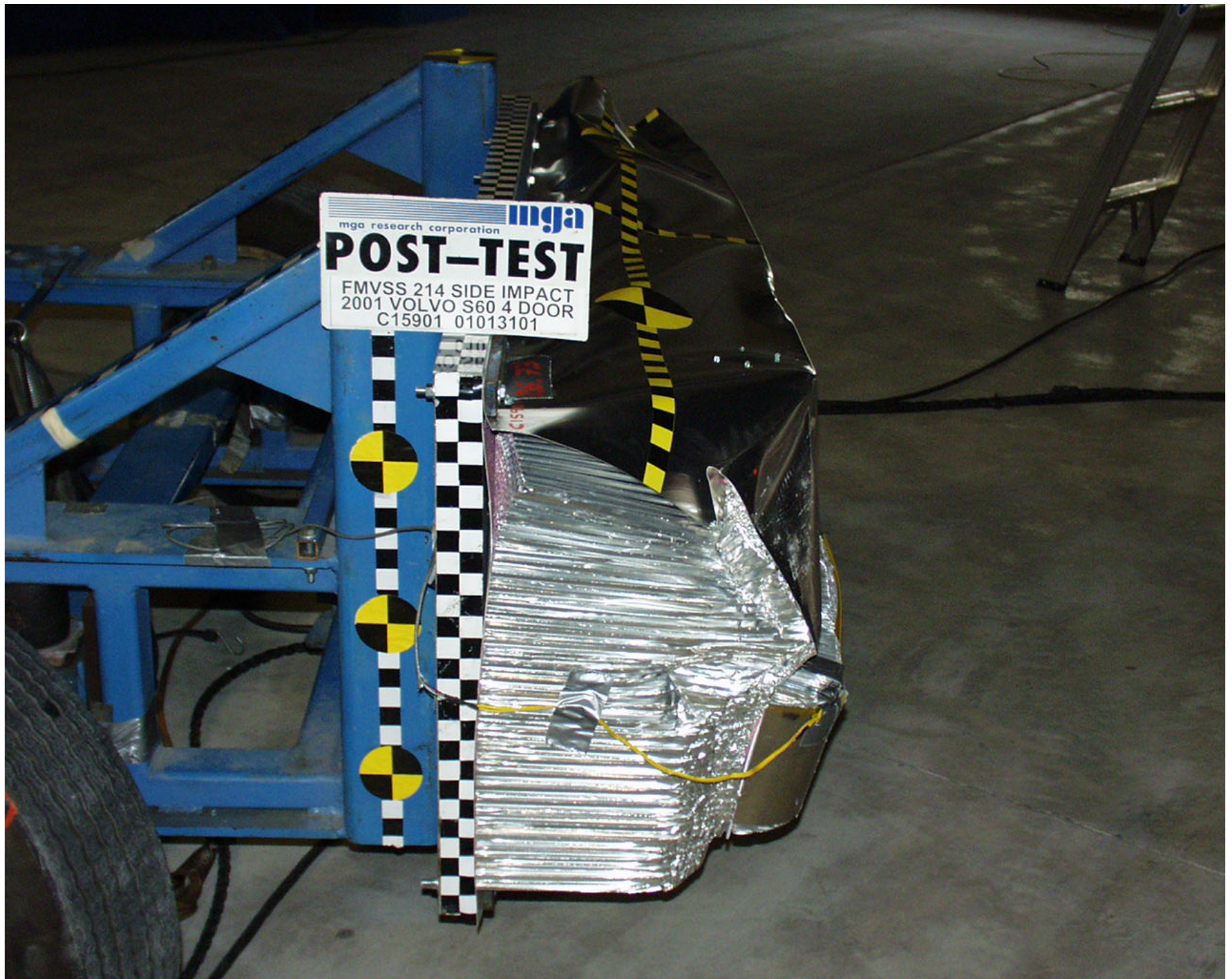


Photo No. A-18 - Post-Test MDB Right Side View



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

A-20



Photo No. A-20 - Post-Test MDB Left Side View



Photo No. A-21 - Pre-Test Driver Dummy Right Side View

A-22



Photo No. A-22 - Post-Test Driver Dummy Right Side View



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



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



Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)



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



Photo No. A-27 - Post-Test Driver Dummy Shoulder and Door Top View

A-28



Photo No. A-28 - Post-Test Driver Dummy Contact

A-29



Photo No. A-29 - Post-Test Driver Dummy Head Contact

A-30



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

A-31



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

A-32



Photo No. A-32 - Pre-Test Passenger Dummy Left Side View

A-33



Photo No. A-33 - Post-Test Passenger Dummy Left Side View



Photo No. A-34 - Pre-Test Passenger Dummy Left Side View (Door Open)

A-35



Photo No. A-35 - Pre-Test Passenger Dummy Shoulder and Door Top View



Photo No. A-36 - Post-Test Passenger Dummy Shoulder and Door Top View

A-37



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

A-38



Photo No. A-38 - Post-Test Passenger Dummy Head Contact



Photo No. A-39 - Pre-Test Left Front Impact Point on Vehicle



Photo No. A-40 - Post-Test Left Front Impact Point on Vehicle



Photo No. A-41 – Impact

MFD. BY VOLVO GOTHENBURG SWEDEN

DATE: 09/00 GV.W.R. 4360 GA.W.R.FRONT 2330 GA.W.R.REAR 2220 LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL
MOTOR VEHICLE SAFETY, BUMPER AND THEFT PROTEC-
TION STANDARDS IN EFFECT ON THE DATE OF MANUFAC-
TURE SHOWN ABOVE.

VIN YV1RS61N212001858 PASS.CAR

0021252



T

VOLVO

3514635

VEHICLE CAPACITY		OCCUPANTS			COLD TIRE PRESSURE	
	WEIGHT	FRT	RR	TOTAL	FRONT	REAR
MAX LOAD	890 LB	2	3	5	38	38 PSI

RECOMMENDED FOR FUEL ECONOMY

OPTIONAL PRESSURE						
TIRE SIZE	95/65R15	2	1	3	29	29 PSI

IF TIRES ARE HOT FROM DRIVING ADD 4 PSI. (28kPa) TO THESE RECOMMENDED PRESSURES

T125/80R17	SIZE	SPARE TIRE	INFLATION PRESSURE	60	PSI
------------	------	------------	-----------------------	----	-----

SEE OWNERS MANUAL FOR ADDITIONAL INFORMATION.

0021252

VOLVO

3514949



IMPORTANT

STOP ENGINE BEFORE REFUELLING.
CLOSE CAP AFTER REFUELLING.

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY CAUSE
ONBOARD DIAGNOSTIC SYSTEM TO MALFUNCTION AND
CHECK ENGINE LAMP TO ILLUMINATE.

SEE OWNER'S MANUAL.

VOLVO



9454010

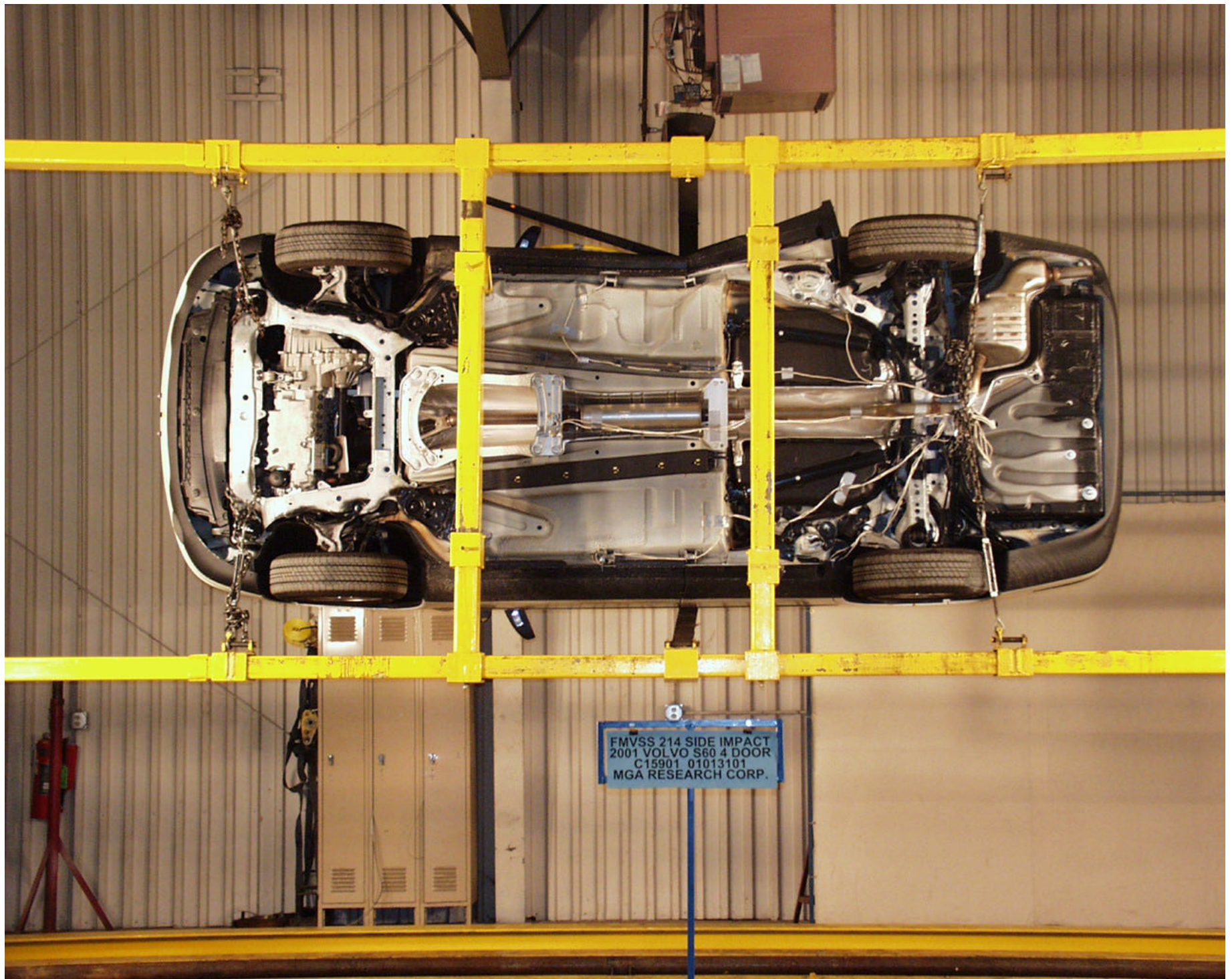


Photo No. A-44 - Rollover 90°



A-45

Photo No. A-45 - Rollover 180°



Photo No. A-46 - Rollover 270°



Photo No. A-47 - Rollover 360°



Photo No. A-48 - Left Front Attitude Point



Photo No. A-49 - Right Front Attitude Point

A-50



Photo No. A-50 - Left Rear Attitude Point



Photo No. A-51 - Right Rear Attitude Point

APPENDIX B

SID, VEHICLE, AND MDB RESPONSE DATA

Table of Data Plots

<u>Occupant:</u>	<u>Page No.</u>
Figure B-1 - Driver Upper Rib Y Acceleration vs. Time	B-1
Figure B-2 - Driver Upper Rib Y Velocity vs. Time	B-2
Figure B-3 - Driver Lower Rib Y Acceleration vs. Time	B-3
Figure B-4 - Driver Lower Rib Y Velocity vs. Time	B-4
Figure B-5 - Driver Lower Spine Y Acceleration vs. Time	B-5
Figure B-6 - Driver Lower Spine Y Velocity vs. Time	B-6
Figure B-7 - Driver Pelvis Y Acceleration vs. Time	B-7
Figure B-8 - Driver Pelvis Y Velocity vs. Time	B-8
Figure B-9 - Rear Passenger Upper Rib Y Acceleration vs. Time	B-9
Figure B-10 - Rear Passenger Upper Rib Y Velocity vs. Time	B-10
Figure B-11 - Rear Passenger Lower Rib Y Acceleration vs. Time	B-11
Figure B-12 - Rear Passenger Lower Rib Y Velocity vs. Time	B-12
Figure B-13 - Rear Passenger Lower Spine Y Acceleration vs. Time	B-13
Figure B-14 - Rear Passenger Lower Spine Y Velocity vs. Time	B-14
Figure B-15 - Rear Passenger Pelvis Y Acceleration vs. Time	B-15
Figure B-16 - Rear Passenger Pelvis Y Velocity vs. Time	B-16
 <u>Vehicle:</u>	
Figure B-17 - Right Side Sill at Front Seat X Acceleration vs. Time	B-17
Figure B-18 - Right Side Sill at Front Seat X Velocity vs. Time	B-18
Figure B-19 - Right Side Sill at Front Seat Y Acceleration vs. Time	B-19
Figure B-20 - Right Side Sill at Front Seat Y Velocity vs. Time	B-20
Figure B-21 - Right Side Sill at Front Seat Z Acceleration vs. Time	B-21
Figure B-22 - Right Side Sill at Front Seat Z Velocity vs. Time	B-22
Figure B-23 - Right Side Sill at Front Seat Resultant Acceleration vs. Time	B-23
Figure B-24 - Right Side Sill at Rear Seat X Acceleration vs. Time	B-24
Figure B-25 - Right Side Sill at Rear Seat X Velocity vs. Time	B-25
Figure B-26 - Right Side Sill at Rear Seat Y Acceleration vs. Time	B-26
Figure B-27 - Right Side Sill at Rear Seat Y Velocity vs. Time	B-27
Figure B-28 - Right Side Sill at Rear Seat Z Acceleration vs. Time	B-28
Figure B-29 - Right Side Sill at Rear Seat Z Velocity vs. Time	B-29
Figure B-30 - Right Side Sill at Rear Seat Resultant Acceleration vs. Time	B-30

Table of Data Plots

<u>Vehicle (Continued):</u>	<u>Page No.</u>
Figure B-31 - Rear Floorpan above Axle X Acceleration vs. Time*	B-31
Figure B-32 - Rear Floorpan above Axle X Velocity vs. Time*	B-32
Figure B-33 - Rear Floorpan above Axle Y Acceleration vs. Time*	B-33
Figure B-34 - Rear Floorpan above Axle Y Velocity vs. Time*	B-34
Figure B-35 - Rear Floorpan above Axle Z Acceleration vs. Time*	B-35
Figure B-36 - Rear Floorpan above Axle Z Velocity vs. Time*	B-36
Figure B-37 - Rear Floorpan above Axle Resultant Acceleration vs. Time*	B-37
Figure B-38 - Left Side Sill at Front Seat Y Acceleration vs. Time**	B-38
Figure B-39 - Left Side Sill at Front Seat Y Velocity vs. Time**	B-39
Figure B-40 - Left Side Sill at Rear Seat Y Acceleration vs. Time	B-40
Figure B-41 - Left Side Sill at Rear Seat Y Velocity vs. Time	B-41
Figure B-42 - Right Rear Occupant Compartment Y Acceleration vs. Time	B-42
Figure B-43 - Right Rear Occupant Compartment Y Velocity vs. Time	B-43
Figure B-44 - Left Lower A-Post Y Acceleration vs. Time	B-44
Figure B-45 - Left Lower A-Post Y Velocity vs. Time	B-45
Figure B-46 - Left Mid A-Post Y Acceleration vs. Time	B-46
Figure B-47 - Left Mid A-Post Y Velocity vs. Time	B-47
Figure B-48 - Left Lower B-Post Y Acceleration vs. Time	B-48
Figure B-49 - Left Lower B-Post Y Velocity vs. Time	B-49
Figure B-50 - Left Mid B-Post Y Acceleration vs. Time	B-50
Figure B-51 - Left Mid B-Post Y Velocity vs. Time	B-51
Figure B-52 - Left Driver Seat Track Y Acceleration vs. Time	B-52
Figure B-53 - Left Driver Seat Track Y Velocity vs. Time	B-53
Figure B-54 - Vehicle Center of Gravity X Acceleration vs. Time	B-54
Figure B-55 - Vehicle Center of Gravity X Velocity vs. Time	B-55
Figure B-56 - Vehicle Center of Gravity Y Acceleration vs. Time	B-56
Figure B-57 - Vehicle Center of Gravity Y Velocity vs. Time	B-57
Figure B-58 - Vehicle Center of Gravity Z Acceleration vs. Time	B-58
Figure B-59 - Vehicle Center of Gravity Z Velocity vs. Time	B-59
Figure B-60 - Vehicle Center of Gravity Resultant Acceleration vs. Time	B-60

* No Valid Data After Approximately 52 msec.

** No Valid Data After Approximately 30 msec.

Table of Data Plots

<u>Barrier:</u>	<u>Page No.</u>
Figure B-61 - Moving Barrier Center of Gravity X Acceleration vs. Time	B-61
Figure B-62 - Moving Barrier Center of Gravity X Velocity vs. Time	B-62
Figure B-63 - Moving Barrier Center of Gravity Y Acceleration vs. Time	B-63
Figure B-64 - Moving Barrier Center of Gravity Y Velocity vs. Time	B-64
Figure B-65 - Moving Barrier Center of Gravity Z Acceleration vs. Time	B-65
Figure B-66 - Moving Barrier Center of Gravity Z Velocity vs. Time	B-66
Figure B-67 - Moving Barrier Center of Gravity Resultant Acceleration vs. Time	B-67
Figure B-68 - Moving Barrier Rear Axle X Acceleration vs. Time	B-68
Figure B-69 - Moving Barrier Rear Axle X Velocity vs. Time	B-69
Figure B-70 - Moving Barrier Rear Axle Y Acceleration vs. Time	B-70
Figure B-71 - Moving Barrier Rear Axle Y Velocity vs. Time	B-71
Figure B-72 - Left Barrier Contact	B-72
Figure B-73 - Right Barrier Contact	B-73
 <u>Redundant:</u>	
Figure B-74 - Driver Upper Rib Y Redundant Acceleration vs. Time	B-74
Figure B-75 - Driver Upper Rib Y Redundant Velocity vs. Time	B-75
Figure B-76 - Driver Lower Rib Y Redundant Acceleration vs. Time	B-76
Figure B-77 - Driver Lower Rib Y Redundant Velocity vs. Time	B-77
Figure B-78 - Driver Lower Spine Y Redundant Acceleration vs. Time	B-78
Figure B-79 - Driver Lower Spine Y Redundant Velocity vs. Time	B-79
Figure B-80 - Driver Pelvis Y Redundant Acceleration vs. Time	B-80
Figure B-81 - Driver Pelvis Y Redundant Velocity vs. Time	B-81
Figure B-82 - Rear Passenger Upper Rib Y Redundant Acceleration vs. Time	B-82
Figure B-83 - Rear Passenger Upper Rib Y Redundant Velocity vs. Time	B-83
Figure B-84 - Rear Passenger Lower Rib Y Redundant Acceleration vs. Time	B-84
Figure B-85 - Rear Passenger Lower Rib Y Redundant Velocity vs. Time	B-85
Figure B-86 - Rear Passenger Lower Spine Y Redundant Acceleration vs. Time	B-86
Figure B-87 - Rear Passenger Lower Spine Y Redundant Velocity vs. Time	B-87
Figure B-88 - Rear Passenger Pelvis Y Redundant Acceleration vs. Time	B-88
Figure B-89 - Rear Passenger Pelvis Y Redundant Velocity vs. Time	B-89

Table of Data Plots

<u>FIR Filtered:</u>	<u>Page No.</u>
Figure B-90 - Driver Upper Rib Y Acceleration vs. Time	B-90
Figure B-91 - Driver Upper Rib Y Velocity vs. Time	B-91
Figure B-92 - Driver Lower Rib Y Acceleration vs. Time	B-92
Figure B-93 - Driver Lower Rib Y Velocity vs. Time	B-93
Figure B-94 - Driver Lower Spine Y Acceleration vs. Time	B-94
Figure B-95 - Driver Lower Spine Y Velocity vs. Time	B-95
Figure B-96 - Driver Pelvis Y Acceleration vs. Time	B-96
Figure B-96 - Driver Pelvis Y Velocity vs. Time	B-97
Figure B-98 - Rear Passenger Upper Rib Y Acceleration vs. Time	B-98
Figure B-99 - Rear Passenger Upper Rib Y Velocity vs. Time	B-99
Figure B-100 - Rear Passenger Lower Rib Y Acceleration vs. Time	B-100
Figure B-101 - Rear Passenger Lower Rib Y Velocity vs. Time	B-101
Figure B-102 - Rear Passenger Lower Spine Y Acceleration vs. Time	B-102
Figure B-103 - Rear Passenger Lower Spine Y Velocity vs. Time	B-103
Figure B-104 - Rear Passenger Pelvis Y Acceleration vs. Time	B-104
Figure B-105 - Rear Passenger Pelvis Y Velocity vs. Time	B-105
Figure B-106 - Driver Upper Rib Redundant Y Acceleration vs. Time	B-106
Figure B-107 - Driver Upper Rib Redundant Y Velocity vs. Time	B-107
Figure B-108 - Driver Lower Rib Redundant Y Acceleration vs. Time	B-108
Figure B-109 - Driver Lower Rib Redundant Y Velocity vs. Time	B-109
Figure B-110 - Driver Lower Spine Redundant Y Acceleration vs. Time	B-110
Figure B-111 - Driver Lower Spine Redundant Y Velocity vs. Time	B-111
Figure B-112 - Driver Pelvis Y Redundant Acceleration vs. Time	B-112
Figure B-113 - Driver Pelvis Y Redundant Velocity vs. Time	B-113
Figure B-114 - Rear Passenger Upper Rib Redundant Y Acceleration vs. Time	B-114
Figure B-115 - Rear Passenger Upper Rib Redundant Y Velocity vs. Time	B-115
Figure B-116 - Rear Passenger Lower Rib Redundant Y Acceleration vs. Time	B-116
Figure B-117 - Rear Passenger Lower Rib Redundant Y Velocity vs. Time	B-117
Figure B-118 - Rear Passenger Lower Spine Redundant Y Acceleration vs. Time	B-118
Figure B-119 - Rear Passenger Lower Spine Redundant Y Velocity vs. Time	B-119
Figure B-120 - Rear Passenger Pelvis Y Redundant Acceleration vs. Time	B-120
Figure B-121 - Rear Passenger Pelvis Y Redundant Velocity vs. Time	B-121



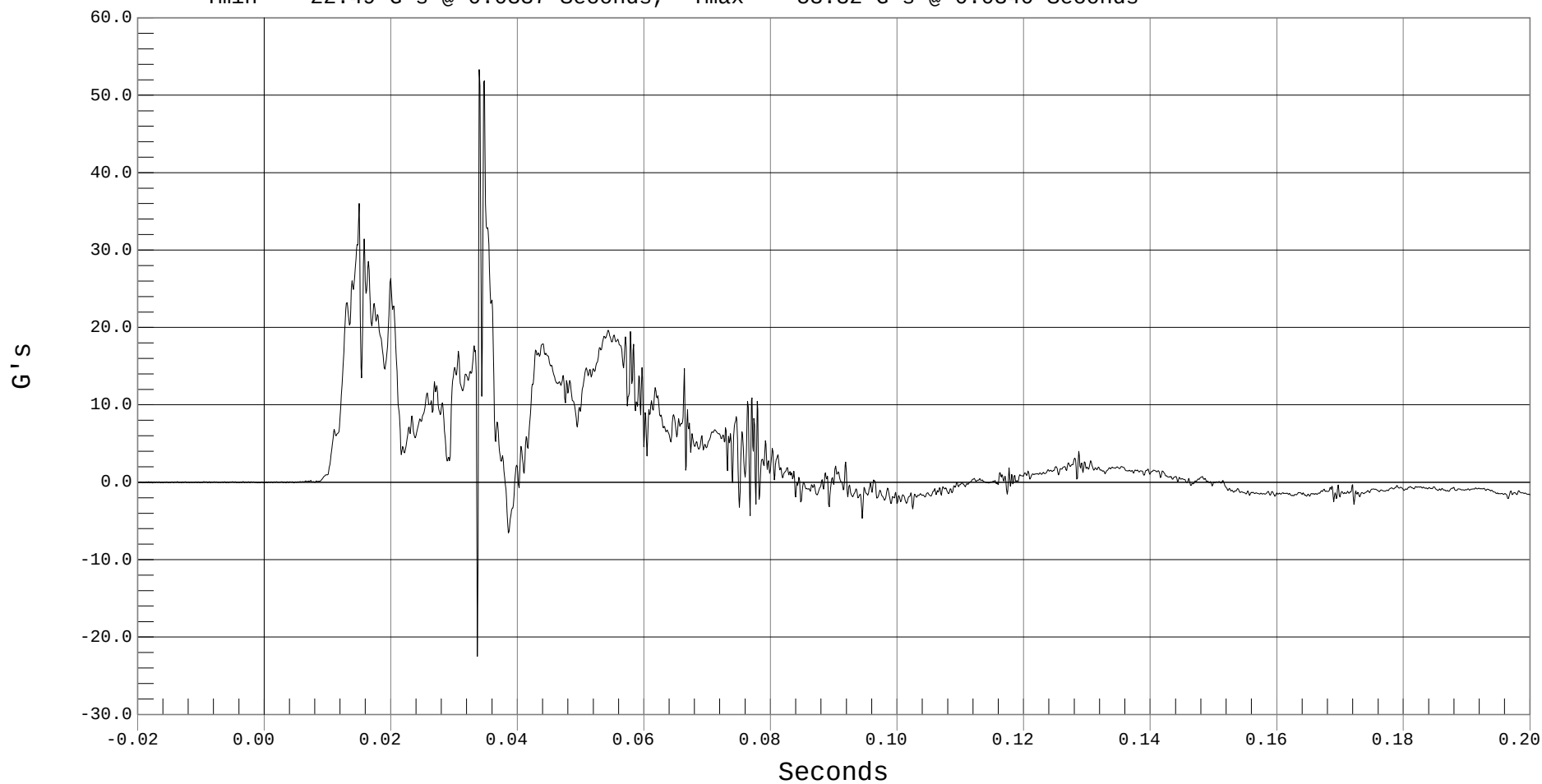
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

1 DRIVER UPPER RIB Y, B01010AT.A04

Ymin = -22.49 G's @ 0.0337 Seconds, Ymax = 53.32 G's @ 0.0340 Seconds





DRIVER UPPER RIB Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

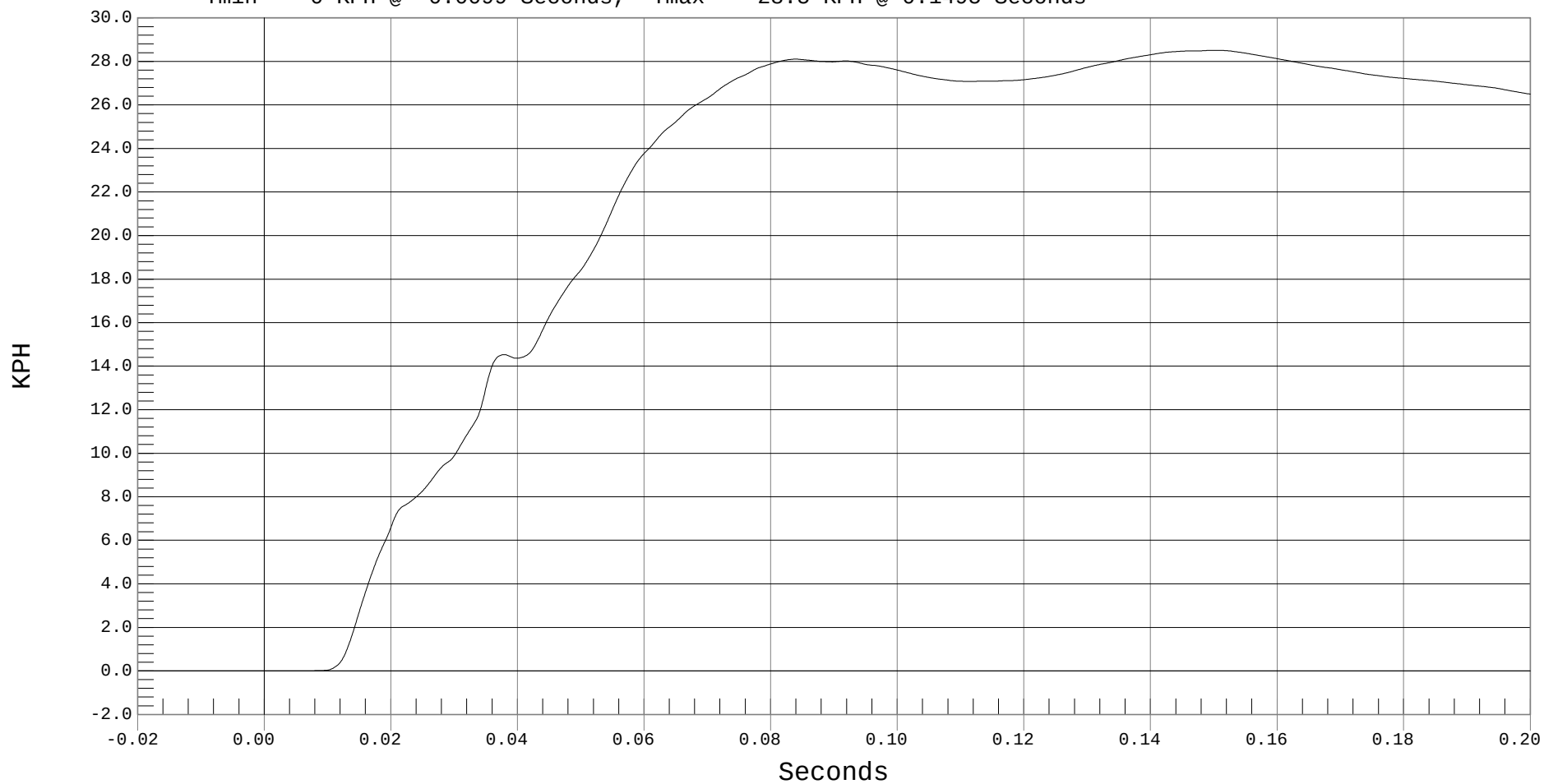
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

1 DRIVER UPPER RIB Y VELOCITY, B01010AI.V04

Ymin = 0 KPH @ -0.0099 Seconds, Ymax = 28.5 KPH @ 0.1495 Seconds





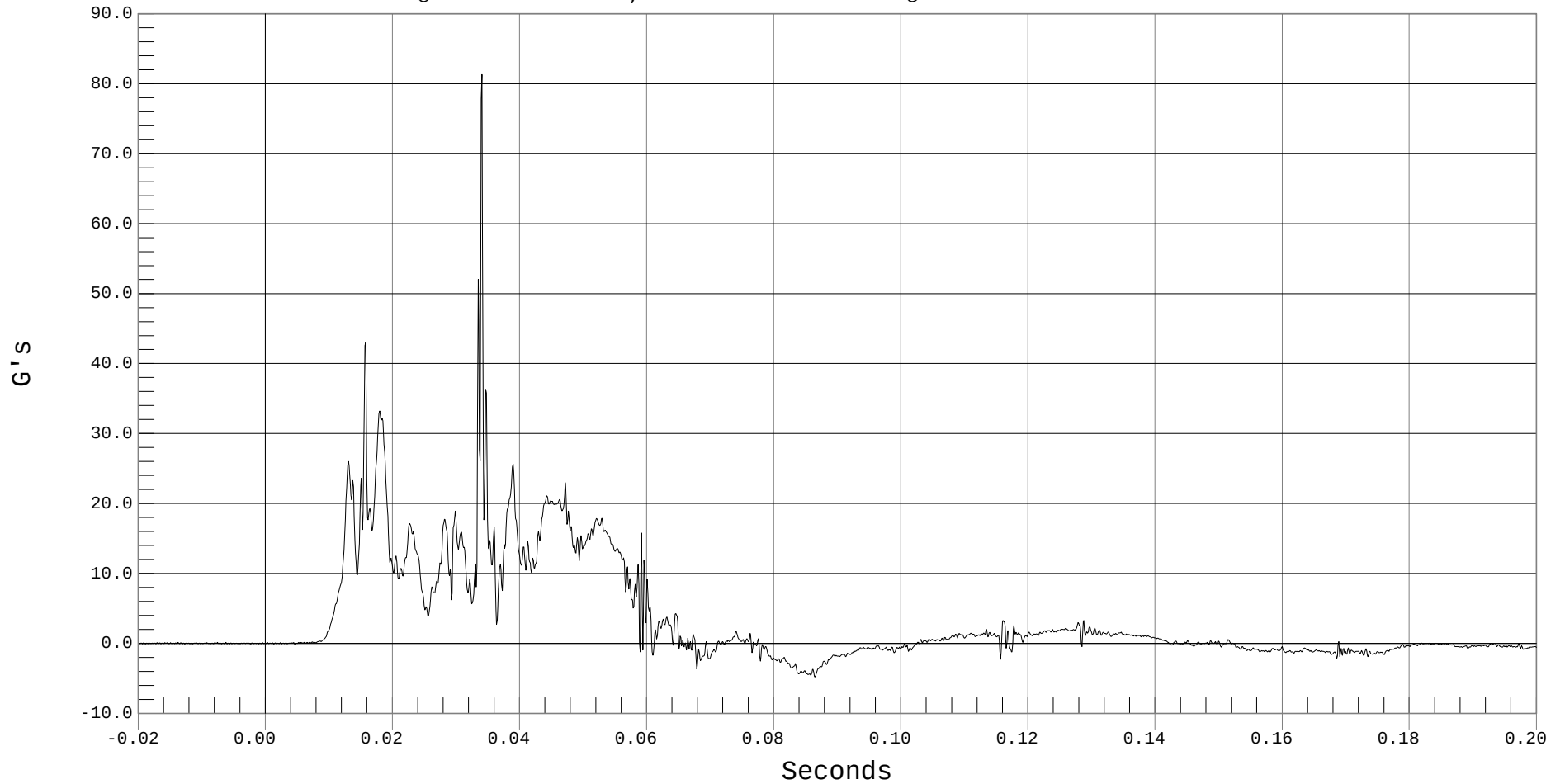
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 DRIVER LOWER RIB Y, B01010AT.A05

Ymin = -4.8 G's @ 0.0865 Seconds, Ymax = 81.31 G's @ 0.0341 Seconds





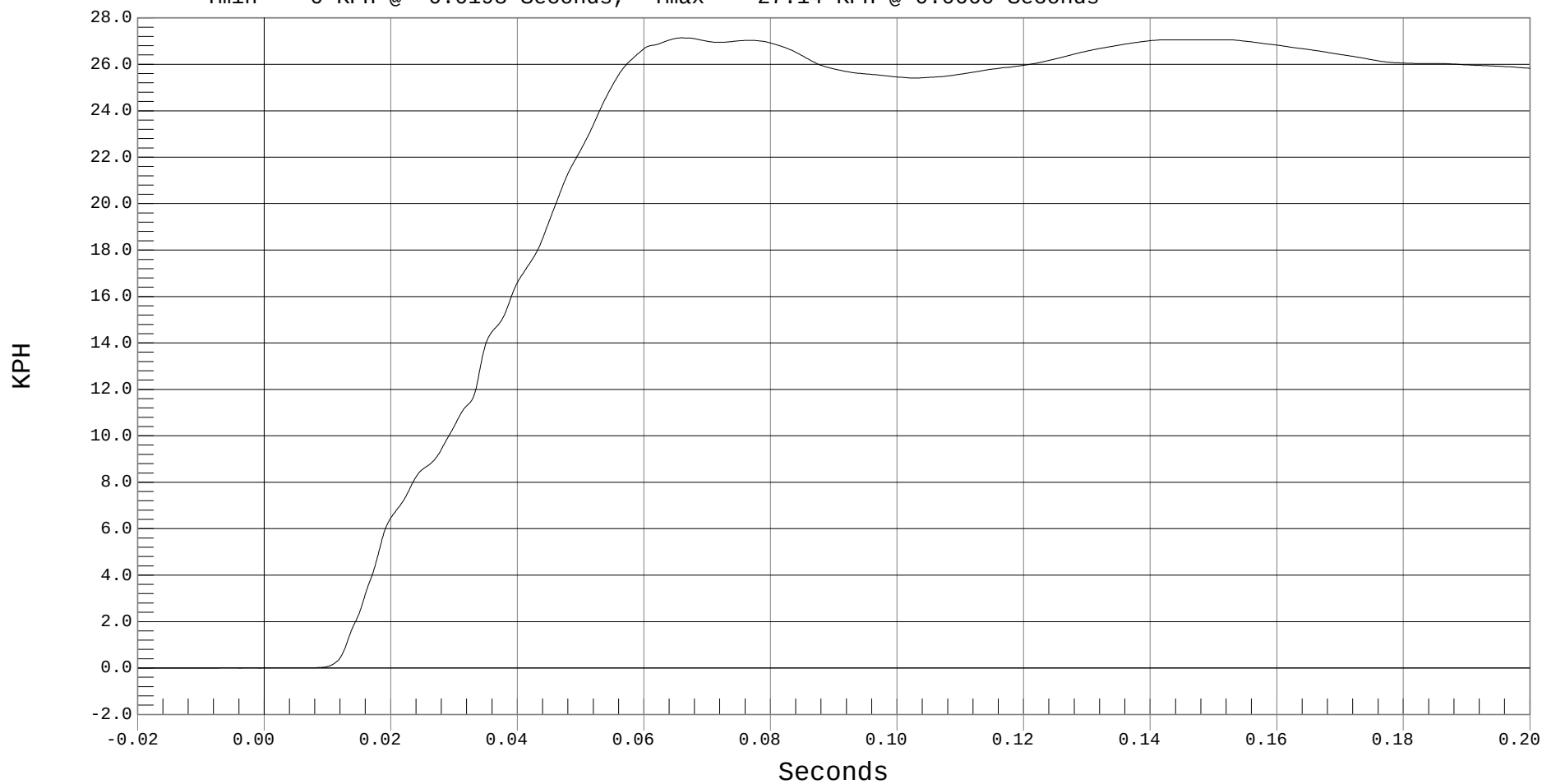
DRIVER LOWER RIB Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 DRIVER LOWER RIB Y VELOCITY, B01010AI.V05

Ymin = 0 KPH @ -0.0198 Seconds, Ymax = 27.14 KPH @ 0.0660 Seconds





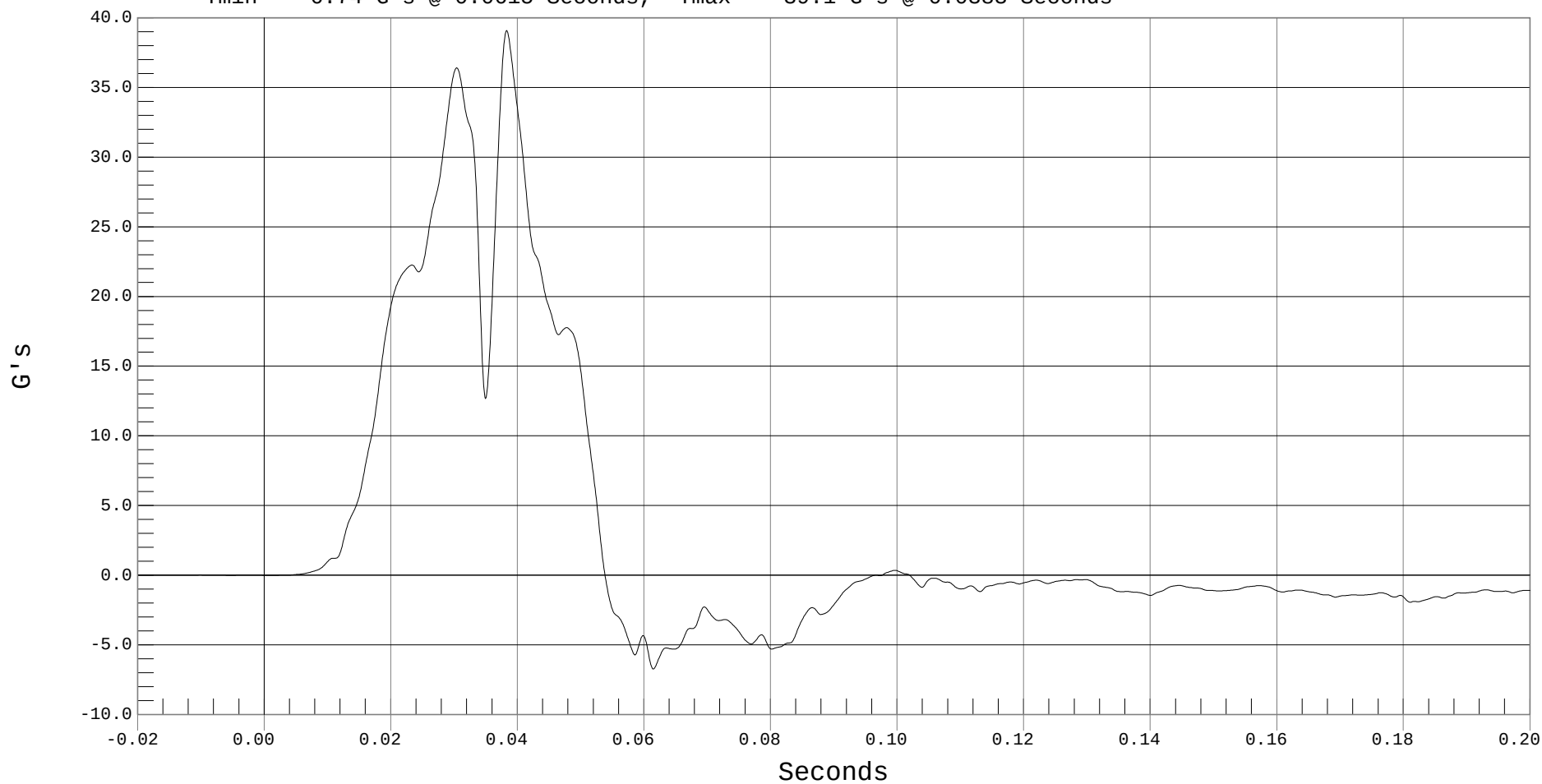
DRIVER LOWER SPINE Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

1 DRIVER LOWER SPINE Y, B01010AF.A06

Ymin = -6.74 G's @ 0.0615 Seconds, Ymax = 39.1 G's @ 0.0383 Seconds





DRIVER LOWER SPINE Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

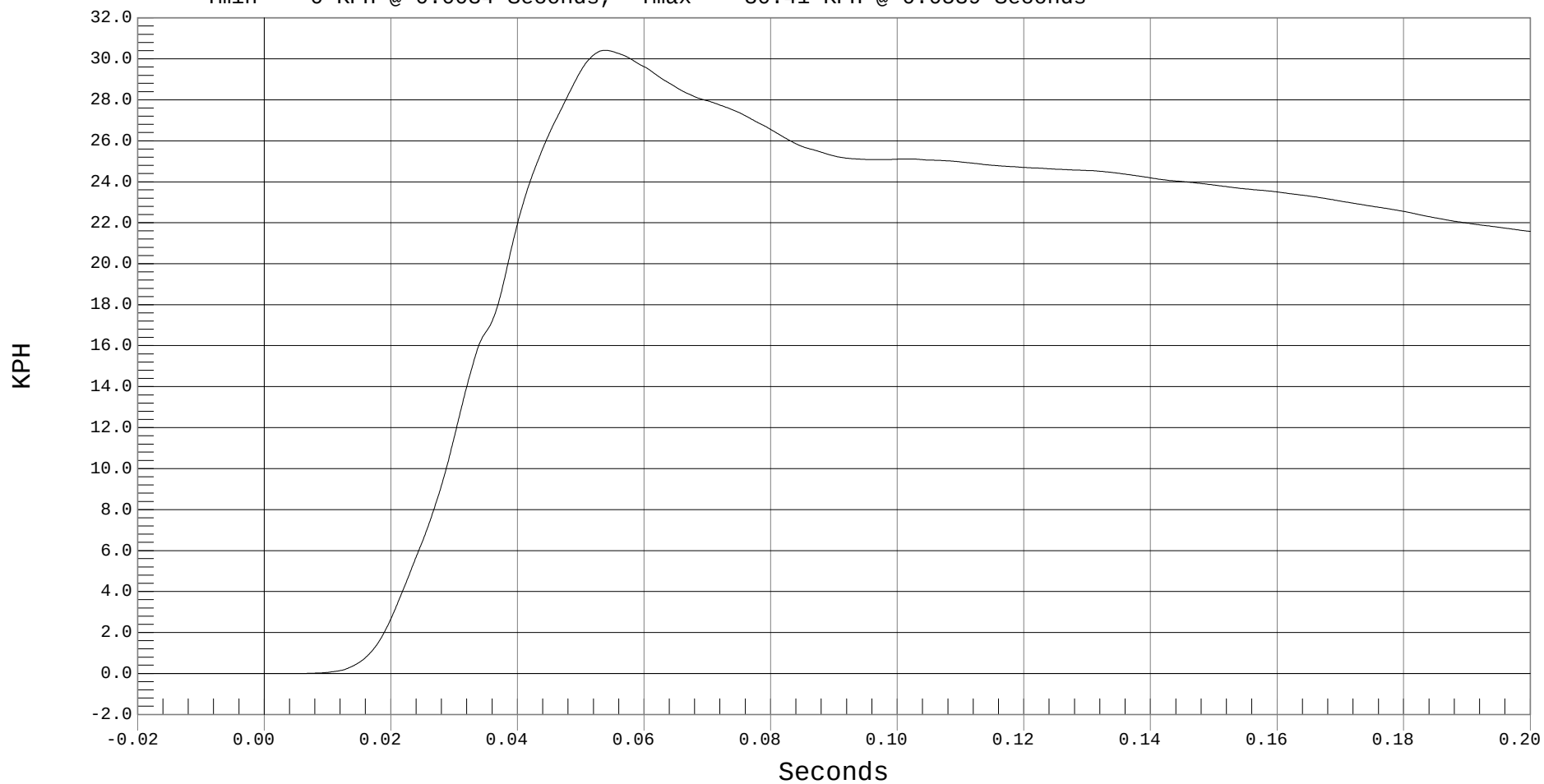
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 DRIVER LOWER SPINE Y VELOCITY, B01010AI.V06

Ymin = 0 KPH @ 0.0034 Seconds, Ymax = 30.41 KPH @ 0.0539 Seconds





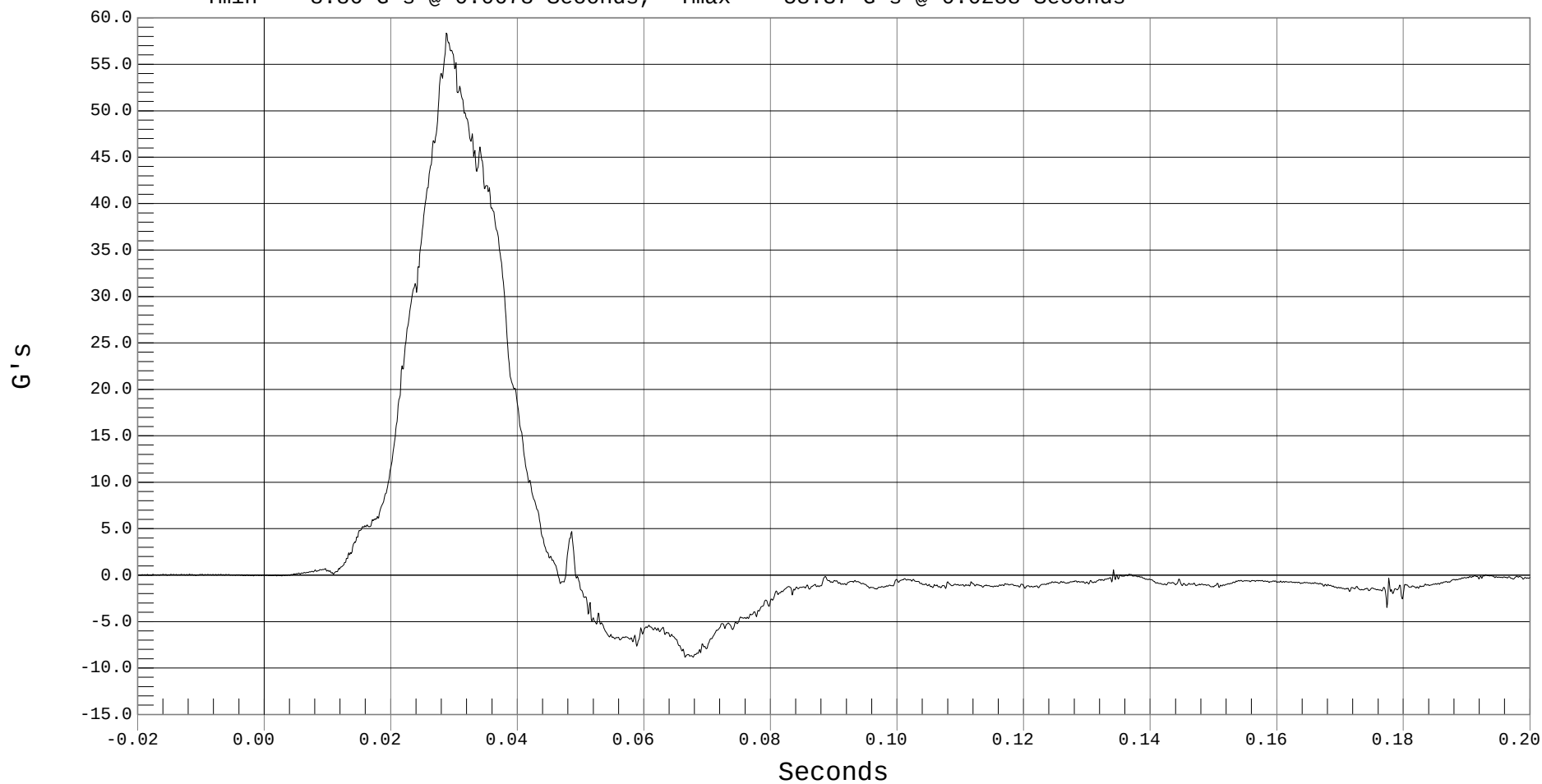
DRIVER PELVIS Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Y, B01010AT.A07

Ymin = -8.86 G's @ 0.0678 Seconds, Ymax = 58.37 G's @ 0.0288 Seconds





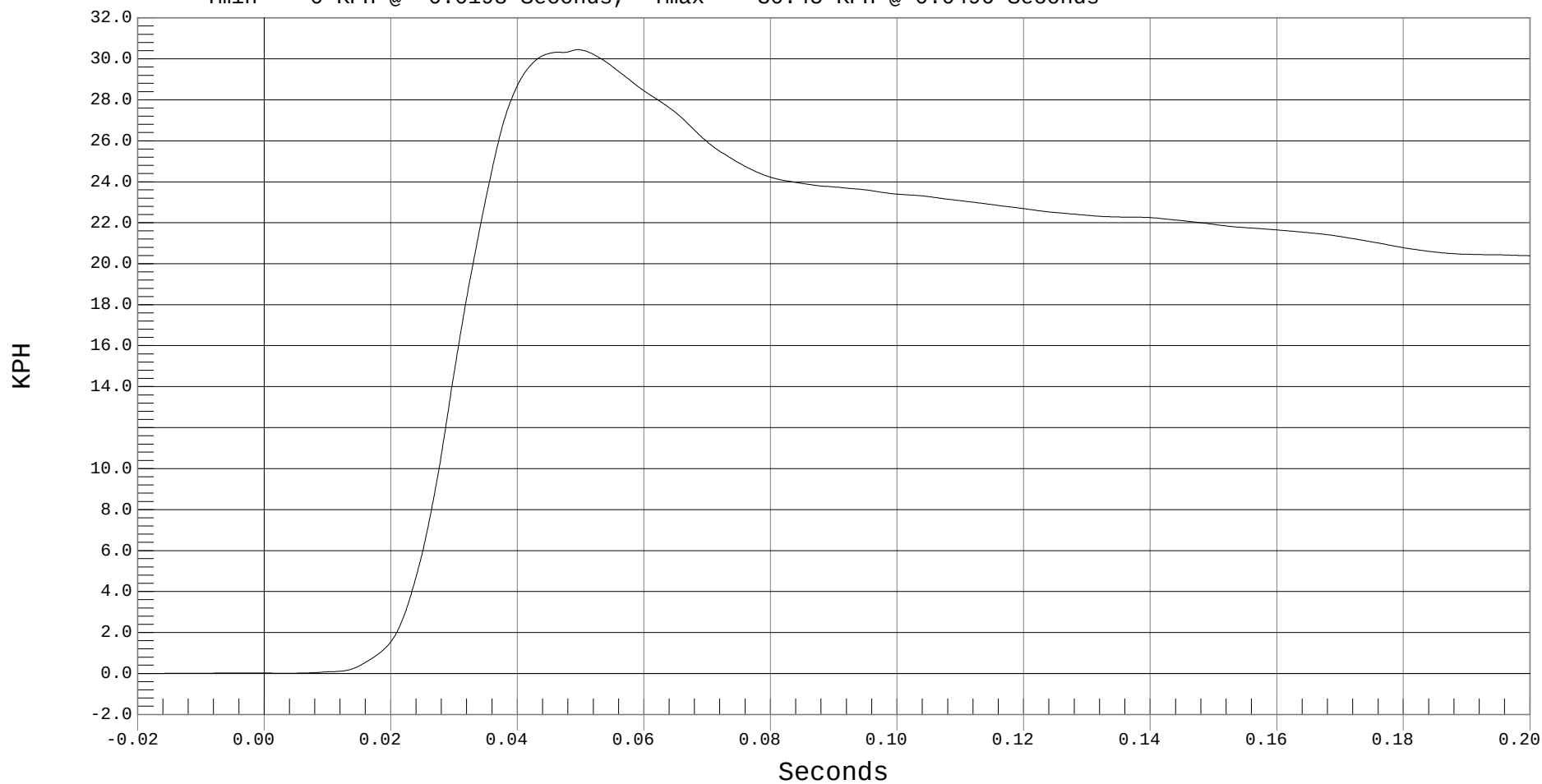
DRIVER PELVIS Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 DRIVER PELVIS Y VELOCITY, B01010AI.V07

Ymin = 0 KPH @ -0.0198 Seconds, Ymax = 30.45 KPH @ 0.0496 Seconds





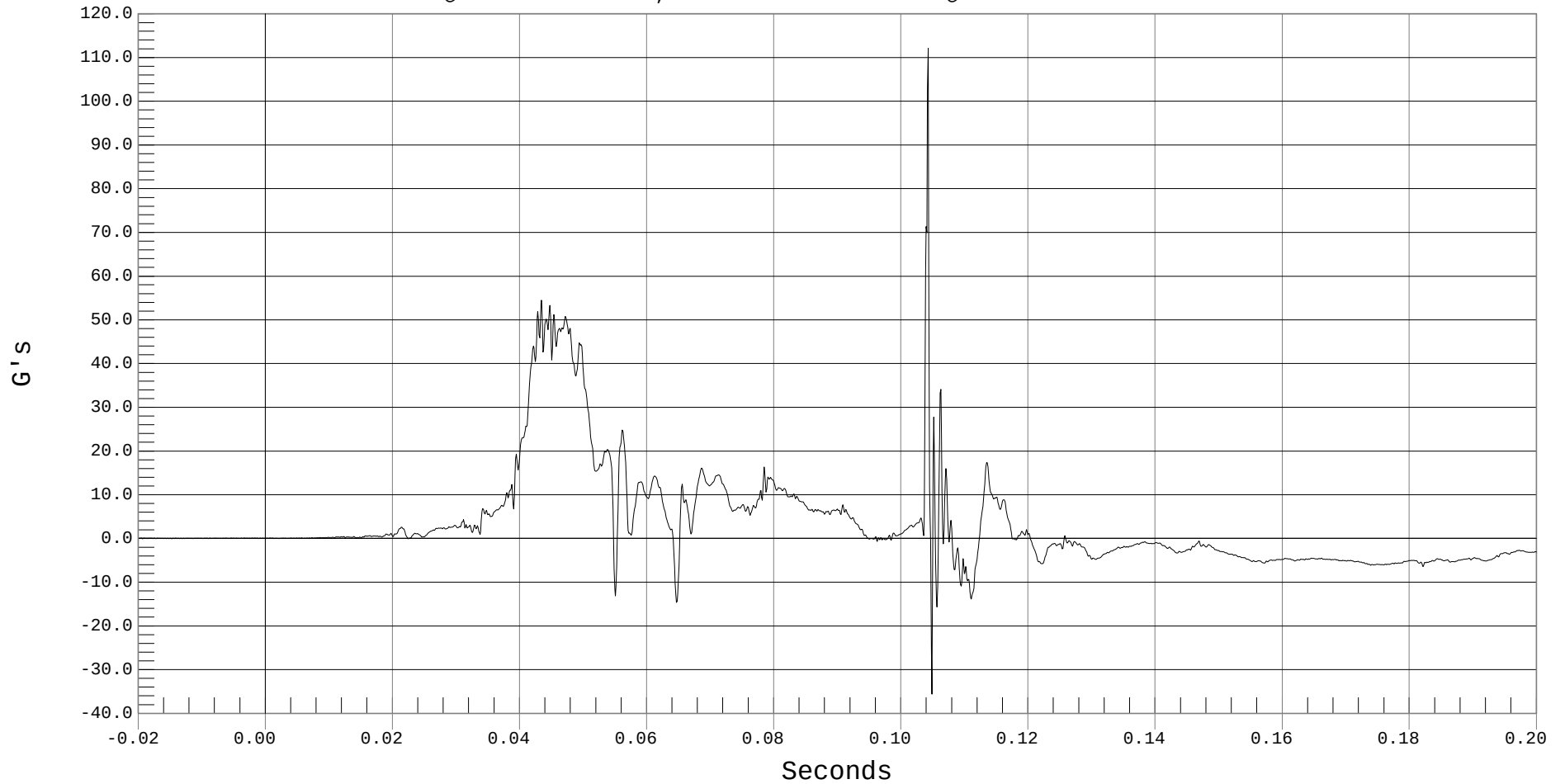
REAR PASSENGER UPPER RIB Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 PASSENGER UPPER RIB Y, B01010AT.A11

Ymin = -35.59 G's @ 0.1049 Seconds, Ymax = 112.08 G's @ 0.1043 Seconds





REAR PASSENGER UPPER RIB Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 D00R (C15901)

Other Info:

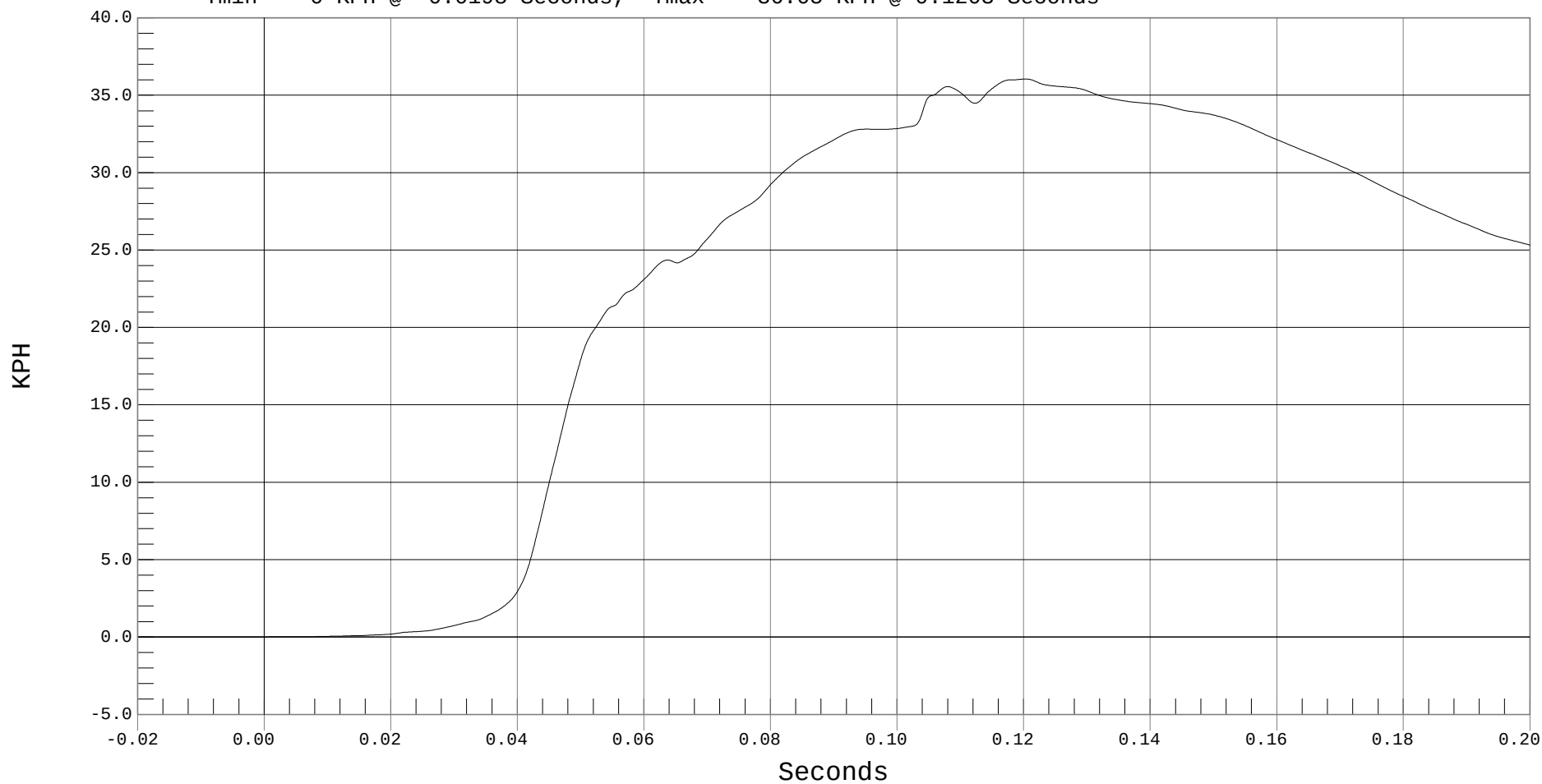
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

1 REAR PASSENGER UPPER RIB Y VELOCITY, B01010AI.V11

Ymin = 0 KPH @ -0.0198 Seconds, Ymax = 36.05 KPH @ 0.1203 Seconds





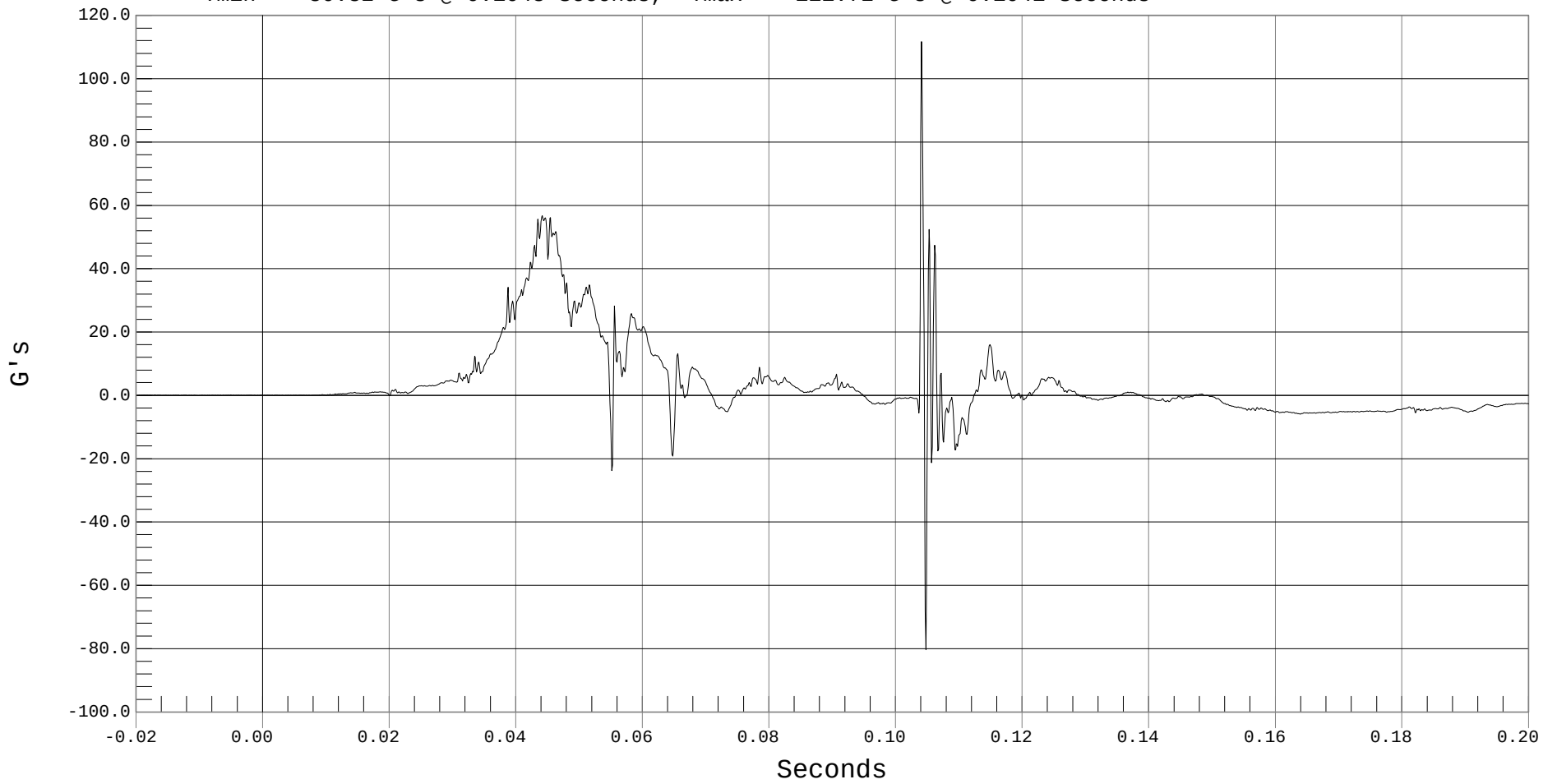
REAR PASSENGER LOWER RIB Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 PASSENGER LOWER RIB Y, B01010AT.A12

Ymin = -80.32 G's @ 0.1048 Seconds, Ymax = 111.72 G's @ 0.1041 Seconds





REAR PASSENGER LOWER RIB Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

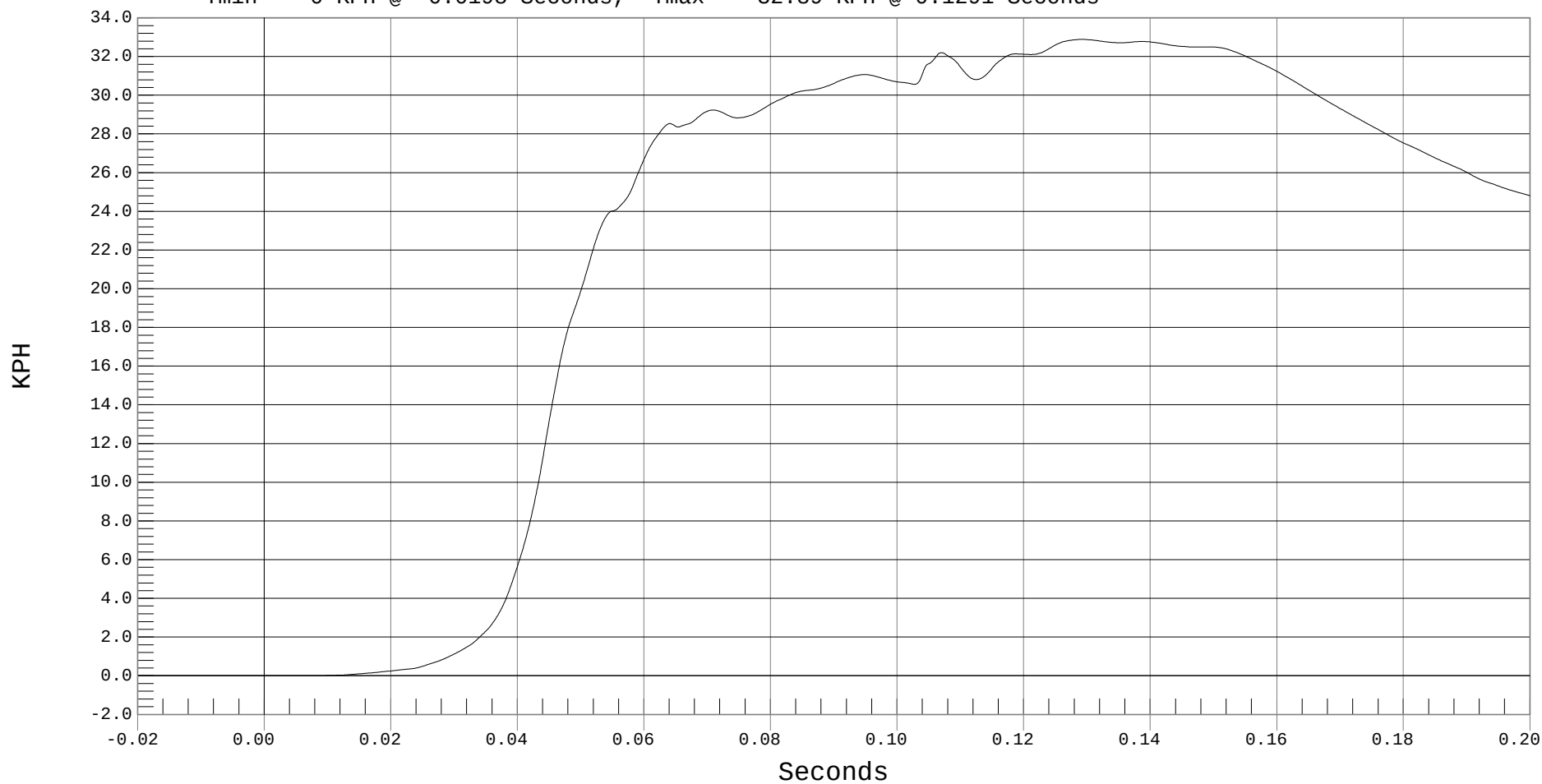
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

1 REAR PASSENGER LOWER RIB Y VELOCITY, B01010AI.V12

Ymin = 0 KPH @ -0.0198 Seconds, Ymax = 32.89 KPH @ 0.1291 Seconds





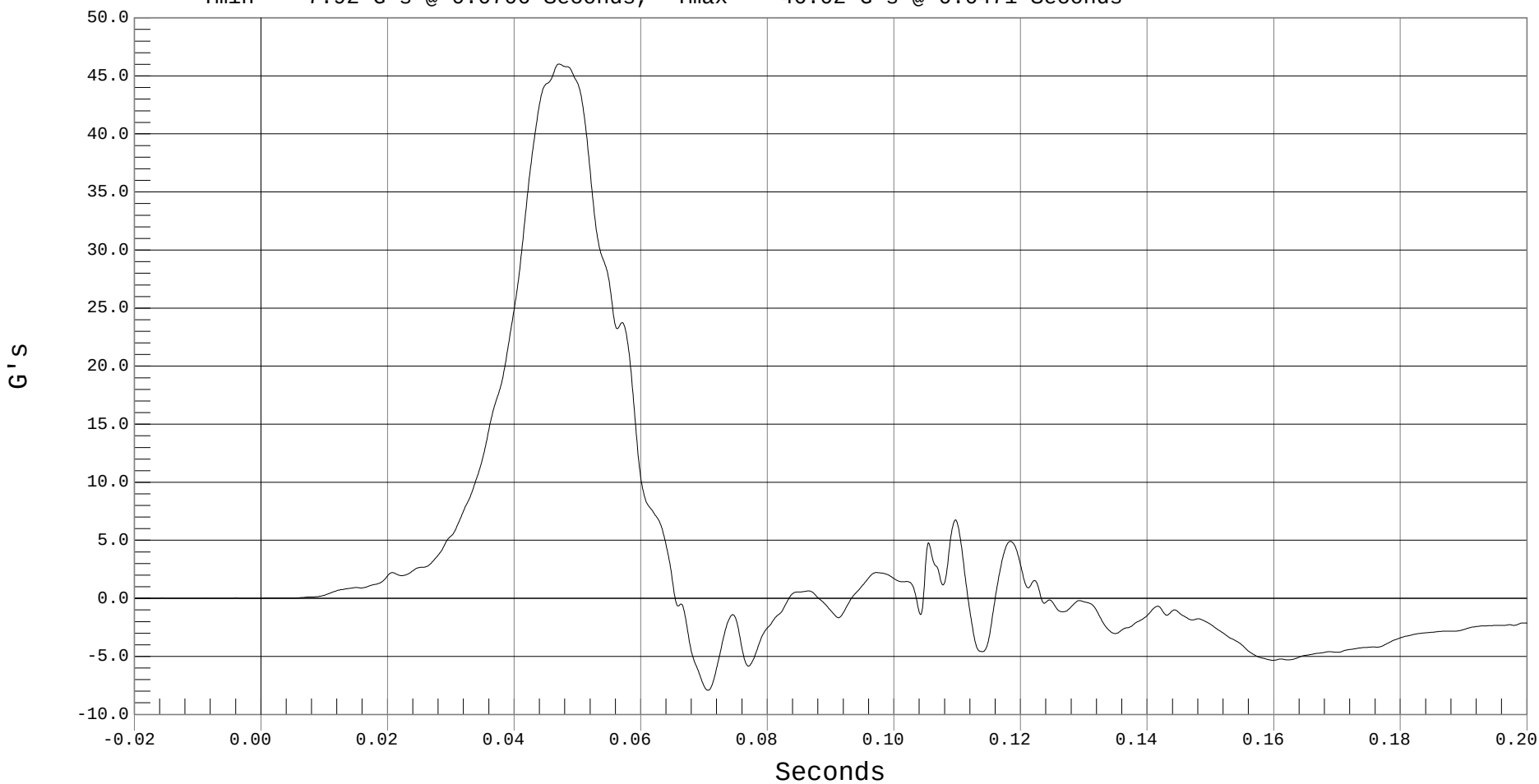
REAR PASSENGER LOWER SPINE Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 PASSENGER LOWER SPINE Y, B01010AF.A13

Ymin = -7.92 G's @ 0.0706 Seconds, Ymax = 46.02 G's @ 0.0471 Seconds





REAR PASSENGER LOWER SPINE Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

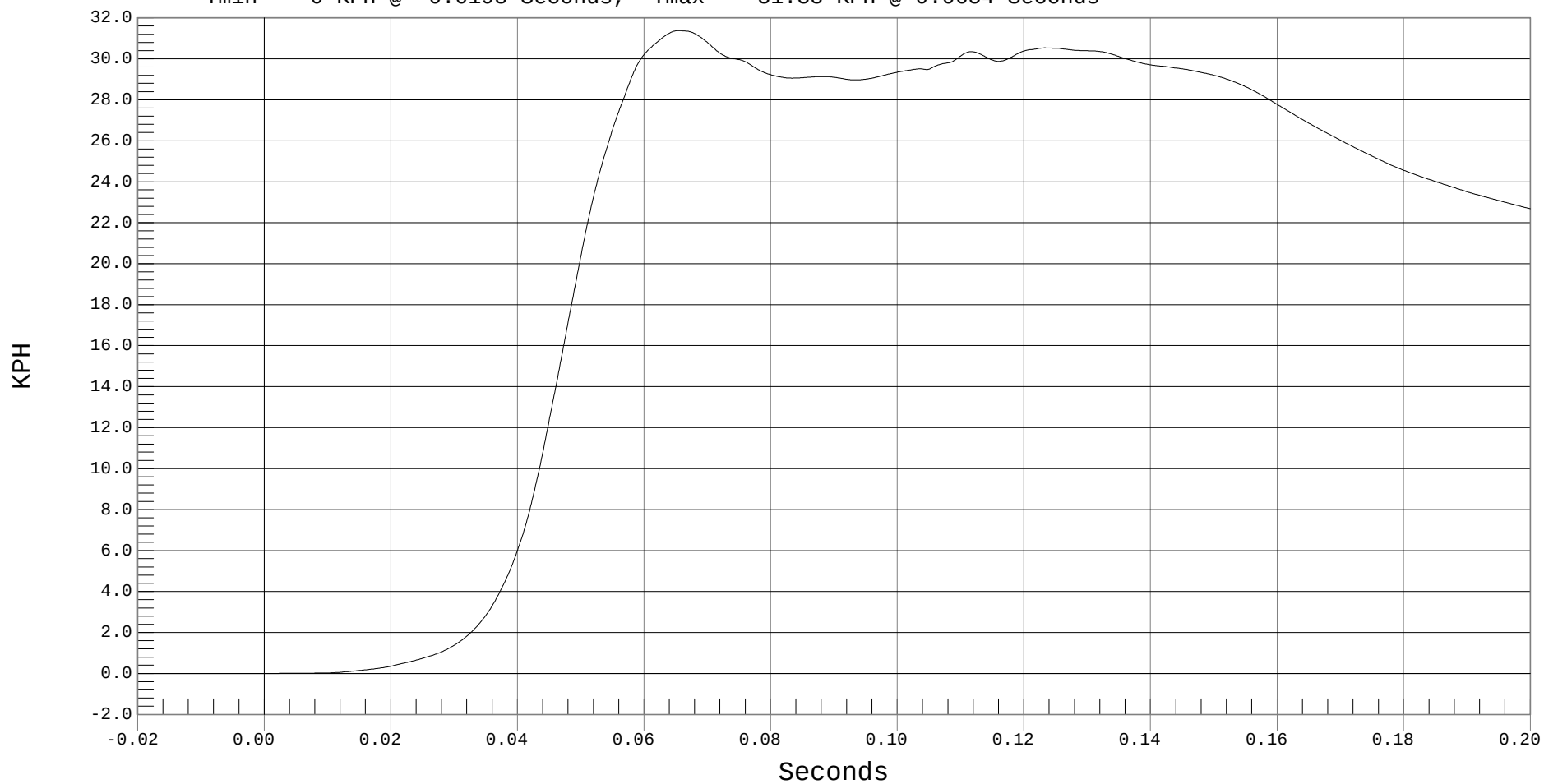
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 REAR PASSENGER LOWER SPINE Y VELOCITY, B01010AI.V13

Ymin = 0 KPH @ -0.0198 Seconds, Ymax = 31.38 KPH @ 0.0654 Seconds





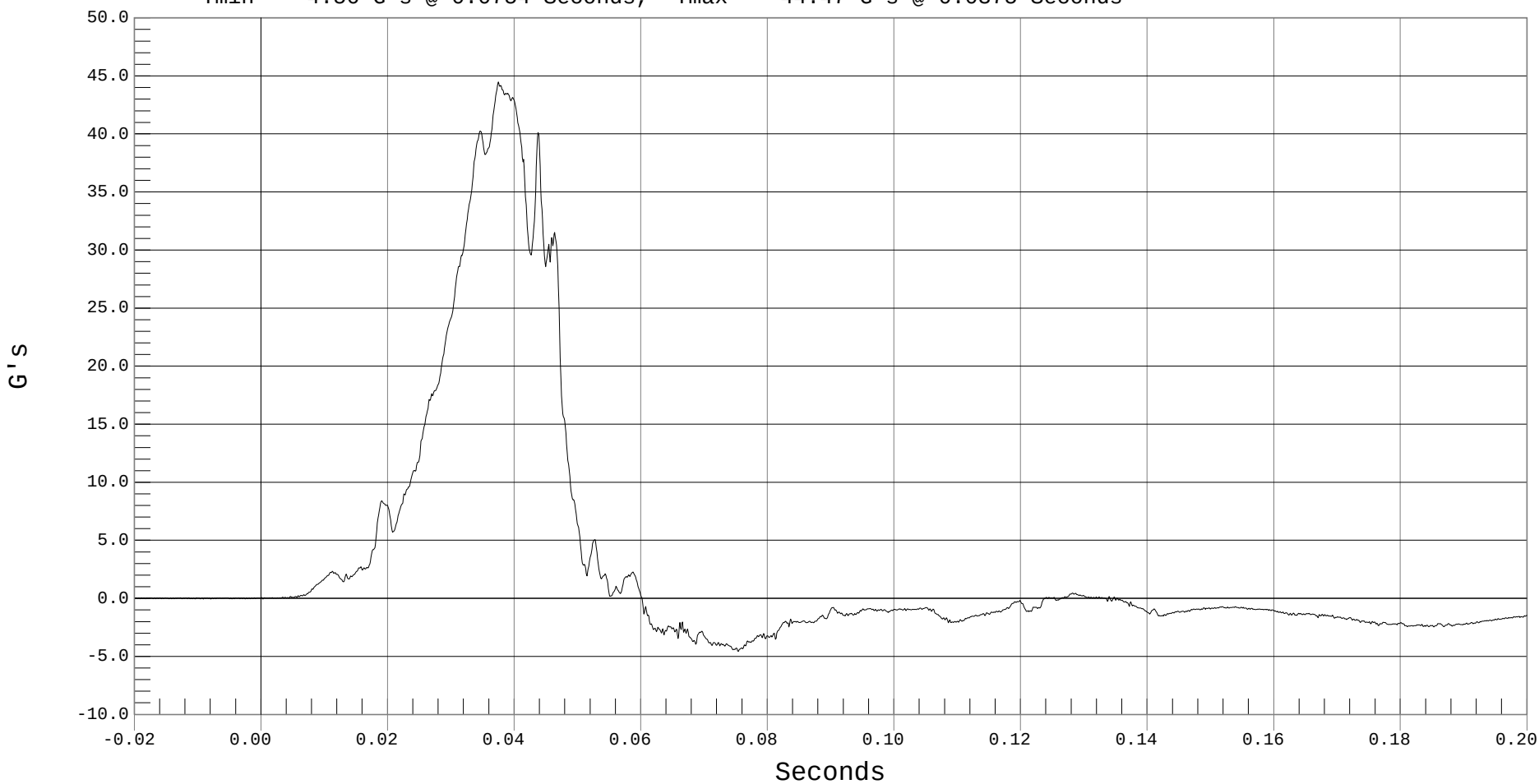
REAR PASSENGER PELVIS Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS Y, B01010AT.A14

Ymin = -4.56 G's @ 0.0754 Seconds, Ymax = 44.47 G's @ 0.0375 Seconds





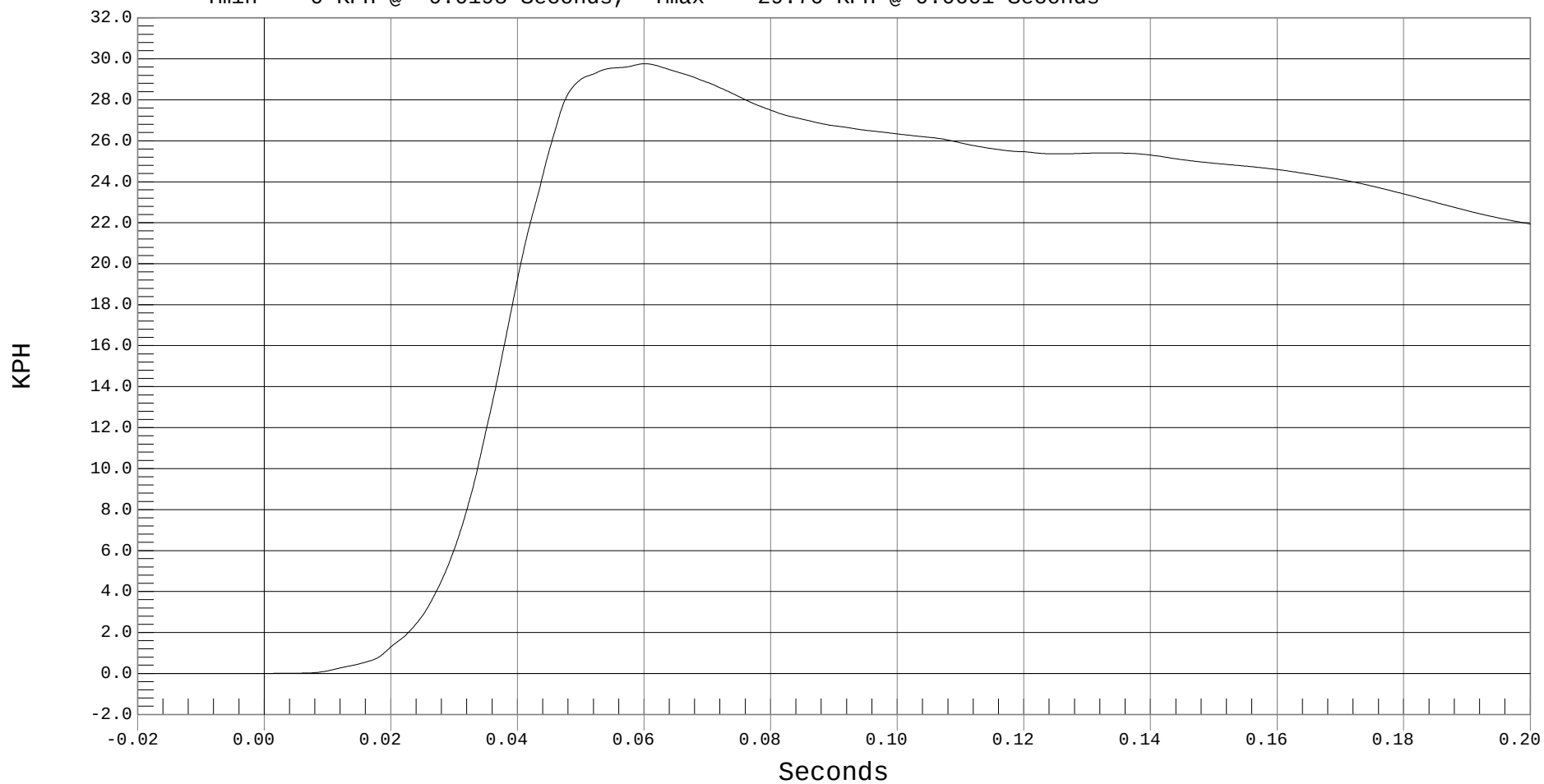
REAR PASSENGER PELVIS Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 REAR PASSENGER PELVIS Y VELOCITY, B01010AI.V14

Ymin = 0 KPH @ -0.0198 Seconds, Ymax = 29.76 KPH @ 0.0601 Seconds





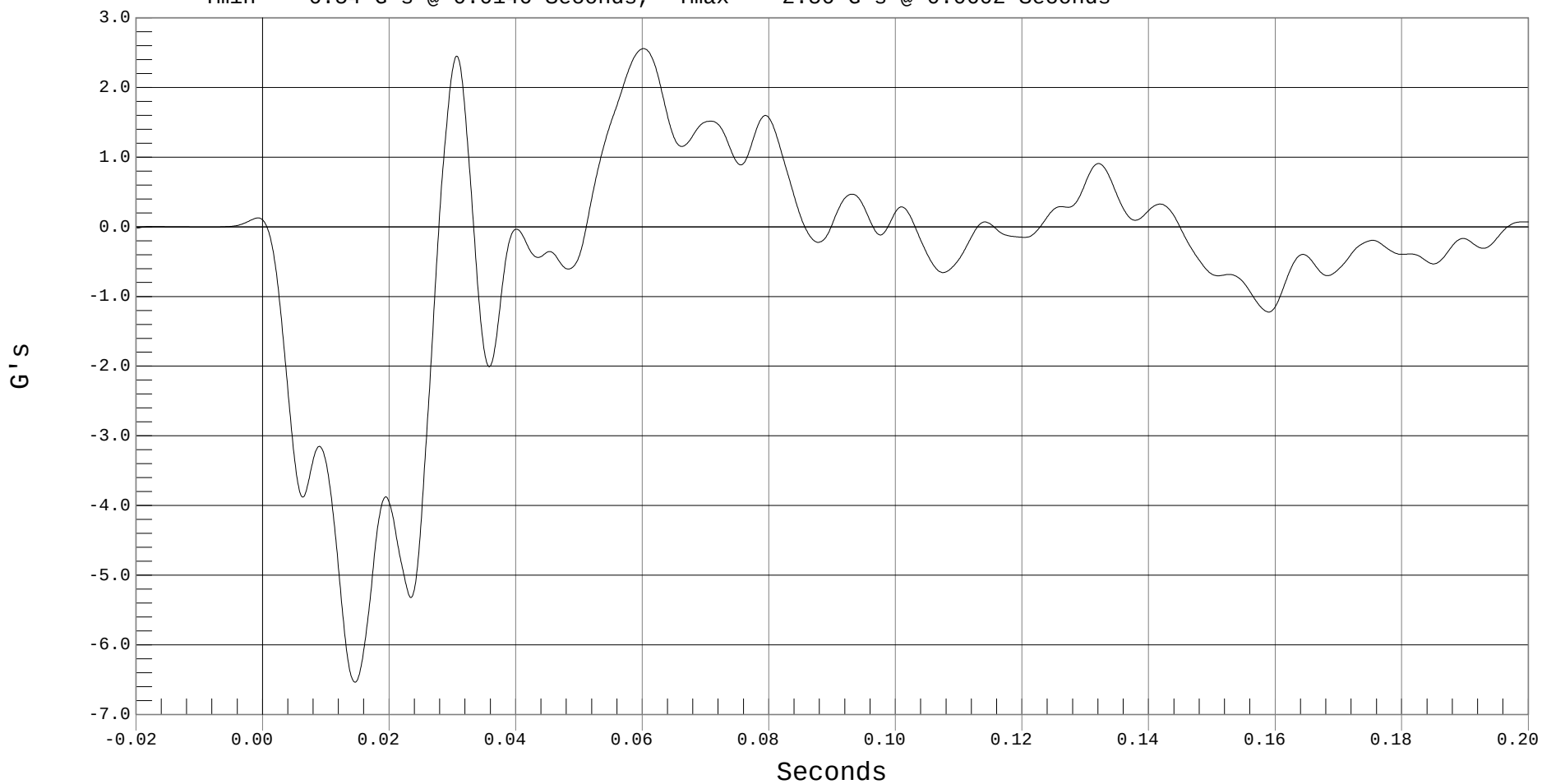
RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL X, B01010AF.A15

Ymin = -6.54 G's @ 0.0146 Seconds, Ymax = 2.56 G's @ 0.0602 Seconds





RIGHT SIDE SILL AT FRONT SEAT X VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

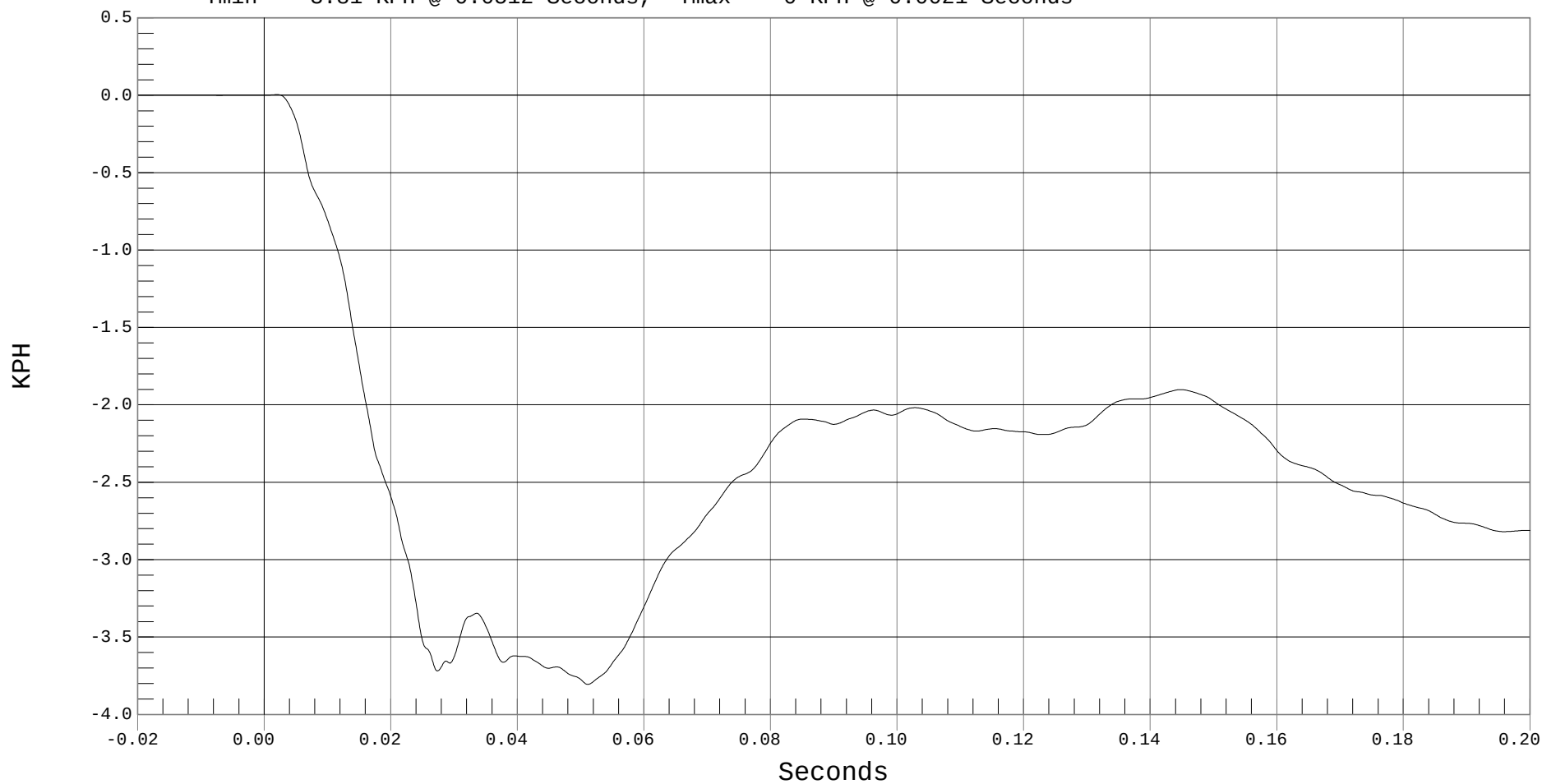
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 RIGHT SIDE SILL AT FRONT SEAT X VELOCITY, B01010AI.V15

Ymin = -3.81 KPH @ 0.0512 Seconds, Ymax = 0 KPH @ 0.0021 Seconds





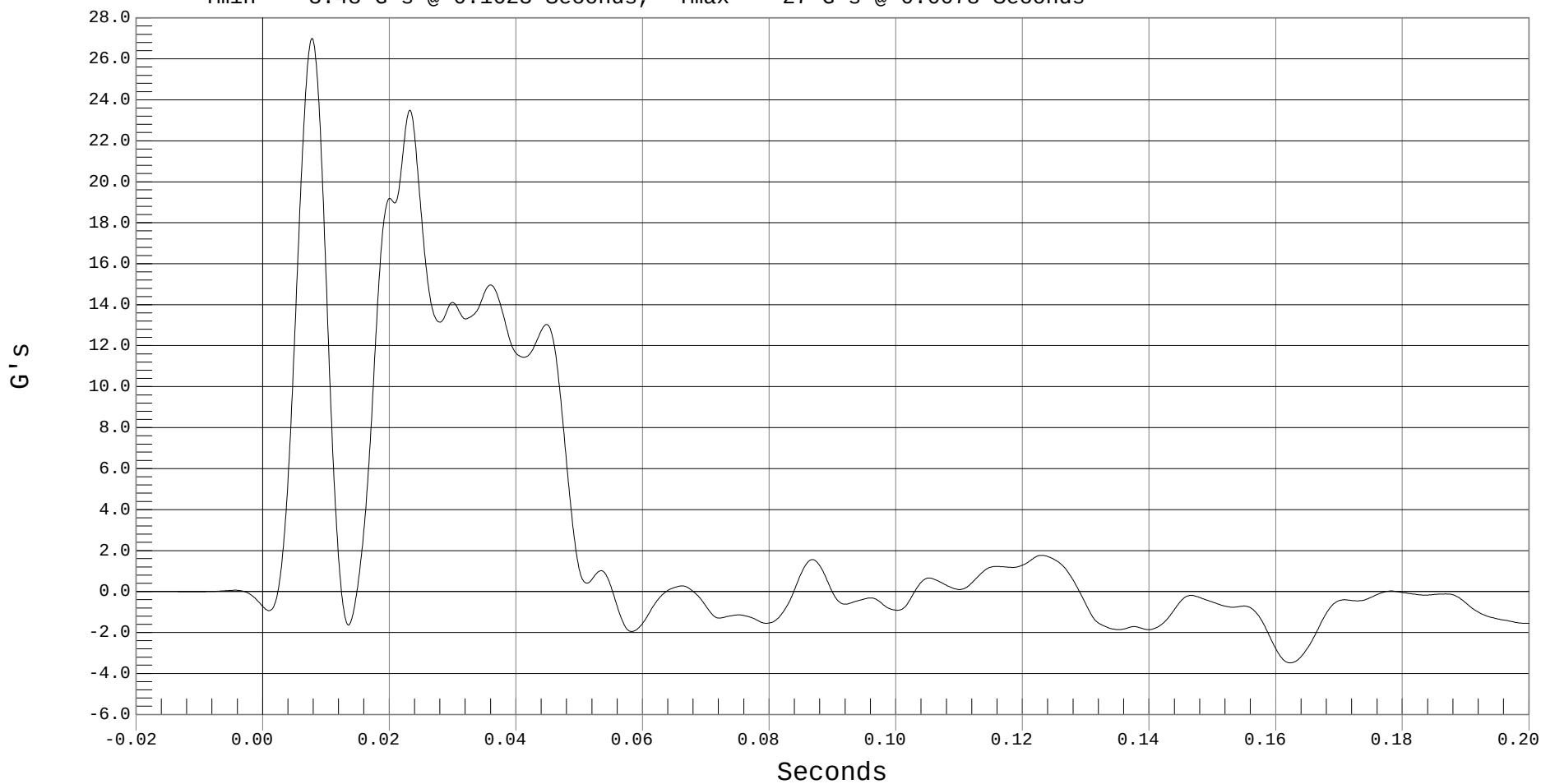
RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL Y, B01010AF.A16

Ymin = -3.48 G's @ 0.1623 Seconds, Ymax = 27 G's @ 0.0078 Seconds





RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

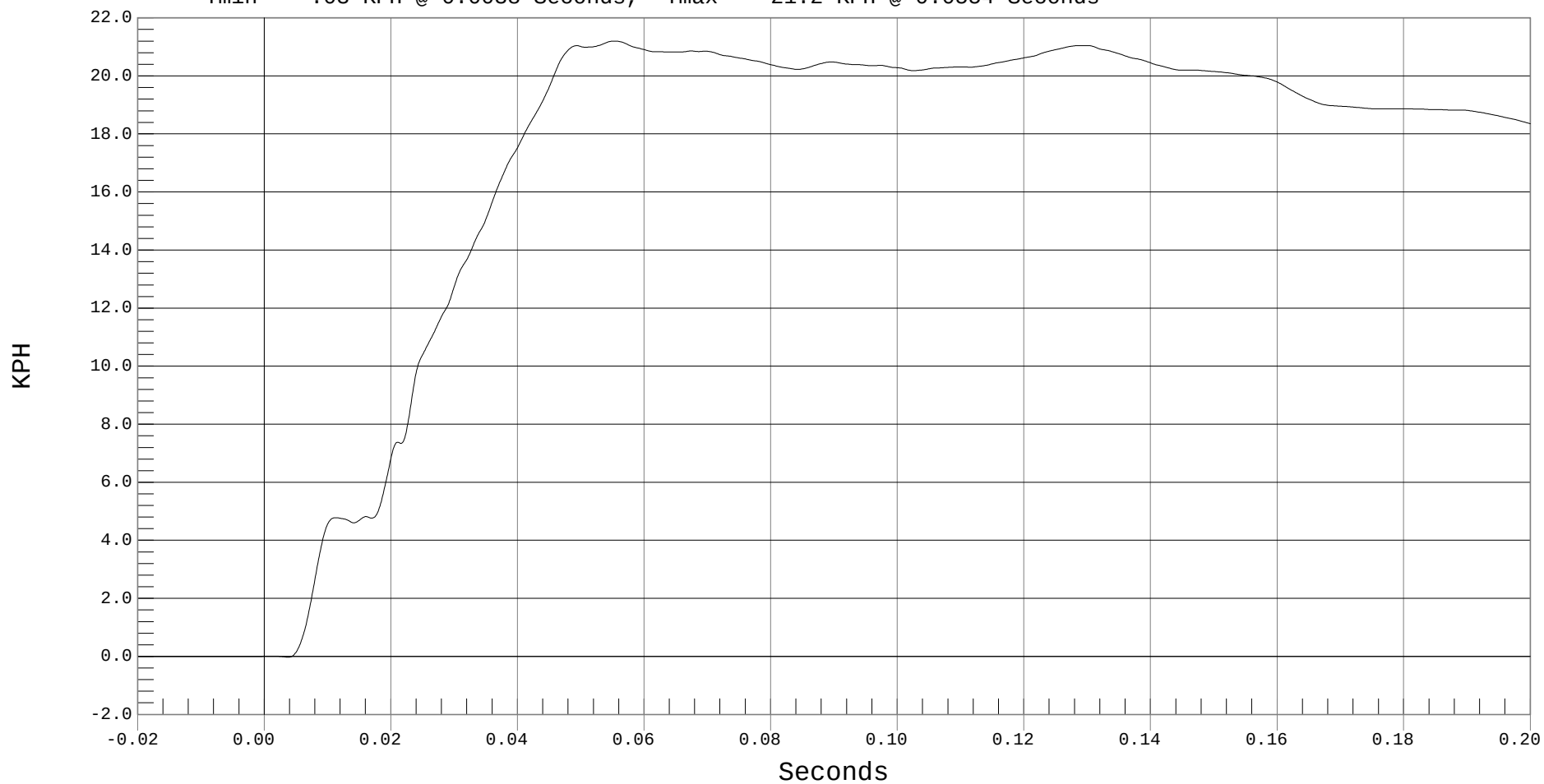
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY, B01010AI.V16

Ymin = -.03 KPH @ 0.0038 Seconds, Ymax = 21.2 KPH @ 0.0554 Seconds





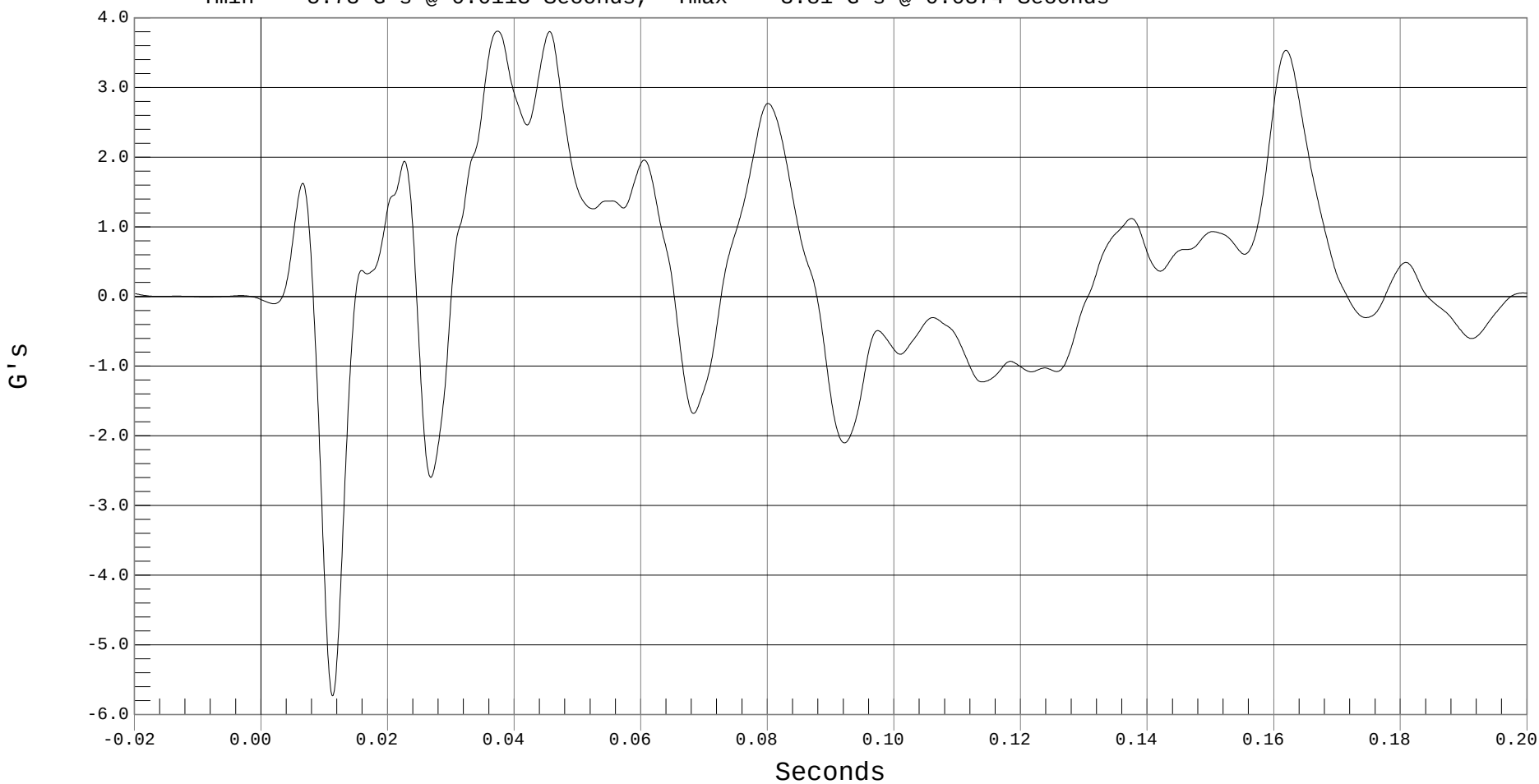
RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 RIGHT FRONT SILL Z, B01010AF.A17

Ymin = -5.73 G's @ 0.0113 Seconds, Ymax = 3.81 G's @ 0.0374 Seconds





RIGHT SIDE SILL AT FRONT SEAT Z VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

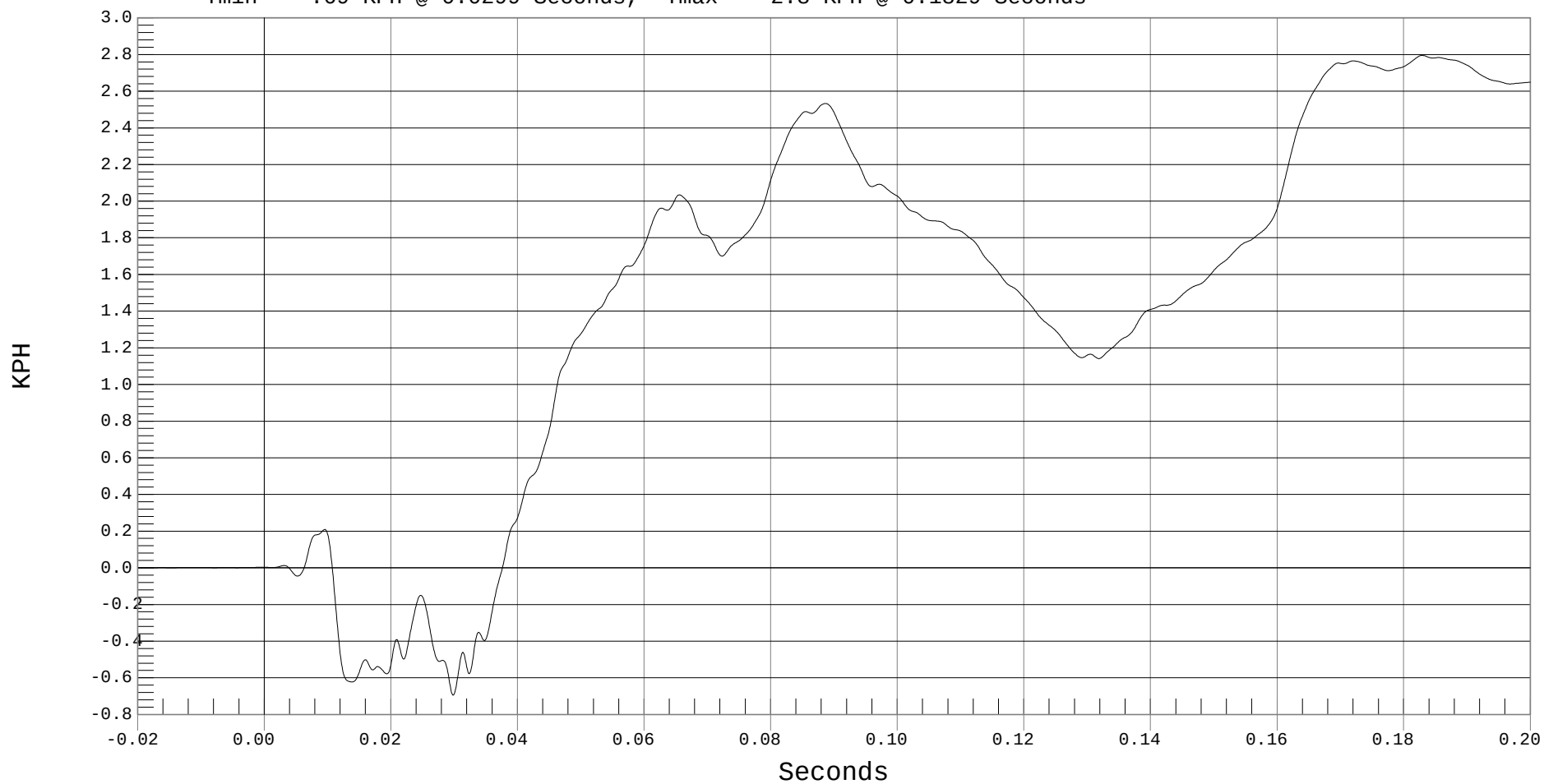
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 RIGHT SIDE SILL AT FRONT SEAT Z VELOCITY, B01010AI.V17

Ymin = -.69 KPH @ 0.0299 Seconds, Ymax = 2.8 KPH @ 0.1829 Seconds





RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

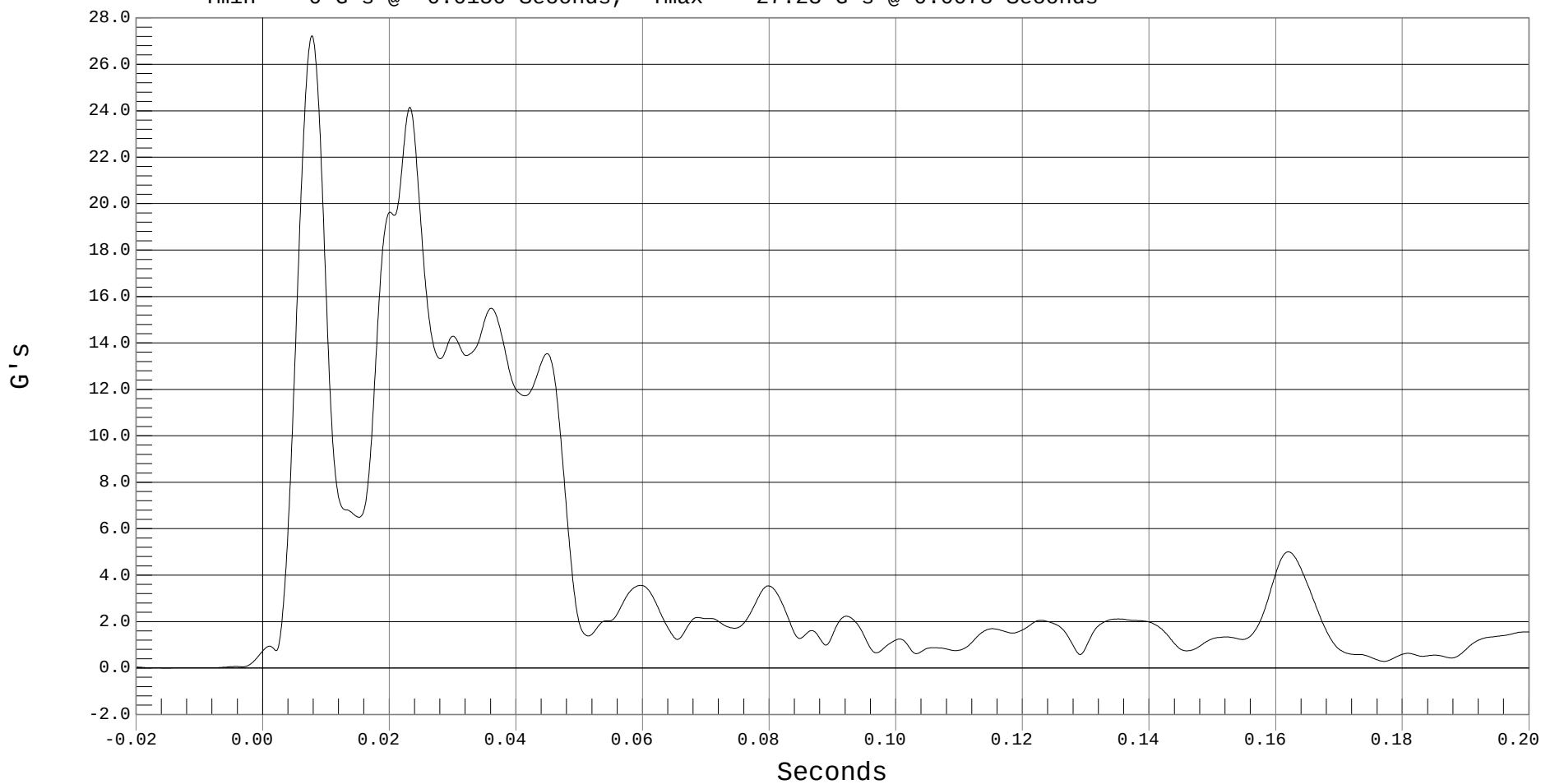
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Filter Class: 60

1 RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION, B01010AV.A15

Ymin = 0 G's @ -0.0150 Seconds, Ymax = 27.23 G's @ 0.0078 Seconds





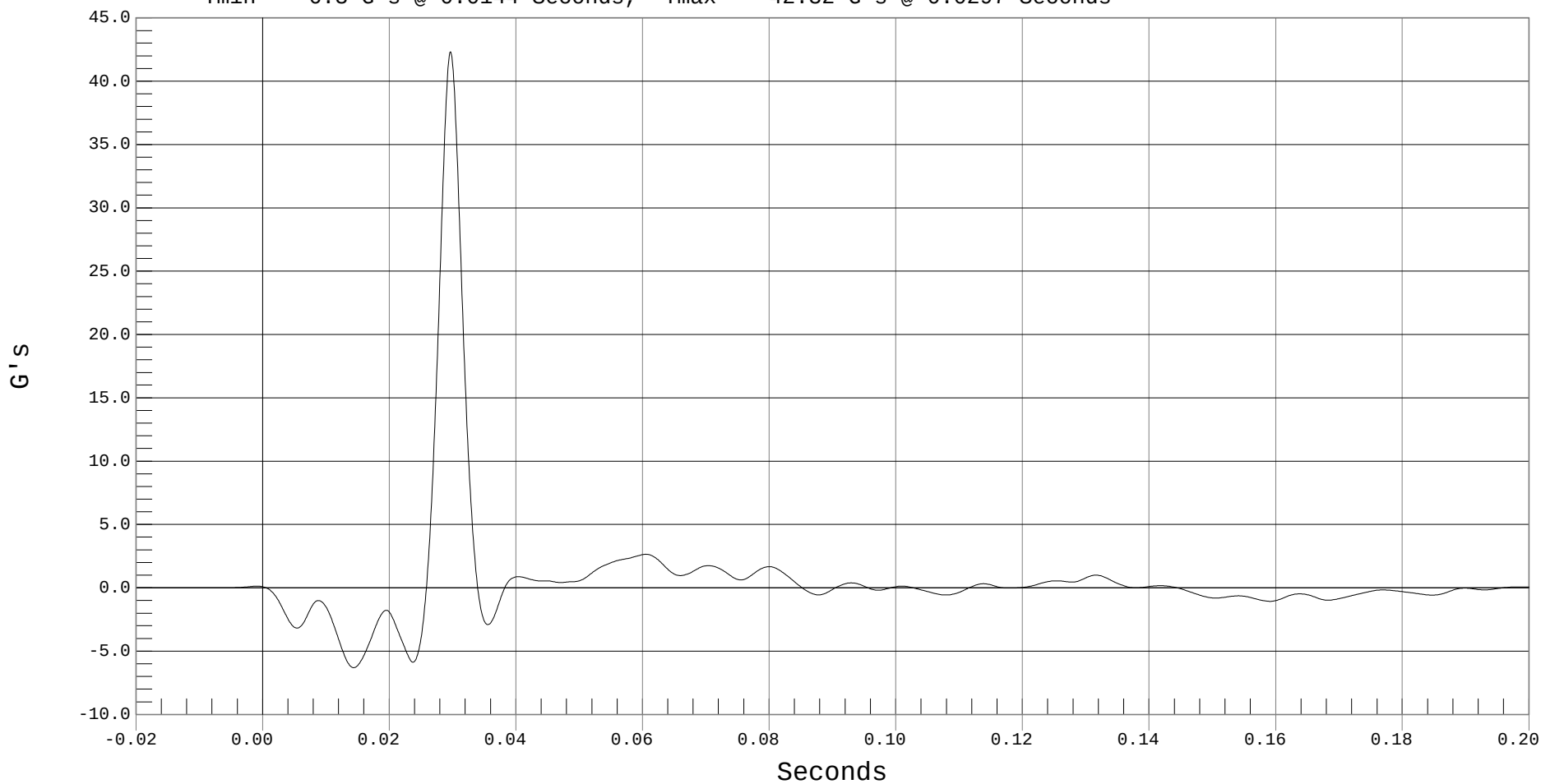
RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 RIGHT REAR SILL X, B01010AF.A18

Ymin = -6.3 G's @ 0.0144 Seconds, Ymax = 42.32 G's @ 0.0297 Seconds





RIGHT SIDE SILL AT REAR SEAT X VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

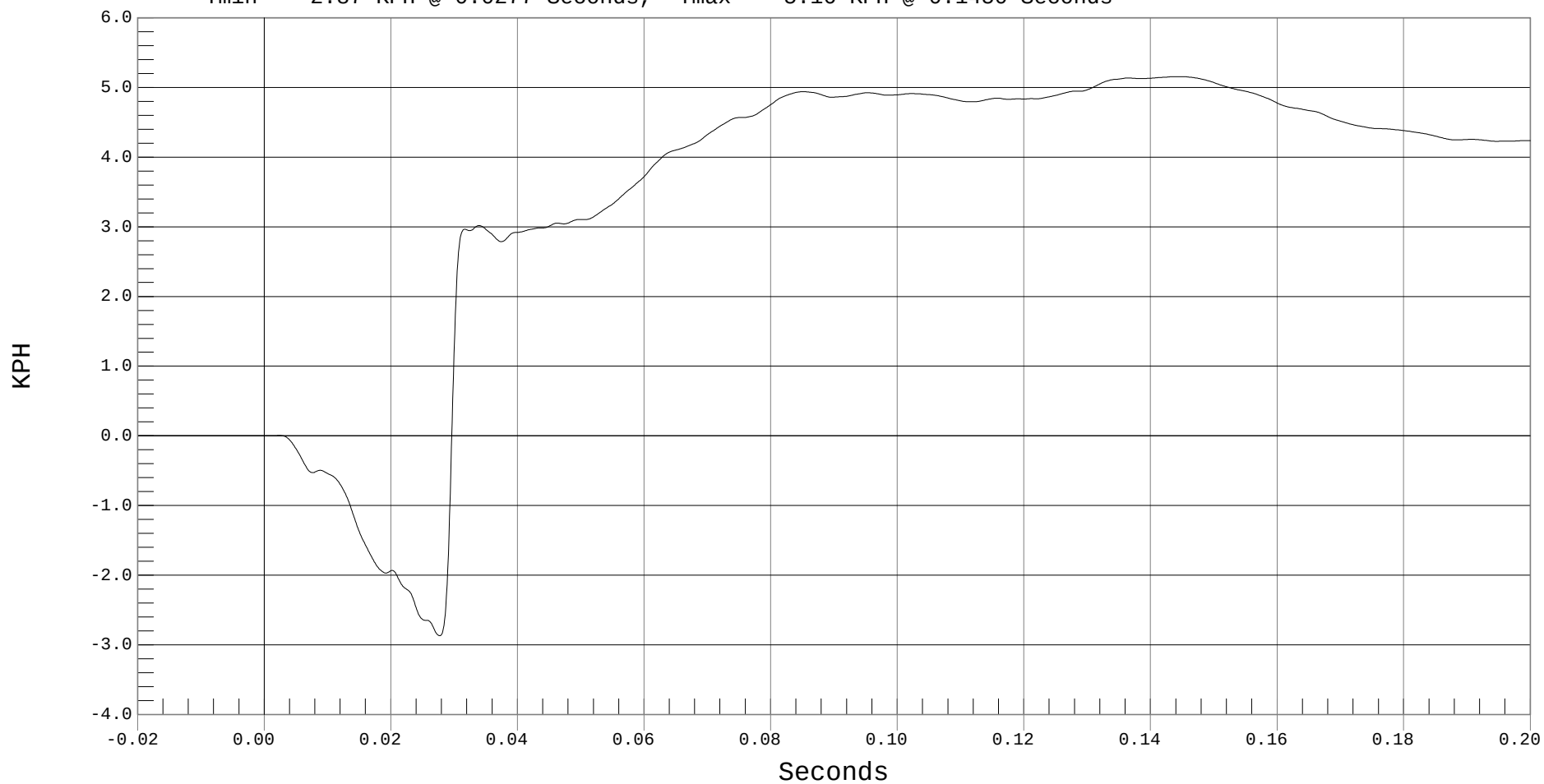
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 RIGHT SIDE SILL AT REAR SEAT X VELOCITY, B01010AI.V18

Ymin = -2.87 KPH @ 0.0277 Seconds, Ymax = 5.16 KPH @ 0.1450 Seconds





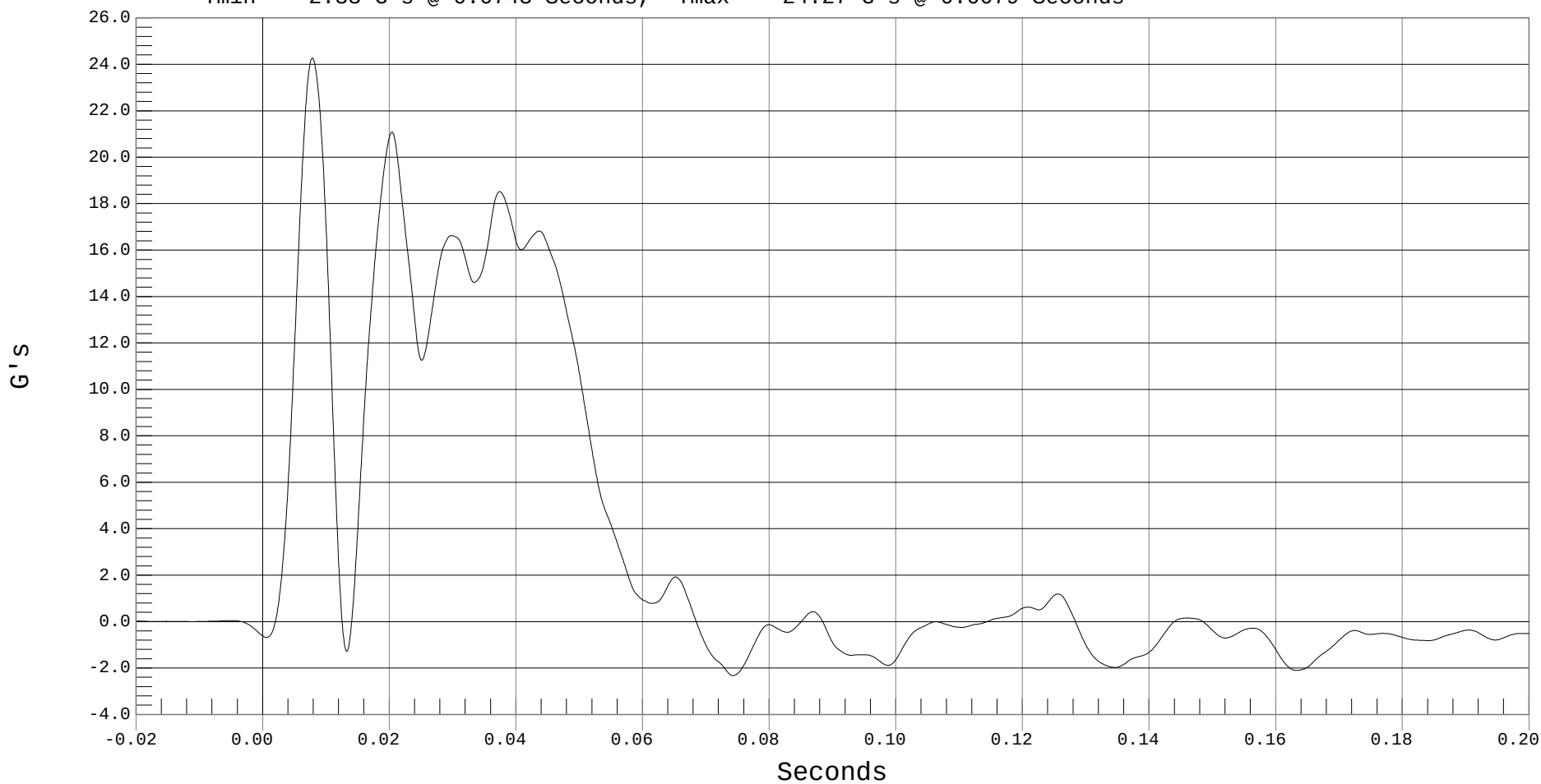
RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 RIGHT REAR SILL Y, B01010AF.A19

Ymin = -2.33 G's @ 0.0743 Seconds, Ymax = 24.27 G's @ 0.0079 Seconds





RIGHT SIDE SILL AT REAR SEAT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

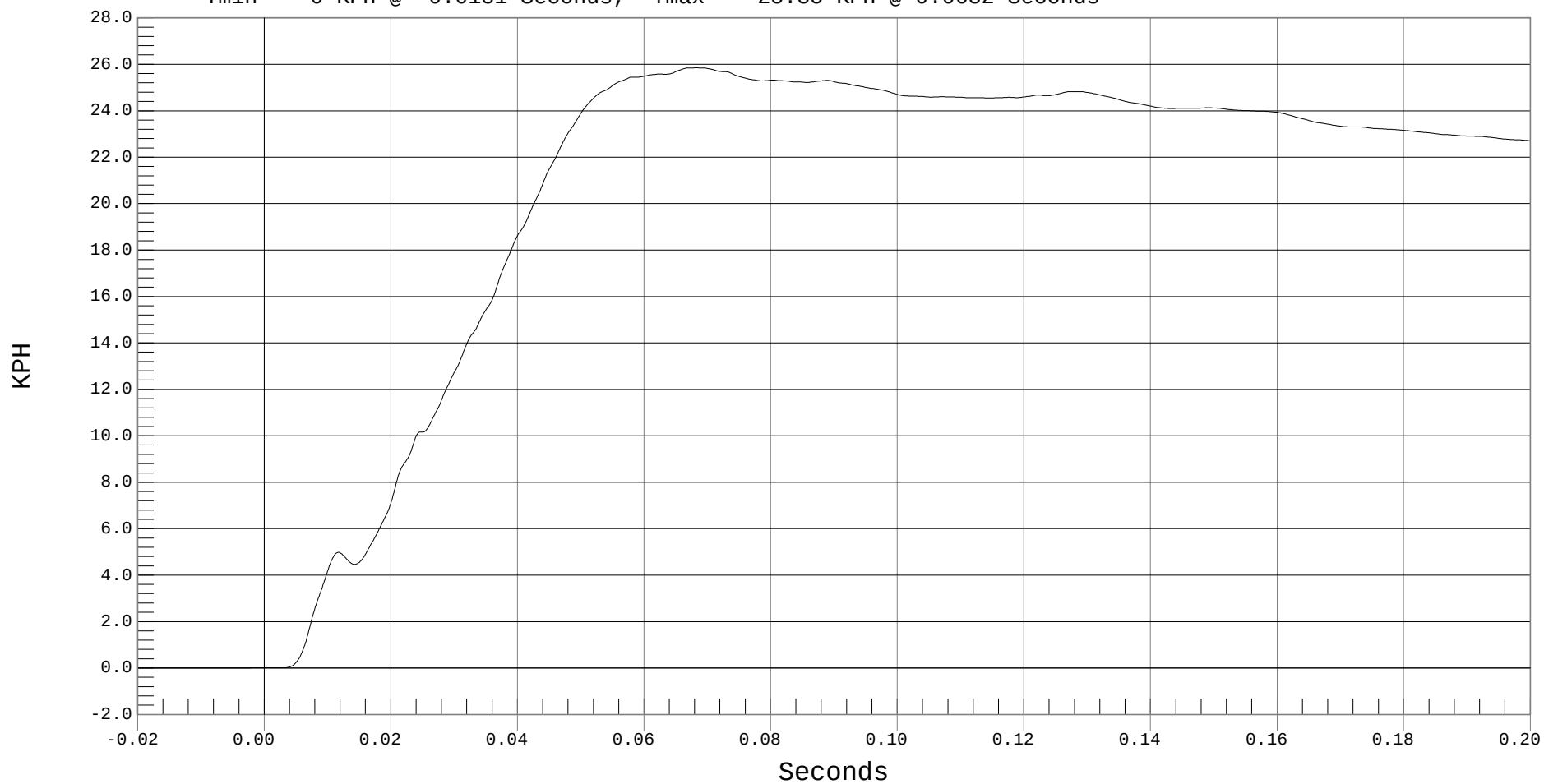
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 RIGHT SIDE SILL AT REAR SEAT Y VELOCITY, B01010AI.V19

Ymin = 0 KPH @ -0.0181 Seconds, Ymax = 25.85 KPH @ 0.0682 Seconds





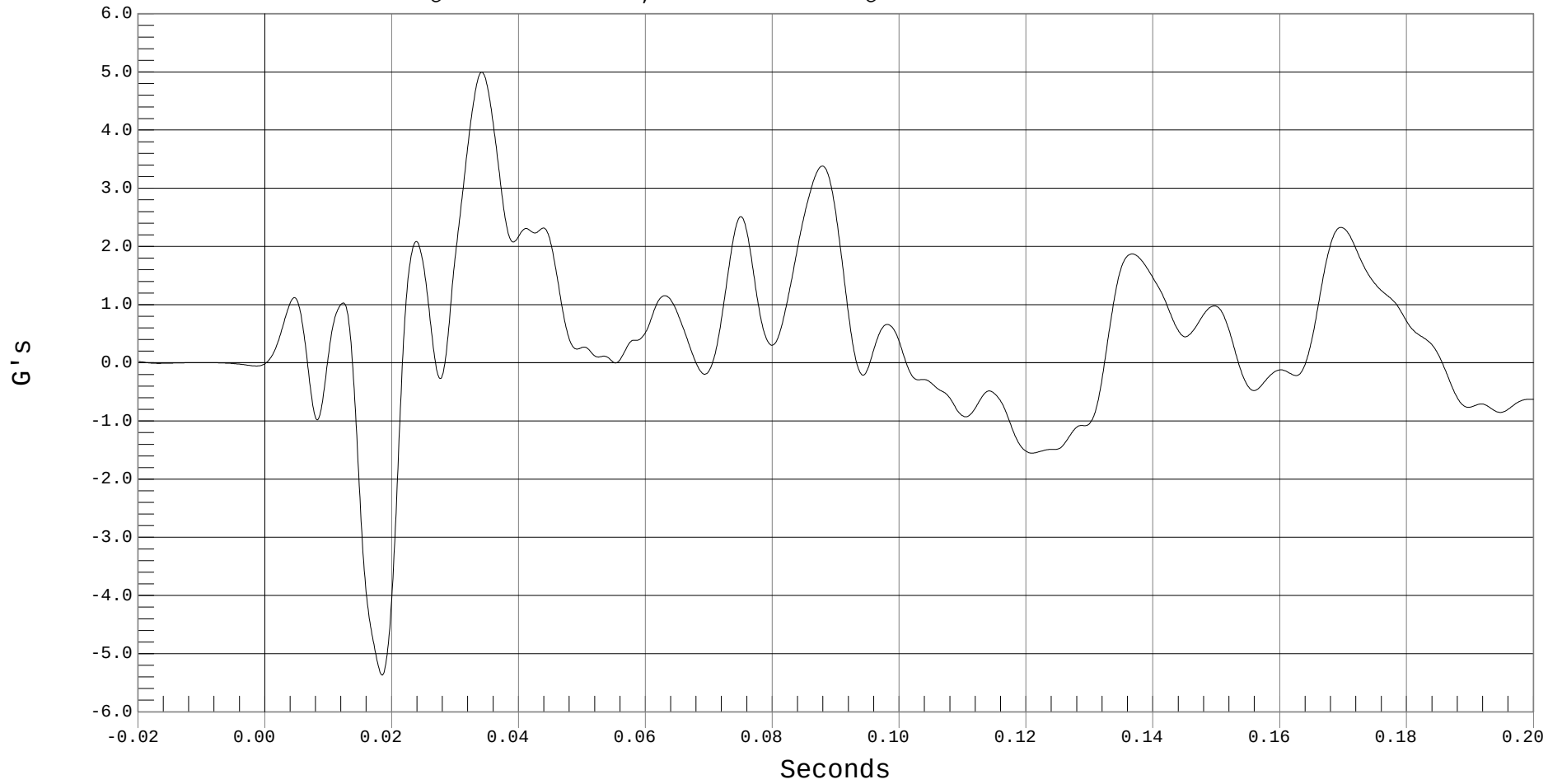
RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 RIGHT REAR SILL Z, B01010AF.A20

Ymin = -5.37 G's @ 0.0185 Seconds, Ymax = 5 G's @ 0.0342 Seconds





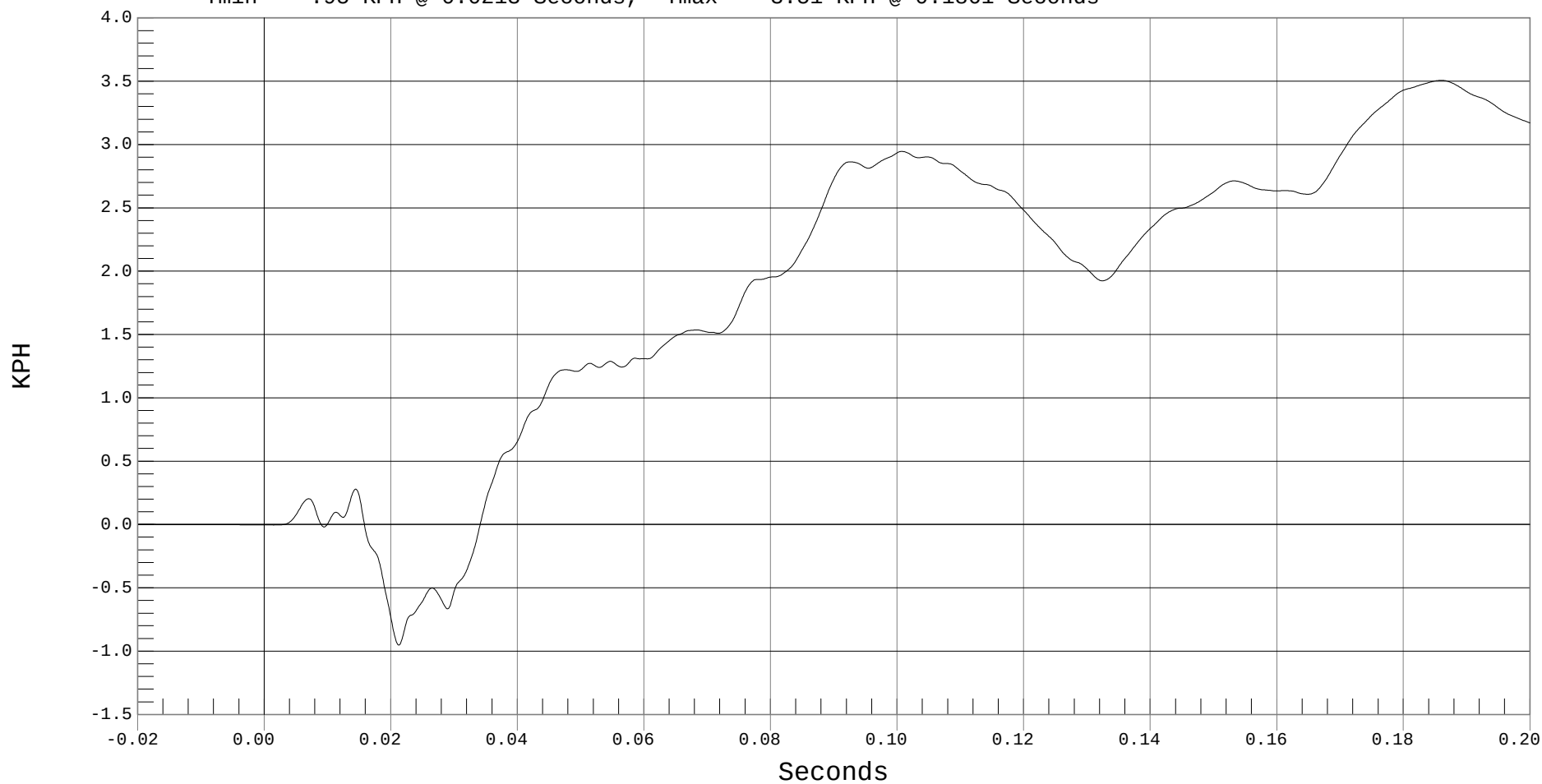
RIGHT SIDE SILL AT REAR SEAT Z VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 RIGHT SIDE SILL AT REAR SEAT Z VELOCITY, B01010AI.V20

Ymin = -.95 KPH @ 0.0213 Seconds, Ymax = 3.51 KPH @ 0.1861 Seconds





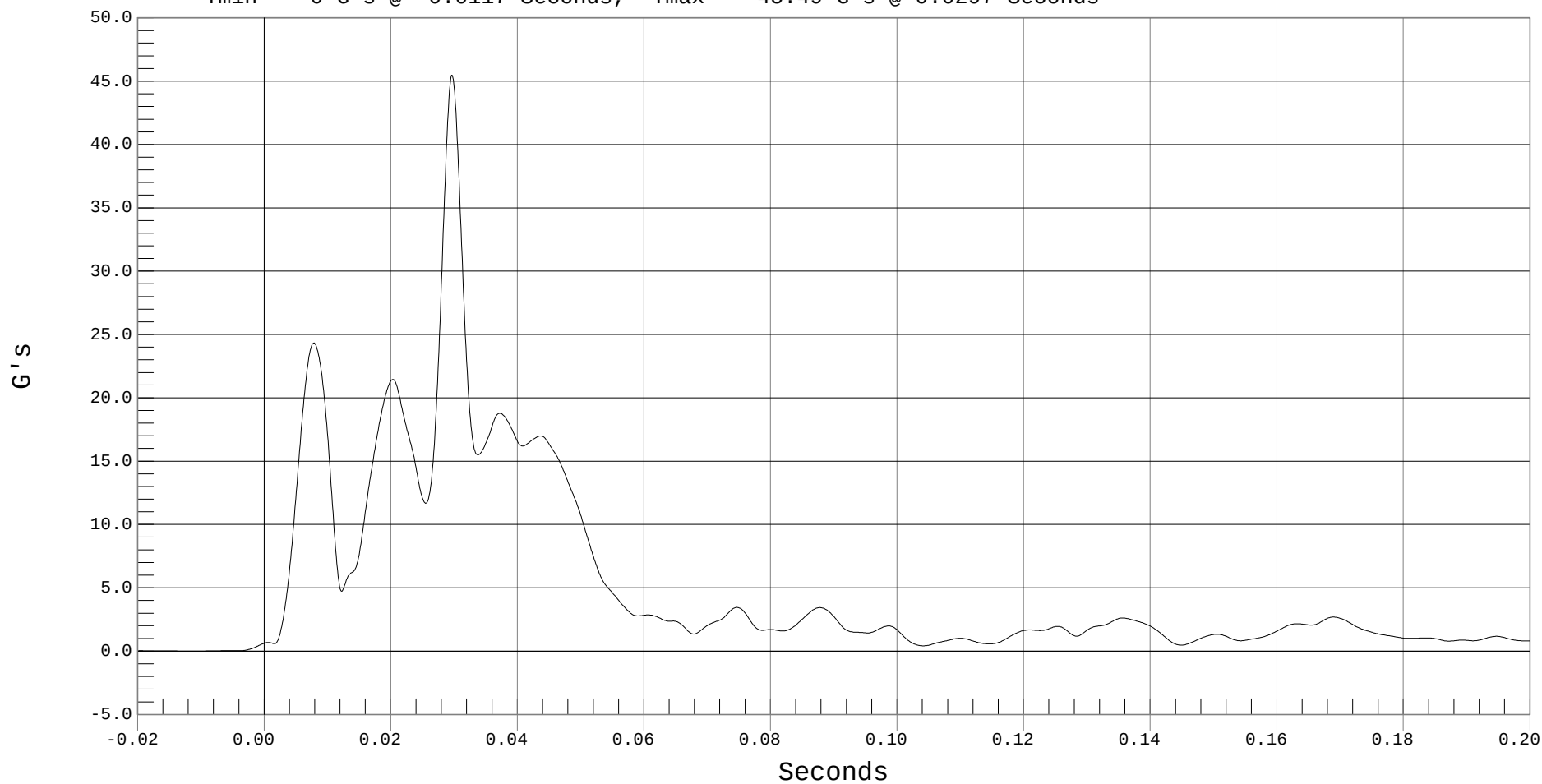
RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

1 RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION, B01010AV.A18

Ymin = 0 G's @ -0.0117 Seconds, Ymax = 45.49 G's @ 0.0297 Seconds





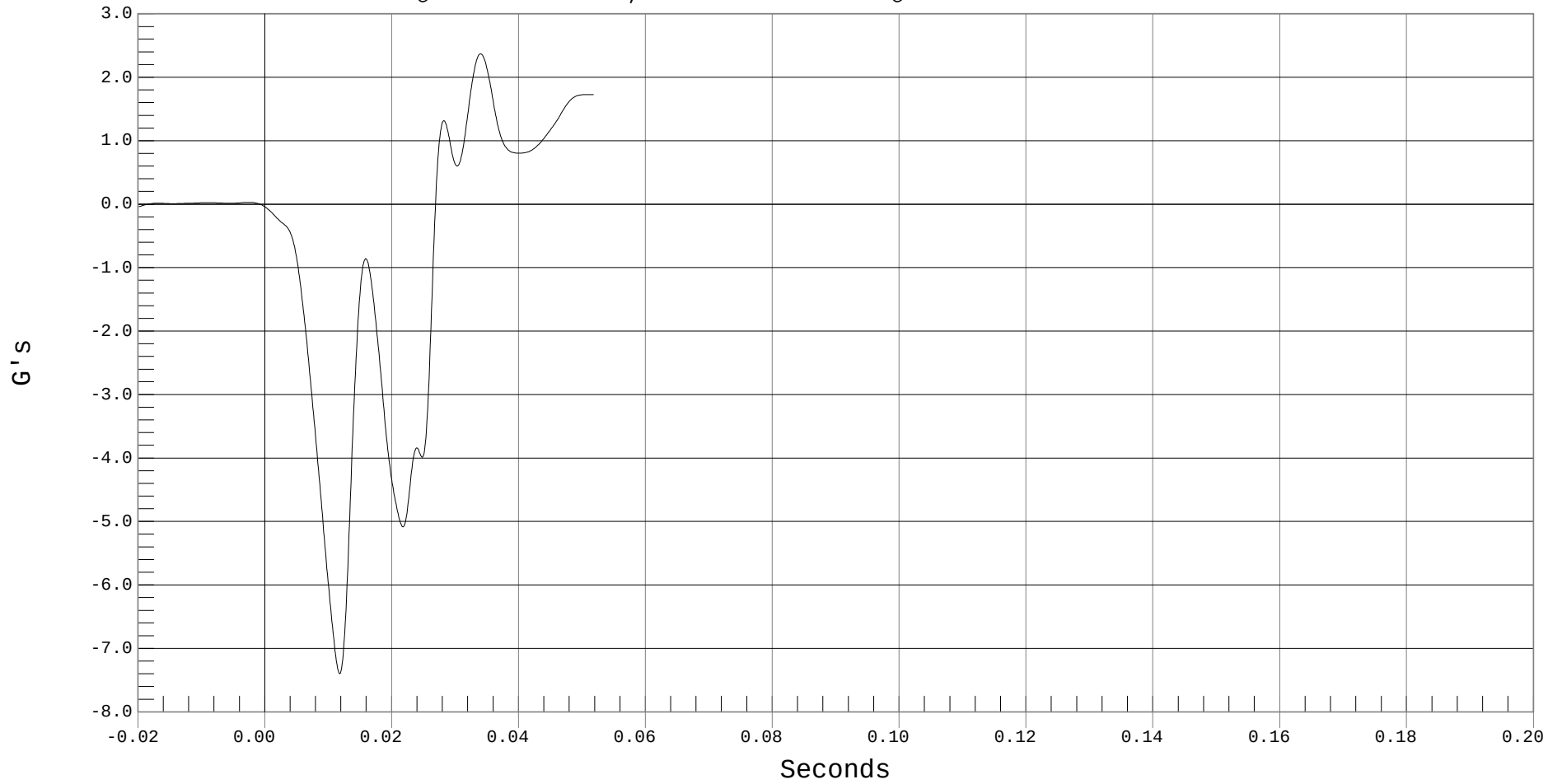
REAR FLOORPAN ABOVE AXLE X ACCELERATION (QD AFTER 52 MSEC)

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE X, B01010AF.A23

Ymin = -7.4 G's @ 0.0118 Seconds, Ymax = 2.37 G's @ 0.0340 Seconds





REAR FLOORPAN ABOVE AXLE X VELOCITY (QD AFTER 52 MSEC)

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

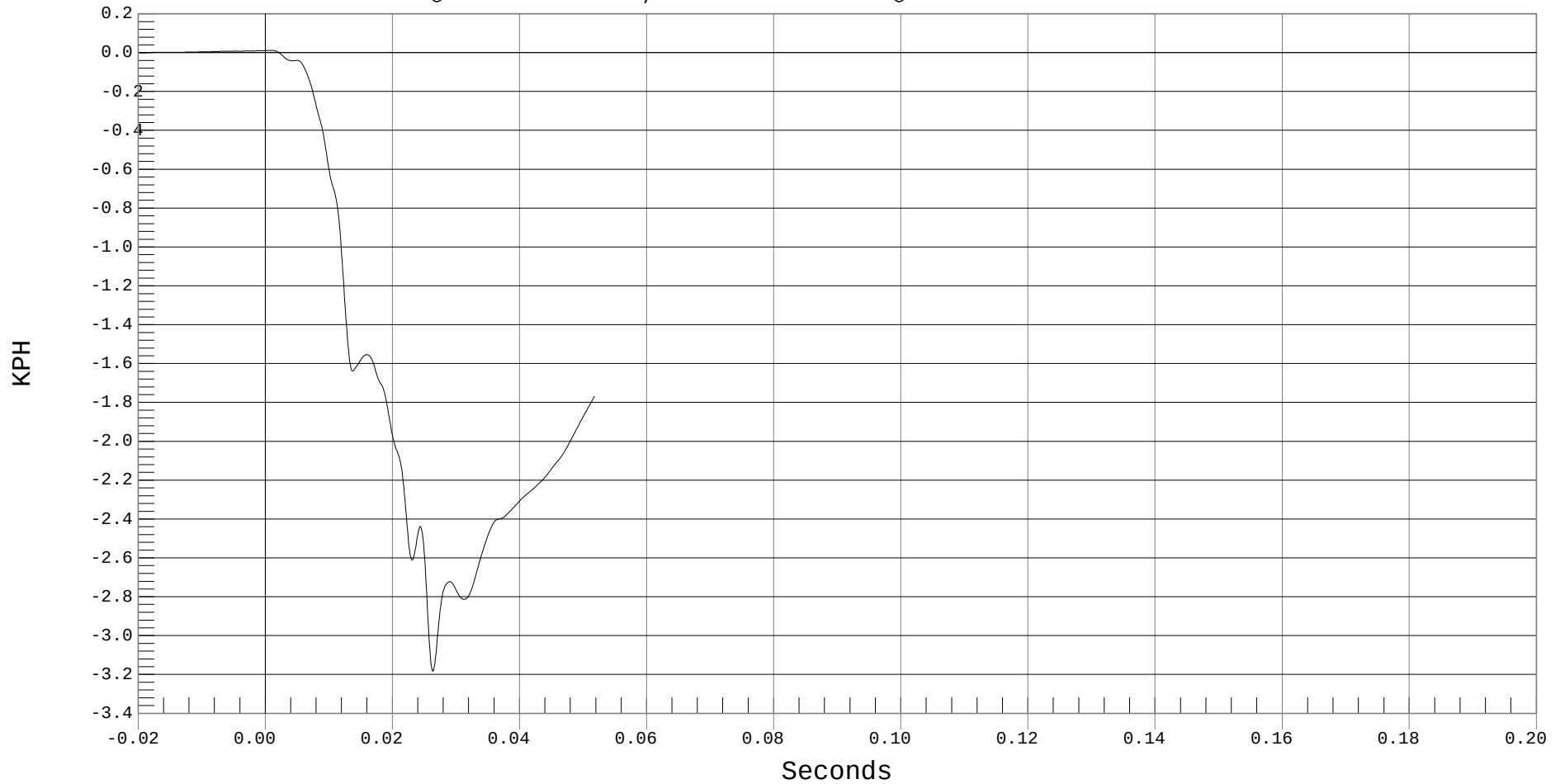
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Filter Class: 180

1 REAR FLOORPAN ABOVE AXLE X VELOCITY, B01010AI.V23

Ymin = -3.18 KPH @ 0.0264 Seconds, Ymax = .01 KPH @ 0.0009 Seconds





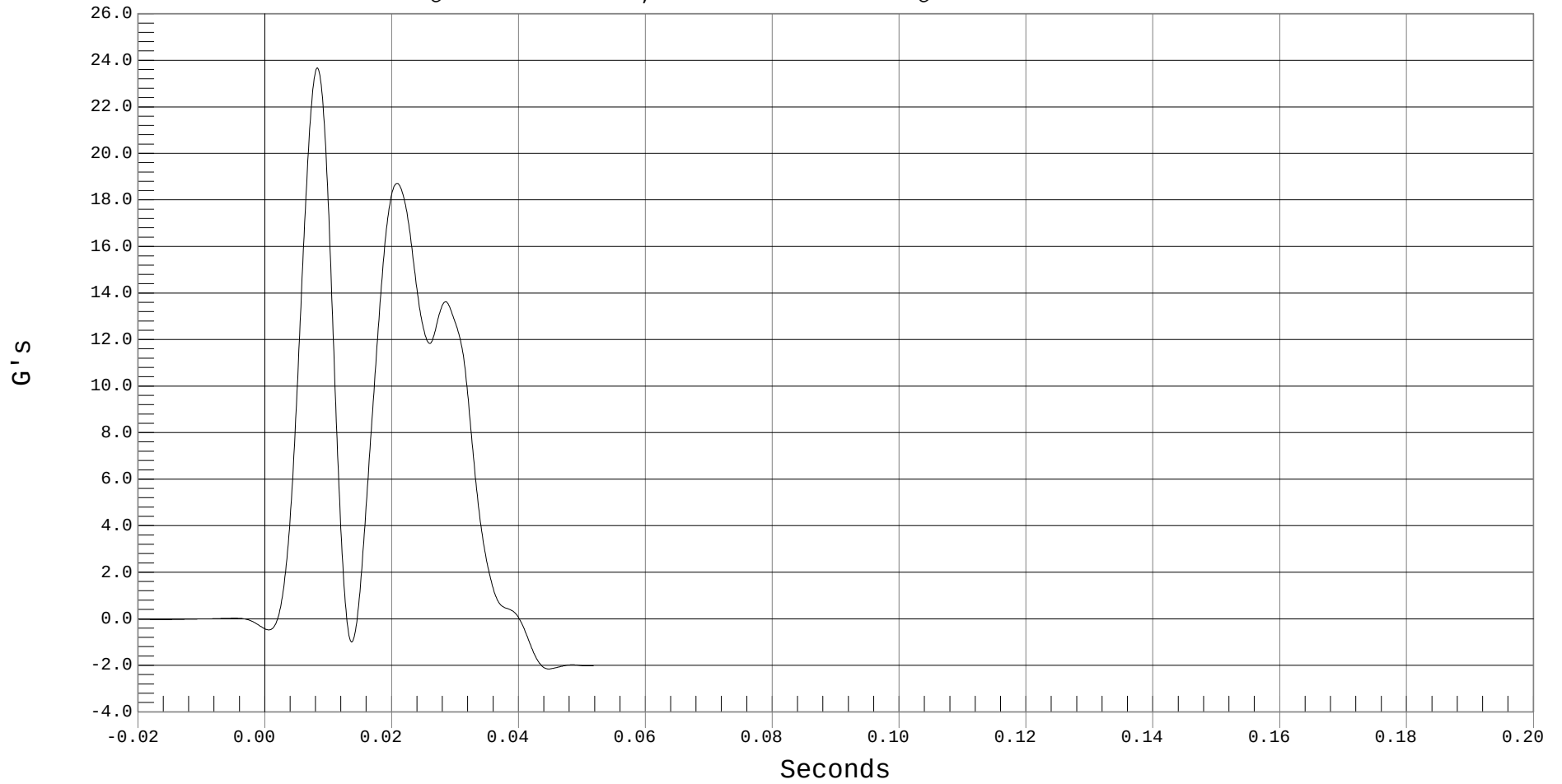
REAR FLOORPAN ABOVE AXLE Y ACCELERATION (QD AFTER 52 MSEC)

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 FLOORAN @ REAR AXLE Y, B01010AF.A51

Ymin = -2.16 G's @ 0.0448 Seconds, Ymax = 23.68 G's @ 0.0083 Seconds





REAR FLOORPAN ABOVE AXLE Y VELOCITY (QD AFTER 52 MSEC)

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

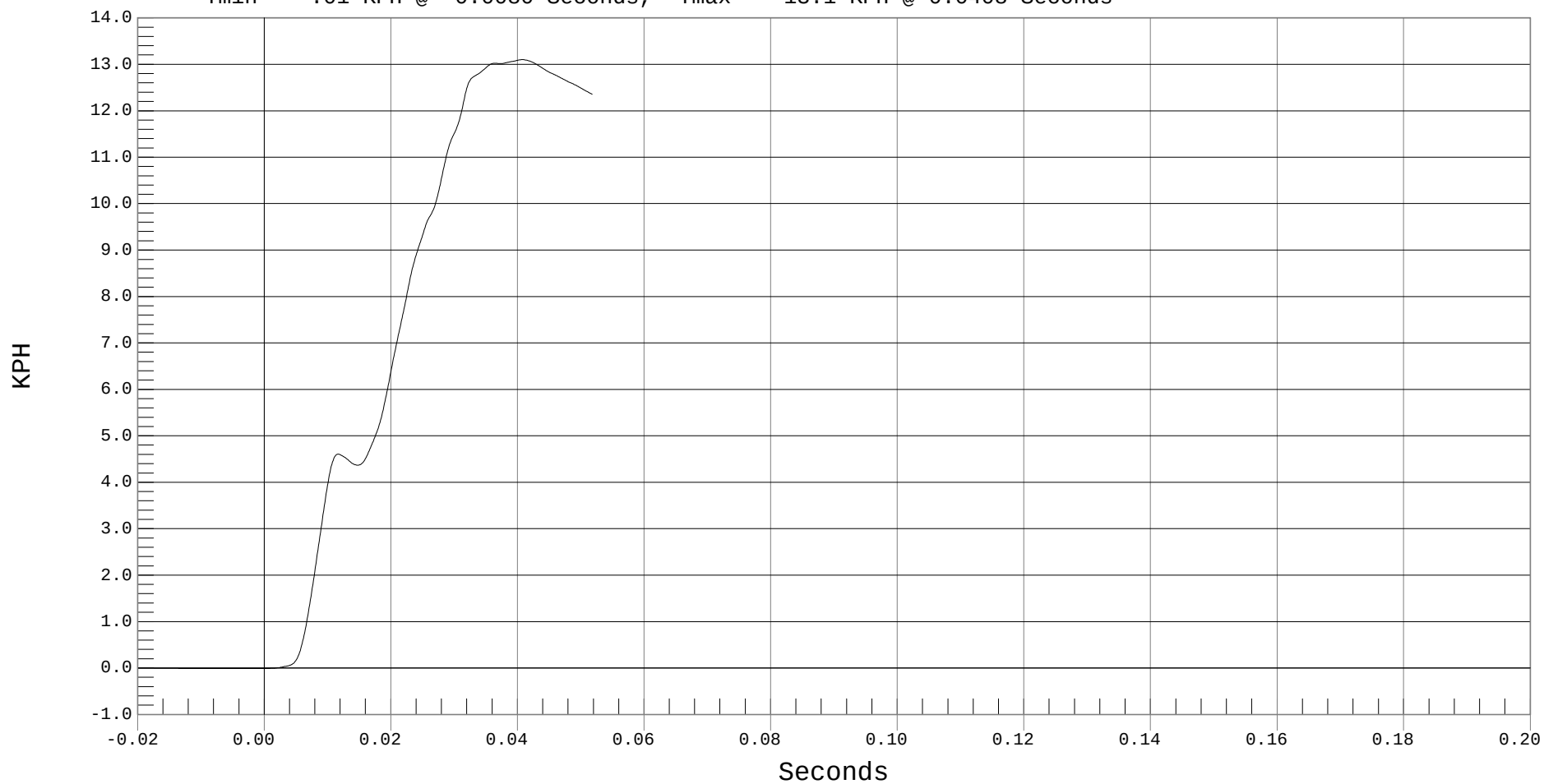
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Filter Class: 180

1 REAR FLOORPAN ABOVE AXLE Y VELOCITY, B01010AI.V51

Ymin = -.01 KPH @ -0.0080 Seconds, Ymax = 13.1 KPH @ 0.0408 Seconds





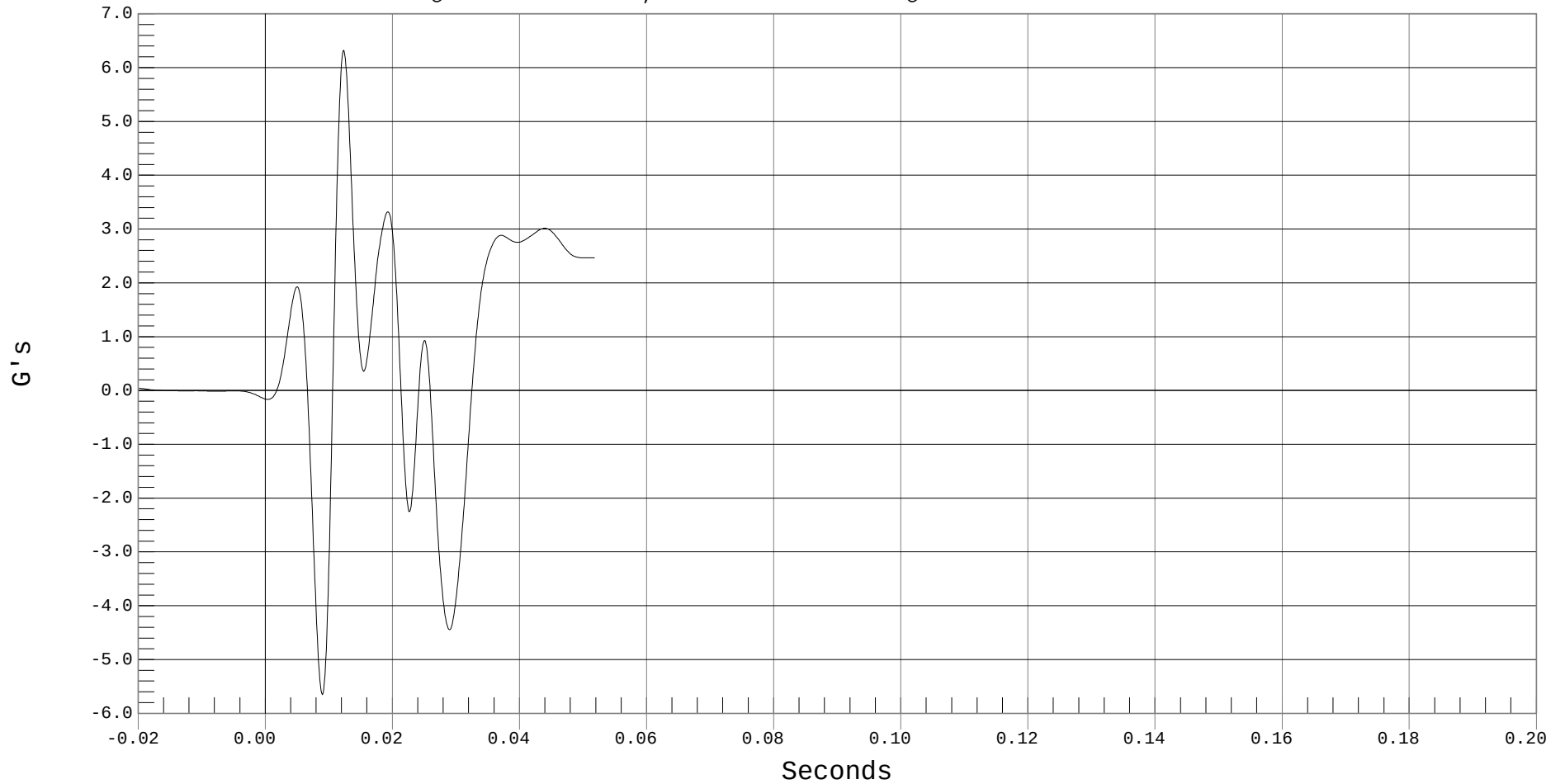
REAR FLOORPAN ABOVE AXLE Z ACCELERATION (QD AFTER 52 MSEC)

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 D00R (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 FLOORPAN @ REAR AXLE Z, B01010AF.A25

Ymin = -5.65 G's @ 0.0090 Seconds, Ymax = 6.32 G's @ 0.0123 Seconds





REAR FLOORPAN ABOVE AXLE Z VELOCITY (QD AFTER 52 MSEC)

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 D00R (C15901)

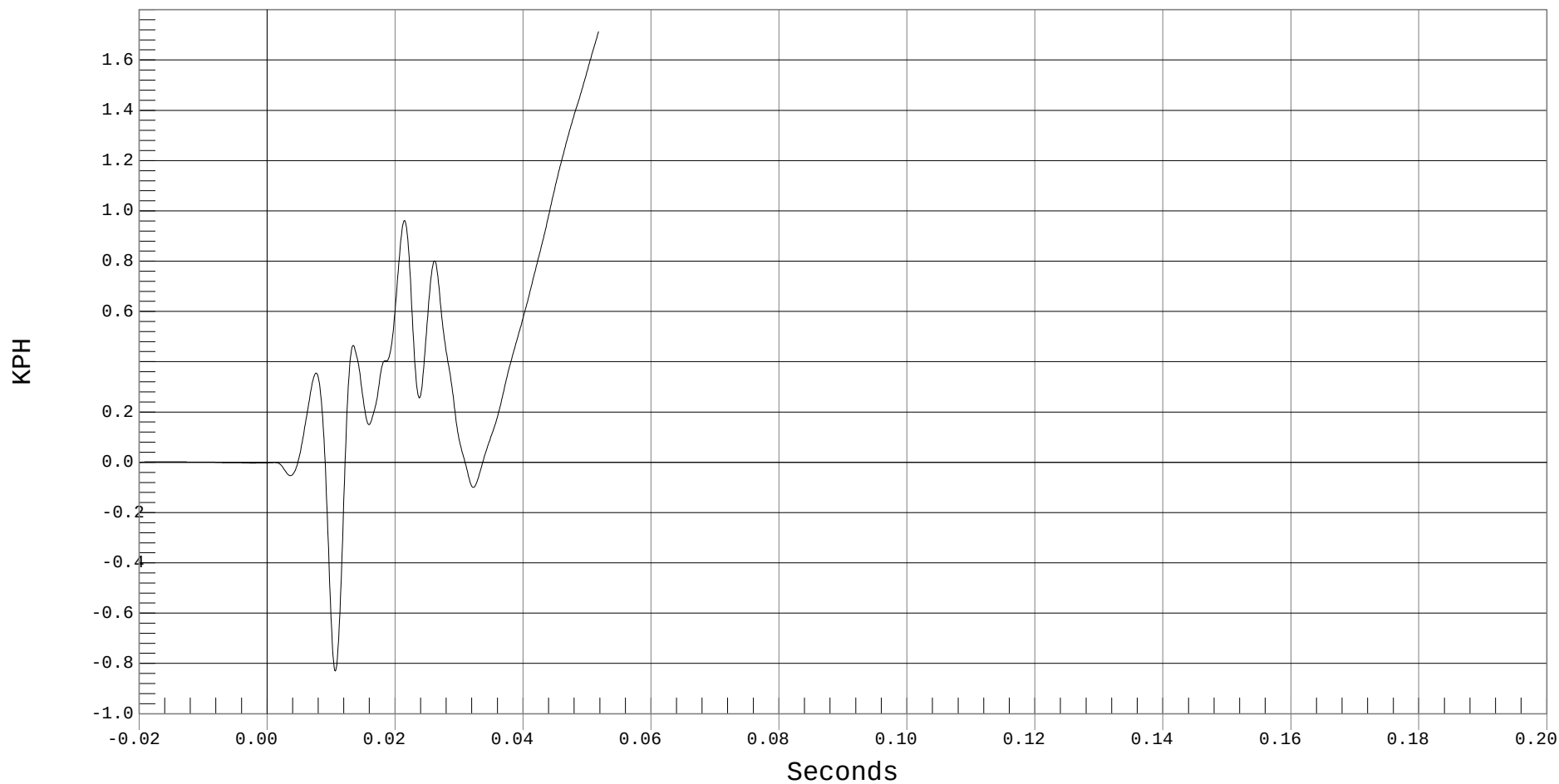
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Filter Class: 180

1 REAR FLOORPAN ABOVE AXLE Z VELOCITY, B01010AI.V25

Ymin = -.83 KPH @ 0.0107 Seconds, Ymax = 1.71 KPH @ 0.0518 Seconds





REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION (QD AFTER 52 MSEC)

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

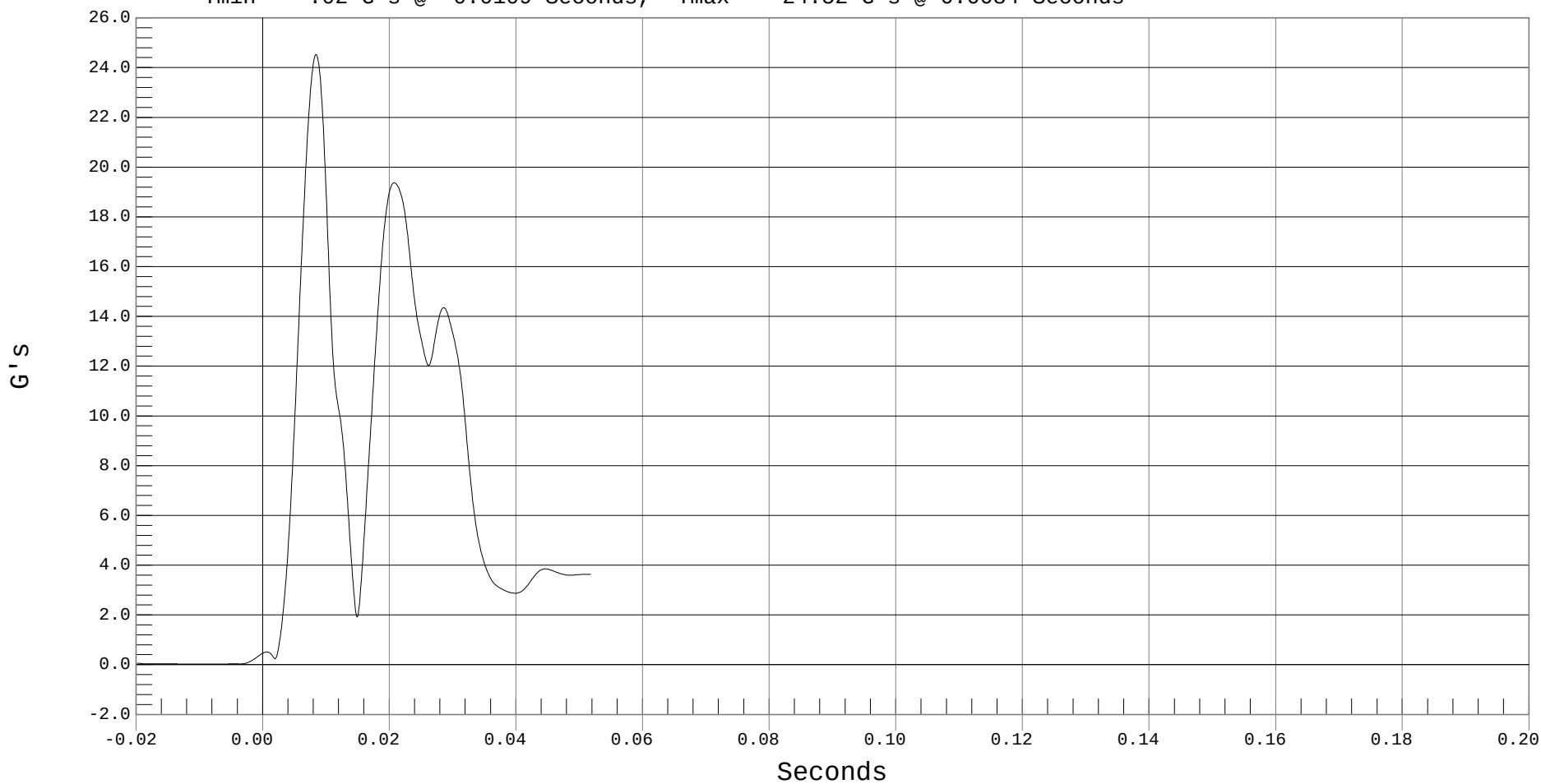
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Filter Class: 60

1 REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION, B01010AV.A23

Ymin = .02 G's @ -0.0109 Seconds, Ymax = 24.52 G's @ 0.0084 Seconds





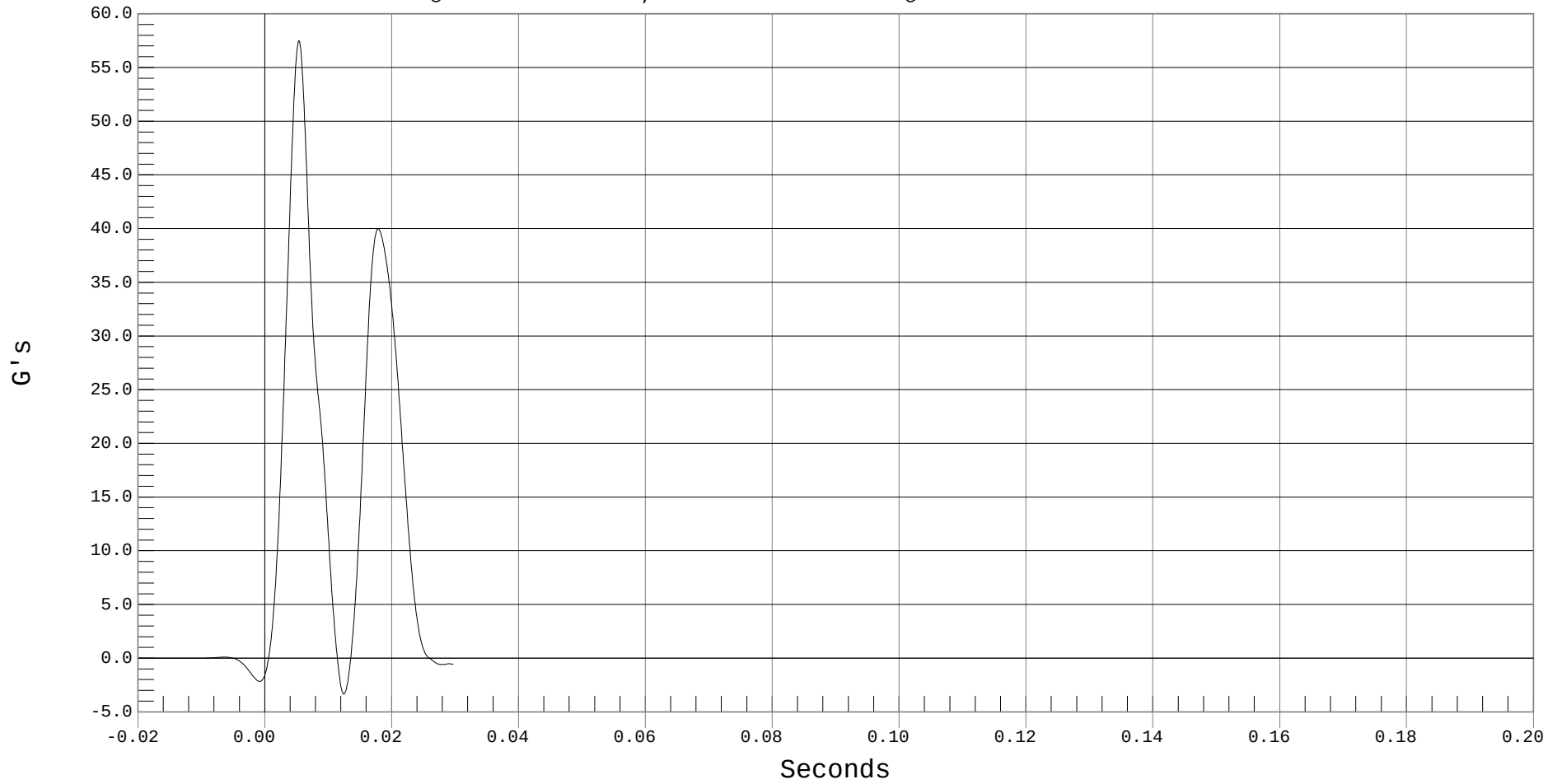
LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION (QD AFTER 30 MSEC)

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 LEFT FRONT SILL Y, B01010AF.A21

Ymin = -3.34 G's @ 0.0125 Seconds, Ymax = 57.5 G's @ 0.0054 Seconds





LEFT SIDE SILL AT FRONT SEAT Y VELOCITY (QD AFTER 30 MSEC)

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

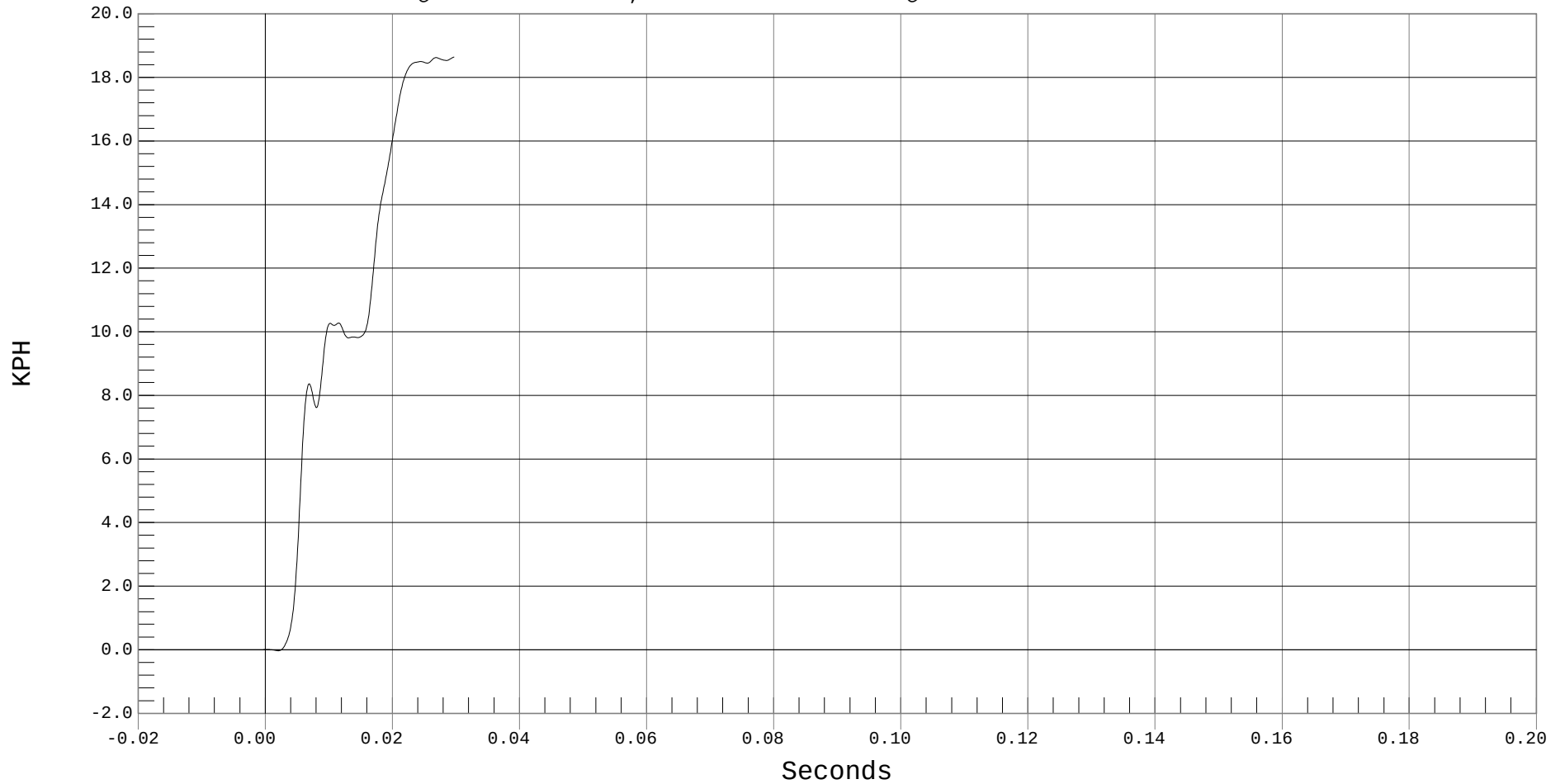
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Filter Class: 180

— 1 LEFT SIDE SILL AT FRONT SEAT Y VELOCITY, B01010AI.V21

Ymin = -.03 KPH @ 0.0021 Seconds, Ymax = 18.64 KPH @ 0.0297 Seconds





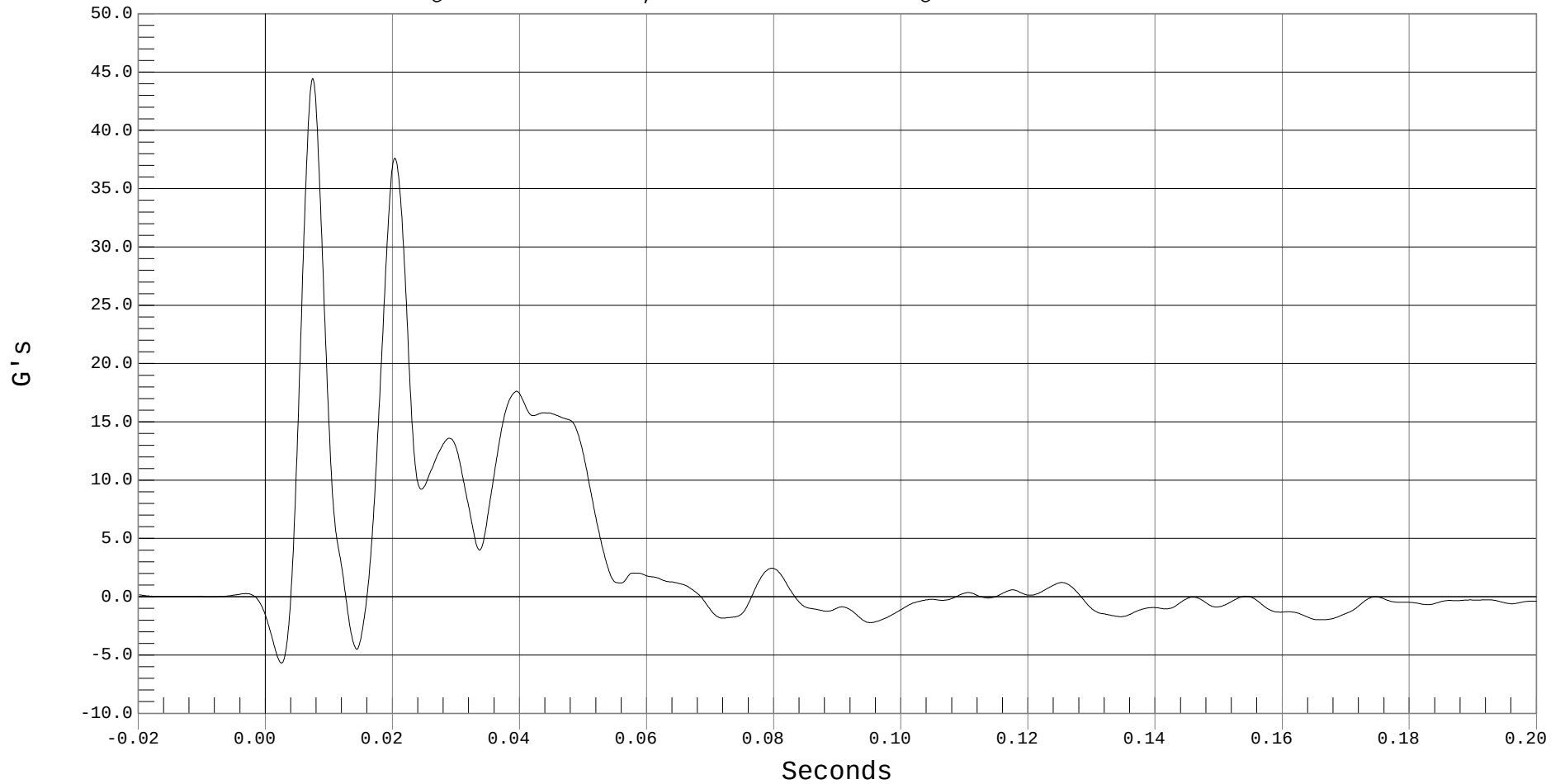
LEFT SIDE SILL AT REAR SEAT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 LEFT REAR SILL Y, B01010AF.A22

Ymin = -5.69 G's @ 0.0026 Seconds, Ymax = 44.46 G's @ 0.0075 Seconds





LEFT SIDE SILL AT REAR SEAT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

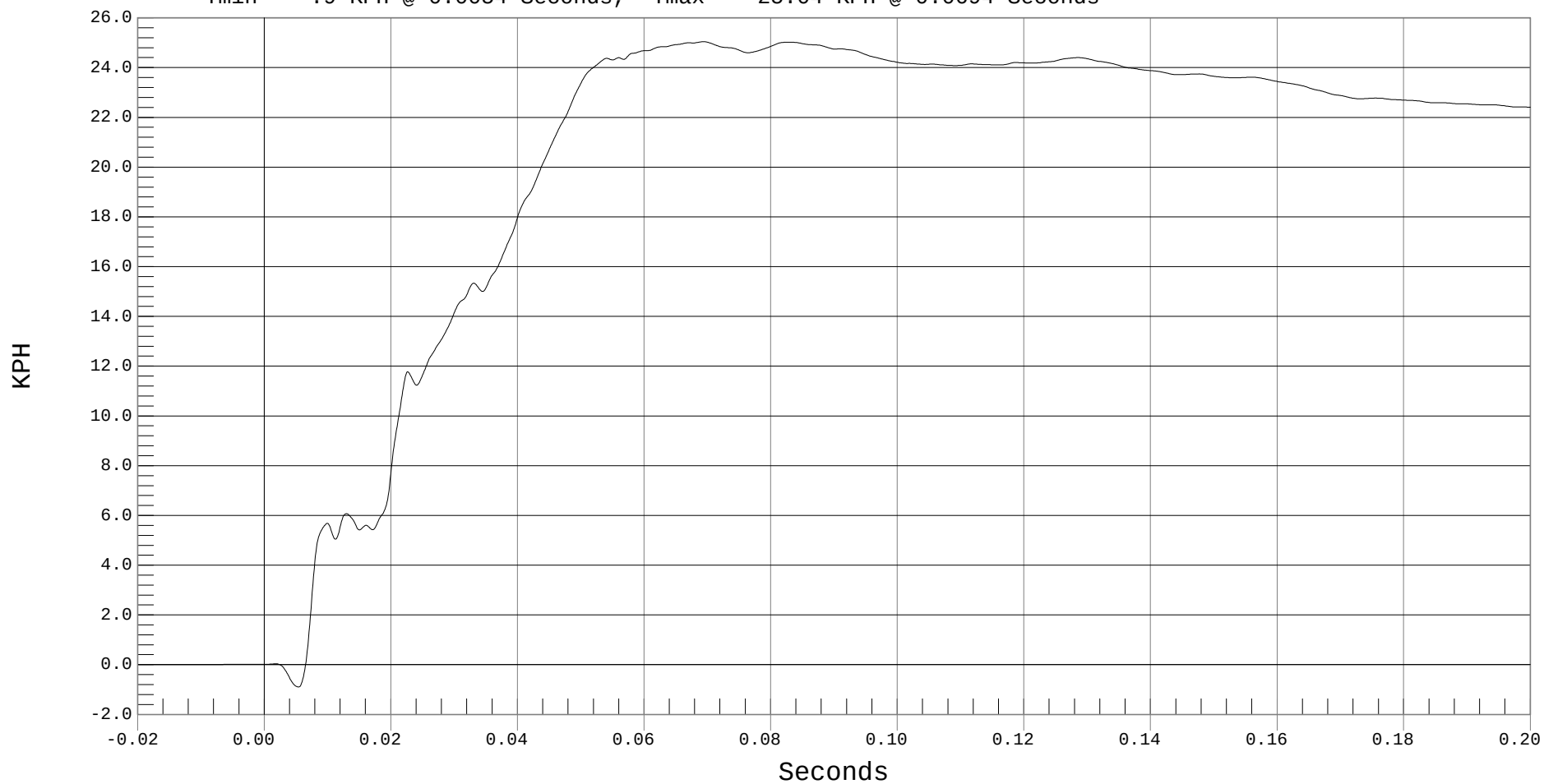
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 LEFT SIDE SILL AT REAR SEAT Y VELOCITY, B01010AI.V22

Ymin = -.9 KPH @ 0.0054 Seconds, Ymax = 25.04 KPH @ 0.0694 Seconds





RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

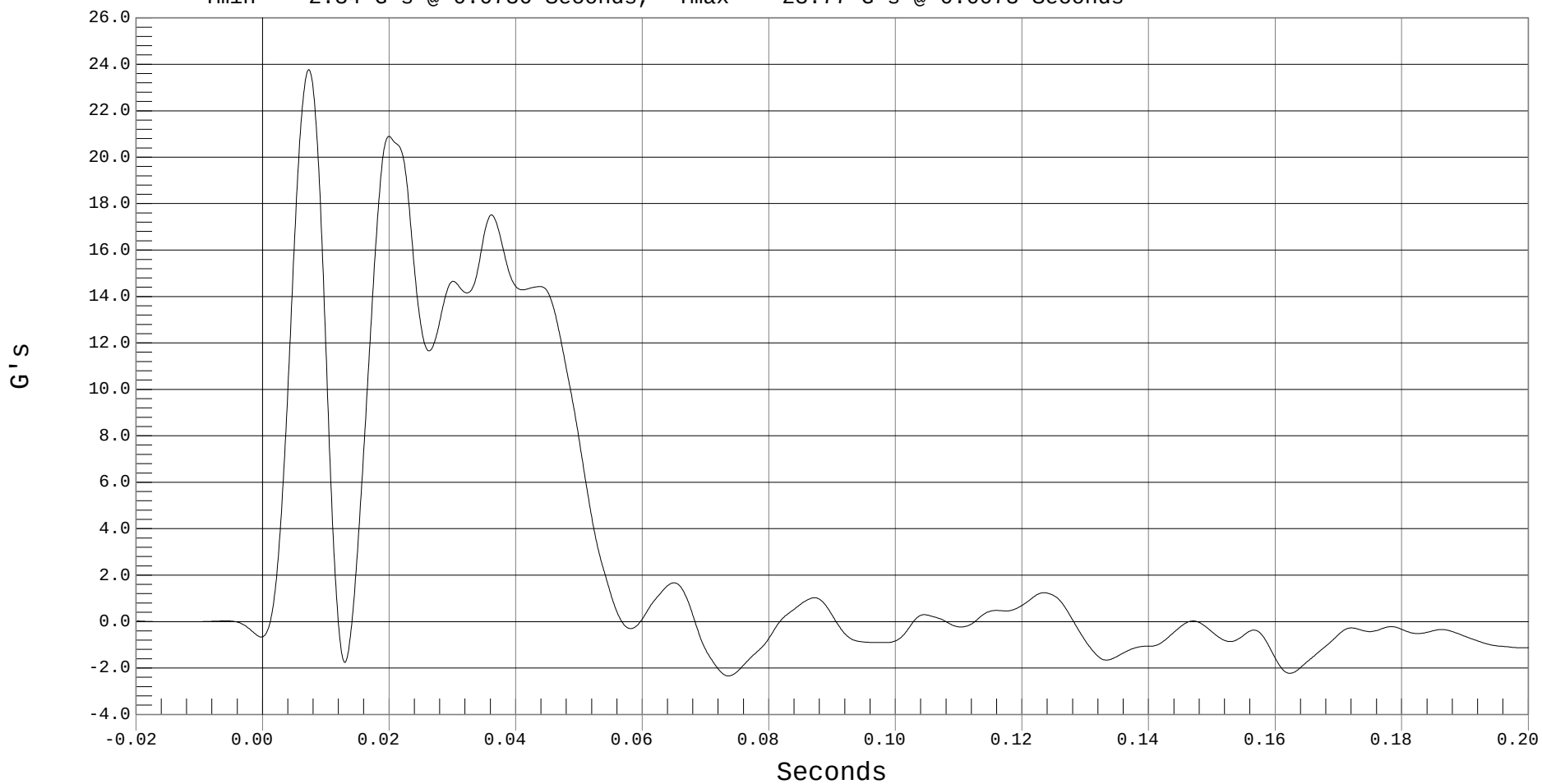
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 60

— 1 RIGHT REAR OCCUPANT COMPARTMENT Y, B01010AF.A31

Ymin = -2.34 G's @ 0.0736 Seconds, Ymax = 23.77 G's @ 0.0073 Seconds





RIGHT REAR OCCUPANT COMPARTMENT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

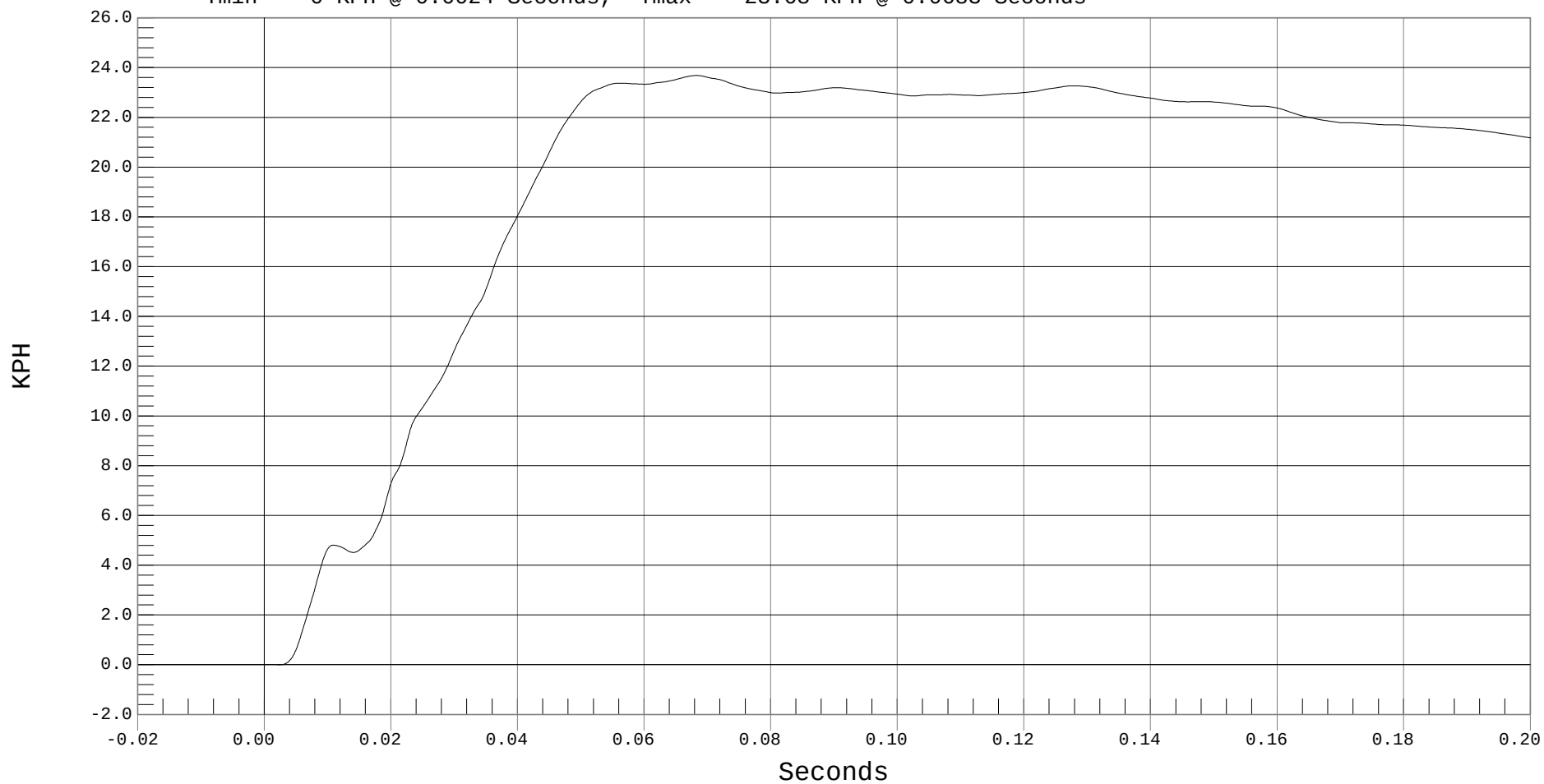
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 RIGHT REAR OCCUPANT COMPARTMENT Y VELOCITY, B01010AI.V31

Ymin = 0 KPH @ 0.0024 Seconds, Ymax = 23.68 KPH @ 0.0683 Seconds





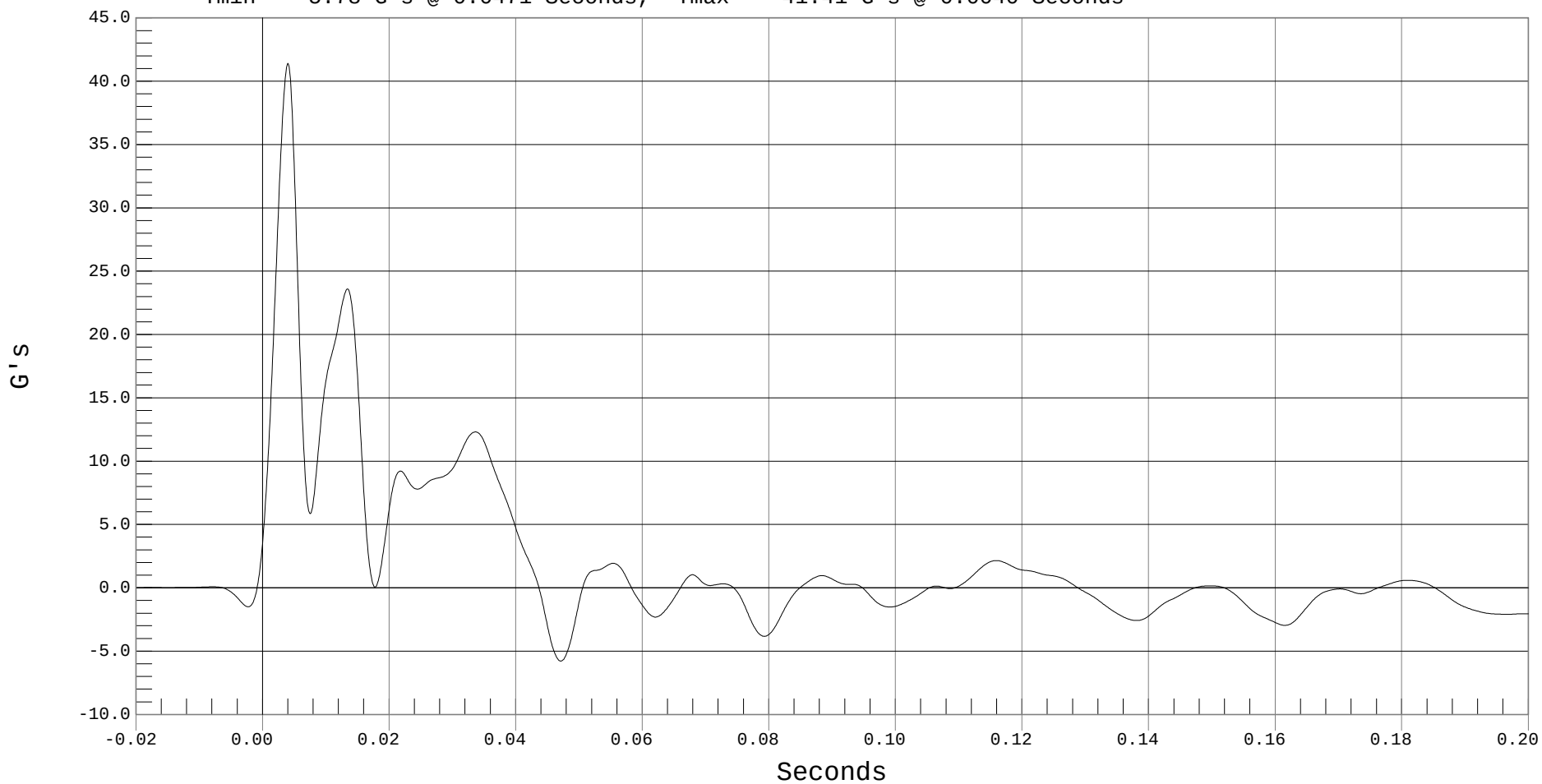
LEFT LOWER A-POST Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

1 LEFT LOWER A-POST Y, B01010AF.A27

Ymin = -5.78 G's @ 0.0471 Seconds, Ymax = 41.41 G's @ 0.0040 Seconds





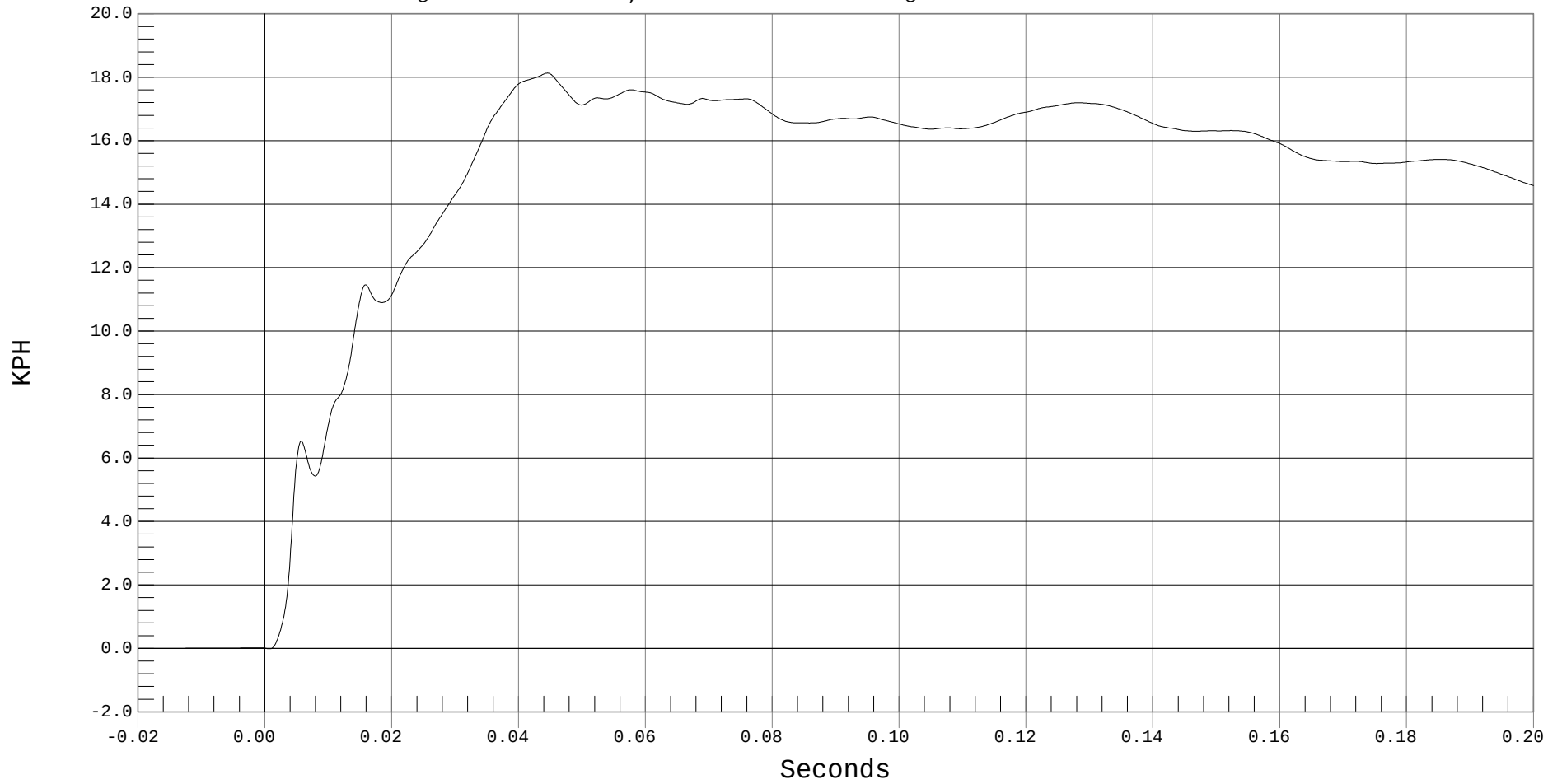
LEFT LOWER A-POST Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 LEFT LOWER A-POST Y VELOCITY, B01010AI.V27

Ymin = -.01 KPH @ 0.0008 Seconds, Ymax = 18.13 KPH @ 0.0446 Seconds





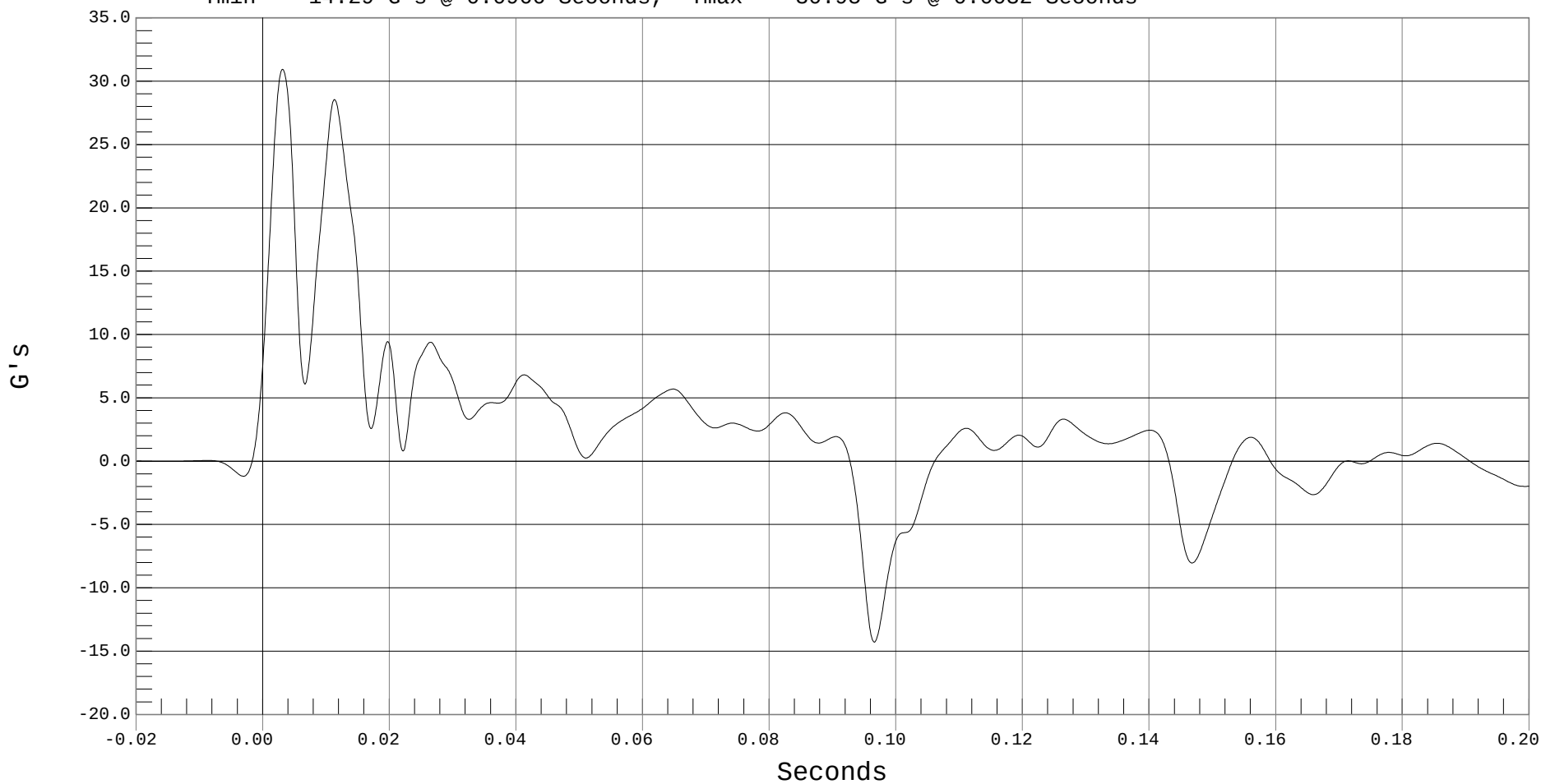
LEFT MID A-POST Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

1 LEFT MID A-POST Y, B01010AF.A26

Ymin = -14.29 G's @ 0.0966 Seconds, Ymax = 30.95 G's @ 0.0032 Seconds





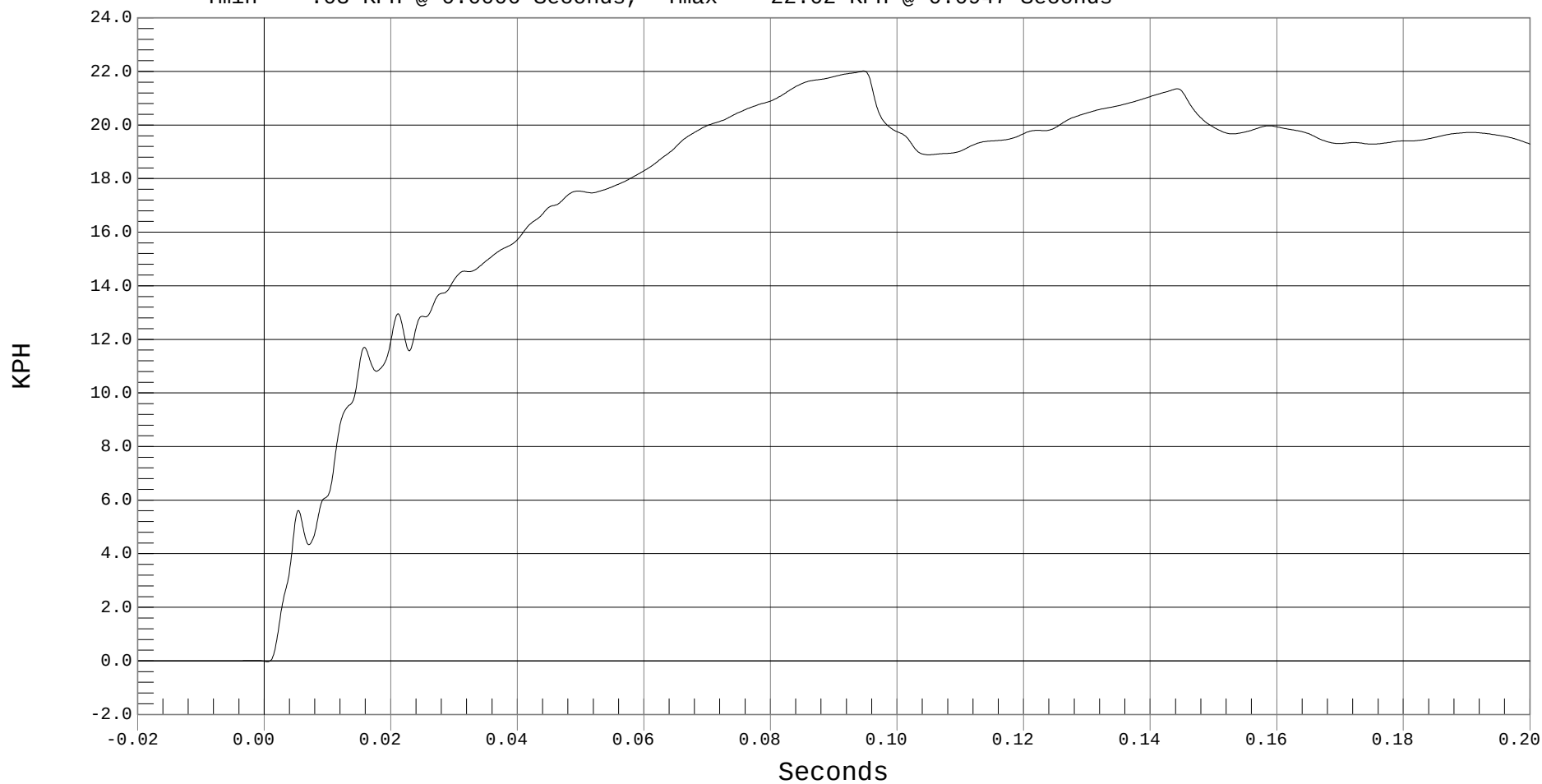
LEFT MID A-POST Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 LEFT MID A-POST Y VELOCITY, B01010AI.V26

Ymin = -.03 KPH @ 0.0006 Seconds, Ymax = 22.02 KPH @ 0.0947 Seconds





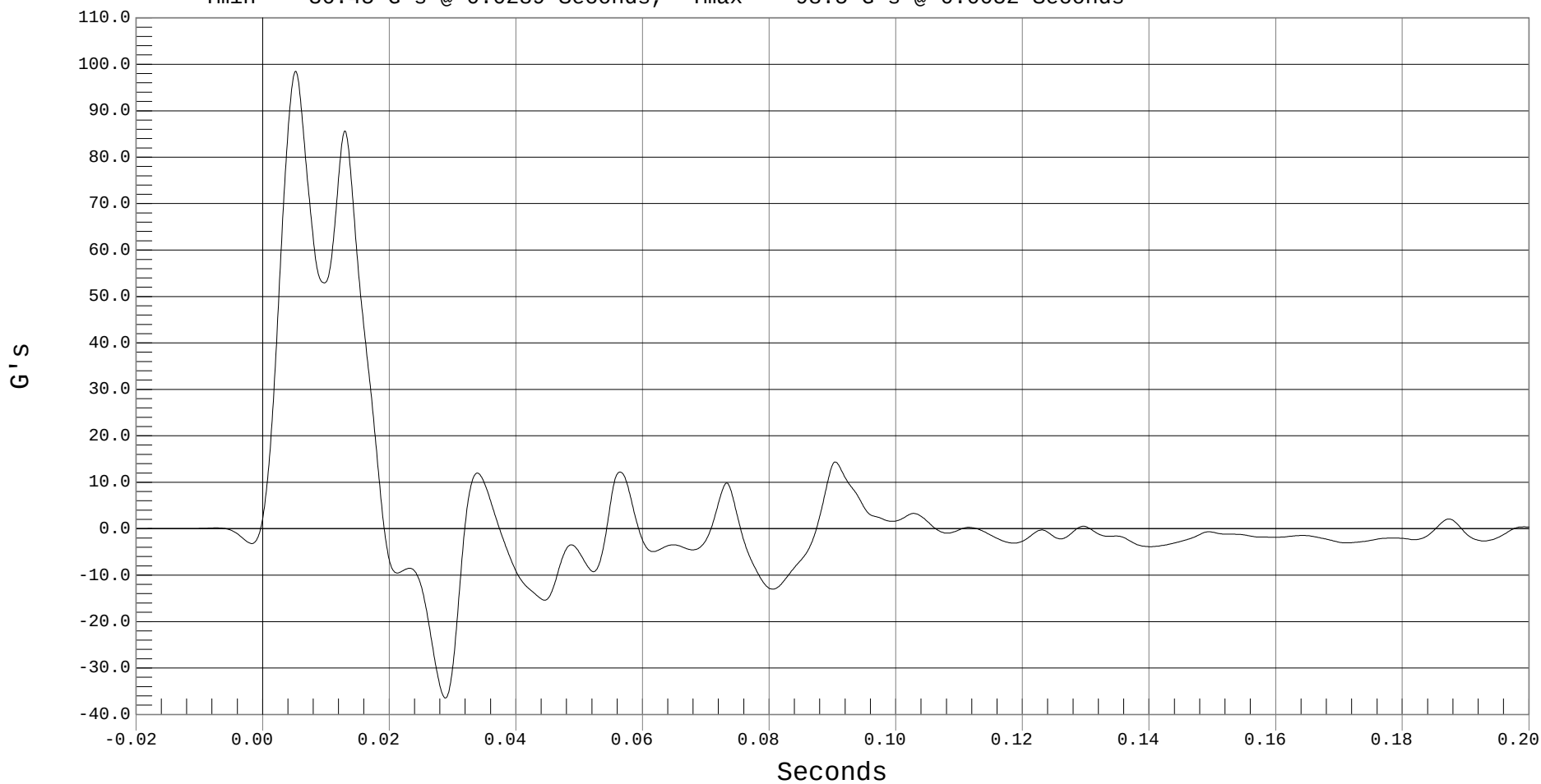
LEFT LOWER B-POST Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 LEFT LOWER B-POST, B01010AF.A29

Ymin = -36.45 G's @ 0.0289 Seconds, Ymax = 98.5 G's @ 0.0052 Seconds





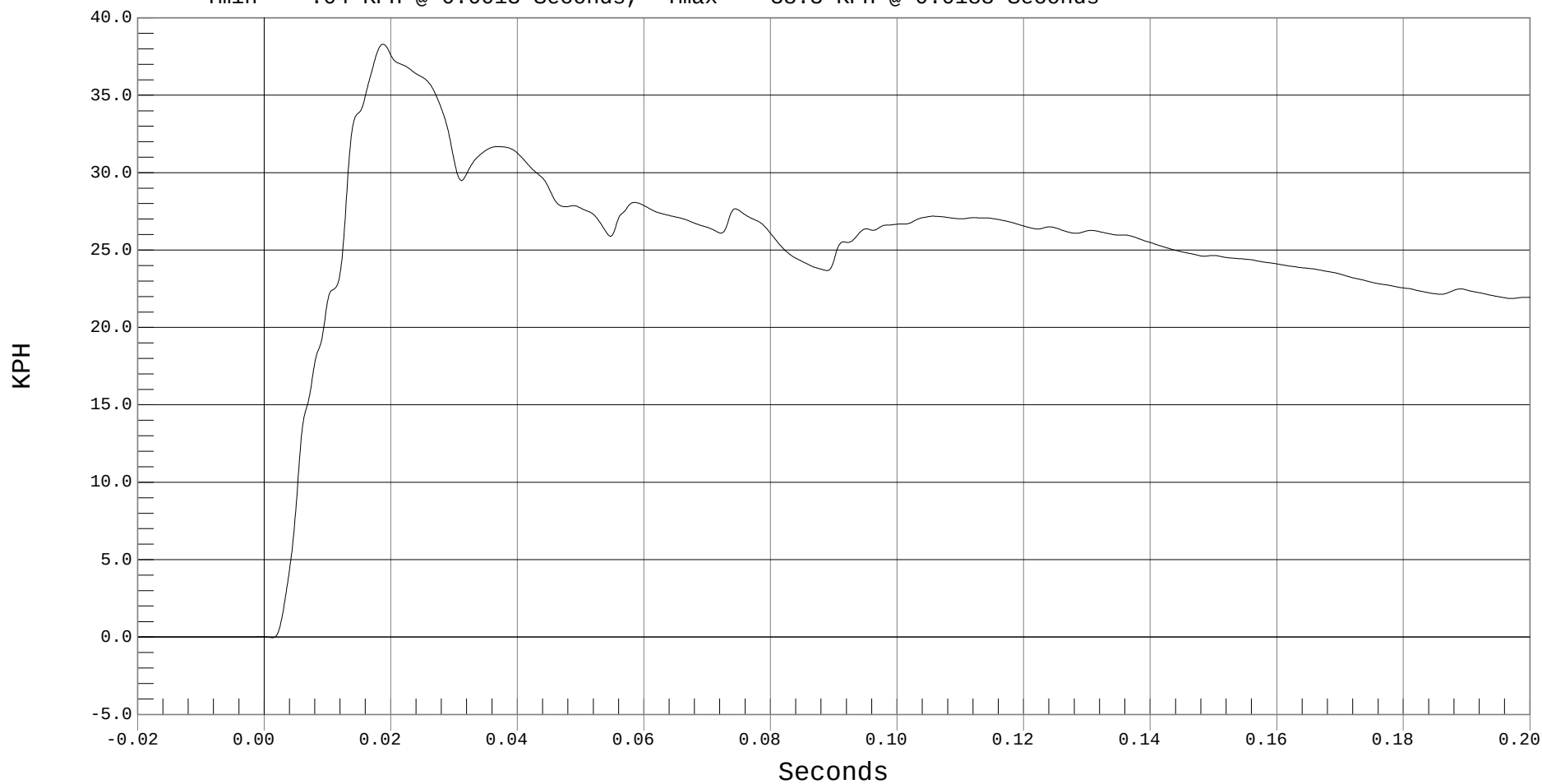
LEFT LOWER B-POST Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 LEFT LOWER B-POST Y VELOCITY, B01010AI.V29

Ymin = -.04 KPH @ 0.0013 Seconds, Ymax = 38.3 KPH @ 0.0188 Seconds





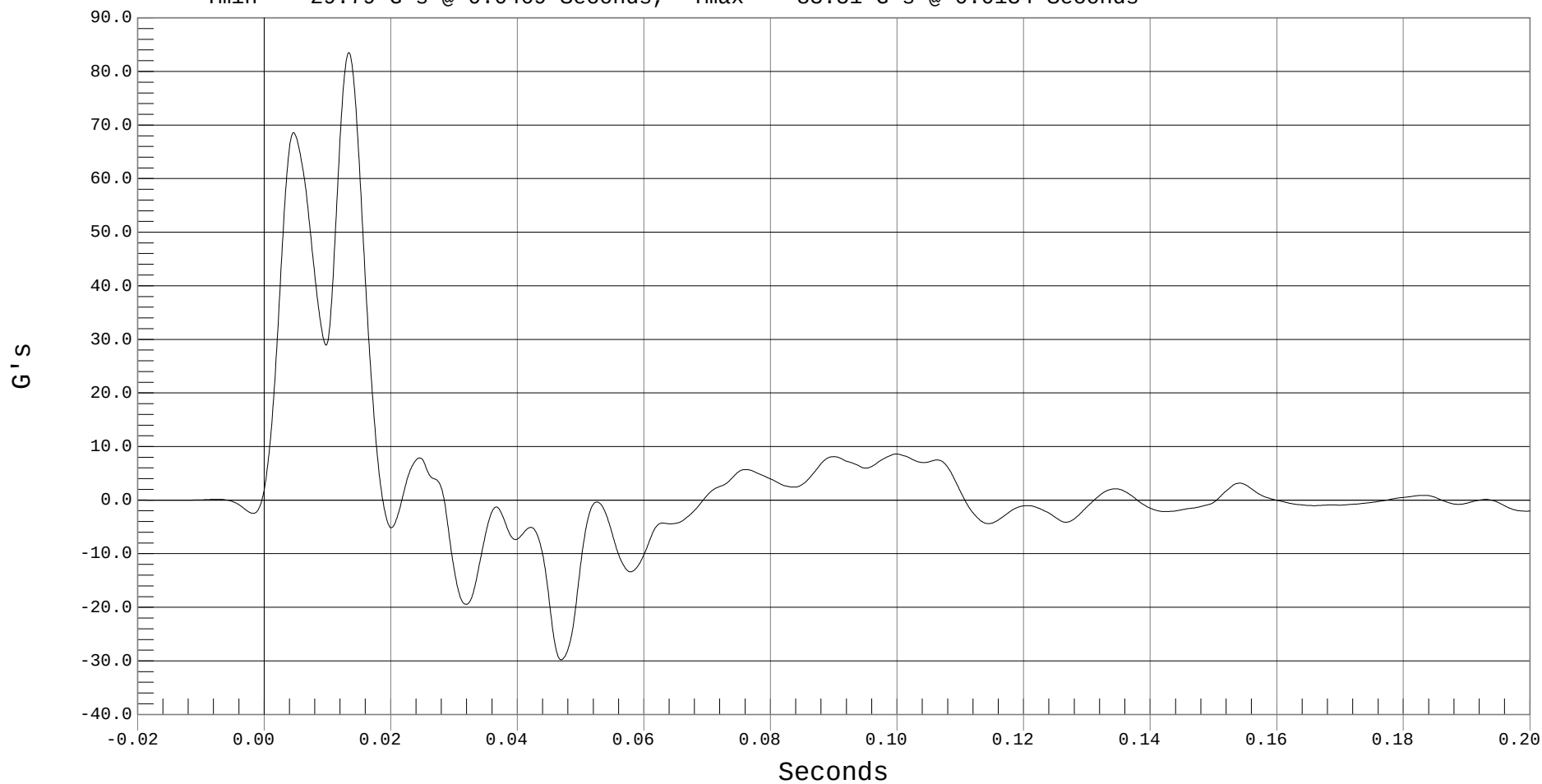
LEFT MID B-POST Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 LEFT MID B-POST, B01010AF.A28

Ymin = -29.79 G's @ 0.0469 Seconds, Ymax = 83.51 G's @ 0.0134 Seconds





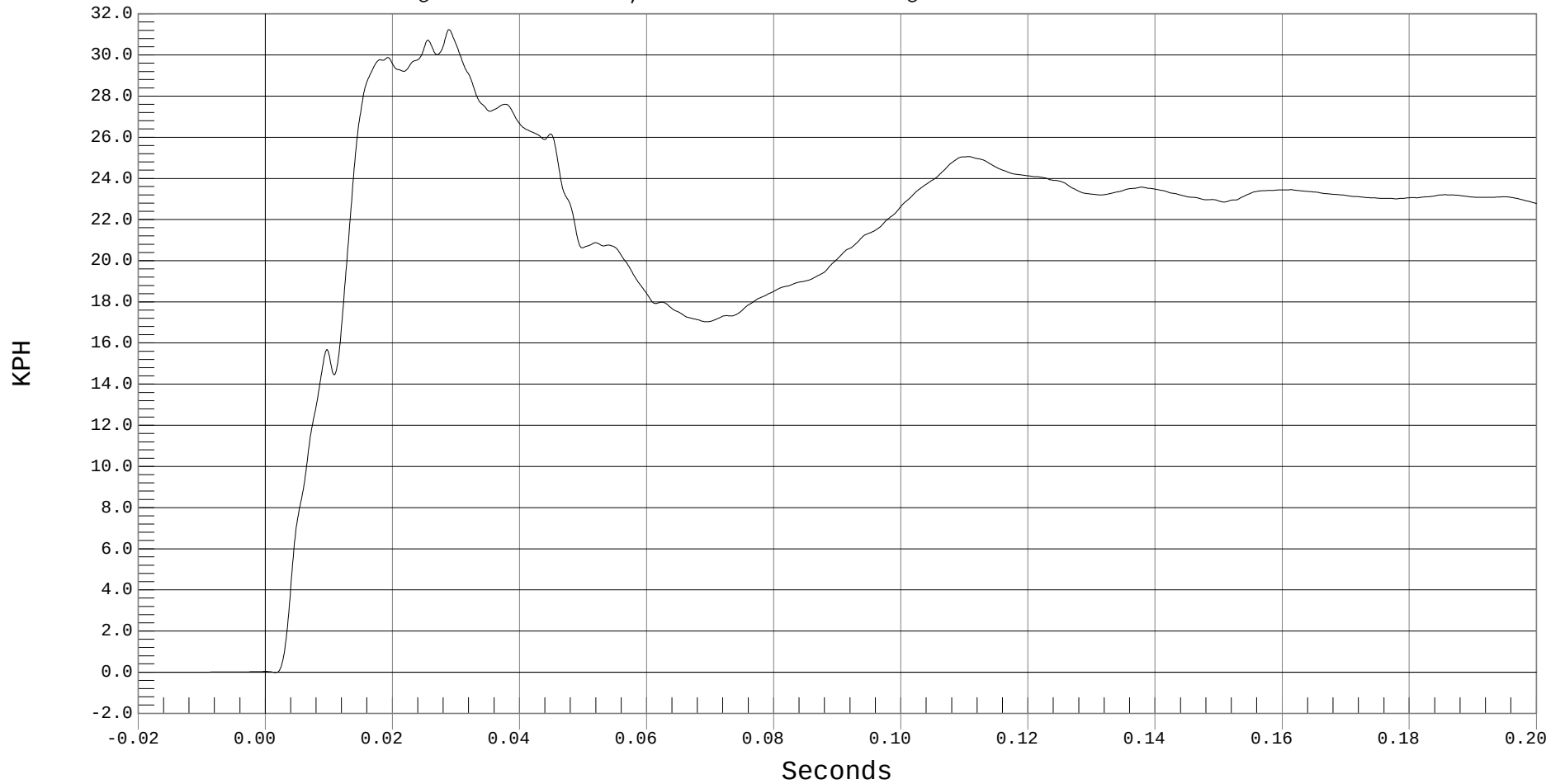
LEFT MID B-POST Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 LEFT MID B-POST Y VELOCITY, B01010AI.V28

Ymin = -.02 KPH @ 0.0016 Seconds, Ymax = 31.23 KPH @ 0.0289 Seconds





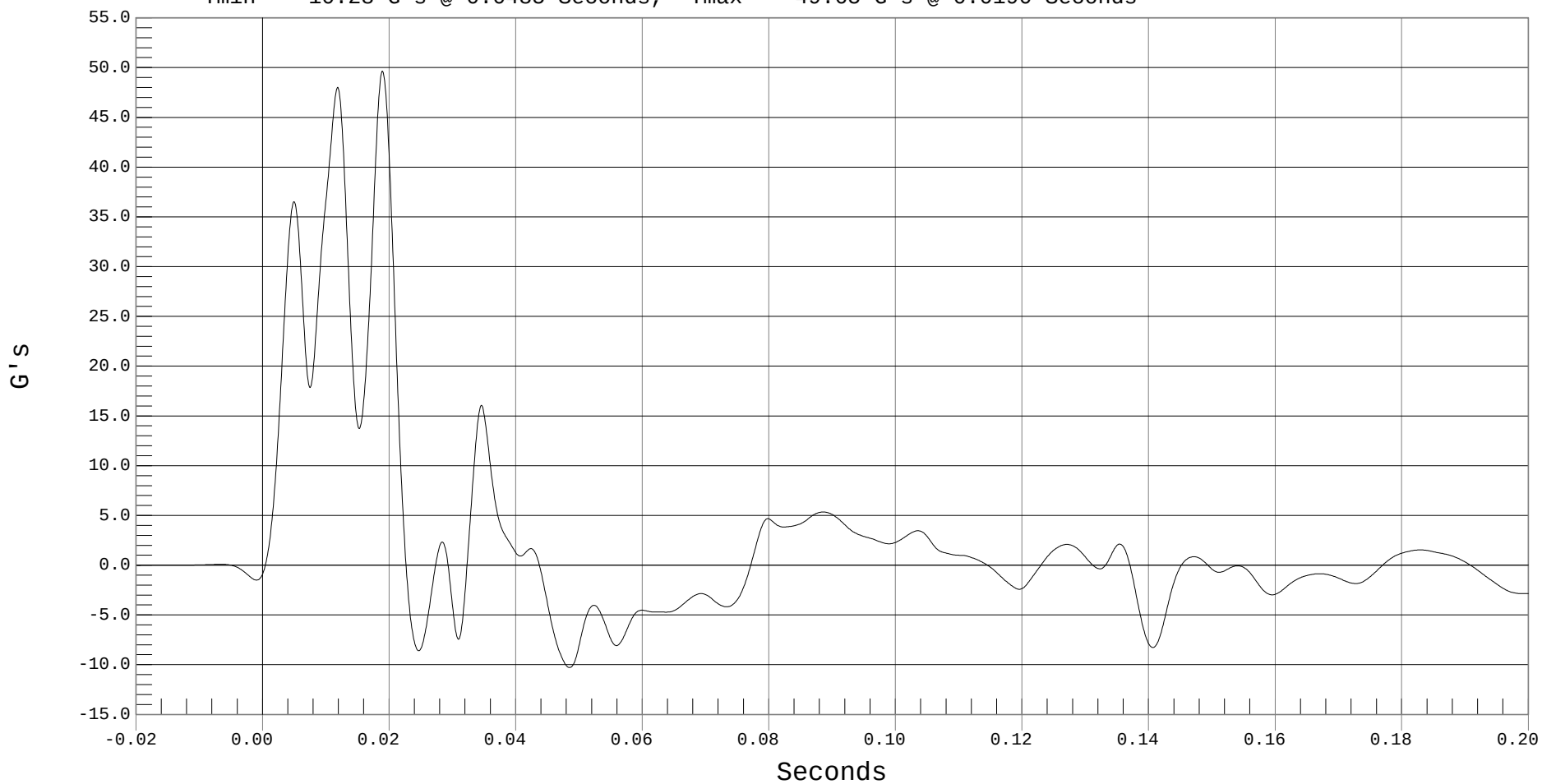
LEFT DRIVER SEAT TRACK Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 DRIVER SEAT TRACK Y, B01010AF.A30

Ymin = -10.28 G's @ 0.0485 Seconds, Ymax = 49.65 G's @ 0.0190 Seconds





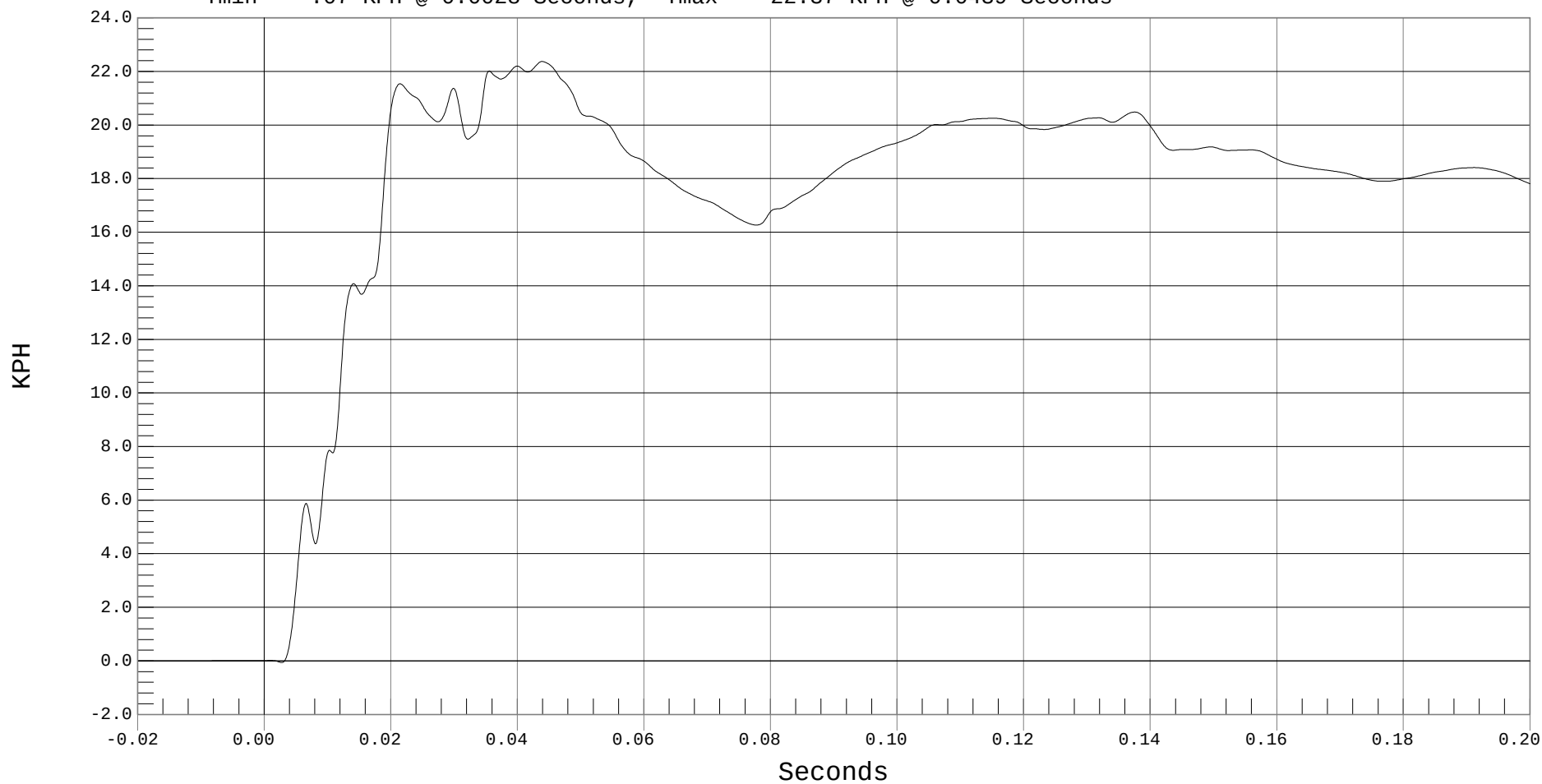
LEFT DRIVER SEAT TRACK Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 DRIVER SEAT TRACK Y VELOCITY, B01010AI.V30

Ymin = -.07 KPH @ 0.0028 Seconds, Ymax = 22.37 KPH @ 0.0439 Seconds





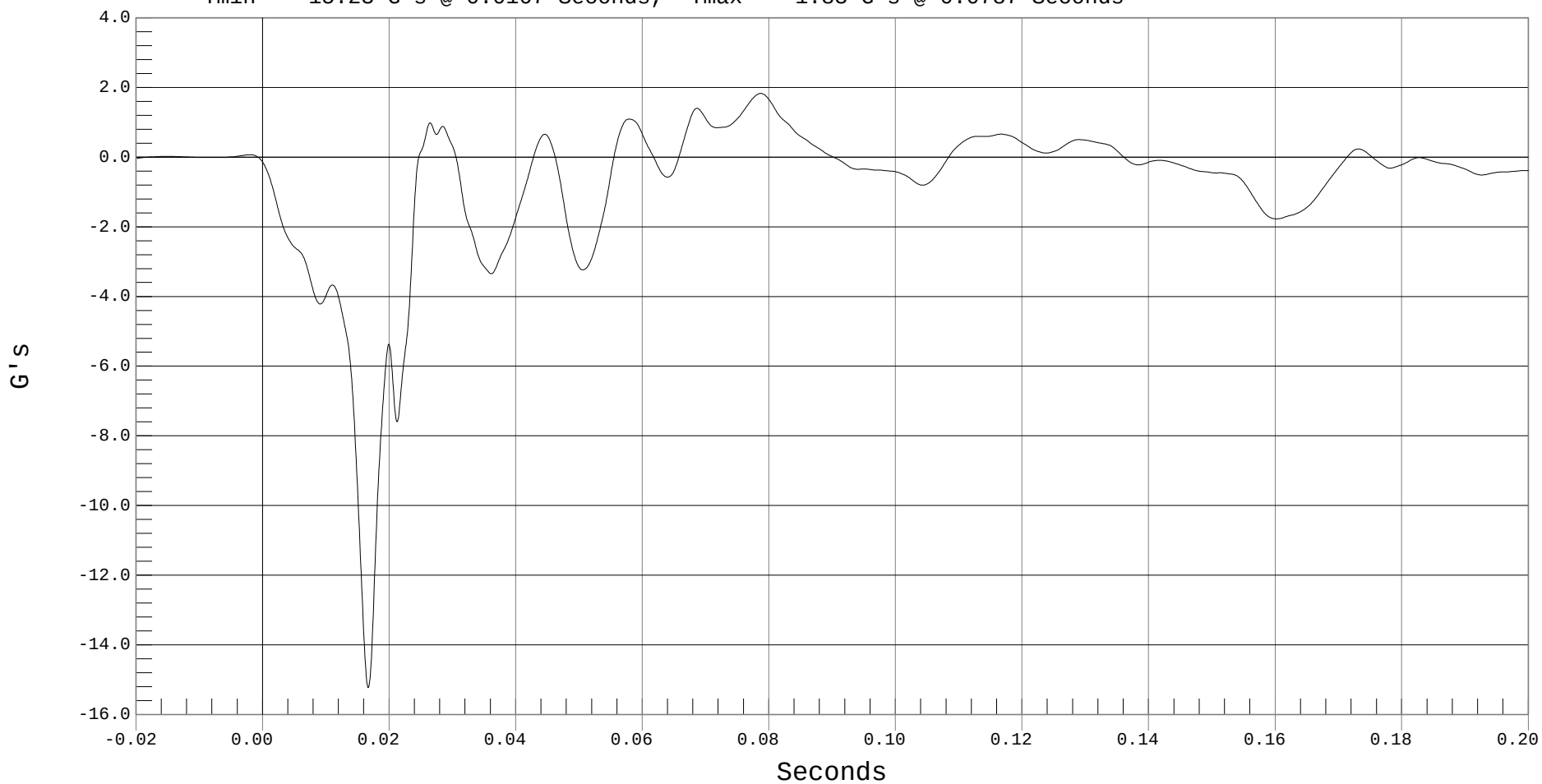
VEHICLE CG X ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 VEHICLE CG X, B01010AF.A33

Ymin = -15.23 G's @ 0.0167 Seconds, Ymax = 1.83 G's @ 0.0787 Seconds





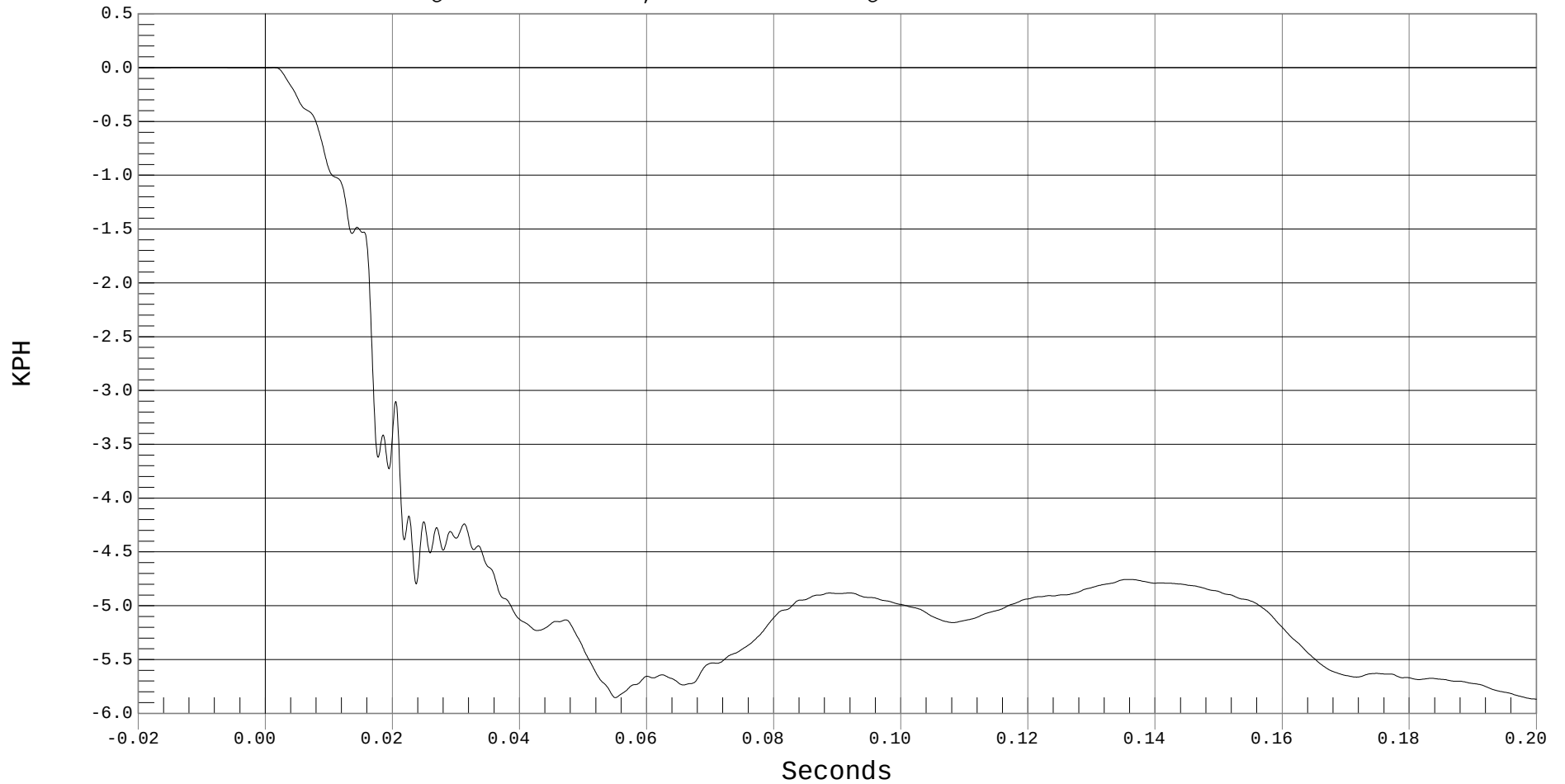
VEHICLE CG X VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 VEHICLE CG X VELOCITY, B01010AI.V33

Ymin = -5.87 KPH @ 0.2001 Seconds, Ymax = 0 KPH @ -0.0121 Seconds





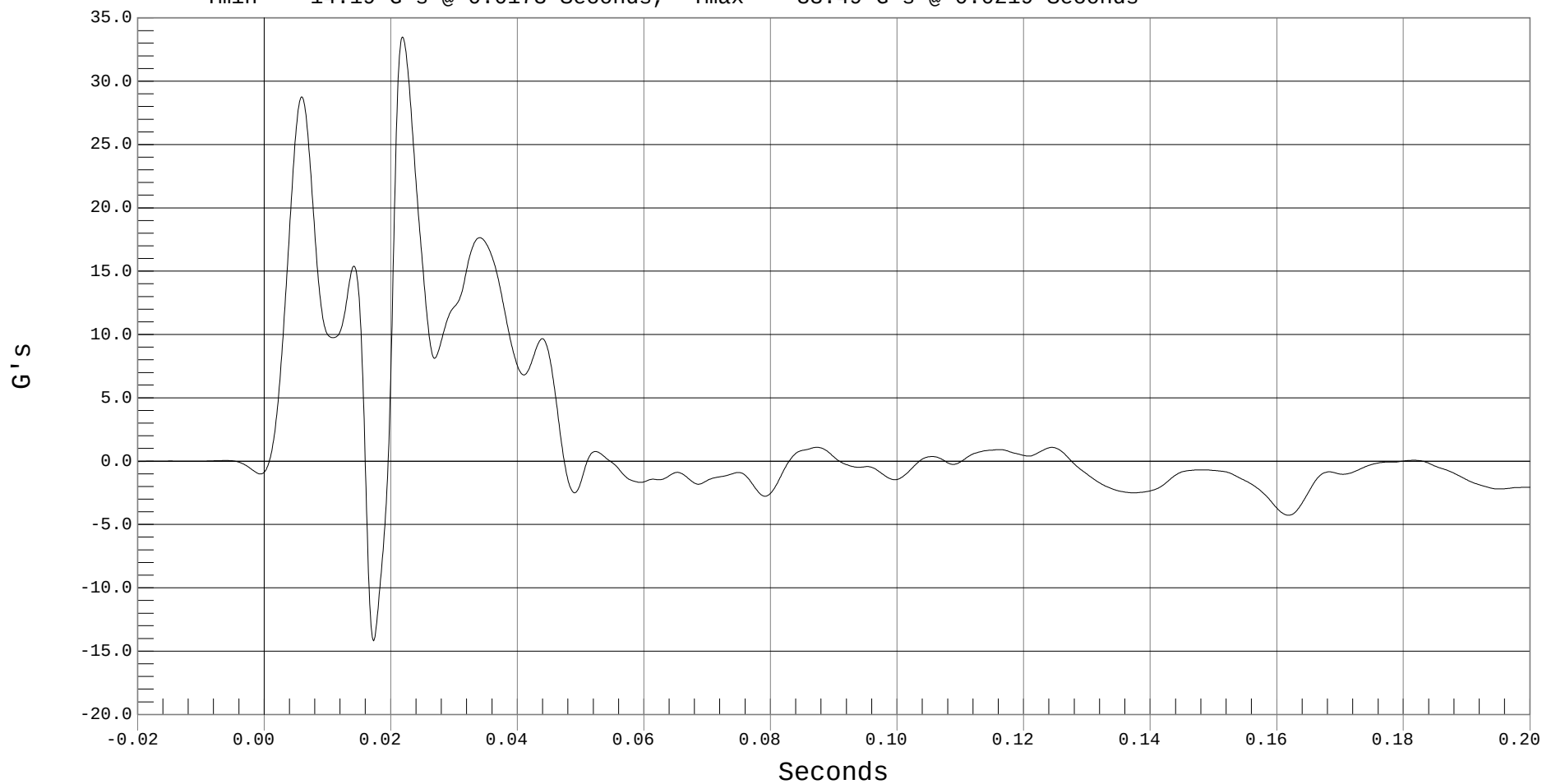
VEHICLE CG Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 VEHICLE CG Y, B01010AF.A34

Ymin = -14.19 G's @ 0.0173 Seconds, Ymax = 33.49 G's @ 0.0219 Seconds





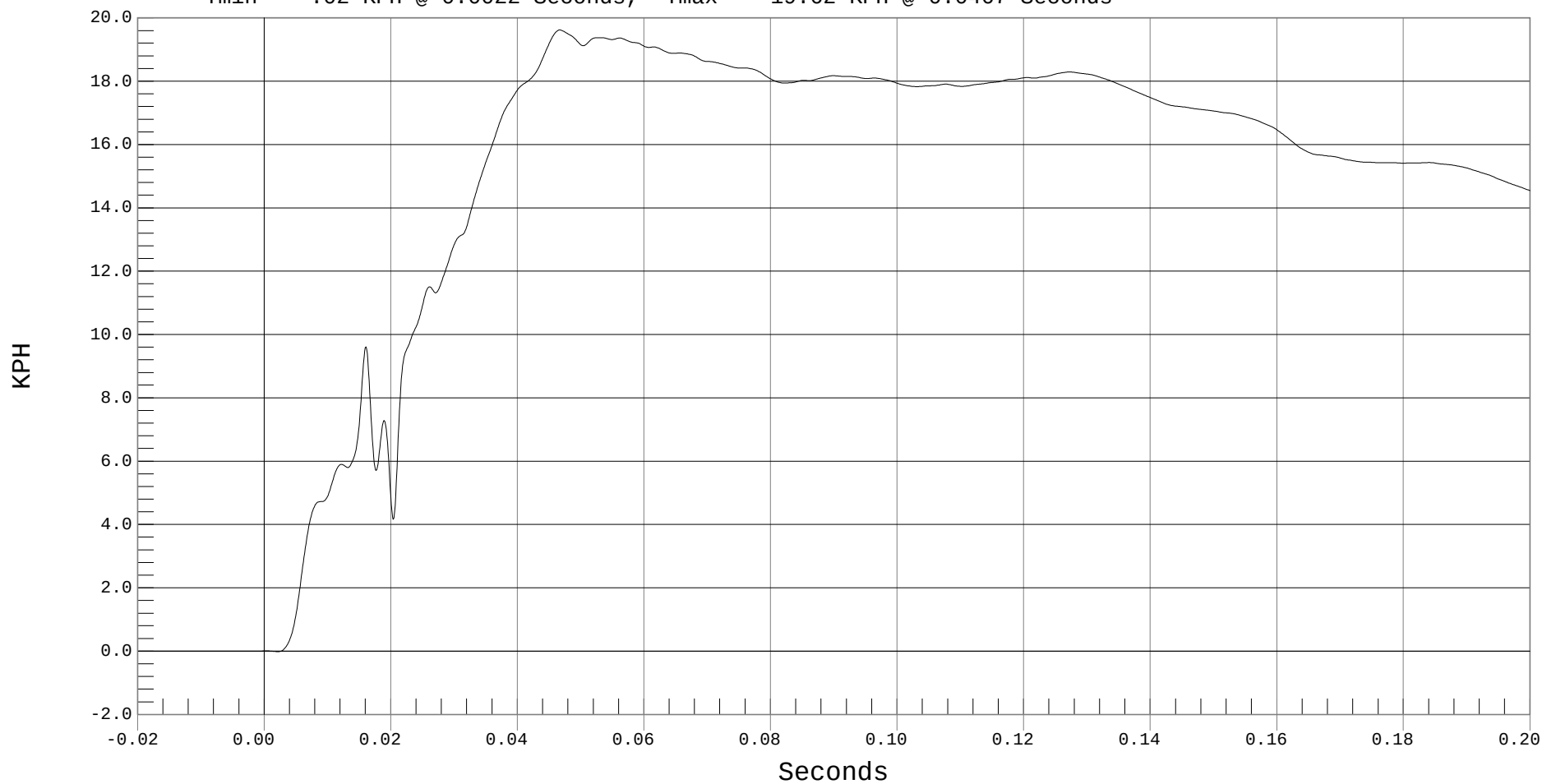
VEHICLE CG Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 VEHICLE CG Y VELOCITY, B01010AI.V34

Ymin = -.02 KPH @ 0.0022 Seconds, Ymax = 19.62 KPH @ 0.0467 Seconds





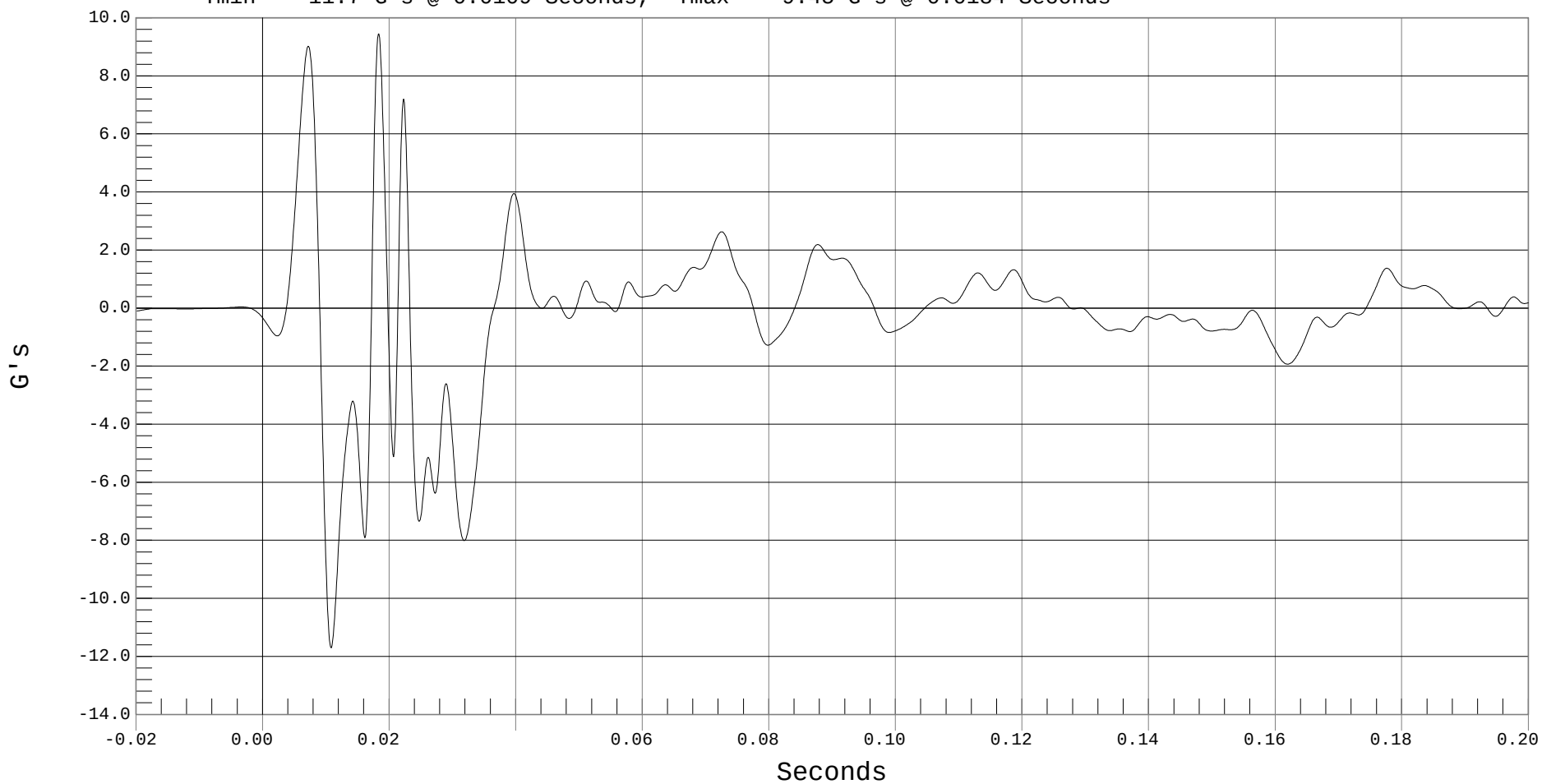
VEHICLE CG Z ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 VEHICLE CG Z, B01010AF.A35

Ymin = -11.7 G's @ 0.0109 Seconds, Ymax = 9.45 G's @ 0.0184 Seconds





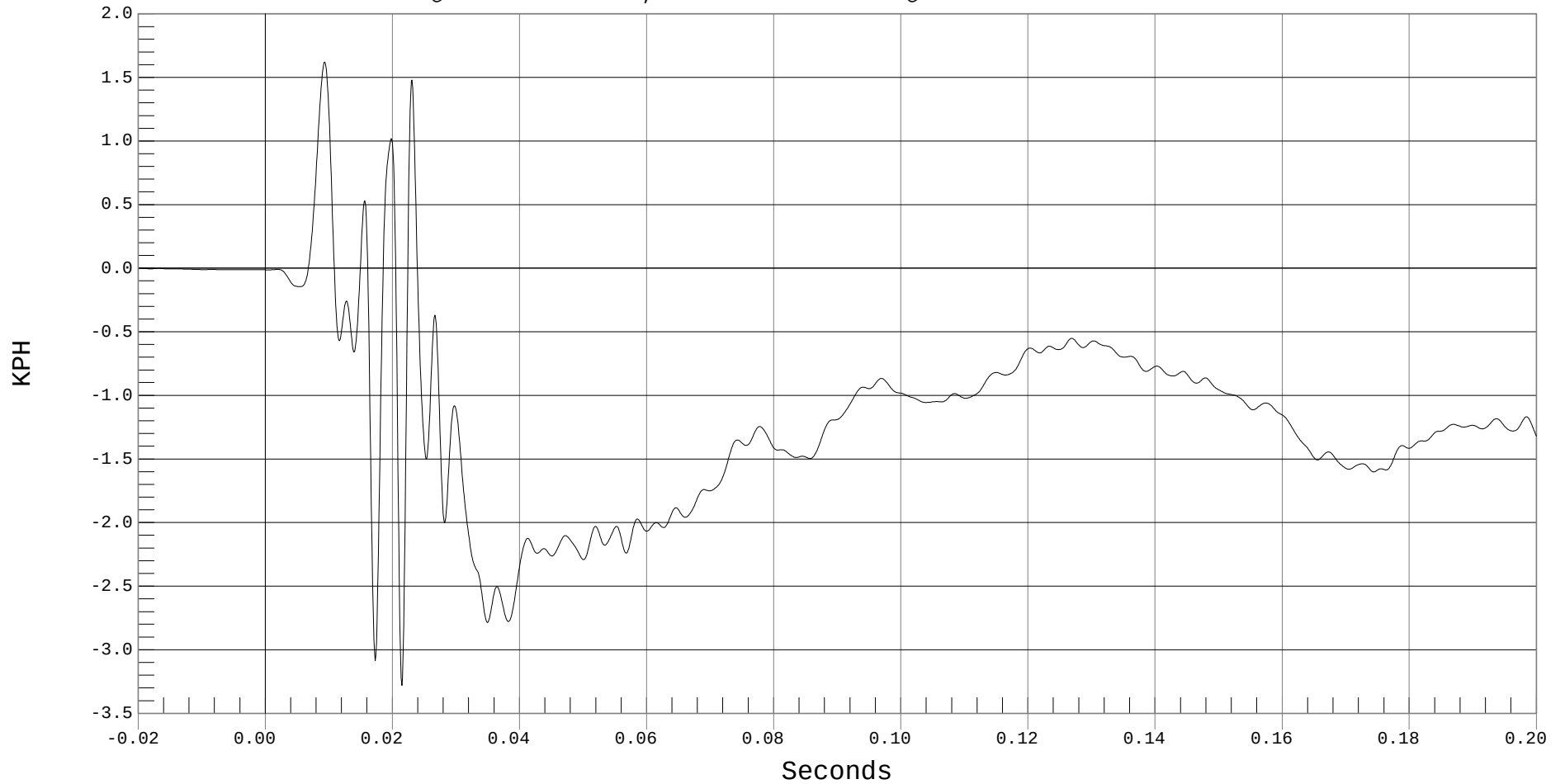
VEHICLE CG Z VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 VEHICLE CG Z VELOCITY, B01010AI.V35

Ymin = -3.28 KPH @ 0.0215 Seconds, Ymax = 1.62 KPH @ 0.0093 Seconds





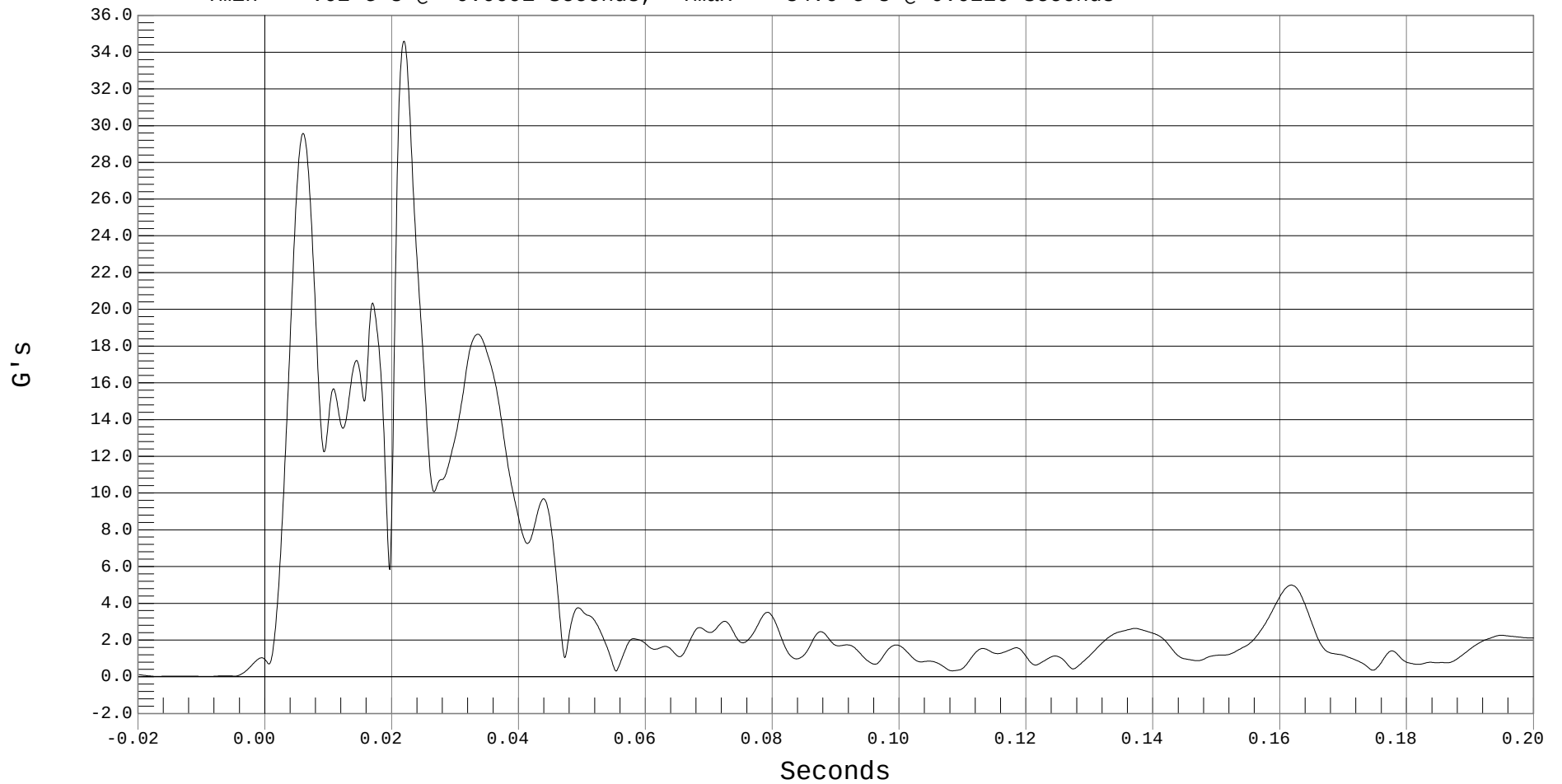
VEHICLE CG RESULTANT ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 VEHICLE CG RESULTANT ACCELERATION, B01010AV.A33

Ymin = .02 G's @ -0.0091 Seconds, Ymax = 34.6 G's @ 0.0220 Seconds





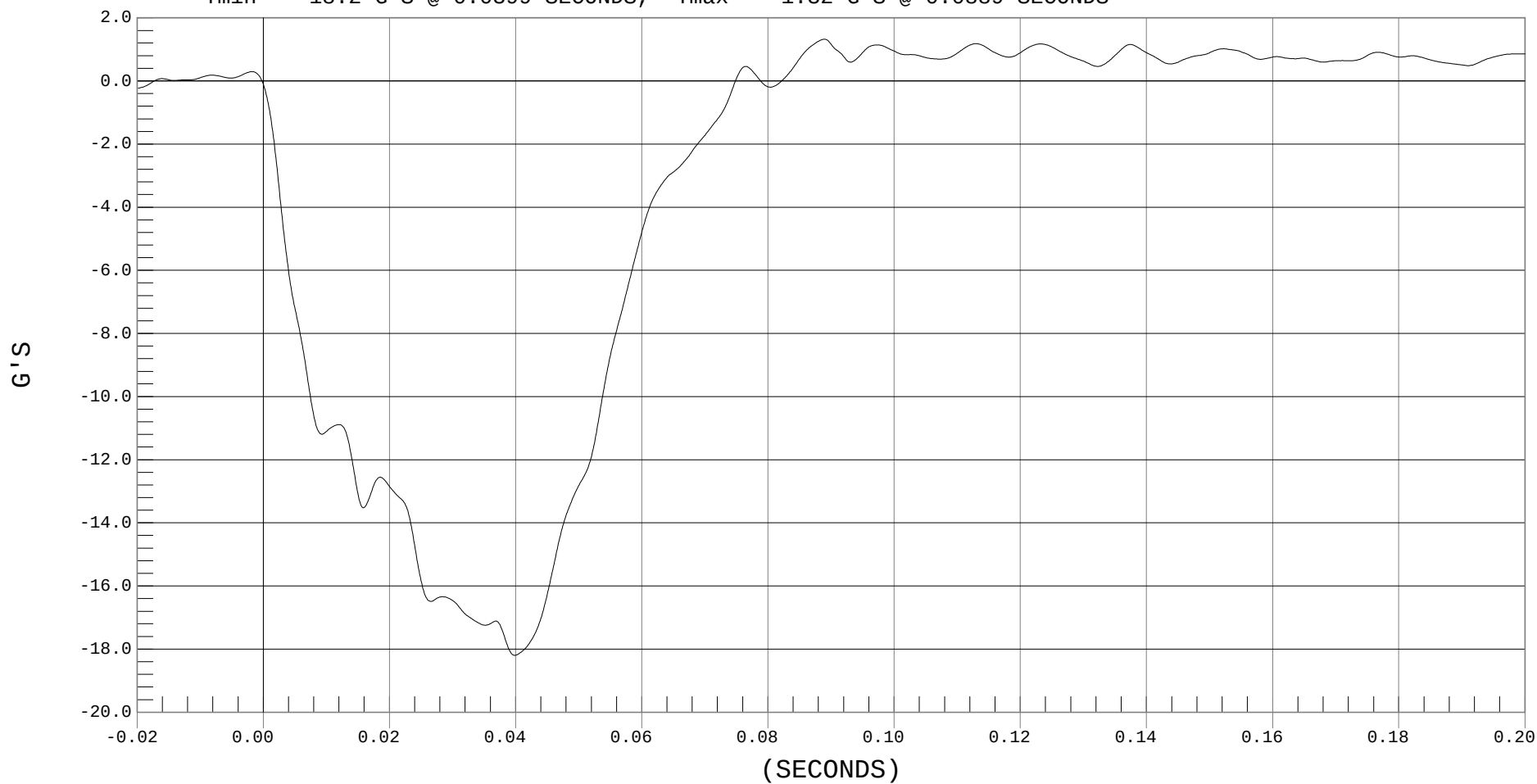
MOVING BARRIER CG X ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 CART CG X, C01010AF.A02

Ymin = -18.2 G'S @ 0.0399 SECONDS, Ymax = 1.32 G'S @ 0.0889 SECONDS





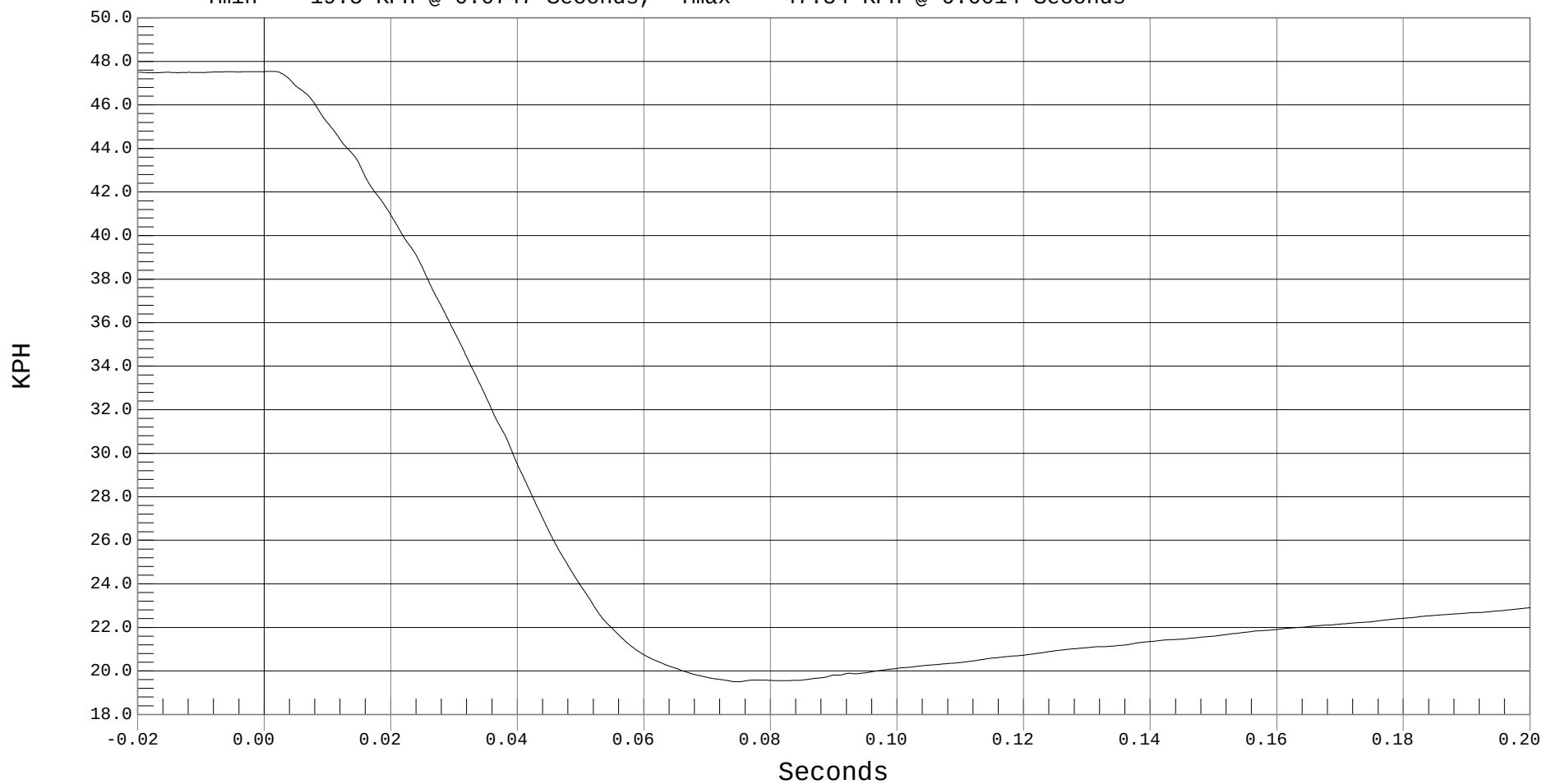
MOVING BARRIER CG X VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

1 MOVING BARRIER CG X VELOCITY, C01010AI.V02

Ymin = 19.5 KPH @ 0.0747 Seconds, Ymax = 47.54 KPH @ 0.0014 Seconds





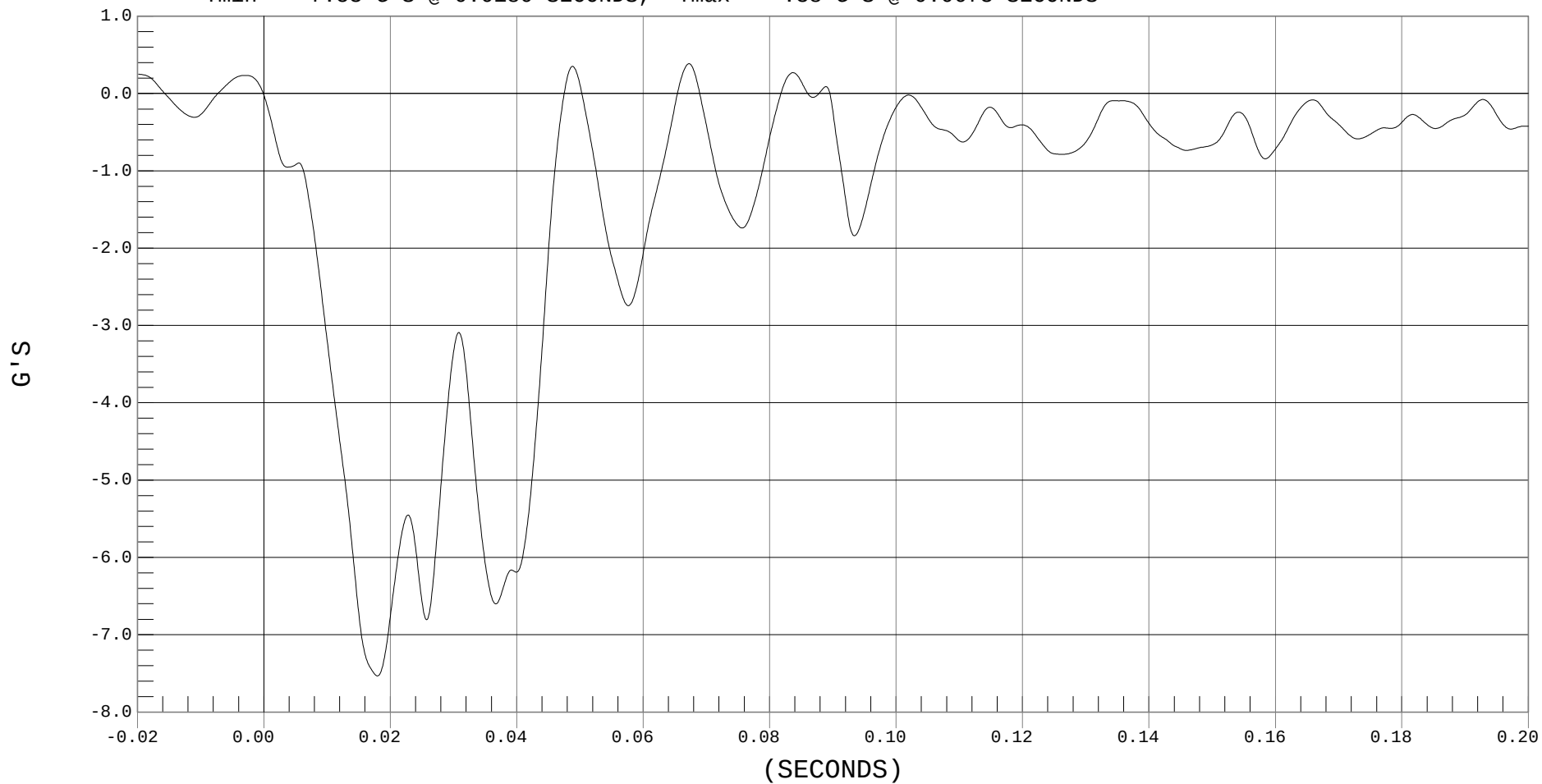
MOVING BARRIER CG Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 CART CG Y, C01010AF.A03

Ymin = -7.53 G'S @ 0.0180 SECONDS, Ymax = .38 G'S @ 0.0673 SECONDS





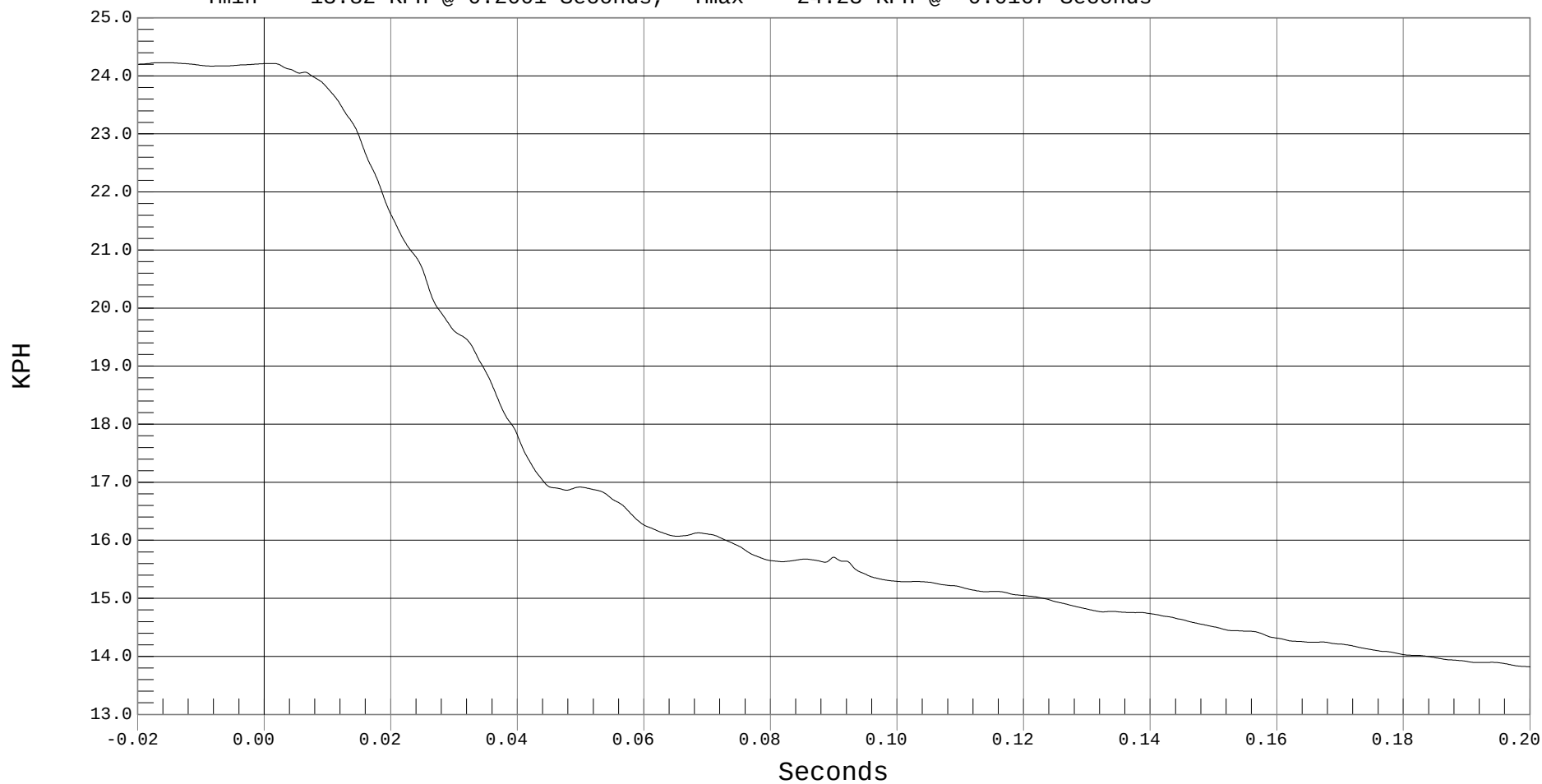
MOVING BARRIER CG Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 MOVING BARRIER CG Y VELOCITY, C01010AI.V03

Ymin = 13.82 KPH @ 0.2001 Seconds, Ymax = 24.23 KPH @ -0.0167 Seconds





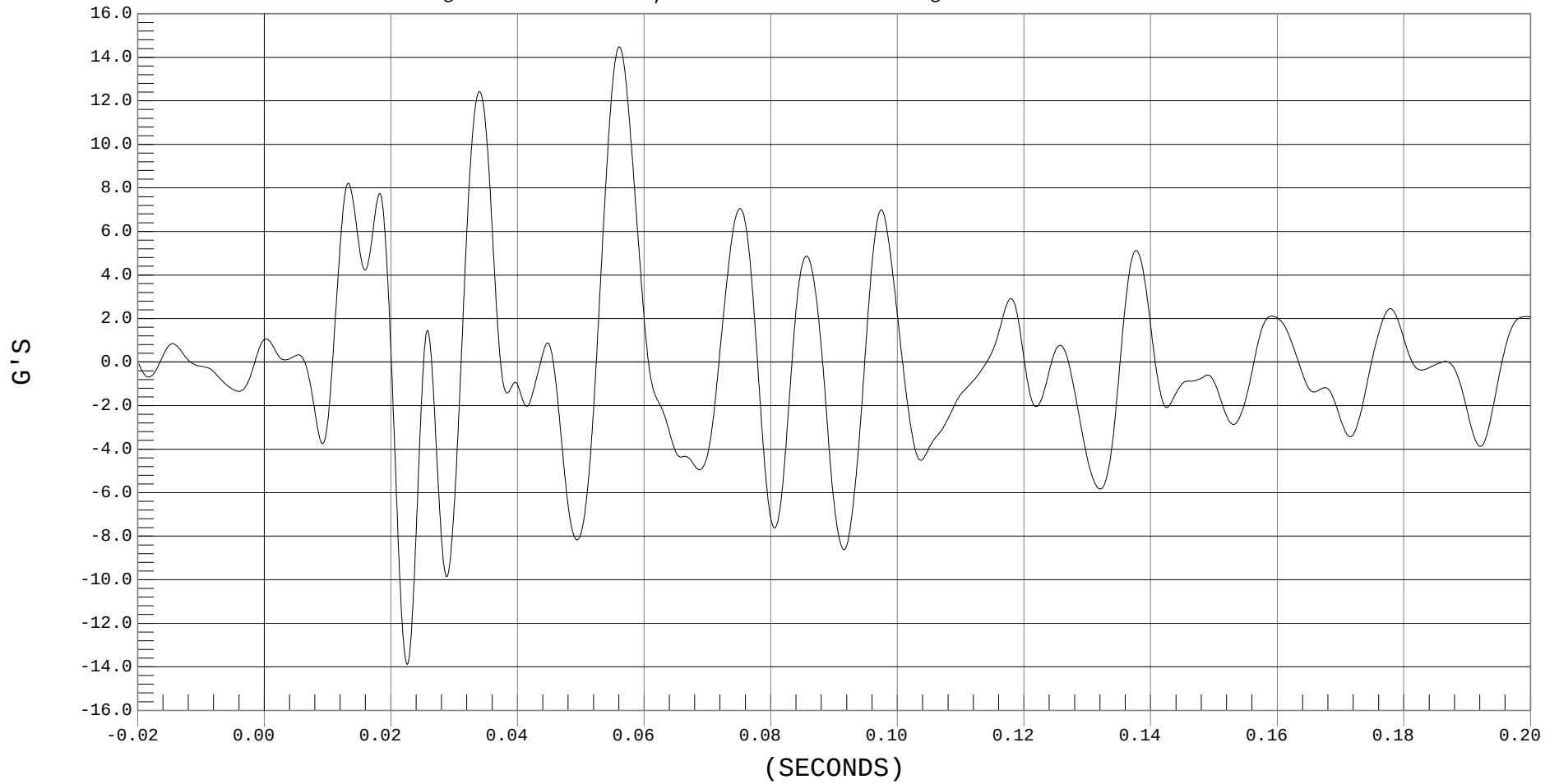
MOVING BARRIER CG Z ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 CART CG Z, C01010AF.A04

Ymin = -13.89 G'S @ 0.0226 SECONDS, Ymax = 14.49 G'S @ 0.0561 SECONDS





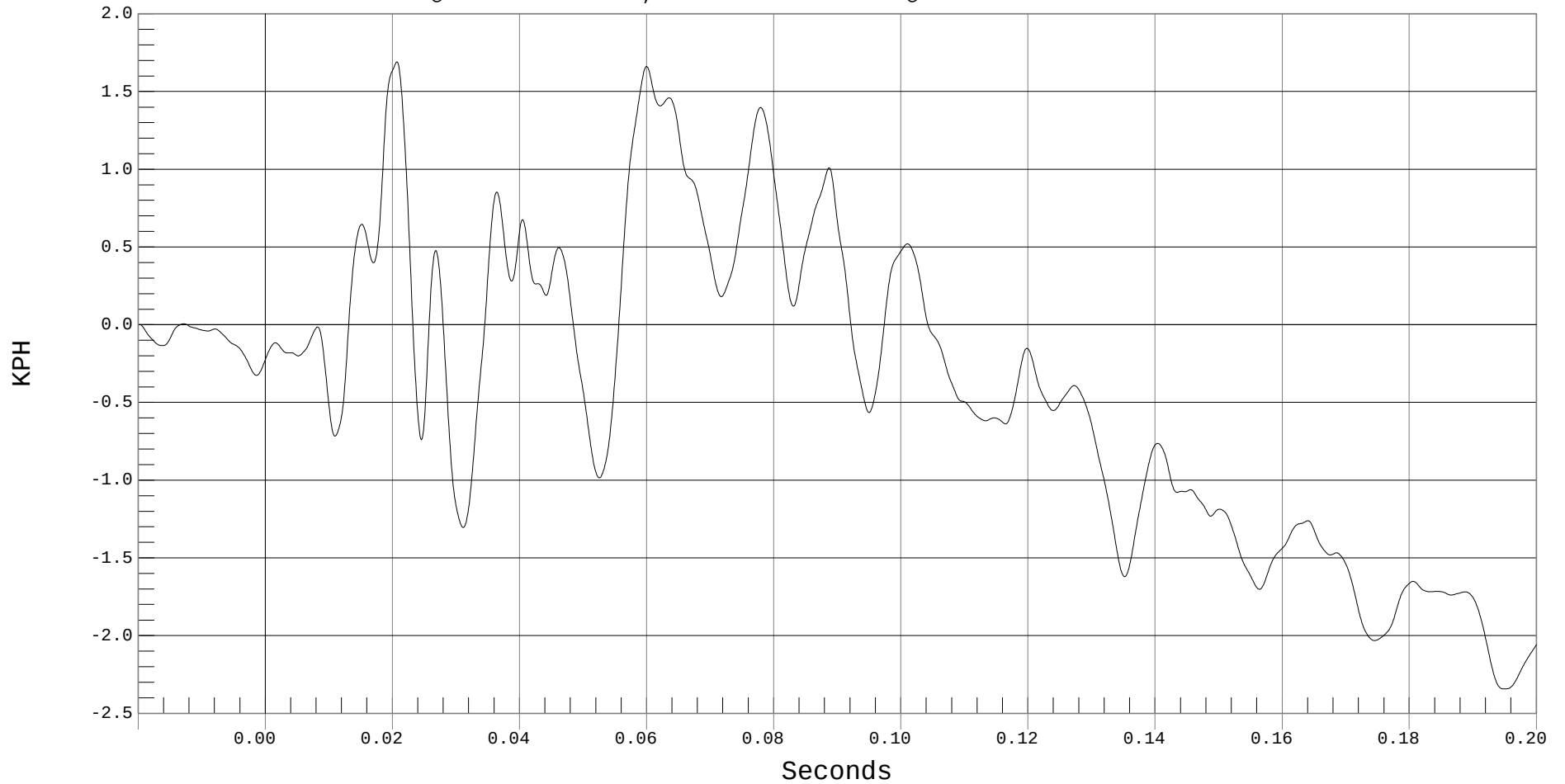
MOVING BARRIER CG Z VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 MOVING BARRIER CG Z VELOCITY, C01010AI.V04

Ymin = -2.34 KPH @ 0.1948 Seconds, Ymax = 1.69 KPH @ 0.0207 Seconds





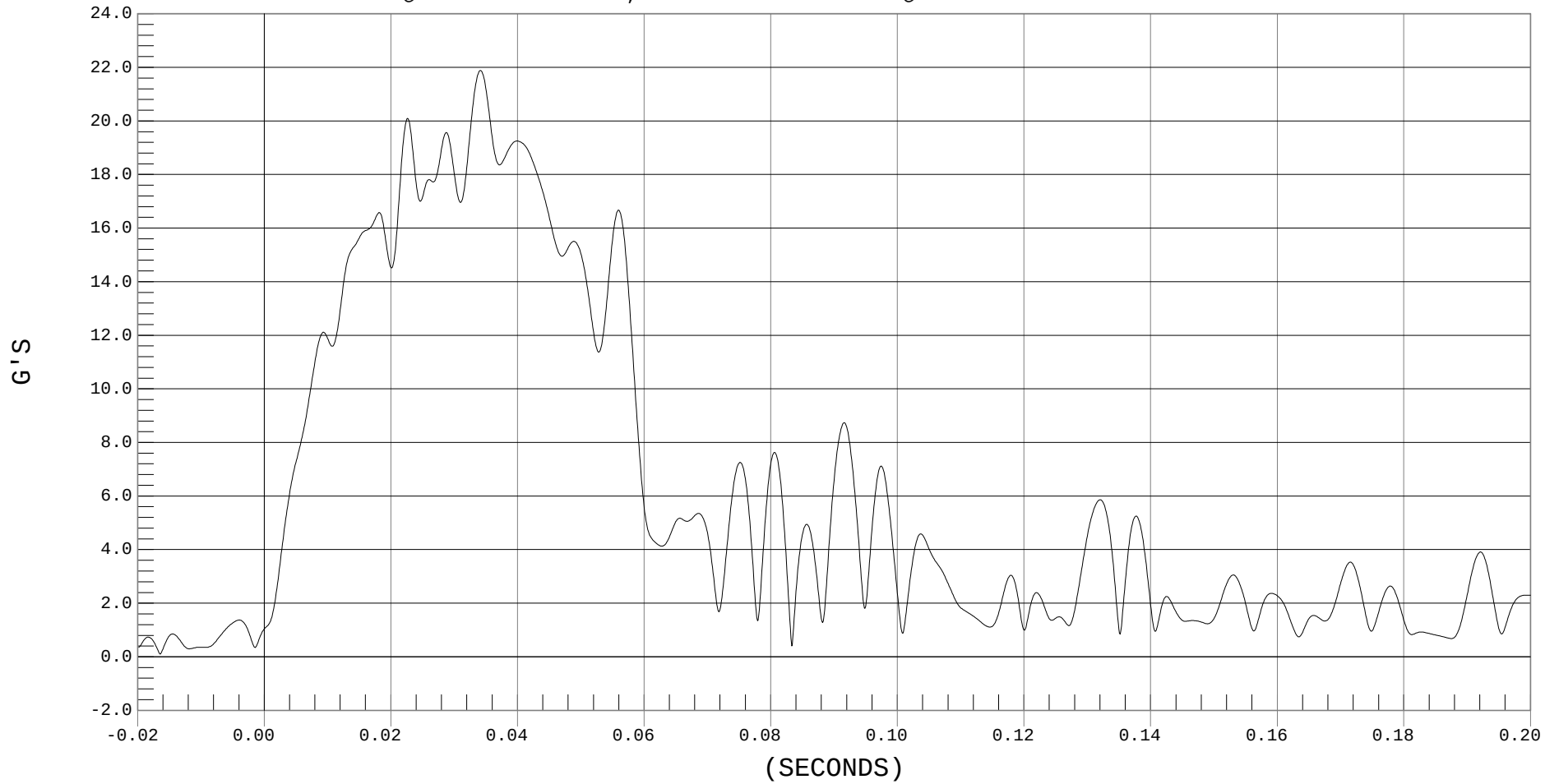
MOVING BARRIER CG RESULTANT ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 MOVING BARRIER CG RESULTANT ACCELERATION, C01010AV.A02

Ymin = .1 G'S @ -0.0164 SECONDS, Ymax = 21.88 G'S @ 0.0342 SECONDS





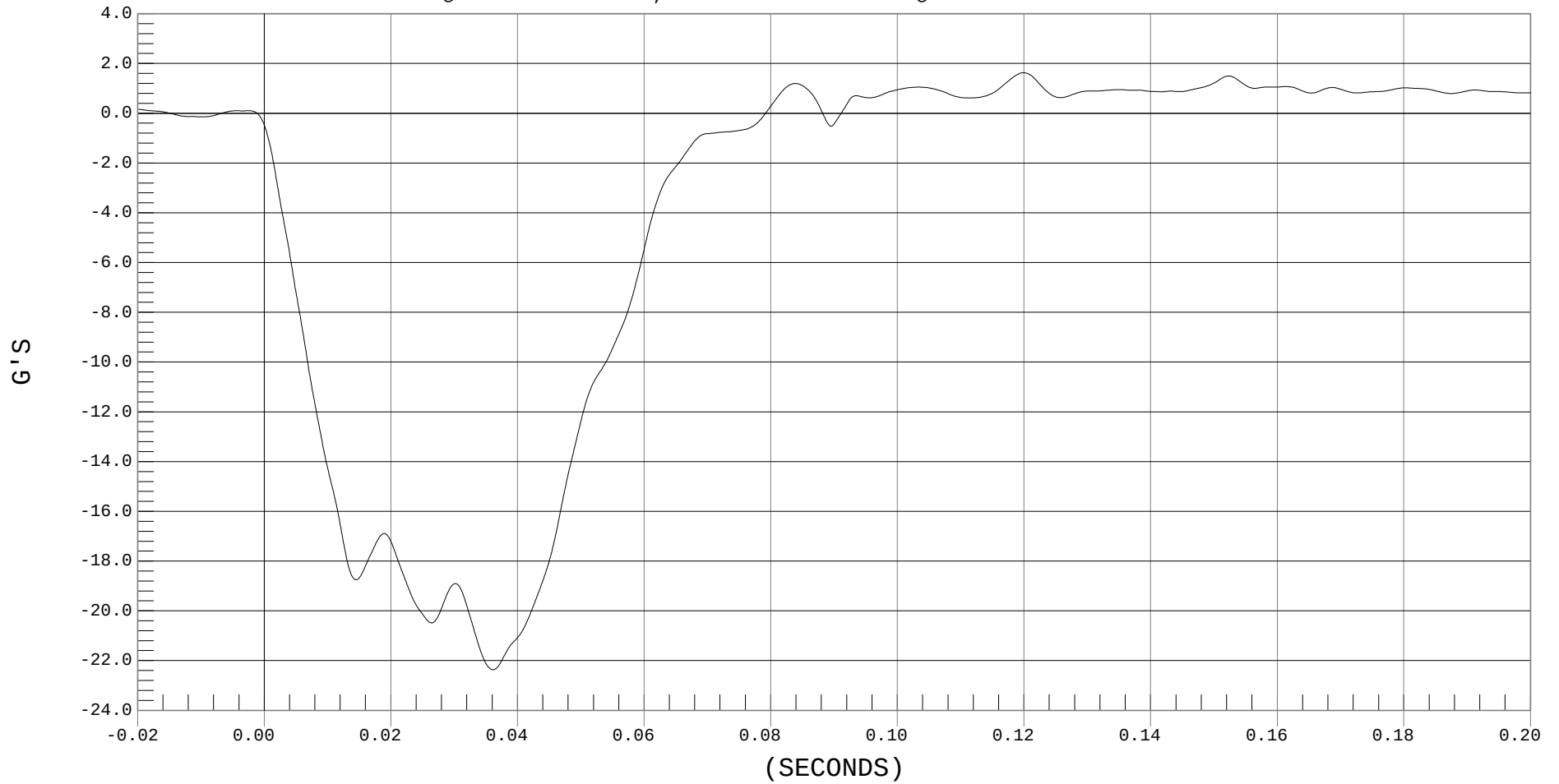
MOVING BARRIER REAR AXLE X ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 CART REAR X, C01010AF.A05

Ymin = -22.37 G'S @ 0.0361 SECONDS, Ymax = 1.63 G'S @ 0.1199 SECONDS





MOVING BARRIER REAR AXLE X VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

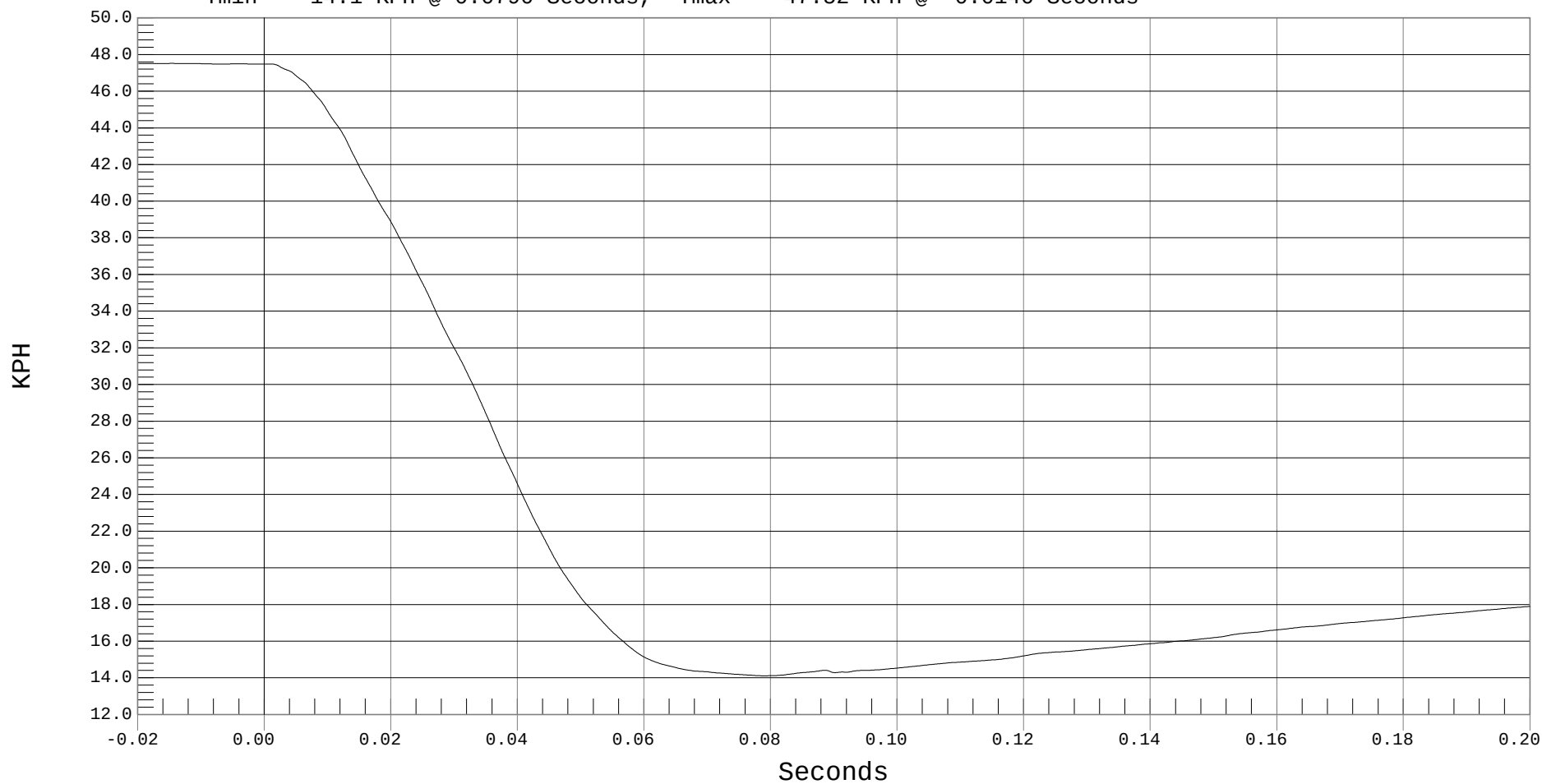
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

1 MOVING BARRIER REAR AXLE X VELOCITY, C01010AI.V05

Ymin = 14.1 KPH @ 0.0790 Seconds, Ymax = 47.52 KPH @ -0.0146 Seconds





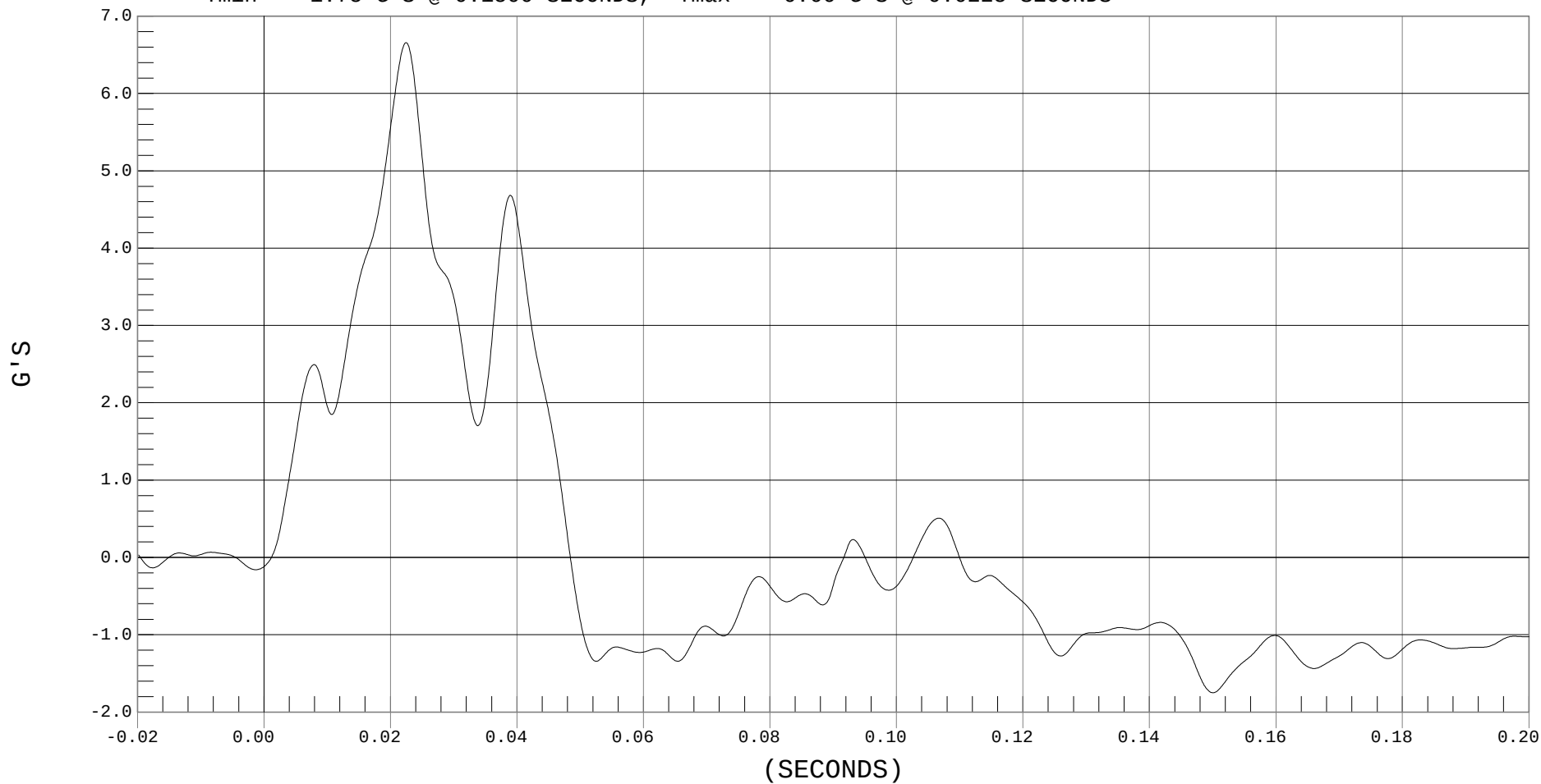
MOVING BARRIER REAR AXLE Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 60

— 1 CART REAR Y, C01010AF.A06

Ymin = -1.75 G'S @ 0.1500 SECONDS, Ymax = 6.66 G'S @ 0.0225 SECONDS





MOVING BARRIER REAR AXLE Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

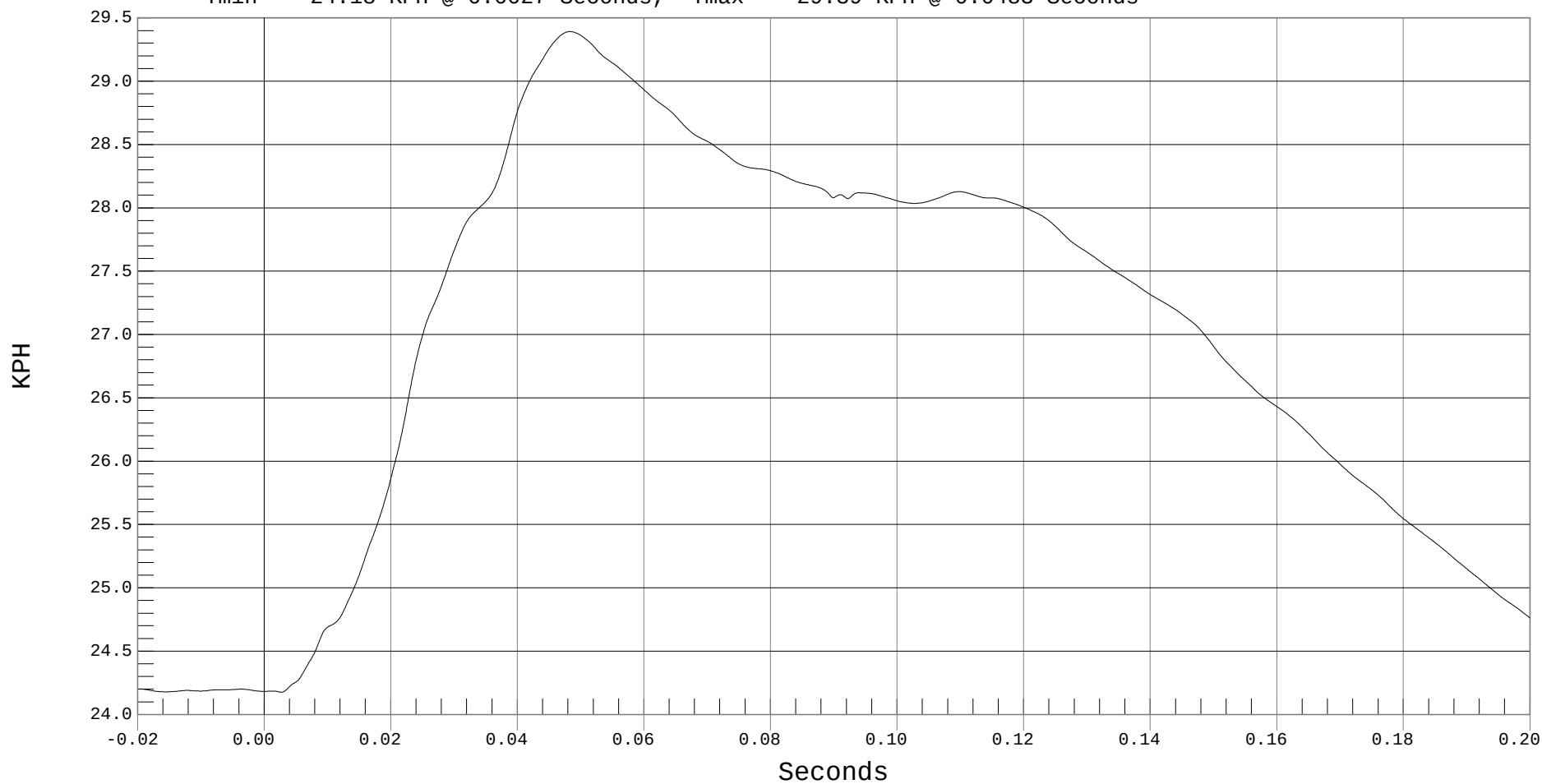
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 MOVING BARRIER REAR AXLE Y VELOCITY, C01010AI.V06

Ymin = 24.18 KPH @ 0.0027 Seconds, Ymax = 29.39 KPH @ 0.0483 Seconds





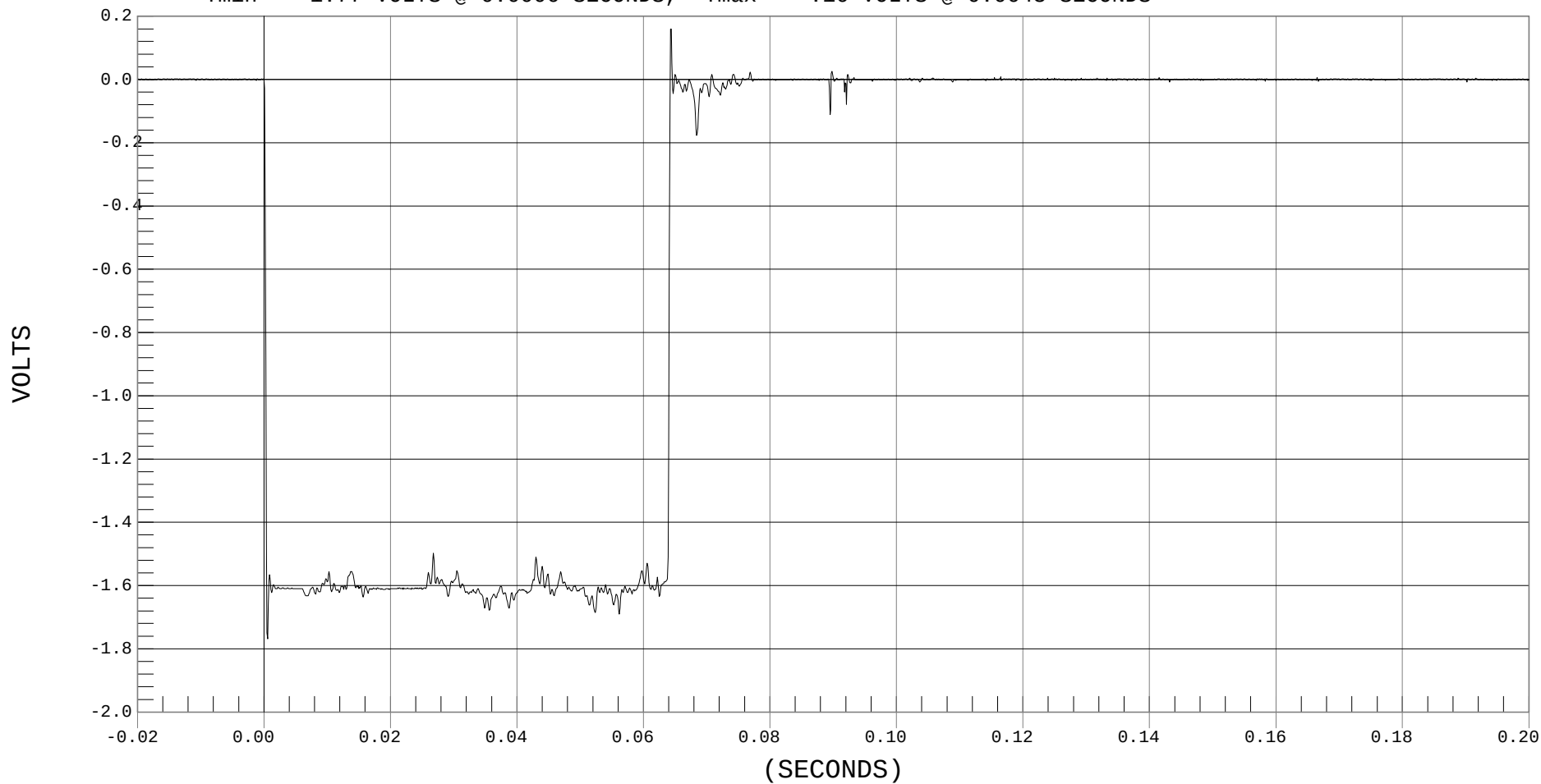
LEFT BARRIER CONTACT

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 LEFT BARRIER CONTACT, C010100T.009

Ymin = -1.77 VOLTS @ 0.0006 SECONDS, Ymax = .16 VOLTS @ 0.0643 SECONDS





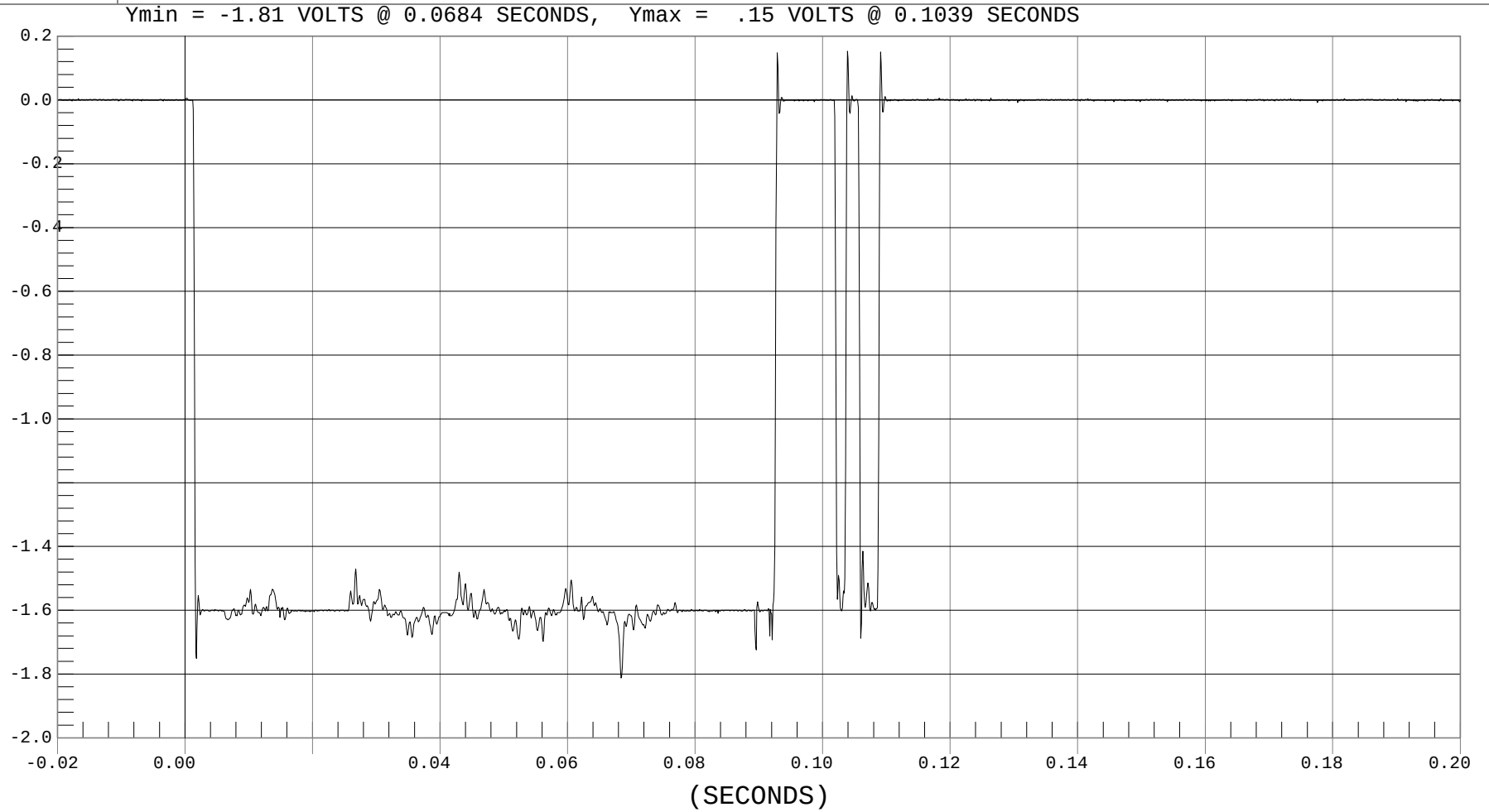
RIGHT BARRIER CONTACT

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 RIGHT BARRIER CONTACT, C010100T.010

VOLTS





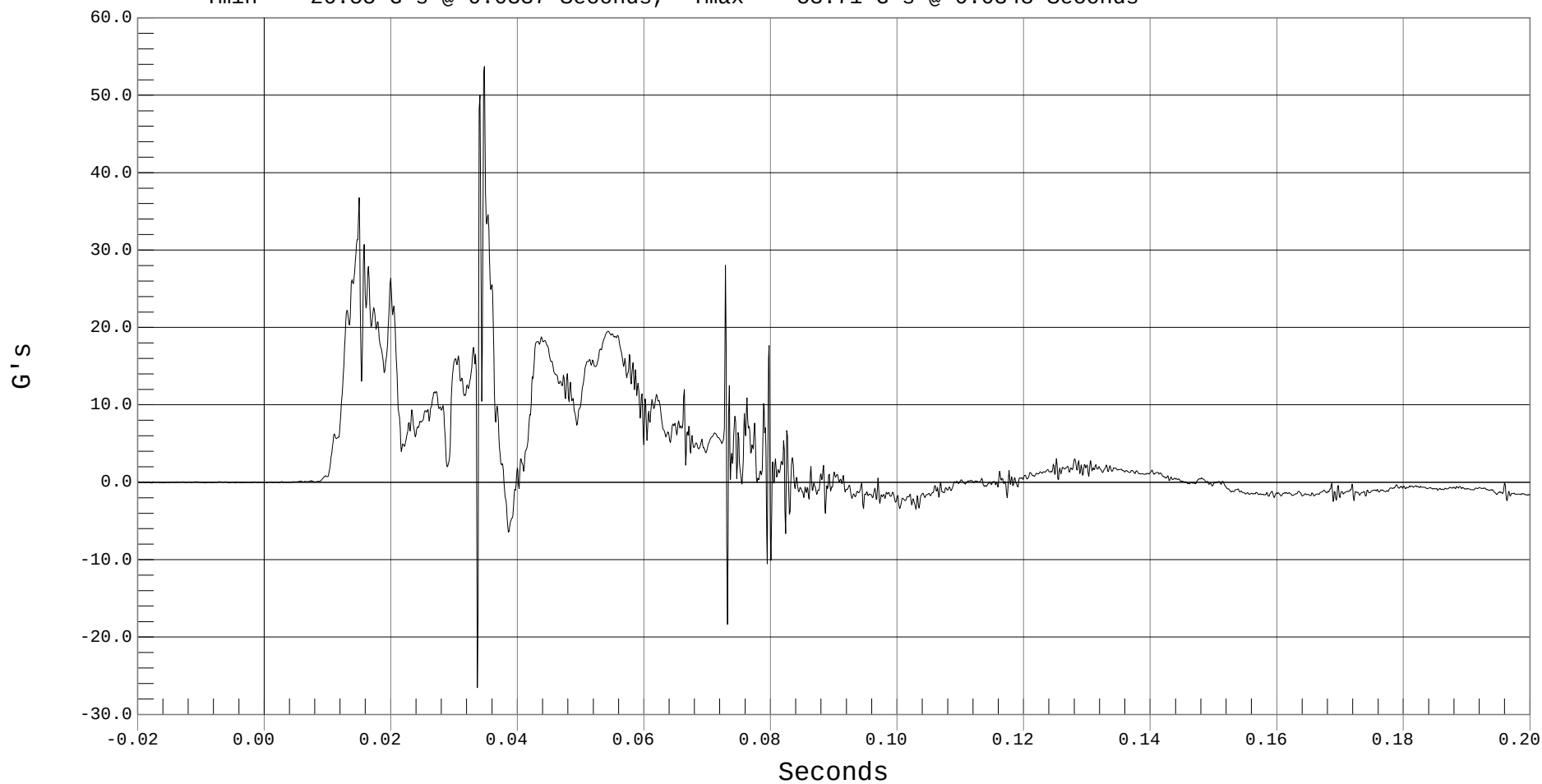
DRIVER UPPER RIB REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 DRIVER UPPER RIB Yr, B01010AT.A41

Ymin = -26.55 G's @ 0.0337 Seconds, Ymax = 53.71 G's @ 0.0348 Seconds





DRIVER UPPER RIB REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

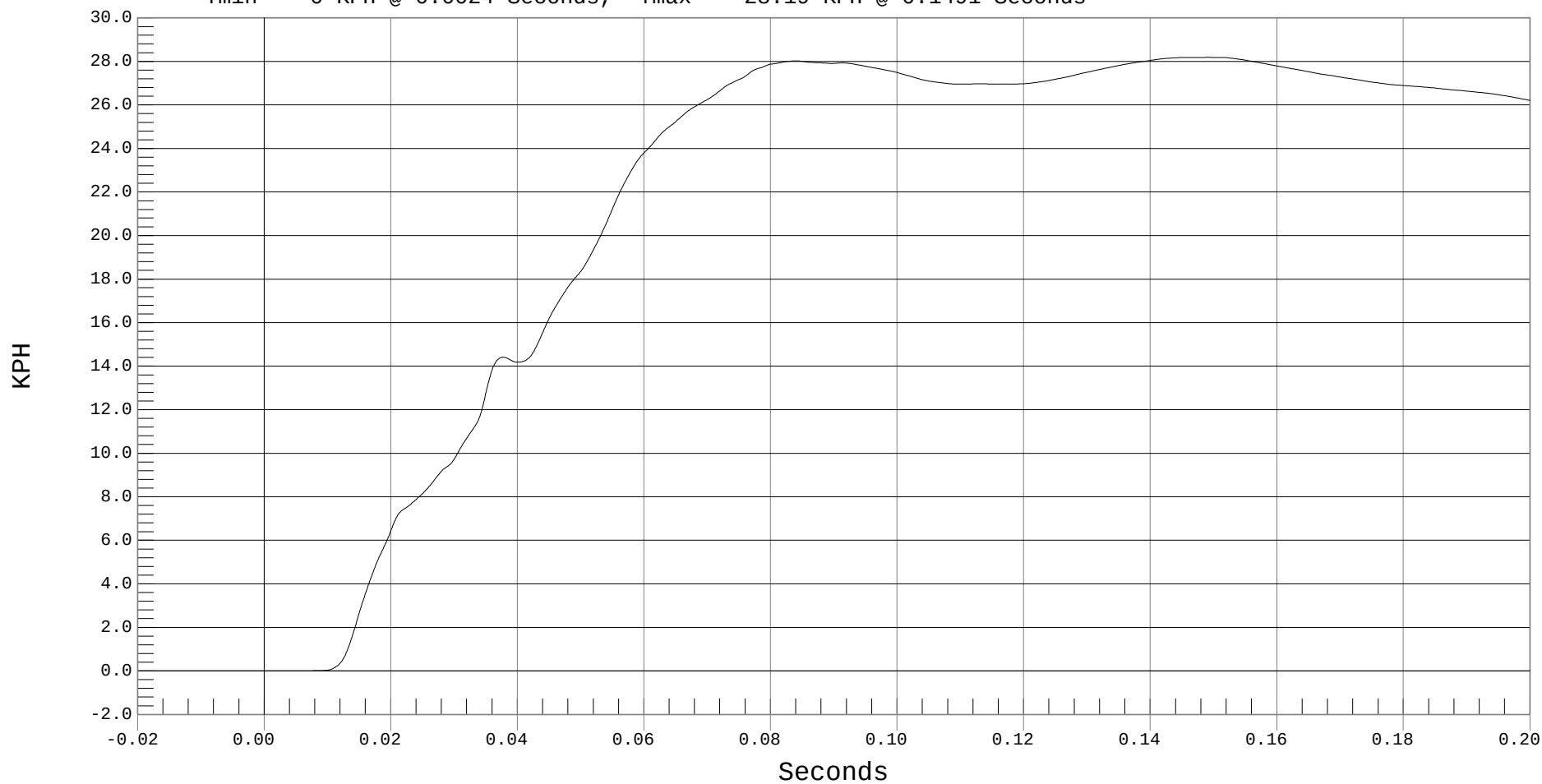
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 DRIVER UPPER RIB Y REDUNDANT VELOCITY, B01010AI.V41

Ymin = 0 KPH @ 0.0024 Seconds, Ymax = 28.19 KPH @ 0.1491 Seconds





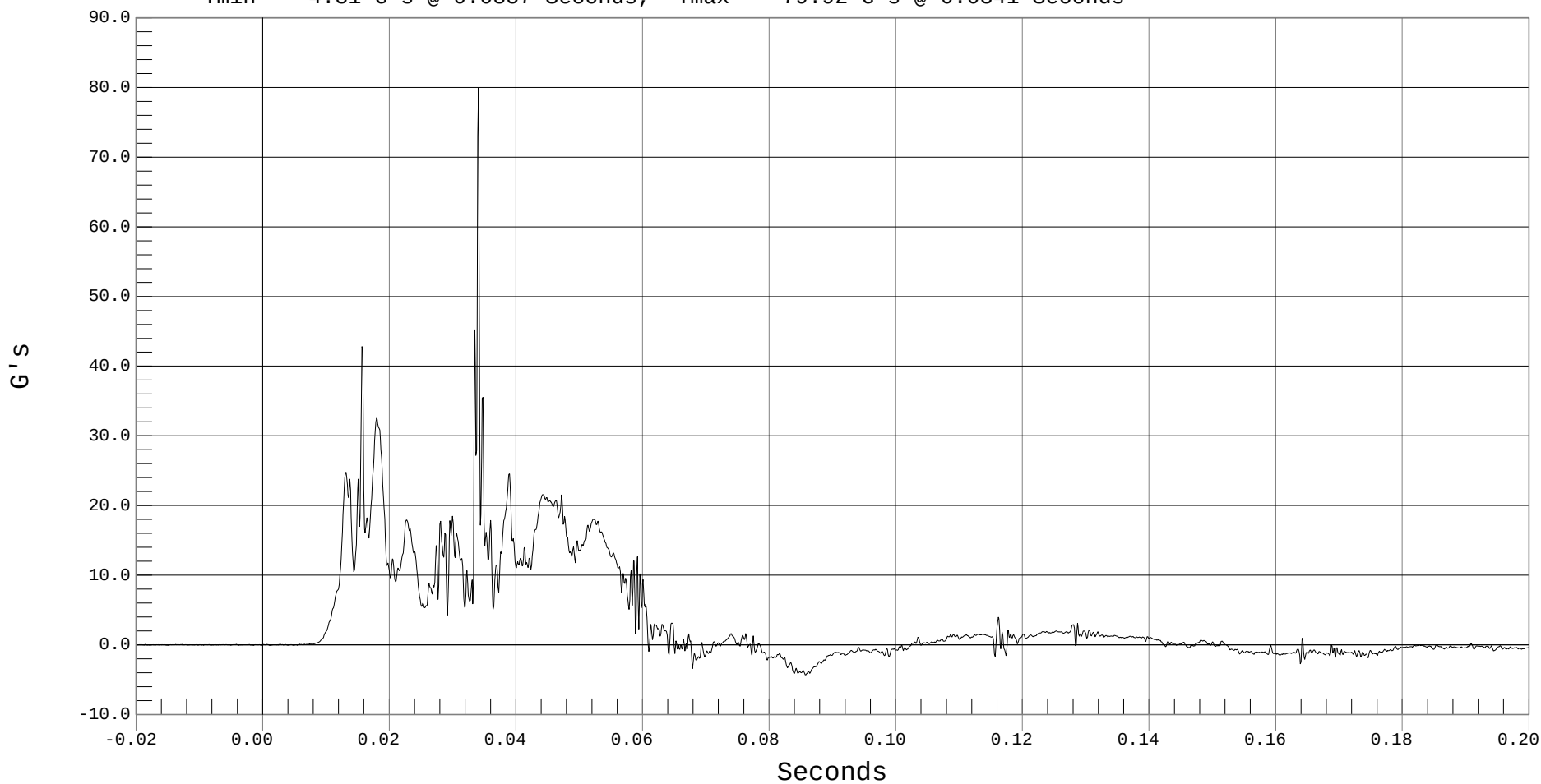
DRIVER LOWER RIB REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 DRIVER LOWER RIB Yr, B01010AT.A42

Ymin = -4.31 G's @ 0.0857 Seconds, Ymax = 79.92 G's @ 0.0341 Seconds





DRIVER LOWER RIB REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

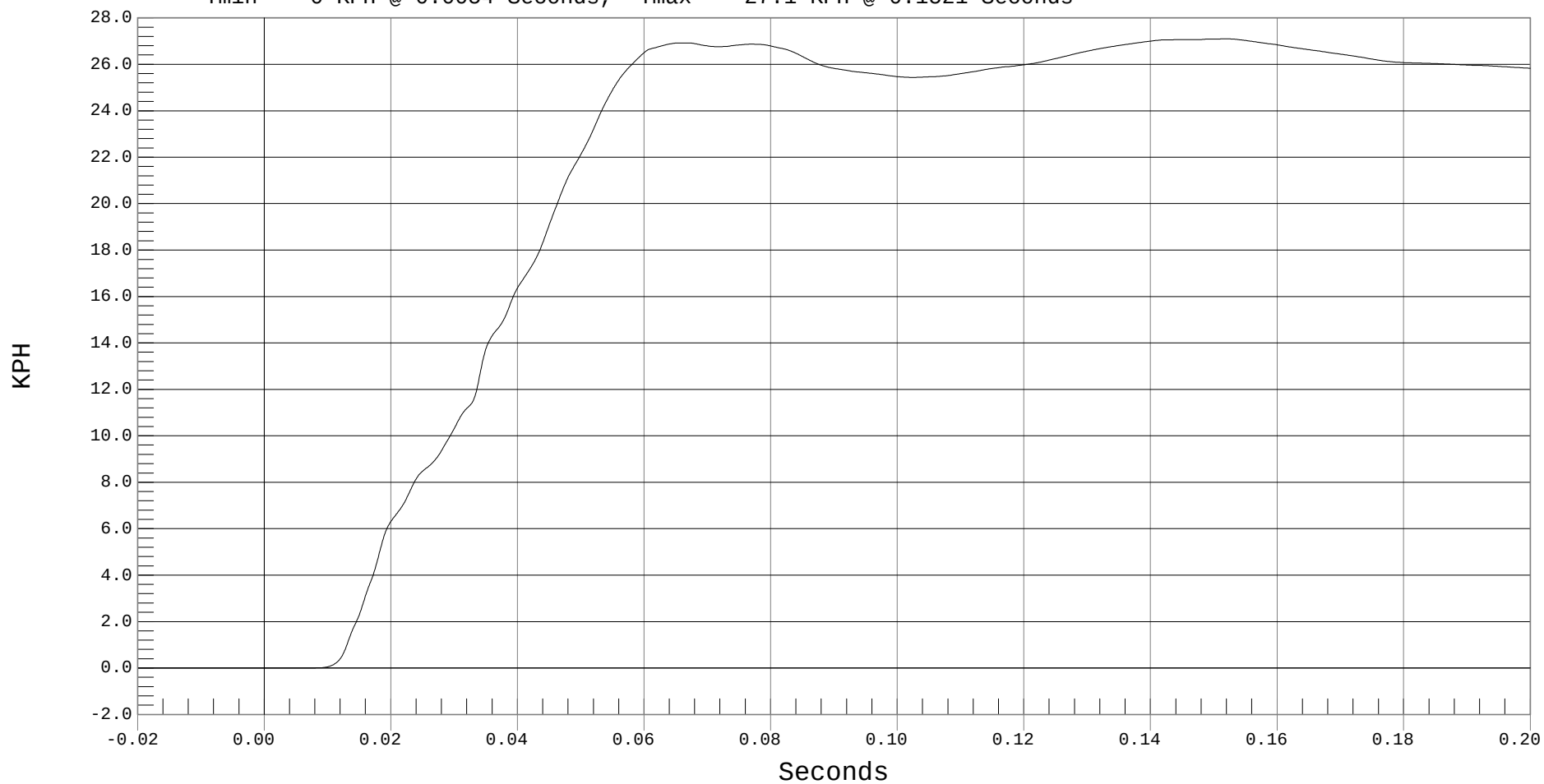
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 DRIVER LOWER RIB Y REDUNDANT VELOCITY, B01010AI.V42

Ymin = 0 KPH @ 0.0054 Seconds, Ymax = 27.1 KPH @ 0.1521 Seconds





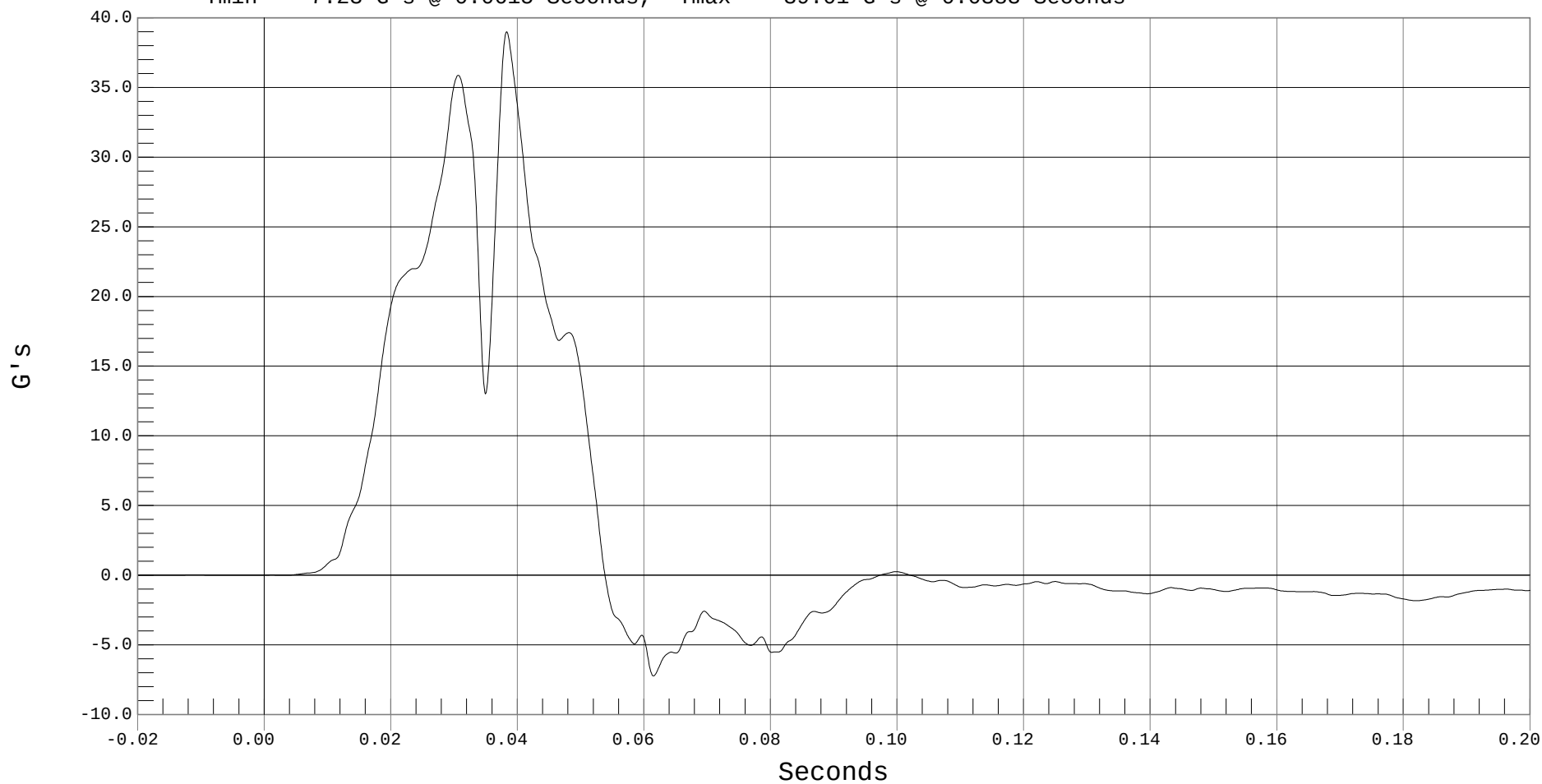
DRIVER LOVER SPINE REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 180

— 1 DRIVER LOWER SPINE Yr, B01010AF.A43

Ymin = -7.23 G's @ 0.0615 Seconds, Ymax = 39.01 G's @ 0.0383 Seconds





DRIVER LOWER SPINE REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

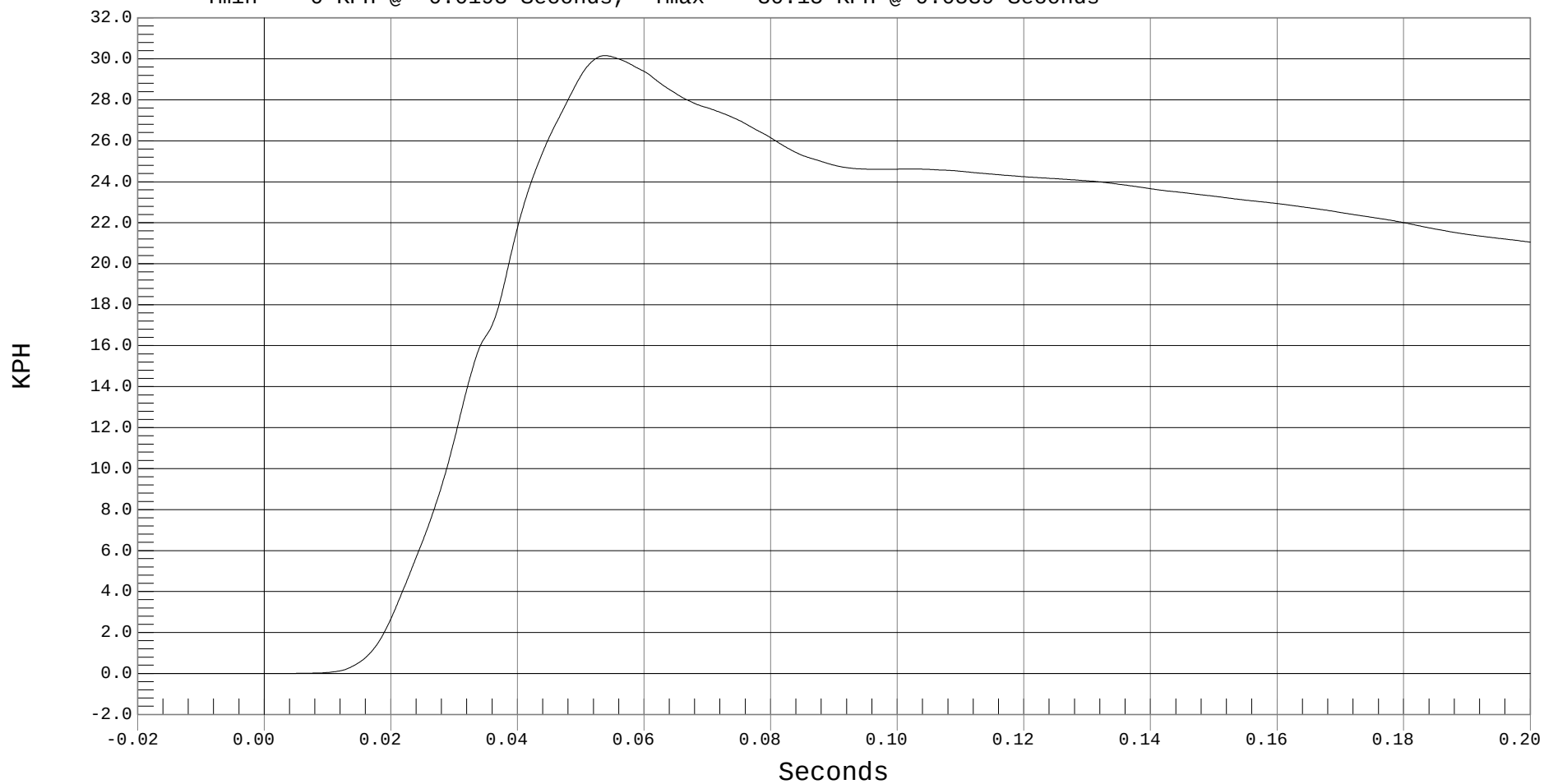
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 DRIVER LOWER SPINE Y REDUNDANT VELOCITY, B01010AI.V43

Ymin = 0 KPH @ -0.0193 Seconds, Ymax = 30.15 KPH @ 0.0539 Seconds





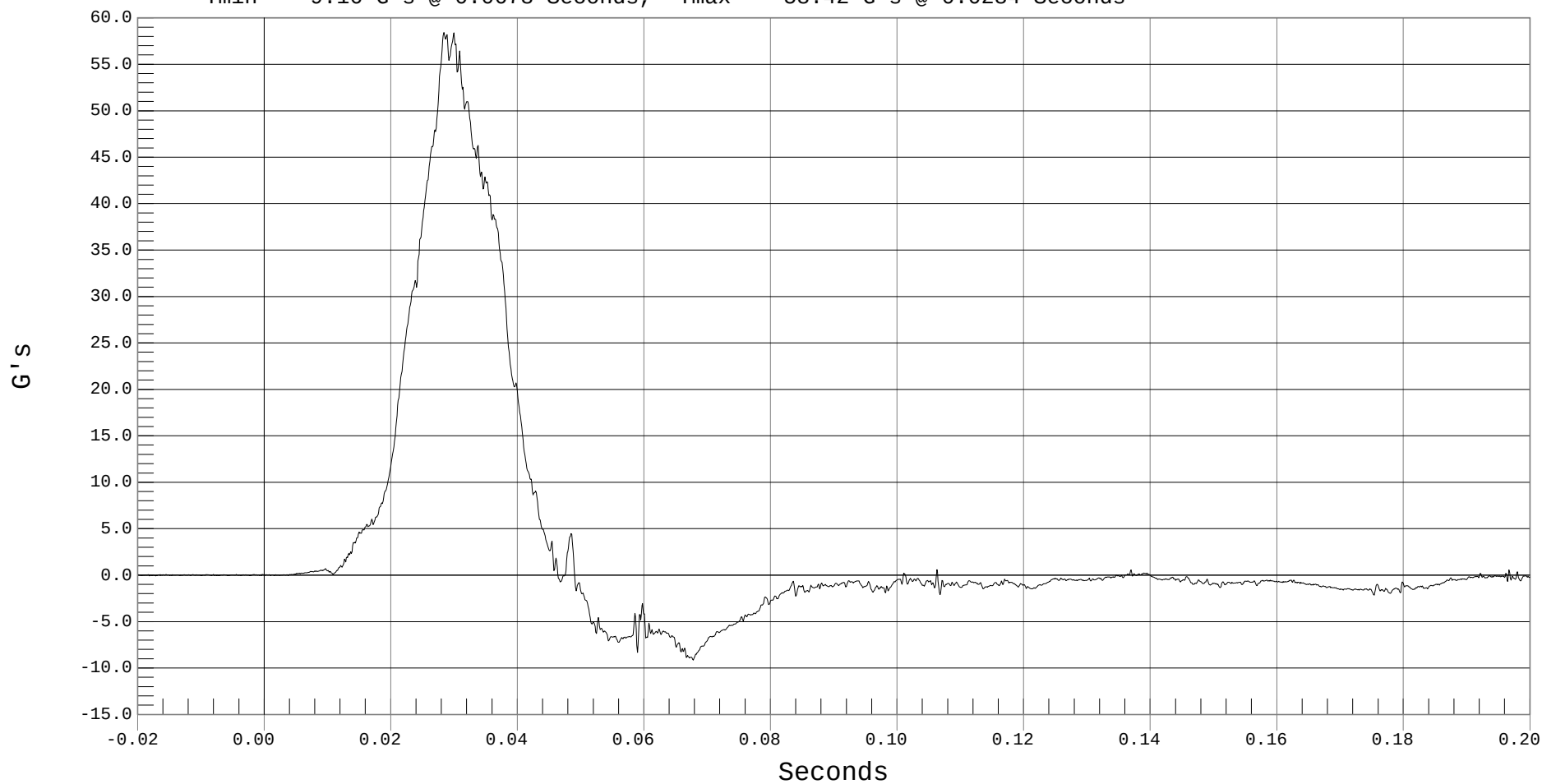
DRIVER PELVIS REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 D00R (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 DRIVER PELVIS Yr, B01010AT.A44

Ymin = -9.16 G's @ 0.0678 Seconds, Ymax = 58.42 G's @ 0.0284 Seconds





DRIVER PELVIS REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

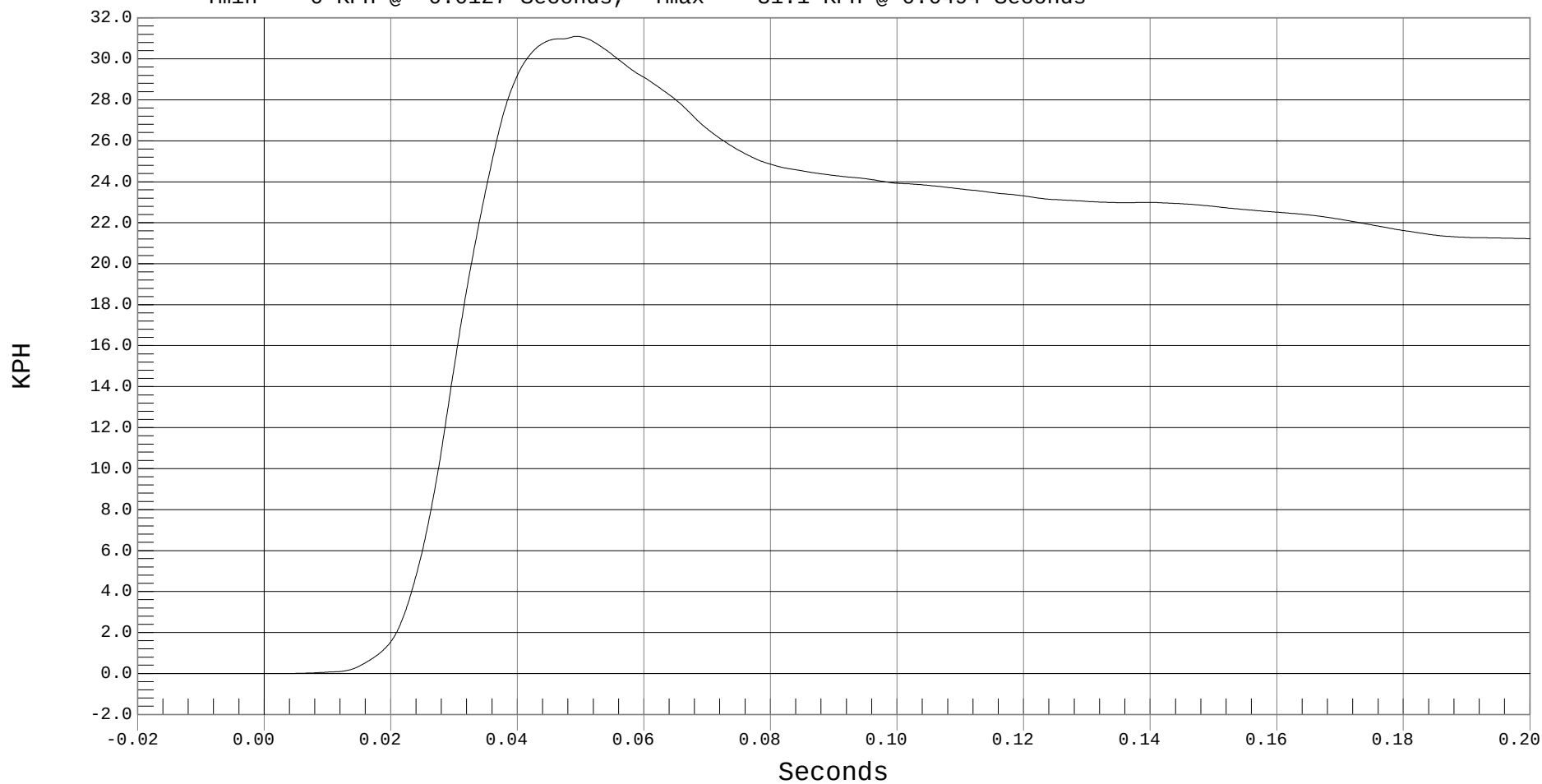
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 DRIVER PELVIS Y REDUNDANT VELOCITY, B01010AI.V44

Ymin = 0 KPH @ -0.0127 Seconds, Ymax = 31.1 KPH @ 0.0494 Seconds





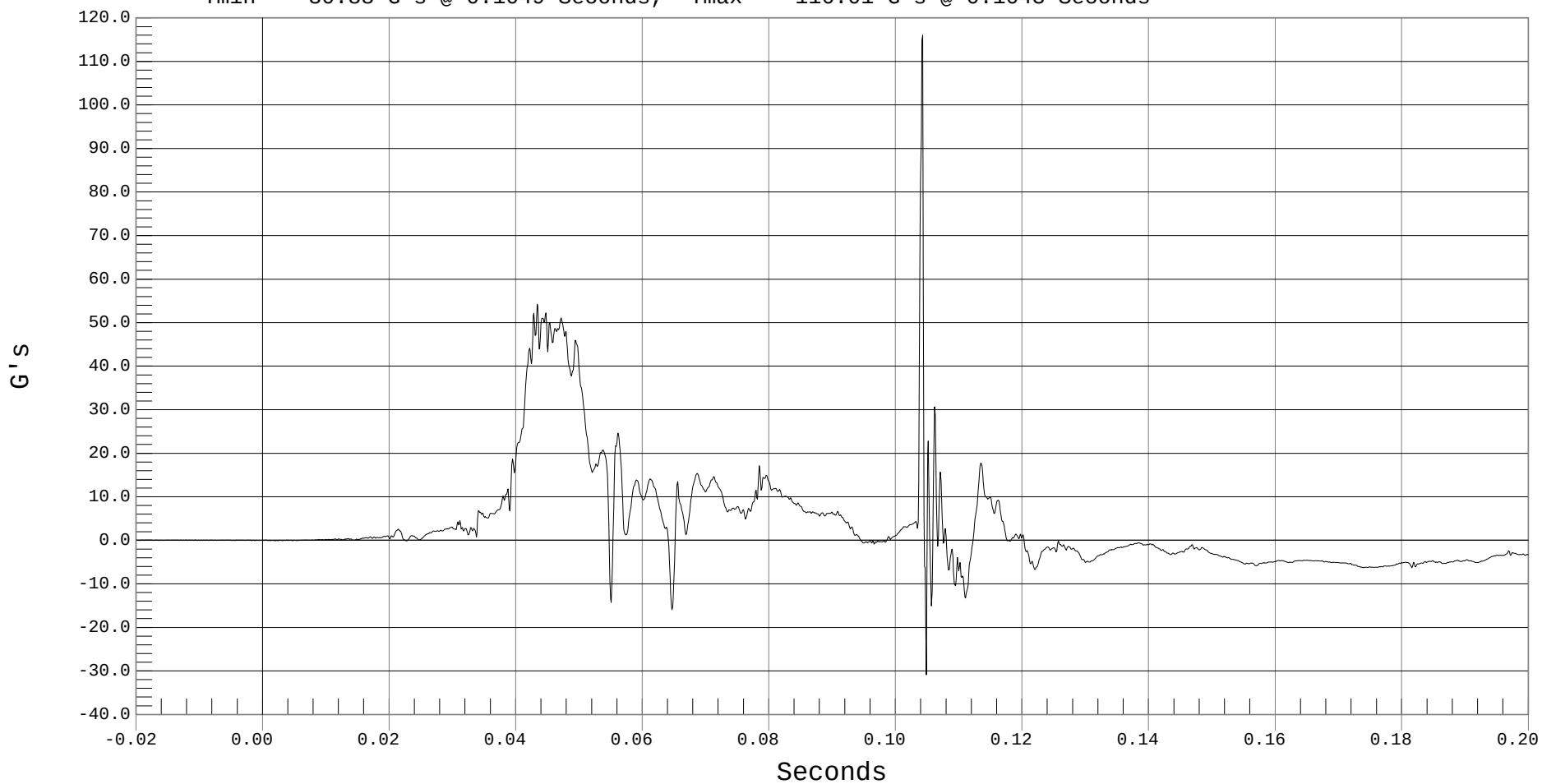
PASSENGER UPPER RIB REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 PASSENGER UPPER RIB Yr, B01010AT.A50

Ymin = -30.88 G's @ 0.1049 Seconds, Ymax = 116.01 G's @ 0.1043 Seconds





PASSENGER UPPER RIB REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

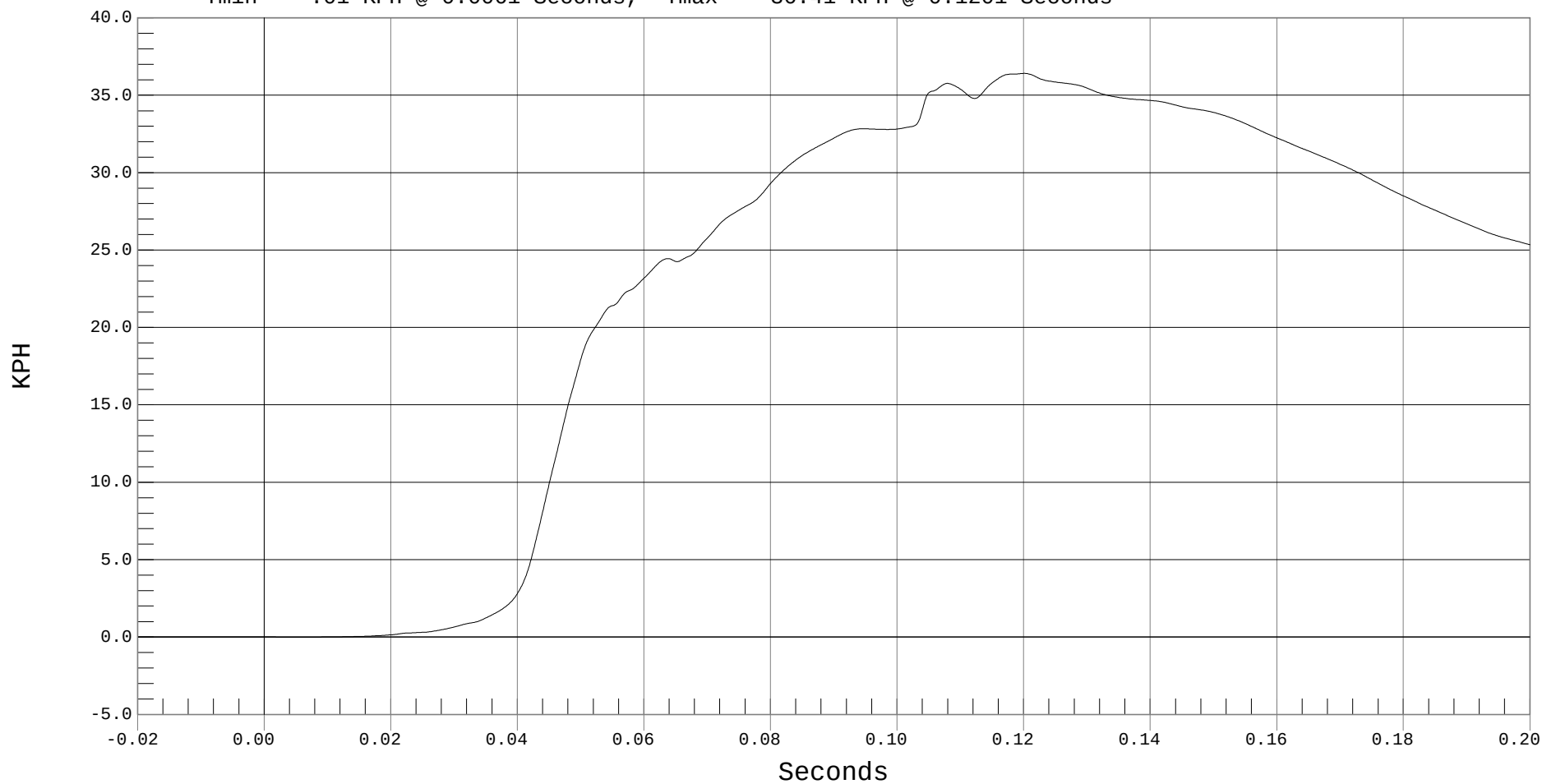
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Filter Class: 180

— 1 REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY, B01010AI.V50

Ymin = -.01 KPH @ 0.0061 Seconds, Ymax = 36.41 KPH @ 0.1201 Seconds





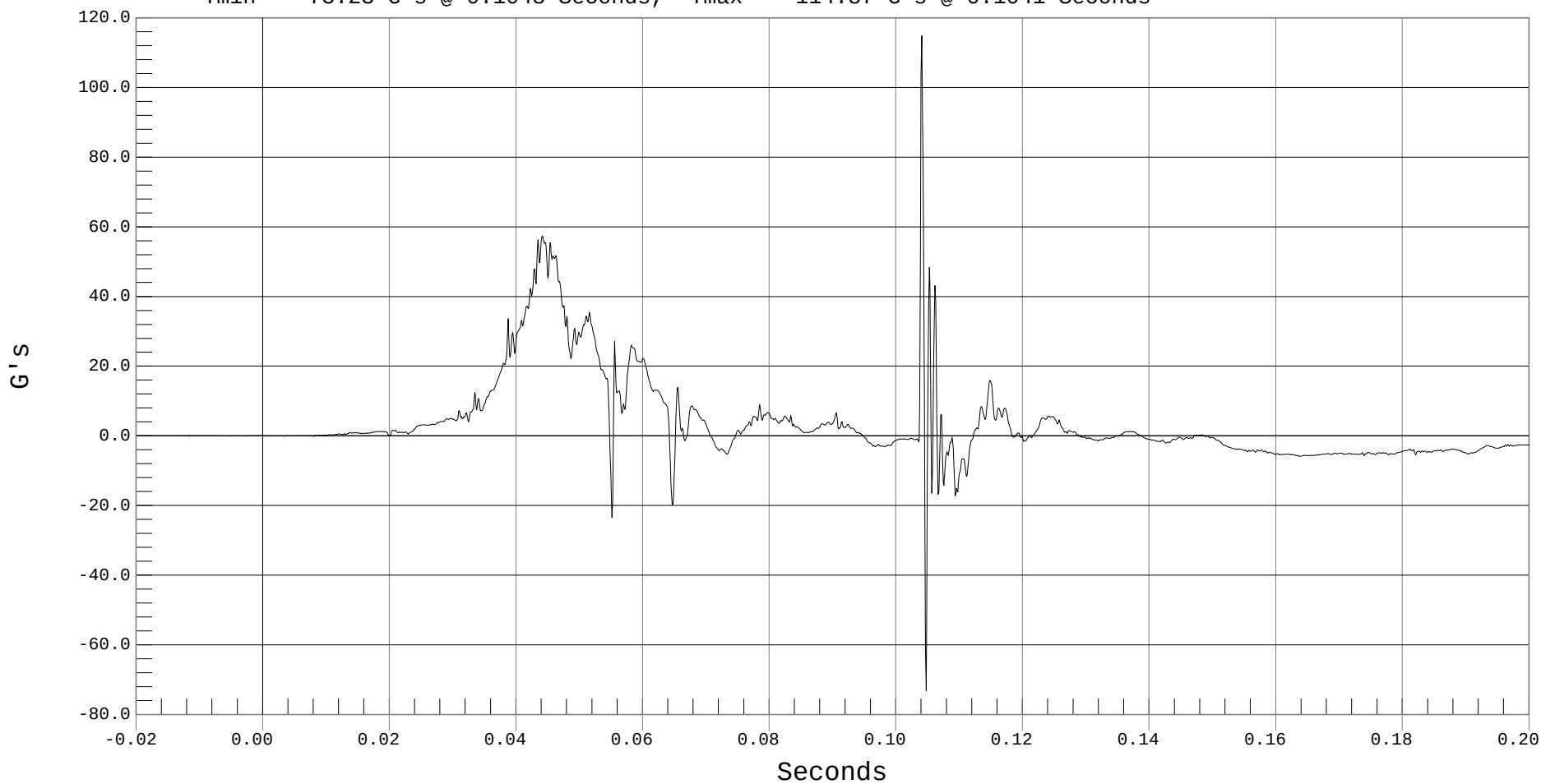
PASSENGER LOWER RIB REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 D00R (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 PASSENGER LOWER RIB Yr, B01010AT.A46

Ymin = -73.23 G's @ 0.1048 Seconds, Ymax = 114.87 G's @ 0.1041 Seconds





PASSENGER LOWER RIB REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

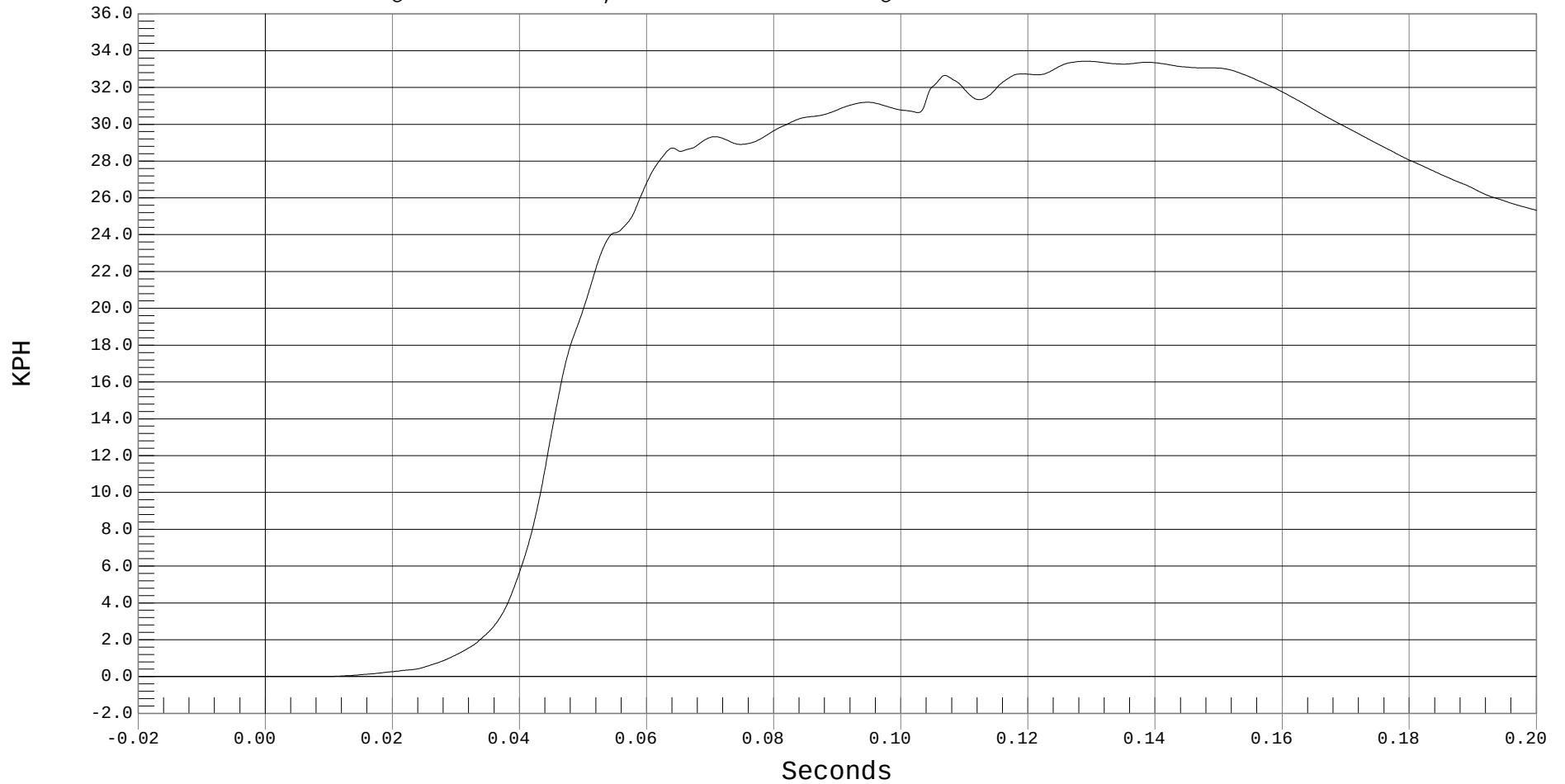
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Filter Class: 180

— 1 REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY, B01010AI.V46

Ymin = 0 KPH @ 0.0049 Seconds, Ymax = 33.42 KPH @ 0.1291 Seconds





PASSENGER LOWER SPINE REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 D00R (C15901)

Other Info:

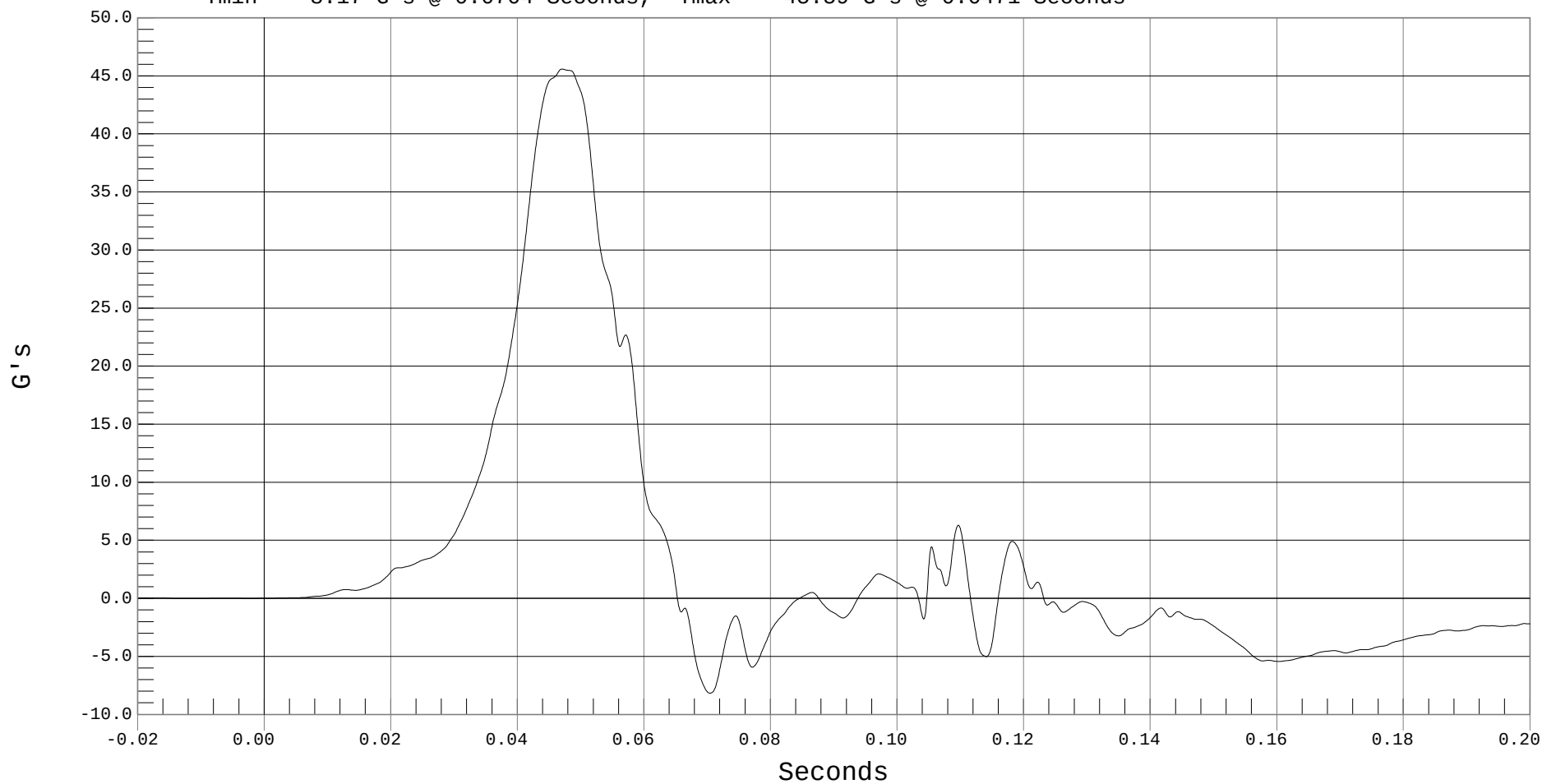
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 PASSENGER LOWER SPINE Yr, B01010AF.A47

Ymin = -8.17 G's @ 0.0704 Seconds, Ymax = 45.59 G's @ 0.0471 Seconds





PASSENGER LOWER SPINE REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

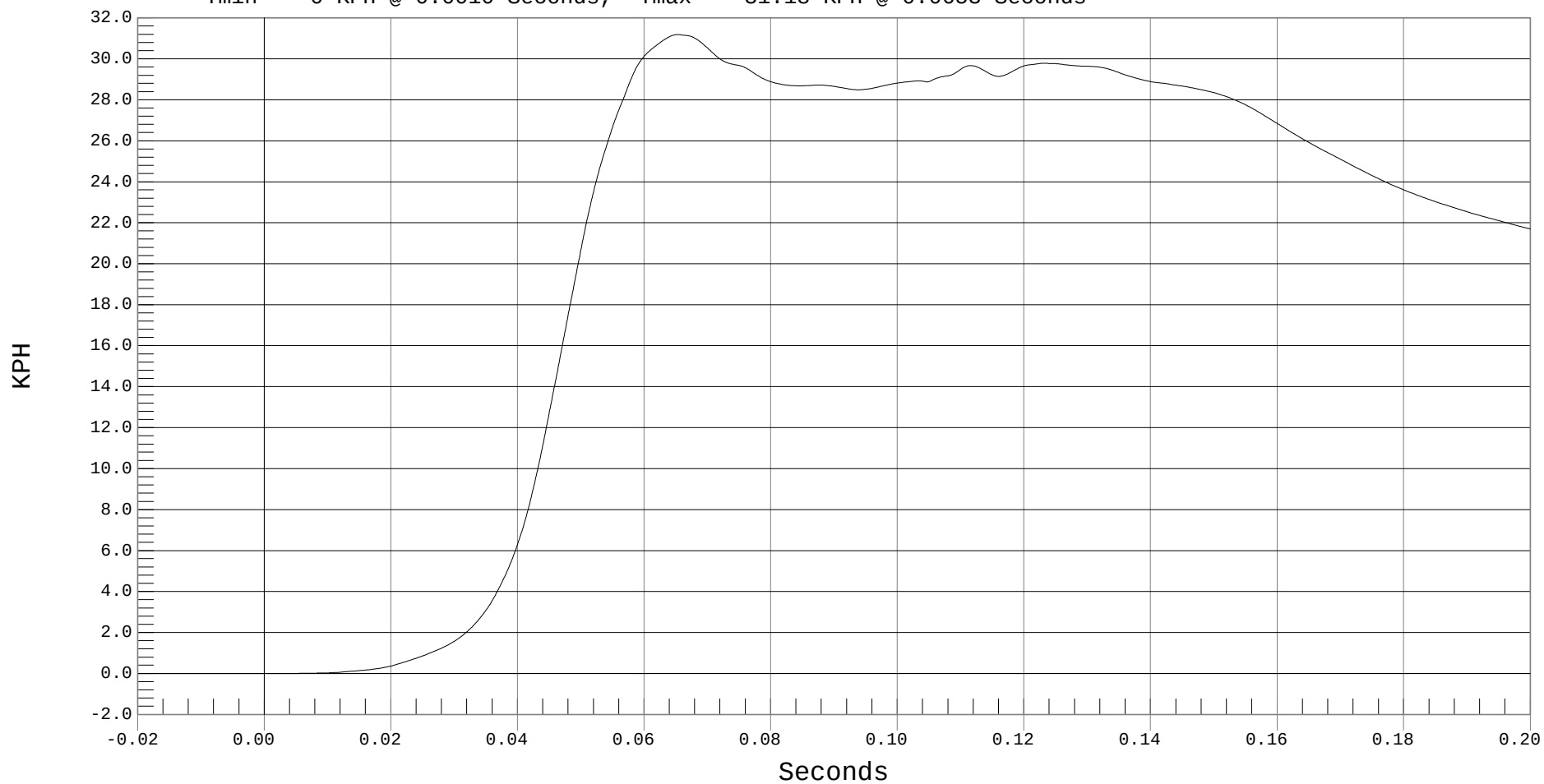
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Filter Class: 180

— 1 REAR PASSENGER LOWER SPINE Y REDUNDANT VELOCITY, B01010AI.V47

Ymin = 0 KPH @ 0.0010 Seconds, Ymax = 31.18 KPH @ 0.0653 Seconds





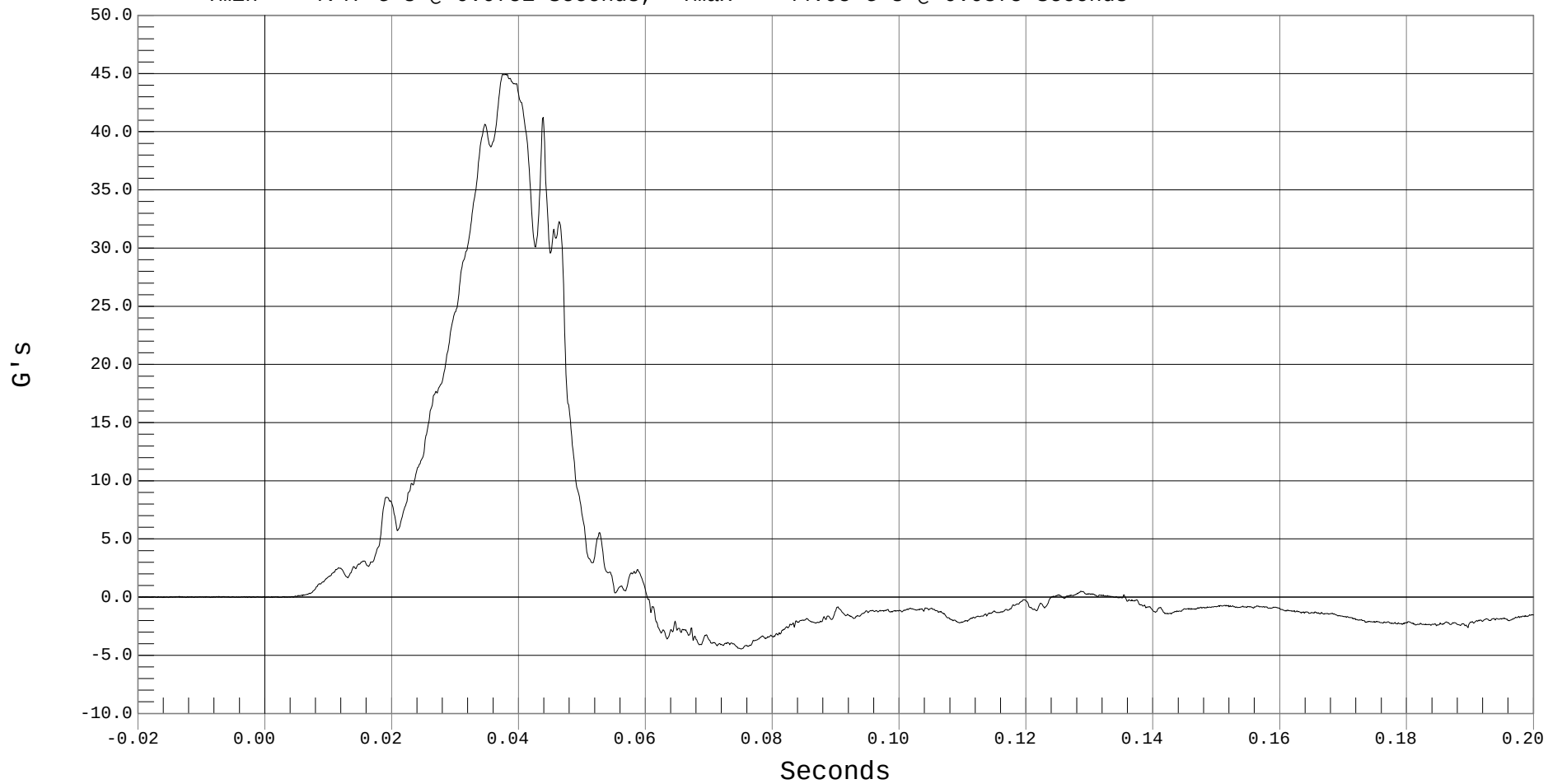
PASSENGER PELVIS REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Filter Class: 1000

— 1 PASSENGER PELVIS Yr, B01010AT.A48

Ymin = -4.47 G's @ 0.0751 Seconds, Ymax = 44.95 G's @ 0.0375 Seconds





PASSENGER PELVIS REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

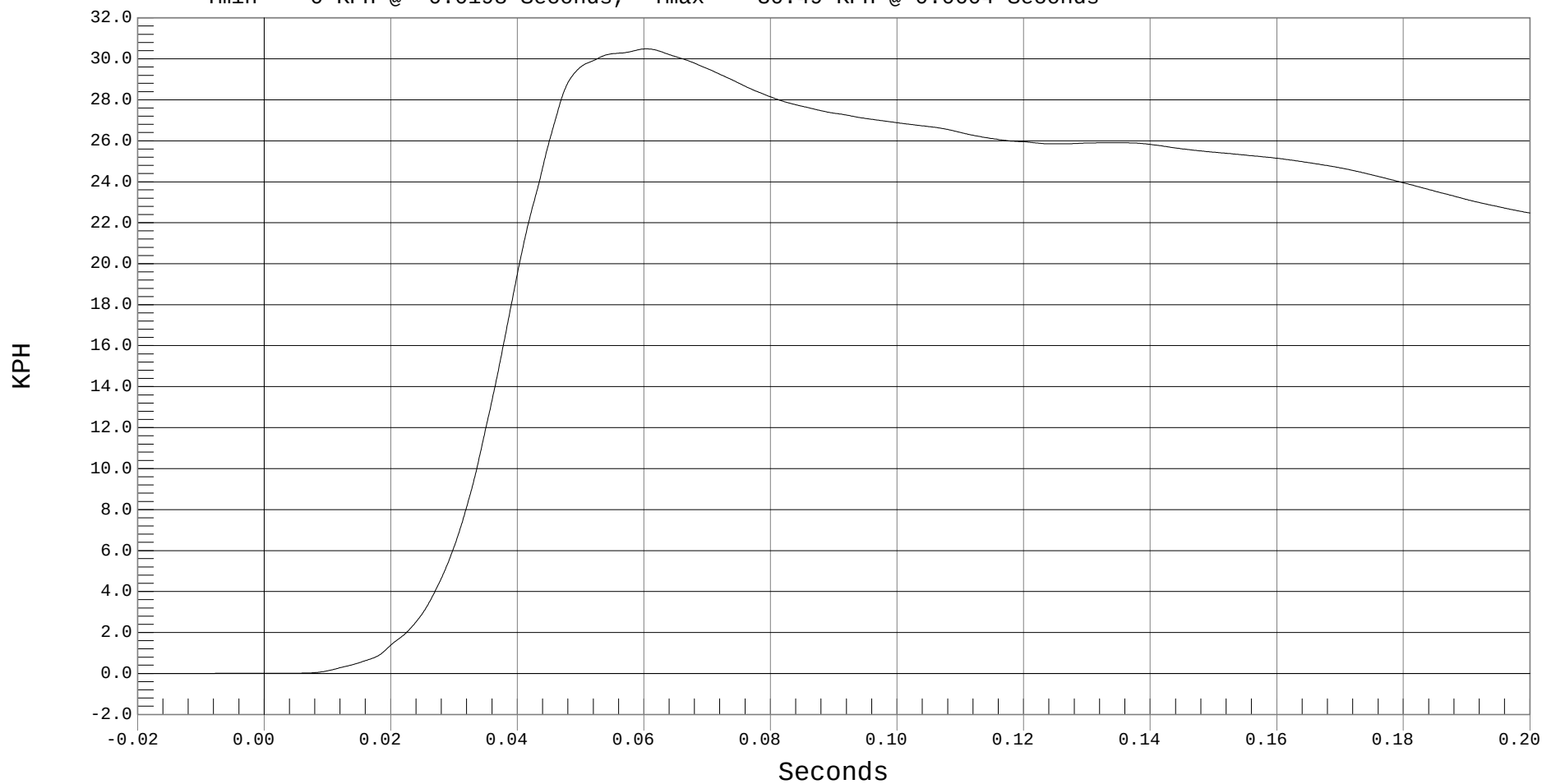
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Filter Class: 180

— 1 REAR PASSENGER PELVIS Y REDUNDANT VELOCITY, B01010AI.V48

Ymin = 0 KPH @ -0.0198 Seconds, Ymax = 30.49 KPH @ 0.0604 Seconds





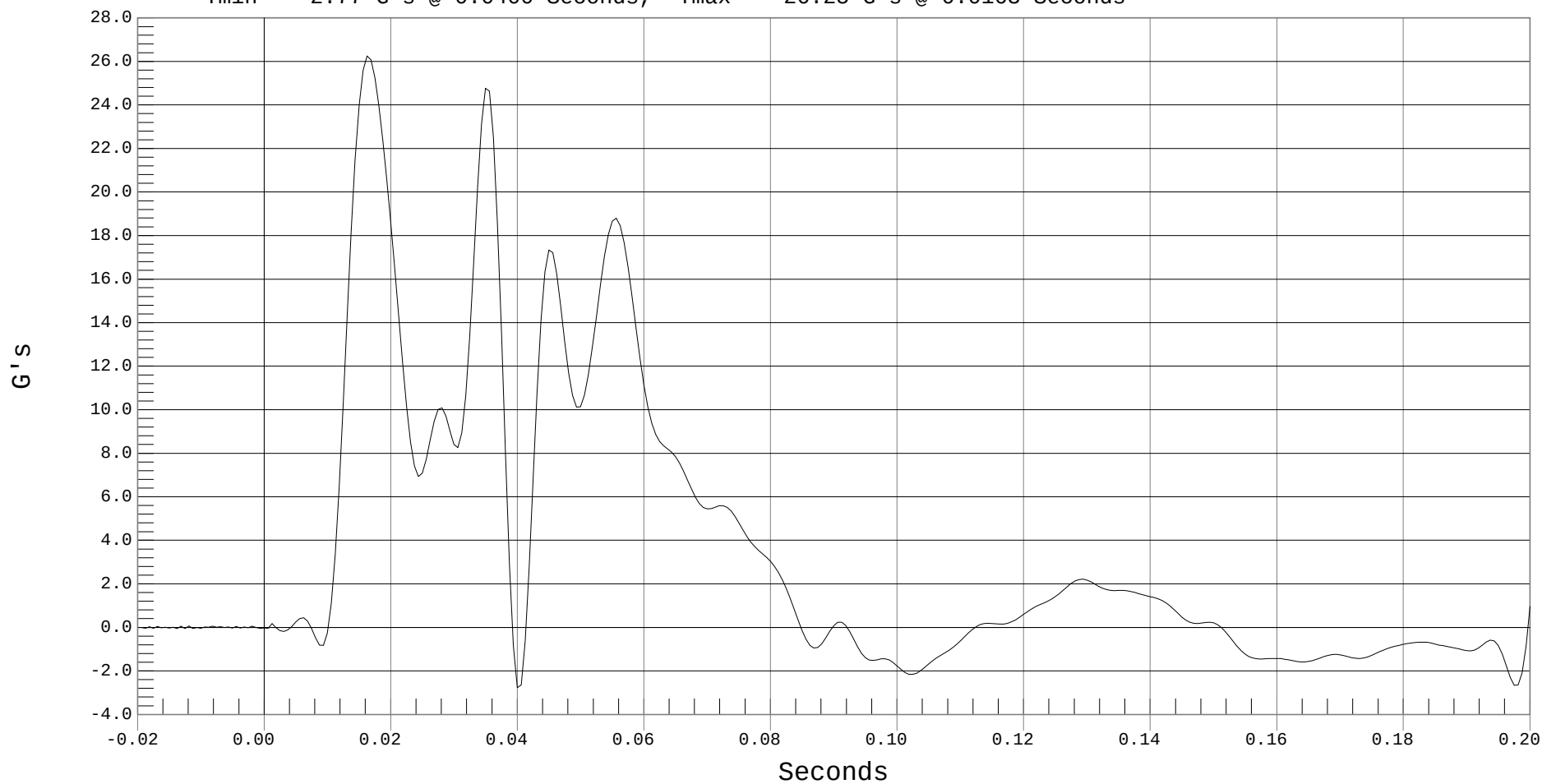
DRIVER UPPER RIB Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER UPPER RIB Y, B01010FI.R04

Ymin = -2.77 G's @ 0.0400 Seconds, Ymax = 26.25 G's @ 0.0163 Seconds





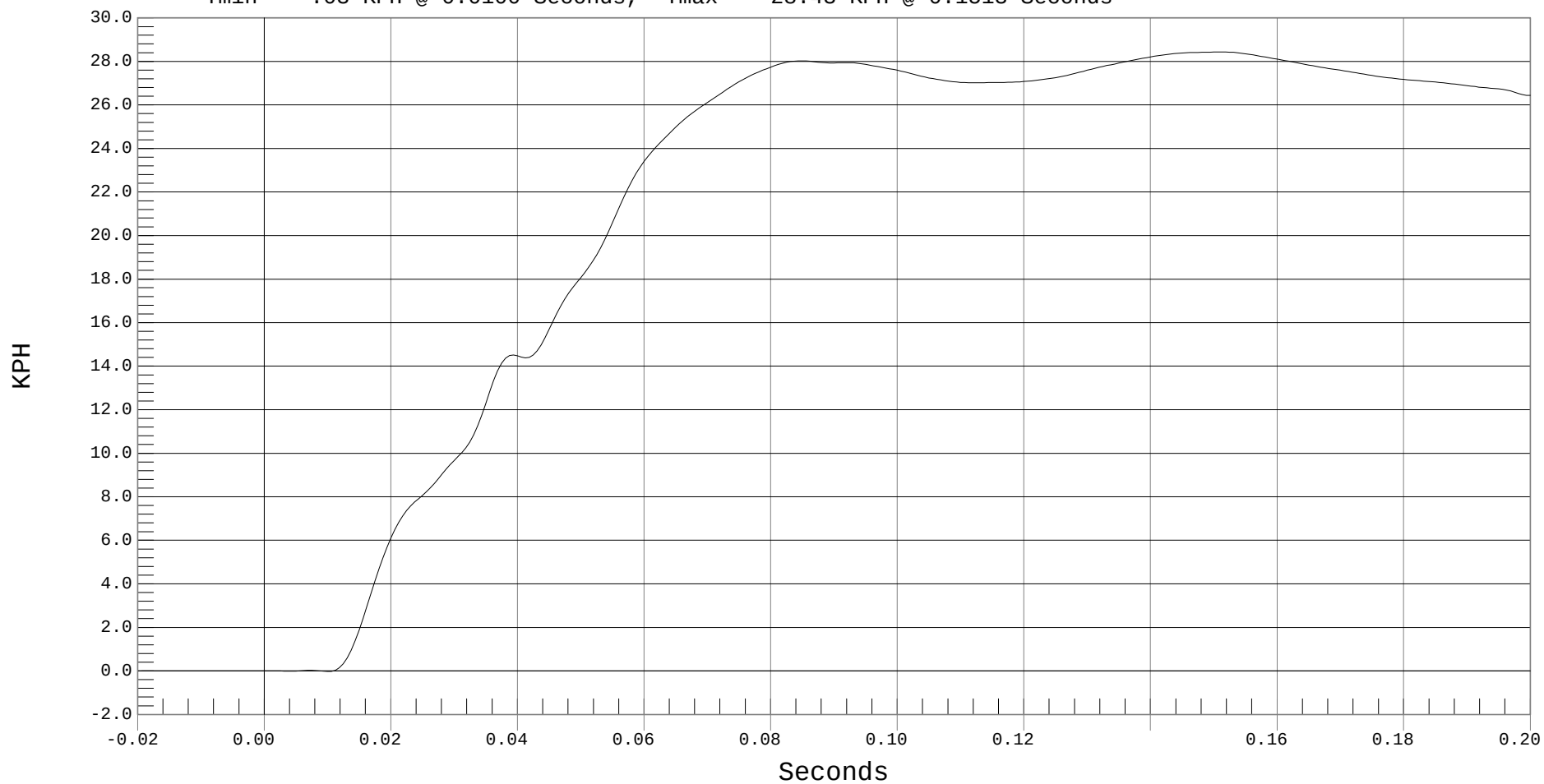
DRIVER UPPER RIB Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER UPPER RIB Y VELOCITY, B01010FI.V04

Ymin = -.03 KPH @ 0.0100 Seconds, Ymax = 28.43 KPH @ 0.1513 Seconds





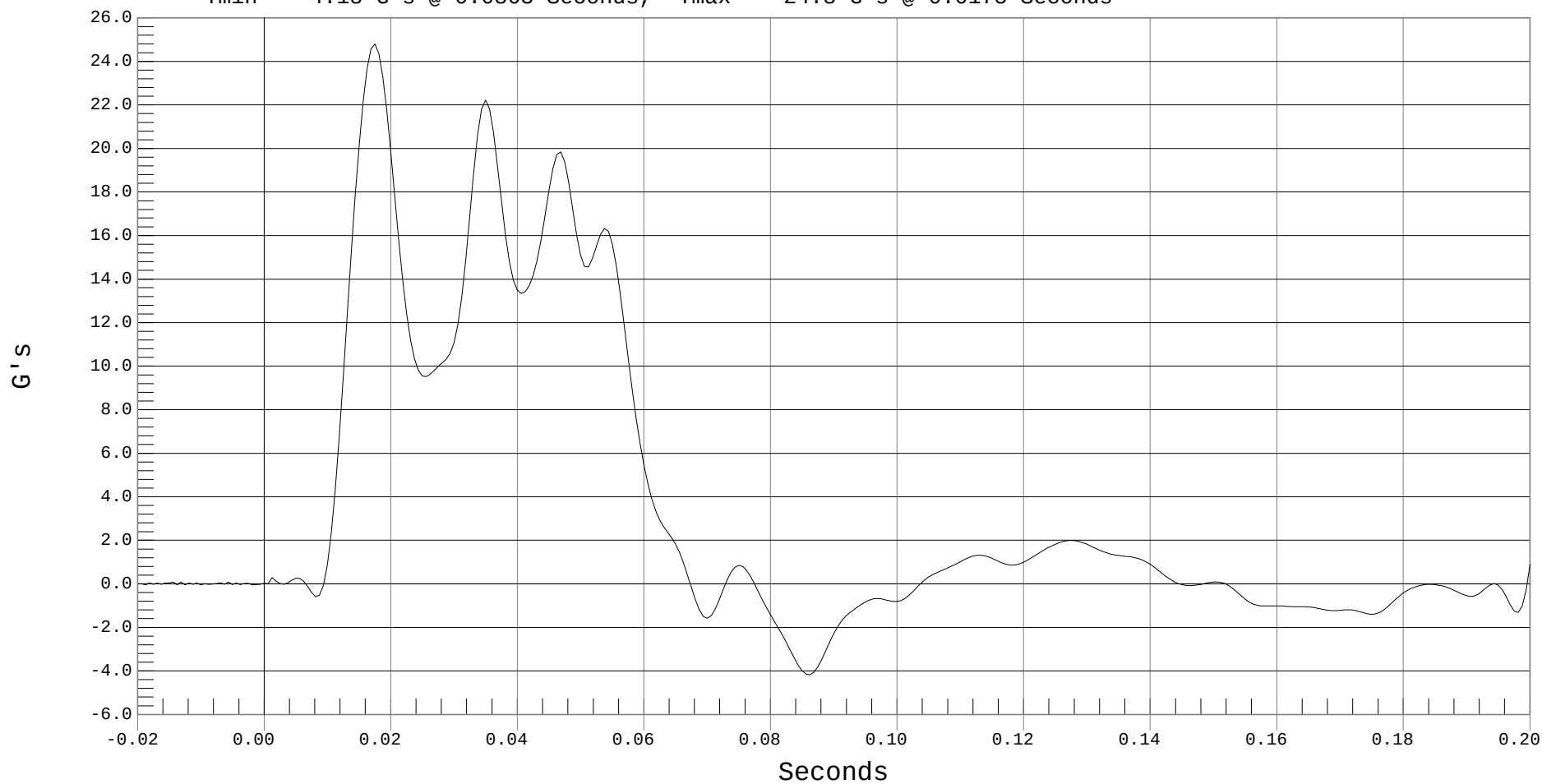
DRIVER LOWER RIB Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER LOWER RIB Y, B01010FI.R05

Ymin = -4.18 G's @ 0.0863 Seconds, Ymax = 24.8 G's @ 0.0175 Seconds





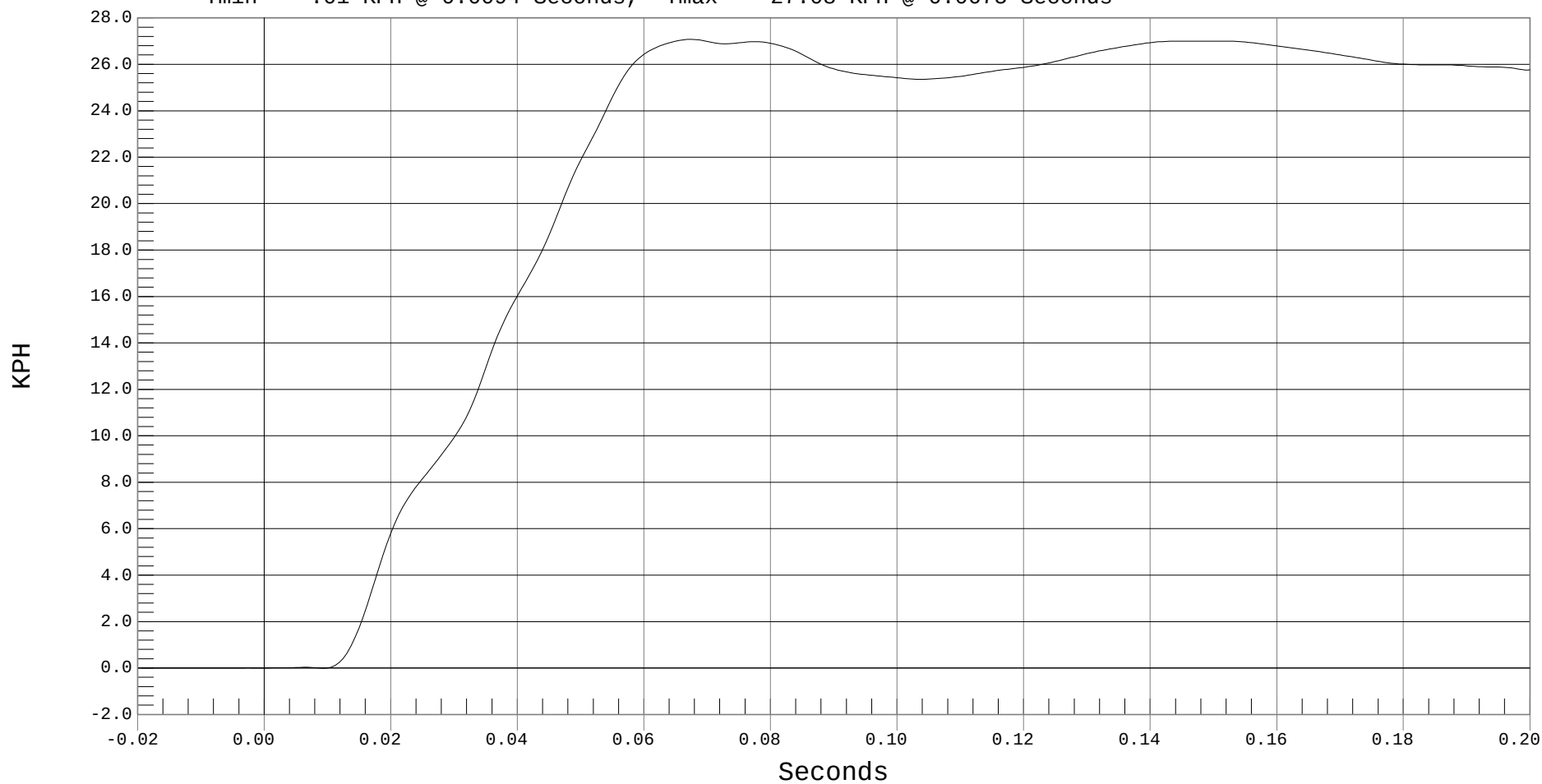
DRIVER LOWER RIB Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER LOWER RIB Y VELOCITY, B01010FI.V05

Ymin = -.01 KPH @ 0.0094 Seconds, Ymax = 27.08 KPH @ 0.0675 Seconds





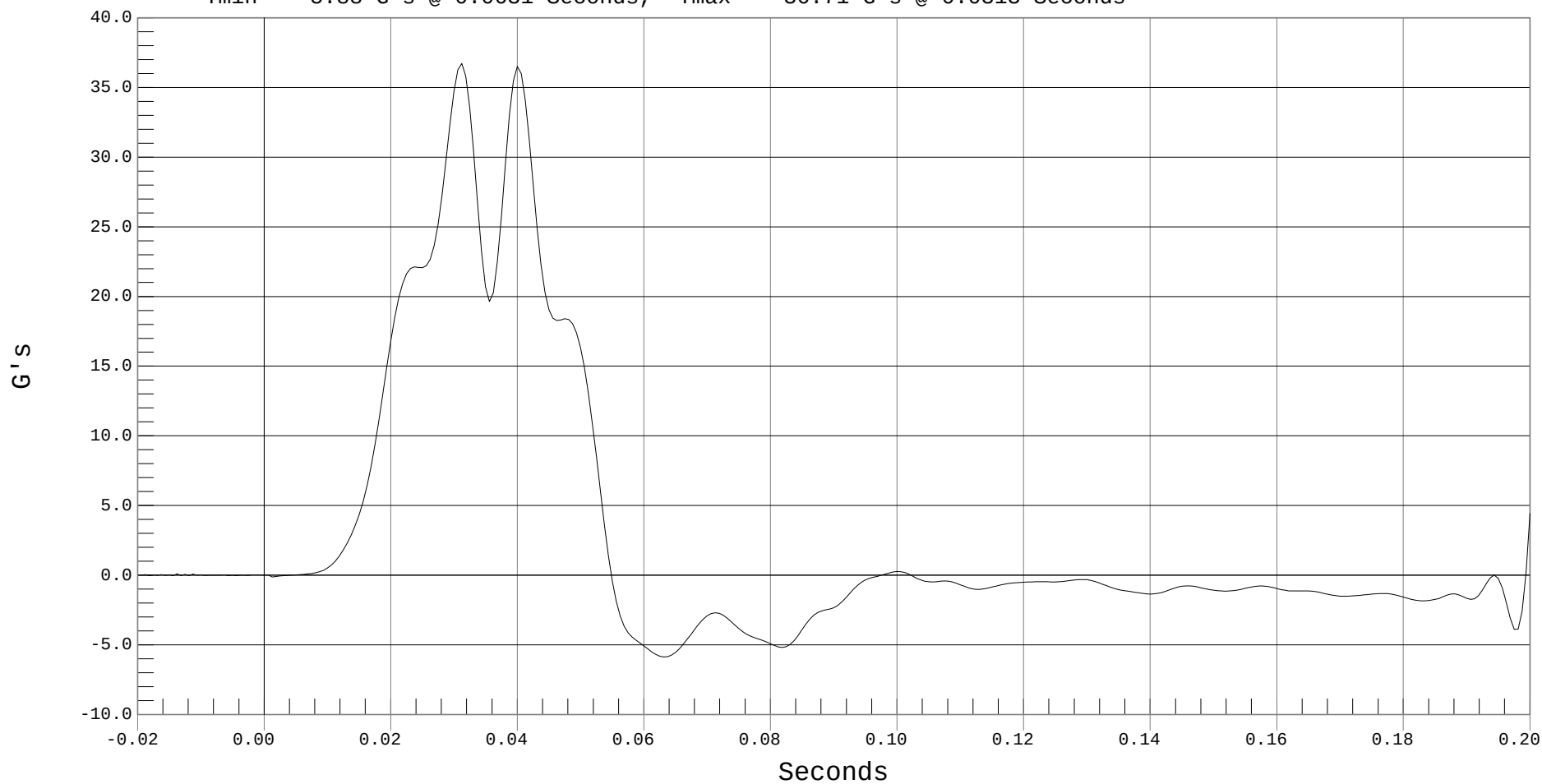
DRIVER LOWER SPINE Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE Y, B01010FI.R06

Ymin = -5.88 G's @ 0.0631 Seconds, Ymax = 36.71 G's @ 0.0313 Seconds





DRIVER LOWER SPINE Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

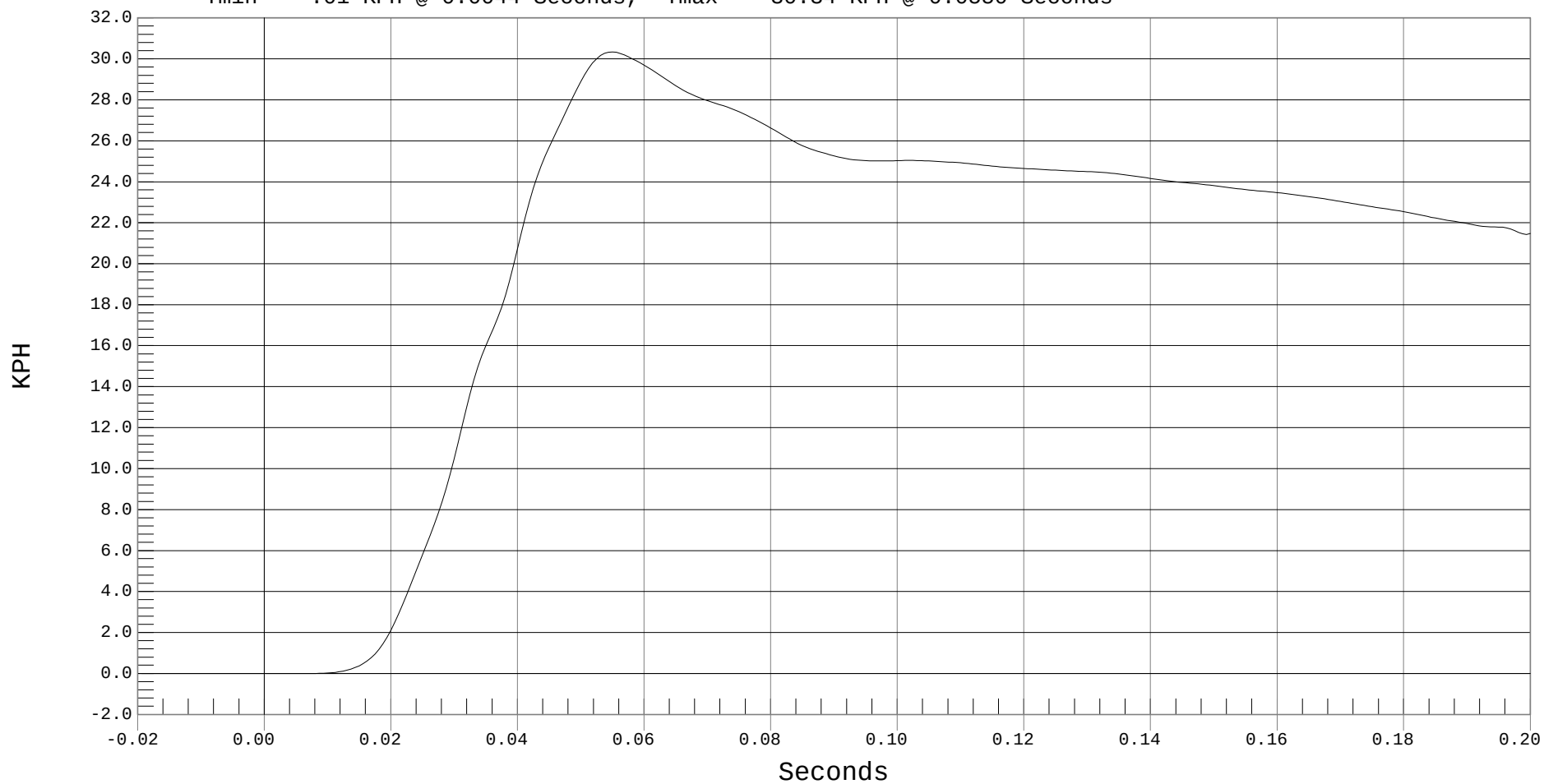
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 DRIVER LOWER SPINE Y VELOCITY, B01010FI.V06

Ymin = -.01 KPH @ 0.0044 Seconds, Ymax = 30.34 KPH @ 0.0550 Seconds





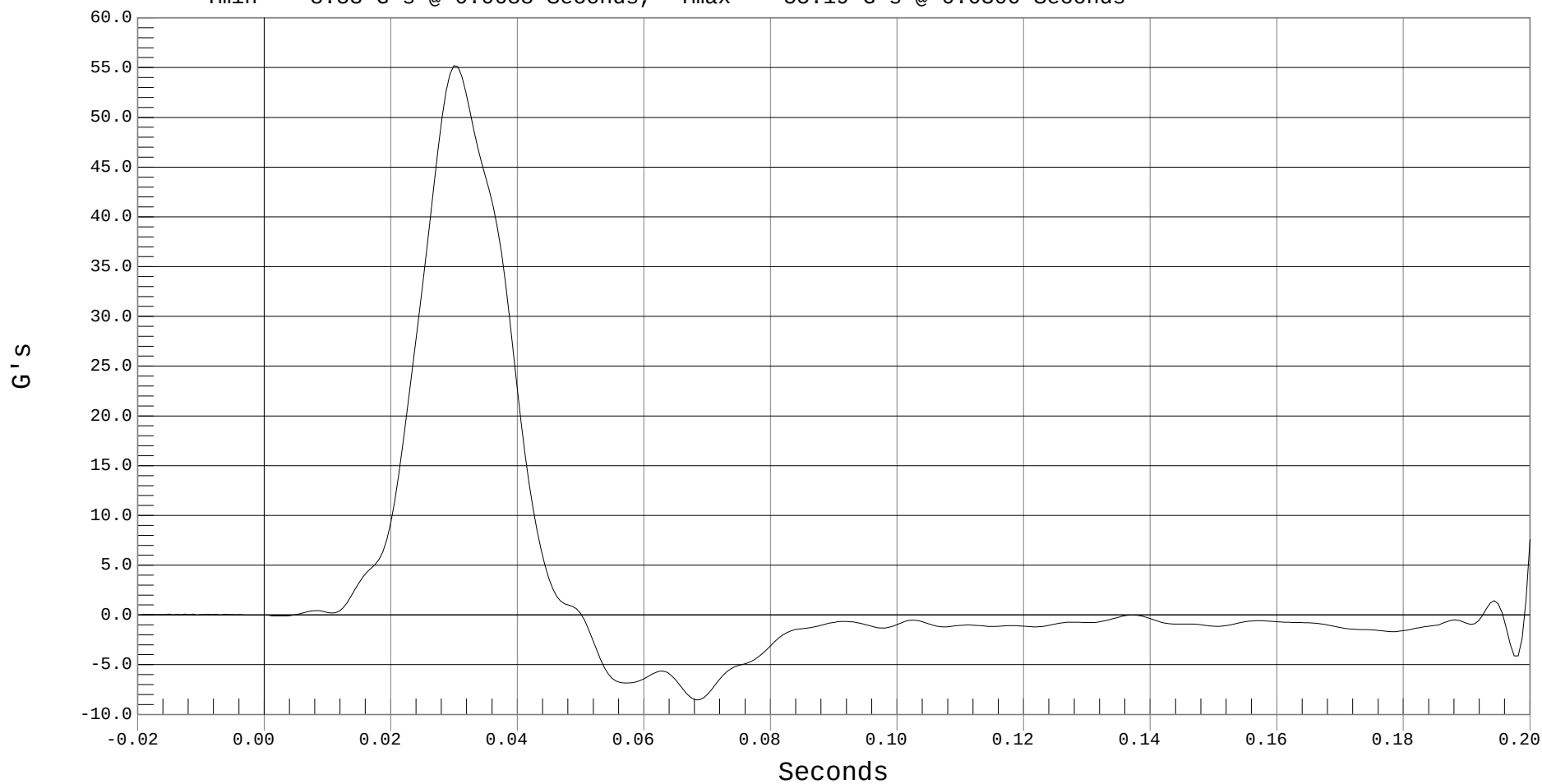
DRIVER PELVIS Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER PELVIS Y, B01010FI.R07

Ymin = -8.53 G's @ 0.0688 Seconds, Ymax = 55.19 G's @ 0.0300 Seconds





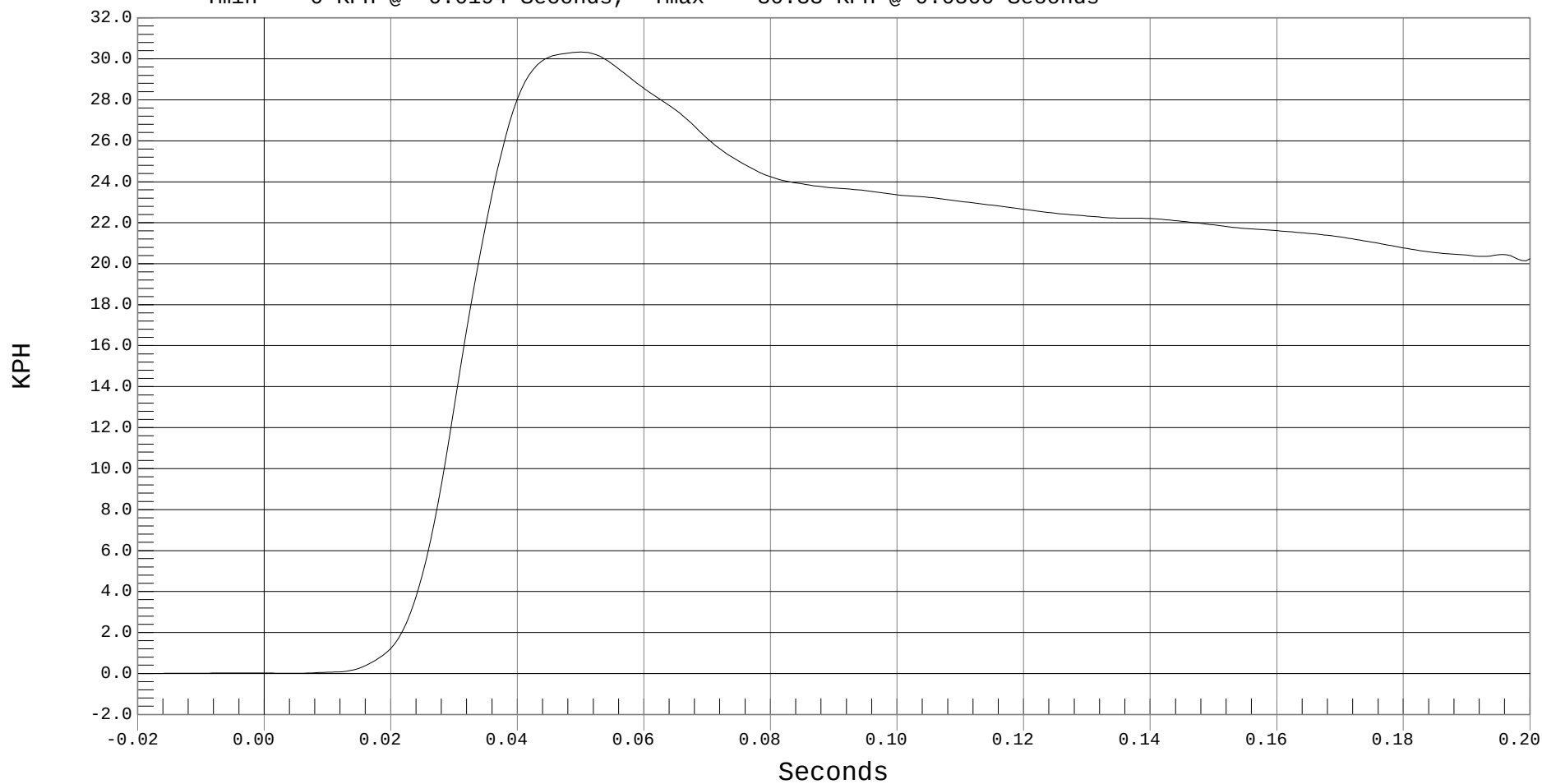
DRIVER PELVIS Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER PELVIS Y VELOCITY, B01010FI.V07

Ymin = 0 KPH @ -0.0194 Seconds, Ymax = 30.33 KPH @ 0.0500 Seconds





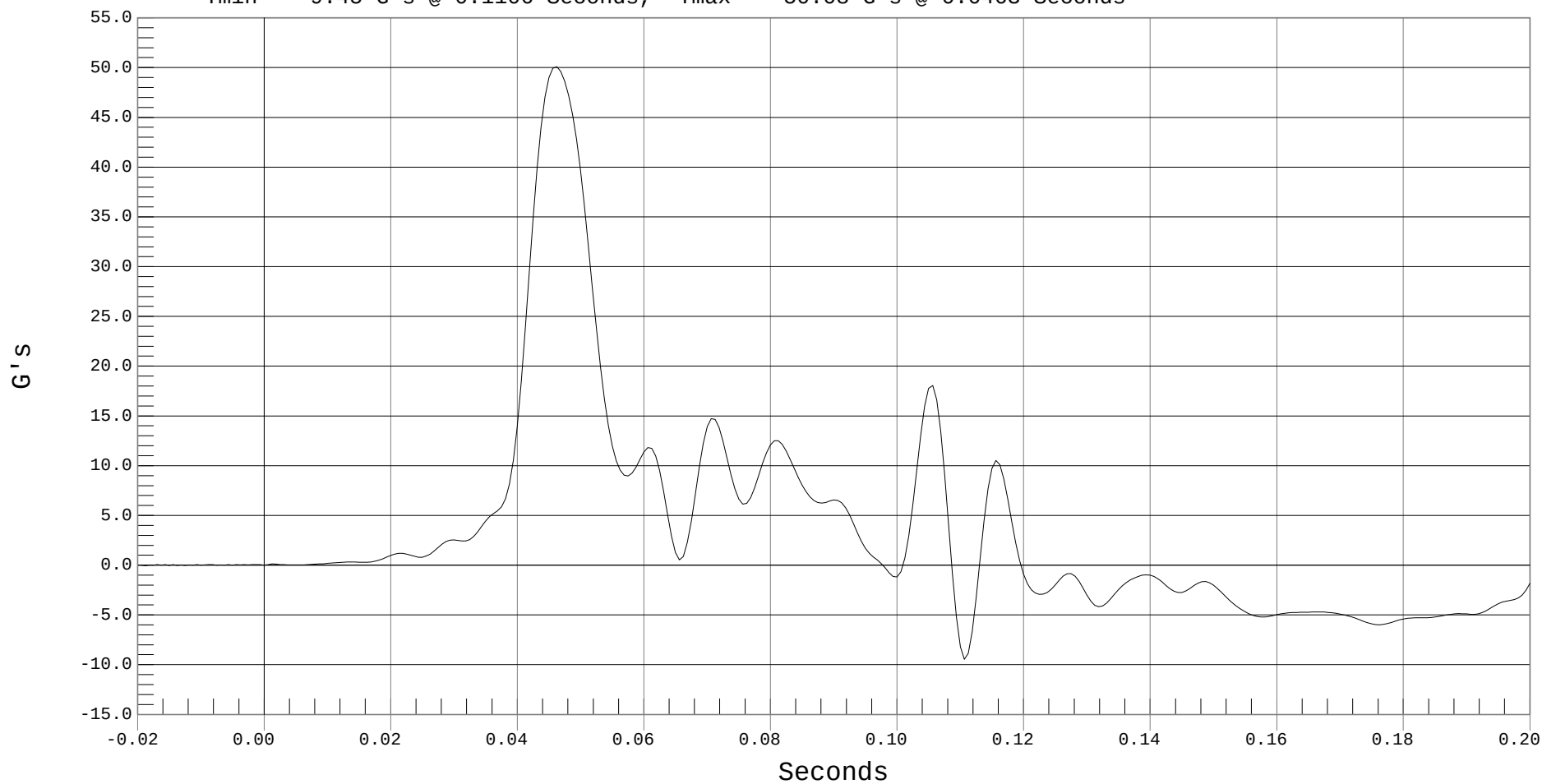
REAR PASSENGER UPPER RIB Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 PASSENGER UPPER RIB Y, B01010FI.R11

Ymin = -9.45 G's @ 0.1106 Seconds, Ymax = 50.08 G's @ 0.0463 Seconds





REAR PASSENGER UPPER RIB Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 D00R (C15901)

Other Info:

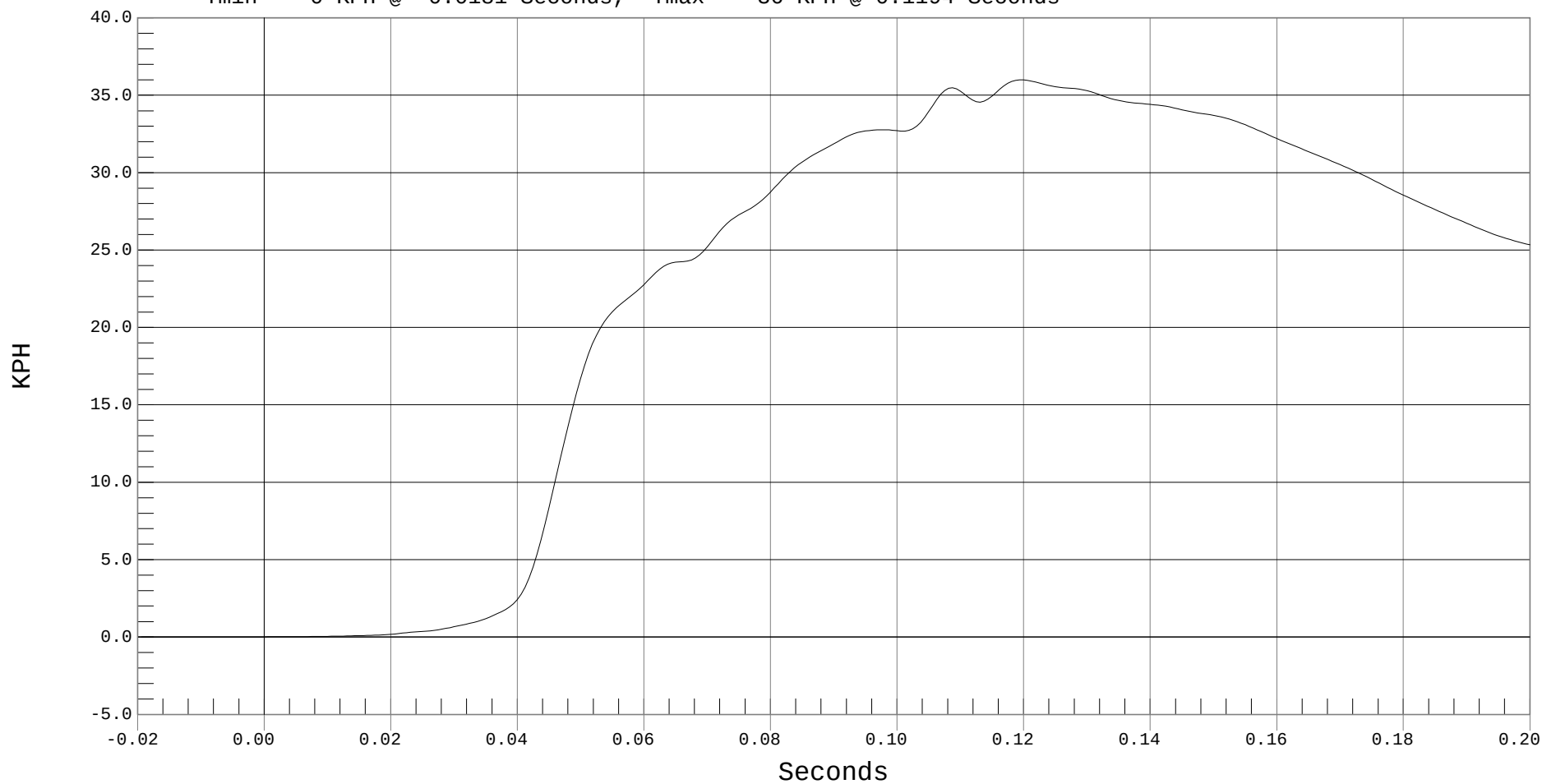
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

1 REAR PASSENGER UPPER RIB Y VELOCITY, B01010FI.V11

Ymin = 0 KPH @ -0.0181 Seconds, Ymax = 36 KPH @ 0.1194 Seconds





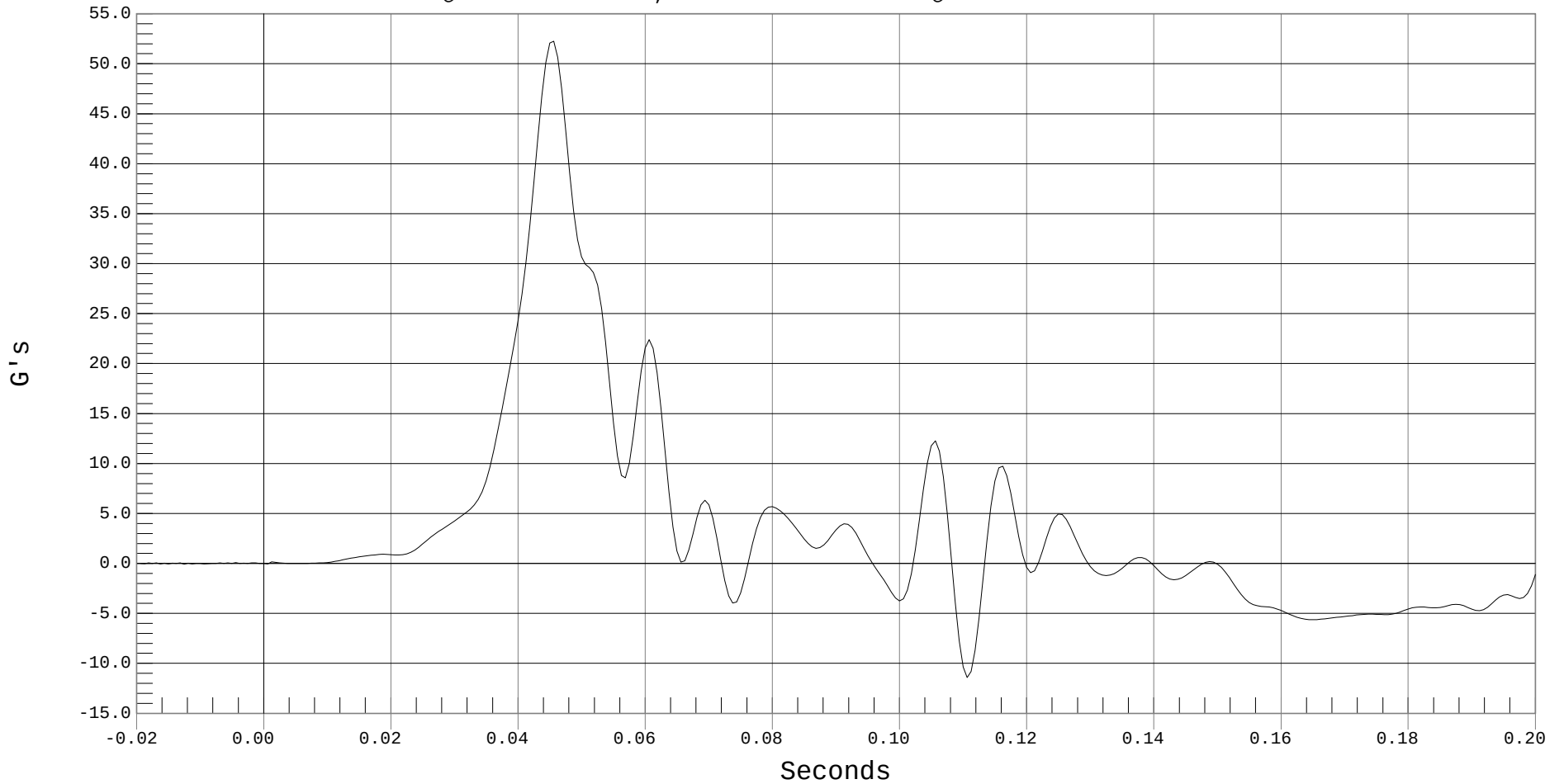
REAR PASSENGER LOWER RIB Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 PASSENGER LOWER RIB Y, B01010FI.R12

Ymin = -11.41 G's @ 0.1106 Seconds, Ymax = 52.25 G's @ 0.0456 Seconds





REAR PASSENGER LOWER RIB Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

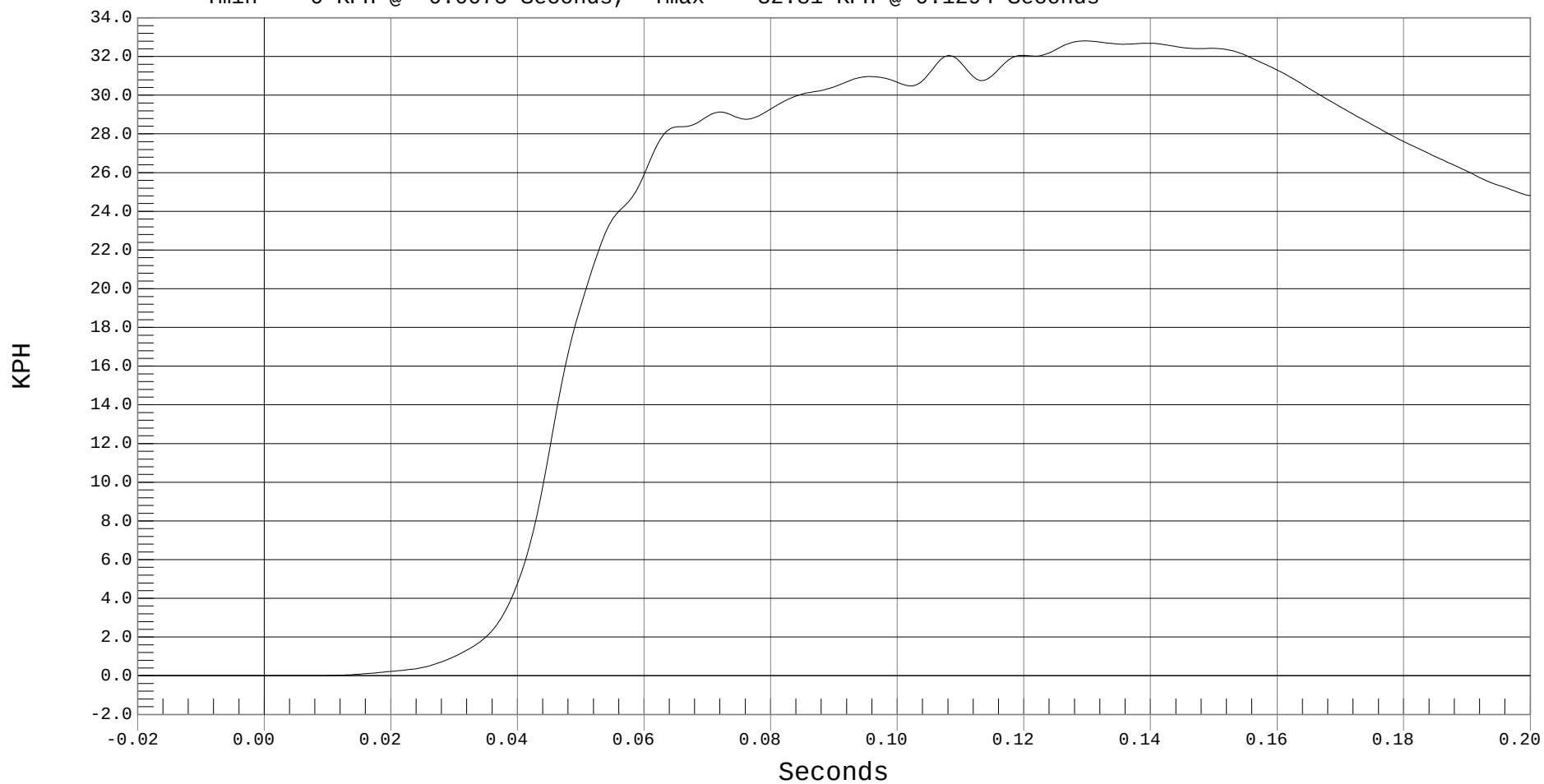
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

1 REAR PASSENGER LOWER RIB Y VELOCITY, B01010FI.V12

Ymin = 0 KPH @ -0.0075 Seconds, Ymax = 32.81 KPH @ 0.1294 Seconds





REAR PASSENGER LOWER SPINE Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

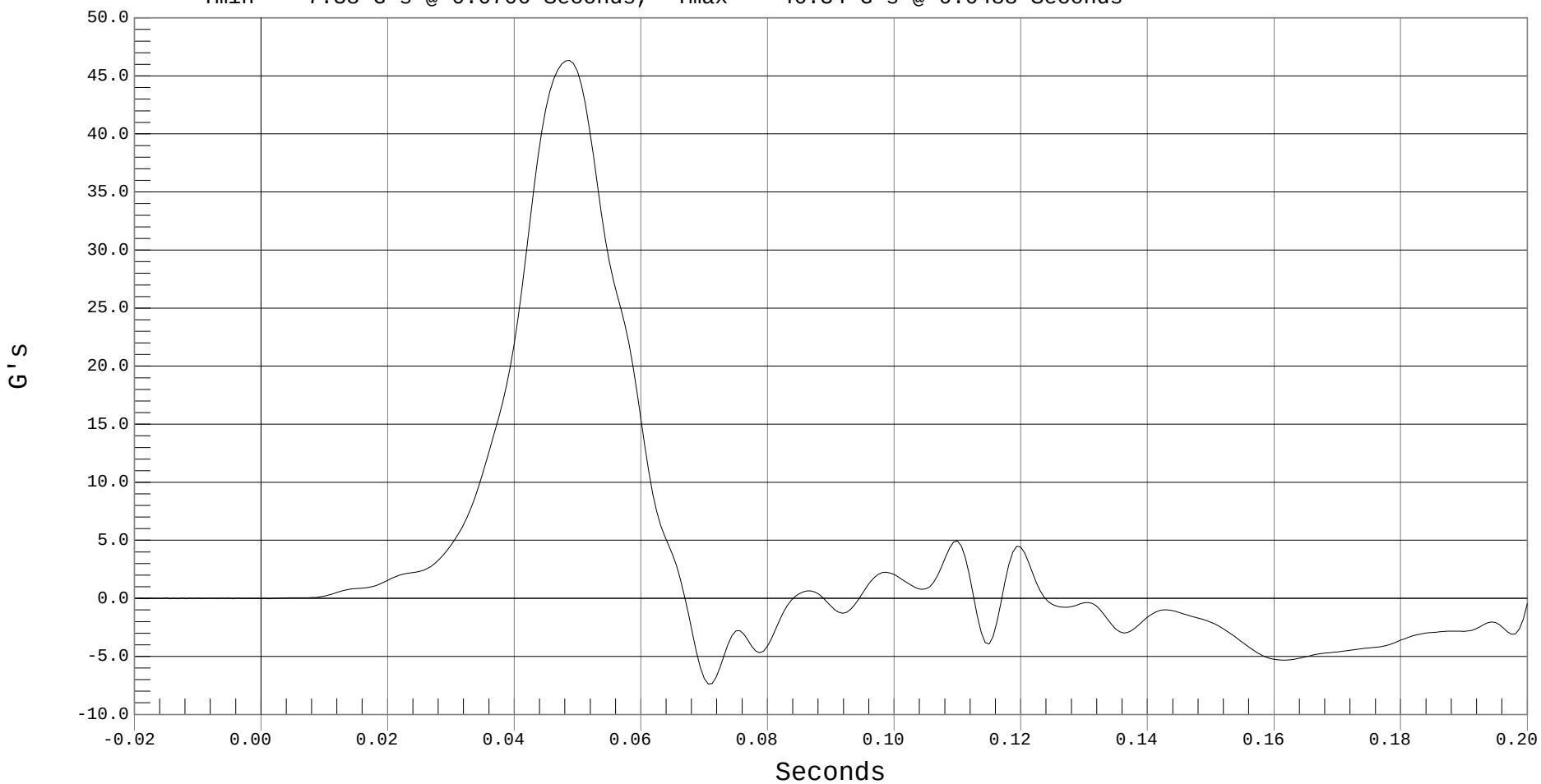
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 PASSENGER LOWER SPINE Y, B01010FI.R13

Ymin = -7.38 G's @ 0.0706 Seconds, Ymax = 46.34 G's @ 0.0488 Seconds





REAR PASSENGER LOWER SPINE Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

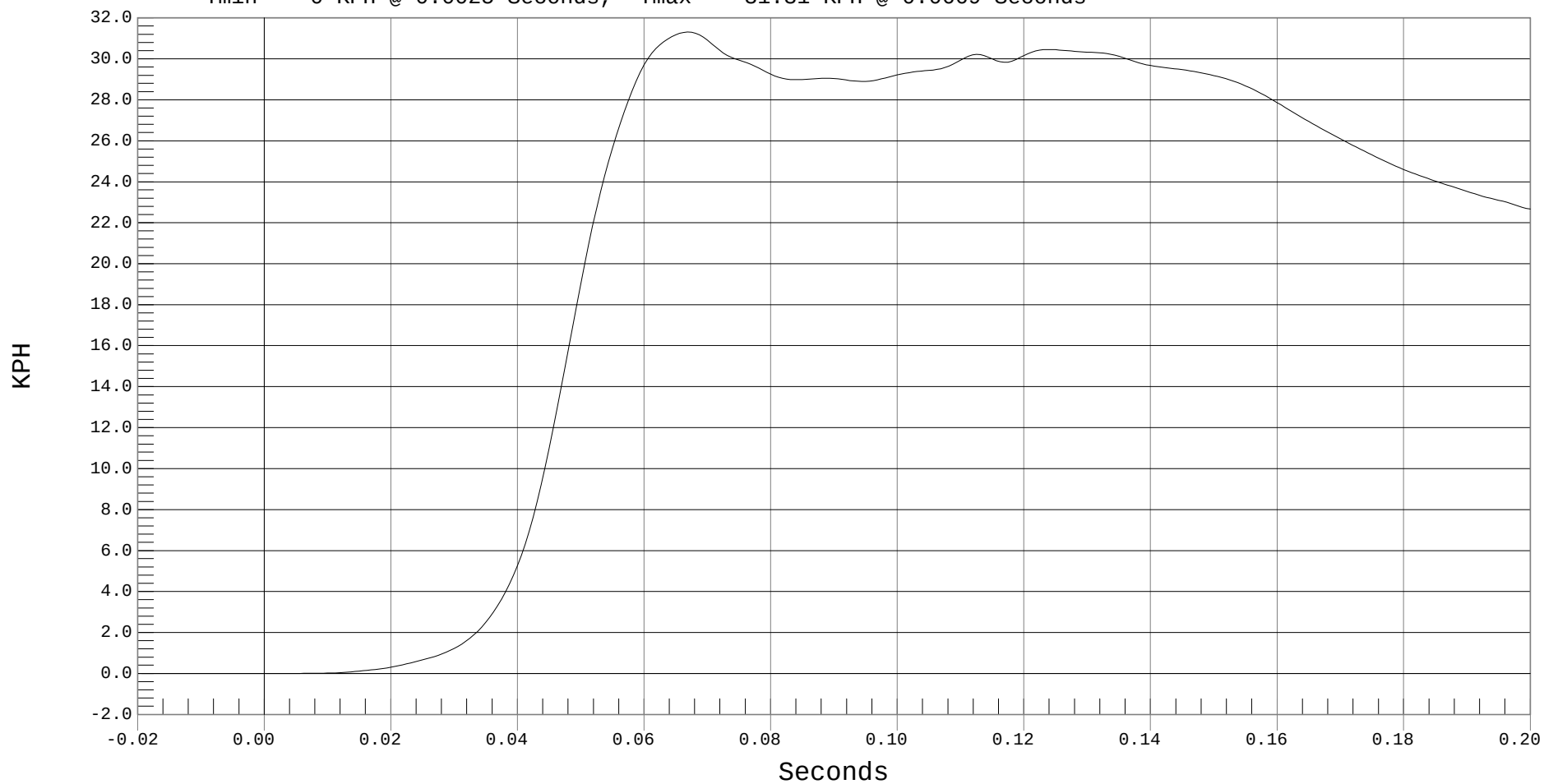
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 REAR PASSENGER LOWER SPINE Y VELOCITY, B01010FI.V13

Ymin = 0 KPH @ 0.0025 Seconds, Ymax = 31.31 KPH @ 0.0669 Seconds





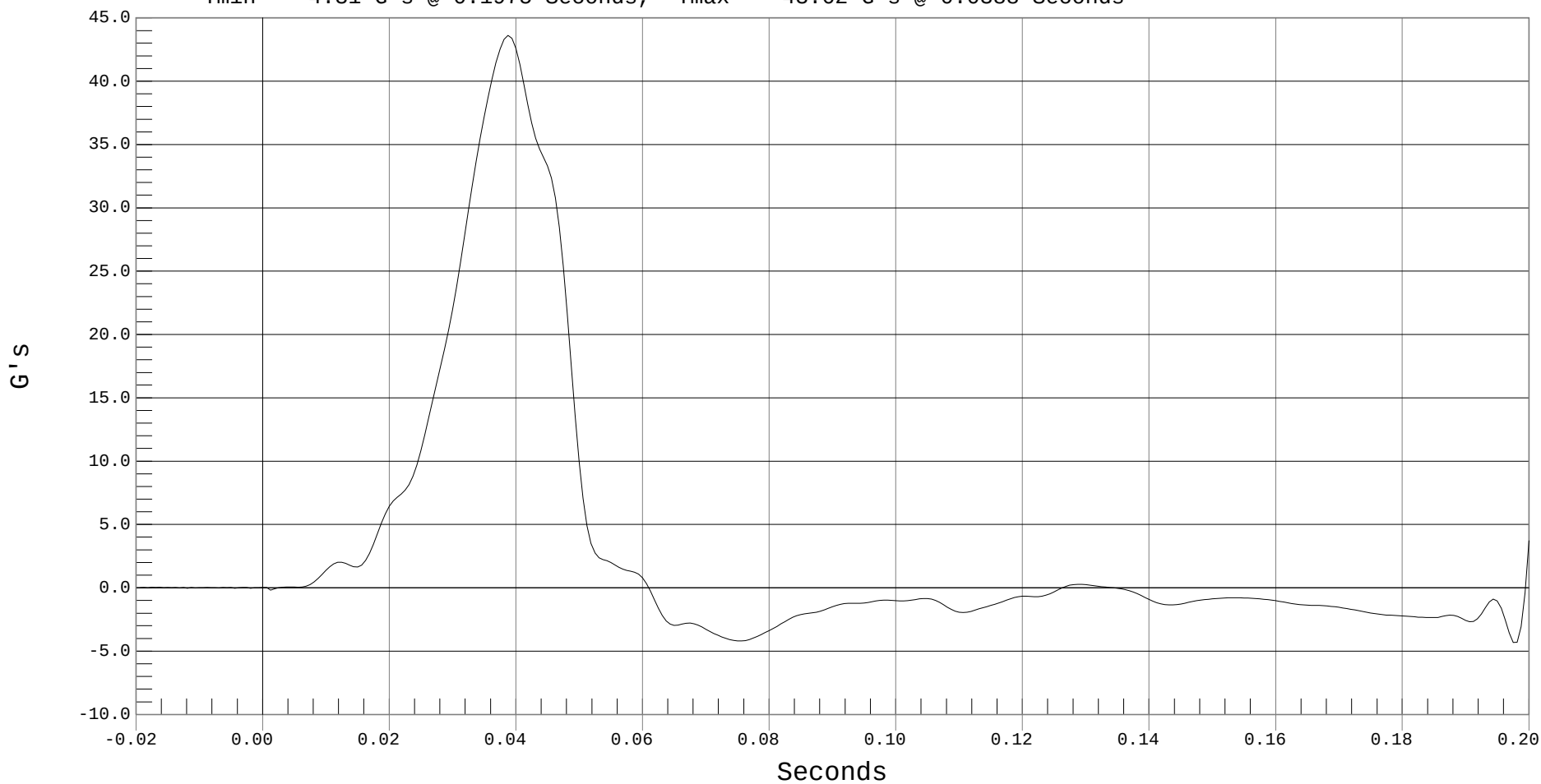
REAR PASSENGER PELVIS Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 PASSENGER PELVIS Y, B01010FI.R14

Ymin = -4.31 G's @ 0.1975 Seconds, Ymax = 43.62 G's @ 0.0388 Seconds





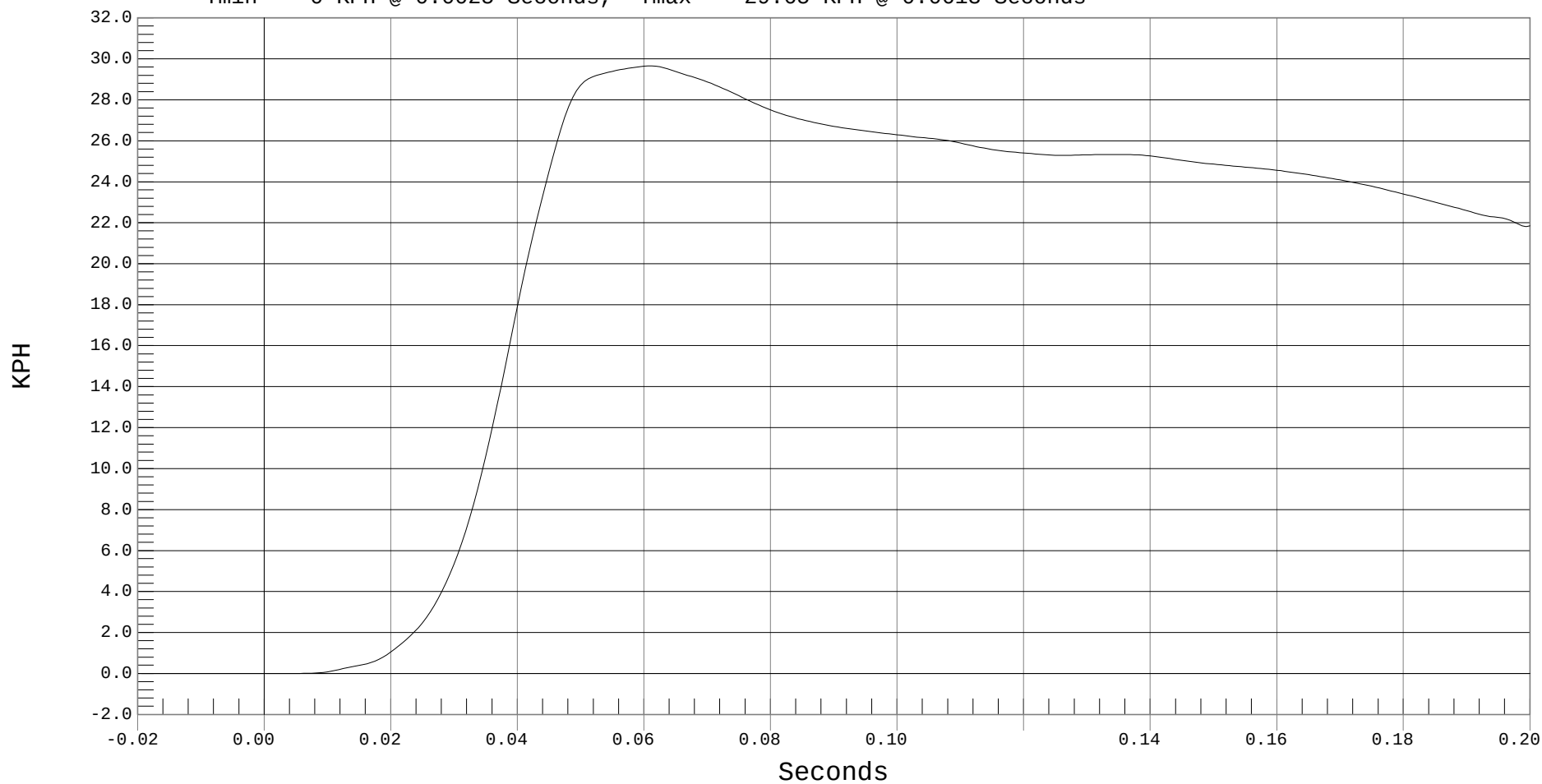
REAR PASSENGER PELVIS Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 REAR PASSENGER PELVIS Y VELOCITY, B01010FI.V14

Ymin = 0 KPH @ 0.0025 Seconds, Ymax = 29.65 KPH @ 0.0613 Seconds





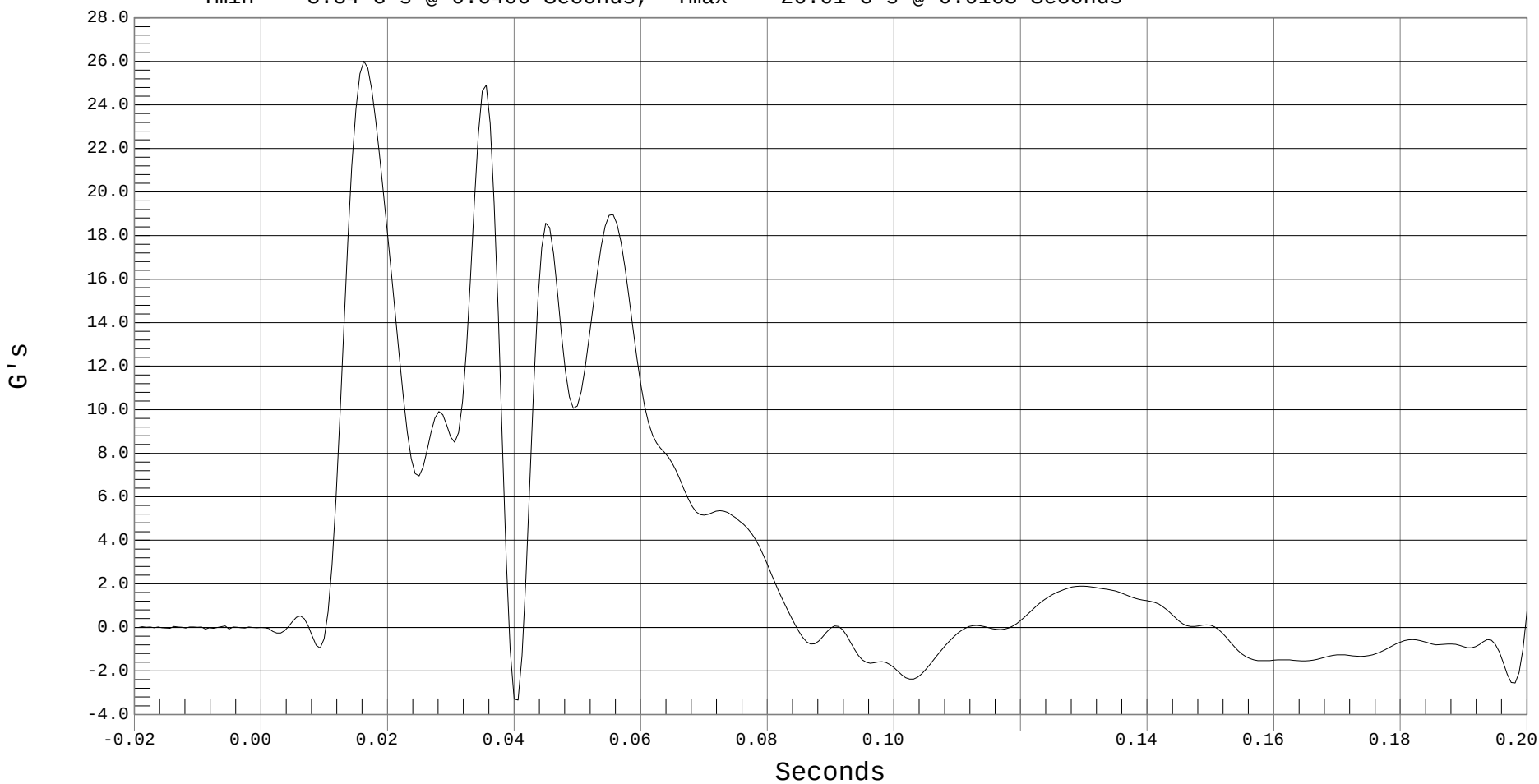
DRIVER UPPER RIB REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER UPPER RIB Yr, B01010FI.R41

Ymin = -3.34 G's @ 0.0406 Seconds, Ymax = 26.01 G's @ 0.0163 Seconds





DRIVER UPPER RIB REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

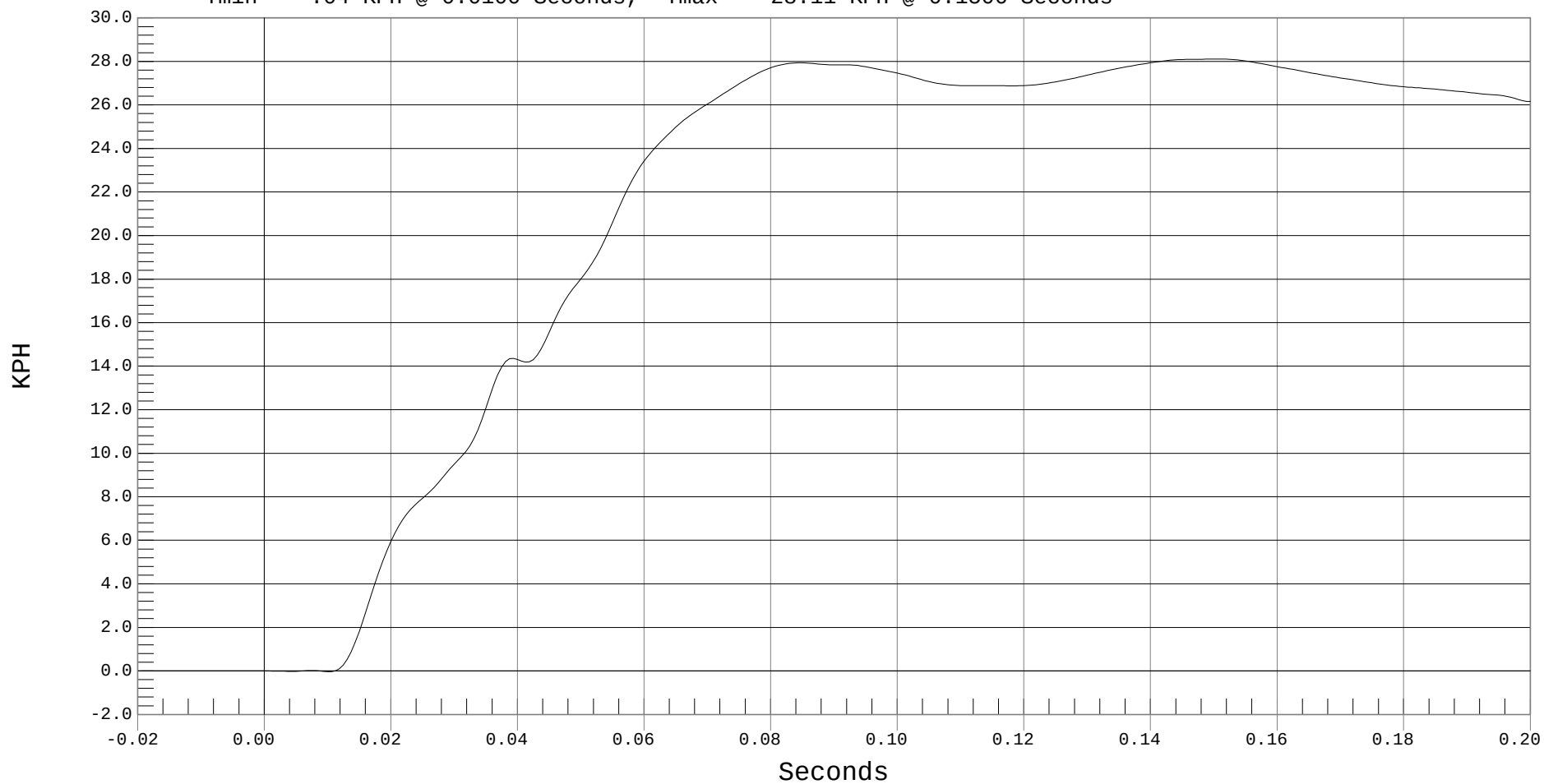
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 DRIVER UPPER RIB Y REDUNDANT VELOCITY, B01010FI.V41

Ymin = -.04 KPH @ 0.0100 Seconds, Ymax = 28.11 KPH @ 0.1506 Seconds





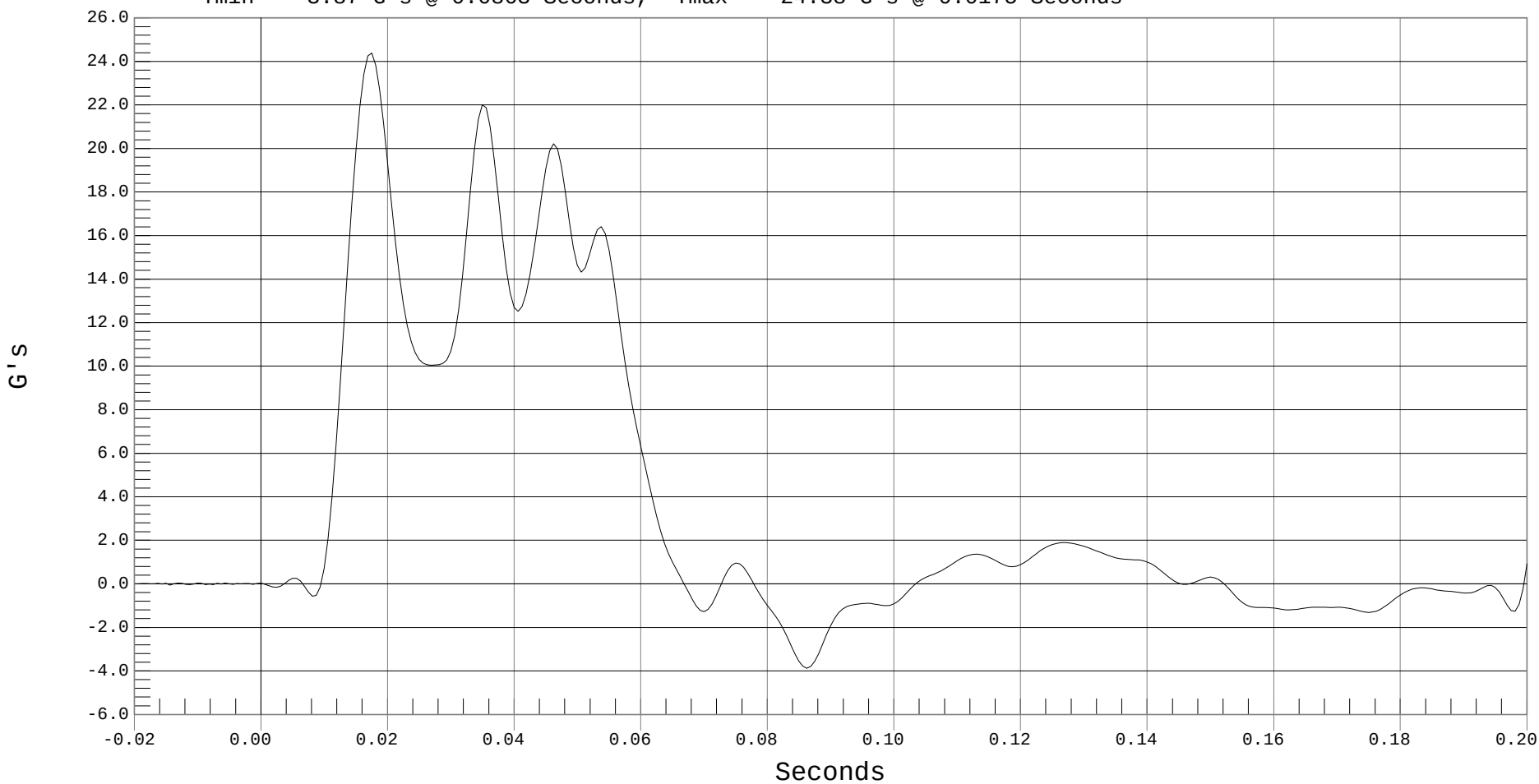
DRIVER LOWER RIB REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 D00R (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER LOWER RIB Yr, B01010FI.R42

Ymin = -3.87 G's @ 0.0863 Seconds, Ymax = 24.38 G's @ 0.0175 Seconds





DRIVER LOWER RIB REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

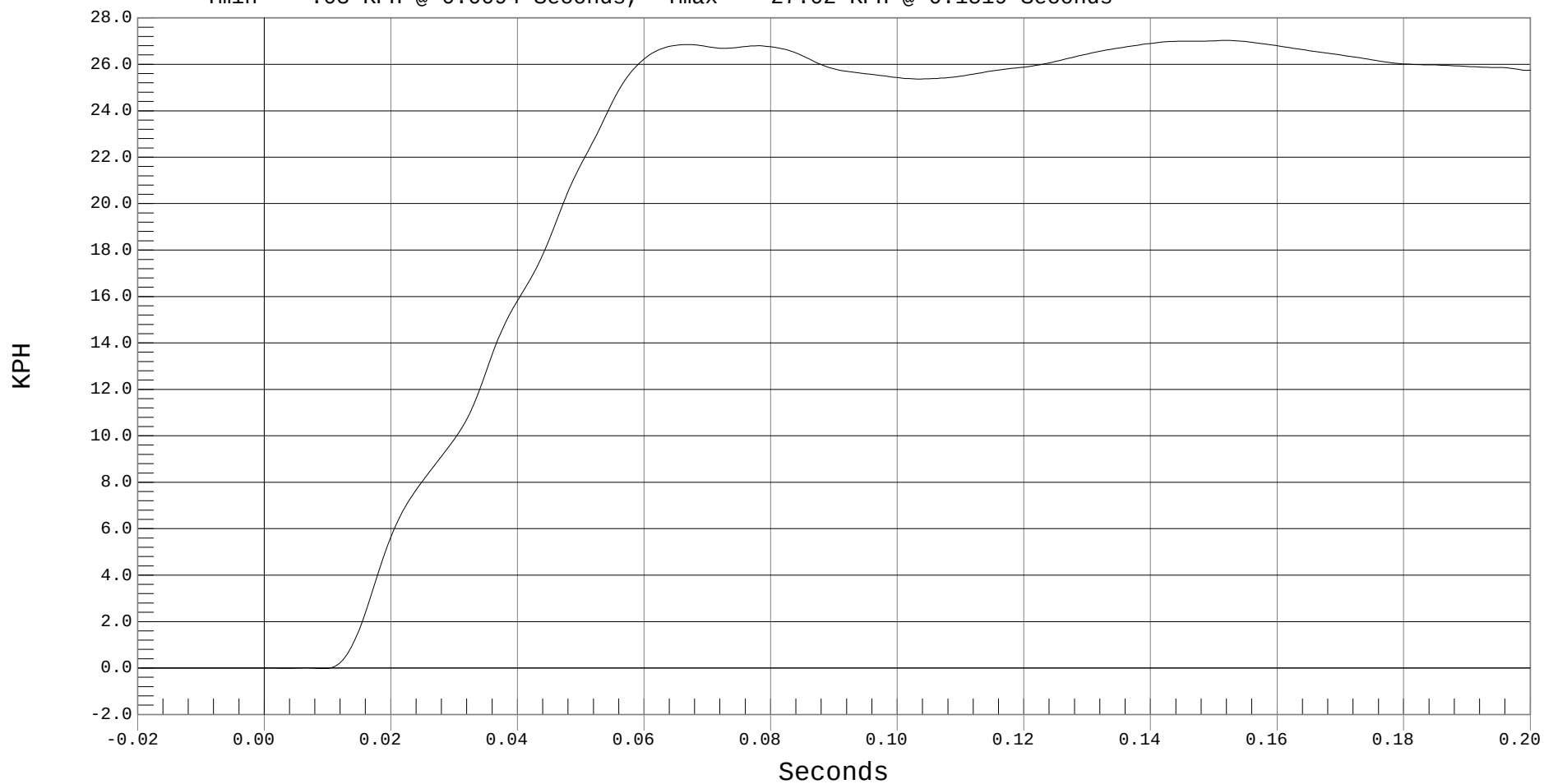
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 DRIVER LOWER RIB Y REDUNDANT VELOCITY, B01010FI.V42

Ymin = -.03 KPH @ 0.0094 Seconds, Ymax = 27.02 KPH @ 0.1519 Seconds





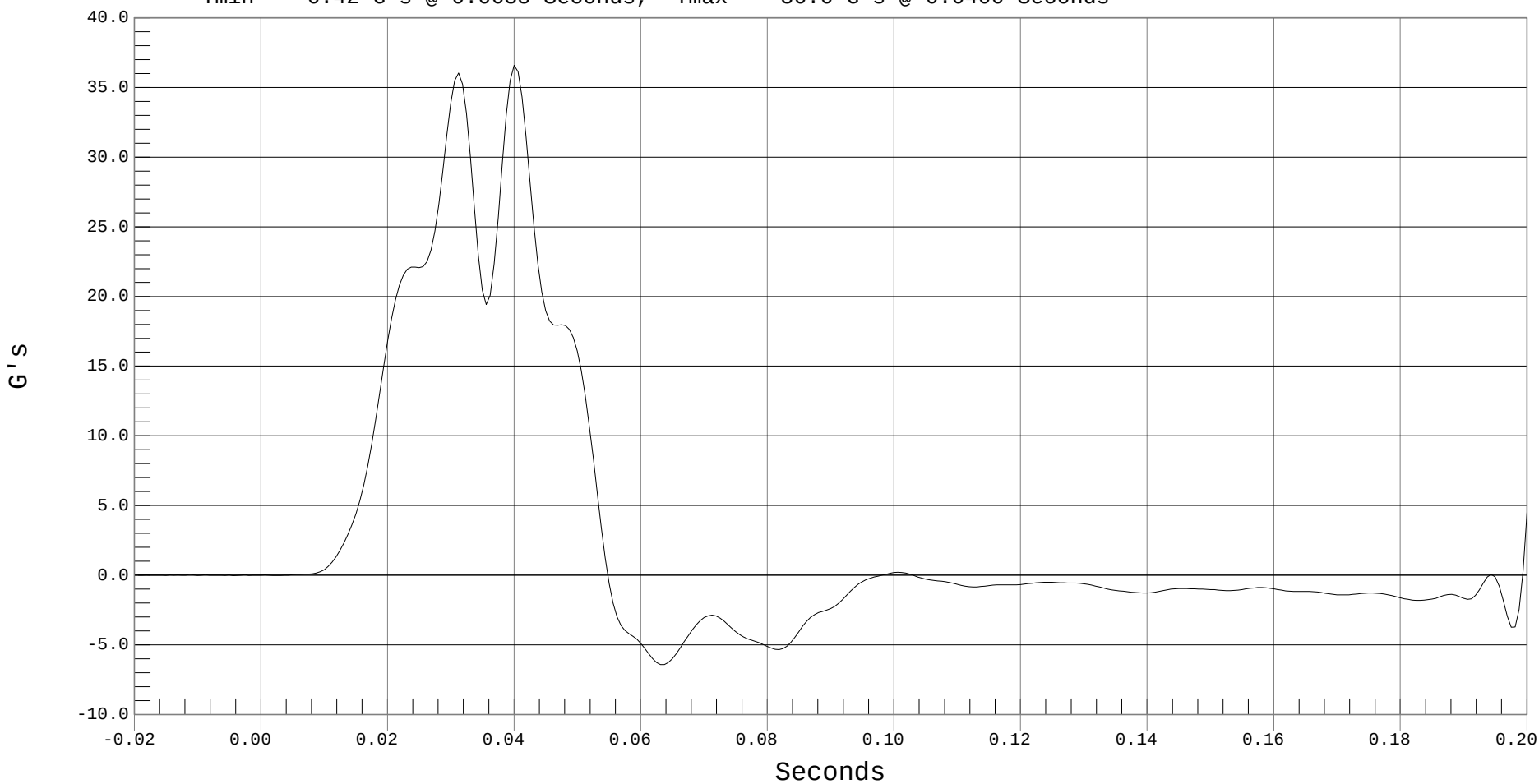
DRIVER LOWER SPINE REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER LOWER SPINE Yr, B01010FI.R43

Ymin = -6.42 G's @ 0.0638 Seconds, Ymax = 36.6 G's @ 0.0400 Seconds





DRIVER LOWER SPINE REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

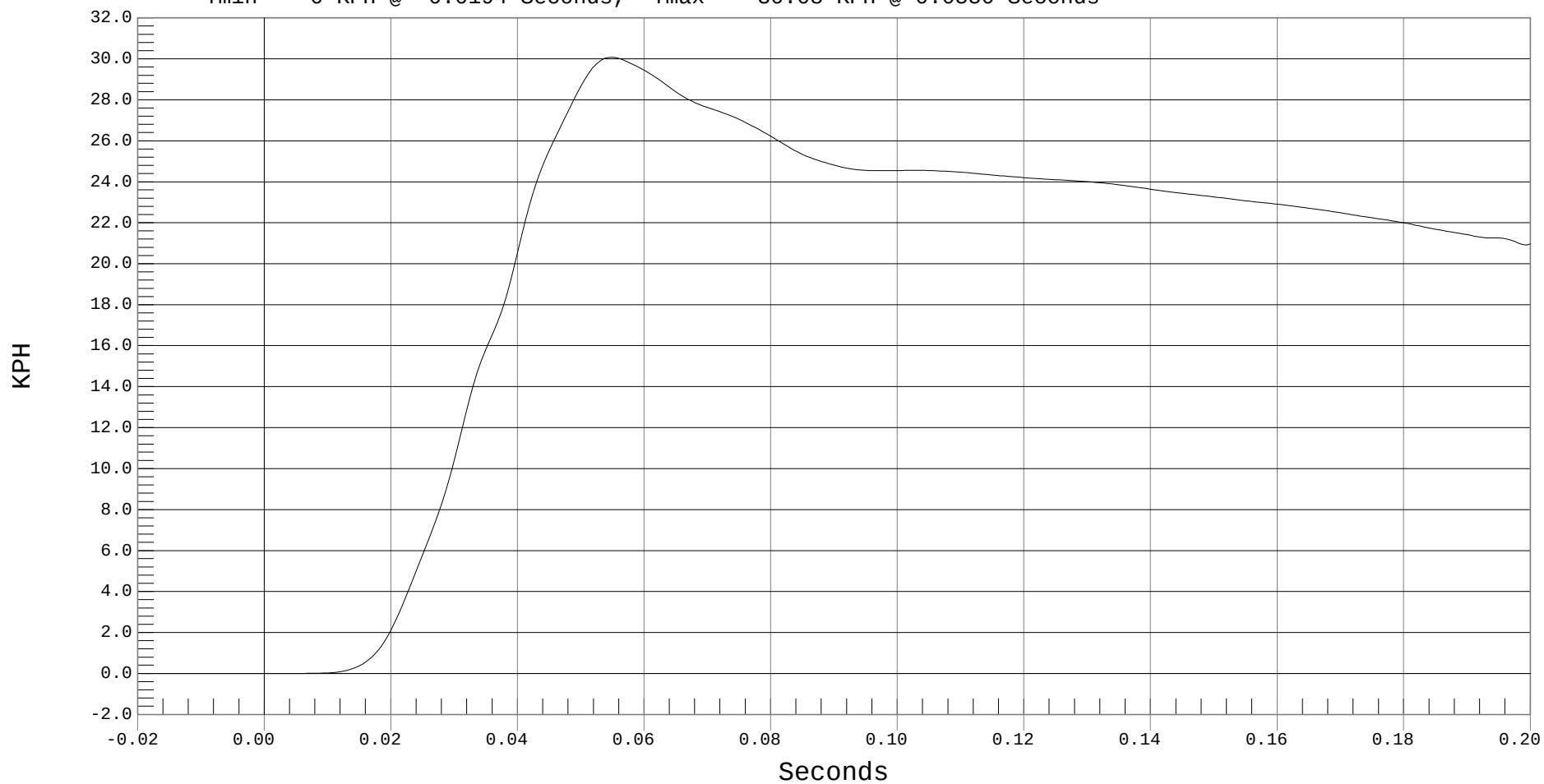
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 DRIVER LOWER SPINE Y REDUNDANT VELOCITY, B01010FI.V43

Ymin = 0 KPH @ -0.0194 Seconds, Ymax = 30.08 KPH @ 0.0550 Seconds





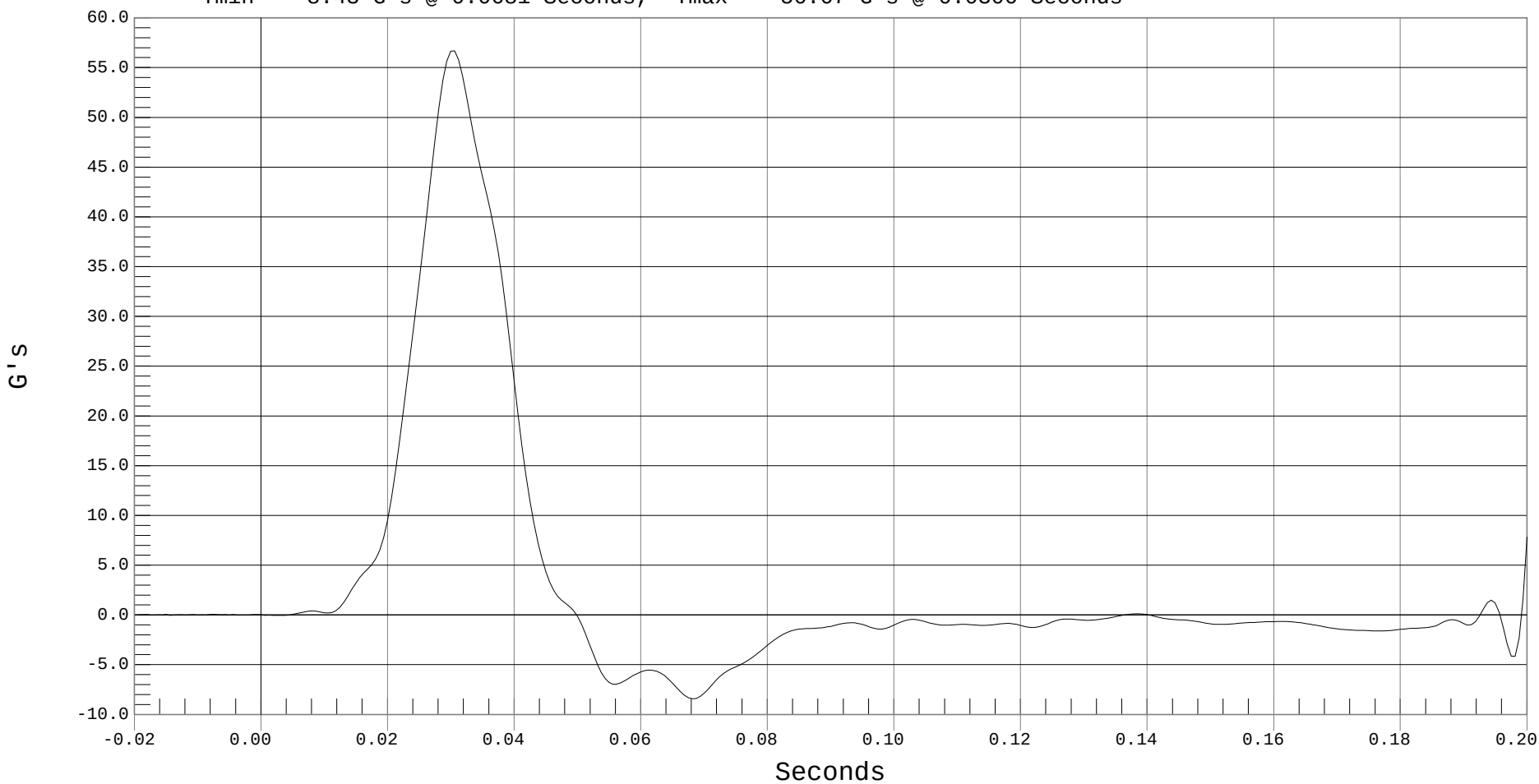
DRIVER PELVIS REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 DRIVER PELVIS Yr, B01010FI.R44

Ymin = -8.43 G's @ 0.0681 Seconds, Ymax = 56.67 G's @ 0.0306 Seconds





DRIVER PELVIS REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

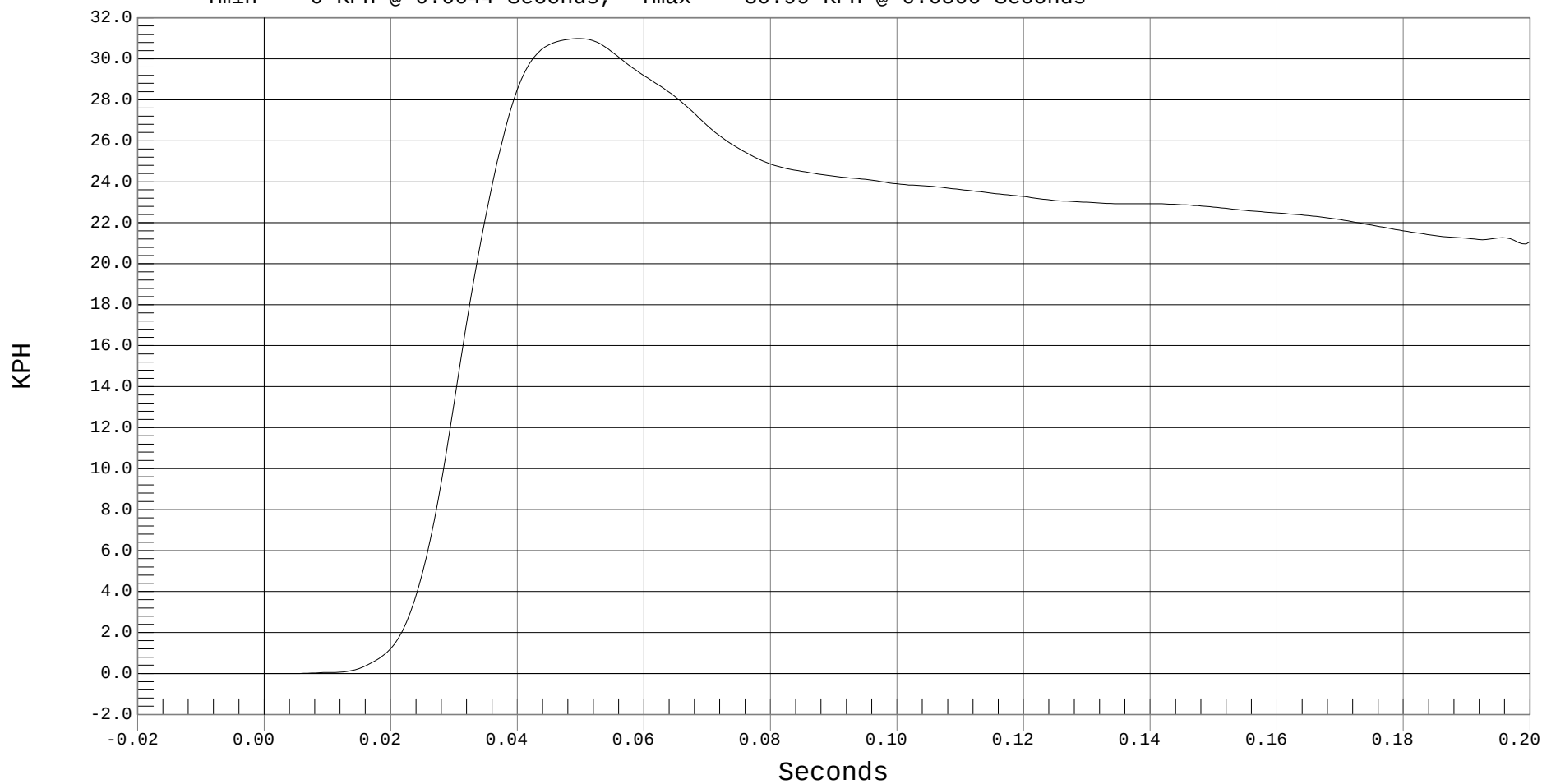
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 DRIVER PELVIS Y REDUNDANT VELOCITY, B01010FI.V44

Ymin = 0 KPH @ 0.0044 Seconds, Ymax = 30.99 KPH @ 0.0500 Seconds





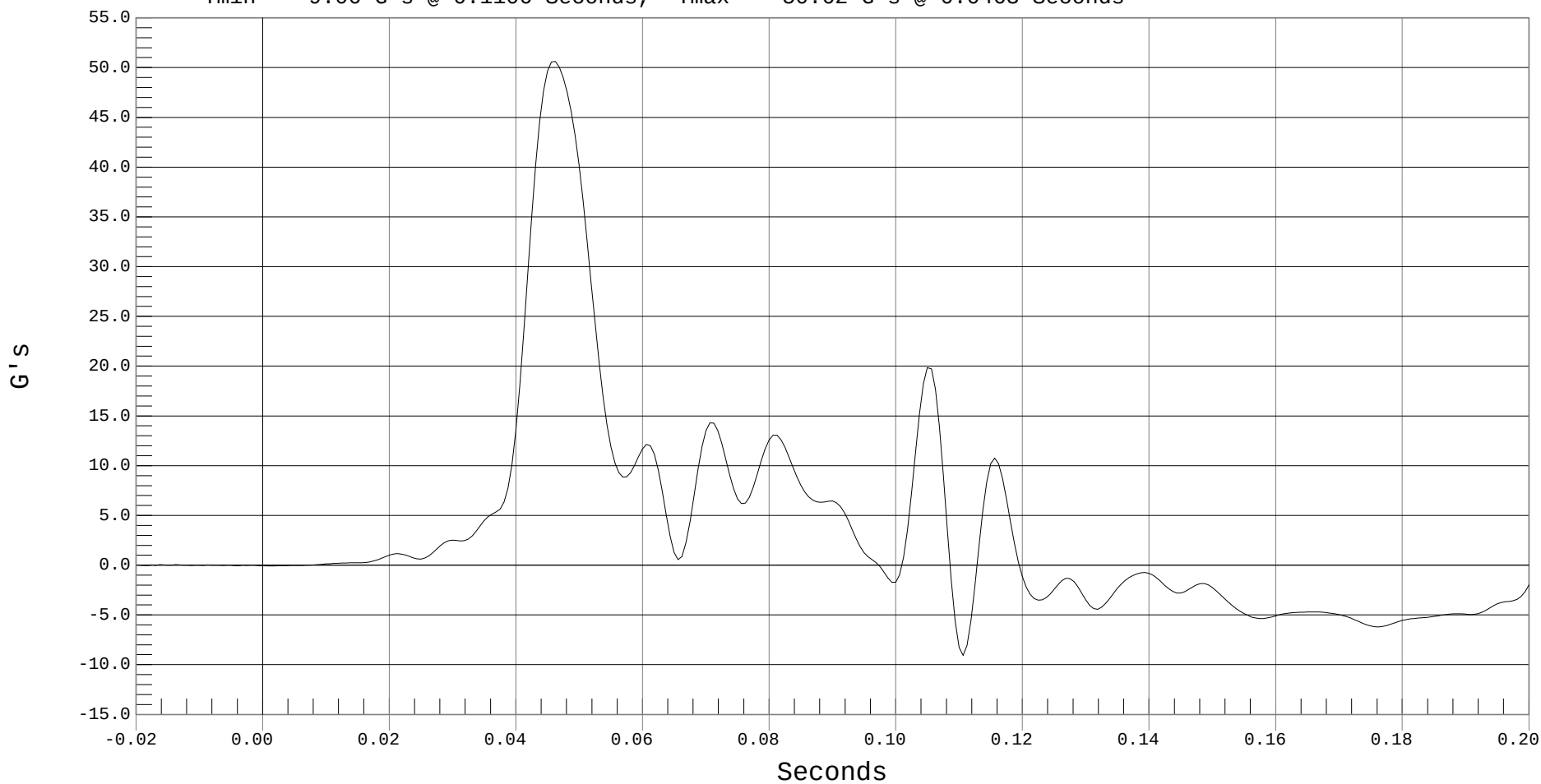
REAR PASSENGER UPPER RIB REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 D00R (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 PASSENGER UPPER RIB Yr, B01010FI.R50

Ymin = -9.06 G's @ 0.1106 Seconds, Ymax = 50.62 G's @ 0.0463 Seconds





REAR PASSENGER UPPER RIB REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

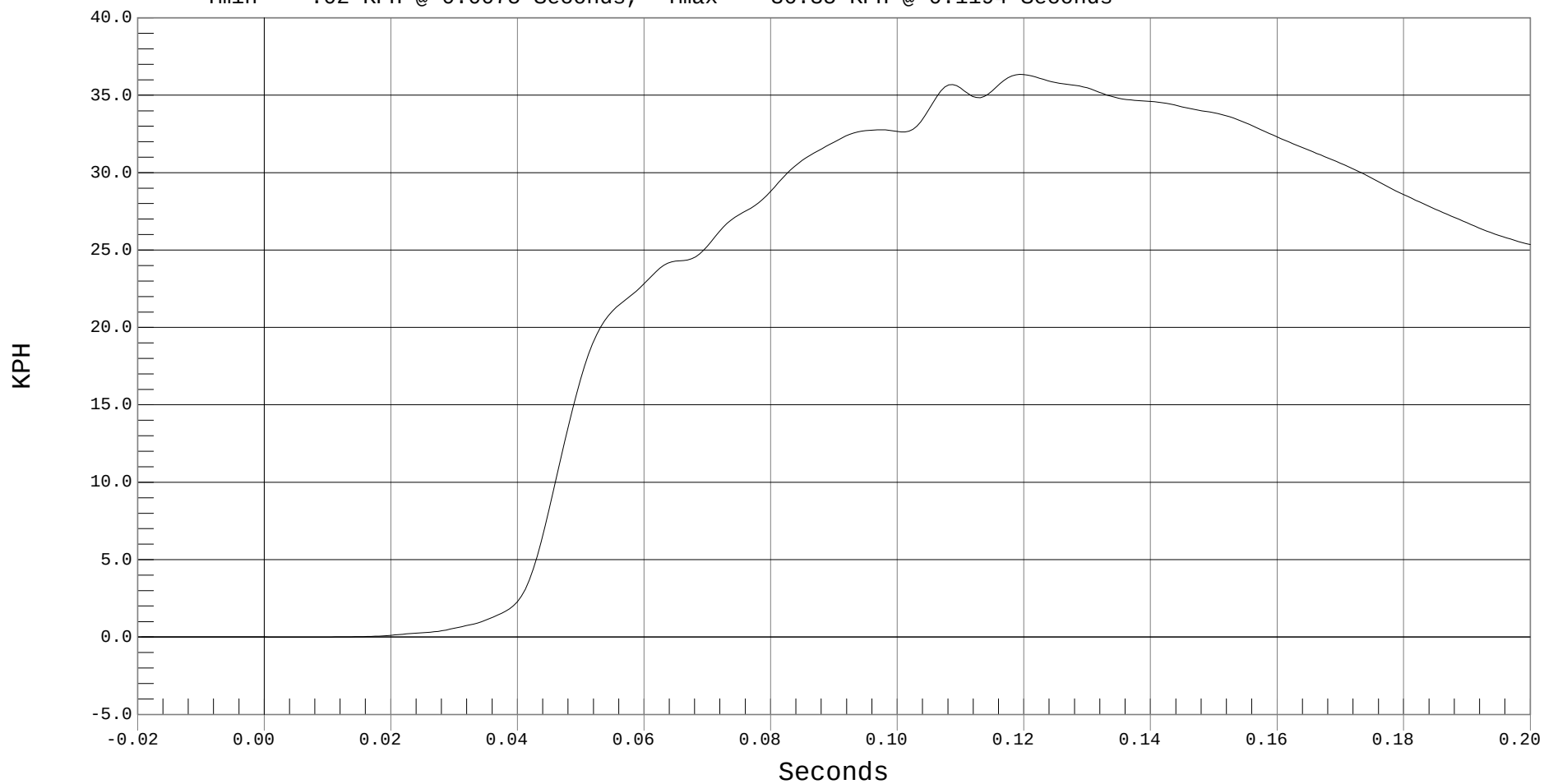
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Fir Filtered

1 REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY, B01010FI.V50

Ymin = -.02 KPH @ 0.0075 Seconds, Ymax = 36.35 KPH @ 0.1194 Seconds





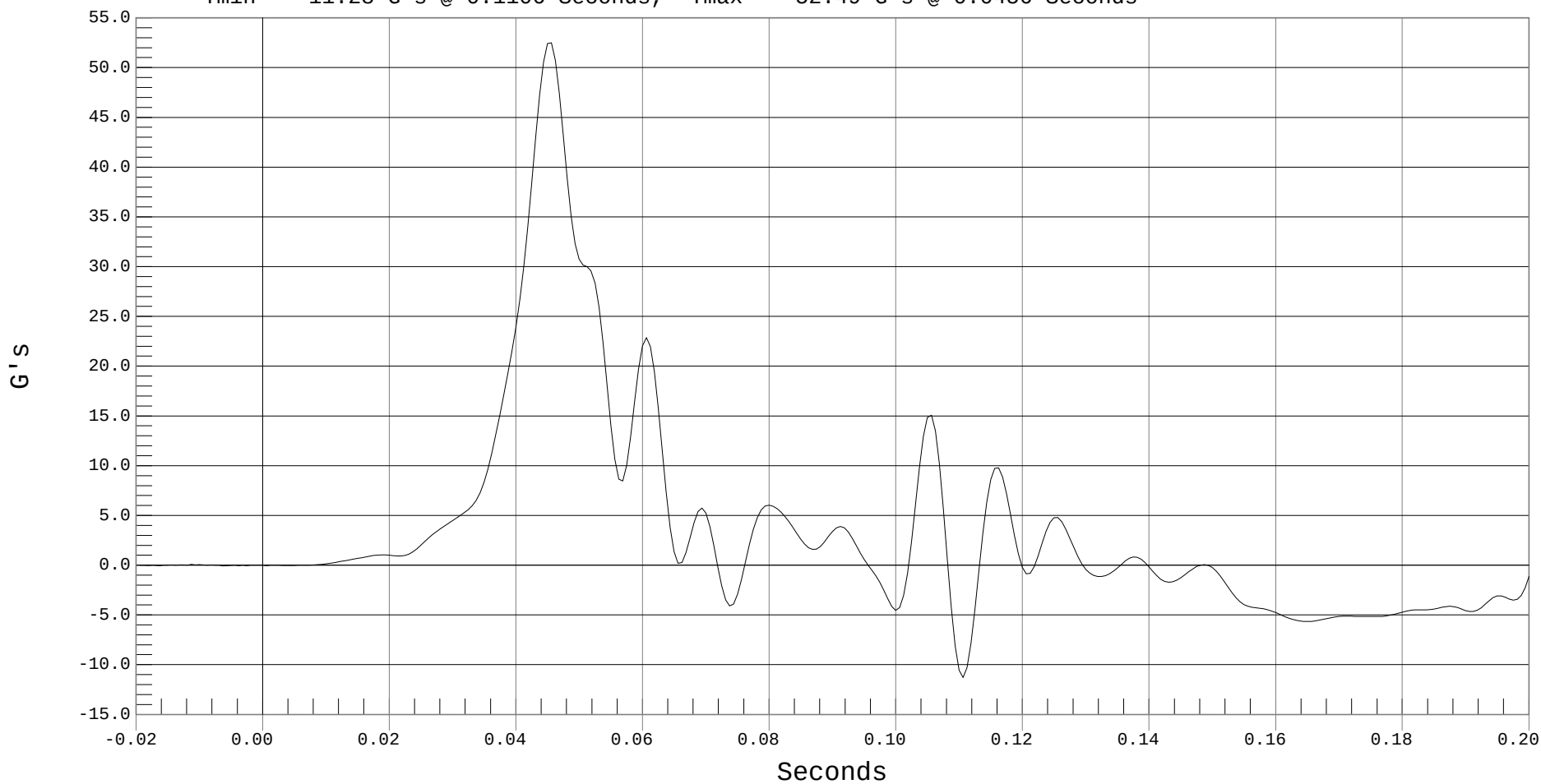
REAR PASSENGER LOWER RIB REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 D00R (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 PASSENGER LOWER RIB Yr, B01010FI.R46

Ymin = -11.28 G's @ 0.1106 Seconds, Ymax = 52.49 G's @ 0.0456 Seconds





REAR PASSENGER LOWER RIB REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Test Date: 01-31-01

Component: 2001 VOLVO S60 4 DOOR (C15901)

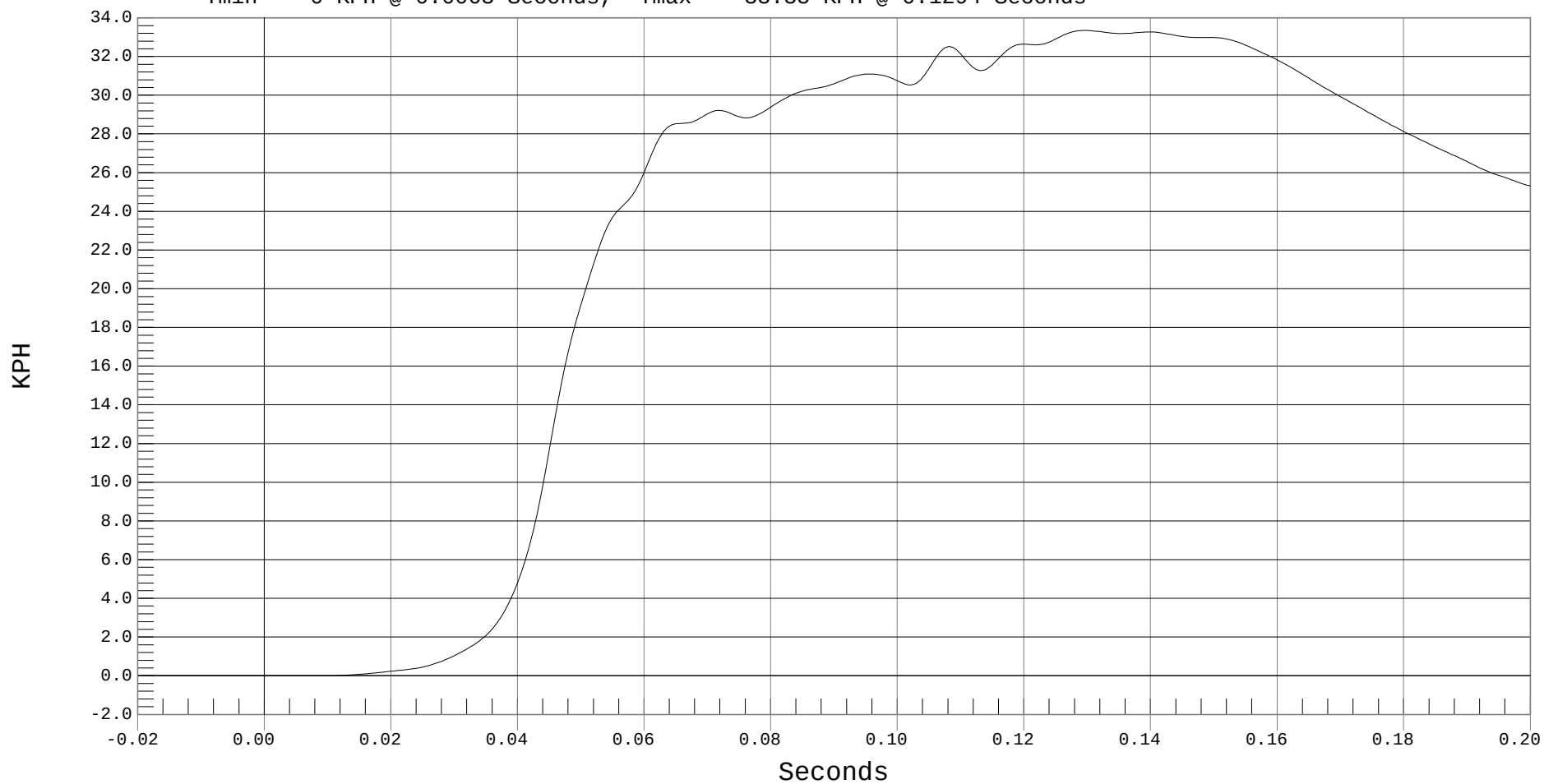
Speed: 33.1 MPH, 53.3 KPH

Other Info:

Fir Filtered

1 REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY, B01010FI.V46

Ymin = 0 KPH @ 0.0063 Seconds, Ymax = 33.35 KPH @ 0.1294 Seconds





REAR PASSENGER LOWER SPINE REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 D00R (C15901)

Other Info:

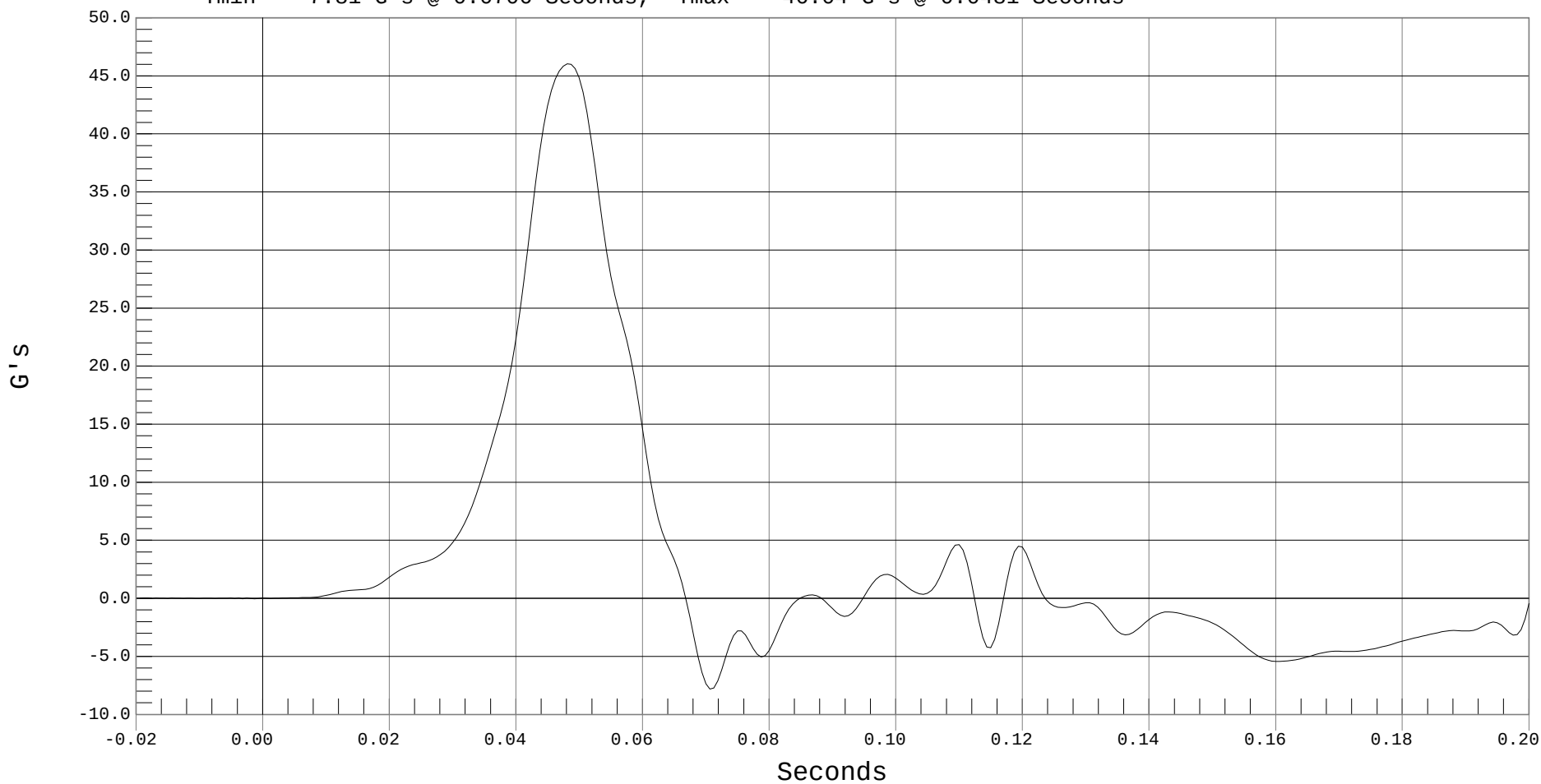
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 PASSENGER LOWER SPINE Yr, B01010FI.R47

Ymin = -7.81 G's @ 0.0706 Seconds, Ymax = 46.04 G's @ 0.0481 Seconds





REAR PASSENGER LOWER SPINE REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

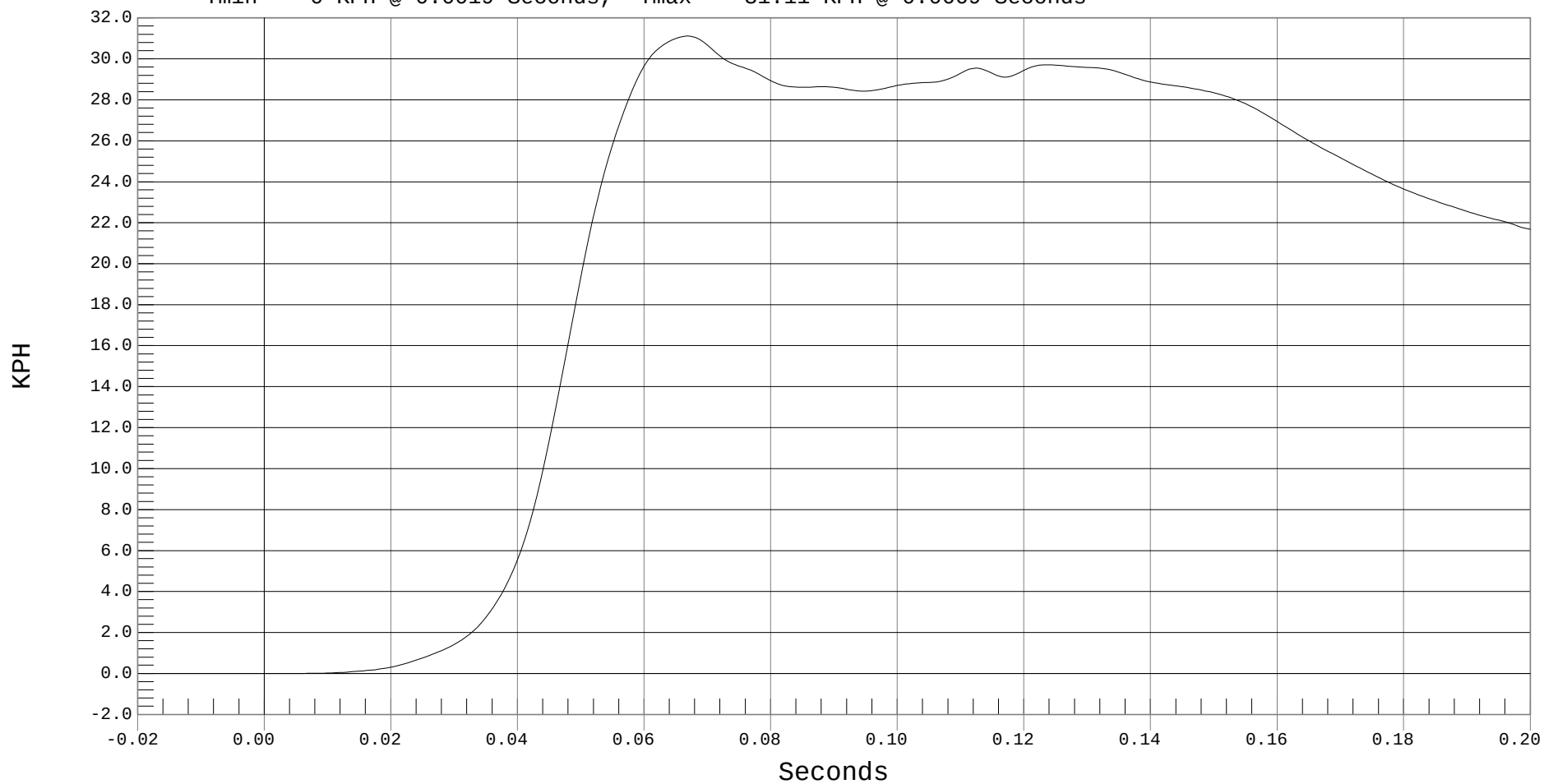
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 REAR PASSENGER LOWER SPINE Y REDUNDANT VELOCITY, B01010FI.V47

Ymin = 0 KPH @ 0.0019 Seconds, Ymax = 31.11 KPH @ 0.0669 Seconds





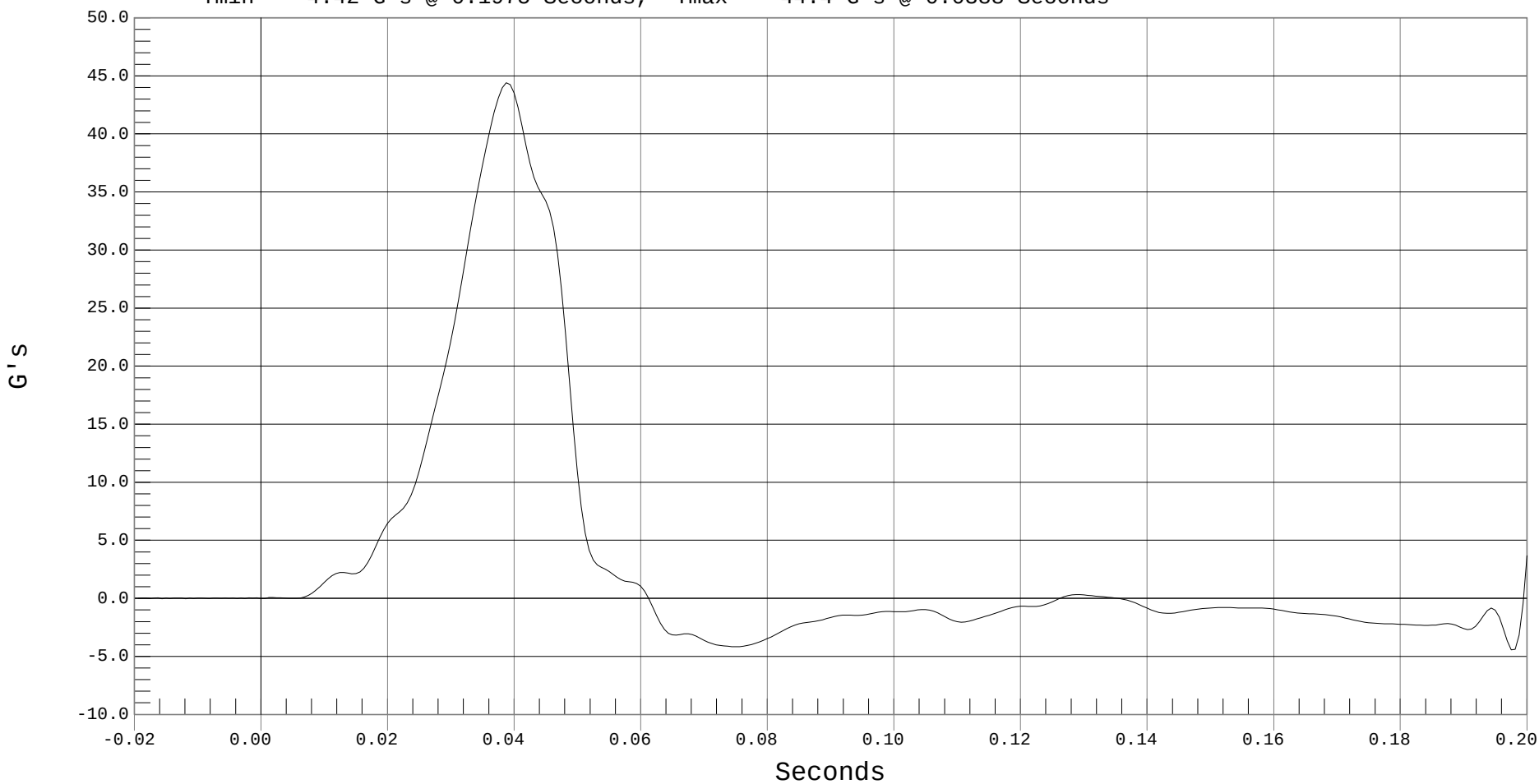
REAR PASSENGER PELVIS REDUNDANT Y ACCELERATION

Test Desc.: FMVSS 214 SIDE IMPACT
Component: 2001 VOLVO S60 4 DOOR (C15901)
Other Info:

Test Date: 01-31-01
Speed: 33.1 MPH, 53.3 KPH
Fir Filtered

— 1 PASSENGER PELVIS Yr, B01010FI.R48

Ymin = -4.42 G's @ 0.1975 Seconds, Ymax = 44.4 G's @ 0.0388 Seconds





REAR PASSENGER PELVIS REDUNDANT Y VELOCITY

Test Desc.: FMVSS 214 SIDE IMPACT

Component: 2001 VOLVO S60 4 DOOR (C15901)

Other Info:

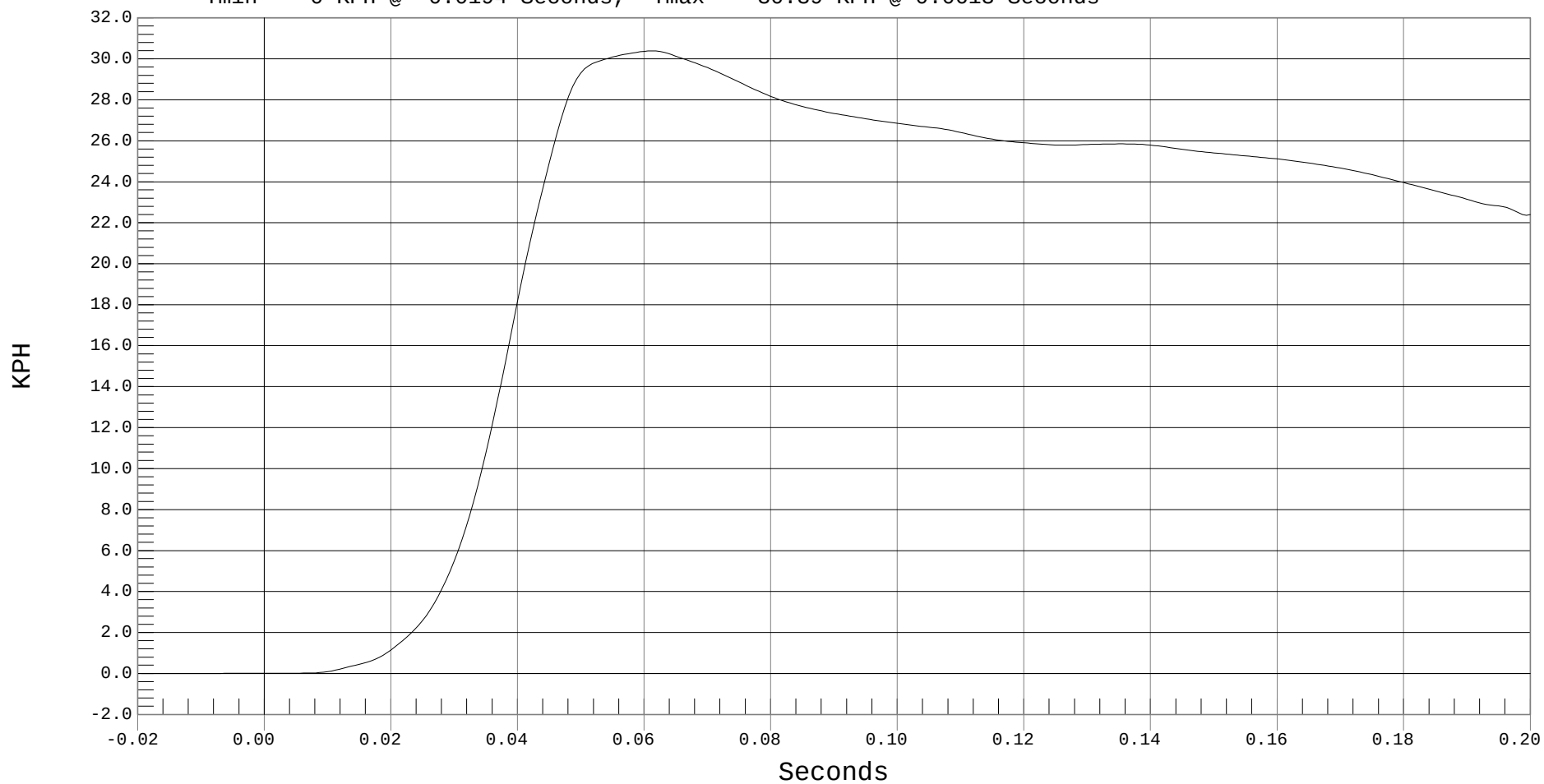
Test Date: 01-31-01

Speed: 33.1 MPH, 53.3 KPH

Fir Filtered

— 1 REAR PASSENGER PELVIS Y REDUNDANT VELOCITY, B01010FI.V48

Ymin = 0 KPH @ -0.0194 Seconds, Ymax = 30.39 KPH @ 0.0613 Seconds



APPENDIX C

SID CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION DATA SUMMARY
SIDE IMPACT DUMMY (SID)
CONFIGURED TO LEFT/RIGHT SIDE IMPACT

Report Date: February 14, 2001

Technician: Tim Michnay

Test Parameter	Specification	Dummy Serial Number: 037		Dummy Serial Number: 036	
		Pre-Test	Post-Test	Pre-Test	Post-Test
SH-Seated Height (mm)	889 – 909	901	901	901	901
RH-Rib Height (mm)	501 – 521	511	511	505	505
HP-Hip Pivot Height (mm)	99 ref.	99	99	99	99
RD-Rib from Back Line (mm)	229 – 241	236	236	234	234
KV-Knee Pivot from Back Line (mm)	511 – 526	520	520	520	520
SW-Knee Pivot to Floor (mm)	490 – 505	494	494	496	496
HW-Hip Width (mm)	356 - 391	380	380	372	372
Thorax Impact					
Temperature (°C)	18.9 – 25.5	21.5	21.0	21.4	20.9
Relative Humidity (%)	10 – 70	29	17	28	15
Probe Speed (m/s)	4.27 – 4.33	4.28	4.28	4.28	4.28
Upper Rib (g's)	37 – 46	46	45	46	43
Lower Rib (g's)	37 – 46	45	46	41	45
Lower Spine (g's)	15 – 22	20	20	19	19
Pelvis Impact					
Temperature (°C)	18.9 – 25.5	21.5	21.0	21.4	20.9
Relative Humidity (%)	10 – 70	29	17	28	15
Probe Speed (m/s)	4.27 – 4.33	4.27	4.27	4.27	4.28
Pelvis (g's)	40 - 60	49	46	45	50

REMARKS:

CERTIFICATION DATA

Dummy Serial Number: 037

Calibration Test Results Summary

Dummy Serial Number: 037

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Dummy Serial Number: 037
 Date of Verification: 1/30/01
 Test Number: D0114

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH-Seated Height (mm)	889 – 909	901
RH-Rib Height (mm)	501 – 521	505
HP-Hip Pivot Height (mm)	99 ref.	99
RD-Rib From Back Line (mm)	229 - 241	234
KV-Knee Pivot From Back Line (mm)	511 – 526	520
SW-Knee Pivot to Floor (mm)	490 – 505	496
HW – Hip Width (mm)	356 – 391	372

Technician: _____

Approved By:_____

MGA RESEARCH CORPORATION

HEAD DROP TEST

SIDE IMPACT DUMMY (SID)

Date: 1/30/01

Dummy Serial Number: 037

Test Number: D01141

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 - 25.5	21.5
Relative Humidity (%)	10 - 70	30
Peak Resultant Acceleration	210 - 260 g's	226
Peak Lateral Acceleration	< 10 g's	-7
Time Above 100 g.	0.9 - 1.5 msec.	1.1

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



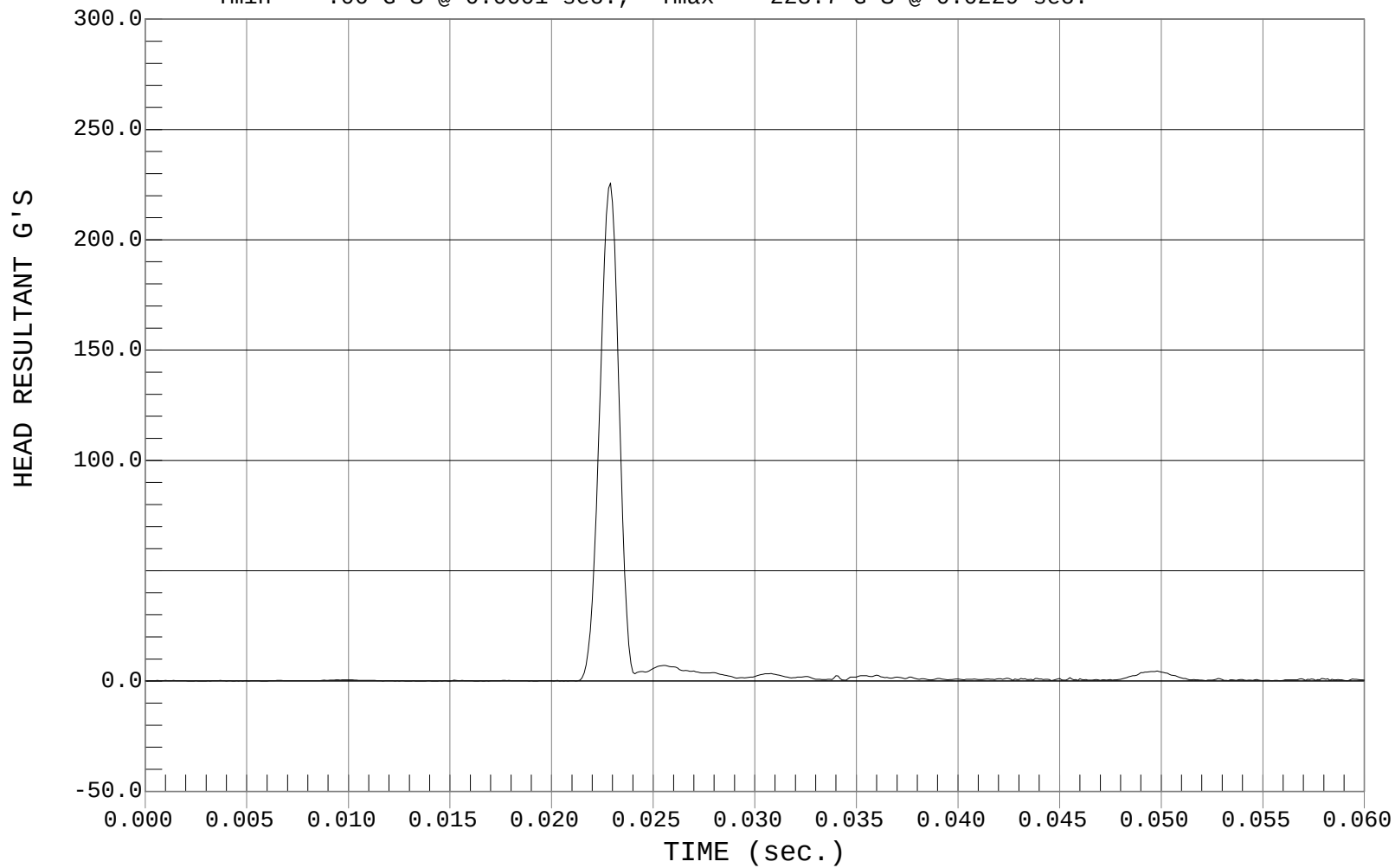
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #037

Test Date: 01-30-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01141av.a01

Ymin = .06 G'S @ 0.0001 sec., Ymax = 225.7 G'S @ 0.0229 sec.





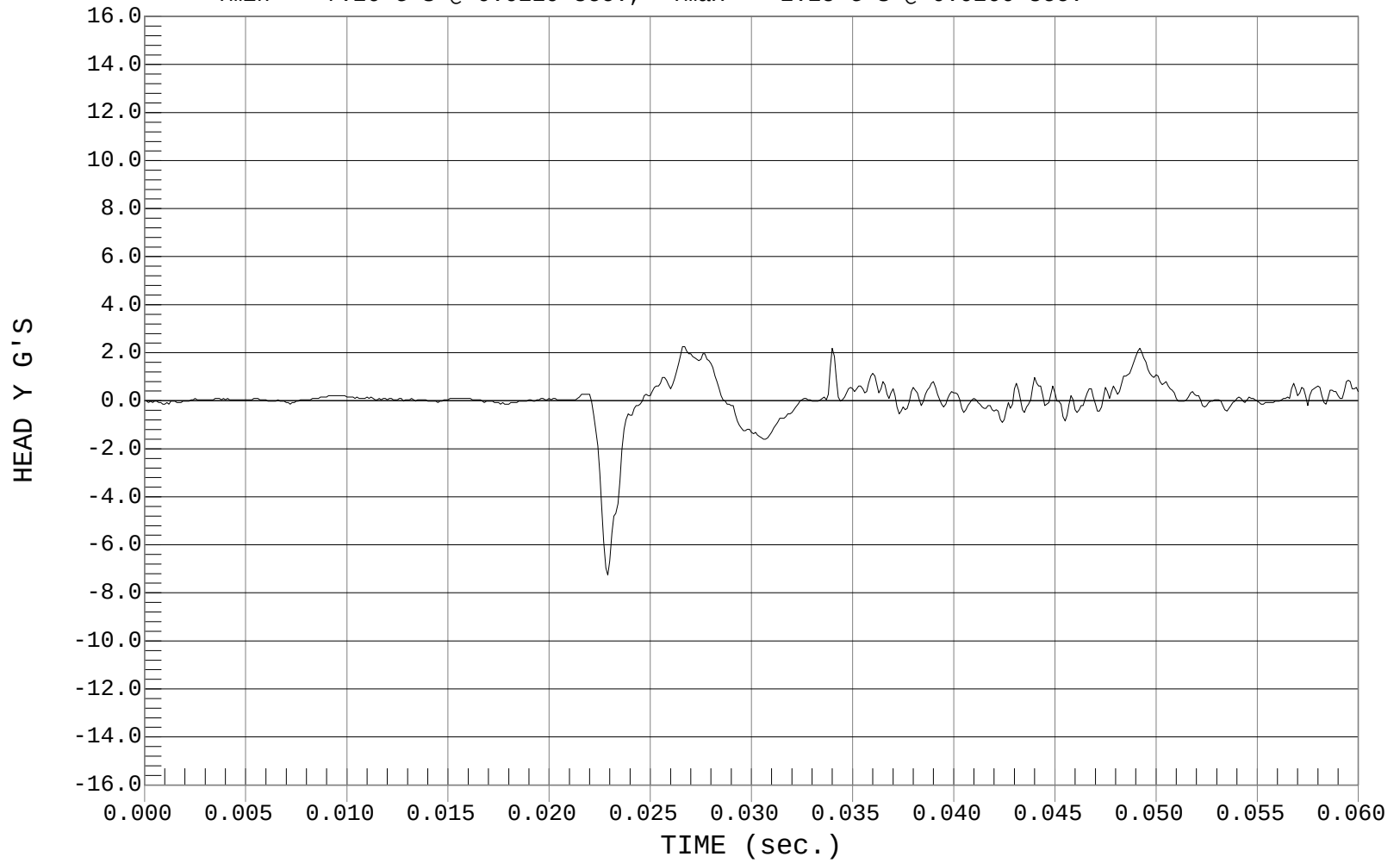
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #037

Test Date: 01-30-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01141AR.A02

Ymin = -7.26 G'S @ 0.0229 sec., Ymax = 2.25 G'S @ 0.0266 sec.



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

Date: 1/30/01

Dummy Serial Number: 037

Test Number: D01142

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.5
Relative Humidity (%)	10 – 70	29
Probe Speed (m/s)	4.27 – 4.33	4.28
Upper Rib (g's)	37 – 46	46
Lower Rib (g's)	37 – 46	45
Lower Spine (g's)	15 - 22	20

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



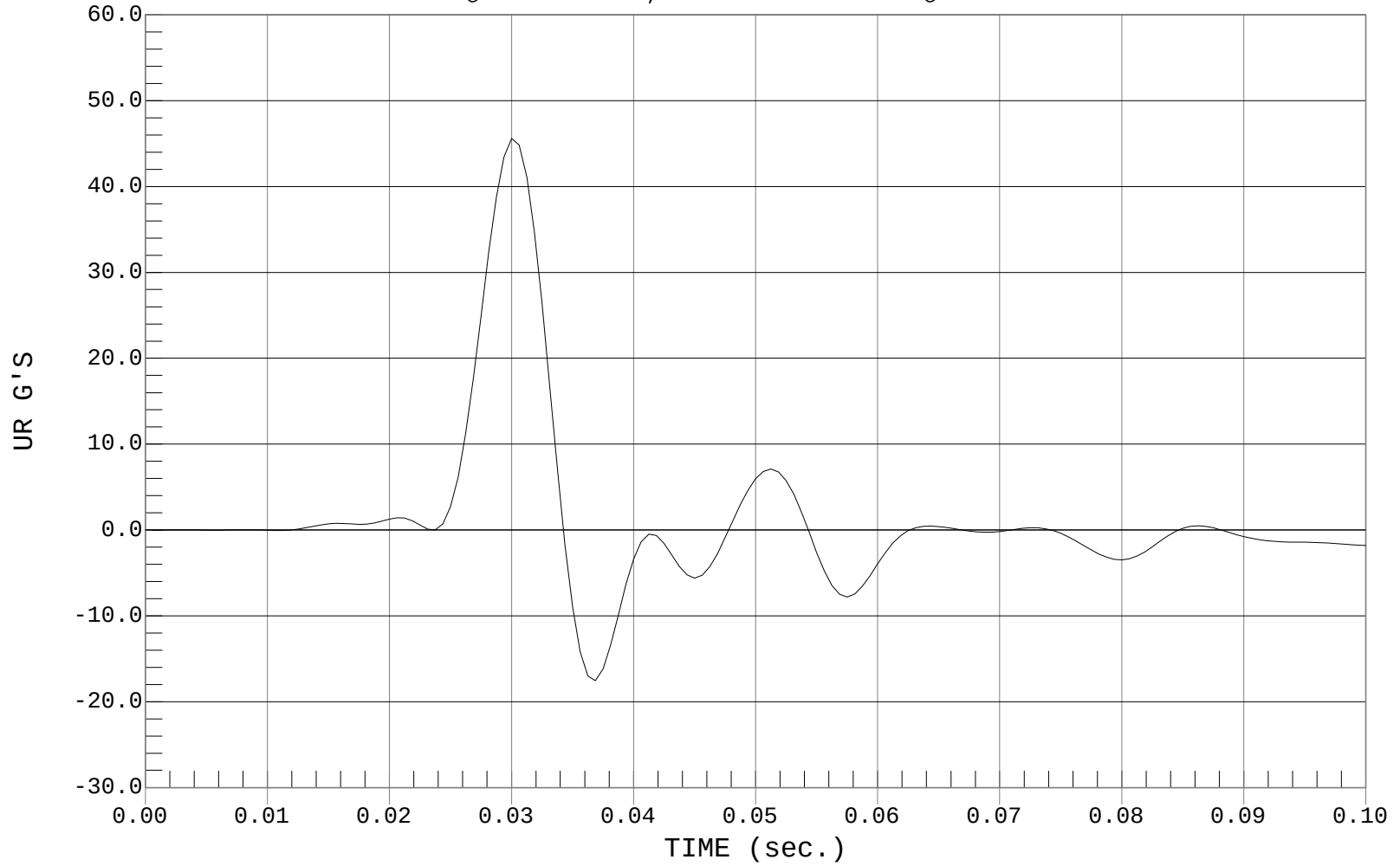
UPPER RIB ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #037

Test Date: 01-30-01
Speed: 14.03 FT/SEC, 4.28 M/SEC

— 1 UR, D01142FI.R08

Ymin = -17.55 G'S @ 0.0369 sec., Ymax = 45.6 G'S @ 0.0300 sec.





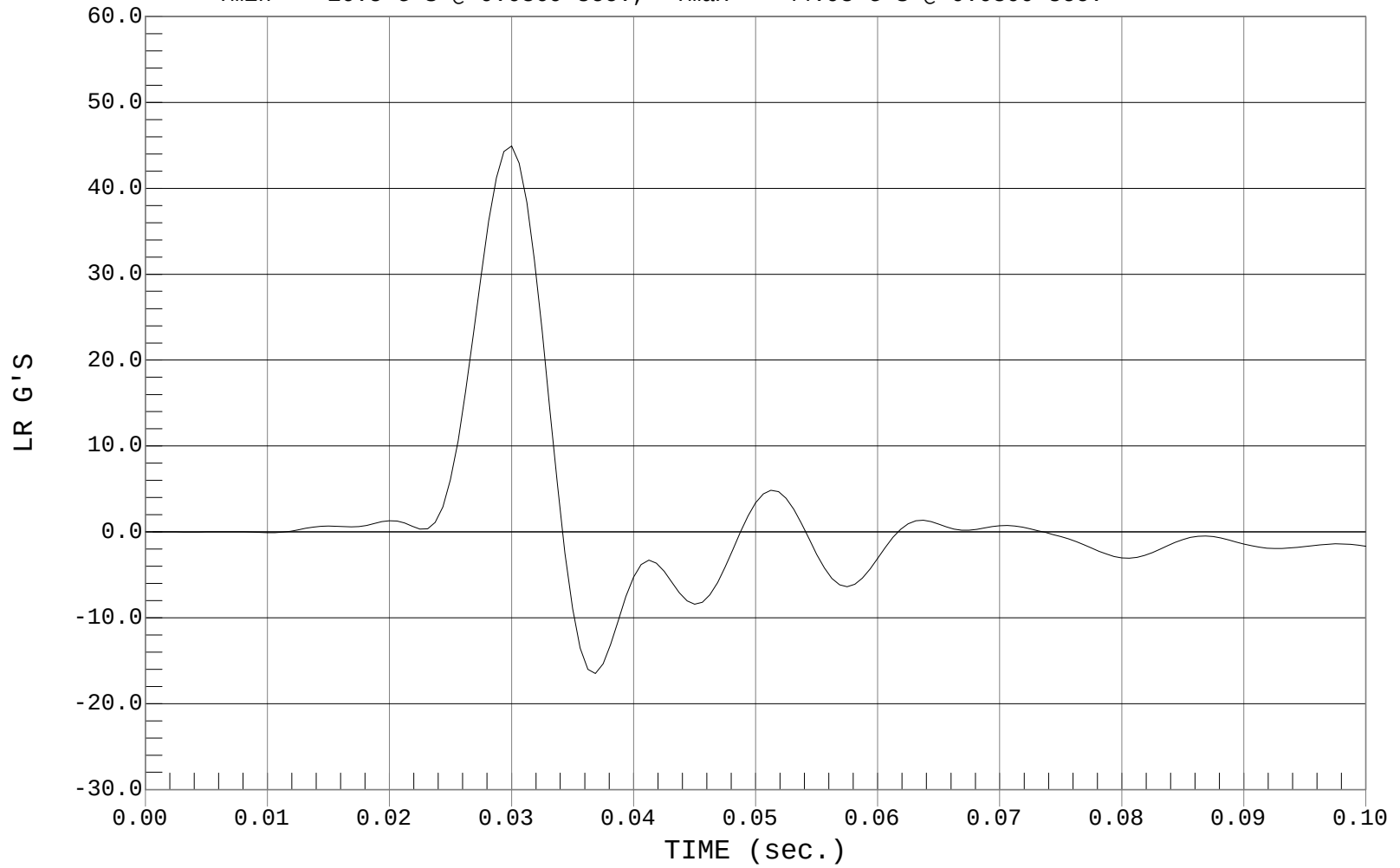
LOWER RIB ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #037

Test Date: 01-30-01
Speed: 14.03 FT/SEC, 4.28 M/SEC

— 1 LR, D01142FI.R09

Ymin = -16.5 G'S @ 0.0369 sec., Ymax = 44.93 G'S @ 0.0300 sec.





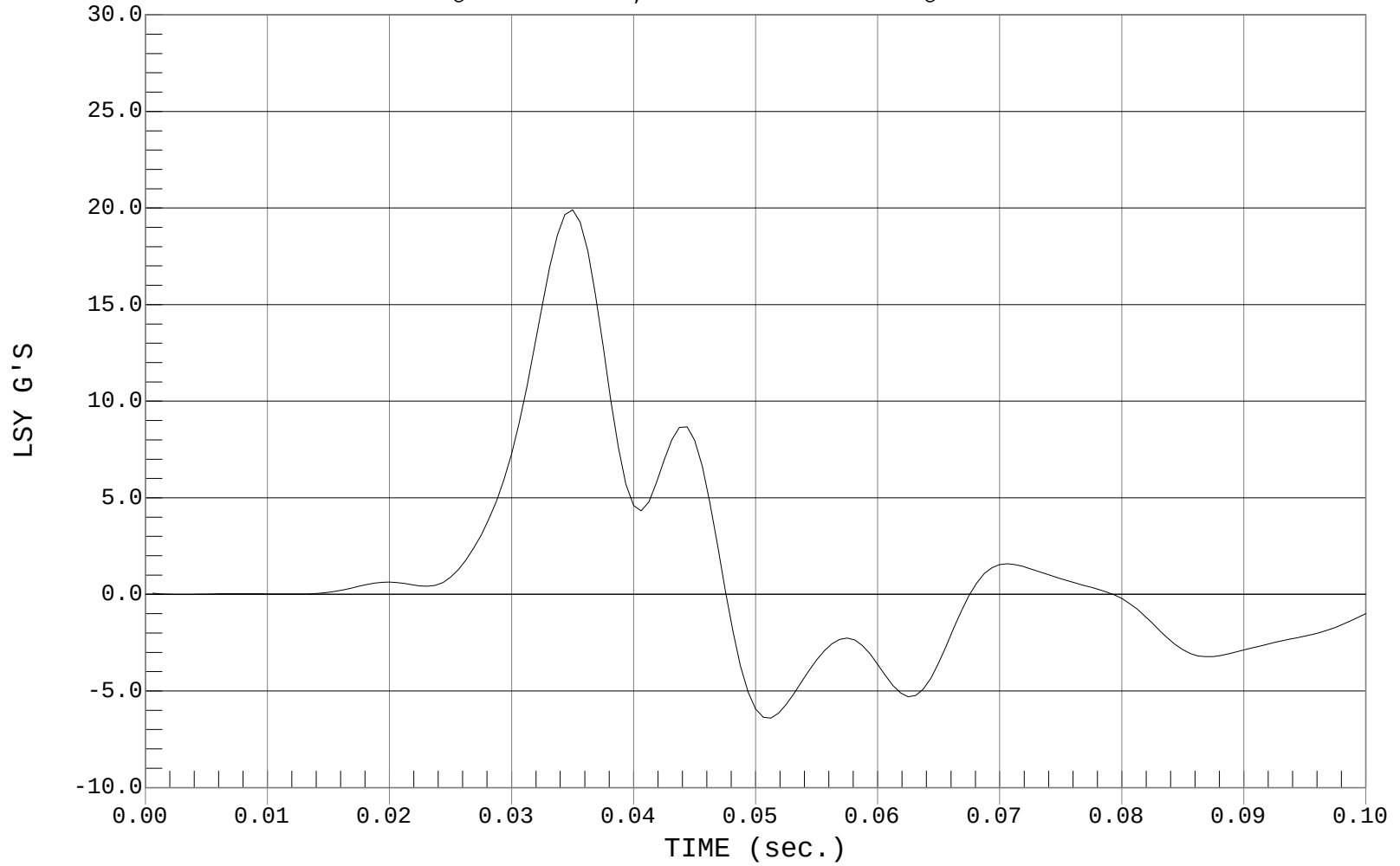
LOWER SPINE ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #037

Test Date: 01-30-01
Speed: 14.03 FT/SEC, 4.28 M/SEC

— 1 LSY, D01142FI.R10

Ymin = -6.41 G'S @ 0.0513 sec., Ymax = 19.91 G'S @ 0.0350 sec.



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

Date: 1/30/01

Dummy Serial Number: 037

Test Number: D01143

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.5
Relative Humidity (%)	10 – 70	29
Probe Speed (m/s)	4.27 – 4.33	4.27
Pelvis Acceleration (g's)	40 – 60	49

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



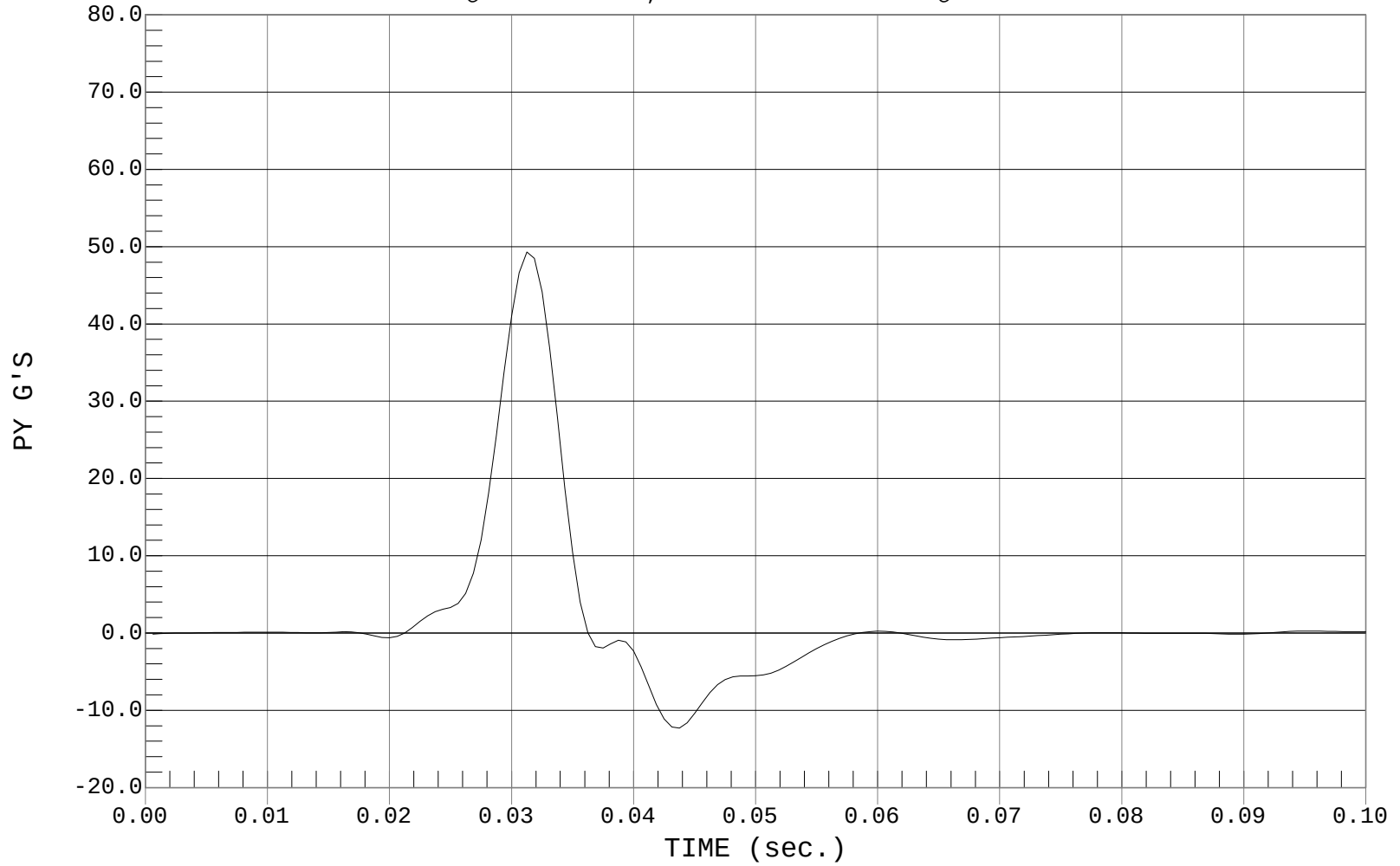
PELVIS ACCELERATION

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #037

Test Date: 01-30-01
Speed: 14.00 FT/SEC, 4.27 M/SEC

— 1 PY, D01143FI.R11

Ymin = -12.29 G'S @ 0.0438 sec., Ymax = 49.32 G'S @ 0.0313 sec.



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

Date: 1/30/01

Dummy Serial Number: 037

Test Number: D01144

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.5
Relative Humidity (%)	10 – 70	29
Force @ 12.7 mm	104 – 162	136
Force @ 19 mm	163 – 222	184
Force @ 25.4 mm	222 – 280	243
Force @ 33 mm	325 - 391	329

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



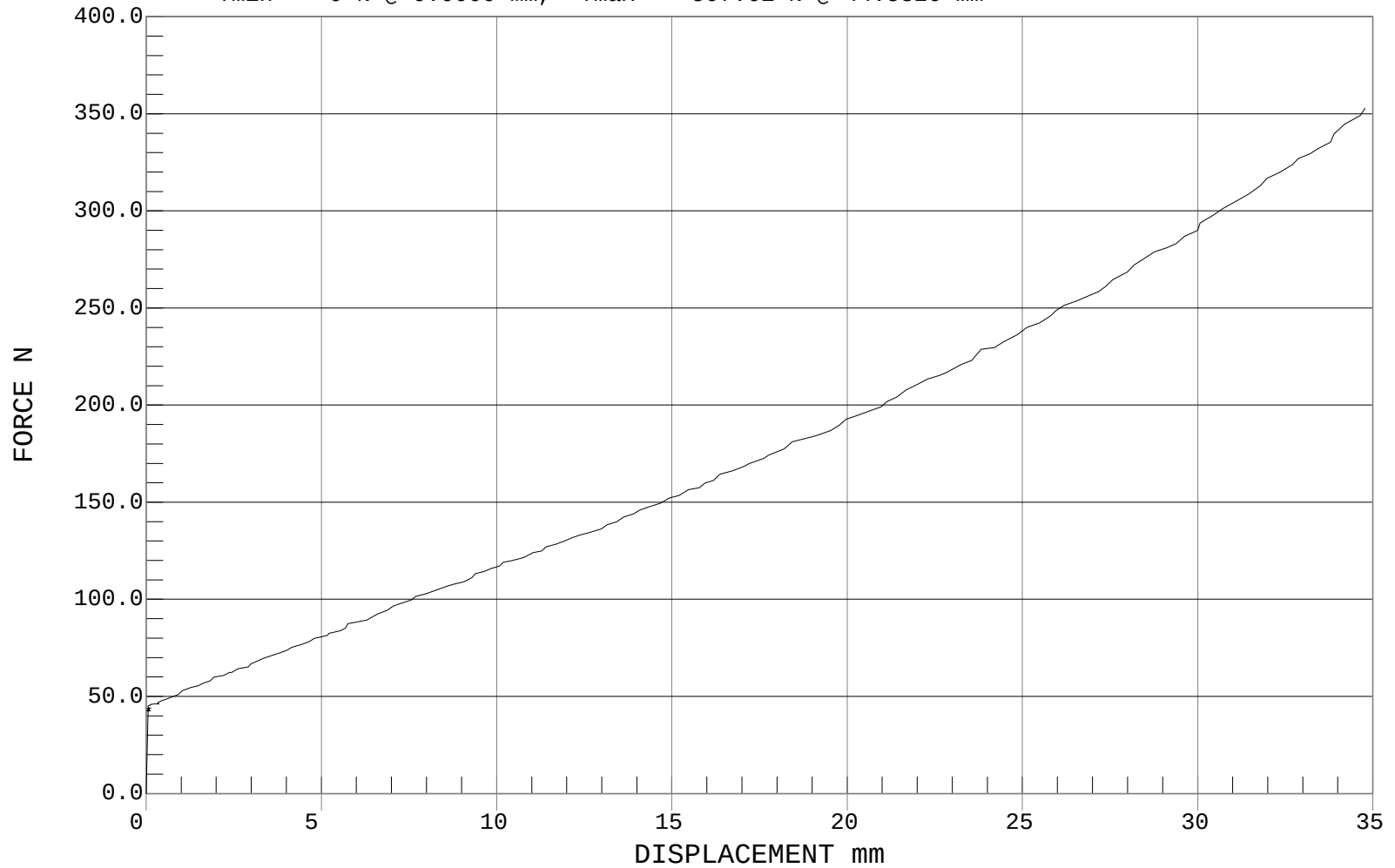
ABDOMEN COMPRESSION

Test Desc.: DUMMY CALIBRATION - ABDOMEN COMPRESSION
Component: DUMMY # 037

Test Date: 01-30-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

1 FORCE, D01144FC.F16

Ymin = 0 N @ 0.0000 mm, Ymax = 507.61 N @ 44.5320 mm



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

Date: 1/30/01

Dummy Serial Number: 037

Test Number: D01145

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.5
Relative Humidity (%)	10 – 70	29
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	106.3
Force @ 30°	151.2 – 204.6	158.4
Force @ 40°	204.6 – 258.0	222.6
Return Angle	12° maximum	6

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



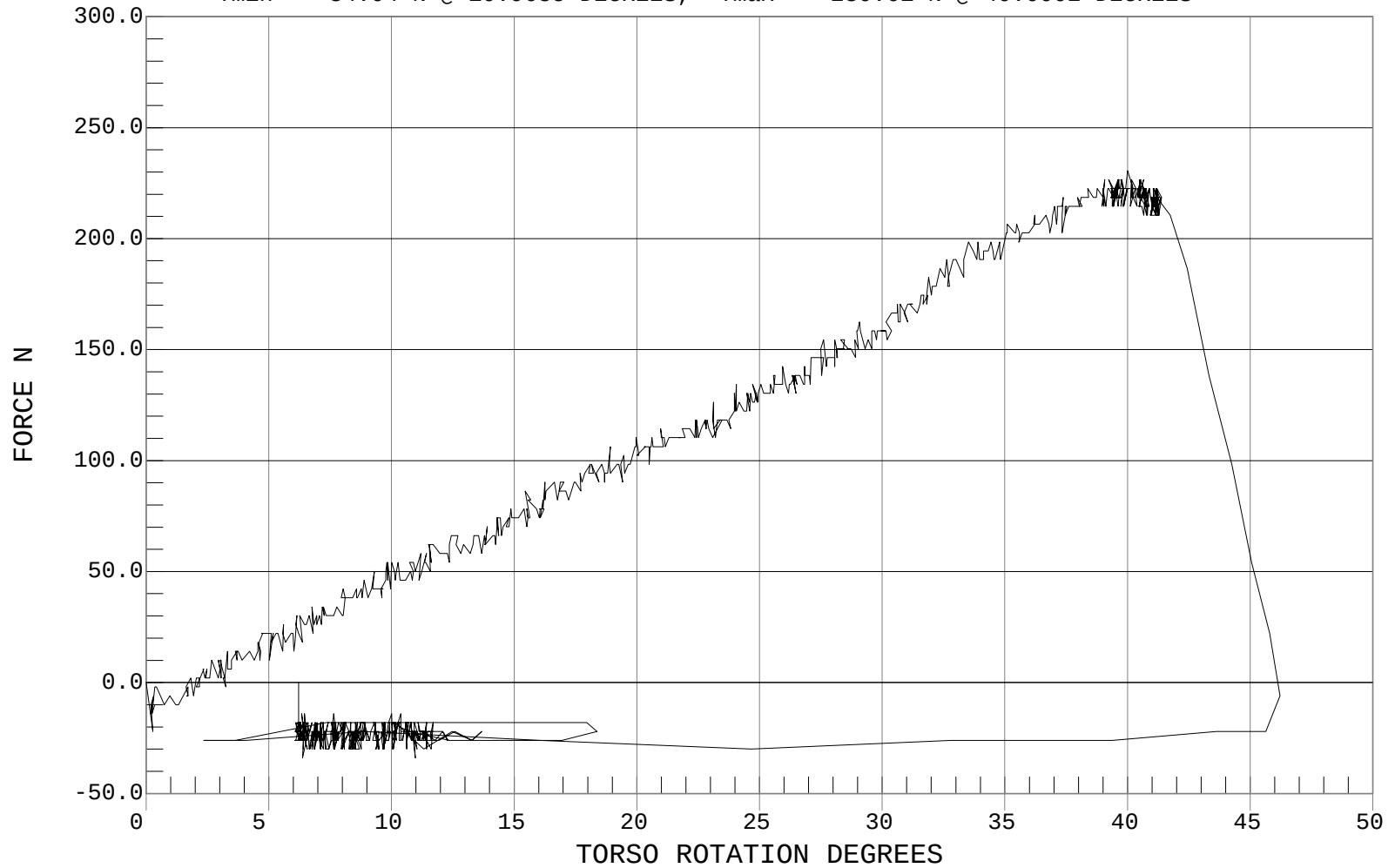
LUMBAR FLEXION

Test Desc.: DUMMY CALIBRATION - LUMBAR FLEXION
Component: DUMMY # 037

Test Date: 01-30-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 FORCE, D01145FC.F14

Ymin = -34.04 N @ 10.9685 DEGREES, Ymax = 230.61 N @ 40.0002 DEGREES



DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Dummy Serial Number: 037

Inspected By: Tim Michnay

Date: 1/30/01

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

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

CERTIFICATION DATA

Dummy Serial Number: 036

Calibration Test Results Summary

Dummy Serial Number: 036

Pre-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Dummy Serial Number: 036
 Date of Verification: 1/30/01
 Test Number: D0113

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH-Seated Height (mm)	889 – 909	901
RH-Rib Height (mm)	501 – 521	505
HP-Hip Pivot Height (mm)	99 ref.	99
RD-Rib From Back Line (mm)	229 - 241	234
KV-Knee Pivot From Back Line (mm)	511 – 526	520
SW-Knee Pivot to Floor (mm)	490 – 505	496
HW – Hip Width (mm)	356 – 391	372

Technician: _____

Approved By:_____

MGA RESEARCH CORPORATION

HEAD DROP TEST

SIDE IMPACT DUMMY (SID)

Date: 1/30/01

Dummy Serial Number: 036

Test Number: D01131

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 - 25.5	21.5
Relative Humidity (%)	10 - 70	30
Peak Resultant Acceleration	210 - 260 g's	216
Peak Lateral Acceleration	< 10 g's	-4
Time Above 100 g.	0.9 - 1.5 msec.	1.2

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



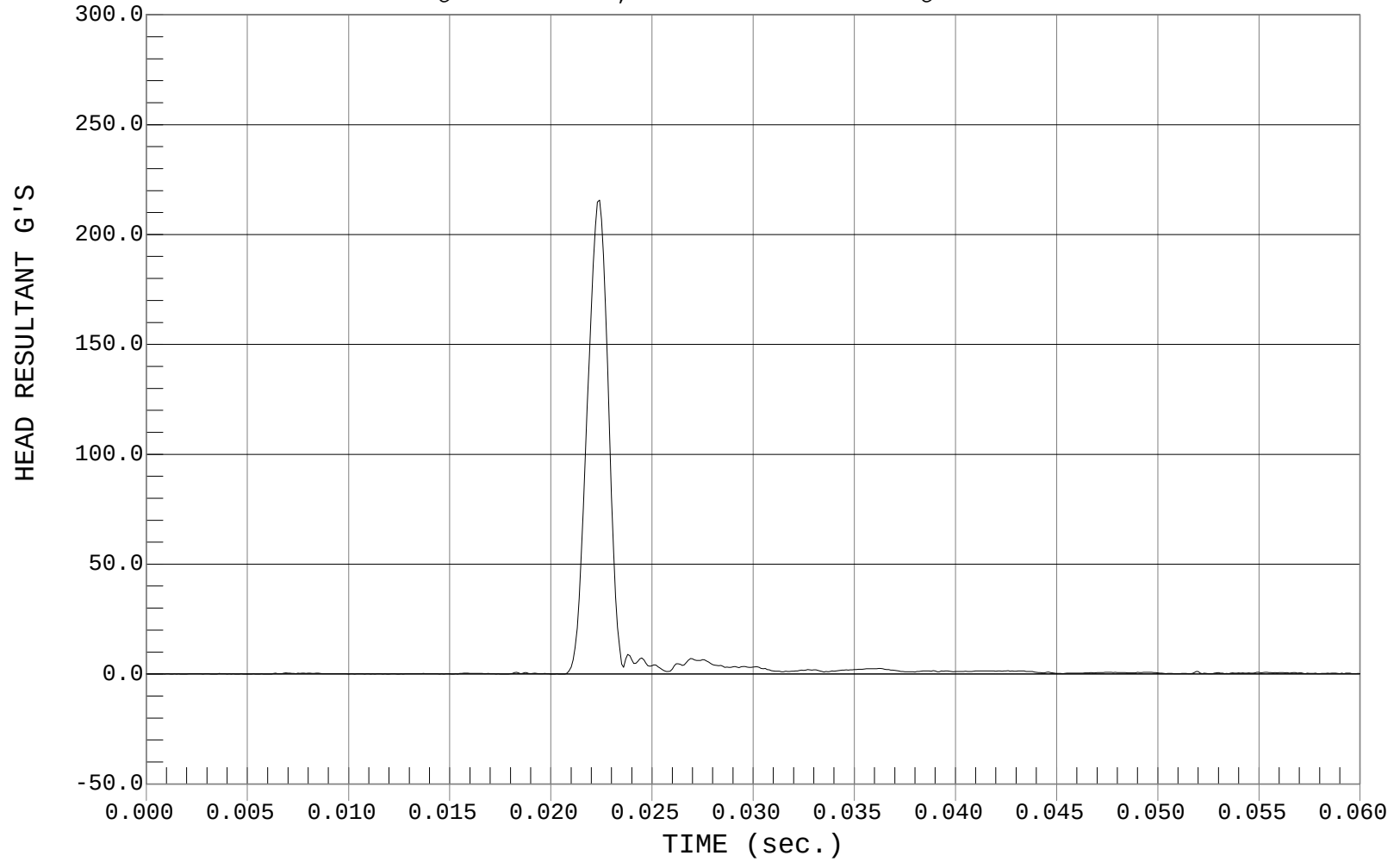
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop

Test Date: 01-30-01

— 1 HEAD RESULTANT ACCELERATION, D01131av.a01

Ymin = .05 G'S @ 0.0012 sec., Ymax = 215.62 G'S @ 0.0224 sec.





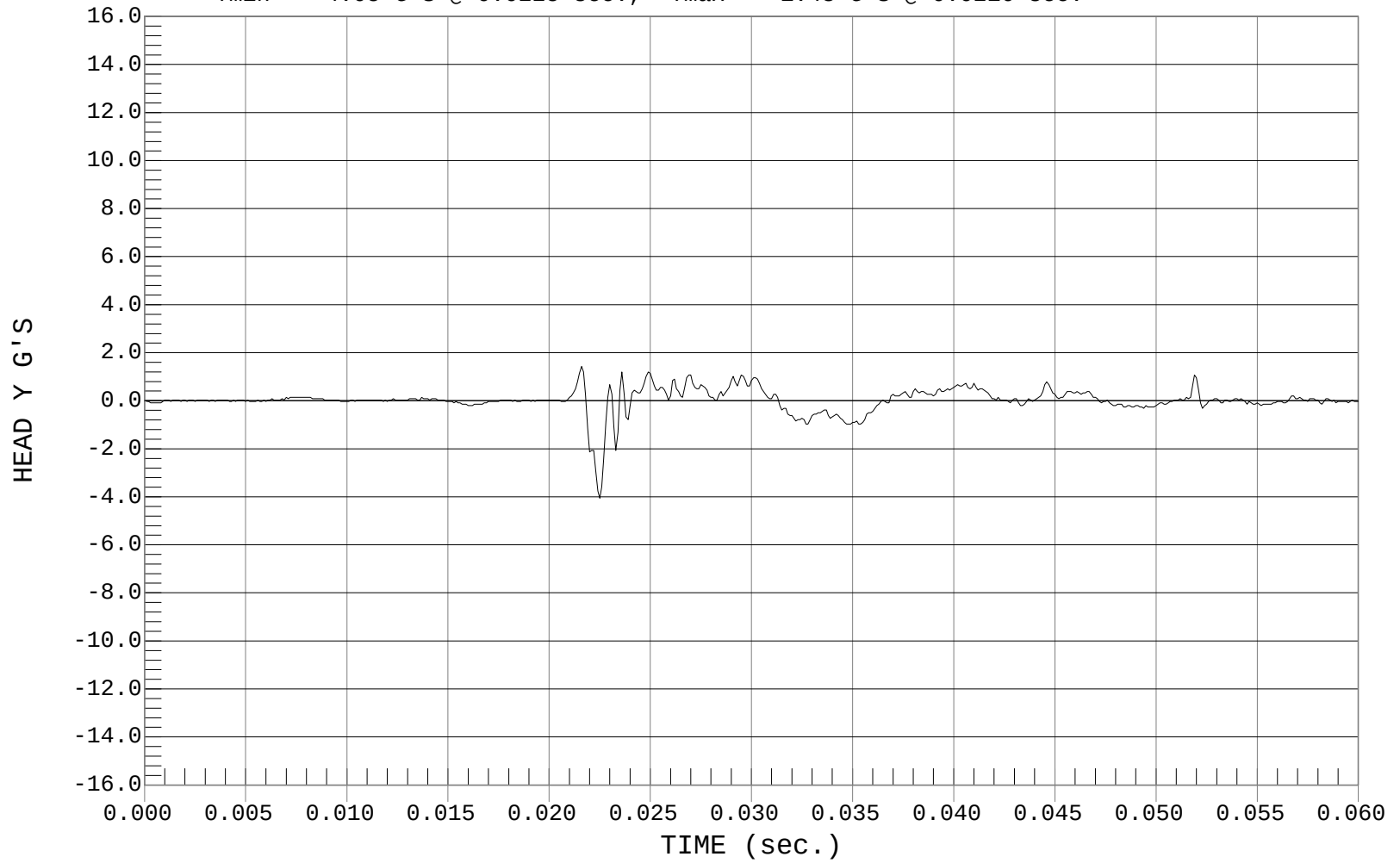
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #036

Test Date: 01-30-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01131AR.A02

Ymin = -4.05 G'S @ 0.0225 sec., Ymax = 1.43 G'S @ 0.0216 sec.



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

Date: 1/30/01

Dummy Serial Number: 036

Test Number: D01132

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.4
Relative Humidity (%)	10 – 70	28
Probe Speed (m/s)	4.27 – 4.33	4.28
Upper Rib (g's)	37 – 46	46
Lower Rib (g's)	37 – 46	41
Lower Spine (g's)	15 - 22	19

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



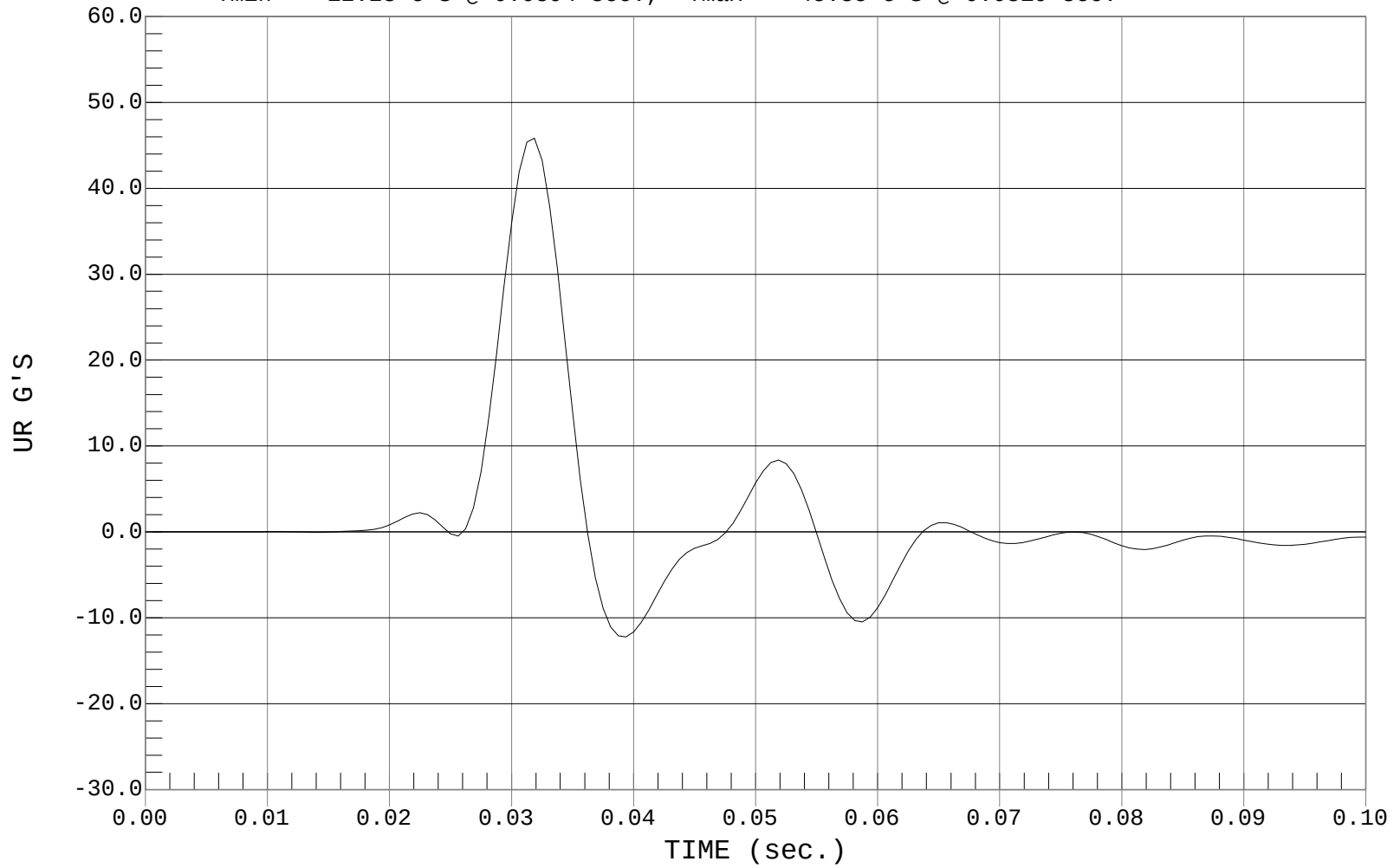
UPPER RIB ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #036

Test Date: 01-30-01
Speed: 14.03 FT/SEC, 4.28 M/SEC

— 1 UR, D01132FI.R08

Ymin = -12.23 G'S @ 0.0394 sec., Ymax = 45.85 G'S @ 0.0319 sec.





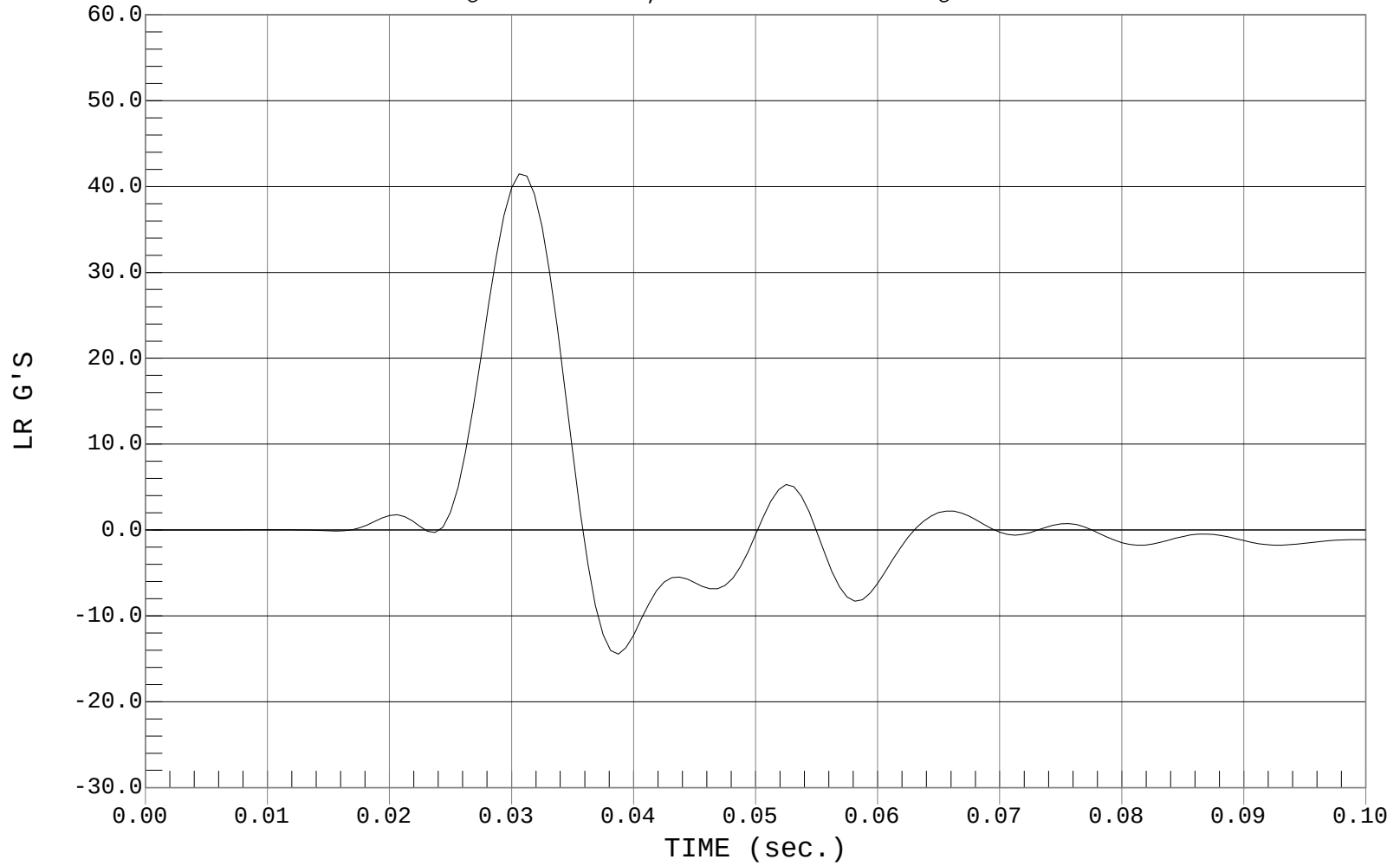
LOWER RIB ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #036

Test Date: 01-30-01
Speed: 14.03 FT/SEC, 4.28 M/SEC

— 1 LR, D01132FI.R09

Ymin = -14.46 G'S @ 0.0388 sec., Ymax = 41.47 G'S @ 0.0306 sec.





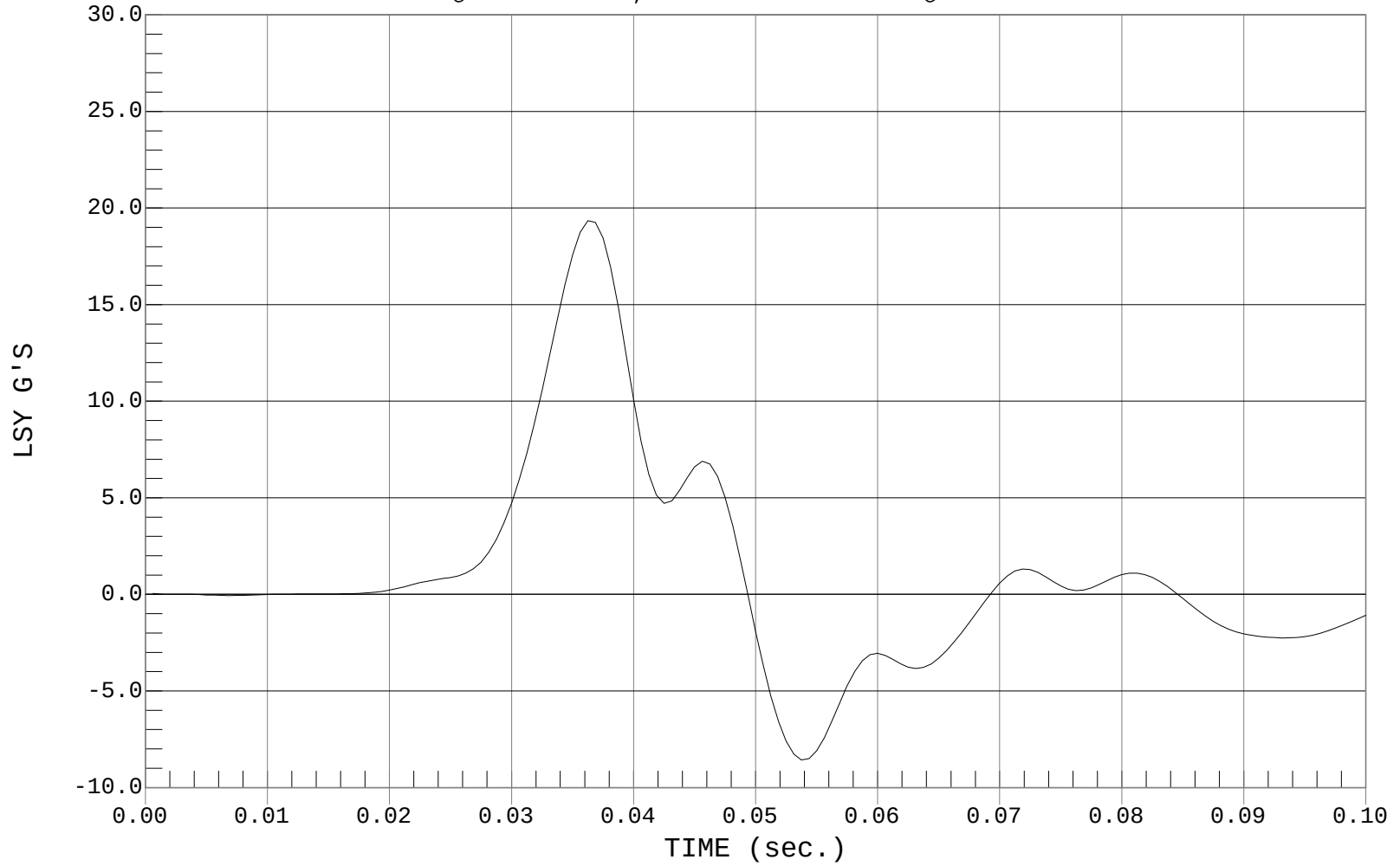
LOWER SPINE ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #036

Test Date: 01-30-01
Speed: 14.03 FT/SEC, 4.28 M/SEC

— 1 LSY, D01132FI.R10

Ymin = -8.56 G'S @ 0.0538 sec., Ymax = 19.34 G'S @ 0.0363 sec.



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

Date: 1/30/01

Dummy Serial Number: 036

Test Number: D01133

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.4
Relative Humidity (%)	10 – 70	28
Probe Speed (m/s)	4.27 – 4.33	4.27
Pelvis Acceleration (g's)	40 – 60	45

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



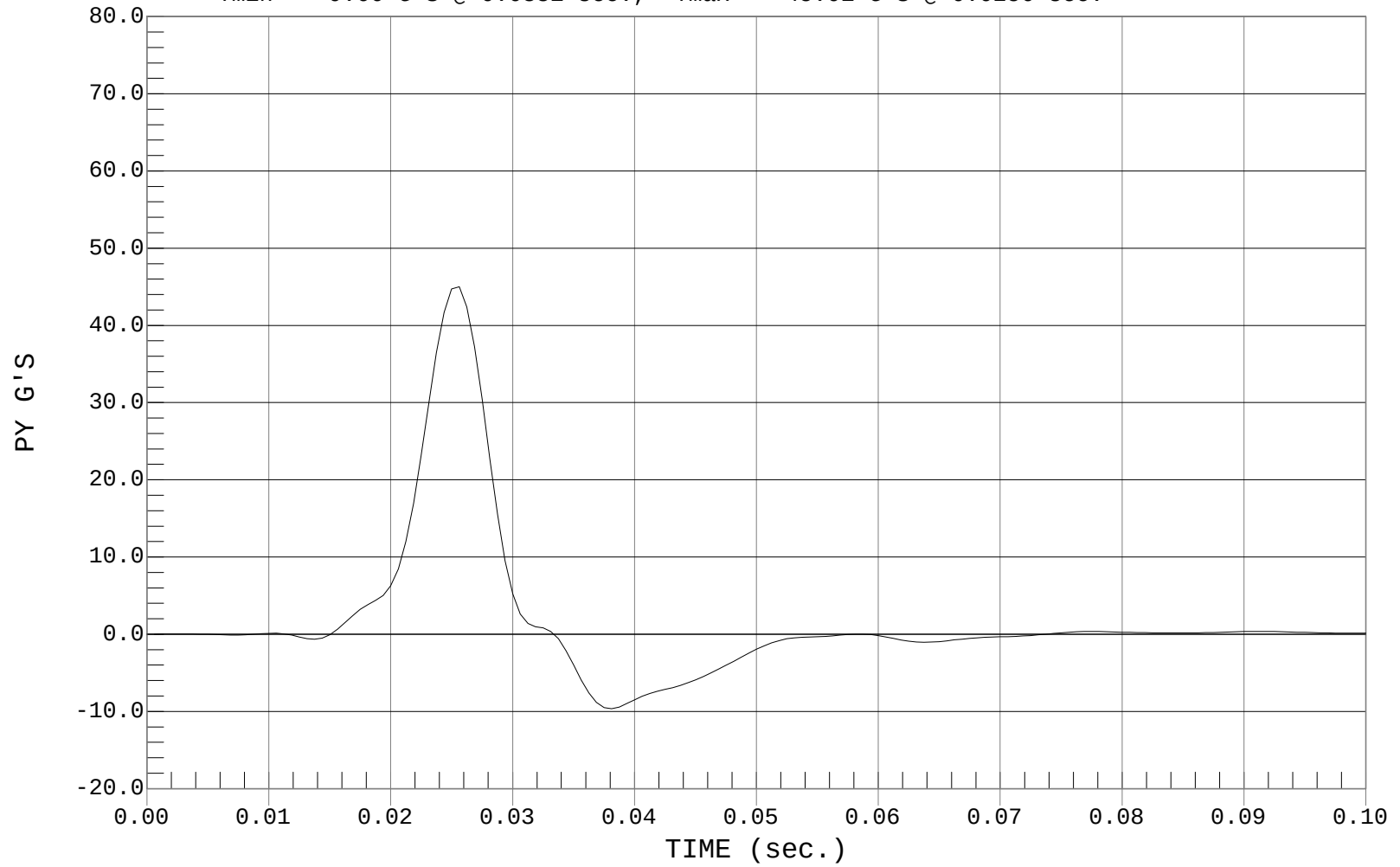
PELVIS ACCELERATION

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #036

Test Date: 01-30-01
Speed: 14.01 FT/SEC, 4.27 M/SEC

— 1 PY, D01133FI.R11

Ymin = -9.66 G'S @ 0.0381 sec., Ymax = 45.01 G'S @ 0.0256 sec.



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

Date: 1/30/01

Dummy Serial Number: 036

Test Number: D01134

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.5
Relative Humidity (%)	10 – 70	29
Force @ 12.7 mm	104 – 162	155
Force @ 19 mm	163 – 222	211
Force @ 25.4 mm	222 – 280	276
Force @ 33 mm	325 - 391	382

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



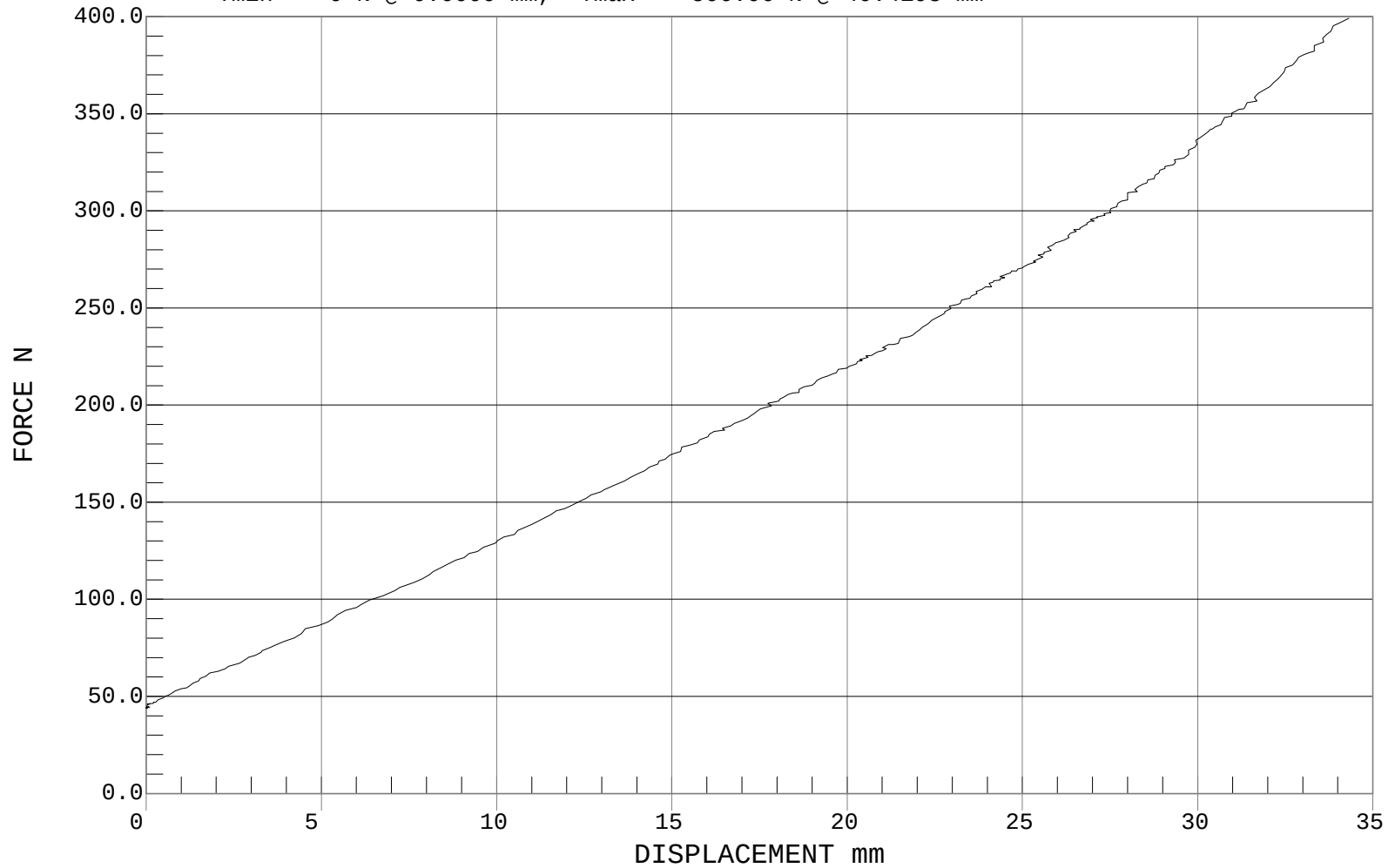
ABDOMEN COMPRESSION

Test Desc.: DUMMY CALIBRATION - ABDOMEN COMPRESSION
Component: DUMMY # 036

Test Date: 01-30-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 FORCE, D01134FC.F16

Ymin = 0 N @ 0.0000 mm, Ymax = 506.06 N @ 40.4198 mm



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

Date: 1/30/01

Dummy Serial Number: 036

Test Number: D01135

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.5
Relative Humidity (%)	10 – 70	29
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	107.8
Force @ 30°	151.2 – 204.6	167.9
Force @ 40°	204.6 – 258.0	219.1
Return Angle	12° maximum	4

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



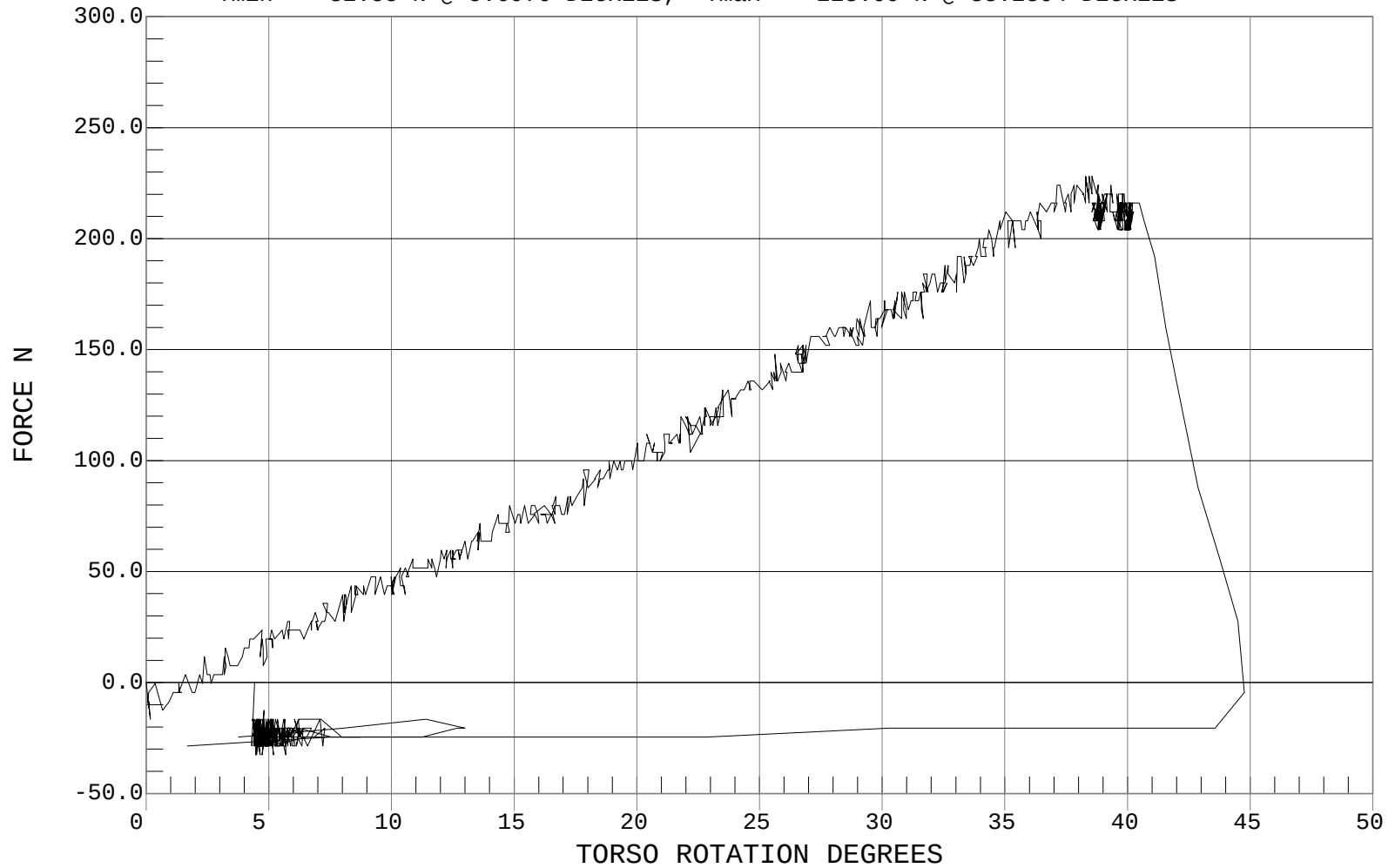
LUMBAR FLEXION

Test Desc.: DUMMY CALIBRATION - LUMBAR FLEXION
Component: DUMMY # 036

Test Date: 01-30-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 FORCE, D01135FC.F14

Ymin = -32.55 N @ 5.6970 DEGREES, Ymax = 228.09 N @ 38.2804 DEGREES



DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Dummy Serial Number: 036

Inspected By: Tim Michnay

Date: 1/30/01

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

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

CERTIFICATION DATA

Dummy Serial Number: 037

Calibration Test Results Summary

Dummy Serial Number: 037

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Dummy Serial Number: 037

Date of Verification: 2/5/01

Test Number: D0116

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH-Seated Height (mm)	889 – 909	901
RH-Rib Height (mm)	501 – 521	511
HP-Hip Pivot Height (mm)	99 ref.	99
RD-Rib From Back Line (mm)	229 - 241	236
KV-Knee Pivot From Back Line (mm)	511 – 526	520
SW-Knee Pivot to Floor (mm)	490 – 505	494
HW – Hip Width (mm)	356 – 391	380

Technician: _____

Approved By:_____

MGA RESEARCH CORPORATION

HEAD DROP TEST

SIDE IMPACT DUMMY (SID)

Date: 2/5/01

Dummy Serial Number: 037

Test Number: D01161

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 - 25.5	21.2
Relative Humidity (%)	10 - 70	20
Peak Resultant Acceleration	210 - 260 g's	218
Peak Lateral Acceleration	< 10 g's	-6
Time Above 100 g.	0.9 - 1.5 msec.	1.1

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



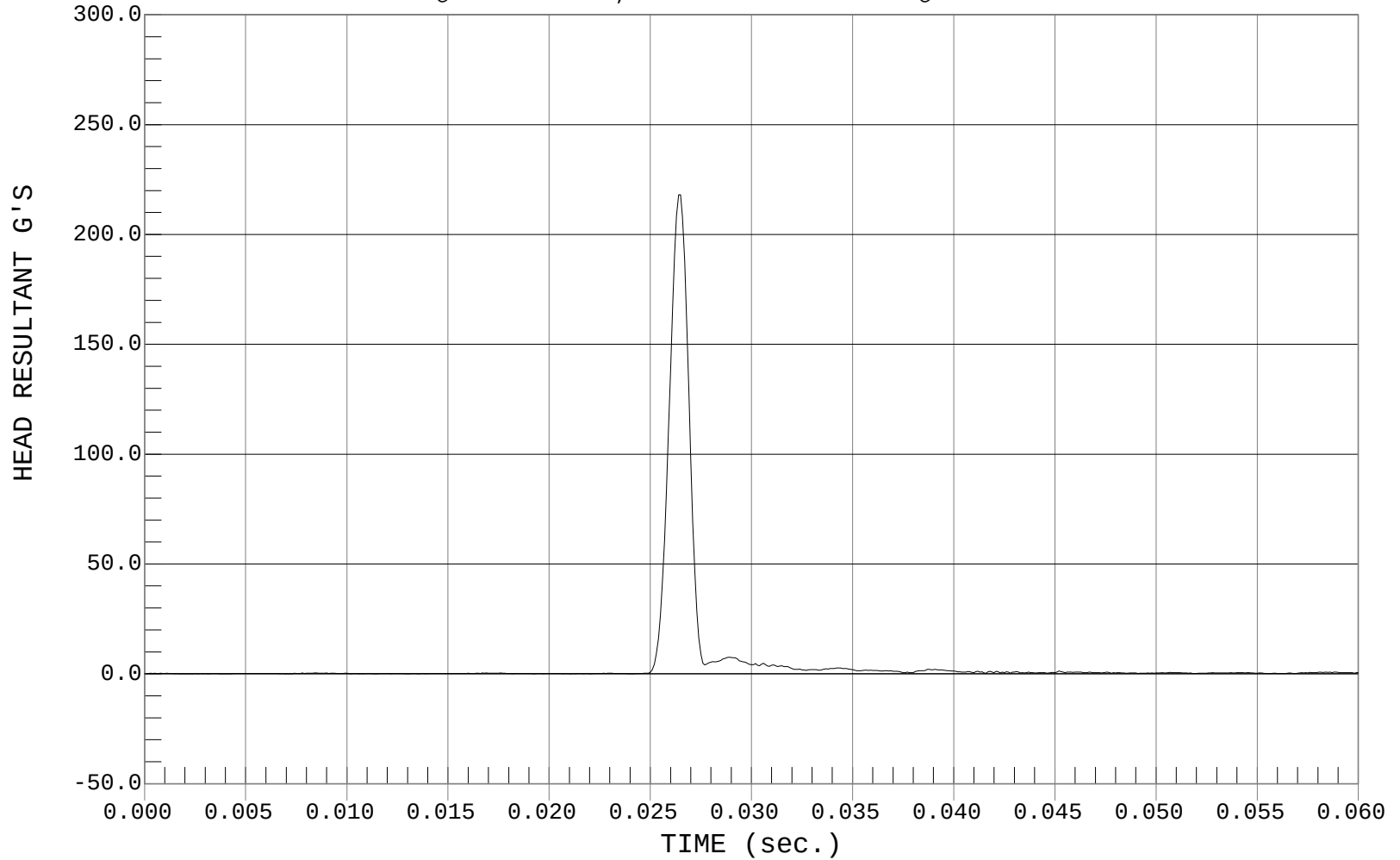
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #037

Test Date: 02-05-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01161av.a01

Ymin = .07 G'S @ 0.0015 sec., Ymax = 218.06 G'S @ 0.0265 sec.





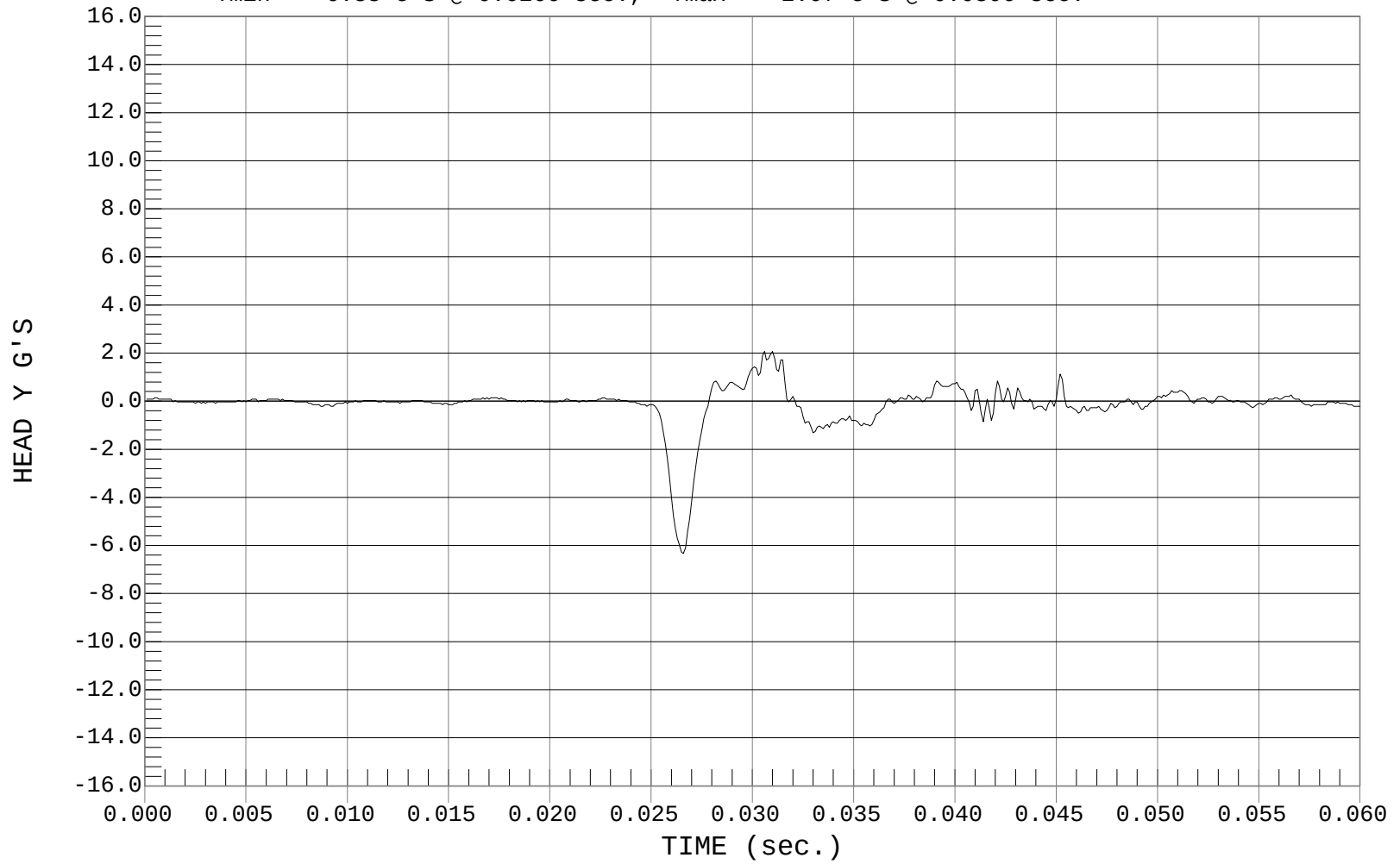
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #037

Test Date: 02-05-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01161AR.A02

Ymin = -6.33 G'S @ 0.0266 sec., Ymax = 2.07 G'S @ 0.0306 sec.



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

Date: 2/2/01
Dummy Serial Number: 037
Test Number: D01162

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	17
Probe Speed (m/s)	4.27 – 4.33	4.28
Upper Rib (g's)	37 – 46	45
Lower Rib (g's)	37 – 46	46
Lower Spine (g's)	15 - 22	20

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



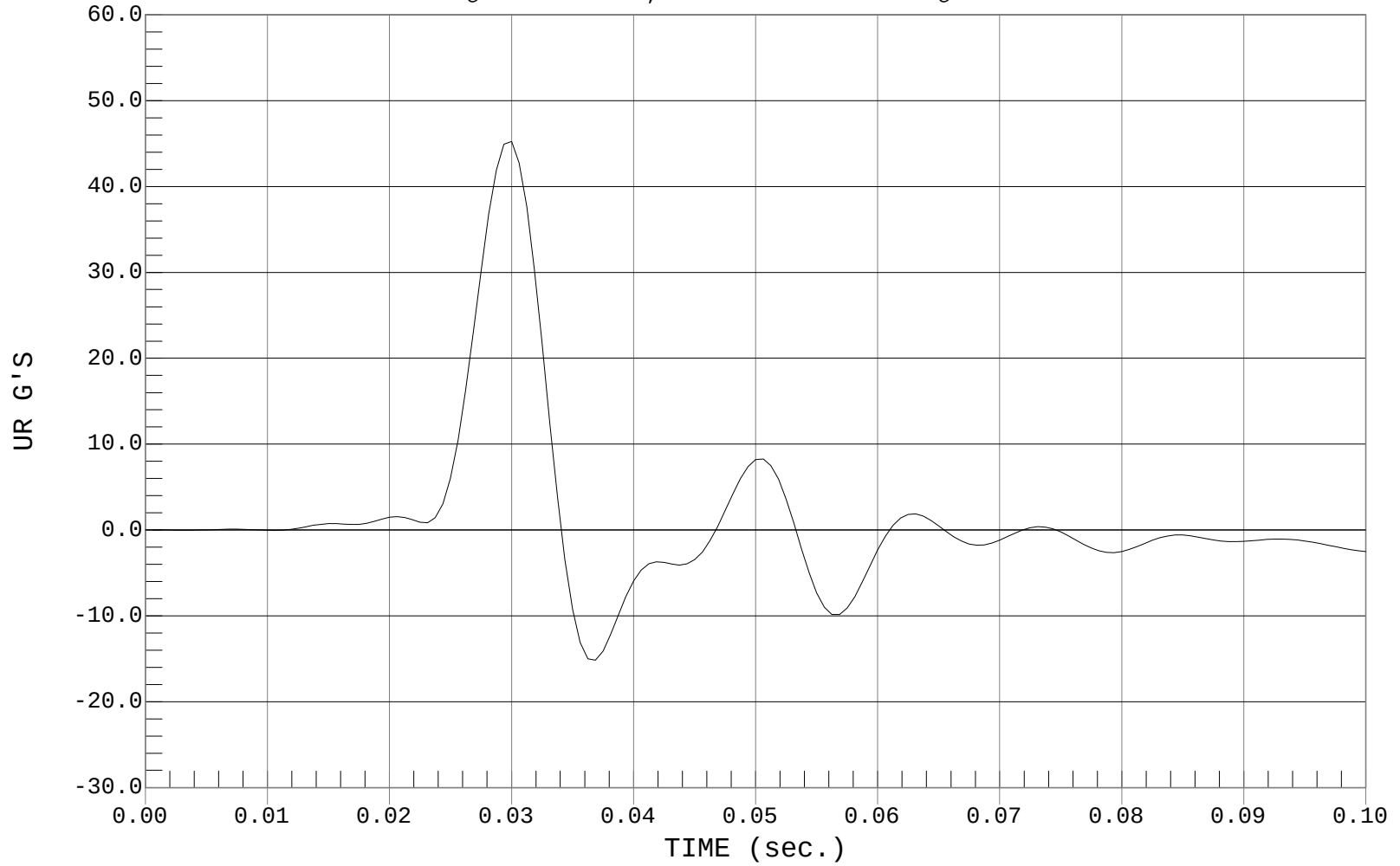
UPPER RIB ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #037

Test Date: 02-02-01
Speed: 14.05 FT/SEC, 4.28 M/SEC

— 1 UR, D01162FI.R08

Ymin = -15.18 G'S @ 0.0369 sec., Ymax = 45.26 G'S @ 0.0300 sec.





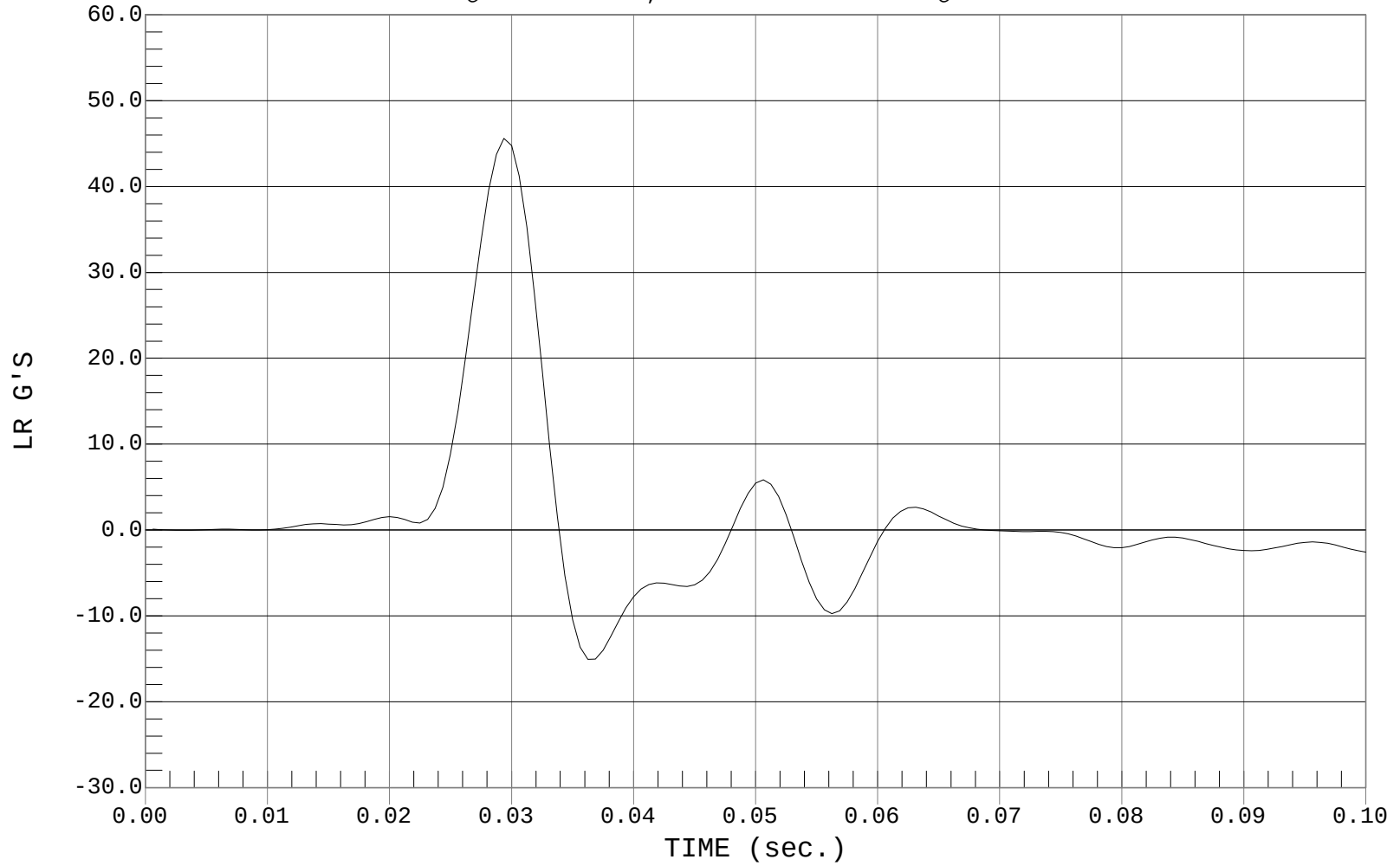
LOWER RIB ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #037

Test Date: 02-02-01
Speed: 14.05 FT/SEC, 4.28 M/SEC

— 1 LR, D01162FI.R09

Ymin = -15.06 G'S @ 0.0363 sec., Ymax = 45.59 G'S @ 0.0294 sec.





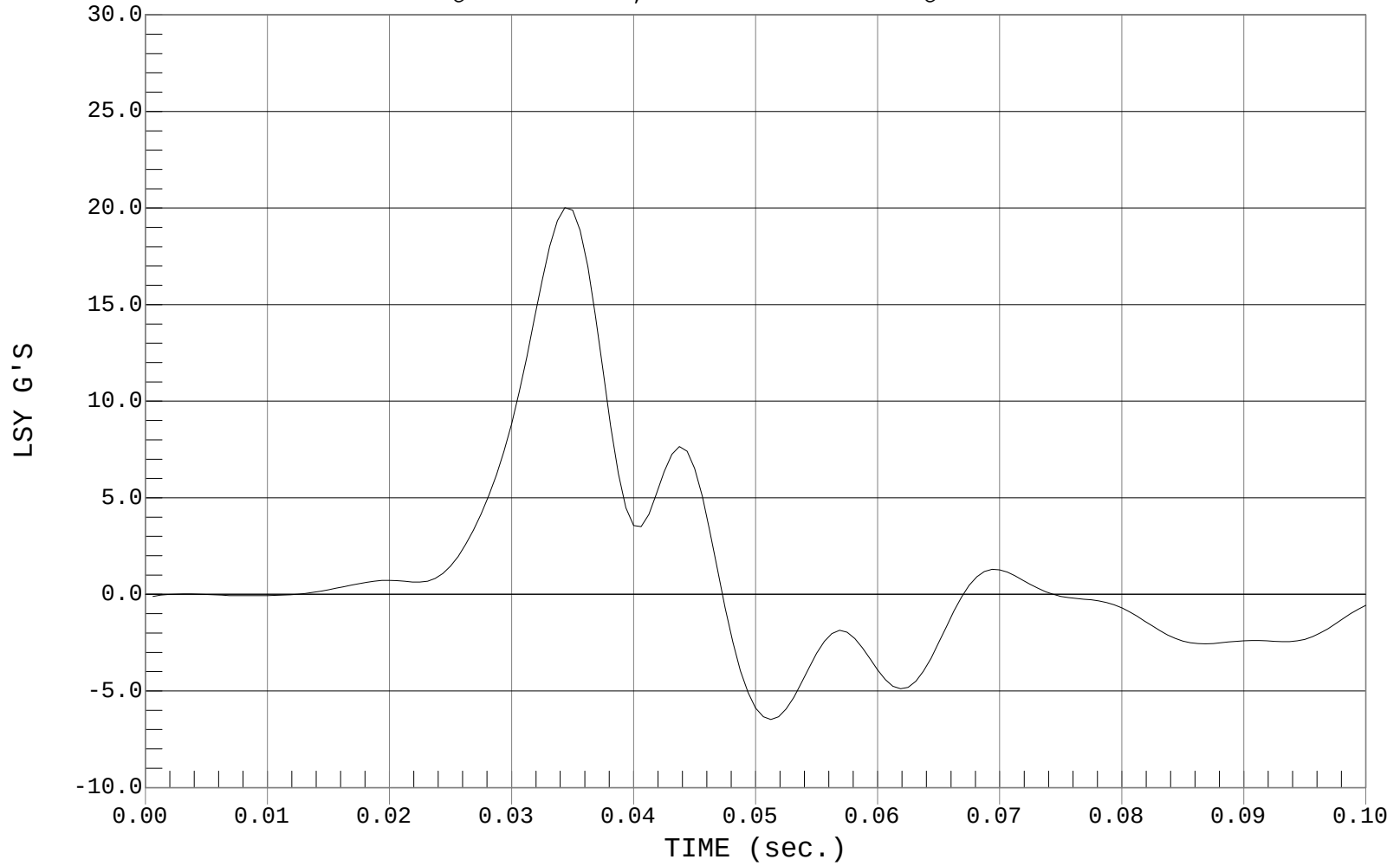
LOWER SPINE ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #037

Test Date: 02-02-01
Speed: 14.05 FT/SEC, 4.28 M/SEC

— 1 LSY, D01162FI.R10

Ymin = -6.48 G'S @ 0.0513 sec., Ymax = 20.03 G'S @ 0.0344 sec.



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

Date: 2/2/01
Dummy Serial Number: 037
Test Number: D01163

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	17
Probe Speed (m/s)	4.27 – 4.33	4.27
Pelvis Acceleration (g's)	40 – 60	46

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



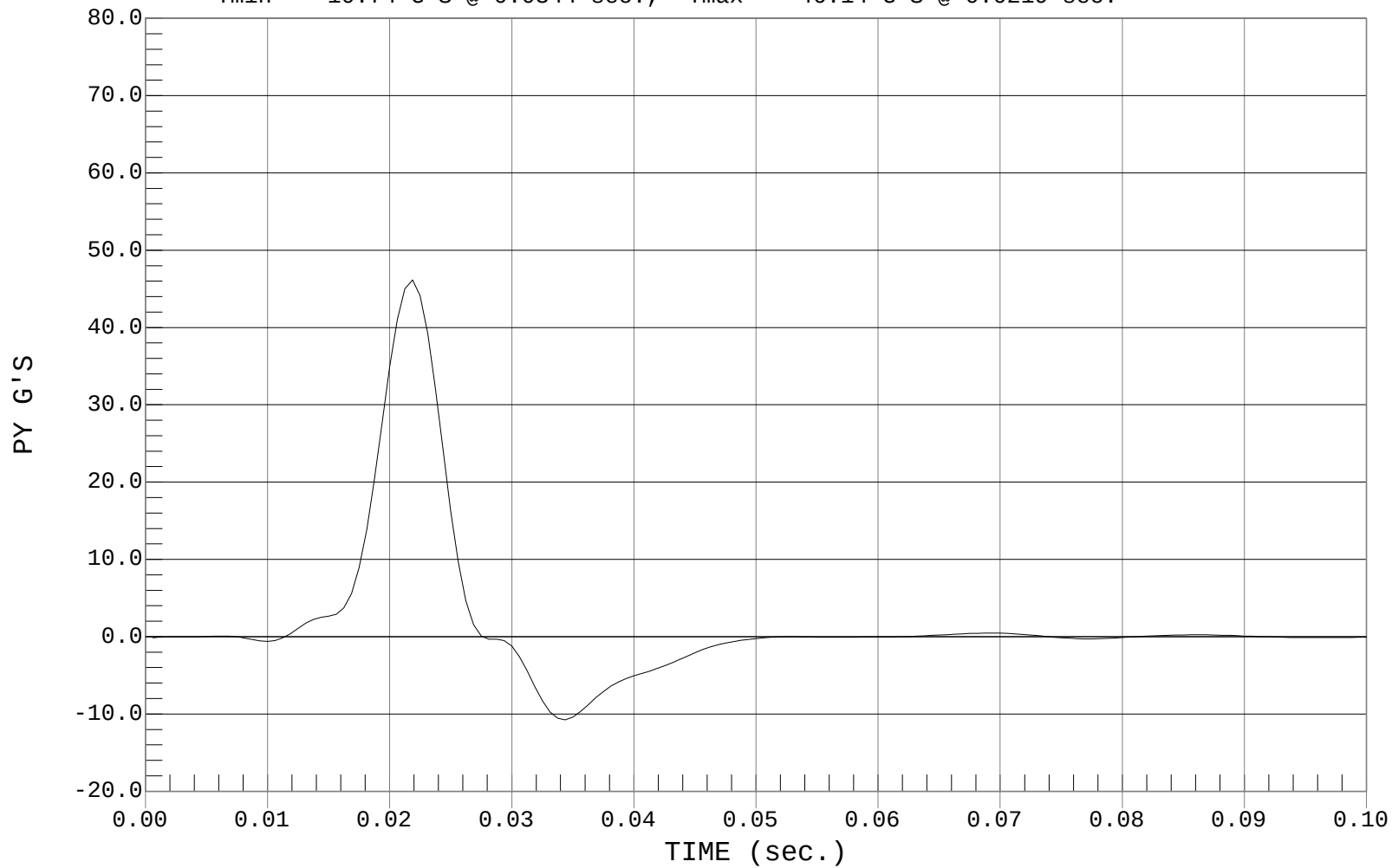
PELVIS ACCELERATION

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #037

Test Date: 02-02-01
Speed: 14.01 FT/SEC, 4.27 M/SEC

— 1 PY, D01163FI.R11

Ymin = -10.74 G'S @ 0.0344 sec., Ymax = 46.14 G'S @ 0.0219 sec.



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

Date: 2/2/01
Dummy Serial Number: 037
Test Number: D01164

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.9
Relative Humidity (%)	10 – 70	18
Force @ 12.7 mm	104 – 162	141
Force @ 19 mm	163 – 222	193
Force @ 25.4 mm	222 – 280	258
Force @ 33 mm	325 - 391	357

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



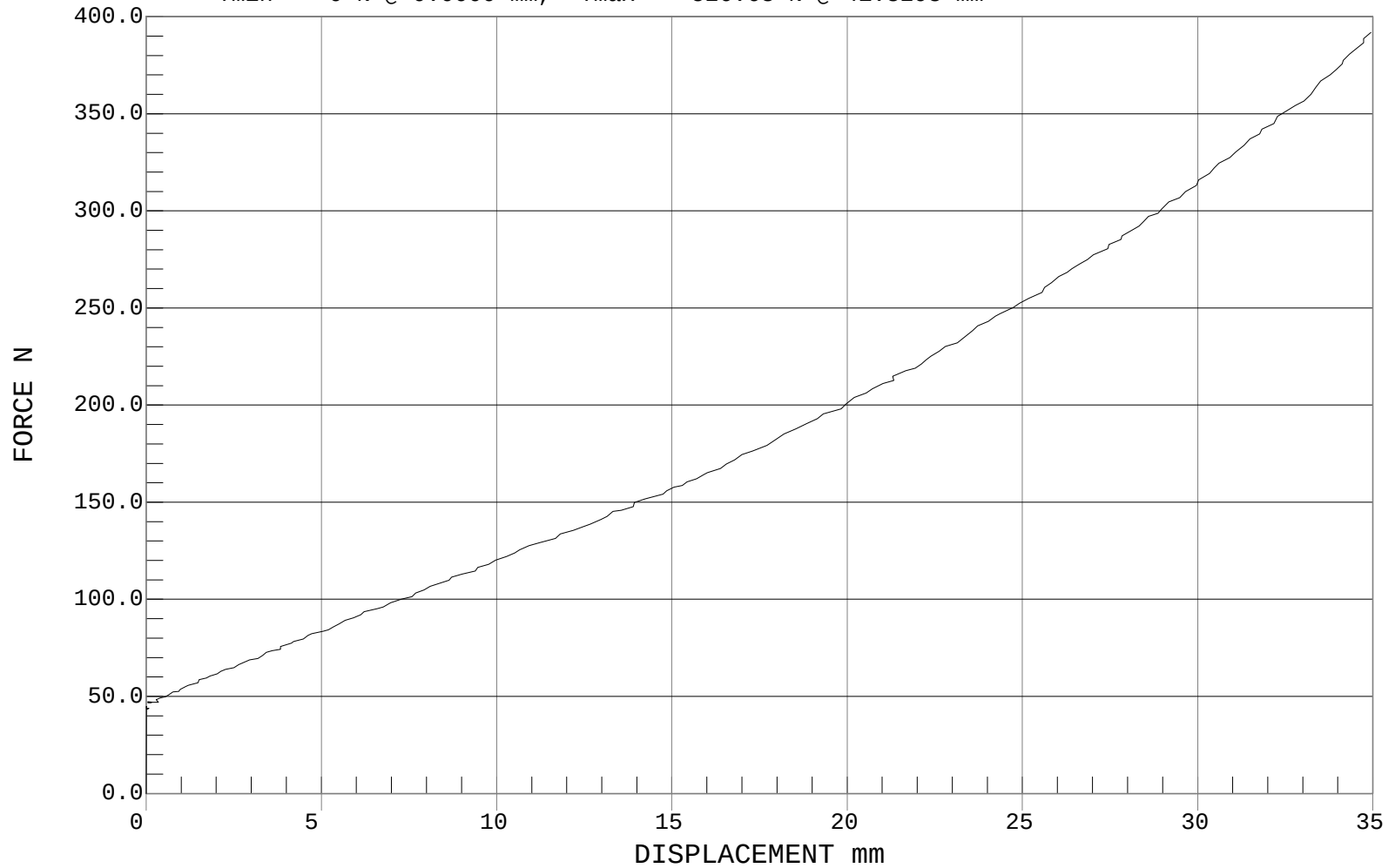
ABDOMEN COMPRESSION

Test Desc.: DUMMY CALIBRATION - ABDOMEN COMPRESSION
Component: DUMMY # 037

Test Date: 02-02-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

1 FORCE, D01164FC.F16

Ymin = 0 N @ 0.0000 mm, Ymax = 526.63 N @ 41.8298 mm



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

Date: 2/2/01
Dummy Serial Number: 037
Test Number: D01165

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.8
Relative Humidity (%)	10 – 70	18
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	101.3
Force @ 30°	151.2 – 204.6	153.4
Force @ 40°	204.6 – 258.0	217.6
Return Angle	12° maximum	8

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



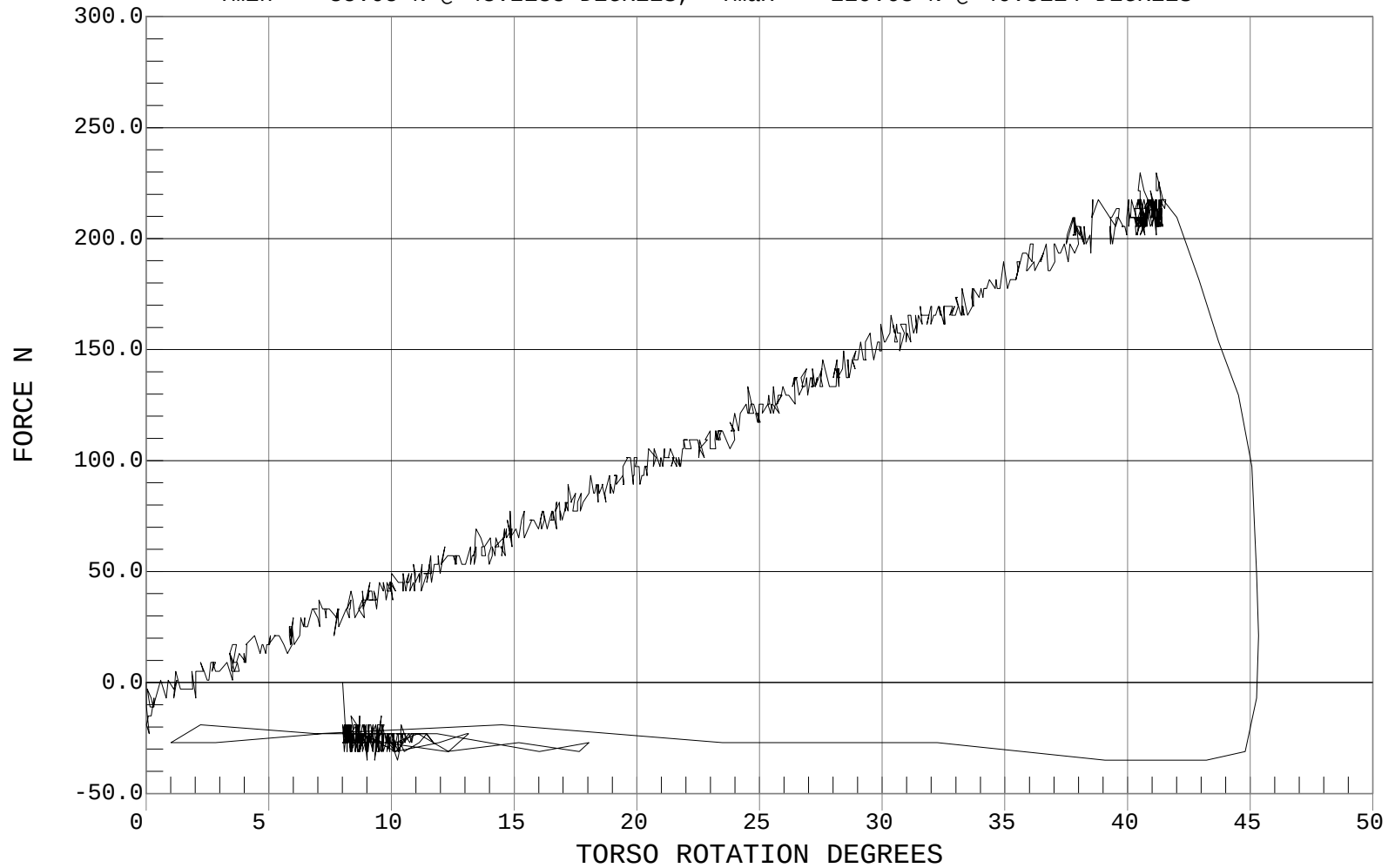
LUMBAR FLEXION

Test Desc.: DUMMY CALIBRATION - LUMBAR FLEXION
Component: DUMMY # 037

Test Date: 02-02-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 FORCE, D01165FC.F14

Ymin = -35.05 N @ 43.2138 DEGREES, Ymax = 229.63 N @ 40.5114 DEGREES



DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Dummy Serial Number: 037

Inspected By: Tim Michnay

Date: 2/5/01

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

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

CERTIFICATION DATA

Dummy Serial Number: 036

Calibration Test Results Summary

Dummy Serial Number: 036

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Dummy Serial Number: 036

Date of Verification: 2/5/01

Test Number: D0115

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH-Seated Height (mm)	889 – 909	901
RH-Rib Height (mm)	501 – 521	505
HP-Hip Pivot Height (mm)	99 ref.	99
RD-Rib From Back Line (mm)	229 - 241	234
KV-Knee Pivot From Back Line (mm)	511 – 526	520
SW-Knee Pivot to Floor (mm)	490 – 505	496
HW – Hip Width (mm)	356 – 391	372

Technician: _____

Approved By:_____

MGA RESEARCH CORPORATION

HEAD DROP TEST

SIDE IMPACT DUMMY (SID)

Date: 2/5/01

Dummy Serial Number: 036

Test Number: D01151

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 - 25.5	21.2
Relative Humidity (%)	10 - 70	20
Peak Resultant Acceleration	210 - 260 g's	220
Peak Lateral Acceleration	< 10 g's	-5
Time Above 100 g.	0.9 - 1.5 msec.	1.2

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



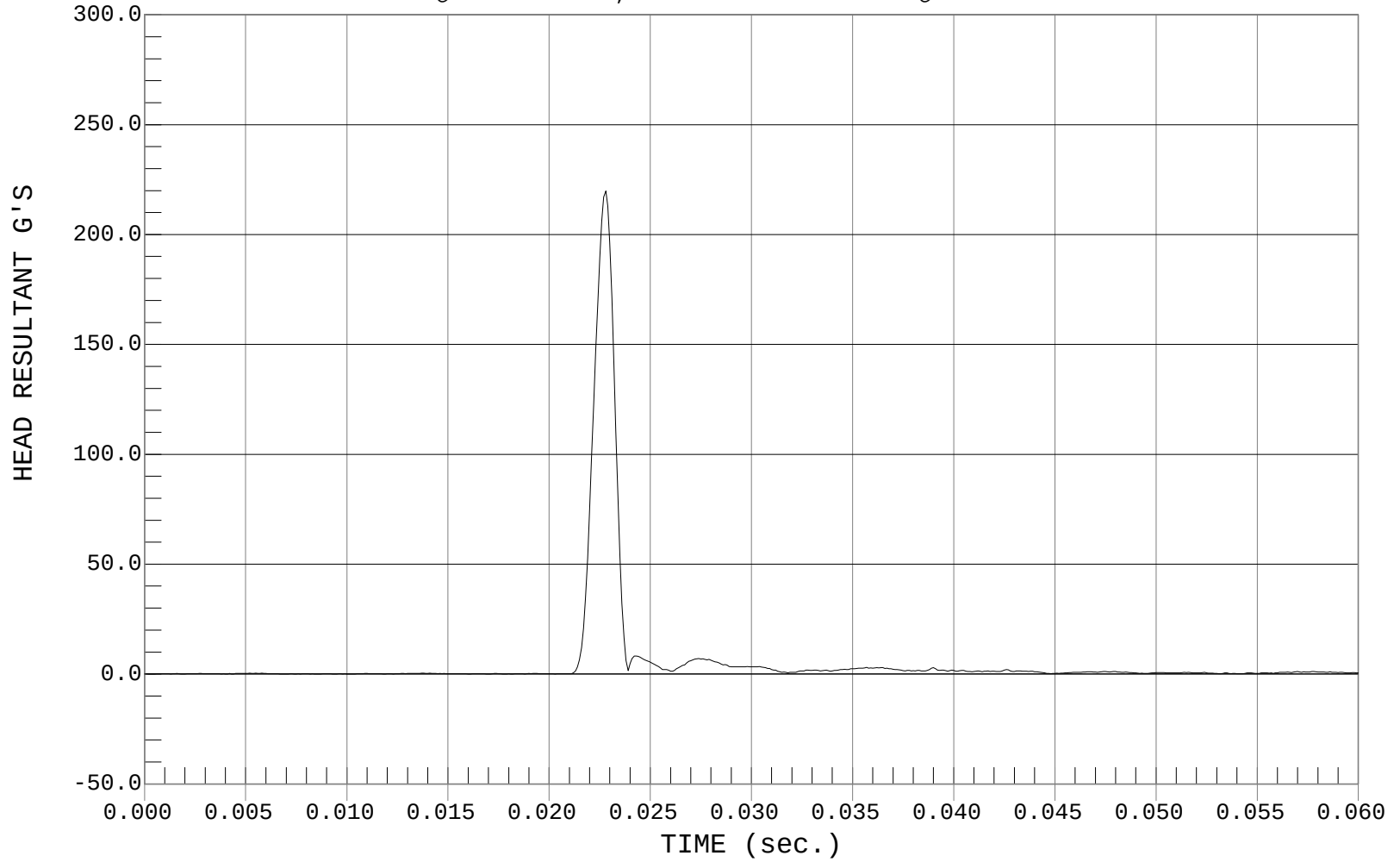
PEAK RESULTANT ACCELERATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #036

Test Date: 02-05-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD RESULTANT ACCELERATION, D01151av.a01

Ymin = .07 G'S @ 0.0002 sec., Ymax = 219.83 G'S @ 0.0228 sec.





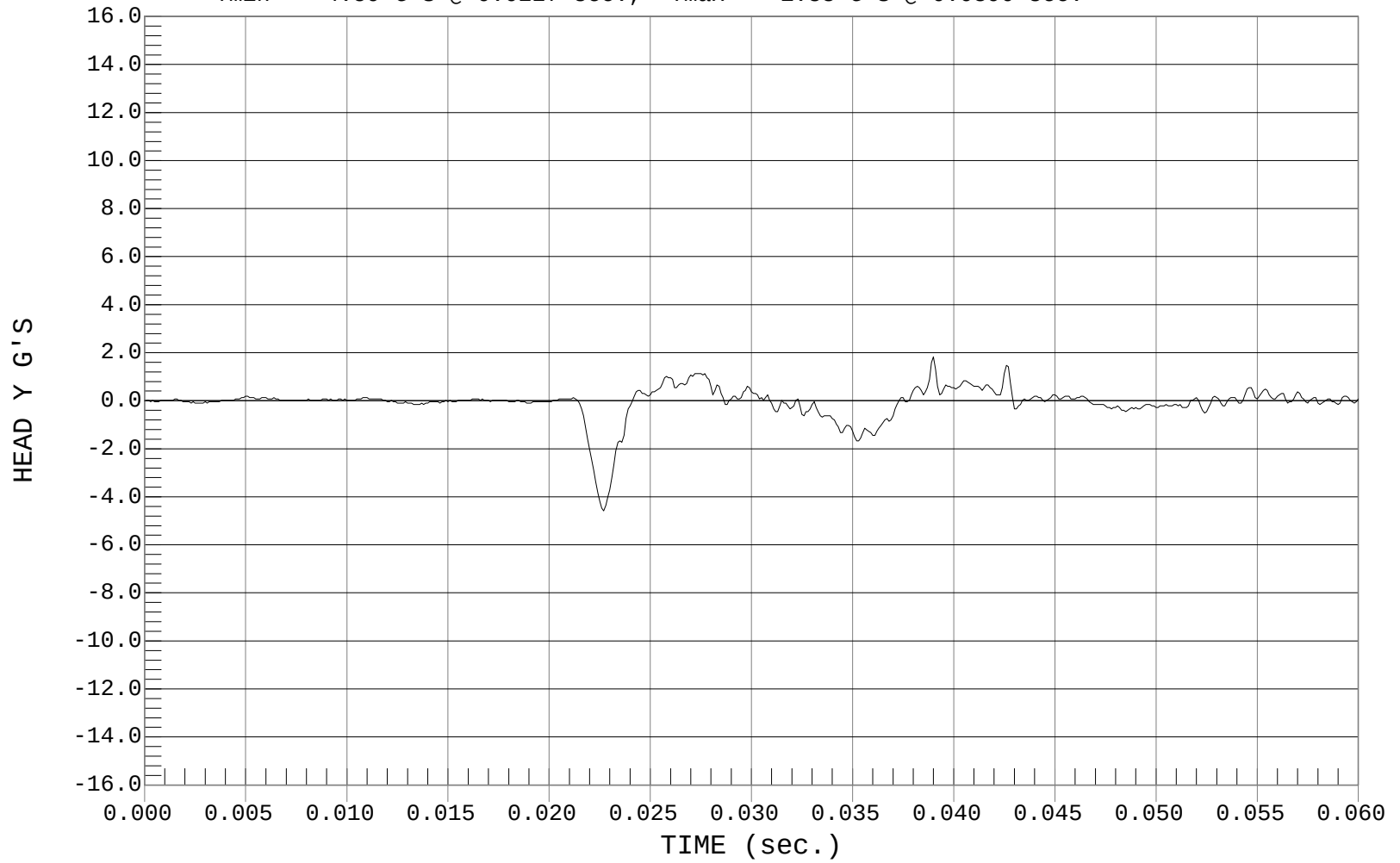
PEAK LATERAL ACCELARATION

Test Desc.: Dummy Calibration - Head Drop
Component: Dummy #036

Test Date: 02-05-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 HEAD Y, D01151AR.A02

Ymin = -4.59 G'S @ 0.0227 sec., Ymax = 1.83 G'S @ 0.0390 sec.



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

Date: 2/2/01
Dummy Serial Number: 036
Test Number: D01152

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.9
Relative Humidity (%)	10 – 70	15
Probe Speed (m/s)	4.27 – 4.33	4.28
Upper Rib (g's)	37 – 46	43
Lower Rib (g's)	37 – 46	45
Lower Spine (g's)	15 - 22	19

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



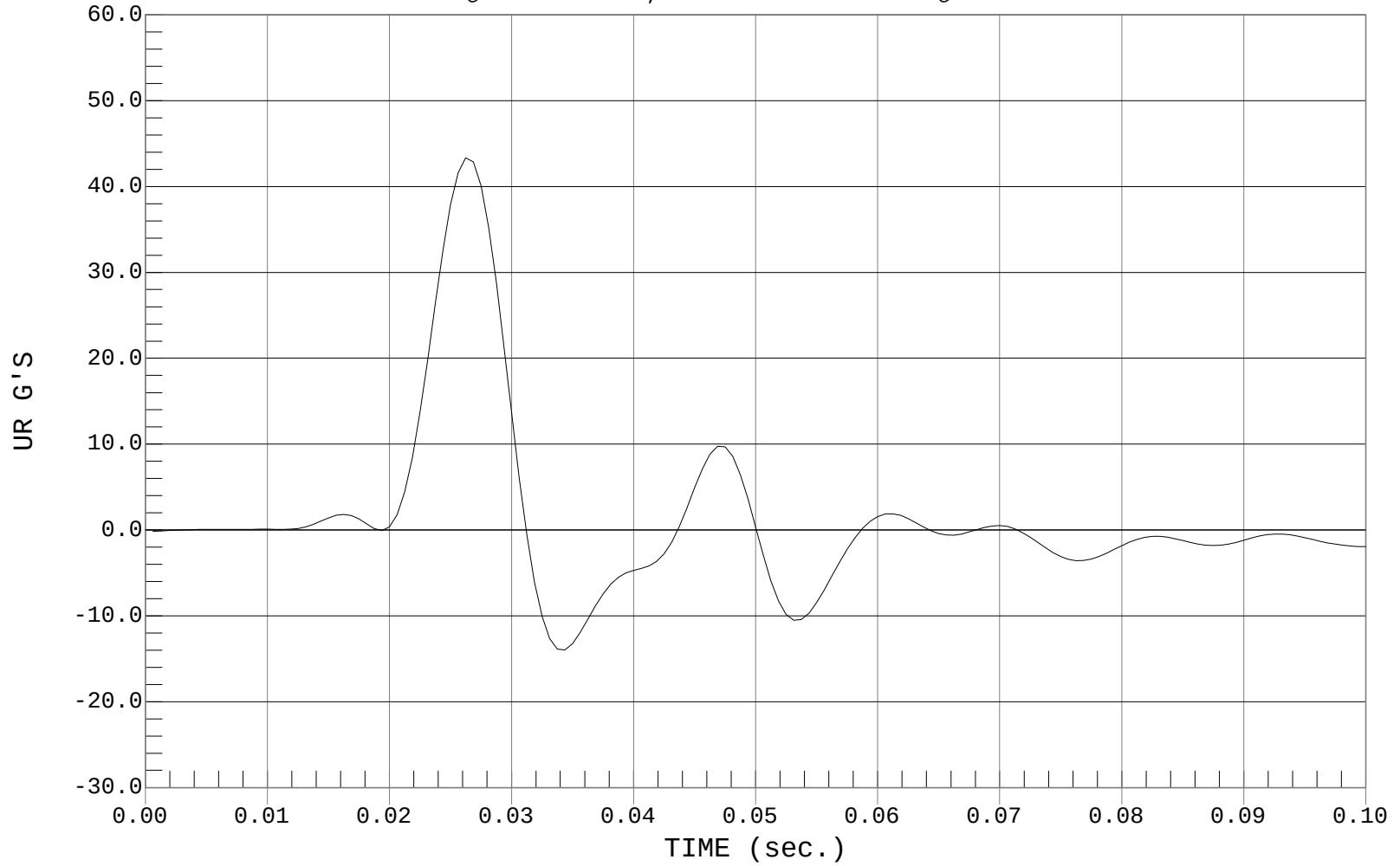
UPPER RIB ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #036

Test Date: 02-02-01
Speed: 14.04 FT/SEC, 4.28 M/SEC

— 1 UR, D01152FI.R08

Ymin = -13.96 G'S @ 0.0344 sec., Ymax = 43.37 G'S @ 0.0263 sec.





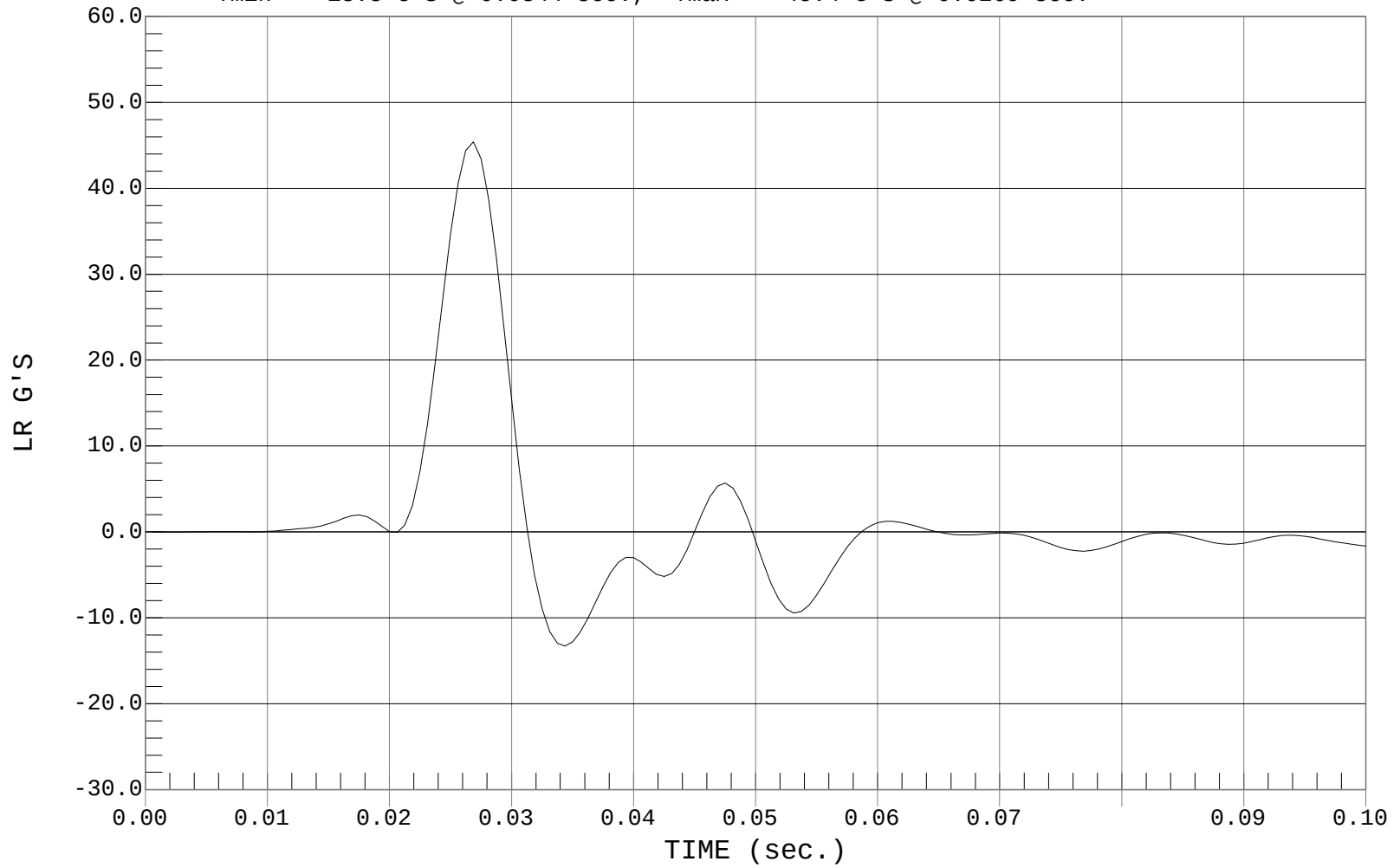
LOWER RIB ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #036

Test Date: 02-02-01
Speed: 14.04 FT/SEC, 4.28 M/SEC

— 1 LR, D01152FI.R09

Ymin = -13.3 G'S @ 0.0344 sec., Ymax = 45.4 G'S @ 0.0269 sec.





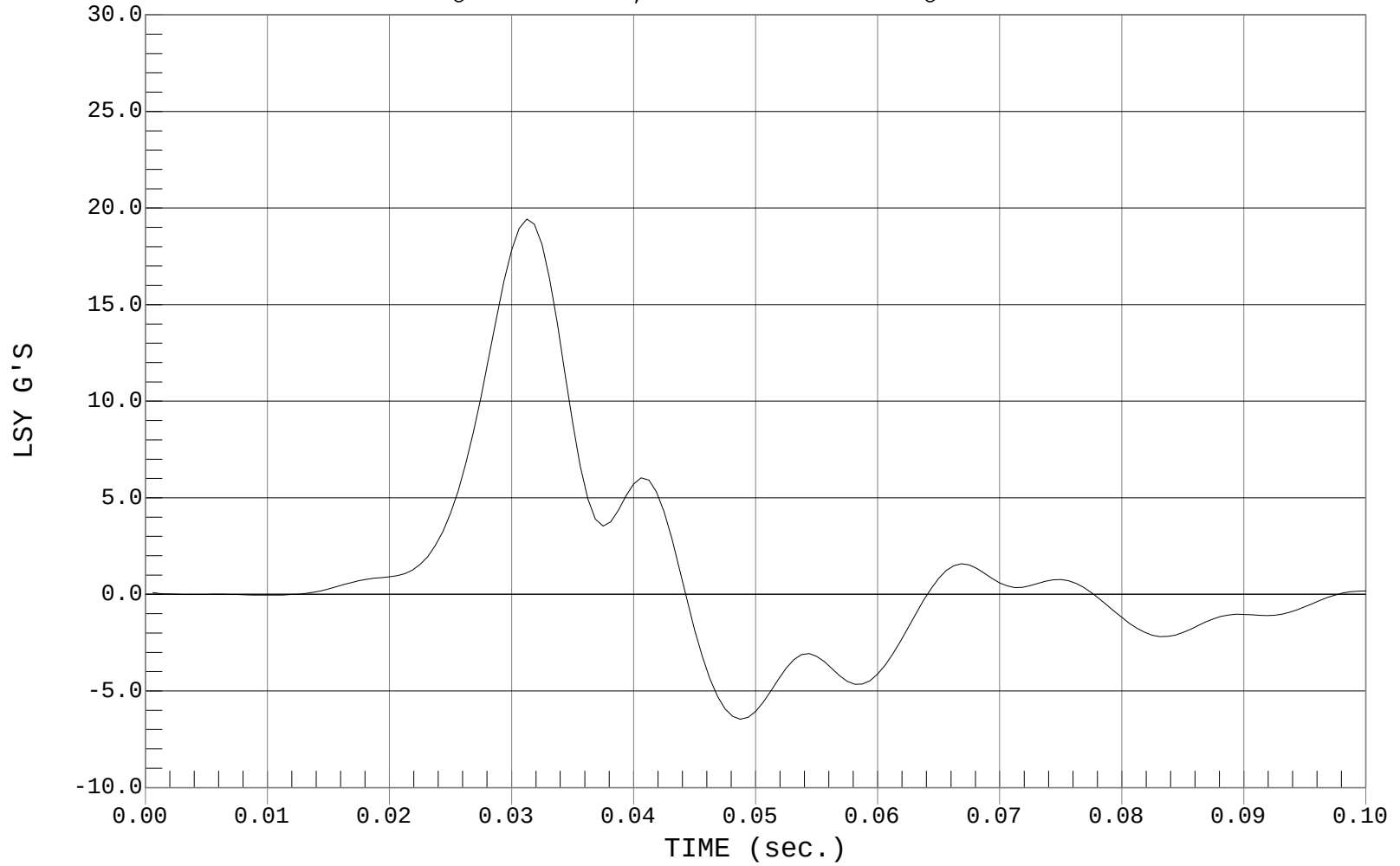
LOWER SPINE ACCELERATION

Test Desc.: Dummy Calibration - Thorax Impact
Component: Dummy #036

Test Date: 02-02-01
Speed: 14.04 FT/SEC, 4.28 M/SEC

— 1 LSY, D01152FI.R10

Ymin = -6.46 G'S @ 0.0488 sec., Ymax = 19.43 G'S @ 0.0313 sec.



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

Date: 2/2/01
Dummy Serial Number: 036
Test Number: D01153

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.9
Relative Humidity (%)	10 – 70	15
Probe Speed (m/s)	4.27 – 4.33	4.28
Pelvis Acceleration (g's)	40 – 60	50

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



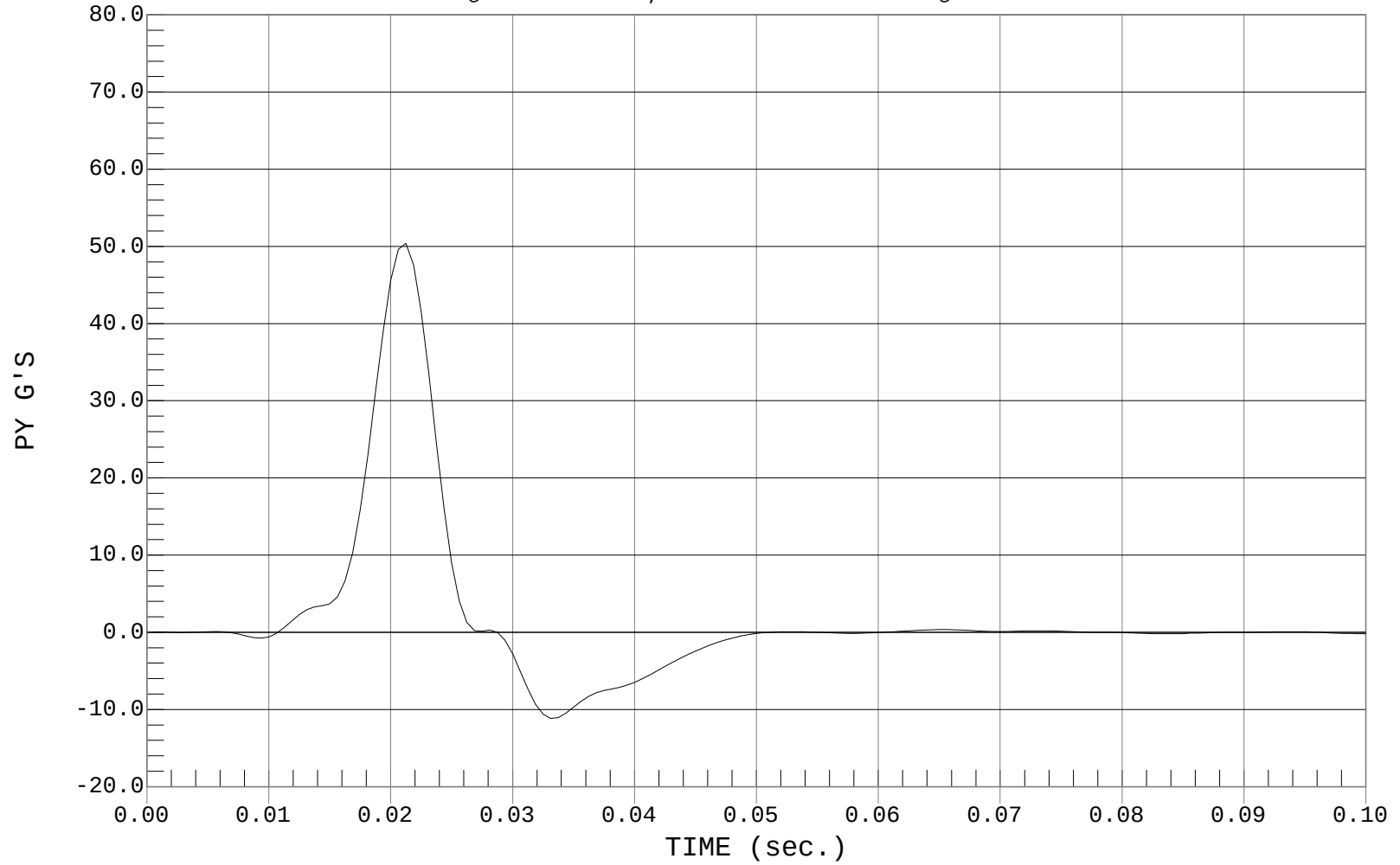
PELVIS ACCELERATION

Test Desc.: Dummy Calibration - Pelvis Impact
Component: Dummy #036

Test Date: 02-02-01
Speed: 14.04 FT/SEC, 4.28 M/SEC

— 1 PY, D01153FI.R11

Ymin = -11.17 G'S @ 0.0331 sec., Ymax = 50.37 G'S @ 0.0213 sec.



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

Date: 2/2/01
Dummy Serial Number: 036
Test Number: D01154

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.9
Relative Humidity (%)	10 – 70	18
Force @ 12.7 mm	104 – 162	147
Force @ 19 mm	163 – 222	201
Force @ 25.4 mm	222 – 280	266
Force @ 33 mm	325 - 391	371

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



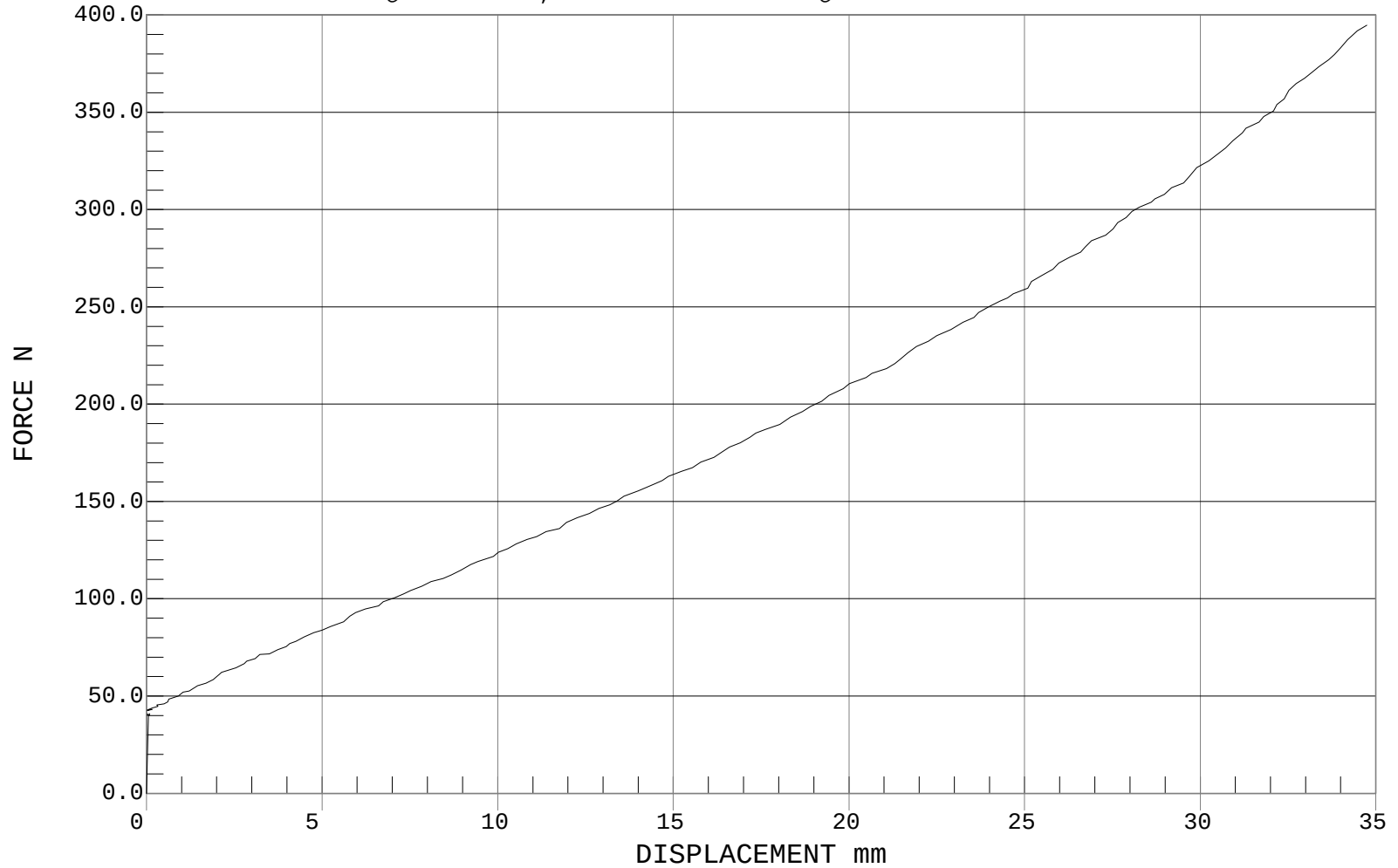
ABDOMEN COMPRESSION

Test Desc.: DUMMY CALIBRATION - ABDOMEN COMPRESSION
Component: DUMMY # 036

Test Date: 02-02-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 FORCE, D01154FC.F16

Ymin = 0 N @ 0.0000 mm, Ymax = 529.51 N @ 42.0421 mm



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

Date: 2/2/01
Dummy Serial Number: 036
Test Number: D01155

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	20.8
Relative Humidity (%)	10 – 70	18
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	113.1
Force @ 30°	151.2 – 204.6	177.2
Force @ 40°	204.6 – 258.0	257.4
Return Angle	12° maximum	3

TEST MEETS SPECIFICATIONS

Technician: _____

Approved By: _____



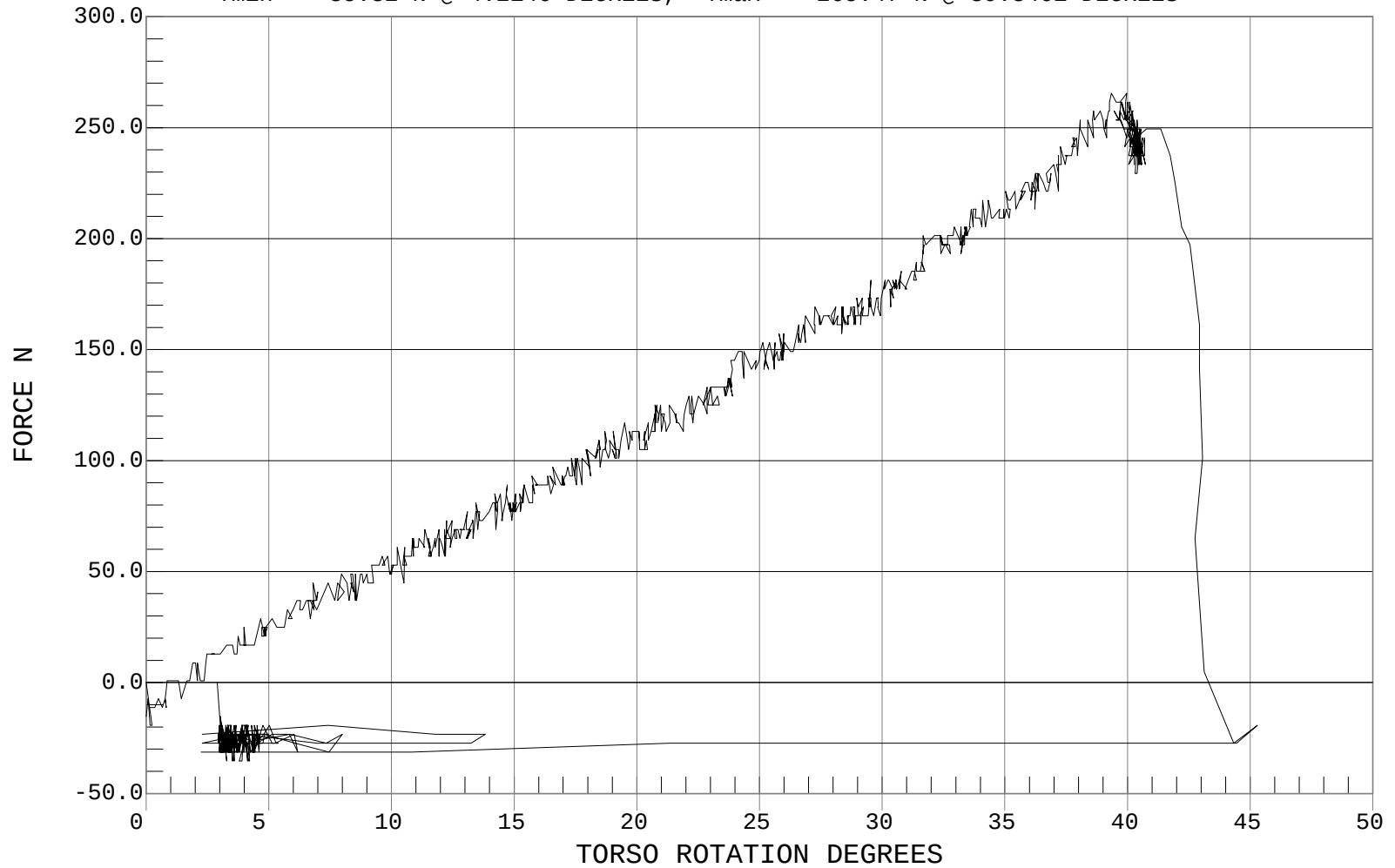
LUMBAR FLEXION

Test Desc.: DUMMY CALIBRATION - LUMBAR FLEXION
Component: DUMMY # 036

Test Date: 02-02-01
Speed: 0.00 FT/SEC, 0.00 M/SEC

— 1 FORCE, D01155FC.F14

Ymin = -35.32 N @ 4.2146 DEGREES, Ymax = 265.47 N @ 39.3461 DEGREES



DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Dummy Serial Number: 036

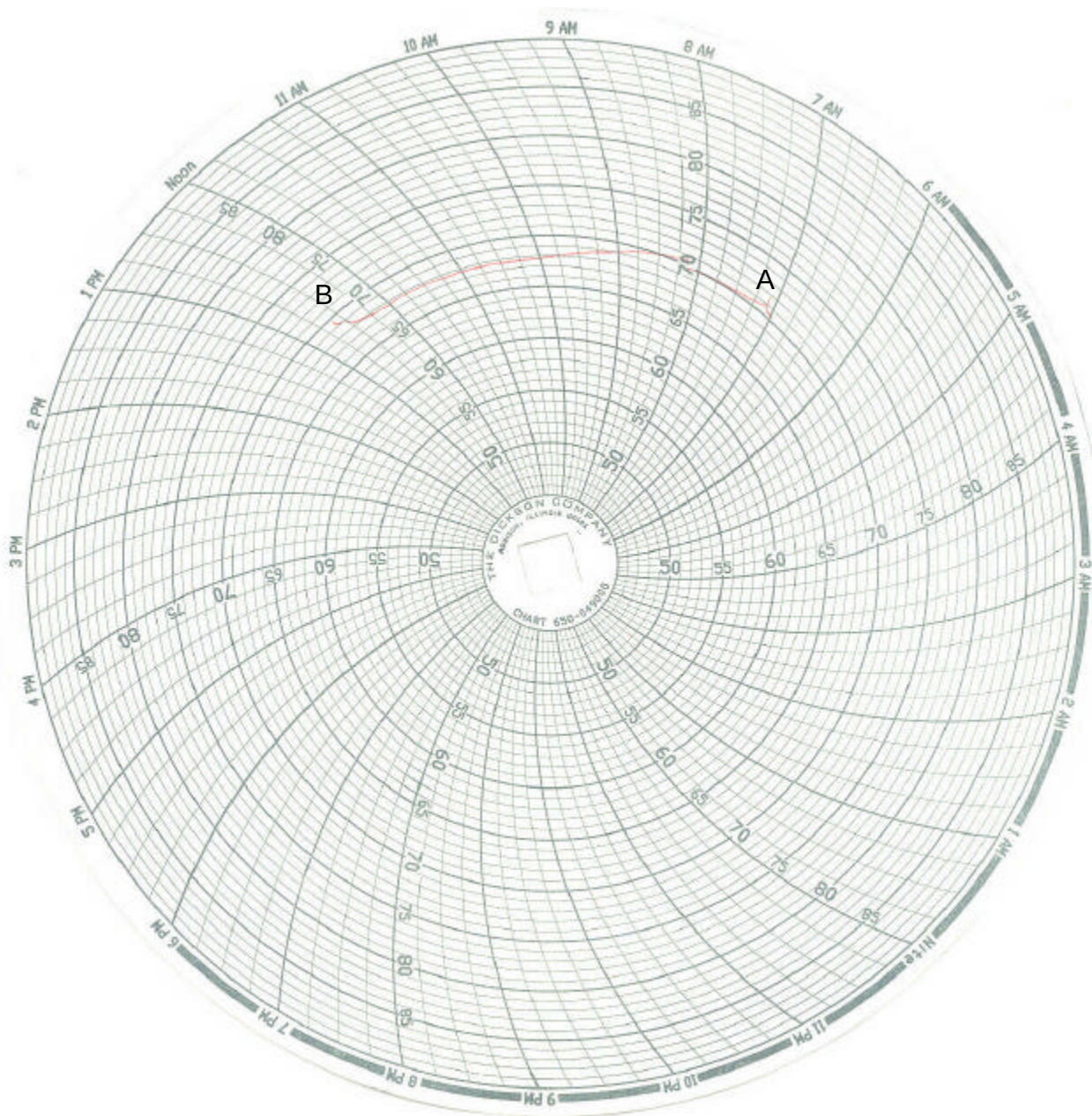
Inspected By: Tim Michnay

Date: 2/5/01

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

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

VEHICLE AND DUMMY TEMPERATURE



A = Dummies installed in vehicle at 7:10 a.m.

B = Test conducted at 12:50 p.m.

APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA

	INSTRUMENTS FOR DRIVER DUMMY NO. 037		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AN8M6	Endevco	November 17, 2000
Lower Rib Y	ALEJ1	Endevco	October 2, 2000
Lower Spine Y	ALDY8	Endevco	November 17, 2000
Pelvis Y	AGP28	Endevco	August 31, 2000
Upper Rib Redundant Y	AN8P9	Endevco	November 17, 2000
Lower Rib Redundant Y	ALDP3	Endevco	October 2, 2000
Lower Spine Redundant Y	AP0E1	Endevco	November 17, 2000
Pelvis Redundant Y	AJ8T5	Endevco	August 31, 2000

	INSTRUMENTS FOR PASSENGER DUMMY NO. 036		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AP138	Endevco	December 19, 2000
Lower Rib Y	J11361	Endevco	October 3, 2000
Lower Spine Y	AMP12	Endevco	November 17, 2000
Pelvis Y	J10411	Endevco	October 2, 2000
Upper Rib Redundant Y	AP0G2	Endevco	December 19, 2000
Lower Rib Redundant Y	J12465	Endevco	October 3, 2000
Lower Spine Redundant Y	AGWA4	Endevco	November 17, 2000
Pelvis Redundant Y	ALEC1	Endevco	October 2, 2000

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	I25-F09	Entran	December 13, 2000
Moving Barrier CG Y	I25-F07	Entran	December 13, 2000
Moving Barrier CG Z	I25-F08	Entran	December 13, 2000
Moving Barrier Rear Axle X	G13-B07	Entran	December 13, 2000
Moving Barrier Rear Axle Y	F11-G02	Entran	January 4, 2001
Left Mid A-Post Y	F18-G13	Entran	October 4, 2000
Left Lower A-Post Y	I25-F03	Entran	November 15, 2000
Left Mid B-Post Y	J04-F10	Entran	August 10, 2000
Left Lower B-Post Y	J13-F22	Entran	November 17, 2000
Rear Floorpan Above Axle X	K16-X02	Entran	December 14, 2000
Rear Floorpan Above Axle Y	I25-J10	Entran	September 14, 2000
Rear Floorpan Above Axle Z	D05-R16	Entran	August 10, 2000
Driver Seat Track Y	I25-J06	Entran	August 10, 2000
Right Side Sill at Front Seat X	J10-E03	Entran	December 14, 2000
Right Side Sill at Front Seat Y	F07-A20	Entran	September 14, 2000
Right Side Sill at Front Seat Z	G01-J04	Entran	December 14, 2000
Right Side Sill at Rear Seat X	A09-G02	Entran	September 12, 2000
Right Side Sill at Rear Seat Y	A09-G07	Entran	December 13, 2000
Right Side Sill at Rear Seat Z	I25-F04	Entran	December 13, 2000
Left Side Sill at Front Seat Y	G01-J05	Entran	September 14, 2000
Left Side Sill at Rear Seat Y	D05-R25	Entran	August 8, 2000
Right Rear Occupant Compartment Y	K16-X06	Entran	September 12, 2000
Vehicle CG X	J16-F02	Entran	November 17, 2000
Vehicle CG Y	I18-E02	Entran	August 10, 2000
Vehicle CG Z	H02-J14	Entran	September 14, 2000

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

All Entran accelerometers are Model No. EGE-72